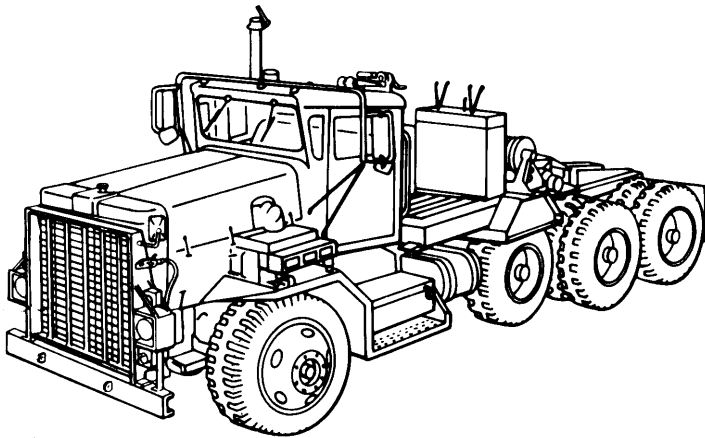


TM 9-2320-270-20-1

TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE

VOLUME 1 OF 3



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**TRUCK, TRACTOR, COMMERCIAL
HEAVY EQUIPMENT TRANSPORTER
(C-H ET) 85,000 GVWR, 8 x 6, M911
(NSN 2320-01-025-3733)**

JUNE 86

HEADQUARTERS, DEPARTMENT OF THE ARMY

Change

No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 14 September 1989

ORGANIZATIONAL MAINTENANCE
VOLUME 1 OF 3
TRUCK, TRACTOR, COMMERCIAL
HEAVY EQUIPMENT TRANSPORTER
(C-HET) 85,000 GVWR, 8X6, M911
(NSN 2320-01-025-3733)

TM 9-2320-270-20-1, dated 10 June 1986, is changed as follows:

1. Change to narrative material is indicated by a vertical bar in the outside margin of the page. Added or revised illustrations are indicated by a vertical bar adjacent to the identification number.
2. Remove old pages and insert new pages as indicated below..
3. File this change sheet in front of the publication for reference purposes.

Remove Pages

Insert Pages

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By Order of the Secretary of the Army

Official:

WILLIAM J. MEEHAN II
Brigadier General, United States Army
The Adjutant General

CARL E. VUONO
General United States Army
Chief of Staff

Distribution:

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flashpoint is 100°F to 138°F (38° to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

WARNING

Methyl alcohol/methanol is toxic and burns easily. Fumes are explosive. Do not smoke or allow open flame nearby when using methyl alcohol/methanol. Do not drink methyl alcohol/methanol, it is extremely poisonous. If methyl alcohol/methanol is swallowed, get medical aid immediately.

WARNING

Do not touch positive lead on back of alternator with anything metal unless batteries are disconnected. You could damage alternator or cause personal injury.

WARNING

Stay clear of fan while engine is being cranked. Failure to do so could result in serious personal injury or death.

WARNING

Ether is highly flammable and explosive. Do not smoke or have open flame near engine compartment when troubleshooting ether starting kit. Inhaling ether may cause drowsiness. If ether has been inhaled, get fresh air immediately. Failure to observe these precautions could cause injury to personnel.

WARNING

Do not touch parts and leads on circuit board. Electric charge maybe stored in capacitor to cause injury.

WARNING

This procedure includes converter stall test. When performing converter stall test, vehicle must be blocked and parking and service brakes must be applied. Keep personnel clear of vehicle and its travel path in the event of brake failure or inadequate blocking. Do not maintain stalled condition longer than 30 seconds. With transmission in neutral, run engine at 1,200 to 1,500 rpm for 2 minutes to cool oil between tests. To prevent overheating transmission fluid, closely watch transmission OIL TEMP. gage and do not allow temperature to exceed 300°F (149°C). Failure to observe this warning could result in injury to personnel.

WARNING

Be sure to wear safety goggles or lenses when venting air lines. Compressed air and particles removed by compressed air can cause damage to your eyes.

WARNING

Hydraulic jacks, such as the one supplied with truck, are intended for lifting truck, not supporting vehicle after it is raised. Do not get under M911 after it is raised unless it is properly supported with trestles or blocks. Truck could fall on you causing injury or death.

WARNING

Compressed air used for blowing away chips, dirt, etc., must leave nozzle at less than 30 psi (207 kPa) to prevent personal injury. Be certain that nozzle is rated to provide a maximum of 30 psi (207 kPa). Be sure to wear safety goggles or lenses when using compressed air. Compressed air and particles moved by compressed air can cause damage to your eyes.

WARNING

Electrical parts solvent cleaning compound (trichlorotrifluoroethane) is flammable, and reacts violently with aluminum, titanium, barium, lithium, samarium, and sodium potassium. Cleaning compound fumes displace air and it maybe carcinogenic. Boiling point is 114°F (46°C). Do not wear jewelry. Wear rubber gloves and use only in well ventilated area. Avoid contact with skin, eyes, and clothes and do not breathe vapors. Do not use near open flame or excessive heat. If you become dizzy while using cleaning compound, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

WARNING

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

WARNING

Although battery ground cable must be connected to test electrical circuit voltage, disconnect battery ground cable before doing resistance test or replacing parts. This will keep you from getting shocked and prevent damage to parts and equipment.

WARNING

No open flames, welding, grinding, smoking or use of heat producing devices permitted nearby when using fuel. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

WARNING

Be sure to wear safety goggles or lenses when using compressed air. Compressed air and particles moved by compressed air can cause damage to your eyes.

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 swiftly moved to a segregation area away from the worksite. 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

Some parts are heavy. Be careful when handling them. Lifting equipment is needed when parts weigh over 50 pounds (23 kg) for a single person lift, over 100 pounds (45 kg) for a two person lift, and over 150 pounds (68 kg) for a three or more person lift. Do not try to handle heavy parts without lifting equipment. Keep clear of heavy parts supported only by lifting equipment. Failure to observe this precaution could cause serious injury or death of personnel.

WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted near fuel tank and fuel lines during maintenance unless the fuel tank has been cleaned and purged of all flammable liquids and vapors. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

WARNING

Ether fumes are flammable, under pressure, and can explode. To avoid serious injury or death, do not smoke, allow open flame nearby, or hit the ether cartridge with tools,

WARNING

Be careful when removing radiator cap. If engine is hot, escaping steam could burn you. Using a rag, cover radiator cap to protect your hand. Unscrew cap just enough to allow any built-up steam to escape. When all pressure has been relieved, unscrew cap the rest of the way, and take off of radiator.

WARNING

Make sure battery ground cable is disconnected before doing this task. Failure to disconnect battery ground cable can cause personal injury and damage to electrical system.

WARNING

Rubber cement and its fumes burn easily. Do not smoke or have open flame nearby while using. Use in well-ventilated area. Failure to observe these precautions can cause serious burns to personnel.

WARNING

Do not touch parts and leads on power supply. Enough of a charge maybe stored in one of the capacitors to cause injury.

WARNING

Make sure all pressure is drained from air system before taking off switch. Parts under pressure can, when removed, fly off with great force causing injury to personnel.

WARNING

Do not remove sending unit while engine is hot. Hot coolant can cause burns to personnel.

WARNING

Do not remove high water temperature switch while engine is hot. Hot coolant can cause burns to personnel.

WARNING

Do not start engine until shutdown solenoid works properly, without binding. If shutdown solenoid linkage is not properly adjusted, engine may be impossible to shutdown resulting in engine runaway conditions which could cause serious injury or death.

WARNING

Do not smoke, use open flame, or allow sparks near batteries. the mixture of oxygen and hydrogen gases released from batteries is highly flammable and can explode causing serious injury or death.

WARNING

Do not let tools touch battery and truck or touch between battery terminals. short circuit will result which will make tools very hot and can cause arcing which may cause battery to explode. Failure to observe these precautions could cause serious injury to personnel.

WARNING

To reduce the possibility of injury and damage to equipment, disconnect ground cable first whenever replacing battery cables.

WARNING

Electrolyte and battery corrosion can cause burns. Wear safety goggles and gloves. If electrolyte or battery corrosion contacts eyes, skin, or clothing, flush immediately with large amounts of clean water, neutralize with baking soda solution, and seek medical attention.

WARNING

Do not pry against batteries to move stop angles. Battery case could break and electrolyte could run out causing burns to personnel.

WARNING

Do not overtighten battery hold-down frame, nut, and wing nuts. Battery case may crack causing electrolyte to run out resulting in burns to personnel.

WARNING

This vehicle has been designed to operate safely and efficiently within the limits specified in this TM. Operation beyond these limits is prohibited IAW AR 70-1 without written approval from the Commander, U.S. Army Tank-Automotive Command, AITN: AMSTA-CM-S, Warren, MI 48397-5000.

TECHNICAL MANUAL }
 NO. 9-2320-270-20-1 }

HEADQUARTERS
 DEPARTMENT OF THE ARMY
 Washington, D. C., 14 June 1986

ORGANIZATIONAL MAINTENANCE MANUAL

**TRUCK, TRACTOR, COMMERCIAL
 HEAVY EQUIPMENT TRANSPORTER (C-HET)
 85,000 GVWR, 8 X 6, M911
 (NSN 2320-01-025-3733)**

CURRENT AS OF NOVEMBER 1985

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, US Army Tank-Automotive Command, AITN: AMSTA-MB, Warren, MI 48397-5000. A reply will be sent to you.

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HOW TO USE THIS MANUAL

1. MANUAL OVERVIEW

This manual is divided into three volumes: TM9-2320-270-20-1, TM9-2320-270-20-2, and TM 9-2320-270-20-3. It provides Organizational Maintenance troubleshooting and maintenance information.

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

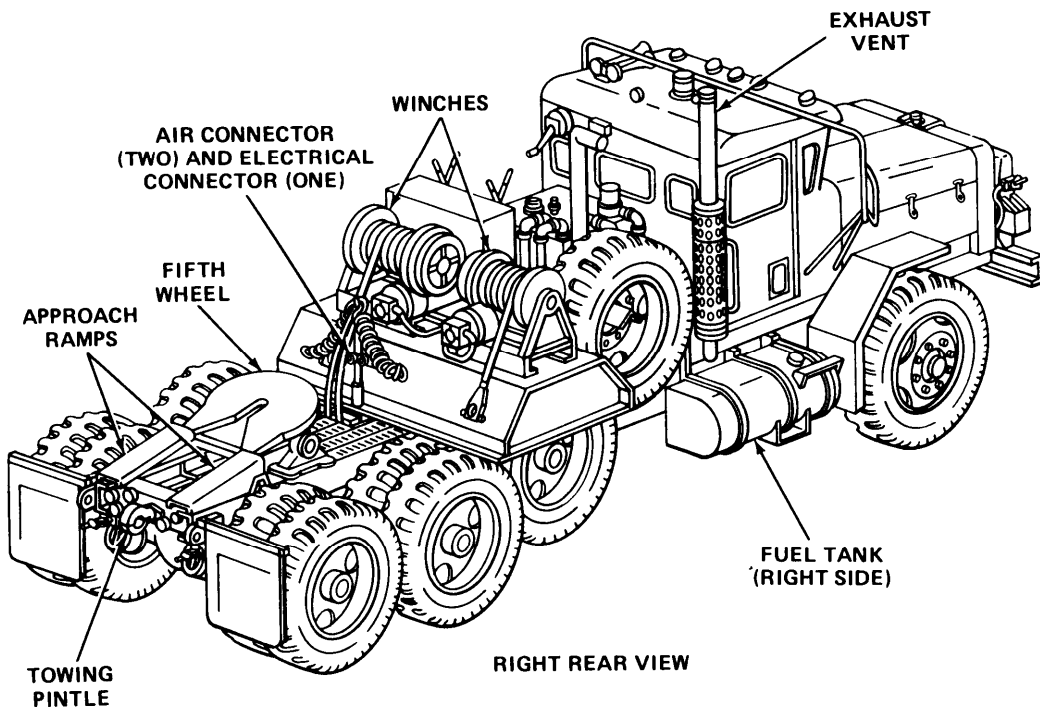
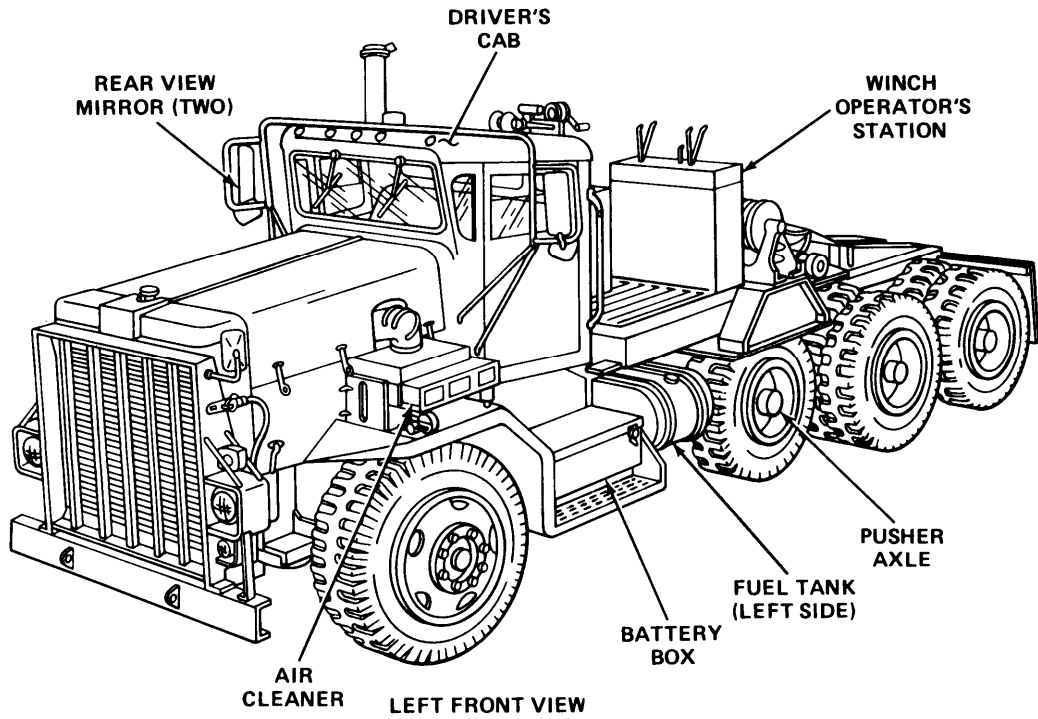
- a. Cover index for access to important information.
- b. General maintenance instructions which provide useful information for the novice but prevent the need for routine tasks to be repeated throughout the manual.
- c. Troubleshooting and maintenance procedures written in tasks, each conforming to 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 List).
- d. An alphabetical index at the head of each section and an overall index in the rear of each volume.
- e. RPSTL names for the parts and system used whenever practical to aid cross accessing between the RPSTL and the manual. Adjectives have been added, when necessary, to clarify one part or system from another.
- f. Maintenance procedures in a three column, step by step format minimizing the number of words used and allowing you to do each task without having to look for needed information.
- g. Tools, parts, materials, and equipment conditions listed at the head of each task allowing you to acquire all things needed for each task before beginning.
- h. Each troubleshooting procedure takes you step by step from most probable and easiest to repair faults, to least likely and most difficult to repair faults.
- i. Electrical, air, and hydraulic diagrams systems are included in Appendix F.
- j. Routine repair and maintenance services listed in tabular format under the heading of Preventive Maintenance Checks and Services (PMCS).

HOW TO USE THIS MANUAL - CONTINUED

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 Troubleshooting Symptom Index (page 3-1).
- b. Go to the troubleshooting procedure for that malfunction and locate the defective assembly and the repair or replacement work needed.
- c. There are two ways to find the maintenance procedure you need. Either look up the name of the defective assembly in the alphabetical index at the rear of each volume, or find the system on the cover index, go to the first page of the section for that system, and use the alphabetical index at the beginning of each section.
- d. Go to the task for the assembly that needs repair or replacement.
- e. Refer to the heading "This Task Covers" for the procedures you need within that task.
- f. Look under the heading "Equipment Condition" and determine what other tasks must be performed before starting the main task.
- g. Familiarize yourself with the main task, the tasks listed under Equipment Condition, and any general maintenance instructions referenced in the task before beginning. You must familiarize yourself with the entire maintenance procedure before beginning the maintenance task.
- h. Acquire the tools and materials listed in the Initial Setup as well as parts you have determined must be replaced.
- i. Make sure assistance is available if more than one person is called out in Initial Setup.
- j. Perform maintenance work as instructed in the task.
- k. Always observe the warnings in each procedure and the general warnings in the front of the manual. They are for your protection.
- l. Observe all cautions to prevent damage to the equipment.
- m. When finished with task, operate that part of the equipment as described in TM 9-2320-270-10 to be sure you have made an effective repair.



TA239579

CHAPTER 1

INTRODUCTION

OVERVIEW

This chapter contains data to familiarize you with the purpose and capabilities of the M911 Truck Tractor. It also contains a brief description of the M911 Truck Tractor systems and components.

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Section I. GENERAL INFORMATION

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SCOPE

Type of Manual: Organizational Maintenance.

Model Number and Equipment Name: M911 Truck Tractor, Commercial Heavy Equipment Transporter (C-H ET).

Purpose of Equipment: Used to pull C-HET Semitrailer.

MAINTENANCE FORMS AND RECORDS

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

EQUIPMENT IMPROVEMENT REPORT AND MAINTENANCE DIGEST (EIR MD)

The semiannual Equipment Improvement Report and Maintenance Digest, TB 43-0001-40 series, contains valuable field information on the equipment covered in this manual. The information in the TB 43-0001-40 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 43-0001-40 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 310-1 (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 750-244-6, Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use (US Army Tank-Automotive Command).

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your M911 Truck Tractor 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. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at Commander, US Army Tank-Automotive Command, AITN: AMSTA-QRT, Warren, MI 48397-5000. We will send you a reply.

WARRANTY INFORMATION

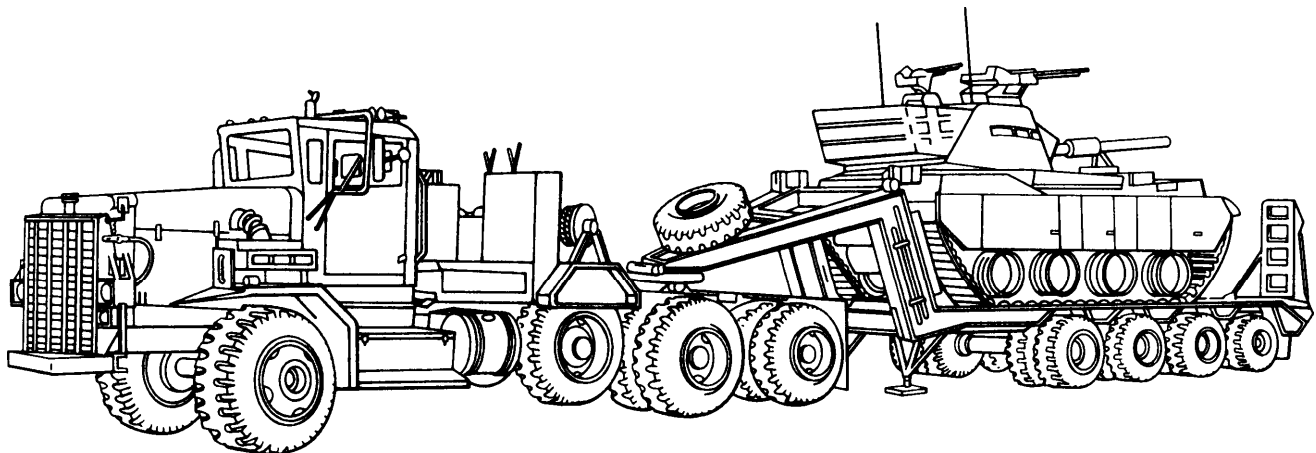
Refer to TB 9-2300-295-15/15 for the M911 Truck Tractor warranty information and data.

Section II. EQUIPMENT DESCRIPTION AND DATA

	Page		Page
Equipment Characteristics, Capabilities, and Features	1-2	Identification and Warranty Plates	1-6
Equipment Data	1-8	Location and Description of Major Components	1-6

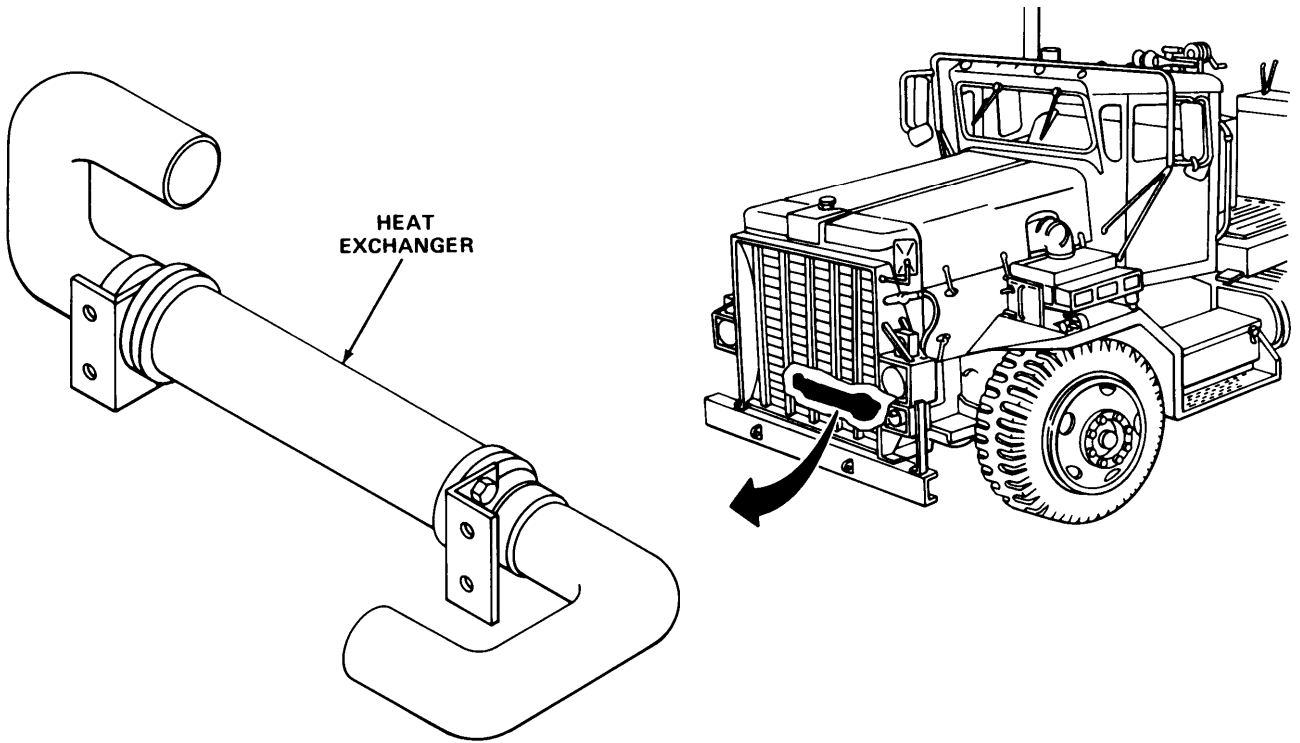
EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

The M911 Truck Tractor is used with the M747 Semitrailer to transport main battle tanks or similar vehicles.

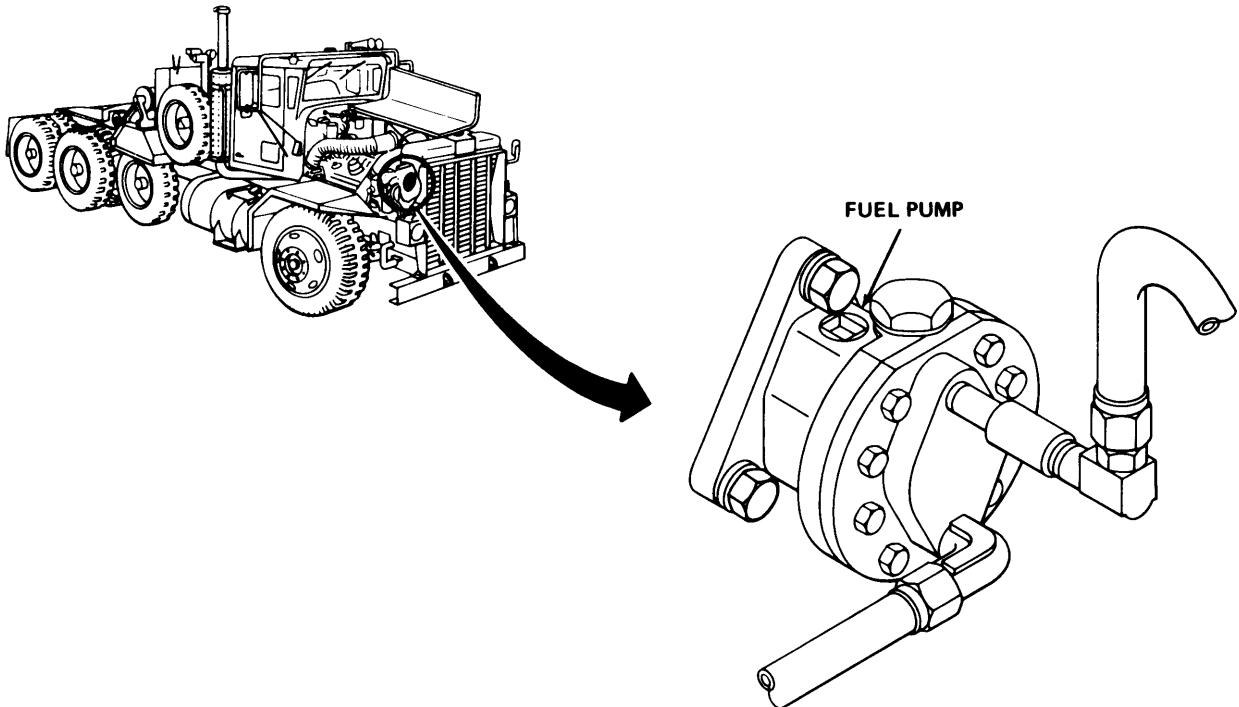


EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES - CONTINUED

The M911 Truck Tractor has a heat exchanger that cools the main transmission oil.



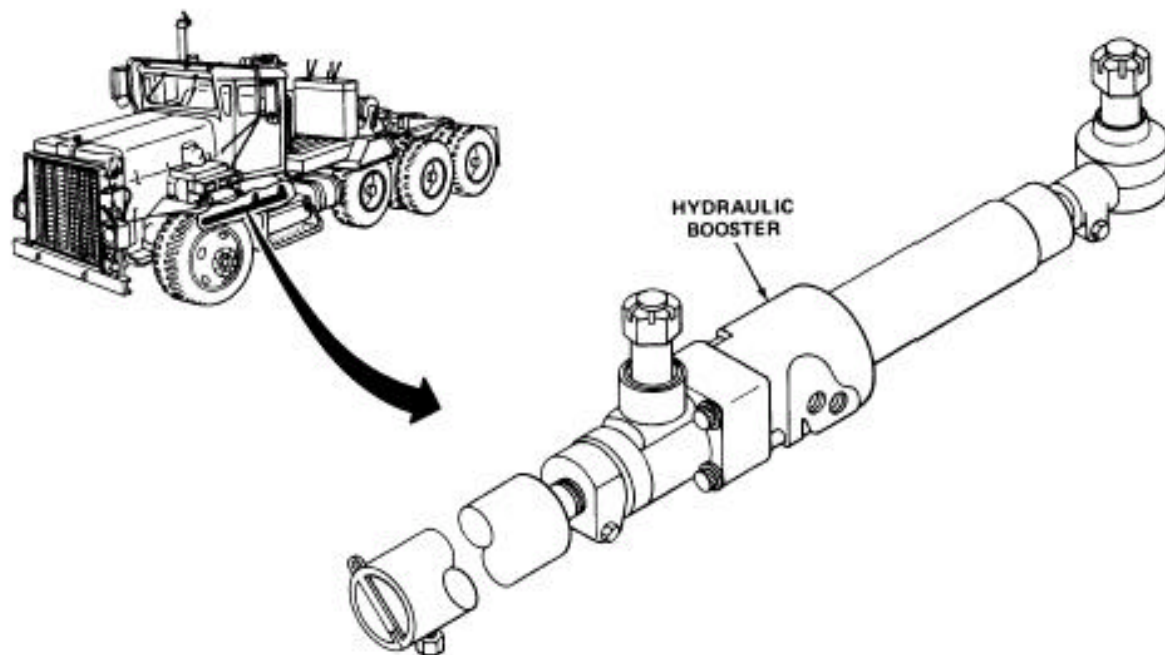
The M911 Truck Tractor has a gear type fuel pump that is driven by the engine.



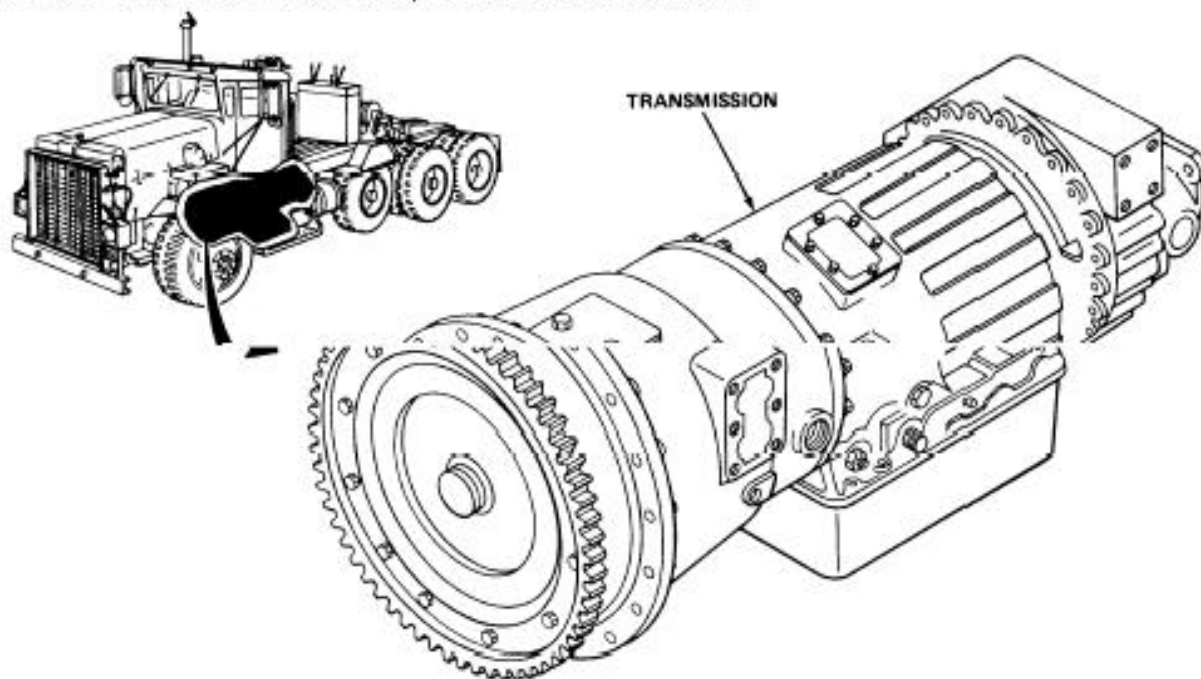
TA239581

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES- CONTINUED

The M911 Truck Tractor has a conventional type power steering system with a hydraulic booster in the linkage.

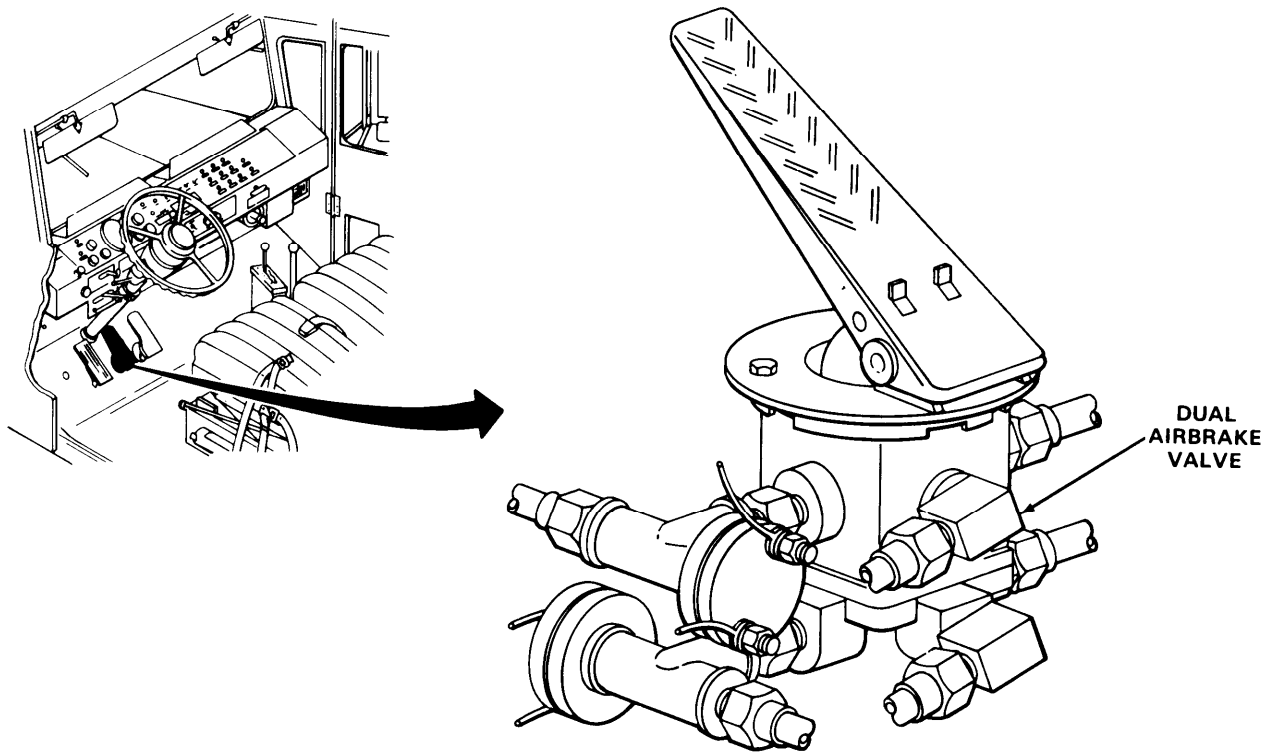


The M911 Truck Tractor has a five-speed automatic transmission.

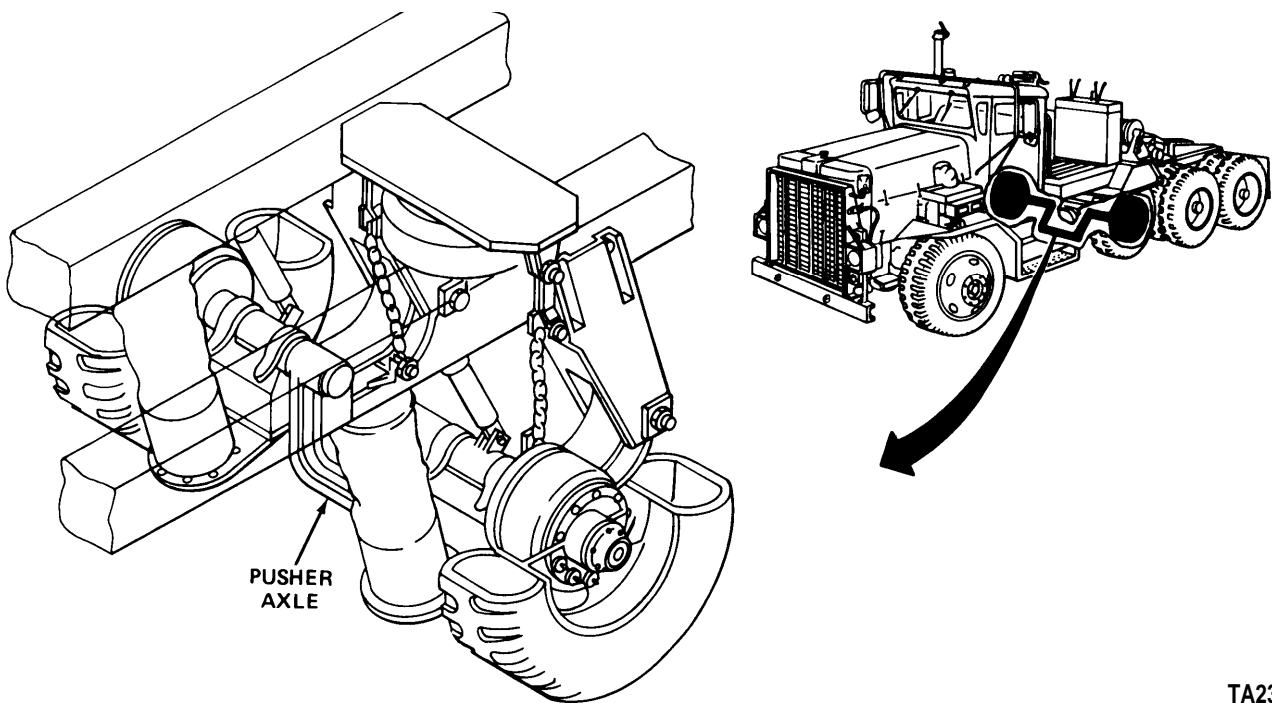


EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES - CONTINUED

The M911 Truck Tractor has a dual airbrake system operated by a dual airbrake valve.



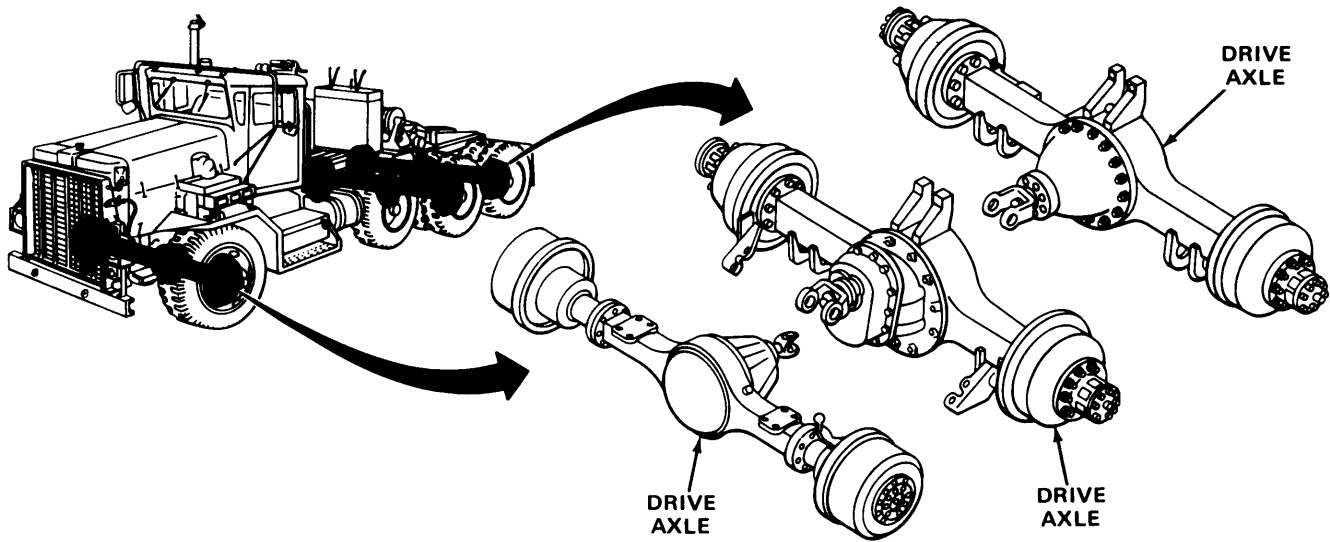
The M911 Truck Tractor has a pusher axle that can be lowered to distribute heavy payloads.



TA239583

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES - CONTINUED

The M911 Truck Tractor has three drive axles.



LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Passenger's Seat

The passenger's seat is a fixed, bench type seat assembly that can seat two crewmembers.

Operator's Seat

The operator's seat adjusts forward and backward. The seat backrest can be adjusted to three positions and a built-in shock absorber assembly adjusts to operator's weight.

IDENTIFICATION AND WARRANTY PLATES

Commercial Identification Plate

Gives identifying commercial equipment data for the M911 Truck Tractor

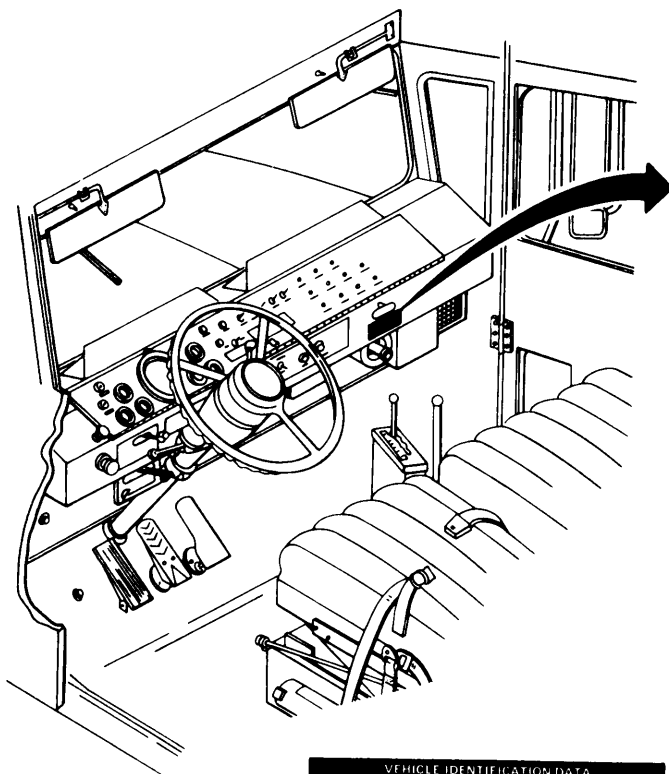
Military Identification Plate

Gives identifying commercial equipment data for the M911 Truck Tractor

Warranty Plate

Gives warranty information for the M911 Truck Tractor

IDENTIFICATION AND WARRANTY PLATES - CONTINUED



COMMERCIAL IDENTIFICATION PLATE

VEHICLE IDENTIFICATION DATA
 MODEL SERIAL NO.
 ENGINE GOV. SPEED RPM FULL LOAD
 AXLE MANUFACTURER'S HUB RATINGS (LESS WHEELS AND TIRES)
 FRONT AXLE LBS. (DRIVING)
 REAR AXLE LBS. (DRIVING)
 AIR SUSPENDED AXLE AXLE LBS. (FA)
 TOTAL COMBINATION OF HUB RATINGS NOT TO EXCEED LBS.

DEFECTS AND DEFERRED MAINTENANCE WILL VOID WARRANTY. THE VEHICLE MANUFACTURER'S WARRANTY PLATE FOR HUB LOADS APPLIES AT THE FABRIKATED WEIGHT OF THIS VEHICLE WITH WHEELS AND TIRES AS FURNISHED AS ORIGINAL EQUIPMENT. FUTURE REPLACEMENT OF TIRES, WHEELS MUST NOT BE OVER LOADED ABOVE AXLE WEIGHT OR HUB RATINGS.

MANUFACTURED UNDER THE FOLLOWING PATENTS
 UNITED STATES 4,252,000 4,002,111 4,002,112
 3,942,917 3,452,111 3,452,112
 3,111,228 3,452,111 3,452,112
 3,452,111 3,452,111 3,452,112
 3,709,962 3,452,111
 3,709,962

OTHER PATENT PENDING

OSHKOSH TRUCK CORP.
 OSHKOSH, WIS., U.S.A.

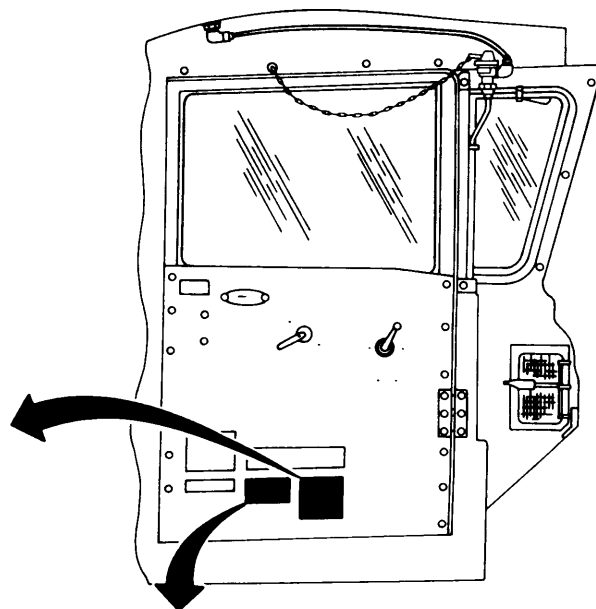
THIS ITEM WARRANTED FOR FIFTEEN (15) MONTHS OR 15,000 MILES, WHICHEVER OCCURS FIRST

WARRANTY BEGINS ON DATE OF GOVERNMENT ACCEPTANCE.

CONTRACT NUMBER DAAE07 76 C 4405.

REPORT FAILURES TO OSHKOSH TRUCK CORP., OSHKOSH WI. 54901

WARRANTY PLATE



MILITARY IDENTIFICATION PLATE

VEHICLE IDENTIFICATION DATA
 MODEL MILITARY M911
 TYPE TRACTOR 8x6
 NSN 2320 01 025 3733
 CONTRACT NO. DAAE07 76 C 4405
 OSHKOSH SERIAL NO. _____
 DATE OF MFG. _____
 US ARMY REG. NO. _____
 ENGINE OOAD 8V 92T 90
 SERIAL NO. _____

EQUIPMENT DATA

ENGINE

Make	Detroit Diesel Allison
Model	8V92T and 8V92TA
Type	Two-stroke, V-type diesel
Cylinders	8
Bore	4.84 in. (123 mm)
Stroke	5 in. (127 mm)
Torque (maximum)	1,223 ft lb (1,658 N•m) at 1,400 rpm
Maximum engine brake hp at 2,100 rpm	430 hp
Maximum governed speed (no load)	2,223 rpm
Lubrication type	Pressure
Oil Filter:	
Type	Full flow, replaceable element
Quantity	1

FUEL

Type	Military type DF-2
------	--------------------

FUEL SYSTEM

Type	Diesel injection
Tank quantity	2
Tank type	cylinder
Tank location	Winch platform sides
Air cleaner:	
Type	Farr, T-528
Quantity	1
Capacity	160 cubic feet/minute (4.48 cubic meters/minute)

COOLING SYSTEM

Radiator working pressure	7 psi (48.3 kPa)
---------------------------	------------------

ELECTRICAL SYSTEM

Voltage	24 volts
Alternator capacity	65 amps
Radio suppression	yes
Circuit breakers:	
Type	Manual reset
Quantity	10
Batteries:	
Quantity	4
Voltage (each)	12 volts
Connection	Series parallel
Capacity	100 amps at 20 hr rate

EQUIPMENT DATA - CONTINUED

TRANSMISSION (AUXILIARY)

Make	Fuller
Model	AT 1202
Type	Manual
Number of ranges	2 forward
Maximum speed in each range:	
Low	21.59 mph (34.74 km/h)
High	46.5 mph (74.82 km/h)

TRANSMISSION (MAIN)

Make	Allison
Model	CLBT 750
Type	Automatic
Number of speeds:	
Forward	5
Reverse	1
Maximum speed in each gear:	
1	8.48 mph (13.64 km/h)
2	13.78 mph (22.17 km/h)
3	21.23 mph (34.16 km/h)
4	31.39 mph (50.51 km/h)
5	46.5 mph (74.82 km/h)
R	9.81 mph (15.78 km/h)

TRANSFER

Make	Oshkosh
Model	63724RX-U
Ratio	1.14:1
Torque proportioning:	
Front	30
Rear	70
Torque capacity	23,000 ft lb (31,188 Nm)

AXLES

Maximum load capacity:	
Axle number 1 (front)	23,000 lb (10,442 kg)
Axle number 2 (pusher)	20,000 lb (9,080 kg)
Axle numbers 3 and 4 tandem	65,000 lb (29,510 kg)
Maximum steering angle (front axle)	30° (0.53 rad)

EQUIPMENT DATA - CONTINUED

BRAKE SYSTEM

Actuation	Air mechanical
Adjustment:	
Front	Manual
Pusher	Self-adjusting
Tandem	Manual
Fail-safe	4(1 at each wheel of tandem axle)
Pressure range	65 to 125 psi (448 to 862 kPa)

WHEELS

Type:	
Front and tandem axles	Budd, R-47820-2
Pusher axle	Oshkosh, 07C63795-C
Quantity	12
Spare wheel quantity	1
Rim size	24x 10 in. (61 x 25.4 cm)
Dish depth:	
Front and tandem axles	8.88 in. (22.6 cm)
Pusher axle	1 in. (2.54 cm)
Bolt circle (diameter):	
Front and tandem axles	13.19 in. (33.5 cm)
Pusher axle	11.25 in. (28.6 cm)
Stud quantity (per wheel)	10

TIRES

Type	Bias ply
Quantity	12
Spare tire quantity	1
Tread type	Traction, nondirectional
Size	14.00 x 24 in. (35.56x 60.96 cm)
Ply rating	J118
Load capacity (95 psi .50 mph) (655 kPa .80 km/h)	11,120 lb (5,048 kg) each
Tire pressures:	
Front axle tires	95 psi (655 kPa)
Pusher axle tires	95 psi (655 kPa)
Tandem axle tires	85 psi (586 kPa)

STEERING SYSTEM

Type	Mechanical
Actuation	Hydraulic power booster

PINTLE

Type	Manual release
Maximum load capacity (constant drawbar pull or intermittent loading)	40,000 lb (18,160 kg)

EQUIPMENT DATA - CONTINUED**TOWING EYES**

Quantity	2 front, 2 rear
Maximum load capacity each (up to 45° angle from longitudinal axis)	85,000 lb (38,590 kg)

TIEDOWNS

Quantity	4(2 each side of frame)
Maximum load capacity each (up to 45° angle from longitudinal axis)	42,000 lb (19,088 kg)

FIFTH WHEEL

Make	Holland
Model	FW-280
Type	Full (4-way) oscillating
Kingpin lock size	3.5 in. (8.89 cm)

CAB

Type	Reinforced heavy-duty steel 3-point cushion mounted
Windshield	Tinted, 1-piece, reverse slope
Personnel capacity	3

WINCHES AND LOADING SYSTEMS

Winch type	Hydraulically driven worm gear
Winch quantity	2
Winch drive	Hydraulic
Winch load capacity (each)	45,000 lb (20.430 kg)
Winch wire rope cable:	
Diameter	1 in. (2.5 cm)
Length	150 ft (45.8 m)
Speed	Refer to chart below
Winch safety brakes	Oil-cooled, adjustable automatic
Maximum input rpm at rated load (each)	330 rpm
Rated line pull and line speed at 330 rpm:	

EQUIPMENT DATA - CONTINUED**WEIGHTS**

Curb	39,952 lb (18,138 kg)
Gross vehicle weight (GVW)	85,952 lb (39,022 kg)
Maximum load in fifth wheel	46,000 lb (20,884 kg)
Gross combination weight rating (GCWR)	191,952 lb (87,146 kg)

WEIGHT DISTRIBUTION

Front:	
Empty	19,954 lb (9,059 kg)
Loaded:	
Pusher axle up	21,324 lb (9,681 kg)
Pusher axle down	13,634 lb (6,190 kg)
Rear:	
Empty	19,998 lb (9,079 kg)
Loaded:	
Pusher axle up	64,628 lb (29,341 kg)
Pusher axle down	52,318 lb (23,752 kg)
Pusher	20,000 lb (9,080 kg)

PERFORMANCE

Cruising range at GCWR with 150 gal (567.8 liters) fuel	280 to 615 mi (450 to 990 km)
Drawbar pull	63,687 lb (28,914 kg)
Maximum load	106,000 lb (48,124 kg)
M911/M747 Combination	
Maximum Speed:	
Forward	43.9 mph (70.6 km/h)
Reverse	9.8 mph (15.8 km/h)
Minimum sustained speed	1.7 mph (2.7 km/h)
Speed on 3°/0 grade	15.5 mph (24.5 km/h)
Speed on 20°/0 grade	1.7 mph (2.7 km/h)
Maximum grade	20 percent
Maximum side slope (with adequate tractive surface)	10 percent
Towed speed	43.9 mph (70.6 km/h)
Fording depth capability (hard-bottomed water body)	28 in. (71 cm)
Ramp angle of approach	28° (0.5 rad)
Ramp angle of departure	Unlimited
Turning radius (wall-to-wall):	
Pusher axle up	47 ft 1 in. (14.36 m)
Pusher axle down	43 ft 1 in. (13.4 m)

EQUIPMENT DATA - CONTINUED

CAPACITIES (WET)

Engine oil	25 qt (23.7 liters)
Engine oil filter (approximately)	2 qt (1.9 liters)
Cooling system	32.5 gal. (123 liters)
Fuel	150 gal. (568 liters)
Right side tank	100 gal. (378.5 liters)
Left side tank	50 gal. (189.2 liters)
Transmission fluid (main):	
Serial numbers below 19269	26 qt (24.6 liters)
Serial numbers 19269 and above	29 qt. (27.4 liters)
Transmission fluid (auxiliary)	5.5 qt (5.2 liters)
Rear axle (forward and aft)	43 qt (20.34 liters)
Alcohol evaporator	1 qt (0.95 liters)
Hydraulic reservoir	100 gal. (378.5 liters)
Stowage capacities	111 cu ft (3.1 cu m)

Section III. TECHNICAL PRINCIPLES OF OPERATION

	Page		Page
Airbrake System	1-21	Engine and Drive Train	1-14
Cooling System	1-18	Exhaust System	1-17
Electrical System	1-20	Fuel System	1-16

ENGINE AND DRIVE TRAIN

The turning power made by the engine is sent directly to the main transmission. A power ratio is selected in the main transmission, and the power is sent through a propeller shaft to the auxiliary transmission. A power ratio is selected in the auxiliary transmission, and the power is sent through a propeller shaft to the transfer case. The transfer case drops the power from the level of the auxiliary transmission to the level of the differential propeller shafts, divides the power, and sends it through the propeller shafts to the front and rear differentials. The differentials divide the power and send it through the axles to the wheels.

Engine – The diesel engine is an internal combustion power unit, in which the heat of fuel is changed into work in the cylinders of the engine. First, air is compressed in a cylinder by a piston. Then, a charge of fuel is sprayed into the cylinder. The heat of compression causes the fuel to ignite and push the piston out. The eight pistons in the engine are connected to a crankshaft. Each time a piston is pushed out it helps turn the crankshaft and create the turning power.

Main Transmission – The automatic transmission has five forward speeds and one reverse. The turning power of the engine is sent to the transmission by a torque converter. The power ratios for the five forward speeds and one reverse are set by three planetary gear sets, controlled by six hydraulic clutches.

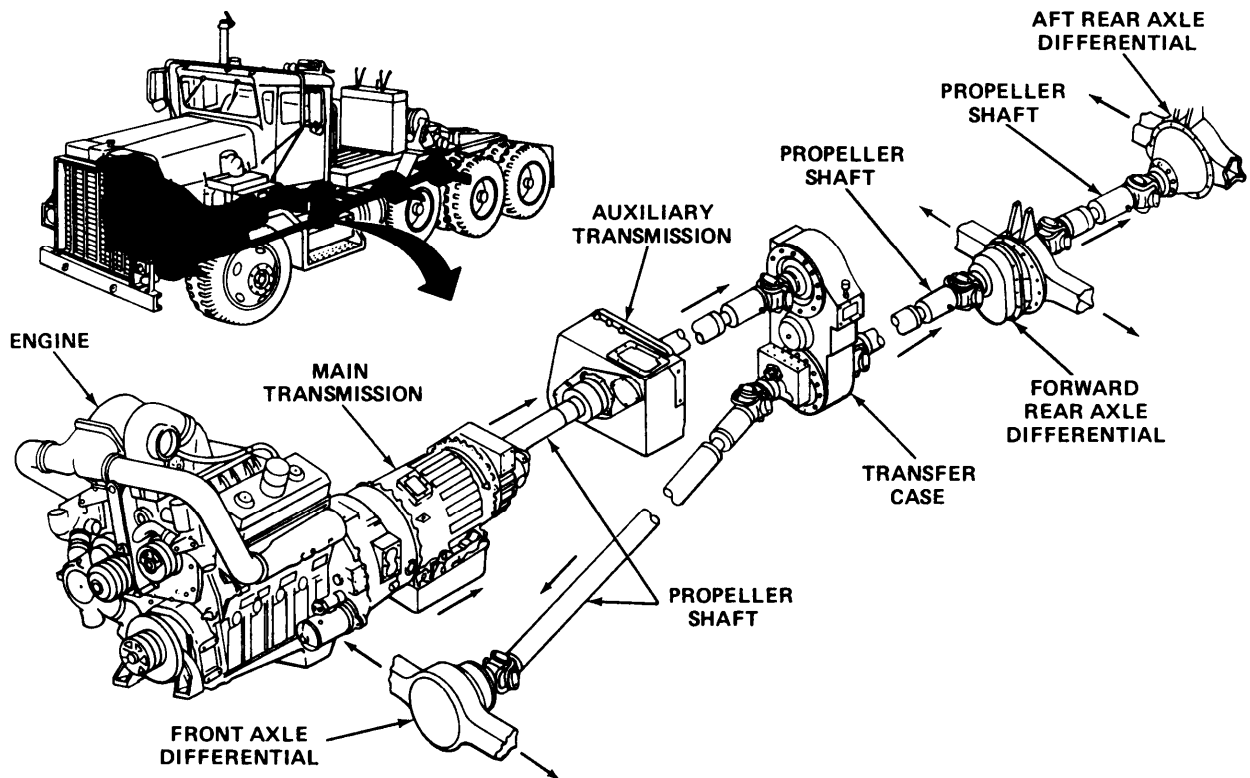
ENGINE AND DRIVE TRAIN - CONTINUED

Propeller Shafts – There are five shafts in the driveline. Each shaft is used to send turning power from one component (such as the main transmission) to another component (such as the auxiliary transmission).

Auxiliary Transmission – The two-speed auxiliary transmission has two sets of gears. When set in low speed, the power is sent through the gears to give a reduced power ratio. When set in high gear, the power is sent directly through to give the same power ratio.

Transfer Case – The transfer case provides output for driving both the front and rear axles. The turning power from the input shaft is dropped down to the output shaft by an intermediate gear. A planetary differential splits up the power and sends 30 percent to the front axle shaft and 70 percent to the rear axle shaft. When the clutch is set, the differential action is locked out and the power is split 50 percent to the front axle shaft and 50 percent to the rear axle shaft.

Axle Differentials – There is one front axle differential and two rear axle differentials. When the vehicle is driving in a straight direction, the differentials split the input power and send 50 percent to the right wheels and 50 percent to the left wheels. When the vehicle is turning, the differentials send more power to the outside wheels than to the inside wheels.



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FUEL SYSTEM

Fuel is pumped from the right fuel tank by the fuel pump through the fuel strainer and fuel filter into the engine. Unused fuel returns to the right fuel tank through the fuel return line. As fuel from the right fuel tank is used, the fuel from the left fuel tank drains into it. The air used to ignite the fuel is drawn into the engine through the air cleaner. The ether starting aid is used to help start the engine in cold weather.

Left Fuel Tank - The left fuel tank is used as a secondary fuel tank. It holds 50 gallons (189 liters) of fuel that is drained into the right fuel tank as needed.

Right Fuel Tank - The right fuel tank is used as the primary fuel tank. It holds 100 gallons (379 liters) of fuel.

Fuel Strainer - Fuel goes through the strainer as it is drawn from the right fuel tank by the fuel pump. The strainer keeps dirt from being drawn into the fuel pump.

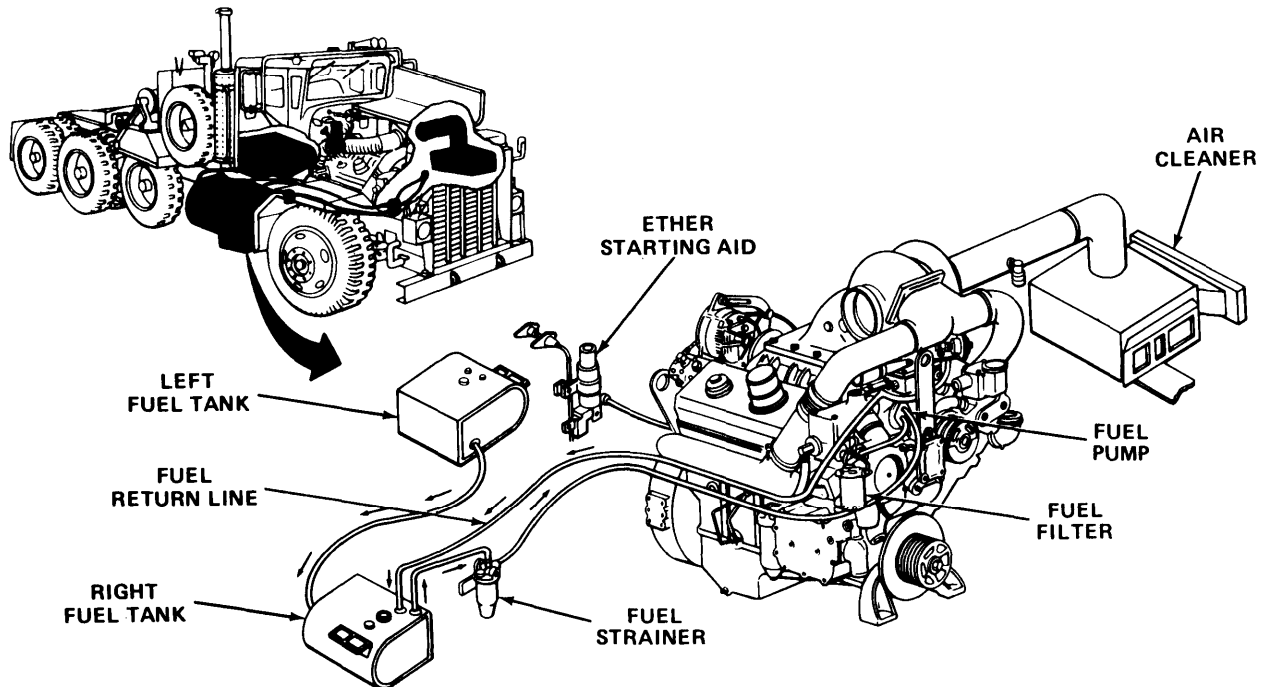
Fuel Filter - Fuel goes through the fuel filter before it is pumped into the engine by the fuel pump. The filter keeps dirt from being pumped into the engine.

Fuel Pump - The gear-type fuel pump removes fuel from the right fuel tank and sends it to the fuel injectors. The fuel pump is a left-hand rotating pump.

Air Cleaner - The dry type air cleaner filters air as it is drawn into the engine. The air cleaner is made up of a centrifugal cleaner and a replaceable filter element.

Ether Starting Aid - The ether starting aid holds 18 oz (170 cc) of ether. The starting aid is connected to the intake manifold by a tube. Ether from the starting aid is forced into the engine to help it start in cold weather conditions. Each cylinder has sufficient capacity for 200 to 300 cold starts.

Fuel Return Line - Used to send unused fuel from the engine back to the right fuel tank.



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EXHAUST SYSTEM

Exhaust gas is pushed out of the engine cylinders by the pistons. The gas goes out through the exhaust manifolds, the exhaust tubes, the turbocharger, the exhaust pipes, the muffler, and finally, the tailpipe.

Exhaust Manifolds - There are two air-cooled manifolds on the engine. Each manifold has a uniform cross section and a flange at one end for attaching the exhaust tubes.

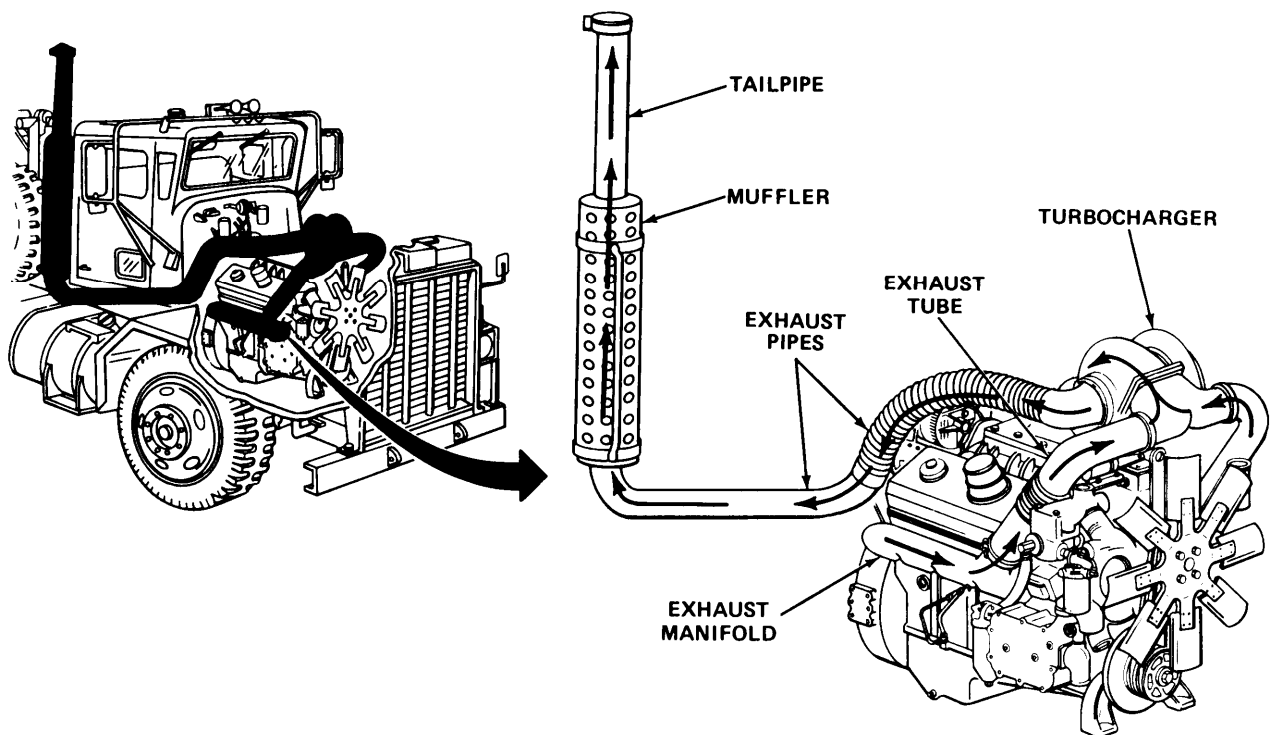
Exhaust Tubes – There are two exhaust tubes on the engine. The tubes are used to send exhaust gases from the manifold to the turbocharger.

Turbocharger – The turbocharger increases the overall efficiency of the engine. As the exhaust gases pass through the turbocharger, they cause a turbine wheel and shaft to rotate. The shaft turns a compressor wheel that draws in fresh air and compresses it into the engine cylinders.

Exhaust Pipes – The exhaust pipes are used to send exhaust gases from the turbocharger to the muffler.

Muffler – The muffler lowers the noise made by the exhaust gases. It is covered by a shield for protecting personnel from the heat caused by the exhaust gases.

Tailpipe – The tailpipe is used to send exhaust gases from the muffler out to the air. It has a cap to help keep water from getting into the muffler.



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COOLING SYSTEM

Coolant is drawn from the bottom of the radiator by the water pump. The coolant passes through the water pump and is forced into the heat exchanger. As the coolant goes through the heat exchanger it cools down the transmission fluid. From the heat exchanger, the coolant goes through the oil cooler to cool the engine oil. From the oil cooler, the coolant goes through the engine cylinder block to help cool the engine. The coolant leaves the engine through the cylinder heads and goes into the thermostats. If the coolant temperature is below normal operating temperature, the coolant is drawn back into the water pump where it is sent back through the heat exchanger, oil cooler, and engine. (A small amount of coolant leaves the right thermostat and goes into the top of the radiator where air bubbles are removed before it is sent to the water pump). As the coolant temperature gets near the normal operating temperature, the thermostat valves start to open. Some of the coolant is drawn through the radiator where it is cooled down before it goes to the water pump. When the coolant temperature reaches the normal operating temperature, all of the coolant is drawn through the radiator to be cooled down before it goes to the water pump. The fan draws air through the radiator to help cool down the coolant.

Water Pump – The centrifugal-type water pump is mounted on the front of the engine and is driven by the front camshaft gear. The water pump has an impeller with blades that forces the coolant outward as it rotates. The water pump shaft seal (used to seal the impeller shaft from leaking) is the only moving water joint in the cooling system.

Heat Exchanger - In the heat exchanger, transmission fluid circulates through tubing. As coolant passes through the heat exchanger, it absorbs the heat of the transmission fluid through the tubing.

Oil Cooler – The oil cooler has 24 plates used to absorb the heat of the engine oil. Coolant passing through the oil cooler helps to cool down the plates.

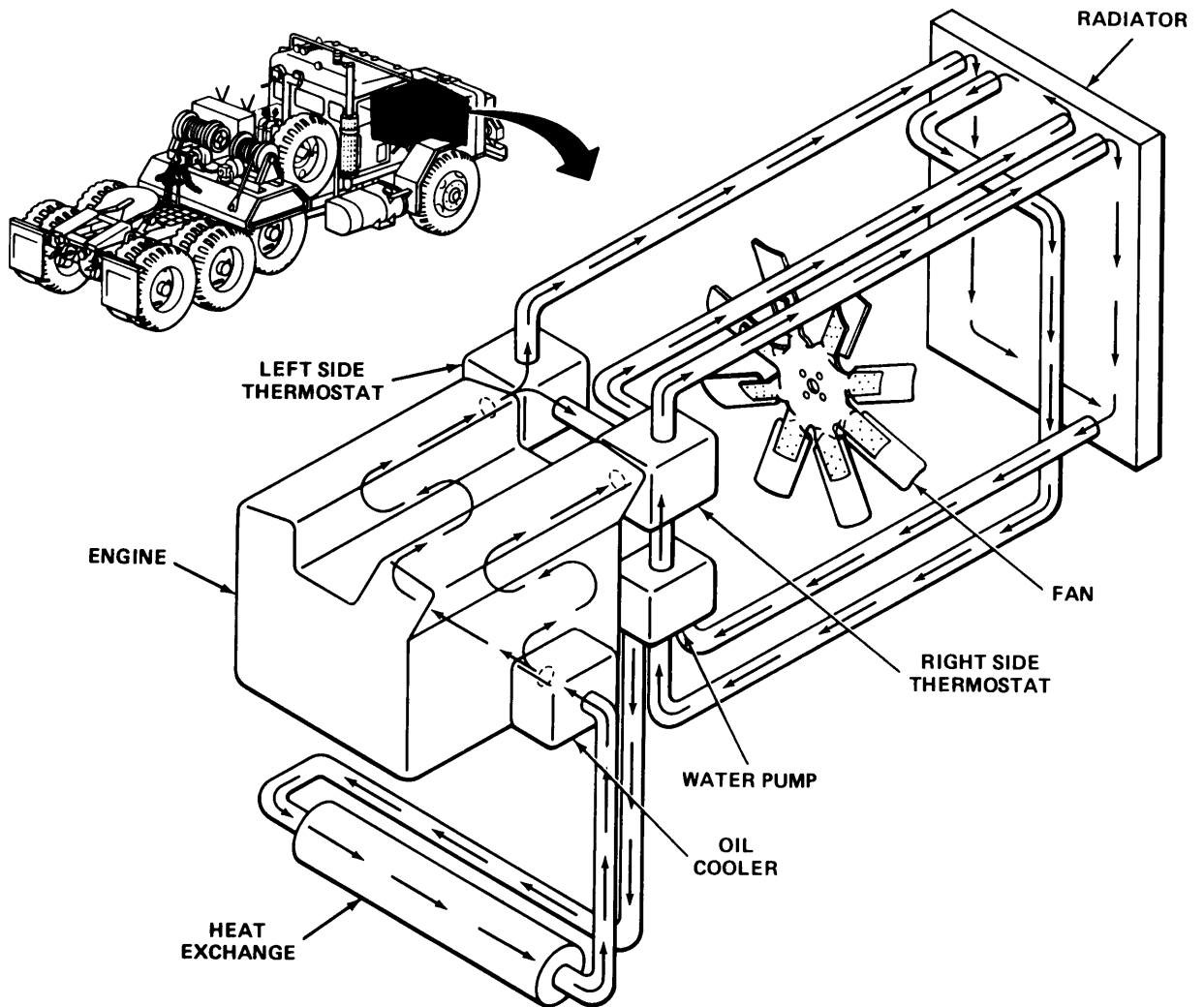
Engine – The engine contains a water jacket. In the cylinder block, the water jacket surrounds the cylinders completely. In the cylinder head, the water jacket covers the combustion chambers at the top of the cylinders. As coolant passes through the water jacket, it absorbs the heat made by the engine.

Thermostats – The two semiblocking bellows type thermostats are mounted to the water outlet ends of each cylinder head. The thermostats contain a liquid which boils at a certain temperature. When that temperature is reached, the boiling liquid creates gas pressure which opens the thermostat valve. When the liquid cools, gas pressure is reduced and the valve closes.

Radiator – The radiator is made up of a top tank, a radiator core, and a bottom tank. The top tank collects incoming coolant and spreads it across the top of the radiator core. An overflow pipe on the top tank provides an opening for the escape of coolant or steam that might cause too much pressure in the cooling system. A radiator cap is also located on the top tank. The cap has a pressure valve and a vacuum valve which open and close to help keep the cooling system at the proper operating temperature. The core is made up of many small tubes and air fins. As coolant passes through the radiator, heat is transferred to the tubes and fins, and carried away by the air moving through the core. The bottom tank collects the coolant from the core and sends it to the water pump through the radiator outlet.

Fan - The fan pulls large amounts of air through the radiator core. The air is used to remove heat from the radiator, and also to help cool down the outside of the engine.

COOLING SYSTEM - CONTINUED



ELECTRICAL SYSTEM

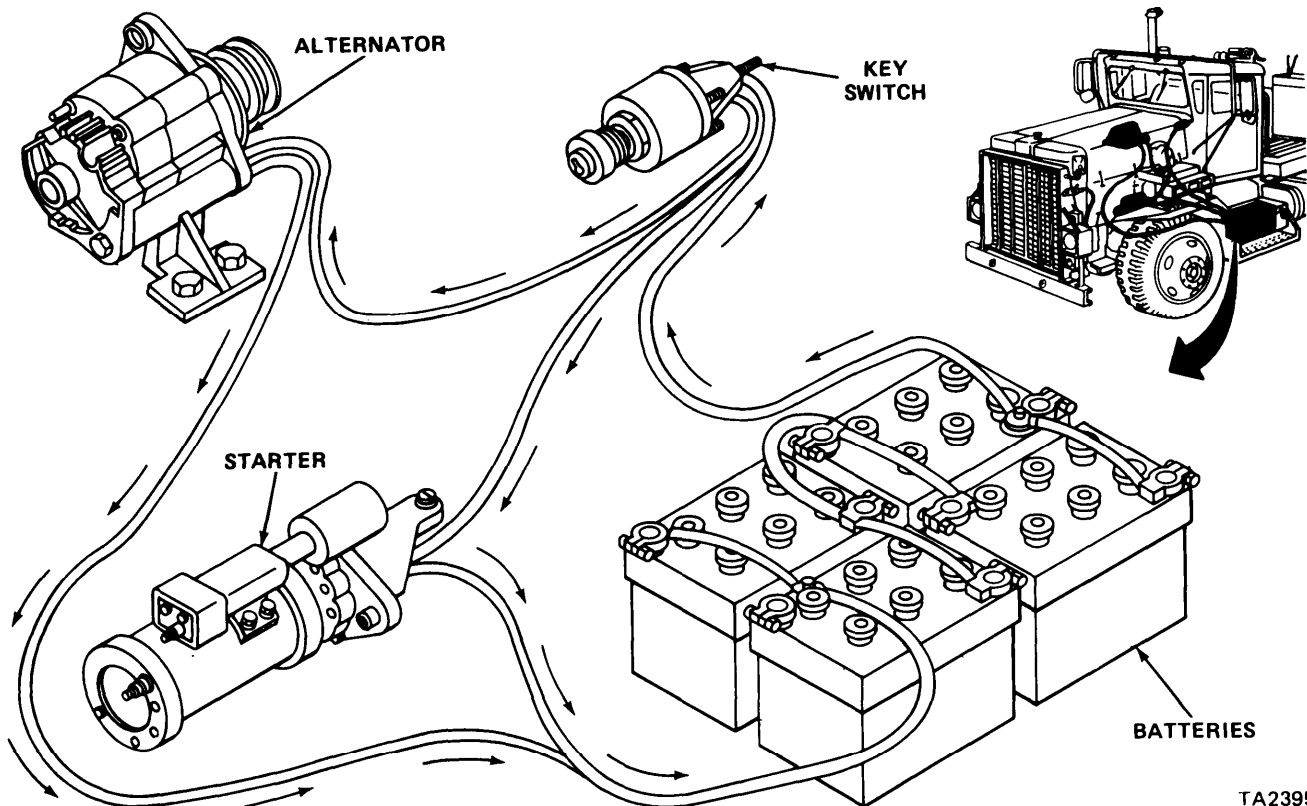
When the key switch is turned to START, the voltage from the batteries is sent to the starter. When the starter is energized, the pinion engages with the torque converter ring gear and engine cranking occurs. After the engine starts, the pinion is disengaged from the torque converter gear. When the engine is running, the alternator provides a source of electrical current for maintaining the storage batteries in a charged state and supplies current to the other electrical components (lights, switches, gages, sending units, etc.). When the key switch is turned to ACC, the voltage from the batteries goes to the lights, switches, and sending units. When the key switch is turned to IGN, the voltage from the batteries is sent to the shift controller switches, the buzzer, and the instrument panel gages.

Key Switch – Located in the cab, the key switch is used by the operator to start the engine and to turn on power to the electrical components on the vehicle (lights, switches, gages, sending units, etc.). The four positions the switch can be turned to are: ACC, OFF, IGN, and START. When the switch is turned to OFF, there is no power in the vehicle.

Batteries - The lead-acid storage batteries are electrochemical devices for changing chemical energy into electrical energy. There are four 12-volt batteries in the electrical system. They are connected in series-parallel to provide a total system voltage of 24 volts.

Starter – The starter has a 24-volt, heavy-duty motor, and a solenoid-operated, positive engagement shifting mechanism. When the starter is energized, the pinion gear of the drive assembly is moved into mesh with the torque converter ring gear by the shift lever. When the engine starts, pinion over run protects the armature from excessive speed until the switch is opened and the pinion is disengaged.

Alternator – The alternator is belt driven off the engine. As the alternator rotates, alternating current is generated by magnetism in the rotor. The alternating current is changed into direct current by a rectifier, and the amount of direct current sent out is controlled by a built-in regulator.



TA23959

AIRBRAKE SYSTEM

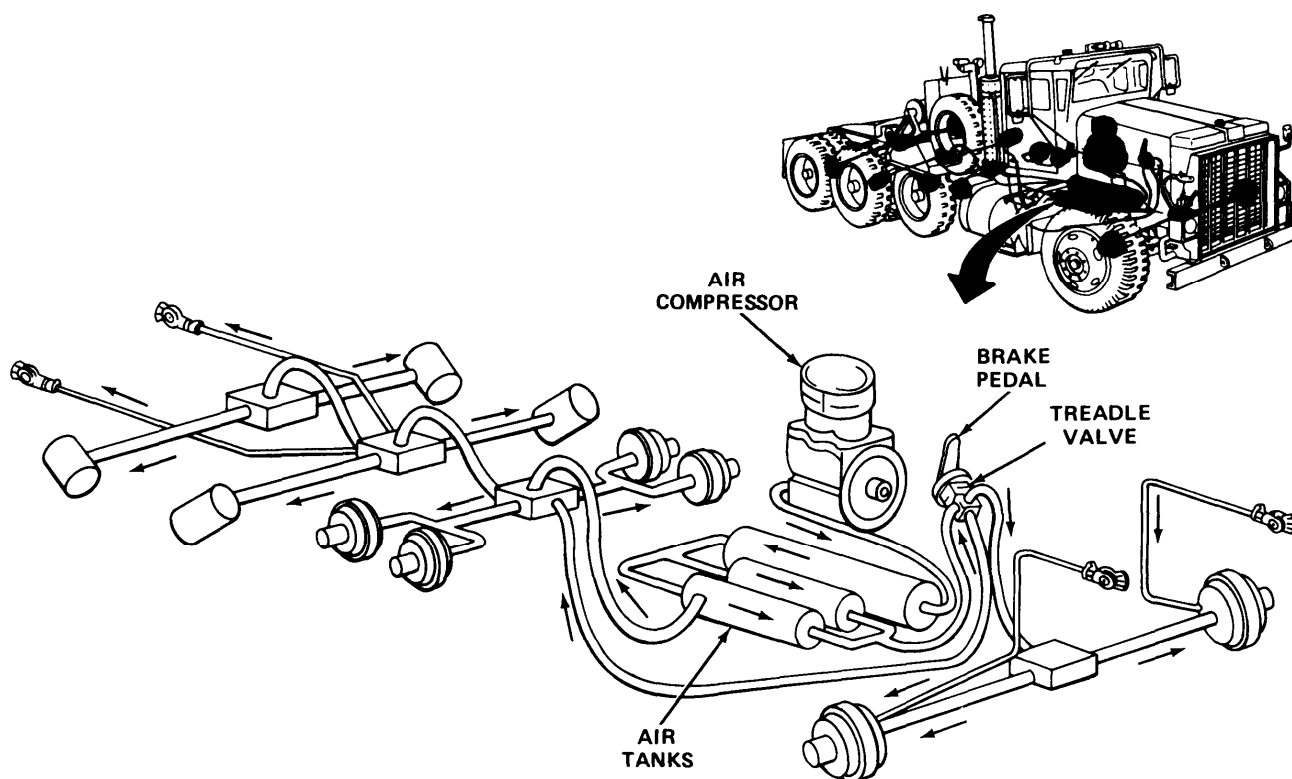
The air compressor supplies air to the air tanks. The air tanks send air to the treadle valve and the relay valves. When the brake pedal is pushed down, the treadle valve opens and air is sent to the quick release valve and the relay valves. Air from the quick release valve goes to the front axle air chamber where it is used for stopping the front axle wheels. Air from the relay valves goes to the pusher axle and tandem axle air chambers where it is used for stopping the pusher axle wheels (when in use) and the tandem axle wheels. The relay valves also apply the tandem axle spring brakes when pressure in the system is lost.

Air Compressor – The air compressor is flange-mounted to the flywheel housing and gear driven by an accessory drive attached to a camshaft gear. The air compressor runs continuously while the engine is running. The actual compression of the air is controlled by the governor. The governor starts and stops the compression of air by loading or unloading the compressor when the air pressure in the system reaches the minimum or maximum pressure.

Air Tanks – There are three air tanks in the airbrake system. The air tanks store air under pressure and supply air to the brake system when needed.

Brake Pedal - Mounted on the cab floor, the brake pedal controls the air sent to the air system by the treadle valve.

Treadle Valve – The treadle valve has two separate supply and delivery circuits for service and secondary braking. The treadle valve provides a graduated control for applying and releasing the vehicle brakes.



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AIRBRAKE SYSTEM - CONTINUED

Gladhand – Mounted at right and left sides of front and rear of vehicle. Provide rear brake operation for M911 truck tractor being towed. Also provide brake operation for vehicles being towed by M911 truck tractor.

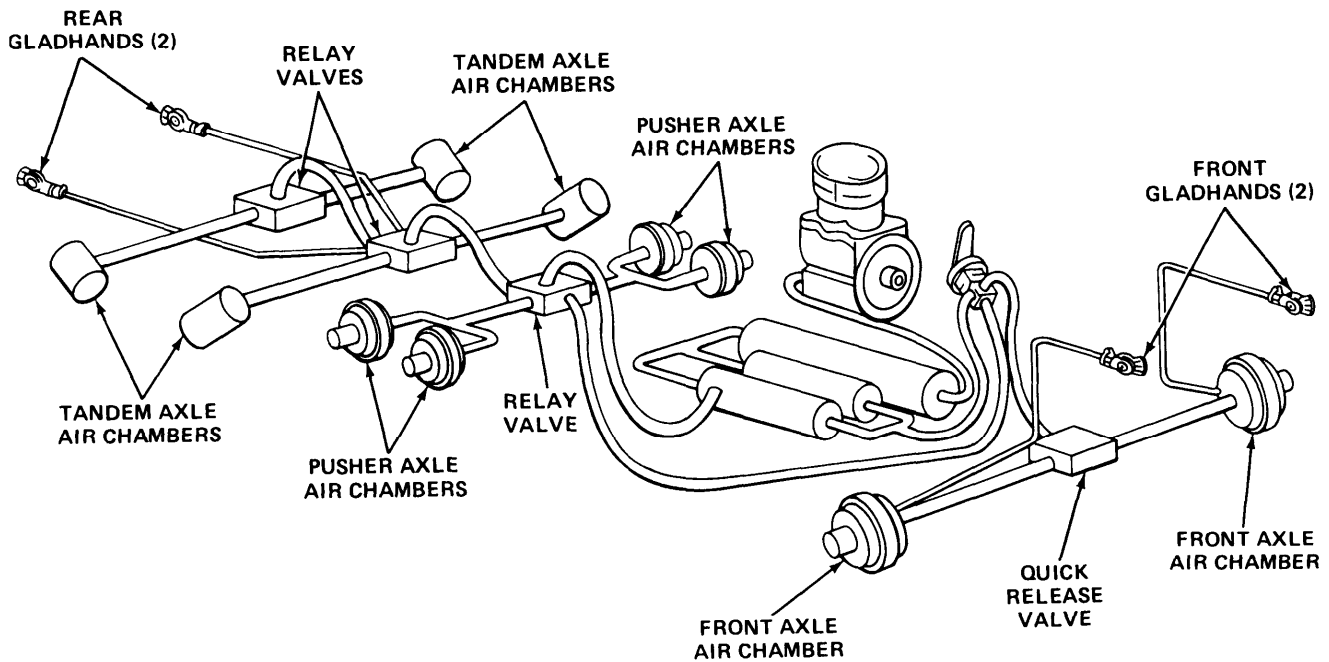
Relay Valves – Each of the three relay valves in the airbrake system have a quick release feature. The valves act as relay station to speed up the application and release of the brakes.

Quick Release Valve – The quick release valve releases air from the front airbrake chambers and speeds up the release of the brakes.

Front Axle Air Chambers – There are two front axle air chambers in the airbrake system. When air enters the air chamber it moves a push rod, diaphragm, and pressure plate, and applies the brakes.

Pusher Axle Air Chambers – There are four pusher axle air chambers in the airbrake system. When the air enters the air chamber it moves a push rod, diaphragm, and pressure plate, and applies the brakes.

Tandem Axle Air Chambers – Each of the four spring brake air chambers contains a piston with a spring behind it. Air pressure acting on the piston face moves the piston and compresses the spring for applying and releasing the tandem axle brakes.



TA239593

CHAPTER 2

INTEGRATED SYSTEMS MAINTENANCE INSTRUCTIONS

OVERVIEW

The purpose of this chapter is to give you information on the tools and materials you will need to maintain the M911 Truck Tractor. It also gives you the information needed to check the condition of the M911 Truck Tractor and to process it when you receive it.

	Page
Section 1. Repair Parts: Special Tools; Test, Measurement, and Diagnostic Equipment (TMDE); and Support Equipment	2-1
Section II. Service Upon Receipt	2-1
Section III. Preventive Maintenance Checks and Services (PMCS)	2-4

Section L REPAIR PARTS: SPECIAL TOOLS: TEST. MEASUREMENT. AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

	Page		Page
Common Tools and Equipment	2-1	Special Tools, TMDE, and Support Equipment	2-1
Repair Parts	2-1		

COMMON TOOLS AND EQUIPMENT

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

SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Special tools for organizational maintenance are listed in TM 9-2320-270-20P and in section III of the Maintenance Allocation Chart (appendix B).

REPAIR PARTS

Repair parts are listed and illustrated in the repair parts and special tools list (TM 9-2320-270-20P) covering organizational maintenance for this equipment.

Section II. SERVICE UPON RECEIPT

SERVICE UPON RECEIPT CHECKLIST

This task covers:

- | | |
|---------------------------------------|-------------------------|
| a. Inspection and Cleaning (page 2-2) | c. Servicing (page 2-3) |
| b. Lubrication (page 2-2) | d. Road Test (page 2-3) |
-

SERVICE UPON RECEIPT CHECKLIST - CONTINUED

INITIAL SETUP

Tools	Materials/Parts – Continued
Battery/Antifreeze tester	Soap, liquid (item 14, appendix C)
Brush, wire	Rags, wiping (item 10, appendix C)
Pail	
Wrench, box, 1/2-inch	
	Personnel Required
Materials/Parts	One
Grease (LO 9-2320-270-12)	

LOCATION	ITEM	ACTION REMARKS
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INSPECTION AND CLEANING

1.	M911 Truck Tractor	Unpacked equipment	<ul style="list-style-type: none"> a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6, Packaging improvement Report. b. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750. c. Check to see whether the equipment has been modified.
2.		Exterior	<ul style="list-style-type: none"> a. Using soap, water, pail and rags, wash and dry. b. Look for rust, fungus, and damage. Clean areas of rust and fungus. Repair areas of damage.

LUBRICATION

NOTE

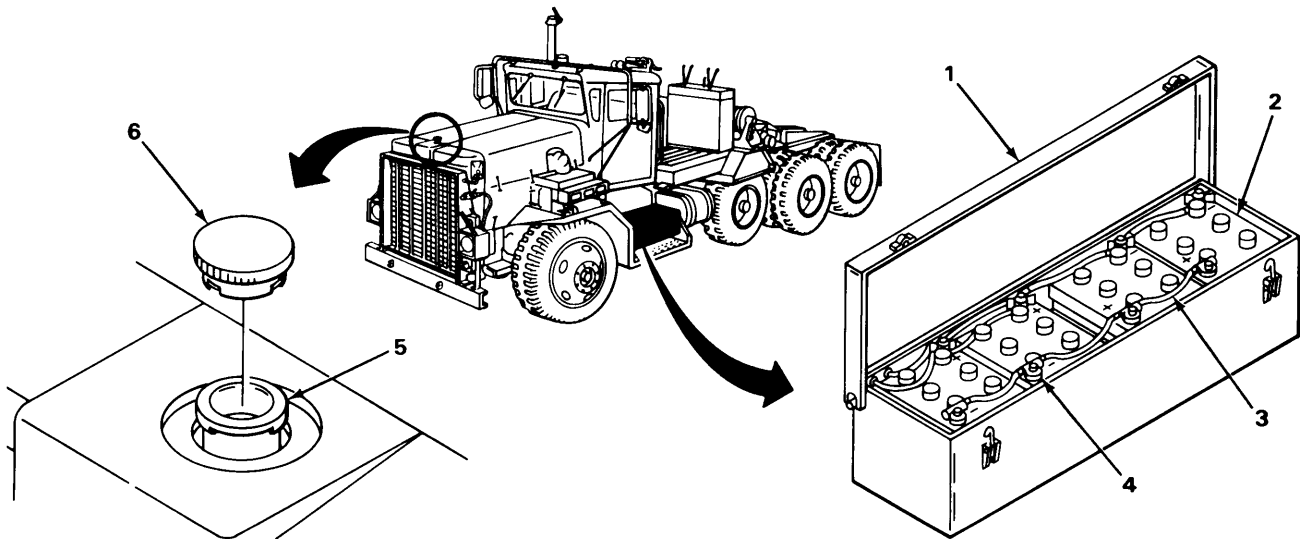
Read the Processing and Reprocessing Record for Storage and Issue of Vehicles and Spare Engines (DD Form 1397) and follow all the precautions checked on it. It will be in the cab, wired to the steering wheel, transmission range selection, or key.

If adequate preservation measures were taken before the vehicle was placed in storage, or if some or all the lubrication points were serviced prior to your receipt of the vehicle, you will not have to perform all the services called out on the lubrication order (LO 9-2320-270-1 2). Only to those required.

3.	M911 Truck Tractor	Exterior	Lubricate as required (LO 9-2320-270-12).
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SERVICE UPON RECEIPT CHECKLIST - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
SERVICING			
4. Battery box (1)	Batteries (2)	a. Using battery tester, test. b. Using wire brush, clean cables (3). c. Using wrench, tighten nuts (4).	
5. Top of radiator (5)	Radiator cap (6)	a. Take off. b. Check coolant level. Fill to required level (TM 9-2320-270-1 O). c. Using antifreeze tester, check anti-freeze protection (LO 9-2320-270-1 2).	



ROAD TEST

NOTE

Before starting the engine, crank it over at least two revolutions with the full cutoff switch in the off position to test for hydro-static lock. There might be an excessive amount of liquid in the cylinders and cranking will push it out.

6.	M911 Truck Tractor	Road test (TM 9-2320-270-10).
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TASK ENDS HERE

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

	Page		Page
General	2-4	Preventive Maintenance	
General Service and		Checks and Services.....	2-7
Inspection Procedures	2-4	Reporting Repairs.....	2-4
Intervals	2-4	Specific PMCS Procedures	2-5

GENERAL

The best way to maintain vehicles covered by this manual is to inspect them on a regular basis so minor faults can be discovered and corrected before they result in serious damage, failure, or injury. This section contains systematic instructions for inspection, adjustment, and correction of vehicle components to avoid costly repairs or major breakdowns. This is preventive maintenance checks and services (PMCS).

INTERVALS

a. Organizational maintenance, assisted by operator/crew will perform the checks and services contained in table 3-1 at the following intervals:

- (1) Semiannually (S). Every 6 months or 6,000 miles (9,654 km), whichever comes first.
- (2) Annually (A). Every 12 months or 12,000 miles (19,308 km), whichever comes first.

b. Perform all (S) inspections in addition to (A) inspections at the time of the annual inspection.

REPORTING REPAIRS

All vehicle shortcomings will be reported on DA 2404 (DA Pam 738-750). Equipment Inspection and Maintenance Worksheet, immediately after the PMCS, and before taking corrective action. All vehicle deficiencies will be reported in the equipment log.

GENERAL SERVICE AND INSPECTION PROCEDURES

a. While performing specific PMCS procedures, make sure items are correctly assembled, secure, serviceable, not worn, not leaking, and adequately lubricated as defined below:

- (1) An item is CORRECTLY ASSEMBLED when it is in proper position and all parts are present.
- (2) When wires, nuts, washers, hoses, or attaching hardware cannot be moved by hand, wrench, or pry-bar, it is SECURE.

GENERAL SERVICE AND INSPECTION PROCEDURES - CONTINUED

(3) An item is Unserviceable if it is worn beyond repair and is likely to fail before the next scheduled inspection.

(4) An item is WORN if there is too much play between joining parts, or marking data, warning, and caution plates are not readable.

(5) Leakage Definition:

(a) Class I – Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.

(b) Class II - Leakage of fluid great enough to form drops but not enough to cause drops to fall away from item being checked or inspected.

(c) Class III – Leakage of fluid great enough to form drops that fall from the item being checked or inspected.

(6) If an item meets the requirements specified by lubrication order, LO 9-2320-270-12, then it is ADEQUATELY LUBRICATED.

b. Where the instruction “tighten” appears in a procedure and a torque is not called out, tighten using the standard torque chart.

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flashpoint is 100°F to 138°F (38° to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

c. Where the instruction “clean” appears in a procedure, you must use cleaning solvent (SD-2), specification P-D 680, to clean grease or oil from metal parts. After the item is cleaned, rinsed, and dried, apply a light grade of oil to unprotected surfaces to prevent rusting. On rubber and plastic materials use soap and water.

SPECIFIC PMCS PROCEDURES

a. The preventive maintenance for which you are responsible is provided in table 2-1. The checks and services listed are arranged in logical order requiring minimal time and effort on your part.

b. The following columns read across on the PMCS schedule:

(1) Item Number. Provides logical order for PMCS performance and is used as a source number for DA 2404, on which your PMCS results will be recorded.

SPECIFIC PMCS PROCEDURES - CONTINUED

(2) Intervals. Shows a bullet(•) opposite each item number to indicate when that check is to be performed. The bullet will be repeated when consecutive item numbers are to be inspected during the same interval. Interval columns include:

(a) Semiannual (six months) checks and

(b) Annual (yearly) checks

(3) Item to be Inspected. Lists the system, common name, or location of the item to be inspected.

(4) Procedures. Provides instructions for servicing, inspection, replacement, or adjustment, and in some cases, having item repaired at a higher level.

NOTE

Always do your preventive maintenance checks and services in the order it has been prepared. Once it gets to be a habit, you'll be able to spot anything wrong in a hurry.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

S – SEMIANNUALLY A – ANNUALLY

ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	s	A		
				<p>Prior to Road Test</p> <p>Perform all before operation checks listed in TM 9-2320-270-10. "Preventive Maintenance Checks and Services".</p> <p>Road Test</p> <p>NOTE</p> <p>The following will be performed during the test. These inspections must be performed before any PMCS regardless of interval.</p>
1	●		Starter	While starting vehicle, listen for unusual noises and difficult cranking of starter.
2	●		Engine and Engine Compartment	<p>a. Listen for unusual noises, hesitations, and varying idle speed. Observe response to accelerator feed.</p> <p>b. Be alert for excessive vibration and the smell of fuel, oil, or exhaust.</p>
3	●		Dials and Gages	<p>Observe the following dials and gages for proper operation.</p> <p>a. Engine water temperature gage – temperature gage should show normal operating temperature of 160° to 185°F (71 ° to 88°C) after warm up.</p> <p>b. Tachograph – check to make sure tachograph is working.</p> <p><u>CAUTION</u></p> <p>Do not operate vehicle without a disc in tachograph. Damage to the tachograph stylus will result.</p> <p>c. Air pressure gage – make sure air pressure gage is working properly and low air pressure warning light and buzzer stay off when air system pressure is more than 60 psi (410 kPa).</p>
	●			

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

S – SEMIANNUALLY A – ANNUALLY

ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	S	A		
4	●		Safety Devices	<p>d. Main transmission oil temperature gage – make sure transmission oil temperature gage indicates normal operating range. Operating range is 160° to 220°F (71 °to 104°C).</p> <p>e. Fuel level gage – make sure fuel level gage reads full. Full level registers in right fuel tank only.</p> <p>f. Battery indicator – make sure battery indicates normal operating ranges of 20-30 vdc, 31 vdc max.</p> <p>g. Engine oil pressure gage – make sure oil pressure gage indicates normal operating range at 180° to 2100 rpm. Normal oil pressure is 50 to 70 psi (342 to 480 kpm) and minimum for safe operation is 30 psi (208 kPa).</p> <p>Observe the following items and their controls for security, ease of movement and proper operation:</p> <ul style="list-style-type: none"> a. Horn b. Windshield wipers and washers c. Seat belts and fasteners d. Turn signals e. Panel lights f. Headlights g. Stoplights h. Blackout lights i. Parking lights j. Hazard warning lights <p style="text-align: center;">NOTE</p> <p>For on-road testing the vehicle will be driven at least five miles over varied terrain. This will provide ample time for detection of malfunctions.</p>
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5	●		Accelerate	<p>Test for engine response to accelerator feed.</p> <p>Observe sticking or binding of accelerator pedal.</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

S- SEMIANNUALLY A- ANNUALLY

ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	S	A		
6	●		Hydraulic Retarder Pedal	<p style="text-align: center;"><u>CAUTION</u></p> <p>Long continuous use of hydraulic retarder will raise transmission oil temperature and may cause damage to transmission.</p> <p>Test retarder pedal for response when slowing down vehicle. Observe sticking or binding of retarder pedal.</p>
7	●		Brakes	<p>a. Test braking response to brake pedal. Vehicle should slow down immediately.</p> <p>b. Reach a desired speed and lightly apply brake pedal with steady force. Vehicle should stop smoothly without noticeable side pull or chatter.</p> <p>c. After stopping vehicle and with transmission in drive 1. Release brake pedal. The wheel brakes should release immediately and without difficulty.</p> <p>d. With vehicle on incline and transmission in neutral, engage parking brakes. Vehicle should not move.</p>
8	●		Steering	<p>a. Check vehicle response to steering wheel action. Vehicle should respond instantly.</p> <p>b. Turn steering wheel to extreme left, then right, to detect hard steering, steering backlash, or shimmy.</p> <p>c. With vehicle on straight, level terrain, lightly hold steering wheel to detect pull or wander.</p>
9	●		Engine	<p>a. Check engine operation at all speeds. Insure that engine does not exceed governed speed (2100 rpm).</p> <p>b. Observe engine instruments to detect malfunctions.</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

S-SEMIANNUALLY A-ANNUALLY

ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	s	A		
10	●		Transmission	<p>c. Be alert for unusual noises or smells.</p> <p>a. Check for response to shifting and smoothness of operation in all speed ranges.</p> <p>b. Be alert for unusual noises and difficulty in shifting in any speed range.</p> <p>c. Observe transmission instruments to detect malfunctions.</p>
11	●		Auxiliary Transmission	Engage auxiliary transmission to insure proper operation, observe smoothness of engagement.
12	●		Transfer	Engage transfer to insure proper operation. Observe smoothness of engagement.
13	●		Suspension	Observe how vehicle responds to road shocks, shifts or constant bouncing indicates malfunction.
<p>NOTE</p> <p>Items 14 and 15 will be performed with engine running: transmission in neutral and parking brake set.</p>				
<p><u>CAUTION</u></p> <p>Do not remove transmission dipstick before cleaning dirt away from filler tube and dipstick. Dirt could enter and damage transmission.</p>				
14	●		Transmission	<p>a. Check transmission fluid level. If low, add or fill according to LO 9-2320-270-12.</p> <p>b. Inspect dipstick and fluid for evidence of metal particles. Notify Direct Support Maintenance if metal particles are found.</p>
15	●		Engine Stop	Engage engine stop switch. When engine has stopped, release switch to original position.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

S- SEMIANNUALLY A- ANNUALLY

ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	S	A		
				<p>After Road Test</p> <p>Vehicle Underside</p>
16	●		Hubs and Drums	<p>a. Beginning at rear of vehicle, cautiously feel each wheel hub and brake drum for overheating which can indicate a defective wheel bearing or dragging brake.</p> <p>b. Brake drums cool to the touch usually indicate improper adjustment defective or inoperative brake.</p>
17	●		Axles, Transmission Transfer, and Differentials	<p>Cautiously feel each for overheating which can indicate low lubrication levels. If any of these components are overheated, check fluid level and add or fill according to LO 9-2320-270-12.</p>
18	●		Frame and Crossmembers	<p>a. Inspect frame side rails for cracks, breaks, bends, wear, and deterioration.</p> <p>b. Inspect crossmembers for missing rivets, bolts, obstructions to other components, breaks, and wear.</p>
19		●	Heat Exchanger	<p>Inspect heat exchanger for damage, secureness and leaks. Tighten loose clamps and bolts. Replace damage or leaking parts (pages 4-147 and 4-168).</p>
20	●		Tie Rod	<p>a. Inspect tie rod for damage, secureness and wear. There should not be any play in ends of tie rod. Torque tie rods end bolts to 160 to 180 ft-lb (218 to 245 N•m).</p> <p>b. Lubricate tie rod (LO 9-2320-270-12).</p>
21	●		Drag Link and Power Steering Cylinder	<p>a. Inspect drag links and power steering cylinder for damage, secureness, and leaks. Replace damaged or leaking parts (page 4-937).</p> <p>b. Adjust drag links to eliminate play in bail socket (page 4-937).</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

s – SEMIANNUALLY A – ANNUALLY

ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	S	A		
22	●		Front Axle and Springs	<p>c. Lubricate(LO9-2320-270-12).</p> <p>a. Inspect steering knuckle for damage. If steering knuckle is damaged, notify Direct Support Maintenance. Lubricate steering knuckle (LO 9-2320-270-1 2).</p> <p>b. Inspect breather for damage. Clean breather. Replace damaged breather (page 4-598).</p> <p>c. Check oil level in differentials add or change oil (LO 9-2320-270-1 2).</p> <p>d. Inspect spring pins for damage. Replace damaged spring pins (page 4-1074).</p> <p>e. Lubricate spring pins (LO 9-2390-270-12).</p> <p>f. Inspect springs for damage or misalignment. If springs are damaged or misaligned, notify Direct Support Maintenance.</p>
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23	●		Pusher Axle	<p>a. Inspect shock absorbers for leaks, damage and secureness. Torque loose shock lock nuts to 550 to 600 ft-lb (746 to 814 N•m).</p> <p>b. Inspect chain and bracket for damage and security, tighten loose mounting bolts. Notify Direct Support Maintenance, if chain or brakes are damaged.</p> <p>c. Inspect air bags and lines for security damage and leaks. Tighten loose lines. Notify Direct Support Maintenance for repair.</p>
	●			
	●			
24	●		Tandem Axles	<p>a. Inspect tandem axles for leaks and damage. If damaged or leaking, notify Direct Support Maintenance.</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

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ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	S	A		
25	●		Brake Shoes and Drums	b. Inspect power divider valve assembly for leaks or damage. Repair leaks (page 4-609). If damaged, notify Direct Support Maintenance.
	●			c. Inspect springs for damage. If springs are damaged, notify Direct Support Maintenance.
	●			d. Inspect torque rods for damage. If torque rods are damaged, notify Direct Support Maintenance.
	●			e. Inspect equalizer beams for damage and security. Loose or damaged equalizer beams, notify Direct Support Maintenance.
	●			f. Add or change oil (LO 9-2320-270-12).
	●			g. Change filter (LO 9-2320-270-12).
26		●	Brake Chambers Spring Brake Units, Slack Adjusters and Camshafts	a. Inspect all brake shoes and drums for cracks or wear. Replace any worn or damaged brake shoes or drums (page 4-609).
		●		b. Inspect brake actuator and wedge assembly for damage. Any damage actuator or wedge assembly, replace (page 4-609).
		●		c. Lubricate wheel bearings (LO 9-2320-270-12).
	●		a. Inspect brake chambers, spring brake units, slack adjusters and camshafts for damage. Replace damaged parts (page 4-609).	
	●			NOTE Do not adjust pusher axle brakes. Pusher axle brakes are self-adjusting. b. Adjust brakes if required (page 4-616).

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

S- SEMIANNUALLY A- ANNUALLY

ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	S	A		
27	●		Brake Valves	<p>c. Lubricate brake camshaft/slack adjuster (LO 9-2320-270-12).</p> <p>a. Inspect all brake valves for leaks or damage. Replace damaged or leaking valves (page 4-609).</p> <p>b. Apply brakes and listen for immediate exhausting of air. If air does not exhaust immediately, replace relay valve (page 4-785).</p> <p>c. Drain air in one tank and observe air pressure gage. If both systems lose air pressure, replace doublecheck valve (page 4-796).</p>
28	●		Air Reservoirs and Air Lines	<p>Inspect air reservoirs and air lines for damage and leakage. Replace damaged or leaking parts (page 4-609).</p>
29		●	Cab Mounts	<p>Inspect cab mounts for secureness and damage. Tighten loose cab mounts. If cab mounts are damaged, notify Direct Support Maintenance.</p>
30	●		Propeller Shafts and U-Joints	<p>Inspect all propeller shafts and U-joints for damage and security. There should not be any movement between propeller shaft and U-joints in any direction. If there is movement between propeller shaft and U-joints, replace damaged U-joints. Tighten loose flange bolts and nuts (page 4-574). Lubricate (LO 9-2320-270-12).</p>
31	●		Main Transmission	<p>a. Inspect main transmission for leaks. If main transmission is leaking, notify Direct Support Maintenance.</p> <p>b. Inspect temperature sending unit and wire for damage. Replace damaged parts (page 4-398).</p> <p>c. Check linkage for proper operation. If linkage requires adjustment, adjust (page 4-525).</p> <p>d. Clean breather (LO 9-2320-270-12).</p> <p>e. Change filters (LO 9-2320-270-12) (pages 4-562 and 4-563).</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

S - SEMIANNUALLY A - ANNUALLY

ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	s	A		
32	●		Auxiliary Transmission	<p>a. Inspect auxiliary transmission for damage or leaks. If leaks or damage, notify Direct Support maintenance.</p> <p>b. Check linkage for proper operation lubricate linkage (LO 9-2320-270-12).</p> <p>c. Inspect auxiliary transmission mounting security. Torque loose mounting bolts to 170 to 185 ft-lb (230 to 251N•m).</p> <p>d. Add or change oil (LO 9-2320-270-12).</p>
33	●		Transfer Case	<p>a. Inspect transfer case for leaks and damage. If damaged or leaking, notify Direct Support Maintenance.</p> <p>b. Inspect transfer case for security. Torque loose mounting bolts to 180 ft-lb (244 rim).</p> <p>c. Add or change oil (LO 9-2320-270-12).</p> <p style="text-align: center;">Engine Compartment</p>
34	●		Hood and Side Panels	Remove hood and side panels (TM 9-2320-270-10). Inspect hood, side panels, and latches for damage. Replace damaged part (pages 4-1088). Lubricate latches (LO 9-2320-270-12).
35	●		Wiring	Inspect engine compartment wiring for loose connections and frayed wires. Tighten loose connections and repair frayed wires.
38	●		Fuel and Oil Lines	Inspect fuel and oil lines for damage and leaks. Repair or replace damage or leaking lines.
37	●		Hydraulic Steering Pump, Lines, and Reservoir	<p>a. Inspect mounting bolts for security. Torque loose mounting bolts to 30 to 40 ft-lb (41 to 54 N•m).</p> <p>b. Inspect steering pump lines and reservoir for leaks and damage. Replace leaking or damaged parts (page 4-985).</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

S - SEMIANNUALLY A- ANNUALLY

ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	s	A		
38	●		Windshield Washer Reservoir	c. Add or change oil (LO 9-2320-270-12).
	●			a. Inspect mounting bracket and bottle for security and damage. Tighten loose parts. Replace damaged parts (page 4-1 180).
	●			b. Inspect hoses for damage. Replace damaged hose (page 4-1 177).
39	●		Air Cleaner and Hoses	a. Remove filter elements (page 4-49). Tap elements lightly against hard surface to take out loose particles.
		●		b. Replace elements annually or when restriction is indicated by restriction indicator (page 4-49).
40	●		Starter	c. inspect mounting bracket for security. Tighten loose mounting bracket bolts.
	●			d. Inspect hoses for damage and security. Tighten loose hose clamps, replace damaged hoses (page 4-64).
	●			a. Inspect mounting bolts for security. Tighten loose mounting bolts.
41	●		Accelerator Treadle Valve	b. Inspect wiring for damage and security. Tighten loose wiring and repair damaged wiring.
	●			Inspect treadle valve and air lines for leaks or damage. Tighten loose air lines. Replace damaged lines or valve (page 4-720).
42	●		Retarder Control Pedal Linkage	Inspect retarder linkage for damage, security, and adjustment. Tighten loose linkage mounting bolts. Adjust linkage and replace damaged linkage (page 4-547).
43	●		Steering Column and Steering Gear	a. Inspect steering column and steering gear for security and damage. Tighten loose mounting bolts. If steering column or steering gear are damaged, notify Direct Support Maintenance.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

S - SEMIANNUALLY

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ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	S	A		
44		●	Oil Pressure Sending Units	b. Adjust steering gear (page 4-981).
	●			c. Lubricate steering gear (LO 9-2320-270-1 2).
45		●	Water Temperature Sending Unit	a. Inspect oil pressure sending unit for leaks and security. Tighten loose sending units. Replace damaged or leaking unit (page 4-393).
	●			b. Inspect wires for security and damage. Tighten loose wires, repair damaged wires.
46		●	Fan Clutch Assembly	a. Inspect water temperature sending unit for leaks and security. Tighten loose units, replace leaking units (pages 4-416 and 4-418).
	●			b. Inspect wires for security and damage. Tighten loose wires and repair damaged wires.
47		●	Air Cylinder Throttle Control	a. Inspect fan and clutch assembly for damage. Replace damaged parts (pages 4-198 and 4-204).
		●		b. Inspect hoses for leaks. Replace leaking hoses (page 4-207).
		●		c. Adjust belts (page 4-200).
		●		d. Start engine (TM 9-2320-270-10). If air pressure is over 100 psi (689.5 kPa), fan should spin freely. If fan does not spin freely, replace thermal air valve (page 4-205). If fan spins freely and air pressure is below 65 psi (448 kPa), replace clutch assembly (page 4-204). Shut down engine (TM 9-2320-270-10).
	●		Inspect throttle control air line for leaks and throttle control for security. Tighten loose mounting bolts and air line. Replace damaged air line and throttle control (page 4-128).	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

S– SEMIANNUALLY A - ANNUALLY

ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	S	A		
48	●		Water Pump	<p>a. Inspect mounting bolts for security. Tighten loose mounting bolts.</p> <p>b. Inspect water pump for leaks. If water pump is leaking, notify Direct Support Maintenance.</p>
49	●		Fuel Pump	<p>a. Inspect mounting bolts for security. Tighten loose mounting bolts.</p> <p>b. Inspect fuel pump for leaks. Replace leaking fuel pump (page 4-37).</p>
50	●		Turbocharger	Inspect turbocharger for leaks and security. Tighten loose mounting bolts. If damaged or leaking, notify Direct Support Maintenance.
51	●		Engine Oil Filter	<p>a. Check engine oil level and condition. Add or change oil (LO 9-2320-270-12).</p> <p>b. Inspect oil filter for damage or leaks, replace leaking or damaged filter (page 4-24 and LO 9-2320-270-1 2).</p>
52	●		Oil Cooler	Inspect oil cooler for leaks and security. Torque loose oil cooler mounting bolts to 30 to 35 ft-lb (40.68 to 47.46 N•m). If oil cooler is leaking, notify Direct Support Maintenance.
53	●		Fuel Filter	Replace fuel filter and strainer (pages 4-110 and 4-114, LO 9-2320-270-1 2).
54	●		Air Compressor and Governor	<p>a. Inspect compressor and governor for security and damage. Tighten loose mounting bolts. Replace damaged compressor or governor (pages 4-842 and 4-851).</p> <p>b. Service breather (LO 9-2320-270-12).</p> <p>c. Inspect air line for security and damage. Tighten loose air lines. Replace damaged air lines (page 4-842).</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

S – SEMIANNUALLY A – ANNUALLY

ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	s	A		
55	●		Ether Starting Aid	Inspect ether canister for contents, damage and security. Tighten loose mounting bolts.
56	●		Starter Magnetic Switch	Inspect mounting screws and wires for security. Tighten loose mounting screws or wires. Repair damaged wires (page 4-232).
57			Alcohol Evaporator	<p style="text-align: center;">WARNING</p> <p>Methyl alcohol/methanol is toxic and burns easily. Fumes are explosive. Do not smoke or allow open flame nearby when using methyl alcohol/methanol. Do not drink methyl alcohol/methanol, it is extremely poisonous. If methyl alcohol/methanol is swallowed, get medical aid immediately.</p> <p style="text-align: center;">NOTE</p> <p style="text-align: center;">Cold Weather Use Only</p> <p>a. Inspect mounting bracket for security and damage. Tighten loose mounting bracket bolts. Replace damaged bracket (page 4-858).</p> <p>b. Fill evaporator (TM 9-2320-270-10).</p>
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	●			

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

S- SEMIANNUALLY A- ANNUALLY

ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	S	A		
58	●		Alternator	<p style="text-align: center;"><u>WARNING</u></p> <p>Do not touch positive lead on back of alternator with anything metal unless batteries are disconnected. You could damage alternator or cause personal injury.</p> <p>a. Inspect alternator mounting brackets for damage and security. Tighten loose mounting bracket bolts. Replace damaged bracket (page 4-215).</p> <p>b. Inspect wiring for security and damage. Tighten loose wires, repair damaged wiring.</p> <p>c. Adjust alternator belts (page 4-223).</p>
59	●		Radiator, Shroud and Hoses	<p>a. Inspect radiator, shroud, and hoses for leaks and damages. Replace leaking or damaged parts (pages, 4-143,4-151, and 4-160).</p> <p>b. Inspect radiator cap for damage. Replace damaged radiator cap (page 4-143).</p> <p>c. Check coolant level, condition, and anti-freeze protection. Add or change coolant if needed (TM 9-2320-270-10).</p>
60	●		Injector Pipes	<p>Remove rocker arm and valve cover (pages 4-12 and 4-18). Start engine (TM 9-2320-270-10). Inspect injector pipes for leaks and damage. If injector pipes are leaking or damaged, notify Direct Support Maintenance. Shut down engine (TM 9-2320-270-10), install rocker arm and valve covers (pages 4-12 and 4-18).</p>
61	●	●	Breather Valves and Hoses	<p>a. Inspect oil breather valves and hoses for damage. Replace damaged parts (pages 4-12 and 4-18).</p> <p>b. Service breather (LO 9-2320-270-12).</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

S - SEMIANNUALLY A - ANNUALLY

ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	s	A		
62	●		Exhaust Pipes	<p>Inspect exhaust pipes for security and damage. Tighten loose exhaust pipe clamps and mounting bolts. Replace damaged exhaust pipes (page 4-131). Install hood (page 4-1093) and install side panels (TM 9-2320-270-10).</p> <p style="text-align: center;">Spare Tire Winches and Towing Equipment</p>
63	●		Spare Tire Bracket and Hoist	<p>Operate spare tire hoist (TM 9-2320-270-10). Inspect hoist and bracket for damage. Replace damaged bracket or inoperable hoist (page 4-1055).</p>
64	●		Winches Hydraulic Lines, Motor, Valves, and Pump	<p>a. Check oil level and filters in reservoir. Add or change oil (page 4-1160, LO 9-2320-270-12).</p> <p>b. Start engine and engage PTO (TM 9-2320-270-10).</p> <p>c. Inspect winch hydraulic reservoir mounting bracket and cat walk for security and hydraulic lines for leaks. Tighten loose hydraulic lines. Replace damaged hydraulic lines (page 4-1 136). If reservoir mounting brackets or cat walk are damaged or cracked, notify Direct Support Maintenance.</p> <p>d. Check operation of winch (TM 9-2320-270-10), if winch is inoperative, notify Direct Support Maintenance.</p> <p>e. Inspect winch cable assemblies for damage. Replace damaged cable assemblies (page 4-1 140).</p> <p>f. Shut down engine (TM 9-2320-270-10).</p>
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65	●		Trailer Brake Lines and Electrical Connectors	<p>Inspect trailer brake lines and electrical connectors for damage. Replace damaged brake lines (page 4-871) and electrical connectors (TM 9-2320-270-10).</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

S- SEMIANNUALLY A - ANNUALLY

ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	s	A		
66	●		Fifth Wheel	<p>a. Inspect fifth wheel for damage and security. Torque loose fifth wheel mounting bolts as follows: Torque 5/8-1 1 grade 8, fifth wheel mounting bolt to 210 ft-lb (285 N•m) and 3/4-10 grade 8, fifth wheel mounting to 375 ft-lb (509 N•m). If fifth wheel is damaged, notify Direct Support Maintenance.</p> <p>b. Check for full oscillation of fifth wheel and engagement of locking jaws. Adjust oscillator lock outs if required (page 4-1064). If locking jaws require adjustment, notify Direct Support Maintenance.</p> <p>c. Lubricate fifth wheel (LO 9-2320-270-12).</p>
67	●		Towing Pintle	<p>a. Inspect towing pintle for damage. Replace damaged towing pintle (page 4-1045).</p> <p>b. Lubricate towing pintle (LO 9-2320-270-12).</p>
68	●		Towing Glad Hands Front and Rear	<p>Inspect front and rear glad hand seals and connectors for damage. Replace damaged glad hand or seals (page 4-838).</p>
69	●		Battery Box and Cables	<p>a. Inspect battery box, latches, and cover. Replace damaged parts (page 4-466).</p> <p>b. Open battery box, check specific gravity of fluid in batteries using hydromotor. Normal reading should be between 1.225 and 1.280 with less than 25 point spread between highest and lowest readings. Replace unserviceable battery (page 4-462).</p> <p>c. Inspect battery cables for damage and security. Tighten loose battery clamps. Replace damaged cables (page 4-446), close battery box, and secure latches.</p>

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

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ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	s	A		
70	●		Vehicle Exterior	<p>Inspect the following items for completeness, security, and deteriorated readability on data plates.</p> <ul style="list-style-type: none"> a. Glass b. Fasteners c. Hinges d. Doors body and access panels e. Storage boxes f. Data caution and warning plates
71	●		Tires	<ul style="list-style-type: none"> a. Check tires for correct air pressure: <ul style="list-style-type: none"> Front axle tires 95 psi (650 kPa) Pusher axle tires 95 psi (650 kPa) Tandem axle tires 85 psi (580 kPa) Spare tire 95 psi (650 kPa) b. Check tires for proper thread depth. Replace tires with thread depth less than 1/8-inch (3.175 mm) (page 4-936). c. Inspect tires for cuts and penetrating objects. Repair or replace tires with cuts or penetrating objects (page 4-936). d. Check to see if all wheel lug nuts are present. Torque all wheel lug nuts as follows: <ul style="list-style-type: none"> Front axle: torque lug nuts to 450-500 ft-lb (611-677 N•m) Pusher axle: torque lug nuts to 300-350 ft-lb (407-474 N•m) Tandem axle: torque outer lug nuts to 750-900 ft-lb (1017-1220 N•m) Tandem axle: torque inner lug nuts to 450-500 ft-lb (611-677 N•m) e. Inspect wheel side rings for dents bands or breaks that could cause them to pop off when tires are being inflated.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES - CONTINUED

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ITEM NO.	INTERVAL		ITEM TO BE INSPECTED	PROCEDURE
	s	A		
72	●		Body/Frame for Corrosion Damage	Check vehicle body/frame for corrosion damage, i.e., rust through, discolored surface, blistered paint, surface separation or other evidence of corrosion damage in accordance with para 1-7 of TB 43-0213, Rustproofing Procedures.
73	●		Lubricate Vehicle	Completely lubricate vehicle in accordance with lubrication order LO 9-2320-270-12.
74	●			<p style="text-align: center;">Final Road Test</p> After all services and inspections have been completed, take vehicle on a short road test to insure all corrections have been accomplished. Correct any defects or malfunctions that may occur during final road test.

CHAPTER 3

TROUBLESHOOTING

OVERVIEW

This chapter contains the information you will need to troubleshoot the M911 Truck Tractor. It gives you the checks and corrective actions which will find defects that can be corrected by organizational maintenance.

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Section L TROUBLESHOOTING SYMPTOM INDEX

This index is provided as a guide to help you identify problems. Choose the malfunction that comes closest to condition of M911 Truck Tractor, and turn to troubleshooting procedure page shown in index.

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Section II. TROUBLESHOOTING PROCEDURES

The troubleshooting procedures in this section will give you information to find, isolate, and correct problems that may have been found during operation or maintenance of the M911 Truck Tractor.

TROUBLESHOOTING

The troubleshooting table lists the common malfunctions that you may find during the operation or maintenance of the M911 Truck Tractor or its components. You should perform the test/inspections and corrective actions in the order listed.

This manual can not list all malfunctions that may occur, or all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

EXPLANATION OF COLUMNS

Malfunction – Visual or operational indication that something is wrong with the Truck Tractor.

Test/Inspection – Procedure to isolate the problem to a component or system.

Corrective Action – Procedure to correct problem.

TROUBLESHOOTING

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

ENGINE

1. ENGINE FAILS TO CRANK.

Step 1. Open left side of hood and remove left side panel (TM 9-2320-270-10). Make sure gear selector is in neutral position. Turn ignition key to START position (instrument panel VOLTMETER shows voltage) and listen to starter (1) and solenoid (2). Turn ignition key to OFF position.

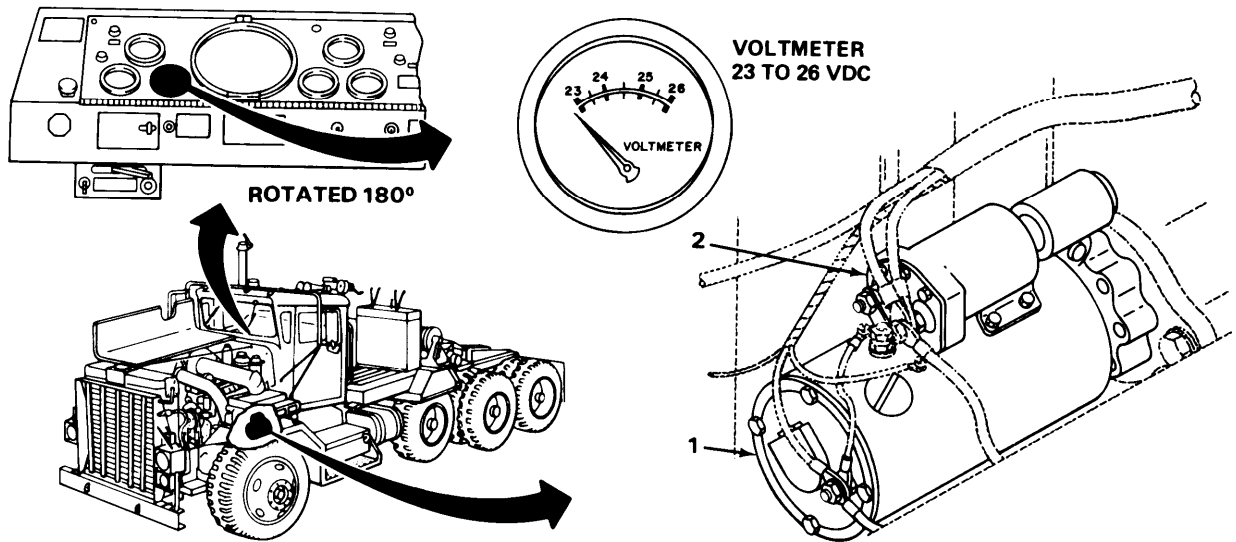
- a. If starter (1) grinds, go to step 17.
- b. If starter (1) spins, replace it (page 4-228).
- c. If solenoid (2) thumps, replace starter (page 4-228).
- d. if instrument panel VOLTMETER showed voltage when ignition key was turned, go to step 8.

TROUBLESHOOTING - CONTINUED

MALFUNCTION

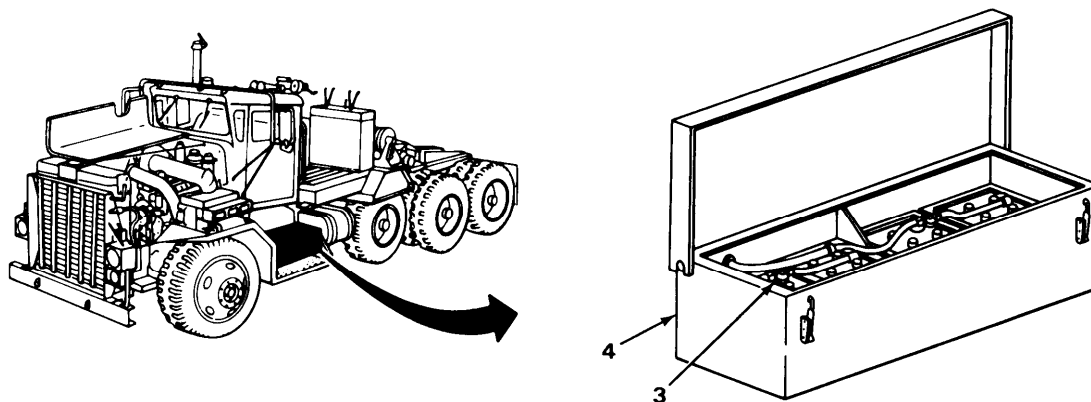
TEST OR INSPECTION

CORRECTIVE ACTION



Step 2. Using multimeter set at 30 vdc, put red probe on positive (+) battery terminal (3) and black probe on frame (4).

If multimeter reads no voltage, replace batteries (page 4-462).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

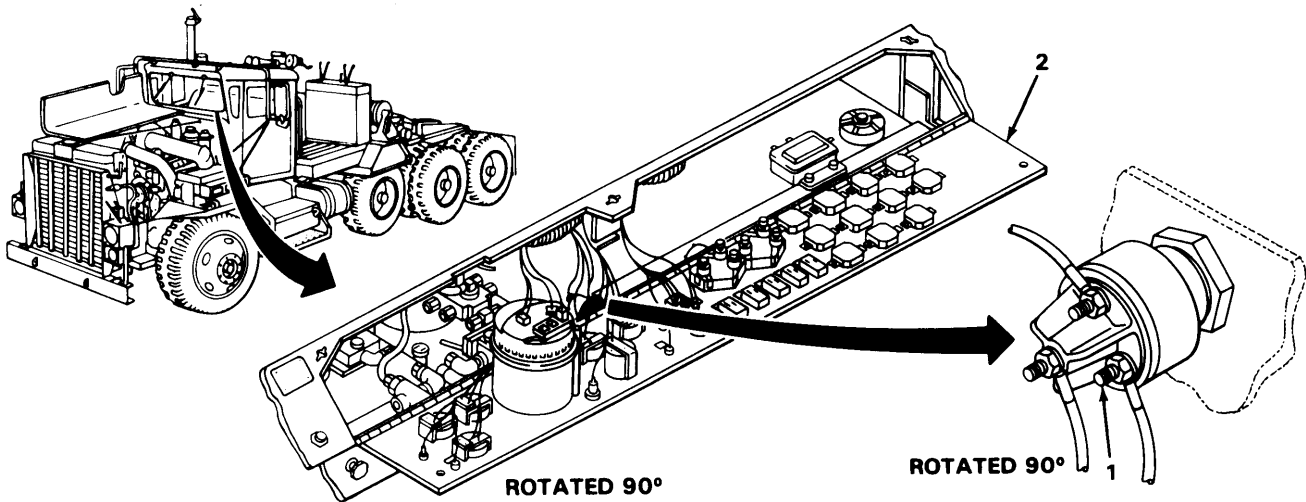
TEST OR INSPECTION

CORRECTIVE ACTION

1. ENGINE FAILS TO CRANK- CONTINUED.

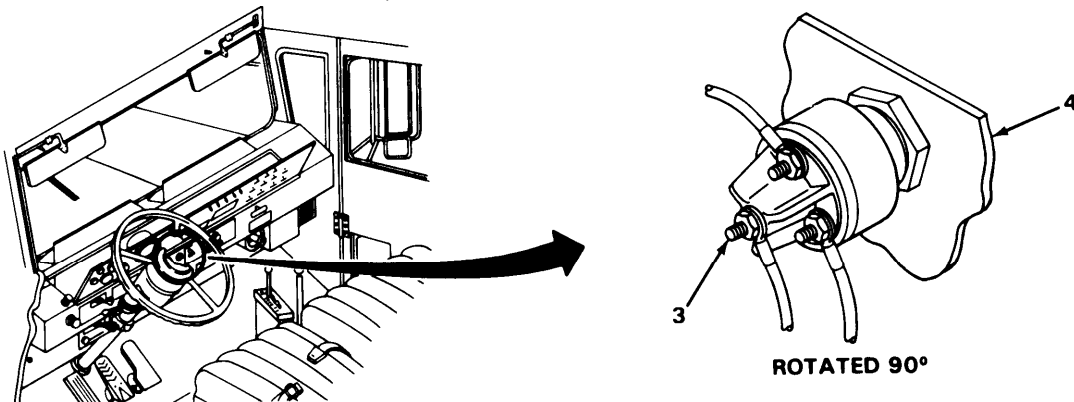
Step 3. Open instrument panel (page 4-244). Using multimeter set at 30 vdc, put red probe on ignition switch BATT terminal (1) and black probe on panel (2).

If multimeter reads no voltage, turn key to OFF position, close instrument panel (page 4-244), install left side panel, close left side of hood (TM 9-2320-270-10), and notify direct support maintenance.



Step 4. Turn key to START position and using multimeter set at 30 vdc, put red probe on ignition switch START terminal (3), and black probe on panel (4).

If meter reads no voltage, turn key to OFF position, replace ignition switch (page 4-246), install left side panel, and close left side of hood (TM 9-2320-270-10).



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TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

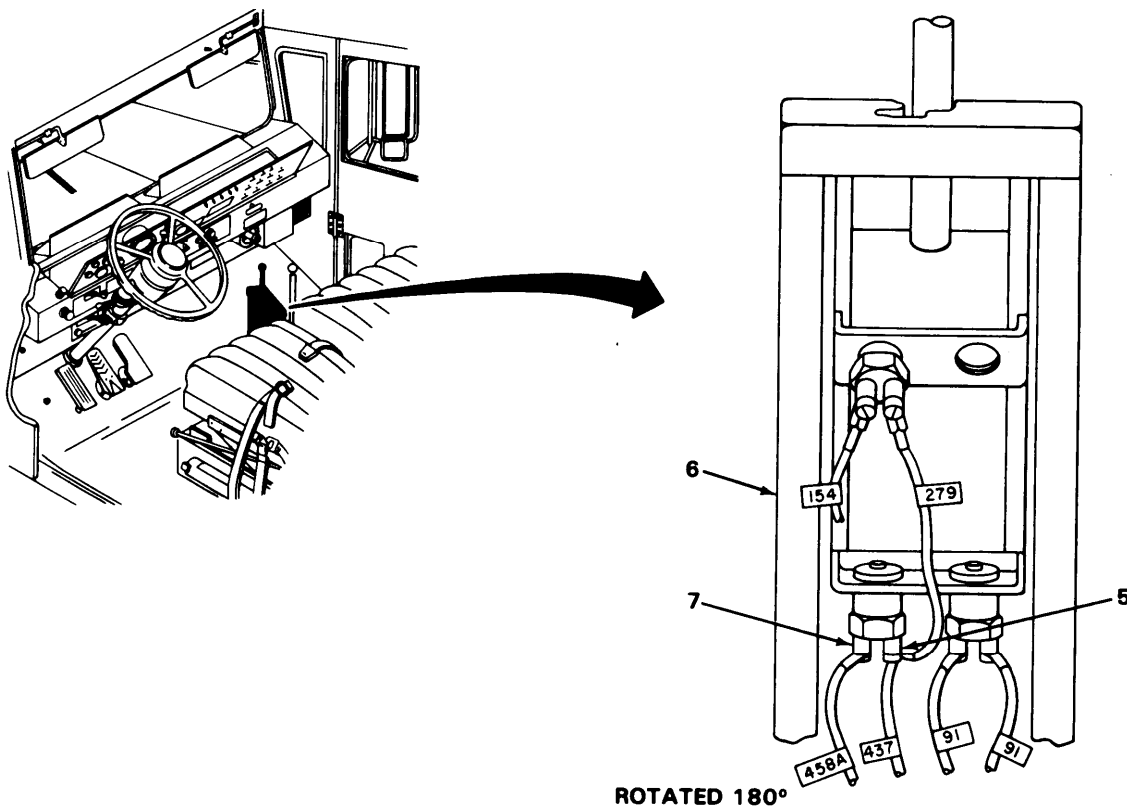
CORRECTIVE ACTION

- Step 5. Turn ignition key to ON position. Using multimeter set at 30 vdc, put red probe on neutral safety switch power terminal (5) and black probe on housing (6).

If meter reads no voltage, turn key to OFF position, close instrument panel (page 4-244), install left side panel, close left side of hood (TM 9-2320-270-10), and notify direct support maintenance.

- Step 6. Using multimeter set at 30 vdc, put red probe on neutral safety switch output terminal (7) and black probe on housing (6).

If meter reads no voltage, turn key to OFF position, replace switch (page 4-512), close instrument panel (page 4-244), install left side panel, and close left side of hood (TM 9-2320-270-10).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

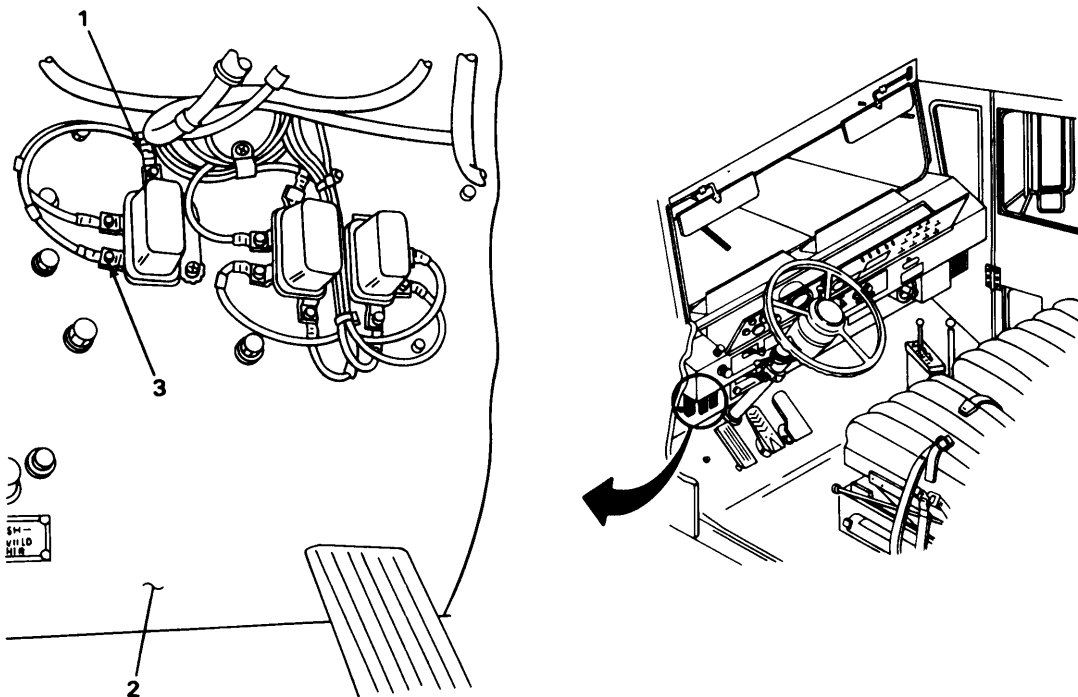
1. ENGINE FAILS TO CRANK – CONTINUED.

- Step 7. Using multimeter set at 30 vdc, put red probe on starter relay terminal (1) and black probe on cab wall (2).

If meter reads no voltage, turn key to OFF position, close instrument panel (page 4-244), install left side panel, close left side of hood (TM 9-2320-270-10), and notify direct support maintenance.

- Step 8. Using multimeter set at 30 vdc, put red probe on relay terminal (3) and black probe on cab wall (2).

If meter reads no voltage, turn key to OFF position, replace relay (page 4-236), close instrument panel (page 4-244), install left side panel, and close left side of hood (TM 9-2320-270-10).



TA239598

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

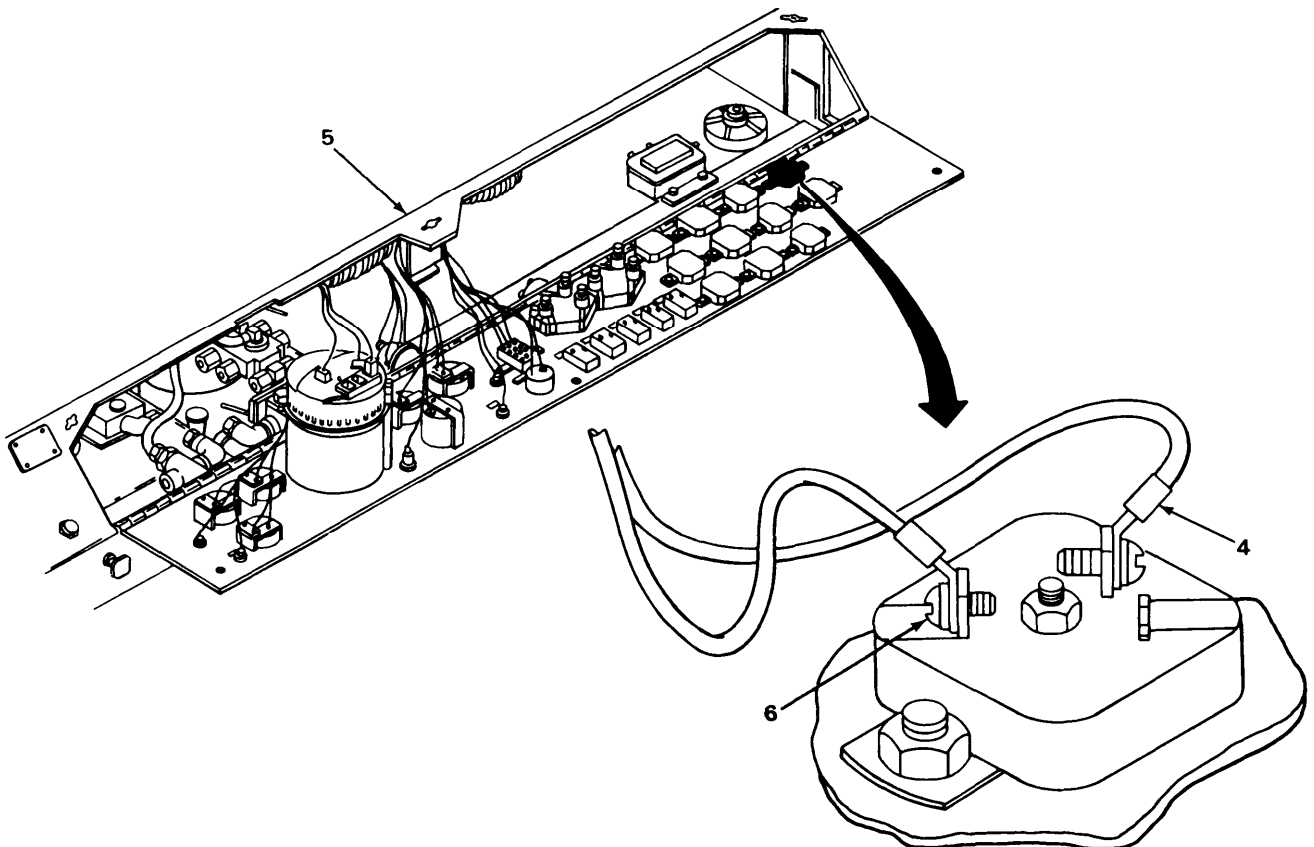
CORRECTIVE ACTION

- Step 9. Using multimeter set at 30 vdc, put red probe on one side of instrument panel ignition switch circuit breaker terminal (4) and black probe on panel (5).

If meter reads no voltage, turn key to OFF position, close instrument panel (page 4-244), install left side panel, close left side of hood (TM 9-2320-270-10), and notify direct support maintenance.

- Step 10. Using multimeter set at 30 vdc, put red probe on one side of instrument panel ignition switch circuit breaker terminal (6) and black probe on panel (5).

If meter reads no voltage, turn key to OFF position, replace circuit breaker (page 4-304), install left side panel and close left side of hood (TM 9-2320-270-10).



TA239599

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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1. ENGINE FAILS TO CRANK – CONTINUED.

Step 11. Open right side of hood and remove right side panel (TM 9-2320-270-10). Have assistant turn ignition key to START position. Using multimeter set at 30 vdc, put red probe on magnetic switch power terminal (1) and black probe on bulkhead (2).

If meter reads no voltage, close instrument panel (page 4-244), install left and right side panels, close right side of hood (TM 9-2320-270-10), and notify direct support maintenance.

Step 12. Using multimeter set at 30 vdc, put red probe on magnetic switch terminal (3) and black probe on bulkhead (2).

If meter reads no voltage, replace switch (page 4-232), close instrument panel (page 4-244), install right and left side panels and close right side of hood (TM 9-2320-270-10).

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

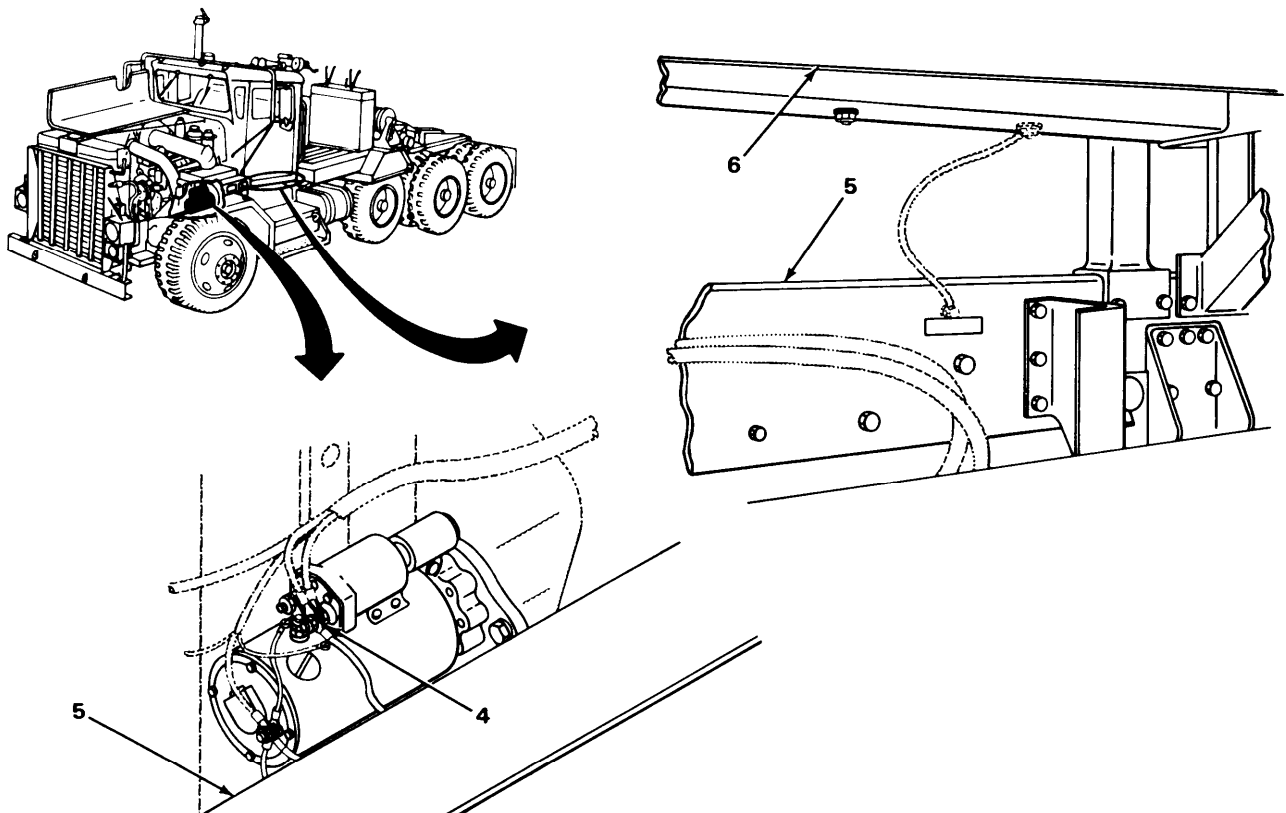
CORRECTIVE ACTION

Step 13. Open left side of hood (TM 9-2320-270-10). Using multimeter set at 30 vdc, put red probe on solenoid power terminal (4) and black probe on frame (5). Have assistant turn key to START position, take the reading and have assistant turn key to OFF position.

If meter reads no voltage, close instrument panel (page 4-244), install right and left side panels, close left side of hood (TM 9-2320-270-10), and notify direct support maintenance.

Step 14. Using multimeter set at RX 1, put red probe on cab (6) and black probe on frame (5).

If meter does not read zero, close instrument panel (page 4-244), install right and left side panels, close left side of hood (TM 9-2320-270-10), and notify direct support maintenance.



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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ENGINE FAILS TO CRANK – CONTINUED.

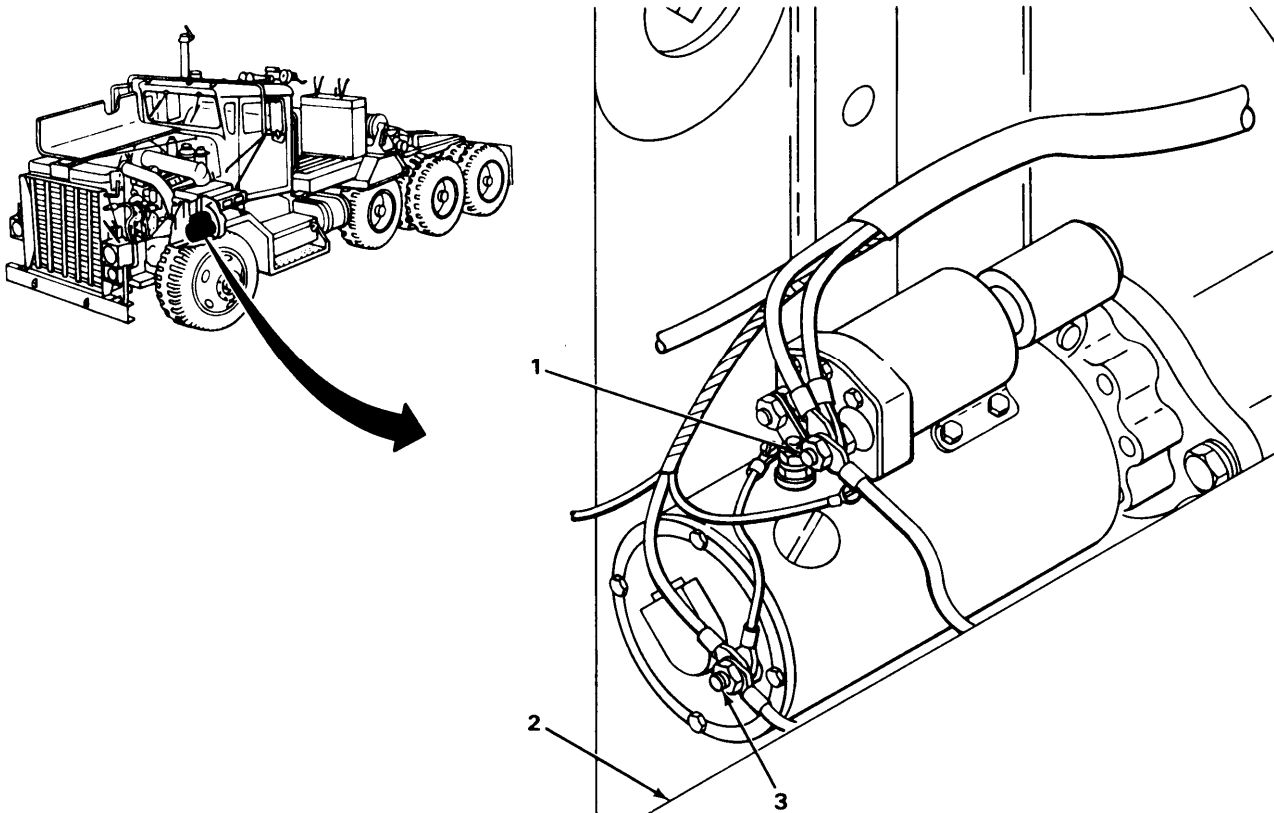
Step 15. Have assistant turn ignition key to START position. Using multimeter set at 30 vdc, put red probe on solenoid terminal (1) and black probe on frame (2).

If meter reads no voltage, turn key to OFF position, close instrument panel (page 4-244) and replace starter (page 4-228).

Step 16. Using multimeter set at RX 1, put red probe on starter motor terminal (3) and black probe on frame (2).

a. If meter reads zero, replace starter (page 4-228) and close instrument panel (page 4-244).

b. If meter does not read zero, install right and left side panels, close left side of hood (TM 9-2320-270-10), close instrument panel (page 4-244), and notify direct support maintenance.



TA39602

TROUBLESHOOTING - CONTINUED

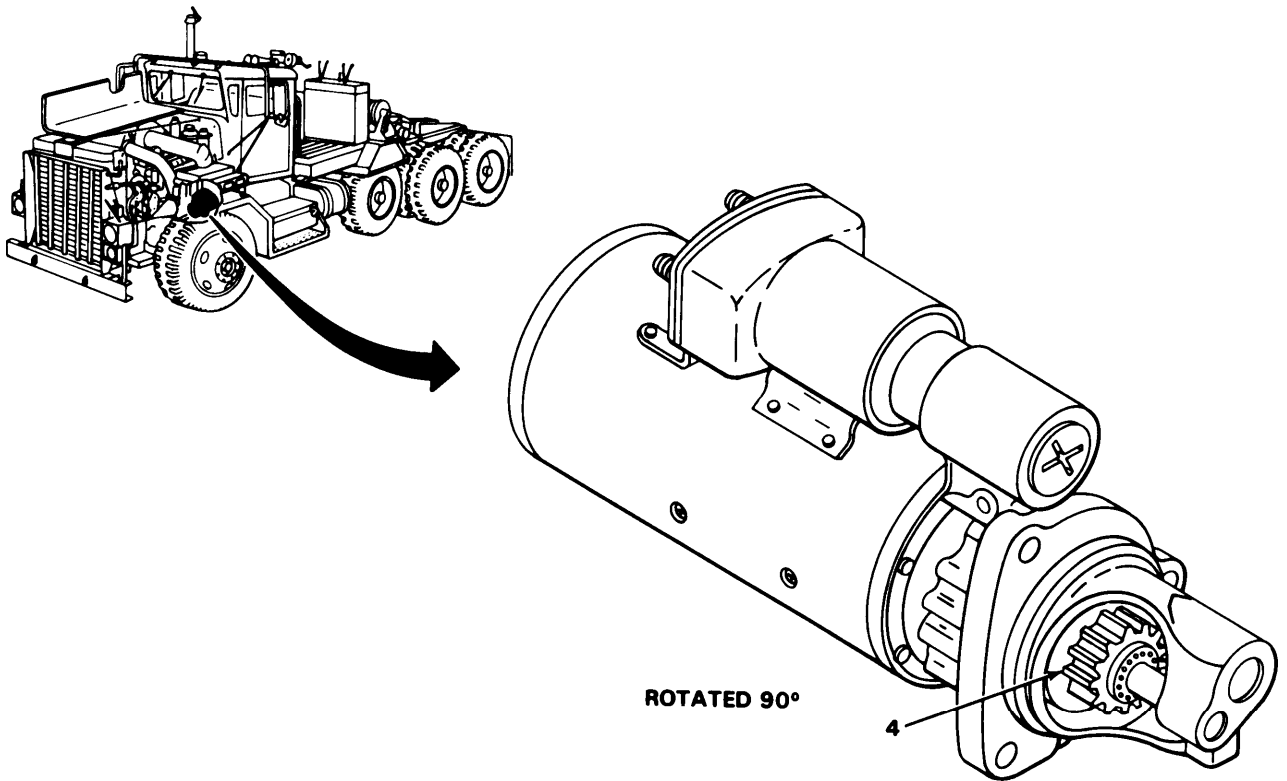
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

Step 17. Remove starter (page 4-228) and look at pinion gear (4).

- a. If pinion gear (4) is damaged, replace starter (page 4-228) and close instrument panel (page 4-224).
- b. If pinion gear (4) is not damaged, close instrument panel (page 4-244), install right and left side panels, close left side of hood (TM 9-2320-270-10), and notify direct support maintenance.



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

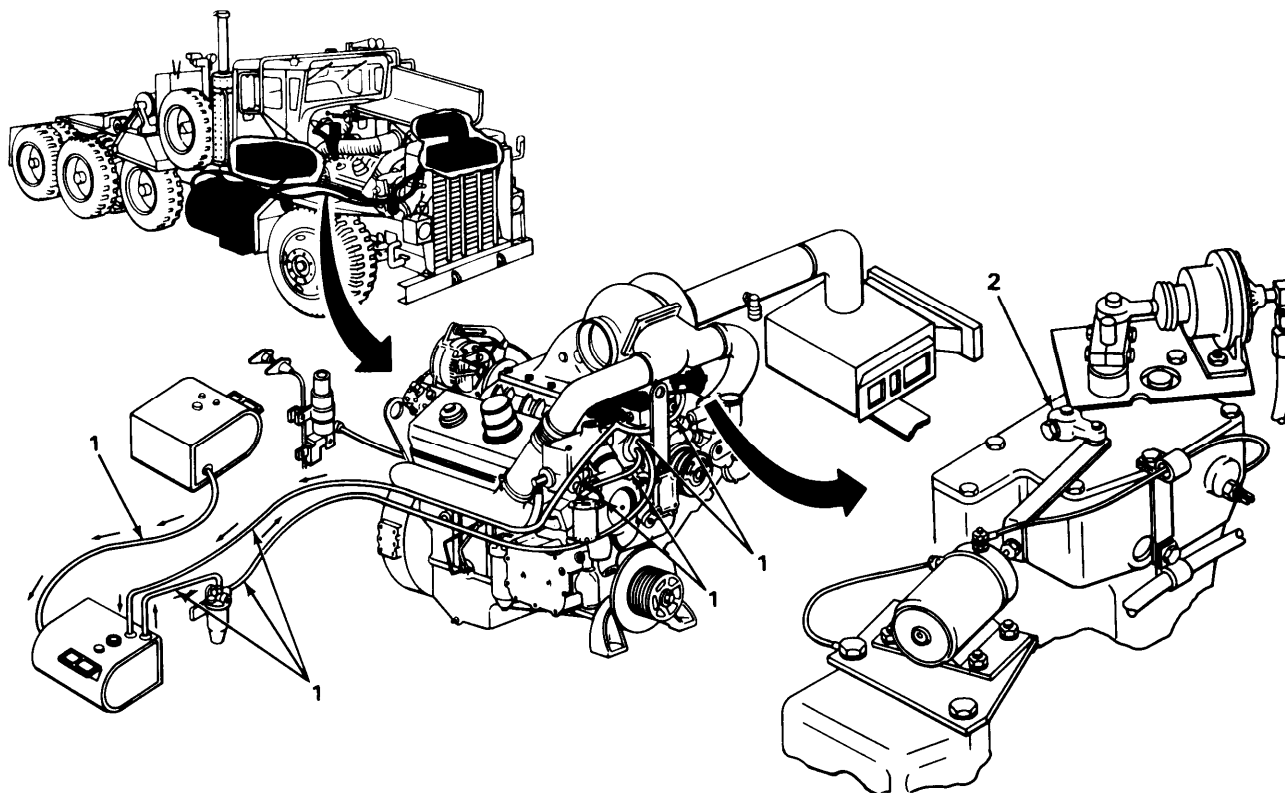
2. ENGINE CRANKS BUT FAILS TO START (ABOVE 40°F) (4.4°C).

CAUTION

Do not crank engine for more than 30 seconds. Allow to cool 1 minute between cranking attempts. Cranking too long can overheat and damage starter.

- Step 1. Open right side of hood and remove right side panel (TM 9-2320-270-10), inspect fuel lines and fittings (1) for leakage and damage.
- a. If fuel lines and fittings (1) are damaged, replace (page 4-32).
 - b. If fuel lines and fittings (1) are loose, tighten.
- Step 2. Check fuel shut off by moving lever (2).

If lever (2) cannot be moved, or if lever (2) does not spring back when let go, notify direct support maintenance.



TA239604

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

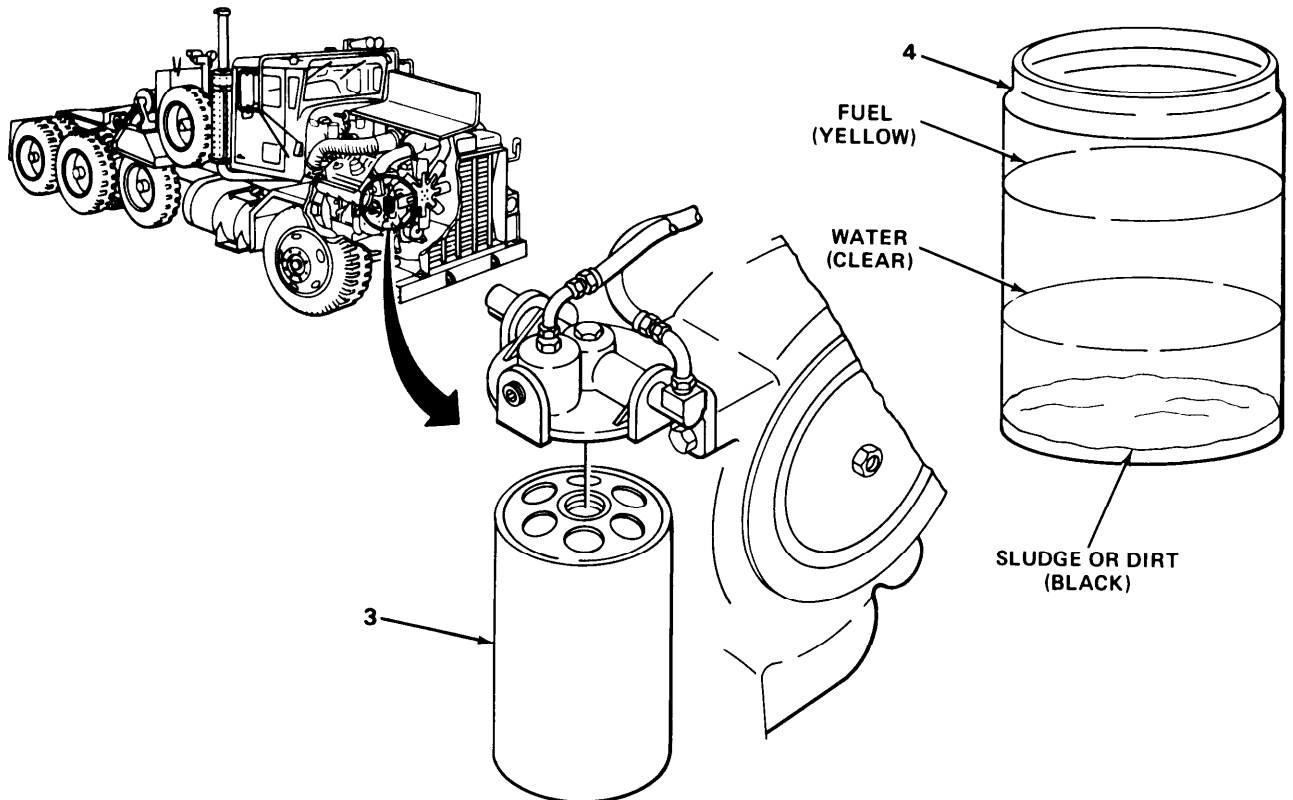
Step 3. Remove fuel filter (page 4-110) and look for air in fuel system.

If filter (3) is not completely full, fill it and install it (page 4-110), and purge fuel system (page 4-32),

Step 4. Pour contents of filter (3) into glass container (4) and look for water, sludge, or dirt.

a. If water, sludge, or dirt are present in container (4), replace filter (page 4-110), replace strainer (page 4-114), drain and refill fuel tanks (page 4-32), and purge fuel system (page 4-32).

b. If only fuel is present in container (4), refill and install filter (page 4-110), and purge fuel system (page 4-32) and check for leaks.



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

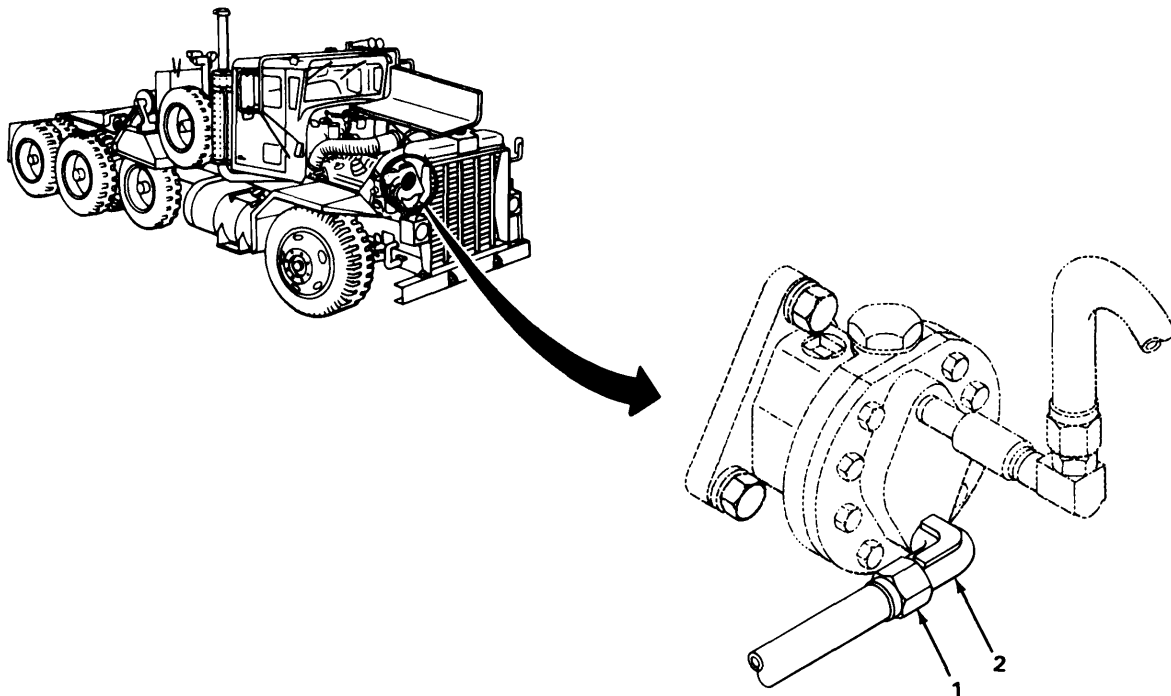
CORRECTIVE ACTION

2. ENGINE CRANKS BUT FAILS TO START (ABOVE 40°F) (4.4°C) - CONTINUED.

WARNING

Stay clear of fan while engine is being cranked. Failure to do so could result in serious personal injury or death.

- Step 5. Disconnect fuel inlet hose (1) from fuel pump inlet elbow (2). Connect vacuum gage to inlet elbow (2). While assistant is cranking engine (TM 9-2320-270-10), note reading on vacuum gage.
- a. If gage shows less than 6 in. (15 cm) Hg of vacuum, replace fuel pump (page 4-37).
 - b. If gage shows more than 6 in. (15 cm) Hg of vacuum, remove, clean, inspect and install fuel lines and fittings (page 4-32), and purge fuel system (page 4-32).
 - c. If engine cranks but still fails to start, install right side panel and close right side of hood (TM 9-2320-270-10) and notify direct support maintenance.



TA239606

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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3. ENGINE CRANKS BUT FAILS TO START (BELOW 40°F) (4.4°C).

WARNING

Ether is highly flammable and explosive. Do not smoke or have open flame near engine compartment when troubleshooting ether starting kit. Inhaling ether may cause drowsiness. If ether has been inhaled, get fresh air immediately. Failure to observe these precautions could cause injury to personnel.

CAUTION

If ether starting kit has been used without cranking engine, allow 5 minutes for ether in engine to evaporate before trying to start engine. Ether buildup in engine could explode, causing damage to engine.

Do not crank engine for more than 30 seconds. Allow to cool 1 minute between cranking attempts. Cranking too long can overheat and damage starter.

NOTE

The ether starting kit should be used to make up for the engine's difficulty firing diesel fuel in cold weather. It should not be used to make up for weak batteries, a defective starter, or problems other than cold weather.

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

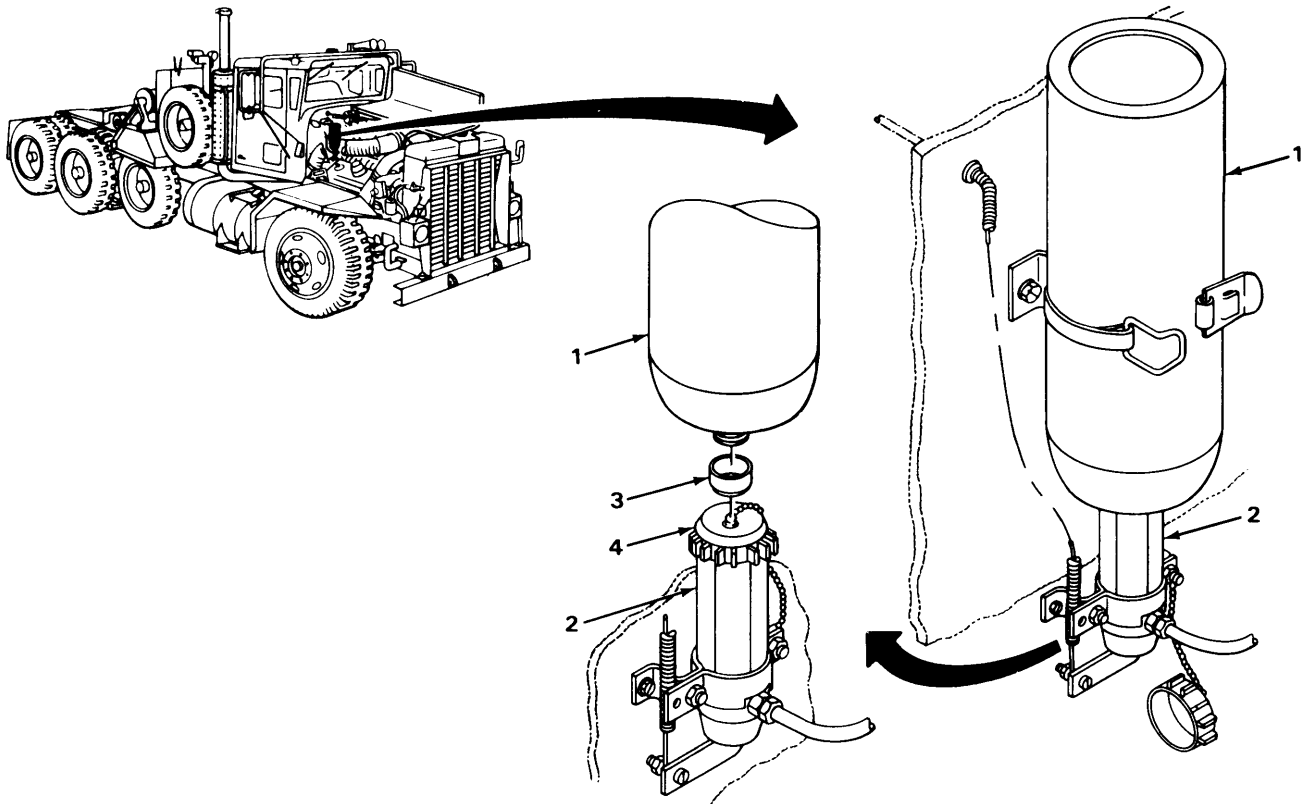
3. ENGINE CRANKS BUT FAILS TO START (BELOW 40°F) (4.4°C) – CONTINUED.

Step 1. Open right side of hood and remove right side panel (TM 9-2320-270-10).
Check to make sure ether cylinder (1) is screwed tight into valve (2).

a. If cylinder (1) is loose, tighten it. Install right side panel and close right side of hood (TM 9-2320-270-10).

b. If cylinder (1) is disconnected and capped, do the following:

1. Unclamp cylinder (1).
2. Remove cap (3) from cylinder (1).
3. Remove cap (4) from valve (2).
4. Screw cylinder (1) into valve (2) and tighten.
5. Clamp cylinder (1).
6. Install right side panel and close right side of hood (TM 9-2320-270-10).



TA239607

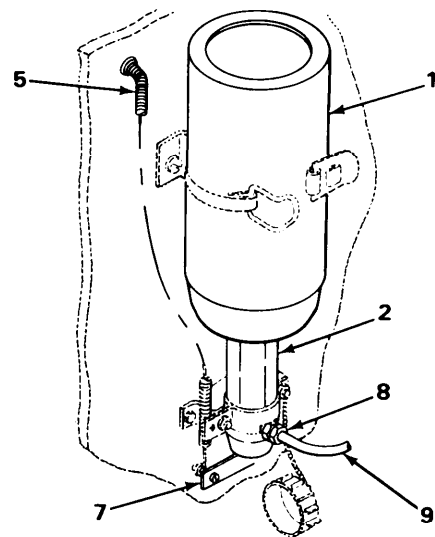
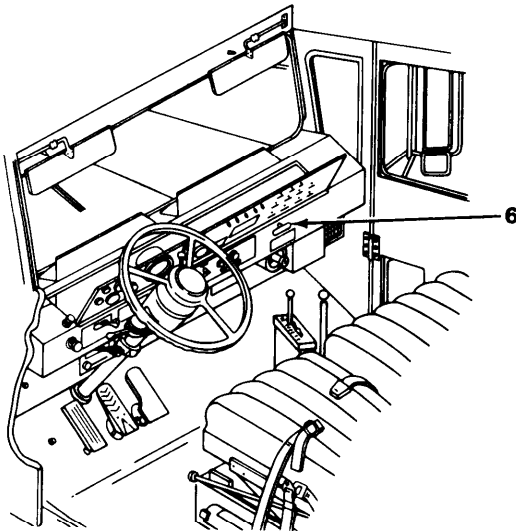
TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

- Step 2. Check operation of cable (5) and listen for leaks while assistant operates quick start handle (6) from inside cab.
- a. If cable (5) is damaged, replace it (page 4-118).
 - b. If cable (5) does not pull lever (7) far enough to open ether valve (2), adjust it (page 4-118).
 - c. If fitting (8) is leaking, tighten it.
 - d. If tubing (9) is leaking or damaged, replace it (page 4-118).
 - e. To determine if ether is in the cylinder, remove cylinder (page 4-1 18) and shake gently.
 - f. If hissing sound is now heard, replace cylinder (1) (page 4-118).
 - g. If engine still does not start, go to ENGINE CRANKS BUT FAILS TO START (ABOVE 40°F) (4.4°C) (page 3-14).
 - h. If engine cranks and starts, install right side panel and close right side hood (TM 9-2320-270-10).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

4. ENGINE LACKS POWER.

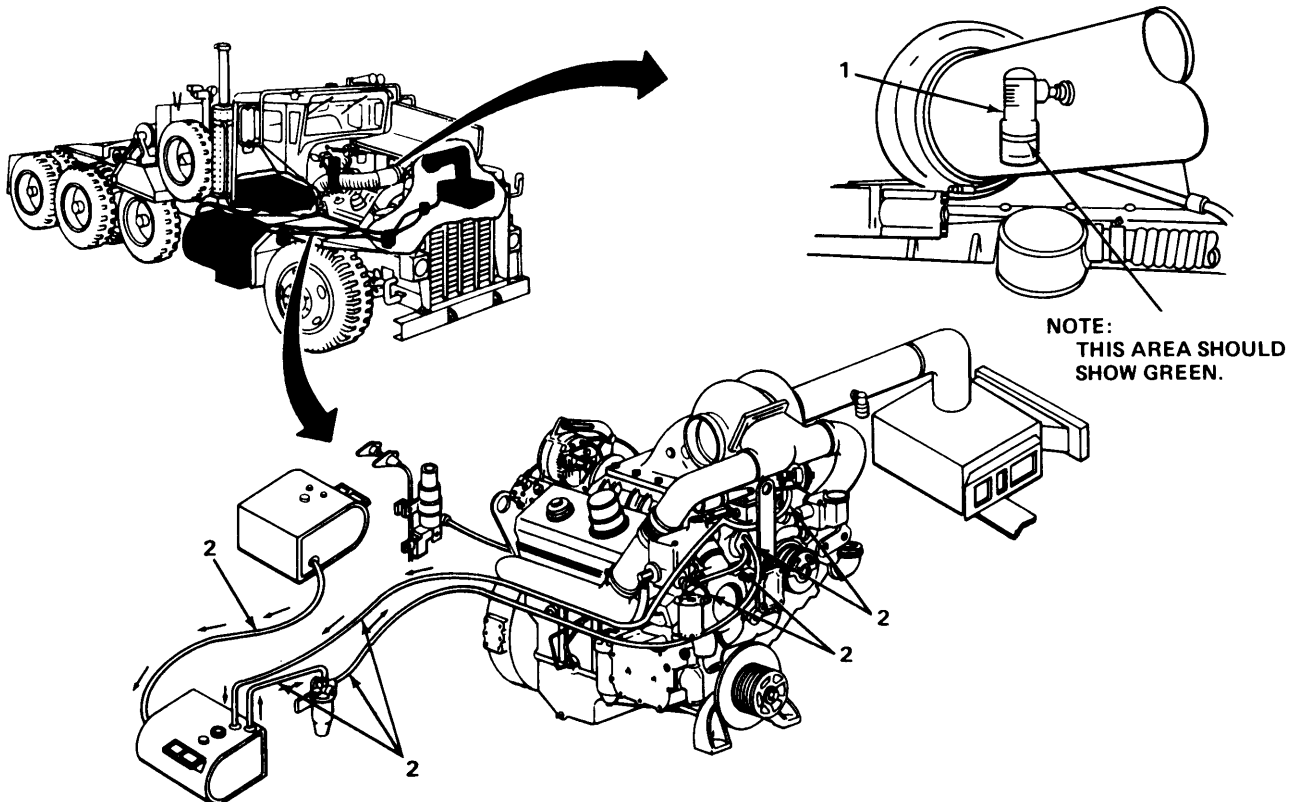
Step 1. Open left side of hood (TM 9-2320-270-10) and check color on air restriction indicator (1).

If restriction indicator (1) is red instead of green, reset and start engine. If indicator (1) shows red again, replace air cleaner element (page 4-45) and close left side of hood (TM 9-2320-270-10).

Step 2. Open right side of hood and remove right side panel (TM 9-2320-270-10). Inspect fuel lines and fittings (2) for leakage and damage.

a. If fuel lines and fittings (2) are damaged, replace (page 4-32).

b. If fuel lines and fittings (2) are loose, tighten and install right side panel and close right side of hood (TM 9-2320-270-10).

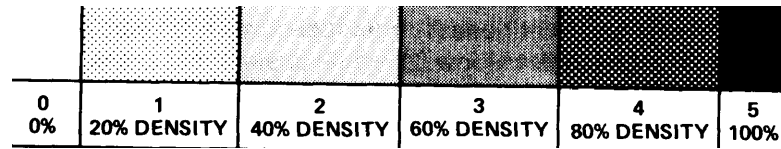


TA239609

TROUBLESHOOTING - CONTINUED

MALFUNCTION
 TEST OR INSPECTION
 CORRECTIVE ACTION

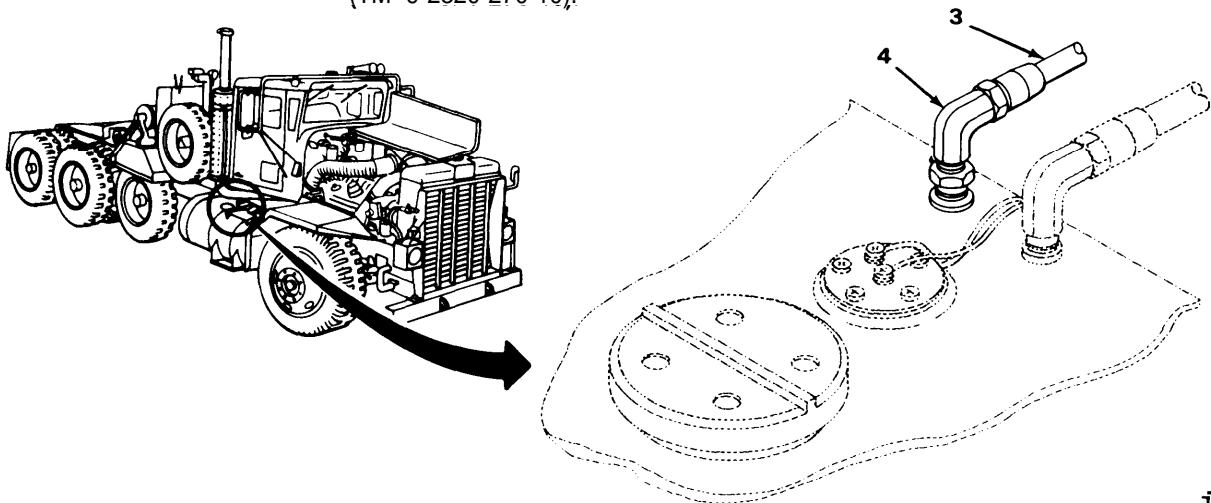
Step 3. Start engine (TM 9-2320-270-10) and compare density of exhaust smoke to chart below.



If smoke is 40 percent density or greater, shut down engine (TM 9-2320-270-10) and notify direct support maintenance.

Step 4. Shut down engine (TM 9-2320-270-10). Disconnect fuel return hose (3) from right fuel tank elbow (4) and put end of hose (3) in container (at least 2-gallon capacity). Start engine (TM 9-2320-270-10) and run at 1,800 rpm for 1 minute, shut down engine (TM 9-2320-270-10). Check amount of fuel in container.

If there is less than 0.9 gallons of fuel in container, replace fuel filter (page 4-110) and fuel strainer (page 4-114), connect fuel return hose (3) to elbow (4), install right side panel and close right side of hood (TM 9-2320-270-10).



TA239610

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

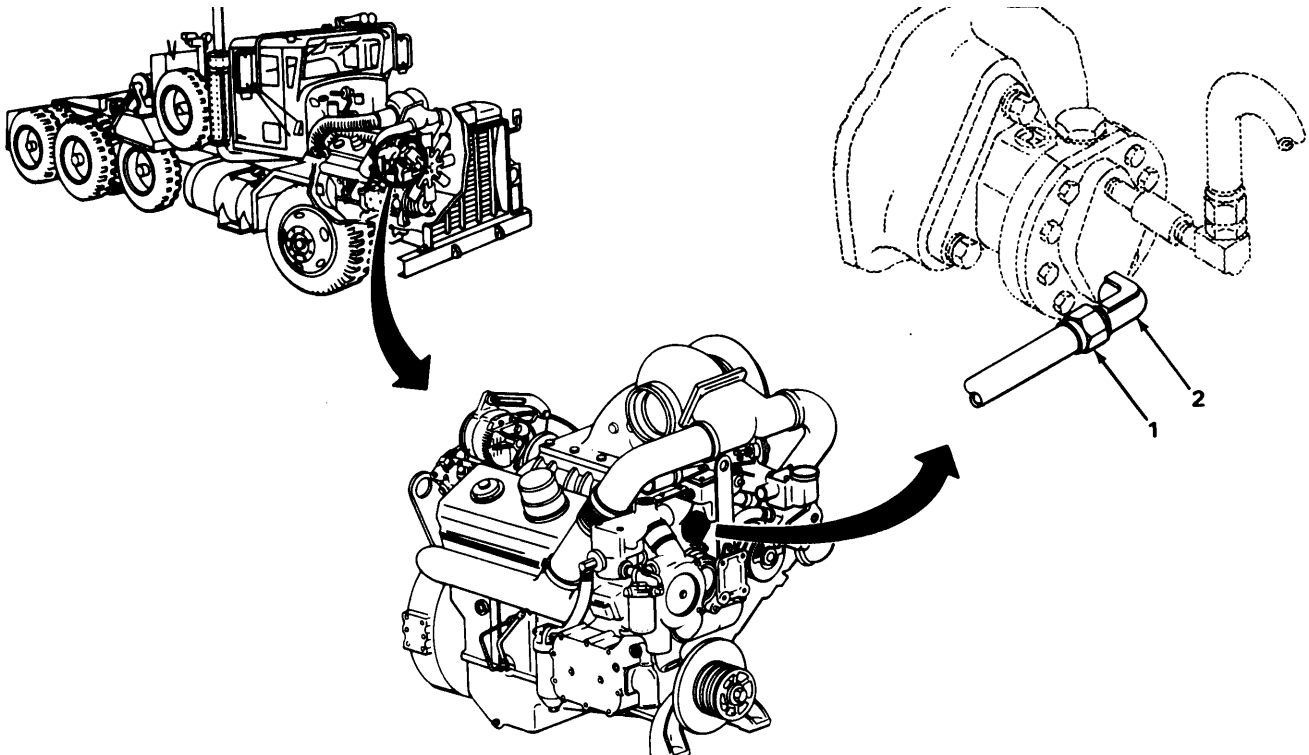
CORRECTIVE ACTION

4. ENGINE LACKS POWER - CONTINUED.

WARNING

Stay clear of fan while engine is being cranked. Failure to do so could result in serious personal injury or death.

- Step 5. Disconnect fuel inlet hose (1) from fuel pump inlet elbow (2). Connect vacuum gage to inlet elbow (2). While assistant is cranking engine (TM 9-2320-270-10), note reading on vacuum gage.
- a. If gage shows less than 6 in. (15 cm) Hg of vacuum, replace fuel pump (page 4-37) and install right side panel and close right side hood (TM 9-2320-270-10).
 - b. If gage shows more than 6 in. (15 cm) Hg of vacuum, remove, clean, inspect and install fuel lines and fittings (page 4-32), and purge fuel system (page 4-32).
 - c. If engine still lacks power, notify direct support maintenance.



TA239611

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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5. ENGINE RUNS ROUGH.

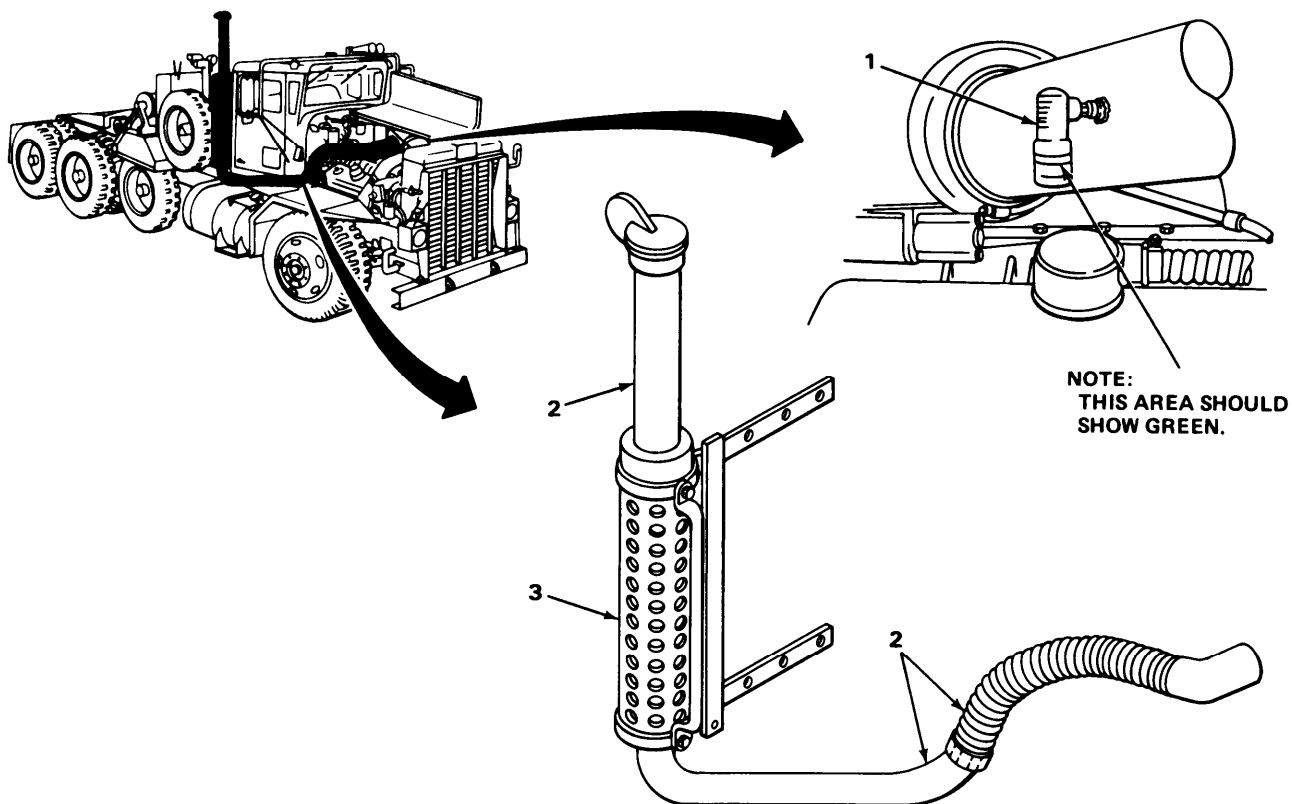
Step 1. Open left side of hood (TM 9-2320-270-10) and check color on air restriction indicator (1).

If restriction indicator (1) is red instead of green, reset and start engine (TM 9-2320-270-10). If indicator (1) shows red again shut down engine (TM 9-2320-270-10), replace air cleaner element (page 4-45), and close left side of hood (TM 9-2320-270-10).

Step 2. Open right side of hood and remove right side panel (TM 9-2320-270-10). Check exhaust pipes (2) and muffler (3) for damage or restriction.

a. Remove any objects causing restriction, and install right side panel and close right side of hood (TM 9-2320-270-10).

b. If exhaust pipes (2) or muffler (3) are damaged, replace (page 4-131) or (page 4-136).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

5. ENGINE RUNS ROUGH – CONTINUED.

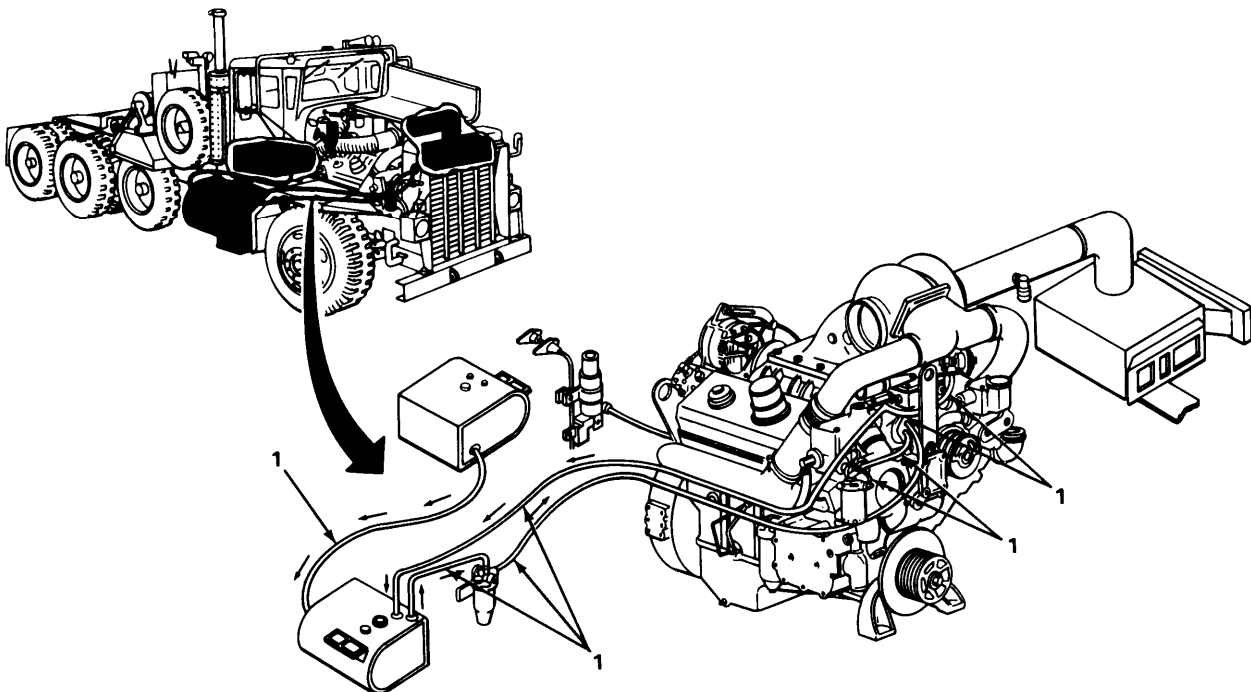
Step 3. Inspect fuel lines and fittings (1) for leakage or damage.

a. If fuel lines and fittings (1) are damaged, replace (page 4-32).

b. If fuel lines and fittings (1) are loose, tighten and install right side panel and close right side of hood (TM 9-2320-270-10).

Step 4. Check for proper use of ether starting kit during engine warm up after cold start (TM 9-2320-270-10).

If ether starting kit was not properly used, wait 5 minutes, then follow procedures for cold starting (TM 9-2320-270-10), and install right side panel and close right side of hood (TM 9-2320-270-10).



TA239613

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

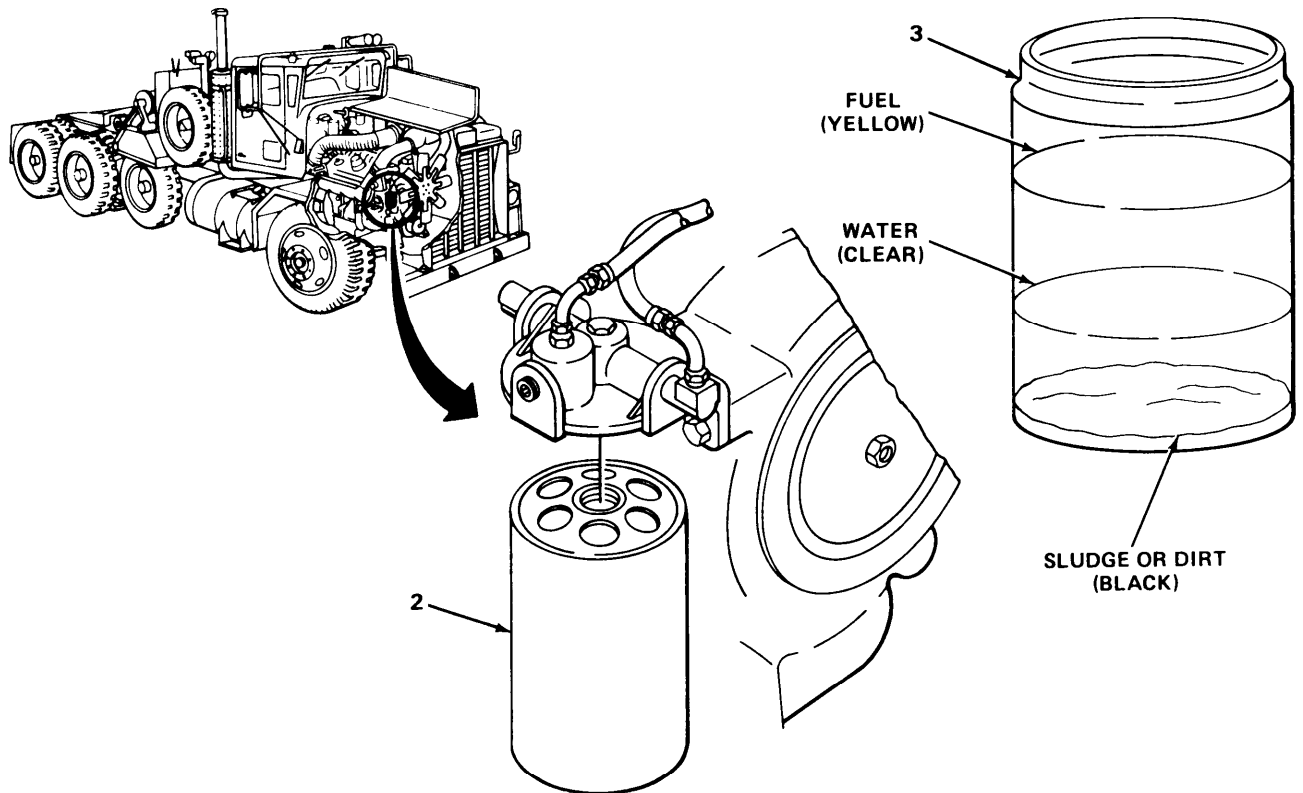
Step 5. Remove fuel filter (2) (page 4-110) and look for air in fuel system.

If filter (2) is not completely full, fill it and install it (page 4-110), and purge fuel system (page 4-32).

Step 6. Pour contents of filter (2) into glass container (3) and look for water, sludge, or dirt.

a. If water, sludge, or dirt are present in container (3), replace filter (page 4-110), replace strainer (page 4-114), drain and refill fuel tanks (page 4-32), and purge fuel system (page 4-32).

b. If only fuel is present in container (3), refill and install filter (page 4-110), and purge fuel system (page 4-32).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

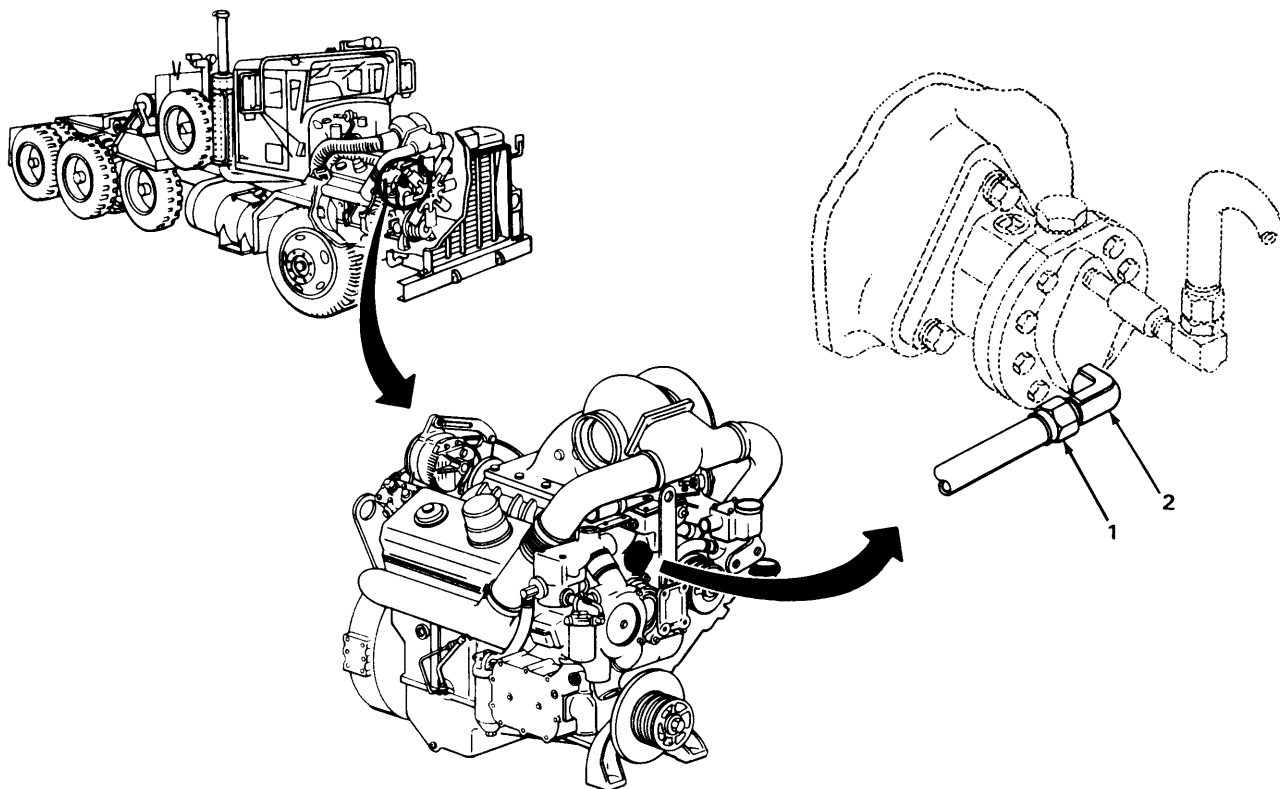
5. ENGINE RUNS ROUGH – CONTINUED.

WARNING

Stay clear of fan while engine is being cranked. Failure to do so could result in serious personal injury or death.

Step 7. Disconnect fuel inlet hose (1) from fuel pump inlet elbow (2). Connect vacuum gage to inlet elbow (2). While assistant is cranking engine, note reading on vacuum gage.

- a. If gage shows less than 6 in. (15 cm) Hg of vacuum, replace fuel pump (page 4-37).
- b. If gage shows more than 6 in. (15 cm) Hg of vacuum, remove, clean, inspect and install fuel lines and fittings (page 4-40), and purge fuel system (page 4-32).
- c. If engine still runs rough, install right side panel and close right side hood (TM 9-2320-270-10), and notify support maintenance.



TA239615

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

6. ENGINE USES TOO MUCH OIL (MORE THAN 10 QUARTS PER 1,000 MILES) (7 LITERS PER 1200 KM).

Step 1. Open hood and remove side panels (TM 9-2320-270-10). Inspect oil filter (1), oil cooler (2), and oil breather tubes (3) for leaking or damage.

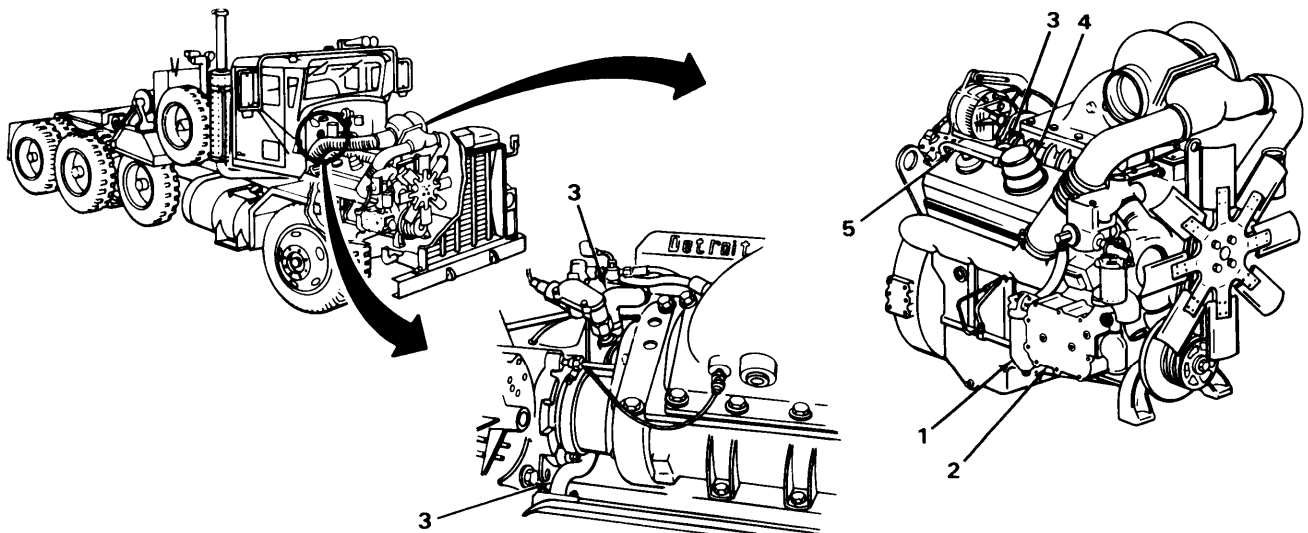
- a. If any parts are loose, tighten. Install side panels and hood (TM 9-2320-270-10).
- b. If oil filter (1) is damaged, replace (page 4-24).
- c. If oil cooler (2) or oil breather tubes (3) are damaged, install side panels and hood (TM 9-2320-270-10) and notify direct support maintenance.

Step 2. Remove and clean oil breathers (4) and hoses (5) and inspect for damage (page 4-12 or 4-18).

- a. If any parts are damaged, replace (page 4-12 or 4-18).
- b. If parts are not damaged, install (page 4-12 or 4-18).

Step 3. Start engine (TM 9-2320-270-10) and observe exhaust smoke.

- a. Shut down engine (TM 9-2320-270-10).
- b. If exhaust smoke is blue, install side panels and hood (TM 9-2320-270-10) and notify direct support maintenance.



TA239616

TROUBLESHOOTING - CONTINUED

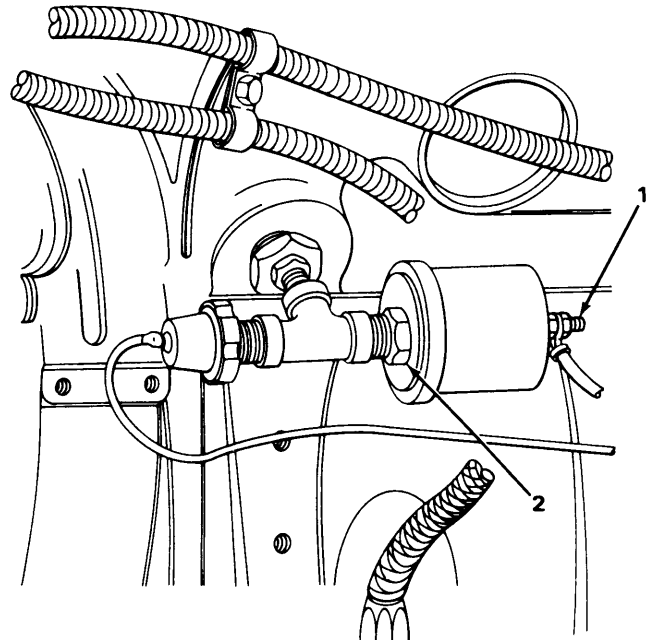
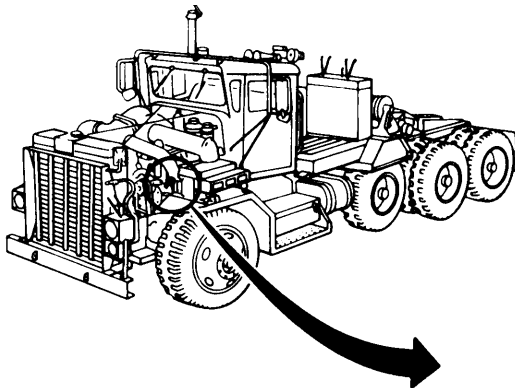
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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7. ENGINE OIL PRESSURE GAGE SHOWS incorrect PRESSURE DURING Operation (MORE THAN 70 PSI (482 KPA) OR LESS THAN 50 PSI (345 KPA).

NOTE

If oil pressure gage shows zero pressure during operation, go to step 3.

- Step 1. Perform steps under ENGINE USES TOO MUCH OIL (page 3-27).
- Step 2. Start engine (TM 9-2320-270-10). Using multimeter set at 30 vdc, put red probe on oil pressure sender terminal (1) and black probe on nut (2).
 - a. If meter reads 6 to 8 volts, shut down engine (TM 9-2320-270-10), replace oil pressure gage (page 4-259), install side panels and hood (TM 9-2320-270-1 O).
 - b. If meter does not read 6 to 8 volts, shut down engine (TM 9-2320-270-10), replace oil pressure sender (page 4-393), and repeat step 2. If meter still does not read 6 to 8 volts, install side panels and hood (TM 9-2320-270-10) and notify direct support maintenance.



TA239617

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

Step 3. Turn ignition key to ON position, and observe battery voltmeter (3).

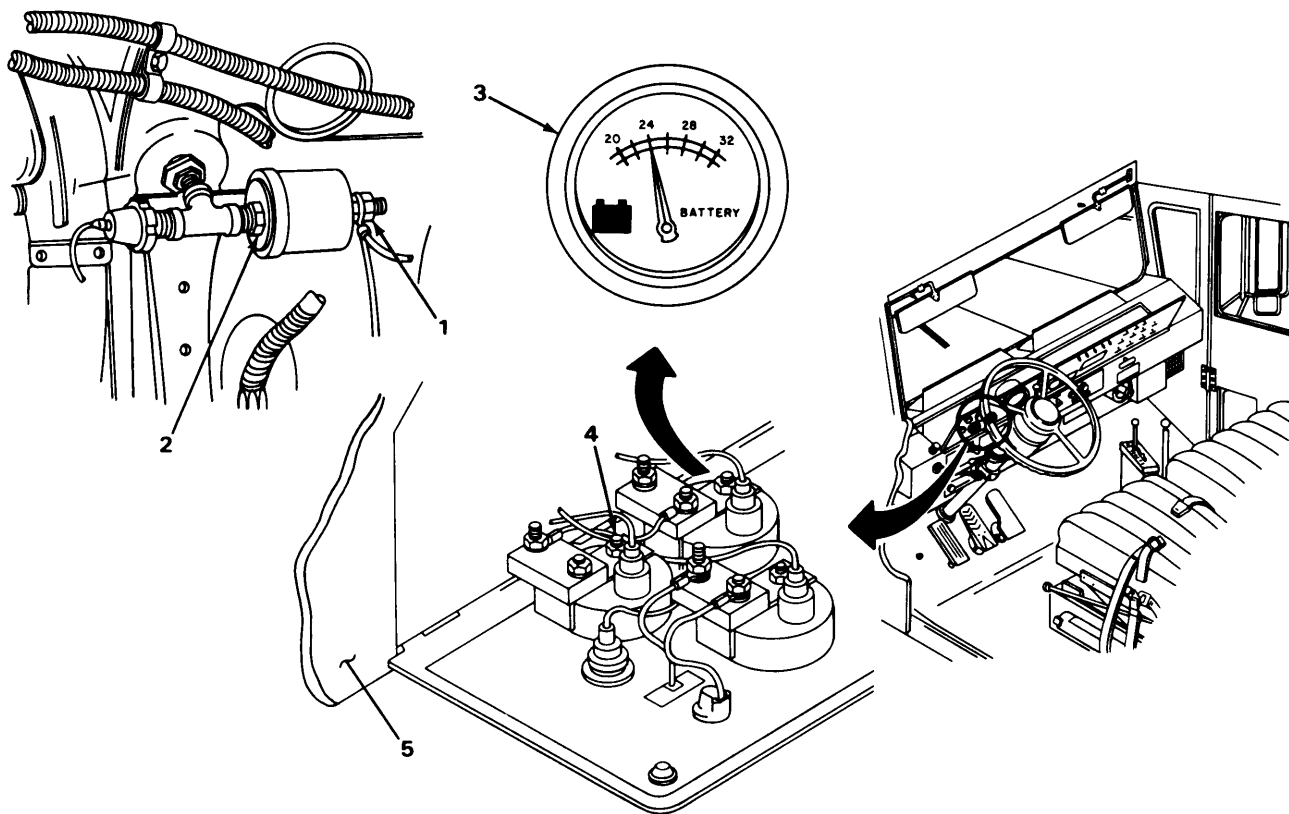
If battery voltmeter (3) does not work, install side panels and hood (TM 9-2320-270-10) and notify direct support maintenance.

Step 4. Open instrument panel (page 4-244). Using multimeter set at 30 vdc, put red probe on oil pressure gage terminal (4) and put black probe on panel (5).

If meter reads no voltage, go to step 6.

Step 5. Using multimeter set at 30 vdc, put red probe on oil pressure sender terminal (1) and black probe on nut (2).

If meter reads voltage, replace oil pressure sender (page 4-393). Install side panels and hood (TM 9-2320-270-10).



TROUBLESHOOTING - CONTINUED

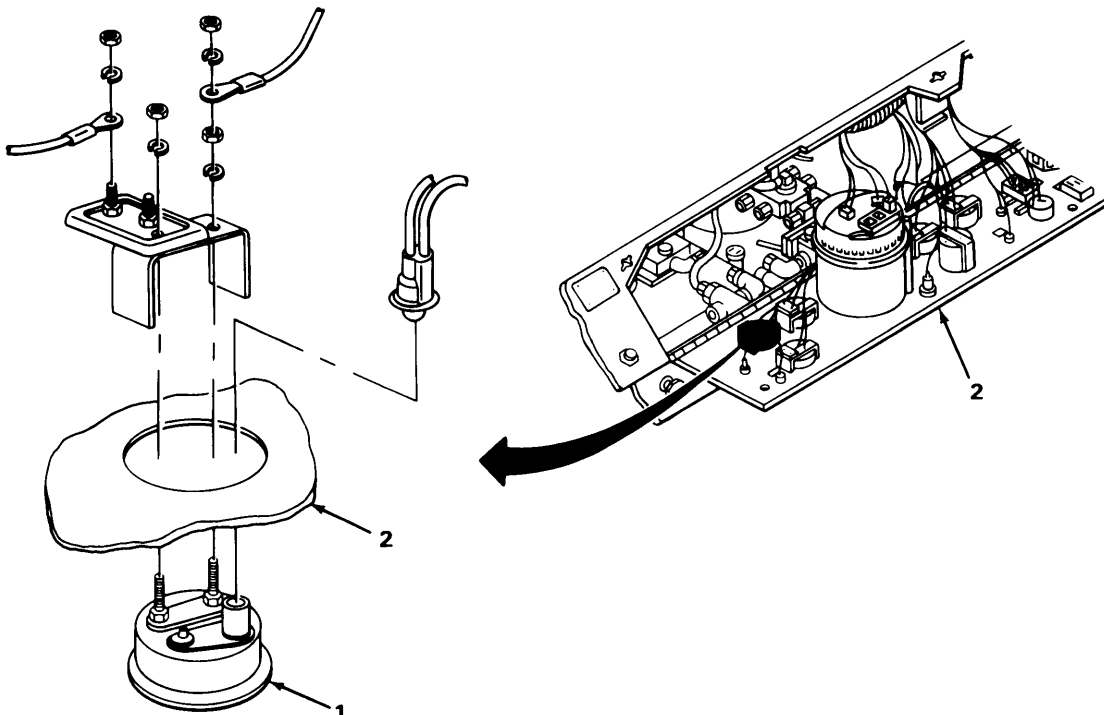
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

7. ENGINE OIL PRESSURE GAGE SHOWS INCORRECT PRESSURE DURING OPERATION (MORE THAN 70 PSI OR LESS THAN 50 PSI) – CONTINUED.

- Step 6. Install side panels and hood (TM 9-2320-270-10). Using multimeter set at 30 vdc, put red probe on oil pressure gage terminal (1) and black probe on panel (2).
- a. If meter reads no voltage, close instrument panel (page 4-244) and notify direct support maintenance.
 - b. If meter reads voltage, replace oil pressure gage (page 4-259).
 - c. If engine oil gauge still shows incorrect pressure during operation, close instrument panel (page 4-244) and notify direct support maintenance.



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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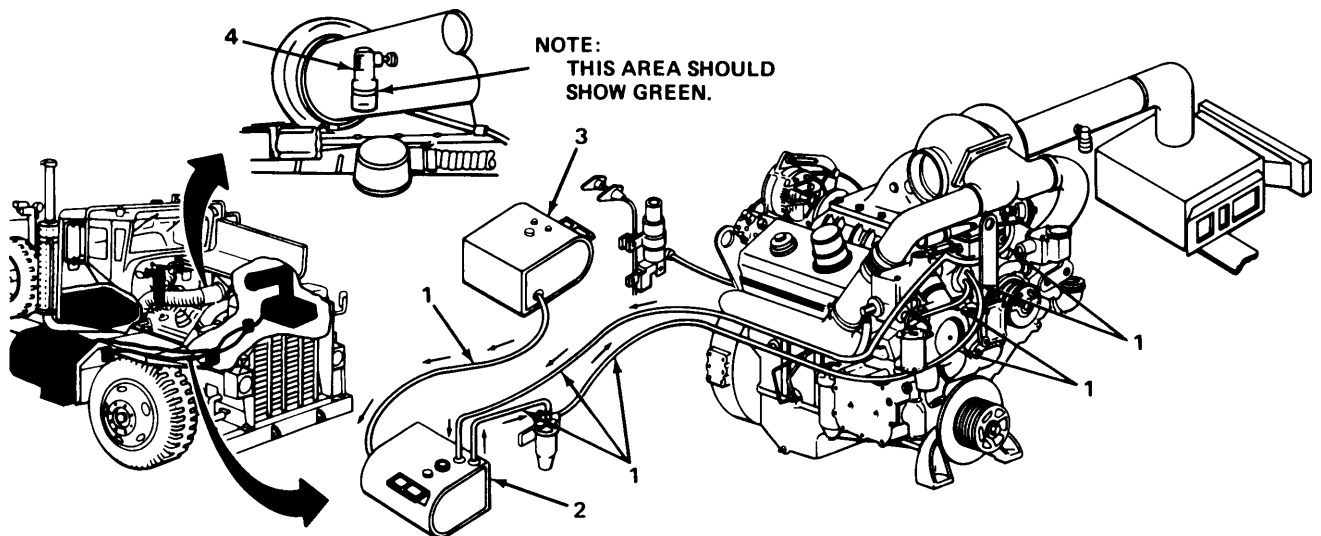
8. ENGINE USES TOO MUCH FUEL (LESS THAN 2 MILES PER GALLON) (.8 KM PER LITER).

Step 1. Open right side of hood and remove right side panel (TM 9-2320-270-10). inspect fuel lines and fittings (1), right fuel tank (2), and left fuel tank (3) for leakage and damage.

- a. If any parts are loose or leaking, tighten.
- b. If any fuel lines and fittings (1) are damaged, replace (page 4-31).
- c. If right fuel tank (2) is damaged, remove (page 4-66) and notify direct support maintenance for repair.
- d. If left fuel tank (3) is damaged, remove (page 4-66) and notify direct support maintenance for repair.

Step 2. Open left side of hood (TM 9-2320-270-10) and check color on air restriction indicator (4).

- a. If restriction indicator (4) is red instead of green, reset and start engine (TM 9-2320-270-10). If indicator (4) shows red again, shut down engine (TM 9-2320-270-10) replace air cleaner element (page 4-45), and close left side of hood and replace right side panel (TM 9-2320-270-10).
- b. If engine still uses too much fuel, close left side of hood, replace right side panel (TM 9-2320-270-10) and notify direct support maintenance.



TA239620

TROUBLESHOOTING - CONTINUED

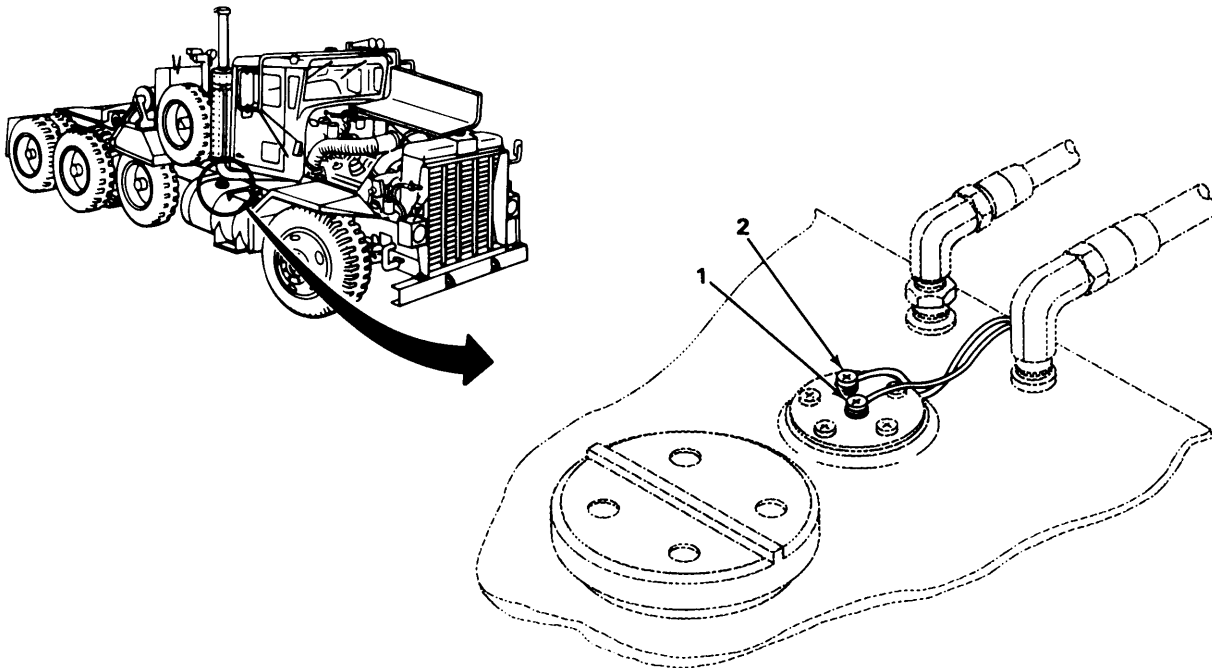
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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9. FUEL LEVEL GAGE SHOWS INCORRECT FUEL LEVEL.

NOTE

If fuel level gage shows zero fuel during operation, go to step 4.

- Step 1. Perform step 1 under ENGINE USES TOO MUCH FUEL (page 3-31).
- Step 2. Drain fuel tanks (page 4-32). TURN KEY TO ON. Using multimeter set at 30 vdc, put red probe on fuel sender terminal (1) and black probe on terminal (2).
 - If meter does not read 8 to 10 volts, put key in OFF position and replace fuel sender (page 4-390).
- Step 3. PUT IGNITION KEY in OFF position. Fill fuel tank (TM 9-2320-270-10). Put IGNITION KEY in ON position. Using multimeter set at 30 vdc, put red probe on fuel sender terminal (1) and black probe on terminal (2).
 - a. If meter does not read 3 to 6 volts, put key in OFF position and replace fuel sender (page 4-390).
 - b. If meter does read 3 to 6 volts, put key in OFF position and replace fuel gage (page 4-268).



TA239621

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

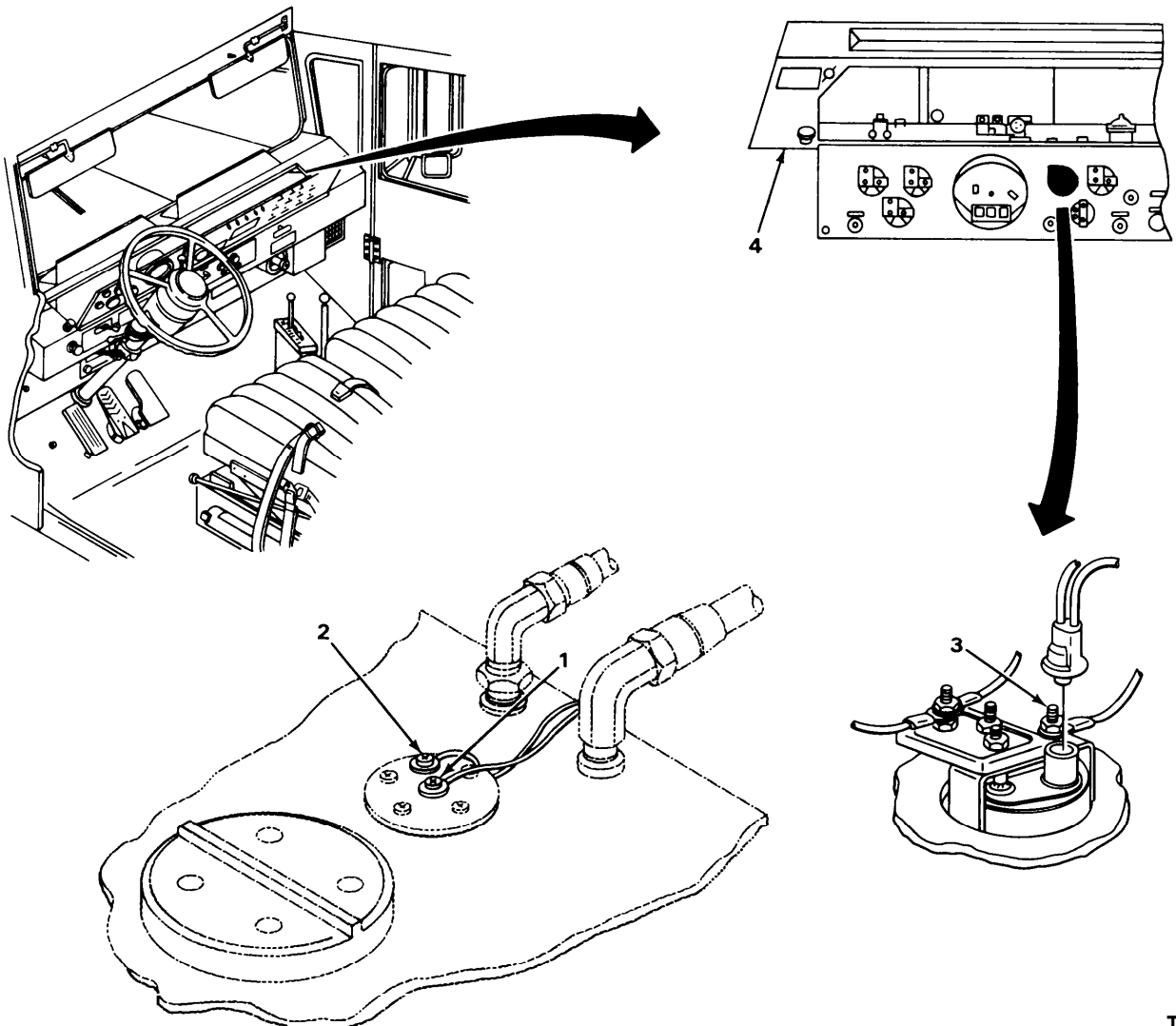
CORRECTIVE ACTION

Step 4. Make sure ignition key is in ON position. Open instrument panel (page 4-244). Using multimeter set at 30 vdc, put red probe on fuel gage terminal (3) and black probe on panel (4).

If meter reads no voltage, go to step 6.

Step 5. Using multimeter set at 30 vdc, put red probe on fuel sender terminal (1) and black probe on terminal (2).

If meter reads voltage, put key in OFF position and replace fuel sender (page 4-390). Close instrument panel (page 4-244).



TA239622

TROUBLESHOOTING - CONTINUED

MALFUNCTION

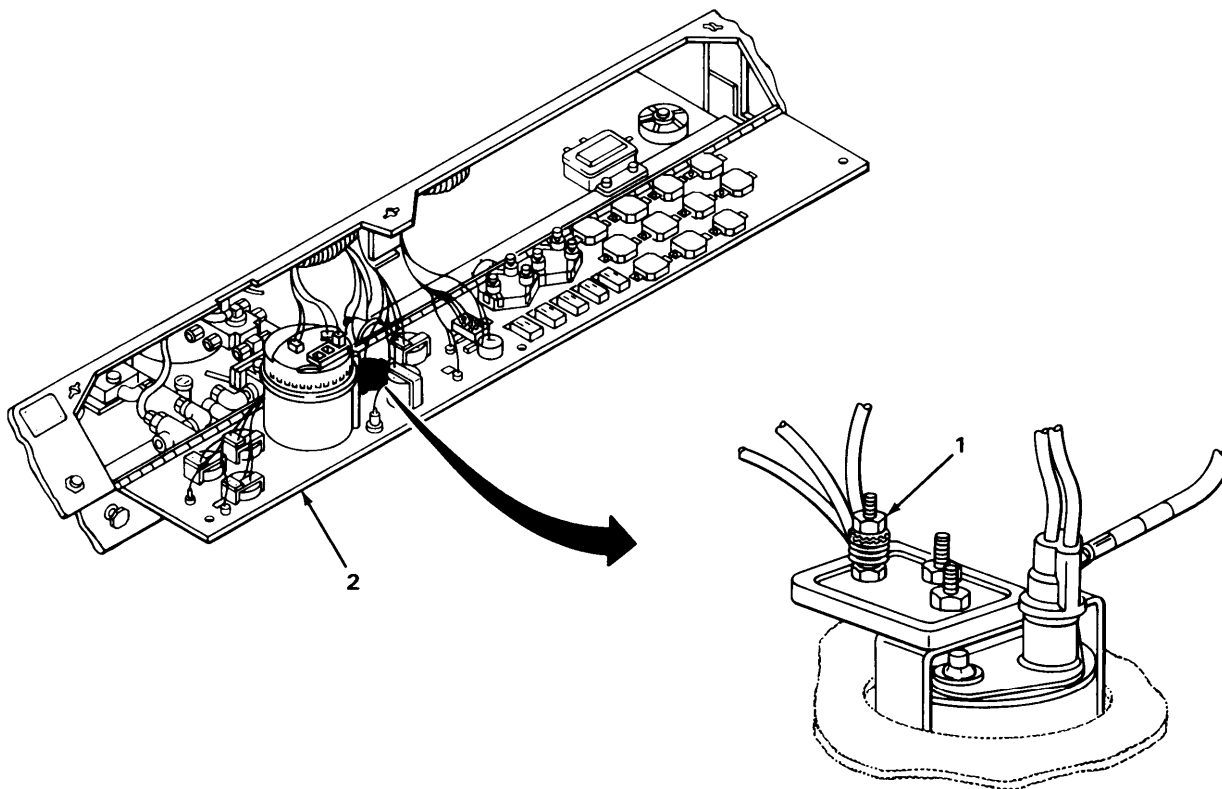
TEST OR INSPECTION

CORRECTIVE ACTION

9. FUEL LEVEL GAGE SHOWS INCORRECT FUEL LEVEL – CONTINUED.

Step 6. Install right side panel and close right side of hood (TM 9-2320-270-10). Using multimeter set at 30 vdc, put red probe on fuel gage terminal (1) and black probe on panel (2).

- a. If meter reads no voltage, close instrument panel (page 4-244) and notify direct support maintenance.
- b. If meter reads voltage, put key in OFF position and replace fuel level gage (page 4-268).
- c. If fuel level gage still shows incorrect level, put key in OFF position, close instrument panel (page 4-244) and notify direct support maintenance.



TA239623

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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10. ENGINE OVERHEATS.

Step 1. Open left side of hood and remove left side panel (TM 9-2320-270-10). Inspect fan belts (1) for damage and wear (page 4-200).

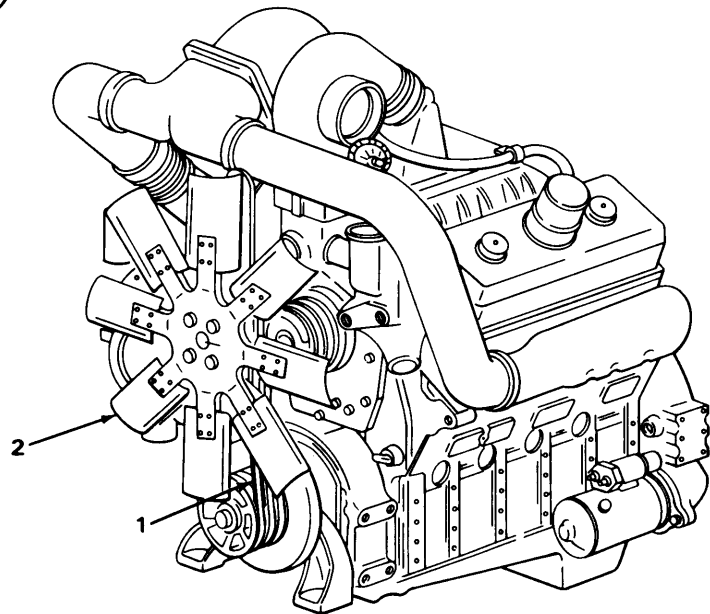
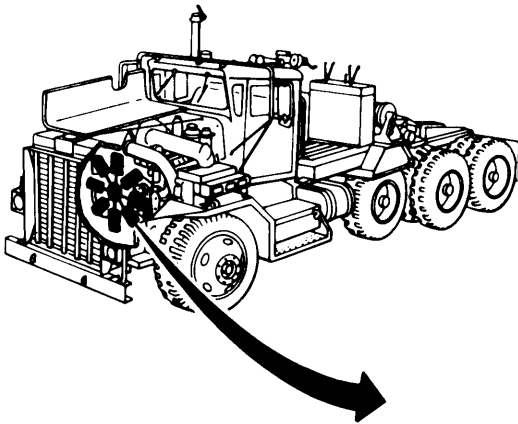
If damaged or worn, replace fan belts (page 4-200).

Step 2. Inspect fan (2) for damage.

If damaged, replace fan (page 4-198).

Step 3. Start engine (TM 9-2320-270-10) and let air pressure build up to normal operating pressure of 90 to 120 psi (615 to 820 kPa). Shut down engine (TM 9-2320-270-10). Drain air from air system until air pressure is below 60 psi (414 kPa) (TM 9-2320-270-10).

If fan (2) spins freely, replace fan clutch drive (page 4-204).



TA239624

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

10. ENGINE OVERHEATS – CONTINUED.

Step 4. Inspect radiator (1) for leakage or damage (page 4-143).

If leaking or damaged, remove radiator (page 4-143) and notify direct support maintenance for repair.

Step 5. Install left side panel and open right side of hood and remove right side panel (TM 9-2320-270-10). Inspect heater hoses (2) for leakage or damage.

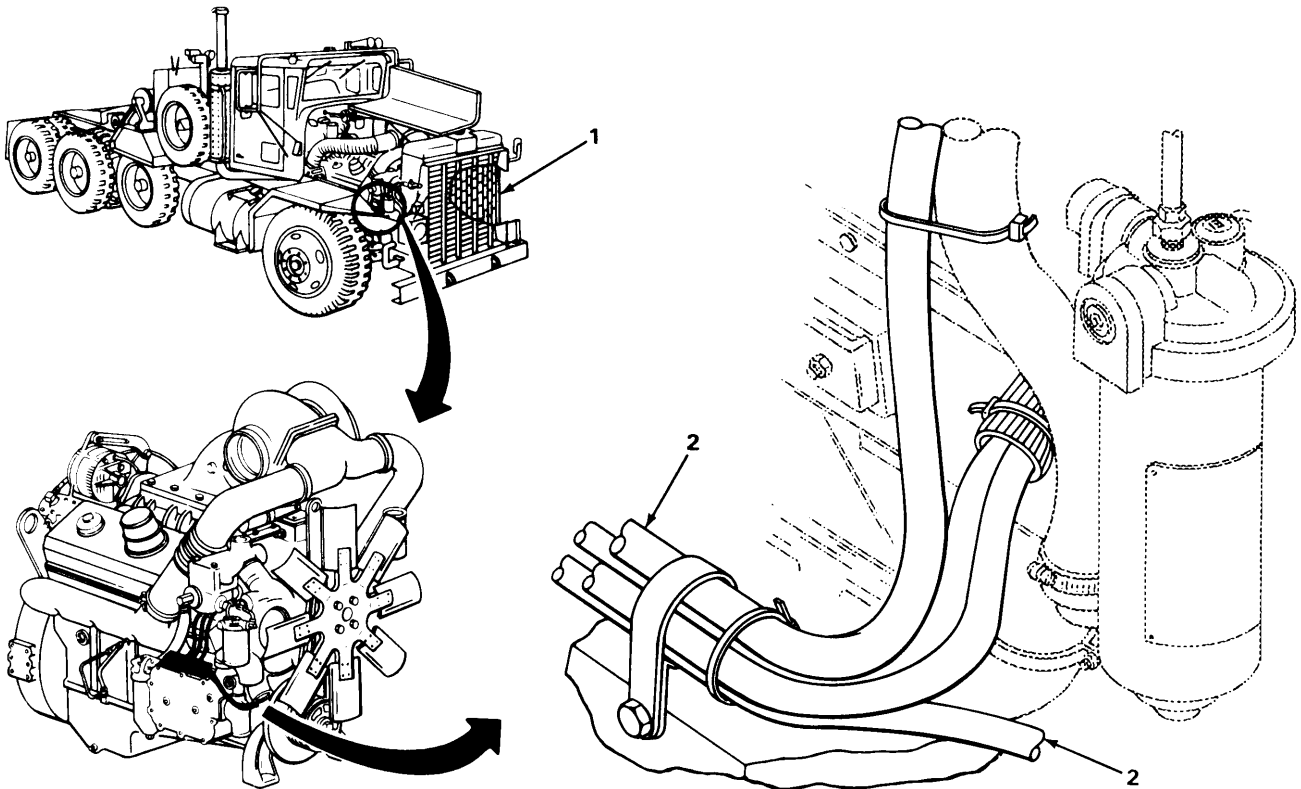
a. If loose and leaking, tighten. Install right side panel and close right side of hood (TM 9-2320-270-10).

b. If damaged, replace heater hoses (page 4-1293).

Step 6. Remove and test thermostats (page 4-173).

a. If not operating properly, replace (page 4-173).

b. If engine still overheats, notify direct support maintenance.



TA239625

TROUBLESHOOTING - CONTINUED

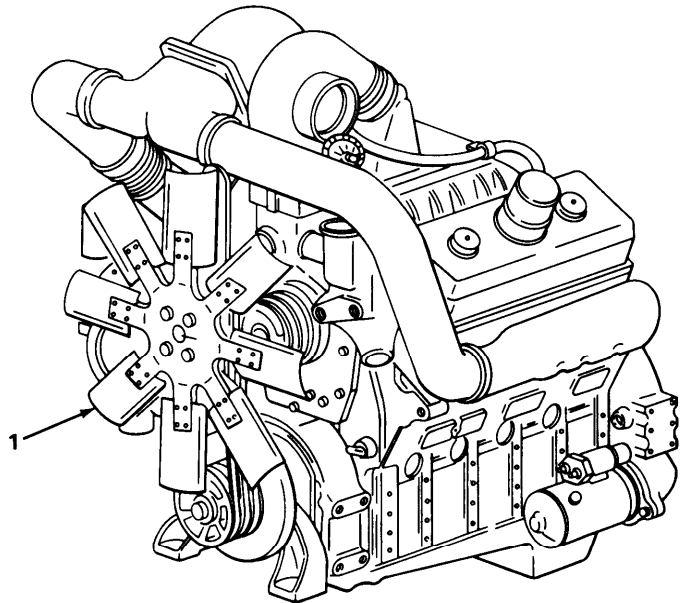
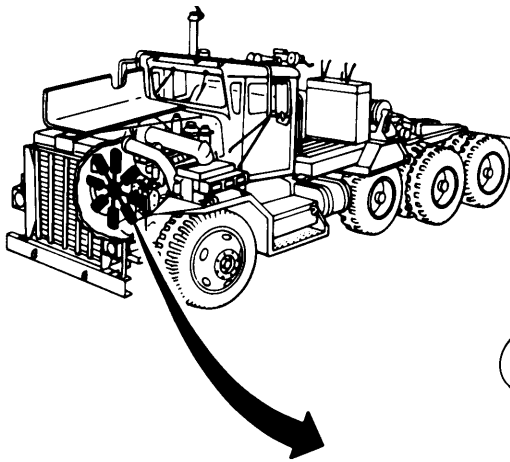
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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11. ENGINE DOES NOT REACH NORMAL OPERATING TEMPERATURE.

- Step 1. Start engine (TM 9-2320-270-10) and let it run for 20 minutes. Shut down engine (TM 9-2320-270-10). Open left side of hood and remove left side panel (TM 9-232-270-10).

If water temperature is below 185 °F(850C) (TM 9-2320-270-10) and fan (1) does not spin freely, replace thermal air valve (page 4-205).

- Step 2. Remove and test thermostats (page 4-173).
- If not operating properly, replace (page 4-173).
 - If engine still does not reach normal operating temperature, install left side panel and close left side of hood (TM 9-2320-270-10) and notify direct support maintenance.



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

12. ENGINE WATER TEMPERATURE GAGE SHOWS INCORRECT TEMPERATURE DURING OPERATION (MORE THAN 185°F (85°C) OR LESS THAN 160°F (71°C)).

NOTE

If water temperature gage shows zero temperature during operation, go to step 4.

Step 1. If water temperature gage shows more than 185°F (85°C), perform steps under ENGINE OVERHEATS (page 3-35). If water temperature gage shows less than 160°F (71°C), perform steps under ENGINE DOES NOT REACH NORMAL OPERATING TEMPERATURE (page 3-37).

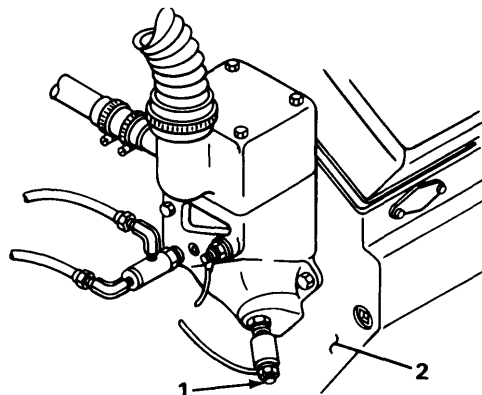
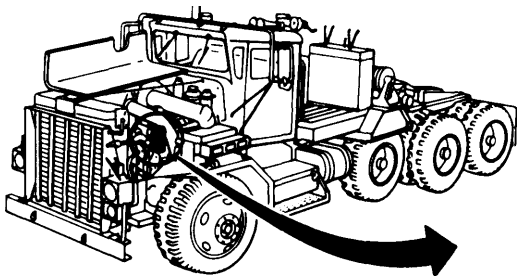
Step 2. Open left side of hood and remove left side panel (TM 9-2320-270-10). Put key in ON position. Make sure engine has cooled down. Using multimeter set at 30 vdc, put red probe on water temperature sender terminal (1) and black probe on engine (2).

If meter does not read 12 to 15 volts, replace water temperature sender (page 4-416).

Step 3. Start engine and let it heat up (TM 9-2320-270-10). Using multimeter set at 30 vdc, put red probe on water temperature sender terminal (1) and black probe on engine (2), take the reading and shut down engine (TM 9-2320-270-10).

a. If meter reads 3 to 6 volts, replace water temperature gage (page 4-262). Install left side panel and close left side of hood (TM 9-2320-270-10).

b. If meter does not read 3 to 6 volts, replace water temperature sender (page 4-416), and repeat step 3. If meter still does not read 3 to 6 volts, install left side panel and close left side of hood (TM 9-2320-270-10) and notify direct support maintenance.



TA239627

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

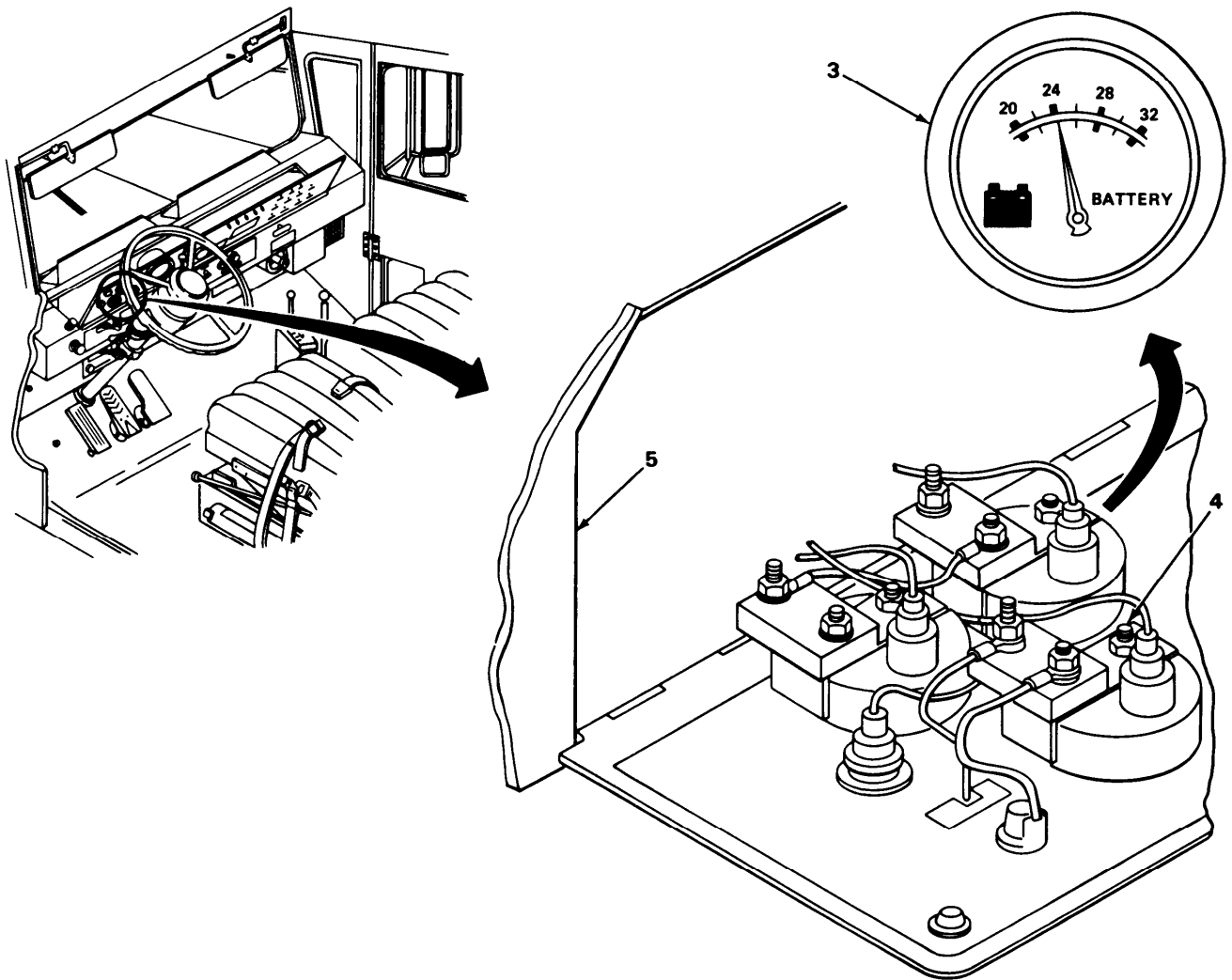
CORRECTIVE ACTION

Step 4. Turn ignition key to ON position, and observe battery voltmeter (3).

If battery voltmeter (3) does not work, turn key to OFF position, install left side panel and close left side of hood (TM 9-2320-270-10) and notify direct support maintenance.

Step 5. Install left side panel, close left side of hood (TM 9-2320-270-10), and open instrument panel (page 4-244). Using multimeter set at 30 vdc, put red probe on water temperature gage terminal (4) and black probe on panel (5).

If meter reads no voltage, go to step 7.



TA239628

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

12. ENGINE WATER TEMPERATURE GAGE SHOWS INCORRECT TEMPERATURE DURING OPERATION (MORE THAN 185°F (85°C) OR LESS THAN 160°F (71°C)) - CONTINUED.

Step 6. Using multimeter set at 30 vdc, put red probe on oil pressure gage terminal (1) and black probe on panel (2).

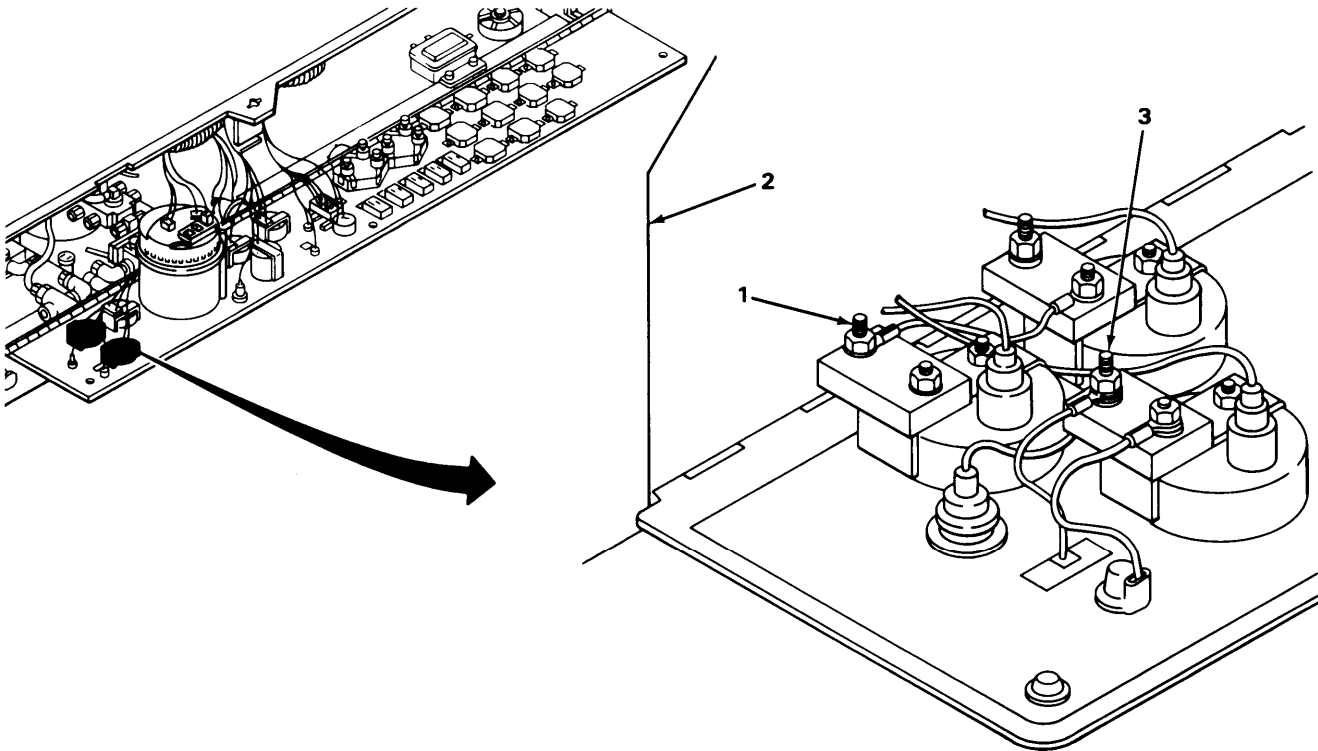
If meter reads no voltage, put key in OFF position, close instrument panel (page 4-244), and notify direct support maintenance.

Step 7. Using multimeter set at 30 vdc, put red probe on water temperature gage terminal (3) and black probe on panel (2).

a. If meter reads no voltage, put key in OFF position, close instrument panel (page 4-244), and notify direct support maintenance.

b. If meter reads voltage, put key in OFF position, and replace water temperature gage (page 4-262).

c. If engine water temperature gage still shows incorrect temperature, close instrument panel (page 4-244) and notify direct support maintenance.



TA239629

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

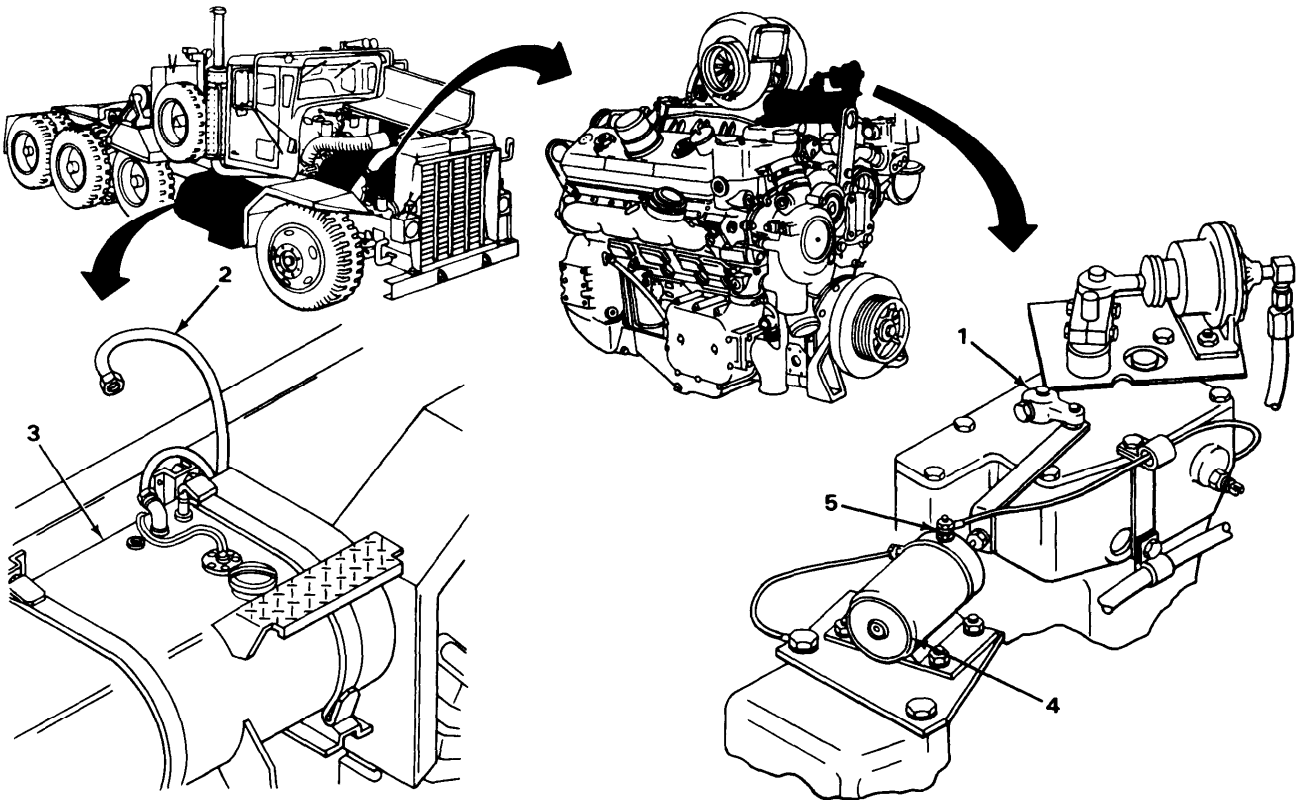
13. ENGINE WILL NOT SHUTDOWN.

- Step 1. Open left side of hood (TM 9-2320-270-10), and manually shut down engine by moving engine shutoff lever (1) to OFF position.

If lever will not move, disconnect suction fuel line (2) at tank (3) on right side of truck. Wait until engine shuts down and connect suction fuel line (2). Close left side of hood (TM 9-2320-270-10).

- Step 2. Open right side of hood and remove right side panel (TM 9-2320-270-10). At engine shutdown solenoid (4) using multimeter set at 30 vdc, put red probe on terminal for wire no. 019 (5) and black probe to good ground. Have assistant turn on shutdown switch (TM 9-2320-270-10).

If meter reads no voltage, turn shutdown switch in OFF position and go to step 4.



TA239630

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

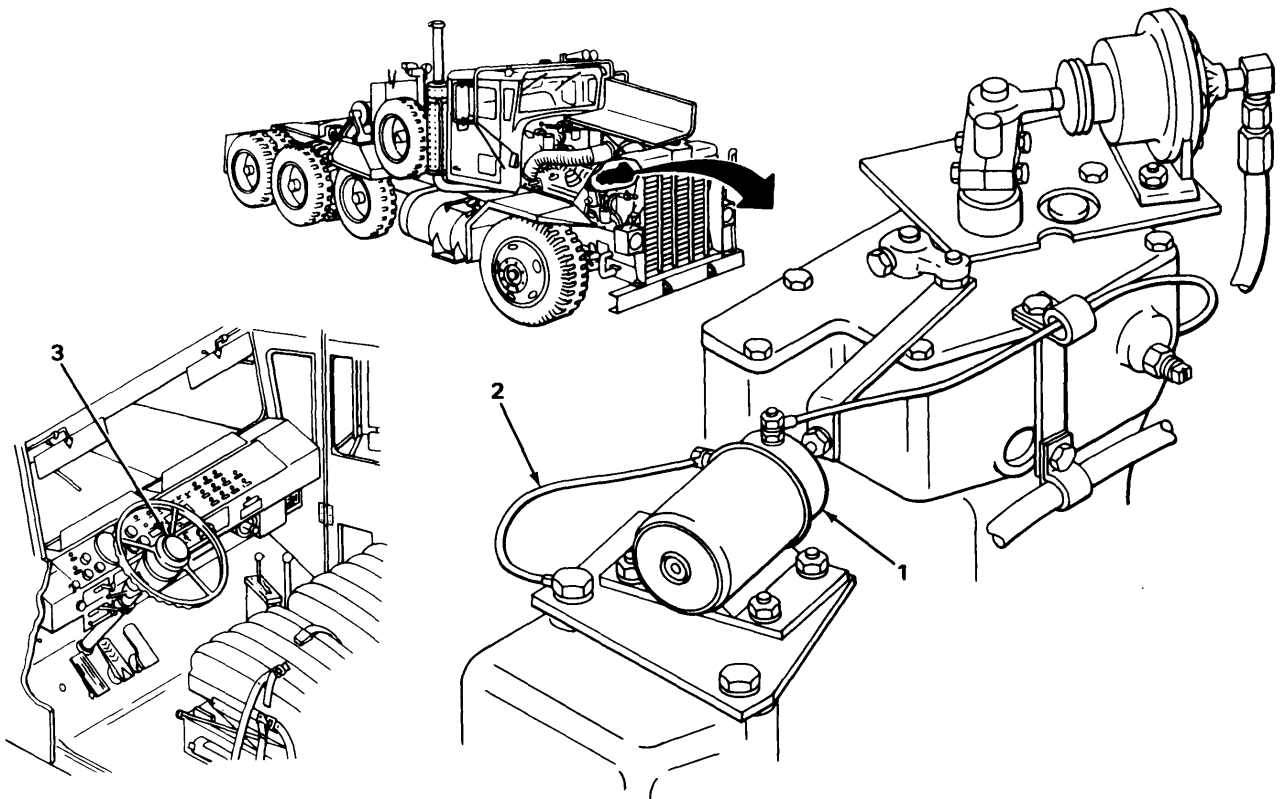
13. ENGINE WILL NOT SHUT DOWN - CONTINUED.

Step 3. At engine shutdown solenoid (1). Take off ground wire (2) using multi-meter set for CRX1, and put one probe on each end of wire.

- a. If meter reads zero, replace solenoid (page 4-422).
- b. If meter does not read zero, replace ground wire (page 4-422).

Step 4. Go to cab and sound electric horn (3).

If horn does not sound, go to BOTH HEADLIGHTS DO NOT WORK (page 3-48).



TROUBLESHOOTING - CONTINUED)

MALFUNCTION

TEST OR INSPECTION

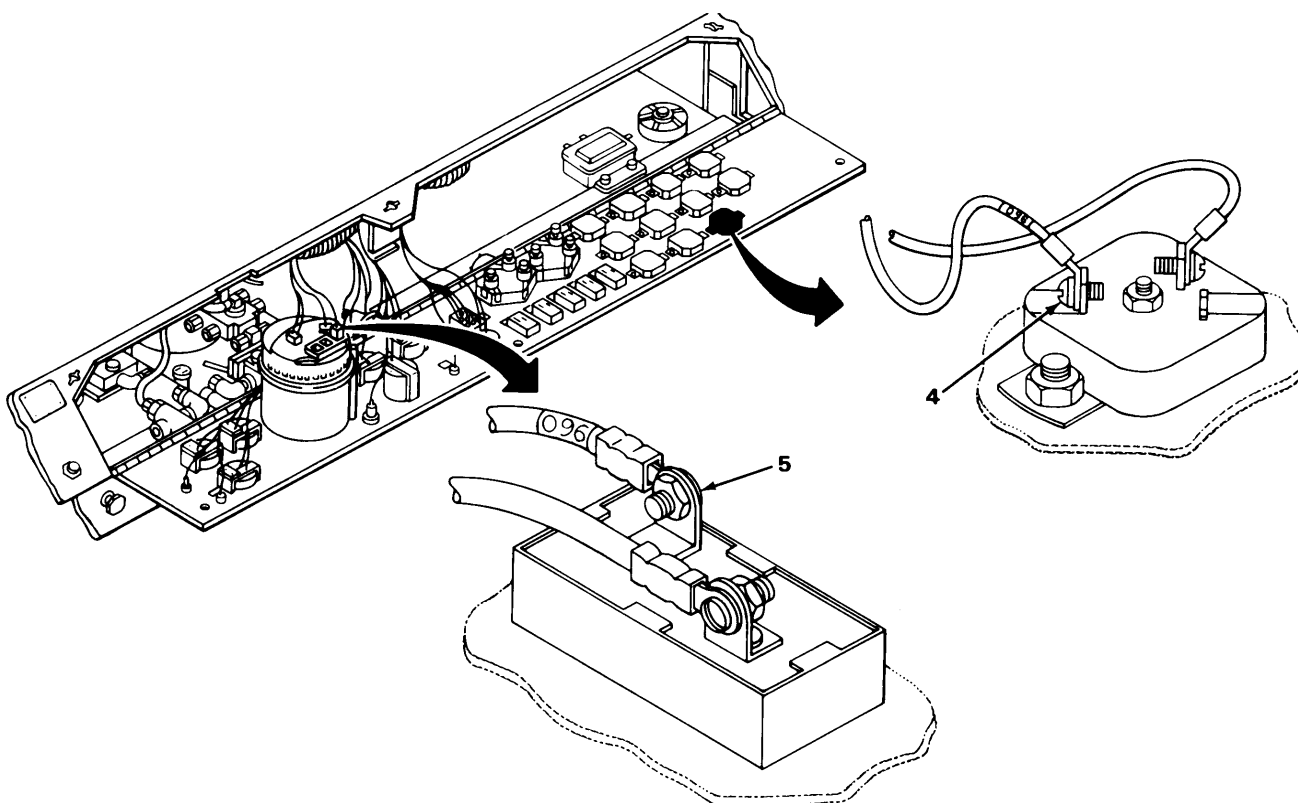
CORRECTIVE ACTION

Step 5. open instrument panel (page 4-244) using multimeter set at 30 vdc, put red probe on horn circuit breaker (4) terminal for wire no. 096, and black probe to good ground.

If meter reads no voltage, replace circuit breaker (page 4-304).

Step 6. Go to shutdown switch (5) using multimeter set at 30 vdc, put red probe on terminal for wire no. 096, and black probe to good ground.

If meter reads no voltage, close instrument panel (page 4-244), install right side panel and close right side of hood (TM 9-2320-270-10), and notify direct support maintenance.



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

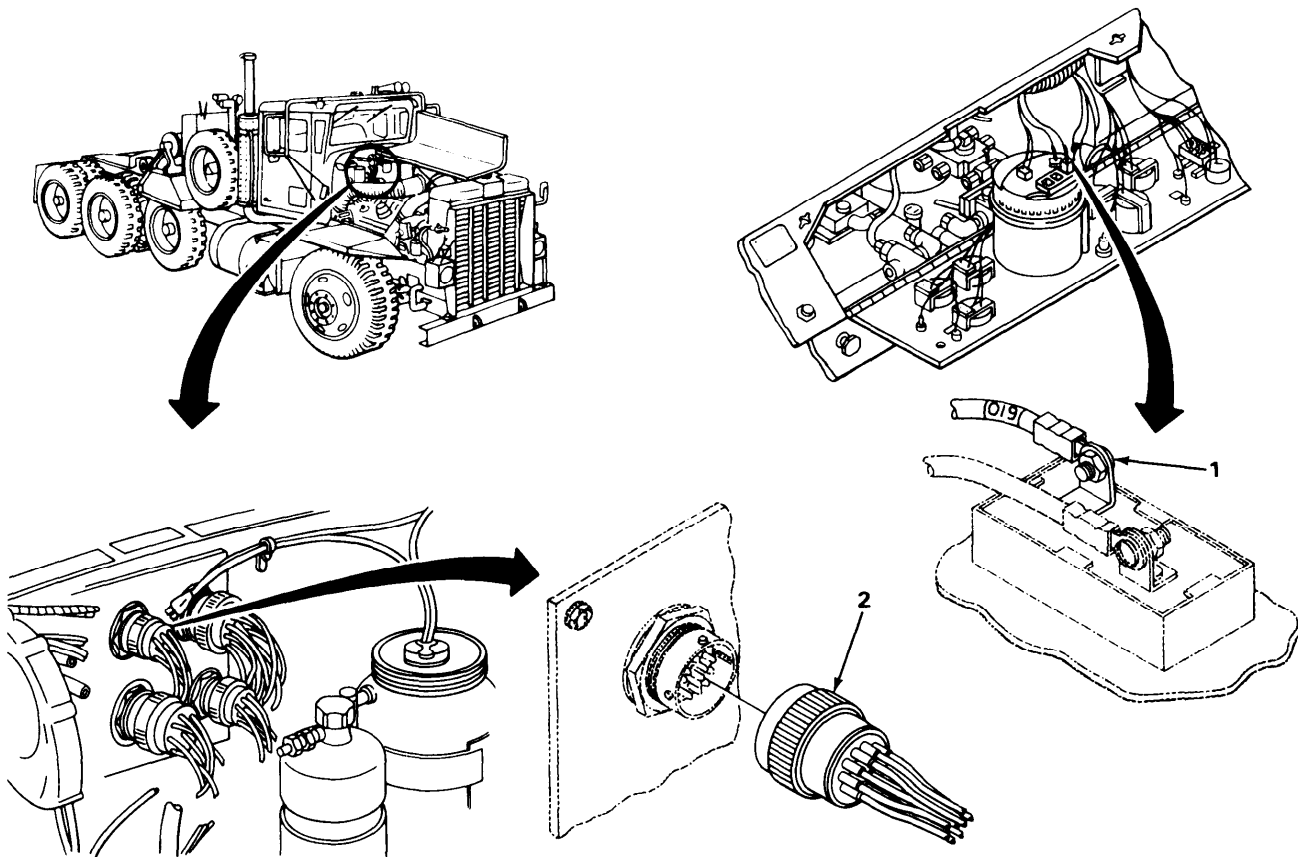
13. ENGINE WILL NOT SHUT DOWN – CONTINUED.

Step 7. At engine stop switch (1) using multimeter set at 30 vdc, put red probe on terminal for wire no. 019, and black probe to good ground. Have assistant turn on shutdown switch.

If meter reads no voltage, replace engine stop switch (page 4-249).

Step 8. Close instrument panel (page 4-244) and go to engine bulkhead connector (2) and disconnect. Using multimeter set at 30 vdc, put red probe on pin F and black probe to good ground. Have assistant turn on engine stop switch.

If meter reads no voltage, plug in engine bulkhead connector (2), install right side panel and close right side of hood (TM 9-2320-270-10), and notify direct support maintenance.



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

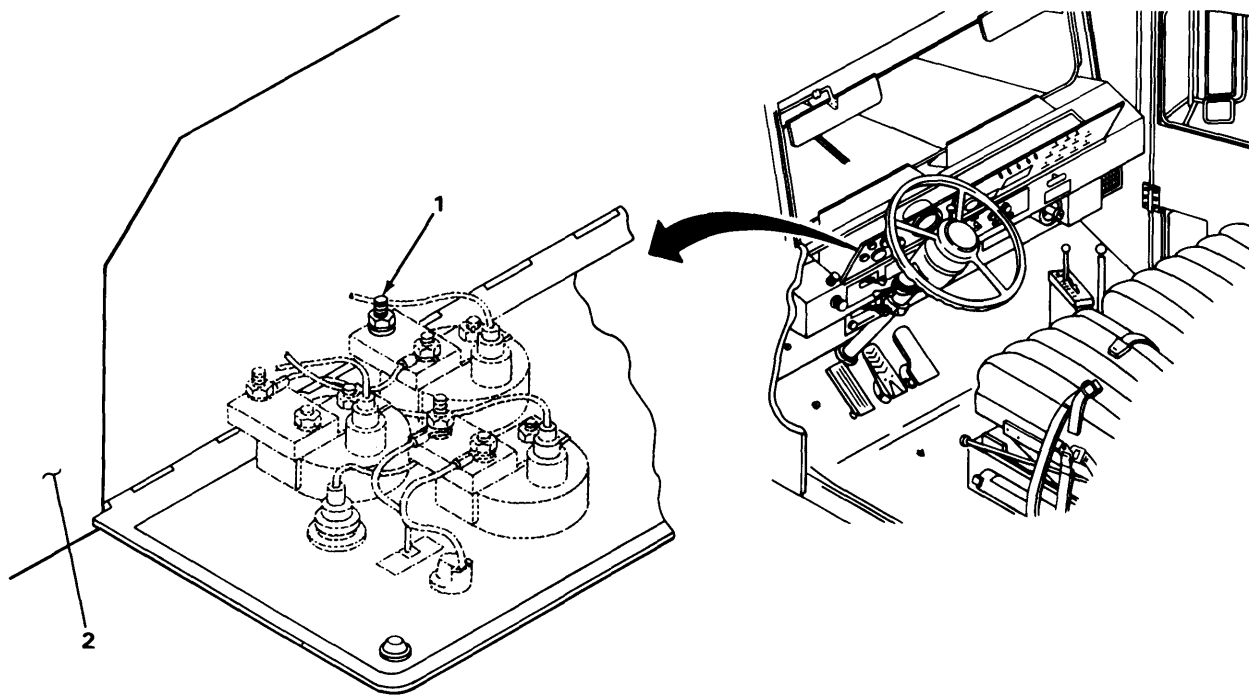
ELECTRICAL SYSTEM

14. BATTERY VOLTMETER SHOWS INCORRECT VOLTAGE DURING OPERATION (LESS THAN 26 VOLTS OR MORE THAN 30 VOLTS).

NOTE

If battery gage voltmeter shows zero voltage during operation, check and adjust alternator belts (page 4-223).

- Step 1. Open instrument panel (page 4-244). Start engine (TM 9-2320-270-10). Using multimeter set at 30 vdc, put red probe on battery gage voltmeter terminal (1) and black probe on panel (2) take reading. Shut down engine (TM 9-2320-270-10).
- a. If meter reads less than 26 volts, close instrument panel (page 4-244) adjust alternator (page 4-215).
 - b. If meter reads more than 30 volts, close instrument panel (page 4-244) adjust alternator (page 4-215).
 - c. If meter reads 26 to 30 volts, and the battery voltmeter does not read 26 to 30 volts, replace battery gage voltmeter (page 4-265).



TA239634

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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14. BATTERY VOLTMETER SHOWS INCORRECT VOLTAGE DURING OPERATION (LESS THAN 26 VOLTS OR MORE THAN 30 VOLTS) - CONTINUED.

Step 2. Put ignition key in ON position. Using multimeter set at 30 vdc, put red probe on battery gage voltmeter terminal (1) and black probe on panel (2).

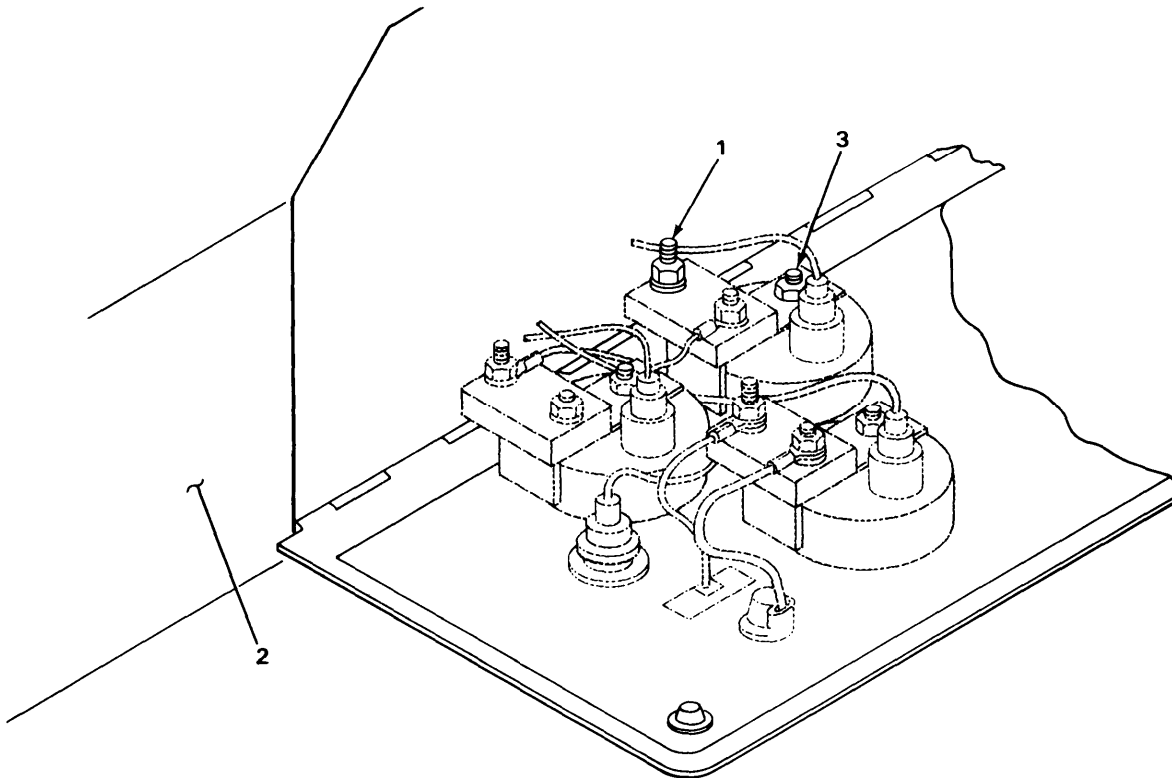
If meter reads no voltage, turn key to OFF position, close instrument panel (page 4-244) and notify direct support maintenance.

Step 3. Using multimeter set at 30 vdc, put red probe on battery gage voltmeter terminal (3) and black probe on panel (2).

a. If meter reads no voltage, turn key to OFF position and replace battery gage voltmeter (page 4-265).

b. If meter reads voltage, turn key to OFF position, close instrument panel (page 4-244) and notify direct support maintenance

c. If battery gage voltmeter still shows incorrect voltage, notify direct support maintenance.



T A 2 3 9 6 3 5

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

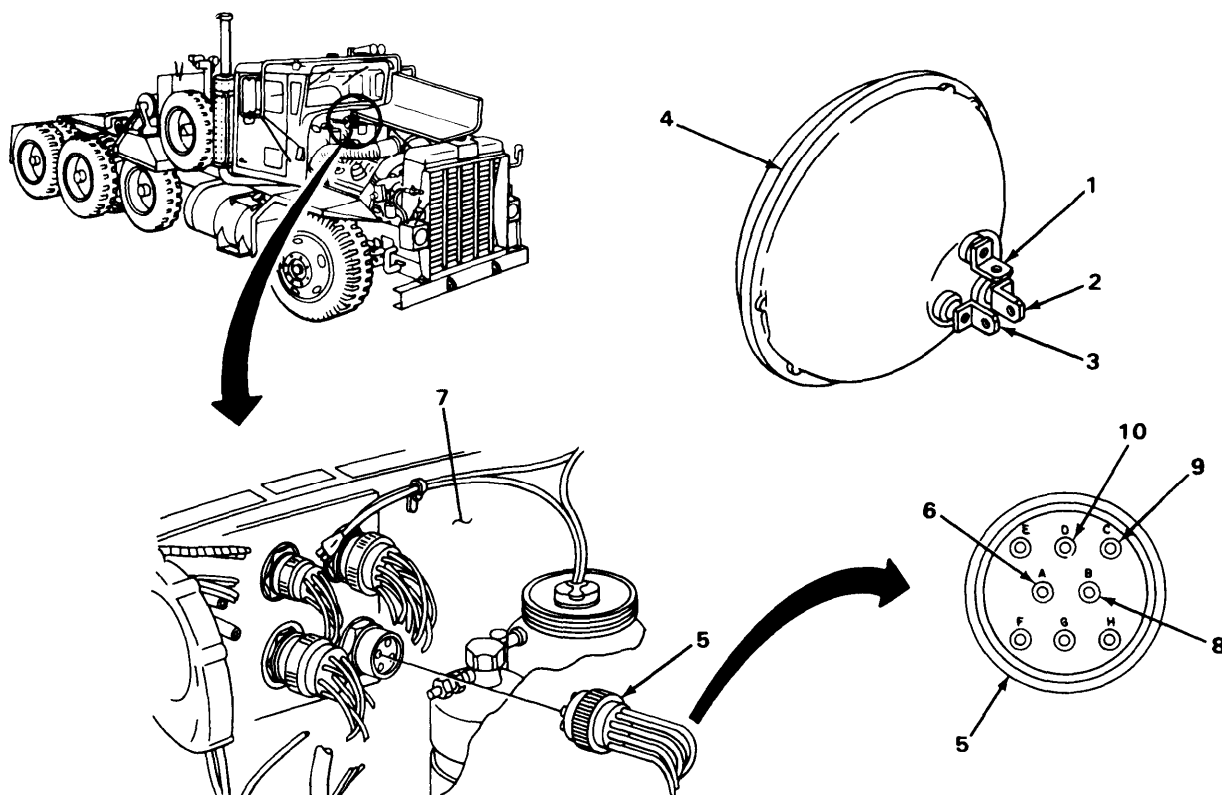
15. ONE HEADLIGHT DOES NOT WORK.

Step 1. Remove headlight lamp (page 4-348). Set multimeter at RX1. If low beam does not work, put probes on terminal (1) and terminal (2). If high beam does not work, put probes on terminal (1) and terminal (3).

If meter does not read zero, replace lamp (4) (page 4-348).

Step 2. Install headlight lamp (page 4-348). Open right side of hood (TM 9-2320-270-10). Unscrew and disconnect headlight harness plug (5). Set multimeter at RX1. If right low beam does not work, put probes on plug terminal A (6) and bulkhead (7). If right beam does not work, put probes on plug terminal B (8) and bulkhead (7). If left low beam does not work, put probes on plug terminal C (9) and bulkhead (7). If left high beam does not work, put probes on socket terminal D (10) and bulkhead (7).

Plug in headlight harness plug, close right side of hood (TM 9-2320-270-10) and notify direct support maintenance.



TA239636

TROUBLESHOOTING - CONTINUED

MALFUNCTION

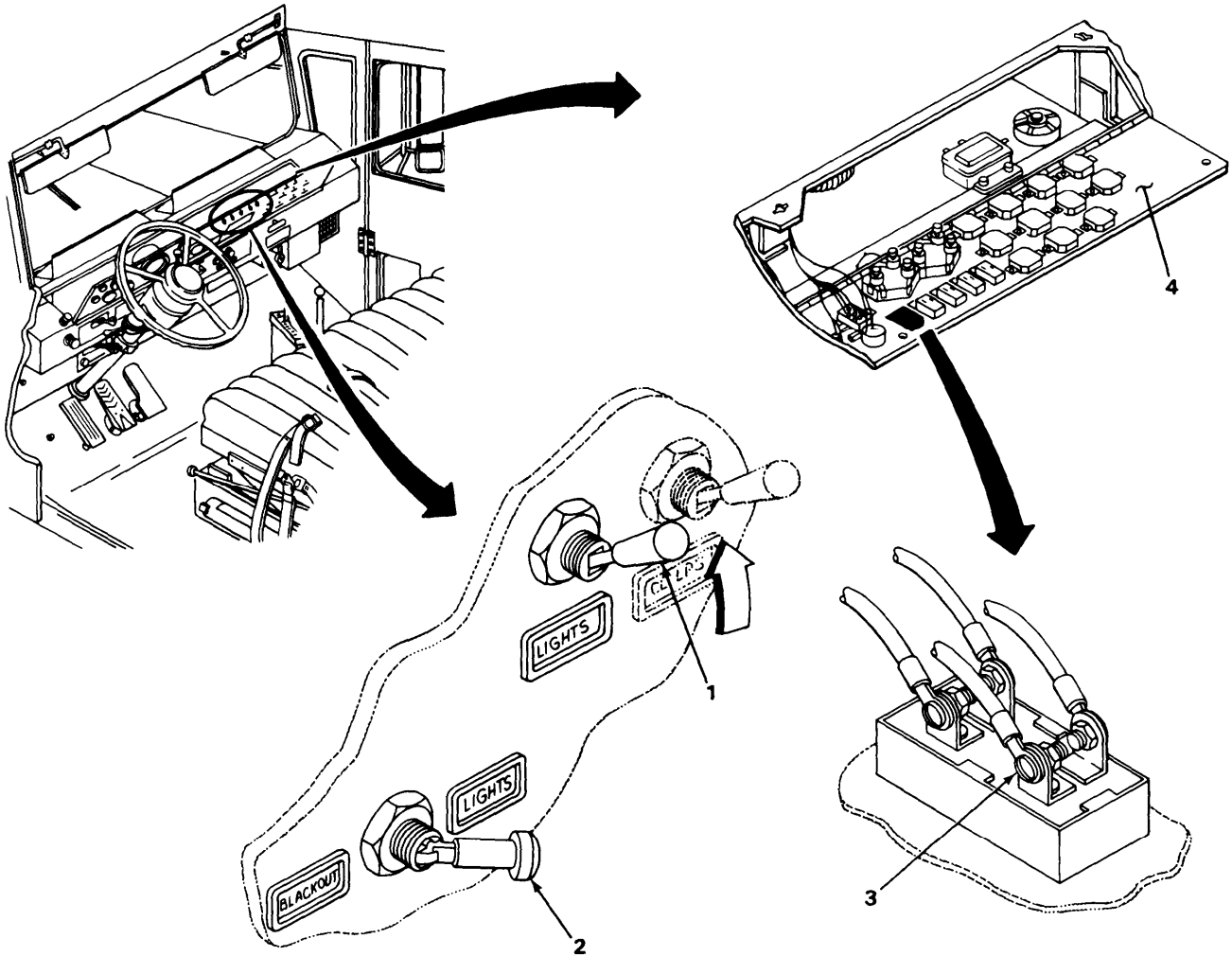
TEST OR INSPECTION

CORRECTIVE ACTION

16. BOTH HEADLIGHTS DO NOT WORK.

Step 1. Put headlight switch (1) in ON position, and make sure blackout switch (2) is in LIGHTS position. Open instrument panel (page 4-244). Using multimeter set at 30 vdc, put red probe on headlight switch terminal (3) and black probe on panel (4).

If meter reads no voltage, go to step 3.



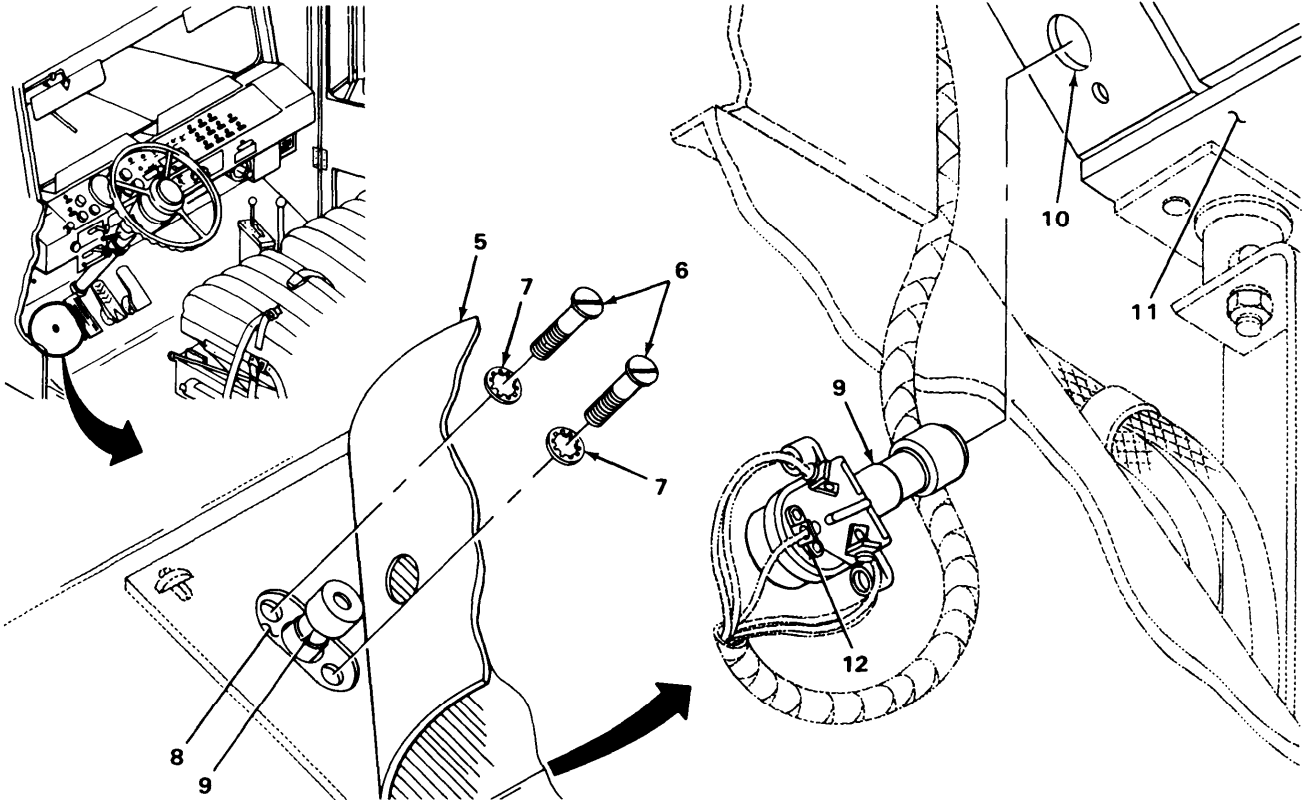
TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

- Step 2. Pull back rubber floor mat (5). Using 3/8-inch flat-tip screwdriver, unscrew and take out two screws (6) and lockwashers (7) from cab floor (8) and dimmer switch (9). Push dimmer switch (9) down through cab floor (8) and pull out through access hole (10) under cab (11). Using multimeter set at 30 vdc, put red probe on dimmer switch terminal (12) and black probe on cab (11).
- a. If meter reads no voltage, put headlight switch in OFF position.
 - b. if meter reads voltage, replace dimmer switch (page 4-307), put headlight switch in OFF position and close instrument panel (page 4-244).
 - c. If both headlights still do not work, perform steps under ONE HEADLIGHT DOES NOT WORK (page 3-47).



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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Step 3. Using multimeter set at 30 vdc, put red probe on circuit breaker terminal (1) and black probe on panel (2).

If meter reads no voltage, go to step 6.

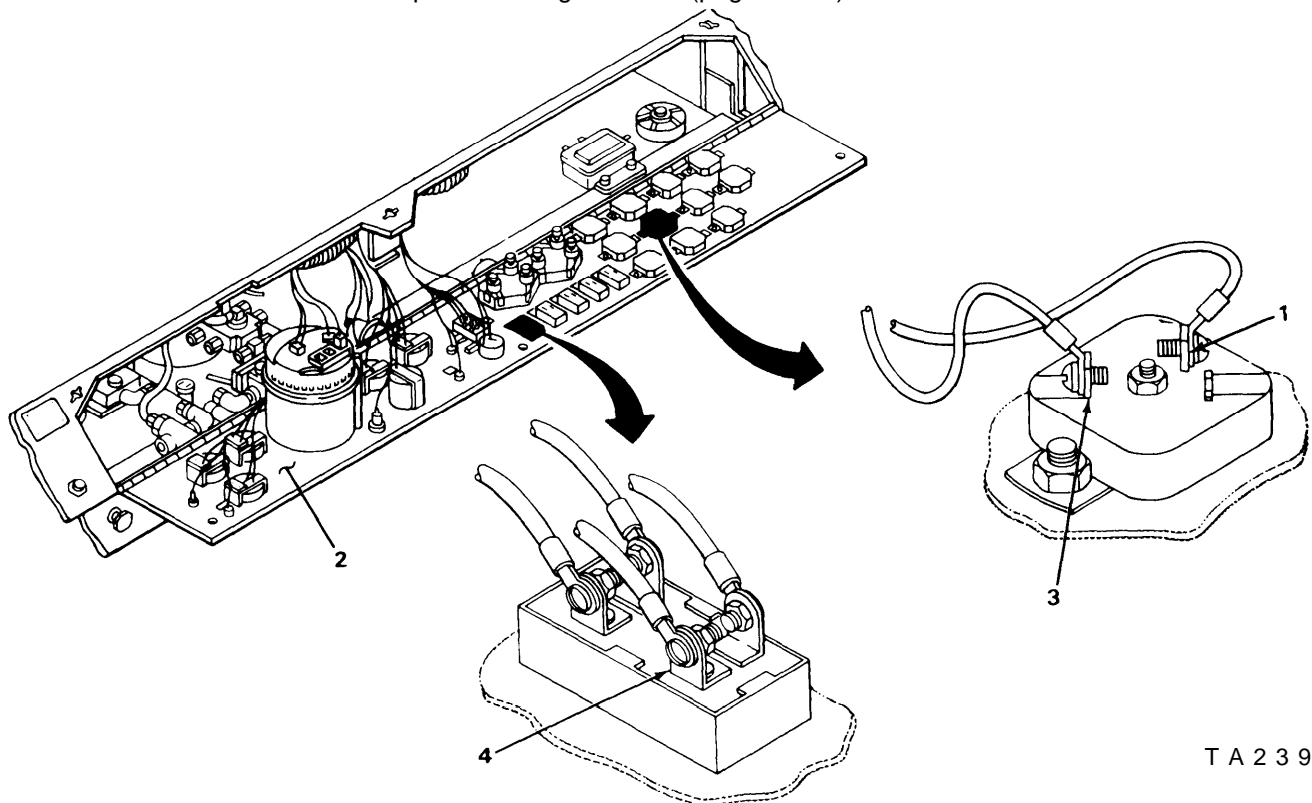
Step 4. Using multimeter set at 30 vdc, put red probe on circuit breaker terminal (3) and black probe on panel (2).

If meter reads no voltage, put headlight switch in OFF position and replace LIGHTS circuit breaker (page 4-304).

Step 5. Using multimeter set at 30 vdc, put red probe on headlight switch terminal (4) and black probe on panel (2).

a. If meter reads no voltage, put headlight switch in OFF position, close instrument panel (page 4-244) and notify direct support maintenance.

b. If meter reads voltage, put headlight switch in OFF position and replace headlight switch (page 4-288).



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TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

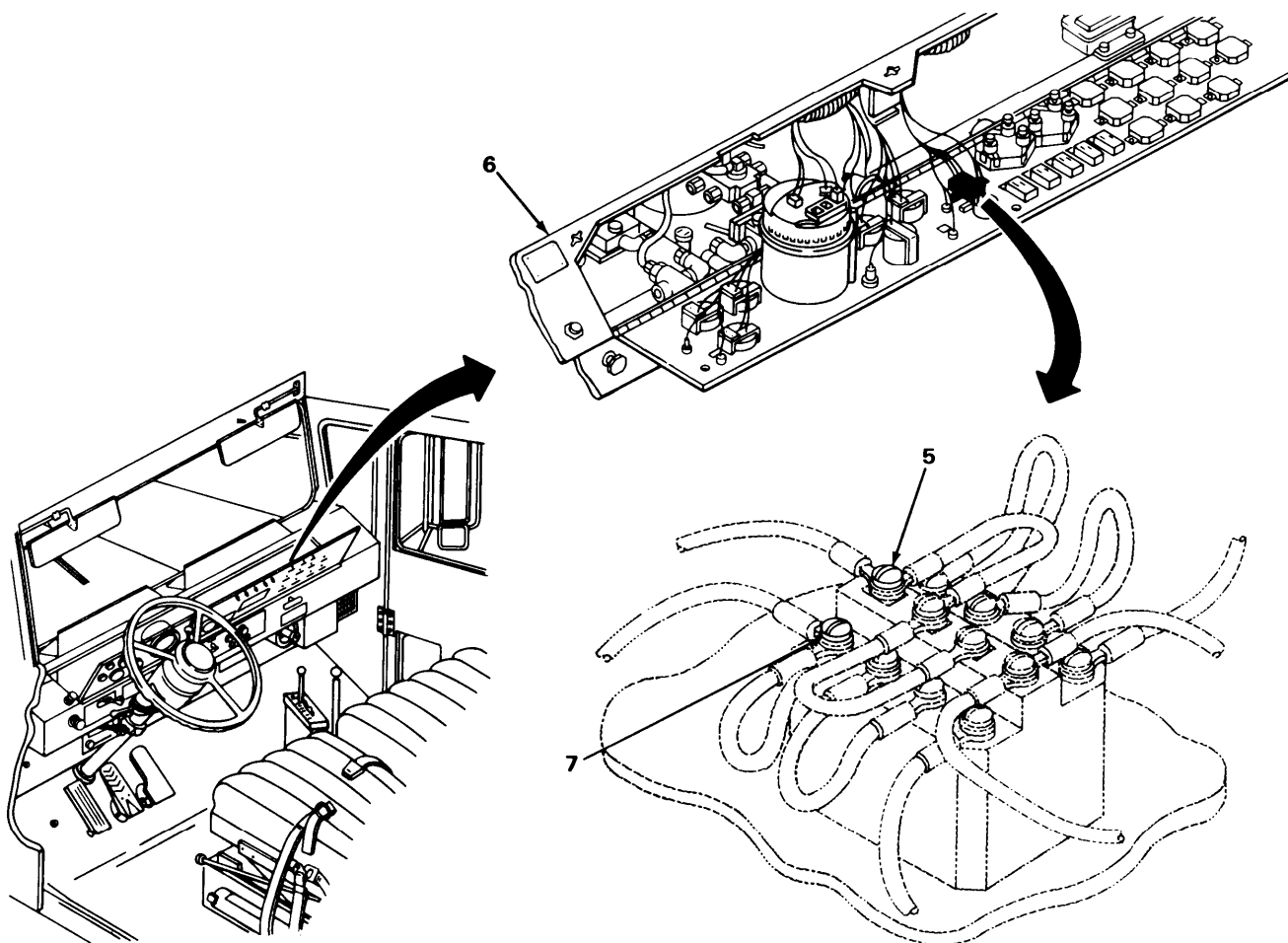
Step 6. Using multimeter set at 30 vdc, put red probe on blackout switch terminal (5) and black probe on panel (6).

If meter reads no voltage, go to step 8.

Step 7. Using multimeter set at 30 vdc, put red probe on blackout switch terminal (7) and black probe on panel (6).

a. If meter reads no voltage, put headlight switch in OFF position and replace blackout switch (page 4-298).

b. If meter reads voltage, put headlight switch in OFF position, close instrument panel (page 4-244) and notify direct support maintenance.



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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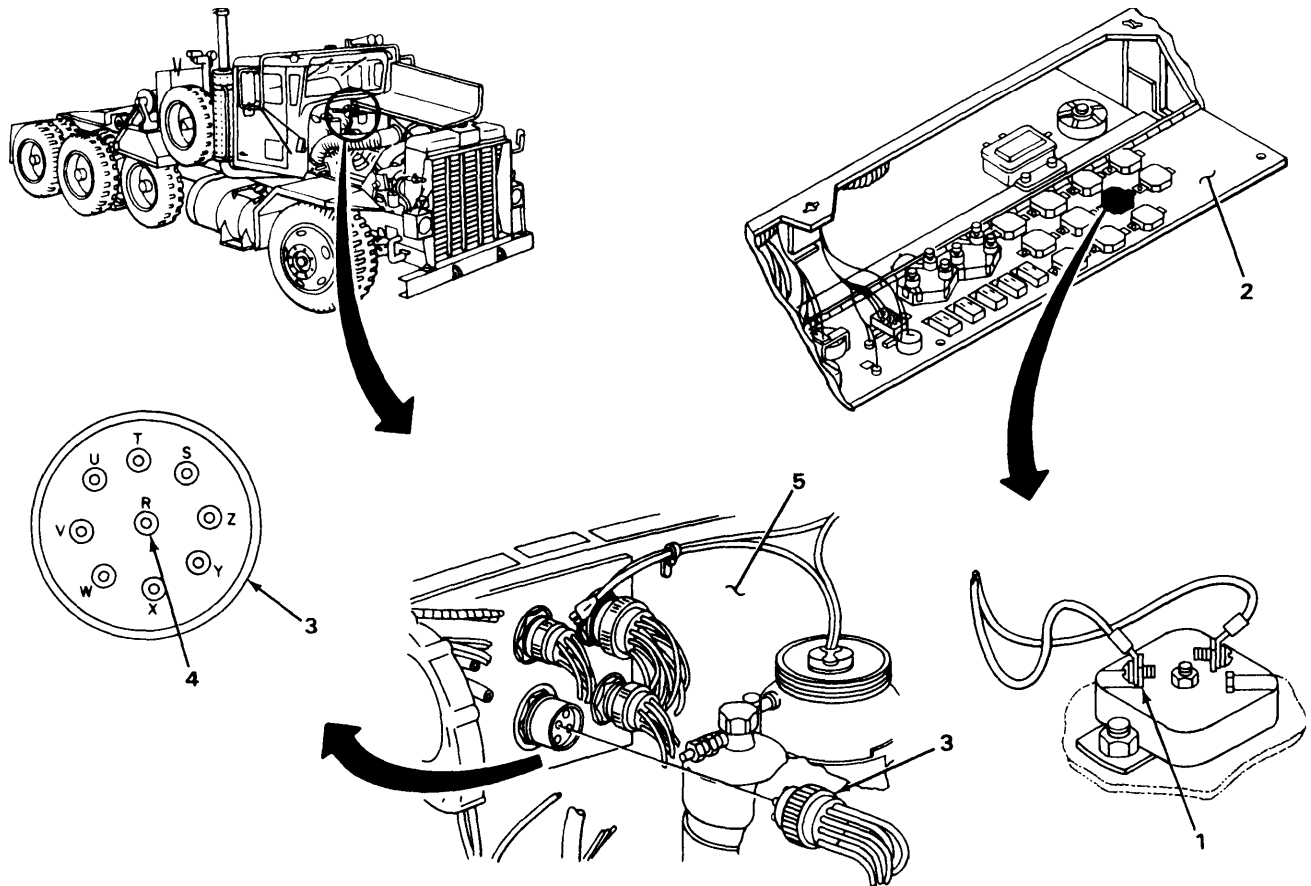
16. BOTH HEADLIGHTS DO NOT WORK- CONTINUED.

Step 8. Using multimeter set at 30 vdc, put red probe on circuit breaker terminal (1) and black probe on panel (2).

If meter reads no voltage, put headlight switch in OFF position, close instrument panel (page 4-244) and notify direct support maintenance.

Step 9. Open right side of hood (TM 9-2320-270-10), unscrew and disconnect firewall harness plug (3). Using multimeter set at 30 vdc, put red probe on socket terminal R (4) and black probe on bulkhead (5).

If meter reads no voltage, put headlight switch in OFF position, close instrument panel (page 4-244), plug in firewall harness, close right side of hood (TM 9-2320-270-10) and notify direct support maintenance.



TA239641

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

17. HIGH BEAM INDICATOR LIGHT DOES NOT WORK.

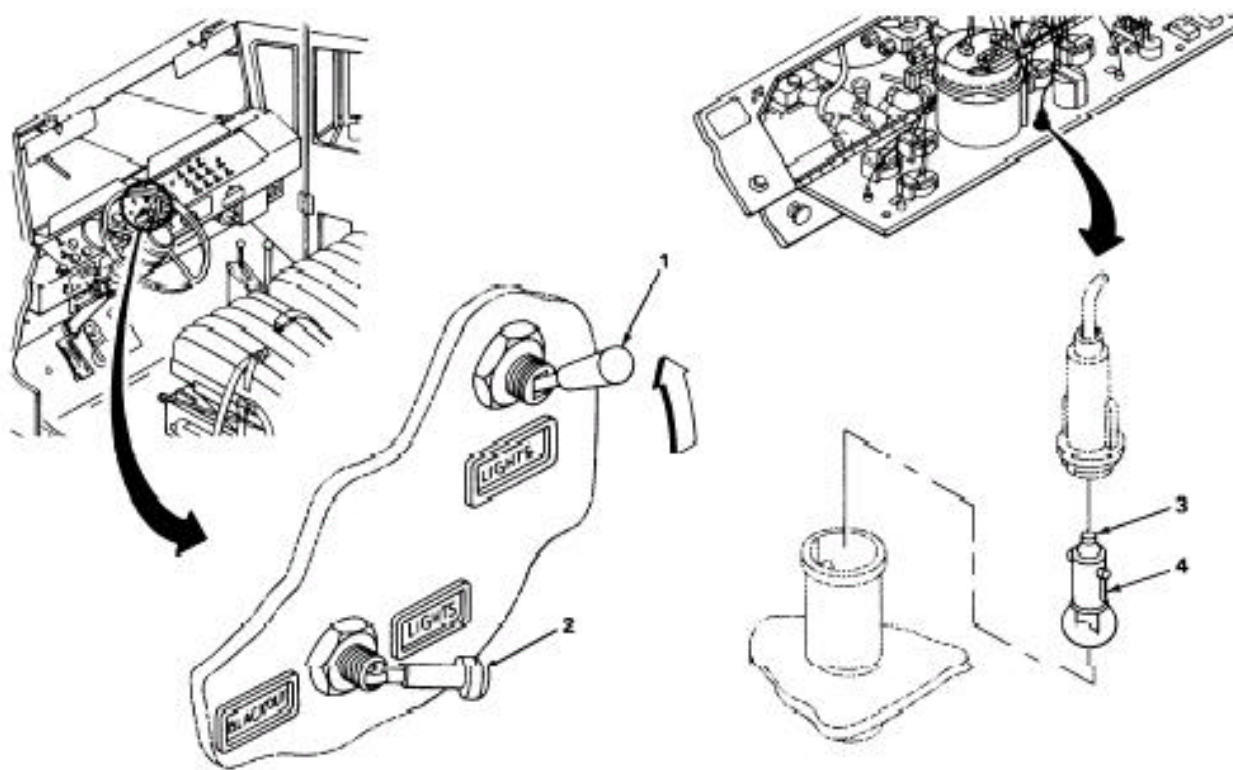
- Step 1. Put headlight switch (1) in ON position, and make sure blackout switch (2) is in LIGHTS position.

If headlights do not work, go to BOTH HEADLIGHTS DO NOT WORK (page 3-48).

- Step 2. Put headlight switch (1) in OFF position. Remove high beam indicator light lamp (page 4-276). Using multi meter set at RX1, put probes on contact (3) and lamp housing (4).

a. If meter reads zero, install lamp (page 4-276) and notify direct support maintenance.

b. If meter does not read zero, replace lamp (page 4-276).



TA239S42

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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18. DIRECTIONAL INDICATOR LIGHT DOES NOT WORK.

NOTE

If both directional indicator lights do not work, go to step 2.

- Step 1. Remove directional indicator light lamp (page 4-320). Using multimeter set at RX1, put probes on contact (1) and lamp housing (2).
- a. If meter reads zero, install lamp (page 4-320).
 - b. If meter does not read zero, replace lamp (page 4-320).
- Step 2. Put clearance light switch (3) in ON position, and make sure blackout switch (4) is in LIGHTS position.
- a. If marker lights work, do steps 3 thru 6 under FRONT DIRECTIONAL LIGHT DOES NOT WORK (page 3-55).
 - b. If marker lights do not work, do step 7 under FRONT DIRECTIONAL LIGHT DOES NOT WORK (page 3-55).
 - c. If directional indicator light still does not work, notify direct support maintenance.

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

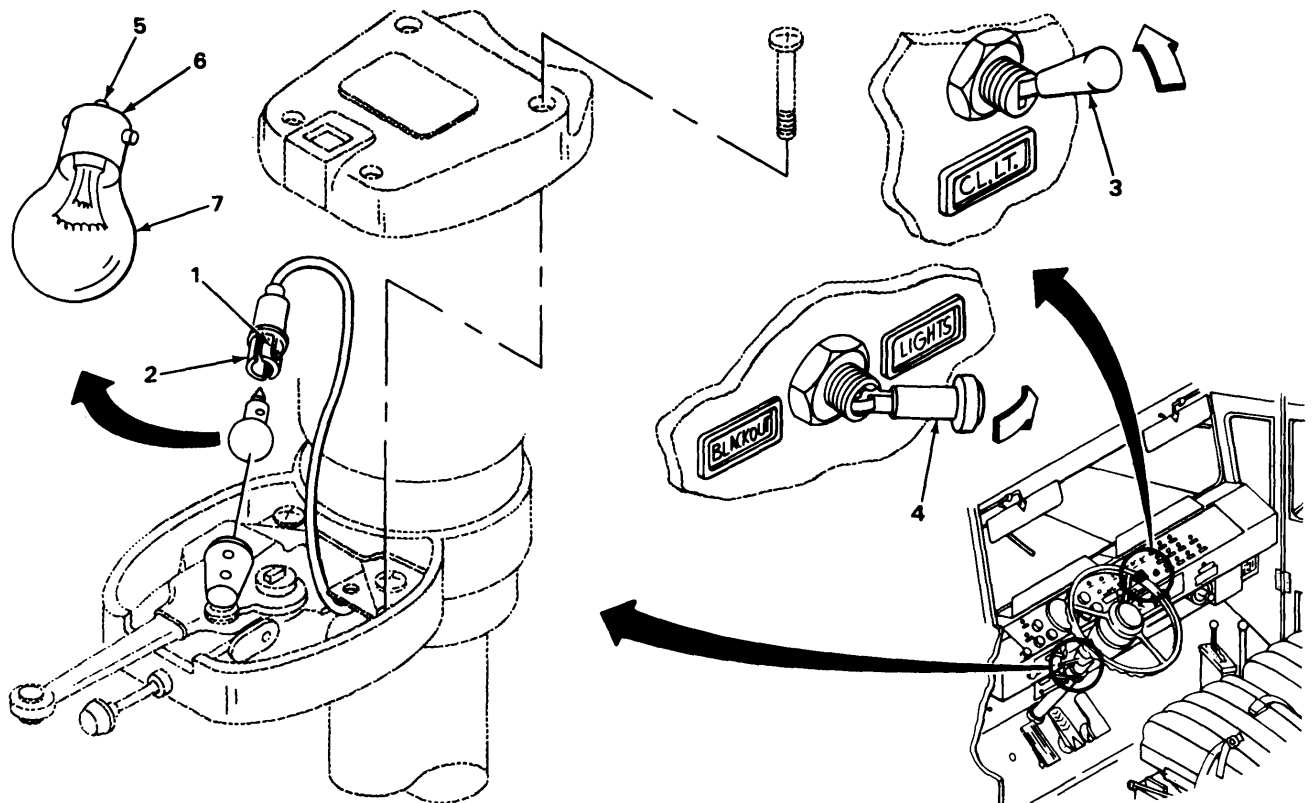
19. FRONT DIRECTIONAL SIGNAL CONTROL LIGHT DOES NOT WORK.

NOTE

If both front directional lights do not work, go to step 2.

Step 1. Remove directional light lamp (page 4-320). Using multimeter set at RX1, put probes on contact (5) and lamp housing (6).

If meter does not read zero, replace lamp (7) (page 4-320).



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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19. FRONT DIRECTIONAL LIGHT DOES NOT WORK - CONTINUED.

Step 2. Install directional light lamp (page 4-320). Put clearance light switch (1) in ON position, and make sure blackout switch (2) is in LIGHTS position.

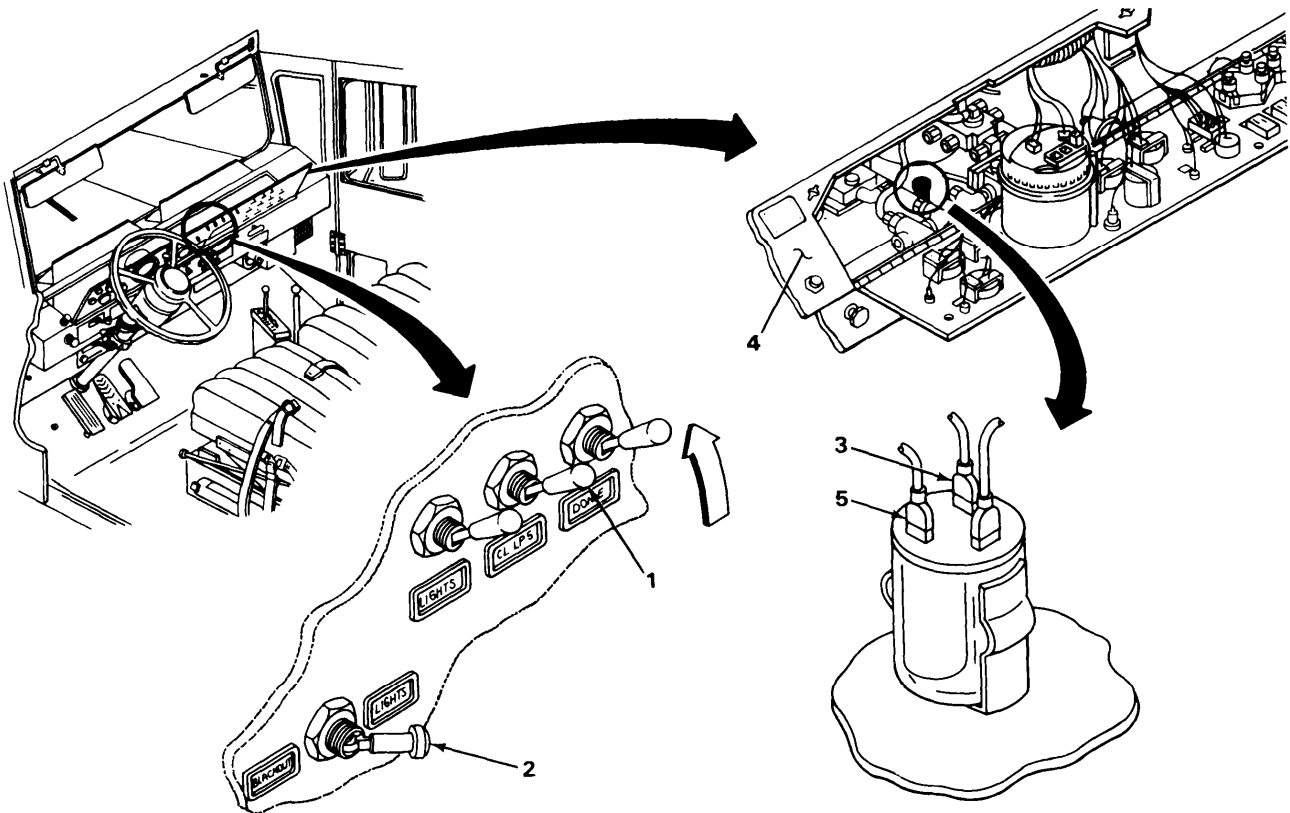
If marker lights do not work, go to step 7.

Step 3. Put clearance light switch (1) in OFF position. Open instrument panel (page 4-244). Using multimeter set at 30 vdc, put red probe on flasher terminal X (3) and black probe on panel (4).

If meter reads no voltage, go to step 5.

Step 4. Using multimeter set at 30 vdc, put red probe on flasher terminal L(5) and black probe on panel (4).

If meter reads no voltage, replace flasher (page 4-318).



TA239644

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

Step 5. Using **multimeter** set at 30 **vdc**, put red probe on circuit breaker terminal (6) and black probe on panel (4).

If meter reads no voltage, close instrument panel (page 4-244) and notify direct support maintenance.

Step 6. Using multimeter set at 30 vdc, put red probe on circuit breaker terminal (7) and black probe on panel (4).

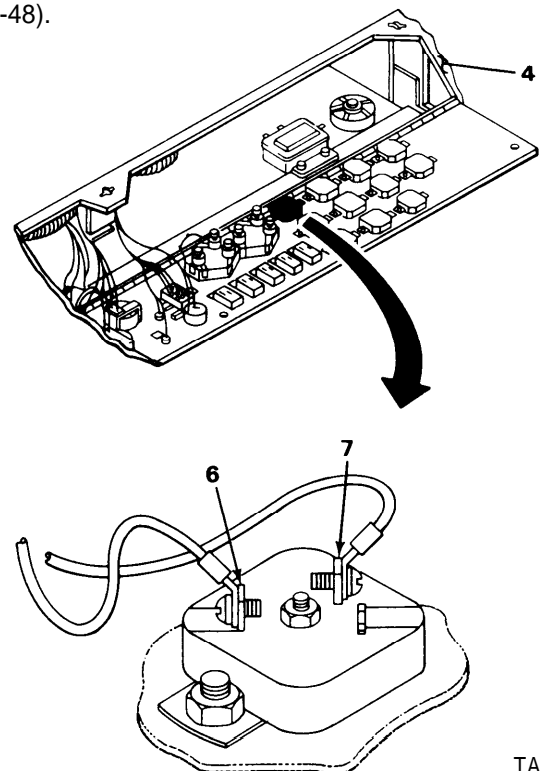
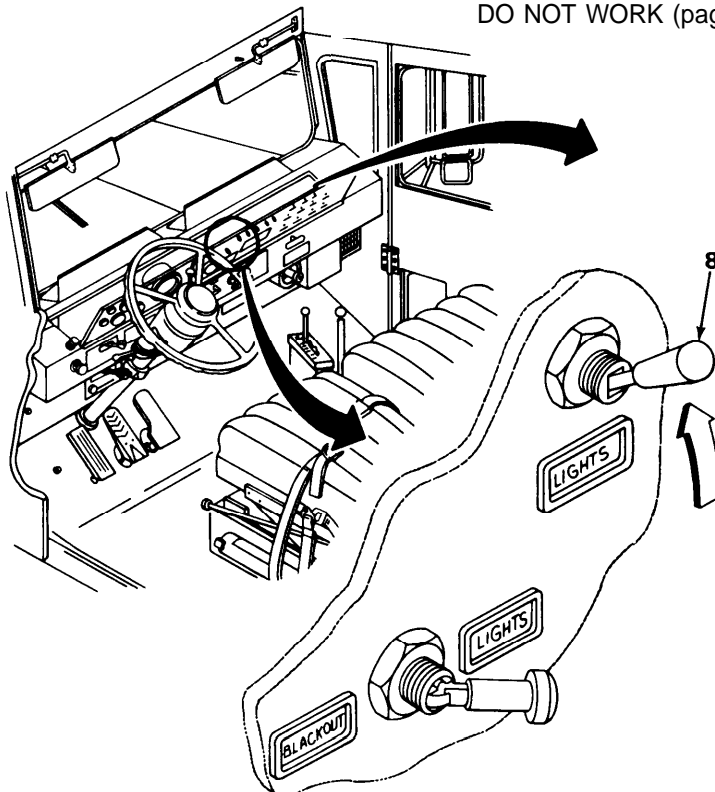
a. If meter reads no voltage, replace TURN SIG circuit breaker (page 4-304).

b. If meter reads voltage, close instrument panel (page 4-244) and notify direct support maintenance.

Step 7. Put clearance light switch in OFF position. Put headlight switch (8) in ON position.

a. If headlights work, put headlight switch in OFF position, close instrument panel (page 4-244) and notify direct support maintenance.

b. If headlights do not work, do steps 6 thru 9 under BOTH HEADLIGHTS DO NOT WORK (page 3-48).



TA239645

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

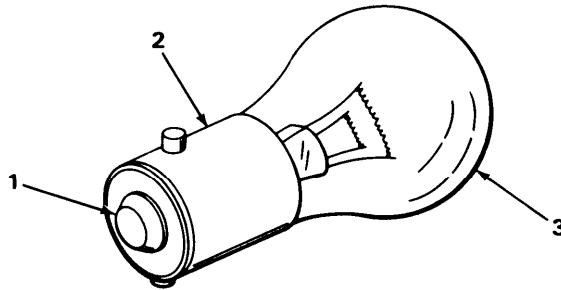
20. REAR DIRECTIONAL LIGHT DOES NOT WORK.

NOTE

If both rear directional lights do not work, go to step 2.

Step 1. Remove stop and taillight lamp (page 4-366). Using multimeter set at RX1, put probes on contact (1) and lamp housing (2).

If meter does not read zero, replace lamp (3).



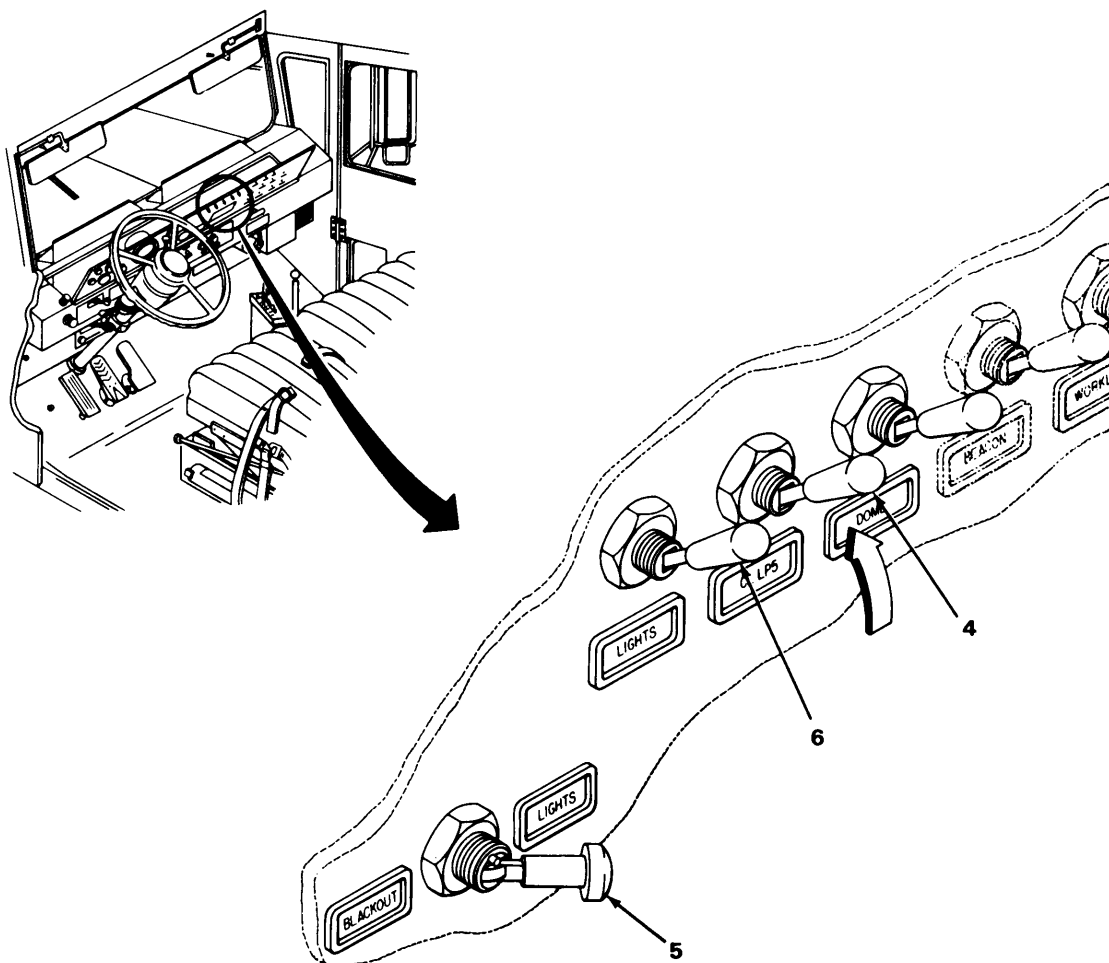
Step 2. Install stop and taillight lamp (page 4-366). Put clearance light switch (4) to ON position, and make sure blackout switch (5) is in LIGHTS position.

If marker lights work, do steps 4 thru 7 under FRONT DIRECTIONAL LIGHT DOES NOT WORK (page 3-54).

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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- Step 3. Put headlight switch (6) in ON position.
- a. If headlights work, put headlight switch in OFF position and notify direct support maintenance.
 - b. If headlights do not work, open instrument panel (page 4-244) and do steps 6 thru 9 under BOTH HEADLIGHTS DO NOT WORK (page 3-48).



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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21. CLEARANCE LIGHT DOES NOT WORK.

NOTE

If all clearance lights do not work, go to step 2.

Step 1. Remove clearance light lamp (page 4-342). Using multimeter set at RX1, put probes on contact (1) and lamp housing (2).

a. If meter reads zero, install clearance lamp (page 4-342).

b. If meter does not read zero, replace lamp (3) (page 4-342).

Step 2. Put clearance light switch (4) to ON position and make sure blackout switch (5) is in LIGHTS position.

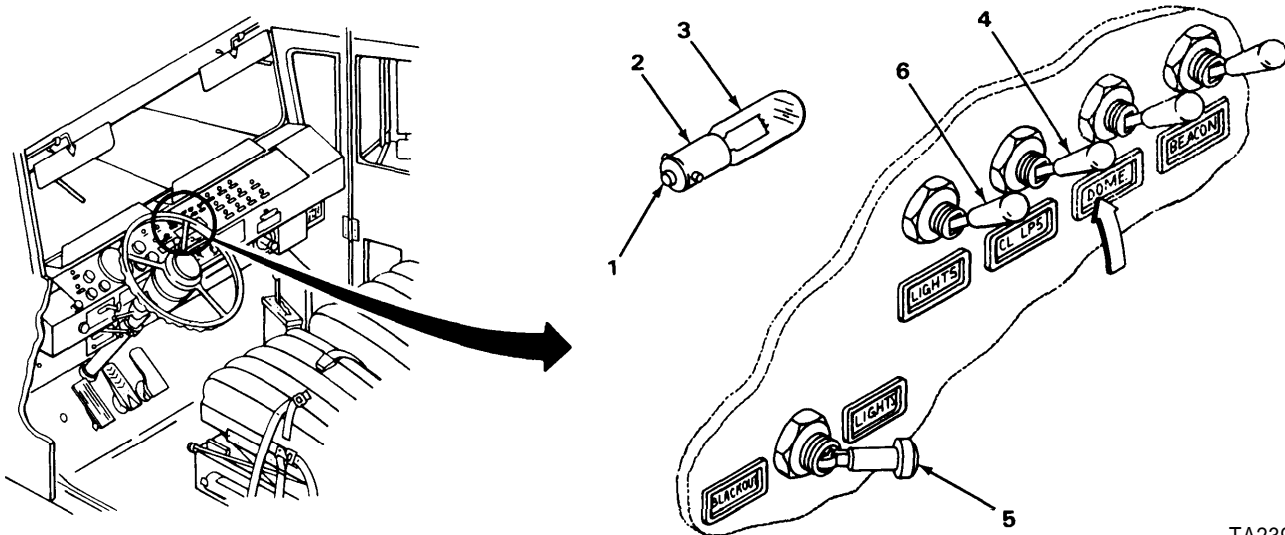
If marker lights work, put clearance light switch in OFF position and notify direct support maintenance.

Step 3. Put clearance light switch (4) in OFF position. Put headlights switch (6) in ON position.

a. If headlights work, do steps 5 thru 7 under SIDE MARKER LIGHT DOES NOT WORK (page 3-63).

b. If headlights do not work, do steps 6 thru 9 under BOTH HEADLIGHTS DO NOT WORK (page 3-48).

c. If clearance light still does not work, notify direct support maintenance.



TA239648

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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22. BACKUP LIGHT DOES NOT WORK.

Step 1. Put clearance light switch (1) in ON position, and make sure blackout switch (2) is in LIGHTS position.

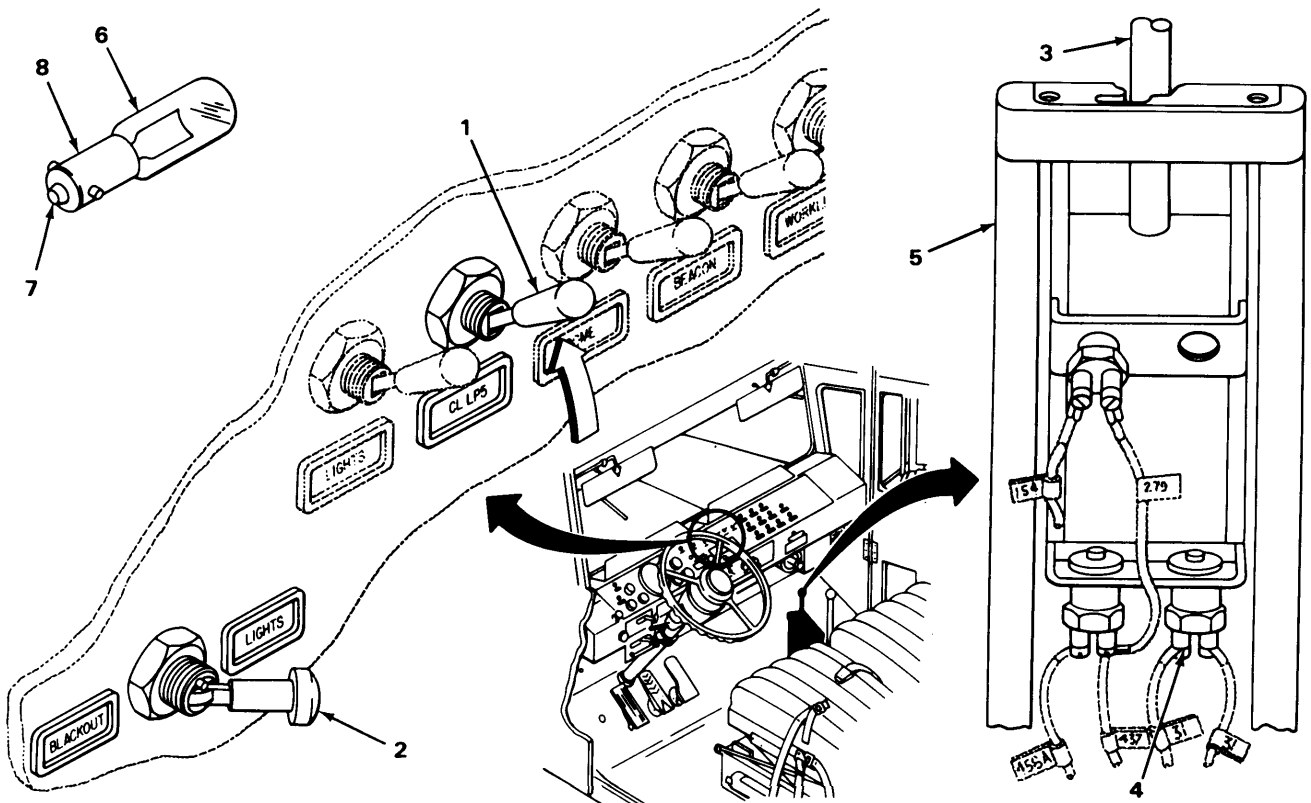
If clearance lights do not work, go to step 5.

Step 2. Put clearance light switch (1) in OFF position. Make sure parking brake is applied (TM 9-2320-270-10). Put transmission shift control (3) in reverse position (R). Put key in ON position. Using multimeter set at 30 vdc, put red probe on backup light switch terminal (4) and black probe on housing (5). Take reading and put key in OFF position.

If meter reads no voltage, go to step 4.

Step 3. Put transmission shift control (3) in neutral position (N). Remove backup light lamp (6) (page 4-325). Using multimeter set at RX1, put probes on contact (7) and lamp housing (8).

If meter does not read zero, replace lamp (6) (page 4-325).



TA239649

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

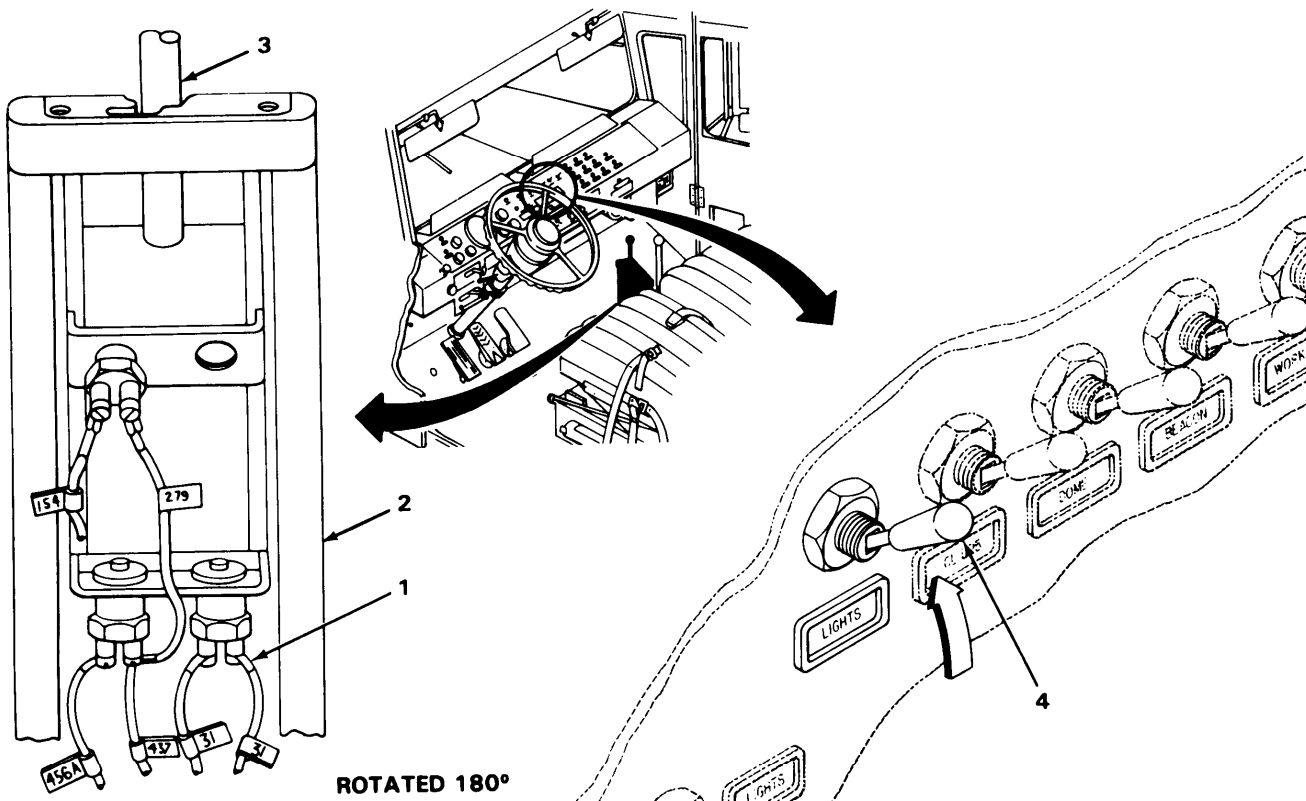
22. BACKUP LIGHT DOES NOT WORK – CONTINUED.

Step 4. Put key in ON position. Using multimeter set at 30 vdc, put red probe on backup light switch terminal (1) and black probe on housing (2). Take reading and put key in OFF position.

- a. If meter reads no voltage, put transmission shift control (3) in neutral position (N).
- b. If meter reads voltage, put transmission shift control (3) in neutral position (N) and replace backup light switch (page 4-512).

Step 5. Put headlight switch (4) in ON position.

- a. If headlights work, do step 7 under SIDE MARKER LIGHT DOES NOT WORK (page 3-63).
- b. If headlights do not work, do steps 6 thru 9 under BOTH HEADLIGHTS DO NOT WORK (page 3-48).



TA239650

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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23. SIDE MARKER LIGHT DOES NOT WORK.

Step 1. Put headlight switch (1) in ON position and make sure blackout switch (2) is in LIGHTS position.

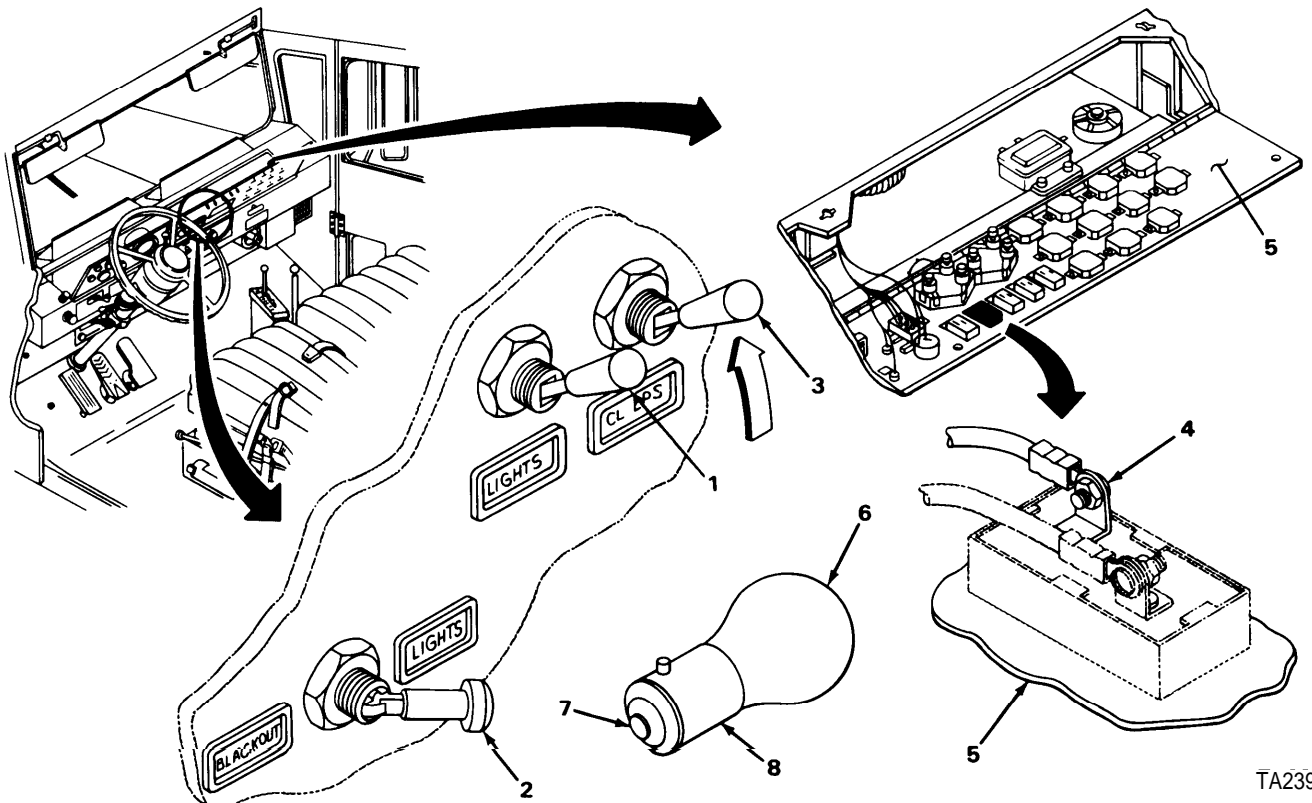
If both headlights do not work, do steps 6 thru 9 under BOTH HEADLIGHTS DO NOT WORK (page 3-48).

Step 2. Put headlight switch (1) in OFF position. Put clearance lights switch (3) in ON position. Open instrument panel (page 4-244). Using multimeter set at 30 vdc, put red probe on clearance light switch terminal (4) and black probe on panel (5).

If meter reads no voltage, go to step 4.

Step 3. Put clearance light switch in OFF position. Remove side marker light lamps (6) (page 4-370). Using multi meter set at RXI, put probes on contact (7) and lamp housing (8).

If meter does not read zero, close instrument panel (page 4-244) and replace lamp (6) (page 4-370).



TA239651

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

23. SIDE MARKER LIGHT DOES NOT WORK - CONTINUED.

Step 4. Using multimeter set at 30 vdc, put red probe on circuit breaker terminal (1) and black probe on panel (2).

If meter reads no voltage, go to step 6.

Step 5. Using multimeter set at 30 vdc, put red probe on clearance light switch terminal (3) and black probe on panel (2).

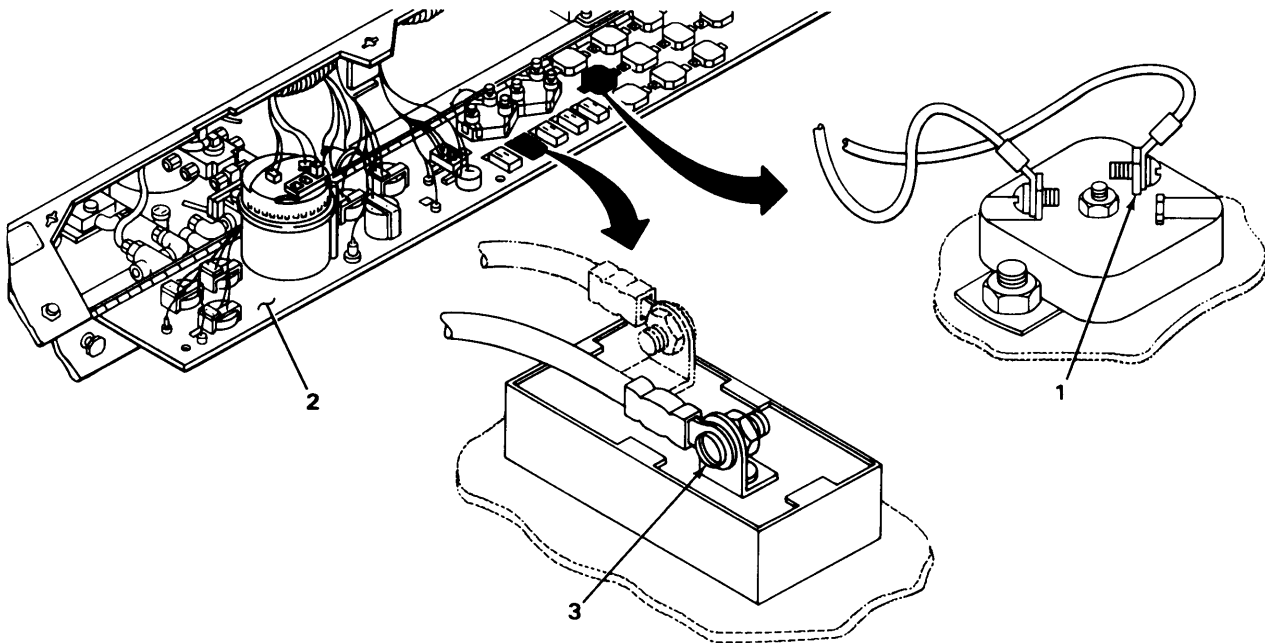
a. If meter reads no voltage, close instrument panel (page 4-244) and notify direct support maintenance.

b. If meter reads voltage, replace clearance light switch (page 4-291).

Step 6. Using multimeter set at 30 vdc, put red probe on circuit breaker terminal (1) and black probe on panel (2).

a. If meter reads no voltage, close instrument panel (page 4-244), put clearance light switch in OFF position, and notify direct support maintenance.

b. If meter reads voltage, put clearance light switch in OFF position and replace CL LPS circuit breaker (page 4-304).



TA239652

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

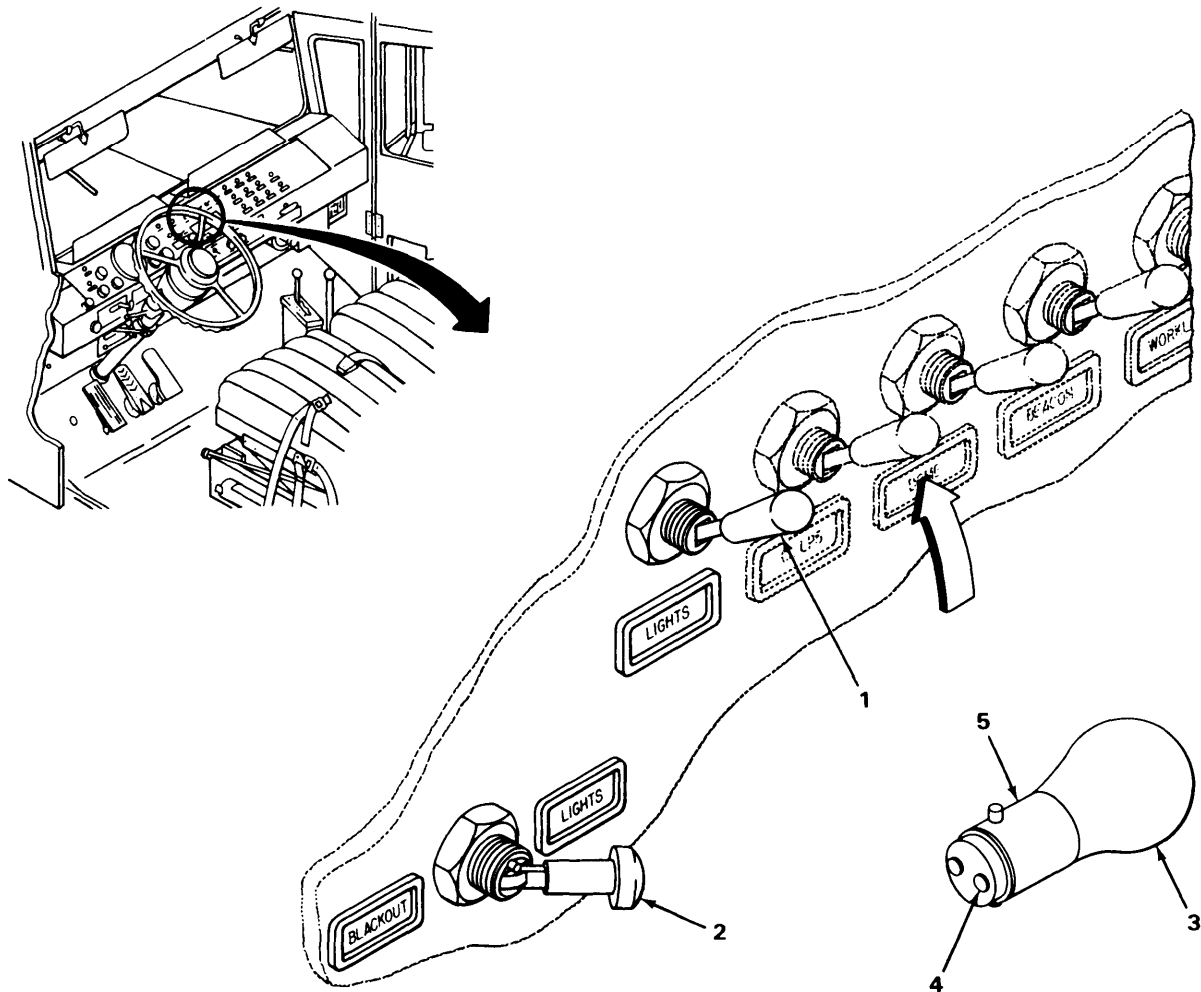
24. TAILLIGHT DOES NOT WORK.

Step 1. Put headlight switch (1) in ON position, and make sure blackout switch (2) is in LIGHTS position.

If both headlights do not work, do steps 3 thru 9 under BOTH HEADLIGHTS DO NOT WORK (page 3-48).

Step 2. Put headlight switch in OFF position. Remove stop and taillight lamp (3) (page 4-366). Using multi meter set at RX1, put probes on contact (4) and lamp housing (5), take reading and repeat for other contact.

If meter does not read zero, replace lamp (3) (page 4-366).



TA239653

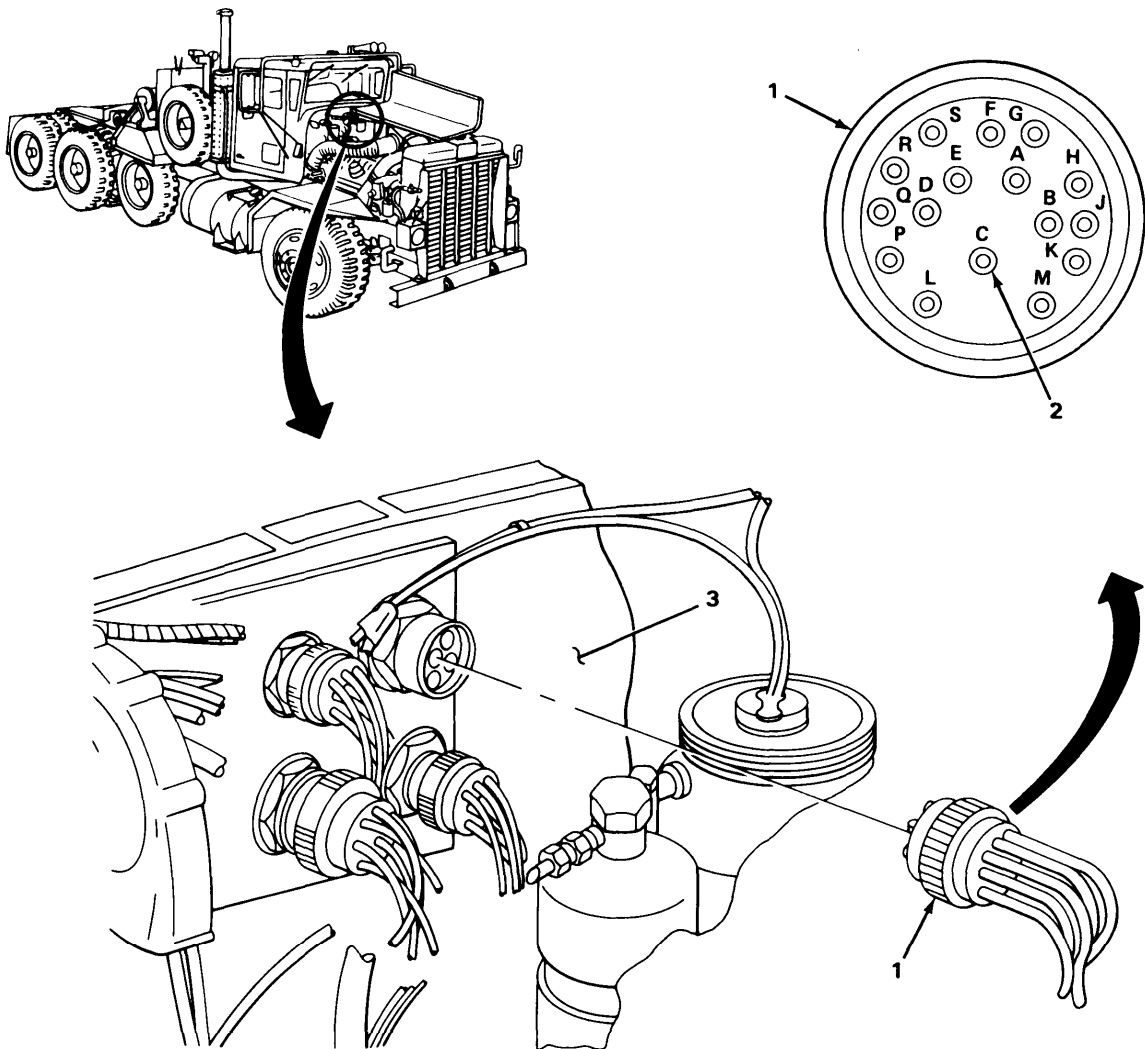
TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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24. TAILLIGHT DOES NOT WORK - CONTINUED.

Step 3. Install stop and taillight lamp (page 4-366). Open right side of hood (TM9-2320-270-10). Take apart chassis harness plug (1). Using multimeter set at RX1, PUT PROBES ON PLUG TERMINAL c (2) and bulkhead (3).

Plug in chassis harness plug, close right side of hood (TM9-2320-270-10) and notify direct support maintenance.



TA239654

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

25. BLACKOUT HEADLIGHT OR MARKER LIGHT DOES NOT WORK.

NOTE

If blackout headlight and both marker lights do not work, go to step 2.

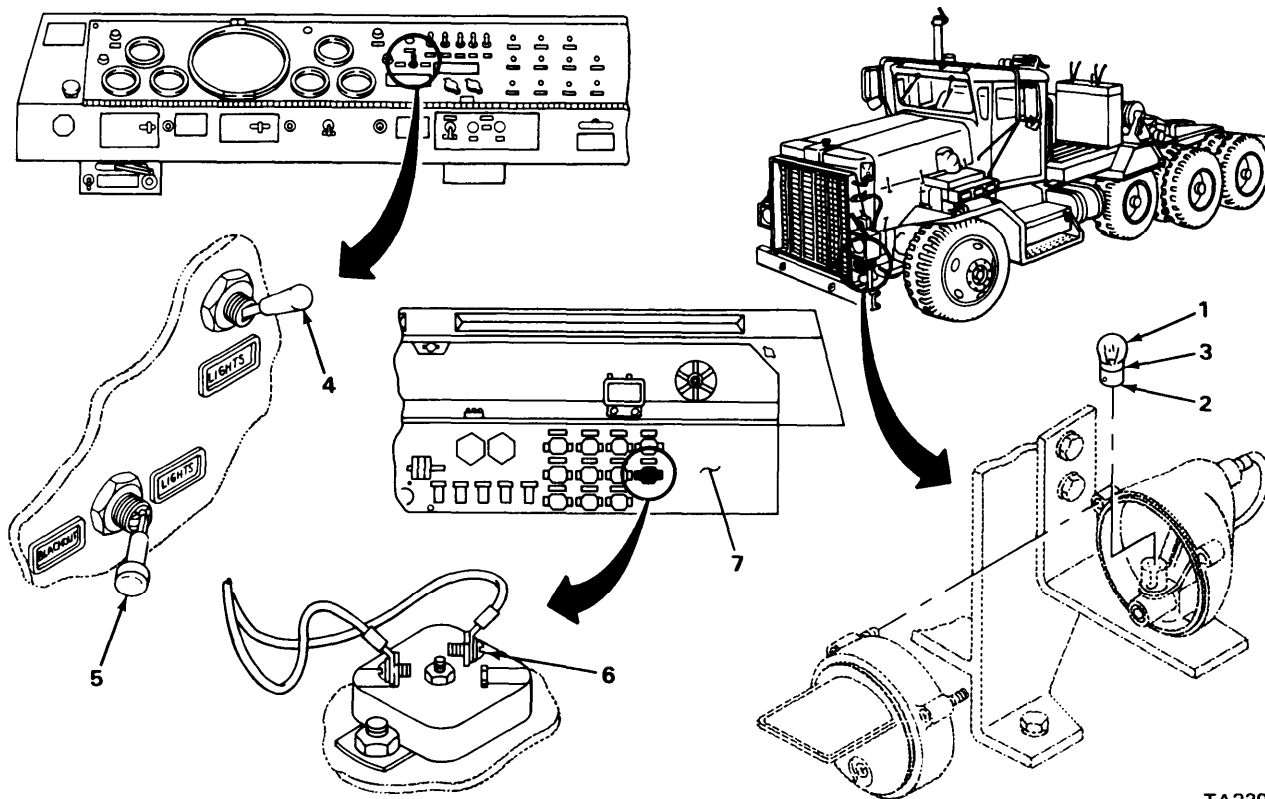
Step 1. Remove blackout headlight lamp (page 4-386) or marker light lamp (1) (page 4-370). Using multimeter set at RX1, put probes on contact (2) and lamp housing (3).

a. If meter reads zero, install blackout headlight lamp (page 4-386) or marker light lamp (page 4-370), and notify direct support maintenance.

b. If meter does not read zero, replace lamp (1), blackout headlight (page 4-386) or marker light (4-370).

Step 2. Put headlight switch (4) in on position. Put blackout switch (5) to BLACKOUT position. Open instrument panel (page 4-244). Using multimeter set at 30 vdc, put red probe on circuit breaker terminal (6) and black probe on panel (7).

If meter reads no voltage, go to step 3.



TA239655

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

25. BLACKOUT HEADLIGHT OR MARKER LIGHT DOES NOT WORK - CONTINUED.

Step 3. Using multimeter set at 30 vdc, put red probe on blackout switch terminal (1) and black probe on panel (2).

If meter reads no voltage, go to step 5.

Step 4. Using multimeter set at 30 vdc, put red probe on circuit breaker terminal (3) and black probe on panel (2).

a. If meter reads no voltage, close instrument panel (page 4-244) and notify direct support maintenance.

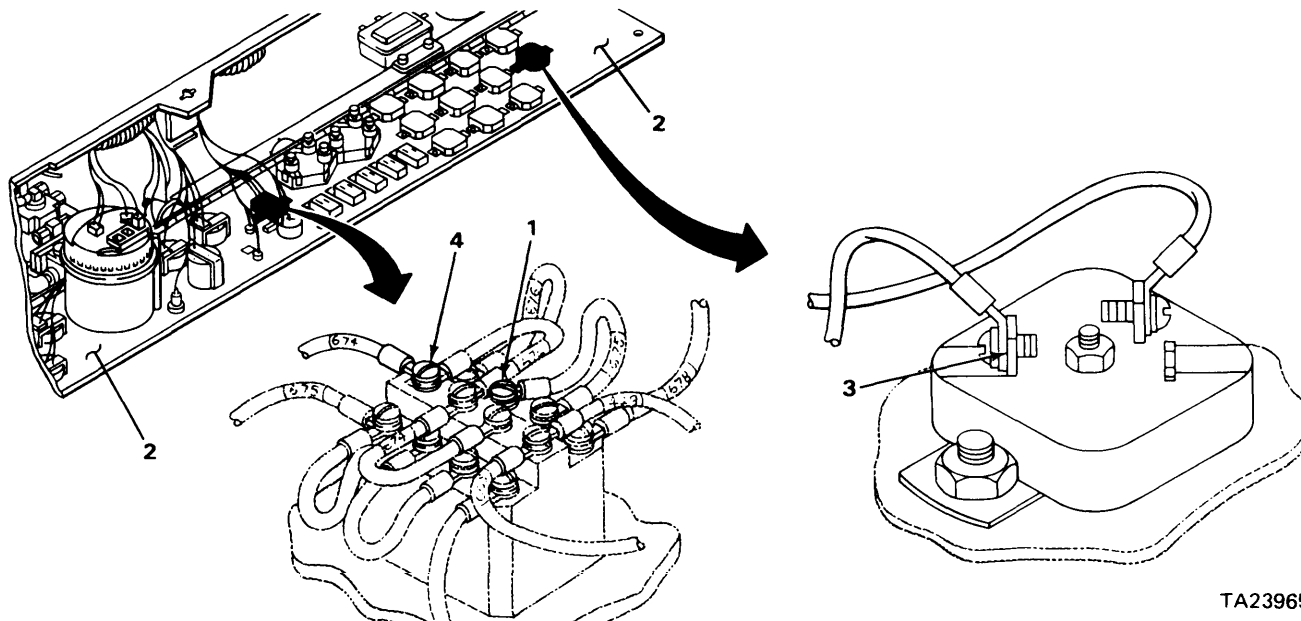
b. If meter reads voltage, replace BLACKOUT LT circuit breaker (page 4-304).

Step 5. Using multimeter set at 30 vdc, put red probe on blackout switch terminal (4) and black probe on panel (2).

a. If meter reads no voltage, do steps 8 and 9 under BOTH HEADLIGHTS DO NOT WORK (page 3-48).

b. If meter reads voltage, put light switch in OFF position, replace blackout light switch (page 4-298).

c. If blackout headlight or marker light still do not work, notify direct support maintenance.



TA239656

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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26. BLACKOUT TAILLIGHT DOES NOT WORK.

NOTE

If both blackout taillights do not work, go to step 2.

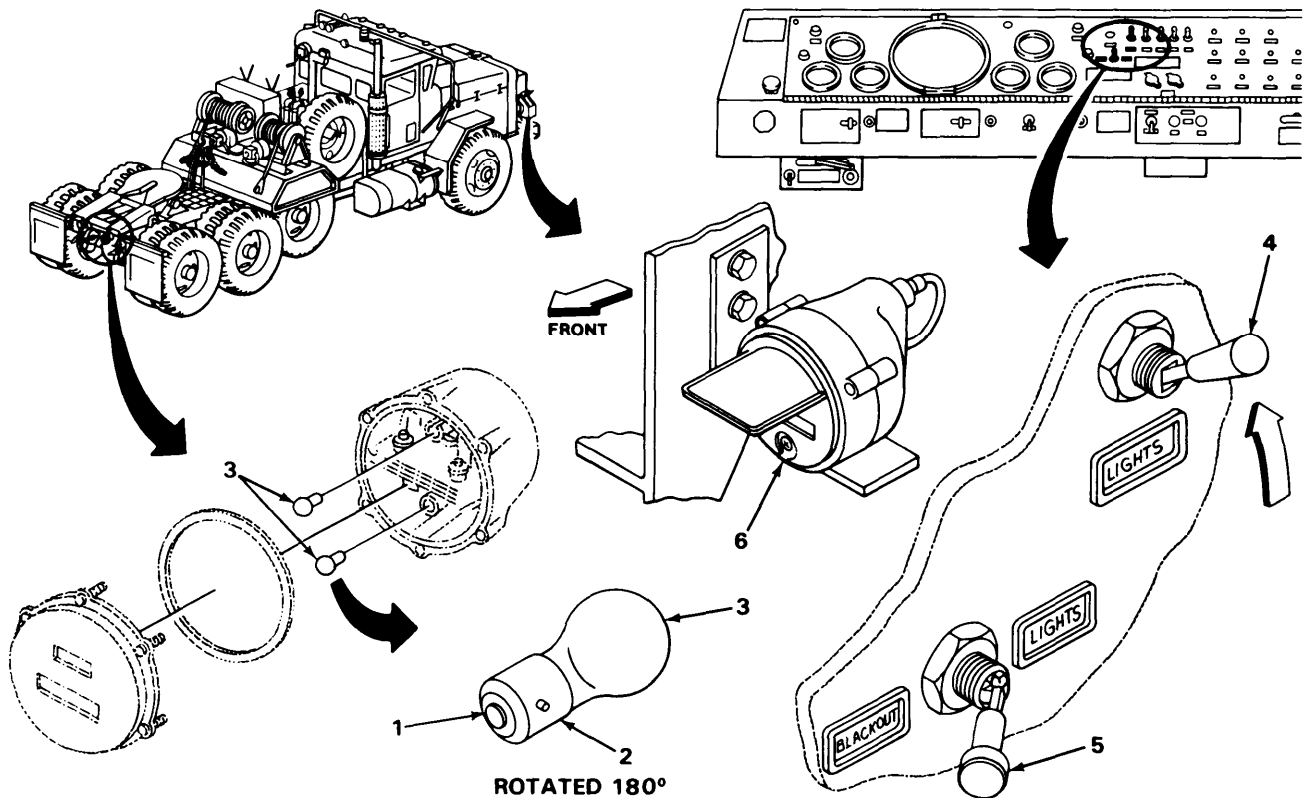
Step 1. Remove blackout stop and taillight lamp (page 4-376). Using multimeter set at RX1, put probes on contact (1) and lamp housing (2).

a. If meter reads zero, install blackout stop and taillight lamp (page 4-376), and notify direct support maintenance.

b. If meter does not read zero, replace lamp (3) (page 4-376).

Step 2. Put headlight switch (4) in ON position. Put blackout switch (5) in BLACKOUT position.

If blackout headlight (6) does not work, do steps 4 and 5 under BLACK-OUT HEADLIGHT OR MARKER LIGHT DOES NOT WORK (page 3-67).



TA239657

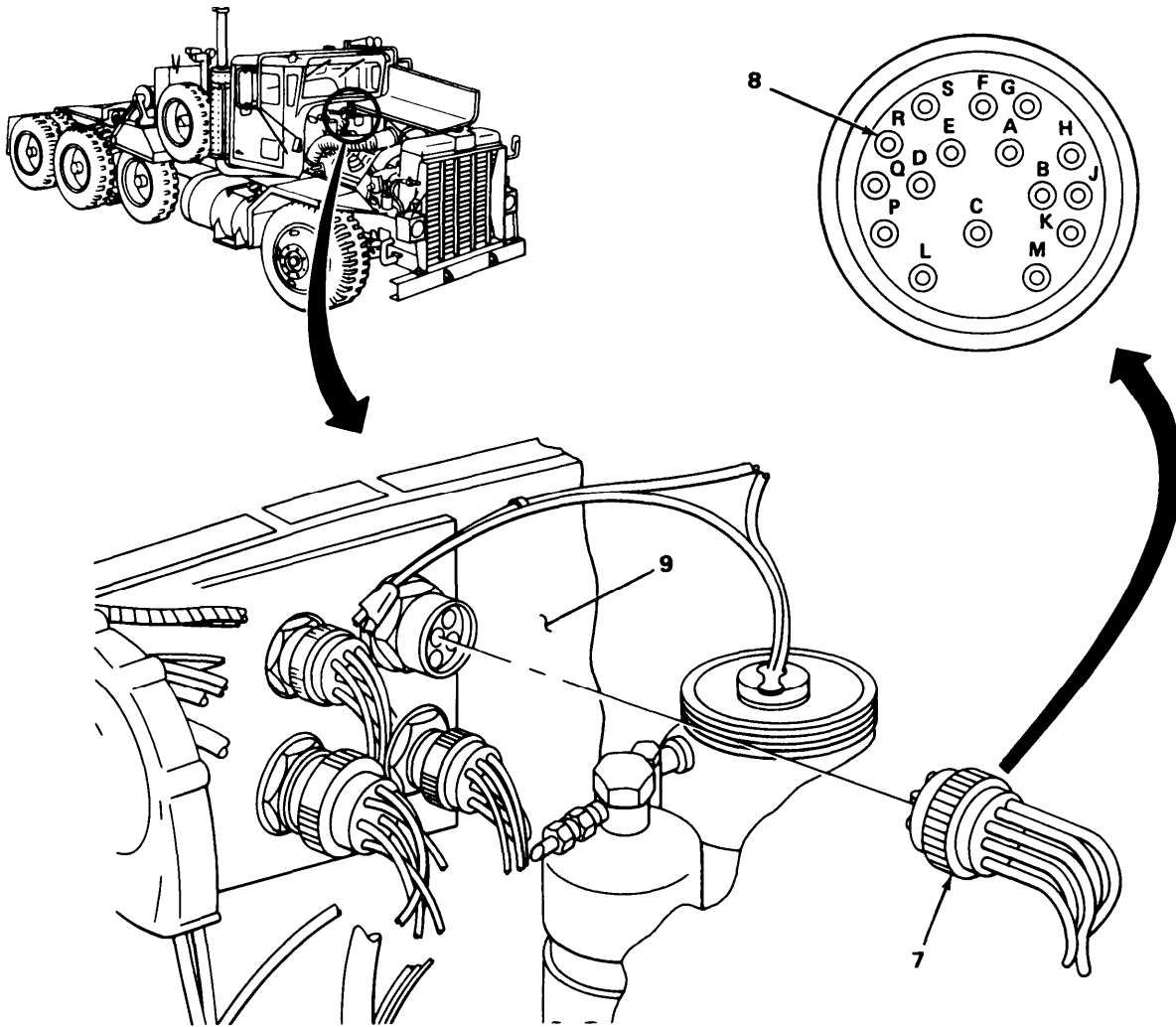
TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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26. BLACKOUT TAILLIGHT DOES NOT WORK - CONTINUED.

Step 3. Open right side of hood (TM 9-2320-270-10). Unscrew and disconnect chassis harness plug (7). Using multimeter set at 30 vdc, put red probe on chassis bulkhead connector pin R (8) and black probe on bulkhead (9).

Put chassis harness plug back in, close right side of hood (TM 9-2320-270-10) and notify direct support maintenance.



TA239658

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

27. SHIFT CONTROL LIGHT DOES NOT WORK.

NOTE

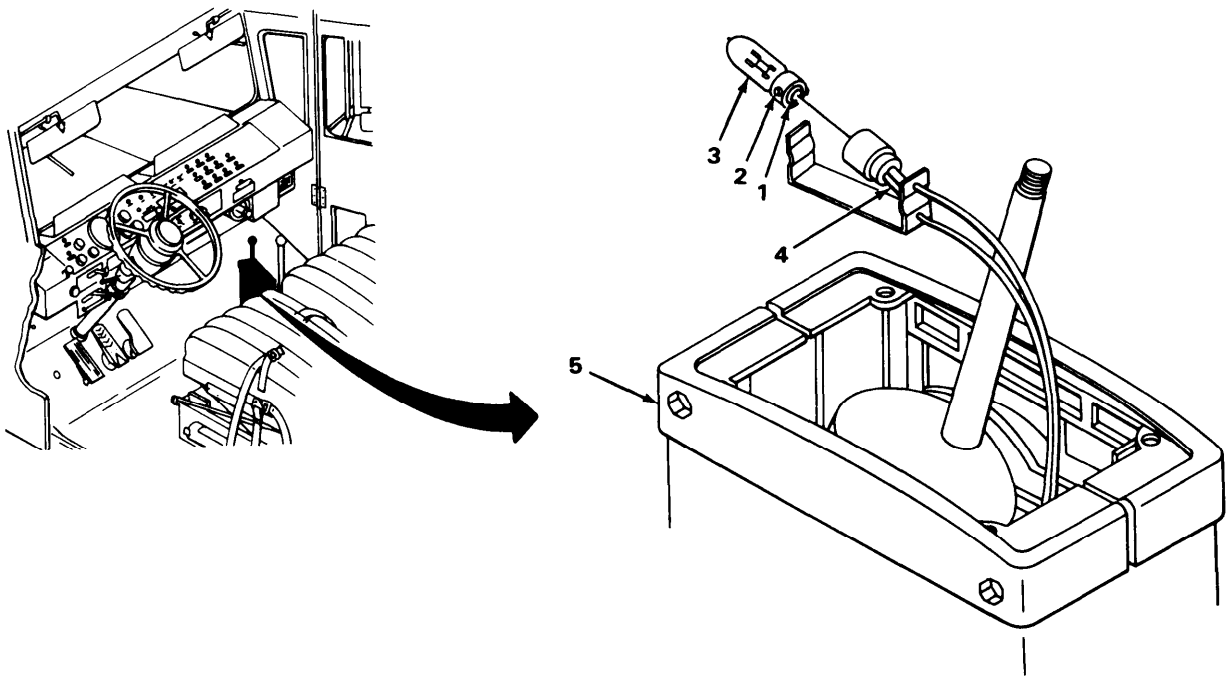
If instrument panel gage lights do not work, do steps 4 thru 8 under INSTRUMENT PANEL GAGE LIGHT DOES NOT WORK (page 3-77).

- Step 1. Remove shift control lamp (page 4-519). Using multimeter set at RX1, put probes on contact (1) and lamp housing (2).

If meter does not read zero, replace lamp (3) (page 4-519).

- Step 2. Using multimeter set at RX1, put probes in end of black ground wire (4) and housing (5). Take reading and wrap wire with electrical tape.

Install shift control lamp (page 4-519), and notify direct support maintenance.



TA239659

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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28. TACHOGRAPH LIGHT DOES NOT WORK.

NOTE

If instrument panel gage lights do not work, do steps 3 thru 8 under INSTRUMENT PANEL GAGE LIGHT DOES NOT WORK (page 3-77).

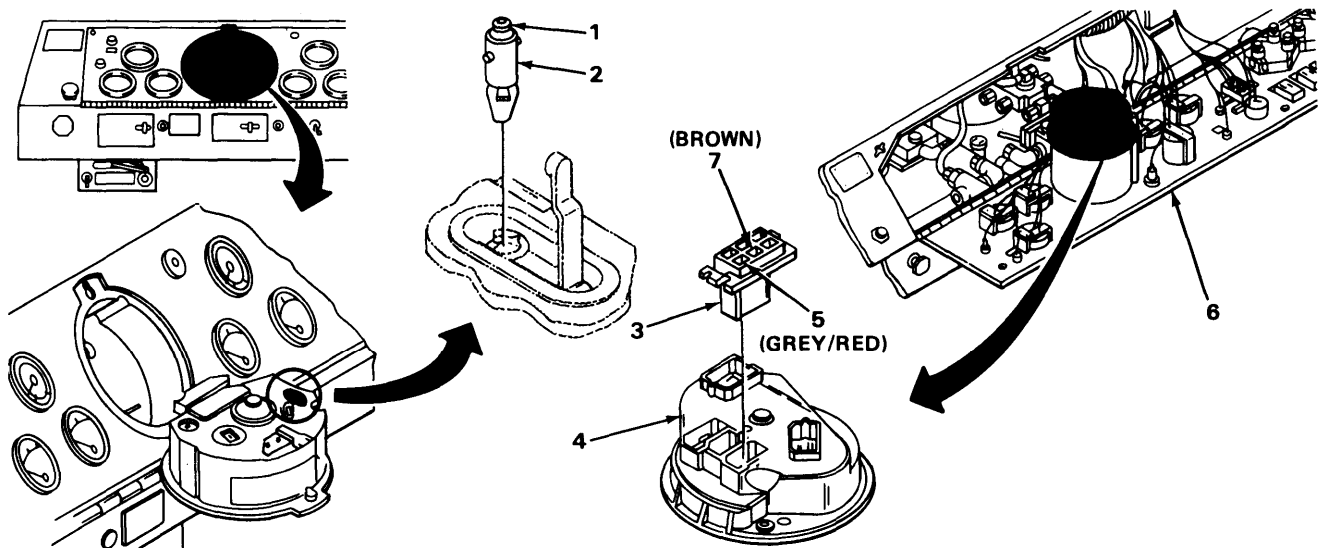
If all three tachograph lights do not work, go to step 2.

- Step 1. Remove tachograph lamp (page 4-283). Using multimeter set at RX1, put probes on contact (1) and lamp housing (2).

If meter does not read zero, replace lamp.

- Step 2. Install tachograph lamp (page 4-283). Open instrument panel (page 4-244) and pull plug (3) out of tachograph (4). Using multimeter set at RX1, put probes on plug terminal (5) and panel (6), and on plug terminal (7) and panel (6).

Push plug (3) into tachograph (4), close instrument panel (page 4-244) and notify direct support maintenance.



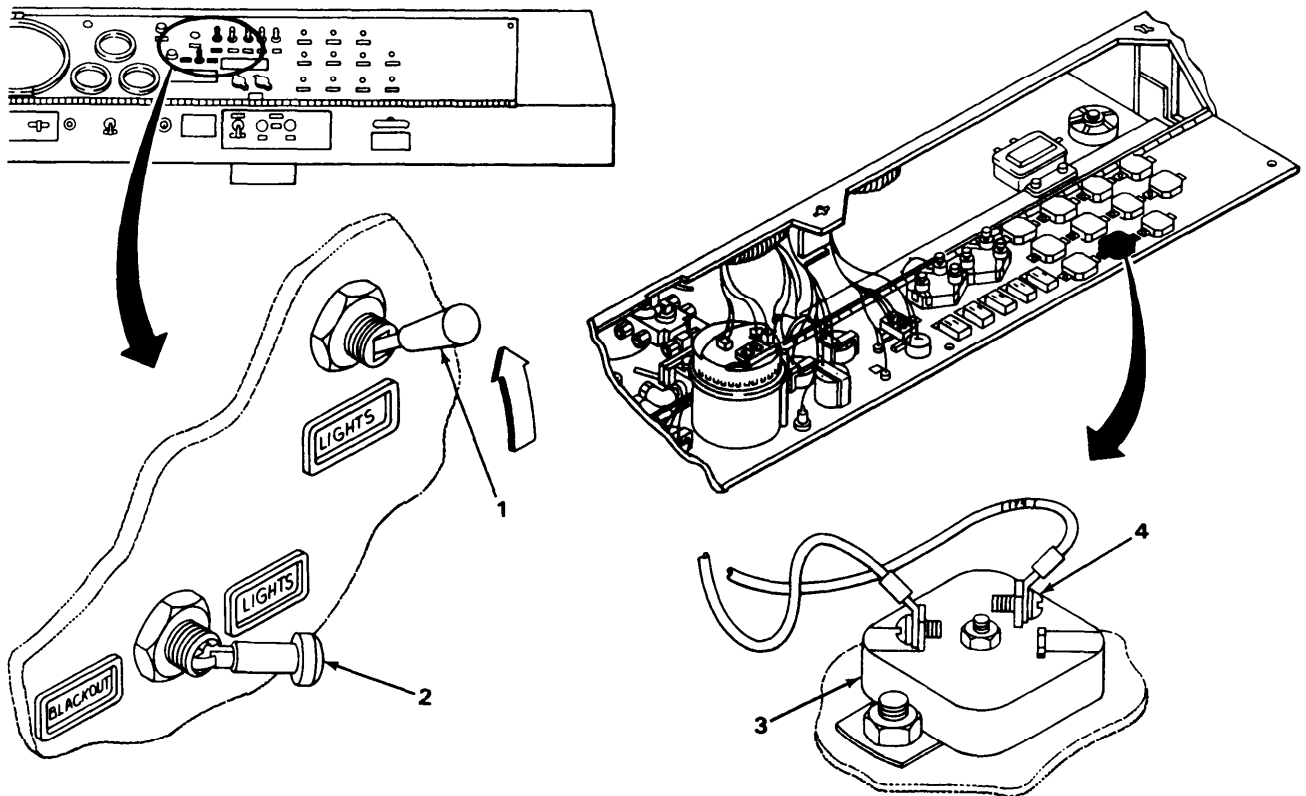
TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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29. WARNING LIGHT DOES NOT WORK.

- Step 1. Put headlight switch (1) in ON position and make sure blackout switch (2) is in LIGHTS position.
- a. If headlights do not work, do steps 6 thru 9 under BOTH HEADLIGHTS DO NOT WORK (page 3-46).
 - b. If headlights work, put headlight switch in OFF position and go to step 2.
- Step 2. Open instrument panel (page 4-244). Go to dome light circuit breaker(3) using multimeter set at 30 vdc, put red probe on wire no. 174 (4) and black probe to good ground. Put headlight switch in ON position.

If meter reads no voltage, put headlight switch in OFF position, close instrument panel (page 4-244), and notify direct support maintenance.



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

29. WARNING LIGHT DOES NOT WORK – CONTINUED,

Step 3. At dome light circuit breaker (1), using multimeter set at 30 vdc, put red probe on wire no. 029 (2), and black probe to good ground.

If meter reads no voltage, put headlight switch in OFF position and replace circuit breaker (page 4-304).

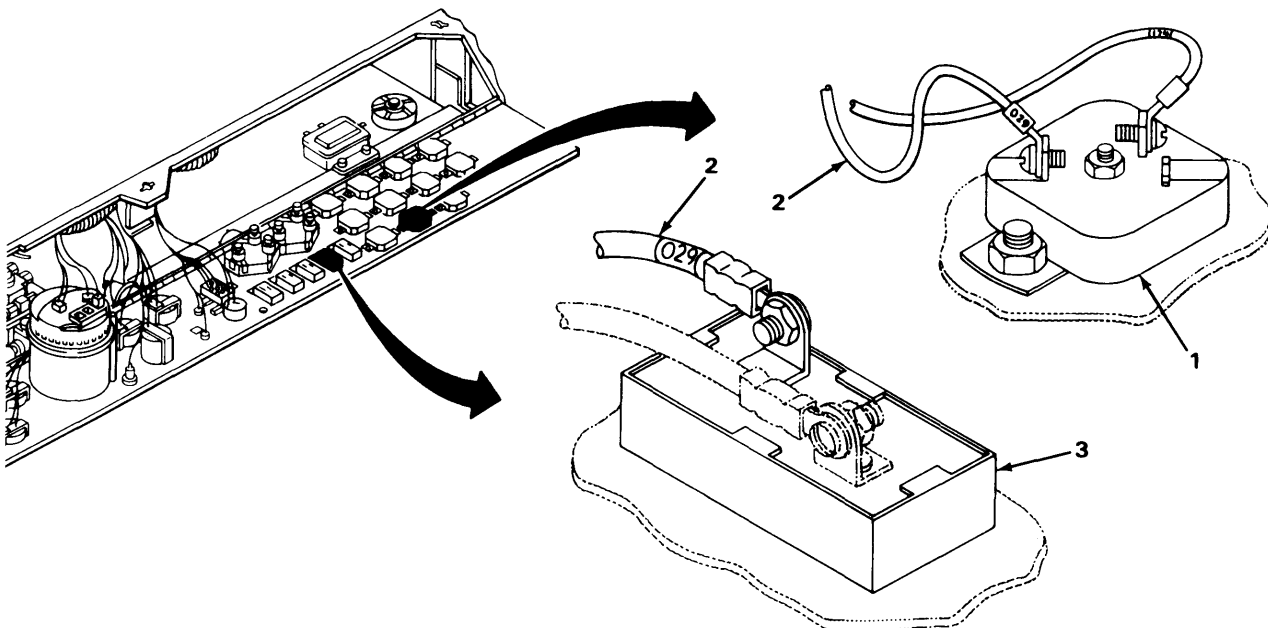
Step 4. At warning switch (3), using multimeter set at 30 vdc, put red probe on wire no. 029 (2), from breaker to switch and black probe to good ground.

If meter reads no voltage, put headlight switch in OFF position, close instrument panel (page 4-244), and notify direct support maintenance.

Step 5. Put warning switch (3) in ON position. Using multimeter set at 30 vdc, put red probe on wire no. 029 (2) from switch to warning, and black probe to good ground.

a. If meter reads no voltage, put headlight switch and warning switch (3) in OFF position and replace warning switch (page 4-294).

b. If meter reads voltage, put headlight switch and warning switch in OFF position and close instrument panel (page 4-244).



TA239662

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

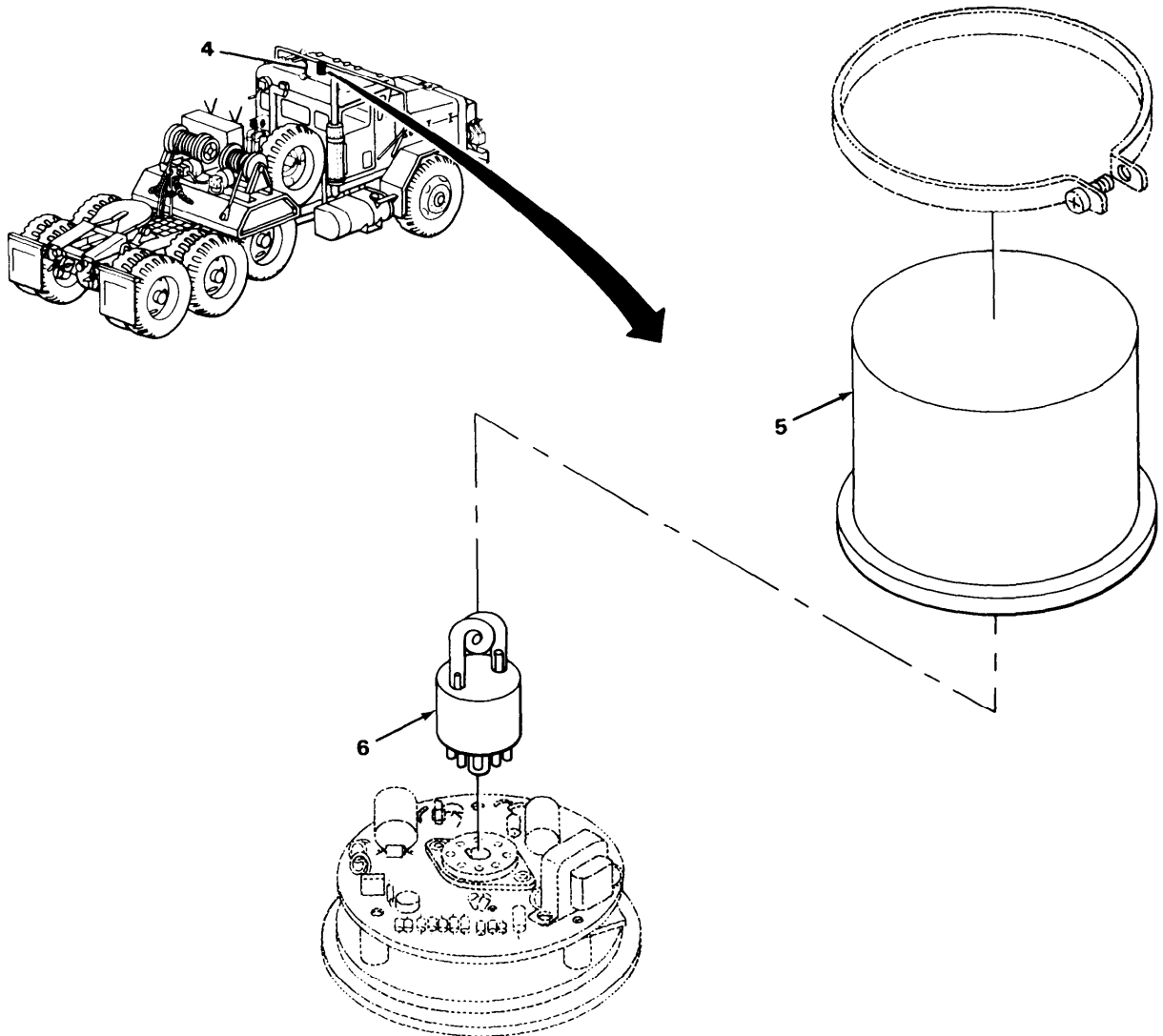
CORRECTIVE ACTION

W A R N I N G

Do not touch parts and leads on circuit board. Electric charge maybe stored in capacitor to cause injury.

Step 6. At roof (4), take off lens (5) and remove lamp (6) (page 4-362). Put in lamp known to be serviceable. Put warning switch in ON position.

If light works, replace old lamp with a good one and put warning switch in OFF position.



TA239663

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

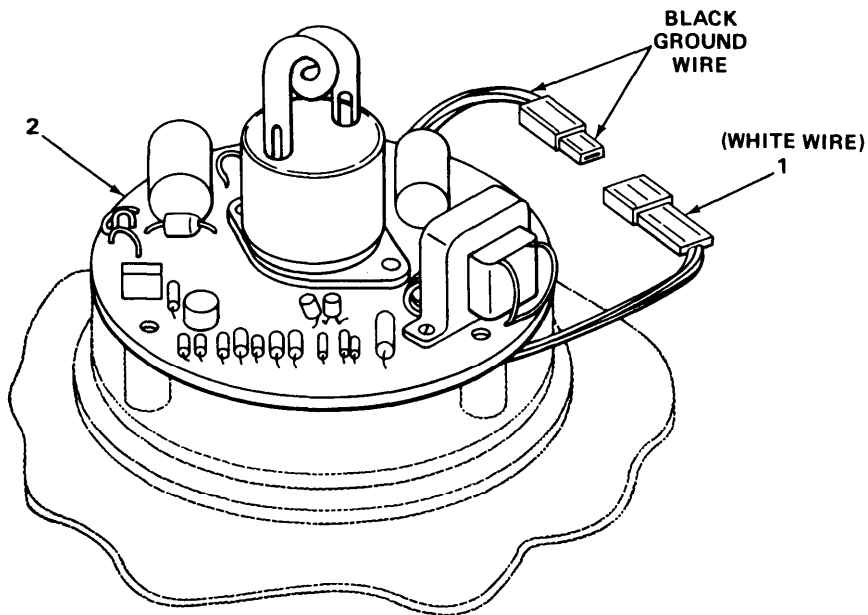
29. WARNING LIGHT DOES NOT WORK – CONTINUED.

- Step 7. Take apart connector (1) under circuit board (2). Put warning switch in ON position. Using multimeter set at 30 vdc, put red probe to wire no. 029 (white wire) and black probe to good ground.

If meter reads no voltage, put warning switch in OFF position, install warning light (page 4-362) and notify direct support maintenance.

- Step 8. At connector(l), using multimeter set on RX 1, put red probe on ground wire (black) and black probe to good ground.

Put warning switch in OFF position, install warning light (page 4-362) and notify direct support maintenance.



TA239664

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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30. INSTRUMENT PANEL GAGE LIGHT DOES NOT WORK.

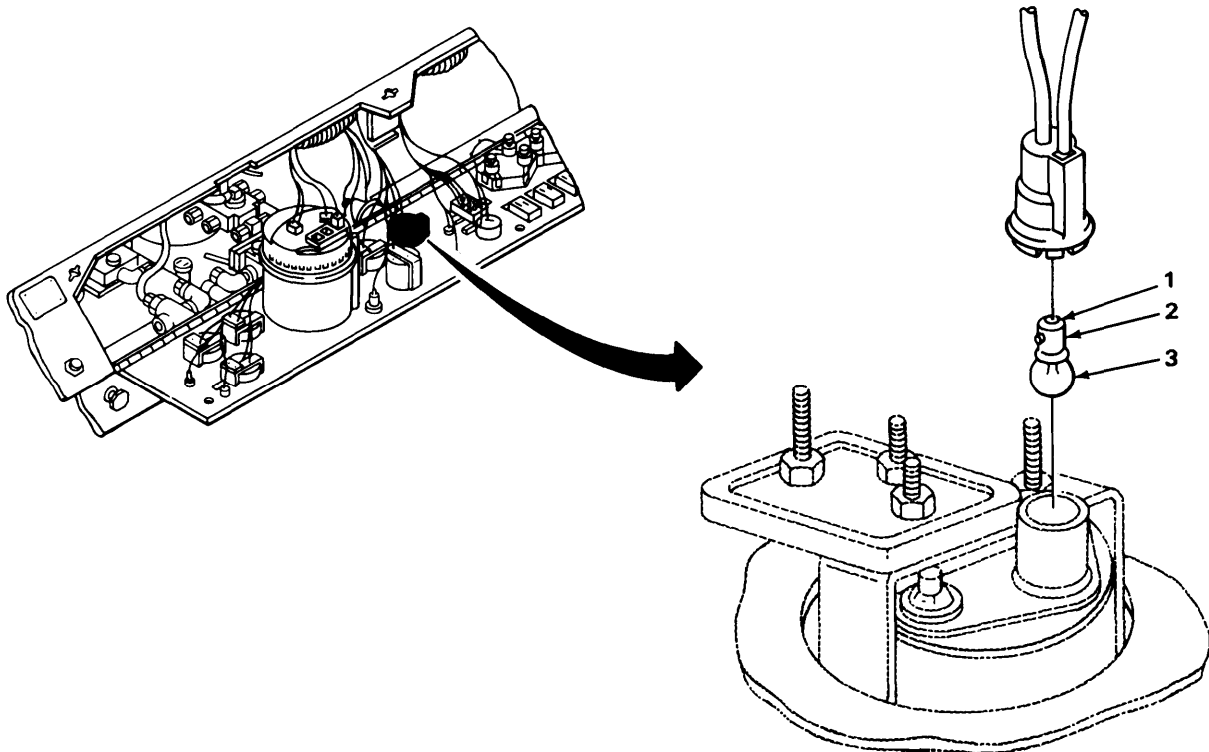
NOTE

If lights in all gages do not work, go to step 2.

Step 1. Remove instrument panel gage lamp (page 4-274). Using multimeter set at RX 1, put probes on contact (1) and lamp housing (2).

a. If meter reads zero, install instrument panel gage lamp (page 4-274).

b. If meter does not read zero, replace lamp (3) (page 4-274).



TA239665

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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30. INSTRUMENT PANEL GAGE LIGHT DOES NOT WORK – CONTINUED.

Step 2. Put headlight switch (1) to ON position. Put blackout switch (2) in LIGHTS position. Turn light control rheostat (3) clockwise as far as possible. Open instrument panel (page 4-244). Using multimeter set at 30 vdc, put red probe on rheostat terminal (4) and black probe on panel (5).

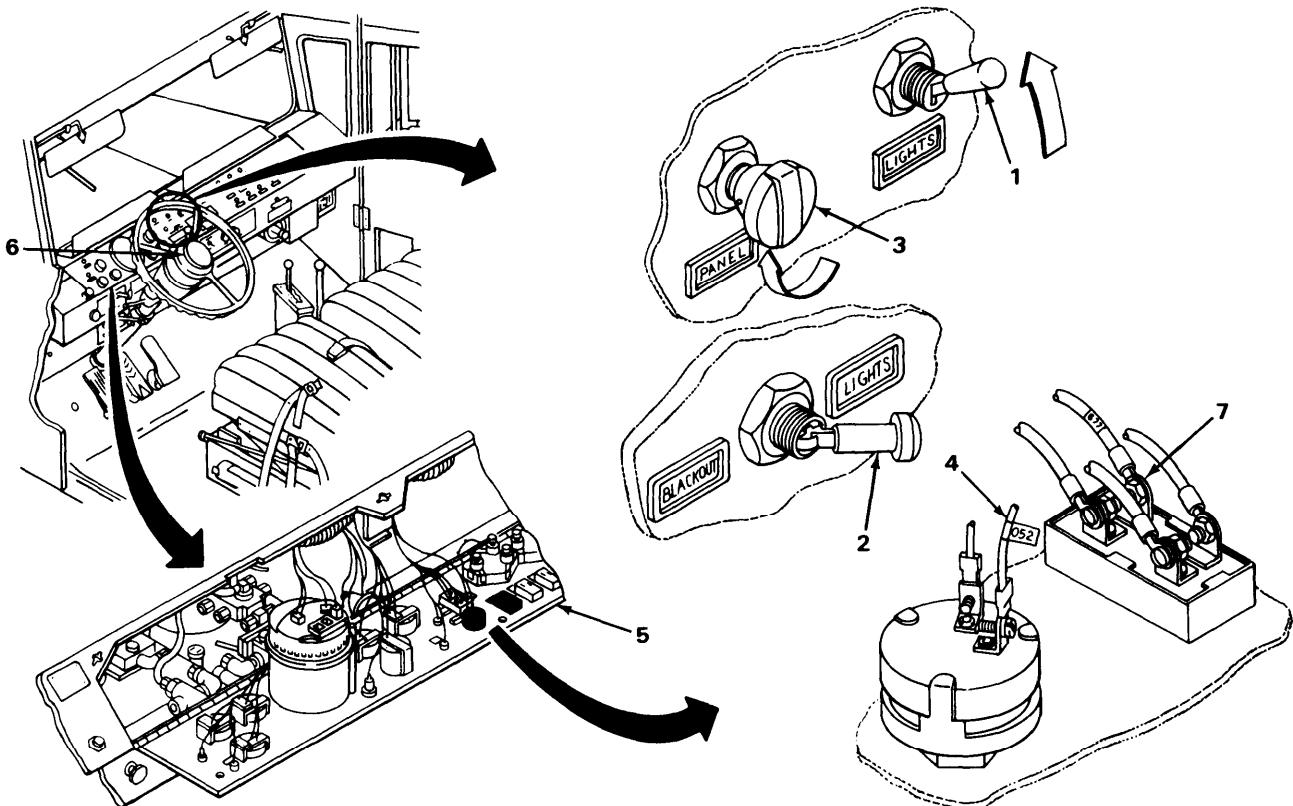
If meter reads voltage, close instrument panel (page 4-244), put headlight switch in OFF position and notify direct support maintenance.

Step 3. Push horn button (6).

If horn does not sound, go to step 7.

Step 4. Using voltmeter set at 30 vdc, put red probe on headlight switch terminal (7) and black probe on panel (5).

If meter reads no voltage, go to step 6.



T A 2 3 9 6 6 6

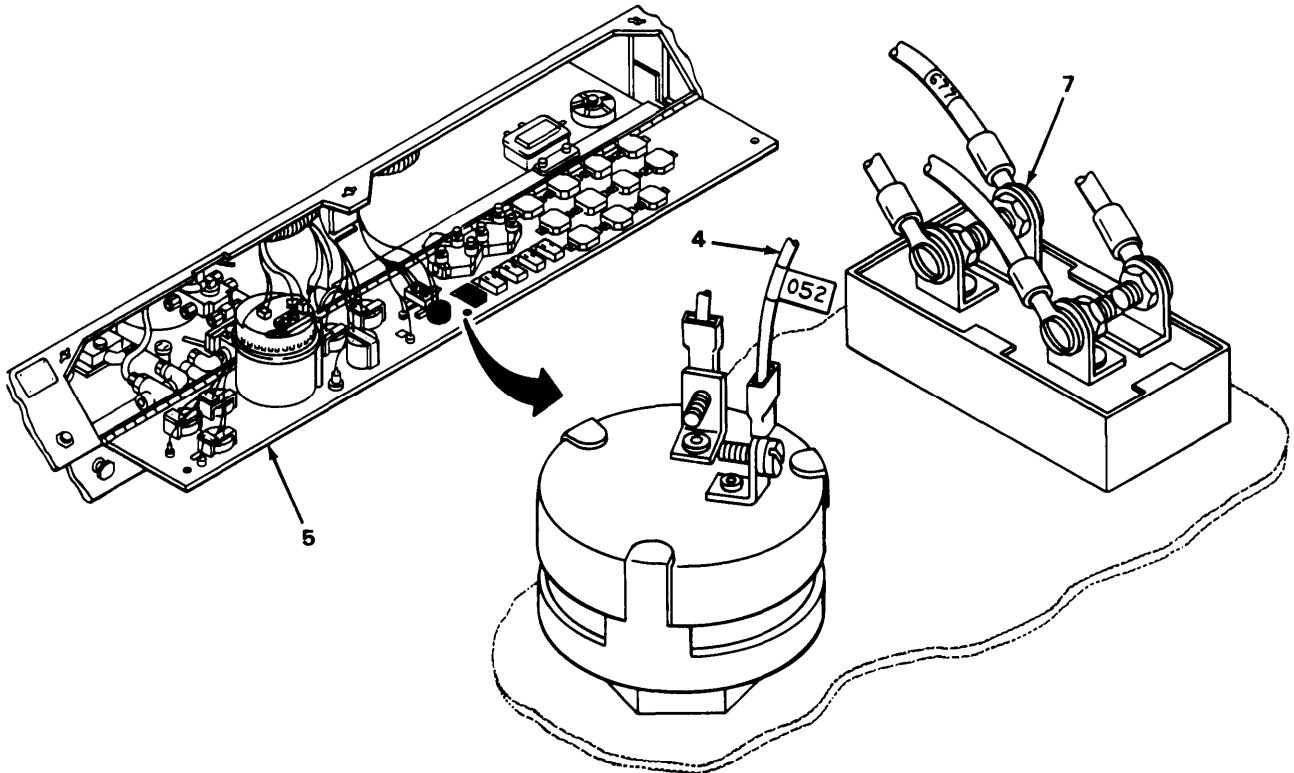
TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

- Step 5. Using multimeter set at 30 vdc, put red probe on light control rheostat terminal (4) and black probe on panel (5).
- a. If meter reads no voltage, put headlight switch in OFF position and replace light control rheostat (page 4-286).
 - b. If meter reads voltage, close instrument panel (page 4-244), put headlight switch in OFF position and notify direct support maintenance.
- Step 6. Using multimeter set at 30 vdc, put red probe on headlight switch terminal (6) and black probe on panel (5).
- a. If meter reads no voltage, close instrument panel (page 4-244), put headlight switch in OFF position and notify direct support maintenance.
 - b. If meter reads voltage, put light switch in OFF position and replace headlight switch (page 4-288).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

30. INSTRUMENT PANEL GAGE LIGHT DOES NOT WORK – CONTINUED.

Step 7. Using multimeter set at 30 vdc, put red probe on circuit breaker terminal (1) and black probe on panel (2).

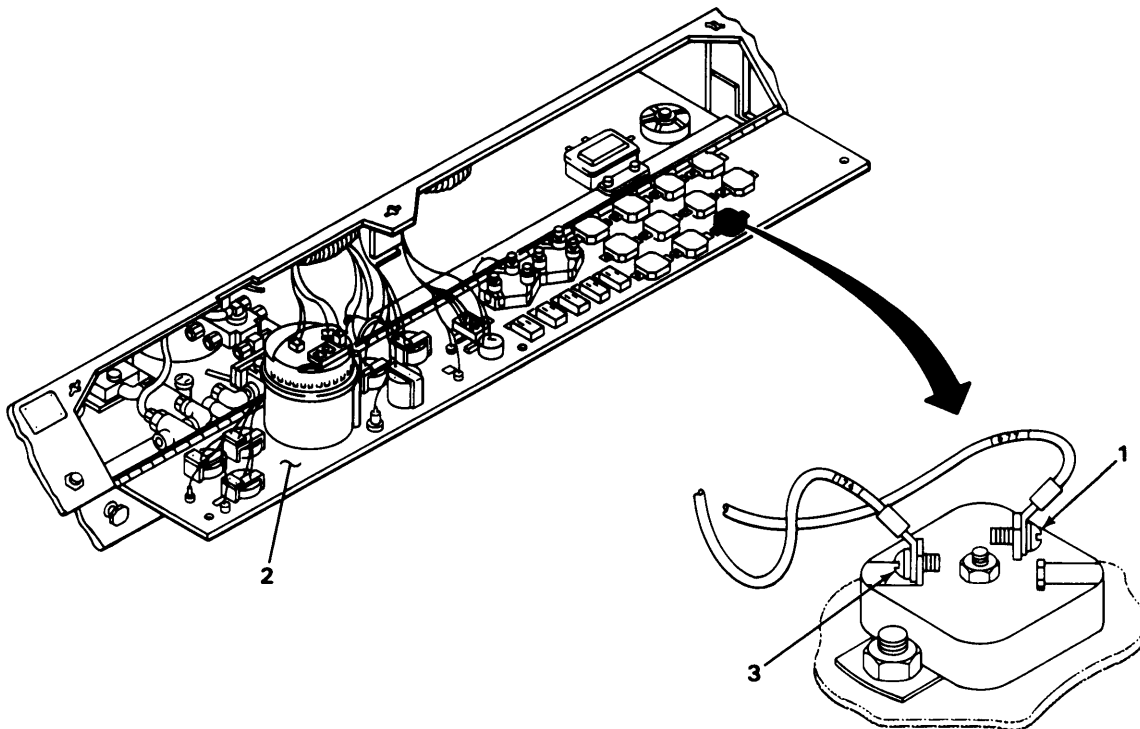
If meter reads no voltage, do step 9 under BOTH HEADLIGHTS DO NOT WORK (page 3-48).

Step 8. Using multimeter set at 30 vdc, put red probe on circuit breaker terminal (3) and black probe on panel (2).

a. If meter reads no voltage, close instrument panel (page 4-244), put headlight switch in OFF position and notify direct support maintenance.

b. If meter reads voltage, put headlight switch in OFF position and replace horn circuit breaker (page 4-304).

c. If instrument panel gage lights still do not work, notify direct support maintenance.



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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31. WORK LIGHT DOES NOT WORK.

NOTE

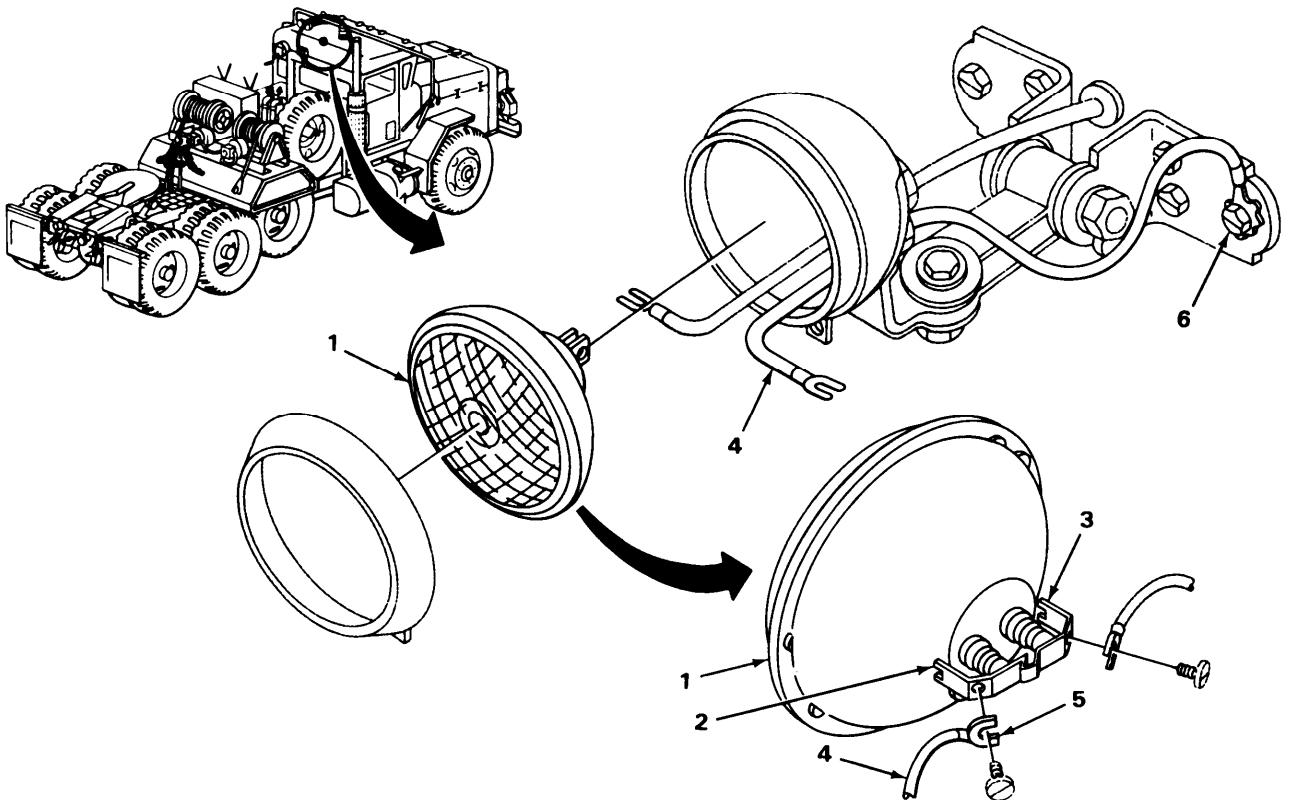
If both lights do not work, go to step 3.

Step 1. Remove work light lamp (1) (page 4-332). Using multi meter set at RX1, put red probe on one lamp terminal (2) and black probe on other terminal (3).

If meter does not show zero, replace lamp (page 4-332).

Step 2. Go to ground wire (4). Using multimeter set for RX1 continuity check, put red probe on wire end (5) and black probe to good ground (6).

If meter does not show zero, install work light lamp (page 4-332) and notify direct support maintenance.



TA239669

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

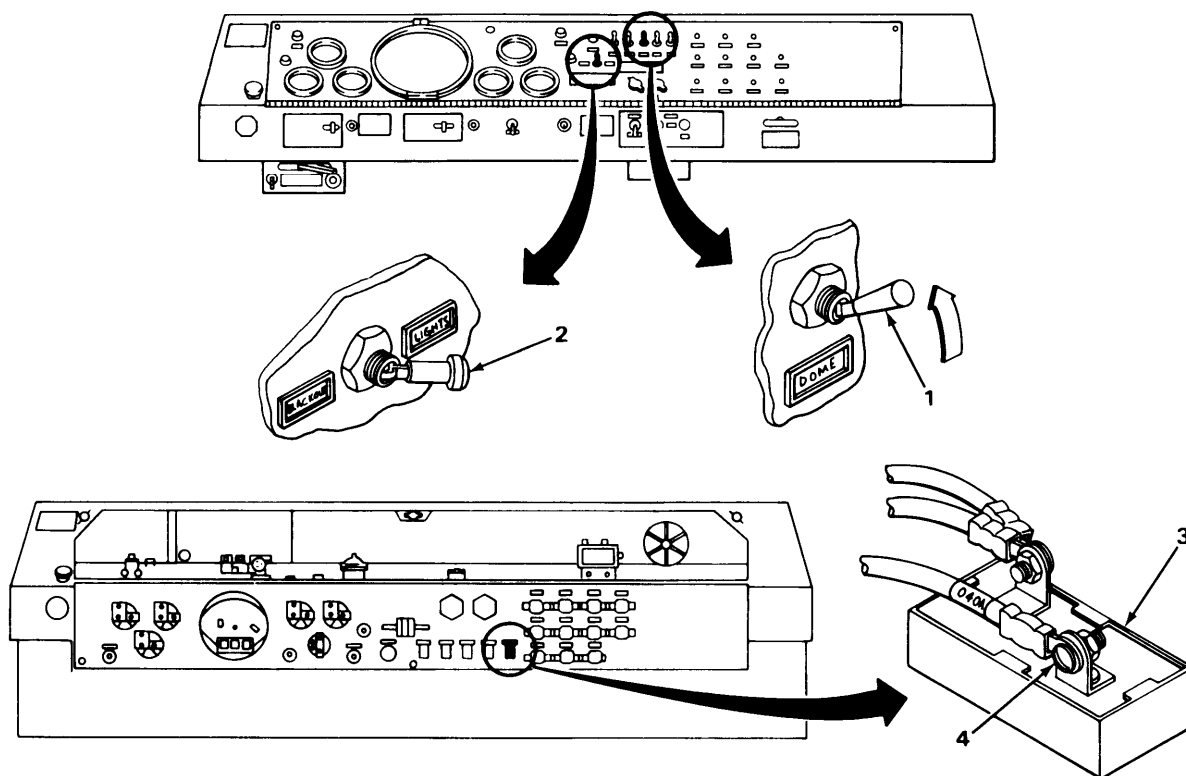
31. WORK LIGHT DOES NOT WORK – CONTINUED.

Step 3. Install work light lamp (page 4-332). Go to instrument panel. Put dome light switch (1) in ON position, and blackout switch (2) in LIGHTS position.

If dome light does not work, do BOTH HEADLIGHTS DO NOT WORK (page 3-48), steps 6 thru 9.

Step 4. Put dome light switch (1) in OFF position, open instrument panel (page 4-244) and go to work light switch (3). Using multimeter set at 30 vdc, put red probe on wire no. 040 (4) from circuit breaker to switch, and black probe to good ground.

If meter reads no voltage, close instrument panel (page 4-244) and notify direct support maintenance.



TA239670

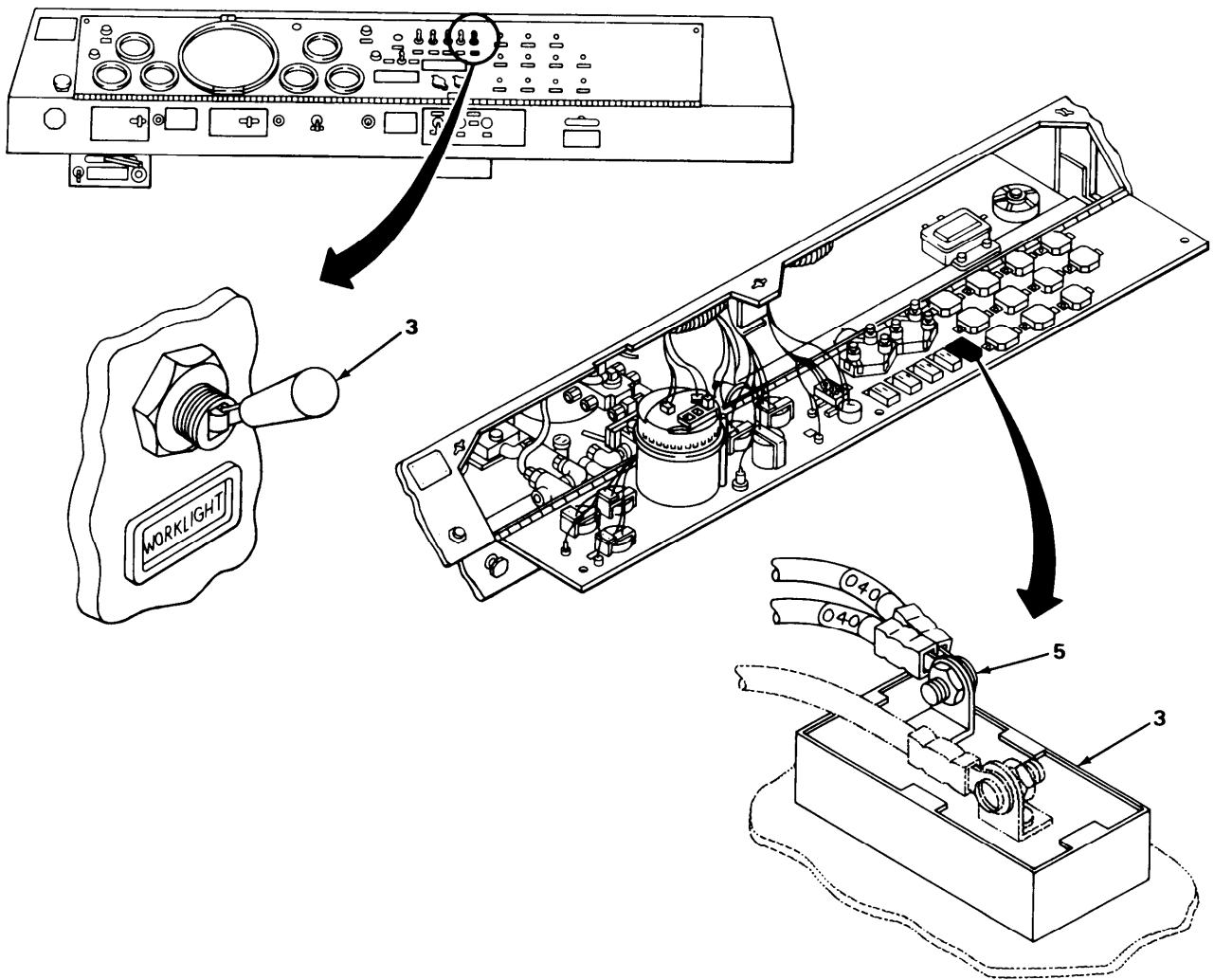
TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

- Step 5. Put work light switch (3) in ON position. Using multimeter set at 30 vdc, put red probe on wire terminal for two wires no. 040 (5) from switch to work lights and black probe to good ground.
- a. If meter reads no voltage, turn light switch OFF, replace switch (3) (page 4-296).
 - b. If meter reads voltage, put work light switch (3) in OFF position, close instrument panel (page 4-244) and notify direct support maintenance.



TA239671

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

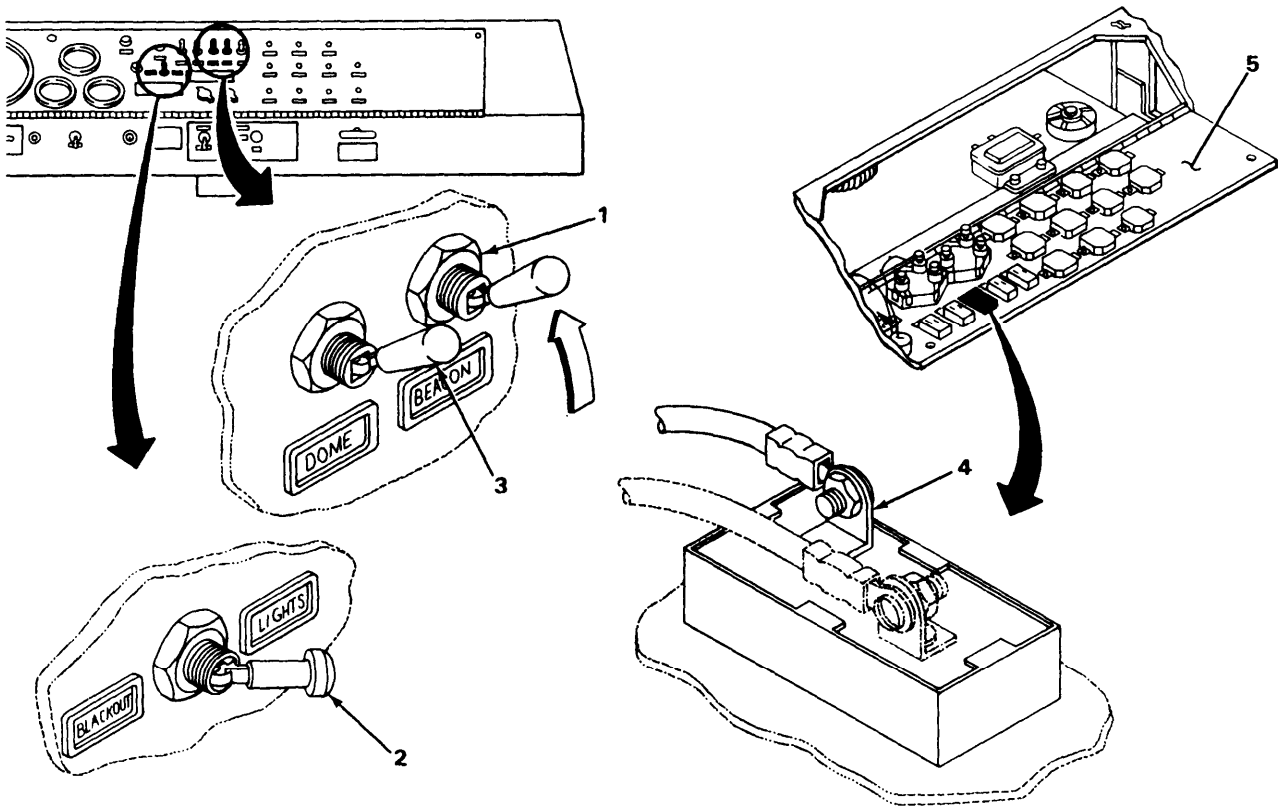
32. DOME LIGHT DOES NOT WORK.

Step 1. Put warning light switch (1) in ON position, and make sure blackout switch (2) is in LIGHTS position.

If warning light does not work, go to step 5.

Step 2. Put warning light switch (1) in OFF position. Put dome light switch (3) in ON position. Open instrument panel (page 4-244). Using multimeter set at 30 vdc, put red probe on dome lights-switch terminal (4) and black probe on panel (5).

If meter reads no voltage, go to step 4.



TROUBLESHOOTING - CONTINUED

MALFUNCTION

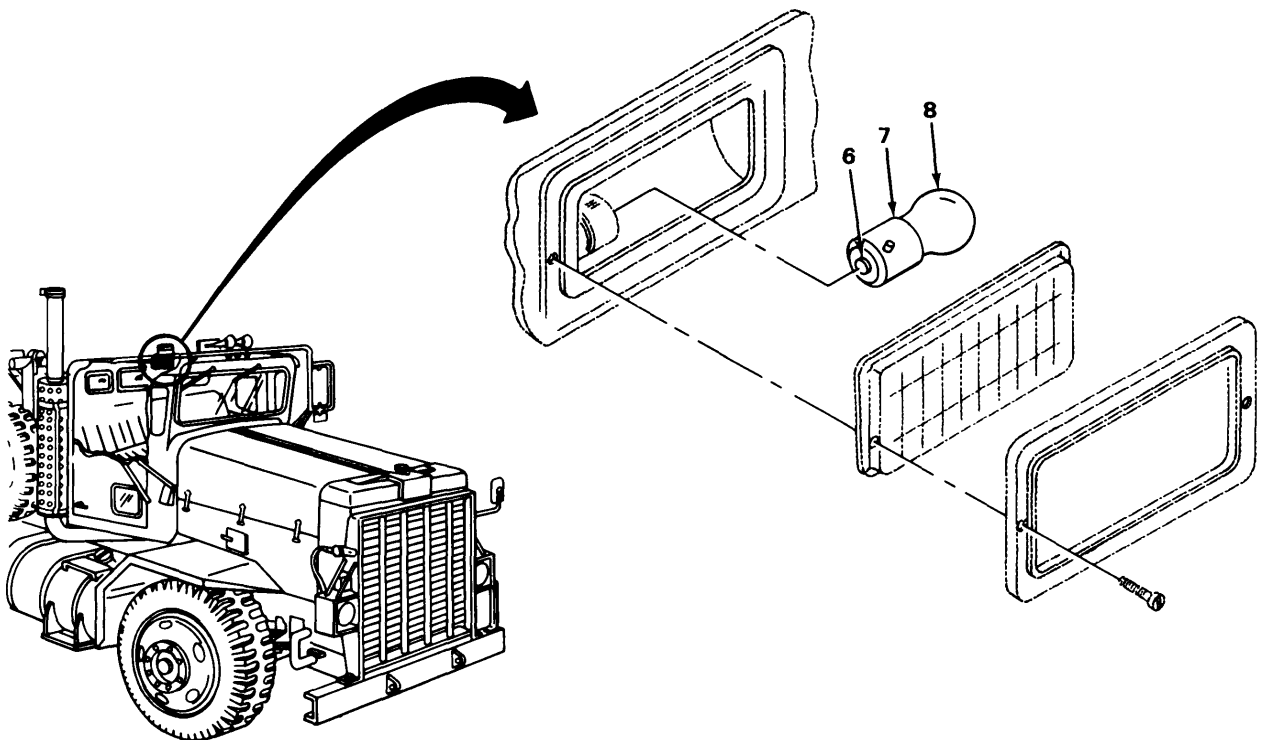
TEST OR INSPECTION

CORRECTIVE ACTION

Step 3. Put dome light switch in OFF position. Close instrument panel (page 4-244). Remove dome light lamp (page 4-329). Using multimeter set at RX1, put probes on contact (6) and lamp housing (7).

a. If meter reads zero, install dome light lamp (page 4-329) and notify direct support maintenance.

b. If meter does not read zero, replace lamp (8) (page 4-329).



TA239673

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

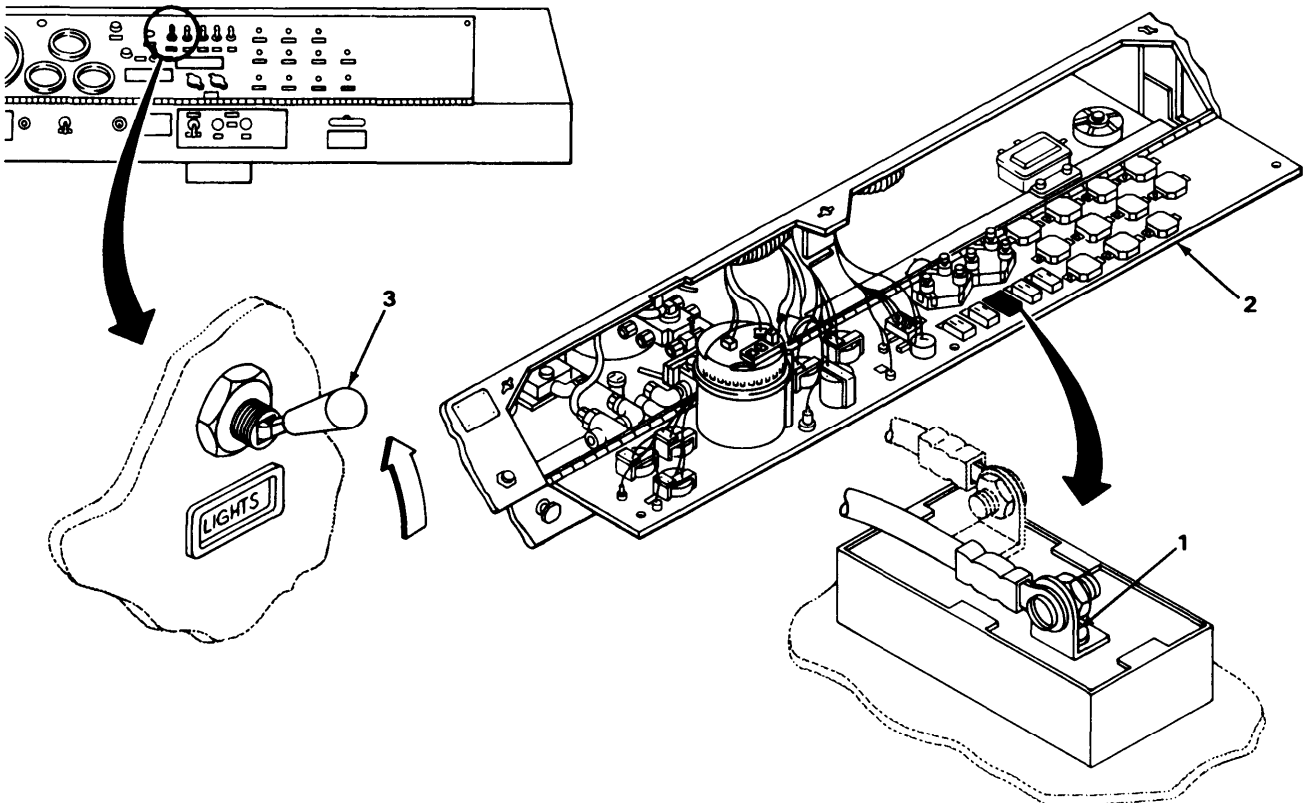
32. DOME LIGHT DOES NOT WORK - CONTINUED.

Step 4. Put dome light switch in ON position and open instrument panel (page 4-244). Using multimeter set at 30 vdc, put red probe on dome light switch terminal (1) and black probe on panel (2).

- a. if meter reads no voltage, put dome light switch in OFF position, close instrument panel (page 4-244) and notify direct support maintenance.
- b. If meter reads voltage, put dome light switch in OFF position and replace dome light switch (page 4-294).

Step 5. Put headlight switch (3) in ON position.

- a. if headlights work, do steps 2 and 3 under WARNING LIGHT DOES NOT WORK (page 3-73).
- b. if headlights do not work, do step 6 thru 9 under BOTH HEADLIGHTS DO NOT WORK (page 3-48).



TA239674

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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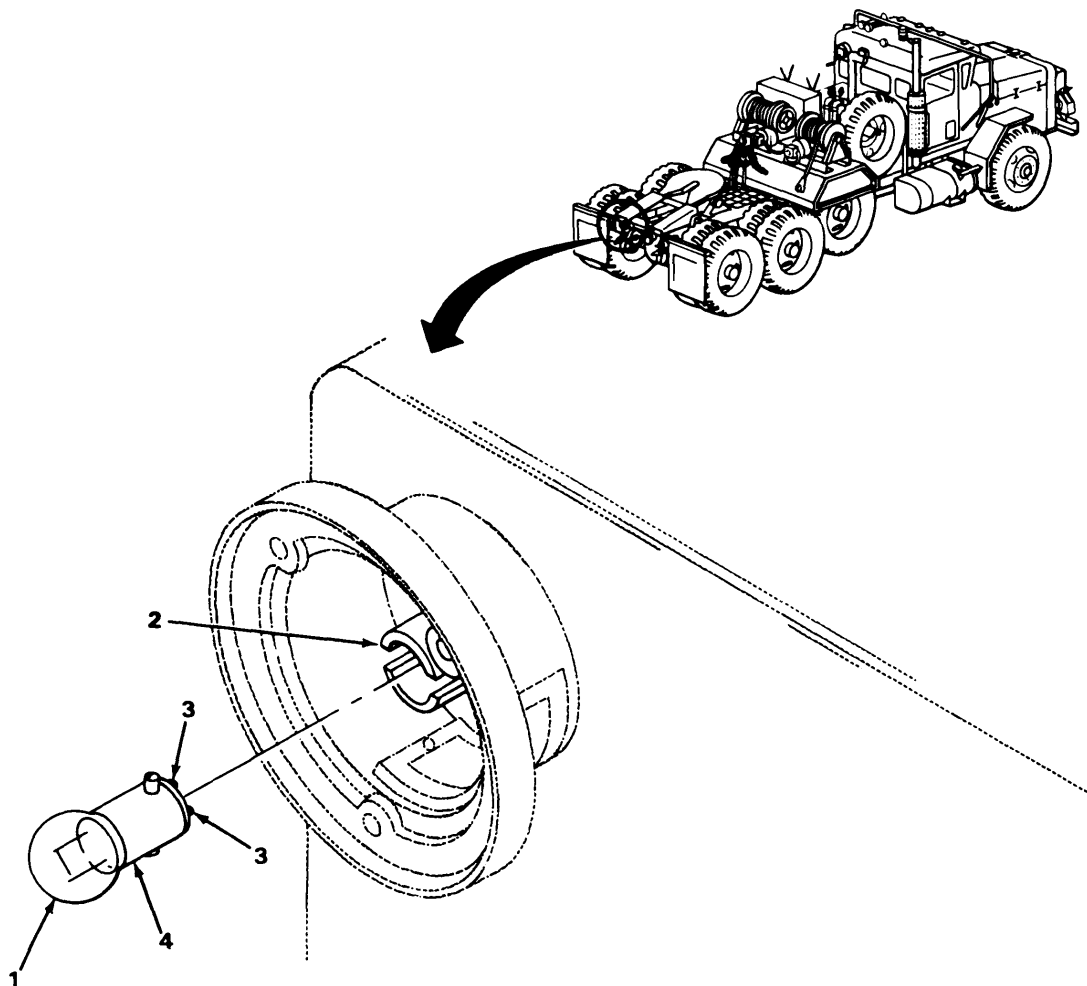
33. STOPLIGHT DOES NOT WORK WHEN TRACTOR BRAKES ARE APPLIED.

NOTE

If both stoplights do not work when tractor brakes are applied, go to step 3.

Step 1. Take stoplight lamp (1) out of stoplight socket (2) (page 4-366), With multi-meter set on RX1, put probe on each lamp contact (3) and black probe on lamp housing (4).

If meter reads zero, replace lamp (1) (page 4-366).



TA239675

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

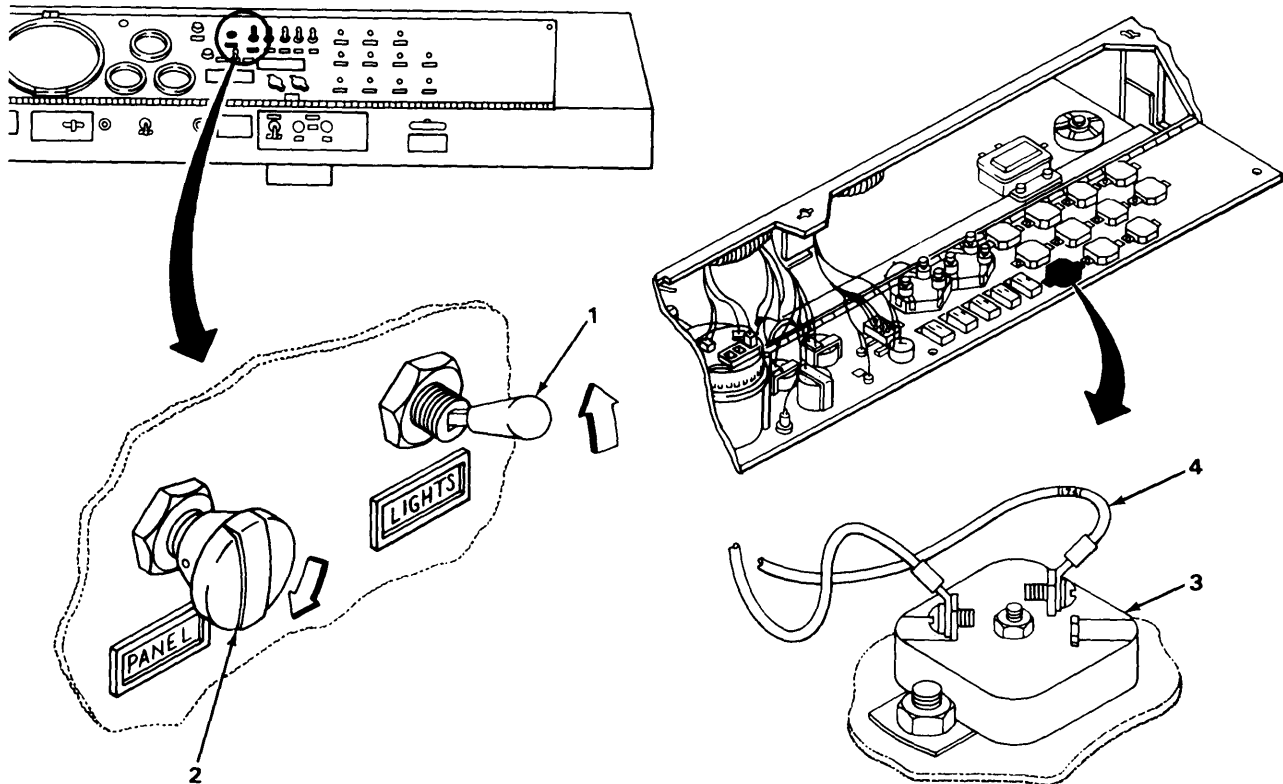
33. STOPLIGHT DOES NOT WORK WHEN TRACTOR BRAKES ARE APPLIED - CONTINUED.

Step 2. Put stoplight lamp back in socket, put ignition switch and dashlights switch (1) in ON position, and make sure dimmer switch (2) is turned to BRIGHT.

If dashlights do not work, go to BOTH HEADLIGHTS DO NOT WORK and do steps 6 thru 9 (page 3-48).

Step 3. Put ignition switch and dashlights switch in OFF position. Open instrument panel (4-244). Go to circuit breaker(3) for stoplight. Using multimeter set at 30 vdc, put red probe on wire no. 174 (4) and black probe to good ground.

If meter reads no voltage, notify direct support maintenance.



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

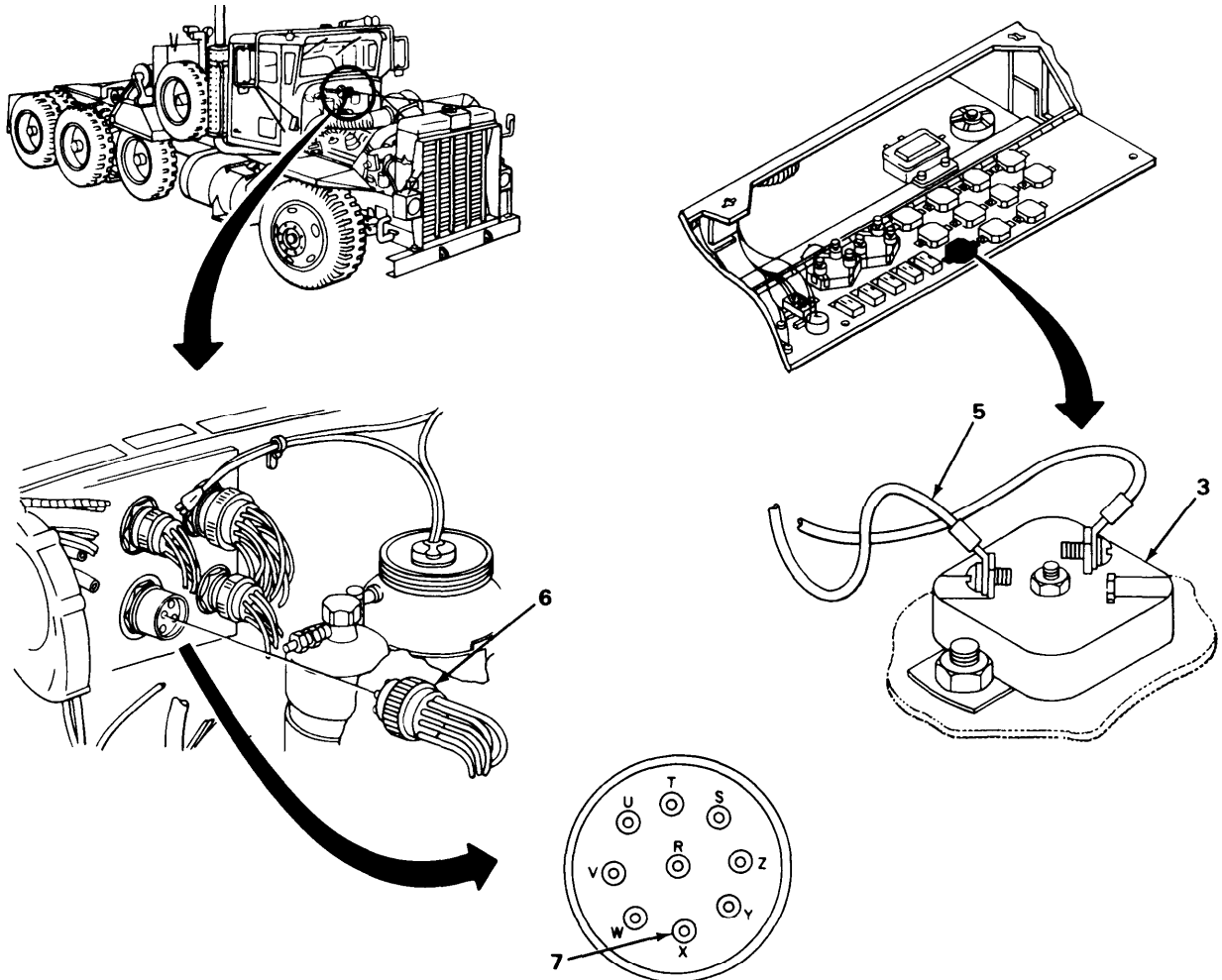
CORRECTIVE ACTION

Step 4. At circuit breaker for stoplight (3), using multimeter set at 30 vdc, put red probe on wire no. 009 (5). Put black probe to good ground.

If meter reads no voltage, replace breaker (page 4-304).

Step 5. Open left side of hood (TM 9-2320-270-10). Disconnect firewall harness plug (6). Using multimeter, set at 30 vdc, put red probe on socket X (7) and black probe to good ground.

If meter reads no voltage, plug in firewall harness plug (6) and notify direct support maintenance. Close left side of hood (TM 9-2320-270-10) and close instrument panel (page 4-244).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

33. STOPLIGHT DOES NOT WORK WHEN TRACTOR BRAKES ARE APPLIED – CONTINUED.

- Step 6. Plug in firewall harness plug. Go to first switch (1) on brake valves in engine compartment. Using multimeter set at 30 vdc, put red probe on wire no. 009 (2) and black probe to good ground.

If meter reads no voltage, close instrument panel (4-244), and left side of hood (TM 9-2320-270-10) and notify direct support maintenance.

- Step 7. At second brake valve switch (3), using multimeter set at 30 vdc, put red probe on terminal for jumper wire no. 009 (4) and black probe to good ground.

If meter reads no voltage, close instrument panel (4-244), and left side of hood (TM 9-2320-270-10) and notify direct support maintenance.

- Step 8. Disconnect and take out jumper wire no. 005 (5) between first switch and second switch. Using multimeter set at 30 vdc, put red probe on terminal for wire no. 005 on second switch (3). Have assistant apply brakes. Put black probe on good ground. Make sure air pressure is at operational level (TM 9-2320-270-10).

If meter reads no voltage, install jumper wire and replace second switch (page 4-407).

- Step 9. Using multimeter set at RX1, put probe on each end of jumper wire no. 005 (5).

If meter does not read zero, close instrument panel (page 4-244) and left side of hood (TM 9-2320-270-10) and notify direct support maintenance.

TROUBLESHOOTING - CONTINUED

MALFUNCTION

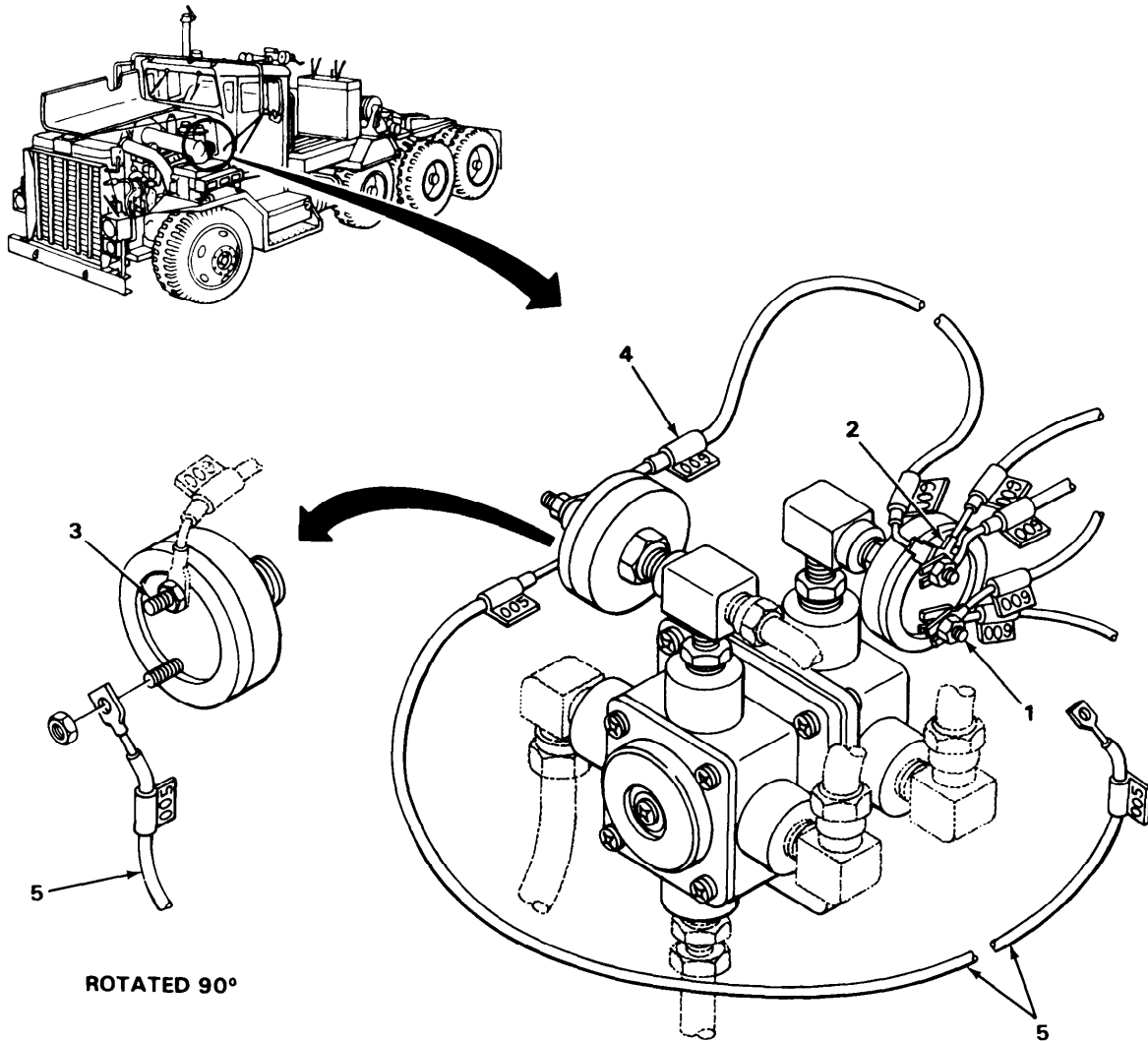
TEST OR INSPECTION

CORRECTIVE ACTION

Step 10. Using multimeter set at 30 vdc, put red probe on terminal for wire no. 005 on first switch (1) and black probe to good ground. While assistant applies brakes, take the reading, then release brakes.

a. If meter reads no voltage, install jumper wire and replace first switch (page 4-407).

b. If meter reads voltage, put wire no. 005 (5) back in place.



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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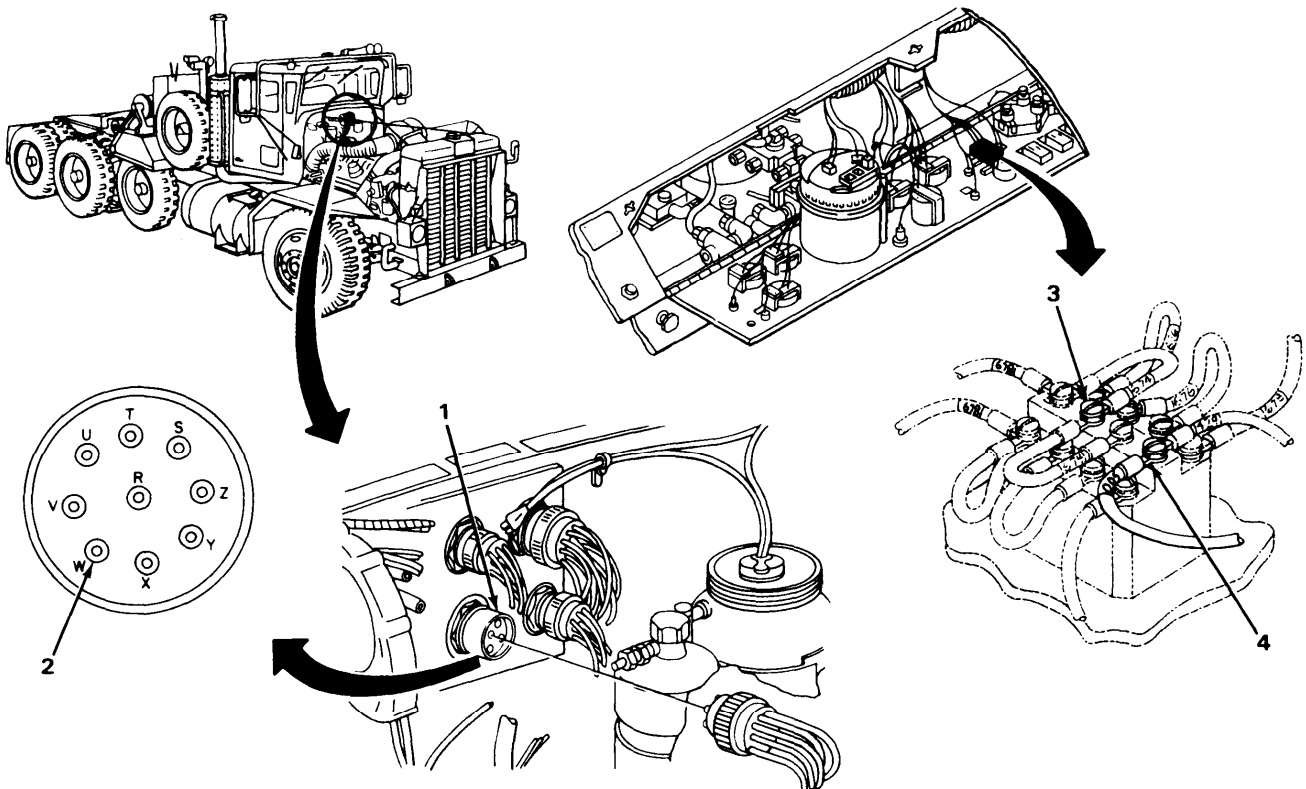
33. STOPLIGHT DOES NOT WORK WHEN TRACTOR BRAKES ARE APPLIED - CONTINUED.

Step 11. Disconnect firewall harness connector (1). Using multimeter set at 30 vdc, put red probe on pin W (2) and black probe to good ground. While assistant applies brakes, take the reading, and release brakes.

If meter reads no voltage, close left side of hood (TM 9-2320-270-10) and instrument panel (page 4-244) and notify direct support maintenance.

Step 12. Connect firewall harness connector (1), and close left side of hood (TM 9-2320-270-10). At blackout switch (3) inside instrument panel. Using multimeter set at 30 vdc, put red probe on wire no. 005 (4), and black probe to good ground. While assistant applies brakes, take reading, and release brakes.

If meter reads no voltage, close instrument panel (page 4-244) and notify direct support maintenance.



TA239679

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

- Step 13. Put blackout switch (3) switch lever in LIGHTS position. Using multimeter set at 30 vdc, put red probe on wire no. 294 (5), and black probe to good ground. While assistant applies brakes, take reading, and release brakes.

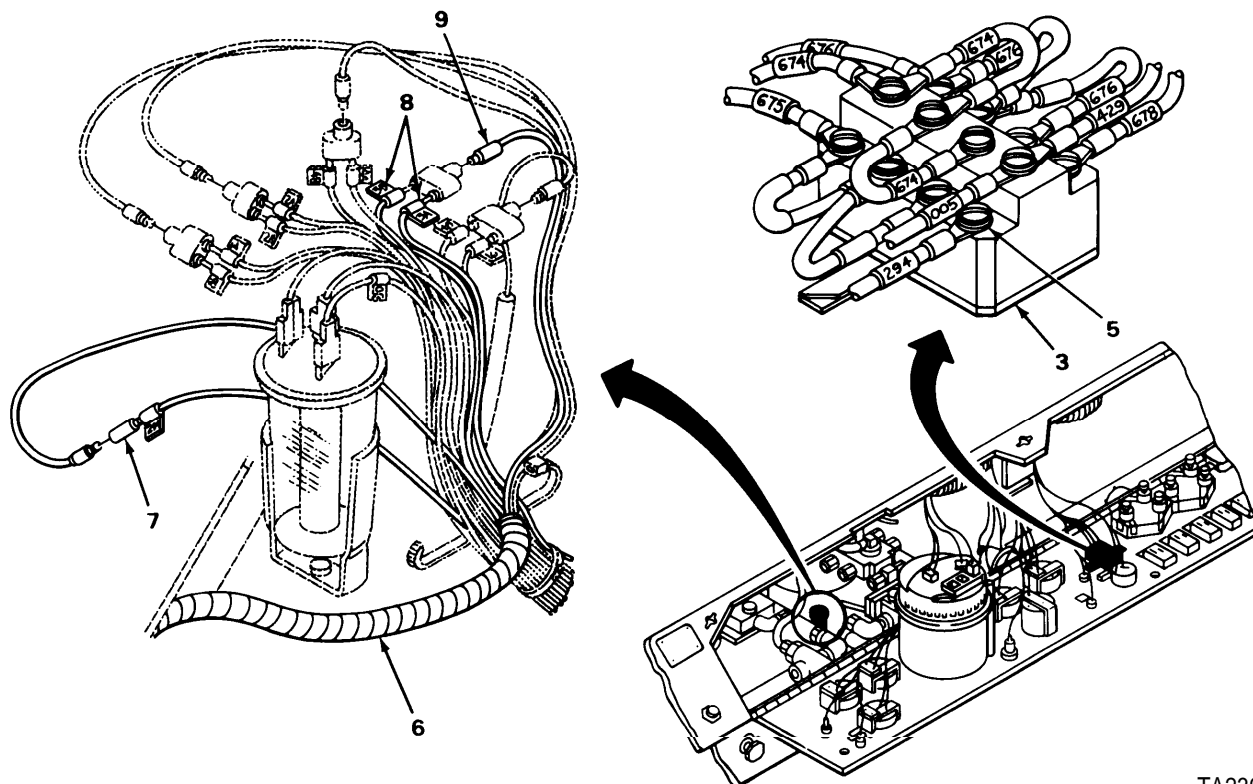
If meter reads no voltage, replace blackout switch (page 4-298).

- Step 14. At connector harness (6) for directional signal control, disconnect wire no. 294 (7) from red wire. Using multimeter set at 30 vdc, put red probe on wire no. 294 (7) and black probe to good ground. While assistant applies brakes, take reading, and release brakes.

If meter reads no voltage, close instrument panel (page 4-244) and notify direct support maintenance.

- Step 15. Plug wire 294 into connector. At to connector harness (6) for directional signal control, disconnect wires no. 003, A and B (8) from orange wire (9). Using multimeter set at 30 vdc, put red probe on orange wire and black probe to good ground. While assistant applies brakes, take reading, and release brakes.

If meter reads no voltage, replace directional signal control (page 4-314).



TA239680

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

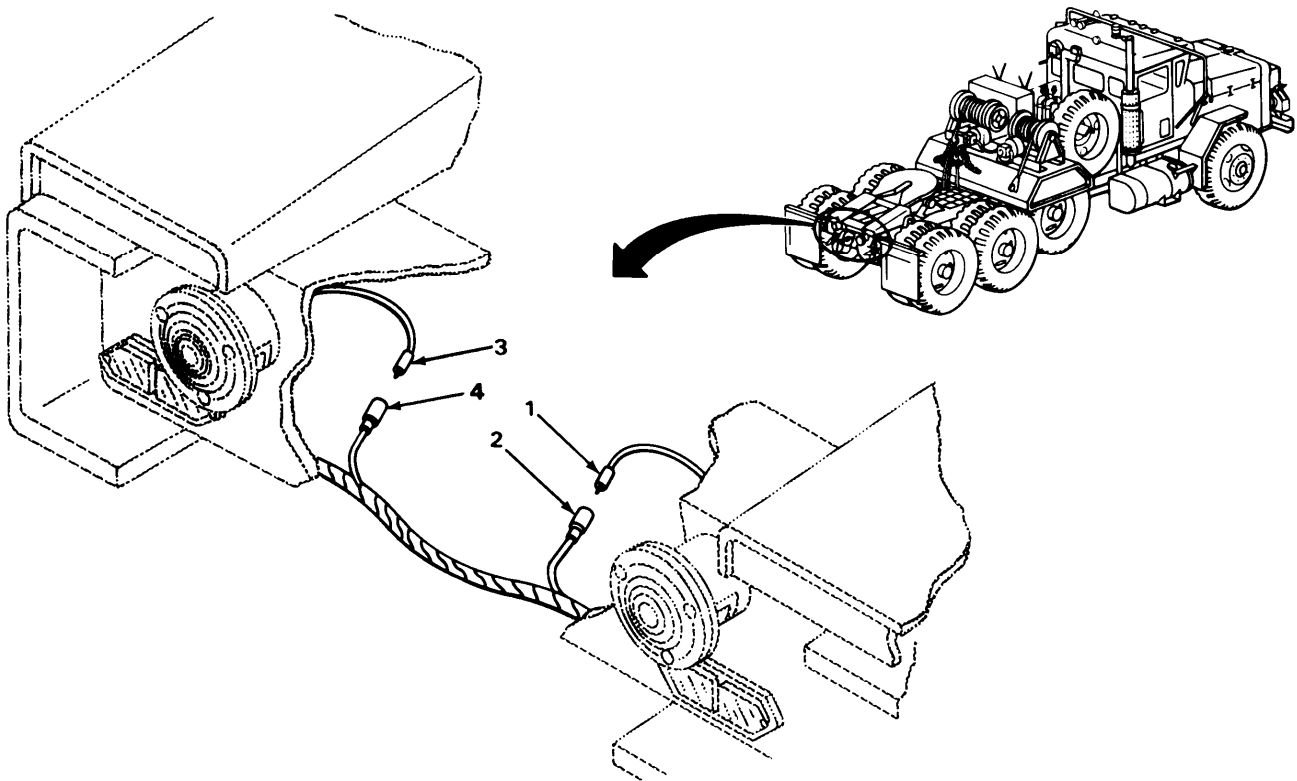
33. STOPLIGHT DOES NOT WORK WHEN TRACTOR BRAKES ARE APPLIED - CONTINUED.

Step 16. Close instrument panel (page 4-244). Disconnect wire no. 003 (1) from end connector (2). Using multimeter set at 30 vdc, put red probe on wire no. 003 (1) and black probe to good ground. While assistant applies brakes, take reading, and release brakes.

If meter shows no voltage, plug wires back in and notify direct support maintenance.

Step 17. Disconnect wire no. 004 (3) from end connector (4). Using multimeter set at 30 vdc, put red probe on wire no. 004 (3) and black probe to good ground. While assistant applies brakes, take reading, and release brakes.

Plug in wire (3) and notify direct support maintenance.



TA239681

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

34. PARKING BRAKE VALVE STOPLIGHT SWITCH INOPERATIVE.

Step 1. Start engine, build air pressure to operational level, and shut down engine (TM 9-2320-270-10). Have assistant apply brakes.

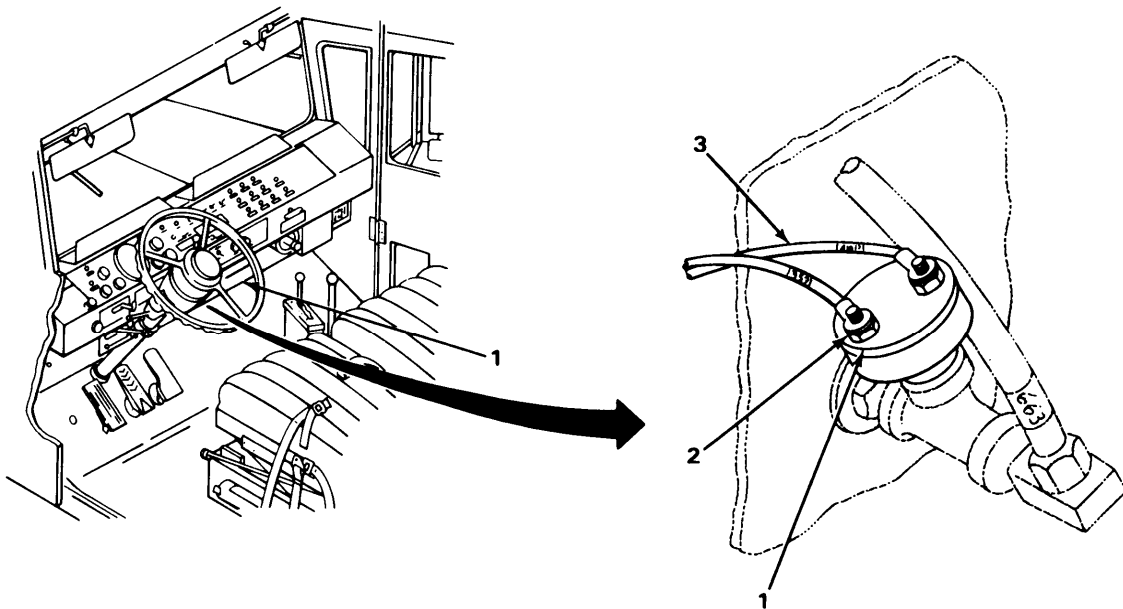
If stoplights do not work, release brakes and go to STOPLIGHT DOES NOT WORK WHEN TRACTOR BRAKES ARE APPLIED (page 3-87).

Step 2. Release brakes, open instrument panel (page 4-244). At stoplight switch (1), using multimeter set at 30 vdc, put red probe on wire no. 359 (2) and black probe to good ground.

If meter reads no voltage, close instrument panel (page 4-244) and notify direct support maintenance.

Step 3. At stoplight switch (1), using multimeter set on 30 vdc, put red probe on wire no. 360 (3) and black probe to good ground.

if meter reads no voltage, close instrument panel (page 4-244) and replace stoplight switch (page 4-407).



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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34. PARKING BRAKE VALVE STOPLIGHT SWITCH INOPERATIVE – CONTINUED.

Step 4. At diode (1), using multimeter set at 30 vdc, disconnect plug on wire no. 360. Put red probe on wire no. 360 (2), and black probe on good ground.

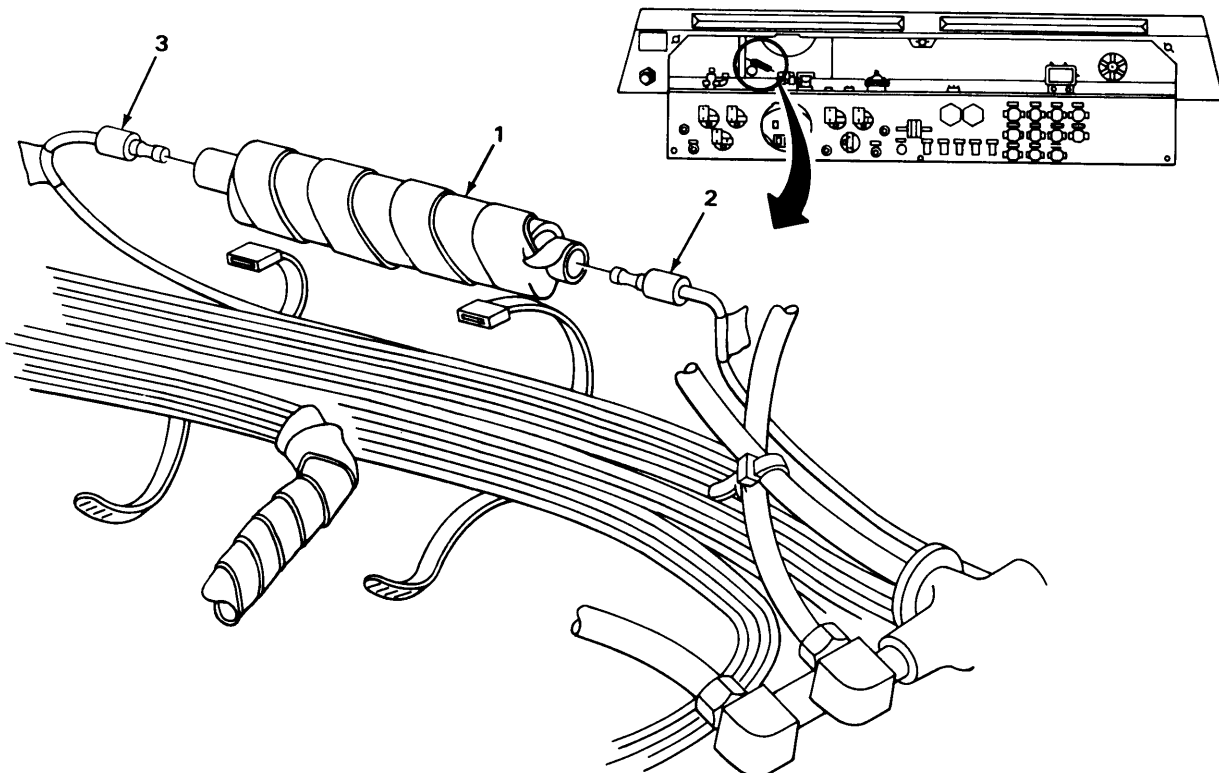
If meter reads no voltage, plug in wire, close instrument panel (page 4-244) and notify direct support maintenance.

Step 5. At diode (1), disconnect wire no. 429 (3). Using multimeter set at 30 vdc, put red probe on diode and black probe to good ground.

If meter reads no voltage, replace diode (page 4-323).

Step 6. At disconnected end of diode wire no. 429 (3), using multimeter set at 30 vdc, put red probe on wire no. 429 and black probe to good ground. Apply brakes.

Plug in wire no. 429 (3), close instrument panel (page 4-244), and notify direct support maintenance.



TA239683

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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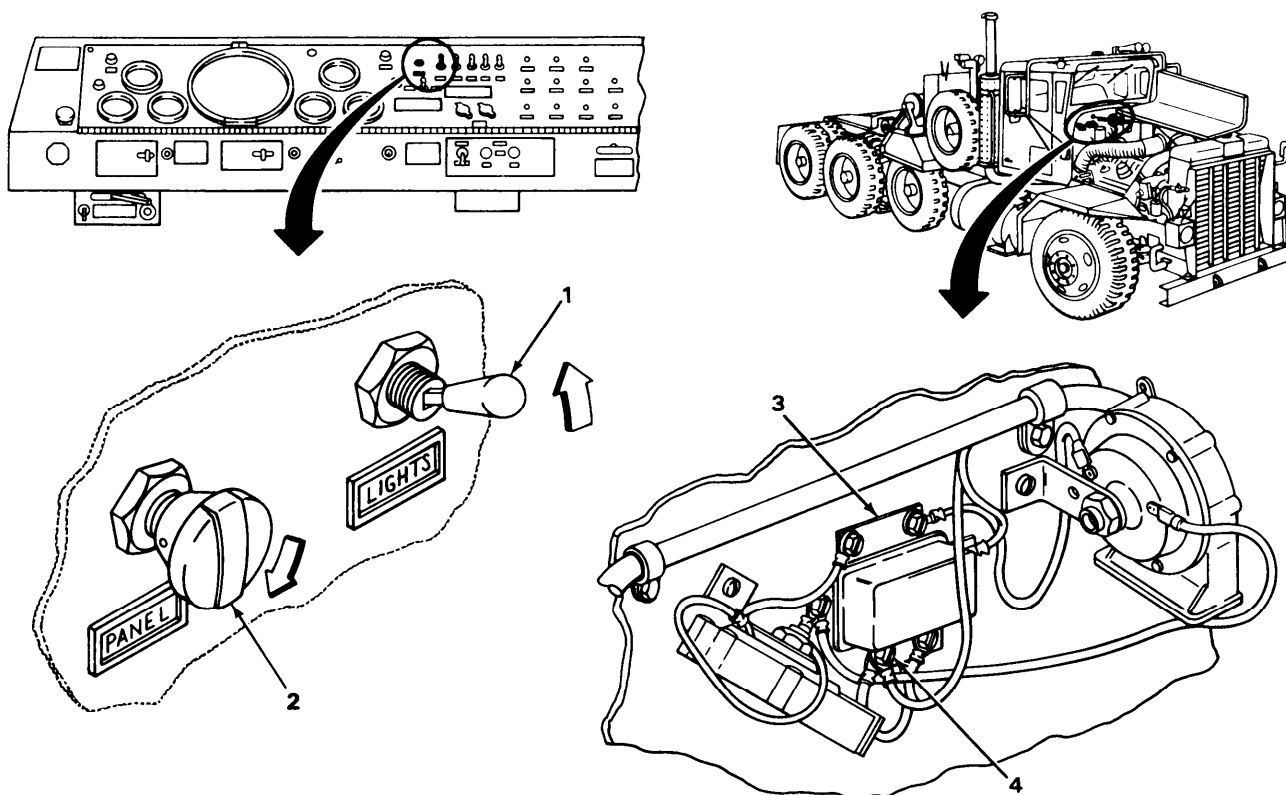
35. HORN INOPERATIVE.

Step 1. Put dashlights switch (1) in ON position and make sure dimmer switch (2) is turned to bright.

If dashlights do not work, go to step 9b.

Step 2. Put dashlights switch in OFF position. Open right side of hood (TM 9-2320-270-10). At horn relay (3), using multimeter set at 30 vdc, put red probe on wire no. 031 (4). Put black probe on good ground.

If meter reads no voltage, close right side of hood (TM 9-2320-270-10) and notify direct support maintenance.



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

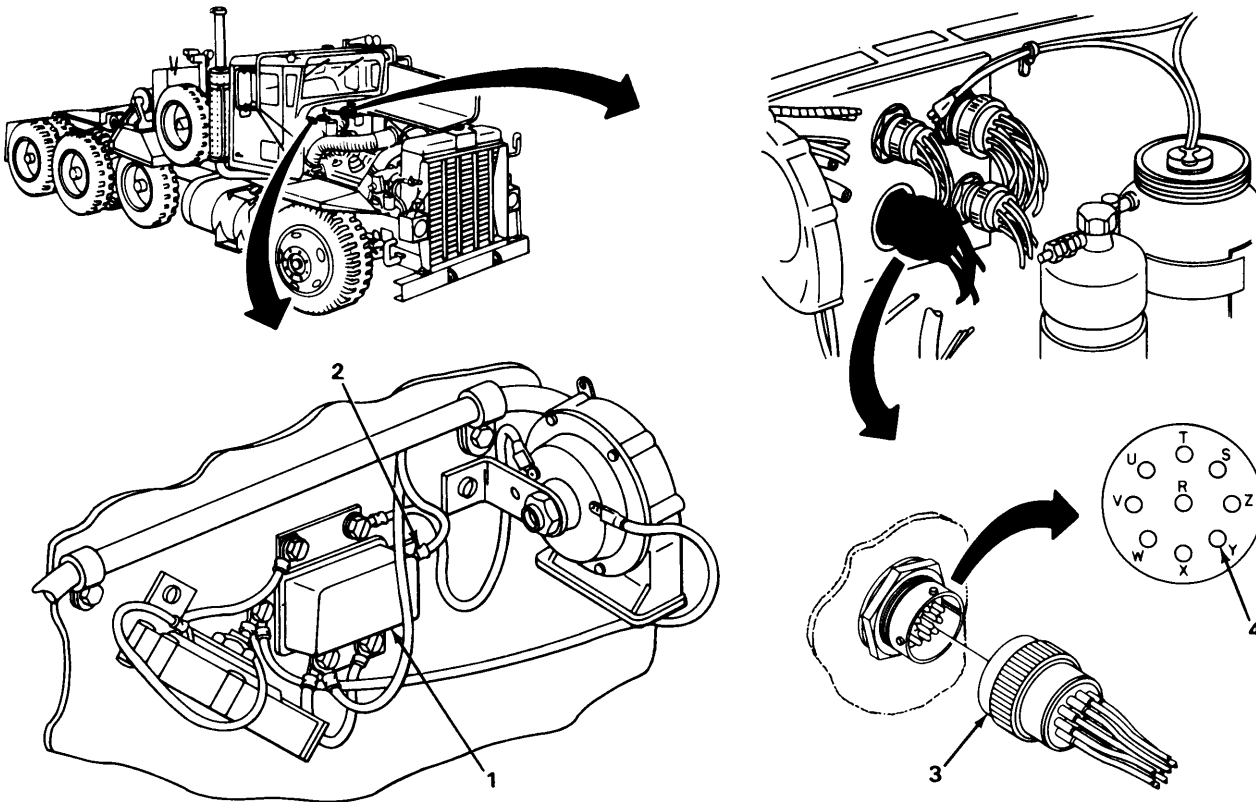
35. HORN INOPERATIVE – CONTINUED.

Step 3. At horn relay (1), using multimeter set at 30 vdc, put red probe on wire no. 016 (2). Put black probe to good ground.

If meter reads no voltage, replace door ajar warning relay (page 4-242).

Step 4. Disconnect firewall harness connector (3). Using multimeter set at 30 vdc, put red probe on socket Y (4), and black probe to good ground. Take reading and put firewall connector together.

If meter reads no voltage, close right side of hood (TM 9-2320-270-10) and notify direct support maintenance.



TA239685

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

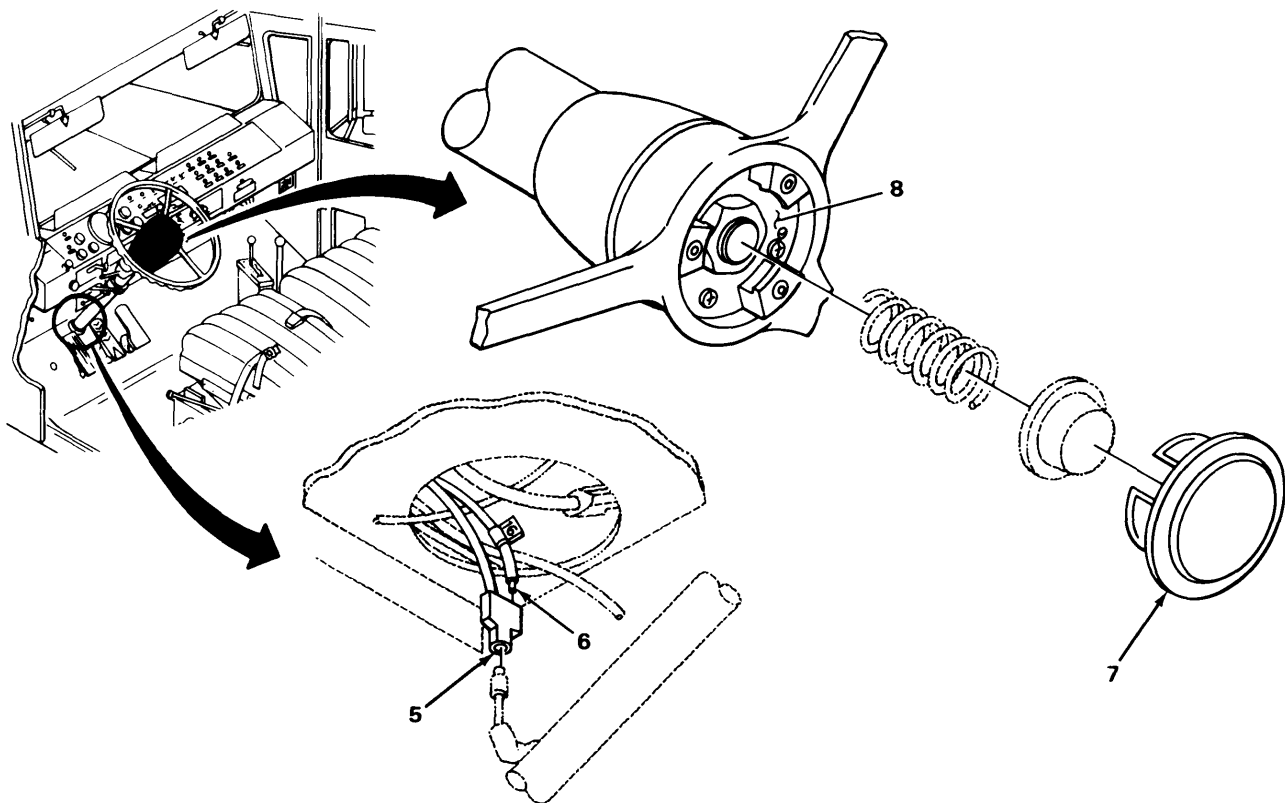
CORRECTIVE ACTION

Step 5. Connect firewall connector and take apart connector (5). Using multimeter set at 30 vdc, put red probe on wire no. 016 (6) and black probe to good ground.

If meter reads no voltage, put connector together, close right side of hood (TM 9-2320-270-10) and notify direct support maintenance.

Step 6. Take off horn button cover (7). Using multimeter set at 30 vdc, put red probe on outer ring (8), and black probe on good ground.

If meter reads no voltage, replace steering column wire and ring brush (page 4-436). Put on horn button cover (7) and close right side of hood (TM 9-2320-270-10).



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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35. HORN INOPERATIVE – CONTINUED.

Step 7. At two horns (1), using multimeter set at 30 vdc, put red probe on horn terminal for wire no. 168 (2) and black probe to good ground. Have assistant push horn button, hold and release.

If meter reads no voltage, close right side of hood (TM 9-2320-270-10) and notify direct support maintenance.

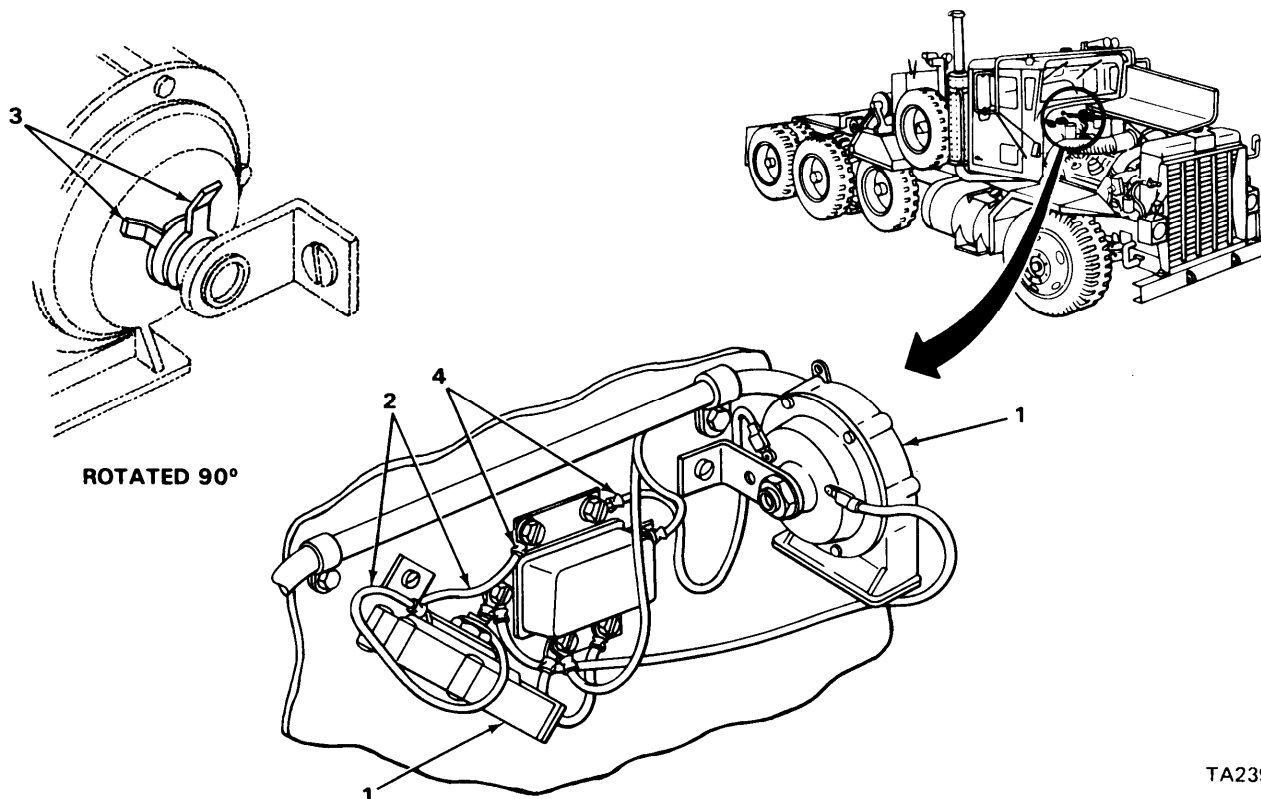
Step 8. Take off wires to two horns (1). Using multimeter set at RX1, put probes on horn contacts (3).

If meter does not read zero, replace horns (page 4-438).

Step 9. Take off ground wires (4). Using multimeter set at RX1, put probe on each end.

a. If meter reads zero, close right side of hood (TM 9-2320-270-10) and notify direct support maintenance.

b. If meter does not read zero, put on wires and go to BOTH HEAD-LIGHTS DO NOT WORK, and do steps 6 thru 9 (page 3-48).



TA239687

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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36. HORN INOPERATIVE (WARNING DEVICE DOES NOT SOUND WHEN TRANSMISSION IS LEFT IN GEAR).

Step 1. Push horn button (1), hold, and release.

If horn does not sound, go to HORN INOPERATIVE (page 3-97).

Step 2. Remove screws (2) and remove door pillar switch (3). Using multimeter set at 30 vdc, put red probe on wire no. 048 (4) and black probe on good ground.

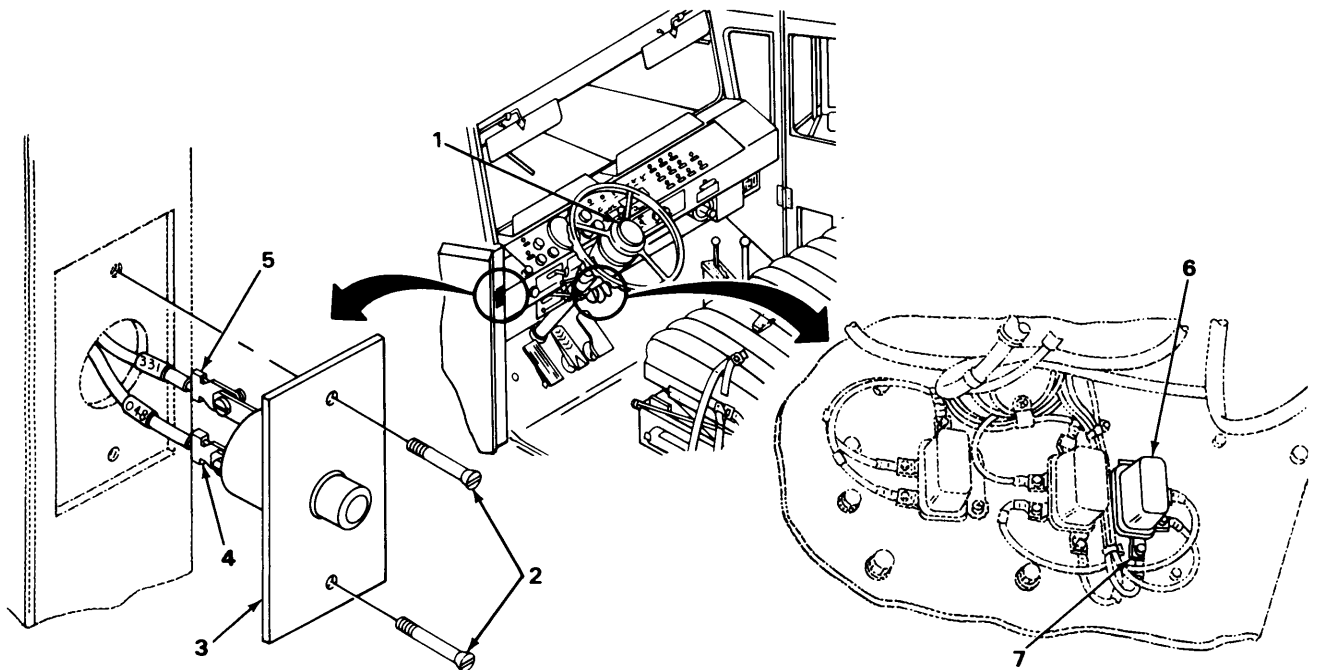
If meter reads no voltage, install switch (page 4-312) and notify direct support maintenance.

Step 3. At door pillar switch (3), using multimeter set at 30 vdc, put red probe on wire no. 331 (5), and black probe to good ground.

If meter reads no voltage, replace door pillar switch (page 4-312)

Step 4. Install door pillar switch (page 4-312). At relay (6), using multimeter set at 30 vdc, put red probe on wire no. 331 (7) and black probe to good ground. Truck door must be open.

If meter reads no voltage, notify direct support maintenance.



TA239688

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

36. HORN INOPERATIVE (WARNING DEVICE DOES NOT SOUND WHEN TRANSMISSION IS LEFT IN GEAR) - CONTINUED.

Step 5. Put main transmission in fifth gear(D), ignition switch in ON position, and open door on driver's side. Go to auxiliary transmission under truck cab. Using multimeter set at 30 vdc, put red probe on wire no. 154 (1) and black probe to good ground.

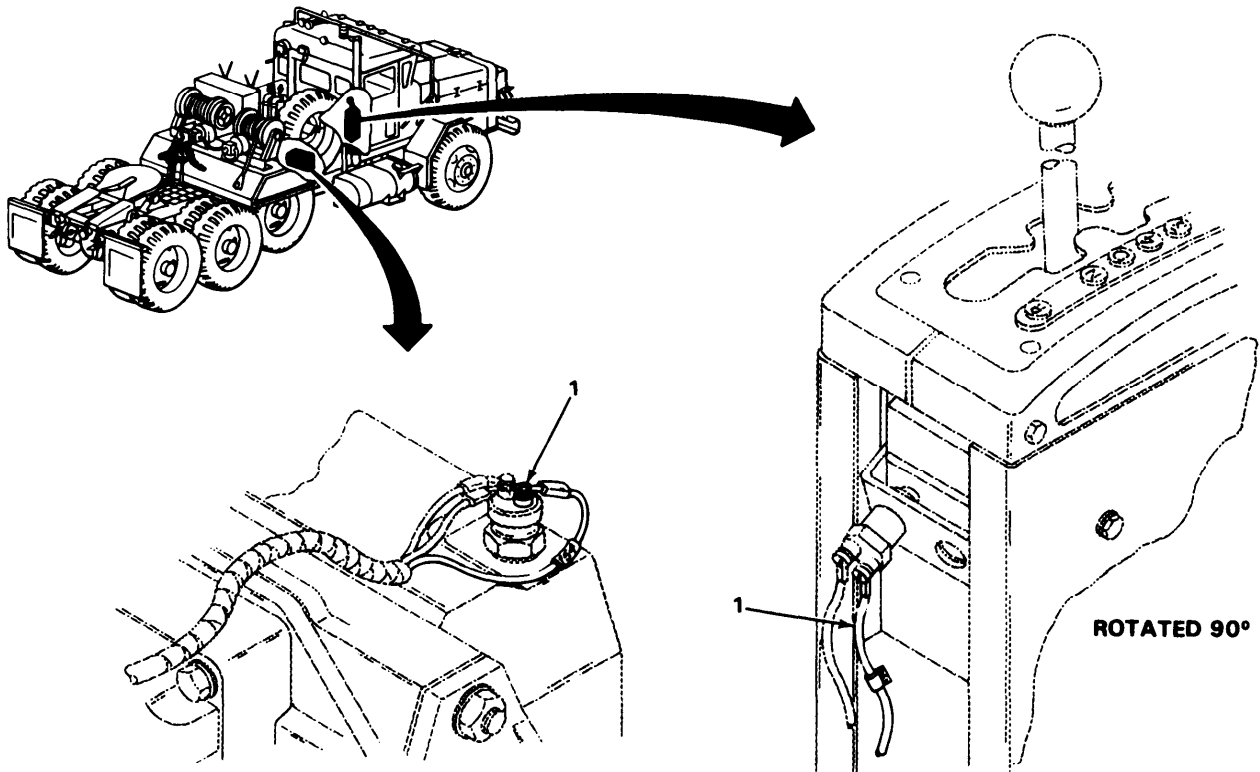
If meter reads no voltage, notify direct support maintenance.

Step 6. At fifth gear switch on front of shift console, using multimeter set at 30 vdc, put red probe on wire no. 154 (1) and black probe to good ground.

a. If meter reads voltage, replace switch (page 4-509).

b. If meter reads no voltage, notify direct support maintenance.

c. If horn is still inoperative, notify direct support maintenance.



TA239689

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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TRANSMISSION

37. FOAMY OIL – TRANSMISSION SLIPS OR OVERHEATS.

NOTE

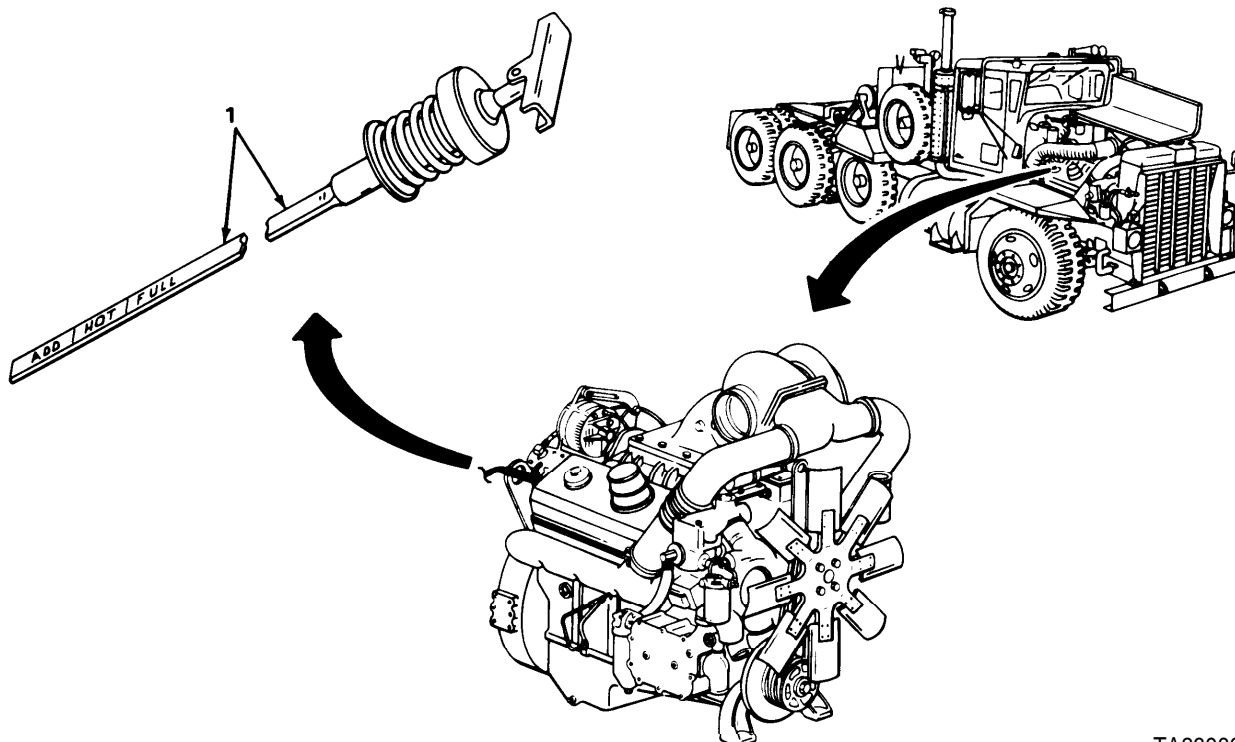
Before checking oil, bring transmission to operating temperature (TM 9-2320-270-10).

Step 1. With engine running open right side of hood (TM 9-2320-270-10). Remove dipstick (1). Check transmission oil level.

- a. If oil level is too low, shut down engine (TM 9-2320-270-10), and fill to proper level (LO 9-2320-270-12).
- b. If oil is too high, shut down engine (TM 9-2320-270-10), and drain to proper level (LO 9-2320-270-12).

Step 2. Go to transmission dipstick (1) and check oil (TM 9-2320-270-10).

If oil is milky or has water drops, install dipstick, shut down engine (TM 9-2320-270-10), and change oil and filters (LO 9-2320-270-12), (page 4-562) and (page 4-563).



TA239690

TROUBLESHOOTING - CONTINUED

MALFUNCTION

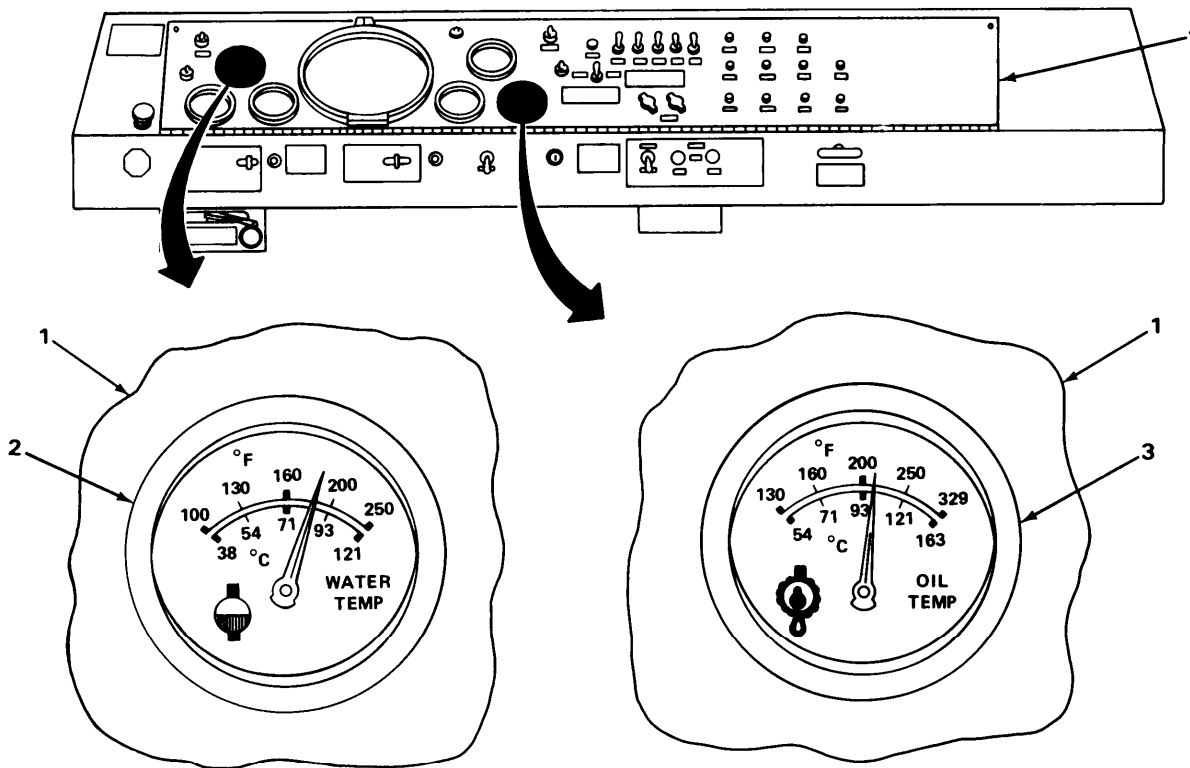
TEST OR INSPECTION

CORRECTIVE ACTION

37. FOAMY OIL – TRANSMISSION SLIPS OR OVERHEATS – CONTINUED.

Step 3. Close right side of hood (TM 9-2320-270-1 O). Go to instrument **panel (1)** and check water (2) and oil (3) temperature gages for engine overheating.

- a. If engine is overheating, shut down engine (TM 9-2320-270-10), and go to ENGINE OVERHEATS (page 3-35).
- b. If engine is not overheating, go to HIGH TRANSMISSION OIL TEMPERATURE (page 3-107).



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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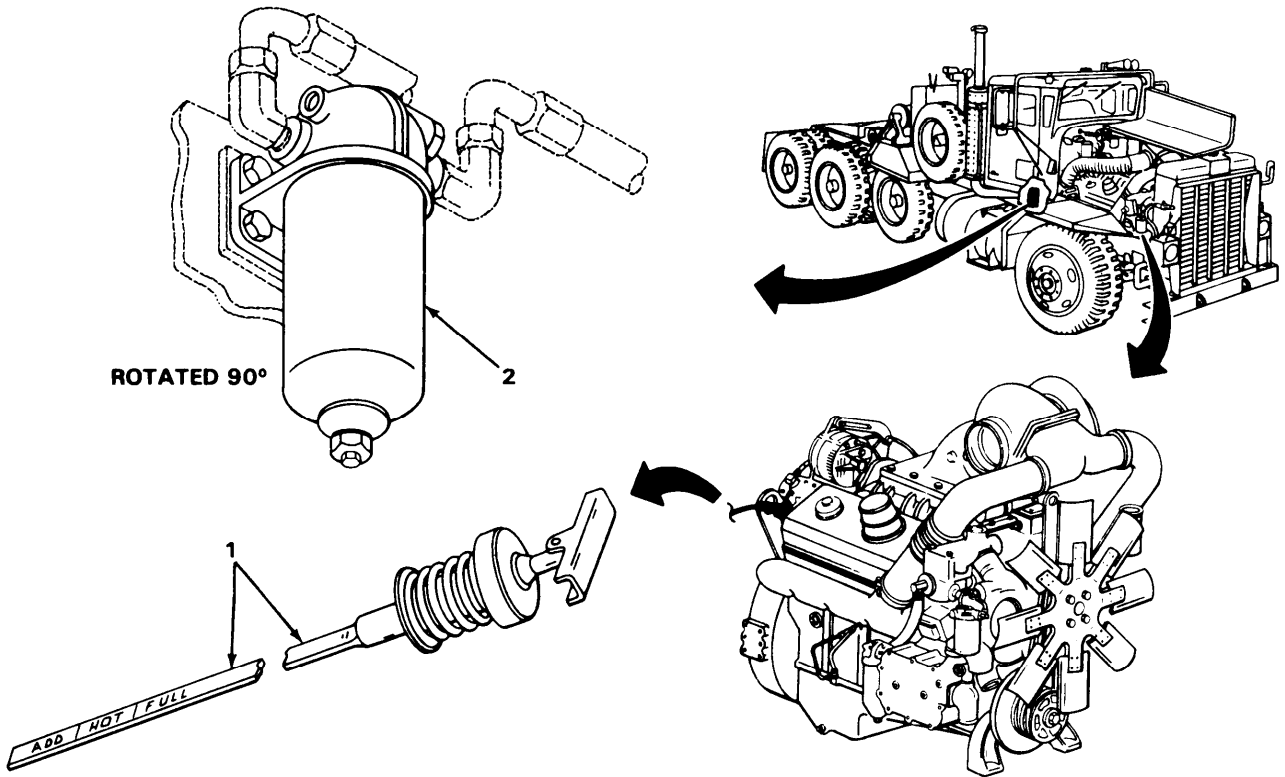
36. SLOW OR ERRATIC TRANSMISSION SHIFTING.

Step 1. Open right side of hood (TM 9-2320-270-10). Check transmission oil level on dipstick (1) with engine running and transmission at normal operating temperature (TM 9-2320-270-10).

- a. If oil level is too low, fill to operating level (LO 9-2320-270-12).
- b. If oil level is too high, drain to proper level.

Step 2. Check external oil filter (2) for leaks or damage.

If filter is leaking, shut down engine (TM 9-2320-270-10) and replace filter (4-563).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

38. SLOW OR ERRATIC TRANSMISSION SHIFTING – CONTINUED.

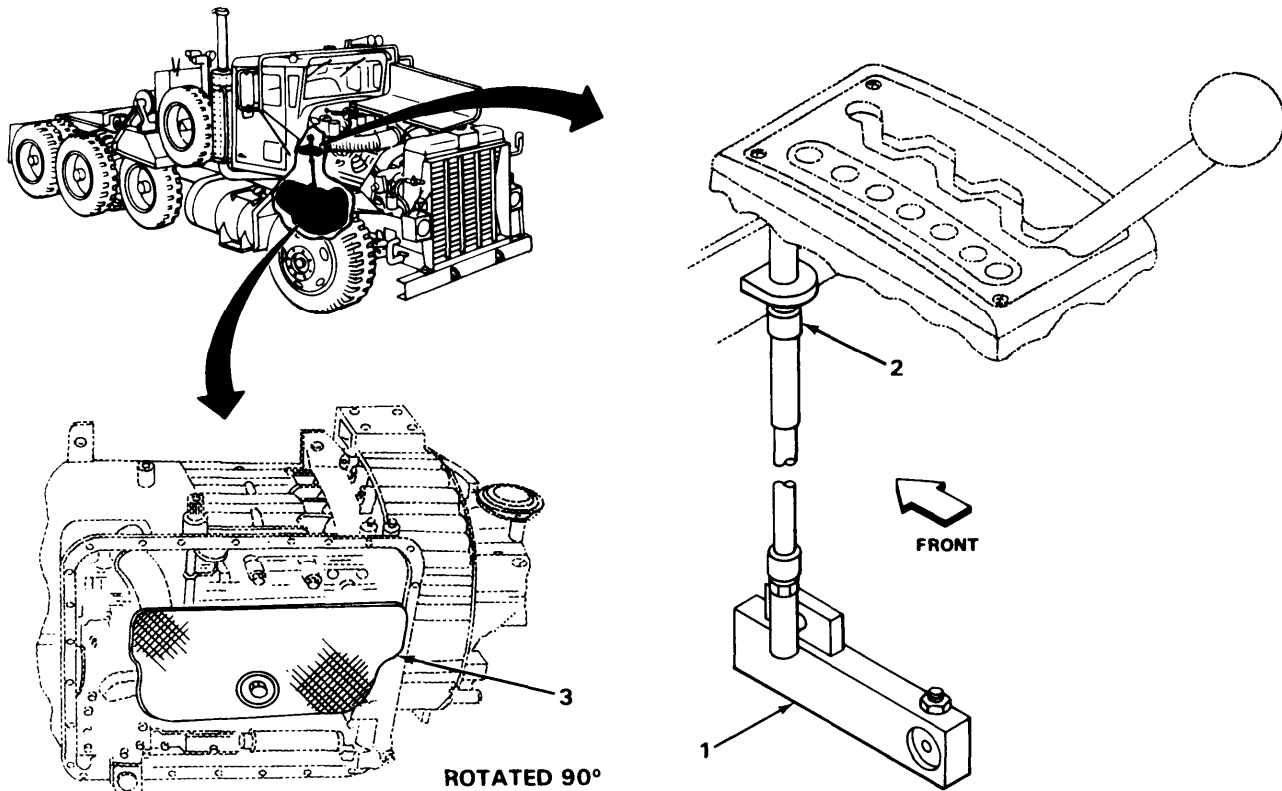
Step 3. Check for damage and proper adjustment at gearshift linkage (1) and gearshift cable (2).

If damaged or out of adjustment replace or adjust (page 4-525).

Step 4. Close right side of hood (TM 9-2320-270-10). Remove internal filter screen (3) (page 4-562).

a. If plugged, clean or replace (page 4-562).

b. If shifting is still slow or erratic, notify direct support maintenance.



TA239693

TROUBLESHOOTING - CONTINUED

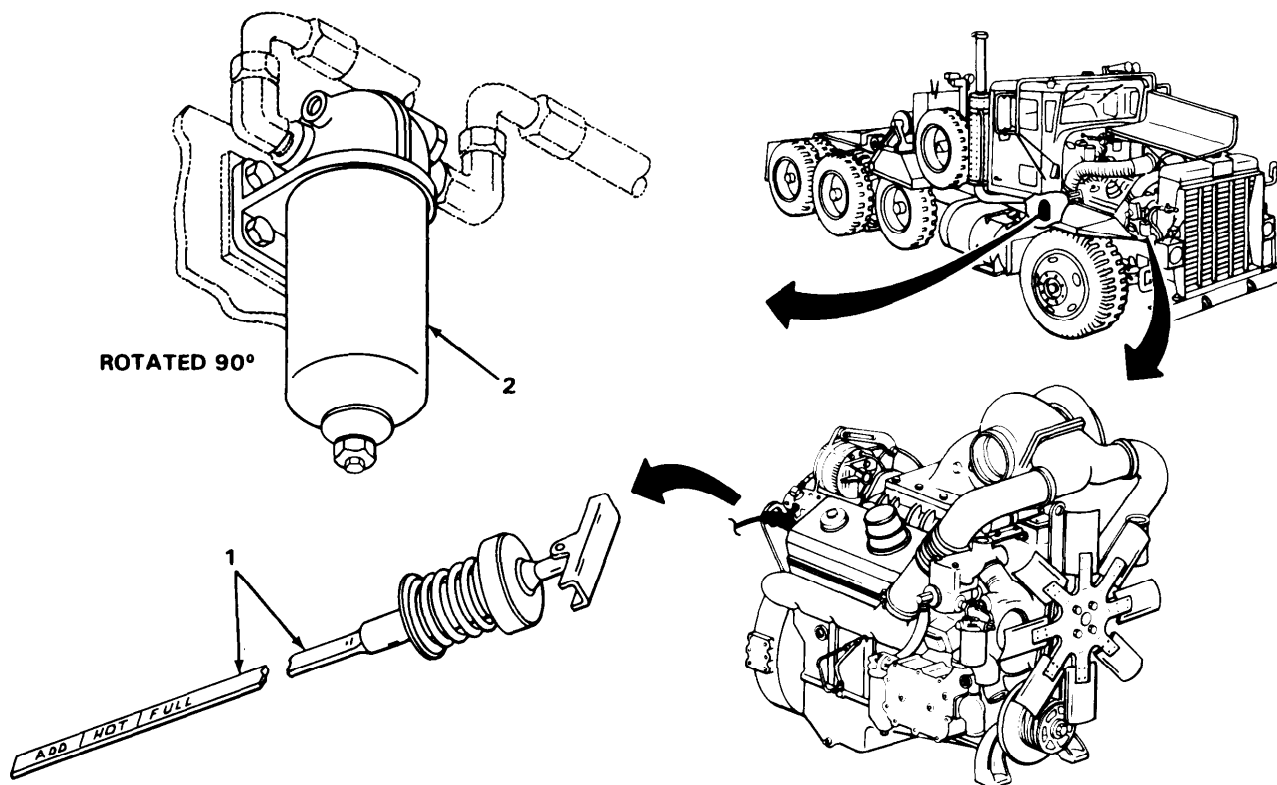
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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39. HIGH TRANSMISSION OIL TEMPERATURE (ENGINE NOT OVERHEATING).

- Step 1. Open right side of hood (TM 9-2320-270-10). Check transmission oil level on dipstick (1) with engine running and transmission at normal operating temperature (TM 9-2320-270-10).
- a. If oil is too low, shut down engine (TM 9-2320-270-10) and fill to proper level (LO 9-2320-270-12).
 - b. If oil is too high, shut down engine (TM 9-2320-270-10) and drain to proper level (LO 9-2320-270-12).

Step 2. Check for leaks or damage at external oil filter (2).

If filter is leaking, shut down engine (TM 9-2320-270-10) and replace filter (page 4-563).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

39. HIGH TRANSMISSION OIL TEMPERATURE (ENGINE NOT OVERHEATING) – CONTINUED.

Step 3. Close right side of hood (TM 9-2320-270-10). Inspect oil lines (1) and (2) for leaks or damage.

If oil lines are leaking or damaged, shut down engine (TM 9-2320-270-10) and replace or repair (page 4-568).

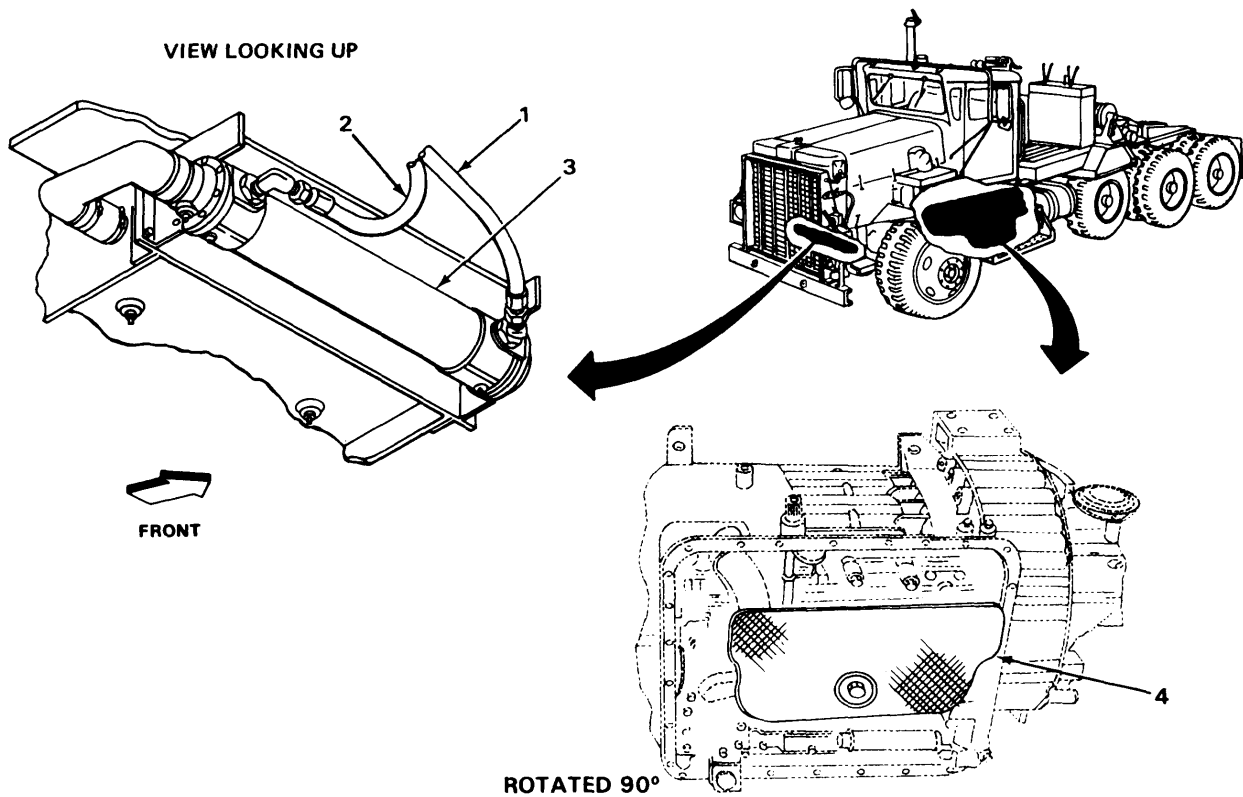
Step 4. Inspect heat exchanger (3) for leaks or damage.

If heat exchanger is leaking or damaged, shut down engine (TM 9-2320-270-10) and notify direct support maintenance.

Step 5. Close instrument panel (page 4-244). At transmission (4), check internal oil filter for clogging (page 4-562).

a. If internal oil filter is clogged, clean filter (page 4-562).

b. If transmission oil temperature is still too high, notify direct support maintenance.



TA239695

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

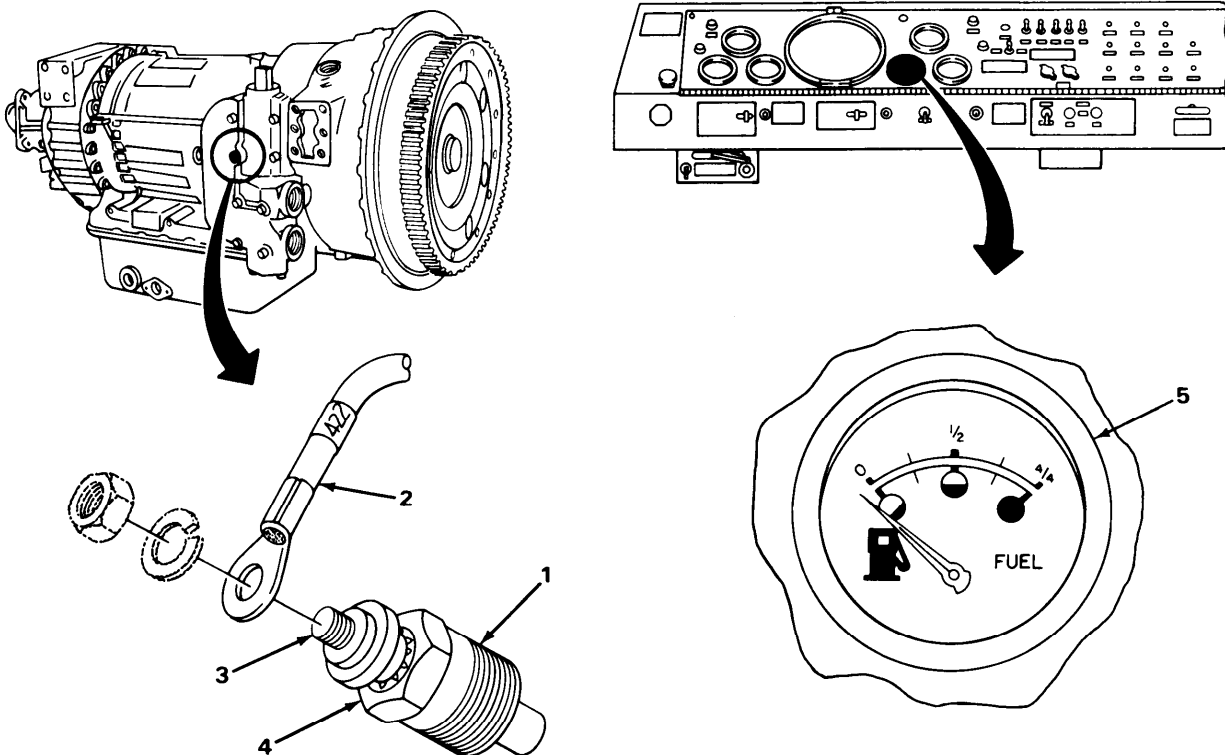
40. TRANSMISSION OIL TEMPERATURE GAGE DOES NOT INDICATE CORRECT TEMPERATURE.

Step 1. Be sure transmission oil is cold. At disconnect wire no. 422 (2), using multimeter set at RX-10, put red probe to terminal (3) on sending unit (1) and black probe on sending unit body (4).

If multimeter does not show continuity, replace sending unit (page 4-398).

Step 2. Go to instrument panel, put ignition switch in ON position, and check if fuel gage (5) works.

If fuel gage does not work, put ignition switch in OFF position and go to FUEL LEVEL GAGE SHOWS INCORRECT FUEL LEVEL (page 3-32).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

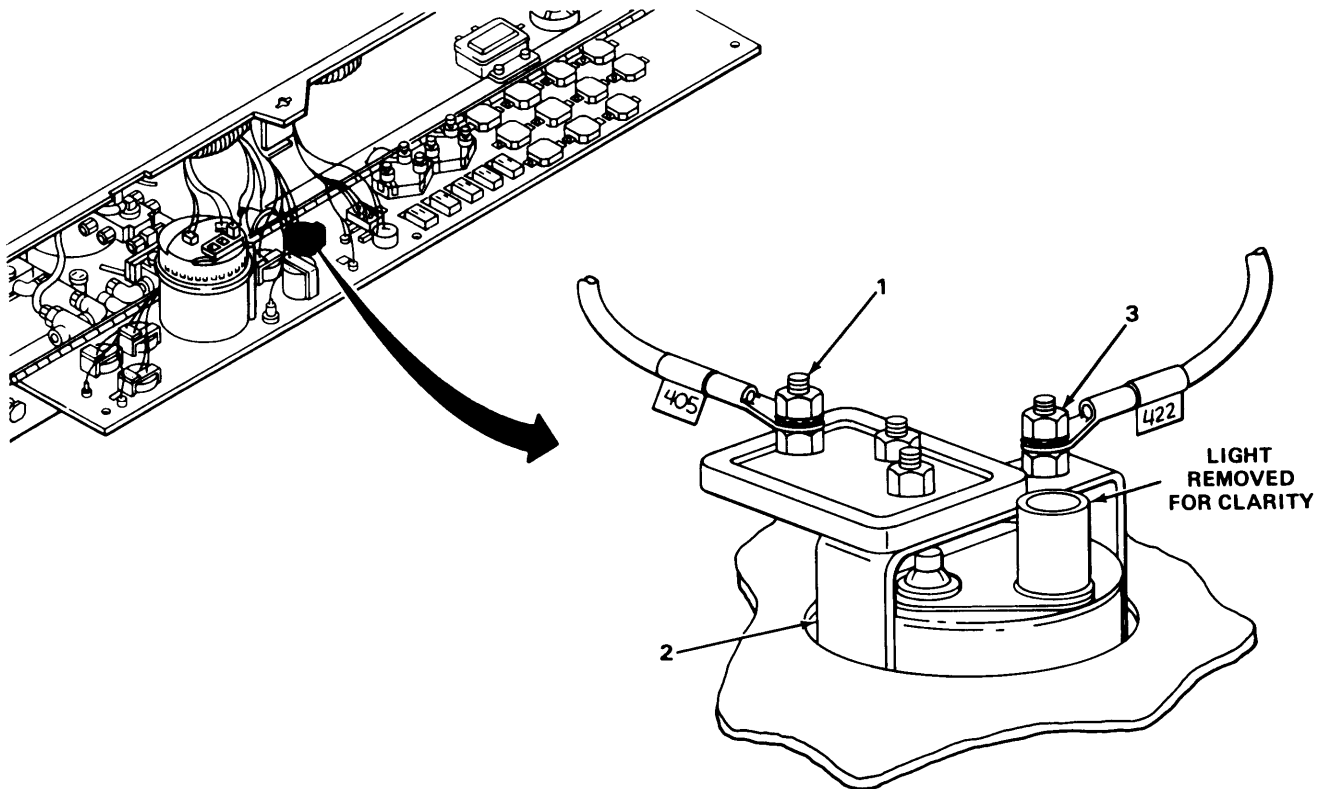
40. TRANSMISSION OIL TEMPERATURE GAGE DOES NOT INDICATE CORRECT TEMPERATURE – (CONTINUED).

Step 3. Open instrument panel (page 4-244). At wire no. 405 (1) terminal, using using multimeter set on 30 vdc, put red probe on terminal (1) and black probe to good ground.

If meter reads zero, put ignition switch in OFF position, close instrument panel (page 4-244) and notify direct support maintenance.

Step 4. At oil temperature gage (2), using multimeter set at 30 vdc, put red probe on terminal for wire no. 422 (3) and black probe to good ground.

If meter reads zero, put ignition switch in OFF position and replace gage (page 4-271).



TROUBLESHOOTING - CONTINUED

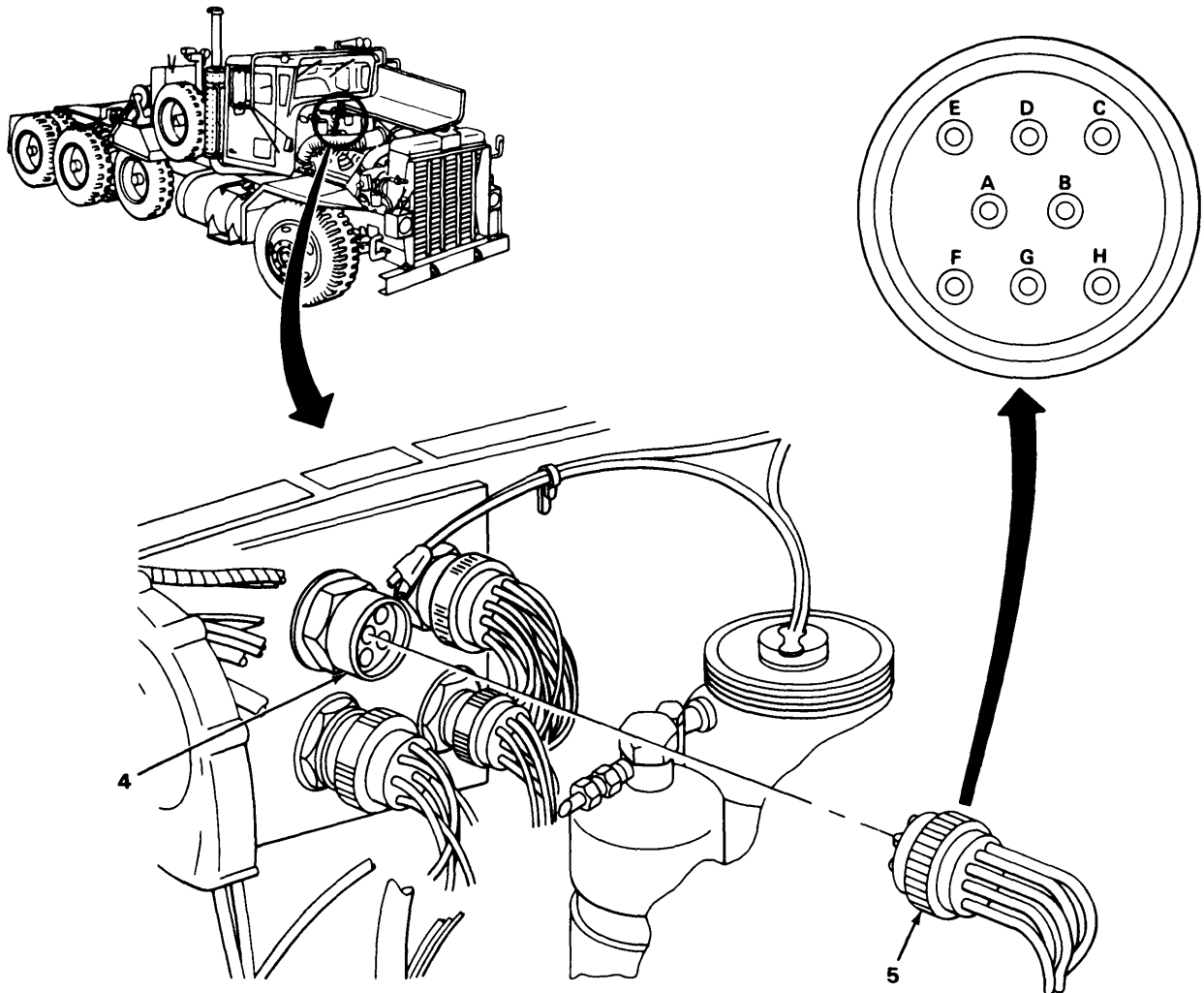
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

Step 5. Close instrument panel (page 4-244). Open right side of hood (TM 9-2320-270-10) and disconnect engine harness connector (4) and plug (5). Using multi-meter set at 30 vdc, put red probe on pin H for wire no. 422 from gage to connector, and black probe to good ground.

Put ignition switch in OFF position and notify direct support maintenance.



TA239698

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

41. LOSS OF DRIVE IN ALL RANGES.

- Step 1. Check auxiliary transmission linkage (1) under cab (2) for damage and proper adjustment (page 4-534).

If linkage is damaged or out of adjustment, repair or adjust (page 4-534).

- Step 2. Check cable (3) for damage and proper adjustment (page 4-525).

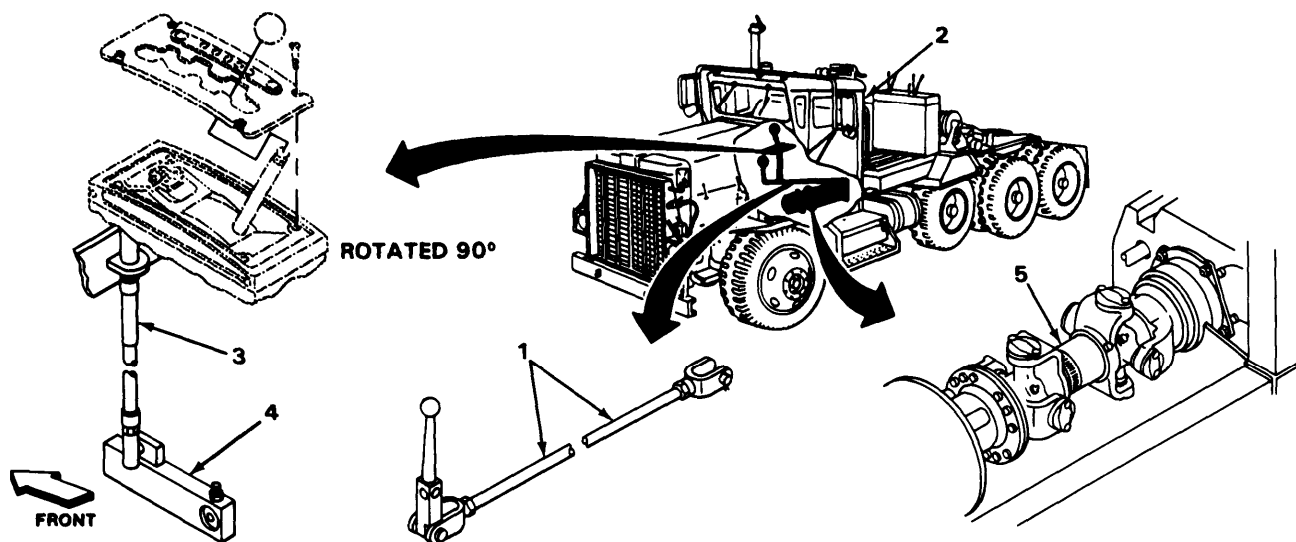
If cable is damaged or out of adjustment, repair or adjust (page 4-525).

- Step 3. Check linkage (4) from cable to transmission for damage and proper adjustment (page 4-525).

If linkage is damaged or out of adjustment, repair or adjust (page 4-525).

- Step 4. Check main transmission to auxiliary transmission propeller shaft (5) and U-joints for damage.

If shaft or U-joints are damaged, replace propeller shaft or U-joint (page 4-574).



TA239699

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

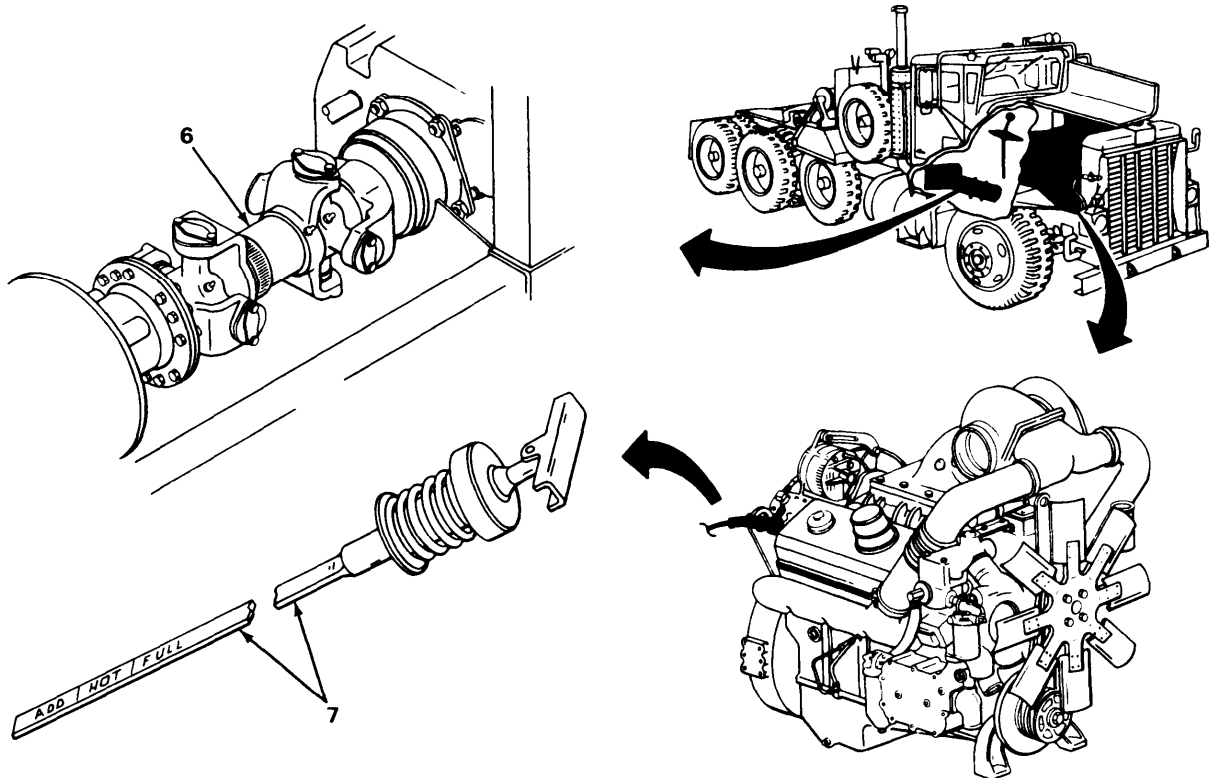
Step 5. Check auxiliary transmission to transfer case propeller shaft (6) and U-joints for damage.

If shaft or U-joints are damaged, replace (page 4-584).

Step 6. With engine running and transmission at normal operating temperature (TM 9-2320-270-10), check transmission oil level on dipstick (7).

a. If oil is too low, shut down engine (TM 9-2320-270-10) and fill to proper level (LO 9-2320-270-12).

b. If oil is too high, shut down engine (TM 9-2320-270-10) and drain to proper level (LO 9-2320-270-12).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

41. LOSS OF DRIVE IN ALL RANGES – CONTINUED.

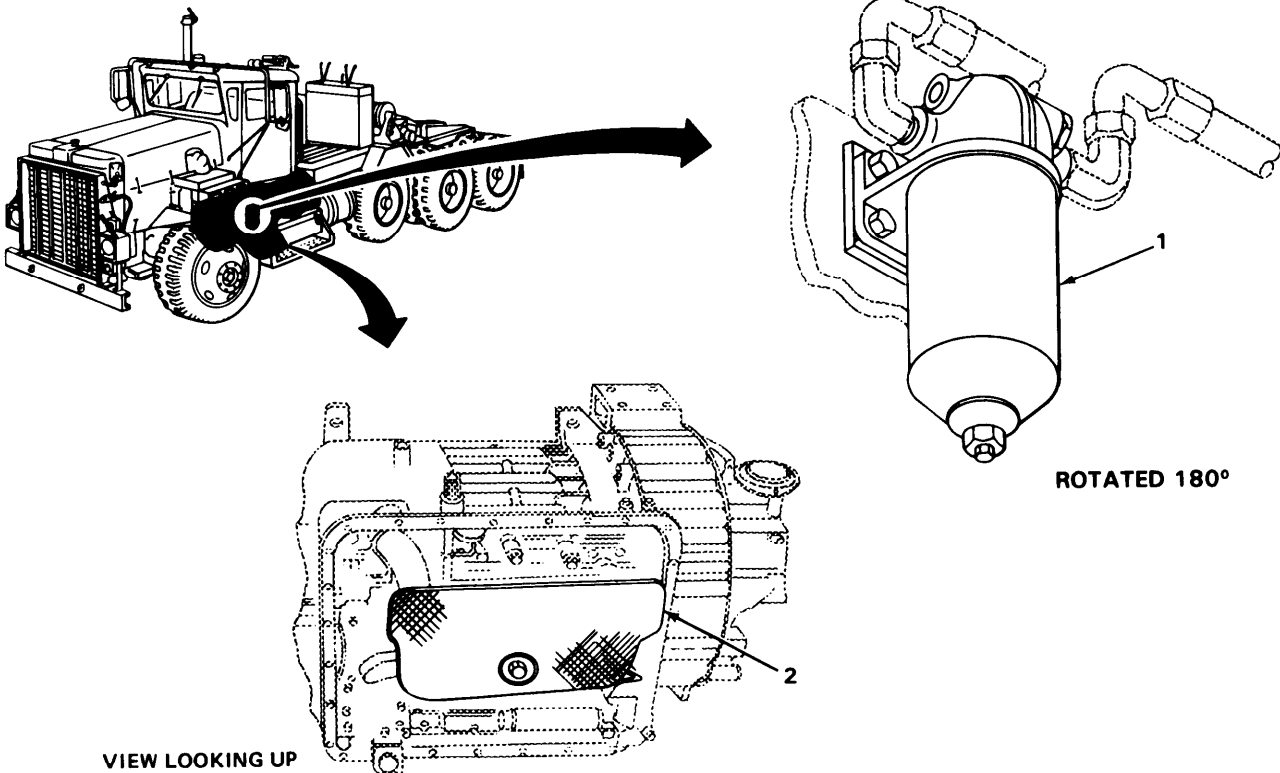
Step 7. Check external oil filter (1) for leaks or damage.

If filter is damaged or leaking, replace filter (page 4-563).

Step 8. Check internal oil filter (2) for clogs (page 4-562).

a. If internal oil filter is clogged, clean (page 4-562).

b. If drive is still lost in all ranges, notify direct support maintenance.



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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42. LOSS OF POWER.

WARNING

This procedure includes converter stall test. When performing converter stall test, vehicle must be blocked and parking and service brakes must be applied. Keep personnel clear of vehicle and its travel path in the event of brake failure or inadequate blocking. Do not maintain stalled condition longer than 30 seconds. With transmission in neutral, run engine at 1,200 to 1,500 rpm for 2 minutes to cool oil between tests. To prevent overheating transmission fluid, closely watch transmission OIL TEMP. gage and do not allow temperature to exceed 300°F (149°C). Failure to observe this warning could result in injury to personnel.

Step 1. Check engine oil level (TM 9-2320-270-10).

a. If engine oil is too low, fill to proper level (LO 9-2320-270-12).

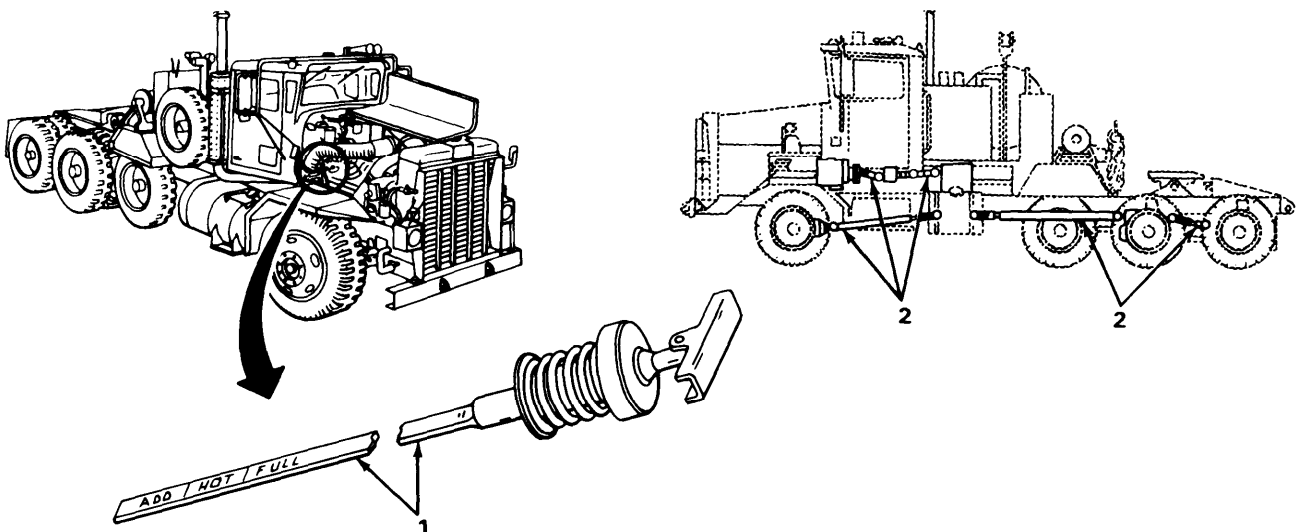
b. If engine oil is too high, drain to proper level (LO 9-2320-270-12).

Step 2. Go to transmission oil dipstick (1) pull it out. Check to see if oil is foamy.

If oil is foamy, put dipstick back and go to FOAMY OIL, TRANSMISSION SLIPS OR OVERHEATS (page 3-103).

Step 3. Check propeller shafts and U-joints (2) for damage (page 4-574).

If propeller shafts or U-joints are damaged, replace (page 4-574).



TA239702

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

42. LOSS OF POWER – CONTINUED.

Step 4. Check all brakes (1) for locked or damaged parts (page 4-609).

If brakes are locked or damaged, replace or repair (page 4-609).

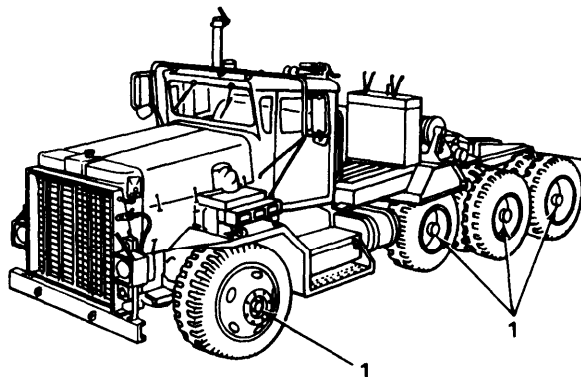
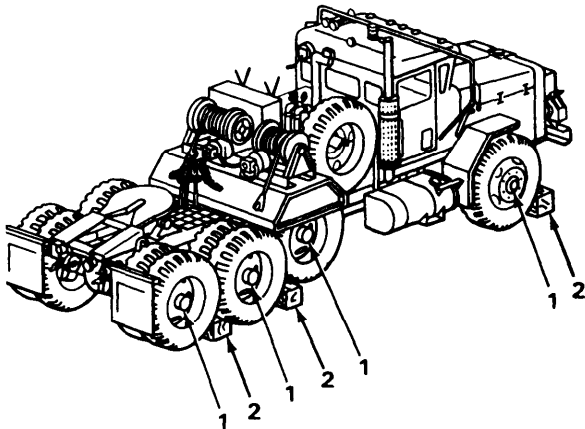
NOTE

Temperature, altitude, engine accessory loss variations, etc., all affect power input to converter. These conditions may cause stall speed to vary ± 150 rpm from established normal value. When deviations do not exceed 50 rpm and can be attributed to such causes, actual speed can be accepted as normal.

Step 5. While observing tachometer, position truck in clear area with adequate room to regain control in case of runaway. Block all wheels (2) and start engine. Bring truck to full operating temperature and pressure. Apply parking and service brakes. Put transmission in low gear and accelerate engine to full throttle. Note maximum rpm engine will attain.

a. If maximum rpm is below $1,924 \pm 150$, go to Troubleshooting – ENGINE LACKS POWER (page 3-20).

b. If maximum rpm is above $1,924 \pm 150$, notify direct support maintenance.



TA239703

TROUBLESHOOTING - CONTINUED

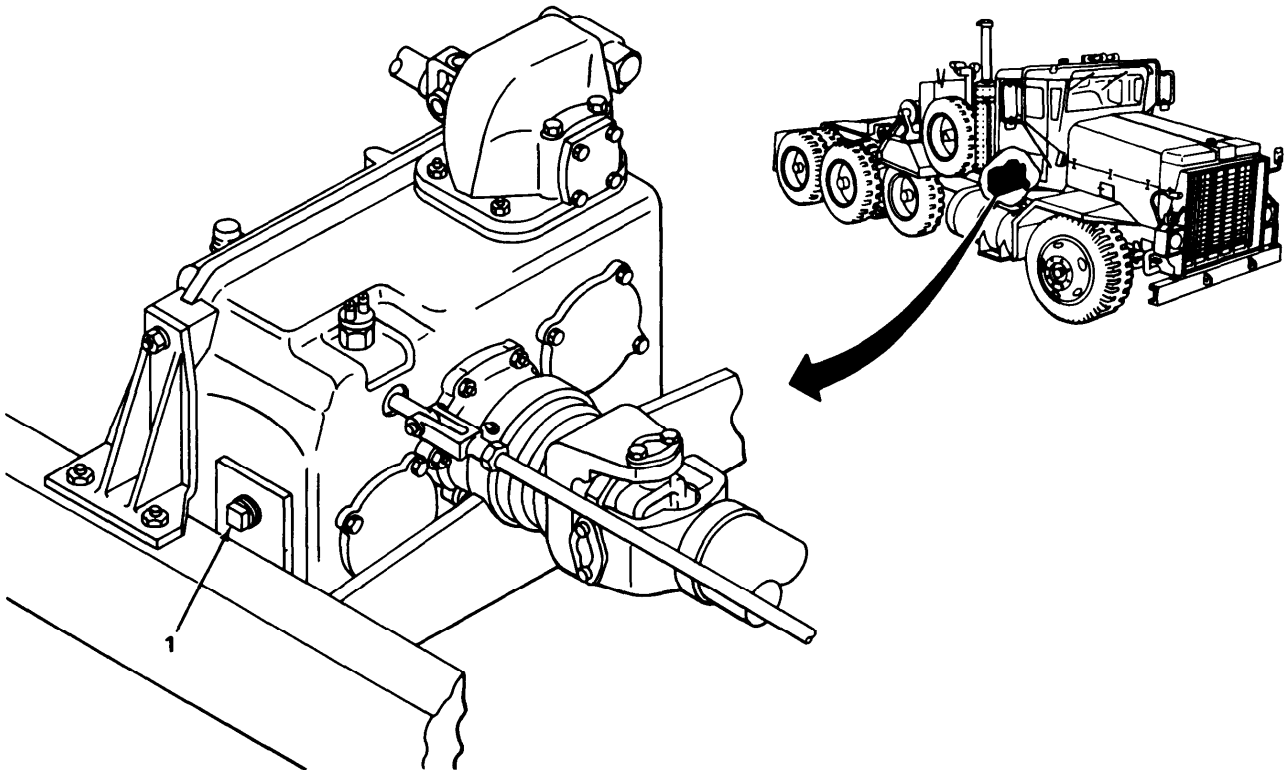
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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AUXILIARY TRANSMISSION

43. AUXILIARY TRANSMISSION OVERHEATING.

On right side of auxiliary transmission, locate drain plug (1). Check oil level (LO 9-2320-270-1 2).

- a. If oil level is too low, fill to proper level (LO 9-2320-270-12).
- b. If oil is at proper level, notify direct support maintenance.



TA239704

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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44. AUXILIARY TRANSMISSION FAILS TO ENGAGE IN LOW OR DIRECT.

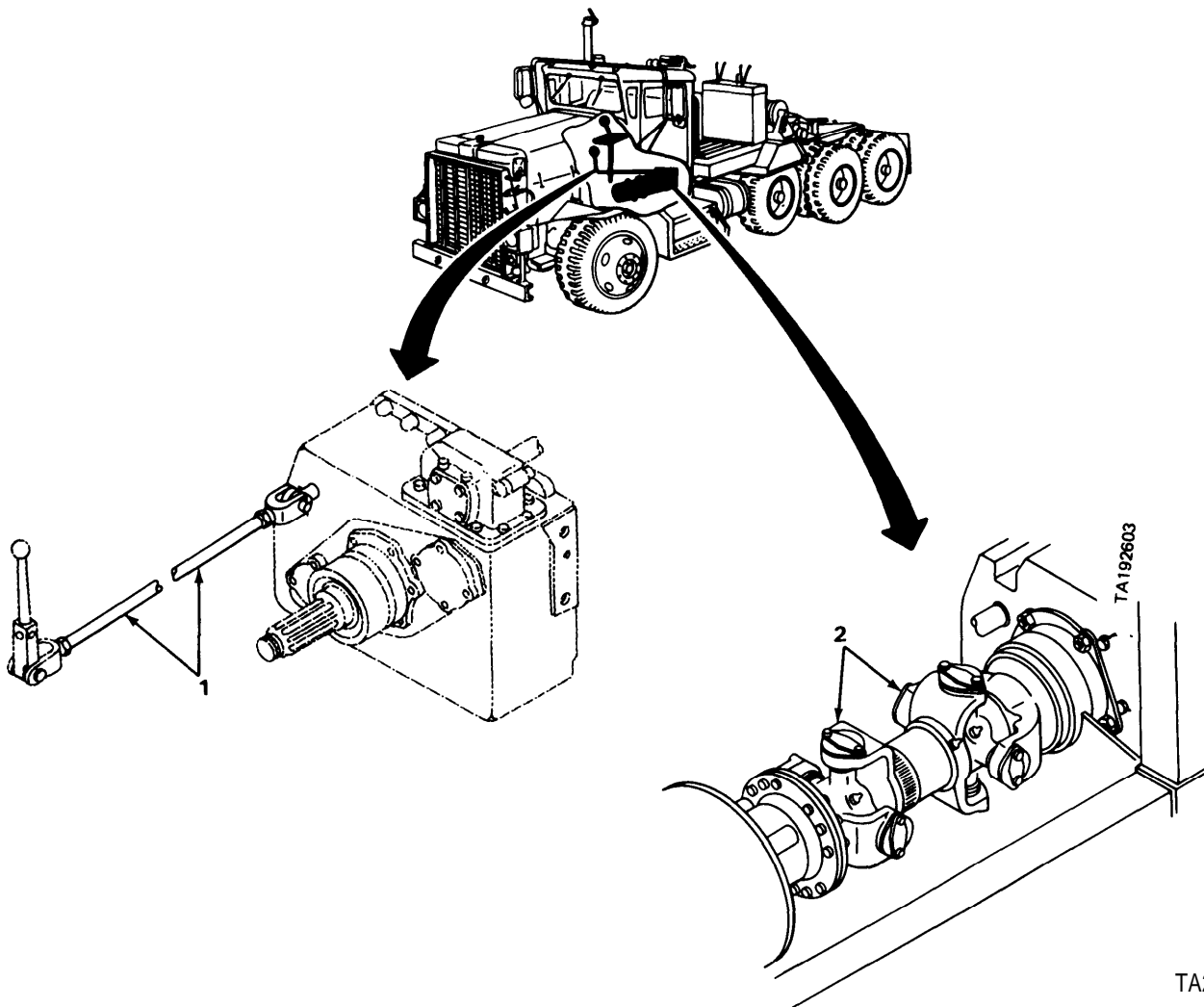
Step 1. Check transmission shift linkage (1) for damage and proper adjustment (page 4-534).

If linkage is damaged or out of adjustment, repair or adjust (page 4-534).

Step 2. Check propeller shaft and U-joints (2) for damage (page 4-574).

a. If propeller shaft and U-joints are damaged, replace (page 4-574).

b. If propeller shaft and U-joints are not damaged, notify direct support maintenance.



TA239705

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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45. NOISY AUXILIARY TRANSMISSION

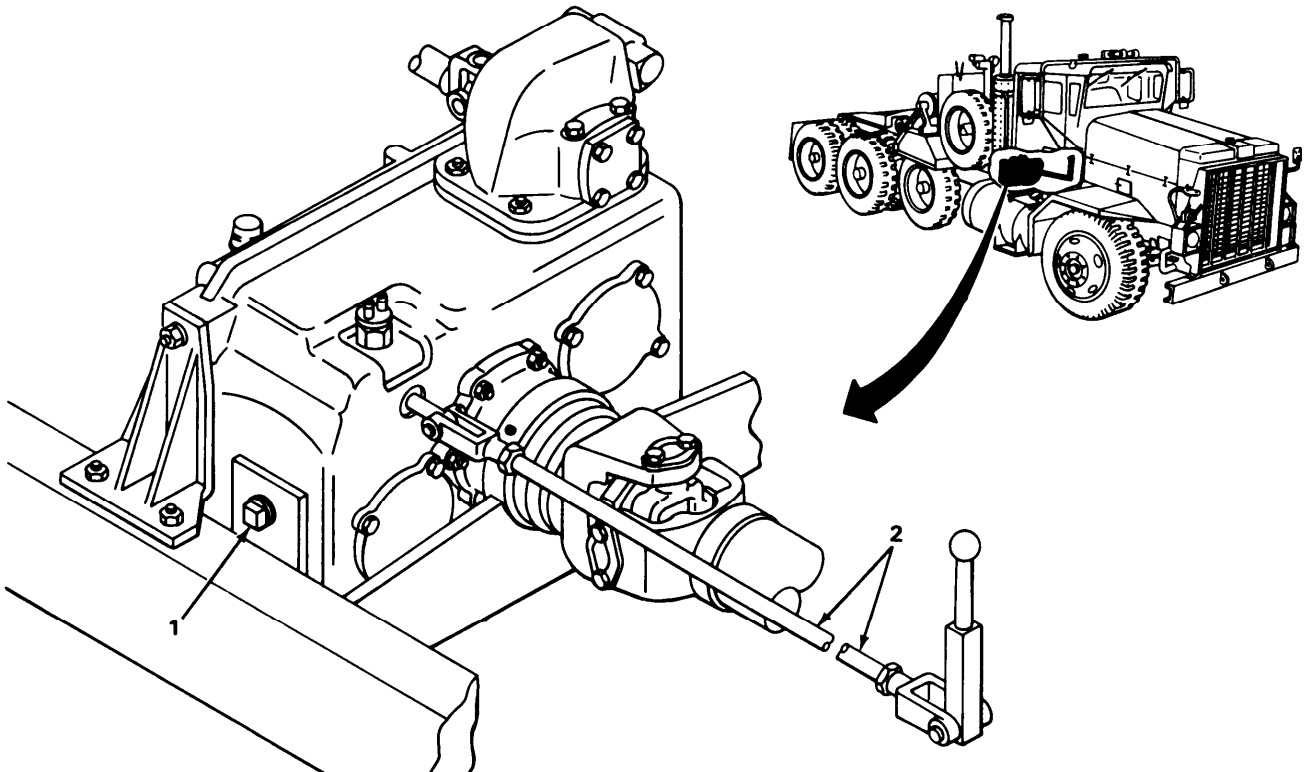
Step 1. On right side of auxiliary transmission locate drain plug (1). Check oil level (LO 9-2320-270-1 2).

If oil level is too low, fill to proper level (LO 9-2320-270-12).

Step 2. Check auxiliary transmission shift linkage (2) for damage and proper adjustment (page 4-534).

a. If linkage is damaged or out of adjustment, repair or adjust (page 4-534).

b. If linkage is not damaged or out of adjustment, notify direct support maintenance.



TA239706

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

TRANSFER CASE

46. TRANSFER CASE OVERHEATING OR UNUSUALLY NOISY.

On transfer case (1), remove plug (2) and check oil level (LO 9-2320-270-12).

- a. If oil level is low, fill to proper level (LO 9-2320-270-12).
- b. If oil level is not low, notify direct support maintenance.

47. TRANSFER LOCKUP FAILS TO ENGAGE OR DISENGAGE.

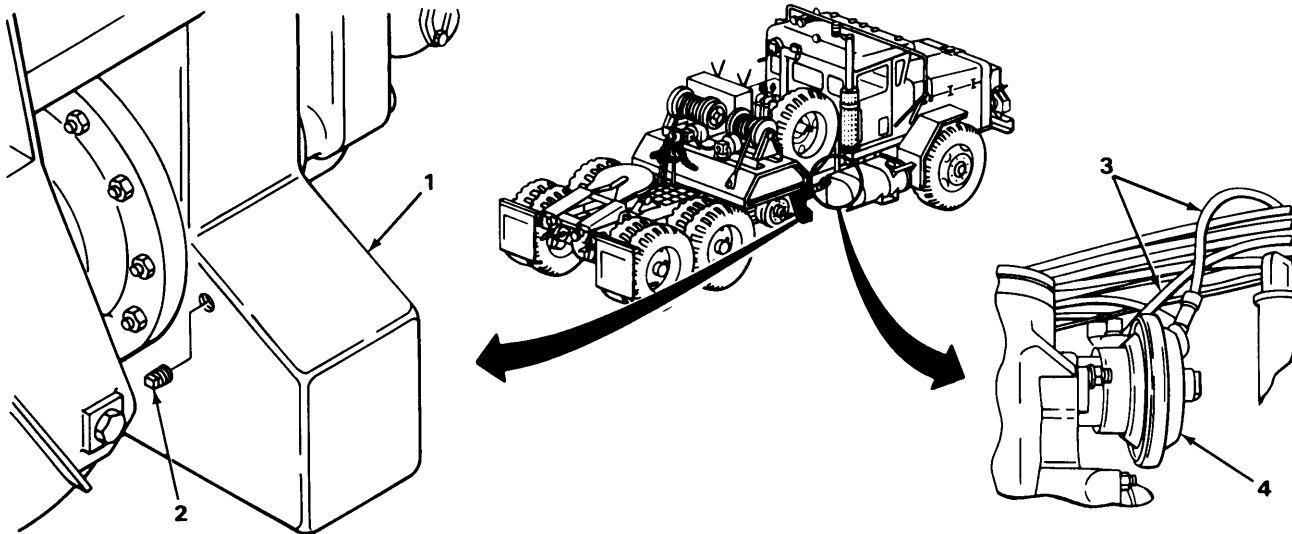
Step 1. Check air lines (3) for leaks or damage (page 4-1).

If leaking or damaged, repair or replace (page 4-609).

Step 2. Check control valve (4) for leaks or damage (page 4-1).

a. If leaking or damaged, repair or replace (page 4-770).

b. If transfer lockup still fails to engage or disengage, notify direct support maintenance.



TA239707

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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AXLES AND PROPELLER SHAFTS

48. NOISY STEERING KNUCKLE AND HARD STEERING.

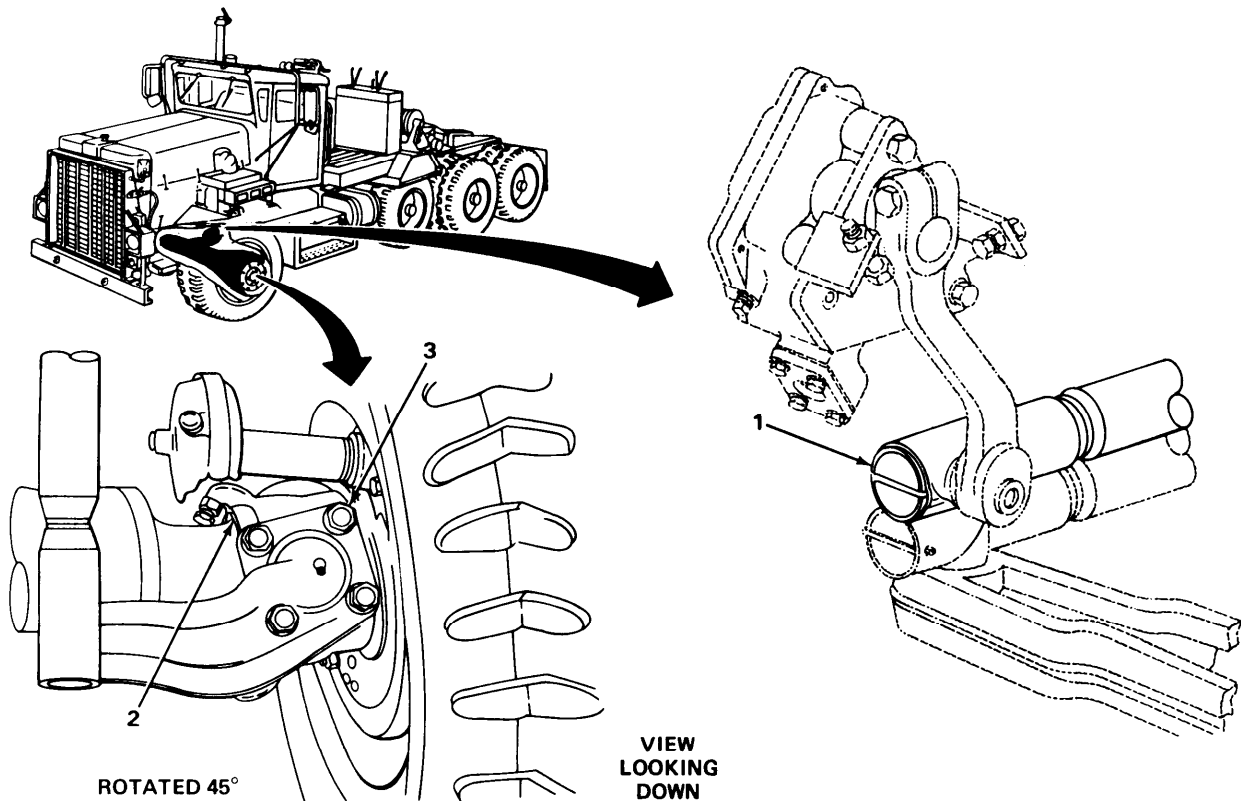
Jack front of truck off ground (TM 9-2320-270-10). Remove drag link (1) (page 4-982) and move wheels from stop to stop. Check for binding.

- a. If steering knuckles (2) are binding, install drag link (page 4-982) and lubricate (LO 9-2320-270-1 2).
- b. If steering knuckles still bind, notify direct support maintenance.

49. LUBRICANT LEAKING FROM KNUCKLE SEAL.

Check bolts (3) for looseness.

- a. If bolts are loose, tighten.
- b. If knuckle still leaks, notify direct support maintenance.



TA239708

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

50. LUBRICANT LEAKING FROM DIFFERENTIAL BREATHER (ANY AXLE).

On axle (1), check oil level (LO 9-2320-270-12).

- a. If oil is too high, drain to proper level (LO 9-2320-270-12).
- b. If leaking continues, notify direct support maintenance.

51. LUBRICANT LEAKING FROM AFT TANDEM AXLE DRIVE FLANGE.

Step 1. Check axle breather (2) for damage.

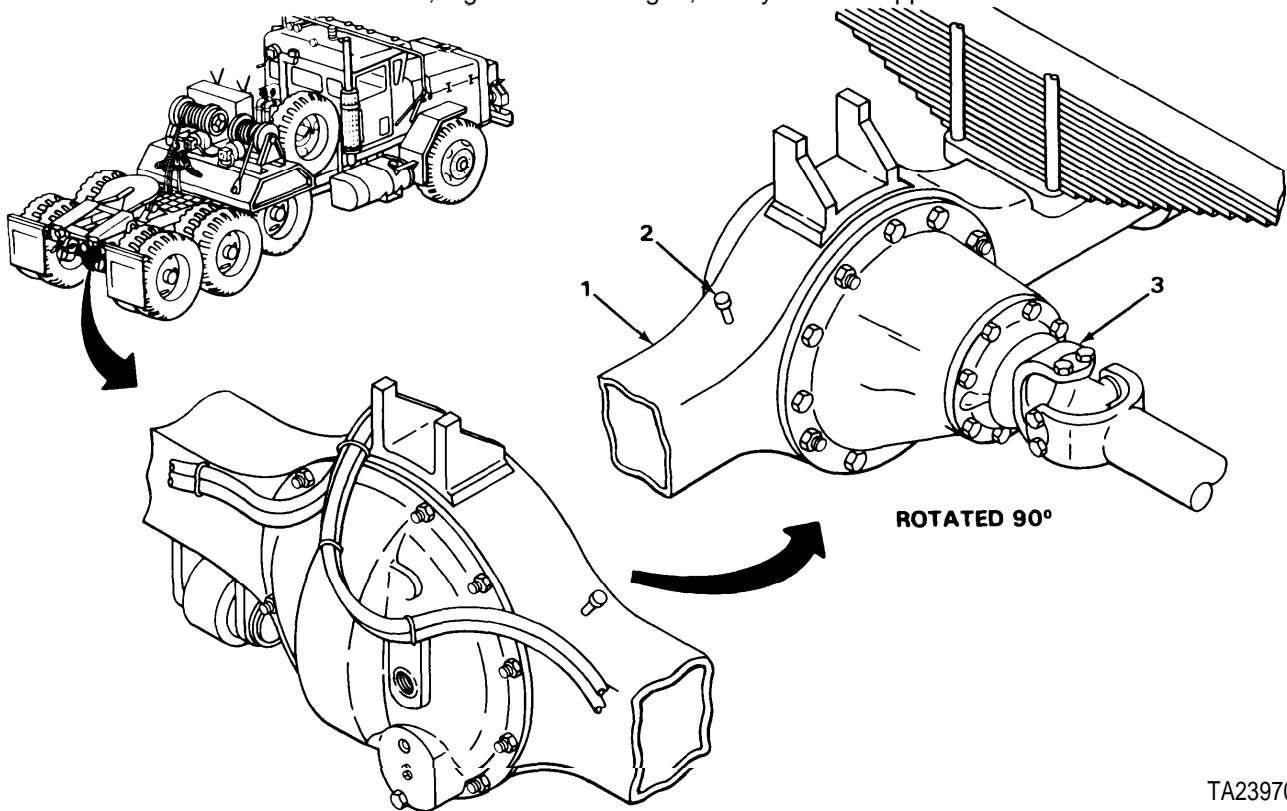
If damaged, replace (page 4-607).

Step 2. Check oil level.

If too high, drain to proper level (LO 9-2320-270-12).

Step 3. Check drive flange (3) for looseness or damage.

If loose, tighten. If damaged, notify direct support maintenance.



TA239709

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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52. CONTINUOUS AXLE OR WHEEL NOISE (ANY AXLE).

Step 1. Check lubricant level at differential (1) (LO 9-2320-270-12).

If oil is low, fill to proper level (LO 9-2320-270-12).

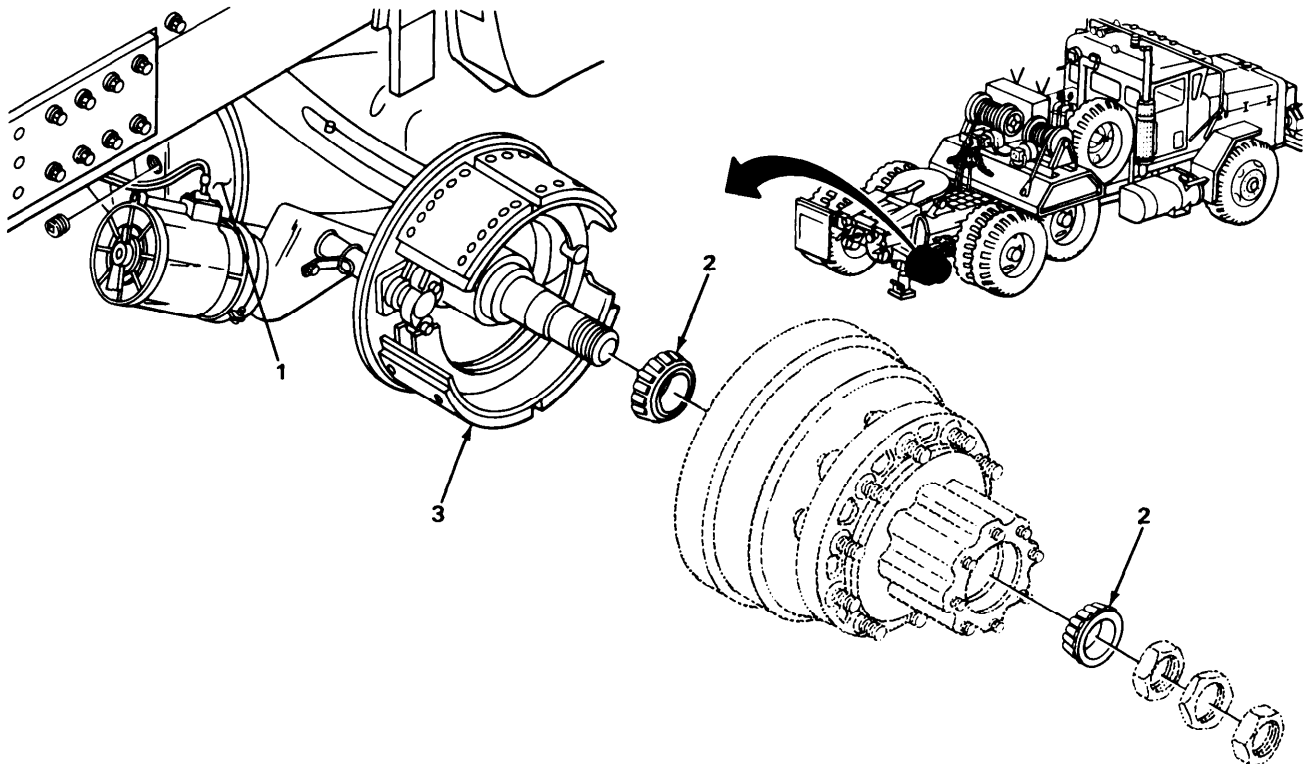
Step 2. Check wheel bearings (2) for damage and proper adjustment (page 4-925).

If wheel bearing is loose or damaged, tighten or replace (page 4-925).

Step 3. Check brakes (3) for dirt, damage, or dragging brake.

a. If brake is dirty, damaged, or dragging, clean, repair, or adjust (page 4-609).

b. If noise is still present, notify direct support maintenance.



TA239710

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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53. DIFFERENTIAL CARRIER ASSEMBLY OVERHEATING.

Step 1. Check carrier assembly (1) for buildup of mud or dirt.

If assembly is dirty, clean (page 4-1).

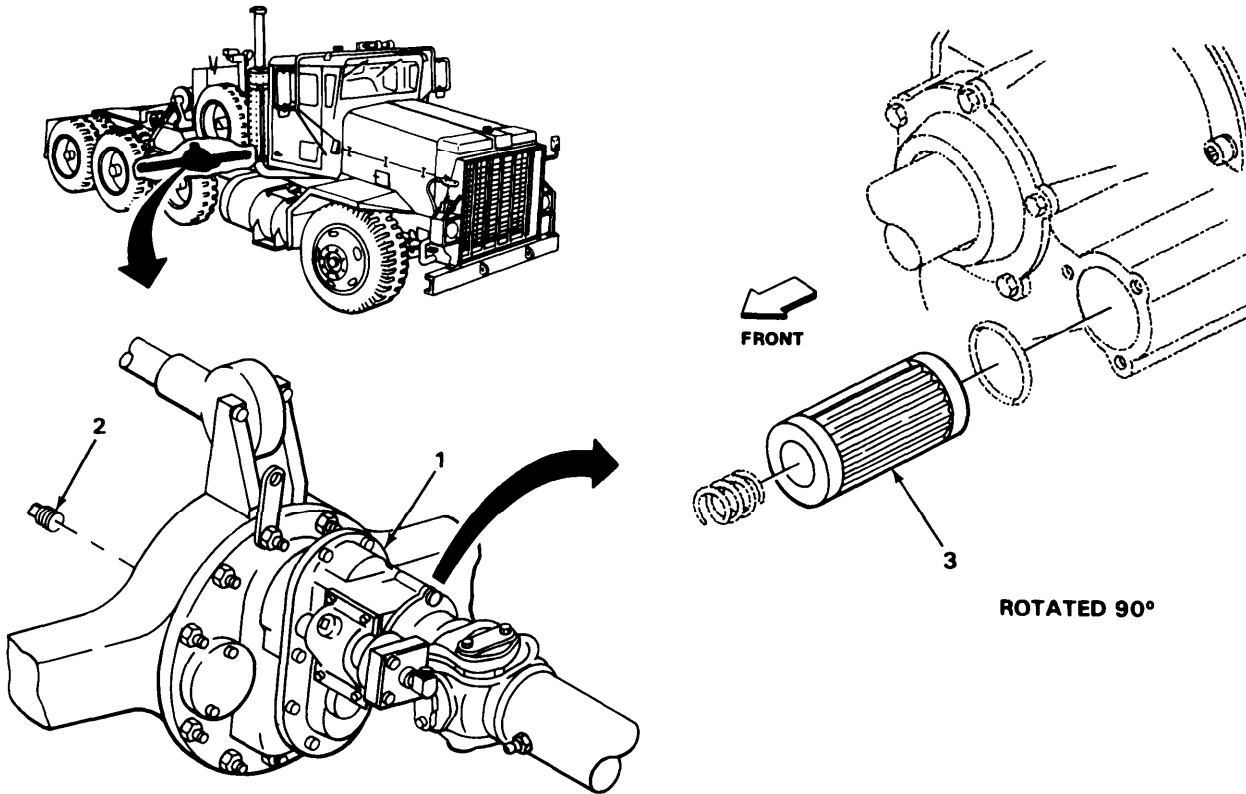
Step 2. Check oil level at lubricant check plug (2) (LO 9-2320-270-12).

If oil is low, fill to proper level (LO 9-2320-270-12).

Step 3. Check front tandem axle filter (3) for clogging (page 4-605).

a. If filter is clogged, replace (page 4-605).

b. If carrier assembly (1) still overheats, notify direct support maintenance.



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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54. EXCESSIVE NOISE OR VIBRATION IN PROPELLER SHAFT.

Step 1. Check bearing caps (1) for looseness.

If bearing caps are loose, tighten.

Step 2. Check U-joints (2) and propeller shaft (3) for insufficient lubrication, excessive wear, or damage (page 4-1).

a. If U-joints are dry, lubricate (LO 9-2320-270-12). If excessive wear or damage is found, replace (page 4-574).

b. If excessive noise or vibration is still present, notify direct support maintenance.



TA239712

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

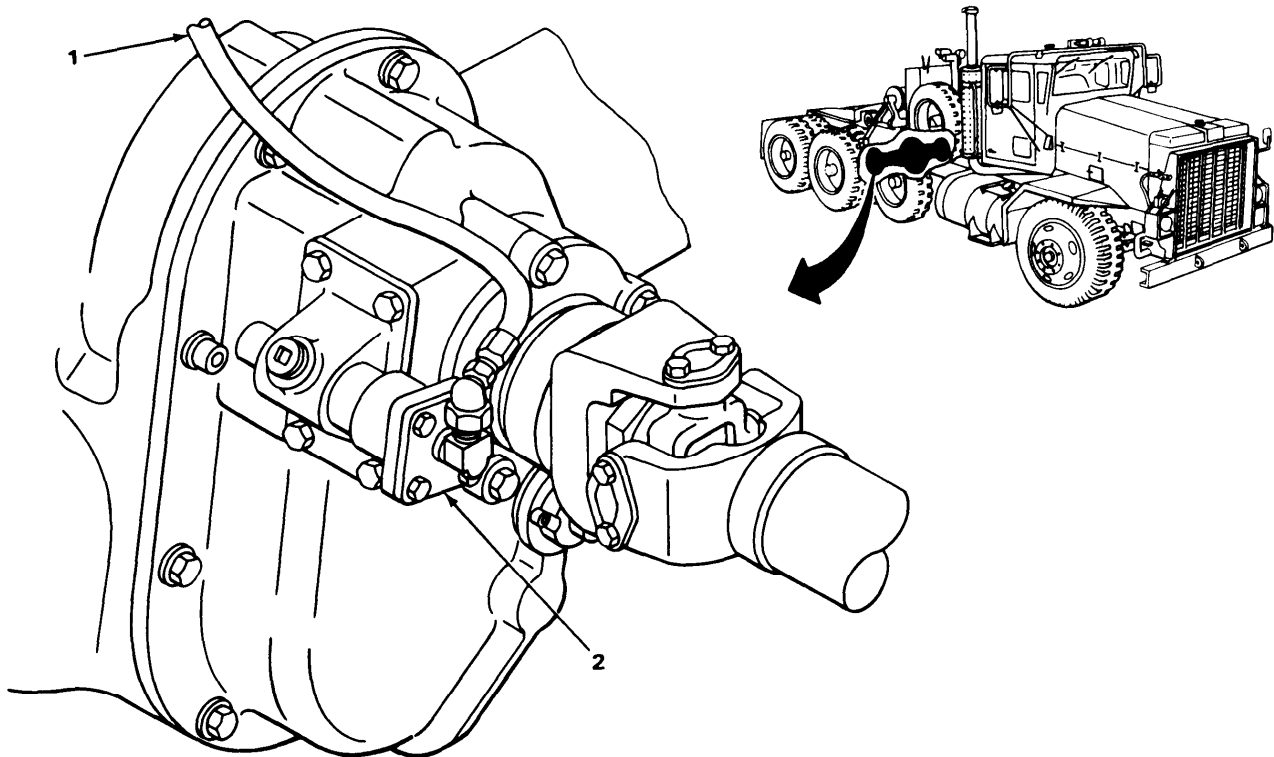
55. FORWARD TANDEM AXLE DIFFERENTIAL LOCKUP FAILS TO ENGAGE OR DISENGAGE.

Step 1. Start engine and build air pressure to operating level (TM 9-2320-270-10). Shut down engine charge line (1) to lockup control valve (2) by having assistant operate control (TM 9-2320-270-10). Using mild soap solution, check for air leaks in line (page 4-1).

If line is leaking, replace (page 4-609).

Step 2. Inspect lockup control valve (2) for damage (page 4-1).

If valve is damaged, notify direct support maintenance.



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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56. TANDEM AXLE NOT TRACKING PROPERLY.

Step 1. Check all tires (1) for correct pressure (TM 9-2320-270-10).

If pressure is low, add air (TM 9-2320-270-10).

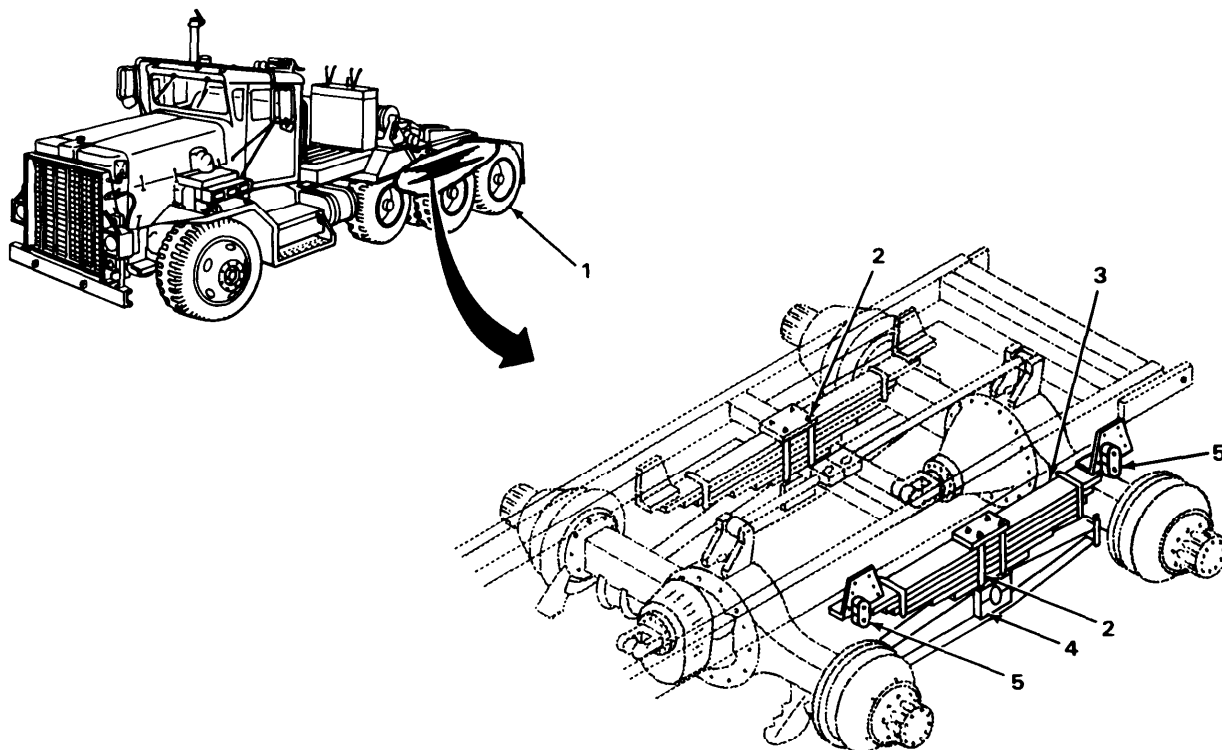
Step 2. Check U-bolts (2) for damage or looseness (page 4-1).

a. If U-bolts are damaged, notify direct support maintenance.

b. If U-bolts are loose, torque to 225-275 ft-lb (305-373 rim).

Step 3. Check springs (3), walking beam (4), and spring pins (5) for damage (page 4-1).

If springs, spring pins, or walking beam are damaged, notify direct support maintenance.



TA239714

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

56. TANDEM AXLE NOT TRACKING PROPERLY – CONTINUED.

Step 4. Check for dragging brake by jacking vehicle (TM 9-2320-270-10) and turning wheel (1).

If brake is dragging, repair (page 4-609).

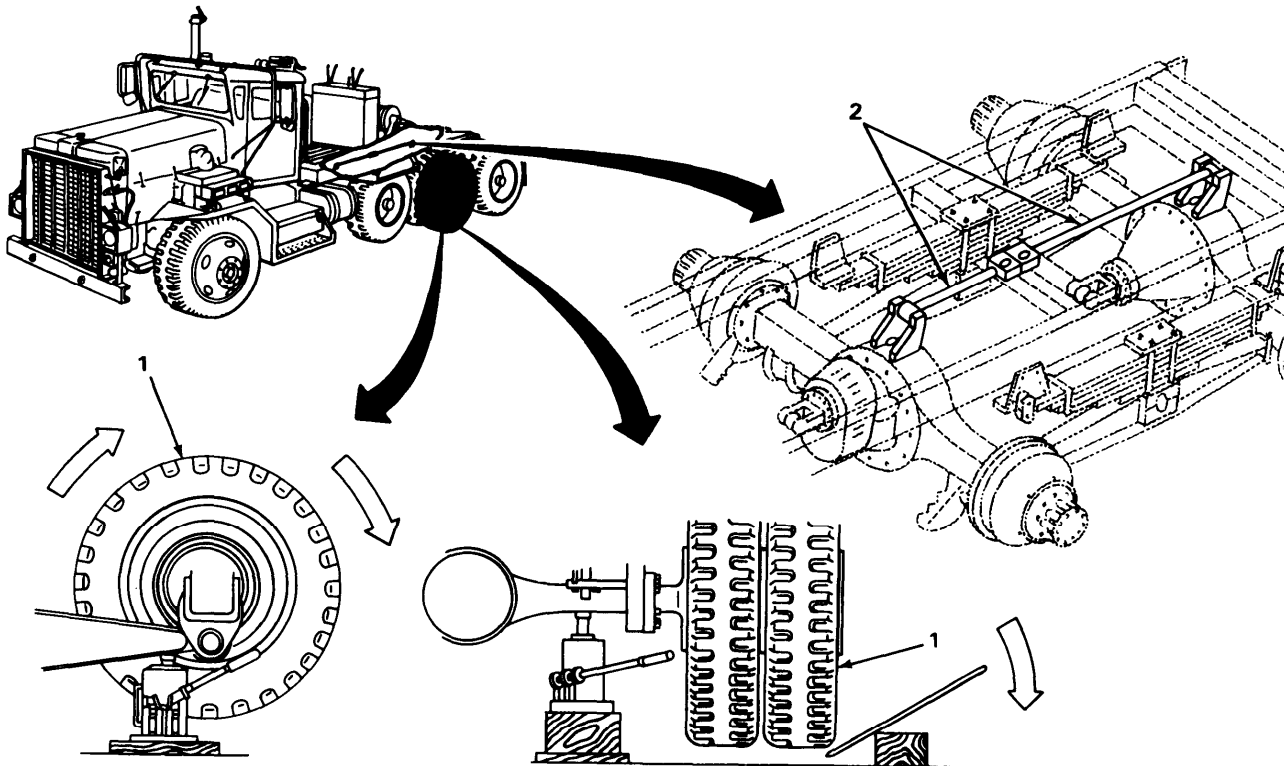
Step 5. Check for loose or damaged wheel bearings by jacking vehicle (TM 9-2320-270-10) and using pry bar to check for movement of wheel (1).

If bearings are worn or out of adjustment, replace or adjust (page 4-925).

Step 6. Check torque rods (2) for damage or looseness (page 4-1).

a. If torque rods are loose or damaged, notify direct support maintenance.

b. If axle still will not track properly, notify direct support maintenance.



TA239715

TROUBLESHOOTING - CONTINUED

MALFUNCTION	
	TEST OR INSPECTION
	CORRECTIVE ACTION

AIRBRAKE SYSTEM

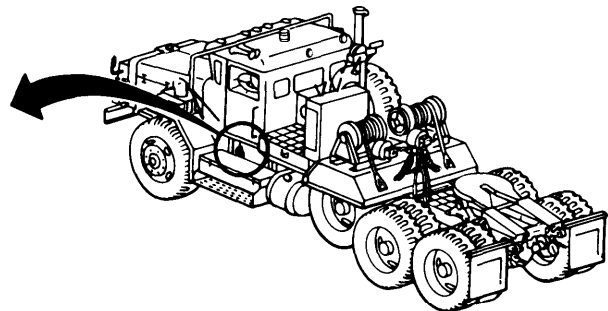
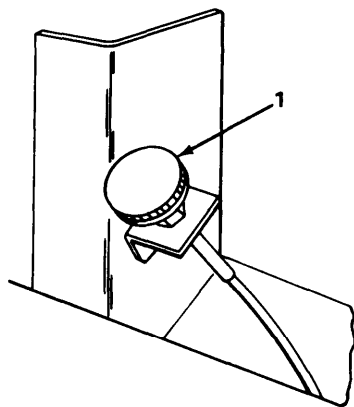
57. NO OR LOW AIR PRESSURE.

NOTE

If there is no air pressure, go to step 5.

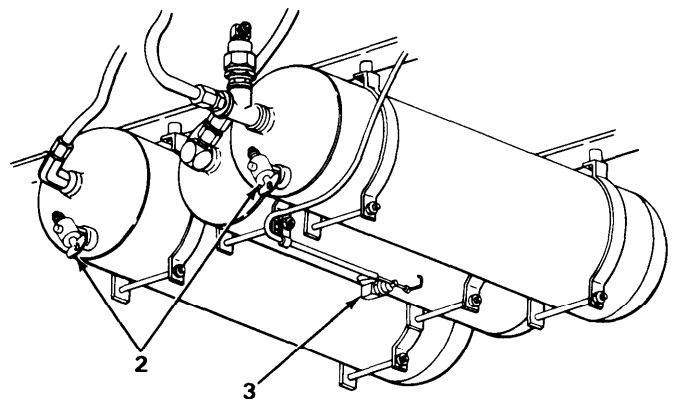
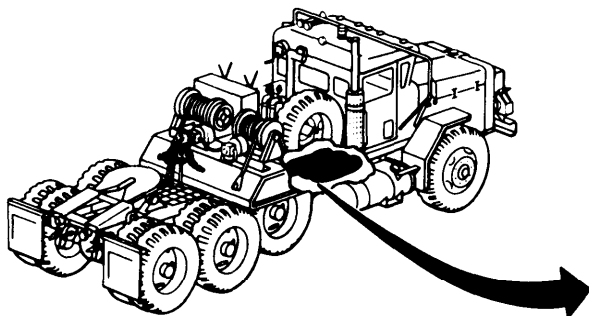
Step 1. Start engine and build air pressure to operational level (TM 9-2320-270-10). Shut down engine (TM 9-2320-270-10). Check if reservoir air pressure release valve (1) is open.

If valve is open, close (TM 9-2320-270-10).



Step 2. Check two reservoir tank drain valves (2) and air pressure release valve (3) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If valves are leaking or damaged, replace (4-718).



TA239716

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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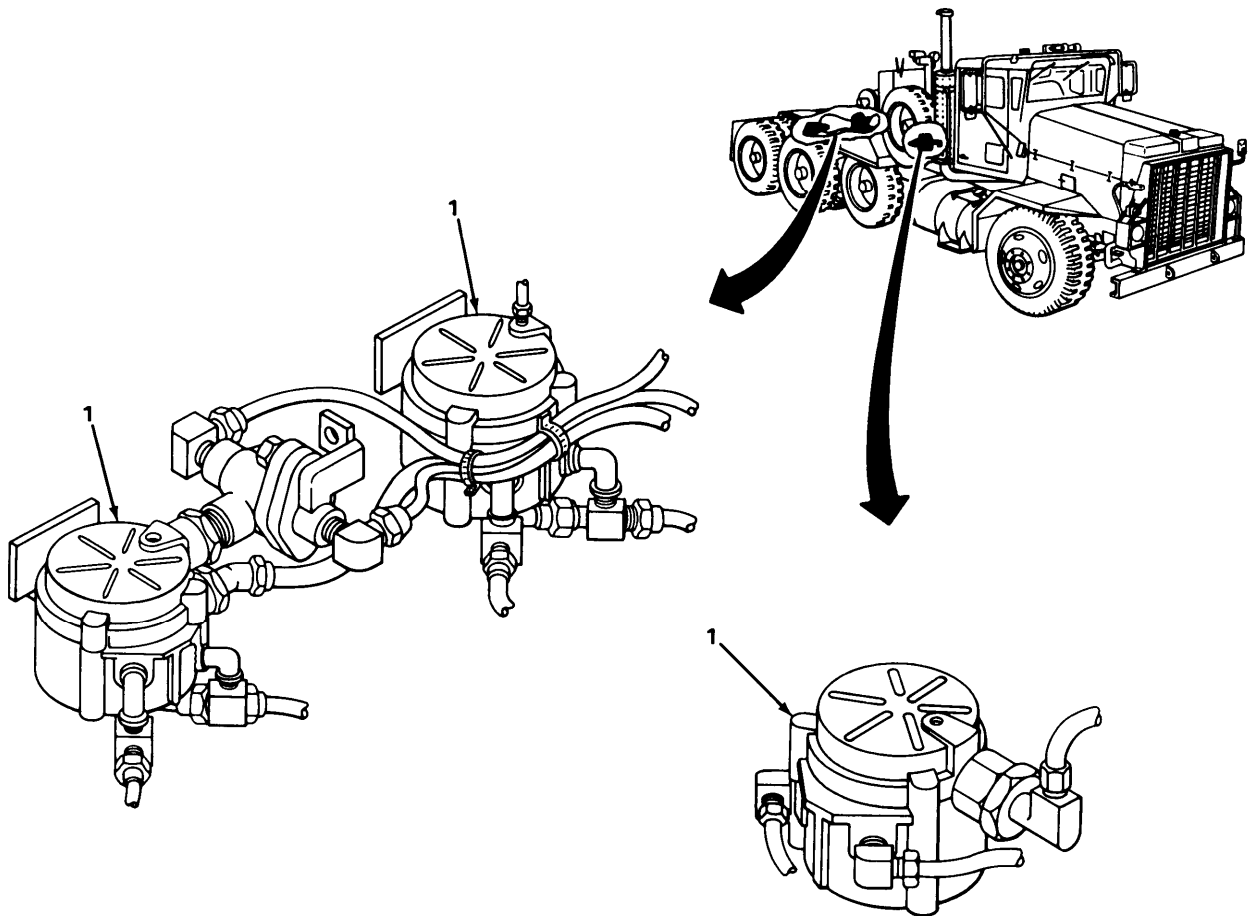
57. NO OR LOW AIR PRESSURE – CONTINUED.

Step 3. Check air lines for leaks or damage by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If lines are damaged or leaking, replace or repair (page 4-609).

Step 4. Check all brake relay valves (1) for leaks or damage by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If brake valves are damaged or leaking, replace (page 4-796).



TA239717

TROUBLESHOOTING - CONTINUED

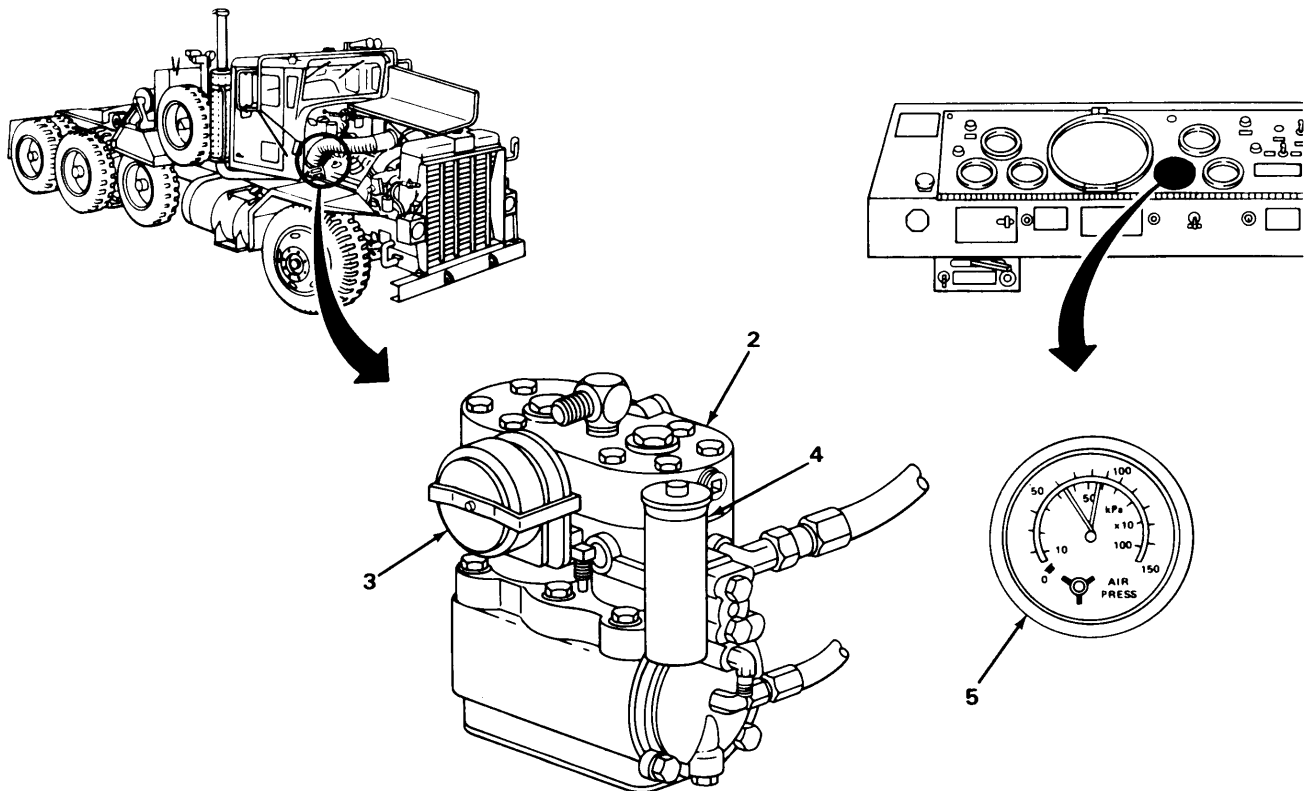
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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Step 5. Open right side of hood and remove side panel (TM 9-2320-270-10). At air compressor (2), remove intake air filter (3) and check for damage or clogs.

If damaged or clogged, replace or clean (page 4-855).

Step 6. Start engine (TM 9-2320-270-10). Build up air pressure until compressor governor (4) cuts off compressor. Watch air pressure gage (5) and note pressure recorded at cutoff. Cutoff pressure should be in accordance with piece number of governor (105 to 125 psi). With engine still running, apply and release brake several times to reduce air pressure and note reading when governor cuts in compressor. Cut-in pressure must be in accordance with piece number of governor (80 to 100 psi).

If governor (4) does not cut off and cut in according to piece number figures, shut down engine (TM 9-2320-270-10) and replace (page 4-851).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

57. NO OR LOW AIR PRESSURE – CONTINUED.

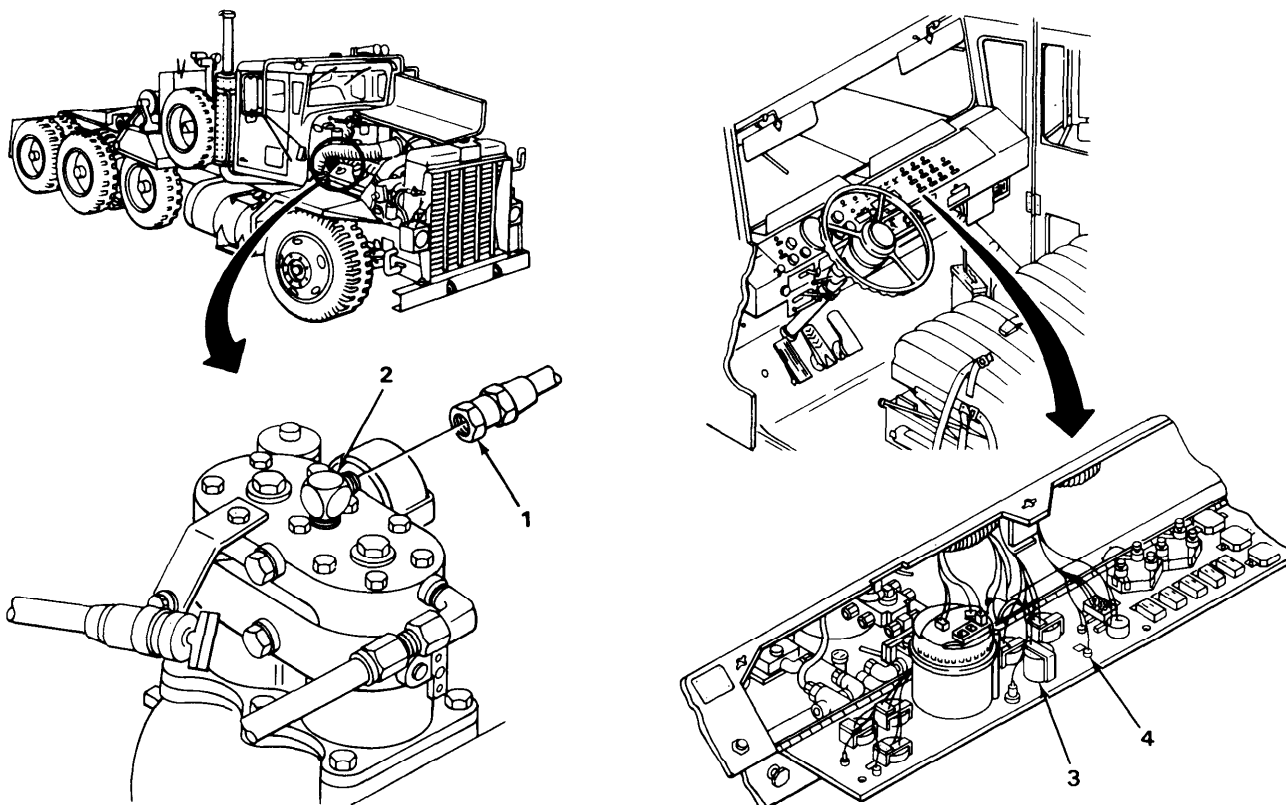
Step 7. Shut down engine (TM 9-2320-270-10). Disconnect air line (1) from outlet on top of compressor (2). Start engine (TM 9-2320-270-10) and see if compressor is working (air will pump out of compressor).

If compressor does not work, shut down engine (TM 9-2320-270-10) and replace (page 4-842).

Step 8. Install side panel and close right side of hood (TM 9-2320-270-10). Open instrument panel (page 4-244). Check air pressure gage (3) and low pressure warning light/buzzer (4) (TM 9-2320-270-10).

a. If gage or warning light/buzzer does not work, replace or repair (page 4-321).

b. If truck still has no or low pressure, close instrument panel (page 4-244) and notify direct support maintenance.



TA239719

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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58. EXCESSIVE AIR PRESSURE.

Step 1. Open right side of hood and remove side panel (TM 9-2320-270-10). Check air compressor governor (1) if it is working (NO OR LOW AIR PRESSURE – (step 6)) (page 3-129).

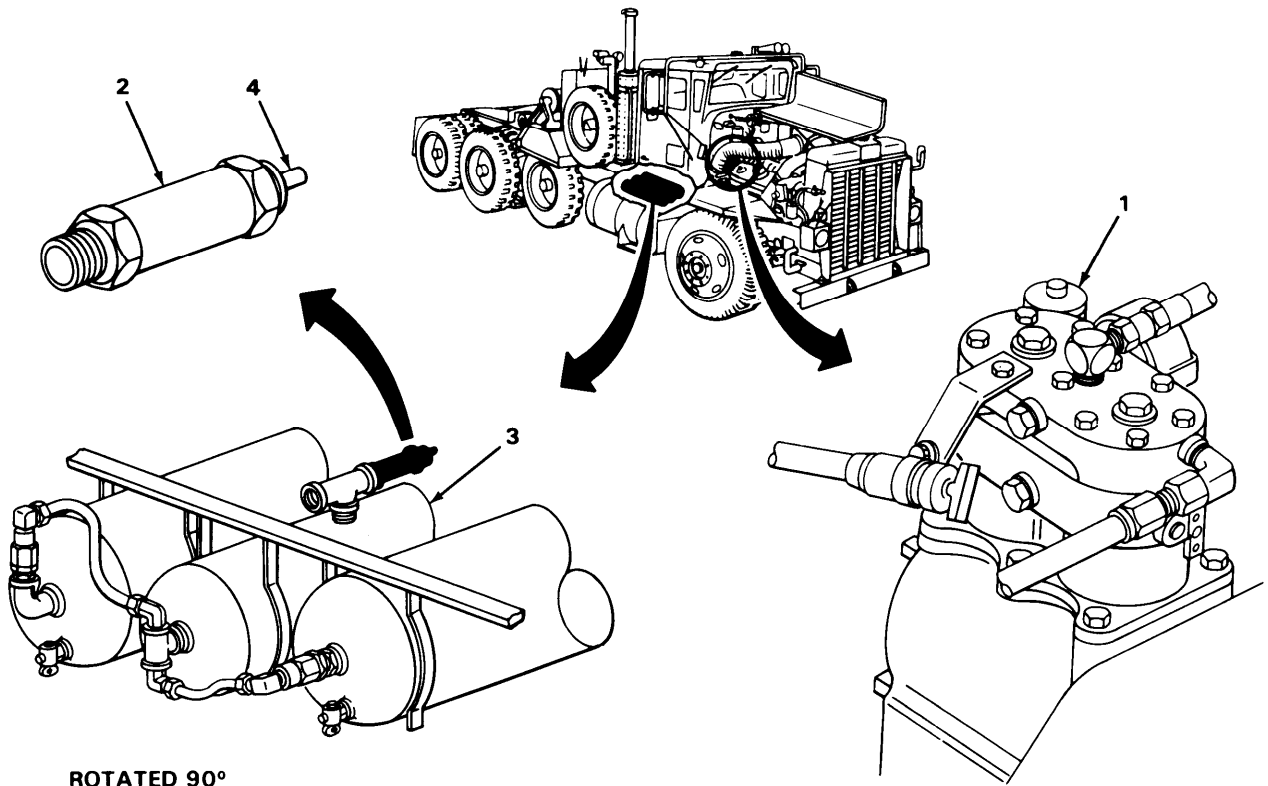
If governor does not work, replace (page 4-851).

WARNING

Be sure to wear safety goggles or lenses when venting air lines. Compressed air and particles amoved by compressed air can cause damage to your eyes.

Step 2. Install side panel and close right side of hood (TM 9-2320-270-10). Check safety release valve (2), on top of reservoir tank (3), for operation by pulling exposed stem (4) to open valve and then releasing. Air should be released when stem is pulled and stopped when stem is released.

If safety valve does not work, replace (page 4-714).



ROTATED 90°

TA239720

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

58. EXCESSIVE AIR PRESSURE – CONTINUED.

Step 3. Open instrument panel (page 4-244). Using pressure gage of known accuracy, check pressure gage (1) in truck. (TM 9-2320-270-10).

- a. If gage does not work, replace gage (4-1330).
- b. If gage works, close instrument panel (page 4-244) and notify direct support maintenance.

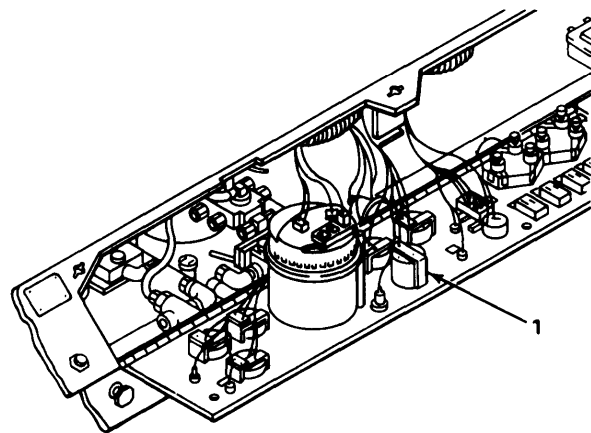
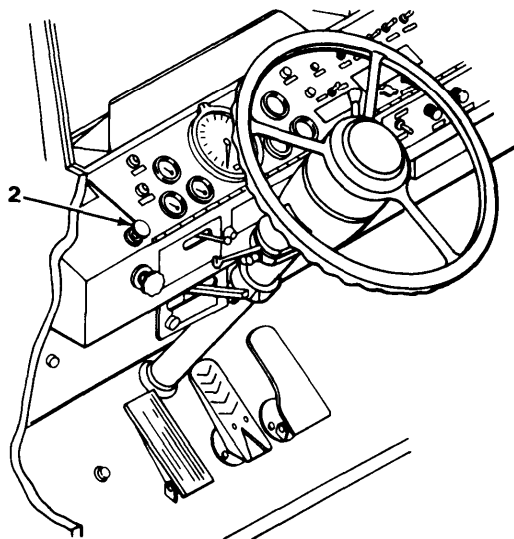
59. SPRING BRAKES WILL NOT RELEASE.

Step 1. Start engine and build air pressure to operational level (TM 9-2320-270-10). Check parking brake valve for air pressure at valve. Shut down engine (TM 9-2320-270-10).

If there is no air pressure at parking brake valve, go to NO OR LOW AIR PRESSURE (page 3-129).

Step 2. Check parking brake hand valve (2) for leaks or damage. Listen for hissing or use soap solution and watch for bubbles (page 4-1).

If valve is damaged or leaking, replace valve (4-806).



TA239721

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

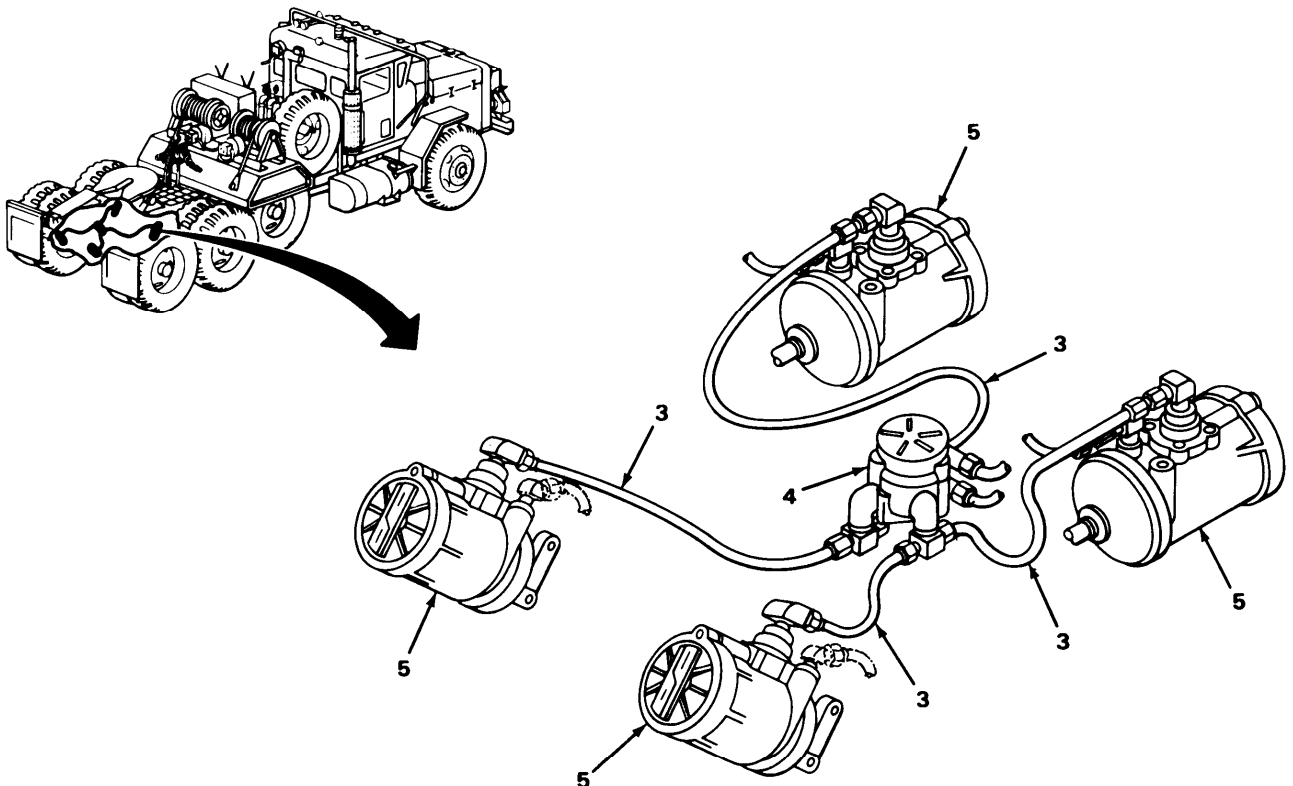
CORRECTIVE ACTION

Step 3. Check for damage or leaks in four lines (3) from relay valve (4) to spring brake chambers (5) by listening for hissing sound or using soap solution and watching for bubbles (page 4-1).

If lines are damaged or leaking, repair or replace (page 4-609).

Step 4. Check four spring brake air chambers (5) for damage or leaks by listening for hissing sound or using soap solution and watching for bubbles (page 4-1).

If chambers are damaged or leaking, replace (page 4-701), or notify direct support maintenance for repair.



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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59. SPRING BRAKES WILL NOT RELEASE – CONTINUED.

Step 5. Check double check valve (1) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If valve is damaged or leaking, replace (page 4-796), or notify direct support maintenance for repair.

Step 6. Check rear axle relay valve (2) for damage or leaks by listening for hissing or by using soap solution and watching for bubbles (page 4-1).

If relay valve is damaged or leaking, replace (page 4-785), or notify direct support maintenance for repair.

Step 7. Check spring brake valve (3) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If valve is damaged or leaking, replace (page 4-806), or notify direct support maintenance for repair.

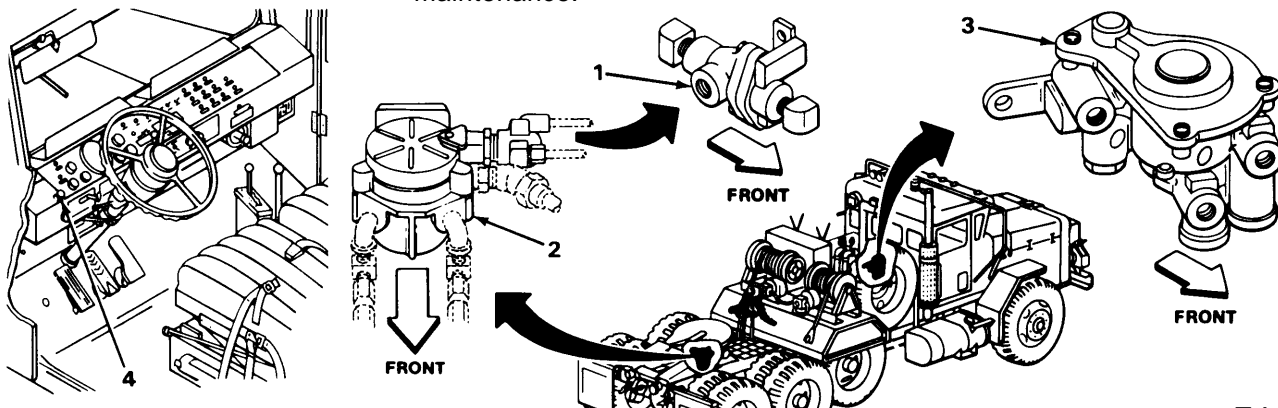
Step 8. Check hose no. 612 from parking brake hand valve (4) in cab to spring brake valve (3) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose is damaged or leaking, replace or repair (4-609).

Step 9. Check hose no. 622 from spring brake valve (3) to double check valve (1) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

a. If hose is damaged or leaking, repair or replace (page 4-609).

b. If all spring brakes still will not release, notify direct support maintenance.



TA239723

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

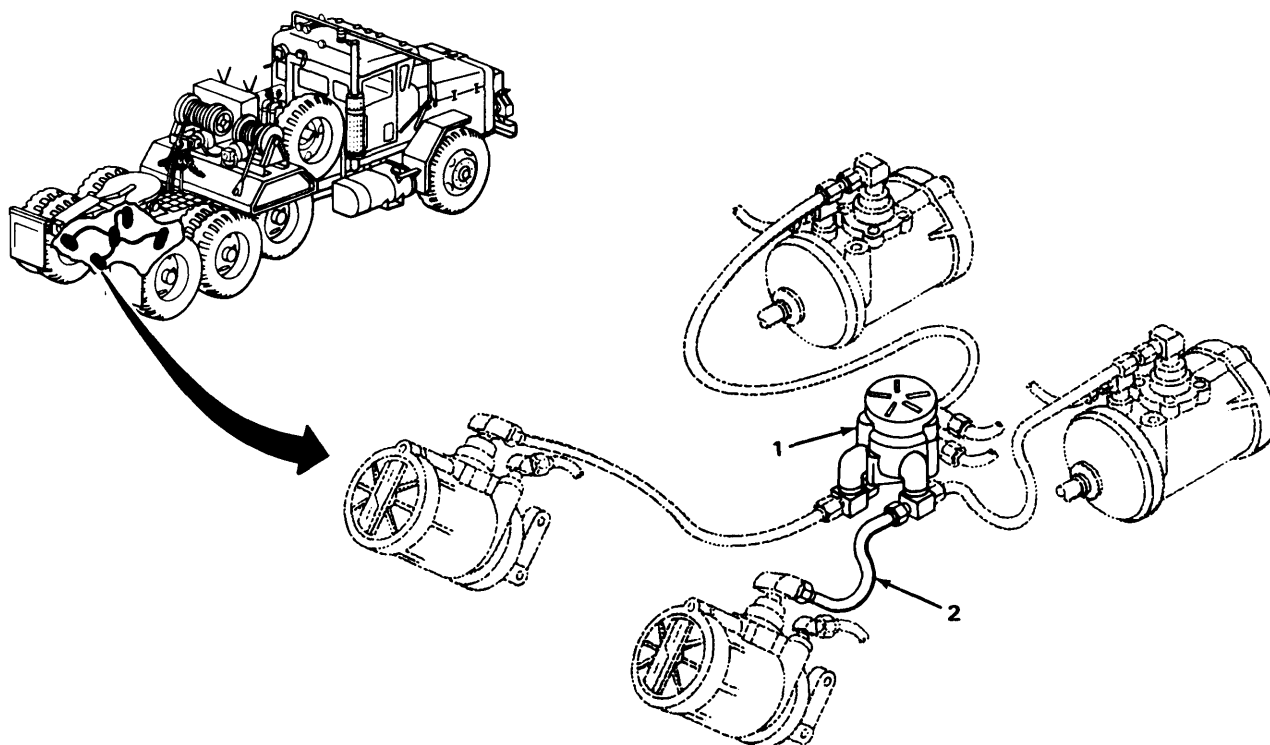
60. SPRING BRAKE WILL NOT RELEASE (ONE OR MORE WHEELS).

- Step 1. Start engine and build air pressure to operational level (TM 9-2320-270-10). Shut down engine (TM 9-2320-270-10). Check spring brake relay valve (1) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If relay valve is damaged or leaking, replace (page 4-796), or notify direct support maintenance for repair.

- Step 2. Check hose (2) from relay valve to brake chamber for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose is damaged or leaking, repair or replace (page 4-609).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

60. SPRING BRAKE WILL NOT RELEASE (ONE OR MORE WHEELS) - CONTINUED.

Step 3. Check brake chamber (1) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If brake chamber is damaged or leaking, replace (page 4-701), or notify direct support maintenance for repair.

Step 4. Check slack adjuster (2) for damage and proper adjustment (page 4-624).

If slack adjuster is damaged or out of adjustment, repair or adjust (page 4-624).

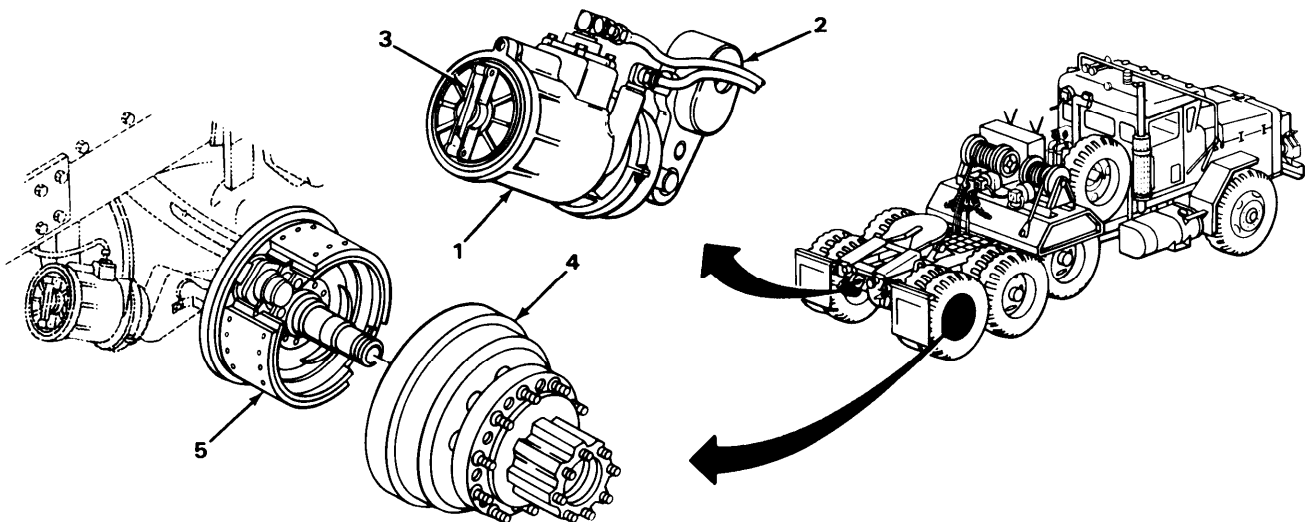
Step 5. Check spring brake hand release system (3) for damage.

If release system is damaged, replace (page 4-701), or notify direct support for repair.

Step 6. Check brakedrum (4) and brakeshoes (5) for damage (page 4-1).

a. If drum or shoes are damaged, replace (page 4-925 or 4-621) or notify direct support maintenance for repair.

b. If spring brakes still will not release, notify direct support maintenance.



TA239725

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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61. SPRING BRAKES DO NOT APPLY.

Step 1. Check parking brake hand valve (1) (TM 9-2320-270-10).

If valve does not release air pressure, bleed off pressure and replace valve (page 4-731).

Step 2. Check spring brake valve (2) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If valve is damaged, replace valve (page 4-806).

Step 3. Check hose no. 612 from parking brake hand valve (1) to spring brake valve (2) and hose no. 622 from spring brake valve to doublecheck valve (3) for damage or leaks by listening for hissing or using a mild soap solution and watching for bubbles (page 4-1).

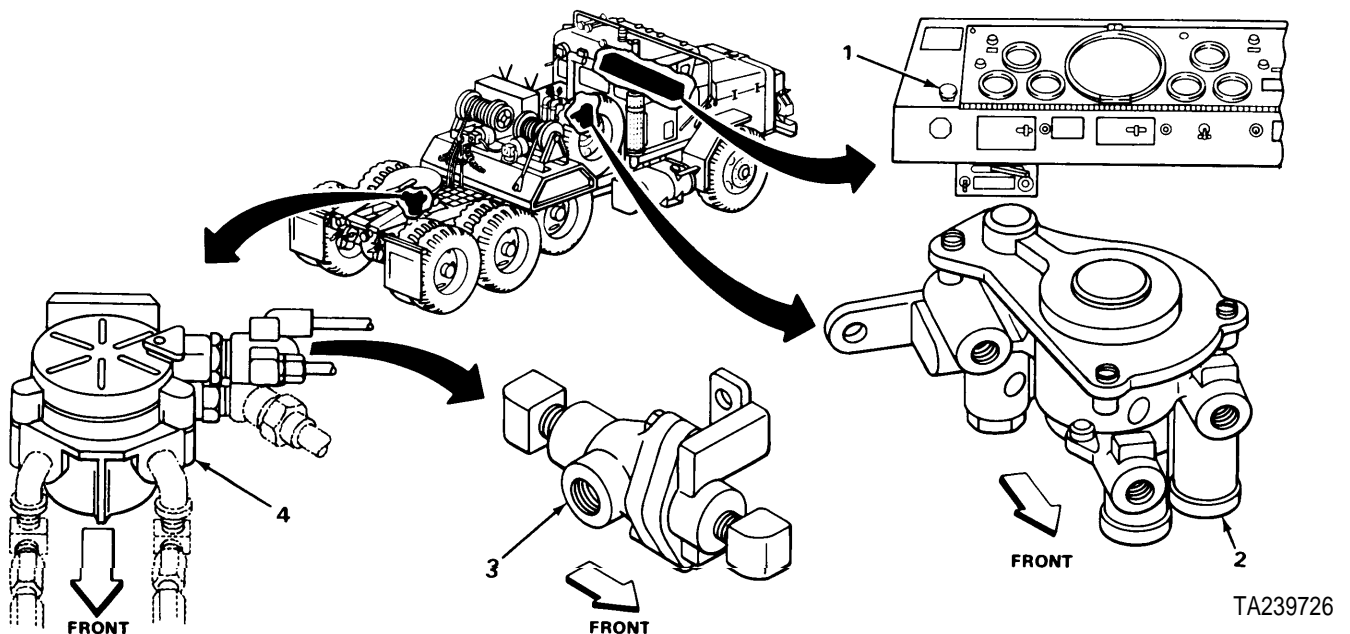
If hoses are damaged or leaking, repair or replace (page 4-609).

Step 4. Check doublecheck valve (3) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If valve is damaged or leaking, replace (4-731).

Step 5. Check exhaust port on relay valve (4) for damage or clogs (page 4-1).

If port is damaged or clogged, replace or clean (page 4-785).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

61. SPRING BRAKES DO NOT APPLY – CONTINUED.

Step 6. Check spring brakes (1) for mud, stones, or other obstructions.

If brakes are obstructed, clear away obstructing material (page 4-1).

Step 7. Cage spring (TM 9-2320-270-10) and check if spring (2) is broken.

If spring is broken, replace air chamber (page 4-701).

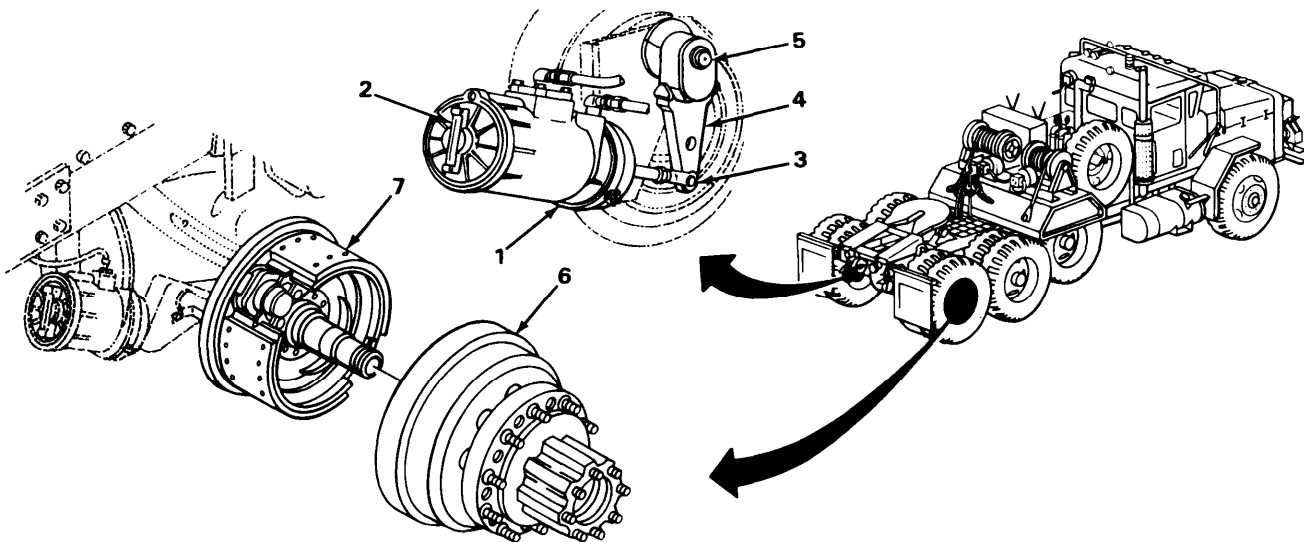
Step 8. Disconnect plunger end (3) from slack adjuster (4). Check slack adjuster and camshaft (5) for damage and freedom of movement.

If slack adjuster and camshaft are damaged, or do not move freely, replace (page 4-624).

Step 9. Connect slack adjuster to plunger end and uncage air chamber spring (TM 9-2320-270-10). Check brakedrum (6) and brakeshoes (7) for damage and adjustment (page 2-35).

a. If brakedrum or brakeshoes are damaged, or out of adjustment, adjust, replace (page 4-621), or notify direct support maintenance for repair.

b. If spring brakes still do not apply, notify direct support maintenance.



TA239727

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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62. SERVICE BRAKES FAIL TO APPLY OR RELEASE, OR APPLY OR RELEASE SLOWLY.

Step 1. Start engine and build air pressure to operating level (TM 9-2320-270-10). Shut down engine (TM 9-2320-270-10). Check treadle valve for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If treadle valve is leaking or damaged, replace (page 4-720).

Step 2. Check air line no. 488 from treadle valve (1) to quick release valve (2) on front axle for leaks or damage by listening for hissing or using soap solution and watching for bubbles (page 4-1).

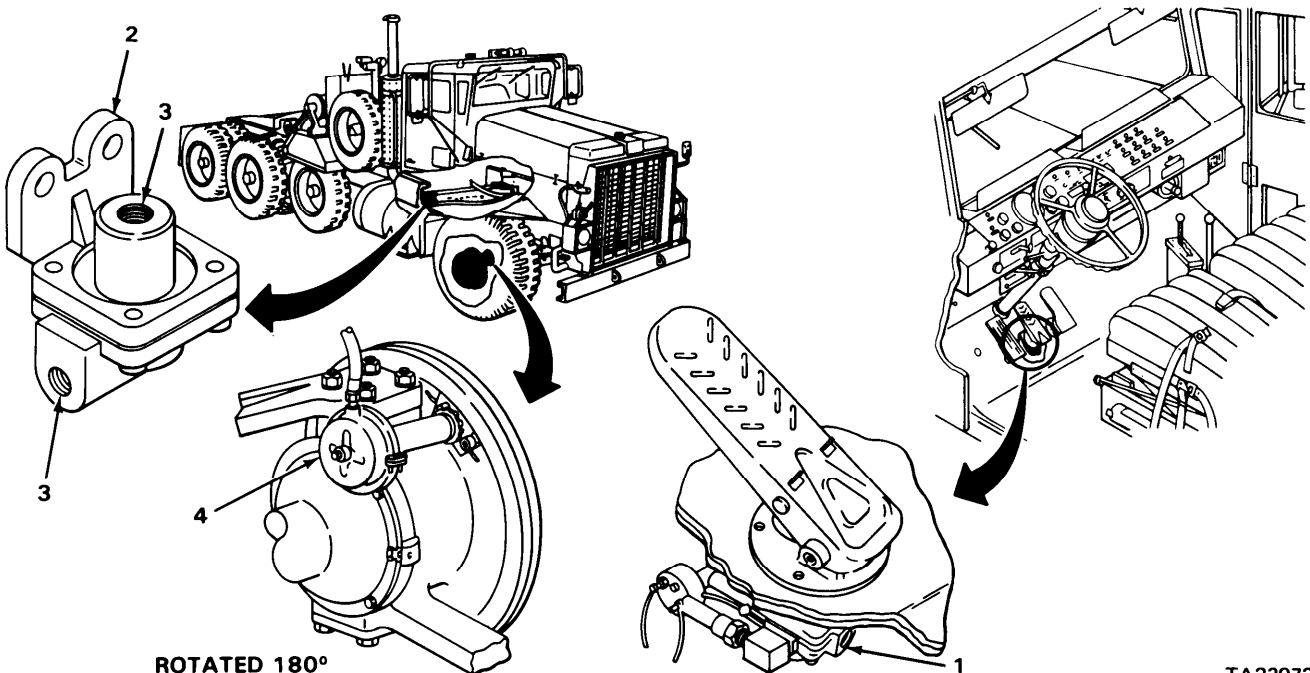
If line is damaged or leaking, repair or replace (page 4-609).

Step 3. Check quick release valve (2) for damage or clogged ports (3).

If valve is damaged or has clogged ports, replace (page 4-812).

Step 4. Check air lines from quick release valve (2) to both front brake chambers (4) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

if lines are damaged or leaking, repair or replace (page 4-609).



ROTATED 180°

TA239728

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

- Step 5. Check both front axle brake chambers (1) for damage, clogs, or sticking parts (page 4-1).

If brake chambers are damaged, clogged, or sticking, clean or replace (page 4-686).
- Step 6. Check both front brakedrums (2) and brakeshoes (3) for damage or foreign material (page 2-35).

If brakedrums or shoes are damaged or dirty, Replace, clean (page 4-893) or (page 4-610), or notify direct support maintenance for repair.
- Step 7. Check air line no. 633 from reservoir (4) to pusher axle relay valve (5), and air line no. 536 from reservoir to tandem axle relay valve (6) for damage and leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If lines are damaged or leaking, replace or repair (page 4-609).
- Step 8. Check pusher axle relay valve (5) and rear axle relay valve (6) for damage, leaks, or clogged exhaust ports (page 4-1).

If either relay valve is damaged, leaking or clogged, clean or replace (page 4-779 and page 4-785).
- Step 9. Check hoses from pusher axle relay valve (5) to pusher axle brake chambers (7) for damage or leaks by listening for hissing or by using mild soap solution and watching for bubbles (page 4-1).

If hoses are damaged or leaking, repair or replace hoses (page 4-609).
- Step 10. Check four pusher axle brake chambers (7) for damage, clogs, or sticking parts (page 4-1).

If brake chambers are damaged, clogged, or sticking, clean or replace (page 4-692).

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

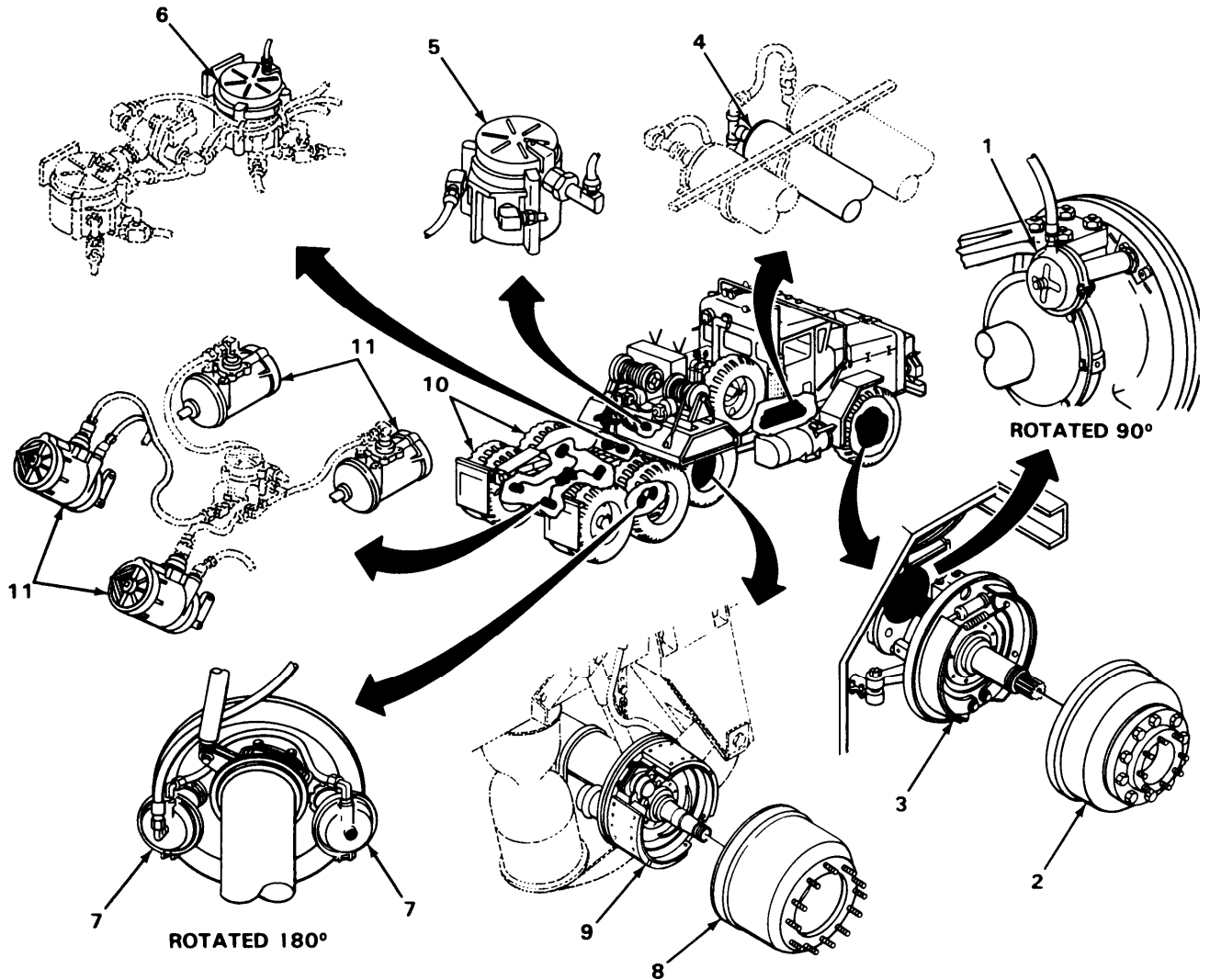
CORRECTIVE ACTION

Step 11. Check pusher axle brakedrums (8) and brakeshoes (9) for damage or foreign material (page 4-910 and page 4-616).

If brakedrums or shoes are damaged or dirty, repair or clean (page 4-910) or (page 4-616).

Step 12. On tandem axles (10) check four spring brakes (11) for correct operation (TM 9-2320-270-10).

If spring brakes are not operating correctly, go to **SPRING BRAKE WILL NOT RELEASE** (page 3-134).



TA239729

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

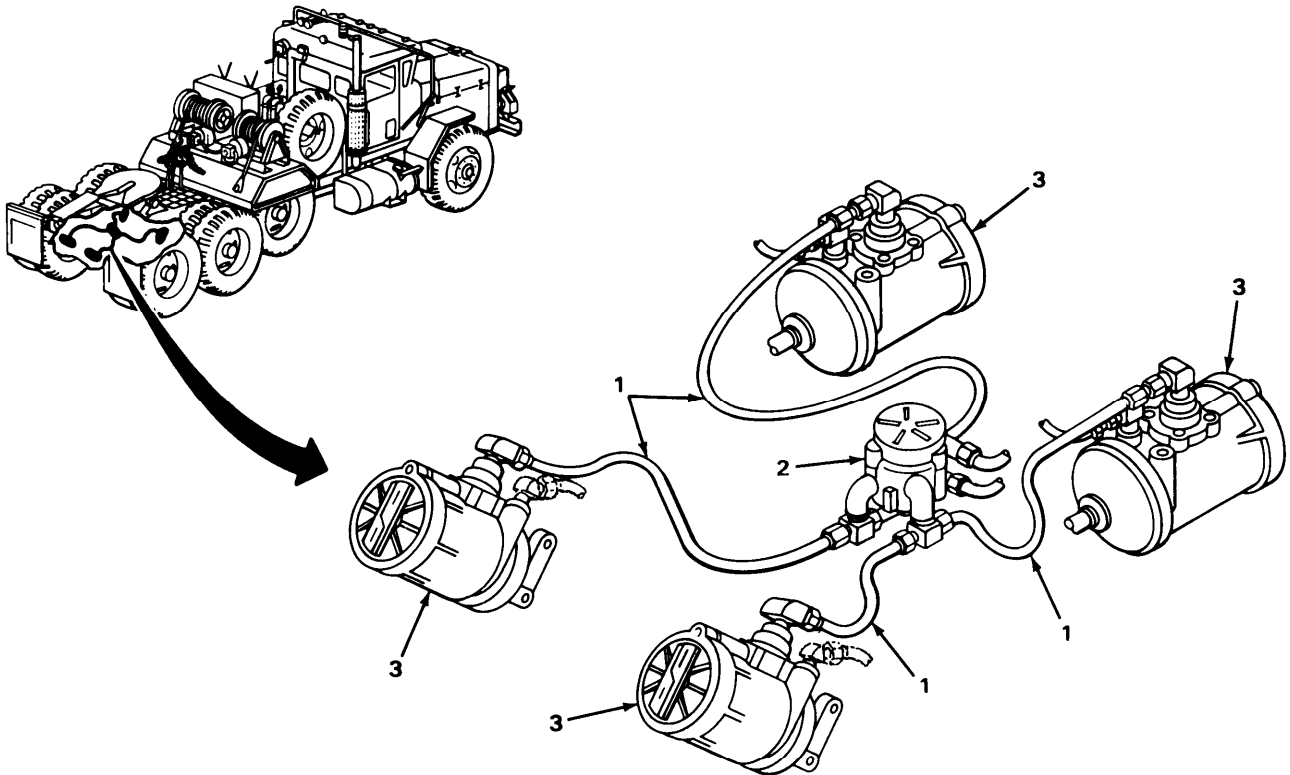
62. SERVICE BRAKES FAIL TO APPLY OR RELEASE, OR APPLY OR RELEASE SLOWLY – CONTINUED.

Step 13. Check four hoses (1) from rear axle relay valve (2) to four rear axle brake chambers (3) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hoses are damaged or leaking, repair or replace (page 4-609).

Step 14. Check four rear axle brake chambers (3) for damage, clogs, or sticking parts (page 4-1).

If brake chambers are damaged, clogged, or sticking, clean or replace (page 4-701).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

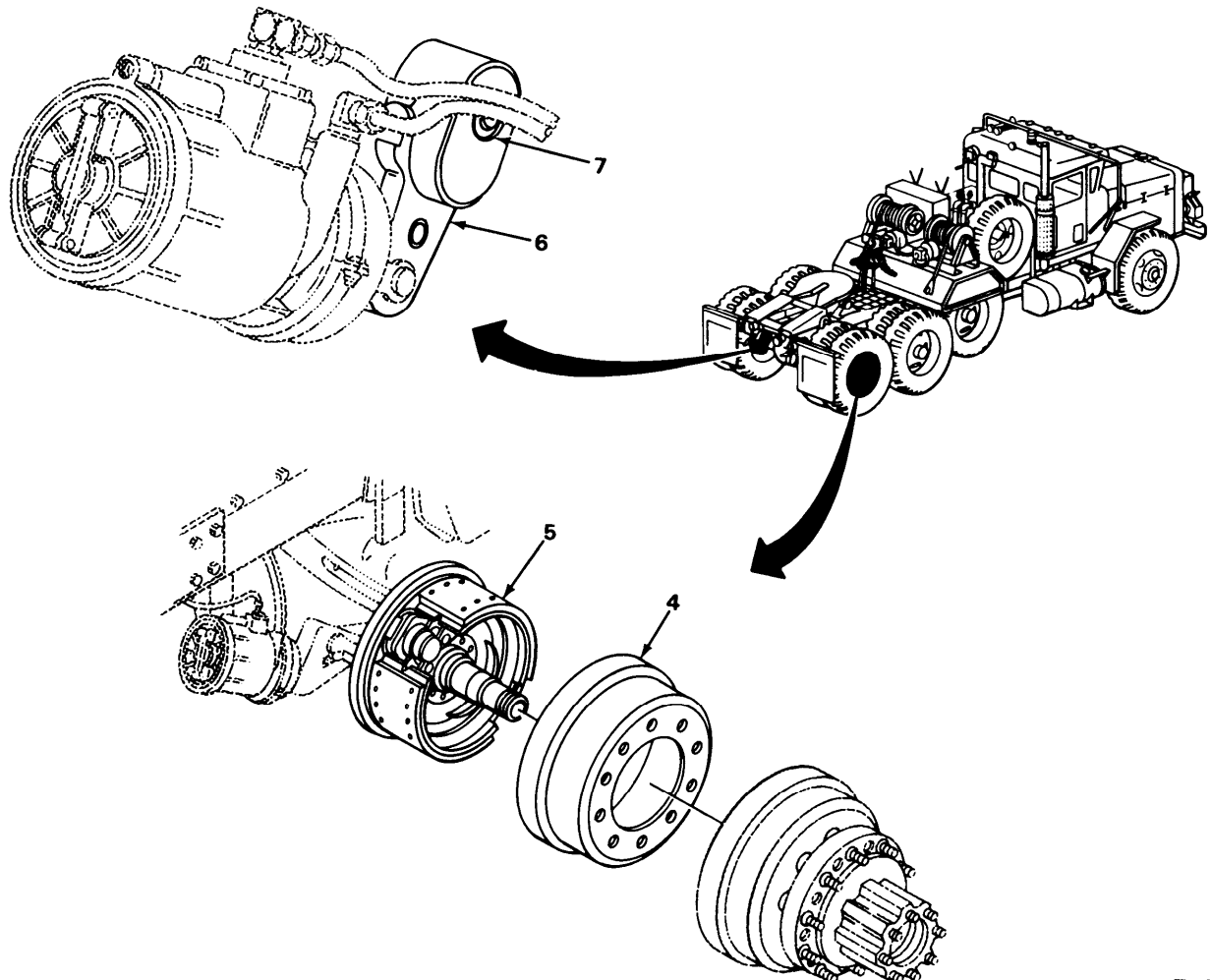
CORRECTIVE ACTION

Step 15. Check four brakedrums (4) and brakeshoes (5) on tandem axles for damage or foreign material (page 4-925 and page 4-621).

If brakedrums or shoes are damaged or dirty, replace or clean (page 4-925) or (page 4-621), or notify direct support maintenance for repair.

Step 16. Check slack adjusters (6) and camshafts (7) for damage, adjustment, and freedom of movement (page 4-1).

If slack adjusters or camshafts are damaged, out of adjustment, or binding, adjust, repair, or lubricate (page 4-624) or (LO 9-2320-270-12).



TA239731

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

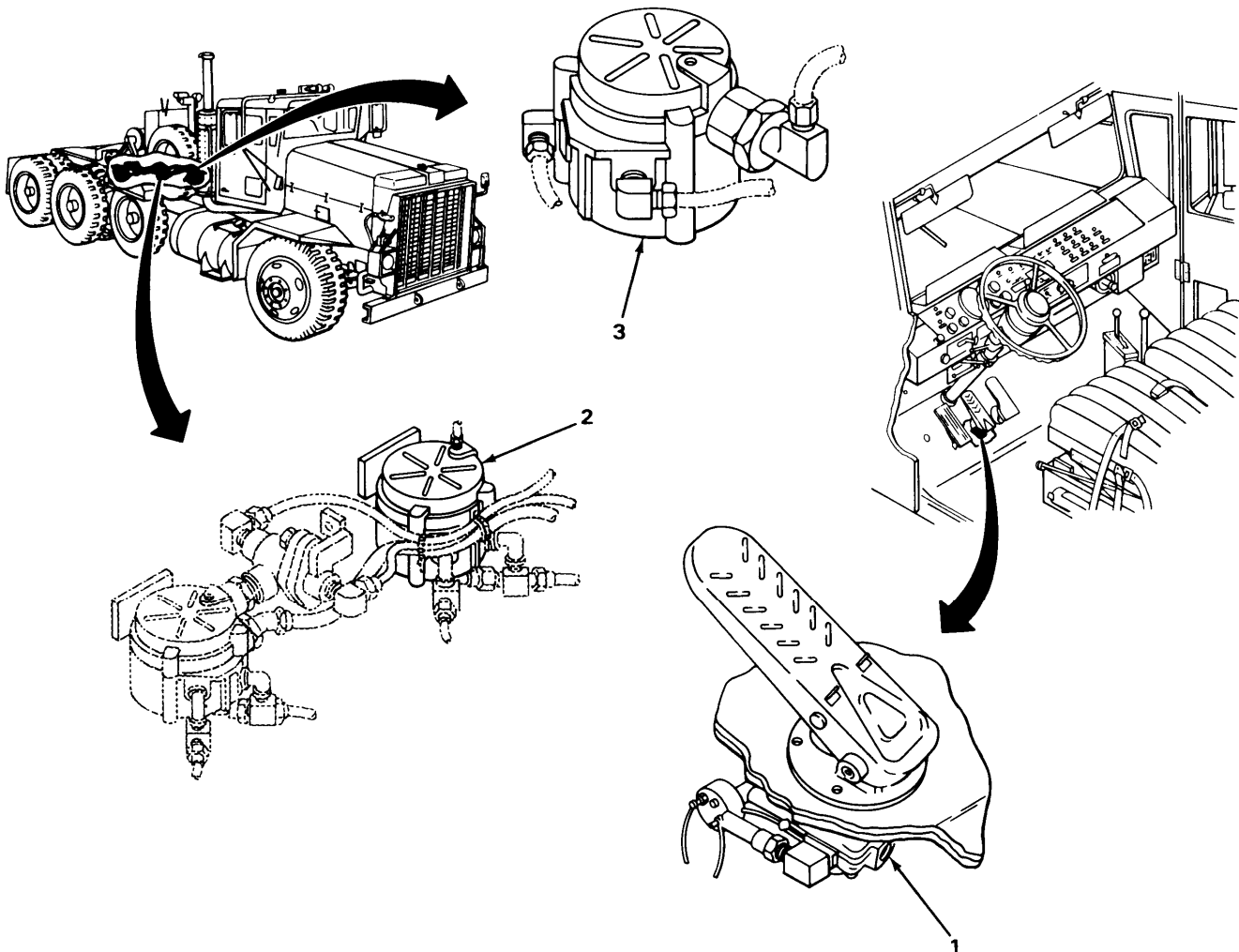
CORRECTIVE ACTION

62. SERVICE BRAKES FAIL TO APPLY OR RELEASE, OR APPLY OR RELEASE SLOWLY – CONTINUED.

Step 17. Check hoses from treadle valve (1) to tandem axle relay valve (2) and pusher axle relay valve (3) for damage and leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

a. If hoses are leaking or damaged, repair or replace hoses (page 4-609).

b. If service brakes still fail to release or release slowly, notify direct support maintenance.



TA239732

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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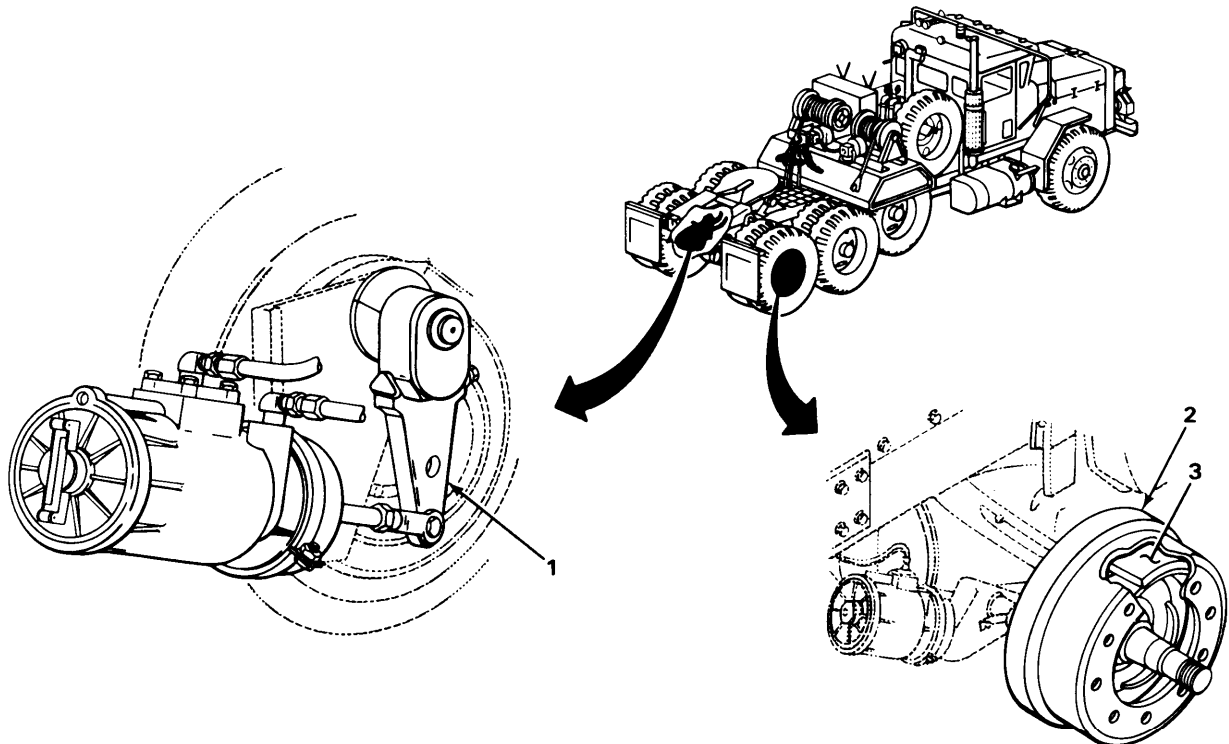
63. UNEVEN OR ERRATIC SERVICE BRAKES ON TANDEM AXLE WHEELS.

Step 1. Check four rear axle slack adjusters (1) for damage and proper adjustment (page 4-1).

If slack adjusters are damaged or out of adjustment, repair or adjust (page 4-624).

Step 2. Check four tandem axle brakedrums (2) and rear axle brakeshoes (3) for damage or foreign material (page 4-925).

If brakedrums or shoes are damaged or dirty, replace clean (page 4-925) or (page 4-621) or notify direct support maintenance for repair.



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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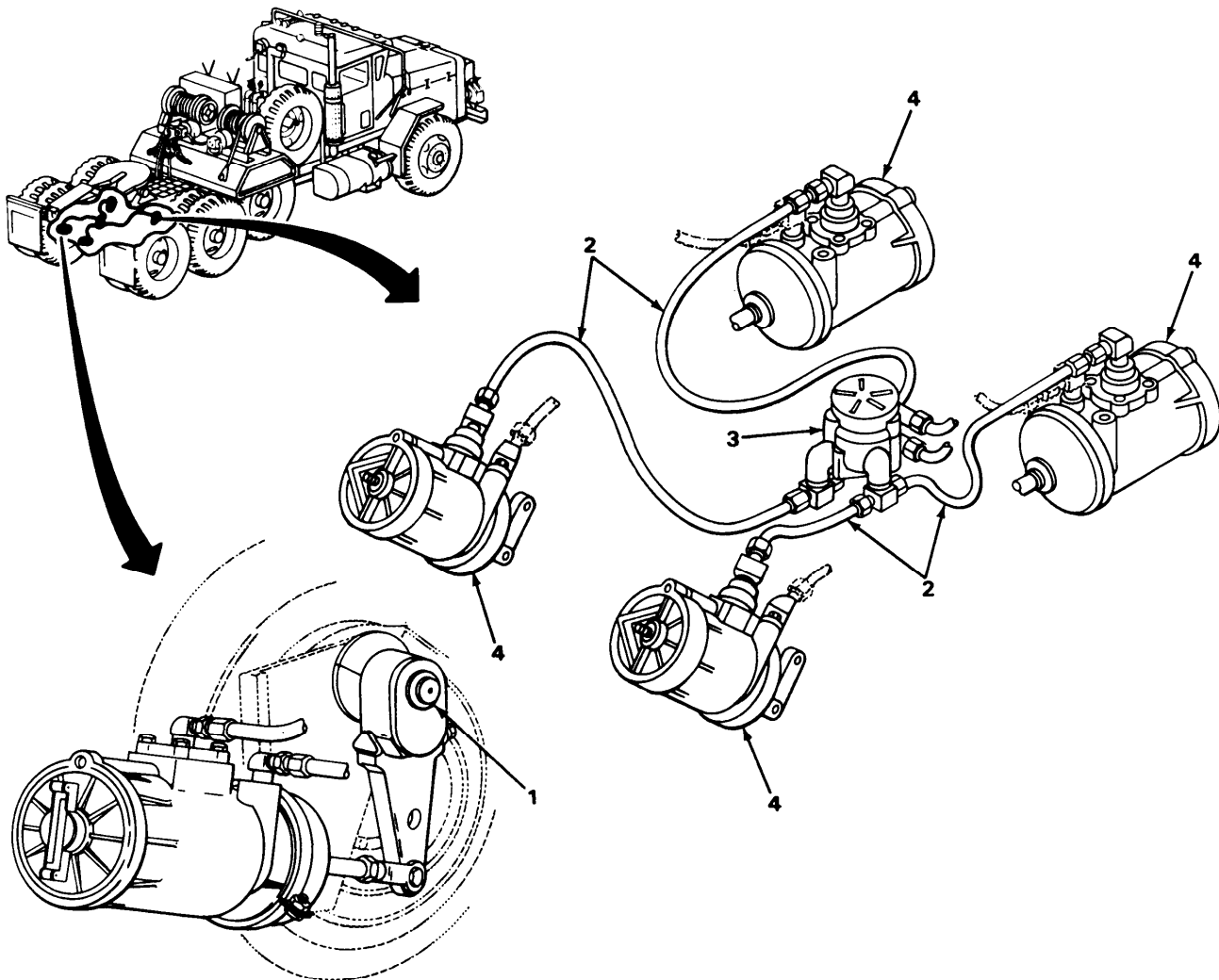
83. UNEVEN OR ERRATIC SERVICE BRAKES ON TANDEM AXLE WHEELS – CONTINUED.

Step 3. Check camshaft (1) for damage and freedom of movement (page 4-1).

If camshaft is damaged or binding, repair or replace (page 4-828).

Step 4. Check four air lines (2) from tandem axle service brake relay valve (3) to brake chambers (4) for damage or leaks by listening for hissing or using mild soap solution and watching for bubbles (page 4-1).

If lines are damaged or leaking, repair or replace (page 4-809).



TA239734

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

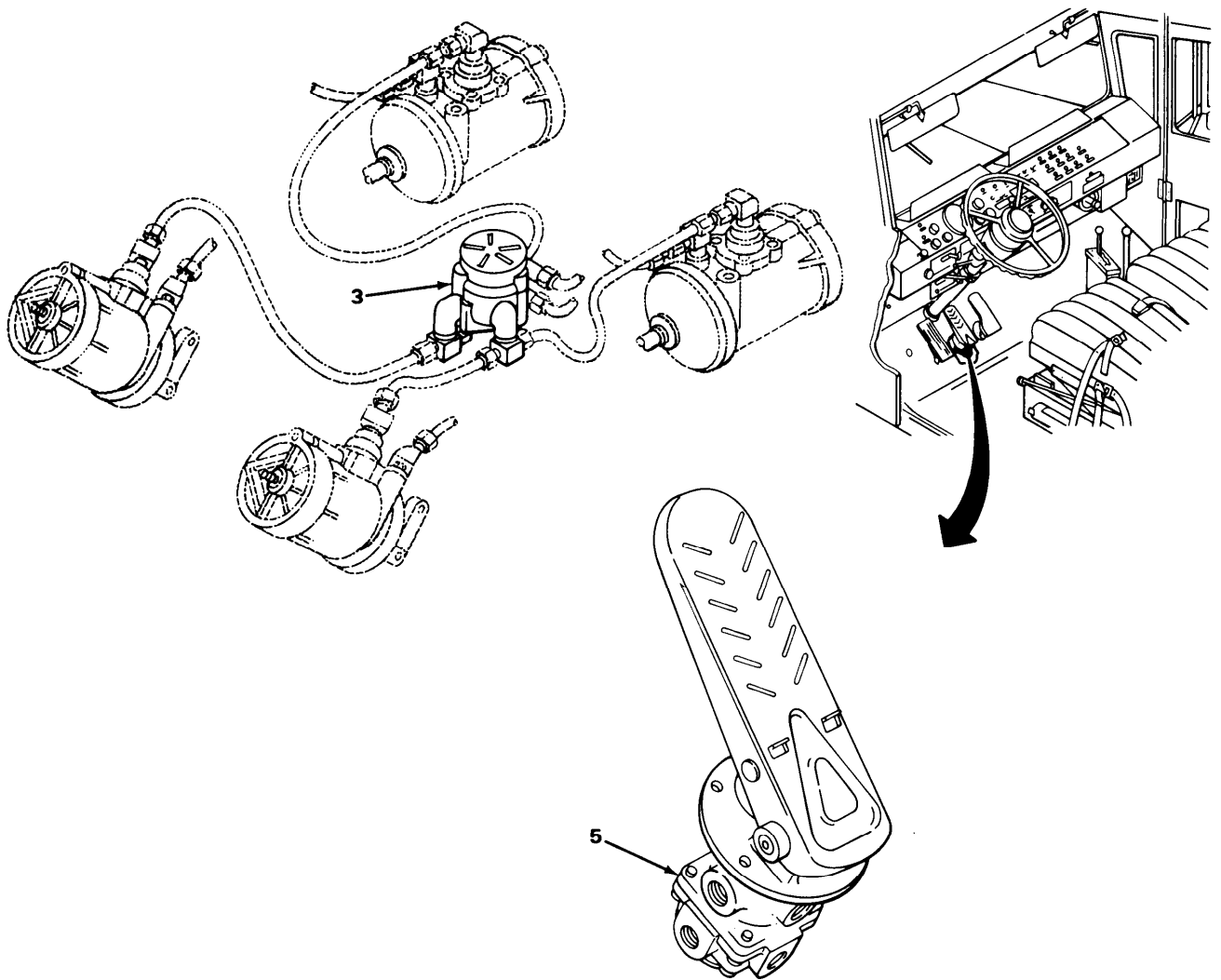
CORRECTIVE ACTION

Step 5. Check rear axle relay valve (3) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If relay valve is damaged or leaking, replace (page 4-785) or notify direct support maintenance for repair.

Step 6. Check treadle valve (5) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If treadle valve is damaged or leaking, replace (page 4-720).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

63. UNEVEN OR ERRATIC SERVICE BRAKES ON TANDEM AXLE WHEELS – CONTINUED.

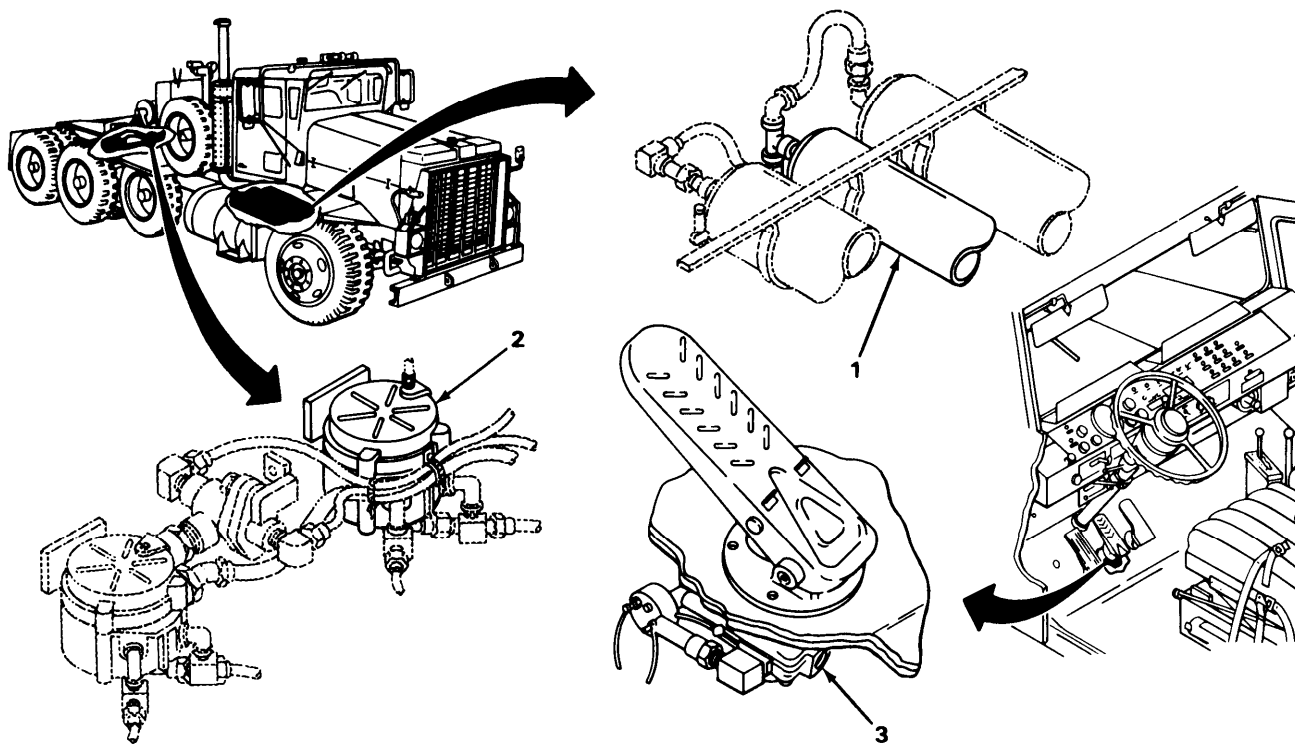
Step 7. Check hose no. 536 from air reservoir (1) to rear axle relay valve (2) for damage or leaks by listening for hissing or using soap solution and watching for hubbles (page 4-1).

If hose is damaged or leaking, repair or replace hose (page 4-609).

Step 8. Check pilot hose from brake treadle valve (3) to rear axle relay valve for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

a. if hose is damaged or leaking, repair or replace (page 4-609).

b. If brakes still operate unevenly or erratically, notify direct support maintenance.



TA239736

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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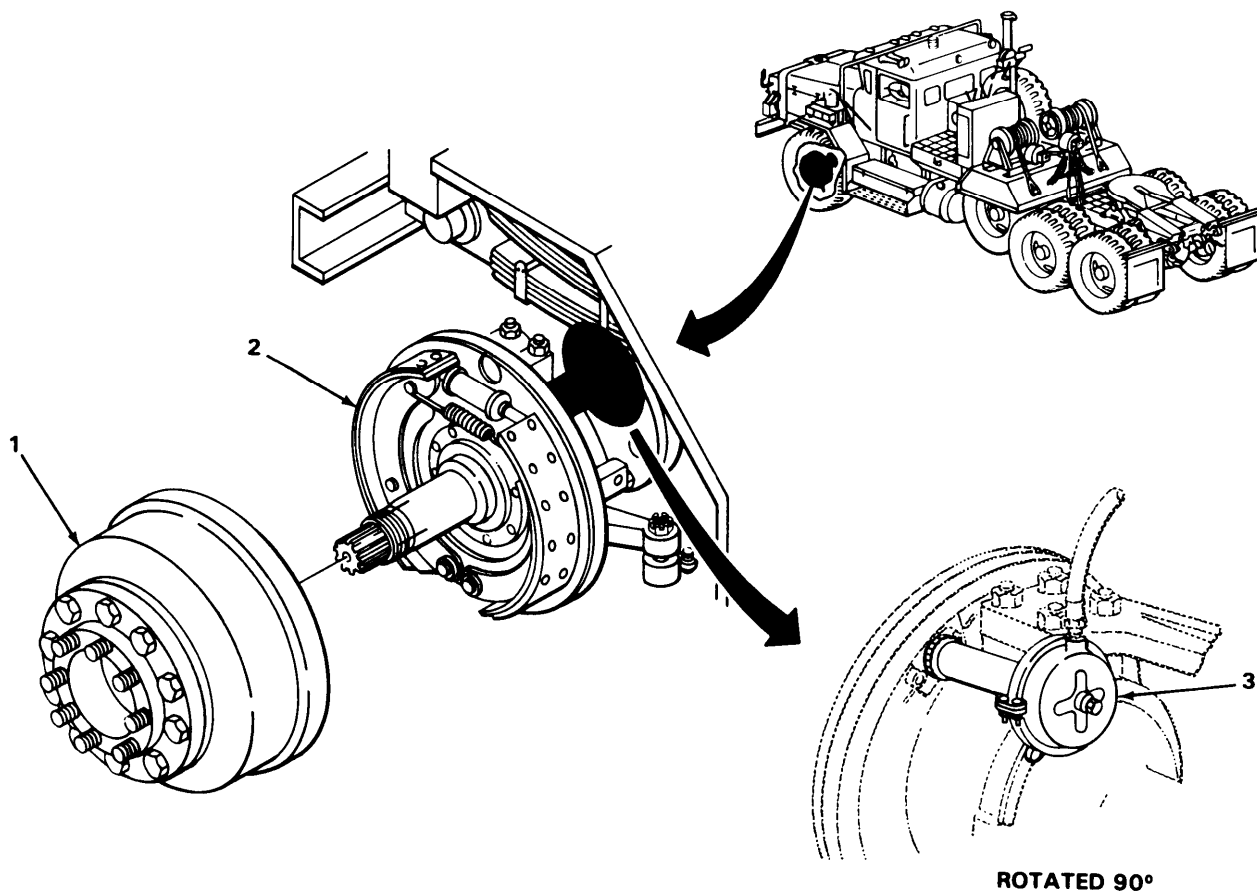
64. UNEVEN OR ERRATIC SERVICE BRAKES ON FRONT WHEELS.

Step 1. Check front axle brakedrums (1) and brakeshoes (2) for damage or foreign material (page 4-893).

If brakedrums or shoes are damaged or dirty, replace clean (page 4-893) or (page 4-610), or notify direct support maintenance for repair.

Step 2. Check air chamber and wedge assembly (3) for damage and freedom of movement (page 4-1).

If air chamber and wedge assembly are damaged or binding, replace (page 4-686) and (page 4-615), or notify direct support maintenance for repair.



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

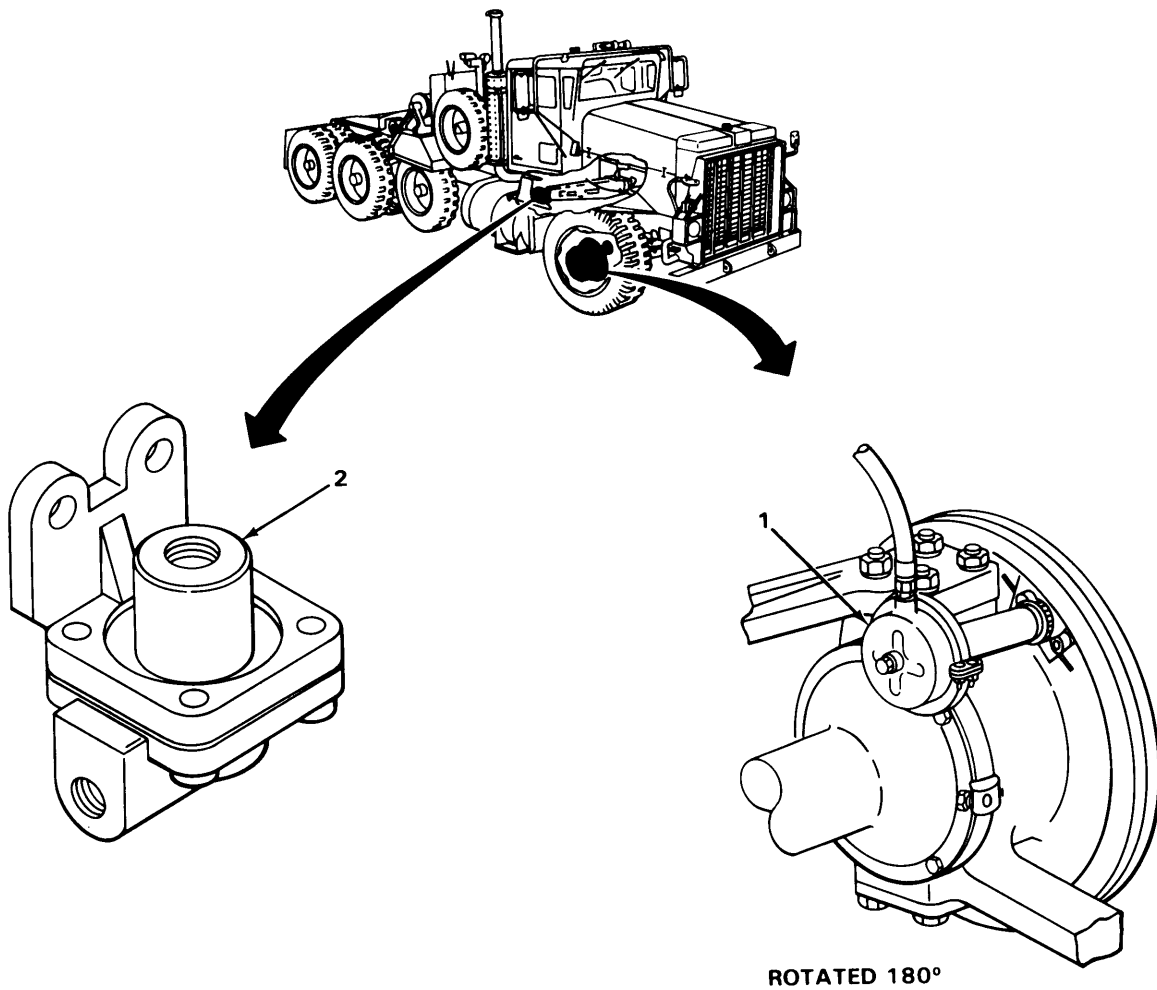
64. UNEVEN OR ERRATIC SERVICE BRAKES ON FRONT WHEELS - CONTINUED.

Step 3. Check two airhoses from brake chambers (1) to quick release valve (2) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hoses are damaged or leaking, repair or replace (page 4-609).

Step 4. Check quick release valve (2) for damage or clogs (page 4-1).

If valve is damaged or clogged, replace or clean (page 4-812).



TA239738

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

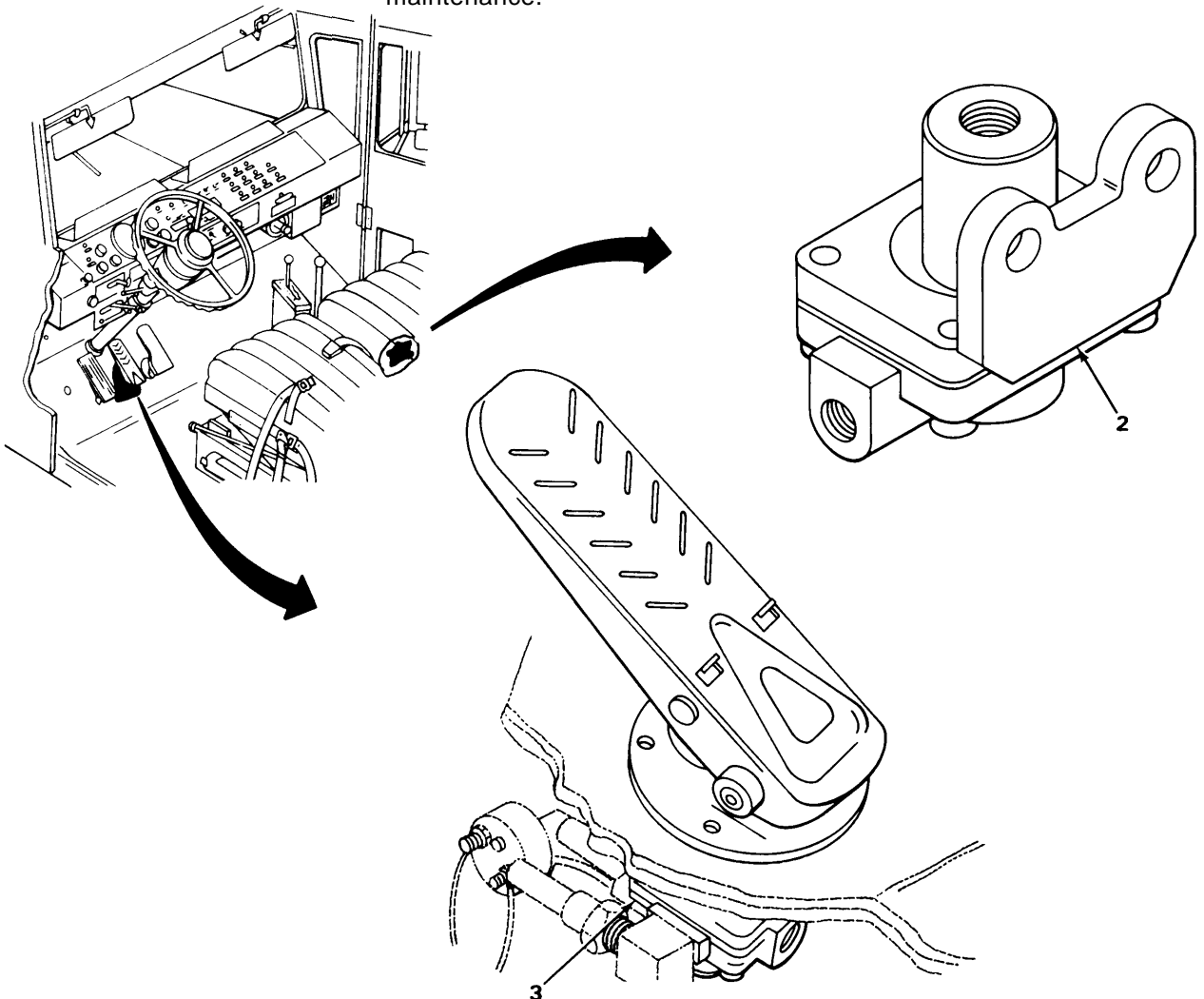
Step 5. Check hose no. 488 from treadle valve (3) to quick release valve (2) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose is damaged or leaking, repair or replace (page 4-609).

Step 6. Check treadle valve (3) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

a. If hose is damaged or leaking, repair or replace hose (page 4-609).

b. If service brakes are still uneven or erratic, notify direct support maintenance.



TA239739

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

65. UNEVEN OR ERRATIC SERVICE BRAKES ON PUSHER AXLE.

Step 1. Check both brakedrums (1) and brakeshoes (2) for damage or foreign material (page 4-910).

If brakedrums or shoes are damaged or dirty, replace clean (page 4-910) or (page 4-616), or notify direct support maintenance for repair.

Step 2. Check four air chambers and wedge assemblies (3) for damage and freedom of movement (page 4-1).

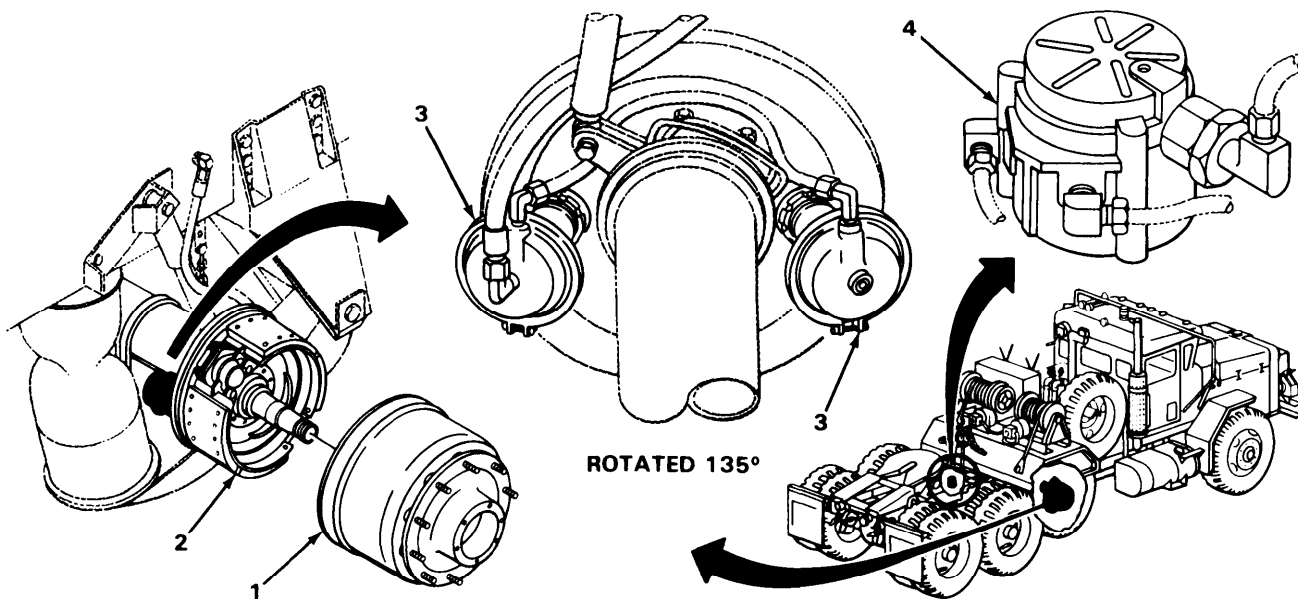
If air chambers or wedge assemblies are damaged or binding, replace (page 4-692) and (page 4-615), or notify direct support maintenance for repair.

Step 3. Check hoses from brake chambers (3) to pusher axle relay valve (4) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hoses are damaged or leaking, repair or replace (page 4-609).

Step 4. Check pusher axle relay valve (4) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If valve is damaged or leaking, replace (page 4-779).



TA239740

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

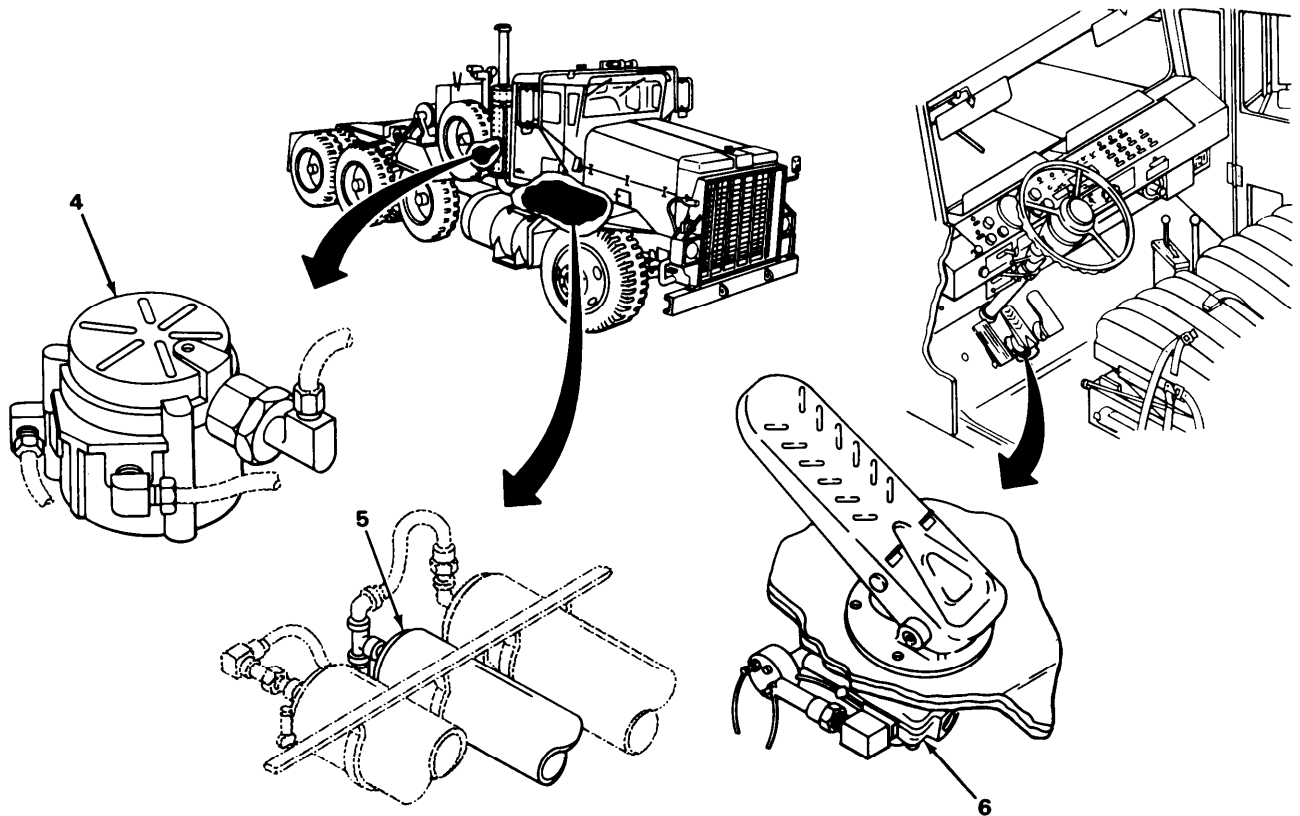
CORRECTIVE ACTION

Step 5. Check hose no. 633 from reservoir (5) to pusher axle relay valve (4) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose is damaged or leaking, repair or replace (page 4-609).

Step 6. Check treadle valve (6) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If valve is damaged or leaking, replace (page 4-720), or notify direct support maintenance for repair.



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

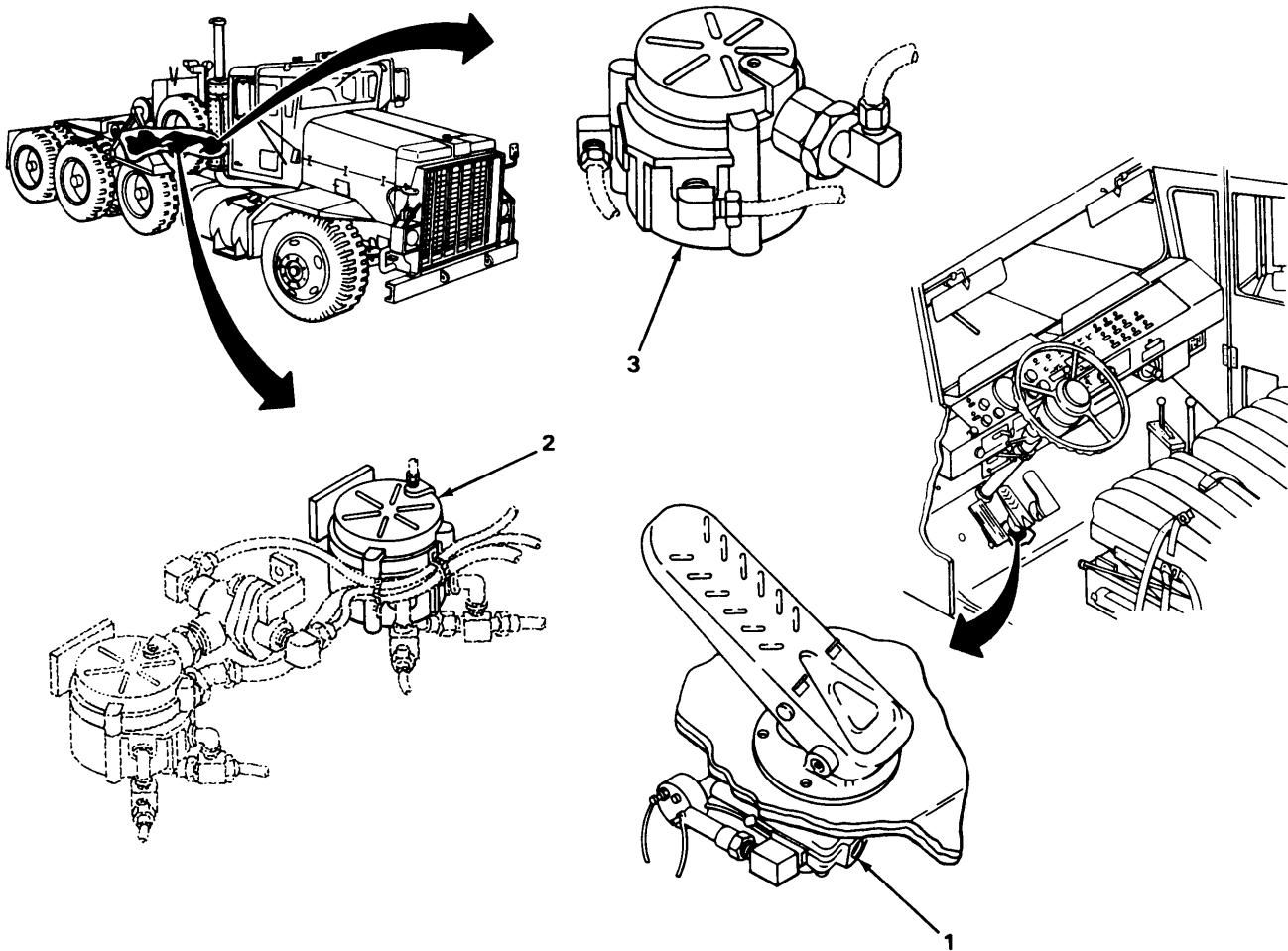
CORRECTIVE ACTION

65. UNEVEN OR ERRATIC SERVICE BRAKES ON PUSHER AXLE - CONTINUED.

Step 7. Check pilot hose from treadle valve (1) to tandem axle relay valve (2), and from tandem axle relay valve to pusher axle relay valve (3) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

a. If either pilot hose is damaged or leaking, repair or replace (page 4-609).

b. If brakes are still uneven or erratic, notify direct support maintenance.



TA239742

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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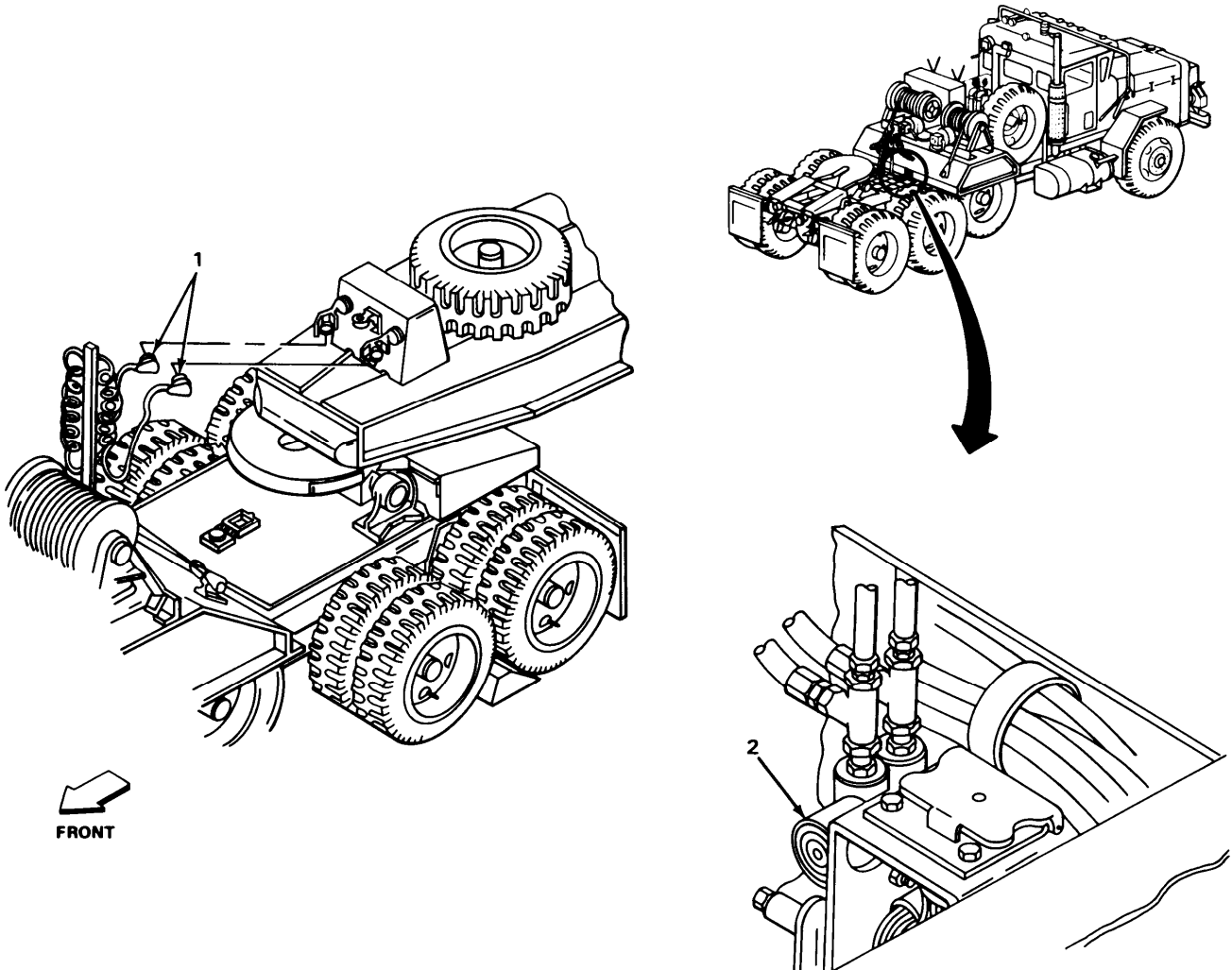
66. SERVICE BRAKES DO NOT RESPOND WHEN APPLIED BY TRAILER BRAKE HAND CONTROL.

Step 1. Check that gladhands (1) are correctly hooked upon trailer (TM 9-2320-270-10).

If gladhands are not hooked up correctly, take off and connect correctly (TM 9-2320-270-10).

Step 2. Check two hoses from gladhands (1) to tractor protection valve (2) for damage or leaks by listening for hissing or using a soap solution and watching for bubbles (page 4-1).

If hoses are damaged or leaking, repair or replace (page 4-609).



TA239743

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

66. SERVICE BRAKES DO NOT RESPOND WHEN APPLIED BY TRAILER BRAKE HAND CONTROL - CONTINUED.

Step 3. Check tractor protection valve (1) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If valve is damaged or leaking, replace (page 4-878).

Step 4. Check trailer brake valve (2) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

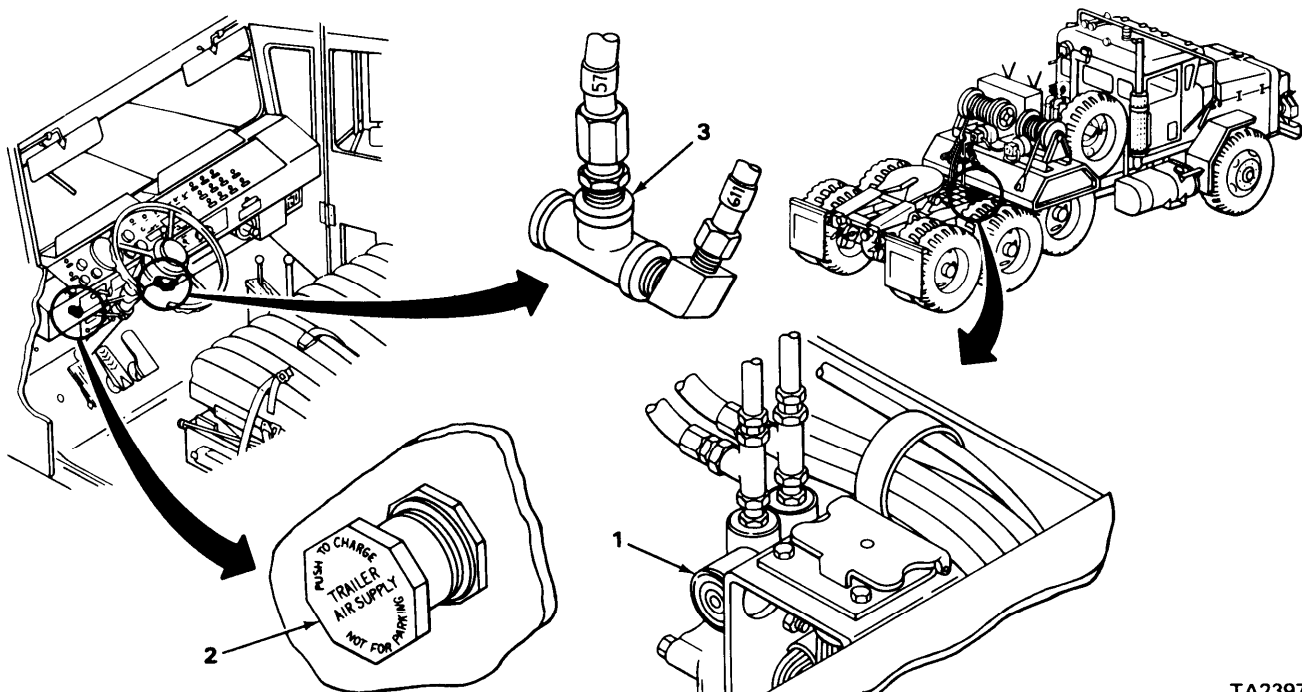
If brake valve is damaged or leaking, replace (page 4-863).

Step 5. Check hose no. 662 from tractor protection valve (1) to trailer brake valve (2) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose is damaged or leaking, repair or replace (page 4-609).

Step 6. Check hose no. 054 from trailer brake valve (2) to tee (3) and hose no.611 for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose is damaged or leaking, repair or replace (page 4-609).



TA239744

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

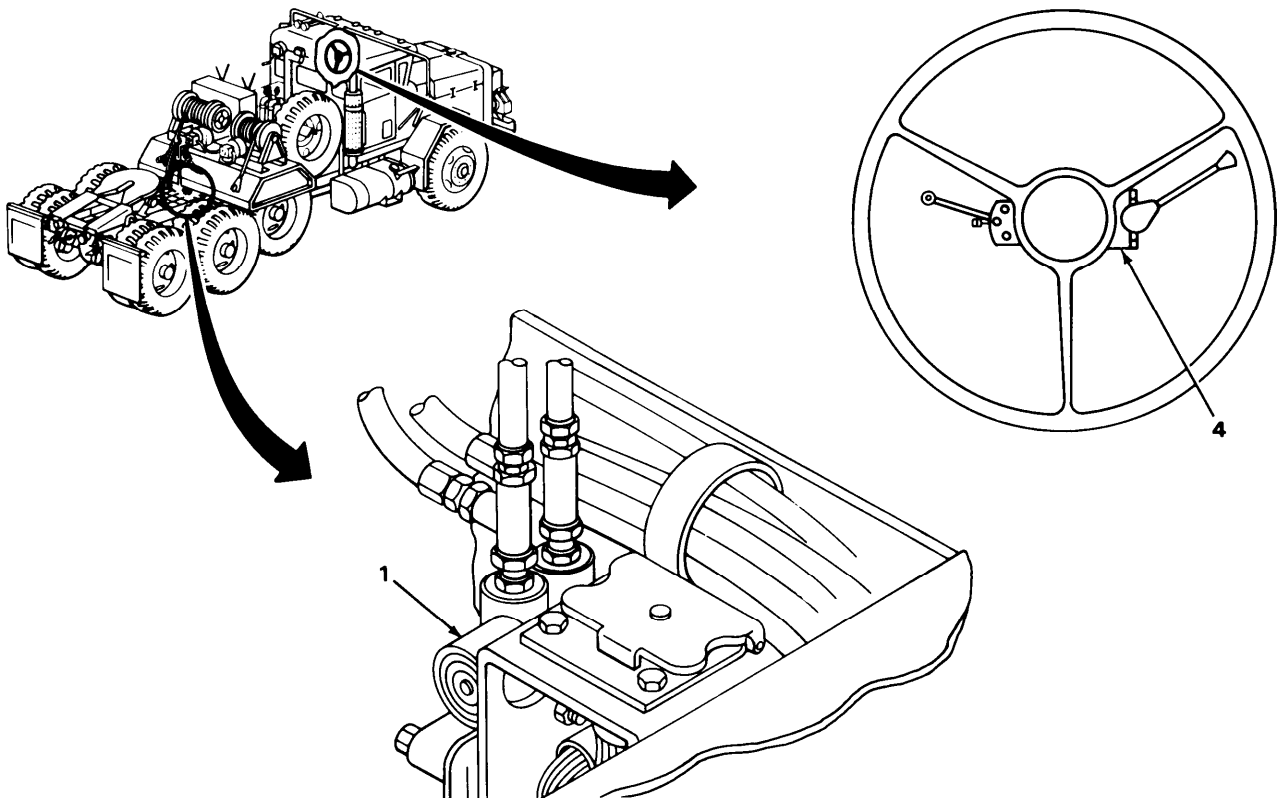
Step 7. Check trailer brake hand control valve (4) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If control valve is damaged or leaking replace (page 4-868).

Step 8. Check hose no. 663 from hand control valve (4) to tractor protection valve (1) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

a. If hose is damaged or leaking, repair or replace (page 4-609).

b. If hose is not damaged or leaking, troubleshoot trailer.



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

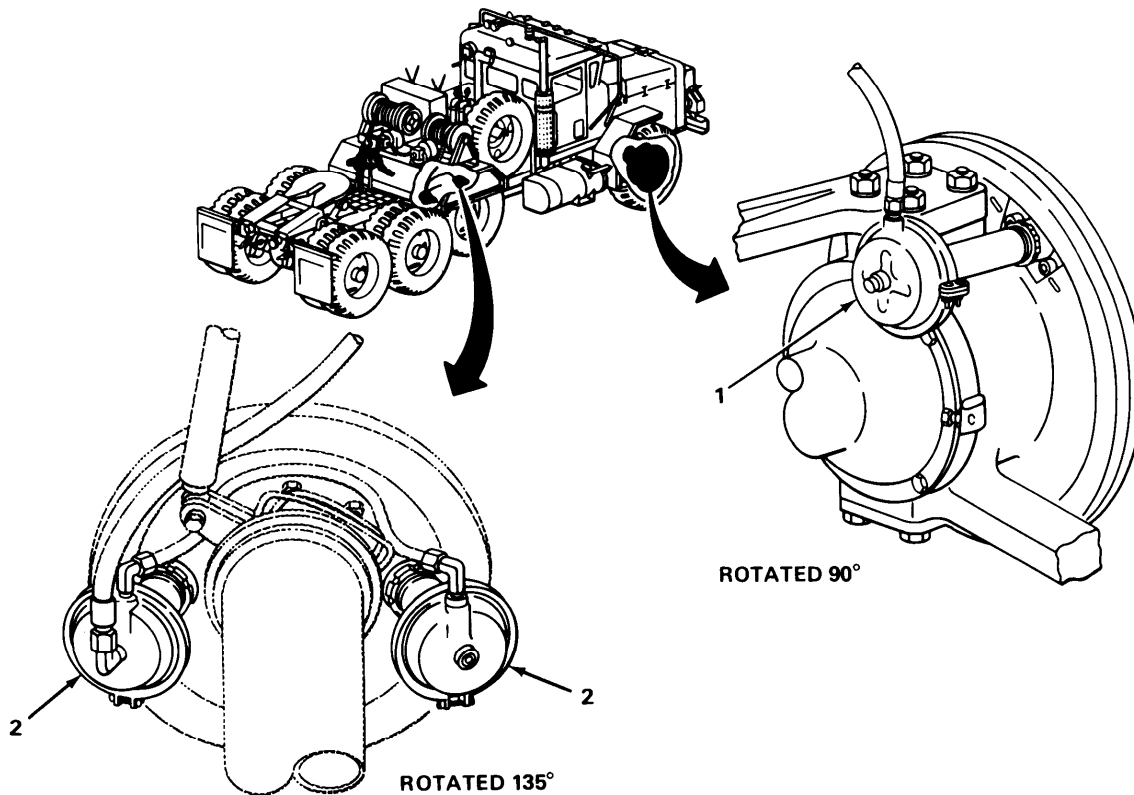
67. SEVERE PRESSURE DROP WHEN BRAKE PEDAL IS APPLIED OVER 25 PSI (172 KPA).

Step 1. Start engine and build pressure to operating level (TM 9-2320-270-10). Shut down engine (TM 9-2320-270-10). While assistant applies brake pedal, check two front brake chambers (1) for leaks or damage by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If front brake chambers are damaged or leaking, replace (page 4-686).

Step 2. While assistant applies brake pedal, check four pusher axle brake chambers (2) for leaks or damage by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If pusher axle brake chambers are damaged or leaking, release brakes and replace chambers (page 4-692).



TA239746

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

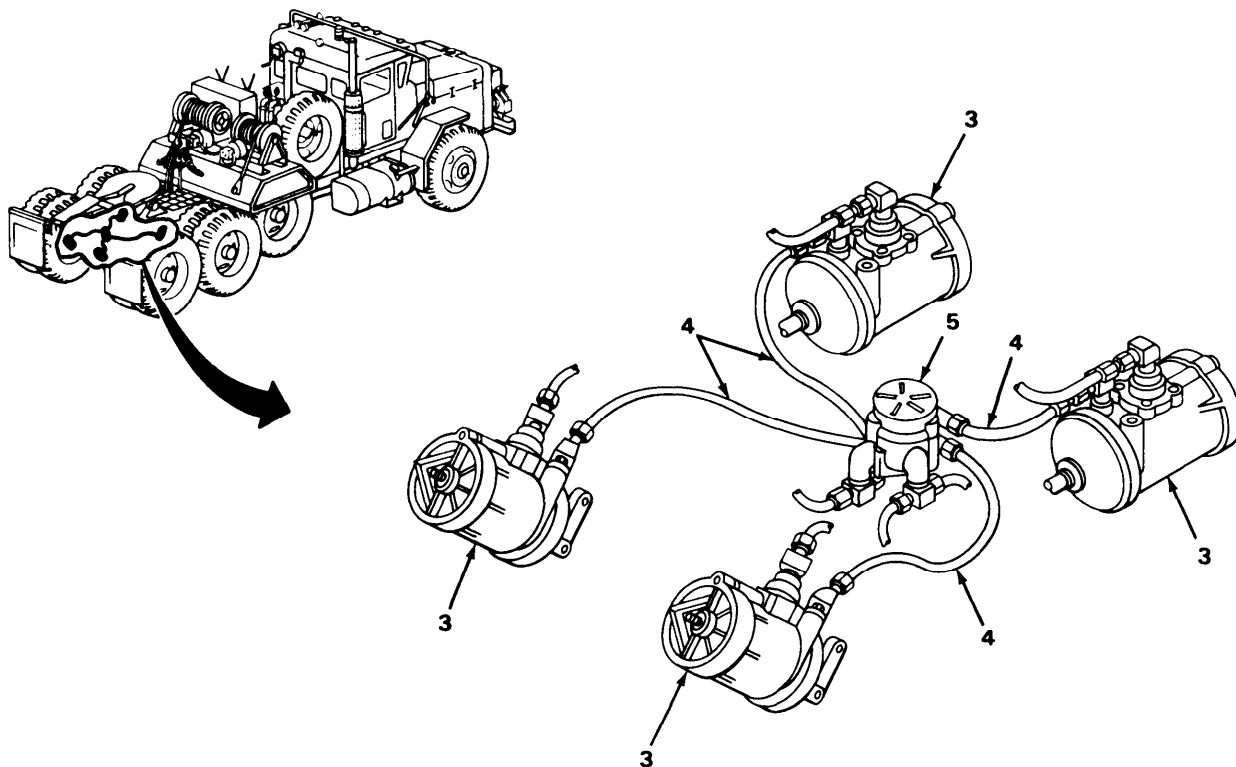
CORRECTIVE ACTION

Step 3. While assistant applies brake pedal, check four rear axle brake chambers (3) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If brake chambers are leaking or damaged, release brakes and replace chambers (page 4-701).

Step 4. While assistant applies brake pedal, check four hoses (4) from rear axle relay valve (5) to rear axle brake chambers (3) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hoses are damaged or leaking, release brakes and replace or repair hoses (page 4-609).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

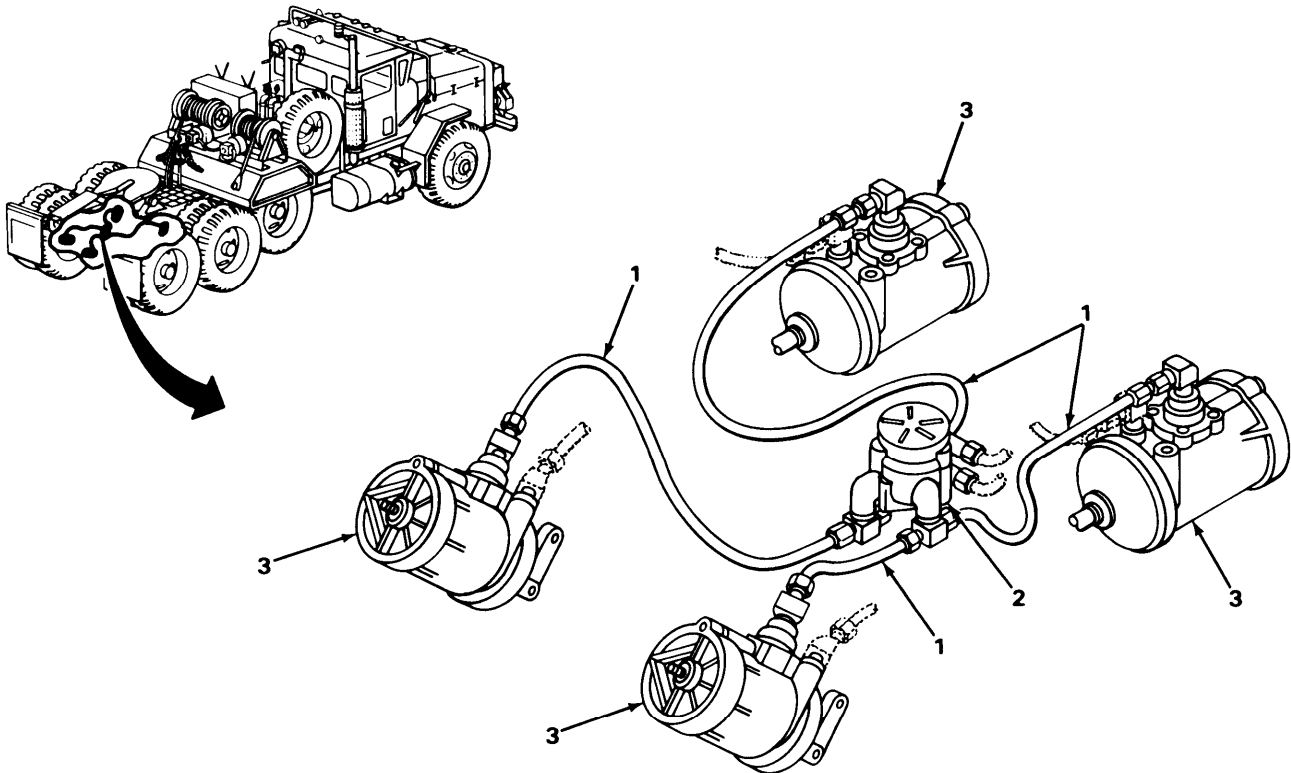
67. SEVERE PRESSURE DROP WHEN BRAKE PEDAL IS APPLIED OVER 25 PSI (172 KPA) - CONTINUED.

Step 5. While assistant applies brake pedal, check four hoses (1) from spring brake relay valve (2) to rear axle brake chambers (3) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hoses are damaged or leaking, release brakes and replace or repair hoses (page 4-609).

Step 6. While assistant applies brake pedal, check spring brake relay valve (2) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If spring brake relay valve is damaged or leaking, release brakes and replace valve (page 4-796).



TROUBLESHOOTING - CONTINUED

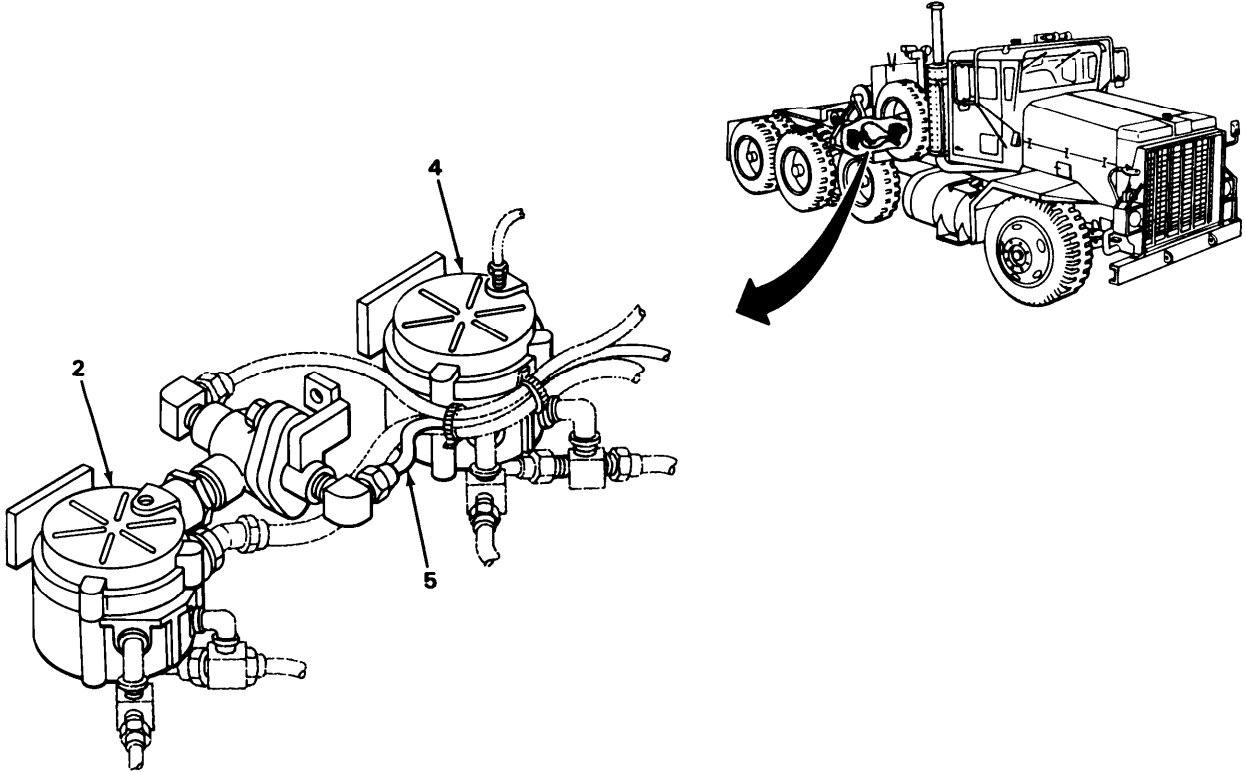
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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Step 7. While assistant applies brake pedal, check rear axle relay valve (4) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If relay valve is damaged or leaking, release brakes and replace valve (page 4-785).

Step 8. While assistant applies brake pedal, check pilot hose no. 660 (5) between spring brake relay valve (2) and rear axle relay valve (4) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose is leaking, release brakes and repair or replace hose (page 4-609).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

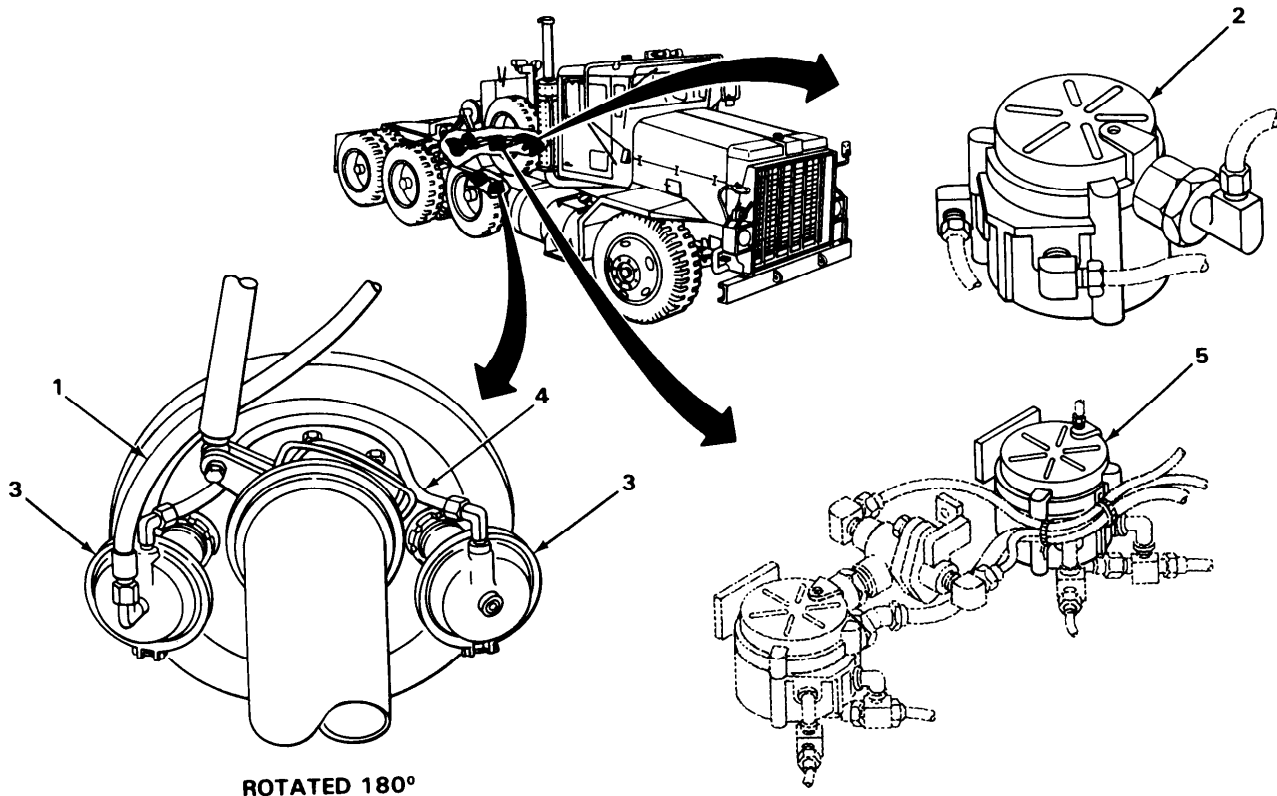
67. SEVERE PRESSURE DROP WHEN BRAKE PEDAL IS APPLIED OVER 25 PSI (172 KPA) – CONTINUED.

Step 9. While assistant applies brake pedal, check two hoses (1) from pusher axle relay valve (2) to pusher axle brake chambers (3) and two jumper hoses (4) between chambers for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hoses are damaged or leaking, release brakes and replace or repair hoses (page 4-609).

Step 10. While assistant applies brake pedal, check pusher axle relay valve (2) and pilot hose no. 636 from pusher axle relay valve (2) to tandem axle service brake relay valve (5) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If pusher axle relay valve or pilot hose is leaking, release brakes and repair or replace valve or hose (page 4-609).



TA239750

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

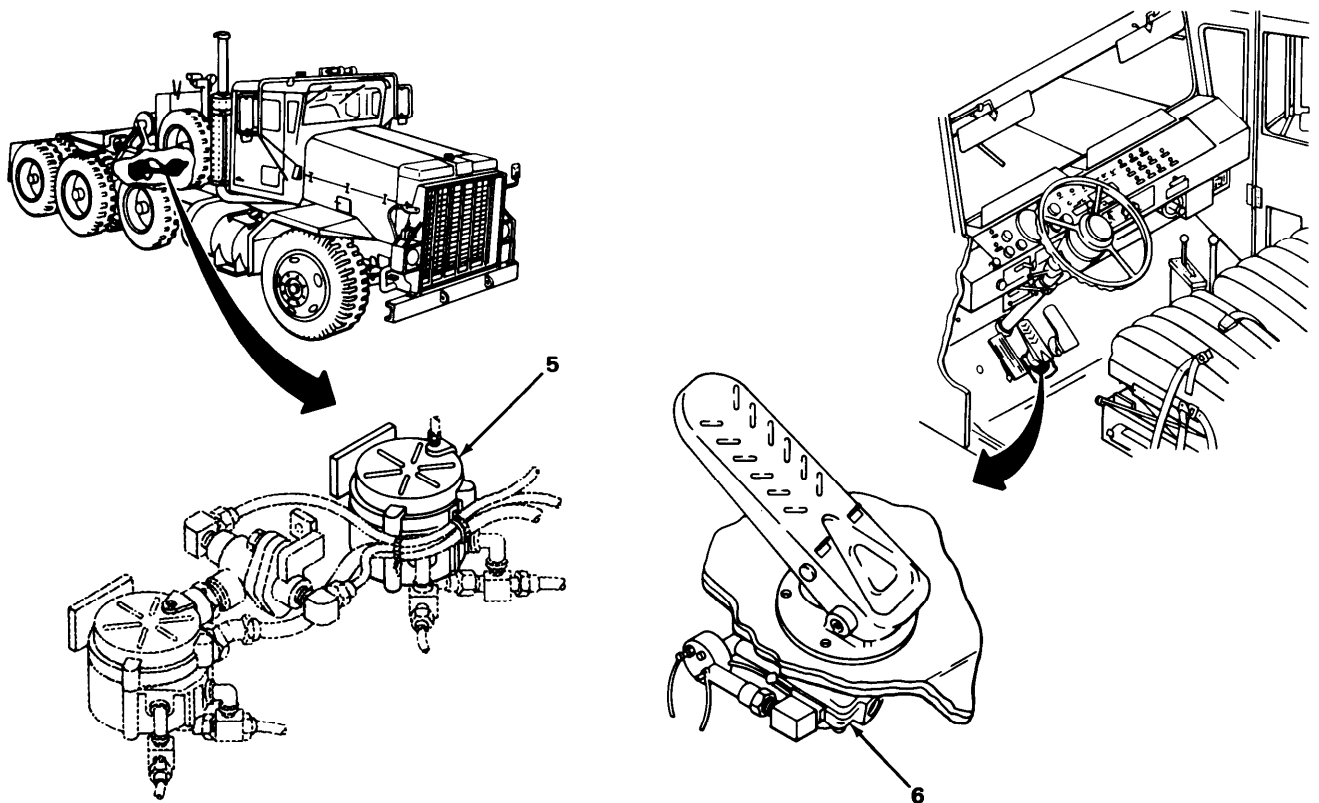
CORRECTIVE ACTION

Step 11. While assistant applies brake pedal, check pilot hose from rear axle service brake relay valve (5) to treadle valve (6) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose is leaking, release brakes and repair or replace hose (page 4-609).

Step 12. While assistant applies brake pedal, check treadle valve (6) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If treadle valve is damaged or leaking, release brakes and replace valve (page 4-720).



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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67. SEVERE PRESSURE DROP WHEN BRAKE PEDAL IS APPLIED OVER 25 PSI (172 KPA) - CONTINUED.

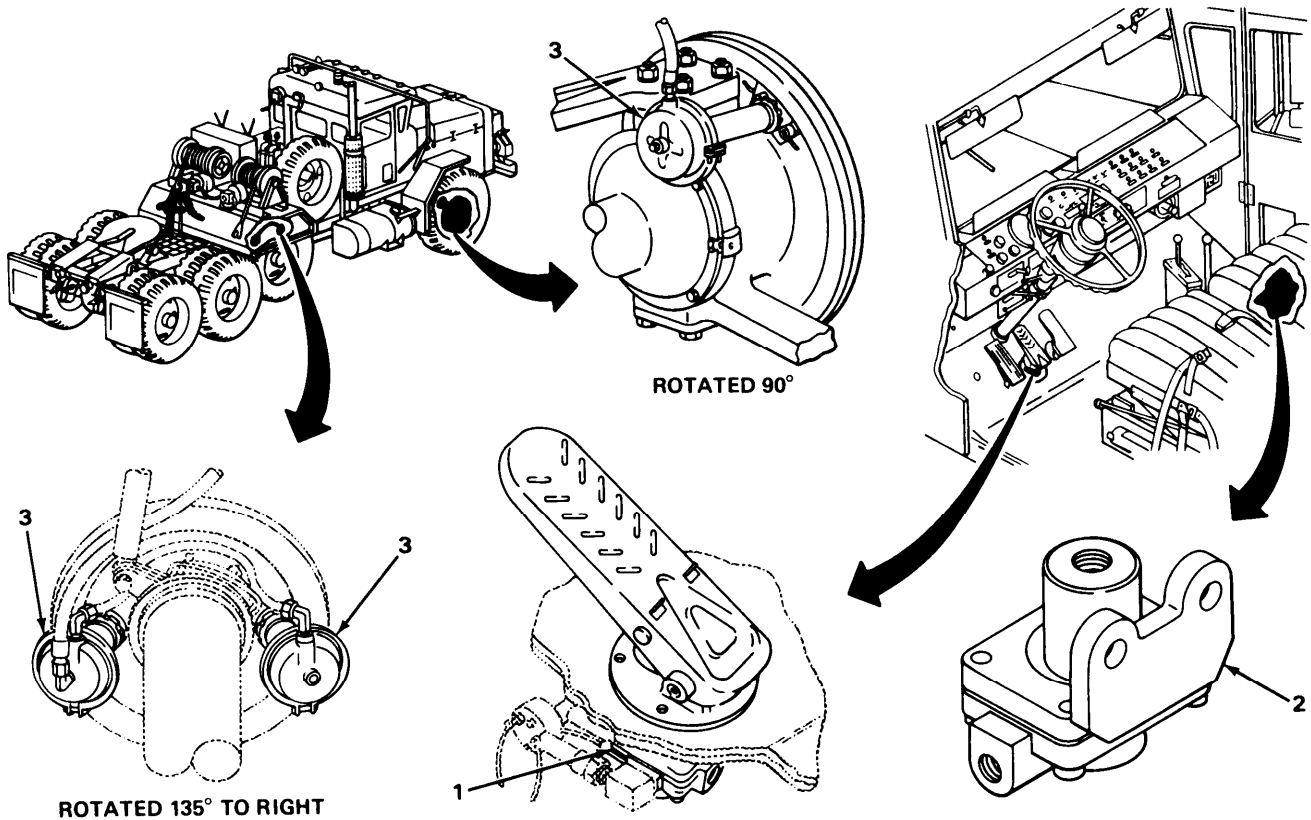
Step 13. While assistant applies brake pedal, check hose no. 468 from treadle valve (1) to quick release valve (2) and two hoses from quick release valve (2) to brake chambers (3) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hoses are damaged or leaking, release brakes and repair or replace hoses (page 4-609).

Step 14. While assistant applies brake pedal, check quick release valve (2) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

a. If quick release valve is damaged or leaking, release brakes and replace valve (page 4-812).

b. If pressure still drops, release brakes and notify direct support maintenance.



TA239752

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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68. SERVICE BRAKES DO NOT WORK WHEN TRUCK IS BEING TOWED.

NOTE

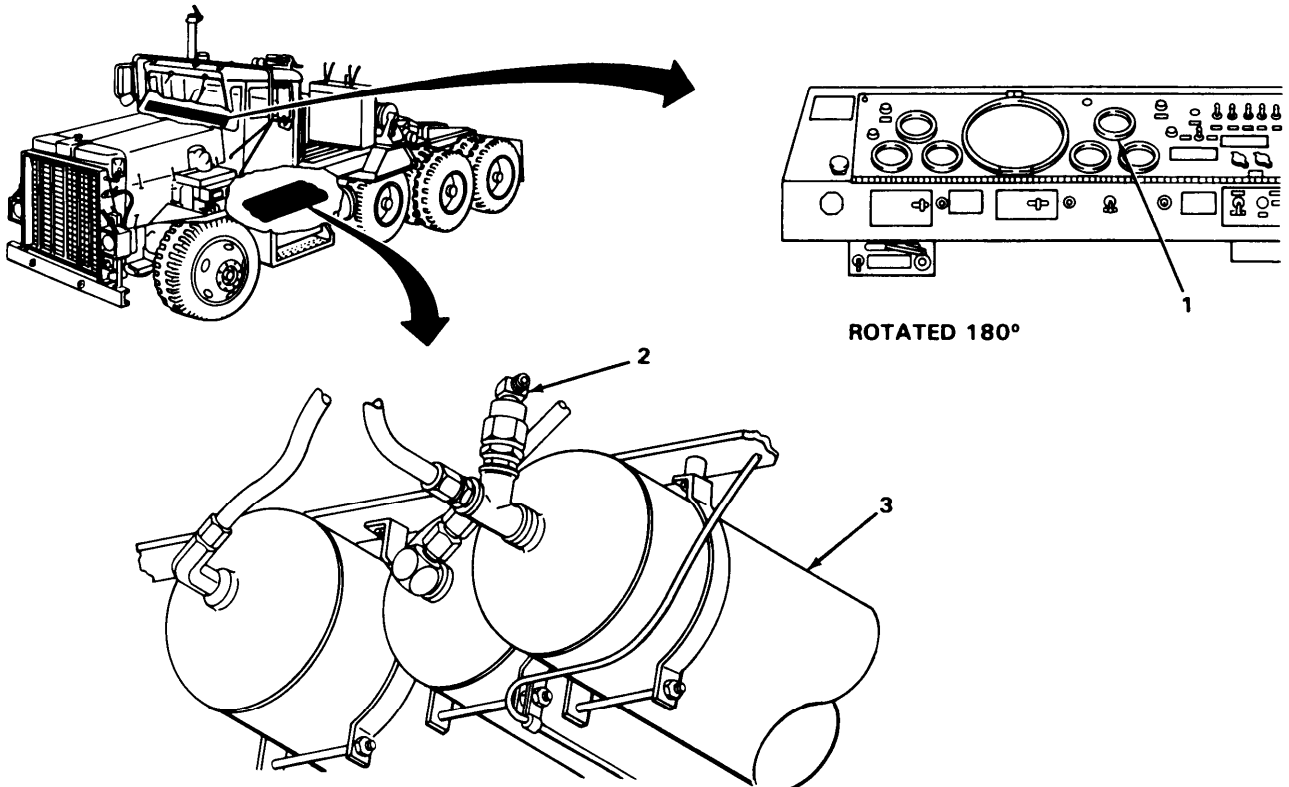
To carry out this procedure, truck must be hooked up to towing vehicle (TM 9-2320-270-10).

Step 1. Go to cab and check air pressure gage (1).

If gage shows operating pressure, of at least 60 psi (414 kPa) go to step 7.

Step 2. Check check valve (2) at reservoir (3) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If check valve is damaged or leaking, replace (page 4-826).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

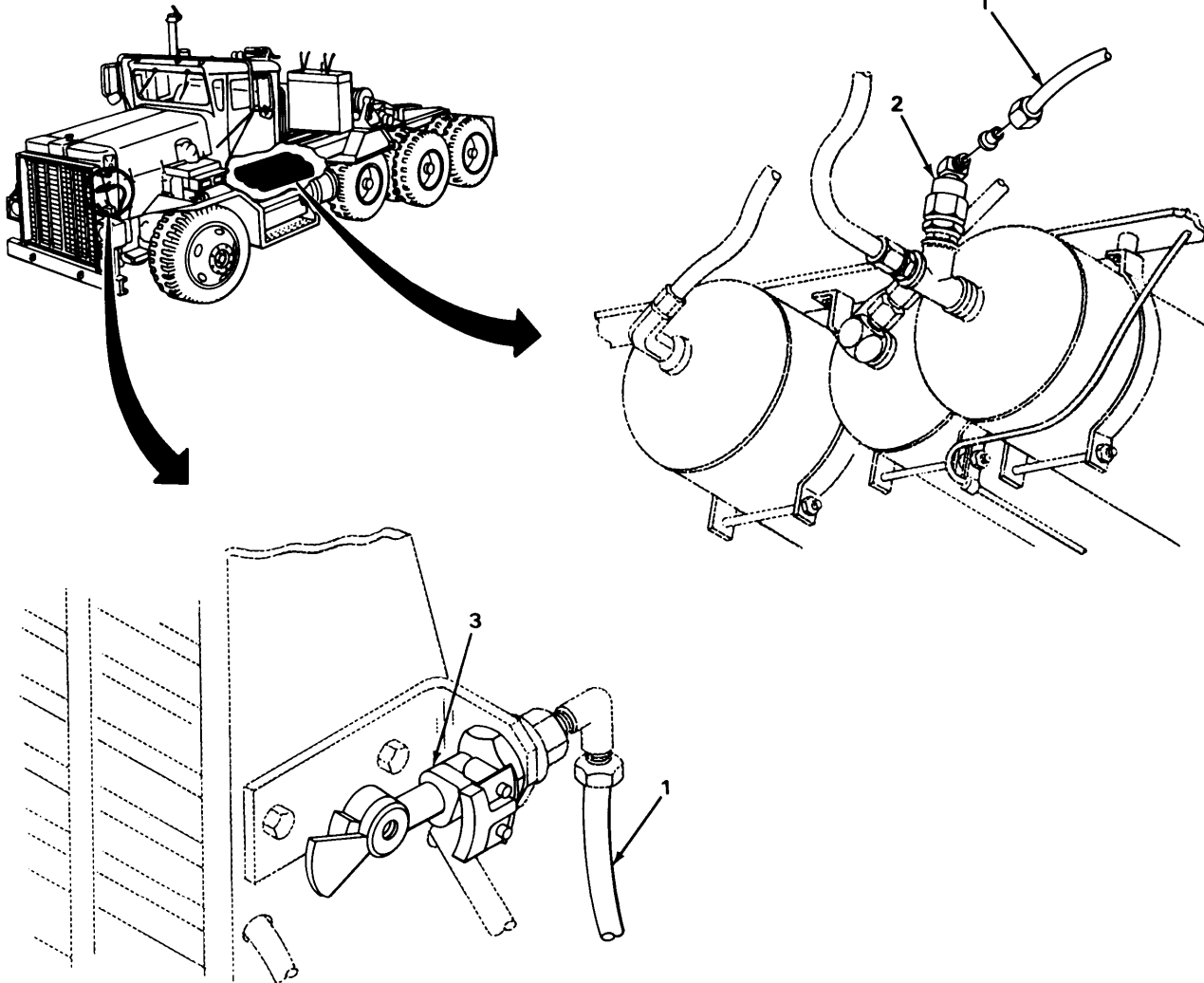
68. SERVICE BRAKES DO NOT WORK WHEN TRUCK IS BEING TOWED – CONTINUED.

Step 3. Check hose (1) from reservoir check valve (2) to left front gladhand (3) for damage or leaks by listening for hissing, or by using soap solution and watching for bubbles (page 4-1).

If hose is leaking, repair or replace (page 4-609).

Step 4. Check left front gladhand (3) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If gladhand is damaged or leaking, repair or replace (page 4-838).



TA239754

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

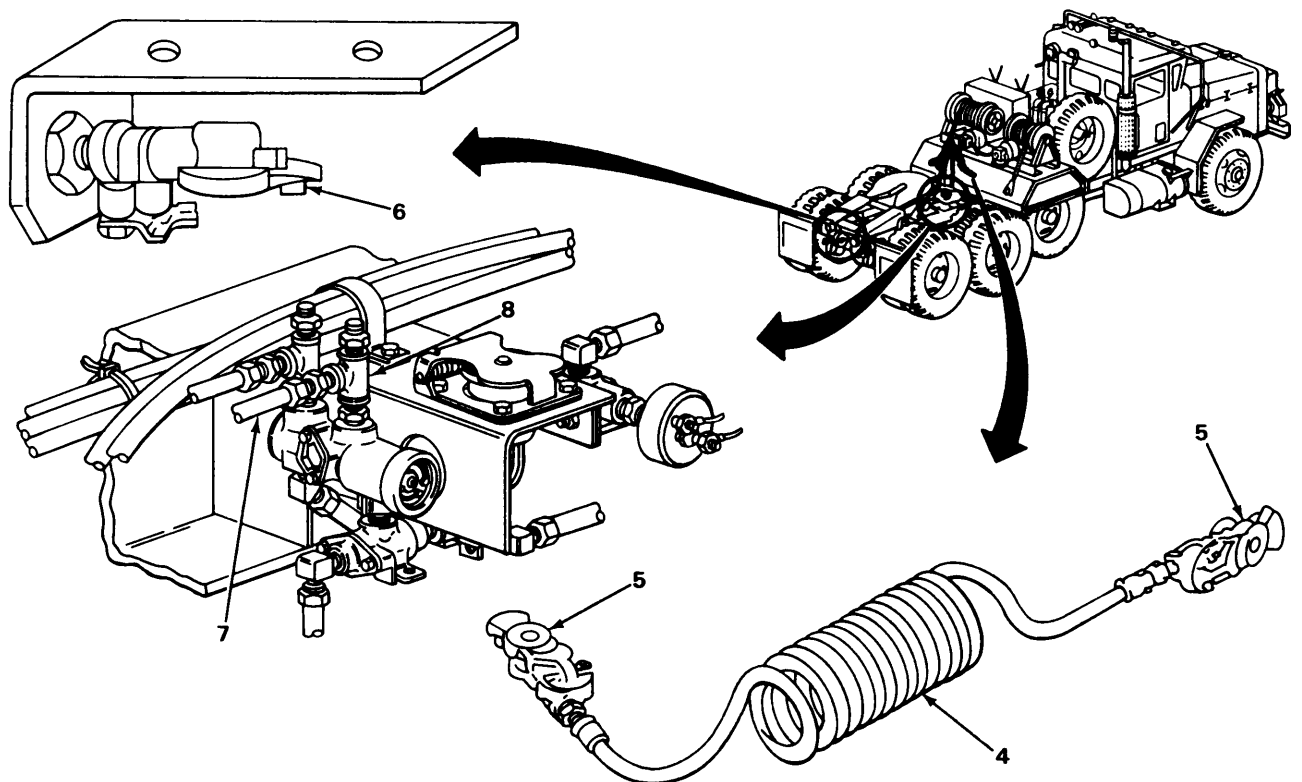
Step 5. Go to EMERGENCY hookup hose (4) color coded red. Check hose and two gladhands (5) for damage, clogs, or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If EMERGENCY hookup hose or gladhands are damaged, clogged, or leaking, clean, replace, or repair (page 4-838).

Step 6. Go to towing vehicle and check service gladhand (6) and hose (7) to tractor protection valve (8) for clogs, damage, or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

a. If gladhand or hose are clogged, damaged, or leaking, repair, replace, or clean (page 4-609).

b. If gladhand and hose are not clogged, damaged or leaking, go to SERVICE BRAKES DO NOT RESPOND WHEN APPLIED BY TRAILER HANDBRAKE CONTROL (page 3-157).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

68. SERVICE BRAKES DO NOT WORK WHEN TRUCK IS BEING TOWED – CONTINUED.

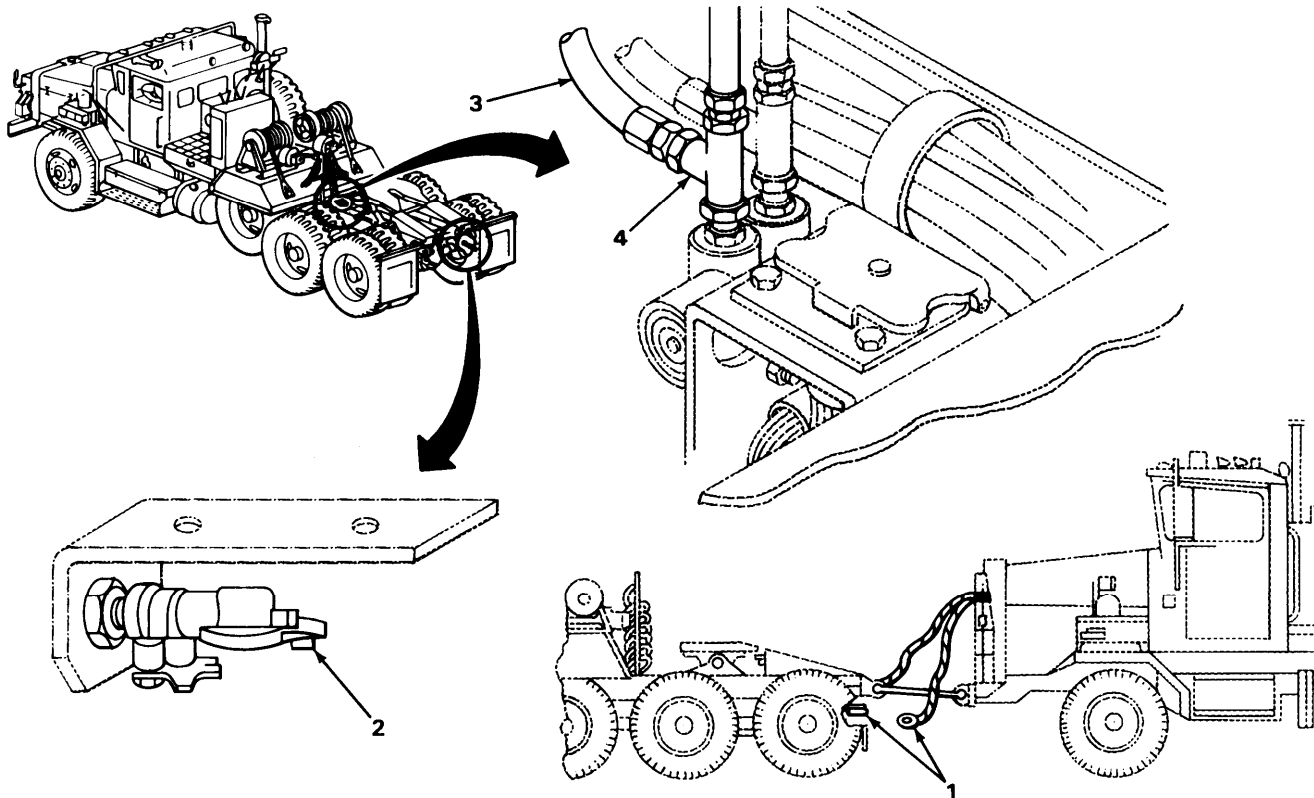
Step 7. Disconnect service hookup hose gladhand (1) color coded blue. Have assistant apply trailer brakes in towing vehicle.

If there is air pressure at gladhand, release brakes and go to step 9.

Step 8. Release brakes, go to towing vehicle and check service gladhand (2) and hose (3) to trailer protection valve (4) for clogs, damage, or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

a. If gladhand or hose are clogged, damaged or leaking, repair, replace, or clean (page 4-838).

b. If gladhand or hose are not clogged, leaking or damaged, go to SERVICE BRAKES DO NOT RESPOND WHEN APPLIED BY TRAILER BRAKEHAND CONTROL (page 3-157).



TA239756

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

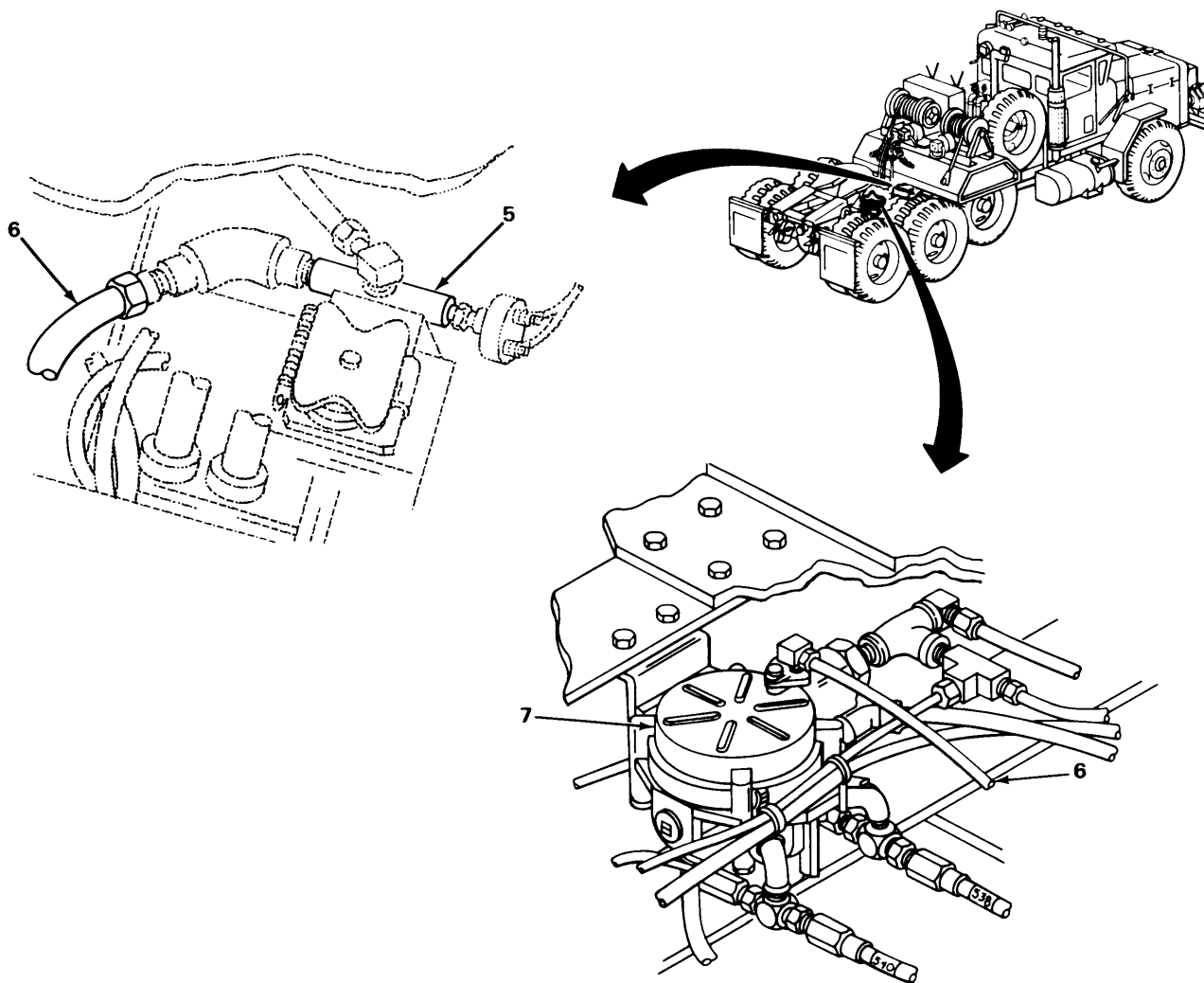
CORRECTIVE ACTION

Step 9. Check quick release valve (5) for damage, clogs, or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If quick release valve is damaged, clogged, or leaking, clean or replace (page 4-829).

Step 10. Check hose (6) from quick release valve (5) to tandem axle service brake relay (7) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose is damaged or leaking, repair or replace (page 4-609).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

66. SERVICE BRAKES DO NOT WORK WHEN TRUCK IS BEING TOWED – CONTINUED.

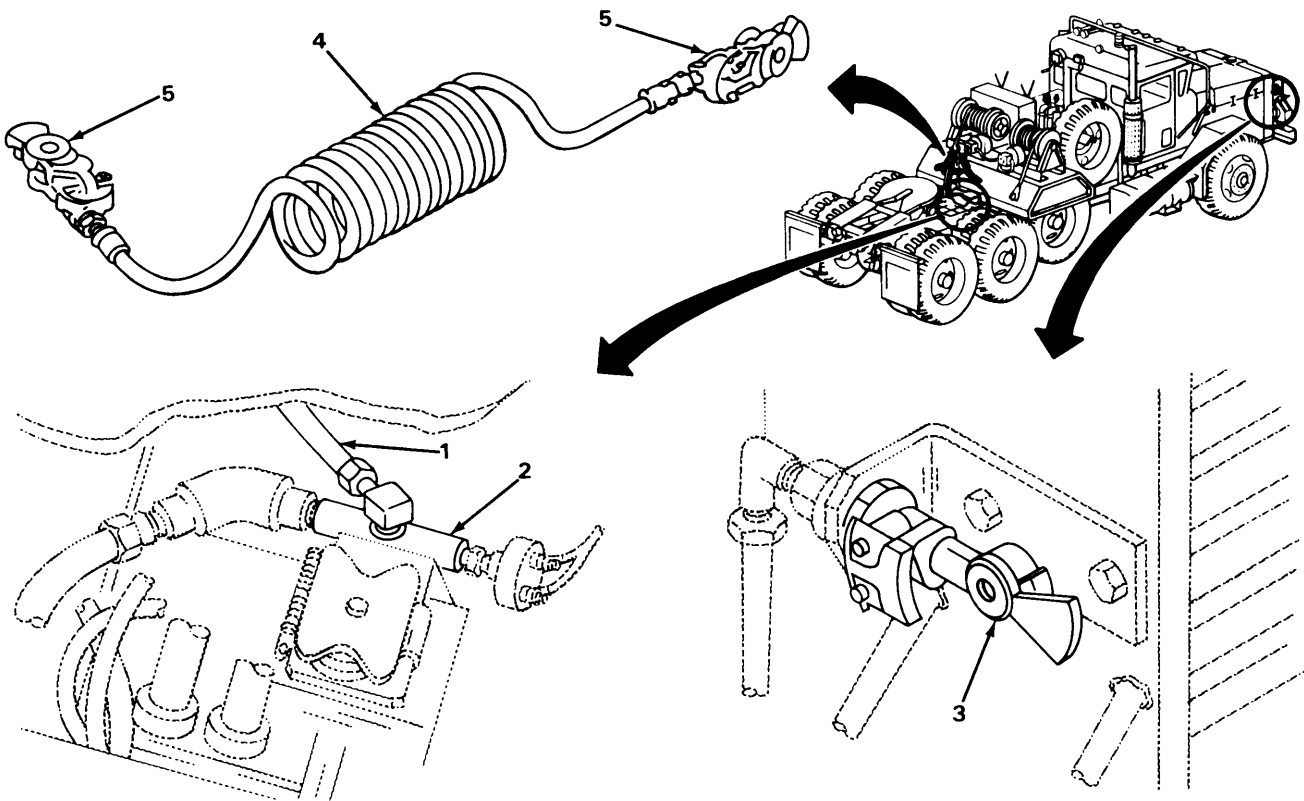
Step 11. Check hose (1) from quick release valve (2) to right front service gladhand (3) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose or gladhand are damaged or leaking, repair or replace (page 4-609).

Step 12. Check service hookup hose (4) and two gladhands (5) color coded blue for damage, clogs, or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

a. If hookup hose is damaged, clogged, or leaking, repair, replace, or clean (page 4-609).

b. If hookup hose is not damaged, clogged, or leaking, go to SERVICE BRAKES FAIL TO APPLY OR RELEASE, OR APPLY OR RELEASE SLOWLY (page 3-141), for vehicle being towed.



TA239758

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

AIR HORN

69. AIR HORN DOES NOT WORK.

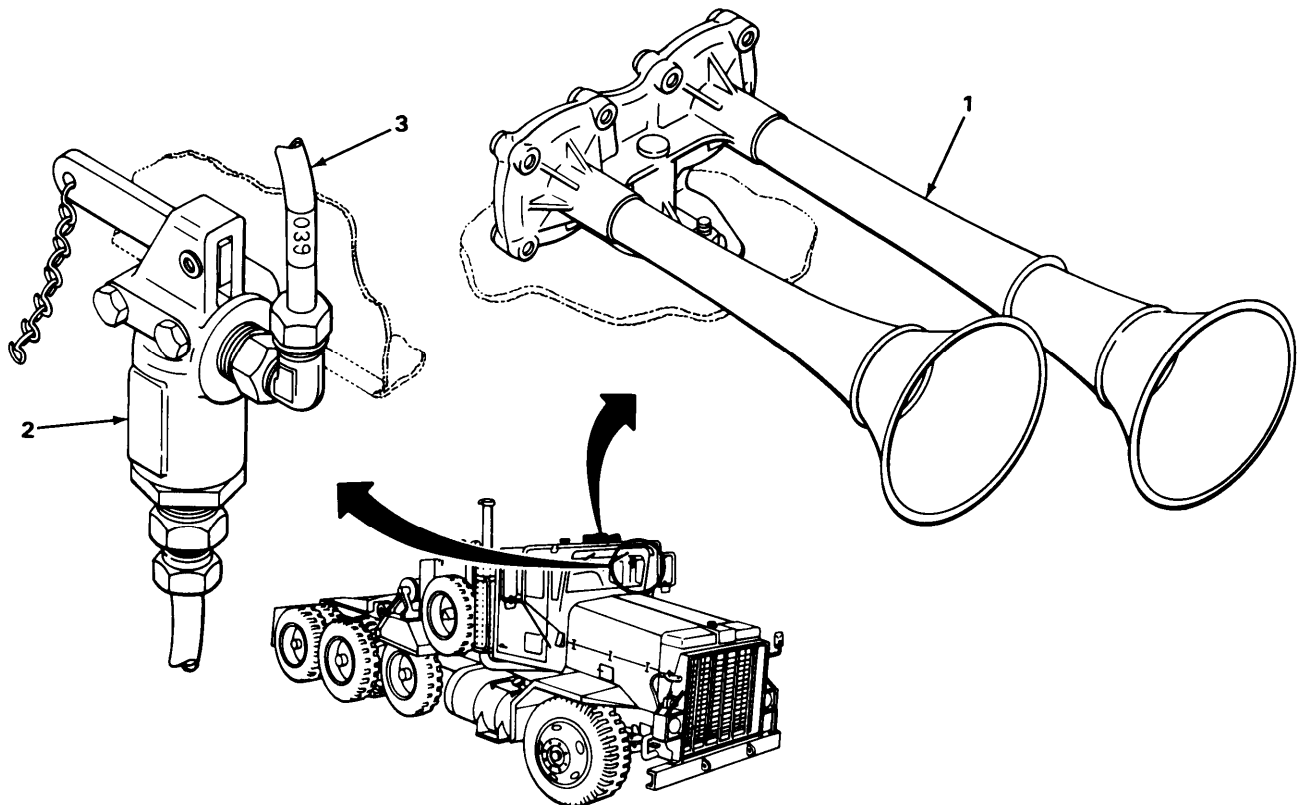
- Step 1. Start engine and build air pressure to operating level (TM 9-2320-270-10). Shut down engine (TM 9-2320-270-10). Check for damage or leaks in air hose no. 039 from horn (1) to valve (2) by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hoses are damaged or leaking, repair or replace (page 4-1260).

- Step 2. Take off hose no. 039 (3) at air horn valve (2). Apply known air supply to end of hose.

a. If horn does not sound, replace (page 4-1251).

b. If horn does sound, replace horn air valve (page 4-1244).



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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WHEELS AND TIRES

70. FRONT TIRES WEARING UNEVENLY.

Step 1. Check air pressure in both tires (1) (TM 9-2320-270-10).

If air pressure is not correct, add or remove air (TM 9-2320-270-10).

Step 2. Check U-bolts (2) for damage or tightness.

a. If U-bolts are loose, notify direct support maintenance.

b. If U-bolts are damaged, notify direct support maintenance.

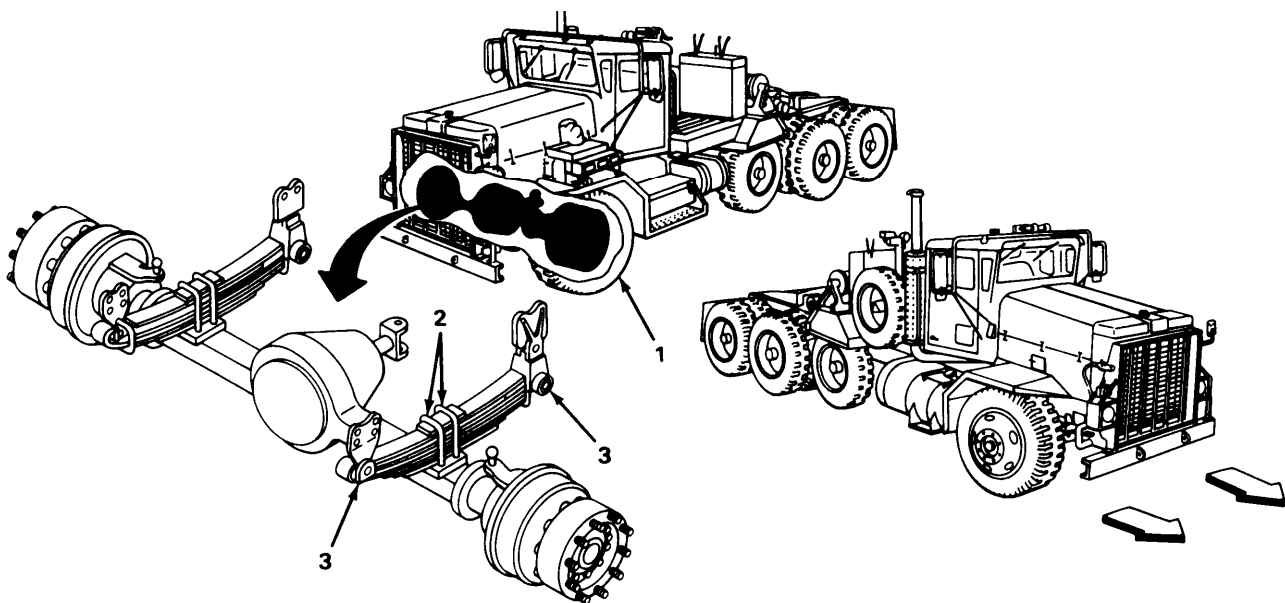
Step 3. Check spring pins (3) for damage by using pry bar. There should be no noticeable movement.

If spring pins are damaged, replace (page 4-1074).

Step 4. Check front tire toe-in.

a. If toe-in is not correct, adjust (page 4-1035).

b. If front tires still wear unevenly, notify direct support maintenance.



TA239760

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

STEERING

71. HARD STEERING.

Step 1. Check two front tires (1) for air pressure (TM 9-2320-270-10).

If tire pressure is low, add air (TM 9-2320-270-10).

Step 2. Open left side of hood and remove left side panel (TM 9-2320-270-10). Check reservoir (2) oil level.

If oil level is low, fill to proper level (LO 9-2320-270-12).

Step 3. Check two hoses (3) from reservoir (2) to pump (4) for damage or leaking.

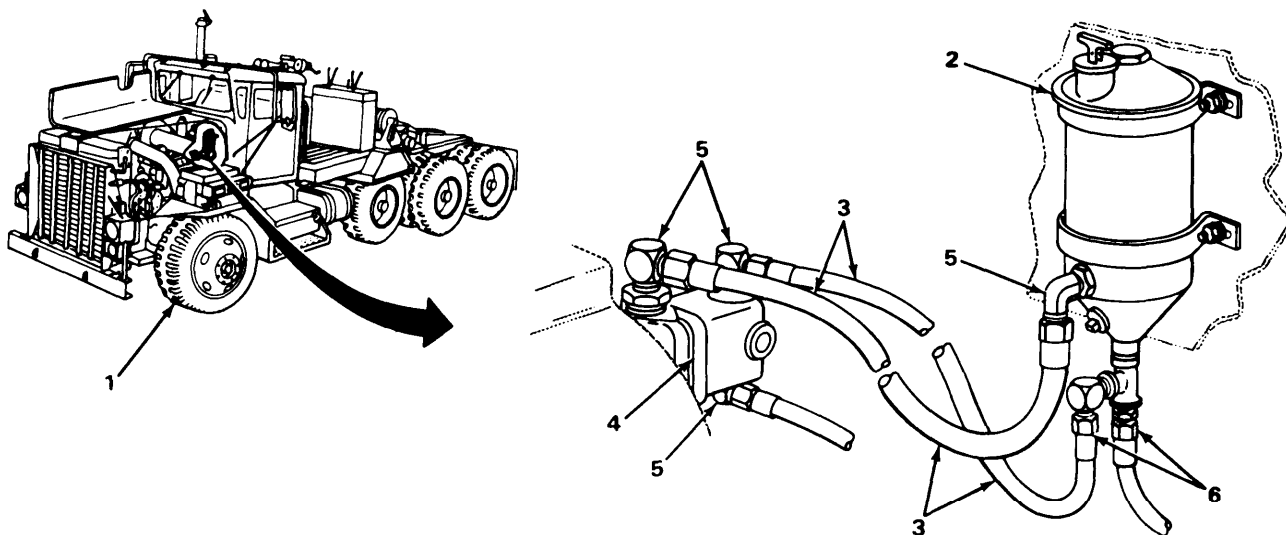
If hoses are damaged or leaking repair or replace (page 4-937).

Step 4. Check four fittings (5) for damage or tightness (page 4-1).

If fittings are damaged or loose, replace or tighten (page 4-937).

Step 5. Check two fittings (6) for damage or looseness (page 4-1).

If fittings are damaged or loose, replace or tighten (page 4-937).



TA239761

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

71. HARD STEERING - CONTINUED

Step 6. Install left side panel and close left side of hood (TM 9-2320-270-10). Check two hoses (1) from drag link (2), and check two fittings (3) for damage, looseness or leaks.

If damaged, loose or leaking, replace or tighten (page 4-937).

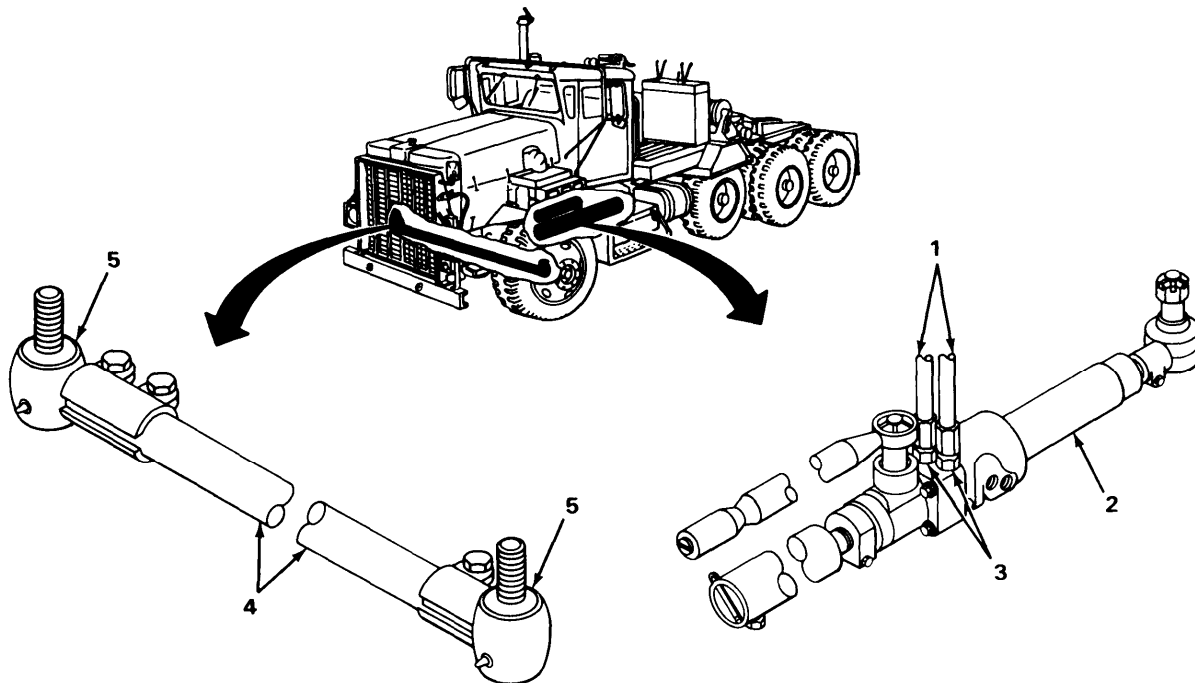
Step 7. Check drag link (2) for damage, leaking, or binding (page 4-1).

If drag link is damaged, leaking, or binding, replace drag link (page 4-937).

Step 8. Check tie rod (4) and tie rod ends (5) for damage and freedom of movement (page 4-1).

a. If tie rod or tie rod ends are damaged, repair or replace (page 4-968).

b. If tie rod ends are binding, lubricate (LO 9-2320-270-12).

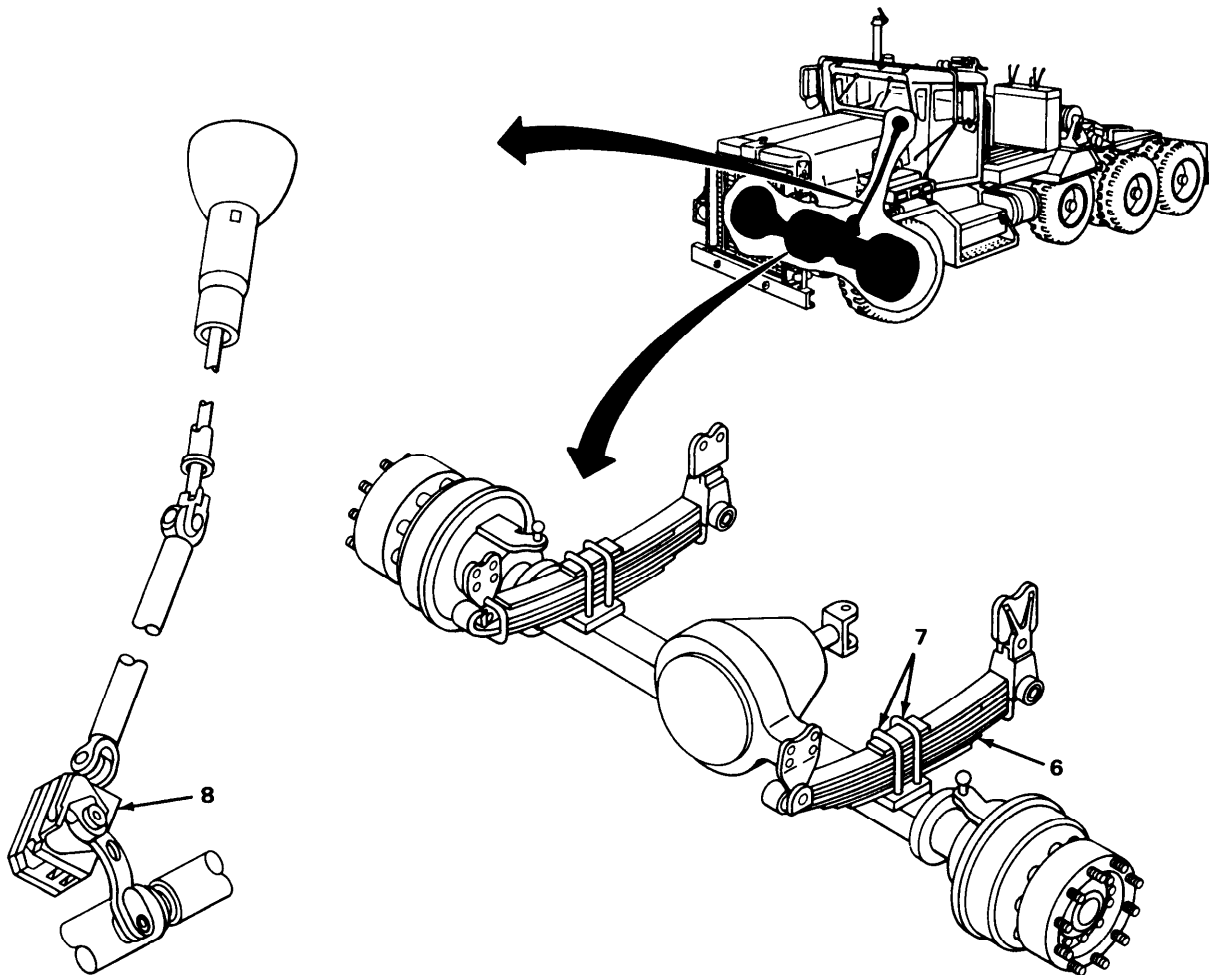


TA239762

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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- Step 9. Check springs (6) and U-bolts (7) for damage or tightness (page 4-1).
- a. If U-bolts are loose, notify direct support maintenance.
 - b. If springs or U-bolts are damaged, notify direct support maintenance.
- Step 10. Check steering gear (8) for damage, adjustment, or binding (page 4-1).
- a. If steering gear is damaged, notify direct support maintenance.
 - b. If steering gear is binding or out of adjustment, lubricate (LO 9-2320-270-12) or adjust (page 4-981).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

71. HARD STEERING – CONTINUED.

WARNING

Hydraulic jacks, such as the one supplied with truck, are intended for lifting truck, not supporting vehicle after it is raised. Do not get under M911 after it is raised unless it is properly supported with trestles or blocks. Truck could fall on you causing injury or death.

- Step 11. Check two steering knuckles (1) for damage and freedom of movement by jacking tire off ground, unhooking linkage and using pry bar.

If either steering knuckle is loose or binding, hookup linkage and notify direct support maintenance.

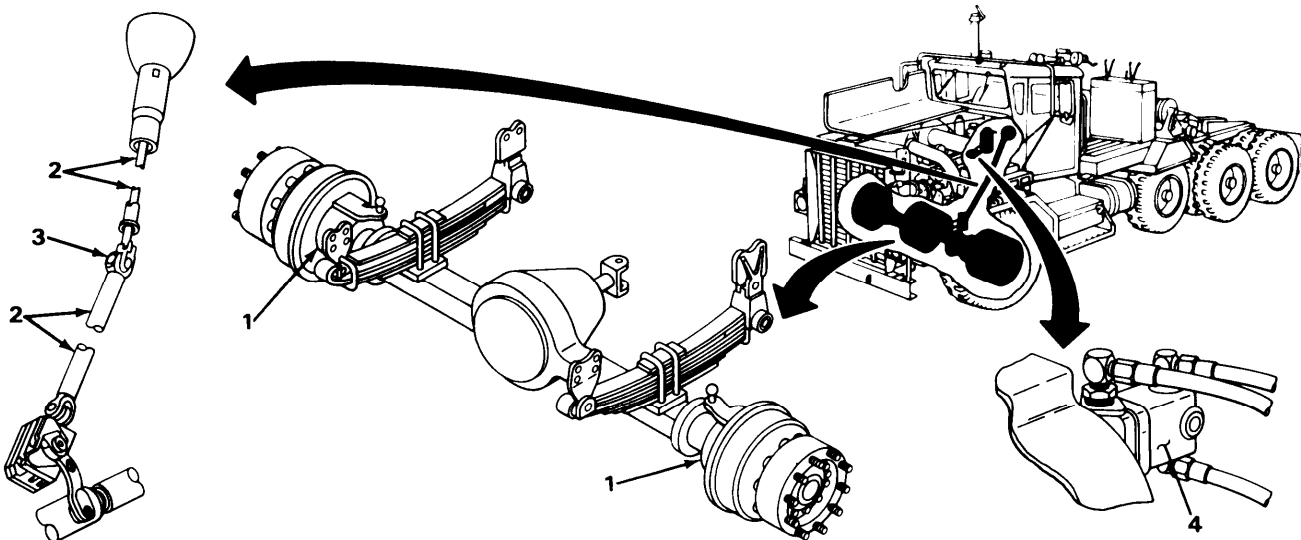
- Step 12. Open left side of hood and remove left side panel (TM 9-2320-270-10). Check steering column (2) and U-joint (3) for damage or binding (page 4-1).

If column or U-joint are damaged or binding, lubricate (LO 9-2320-270-12), or notify direct support maintenance for repair.

- Step 13. Check power steering pump (4) for excessive noise or heat (page 4-1).

a. If pump is noisy or overheating, replace (page 4-985).

b. If truck still steers hard, install left side panel and close left side of hood (TM 9-2320-270-10), and notify direct support maintenance.



TA239764

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

SUSPENSION

72. VEHICLE WANDERS OR PULLS TO ONE SIDE.

Step 1. Check pressure in front tires (1) (TM 9-2320-270-10).

If pressure is low, add air (TM 9-2320-270-10).

Step 2. Check tie rod (2) for damage or loose ends (page 4-1).

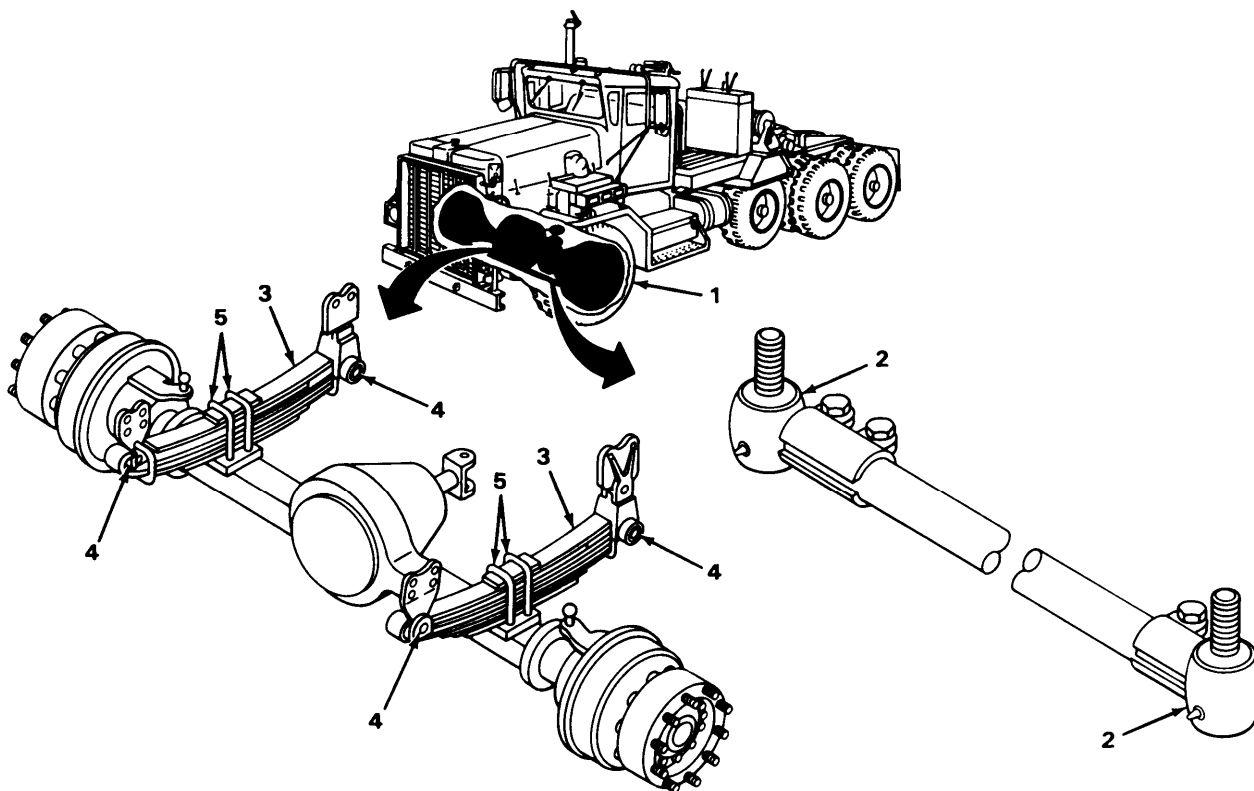
If tie rod is damaged or loose, repair or replace (page 4-968).

Step 3. Check springs (3), spring pins (4), and U-bolts (5) for damage or looseness (page 4-1).

a. If springs are damaged, notify direct support maintenance.

b. If spring pins are damaged, replace (page 4-1074).

c. If U-bolts are loose, notify direct support maintenance.



TA239765

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

72. VEHICLE WANDERS OR PULLS TO ONE SIDE - CONTINUED.

Step 4. Check alinement on front tires (1) (page 4-1035).

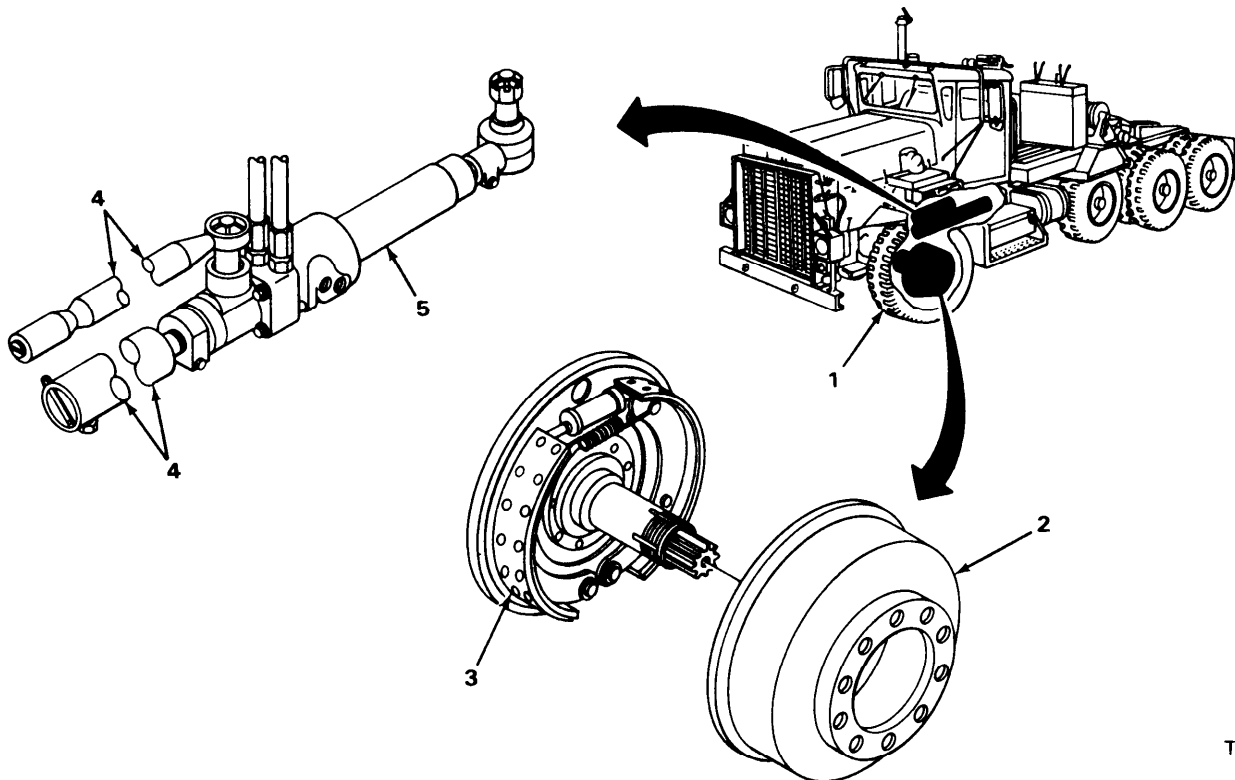
If tires are out of alinement, aline (page 4-1035).

Step 5. Check brakedrums (2) and brakeshoes (3) for damage and adjustment (page 4-1).

- a. If drums are damaged, replace (page 4-893), or notify direct support maintenance for repair.
- b. If shoes are damaged or out of adjustment, replace or adjust (page 4-610), or notify direct support maintenance for repair.

Step 6. Check drag links (4) and booster cylinder (5) for damage or binding (page 4-1).

- a. If drag links are damaged or binding, replace or repair (page 4-962 and 4-955).
- b. If booster cylinder is damaged, replace (page 4-1016).



TA239766

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

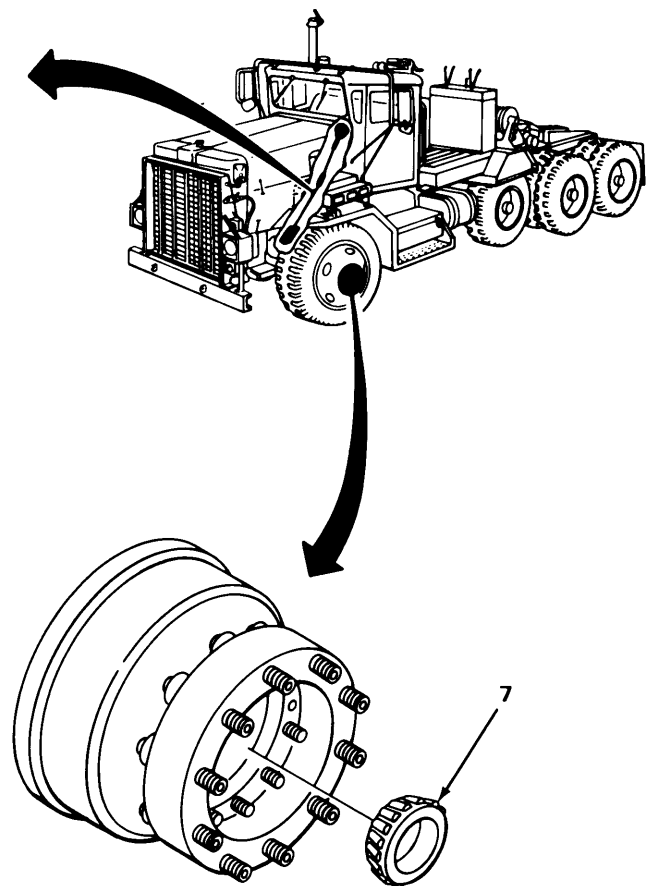
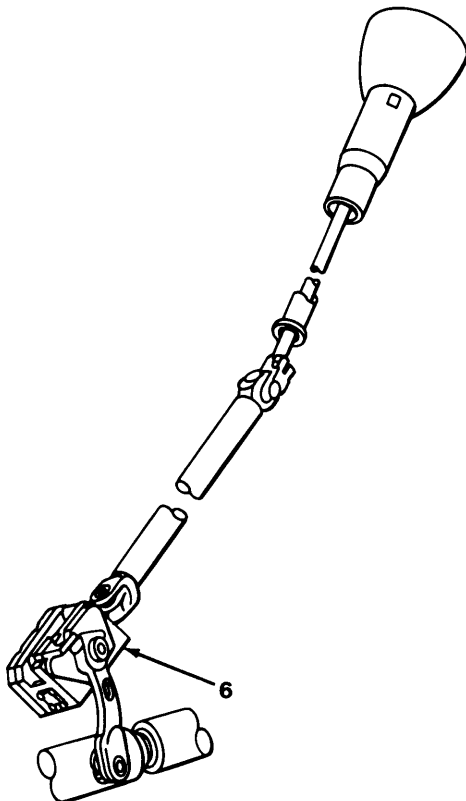
CORRECTIVE ACTION

Step 7. Check steering gear (6) for damage or adjustment (page 4-1).

- a. If gear is out of adjustment, adjust (page 4-981).
- b. If gear is damaged, notify direct support maintenance.

Step 8. Check wheel bearings (7) for damage or adjustment (page 4-1).

- a. If bearings are damaged or out of adjustment, replace or adjust (page 4-893).
- b. If vehicle still wanders or pulls, notify direct support maintenance.



TA239767

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

73. PUSHER AXLE WILL NOT RAISE OR LOWER.

Step 1. Start engine and build air pressure to operating level (TM 9-2320-270-10).

If pressure does not build to operating level, go to **NO OR LOW AIR PRESSURE** (page 3-129).

NOTE

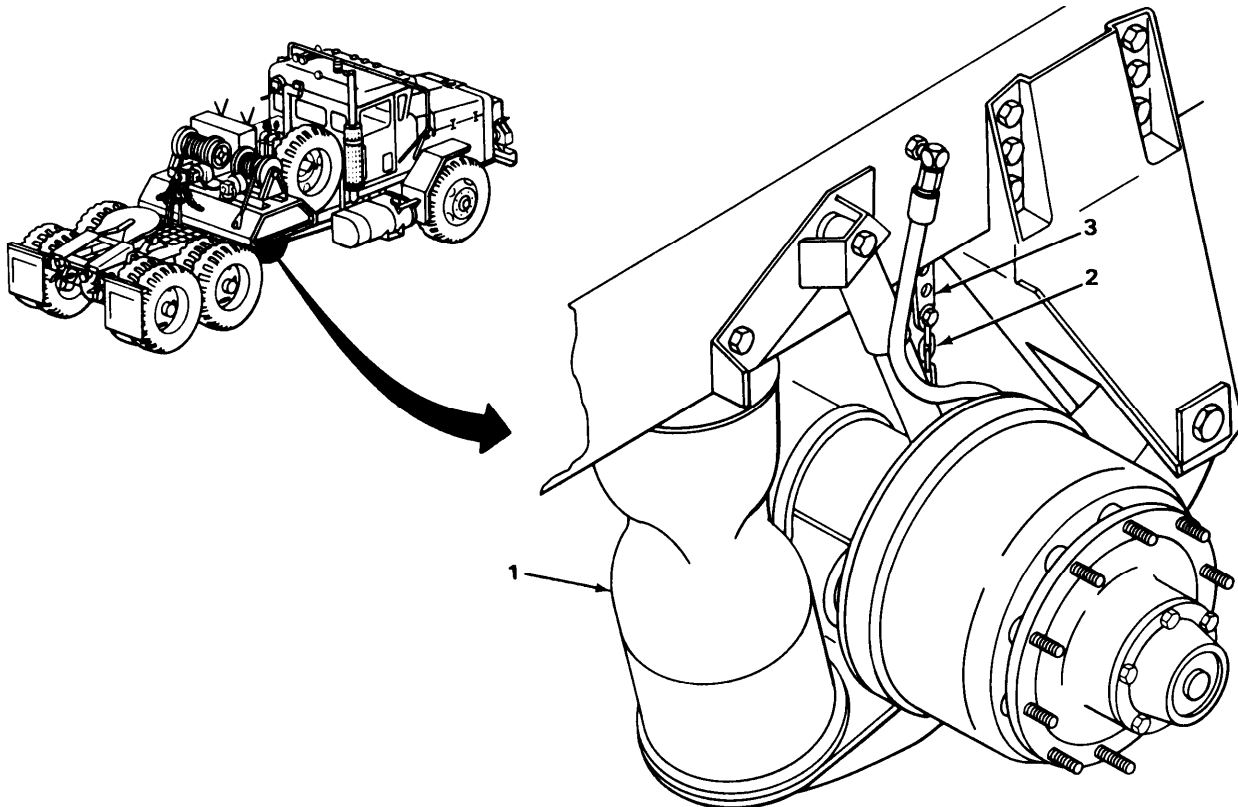
There are three air bags on the axle. Only one is shown.

Step 2. Shut down engine (TM 9-2320-270-10). Check three air bags (1) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

if bags are damaged or leaking, notify direct support maintenance.

Step 3. Check two lift chains (2) and brackets (3) for damage (page 4-1).

if chains or brackets are damaged, notify direct support maintenance.



TA239768

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

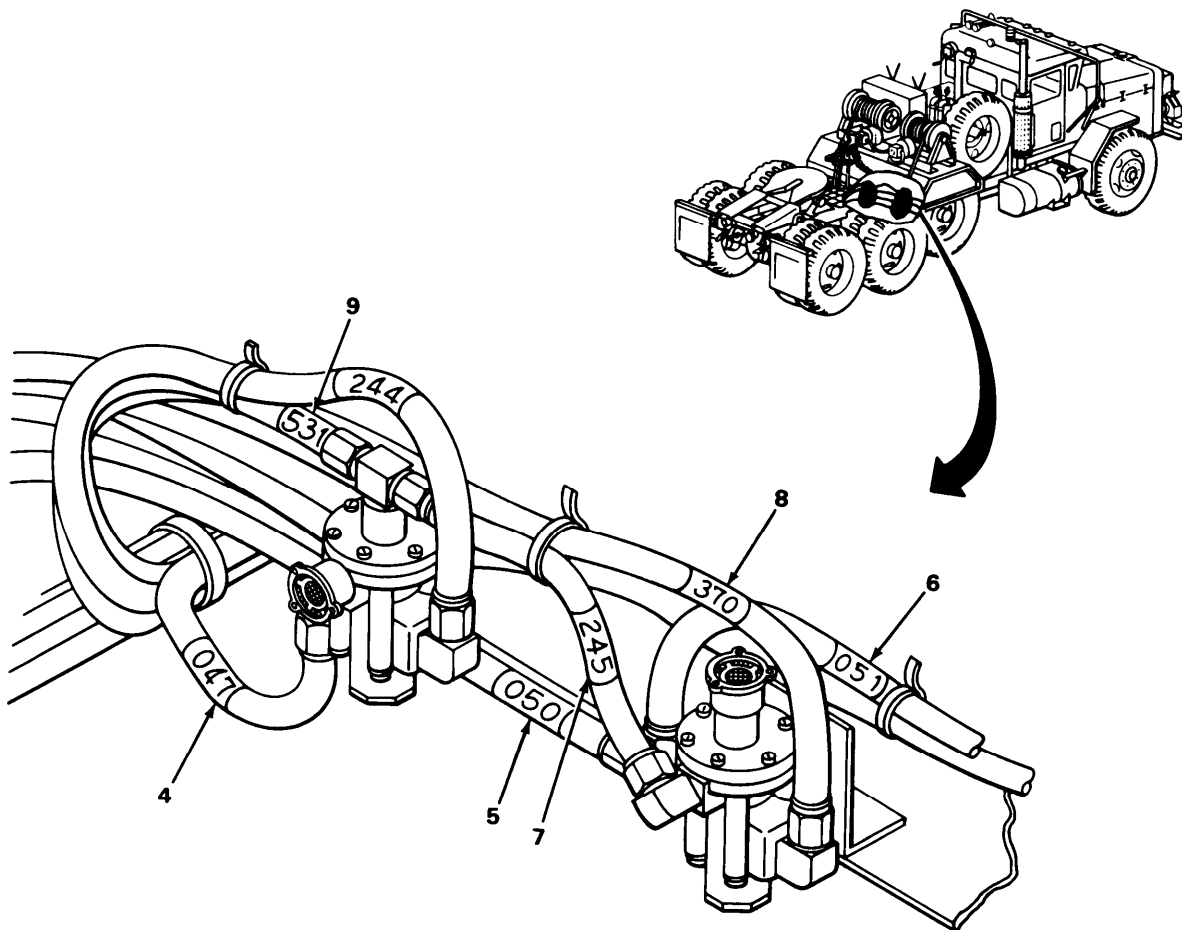
CORRECTIVE ACTION

Step 4. Check hose no. 047 (4), hose no. 050 (5), and hose no. 051 (6) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose is damaged or leaking, repair or replace (page 4-609).

Step 5. Check hose no. 245 (7), hose no. 370 (8), and hose no. 531 (9) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose is damaged or leaking, repair or replace (page 4-609).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

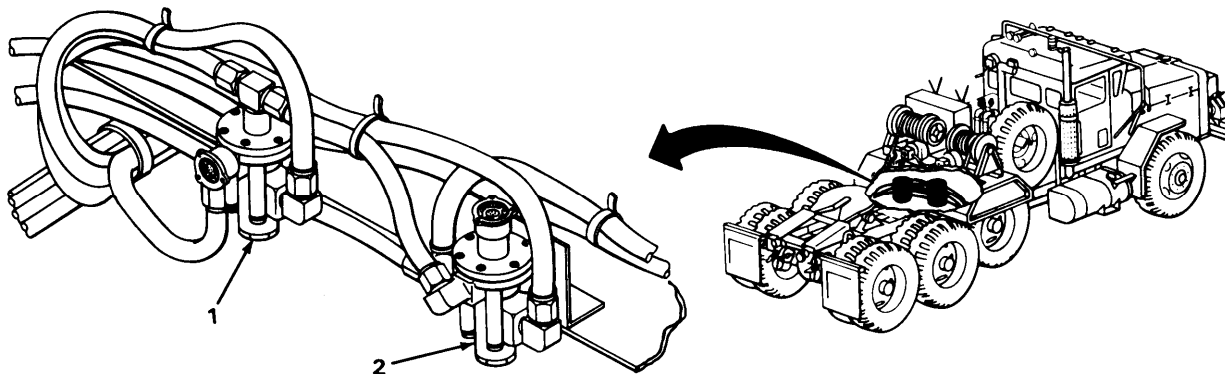
TEST OR INSPECTION

CORRECTIVE ACTION

73. PUSHER AXLE WILL NOT RAISE OR LOWER – CONTINUED.

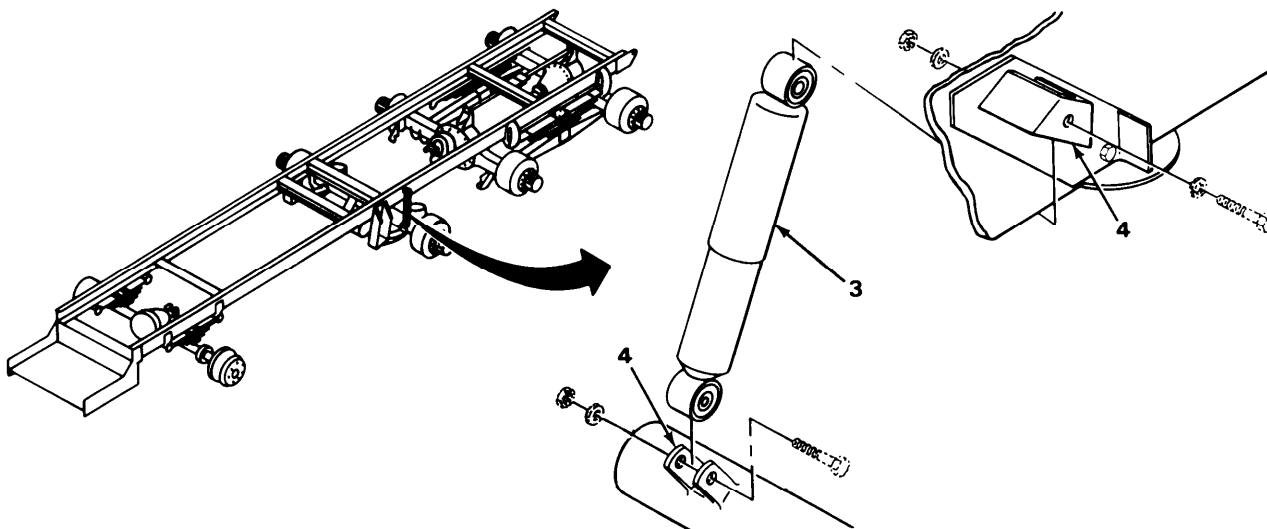
Step 6. Check left air pilot valve and fittings (1) and right air pilot valve and fittings (2) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If either valve or any fittings are damaged or leaking, replace (page 4-1065) or (page 4-1070).



Step 7. Check two shock absorbers (3) and mounting brackets (4) for damage (page 4-1).

If shock absorbers or mounting brackets are damaged, repair or replace (page 4-1084).



TA239770

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

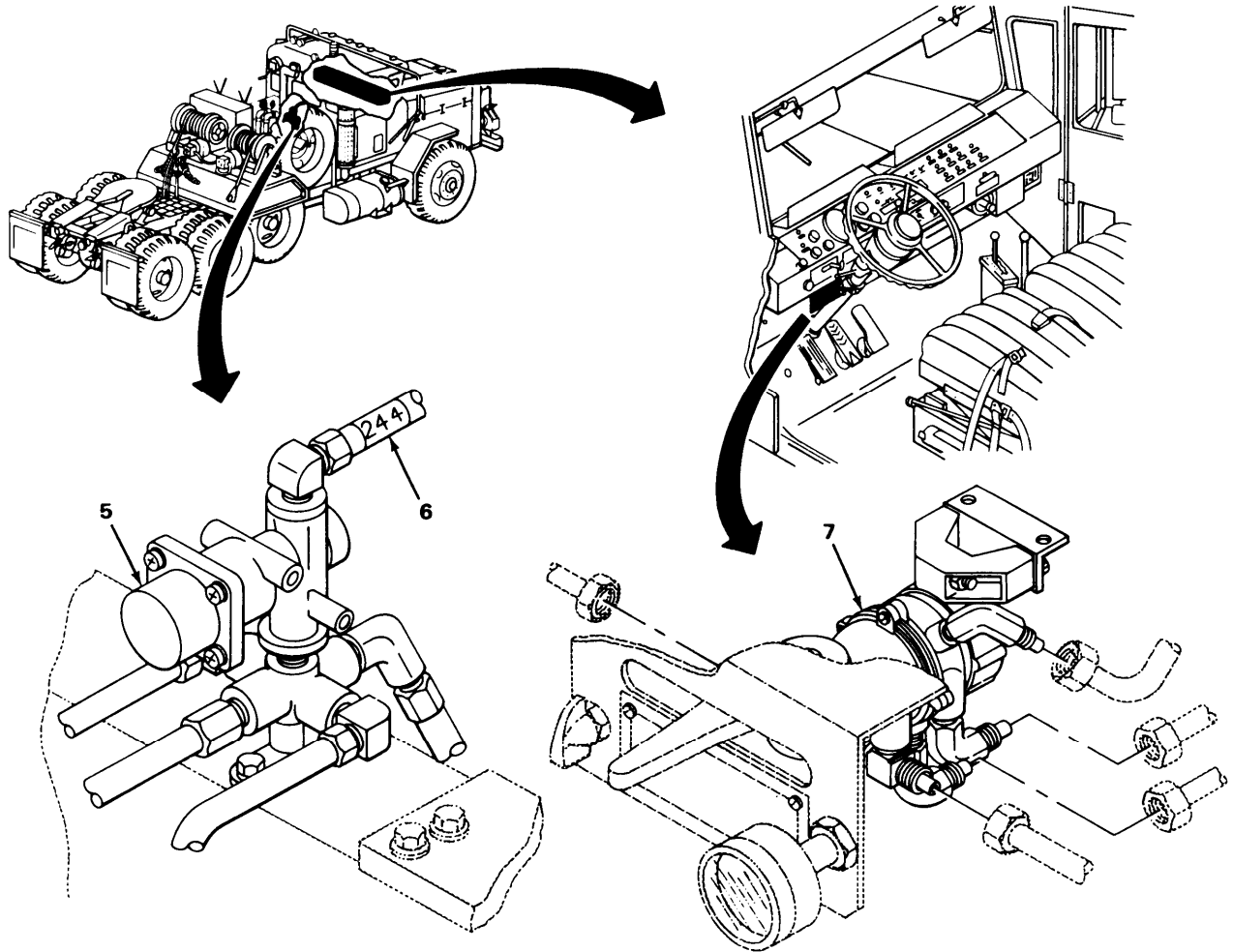
CORRECTIVE ACTION

Step 8. Check accessory pressure protection valve (5) and hose no. 244 (6) to left air pilot valve for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If valve is damaged or leaking, replace (page 4-752).

Step 9. Check pusher axle load control valve (7) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If valve is damaged or leaking, replace (page 4-1079).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

73. PUSHER AXLE WILL NOT RAISE OR LOWER - CONTINUED.

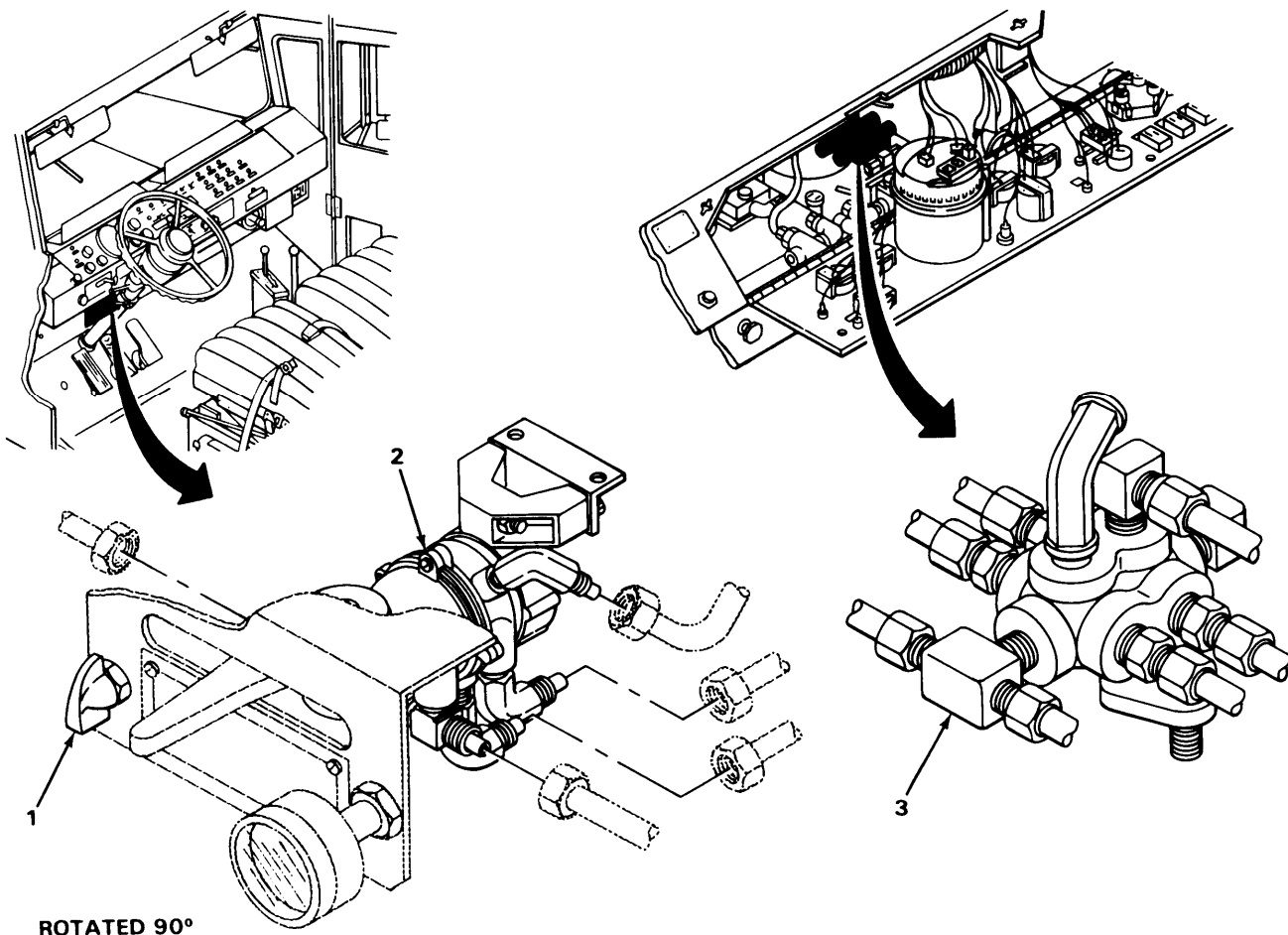
Step 10. Check raise/lower control valve (1) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If valve is damaged or leaking, replace (page 4-619).

Step 11. Check hose no. 533 from load control valve (2) to air manifold (3) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

a. If hose is damaged or leaking, replace or repair (page 4-609).

b. If pusher axle still will not raise or lower, notify direct support maintenance.



TA239772

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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WINCH SYSTEM

74. NEITHER WINCH OPERATES.

Step 1. Start engine and build air pressure to operating level (TM 9-2320-270-10). Engage winch station (TM 9-2320-270-10). Open driver's door of cab (I).

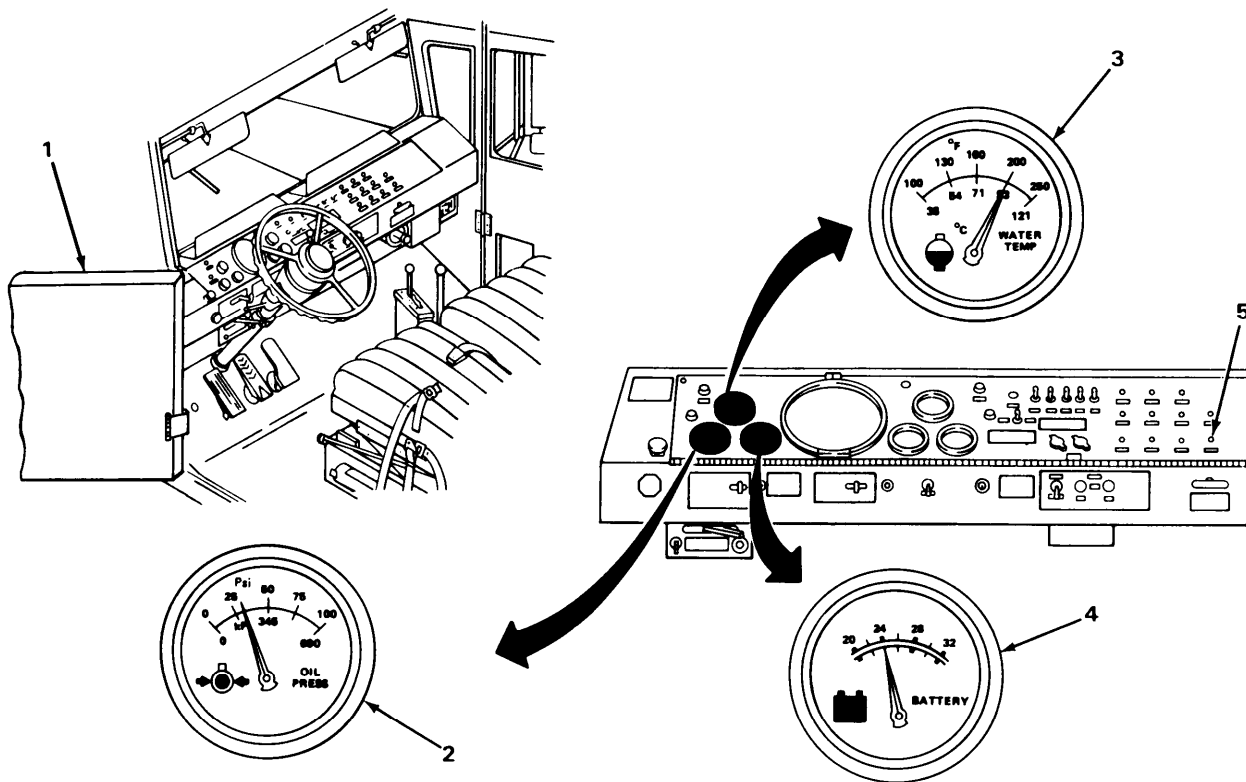
If electric horn does not blow, go to step 10.

Step 2. Check OIL PRESS gage (2), WATER TEMP gage (3), and BATTERY (4).

If three gages are working, shut down engine (TM 9-2320-270-10) and go to step 5.

Step 3. Check instrument panel circuit breaker (5) shut down engine (TM 9-2320-270-10) and put key in accessory position.

If breaker is tripped, push button in to reset breaker.

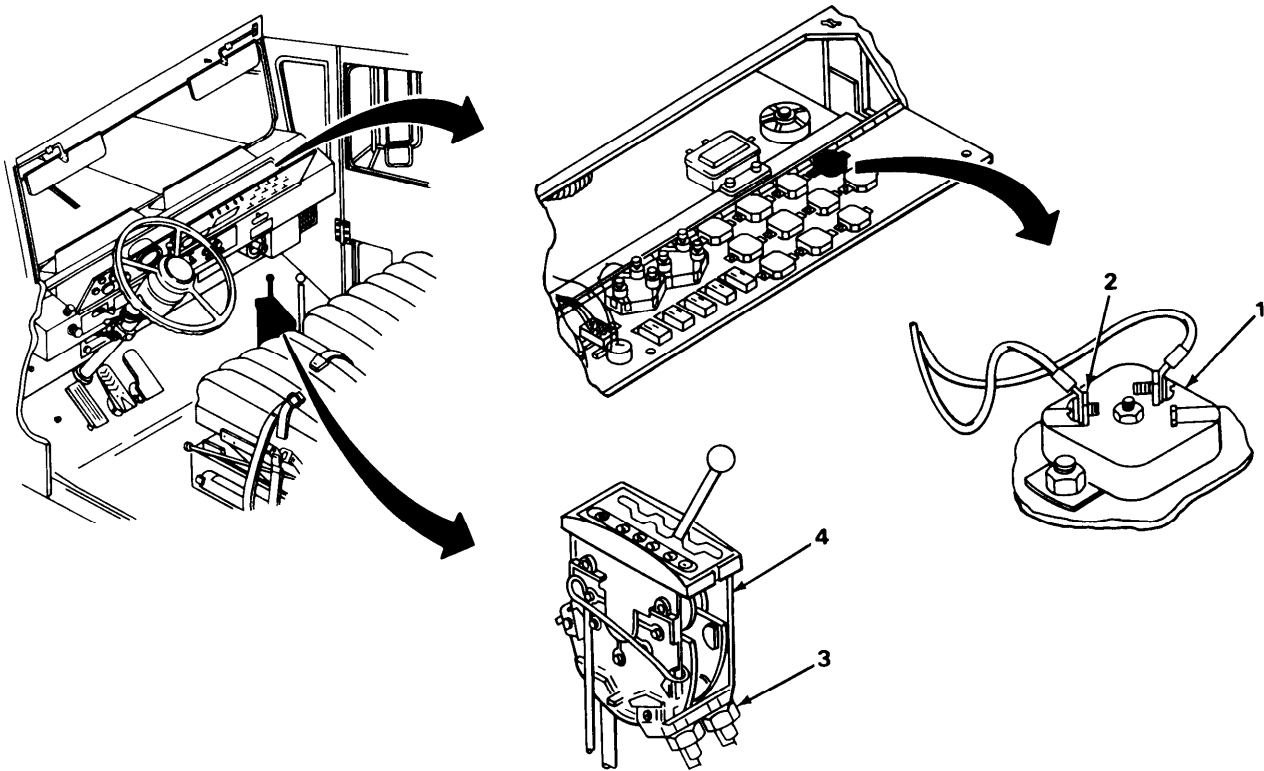


TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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74. NEITHER WINCH OPERATES- CONTINUED.

- Step 4. Open instrument panel (page 4-244). Go to instrument panel circuit breaker (I). Using multimeter set at 30 vdc, put red probe on terminal (2) for wire no. 075 and black probe to good ground.
- a. If meter reads voltage, put key in OFF position and replace circuit breaker (page 4-304).
 - b. If meter does not read voltage, put key in OFF position, close instrument panel (page 4-244).
- Step 5. Go to terminal for wire no. 437 on neutral safety switch (3) on shift tower (4). Using multimeter set at 30 vdc, put red probe on terminal and black probe to good ground.
- If meter reads no voltage, put key in OFF position and notify direct support maintenance.



CASE REMOVED FOR CLARITY

TA239774

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

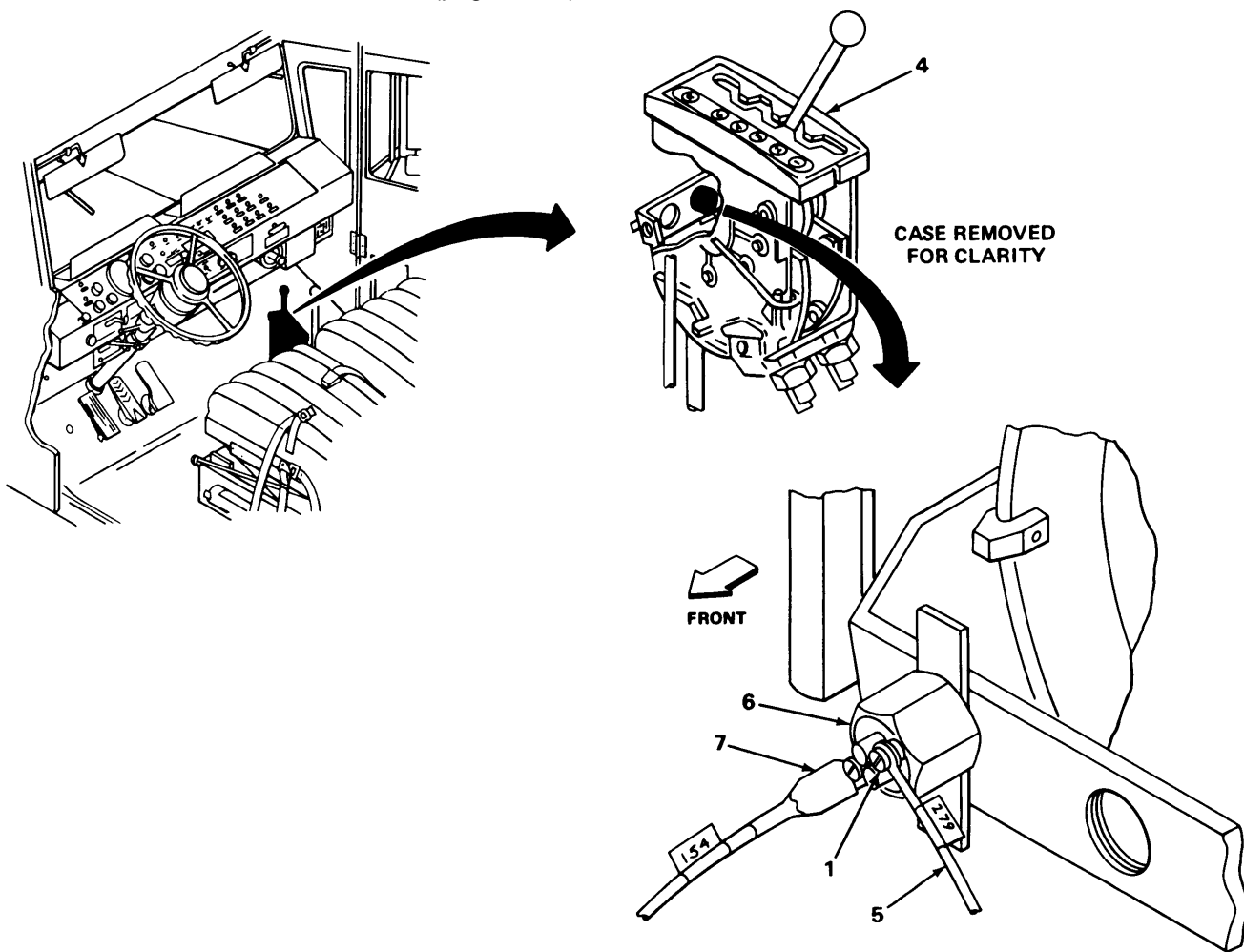
CORRECTIVE ACTION

Step 6. Go to terminal for wire no. 279 (5) on fifth gear switch (6) on shift tower (4). Using multimeter set at 30 vdc, put red probe on terminal and black to probe to good ground.

If meter reads no voltage, put key in OFF position and notify direct support maintenance.

Step 7. With main transmission in fifth gear, go to terminal for wire no. 154 (7) on fifth gear switch. Using multimeter set at 30 vdc, put red probe on terminal and black probe to good ground.

If meter reads no voltage, put key in OFF position replace fifth gear switch (page 4-509).



TA239775

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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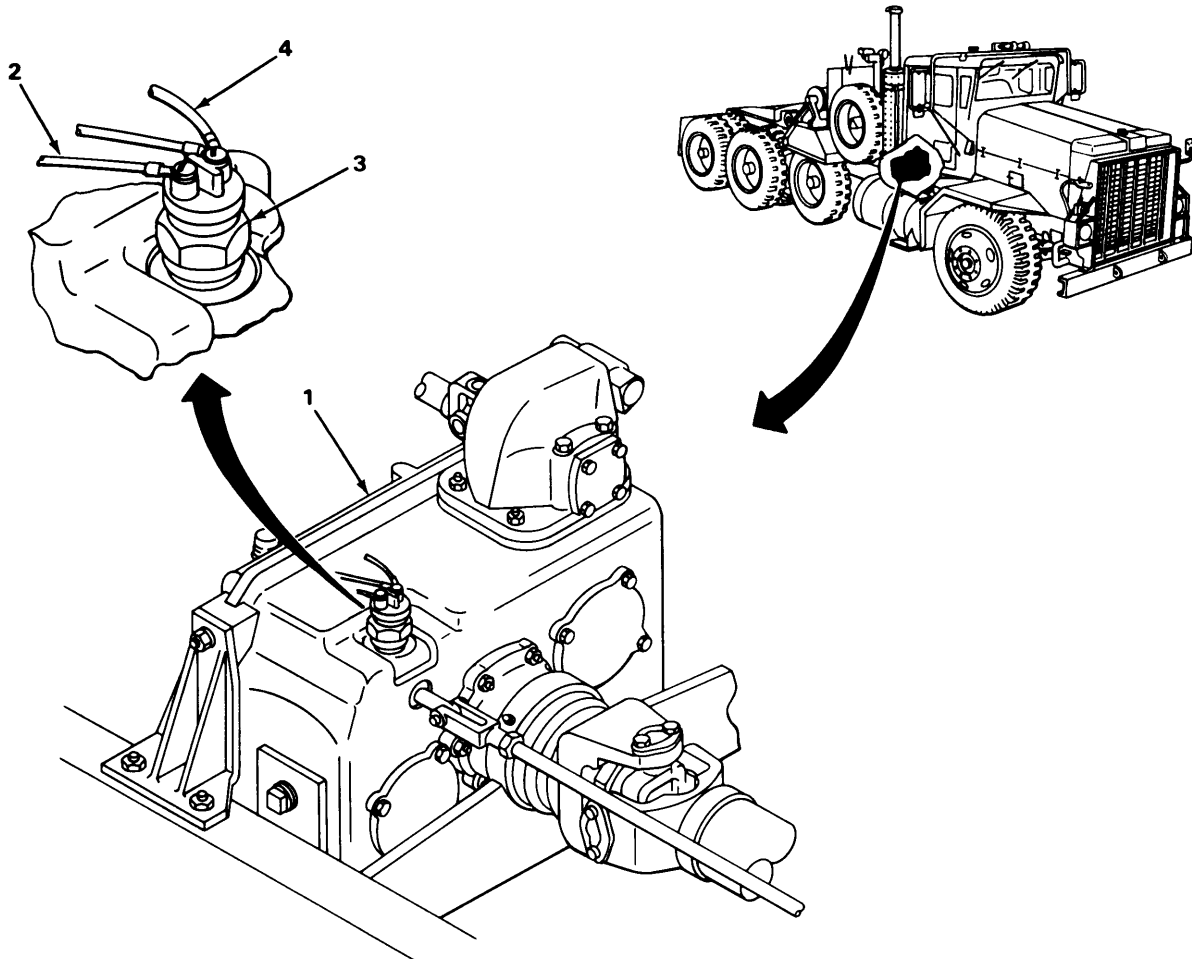
74. NEITHER WINCH OPERATES - CONTINUED.

Step 8. Go to auxiliary transmission (1). Using multimeter set at 30 vdc, put red probe on terminal for wire no. 154 (2) on auxiliary transmission neutral safety switch (3) and black probe to good ground.

If meter reads no voltage, put key in OFF position and notify direct support maintenance.

Step 9. Using multimeter set at 30 vdc, put red probe on terminal for wire no. 154-A (4) and black probe to good ground.

If meter reads no voltage, put key in OFF position and replace auxiliary transmission neutral safety switch (page 4-414).



TA239776

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

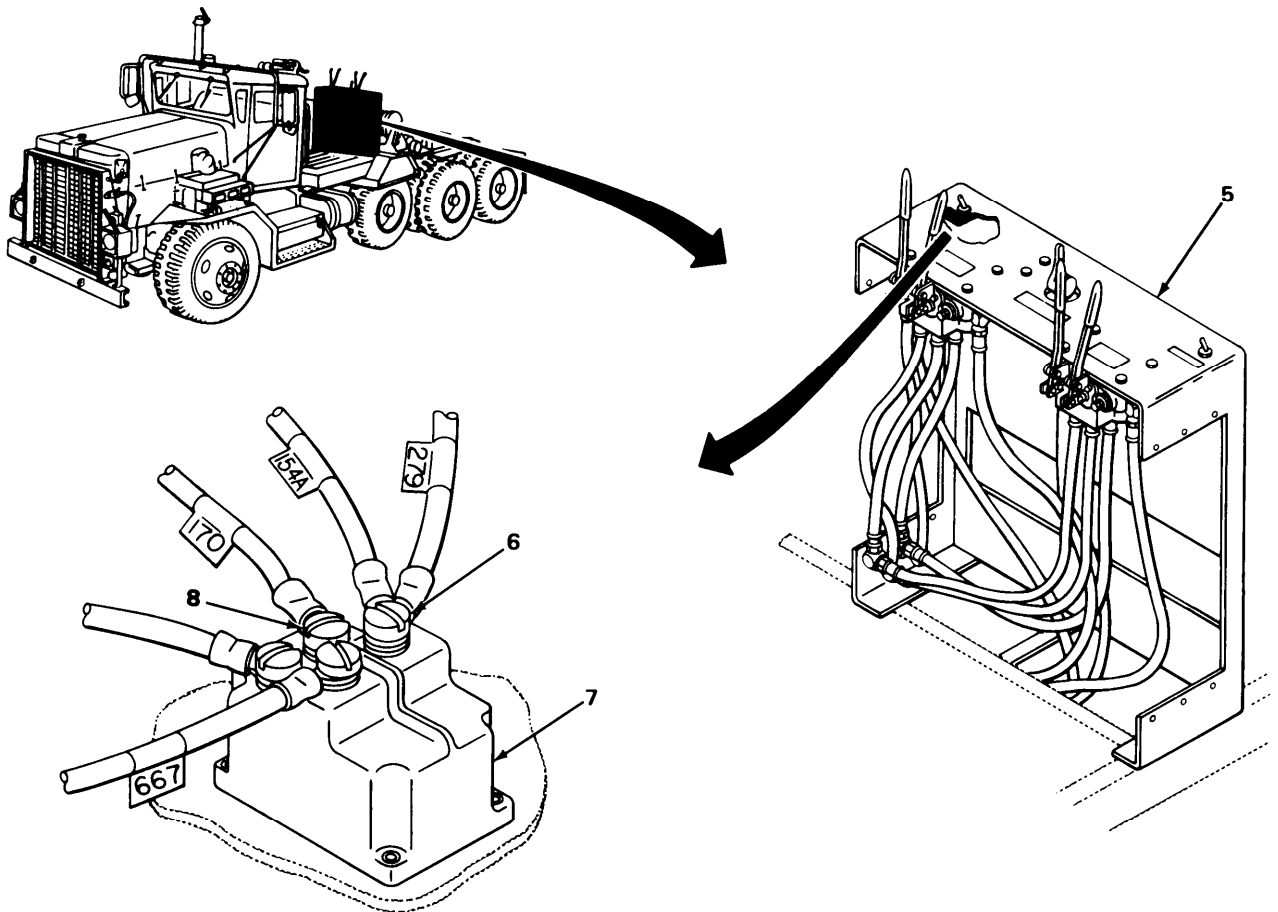
CORRECTIVE ACTION

Step 10, At winch station (5), remove winch front cover (page 4-1136). Using multimeter set at 30 vdc, put red probe on terminal for wire no. 154-A (6) on electric throttle switch (7), and black probe to good ground.

If meter reads no voltage, put key in OFF position and notify direct support maintenance.

Step 11. With winch throttle valve (7) in ON position, and using multimeter set at 30 vdc, put red probe on terminal for air solenoid valve wire no. 170 (8) and black probe to good ground.

If meter reads no voltage, put key in OFF position and replace winch throttle valve (page 4-1141).



VIEW LOOKING UP

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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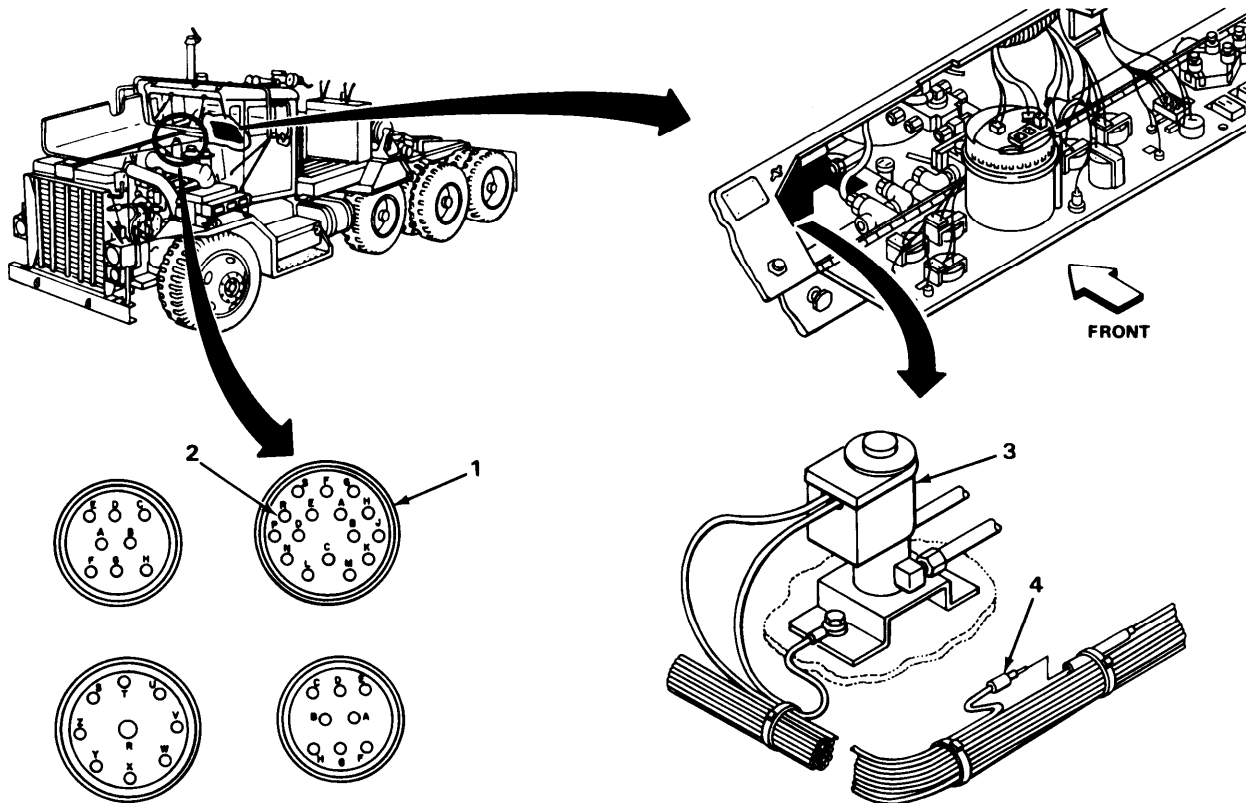
74. NEITHER WINCH OPERATES – CONTINUED.

Step 12. Open left side of hood and remove left side panel (TM 9-2320-270-10). Go to chassis firewall connector (1). Using multimeter set at 30 vdc, put red probe on terminal N (2) and black probe to good ground.

If meter reads no voltage, put key in OFF position, install left side panel and close left side of hood (TM 9-2320-270-10) and notify direct support maintenance.

Step 13. Install left side panel and close left side of hood (TM 9-2320-270-10) and open instrument panel (page 4-244). Go to air solenoid valve (3). Using multimeter set at 30 vdc, put red probe on terminal for wire no. 170 (4) and black probe to good ground.

If meter reads no voltage, put key in **OFF** position, close instrument panel (page 4-244) and notify direct support maintenance.



TA239778

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

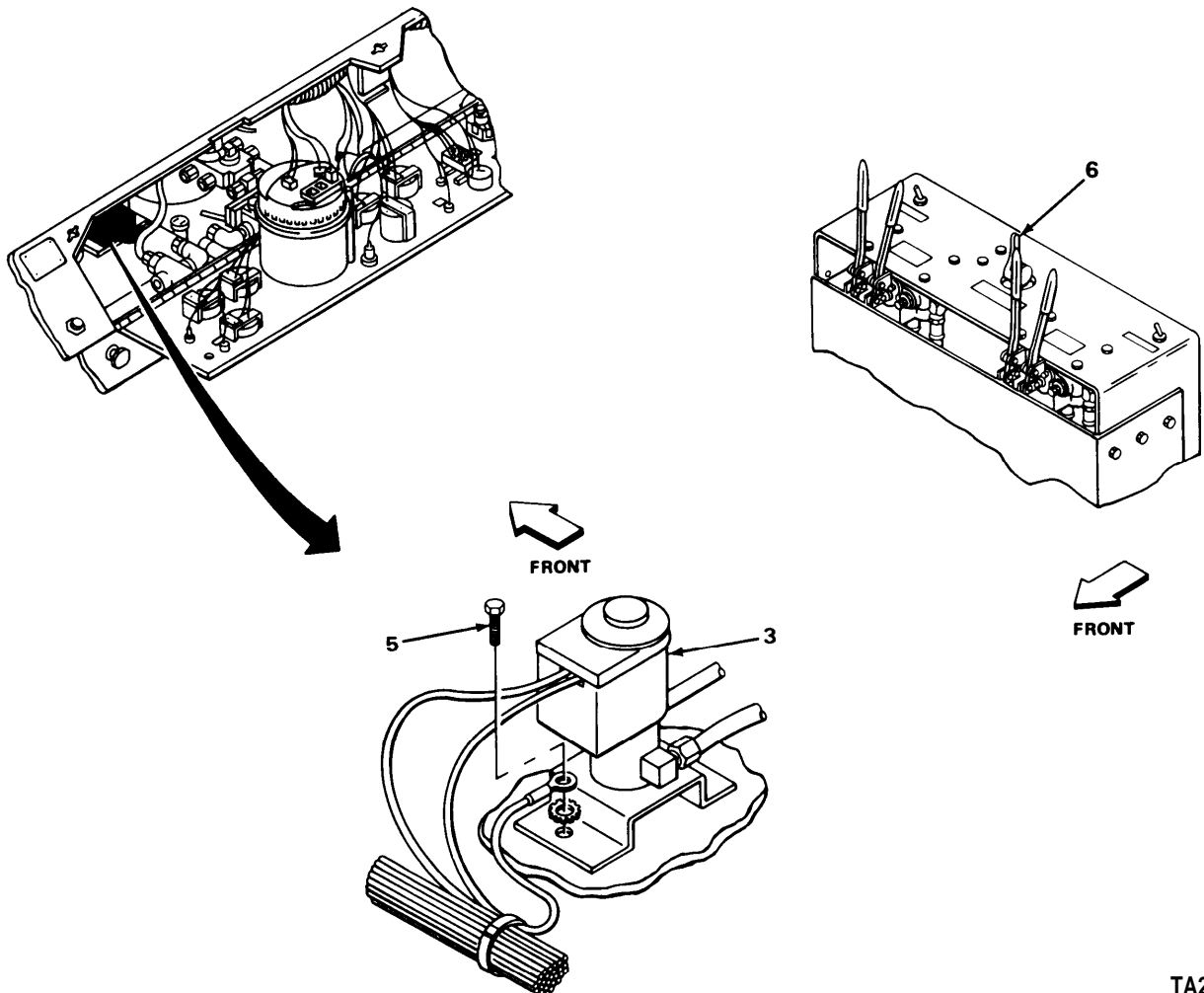
CORRECTIVE ACTION

- Step 14. At auxiliary throttle air solenoid valve (3). Disconnect ground wire from ground bolt (5). Using multimeter set at 30 vdc, put red probe on end of ground wire and black probe to good ground.

If meter reads no voltage, put key in OFF position and replace air solenoid valve (page 4-760).

- Step 15. Close instrument panel (page 4-244). Start engine and engage winch station (TM 9-2320-270-10). Go to winch station throttle control valve (6). Check to see if throttle control valve will change engine rpm when handle is moved.

If winch station throttle control valve controls engine rpm, make sure air pressure has built up to operating level, then shut down engine (TM 9-2320-270-10) and go to step 22.



TA239779

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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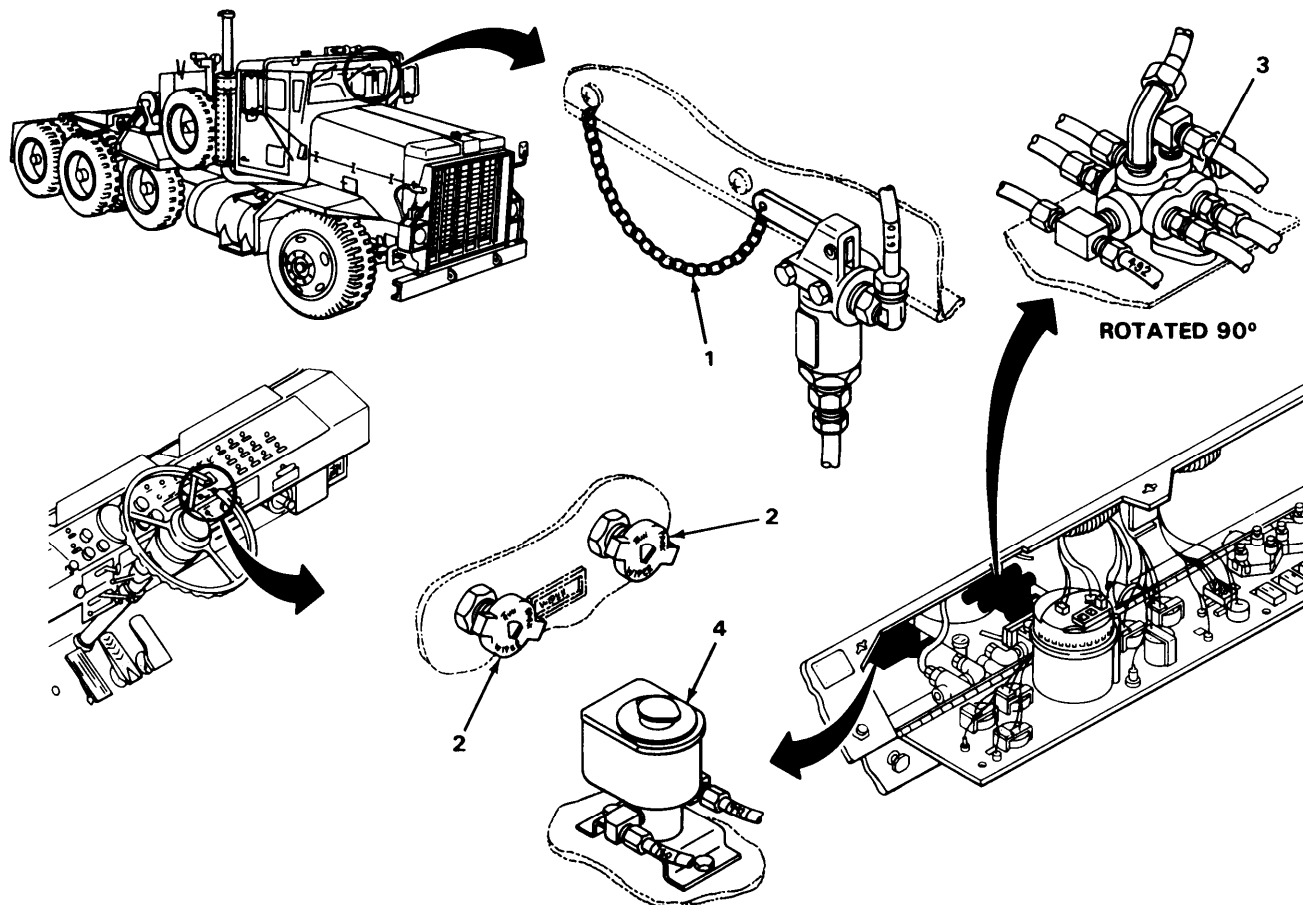
74. NEITHER WINCH OPERATES – CONTINUED.

Step 16. Sound air horn (1) and turn on windshield wipers (2) (TM 9-2320-270-10).

If both horn and wipers fail to work, go to NO OR LOW AIR PRESSURE (page 3-129).

Step 17. Make sure air pressure has built up to operating level then shut down engine (TM 9-2320-270-10). Open instrument panel (page 4-244). Check hose no. 492 from air manifold (3) to air solenoid valve (4) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose is damaged or leaking, replace or repair (page 4-609).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

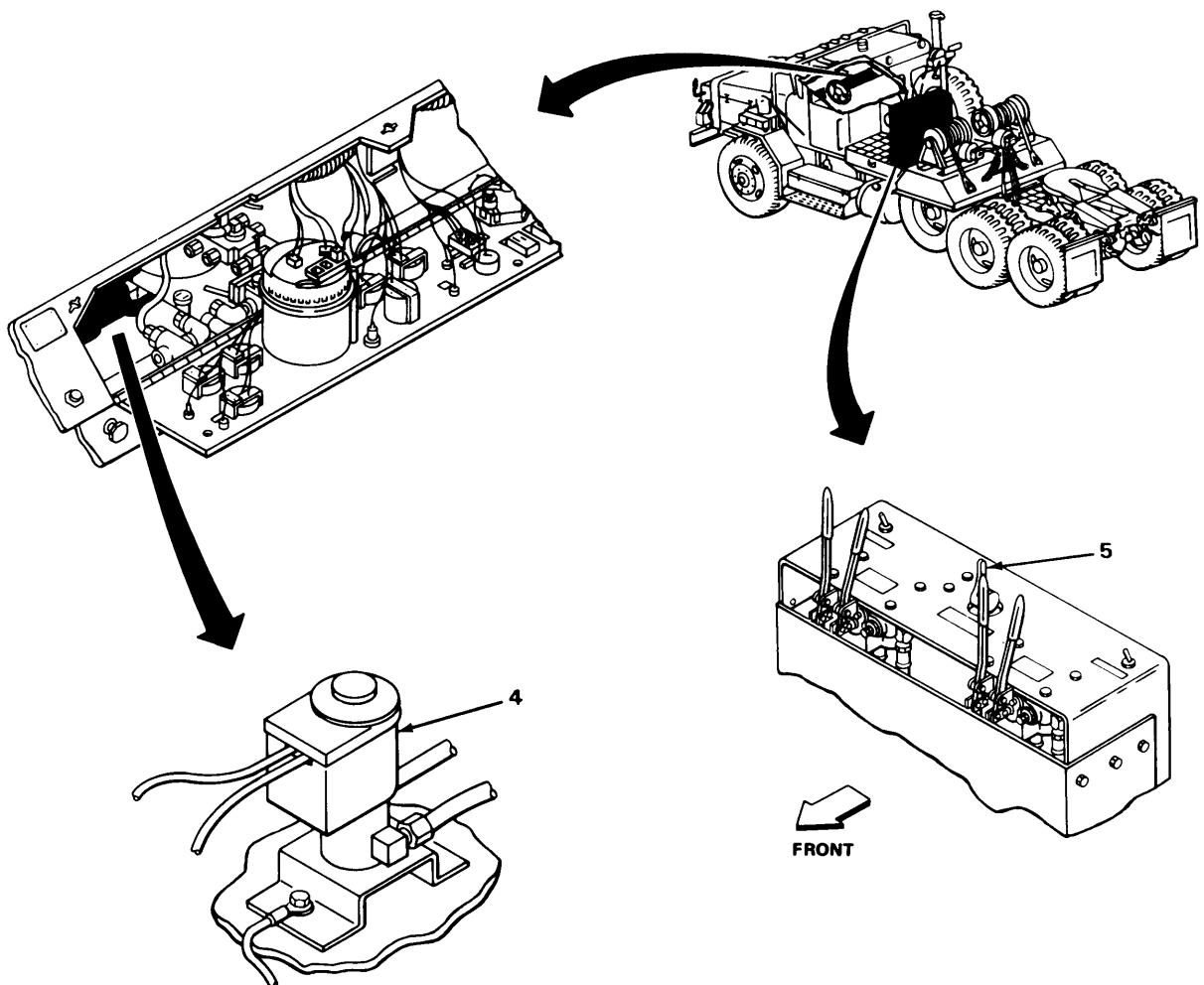
CORRECTIVE ACTION

Step 18. Check auxiliary throttle solenoid valve (4) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If valve is damaged or leaking, replace (page 4-760).

Step 19. Check hose no. 750 from auxiliary throttle solenoid valve (4) to air regulating valve (5) on winch station for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose is damaged or leaking, repair or replace (page 4-609).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

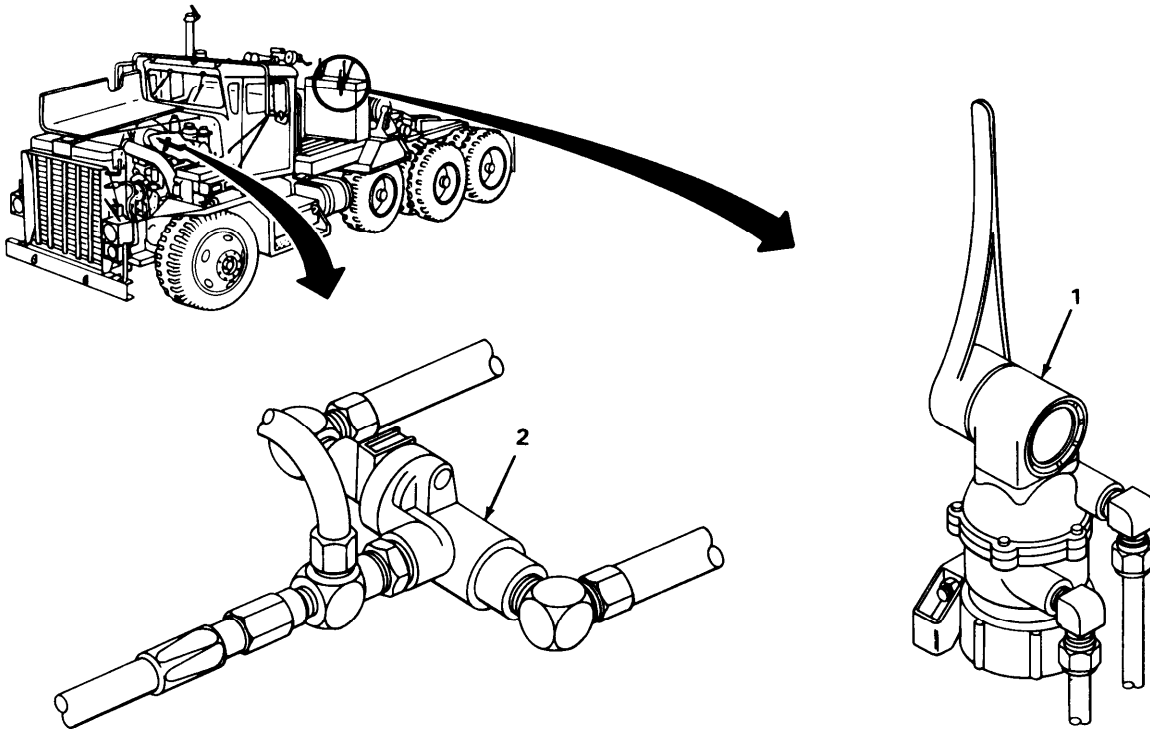
74. NEITHER WINCH OPERATES – CONTINUED.

Step 20. Close instrument panel (page 4-244). Check throttle valve (1) on winch station for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If valve is damaged or leaking, replace (page 4-1141).

Step 21. Open left side of hood and remove left side panel (TM 9-2320-270-10). Check hose no. 464 from throttle valve (1) to doublecheck valve (2) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose is damaged or leaking, repair or replace (page 4-609).

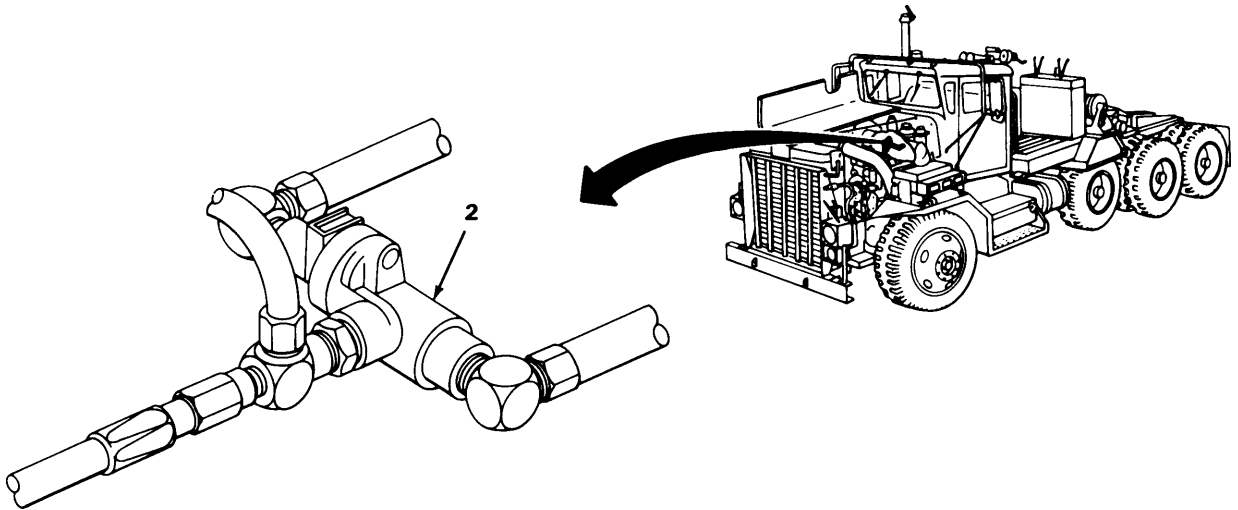


TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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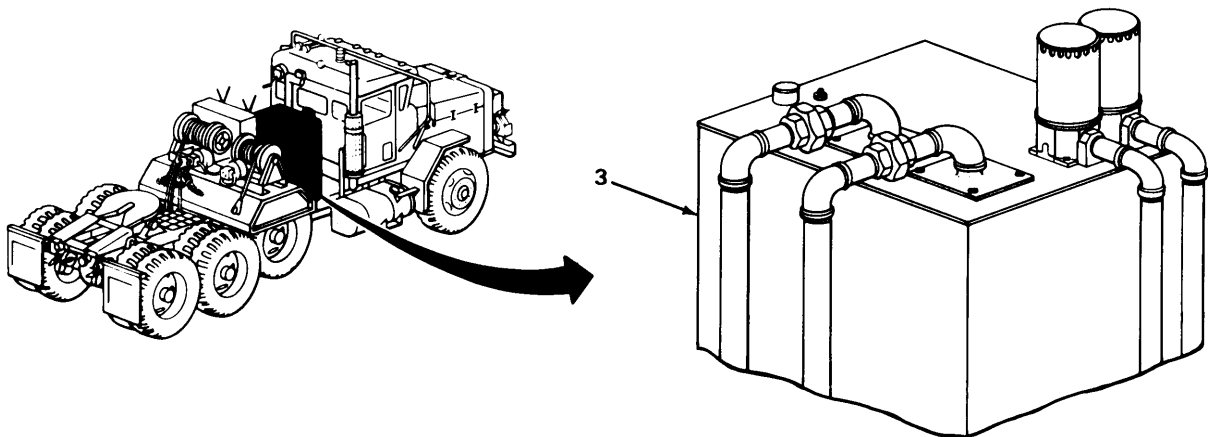
Step 22. Check doublecheck valve (2) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If check valve is damaged or leaking, replace (page 4-796).



Step 23. Install left side panel and close left side of hood (TM 9-2320-270-10). Go to oil reservoir (3). Check oil level (LO 9-2320-270-1 2).

If oil is low, fill to proper level (LO 9-2320-270-12).



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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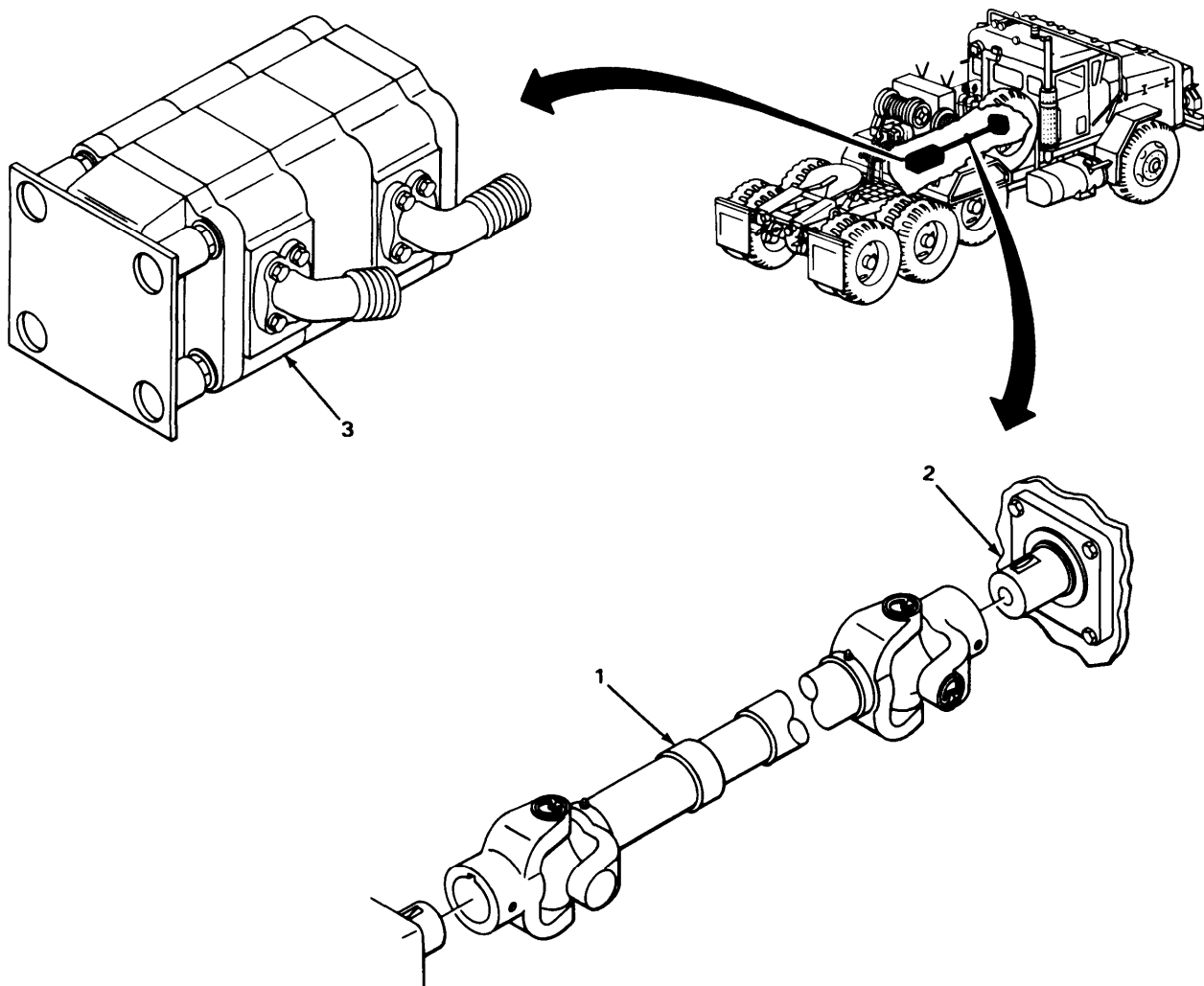
74. NEITHER WINCH OPERATES - CONTINUED.

Step 24. Check winch propeller shaft (1) between auxiliary transmission (2) and hydraulic pump (3) for damage and rotation (page 4-1).

- a. If shaft does not rotate, go to step 29.
- b. If shaft is damaged, replace (page 4-1175).

Step 25. Check hydraulic pump (3) for damage or leaks (page 4-1).

If pump is damaged or leaking, notify direct support maintenance.



TA239784

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

Step 26. Check hoses from reservoir (4) to pump (3) for damage or leaks (page 4-1).

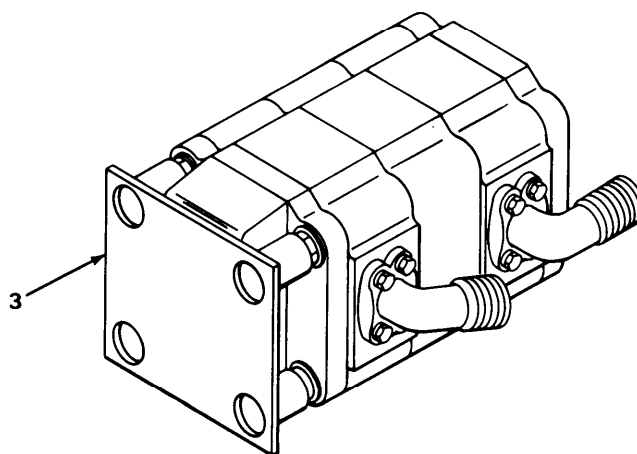
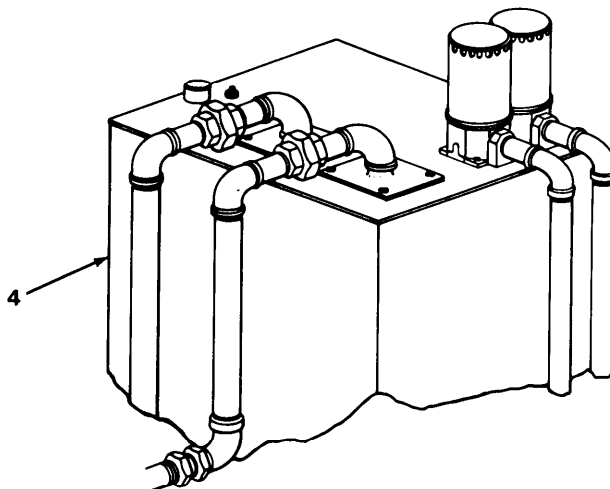
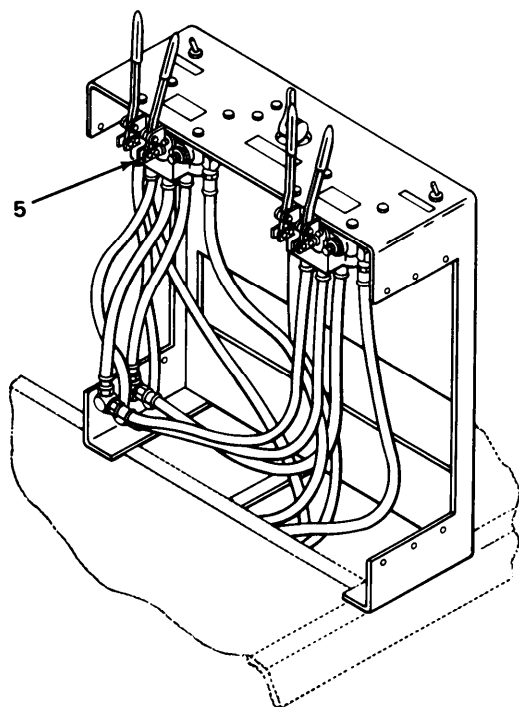
If hoses are damaged or leaking, replace (page 4-1146).

Step 27. Check hoses from pump (3) to valves (5) for damage or leaks (page 4-1).

If hoses are damaged or leaking, replace (page 4-1150).

Step 28. Check hoses from valves (5) to reservoir (4) for damage or leaks (page 4-1).

If hoses are damaged or leaking, replace (page 4-1146).



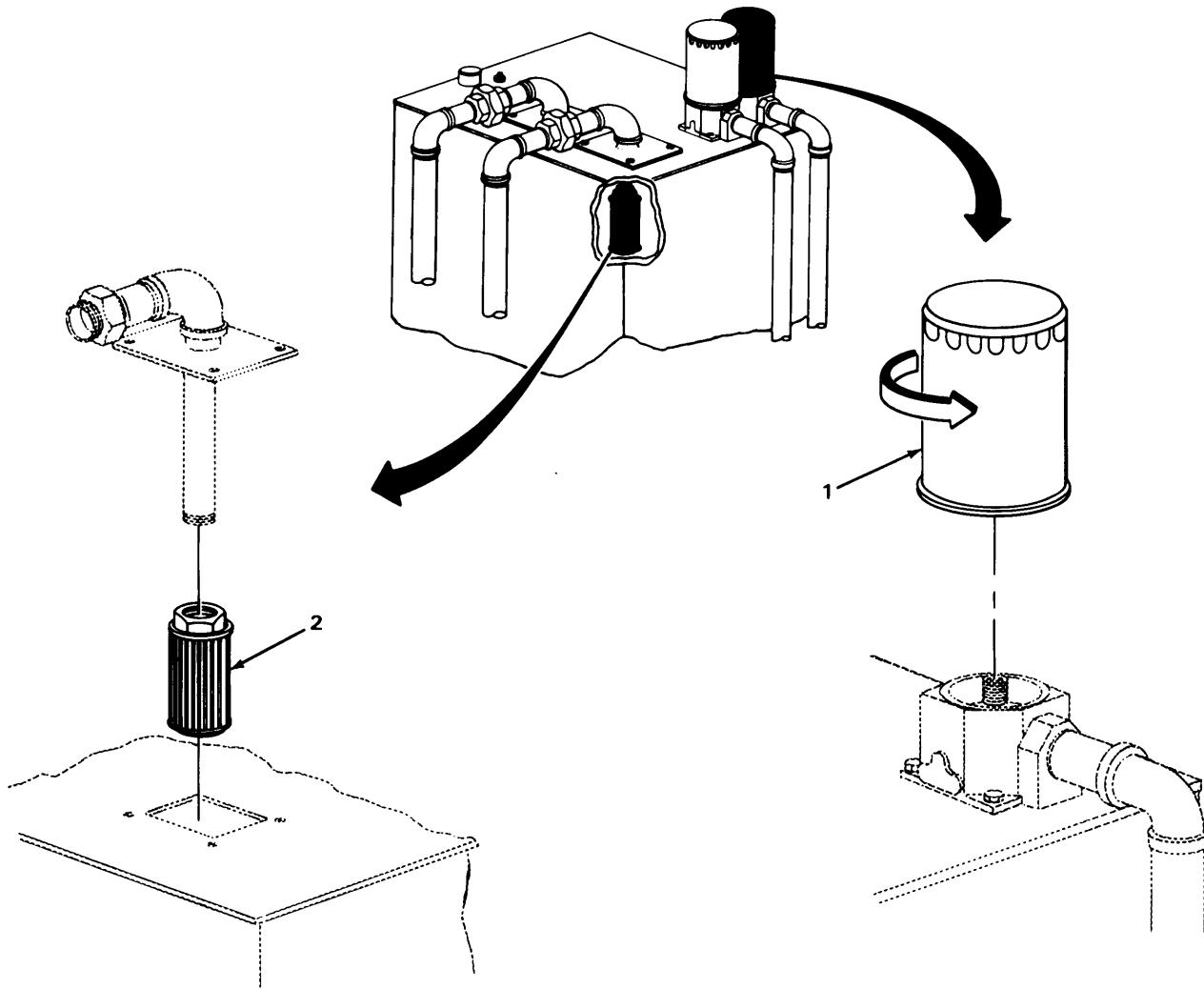
TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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74. NEITHER WINCH OPERATES – CONTINUED.

Step 29. Check two filters (1) and two screens (2) at reservoir for damage or clogs (page 4-1).

- a. If filters are clogged, replace (page 4-1172).
- b. If screens are clogged, replace or clean (page 4-1172).
- c. If both winches still do not work, notify direct support maintenance.



TA239786

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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75. ONE WINCH DOES NOT WORK.

- Step 1. Check hoses from control valve (1) to pump (2) for damage or leaks (page 4-1).

If hoses are damaged or leaking, replace (page 4-1150).

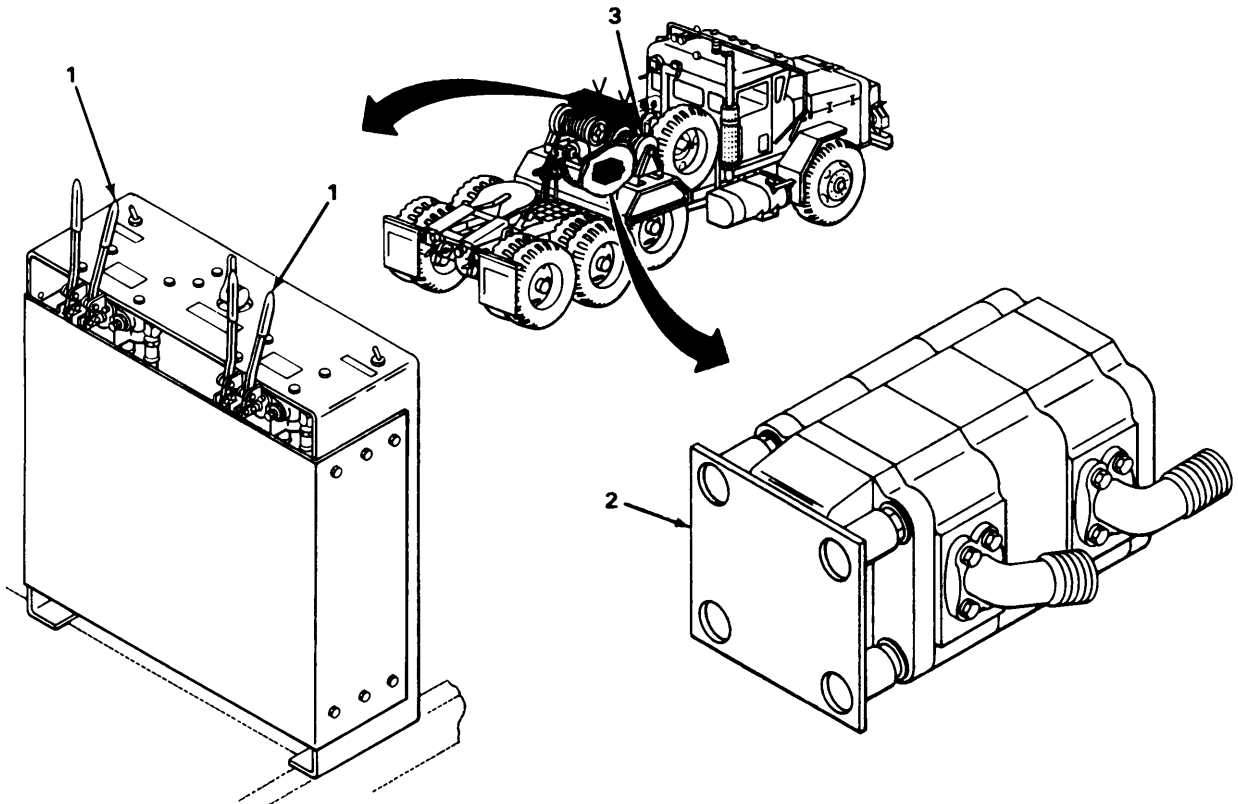
- Step 2. Check control valve (1) for damage or leaks (page 4-1).

If valve is damaged or leaking, replace (page 4-1157).

- Step 3. Check winch (3) for freedom of movement or damage (page 4-1).

a. If winch is damaged or binding, replace (page 4-1136).

b. If winch still does not work, notify direct support maintenance.



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

PERSONNEL HEATER AND DEFROSTER SYSTEM

76. HEATER MOTOR DOES NOT WORK.

Step 1. Turn on heater (TM 9-2320-270-10). Check if heater works only on high or low speed, or not at all.

If motor works on low speed only, turn heater off (TM 9-2320-270-10) and go to step 4.

Step 2. Open instrument panel (page 4-244). If heater works on high speed only, go to terminal for wire no. 071 (1) on resistor. Set switch (2) on low speed. Using multimeter set at 30 vdc, put red probe on wire no. 071 terminal and black probe to good ground.

a. If meter reads voltage, turn heater off (TM 9-2320-270-10) and replace resistor (page 4-1315).

b. If meter does not read voltage, turn heater off (TM 9-2320-270-10), close instrument panel (page 4-244), and notify direct support maintenance.

Step 3. Close instrument panel (page 4-244). Disconnect motor ground wire (3) from ground point. Put switch (2) in on position. Using multimeter set at 30 vdc, put red probe on ground wire and black probe to good ground.

If meter reads voltage, put switch in OFF position and reattach ground wire to good ground.

Step 4. With motor ground wire reattached and switch (2) in ON position, go to radio interference suppressor (4). Using multimeter set at 30 vdc, put red probe on terminal (5) for wire leading to heater motor and black probe to good ground.

If meter reads voltage, replace heater motor (page 4-1270).

Step 5. Put heater switch (2) in OFF position. Remove radio interference suppressor (4) from line. Using multimeter set at RX-1, check capacitor for continuity.

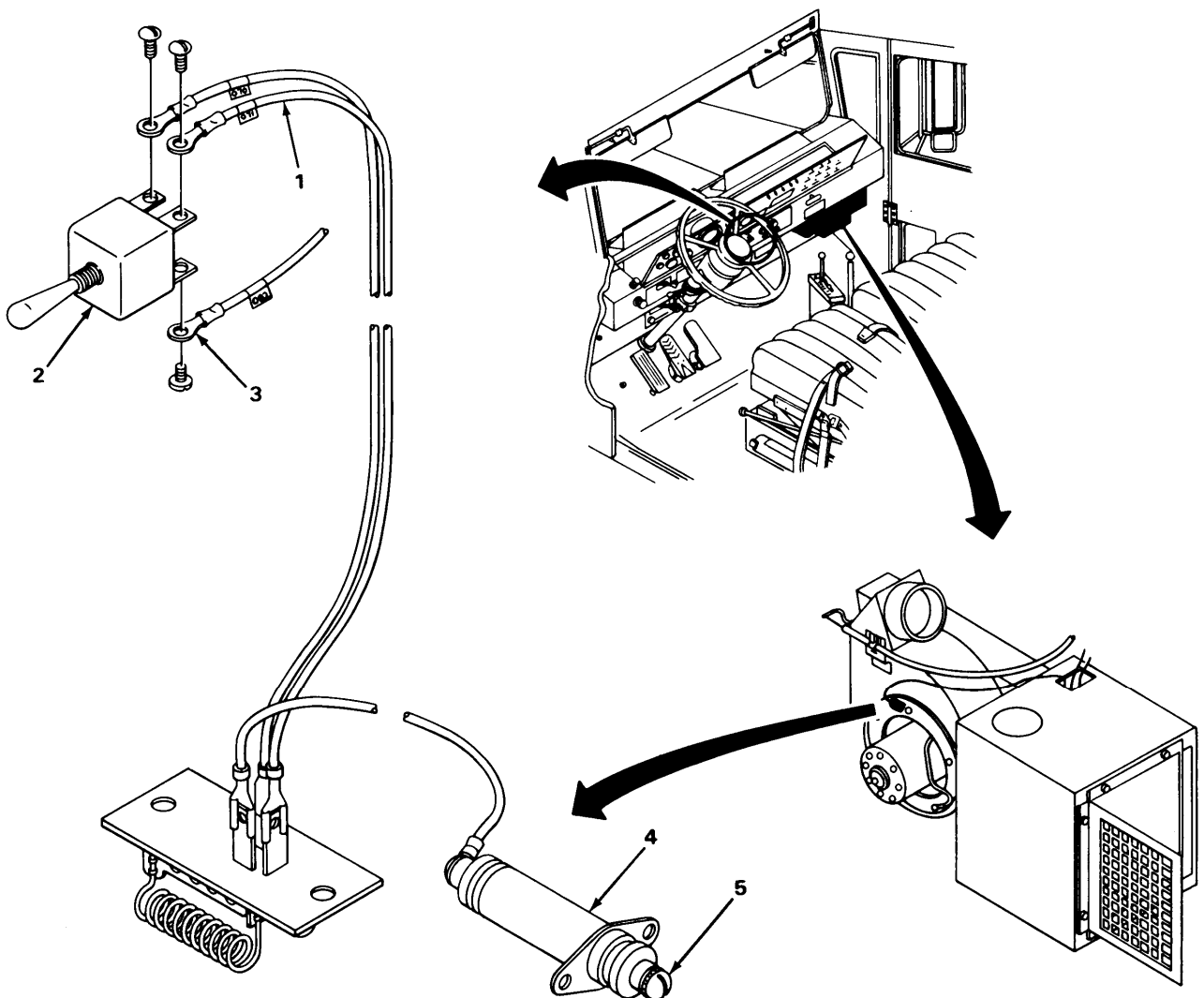
If meter does not read continuity, replace suppressor (page 4-1316).

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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Step 6. Open instrument panel (page 4-244). Go to heater switch (2). Put ignition switch in ON position and using multimeter set at 30 vdc, put red probe to terminal for wire no. 082 (3) and black probe to good ground.

If meter reads voltage, put ignition switch in OFF position and replace heater control switch (page 4-1312).



TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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76. HEATER MOTOR DOES NOT WORK - CONTINUED.

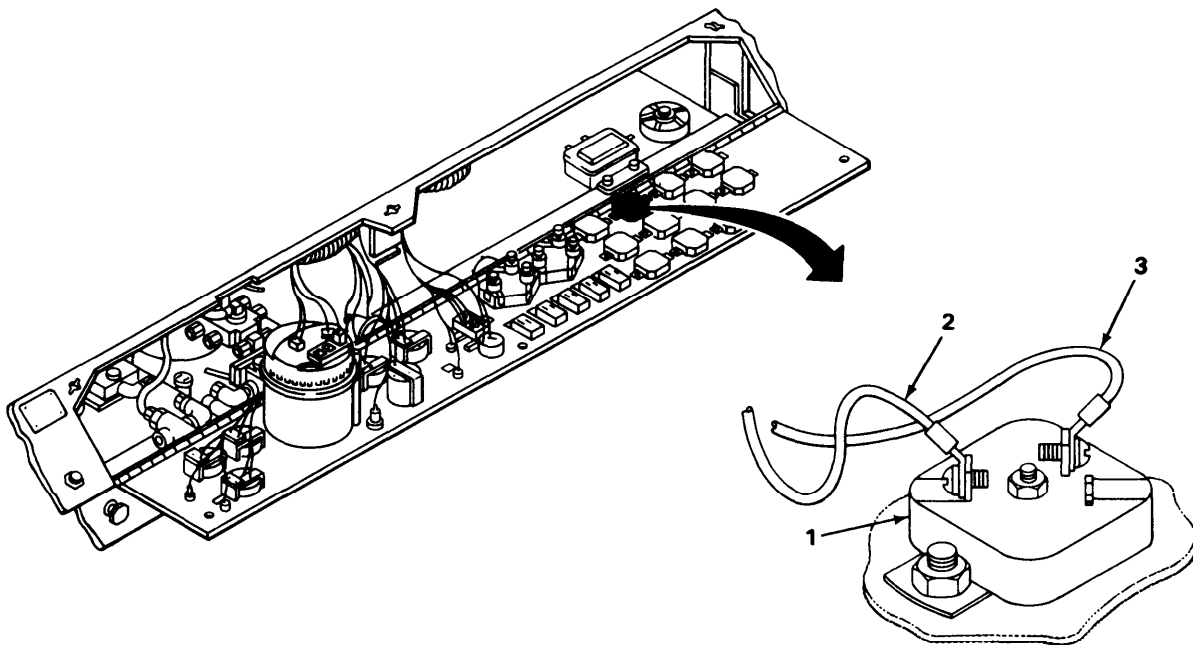
Step 7. Go to circuit breaker (1) for defrost. Using multimeter set at 30 vdc, put red probe on terminal for wire no. 082 (2) and black probe to good ground.

If meter reads voltage, put ignition switch in OFF position, close instrument panel (page 2-244), and notify direct support maintenance.

Step 8. Go to terminal for wire no. 174 (3) on circuit breaker (1). Using multimeter set at 30 vdc, put red probe on terminal and black probe to good ground.

a. If meter reads voltage, put ignition switch in OFF position and replace circuit breaker (page 4-304).

b. If meter does not read voltage, put ignition switch in OFF position, close instrument panel (page 4-244), and notify direct support maintenance.



TA239789

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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77. HEATER BLOWS COLD AIR.

Step 1. Start engine and bring to operating temperature (TM 9-2320-270-10).

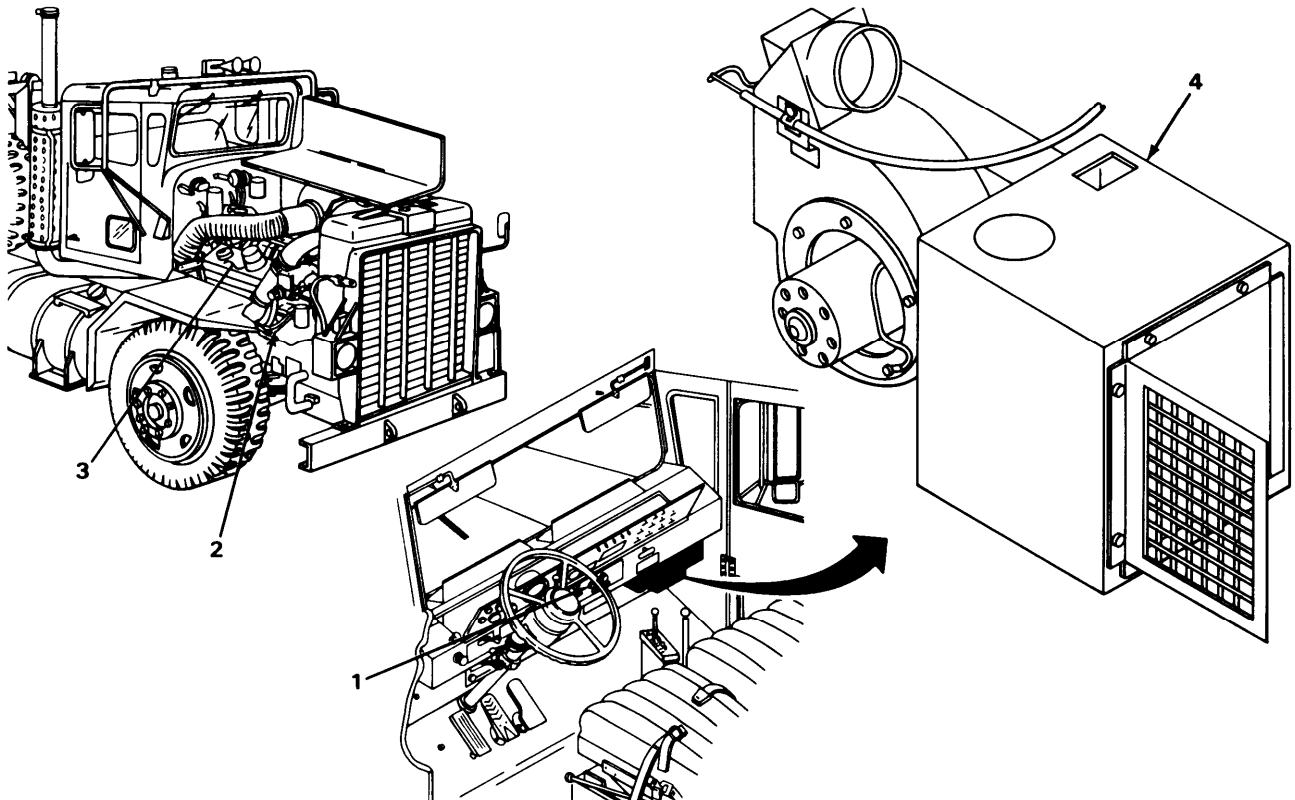
If engine does not reach operating temperature, go to ENGINE DOES NOT REACH NORMAL OPERATING TEMPERATURE (page 3-37).

Step 2. Go to Cab. Pull heat knob (1) to ON position.

If knob will not pull, go to step 5.

Step 3. Open left side of hood and remove left side panel (TM 9-2320-270-10). Check two hoses (2) from engine (3) to heater (4) for damage or leaks, (page 4-1) then put heat knob in OFF position and shut down engine (TM 9-2320-270-10).

If hoses are damaged or leaking, replace or repair hoses (page 4-1293).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

77. HEATER BLOWS COLD AIR – CONTINUED.

Step 4. Check heater core (1) for damage or leaks (page 4-1).

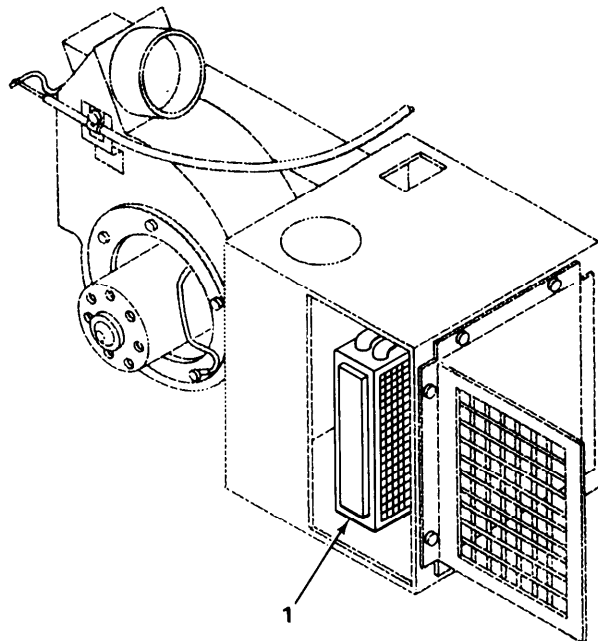
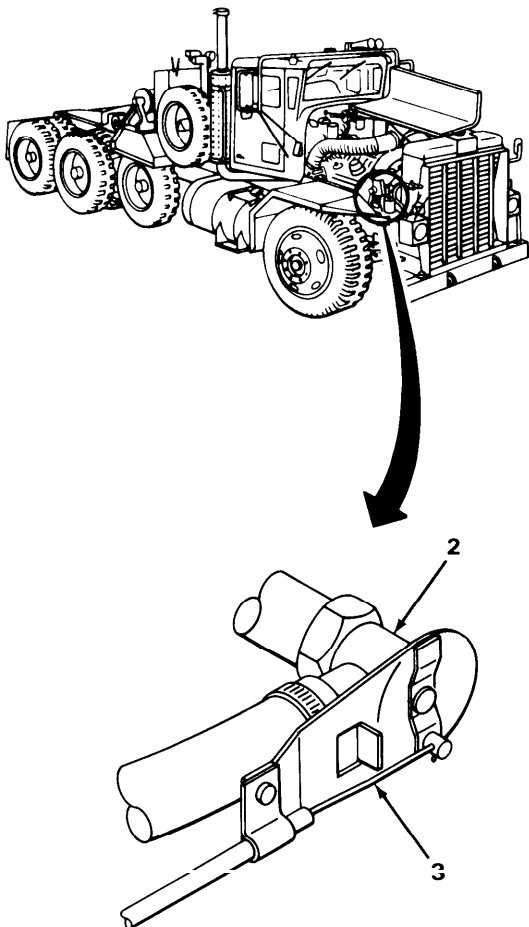
If core is damaged or leaking, replace (page 4-1265).

Step 5. Go to heater control valve (2). Disconnect cable (3) from valve. Check valve and cable for freedom of movement and damage (page 4-1).

a. If cable is damaged or binding, lubricate (LO 9-2320-270-10) or replace (page 4-1284).

b. If valve is damaged or binding, lubricate (LO 9-2320-270-10) or replace (page 4-1302).

c. If heater still blows cold air, install left side panel and close left side of hood (TM 9-2320-270-10) and notify direct support maintenance.



TA239791

TROUBLESHOOTING - CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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WINDSHIELD WIPERS AND WASHERS

78. WINDSHIELD WASHERS DO NOT WORK.

Step 1. Check reservoir (1) for fluid level (TM 9-2320-270-10).

If reservoir is empty, fill (TM 9-2320-270-10).

Step 2. Start engine and build air pressure to operating level, then shut down engine (TM 9-2320-270-10). Open left side of hood and remove left side panel (TM 9-2320-270-10) and open instrument panel (page 4-244). Check hose no. 074 (2) from manifold (3) to foot valve (4) for damage or leaks by listening for hissing or using mild soap solution and watching for bubbles (page 4-1).

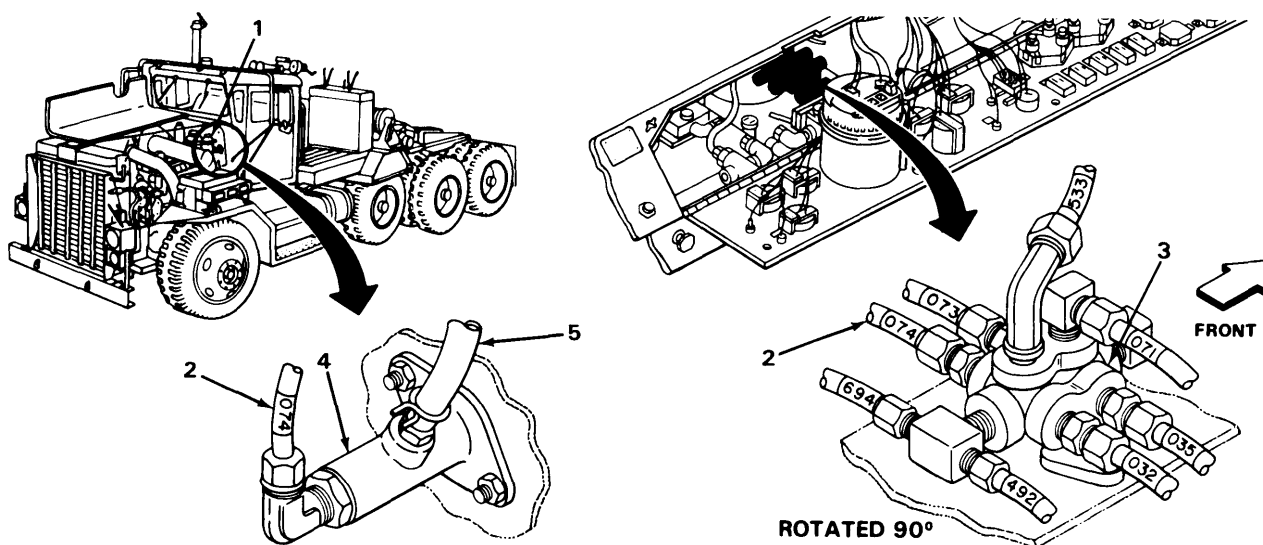
If hose is damaged or leaking, replace or repair (page 4-1185).

WARNING

Be sure to wear safety goggles or lenses when venting air lines. Compressed air and particles moved by compressed air can cause damage to your eyes.

Step 3. Close instrument panel (page 4-244). Remove hose (5) from foot valve. Have assistant push valve while under pressure. Check for damage, clogs or leaks (page 4-1).

If valve is damaged, clogged, or leaking, replace (page 4-1182).



TA239792

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

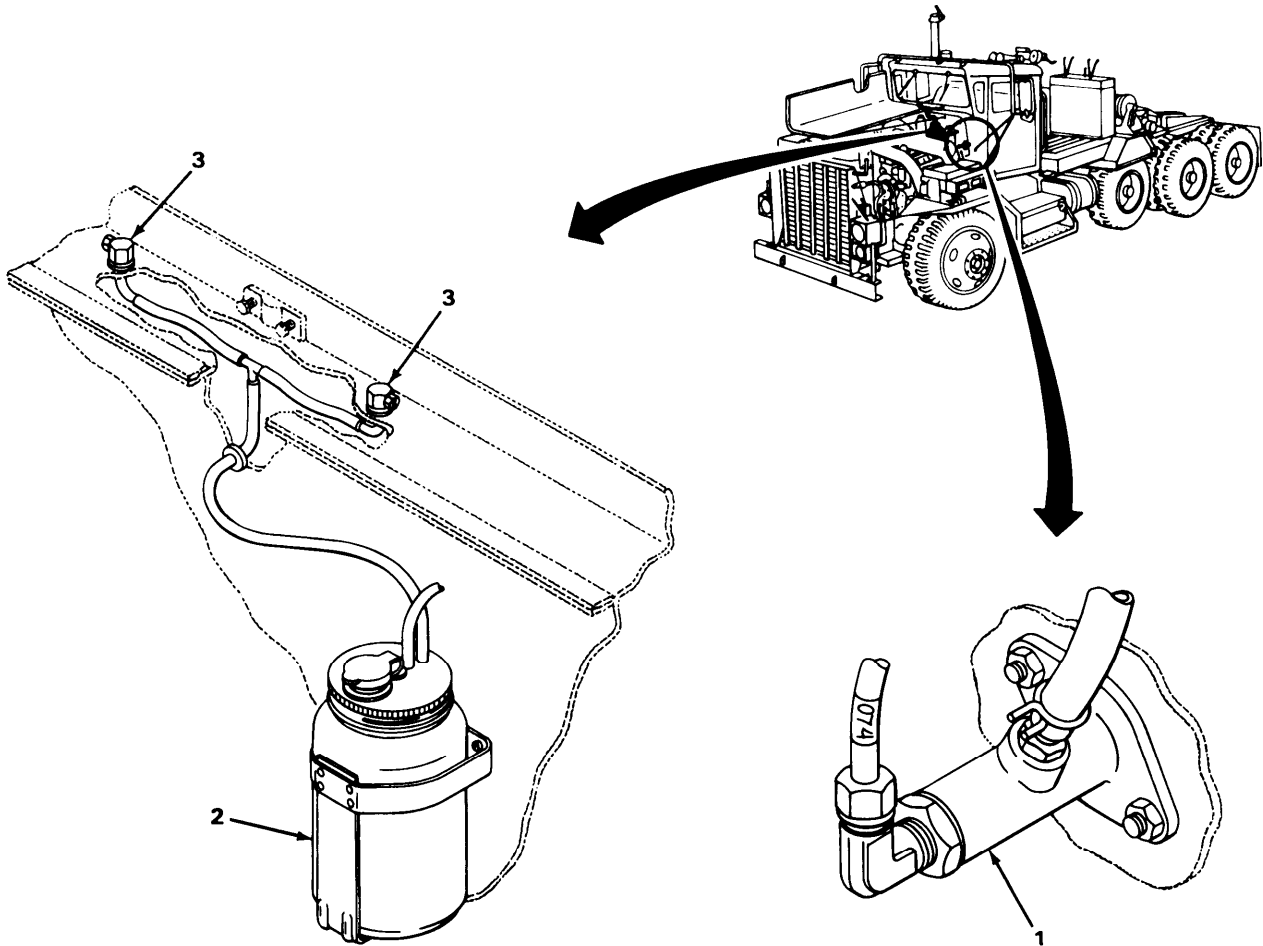
78. WINDSHIELD WASHERS DO NOT WORK - CONTINUED.

Step 4. Check hose from foot valve (1) to reservoir (2) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose is damaged or leaking, repair or replace (page 4-1185).

Step 5. Check two washer jet assemblies (3) for damage or clogs (page 4-1).

If jets are damaged or clogged, install left side panel and close left side of hood (TM 9-2320-270-10) and replace jets (page 4-1177).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

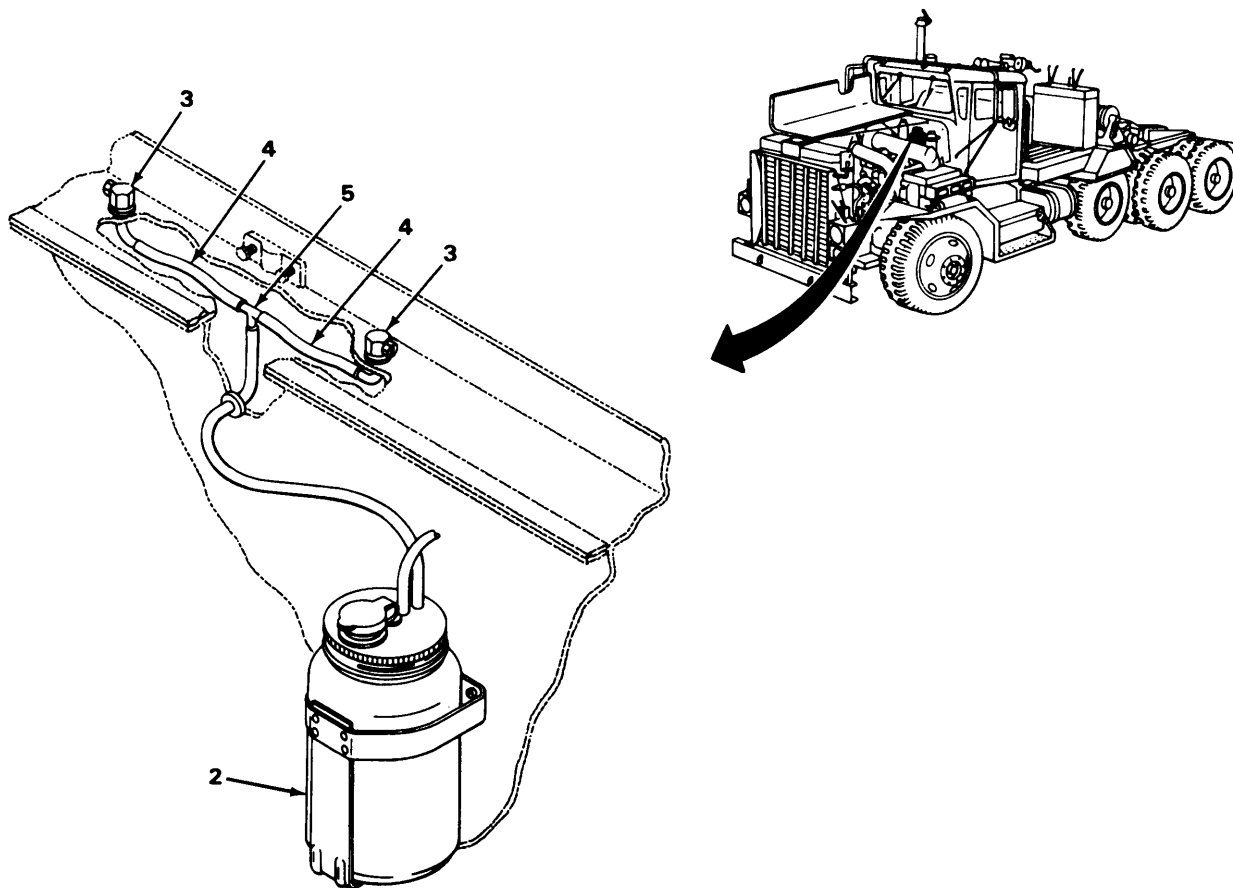
Step 6. Install left side panel (TM 9-2320-270-10). Check two hoses (4) and tee (5) between jet assemblies (3) for damage, clogs or leaks (page 4-1).

If hoses or tee are damaged, clogged, or leaking, replace (page 4-1185).

Step 7. Check hose from tee (5) to reservoir (2) for damage, clogs, or leaks (page 4-1).

a. If hose is damaged, clogged, or leaking, replace (page 4-1185).

b. If hose is ok, replace reservoir (page 4-1180).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

79. WINDSHIELD WIPERS DO NOT WORK, OR WORK SLOWLY.

NOTE

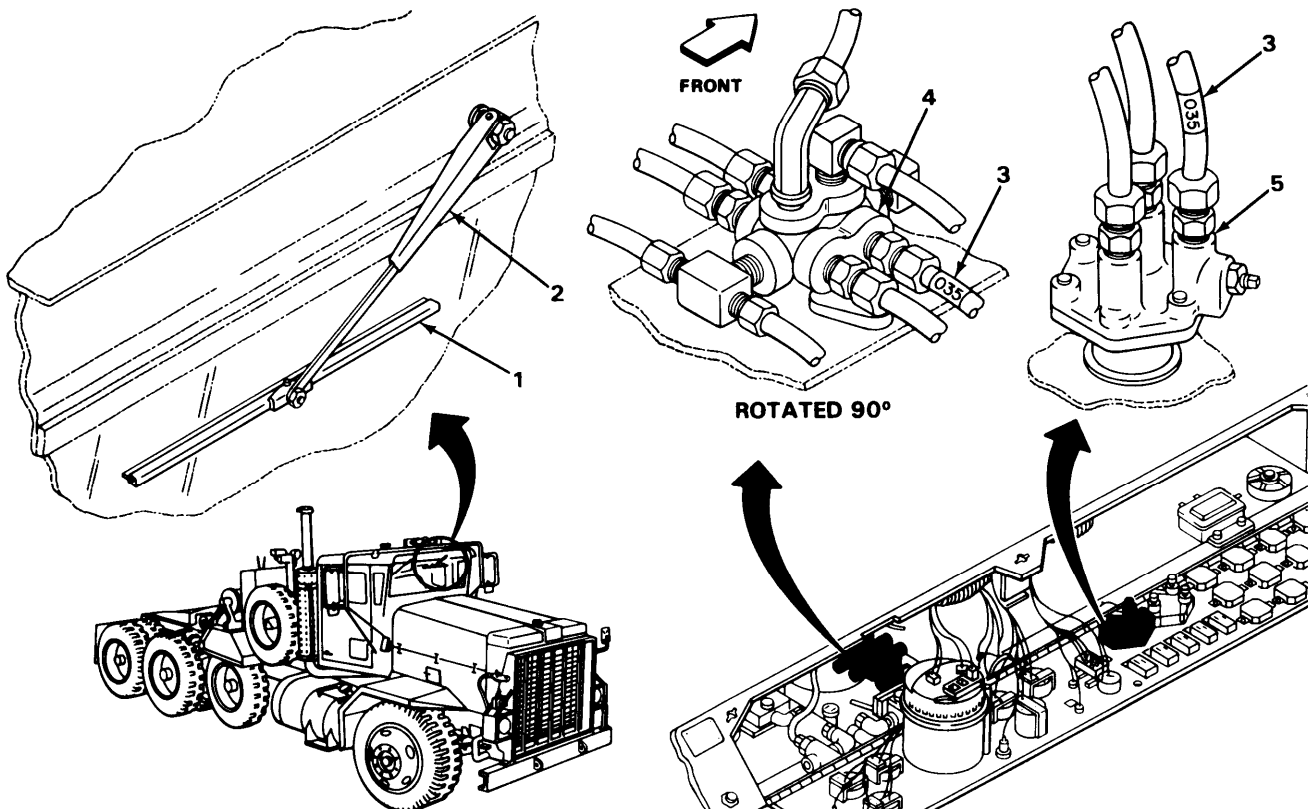
There are two windshield wipers. This procedure is for one. Repeat procedure for the other.

Step 1. Check wiper blade (1), arm (2), and mounting nut for damage or looseness (page 4-41).

If blade, arm, or nut are damaged, or loose, replace, or tighten (page 4-1205).

Step 2. Start engine and build air pressure to operating level (TM 9-2320-270-10). Shut down engine (TM 9-2320-270-10). Open instrument panel (page 4-244). Check hose (3) from manifold (4) to wiper control valve (5) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If hose is damaged or leaking, replace (page 4-1208).



TA239795

TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

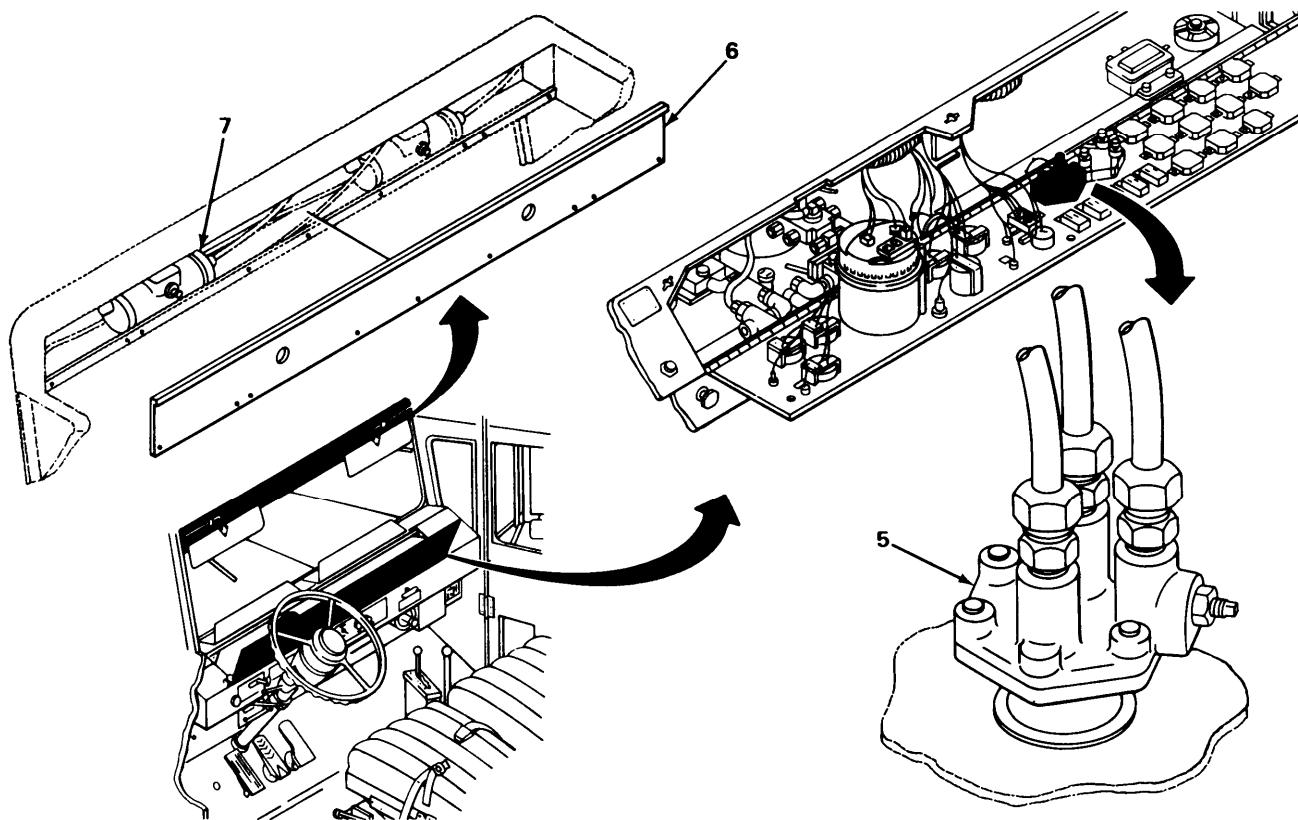
CORRECTIVE ACTION

Step 3. Check control valve (5) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If valve is damaged or leaking, replace (page 4-1182).

Step 4. Take off inner roof panel (6). Check two hoses from control valve (5) to wiper motor (7') for damage or leaks by listening for hissing or using mild soap solution and watching for bubbles (page 4-1).

If hoses are damaged or leaking, replace hoses (page 4-1208).



TROUBLESHOOTING - CONTINUED

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

79. WINDSHIELD WIPERS DO NOT WORK, OR WORK SLOWLY - CONTINUED.

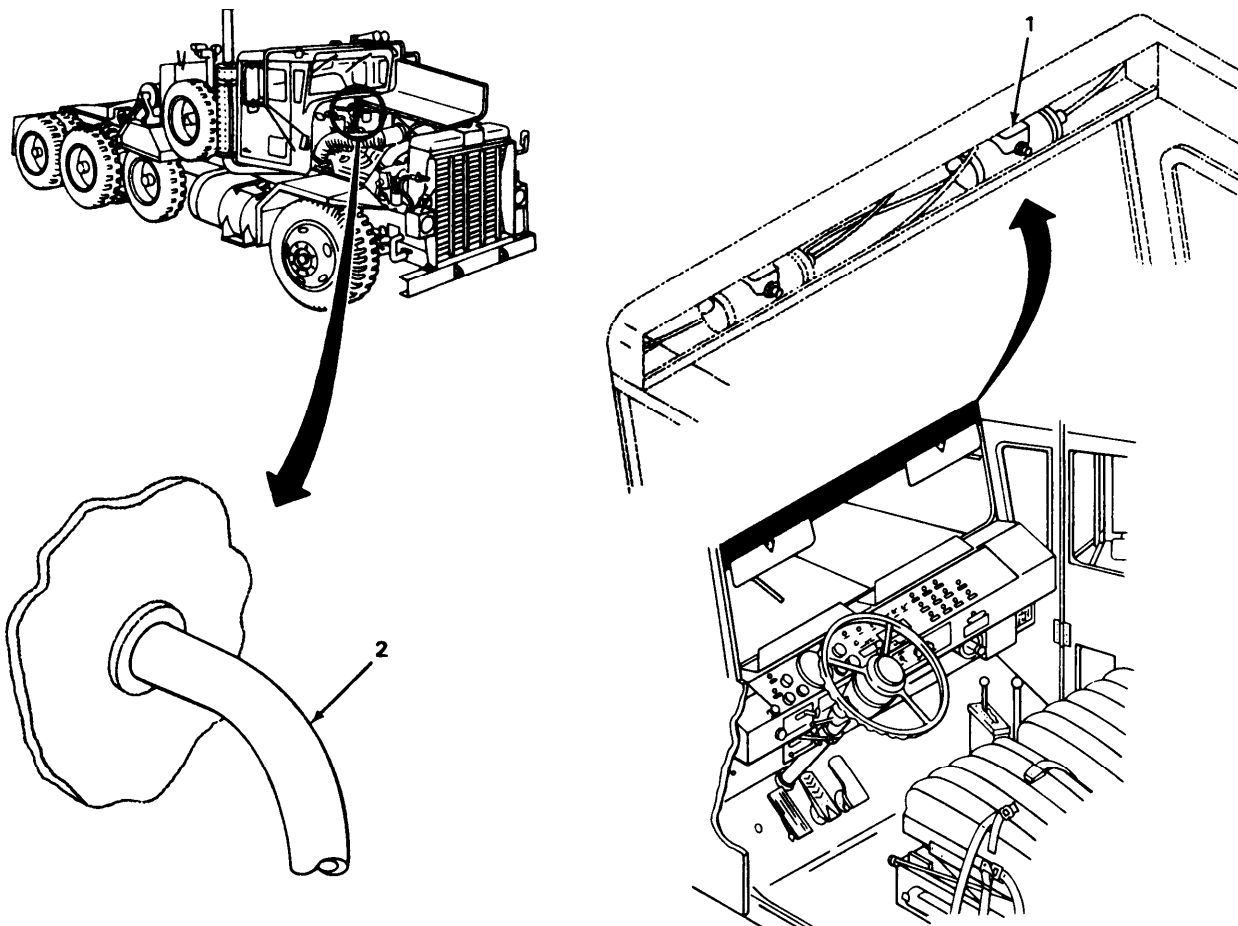
Step 5. Close instrument panel (page 4-244). Check wiper motor (1) for damage or leaks by listening for hissing or using soap solution and watching for bubbles (page 4-1).

If motor is damaged or leaking, replace (page 4-1191).

Step 6. Open right side of engine compartment (TM 9-2320-270-10). Check end of exhaust hose (2) from wiper motor for clogs or damage (page 4-1).

a. If exhaust hose is damaged or clogged, clean or replace (page 4-1220) and close right side of hood (TM 9-2320-270-10).

b. If wipers still do not work, or work slowly, close right side of hood (TM 9-2320-270-10) and notify direct support maintenance.



TA239797

CHAPTER 4

MAINTENANCE INSTRUCTIONS

OVERVIEW

This chapter contains detailed maintenance procedures that may be performed by Organizational Maintenance to maintain M911 tractor.

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Section L GENERAL MAINTENANCE INSTRUCTIONS

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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 M911 truck tractor. You should read and understand the information provided here before performing Organizational Maintenance tasks on the M911 truck tractor.

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, rubber apron, or gloves. Protect yourself against injury. Always clean up spilled fluids right away to avoid slipping hazard. When lifting heavy parts, have someone help you. Make sure that 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.

Observe all WARNINGS and CAUTIONS.

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 repair or 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 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, self-locking nuts, self-locking screws, and packings.

CLEANING

All parts must be cleaned before inspection and assembly and after repair. If part is to be removed from vehicle, wipe off grease and grime before removal so dirt particles will not fall into delicate engine or hydraulic components. When working on systems where extreme cleanliness is required, steam clean parts and surrounding area before removal or disassembly. Hands should be kept clean and free of grease, which can collect dust and dirt.

WARNING

Dry cleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point is 100°F to 138°F (38°C to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

Clean inner and outer surfaces of metal parts and all areas that get greasy or oily with drycleaning solvent (item 16, 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 build-up. After drycleaning solvent has been applied, dry with clean rags (item 10, appendix C).

CLEANING - CONTINUED**WARNING**

Compressed air used for blowing away chips, dirt, etc., must leave nozzle at less than 30 psi (207 kPa) to prevent personal injury. Be certain that nozzle is rated to provide a maximum of 30 psi (207 kPa). Be sure to wear safety goggles or lenses when using compressed air. Compressed air and particles moved by compressed air can cause damage to your eyes.

Use clean water or soap (item 14, appendix C) and water to clean rubber or plastic material. Clean off rust on metallic parts with wire brush or crocus cloth (item 5, appendix C). Use low pressure compressed air to blow away rust and cloth particles. 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.

WARNING

Electrical parts solvent cleaning compound (trichlorotrifluoroethane) is flammable, and reacts violently with aluminum, titanium, barium, lithium, samarium, and sodium potassium. Cleaning compound fumes displace air and it maybe carcinogenic. Boiling point is 114°F (46°C). Do not wear jewelry. Wear rubber gloves and use only in well ventilated area. Avoid contact with skin, eyes, and clothes and do not breathe vapors. Do not use near open flame or excessive heat. If you become dizzy while using cleaning compound, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

Compressed air used for blowing away chips, dirt, etc., must leave nozzle at less than 30 psi (207 kPa) to prevent personal injury. Be certain that nozzle is rated to provide a maximum of 30 psi (207 kPa). Be sure to wear safety goggles or lenses when using compressed air. Compressed air and particles moved by compressed air can cause damage to your eyes.

Use clean rags dampened with electrical parts solvent cleaning compound (item 4, 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 dry 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.

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 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.

Inspect castings for wear, distortion, cracks and breaks in and around drilled and tapped holes. Look for damaged threads.

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 too much 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.

TAGGING PARTS

Use cardboard tags with wire fasteners (item 18, 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.

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 appropriate electrical schematic in Appendix F, Electrical System (page F-1).

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. For example, "Bulkhead adapter to scarifier cylinder tube and adapter" might be written on the tag for a hydraulic hose. 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 low-wattage soldering gun when soldering electrical wires, connectors, terminal lugs, and receptacles. High-wattage soldering gun may damage parts by overheating them.

Solder connections must be bright and clean before soldering (see page 4-3 of this section for instructions on how to clean electrical parts). Solder must be non-acid type (item 15, appendix C). Use rosin flux (item 7, appendix C). All wires, parts, and soldering gun must be pre-tinned for good connection 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 8, 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.

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 AND CONNECTOR REPLACEMENT

Replace wire terminal lugs and connectors as follows:

1. Cut off damaged terminal lug or connector with diagonal-cutting pliers.
2. Slide new length of heat shrinkable tubing (item 8, appendix C) onto wire if desired.
3. Using wire stripper, strip enough insulation from wire to allow bare wire to go all the way into hole in terminal lug or connector.
4. Select proper terminal lug or connector for **wire size and terminal stud or other mating connector**.

WIRE TERMINAL LUG AND CONNECTOR REPLACEMENT - CONTINUED

5. Insert bare end of wire all the way into hole in terminal lug or connector.
6. Crimp or solder terminal lug or connector to wire. Make sure that connection is tight.
7. If heat shrinkable tubing is used, shrink it around connection.

WIRE REPLACEMENT

WARNING

Although battery ground cable must be connected to test electrical circuit voltage, disconnect battery ground cable before doing resistance tests or replacing parts. This will keep you from getting shocked and prevent damage to parts and equipment.

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 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.
5. Slide new lengths of heat shrinkable tubing (item 8, appendix C) onto wire ends if desired. Always use heat shrinkable tubing around wire splices, or wrap them with electrical tape (item 20, appendix C).
6. Connect terminal lugs or connectors 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 ends 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:

WARNING

Although battery ground cable must be connected to test electrical circuit voltage, disconnect battery ground cable before doing resistance tests or replacing parts. This will keep you from getting shocked and prevent damage to parts and equipment.

1. Remove hardware connecting ground cable terminal lug to ground point.

WARNING

Electrical parts solvent cleaning compound (trichlorotrifluoroethane) is flammable, and reacts violently with aluminum, titanium, barium, lithium, samarium, and sodium potassium. Cleaning compound fumes displace air and it maybe carcinogenic. Boiling point is 114°F (46°C). Do not wear jewelry. Wear rubber gloves and use only in well ventilated area. Avoid contact with skin, eyes, and clothes and do not breathe vapors. Do not use near open flame or excessive heat. If you become dizzy while using cleaning compound, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

2. Clean mounting hardware, ground cable terminal lug, and ground point with electrical parts solvent cleaning compound (item 4, appendix C) and acid swabbing brush.
3. Remove any rust with wire brush and crocus cloth (item 5, appendix C).
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. Make sure that all hardware is tight.

LINES AND PORTS

To keep dirt from contaminating fluid systems when removing and installing hydraulic, fuel, coolant and oil lines, 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 and plugs. When these are not available, use hand-carved wooden plugs, clean rags (item 10, appendix C), duct tape (item 19, 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 and ports until just before installing lines.

TEFLON TAPE

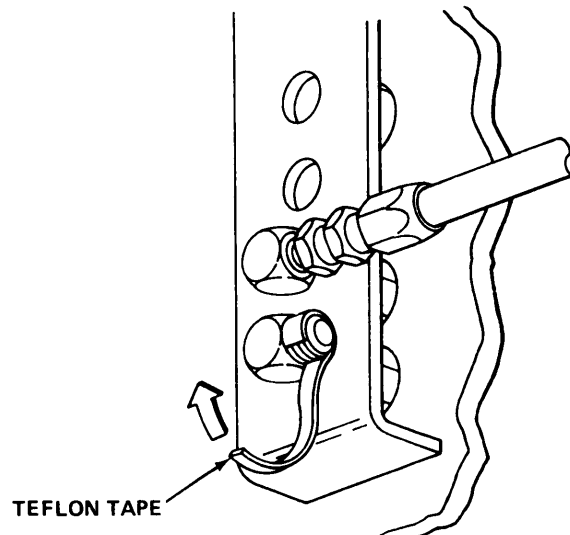
New teflon tape (item 22, appendix C) should be used to keep connections from leaking whenever you are connecting fuel, oil, air, and hydraulic system lines and fittings without compression sleeves or packings as follows:

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 coarse 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. Over-tightening could damage fitting threads and cause connection to leak.

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



AIR SYSTEM LEAK CHECK

If air system leakage is suspected, check suspected components as follows:

1. Make sure that components are under air pressure by having an assistant operate them (TM 9-2320-270-10). For example, if you suspect a leak in brake parts, have assistant step on brake treadle with air system fully charged.
2. Coat suspected parts with solution of soap (item 14, appendix C) and water.

AIR SYSTEM LEAK CHECK - CONTINUED

3. Air valve exhaust parts may produce up to a 1-inch (2.5 cm) bubble in one minute. If soap solution foams or makes a bubble faster, replace valve.
4. Air line connections and air chambers should not leak at all. Any bubbling of soap solution is cause to repair or replace connection or air chamber.

FLUID DISPOSAL

Get rid of contaminated drained fluids in accordance with your unit's Standard Operating Procedures (SOP).

Section II. ENGINE SYSTEM MAINTENANCE

	Page		Page
Engine.....	4-9	Rocker Arm and Valve Cover and	
Oil Filter.....	4-24	Gasket	4-12
Oil Level Gage.....	4-30	Rocker Arm and Valve Cover and	
		Gasket for Early T Engine	4-18

ENGINE

This task covers:

Engine Oil Servicing (page 4-10)

INITIAL SETUP

Tools

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

Materials/Parts

- Container
- Gasket
- Oil filter element

Personnel Required

One

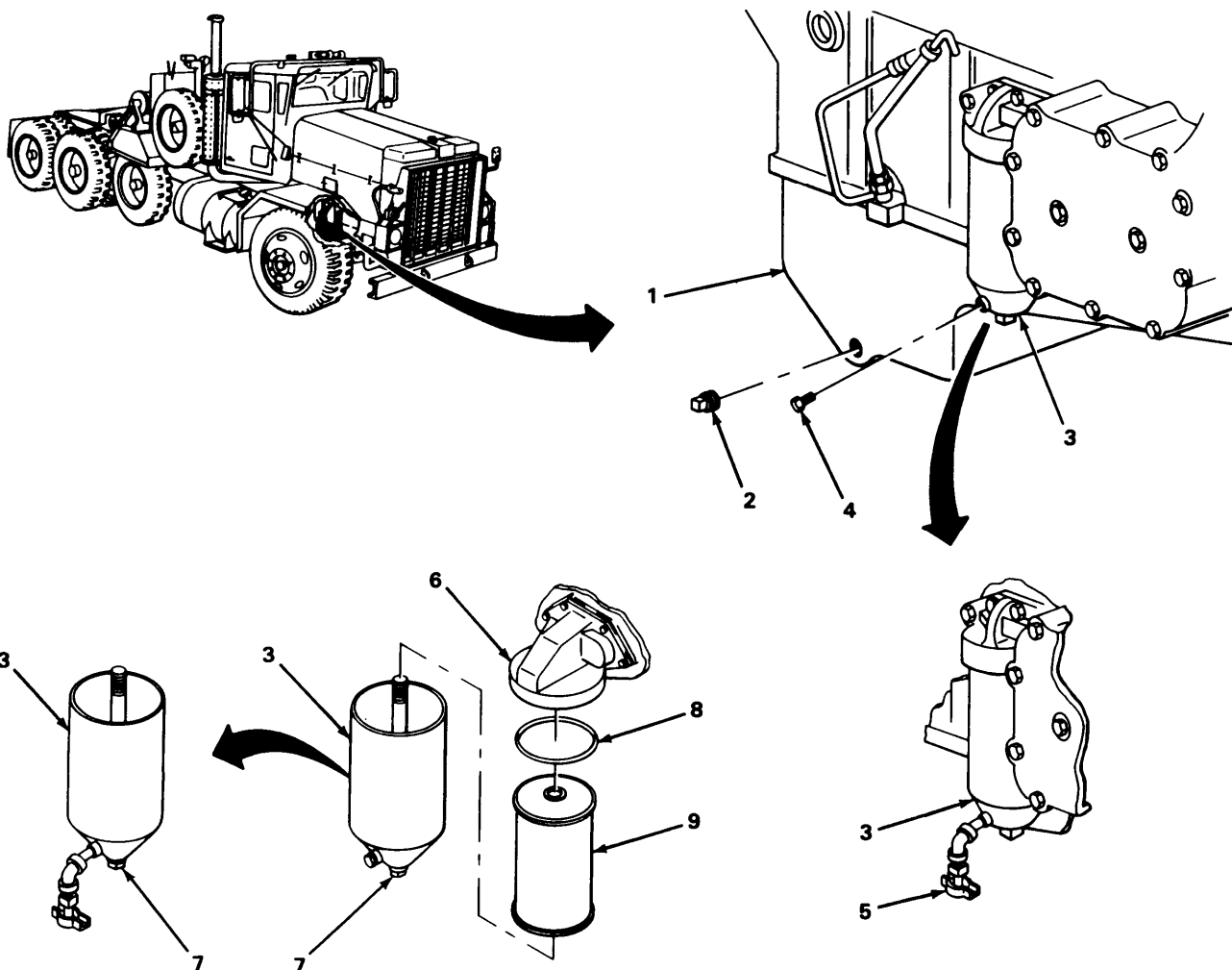
ENGINE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ENGINE OIL SERVICING		
1. Oil pan (1)	Plug (2)	a. Put container underneath. b. Using 5/8-inch wrench, unscrew and take out. c. When oil stops draining, screw in and tighten using 5/8-inch wrench. d. Get rid of fluid (page 4-1).
NOTE		
Some oil filter shells have plug, others have draincock. If shell has draincock (5), skip step 2.		
2. Oil filter shell (3)	Plug (4)	a. Put container underneath. b. Using 9/16-inch socket and handle, unscrew and take out. c. When oil stops draining, screw in and tighten using 9/16-inch socket and handle. d. Get rid of fluid (page 4-1).
NOTE		
If oil filter shell has plug, skip step 3.		
	Draincock (5)	a. Put container underneath. b. Open. c. When oil stops draining, close. d. Get rid of fluid (page 4-1).
4. Oil filter shell (3) to adapter (6)	Stud (7)	Using 5/8-inch socket and handle, unscrew until shell (3) separates from adapter (6).
5. Adapter (6)	Oil filter shell (3) and gasket (8)	a. Take out. b. Get rid of gasket (8).
6. Oil filter shell (3)	Oil filter element (9)	a. Take out. b. Get rid of.
7.	New oil filter element (9)	Put in.
8. Adapter (6)	Oil filter shell (3) and new gasket (8)	Put in.

ENGINE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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9. Oil filter shell (3) to adapter (6)	Stud (7)	Screw in and tighten using 5/6-inch socket and handle.
---	----------	---



NOTE

FOLLOW-ON MAINTENANCE:

1. Fill engine with oil (LO 9-2330-270-12).
2. Start engine and check for leaks (TM 9-2320-270-10).

TASK ENDS HERE

TA239799

ROCKER ARM AND VALVE COVER AND GASKET

This task covers:

- a. Removal (page 4-12)
 - b. Disassembly (page 4-14)
 - c. Cleaning and Inspection (page 4-15)
 - d. Assembly (page 4-15)
 - e. Installation (page 4-16)
-

INITIAL SETUP

Tools

- Drift, brass, 1/2-inch
- Extension, 1/4-inch drive
- Hammer, plastic face, medium
- Handle, ratchet, 1/4-inch drive
- Pliers, slip-joint, straight-nose
- Screwdriver, flat-tip, 1/4-inch, 4-inch blade
- Socket, 5/16-inch, 1/4-inch drive
- Socket, 3/8-inch, 1/4-inch drive, 12-point
- Wrench, open-end, 9/16-inch

Materials/Parts – Continued

- Cotter pin
- Isolator (two required)
- Rags, wiping (item 10, appendix C)
- Seal
- Wrap, tie (item 24, appendix C)

Personnel Required

One

Equipment Condition

Right or left side of hood open and right or left side panel removed (TM 9-2320-270-10).

Materials/Parts

- Gasket
 - Grease (LO 9-2320-270-12)
-

**ACTION
REMARKS**

LOCATION

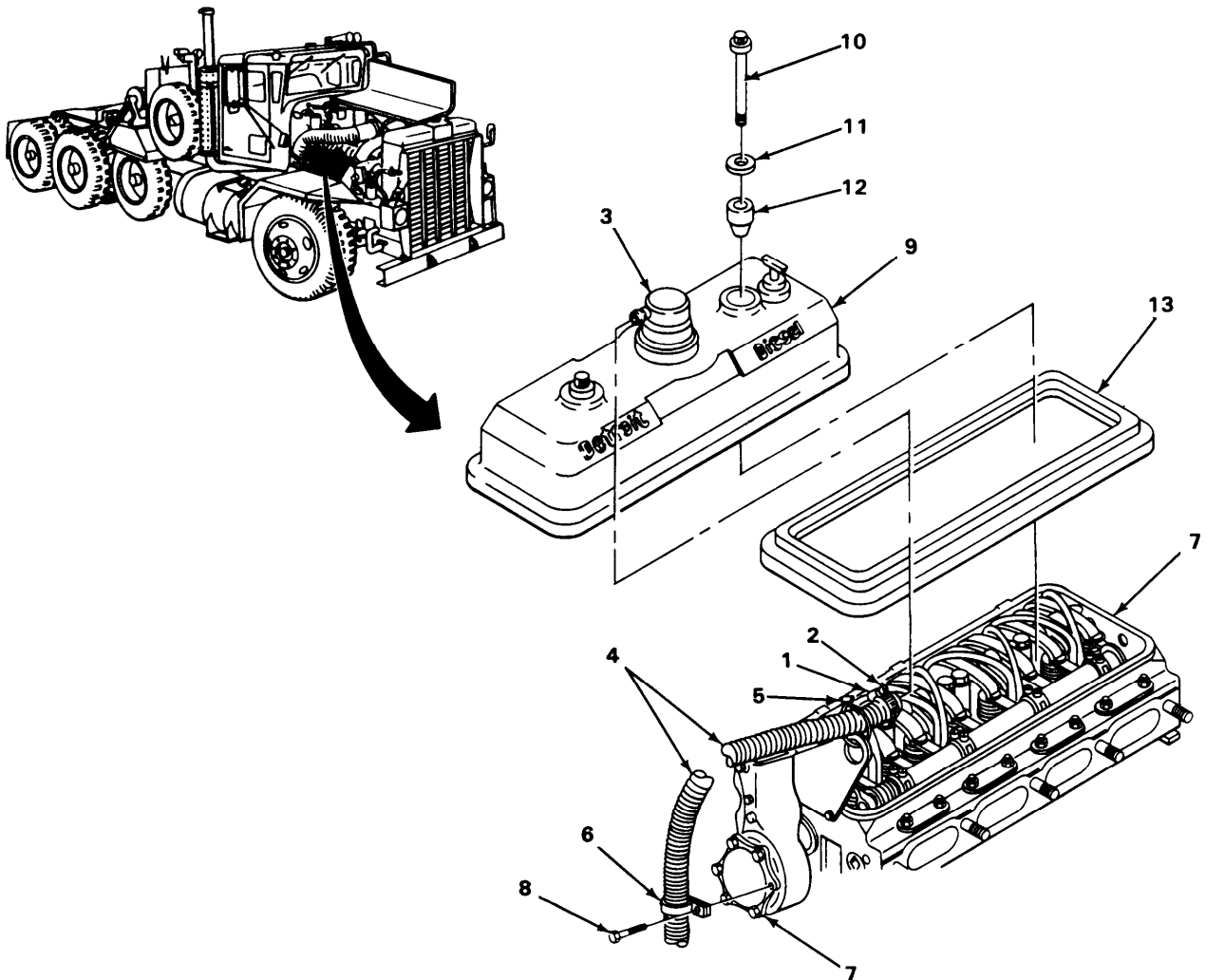
ITEM

REMOVAL

- | | | |
|--------------------------------|-----------------------|---|
| 1. Oil breather hose clamp (1) | Screw (2) | Using screwdriver, unscrew part way. |
| 2. Oil breather housing (3) | Oil breather hose (4) | Pull off.
Leave clamp on hose. |
| 3. Oil breather hose (4) | Tie wrap (5) | a. Using pliers, cut off.
b. Get rid of. |
| 4. Clamp (6) to engine (7) | Screw (8) | Using wrench, unscrew and take out. |
| 5. Oil breather hose (4) | Clamp (6) | Take off. |

ROCKER ARM AND VALVE COVER AND GASKET - CONTINUED

LOCATION	ITEM	ACTION REMARKS
6. Engine (7)	Oil breather hose (4)	Take off.
7. Rocker arm and valve cover (9) to engine (7)	Two screws (10), washers (11) and isolators (12)	a. Using 3/8-inch socket, extension, and handle, unscrew and take out. b. Get rid of isolators (12).
8. Engine (7)	Rocker arm and valve cover (9)	a. Wipe off outside with rag. b. Take off.
9. Rocker arm and valve cover (9)	Gasket (13)	a. Take out. b. Get rid of.



TA239800

ROCKER ARM AND VALVE COVER AND GASKET - CONTINUED

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

DISASSEMBLY

N O T E

Do steps 10, 11, and 12 for right side rocker arm and valve cover only.

10. Right side rocker arm and valve cover (1)	Oil filter cap (2)	a. Unscrew and take out. b. Using pliers, take off S-hook (3).
11. Strainer (4)	Cotter pin (5)	a. Using pliers, bend tabs together and take out. b. Get rid of. c. Take off chain (6).
12. Rocker arm and valve cover (1)	Strainer (4)	Using hammer and brass drift, push out.
13. Plate (7) to rocker arm and valve cover (1)	Three screws (8)	Using 5/16-inch socket, extension, and handle, unscrew and take out.
14. Rocker arm and valve cover (1)	Plate (7)	Take out.
15. Oil breather housing (9)	Filter element (10) and retainer (11)	Take out.
16. Rocker arm and valve cover (1)	Oil breather housing (9) and seal (12)	Take out.
17. Oil breather housing (9)	Seal (12)	a. Take off. b. Get rid of.

ROCKER ARM AND VALVE COVER AND GASKET - CONTINUED

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

CLEANING AND INSPECTION

18.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
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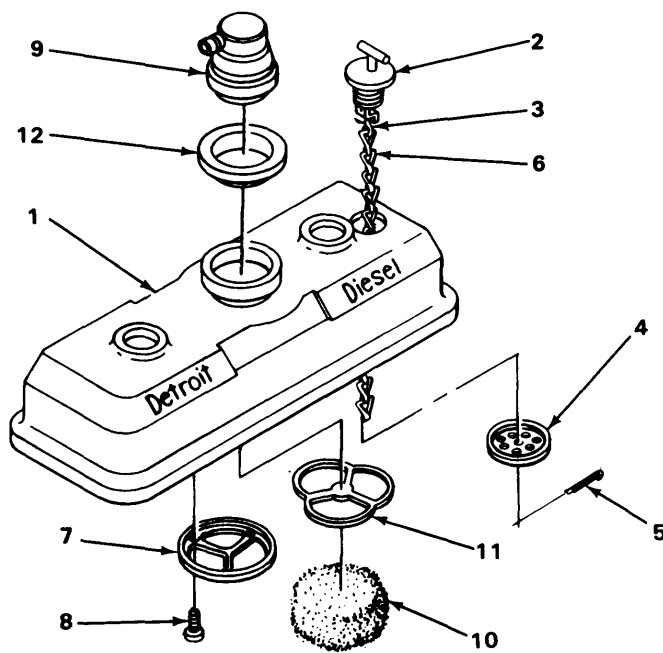
ASSEMBLY

19.	Rocker arm and valve cover (1)	New seal (12)	a. Put in position. b. Coat with grease.
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NOTE

Make sure inlet on oil breather housing faces rear of engine.

20.	Rocker arm and valve cover (1)	Oil breather housing (9)	Put in.
21.	Oil breather housing (9)	Retainer (11) and filter element (10)	Put in.
22.	Rocker arm and valve cover (1)	Plate (7)	Put on.
23.	Plate (7) to rocker arm and valve cover (1)	Three screws (8)	Screw in and tighten using 5/18-inch socket, extension, and handle.



TA239801

ROCKER ARM AND VALVE COVER AND GASKET- CONTINUED

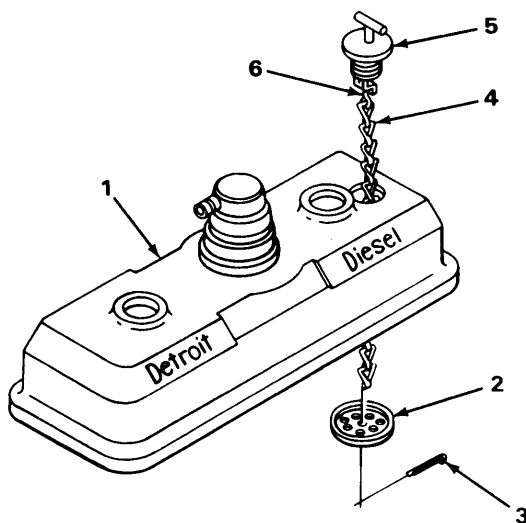
LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------

ASSEMBLY – CONTINUED

NOTE

Do steps 24, 25, and 26 for right side rocker arm and valve cover only.

24. Rocker arm and valve cover (1)	Strainer (2)	Using hammer and brass drift, tap in.
25. Strainer (2)	New cotter pin (3)	a. Put on end of chain (4) and into strainer (2). b. Using pliers, bend ends out.
26. Rocker arm and valve cover (1)	Oil filler cap (5)	a. Using pliers, put on S-hook (6). b. Put in. c. Screw in and tighten.



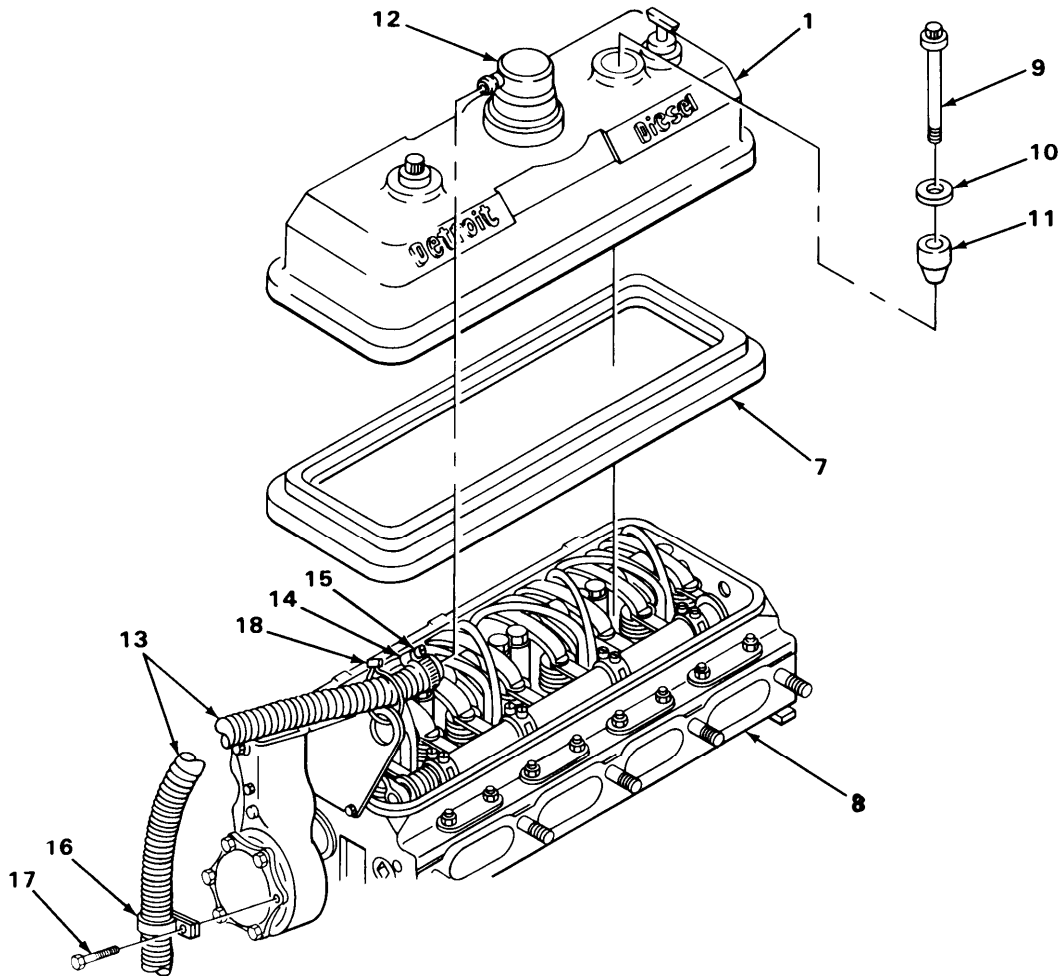
INSTALLATION

27. Rocker arm and valve cover (1)	New gasket (7)	Put into groove.
28. Engine (8)	Rocker arm and valve cover (1)	Put on.
29. Rocker arm and valve cover (1) to engine (8)	Two screws (9), washers (10), and new isolators (11)	Screw in and tighten using 3/8-inch socket, extension, and handle. Long screw goes on rear side of engine.

TA239802

ROCKER ARM AND VALVE COVER AND GASKET - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
30. Oil breather housing (12)	Oil breather hose (13)	Put on.	
31. Oil breather hose clamp (14)	Screw (15)	Using screwdriver, tighten.	Make sure clamp is at end of hose.
32. Oil breather hose (13)	Clamp (16)	Put on.	
33. Clamp (16) to engine (8)	Screw (17)	Screw in and tighten using wrench.	
34. Oil breather hose (13) and engine (8)	New tie wrap (18)	Put on.	



ROCKER ARM AND VALVE COVER AND GASKET - CONTINUED

INSTALLATION – CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Start engine and check for leaks (TM 9-2320-270-10).
2. Install side panel and close hood (TM 9-2320-270-10).

TASK ENDS HERE

ROCKER ARM AND VALVE COVER AND GASKET FOR EARLY T ENGINE

This task covers:

- | | |
|--|-----------------------------|
| a. Removal (page 4-18) | d. Assembly (page 4-21) |
| b. Disassembly (page 4-20) | e. Installation (page 4-22) |
| c. Cleaning and Inspection (page 4-20) | |
-

INITIAL SETUP

Tools

- Drift, brass, 1/2-inch
- Hammer, plastic-face, medium
- Pliers, retaining ring
- Pliers, slip-joint, straight-nose
- Screwdriver, flat-tip, 1/4-inch,
- Wrench, open-end, 9/16-inch

Materials/Parts – Continued

- Gasket, rocker arm and valve cover
- Wrap, tie (item 24, appendix C)

Personnel Required

One

Materials/Parts

- Cotter pin
- Gasket, breather

Equipment Condition

Right or left side of hood open and right or left side panel removed (TM 9-2320-270-10).

LOCATION	ITEM	ACTION REMARKS
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REMOVAL

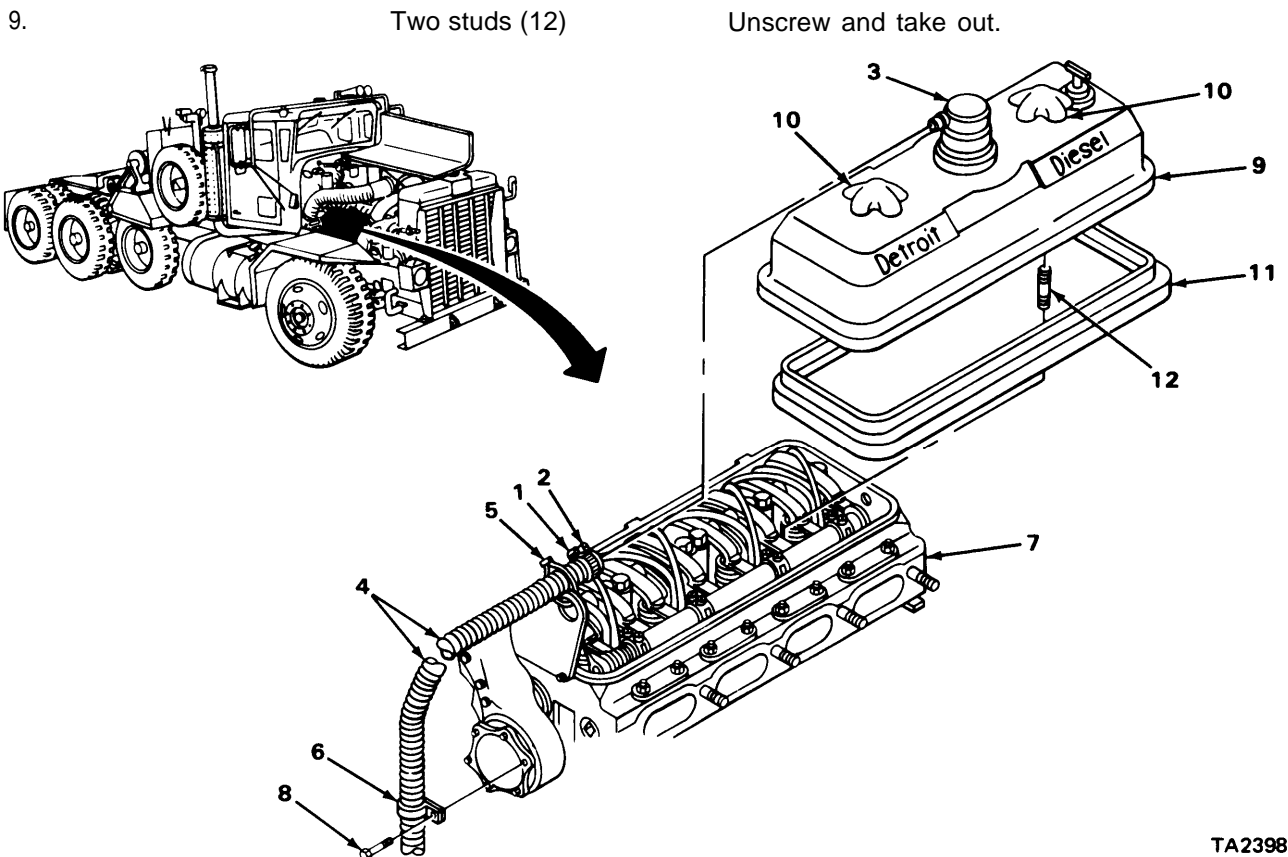
- | | | |
|--------------------------------|-----------------------|--|
| 1. Oil breather hose clamp (1) | Screw (2) | Using screwdriver, unscrew part way. |
| 2. Oil breather housing (3) | Oil breather hose (4) | Pull off.
Leave clamp on hose. |
| 3. Oil breather hose (4) | Tie wrap (5) | a. Using slip-joint pliers, cut off.
b. Get rid of. |

ROCKER ARM AND VALVE COVER AND GASKET FOR EARLY T ENGINE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
4. Clamp (6) to cylinder head (7)	Screw (8)	Using wrench, unscrew and take out.	
5. Oil breather hose (4)	Clamp (6)	Take off.	
6. Cylinder head (7)	Oil breather hose (4)	Take off.	
7. Rocker arm and valve cover (9)	Two thumb screws (10)	Unscrew.	
8. Cylinder head (7')	Rocker arm and valve cover (9) and gasket (11)	a. Take off. b. Get rid of gasket (11).	

NOTE

If cover is being replaced with new style cover, do step 9. If cover is not being replaced, skip step 9.



TA239804

ROCKER ARM AND VALVE COVER AND GASKET FOR EARLY T ENGINE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
DISASSEMBLY		
NOTE		
Do steps 10, 11, and 12 for right side rocker arm and valve cover only.		
10. Right side rocker arm and valve cover (1)	Oil filter cap (2)	a. Unscrew and take out. b. Using slip-joint pliers, take off S-hook (3).
11.	Strainer (4)	Using hammer and brass drift, push out.
12. Strainer (4)	Cotter pin (5)	a. Using slip-joint pliers, bend tabs together and take out. b. Get rid of. c. Take off chain (6).
13. Clamp (7)	Screw (8)	Unscrew until clamp (7) is loose.
14.	Breather cover (9) and gasket (10)	a. Take off. b. Get rid of gasket (10).
15. Rocker arm and valve cover (1)	Clamp (7) with screw (8)	Take off.
16. Breather cover (9)	Retainer (11)	Using slip-joint pliers, take out.
17.	Two fiber pads (12) and filter element (13)	Take out.
18. Two thumbscrews (14) and rocker arm and valve cover (1)	Two retaining rings (15)	Using retaining ring pliers, take out.
19. Rocker arm and valve cover (1)	Two thumbscrews (14) and washers (16)	Take out.

CLEANING AND INSPECTION

20.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
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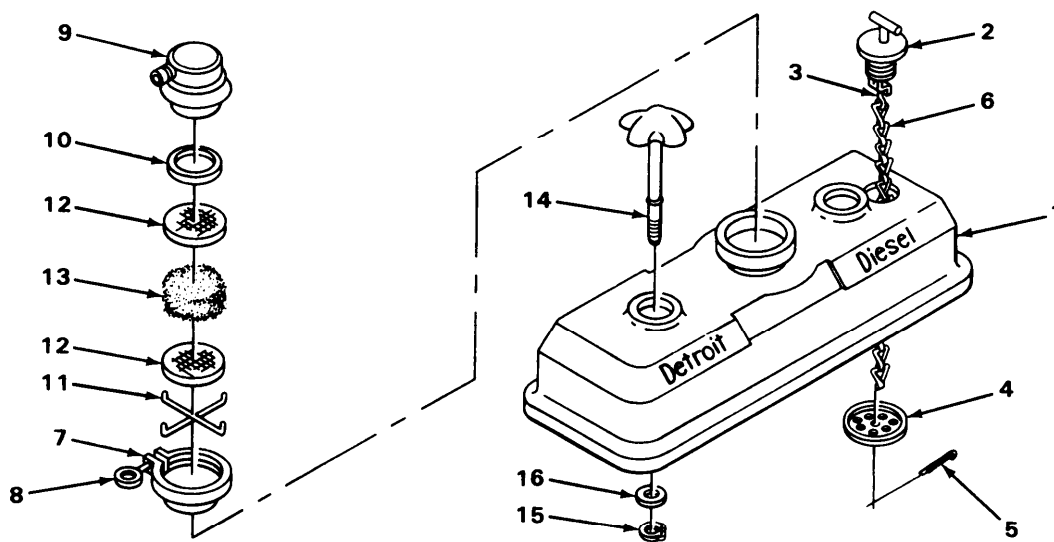
ROCKER ARM AND VALVE COVER AND GASKET FOR EARLY T ENGINE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ASSEMBLY		
21. Rocker arm and valve cover (1)	Two thumbscrews (14) and washers (16)	Place in position.
22. Two thumbscrews (14) and rocker arm and valve cover (1)	Two retaining rings (15)	Using retaining ring pliers, put on.
23. Breather cover (9)	Two fiber pads (12) and filter element (13)	Place in position.
24.	Retainer (11)	Using slip-joint pliers, place in position.
25. Rocker arm and valve cover (1)	Clamp (7) with screw (8)	Put on.
26. Clamp (7)	New gasket (10) and breather cover (9)	Place in position.

NOTE

Make sure inlet on oil breather cover faces the rear of the engine.

27. Clamp (7)	Screw (8)	Screw in and tighten.
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TA239805

ROCKER ARM AND VALVE COVER AND GASKET FOR EARLY T ENGINE - CONTINUED

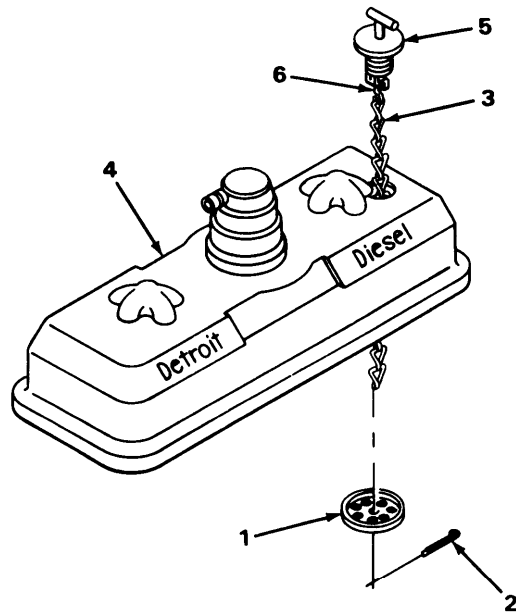
LOCATION	ITEM	ACTION	REMARKS
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ASSEMBLY – CONTINUED

NOTE

Do steps 28, 29, and 30 for right side rocker arm and valve cover only.

- | | | | |
|-----|--------------------------------|--------------------|--|
| 28. | Strainer (1) | New cotter pin (2) | a. Put on end of chain (3) and into strainer (1).
b. Using slipjoint pliers, bend ends out. |
| 29. | Rocker arm and valve cover (4) | Strainer (1) | Put in. |
| 30. | | Oil filler cap (5) | a. Using slip-joint pliers, put on S-hook (6).
b. Put in. |



INSTALLATION

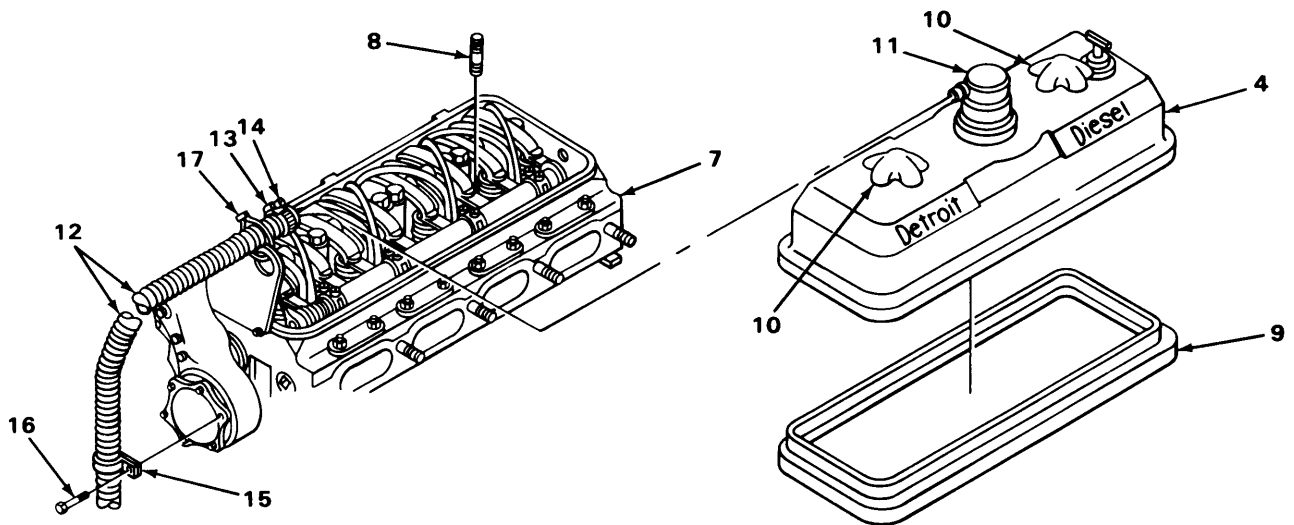
NOTE

Skip step 31 if new style cover will not be installed.

- | | | | |
|-----|--------------------------------|---|-----------------------|
| 31. | Cylinder head (7) | Two studs (8) | Screw in and tighten. |
| 32. | Rocker arm and valve cover (4) | New gasket (9) and rocker arm and valve cover (4) | Place in position. |

ROCKER ARM AND VALVE COVER AND GASKET FOR EARLY T ENGINE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
33. Rocker arm and valve cover (4)	Two thumbscrews (10)	Tighten.
34. Oil breather housing (11)	Oil breather hose (12)	Put on.
35. Oil breather hose clamp (13)	Screw (14)	Using screwdriver, tighten. Make sure clamp is at end of hose.
36. Oil breather hose (12)	Clamp (15)	Put on.
37. Clamp (15) to cylinder head (7)	Screw (16)	Using wrench, screw in and tighten.
36. Oil breather hose (12) and engine (7)	New tie wrap (17)	Put on.



NOTE

FOLLOW-ON MAINTENANCE:

1. Start engine and check for leaks (TM 9-2320-270-10).
2. Install side panel and close hood (TM 9-2320-270-10).

TASK ENDS HERE

OIL FILTER

This task covers:

- a. Removal (page 4-24)
 - b. Disassembly (page 4-26)
 - c. Cleaning and Inspection (page 4-26)
 - d. Assembly (page 4-27)
 - e. Installation (page 4-28)
-

INITIAL SETUP

Tools

- Extension, 5-inch, 3/8-inch drive
- Handle, ratchet, 3/8-inch drive
- Socket, 9/16-inch, 3/8-inch drive
- Socket, 5/8-inch, 3/8-inch drive
- Wrench, adjustable
- Wrench, open-end, 15/16-inch
- Wrench, pipe, adjustable

Materials/Parts

- Container
- Gasket, adapter

Materials/Parts - Continued

- Gasket, filter
- Gasket, stud
- Lockwasher (six required)
- Seal

Personnel Required

One

Equipment Condition

Right side of hood open and right side panel removed (TM 9-2320-270-10).

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

REMOVAL

NOTE

Some oil filter shells have plug, others have draincock. If shell has draincock, skip step 1.

- | | | |
|-------------------------|----------|--|
| 1. Oil filter shell (1) | Plug (2) | <ul style="list-style-type: none"> a. Put container underneath. b. Using 9/16-inch socket, extension, and handle, unscrew and take out. c. Get rid of fluid (page 4-1). |
|-------------------------|----------|--|

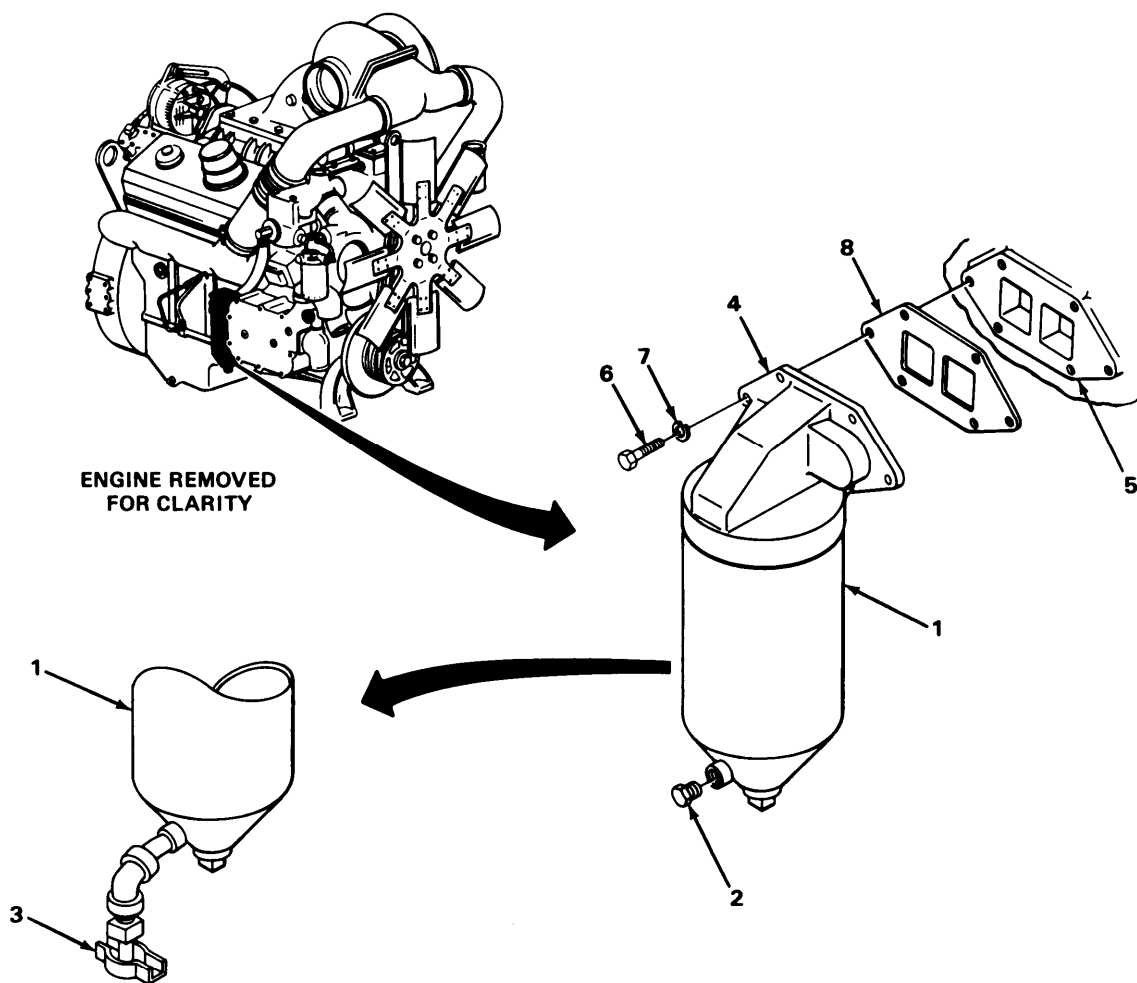
NOTE

If oil filter shell has plug, skip step 2.

- | | | |
|----|---------------|---|
| 2. | Draincock (3) | <ul style="list-style-type: none"> a. Put container underneath. b. Open. c. Get rid of fluid (page 4-1). |
|----|---------------|---|

OIL FILTER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
3. Adapter (4) to engine (5)	Six screws (6) and lockwashers (7)	a. Using 9/16-inch socket, extension, and handle, unscrew and take out. b. Get rid of lockwashers (7).
4. Engine (5)	Adapter (4) and gasket (8)	a. Take off. b. Get rid of gasket (8).



OIL FILTER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
DISASSEMBLY		
5. Shell (1) to adapter (2)	Stud (3)	Using 5/8-inch socket and handle, unscrew until shell (1) and adapter separate.
6. Shell (1)	Filter element (4) and gasket (5)	a. Take out. b. Get rid of gasket (5).
7. Stud (3)	Nut (6)	Using 5/8-inch socket, handle, and wrench, unscrew and take off.
8.	Retainer (7), seal (8), washer (9), and spring (10)	a. Take off. b. Get rid of seal (8).
9. Shell (1)	Stud (3) and gasket (11)	a. Take out. b. Get rid of gasket (11).

NOTE

If oil filter shell does not have draincock, skip steps 10 thru 12.

10. Elbow (12)	Draincock (13)	Using adjustable wrench, unscrew and take out.
11. Pipe nipple (14)	Elbow (12)	a. Note position for proper placement during assembly. b. Using adjustable pipe wrench, unscrew and take off.
12. Shell (1)	Pipe nipple (14)	Using adjustable pipe wrench, unscrew and take out.

CLEANING AND INSPECTION

13.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
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OIL FILTER - CONTINUED

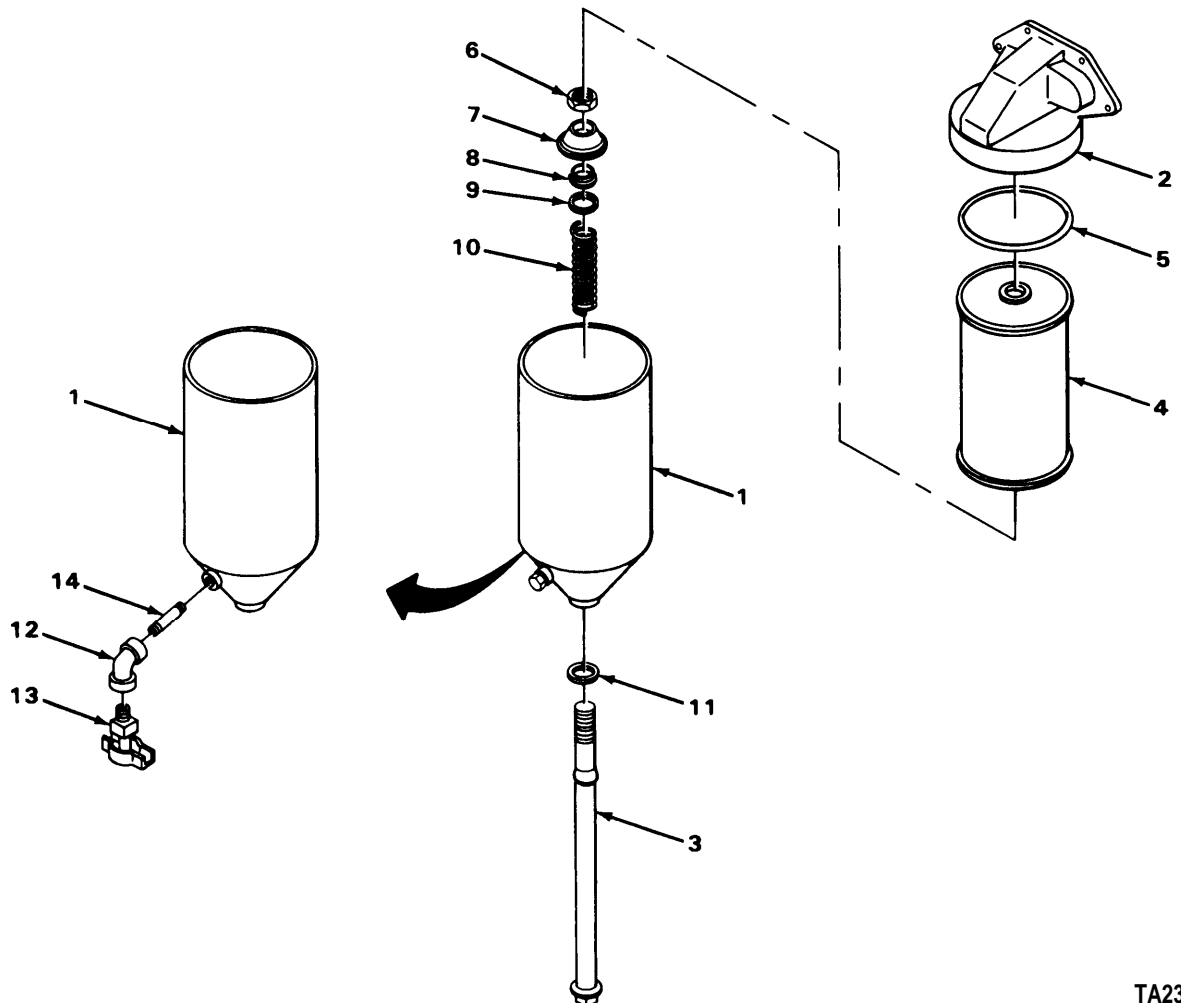
LOCATION	ITEM	ACTION REMARKS
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ASSEMBLY

NOTE

If oil filter shell does not have draincock, skip steps 14 thru 16.

14. Shell (1)	Pipe nipple (14)	Screw in and tighten using adjustable pipe wrench, tighten.
15. Pipe nipple (14)	Elbow (12)	Using adjustable pipe wrench, screw on and tighten to position noted during disassembly.
16. Elbow (12)	Draincock (13)	Screw in and tighten using adjustable wrench, tighten.



TA239809

OIL FILTER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ASSEMBLY – CONTINUED		
17. Shell (1)	Stud (2) and new gasket (3)	Put in.
18. Stud (2)	Retainer (4), new seal (5), washer (6), and spring (7)	Put on.
19.	Nut (8)	Screw on and tighten using 5/6-inch socket, handle, and wrench.
20. Adapter (9)	New gasket (10)	Put in position.
21. Shell (1)	Filter element (11)	Put in.
22. Shell (1) to adapter (9)	Stud (2)	Screw in and tighten using 5/8-inch socket and handle.

INSTALLATION

23. Engine (12)	Adapter (9) and new gasket (13)	Put on.
-----------------	---------------------------------	---------

NOTE

Two longer screws go in each end of adapter.

24. Adapter (9) to engine (12)	Six screws (14) and new lockwashers (15)	Screw in and tighten using 9/16-inch socket, extension, and handle.
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NOTE

If oil filter shell has plug, skip step 25.

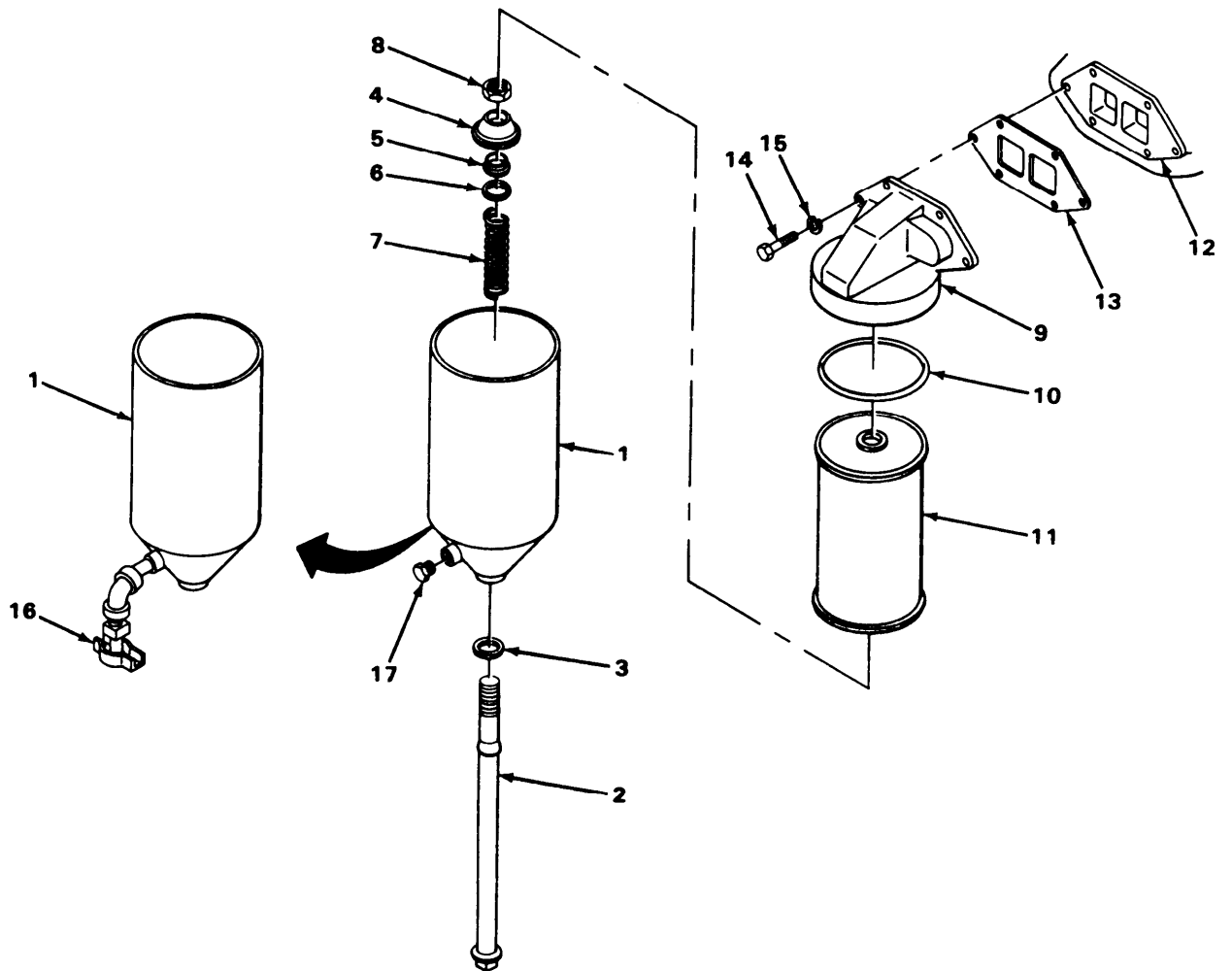
25. Shell (1)	Draincock (16)	Close.
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NOTE

If oil filter shell has draincock, skip step 26.

26.	Plug (17)	Screw in and tighten using 9/16-inch socket and handle.
-----	-----------	---

OIL FILTER - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Fill engine with oil (LO 9-2320-270-12).
2. Start engine and check for leaks (TM 9-2320-270-10).
3. Install right side panel and close right side of hood (TM 9-2320-270-10).

TASK ENDS HERE

OIL LEVEL GAGE

This task covers:

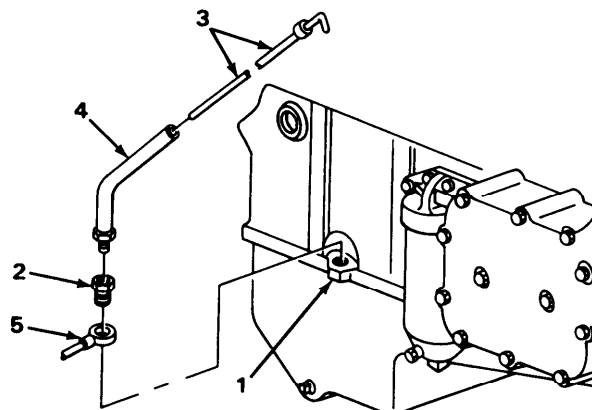
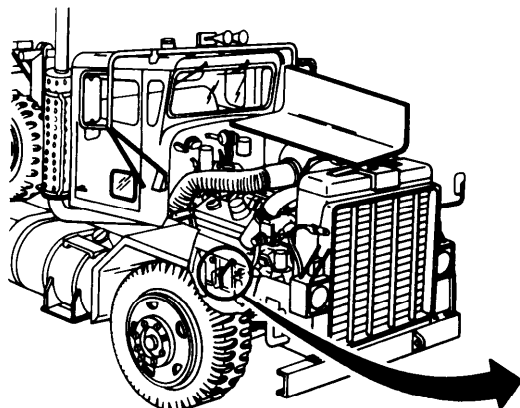
- a. Removal (page 4-30)
 - b. Cleaning and Inspection (page 4-30)
 - c. Installation (page 4-30)
-

INITIAL SETUP

<p>Tools</p> <p>Wrench, open-end, 3/4-inch Wrench, open-end, 7/8-inch</p> <p>Personnel Required</p> <p>One</p>	<p>Equipment Condition</p> <p>Right side of hood open and right side panel removed (TM 9-2320-270-10).</p>
--	--

LOCATION	ITEM	ACTION REMARKS
REMOVAL		
1. Right side of engine (1) and adapter (2)	Dipstick (3)	Pull out.
2. Adapter (2)	Guide (4)	Using 3/4-inch wrench, unscrew and take out.
3. Engine (1)	Adapter (2) and line (5)	Using 7/8-inch wrench, unscrew and take out.
CLEANING AND INSPECTION		
4.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
INSTALLATION		
5. Engine (1)	Line (5) and adapter (2)	Screw in and tighten using 7/8-inch wrench.
6. Adapter (2)	Guide (4)	Screw in and tighten using 3/4-inch wrench.
7. Guide (4)	Dipstick (3)	Put in.

OIL LEVEL GAGE - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE: Install right side panel and close right side of hood (TM 9-2320-270-10).

TASK ENDS HERE

Section III. FUEL SYSTEM MAINTENANCE

	Page		Page
Accelerator Assembly	4-126	Fuel Return Lines and Fittings	4-98
Air Cleaner Assembly	4-49	Fuel Strainer, Cover, and	
Air Cleaner Filters	4-45	Bracket	4-114
Air Cleaner Hoses and Air Restriction		Fuel Strainer to Fuel Pump Lines	
Indicator	4-64	and Fittings	4-90
Engine Throttle Control	4-128	Fuel System	4-32
Ether Starting Kit	4-118	Fuel Tanks	4-66
Fuel Filter and Cover	4-10	Fuel Tank to Fuel Tank Line and	
Fuel Filter to Engine Lines and		Fittings	4-81
Fittings	4-42	Right Fuel Tank to Fuel Strainer	
Fuel Pump	4-37	Line and Fittings	4-87
Fuel Pump to Fuel Filter Line and			
Fittings	4-40		

FUEL SYSTEM

This task covers:

- a. Fuel Tank Draining (page 4-32)
 - b. Fuel System Purging (page 4-33)
-

INITIAL SETUP

INITIAL SETUP

Tools	Materials/Parts
Compressor, reciprocating air	Container (as required)
Handle, ratchet, 3/8-inch drive	Personnel Required
Hose assembly, rubber	One
Socket, 9/16-inch, 3/8-inch drive	
Wrench, open-end, 9/16-inch	
Wrench, open-end, 3/4-inch	

		ACTION
LOCATION	ITEM	REMARKS

FUEL TANK DRAINING

WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted nearby when using fuel. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

NOTE

When draining one tank, make sure handle on valve is pointing up (closed position). After tank has been drained and refilled, pull handle down (open position).

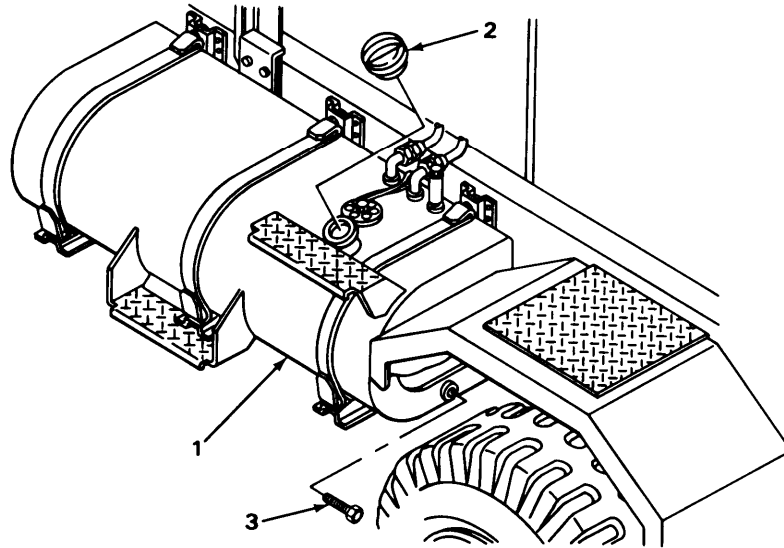
There are two fuel tanks on the vehicle. Steps 1,2, and 3 can be used to drain either fuel tank. Right fuel tank is shown.

- | | | |
|------------------------|----------|---|
| 1. Right fuel tank (1) | Cap (2) | Unscrew and take off. |
| 2. | Plug (3) | <ul style="list-style-type: none"> a. Put container underneath. b. Using 3/8-inch ratchet handle and socket, unscrew and take out. c. When fuel stops draining, using 3/8-inch ratchet handle and socket, screw in and tighten. d. Get rid of drained fluid (page 4-1). |

FUEL SYSTEM - CONTINUED

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

- | | | | |
|----|---------|-----------|--|
| 3. | Cap (2) | Screw on. | |
|----|---------|-----------|--|



FUEL SYSTEM PURGING

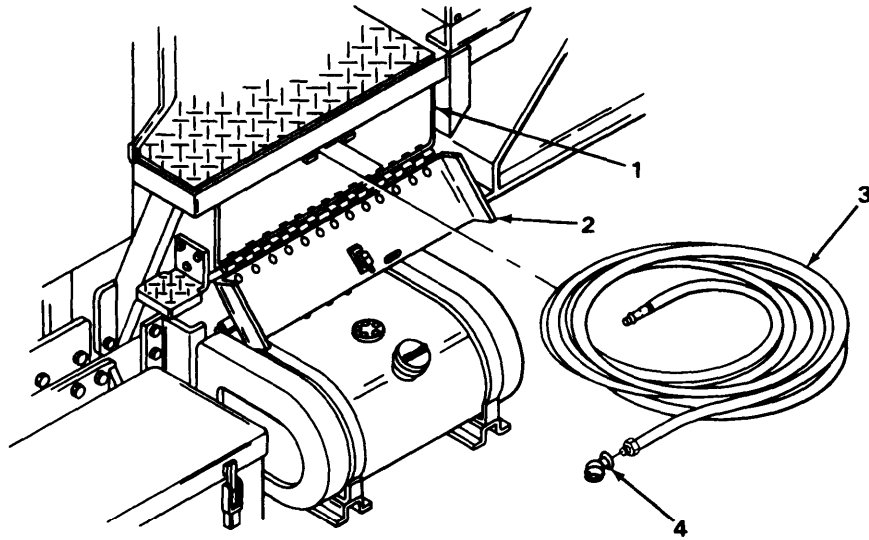
WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted nearby when using fuel. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

- | | | | |
|------------|------------------------------------|--------------------------|--|
| 4. Vehicle | Right fuel tank and left fuel tank | Fill (TM 9-2320-270-10). | |
|------------|------------------------------------|--------------------------|--|

FUEL SYSTEM -CONTINUED

LOCATION	ITEM	ACTION	REMARKS
FUEL SYSTEM PURGING - CONTINUED			
5. Tool box (1)	Cover (2)	Open.	
6.	Hose (3)	Take out.	
7. Hose (3)	Tire inflator (4)	Using 9/16-inch and 3/4-inch wrenches, unscrew and take off.	



W A R N I N G

No open flames, welding, grinding, smoking, or use of heat producing devices permitted nearby when using fuel. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

8. Valve (5)	Handle (6)	Pull up.	
9. Right fuel tank (7)	Air vent plug (8)	Using 9/16-inch socket and handle, unscrew and take out.	
10.	Hose (3)	Screw in and tighten using 9/16-inch wrench.	

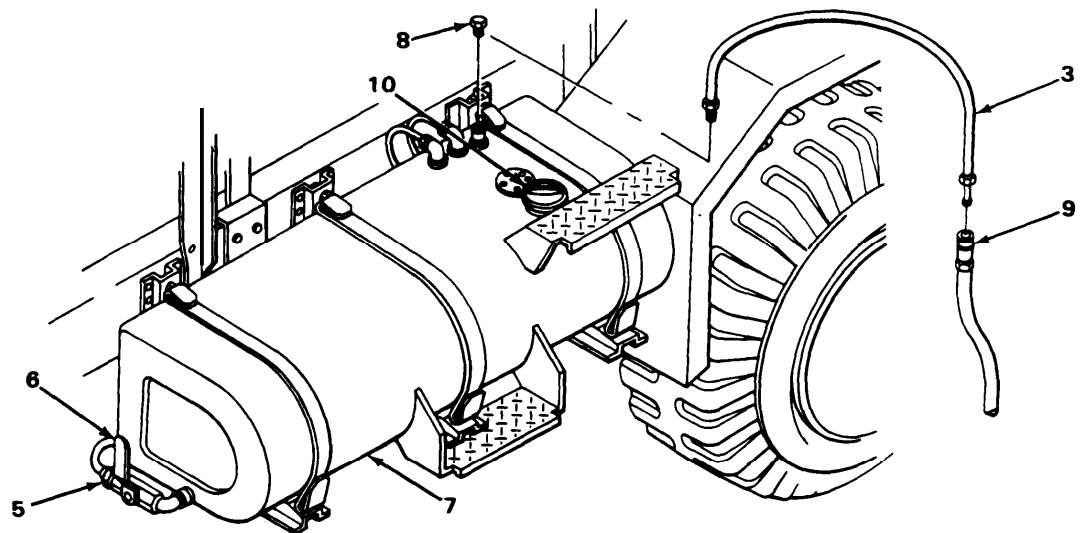
FUEL SYSTEM - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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W A R N I N G

Be sure to wear safety goggles or lenses when using compressed air. Compressed air and particles moved by compressed air can cause damage to your eyes.

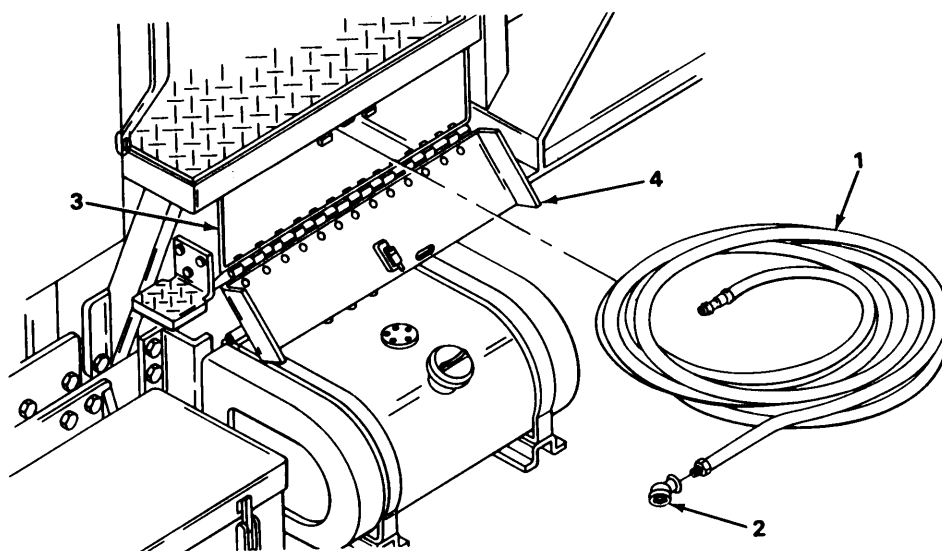
11. Air supply hose (9)	Hose (3)	<ul style="list-style-type: none"> a. Connect to air supply hose (9) and air pressure gage to right fuel tank (7). b. Using air compressor, pressurize fuel tank (7). c. When air pressure reaches 40 psi (276 kPa), turn off air supply.
12.	Engine	Start and let run for a few minutes, then shut down (TM 9-2320-270-10).
13. Right fuel tank (7)	Cap (10)	<ul style="list-style-type: none"> a. Unscrew, part way. b. Let air pressure escape. c. When all air pressure has escaped, screw on and tighten. d. Disconnect air supply.
14.	Hose (3)	Using 9/16-inch wrench, unscrew and take out.
15.	Vent plug (8)	Screw into right fuel tank (7) and tighten using 9/16-inch socket and handle.
16. Valve (5)	Handle (6)	Push down.



TA239814

FUEL SYSTEM - CONTINUED

LOCATION	ITEM	ACTION REMARKS
FUEL SYSTEM PURGING – CONTINUED		
17. Hose (1)	Tire inflator (2)	Screw on and tighten using 9/16-inch and 3/4-inch wrenches.
18. Tool box (3)	Hose (1)	Put into tool box (3).
19.	Cover (4)	Close.



TASK ENDS HERE

FUEL PUMP

This task covers:

- a. Removal (page 4-37)
- b. Cleaning and Inspection (page 4-38)
- c. Installation (page 4-38)

INITIAL SETUP

<p>Tools</p> <p>Extension, 5-inch, 3/8-inch drive Handle, ratchet, 3/8-inch drive Knife, putty Pipe wrench, 10-inch Socket, universal joint, 1/2-inch Vise, machinist's Wrench, open-end, 1/2-inch Wrench, open-end, 5/8-inch Wrench, open-end, 1 1/16-inch Wrench, open-end, 1-inch</p>	<p>Materials/Parts</p> <p>Container Gasket Tape, teflon (item 22, appendix C)</p> <p>Personnel Required</p> <p>One</p> <p>Equipment Condition</p> <p>Right side of hood open (TM 9-2320-270-10).</p>
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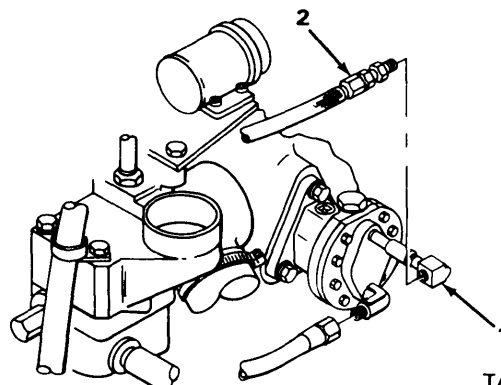
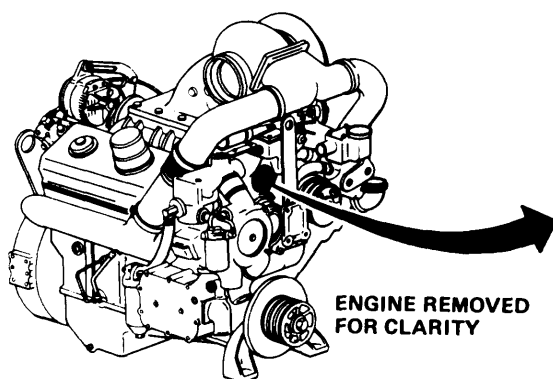
LOCATION	ITEM	ACTION REMARKS
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REMOVAL

WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted nearby when using fuel. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

- | | | |
|---------------------|--------------------|--|
| <p>1. Elbow (1)</p> | <p>Fitting (2)</p> | <p>a. Put container underneath.
 b. Using 1/2-inch and 5/8-inch wrenches, unscrew and take out.
 c. Put in container and let fuel drain.</p> |
|---------------------|--------------------|--|



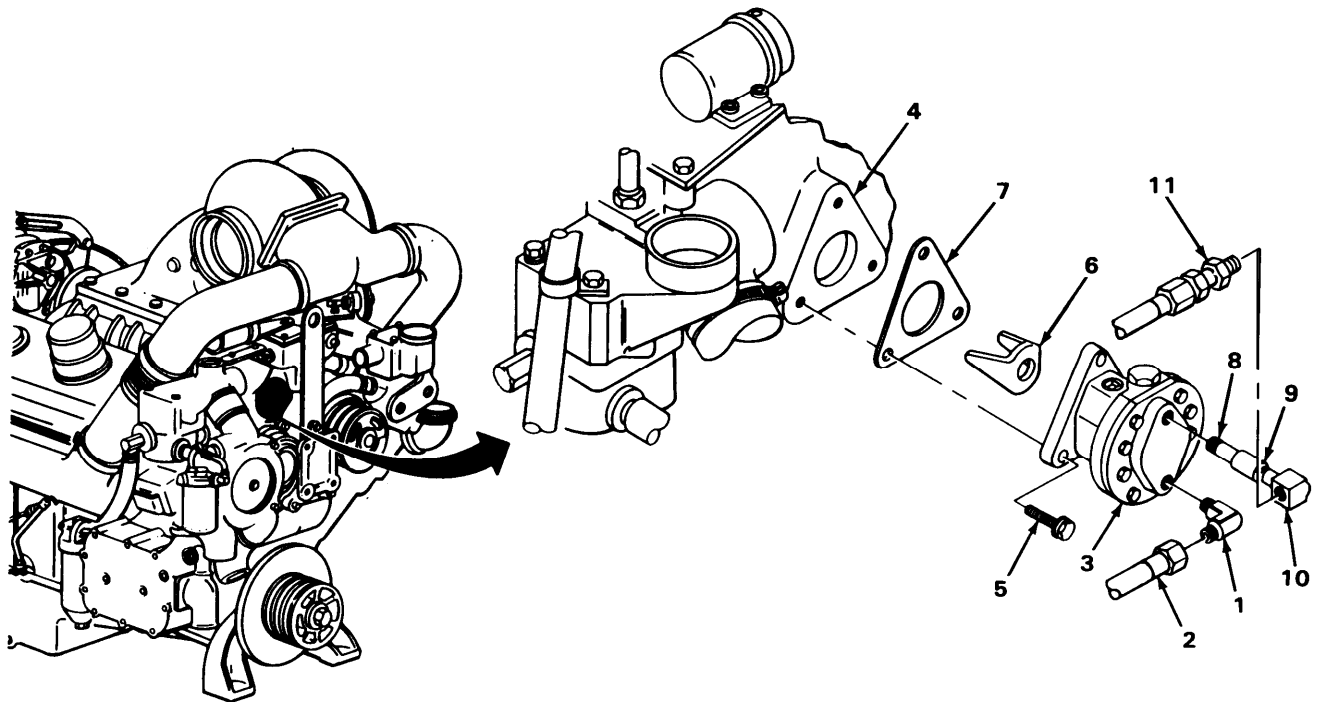
TA239816

FUEL PUMP - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL – CONTINUED		
2. Inlet elbow (1)	Inlet hose (2)	<ul style="list-style-type: none"> a. Put container underneath. b. Using 1-inch wrench, unscrew and take out. c. Put end of hose (2) in container and let fuel drain out. d. Get rid of fluid (page 4-1).
3. Fuel pump (3) to engine (4)	Three screws (5)	Using 1/2-inch socket, extension, handle, and 1/2-inch open-end wrench, unscrew and take out.
4. Engine (4)	Fuel pump (3) and drive fork (6)	Take off.
5. Fuel pump (3)	Gasket (7)	<ul style="list-style-type: none"> a. Using putty knife, scrape off. b. Get rid of.
6.	Outlet nipple (8), coupling (9), and outlet elbow (10)	<ul style="list-style-type: none"> a. Put fuel pump (1) in vise. b. Using pipe wrench and 11/16-inch wrench, unscrew and take out.
7.	Inlet elbow (1)	<ul style="list-style-type: none"> a. Using 11/16-inch wrench, unscrew and take out. b. Take fuel pump (3) out of vise.
CLEANING AND INSPECTION		
8.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
INSTALLATION		
9. Fuel pump (3)	Inlet elbow (1)	<ul style="list-style-type: none"> a. Put fuel pump (3) in vise. b. Wrap threads with teflon tape (page 4-1). c. Screw in about halfway using 11/16-inch wrench.
10.	Outlet nipple (8), coupling (9), and outlet elbow (10)	<ul style="list-style-type: none"> a. Wrap threads with teflon tape (page 4-1). b. Screw in and tighten using pipe wrench and 11/16-inch wrench. c. Take fuel pump (3) out of vise.

FUEL PUMP - CONTINUED

LOCATION	ITEM	ACTION REMARKS
11. Engine (4)	Drive fork (6), new gasket (7), and fuel pump (3)	a. Line up drive fork. b. Put on.
12. Fuel pump (3) to engine (4)	Three screws (5)	Screw in and tighten using socket, extension, handle, and 1/2-inch wrench.
13. Inlet elbow (1)	Inlet hose (2)	Screw in and tighten using 1-inch wrench.
14. Outlet elbow (10)	Fitting (11)	Screw in and tighten using 1/2-inch and 5/8-inch wrenches.



NOTE

FOLLOW-ON MAINTENANCE:

1. Close right side of hood (TM 9-2320-270-10).
2. Purge fuel system (page 4-32).
3. Test operation (TM 9-2320-270-10).

TASK ENDS HERE

TA239817

FUEL PUMP TO FUEL FILTER LINE AND FITTINGS

This task covers:

- a. Removal (page 4-40)
 - b. Cleaning and Inspection (page 4-41)
 - c. Installation (page 4-41)
-

INITIAL SETUP

<p>Tools</p> <p>Pan, drain Wrench, open-end, 1/2-inch Wrench, open-end, 5/8-inch Wrench, open-end, 3/4-inch</p>	<p>Personnel Required</p> <p>One</p> <p>Equipment Condition</p> <p>Right side of hood open and right side panel removed (TM 9-2320-270-10). Right radiator guard removed (page 4-151).</p>
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LOCATION	ITEM	ACTION REMARKS
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WARNING

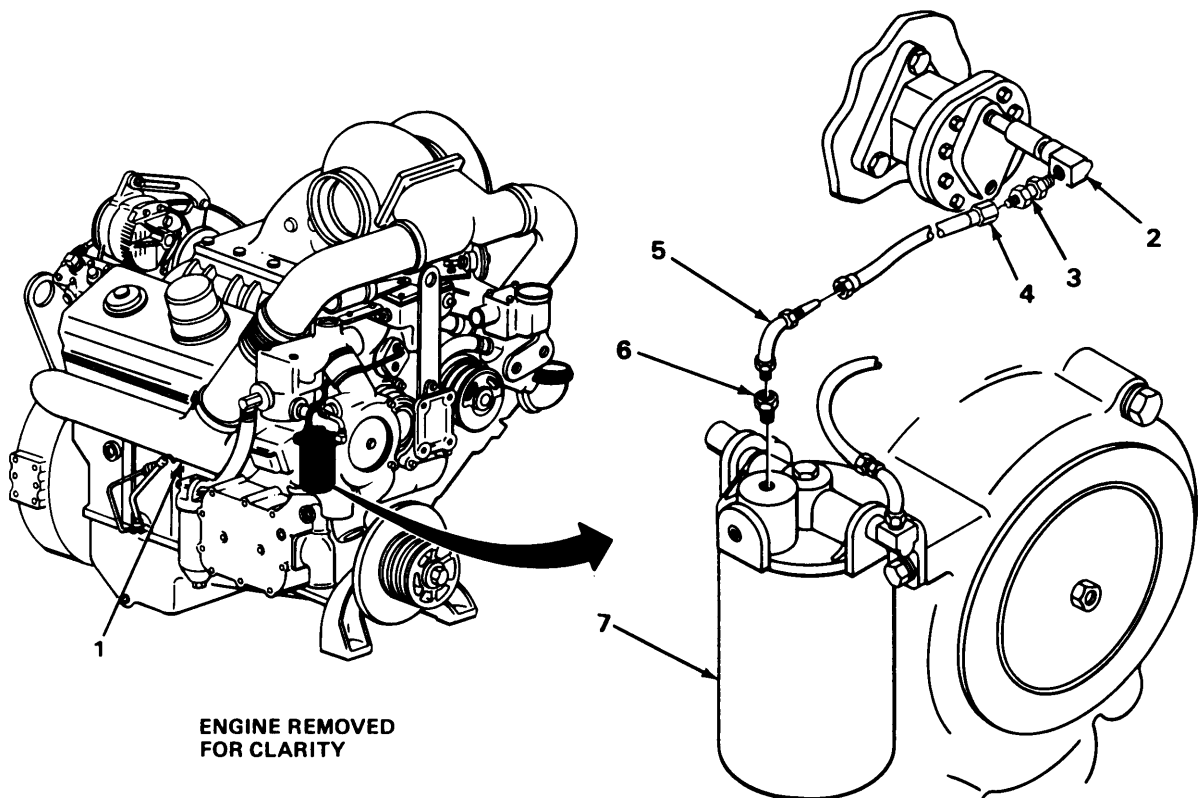
No open flames, welding, grinding, smoking, or use of heat producing devices permitted nearby when using fuel. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

REMOVAL

<p>1. Engine (1) fuel pump outlet elbow (2)</p>	<p>Fitting (3)</p>	<p>a. Put drain pan underneath. b. Using 1/2-inch and 5/8-inch wrenches, unscrew and take out. c. Put end of fitting (3) in container and let fuel drain out. d. Get rid of fluid (page 4-1).</p>
<p>2. Hose (4)</p>	<p>Fitting (3)</p>	<p>Using 1/2-inch and 3/4-inch wrenches, unscrew and take out.</p>
<p>3. Fuel filter inlet elbow (5)</p>	<p>Hose (4)</p>	<p>Using 1/2-inch and 3/4-inch wrenches, unscrew and take out.</p>
<p>4. Reducer (6)</p>	<p>Fuel filter inlet elbow (5)</p>	<p>Using 5/8-inch and 3/4-inch wrenches, unscrew and take out.</p>
<p>5. Fuel filter (7)</p>	<p>Reducer (6)</p>	<p>Using 3/4-inch wrench, unscrew and take out.</p>

FUEL PUMP TO FUEL FILTER LINE AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
CLEANING AND INSPECTION		
6.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
INSTALLATION		
7. Fuel filter (7)	Reducer (6)	Screw in and tighten using 3/4-inch wrench.
8. Reducer (6)	Fuel filter inlet elbow (5)	Screw in and tighten using 5/6-inch and 3/4-inch wrenches.
9. Fuel filter inlet elbow (5)	Hose (4)	Screw on and tighten using 1/2-inch and 3/4-inch wrenches.
10. Hose (4)	Fitting (3)	Screw in and tighten using 1/2-inch and 3/4-inch wrenches.
11. Fuel pump outlet elbow (2)	Fitting (3)	Screw in and tighten using 1/2-inch and 5/8-inch wrenches.



TA239818

FUEL PUMP TO FUEL FILTER LINE AND FITTINGS - CONTINUED

INSTALLATION – CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Install right radiator guard (page 4-151).
2. Install right side panel and close right side of hood (TM 9-2320-270-10).
3. Purge fuel system (page 4-32).
4. Test operation (TM 9-2320-270-10).

TASK ENDS HERE

FUEL FILTER TO ENGINE LINES AND FITTINGS

This task covers:

- | | |
|--|-----------------------------|
| a. Removal (page 4-42) | c. Installation (page 4-44) |
| b. Cleaning and Inspection (page 4-43) | |
-

INITIAL SETUP

<p>Tools</p> <p>Wrench, open-end, 1/2-inch Wrench, open-end, 5/8-inch Wrench, open-end, 11/16-inch Wrench, open-end, 3/4-inch Wrench, open-end, 13/16-inch</p> <p>Materials/Parts</p> <p>Container</p>	<p>Personnel Required</p> <p>One</p> <p>Equipment Condition</p> <p>Right radiator guard removed (page 4-151). Shutdown solenoid removed (page 4-422).</p>
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LOCATION	ITEM	ACTION	REMARKS
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WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted nearby when using fuel. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

REMOVAL

NOTE

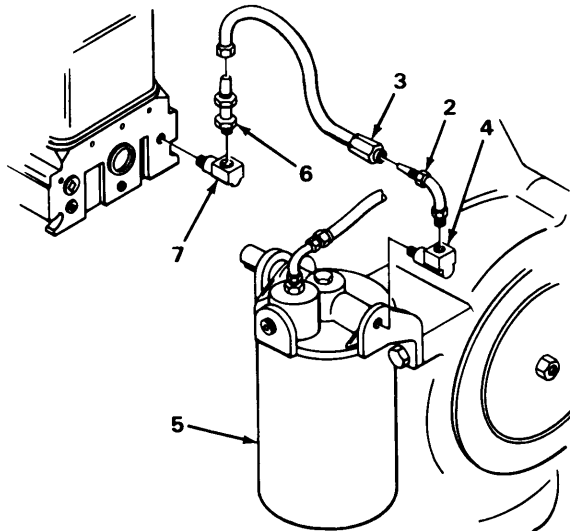
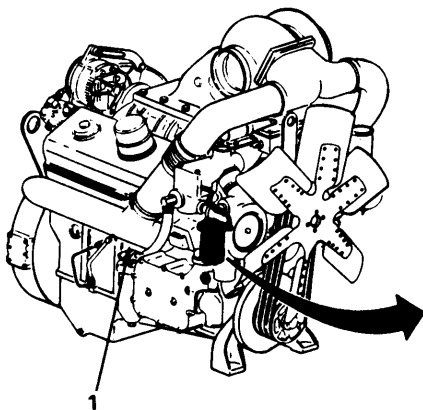
There are two sets of fuel filters to engine lines and fittings. Use this procedure to replace either set.

FUEL FILTER TO ENGINE LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
1. Right side of engine (1), elbow (2)	Hose (3)	a. Put container underneath. b. Using 1/2-inch and 3/4-inch wrenches, unscrew and take off. c. Get rid of fluid (page 4-1).
2. Elbow (4)	Elbow (2)	Using 5/6-inch wrench, unscrew and take out.
3. Fuel filter (5)	Elbow (4)	Using 11/16-inch wrench, unscrew and take out.
4. Tube (6)	Hose (3)	Using 1/2-inch and 3/4-inch wrenches, unscrew and take off.
5. Elbow (7)	Tube (6)	Using 5/6-inch wrench, unscrew and take out.
6. Engine (1)	Elbow (7)	Using 13/16-inch wrench, unscrew and take out.

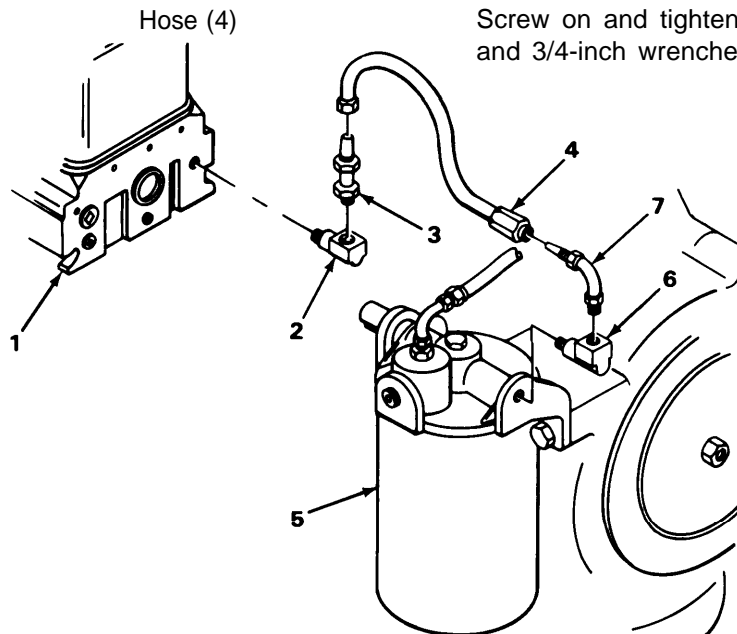
CLEANING AND INSPECTION

7. All parts Clean and inspect as shown in the general maintenance instructions (page 4-1).



FUEL FILTER TO ENGINE LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
8. Engine (1)	Elbow (2)	Screw in and tighten using 13/16-inch wrench.
9. Elbow (2)	Tube (3)	Screw in and tighten using 5/8-inch wrench.
10. Tube (3)	Hose (4)	Screw on and tighten using 1/2-inch and 3/4-inch wrenches.
11. Fuel filter (5)	Elbow (6)	Screw in and tighten using 11/16-inch wrench.
12. Elbow (6)	Elbow (7)	Screw in and tighten using 5/8-inch wrench.
13. Elbow (7)	Hose (4)	Screw on and tighten using 1/2-inch and 3/4-inch wrenches.



NOTE

FOLLOW-ON MAINTENANCE:

1. Install shutdown solenoid (page 4-422).
2. Install right radiator guard (page 4-151).
3. Purge fuel system (page 4-32).
4. Test operation (TM 9-2320-270-10).

TASK ENDS HERE

TA239820

AIR CLEANER FILTERS

This task covers:

- a. Removal (page 4-45)
- b. Cleaning and Inspection (page 4-47)
- c. Installation (page 4-47)

INITIAL SETUP

Tools

Extension, 3/8-inch drive, 5-inch
 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, 1/2-inch
 Wrench, open-end, 9/16-inch

Personnel Required

Two

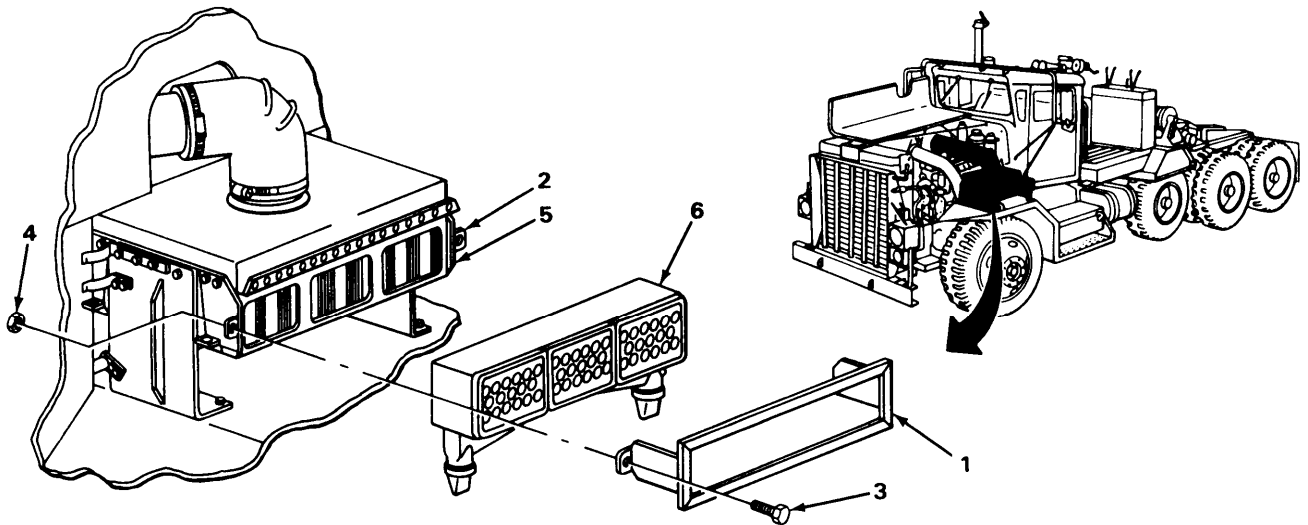
Equipment Condition

Left side hood open and left side panel removed (TM 9-2320-270-10).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

- | | | |
|---|-----------------------------------|--|
| <p>1. Left side of vehicle, filter bracket (1) to two mounting brackets (2)</p> | <p>Two bolts (3) and nuts (4)</p> | <p>Using 1/2-inch socket, handle, and 1/2-inch wrench, unscrew and take out.</p> |
| <p>2. Filter (5)</p> | <p>Bracket (1) and filter (6)</p> | <p>a. Take off.
 b. Take apart.
 c. Tap filter (6) against hard surface to remove surface particles.</p> |



TA239821

AIR CLEANER FILTERS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL – CONTINUED		
3. Strap (1) to two brackets (2)	Two bolts (3) and nuts (4)	Using 1/2-inch socket, handle, extension, and 1/2-inch wrench, unscrew and take out.
4. Filter (5)	Strap (1)	Take off.
5. Strap (6) to two brackets (7)	Two bolts (8) and nuts (9)	Using 1/2-inch socket, handle, and 1/2-inch wrench, unscrew and take out.
6. Filter (5)	Strap (6)	Take off.
7. Front bracket (10) to housing (11)	Four bolts (12) and nuts (13)	Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take out.
8. Housing (11)	Front bracket (10)	Take off.

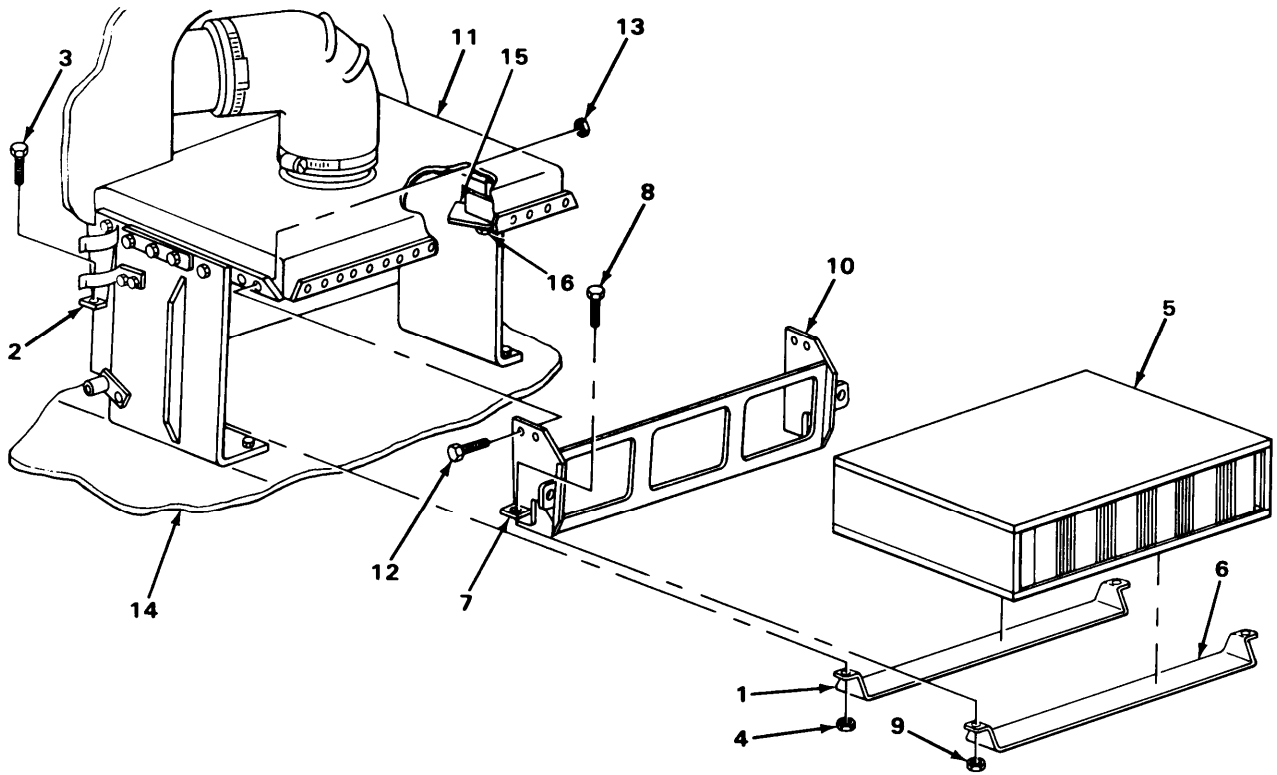
WARNING

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 swiftly moved to a segregation area away from the worksite. 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.

9. Fender (14)	Filter (5)	Take off.
10. Four tabs (15) to housing (11)	Four screws (16)	Using 1/2-inch socket and handle, loosen, but do not remove.
11. Housing (11)	Filter (5)	Move four tabs (15) and take out.

AIR CLEANER FILTERS - CONTINUED

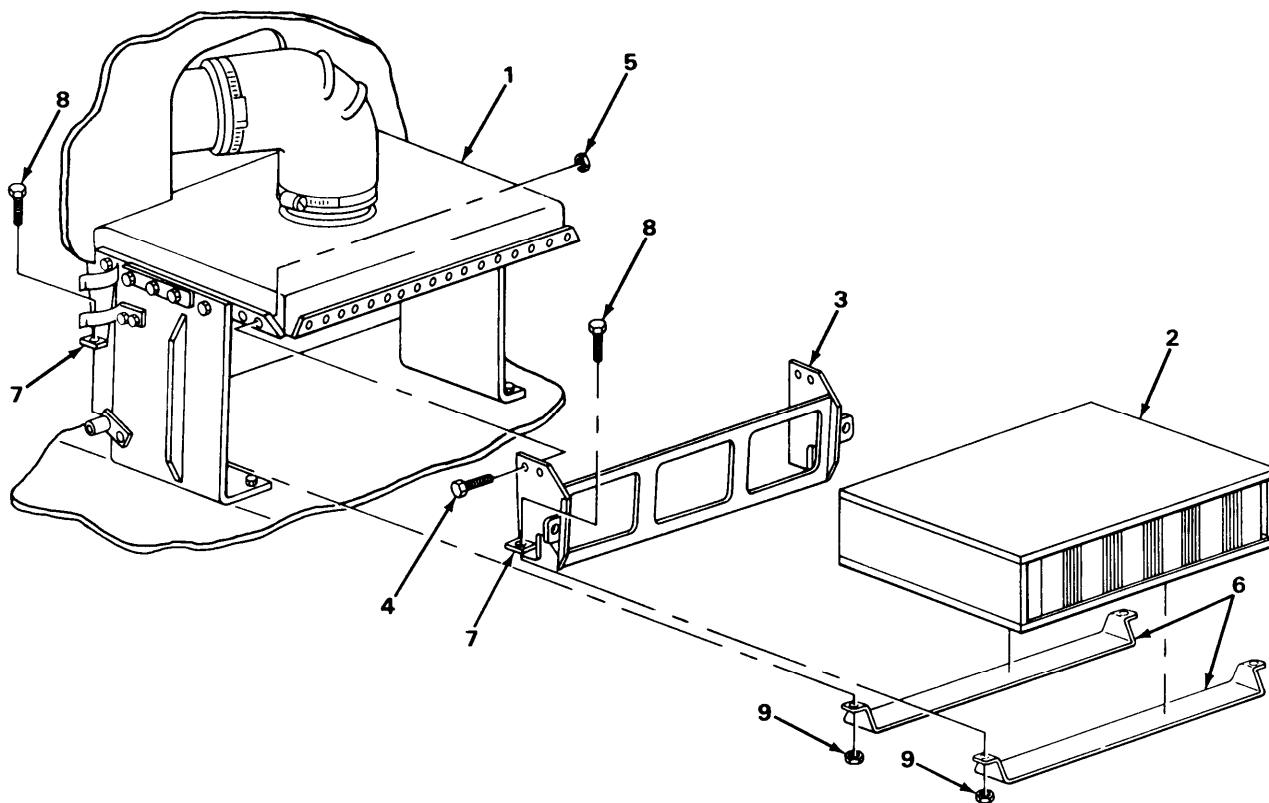
LOCATION	ITEM	ACTION REMARKS
CLEANING AND INSPECTION		
12.	Filter (5)	Inspect as shown in the general maintenance instructions (page 4-1). Do not clean filter. If filter is dirty, get rid of it.
13.	All parts except filter (5)	Clean and inspect as shown in the general maintenance instructions (page 4-1).
INSTALLATION		
14. Housing (11)	Filter (5)	Put in and move tabs (15) under filter (5). Make sure arrows on filter point up.
15. Four tabs (15) to housing (11)	Four screws (16)	Tighten using 1/2-inch socket and handle.



TA239822

AIR CLEANER FILTERS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
16. Housing (1)	Filter (2)	Put in position and have assistant hold in place.	
17. Housing (1)	Bracket (3)	Put on.	
18. Bracket (3) to housing (1)	Four bolts (4) and nuts (5)	Screw in and tighten using 9/16-inch socket, handle, and 9/18-inch wrench.	
19. Filter (2)	Two straps (6)	Put under.	
20. Two straps (6) to four brackets (7)	Four bolts (8) and nuts (9)	Screw in and tighten using 1/2-inch socket and handle.	

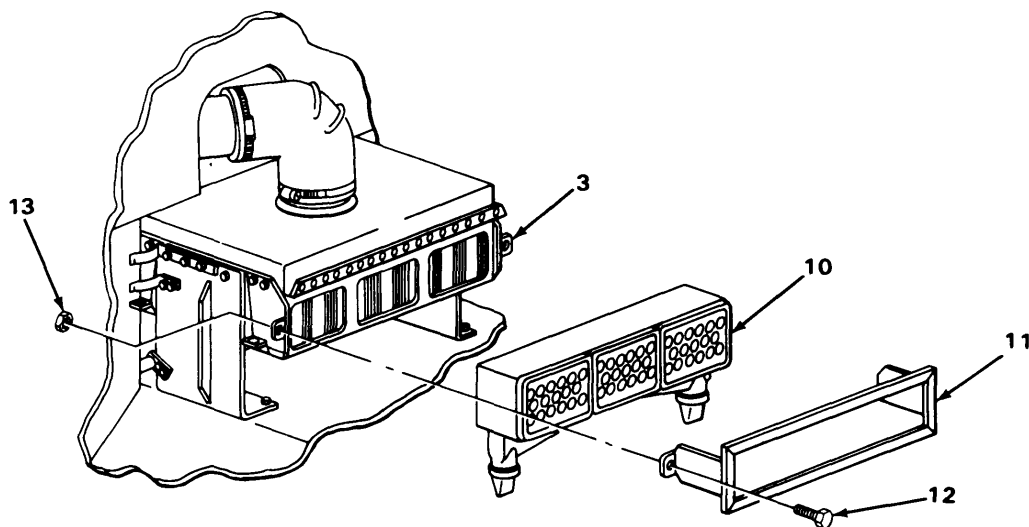


21. Filter (10)	Bracket (11)	Put on.	
22. Bracket (3)	Filter (10) and bracket (11)	Put on.	

TA239823

AIR CLEANER FILTER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
23. Filter bracket (11) to mounting bracket (3)	Two bolts (12) and nuts (13)	Screw in and tighten using 1/2-inch socket and handle.

**NOTE**

FOLLOW-ON MAINTENANCE: Close left side hood and install left side panel (TM 9-2320-270-10).

TASK ENDS HERE**AIR CLEANER ASSEMBLY**

This task covers:

- | | |
|--|-----------------------------|
| a. Removal (page 4-50) | d. Assembly (page 4-56) |
| b. Disassembly (page 4-52) | e. Installation (page 4-62) |
| c. Cleaning and Inspection (page 4-56) | |

TA239S24

AIR CLEANER ASSEMBLY - CONTINUED

INITIAL SETUP

Tools

- Handle, ratchet, 3/8-inch drive
- Screwdriver, flat-tip, 1/4-inch, 4-inch blade
- Socket, 7/16-inch, 3/8-inch drive
- Socket, 1/2-inch, 3/8-inch drive
- Socket, 9/16-inch, 3/8-inch drive
- Wrench, open-end, 7/16-inch
- Wrench, open-end, 1/2-inch
- Wrench, open-end, 9/16-inch

Materials/Parts

- Lockwasher, air cleaner bracket to fender (five required)
- Lockwasher, air cleaner bracket to housing (eight required)

Materials/Parts – Continued

- Lockwasher, heat shield to fender (three required)
- Lockwasher, pivot bracket to air cleaner bracket (two required)
- Lockwasher, stop to air cleaner bracket (two required)

Personnel Required

Two

Equipment Condition

Left side of hood open and left side panel removed (TM 9-2320-270-10).

LOCATION	ITEM	ACTION REMARKS
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REMOVAL

- | | | |
|--|--|--|
| 1. Left front of vehicle/two air cleaner hose clamps (1) | Two screws (2) | Using screwdriver, unscrew part way. |
| 2. Air cleaner assembly (3) | Air cleaner hose (4) | Pull off and move aside. |
| 3. Two air cleaner brackets (5) to fender (6) | Three bolts (7), six washers (8), three lockwashers (9), and nuts (10) | <ul style="list-style-type: none"> a. Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take out. b. Get rid of lockwashers (9). |
| 4. | Two bolts (1 1), lockwashers (12), and six washers (13) | <ul style="list-style-type: none"> a. Using 9/16-inch socket and handle, unscrew and take out. b. Get rid of lockwashers (12). |

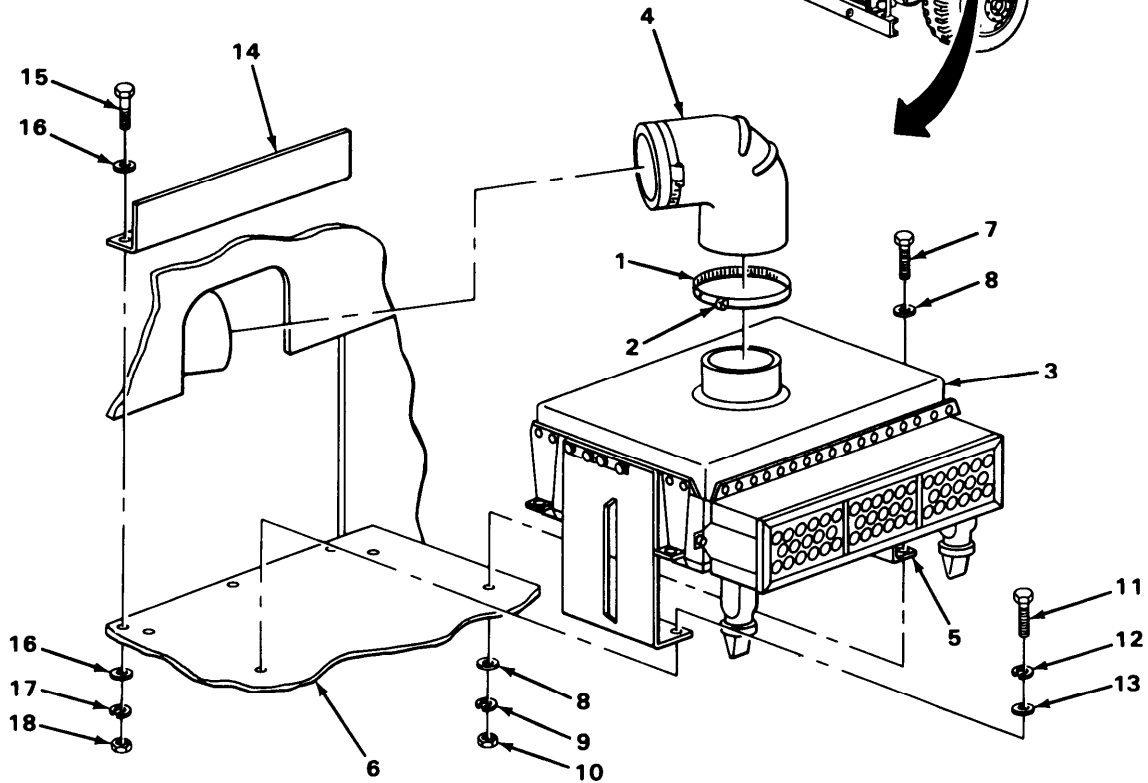
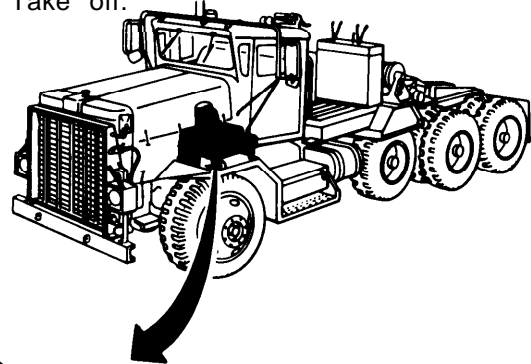
AIR CLEANER ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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WARNING

Some parts are heavy. Be careful when handling them. Lifting equipment is needed when parts weigh over 50 pounds (23 kg) for a single person lift, over 100 pounds (45 kg) for a two person lift, and over 150 pounds (68 kg) for a three or more person lift. Do not try to handle heavy parts without lifting equipment. Keep clear of heavy parts supported only by lifting equipment. Failure to observe this precaution could cause serious injury or death of personnel.

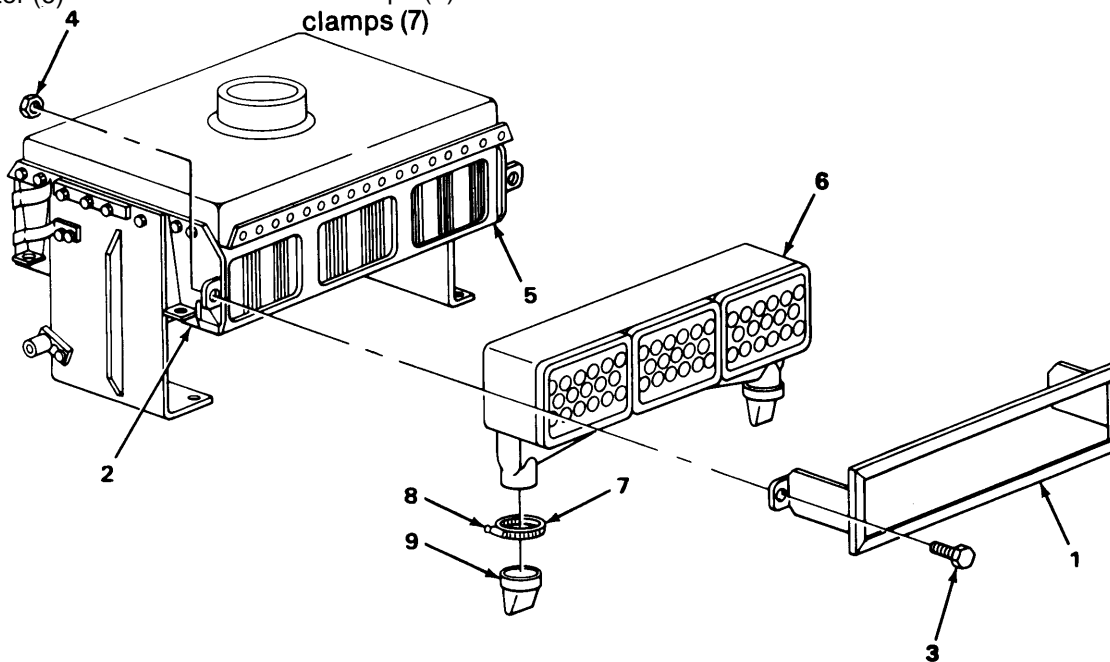
- | | | |
|--------------------------------------|--|---|
| 5. Fender (6) | Air cleaner assembly (3) | Take off. |
| 6. Heat shield (14)
to fender (6) | Three bolts (15),
six washers (16),
lockwashers (17),
and nuts (18) | a. Using 7/16-inch socket, handle, and
7/16-inch wrench, unscrew and take
out.
b. Get rid of lockwashers (17). |
| 7. Fender (6) | Heat shield (14) | Take off. |



TA239825

AIR CLEANER ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
DISASSEMBLY		
8. Filter bracket (1) to two mounting brackets (2)	Two bolts (3) and nuts (4)	Using 1/2-inch socket, handle, and 1/2-inch wrench, unscrew and take out.
9. Filter (5)	Bracket (1) and filter (6)	a. Take off. b. Take apart. c. Tap filter (6) against hard surface to remove surface particles.
10. Two clamps (7)	Two clamp screws (8)	Using screwdriver, unscrew part way.
11. Filter (6)	Two caps (9) and clamps (7)	Take off.
12. Two straps (10) to four brackets (2) and (11)	Four bolts (12) and nuts (13)	Using 1/2-inch socket, handle, and 1/2-inch wrench, unscrew and take out.



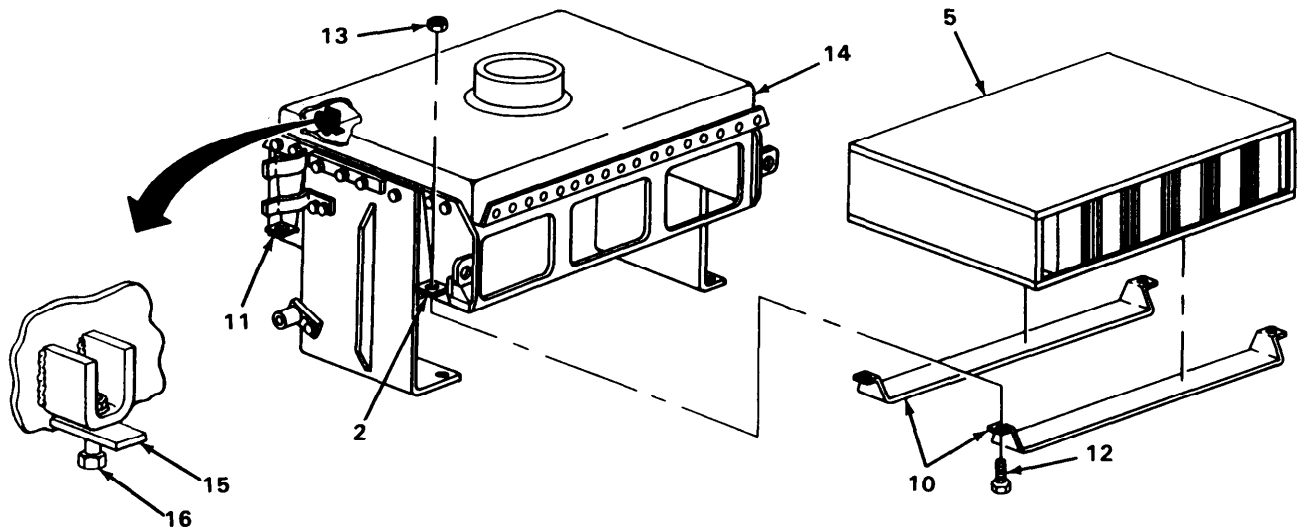
AIR CLEANER ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
13. Housing (14)	Filter (5) and two straps (10)	a. Take off. b. Take apart.
14. Four tabs (15) to housing (14)	Four bolts (16)	Using 1/2-inch socket and handle, unscrew part way.

WARNING

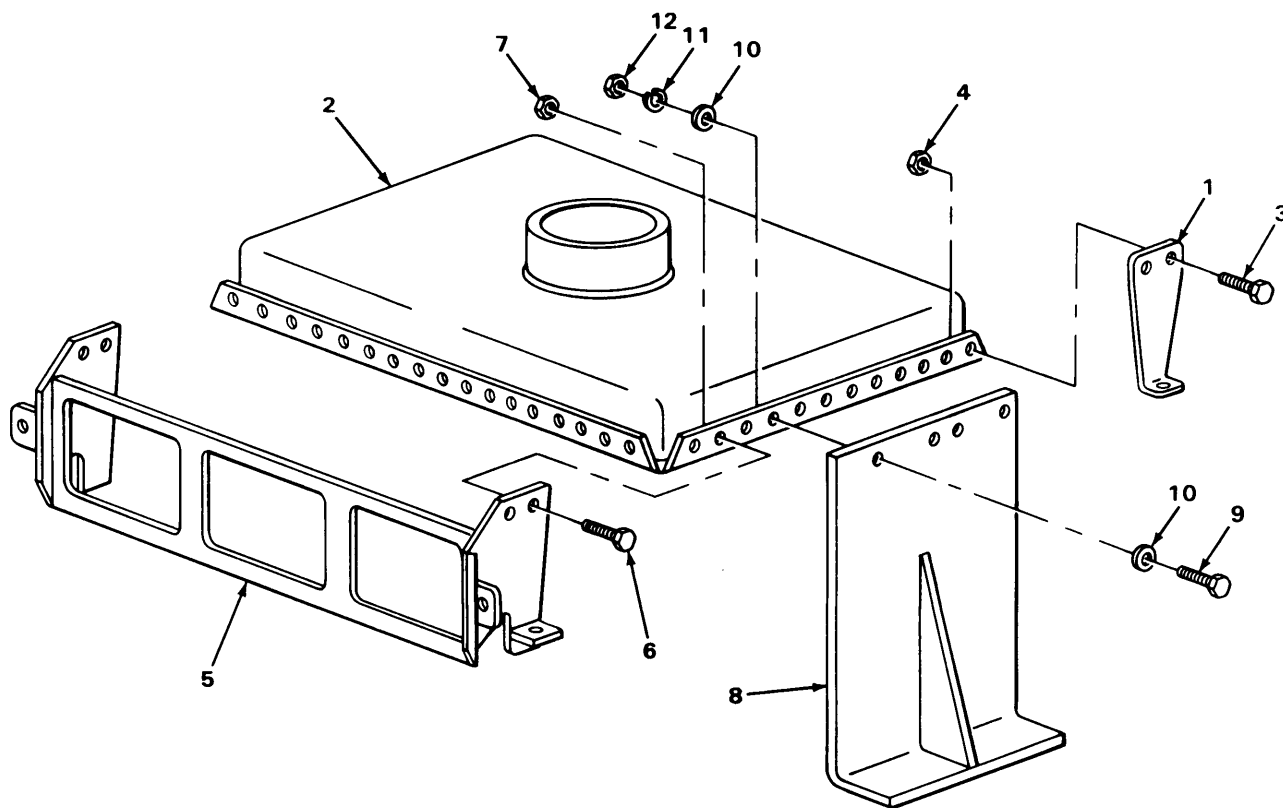
After Nuclear, Biological, or Chemical (NBC) exposure of this vehicle, all air filters shall be handled with extreme caution. Unprotected personnel may experience injury or death if residual toxic agents or radioactive material are present. If vehicle is exposed to chemical or biological agents, servicing 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 swiftly moved to a segregation area away from the worksite. 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.

15. Housing (14) Filter (5) Move four tabs (15) away from filter and take out.



AIR CLEANER ASSEMBLY - CONTINUED

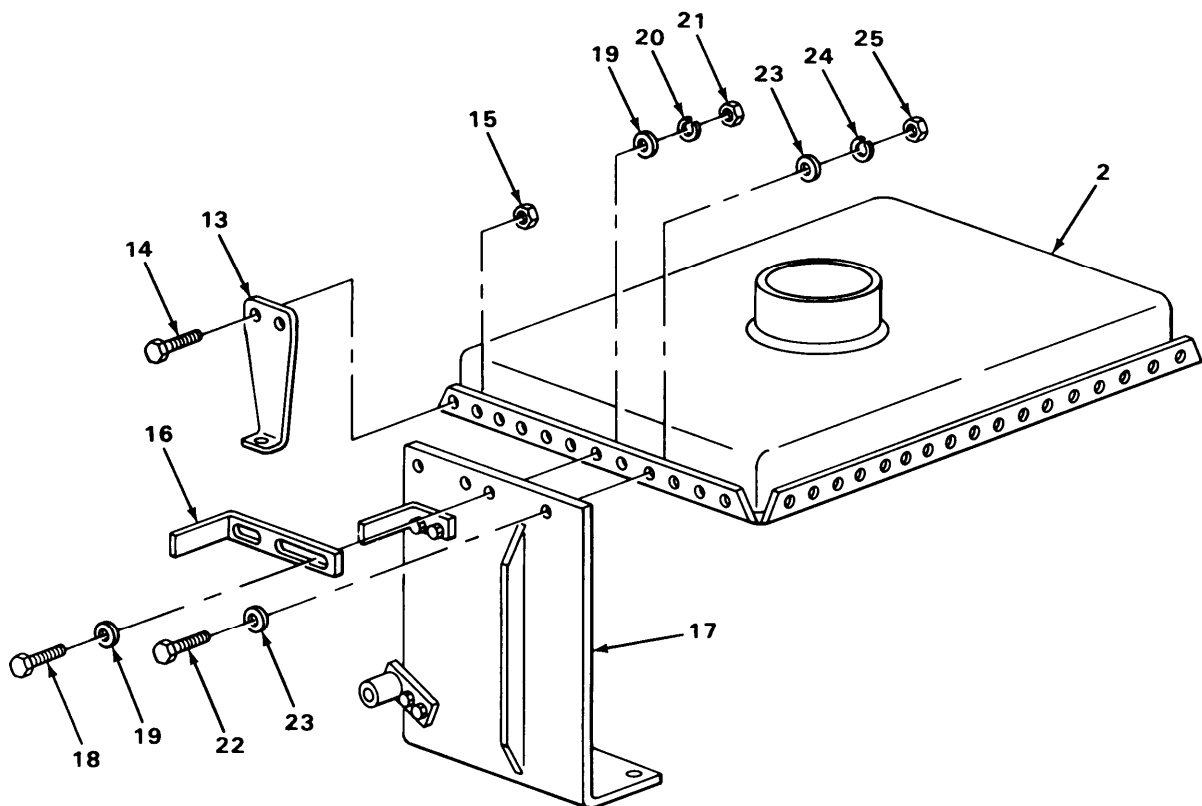
LOCATION	ITEM	ACTION REMARKS
DISASSEMBLY – CONTINUED		
16. Bracket (1) to housing (2)	Two bolts (3) and nuts (4)	Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take out.
17. Housing (2)	Bracket (1)	Take off.
18. Bracket (5) to housing (2)	Four bolts (6) and nuts (7)	Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take out.
19. Housing (2)	Bracket (5)	Take off.
20. Bracket (8) to housing (2)	Four bolts (9), eight washers (10), four lockwashers (11), and nuts (12)	a. Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take out. b. Get rid of lockwashers (11).
21. Housing (2)	Bracket (8)	Take off.



TA239828

AIR CLEANER ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
22. Bracket (13) to housing (2)	Two bolts (14) and nuts (15)	Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take out.
23. Housing (2)	Bracket (13)	Take off.
24. Stop (16) to bracket (17) and housing (2)	Three bolts (18), six washers (19), three lockwashers (20), and nuts (21)	a. Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take out. b. Get rid of lockwashers (20).
25. Bracket (11)	Stop (16)	Take off.
26. Bracket (17) to housing (2)	Bolts (22), two washers (23), lockwasher (24), and nut (25)	a. Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take out. b. Get rid of lockwasher (24).
27. Housing (2)	Bracket (17)	Take off.



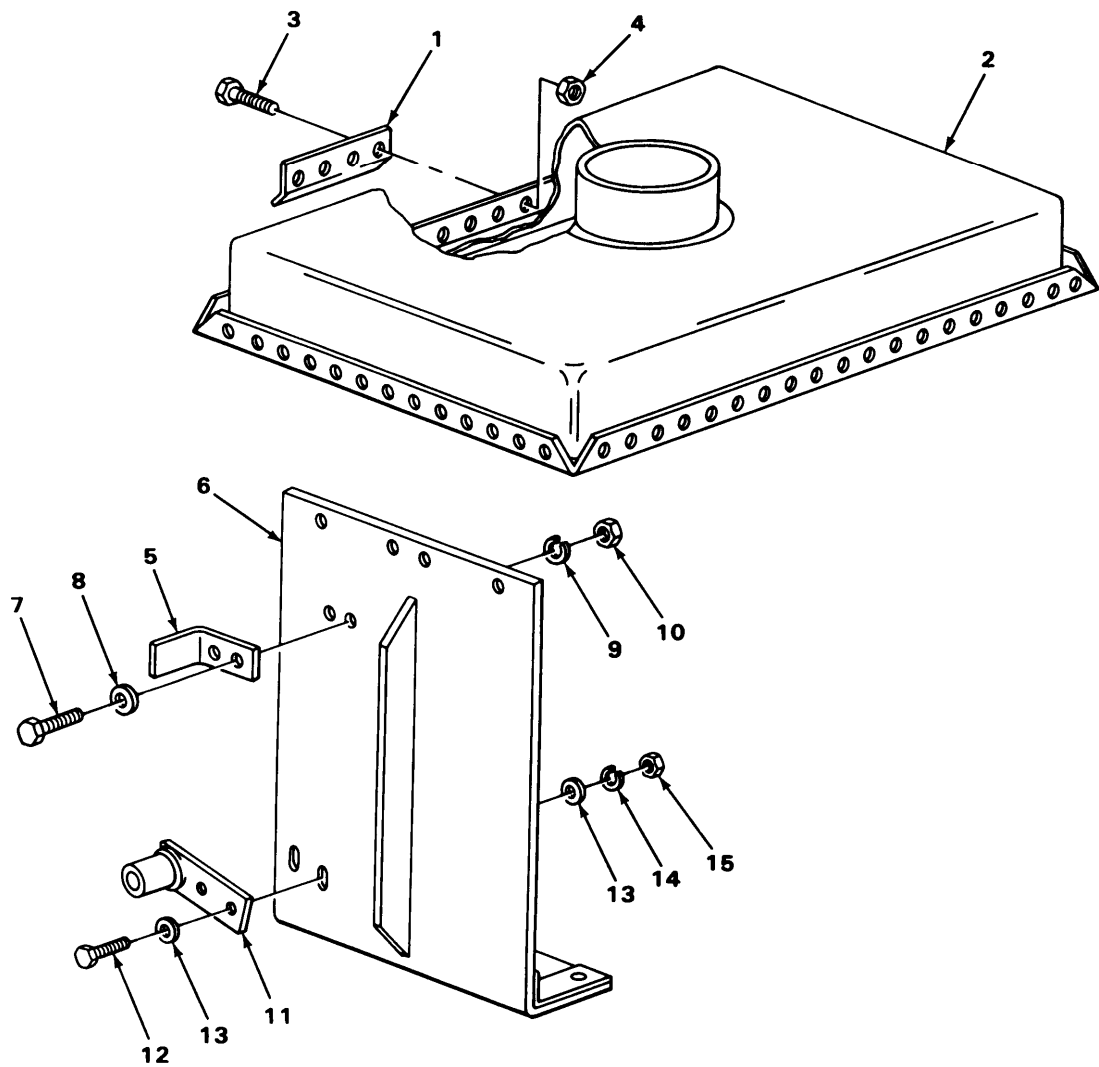
TA239829

AIR CLEANER ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
DISASSEMBLY - CONTINUED		
28. Angle (1) to housing (2)	Two bolts (3) and nuts (4)	Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take out.
29. Housing (2)	Angle (1)	Take off.
30. stop (5) to bracket (6)	Two bolts (7), washers (8), lockwashers (9), and nuts (10)	a. Using 1/2-inch socket, handle, and 1/2-inch wrench, unscrew and take out. b. Get rid of lockwashers (9).
31. Bracket (6)	stop (5)	Take off.
32. Pivot bracket (11) to bracket (6)	Two bolts (12), four washers (13), two lockwashers (14), and nuts (15)	a. Using 7/16-inch socket, handle, and 7/16-inch wrench, unscrew and take out. b. Get rid of lockwashers (14).
33. Bracket (6)	Pivot bracket (11)	Take off.
CLEANING AND INSPECTION		
34.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
ASSEMBLY		
35. Bracket (6)	Pivot bracket (11)	Put on.
36. Pivot bracket (11) to bracket (6)	Two bolts (12), four washers (13), and two new lockwashers (14), and nuts (15)	Screw in and tighten using 7/16-inch socket, handle, and 7/16-inch wrench.
37. Bracket (6)	stop (5)	Put on bracket (6).
38. stop (5) to bracket (6)	Two bolts (7), washers (8), new lockwashers (9), and nuts (10)	Screw in and tighten using 1/2-inch socket, handle, and 1/2-inch wrench.

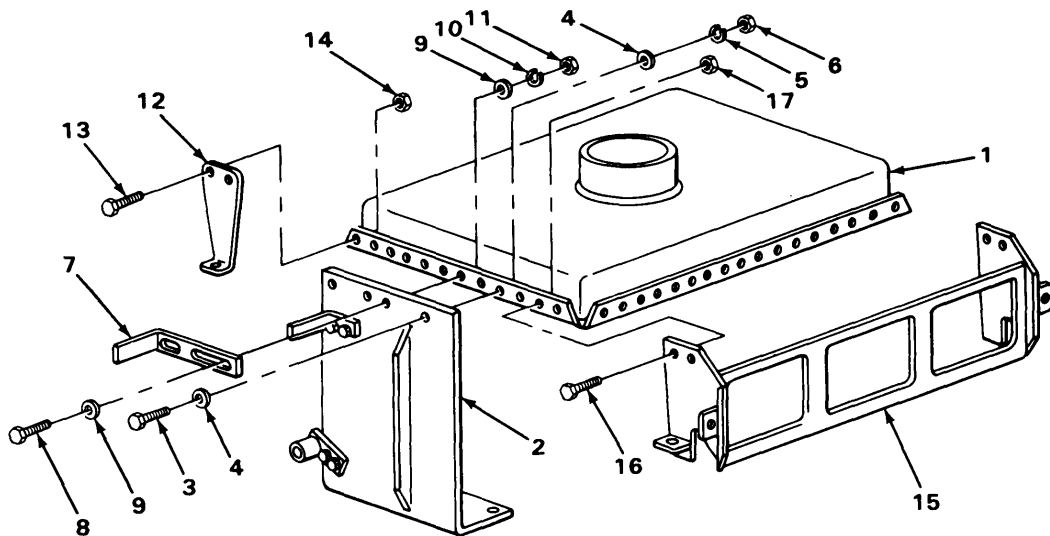
AIR CLEANER ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
39. Housing (2)	Angle (1)	Put on.
40. Angle (1) to housing (2)	Two bolts (3) and nuts (4)	Screw in and tighten using 9/16-inch socket, handle, and 9/16-inch wrench.



AIR CLEANER ASSEMBLY - CONTINUED

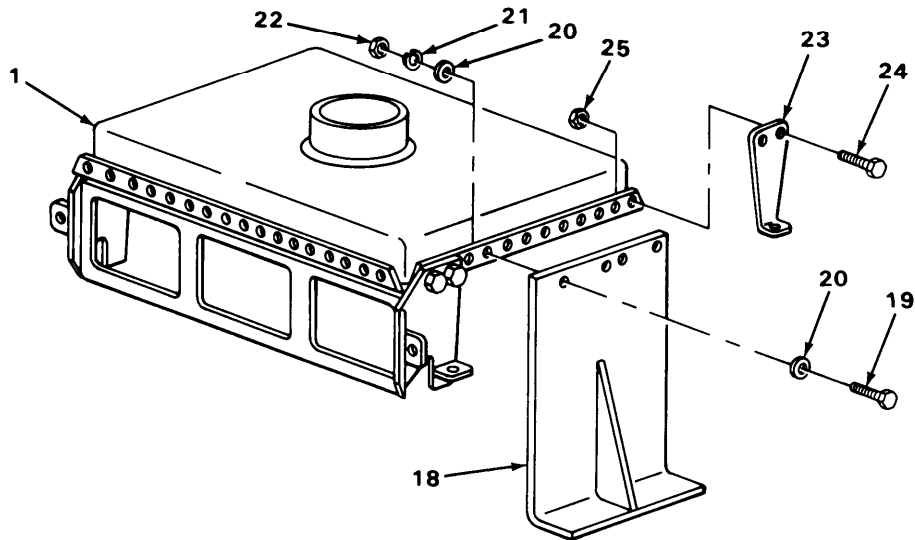
LOCATION	ITEM	ACTION REMARKS
ASSEMBLY – CONTINUED		
41. Housing (1)	Bracket (2)	Put on.
42. Bracket (2) to housing (1)	Bolt (3), two washers (4), new lockwasher (5), and nut (6)	Screw in and tighten using 9/16-inch socket, handle, and 9/16-inch wrench.
43. Bracket (2)	stop (7)	Put on.
44. Stop (7) to bracket (2) and housing (1)	Three bolts (8), six washers (9), three new lockwashers (10), and nuts (11)	Screw in and tighten using 9/16-inch socket, handle, and 9/16-inch wrench.
45. Housing (1)	Bracket (12)	Put on.
46. Bracket (12) to housing (1)	Two bolts (13) and nuts (14)	Screw in and tighten using 9/16-inch socket, handle, and 5/16-inch wrench.
47. Housing (1)	Bracket (15)	Put on.
48. Bracket (15) to housing (1)	Four bolts (16) and nuts (17)	Screw in and tighten using 9/16-inch socket, handle, and 9/16-inch wrench.



TA239831

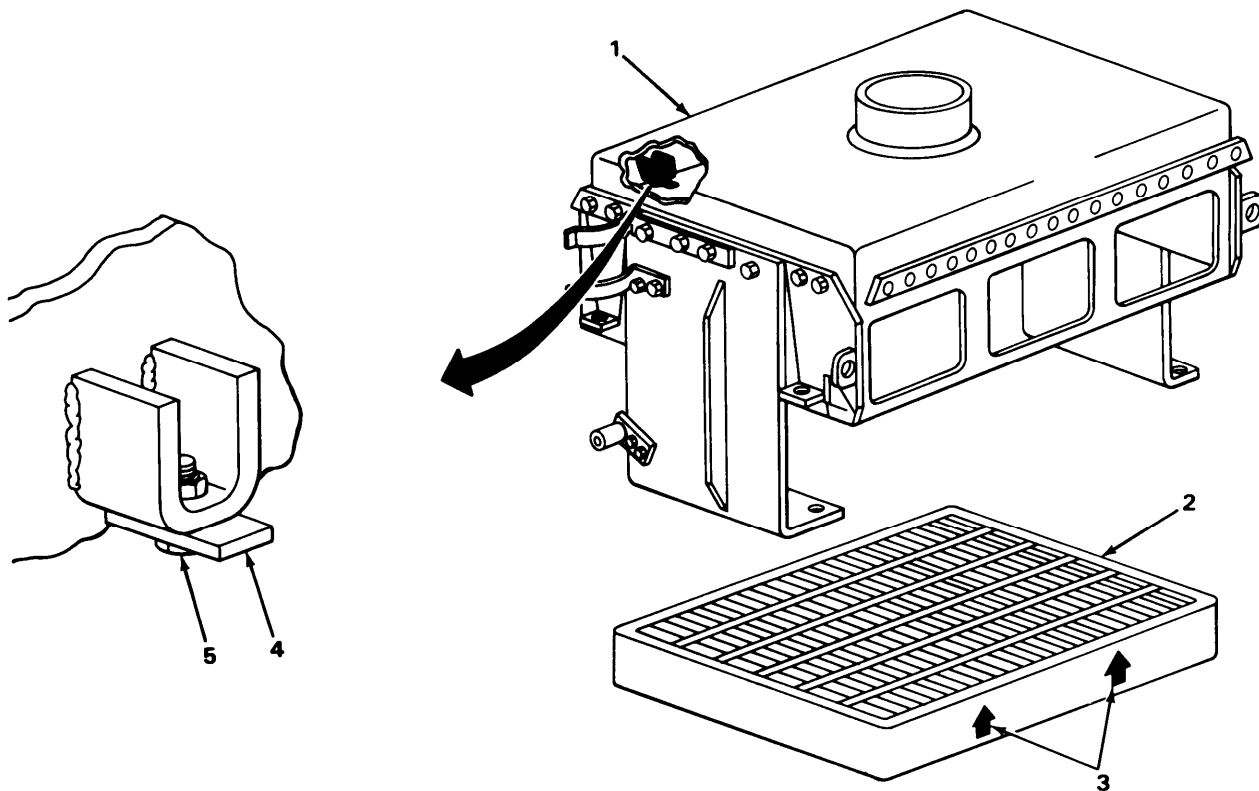
AIR CLEANER ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
49. Housing (1)	Bracket (18)	Put on.
50. Bracket (18) to housing (1)	Four bolts (19), eight washers (20), four new lock-washers (21), and nuts (22)	Screw in and tighten using 9/16-inch socket, handle, and 9/16-inch wrench.
51. Housing (1)	Bracket (23)	Put on.
52. Bracket (23) to housing (1)	Two bolts (24) and nuts (25)	Screw in and tighten using 9/16-inch socket, handle, and 9/16-inch wrench.



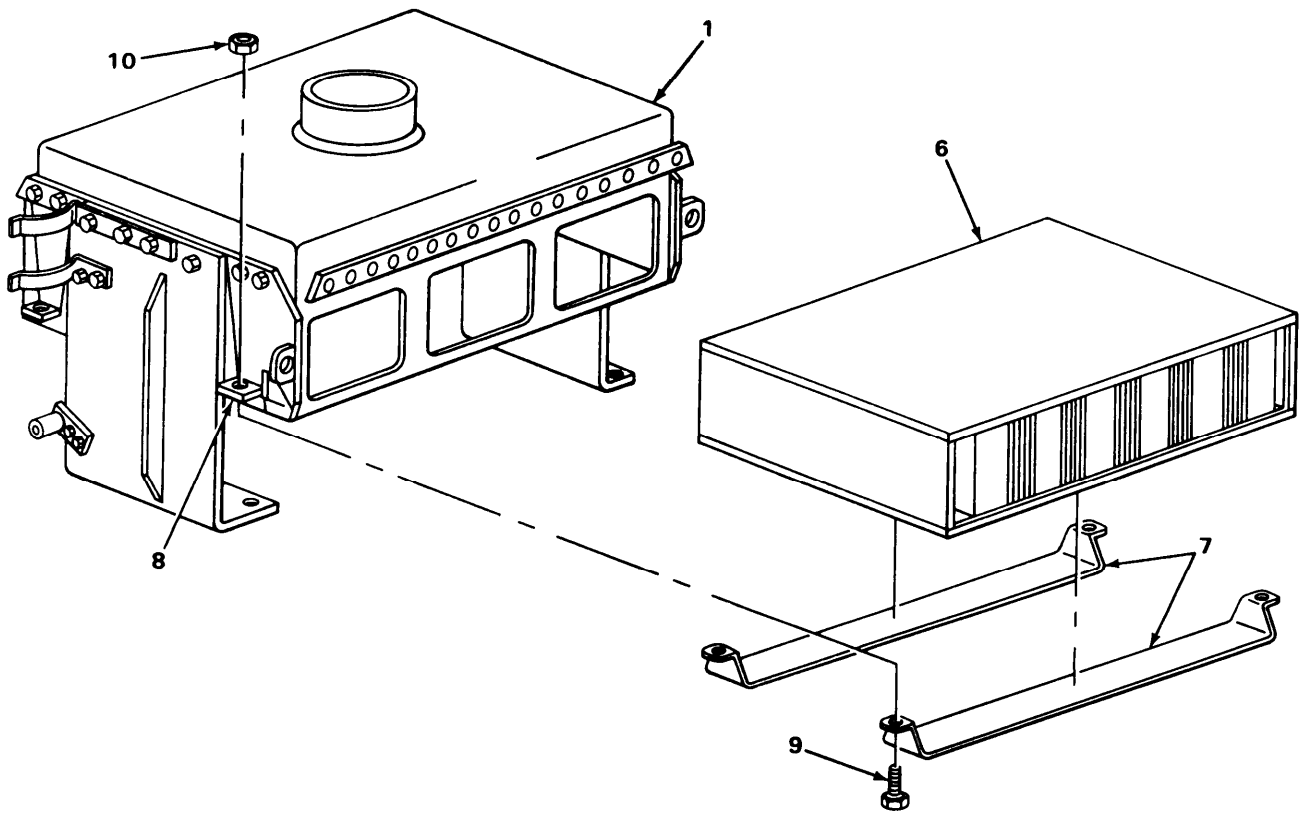
AIR CLEANER ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ASSEMBLY - CONTINUED		
53. Housing (1)	Filter (2)	a. Put in. Make sure arrows (3) on filter (2) point up. b. Move four tabs (4) under filter (2).
54. Four tabs (4) to housing (1)	Four bolts (5)	Using 1/2-inch socket and handle, tighten.



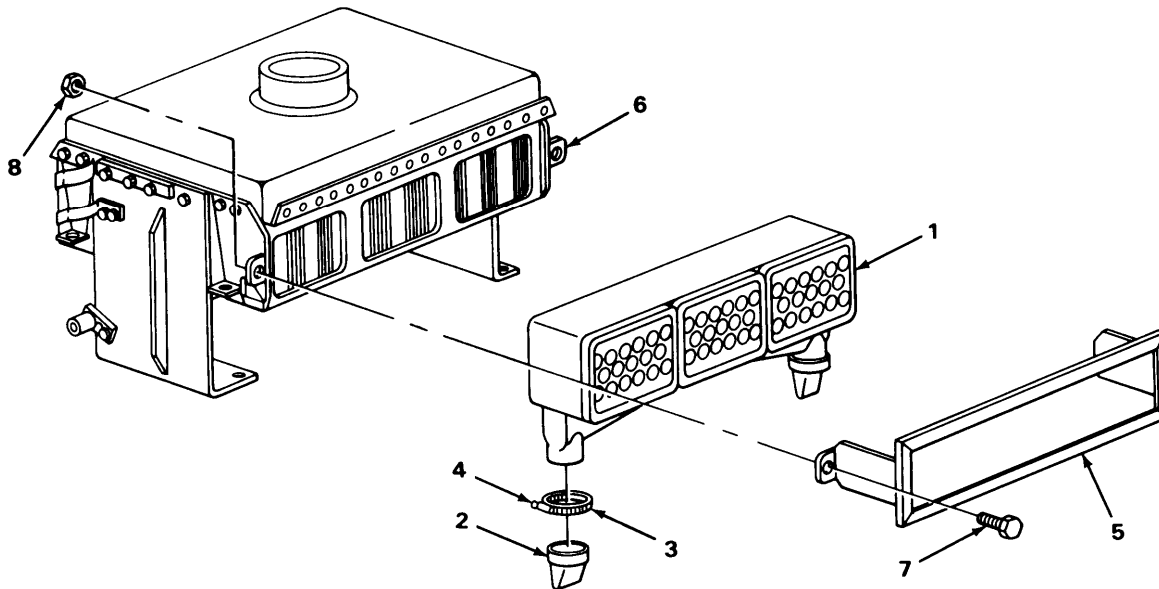
AIR CLEANER ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
55. Housing (1)	Filter (6)	Put in.
56. Filter (6)	Two straps (7)	Put on.
57. Two straps (7) to four brackets (8)	Four bolts (9) and nuts (10)	Screw in and tighten using 1/2-inch socket, handle, and 1/2-inch wrench.



AIR CLEANER ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
ASSEMBLY – CONTINUED			
58. Filter (1)	Two caps (2) and clamps (3)	Put on.	
59. Two clamps (3)	Two clamp screws (4)	Tighten using screwdriver.	
60. Filter (1)	Bracket (5)	Put on.	
61. Two mounting brackets (6)	Filter (1) and bracket (5)	Put on.	
62. Filter bracket (5) to two mounting brackets (6)	Two bolts (7) and nuts (8)	Screw in and tighten using 1/2-inch socket, handle, and 1/2-inch wrench.	



INSTALLATION

63. Fender (9)	Heat shield (10)	Put on.	
64. Heat shield (10) to fender (9)	Three bolts (11), six washers (12), new lockwashers (13), and nuts (14)	Screw in and tighten using 7/18-inch socket, handle, and 7/16-inch wrench.	

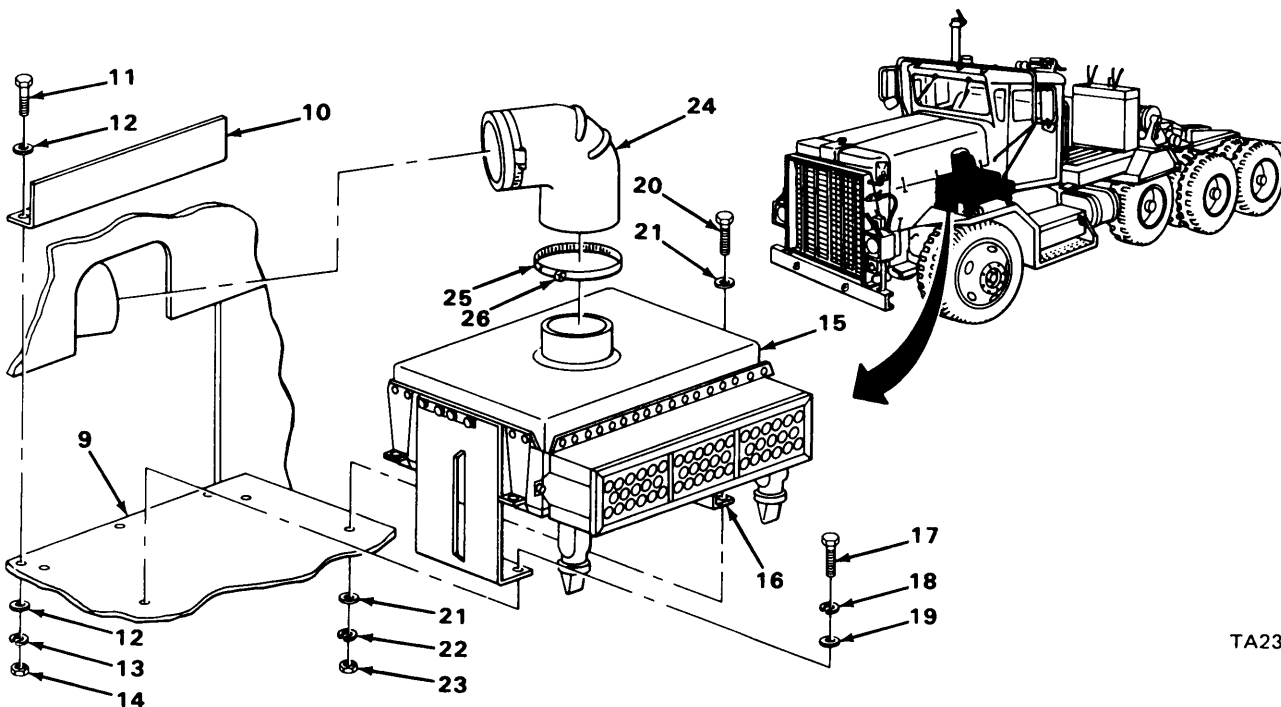
AIR CLEANER ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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WARNING

Some parts are heavy. Be careful when handling them. Lifting equipment is needed when parts weigh over 50 pounds (23 kg) for a single person lift, over 100 pounds (45 kg) for a two person lift, and over 150 pounds (88 kg) for a three or more person lift. Do not try to handle heavy parts without lifting equipment. Keep clear of heavy parts supported only by lifting equipment. Failure to observe this precaution could cause serious injury or death of personnel.

- | | | |
|---|---|--|
| 65. Fender (9) | Air cleaner assembly (15) | Put on. |
| 66. Two air cleaner brackets (16) to fender (9) | Two bolts (17), new lockwashers (18), and washers (19) | Screw in and tighten using 9/16-inch socket and handle. |
| 67. | Three bolts (20), six washers (21), three new lockwashers (22), and nuts (23) | Screw in and tighten using 9/16-inch socket, handle, and 9/16-inch wrench, |
| 68. Air cleaner assembly (15) | Air cleaner hose (24) | Push on. |
| 69. Two hose clamps (25) | Two clamp screws (26) | Using screwdriver, tighten. |



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AIR CLEANER ASSEMBLY - CONTINUED

INSTALLATION – CONTINUED

NOTE

FOLLOW-ON MAINTENANCE: Install left side panel and close left side of hood (TM 9-2320-270-10).

TASK ENDS HERE

AIR CLEANER HOSES AND AIR RESTRICTION INDICATOR

This task covers:

- a. Removal (page 4-64)
 - b. Cleaning and Inspection (page 4-64)
 - c. Installation (page 4-65)
-

INITIAL SETUP

Tools	Personnel Required
Screwdriver, flat-tip, 1/4-inch	One
Wrench, open-end, 7/16-inch	Equipment Condition
	Left side of hood open (TM 9-2320-270-10).

LOCATION	ITEM	ACTION REMARKS
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REMOVAL

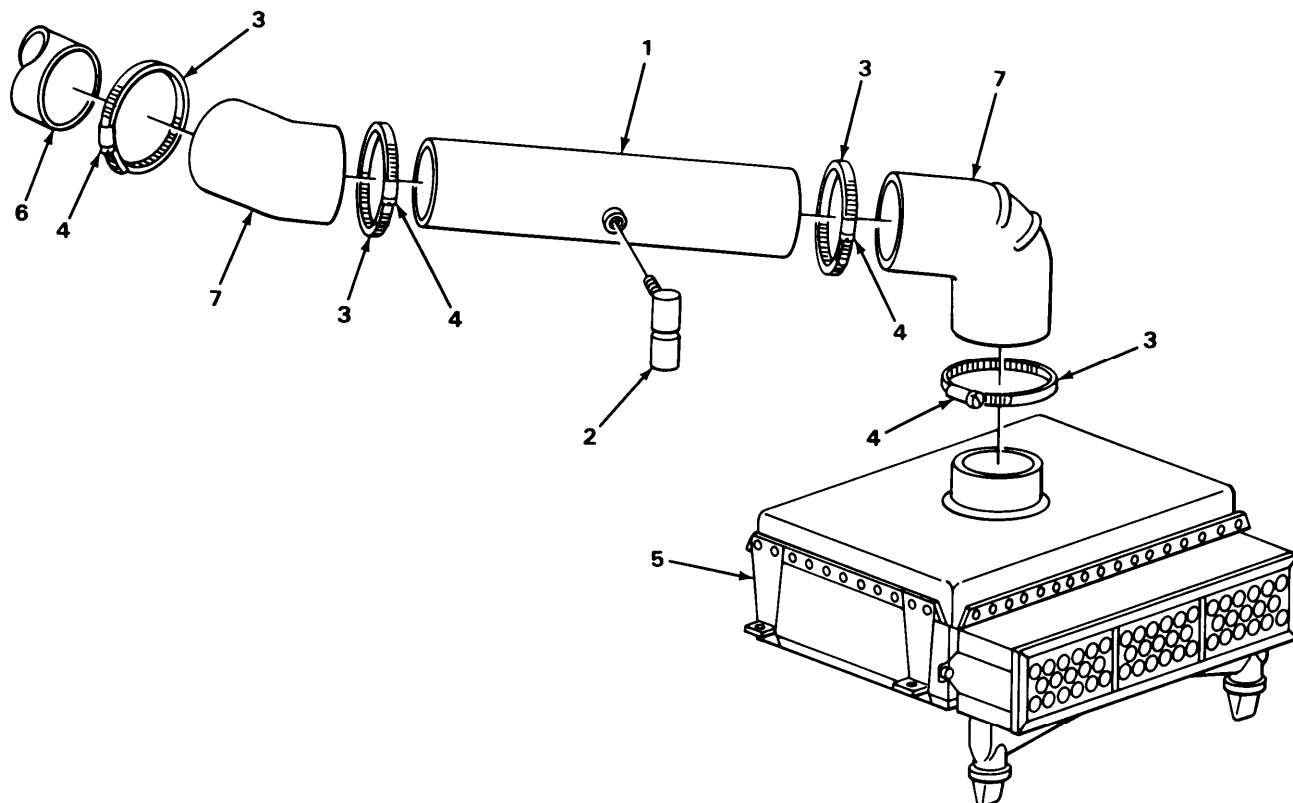
1. Air cleaner pipe (1)	Air restriction indicator (2)	Using wrench, unscrew and take out.
2. Four clamps (3)	Four clamp screws (4)	Using screwdriver, unscrew part way.
3. Air cleaner assembly (5) and air inlet housing (6)	Air cleaner pipe (1), two hoses (7), and four clamps (3)	a. Take off. b. Take apart.

CLEANING AND INSPECTION

4.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
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AIR CLEANER HOSES AND AIR RESTRICTION INDICATOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
5. Air cleaner pipe (1)	Two clamps (3) and two hoses (7)	Put on.	
6. Two hoses (7)	Two clamps (3)	Put on.	
7. Air cleaner assembly (5) and air inlet housing (6)	Air cleaner pipe (1), two hoses (7), and four clamps (3)	Put on.	
8. Four clamps(s)	Four clamp screws (4)	Using screwdriver, tighten.	
9. Air cleaner pipe (1)	Air restriction indicator (2)	Screw in and tighten using 7/16-inch wrench.	



NOTE

FOLLOW-ON MAINTENANCE: Close left side of hood (TM 9-2320-270-10).

TASK ENDS HERE

FUEL TANKS

This task covers:

- a. Right Fuel Tank Removal (page 4-66)
 - b. Left Fuel Tank Removal (page 4-70)
 - c. Cleaning and Inspection (page 4-73)
 - d. Left Fuel Tank Installation (page 4-73)
 - e. Right Fuel Tank Installation (page 4-76)
-

INITIAL SETUP

Tools

- Handle, ratchet, 3/8-inch drive
- Handle, ratchet, 1/2-inch drive
- Screwdriver, cross-tip, no. 2
- Screwdriver, flat-tip
- Socket, 7/16-inch, 3/8-inch drive
- Socket, 15/16-inch, 1/2-inch drive
- Wrench, open-end, 7/16-inch
- Wrench, open-end, 3/4-inch
- Wrench, open-end, 7/8-inch
- Wrench, open-end, 15/16-inch
- Wrench, open-end, 1-inch
- Wrench, pipe, 14-inch

Materials/Parts

Lockwasher

Personnel Required

Two

Equipment Condition

Right and left fuel tanks drained (page 4-32).

LOCATION	ITEM	ACTION	REMARKS
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RIGHT FUEL TANK REMOVAL

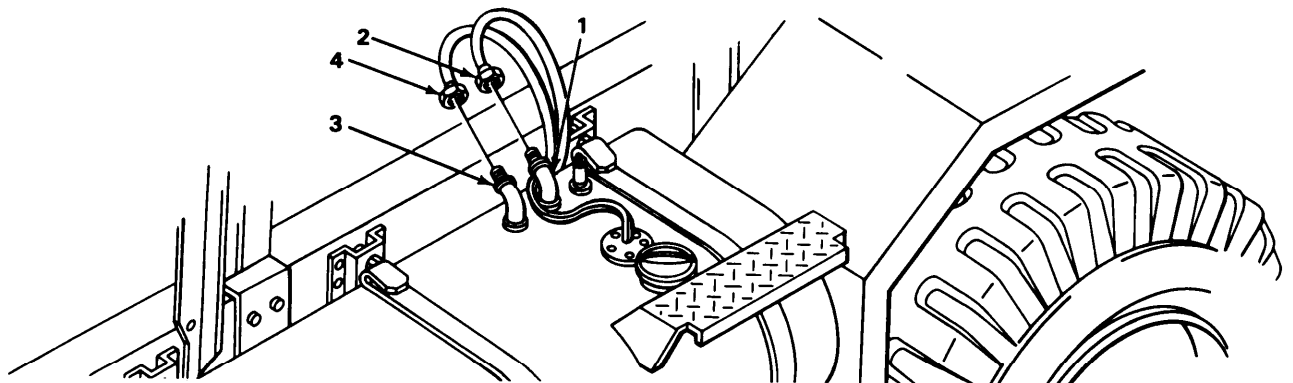
W A R N I N G

No open flames, welding, grinding, smoking, or use of heat producing devices permitted near fuel tank and fuel lines during maintenance unless the fuel tank has been cleaned and purged of all flammable liquids and vapors. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

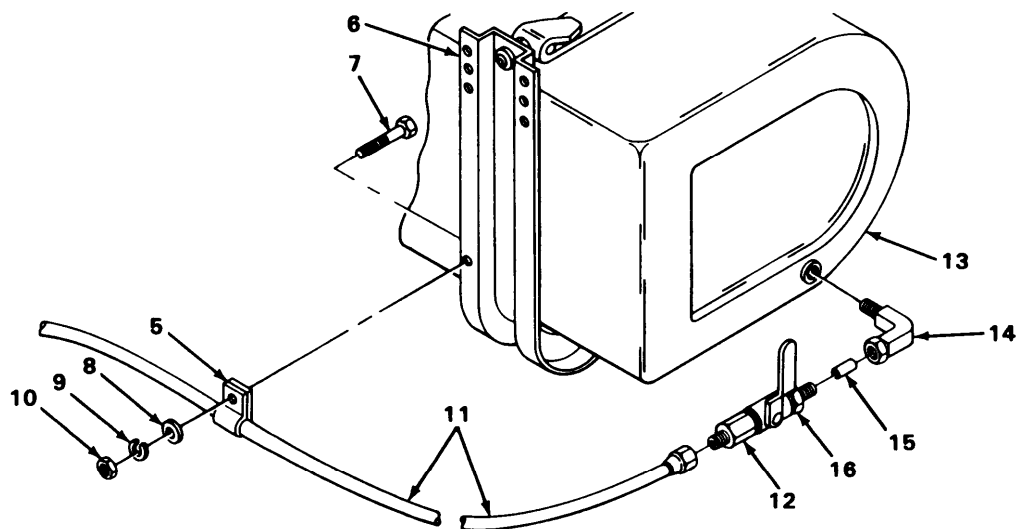
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|--------------|----------------------|--|
| 1. Fuel tank | Fuel sending unit | Remove (page 4-390). |
| 2. Elbow (1) | Fuel supply hose (2) | Using 1-inch wrench, unscrew and take off. |
| 3. Elbow (3) | Fuel return hose (4) | Using 3/4-inch wrench, unscrew and take off. |

FUEL TANKS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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- | | | |
|---|---|---|
| 4. Hose clamp (5) to bracket (6) | Bolt (7), washer (8), lockwasher (9), and nut (10) | a. Using 7/16-inch socket, handle, and 7/16-inch wrench, unscrew and take out.
b. Get rid of lockwasher (9). |
| 5. Bracket (6) and fuel tank to fuel tank hose (11) | Clamp (5) | Using flat-tip screwdriver, spread and take off. |
| 6. Fitting (12) | Fuel tank to fuel tank hose (11) | Using 7/8-inch and 15/16-inch wrenches, unscrew and take off. |
| 7. Right fuel tank (13) | Elbow (14), nipple (15), valve (16), and fitting (12) | Using pipe wrench, unscrew and take out. |



TA239838

FUEL TANKS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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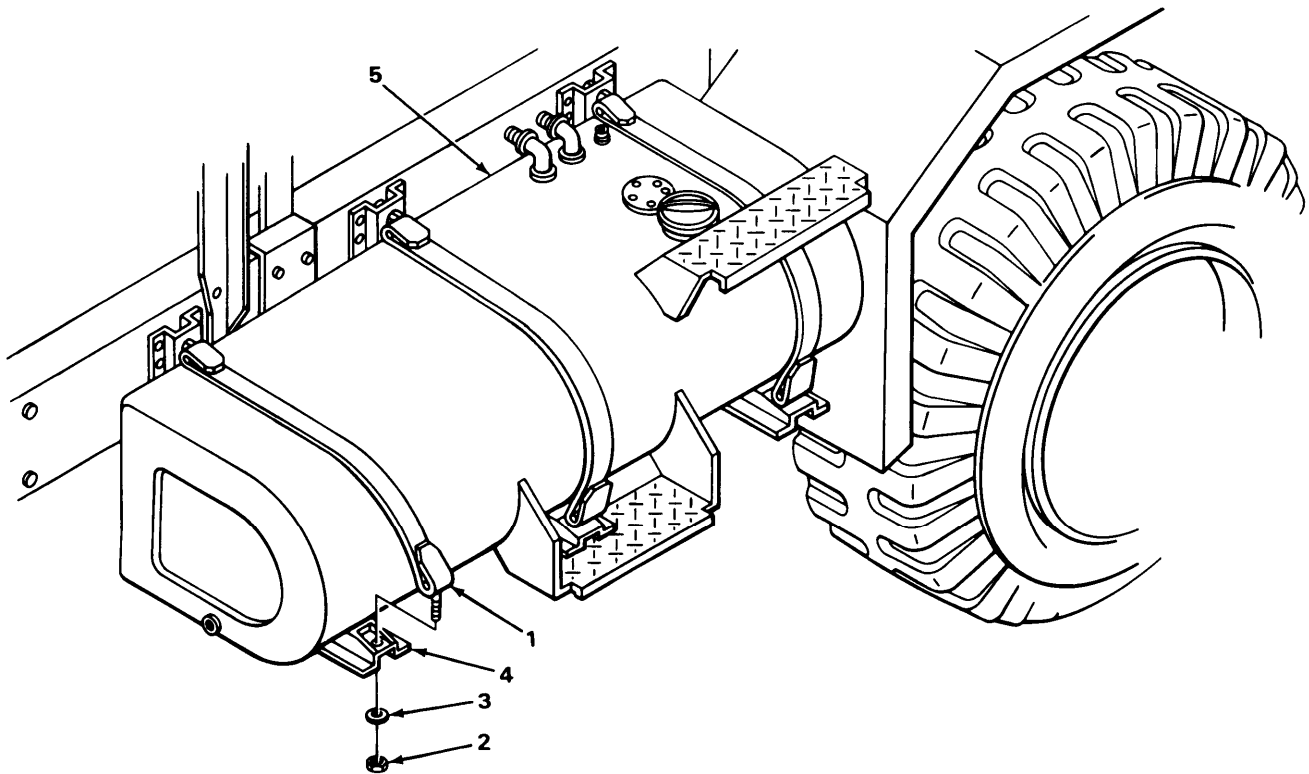
RIGHT FUEL TANK REMOVAL- CONTINUED

- | | | | |
|-----------------------|--------------------------------|--|--|
| 8. Three straps(1) | Three nuts (2) and washers (3) | Using 3/4-inch wrench, unscrew and take off. | |
| 9. Three brackets (4) | Three straps (1) | Take out. | |

WARNING

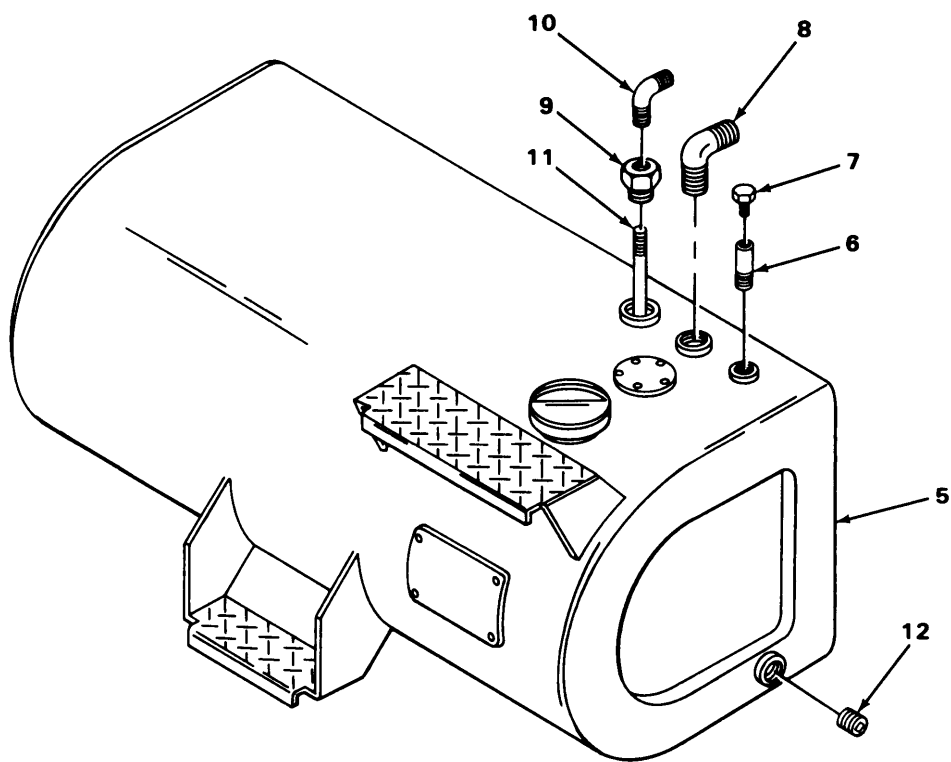
Some parts are heavy. Be careful when handling them. Lifting equipment is needed when parts weigh over 50 pounds (23 kg) for a single person lift, over 100 pounds (45 kg) for a two person lift, and over 150 pounds (68 kg) for a three or more person lift. Do not try to handle heavy parts without lifting equipment. Keep clear of heavy parts supported only by lifting equipment. Failure to observe this precaution could cause serious injury or death of personnel.

- | | | | |
|-----|---------------------|-----------|--|
| 10. | Right fuel tank (5) | Take off. | |
|-----|---------------------|-----------|--|



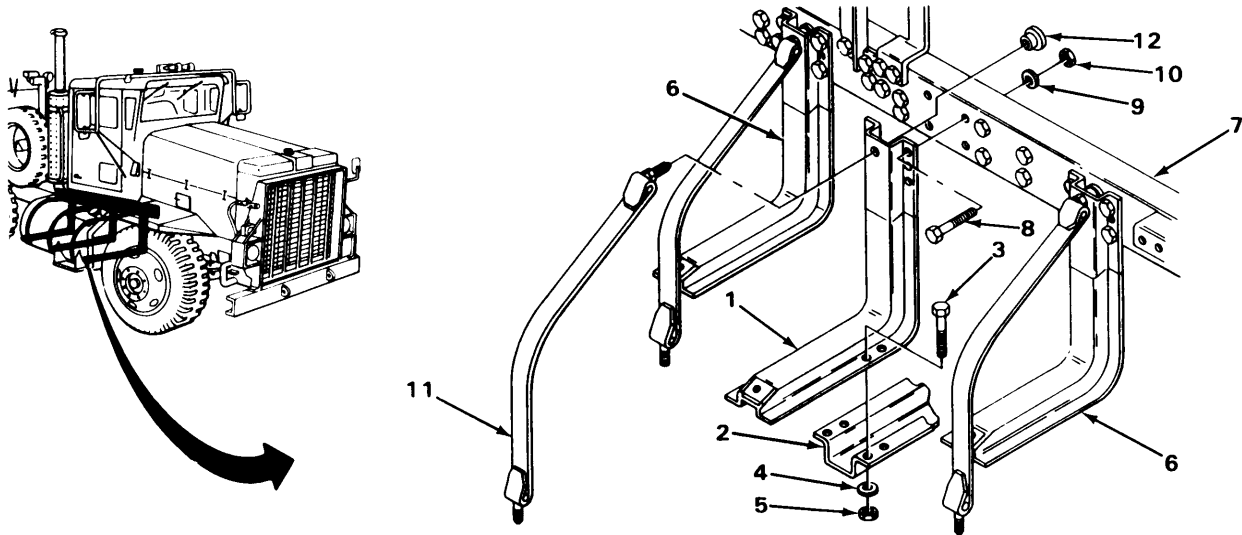
FUEL TANKS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
11. Right fuel tank (5)	Pipe (6) and vent plug (7)	Using pipe wrench, unscrew and take out.
12.	Elbow (8)	Using 3/4-inch wrench, unscrew and take out.
13.	Reducer (9), elbow (10), and tube (11)	Using 7/8-inch wrench, unscrew and take out.
14.	Plug (12)	Using 3/8-inch handle, unscrew and take out.



FUEL TANKS- CONTINUED

LOCATION	ITEM	ACTION REMARKS
RIGHT FUEL TANK REMOVAL – CONTINUED		
15. Bracket (1) to brace (2)	Four bolts (3), eight washers (4), and four nuts (5)	Using 15/16-inch socket, handle with 1/2- inch drive and 15/16-inch wrench, unscrew and take out.
16. Three brackets (1) and (6) to frame (7)	Twelve bolts (8), 24 washers (9), and 12 nuts (10)	Using 15/16-inch socket, handle with 1/2- inch drive and 15/16-inch wrench, unscrew and take out.
17. Frame (7)	Three brackets (1) and (6) and straps (11)	Take off.
18. Three brackets (1) and (6)	Three straps (11) and adjustable nuts (12)	Using 3/4-inch wrench, unscrew and take apart.



LEFT FUEL TANK REMOVAL

WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted near fuel tank and fuel lines during maintenance unless the fuel tank has been cleaned and purged of all flammable liquids and vapors. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

TA239841

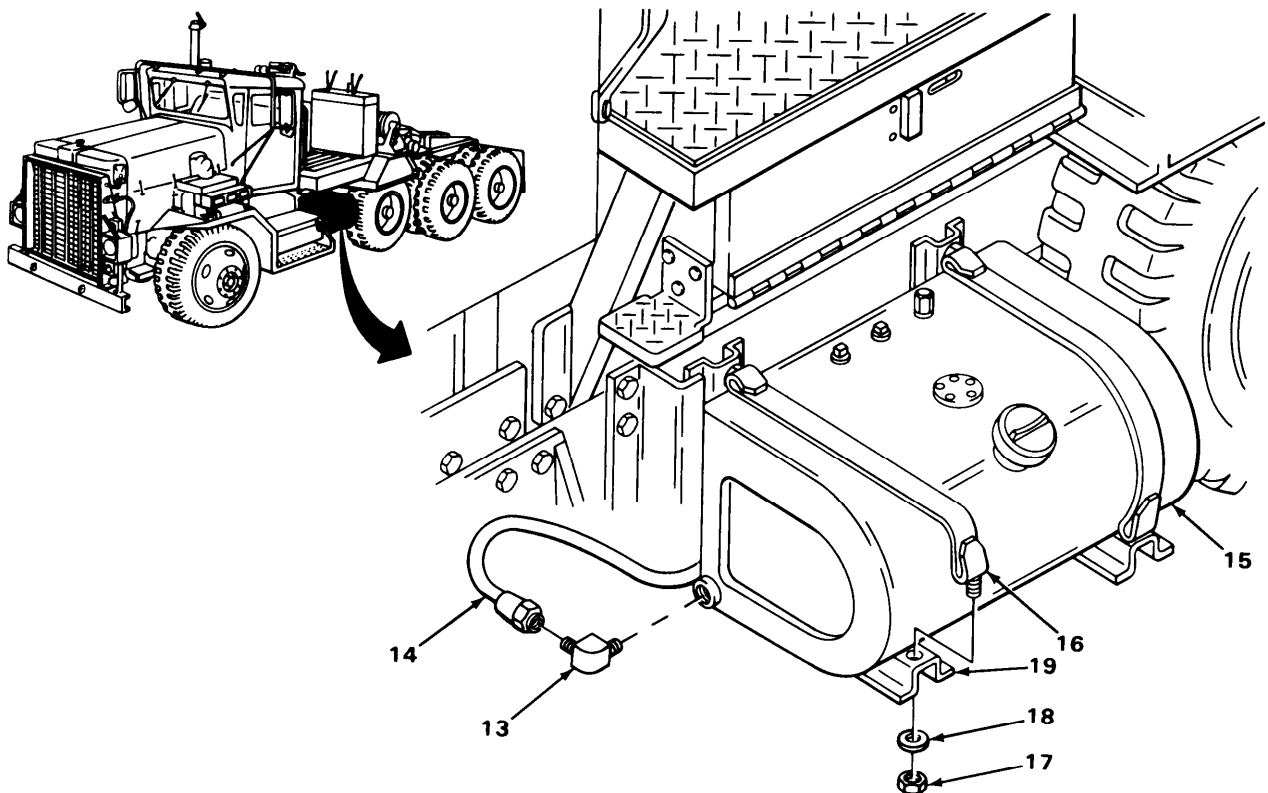
FUEL TANKS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
19. Elbow (13)	Fuel tank to fuel tank hose (14)	Using 15/16-inch wrench, unscrew and take off.	
20. Left fuel tank (15)	Elbow (13)	Using 7/8-inch wrench, unscrew and take out.	
21. Two straps (16)	Two nuts (17) and washers (18)	Using 3/4-inch wrench, unscrew and take off.	
22. Two brackets (19)	Two straps (16)	Take out.	

W A R N I N G

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23. Left fuel tank (15) Take off.



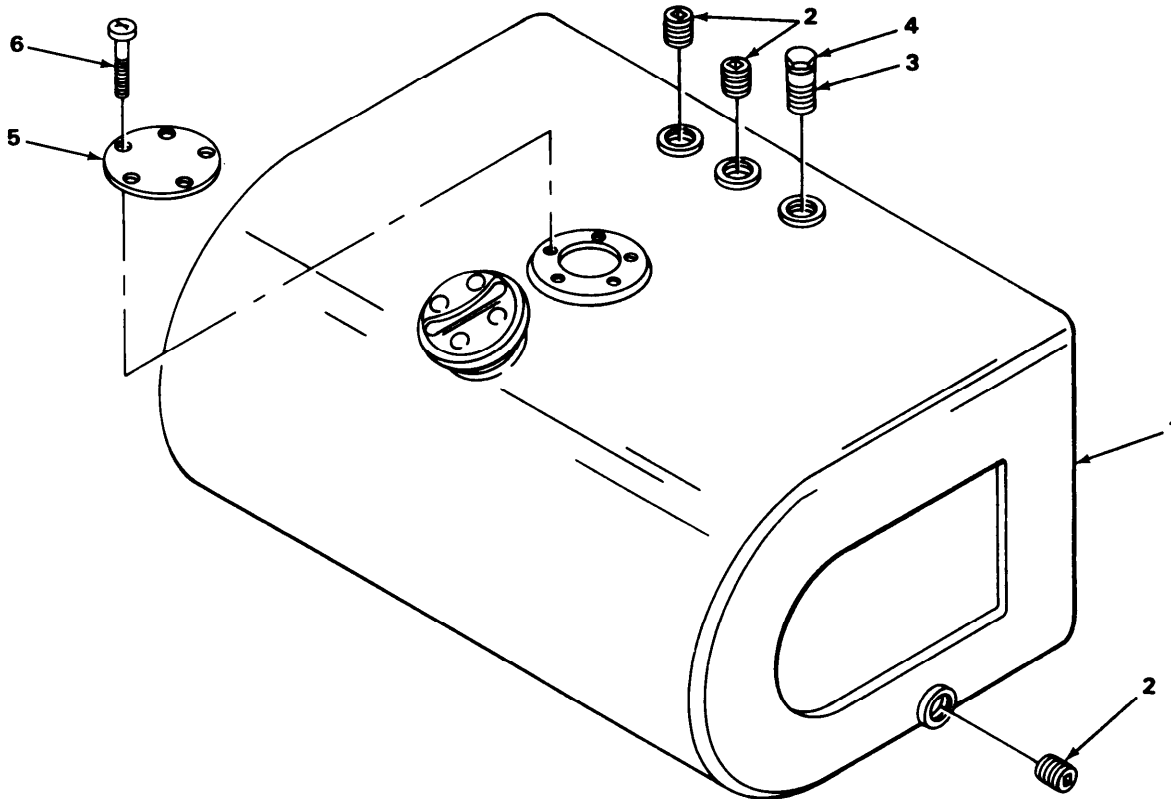
TA239842

FUEL TANKS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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LEFT FUEL TANK REMOVAL - CONTINUED

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|-------------------------------------|----------------------------|--|
| 24. Left fuel tank (1) | Three plugs (2) | Using 3/8-inch handle, unscrew and take out. |
| 25. | Pipe (3) and vent plug (4) | Using pipe wrench, unscrew and take out. |
| 26. Cover (5) to left fuel tank (1) | Five screws (6) | Using cross-tip screwdriver, unscrew and take out. |
| 27. Left fuel tank (1) | Cover (5) | Using flat-tip screwdriver, pry off. |

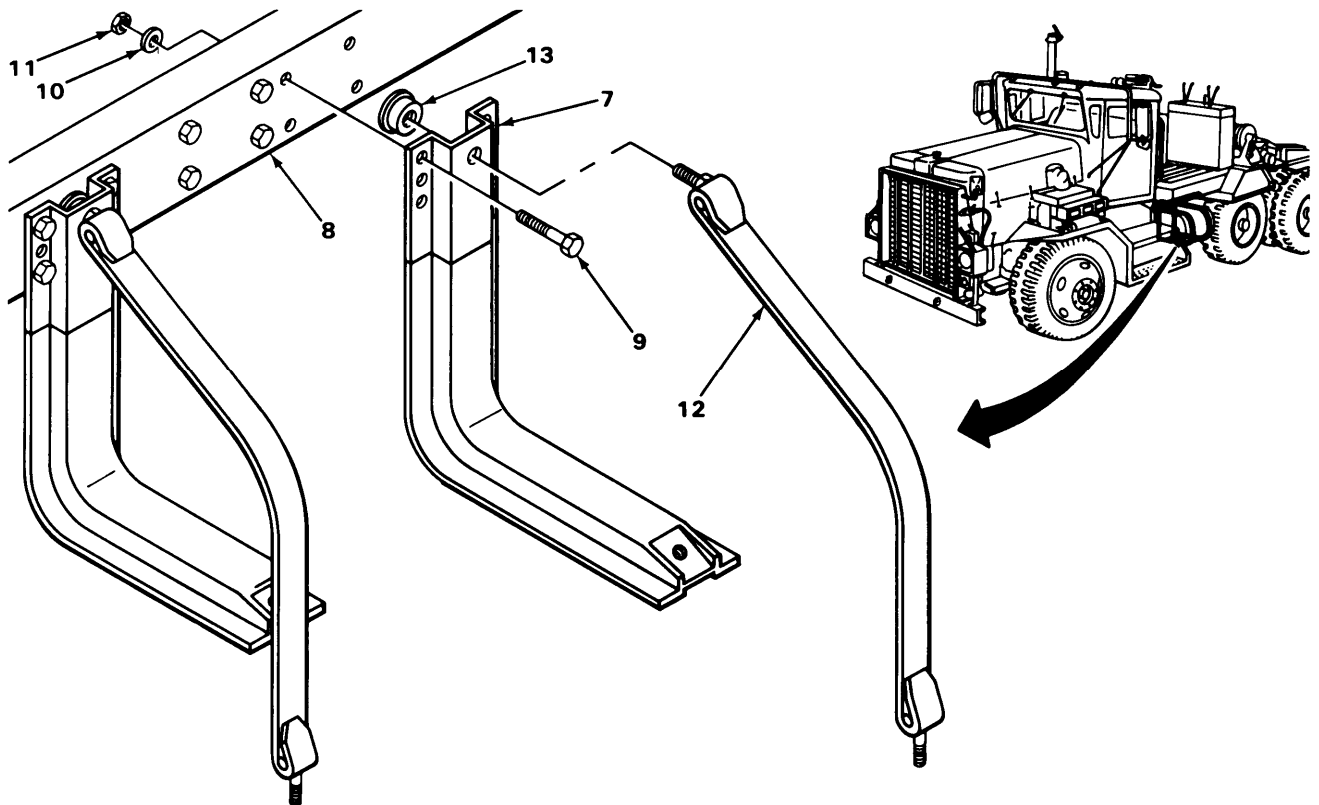


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|-----------------------------------|---|--|
| 28. Two brackets (7) to frame (8) | Eight bolts (9), 16 washers (10), and eight nuts (11) | Using 15/16-inch socket, handle with 1/2-inch drive and 15/18-inch wrench, unscrew and take out. |
| 29. Frame (8) | Two brackets (7) | Take off. |
| 30. Two brackets (7) | Two straps (12) and adjustable nuts (13) | Using 3/4-inch wrench, unscrew and take apart. |

TA239S43

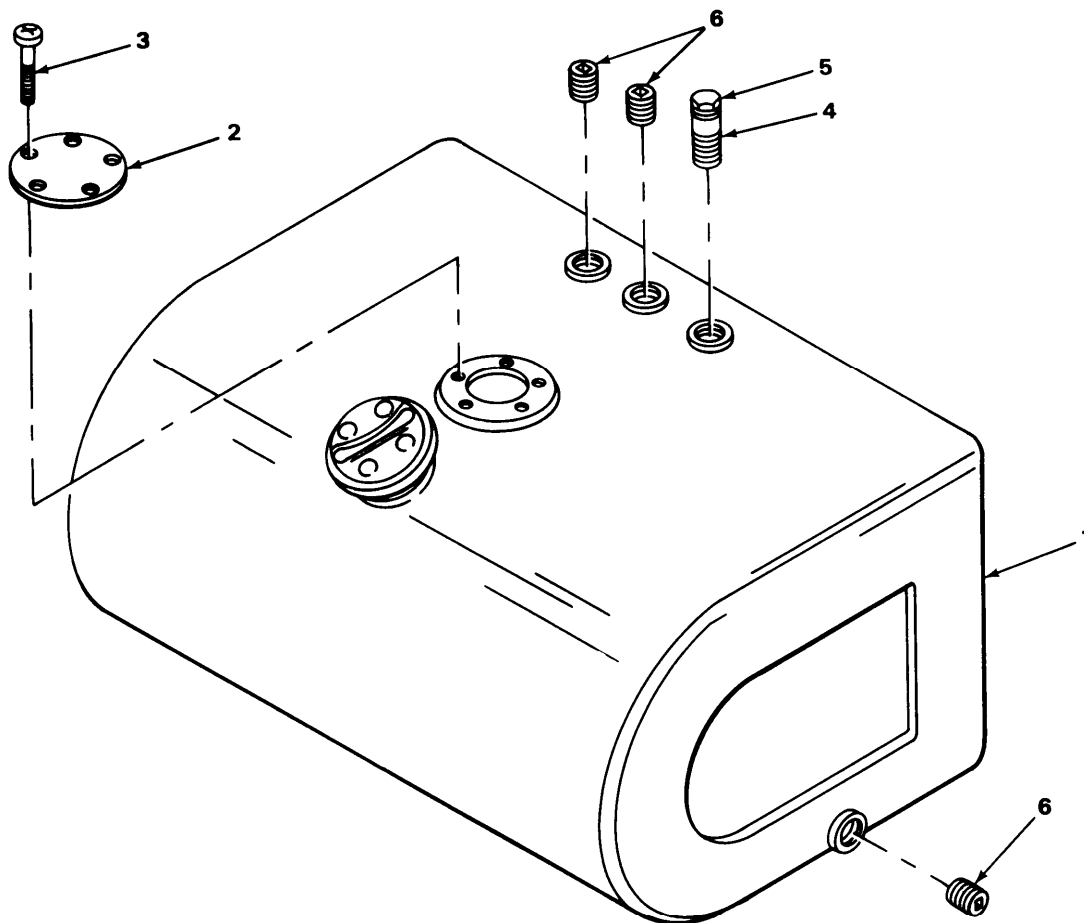
FUEL TANKS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
CLEANING AND INSPECTION		
31	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
LEFT FUEL TANK INSTALLATION		
32. Two brackets (7)	Two straps (12) and adjustable nuts (13)	a. Put ends through. b. Screw on nuts (13) and tighten using 3/4-inch wrench.
33. Frame (8)	Two brackets (7)	Put on frame (8).
34. Two brackets (7) to frame (8)	Eight bolts (9), 16 washers (10), and eight nuts (11)	Screw in and tighten using 15/16-inch socket, handle with 1/2-inch drive and 15/16-inch wrench.



FUEL TANKS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
LEFT FUEL TANK INSTALLATION – CONTINUED			
35. Left fuel tank (1)	Cover (2)	Put on.	
36. Cover (2) to left fuel tank (1)	Five screws (3)	Screw in and tighten using cross-tip screwdriver.	
37. Left fuel tank (1)	Pipe (4) and vent plug (5)	Screw in and tighten using pipe wrench.	
38.	Three plugs (6)	Screw in until flush using 3/8-inch handle.	



TA239845

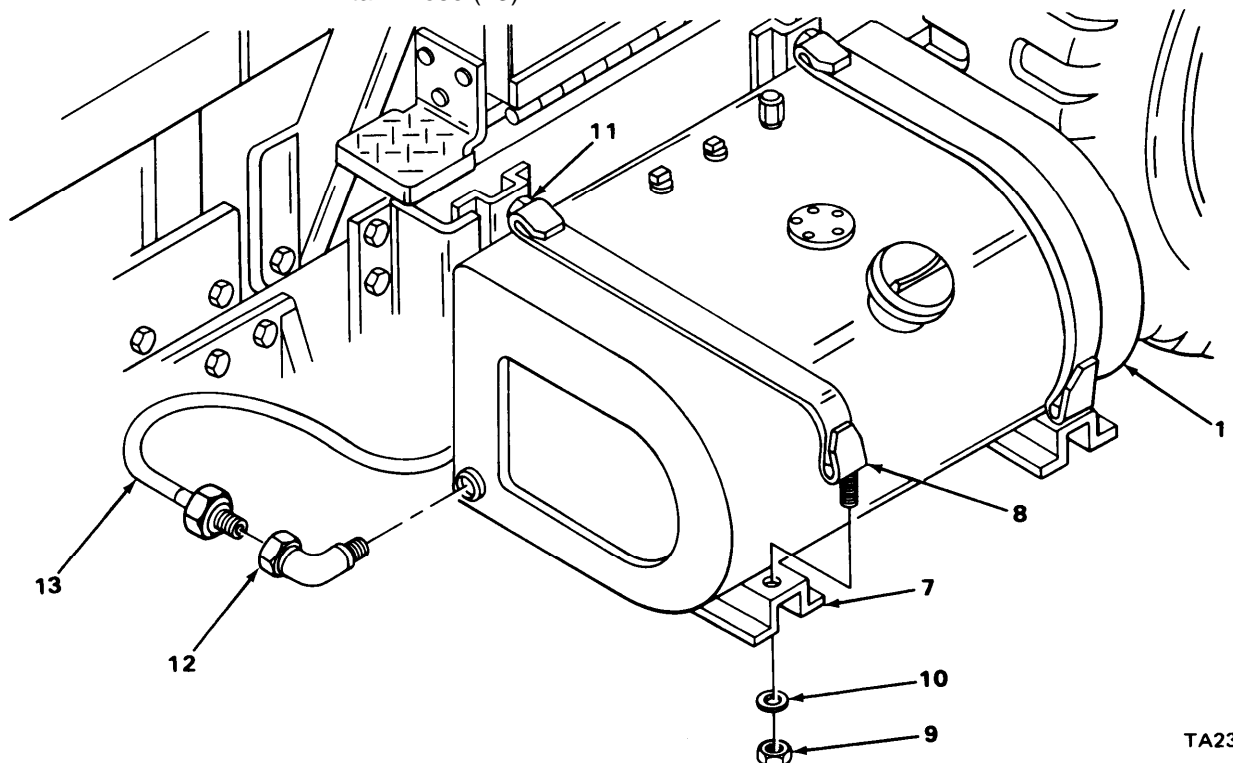
FUEL TANKS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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WARNING

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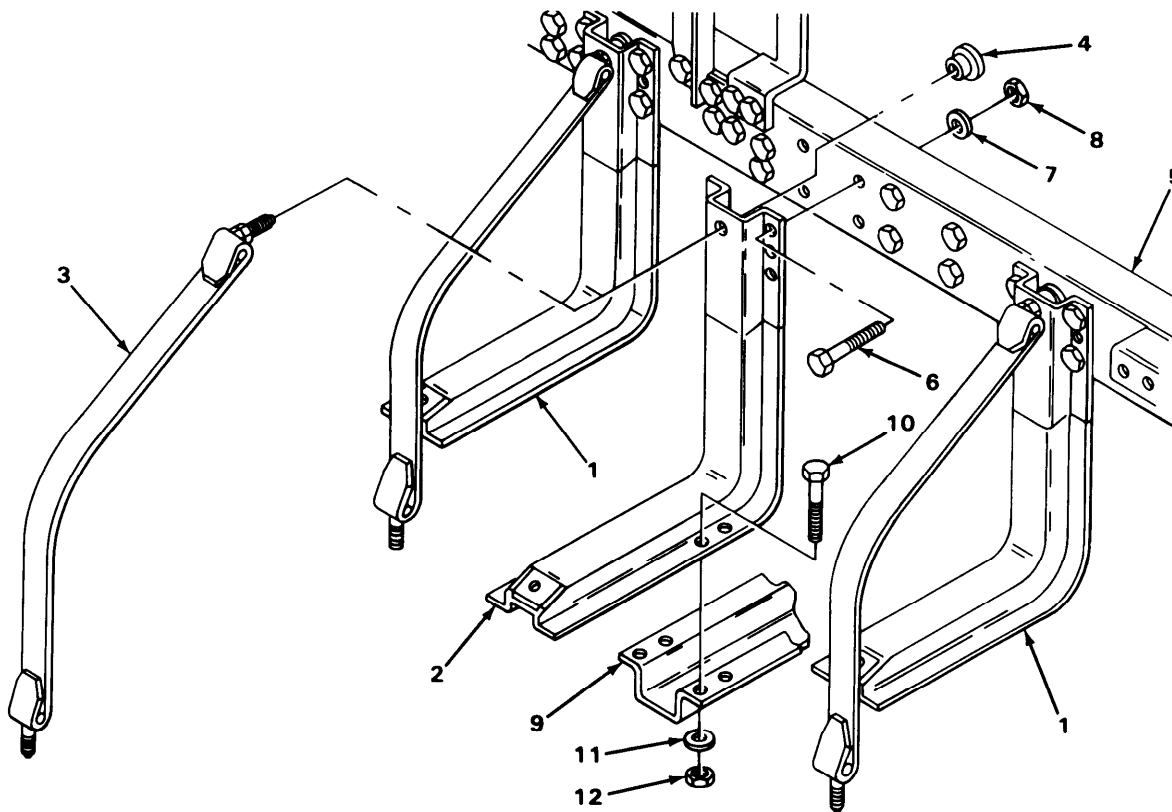
39.	Two brackets (7)	Left fuel tank (1)	Put on.
40.	Two straps (8)		Put in.
41.	Two straps (8)	Two nuts (9) and washers (10)	Screw on and tighten using 3/4-inch wrench.
42.		Two adjustable nuts(n)	Using 3/4-inch wrench, tighten.
43.	Left fuel tank (1)	Elbow (12)	Screw in and tighten using 7/8-inch wrench.
44.	Elbow (12)	Fuel tank to fuel tank hose (13)	Screw on and tighten using 15/16-inch wrench.



TA239846

FUEL TANKS - CONTINUED

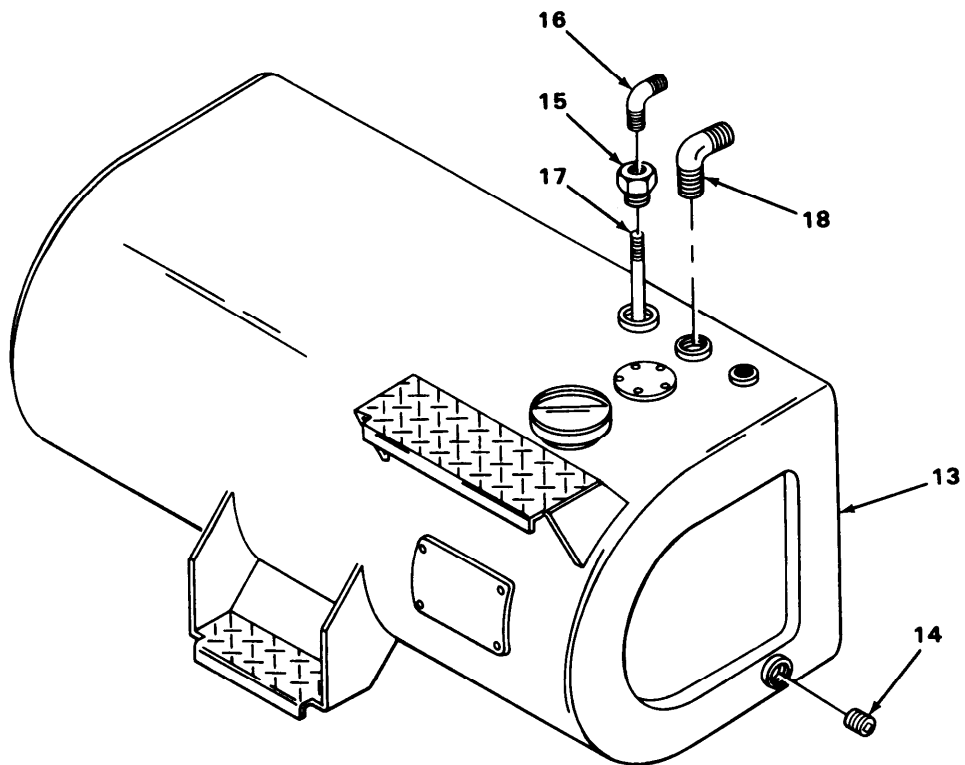
LOCATION	ITEM	ACTION REMARKS
RIGHT FUEL TANK INSTALLATION		
45. Three brackets (1) and (2)	Three straps (3) and adjustable nuts (4)	a. Put ends through. b. Screw on nuts (4) and tighten using 3/4-inch wrench.
46. Frame (5)	Three brackets (1) and (2)	Put on.
47. Three brackets (1) and (2) to frame (5)	Twelve bolts (6), 24 washers (7), and 12 nuts (8)	Screw in and tighten using 15/16-inch socket, handle with 1/2-inch drive and 15/16-inch wrench.
48. Bracket (2) to brace (9)	Four bolts (10), eight washers (11), and four nuts (12)	Screw in and tighten using 15/16-inch socket, handle with 1/2-inch drive and 15/16-inch wrench.



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FUEL TANKS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
49. Right fuel tank (13)	Plug (14)	Screw in until flush using 3/8-inch handle.
50.	Reducer (15), elbow (16), and tube (17)	Screw in and tighten using 7/8-inch wrench.
51.	Elbow (18)	Screw in and tighten using 3/4-inch wrench.



FUEL TANKS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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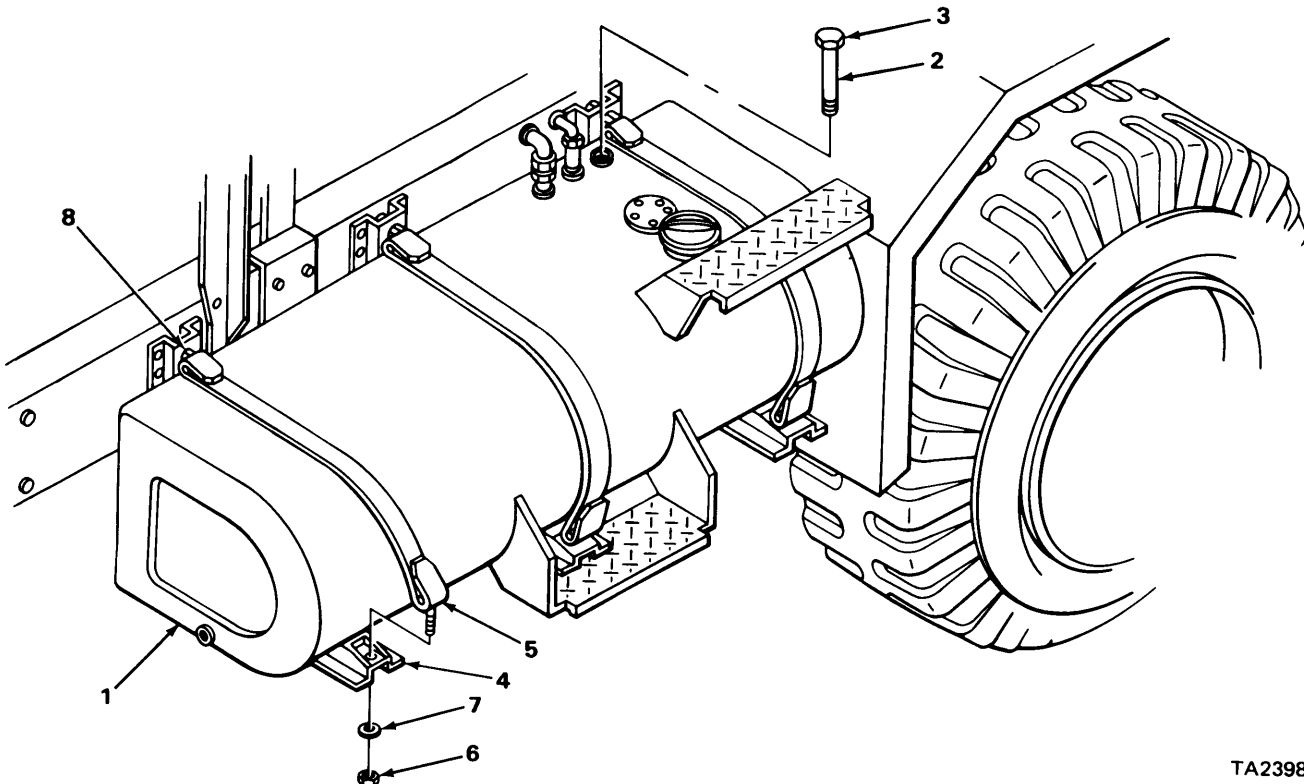
RIGHT FUEL TANK INSTALLATION – CONTINUED

52. Right fuel tank (1)	Pipe (2) and vent plug (3)	Screw in and tighten using pipe wrench.	
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WARNING

Some parts are heavy. Be careful when handling them. Lifting equipment is needed when parts weigh over 50 pounds (23 kg) for a single person lift, over 100 pounds (45 kg) for a two person lift, and over 150 pounds (68 kg) for a three or more person lift. Do not try to handle heavy parts without lifting equipment. Keep clear of heavy parts supported only by lifting equipment. Failure to observe this precaution could cause serious injury or death of personnel.

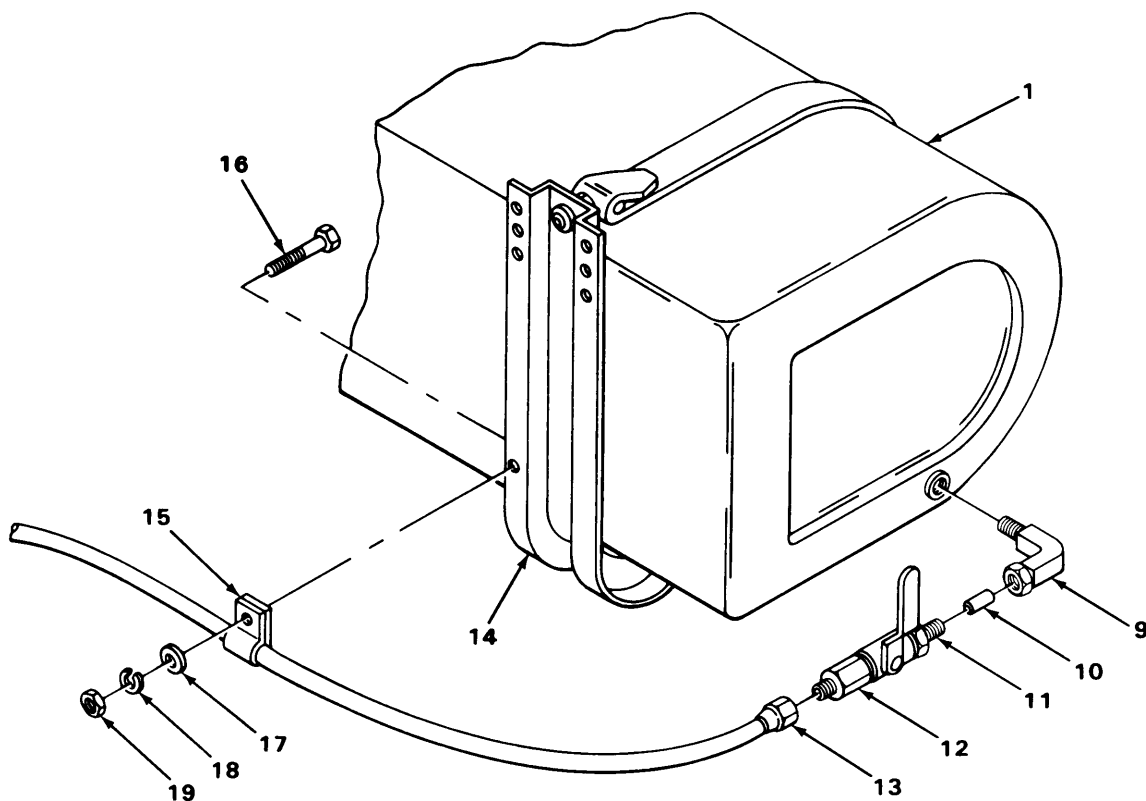
53. Three brackets (4)	Right fuel tank (1)	Put on.	
54.	Three straps (5)	Put in.	
55. Three straps (5)	Three nuts (6) and washers (7)	Screw on and tighten using 3/4-inch wrench.	
56.	Three adjustable nuts (8)	Using 3/4-inch wrench, tighten.	



TA239849

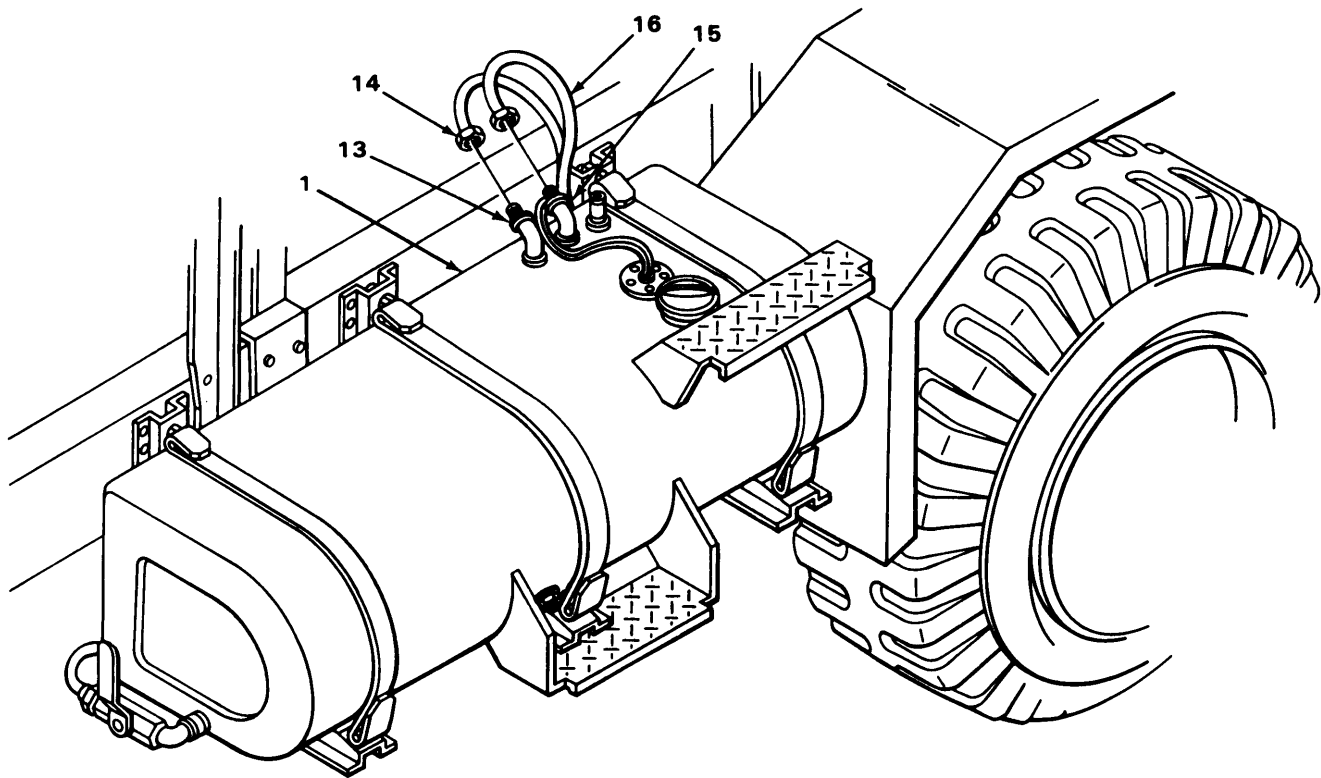
FUEL TANKS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
57. Right fuel tank (1)	Elbow (9), nipple (10), valve (11), and fitting (12)	Screw in and tighten using pipe wrench.
58. Fitting (12)	Fuel tank to fuel tank hose (13)	Screw on and tighten using 7/8-inch and 15/16-inch wrenches.
59. Bracket (14) and fuel tank to fuel tank hose (13)	Clamp (15)	Put on.
60. Clamp (15) to bracket (14)	Bolt (16), washer (17), new lockwasher (18), and nut (19)	Screw in and tighten using 7/16-inch socket, handle, and 7/16-inch wrench.



FUEL TANKS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
RIGHT FUEL TANK INSTALLATION - CONTINUED			
61. Elbow (13)	Fuel return hose (14)	Screw on and tighten using 3/4-inch wrench.	
62. Elbow (15)	Fuel supply hose (16)	Screw on and tighten using 1-inch wrench.	
63. Right fuel tank	Fuel sending unit	Install (page 4-390).	



NOTE

FOLLOW-ON MAINTENANCE:

1. Fill fuel tanks (TM 9-2320-270-10).
2. Purge fuel system (page 4-32).
3. Check for leaks (page 4-1).

TASK ENDS HERE

TA239851

FUEL TANK TO FUEL TANK LINE AND FITTINGS

This task covers:

- | | |
|--|---|
| <ul style="list-style-type: none"> a. Removal (page 4-82) b. Cleaning and Inspection (page 4-84) | <ul style="list-style-type: none"> c. Installation (page 4-84) |
|--|---|
-

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch drive
 Screwdriver, flat-tip, 1/4-inch
 Socket, 7/16-inch, 3/8-inch drive
 Socket, 9/16-inch, 3/8-inch drive
 Vise, machinist's
 Wrench, open-end, 7/16-inch
 Wrench, open-end, 9/16-inch
 Wrench, open-end, 7/8-inch
 Wrench, open-end, 15/16-inch
 Wrench, pipe, 14-inch

Materials/Parts

Lockwasher, bracket to support
 Lockwasher, clamp to bracket or brace (five required)

Personnel Required

One

Equipment Condition

Left and right fuel tanks drained (page 4-32).

FUEL TANK TO FUEL TANK LINE AND FITTINGS

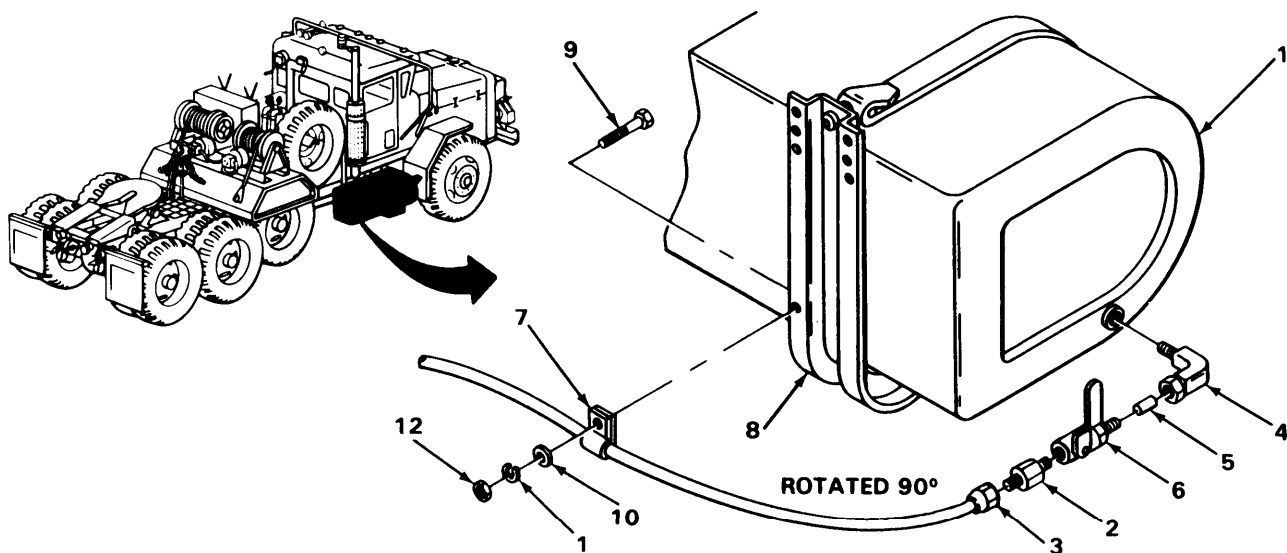
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted nearby when using fuel. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

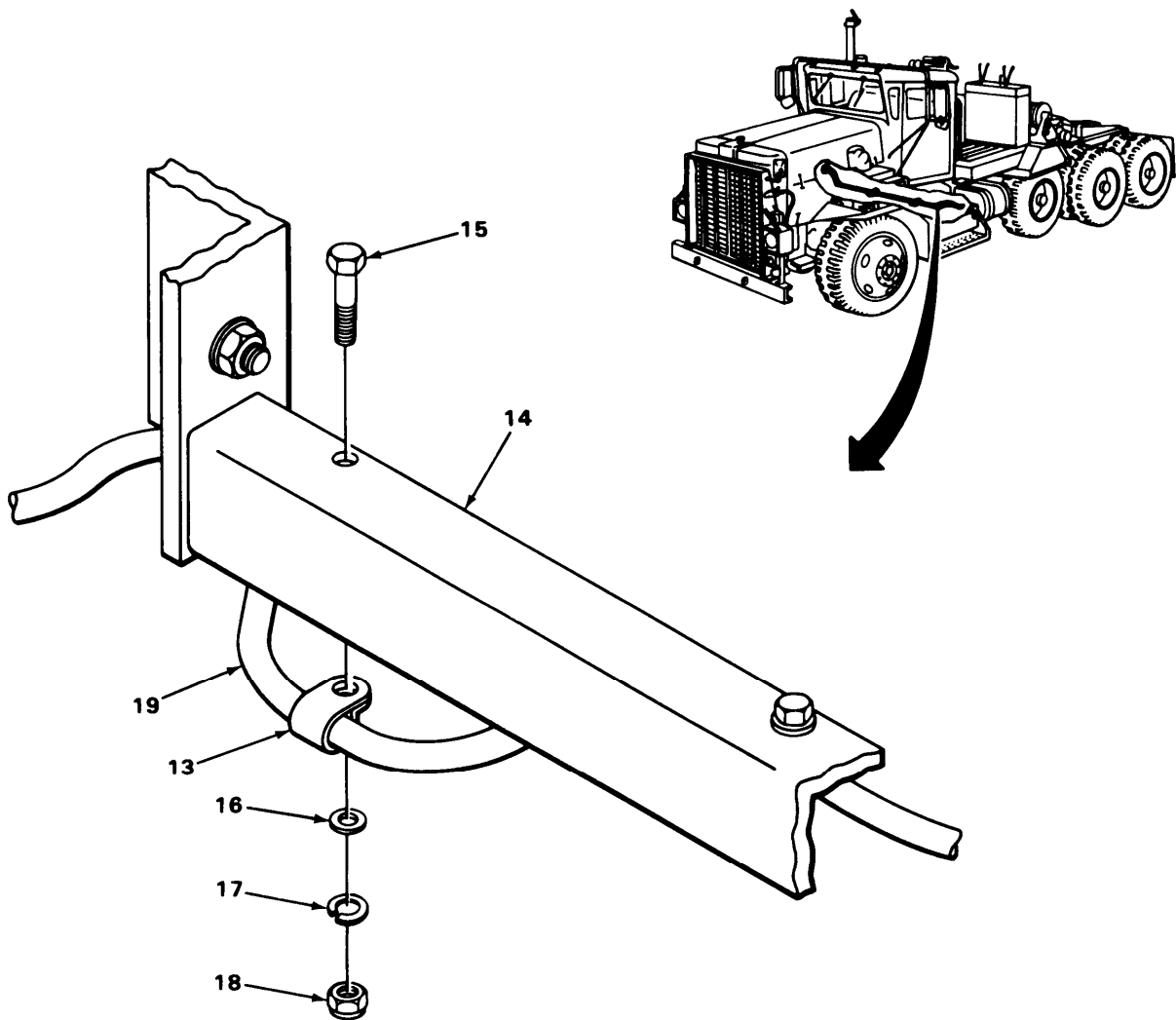
- | | | |
|--|--|---|
| 1. Right fuel tank (1) and fitting (2) | Fuel tank to fuel tank hose (3) | Using 7/8-inch and 15/16-inch wrenches, unscrew and take off. |
| 2. Right fuel tank (1) | Elbow (4), nipple (5), valve (6), and fitting (2) | a. Using pipe wrench, unscrew and take out.
b. Put in vise.
c. Using pipe wrench and 7/8-inch wrench, unscrew and take apart. |
| 3. Clamp (7) to bracket (8) | Bolt (9), washer (10), lockwasher (11), and nut (12) | a. Using 7/16-inch socket, handle and 7/16-inch wrench, unscrew and take out.
b. Get rid of lockwasher (11). |
| 4. Bracket (8) and hose (3) | Clamp (7) | Using screwdriver, spread and take off. |



TA239852

FUEL TANK TO FUEL TANK LINE AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
5. Three clamps (13) to brace (14)	Three bolts (15), washers (16), lock- washers (17) and nuts (18)	a. Using 7/16-inch socket, handle and 7/16-inch wrench, unscrew and take out. b. Get rid of lockwashers (17).
6. Brace (14) and hose (19)	Three clamps (13)	Take off.

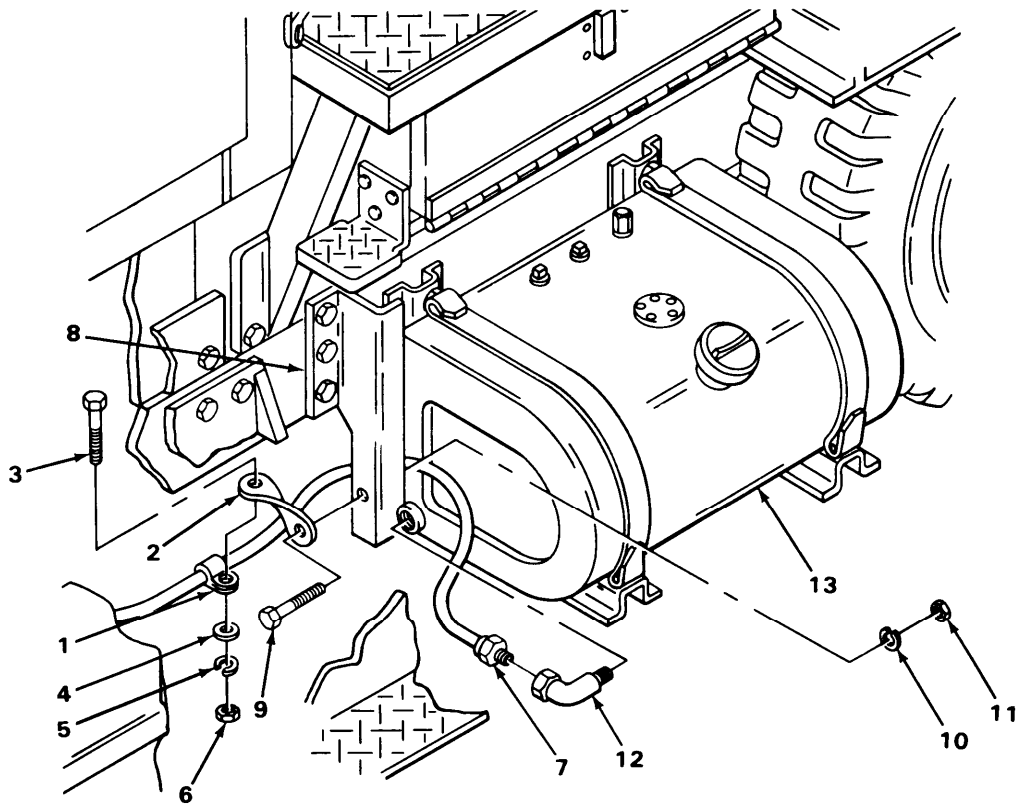


FUEL TANK TO FUEL TANK LINE AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL – CONTINUED		
7. Clamp (1) to bracket (2)	Bolt (3), washer (4), lockwasher (5), and nut (6)	a. Using 7/16-inch socket, handle, and 7/16-inch wrench, unscrew and take out. b. Get rid of lockwasher (5).
8. Bracket (2) and hose (7)	Clamp (1)	Using screwdriver, spread clamp (1) and take off.
9. Bracket (2) to support (8)	Bolt (9), lockwasher (10), and nut (11)	a. Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take out. b. Get rid of lockwasher (10).
10. Support (8)	Bracket (2)	Take off.
11. Elbow (12)	Hose (7)	Using 15/16-inch wrench, unscrew and take off.
12. Left fuel tank (13)	Elbow (12)	Using 7/8-inch wrench, unscrew and take out.
CLEANING AND INSPECTION		
13.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
INSTALLATION		
14. Left fuel tank (13)	Elbow (12)	Screw in and tighten using 7/8-inch wrench.
15. Elbow (12)	Hose (7)	Screw in and tighten using 15/16-inch wrench.
16. Support (8)	Bracket (2)	Put on.
17. Bracket (2) to support (8)	Bolt (9), new lockwasher (10), and nut (11)	Screw in and tighten, using 9/16-inch socket, handle, and 9/16-inch wrench.

FUEL TANK TO FUEL TANK LINE AND FITTINGS - CONTINUED

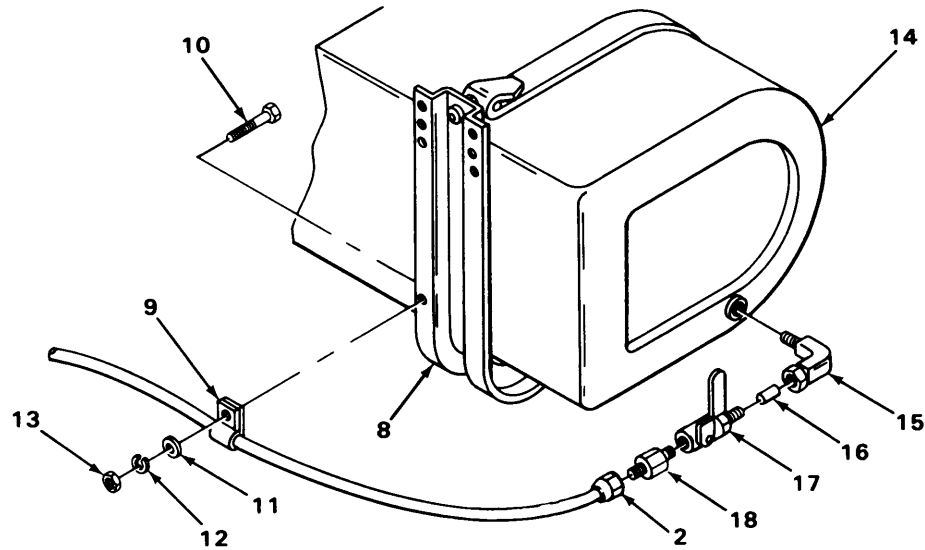
LOCATION	ITEM	ACTION REMARKS
18. Bracket (2) and hose (7)	Clamp (1)	Put on.
19. Clamp (1) to bracket (2)	Bolt (3), washer (4), new lock- washer (5), and nut (6)	Screw in and tighten, using 7/16-inch socket, handle, and 7/16-inch wrench.



FUEL TANK TO FUEL TANK LINE AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION – CONTINUED		
20. Brace (1) and hose (2)	Three clamps (3)	Put on.
21. Three clamps (3) to brace (1)	Three bolts (4), washers (5), new lockwashers (6), and nuts (7)	Screw in and tighten, using 7/16-inch socket, handle, and 7/16-inch wrench.
22. Bracket (8) and hose (2)	Clamp (9)	Put on.
23. Clamp (9) to bracket (8)	Bolt (10), washer (11), new lock-washer (12), and nut (13)	Screw in and tighten, using 7/16-inch socket, handle, and 7/16-inch wrench.
24. Right fuel tank (14)	Elbow (15), nipple (16), valve (17), and fitting (18)	a. Screw together and tighten using 7/8-inch wrench and pipe wrench and vise. b. Screw in using pipe wrench.
25. Fitting (18)	Hose (2)	Screw on and tighten, using 7/8-inch and 15/16-inch wrenches.

FUEL TANK TO FUEL TANK LINE AND FITTINGS - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Fill fuel tank (TM 9-2320-270-10).
2. Purge fuel system (page 4-32).
3. Check for leaks (page 4-1).

TASK ENDS HERE

RIGHT FUEL TANK TO FUEL STRAINER LINE AND FITTINGS

This task covers:

- | | |
|--|---|
| <ol style="list-style-type: none"> a. Removal (page 4-94) b. Cleaning and Inspection (page 4-94) | <ol style="list-style-type: none"> c. Installation (page 4-95) |
|--|---|
-

INITIAL SETUP

Tools

- Pliers, diagonal cutting
- Pliers, slip-joint, straight-nose
- Wrench, open-end, 3/4-inch
- Wrench, open-end, 1-inch

Materials/Parts

- Wrap, tie (item 24, appendix C)

Personnel Required

One

RIGHT FUEL TANK TO FUEL STRAINER LINE AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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REMOVAL

WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted nearby when using fuel. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

1. Right fuel tank (1) elbow (2)	Hose (3)	Using 1-inch wrench, unscrew and take off.
2. Right fuel tank (1)	Elbow (2)	Using 3/4-inch wrench, unscrew and take out.
3. Fuel strainer (4) and elbow (5)	Hose (3)	Using 1-inch wrench, unscrew and take off.
4. Fuel strainer (4)	Elbow (5)	Using 3/4-inch wrench, unscrew and take out.
5. Hose (3)	Three tie wraps (6)	a. Using diagonal cutting pliers, cut off. b. Get rid of.
6. Vehicle	Hose (3)	Take off.

CLEANING AND INSPECTION

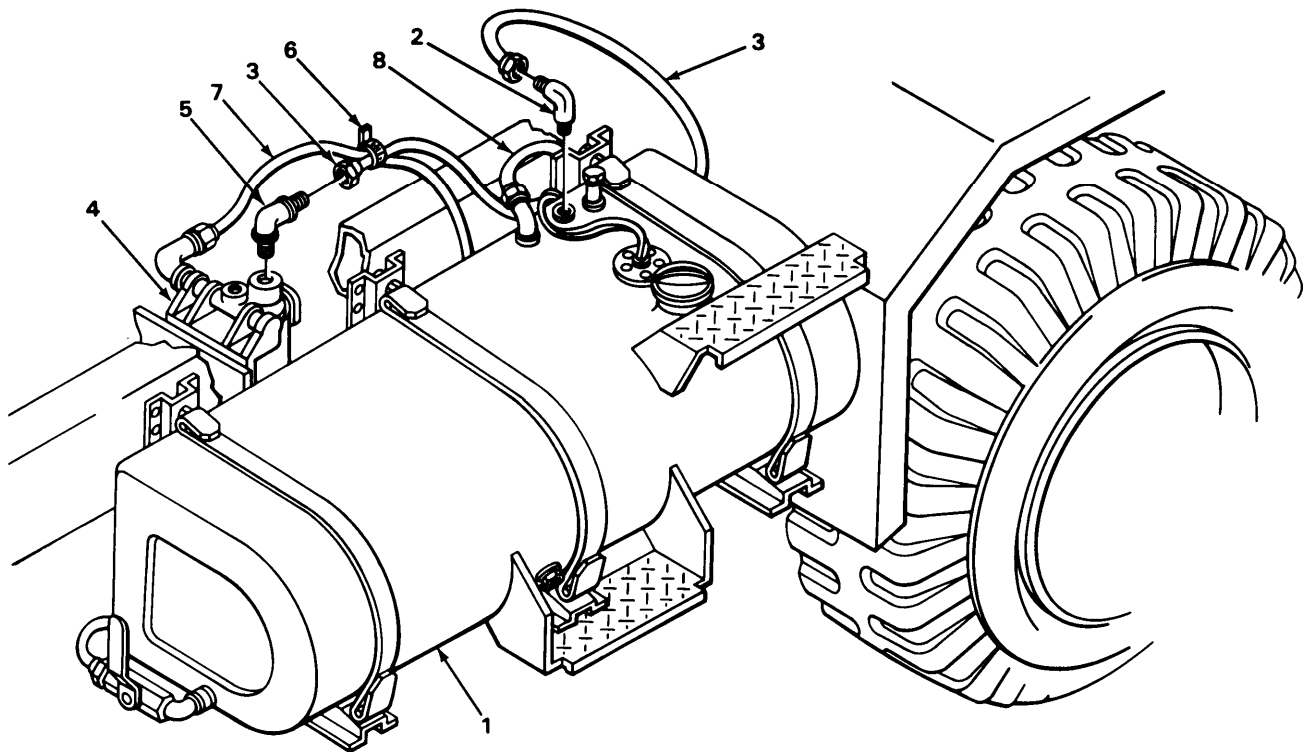
7.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
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INSTALLATION

8. Vehicle	Hose (3)	Put under right side of vehicle.
9. Hoses (3,7, and 8)	Three new tie wraps (6)	Using slip-joint pliers, put on.
10. Fuel strainer (4)	Elbow (5)	Screw in and tighten using 3/4-inch wrench.
11. Elbow (5)	Hose (3)	Screw on and tighten, using 1-inch wrench.

RIGHT FUEL TANK TO FUEL STRAINER LINE AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
12. Right fuel tank (1)	Elbow (2)	Screw in and tighten using 3/4-inch wrench.
13. Elbow (2)	Hose (3)	Screw on and tighten using 1-inch wrench.



TASK ENDS HERE

FUEL STRAINER TO FUEL PUMP LINES AND FITTINGS

This task covers:

- a. Removal (page 4-90)
 - b. Cleaning and Inspection (page 4-94)
 - c. Installation (page 4-94)
-

INITIAL SETUP

Tools

- Handle, ratchet, 3/8-inch drive
- Pliers, diagonal cutting
- Pliers, slip-joint, straight-nose
- Screwdriver, flat-tip, 1/4-inch
- Socket, 7/16-inch, 3/8-inch drive
- Socket, 1/2-inch, 3/8-inch drive
- Wrench, open-end, 7/16-inch
- Wrench, open-end, 1 1/16-inch
- Wrench, open-end, 15/16-inch
- Wrench, open-end, 1-inch

Materials/Parts

- Lockwasher, clamp to bracket
- Lockwasher, clamp to oil cooler
- Wrap, tie (item 24, appendix C)

Personnel Required

One

Equipment Condition

- Right side of hood open and right side panel removed (TM 9-2320-270-1 0).
 - Right side radiator guard removed (page 4-151).
-

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

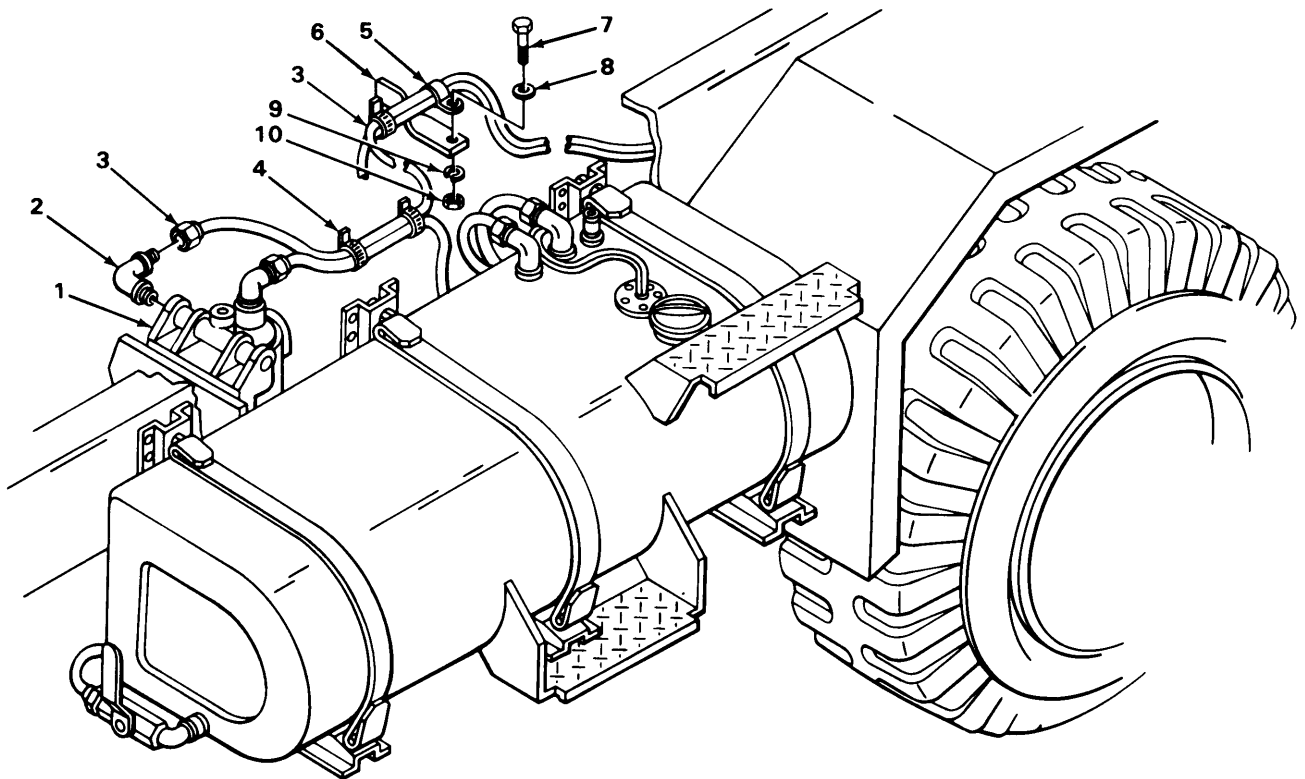
WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted nearby when using fuel. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

- | | | |
|-----------------------------------|----------|--|
| 1. Fuel strainer (1)
elbow (2) | Hose (3) | Using 1-inch wrench, unscrew and take off. |
|-----------------------------------|----------|--|

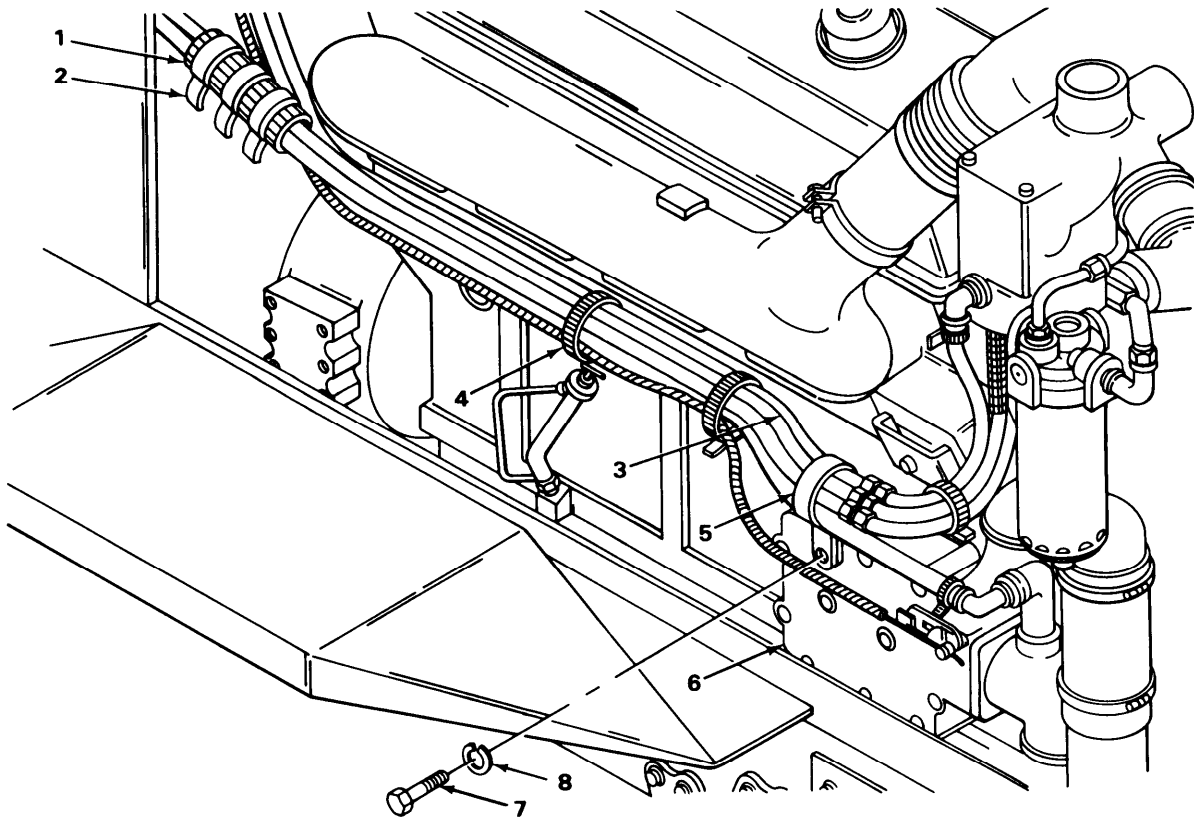
FUEL STRAINER TO FUEL PUMP LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
2. Fuel strainer (1)	Elbow (2)	Using 1 1/16-inch wrench, unscrew and take out.
3. Hose (3)	Three tie wraps (4)	a. Using diagonal cutting pliers, cut off. b. Get rid of.
4. Clamp (5) to bracket (6)	Bolt (7), washer (8), lockwasher (9), and nut (10)	a. Using 7/16-inch socket, handle, and 7/16-inch wrench, unscrew and take out. b. Get rid of lockwasher (9).
5. Bracket (6) and hose (3)	Clamp (5)	Using screwdriver, spread clamp (5) and take off.



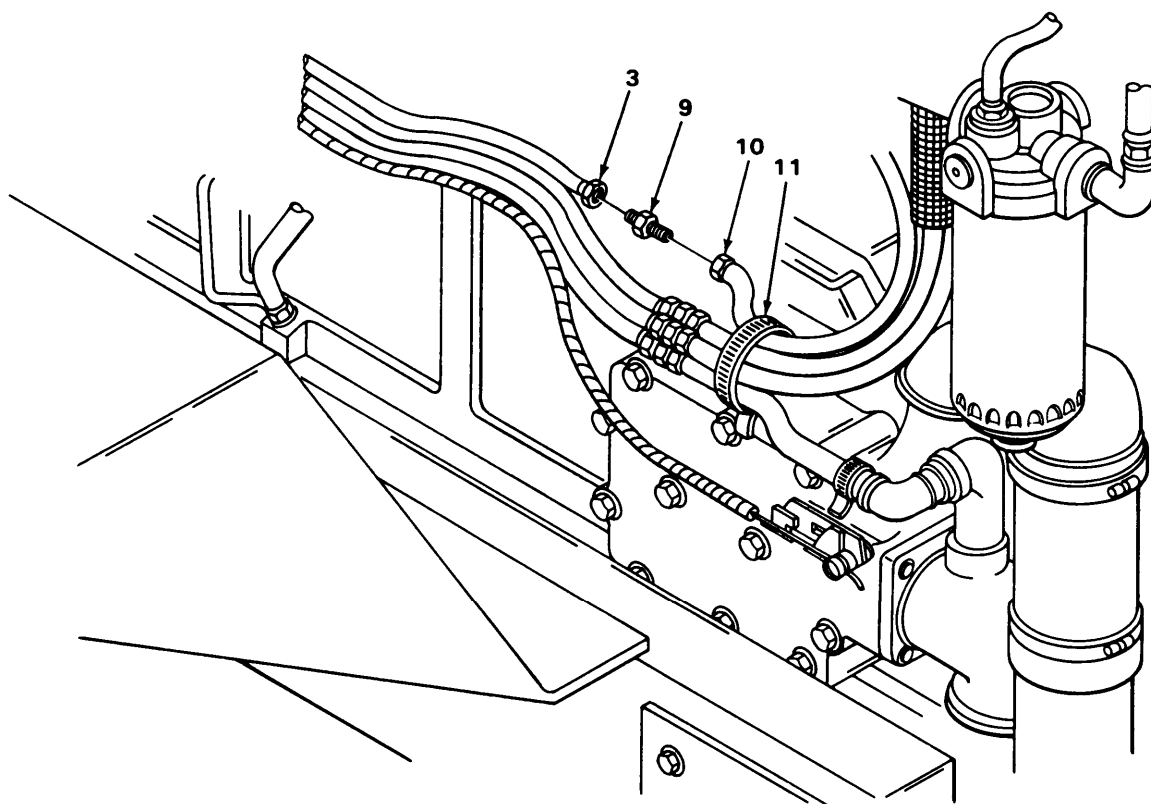
FUEL STRAINER TO FUEL PUMP LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL – CONTINUED		
6. Rubber shield (1)	Three tie wraps (2)	a. Using diagonal cutting pliers, cut off. b. Get rid of.
7. Hose (3)	Rubber shield (1)	Take off.
8.	Two tie wraps (4)	a. Using diagonal cutting pliers, cut off. b. Get rid of.
9. Clamp (5) to oil cooler (6)	Screw (7) and lockwasher (8)	a. Using 1/2-inch socket and handle, unscrew and take out. b. Get rid of lockwasher (8).
10. Oil cooler (6) and hose (3)	Clamp (5)	Using screwdriver, spread clamp (5) and take off.



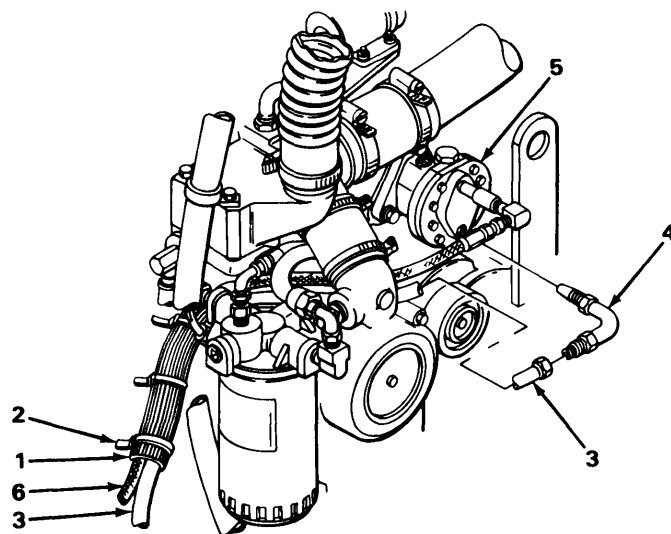
FUEL STRAINER TO FUEL PUMP LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
11. Adapter (9)	Hose (3)	Using 15/16-inch and 1-inch wrenches, unscrew and take off.
12. Hose (10)	Adapter (9)	Using 15/16-inch and 1-inch wrenches, unscrew and take off.
13.	Tie wrap (11)	a. Using diagonal cutting pliers, cut off. b. Get rid of.



FUEL STRAINER TO FUEL PUMP LINES AND FITTINGS - CONTINUED

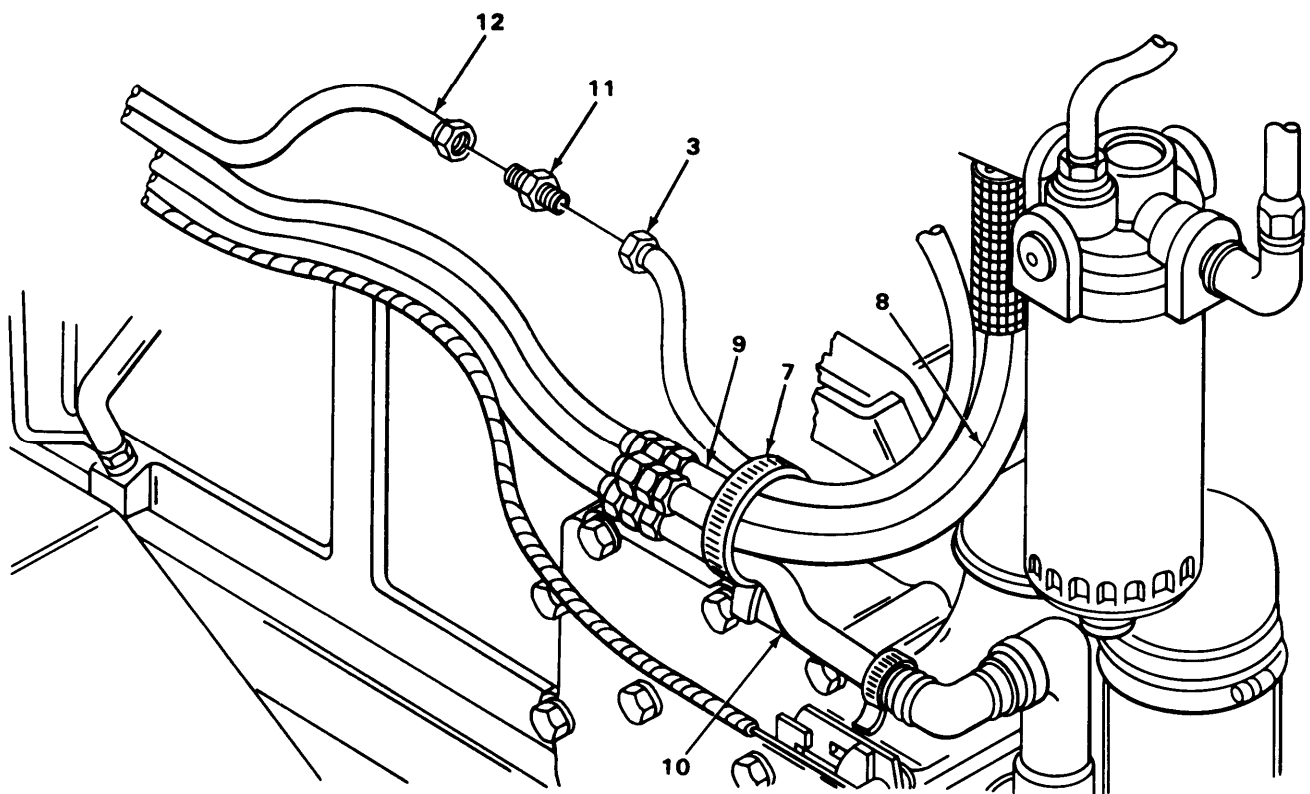
LOCATION	ITEM	ACTION REMARKS
REMOVAL – CONTINUED		
14. Rubber shield (1)	Three tie wraps (2)	a. Using diagonal cutting pliers, cut off. b. Get rid of.
15. Hose (3)	Rubber shield (1)	Take off.
16. Inlet elbow (4)	Hose (3)	Using 1-inch wrench, unscrew and take off.
17. Fuel pump (5)	Inlet elbow (4)	Using 1-inch wrench, unscrew and take out.
CLEANING AND INSPECTION		
18.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
INSTALLATION		
19. Fuel pump (5)	Inlet elbow (4)	Screw in and tighten, using 1-inch wrench.
20. Inlet elbow (4)	Hose (3)	Screw on and tighten, using 1-inch wrench.
21. Hose (3)	Rubber shield (1)	Put on.
22. Rubber shield (1)	Three new tie wraps (2)	Using slip-joint pliers, put on.



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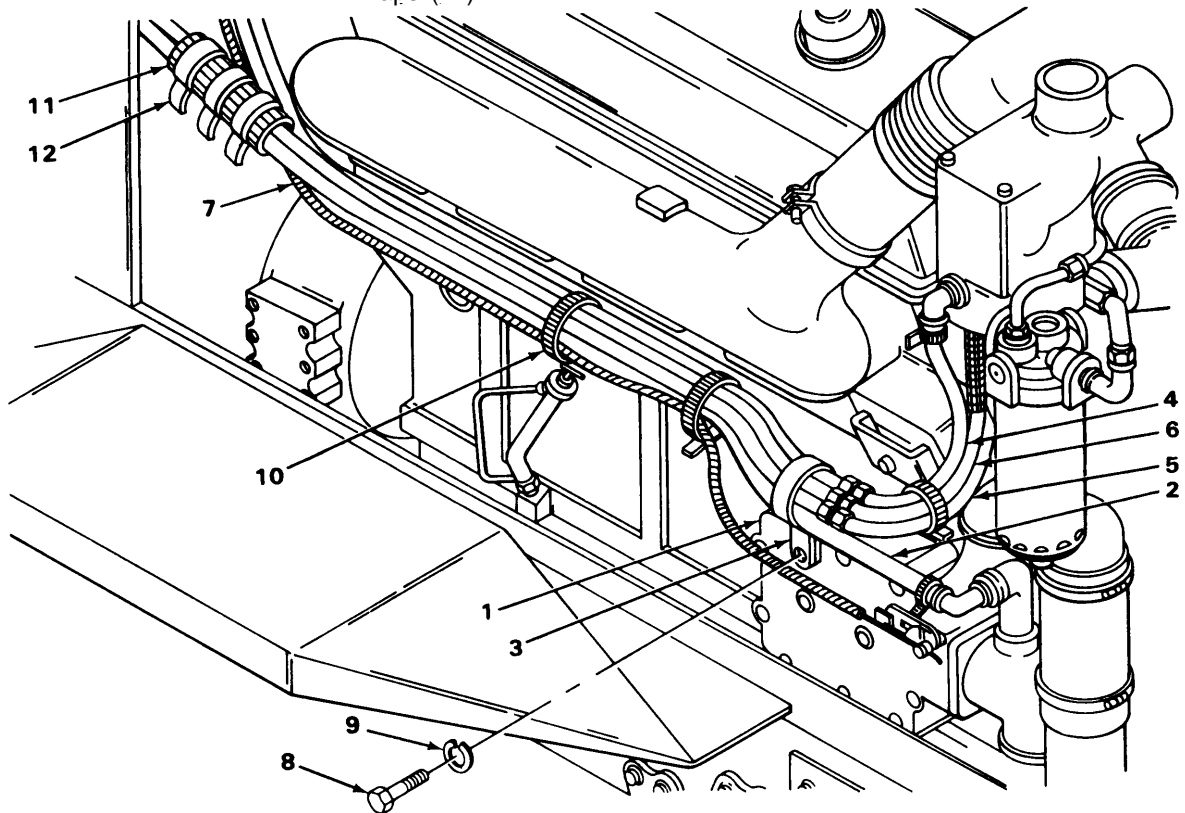
FUEL STRAINER TO FUEL PUMP LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
23. Hose (3)	New tie wrap (7)	Using slip-joint pliers, put on.
24.	Adapter (11)	Screw in and tighten using 15/16-inch and 1-inch wrenches.
25. Adapter (11)	Hose (12)	Screw on and tighten using 15/16-inch and 1-inch wrenches.



FUEL STRAINER TO FUEL PUMP LINES AND FITTINGS - CONTINUED

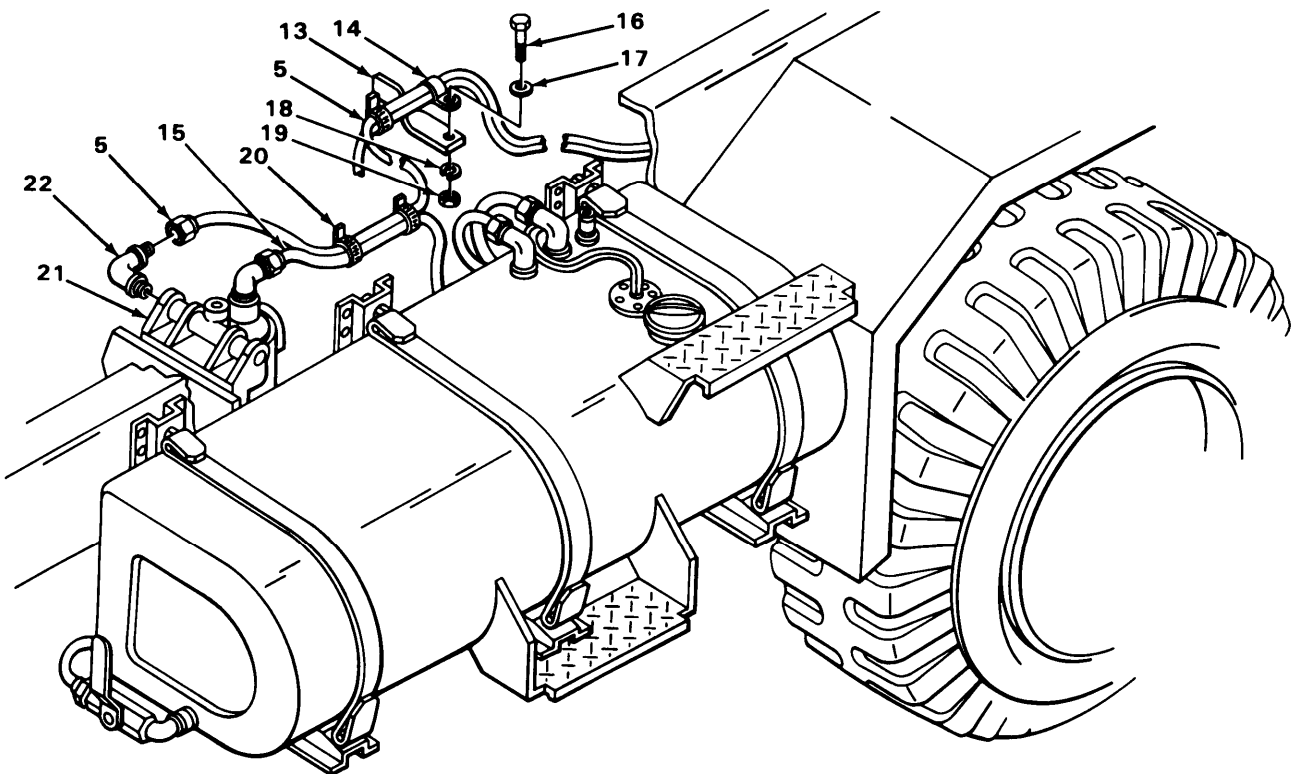
LOCATION	ITEM	ACTION	REMARKS
INSTALLATION – CONTINUED			
28. Oil cooler (1) and hose (2)	Clamp (3)	Put on.	
27. Clamp (3) to oil cooler (1)	Screw (8) and new lockwasher (9)	Screw in and tighten using 1/2-inch socket and handle.	
28. Hose (2)	Two new tie wraps (10)	Using slip-joint pliers, put on.	
29.	Rubber shield (11)	Put on.	
30. Rubber shield (11)	Three new tie wraps (12)	Using slip-joint pliers, put on.	



31. Bracket (13) and hose (5)	Clamp (14)	Put on.	
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FUEL STRAINER TO FUEL PUMP LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
32. Clamp (14) to bracket (13)	Screw (16), washer (17), new lockwasher (18), and nut (19)	Screw in and tighten using 7/16-inch socket, handle, and 7/16-inch wrench.	
33. Hose (5)	Three new tie wraps (20)	Using slip-joint pliers, put on.	
34. Fuel strainer (21)	Elbow (22)	Screw in and tighten using 1 1/16-inch wrench.	
35. Elbow (22)	Hose (5)	Screw on and tighten using 1-inch wrench.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Purge fuel system (page 4-32).
2. Install right side panel and close right side of hood (TM 9-2320-270-10).
3. Install right side radiator guard (page 4-151).

TASK ENDS HERE

FUEL RETURN LINES AND FITTINGS

This task covers:

- a. Removal (page 4-98)
 - b. Cleaning and Inspection (page 4-103)
 - c. Installation (page 4-104)
-

INITIAL SETUP

Tools

- Handle, ratchet, 3/8-inch drive
- Pliers, diagonal cutting
- Pliers, slipjoint, straight-nose
- Screwdriver, flat-tip, 1/4-inch
- Socket, 7/16-inch, 3/8-inch drive
- Socket, 1/2-inch, 3/8-inch drive
- Wrench, open-end, 7/16-inch
- Wrench, open-end, 1/2-inch
- Wrench, open-end, 5/8-inch
- Wrench, open-end, 1 1/16-inch
- Wrench, open-end, 3/4-inch
- Wrench, open-end, 7/8-inch
- Wrench, pipe, 14-inch

Materials/Parts

- Lockwasher, clamp to bracket
- Lockwasher, clamp to oil cooler
- Wrap, tie (item 24, appendix C)

Personnel Required

One

Equipment Condition

- Right side of hood open and right side panel removed TM 9-2320-270-10).
 - Right radiator guard removed (page 4-151).
 - Shutdown solenoid removed (page 4-422).
-

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

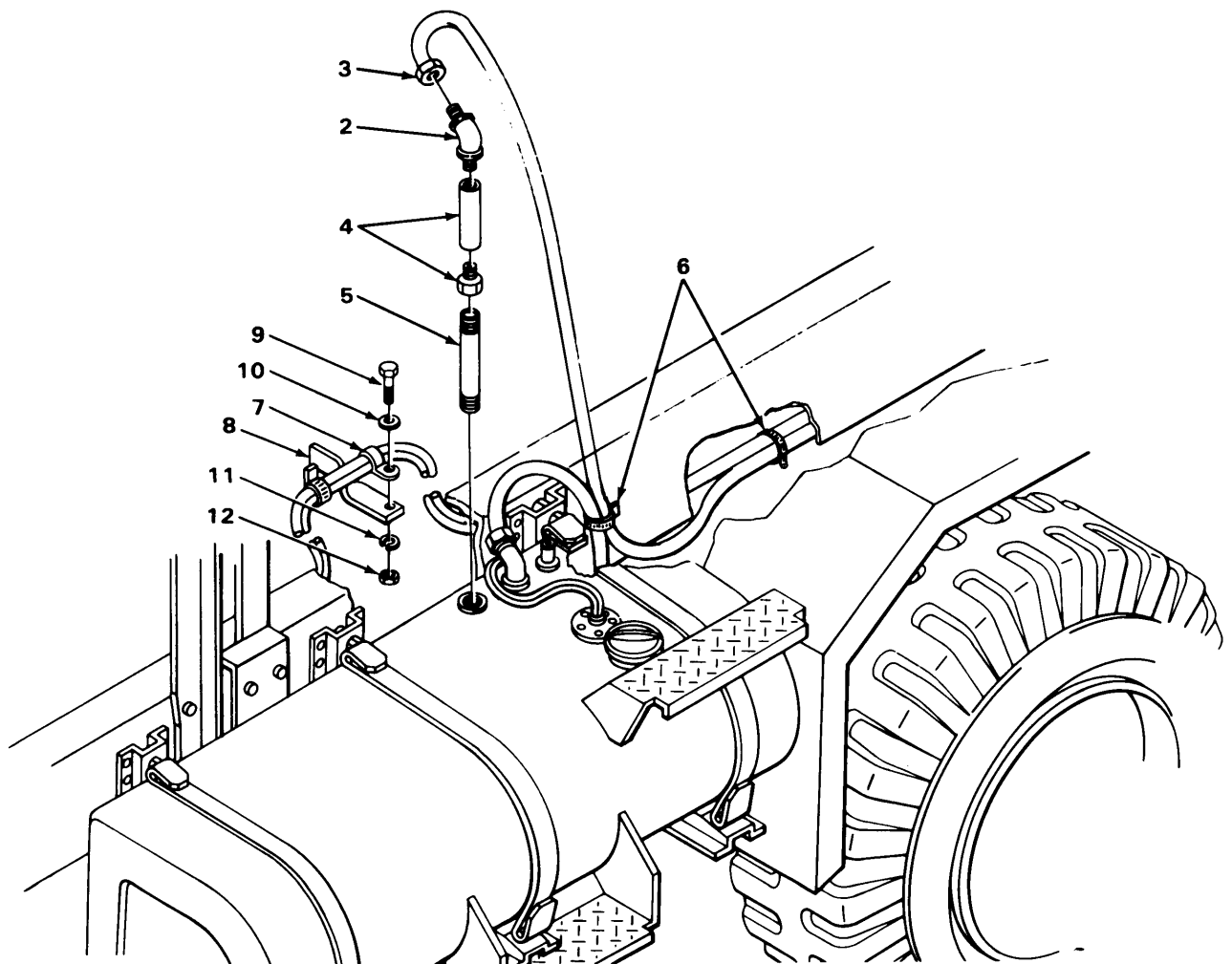
WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted nearby when using fuel. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

- | | | |
|-------------------------------------|--------------------------------------|--|
| 1. Right fuel tank (1)
elbow (2) | Hose (3) | Using 3/4-inch wrench, unscrew and take off. |
| 2. Right fuel tank (1) | Reducer (4), elbow (2), and tube (5) | Using 7/8-inch wrench, unscrew and take off. |

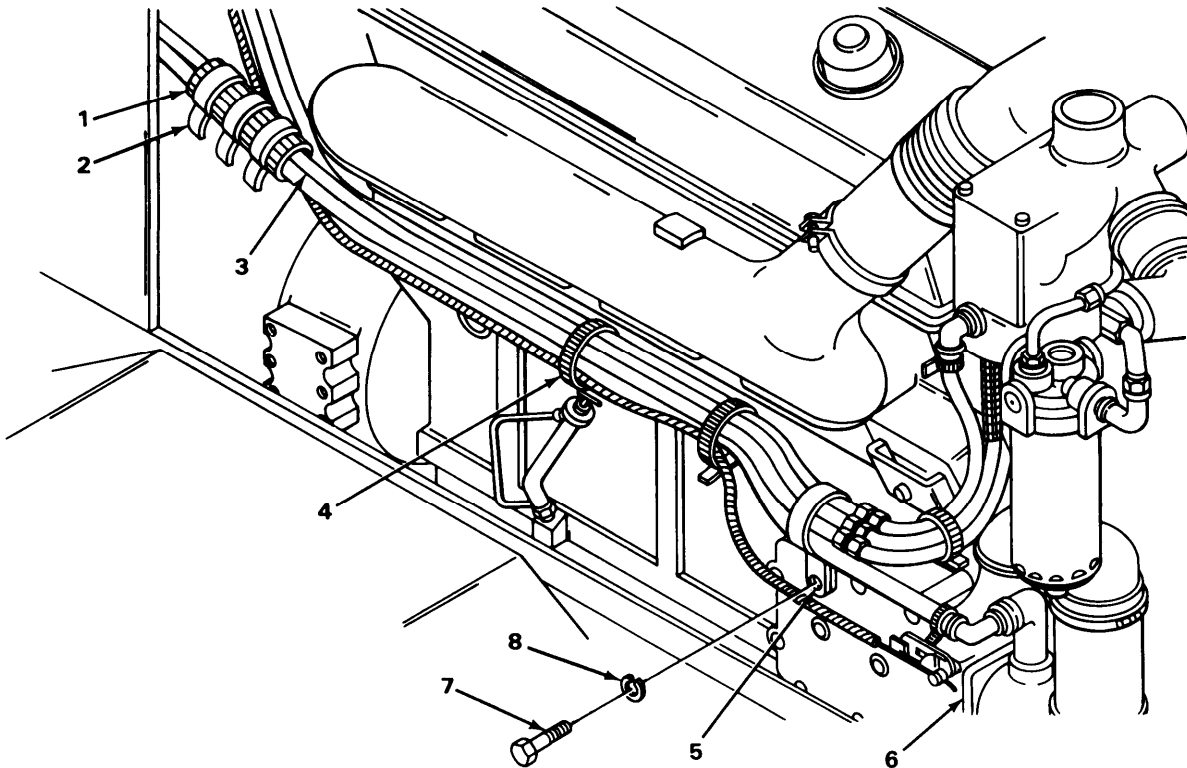
FUEL RETURN LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
3. Elbow (2) and tube (5)	Reducer (4)	Using 7/8-inch wrench and pipe wrench, unscrew and take off.
4. Hose (3)	Two tie wraps (6)	a. Using diagonal cutting pliers, cut off. b. Get rid of.
5. Clamp (7) to bracket (8)	Screw (9), washer (10), lockwasher (11) and nut (12)	a. Using 7/16-inch socket, handle and 7/16-inch wrench, unscrew and take out. b. Get rid of lockwasher (11).
6. Bracket (8) and hose (3)	Clamp (7)	Using screwdriver, spread clamp (7) and take off.



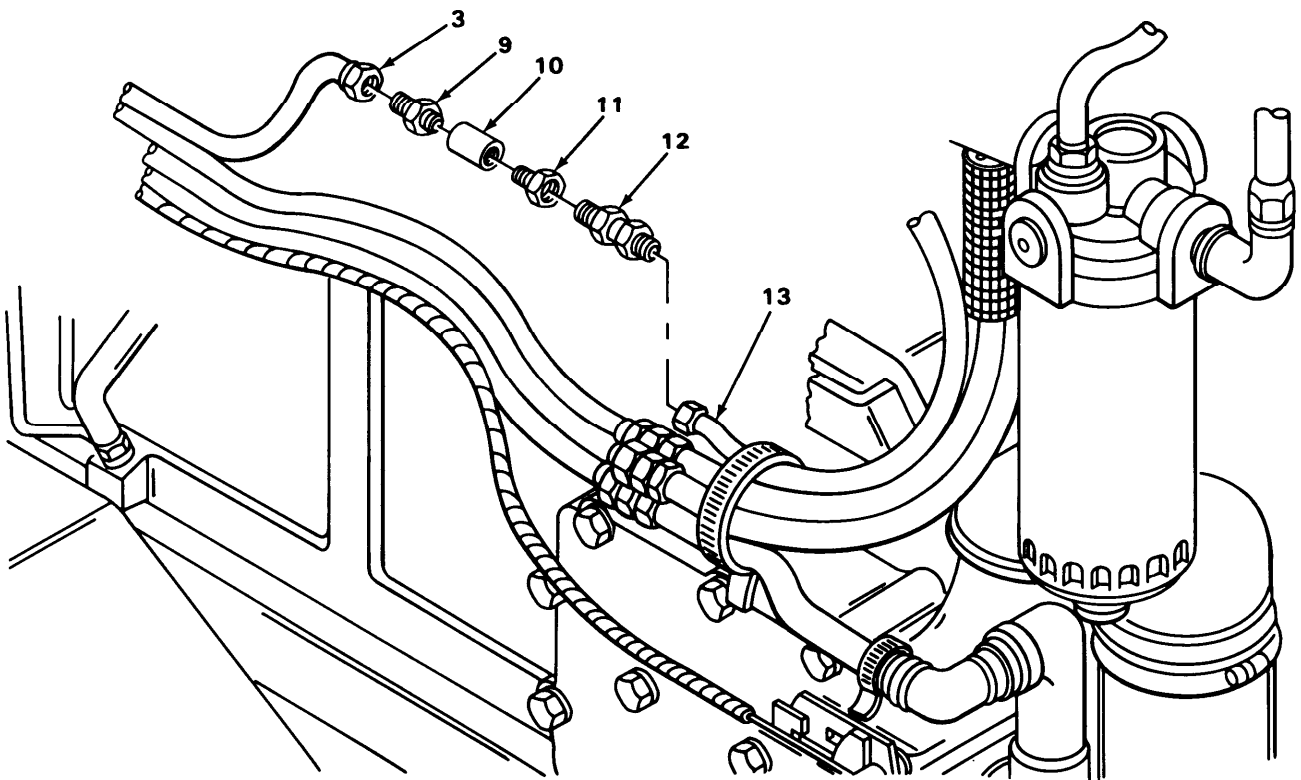
FUEL RETURN LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
7. Rubber shield (1)	Three tie wraps (2)	a. Using diagonal cutting pliers, cut off. b. Get rid of.
8. Hose (3)	Rubber shield (1)	Take off.
9.	Two tie wraps (4)	a. Using diagonal cutting pliers, cut off. b. Get rid of.
10. Clamp (5) to oil cooler (6)	Screw (7) and lockwasher (8)	a. Using 1/2-inch socket and handle, unscrew and take out. b. Get rid of lockwasher (8).
11. Oil cooler (6) and hose (3)	Clamp (5)	Using screwdriver, spread clamp and take off.



FUEL RETURN LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
12. Adapter (9)	Hose (3)	Using 5/8-inch and 3/4-inch wrenches, unscrew and take off.
13. Connector (10)	Adapter (9)	Using 5/8-inch wrench and pipe wrench, unscrew and take out.
14. Reducer (11)	Connector (10)	Using 3/4-inch wrench and pipe wrench, unscrew and take off.
15. Fitting (12)	Reducer (11)	Using 5/8-inch and 3/4-inch wrenches, unscrew and take off.
16. Hose (13)	Fitting (12)	Using 1/2-inch and 3/4-inch wrenches, unscrew and take out.



FUEL RETURN LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL – CONTINUED			
17. Hose (1)	Two tie wraps (2)	a. Using diagonal cutting pliers, cut off. b. Get rid of.	
18. Rubber shield (3)	Three tie wraps (4)	a. Using diagonal cutting pliers, cut off. b. Get rid of.	
19. Hose (5)	Rubber shield (3)	Take off.	
20. Elbow (6)	Fitting (7)	Using 1/2-inch wrench, unscrew and take out.	
21. Hose (8)	Fitting (7)	Using 1/2-inch and 3/4-inch wrenches, unscrew and take out.	
22. Tee (9)	Elbow (6)	Using 1 1/16-inch wrench, unscrew and take out.	
23. Reducer (10)	Fitting (11)	Using 5/8-inch and 3/4-inch wrenches, unscrew and take off.	
24. Tee (9)	Reducer (10)	Using 3/4-inch wrench, unscrew and take out.	

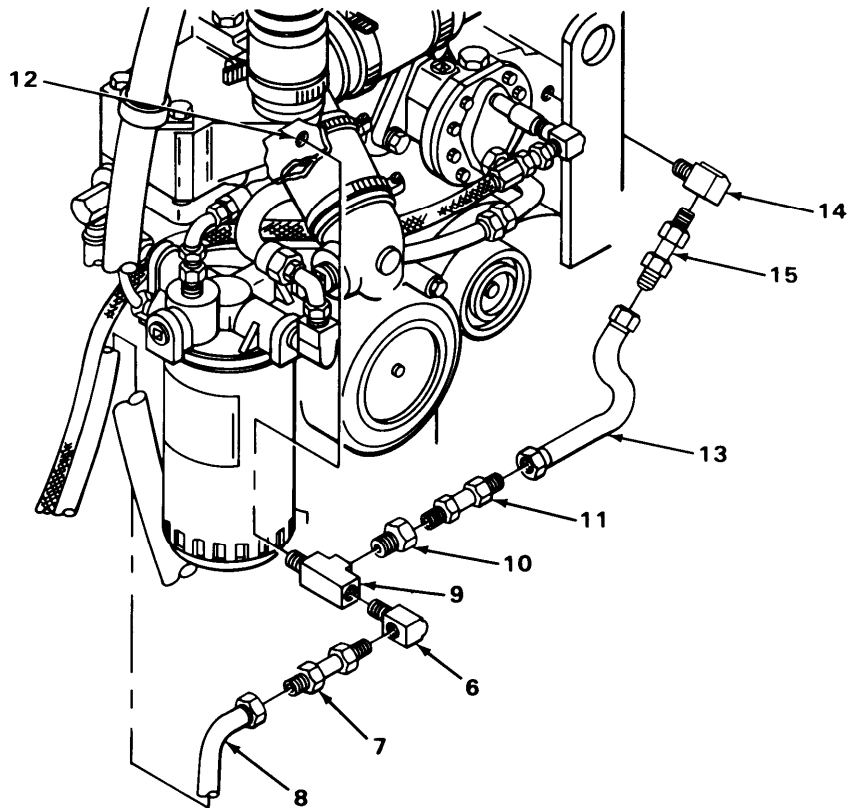
TA239868

FUEL RETURN LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
25. Engine (12)	Tee (9)	Using 3/4-inch wrench, unscrew and take out.
26. Hose (13)	Fitting (11)	Using 1/2-inch and 3/4-inch wrenches, unscrew and take out.
27. Elbow (14)	Fitting (15)	Using 5/8-inch wrench, unscrew and take out.
28. Hose (13)	Fitting (15)	Using 1/2-inch and 3/4-inch wrenches, unscrew and take out.
29. Engine (12)	Elbow (14)	Using 3/4-inch wrench, unscrew and take take out.

CLEANING AND INSPECTION

30. All parts Clean and inspect as shown in the general maintenance instructions (page 4-1).

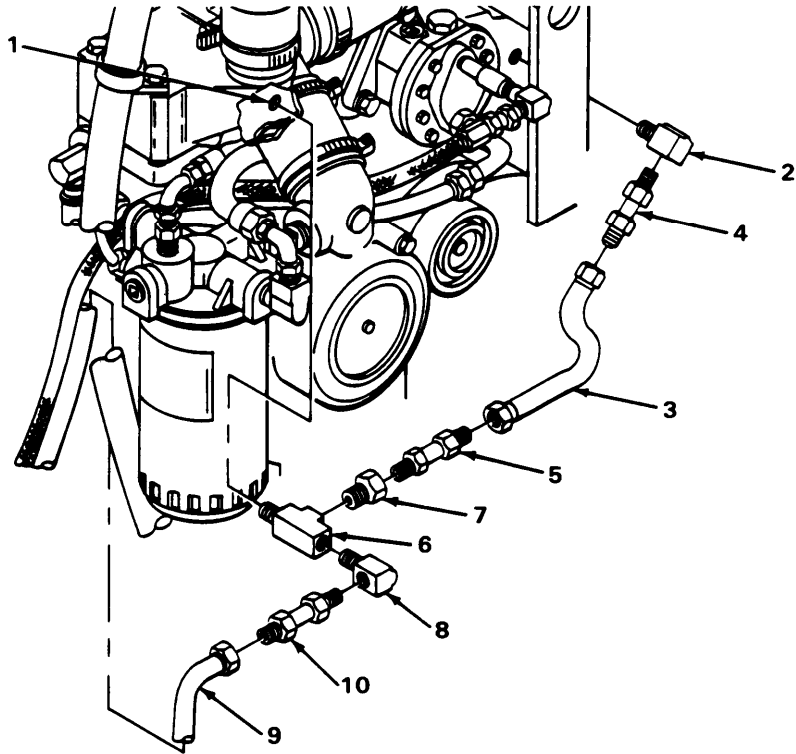


FUEL RETURN LINES AND FITTINGS - CONTINUED

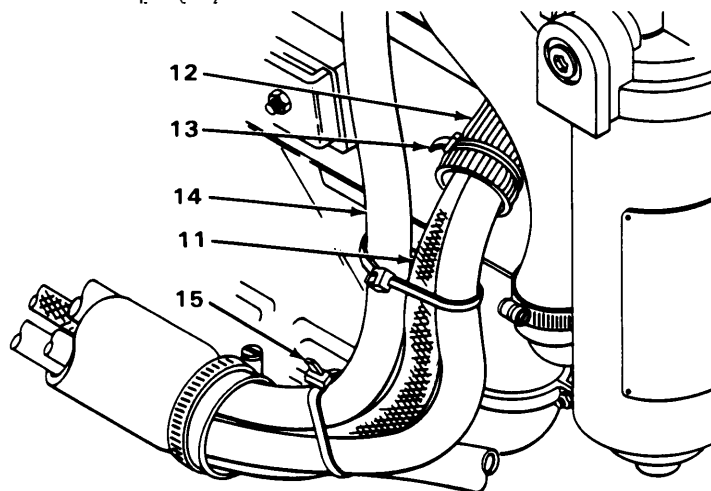
LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
31. Engine (1)	Elbow (2)	Screw in and tighten using 3/4-inch wrench.
32. Hose (3)	Fitting (4)	Screw in and tighten using 1/2-inch and 3/4-inch wrenches.
33. Elbow (2)	Fitting (4)	Screw in and tighten using 5/8-inch wrench.
34. Hose (3)	Fitting (5)	Screw in and tighten using 1/2-inch and 3/4-inch wrenches.
35. Engine (1)	Tee (6)	Screw in and tighten using 3/4-inch wrench.
36. Tee (6)	Reducer (7')	Screw in and tighten using 3/4-inch wrench.
37. Reducer (7)	Fitting (5)	Screw in and tighten using 5/8-inch and 3/4-inch wrenches.
38. Tee (6)	Elbow (8)	Screw in and tighten using 1 1/16-inch wrench.
39. Hose (9)	Fitting (10)	Screw in and tighten using 1/2-inch and 3/4-inch wrenches.
40. Elbow (8)	Fitting (10)	Screw in and tighten using 1/2-inch wrench.

FUEL RETURN LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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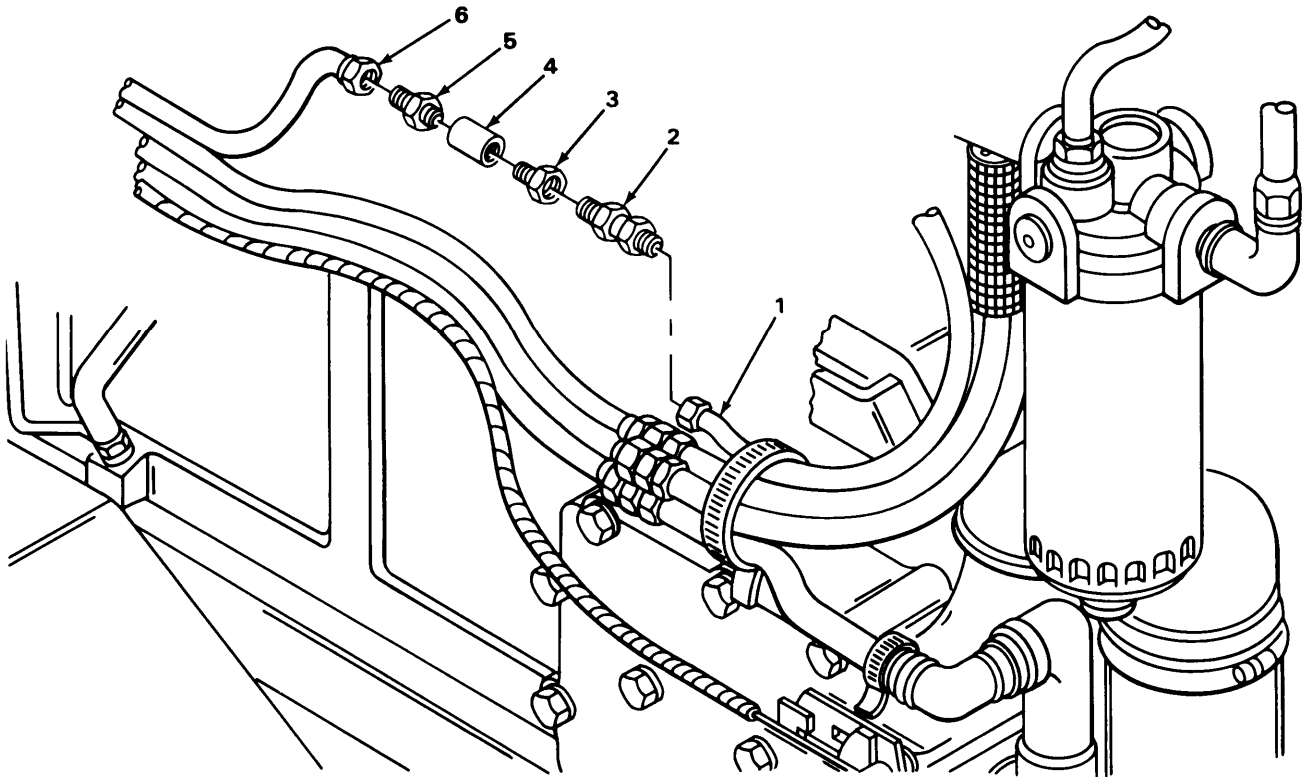


- | | | |
|------------------------|--------------------------|----------------------------------|
| 41. Hose (11) | Rubber shield (12) | Put on. |
| 42. Rubber shield (12) | Three new tie wraps (13) | Using slip-joint pliers, put on. |
| 43. Hose (14) | Two new tie wraps (15) | Using slip-joint pliers, put on. |



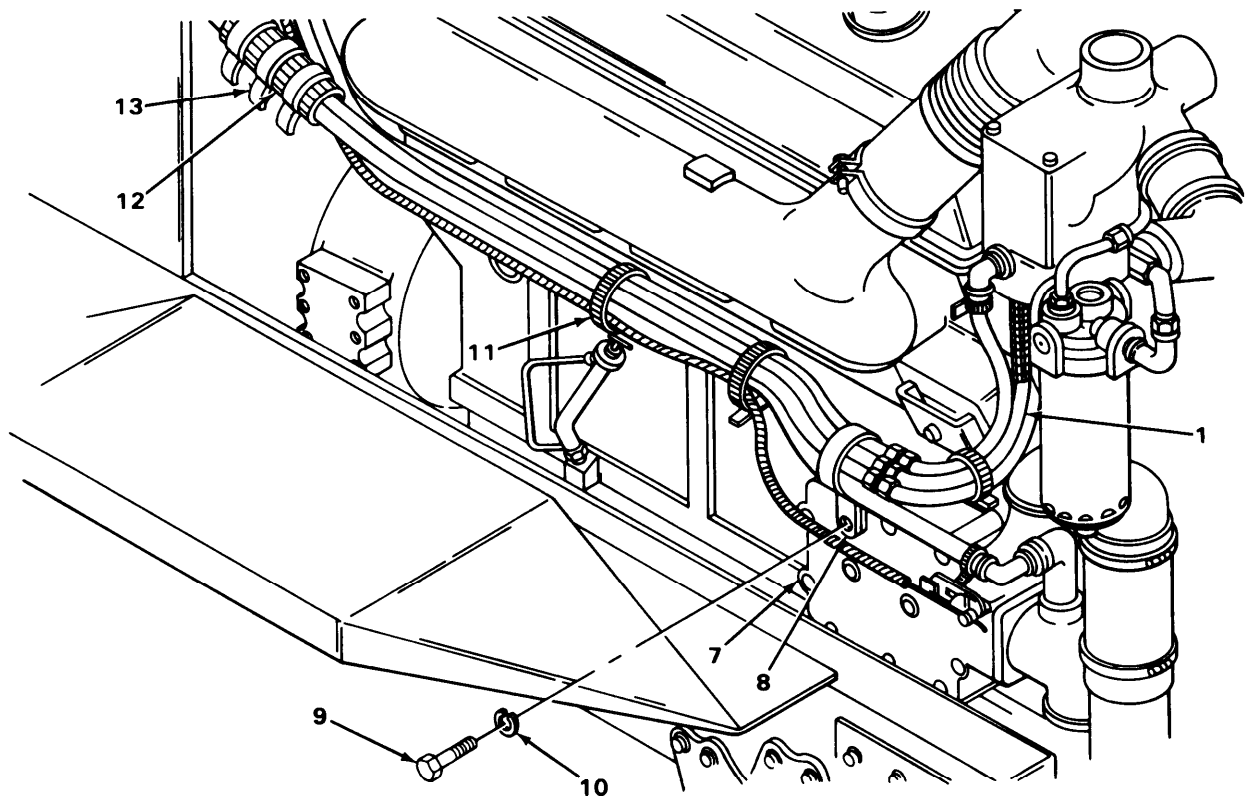
FUEL RETURN LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION – CONTINUED		
44. Hose (1)	Fitting (2)	Screw in and tighten using 1/2-inch and 3/4-inch wrenches.
45. Fitting (2)	Reducer (3)	Screw on and tighten using 5/8-inch and 3/4-inch wrenches.
48. Reducer (3)	Connector (4)	Screw on and tighten using 3/4-inch wrench and pipe wrench.
47. Connector (4)	Adapter (5)	Screw in and tighten using 5/8-inch wrench and pipe wrench.
48. Adapter (5)	Hose (6)	Screw on and tighten using 5/8-inch and 3/4-inch wrenches.



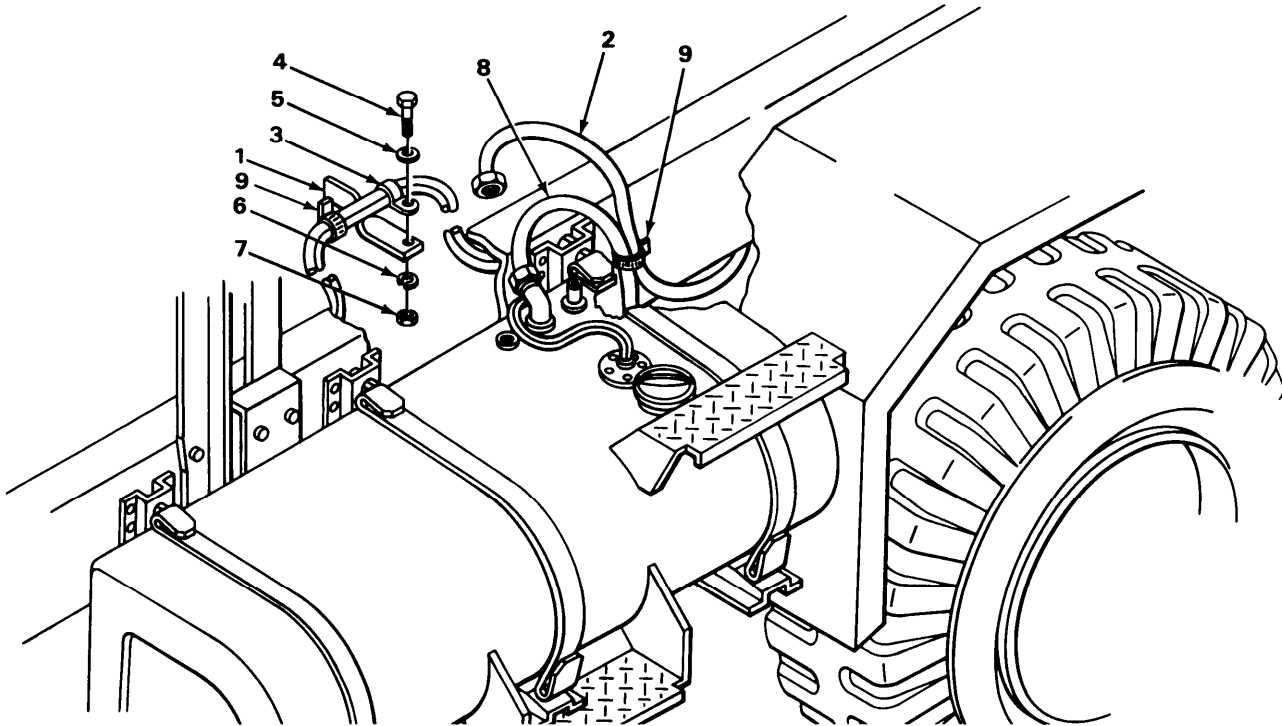
FUEL RETURN LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
49. Oil cooler (7) and hose (1)	Clamp (8)	Put around hoses.
50. Clamp (8) to oil cooler (7)	Screw (9) and new lockwasher (10)	Screw in and tighten using 1/2-inch socket and handle.
51. Hose (1)	Two new tie wraps (11)	Using slip-joint pliers, put on.
52.	Rubber shield (12)	Put on.
53. Rubber shield (12)	Three new tie wraps (13)	Using slip-joint pliers, put on.



FUEL RETURN LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION – CONTINUED		
54. Bracket (1) and hose (2)	Clamp (3)	Put on.
55. Clamp (3) to bracket (1)	Bolt (4), washer (5), new lock-washer (6), and nut (7)	Screw in and tighten using 7/16-inch socket, handle, and 7/16-inch wrench.
56. Hose (8)	Two new tie wraps (9)	Using slip-joint pliers, put on.



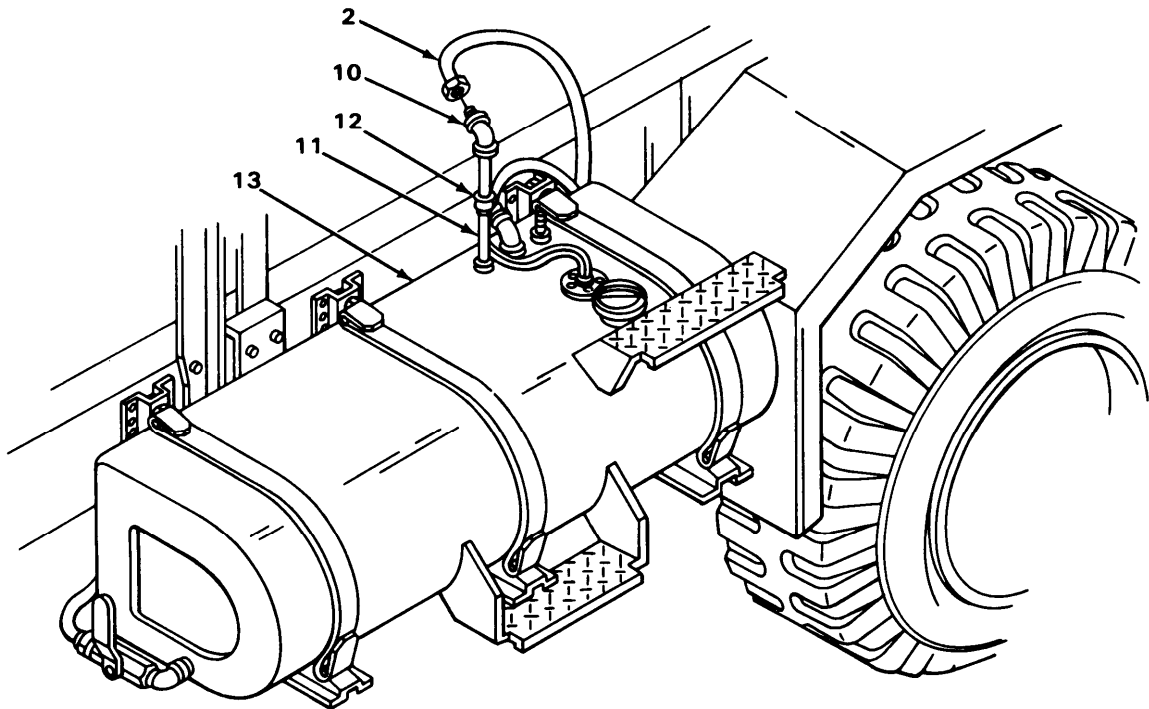
WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted nearby when using fuel. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

TA239873

FUEL RETURN LINES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
57. Elbow (10) and tube (11)	Reducer (12)	Screw on and tighten using 7/8-inch wrench and pipe wrench.	
58. Right fuel tank (13)	Reducer (12), elbow (10), and tube (11)	Screw in and tighten using 7/18-inch wrench.	
59. Elbow (10)	Hose (2)	Screw on and tighten using 3/4-inch wrench.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install shutdown solenoid (page 4-422).
2. Install right side radiator guard (page 4-151).
3. Check for leaks (page 4-1).
4. Install right side panel and close right side of hood (TM 9-2320-270-10).

TASK ENDS HERE

TA239874

FUEL FILTER AND COVER

This task covers:

- a. Removal (page 4-110)
 - b. Cleaning and Inspection (page 4-111)
 - c. Installation (page 4-112)
-

INITIAL SETUP

Tools

- Removal tool, oil filter
- Screw key, socket head, 1/4-inch
- Wrench, box, 9/16-inch
- Wrench, open-end, 5/8-inch
- Wrench, open-end, 1 1/16-inch
- Wrench, open-end, 3/4-inch
- Wrench, open-end, 1-inch

Personnel Required

One

Equipment Condition

- Right side panel removed (TM 9-2320-270-10).
- Right side radiator guard removed (page 4-151).

Materials/Parts

- Container
 - Fuel filter
 - Lockwasher (two required)
-

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted nearby when using fuel. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

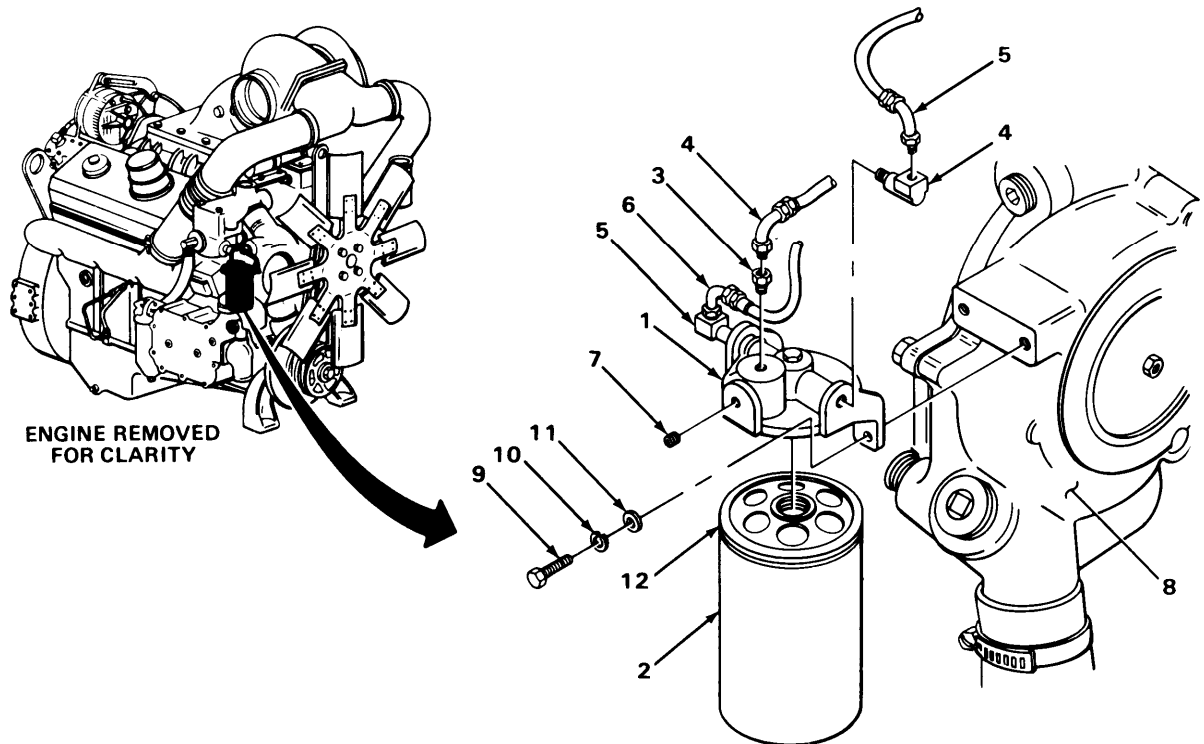
- | | | |
|---------------------|-----------------|---|
| 1. Filter cover (1) | Fuel filter (2) | <ul style="list-style-type: none"> a. Put container underneath. b. Using filter removal tool and 1-inch wrench, unscrew and take out. c. Get rid of fluid (page 4-1) and filter (2). |
| 2. Reducer (3) | Fitting (4) | Using 5/8-inch and 3/4-inch wrenches, unscrew and take out. |
| 3. Filter cover (1) | Reducer (3) | Using 3/4-inch wrench, unscrew and take out. |

FUEL FILTER AND COVER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
4. Two elbows (5)	Two fittings (6)	Using 5/8-inch wrench, unscrew and take out.
5. Filter cover (1)	Two elbows (5)	Using 1 1/16-inch wrench, unscrew and take out.
6.	Plug (7)	Using key, unscrew and take out.
7. Filter cover (1) to water pump (8)	Two screws (9), lockwashers (10), and washers (11)	a. Using 9/16-inch wrench, unscrew and take out. b. Get rid of lockwashers (10).
8. Water pump (8)	Filter cover (1)	Take off.

CLEANING AND INSPECTION

9.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
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FUEL FILTER AND COVER - CONTINUED

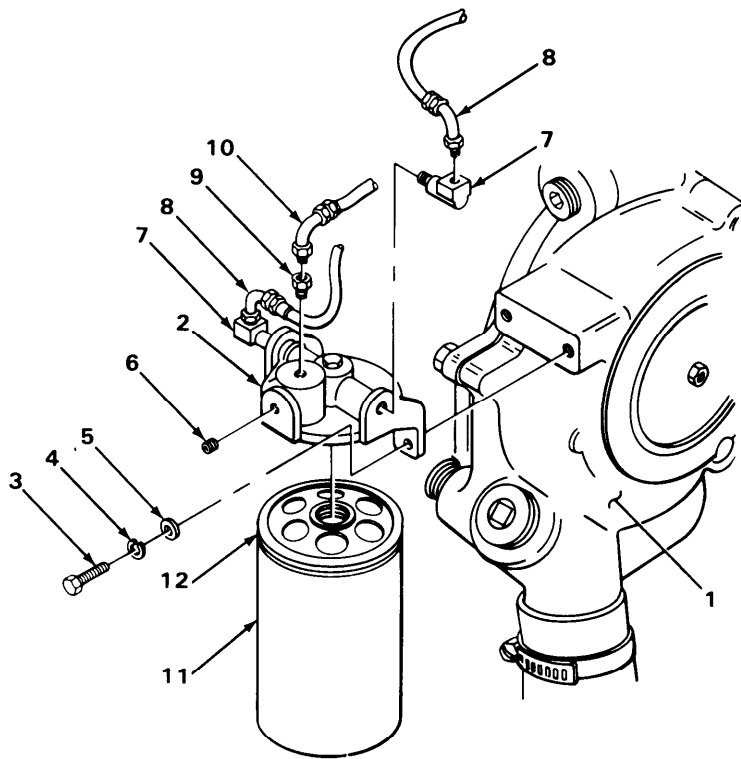
LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
10. Water pump (1)	Filter cover (2)	Put on.
11. Filter cover (2) to water pump (1)	Two screws (3), new lockwashers (4), and washers (5)	Screw in and tighten using 9/16-inch wrench.
12. Filter cover (2)	Plug (6)	Using key, screw in until flush.
13.	Two elbows (7)	Screw in and tighten using 1 1/16-inch wrench.
14. Two elbows (7)	Two fittings (8)	Screw in and tighten using 5/8-inch wrench.
15. Filter cover (2)	Reducer (9)	Screw in and tighten using 3/4-inch wrench.
16. Reducer (9)	Fitting (10)	Screw in and tighten using 5/8-inch and 3/4-inch wrenches.

WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted nearby when using fuel. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

17. Filter cover (2)	New fuel filter (11)	a. Fill to top with diesel fuel. b. Screw on until gasket (12) touches cover. c. Using filter removal tool, turn one more complete turn.
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FUEL FILTER AND COVER - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Purge fuel system (page 4-32).
2. Check for leaks (page 4-1).
3. Install right side radiator guard (page 4-151).
4. Install right side panel (TM 9-2320-270-10).

FUEL STRAINER, COVER, AND BRACKET

This task covers:

- a. Removal (page 4-114)
 - b. Cleaning (page 4-115)
 - c. Installation (page 4-116)
-

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch drive
 Key, socket-head screw, 9/32-inch
 Removal tool, oil filter
 Socket, 9/16-inch, 3/8-inch
 Wrench, box, 9/16-inch
 Wrench, open-end, 3/4-inch
 Wrench, open-end, 1-inch
 Wrench, pipe plug, 9/32-inch

Materials/Parts

Container
 Fuel strainer
 Lockwasher (four required)

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted nearby when using fuel. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

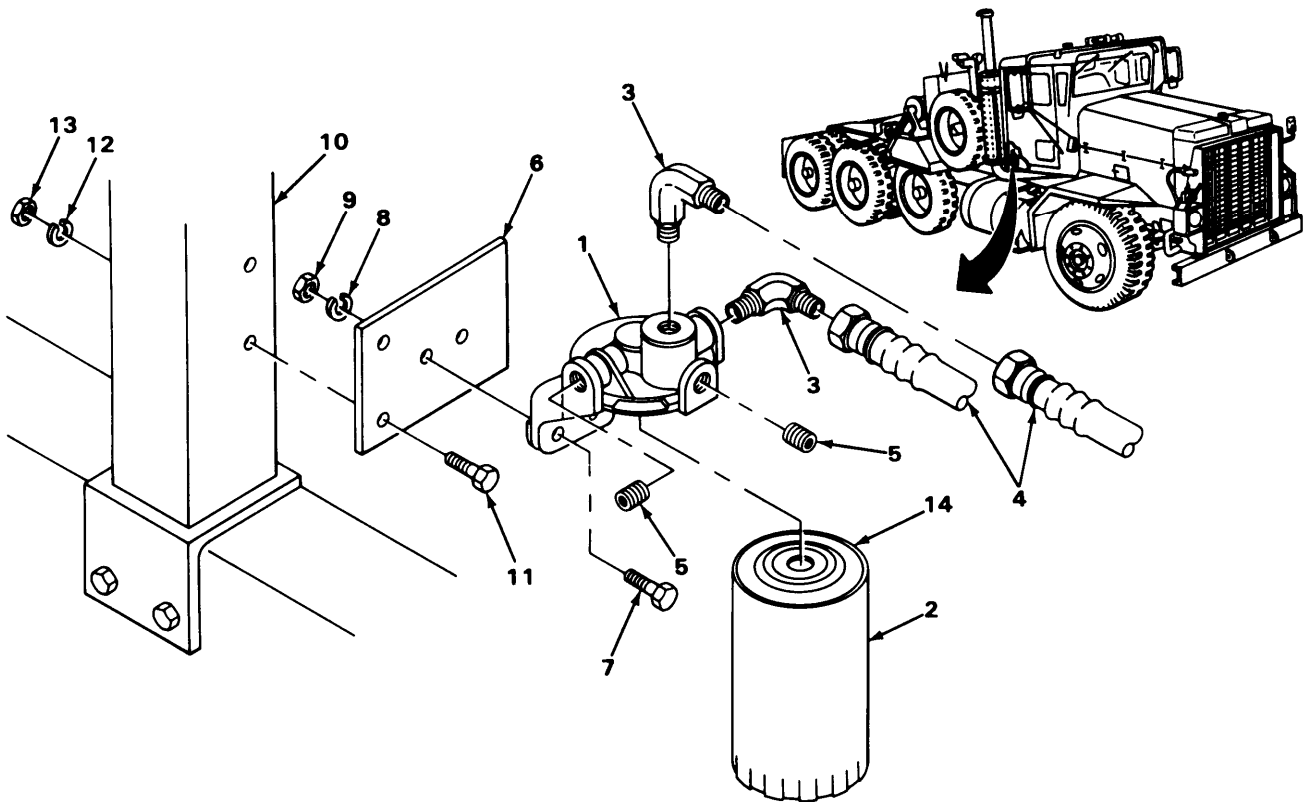
- | | | |
|--------------------------------------|---|---|
| 1. Fuel strainer cover (1) | Fuel strainer (2) | a. Put container underneath.
b. Using filter removal tool and 1-inch wrench, unscrew and take out.
c. Get rid of fluid (page 4-1) and strainer (2). |
| 2. Two elbows (3) | Two hoses (4) | Using 1-inch wrench, unscrew and take off. |
| 3. Strainer cover (1) | Two elbows (3) | Using 3/4-inch wrench, unscrew and take out. |
| 4. | Two plugs (5) | Using 9/32-inch pipe plug wrench, unscrew and take out. |
| 5. Strainer cover (1) to bracket (6) | Two screws (7), lockwashers (8), and nuts (9) | a. Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take out.
b. Get rid of lockwashers (8). |

FUEL STRAINER, COVER, AND BRACKET - CONTINUED

LOCATION	ITEM	ACTION REMARKS
6. Bracket (6)	Strainer cover (1)	Take off.
7. Bracket (6) to frame (10)	Two screws (11), lockwashers (12), and nuts (13)	a. Using 9/16-inch socket, handle, and 9/16-inch wrench, unscrew and take out. b. Get rid of lockwashers (12).
8. Frame (10)	Bracket (6)	Take off.

CLEANING AND INSPECTION

9.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
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FUEL STRAINER, COVER, AND BRACKET - CONTINUED

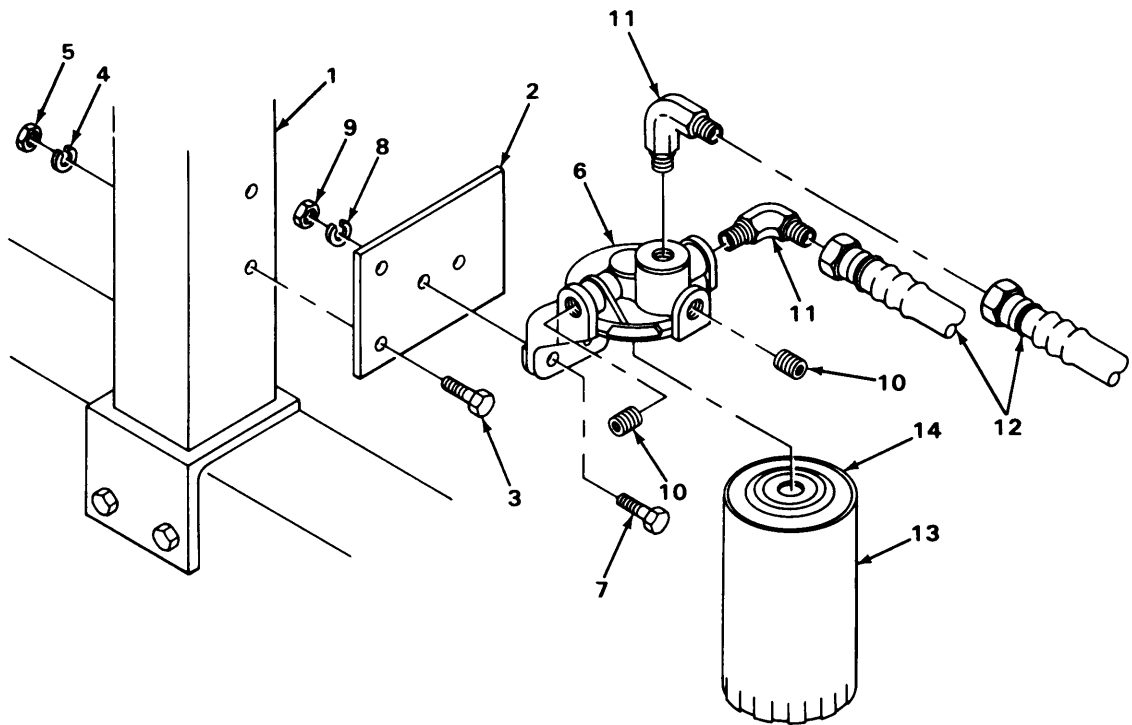
LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
10. Frame (1)	Bracket (2)	Put on.
11. Bracket (2) to frame (1)	Two screws (3), new lockwashers (4), and nuts (5)	Screw in and tighten using 9/16-inch socket, handle, and 9/16-inch wrench.
12. Bracket (2)	Strainer cover (6)	Put on.
13. Strainer cover (6) to bracket (2)	Two screws (7), new lockwashers (8), and nuts (9)	Screw in and tighten using 9/16-inch socket, handle, and 9/16-inch wrench.
14. Strainer cover (6)	Two plugs (10)	Screw in until flush using 9/32-inch pipe plug wrench.
15.	Two elbows (11)	Screw in and tighten using 3/4-inch wrench.
16. Two elbows (11)	Two hoses (12)	Screw on and tighten using 1-inch wrench.

WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted nearby when using fuel. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

17. Strainer cover (6)	New fuel strainer (13)	a. Fill to top with diesel fuel. b. Screw on until gasket (14) touches cover (1), then using filter removal tool, screw on one more complete turn.
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FUEL STRAINER, COVER, AND BRACKET - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Purge fuel system (page 4-32).
2. Check for leaks (page 4-1).

TASK ENDS HERE

ETHER STARTING KIT

This task covers:

- a. Removal (page 4-118)
 - b. Cleaning and Inspection (page 4-121)
 - c. Installation (page 4-122)
-

INITIAL SETUP

Tools

- Pliers, diagonal cutting
- Pliers, slip-joint, straight-nose
- Screwdriver, flat-tip, 1/4-inch, 4-inch blade
- Wrench, adjustable, 10-inch
- Wrench, open-end, 3/8-inch
- Wrench, open-end, 7/16-inch
- Wrench, open-end, 9/16-inch
- Wrench, open-end, 5/8-inch
- Wrench, open-end, 7/8-inch

Materials/Parts

- Lockwasher (four required)
- Wrap, tie (item 24, appendix C)

Personnel Required

One

Equipment Condition

Right side of hood open and right and left side panels removed (TM 9-2320-270-10).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

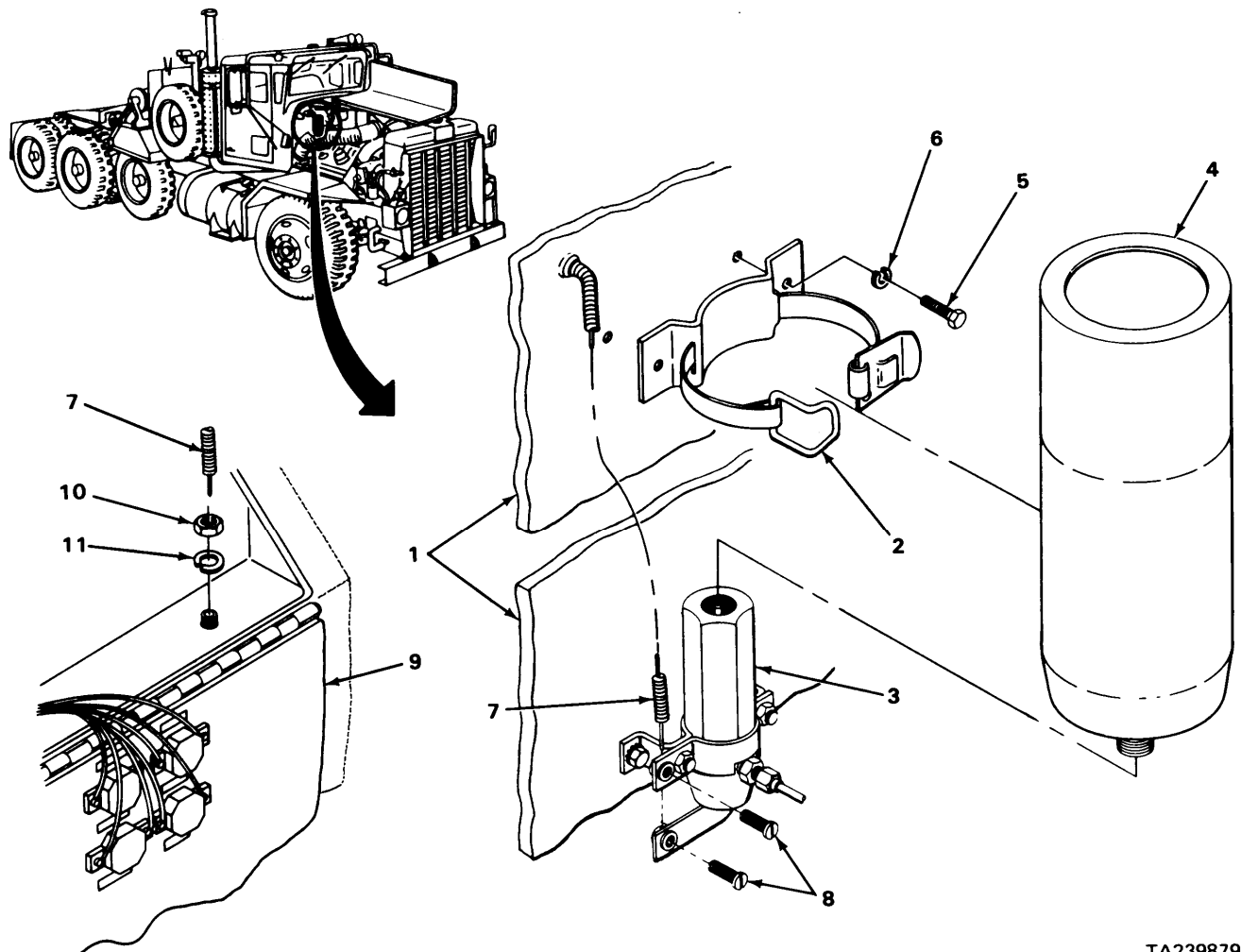
WARNING

Ether fumes are flammable, under pressure, and can explode. To avoid serious injury or death, do not smoke, allow open flame nearby, or hit the ether cartridge with tools.

1. Firewall (1)	Ether cylinder mounting clamp (2)	Pull open.	
2. Mounting clamp (2) and valve assembly (3)	Ether cylinder (4)	Unscrew and take out.	
3. Mounting clamp (2) to firewall (1)	Two screws (5) and lockwashers (6)	a. Using 3/8-inch wrench, unscrew and take out. b. Get rid of lockwashers (6).	
4. Firewall (1)	Mounting clamp (2)	Take off.	

ETHER STARTING KIT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
5. Cable (7) to valve assembly (3)	Two screws (8)	Using screwdriver, unscrew and take out.	
6. Valve assembly (3)	Cable (7)	Using slip-joint pliers, pull out.	
7.	Instrument panel	Open (page 4-244).	
8. Cable (7) to panel (9)	Nut (10) and lockwasher (11)	Using 9/16-inch wrench, unscrew and take off.	Nut and lockwasher will slide onto cable.
9. Firewall (1) and panel (9)	Cable (7)	Pull out.	Nut and lockwasher will come off end of cable.



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ETHER STARTING KIT - CONTINUED

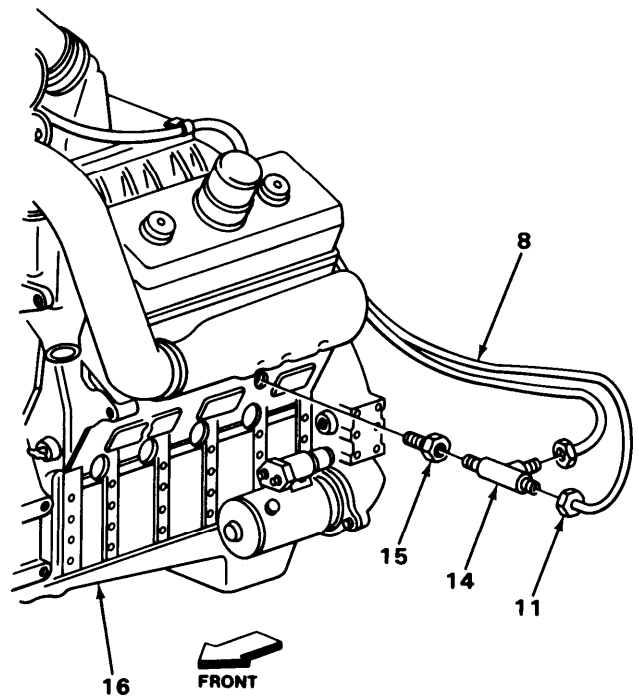
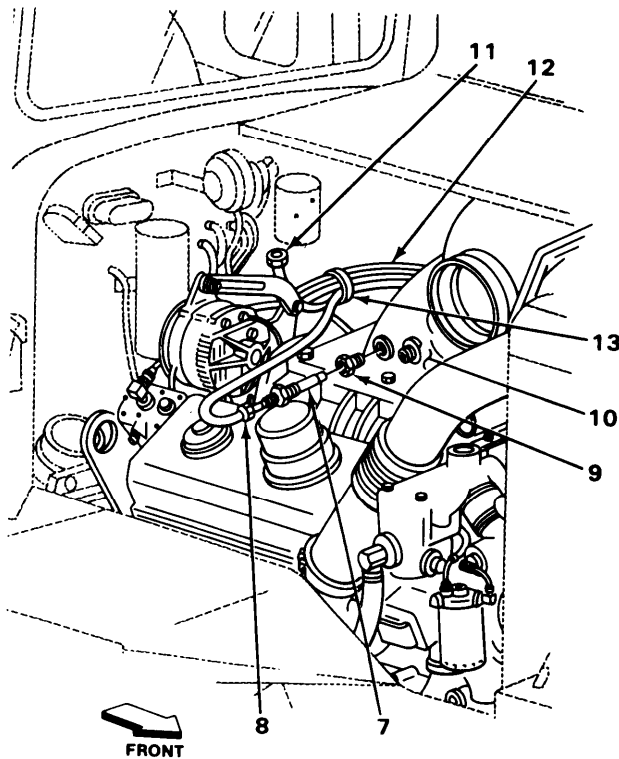
LOCATION	ITEM	ACTION REMARKS
REMOVAL – CONTINUED		
10. Fitting (1)	Hose (2)	Using 3/8-inch and 7/16-inch wrenches, unscrew and take off.
11. Valve assembly (3)	Fitting (1)	Using 7/16-inch wrench, unscrew and take out.
12. Valve assembly (3) to firewall (4)	Two screws (5) and lockwasher (6)	a. Using 3/8-inch wrench, unscrew and take out. b. Get rid of lockwashers (6).
13. Firewall (4)	Valve assembly (3)	Take off.
14. Fitting (7)	Hose (8)	Using 3/8-inch and 7/16-inch wrenches, unscrew and take off.
15. Reducer (9)	Fitting (7)	Using 7/16-inch and 5/8-inch wrenches, unscrew and take out.
16. Air inlet housing (10)	Reducer (9)	Using 3/8-inch wrench, unscrew and take out.
17. Hose (8), hose (11), and hose (12)	Five tie wraps (13)	a. Using diagonal cutting pliers, cut off. b. Get rid of. c. Open left side hood (TM 9-2320-270-10).

ETHER STARTING KIT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
18. Thermoguard (14)	Hose (8) and hose (11)	Using 3/8-inch wrench, unscrew and take off.
19. Reducer (15)	Thermoguard (14)	Using 7/8-inch wrench and adjustable wrench, uncrew and take out.
20. Engine (16)	Reducer (15)	Using adjustable wrench, unscrew and take out.

CLEANING AND INSPECTION

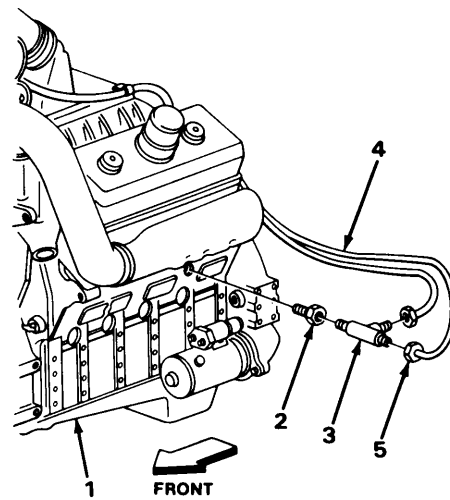
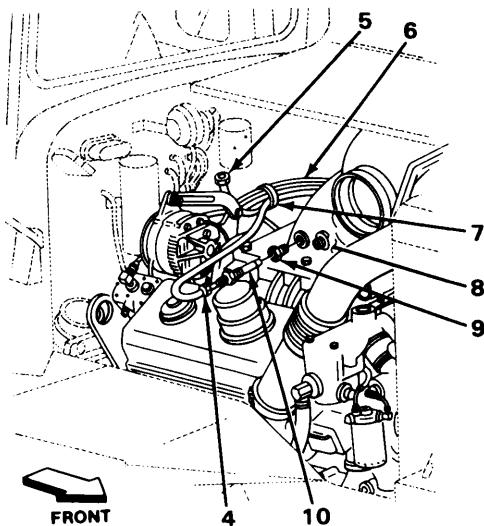
21. All parts
Clean and inspect as shown in the general maintenance instructions (page 4-1).



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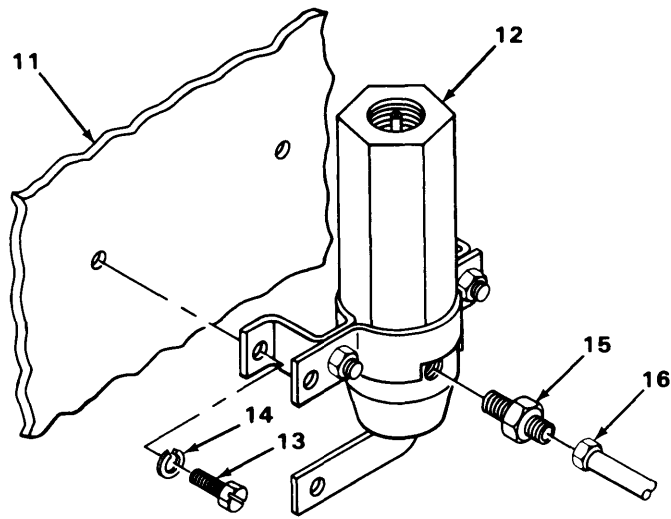
ETHER STARTING KIT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
22. Engine (1)	Reducer (2)	Screw in and tighten using adjustable wrench.
23. Reducer (2)	Thermoguard (3)	Screw in and tighten using 7/8-inch wrench and adjustable wrench.
24. Thermoguard (3)	Hose (4) and hose (5)	a. Screw in and tighten using 3/8-inch wrench. b. Open right side hood (TM 9-2320-270-10).
25. Hose (4), hose (5), and hose (6)	Five new tie wraps (7)	Using slip-joint pliers, put on.
26. Air inlet housing (8)	Reducer (9)	Screw in and tighten using 5/8-inch wrench.
27. Reducer (9)	Fitting (10)	Screw in and tighten using 7/16-inch and 5/8-inch wrenches.
28. Fitting (10)	Hose (4)	Screw on and tighten using 3/8-inch and 7/16-inch wrenches.



ETHER STARTING KIT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
29. Firewall (11)	Valve assembly (12)	Put on.
30. Valve assembly (12) to firewall (11)	Two screws (13) and new lockwashers (14)	Screw in and tighten using 3/8-inch wrench.
31. Valve assembly (12)	Fitting (15)	Screw into valve assembly (12) and tighten using 7/16-inch wrench.
32. Fitting (15)	Hose (16)	Screw onto fitting (15) and tighten using 3/8-inch and 7/16-inch wrenches.



ETHER STARTING KIT - CONTINUED

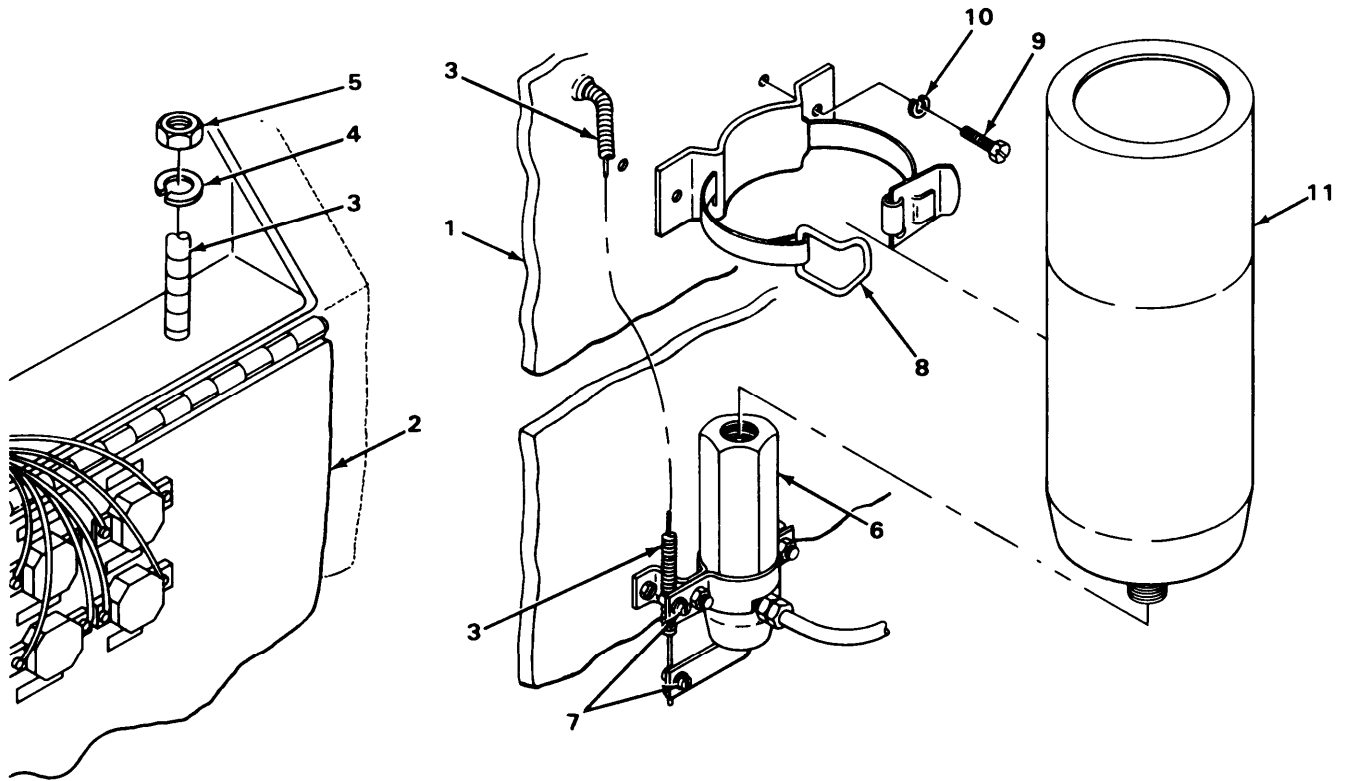
LOCATION	ITEM	ACTION REMARKS
INSTALLATION – CONTINUED		
33. Firewall (1) and panel (2)	Cable (3), new lock-washer (4) and nut (5)	a. Put through panel (2). b. Put on lockwasher (4) and nut (5). c. Put through firewall (1).
34. Cable (3) to panel (2)	Nut (5)	Screw on and tighten using 9/16-inch wrench.
35.	Instrument panel	Close (page 4-244).
36. Valve assembly (6)	Cable (3)	Using slip-joint pliers, put in.
37. Cable (3) to valve assembly (6)	Two screws (7)	Screw in and tighten against cable (3) using screwdriver.
38. Firewall (1)	Mounting clamp (8)	Put on.
39. Mounting clamp (8) to firewall (1)	Two screws (9) and new lockwashers (10)	Screw in and tighten using 3/8-inch wrench.

WARNING

Ether fumes are flammable, under pressure, and can explode. To avoid serious injury or death, do not smoke, allow open flame nearby, or hit the ether cartridge with tools.

40. Mounting clamp (8) and valve assembly (6)	Ether cylinder (11)	Screw in and tighten.
41. Firewall (1)	Mounting clamp (8)	Push close

ETHER STARTING KIT - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE: Install right and left side panels and close right side hood (TM 9-2320-270-10).

TASK ENDS HERE

ACCELERATOR ASSEMBLY

This task covers:

- a. Removal (page 4-126)
 - b. Cleaning and Inspection (page 4-126)
 - c. installation (page 4-126)
-

INITIAL SETUP

Tools

- Handle, ratchet, 3/8-inch drive
- Socket, 1/2-inch, 3/8-inch drive
- Wrench, box-end, 1/2-inch
- Wrench, open-end, 9/16-inch
(two required)
- Wrench, open-end, 5/8-inch

Materials/Parts

Lockwashers (three required)

Personnel Required

Two

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

REMOVAL

- | | | | |
|----|---|---|---|
| 1. | Fitting (1) | Hose (2) | Using two 9/16-inch wrenches, unscrew and take off. |
| 2. | Fitting (3) | Hose (4) | Using 9/16-inch and 5/8-inch wrenches, unscrew and take off. |
| 3. | Accelerator assembly (5) to cab floor (6) | Three screws (7), lockwashers (8), and nuts (9) | <ul style="list-style-type: none"> a. With help from assistant and using 1/2-inch socket, handle, and 1/2-inch wrench, unscrew and take out. b. Get rid of lockwashers (8). |
| 4. | Cab floor (6) | Accelerator assembly (5) | Take off. |

CLEANING AND INSPECTION

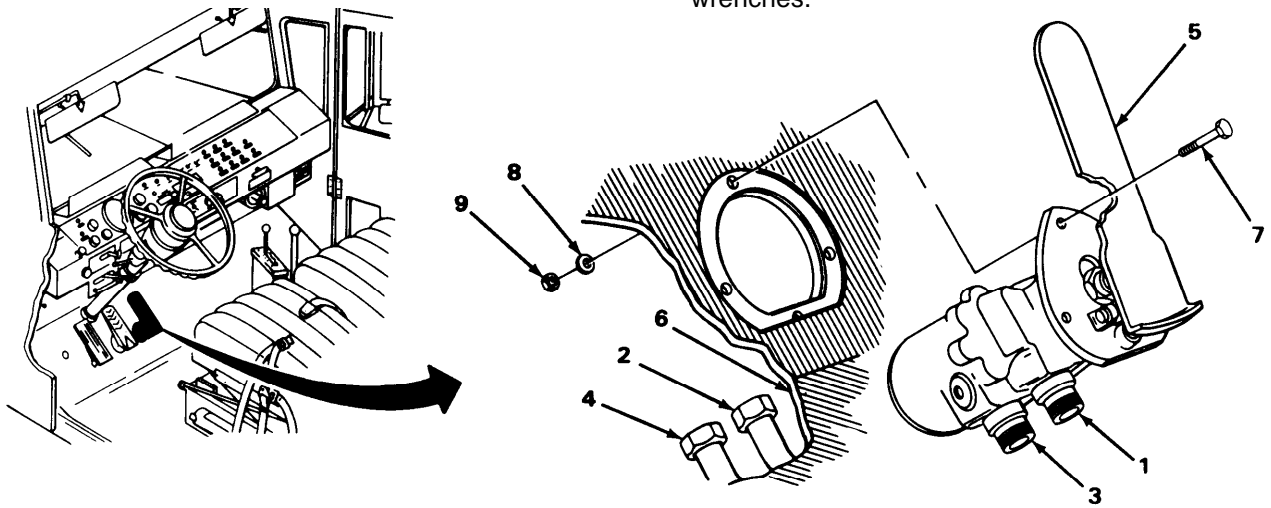
- | | | | |
|----|-----------|--|--|
| 5. | All parts | | Clean and inspect as shown in the general maintenance instructions (page 4-1). |
|----|-----------|--|--|

INSTALLATION

- | | | | |
|----|---------------|--------------------------|---------|
| 6. | Cab floor (6) | Accelerator assembly (5) | Put on. |
|----|---------------|--------------------------|---------|

ACCELERATOR ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
7. Accelerator assembly (5) to cab floor (6)	Three screws (7), new lockwashers (8), and nuts (9)	With help from assistant, screw in and tighten using 1/2-inch socket, handle, and 1/2-inch wrench.
8. Fitting (3)	Hose (4)	Screw on and tighten using 9/16-inch and 5/8-inch wrenches.
9. Fitting (1)	Hose (2)	Screw on and tighten using two 9/16-inch wrenches.



NOTE

FOLLOW-ON MAINTENANCE: Check for air leaks (page 4-1).

TASK ENDS HERE

ENGINE THROTTLE CONTROL

This task covers:

- a. Removal (page 4-128)
 - b. Cleaning and Inspection (page 4-129)
 - c. Installation (page 4-129)
-

INITIAL SETUP

Tools

- Handle, ratchet, 3/8-inch drive
- Pliers, slip-joint
- Socket, 7/16-inch, 3/8-inch drive
- Wrench, open-end, 7/16-inch
- Wrench, open-end, 9/16-inch
- Wrench, open-end, 5/8-inch

Personnel Required

One

Equipment Condition

Left side hood open (TM 9-2320-270-10).

Materials/Parts

- Lockwasher (four required)
-

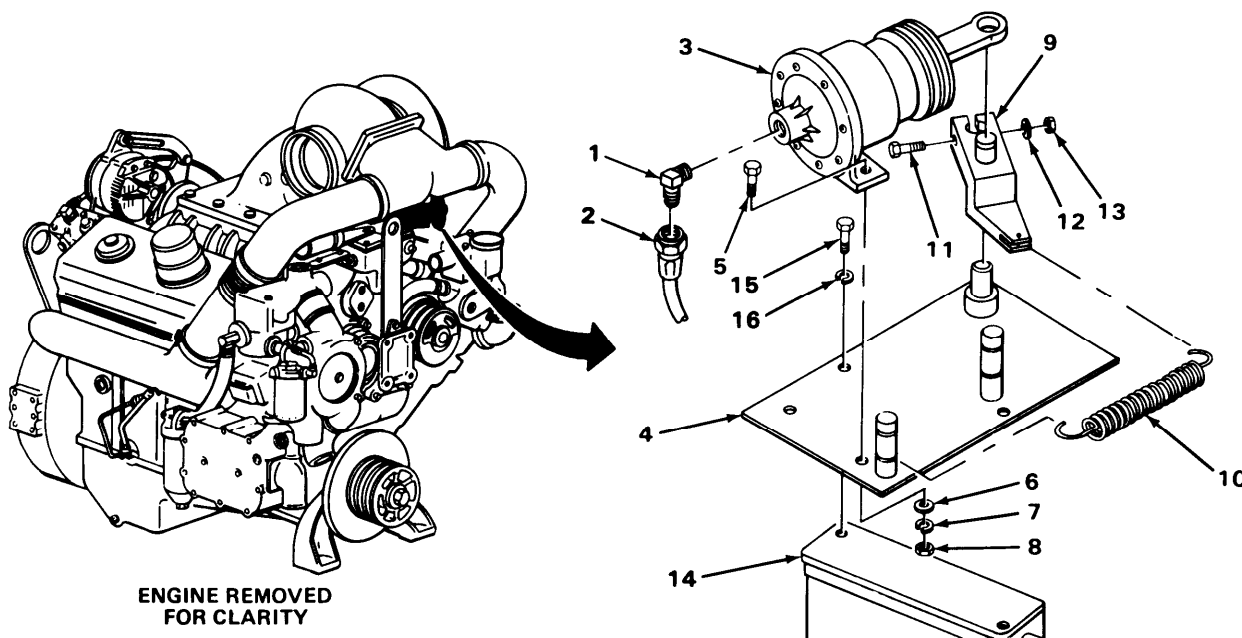
LOCATION	ITEM	ACTION REMARKS
----------	------	-------------------

REMOVAL

1. Elbow (1)	Hose (2)	Using 9/16-inch wrench, unscrew and take off.
2. Cylinder (3) to plate (4)	Two screws (5), flat washers (6), lockwashers (7), and nuts (8)	a. Using 7/16-inch socket, handle, and 7/16-inch wrench, unscrew and take out. b. Get rid of lockwashers (7).
3. Lever (9) and plate (4)	Cylinder (3)	Take off.
4. Cylinder (3)	Elbow (1)	Using 5/8-inch wrench, unscrew and take out.
5. Lever(9) and plate (4)	Spring (10)	Using slip-joint pliers, take off.
6. Lever (9)	Two screws (11), flat washers (12), nuts (13)	Using 7/16-inch socket, handle, and 7/16-inch wrench, unscrew and take out.
7. Plate (4)	Lever (1)	Take off.

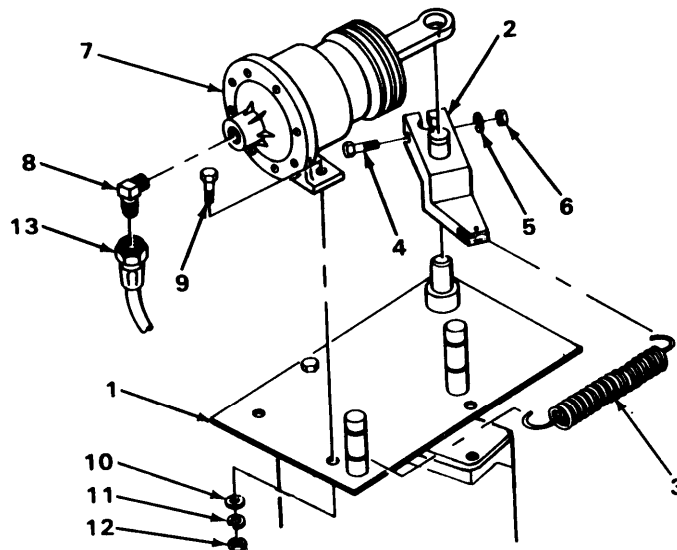
ENGINE THROTTLE CONTROL - CONTINUED

LOCATION	ITEM	ACTION REMARKS
8. Plate (4) to engine (14)	Two screws (15) and lockwashers (16)	a. Using 7/16-inch socket and handle, unscrew and take out. b. Get rid of lockwashers (16).
9. Engine (14)	Plate (4)	Take off.
CLEANING AND INSPECTION		
10.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
INSTALLATION		
11. Engine (14)	Plate (4)	Put on.
12. Plate (4) to engine (14)	Two screws (15) and new lockwashers (16)	Screw in and tighten using 7/16-inch socket and handle.



ENGINE THROTTLE CONTROL - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION - CONTINUED		
13. Plate (1)	Lever (2)	Put on.
14. Lever (2) and plate (1)	Spring (3)	Using slipjoint pliers, put on.
15. Lever (2)	Two screws (4), fiat washers (5), and nuts (6)	Screw in and tighten using 7/16-inch socket, handle, and 7/16-inch wrench.
16. Cylinder (7)	Elbow (8)	Screw in and tighten using 5/8-inch wrench.
17. Lever (2) and plate (1)	Cylinder (7)	Put on.
18. Cylinder (7) to plate (1)	Two screws (9), fiat washers (10), new lockwashers (11), and nuts (12)	Screw in and tighten using 7/16-inch socket, handle, and 7/16-inch wrench.
19. Elbow (8)	Hose (13)	Screw on and tighten using 9/16-inch wrench.



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ENGINE THROTTLE CONTROL - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Close left side of hood (TM 9-2320-270-10).
2. Check for air leaks (page 4-1).

TASK ENDS HERE

Section IV. EXHAUST SYSTEM MAINTENANCE

	Page		Page
Exhaust Pipes	4-131	Muffler	4-138

EXHAUST PIPES

This task covers:

- | | |
|--|--|
| <ul style="list-style-type: none"> a. Removal (page 4-132) b. Cleaning and Inspection (page 4-133) | <ul style="list-style-type: none"> c. Installation (page 4-134) |
|--|--|

INITIAL SETUP

Tools

- Hammer, ball-peen, 1-pound
- Handle, ratchet, 3/8-inch drive
- Socket, 1/2-inch, 3/8-inch drive
- Socket, 3/4-inch, 3/8-inch drive
- Socket, deep-well, 9/18-inch, 3/8-inch drive
- Wrench, open-end, 7/18-inch
- Wrench, open-end, 1/2-inch

Materials/Parts - Continued

- Lockwasher, lower bracket (two required)
- Lockwasher, upper bracket

Personnel Required

Equipment Condition

- Right side hood open and right side panel removed (TM 9-2320-270-1 O).

EXHAUST PIPES - CONTINUED

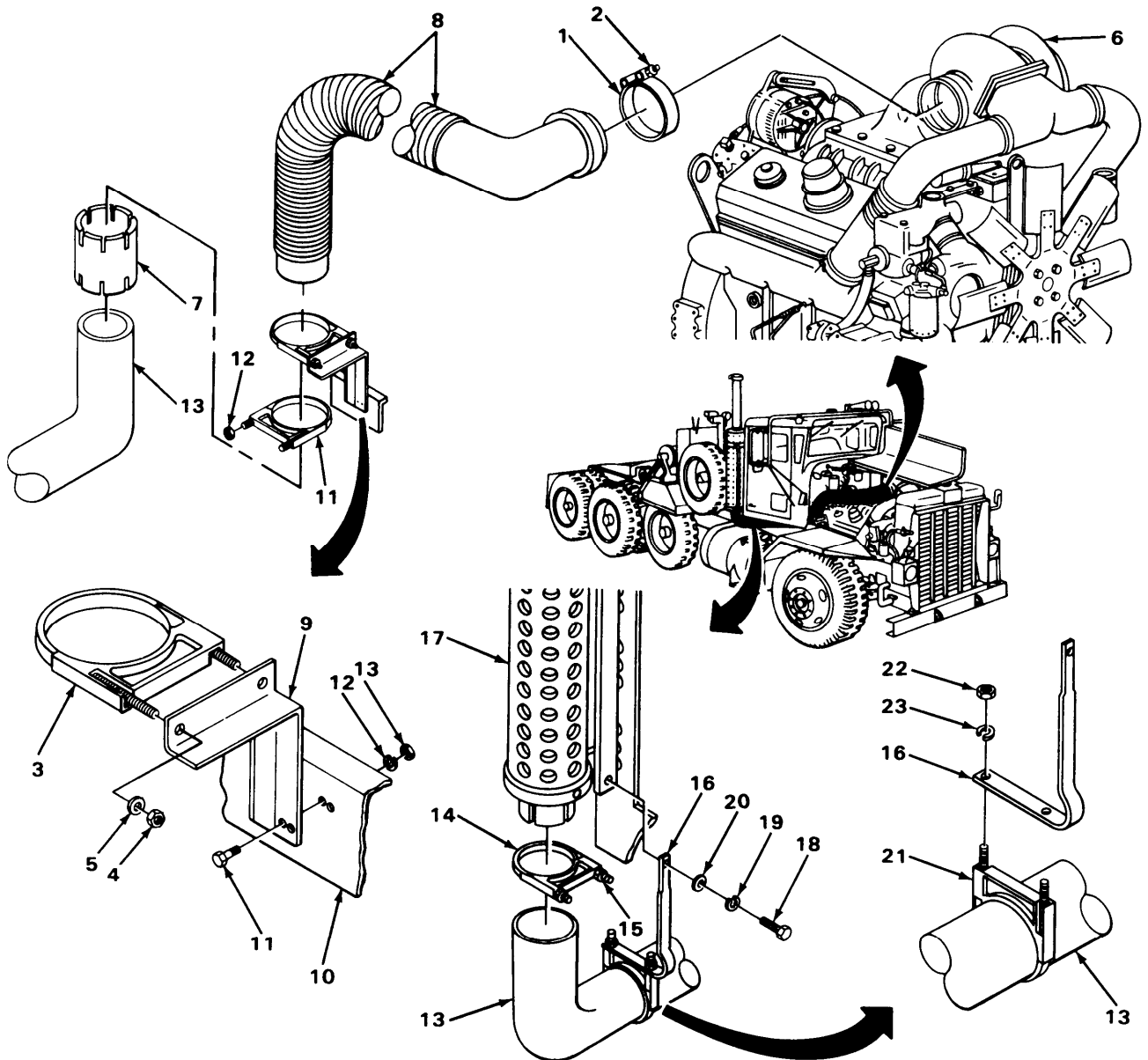
LOCATION	ITEM	ACTION REMARKS
REMOVAL		
1. Clamp (1)	Nut (2)	Using 7/16-inch wrench, unscrew part way.
2. Clamp (3)	Two nuts (4) and washers (5)	Using 9/16-inch socket and handle, unscrew and take off.
3. Turbocharger (6) and joint (7)	Front exhaust pipe (8)	Take off. Use penetrating oil and hammer if needed.
4. Bracket (9)	Clamp (3)	Take out.
5. Bracket (9) to frame (10)	Two screws (11), lockwashers (12), and nuts (13)	a. Using 1/2-inch socket, handle, and 1/2-inch wrench, unscrew and take out. b. Get rid of lockwashers (12).
6. Frame (10)	Bracket (9)	Take off.
7. Clamp (11)	Two nuts (12)	Using 9/16-inch socket and handle, unscrew part way.
8. Exhaust pipe (13)	Clamp(n)	Take off.
9.	Joint (7)	Take out. Use penetrating oil and hammer, if needed.
10. Clamp (14)	Two nuts (15)	Using 9/16-inch socket and handle, unscrew part way.
11. Bracket (16) to muffler (17)	Screw (18), lock-washer (19) and flat washer (20)	a. Using 3/4-inch socket, and handle, unscrew and take out. b. Get rid of lockwasher (19).
12. Muffler (17)	Exhaust pipe (13)	Take off. Use penetrating oil and hammer, if needed.
13. Clamp (21)	Two nuts (22) and lockwashers (23)	a. Using 9/16-inch socket and handle, unscrew and take off. b. Get rid of lockwashers (23).
14.	Bracket (16)	Take off.
15. Exhaust pipe (13)	Clamp (21)	Take off.

EXHAUST PIPES - CONTINUED

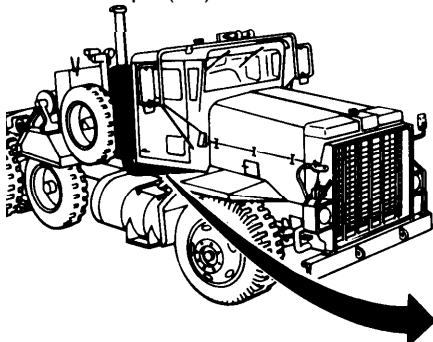
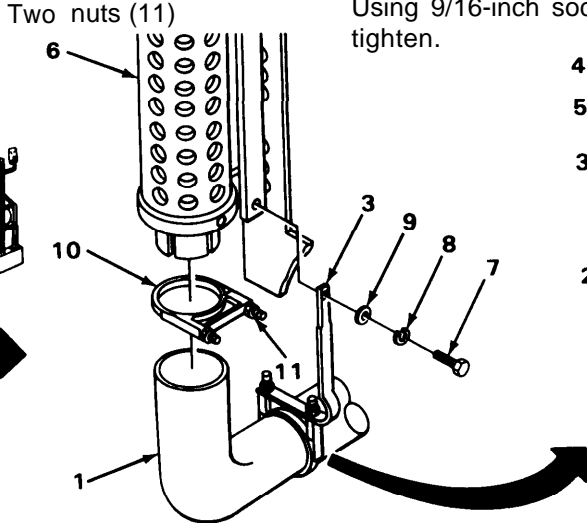
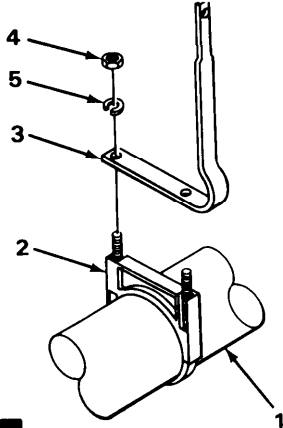
LOCATION	ITEM	ACTION REMARKS
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CLEANING AND INSPECTION

- | | | |
|-----|-----------|--|
| 16. | All parts | Clean and inspect as shown in the general maintenance instructions (page 4-1). |
|-----|-----------|--|



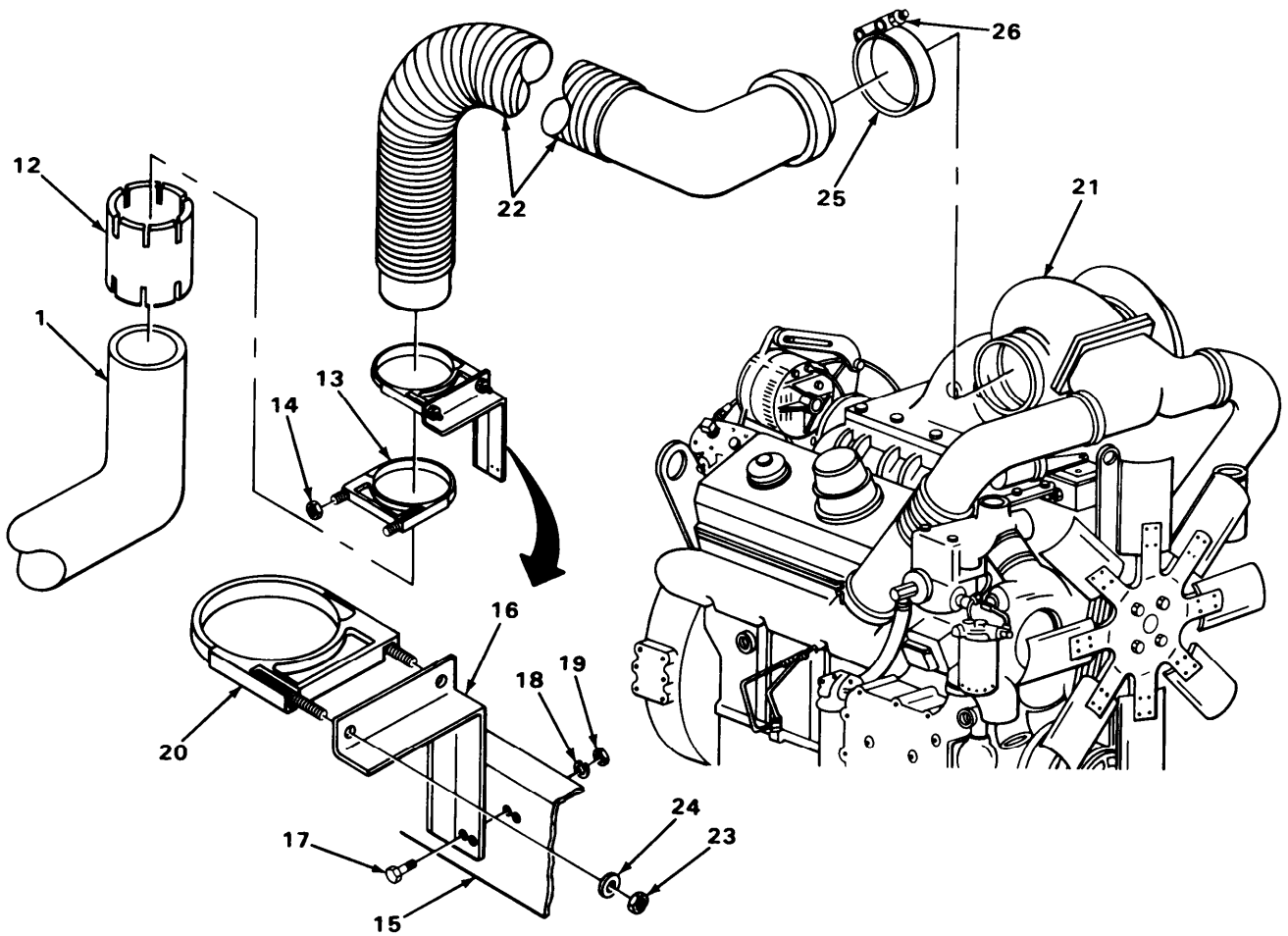
EXHAUST PIPES- CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
17. Exhaust pipe (1)	Clamp (2)	Put on.
18. Clamp (2)	Bracket (3)	Put on.
19.	Two nuts (4) and lockwashers (5)	Screw on and tighten using 9/16-inch socket and handle.
20. Muffler (6)	Exhaust pipe (1)	Put on.
21. Bracket (3) to muffler (6)	Screw (7), new lockwasher (8), and flat washer (9)	Screw in using 3/4-inch socket and handle.
22. Clamp (10)	Two nuts (11)	Using 9/16-inch socket and handle, tighten.
		
23. Exhaust pipe (1)	Joint (12)	Put in.
24.	Clamp (13)	Put on.
25. Clamp (13)	Two nuts (14)	Using 9/16-inch socket and handle, tighten.
26. Frame (15)	Bracket (16)	Put on.
27. Bracket (16) to frame (15)	Two screws (17), new lockwashers (18), and nuts (19)	Screw in using 1/2-inch socket, handle, and 1/2-inch wrench.
28. Bracket (16)	Clamp (20)	Put in.

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EXHAUST PIPES - CONTINUED

LOCATION	ITEM	ACTION REMARKS
29. Turbocharger (21) and joint (12)	Front exhaust pipe (22)	Put on.
30. Clamp (20)	Two nuts (23) and washers (24)	Screw on and tighten using 9/16-inch socket and handle.
31. Clamp (25)	Nut (26)	Using 7/16-inch wrench, tighten.



NOTE

FOLLOW-ON MAINTENANCE:

1. Start engine and check for leaks (TM 9-2320-270-10).
2. Install right side panel and close right side of hood (TM 9-2320-270-10).

TASK ENDS HERE

MUFFLER

This task covers:

- a. Removal (page 4-136)
 - b. Cleaning and Inspection (page 4-139)
 - c. Installation (page 4-139)
-

INITIAL SETUP

Tools

Hammer, ball-peen, 1-pound
 Handle, ratchet, 3/8-inch drive
 Socket, deep-well, 1/2-inch,
 3/8-inch drive
 Socket, deep-well, 9/16-inch,
 3/8-inch drive
 Socket, 3/4-inch, 3/8-inch drive
 Wrench, open-end, 1/2-inch

Materials/Parts

Lockwasher, bracket to muffler
 Lockwasher, cab to muffler (nine required)
 Lockwasher, handle to muffler (two required)
 Lockwasher, mount to cab (18 required)

Personnel Required

One

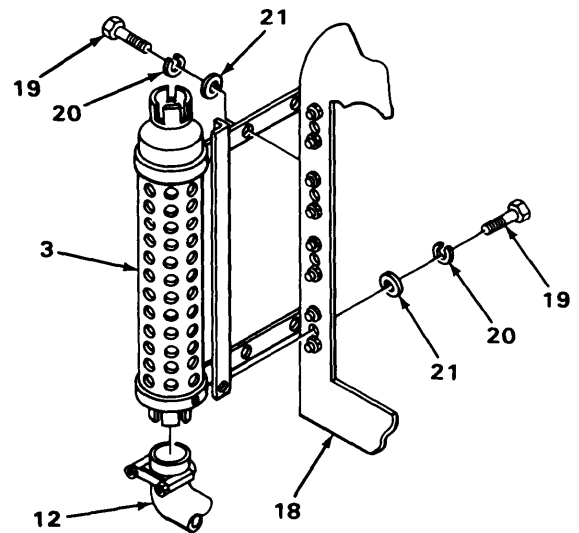
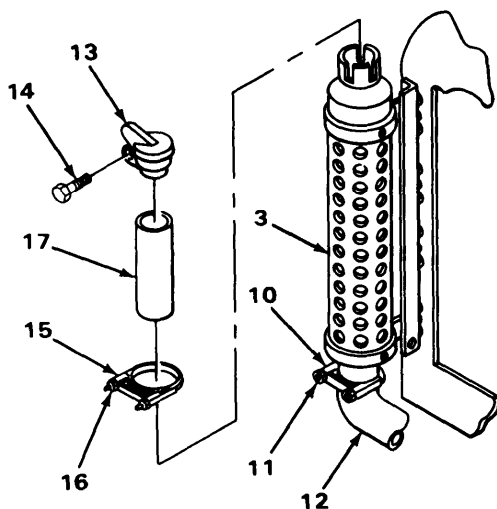
LOCATION	ITEM	ACTION REMARKS
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REMOVAL

- | | | |
|--|---|--|
| 1. Right side of cab (1)/handle (2) to muffler (3) | Two screws (4) and lockwashers (5) | a. Using 1/2-inch socket and handle, unscrew and take out.
b. Get rid of lockwashers (5). |
| 2. Muffler(3) | Handle (2) | Take off. |
| 3. Bracket (6) to muffler (3) | Screw (7), lock-washer (8), and flat washer (9) | s. Using 3/4-inch socket, and handle, unscrew and take out.
b. Get rid of lockwasher (8). |

MUFFLER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
4. Clamp (10)	Two nuts (11)	Using 9/16-inch socket and handle, un-screw part way.
5. Exhaust pipe (12)	Clamp (10)	Slide down.
6. Cap (13)	Screw (14)	Using 1/2-inch wrench, unscrew and take out.
7. Muffler(3)	Cap (13)	Take off.
8. Clamp (15)	Two nuts (16)	Using 9/16-inch socket and handle, un-screw part way.
9. Muffler(3)	Clamp (15)	Take off.
10.	Tailpipe (17)	Take out. Use penetrating oil and hammer, if needed.
11. Cab (18) to muffler (3)	Nine screws (19), lockwashers (20), and washers (21)	a. Using 3/4-inch socket and handle, un-screw and take out. b. Get rid of lockwashers (20).
12. Exhaust pipe (12)	Muffler (3)	Take off. Use penetrating oil and hammer, if needed.



MUFFLER - CONTINUED

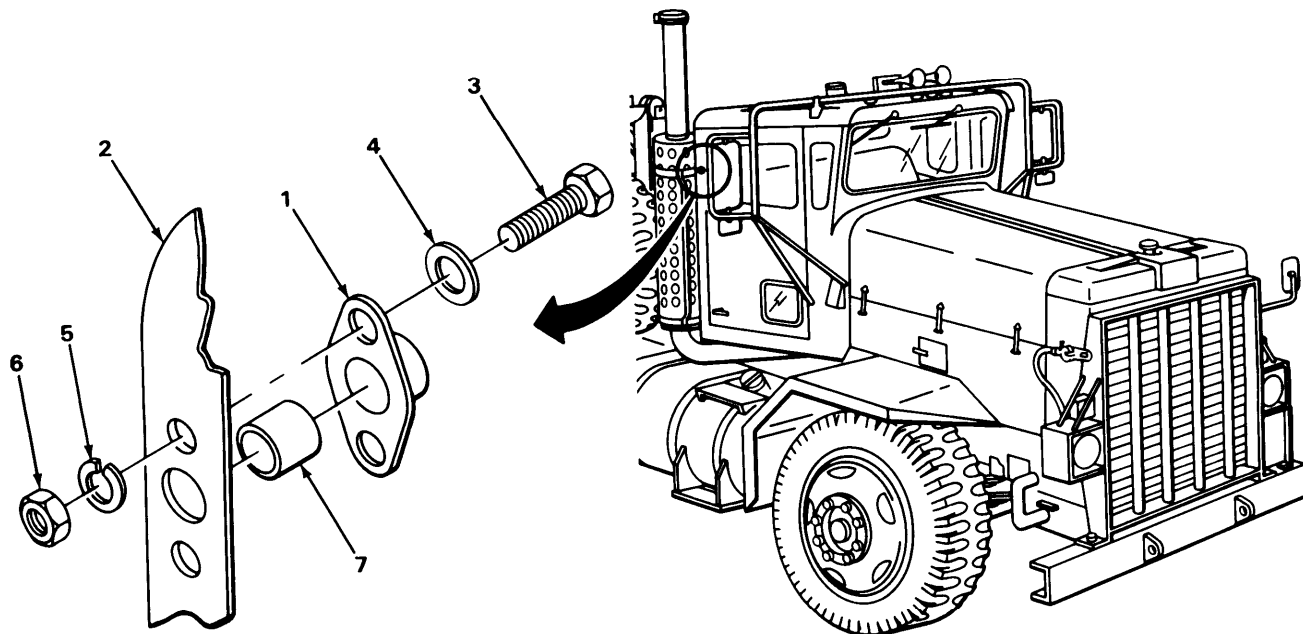
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

NOTE

There are four bracket rubber mounts. Do steps 13, 14, and 15 to take off any bracket rubber mount.

- | | | |
|---|--|--|
| 13. Bracket rubber mount (1) to cab (2) | Two screws (3), washers (4), lockwashers (5), and nuts (6) | a. Using 1/2-inch socket, handle, and 1/2-inch wrench, unscrew and take out.
b. Get rid of lockwashers (5). |
| 14. Cab (2) | Bracket rubber mount (1) | Take off. |
| 15. Bracket rubber mount (1) | Spacer (7) | Take off. |



NOTE

There are five strap rubber mounts. Do steps 16 and 17 to take off any strap rubber mount.

- | | | |
|---------------------------------------|---|---|
| 16. Strap rubber mount (8) to cab (2) | Two screws (9), washers (10), lockwashers (11), and nuts (12) | a. Using 1/2-inch socket, handle, and 1/2-inch wrenches, unscrew and take out.
b. Get rid of lockwashers (11). |
|---------------------------------------|---|---|

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MUFFLER - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
17. Cab (2)	Strap rubber mount (8)	Take off.	

CLEANING AND INSPECTION

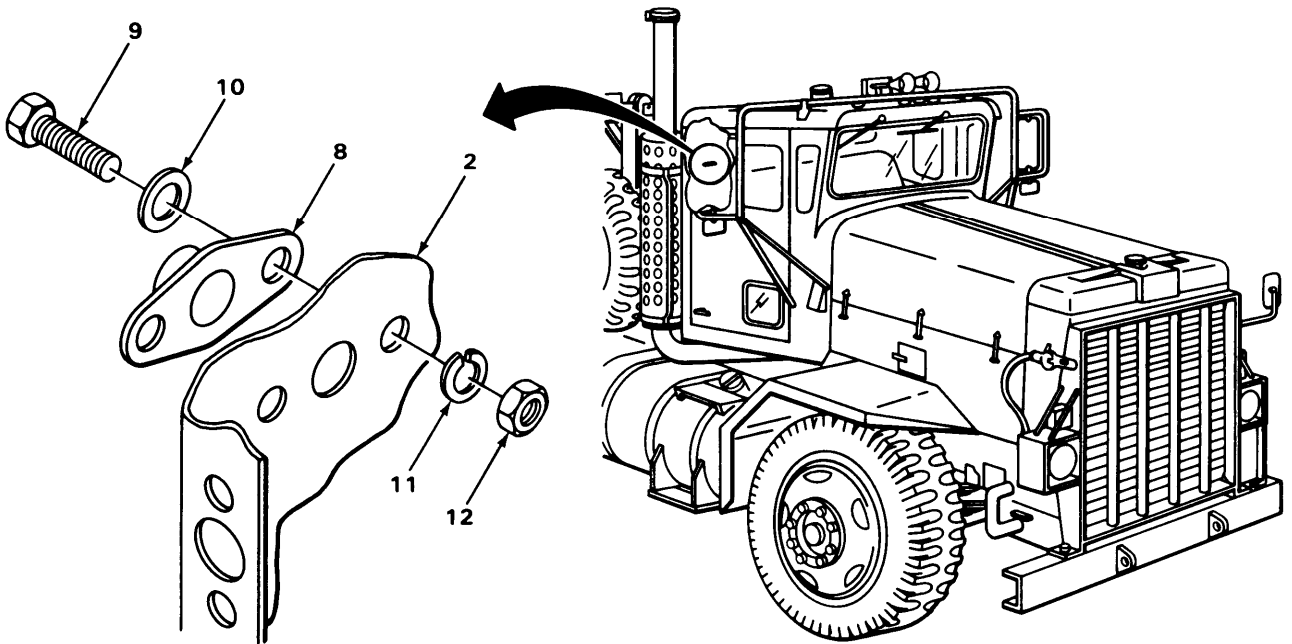
18.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
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INSTALLATION

NOTE

There are five strap rubber mounts. Do steps 19 and 20 to put on any strap rubber mount.

19. Cab (2)	Strap rubber mount (8)	Put on.
20. Strap rubber mount (8) to cab (2)	Two screws (9), washers (10), new lockwashers (11), and nuts (12)	Screw in and tighten using 1/2-inch socket, handle, and 1/2-inch wrench.



MUFFLER - CONTINUED

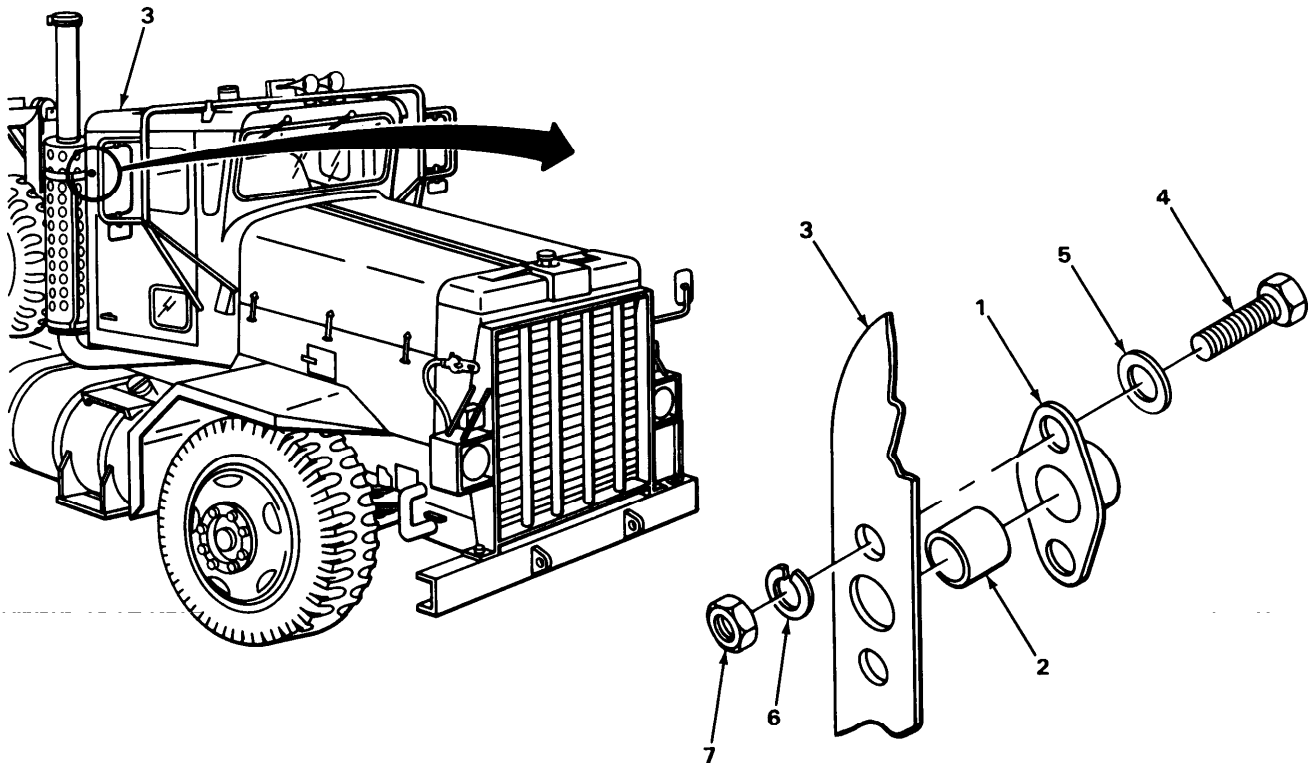
LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION – CONTINUED

NOTE

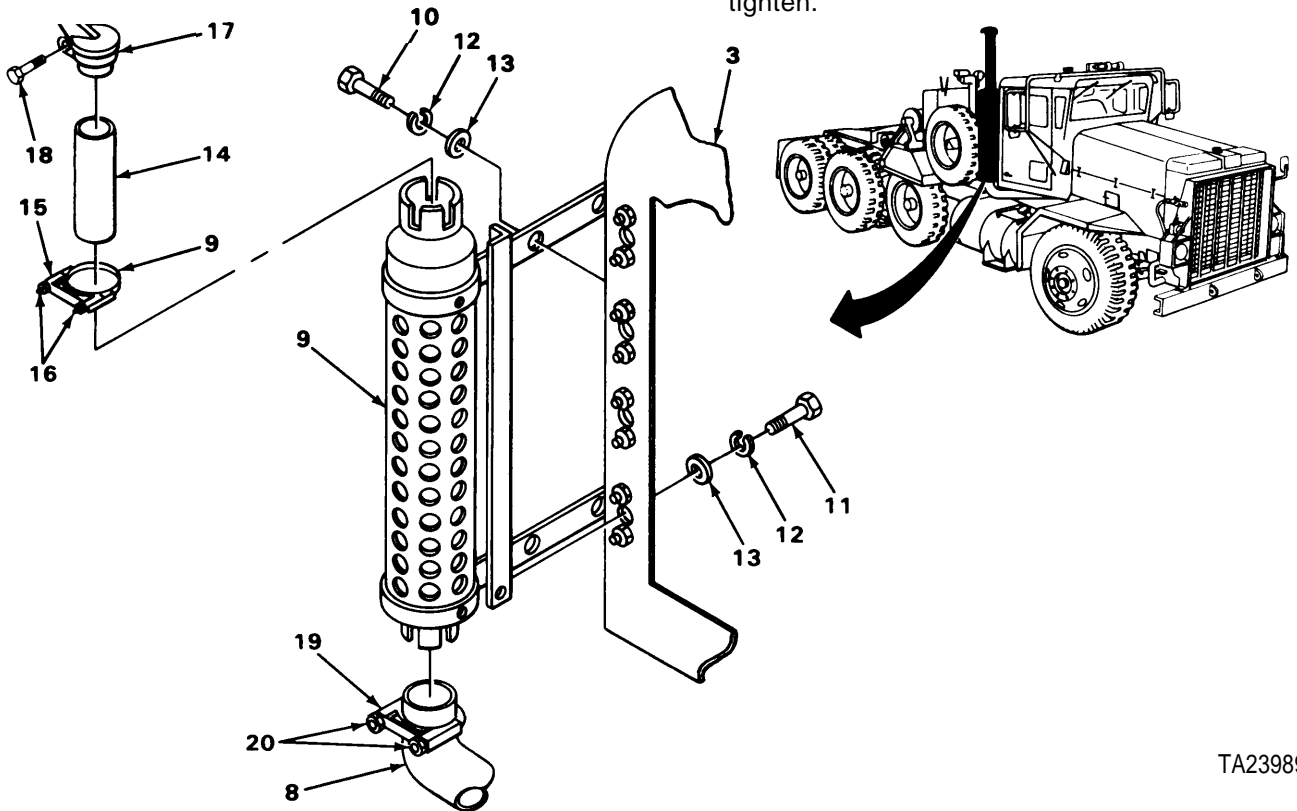
There are four bracket rubber mounts. Repeat steps 21,22, and 23 to put on any bracket rubber mount.

- | | | | |
|-----|-------------------------------------|--|--|
| 21. | Bracket rubber mount (1) | Spacer (2) | Put in. |
| 22. | Inside cab (3) | Bracket rubber mount (1) | Put on. |
| 23. | Bracket rubber mount (1) to cab (3) | Two screws (4), washers (5), new lockwashers (6), and nuts (7) | Screw in and tighten using 1/2-inch socket, handle, and 1/2-inch wrench. |



MUFFLER - CONTINUED

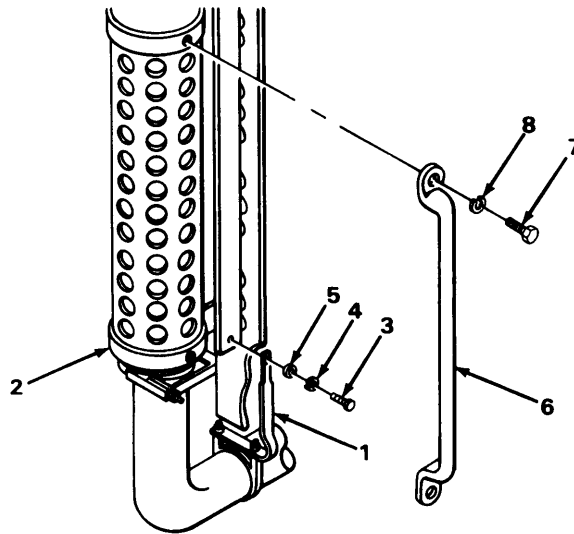
LOCATION	ITEM	ACTION	REMARKS
24. Exhaust pipe (8)	Muffler (9)	Put on.	
25. Cab (3) to muffler (9)	Four long screws (10), five short screws (11), nine new lockwashers (12), and washers (13)	Screw in using 3/4-inch socket and handle.	Long screws go outside cab. Short screws go inside cab.
26. Muffler (9)	Tailpipe (14)	Put in.	
27.	Clamp (15)	Put on.	
28. Clamp (15)	Two nuts (16)	Using 9/16-inch socket and handle, tighten.	
29. Tailpipe (14)	Cap (17)	Put on.	
30. Cap (17)	Screw (18)	Screw in and tighten using 1/2-inch wrench.	
31. Exhaust pipe (8)	Clamp (19)	Place in position.	
32. Clamp (19)	Two nuts (20)	Using 9/16-inch socket and handle, tighten.	



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MUFFLER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION – CONTINUED		
33. Bracket (1) to muffler (2)	Screw (3), new lockwasher (4), and flat washer (5)	Screw in using 3/4-inch socket and handle.
34. Muffler (2)	Handle (6)	Put on.
35. Handle (6) to muffler (2)	Two screws (7) and new lockwashers (8)	Screw in using 1/2-inch socket and handle.



TASK ENDS HERE

Section V. COOLING SYSTEM MAINTENANCE

	Page		Page
Fan	4-198	Radiator	4-143
Fan Belts	4-200	Radiator Guards and Shrouds	4-151
Fan Clutch Drive	4-204	Radiator Hoses and Fittings	4-160
Fan Clutch Drive Hoses and Fittings	4-207	Thermal Air Valve	4-205
Heat Exchanger	4-147	Thermostats	4-173
Heat Exchanger Hoses, Tubes, and Fittings	4-168	Thermostat Housings	4-182

RADIATOR

This task covers:

- | | |
|--|---|
| <ul style="list-style-type: none"> a. Removal (page 4-144) b. Cleaning and Inspection (page 4-145) | <ul style="list-style-type: none"> c. Testing (page 4-145) d. Installation (page 4-145) |
|--|---|
-

INITIAL SETUP

Tools

- Handle, ratchet, 1/2-inch drive
- Hoist
- Screwdriver, flat-tip, 1/4-inch
- Stud remover and installer,
1/2-inch drive
- Wrench, open-end, 3/4-inch
(two required)
- Wrench, open-end, 15/16-inch
- Wrench, open-end, 1 1/8-inch

Personnel Required

Two

Equipment Condition

Radiator guards and shrouds removed
(page 4-151).

Materials/Parts

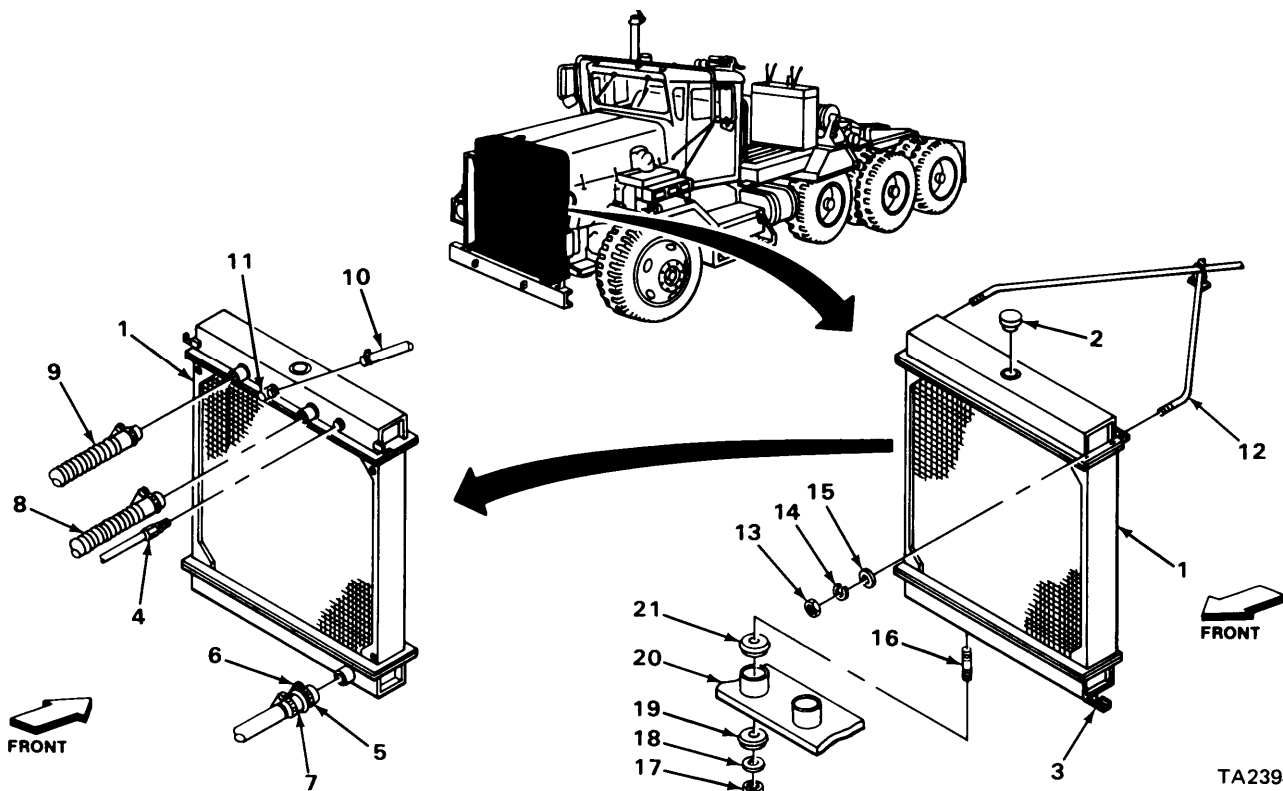
- Container (35 gallon capacity)
- Locknut (two required)
- Lockwasher (two required)

RADIATOR - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL		
<u>WARNING</u>		
Be careful when removing radiator cap. If engine is hot, escaping steam could burn you. Using a rag, cover radiator cap to protect your hand. Unscrew cap just enough to allow any built-up steam to escape. When all pressure has been relieved, unscrew cap the rest of the way, and take off of radiator.		
1. Radiator (1)	Radiator cap (2)	a. Slowly turn to first stop and let pressure escape. b. When all pressure has escaped, unscrew and take off.
2.	Draincock (3)	a. Put container underneath. b. Open and let coolant drain. c. When coolant stops draining, close. d. Get rid of fluid (page 4-1).
3.	Hose (4)	Using 3/4-inch wrench, unscrew and take off.
4. Four hose clamps (5)	Four screws (6)	Using screwdriver, unscrew part way.
5. Radiator (1)	Four hoses (7), (8), (9), and (10)	Pull off.
6.	Elbow (11)	Using 1 1/8-inch wrench, unscrew and take out.
7. Crossbar support (12)	Two nuts (13), lockwashers (14), and washers (15)	a. Using two 3/4-inch wrenches, unscrew and take off. b. Get rid of lockwashers (14).
8. Radiator (1)	Crossbar support (12)	Lift out.
9. Two studs (16)	Two locknuts (17), washers (18), and rubber cushions (19)	a. Using 15/16-inch wrench, unscrew and take off. b. Get rid of locknuts (17),
10. Frame (20)	Radiator (1) and two rubber cushions (21)	Using hoist, take off.
11. Radiator (1)	Two studs (16)	Using stud remover and installer and handle, unscrew and take out.

RADIATOR - CONTINUED

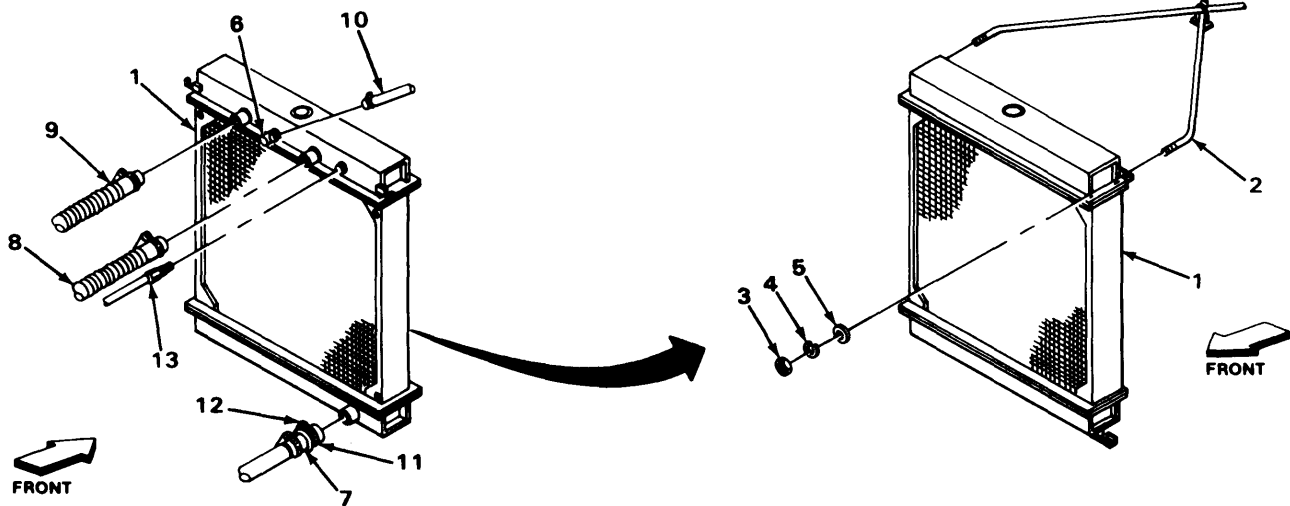
LOCATION	ITEM	ACTION	REMARKS
CLEANING AND INSPECTION			
12.	Radiator (1)	Clean and inspect (TM 750-254).	
13.	All parts except radiator (1)	Clean and inspect as shown in the general maintenance instructions (page 4-1).	
TESTING			
14.	Radiator (1)	Test (TB 750-651).	
INSTALLATION			
15. Radiator (1)	Two studs (16)	Screw in and tighten using stud remover and installer and handle.	
16. Frame (20)	Radiator (1) and two rubber cushions (21)	Using hoist, lower into position.	
17. Two studs (16)	Two new locknuts (17), washers (18), and rubber cushions (19)	Screw on and tighten using 15/16-inch wrench.	



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RADIATOR - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION - CONTINUED		
18. Radiator (1)	Crossbar support (2)	Put in.
19. Crossbar support (2)	Two nuts (3), new lockwashers (4), and washers (5)	Screw on and tighten using two 3/4-inch wrenches.
20. Radiator (1)	Elbow (6)	Screw in and tighten using 1 1/8-inch wrench. Make sure elbow opening is facing up.
21.	Four hoses (7), (8), (9), and (10)	Push on.
22. Four hose clamps(11)	Four screws (12)	Using screwdriver, tighten.
23. Radiator (1)	Hose (13)	Screw on and tighten using 3/4-inch wrench.



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RADIATOR - CONTINUED**NOTE**

FOLLOW-ON MAINTENANCE:

1. Fill cooling system (TM 9-2320-270-10).
2. Check for leaks (page 4-1).
3. Install radiator guards and shrouds (page 4-151).

TASK ENDS HERE**HEAT EXCHANGER**

This task covers:

- | | |
|--|--|
| <ul style="list-style-type: none"> a. Removal (page 4-148) b. Cleaning and Inspection (page 4-148) | <ul style="list-style-type: none"> c. installation (page 4-149) |
|--|--|
-

INITIAL SETUP**Tools**

Handle, ratchet, 3/8-inch drive
 Jack, hydraulic
 Pry bar
 Socket, 9/16-inch, 3/8-inch drive
 Wrench, 15-inch adjustable
 Wrench, open-end, 7/16-inch
 Wrench, open-end, 9/16-inch

Materials/Parts

Container (three required)
 Lockwasher (four required)

Personnel Required

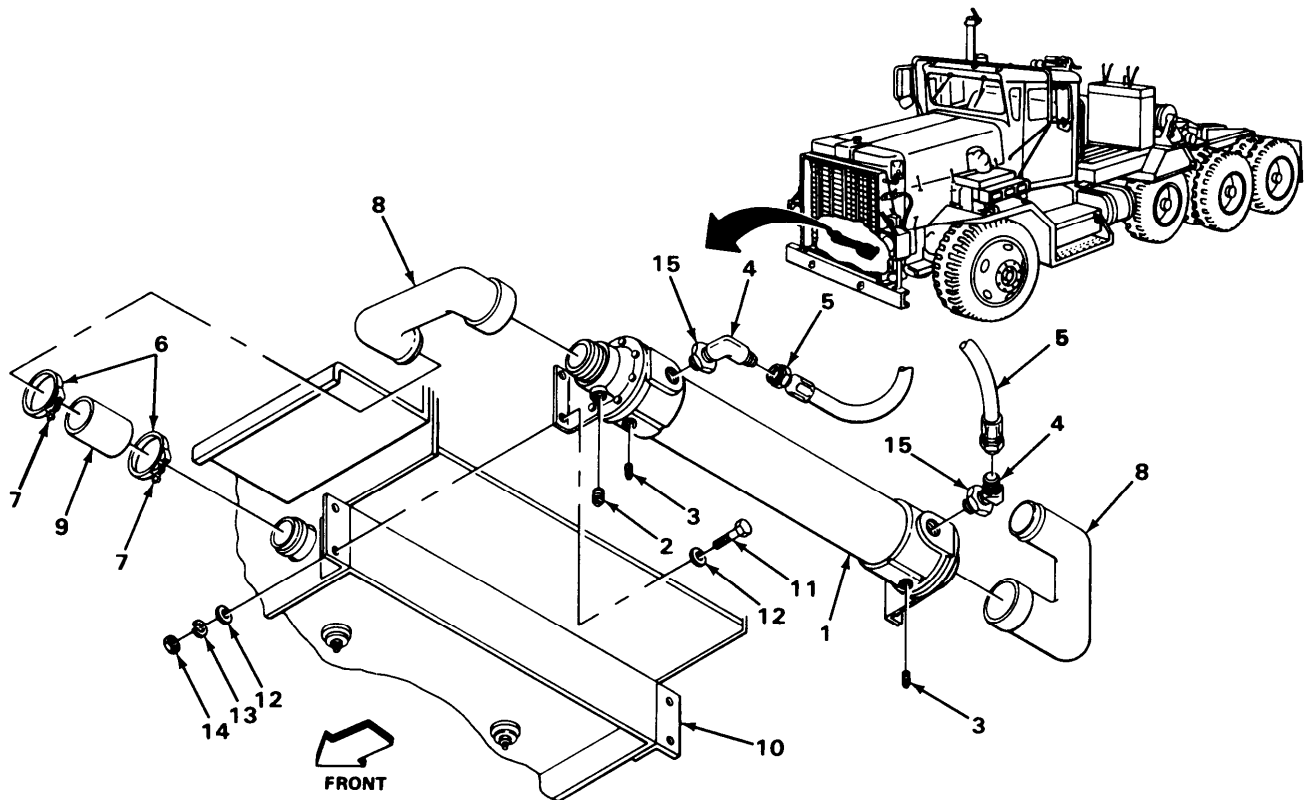
One

HEAT EXCHANGER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL		
1. Heat exchanger (1)	Coolant plug (2)	a. Put container underneath. b. Using 9/16-inch wrench, unscrew and take out. c. When coolant stops draining, screw in and tighten using 9/16-inch wrench.
2.	Two transmission oil plugs (3)	a. Put containers underneath. b. Using 7/16-inch wrench, unscrew and take out. c. When transmission oil stops draining, screw in and tighten using 7/16-inch wrench. d. Get rid of fluid (page 4-1).
3. Two elbows (4)	Two transmission oil hoses (5)	Using adjustable wrench, unscrew and take off.
4. Four hose clamps (6)	Four nuts (7)	Using 7/16-inch wrench, unscrew and take off.
5. Two tubes (8)	Two hoses (9)	Pull off.
6. Under vehicle	Heat exchanger (1)	Using jack, support.
7. Heat exchanger (1) to bracket (10)	Four bolts (11), eight washers (12), four lockwashers (13), and nuts (14)	a. Using socket, handle, and 9/16-inch wrench, unscrew and take out. b. Get rid of lockwashers (13).
8. Under vehicle	Heat exchanger (1)	Using jack, take out.
9. Heat exchanger (1)	Two reducers (15)	Using adjustable wrench, unscrew and take out.
10.	Two tubes (8)	Using pry bar, unscrew and take out.
CLEANING AND INSPECTION		
11.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).

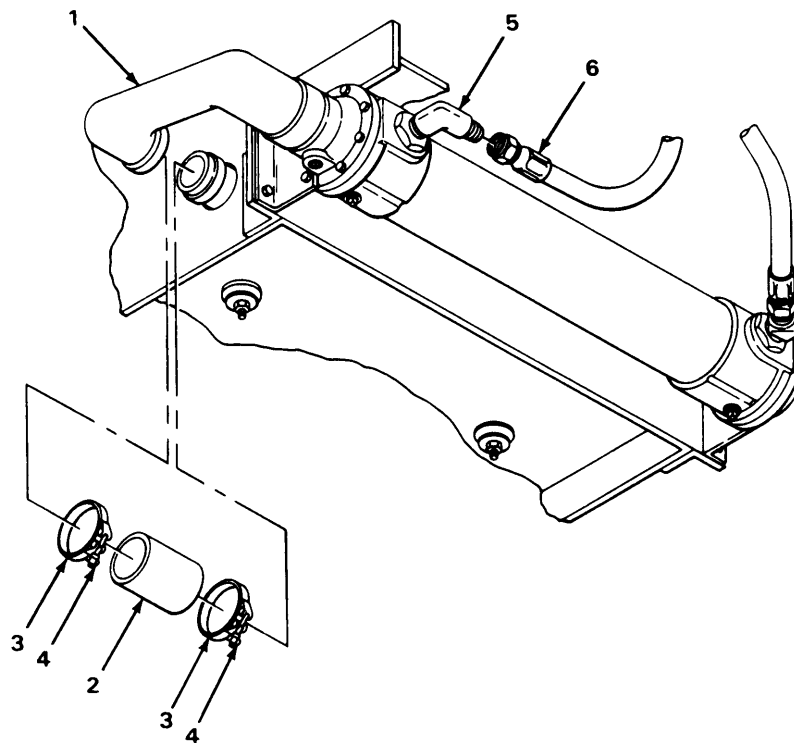
HEAT EXCHANGER - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
12. Heat exchanger (1)	Two tubes (8)	Screw in and tighten using pry bar.	Make sure right side tube opening is on top and left side tube opening is toward front of heat exchanger.
13.	Two reducers (15)	Screw in and tighten using adjustable wrench.	Make sure elbows are turned toward each other.
14. Under vehicle	Heat exchanger (1)	Place in position and using jack, support.	
15. Heat exchanger (1) to bracket (10)	Four bolts (11), eight washers (12), four new lockwashers (13), and nuts (14)	Screw in and tighten using socket, handle, and 9/16-inch wrench.	



HEAT EXCHANGER - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION – CONTINUED			
16. Two tubes (1)	Two hoses (2)	Push on.	
17. Four hose clamps (3)	Four nuts (4)	Screw in and tighten using 7/16-inch wrench.	
18. Two elbows (5)	Two transmission oil hoses (6)	Screw on and thighten using adjustable wrench.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Fill cooling system (TM 9-2320-270-10).
2. Fill transmission with fluid (TM 9-2320-270-10).
3. Check for leaks (page 4-1).

TASK ENDS HERE

TA239901

RADIATOR GUARDS AND SHROUDS

This task covers:

- | | |
|--|--|
| <ul style="list-style-type: none"> a. Removal (page 4-152) b. Cleaning and Inspection (page 4-156) | <ul style="list-style-type: none"> c. Installation (page 4-156) |
|--|--|
-

INITIAL SETUP

Tools

Extension, 5-inch, 1/2-inch drive
 Handle, ratchet, 1/2-inch drive
 Screwdriver, flat-tip, 3/8-inch,
 Socket, 7/16-inch, 1/2-inch drive
 Socket, 1/2-inch, 1/2-inch drive
 Socket, 3/4-inch, 1/2-inch drive
 Socket, 15/16-inch, 1/2-inch drive
 Wrench, open-end, 1/2-inch
 Wrench, open-end, 3/4-inch
 Wrench, open-end, 15/16-inch

Materials/Parts

Lockwasher, fan guard to fan shroud
 (six required)
 Lockwasher, support brace to clamp
 (four required)

Materials/Parts – Continued

Lockwasher, upper radiator shroud to radiator
 guard (11 required)
 Lockwasher, radiator guard to radiator guard
 support (12 required)
 Lockwasher, radiator guard support to
 radiator shroud (10 required)

Personnel Required

Two

Equipment Condition

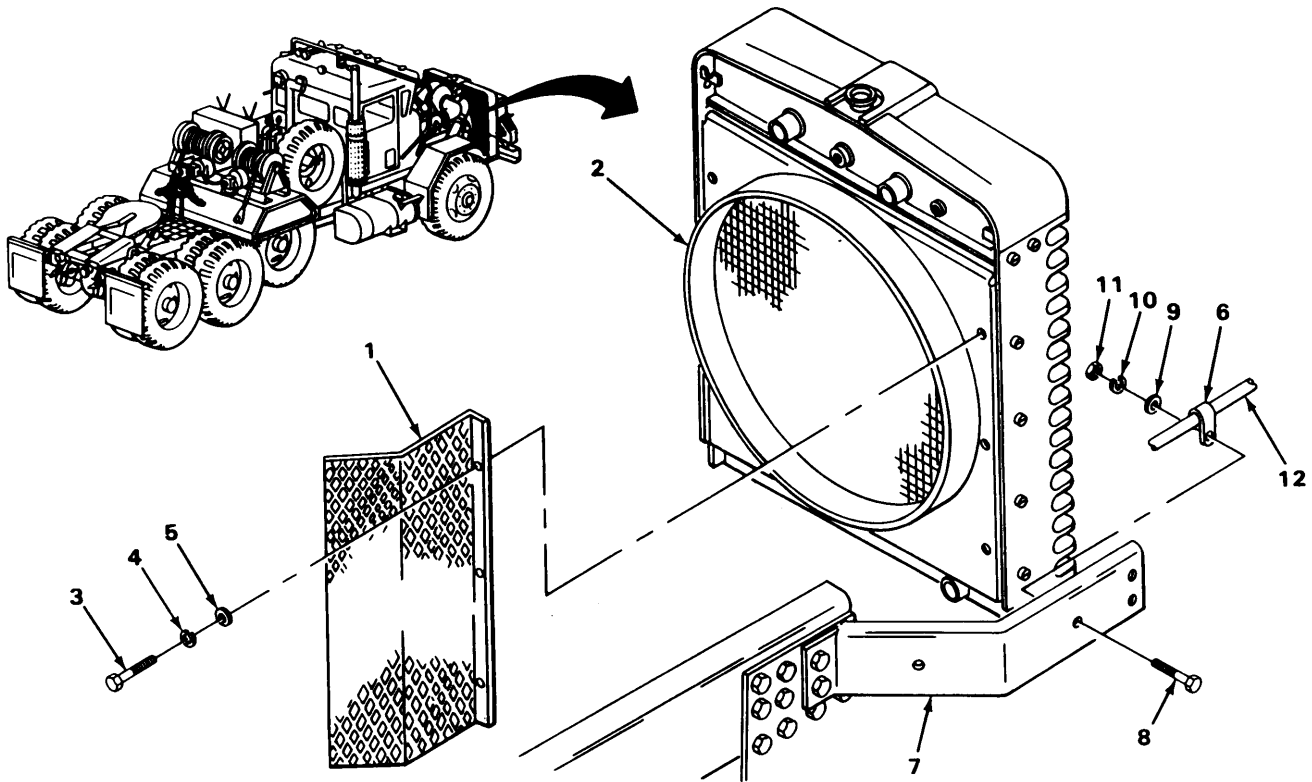
Remove hood (TM 9-2320-270-10).
 Remove side panels (TM 9-2320-270-10).

RADIATOR GUARDS AND SHROUDS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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REMOVAL

- | | | |
|---|--|---|
| <p>1. Two fan guards (1)
to fan shroud (2)</p> | <p>Six screws (3),
lockwashers (4),
and washers (5)</p> | <p>a. Using 7/16-inch socket, extension,
and handle, unscrew and take out.
b. Get rid of lockwashers (4).</p> |
| <p>2. Fan shroud (2)</p> | <p>Two fan guards (1)</p> | <p>Take off.</p> |
| <p>3. Four clamps (6)
to two support
braces (7)</p> | <p>Four bolts (8),
washers (9), lock-
washers (10) and
nuts (11)</p> | <p>a. Using 1/2-inch socket, handle, and
1/2-inch wrench, unscrew and take
out.
b. Get rid of lockwashers (10).</p> |



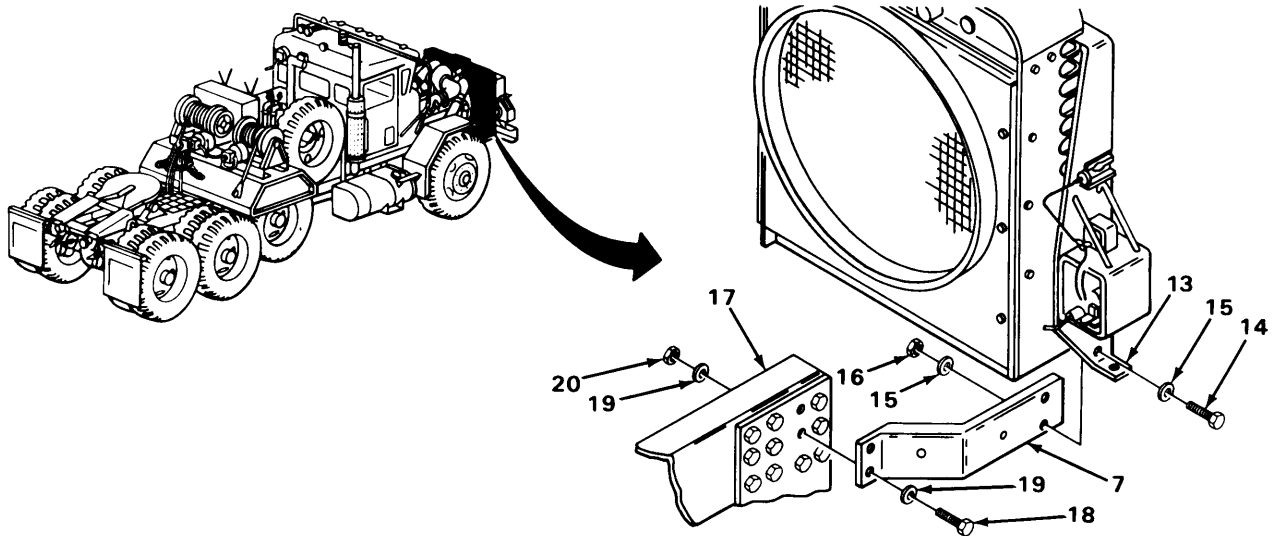
- | | | |
|---|--|--|
| <p>4. Two support braces
(7) to radiator and
headlight guard (13)</p> | <p>Four bolts (14),
eight washers (15),
and four nuts (16)</p> | <p>Using 3/4-inch socket, handle, and 3/4-
inch wrench, unscrew and take out.</p> |
| <p>5. Two support braces
(7) to frame (17)</p> | <p>Four bolts (18),
eight washers (19),
and four nuts (20)</p> | <p>Using 15/16-inch socket, handle, and
15/16-inch wrench, unscrew and take out.</p> |

TA239902

RADIATOR GUARDS AND SHROUDS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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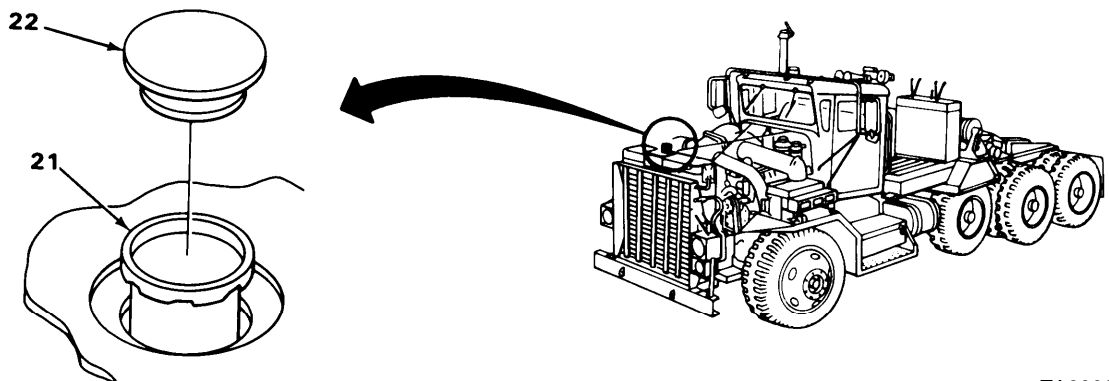
- | | | |
|---|------------------------|----------------------|
| 6. Radiator and headlight guard (13) and frame (17) | Two support braces (7) | Move out of the way. |
|---|------------------------|----------------------|



WARNING

Be careful when removing radiator cap. If engine is hot, escaping steam could burn you. Using a rag, cover radiator cap to protect your hand. Unscrew cap just enough to allow any built-up steam to escape. When all pressure has been relieved, unscrew cap the rest of the way, and take off of radiator.

- | | | |
|------------------|-------------------|--|
| 7. Radiator (21) | Radiator cap (22) | a. Slowly turn to first step and let pressure escape.
b. When all pressure has escaped, unscrew and take off. |
|------------------|-------------------|--|



RADIATOR GUARDS AND SHROUDS- CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL- CONTINUED		
8. Radiator guard (1) to two radiator guard supports (2)	12 screws (3) and lockwashers (4)	a. Using screwdriver, unscrew and take out. b. Get rid of lockwashers (4).
<u>WARNING</u>		
Some parts are heavy. Be careful when handling them. Lifting equipment is needed when parts weigh over 50 pounds (23 kg) for a single person lift, over 100 pounds (45 kg) for a two person lift, and over 150 pounds (68 kg) for a three or more person lift. Do not try to handle heavy parts without lifting equipment. Keep clear of heavy parts supported only by lifting equipment. Failure to observe this precaution could cause serious injury or death of personnel.		
9. Two radiator guard supports (2)	Radiator guard (1) and upper radiator shroud (5)	Take off.
10. Upper radiator shroud (5) to radiator guard (1)	11 screws (6), 11 washers (7), 22 lockwashers (8), and nuts (9)	a. Using screwdriver, 1/2-inch socket, and handle, unscrew and take out. b. Get rid of lockwashers (8).
11. Radiator guard (1)	Upper radiator shroud (5)	Take off.
12. Radiator fan (10) to pulley (n)	Four screws (12) and lockwashers (13)	Using 3/4-inch socket and handle, unscrew and take out.
13. Pulley (n)	Radiator fan (10)	Take off.
14. Two radiator guard supports (2) to radiator (14)	10 screws (15) and lockwashers (16)	a. Using 1/2-inch socket, extension, and handle, unscrew and take out. b. Get rid of lockwashers (16).
15. Right side support (14)	Three clamps (17)	Take off.
16. Radiator (14)	Two radiator guard supports (2)	Take off.

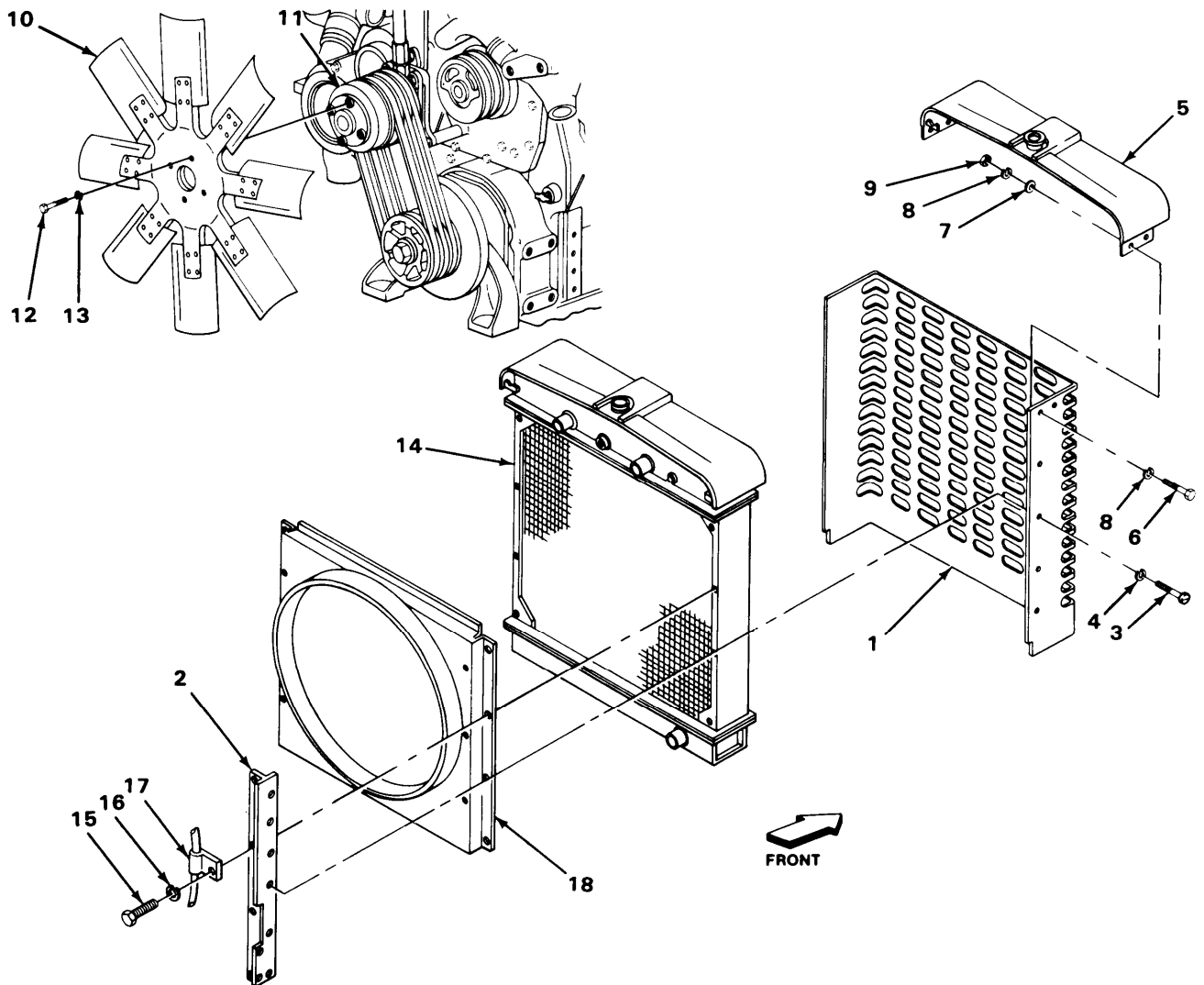
RADIATOR GUARDS AND SHROUDS- CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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WARNING

Some parts are heavy. Be careful when handling them. Lifting equipment is needed when parts weigh over 50 pounds (23 kg) for a single person lift, over 100 pounds (45 kg) for a two person lift, and over 150 pounds (88 kg) for a three or more person lift. Do not try to handle heavy parts without lifting equipment. Keep clear of heavy parts supported only by lifting equipment. Failure to observe this precaution could cause serious injury or death of personnel.

- | | | | |
|-----|----------------------|-----------|--|
| 17. | Radiator shroud (18) | Take off. | |
|-----|----------------------|-----------|--|



RADIATOR GUARDS AND SHROUDS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
CLEANING AND INSPECTION		
18.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-l).

INSTALLATION

WARNING

Some parts are heavy. Be careful when handling them. Lifting equipment is needed when parts weigh over 50 pounds (23 kg) for a single person lift, over 100 pounds (45 kg) for a two person lift, and over 150 pounds (68 kg) for a three or more person lift. Do not try to handle heavy parts without lifting equipment. Keep clear of heavy parts supported only by lifting equipment. Failure to observe this precaution could cause serious injury or death of personnel.

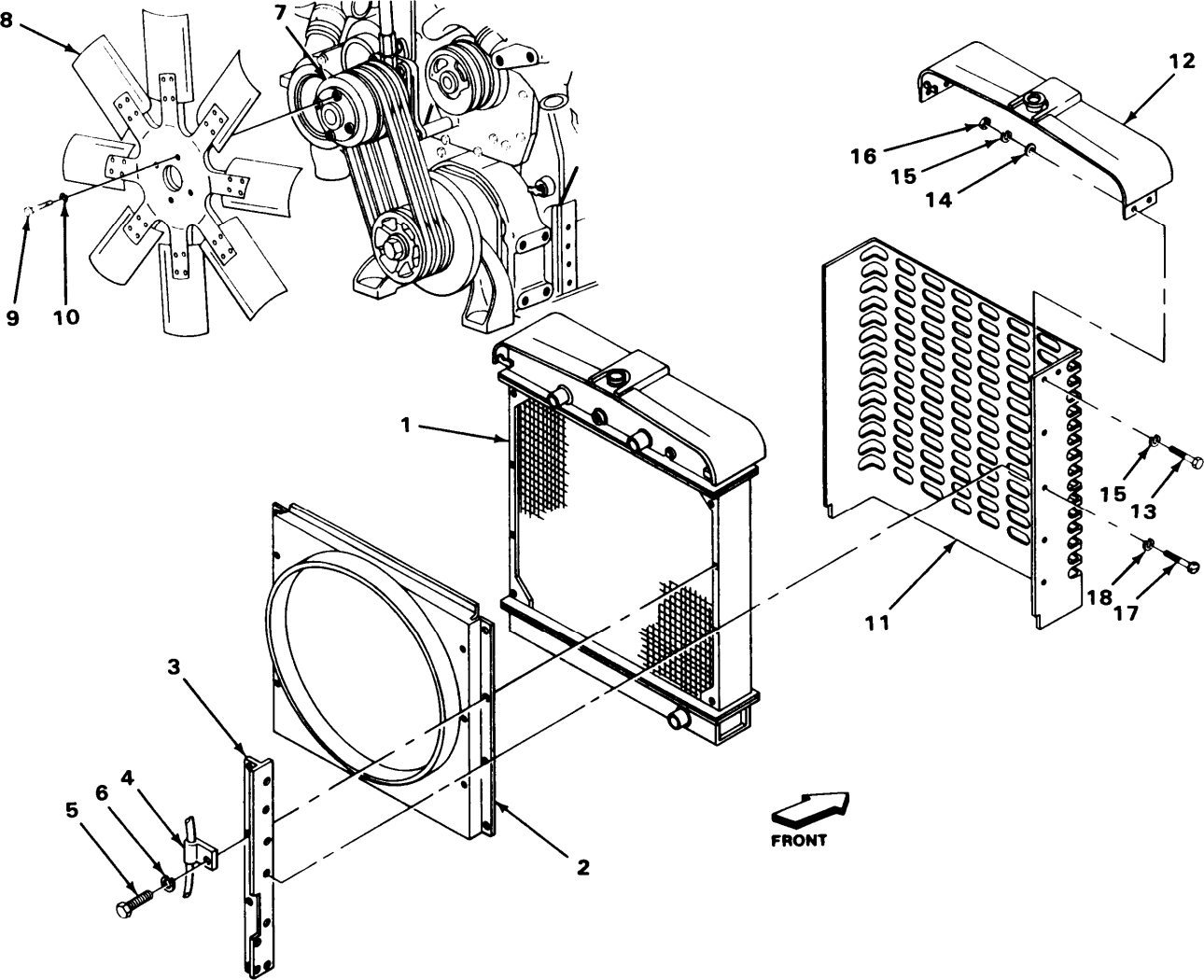
19. Radiator (1)	Radiator shroud (2) and two radiator guard supports (3)	Put on.
20. Right side support (3)	Three clamps (4)	Put on.
21. Two radiator guard supports (3) to radiator (1)	10 screws (5) and new lockwashers (6)	Screw in and tighten using 1/2-inch socket, extension, and handle.
22. Pulley (7)	Radiator fan (8)	Put on.
23. Radiator fan (8) to pulley (7)	Four screws (9) and lockwasher (10)	Screw in and tighten using 3/4-inch socket and handle.
24. Radiator guard (11)	Upper radiator shroud (12)	With help from assistant, put on.
25. Upper radiator shroud (12) to radiator guard (11)	11 screws (13), 11 washers (14), 22 new lockwashers (15), and nuts (16)	Screw in and tighten using 1/2-inch socket and handle and screwdriver.

WARNING

Some parts are heavy. Be careful when handling them. Lifting equipment is needed when parts weigh over 50 pounds (23 kg) for a single person lift, over 100 pounds (45 kg) for a two person lift, and over 150 pounds (66 kg) for a three or more person lift. Do not try to handle heavy parts without lifting equipment. Keep clear of heavy parts supported only by lifting equipment. Failure to observe this precaution could cause serious injury or death of personnel.

RADIATOR GUARDS AND SHROUDS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
26. Radiator guard support (3)	Radiator guard (11) and upper radiator shroud (12)	Put on.	
27. Radiator guard (11) to two radiator guard supports (3)	12 screws (17) and new lockwashers (18)	Screw in and tighten using screwdriver.	

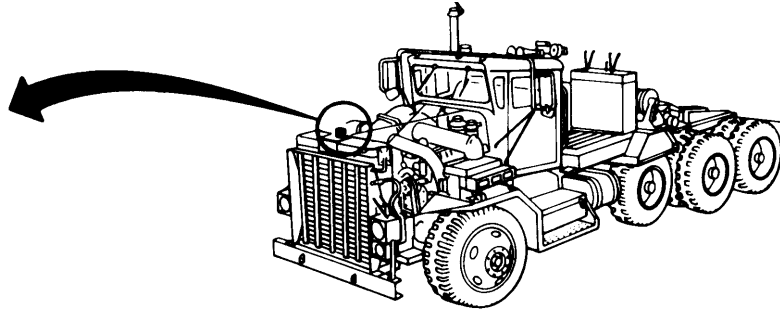
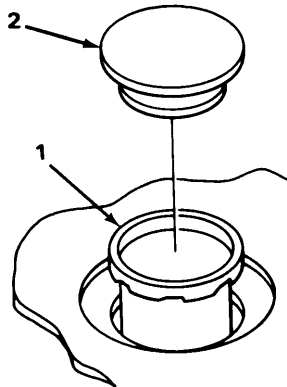


RADIATOR GUARDS AND SHROUDS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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INSTALLATION - CONTINUED

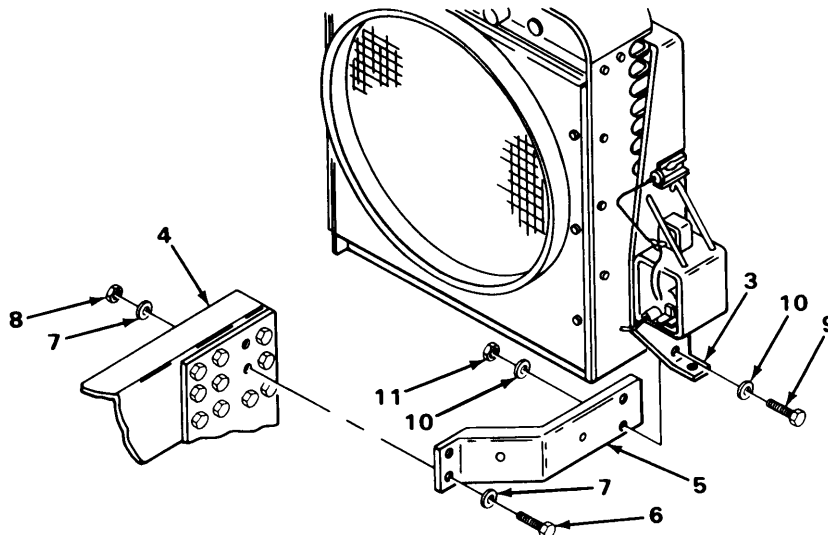
28. Radiator (1) Radiator cap (2) Screw on and tighten.



29. Radiator and headlight guard (3) and frame (4) Two support braces (5) Put on.

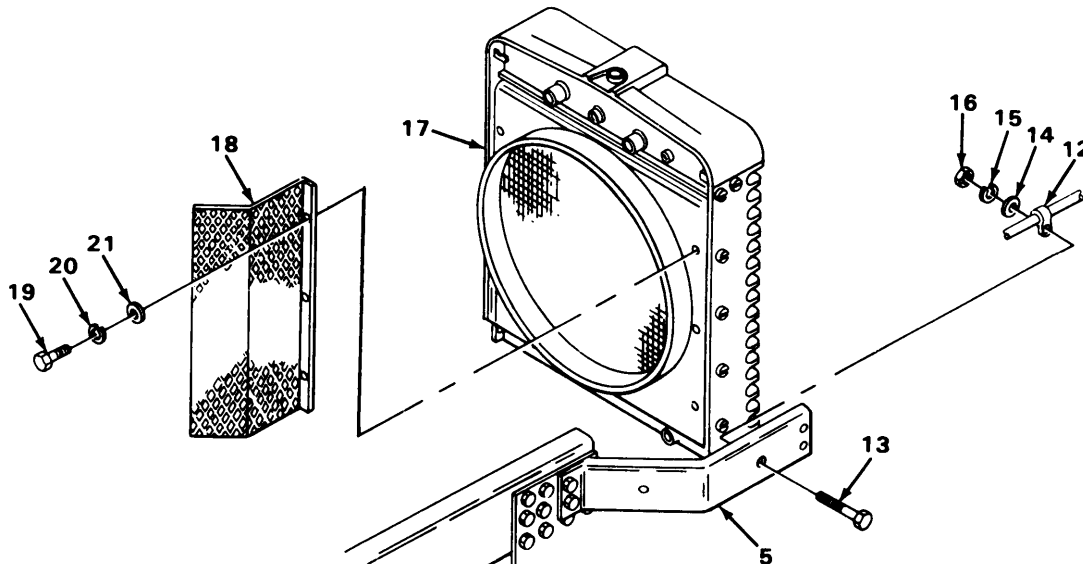
30. Two support braces (5) to frame (4) Four bolts (6), eight washers (7), and four nuts (8) Screw in and tighten using 15/16-inch socket, handle, and 15/16-inch wrench.

31. Two support braces (5) to radiator and headlight guard (3) Four bolts (9), eight washers (10), and four nuts (11) Screw in and tighten using 3/4-inch socket, handle, and 3/4-inch wrench.



RADIATOR GUARDS AND SHROUDS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
32. Two support braces (5)	Four clamps (12)	Put on.	
33. Four clamps (12) and two support braces (5)	Four bolts (13), washers (14), new lockwashers (15), and nuts (16)	Screw in and tighten using 1/2-inch socket, handle, and 1/2-inch wrench.	
34. Fan shroud (17)	Two fan guards (18)	Put on.	
35. Two fan guards (18) to fan shroud (17)	Six screws (19), new lockwashers (20), and washers (21)	Screw in and tighten using 7/16-inch socket, extension, and handle.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install side panels (TM 9-2320-270-10).
2. Install hood (TM 9-2320-270-10).

TASK ENDS HERE

RADIATOR HOSES AND FITTINGS

This task covers:

- a. Removal (page 4-160)
 - b. Cleaning and Inspection (page 4-164)
 - c. Installation (page 4-164)
-

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch drive
 Key, socket-head screw, 3/16-inch
 Screwdriver, flat-tip, 1/4-inch, 4-inch blade
 Socket, 7/16-inch, 3/8-inch drive
 Wrench, adjustable, 10-inch
 Wrench; open-end, 7/16-inch
 Wrench, open-end, 11/16-inch
 Wrench, open-end, 3/4-inch
 Wrench, open-end, 1 1/8-inch

Materials/Parts

Container (35 gallon capacity)
 Lockwasher

Personnel Required

One

Equipment Condition

Hood removed (TM 9-2320-270-10).
 Side panels removed (TM 9-2320-270-10).

LOCATION	ITEM	ACTION REMARKS
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REMOVAL

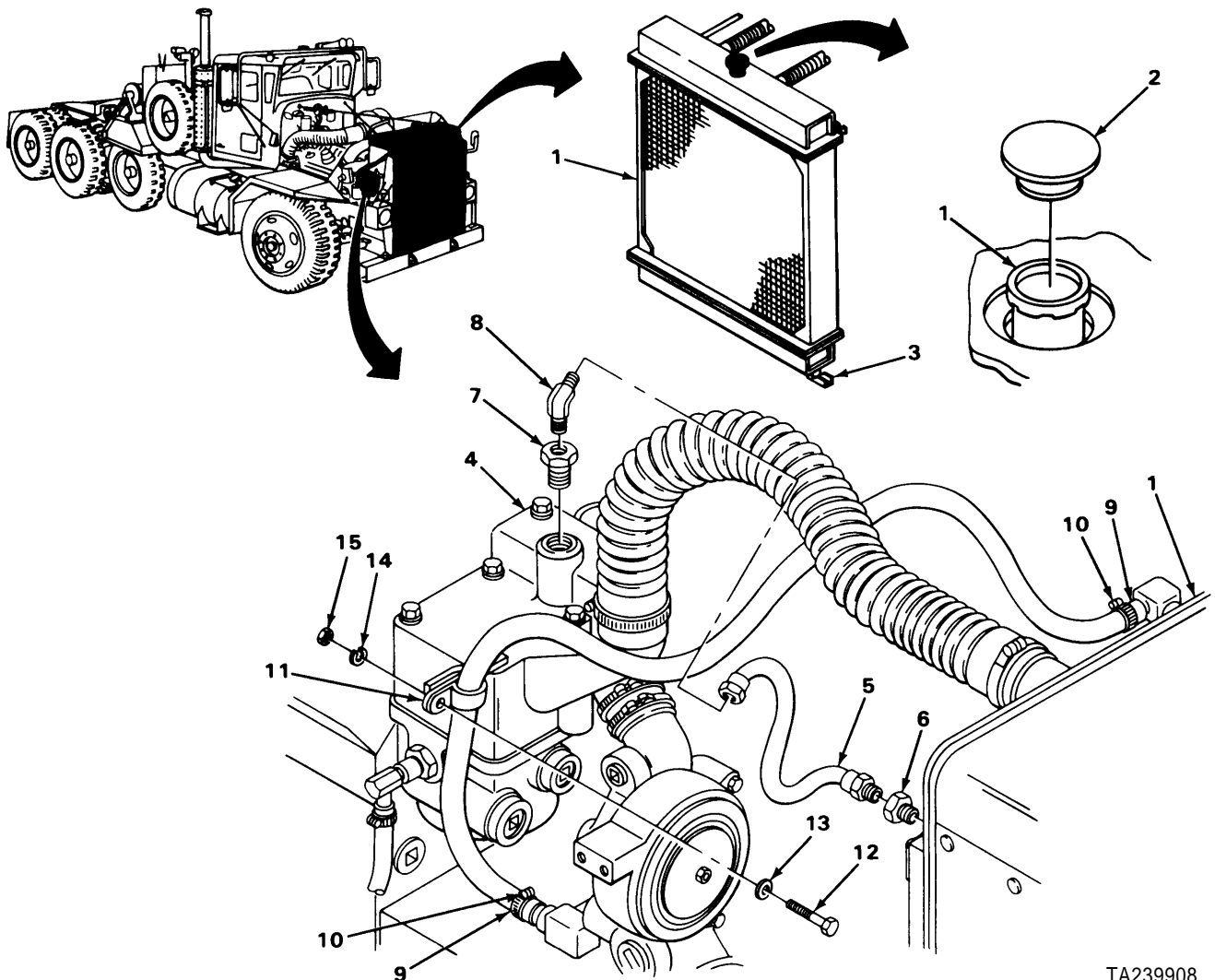
WARNING

Be careful when removing radiator cap. If engine is hot, escaping steam could burn you. Using a rag, cover radiator cap to protect your hand. Unscrew cap just enough to allow any built-up steam to escape. When all pressure has been relieved, unscrew cap the rest of the way, and take off of radiator.

- | | | |
|--|------------------|---|
| 1. Radiator (1) | Radiator cap (2) | <ul style="list-style-type: none"> a. Slowly turn to first stop and let pressure escape. b. When all pressure has escaped, unscrew and take off. |
| 2. | Draincock (3) | <ul style="list-style-type: none"> a. Put container underneath. b. Open and let coolant drain. c. When coolant stops draining, close. d. If fluid is contaminated, get rid of (page 4-1). |
| 3. Radiator (1) and thermostat housing cover (4) | Hose (5) | Using 3/4-inch wrench, unscrew and take off both ends. |

RADIATOR HOSES AND FITTINGS - CONTINUED

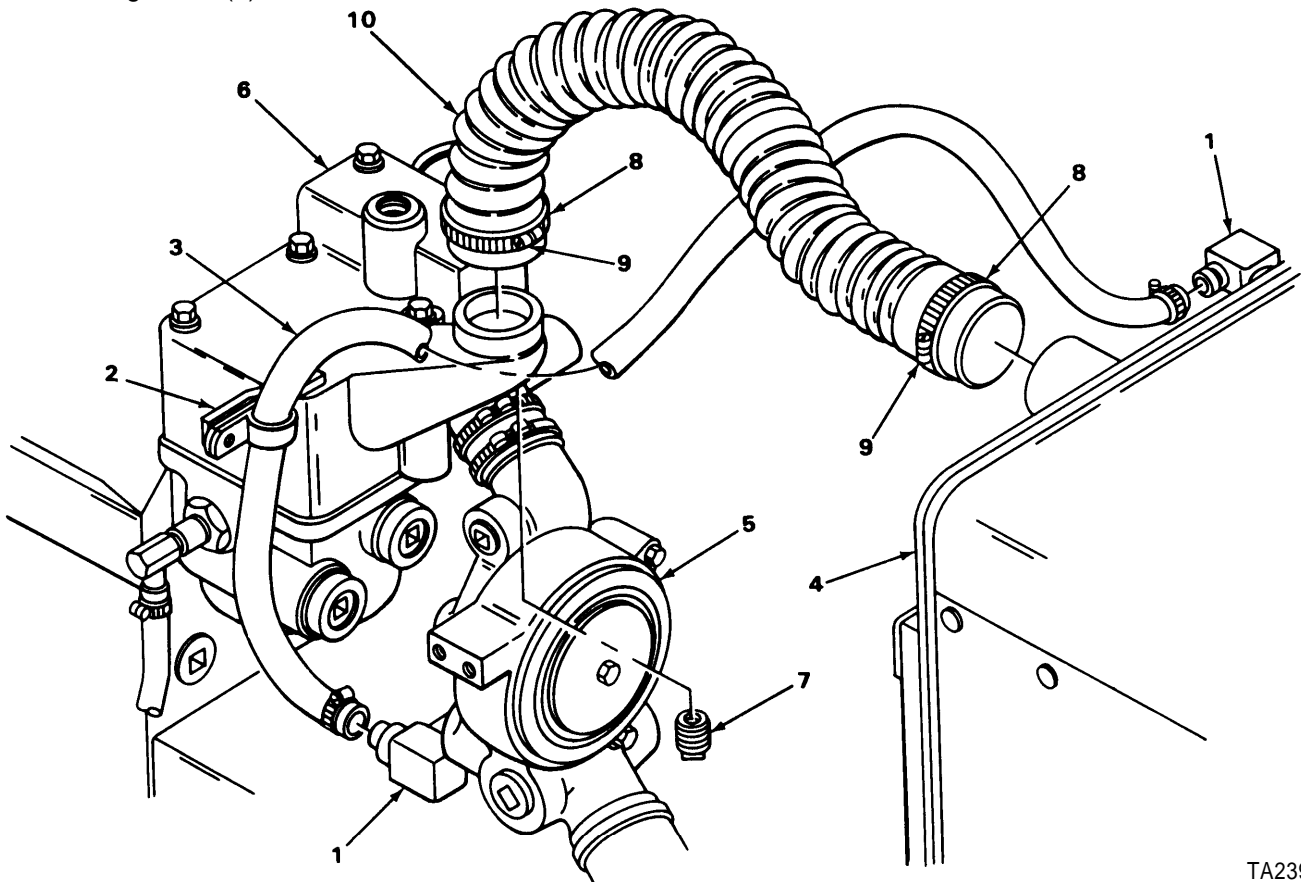
LOCATION	ITEM	ACTION REMARKS
4. Radiator (1)	Fitting (6)	Using 11/16-inch wrench, unscrew and take out.
5. Right thermostat housing cover (4)	Fitting (7) and elbow (8)	a. Using 11/16-inch wrench, unscrew and take out. b. Using 11/16-inch wrench and adjustable wrench, unscrew and take apart.
6. Two hose clamps (9)	Two screws (10)	Using screwdriver, unscrew part way.
7. Hose clamp (11)	Bolt (12), washer (13), lockwasher (14), and nut (15)	a. Using 7/16-inch socket, handle, and 7/16-inch wrench, unscrew and take out. b. Get rid of lockwasher (14).



TA239908

RADIATOR HOSES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
8. Two fittings(1) and bracket (2)	Hose (3)	Take off.	
9. Radiator (4) and water pump (5)	Two fittings (1)	Using 1 1/8-inch pipe wrench, unscrew and take out.	
10. Right thermostat housing cover (6)	Plug (7)	a. Put container underneath. b. Using key, unscrew and take out. c. When coolant stops draining, screw in until flush with cover (6) using key. d. Get rid of drained fluid (page 4-1).	
11. Two hose clamps (8)	Two screws (9)	Using screwdriver, unscrew part way.	
12. Radiator (4) and right thermostat housing cover (6)	Hose (10)	Take off.	

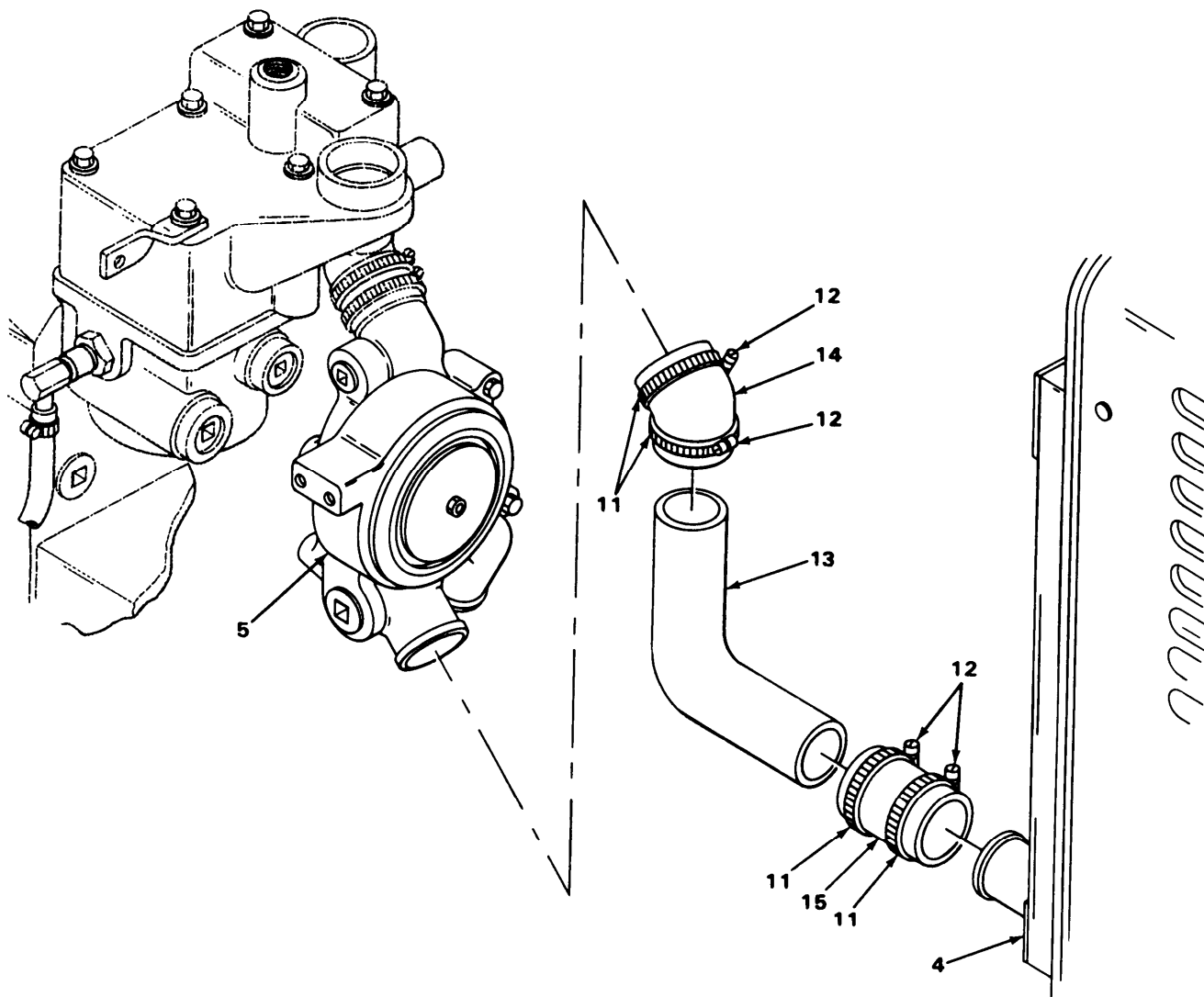


TA239909

RADIATOR HOSES AND FITTINGS - CONTINUED

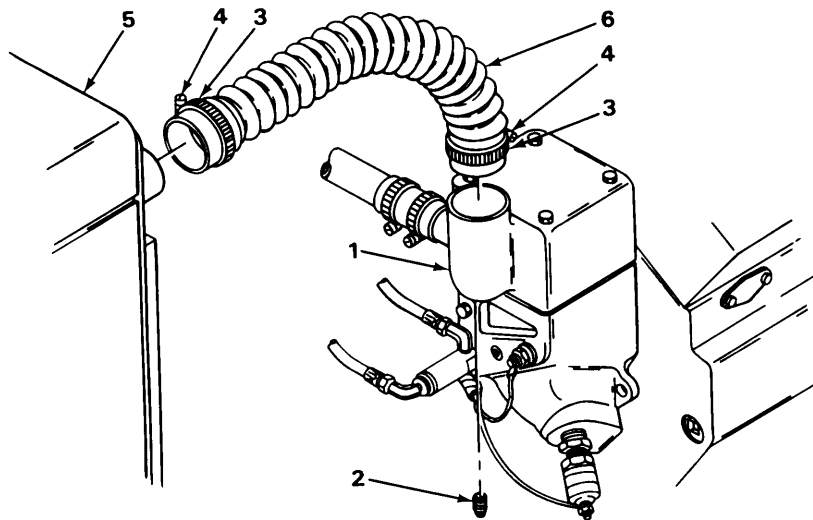
LOCATION	ITEM	ACTION REMARKS
----------	------	-------------------

- | | | |
|---|---------------------------------------|--------------------------------------|
| 13. Four hose clamps (11) | Four screws (12) | Using screwdriver, unscrew part way. |
| 14. Bottom of radiator (4) and water pump (5) | Tube (13) and two hoses (14) and (15) | a. Takeoff.
b. Pull apart. |



RADIATOR HOSES AND FITTINGS - CONTINUED

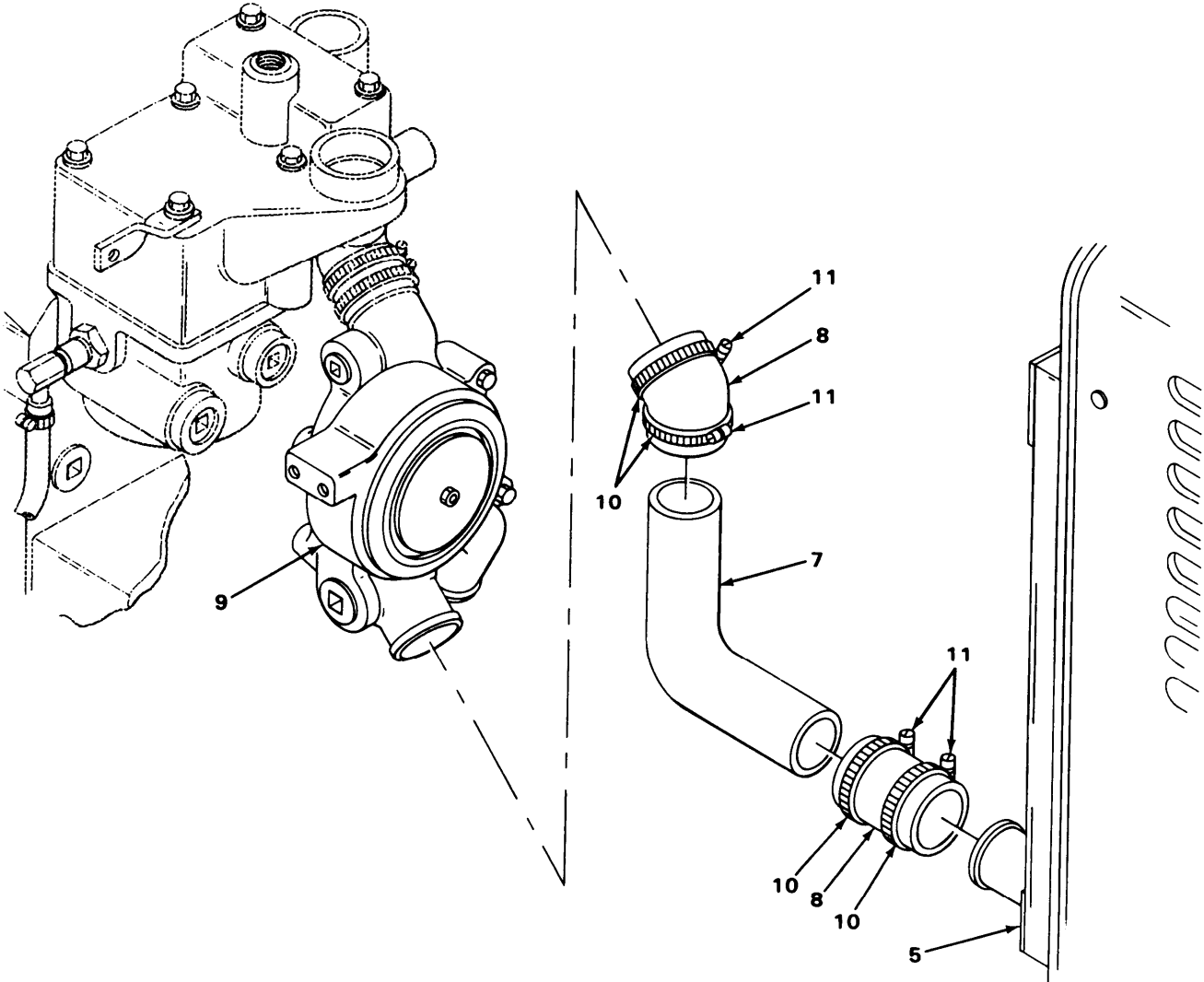
LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
15. Left thermostat housing cover (1)	Plug (2)	a. Put container underneath. b. Using key, unscrew and take out. c. Screw in until flush using key. d. Get rid of fluid (page 4-1).
16. Two hose clamps (3)	Two screws (4)	Using screwdriver, unscrew part way.
17. Radiator (5) and left thermostat housing cover (1)	Hose (6)	Take off.
CLEANING AND INSPECTION		
18.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
INSTALLATION		
19. Radiator (5) and left thermostat housing cover (1)	Hose (6)	Push on.
20. Hose (6)	Two hose clamps (3)	Put in position.
21. Two hose clamps (3)	Two screws (4)	Using screwdriver, tighten.



TA239911

RADIATOR HOSES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
22. Tube (7)	Two hoses (8)	Push on.	
23. Bottom of radiator (5) and water pump (9)	Tube (7) and two hoses (8)	Push on.	
24. Tube (7) and two hoses (8)	Four hose clamps (10)	Put in place.	
25. Four hose clamps (10)	Four screws (11)	Using screwdriver, tighten.	

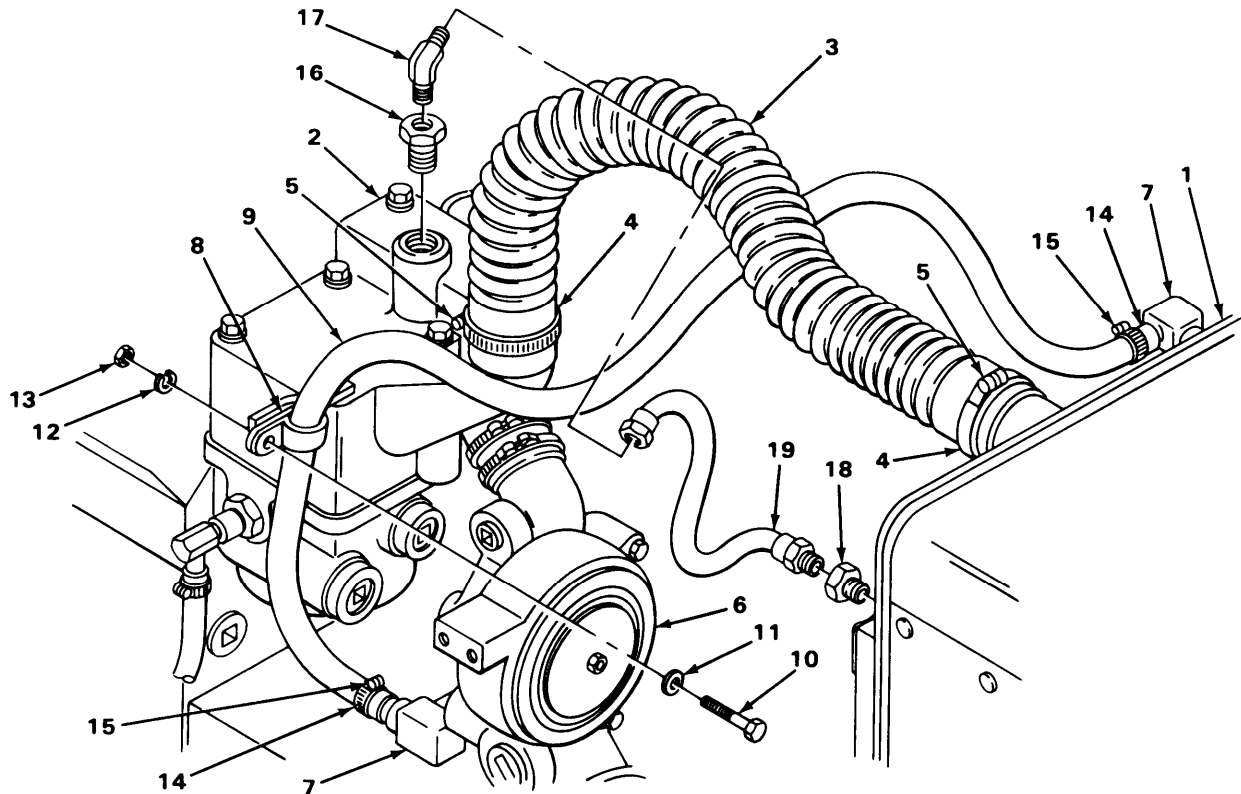


TA239912

RADIATOR HOSES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION – CONTINUED		
26. Radiator (1) and right thermostat housing cover (2)	Hose (3)	Push on.
27. Hose (3)	Two hose clamps (4)	Put in place.
28. Two hose clamps (4)	Two screws (5)	Screw in and tighten using screwdriver.
29. Radiator (1) and water pump (6)	Two fittings (7)	Screw in and tighten using 1 1/8-inch wrench.
30. Two fittings (7) and bracket (8)	Hose (9)	Put in.
31. Hose bracket (8)	Bolt (10), washer (11), new lock-washer (12), and nut (13)	Screw in and tighten using 7/16-inch socket, handle, and 7/16-inch wrench.
32. Two hose clamps (14)	Two screws (15)	Screw in and tighten using screwdriver.
33. Right thermostat housing cover (2)	Fitting (16) and elbow (17)	<p>a. Screw together using adjustable and 1 1/16-inch wrenches.</p> <p>b. Screw into cover (2) and tighten using 11/16-inch wrench. Make sure elbow faces front of vehicle.</p>
34. Radiator (1)	Fitting (18)	Screw in and tighten using 11/16-inch wrench.
35. Radiator (1) and right thermostat housing cover (2)	Hose (19)	Screw in and tighten using 3/4-inch wrench.

RADIATOR HOSES AND FITTINGS - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Fill cooling system (TM 9-2320-270-10).
2. Install side panels (TM 9-2320-270-10).
3. Install hood (TM 9-2320-270-10).
4. Operate vehicle (TM 9-2320-270-10), and check for leaks.

TASK ENDS HERE

HEAT EXCHANGER HOSES, TUBES, AND FITTINGS

This task covers:

- a. Removal (page 4-168)
 - b. Cleaning and Inspection (page 4-170)
 - c. Installation (page 4-170)
-

INITIAL SETUP

Tools

- Extension, 5-inch, 3/8-inch drive
- Handle, ratchet, 3/8-inch drive
- Pry bar
- Screwdriver, flat-tip, 1/4-inch,
- Socket, 7/16-inch, 3/8-inch drive
- Socket, 9/16-inch, 3/8-inch drive
- Wrench, open-end, 7/16-inch
- Wrench, open-end, 1/2-inch
- Wrench, open-end, 9/16-inch
- Wrench, pipe, 14-inch

Materials/Parts

- Container
- Lockwasher, brace to clamp (two required)
- Lockwasher, brace to frame
- Lockwasher, bracket to frame (four required)

Personnel Required

One

Equipment Condition

Side panels removed (TM 9-2320-270-10).

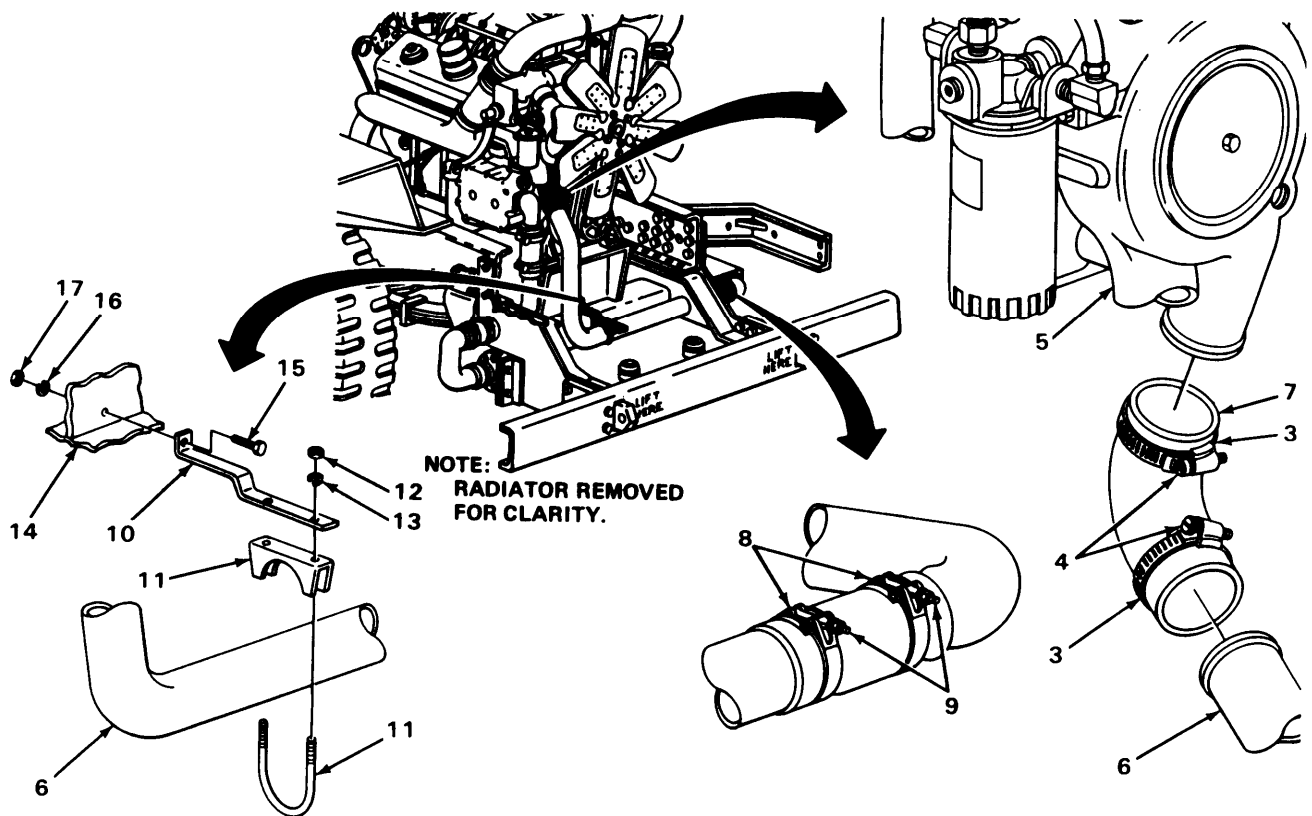
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

- | | | | |
|-----------------------|----------|---|--|
| 1. Heat exchanger (1) | Plug (2) | <ul style="list-style-type: none"> a. Put container underneath. b. Using 9/16-inch wrench, unscrew and take out. c. When coolant stops draining, screw in and tighten using 9/16-inch wrench. d. Get rid of fluid (page 4-1). | |
|-----------------------|----------|---|--|

HEAT EXCHANGER HOSES, TUBES, AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
2. Two hose clamps (3)	Two screws (4)	Using screwdriver, unscrew part way.	
3. Water pump (5) and tube (6)	Hose (7)	Take off.	
4. Two hose clamps (8)	Two nuts (9)	Using 7/16-inch wrench, unscrew part way.	
5. Brace (10) to clamp (11)	Two nuts (12) and lockwasher (13)	a. Using 1/2-inch wrench, unscrew and take out. b. Get rid of lockwashers (13).	
6. Brace (10)	Clamp (11)	Take off.	
7. Brace (10) to frame (14)	Bolt (15), lock-washer (16), and nut (17)	a. Using 7/16-inch socket, extension, handle, 7/16-inch wrench, unscrew and take out. b. Get rid of lockwasher (16).	
8. Frame (14)	Brace (10)	Take off.	



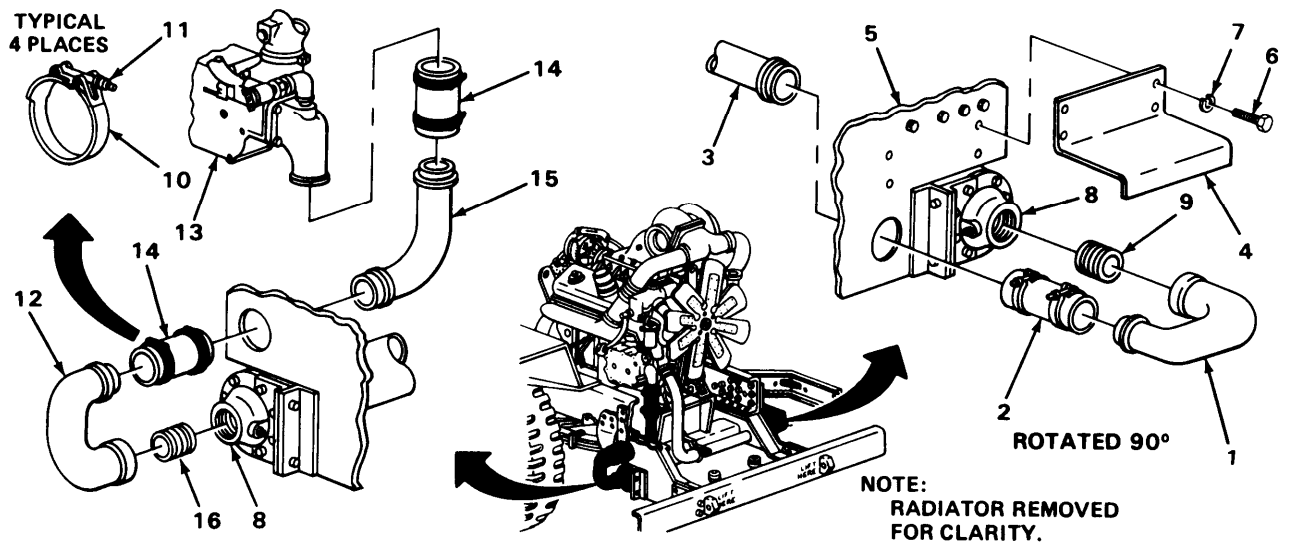
TA239915

HEAT EXCHANGER HOSES, TUBES, AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
9. Tube (1)	Hose (2) and tube (3)	a. Pull off. b. Pull apart.
10. Bracket (4) to frame (5)	Four screws (6) and lockwashers (7)	a. Using 9/16-inch socket, extension, and handle, unscrew and take out. b. Get rid of lockwashers (7).
11. Frame (5)	Bracket (4)	Take off.
12. Heat exchanger (8)	Tube (1) and nipple (9)	a. Using pry bar, unscrew and take out. b. Using pipe wrench, unscrew and take apart.
13. Four hose clamps (10)	Four nuts (11)	Using 7/16-inch wrench, unscrew part way.
14. Tube (12) and oil cooler (13)	Two hoses (14) and tube (15)	a. Pull off. b. Pull apart.
15. Heat exchanger (8)	Tube (12) and nipple (16)	a. Using pry bar, unscrew and take out. b. Using pipe wrench, unscrew and take apart.
CLEANING AND INSPECTION		
16.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
INSTALLATION		
17. Tube (12)	Nipple (16)	Screw in about halfway using pipe wrench.
18. Heat exchanger (8)	Tube (12) and nipple (16)	Screw in almost all the way. Make sure tube opening is on top.
19. Tube (15)	Two hoses (14)	Push on.
20. Tube (12) and oil cooler (13)	Two hoses (14) and tube (15)	Push on.
21. Four hose clamps (10)	Four nuts (11)	Using 7/16-inch wrench, tighten.

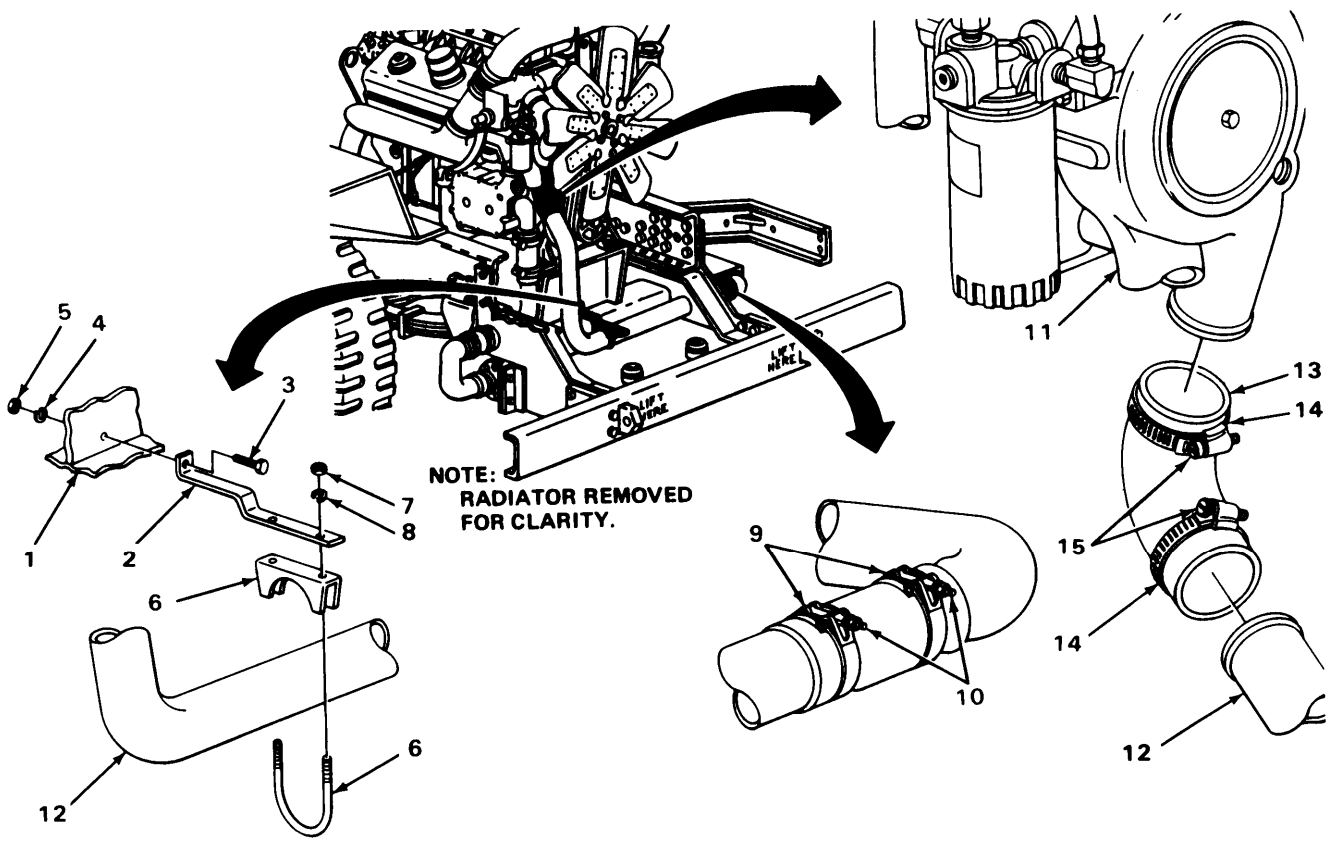
HEAT EXCHANGER HOSES, TUBES, AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
22. Tube (1)	Nipple (9)	Screw in about half way with pipe wrench.	
23. Heat exchanger (8)	Tube (1) and nipple (9)	Screw in almost all the way. Make sure tube opening is toward front of vehicle.	
24. Frame (5)	Bracket (4)	Put on.	
25. Bracket (4) to frame (5)	Four screws (6) and new lockwashers (7)	Screw in and tighten using 9/16-inch socket, extension, and handle.	
26. Tube (3)	Hose (2)	Push on.	
27. Tube (1)	Hose (2) and tube (3)	Push on.	



HEAT EXCHANGER HOSES, TUBES, AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
28.	Frame (1)	Brace (2)	Put on.
29.	Brace (2) to frame (1)	Bolt (3), new lockwasher (4), and nut (5)	Screw in and tighten using 7/16-inch socket, extension, handle, and 7/16-inch wrench.
30.	Brace (2)	Clamp (6)	Put in.
31.	Clamp (6)	Two nuts (7) and new lockwashers (8)	Screw on and tighten using 1/2-inch wrench.
32.	Two hose clamps (9)	Two nuts (10)	Using 7/16-inch wrench, tighten.
33.	Water pump (11) and tube (12)	Hose (13)	Push on.
34.	Two hose clamps (14)	Two screws (15)	Using screwdriver, tighten.



TA239917

HEAT EXCHANGER HOSES, TUBES, AND FITTINGS - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Fill cooling system (TM 9-2320-270-10).
2. Check for leaks (page 4-1).
3. Install side panels (TM 9-2320-270-10).

TASK ENDS HERE

THERMOSTATS

This task covers:

- | | |
|--|--|
| <ul style="list-style-type: none"> a. Right Thermostat Removal
(page 4-174) b. Left Thermostat Removal (page 4-176) c. Cleaning and Inspection (page 4-178) | <ul style="list-style-type: none"> d. Testing (page 4-178) e. Left Thermostat Installation (page 4-179) f. Right Thermostat Installation (page 4-180) |
|--|--|
-

INITIAL SETUP

Tools

Extension, 5-inch, 3/8-inch drive
 Hammer, rubber
 Handle (J7079-2)
 Handle, ratchet, 3/8-inch drive
 Handle, ratchet, 1/2-inch drive
 Installer (J8550)
 Key, socket-head screw, 3/16-inch
 Knife, putty
 Screwdriver, flat-tip, 1/4-inch,
 Socket, 9/16-inch, 3/8-inch drive
 Wrench, open-end, 3/4-inch

Materials/Pads

Container, 35 gallon capacity
 Gasket, thermostat housing to cover

Materials/Parts - Continued

Gasket, thermostat housing to cover
 Lockwasher (eight required)
 Packing (two required)

Personnel Required

One

Equipment Condition

Shutdown solenoid removed for right side
 thermostat (page 4-422).
 Radiator guards removed (page 4-151).

THERMOSTATS - CONTINUED

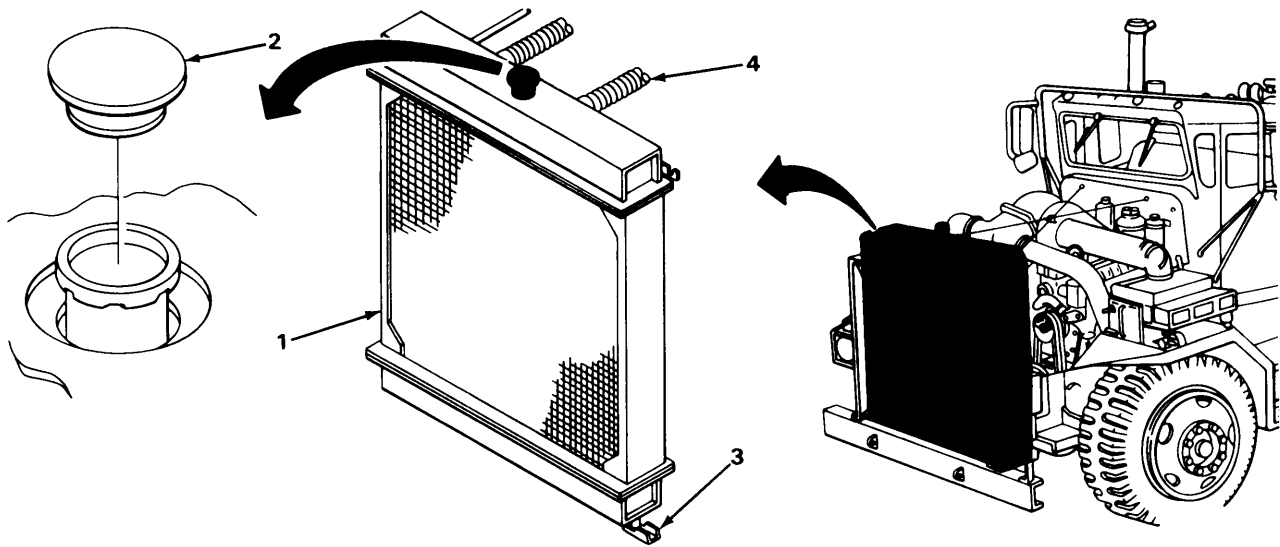
LOCATION	ITEM	ACTION	REMARKS
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RIGHT THERMOSTAT REMOVAL

WARNING

Be careful when removing radiator cap. If engine is hot, escaping steam could burn you. Using a rag, cover radiator cap to protect your hand. Unscrew cap just enough to allow any built-up steam to escape. When all pressure has been relieved, unscrew cap the rest of the way, and take off of radiator.

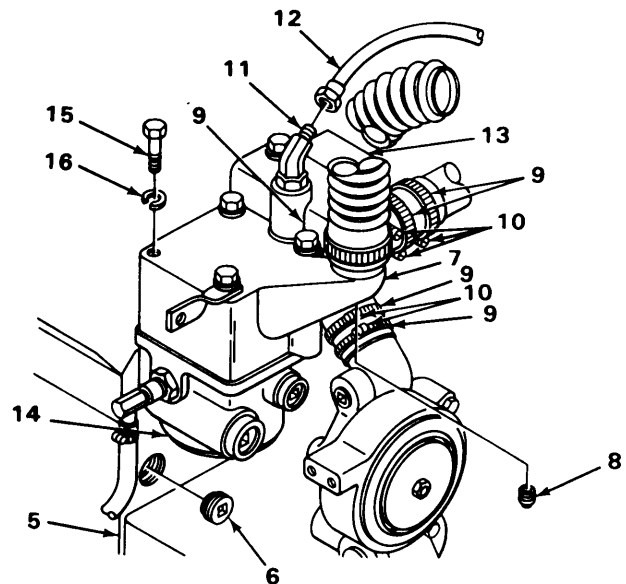
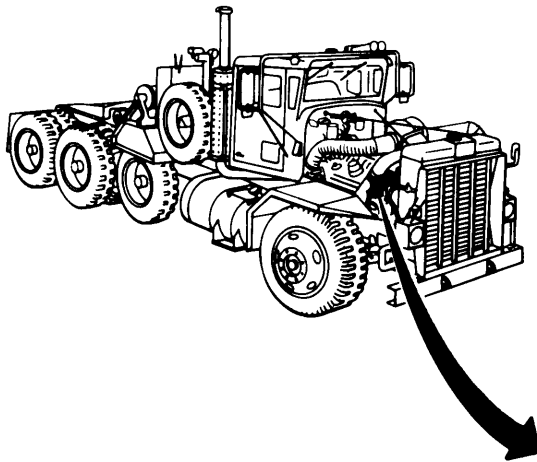
- | | | |
|-----------------|------------------|---|
| 1. Radiator (1) | Radiator cap (2) | <ul style="list-style-type: none"> a. Slowly turn to first stop and allow pressure escape. b. When all pressure has escaped, unscrew and take off. |
| 2. | Draincock (3) | <ul style="list-style-type: none"> a. Put container underneath. b. Open and let coolant drain. c. When coolant level is below level of hose (4), close. d. Get rid of fluid (page 4-1). |



- | | | |
|-----------------------------------|----------|--|
| 3. Front right side of engine (5) | Plug (6) | <ul style="list-style-type: none"> a. Put container underneath. b. Using handle with 1/2-inch drive, unscrew and take out. c. When coolant stops draining, screw in until flush using handle with 1/2-inch drive. |
|-----------------------------------|----------|--|

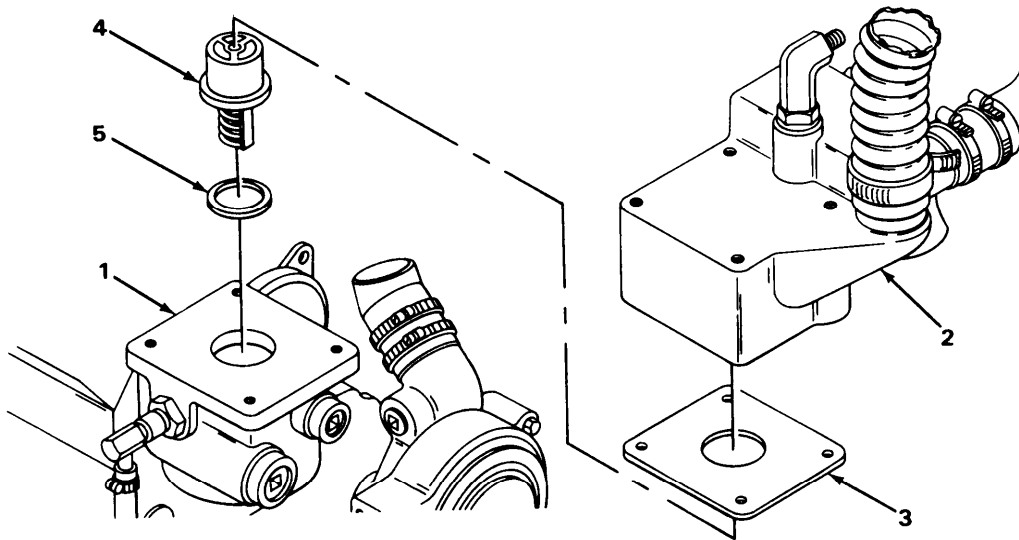
THERMOSTATS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
4. Right thermostat housing cover (7)	Plug (8)	a. Put container underneath. b. Using key, unscrew and take out. c. When coolant stops draining, screw in until flush with cover (7) using key. d. Get rid of fluid (page 4-1).
5. Five hose clamps (9)	Five screws (10)	Using screwdriver, unscrew part way.
6. Elbow (11)	Hose (12)	Using 3/4-inch wrench, unscrew and take off.
7. Thermostat housing cover (7) to solenoid bracket (13) and thermostat housing (14)	Four screws (15) and lockwashers (16)	a. Using 9/16-inch socket, extension, and handle, unscrew and take out. b. Get rid of lockwasher (16).



THERMOSTATS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
RIGHT THERMOSTAT REMOVAL - CONTINUED		
8. Thermostat housing (1)	Thermostat housing cover (2)	Using rubber hammer, tap off.
9. Thermostat housing cover (2)	Gasket (3)	a. Using knife, scrape off. b. Get rid of.
10. Thermostat housing (1)	Thermostat (4) and packing (5)	a. Take out. b. Get rid of packing (5).



LEFT THERMOSTAT REMOVAL

WARNING

Be careful when removing radiator cap. If engine is hot, escaping steam could burn you. Using a rag, cover radiator cap to protect your hand. Unscrew cap just enough to allow any built-up steam to escape. When all pressure has been relieved, unscrew cap the rest of the way, and take off of radiator.

NOTE

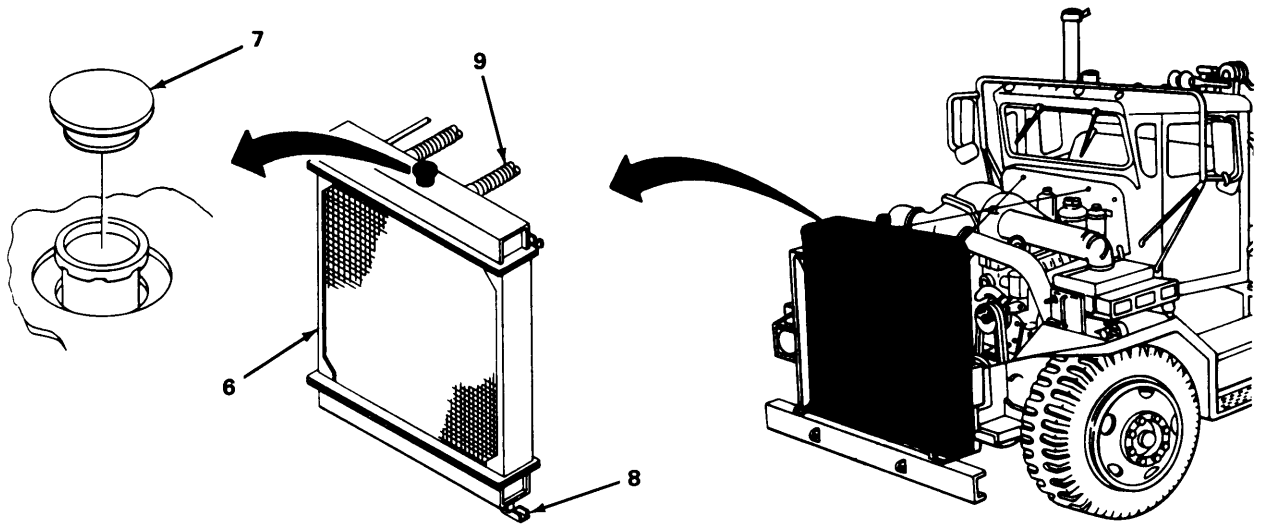
If right thermostat was removed, skip steps 11 and 12.

11. Radiator (6)	Radiator cap (7)	a. Slowly turn to first step and let pressure escape. b. When all pressure has escaped, unscrew and take off.
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TA239920

THERMOSTATS - CONTINUED

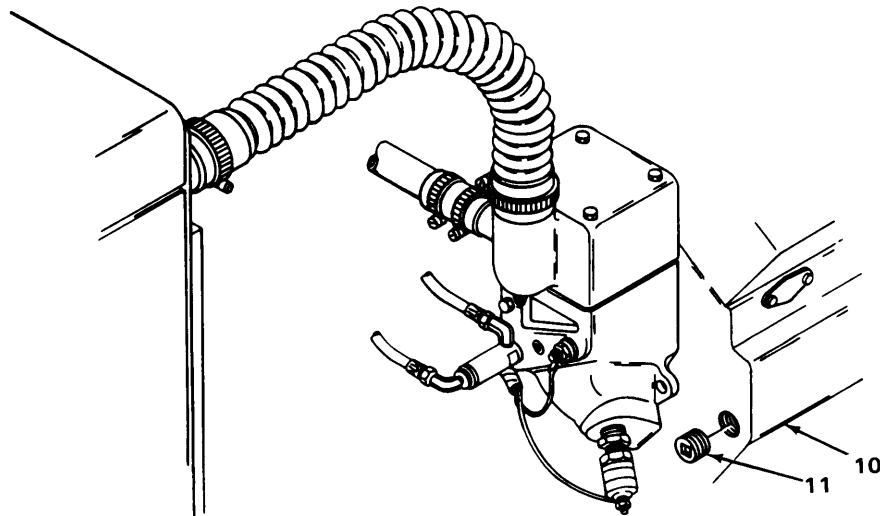
LOCATION	ITEM	ACTION REMARKS
12.	Draincock (8)	a. Put container underneath. b. Open and let coolant drain. c. When coolant level is below level of hose (9), close. d. Get rid of fluid (page 4-1).



13. Engine (10)

Plug(11)

- Put container underneath.
- Using handle with 1/2-inch drive, unscrew and take out.
- When coolant stops draining, screw in until flush using handle with 1/2-inch drive.



TA239921

THERMOSTATS - CONTINUED

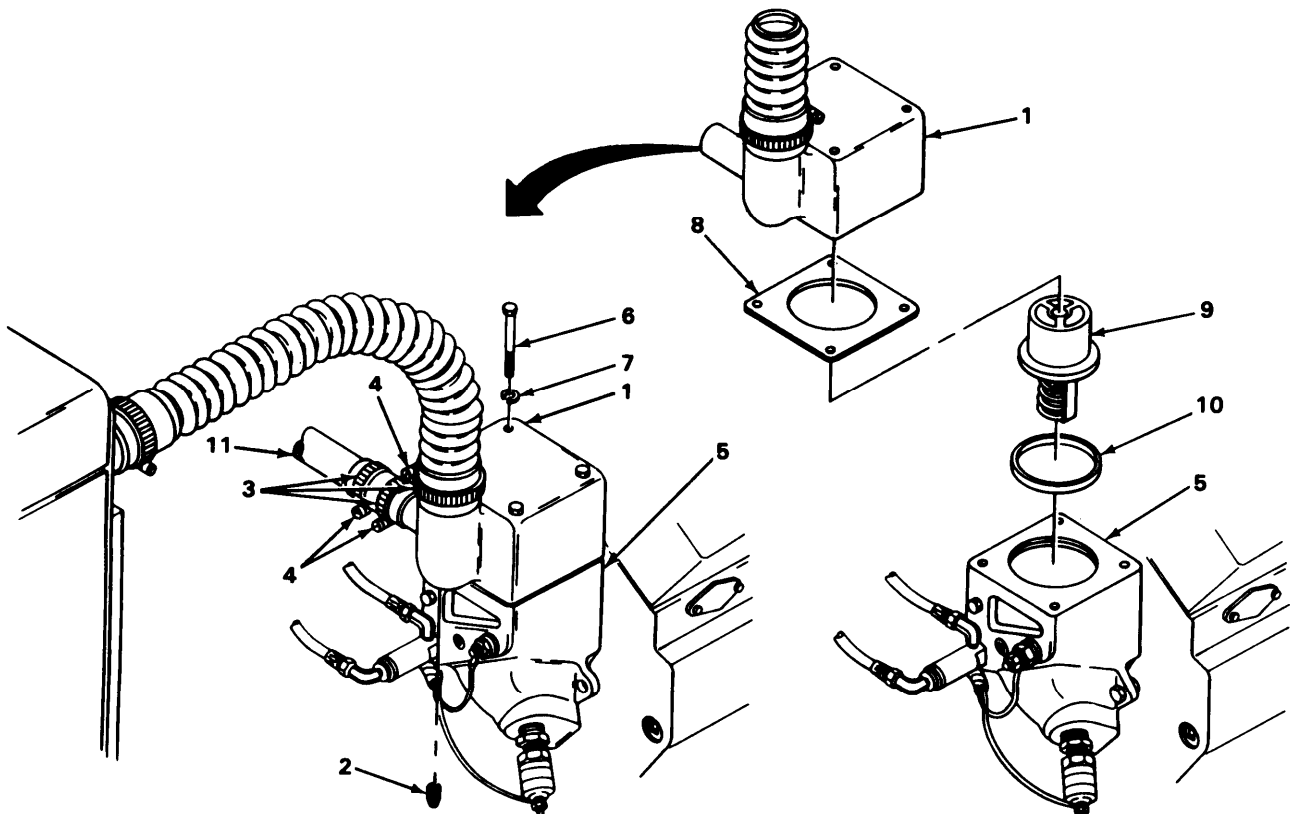
LOCATION	ITEM	ACTION REMARKS
LEFT THERMOSTAT REMOVAL - CONTINUED		
14. Left thermostat housing cover (1)	Plug (2)	a. Put container underneath. b. Using key, unscrew and take out. c. When coolant stops draining, screw in until flush with cover (1) using key. d. Get rid of fluid (page 4-1).
15. Three hose clamps (3)	Three screws (4)	Using screwdriver, unscrew part way.
16. Thermostat housing cover (1) to thermostat housing (5)	Four screws (6) and lockwashers (7)	a. Using 9/16-inch socket, extension, and handle, unscrew and take out. b. Get rid of lockwashers (7).
17. Thermostat housing (5)	Thermostat housing cover (1)	Using rubber hammer, tap off.
18. Thermostat housing cover (1)	Gasket (8)	a. Using knife, scrape off. b. Get rid of.
19. Thermostat housing (5)	Thermostat (9) and packing (10)	a. Take out. b. Get rid of packing (10).
CLEANING AND INSPECTION		
20.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).
TESTING		
21.	Thermostat (9)	a. Put in container of water heated to between 170° and 185°F (77° and 85°C). c. If thermostat (9) does not open in 10 minutes, replace it.

NOTE

If one thermostat is bad, replace both.

THERMOSTATS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
LEFT THERMOSTAT INSTALLATION			
22. Thermostat housing (5)	New packing (10)	Using installer and handle, put in.	
23.	Thermostat (9)	Put in.	
24.	New gasket (8) and thermostat housing cover (1)	Put on.	
25. Thermostat housing cover (1) to thermostat housing (5)	Four screws (6) and new lockwashers (7)	Screw in and tighten using 9/16-inch socket, extension, and handle.	
26. Thermostat housing cover (1)	Two hoses (11)	Push on.	
27. Three hose clamps (3)	Three screws (4)	Using screwdriver, tighten.	



TA239922

THERMOSTATS - CONTINUED

**ACTION
REMARKS**

LOCATION

ITEM

NOTE

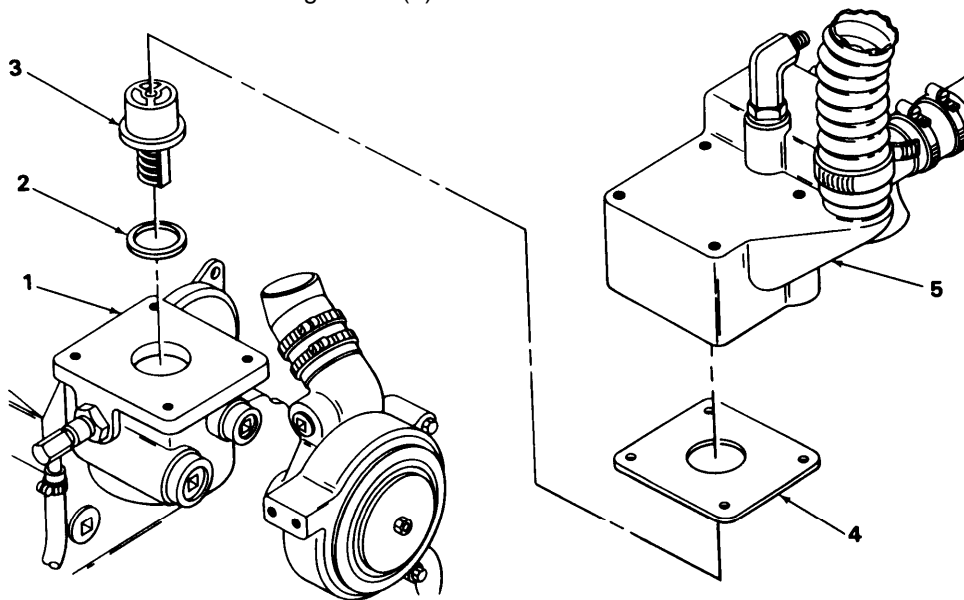
If right thermostat was not removed, go to follow-on maintenance.

RIGHT THERMOSTAT INSTALLATION

28. Thermostat housing (1) New packing (2) Using installer and handle, put in.

Thermostat (3) Put in.

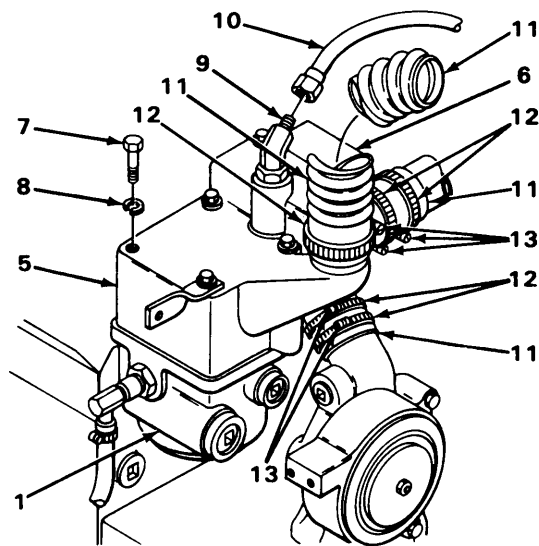
30. New gasket (4) and thermostat housing cover (5) Put on.



31. Thermostat housing cover (5) to solenoid bracket (6) and thermostat housing (1) Four screws (7) and new lockwashers (8) Screw in and tighten using 9/16-inch socket, extension, and handle.

THERMOSTATS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
32. Elbow (9)	Hose (10)	Screw on and tighten using 3/4-inch wrench.
33. Thermostat housing cover (5)	Three hoses (11)	Push on.
34. Five hose clamps (12)	Five screws (13)	Using screwdriver, tighten.



NOTE

FOLLOW-ON MAINTENANCE:

1. Fill cooling system (TM 9-2320-270-10).
2. Install shutdown solenoid (page 4-422).
3. Install radiator guards (page 4-151).

TASK ENDS HERE

THERMOSTAT HOUSINGS

This task covers:

- | | |
|---|--|
| <ul style="list-style-type: none"> a. Right Side Thermostat Housing Removal (page 4-183) b. Right Side Thermostat Housing Disassembly (page 4-187) c. Left Side Thermostat Housing Removal (page 4-188) d. Left Side Thermostat Housing Disassembly (page 4-190) e. Cleaning and Inspection (page 4-191) | <ul style="list-style-type: none"> f. Left Side Thermostat Housing Assembly (page 4-192) g. Left Side Thermostat Housing Installation (page 4-192) h. Right Side Thermostat Housing Assembly (page 4-195) i. Right Side Thermostat Housing Installation (page 4-196) |
|---|--|
-

INITIAL SETUP

Tools

Bar, pry
 Extension, 5-inch, 3/8-inch drive
 Hammer, rubber
 Handle, ratchet, 3/8-inch drive
 Handle, ratchet, 1/2-inch drive
 Installer, packing
 Key, socket-head screw, 3/16-inch
 Knife, putty
 Screwdriver, flat-tip, 1/4-inch,
 Socket, 7/16-inch, 3/8-inch drive
 Socket, 9/16-inch, 3/8-inch drive
 Socket, 5/8-inch, 3/8-inch drive
 Wrench, open-end, 1 1/32-inch (left only)
 Wrench, open-end, 3/8-inch (left only)
 Wrench, open-end, 7/16-inch (right only)
 Wrench, open-end, 9/16-inch
 Wrench, open-end, 1 1/16-inch (right only)
 Wrench, open-end, 3/4-inch (right only)
 Wrench, open-end, 7/8-inch
 Wrench, open-end, 1-inch (left only)
 Wrench, open-end, 1 1/8-inch
 Wrench, open-end, 1 3/8-inch (left only)

Materials/Parts

Container
 Gasket, thermostat housing cover (left only)
 Gasket, thermostat housing cover (right only)
 Gasket, thermostat housing to cylinder (left only)
 Gasket, thermostat housing to cylinder (right only)
 Lockwasher (seven required, left only)
 Lockwasher (ten required, right only)
 Packing (one right, one left)

Personnel Required

One

Equipment Condition

Engine shutdown solenoid removed (page 4-422) (right side thermostat housing only).
 Fuel filter to engine lines and fittings removed (page 4-42).
 Right or left side hood open and right or left side panel removed (TM 9-2320-270-10).
 Right or left side radiator guard removed (page 4-151).

THERMOSTAT HOUSINGS - CONTINUED

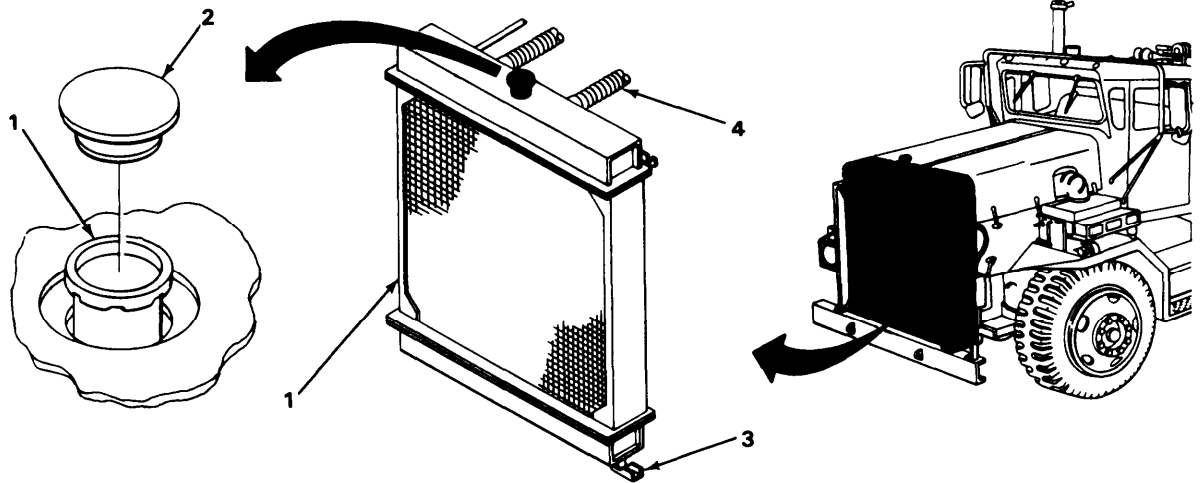
LOCATION	ITEM	ACTION	REMARKS
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RIGHT SIDE THERMOSTAT HOUSING REMOVAL

WARNING

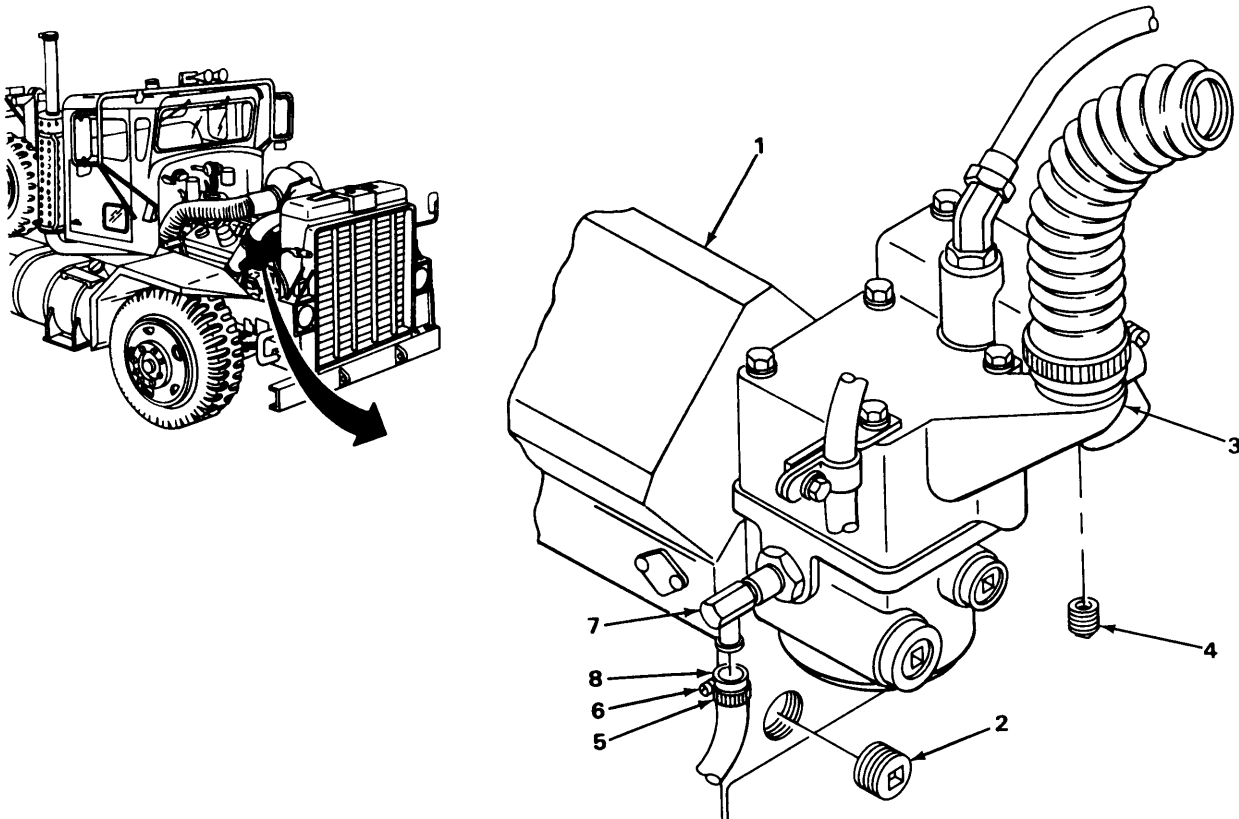
Be careful when removing radiator cap. If engine is hot, escaping steam could burn you. Using a rag, cover radiator cap to protect your hand. Unscrew cap just enough to allow any built-up steam to escape. When all pressure has been relieved, unscrew cap the rest of the way, and take off of radiator.

- | | | |
|-----------------|------------------|---|
| 1. Radiator (1) | Radiator cap (2) | <ul style="list-style-type: none"> a. Slowly turn to first stop and allow pressure escape. b. When all pressure has escaped, unscrew and take off. |
| 2. | Draincock (3) | <ul style="list-style-type: none"> a. Put container underneath. b. Open and let coolant drain. c. When coolant level is below level of hose (4), close. d. Get rid of fluid (page 4-1). |



THERMOSTAT HOUSINGS - CONTINUED

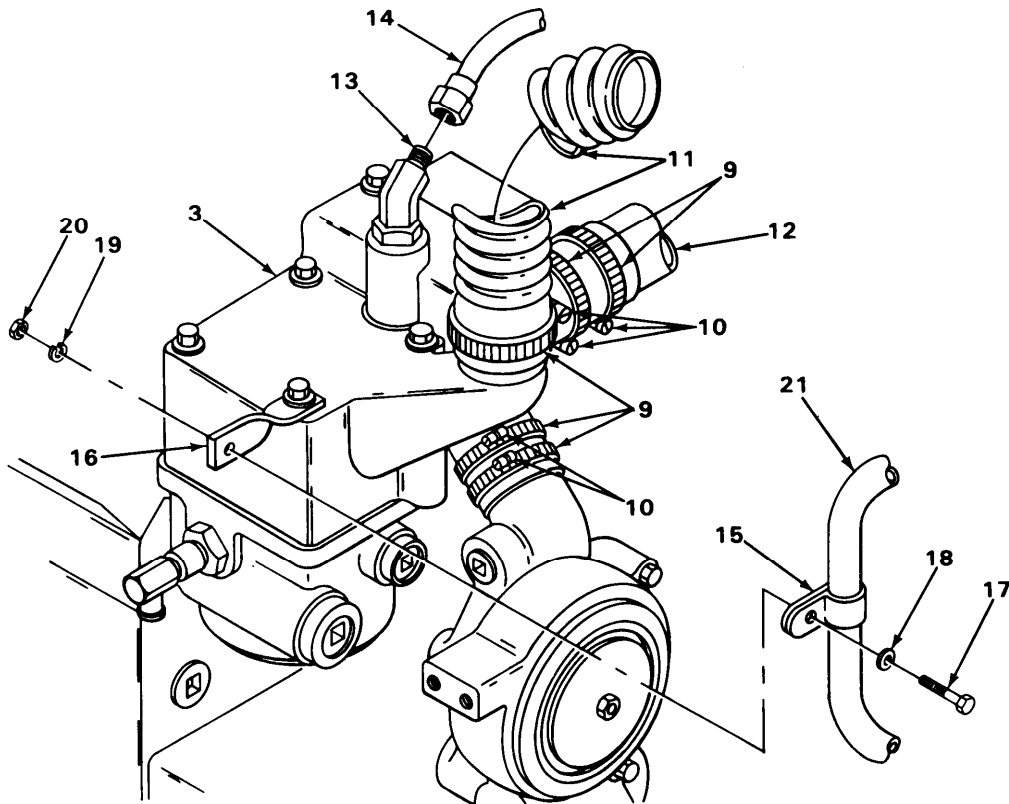
LOCATION	ITEM	ACTION REMARKS
RIGHT SIDE THERMOSTAT HOUSING REMOVAL – CONTINUED		
3. Engine (1)	Plug (2)	a. Put container underneath. b. Using handle with 1/2-inch drive, unscrew and take out. c. When coolant stops draining, screw in until flush using handle with 1/2-inch drive.
4. Thermostat housing cover (3)	Plug (4)	a. Put container underneath. b. Using key, unscrew and take out. c. When coolant stops draining, screw in until flush with cover (3) using key. d. Get rid of fluid (page 4-1).
5. Clamp (5)	Screw (6)	Using screwdriver, unscrew part way.
6. Fitting (7)	Hose (8)	a. Put container underneath. b. pull off. c. Get rid of fluid (page 4-1).



TA239926

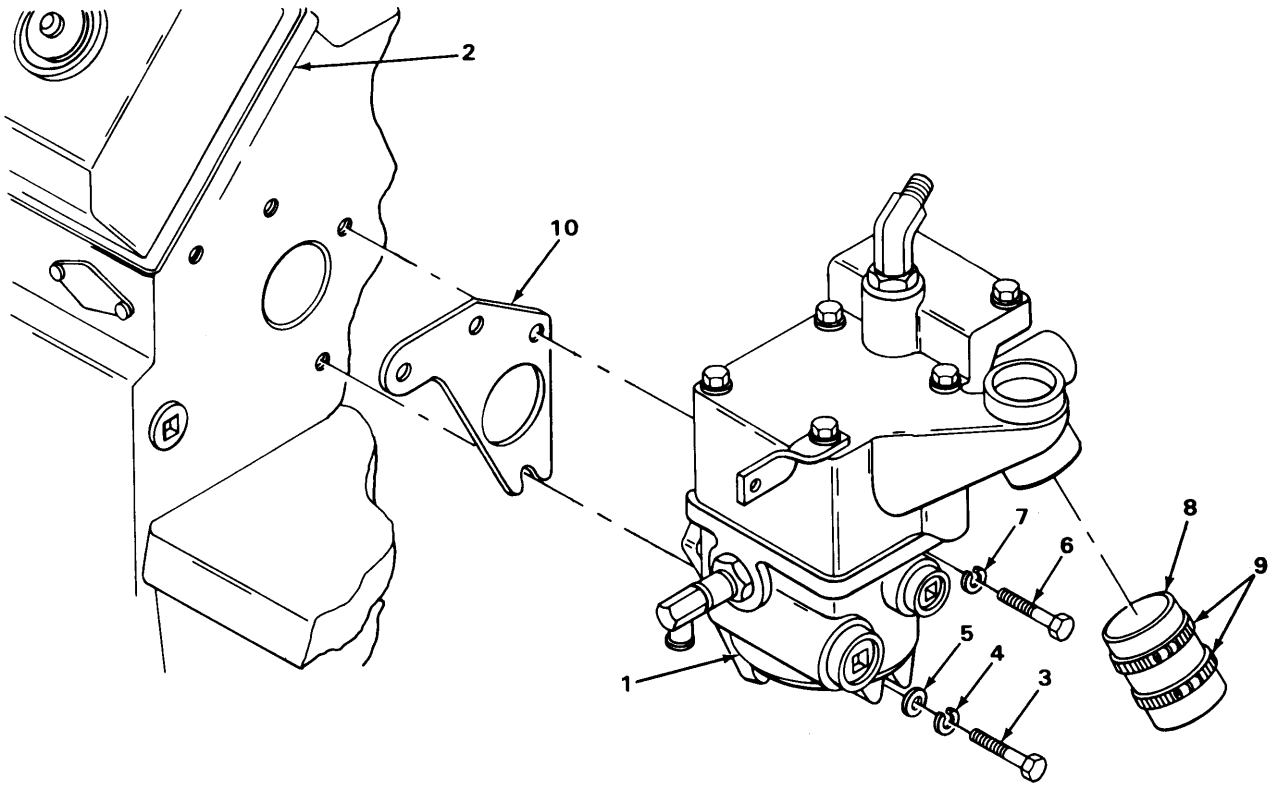
THERMOSTAT HOUSINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
7. Five hose clamps (9)	Five screws (10)	Using screwdriver, unscrew part way.
8. Thermostat housing cover (3)	Two hoses (11 and 12)	Using screwdriver, take off.
9. Elbow (13)	Hose (14)	Using 3/4-inch wrench, unscrew and take off.
10. Hose clamp (15) and hose bracket (16)	Screw (17), washer (18), lockwasher (19) and nut (20)	a. Using 7/16-inch socket, handle, and 7/16-inch wrench, unscrew and take out. b. Get rid of lockwasher (19).
11. Hose bracket (16)	Hose clamp (15) with hose (21)	Move away.



THERMOSTAT HOUSINGS - CONTINUED

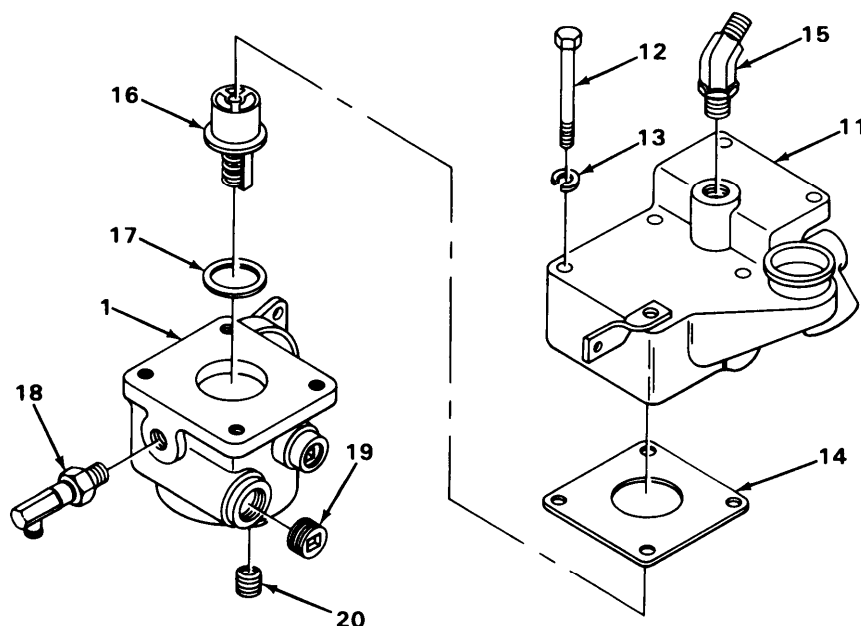
LOCATION	ITEM	ACTION REMARKS
RIGHT SIDE THERMOSTAT HOUSING REMOVAL – CONTINUED		
12. Thermostat housing (1) to engine (2)	Three screws (3), four lockwashers (4), and one washer (5)	a. Using 9/16-inch socket, extension, handle, and 9/16-inch wrench, unscrew and take out. b. Get rid of lockwashers (4).
13.	Screw (6) and lockwasher (7)	a. Using 5/8-inch socket, extension, and handle, unscrew and take out. b. Get rid of lockwasher (7).
14. Engine (2)	Thermostat housing (1)	Using pry bar, take off.
15. Thermostat housing (1)	Hose (8) with two clamps (9)	Using screwdriver, take off.
16.	Gasket (10)	a. Using knife, scrape off. b. Get rid of.



TA239928

THERMOSTAT HOUSINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
RIGHT SIDE THERMOSTAT HOUSING DISASSEMBLY			
17.	Thermostat housing cover (11) to thermostat housing (1)	Four screws (12) and lockwashers (13)	a. Using 9/16-inch socket and handle, unscrew and take out. b. Get rid of lockwashers (13).
18.	Thermostat housing (1)	Thermostat housing cover (11)	Using rubber hammer, tap off.
19.	Thermostat housing cover (11)	Gasket (14)	a. Using knife, scrape off. b. Get rid of.
20.		Elbow (15)	Using 1 1/16-inch wrench, unscrew and take out.
21.	Thermostat housing (1)	Thermostat (16) and packing (17')	a. Take out. b. Get rid of packing (17).
22.		Fitting (18)	Using 1 1/8-inch wrench, unscrew and take out.
23.		Plug (19)	Using handle with 3/8-inch drive, unscrew and take out.
24.		Plug (20)	Using handle with 1/2-inch drive, unscrew and take out.



TA239929

THERMOSTAT HOUSINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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LEFT SIDE THERMOSTAT HOUSING REMOVAL

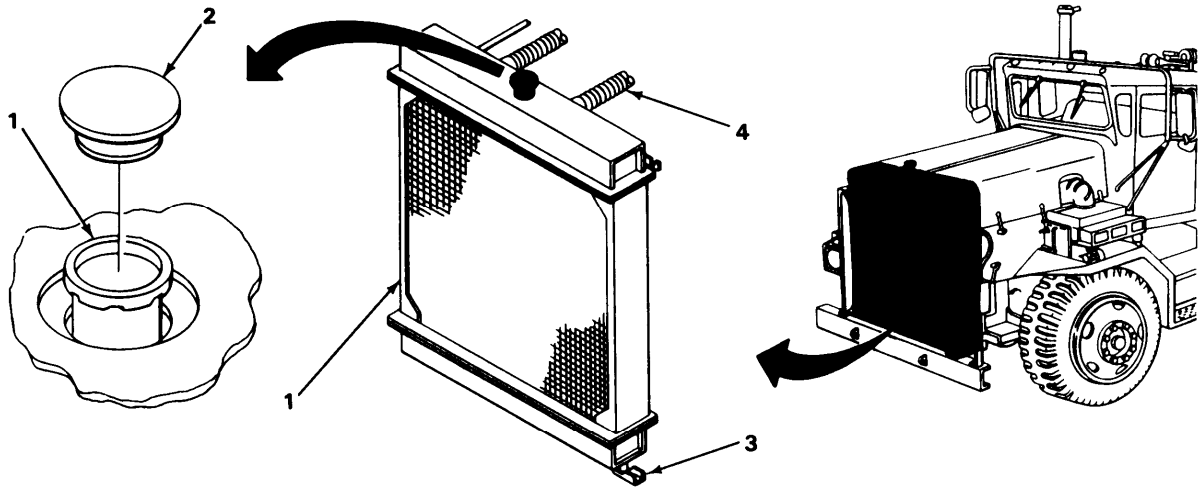
WARNING

Be careful when removing radiator cap. If engine is hot, escaping steam could burn you. Using a rag, cover radiator cap to protect your hand. Unscrew cap just enough to allow any built-up steam to escape. When all pressure has been relieved, unscrew cap the rest of the way, and take off of radiator.

NOTE

If right thermostat housing was removed, skip steps 25 and 26.

- | | | |
|------------------|------------------|---|
| 25. Radiator (1) | Radiator cap (2) | <ul style="list-style-type: none"> a. Slowly turn to first stop and allow pressure escape. b. When all pressure has escaped, unscrew and take off. |
| 26. | Draincock (3) | <ul style="list-style-type: none"> a. Put container underneath. b. Open and let coolant drain. c. When coolant level is below level of hose (4), close. d. Get rid of fluid (page 4-1). |

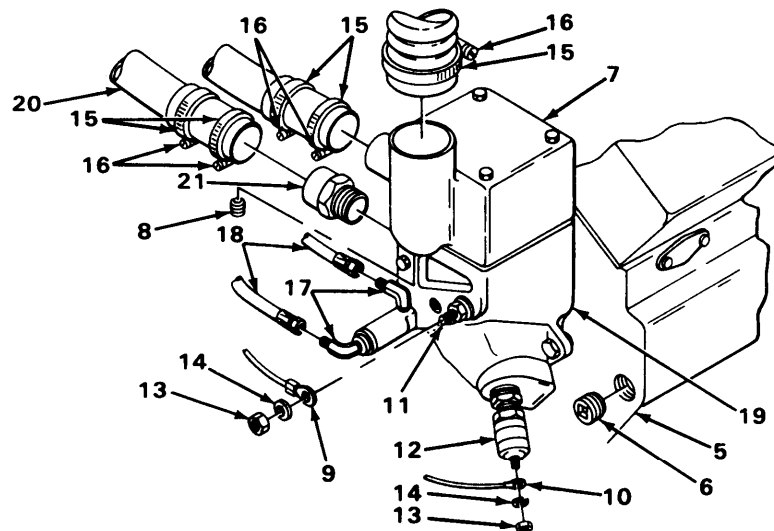


- | | | |
|----------------|----------|--|
| 27. Engine (5) | Plug (6) | <ul style="list-style-type: none"> a. Put container underneath. b. Using handle with 1/2-inch drive, unscrew and take out. c. When coolant stops draining, screw in until flush using handle with 1/2-inch drive. |
|----------------|----------|--|

TA239930

THERMOSTAT HOUSINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
28. Left thermostat housing cover (7)	Plug (8)	a. Put container underneath. b. Using key, unscrew and take out. c. When coolant stops draining, screw in until flush with cover (7) using key. d. Get rid of fluid (page 4-1).
29. Two wires (9 and 10) to two senders (11) and (12)	Two nuts (13) and lockwashers (14)	a. Using 1 1/32-inch and 3/8-inch wrenches, unscrew and take out. b. Get rid of lockwashers (14).
30. Two senders (11) and (12)	Two wires (9) and (10)	a. Take off. b. Tag (page 4-1).
31. Five hose clamps (15)	Five screws (16)	Using screwdriver, unscrew part way.
32. Two elbows (17)	Two hoses (18)	Using 9/16-inch wrench, unscrew and take off.
33. Left thermostat housing (19)	Hose (20) and adapter (21)	Using 1 3/6-inch wrench, unscrew.

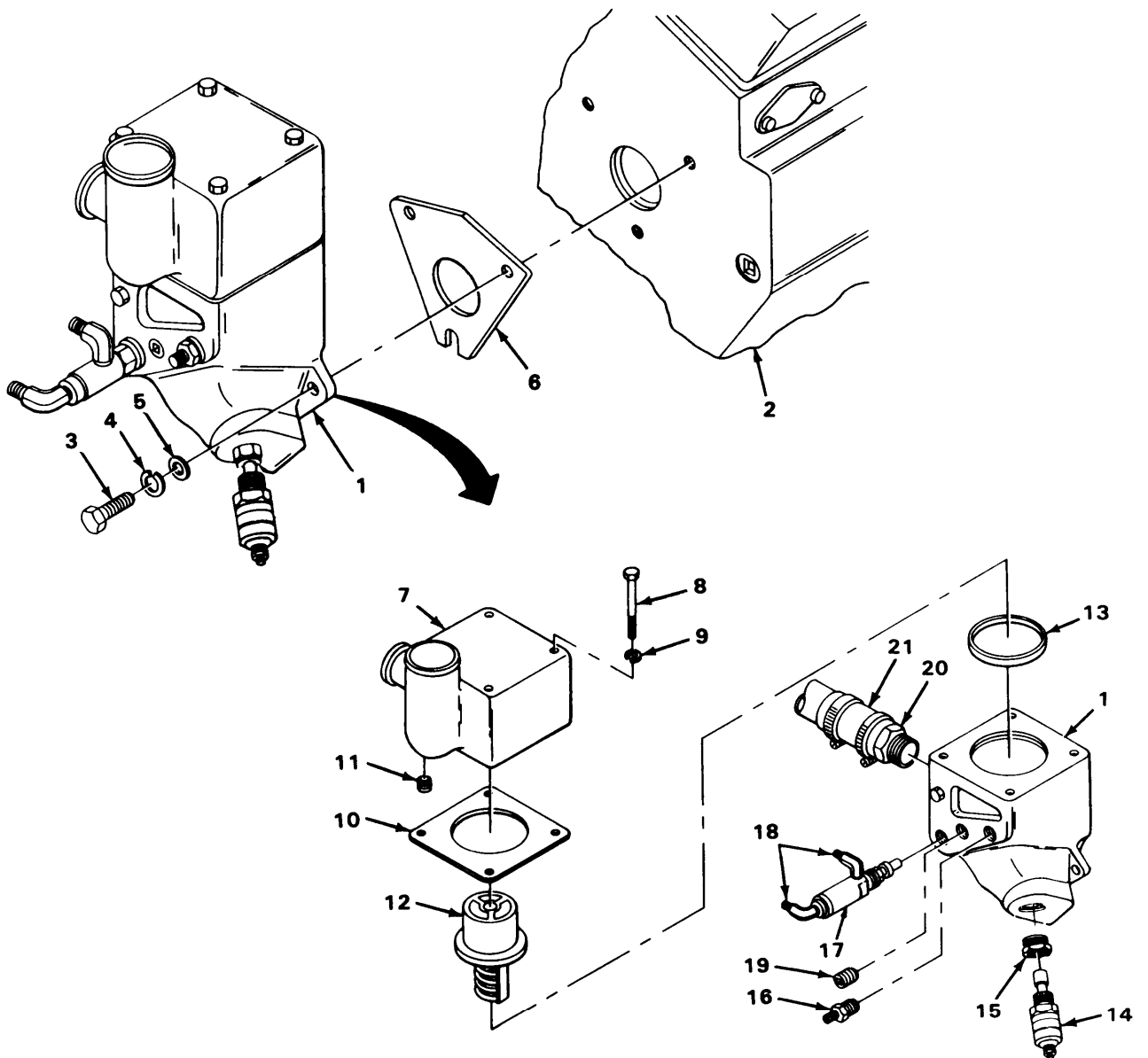


THERMOSTAT HOUSINGS- CONTINUED

LOCATION	ITEM	ACTION REMARKS
LEFT SIDE THERMOSTAT HOUSING REMOVAL – CONTINUED		
34. Thermostat housing (1) to engine (2)	Three screws (3), one lockwasher (4), and three washers (5)	a. Using 9/16-inch socket, extension, and handle, unscrew and take out. b. Get rid of lockwasher (4).
35. Engine (2)	Thermostat housing (1)	Take off.
36. Thermostat housing (1)	Gasket (6)	a. Using knife, scrape off. b. Get rid of.
LEFT SIDE THERMOSTAT HOUSING DISASSEMBLY		
37. Thermostat housing cover (7) to thermostat housing (1)	Four screws (8) and lockwashers (9)	a. Using 9/16-inch socket, and handle, unscrew and take out. b. Get rid of lockwashers (9).
36. Thermostat housing (1)	Thermostat housing cover (7)	Take off.
39. Thermostat housing cover (7)	Gasket (10)	a. Using knife, scrape off. b. Get rid of.
40.	Plug(n)	Using key, unscrew and take out.
41. Thermostat housing (1)	Thermostat (12) and packing (13)	a. Take out. b. Get rid of packing (13).
42.	Sender (14) and adapter (15)	Using 1 1/8-inch wrench, unscrew and take out.
43.	Sender (16)	Using 7/8-inch wrench, unscrew and take out.
44.	Air valve (17) with elbows (18)	Using 1-inch wrench, unscrew and take out.
45.	Plug (19)	Using handle with 3/8-inch drive, unscrew and take out.
46.	Adapter (20) and hose (21)	Using 1 1/8-inch wrench, unscrew and take out.

THERMOSTAT HOUSINGS - CONTINUED

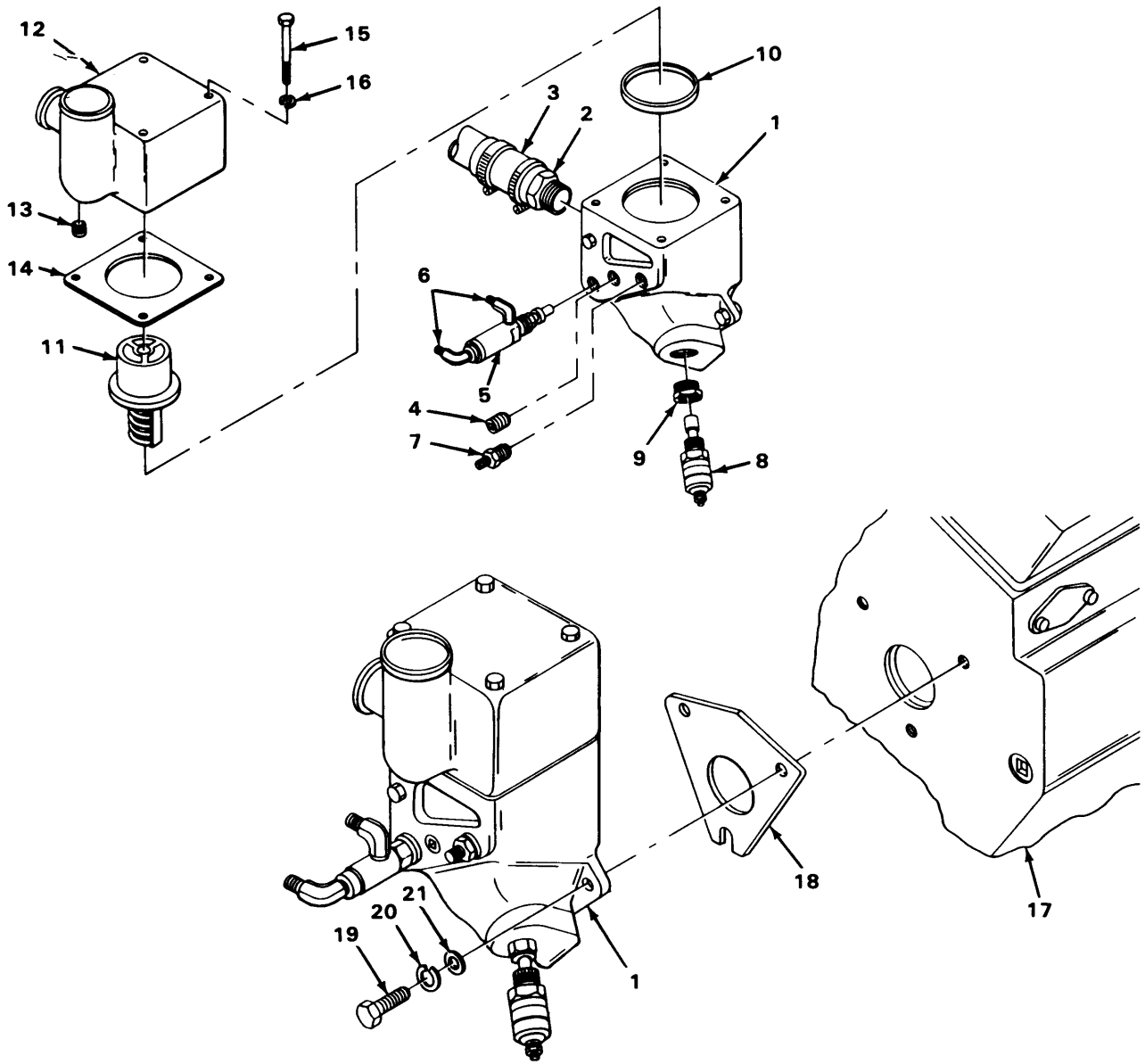
LOCATION	ITEM	ACTION REMARKS
CLEANING AND INSPECTION		
47.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4-1).



HERMOSTAT HOUSINGS- CONTINUED

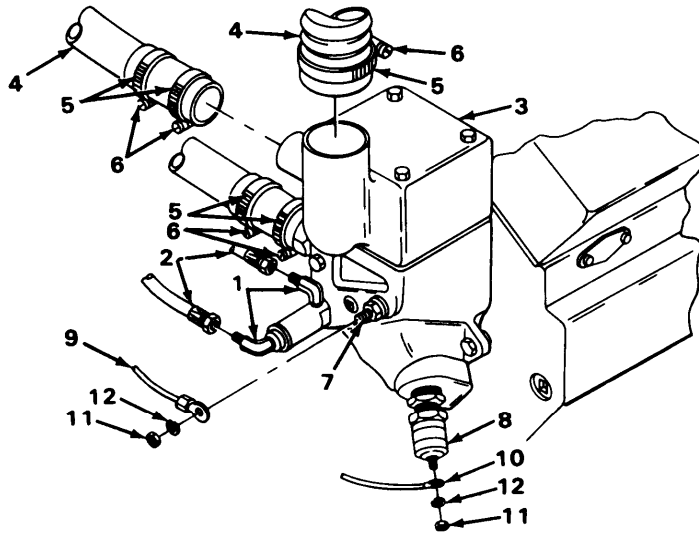
	LOCATION	ITEM	ACTION REMARKS
LEFT SIDE THERMOSTAT HOUSING ASSEMBLY			
48.	Thermostat housing (1)	Adapter (2) and hose (3)	Screw in and tighten using 1 1/8-inch wrench.
49.		Plug (4)	Screw in until flush using handle with 3/8-inch drive.
50.		Air valve (5) with elbows (6)	Screw in and tighten using 1-inch wrench. Make sure side elbow is on top.
51.		Sender (7)	Screw in and tighten using 7/8-inch wrench.
52.		Sender (8) and adapter (9)	Screw in and tighten using 1 1/8-inch wrench.
53.		New packing (10)	Using installer and handle, put in.
54.		Thermostat (11)	Put in.
55.	Thermostat housing cover (12)	Plug (13)	Screw in until flush using key.
56.	Thermostat housing (1)	New gasket (14) and thermostat housing cover (12)	Put on.
57.	Thermostat housing cover (12) to thermostat housing (1)	Four screws (15) and new lock-washers (16)	Screw in and tighten using 9/16-inch socket, extension, and handle.
LEFT SIDE THERMOSTAT HOUSING INSTALLATION			
58.	Engine (17)	New gasket (18) and thermostat housing (1)	Put on.
59.	Thermostat housing (1) to engine (17)	Three screws (19), one new lockwasher (20), and three washers (21)	Screw in and tighten using 9/16-inch socket, extension, and handle.

THERMOSTAT HOUSINGS - CONTINUED



THERMOSTAT HOUSINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
LEFT THERMOSTAT HOUSING INSTALLATION - CONTINUED			
60.	Two elbows (1)	Two hoses (2)	Screw on and tighten using 9/16-inch wrench.
61.	Thermostat housing cover (3)	Two hoses (4)	Push on.
62.	Five hose clamps (5)	Five screws (6)	Using screwdriver, tighten.
63.	Two senders (7) and (8)	Two wires (9) and (10)	Put on.
64.	Two wires (9) and (10) to two senders (7) and (8)	Two nuts (11) and new lock-washers (12)	Screw on and tighten using 1 1/32-inch and 3/8-inch wrenches.



RIGHT SIDE THERMOSTAT HOUSING ASSEMBLY

NOTE

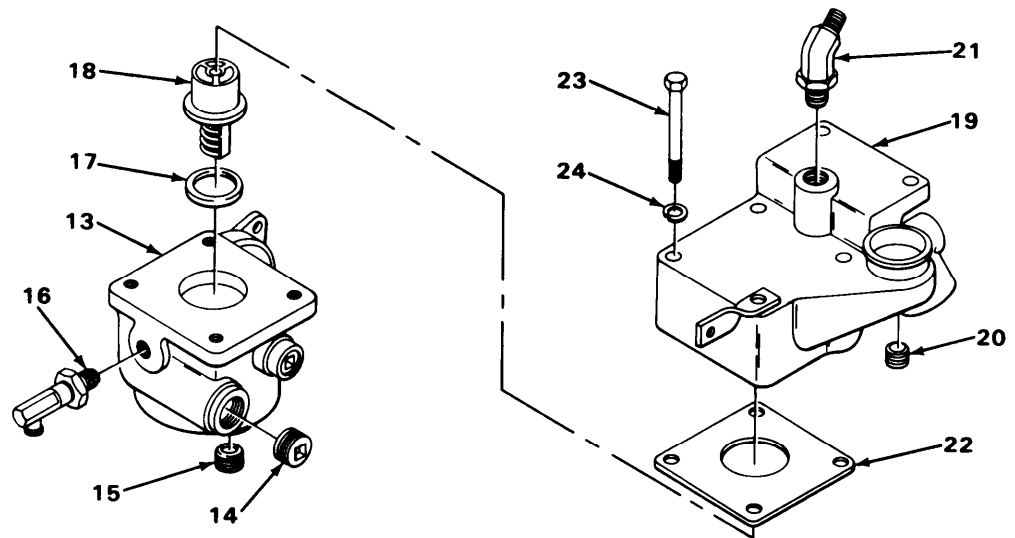
If right thermostat housing was not removed, go to follow-on maintenance.

65.	Thermostat housing (13)	Plug (14)	Screw in until flush using handle with 3/8-inch drive.
66.		Plug (15)	Screw in until flush using handle with 3/8-inch drive.

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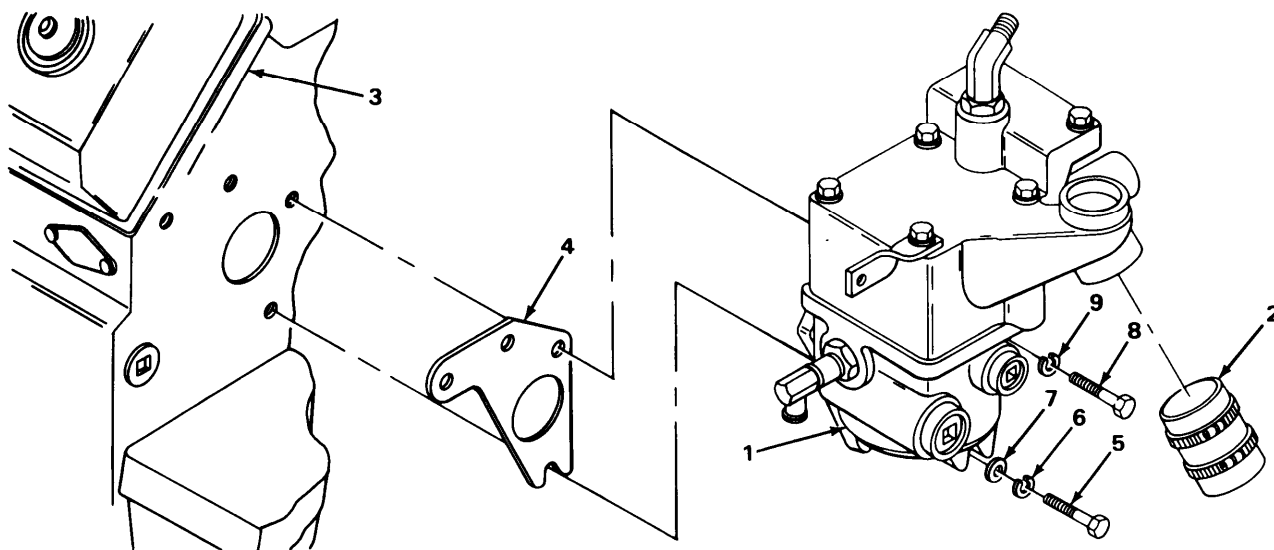
THERMOSTAT HOUSINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
67.	Fitting (16)	Screw in and tighten using 1 1/8-inch wrench. Make sure fitting opening faces down.
88.	New packing (17)	Put in using installer and handle.
69.	Thermostat (18)	Put in.
70. Thermostat housing cover (19)	Plug (20)	Screw in until flush using key.
71.	Fitting (21)	Screw in and tighten using 1 1/16-inch wrench.
72. Thermostat housing (13)	New gasket (22) and thermostat housing cover (19)	Put on.
73. Thermostat housing cover (19) to thermostat housing (13)	Four screws (23) and new lock-washers (24)	Screw in and tighten using 9/16-inch socket, and handle.



THERMOSTAT HOUSINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
RIGHT SIDE THERMOSTAT HOUSING INSTALLATION			
74. Thermostat housing (1)	Hose (2)	Push on.	
75. Engine (3)	New gasket (4) and thermostat housing (1)	Put on.	
76. Thermostat housing (1) to engine (3)	Three screws (5), one new lockwasher (6), and four washers (7)	Screw in and tighten using 9/18-inch socket, extension, handle, and 9/16-inch wrench.	
77.	Screw (8) and new lockwasher (9)	Screw in and tighten using 5/8-inch socket, extension, and handle.	

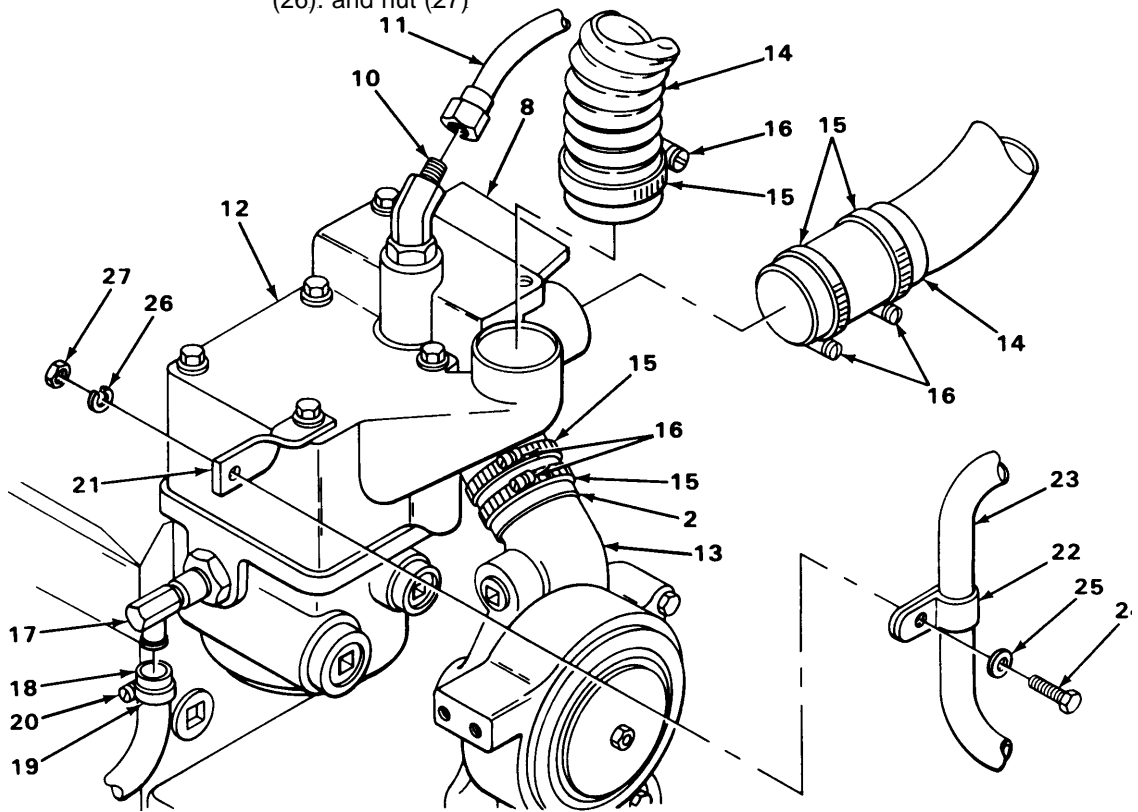


78. Elbow (10)	Hose (11)	Screw on and tighten using 3/4-inch wrench.	
79. Thermostat housing cover (12) and water pump (13)	Two hoses (14) and hose (2)	Push on.	
80. Three hose clamps (15)	Three screws (16)	Using screwdriver, tighten.	

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THERMOSTAT HOUSINGS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
81. Fitting (17)	Hose (18)	Push on.	
82. Clamp (19)	Screw (20)	Using screwdriver, tighten.	
83. Bracket (21)	Hose clamp (22) with hose (23)	Put in position.	
84. Hose clamp (22) and bracket (21)	Screw (24), washer (25), new lockwasher (26), and nut (27)	Screw in and tighten using 9/16-inch socket, handle, and 9/16-inch wrench.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Install filter to engine lines and fittings (page 4-42).
2. Install right or left side radiator guard (page 4-151).
3. Install engine shutdown solenoid (page 4-422).
4. Fill cooling system (TM 9-2320-270-10).
5. Check for leaks (page 4-1).

TASK END HERE

FAN

This task covers:

- a. Removal (page 4-198)
 - b. Cleaning and Inspection (page 4-198)
 - c. Installation (page 4-198)
-

INITIAL SETUP

Tools

Handle, ratchet, 1/2-inch drive
 Socket, 3/4-inch, 1/2-inch drive

Equipment Condition

Radiator guards and shrouds removed
 (page 4-151).

Personnel Required

Two

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

REMOVAL

- | | | |
|---|---------------------------------|---|
| 1. Radiator fan (1) to clutch drive (2) | Four screws (3) | Using 3/4-inch socket and handle, unscrew and take out. |
| 2. Clutch drive (2) | Radiator fan (1) and spacer (4) | With help from assistant, take off. |

CLEANING AND INSPECTION

- | | | |
|----|-----------|--|
| 3. | All parts | Clean and inspect as shown in the general maintenance instructions (page 4-1). |
|----|-----------|--|

INSTALLATION

- | | | |
|---------------------|---------------------------------|----------------------------------|
| 4. Clutch drive (2) | Radiator fan (1) and spacer (4) | With help from assistant put on. |
|---------------------|---------------------------------|----------------------------------|

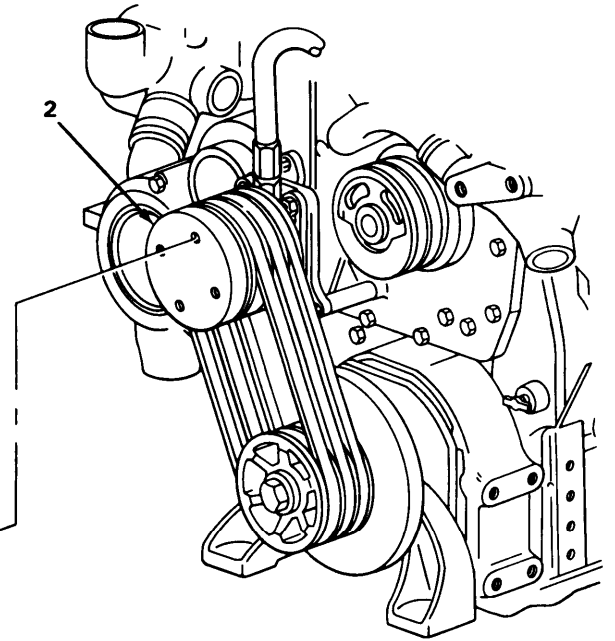
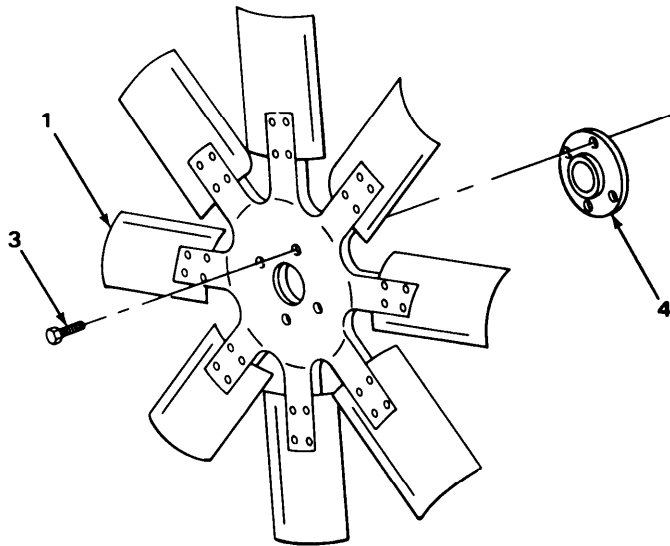
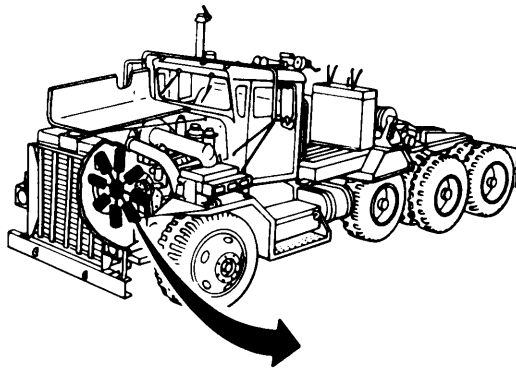
FAN - CONTINUED

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

5. Radiator fan (1)
to clutch drive (2)

Four screws (3)

Screw into and tighten using 3/4-inch
socket and handle.



NOTE

FOLLOW-ON MAINTENANCE: Install radiator guards and shrouds (page 4-151).

TASK ENDS HERE

FAN BELTS

This task covers:

- | | |
|----------------------------|------------------------------|
| a. Removal (page 4-200) | c. Installation (page 4-201) |
| b. Inspection (page 4-200) | d. Adjustment (page 4-202) |
-

INITIAL SETUP

- | | |
|----------------------------------|----------------------------|
| Tools | Personnel Required |
| Handle, ratchet, 1/2-inch drive | One |
| Machinist's rule | |
| Socket, 3/4-inch, 1/2-inch drive | Equipment Condition |
| Wrench, open-end, 3/4-inch | Fan removed (page 4-198). |
| Materials/Parts | |
| Straight edge | |
-

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

REMOVAL

- | | | |
|---------------------------------------|---------------------|---|
| 1. Clutch drive (1)
to bracket (2) | Four screws (3) | Using 3/4-inch wrench, unscrew part way. |
| 2. | Adjusting screw (4) | Using 3/4-inch socket and handle, unscrew until two belts (5) can be taken off clutch drive (1) and pulley (6). |
| 3. Clutch drive (1)
and pulley (6) | Three belts (5) | Take off. |

INSPECTION

NOTE

If any belt is worn or damaged, replace all belts.

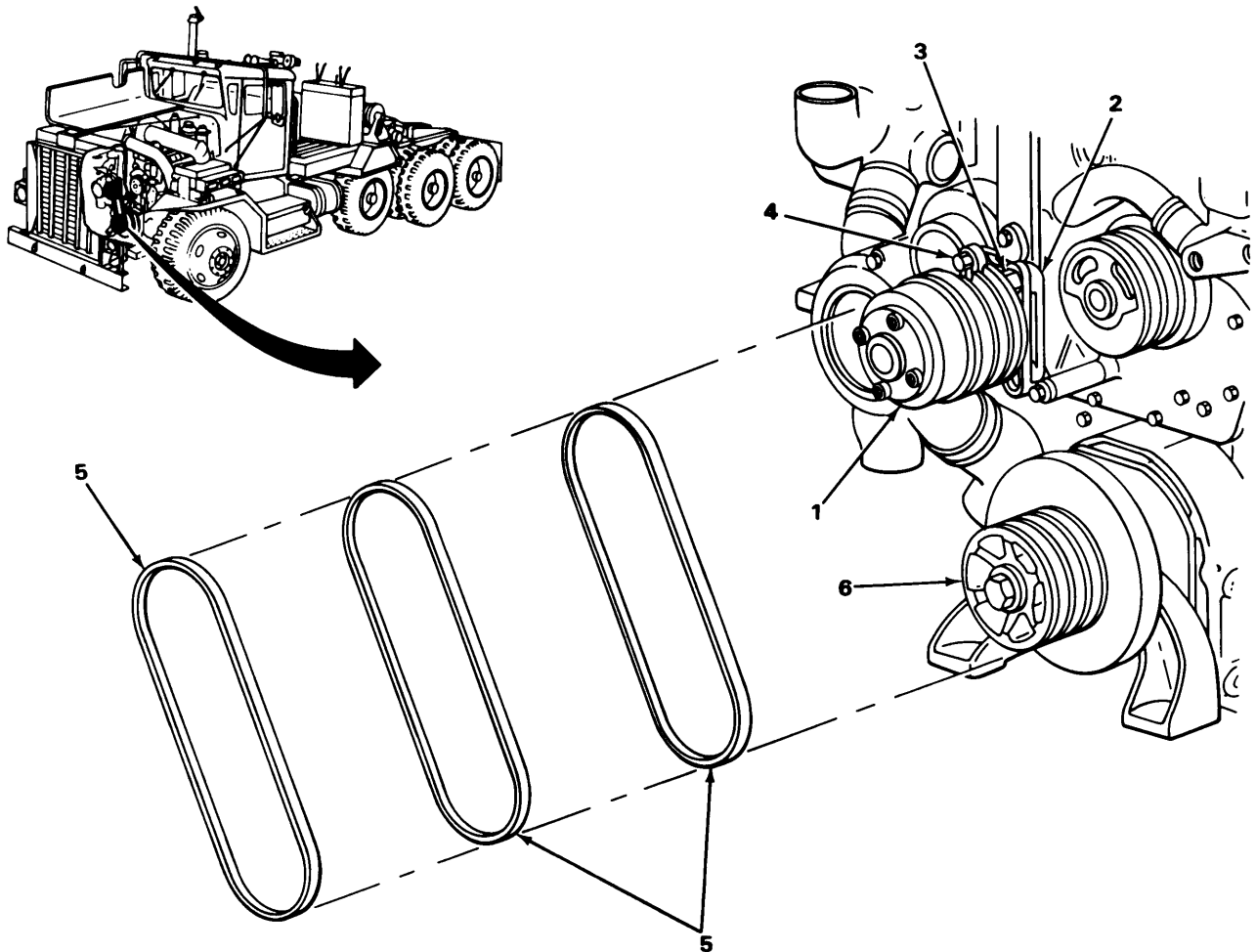
- | | | |
|----|-----------|--|
| 4. | Belts (5) | Inspect as shown in the general maintenance instructions (page 4-1). |
|----|-----------|--|

FAN BELTS - CONTINUED

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

INSTALLATION

- | | | |
|---------------------------------------|---------------------|--|
| 5. Clutch drive (1)
and pulley (6) | Three belts (5) | Put on. |
| 6. Clutch drive (1)
to bracket (2) | Adjusting screw (4) | Screw in until belts (5) are tight, using
3/4-inch socket and handle. |
| 7. | Four screws (3) | Using 3/4-inch wrench, tighten. |



FAN BELTS - CONTINUED

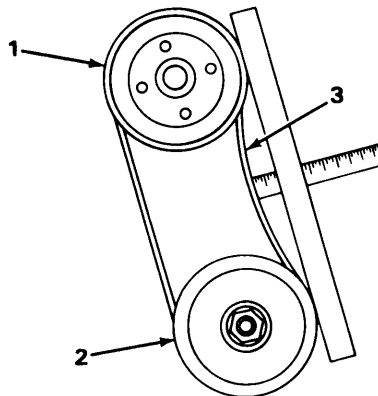
LOCATION	ITEM	ACTION	REMARKS
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ADJUSTMENT

NOTE

All belts should show same measurement. If any belt cannot be adjusted to match other belts, replace all belts.

- | | | |
|---------------------------------------|-----------------|--|
| 8. Clutch drive (1)
and pulley (2) | Three belts (3) | a. Put straightedge across clutch drive (1) and pulley (2).
b. Push down on one belt (3) at a time and using rule, note movement. Each belt should move between 3/8 inch (9.5 cm) and 5/8 Inch (15.9 cm). |
|---------------------------------------|-----------------|--|



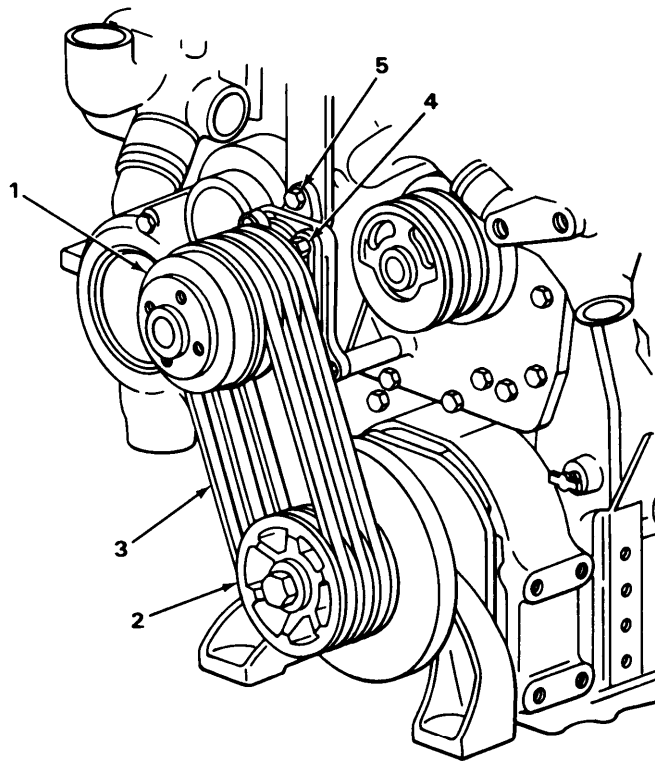
NOTE

if fan belts move too much, do steps 9 and 10, 12 and 13. if fan belts move too little, do steps 9 and 11 thru 13. if fan belts move the right amount, go to follow-on maintenance.

- | | | |
|---------------------|---------------------|---|
| 9. Clutch drive (1) | Four screws (4) | Using 3/4-inch wrench, unscrew part way. |
| 10. | Adjusting screw (5) | Using 3/4-inch socket and handle, screw in one full turn. |
| 11. | Adjusting screw (5) | Using 3/4-inch socket and handle, unscrew one full turn. |

FAN BELTS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
12. Clutch drive (1) and pulley (2)	Three belts (3)	Repeat step 8.
13. Clutch drive (1)	Four screws (4)	Using 3/4-inch wrench, tighten.



NOTE

FOLLOW-ON MAINTENANCE: Install fan (page 4-198).

TASK ENDS HERE

FAN CLUTCH DRIVE

This task covers:

- a. Removal (page 4-204)
 - b. Cleaning and inspection (page 4-204)
 - c. installation (page 4-204)
-

INITIAL SETUP

Tools

- Wrench, open-end, 9/16-inch
- Wrench, open-end, 5/6-inch
- Wrench, open-end, 1 1/16-inch
- Wrench, open-end, 3/4-inch

Materials/Parts

- Lockwasher (four required)

Personnel Required

One

Equipment Condition

Fan belts removed (page 4-200).

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

REMOVAL

- | | | |
|---------------------------------------|--|---|
| 1. Clutch drive (1) | Two hoses (2) | Using 9/16-inch wrench, unscrew and take off. |
| 2. | Hose (3) | Using 5/6-inch and 1 1/16-inch wrenches, unscrew and take off. |
| 3. Clutch drive (1)
to bracket (4) | Four screws (5) and
lockwashers (6) | a. Using 3/4-inch wrench, unscrew and take out.
b. Get rid of lockwashers (6). |
| 4. Bracket (4) | Clutch drive (1) | Take off. |

CLEANING AND INSPECTION

- | | | |
|----|-----------|--|
| 5. | All parts | Clean and inspect as shown in the general maintenance instructions (page 4-1). |
|----|-----------|--|

INSTALLATION

- | | | |
|---------------------------------------|---|--|
| 6. Bracket (4) | Clutch drive (1) | Put on. |
| 7. Clutch drive (1)
to bracket (4) | Four screws (5)
and new lock-
washers (6) | Screw in but, do not tighten, using 3/4-inch wrench. |

FAN CLUTCH DRIVE - CONTINUED

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

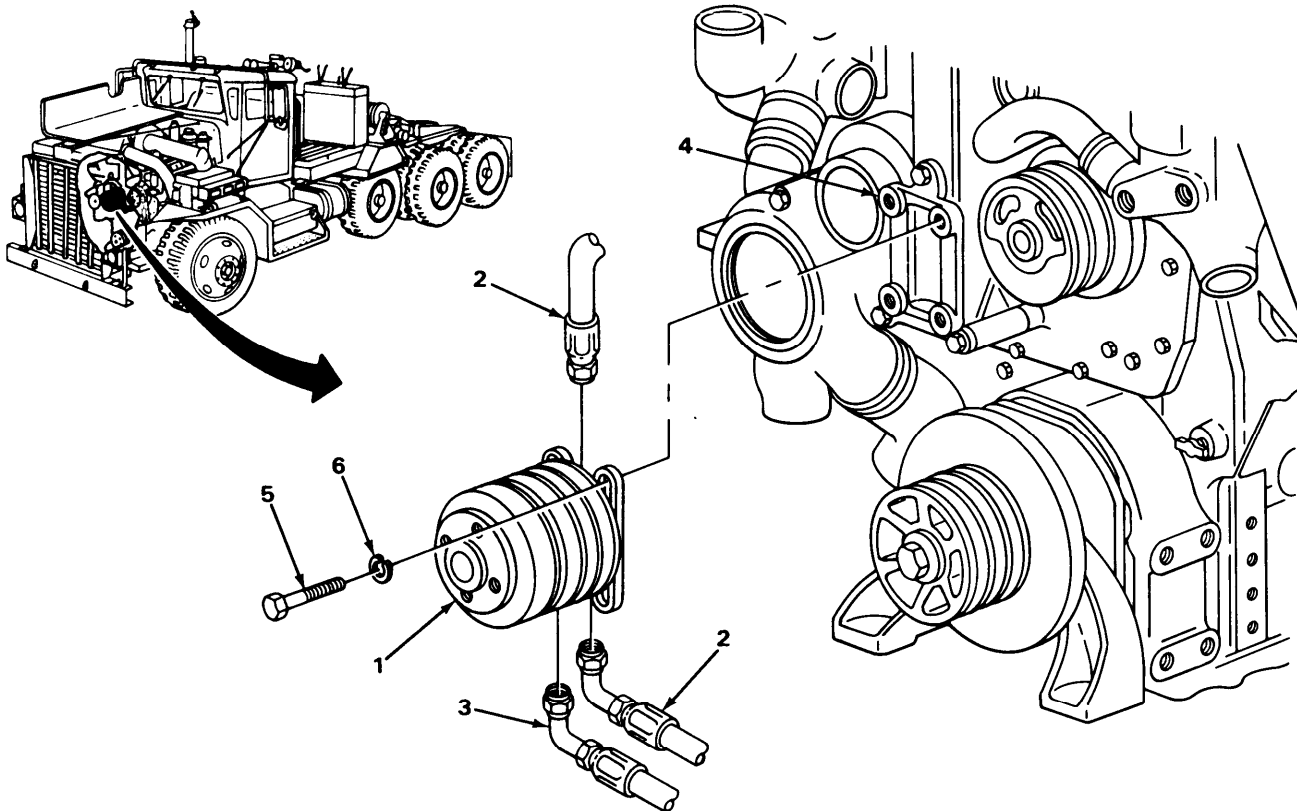
8. Clutch drive (1)

Two hoses (2)

Screw on and tighten using 9/16-inch wrench.

Hose (3)

Screw on and tighten using 5/8-inch and 1 1/16-inch wrenches.



NOTE

FOLLOW-ON MAINTENANCE: Install fan belts (page 4-200).

TASK ENDS HERE

THERMAL AIR VALVE

This task covers:

- a. Removal (page 4-206)
- b. Cleaning and Inspection (page 4-206)
- c. Installation (page 4-206)

THERMAL AIR VALVE - CONTINUED

INITIAL SETUP

Tools

- Caps, vise jaw (one pair)
- Vise, machinist's
- Wrench, adjustable, 10-inch
- Wrench, open-end, 9/16-inch
- Wrench, open-end, 1-inch

Materials/Parts

Container

Personnel Required

One

Equipment Condition

Air system drained
(TM 9-2320-270-10).
Left radiator guard removed (page 4-151).

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

REMOVAL

- | | | |
|--|-----------------------|---|
| 1. Left side of vehicle/two elbows (1) | Two hoses (2) | Using 9/16-inch wrench, unscrew and take off. |
| 2. Left side thermostat (3) | Thermal air valve (4) | <ul style="list-style-type: none"> a. Put container underneath. b. Using 1-inch wrench, unscrew and take out. c. Get rid of fluid (page 4-1). |
| 3. Thermal air valve (4) | Two elbows (1) | <ul style="list-style-type: none"> a. Secure valve (4) in vise with caps. b. Using adjustable wrench, unscrew and take out. c. Take valve (4) out of vise. |

CLEANING AND INSPECTION

- | | | |
|----|-----------|--|
| 4. | All parts | Clean and inspect as shown in the general maintenance instructions (page 4-1). |
|----|-----------|--|

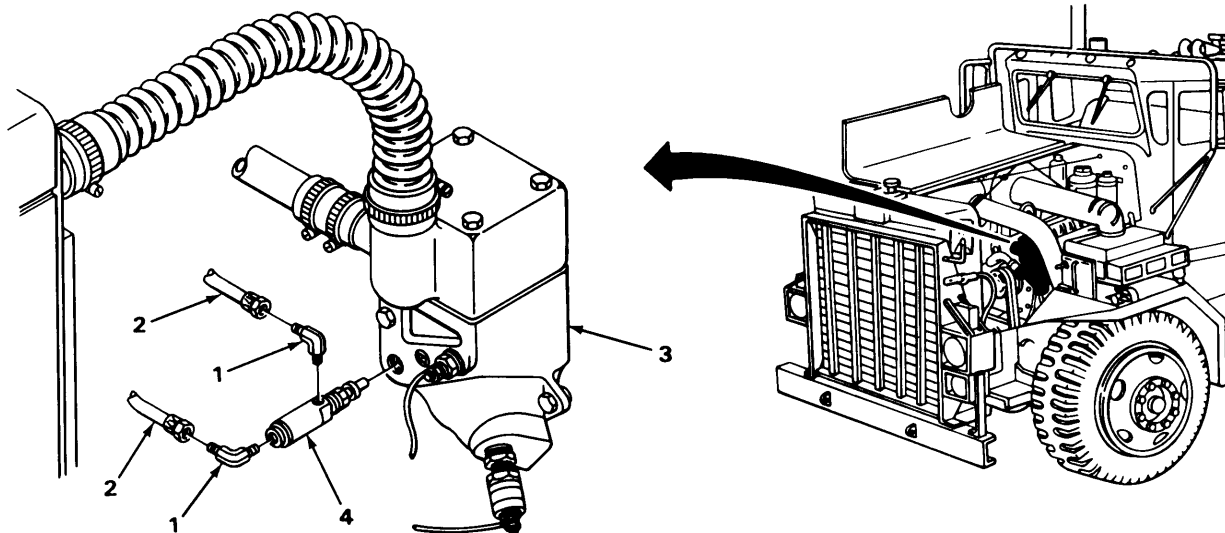
INSTALLATION

- | | | |
|-----------------------------|-----------------------|--|
| 5. Thermal air valve (4) | Two elbows (1) | Screw in, but do not tighten, using adjustable wrench. |
| 6. Left side thermostat (3) | Thermal air valve (4) | Screw in and tighten using 1-inch wrench.
Make sure side elbow is on top. |
| 7. | Two elbows (1) | Using adjustable wrench, screw in and tighten.
Make sure elbow openings go towards center of vehicle. |

THERMAL AIR VALVE - CONTINUED

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

8. Two elbows (1)	Two hoses (2)	Screw on and tighten using 9/16-inch wrench.	
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FOLLOW-ON MAINTENANCE: Install left radiator guard (page 4-151).

TASK ENDS HERE

FAN CLUTCH DRIVE HOSES AND FITTINGS

This task covers:

- | | |
|---|--|
| a. Oil Hoses Removal (page 4-208) | d. Air Hoses Installation (page 4-210) |
| b. Air Hoses Removal (page 4-210) | e. Oil Hoses Installation (page 4-212) |
| c. Cleaning and Inspection (page 4-210) | |

INITIAL SETUP

Tools

- Extension, 5-inch, 3/8-inch drive
- Handle, ratchet, 3/8-inch drive
- Pliers, diagonal-cutting
- Socket, 9/16-inch, 3/8-inch drive
- Vise, machinist's
- Wrench, adjustable, 10-inch

Tools – Continued

- Wrench, open-end, 7/16-inch
- Wrench, open-end, 9/16-inch
- Wrench, open-end, 5/8-inch
- Wrench, open-end, 1 1/16-inch
- Wrench, open-end, 3/4-inch

FAN CLUTCH DRIVE HOSES AND FITTINGS - CONTINUED

INITIAL SETUP – CONTINUED

Materials/Parts

Equipment Condition

Wraps, tie (item 24, appendix c)

Left radiator guard removed (page 4-151).

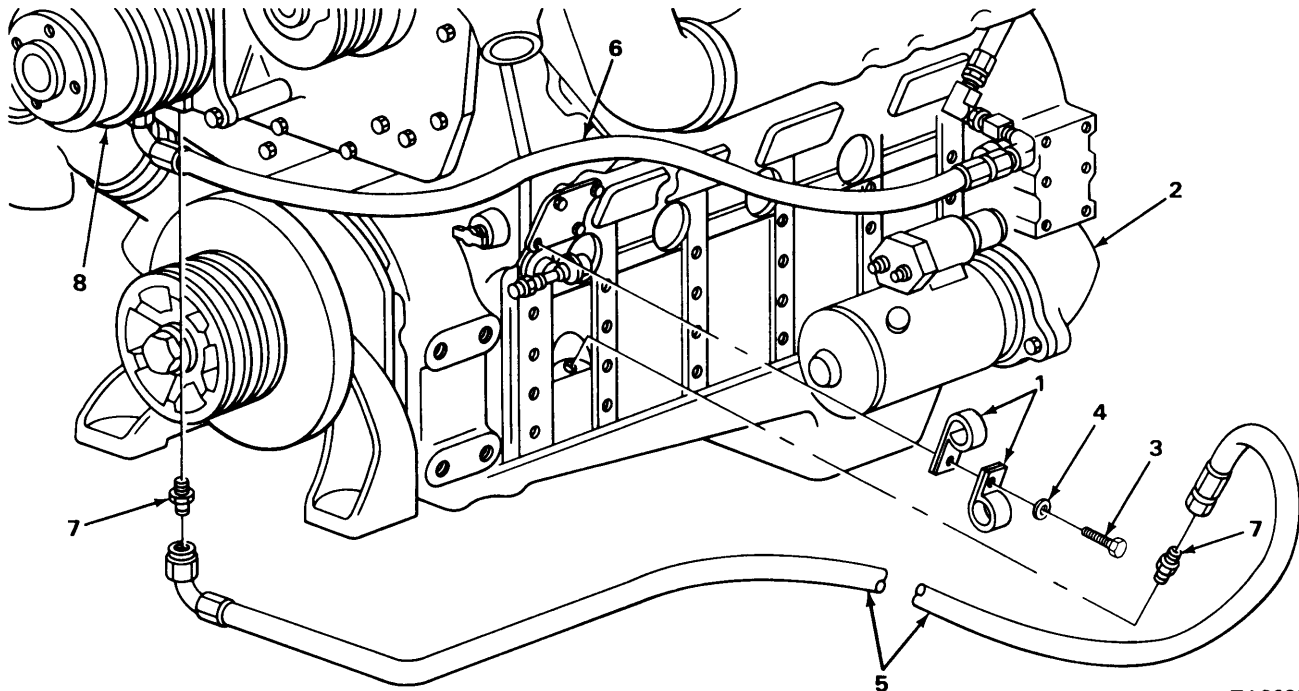
Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
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OIL HOSES REMOVAL

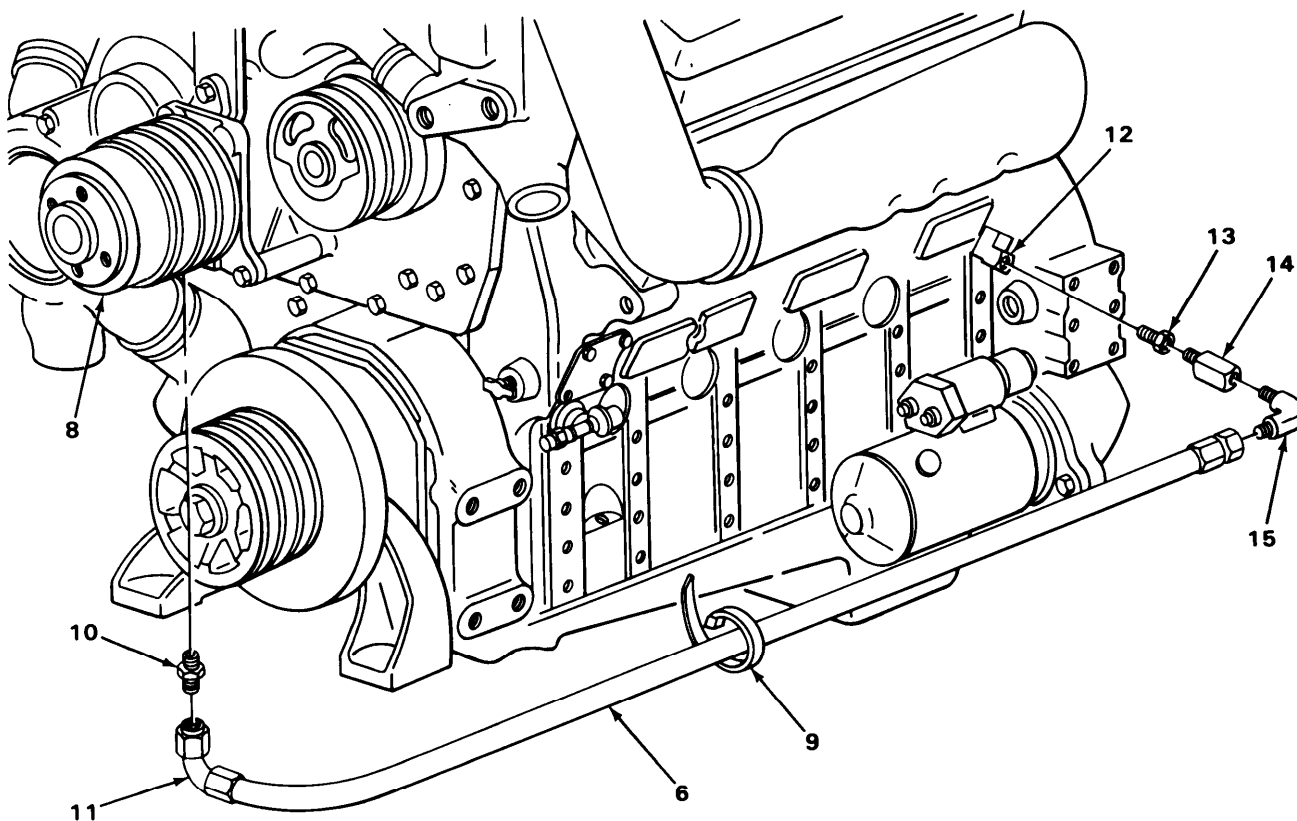
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|---|--------------------------|--|
| 1. Two clamps (1) to engine (2) | Screw (3) and washer (4) | Using 9/16-inch socket, extension, and handle, unscrew and take out. |
| 2. Engine (2) and two hoses (5) and (6) | Two clamps (1) | Take off. |
| 3. Two connectors (7) | Hose (5) | Using 1 1/16-inch and 5/8-inch wrenches, unscrew and take off. |
| 4. Engine (2) and clutch drive (8) | Two connectors (7') | Using 5/8-inch wrench, unscrew and take out. |



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FAN CLUTCH DRIVE HOSES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
5. Hose (6)	Tie wrap (9)	a. Using pliers, cut off. b. Get rid of.
6. Connector (10) and elbow (11)	Hose (6)	Using 9/16-inch wrench, unscrew and take off.
7. Clutch drive (8)	Connector (10)	Using 9/16-inch wrench, unscrew and take out.
8. Tee (12)	Bushing (13), orifice fitting (14), and elbow (15)	a. Using 5/8-inch and 3/4-inch wrenches, unscrew and take out. b. Put orifice fitting (14) in vise. c. Using 5/8-inch wrench, unscrew and take out bushing (13). d. Using adjustable wrench, unscrew and take out elbow (11). e. Take orifice fitting (14) out of vise.

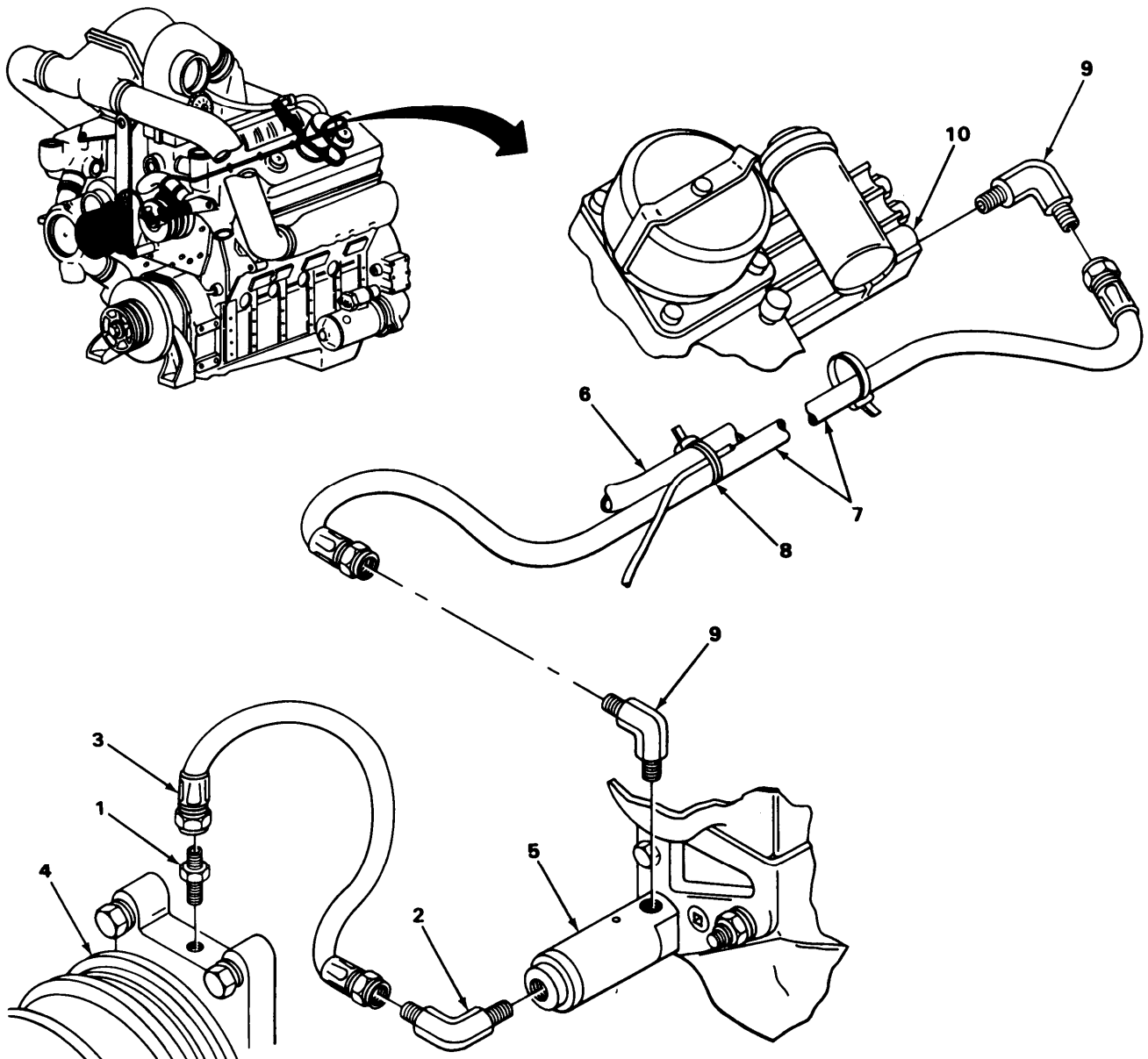


FAN CLUTCH DRIVE HOSES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
AIR HOSES REMOVAL		
9. Connector (1) and elbow (2)	Hose (3)	Using 9/16-inch wrench, unscrew and take off.
10. Clutch drive (4)	Connector (1)	Using 7/16-inch wrench, unscrew and take off.
11. Thermal air valve (5)	Elbow (2)	Using adjustable wrench, unscrew and take out.
12. Hoses (6 and 7)	Four tie wraps (8)	a. Using pliers, cut. b. Get rid of.
13. Two elbows (9)	Hose (7)	Using 9/16-inch wrench, unscrew and take off.
14. Thermal air valve (5) and governor (10)	Two elbows (9)	Using adjustable wrench, unscrew and take out.
CLEANING AND inspection		
15.	All parts	Clean and inspect as shown in the general maintenance instructions (page 4.1).
AIR HOSES INSTALLATION		
16. Thermal air valve (5) and governor (10)	Two elbows (9)	Screw in and tighten using adjustable wrench. Make sure elbow openings face center of vehicle.
17. Two elbows (9)	Hose (7)	Screw on and tighten using 9/16-inch wrench.
18. Hoses (6) and (7)	Four new tie wraps (8)	Put on.
19. Thermal air valve (5)	Elbow (2)	Screw in and tighten using adjustable wrench. Make sure elbow opening faces center of vehicle.

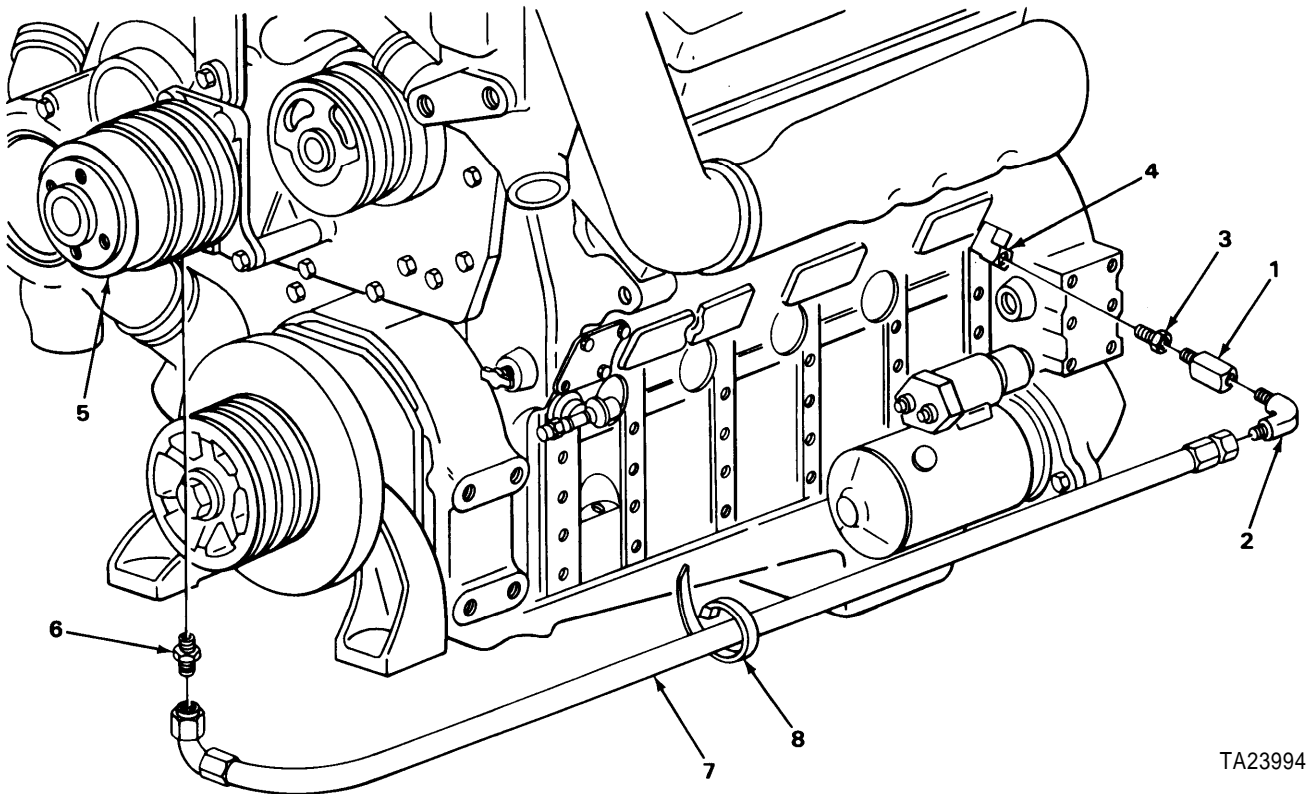
FAN CLUTCH DRIVE HOSES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
20. Clutch drive (4)	Connector (1)	Screw in and tighten using 7/16-inch wrench.
21. Connector (1) and elbow (2)	Hose (3)	Screw on and tighten using 9/16-inch wrench.



FAN CLUTCH DRIVE HOSES AND FITTINGS - CONTINUED

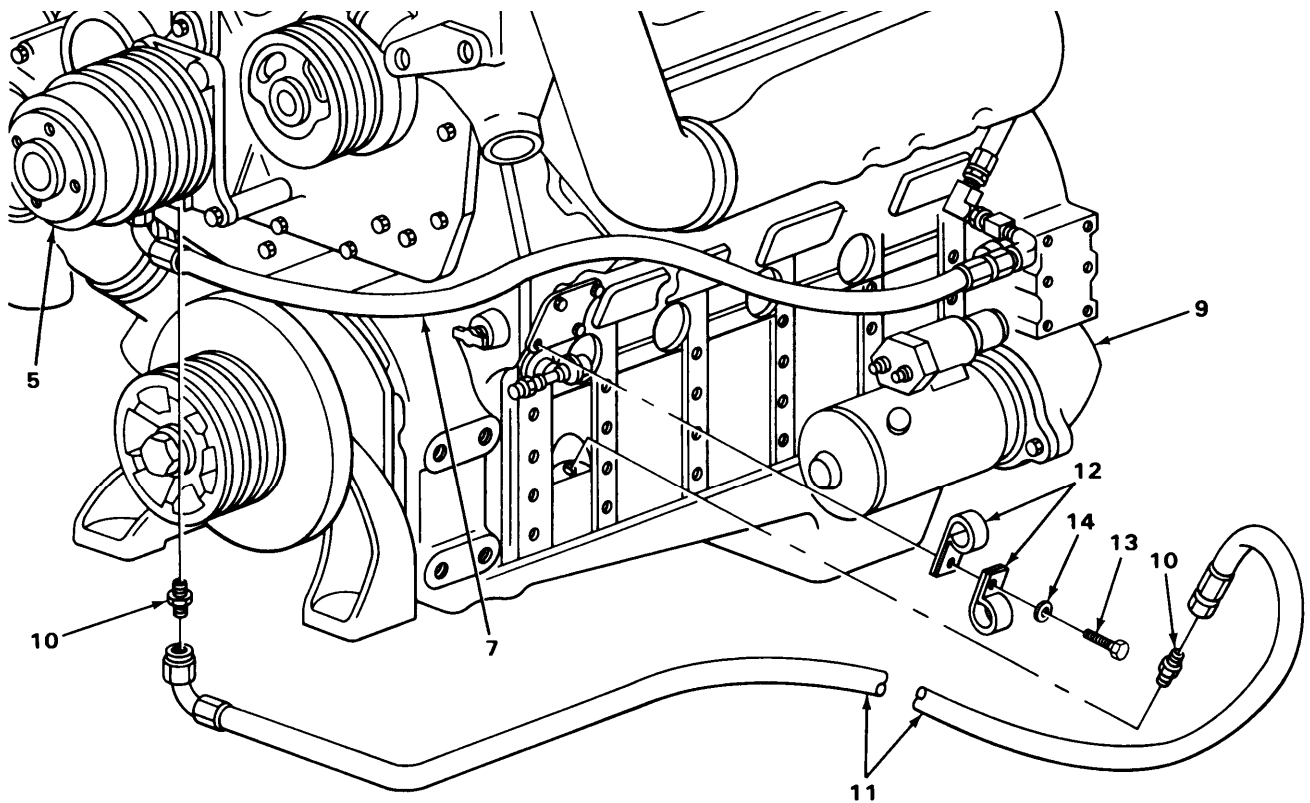
LOCATION	ITEM	ACTION REMARKS
OIL HOSES INSTALLATION		
22.	Orifice fitting (1)	Secure in vise.
23. Orifice fitting (1)	Elbow (2)	Screw in and tighten using adjustable wrench.
24.	Bushing (3)	a. Screw in and tighten using 5/8-inch wrench. b. Take fitting (1) out of vise.
25. Tee (4)	Bushing (3), orifice fitting (1), and elbow (2)	Screw in and tighten using 5/8-inch and 3/4-inch wrenches. Make sure elbow opening faces front of vehicle.
26. Clutch drive (5)	Connector (6)	Screw in and tighten using 9/16-inch wrench.
27. Connector (6) and elbow (2)	Hose (7)	Screw on and tighten using 9/16-inch wrench.
28. Hose (7)	New tie wrap (8)	Put on.



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FAN CLUTCH DRIVE HOSES AND FITTINGS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
29. Engine (9) and clutch drive (5)	Two connectors (10)	Screw in and tighten using 5/8-inch wrench.
30. Two connectors (10)	Hose(n)	Screw on and tighten using 11/18-inch and 5/8-inch wrenches.
31. Engine (9) and two hoses (7) and (11)	Two clamps (12)	Put on.
32. Two clamps (12) to engine (9)	Screw (13) and washer (14)	Screw in and tighten using 9/16 inch socket, extension, and handle.



NOTE

FOLLOW-ON MAINTENANCE: Install left radiator guard (page 4-151).

TASK ENDS HERE

Section VI. ELECTRICAL SYSTEM MAINTENANCE

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High Beam Indicator Lamp			
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Section VI, ELECTRICAL SYSTEM MAINTENANCE - CONTINUED

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ALTERNATOR

This task covers:

- | | |
|---|--|
| <ul style="list-style-type: none"> a. Removal (page 4-216) b. Installation (page 4-218) | <ul style="list-style-type: none"> c. Adjustment (page 4-220) |
|---|--|
-

INITIAL SETUP

Tools

- Handle, ratchet, 3/8-inch drive
- Rule, machinist's
- Socket, 3/8-inch, 3/8-inch drive
- Socket, 1/2-inch, 3/8-inch drive
- Socket, 3/4 inch, 3/8-inch drive
- Straight edge
- Wrench, box, 3/4-inch

Materials/Parts

- Lockwasher, ground terminal screw to alternator
- Lockwasher, adjusting link to bracket

Materials/Parts – Continued

- Lockwasher, adjusting link to alternator
- Tags, marking (item 18, appendix C)

Personnel Required

One

Equipment Condition

- Right side of hood open and right side panel removed (TM 9-2320-270-10).
- Battery ground cable disconnected (page 4-444).

ALTERNATOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

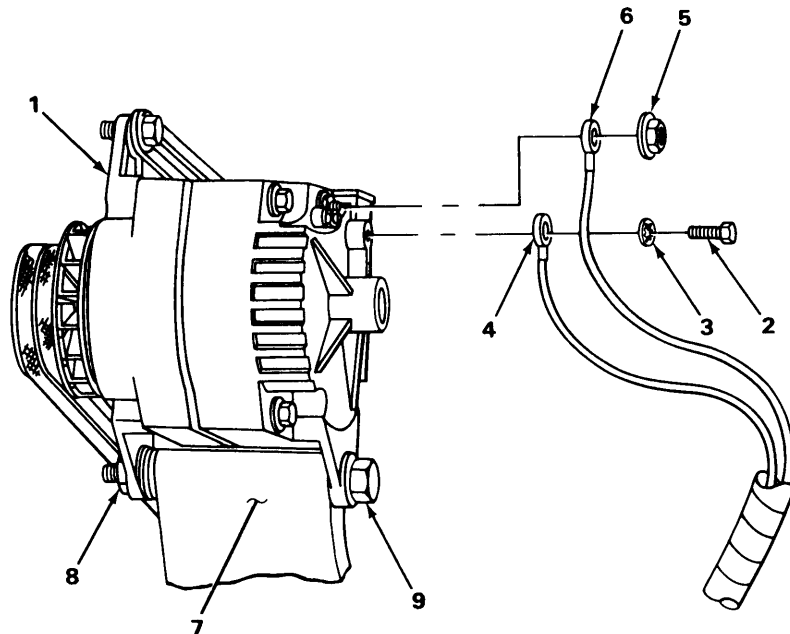
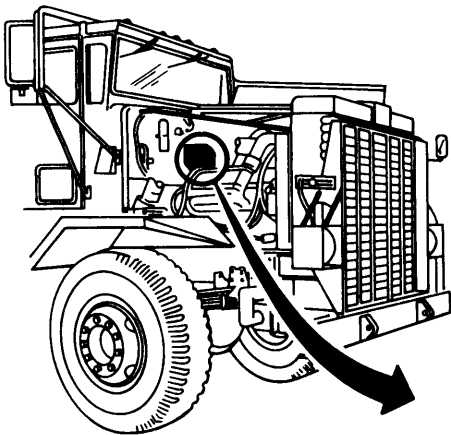
WARNING

Make sure battery ground cable is disconnected before doing this task. Failure to disconnect battery ground cable can cause personal injury and damage to electrical system.

NOTE

Tag wires according to general maintenance instructions (page 4-1).

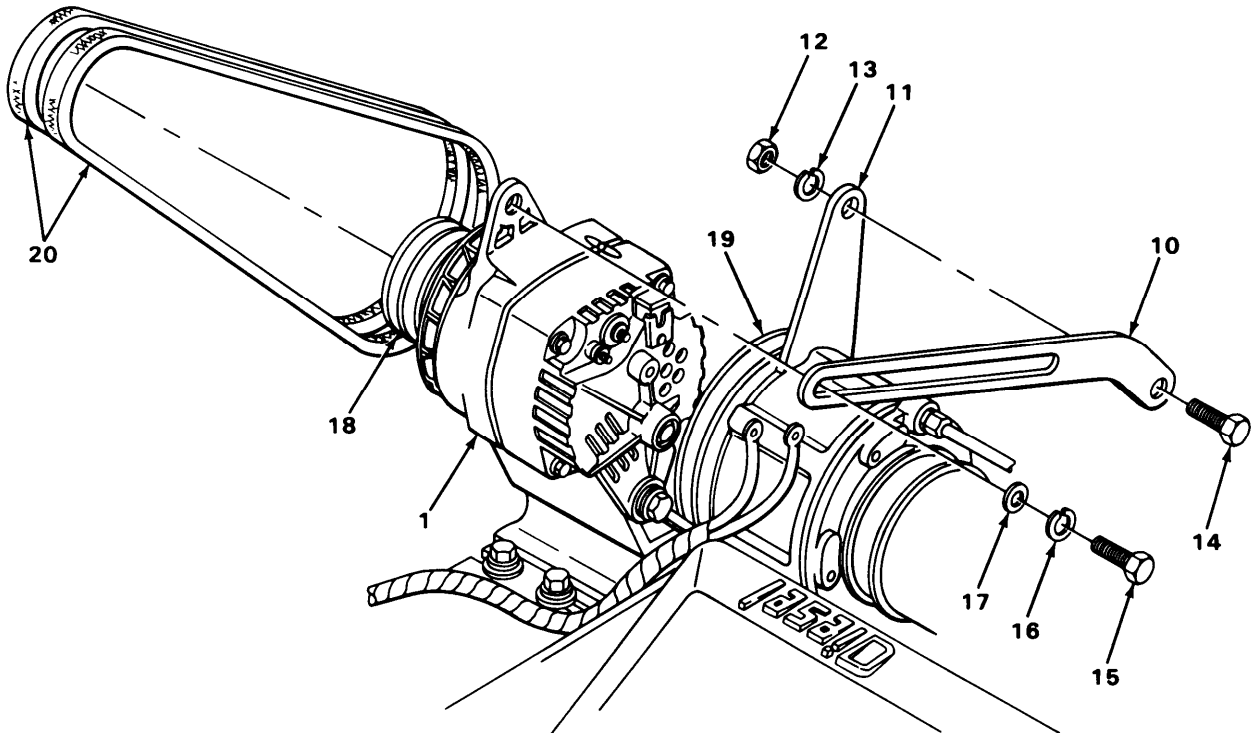
- | | | |
|---|--|---|
| 1. Alternator (1) | Ground terminal screw (2), lock-washer (3), and wire 128 (4) | a. Using 1/2-inch socket and handle, unscrew and take off.
b. Get rid of lockwasher (3). |
| 2. | Nut (5) and wire 278 (6) | Using 3/8-inch socket and handle, unscrew and take off. |
| 3. Alternator (1) to mounting bracket (7) | Nut (8) and screw (9) | Using 3/4-inch socket, handle, and 3/4-inch wrench, unscrew part way. |



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ALTERNATOR - CONTINUED

LOCATION	ITEM	ACTION REMARKS
4. Adjusting link (10) to adjusting bracket (11)	Nut (12), lockwasher (13), and bolt (14)	a. Using 3/4-inch socket, handle, and 3/4-inch wrench, unscrew and take out. b. Get rid of lockwasher (13).
5. Adjusting link (10) to alternator(1)	Screw (15), lockwasher (16), and washer (17)	a. Using 3/4-inch socket and handle, unscrew and take out. b. Get rid of lockwasher (16).
6. Alternator (1)	Adjusting link (10)	Take off.
7.	Alternator (1)	Push toward center of truck.
8. Alternator pulley (18) to drive pulley (19)	Two alternator belts (20)	Take off.



ALTERNATOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL - CONTINUED			
9. Alternator (1) to mounting bracket (2)	Nut (3), four washers (4, 5, and 6), and screw (7)		Using 3/4-inch socket, handle, and 3/4-inch wrench, unscrew and take out.
10. Mounting bracket (2)	Alternator (1)	Take off.	
INSTALLATION			
11. Mounting bracket (2)	Alternator (1)	Put on.	
12. Mounting bracket (2) and alternator (1)	Two washers (4)	Put in between.	
13.	Screw (7) and two washers (5) and (6)	Put through.	
14. Screw (7)	Nut (3)	Screw on and tighten.	
15. Alternator pulley (8) and drive pulley (9)	Two belts (10)	Put on.	
16. Adjusting bracket (11)	Adjusting link (12), bolt (13), new lockwasher (14), and nut (15)	Screw on and tighten.	
17. Adjusting link (12) to alternator (1)	Screw (16), new lockwasher (17), and washer (18)	Screw in finger tight.	

ALTERNATOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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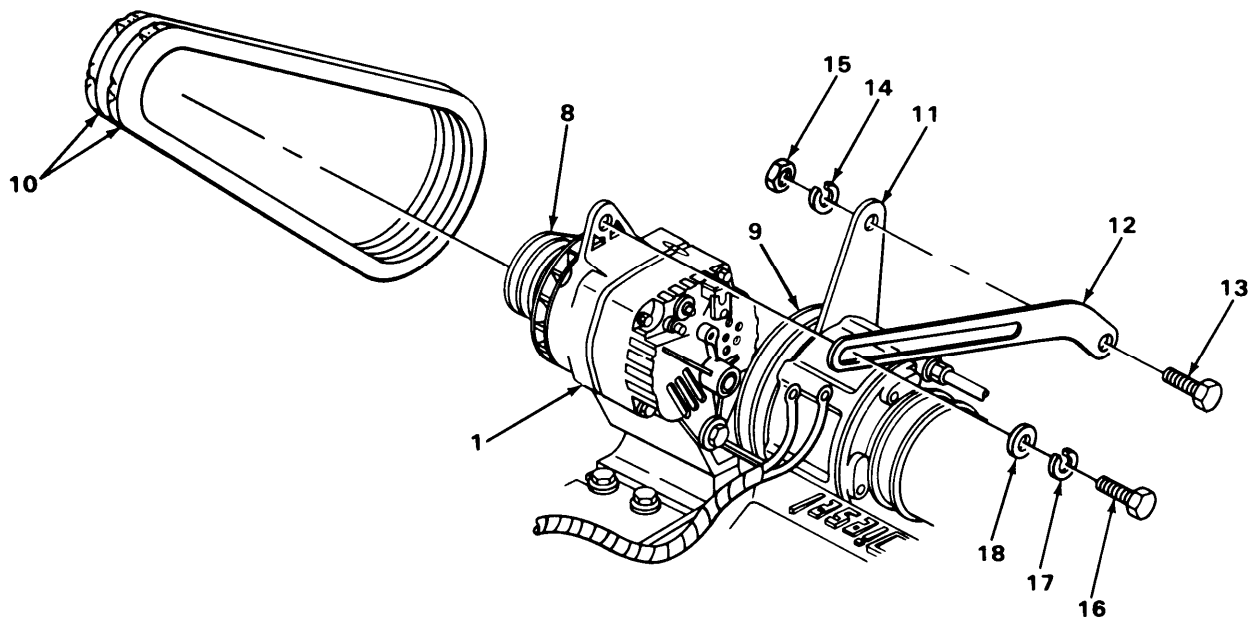
CAUTION

If alternator belts are too loose, alternator will not charge enough and belts will wear out. If belts are too tight, alternator bearings will wear out.

NOTE

If any belt is worn or damaged, replace all belts.

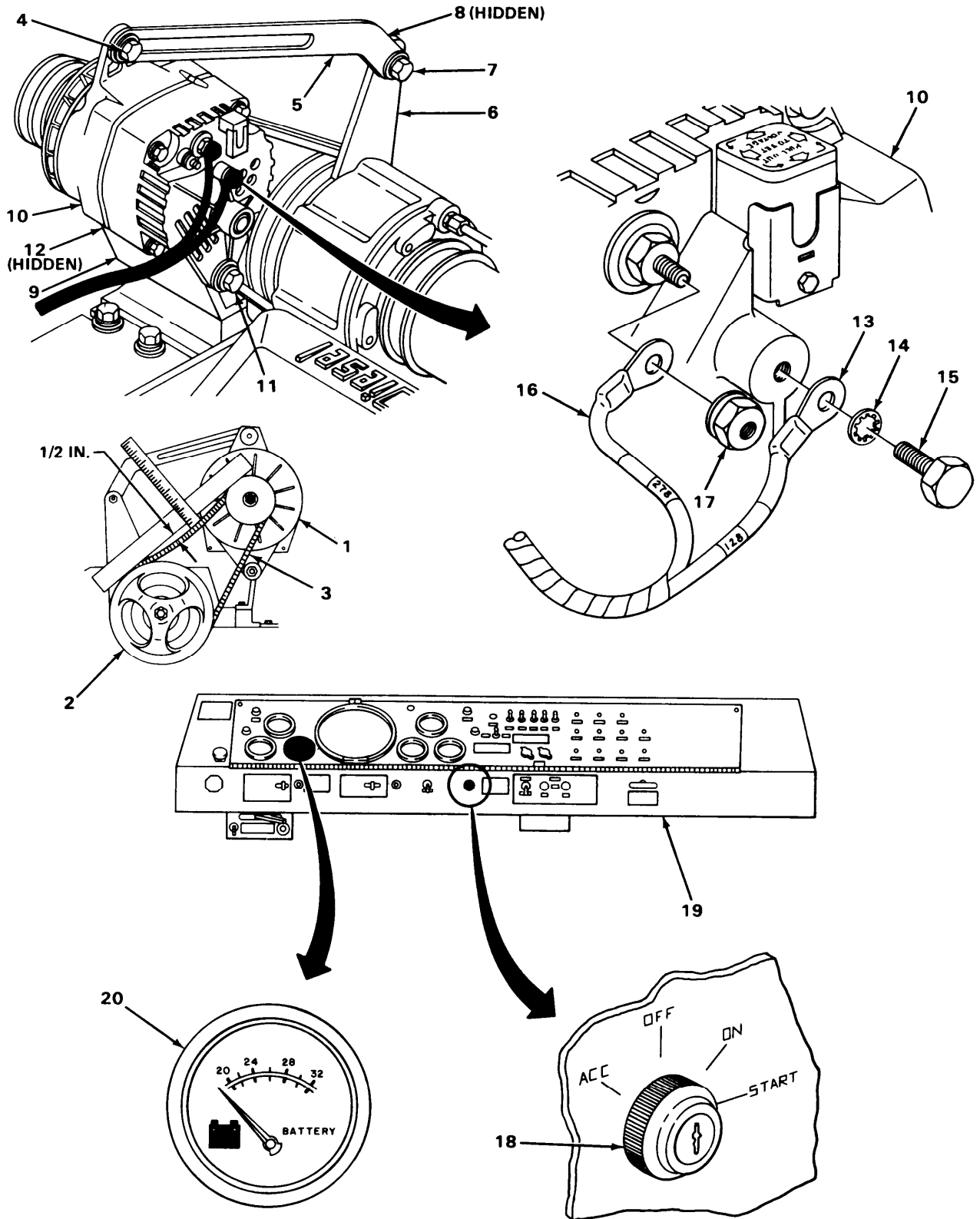
- | | | |
|---|--|---|
| 18. Adjusting link (12)
to alternator(1) | Alternator (1),
screw (16), and
belts (10) | a. Pull on alternator (1) to put tension
on belts (10).
b. Using 3/4-inch socket and handle,
tighten screw (16). |
|---|--|---|



ALTERNATOR - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION – CONTINUED		
19. Alternator pulley (1) and drive pulley (2)	Two alternator belts (3)	a. Put straightedge across pulleys (1) and (2). b. Push down on one belt (3) at a time and using rule, measure movement. Each belt should move between 3/8-inch (9.52 millimeter) and 5/8-inch (15.87 millimeter). if belt moves too much or too little, loosen screw(4) and repeat step 18. If any belt cannot be adjusted to correct measurement, replace all belts.
20. Adjusting link (5) to adjusting bracket (6)	Bolt (7) and nut (8)	Using 3/4-inch socket, handle, and 3/4-inch box wrench, tighten.
21. Alternator mounting bracket (9) to alternator (10)	Screw (11) and nut (12)	Using 3/4-inch socket, handle, and 3/4-inch box wrench, tighten.
22. Wire 128 (13) to alternator (10)	New lockwasher (14) and screw (15)	Screw in and tighten using 1/2-inch socket and handle.
23. Wire 278 (16) to alternator (10)	Nut (17)	Screw in and tighten using 3/8-inch socket and handle.
24.	Battery ground cable	Connect (page 4-444).
ADJUSTMENT		
25.	Ignition switch (18)	Turn on.
26. Instrument panel (19)	BATTERY gage (20)	Note voltage reading.
27.	Engine	Start (TM 9-2320-270-10).
28.	BATTERY gage (20)	Note voltage reading.

ALTERNATOR - CONTINUED



ALTERNATOR - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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ADJUSTMENT- CONTINUED

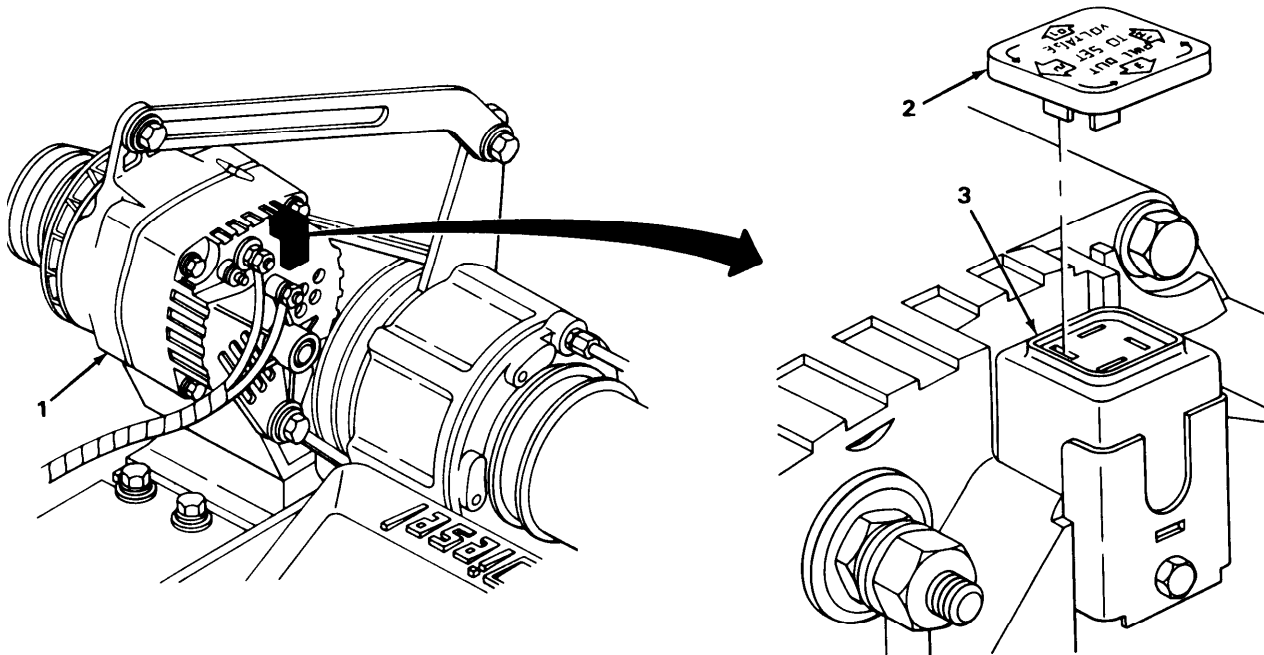
NOTE

Voltage reading in step 28 should be 2-4 volts higher than voltage reading in step 26. Do steps 29 and 30 only if voltage reading in step 28 is too high or too low.

20.	Engine	Shut down (TM 9-2320-270-10).	
30. Alternator (1)	Voltage adjustment cap (2)	a. Note position (3) as shown by arrow. b. Unplug. c. If voltage was too high, rotate to next lower position and plug in. d. If voltage was too low, rotate to next higher position and plug in. Repeat steps 26 thru 30.	

NOTE

If adjusting the alternator required turning adjustment cap higher than HI or lower than LO, replace alternator.



ALTERNATOR - CONTINUED**NOTE****FOLLOW-ON MAINTENANCE:**

1. Check operation (TM9-2320-270-10).
2. Close right side of hood and install right side panel TM9-23-270-10).

TASK ENDS HERE**ALTERNATOR DRIVE BELTS**

This task covers:

- | | |
|----------------------------|------------------------------|
| a. Removal (page 4-224) | c. Installation (page 4-224) |
| b. Inspection (page 4-224) | d. Adjustment (page 4-226) |
-

INITIAL SETUP**Tools**

Handle, ratchet, 3/8-inch drive
 Rule, machinist's
 Socket, 3/4-inch, 3/8-inch drive
 Straightedge
 Wrench, box, 3/4-inch

Personnel Required

One

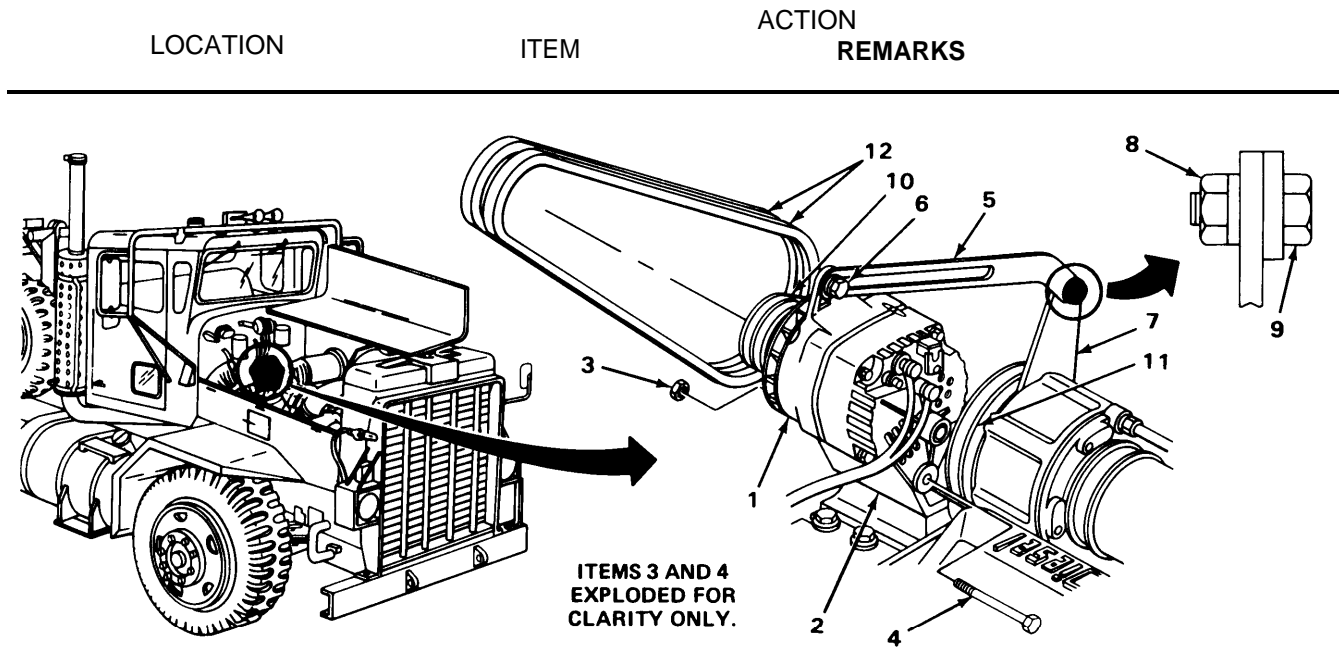
Equipment Condition

Right side hood open and right side panel removed (TM 9-2320-270-1 O).

ALTERNATOR DRIVE BELTS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL		
1. Alternator (1) to mounting bracket (2)	Nut (3) and bolt (4)	Using 3/4-inch socket, handle, and 3/4-inch box wrench, unscrew part way.
2. Adjusting link (5) to alternator (1)	Screw (6)	Using socket and handle, unscrew part way.
3. Adjusting link (5) to adjusting bracket (7)	Nut (8) and bolt (9)	Using 3/4-inch socket, handle, and 3/4-inch box wrench, unscrew part way.
4.	Alternator (1)	Push toward center of truck.
5. Alternator pulley (10) and drive pulley (n)	Two alternator belts (12)	Take off.
INSPECTION		
6.	Two alternator belts (12)	Look for cracks, glazing, signs of extreme wear and cuts. If damaged, replace.
INSTALLATION		
7. Alternator pulley (10) and drive pulley (n)	Two alternator belts (12)	Put on.
8. Adjusting link (5) to alternator (1)	Screw (6)	Pull on alternator (1) to put tension on belts (12) and tighten, using socket and handle.
9. Adjusting link (5) to adjusting bracket (7)	Nut (8) and bolt (9)	Using 3/4-inch socket, handle, and 3/4-inch box wrench, tighten.
10. Alternator (1) to mounting bracket (2)	Nut (3) and bolt (4)	Using 3/4-inch socket, handle, and 3/4-inch box wrench, tighten.

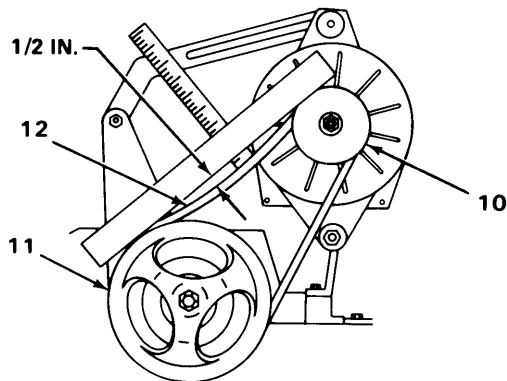
ALTERNATOR DRIVE BELTS- CONTINUED



CAUTION

If alternator belts are too loose, alternator will not charge enough and belts will wear out too soon. If alternator belts are too tight, alternator bearings will wear out too soon.

- | | | |
|--|-----------------------|---|
| <p>11. Alternator pulley (10) and drive pulley (n)</p> | <p>Two belts (12)</p> | <p>a. Put straightedge across pulley (10) and pulley (11).</p> <p>b. Using rule, push down on one belt (12) at a time and measure amount it moves.
 Each belt should move between 3/8 inch (9.52 millimeter) and 5/8 inch (15.87 millimeter). If belts move too much or too little, adjust (page 4-226).</p> |
|--|-----------------------|---|

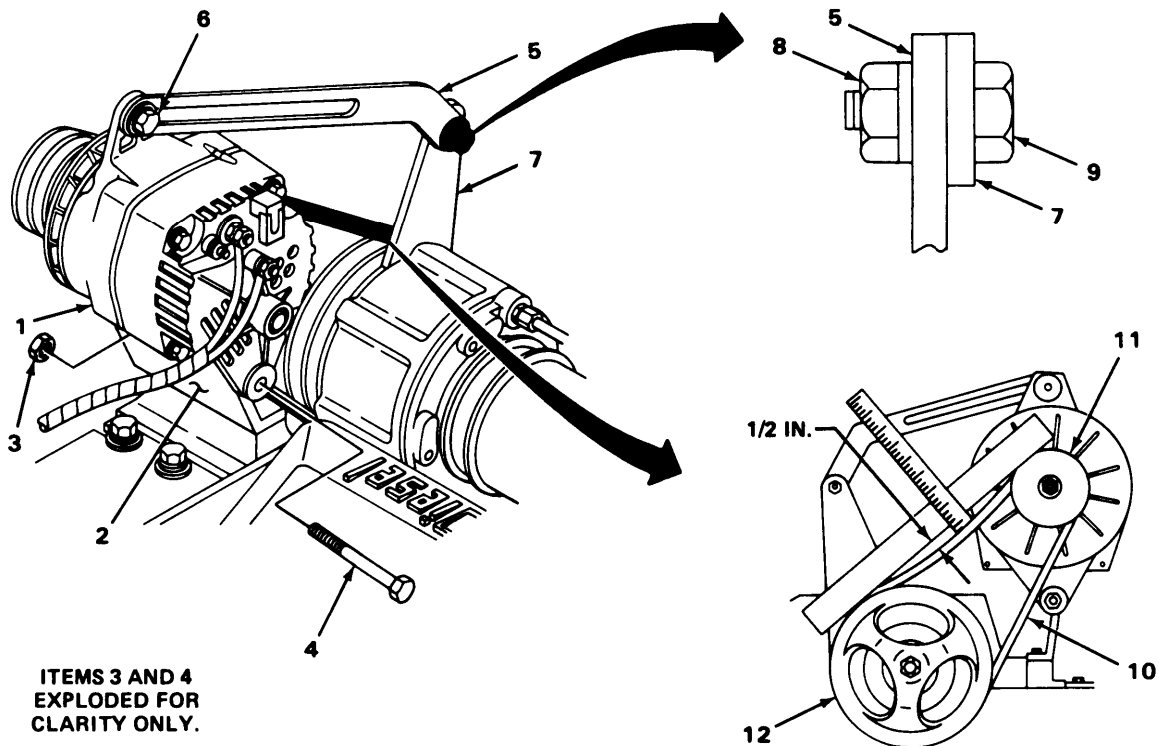


ALTERNATOR DRIVE BELTS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ADJUSTMENT		
12. Alternator (1) to mounting bracket (2)	Nut (3) and bolt (4)	Using 3/4-inch socket, handle, and 3/4-inch box wrench, unscrew part way.
13. Alternator (1) to adjusting link (5)	Screw (6)	Using 3/4-inch socket, and handle, unscrew part way.
14. Alternator adjusting link (5) to adjusting bracket (7)	Nut (8) and bolt (9)	Using 3/4-inch socket, handle, and 3/4-inch box wrench, unscrew part way.
<u>CAUTION</u>		
If alternator belts are too loose, alternator will not charge enough and belts will wear out too soon. If alternator belts are too tight, alternator bearings will wear too soon.		
15. Adjusting link (5) to alternator (1)	Alternator (1), screw (6), and belts (10)	Pull on alternator (1) hard enough to put tension on belts (10) and, using 3/4-inch socket and handle, tighten.
16. Alternator pulley (11) and drive pulley (12)	Two alternator belts (10)	<p>a. Put straightedge across pulleys (11) and (12).</p> <p>b. Using rule, push down on belts (10) one at a time and measure the amount it moves.</p> <p>Each belt should move between 3/8 inch (9.52 millimeter) and 5/8 inch (15.87 millimeter). if belt moves too much or too little, loosen screw and repeat step 14.</p>
17. Alternator adjusting link (5) to adjusting bracket (7)	Bolt (9) and nut (8)	Using 3/4-inch socket, handle, and 3/4-inch box wrench, tighten.
18. Mounting bracket (2) to alternator (1)	Bolt (4) and nut (3)	Using 3/4-inch socket, handle, and 3/4-inch box wrench, tighten.

ALTERNATOR DRIVE BELTS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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ITEMS 3 AND 4
EXPLODED FOR
CLARITY ONLY.

19.

Engine

- a. Start (TM 9-2320-270-10).
- b. Run at fast idle, then slow idle.
- c. Listen for chirping or squealing that indicates slippage.
- d. Shut down (TM 9-2320-270-10).
- e. If belt slip, repeat steps 12 thru 19d.

NOTE

FOLLOW-ON MAINTENANCE:

1. Check operation (TM 9-2320-270-10).
2. Close right side of hood and install right side panel (TM 9-2320-270-10).

TASK ENDS HERE

STARTER

This task covers:

- a. Removal (page 4-228)
 - b. Installation (page 4-230)
-

INITIAL SETUP

Tools

Extension, 6-inch, 3/8-inch drive
 Handle, ratchet, 3/8-inch drive
 Joint, universal, 3/8-inch drive
 Screwdriver, flat-tip, 3/16-inch
 Socket, 5/8-inch, 3/8-inch drive
 Socket, deep well, 3/4-inch with
 3/8-inch drive

Materials/Parts – Continued

Lockwasher, starter to engine (three
 required)
 Tags, marking (item 18, appendix C)

Personnel Required

Two

Materials/Parts

Gasket
 Lockwasher, starter battery terminal
 Lockwasher, starter ground terminal

Equipment Condition

Left side of hood open and left side panel
 removed (TM 9-2320-272-1 0).
 Battery ground cable disconnected
 (page 4-444).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

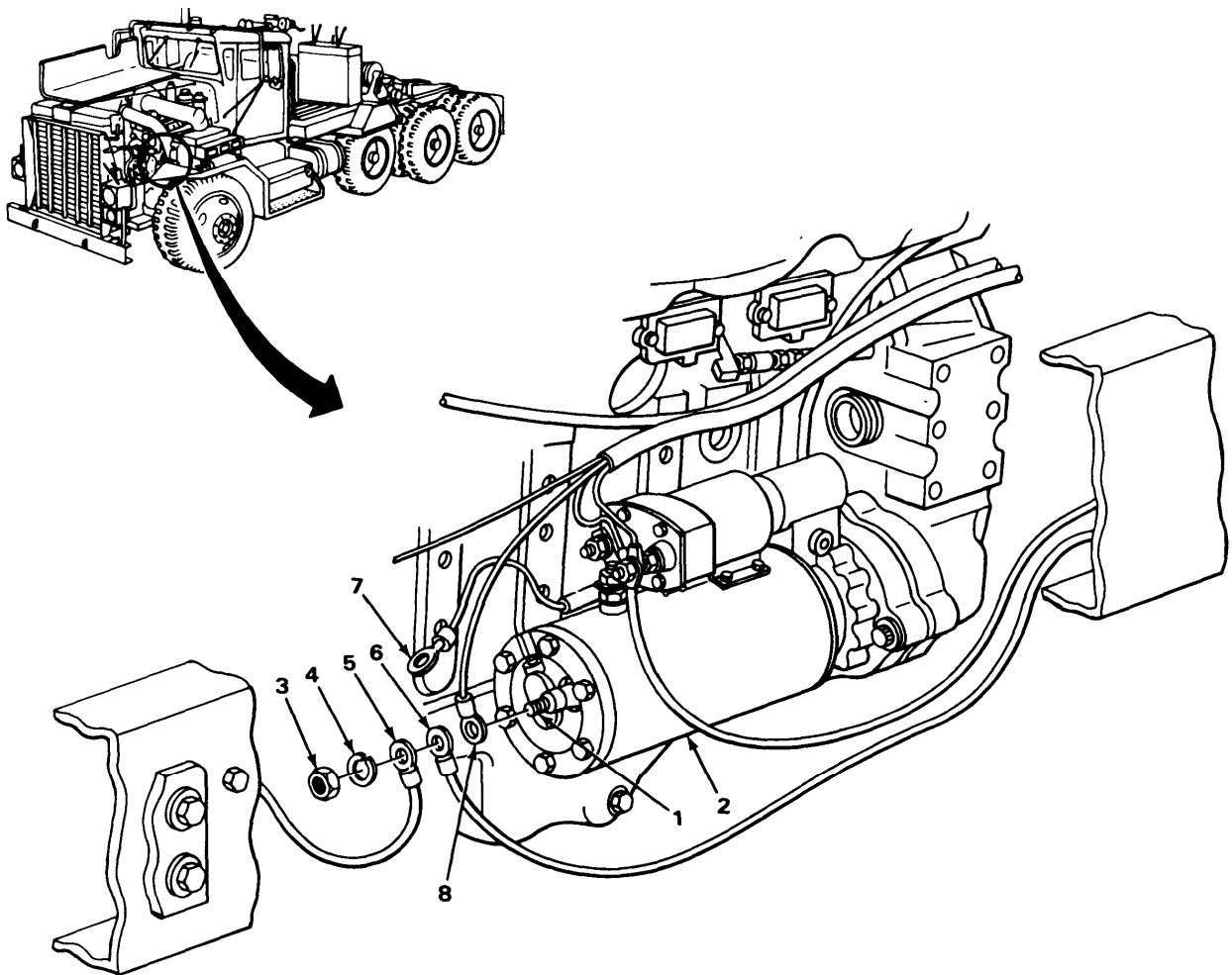
Make sure battery ground cable is disconnected before doing this task. Failure to disconnect battery ground cable can cause injury to personnel and damage to electrical system.

NOTE

Tag wires according to general maintenance instructions (page 4-1).

STARTER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
1. Ground terminal (1) on starter (2)	Nut (3) and lockwasher (4)	a. Using 3/4-inch socket and handle, un- screw and take off. b. Get rid of lockwasher (4).
2. Ground terminal (1)	Chassis ground wire (5), battery ground cable (6), solenoid ground wire (7) and wire 128 (8)	Take off.



STARTER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
3. Battery terminal (1)	Nut (2) and lockwasher (3)	a. Using 3/4-inch socket and handle, unscrew and take off. b. Get rid of lockwasher (3).
4.	Battery cable (4), wire 046 (5), and wire 278 (6)	Take off.
5. Ignition switch terminal (7)	Screw (8) and wire 045 (9)	Using screwdriver, unscrew and take off.

NOTE

Have assistant support starter while removing screws.

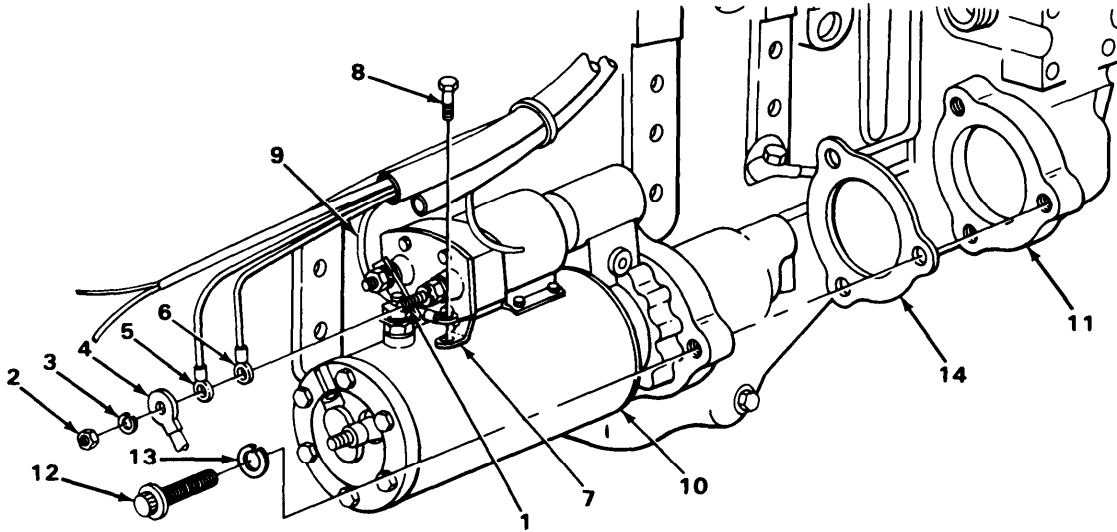
6. Starter (10) to engine (11)	Three screws (12) and lockwasher (13)	a. Using 5/8-inch socket, universal joint extension, and handle, unscrew and take out. b. Get rid of lockwashers (13).
7. Engine (11)	Starter (10) and gasket (14)	a. Take out from underneath. b. Get rid of gasket (14).

INSTALLATION

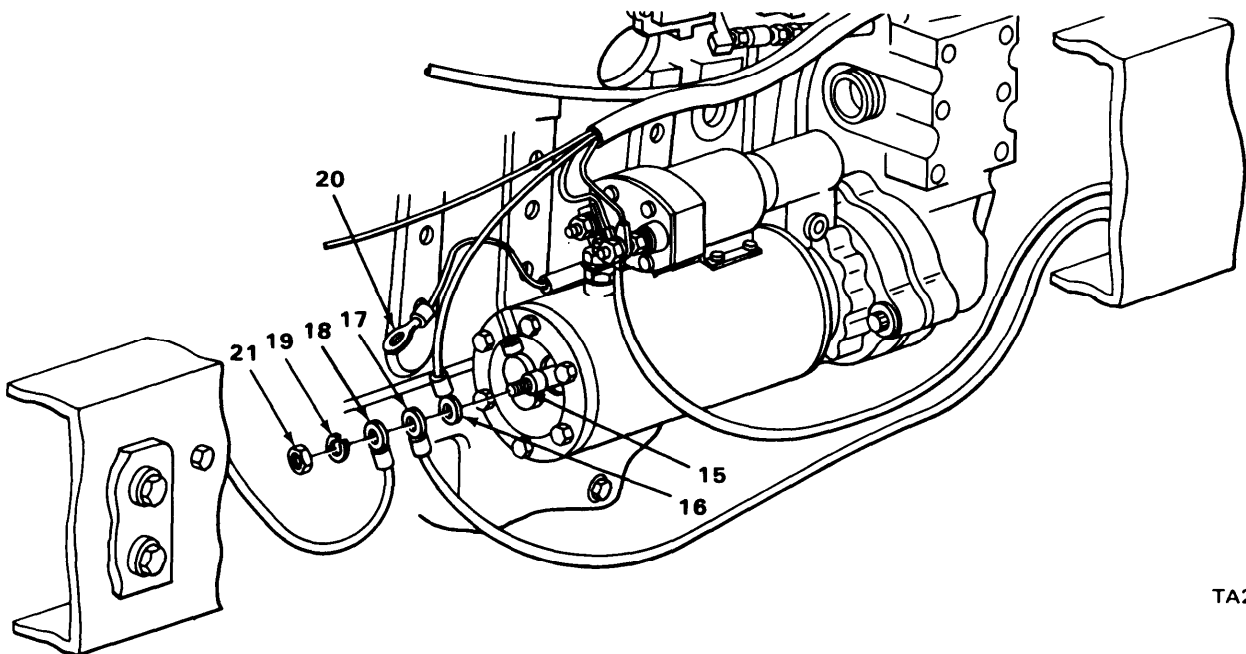
8. Engine (11)	Starter (10) and new gasket (14)	With help from assistant, put in position.
9. Starter (10) to engine(n)	Three screws (12) and new lockwashers (13)	Screw in and tighten using 5/8-inch socket, universal joint, extension, and handle.
10. Ignition switch terminal (7)	Wire 045 (9), and screw (8)	Screw in and tighten using screwdriver.
11. Battery terminal (1)	Wire 278 (6), wire 046 (5), battery cable (4), new lockwasher (3) and nut (2)	a. Put on. b. Screw on and tighten using 3/4-inch socket handle.

STARTER - CONTINUED

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



- | | | |
|--------------------------|---|--|
| 12. Ground terminal (15) | Solenoid ground wire (16), battery ground cable (17), chassis ground wire (18), new lockwasher (19) and wire 128 (20) | Put on. |
| 13. | Nut (21) | Screw on and tighten using 3/4-inch socket and handle. |



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STARTER - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Close left side of hood and install left hood side panel (TM 9-2320-272-10).
2. Connect battery ground cable (page 4-444).
3. Check operation (TM 9-2320-270-10).

TASK ENDS HERE

MAGNETIC SWITCH

This task covers:

- a. Removal (page 4-232)
 - b. Installation (page 4-234)
-

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch drive
 Screwdriver, cross-tip, number 3
 Socket, 1/2-inch, 3/8-inch drive
 Wrench, open-end, 1 1/32-inch

Materials/Parts

Lockwasher, ignition switch and ground terminal (two required)
 Lockwasher, battery and starter terminal (two required)
 Lockwasher, magnetic switch to fire-wall (two required)

Materials/Parts – Continued

Sand paper, fine grit (item 12, appendix C)
 Tag, marking (item 18, appendix C)

Personnel Required

One

Equipment Condition

Right side of hood open and right side panel removed (TM 9-2320-270-10).
 Battery ground cable disconnected (page 4-444).

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

REMOVAL

WARNING

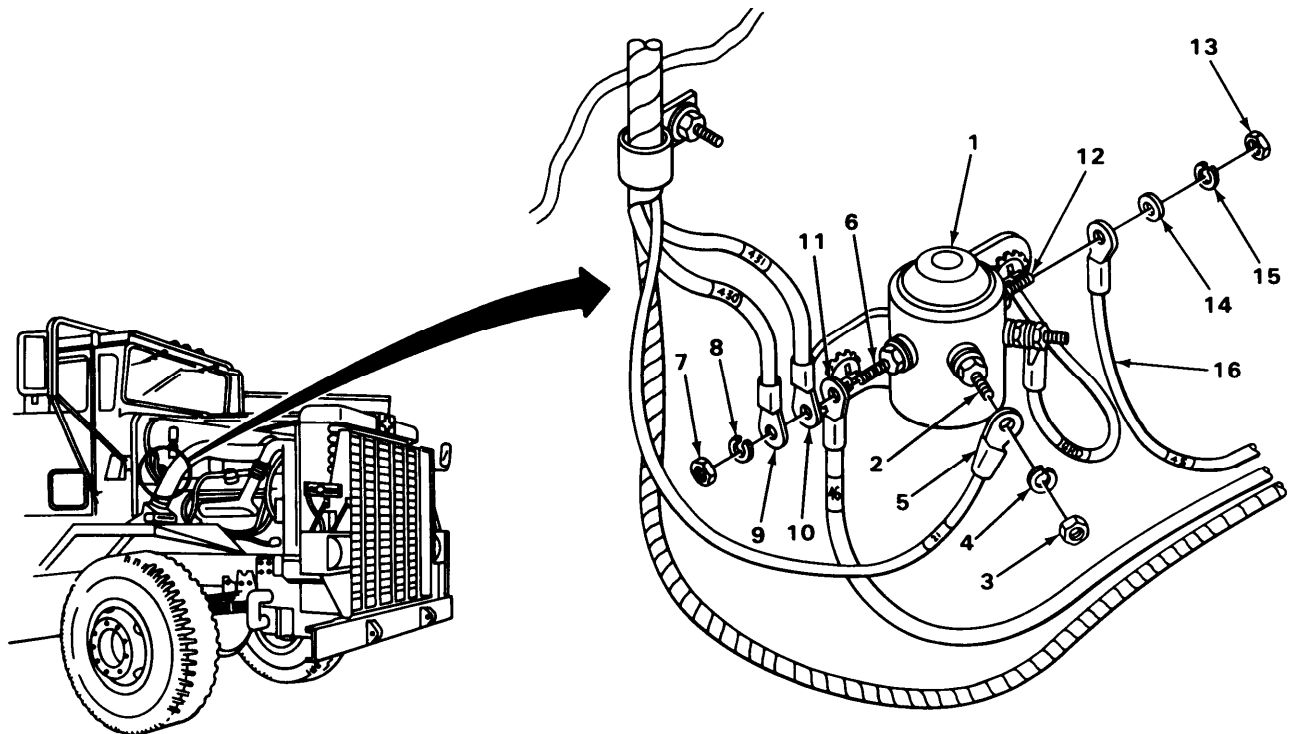
Make sure battery ground cable is disconnected before doing this task. Failure to disconnect battery ground cable can cause personal injury or damage to electrical system.

NOTE

Tag wires according to general maintenance instructions (page 4-1).

MAGNETIC SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
1. Magnetic switch (1), ignition switch terminal (2)	Nut (3)	Using 1 1/32-inch wrench, unscrew and take off.
2.	Lockwasher (4) and wire 21 (5)	a. Take off. b. Get rid of lockwasher (4).
3. Battery terminal (6)	Nut (7)	Using 1/2-inch socket and handle, unscrew and take off.
4.	Lockwasher (8), wire 430 (9), 431 (10), and 46(11)	a. Take off. b. Get rid of lockwasher (8).
5. Starter terminal (12)	Nut (13)	Using 1/2-inch socket and handle, unscrew and take off.
6.	Flat washer (14), lockwasher (15) and wire 45 (16)	a. Takeoff. b. Get rid of lockwasher (15).

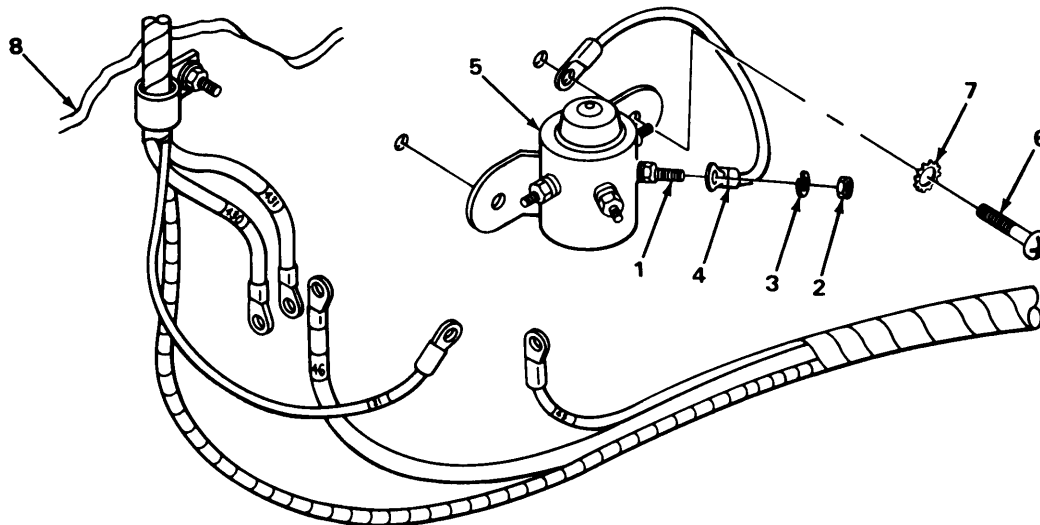


MAGNETIC SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
7. Ground terminal (1))	Nut (2)	Using 1 1/32-inch wrench, unscrew and take off.
8.	Lockwasher (3) and ground wire (4)	a. Take off. b. Get rid of lockwasher (3).
9. Magnetic switch (5)	Two screws (6) and lockwasher (7)	a. Using screwdriver, unscrew and take out. b. Get rid of lockwashers (7).
10. Firewall (8)	Magnetic switch (5) and ground wire (4)	Take out.

INSTALIATION

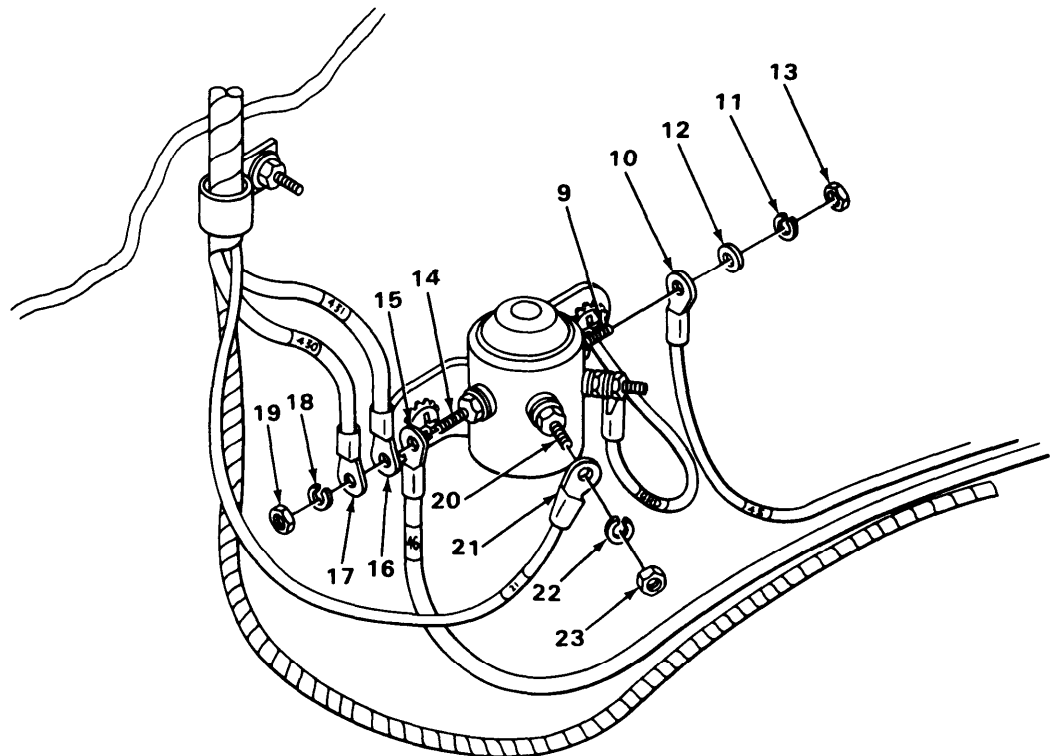
11.	Firewall (8)	Using fine sandpaper, sand to bare metal an area about 1/8 inch (3.17 millimeters) around hole.
12.	Magnetic switch (5) and ground wire (4)	Put in position.
13. Magnetic switch (5)	Two screws (6) and new lockwasher (7)	Using screwdriver, screw in and tighten.
14. Ground terminal (1)	Ground wire (4) and new lockwasher (3)	Put on.
15.	Nut (2)	Screw on and, using 1 1/32-inch wrench, tighten.



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MAGNETIC SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
16. Starter terminal (9)	Wire 45 (10), new lockwasher (11) and washer (12)	Put on.
17.	Nut (13)	Using 1/2-inch socket and handle, screw on and tighten.
18. Battery terminal (14)	Wire 46 (15), 431 (16), 430 (17), and new lockwasher (18)	Put on.
19.	Nut (19)	Using 1/2-inch socket and handle, screw on and tighten.
20. Ignition switch terminal (20)	Wire 21 (21) and new lockwasher (22)	Put on.
21.	Nut (23)	Using 1 1/32-inch wrench, screw on and tighten.



MAGNETIC SWITCH - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation of switch (TM 92320-270-10).
3. Close right side of hood and install right side panel (TM 9--2320-272-10).

TASK ENDS HERE

STARTER RELAY

This task covers:

- a. Removal (page 4-238)
 - b. Installation (page 4-238)
-

INITIAL SETUP

Tools

Screwdriver, cross-tip, number 3
Screwdriver, fiat-tip, 1/4-inch

Personnel Required

One

Equipment Condition

Battery ground cable disconnected
(page 4-444).

Materials/Parts

Lockwasher, relay to firewall
(two required)
Tag, marking (item 18, appendix C)

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

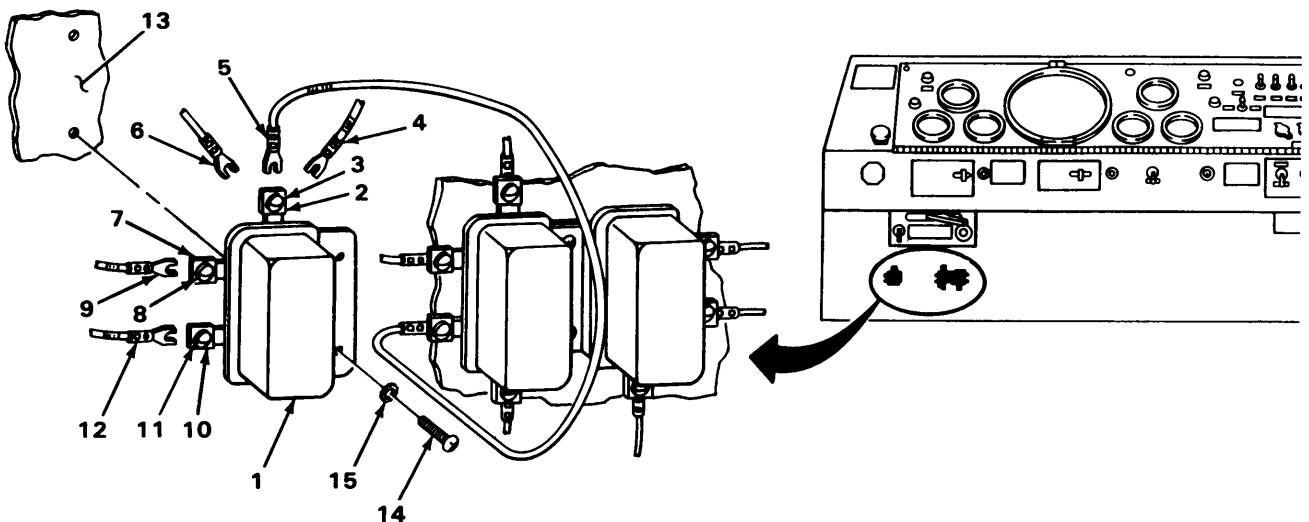
Make sure battery ground cable is disconnected before doing this task. Failure to disconnect ground cable can cause personal injury and damage to electrical system.

NOTE

Tag wires according to general maintenance instructions (page 4-1).

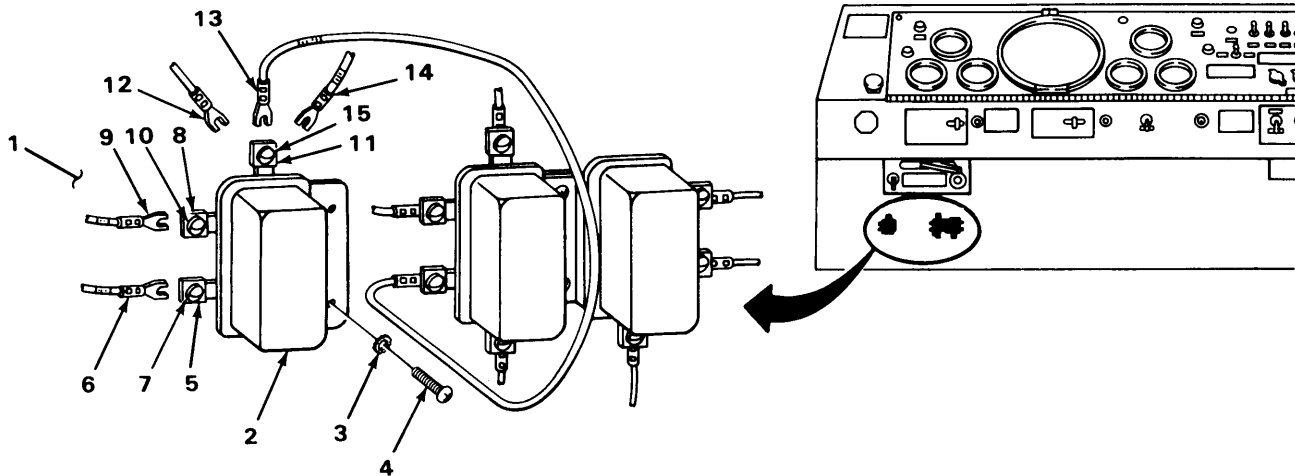
STARTER RELAY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
1. Starter relay (1) and terminal (2)	Screw (3)	Using flat-tip screwdriver, unscrew part way.
2.	458C wire (4), 458A wire (5), and 279 wire (6)	Pull out.
3. Terminal (7)	Screw (8)	Using flat-tip screwdriver, unscrew part way.
4.	21 wire (9)	Pull out.
5. Terminal (10)	Screw (11)	Using flat-tip screwdriver, unscrew part way.
6.	436 wire (12)	Pull out.
7. Starter relay (1) to firewall (13)	Two screws (14) and lockwashers (15)	a. Using cross-tip screwdriver, unscrew and take out. b. Get rid of lockwashers (15).
8. Firewall (13)	Starter relay (1)	Take off.



STARTER RELAY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
9. Firewall (1)	Starter relay (2)	Put in position.	
10. Starter relay (2)	Two new lockwashers (3) and screws (4)	Using cross-tip screwdriver, screw in and tighten.	
11. Terminal (5)	436 wire (6)	Put on.	
12.	Screw (7)	Using flat-tip screwdriver, tighten.	
13. Terminal (8)	21 wire (9)	Put on.	
14.	Screw (10)	Using flat-tip screwdriver, tighten.	
15. Terminal (11)	279 wire (12), 458A wire (13), and 458C wire (14)	Put on.	
16.	Screw (15)	Using flat-tip screwdriver, tighten.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).

TASK ENDS HERE

NEUTRAL SAFETY RELAY

This task covers:

- a. Removal (page 4-239)
 - b. Installation (page 4-240)
-

INITIAL SETUP

Tools	Personnel Required
Screwdriver, cross-tip, number 3	One
Screwdriver, flat-tip, 1/4-inch	
Materials/Parts	Equipment Condition
Lockwasher, relay to firewall (two required)	Battery ground cable disconnected (page 4-444).
Tag, marking (item 18, appendix C)	

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Make sure battery ground cable is disconnected before doing this task. Failure to disconnect ground cable can cause personal injury and damage to electrical system.

NOTE

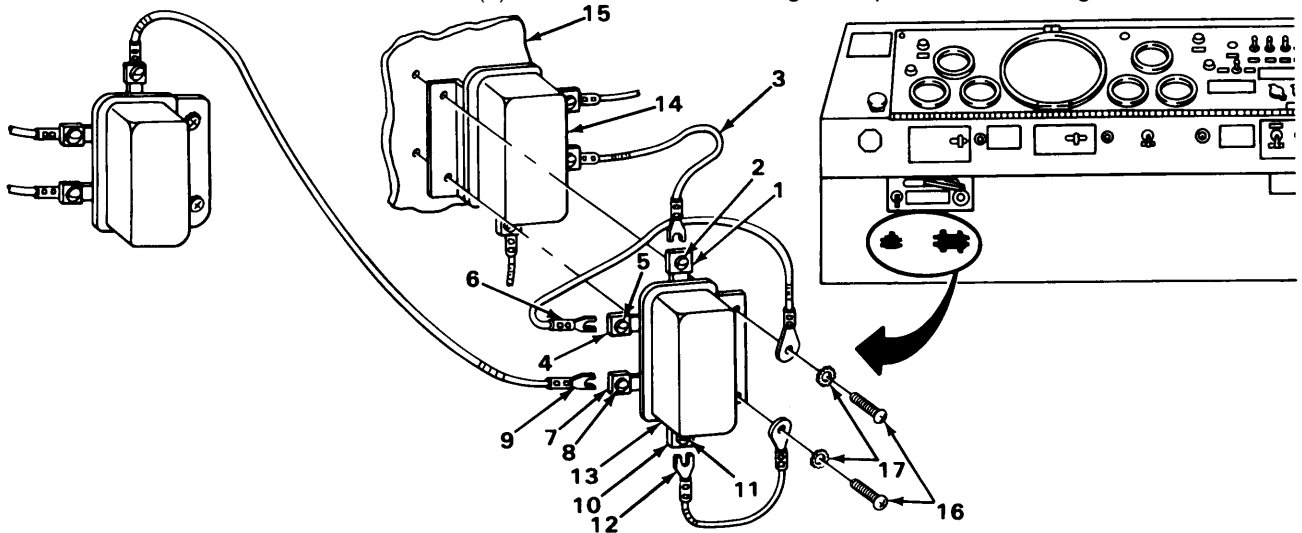
Tag wires according to general maintenance instructions (page 4-1).

NEUTRAL SAFELY RELAY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL – CONTINUED		
1. Terminal (1)	Screw (2)	Using flat-tip screwdriver, unscrew part way.
2.	Wire 376 (3)	Pull out.
3. Terminal (4)	Screw (5)	Using flat-tip screwdriver, unscrew part way.
4.	Wire 330 (6)	Pull out.
5. Terminal (7)	Screw (8)	Using flat-tip screwdriver, unscrew part way.
6.	Wire 279 (9)	Pull out.
7. Terminal (10)	Screw (11)	Using flat-tip screwdriver, unscrew part way.
8.	Wire 330 (12)	Pull out.
9. Neutral safety relay (13) and horn relay (14) to firewall (15)	Two screws (16), lockwashers (17), wire 330 (6), and 330 (12)	a. Using cross-tip screwdriver, unscrew and take off. b. Get rid of lockwashers (17).
10. Firewall (15)	Neutral safety relay (13)	Take off.
INSTALLATION		
11. Firewall (15)	Neutral safety relay (13) and horn relay (14)	Place in position.
12. Neutral safety relay (13) and horn relay (14) to firewall (15)	Two screws (16), two new lockwashers (17), wire 330 (6), and wire 330 (12)	Put together and, using cross-tip screwdriver, tighten.
13. Terminal (10)	Wire 330 (12)	Put in.

NEUTRAL SAFETY RELAY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
14.	Screw (11)	Using flat-tip screwdriver, tighten.	
15. Terminal (7)	Wire 279 (9)	Put in.	
16.	Screw (8)	Using flat-tip screwdriver, tighten.	
17. Terminal (4)	Wire 330 (6)	Put in.	
18.	Screw (5)	Using flat-tip screwdriver, tighten.	
19. Terminal (1)	Wire 376 (3)	Put in.	
20.	Screw (2)	Using flat-tip screwdriver, tighten.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).

TASK ENDS HERE

DOOR AJAR WARNING RELAY

This task covers:

- a. Removal (page 4-242)
 - b. Installation (page 4-243)
-

INITIAL SETUP

Tools

Screwdriver, cross-tip, number 3
 Screwdriver, flat-tip, 1/4-inch

Personnel Required

One

Materials/Parts

Lockwasher, relay to firewall
 (two required)
 Tag, marking (item 18, appendix C)

Equipment Condition

Battery ground cable disconnected
 (page 4-444).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Make sure battery ground cable is disconnected before doing this task. Failure to disconnect ground cable can cause personal injury and damage to electrical system.

NOTE

Tag wires according to general maintenance instructions (page 4-1).

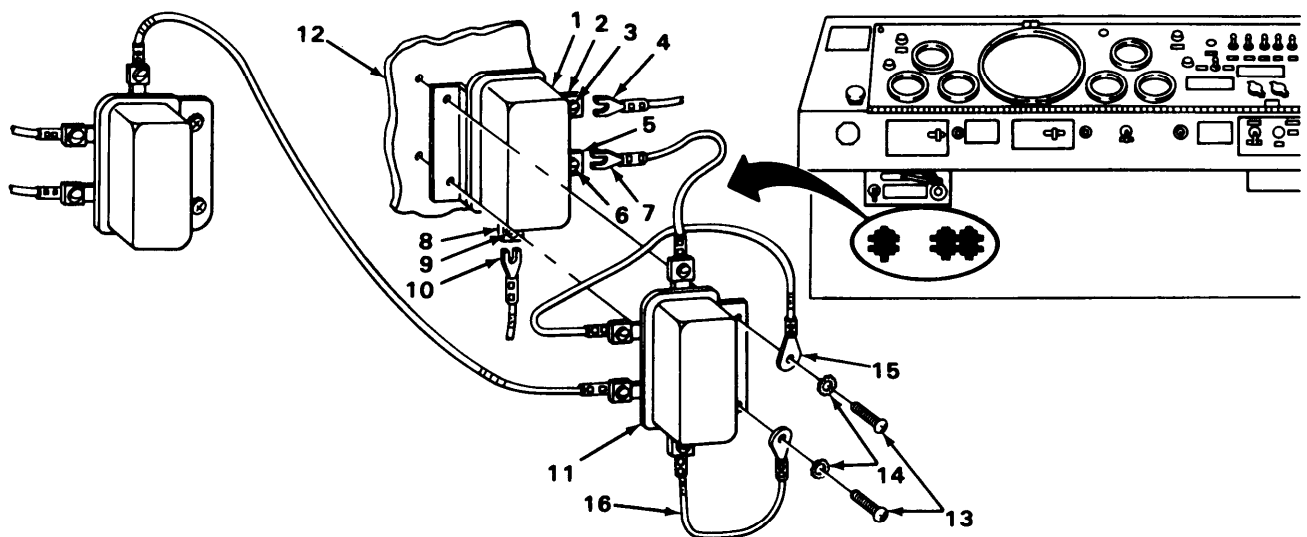
1. Horn relay (1) and terminal (2)	Screw (3)	Using flat-tip screwdriver, unscrew part way.
2.	Wire 429 (4)	Pull out.
3. Terminal (5)	Screw (6)	Using flat-tip screwdriver, unscrew part way.
4.	Wire 376 (7)	Pull out.
5. Terminal (8)	Screw (9)	Using flat-tip screwdriver, unscrew part way.
6.	Wire 331 (10)	Pull out.

DOOR AJAR WARNING RELAY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
7. Horn relay (1) and neutral safety relay (11) to firewall (12)	Two screws (13), lockwashers (14), wire 330 (15), and wire 330 (16)	a. Using cross-tip screwdriver, unscrew and take off. b. Get rid of lockwashers (14).
8.	Horn relay (1)	Take off.

INSTALLATION

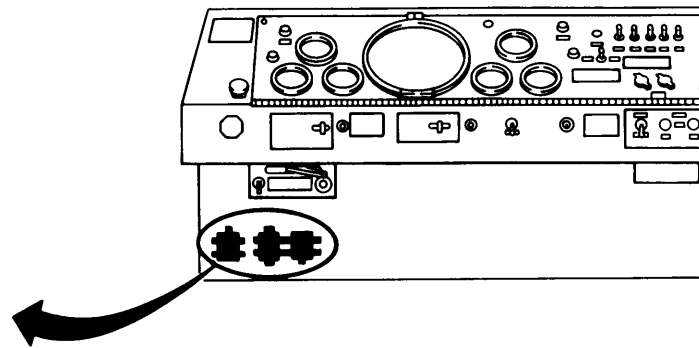
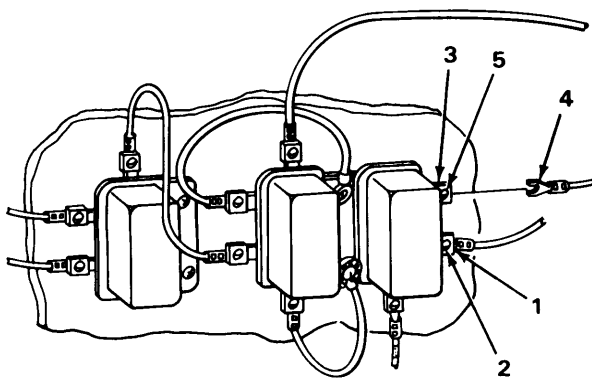
9. Firewall (12)	Horn relay (1) and neutral safety relay (11)	Put in position.
10. Neutral safety relay (11) and horn relay (1) to firewall (12)	Wire 330 (16), new lockwasher (14), and screw (13)	Screw in and tighten using cross-tip screwdriver.
11.	Wire 330 (15), new lockwasher (14), and screw (13)	Screw in and tighten using cross-tip screwdriver.
12. Bottom terminal (8)	Wire 331 (10)	Put in.
13.	Screw (9)	Using flat-tip screwdriver, tighten.
14. Terminal (5)	Wire 376 (7)	Put in.



TA239965

DOOR AJAR WARNING RELAY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION – CONTINUED			
15. Terminal (1)	Screw (2)	Using flat-tip screwdriver, tighten.	
16. Terminal (3)	Wire 429 (4)	Put in.	
17.	Screw (5)	Using flat-tip screwdriver, tighten.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).

TASK ENDS HERE

INSTRUMENT PANEL

This task covers:

- a. Open (page 4-245)
- b. Close (page 4-245)

INITIAL SETUP

Tools

Screwdriver, flat-tip, 3/8-inch

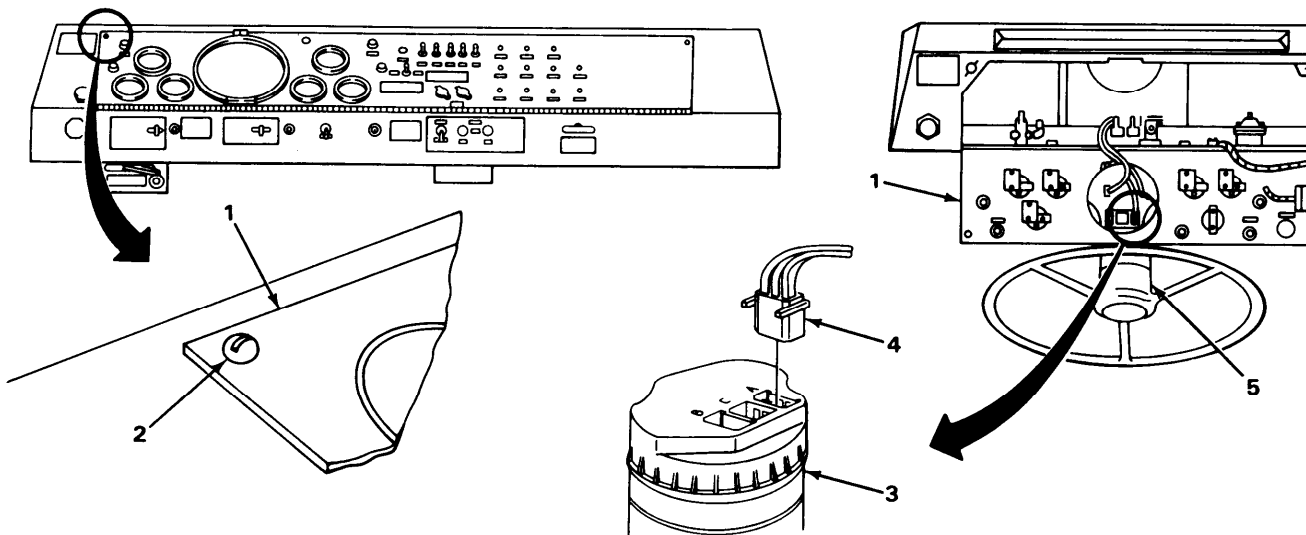
Personnel Required

One

TA239966

INSTRUMENT PANEL - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
OPEN			
1. Instrument panel (1)	Three lockscrews (2)	Using screwdriver, unscrew one-half turn.	
2.	Instrument panel (1)	Open.	
3. Tachograph (3)	Plug (4)	Pull off.	Plug is hidden by tachograph and dashboard.
4.	Instrument panel (1)	Open and support on steering column (5).	
CLOSE			
5.	Instrument panel (1)	Close part way.	
6. Tachograph (3)	Plug (4)	Plug in.	
7.	Instrument panel (1)	Close.	
8. Instrument panel (1)	Three lockscrews (2)	Using screwdriver, screw in one half turn.	



TASK ENDS HERE

IGNITION SWITCH

This task covers:

- a. Removal (page 4-246)
 - b. Installation (page 4-247)
-

INITIAL SETUP

Tools

Pliers, slip-joint, angle-nose
Wrench, open-end, 3/8-inch

Personnel Required

One

Materials/Parts

Tag, marking (item 18, appendix C)

Equipment Condition

Battery ground cable disconnected
(page 4-444).

LOCATION	ITEM	ACTION REMARKS
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WARNING

Make sure battery ground cable is disconnected before doing this task. Failure to disconnect battery ground cable can cause personal injury and damage to electrical system.

NOTE

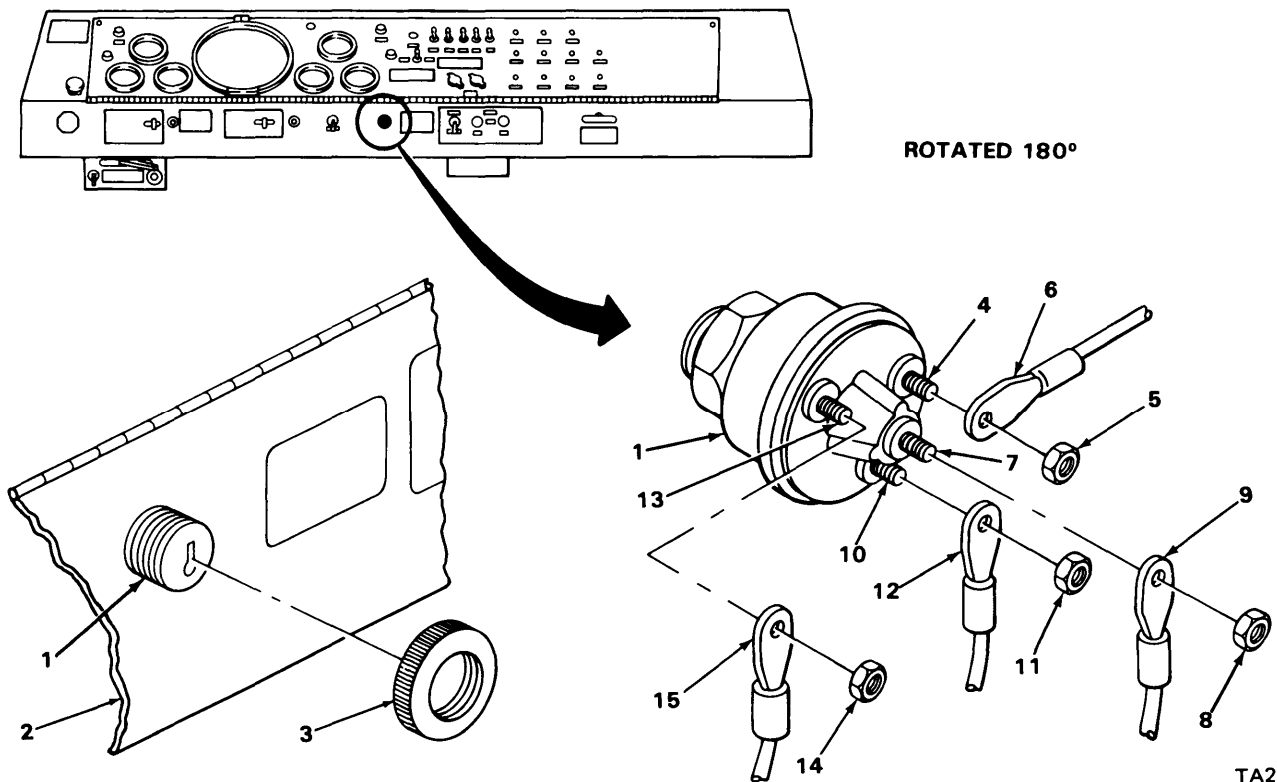
Tag wires according to general maintenance instructions (page 4-1).

REMOVAL

- | | | |
|--|-------------------------------|---|
| 1. ignition switch (1)
to instrument
panel (2) | Nut (3) | Using pliers, unscrew and take off. |
| 2. | ignition switch (1) | Push in until wire terminals can be accessed. |
| 3. Terminal (4) | Nut (5) and
wire 75 (6) | Using 3/8-inch wrench, unscrew and take off. |
| 4. Terminal (7) | Nut (8) and
wire 436 (9) | Using 3/8-inch wrench, unscrew and take off. |
| 5. Terminal (10) | Nut (11) and
wire 431 (12) | Using 3/8-inch wrench, unscrew and take off. |

IGNITION SWITCH - CONTINUED

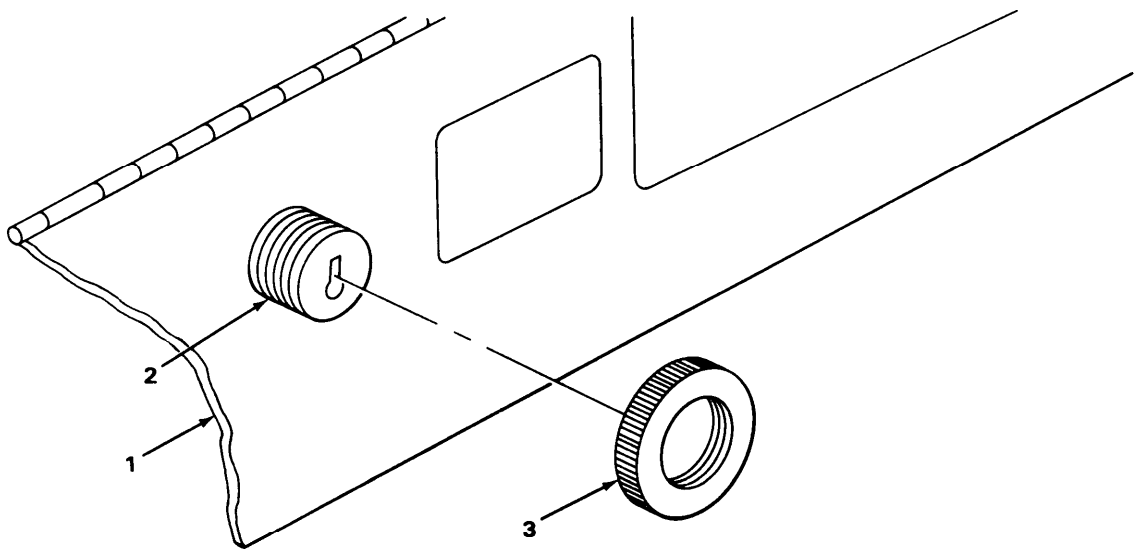
LOCATION	ITEM	ACTION	REMARKS
6. Terminal (13)	Nut (14) and wire 622 (15)	Using 3/8-inch wrench, unscrew and take off.	
7. Instrument panel (2)	Ignition switch (1)	Take out.	
INSTALLATION			
8. Instrument panel (2)	Ignition switch (1)	Place in position.	
9. Terminal (13)	Wire 622 (15) and nut (14)	Screw on and tighten using 3/8-inch wrench.	
10. Terminal (10)	Wire 431 (12) and nut (11)	Screw on and tighten using 3/8-inch wrench.	
11. Terminal (7)	Wire 436 (9) and nut (8)	Screw on and tighten using 3/8-inch wrench.	
12. Terminal (4)	Wire 75 (6) and nut (5)	Screw on and tighten using 3/8-inch wrench.	



TA239968

IGNITION SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION - CONTINUED		
13. Instrument panel (1)	Ignition switch (2)	Push into place.
14. Ignition switch (2) to instrument panel (1)	Nut (3)	Screw on and tighten using pliers.



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).

TASK ENDS HERE

TA239969

ENGINE STOP SWITCH

This task covers:

- a. Removal (page 4-249)
- b. Installation (page 4-250)

INITIAL SETUP

<p>Tools</p> <p>Screwdriver, flat-tip, 3/16-inch Wrench, box-end, 9/16-inch</p> <p>Materials/Parts</p> <p>Lockwasher (two required) Tag, marking (item 18, appendix C)</p>	<p>Personnel Required</p> <p>One</p> <p>Equipment Condition</p> <p>Battery ground cable disconnected (page 4-444).</p>
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LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

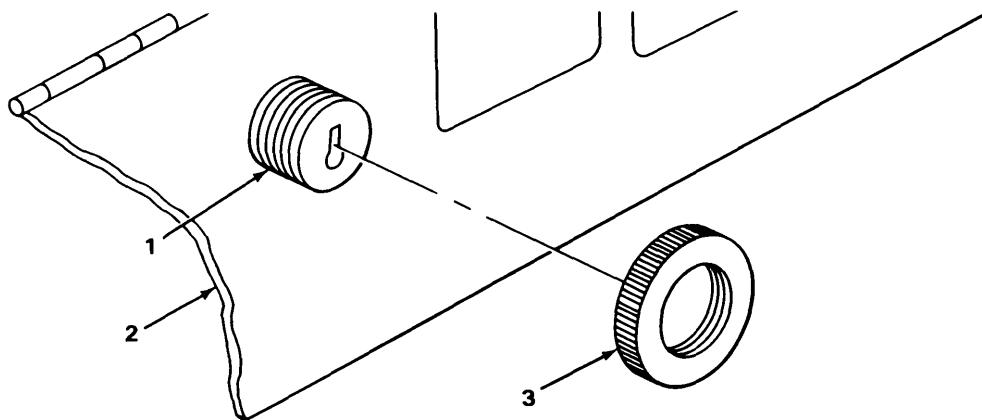
WARNING

Make sure battery ground cable is disconnected before doing this task. Failure to disconnect battery ground cable can cause personal injury and damage electrical system.

NOTE

Tag wires according to general maintenance instructions (page 4-1).

- | | | |
|---|---------|--|
| 1. Engine stop switch
(1) to instrument
panel (2) | Nut (3) | Using 9/16-inch box-end wrench, unscrew
and take off. |
|---|---------|--|

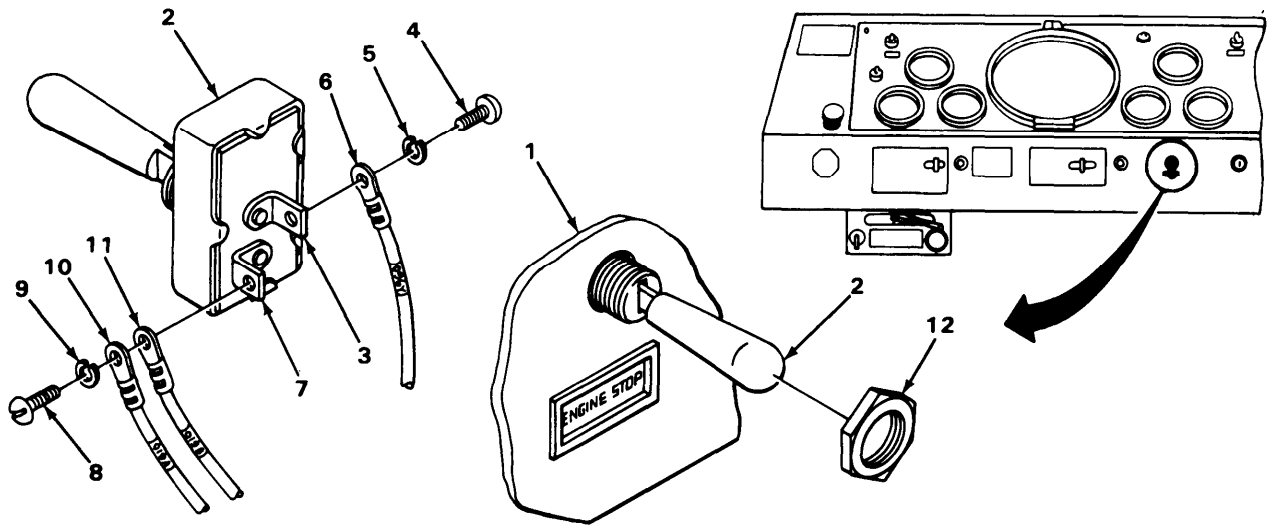


TA239970

ENGINE STOP SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL – CONTINUED		
2. Instrument panel (1)	Engine stop switch (2)	Push through until connections can be reached.
3. Terminal (3)	Screw (4), lock-washer (5), and wire 096 (6)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (5).
4. Terminal (7)	Screw (8), lock-washer (9), wire 019A (10), and 019B (11)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (9).
5. Instrument panel (1)	Engine stop switch (2)	Take out.
INSTALLATION		
6. Instrument panel (1)	Engine stop switch (2)	Place in position.
7. Terminal (7)	Screw (8), new lockwasher (9), wire 019A (10), and 019B (11)	Screw together and tighten using screwdriver.
8. Terminal (3)	Screw (4), new lockwasher (5), and wire 096 (6)	Screw together and tighten using screwdriver.
9. Instrument panel (1)	Engine stop switch (2)	Push into place.
10. Engine stop switch (2) to instrument panel (1)	Nut (12)	Screw on and tighten using 9/16-inch wrench.

ENGINE STOP SWITCH - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).

TASK ENDS HERE

WARNING AND INDICATING LAMP

This task covers:

- a. Removal (page 4-252)
- b. Installation (page 4-252)

INITIAL SETUP

Tools

Screwdriver, flat-tip, 3/8-inch

Personnel Required

One

WARNING AND INDICATING LAMP - CONTINUED

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

REMOVAL

NOTE

Steps in this task apply to left turn signal indicator lamp, low oil pressure/high water temperature warning lamp; low air pressure warning lamp; right turn signal indicator lamp; differential lock indicator lamp; and PTO auxiliary throttle indicator lamp. Low oil pressure/high water temperature warning lamp is shown.

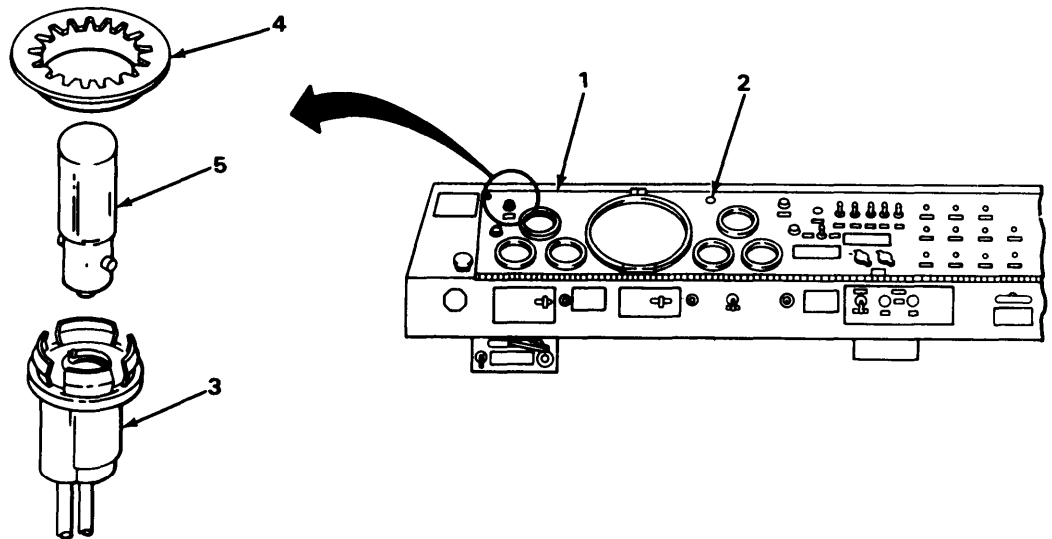
- | | | |
|--|-----------------------|--|
| 1. Instrument panel (1) | Three lock screws (2) | Using screwdriver, turn left one-half turn. |
| 2. | instrument panel (1) | Open. |
| 3. Low oil pressure/
high water temperature warning lamp assembly (3) | Lampholder (4) | Pull out. |
| 4. Lampholder (4) | Lamp (5) | Push and turn one-quarter turn counter-clockwise and take out. |

INSTALLATION

- | | | |
|--|----------------------|---|
| 5. Lampholder (4) | Lamp (5) | Push and turn clockwise one-quarter turn. |
| 6. Low oil pressure/
high water temperature warning lamp assembly (3) | Lampholder (4) | Push in. |
| 7. | instrument panel (1) | Close. |

WARNING AND INDICATING LAMP - CONTINUED

LOCATION	ITEM	ACTION REMARKS
8. Instrument panel (1)	Three lock screws (2)	Using screwdriver, turn right one-half turn.



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM9-2320-270-10).

TASK ENDS HERE

WARNING AND INDICATING LAMP ASSEMBLY

This task covers:

- a. Removal (page 4-254)
- b. Installation (page 4-256)

INITIAL SETUP

Tools

- Crimping tool
- Pliers, diagonal-cutting
- Pliers, slip-joint
- Stripper, wire
- Wrench, box, 7/8-inch
- Wrench, open-end, 3/8-inch

Materials/Parts

- Lockwasher
- Tag, marking (item 18, appendix C)
- Wrap, tie (item 24, appendix C)

Personnel Required

One

TA239972

WARNING AND INDICATING LAMP ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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REMOVAL

CAUTION

Ignition switch must be off before changing lamp assemblies to prevent damage to electrical system.

NOTE

Steps in this task are similar for: low oil pressure/high water temperature warning lamp assembly; low air pressure warning lamp assembly; differential lock indicator lamp assembly; and PTO auxiliary throttle indicator lamp assembly. Low oil pressure/high water temperature warning lamp assembly is shown.

Tag wires according to general maintenance instructions (page 4-1).

1. Instrument panel (1)	Lens assembly (2)	Pull Off.
2.	Instrument panel	Open (page 4-244).
3. Lamp body (3)	Lampholder (4)	Pull out.
4. Lampholder (4)	Lamp (5)	Push and turn one-quarter turn counter-clockwise and take out.
5. Lamp body (3) to instrument panel (1)	Nut (6)	Using 7/8-inch box wrench, unscrew and take off.
6. Instrument panel (1)	Lamp body (3) and lockwasher (7)	a. Take out. b. Get rid of lockwasher (7).
7. Wires (8)	Tie wraps	a. Note number and location. b. Using cutting pliers, cut and take off. c. Get rid of.
8. Lampholder (4) to IGN terminal (9)	Nut (10)	Using 3/8-inch open-end wrench, unscrew and take off.
9.	Lockwasher (11) and wire (12)	a. Take off. b. Get rid of lockwasher (11).
10. Bullet connector (13)	Bullet plug (14)	Unplug and take out lampholder (4).

WARNING AND INDICATING LAMP ASSEMBLY - CONTINUED

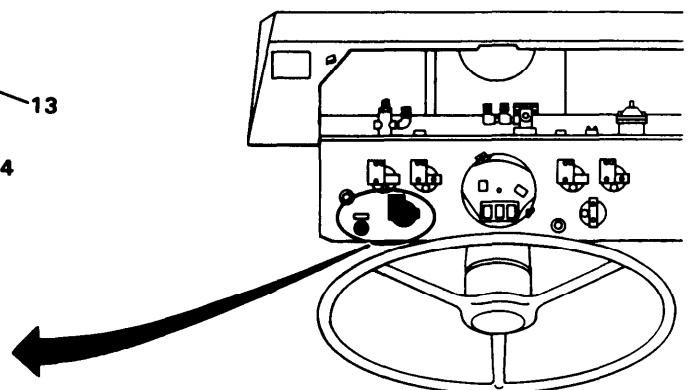
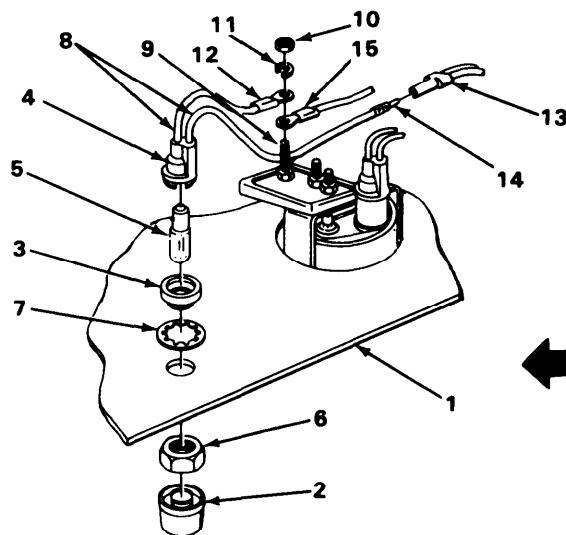
LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION

NOTE

If wire or connector repair is necessary, see general maintenance instructions (page 4-1).

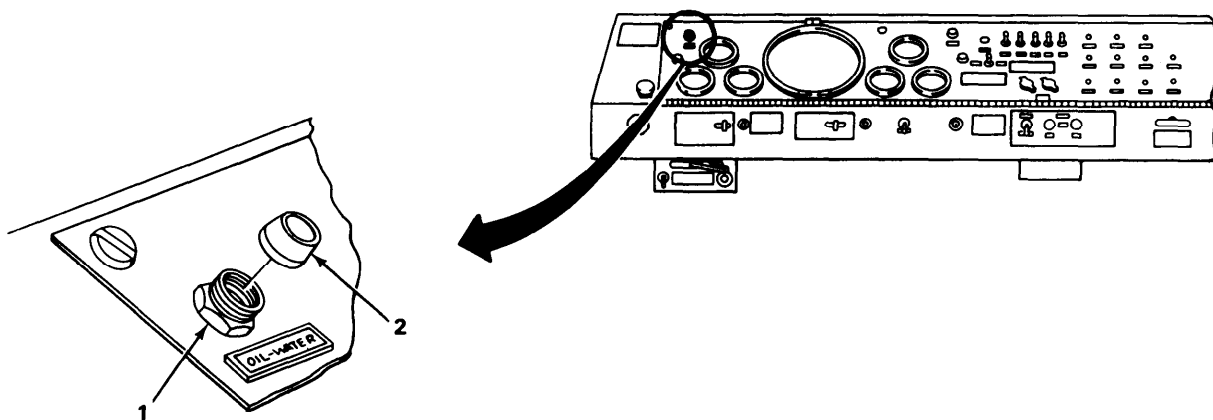
- | | | | |
|-----|--|---|---|
| 11. | Lampholder (4) to
IGN terminal (9) | Lug terminal (15),
wire (12), and new
lockwasher (11) | Put on. |
| 12. | | Nut (10) | Screw on and tighten using 3/8-inch
open-end wrench. |
| 13. | Bullet
connector (13) | Bullet plug (14) | Plug in. |
| 14. | Instrument
panel (1) | Lamp body (3) and
new lockwasher (7) | Put in. |
| 15. | Lamp body (3) to
instrument panel (1) | Nut (6) | Screw on and tighten using 7/8-inch
box wrench. |
| 16. | Lampholder (4) | Lamp (5) | Push in and turn clockwise one-quarter
turn. |
| 17. | Lamp body (3) | Lampholder (4) | Push in. |
| 18. | Wires (8) | New tie wraps | Using slip-joint pliers, put on. |



TA239973

WARNING AND INDICATING LAMP ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION – CONTINUED		
19.	Instrument panel	Close (page 4-244).
20. Warning lamp assembly (1)	Lens assembly (2)	Push on.



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

RIGHT OR LEFT TURN SIGNAL INDICATOR LAMP ASSEMBLY

This task covers:

- a. Removal (page 4-257)
- b. Installation (page 4-256)

INITIAL SETUP

Tools

Wrench, box, 13/16-inch

Personnel Required

One

TA239974

RIGHT OR LEFT TURN SIGNAL INDICATOR LAMP ASSEMBLY - CONTINUED

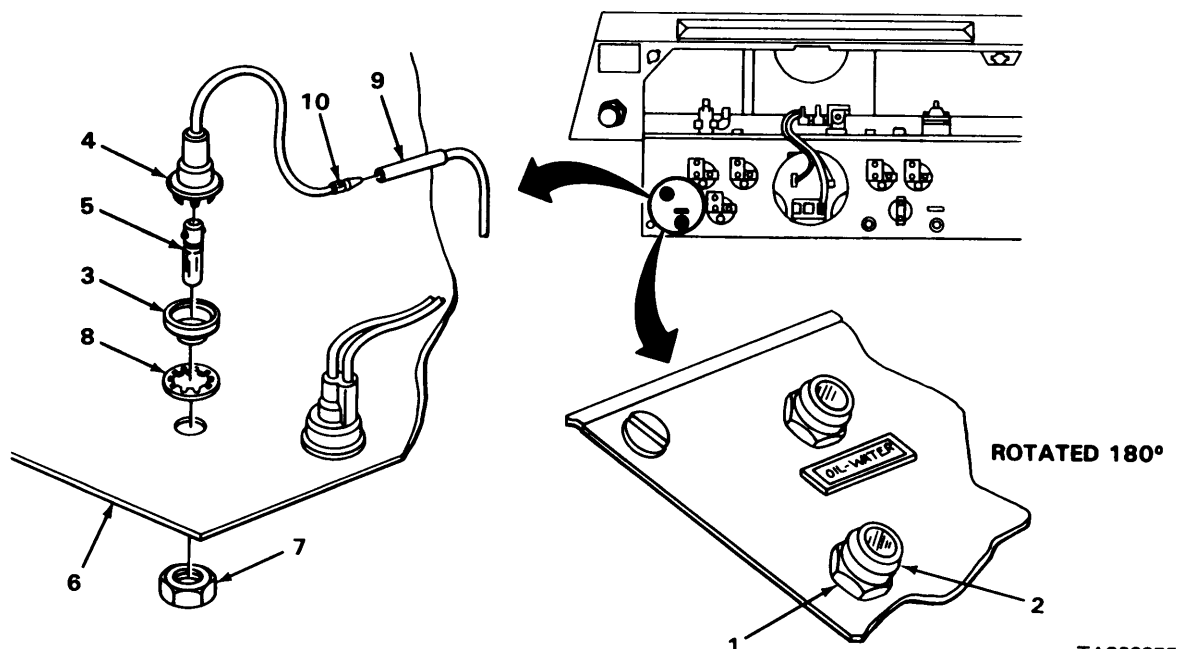
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

Steps in this task are the same for either right or left turn signal indicator lamp assembly. Left turn signal lamp assembly is shown.

1. Turn signal indicator lamp assembly (1)	Lens assembly (2)	Pull off.
2.	Instrument panel	Open (page 4-244).
3. Lamp body (3)	Lampholder (4)	Pull out.
4. Lampholder (4)	Lamp (5)	Push on and turn right one-quarter turn and take out.
5. Lamp body (3) to instrument panel (6)	Nut (7)	Using 13/16-inch wrench, unscrew and take off.
6. Instrument panel (6)	Lamp body (3) and lockwasher (8)	Take out.
7. Lampholder (4) to bullet connector (9)	Bullet plug (10) and lampholder (4)	Pull out.



TA239975

RIGHT OR LEFT TURN SIGNAL INDICATOR LAMP ASSEMBLY - CONTINUED

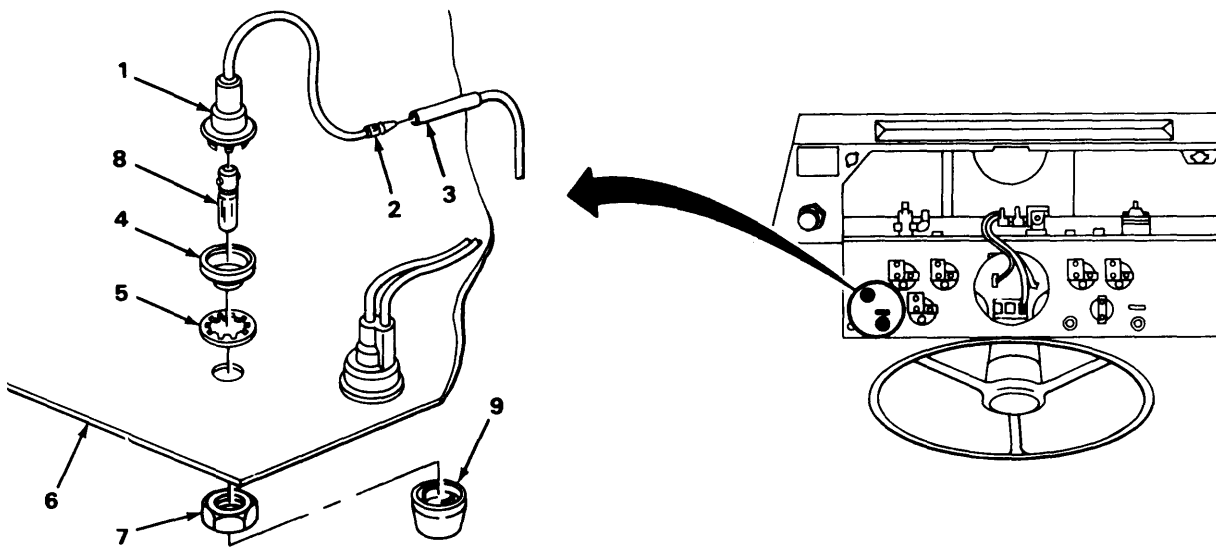
LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION

NOTE

If wire or connector repair is necessary, see general maintenance instructions (page 4-1).

8. Lampholder (1)	Bullet plug (2)	Plug in connector (3).	
9.	Lamp body (4) and lockwasher (5)	Put in.	
10. Lamp body (4) to instrument panel (6)	Nut (7)	Screw on and tighten using 13/16-inch wrench.	
11. Lampholder (1)	Lamp (8)	Push in and turn one-quarter turn.	
12. Lamp body (4)	Lampholder (1)	Push in.	
13.	Lens assembly (9)	Push on.	



TA239976

RIGHT OR LEFT TURN SIGNAL INDICATOR LAMP ASSEMBLY - CONTINUED**NOTE**

FOLLOW-ON MAINTENANCE:

1. Close instrument panel (page 4-244).
2. Check operation (TM 9-2320-270-10).

TASK ENDS HERE**OIL PRESSURE GAGE**

This task covers:

- a. Removal (page 4-280)
 - b. Installation (page 4-280)
-

INITIAL SETUP**Tools**

Wrench, open-end, 3/8-inch

Materials/Parts

Lockwasher, wires to voltage adapter
IGN terminal
Lockwasher, voltage adapter to gage
(two required)
Lockwasher, wire to sending unit
terminal

Materials/Parts - Continued

Tag, marking (item 18, appendix C)

Personnel Required

One

Equipment Condition

Instrument panel open (page 2-244).

OIL PRESSURE GAGE - CONTINUED

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

REMOVAL

CAUTION

Ignition switch must be off before replacing oil pressure gage to prevent possible damage to electrical system.

NOTE

Tag wires according to general maintenance instructions (page 4-1).

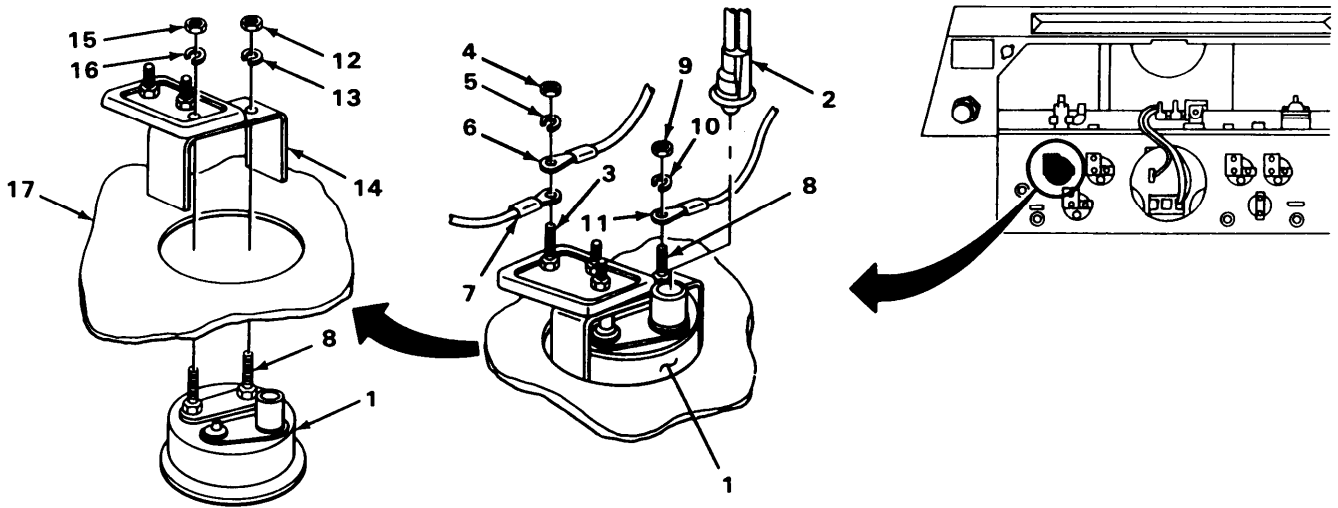
1. Oil pressure gage (1)	Instrument panel lamp assembly (2)	Pull out.
2. IGN terminal (3)	Nut (4)	Using wrench, unscrew and take off.
3.	Lockwasher (5), wire 320 (6), and black wire 113 (7)	a. Take off. b. Get rid of lockwasher (5).
4. Sending unit terminal (8)	Nut (9)	Using wrench, unscrew and take off.
5.	Lockwasher (10) and white wire 113 (11)	a. Take off. b. Get rid of lockwasher (10).
6. Sending unit terminal (8)	Nut (12) and lockwasher (13)	a. Using wrench, unscrew and take off. b. Get rid of lockwasher (13).
7. Oil pressure gage (1) to voltage adapter (14)	Nut (15) and lockwasher (16)	a. Using wrench, unscrew and take off. b. Get rid of lockwasher (16).
8. Oil pressure gage (1)	Voltage adapter (14)	Take off.
9. Instrument panel (17)	Oil pressure gage (1)	Take out.

INSTALLATION

10. Instrument panel (17)	Oil pressure gage (1)	Put in.
11. Oil pressure gage (1)	Voltage adapter (14)	Put on.

OIL PRESSURE GAGE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
12. Oil pressure gage (1)	Nut (15) and new lockwasher (16)	Screw on and tighten using wrench.	
13. Sending unit terminal (8)	Nut (12) and new lockwasher (13)	Screw on and tighten using wrench.	
14. Sending unit terminal (8)	White wire 113 (11), new lockwasher (10), and nut (9)	Screw on and tighten using wrench.	
15. IGN terminal (3)	Black wire 113 (7), wire 320 (6), new lockwasher (5), and nut (4)	Screw on and tighten using wrench.	
16. Oil pressure gage (1)	Instrument panel lamp assembly (2)	Push in.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Close instrument panel (page 4-244).
2. Check operation (TM 9-2320-270-10).

TASK ENDS HERE

TA239977

WATER TEMPERATURE GAGE

This task covers:

- a. Removal (page 4-262)
 - b. Installation (page 4-264)
-

INITIAL SETUP

Tools

Wrench, open-end, 3/8-inch

Materials/Parts

Lockwasher, wires to voltage adapter
IGN terminal
Lockwasher, voltage adapter gage

Materials/Parts – Continued

Lockwasher, wire to terminal
Lockwasher, terminal to voltage adapter
Tag, marking (item 18, appendix C)

Personnel Required

One

Equipment Condition

Instrument panel open (page 4-244).

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

REMOVAL

CAUTION

Ignition switch must be off before replacing water temperature gage to prevent possible damage to electrical system.

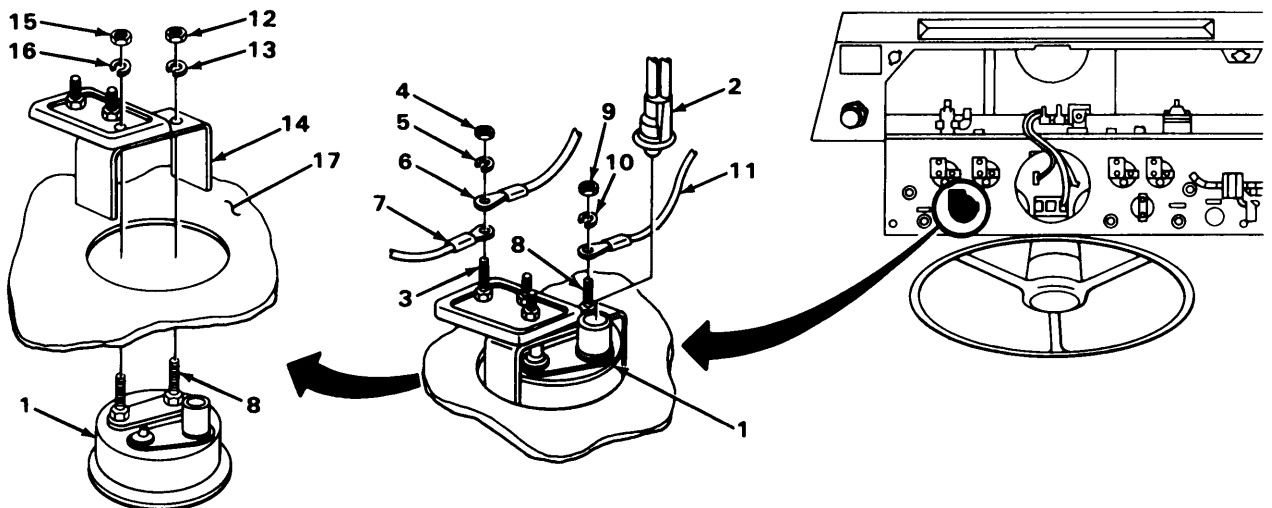
NOTE

Tag wires according to general maintenance instructions (page 4-1).

- | | | |
|-------------------------------|---|---|
| 1. Water temperature gage (1) | Instrument panel lamp assembly (2) | Pull out. |
| 2. IGN terminal (3) | Nut (4) | Using wrench, unscrew and take off. |
| 3. | Lockwasher (5), oil-water warning lamp wire (6), and black wire 320 (7) | a. Take off.
b. Get rid of lockwasher (5). |
| 4. Sending unit terminal (8) | Nut (9) | Using wrench, unscrew and take off. |

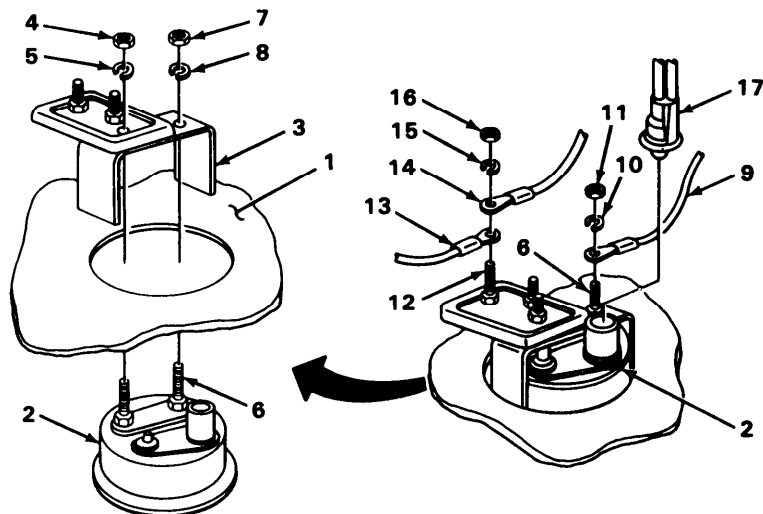
WATER TEMPERATURE GAGE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
5.	Lockwasher (10) and white wire 320 (11)	a. Take off. b. Get rid of lockwasher (11).
6.	Nut (12) and lockwasher (13)	a. Using wrench, unscrew and take off. b. Get rid of lockwasher (13).
7. Water temperature gauge (1) to voltage adapter (14)	Nut (15) and lockwasher (16)	a. Using wrench, unscrew and take off. b. Get rid of lockwasher (16).
8. Water temperature gauge (1)	Voltage adapter (14)	Take off.
9. Instrument panel (17)	Water temperature gauge (1)	Take out.



WATER TEMPERATURE GAGE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
10.	Instrument panel (1)	Water temperature gage (2)	Put in.
11.	Water temperature gage (2)	Voltage adapter (3)	Put on.
12.	Water temperature gage (2) to voltage adapter (3)	Nut (4) and new lockwasher (5)	Screw on and tighten using wrench.
13.	Sending unit terminal (6) to voltage adapter (3)	Nut (7) and new lockwasher (8)	Screw on and tighten using wrench.
14.	Sending unit terminal (6)	White wire 320 (9) and new lockwasher (10)	Put on.
15.		Nut (11)	Screw on and tighten using wrench.
16.	IGN terminal (12)	Black wire 320 (13), oil-water warning lamp wire (14), and new lockwasher (15)	Put on.
17.		Nut (16)	Screw on and tighten using wrench.
18.	Water temperature gage (2)	instrument panel lamp (17)	Push in.



TA239979

WATER TEMPERATURE GAGE - CONTINUED**NOTE**

FOLLOW-ON MAINTENANCE:

1. Check operation (TM 9-2320-270-10).
2. Close instrument panel (page 4-244).

TASK ENDS HERE**BATTERY GAGE VOLTMETER**

This task covers:

- a. Removal (page 4-266)
- b. installation (page 4-266)

INITIAL SETUP**Tools**

Wrench, open-end, 3/8-inch

Materials/Parts

Lockwasher, wires to voltage adapter
positive terminal

Lockwasher, voltage adapter to gage

Materials/Parts - Continued

Lockwasher, wires to negative terminal

Lockwasher, negative terminal to
voltage adapter

Tags, marking (item 18, appendix C)

Personnel Required

One

BATTERY GAGE VOLTMETER - CONTINUED

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

REMOVAL

CAUTION

Ignition switch must be off before replacing battery gage voltmeter to prevent possible damage to electrical system.

NOTE

Tag wires according to general maintenance instructions (page 4-).

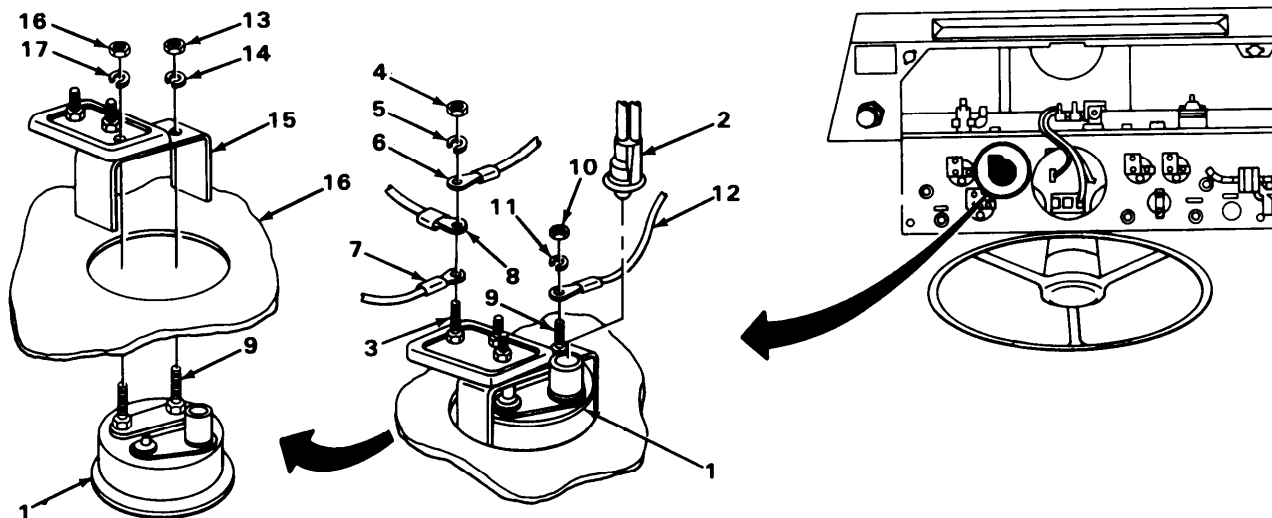
1. Battery gage (1)	Instrument panel lamp assembly (2)	Pull out.	
2. Positive terminal (3)	Nut (4)	Using wrench, unscrew and take off.	
3.	Lockwasher (5), wire 074 (6), PTO auxiliary throttle indicator light wire 074 (7), and wire 113 (8)	a. Take off. b. Get rid of lockwasher (5).	
4. Negative terminal (9)	Nut (10)	Using wrench, unscrew and take off.	
5.	Lockwasher (11) and wire 232 (12)	a. Take off. b. Get rid of lockwasher (11).	
6.	Nut (13) and lockwasher (14)	a. Using wrench, unscrew and take off. b. Get rid of lockwasher (14).	
7. Battery gage (1) to voltage adapter (15)	Nut (16) and lockwasher (17)	a. Using wrench, unscrew and take off. b. Get rid of lockwasher (17).	
8. Battery gage (1)	Voltage adapter (15)	Take off.	
9. Instrument panel (16)	Battery gage (1)	Take out.	

INSTALLATION

10. Instrument panel (16)	Battery gage (1)	Put in.	
11. Battery gage (1)	Voltage adapter (15)	Put on.	

BATTERY GAGE VOLTMETER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
12.	Nut (16) and new lockwasher (17)	Screw on and tighten using wrench.
13. Negative terminal (9) to voltage adapter (15)	Nut (13) and new lockwasher (14)	Screw on and tighten using wrench.
14. Negative terminal (9)	Wire 232 (12), new lockwasher (11), and nut (10)	Screw on and tighten using wrench.
15. Positive terminal (3)	PTO auxiliary throttle indicator light wire (7), wire 074 (6), new lockwasher (5), wire 113 (8), and nut (4)	Screw on and tighten using wrench.
16. Battery gage (1)	Instrument panel lamp assembly (2)	Push in.



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

TA239980

FUEL GAGE

This task covers:

- a. Removal (page 4-268)
 - b. Installation (page 4-270)
-

INITIAL SETUP

Tools

Wrench, open-end, 3/8-inch

Materials/Parts

- Lockwasher, wires to voltage adapter
IGN terminal
- Lockwasher, voltage adapter to gage
- Lockwasher, wire to sending unit
terminal

Materials/Parts - Continued

- Lockwasher, sending unit terminal to
voltage adapter
- Tags, marking (item 18, appendix C)

Personnel Required

One

Equipment Condition

Instrument panel open (page 4-244).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

CAUTION

Ignition switch must be off before replacing fuel gage to prevent possible damage to electrical system.

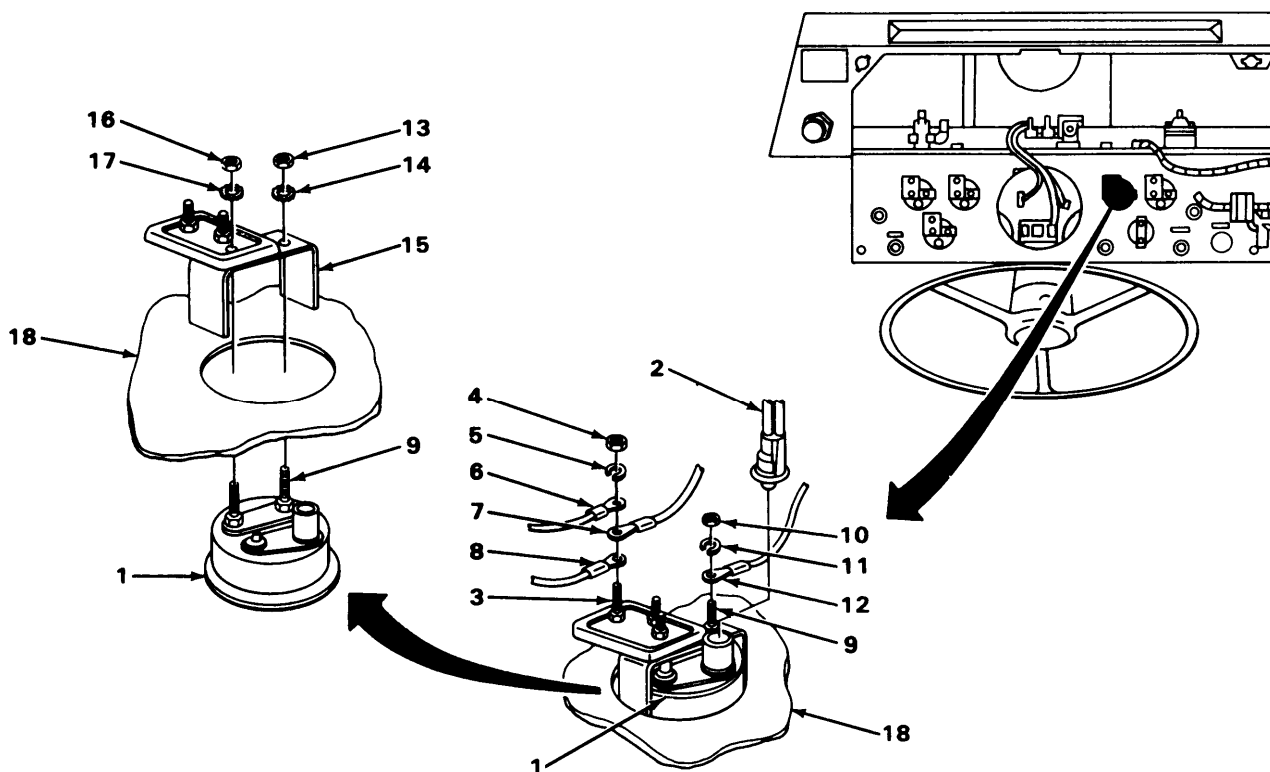
NOTE

Tag wires according to general maintenance instructions (page 4-1).

- | | | |
|---------------------|--|---|
| 1. Fuel gage (1) | Instrument panel
lamp assembly (2) | Pull out. |
| 2. IGN terminal (3) | Nut (4) | Using wrench, unscrew and take off. |
| 3. | Lockwasher (5) on
wire 405 (6), 078
(7), and differ-
ential lockout
indicator lamp
wire (8) | a. Take off.
b. Get rid of lockwasher (5). |

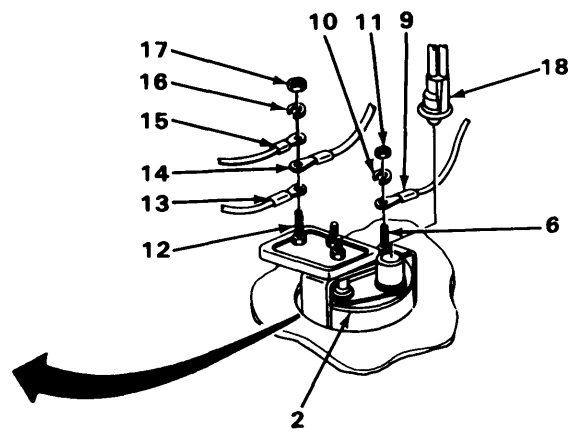
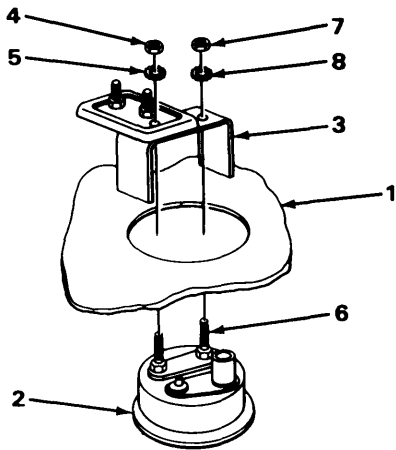
FUEL GAGE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
4. Sending unit terminal (9)	Nut (10)	Using wrench, unscrew and take off.
5.	Lockwasher (11) and wire 318 (12)	a. Take off. b. Get rid of lockwasher (11).
6.	Nut (13) and lockwasher (14)	a. Using wrench, unscrew and take off. b. Get rid of lockwasher (14).
7. Fuel gage (1) to voltage adapter (15)	Nut (16) and lockwasher (17)	a. Using wrench, unscrew and take off. b. Get rid of lockwasher (17).
8. Fuel gage (1)	Voltage adapter (15)	Take off.
9. Instrument panel (18)	Fuel gage (1)	Take out.



FUEL GAGE - CONTINUED

	LOCATION	ITEM	ACTION	REMARKS
INSTALLATION				
10.	Instrument panel (1)	Fuel gage (2)	Put in.	
11.	Fuel gage (2)	Voltage adapter (3)	Put on.	
12.	Fuel gage (2) to voltage adapter (3)	Nut (4) and new lockwasher (5)	Screw on and tighten using wrench.	
13.	Sending unit terminal (6) to voltage adapter (3)	Nut (7) and new lockwasher (8)	Screw on and tighten using wrench.	
14.	Sending unit terminal (6)	Wire 318 (9) and new lockwasher (10)	Put on.	
15.		Nut (11)	Screw on and tighten using wrench.	
16.	IGN terminal (12)	Differential lockout indicating light wire (13), wire 078 (14), wire 405 (15), and new lockwasher (16)	Put on.	
17.		Nut (17)	Screw on and tighten using wrench.	
18.	Fuel gage (2)	Instrument panel lamp (18)	Push in.	



TA239982

FUEL GAGE - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Check operation (TM 9-2320-270-10).
2. Close instrument panel (page 4-244).

TASK ENDS HERE

TRANSMISSION OIL TEMPERATURE GAGE

This task covers:

- a. Removal (page 4-271)
 - b. Installation (page 4-271)
-

INITIAL SETUP

Tools

Wrench, open-end, 3/8-inch

Materials/Parts

Lockwasher, IGN terminal
 Lockwasher, sending unit terminal
 (two required)

Materials/Parts - Continued

Lockwasher, transmission oil temperature
 gage

Tag, marking (item 18, appendix C)

Personnel Required

One

Equipment Condition

Instrument panel open (page 4-244).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

CAUTION

Ignition switch must be off before replacing transmission oil temperature gage to prevent possible damage to electrical system.

NOTE

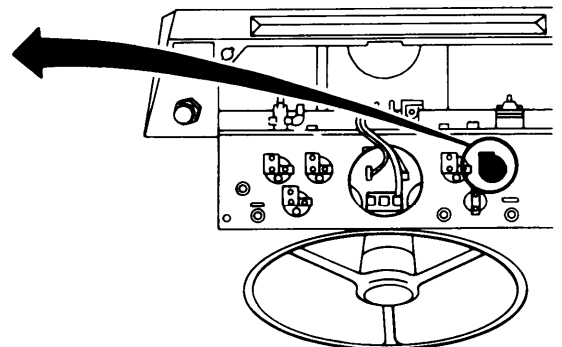
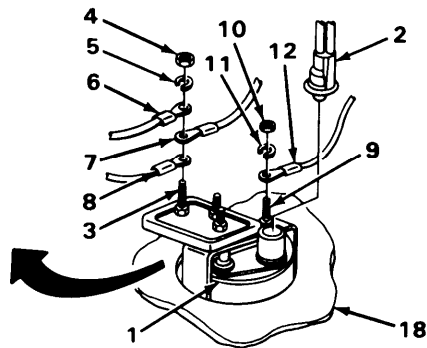
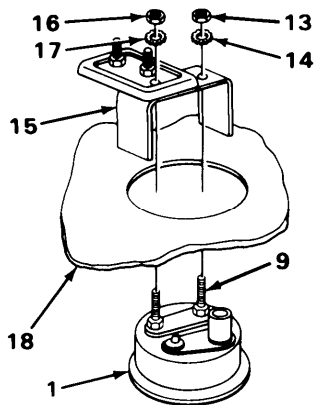
Tag wires according to general maintenance instructions (page 4-1).

TRANSMISSION OIL TEMPERATURE GAGE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL- CONTINUED		
1. Transmission oil temperature gage (1)	Instrument panel lamp assembly (2)	Pull out.
2. IGN terminal (3)	Nut (4)	Using wrench, unscrew and take off.
3.	Lockwasher (5) and wire 405 (6), air warning light wire (7), and green and black wire (8)	a. Take off. b. Get rid of lockwasher (5).
4. Sending unit terminal (9)	Nut (10)	Using wrench, unscrew and take off.
5.	Lockwasher (11) and wire 422 (12)	a. Take off. b. Get rid of lockwasher (11).
6.	Nut (13) and lockwasher (14)	a. Using wrench, unscrew and take off. b. Get rid of lockwasher (14).
7. Transmission oil temperature gage (1) to voltage adapter (15)	Nut (16) and lockwasher (17)	a. Using wrench, unscrew and take off. b. Get rid of lockwasher (17).
8. Transmission oil temperature gage (1)	Voltage adapter (15)	Take off.
9. Instrument panel (18)	Transmission oil temperature gage (1)	Take out.
INSTALLATION		
10. Instrument panel (18)	Transmission oil temperature gage (1)	Put in.
11. Transmission oil temperature gage (1)	Voltage adapter (15)	Put on.
12. Transmission oil temperature gage (1) to voltage adapter (15)	Nut (16) and new lockwasher (17)	Screw on and tighten using wrench.

TRANSMISSION OIL TEMPERATURE GAGE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
13. Sending unit terminal (9) to voltage adapter (15)	Nut (13) and new lockwasher (14)	Screw on and tighten using wrench.
14. Sending unit terminal (9)	Wire 422 (12) and new lockwasher (14)	Put on.
15.	Nut (10)	Screw on and tighten using wrench.
16. IGN terminal (3)	Green and black wire (8), air warning lamp wire (7'), wire 405 (6), and new lockwasher (5)	Put on.
17.	Nut (4)	Screw on and tighten using wrench.
18. Transmission oil temperature gage (1)	Instrument panel lamp assembly (2)	Push in.



TRANSMISSION OIL TEMPERATURE GAGE - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Check operation (TM 9-2320-270-10).
2. Close instrument panel (page 4-244).

TASK ENDS HERE

INSTRUMENT PANEL LAMP

This task covers:

- a. Removal (page 4-274)
 - b. installation (page 4-275)
-

INITIAL SETUP

Tools	Personnel Required
Screwdriver, fiat-tip, 3/8-inch	One

LOCATION	ITEM	ACTION REMARKS
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REMOVAL

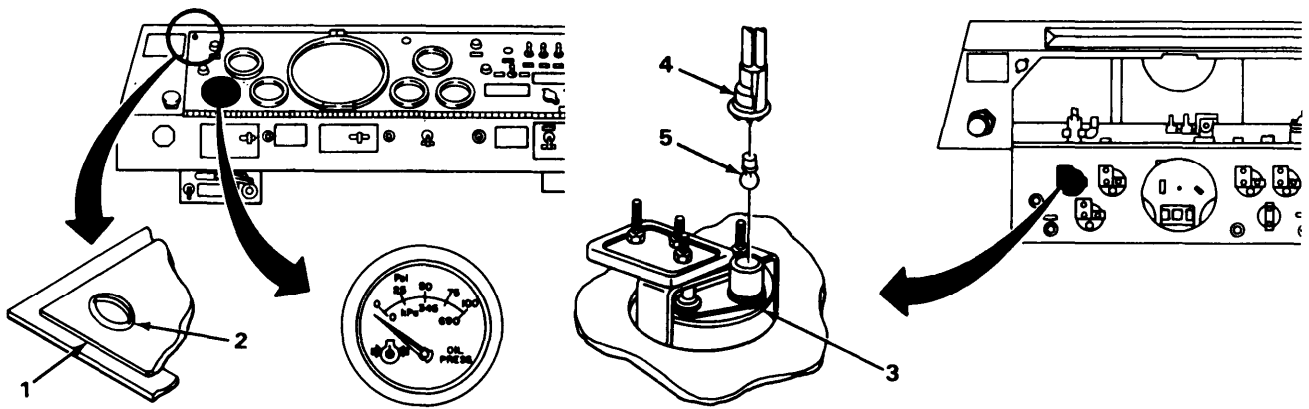
NOTE

Steps in this task apply to instrument panel lamps for oil pressure gage, water temperature gage, battery gage, fuel gage, air pressure gage, and transmission oil temperature gage. Oil pressure gage instrument panel lamp is shown.

- | | | |
|--------------------------|----------------------|---|
| 1. Instrument panel (1) | Three lockscrews (2) | Using screwdriver, turn one-half turn counterclockwise. |
| 2. | Instrument panel (1) | Open. |
| 3. Oil pressure gage (3) | Lamp holder (4) | Pull out. |
| 4. Lamp holder (4) | Lamp (5) | Push and turn one-quarter turn counterclockwise and take out. |

INSTRUMENT PANEL LAMP - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
5. Lamp holder (4)	Lamp (5)	Put in and turn one-quarter turn clockwise.	
6. Oil pressure gage (3)	Lamp holder (4)	Push in.	
7.	Instrument panel (1)	Close.	
8. Instrument panel (1)	Three lock screws (2)	Using screwdriver, turn one-half turn clockwise.	



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

HIGH BEAM INDICATOR LAMP

This task covers:

- a. Removal (page 4-276)
 - b. Installation (page 4-276)
-

INITIAL SETUP

Tools	Personnel Required
Screwdriver, flat-tip, 3/8-inch	One

LOCATION	ITEM	ACTION REMARKS
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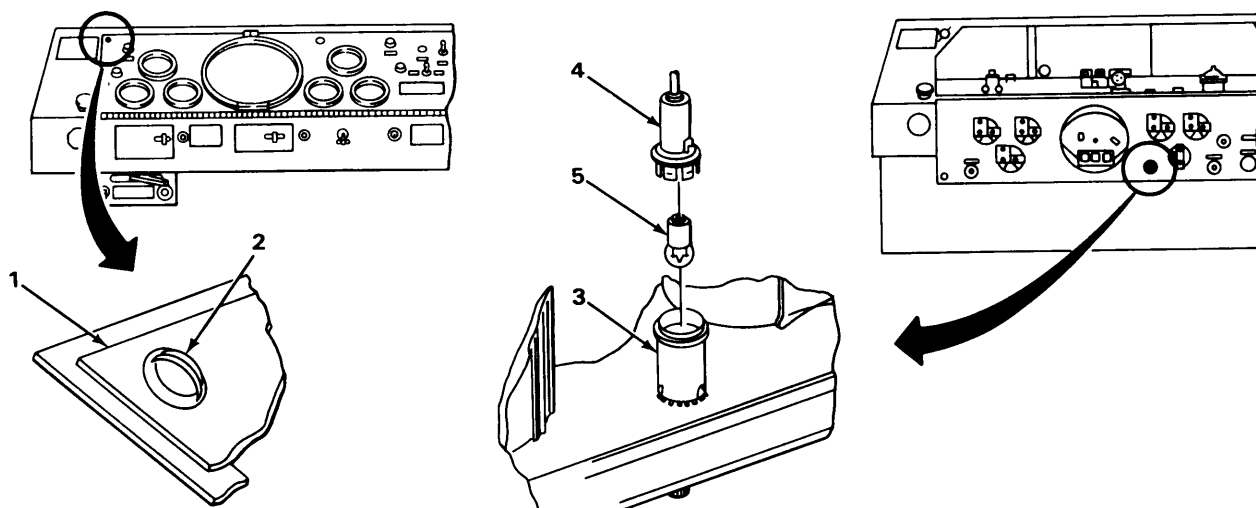
REMOVAL

1. Instrument panel (1)	Three lock screws (2)	Using screwdriver, turn one-half turn counterclockwise.
2.	Instrument panel (1)	Open.
3. High beam indicating lamp assembly (3)	Lamp holder (4)	Pull out.
4. Lamp holder (4)	Lamp (5)	Push on and turn one-quarter turn counterclockwise and take out.

INSTALLATION

5. Lamp holder (4)	Lamp (5)	Put in and turn one-quarter turn clockwise.
6. High beam indicating lamp assembly (3)	Lamp holder (4)	Push in.
7.	Instrument panel (1)	Close.
8. Instrument panel (1)	Three lock screws (2)	Using screwdriver, turn one-half turn clockwise.

HIGH BEAM INDICATOR LAMP - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 92320-270-10).

TASK ENDS HERE

HIGH BEAM INDICATING LAMP ASSEMBLY

This task covers:

- a. Removal (page 4-278)
 - b. Installation (page 4-278)
-

INITIAL SETUP

Tools

Pliers, diagonal-cutting
 Pliers, slip-joint, straight-nose

Materials/Parts

Lockwasher, lamp body to instrument panel
 Wrap, tie (item 24, appendix C)

Personnel Required

One

Equipment Condition

Instrument panel open (page 4-244).

HIGH BEAM INDICATING LAMP ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL		
CAUTION		
Light switch must be off before changing high beam indicator lamp assembly to prevent possible damage to electrical system.		
1. Lamp body (1)	Lamp holder (2)	Pull out.
2. Lamp holder (2)	Lamp (3)	Push on and turn one-quarter turn counterclockwise and take out.
3. Wire (4))	Tie wrap (5)	a. Using cutting pliers, cut. b. Get rid of.
4. Bullet connector (6) on wire 018 (7)	Bullet plug (8) and lamp holder (2)	Pull out.
5.	Lens assembly (9)	Using slip-joint pliers, unscrew partway.
6. Lens assembly (9)	Lamp body (1)	Take off.
7.	Lockwasher (10)	a. Take off. b. Get rid of.
8. Instrument panel (11)	Lens assembly (9)	Take out.

INSTALLATION

NOTE

If wire or connector repair is necessary, see general maintenance instructions (page 4-1).

9. Instrument panel (11)	Lens assembly (9)	Put in.
10. Lens assembly (9)	New lockwasher (10)	Put on.
11.	Lamp body (1)	Screw on.

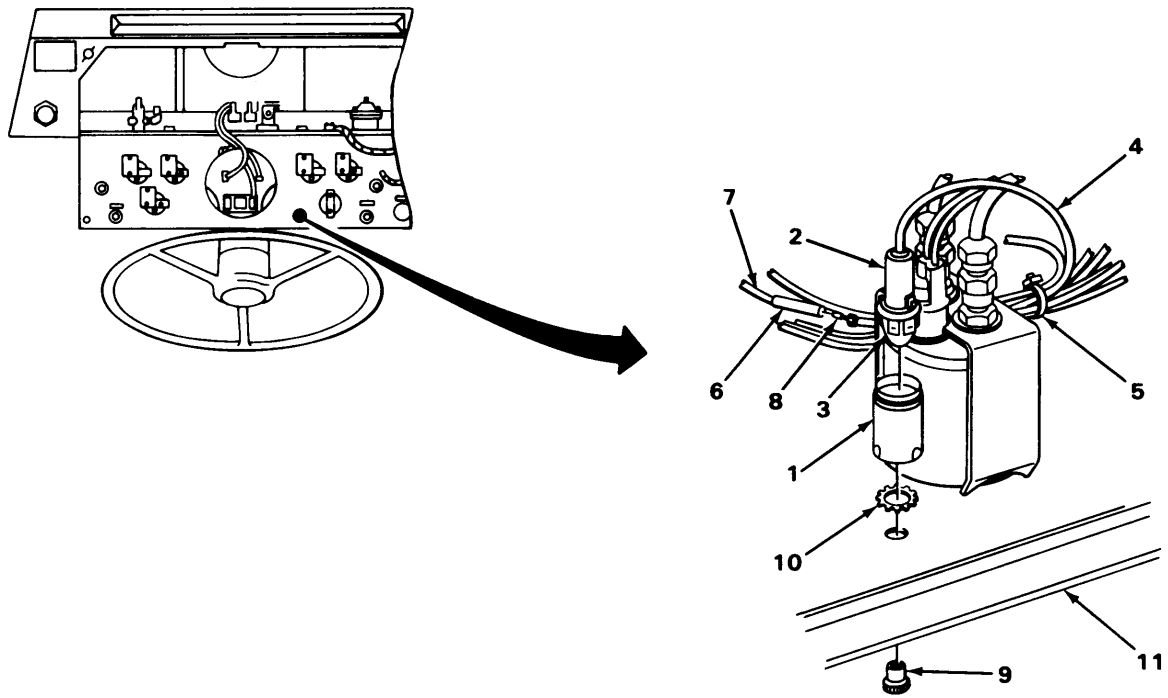
HIGH BEAM INDICATING LAMP ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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CAUTION

Do not overtighten or squeeze too hard on pliers or lamp assembly may be damaged. Do not tighten by using pliers on lamp body.

- | | | |
|-----|--------------------------------------|--|
| 12. | Lens assembly (9) | Using slip-joint pliers, tighten. |
| 13. | Bullet connector (6) on wire 018 (7) | Plug in. |
| 14. | Lamp holder (2) | Push in and turn clockwise one-quarter turn. |
| 15. | Lamp body (1) | Push in. |
| 16. | Wires (4) | New tie wrap (5) |



NOTE

FOLLOW-ON MAINTENANCE:

1. Check operation (TM 9-2320-270-10).
2. Close instrument panel (page 4-244).

TASK ENDS HERE

TA239986

TACHOGRAPH RECORDING CHART PACK

This task covers:

- a. Removal (page 4-280)
- b. Installation (page 4-281)

INITIAL SETUP

Materials/Parts

Personnel Required

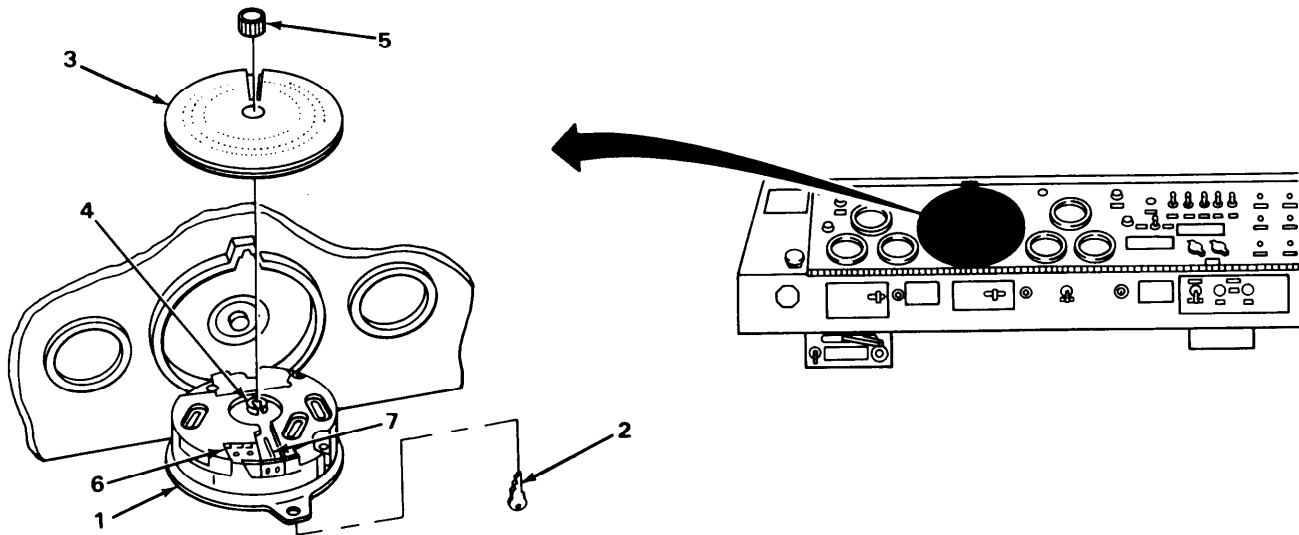
Tachograph recording chart pack

One

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

REMOVAL

- | | | |
|-------------------------------------|--------------------|--|
| 1. Tachograph (1) | Key (2) | Put in and turn counterclockwise one-quarter turn, and open. |
| 2. Chart pack (3) to center hub (4) | Fastening ring (5) | Unscrew and take off. |
| 3. | Chart pack (3) | Lift off, and slide out from under separating knife (6) and RPM indication transfer (7). |



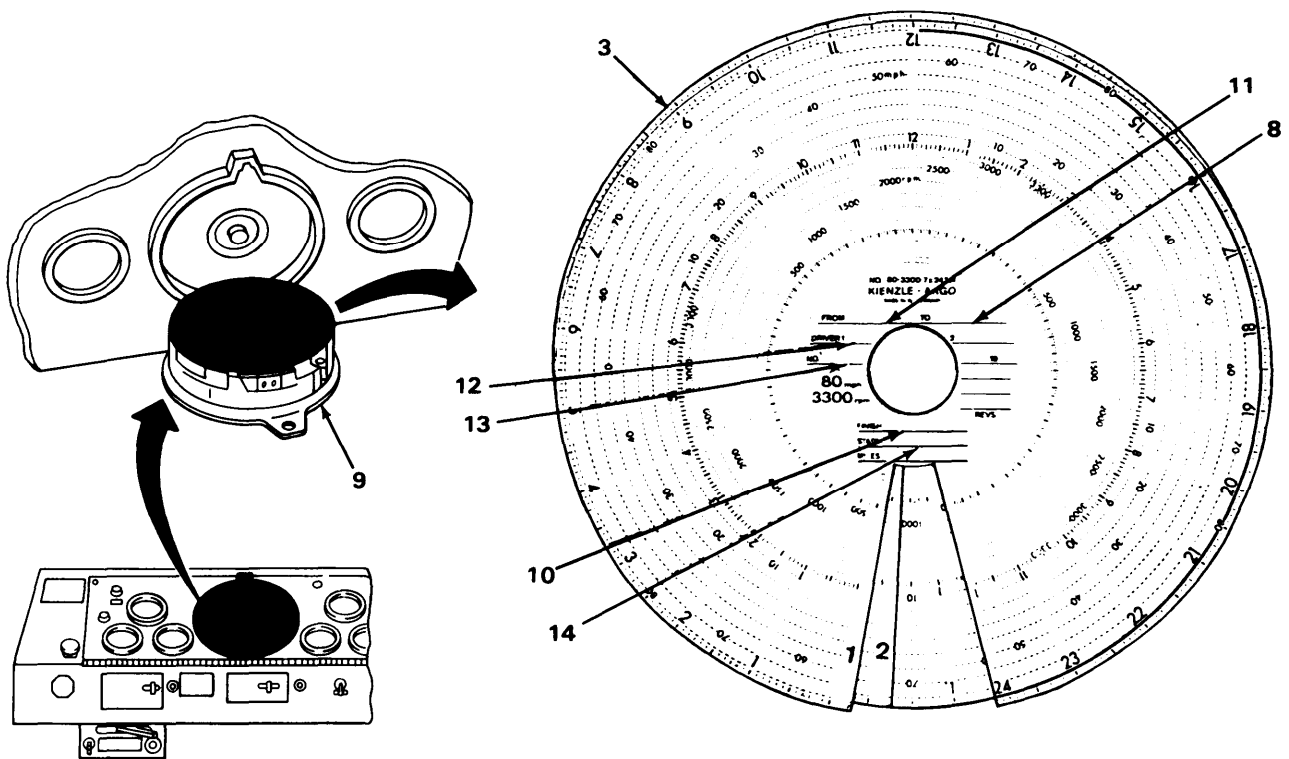
TA239987

TACHOGRAPH RECORDING CHART PACK - CONTINUED

LOCATION	ITEM	ACTION REMARKS
4. Chart pack (3)	Date line (8)	Write in today's date.
5.	Odometer (9) and mileage line (10)	a. Read mileage. b. Record mileage on mileage line (10).
6.	Chart pack (3)	Turn into commander.

INSTALLATION

7. New chart pack (3)	Date line (11)	Write in today's date.
8.	Name line (12)	Write in name of driver.
9.	Number line (13)	Write in truck number.
10.	Mileage line (14)	a. Read mileage. b. Record mileage on line (14).

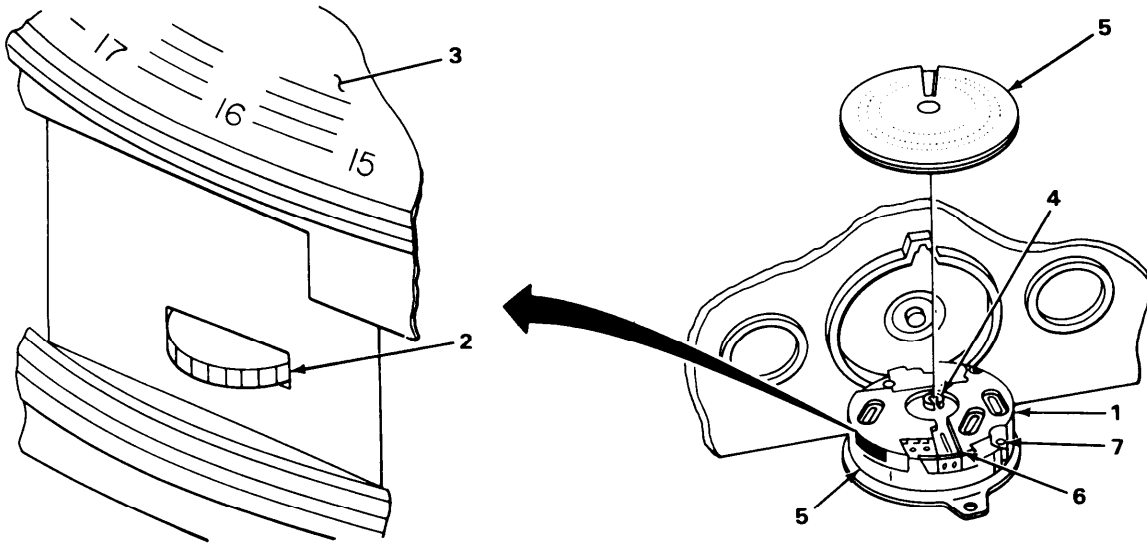


TACHOGRAPH RECORDING CHART PACK - CONTINUED

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

INSTALLATION - CONTINUED

- | | | | |
|--------------------|----------------|---|--|
| 11. Tachograph (1) | Wheel (2) | Turn to set clock (3). | |
| 12. Center hub (4) | Chart pack (5) | Slide under separating knife (6) and RPM indication transfer (7) and put onto center hub (4). | |



NOTE

Tachograph recording chart pack is marked for 24 hours. Each number on the outer ring of the chart shows the hour. Each mark stands for five minutes.

- | | | |
|--------------------------------------|-----------------------|---|
| 13. Red dot (8) | Hour number (9) | Check the time. Line up the hour number (9) of the time with the red dot (8). |
| 14. | Five minute mark (10) | For each five minutes after hour, turn chart one mark (10) counterclockwise past red dot (8) to set chart at right time.
Example is set at 12:34 hours p.m. |
| 15. Chart pack (5) to center hub (4) | Fastening ring (11) | Screw on. |

TA 239989

TACHOGRAPH RECORDING CHART PACK - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
16.	Tachograph (1)	Close.	
17. Tachograph (1)	Key (12)	Turn one-quarter turn clockwise and take out.	

TASK ENDS HERE

TACHOGRAPH LAMPS

This task covers:

- a. Removal (page 4-284)
- b. Installation (page 4-284)

INITIAL SETUP

Tools

Mechanical finger

Personnel Required

One

NOTE

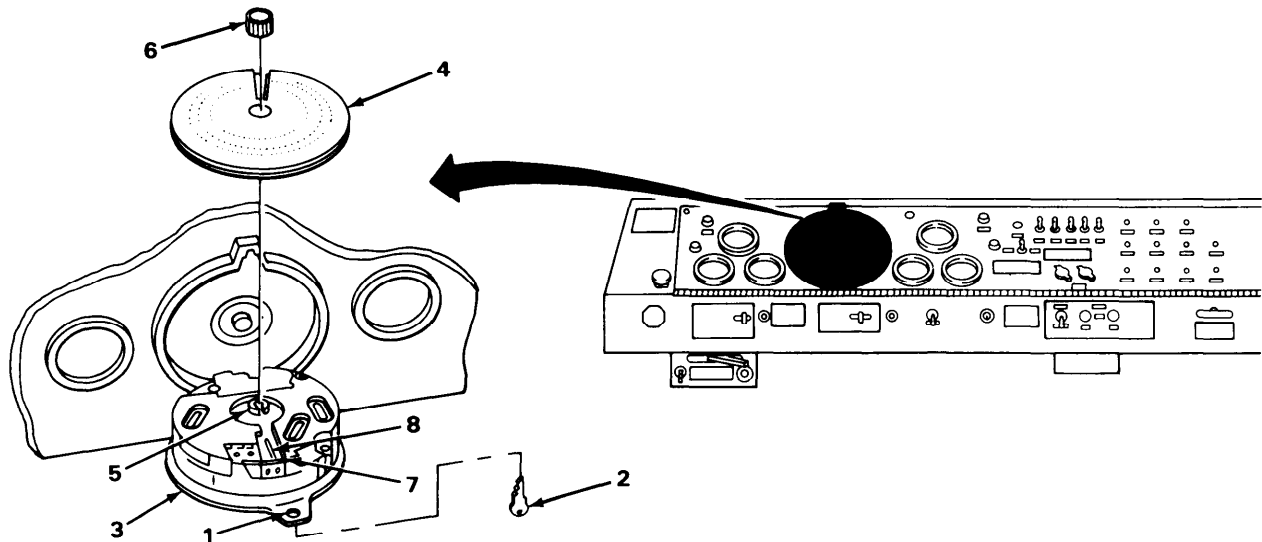
There are three lamps in the tachograph. Same steps are used to change all lamps. One lamp is shown.

High rpm/high speed warning light is light-emitting diode and may not be changed by organizational maintenance.

TA239990

TACHOGRAPH LAMPS - CONTINUED

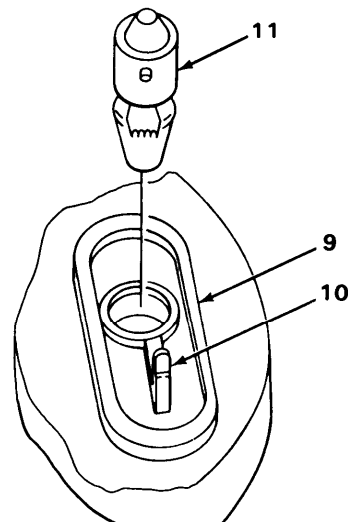
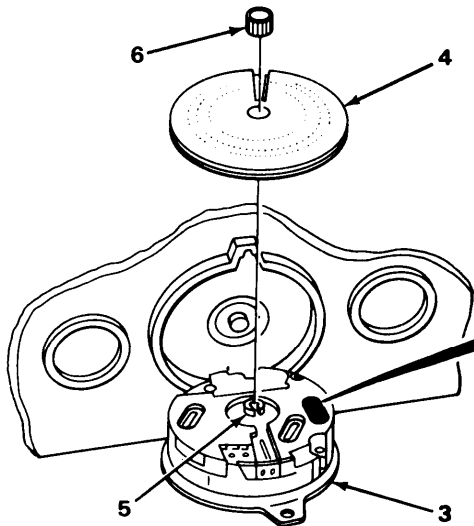
LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1. Tachograph key slot (1)	Key (2) and tachograph (3)	a. Put into slot (1) and turn counter-clockwise one-quarter turn. b. Using key (2) as handle, open tachograph (3).	
2. Chart pack (4) to center hub (5)	Fastening ring (6)	Unscrew and take off.	
3.	Chart pack (4)	Lift off and slide out from under separating knife (7) and RPM indication transfer (8).	



4. Socket (9)	Lamp retainer (10)	Turn up.	
5.	Lamp(n)	Using mechanical finger, lift out.	
INSTALLATION			
6. Socket (9)	Lamp(n)	Put in.	
7.	Lamp retainer (10)	Turn down over lamp (11).	
8.	Chart pack (4)	Install (page 4-280).	
9. Chart pack (4) to center hub (5)	Fastening ring (6)	Screw on.	
10.	Tachograph (3)	Close.	TA239991

TACHOGRAPH LAMPS - CONTINUED

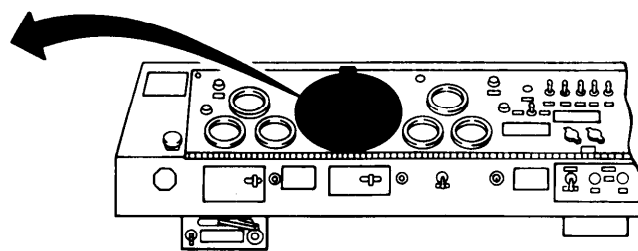
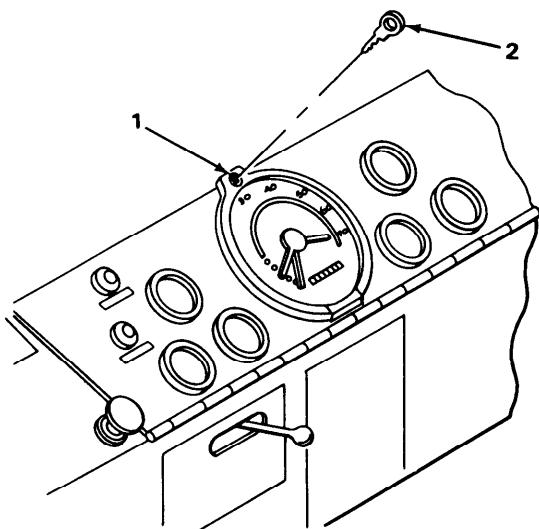
LOCATION	ITEM	ACTION	REMARKS
----------	------	--------	---------



11. Key slot (1)

Key (2)

Turn key (2) one-quarter turn clockwise and take out.



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

LIGHT CONTROL RHEOSTAT

This task covers:

- a. Removal (page 4-286)
 - b. Installation (page 4-287)
-

INITIAL SETUP

Tools

Screwdriver, flat-tip, 1/8-inch
 Screwdriver, flat-tip, 1/4-inch,
 Screwdriver, flat-tip, 3/8-inch
 Wrench, box, 5/8-inch

Materials/Parts

Tag, marking (item 18, appendix C)

Personnel Required

One

Equipment Condition

Instrument panel opened (page 4-244).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

CAUTION

Make sure light switch is off before changing light control rheostat to prevent damage to electrical system.

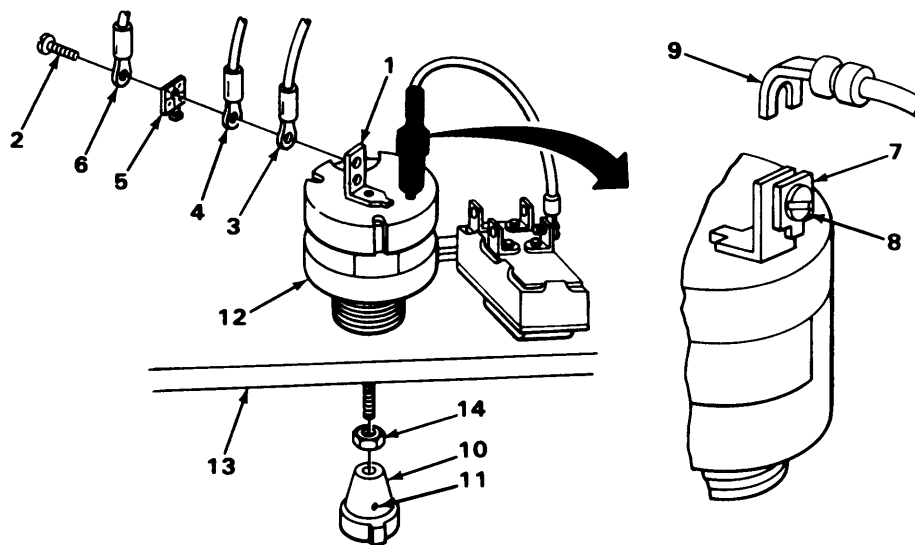
NOTE

Tag wires according to general maintenance instructions (page 4-1).

1. Terminal (1)	Screw (2), cream wire (3), black wire (4), tab washer (5), and wire 52 (6)	Using 1/4-inch screwdriver, unscrew and take out.
2. Terminal (7)	Screw (8)	Using 1/4-inch screwdriver, unscrew part way.
3.	Wire 52 (9)	Pull out.
4. Knob (10)	Setscrew (11)	Using 1/8-inch screwdriver, unscrew part way.
5.	Knob (10)	Take off.

LIGHT CONTROL RHEOSTAT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
6. Light control rheostat (12) to instrument panel (13)	Nut (14)	Using wrench, unscrew and take out.
7. Instrument panel (13)	Light control rheostat (12)	Take out.
INSTALLATION		
8. Instrument panel (13)	Light control rheostat (12)	Put in.
9. Light control rheostat (12)	Nut (14)	Screw on and tighten using wrench.
10. Light control rheostat (12)	Knob (10)	Put on.
11. Knob (10)	Setscrew (11)	Using 1/8-inch screwdriver, tighten.
12. Screw (2)	Cream wire (3), black wire (4), tab washer (5), and wire 52 (6)	Put on so that tab goes in hole.
13. Terminal (1)	Screw (2)	Screw in and tighten using 1/4-inch screwdriver.
14. Terminal (7)	Wire 52 (9)	Put in.
15.	Screw (8)	Using 1/4-inch screwdriver, tighten.



TA239993

LIGHT CONTROL RHEOSTAT - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Check operation (TM 9-2320-270-10).
2. Close instrument panel (page 4-244).

TASK ENDS HERE

LIGHT SWITCH

This task covers:

- a. Removal (page 4-288)
 - b. Installation (page 4-289)
-

INITIAL SETUP

Tools

Screwdriver, flat-tip, 1/4-inch,
Screwdriver, flat-tip, 3/8-inch
Wrench, box, 9/16-inch

Personnel Required

One

Equipment Condition

Materials/Parts

Lockwashers, wire to terminal
Tag, marking (item 18, appendix C)

Battery ground cable disconnected
(page 4-444).
Instrument panel open (page 4-244).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Make sure battery ground cable is disconnected before doing this task. Failure to disconnect battery ground cable can cause personal injury and damage to electrical system.

NOTE

Tag wires according to general maintenance instructions (page 4-1).

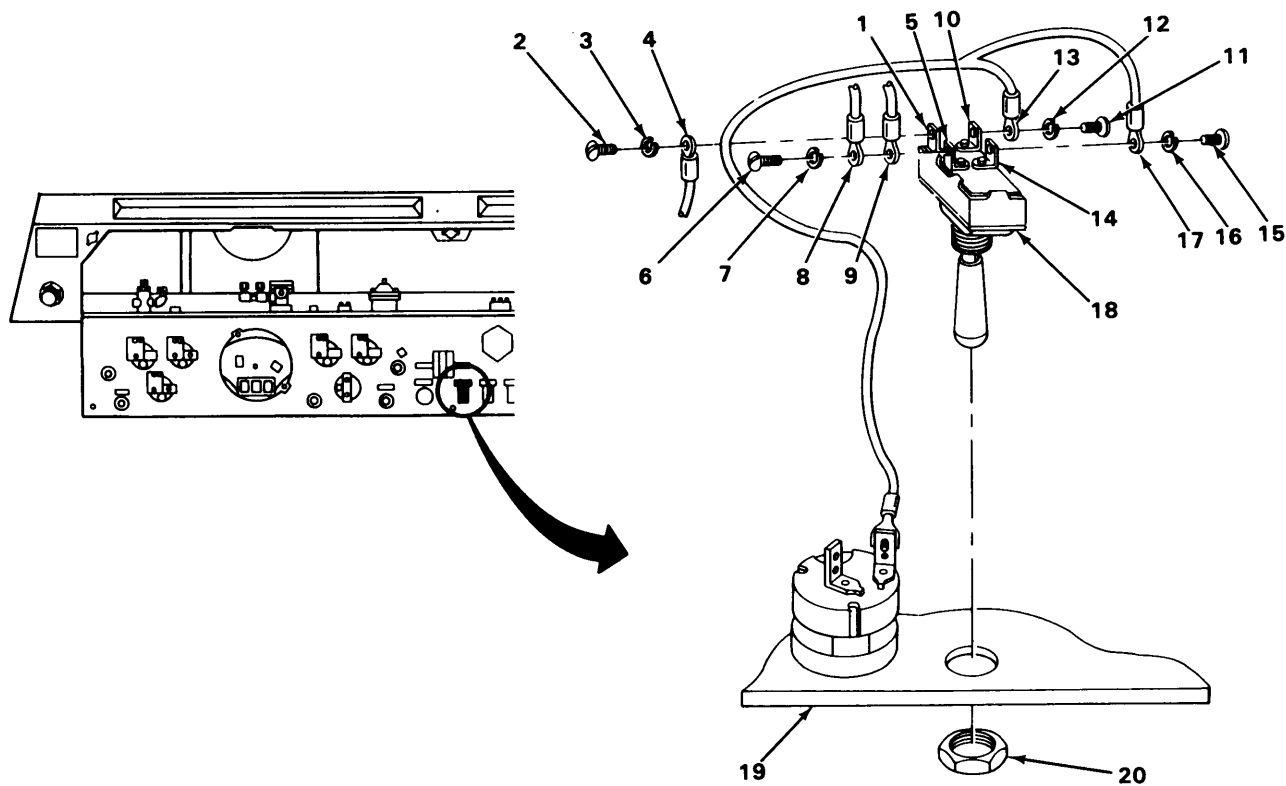
- | | | |
|-----------------|---|---|
| 1. Terminal (1) | Screw (2), lock-washer (3), and wire 084 (4) | s. Using 1/4-inch screwdriver, unscrew and take off.
b. Get rid of lockwasher (3). |
| 2. Terminal (5) | Screw (6), lock-washer (7), and wire 017 (8) or 08A (9) | s. Using 1/4-inch screwdriver, unscrew and take off.
b. Get rid of lockwasher (7). |

LIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
3. Terminal (10)	Screw (11), lock-washer (12), and wire 677 (13)	a. Using 1/4-inch screwdriver, unscrew and take off. b. Get rid of lockwasher (12).
4. Terminal (14)	Screw (15), lock-washer (16), and wire 52 (17)	a. Using 1/4-inch screwdriver, unscrew and take off. b. Get rid of lockwasher (16).
5. Light switch (18) to instrument panel (19)	Nut (20)	Using wrench, unscrew and take off.
6. Instrument panel (19)	Light switch (18)	Take out.

INSTALLATION

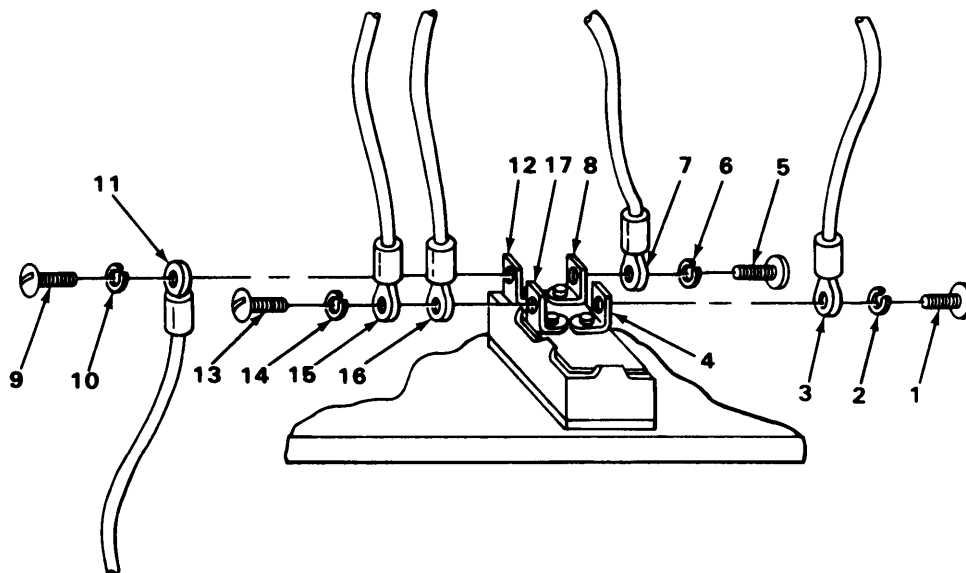
7. Instrument panel (19)	Light switch (18)	Put in.
8. Light switch (18) to instrument panel (19)	Nut (20)	Screw on and tighten using wrench.



TA239994

LIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION - CONTINUED		
9. Screw (1)	New lockwasher (2) and wire 52 (3)	Put on.
10. Terminal (4)	Screw (1)	Screw in and tighten using 1/4-inch screwdriver.
11. Screw (5)	New lockwasher (6) and wire 677 (7)	Put on.
12. Terminal (8)	Screw (5)	Screw in and tighten using 1/4-inch screwdriver.
13. Screw (9)	New lockwasher (10) and wire 084 (11)	Put on.
14. Terminal (12)	Screw (9)	Screw in and tighten using 1/4-inch screwdriver.
15. Screw (13)	New lockwasher (14), wire 017 (15), and 08A (16)	Put on.
16. Terminal (17)	Screw (13)	Screw in and tighten using 1/4-inch screwdriver.



TA239995

LIGHT SWITCH - CONTINUED**NOTE**

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).
3. Close instrument panel (page 4-244).

TASK ENDS HERE**CLEARANCE LIGHT SWITCH**

This task covers:

- a. Removal (page 4-292)
 - b. Installation (page 4-292)
-

INITIAL SETUP**Tools**

Screwdriver, flat-tip, 1/4-inch
 Screwdriver, flat-tip, 3/8-inch
 Wrench, box, 9/18-inch

Personnel Required

One

Equipment Condition**Materials/Parts**

Lockwasher, terminal screw
 (two required)
 Tag, marking (item 18, appendix C)

Battery ground cable disconnected
 (page 4-444).
 Instrument panel open (page 4-244).

CLEARANCE LIGHT SWITCH - CONTINUED

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

REMOVAL

WARNING

Make sure battery ground cable is disconnected before doing this task. Failure to disconnect battery ground cable can cause personal injury and damage to electrical system.

NOTE

Tag wires according to general maintenance instructions (page 4-1).

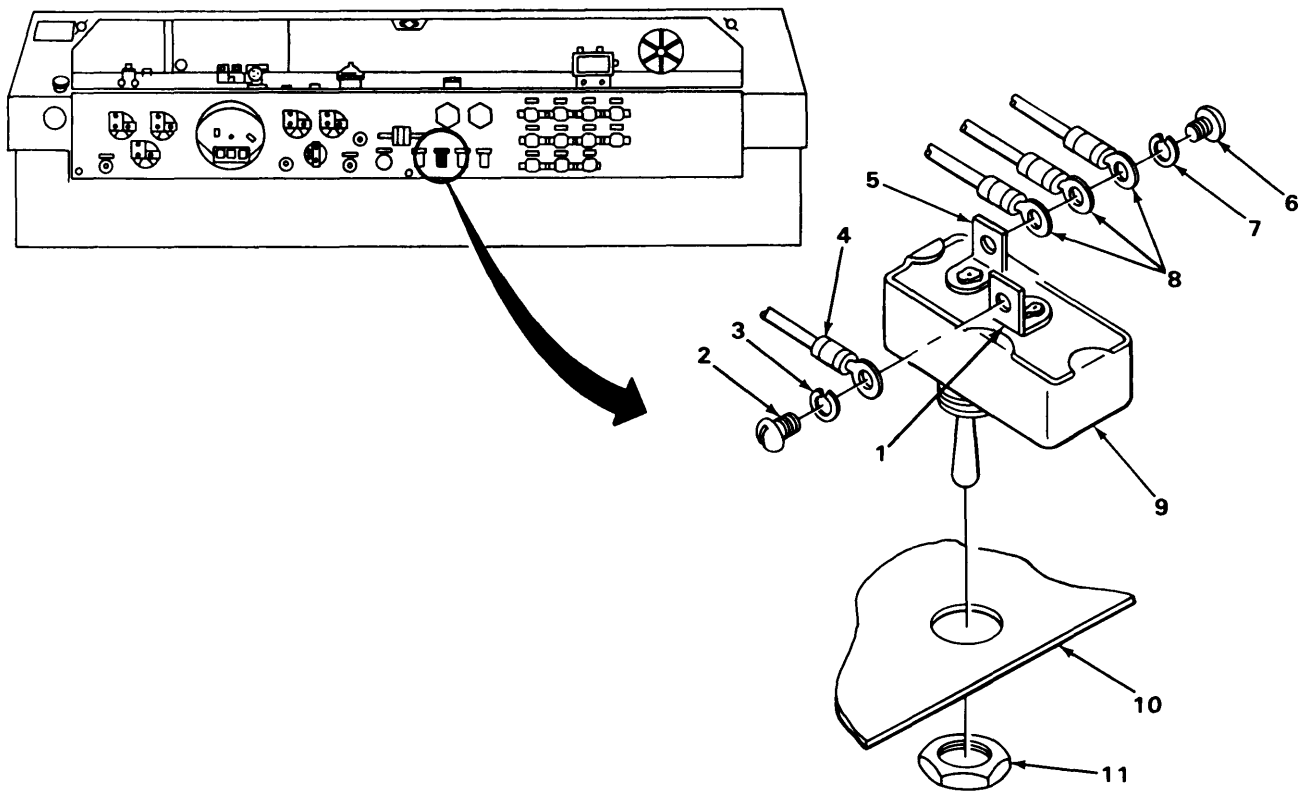
1. Terminal (1)	Screw (2), lock-washer (3), and wire 090 (4)	s. Using 1/4-inch screwdriver, unscrew and take off. b. Get rid of lockwasher (3).
2. Terminal (5)	Screw (6), lock-washer (7) and three wires 012 (8)	s. Using 1/4-inch screwdriver, unscrew and take off. b. Get rid of lockwasher (7).
3. Clearance light switch (9) to instrument panel (10)	Nut (11)	Using wrench, unscrew and take off.
4. Instrument panel (10)	Clearance light switch (9)	Take out.

INSTALLATION

5. Instrument panel (10)	Clearance light switch (9)	Put in.
6. Clearance light switch (9) to instrument panel (10)	Nut (11)	Screw on and tighten using 9/16-inch wrench.
7. Screw (6)	New lockwasher (7) and three wires 012 (8)	Put on.

CLEARANCE LIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
8. Terminal (5)	Screw (6)	Screw in and tighten using 1/4-inch screwdriver.
9. Screw (2)	New lockwasher (3) and wire 090 (4)	Put on.
10. Terminal (1)	Screw (2)	Screw in and tighten using 1/4-inch screwdriver.



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).
3. Close instrument panel (page 4-244).

TASK ENDS HERE

DOME LIGHT SWITCH AND WARNING LIGHT SWITCH

This task covers:

- a. Removal (page 4-294)
 - b. Installation (page 4-295)
-

INITIAL SETUP

Tools

Screwdriver, flat-tip, 1/4-inch
Wrench, box, 9/16-inch

Personnel Required

One

Equipment Condition

Materials/Parts

Lockwasher, terminal screw
(two required)
Tag, marking (item 18, appendix C)

Battery ground cable disconnected
(page 4-444).
Instrument panel open (page 4-244).

LOCATION	ITEM	ACTION REMARKS
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REMOVAL

WARNING

Make sure battery ground cable is disconnected before doing this task. Failure to disconnect battery ground cable can cause personal injury and damage to electrical system.

NOTE

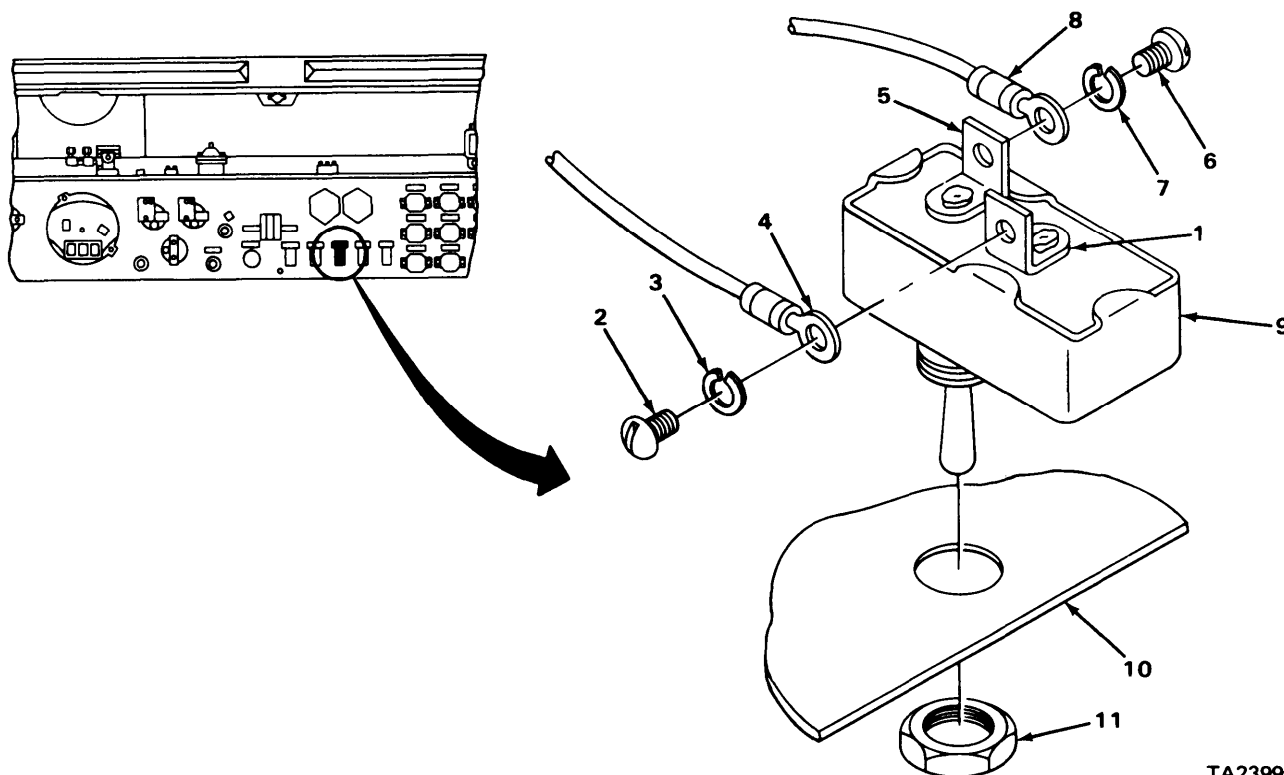
Tag wires according to general maintenance instructions (page 4-1).

Steps in this task apply to both the dome light switch and beacon light switch except as noted. Dome light switch is shown.

1. Terminal (1)	Screw (2), lockwasher (3), and wire 094 (4)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (3).
2. Terminal (5)	Screw (6) lockwasher (7), and wire 153 (8)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (7).
3. Dome light switch (9) to instrument panel (10)	Nut (11)	Using wrench, unscrew and take off.

DOME LIGHT SWITCH AND WARNING LIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
4. Instrument panel (10)	Dome light switch (9)	Take out.
INSTALLATION		
5. Instrument panel (10)	Dome light switch (9)	Put in.
6. Dome light switch (9) to instrument panel (10)	Nut (19)	Screw on and tighten using wrench.
7. Screw (6)	New lockwasher (7) and wire 153 (8)	Put on.
8. Terminal (5)	Screw (6)	Screw in and tighten using screwdriver.
9. Screw (2)	New lockwasher (3) and wire 094 (4)	Put on.
10. Terminal (1)	Screw (2)	Screw in and tighten using screwdriver.



TA239997

DOME LIGHT SWITCH AND WARNING LIGHT SWITCH - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).
3. Close instrument panel (page 4-244).

TASK ENDS HERE

WORK LIGHT SWITCH

This task covers:

- a. Removal (page 4-296)
 - b. Installation (page 4-297)
-

INITIAL SETUP

Tools

Screwdriver, flat-tip, 1/4-inch
Wrench, box, 9/16-inch

Personnel Required

One

Materials/Parts

Lockwasher, terminal screw
(two required)
Tag, marking (item 18, appendix C)

Equipment Condition

Battery ground cable disconnected
(4-444).
Instrument panel open (page 4-244).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Make sure battery ground cable is disconnected before doing this task. Failure to disconnect battery ground cable can cause personal injury and damage to electrical system.

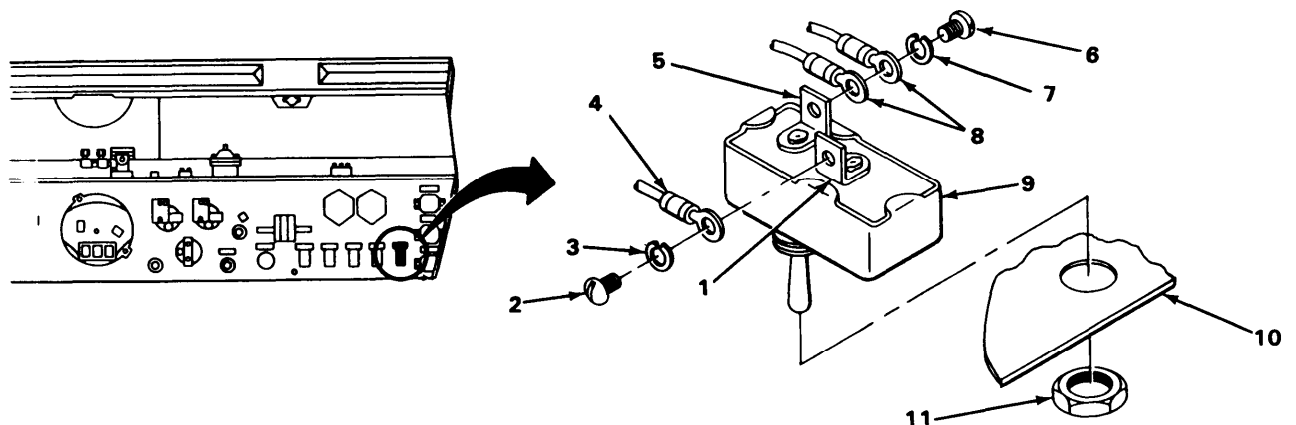
NOTE

Tag wires according to general maintenance instructions (page 4-1).

- | | | |
|---|---|--|
| <ol style="list-style-type: none"> 1. Terminal (1) | <ol style="list-style-type: none"> Screw (2), lock-washer (3), and wire 040A (4) | <ol style="list-style-type: none"> s. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (3). |
|---|---|--|

WORK LIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
2. Terminal (5)	Screw (6), lock-washer (7), and two wires 040 (8)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (7).
3. Work light switch (9) to instrument panel (10)	Nut (11)	Using wrench, unscrew and take off.
4. Instrument panel (10)	Work light switch (9)	Take out.
INSTALLATION		
5. Instrument panel (10)	Work light switch (9)	Put in.
6. Work light switch (9) to instrument panel (10)	Nut (11)	Screw on and tighten using wrench.
7. Screw (6)	New lockwasher (7) and two wires 040 (8)	Put on.
8. Terminal (5)	Screw (6)	Screw in and tighten using screwdriver.
9. Screw (2)	New lockwasher (3) and wire 040A (4)	Put on.
10. Terminal (1)	Screw (2)	Screw in and tighten using screwdriver.



TA239998

WORK LIGHT SWITCH - CONTINUED

INSTALLATION - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).
3. Close instrument panel (page 4-244).

TASK ENDS HERE

BLACKOUT LIGHT SWITCH

This task covers:

- a. Removal (page 4-298)
 - b. Installation (page 4-300)
-

INITIAL SETUP

Tools

Screwdriver, flat-tip, 1/4-inch,
Wrench, box, 9/18-inch

Personnel Required

One

Equipment Condition

Battery ground cable disconnected
(page 4-444).
Instrument panel open (page 4-244).

Materials/Parts

Lockwasher, terminal screw
(12 required)
Tag, marking (item 18, appendix C)

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

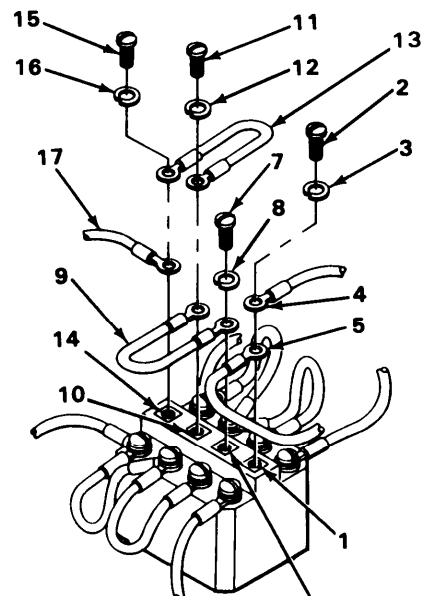
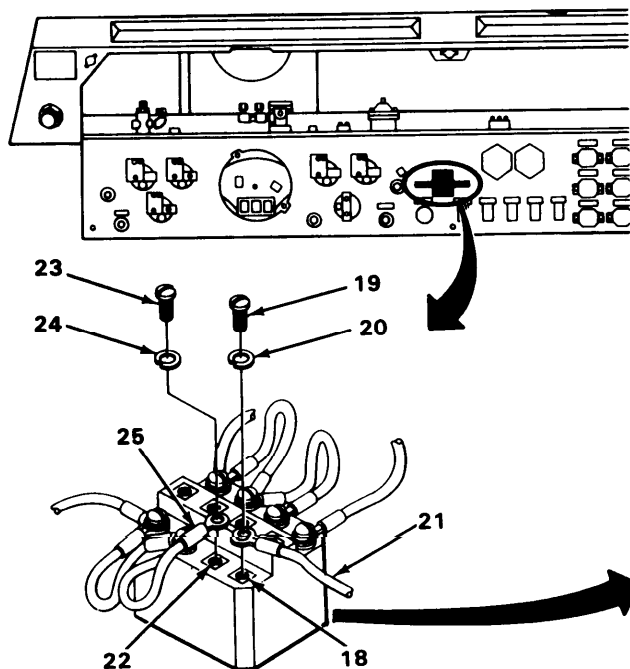
Make sure battery ground cable is disconnected before doing this task. Failure to disconnect battery ground cable can cause personal injury and damage to electrical system.

NOTE

Tag wires according to general maintenance instructions, (page 4-1).

BLACKOUT LIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
1. Terminal (1)	Screw (2), lock-washer (3), yellow wire 429 (4), and yellow wire 9 (5)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (3).
2. Terminal (6)	Screw (7), lock-washer (8), and brown wire 674 (9)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (8).
3. Terminal (10)	Screw (11), lock-washer (12), brown wire 674 (9), and brown wire 674 (13)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (12).
4. Terminal (14)	Screw (15), lock-washer (16), brown wire 674 (13), and white wire 674 (17)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (16).
5. Terminal (18)	Screw (19), lock-washer (20), and yellow wire 294 (21)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (20).
6. Terminal (22)	Screw (23), lock-washer (24), and brown wire 675 (25)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (24).



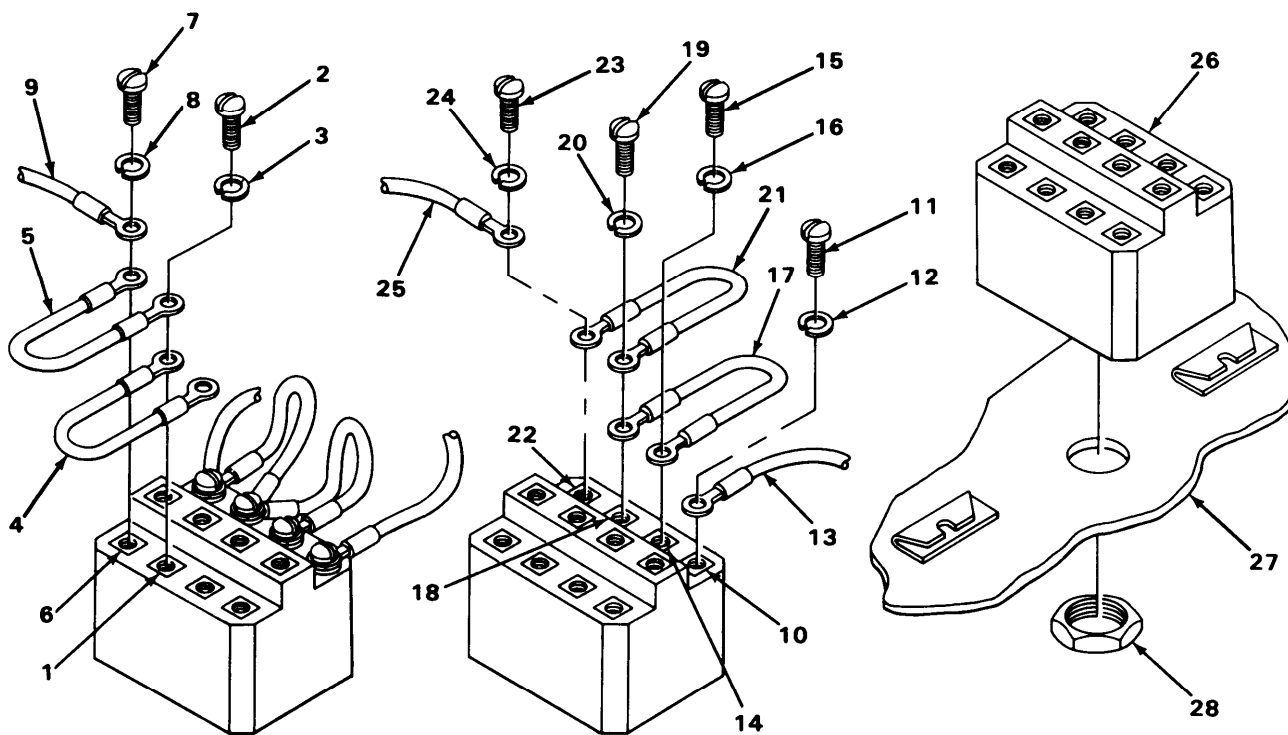
TA239999

BLACKOUT LIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
7. Terminal (1)	Screw (2), lock-washer (3), brown wire 675 (4), and brown wire 675 (5)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (3).
8. Terminal (6)	Screw (7), lock-washer (8), brown wire 675 (5), and white wire 675 (9)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (8).
9. Terminal (10)	Screw (11), lock-washer (12), and yellow wire 678 (13)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (12).
10. Terminal (14)	Screw (15), lock-washer (16), and brown wire 676 (17)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (16).
11. Terminal (18)	Screw (19), lock-washer (20), brown wire 676 (17), and brown wire 676 (21)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (20).
12. Terminal (22)	Screw (23), lock-washer (24), brown wire 676 (21), and white wire 676 (25)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (24).
13. Blackout light switch (26) to instrument panel (27)	Nut (28)	Using wrench, unscrew and take off.
14. Instrument panel (27)	Blackout light switch (26)	Take out.
INSTALLATION		
15. Instrument panel (27)	Blackout light switch (26)	Put in.

BLACKOUT LIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
16. Blackout light switch (26) to instrument panel (27)	Nut (28)	Screw on and tighten using wrench.
17. Screw (23)	New lockwasher (24), brown wire 676 (21), and white wire 676 (25)	Put on.
18. Terminal (22)	Screw (23)	Screw in and tighten using screwdriver.
19. Screw (19)	New lockwasher (20), brown wire 676 (17), and brown wire 676 (21)	Put on.
20. Terminal (18)	Screw (19)	Screw in and tighten using screwdriver.



TA240000

BLACKOUT LIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION – CONTINUED		
21. Screw (1)	New lockwasher (2), and brown wire 676 (3)	Put on.
22. Terminal (4)	Screw (1)	Screw in and tighten using screwdriver.
23. Screw (5)	New lockwasher (6), and yellow wire 678 (7)	Put on.
24. Terminal (8)	Screw (5)	Screw in and tighten using screwdriver.
25. Screw (9)	New lockwasher (10), white wire 675 (11), and brown wire 675 (12)	Put on.
26. Terminal (13)	Screw (9)	Screw in and tighten using screwdriver.
27. Screw (14)	New lockwasher (15), brown wire 675 (12), and brown wire 675 (16)	Put on.
28. Terminal (17)	Screw (14)	Screw in and tighten using screwdriver.
29. Screw (18)	New lockwasher (19), and brown wire 675 (16)	Put on.
30. Terminal (20)	Screw (18)	Screw in and tighten using screwdriver.
31. Screw (21)	New lockwasher (22) and yellow wire 294 (23)	Put on.
32. Terminal (24)	Screw (21)	Screw in and tighten using screwdriver.

BLACKOUT LIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
33. Screw (25)	New lockwasher (26), white wire 674 (27), and brown wire 674 (28)	Put on.
34. Terminal (29)	Screw (25)	Screw in and tighten using screwdriver.
35. Screw (30)	New lockwasher (31), brown wire 674 (28), and wire 674 (32)	Put on.
36. Terminal (33)	Screw (30)	Screw in and tighten using screwdriver.
37. Screw (34)	New lockwasher (35), and wire 674 (32)	Put on.
38. Terminal (36)	Screw (34)	Screw in and tighten using screwdriver.
39. Screw (37)	New lockwasher (38), and yellow wires 9 (39) and 429 (40)	Put on.
40. Terminal (41)	Screw (37)	Screw in and tighten using screwdriver.

TA240001

BLACKOUT LIGHT SWITCH - CONTINUED

INSTALLATION – CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (4-444).
2. Check operation (TM 9-2320-270-10).

TASK ENDS HERE

CIRCUIT BREAKERS

This task covers:

- | | |
|-------------------------|------------------------------|
| a. Removal (page 4-304) | b. Installation (page 4-305) |
|-------------------------|------------------------------|
-

INITIAL SETUP

<p>Tools</p> <p>Screwdriver, cross-tip, number 1 Screwdriver, flat-tip, 1/4-inch Wrench, open-end, 3/8-inch</p> <p>Materials/Parts</p> <p>Lockwasher, circuit breaker (two required) Lockwasher, terminal (two required) Tag, marking (item 18, appendix C)</p>	<p>Personnel Required</p> <p>One</p> <p>Equipment Condition</p> <p>Battery ground cable disconnected (page 4-444). Instrument panel open (page 4-244).</p>
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LOCATION	ITEM	ACTION REMARKS
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REMOVAL

WARNING

Make sure battery ground cable is disconnected before doing this task. Failure to disconnect battery can cause personal injury and damage to electrical system.

NOTE

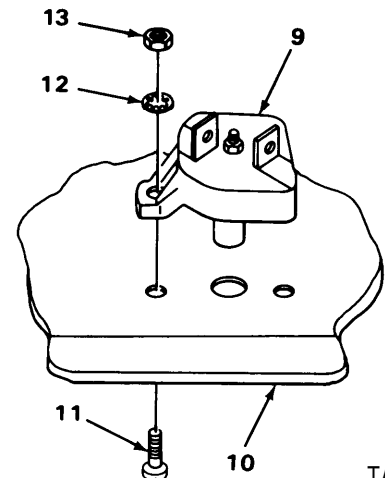
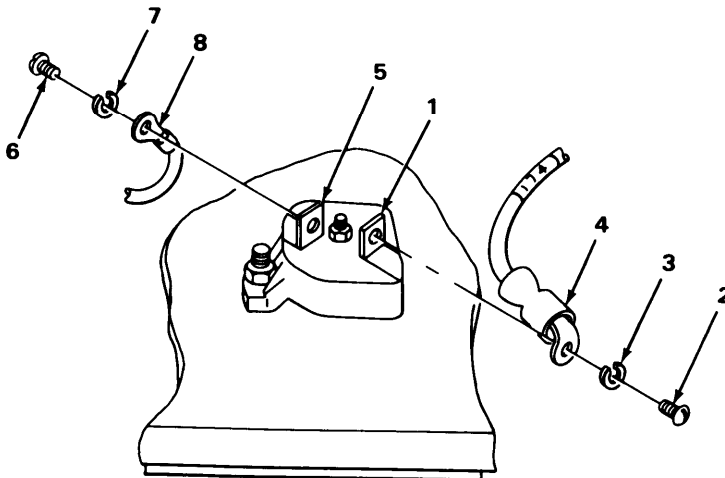
Steps in this task apply to all circuit breakers in the instrument panel. Number of wires will vary. STOP LT circuit breaker is shown. Refer to Appendix F Wire List for all circuit breaker wiring numbers and destinations. Tag wires according to general maintenance instructions (page 4-1).

CIRCUIT BREAKERS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
1. Terminal (1)	Screw (2), lock-washer (3), and wire (4)	a. Using flat-tip screwdriver, unscrew and take off. b. Get rid of lockwasher (3).	
2. Terminal (5)	Screw (6), lock-washer (7), and wire (8)	a. Using flat-tip screwdriver, unscrew and take off. b. Get rid of lockwasher (7).	
3. Circuit breaker (9) to instrument panel (10)	Two screws (11), lockwashers (12), nuts (13), and circuit breaker (9)	a. Using cross-tip screwdriver and 3/8-inch wrench, unscrew and take out. b. Get rid of lockwashers (12).	

INSTALLATION

4. Instrument panel (10)	Circuit breaker (9)	Put in.
5. Circuit breaker (9)	Two screws (11), new lockwashers (12), and nuts (13)	Screw together and tighten using cross-tip screwdriver and 3/8-inch wrench.
6. Screw (6)	New lockwasher (7) and yellow wire 9 (8)	Put on.
7. Terminal (5)	Screw (6)	Screw in and tighten using flat-tip screwdriver.
8. Screw (2)	New lockwasher (3), and black wire 174 (4)	Put on.
9. Terminal (1)	Screw (2)	Screw in and tighten using flat-tip screwdriver.



CIRCUIT BREAKERS - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).
3. Close instrument panel (page 4-244).

TASK ENDS HERE

INSTRUMENT PANEL LABEL ASSEMBLY

This task covers:

- a. Removal (page 4-306)
 - b. installation (page 4-306)
-

INITIAL SETUP

Personnel Required

One

Equipment Condition

Instrument panel open (page 4-244).

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

REMOVAL

NOTE

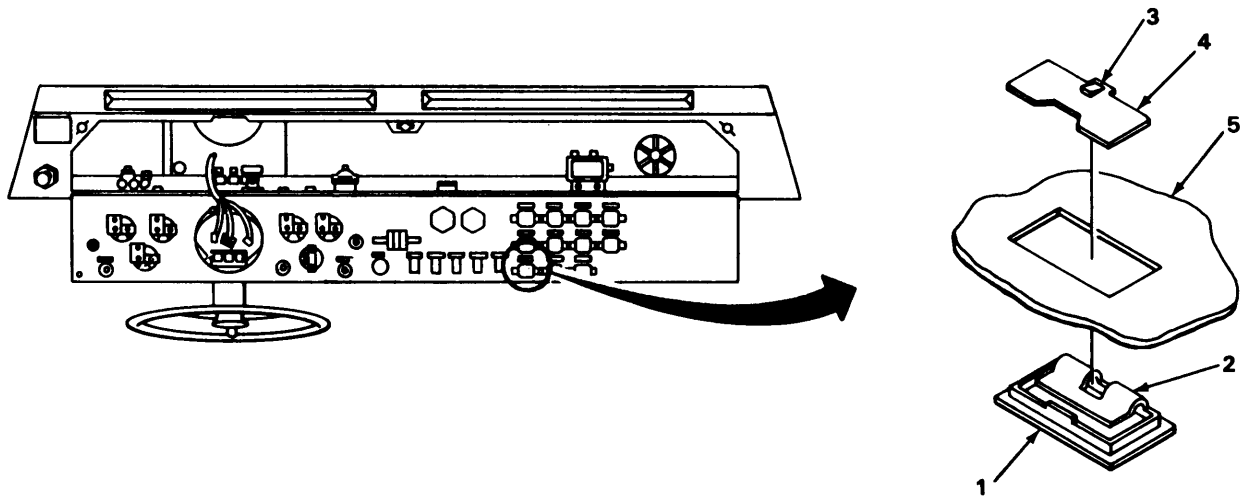
The steps in this task apply to instrument panel label assemblies that do not light when lights are turned on. They are: OIL-WATER, AIR, PANEL LPS, and all circuit breaker labels. STOP LT circuit breaker label is shown.

- | | | | |
|-------------------------|-----------|-------------------------------|--|
| 1. Bezel (1) | Tab (2) | Lift enough to clear nib (3). | |
| 2. | Decal (4) | Slide out. | |
| 3. Instrument panel (5) | Bezel (1) | Pull out. | |

INSTALLATION

- | | | | |
|-------------------------|-----------|--------------------------------|--|
| 4. Instrument panel (5) | Bezel (1) | Put into instrument panel (5). | |
| 5. Bezel (1) | Tab (2) | Lift enough to clear nib (3). | |
| 6. | Decal (4) | Slide in | |

INSTRUMENT PANEL LABEL ASSEMBLY - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE: Close instrument panel (page 4-244).

TASK ENDS HERE

DIMMER SWITCH

This task covers:

- a. Removal (page 4-308)
- b. Installation (page 4-310)

INITIAL SETUP

Tools

- Screwdriver, flat-tip, 1/4-inch
- Screwdriver, flat-tip, 3/8-inch

Materials/Parts

- Lockwasher, dimmer switch to cab floor (two required)
- Tag, marking (item 18, appendix C)

Personnel Required

Two

DIMMER SWITCH - CONTINUED

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

REMOVAL

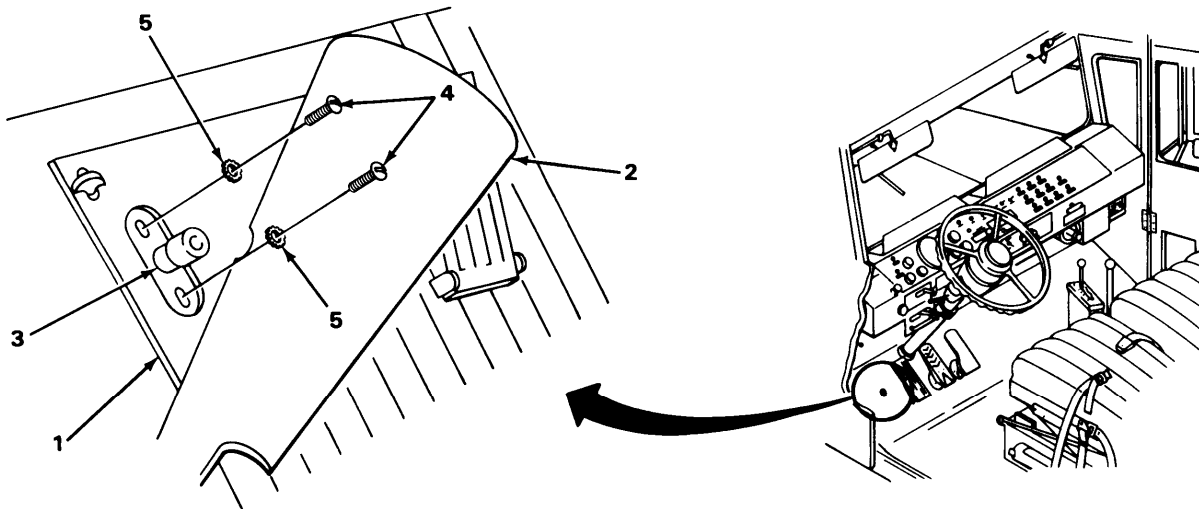
CAUTION

Make sure the light switch is off before replacing the dimmer switch to prevent damage to electrical system.

NOTE

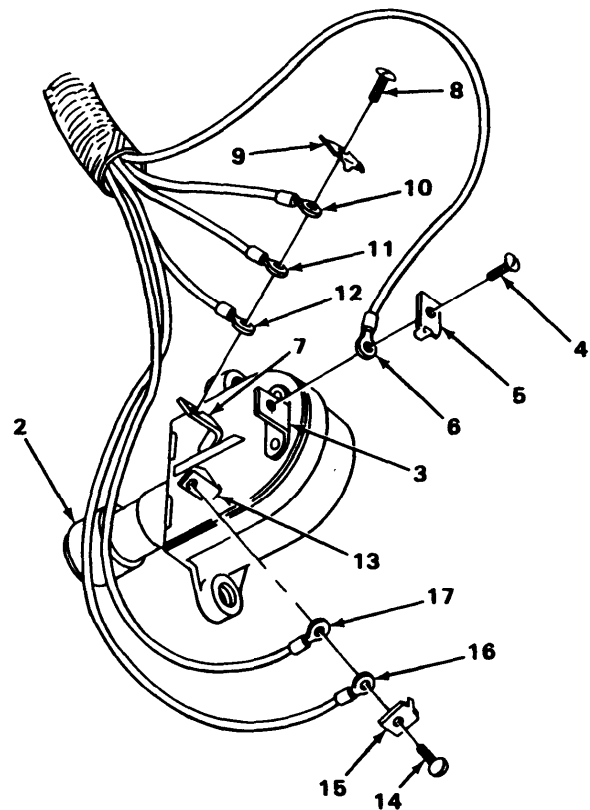
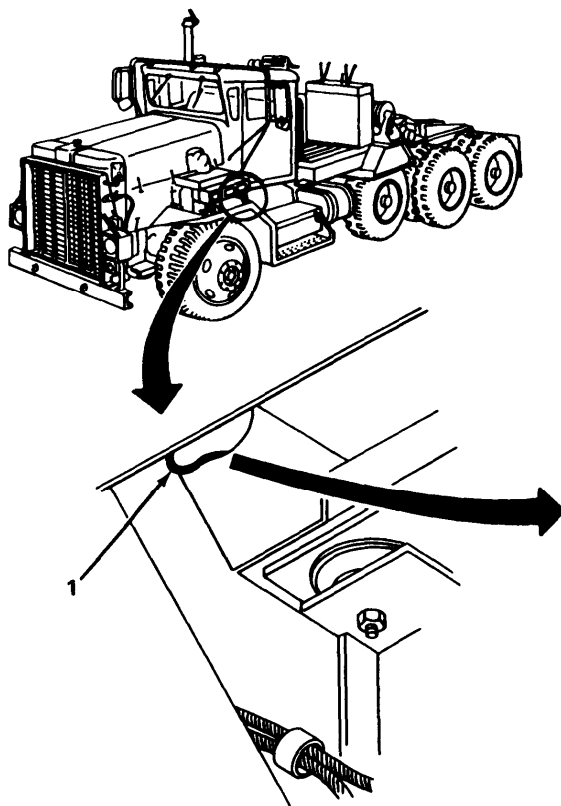
Tag wires according to general maintenance instructions (page 4-1).

- | | | |
|--|---------------------------------------|---|
| 1. Cab floor (1) | Floor mat (2) | Pull up and lay back, |
| 2. Dimmer switch (3)
to cab floor (1) | Two screws (4) and
lockwashers (5) | a. Using 3/8-inch screwdriver, unscrew
and take out.
b. Get rid of lockwashers (5). |



DIMMER SWITCH - CONTINUED

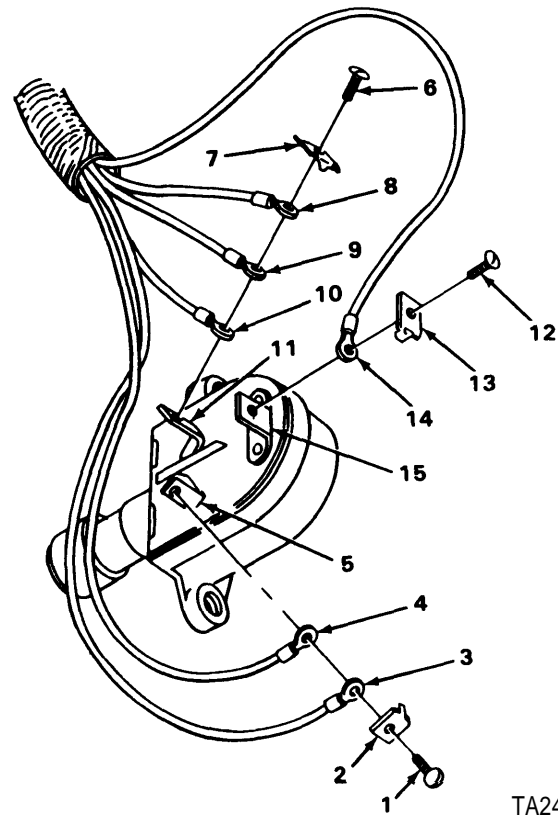
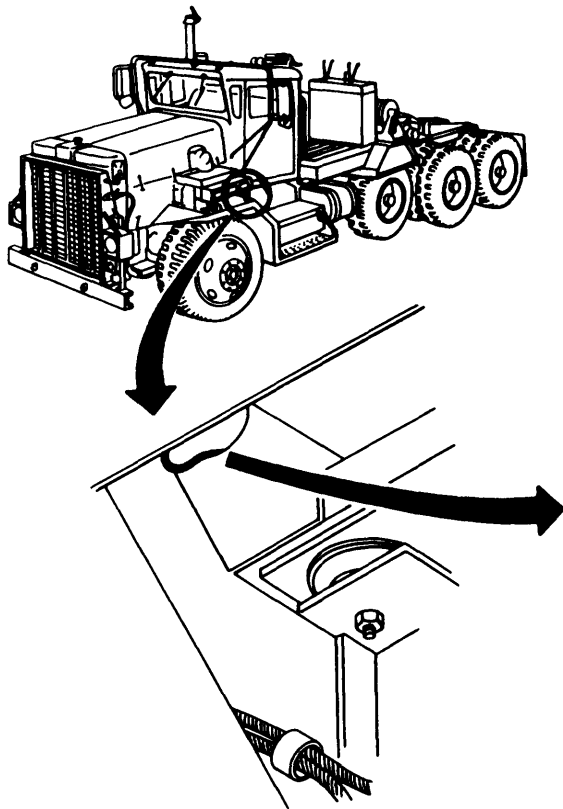
LOCATION	ITEM	ACTION REMARKS
3. Cab floor (1)	Dimmer switch (2)	Pull out from underneath.
4. Terminal (3)	Screw (4), tab washer (5), and wire 17 (6)	Using 1/4-inch screwdriver, unscrew and take out.
5. Terminal (7)	Screw (8), tab washer (9), wires 81 (10), 7B (11), and 7A (12)	Using 1/4-inch screwdriver, unscrew and take out.
6. Terminal (13)	Screw (14), tab washer (15), wires 6A (16) and 6B (17)	Using 1/4-inch screwdriver, unscrew and take out.



TA240005

DIMMER SWITCH - CONTINUED

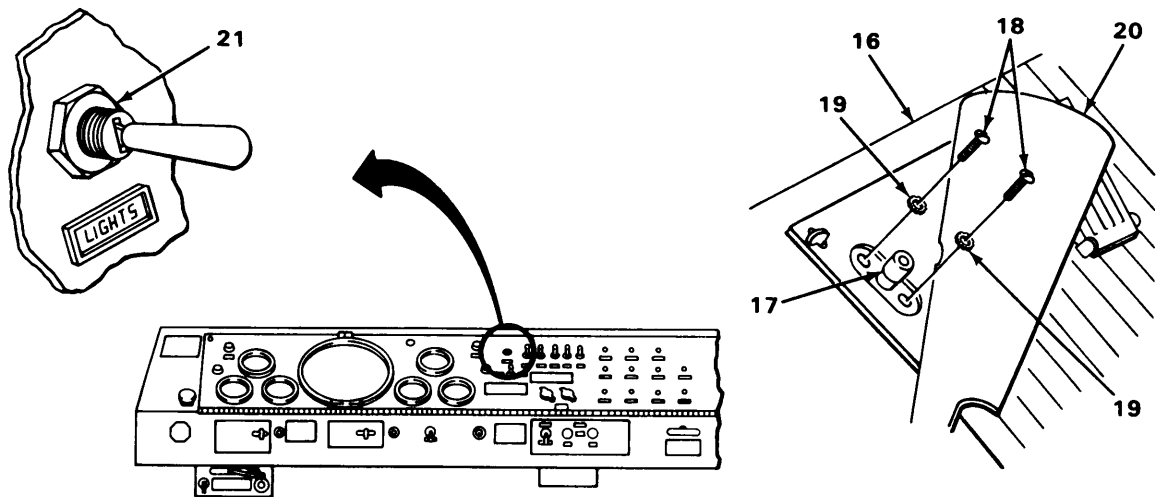
LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
7. Screw (1)	Tab washer (2) and wires 6A (3) and 6B (4)	Put on.	
8. Terminal (5)	Screw (1)	Screw in and tighten using 1/4-inch screwdriver.	
9. Screw (6)	Tab washer (7), and wires 81 (8), 7B (9), and 7A (10)	Put on.	
10. Terminal (11)	Screw (6)	Screw in and tighten using 1/4-inch screwdriver.	
11. Screw (12)	Tab washer (13) and wire 17(14)	Put on.	
12. Terminal (15)	Screw (12)	Screw in and tighten using 1/4-inch screw-screwdriver.	



TA240006

DIMMER SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
13. Cab floor (16)	Dimmer switch (17)	With help of assistant, place in position.
14. Cab floor (16) to dimmer switch (17)	Two screws (18) and new lockwashers (19)	Have assistant screw into switch (17) and tighten using 3/8-inch screwdriver.
15. Cab floor (16)	Floor mat (20)	Put in place.
16.	Light switch (21)	Turn on.
17.	Dimmer switch (17)	Check operation (TM 9-2320-270-10).



TASK ENDS HERE

DOOR AJAR WARNING SWITCH

This task covers:

- a. Removal (page 4-312)
 - b. Installation (page 4-313)
-

INITIAL SETUP

Tools	Personnel Required
Screwdriver, flat-tip, 3/16-inch	One
Materials/Parts	Equipment Condition
Lockwasher, terminal (two required) Tag, marking (item 18, appendix C)	Battery ground cable disconnected (page 4-444).

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

REMOVAL

CAUTION

Make sure battery cable is disconnected before replacing door warning switch to prevent possible damage to electrical system.

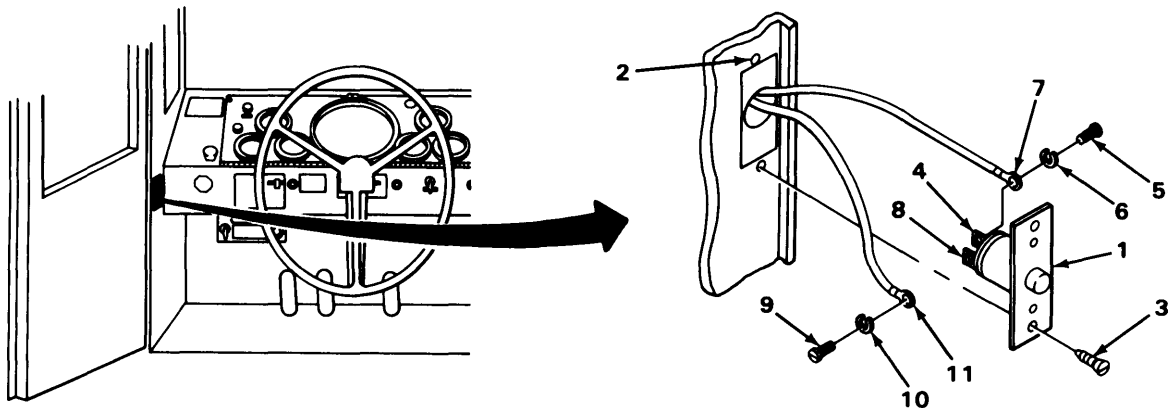
NOTE

Tag wires according to general maintenance instructions (page 4-1).

1. Door ajar warning switch (1), to door pillar (2)	Two screws (3)	Using screwdriver, unscrew and take out.
2. Door pillar (2)	Door ajar warning switch (1)	Pull out part way.
3. Terminal (4)	Screw (5), lockwasher (6), and wire 048 (7)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (6).
4. Terminal (8)	Screw (9), lockwasher (10), and wire 331 (11)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (10).

DOOR AJAR WARNING SWITCH - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
5. Screw (9)	New lockwasher (10) and wire 331 (11)	Put on.	
6. Terminal (8)	Screw (9)	Screw in and tighten using screwdriver.	
7. Screw (5)	New lockwasher (6) and wire 048 (7)	Put on.	
8. Terminal (4)	Screw (5)	Screw in and tighten using screwdriver.	
9. Door pillar (2)	Door ajar warning switch (1)	Put in.	
10. Door ajar warning switch (1) to door pillar (2)	Two screws (3)	Screw in and tighten using screwdriver.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).

TASK ENDS HERE

DIRECTIONAL SIGNAL CONTROL

This task covers:

- a. Removal (page 4-314)
 - b. Installation (page 4-316)
-

INITIAL SETUP

Tools

- Pliers, diagonal-cutting
- Screwdriver, cross-tip, number 2
- Screwdriver, flat-tip, 3/8-inch
- Pliers, slip-joint, straight-nose

Personnel Required

One

Equipment Condition

Battery ground cable disconnected (page 4-444).
Instrument panel open (page 4-244).

Materials/Parts

- Tag, marking (item 18, appendix C)
 - Wrap, tie (item 24, appendix C)
-

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

CAUTION

Make sure battery ground cable is disconnected before replacing the directional signal control to prevent possible damage to electrical system.

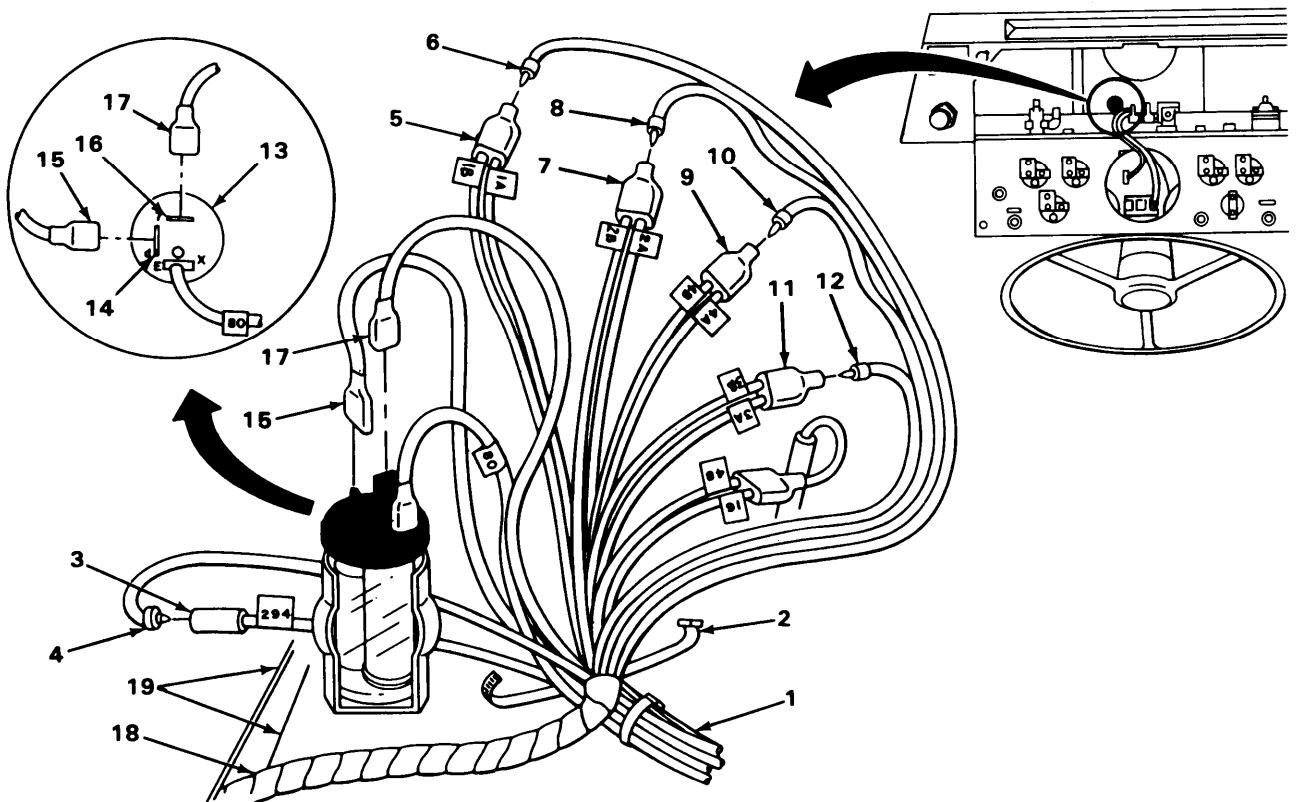
NOTE

Tag wires according to general maintenance instructions (4-1).

- | | | |
|------------------------------|--------------|---|
| 1. Wires (1) | Tie wrap (2) | a. Using cutting pliers, cut.
b. Get rid of. |
| 2. Wire 294
connector (3) | Red wire (4) | Unplug. |

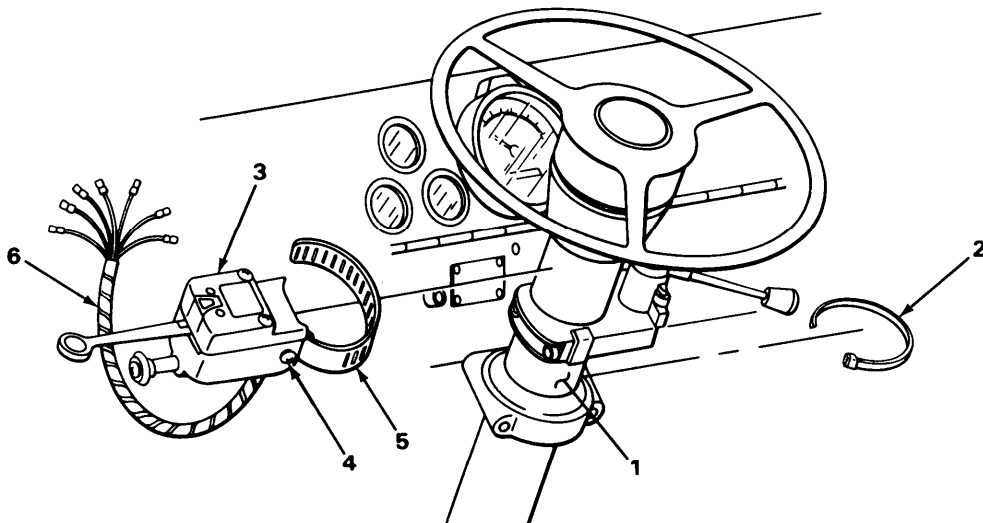
DIRECTIONAL SIGNAL CONTROL - CONTINUED

LOCATION	ITEM	ACTION REMARKS
3. Wire 1A and 1B three way connector (5)	Green wire (6)	Unplug.
4. Wire 2A and 2B three way connector (7)	Yellow wire (8)	Unplug.
5. Wire 4A and 4B three way connector (9)	Brown wire (10)	Unplug.
6. Wire 3A and 3B three way connector (11)	Orange wire (12)	Unplug.
7. Fisher terminal P (14)	Gray wire (15)	Unplug.
8. Terminal L (16)	Black wire (17)	Unplug.
9.	Cable (18)	Push out between brackets (19).



DIRECTIONAL SIGNAL CONTROL - CONTINUED

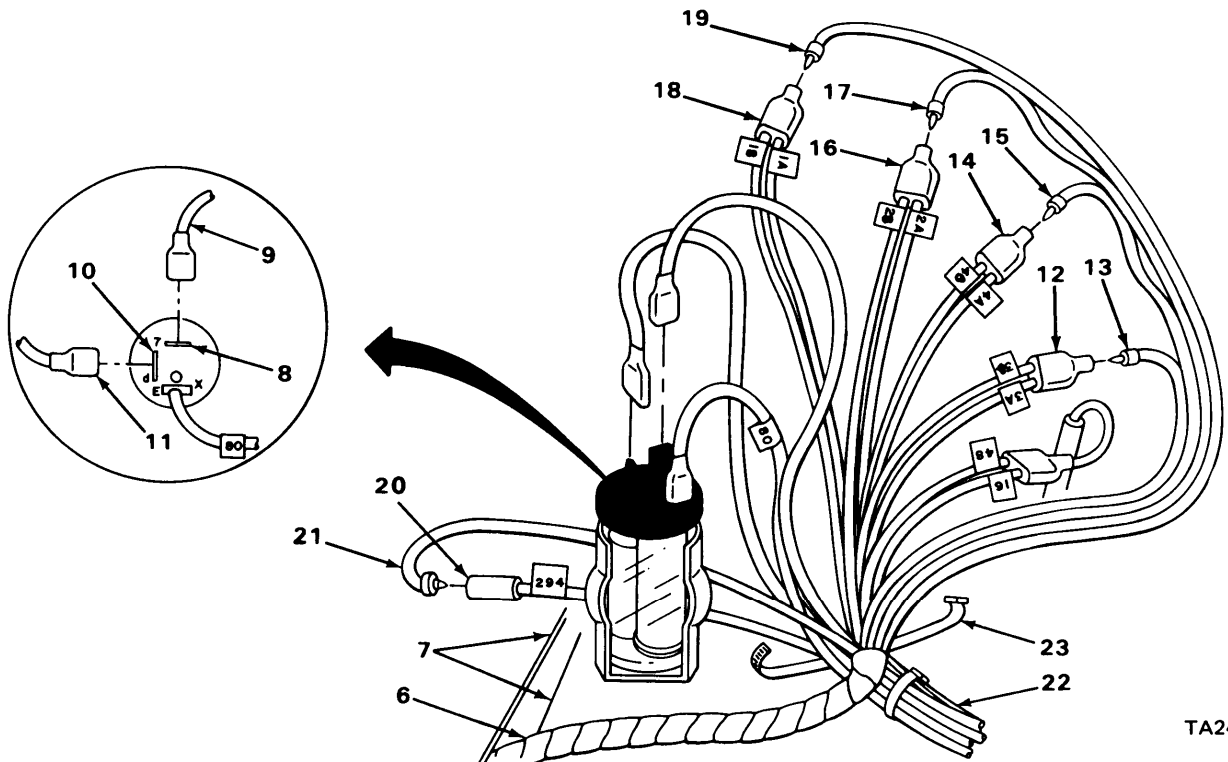
LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
10. Steering column (1)	Tie wrap (2)	a. Using cutting pliers, cut off. b. Get rid of.
11. Directional signal control (3)	Strap screw (4)	Using number 2 screwdriver, unscrew part way.
12.	Strap (5)	Pull out.
13. Steering column (1)	Directional signal control (3)	Take off.
INSTALLATION		
14. Steering column (1)	Directional signal control (3)	Put in position with strap in place.
15. Directional signal control (3)	Strap screw (4)	Using number 2 screwdriver, tighten.
16. Cable (6) to steering column (1)	New tie wrap (2)	Using slip-joint pliers, put on.



TA240010

DIRECTIONAL SIGNAL CONTROL - CONTINUED

LOCATION	ITEM	ACTION REMARKS
17. Two brackets (7)	Cable (6)	Push up between.
18. Flasher terminal L (8)	Black wire (9)	Plug in.
19. Terminal P (10)	Gray wire (11)	Plug in.
20. Wire 3A and 3B three way connector (12)	Orange wire (13)	Plug in.
21. Wire 4A and 4B three way connector (14)	Brown wire (15)	Plug in.
22. Wire 2A and 2B three way connector (16)	Yellow wire (17)	Plug in.
23. Wire 1A and 1B three way connector (18)	Green wire (19)	Plug in.
24. Wire 294 connector (20)	Red wire (21)	Plug in.
25. All wires (22)	New tie wrap (23)	Using slip-joint pliers, put on.



TA240011

DIRECTIONAL SIGNAL CONTROL - CONTINUED

INSTALLATION – CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).
3. Close instrument panel (page 4-244).

TASK ENDS HERE

DIRECTIONAL SIGNAL FLASHER

This task covers:

- a. Removal (page 4-318)
 - b. Installation (page 4-319)
-

INITIAL SETUP

Personel Required

One

Materials/Parts

Tag, marking (item 18, appendix C)

Equipment Condition

Battery ground cable disconnected,
(page 4-444).
instrument panel open (page 4-244).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

CAUTION

Make sure battery ground cable is disconnected before replacing the directional signal flasher to prevent possible damage to electrical system.

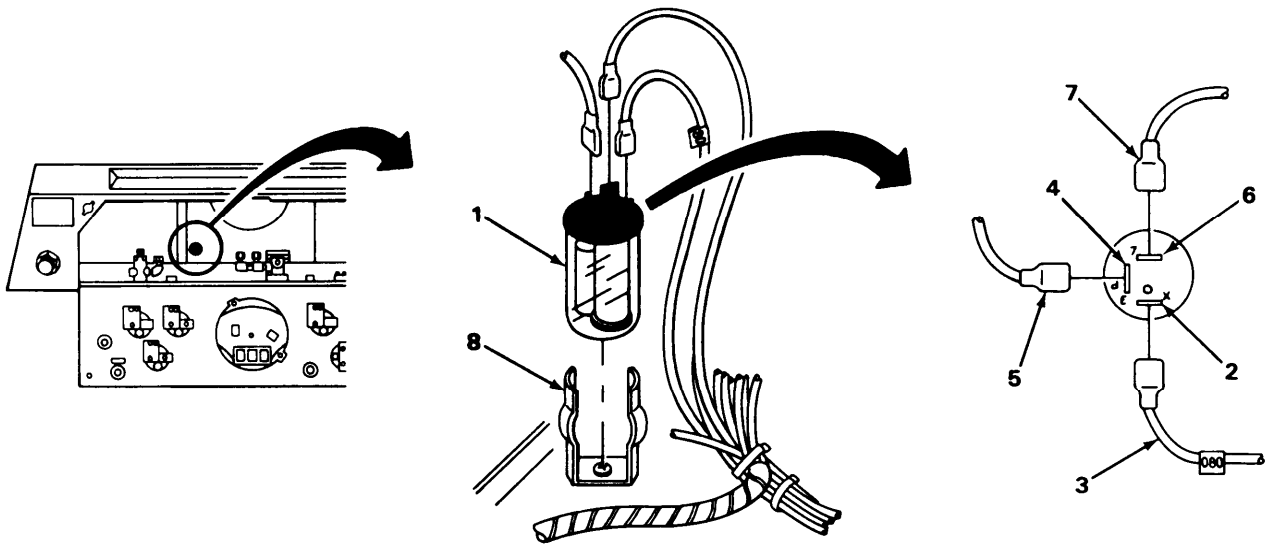
NOTE

Tag wires according to general maintenance instructions (page 4-1).

- | | | |
|----------------------------------|----------------|---------|
| 1. Flasher (1)
Terminal X (2) | Wire 080 (3) | Unplug. |
| 2. Terminal P (4) | Gray wire (5) | Unplug. |
| 3. Terminal L (6) | Black wire (7) | Unplug. |

DIRECTIONAL SIGNAL FLASHER - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
4. Flasher holder (8)	Flasher (1)	Pull out.	
INSTALLATION			
5. Flasher holder (8)	Flasher (1)	Push in.	Flasher does not go all the way to bottom of holder.
6. Terminal L (6)	Black wire (7)	Plug in.	
7. Terminal P (4)	Gray wire (5)	Plug in.	
8. Terminal X (2)	Wire 080 (3)	Plug in.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).
3. Close instrument panel (page 4-244).

TASK ENDS HERE

DIRECTIONAL SIGNAL CONTROL INDICATOR LAMP

This task covers:

- a. Removal (page 4-320)
 - b. Installation (page 4-320)
-

INITIAL SETUP

Tools	Personnel Required
Screwdriver, cross-tip, number 1	One

LOCATION	ITEM	ACTION REMARKS
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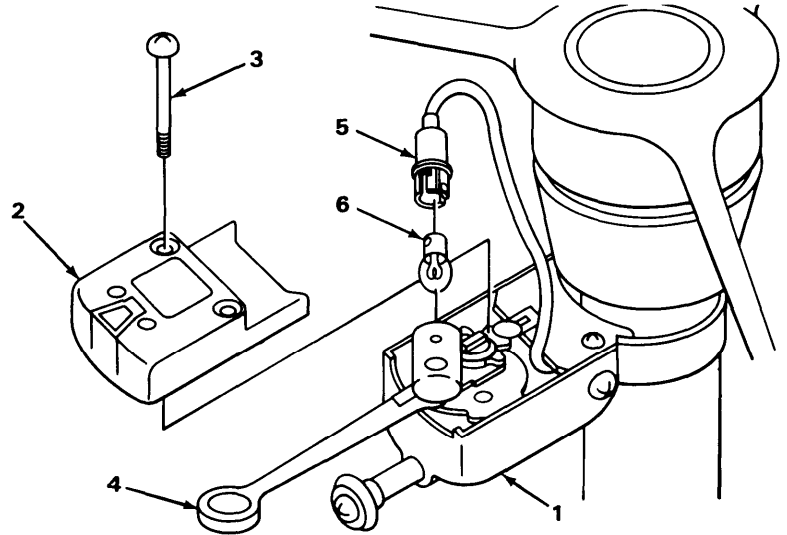
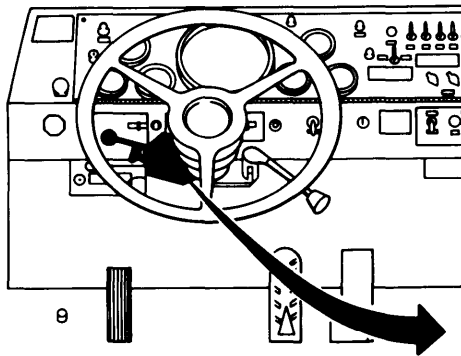
REMOVAL

1. Directional signal control (1) to cover (2)	Two screws (3)	Using screwdriver, unscrew and take out.
2. Directional signal control (1)	Cover (2)	Lift off.
3. Control handle (4)	Lamp holder (5)	Pull out.
4. Lamp holder (5)	Lamp (6)	Push, turn one-quarter turn counterclockwise and take out.

INSTALLATION

5. Lamp holder (5)	Lamp (6)	Push in and turn one-quarter turn clockwise.
6. Control handle (4)	Lamp holder (5)	Push in. Make sure notch in lamp holder lines up with hole in control handle.
7. Directional signal control (1)	Cover (2)	Put on.
8. Directional signal control (1) to cover (2)	Two screws (3)	Screw in and tighten using screwdriver.

DIRECTIONAL SIGNAL CONTROL INDICATOR LAMP - CONTINUED



TASK ENDS HERE

WARNING BUZZER

This task covers:

a. Removal (page 4-321)

b. Installation (page 4-323)

INITIAL SETUP

Tools

Screwdriver, cross-tip, number 2

Personnel Required

One

Materials/Parts

Tag, marking (item 18, appendix C)

Equipment Condition

Battery ground cable disconnected (page 4-444).
Instrument panel open (page 4-244).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

CAUTION

Make sure ignition switch is off before replacing warning buzzer to prevent possible damage to electrical system.

WARNING BUZZER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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REMOVAL - CONTINUED

NOTE

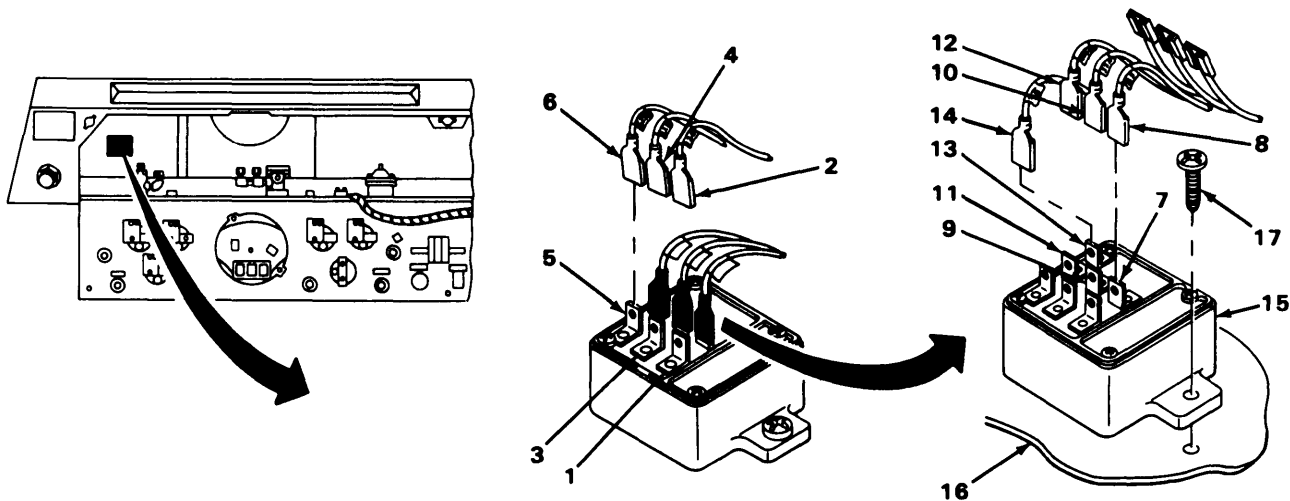
Tag wires according to general maintenance instructions (page 4-1).

1. Terminal (1)	Wire 120 (2)	Pull off.
2. Terminal (3)	Wire 32B (4)	Pull off.
3. Terminal (5)	Wire 525B (6)	Pull off.
4. Terminal (7)	Wire 085 (8)	Pull off.
5. Terminal (9)	Wire 32A (10)	Pull off.
6. Terminal (11)	Wire 525A (12)	Pull off.
7. Terminal (13)	Wire 079 (14)	Pull off.
8. Buzzer (15) to bracket (16)	Two screws (17)	Using cross-tip screwdriver, unscrew and take out.
9. Bracket (16)	Buzzer (15)	Take out.

INSTALLATION

10. Bracket (16)	Buzzer (15)	Put in place.
11. Buzzer (15) to bracket (16)	Two screws (17)	Using cross-tip screwdriver, screw in and tighten.
12. Terminal (13)	Wire 079 (14)	Plug in.
13. Terminal (11)	Wire 525A (12)	Plug in.
14. Terminal (9)	Wire 32A (10)	Plug in.
15. Terminal (7)	Wire 065 (8)	Plug in.
16. Terminal (5)	Wire 525B (6)	Plug in.
17. Terminal (3)	Wire 32B (4)	Plug in.
18. Terminal (1)	Wire 120 (2)	Plug in.

WARNING BUZZER - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).
3. Close instrument panel (page 4-244).

TASK ENDS HERE

DIODE ASSEMBLY

This task covers:

- a. Removal (page 4-324)
- b. Installation (page 4-324)

INITIAL SETUP

Tools

- Pliers, diagonal-cutting
- Pliers, slip-joint, straight-nose
- Screwdriver, flat-tip, 3/8-inch

Personnel Required

One

Equipment Condition

Instrument panel open (page 4-244).

Materials/Parts

- Tag, marking (item 18, appendix C)
- Tie wrap (item 24, appendix C)

DIODE ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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REMOVAL

CAUTION

Make sure ignition switch is off before replacing either diode assembly to prevent possible damage to electrical system.

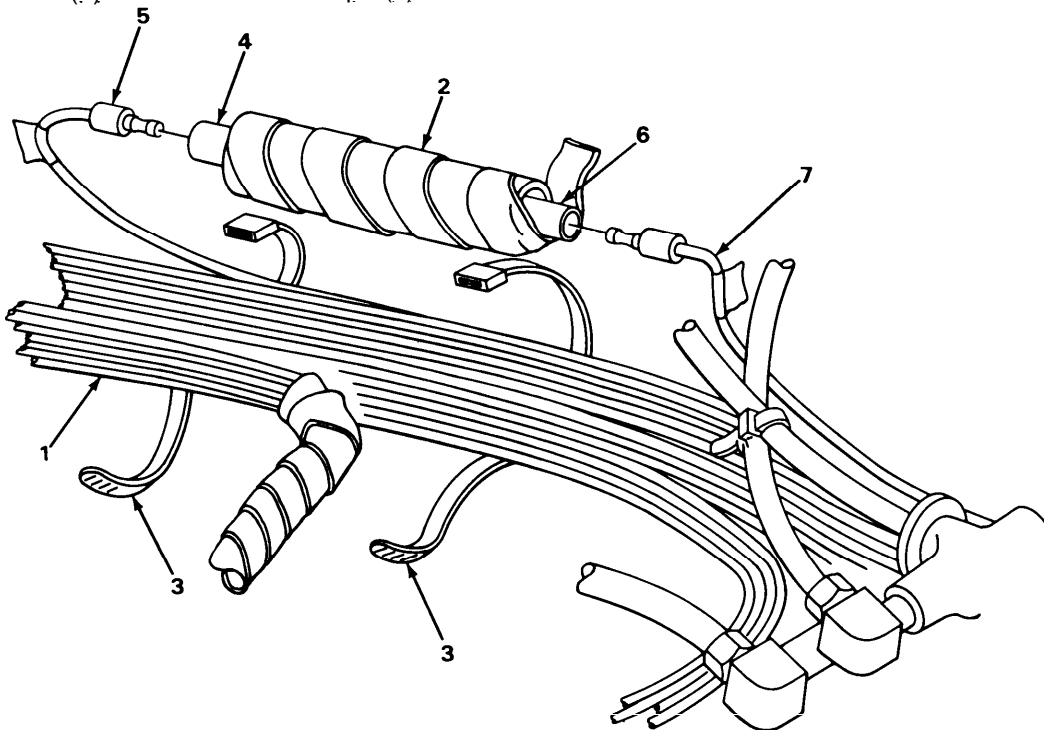
NOTE

Tag wires according to general maintenance instructions (page 4-1).

1. Wire bundles (1) and diode (2)	Two tie wraps (3)	a. Using diagonal-cutting pliers, cut. b. Get rid of.
2. Diode red end (4)	Wire (5)	Unplug.
3. Taped end (6)	Wire (7)	Unplug and take out.

INSTALLATION

4. Taped end (6)	Wire (7)	Plug in.
5. Diode red end (4)	Wire (5)	Plug in.
6. Diode (2) and wire bundles (1)	Two new tie wraps (3)	Using slip-joint pliers, put on.



DIODE ASSEMBLY - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE: Close instrument panel (page 4-244).

TASK ENDS HERE

BACKUP LIGHT ASSEMBLY

This task covers:

- | | |
|-----------------------------|------------------------------|
| a. Removal (page 4-325) | c. Assembly (page 4-327) |
| b. Disassembly (page 4-327) | d. Installation (page 4-328) |
-

INITIAL SETUP

Tools	Materials/Parts
Crimping tool	Lockwasher, backup light to rear cross=
Extension, 12-inch, 3/8-inch drive	member (two required)
Handle, ratchet, 3/8-inch drive	Tag, marking (item 18, appendix C)
Pliers, diagonal-cutting	
Remover, wire, 0.120-inch diameter	Personnel Required
Screwdriver, flat-tip, 1/8-inch	
Socket, deep-well, 7/16-inch,	One
3/8-inch drive	
Wire stripper	

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

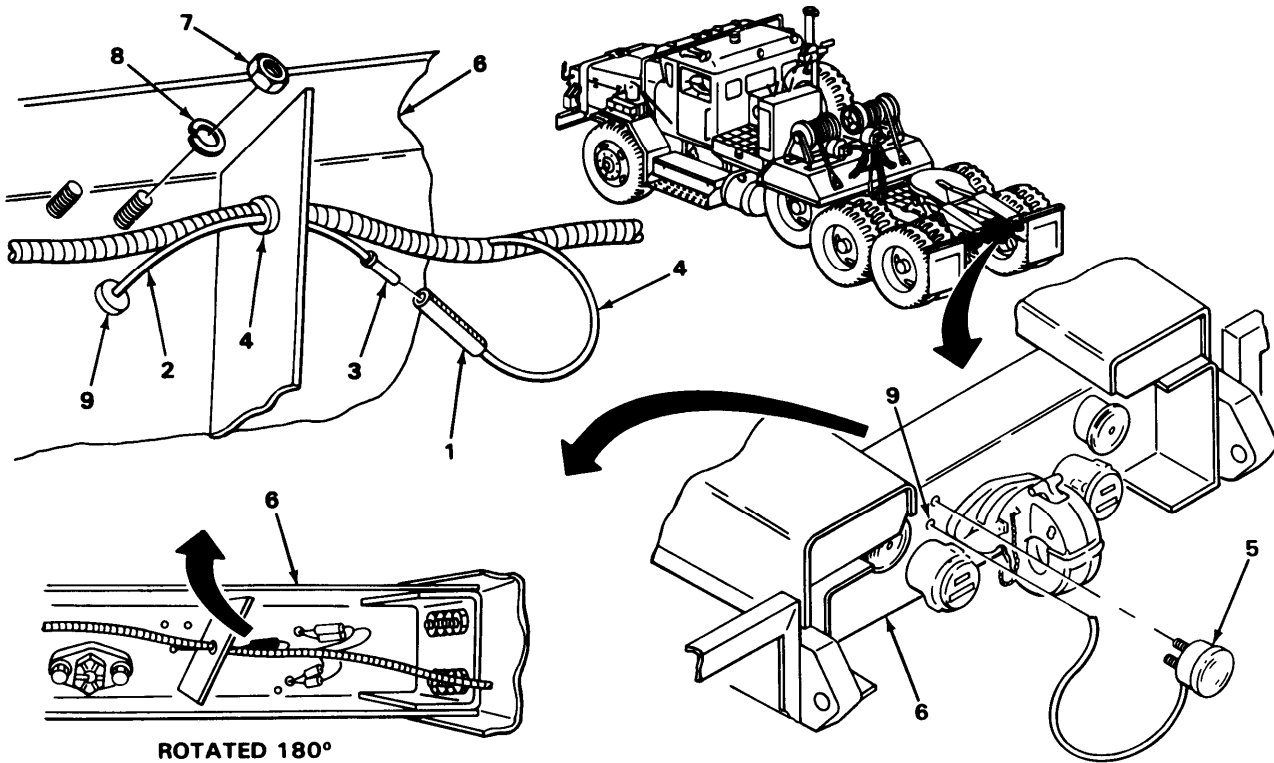
NOTE

It is not necessary to remove backup light assembly to change lamp. To change lamp, go to disassembly.

Tag hoses according to general maintenance instructions (page 4-1).

BACKUP LIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL – CONTINUED		
1. Connector (1)	Lead (2)	Using wire remover, remove pin (3) from connector.
2. Grommet (4)	Lead (2)	Pull out.
3. Backup light (5) to crossmember (6)	Two nuts (7) and lockwashers (8)	a. Using handle, socket, and extension, unscrew and take out. b. Get rid of lockwashers (8).
4. Crossmember (6)	Backup light (5)	Take off.
5. Grommet (9)	Lead (2)	Pull out.



TA240016

BACKUP LIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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DISASSEMBLY

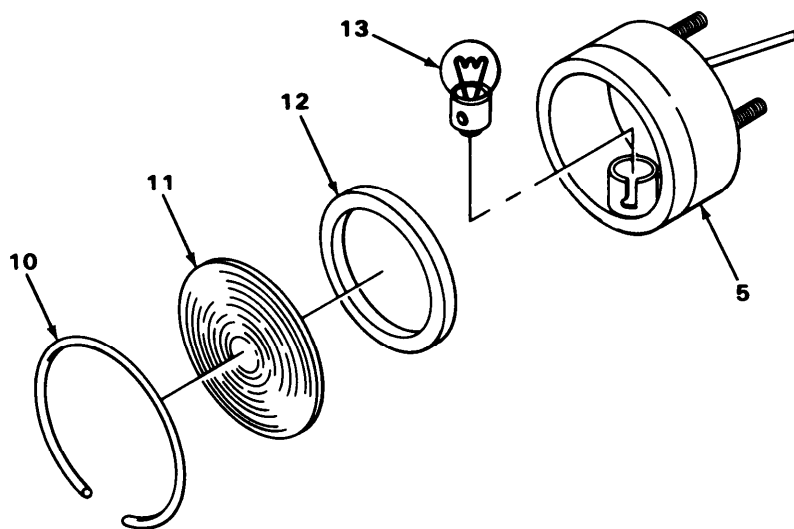
CAUTION

Do not pry against lens to remove snapping. Lens may be broken.

6. Backup light (5)	Snapping (10)	Using screwdriver, pry out.
7.	Lens (11) and socket gasket (12)	Take out.
8.	Lamp (13)	Push down and turn one-quarter turn counterclockwise and take out.

ASSEMBLY

9. Backup light (5)	Lamp (13)	Put in, push down and turn one-quarter turn clockwise.
10.	Gasket (12) and lens (11)	Put in.
11.	Snapping (10)	Push into place.



BACKUP LIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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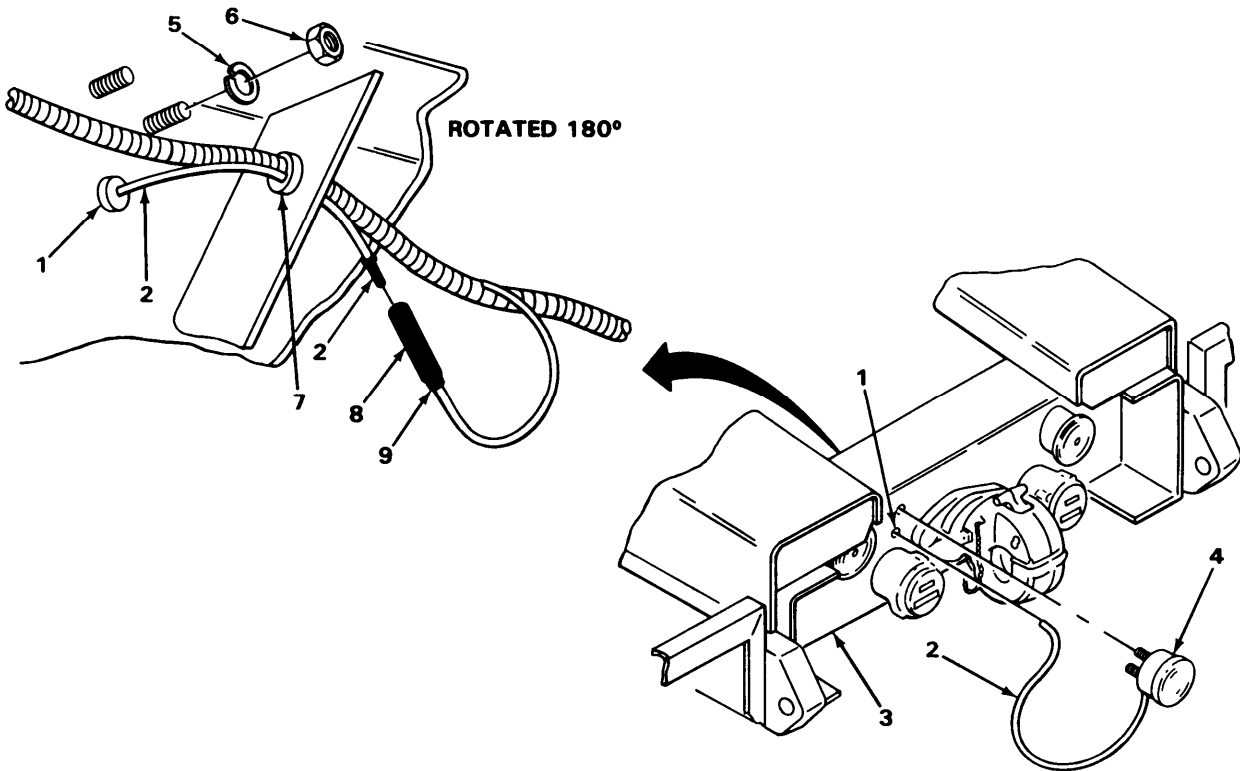
ASSEMBLY – CONTINUED

NOTE

If wire or connector repair is necessary, see general maintenance instructions (page 4-1).

INSTALLATION

- | | | | |
|-----|-------------------------------------|--------------------------------------|---|
| 12. | Grommet (1) | Lead (2) | Push through. |
| 13. | Crossmember (3) | Backup light (4) | Put in place. |
| 14. | Backup light (4) to crossmember (3) | Two new lockwashers (5) and nuts (6) | Screw on and tighten using socket, extension, and handle. |
| 15. | Grommet (7) | Lead (2) | Push through. |
| 16. | Connector (8) | Lead (2) | Push pin (9) in until locked. |



TA240018

BACKUP LIGHT ASSEMBLY - CONTINUED**NOTE**

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE**DOME LIGHT**

This task covers:

- a. Removal (page 4-330)
 - b. Installation (page 4430)
-

INITIAL SETUP**Tools**

Crimping tool
Pliers, diagonal-cutting
Screwdriver, cross-tip, number 2
Screwdriver, fiat-tip, 1/8-inch
Wire stripper

Materials/Parts

Cement, rubber (item 3, appendix C)
Crimp connector, dome light lead to wire
Gasket

Personnel Required

One

DOMELIGHT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL		
1. Rim (1) to bowl (2)	Two screws (3)	Using flat-tip screwdriver, unscrew and take out.
2. Bowl (2)	Rim (1) and lens (4)	Take off.
3.	Lamp (5)	Push, turn one-quarter turn counter-clockwise and take out lamp.
4.	Gasket (6)	a. Take off. b. Get rid of.
5. Bowl (2) to inner roof panel (7)	Four screws (8)	Using cross-tip screwdriver, unscrew and take out.
6. Inner roof panel (7)	Bowl (2)	Pull out part way.
7. Crimp connector (9)	Wire (10)	Using diagonal-cutting pliers, cut at end nearest panel (7).
8.	Lead (11)	a. Using diagonal-cutting pliers, cut. b. Get rid of connector (11).

INSTALLATION

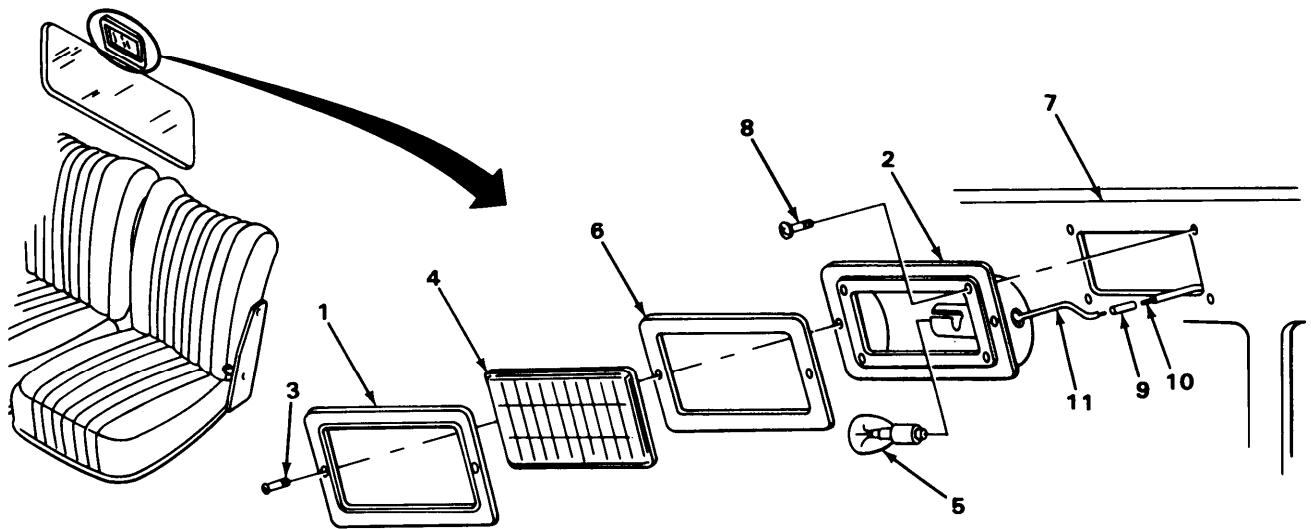
NOTE

For wire and connector repair, see general maintenance instructions (page 4-1).

9. Lead (11)	Connector (9)	Put on.
10. Connector (9)	Wire (10)	Put in.
11.	Connector (9)	Using crimping tool, crimp.

DOME LIGHT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
12. Inner roof panel (7')	Light bowl (2)	Put in.	
13. Light bowl (2) to roof panel (7)	Four screws (8)	Using cross-tip screwdriver, screw in and tighten.	
<u>WARNING</u>			
<p>Rubber cement and its fumes burn easily. Do not smoke or have open flame nearby while using. Use in well-ventilated area. Failure to observe these precautions can cause serious burns to personnel.</p>			
14. Light bowl (2)	Gasket (6)	a. Apply small amount of rubber cement on bowl side. b. Press in.	
15.	Lamp (5)	Push in and turn one-quarter turn clockwise.	
16. Rim (1)	Lens (4)	Put together.	
17. Light bowl (2)	Lens (4) and rim (1)	Put on.	
18. Rim (1) to bowl (2)	Two screws (3)	Screw in and tighten with fiat-tip screw-driver.	



TA240019

DOME LIGHT - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

WORK LIGHT

This task covers:

- | | |
|-----------------------------|------------------------------|
| a. Removal (page 4-333) | d. installation (page 4-338) |
| b. Disassembly (page 4-334) | e. Alinement (page 4-340) |
| c. Assembly (page 4-338) | |
-

INITIAL SETUP

Tools

Crimping tool
Extension, 5-inch, 3/8-inch drive
Handle, ratchet, 3/8-inch drive
Pliers, diagonal-cutting
Pliers, long round-nose
Screwdriver, cross-tip, number 2
Screwdriver, fiat-tip, 3/8-inch
Screwdriver, fiat-tip, 5/8-inch
Socket, 9/18-inch, 3/8-inch drive
Wire stripper
Wrench, box, 9/18-inch
Wrench, open-end, 1/2-inch

Materials/Parts

Crimp connector, work light lens to wire
Lockwasher, ring retaining screw
(two required)
Lockwasher, ground wire to bracket
Lockwasher, swivel to brackets
Self locking nut, swivel to lamp bracket
Tag, marking (item 18, appendix C)

Personnel Required

One

WORK LIGHT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

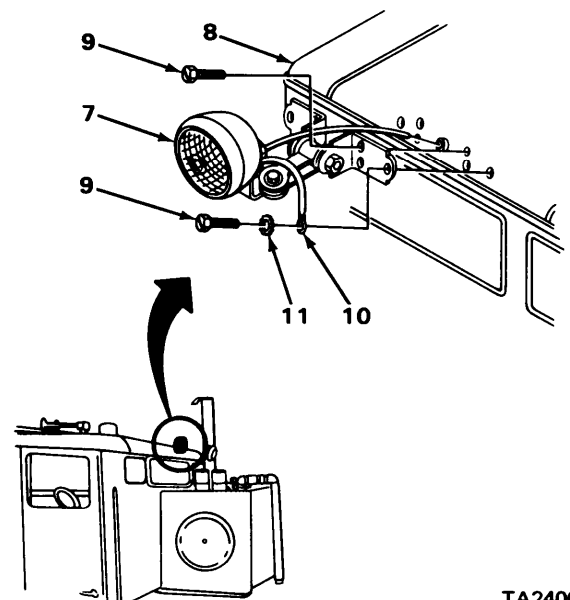
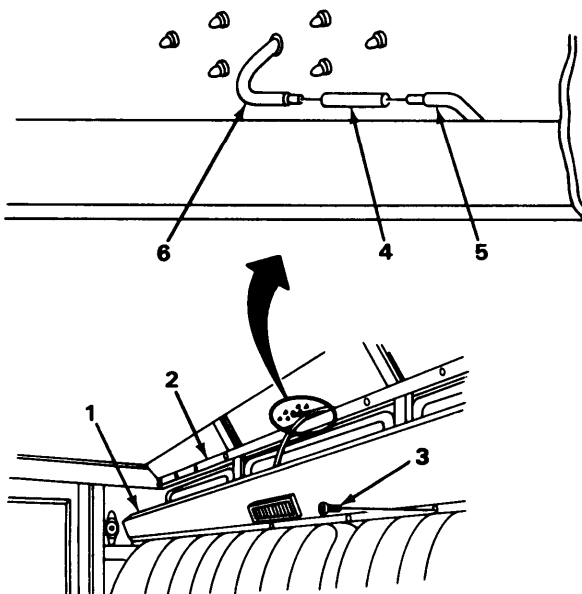
NOTE

The steps in this task apply to both the left and right work lights. The left work light is shown as an example.

To change work light lamp, do only steps 9 thru 14 and 23 thru 29. It is not necessary to remove work light to change lamp.

Tag wires according to general maintenance instructions (page 4-1).

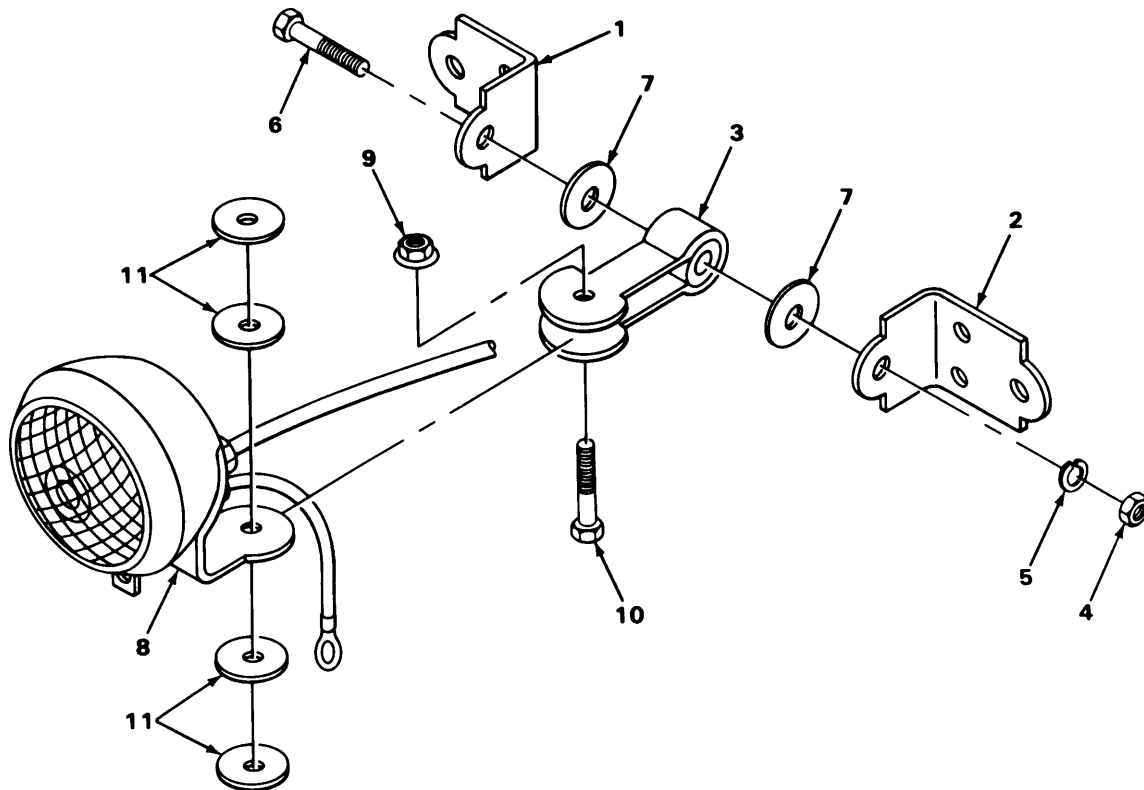
- | | | | |
|----|---|---|--|
| 1. | Cab, rear inner roof panel (1) to cab (2) | Seven screws (3) | Using cross-tip screwdriver, unscrew and take out. |
| 2. | Rear inner roof panel (1) | Rear inner roof panel (1) | Lower and rest on tops of seatback. |
| 3. | Crimp connector (4) | Wire (5) and lead (6) | a. Using diagonal-cutting pliers, cut at connector (4) and take out.
b. Get rid of connector (4). |
| 4. | Work light (7) to cab roof (8) | Six screws (9), ground lead (10), and lockwasher (11) | a. Using 5/8-inch flat-tip screwdriver, unscrew and take out.
b. Get rid of lockwasher (11). |
| 5. | Cab roof (8) | Work light (7) | Take off. |



TA240020

WORK LIGHT - CONTINUED

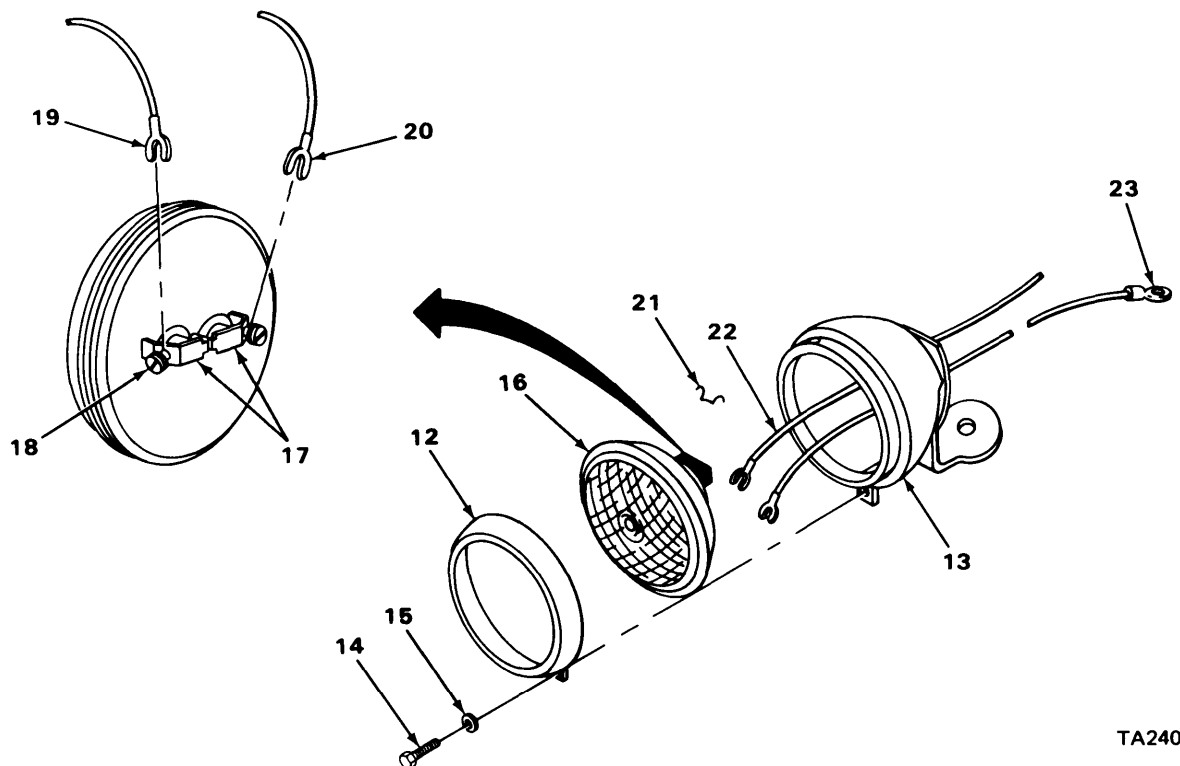
LOCATION	ITEM	ACTION REMARKS
DISASSEMBLY		
6. Two mounting brackets (1) and (2) and swivel (3)	Nut (4), lockwasher (5), and bolt (6)	a. Using 9/16-inch wrench, 9/16 socket, extension and handle, unscrew and take off. b. Get rid of lockwasher (5).
7. Bolt (6)	Two mounting brackets (1) and (2), two fiber washers (7), and swivel (3)	Take off.
8. Bowl bracket (8) to swivel (3)	Self-locking nut (9) and screw (10)	a. Using 9/16-inch wrench, 9/16-inch socket, extension and handle, unscrew and take out. b. Get rid of self-locking nut (9).
9. Swivel (3)	Bowl bracket (8) and four fiber washers (11)	Take out.



TA240021

WORK LIGHT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
10. Ring (12) to bowl (13)	Screw (14) and lock-washer (15)	a. Using 3/8-inch screwdriver, unscrew and take out. b. Get rid of lockwasher (15).
11. Bowl (13)	Ring (12)	Lift off.
12. Lamp (16) terminals (17)	Two terminal screws (18)	Using 3/8-inch screwdriver, unscrew part way.
13.	Ground lead (19) and power lead (20)	Pull off.
14. Lamp (16) to ring (12)	Four lamp retainer springs (21)	Using long-nose pliers, push in one leg of spring far enough to clear edge of ring (12) and take out.
15. Ring (12)	Lamp (16)	Take out.
16. Bowl (13)	Lead (22)	Pull out through lamp side.
17. Ground lead (19)	Ring terminal (23)	a. Using diagonal-cutting pliers, cut lead (22) to take off ring terminal (23). b. Get rid of ring terminal (23).



TA240022

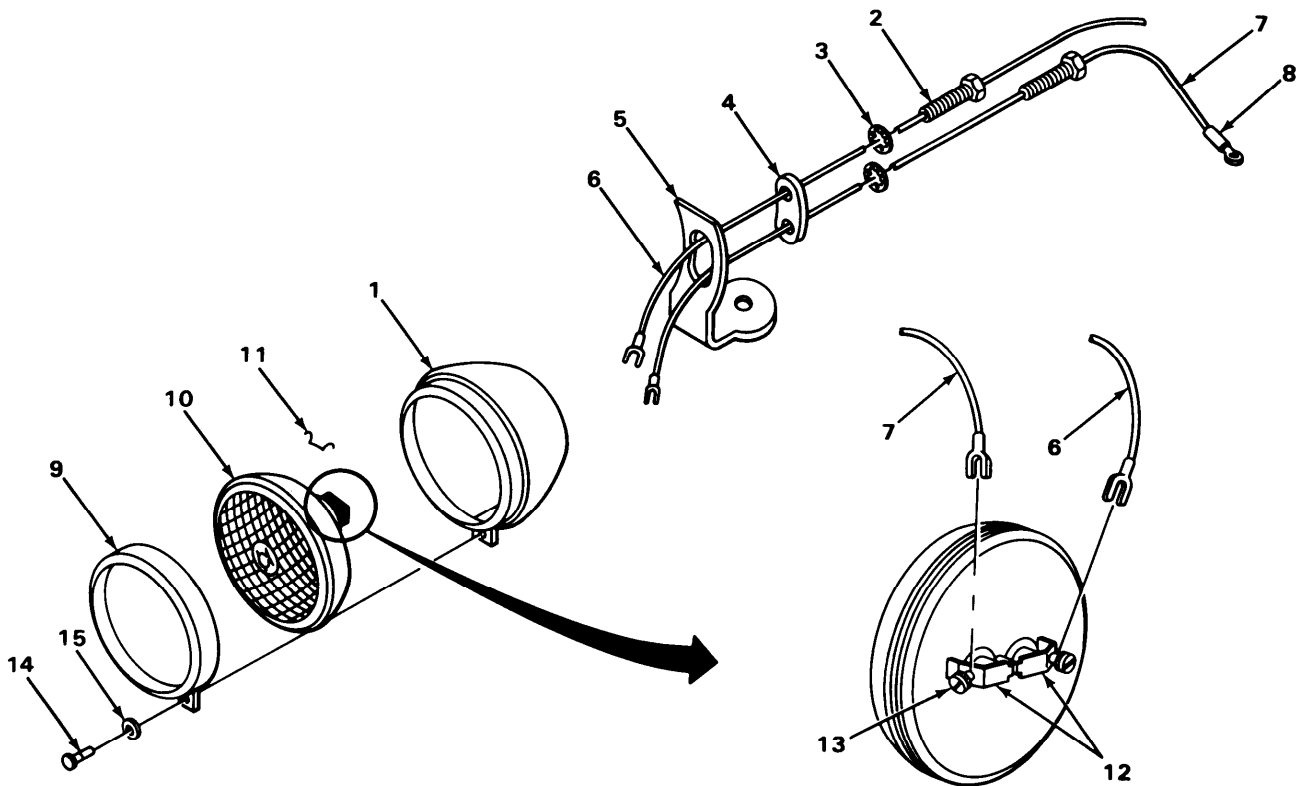
WORK LIGHT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
DISASSEMBLY - CONTINUED		
18. Bowl (1)	Two hollow bolts (2), two lock-washers (3), friction plate (4), and bowl bracket (5)	a. Using 1/2-inch open-end wrench, unscrew and take off. b. Get rid of lockwashers (3).
ASSEMBLY		
19. Bowl (1)	Bowl bracket (5) and friction plate (4)	Put in place.
20. Bowl bracket (5) and friction plate (4) to bowl (1)	Two hollow bolts (2) and new lock-washers (3)	Screw in and tighten using 1/2-inch open-end wrench.
21. Hollow bolt (2)	Lead (6)	Put through and pull out all but about 3 inches (76 millimeters).
22.	Ground lead (7)	Pull through and pull out all but about 3 inches (76 millimeters).
23. Ground lead (7)	New ring terminal (8)	Using crimping tool pliers, crimp on.
24. Ring (9)	Lamp (10)	Put in.
25. Lamp (10) to ring (9)	Four retainer springs (11)	Using long round-nose pliers, put in.
26. Terminals (12)	Ground lead (7) and lead (6)	Put on.
27.	Terminal screws (13)	Using 3/6-inch screwdriver, tighten.

WORK LIGHT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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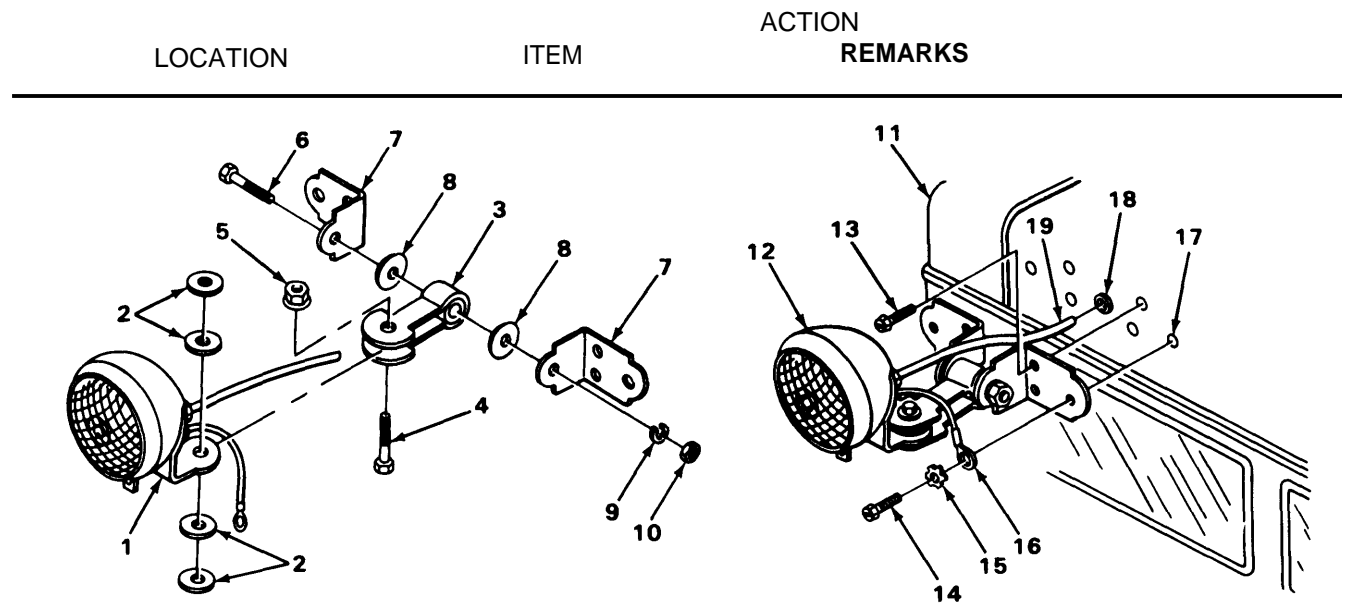
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|--------------------------|------------------------------------|---|
| 28. Bowl (1) | Ring (9) | Hook on top of bowl (1) and close. |
| 29. Ring (9) to bowl (1) | Screw (14) and new lockwasher (15) | Screw in and tighten using 3/8-inch flat-tip screwdriver. |



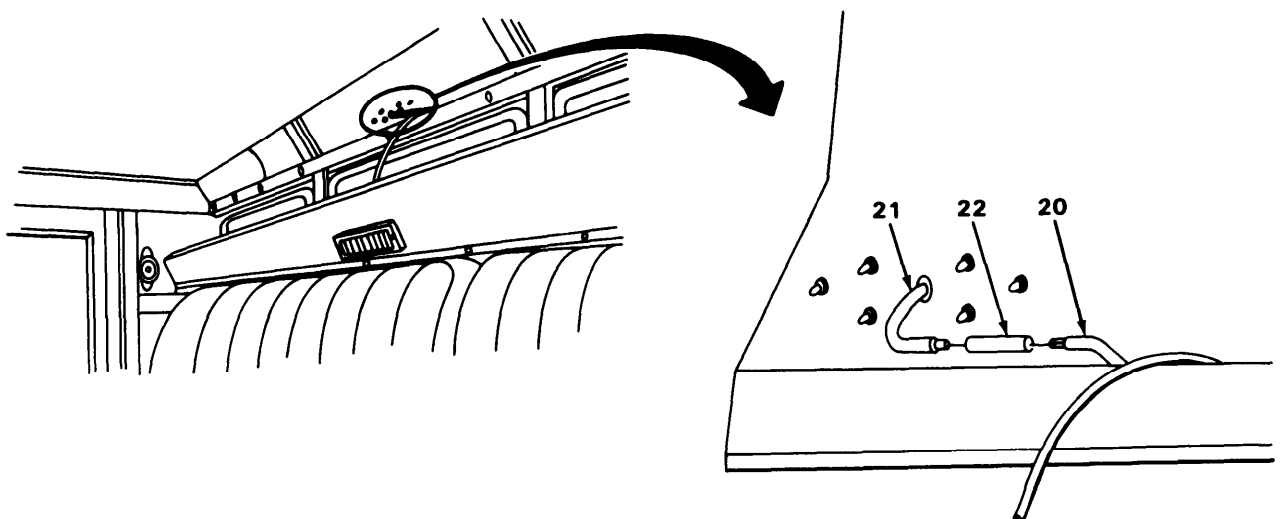
WORK LIGHT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ASSEMBLY - CONTINUED		
30. Bowl bracket (1)	Four fiber washers (2)	Put in place.
31. Swivel (3)	Bowl bracket (1) and four fiber washers (2)	Slide in.
32. Bowl bracket (1) to swivel (3)	Bolt (4) and new self-locking nut (5)	Screw on and tighten using 9/16-inch wrench and socket, handle and extension.
33. Bolt (6)	Two mounting brackets (7'), two fiber washers (8), swivel (3), and new lock-washer (9)	Put on.
34.	Nut (10)	Screw on and tighten using 9/16-inch wrench and socket, extension and handle.
INSTALLATION		
35. Cab (11)	Work light assembly (12)	Place in position.
36. Work light assembly (12) to cab (11)	Five screws (13)	Screw in and tighten using 5/8-inch flat-tip screwdriver.
37. Screw (14)	New lockwasher (15) and ground lead (16)	Put on.
38. Work light assembly (12) to cab (11), remaining hole (17)	Screw (14)	Screw in and tighten using 5/8-inch flat-tip screwdriver.
39. Grommet (18)	Lead (19)	Push through.

WORK LIGHT - CONTINUED



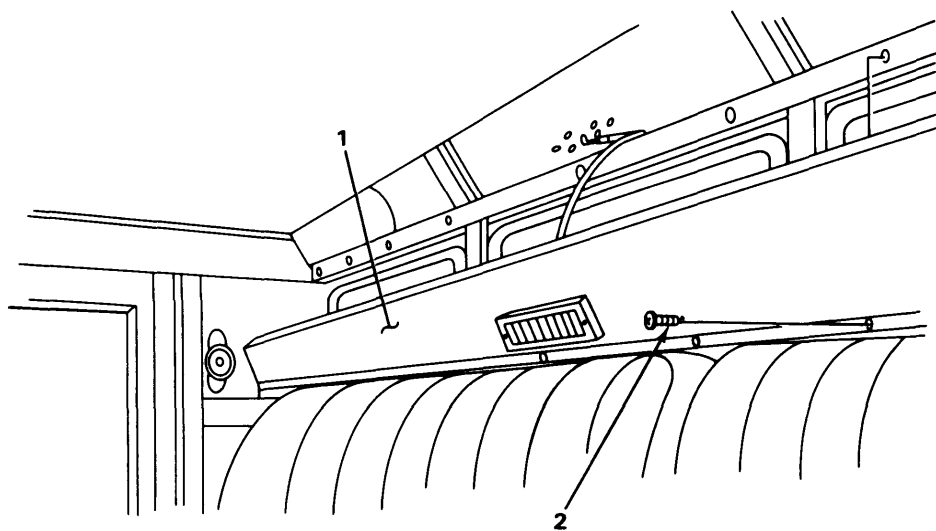
- | | | |
|----------------------------|-------------------------|--------------------------------|
| 40. | Wire (20) and lead (21) | Repair (page 4-1). |
| 41. Wire (20) | Crimp connector (22) | Put on. |
| 42. Crimp connector (22) | Lead (21) | Put in. |
| 43. Wire (20) to lead (21) | Crimp connector (22) | Using crimping tool, crimp on. |



TA240024

WORK LIGHT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION – CONTINUED			
44. Cab	Rear inner roof panel (1)	Put in place.	
45. Rear inner roof panel (1) to cab	Seven screws (2)	Using number two cross-tip screwdriver, screw in and tighten.	

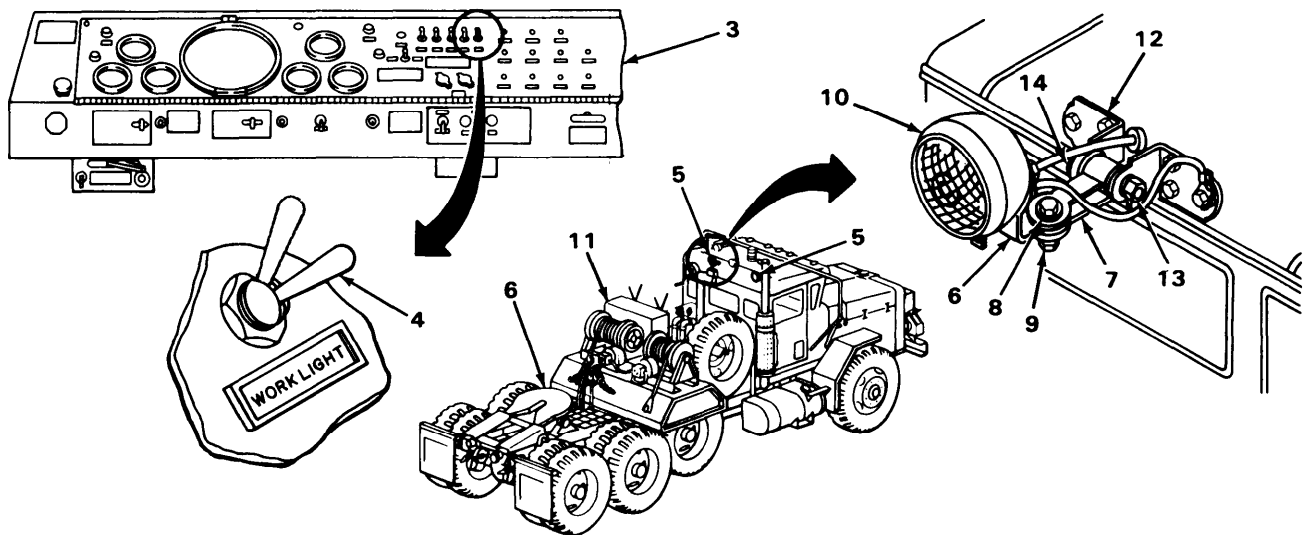


ALINEMENT

46. instrument panel (3)	Work light switch (4)	Turn on.	
47. Left work light (5), bowl bracket (6) to swivel (7)	Self-locking nut (8) and bolt (9)	Using 9/16-inch wrench, socket, extension, and handle, unscrew part way, then tighten just enough so there is drag on bracket (6).	
48.	Bowl (10)	Turn right and left until light shines on winch instrument panel (11).	

WORK LIGHT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
49. Bowl bracket (6) to swivel (7)	Self-locking nut (8) and bolt (9)	Using 9/16-inch wrench, socket, extension, and handle, tighten.
50. Swivel (7) to mounting brackets (12)	Nut (13) and bolt (14)	Using 9/16-inch wrench, socket, extension, and handle, unscrew part way then tighten just enough so there is drag on swivel (7).
51.	Bowl (10)	Turn up and down until light shines on winch instrument panel (11).
52. Swivel (7) to mounting brackets (12)	Nut (13) and bolt (14)	Using 9/16-inch wrench, socket, extension, and handle, tighten.
53. Instrument panel (3)	Work light switch (4)	Turn off.



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

CLEARANCE LIGHTS

This task covers:

- a. Removal (page 4-342)
 - b. Installation (page 4-344)
-

INITIAL SETUP

Tools

Crimping tool
 Pliers, diagonal-cutting
 Screwdriver, cross-tip, number three
 Screwdriver, cross-tip, number two
 Wire stripper
 Wrench, box, 7/16-inch

Materials/Parts

Crimp connector, clearance light lead
 Gasket
 Gasket, lens
 Gasket cement, silicone (item 2, appendix C)
 Tag, marking (item 18, appendix C)

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

Steps in this task are the same for all five clearance lights. Far left clearance light is shown.

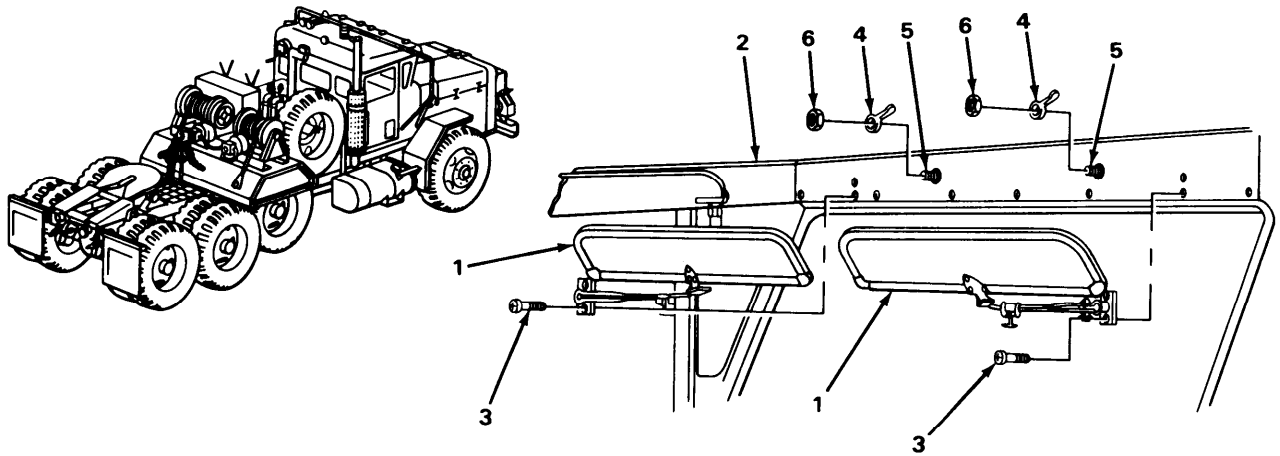
To change clearance light lamp do steps 7 thru 9 and 23 thru 25. It is not necessary to remove work light to change lamp.

Tag hoses according to general maintenance instructions (page 4-1).

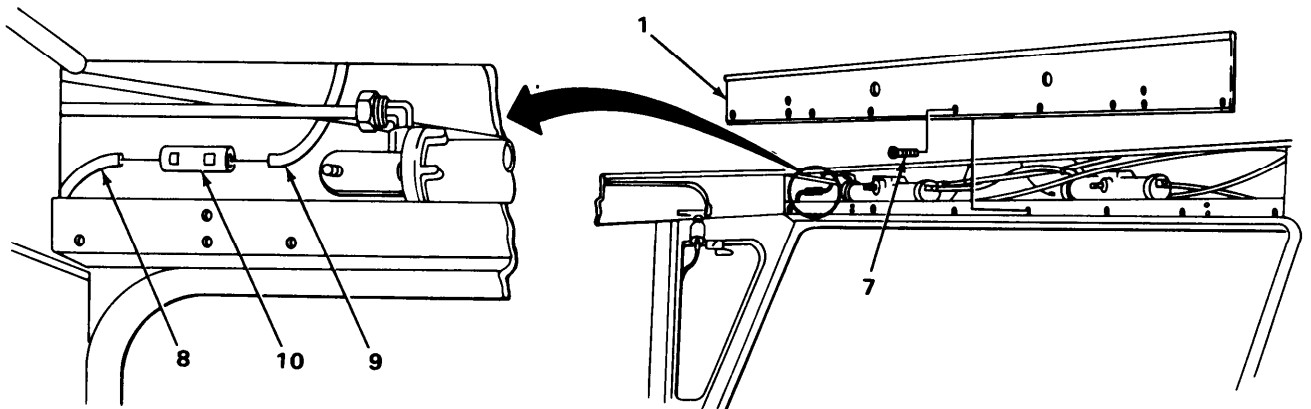
- | | | |
|--|---|---|
| 1. Two sunvisor assemblies (1) to front inner roof panel (2) | Four screws (3) and two sunvisor assemblies (1) | Using number three cross-tip screwdriver, unscrew and take off. |
| 2. Two windshield wiper handles (4) to wiper motors (5) | Two nuts (6) | Using wrench, unscrew and take off. |
| 3. Wiper motors (5) | Two handles (4) | Take off. |

CLEARANCE LIGHTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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- | | | |
|--------------------------------------|----------------------------|--|
| 4. Front inner roof panel (2) to cab | Seven screws (7) | Using number two cross-tip screwdriver, unscrew and take out. |
| 5. | Front inner roof panel (2) | Take out. |
| 6. Wire 012 (8) to lead (9) | Crimp connector (10) | a. Using pliers, cut wire (8) and lead (9) on both sides of connector (10).
b. Get rid of connector (10). |

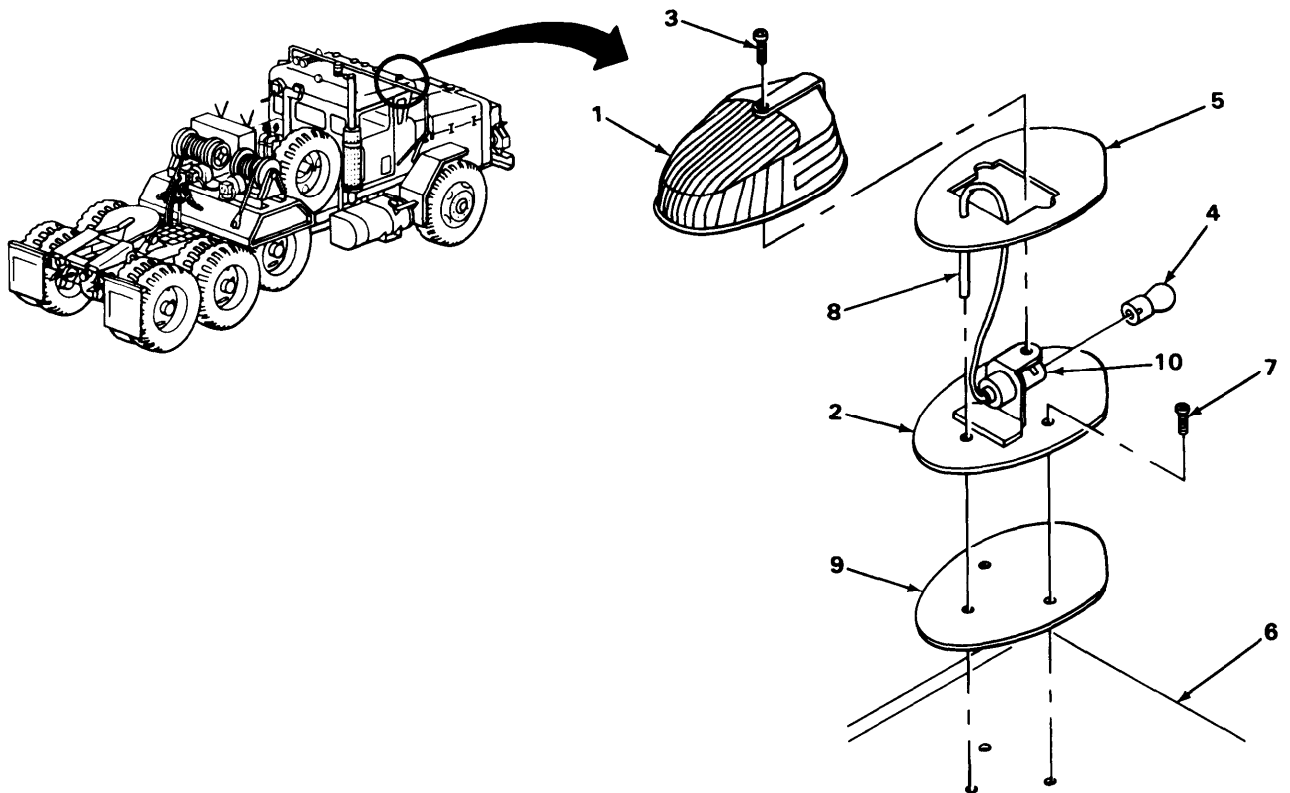


CLEARANCE LIGHTS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL – CONTINUED		
7. Lens (1) to pedestal (2)	Screw (3)	Using number two cross-tip screwdriver, unscrew and take out.
8. Pedestal (2)	Lens (1)	Take off.
9.	Lamp (4)	Push on lamp and turn one-quarter turn counterclockwise and take out.
10.	Lens gasket (5)	Lift.
11. Pedestal (2) to cab roof (6)	Two screws (7)	Using number two cross-tip screwdriver, unscrew and take out.
12. Cab roof (6)	Pedestal (2)	Take off, pulling out lead (8) with pedestal (2).
13.	Gasket (9)	a. Peel off. b. Get rid of.
14. Pedestal (2)	Lead (8)	Pull up and out through base.
15.	Lens gasket (5)	a. Take off. b. Get rid of.
INSTALLATION		
16. Pedestal (2)	New lens gasket (5)	Put on.
17.	Lead (8)	Thread through hole.
18. Cab roof (6)	New gasket (9)	Using small amount of silicone gasket cement, glue in place.

CLEARANCE LIGHTS - CONTINUED

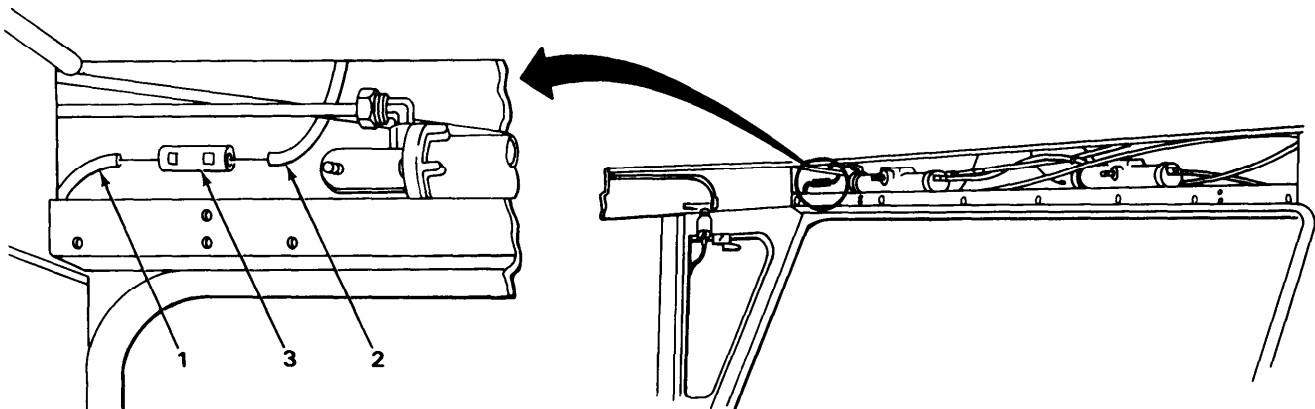
LOCATION	ITEM	ACTION REMARKS
19.	Lead (8)	Thread through hole.
20.	Pedestal (2)	Put in place.
21. Pedestal (2) to cab roof (6)	Two screws (7)	a. Coat screws with silicone gasket cement. b. Screw in and tighten using number two cross-tip screwdriver.
22. Pedestal (2) to lamp holder (10)	Lamp (4)	Push in and turn one-quarter turn clockwise.
23. Pedestal (2)	Lens (1)	Put on.
24. Lens (1) to pedestal (2)	Screw (3)	Screw in and tighten using number two cross-tip screwdriver.



TA240028

CLEARANCE LIGHTS - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
25.	Wire 012 (1) and lead (2)	Using wire stripper, strip off 3/16-inch (4.77 millimeter) insulation.	
26. Wire 012 (1)	New crimp connector (3)	Put on.	
27. Crimp connector (3)	L e a d (2)	Put in.	
28.	Crimp connector (3)	Using crimping tool, crimp on.	

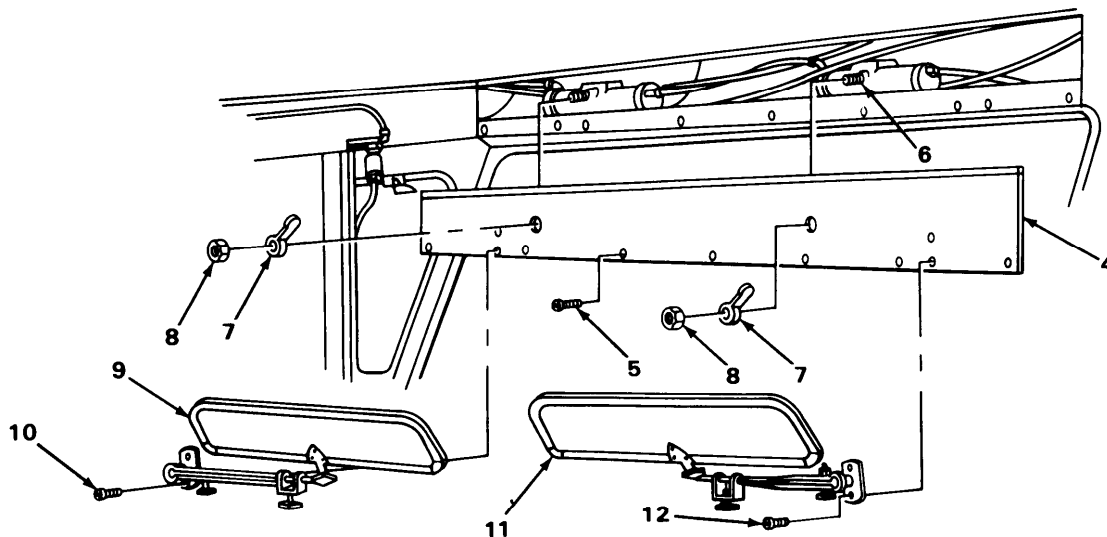


29. Cab	Front inner roof panel (4)	Put in place.	
30. Front inner roof panel (4) to cab	Seven screws (5)	Screw in and tighten using number two cross-tip screwdriver.	
31. Two wiper motors (6)	Two wiper handles (7)	Put on.	

TA240029

CLEARANCE LIGHTS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
32. Wiper handles (7) to wiper motors (6)	Two nuts (8)	Screw on and tighten using wrench.
33. Front inner roof panel (4)	Left sunvisor assembly (9)	Put in place.
34. Left sunvisor assembly (9) to front inner roof panel (4)	Two screws (10)	Using number three cross-tip screwdriver, screw in and tighten.
35. Front inner roof panel (4)	Right sunvisor assembly (11)	Put in place.
36. Right sunvisor assembly (11) to front inner roof panel (4)	Two screws (12)	Using number three cross-tip screwdriver, screw in and tighten.



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

HEADLIGHT ASSEMBLY

This task covers:

- a. Removal (page 4-348)
 - b. Disassembly (page 4-352)
 - c. Assembly (page 4-352)
 - d. Installation (page 4-354)
 - e. Alinement (page 4-357)
-

INITIAL SETUP

Tools

- Handle, ratchet, 3/8-inch drive
- Knife, pocket
- Remover, wire, 0, 120-inch diameter
- Screwdriver, cross-tip, number 2
- Socket, 1/2-inch, 3/8-inch drive
- Socket, deep-well, 11/16-inch, 3/8-inch drive
- Square, combination
- Tape measure
- Wrench, open-end, 1/2-inch

Materials/Parts

- Chalk
- Deutsch connector assembly (two required)

Materials/Parts – Continued

- Lockwasher, ground strap to grille guard (two required)
- Lockwasher, ground strap to headlight bracket (two required)
- Lockwasher, headlamp bowl to bracket
- Lockwasher, headlamp bracket to rubber mounts (four required)
- Lockwashers, rubber mounts to grille guard (three required)
- String (item 17, appendix C)
- Tag, marking (item 18, appendix C)
- Tape, electrical (item 20, appendix C)

Personnel Required

Three

LOCATION	ITEM	ACTION	REMARKS
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NOTE

To change lamp go to disassembly. It is not necessary to remove headlight assembly to change lamp.

REMOVAL

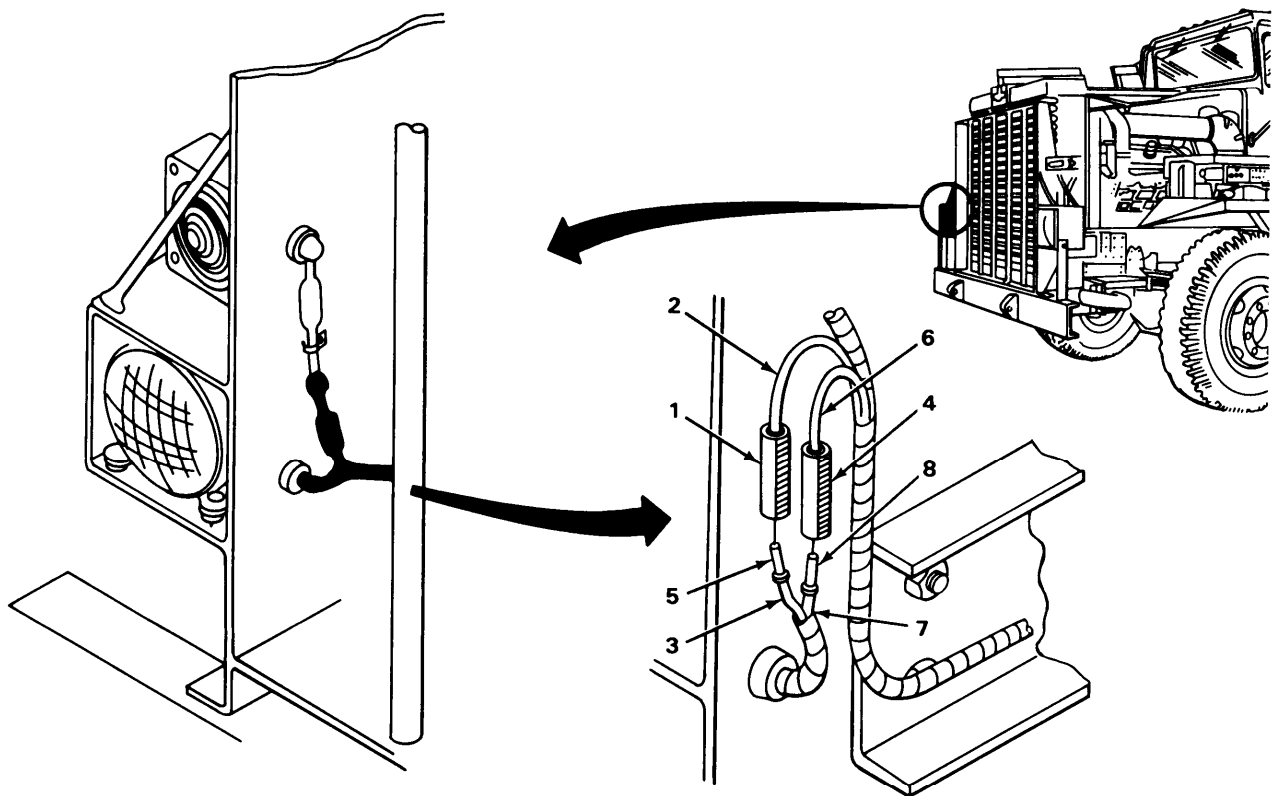
NOTE

The steps in this task are the same for both the right and the left headlight assemblies. The right headlight assembly is shown.

Tag wires according to general maintenance instructions (page 4-1).

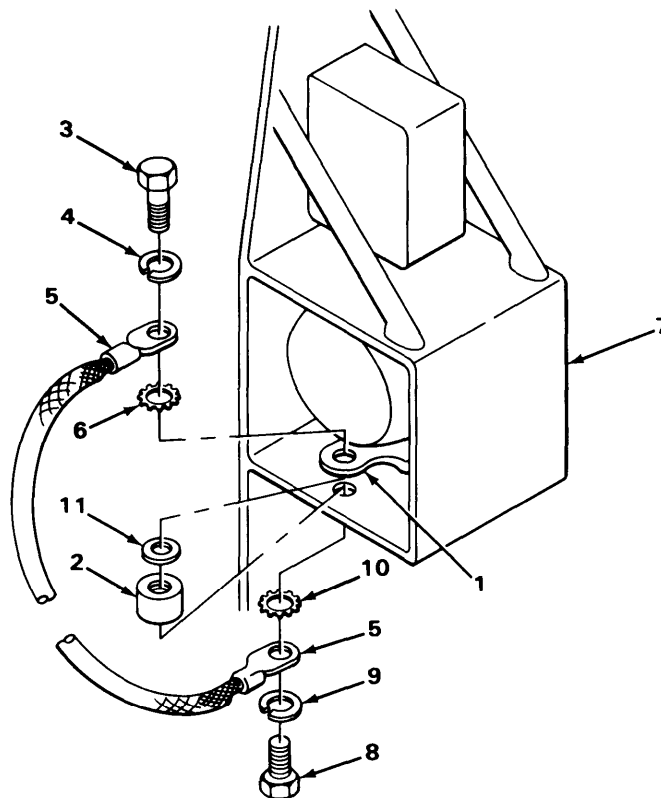
HEADLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
1. Connector (1) on wire 007 (2)	Yellow wire (3)	a. Using pocket knife, cut tape enough to expose connectors (1) and (4). b. Push remover into connector (1) and pull out pin (5).
2. Connector (4) on wire 006 (6)	Red wire (7)	Push remover into connector (4) and pull out pin (8).



HEADLIGHT ASSEMBLY - CONTINUED

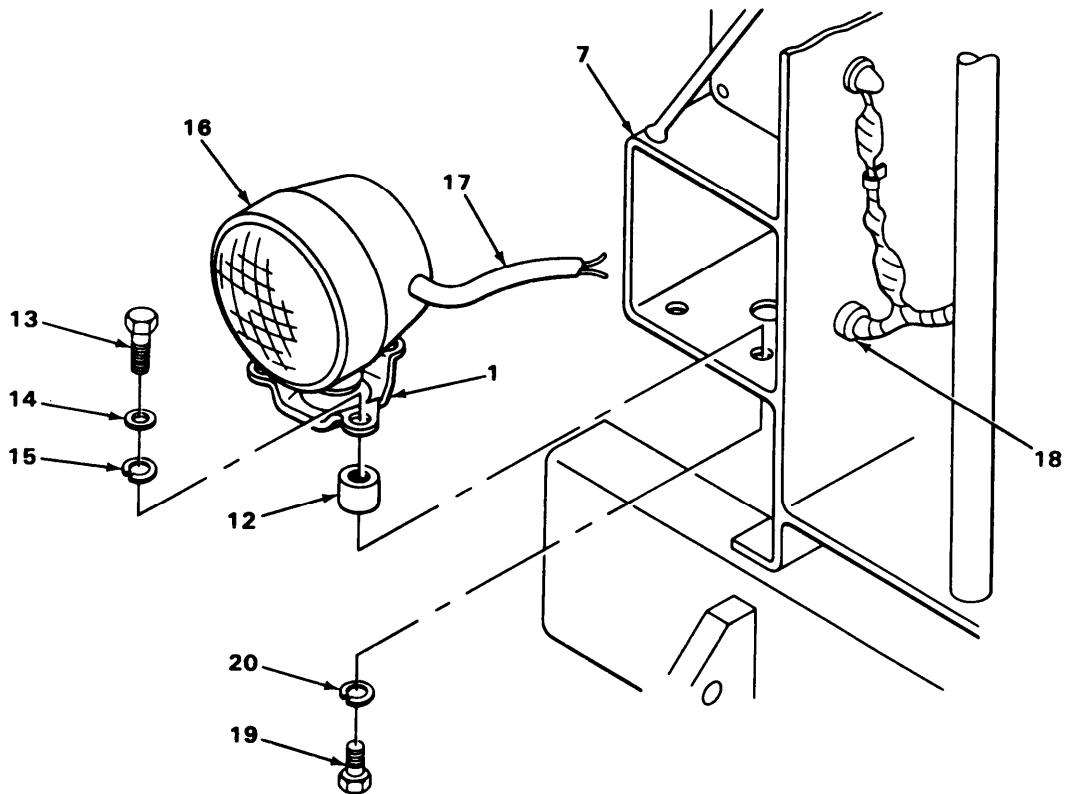
LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
3. Headlight bracket (1) to rear rubber mount (2)	Bolt (3), lock-washer (4), ground strap (5), and lockwasher (6)	s. Using open-end wrench, unscrew and take out. b. Get rid of lockwashers (4) and (6).
4. Rear rubber mount (2) to grille guard (7)	Bolt (8), lockwasher (9), ground strap (5), and lockwasher (10)	a. Using open-end wrench, unscrew and take out. b. Get rid of lockwashers (9) and (10).
5. Headlight bracket (1) to grille guard (7)	Rubber mount (2) and washer (11)	Take out.



TA240032

HEADLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
6. Headlight bracket (1) to two rubber mounts (12)	Two bolts (13), washers (14), and lockwashers (15)	a. Using open-end wrench, unscrew and take out. b. Get rid of lockwashers (15).
7. Grill guard (7)	Headlight assembly (16)	Tilt toward front of truck, lift out.
8.	Loom (17)	Pull out from grommet (18).
9.	Two bolts (19), lockwashers (20), and two rubber mounts (12)	a. Using 1/2-inch socket and handle, unscrew and take out. b. Get rid of lockwasher (20). c. Take off rubber mounts (12).



HEADLIGHT ASSEMBLY - CONTINUED

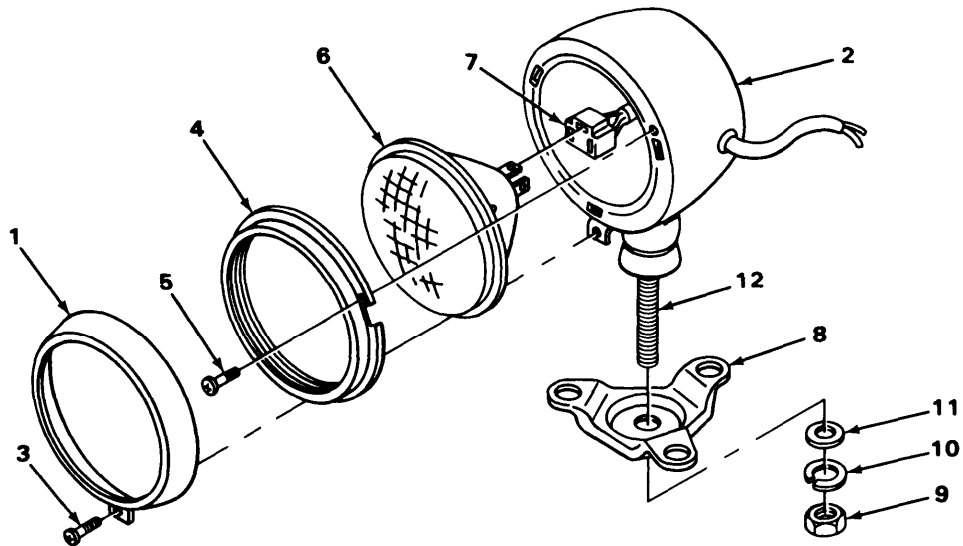
LOCATION	ITEM	ACTION REMARKS
DISASSEMBLY		
10. Outer ring (1) to bowl (2)	Screw (3)	Using screwdriver, unscrew and take out.
11.	Outer ring (1)	Pull off from bottom.
12. Inner ring (4) to bowl (2)	Four screws (5)	Using screwdriver, unscrew and take out.
13. Bowl (2)	Inner ring (4)	Take off.
14.	Sealed beam lamp (6)	Pull out part way.
15. Sealed beam lamp (6)	Plug (7)	Unplug.
16.	Sealed beam lamp (6)	Take out.
17. Headlight bracket (8) to bowl (2)	Nut (9), lockwasher (10), and washer (11)	a. Using 1 1/16-inch socket, unscrew and take off. b. Get rid of lockwasher (10). c. Pull bracket (8) off mounting stud (12).
ASSEMBLY		
18. Bowl (2) to mounting stud (12)	Headlight bracket (8)	Put on.
19. Mounting stud (12)	Washer (11), new lockwasher (10), and nut (9)	Screw on, but do not tighten.
20. Bowl (2)	Headlight bracket (8)	Place in position with two holes parallel to front.
21. Headlight bracket (8) to bowl (2)	Nut (9)	Using 11/16-inch socket and handle, tighten.
22. Sealed beam lamp (6)	Plug (7)	Plug in.

HEADLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
23. Bowl (2)	Sealed beam lamp (6)	Put in.	Trademark on face of lamp should be horizontal.
24. Sealed beam lamp (6) to bowl (2)	Inner ring (4)	Put on.	
25. Inner ring (4) to bowl (2)	Four screws (5)	Screw in and tighten using screwdriver.	
26. Bowl (2)	Outer ring (1)	Place in position, lining up tabs.	
27. Outer ring (1) to bowl (2)	Screw (3)	Screw in and tighten using screwdriver.	

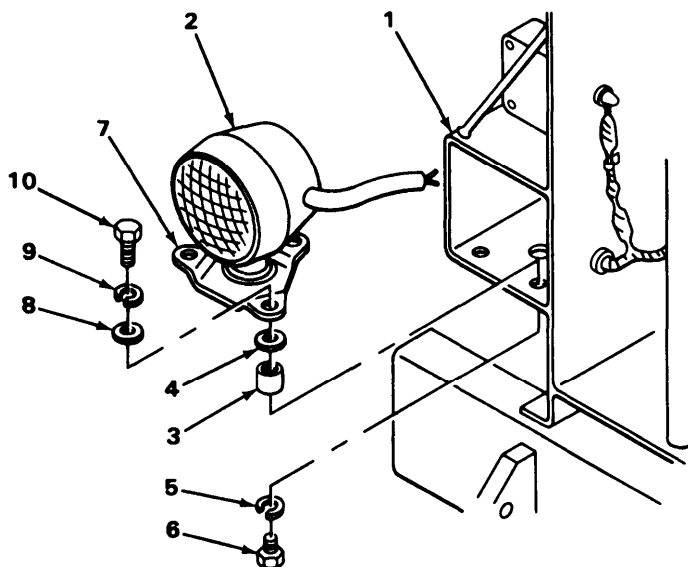
NOTE

If only replacing lamp go to FOLLOW-ON MAINTENANCE.



HEADLIGHT ASSEMBLY - CONTINUED

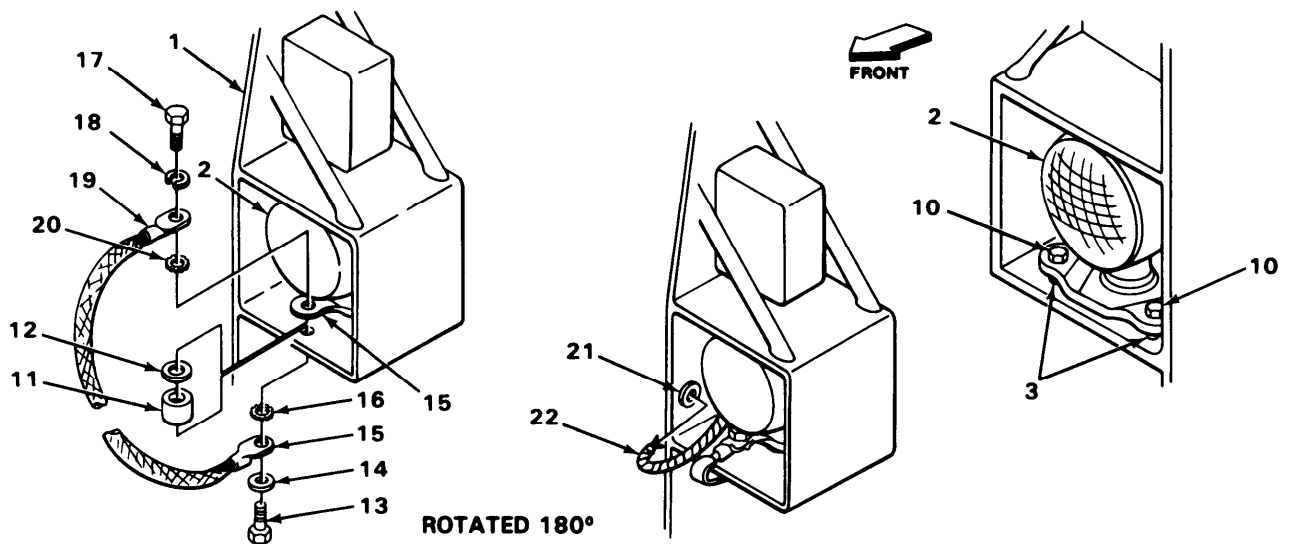
	LOCATION	ITEM	ACTION	REMARKS
INSTALLATION				
28.	Grille guard (1)	Headlight assembly (2)	Place in positon.	
29.	Headlight assembly (2) to grille guard (1)	Two rubber mounts (3) and two washers (4)	Put in place.	
30.	Rubber mounts (3) to grille guard (1)	Two new lockwashers (5) and two bolts (6)	Screw in and tighten using 1/2-inch socket and handle.	
31.	Rubber mounts (3) to headlight bracket (7)	Two washers (8), new lockwashers (9), and bolts (10)	Screw in, but do not tighten.	



TA240035

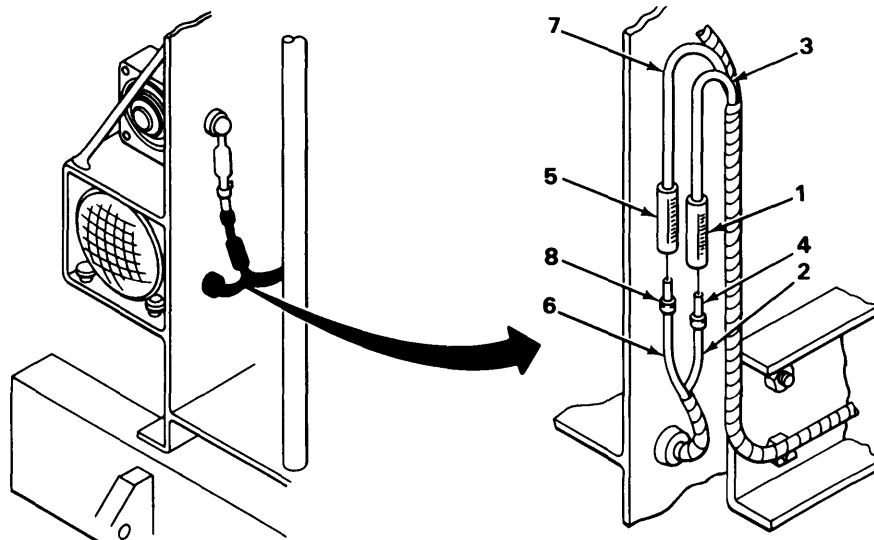
HEADLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
32. Headlight assembly (2) to grille guard (1)	Rubber mount (11) and washer (12)	Put in place.
33. Bolt (13)	New lockwasher (14), ground strap (15), and new lockwasher (16)	Put on.
34. Rubber mount (11) to grille guard (1)	Bolt (13)	Screw in and tighten using 1/2-inch open-end wrench.
35. Bolt (17)	New lockwasher (18), ground strap (19), and new lockwasher (20)	Put on.
36. Headlight assembly (2) to rubber mount (11)	Bolt (17)	Screw in and tighten using open-end wrench.
37. Grommet (21)	Wire loom (22)	Push through.
38. Headlight assembly (2) to two rubber mounts (3)	Two bolts (10)	Using open-end wrench, tighten.



HEADLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION - CONTINUED		
39. Connector (1) on wire 006 (2)	Red wire (3)	Push in until pin (4) is locked.
40. Connector (5) on wire 007 (6)	Yellow wire (7)	Push in until pin (8) is locked.
41.	Wires (2), (3), (6), and (7) and connectors (1) and (5)	Wrap with vinyl electrical tape.



HEADLIGHT ASSEMBLY - CONTINUED

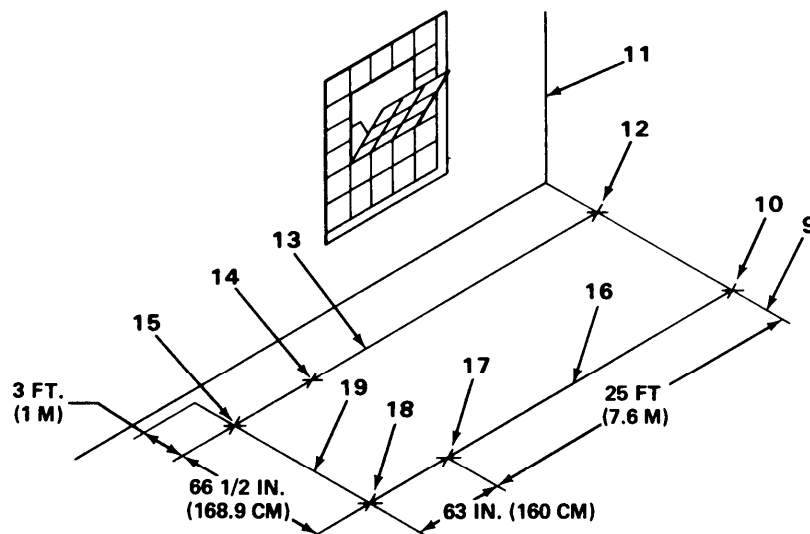
LOCATION	ITEM	ACTION REMARKS
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ALINEMENT

42. Level area with wall at one end

Floor (9)

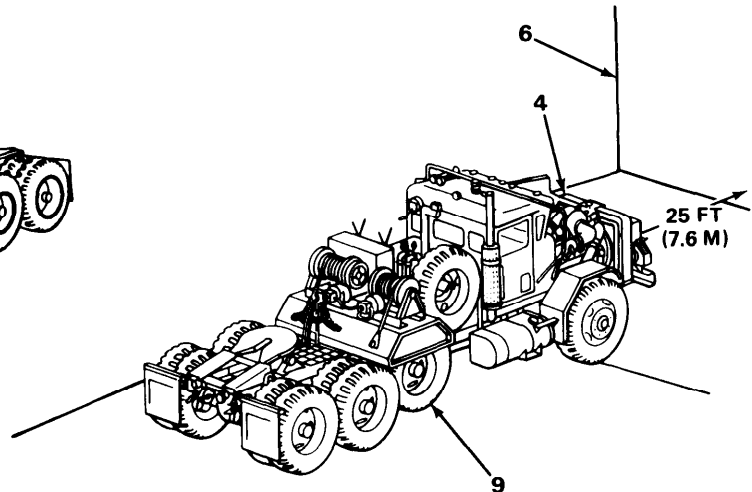
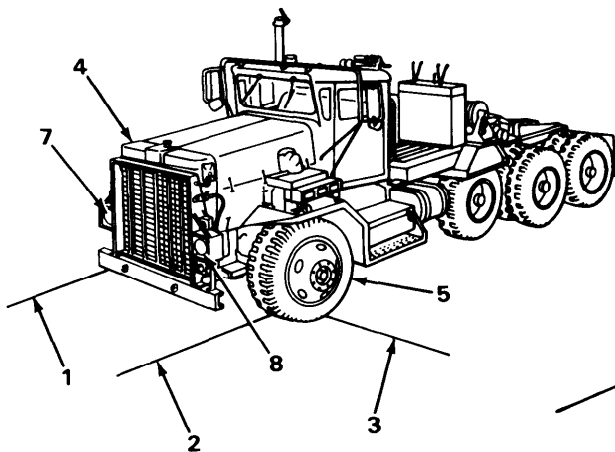
- a. Using chalk, make mark (10) where wall (11) meets floor (9).
- b. Using tape measure, measure 66 1/2 inches (168.9 cm) to left of first mark (10) and using chalk, make mark (12) on floor (9) at wall (11).
- c. Using tape measure, combination square, and chalk, draw line (13) 25 feet (7.6 m) straight out from wall at mark (12) and make mark (14) on floor (9) at end of line (13).
- d. Using tape measure and chalk, continue line (13) 63 inches (160 cm) farther away from wall and make mark (15) at end of line (13).
- e. Using tape measure, combination square, and chalk, draw line (16) 25 feet (7.6 m) straight out from wall (11) at mark (10) and make mark (17) at end of line (16).
- f. Using tape measure and chalk, continue line (16) 63 inches (160 cm) farther away from wall (11) and make mark (18) at end of line (16).
- g. Using chalk and tape measure, draw line (19) between marks (15) and (18) and continue 3 feet (1 m) to the outside of lines (15) and (18).



TA240038

HEADLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
ALINEMENT – CONTINUED			
43. Lines (1), (2), and (3)	Truck (4)		Using lines (1) and (2) to guide the driver, park truck so the center of each front wheel (5) is directly over line (3) and tires are evenly placed on lines (1) and (2). Refer to TM 9-2320-270-10 for driving instructions.
44. Wall (6)	Headlights (7) and (8)		Using string, check distance between headlights and wall. Move truck to lineup headlights to plus or minus 1/2-inch (1.27 centimeters).
45.	Tires		Check for proper inflation (TM 9-2320-270-10).
46.	Pusher axle (9)		Make sure pusher axle (9) is retracted (TM 9-2320-270-10).
47.	Springs		Inspect for broken or sagging springs (page 2-40).

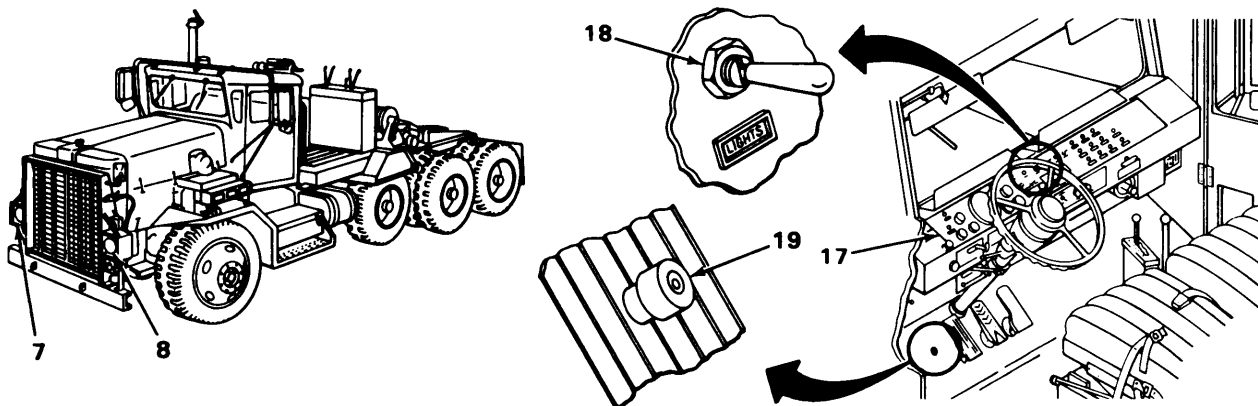


48. Wall (6)	Lines (10) and (11)		Using chalk and combination square, draw lines (10) and (11) 65 inches (165.1 cm) straight up from marks (12) and (13).
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TA240039

HEADLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
49.	Marks (14) and (15)	Using tape measure, measure 52 11/16 inches (133.8 cm) from the ground on lines (10) and (11) and using chalk, mark.
50.	Line (16)	Using chalk, draw line (16) between marks (14) and (15) and 12 inches (30.48 cm) to the outside of lines (10) and (11).
51.	Headlight switch (18)	Put in on position.
52.	Headlights (7) and (8)	Make sure they are on.
53.	Dimmer switch (19)	Step onto put headlights on high beam.
54.	Headlights (7) and (8)	Make sure headlights are on.

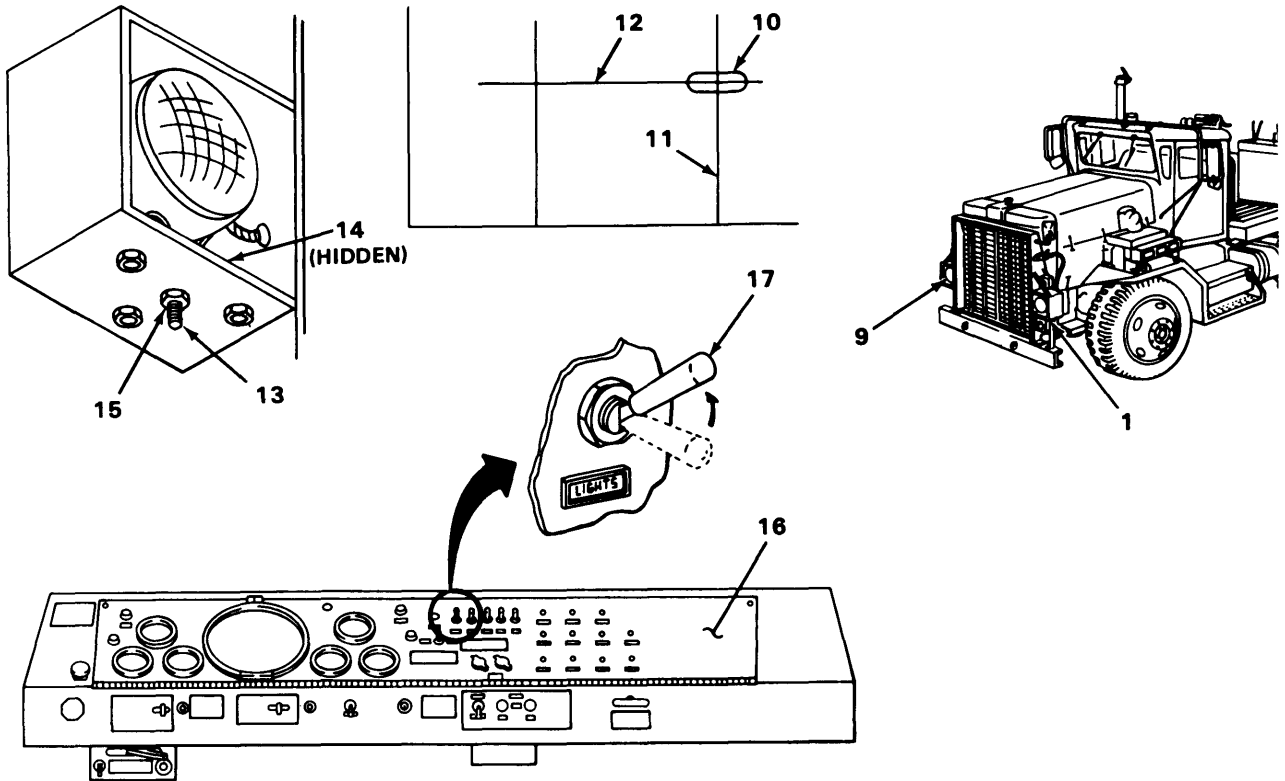


HEADLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ALINEMENT – CONTINUED		
55.	Left headlight (1)	Using rag, cover.
56.	Wall (2) Brightest part of right headlamp light (3)	Center of brightest part of headlamp light (3) should be where lines (4) and (5) cross. If all right, go to step 60.
57.	Nut (8) Headlight bowl mounting stud (6) to bracket (7)	Using 11/16-inch wrench, unscrew part way.
56.	Right headlight (9)	Move until center of brightest part of headlamp light is where lines (4) and (5) cross.
59.	Nut (8) Mounting stud (6)	Using 11/16-inch wrench, tighten.
60.	Left headlight (1)	Take off rag.
61.	Right headlight (9)	Using rag cover right headlight.

HEADLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
62.	Brightest part of left headlamp light (10)	Center of brightest part of left headlamp light (10) should be where lines (11) and (12) cross. If all right, go to step 66.
63. Headlight bowl mounting stud (13) to bracket (14)	Nut (15)	Using 11/16-inch wrench, unscrew part way.
64.	Headlight (1)	Move until center of brightest part of headlamp light is where lines (11) and (12) cross.
65.	Nut (15)	Using 9/16-inch wrench, tighten.
66. Instrument panel (16)	Headlight switch (17)	Put in OFF position.



TASK ENDS HERE

WARNING LIGHT

This task covers:

- a. Removal (page 4-362)
 - b. Disassembly (page 4-363)
 - c. Assembly (page 4-364)
 - d. Installation (page 4-365)
-

INITIAL SETUP

Tools

- Screwdriver, cross-tip, number 1
- Screwdriver, cross-tip, number 2
- Screwdriver, flat-tip, 1/8-inch

Materials/Parts

- Gasket
- Lockwasher, ground wire to roof
- Tape, electrical (item 20, appendix C)

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
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NOTE

To change lamp go to disassembly. It is not necessary to remove warning light assembly to change lamp.

REMOVAL

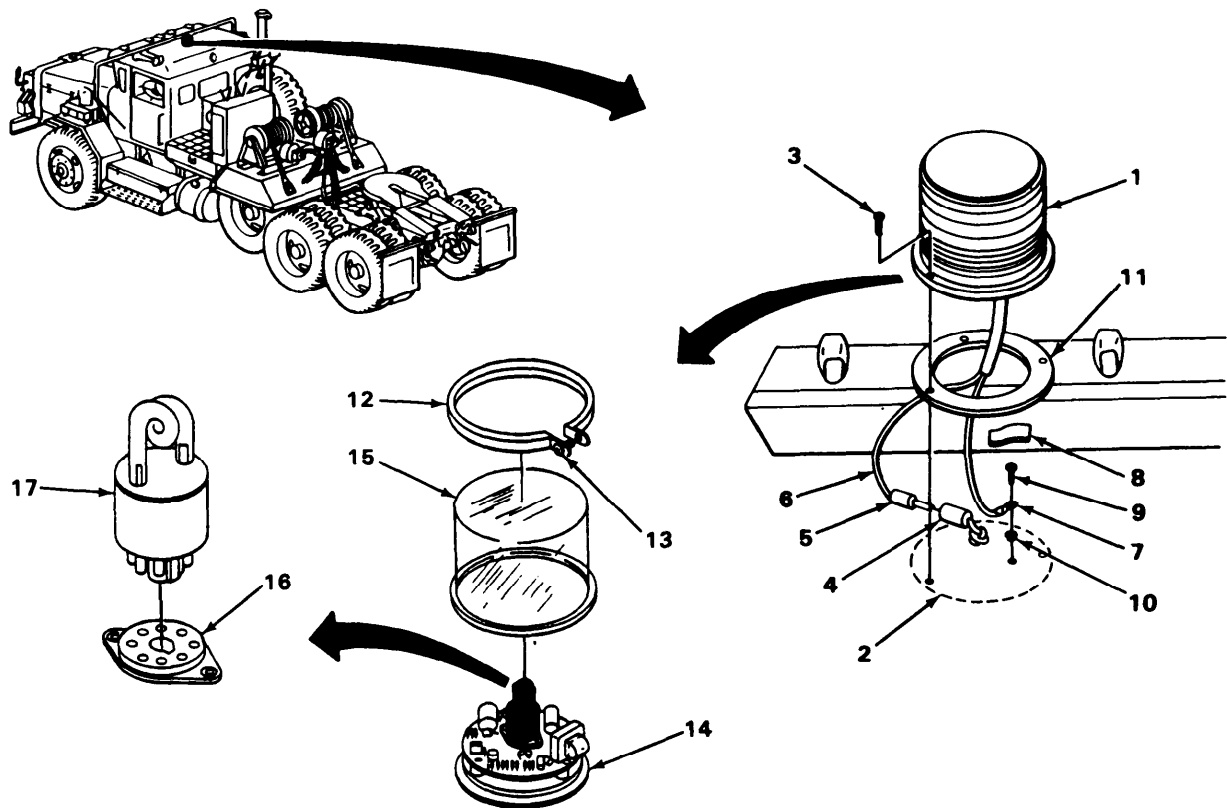
- | | | |
|--------------------------------------|-------------------------------|---|
| 1. Warning light (1) to cab roof (2) | Three screws (3) | Using number 2 cross-tip screwdriver, unscrew and take out. |
| 2. Cab roof (2) | Warning light (1) | Lift up and tip over on its side. |
| 3. Bullet connector (4) | Bullet plug (5) on lead (6) | Unplug. |
| 4. Ground lead (7) to cab roof (2) | Screw (9) and lockwasher (10) | a. Pull off tape.
b. Using number 2 cross-tip screwdriver, unscrew and take off.
c. Get rid of lockwasher (10). |
| 5. Cab roof (2) | Warning light (1) | Take off. |
| 6. | Gasket (11) | a. Pull off.
b. Get rid of. |

WARNING LIGHT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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DISASSEMBLY

7. Clamp ring (12)	Screw (13)	Using number 2 cross-tip screwdriver, unscrew part way.
8. Base (14)	Clamp ring (12) and lens (15)	Take off.
9. Lens (15)	Clamp ring (12)	Take off.
10. Lamp holder (16)	Lamp (17)	Pull out.



WARNING LIGHT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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DISASSEMBLY – CONTINUED

WARNING

Do not touch parts and leads on power supply. Enough of a charge may be stored in one of the capacitors to cause injury.

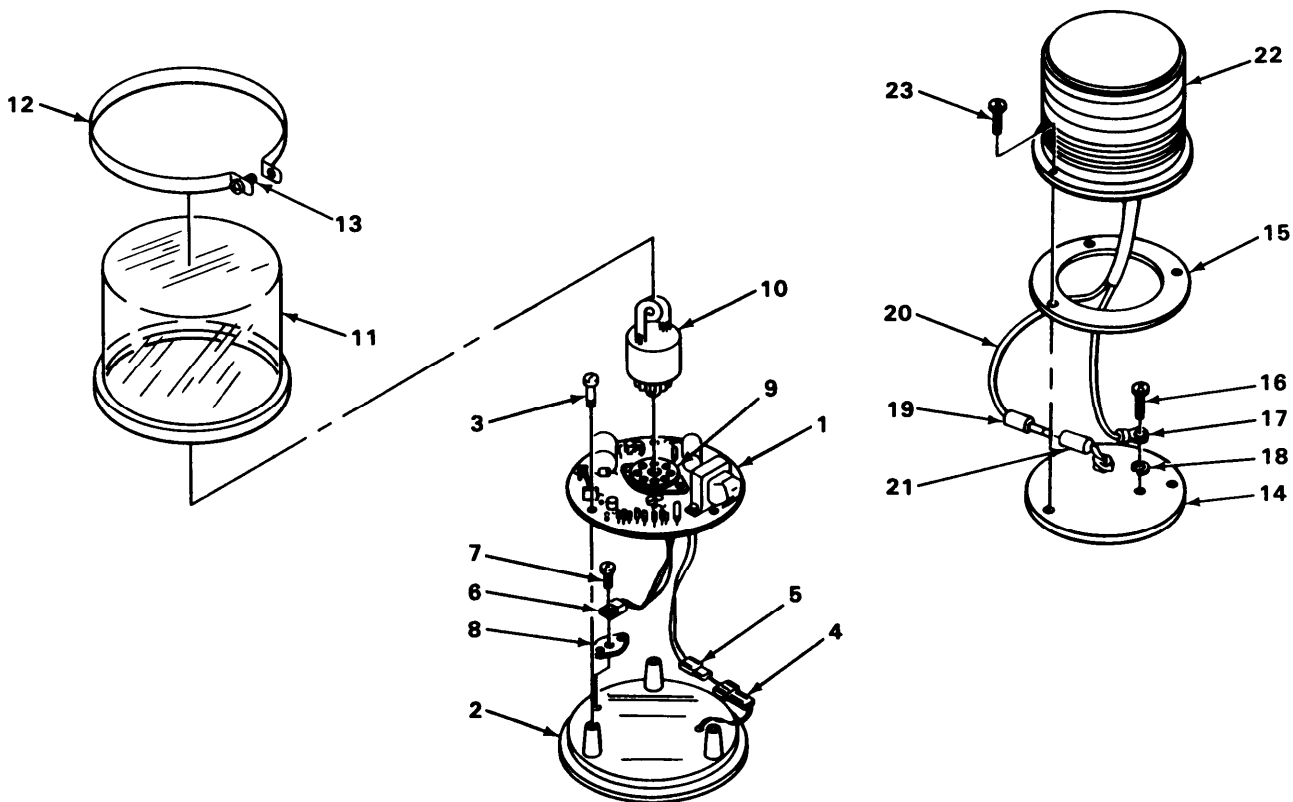
11.	Power supply (1) to base (2)	Three screws (3)	Using number 1 cross-tip screwdriver, unscrew and take out.
12.	Connector (4)	Plug (5)	Unplug.
13.	Component (6) to base (2)	Plastic screw (7), component (6), and insulator (8)	Using flat-tip screwdriver, unscrew and take off.
14.		Power supply (1)	Take off.

ASSEMBLY

15.	Base (2)	Component (6) and insulator (8)	Put in place.
16.	Component (6) to base (2)	Plastic screw (7)	Screw in and tighten using flat-tip screwdriver.
17.	Connector (4)	Plug (5)	Plug in.
18.	Base (2)	Power supply (1)	Put into place.
19.	Power supply (1) to base (2)	Three screws (3)	Screw in and tighten using number 1 cross-tip screwdriver.
20.	Lamp holder (9)	Lamp (10)	Line up tab and slot and plug in.
21.	Lens (11)	Clamp ring (2)	Put on.
22.	Base (2)	Lens (11) and clamp ring (12)	Put on.
23.	Clamp ring (12)	Screw (13)	Using number 2 cross-tip screwdriver, tighten.

WARNING LIGHT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
24. Cab roof (14)	New gasket (15)	Put in place.
25. Screw (16)	Ground lead (17) and new lockwasher (18)	Put on.
26. Cab roof (14)	Screw (16)	a. Screw in and tighten using number 2 cross-tip screwdriver. b. Wrap with 2 inches (5 centimeters) of electrical tape.
27. Bullet plug (19) on lead (20)	Bullet connector (21)	Plug in.
28. Cab roof (14)	Warning light (22)	Place in position.
29. Warning light (22) to cab roof (14)	Three screws (23)	Screw in and tighten using number 2 cross-tip screwdriver.



TA240044

WARNING LIGHT - CONTINUED

INSTALLATION – CONTINUED

NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

STOPLIGHT AND TAILLIGHT ASSEMBLY

This task covers:

- | | |
|-----------------------------|------------------------------|
| a. Removal (page 4-366) | c. Assembly (page 4-368) |
| b. Disassembly (page 4-368) | d. Installation (page 4-369) |
-

INITIAL SETUP

Tools

- Crimping tool
- Extension, 12-inch, 3/8-inch drive
- Handle, ratchet, 3/8-inch drive
- Pliers, diagonal-cutting
- Remover wire, 1.20-inch diameter
- Screwdriver, cross-tip, number 1
- Screwdriver, flat-tip
- Socket, deep-well, 7/16-inch
- Wire stripper

Materials/Parts

- Lockwasher, stoplight and tail lamp assembly to cross member (two required)
- Tag, marking (item 18, appendix C)

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
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NOTE

To change lamp, go to disassembly. it is not necessary to remove stoplight and taillight assembly to change lamp.

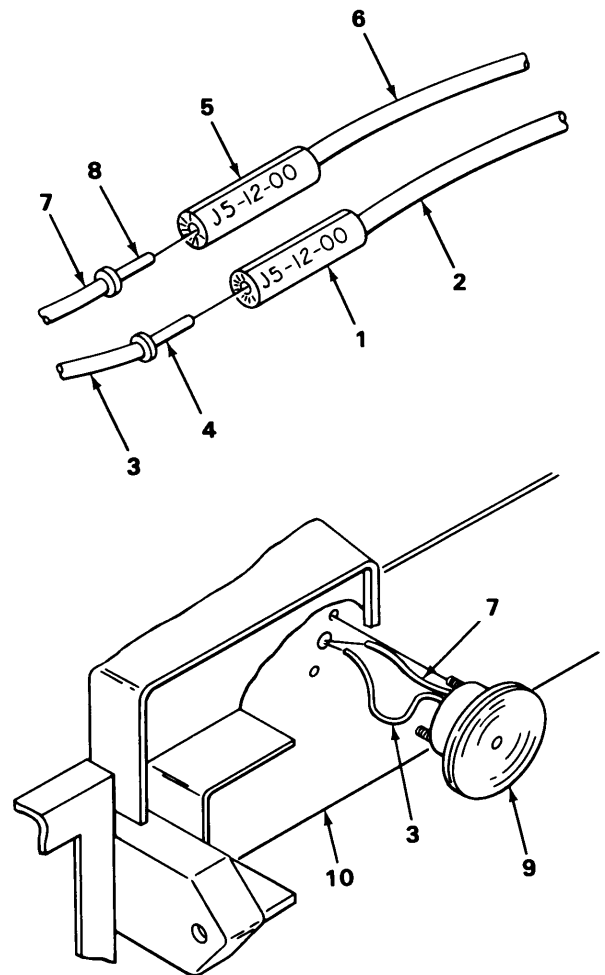
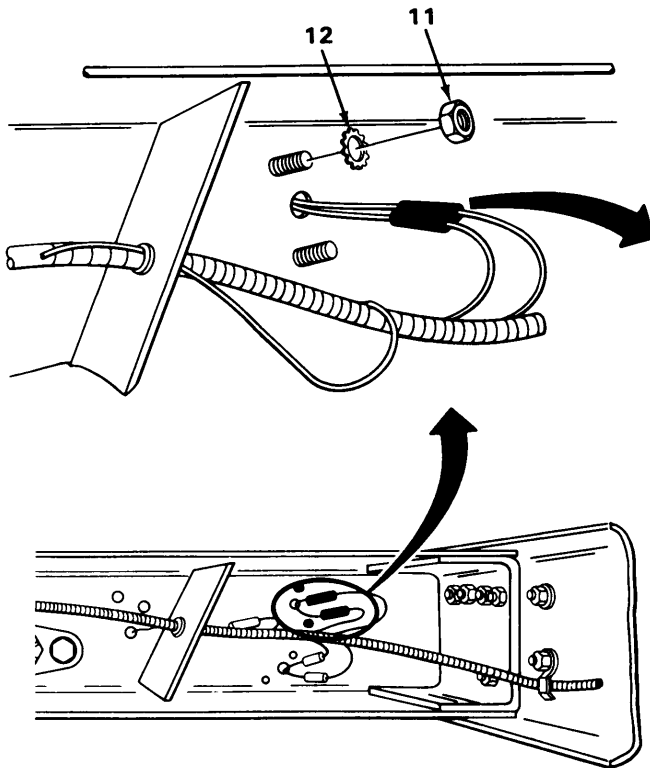
REMOVAL

NOTE

Steps in this task apply to either left or right stoplight and taillight assembly. Left stoplight and taillight assembly is shown. Tag wires according to general maintenance instructions (page 4-1). Refer to Appendix F for wire numbers and lead colors.

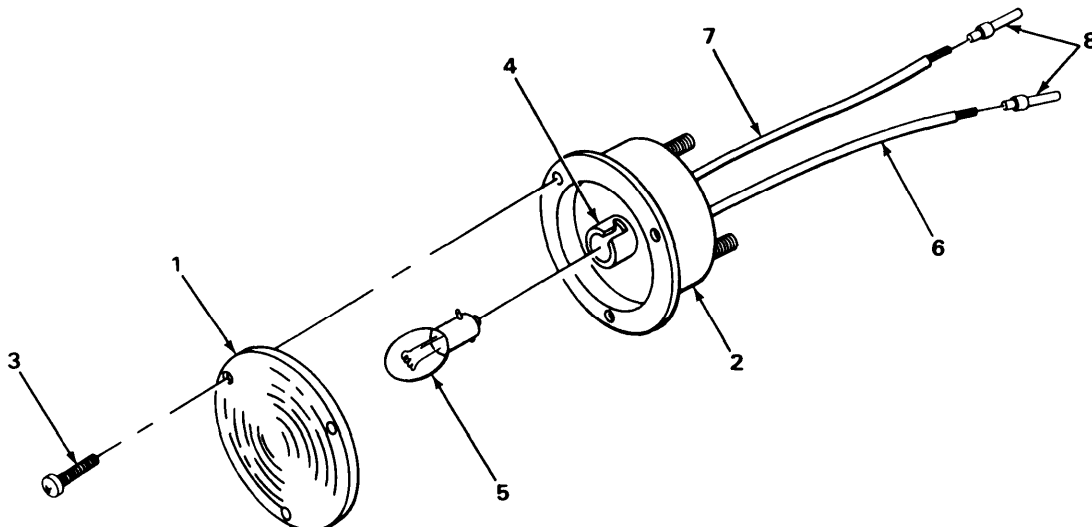
STOPLIGHT AND TAILLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
1. Connector (1) on wire 003 (2)	Brown lead (3)	Using wire remover, unlock pin (4) and pull out.
2. Connector (5) on wire 008 (6)	Red lead (7')	Using wire remover, unlock pin (8) and pull out.
3. Left taillight (9) to cross member (10)	Two nuts (11) and lockwashers (12)	a. Using socket, extension, and handle, unscrew and take off. b. Get rid of lockwashers (12).
4. Cross member (10)	Left taillight (9) and leads (3) and (7)	Pull out.



STOPLIGHT AND TAILLIGHT ASSEMBLY - CONTINUED

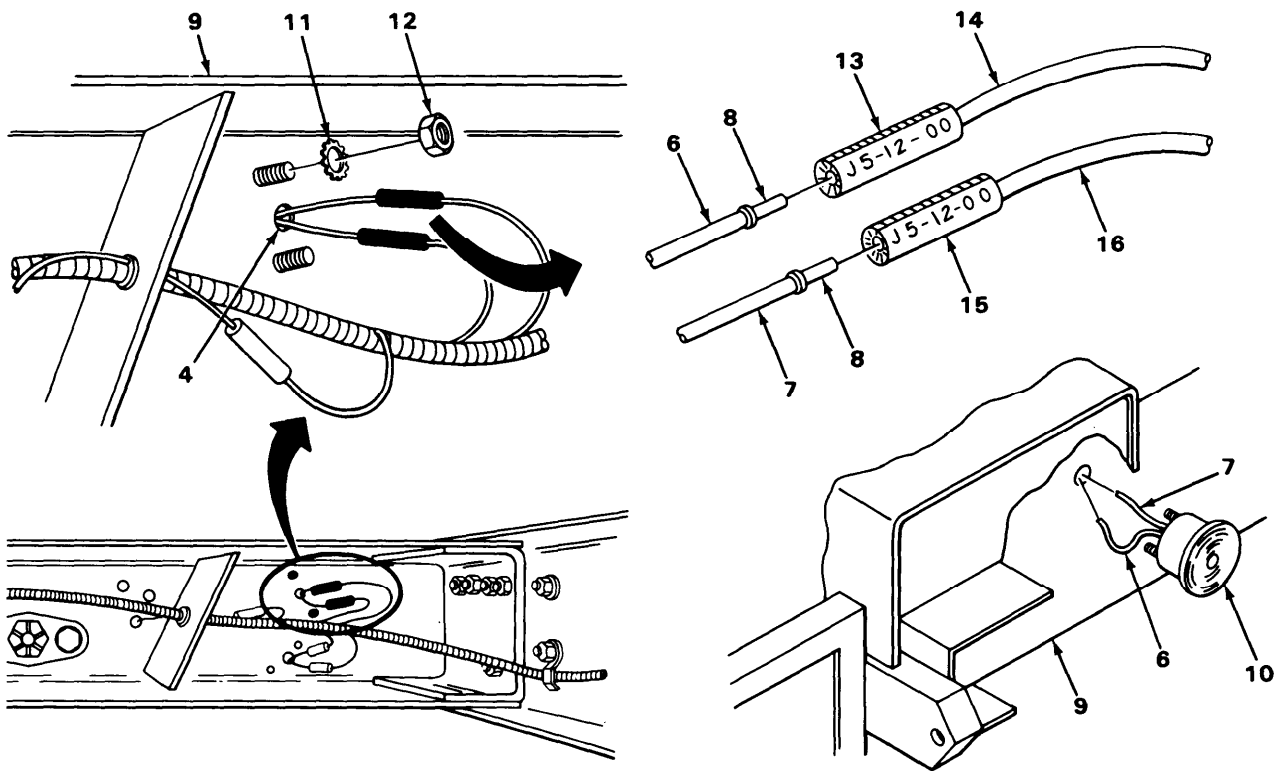
LOCATION	ITEM	ACTION	REMARKS
DISASSEMBLY			
5. Lens (1) to bowl (2)	Three screws (3)	Using cross-tip screwdriver, unscrew and take out.	
6. Bowl (2)	Lens (1)	Take out. It may be necessary to pry gently at edges with flat-tip screwdriver.	
7. Bowl (2), lampholder (4)	Lamp (5)	Push on, turn one-quarter turn counter-clockwise, and take out.	
ASSEMBLY			
8. Lampholder (4) in bowl (2)	Lamp (5)	Push in and turn one-quarter turn clockwise.	
9. Bowl (2)	Lens (1)	Put in place.	
10. Lens (1) to bowl (2)	Three screws (3)	Using cross-tip screwdriver, screw in and tighten.	
11. Bowl (2)	Two leads (6) and (7)	a. If installing new light using diagonal cutting pliers, cut leads (6) and (7) to length of old ones. b. Using wire stripper, strip off 3/16-inch (5 millimeters) of insulation.	
12. Two leads (6) and (7)	Two connector pins (8)	Using crimping tool, crimp on.	



TA240046

STOPLIGHT AND TAILLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
13. Rear cross member (9)	Leads (6) and (7)	Put through.	
14.	Taillight assembly (10)	Put in place.	
15. Taillight assembly (10) to rear cross member (9)	Two new lockwashers (11) and nuts (12)	Screw on and tighten using socket, extension, and handle.	
16. Connector (13) on wire 008 (14)	Red lead (6)	Push in until pin (8) is securely locked.	
17. Connector (15) on wire 003 (16)	Brown lead (7)	Push in until pin (8) is securely locked.	



FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

TA240047

FRONT TURN SIGNAL AND SIDE MARKER LIGHT ASSEMBLY

This task covers:

- | | |
|-----------------------------|------------------------------|
| a. Removal (page 4-370) | c. Assembly (page 4-372) |
| b. Disassembly (page 4-372) | d. Installation (page 4-374) |
-

INITIAL SETUP

Tools

- Crimping tool, electrical connections
- Knife, pocket
- Pliers, long-nose
- Remover, wire, 1.20 diameter
- Screwdriver, cross-tip, number one
- Wire stripper
- Wrench, open-end, 3/4-inch

Materials/Parts

- Deutsch connector (two required)
- Gasket (two required)
- Gasket, side marker lamp
- Lockwasher, external tooth, turn signal assembly to grille guard (two required)
- Lockwasher, turn signal assembly to boot clip
- Loom, lacquered wire, 1/4-inch
- Tag, marking (item 18, appendix C)
- Tape, electrical (Item 20, appendix C)

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
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NOTE

The steps in this task apply to either right or left turn signal and side marker light assemblies. The right turn signal and side marker light assembly is shown.

Tag wires according to general maintenance instructions (page 4-1). Refer to Appendix F for wire numbers and lead colors.

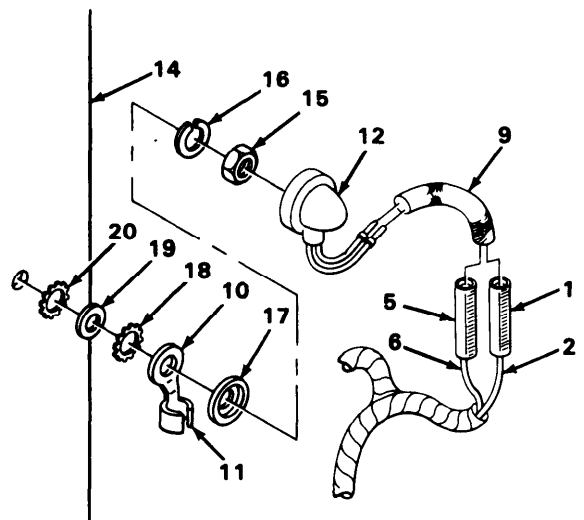
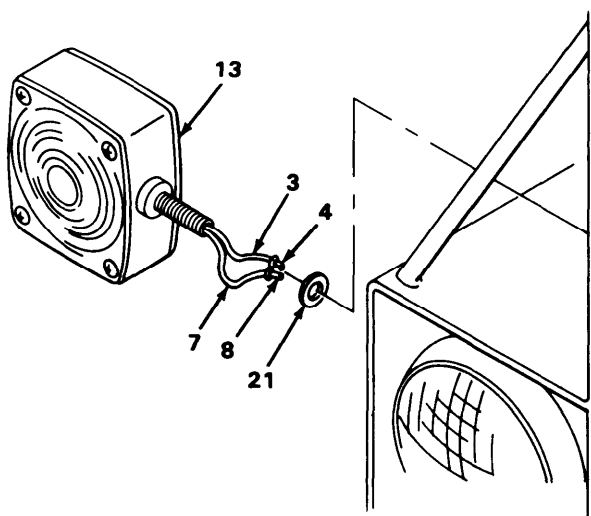
To change front turn lamp do steps 10 thru 12 and 29 thru 31. To change side marker lamp do steps 18 thru 20 and 23 thru 25. It is not necessary to remove light assembly to change lamps.

REMOVAL

- | | | |
|----------------------------------|-----------------|--|
| 1. Connector (1) on wire 012 (2) | Blue lead (3) | <ul style="list-style-type: none"> a. Using pocket knife, cut tape and take off. b. Using wire remover, unlock pin (4) and pull out. |
| 2. Connector (5) on wire 001 (6) | Orange lead (7) | Using wire remover, unlock pin (8) and pull out. |

FRONT TURN SIGNAL AND SIDE MARKER LIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
3. Blue lead (3) and orange lead (7)	Loom (9)	a. Pull off. b. Get rid of.
4. Boot clip (10)	Tabs (11)	Using long-nose pliers, bend out part way.
5. Blue lead (3) and orange lead (7)	Boot (12)	Pull off.
6. Turn signal light (13) to grille guard (14)	Nut (15)	Using 3/4-inch wrench, unscrew and take off.
7. Turn signal light (13)	Lockwasher (16), cupwasher (17), boot clip (10), lockwasher (18), washer (19), and lockwasher (20)	a. Takeoff. b. Get rid of lockwashers (16), (18), and (20).
8. Grille guard (14)	Turn signal light (13)	Take off.
9. Turn signal light (13)	Washer (21)	Take off.

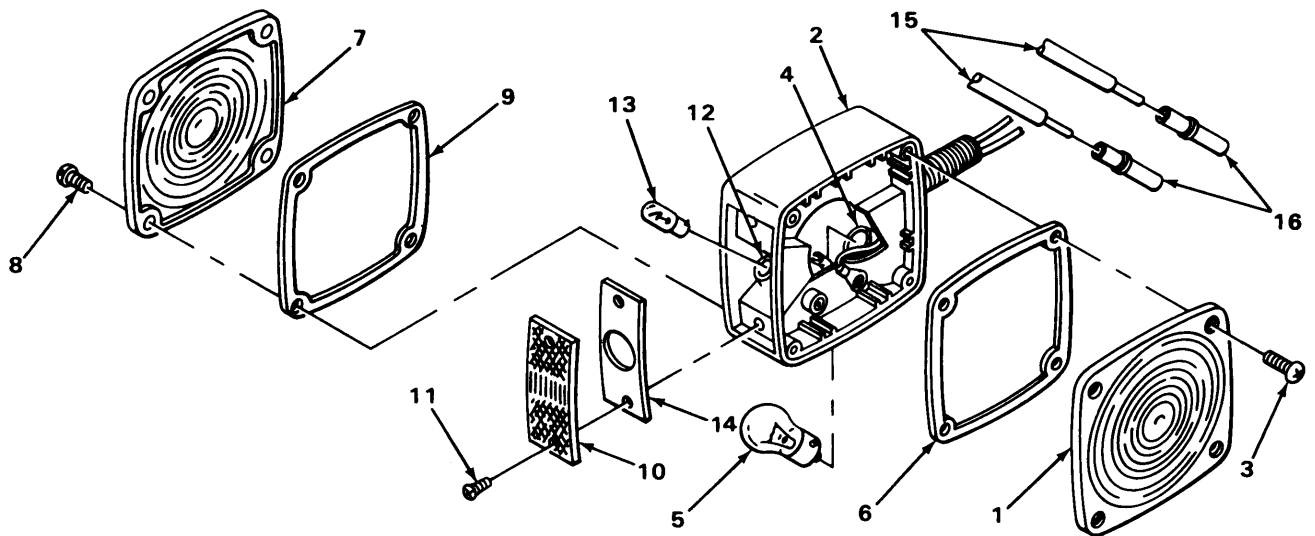


FRONT TURN SIGNAL AND SIDE MARKER LIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
DISASSEMBLY		
10. Amber lens (1) to light body (2)	Four screws (3)	Using cross-tip screwdriver, unscrew and take out.
11. Light body (2)	Amber lens (1)	Take off. You may have to use pocket knife to pry loose.
12. Lamp holder (4)	Lamp (5)	Push in, turn one-quarter turn counter-clockwise, and take out.
13. Amber lens (1)	Gasket (6)	a. Take off. b. Get rid of.
14. Red lens (7) to light body (2)	Four screws (8)	Using cross-tip screwdriver, unscrew and take out.
15. Light body (2)	Red lens (7)	Take off.
16. Red lens (7)	Gasket (9)	a. Take off. You may have to use pocket knife to pry loose. b. Get rid of.
17. Side marker lens (10) to light body (2)	Two screws (11)	Using cross-tip screwdriver, unscrew and take out.
18. Light body (2)	Side marker lens (10)	Take out. You may have to use pocket knife to pry loose.
19. Side marker lamp holder (12)	Side marker lamp (13)	Push in, turn one-quarter turn counter-clockwise, and take out.
20. Light body (2)	Side marker lamp gasket (14)	a. Take out. b. Get rid of.
ASSEMBLY		
21. Light body (2)	New side marker lamp gasket (14)	Push into place.
22. Side marker lamp holder (12)	Side marker lamp (13)	Push in and turn one-quarter turn clockwise.

FRONT TURN SIGNAL AND SIDE MARKER LIGHT ASSEMBLY - CONTINUED

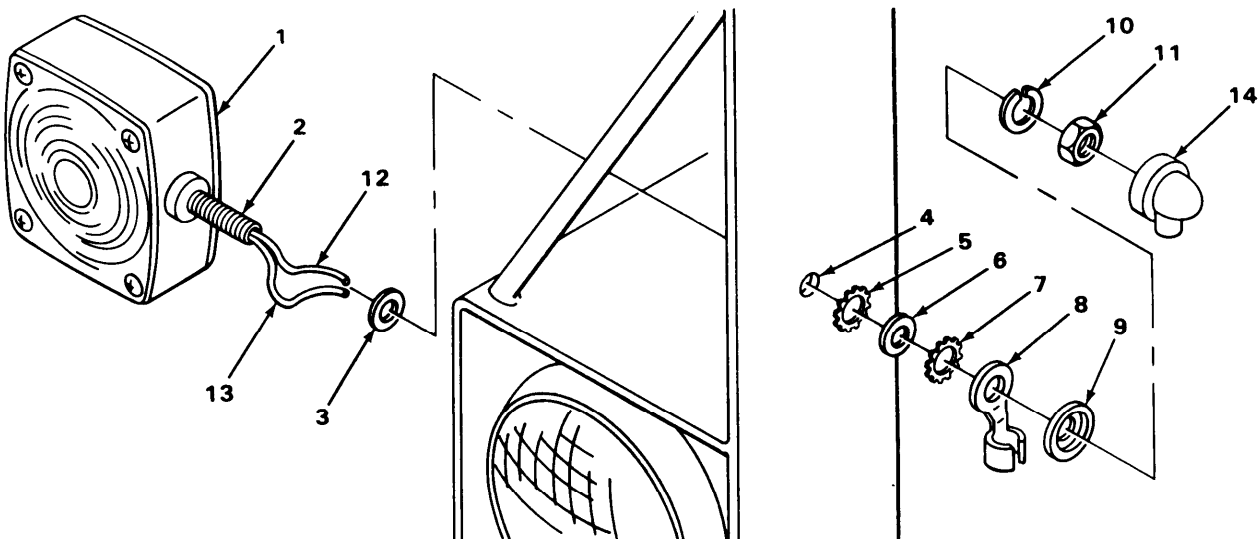
LOCATION	ITEM	ACTION REMARKS
23. Light body (2)	Side marker lens (10)	Put in.
24. Side marker lens (10) to light body (2)	Two screws (11)	Screw in and tighten using cross-tip screwdriver.
25. Red lens (7)	New gasket (9)	Push in place.
26. Light body (2)	Red lens (7)	Put in place.
27. Red lens (7) to light body (2)	Four screws (8)	Screw in and tighten using cross-tip screwdriver.
28. Amber lens (1)	New gasket (6)	Push in place.
29. Lamp holder (4)	Lamp (5)	Push in and turn one-quarter turn clockwise.
30. Light body (2)	Amber lens (1)	Put in place.
31. Amber lens (1) to light body (2)	Four screws (3)	Screw in and tighten using cross-tip screwdriver.
32. Light body (2)	Two leads (15)	If installing new light assembly, use wire stripper to strip off 3/16 inch (5 millimeters) of insulation.
33. Two leads (15)	Two pins (16)	Using crimping tool, crimp on.



TA240049

FRONT TURN SIGNAL AND SIDE MARKER LIGHT ASSEMBLY - CONTINUED

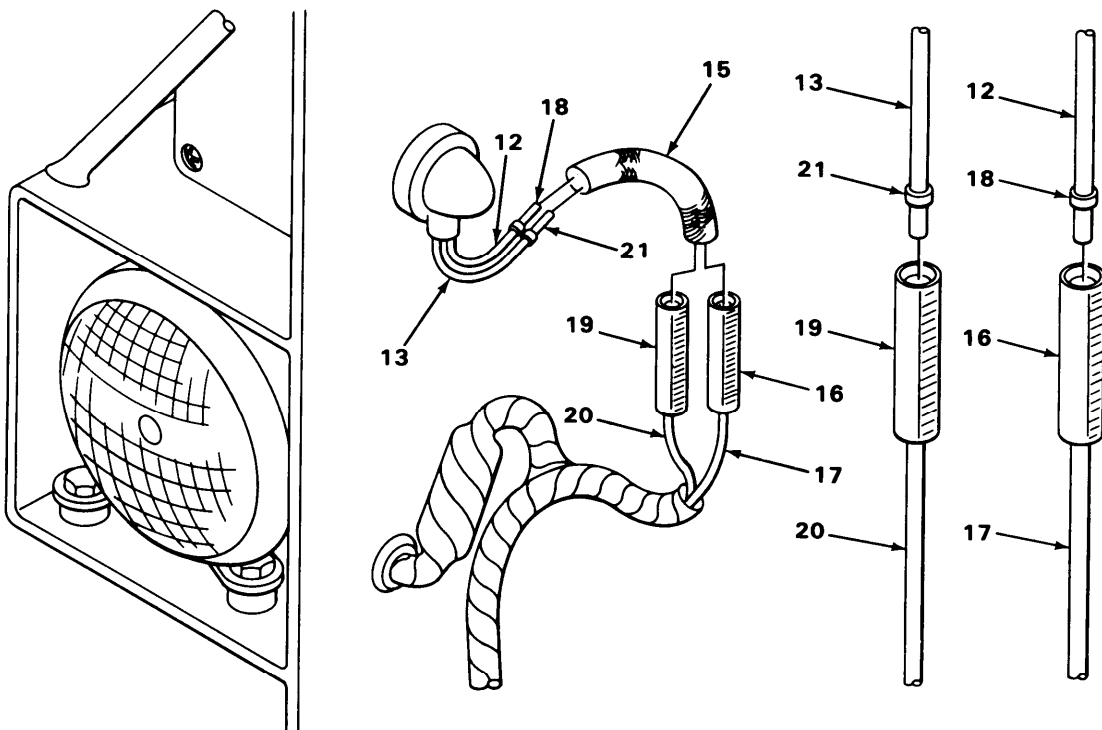
LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
34. Turn signal light (1) hollow bolt (2)	Washer (3)	Put on.	
35. Grille guard (4)	Turn signal light light (1)	Place in position.	
36. Hollow bolt (2)	New external tooth lockwasher (5), washer (6), new external tooth lock- washer (7), boot clip (8), cup washer (9), and new lockwasher (10)	Put on.	
37. Turn signal light (1) to grille guard (4)	Nut (11)	Screw on and tighten using wrench.	
38. Leads (12) and (13)	Boot (14)	Put on.	
39. Cap washer (9)	Boot (14)	Snap on.	
40. Boot (14)	Boot Clip (8)	Using long-nose pliers, bend tabs.	



TA240050

FRONT TURN SIGNAL AND SIDE MARKER LIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
41. Leads (12) and (13)	New loom (15)	Put on.
42. Connector (16) on wire 001 (17)	Orange lead (12)	Push in until pin (18) is firmly locked.
43. Connector (19) on wire 012 (20)	Blue lead (13)	Push in until pin (21) is firmly locked.
44.	Leads (12) and (13) and wires (17) and (20) and connectors (16) and (19)	Wrap with electrical tape.



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

BLACKOUT STOPLIGHT AND TAILLIGHT ASSEMBLY

This task covers:

- | | |
|-----------------------------|------------------------------|
| a. Removal (page 4-376) | c. Assembly (page 4-379) |
| b. Disassembly (page 4-378) | d. Installation (page 4-381) |
-

INITIAL SETUP

Tools

Extension, 6-inch, 3/8-inch drive
 Handle, ratchet, 3/8-inch drive
 Screwdriver, cross-tip, number 2
 Screwdriver, flat-tip, 3/16-inch
 Socket, 9/16-inch, 3/8-inch drive

Materials/Parts

Lockwasher, blackout light to rear
 cross member (two required)
 Packing
 Tag, marking (item 18, appendix C)

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
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NOTE

To change lamps go to disassembly. It is not necessary to remove light assembly to change lamps.

REMOVAL

NOTE

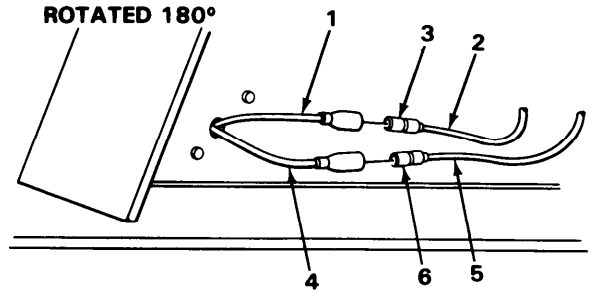
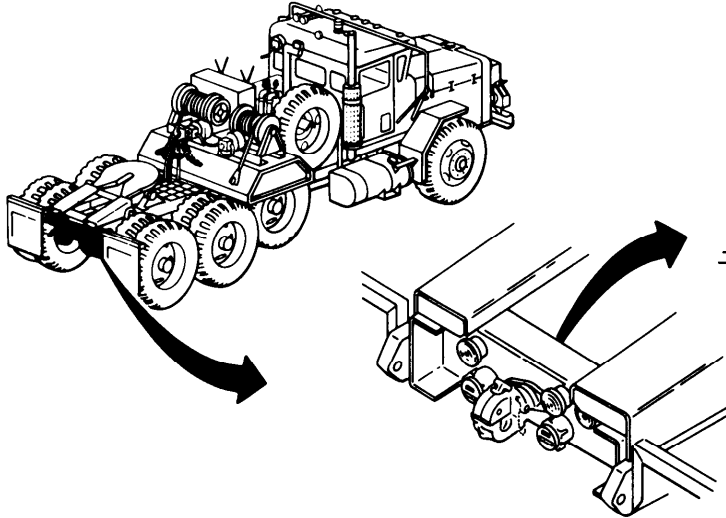
Steps in this task are same for either left or right blackout stoplight and taillight. Wire numbers are the same for both blackout taillights. Left blackout stoplight and taillight is shown.

Tag wires according to general maintenance instructions (page 4-1).

- | | | |
|-----------------------------------|----------|---------|
| 1. Lead 23 (1) to
wire 678 (2) | Plug (3) | Unplug. |
| 2. Lead 24 (4) to
wire 680 (5) | Plug (6) | Unplug. |

BLACKOUT STOPLIGHT AND TAILLIGHT ASSEMBLY - CONTINUED

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



3. Blackout light (7)
to rear cross
member (8)

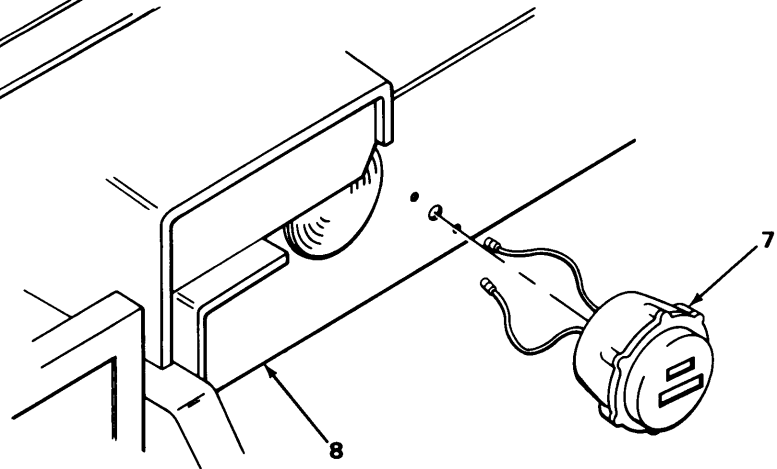
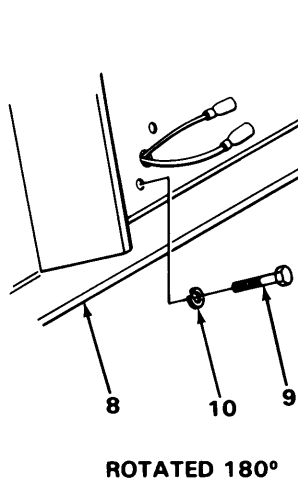
Two screws (9) and
lockwashers (10)

a. Using socket, extension, and handle,
unscrew and take out.
b. Get rid of lockwashers (10).

4. Rear cross
member (8)

Blackout light (7')

Take off.

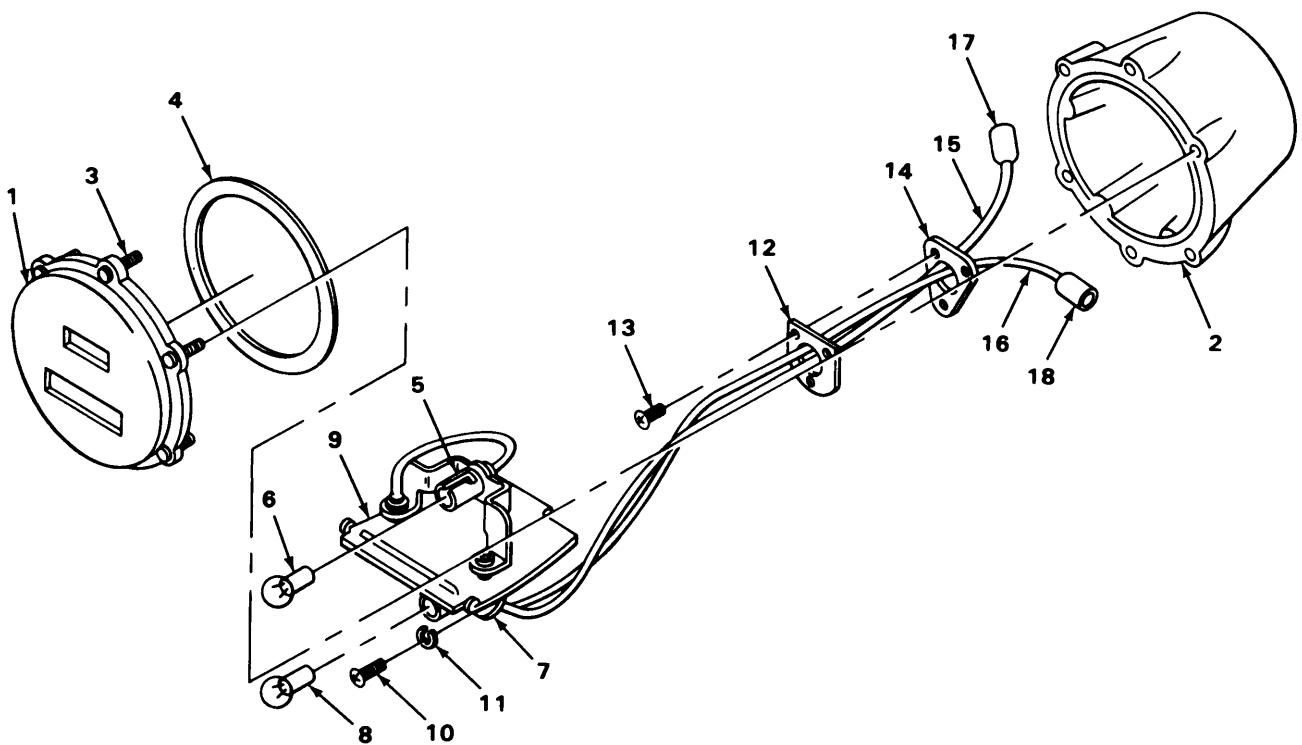


BLACKOUT STOPLIGHT AND TAILLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
DISASSEMBLY		
5. Door (1) to light body (2)	Six screws (3)	Using flat-tip screwdriver, unscrew.
6. Light body (2)	Door (1)	Take off.
7. Door (1)	Packing (4)	a. Take out. b. Get rid of.
8. Upper lamp-holder (5)	Stop lamp (6)	Push in, turn one-quarter turn counter-clockwise, and take out.
9. Lower lamp-holder (7)	Marker lamp (8)	Push in, turn one-quarter turn counter-clockwise, and take out.
10. Lampholder assembly (9) to light body (2)	Two screws (10) and washers (11)	Using cross-tip screwdriver, unscrew and take out.
11. Light body (2)	Lampholder assembly (9)	Take out.
12. Grommet retainer (12) to light body (2)	Three screws (13)	Using cross-tip screwdriver, unscrew and take out.
13. Light body (2)	Grommet retainer (12)	Take out.
14.	Grommet (14), leads (15) and (16), and plugs (17) and (18)	Take out.

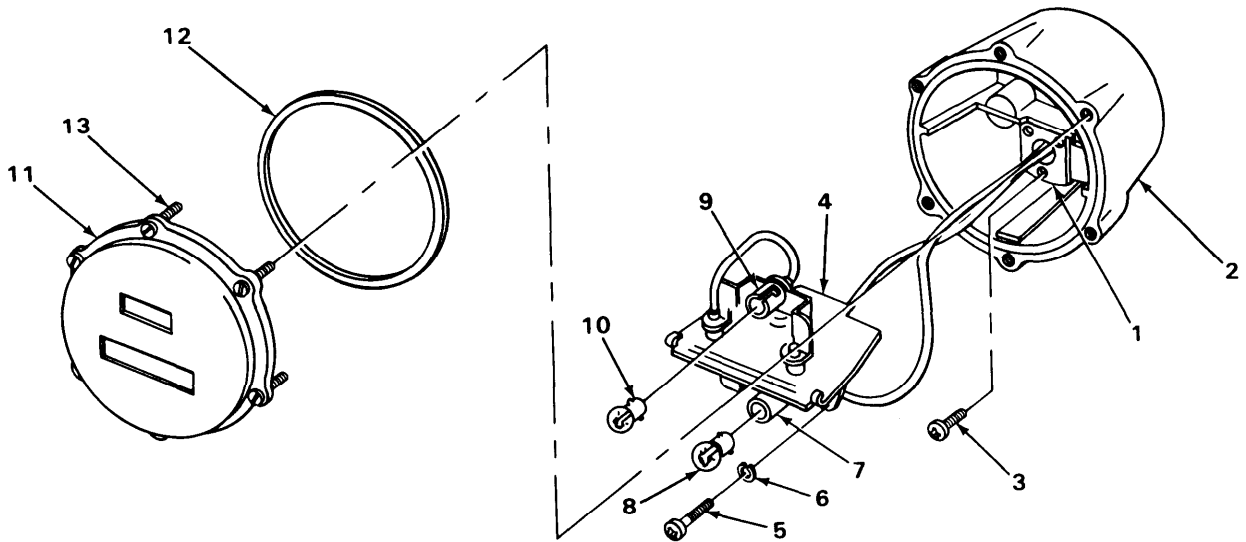
BLACKOUT STOPLIGHT AND TAILLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ASSEMBLY		
15. Light body (2)	Plugs (17) and (18) and leads (15) and (16)	Thread through hole in light body (2) one at a time. Replace plug if necessary.
16.	Grommet (14)	Push in place.
17.	Grommet retainer (12)	Put in place.



BLACKOUT STOPLIGHT AND TAILLIGHT ASSEMBLY - CONTINUED

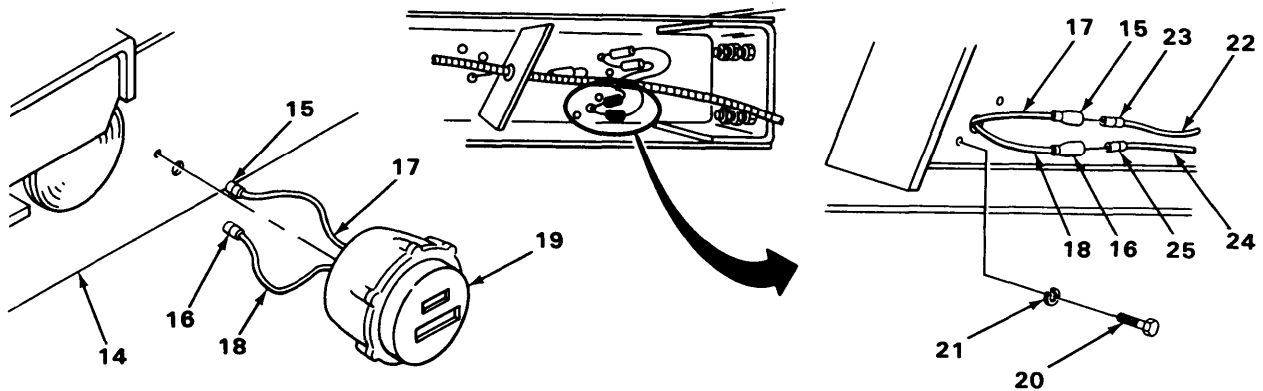
LOCATION	ITEM	ACTION	REMARKS
ASSEMBLY - CONTINUED			
18. Grommet retainer (1) to light body (2)	Three screws (3)	Screw in and tighten using cross-tip screwdriver.	
19. Light body (2)	Lampholder assembly (4)	Push in.	
20. Lampholder assembly (4) to light body (2)	Two screws (5) and washers (6)	Screw in and tighten using cross-tip screwdriver.	
21. Lower lampholder (7)	Marker lamp (8)	Push in and turn one-quarter turn clockwise.	
22. Upper lampholder (9)	Stop lamp (10)	Push in and turn one-quarter turn clockwise.	
23. Door (11)	New packing (12)	Push into place.	
24. Light body (2)	Door (11)	Put on.	
25. Door (11) to light body (2)	Six screws (13)	Screw in and alternately tighten using flat-tip screwdriver.	



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BLACKOUT STOPLIGHT AND TAILLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
26. Rear cross member (14)	Connectors (15) and (16) and leads (17) and (18)	Put through.	
27.	Blackout light (19)	Put in place.	
28. Blackout light (19) to rear cross member (14)	Two screws (20) and new lockwashers (21)	Screw in and tighten using socket, extension, and handle.	
29. Lead 23(17) to wire 678 (22)	Plug (23)	Plug in.	
30. Lead 24 (18) to wire 680 (24)	Plug (25)	Plug in.	



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

FRONT BLACKOUT MARKER LIGHT ASSEMBLY

This task covers:

- a. Removal (page 4-382)
 - b. Disassembly (page 4-383)
 - c. Assembly (page 4-384)
 - d. Installation (page 4-384)
-

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch drive
 Screwdriver, flat-tip, 3/16-inch
 Screwdriver, flat-tip, 1/4-inch
 Socket, 1/2-inch, deep well,
 3/8-inch drive

Materials/Parts

Gasket
 Lockwasher, blackout marker stud
 to fender
 Lockwasher, blackout marker screw
 to fender

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
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NOTE

To change lamp go to disassembly. it is not necessary to remove light assembly to change lamp.

REMOVAL

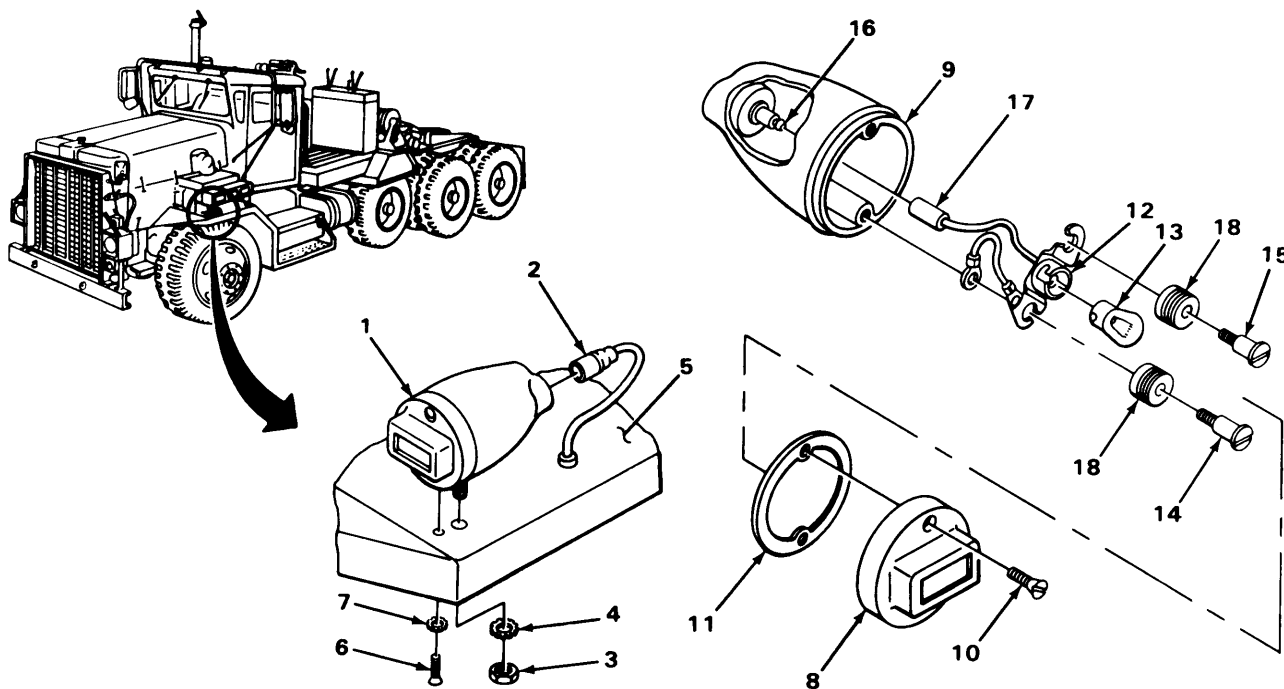
NOTE

Steps in this task apply to either left or right blackout marker light. Left blackout marker light is shown.

- | | | |
|--|------------------------------|---|
| 1. Blackout marker light (1) | Connector (2) | Unplug. |
| 2. | Nut (3) and lockwasher (4) | a. Using socket and handle, unscrew and take off.
b. Get rid of lockwasher (4). |
| 3. Blackout marker light (1) to fender (5) | Screw (6) and lockwasher (7) | a. Using 1/4-inch screwdriver, unscrew and take out.
b. Get rid of lockwasher (7). |
| 4. Fender(5) | Blackout marker light (1) | Take off. |

FRONT BLACKOUT MARKER LIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
DISASSEMBLY		
5. Door (8) to body (9)	Two screws (10)	Using 3/16-inch screwdriver, unscrew and take out.
6. Body (9)	Door (8)	Take off.
7. Door (8)	Gasket (11)	a. Take out. b. Get rid of.
8. Lampholder (12)	Lamp (13)	Push, and turn one-quarter turn counter-clockwise, and take out.
9. Lampholder (12) to body (9)	Two screws (14) and (15)	Using 3/16-inch screwdriver, unscrew and take out.
10. Body (9)	Lampholder (12)	Pull forward enough to gain access to terminal (16).
11. Terminal (16)	Plug (17)	Pull off.
12. Body (9)	Lampholder (12)	Take out.
13. Lampholder (12)	Two insulators (18)	Take off.



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FRONT BLACKOUT MARKER LIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ASSEMBLY		
14. Terminal (1) in body (2)	Plug (3)	Plug in.
15. Lampholder (4)	Two insulators (5)	Put in.
16. Two insulators (5)	Two screws (6 and 7)	Put through.
17. Screw (6)	Lampholder (4) and ground terminal (8)	Put on.
18. Body (2)	Lampholder (4)	Put in.
19.	Two screws (6 and 7)	Using 3/16-inch screwdriver, screw in and tighten.
20. Lampholder (4)	Lamp (9)	Push in and turn one-quarter turn clockwise.
21. Door (10)	New gasket (11)	Push in.
22. Body (2)	Door (10)	Put on with slot at bottom.
23. Door (10) to body (2)	Two screws (12)	Using 3/16-inch screwdriver, screw in and tighten.
INSTALLATION		
24. Front fender (13)	Blackout marker light (14)	Put in place.
25. Blackout marker light (14) to fender (13)	Screw (15) and new lockwasher (16)	Screw in and tighten using 1/4-inch screwdriver.
26.	Nut (17) and new lockwasher (18)	Screw on and tighten using socket and handle.
27. Blackout marker light (14)	Connector (19)	Plug in.

BLACKOUT HEADLIGHT ASSEMBLY

This task covers:

- | | |
|-----------------------------|------------------------------|
| a. Removal (page 4-386) | c. Assembly (page 4-388) |
| b. Disassembly (page 4-366) | d. Installation (page 4-388) |
-

INITIAL SETUP

Tools Handle, ratchet, 3/8-inch drive Knife, pocket Pliers, long-nose Screwdriver, cross-tip, number 2 Screwdriver, flat-tip, 1/4-inch Screwdriver, offset, cross-tip, number 2 Socket, 9/16-inch, 3/8-inch drive	Materials/Parts Gasket Lockwasher, blackout headlight to bracket Packing, preformed Personnel Required One
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LOCATION	ITEM	ACTION	REMARKS
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NOTE

To change lamp go to disassembly. It is not necessary to remove light assembly to change lamp.

REMOVAL

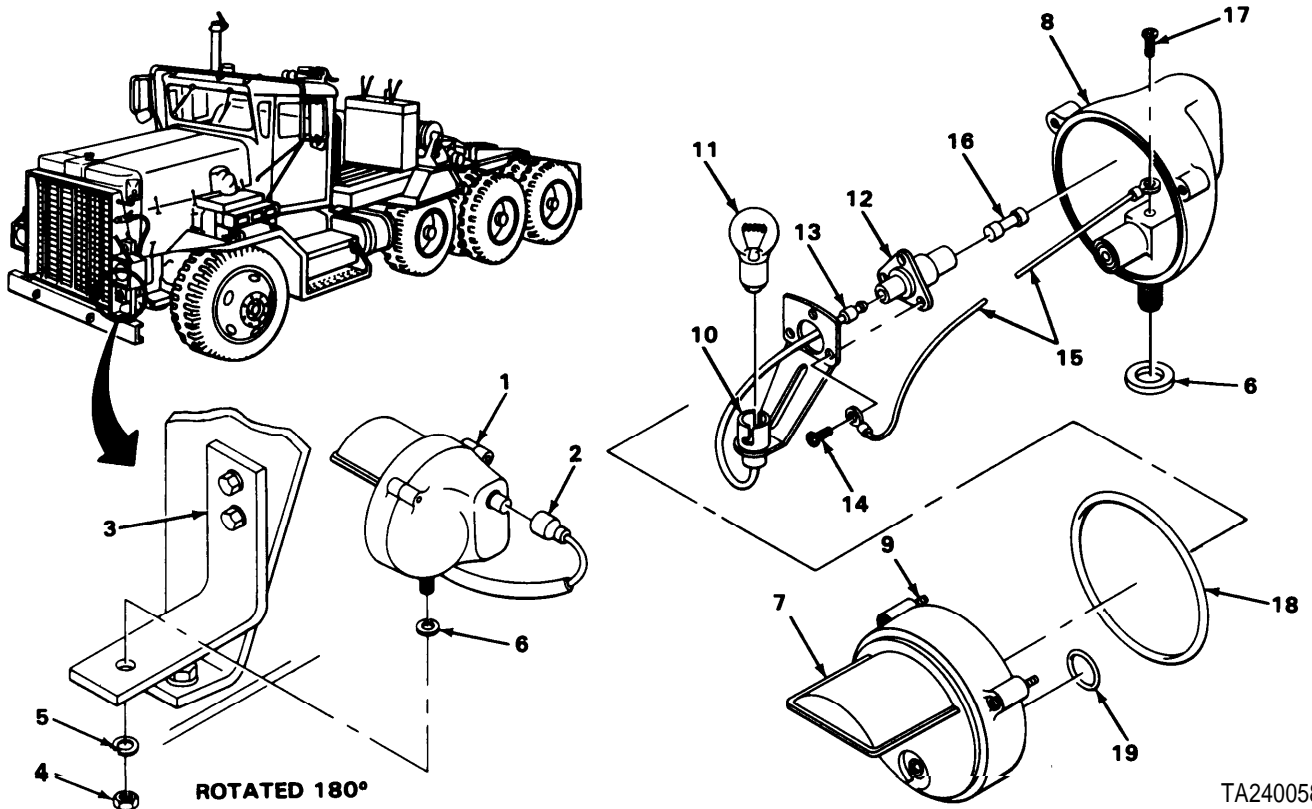
1. Blackout headlight (1)	Connector (2)	Unplug.
2. Blackout headlight (1) to bracket (3)	Nut (4) and lockwasher (5)	a. Using socket and handle, unscrew and take off. b. Get rid of lockwasher (5).
3. Bracket(3)	Blackout headlight (1)	Take off.
4. Blackout headlight (1)	Spacer (6)	Take off.

DISASSEMBLY

5. Door (7) to body (8)	Three screws (9)	Using fiat-tip screwdriver, unscrew.
-------------------------	------------------	--------------------------------------

BLACKOUT HEADLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
6. Body (8)	Door (7)	Take off.	
7. Lampholder (10)	Lamp(n)	Push down, turn one-quarter turn counter-clockwise, and take out.	
8. Connector body (12)	Lampholder lead (13)	Unplug.	
9. Lampholder (10) to body (8)	Three screws (14)	Using cross-tip screwdriver, unscrew and take out.	
10. Connector body (12)	Ground wire (15) and lampholder (10)	Take off.	
11. Body (8)	Connector body (12)	Take out.	
12. Connector body (12)	Connector bushing (16)	Using long-nose pliers, pull out.	
13. Body (8)	Screw (17) and ground wire (15)	Using offset cross-tip screwdriver, unscrew and take out.	
14. Door (7)	Gasket (18) and packing (19)	a. Using pocket knife, take out. b. Get rid of.	

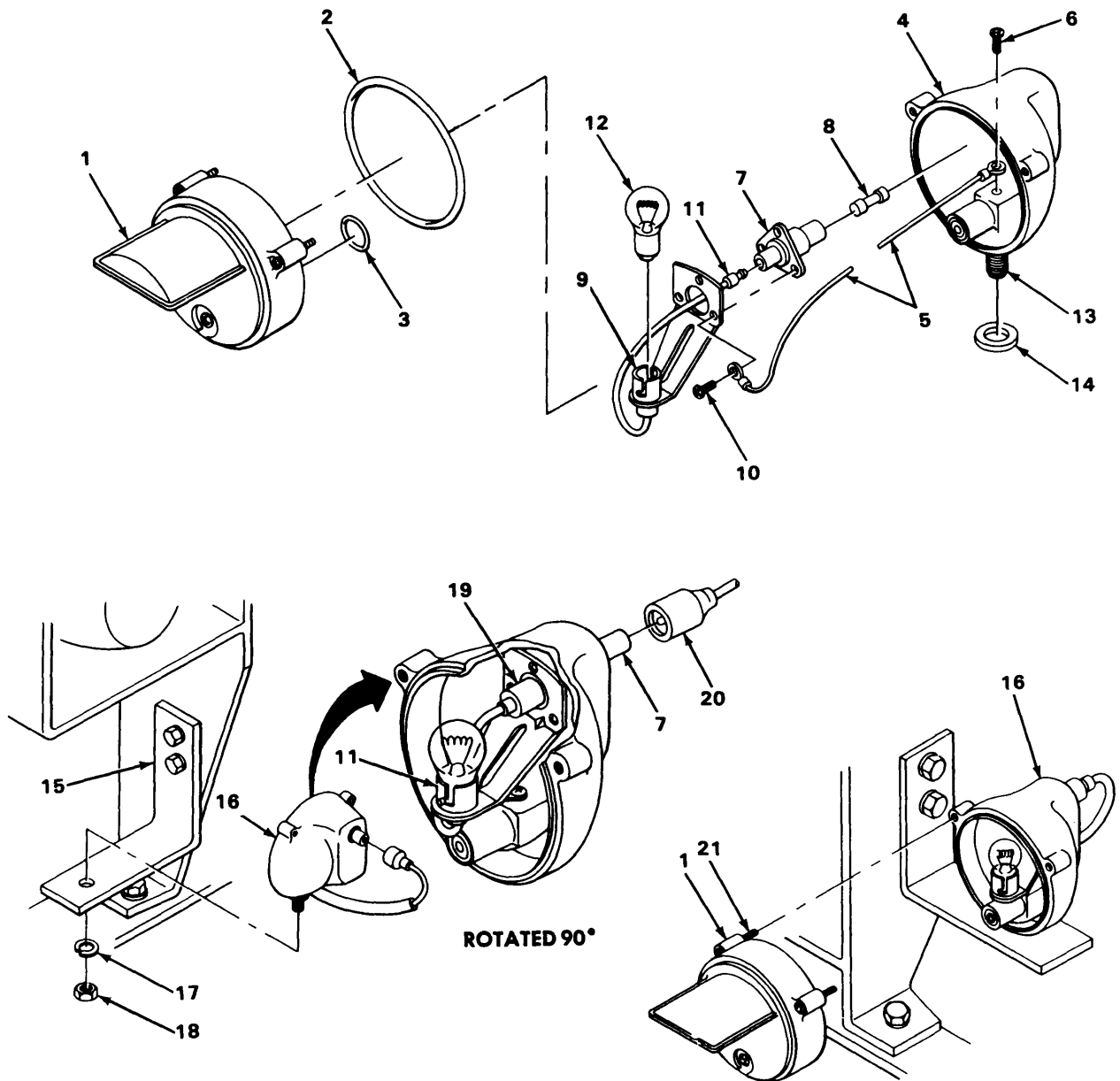


BLACKOUT HEADLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
ASSEMBLY		
15. Door (1)	New gasket (2) and packing (3)	Push into place.
16. Body (4)	Ground wire (5)	Put in place.
17. Ground wire (5) to body (4)	Screw (6)	Screw in and tighten using offset screwdriver.
18. Connector body (7)	Connector bushing (8)	Push in.
19. Body (4)	Connector body (7)	Push in.
20. Connector body (7)	Lampholder (9) and ground wire (5)	Put in.
21. Lampholder (9) to body (4)	Three screws (10)	Screw in and tighten using cross-tip screwdriver.
22. Connector body (7)	Lampholder lead (11)	Plug in.
23. Lampholder (9)	Lamp (12)	Push in and turn one-quarter turn clockwise.
INSTALLATION		
24. Stud (13)	Spacer (14)	Put on.
25. Blackout headlight bracket (15)	Blackout headlight (16)	Put in place.
26. Blackout headlight (16) to bracket (15)	New lockwasher (17) and nut (18)	Using socket and handle, screw on and tighten.
27. Blackout headlight (16)	Plug (19) on lampholder lead (11)	Using long-nose pliers, hold firmly.
28. Connector body (7)	Plug (20)	Push in.

BLACKOUT HEADLIGHT ASSEMBLY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
29. Blackout headlight (16)	Door (1)	Put on.
30. Door (1) to blackout headlight (16)	Three screws (21)	Using flat-tip screwdriver, screw in and tighten.



BLACKOUT HEADLIGHT ASSEMBLY - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

FUEL GAGE SENDING UNIT

This task covers:

- a. Removal (page 4-390)
 - b. Installation (page 4-392)
-

INITIAL SETUP

Tools

- Knife, putty
- Screwdriver, cross-tip, number one
- Screwdriver, flat-tip, 3/16-inch

Materials/Parts

- Cement, gasket (item 2, appendix C)
- Gasket
- Lockwasher, sending unit to wire

Equipment Condition

Battery disconnected (page 4-444).

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

WARNING

No open flames, welding, grinding, smoking, or use of heat producing devices permitted near fuel tank and fuel lines during maintenance unless the fuel tank has been cleaned and purged of all flammable liquids and vapors. Fuel burns easily and fumes are explosive. Keep battery disconnected. Failure to observe these precautions could cause serious injury.

REMOVAL

- | | | |
|---|--|---|
| <p>1. Fuel gage wire (1) to sending unit (2)</p> | <p>Screw (3), lock-washer (4), washer (5) and fuel gage wire (1)</p> | <p>s. Using flat-tip screwdriver, unscrew and take off.
b. Get rid of lockwasher (4).</p> |
| <p>2. Ground wire (6) to sending unit (2) and fuel tank (7)</p> | <p>Screw (8) and ground wire (6)</p> | <p>Using cross-tip screwdriver, unscrew and take off.</p> |

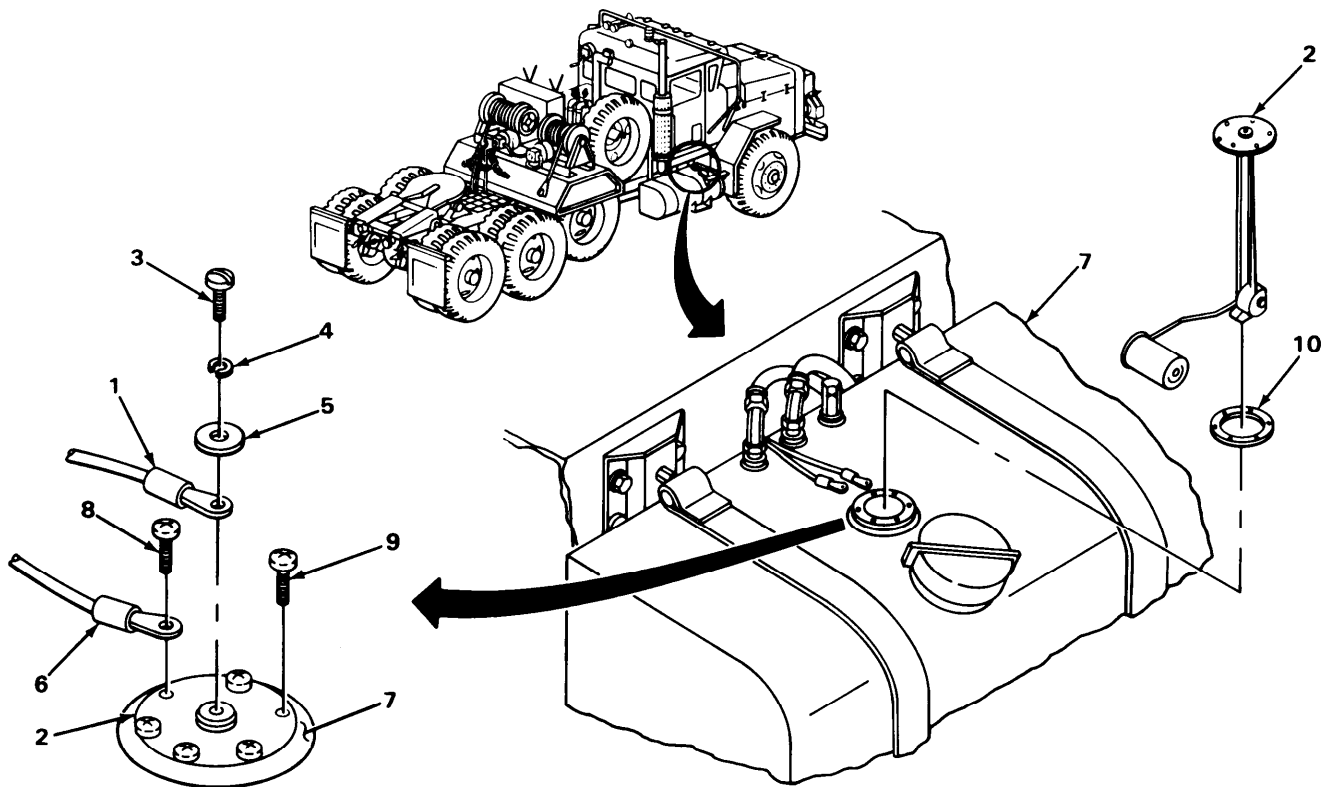
FUEL GAGE SENDING UNIT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
3. Sending unit (2) to fuel tank (7)	Six screws (9)	Using cross-tip screwdriver, unscrew and take out.
4. Fuel tank (7)	Sending unit (2)	Using flat-tip screwdriver, pry loose and take out.

CAUTION

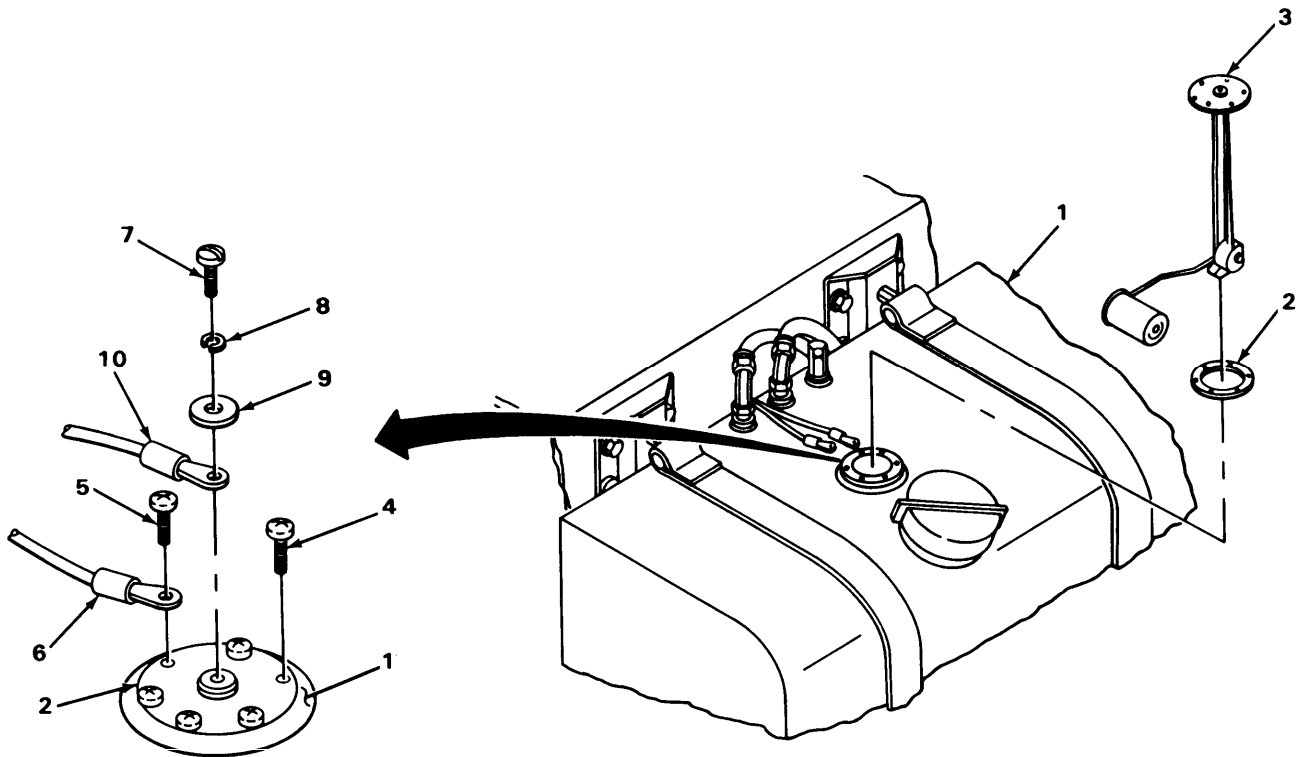
When removing gasket and gasket cement from fuel tank, do not allow debris to enter fuel tank to prevent contaminating fuel system.

5. Fuel tank (7) or sending unit (2)	Gasket (10)	Using putty knife, scrape off gasket material and gasket cement.
--------------------------------------	-------------	--



FUEL GAGE SENDING UNIT - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
6. Fuel tank (1)	New gasket (2)	Apply gasket cement and put in place.	
7.	Sending unit (3)	Put in.	
8. Sending unit (3) to fuel tank (1)	Six screws (4)	Screw in and tighten using cross-tip screwdriver.	
9. Screw (5)	Ground wire (6)	Put on.	
10. Ground wire (6) to sending unit (3) and fuel tank (1)	Screw (5)	Screw in and tighten using cross-tip screwdriver.	
11. Screw (7)	New lockwasher (8), washer (9), and wire (10)	Put on.	
12. Wire (10) to sending unit (3)	Screw (7)	Screw in and tighten using flat-tip screwdriver.	



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FUEL GAGE SENDING UNIT - CONTINUED

NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

OIL PRESSURE SENDING UNIT AND LOW OIL PRESSURE SWITCH

This task covers:

- | | |
|--------------------------|------------------------------|
| a. Removal (page 4-393) | c. Inspection (page 4-396) |
| b. Cleaning (page 4-395) | d. Installation (page 4-396) |
-

INITIAL SETUP

<p>Tools</p> <p>Vise</p> <p>Wrench, adjustable</p> <p>Wrench, open-end, 3/8-inch</p> <p>Wrench, open-end, 5/8-inch</p> <p>Wrench, open-end, 1 1/16-inch</p> <p>Wrench, pipe, 1/4 – 1 inch</p>	<p>Personnel Required</p> <p>One</p> <p>Equipment Condition</p> <p>Left hood open and left hood side panel removed (TM 9-2320-270-1 O).</p>
---	---

Materials/Parts

- Lockwasher, sending unit terminal nut to terminal
 - Rags, wiping (item 10, appendix C)
 - Solvent, cleaning (item 16, appendix C)
 - Tag, marking (item 18, appendix C)
 - Tape, teflon (item 22, appendix C)
-

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

If you only need to replace the oil gage sending unit, only do steps 1 thru 3 and 22 thru 24. If you only need to replace the oil pressure switch, only do steps 4,5,20, and 21.

Tag wires according to general maintenance instructions (page 4-1).

OIL PRESSURE SENDING UNIT AND LOW OIL PRESSURE SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
1. Wire 113 (1) to sending unit (2)	Nut (3) and lockwasher (4)	a. Using 3/8-inch wrench, unscrew and take off. b. Get rid of lockwasher (4).
2. Terminal (5)	Wire 113 (1), nut (6), and washer (7)	Take off.
3. Tee (8)	Sending unit (2)	Using adjustable wrench, unscrew and take out.
4. Low oil pressure switch (9)	Wire 525 (10)	Unplug.
5. Tee (8)	Low oil pressure switch (9)	Using 1 1/16-inch wrench, unscrew and take out.
6. Reducer (11)	Tee (8)	a. Using 5/8-inch and pipe wrenches, unscrew and take off. b. If nipple (12) stayed in tee (8) and is damaged, secure tee (8) in vise. c. Using pipe wrench, unscrew and take out nipple (12). d. Get rid of nipple (12).
7.	Nipple (12)	a. If nipple stayed in reducer (11) and is damaged, using pipe and 5/8-inch wrenches, unscrew and take out. b. Get rid of.
8. Block fitting (13)	Reducer (11)	Using 5/8-inch and 1 1/16-inch wrenches, unscrew and take out.
9. Engine block (14)	Block fitting (13)	Using 1 1/16-inch wrench, unscrew and take out.

OIL PRESSURE SENDING UNIT AND LOW OIL PRESSURE SWITCH - CONTINUED

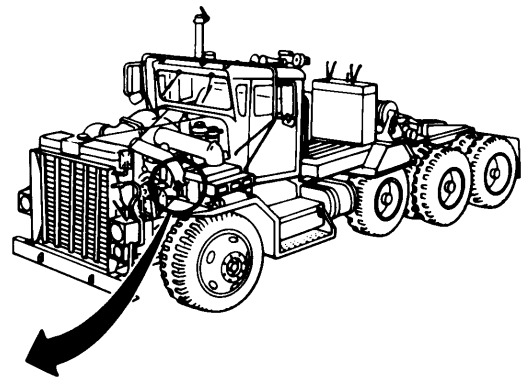
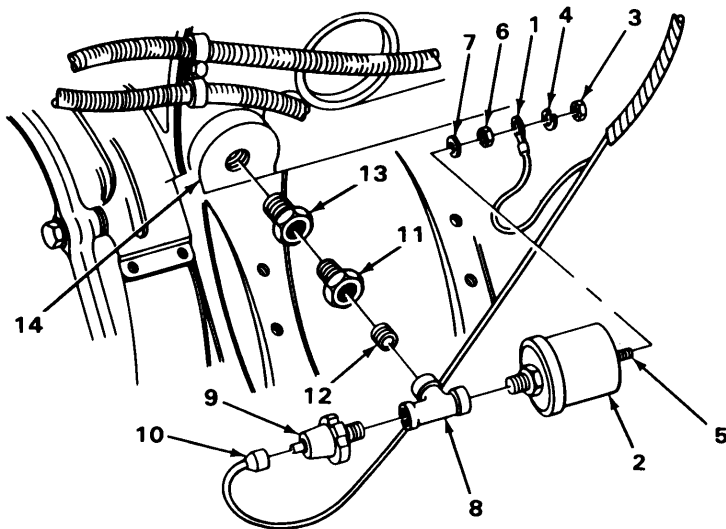
LOCATION	ITEM	ACTION	REMARKS
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CLEANING

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flashpoint is 100°F to 138°F (38° to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

- | | | |
|-----|---|---|
| 10. | All metal parts except sending unit (2) and low oil pressure switch (9) | <ul style="list-style-type: none"> a. Clean in drycleaning solvent. b. Wipe dry with clean, dry rags. |
| 11. | Sending unit (2) and low oil pressure switch (9) | <ul style="list-style-type: none"> a. Using clean rag dampened with dry-cleaning solvent. b. Wipe dry with clean, dry rags. |

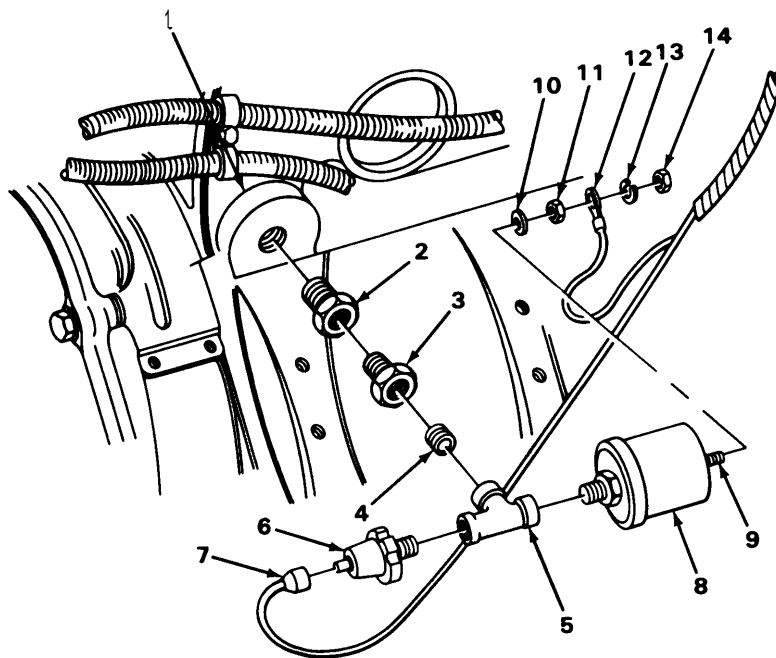


OIL PRESSURE SENDING UNIT AND LOW OIL PRESSURE SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSPECTION		
12.	All parts	Inspect for stripped threads, cracks, and breaks. Replace damaged parts.
INSTALLATION		
13. Engine block (1)	Block fitting (2)	a. Wrap threads with teflon tape (page 4-1). b. Screw in and tighten using 1 1/16-inch wrench.
14. Block fitting (2)	Reducer (3)	a. Wrap threads with teflon tape (page 4-1). b. Screw in and tighten using 5/8-inch wrench.
15. Reducer (3)	Nipple (4)	a. Wrap thread with teflon tape (page 4-1). b. Screw in finger tight.
16. Nipple (4)	Tee (5)	Screw on and tighten using pipe wrench. Make sure tee is in horizontal position when tightened.
17. Tee (5)	Low oil pressure switch (6)	a. Wrap threads with teflon tape (page 4-1). b. Screw in and tighten using 1 1/16-inch wrench.
18. Low oil pressure switch (6)	Wire 525 (7)	Plug in.
19. Pipe tee (5)	Sending unit (8)	a. Wrap threads with teflon tape (page 4-1). b. Screw in and tighten using adjustable wrench.

OIL PRESSURE SENDING UNIT AND LOW OIL PRESSURE SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
20. Terminal (9)	Washer (10), nut (11), wire 113 (12) and new lockwasher(13)	Put on.
21.	Nut (14)	Screw on and tighten using 3/8-inch wrench.



NOTE

FOLLOW-ON MAINTENANCE:

1. Check operation (TM 9-2320-270-10).
2. Install left hood side panel and close left side of hood (TM 9-2320-270-10).

TASK ENDS HERE

TRANSMISSION OIL TEMPERATURE SENDING UNIT

This task covers:

- a. Removal (page 4-398)
 - b. Cleaning/Inspection (page 4-398)
 - c. Installation (page 4-399)
-

INITIAL SETUP

Tools

- Extension, 3-inch, 3/8-inch drive
- Handle, ratchet, 1/2-inch drive
- Socket, 7/8-inch, 1/2-inch drive
- Wrench, box, 3/8-inch
- Universal, 1/2-inch drive

Materials/Parts

- Lockwasher, terminal nut to terminal
- Rags, wiping (item 10, appendix C)
- Solvent, cleaning (item 16, appendix C)
- Tape, teflon (item 22, appendix C)

Personnel Required

One

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

REMOVAL

- | | | |
|-------------------------------------|--|--|
| 1. Oil temperature sending unit (1) | Nut (2), lockwasher (3), wire 422 (4), and two washers (5 and 6) | a. Using 3/8-inch wrench, unscrew and take off.
b. Get rid of lockwasher (3). |
| 2. Retarder valve body (7) | Oil temperature sending unit (1) | Using socket, handle, universal, and extension, unscrew and take off. |

CLEANING/INSPECTION

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flashpoint is 100°F to 138°F (38° to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

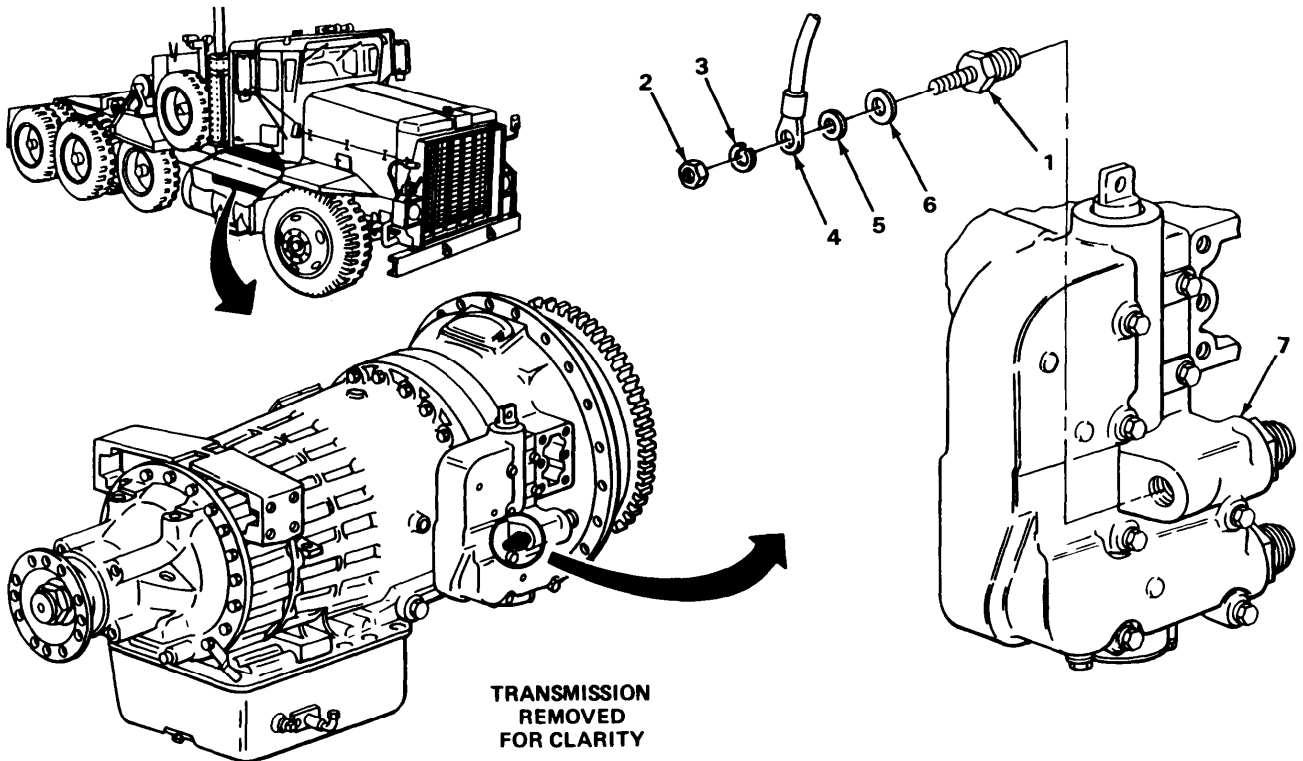
- | | | |
|----|----------------------------------|---|
| 3. | Oil temperature sending unit (1) | a. Using clean rag dampened with dry-cleaning solvent, wipe clean.
b. Wipe dry with clean, dry rags. |
|----|----------------------------------|---|

TRANSMISSION OIL TEMPERATURE SENDING UNIT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
4.	Oil temperature sending unit (1)	Look for stripped or damaged threads, loose terminal, or cracked enamel. If defective, replace.

INSTALLATION

5. Retarder valve body (7')	Oil temperature sending unit (1)	a. Wrap large threads with teflon tape (page 4-1). b. Screw in and tighten using socket, universal, ratchet handle and extension.
6. Oil temperature sending unit (1)	Two washers (6 and 5), wire 422 (4), and new lockwasher (3)	Put on.
7.	Nut (2)	Screw on and tighten using 3/8-inch wrench.



TRANSMISSION OIL TEMPERATURE SENDING UNIT - CONTINUED

INSTALLATION – CONTINUED

NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

PRIMARY AIR SYSTEM LOW PRESSURE SWITCH

This task covers:

- | | |
|-------------------------------------|------------------------------|
| a. Removal (page 4-400) | c. Installation (page 4-401) |
| b. Cleaning/Inspection (page 4-401) | |
-

INITIAL SETUP

Tools	Personnel Required
Brush, wire	One
Wrench, open-end, 1 1/16-inch	
Materials/Parts	Equipment Condition
Tape, teflon (item 22, appendix C)	Air pressure drained (TM 9-2320-270-10).

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

REMOVAL

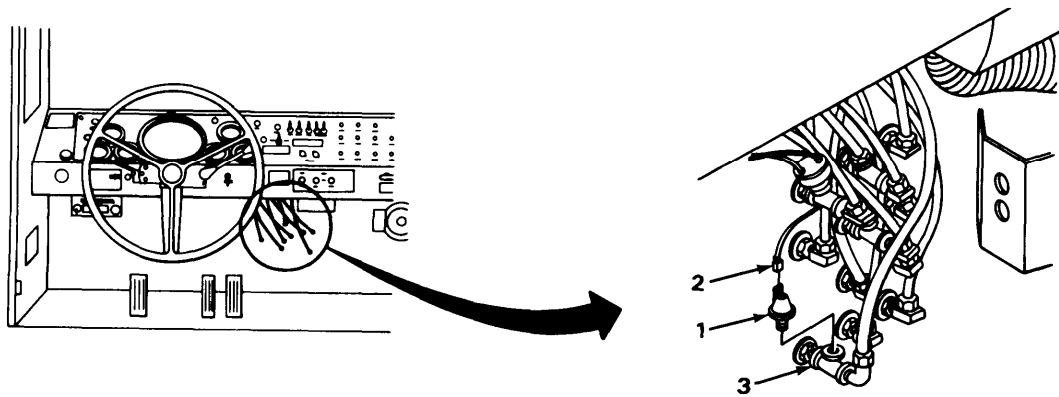
WARNING

Make sure all pressure is drained from air system before taking off switch. Parts under pressure can, when removed, fly off with great force, causing injury to personnel.

- | | | |
|---|-------------------------|---|
| 1. Primary system low pressure switch (1) | Wire 120 (2) | Unplug. |
| 2. Tee (3) | Low pressure switch (1) | Using 1 1/16-inch wrench, unscrew and take out. |

PRIMARY AIR SYSTEM LOW PRESSURE SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
CLEANING/INSPECTION		
3.	Low pressure switch (1)	a. Using wire brush, clean all old sealer from threads. b. Inspect for stripped or damaged threads. If threads are damaged, replace.
4.	Tee (3)	Inspect for stripped or damaged threads. If threads are damaged, replace.
INSTALLATION		
5. Tee (3)	Low pressure switch (1)	a. Wrap threads with teflon tape. (page 4-1). b. Screw in and tighten using 1 1/16-inch wrench.
6. Low pressure switch (1)	Wire 120 (2)	Plug in.



NOTE

FOLLOW-ON MAINTENANCE:

1. Check for leaks (page 4-1).
2. Check operation (TM 9-2320-270-10).

TASK ENDS HERE

SECONDARY AIR SYSTEM LOW PRESSURE SWITCH

This task covers:

- a. Removal (page 4-402)
 - b. Cleaning/Inspection (page 4-402)
 - c. Installation (page 4-403)
-

INITIAL SETUP

Tools	Personnel Required
Brush, wire	One
Screwdriver, flat-tip, 3/6-inch	
Wrench, open-end, 1 1/16-inch	Equipment Condition
Materials/Parts	Air pressure drained (TM 9-2320-270-10). instrument panel open (page 4-244).
Tape, teflon (item 22, appendix C)	

		ACTION
LOCATION	ITEM	REMARKS

REMOVAL

WARNING

Make sure all pressure is drained from air system before taking off switch. Parts under pressure can, when removed, fly off with great force causing injury to personnel.

1. Secondary system low pressure switch (1)	Wire 120 (2)	Unplug.
2. Tee (3)	Low pressure switch (1)	Using 1 1/16-inch wrench, unscrew and take out.

CLEANING/INSPECTION

3.	Low pressure switch (1)	a. Using wire brush, clean all old sealer from threads. b. Inspect for stripped or damaged threads. If threads are stripped or damaged, replace.
4.	Tee (3)	inspect for stripped or damaged threads. If threads are stripped or damaged, replace.

SECONDARY AIR SYSTEM LOW PRESSURE SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
5.	Low air pressure switch (1)	a. Wrap threads with teflon tape (page 4-1). b. Screw in and tighten using 1 1/16-inch wrench.
6. Low air pressure switch (1)	Wire 120 (2)	Plug in.

NOTE

FOLLOW-ON MAINTENANCE:

1. Check for leaks (page 4-1).
2. Check operation (TM 9-2320-270-10).
3. Close instrument panel (page 4-244).

TASK ENDS HERE

INTERAXLE DIFFERENTIAL AND TRANSFER CASE WARNING LIGHT SWITCH

This task covers:

- a. Removal (page 4-404)
 - b. Cleaning/Inspection (page 4-405)
 - c. Installation (page 4-406)
-

INITIAL SETUP

Tools

Brush, wire
 Screwdriver, flat-tip, 1/4-inch
 Wrench, open-end, 5/8-inch
 Wrench, open-end, 1 1/16-inch

Personnel Required

One

Equipment Condition

Air pressure drained (TM 9-2320-270-10).

Materials/Parts

Lockwasher (two required)
 Tape, teflon (item 22, appendix C)

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

REMOVAL

WARNING

Make sure all pressure is drained from air system before taking off switch. Parts under pressure can, when removed, fly off with great force causing injury to personnel.

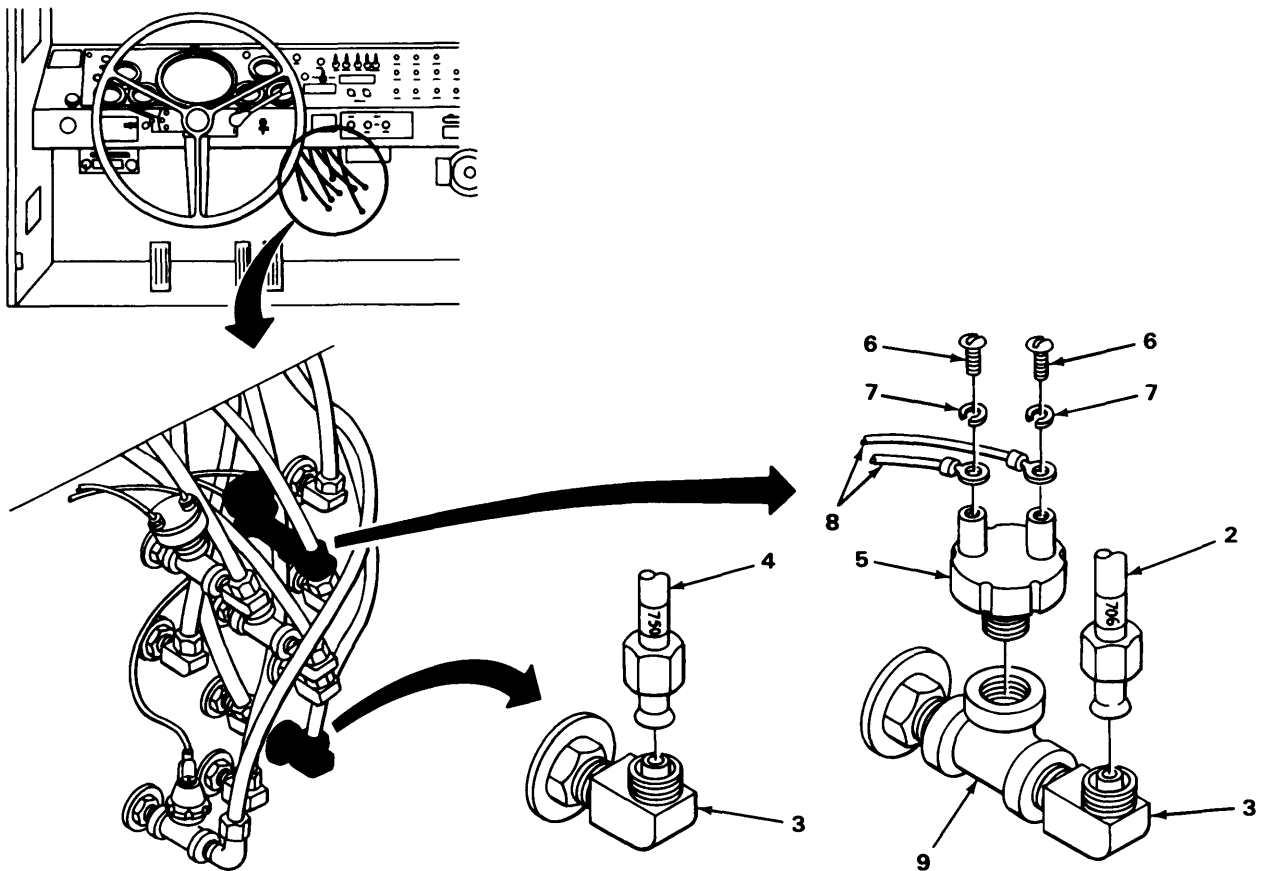
1. Elbow (1)	Air line 706(2)	Using 5/8-inch wrench, unscrew and take off.
2. Elbow (3)	Air line 750 (4)	Using 5/8-inch wrench, unscrew and take off.
3. Switch (5)	Two screws (6), lockwashers (7), and wires 423 (8)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwashers (7).
4. Tee (9)	Switch (5)	Using 1 1/16-inch wrench, unscrew and take out.

INTERAXLE DIFFERENTIAL AND TRANSFER CASE WARNING LIGHT SWITCH - CONTINUED

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

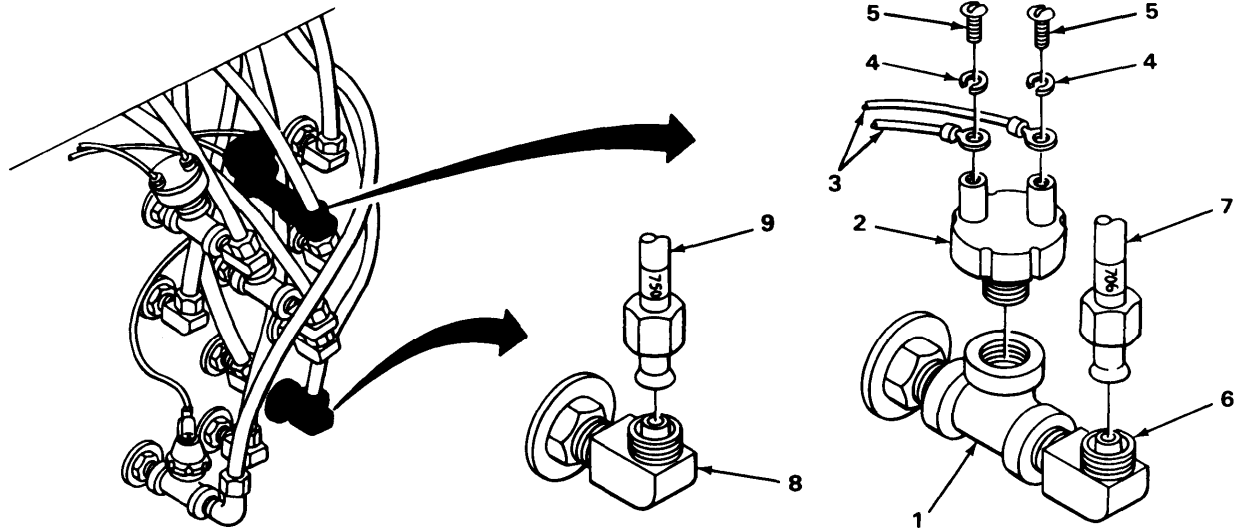
CLEANING/INSPECTION

- | | | | |
|----|------------|---|---|
| 5. | Switch (5) | a. Using wire brush, clean all old sealer from threads. | b. Inspect for stripped or damaged threads.
If threads are stripped or damaged, replace. |
| 6. | Tee (9) | Inspect for stripped or damaged threads.
Replace if damaged. | |



INTERAXLE DIFFERENTIAL AND TRANSFER CASE WARNING LIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSTALLATION			
7. Tee (1)	Switch (2)	a. Wrap threads with teflon tape (page 4-1). b. Screw in and tighten using 1 1/16-inch wrench.	
8. Switch (2)	Two wires 423 (3), new lockwashers (4), and screws (5)	Screw on and tighten using screwdriver.	
9. Elbow (6)	Air line 706 (7)	Screw on and tighten using 5/8-inch wrench.	
10. Elbow (8)	Air line 750(9)	Screw on and tighten using 5/6-inch wrench.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Check for leaks (page 4-1).
2. Check operation (TM 9-2320-270-10).

TASK ENDS HERE

TA240068

TREADLE VALVE STOPLIGHT SWITCH

This task covers:

- a. Removal (page 4-407)
 - b. Cleaning/Inspection (page 4-408)
 - c. Installation (page 4-408)
-

INITIAL SETUP

Tools

Brush, wire
 Wrench, open-end, 1 1/32-inch
 Wrench, open-end, 3/4-inch

Personnel Required

One

Equipment Condition

Materials/Parts

Lockwasher, stoplight switch terminal
 (two required)
 Tag, marking (item 18, appendix C)
 Tape, teflon (item 22, appendix C)

Air pressure drained
 TM 9-2320-270-10).
 Left side hood open and left side panel
 removed (TM 9-2320-270-10).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Make sure all pressure is drained from air system before taking off switch. Parts under pressure can, when removed, fly off with great force causing injury to personnel.

NOTE

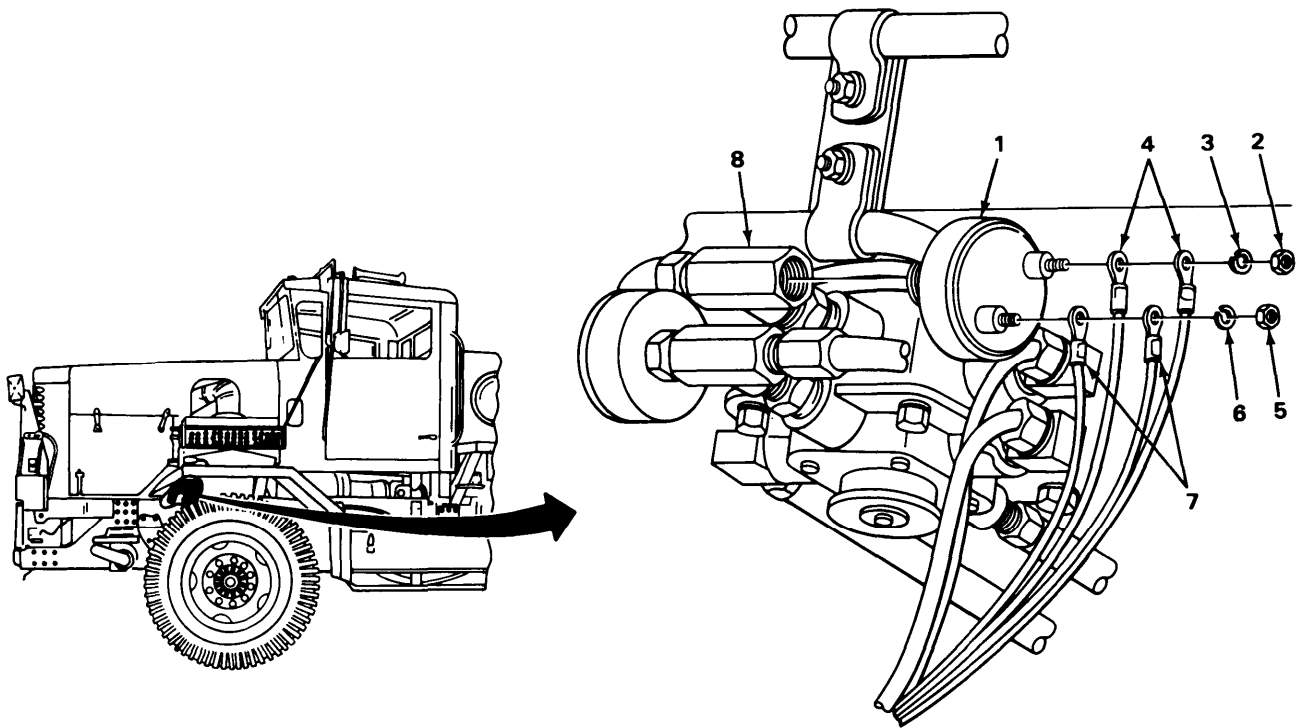
Except as noted the steps in this task apply to either primary or secondary air system stoplight switch. Primary stoplight switch is shown. See Appendix F for wire numbers and location.

Tag wires according to general maintenance instructions (page 4-1).

TREADLE VALVE STOPLIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL – CONTINUED		
1. Stoplight switch (1)	Nut (2), lockwasher (3), and two wires 005 (4)	a. Using 1 1/32-inch wrench, unscrew and take off. b. Get rid of lockwasher (3).
2.	Nut (5), lockwasher (6), and two wires 009 (7)	a. Using 1 1/32-inch wrench, unscrew and take off. b. Get rid of lockwasher (6).
3. Tee (8)	Stoplight switch (1)	Using 3/4-inch wrench, unscrew and take off.
CLEANING/INSPECTION		
4.	Stoplight switch (1)	a. Using wire brush, clean all old sealer. b. Inspect for stripped or damaged threads. If threads are stripped or damaged, replace.
5.	Tee (8)	Inspect for stripped or damaged threads. If threads are stripped or damaged, replace.
INSTALLATION		
6. Tee (8)	Stoplight switch (1)	a. Wrap threads with teflon tape (page 4-1). b. Screw in and tighten using 3/4-inch wrench.
7. Stoplight switch (1)	Two wires 005 (4), new lockwasher (3), and nut (2)	Screw on and tighten using 1 1/32-inch wrench.
8.	Two wires 009 (7), new lockwasher (6), and nut (5)	Screw on and tighten using 1 1/32-inch wrench.

TREADLE VALVE STOPLIGHT SWITCH - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

TRAILER BRAKE STOPLIGHT SWITCH

This task covers:

- a. Removal (page 4-410)
 - b. Cleaning/Inspection (page 4-410)
 - c. Installation (page 4-411)
-

INITIAL SETUP

Tools

- Brush, wire
- Wrench, open-end, 3/8-inch
- Wrench, open-end, 3/4-inch

Personnel Required

One

Equipment Condition

Materials/Parts

Air pressure drained (TM 9-2320-270-10).

- Lockwasher, terminal (two required)
 - Tag, marking (item 18, appendix C)
 - Tape, teflon (item 22, appendix C)
-

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

REMOVAL

WARNING

Make sure all pressure is drained from air system before taking off switch. Parts under pressure can, when removed, fly off with great force causing injury to personnel.

NOTE

Tag wires according to general maintenance instructions (page 4-1).

- | | | |
|---------------------------------|--|--|
| 1. Wire 359(1) to terminal (2) | Nut (3), lock-washer (4), and wire 359 (1) | s. Using 3/8-inch wrench, unscrew and take off.
b. Get rid of lockwasher (4). |
| 2. Wire 360 (5) to terminal (6) | Nut (7), lock-washer (8), and wire 360 (5) | s. Using 3/8-inch wrench, unscrew and take off.
b. Get rid of lockwasher (8). |
| 3. Tee(9) | Stoplight switch (10) | Using 3/4-inch wrench, unscrew and take out. |

CLEANING/INSPECTION

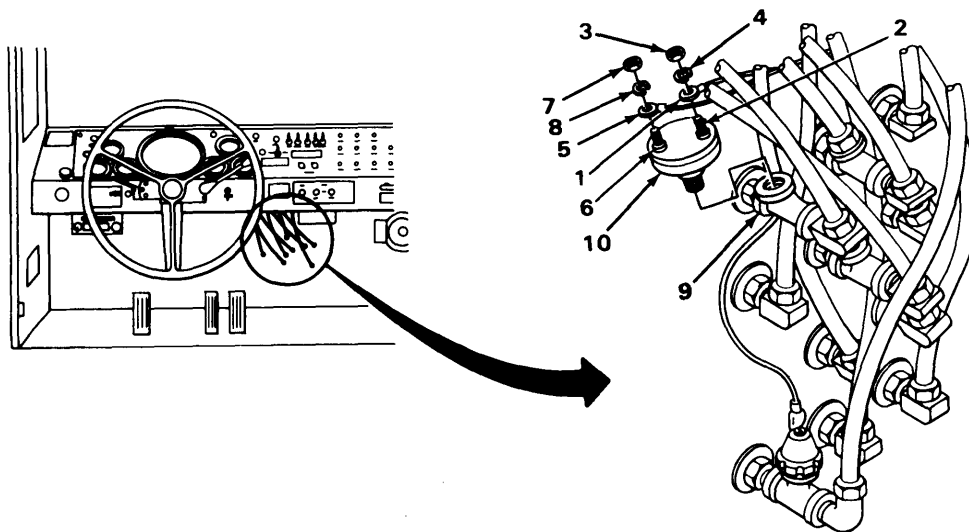
- | | | |
|----|-----------------------|---|
| 4. | Stoplight switch (10) | Using wire brush, clean off all old sealer. |
|----|-----------------------|---|

TRAILER BRAKE STOPLIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
5.	Stoplight switch (10)	Inspect for stripped or damaged threads.	If threads are stripped or damaged, replace.
6.	Tee (9)	Inspect for stripped or damaged threads.	If threads are stripped or damaged, replace.

INSTALLATION

- | | | |
|-----------------|---|--|
| 7. Tee (9) | Stoplight switch (10) | <ul style="list-style-type: none"> a. Wrap threads with teflon tape (page 4-1). b. Screw in and tighten using 3/4-inch wrench. |
| 8. Terminal (6) | Wire 360 (5), new lockwasher (8), and nut (7) | Screw on and tighten using 3/8-inch wrench. |
| 9. Terminal (2) | Wire 359 (1), lockwasher (4), and nut (3) | Screw on and tighten using 3/8-inch wrench. |



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

TA240070

PTO NEUTRAL SAFETY SWITCH

This task covers:

- a. Removal (page 4-412)
 - b. Cleaning/Inspection (page 4-412)
 - c. Installation (page 4-413)
-

INITIAL SETUP

Tools

Screwdriver, flat-tip, 3/16-inch
Wrench, box, 7/8-inch

Materials/Parts

Lockwasher, terminal screw
Packing, safety switch
Tag, marking (item 18, appendix C)

Personnel Required

One

Equipment Condition

Power take off in neutral
(TM 9-2320-270-10).

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

REMOVAL

NOTE

Tag wires according to general maintenance instructions (page 4-1).

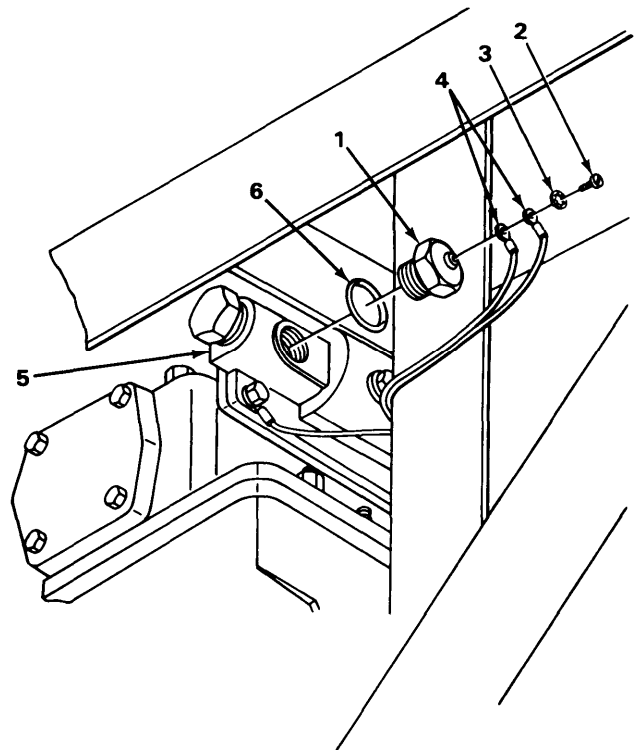
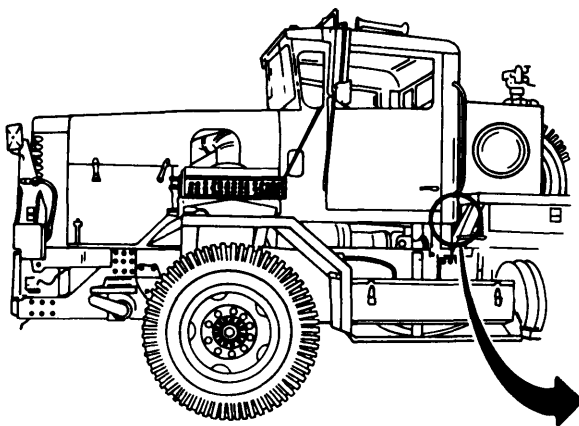
- | | | |
|------------------------------|---|--|
| 1. Neutral safety switch (1) | Screw (2), lock-washer (3), and two wires (4) | s. Using screwdriver, unscrew and take off.
b. Get rid of lockwasher (3). |
| 2. PTO housing (5) | Neutral safety switch (1) | Using wrench, unscrew and take off. |
| 3. Neutral safety switch (1) | Packing (6) | a. Take off.
b. Get rid of. |

CLEANING AND INSPECTION

- | | | |
|----|---------------------------|---|
| 4. | Neutral safety switch (1) | Clean and inspect according to general maintenance instructions (page 4-1). |
|----|---------------------------|---|

PTO NEUTRAL SAFETY SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
5. Neutral safety switch (1)	blew packing (6)	Put on.
6. PTO housing (5)	Neutral safety switch (1)	Screw in and tighten using wrench.
7. Screw (2)	New lockwasher (3) and two wires (4)	Put on.
8. Neutral safety switch (1)	Screw (2)	Screw in and tighten using screwdriver.



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

AUXILIARY TRANSMISSION NEUTRAL SAFETY SWITCH

This task covers:

- a. Removal (page 4-414)
 - b. Cleaning/Inspection (page 4-415)
 - c. Installation (page 4-415)
-

INITIAL SETUP

Tools

- Screwdriver, flat-tip, 1/4-inch
- Wrench, box, 1 2/8-inch

Materials/Parts

- Gasket
- Lockwasher, terminal screw (two required)
- Tag, marking (item 18, appendix C)

Personnel Required

One

Equipment Condition

Auxiliary transmission in gear (TM 9-2320-270-10).

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

REMOVAL

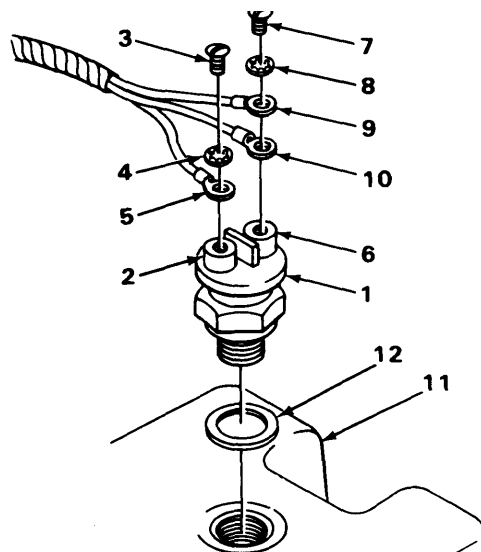
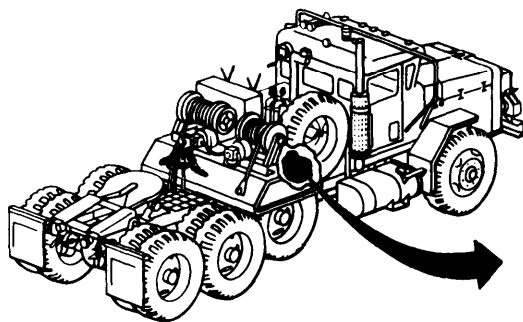
NOTE

Tag wires according to general maintenance instructions (page 4-1).

1. Neutral safety switch (1) terminal (2)	Screw (3), lock-washer (4), and wire 154 (5)	s. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (4).
2. Terminal (6)	Screw (7), lock-washer (8), wire 458 (9), and wire 154A (10)	s. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (8).
3. Auxiliary transmission (11)	Neutral safety switch (1)	Using wrench, unscrew and take out.
4. Neutral safety switch (1)	Gasket (12)	a. Take off. b. Get rid of.

AUXILIARY TRANSMISSION NEUTRAL SAFETY SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
CLEANING/INSPECTION		
5.	Neutral safety switch (1)	Clean and inspect according to general maintenance instructions (page 4-1).
INSTALLATION		
6. Neutral safety switch (1)	New gasket (12)	Put on.
7. Auxiliary transmission (11)	Neutral safety switch (1)	Screw in and tighten using wrench.
8. Screw (7)	New lockwasher (8), wire 458 (9), and wire 154A (10)	Put on.
9. Terminal (6)	Screw (7)	Screw in and tighten using screwdriver.
10. Screw (3)	New lockwasher (4) and wire 154 (5)	Put on.
11. Terminal (2)	Screw (3)	Screw in and tighten using screwdriver.



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

TA240072

WATER TEMPERATURE SENDING UNIT

This task covers:

- a. Removal (page 4-416)
 - b. Cleaning/Inspection (page 4-416)
 - c. Installation (page 4-417)
-

INITIAL SETUP

<p>Tools</p> <p>Brush, wire Pan, drain, 3-gallon Wrench, open-end, 1 1/32-inch Wrench, open-end, 1-inch Wrench, open-end, 1 1/16-inch</p> <p>Materials/Parts</p> <p>Lockwasher, terminal nut</p>	<p>Materials/Parts – Continued</p> <p>Tape, teflon (item 22, appendix C)</p> <p>Personnel Required</p> <p>One</p> <p>Equipment Condition</p> <p>Left hood side panel removed (TM 9-2320-270-10).</p>
--	--

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

WARNING

Do not remove sending unit while engine is hot. Hot coolant can cause burns to personnel.

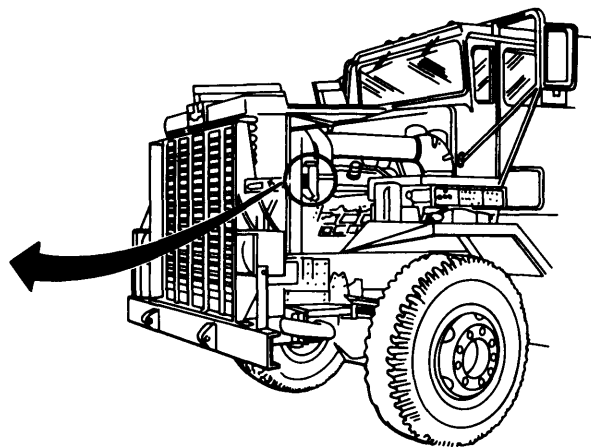
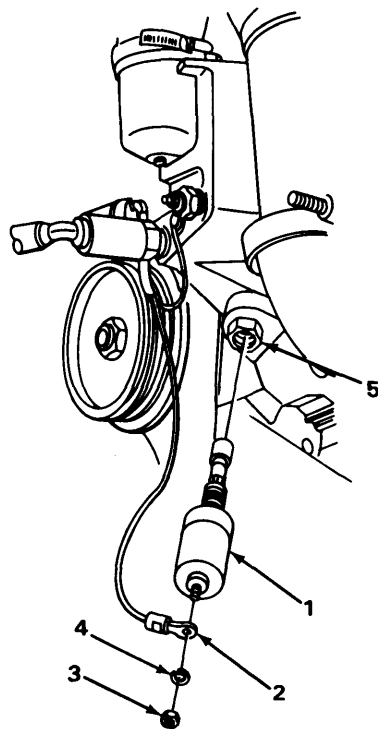
- | | | |
|----------------------------|--|---|
| <p>1. Sending unit (1)</p> | <p>Wire 032 (2), nut (3), lockwasher (4)</p> | <p>a. Using 1 1/32-inch wrench, unscrew and take off.
b. Get rid of lockwasher (4).</p> |
| <p>2. Adapter (5)</p> | <p>Sending unit (1)</p> | <p>a. Place drain pan underneath.
b. Using 1-inch and 1 1/16-inch wrenches, unscrew and take out.
c. Get rid of fluid (page 4-1).</p> |

CLEANING/INSPECTION

- | | | |
|-----------|-------------------------|--|
| <p>3.</p> | <p>Sending unit (1)</p> | <p>a. Using wire brush, clean off old sealer.
b. Inspect for stripped or damaged threads.
If threads are damaged, replace.</p> |
|-----------|-------------------------|--|

WATER TEMPERATURE SENDING UNIT - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
4. Adapter(5)	Sending unit (1)	a. Wrap threads with teflon tape (page 4-1). b. Screw in and tighten using 1-inch and 1 1/16-inch wrenches.
5. Sending unit (1)	Wire 032 (2), new lockwasher (4), and nut (3)	Screw on and tighten using 1 1/32-inch wrench.



NOTE

FOLLOW-ON MAINTENANCE:

1. Fill cooling system (TM 9-2320-270-10).
2. Check operation (TM 9-2320-270-10).
3. Install left hood side panel and close left side of hood (TM 9-2320-270-10).

TASK ENDS HERE

HIGH WATER TEMPERATURE SWITCH

This task covers:

- a. Removal (page 4-418)
 - b. Cleaning/Inspection (page 4-419)
 - c. Installation (page 4-419)
-

INITIAL SETUP

Tools

- Brush, wire
- Pan, drain, 3-gallon
- Wrench, box, 3/8-inch
- Wrench, box, 7/8-inch

Materials/Parts

- Tape, teflon (item 22, appendix C)
- Lockwasher, terminal nut

Personnel Required

One

Equipment Condition

Side hood open and left hood side panel removed (TM 9-2320-270-10).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

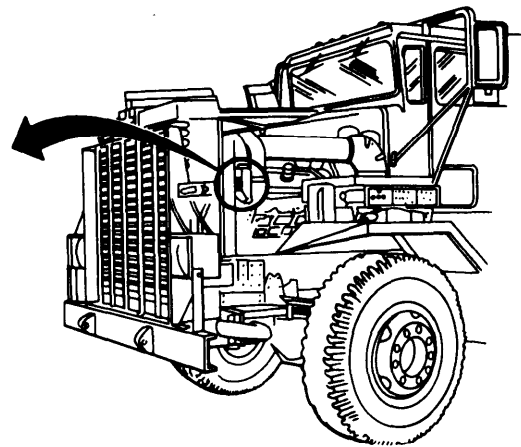
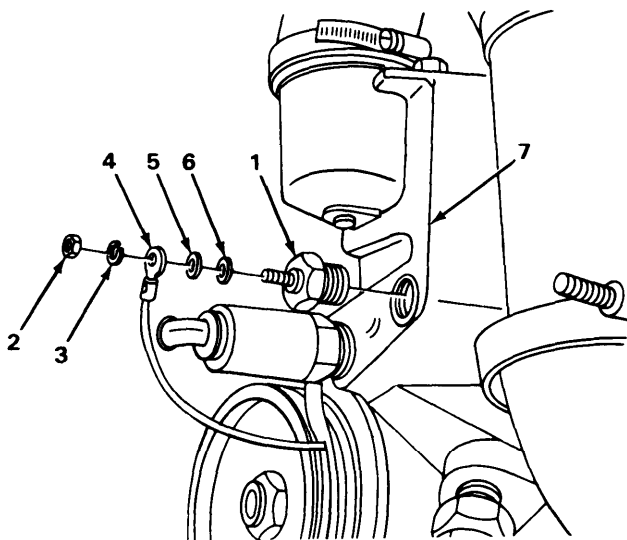
WARNING

Do not remove high water temperature switch while engine is hot. Hot coolant can cause burns to personnel.

- | | | |
|---|---|--|
| <p>1. High water temperature switch (1)</p> | <p>Nut (2), lockwasher (3), wire 320 (4), washer (5), and insulator (6)</p> | <p>a. Using 3/8-inch wrench, unscrew and take off.
b. Get rid of lockwasher (3).</p> |
| <p>2. Thermostat housing (7)</p> | <p>High water temperature switch (1)</p> | <p>a. Place drainpan underneath.
b. Using 7/8-inch wrench, unscrew and take out.
c. Get rid of fluid (page 4-1).</p> |

HIGH WATER TEMPERATURE SWITCH -CONTINUED

LOCATION	ITEM	ACTION	REMARKS
CLEANING/INSPECTION			
3.	High water temperature switch (1)	a. Using wire brush, clean off old sealing tape. b. Inspect switch for stripped or damaged threads and cracks. Replace damaged switch.	
INSTALLATION			
4. Thermostat housing (7)	High water temperature switch (1)	a. Wrap threads with teflon tape (page 4-1). b. Screw in and tighten using 7/6-inch wrench.	
5. High water temperature switch (1)	Wire 320 (4), new lockwasher (3), washer (5), insulator (6), and nut (2)	Screw on and tighten using 3/8-inch wrench.	



N O T E

FOLLOW-ON MAINTENANCE:

1. Fill cooling system (TM 9-2320-270-10).
2. Install left hood side panel and close left side of hood (TM 9-2320-270-10).

TASK ENDS HERE

TA240074

SPEEDOMETER AND TACHOMETER SENDING UNIT

This task covers:

- a. Removal (page 4-420)
 - b. Installation (page 4-421)
-

INITIAL SETUP

Tools	Equipment Condition
Screwdriver, flat-tip, 1/4-inch Wrench, open-end, 1 1/16-inch	Right side of hood open (TM 9-2320-270-10).
Personnel Required	
One	

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

NOTE

Steps in this task apply to both speedometer sending units, located on transfer case, and tachometer sending unit, located on engine. Tachometer sending unit is shown.

Speedometer and tachometer sending units look the same. Speedometer sending unit has 1,169 stamped on it. Tachometer sending unit has 1,002 stamped on it.

REMOVAL

- | | | |
|--------------------------------------|------------------|--|
| 1. Sending unit (1) | Cable (2) | Unscrew and unplug. |
| 2. Sending unit (1)
to adapter(3) | Nut (4) | Using 1 1/16-inch wrench, unscrew counterclockwise until sending unit (1) is loose from adapter (3). |
| 3. Adapter(3) | Sending unit (1) | Take off. |
| 4. Sending unit (1) | Nut (4) | Unscrew clockwise and take off. |

SPEEDOMETER AND TACHOMETER SENDING UNIT - CONTINUED

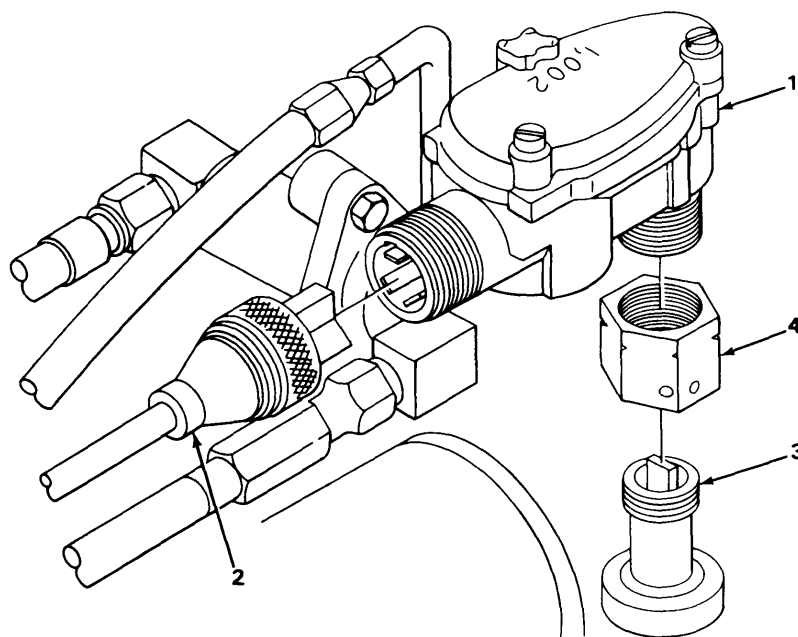
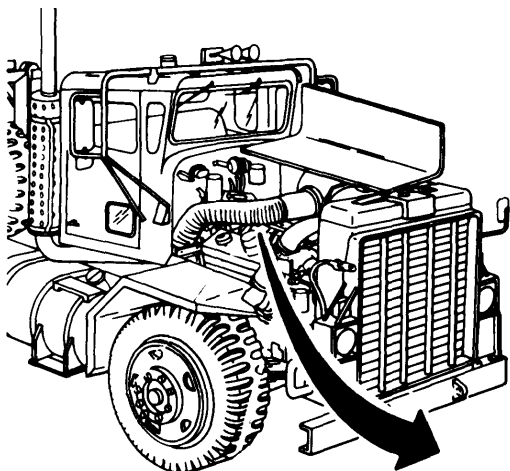
LOCATION	ITEM	ACTION REMARKS
----------	------	-------------------

INSTALLATION

NOTE

Make sure you have correct sending unit. Tachometer sending unit has 1,002 stamped on its top. Speedometer sending unit has 1,169 stamped on its top.

- | | | |
|--------------------------------------|------------------|--|
| 5. Sending unit (1) | Nut (4) | Screw on counterclockwise, one or two threads. |
| 6. Adapter(3) | Sending unit (1) | a. Using screwdriver, aline tongue and slot.
b. Put on.
If sending unit does not seat enough to start nut, tongue and slot are not alined. |
| 7. Sending unit (1)
to adapter(3) | Nut (4) | Screw clockwise and tighten using 1 1/16-inch wrench. |
| 8. Sending unit (1) | Cable (2) | a. Plug in.
b. Screw on and tighten. |



TA240075

SPEEDOMETER AND TACHOMETER SENDING UNIT - CONTINUED

INSTALLATION – CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Check operation (TM 9-2320-270-10).
2. Close right side of hood (TM 9-2320-270-10).

TASK ENDS HERE

ENGINE SHUTDOWN SOLENOID, LINK, AND LEVER

This task covers:

- | | |
|---|--|
| <ul style="list-style-type: none"> a. Removal (page 4-423) b. Installation (page 4-424) | <ul style="list-style-type: none"> c. Adjustment (page 4-428) |
|---|--|
-

INITIAL SETUP

Tools

- Extension, 5-inch, 3/8-inch drive
- Gage set, thickness
- Hammer, hand, rubber
- Handle, ratchet, 3/8-inch drive
- Joint, universal, 3/8-inch drive
- Lifter, battery terminal
- Pliers, slip-joint
- Rule machinist's
- Socket, 7/16-inch, 3/8-inch drive
- Socket, 1/2-inch, 3/8-inch drive
- Socket, 9/16-inch, 3/8-inch drive
- Wrench, box, 7/16-inch
- Wrench, open-end, 1 1/32-inch
- Wrench, open-end, 7/16-inch

Materials/Parts

- Lockwasher, shutdown lever
- Lockwasher, solenoid plunger to link

Materials/Parts – Continued

- Lockwasher, solenoid to mounting bracket (four required)
- Lockwasher, solenoid bracket to thermostat housing
- Washer, mounting bracket support to blower housing (two required)
- Tag, marking (item 18, appendix C)

Personnel Required

One

Equipment Condition

Right side of hood open and right side panel removed (TM 9-2320-270-10).

LOCATION	ITEM	ACTION REMARKS
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NOTE

To remove and install solenoid without removing link and lever, do steps 1 thru 10, 26 thru 34, and 43 thru 56. To remove and install link and lever without removing solenoid, do steps 4 thru 6, 11 thru 15, and 35 thru 56.

ENGINE SHUTDOWN SOLENOID, LINK, AND LEVER - CONTINUED

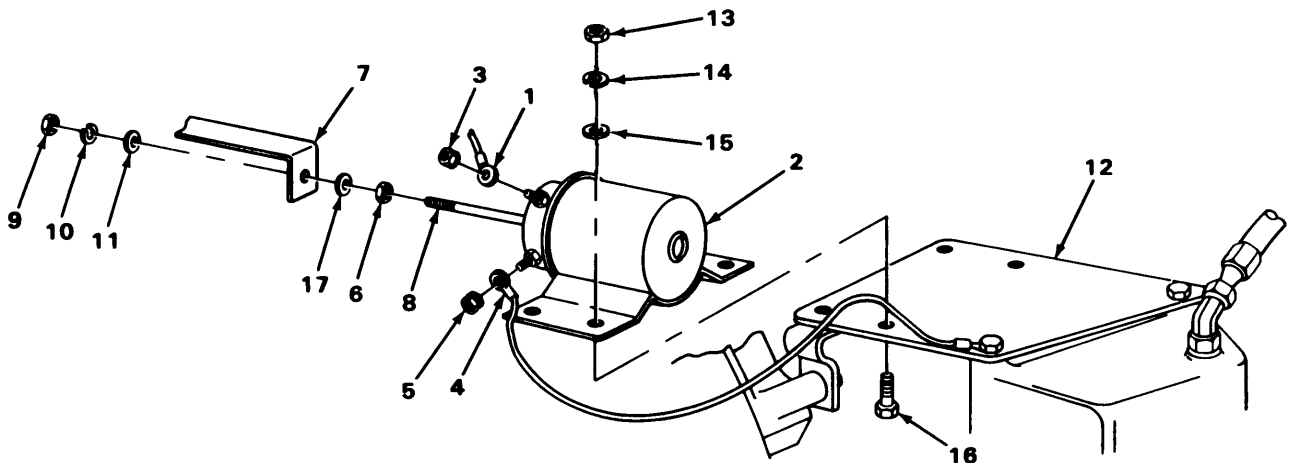
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

NOTE

Tag wires according to general maintenance instructions (page 4-1).

- | | | | |
|----|---|---|---|
| 1. | Wire 19 (1) to shutdown solenoid (2) | Nut (3) and wire 19(1) | Using 1 1/32-inch wrench, unscrew and take off. |
| 2. | Ground wire (4) to shutdown solenoid (2) | Nut (5) and ground wire (4) | Using 1 1/32-inch wrench, unscrew and take off. |
| 3. | Link locknut (6), link (7) to solenoid plunger (8) | Nut (9), lockwasher (10), and washer (11) | a. Using 7/16-inch box and open-end wrenches, unscrew and take off.
b. Get rid of lockwasher (10). |
| 4. | Shutdown solenoid (2) | Solenoid plunger(8) | Push in. |
| 5. | Shutdown solenoid (2) to shutdown solenoid bracket (12) | Four nuts (13), lockwashers (14), washers (15), and screws (16) | a. Using 7/16-inch box wrench, 7/16-inch, 3/8-inch drive socket, extension, universal joint, and handle, unscrew and take off.
b. Get rid of lockwashers (14). |
| 6. | Solenoid plunger (8) | Link (7) | Take off. |
| 7. | | Link locknut (6) and washer (17) | Using pliers and 7/16-inch open-end wrenches, unscrew and take off. |
| 8. | Shutdown solenoid bracket (12) | Shutdown solenoid (2) | Take off. |



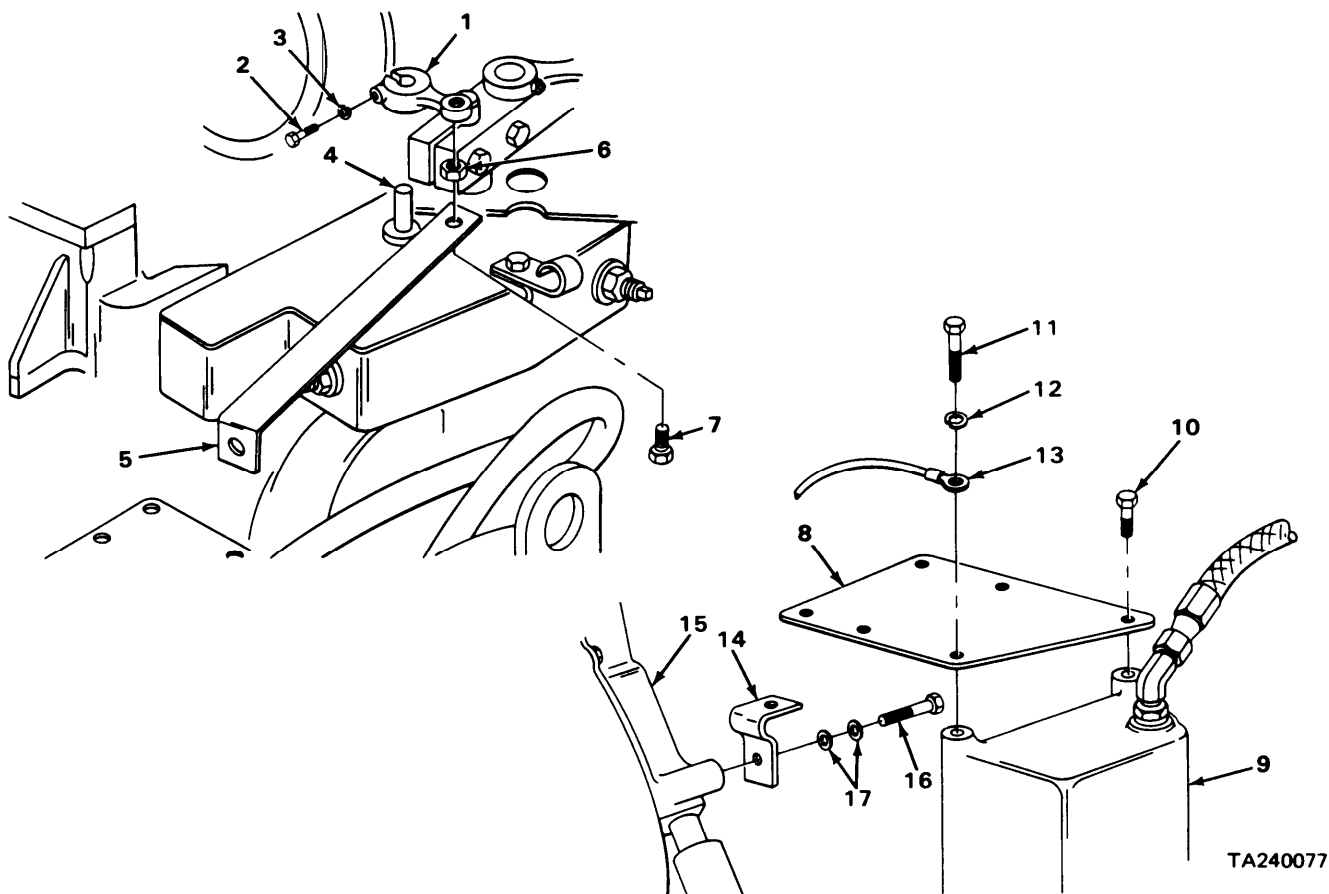
TA240076

ENGINE SHUTDOWN SOLENOID, LINK, AND LEVER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL – CONTINUED		
9. Shutdown lever (1)	Clamp screw (2) and lockwasher (3)	a. Using 7/16-inch socket with 3/8-inch drive, and 3/8-inch drive extension and handle, unscrew and take out. b. Get rid of lockwasher (3).
10. Shutdown lever shaft (4)	Shutdown lever (1)	Using battery terminal lifter, pull off.
11. Shutdown link (5) to shutdown lever (1)	Locking nut (6)	Using 7/16-inch open-end wrench, loosen.
12.	Screw (7)	Using 7/16-inch open-end wrench, unscrew and take off.
13. Screw (7) and shutdown link (5)	Locking nut (6)	Unscrew and take off.
14.	Shutdown link (5)	Take off.
15. Shutdown solenoid bracket (8) to thermostat housing (9)	Screw (10)	Using 9/16-inch socket and handle, unscrew and take off.
16.	Screw (11), lockwasher (12), and ground wire 19 (13)	a. Using 9/16-inch socket and handle, unscrew and take off. b. Get rid of lockwasher (12).
17. Thermostat housing (9) and solenoid bracket support (14)	Shutdown solenoid bracket (8)	Lift off.
18. Blower housing (15)	Screw (16), two washers (17), and solenoid bracket support (14)	a. Using 1/2-inch socket, handle, and extension, unscrew and take off. b. Get rid of washers (17).
INSTALLATION		
19. Blower housing (15)	Solenoid bracket support (14)	Put in place.

ENGINE SHUTDOWN SOLENOID, LINK, AND LEVER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
20. Solenoid bracket support (14) to blower housing (15)	Screw (16) and two new washers (17)	Screw in, but do not tighten.
21. Thermostat housing (9) and solenoid bracket support (14)	Shutdown solenoid bracket (8)	Put in place.
22. Shutdown solenoid bracket (8) to thermostat housing (9)	Screw (10)	Screw in, but do not tighten.
23.	Screw (11), new lockwasher (12), and ground wire 19 (13)	Screw in and tighten using 9/16-inch socket and handle.
24.	Screw (10)	Using 9/16-inch socket and handle, tighten.

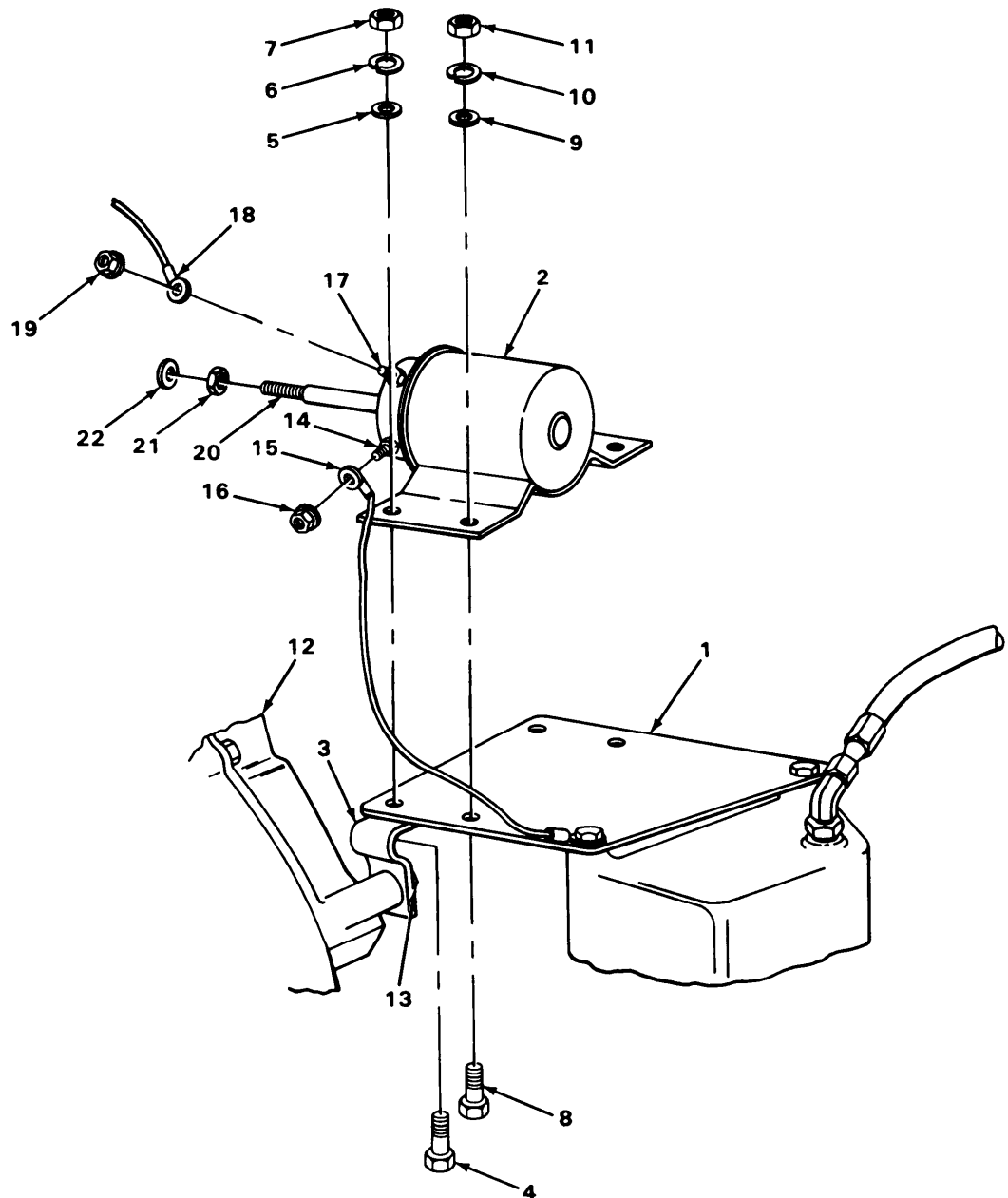


ENGINE SHUTDOWN SOLENOID, LINK, AND LEVER - CONTINUED

	LOCATION	ITEM	ACTION REMARKS
INSTALLATION - CONTINUED			
25.	Shutdown solenoid bracket (1)	Shutdown solenoid (2)	Put in place.
26.	Shutdown solenoid (2) to shutdown solenoid bracket (1) and support (3)	Screw (4), washer (5), new lock-washer (6), and nut (7)	Screw in but do not tighten.
27.	Shutdown solenoid (2) to shutdown solenoid bracket (1)	Three screws (8), washers (9), new lockwashers (10), and nuts (11)	Screw in and tighten using 7/16-inch box wrench and 7/16-inch socket, handle and extension.
28.	Shutdown solenoid (2) to shutdown solenoid bracket (1) and support (3)	Screw (4) and nut (7)	Using 7/16-inch box wrench and 7/16-inch socket, handle, universal joint, and extension, tighten.
29.	support (3) to blower housing (12)	Screw (13)	Using 1/2-inch socket and handle, tighten.
30.	Lower solenoid terminal (14)	Ground wire 19(15)	Put on.
31.		Nut (16)	Screw on and tighten using 1 1/32-inch wrench.
32.	Upper solenoid terminal (17)	Wire 19 (18)	Put on.

ENGINE SHUTDOWN SOLENOID, LINK, AND LEVER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
33.	Nut (19)	Screw on and tighten using 1 1/32-inch wrench.
34. Solenoid plunger (20)	Nut (21) and washer (22)	Screw on all the way.



ENGINE SHUTDOWN SOLENOID, LINK, AND LEVER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION - CONTINUED		
35. Link (1)	Screw (2), locking nut (3), and shutdown lever (4)	a. Screw on. b. Using thickness gage, adjust gap between locking nut (3) and link (1) to at least .031 inch (.79 millimeters). c. Using 7/16-inch open-end and box wrenches, tighten nut (3) against shutdown lever (4).
36. Screw (5)	New lockwasher (6)	Put on.
37. Shutdown lever (4)	Clamp screw (5)	Screw in but do not tighten.
38. Solenoid plunger (7)	Link (1)	Put on.
39. Shutdown shaft (8)	Shutdown lever (4)	Line up splines and using rubber hammer, tap on.
40. Solenoid plunger (7)	Washer (9) and new lockwasher (10)	Put on.
41.	Nut (11)	Screw on, but do not tighten.

ADJUSTMENT

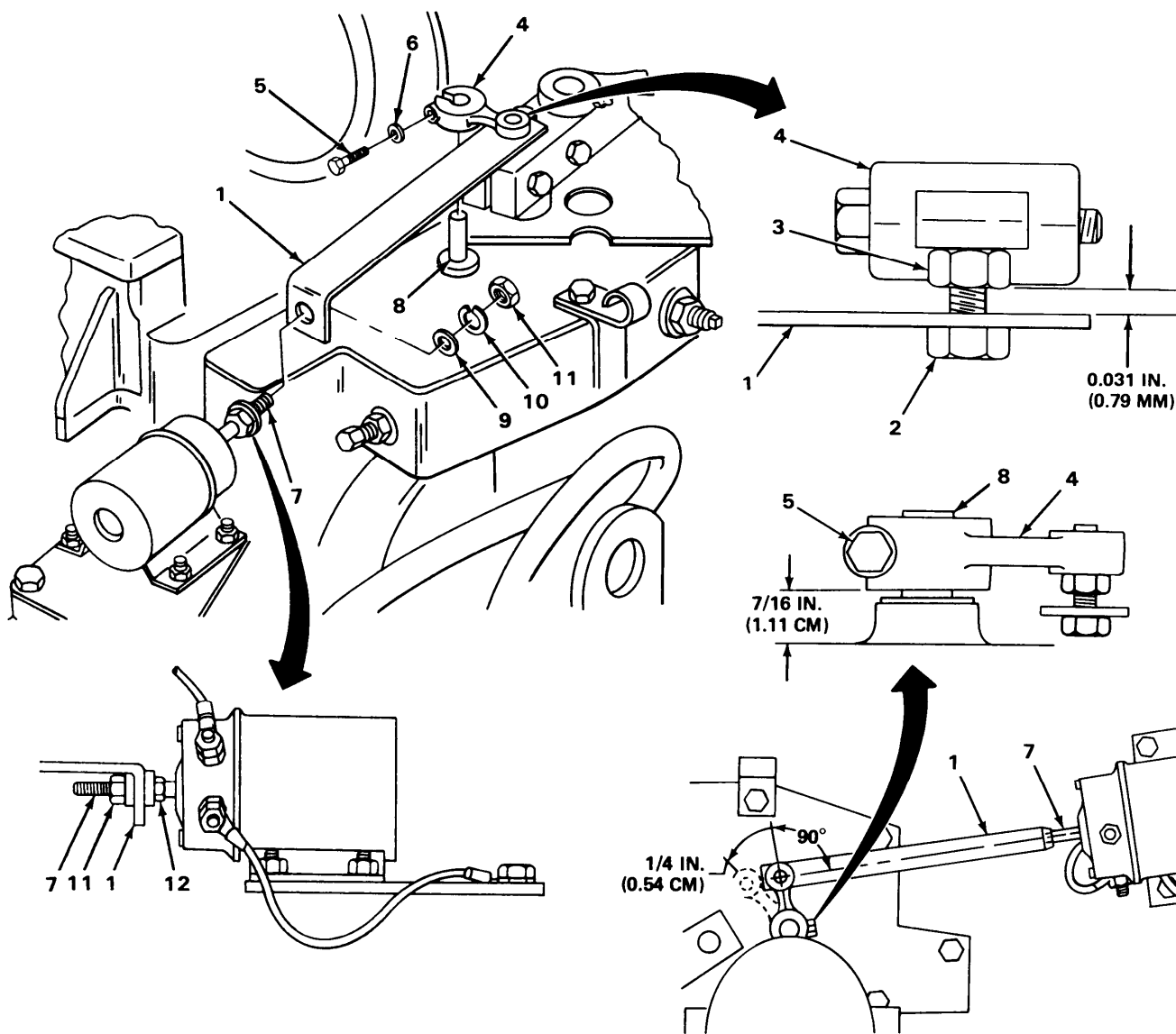
WARNING

Do not start engine until shutdown solenoid works properly, without binding. If shutdown solenoid linkage is not properly adjusted, engine maybe impossible to shutdown resulting in engine runaway condition which could cause serious injury or death.

42. Shutdown shaft (8)	Shutdown lever (4)	a. Using machinists rule, adjust height to 7/16-inch (1.1 1 centimeters) above governor top. b. Move lever (2) to right angles of link (1). c. Using machinists rule to measure, turn lever (2) 1/4-inch (1.1 1 centimeters) counterclockwise.
43. Shutdown lever (4)	Clamp screw (5)	Using 7/16-inch socket, extension, and handle, tighten.
44. Shutdown lever (4) to solenoid plunger(7)	Link (1)	Push away from solenoid (7).

ENGINE SHUTDOWN SOLENOID, LINK, AND LEVER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
45. Solenoid plunger (7)	Locknut (12)	Screw against link (1).
46.	Nut (11)	Screw up against link (1).
47.	Locknut (12) and nut (11)	Using 7/16-inch open-end and box wrenches, tighten nut (11).



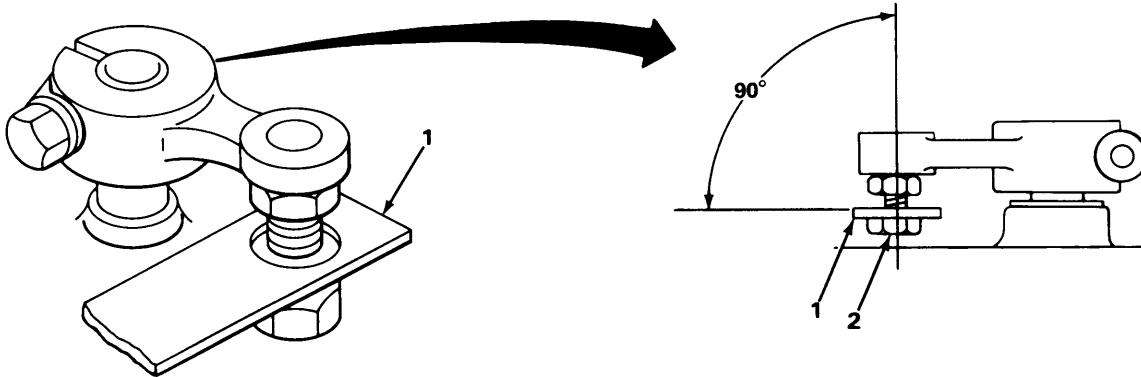
TA240079

ENGINE SHUTDOWN SOLENOID, LINK, AND LEVER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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ADJUSTMENT – CONTINUED

48. Link (1) Turn right angles to lever screw (2).



NOTE

FOLLOW-ON MAINTENANCE:

1. Check operation (TM 9-2320-270-10).
2. Close right side of hood and install right side panel (TM 9-2320-270-10).

TASK ENDS HERE

WINCH CONTROL PANEL ENGINE SHUTDOWN SWITCH

This task covers:

- a. Removal (page 4-431)
- b. Installation (page 4-432)

INITIAL SETUP

Tools

Screwdriver, flat-tip, 3/8-inch
Wrench, open-end, 5/8-inch

Materials/Parts

Lockwasher, switch to panel
Lockwasher, terminal screw (two required)
Tag, marking (item 18, appendix C)

Personnel Required

One

TA240080

WINCH CONTROL PANEL ENGINE SHUTDOWN SWITCH - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

CAUTION

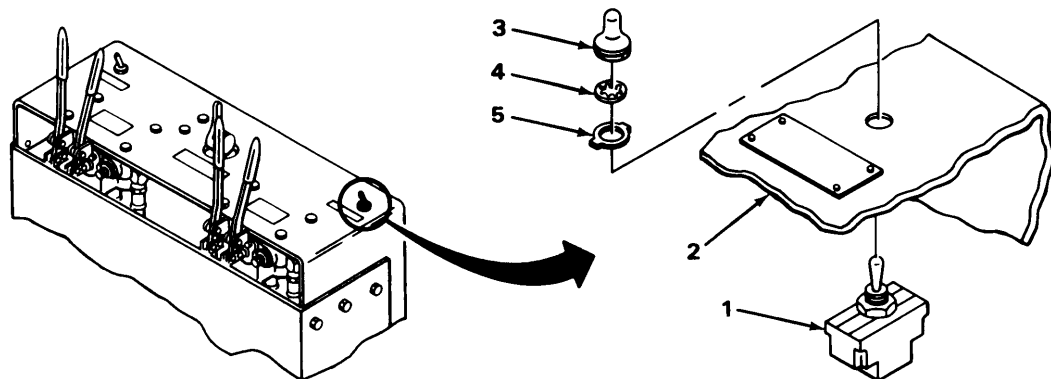
Make sure ignition switch is off to prevent damage to electrical system.

Do not remove switch lever rubber boot. Removing rubber boot from nut will ruin it.

NOTE

Tag wires according to general maintenance instructions (page 4-1).

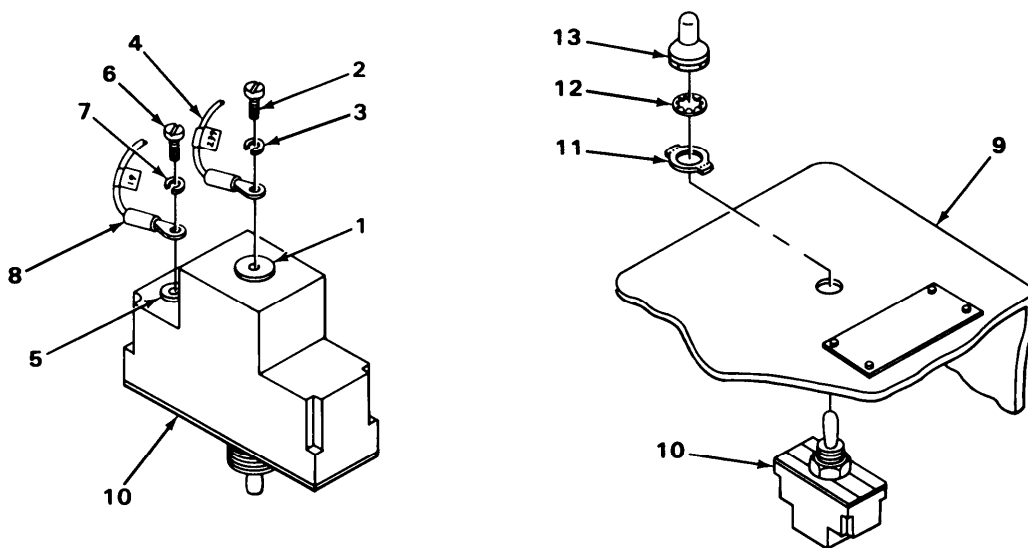
1. Engine shutdown switch (1) to winch control panel (2)	Nut and boot assembly (3), lockwasher (4)	a. Using 5/8-inch wrench, unscrew and pull off. b. Get rid of lockwasher (4). c. Inspect boot (3) for cracking or tears. If cracked or torn, replace assembly.
2. Winch control panel (3)	Engine shutdown switch (2)	Pull out from underneath.
3.	ON/OFF ring (5)	Take off.



WINCH CONTROL PANEL ENGINE SHUTDOWN SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL – CONTINUED		
4. Terminal (1)	Screw (2), lock-washer (3), and wire 279 (4)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (3).
5. Terminal (5)	Screw (6), lock-washer (7), and wire 019 (8)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (7).
6. Winch control panel (9)	Shutdown switch (10)	Take out.
INSTALLATION		
7. Winch control panel (9)	Shutdown switch (10)	Place in position.
8. Screw (6)	New lockwasher (7) and wire 019 (8)	Put on.
9. Terminal (5)	Screw (6)	Screw in and tighten using screwdriver.
10. Screw (2)	New lockwasher (3) and wire 279 (4)	Put on.
11. Terminal (1)	Screw (2)	Screw in and tighten using screwdriver.
12. Winch control panel (9)	Shutdown switch (10)	Push into place.
13.	ON/OFF ring (11)	Put in place.
14. Shutdown switch (10)	New lockwasher (12)	Put on.
15.	Nut and boot assembly (13)	a. Push on. b. Screw on and tighten using 5/8-inch wrench.

WINCH CONTROL PANEL ENGINE SHUTDOWN SWITCH - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE; Check operation (TM 9-2320-270-10).

TASK ENDS HERE

WINCH CONTROL PANEL AUXILIARY THROTTLE SWITCH

This task covers:

- a. Removal (page 4-434)
 - b. Installation (page 4-435)
-

INITIAL SETUP

Tools

Screwdriver, flat-tip, 3/8-inch
 Wrench, open-end, 5/8-inch

Materials/Parts

Lockwasher, switch to winch control panel

Materials/Parts – Continued

Lockwasher, terminal screw
 (four required)
 Tag, marking (item 18, appendix C)

Personnel Required

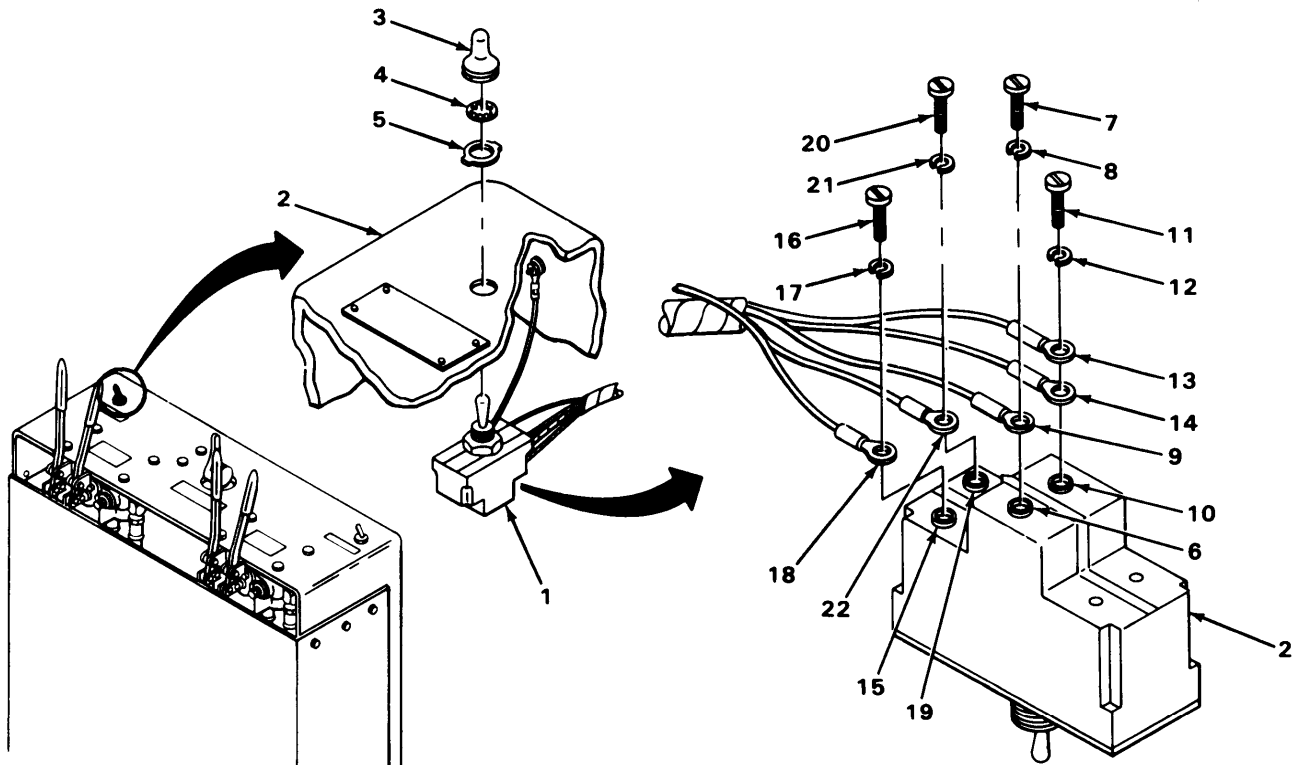
One

WINCH CONTROL PANEL AUXILIARY THROTTLE SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL		
<u>CAUTION</u>		
Make sure ignition switch is off to prevent damage to electrical system.		
Do not remove switch lever rubber boot from nut. Removing rubber boot from nut will ruin it.		
NOTE		
Tag wires according to general maintenance instructions (page 4-1).		
1. Auxiliary throttle switch (1) to winch control panel (2)	Nut and boot assembly (3) and lockwasher (4)	a. Using 5/8-inch wrench, unscrew and pull off. b. Get rid of lockwasher (4). c. Inspect boot (3) for cracking or tears. If cracked or torn, replace assembly.
2. Winch control panel (2)	Auxiliary throttle switch (1)	Take out from underneath.
3.	ON/OFF ring (5)	Take off.
4. Terminal (6)	Screw (7), lockwasher (8), and wire 167 (9)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (8).
5. Terminal (10)	Screw (11), lockwasher (12), wire 279 (13), and wire 154A (14)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (12).
6. Terminal (15)	Screw (16), lockwasher (17), and wire 170 (18)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (17).
7. Terminal (19)	Screw (20), lockwasher (21), and wire 667 (22)	a. Using screwdriver, unscrew and take off. b. Get rid of lockwasher (21).
8. Winch control panel (2)	Auxiliary throttle switch (1)	Take out.

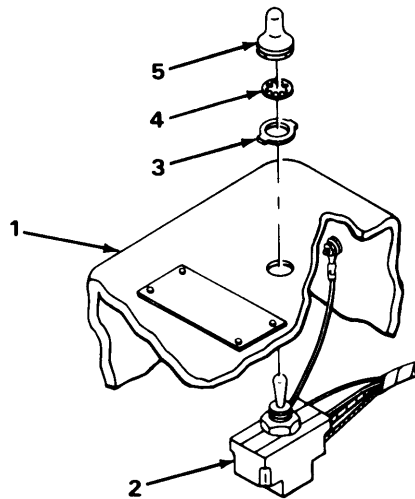
WINCH CONTROL PANEL AUXILIARY THROTTLE SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
9. Winch control panel (2)	Auxiliary throttle switch (1)	Place in position.
10. Terminal (19)	Wire 667 (22), new lockwasher (21), and screw (20)	Screw in and tighten using screwdriver.
11. Terminal (15)	Wire 170 (18), new lockwasher (17), and screw (16)	Screw in and tighten using screwdriver.
12. Terminal (10)	Wire 279 (13), wire 154A (14), new lockwasher (12), and screw (11)	Screw in and tighten using screwdriver.
13. Terminal (6)	Wire 167 (9), new lockwasher (8), and screw (7)	Screw in and tighten using screwdriver.



WINCH CONTROL PANEL AUXILIARY THROTTLE SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION – CONTINUED		
14. Winch control panel (1)	Auxiliary throttle switch (2)	Push up into place.
15.	ON/OFF ring (3)	Put in place.
16. Auxiliary throttle switch (2)	New lockwasher (4)	Put on.
17.	Nut and boot assembly (5)	a. Push on. b. Screw on and tighten using 5/8-inch wrench.



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK END HERE

HORN BUTTON ASSEMBLY

This task covers:

- a. Removal (page 4-437)
- b. Installation (page 4-437)

HORN BUTTON ASSEMBLY - CONTINUED

INITIAL SETUP

Tools	Personnel Required
Screwdriver, flat-tip, 1/4-inch	One
Materials/Parts	Equipment Condition
String (item 17, appendix C)	Steering wheel removed (page 4-937).

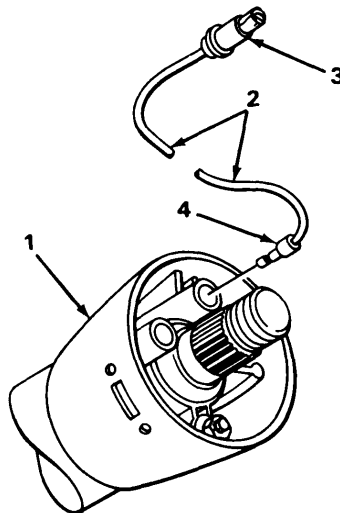
LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

1. Steering column (1)	Brush and wire assembly (2)	a. Tie string to brush (3). b. Using string, pull out until bullet plug (4) comes out. c. Take off string.	
------------------------	-----------------------------	--	--

INSTALLATION

2. Steering column (1)	Brush and wire assembly (2)	a. Tie string to bullet plug (4). b. Using string, pull wire through steering column until brush (3) is seated.	
------------------------	-----------------------------	--	--



FOLLOW-ON MAINTENANCE:

1. install steering wheel (page 4-937).
2. Check operation (TM 9-2320-270-10).

TASK ENDS HERE

HORNS AND RELAY

This task covers:

- a. Removal (page 4-438)
 - b. Installation (page 4-441)
-

INITIAL SETUP

Tools

Extension, 12-inch, 3/8-inch drive
 Handle, ratchet, 3/8-inch drive
 Screwdriver, fiat-tip, 1/4-inch
 Socket, 3/8-inch, 3/8-inch drive

Materials/Parts

Lockwasher, horn to firewall
 (two required)
 Lockwasher, relay to firewall
 (two required)
 Tag, marking (item 18, appendix C)

Personnel Required

One

Equipment Condition

Battery ground cable disconnected
 (page 4-444).
 Right side of hood opened
 (TM 9-2320-270-10).

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

CAUTION

Make sure battery ground cable is disconnected to prevent damage to electrical system.

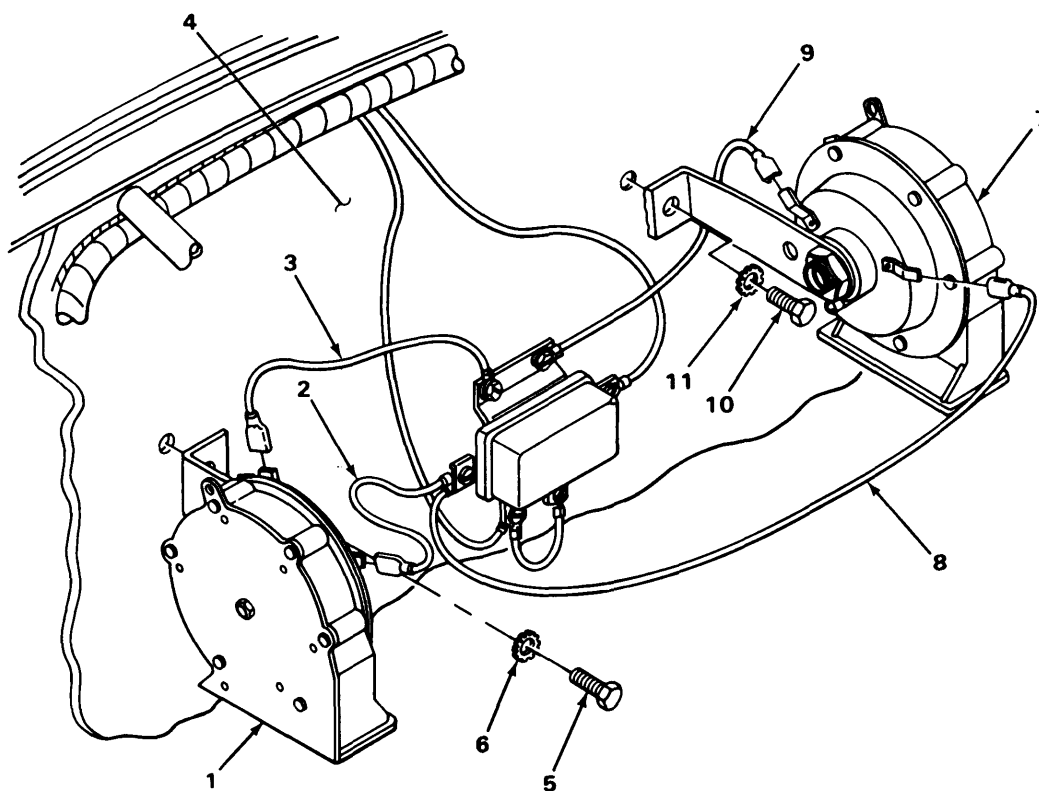
NOTE

Tag wires according to general maintenance instructions (page 4-1).

1. Right horn (1)	Wire 168 (2)	Unplug.	
2.	GND wire (3)	Unplug.	
3. Right horn (1) to firewall (4)	Screw (5) and lockwasher (6)	a. Using socket, handle, and extension, unscrew and take out. b. Get rid of lockwasher (6).	
4. Firewall (4)	Right horn (1)	Take off.	

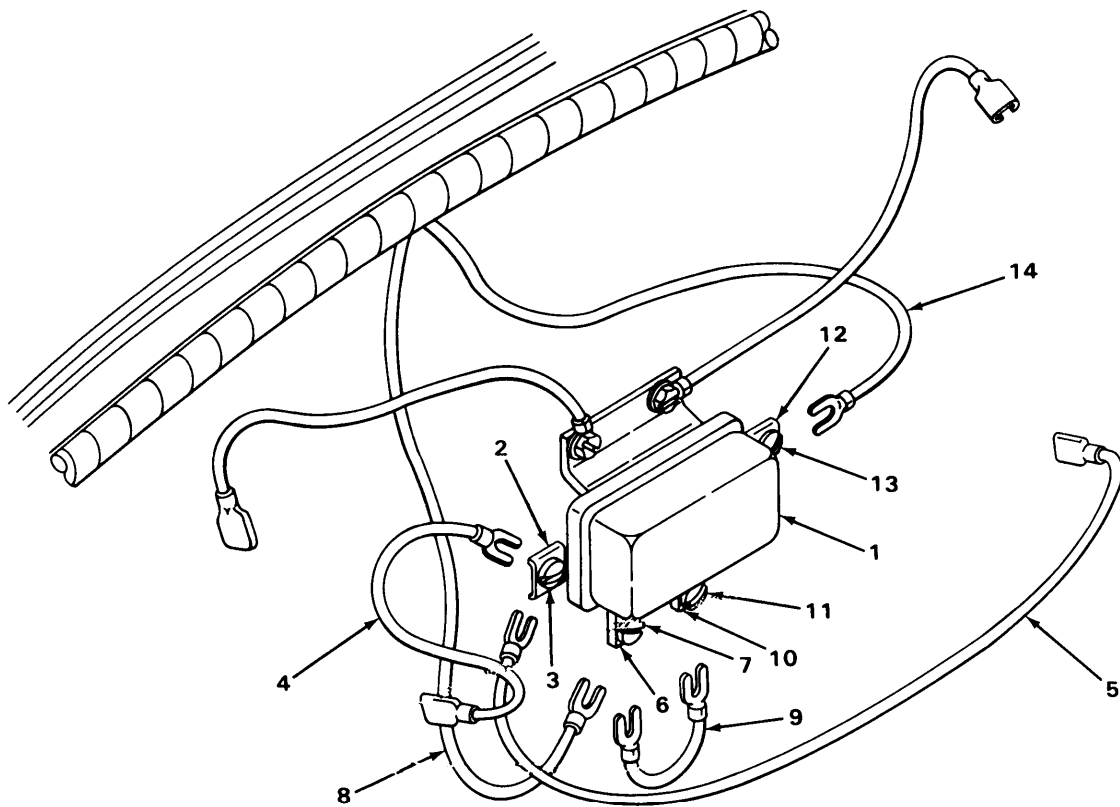
HORNS AND RELAY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
5. Left horn (7)	Wire 168 (8)	Unplug.
6.	GND wire (9)	Unplug.
7. Left horn (7') to firewall (4)	Screw (10) and lockwasher (11)	a. Using socket, handle, and extension, unscrew and take out. b. Get rid of lockwasher (11).
8. Firewall (4)	Left horn (7)	Take off.



HORNS AND RELAY - CONTINUED

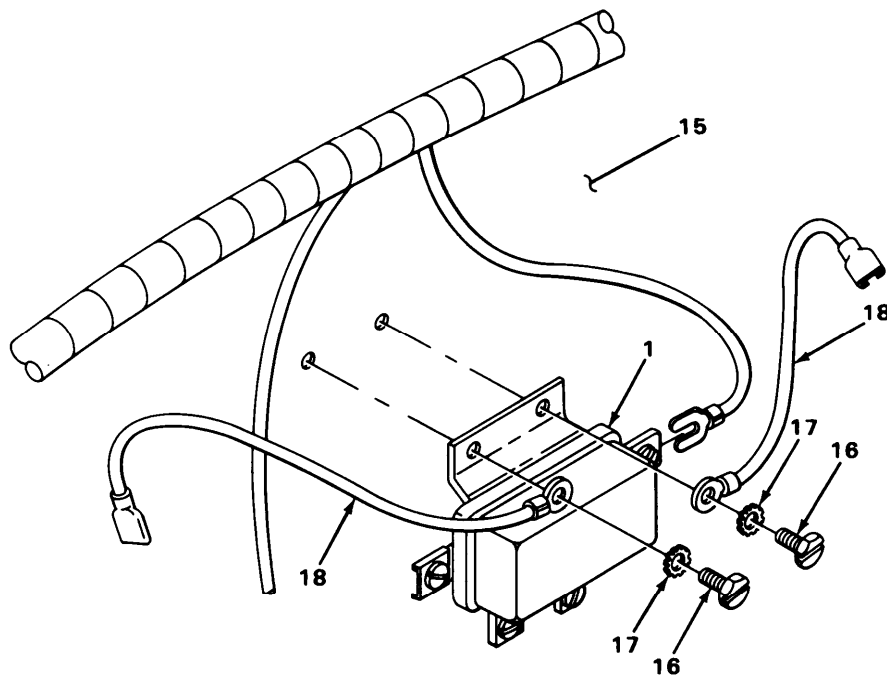
LOCATION	ITEM	ACTION	REMARKS
REMOVAL – CONTINUED			
9.	Relay (1) and terminal (2)	Screw (3)	Using screwdriver, unscrew part way.
10.		Wire 168 (4) and (5)	Pull out.
11.	Terminal (6)	Screw (7)	Using screwdriver, unscrew part way.
12.		Wire 31 (8) and 279 (9)	Pull out.
13.	Terminal (10)	Screw (11)	Using screwdriver, unscrew part way.
14.		Wire 279 (9)	Pull out.
15.	Terminal (12)	Screw (13)	Using screwdriver, unscrew part way.
16.		Wire 16 (14)	Pull out.



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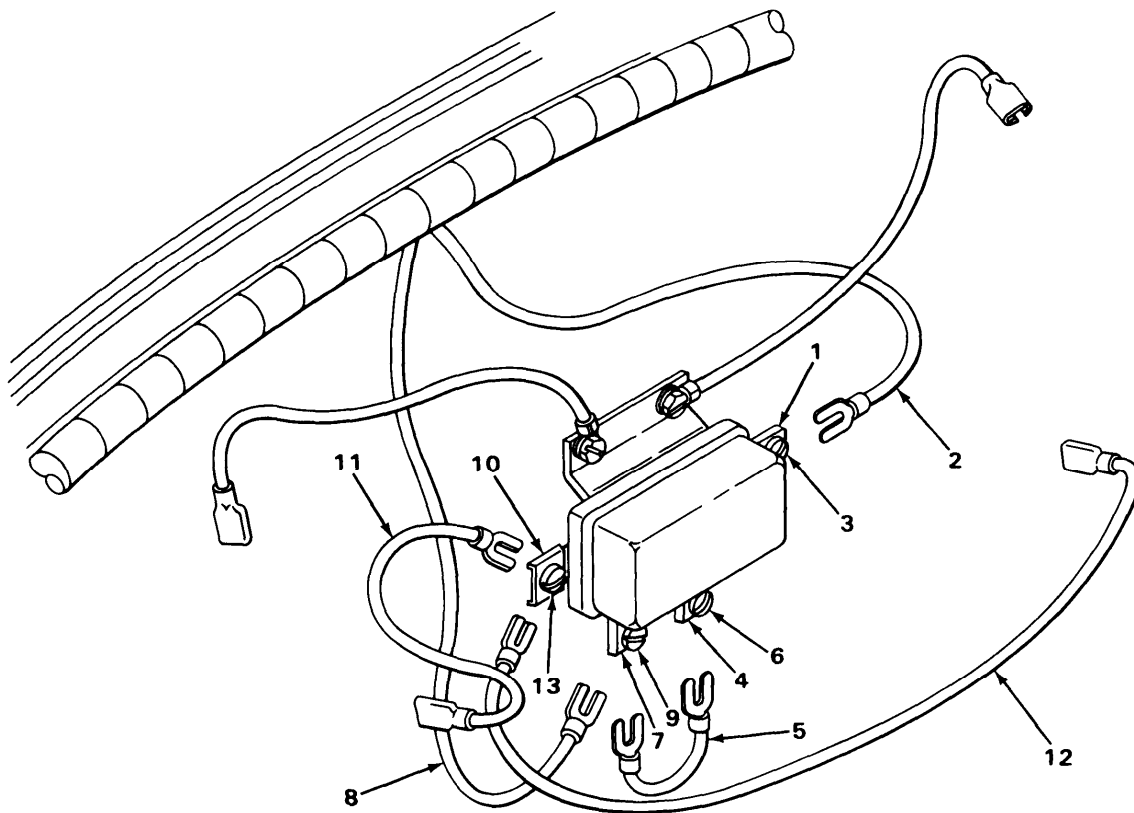
HORNS AND RELAY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
17. Relay (1) to firewall (15)	Two screws (16), new lockwashers (17), and GND wires (18)	a. Using socket, extension, and handle, unscrew and take out. b. Get rid of lockwasher (17').
18. Firewall (15)	Relay (1)	Take off.
INSTALLATION		
19. Firewall (15)	Relay (1)	Place in position.
20. Two screws (16)	Two new lockwashers (17) and GND wires (18)	Put on.
21. Relay (1) to firewall (15)	Two screws (16)	Screw in and tighten using socket, handle, and extension.



HORNS AND RELAY - CONTINUED

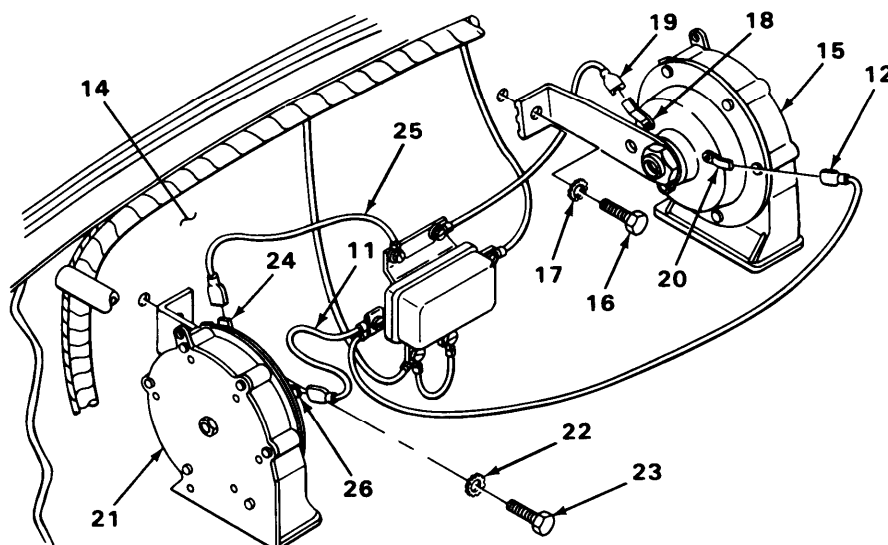
LOCATION	ITEM	ACTION	REMARKS
INSTALLATION - CONTINUED			
22. Terminal (1)	Wire 16 (2)	Push in.	
23.	Screw (3)	Using screwdriver, tighten.	
24. Terminal (4)	Wire 279 (5)	Push in.	
25.	Screw (6)	Using screwdriver, tighten.	
26. Terminal (7)	Wire 31 (8) and 279 (5)	Push in.	
27.	Screw (9)	Using screwdriver, tighten.	
28. Terminal (10)	Two wires 168 (11) and (12)	Push in.	
29.	Screw (13)	Using screwdriver, tighten.	



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HORNS AND RELAY - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
30. Firewall (14)	Left horn (15)	Place in position.	
31. Left horn (15) to firewall (14)	Screw (16) and new lockwasher (17)	Screw in and tighten using socket, handle, and extension.	
32. Terminal (18)	GND wire (19)	Plug in.	
33. Terminal (20)	Wire 168 (12)	Plug in.	
34. Firewall (14)	Right horn (21)	Put in place.	
35. Right horn (21) to firewall (14)	Screw (23) and new lockwasher (22)	Screw in and tighten using socket, handle, and extension.	
36. Terminal (24)	GND wire (25)	Plug in.	
37. Terminal (26)	Wire 168 (11)	Plug in.	



NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).
3. Close right side of hood (TM 9-2320-270-10).

TASK ENDS HERE

BATTERY GROUND CABLE

This task covers:

- a. Disconnect (page 4-444)
 - b. Connect (page 4-445)
-

INITIAL SETUP

Tools

Pliers, slip-joint, straight-nose

Personnel Required

One

Materials/Parts

Grease, (LO 9-2320-270-1 2)
 Lockwasher wing nut to terminal

LOCATION	ITEM	ACTION	REMARKS
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DISCONNECT

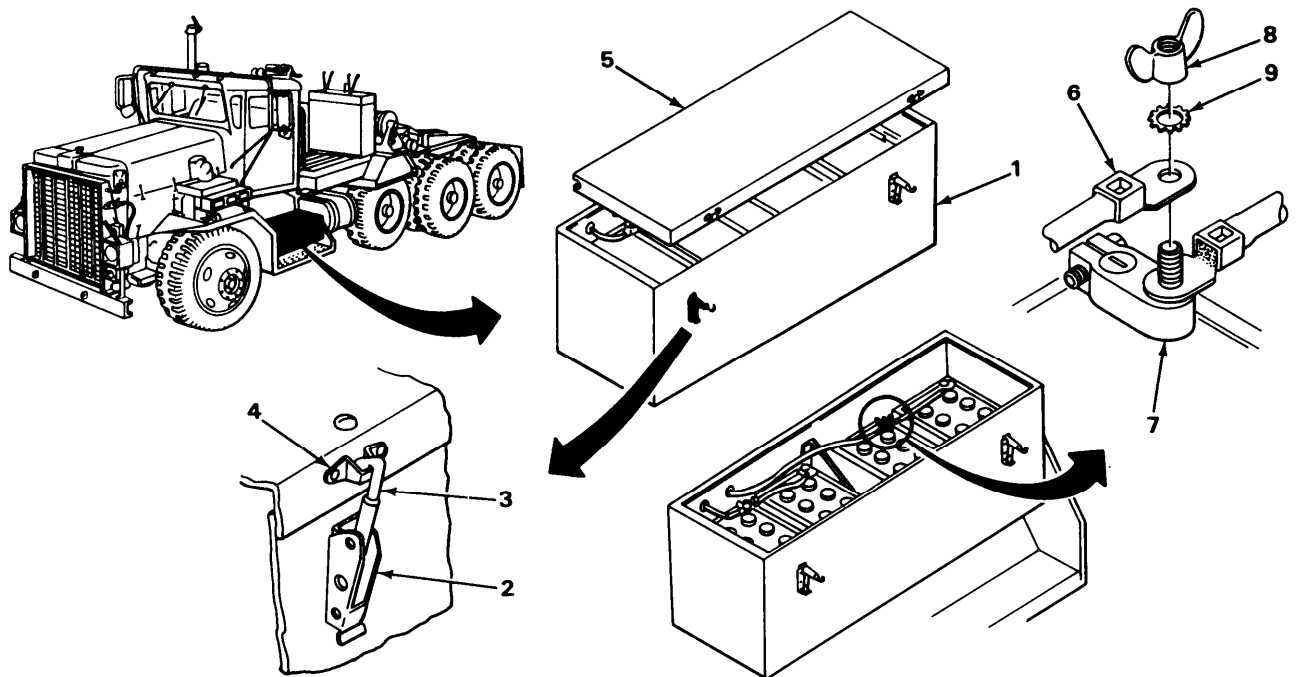
WARNING

Do not smoke, use open flame, or allow sparks near batteries. The mixture of oxygen and hydrogen gases released from batteries is highly flammable and can explode causing serious injury or death.

1. Battery box (1)	Two latches (2)	a. Lift up. b. Pull hook (3) out of socket (4).	
2.	Lid (5)	Lift off.	
3. Ground cable (6) to adapter (7)	Wing nut (8) and lockwasher (9)	a. Unscrew and take off. b. Get rid of lockwasher (9). It might be necessary to use pliers to loosen.	
4. Adapter (7)	Ground cable (6)	Lift off and set aside.	

BATTERY GROUND CABLE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
CONNECT			
5. Adapter (7)	Ground cable (6)	Put on.	
6. Ground cable (6) to adapter (7)	Wing nut (8) and new lockwasher (9)	a. Screw on and tighten. b. Apply grease to prevent corrosion.	
7. Battery box (1)	Lid (5)	Put on.	
8. Two sockets (4)	Two hooks (3)	Put in.	
9. Battery box (1) to lid (5)	Two latches (2)	Push down.	
10.	Truck electrical components	Check operation (TM 9-2320-270-10.)	



TASK ENDS HERE

BATTERY CABLES

This task covers:

- a. Removal (page 4-447)
 - b. Cleaning/Inspection (page 4-452)
 - c. Installation (page 4-452)
-

INITIAL SETUP

Tools

- Handle, ratchet, 3/8-inch drive
- Lifter, battery terminal
- Pliers, cutting
- Pliers, slip-joint, straight-nose
- Socket, deepwell, 9/16-inch, 3/8-inch drive
- Socket, 7/16-inch, 3/8-inch drive
- Socket, 3/4-inch, 3/8-inch drive
- Wrench, box, 1/2-inch
- Wrench, box, 7/16-inch
- Wrench, box, 9/16-inch
- Wrench, open-end, 1/2-inch
- Wrench, open-end, 5/8-inch

Materials/Parts

- Grease (LO 9-2320-270-12)
- Lockwasher, wingnut to battery adapter clamp (two required)

Materials/Parts - Continued

- Lockwasher, loop clamp to threaded rod
- Lockwasher, loop clamp to battery box support
- Lockwasher, loop clamp to transmission support
- Lockwasher, loop clamp to frame (two required)
- Lockwasher, ground terminal and starter
- Lockwasher, solenoid battery terminal
- Tag, marking (item 18, appendix C)
- Wrap, tie (item 24, appendix C)

Personnel Required

One

Equipment Condition

Left side of hood open and left hood side panel removed (TM 9-2320270-10).

BATTERY CABLES - CONTINUED

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

REMOVAL

WARNING

Do not let tools touch battery and truck or touch between battery terminals. Short circuit will result which will make tools very hot and can cause arcing which may cause battery to explode. Failure to observe these precautions could cause serious injury to personnel.

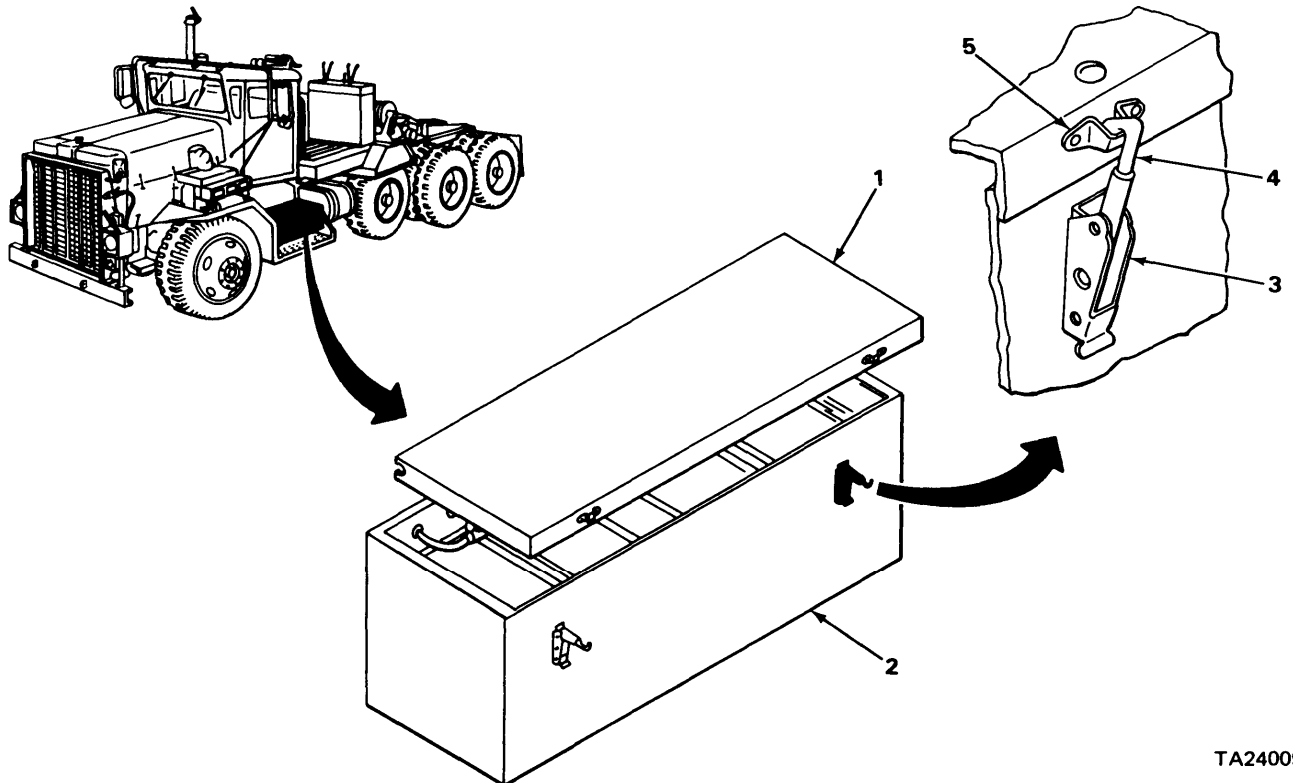
Do not smoke, use open flame, or allow sparks near batteries. The mixture of oxygen and hydrogen gases released from batteries is highly flammable and can explode causing serious injury or death.

To reduce the possibility of injury and damage to equipment, disconnect ground cable first whenever replacing battery cables.

NOTE

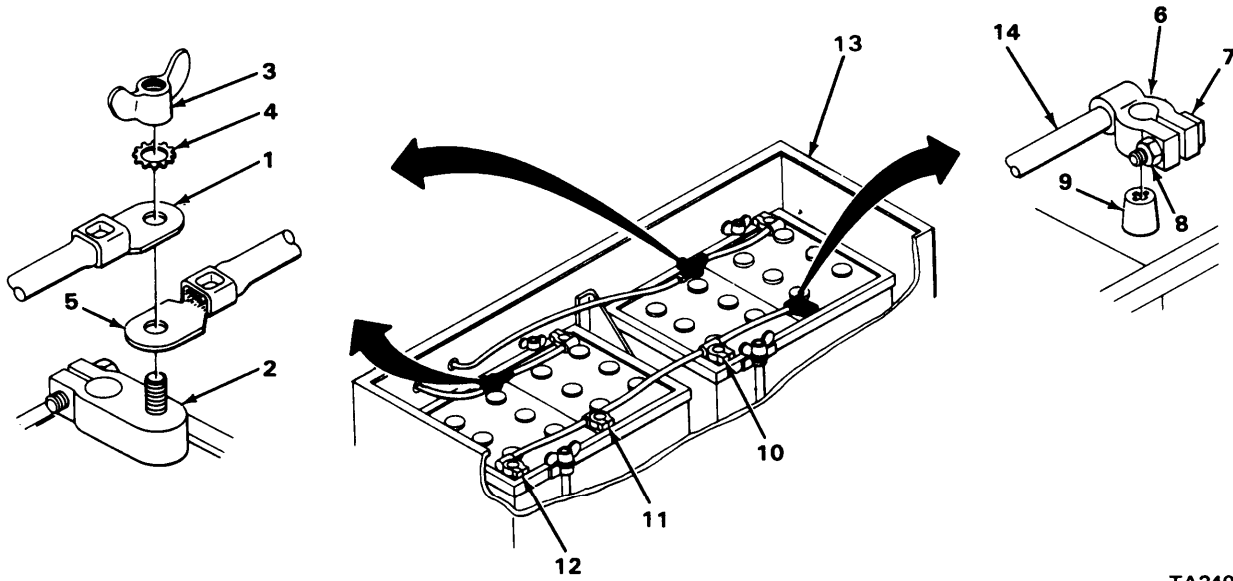
Tag all cables and wires according to general maintenance instructions (page 4-1).

- | | | |
|-------------------------------|-----------------|--|
| 1. Lid (1) to battery box (2) | Two latches (3) | a. Lift up.
b. Pull hook (4) out of socket (5). |
| 2. Battery box (2) | Lid (1) | Lift off and set aside. |



BATTERY CABLES - CONTINUED

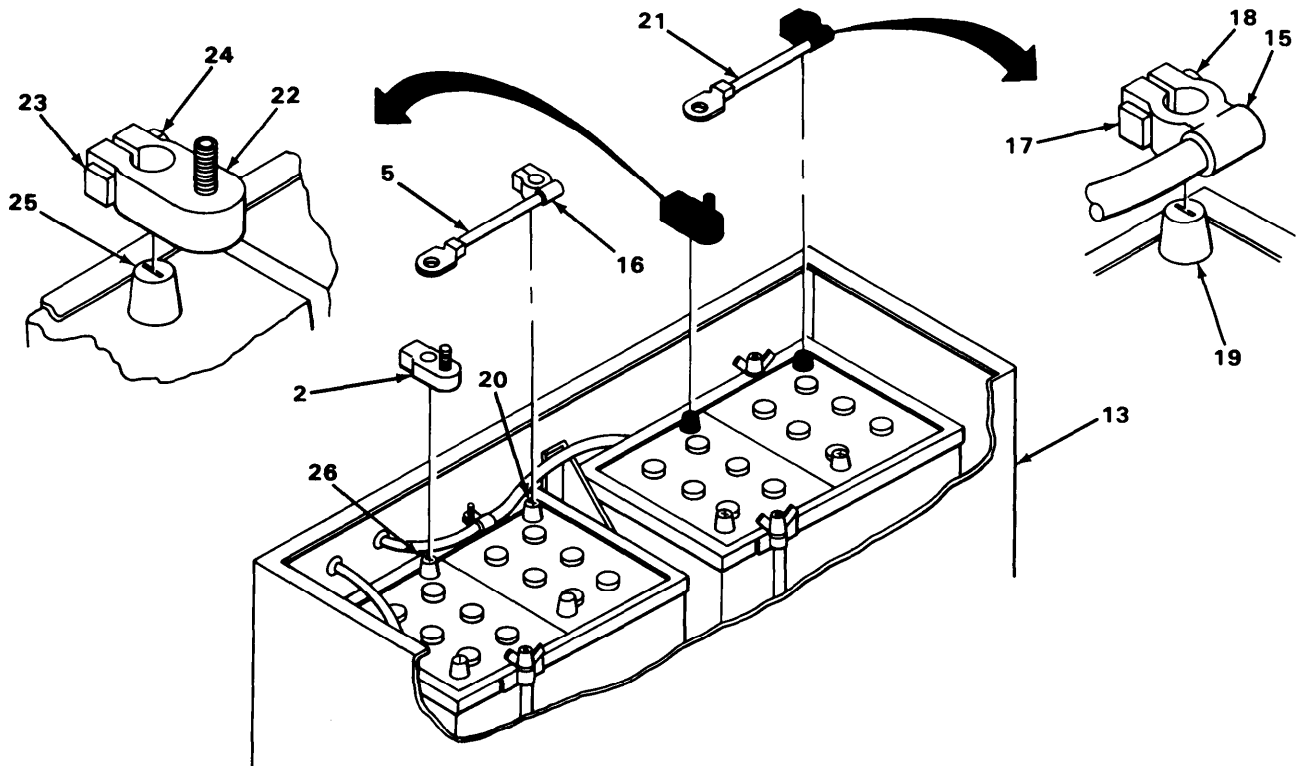
LOCATION	ITEM	ACTION REMARKS
REMOVAL- CONTINUED		
3. Ground cable (1) to adapter clamp (2)	Wingnut (3) and lockwasher (4)	a. Unscrew and take off. You may have to use slip-joint pliers. b. Get rid of lockwasher (4).
4. Adapter clamp (2)	Ground cable (1) and negative inter-battery cable (5)	Take off and move away from batteries.
5. Positive cable (1) to adapter clamp (2)	Wingnut (3) and lockwasher (4)	a. Unscrew and take off. You may have to use slip-joint pliers. b. Get rid of lockwasher (4).
6. Adapter clamp (2)	Positive cable (1) and inter-battery cable (5)	Take off and move away from batteries.
7. Four battery connector cable clamps (6)	Four capscrews (7') and nuts (8)	Using 1/2-inch open-end wrench and 1/2-inch box wrench, unscrew part way.
8. Battery posts (9), (10), (11) and (12)	Four battery connector cable clamps (6)	Using battery terminal lifter, pull off.
9. Battery box (13)	Battery connector cable (14)	Take out.



TA240093

BATTERY CABLES - CONTINUED

LOCATION	ITEM	ACTION REMARKS
10. Two inter-battery cable terminal clamps (15) and (16)	Two capscrews (17) and nuts (18)	Using 1/2-inch box wrench and 1/2-inch open-end wrench, unscrew part way.
11. Two battery posts (19) and (20)	Two terminal clamps (15) and (16)	Using battery terminal lifter, pull off.
12. Battery box (13)	Two inter-battery cables (5) and (21)	Take out.
13. Two adapter clamps (2) and (22)	Two capscrews (23) and nuts (24)	Using 1/2-inch box wrench and 1/2-inch open-end wrench, unscrew part way.
14. Two battery posts (25) and (26)	Two adapter clamps (2) and (22)	Using battery terminal lifter, pull off.

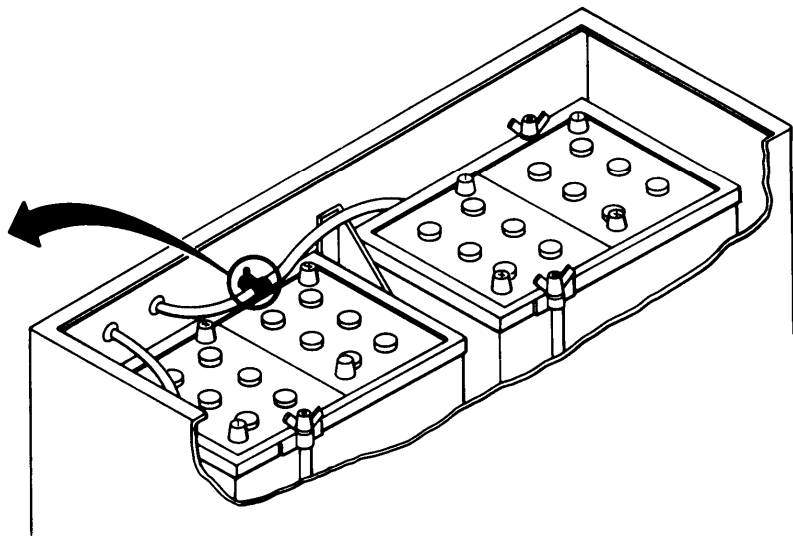
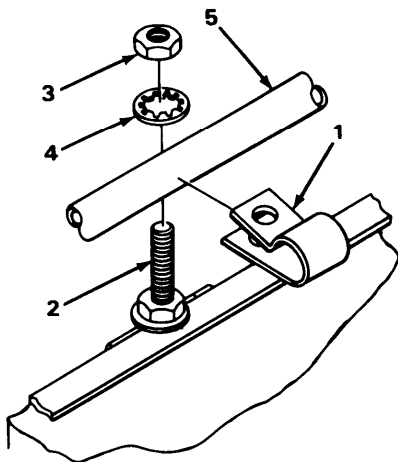


BATTERY CABLES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL - CONTINUED

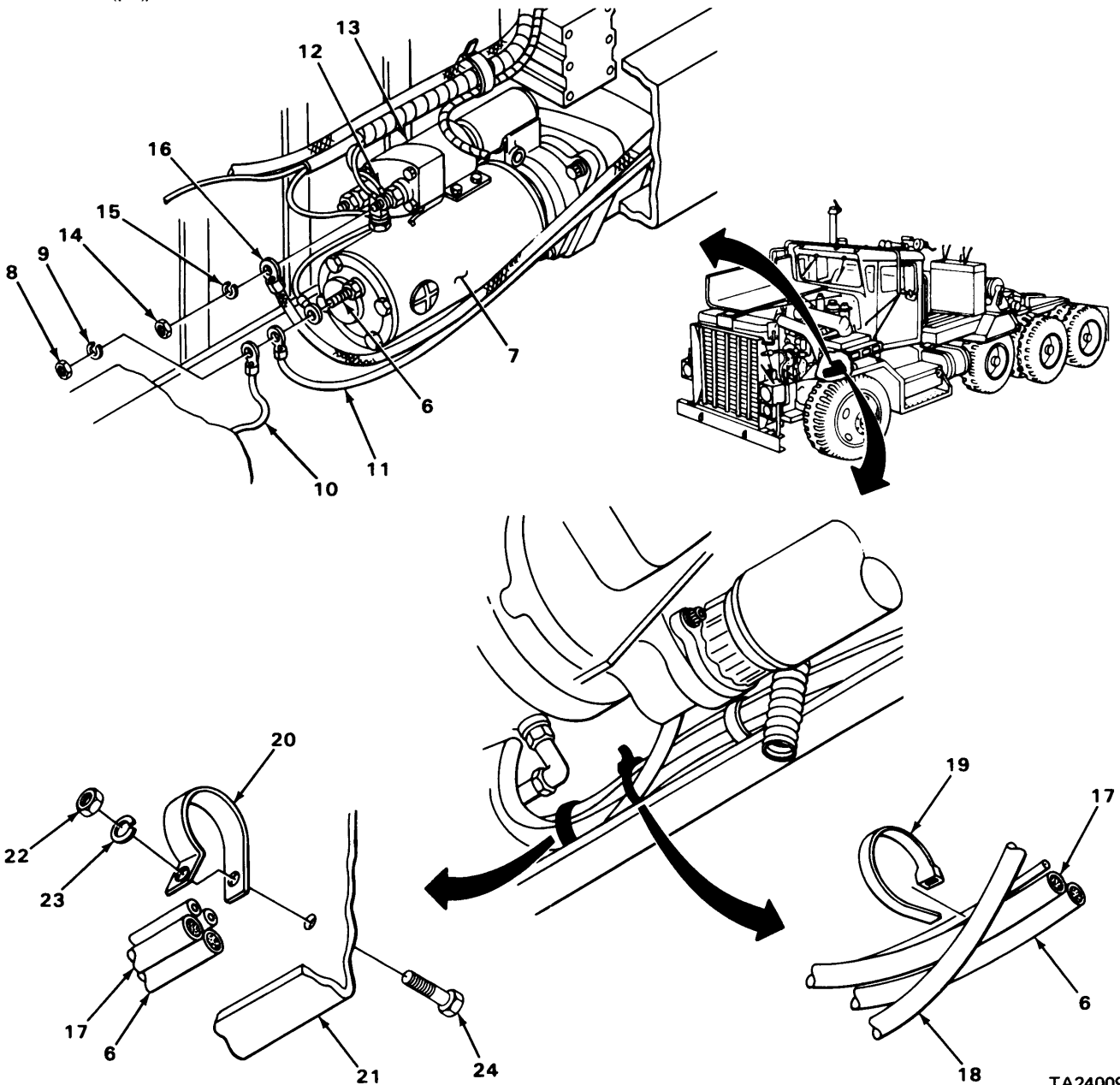
15. Loop clamp (1) to threaded rod (2)	Nut (3) and lockwasher (4)	a. Using 5/8-inch wrench, unscrew and take off. b. Get rid of lockwasher (4).
16. Threaded rod (2)	Loop clamp (1) and ground cable (5)	Take off.
17. Ground cable (5)	Loop clamp (1)	Take off.



18. Ground terminal (6) and starter (7)	Nut (8) and lockwasher (9)	a. Using 3/4-inch socket and handle, unscrew and take off. b. Get rid of lockwasher (9).
19.	Chassis ground wire (10) and battery ground cable (11)	Take off.
20. Battery terminal (12) on solenoid (13)	Nut (14) and lockwasher (15)	a. Using 3/4-inch socket and handle, unscrew and take off. b. Get rid of lockwasher (15).
21.	Positive cable (16)	Take off.
22. Battery cables (11) and (17) and power steering hose (18)	Tie wrap (19)	a. Using cutting pliers, cut and take off. b. Get rid of.

BATTERY CABLES - CONTINUED

LOCATION	ITEM	ACTION REMARKS
23. Two loop clamps (20) to frame (21)	Two nuts (22), lockwashers (23), and capscrews (24)	s. Using 9/16-inch box wrench, 9/16-inch socket and handle, unscrew and take out. b. Get rid of lockwashers (23).
24. Battery cables (11) and (17) to frame (21).	Two loop clamps (20)	Spread and take off.



TA240096

BATTERY CABLES - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL - CONTINUED		
25. Loop clamp (1) to battery box support (2)	Screw (3), washer (4), nut (5), and lockwasher (6)	a. Using 7/16-inch box wrench and 7/16-inch socket and handle, unscrew and take off. b. Get rid of lockwasher (6).
26. Two battery cables (7) and (8)	Loop clamp (1)	Spread and take off.
27. Loop clamp (9) to transmission support (10)	Nut (11) and lockwasher (12)	Using 9/16-inch socket and handle, unscrew and take off.
28. Battery cables (7) and (8)	Loop clamp (9)	Spread and take off.
29.	Tie wraps (13)	a. Using cutting pliers, cut and take off. b. Get rid of.

CAUTION

When pulling out battery cables, do not snag other wires.

30. Under left side of cab (14)	Battery cables (7) and (8)	Pull up.
31. Battery box (15)	Battery cables (7) and (8)	Take out.
CLEANING/inspection		
32.	Battery cables, battery terminals, and battery posts	Clean and inspect (TM 9-6140-200-14).

INSTALLATION

WARNING

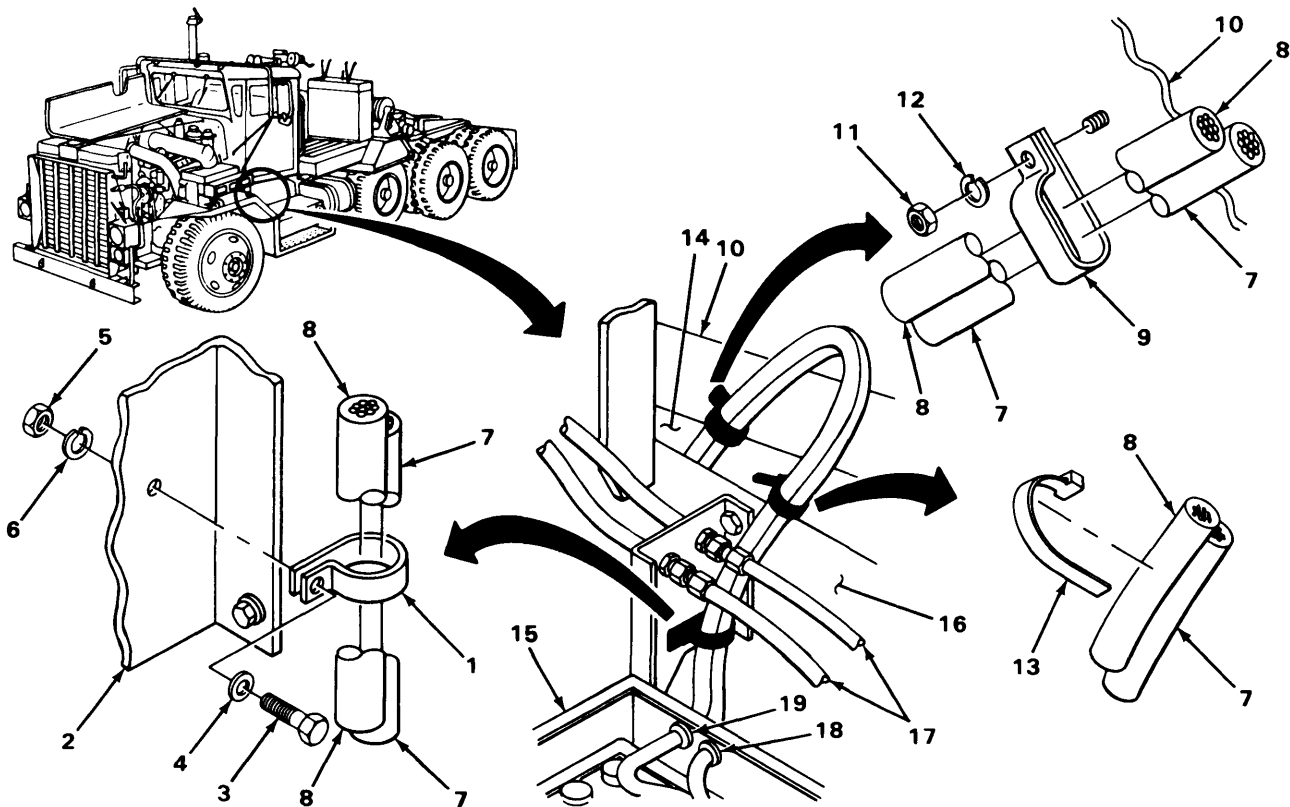
Do not smoke, use open flame, or allow sparks near batteries. The mixture of oxygen and hydrogen gases released from batteries is highly flammable and can explode causing serious injury or death.

NOTE

On positive cable and ground cable, 1/2-inch terminal goes to starter and 3/8-inch terminal goes to battery.

BATTERY CABLES - CONTINUED

LOCATION	ITEM	ACTION REMARKS
33. Frame (16) and power steering hoses (17)	Positive cable (8)	Thread battery end of cable behind power steering hoses.
34. Battery box (15) front grommet (18)	Positive cable (8)	Push through and pull about 14 inches (35 centimeters) of cable (8) into battery box (15) and place it so it does not touch battery posts.
35. Frame (16) and transmission support (10)	Ground cable (7)	Loop starter end of cable under frame (16) and transmission mount and under truck.
38. Frame (16) and power steering hoses (17)	Ground cable (7)	Thread battery end of cable (7) behind power steering hoses (17).
37. Battery box (15) rear grommet (19)	Ground cable (7)	Push cable (7) through rear grommet (19) and pull about 29 inches (74 centimeters) of cable (7) into battery box (15) and place it so it does not touch battery posts.

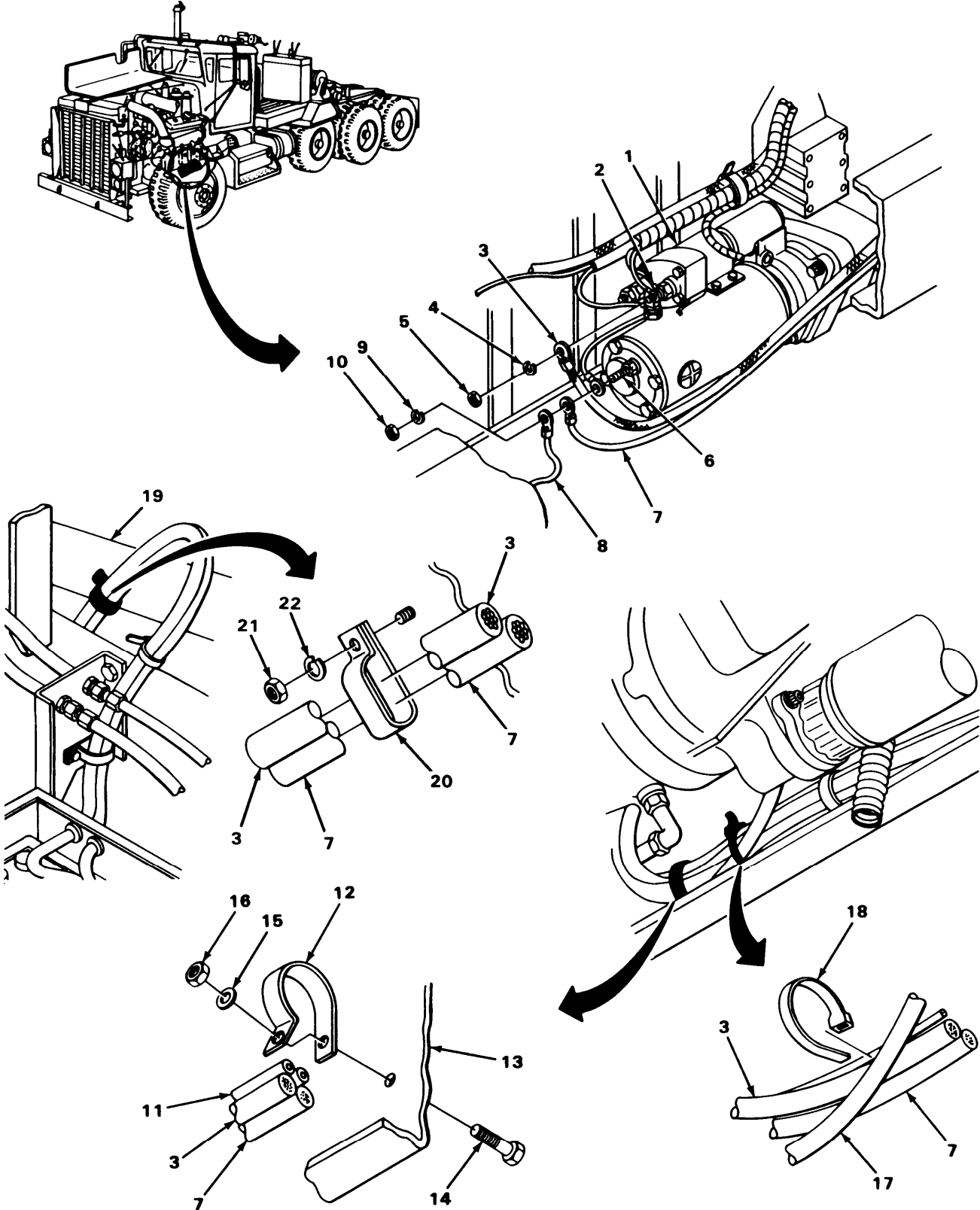


TA240097

BATTERY CABLES - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION – CONTINUED		
38. Starter solenoid (1) battery terminal (2)	Battery cable (3) and new lockwasher (4)	Put on.
39.	Nut (5)	Screw on and tighten using 3/4-inch socket and handle.
40. Starter ground terminal (6)	Battery ground cable (7), chassis ground wire (8), and new lockwasher (9)	Put on.
41.	Nut (10)	Screw on and tighten using 3/4-inch socket and handle.
42. Battery cables (3) and (7) and brake lines (11)	Two loop clamps (12)	a. Put on. b. Push into place.
43. Two loop clamps (12) to frame (13)	Two capscrews (14), new lockwashers (15), and nuts (16)	Screw in and tighten using 9/16-inch box wrench, 9/16-inch socket, and handle.
44. Battery cables (3) and (7) and power steering hose (17)	New tie wraps (18)	Put on.
45. Battery cables (3) and (7) to trans- mission support (19)	Loop clamp (20)	a. Put on. b. Put in place.
46. Loop clamp (20) to transmission support (19)	Nut (21) and new lockwasher (22)	Screw together and tighten using 9/16-inch socket and handle.

BATTERY CABLES - CONTINUED

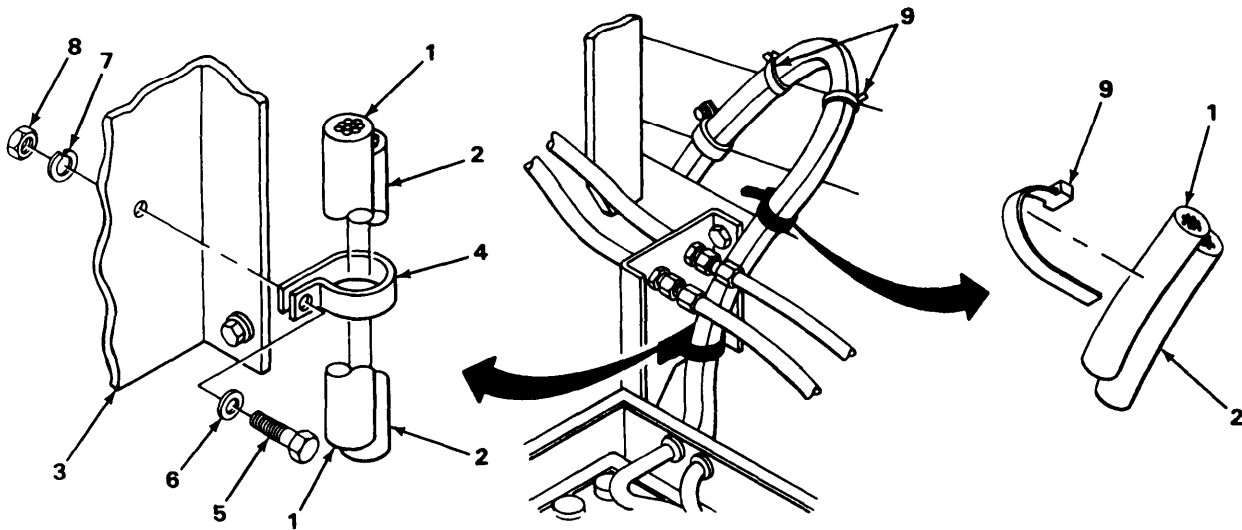


BATTERY CABLES - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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INSTALLATION - CONTINUED

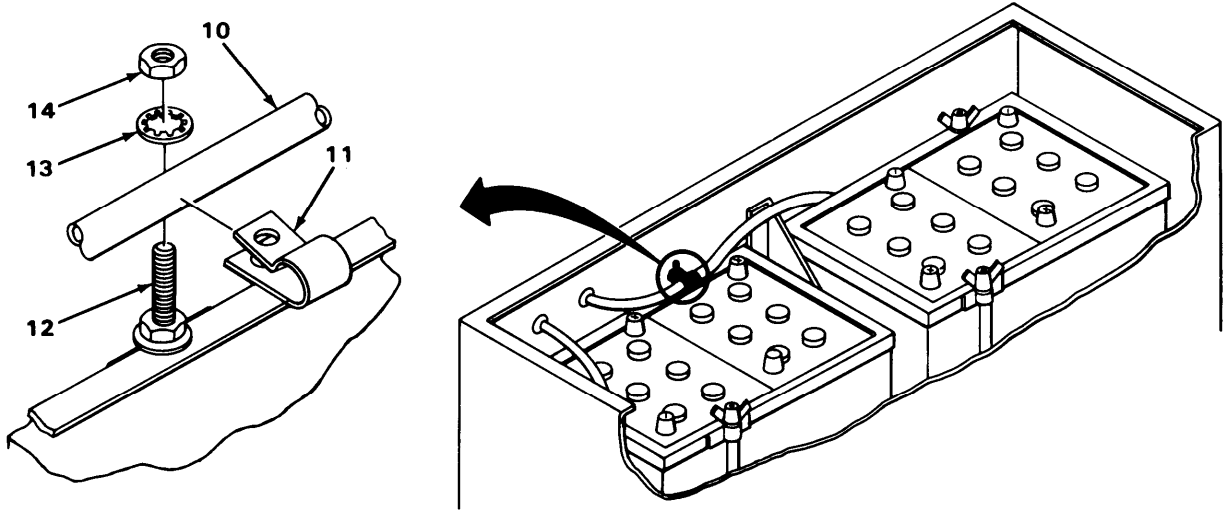
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|---|--|--|
| 47. Battery cables (1) and (2) to battery box support (3) | Loop clamp (4) | Put on. |
| 48. Loop clamp (4) to battery box support (3) | Capscrews (5), washer (6), new lockwasher (7), and nut (8) | Screw together and tighten using 7/16-inch box wrench, 7/16-inch socket, and handle. |
| 49. Battery cables (1) and (2) | Three new tie wraps (9) | Using slip-joint pliers, put on. |



- | | | |
|--|---|---|
| 50. Ground cable (10) | Loop clamp (11) | Put on. |
| 51. Threaded rod (12) | Loop clamp (11) and new lockwasher (13) | Put on. |
| 52. Loop clamp (11) to threaded rod (12) | Nut (14) | Screw on and tighten using 5/8-inch wrench. |

BATTERY CABLES - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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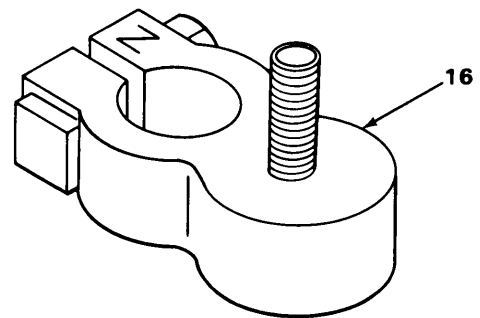
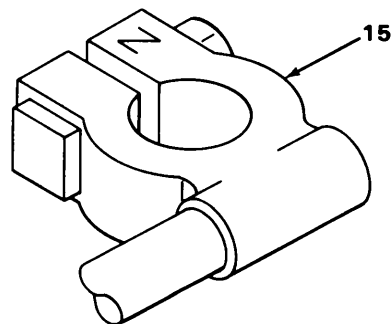
NOTE

Positive battery posts are larger than negative battery posts. Make sure terminal clamps and posts are matched correctly.

53.

All terminal clamps (15) and adapter clamps (16)

Using screwdriver, spread.

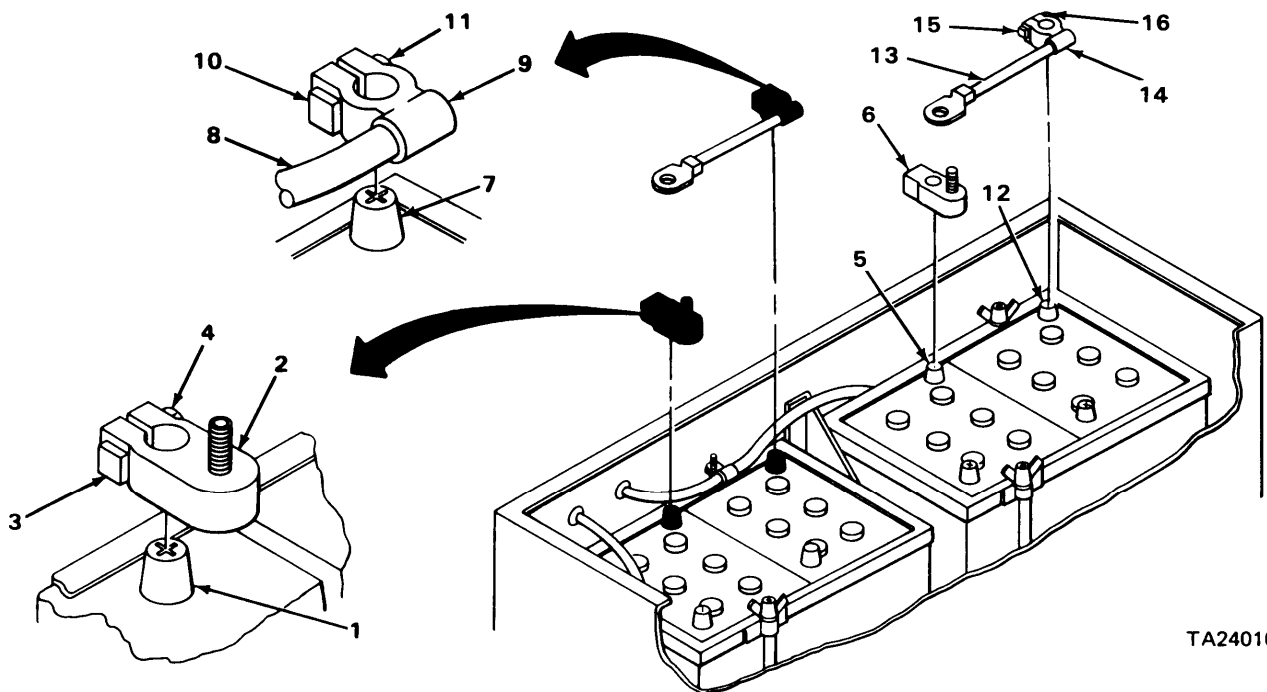


BATTERY CABLES - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION – CONTINUED

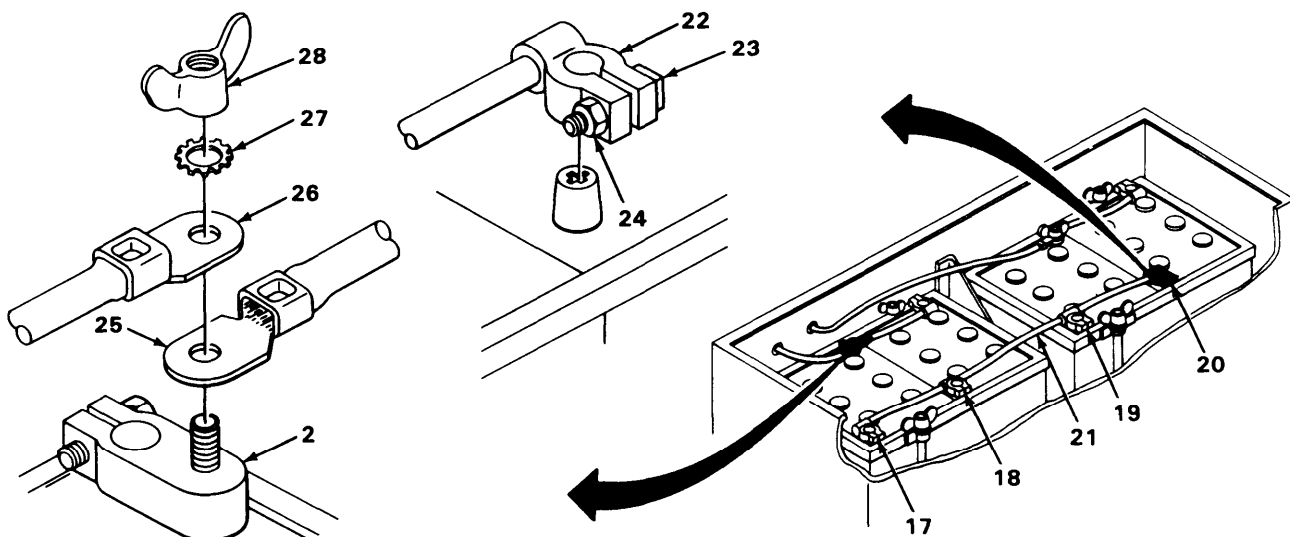
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|-----|----------------------------|---|--|
| 54. | Positive battery post (1) | Positive adapter clamp (2) | Put on. |
| 55. | Positive adapter clamp (2) | Capscrew (3) and nut (4) | Using 1/2-inch open-end wrench and 1/2-inch box wrench, tighten. |
| 56. | Negative battery post (5) | Negative adapter clamp (6) | Put on. |
| 57. | Negative adapter clamp (6) | Capscrew (3) and nut (4) | Using 1/2-inch open-end wrench and 1/2-inch box wrench, tighten. |
| 56. | Positive battery post (7) | Positive inter-battery cable (8) terminal clamp (9) | Put on. |
| 59. | Terminal clamp (9) | Capscrew (10) and nut (11) | Using 1/2-inch open-end wrench and 1/2-inch box wrench, tighten. |
| 60. | Negative battery post (12) | Negative inter-battery cable (13) terminal clamp (14) | Put on. |
| 61. | Terminal clamp (14) | Capscrew (15) and nut (16) | Using 1/2-inch open-end wrench and 1/2-inch box wrench, tighten. |



TA240101

BATTERY CABLES - CONTINUED

LOCATION	ITEM	ACTION REMARKS
62. Battery posts (17'), (18), (19) and (20)	Four battery connector cables (21) and inter-battery terminal clamps (22)	Put on.
63. Four inter-battery cable terminal clamps (22)	Four capscrews (23) and nuts (24)	Using 1/2-inch open-end wrench and 1/2-inch box wrench, tighten.
64. Positive adapter clamp (2)	Positive inter-battery cable (25), positive cable (26), and new lockwasher (27')	Put on.
65. Positive inter-battery cable (25) and positive cable (26) to adapter clamp (2)	Wingnut (28)	Screw on and tighten.

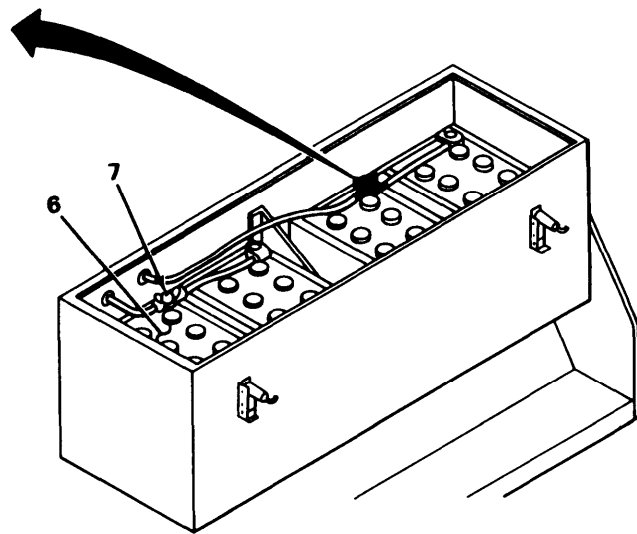
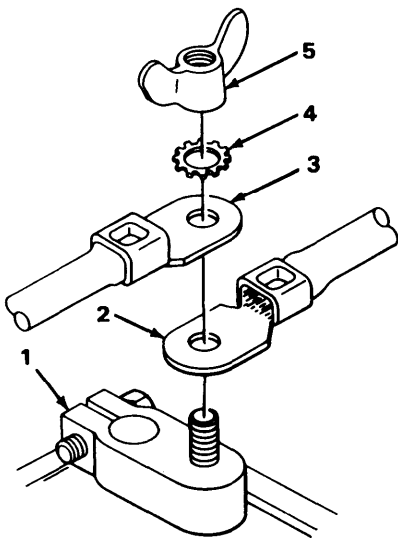


BATTERY CABLES - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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INSTALLATION – CONTINUED

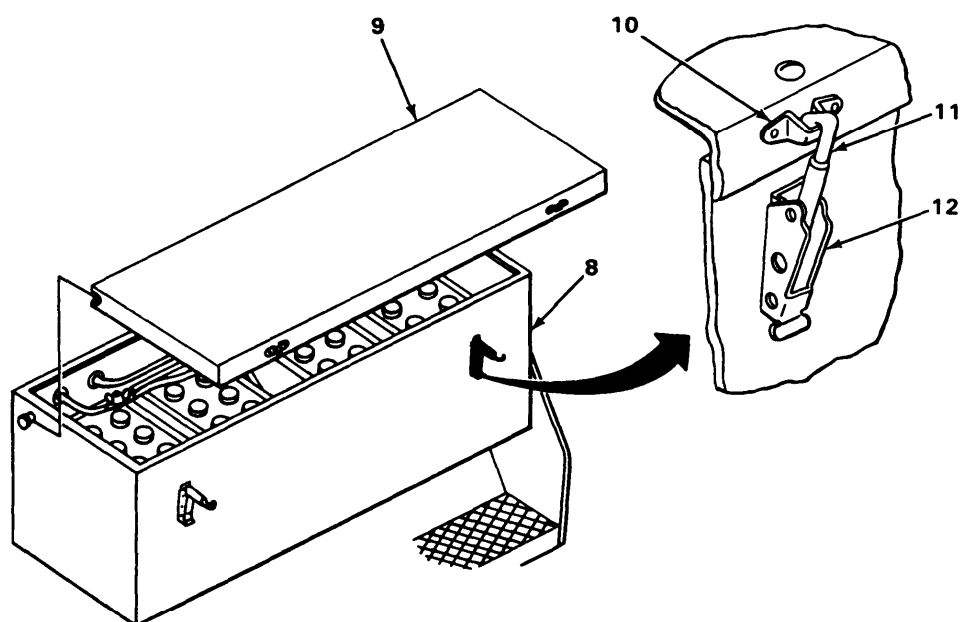
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|--|--|-----------------------|
| 66. Negative adapter clamp (1) | Negative inter-battery cable (2), ground cable (3), and new lockwasher (4) | Put on. |
| 67. Negative inter-battery cable (2) and ground cable (3) to adapter clamp (1) | Wingnut (5) | Screw on and tighten. |
| 68. All batteries (6) | All battery connections (7) | Coat with grease. |



- | | | |
|----------------------------|------------------|------------|
| 69. Battery box (8) | Lid (9) | Put on. |
| 70. Two latch sockets (10) | Two hooks (11) | Put in. |
| 71. Battery box (8) | Two latches (12) | Push down. |

TA240103

BATTERY CABLES - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Check operation (TM 92320-270-10).
2. Install left side panel and close left side of hood (TM 9-2320-270-10).

TASK ENDS HERE

BATTERIES

This task covers:

- | | |
|-------------------------------------|---------------------------------|
| a. Removal (page 4-462) | c. Test Procedures (page 4-464) |
| b. Cleaning/Inspection (page 4-464) | d. Installation (page 4-464) |
-

INITIAL SETUP

<p>Tools</p> <p>Extension, 1/2-inch, 3/8-inch drive Handle, ratchet, 3/8-inch drive Pliers, slip-joint, straight-nose Socket, 1/2-inch, 3/8-inch drive Wrench, open-end, 5/8-inch</p>	<p>Personnel Required</p> <p>One</p> <p>Equipment Condition</p> <p>Battery cables removed (page 4-446).</p>
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LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

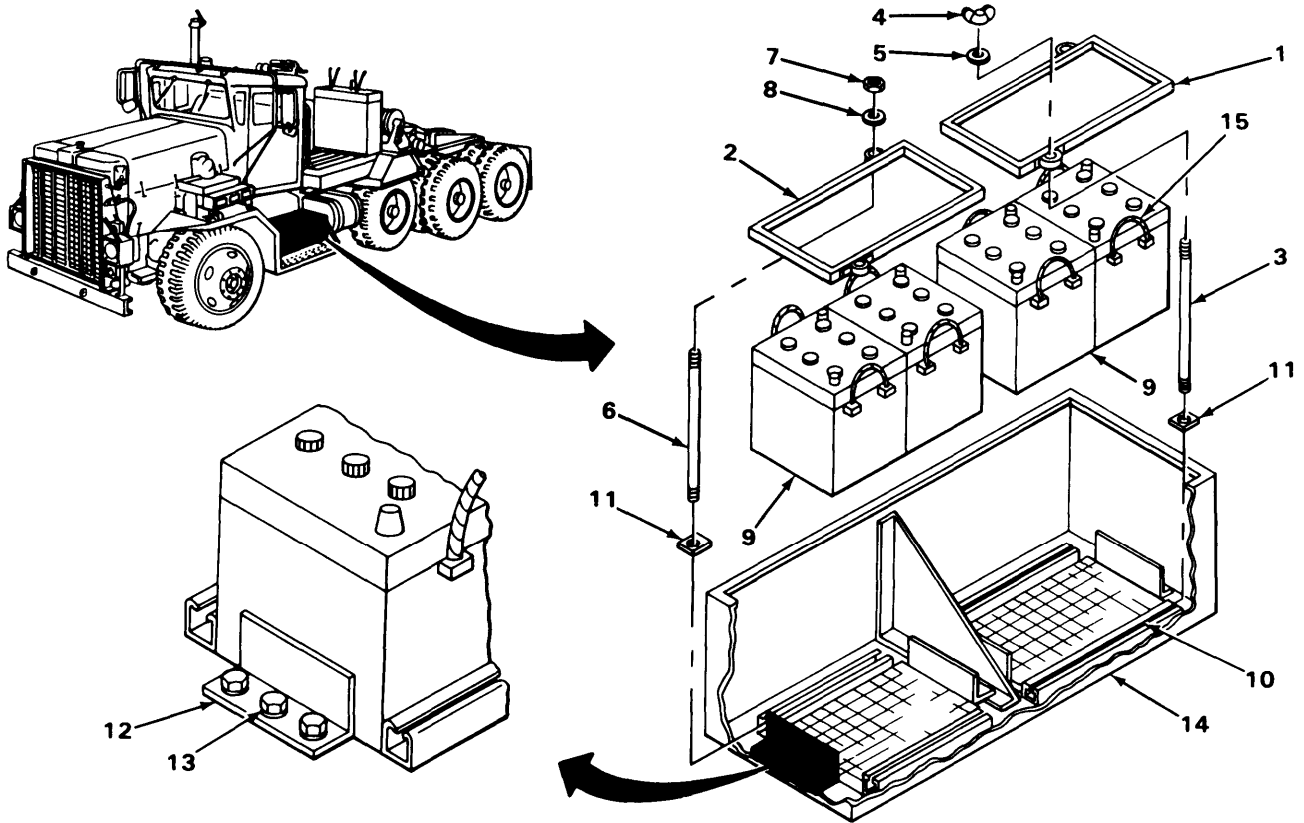
WARNING

Electrolyte and battery corrosion can cause burns. Wear safety goggles and gloves. If electrolyte or battery corrosion contacts eyes, skin, or clothing, flush immediately with large amounts of clean water, neutralize with baking soda solution, and seek medical attention.

1. Two battery hold-down frames (1) and (2) to three threaded rods (3)	Three wing nuts (4) and washers (5)	Unscrew and take off. You may have to use pliers to loosen.
2. Battery hold-down frame (2) to threaded rod (6)	Nut (7) and washer (8)	Using 5/8-inch wrench, unscrew and take off.
3. Four batteries (9)	Two battery hold-down frames (1) and (2)	Take off.
4. Four tiedown channels (10)	Four threaded rods (3) and (6)	Slide out.

BATTERIES - CONTINUED

LOCATION	ITEM	ACTION REMARKS
5. Four threaded rods (3) and (6)	Four spring nuts(n)	Using pliers, unscrew and take off.
<u>WARNING</u>		
Do not pry against batteries to move stop angles. Battery case could break and electrolyte could run out causing burns to personnel.		
6. Four battery stop angles (12)	12 capscrews (13)	Using 1/2-inch socket, extension, and handle, unscrew part way.
7. Battery box (14)	Four battery stop angles (12)	Push away from batteries.
8.	Four batteries (9)	a. Not location of each battery (9). b. Using handles, lift out.



BATTERIES - CONTINUED

LOCATION	ITEM	ACTION REMARKS
CLEANING/inspection		
9.	Four batteries (1)	Clean and inspect (TM 9-6140-200-14).
TEST PROCEDURES		
10.	Four batteries (1)	Test (TM 9-6140-200-14).
INSTALLATION		
<u>CAUTION</u>		
Make sure batteries are installed in same locations. Batteries must be installed correctly to prevent damage to electrical system.		
11. Battery box (2)	Four batteries (1)	Using handles, set in place.
12.	Four battery stop angles (3)	Push firmly against batteries (1).
13. Four battery stop angles (3) to battery box (2)	12 capscrews (4)	Using socket, handle and extension, tighten.
14. Four threaded rods (5) and (6)	Four spring nuts (7)	Screw on.
15. Four tiedown channels (8)	Four spring nuts (7) on threaded rods (5) and (6)	Slide in and put in place.
16. Four batteries (2) and four threaded rods (5) and (6)	Two battery hold-down frames (9)	Put in place.
17. Three threaded rods (5)	Three washers (10) and wingnut (11)	Screw on, but do not tighten.
18. Threaded rod (6)	Washer (12) and nut (13)	Screw on, but do not tighten.

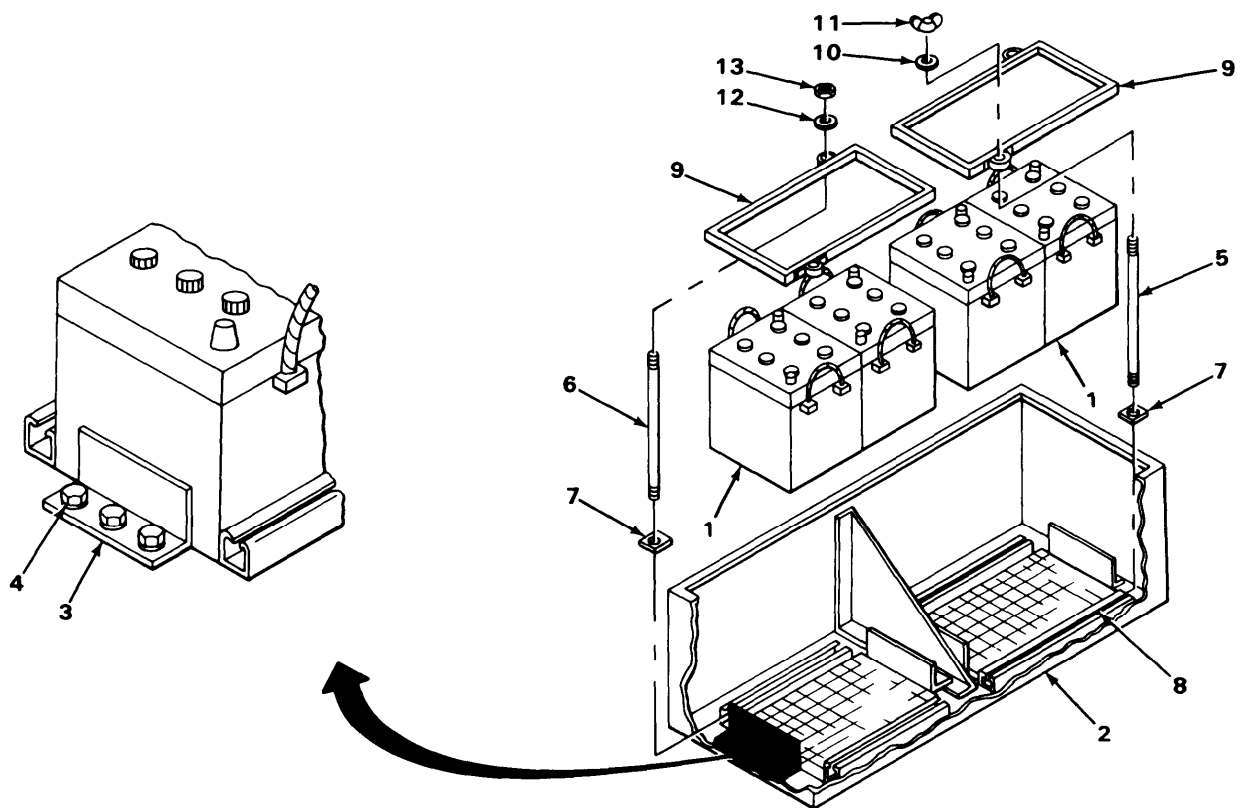
BATTERIES - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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WARNING

Do not overtighten battery hold-down frame, nut, and wing nuts. Battery case may crack causing electrolyte to run out resulting in burns to personnel.

- | | | |
|---|----------------------------|---|
| 19. Battery hold-down frames (9) to threaded rods (5) and (6) | Nut (13) and wingnuts (11) | Using 5/8-inch wrench, tighten alternately. |
|---|----------------------------|---|



NOTE

FOLLOW-ON MAINTENANCE:

1. Install battery cables (page 4-446).
2. Check operation (TM 9-2320-270-10).

TASK ENDS HERE

BATTERY BOX AND BRACKETS

This task covers:

- a. Removal (page 4-466)
 - b. Disassembly (page 4-470)
 - c. Cleaning/Inspection (page 4-471)
 - d. Repair (page 4-471)
 - e. Assembly (page 4-471)
 - f. Installation (page 4-473)
-

INITIAL SETUP

Tools

- Extension, 3-inch, 3/8-inch drive
- Handle, ratchet, 3/8-inch drive
- Handle, ratchet, 1/2-inch drive
- Socket, 1/2-inch, 3/8-inch drive
- Socket, 9/16-inch, 1/2-inch drive
- Socket, 3/4-inch, 1/2-inch drive
- Socket, 15/16-inch, 1/2-inch drive
- Wrench, box, 1/2-inch
- Wrench, box, 9/16-inch
- Wrench, box, 3/4-inch
- Wrench, box, 15/16-inch

Materials/Parts

- Lockwasher, battery box to battery box brackets (12 required)
- Lockwasher, fender brace to front battery box brackets (2 required)
- Lockwasher, air tank drain knob to center battery box bracket (two required)
- Lockwasher, rear battery box bracket to hose bracket
- Lockwasher, four tiedown channels to battery box (16 required)

Materials/Parts – Continued

- Lockwasher, step assembly to battery box (four required)
- Lockwasher, fuel line support to rear battery box bracket
- Lockwasher, four battery stop angles to battery box (12 required)
- Self-locking nut, center battery box bracket to fuel tank brace angle to center battery box bracket (two required)
- Self-locking nut, battery box brackets to frame (nine required)
- Rope (item 11, appendix C)

Personnel Required

Three

Equipment Condition

Batteries removed (page 4-462).

LOCATION	ITEM	ACTION	REMARKS
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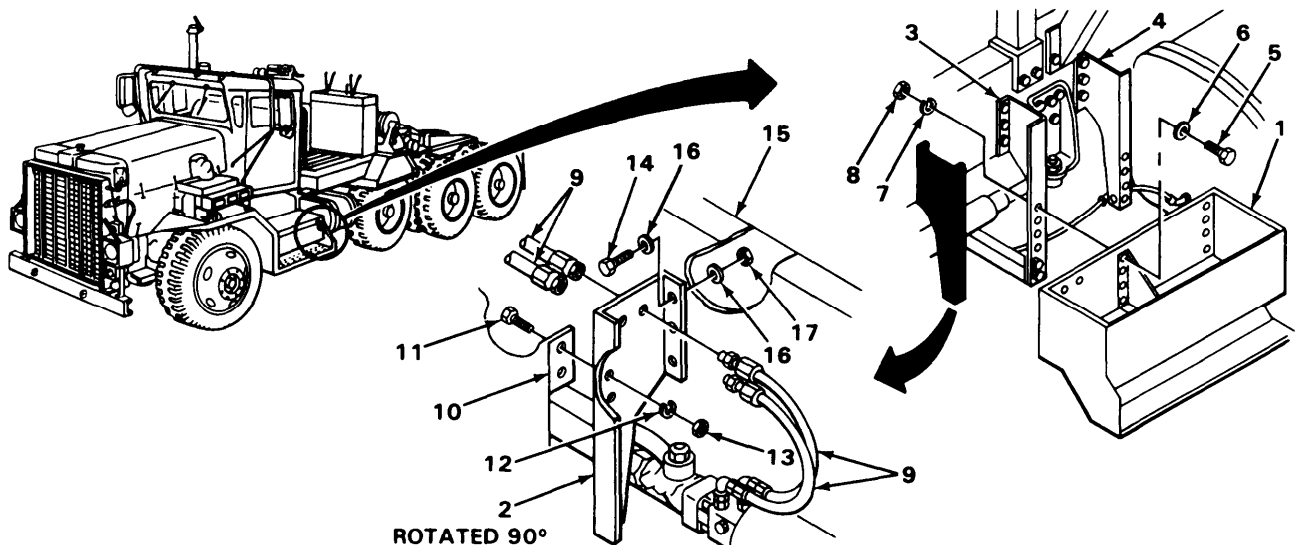
REMOVAL

WARNING

Electrolyte and battery corrosion can cause burns. Wear safety goggles and rubber gloves. If electrolyte or battery corrosion contacts eyes, skin, or clothing, flush immediately with large amounts of clean water, neutralize with baking soda solution, and seek medical attention.

BATTERY BOX AND BRACKETS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
1. Battery box (1) to support brackets (2), (3), and (4)	12 capscrews (5), washers (6), lockwashers (7), and nuts (8)	a. Using 3/4-inch box wrench, 3/4-inch socket, and handle with 1/2-inch drive, unscrew and take off. b. Get rid of lockwashers (7).
2. Battery box brackets (2), (3), and (4)	Battery box (1)	With help from assistants, take off.
3. Front battery box bracket (2)	Power steering hoses (9)	Remove (page 4-993 and 4-999).
4. Front battery box bracket (2) to front fender brace (10)	Two capscrews (11), lockwashers (12), and nuts (13)	a. Using 9/16-inch box wrench, 9/16-inch socket, and handle with 1/2-inch drive, unscrew and take out. b. Get rid of lockwashers (12).
5. Front battery box bracket (2) to frame (15)	Three capscrews (14), six washers (16), and three self-locking nuts (17)	a. With help from assistant, and using 15/16-inch box wrench, 15/16-inch socket, and handle with 1/2-inch drive, unscrew and take out. b. Get rid of nuts (17).
6. Frame (15)	Front battery box bracket (2)	Take off.

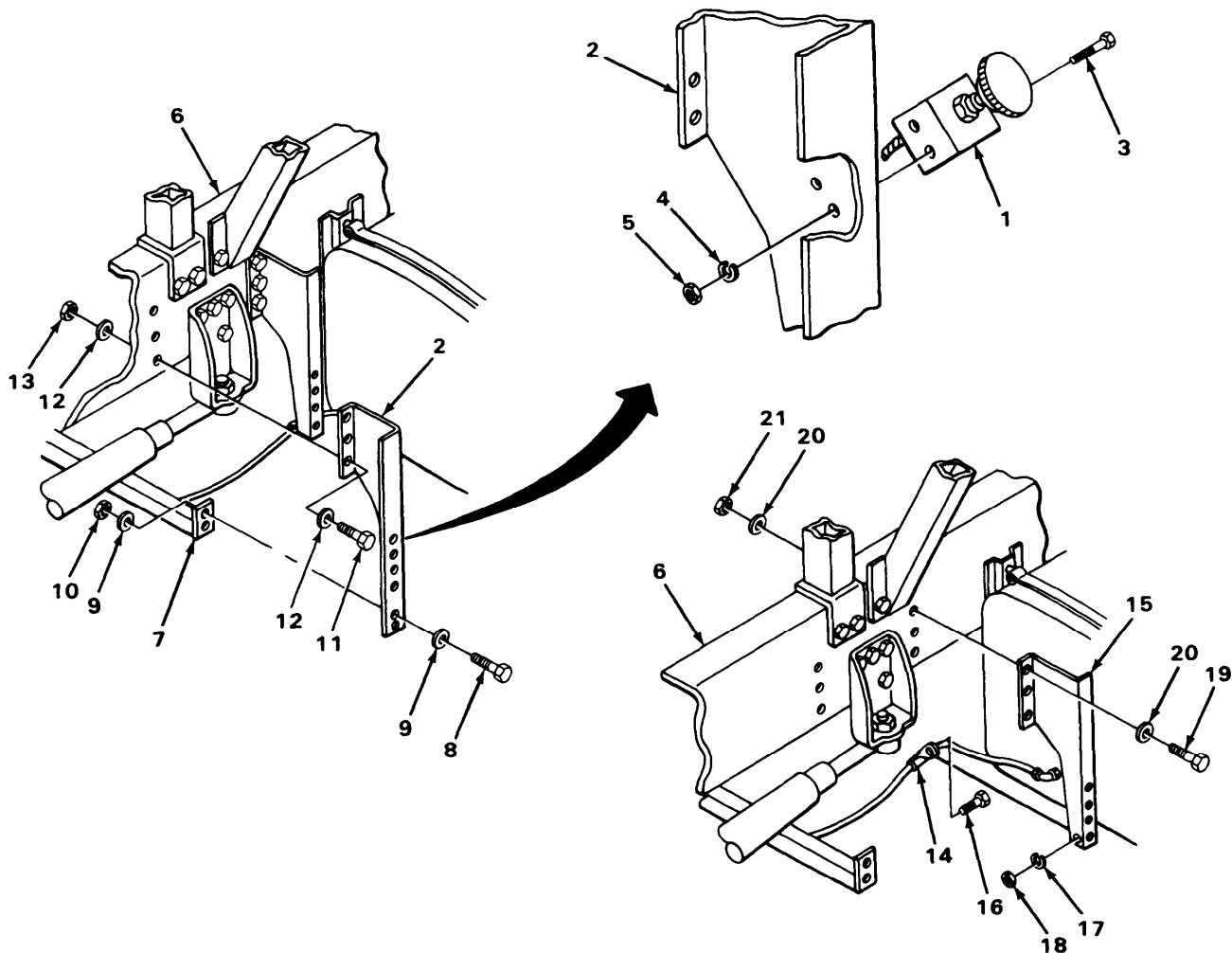


BATTERY BOX AND BRACKETS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL – CONTINUED		
7. Air tank drain knob and bracket (1) to center battery box bracket (2)	Two capscrews (3), lockwashers (4), and nuts (5)	a. Using 9/16-inch box wrench, 9/16-inch socket, and handle with 1/2-inch drive, unscrew and take off. b. Get rid of lockwashers (4).
8. Center battery box bracket (2)	Air tank, drain knob, and bracket (1)	Take off.
9. Frame (6)	Battery box to fuel tank brace angle (7)	Using rope, tie to frame (6).
10. Battery box to fuel tank brace angle (7) to center battery box bracket (2)	Two capscrews (8), four washers (9), and two self-locking nuts (10)	a. Using 15/16-inch box wrench, 15/16-inch socket, and handle with 1/2-inch drive, unscrew and take out. b. Get rid of self-locking nuts (10).
11. Center battery box bracket (2) to frame (6)	Three capscrews (11), six washers (12), and three self-locking nuts (13)	a. With help from assistant, and using 15/16-inch box wrench, 15/16-inch socket, and handle with 1/2-inch drive, unscrew and take out. b. Get rid of self-locking nuts (13).
12. Frame (6)	Center battery box bracket (2)	Take off.
13. Fuel line support (14) to rear battery box bracket (15)	Capscrew (16), lockwasher (17), and nut (18)	a. Using 9/16-inch box wrench, 9/16-inch socket, and handle with 1/2-inch drive, unscrew and take out. b. Get rid of lockwasher (17).

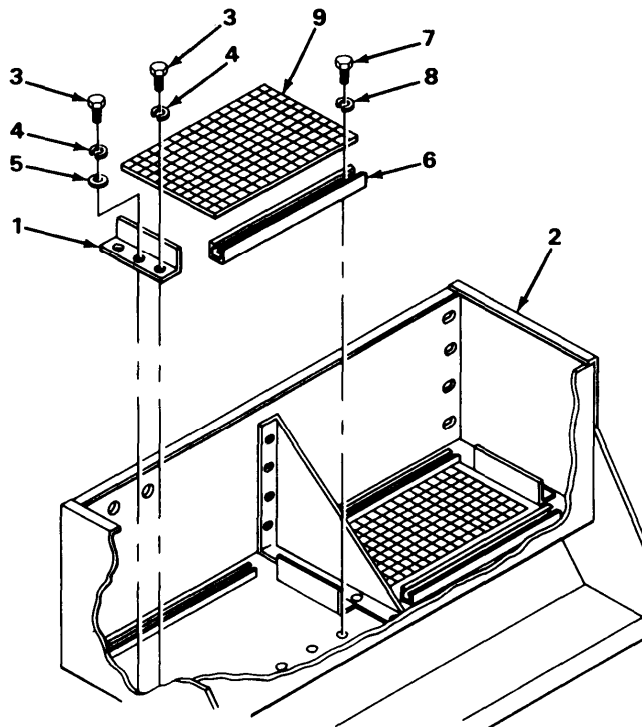
BATTERY BOX AND BRACKETS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
14. Rear battery box bracket (15) to frame (6)	Three capscrews (19), six washers (20), and three self-locking nuts (21)	a. With help from assistant, and using 15/16-inch box wrench, 15/16-inch socket, and handle with 1/2-inch drive, unscrew and take out. b. Get rid of self-locking nut (21).
15. Frame (6)	Rear battery bracket (15)	Take off.



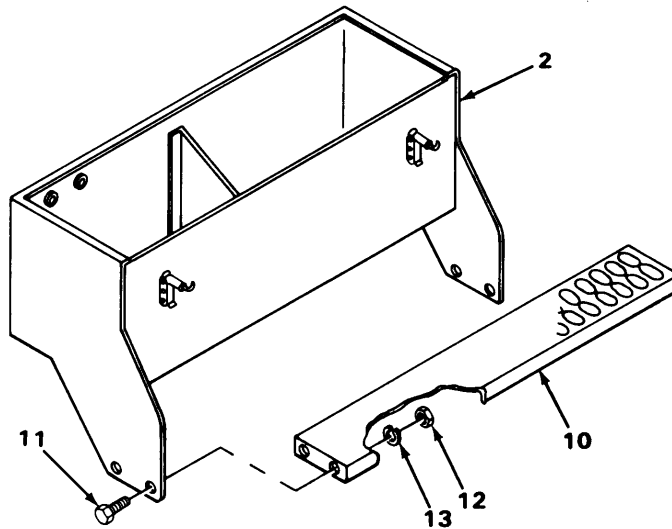
BATTERY BOX AND BRACKETS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
DISASSEMBLY		
16. Four battery stop angles (1) to battery box (2)	12 capscrews (3), 12 lockwashers (4), and four washers (5)	a. Using 1/2-inch socket, extension, and handle with 3/8-inch drive, unscrew and take out. b. Get rid of lockwashers (4).
17. Battery box (2)	Four battery stop angles (1)	Take out.
18. Four tiedown channels (6) to battery box (2)	16 capscrews (7) and lockwashers (8)	a. Using 1/2-inch socket, extension, and handle with 3/8-inch drive, unscrew and take out. b. Get rid of lockwashers (8).
19. Battery box (2)	Four tiedown channels (6)	Take out.
20.	Two insulator boards (9)	Take out.



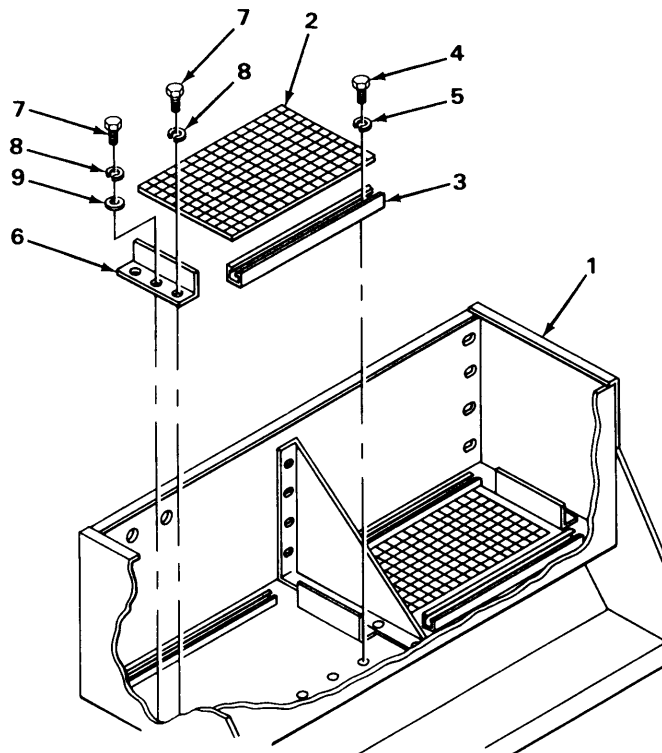
BATTERY BOX AND BRACKETS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
21. Step assembly (10) to battery box (2)	Four capscrews (11), nuts (12), and lockwashers (13)	a. Using 1/2-inch box wrench, 1/2-inch socket, and handle with 3/8-inch drive, unscrew and take out. b. Get rid of lockwashers (13).
22. Battery box (2)	Step assembly (10)	Take off.
CLEANING/inspection		
23.	Battery box (2)	Clean and inspect (TM 9-6140-200-14).
REPAIR		
24.	Battery box (2)	Repair (TM 9-6140-200-14).
ASSEMBLY		
25. Battery box (2)	Step assembly (10)	Put in place.
26. Step assembly (10) to battery box (2)	Four capscrews (11), new lockwashers (13), and nuts (12)	Screw in and tighten using 1/2-inch box wrench, 1/2-inch socket, and handle with 3/8-inch drive.



BATTERY BOX AND BRACKETS - CONTINUED

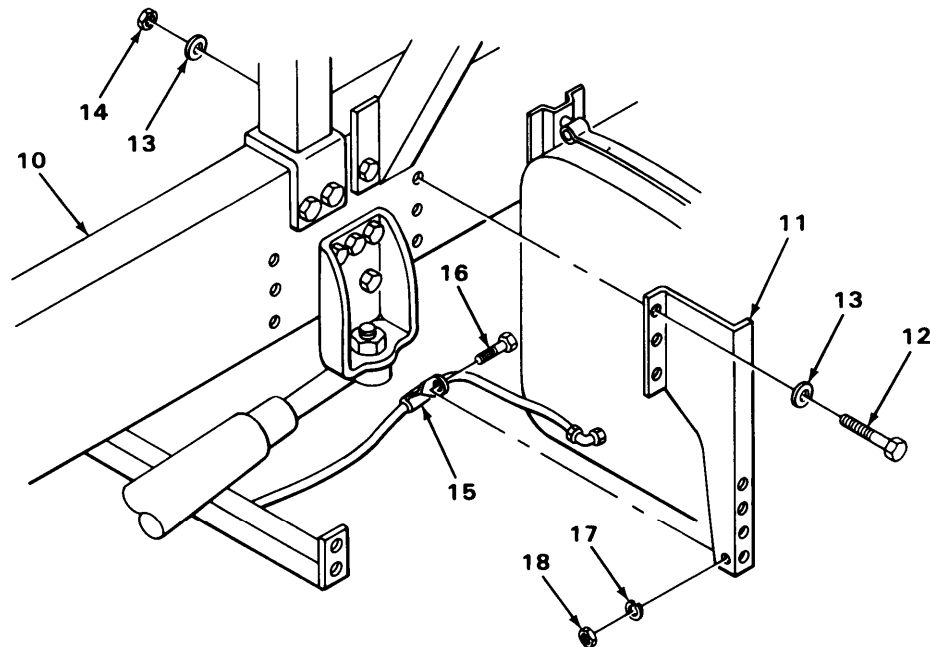
LOCATION	ITEM	ACTION REMARKS
ASSEMBLY – CONTINUED		
27. Battery box (1)	Two insulator boards (2)	Put in place.
28.	Four tiedown channels (3)	Put in place.
29. Four tiedown channels (3) to battery box (1)	16 capscrews (4) and new lockwashers (5)	Screw in and tighten using 1/2-inch socket, extension, and handle with 3/8-inch drive.
30. Battery box (1)	Four battery stop angles (6)	Put in place.
31. Four battery stop angles (6) to battery box (1)	12 capscrews (7), 12 new lockwashers, (8), and four washers (9)	Screw in part way.



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BATTERY BOX AND BRACKETS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
32. Frame (10)	Rear battery box bracket (11)	With help from assistant, put in place.
33. Rear battery box bracket (11) to frame (10)	Three capscrews (12), six washers (13), and three new self-locking nuts (14)	Screw in and tighten using 15/16-inch box wrench, 15/16-inch socket, and handle with 1/2-inch drive.
34. Rear battery box bracket (11)	Fuel line support (15)	Put in place.
35. Fuel line support (15) to rear battery bracket (11)	Capscrew (16), new lockwasher (17), and nut (18)	Screw in and tighten using 9/16-inch box wrench, 9/16-inch socket, and handle with 1/2-inch drive.



BATTERY BOX AND BRACKETS - CONTINUED

	LOCATION	ITEM	ACTION REMARKS
INSTALLATION – CONTINUED			
36.	Frame (1)	Center battery box bracket (2)	With help from assistant, put in place.
37.	Center battery box bracket (2) to frame (1)	Three capscrews (3), six washers (4), and three new self-locking nuts (5)	Screw in and tighten using 15/16-inch box wrench, 15/16-inch socket, and handle with 1/2-inch drive.
36.	Center battery box bracket (2)	Battery box to fuel tank brace angle (6)	Put in place.
39.	Battery box to fuel tank brace angle (6) to center battery box bracket (2)	Two capscrews (7), four washers (8), and two new self-locking nuts (9)	Screw in and tighten using 15/16-inch box wrench, 15/16-inch socket, and handle with 1/2-inch drive.
40.	Frame (1)	Battery box to fuel tank brace angle (6)	Take off rope.
41.	Center battery box bracket (2)	Air tank drain knob and bracket (10)	Put in place.
42.	Air tank drain knob and bracket (10) to center battery box bracket (2)	Two capscrews (11), new lockwashers (12), and nuts (13)	Screw in and tighten using 9/16-inch box wrench, 9/16-inch socket, and handle with 1/2-inch drive.
43.	Frame (1)	Front battery box bracket (14)	With help from assistant, put in place.
44.	Front battery box bracket (14) to frame (1)	Three capscrews (15), six washers (16), and three new self-locking nuts (17)	Screw in and tighten using 15/16-inch box wrench, 15/16-inch socket, and handle with 1/2-inch drive.
45.	Front battery box bracket (14) to front fender brace (18)	Two capscrews (19), new lockwashers (20), and nuts (21)	Screw in and tighten using 9/16-inch box wrench, 9/16-inch socket, and handle with 1/2-inch drive.
46.	Front battery box bracket (14)	Power steering hoses (22)	Install (pages 4-993 and 4-999).
47.	Battery box brackets (2), (14), and (23)	Battery box (24)	With help from assistants, put in place.

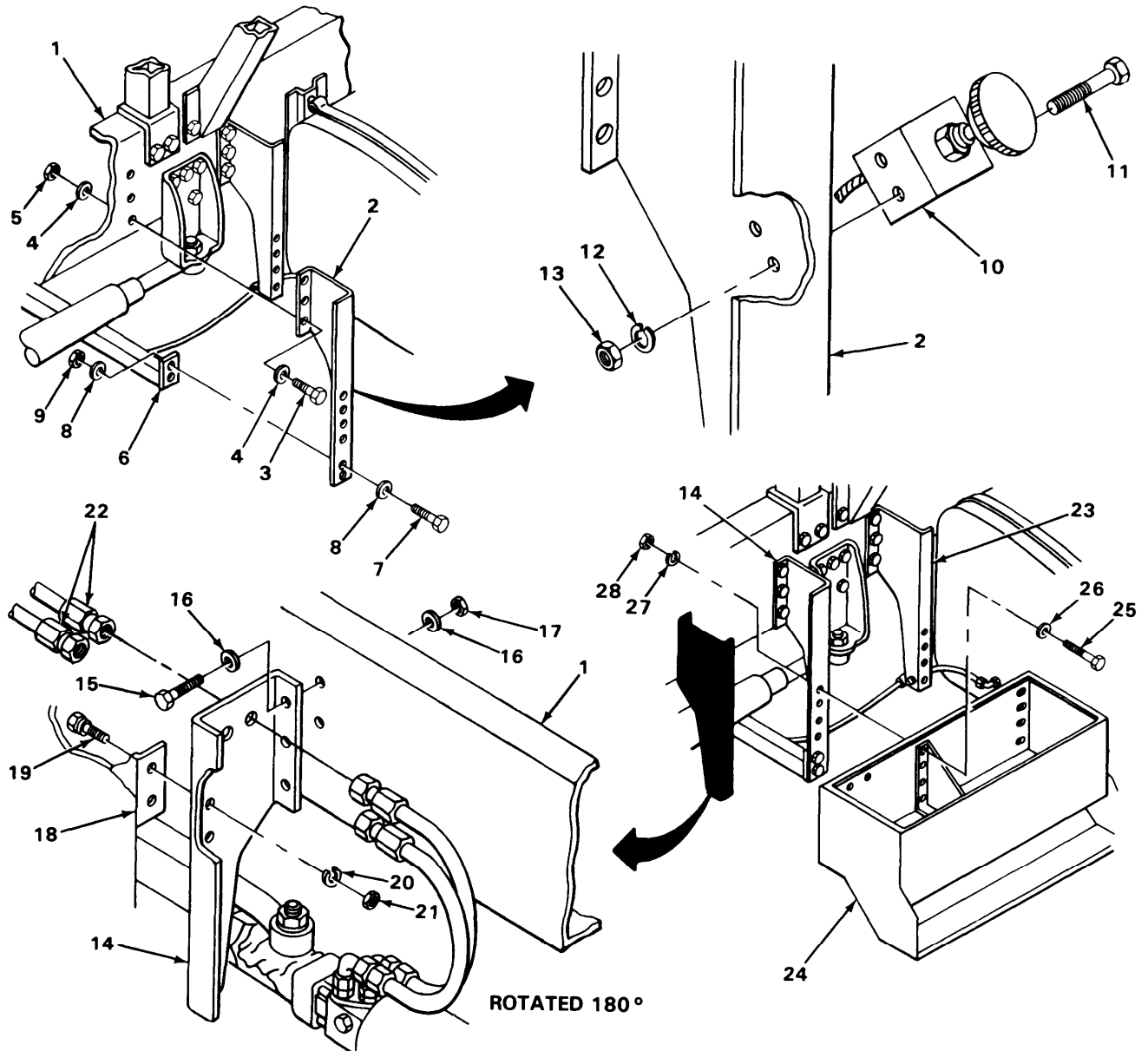
BATTERY BOX AND BRACKETS - CONTINUED

LOCATION	ITEM	ACTION REMARKS
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48. Battery box (24) to battery box brackets (2), (14), and (23)

12 capscrews (25), washers (26), new lockwashers (27), and nuts (28)

Screw in and tighten using 3/4-inch box wrench, 3/4-inch socket, and handle with 1/2-inch drive.



BATTERY BOX AND BRACKETS - CONTINUED

INSTALLATION – CONTINUED

NOTE

FOLLOW-ON MAINTENANCE: Install batteries (page 4-462).

TASK ENDS HERE

OPTICAL RIBBON AND LIGHT SOURCE

This task covers:

- | | |
|-----------------------------|------------------------------|
| a. Removal (page 4-476) | c. Assembly (page 4-481) |
| b. Disassembly (page 4-481) | d. Installation (page 4-482) |

INITIAL SETUP

Tools

- Pliers, diagonal cutting
- Pliers, slip-joint
- Screwdriver, cross-tip, number 1
- Screwdriver, flat-tip, 1/4-inch
- Screwdriver, flat-tip, 3/8-inch
- Wrench, open-end, 3/8-inch

Materials/Parts

- Lockwasher, heater control panel
- Wrap, tie (item 24, appendix C)

Personnel Required

One

Equipment Condition

Instrument panel open (page 4-244).

LOCATION	ITEM	ACTION REMARKS
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REMOVAL

- | | | |
|---------------------|------------------------------------|--|
| 1. Light source (1) | Lampholder (2) | Turn one-quarter turn counterclockwise and take off. |
| 2. Lampholder (2) | Lamp (3) | Pull out. |
| 3. Dashboard (4) | Light source (1) | Pull up and turn over. |
| 4. Light source (1) | Three tabs (5) | Using 3/8-inch flat-tip screwdriver, pry up. |
| 5. | Three optical ribbon terminals (6) | Pull out. |
| 6. Dashboard (4) | Light source (1) | Take out. |

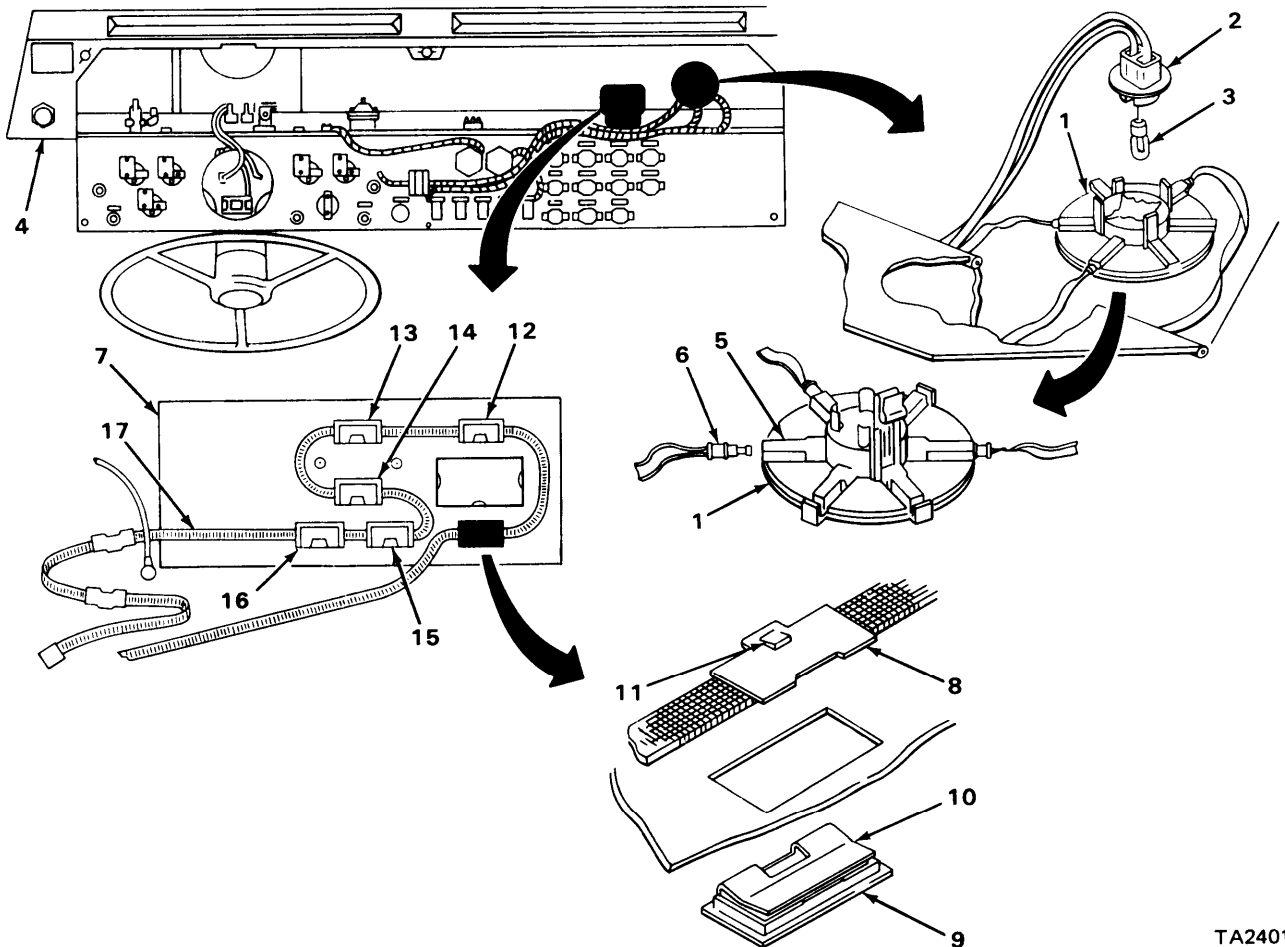
OPTICAL RIBBON AND LIGHT SOURCE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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NOTE

All the labels are removed in the same way. Remove labels in order listed.

- | | | | |
|-----|--|-----------|--|
| 7. | Heater control panel (7), panel decal (8), and bezel (9) | Tab (10) | Lift enough to clear nib (11). |
| 8. | | Decal (8) | Slide out from bezel (9). |
| 9. | Heater control panel (7) | Bezel (9) | a. Pull out.
b. Repeat steps 7 thru 9a and remove LO-ON-OFF label (12), PULL ON label (13), PUSH OFF label (14), HEAT label (15), and DEFROST label (16). |
| 10. | Optical ribbon assembly (17) | | Take out. |



OPTICAL RIBBON AND LIGHT SOURCE - CONTINUED

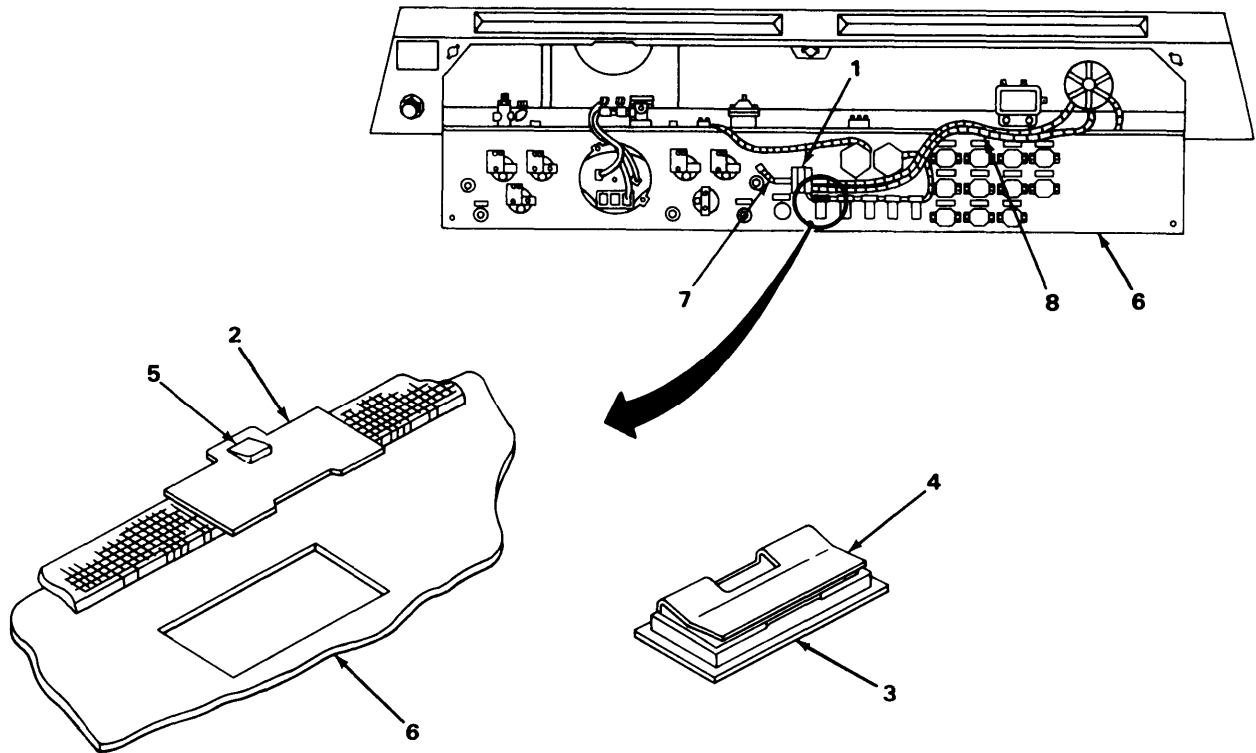
LOCATION	ITEM	ACTION REMARKS
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REMOVAL – CONTINUED

NOTE

All labels are removed in the same way. Remove labels in order listed.

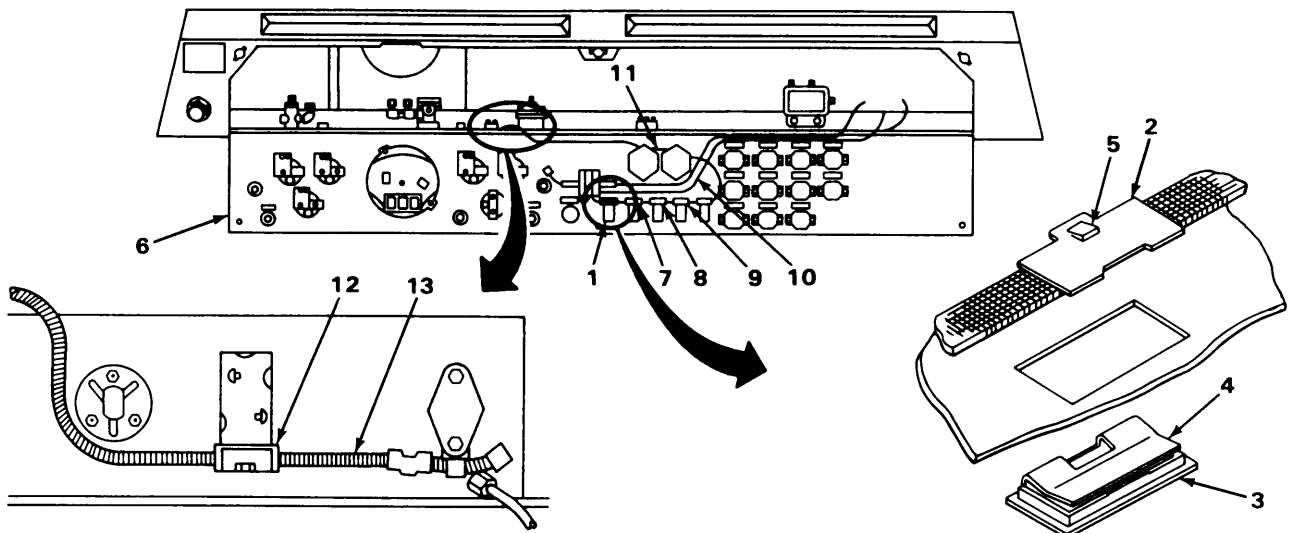
- | | | | |
|-----|--|--------------------|--|
| 11. | Blackout light switch (1), LIGHTS decal (2), and bezel (3) | Tab (4) | Lift enough to clear nib (5) on decal (2). |
| 12. | Decal (2) | Decal (2) | Slide out from bezel (3). |
| 13. | Instrument panel (6) | Bezel (3) | Pull out from front. |
| 14. | BLACKOUT label (7) | BLACKOUT label (7) | Repeat steps 11 thru 13. |
| 15. | Optical ribbon (8) | Optical ribbon (8) | Take out. |



TA240115

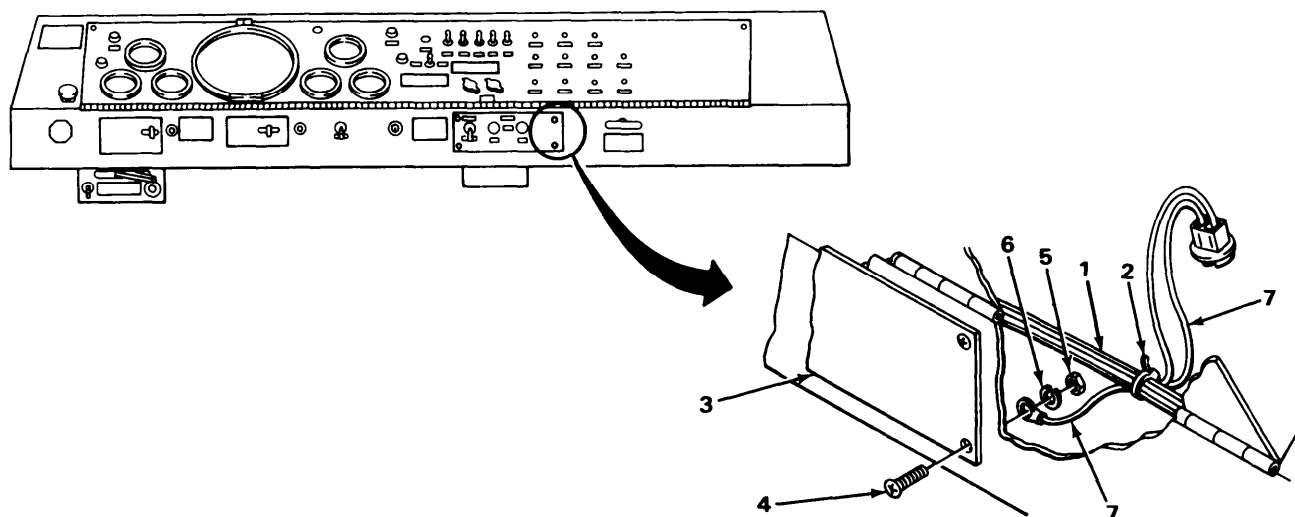
OPTICAL RIBBON AND LIGHT SOURCE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
16. Light switch (1) decals (2) and bezel (3)	Tab (4)	Lift enough to clear nib (5) on decal (2).
17.	Decal (2)	Slide out from bezel (3).
18. Instrument panel (6)	Bezel (3)	a. Take out. b. Repeat steps 16 thru 18a and remove CL LPS label (7), DOME label (8), BEACON label (9), WORK LITE label (10), WIPERS label (11), and ENG stop label (12).
19.	Optical ribbon (13)	Take out.



OPTICAL RIBBON AND LIGHT SOURCE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL – CONTINUED			
20. Wire and hose bundle (1)	Tie wrap (2)	a. Using cutting pliers, cut and take off. b. Get rid of.	
21. Heater control panel (3)	Screw (4), nut (5), lockwasher (6), and ground wire (7)	a. Using cross-tip screwdriver and open-end wrench, unscrew and take off. b. Get rid of lockwasher (6).	

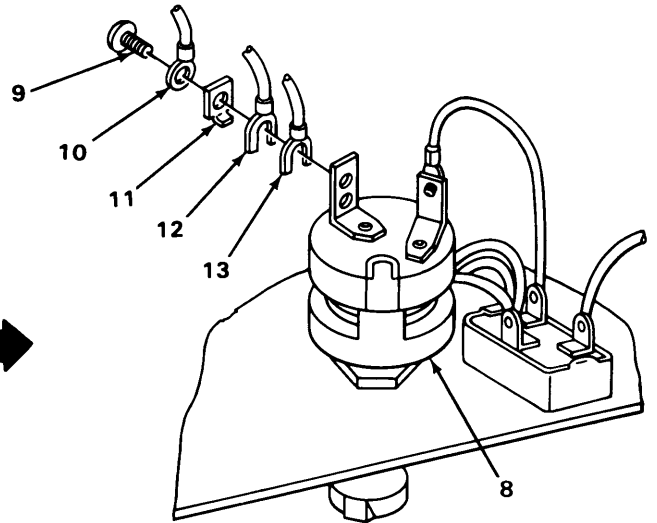
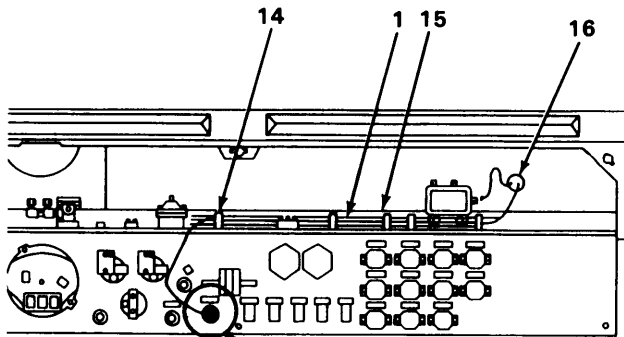


22. Light control rheostat (8)	Screw (9), black wire 52 (10), tab washer (11), optical ribbon lampholder lead (12), and yellow wire 52 (13)	Using 1/4-inch flat-tip screwdriver, unscrew and take off.	
23. Wire and hose bundle (1)	Seven tie wraps (14)	a. Using cutting pliers, cut and take off. b. Get rid of.	
24. Dashboard (15)	Lampholder (16)	Take out.	

TA240117

OPTICAL RIBBON AND LIGHT SOURCE - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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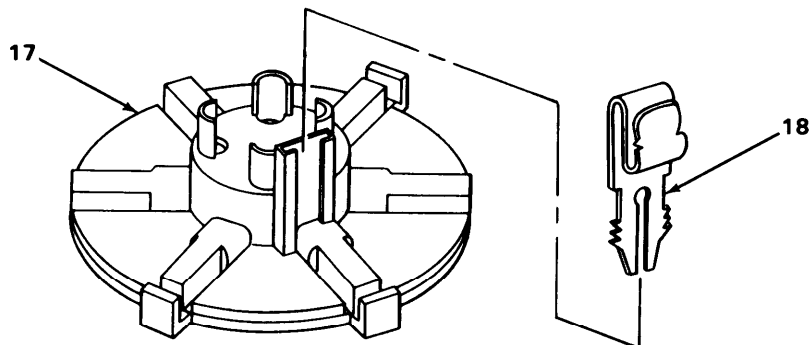


DISASSEMBLY

- | | | |
|------------------------------|-------------------------------------|-----------|
| 25. Light source (17) | Light source to dashboard clip (18) | Pull off. |
|------------------------------|-------------------------------------|-----------|

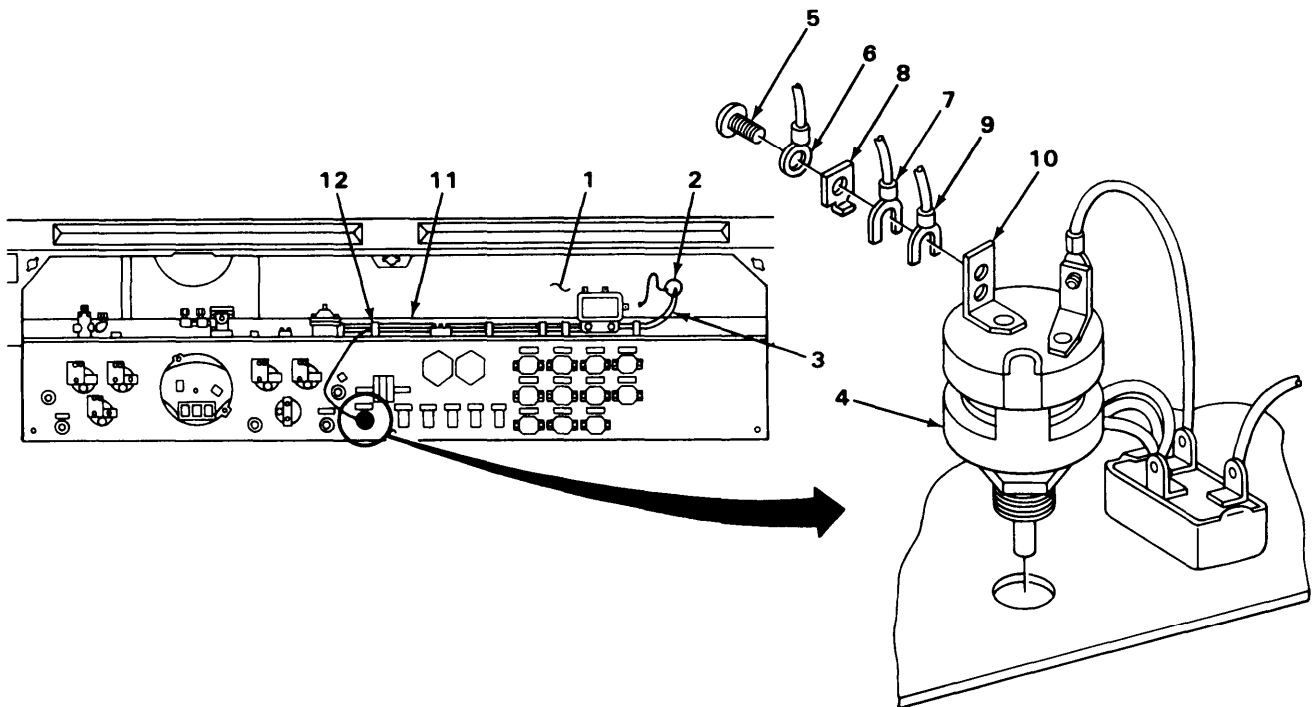
ASSEMBLY

- | | | |
|------------------------------|-------------------------------------|------------------|
| 26. Light source (17) | Light source to dashboard clip (18) | Push into place. |
|------------------------------|-------------------------------------|------------------|



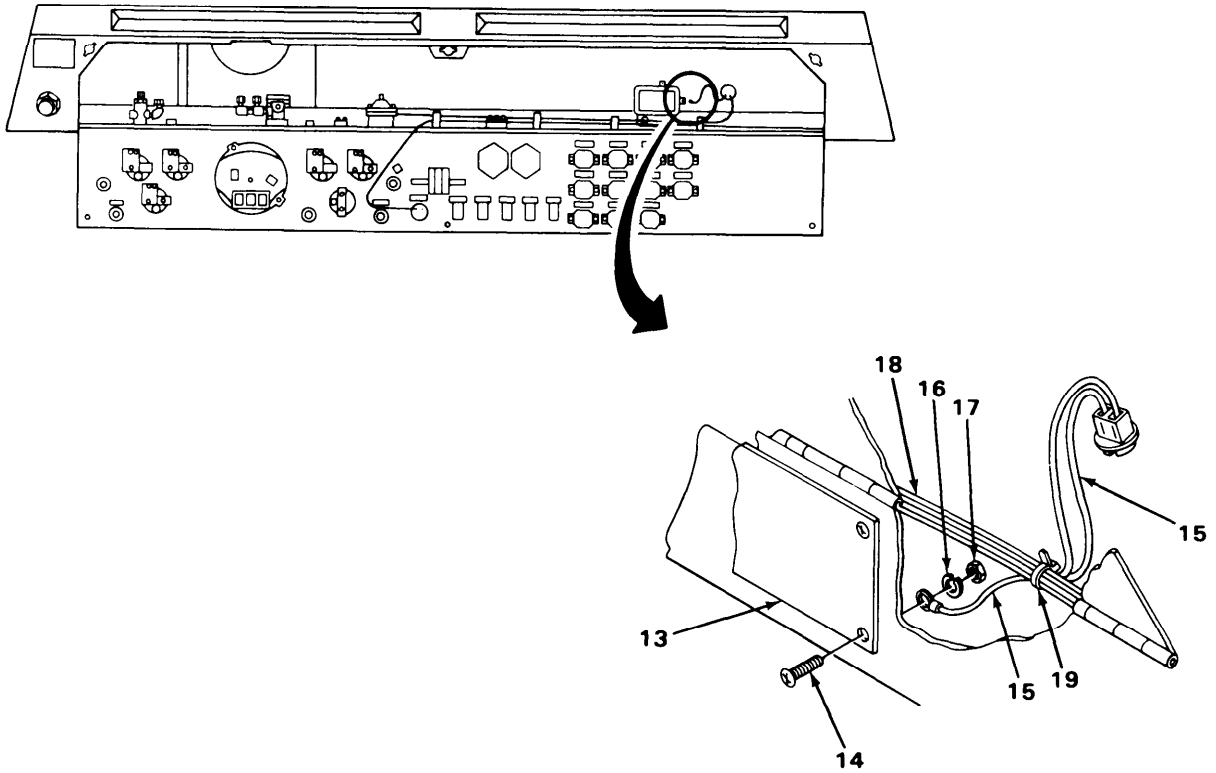
OPTICAL RIBBON AND LIGHT SOURCE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
27. Dashboard (1)	Lampholder (2)	Put in place.
28.	Lampholder lead (3)	Route to light control rheostat (4).
29. Screw (5)	Black wire 52 (6), lampholder lead (7), tab washer (8), and yellow wire 52 (9)	Put on.
30. Light control rheostat (4) and terminal (10)	Screw (5)	Screw in and tighten using 1/4-inch flat-tip screwdriver.
31. Wire and hose bundle(n)	Seven new tie wraps (12)	Using slip-joint pliers, put on.



OPTICAL RIBBON AND LIGHT SOURCE - CONTINUED

	LOCATION	ITEM	ACTION REMARKS
32.	Heater control panel (13)	Screw (14)	Push in.
33.	Screw (14)	Ground wire (5) and new lockwasher (16)	Put on.
34.		Nut (17)	Screw on and tighten using open-end wrench and cross-tip screwdriver.
35.	Wire and hose bundle (18)	New tie wrap (19)	Using slip-joint pliers, put on.



OPTICAL RIBBON AND LIGHT SOURCE - CONTINUED

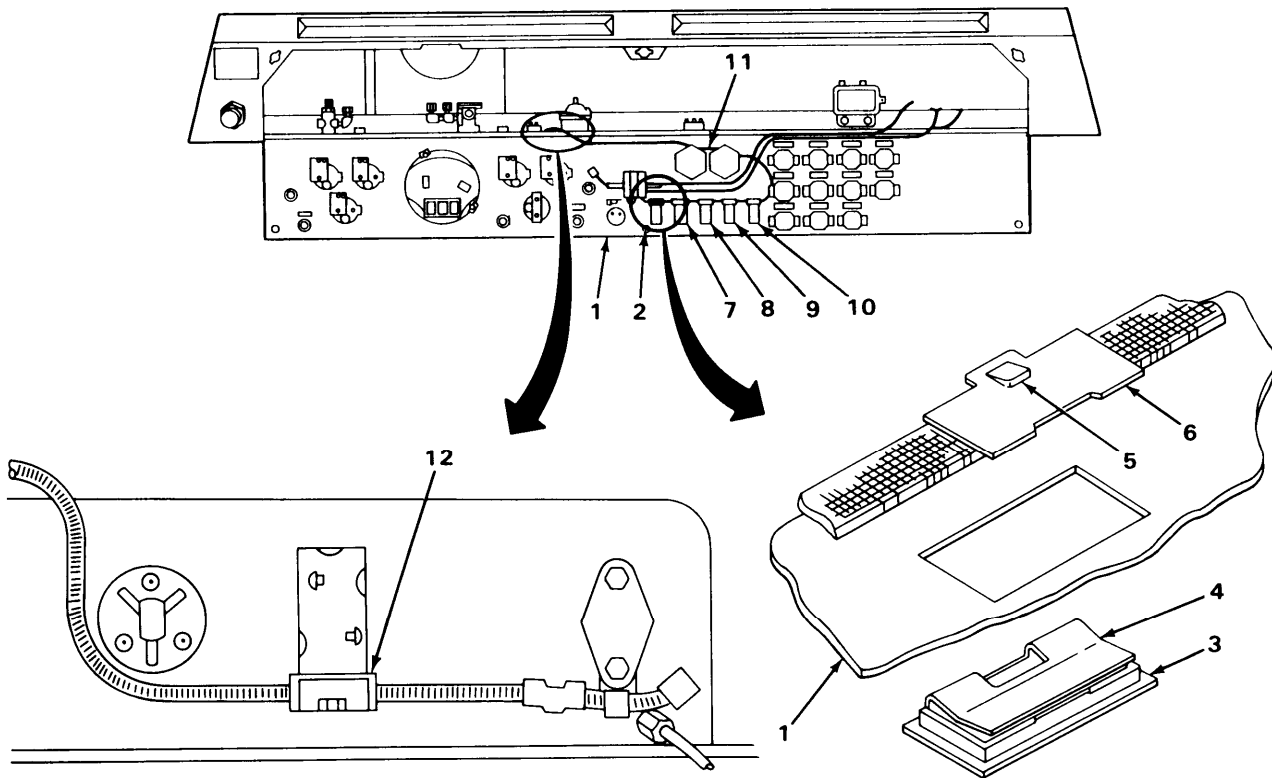
LOCATION	ITEM	ACTION	REMARKS
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INSTALLATION – CONTINUED

NOTE

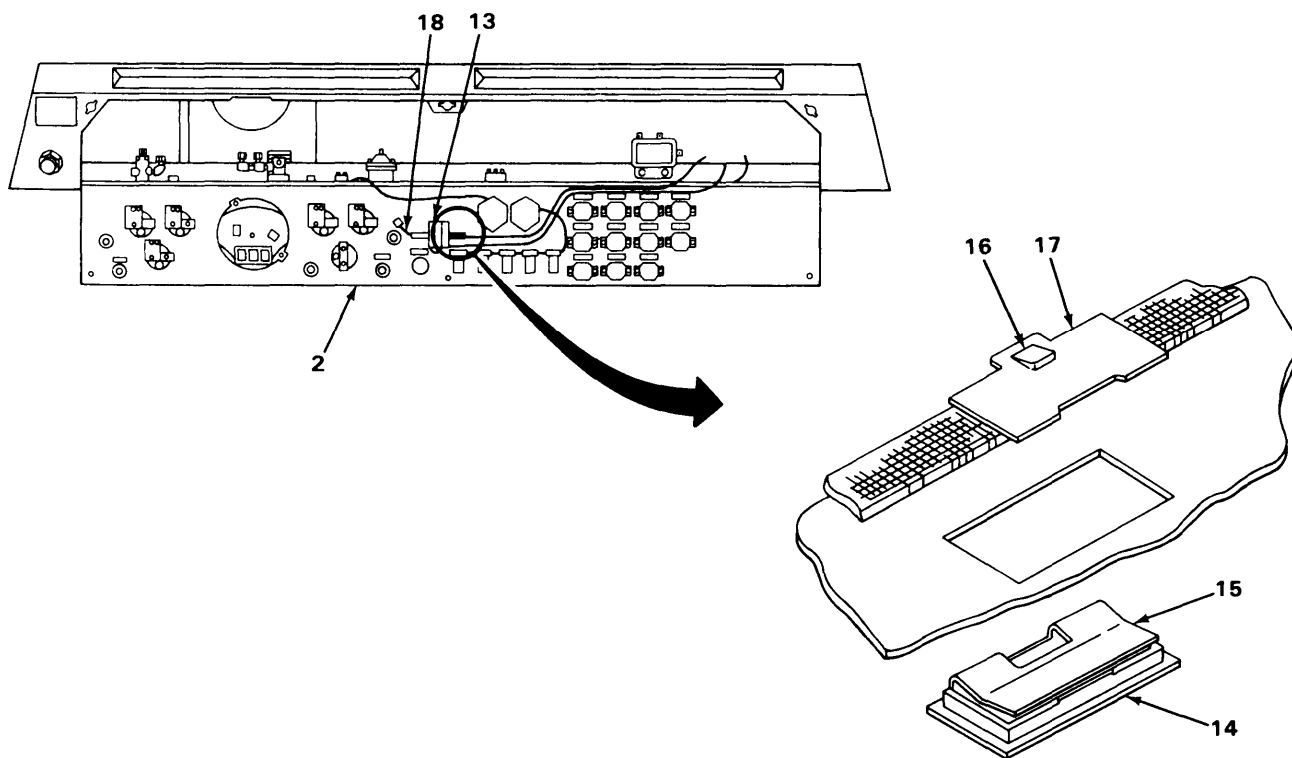
All labels are installed the same way. Install in order listed.

- | | | |
|---|------------------|---|
| 38. Instrument panel
(1) below light
switch (2) | Bezel (3) | Push into place from front. |
| 37. Bezel (3) | Tab (4) | Lift enough to clear nib (5) on decal (6). |
| 38. | LIGHTS decal (6) | a. Slide into bezel (3).
b. Repeat steps 36 thru 38a and install
CL LPS label (7), DOME label (8),
BEACON label (9), WORK LITE label
(10), WIPERS label (11), and ENG
stop label (12). |



OPTICAL RIBBON AND LIGHT SOURCE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
39. Instrument panel (1) to right of black- out light switch (13)	Bezel (14)	Push into place from front.
40. Bezel (14)	Tab (15)	Lift enough to clear nib (16) on decal (17).
41.	LIGHTS decal (17)	a. Slide into place. b. Repeat steps 39 thru 41a to install BLACKOUT label (18).



OPTICAL RIBBON AND LIGHT SOURCE - CONTINUED

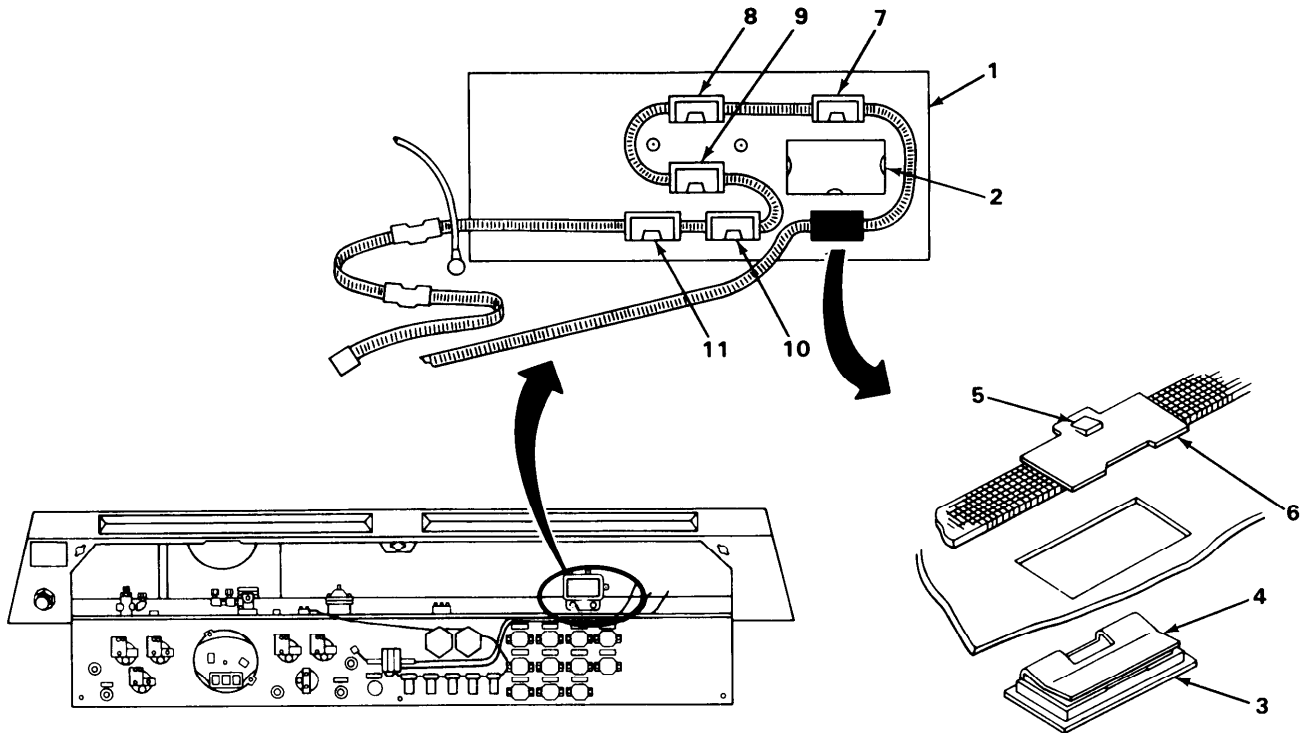
LOCATION	ITEM	ACTION REMARKS
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INSTALLATION – CONTINUED

NOTE

All the labels are installed in the same way. Install labels in order listed.

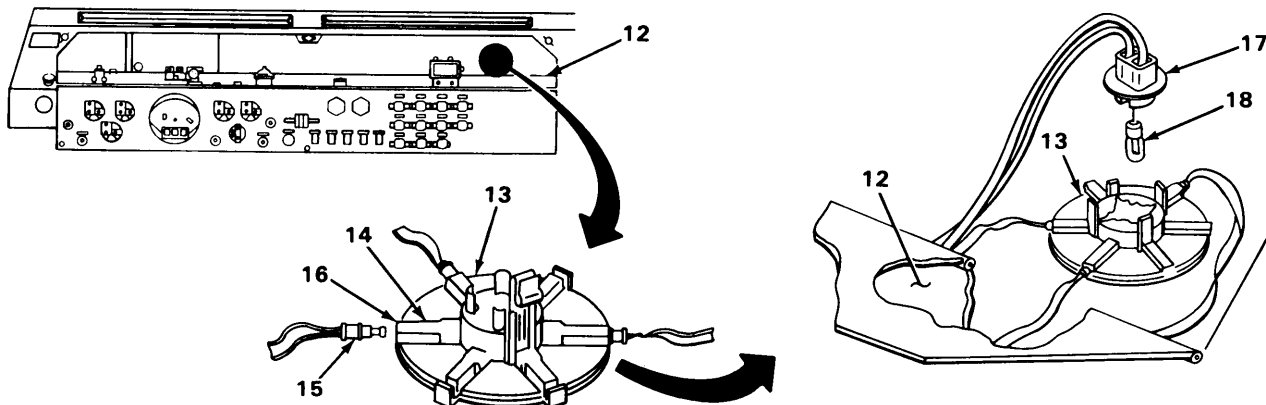
- | | | |
|---|---------------|---|
| 43. Heater control panel (1) below fan switch (2) | Bezel (3) | Push into place from front. |
| 44. Bezel (3) | Tab (4) | Lift enough to clear nib (5) on decal (6). |
| 45. | FAN decal (6) | a. Slide into place.
b. Repeat steps 43 thru 45a to install LO-ON-OFF label (7), PULL ON label (8), PUSH OFF label (9), HEAT label (10), and DEFROST label (11). |



TA240223

OPTICAL RIBBON AND LIGHT SOURCE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
48. Dashboard (12)	Light source (13)	Place in position.
47. Light source (13)	Three tabs (14)	Using 3/8-inch screwdriver, pry up.
48.	Three optical ribbon terminals (15)	Push into socket (16) until ribbon terminal (15) latches.
49. Dashboard (12)	Light source (13)	a. Turn right side up. b. Push into place.
50. Lampholder (17)	Lamp (18)	Push in and turn one-quarter turn clockwise.
51. Light source (13)	Lampholder (17)	Put in.



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

BULKHEAD CONNECTORS

This task covers:

- a. Disconnecting (page 4-488)
 - b. Removal (page 4-489)
 - c. Repair (page 4-491)
 - d. Installation (page 4-492)
 - e. Connecting (page 4-494)
-

INITIAL SETUP

Tools

- Crimping tool
- Pliers, diagonal cutting
- Pliers, slip-joint angle nose
- Remover, wire, .083 in. diameter
- Remover, wire, .120 in. diameter
- Remover, wire, .187 in. diameter
- Wire, stripper

Materials/Parts

Tag, marking (item 18, appendix C)

Personnel Required

One

Equipment Condition

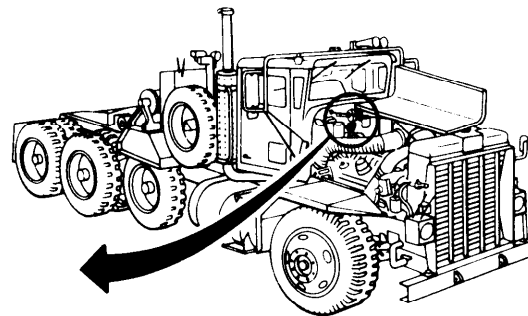
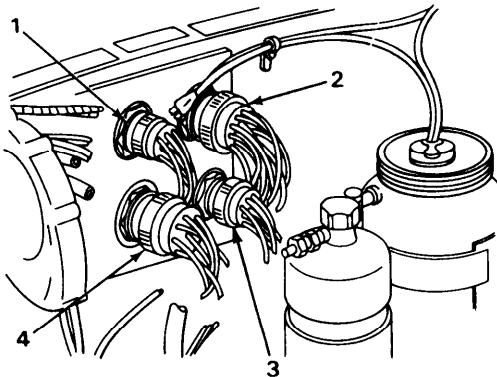
Right side of hood open and right side panel removed (TM 9-2320-270-10).

LOCATION	ITEM	ACTION	REMARKS
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DISCONNECTING

NOTE

There are four bulkhead connectors on the firewall. Connector (1) goes to engine wiring, connector (2) to chassis wiring, connector (3) to headlight wiring, and connector (4) to firewall wiring. Maintenance procedures are the same for all four except as noted. Headlight connector (3) is shown.



TA240225

BULKHEAD CONNECTORS- CONTINUED

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

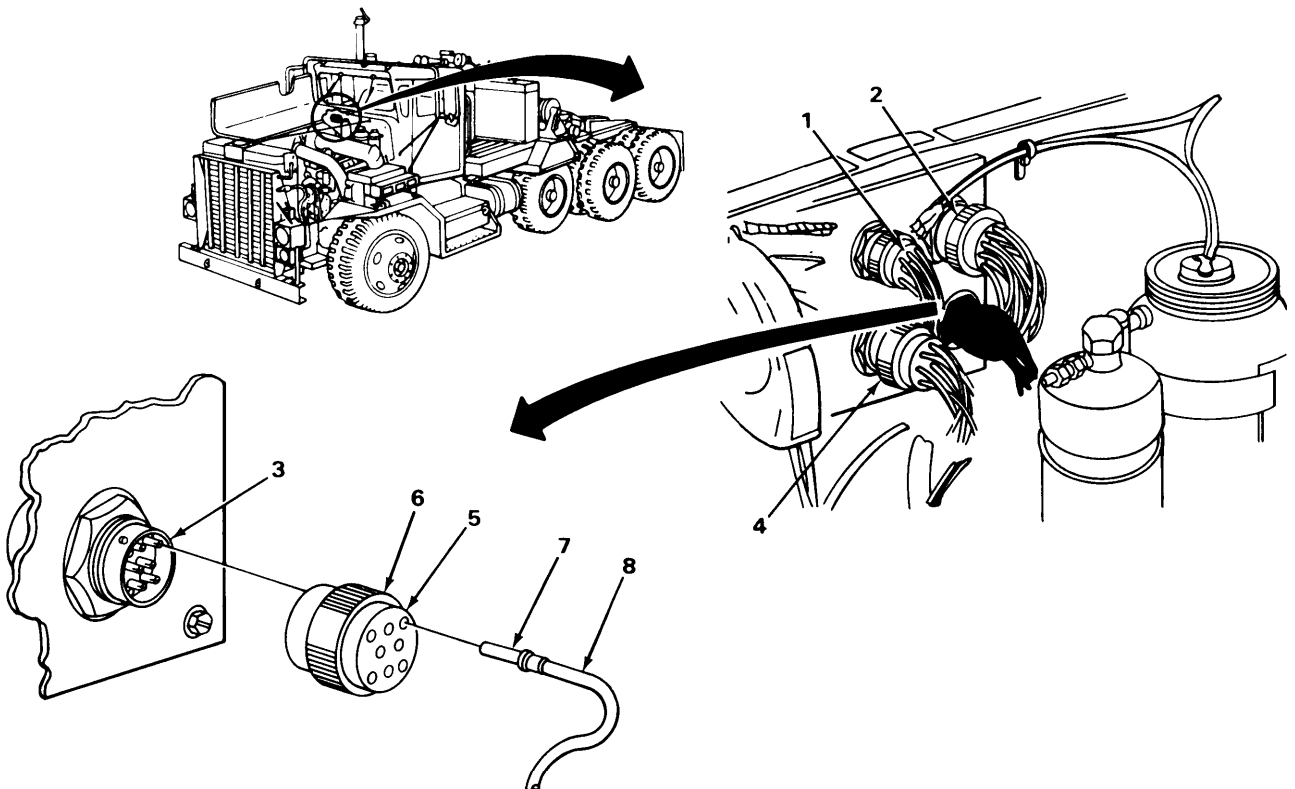
- | | | | |
|--------------------------------|---------|--|--|
| 1. Bulkhead connector plug (5) | Nut (6) | Turn one-quarter turn counterclockwise and pull out. | |
|--------------------------------|---------|--|--|

NOTE

Tag wires according to general maintenance instructions (page 4-1).

Firewall connector plug has male inserts. Headlights, engine and chassis connector plugs have female inserts.

- | | | | |
|--------------------------------|-------------------------------|--|--|
| 2. Bulkhead connector plug (5) | All inserts (7) and wires (8) | Using appropriate size wire removing tool, take out. | |
| 3. | Bulkhead connector plug (5) | Take out. | |
| 4. | Instrument panel | Open (page 4-244). | |



BULKHEAD CONNECTORS- CONTINUED

LOCATION	ITEM	ACTION REMARKS
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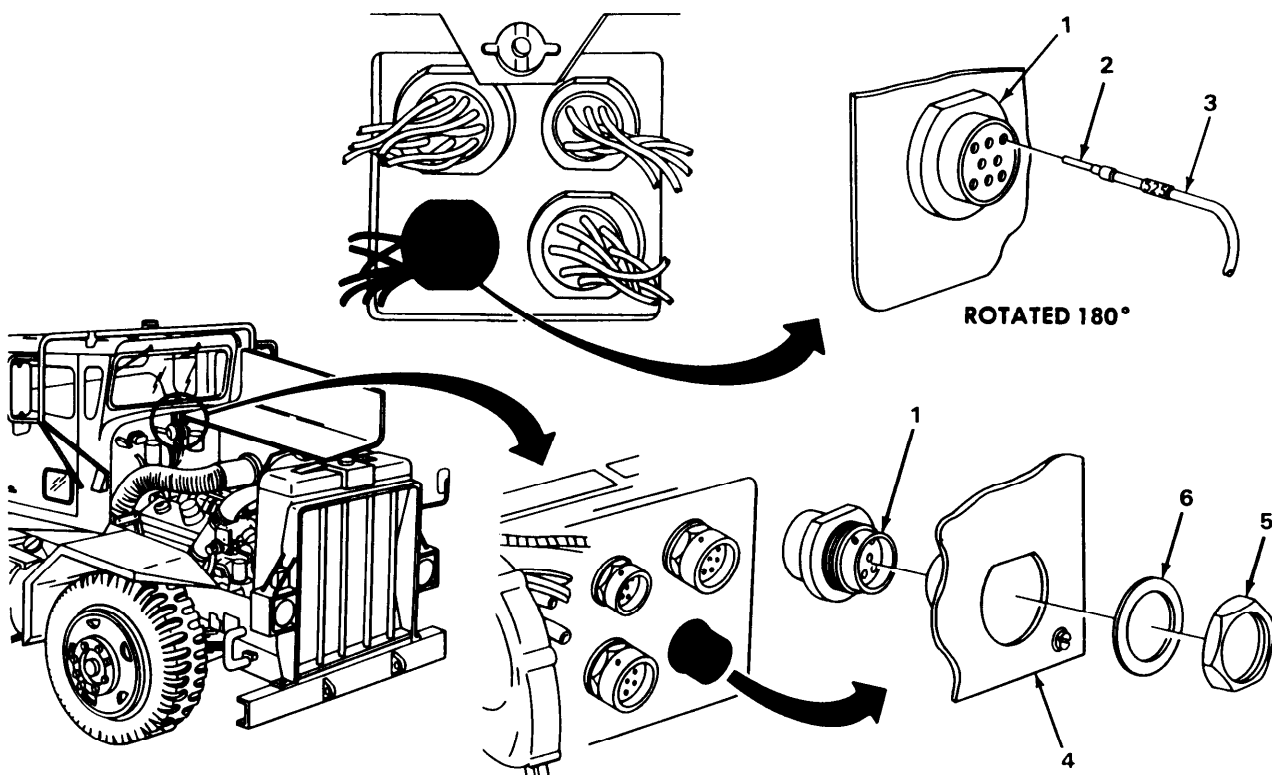
REMOVAL- CONTINUED

NOTE

Firewall bulkhead connector has female inserts. Chassis, engine, and headlight bulkhead connectors have male inserts.

Tag wires according to general maintenance instructions (page 4-1).

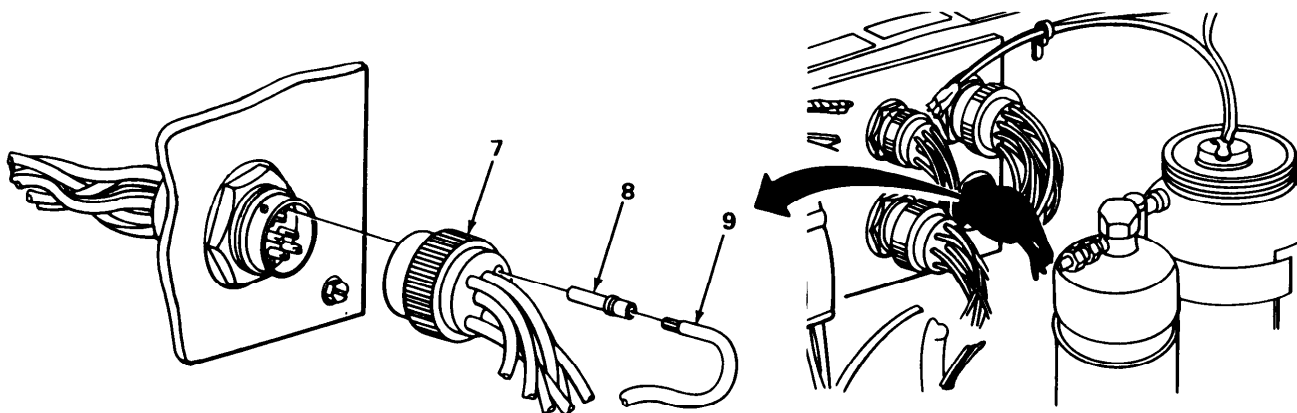
- | | | |
|---|-------------------------------|---|
| 5. Bulkhead connector (1) | All inserts (2) and wires (3) | a. Push appropriate size wire removing tool into connector (1) until insert locks are released.
b. Pull out insert (2), wire (3), and removing tool. |
| 6. Connector mounting plate (4) and connector (1) | Nut (5) and washer (6) | Using angle-nose pliers, unscrew and take off. |
| 7. Connector mounting plate (4) | Bulkhead connector (1) | Take out. |



TA240227

BULKHEAD CONNECTORS- CONTINUED

LOCATION	ITEM	ACTION REMARKS
REPAIR		
NOTE		
Repair is the same for all four bulkhead connectors and plugs. Connectors and plugs may have male or female inserts. Install back same type insert as shown. Repair of male plug is shown.		
Tag wires according to general maintenance instructions (page 4-1).		
8. Plug (7)	Male insert (8)	Using appropriate size wire removing tool, take out.
9. Wire (9)	Male insert (8)	Using cutting pliers, cut.
10.	Wire (9)	Using wire strippers, strip off insulation equal to depth of crimping well of new insert.
11. New male insert (8)	Wire (9) wire (7)	Using crimping tool, put in crimping well and crimp together.
12. Plug (7)	Male insert (8) and wire (9)	Push in until positive stop is felt. Tug lightly on wire to make sure insert is seated.



BULKHEAD CONNECTORS - CONTINUED

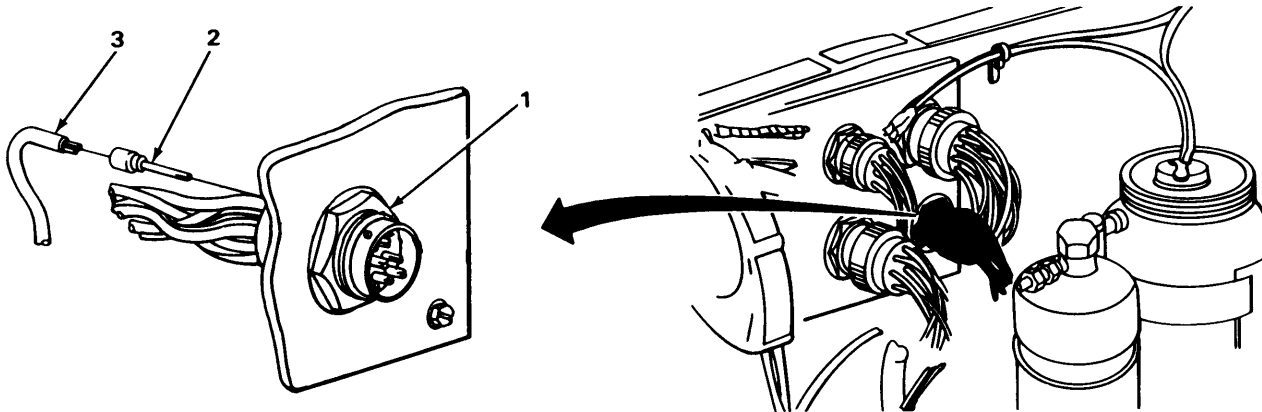
LOCATION	ITEM	ACTION REMARKS
----------	------	-------------------

REPAIR – CONTINUED

NOTE

Connector inserts must be changed from behind instrument panel. If instrument panel is not open, open it (page 4-244).

- | | | | |
|-----|---------------|------------------------------------|---|
| 13. | Connector (1) | Female insert (2) | Using appropriate size wire removing tool, take out. |
| 14. | | Wire (3) | Repeat steps 7 thru 10. |
| 15. | | New female insert (2) and wire (3) | Push in until positive stop is felt.
Tug lightly on wire to make sure insert is seated. |



INSTALLATION

- | | | | |
|-----|---|------------------------|---|
| 16. | Connector mounting plate (4) | Connector (1) | Push into place. |
| 17. | Connector mounting plate (4) to connector (1) | Washer (5) and nut (6) | Screw on and tighten using angle-nose pliers. |

NOTE

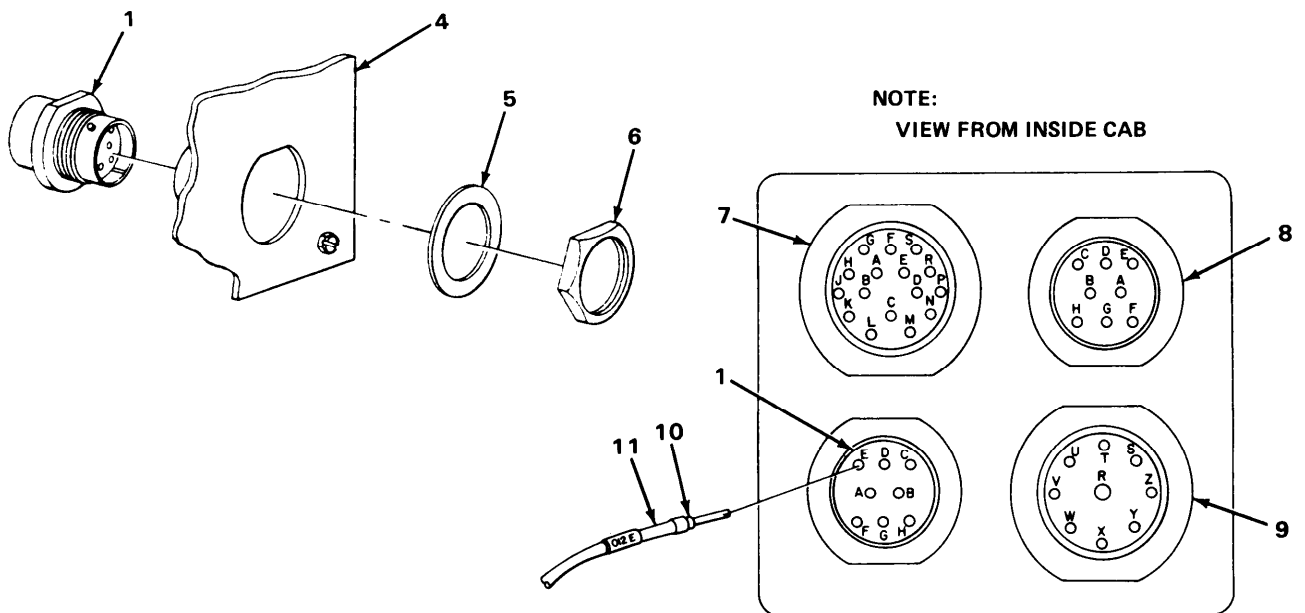
To assure proper assembly, use chart to make sure correct wire and insert goes into correct hole.

- | | | | |
|-----|------------------------------------|---------------------------------|---|
| 18. | Bulkhead connectors (1, 7,8, or 9) | All inserts (10) and wires (11) | Push in until positive stop is felt.
Tug lightly on wire to make sure insert is seated. |
|-----|------------------------------------|---------------------------------|---|

TA240229

BULKHEAD CONNECTORS- CONTINUED

INSERT LETTER	WIRE NUMBER	INSERT LETTER	WIRE NUMBER	INSERT LETTER	WIRE NUMBER	INSERT LETTER	WIRE NUMBER
CHASSIS CONN. (7)							
S	003S	E	003E	D	091	C	008
F	166	A	318	B	004B	K	154
6	458	H	004	J	019	M	665
R	680	P	678	N	170	L	0046
ENGINE CONN. (8)							
E	EMPTY	C	525	B	032	6	320
D	EMPTY	A	113	F	019	H	422
FIREWALL CONN. (9)							
T	021	2	031	V	016		
S	431	R	430	X	009		
U	EMPTY	V	EMPTY	W	005		
HEADLIGHTS CONN. (1)							
C	006C	E	012E	A	006A	6	679
D	007D	B	007B	H	002	F	001



BULKHEAD CONNECTORS - CONTINUED

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

INSTALLATION – CONTINUED

NOTE

To assure proper assembly, use chart to make sure correct wire and insert goes to correct hole.

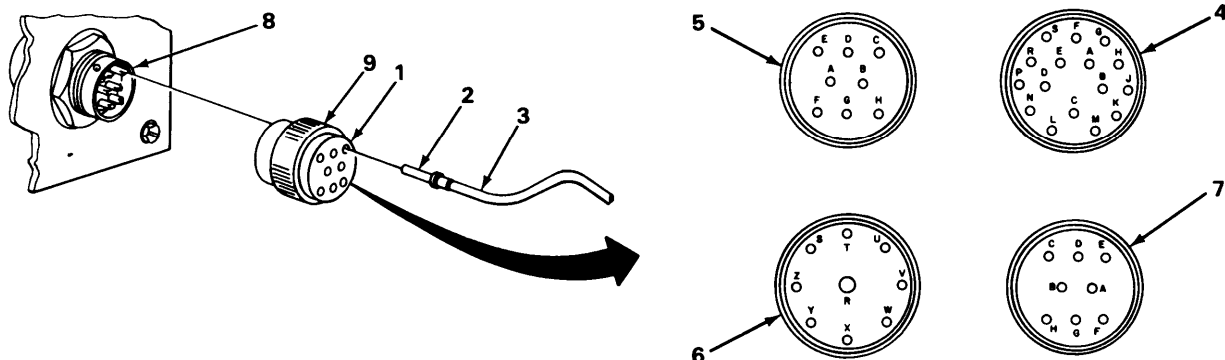
- | | | |
|--|--------------------------------------|---|
| <p>19. Bulkhead connector plug (1)</p> | <p>All inserts (2) and wires (3)</p> | <p>Push in until positive stop is felt.
Tug lightly on wire to make sure insert is seated.</p> |
|--|--------------------------------------|---|

INSERT LETTER	WIRE NUMBER	INSERT LETTER	WIRE NUMBER	INSERT LETTER	WIRE NUMBER	INSERT LETTER	WIRE NUMBER
CHASSIS PLUG (4)							
S	003S	E	003E	D	091	C	008
F	166	A	318	B	004B	K	154
6	458	H	004	J	019	M	665
R	680	P	678	N	170	L	0046
ENGINE PLUG (5)							
E	EMPTY	C	525	B	032	6	320
D	EMPTY	A	113	F	019	H	422
FIREWALL PLUG (6)							
T	021	2	031	Y	016		
S	431	R	430	X	009		
U	EMPTY	V	EMPTY	W	005		
HEADLIGHTS PLUG (7)							
C	006C	E	012E	A	006A	6	679
D	007D	B	007B	H	002	F	001

CONNECTING

- | | | |
|--------------------------|-----------------|--|
| <p>20. Connector (8)</p> | <p>Plug (1)</p> | <p>a. Aline ridges with slots.
b. Push in.</p> |
| <p>21. Plug (1)</p> | <p>Nut (9)</p> | <p>Turn one-quarter turn clockwise.</p> |

BULKHEAD CONNECTORS- CONTINUED



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10), and close right side of hood (TM 9-2320-270-10).

TASK ENDS HERE

DEUTSCH CONNECTOR

This task covers:

- a. Removal (page 4-498)
- b. Repair (page 4-496)
- c. Installation (page 4-497)

INITIAL SETUP

Tools

- Pliers, diagonal cutting
- Remover, wire, 0.120-inch diameter
- Stripper, wire
- Tool, crimping

Materials/Parts

- Tag, marking (item 18, appendix C)

Personnel Required

One

Equipment Condition

Battery ground cable disconnected (page 4-444).

DEUTSCH CONNECTOR - CONTINUED

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

REMOVAL

NOTE

Deutsch brand connectors are replaced and repaired the same way.

Tag wires according to general maintenance instructions (page 4-1).

- | | | |
|-------------|---------------|-------------------------------------|
| 1. Wire (1) | Connector (2) | Using wire removing tool, take out. |
| 2. Wire (3) | Connector (2) | Using wire removing tool, take out. |

REPAIR

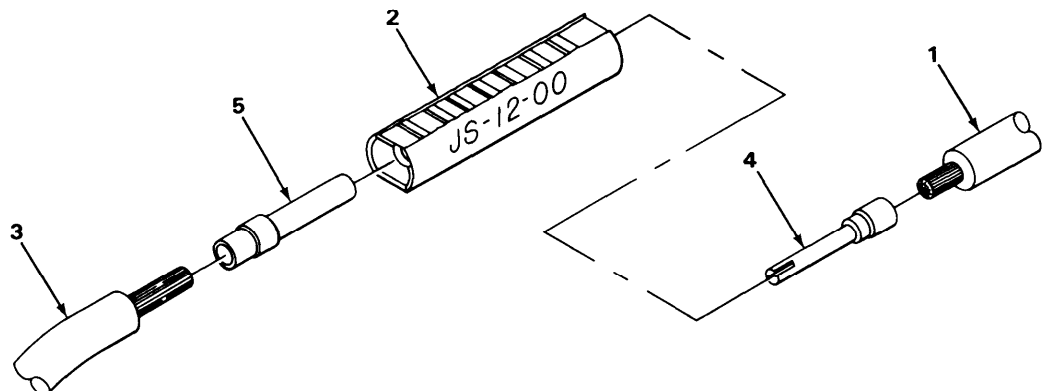
NOTE

Replacing male or female insert is the same. Male insert is shown.

- | | | |
|-------------------|------------|--|
| 3. Wire (1) | Insert (4) | Using cutting pliers, cut off as close to insert (4) as possible. |
| 4. | Wire (1) | Using wire strippers, strip off insulation to depth of well on new insert. |
| 5. New insert (4) | Wire (1) | Using crimping tool, crimp together. |

DEUTSCH CONNECTOR -CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
6. Connector (2)	Female insert (5) and wire (3)	Push in until positive stop is felt. Tug lightly on wire to make sure insert is seated.
7. Connector (2)	Male insert (4) and wire (1)	Push in until positive stop is felt. Tug lightly on wire to make sure insert is seated.



NOTE

FOLLOW-ON MAINTENANCE: Perform operational check of component which connector serves (TM 9-2320-270-10).

TASK ENDS HERE

INTERVEHICULAR WIRING HARNESS RECEPTACLE COVER

This task covers:

- a. Removal (page 4-498)
 - b. Installation (page 4-498)
-

INITIAL SETUP

Tools

Extension, 5-inch, 3/8-inch drive
 Handle, ratchet, 3/8-inch drive
 Socket, 7/16-inch, 3/8-inch drive
 Wrench, box, 7/16-inch

Materials/Parts

Lockwasher, receptacle cover and receptacle
 to bracket (four required)

Personnel Required

One

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

REMOVAL

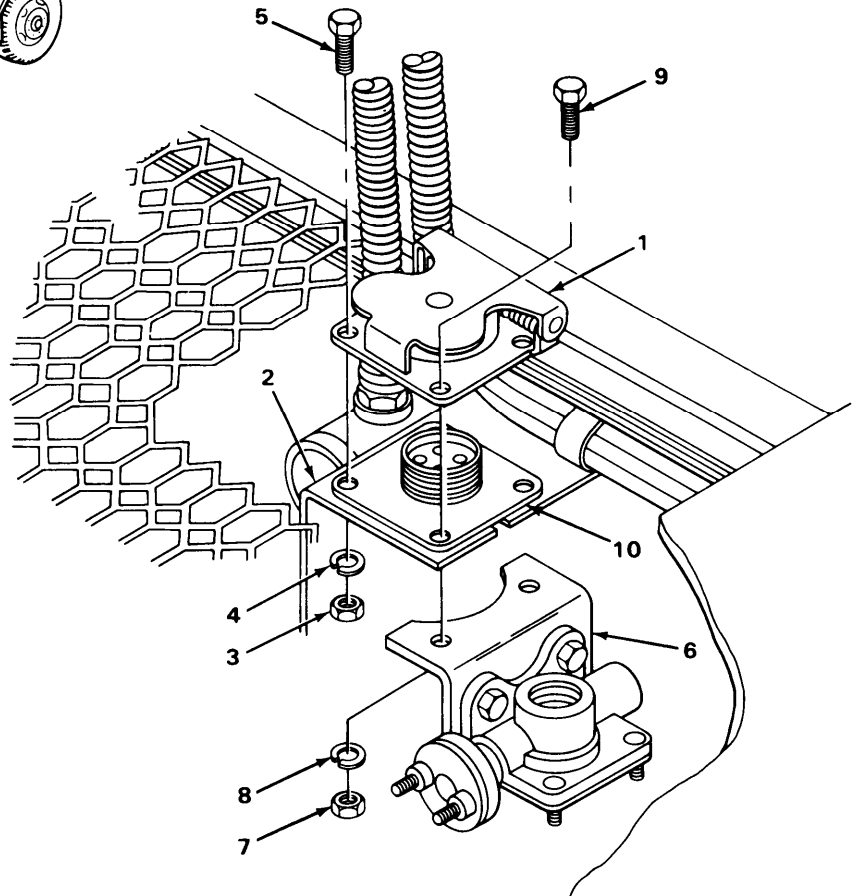
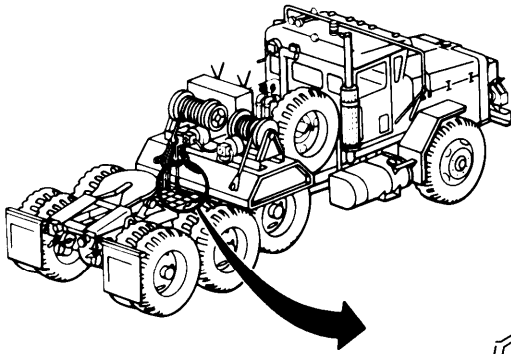
- | | | |
|---|---|---|
| 1. Interverhicular wiring harness receptacle cover (1) to bracket (2) | Two nuts (3), lockwashers (4), and screws (5) | s. Using box wrench, socket, handle, and extension, unscrew and take out.
b. Get rid of lockwashers (4). |
| 2. Interverhicular wiring harness receptacle cover (1) to quick release valve (6) | Two nuts (7), lockwashers (8), and screws (9) | s. Using box wrench, socket, handle, and extension, unscrew and take out.
b. Get rid of lockwashers (8). |
| 3. Bracket (2) and receptacle (10) | Receptacle cover (1) | Take off. |

INSTALLATION

- | | | |
|---|---|------------------------------|
| 4. Interverhicular wiring harness receptacle (10) and bracket (2) | Receptacle cover (1) | Put in place. |
| 5. Receptacle cover (1) to bracket (2) | Two screws (5), new lockwashers (4), and nuts (3) | Screw on but do not tighten. |

INTERVEHICULAR WIRING HARNESS RECEPTACLE COVER - CONTINUED

LOCATION	ITEM	ACTION REMARKS
6. Bracket (2)	Quick release valve (6)	Put in.
7. Receptacle cover (1), bracket (2), and quick release valve (6)	Two screws (9), new lockwashers (8), and nuts (7)	Screw on but do not tighten.
8.	Four screws (5) and (9) and nuts (3) and (7)	Alternately tighten using box wrench, socket, extension, and handle.



TASK ENDS HERE

INTERVEHICULAR WIRING HARNESS RECEPTACLE

This task covers:

- a. Removal (page 4-500)
- b. Repair (page 4-502)
- c. installation (page 4-504)

INITIAL SETUP

Tools

Pliers, long-nose
Soldering iron

Personnel Required

One

Materials/Parts

Solder (item 15, appendix C)
Tag, marking (item 18, appendix C)

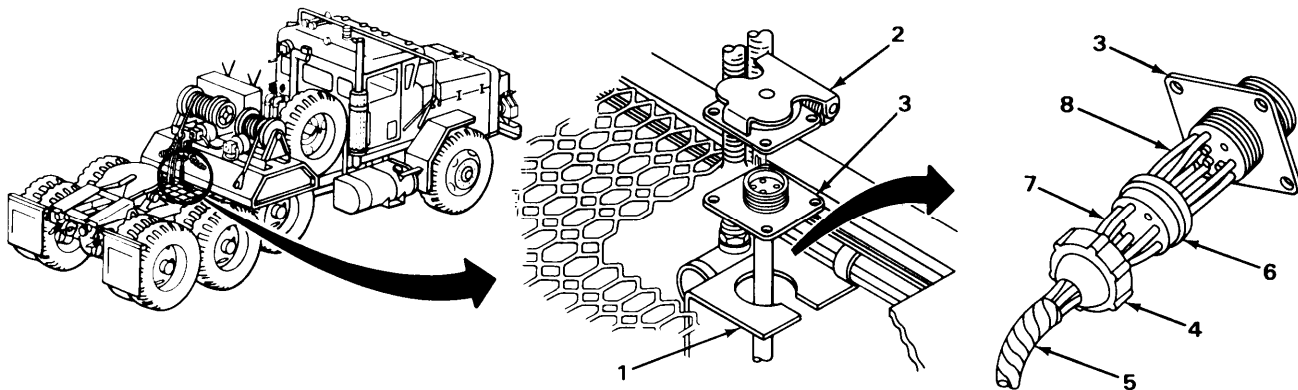
Equipment Condition

Battery ground cable disconnected
(page 4-444).

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

REMOVAL

- | | | |
|-------------------|----------------------|--|
| 1. Bracket (1) | Receptacle cover (2) | Remove (page 4-498). |
| 2. | Receptacle (3) | Pull out. |
| 3. Receptacle (3) | Nut (4) | Unscrew and push back along cable (5). |
| 4. | Grommet (6) | Pull back along wires (7) enough to allow access to contact inserts (8). |



INTERVEHICULAR WIRING HARNESS RECEPTACLE- CONTINUED

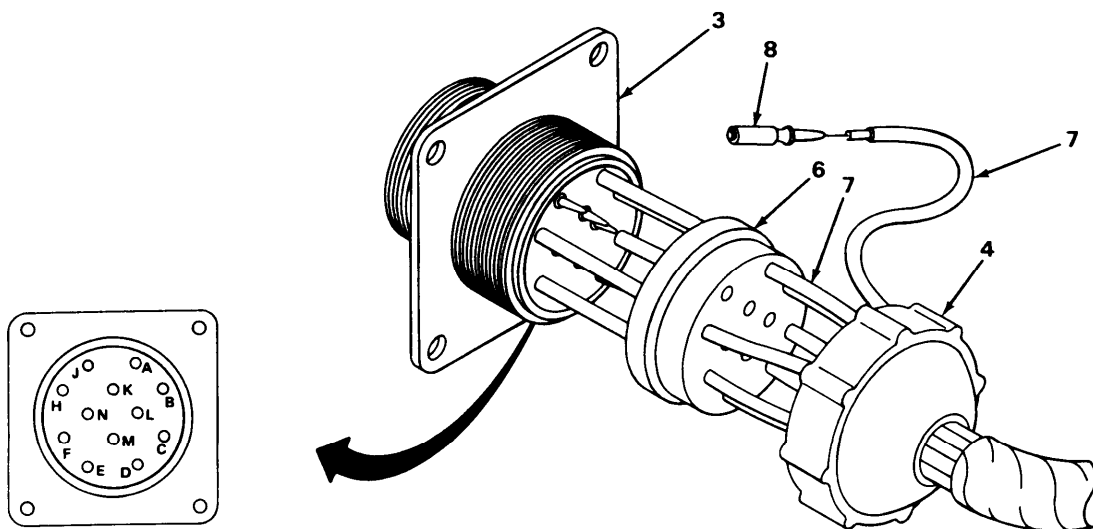
LOCATION	ITEM	ACTION	REMARKS
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NOTE

Use chart below for tagging wires to assure proper reassembly. Receptacle and grommet are marked with insert letters.

INSERT LETTER	WIRE NUMBER	INSERT LETTER	WIRE NUMBER	INSERT LETTER	WIRE NUMBER	INSERT LETTER	WIRE NUMBER
A	680	K	665	N	-	F	678
J	004	H	680	c	680	D	435
B	003	L	435	M		E	012

- | | | |
|-------------------|---------------------------|---|
| 5. Receptacle (3) | Wires (7) | Tag wires according to general maintenance instructions (page 4-1). |
| 6. | Inserts (8) and wires (7) | Using long-nose pliers, pull out. |
| 7. Wires (7) | Inserts (8) | Using soldering iron, melt solder and take off (page 4-1). |
| 8. | Grommet (6) | Pull off. |
| 9. | Nut (4) | Take off. |



INTERVEHICULAR WIRING HARNESS RECEPTACLE- CONTINUED

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

REPAIR

NOTE

It is not necessary to remove wiring harness receptacle or cover to repair it.

- | | | | |
|-----|--|-------------|--|
| 10. | Intervehicular wiring harness receptacle (1) | Nut (2) | Unscrew and push back along cable (3). |
| 11. | | Grommet (4) | Pull back far enough to allow access to contact inserts. |

NOTE

If replacing more than one insert, tag wires (page 4-1).

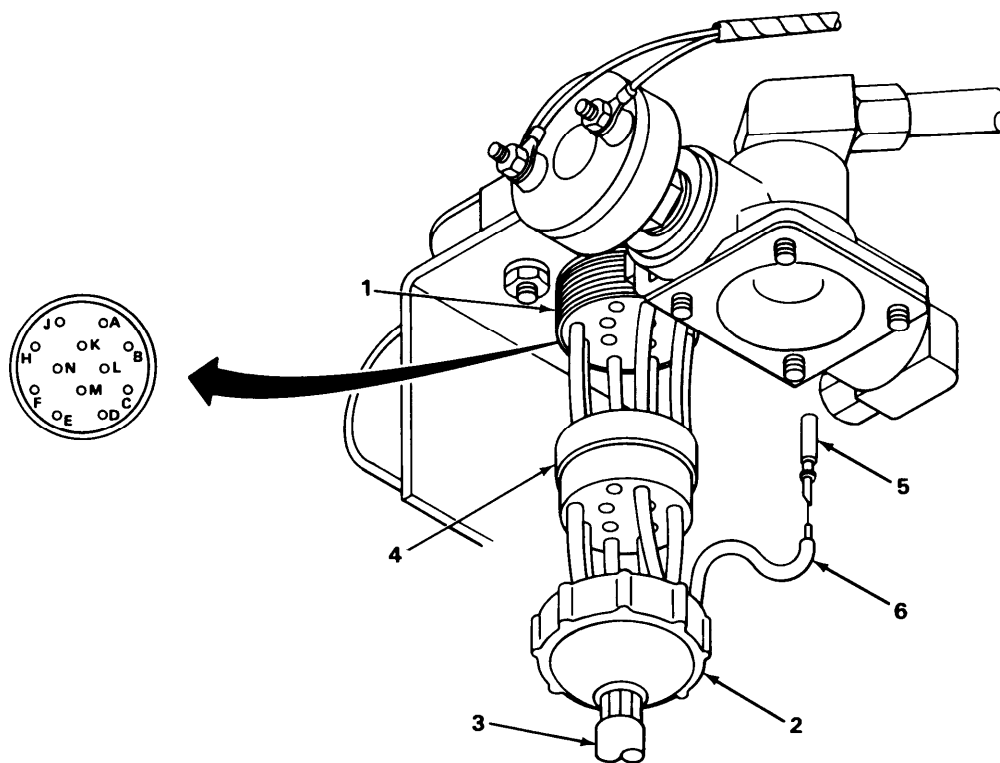
Use chart below for tagging wires to assure proper reassembly. Receptacle and grommet are marked with insert letters.

INSERT LETTER	WIRE NUMBER	INSERT LETTER	WIRE NUMBER	INSERT LETTER	WIRE NUMBER	INSERT LETTER	WIRE NUMBER
A	680	K	665	N	-	F	678
J	004	H	680	C	680	D	435
B	003	L	435	M	-	E	012

- | | | | |
|-----|-----------------|-------------|---|
| 12. | Receptacle (1) | Inserts (5) | Using long-nose pliers, pull out. |
| 13. | Wires (6) | Insert (5) | Using soldering iron, melt solder and take off (page 4-1). |
| 14. | New inserts (5) | Wires (6) | Using soldering iron, pliers, and solder, solder in place (page 4-1). |

INTERVEHICULAR WIRING HARNESS RECEPTACLE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
15. Receptacle (1)	New inserts (5)	Using pliers, push in place.
16.	Grommet (4)	Push up against receptacle (1),
17.	Nut (2)	Screw on and tighten.



INTERVEHICULAR WIRING HARNESS RECEPTACLE - CONTINUED

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

INSTALLATION

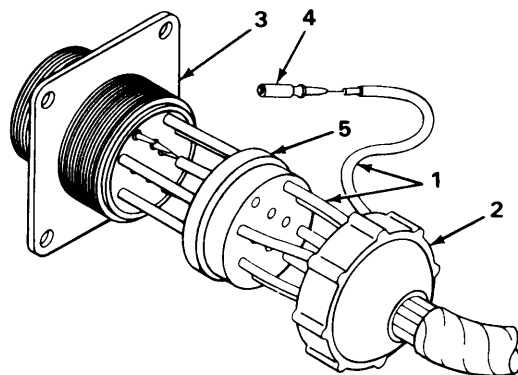
- | | | |
|---------------|---------|---|
| 18. Wires (1) | Nut (2) | Slip over wires so threads on nut (2) will face receptacle (3). |
|---------------|---------|---|

NOTE

Use chart below to assure correct assembly of wires and inserts.

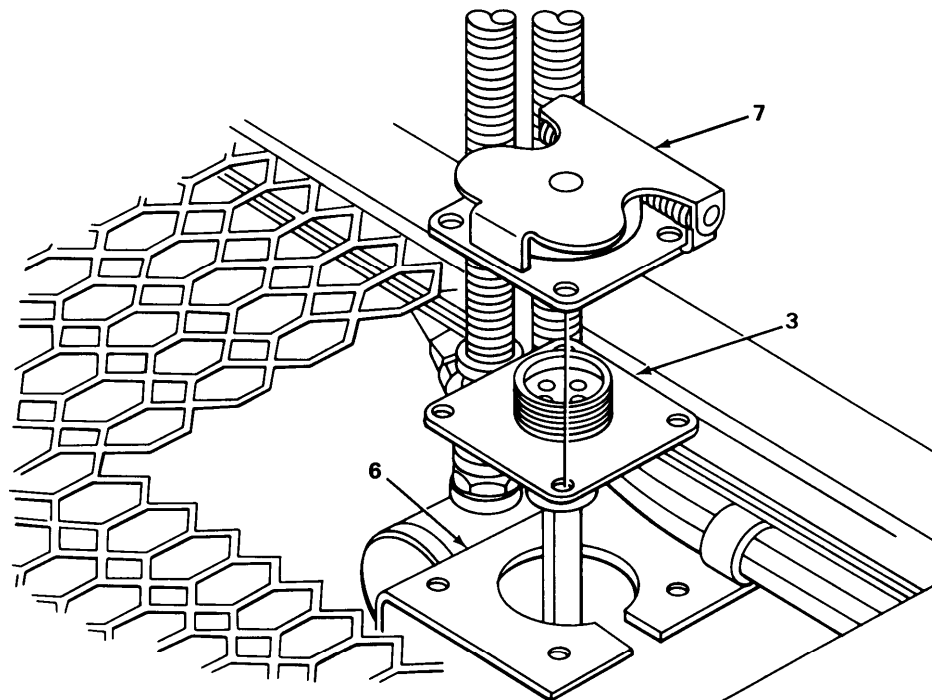
INSERT LETTER	WIRE NUMBER	INSERT LETTER	WIRE NUMBER	INSERT LETTER	WIRE NUMBER	INSERT LETTER	WIRE NUMBER
A	680	K	665	N	680	F	678
J	004	H	680	c		D	435
B	003	L	435	M		E	012

- | | | |
|--------------------|------------------------------|---|
| 19. Inserts (4) | Wires (1) | Using soldering iron, pliers, and solder, solder in place (page 4-1). |
| 20. Receptacle (3) | Inserts (4)
and wires (1) | Using pliers, push into correct hole. |
| 21. | Grommet (5) | Push up. |
| 22. | Nut (2) | Screw on and tighten. |



INTERVEHICULAR WIRING HARNESS RECEPTACLE - CONTINUED

LOCATION	ITEM	ACTION REMARKS
23. Bracket (6)	Receptacle (3)	Put in place.
24.	Receptacle cover (7)	Install (page 4-498).



NOTE

FOLLOW ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).

TASK ENDS HERE

RUBBER WATERPROOF PLUG

This task covers:

- a. Removal (page 4-506)
 - b. installation (page 4-507')
-

INITIAL SETUP

Tools

Pliers, diagonal cutting
 Stripper, wire
 Tool, crimping

Materials/Parts

Compound, insulating (item 6, appendix C)

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

CAUTION

To prevent possible damage to equipment, make sure circuit whose wire you are repairing has no electricity going to it. If necessary, disconnect battery ground cable.

- | | | | |
|-----------------------|--------------|--|--|
| 1. Connector assembly | Shell (1) | Slide up wire (2) until clear of ferrule (3) and C-washer (4). | |
| 2. | C-washer (4) | Take off. | |
| 3. | Shell (1) | Slide off over ferrule (3). | |

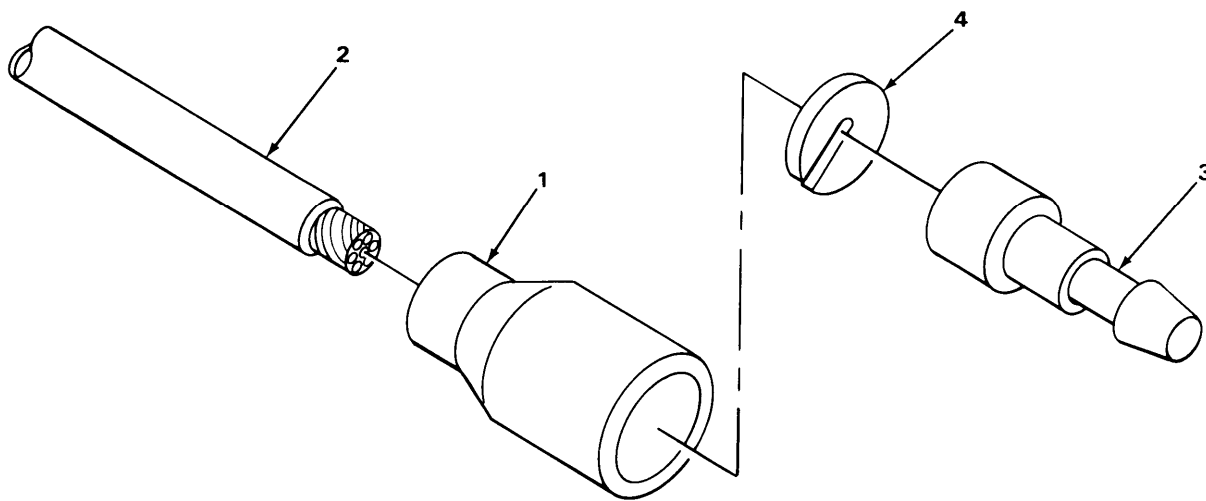
NOTE

If replacing only shell, skip step 4.

- | | | | |
|-------------|-------------|---|--|
| 4. Wire (2) | Ferrule (3) | a. Using cutting pliers, cut off as close to ferrule as possible.
b. Get rid of. | |
|-------------|-------------|---|--|

RUBBER WATERPROOF PLUG -CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
5. Wire (2)	Shell (1)	Apply insulating compound to end and slide on.
NOTE		
If replacing only shell, skip steps 6 and 7.		
6.	Wire (2)	Using wire strippers, strip off insulation to depth of wire well.
7. Wire (2)	Ferrule (3)	Using crimping tool, crimp on.
8.	Washer (4)	Put on.
9.	Shell (1)	Slide over washer (4) and ferrule (3).



TASK ENDS HERE

RUBBER WATERPROOF CONNECTOR

This task covers:

- a. Removal (page 4-508)
 - b. Installation (page 4-508)
-

INITIAL SETUP

<p>Tools</p> <p>Pliers, diagonal cutting Pliers, long-nose Stripper, wire Tool, crimping</p>	<p>Materials/Parts</p> <p>Compound, insulating (item 6, appendix C)</p> <p>Personnel Required</p> <p>One</p>
--	--

LOCATION	ITEM	ACTION	REMARKS
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CAUTION

To prevent possible damage to equipment, make sure circuit whose wire you are repairing has no electricity going to it. If necessary, disconnect battery ground cable.

REMOVAL

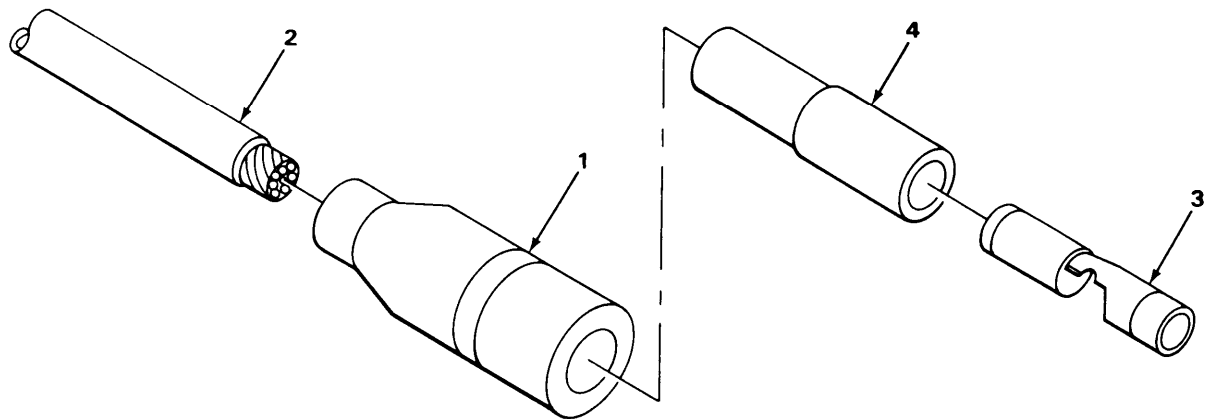
<p>1. Connector assembly</p>	<p>Shell (1)</p>	<p>Slide up wire (2) until clear of terminal (3).</p>
<p>2. Wire (2)</p>	<p>Terminal (3)</p>	<p>a. Using cutting pliers, cut off as close to terminal (3) as possible. b. Get rid of old terminal (3).</p>
<p>3.</p>	<p>Shell (1)</p>	<p>Slide off.</p>
<p>4. Shell (1)</p>	<p>Sleeve (4)</p>	<p>Using long-nose pliers, pull out.</p>

INSTALLATION

<p>5. Shell (1)</p>	<p>Sleeve (4)</p>	<p>Push into shell (1).</p>
---------------------	-------------------	-----------------------------

RUBBER WATERPROOF CONNECTOR - CONTINUED

LOCATION	ITEM	ACTION REMARKS
6. Wire (2)	Shell (1)	Apply insulating compound to end and slide on.
7.	Wire (2)	Using strippers, strip off insulation to depth of wire well.
8. Wire (2)	Terminal (3)	Using crimping tool, crimp on.
9.	Shell (1)	Slide over terminal (3).



TASK ENDS HERE

FIFTH GEAR SWITCH

This task covers:

- a. Removal (page 4-510)
- b. Installation (page 4-510)

INITIAL SETUP

Tools

- Pliers, long-nose
- Screwdriver, flat-tip, 1/4-inch
- Wrench, open-end, 7/8-inch

Materials/Parts

- Tab washer, switch to shift control assembly

Personnel Required

One

Equipment Condition

Battery ground cable disconnected (page 4-444).

FIFTH GEAR SWITCH - CONTINUED

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

REMOVAL

CAUTION

Make sure battery ground cable is disconnected before removing fifth gear switch to avoid possible damage to electrical system.

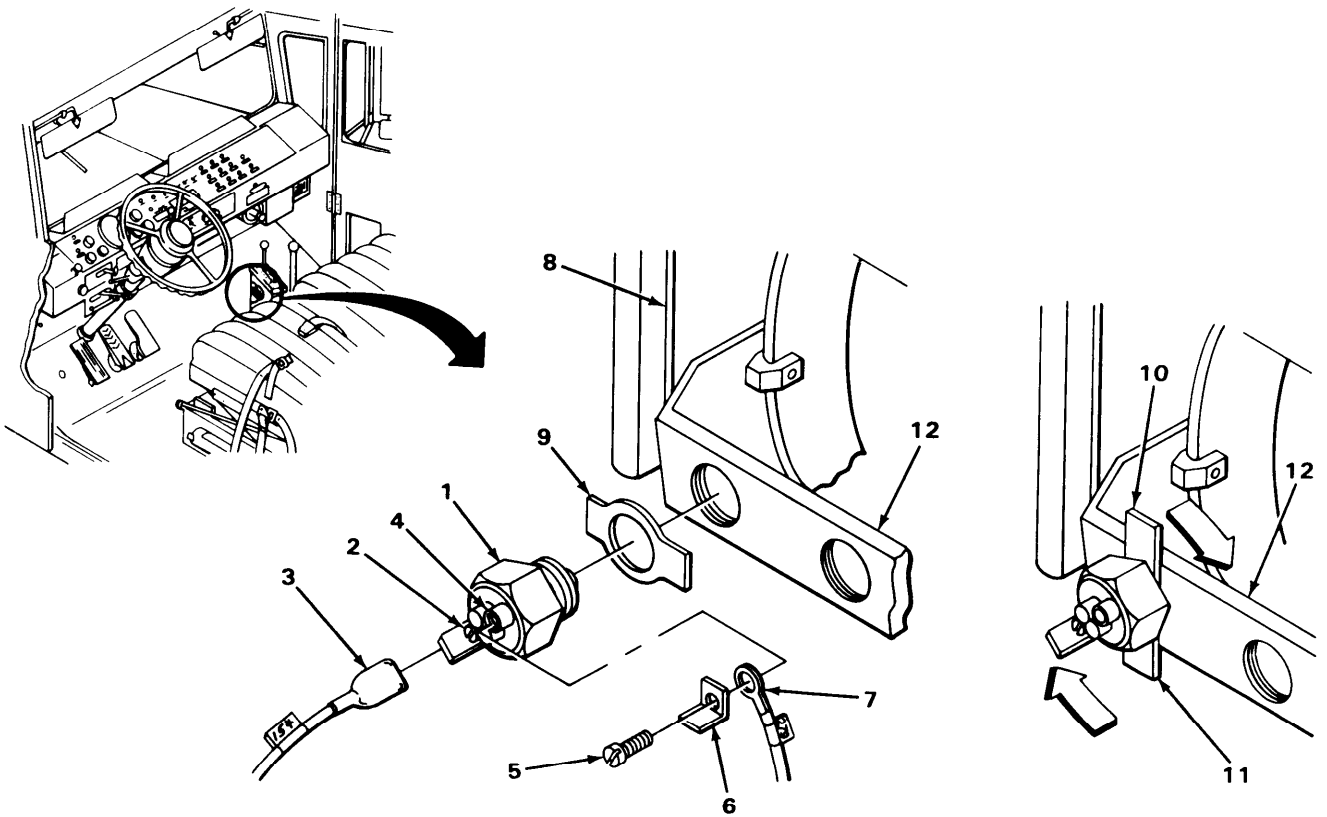
1. Fifth gear switch (1) terminal (2)	Wire 154 (3)	Unplug.
2. Terminal (4)	Screw (5), blade terminal (6), and wire 279 (7)	Using screwdriver, unscrew and take off.
3. Switch (1) to shift control assembly (8)	Tab washer (9)	Using screwdriver and pliers, flatten tabs.
4. Shift control assembly (8)	Switches (1) and tab washer (9)	a. Unscrew and take off using wrench. b. Get rid of tab washer (9).

INSTALLATION

5. Switch (1)	New tab washer (9)	Put on.
6. Shift control assembly (8)	Switch (1)	a. Screw into shift control assembly (8). b. Hold tab washer (9) with pliers so tabs will remain at right angles to switch support (12). c. Using 7/8-inch wrench, tighten.
7. Switch (1) to shift control assembly (8)	Tab washer (9)	Using pliers, bend tabs and switch support (12) flat on switch (1).
8. Screw (5)	Blade terminal (6) and wire 279 (7)	Put on.

FIFTH GEAR SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
9. Terminal (4)	Screw (5)	Screw in and tighten using screwdriver.
10. Terminal (2)	Wire 154 (3)	Plug in.



FIFTH GEAR SWITCH - CONTINUED

INSTALLATION – CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).

TASK ENDS HERE

NEUTRAL SAFETY SWITCH AND BACKUP LIGHT SWITCH

This task covers:

- a. Removal (page 4-513)
 - b. Installation (page 4-513)
-

INITIAL SETUP

Tools

Handle, ratchet, 3/8-inch drive
Pliers, long-nose
Screwdriver, flat-tip, 1/4-inch
Socket, 7/16-inch, 3/8-inch drive
Wrench, open-end, 7/16-inch
Wrench, open-end, 7/8-inch

Personnel Required

One

Equipment Condition

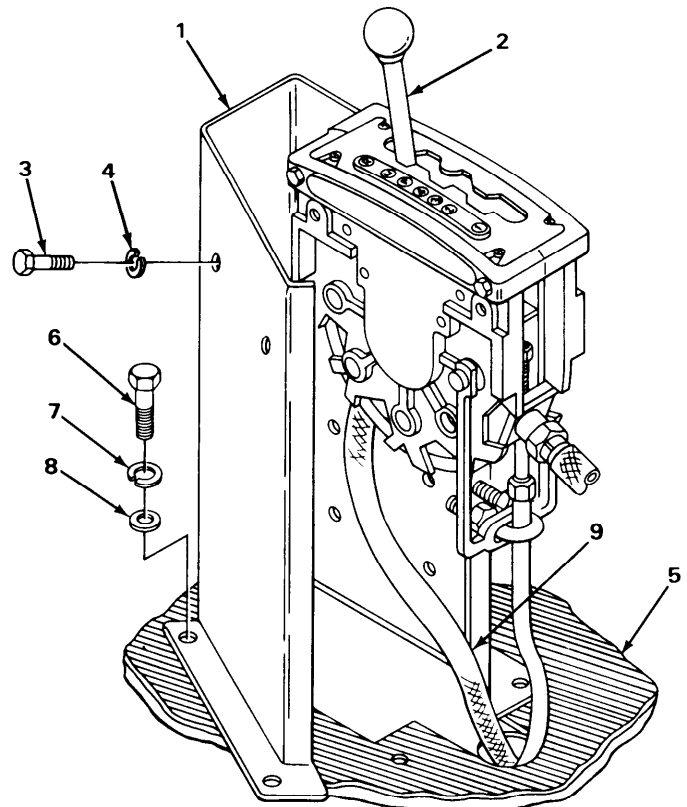
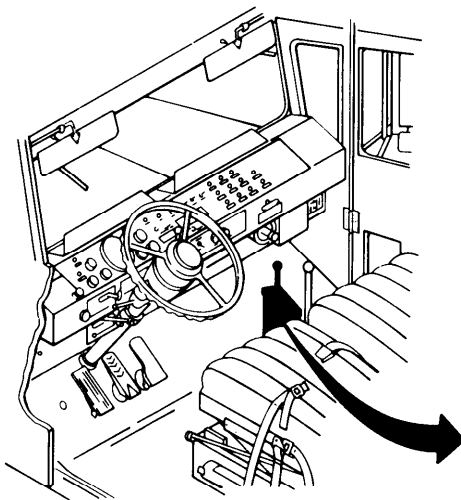
Battery ground cable disconnected
(page 4-444).

Materials/Parts

Lockwasher, housing to shift control
(four required)
Lockwasher, housing to cab floor
(two required)
Tag, marking (item 18, appendix C)
Washer, switch to shift control
assembly

NEUTRAL SAFETY SWITCH AND BACKUP LIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1. Housing (1) to shift control (2)	Four screws (3) and lockwashers (4)	a. Using 7/16-inch socket and handle, unscrew and take out. b. Get rid of lockwashers (4).	
2. Housing (1) to cab floor (5)	Two screws (6), lockwashers (7), and washers (8)	a. Using 7/16-inch open-end wrench, unscrew and take out. b. Get rid of lockwashers (7).	
3. Housing (1)	Shift control (2)	Spread housing (1) far enough to pull shift control (2) forward and out.	
4. Shift control (2)	Five wires (9)	a. Take off. b. Tag wires (page 4-1).	

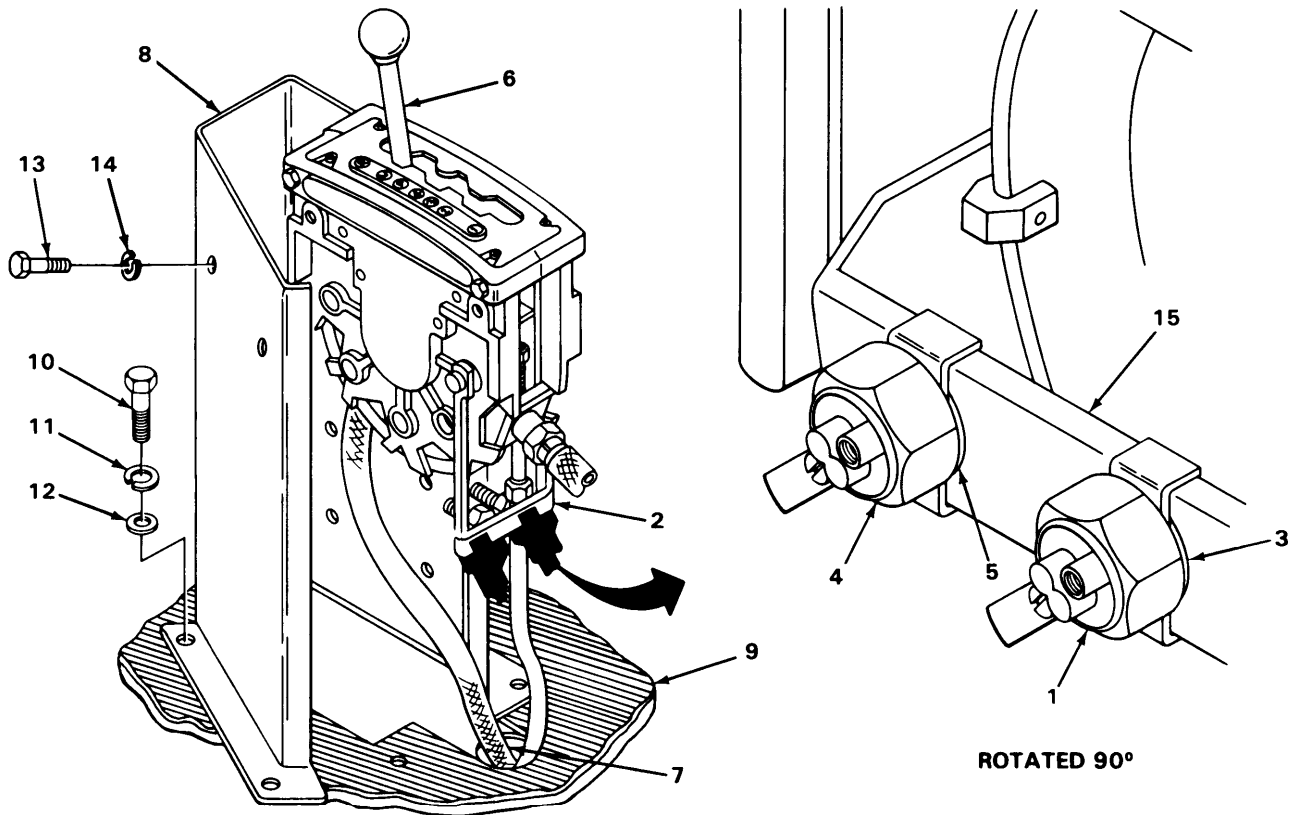


NEUTRAL SAFETY SWITCH AND BACKUP LIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL – CONTINUED		
5. Backup light switch (1) to shift control assembly (2)	Tab washer (3)	Using screwdriver and pliers, flatten tabs.
6. Shift control assembly (2)	Backup light switch (1) and tab washer (3)	a. Unscrew and take off using 7/8-inch wrench. b. Get rid of tab washer (3).
7. Neutral safety switch (4) to shift control assembly (2)	Tab washer (5)	Using screwdriver and pliers, flatten tabs.
8. Shift control assembly (2)	Neutral safety switch (4) and tab washer (5)	a. Unscrew and take off using 7/8-inch wrench. b. Get rid of tab washer (5).
INSTALLATION		
9. Shift control (6)	Five wires (7)	Put on.
10. Housing (8)	Shift control (6)	Push in place and close housing (8).
11. Housing (8) to cab floor (9)	Two screws (10), new lockwashers (11), and washers (12)	Screw in and tighten using 7/16-inch wrench.
12. Housing (8) to shift control (6)	Four screws (13) and new lockwashers (14)	Screw in and tighten using 7/16-inch socket and handle.
13. Neutral safety switch (4)	New tab washer (5)	Put on.
14. Shift control assembly (2)	Neutral safety switch (4)	a. Screw in. b. Using pliers, hold tab washer (5) so tabs will remain at right angles to switch support (15). c. Using 7/8-inch wrench, tighten.
15. Neutral safety switch (4) to shift control assembly (2)	Tab washer (5)	Using pliers, bend tabs over switch support (15) and fasten on switch (4).

NEUTRAL SAFETY SWITCH AND BACKUP LIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
16. Shift control assembly (2)	Backup light switch (1)	a. Screw in. b. Using pliers, hold tab washer (3) so tabs will remain at right angles to switch support (15). c. Using 7/8-inch wrench, tighten.
17. Backup light switch (1) to shift control assembly (2)	New tab washer (3)	Using pliers, bend tab over switch support (4) and flat on switch (1).



NEUTRAL SAFETY SWITCH AND BACKUP LIGHT SWITCH - CONTINUED

INSTALLATION – CONTINUED

NOTE

FOLLOW-ON MAINTENANCE:

1. Connect battery ground cable (page 4-444).
2. Check operation (TM 9-2320-270-10).

TASK ENDS HERE

BACKUP LIGHT RELAY

This task covers:

- a. Removal (page 4-517)
 - b. Installation (page 4-518)
-

INITIAL SETUP

Tools

Extension, 5-inch, 3/8-inch drive
Handle, ratchet, 3/8-inch drive
Screwdriver, flat-tip, 1/4-inch
Socket, 7/16-inch, 3/8-inch drive
Wrench, box, 7/16-inch

Materials/Parts

Lockwasher, relay to dashboard (four
required)
Tag, marking (item 18, appendix C)

Personnel Required

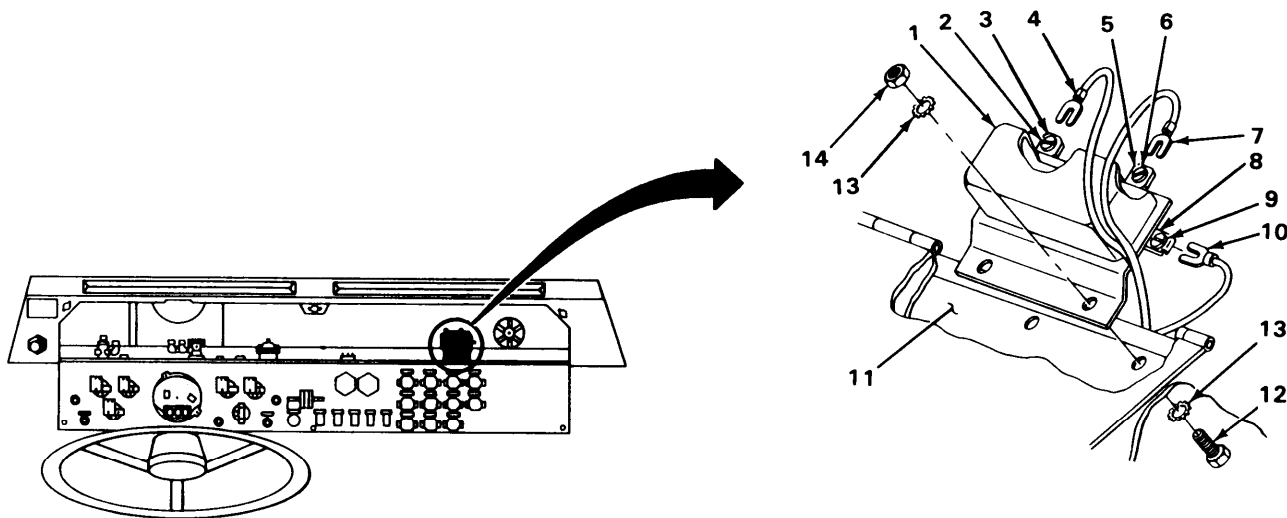
One

Equipment Condition

Battery ground cable disconnected
(page 4-444).
Instrument panel open (page 4-244).

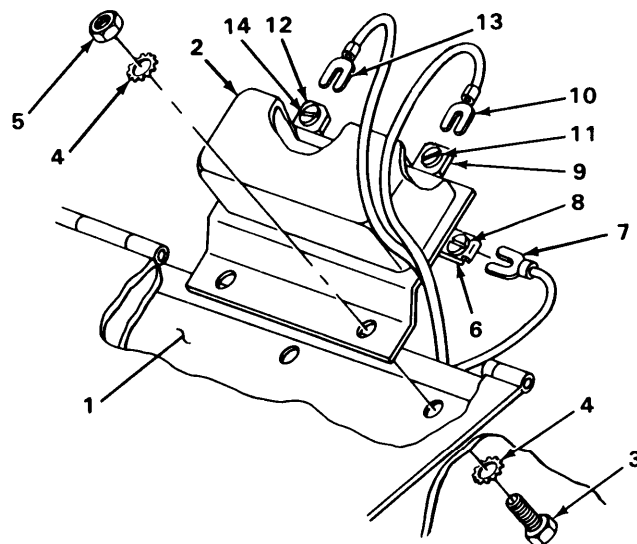
BACKUP LIGHT RELAY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL		
1. Backup light relay (1) left front terminal (2)	Screw (3)	Using 1/4-inch screwdriver, unscrew part way.
2.	Wire 149 (4)	Pull out.
3. Terminal (5)	Screw (6)	Using 1/4-inch screwdriver, unscrew part way.
4.	Yellow wire 91 (7)	Pull out.
5. Terminal (8)	Screw (9)	Using 1/4-inch screwdriver, unscrew part way.
6.	Black wire 91 (10)	Pull out.
7. Backup light relay (1) to dashboard (11)	Two screws (12), four lockwashers (13), and two nuts (14)	a. Using box wrench, socket, handle, and extension, unscrew and take out. b. Get rid of lockwashers (13).
8. Dashboard (11)	Backup light relay (1)	Take out.



BACKUP LIGHT RELAY - CONTINUED

LOCATION	ITEM	ACTION REMARKS
INSTALLATION		
9. Dashboard (1)	Backup light relay (2)	Put in place.
10. Backup light relay (2) to dashboard (1)	Two screws (3), four new lockwashers (4), and two nuts (5)	Screw in and tighten using box wrench, socket, handle, and extension.
11. Terminal (6)	Black wire 91 (7)	Push in.
12.	Screw (8)	Using 1/4-inch screwdriver, tighten.
13. Terminal (9)	Yellow wire 91 (10)	Push in.
14.	Screw (11)	Using 1/4-inch screwdriver, tighten.
15. Terminal (12)	Wire 149 (13)	Push in.
16.	Screw (14)	Using 1/4-inch screwdriver, tighten.



BACKUP LIGHT RELAY - CONTINUED**NOTE**

FOLLOW-ON MAINTENANCE:

1. Close instrument panel (page 4-244).
2. Connect battery ground cable (page 4-444).
3. Check operation (TM 9-2320-270-10).

TASK ENDS HERE**SHIFT CONTROL LAMP**

This task covers:

- a. Removal (page 4-520)
 - b. Installation (page 4-520)
-

INITIAL SETUP

Tools

Screwdriver, cross-tip, number 1
Screwdriver, flat-tip, 1/8-inch

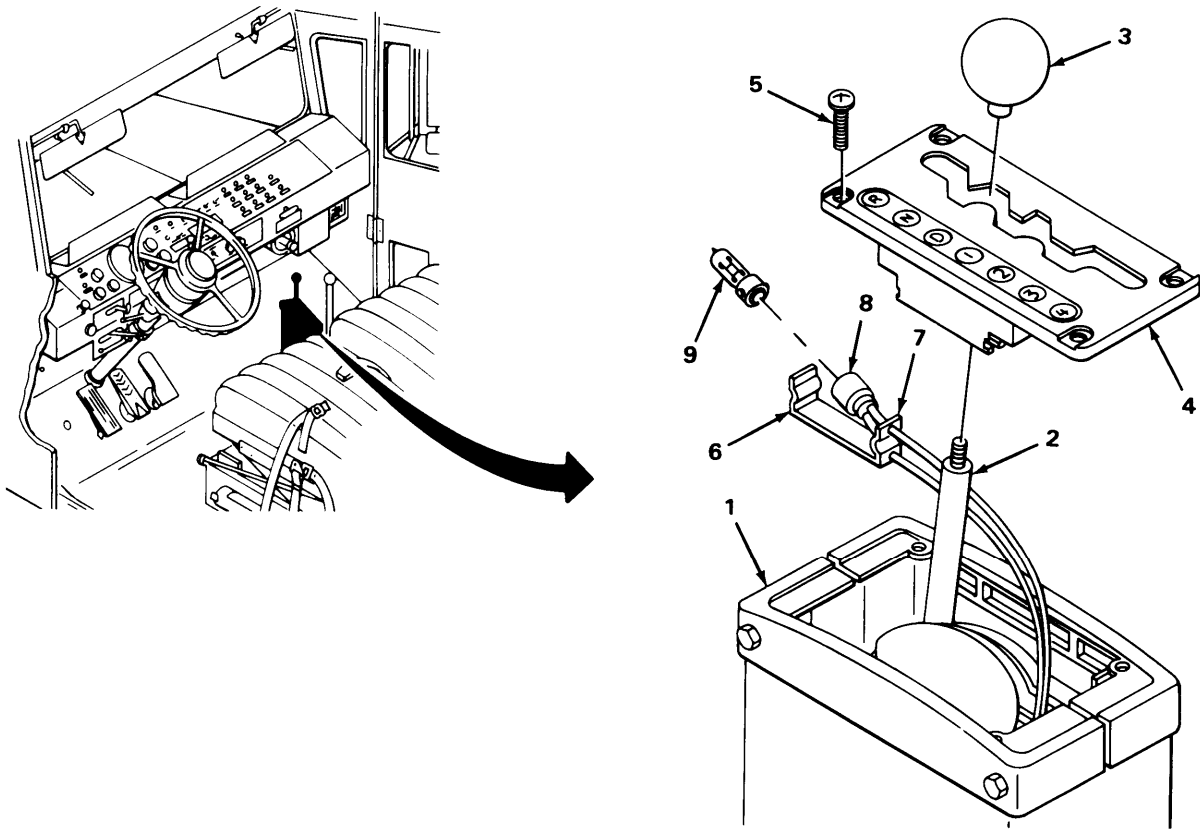
Personnel Required

One

SHIFT CONTROL LAMP - CONTINUED

LOCATION	ITEM	ACTION REMARKS
REMOVAL		
1. Shift control assembly (1)	Shift lever (2)	Put in D (drive) position.
2. Shift lever (2)	Shift knob (3)	Unscrew and take off.
3. Indicator assembly (4) to shift control assembly (1)	Four screws (5)	Using cross-tip screwdriver, unscrew and take out.
4. Shift control assembly (1)	Indicator assembly (4)	Lift up part way.
5. Indicator assembly (4)	Lampholder bracket (6)	a. Using flat-tip screwdriver, pry leg (7) away from indicator assembly (4). b. pull off.
6. Lampholder (8)	Lamp (9)	Push in, turn one-quarter turn counter-clockwise, and take out.
INSTALLATION		
7. Lampholder (8)	Lamp (9)	Push in and turn one-quarter turn clockwise.
8. Indicator assembly (4)	Lampholder bracket (6)	Snap on.
9. Shift control assembly (1)	Indicator assembly (4)	Put in place.
10. Indicator assembly (4) to shift control assembly (1)	Four screws (5)	Screw in and tighten using cross-tip screwdriver.
11. Shift lever (2)	Shift knob (3)	Screw on and tighten.
12. Shift control assembly (1)	Shift lever (2)	Place in N (neutral).

SHIFT CONTROL LAMP - CONTINUED



NOTE

FOLLOW-ON MAINTENANCE: Check operation (TM 9-2320-270-10).

TASK ENDS HERE

TOWING KIT STOPLIGHT SWITCH

This task covers:

- a. Removal (page 4-522)
 - b. Cleaning/Inspection (page 4-523)
 - c. Installation (page 4-523)
-

INITIAL SETUP

<p>Tools</p> <p>Brush, wire Wrench, open-end, 3/4-inch Wrench, open-end, 11/32-inch Wrench, open-end, 11/16-inch</p> <p>Materials/Parts</p> <p>Lockwasher, stoplight switch terminal (two required) Tape, teflon (item 22, appendix C)</p>	<p>Personnel Required</p> <p>One</p> <p>Equipment Condition</p> <p>Air system drained (TM 9-2320-270-10).</p>
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LOCATION	ITEM	ACTION	REMARKS
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REMOVAL

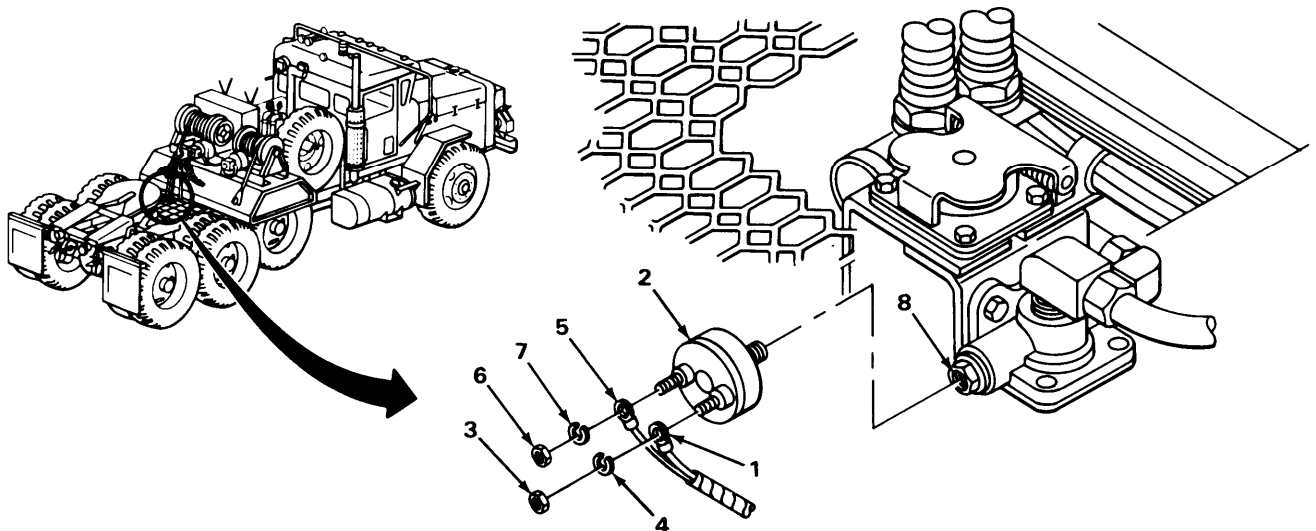
WARNING

Make sure all pressure is drained from air system before disconnecting switch. Parts under pressure can, when removed, fly off with great force causing injury to personnel.

<p>1. Brown wire (1) to stoplight switch (2)</p>	<p>Nut (3) and lockwasher (4)</p>	<p>a. Using 11/32-inch wrench, unscrew and take off. b. Get rid of lockwasher (4).</p>
<p>2. Stoplight switch (2)</p>	<p>Brown wire (1)</p>	<p>Take off.</p>
<p>3. Red wire (5) to stoplight switch (2)</p>	<p>Nut (6) and lockwasher (7)</p>	<p>s. Using 11/32-inch wrench, unscrew and take off. b. Get rid of lockwasher (7).</p>
<p>4. Stoplight switch (2)</p>	<p>Red wire (5)</p>	<p>Take off.</p>
<p>5. Adapter (8)</p>	<p>Stoplight switch (2)</p>	<p>Using 11/16-inch and 3/4-inch wrenches, unscrew and take out.</p>

TOWING KIT STOPLIGHT SWITCH - CONTINUED

LOCATION	ITEM	ACTION REMARKS
CLEANING/inspection		
6.	Stoptlight switch (2)	a. Using wire brush, clean all old sealer from threads. b. Inspect for stripped or damaged threads. If threads are stripped or damaged, replace switch.
INSTALLATION		
7. Adapter (8)	Stoptlight switch (2)	a. Wrap threads with teflon tape (page 4-1). b. Screw in and tighten using 3/4-inch and 11/16-inch wrenches.
8. Stoptlight switch (2)	Red wire (5), new lockwasher (7), and nut (6)	Screw on and tighten using 11/32-inch wrench.
9.	Brown wire (1), new lockwasher (4), and nut (3)	Screw on and tighten using 11/32-inch wrench.



NOTE

FOLLOW-ON MAINTENANCE; Check operation (TM 9-2320-270-10).

TASK ENDS HERE

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By Order of the Secretary of the Army:

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General, United States Army
Chief of Staff

Official:

R.L. DILWORTH
Brigadier General, United States Army
The Adjutant General

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2-119			

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

Step 4 lists two seals to be removed from thermostat housing cover. There are also two ferrules which must be removed at the same time. Also, art on this page does not show ferrules exploded from housing.

SAMPLE

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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=1000 Millimeters=39.37 Inches
 1 Kilometer=1000 Meters=0.621 Miles

SQUARE MEASURE

1 Sq Centimeter=100 Sq Millimeters=0.155 Sq Inches
 1 Sq Meter=10,000 Sq Centimeters=10.76 Sq Feet
 1 Sq Kilometer=1,000,000 Sq Meters=0.386 Sq Miles

WEIGHTS

1 Gram=0.001 Kilograms=1000 Milligrams=0.035 Ounces
 1 Kilogram=1000 Grams=2.2 Lb
 1 Metric Ton=1000 Kilograms=1 Megagram=1.1 Short Tons

CUBIC MEASURE

1 Cu Centimeter=1000 Cu Millimeters=0.06 Cu Inches
 1 Cu Meter=1,000,000 Cu Centimeters=35.31 Cu Feet

LIQUID MEASURE

1 Milliliter=0.001 Liters=0.0338 Fluid Ounces
 1 Liter=1000 Milliliters=33.82 Fluid Ounces

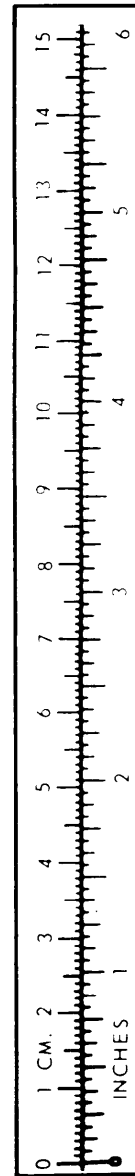
TEMPERATURE

$5/9 (°F - 32) = °C$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5 C° + 32 = F°$

APPROXIMATE CONVERSION FACTORS

<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>
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	5.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per hour	Kilometers per Hour	1.609

<u>TO CHANGE</u>	<u>TO</u>	<u>MULTIPLY BY</u>
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.385
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



(FOR REFERENCE ONLY)

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