TECHNICAL MANUAL
UNIT MAINTENANCE MANUAL

HULL AND
RELATED COMPONENTS
RECOVERY VEHICLE,
FULL-TRACKED:
LIGHT, ARMORED, M578
(2350-00-439-6242) (EIC:3LA)

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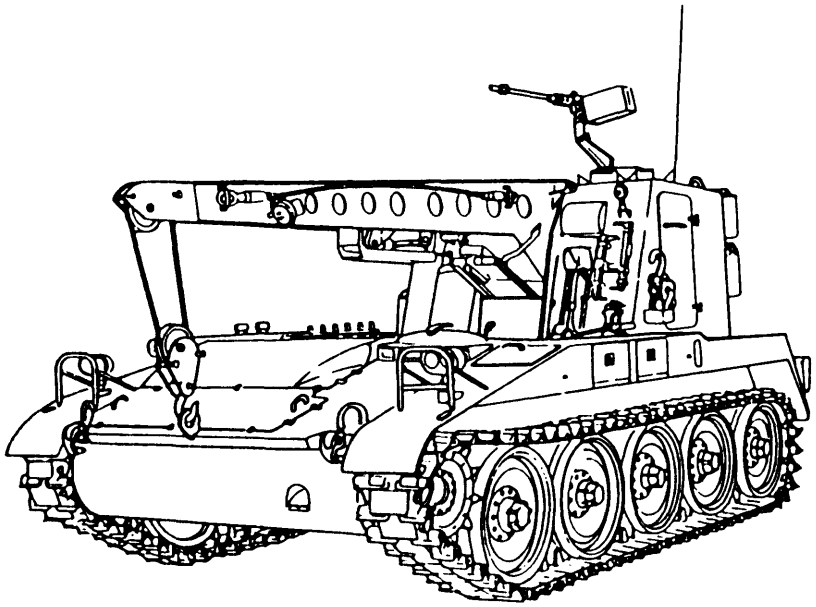

Distribution: Statement A: Approved for public release; distribution is unlimited

This Manual supersedes hull and related components portions of TM 9-2350-238-20, dated 4 October 82, including all changes

HEADQUARTERS, DEPARTMENT OF THE ARMY

15 MAY 1994

WARNING

RADIATION HAZARD

TRITIUM (H_3)

Rules and Regulations

Copies of the following rules and regulations are maintained at HQ, AMCCOM, Rock Island, IL 61299-6000. Copies may be requested or information obtained by contacting the AMCCOM Radiological Protection Officer (RPO), AUTOVON 793-2964, Commercial (309) 782-2964.

10CFR Part 19--Notices, Instructions, and Reports to Workers; Inspections.

10CFR Part 20--Standards for Protection Against Radiation.

NRC license, license condition, and license application.

Safety Precautions

The radioactive material used in these instruments is tritium gas (H_3) sealed in pyrex tubes. It poses no significant hazard to the repair person when intact. These sources illuminate the instrumentation for night operations. Tampering with or removal of the sources in the field is prohibited by Federal law. In the event there is no illumination, notify the local RPO. Do not attempt to repair or replace the instrument in the field! If skin contact is made with any area contaminated with tritium, immediately wash with nonabrasive soap and water.

Identification

Radioactive self-luminous sources are identified by means of radioactive warning labels (as above). These labels should not be defaced or removed and should be replaced immediately when necessary. Refer to the local RPO or the AMCCOM RPO for instructions on handling, storage, or disposal.

Storage and Shipping

All radioactively illuminated instruments or modules which are defective will be evacuated to a depot maintenance activity. These items must be placed in a plastic bag and packaged in the shipping container from which the replacement was taken before evacuation to a higher echelon is made. Spare equipment must be stored in the shipping container, as received, until installed on the weapon. Storage of these items is recommended to be in an outdoor shed-type storage or unoccupied building.

Do not purge and charge any instrument containing tritium gas (H_3) if there is no illumination in the assembly. The local RPO must be notified, and the defective unit will be replaced by a serviceable one.

WARNING (CONT)

GENERAL

Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well ventilated areas.

High-pressure nitrogen gas is used in this equipment. Keep face and body clear of release valves, filling plugs, and bleed valves. Failure to observe safety precautions may result in injury or death.

Unusable CARC mixtures are considered hazardous waste and will require disposal in accordance with Federal, state, DOD, DA, and local installation waste regulations. Consult the installation environmental office for proper disposal guidance. Mixed CARC is extremely flammable-use only in well ventilated areas, keep away from open flames, heat, sparks and other ignition sources.

- For brush/roller painting in confined spaces, an airline respirator is required, unless an air sampling shows exposure to be below standards. If the air sampling is below standards, either chemical cartridge or airline respirators are required.
- Spot painters applying CARC paint by brush or roller must wear clothing and gloves affording full coverage.
- Do not use water, alcohol, or amine based solvents to thin or remove CARC paints. Use of these solvents with CARC paints can produce chemical reactions resulting in nausea, disease, burns, or severe illness to personnel.
- Do not use paint solvents to remove paint/coating from your skin.
- Mix paint/coating in a well-ventilated mixing room or spraying area away from open flames. Personnel mixing paint/coating should wear eye protection.
- Use paint/coating with adequate ventilation.
- Personnel grinding or sanding on painted equipment should use high efficiency air purifying respirators.
- Do not weld or cut CARC-coated metal. Substances causing skin or respiratory irritation may be released. Before applying heat, sand or grind paint down to bare metal on area four inches to either side of the area you plan to weld or cut.

Vehicle has no brakes when powerplant is disconnected. Failure to securely block front and rear vehicle tracks could cause injury to personnel or damage to vehicle or other equipment if vehicle is free to roll out of control.

Ensure that vehicle cannot roll out of control. Block vehicle with 12 x 24-in. (30 x 61-cm) wood blocks placed under front and rear of each track.

Brake foot pedal is spring-loaded. Before working in forward area of driver’s compartment, ensure vehicle tracks are blocked and parking brake is released.

Electrical engine starter weighs 80.0 lb (36.3 kg). Carefully remove and install electrical engine starter.

Block vehicle tracks and release parking brake before working in driver's compartment. Disconnect battery ground leads from battery before working at rear of instrument panel.

Brake foot pedal is spring-loaded. Block tracks and release parking brake before working on instrument (switch) panel. Disconnect battery ground leads from battery before working at rear of instrument panel.

Road wheel arms rotate in an arc when raised or lowered. Ensure that jack is properly located and positioned under arm to allow for rotation and to provide a stable support for arm.

CARBON MONOXIDE POISONING IS DEADLY

Carbon monoxide is a colorless, odorless, deadly poisonous gas, which, when breathed, deprives the body of oxygen and causes suffocation. Exposure to air contaminated with carbon monoxide produces symptoms of headache, loss of muscular control, apparent drowsiness, and coma. Permanent brain damage or death can result from severe exposure.

Carbon monoxide occurs in the exhaust fumes of fuel-burning heaters and internal-combustion engines and becomes dangerously concentrated under conditions of inadequate ventilation. The following precautions must be observed to ensure the safety of personnel whenever the personnel heater, main, or auxiliary engine of any vehicle is operated for maintenance purposes or tactical use.

- Do not operate heater or engine of vehicle in an enclosed area unless it is adequately ventilated.
- Do not idle engine for long periods without maintaining adequate ventilation in personnel compartments.
- Do not drive any vehicle with inspection plates, cover plates, or engine compartment doors removed unless necessary for maintenance purposes.
- Be alert at all times during vehicle operation for exhaust odors and exposure symptoms. If either are present, immediately ventilate personnel compartments. If symptoms persist, remove affected personnel from vehicle, and treat as follows: expose to fresh air; keep warm: DO NOT PERMIT PHYSICAL EXERCISE; if necessary, administer artificial respiration. (Refer to FM 21-11).

THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS ADEQUATE VENTILATION

ELECTRICAL COMPONENTS

Make sure MASTER switch is OFF before repairing electrical components or circuits. Failure to observe this warning could result in injury to personnel.

Failure to remove or disconnect the batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

To avoid battery blow-up, do not connect battery cables before activating batteries with electrolyte.

WARNING (CONT)

HYDRAULICS

Hydraulic system is under high pressure. Make sure all hydraulic pressure is relieved before removal of any tubes or fittings. Follow safety procedures to prevent injury. Wipe up spilled hydraulic fluid.

FIRST AID

Refer to FM 21-11, First Aid for Soldiers.

Serious injury may occur at any time. Read FM 21-11 for information on first aid before an accident happens.

TECHNICAL MANUAL

No. 9-2350 -238-20-1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D. C., 15 May 1994

UNIT MAINTENANCE MANUAL
HULL AND RELATED COMPONENTS
RECOVERY VEHICLE,
FULL TRACKED: LIGHT, ARMORED, M578
(2350-00-439-6242) (EIC:3LA)

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

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, Attn: AMSTA-MB, Warren, Ml 48397-5000. A reply will be furnished to you.

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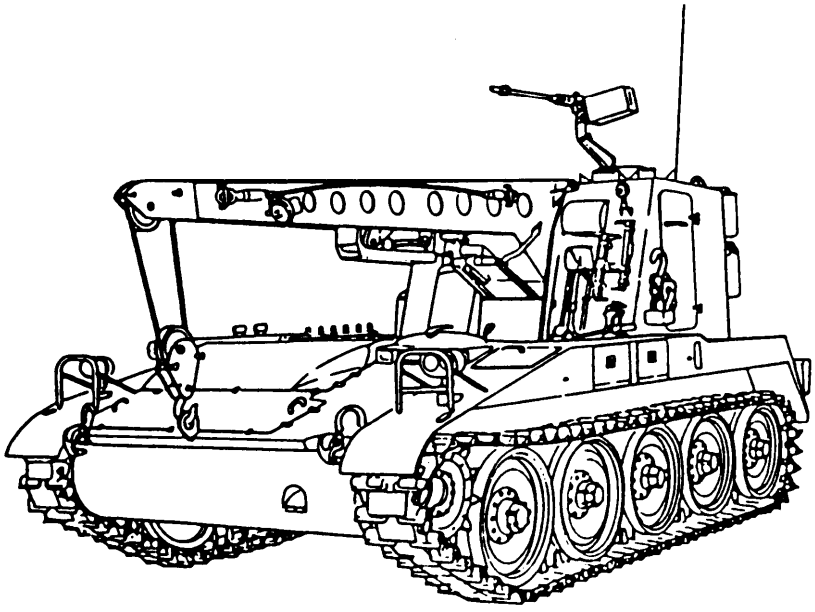
HOW TO USE THIS MANUAL

This manual (TM 9-2350-238-20-1) contains unit level maintenance procedures for the hull and related components of the M578 Recovery Vehicle. This manual is to be used in conjunction with TM 9-2350-238-10 and TM 9-2350-238-24P-1. Chapter 1 contains general information; equipment description and data; and principles of operation. Chapter 2 contains information concerning repair parts, special tools, TMDE, and support equipment; and unit level troubleshooting and maintenance procedures.

Be sure to read and understand maintenance instructions before beginning any maintenance task. Also, read and understand information in Chapter 1 and general maintenance procedures on page 2-379 before beginning any maintenance task.

M578 RECOVERY VEHICLE



CHAPTER 1
INTRODUCTION

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Section 1. GENERAL INFORMATION

1-1. SCOPE.

a. Type of Manual. Unit level maintenance.

b. *Model Number and Equipment Name.* M578, light armored, full-tracked, recovery vehicle.

c. Purpose of Equipment. Travels at convoy speed and provides a number of necessary vehicular support functions.

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

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

a. Tactical Situations. Situations may arise in which it is necessary to abandon equipment in the combat zone. All abandoned equipment must be destroyed to prevent its use by the enemy. The destruction of equipment subject to capture or abandonment in the combat zone will be undertaken only upon authority delegated by a division or higher commander.

b. *Plans.*

(1) Plans for destruction of equipment must be adequate, uniform, and easily carried out in the field.

1-3. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE (CONT).

(2) Destruction must be as complete as the available time, equipment, and personnel will permit. Since complete destruction requires considerable time, priorities must be established so the more essential parts are destroyed first.

(3) The same essential parts must be destroyed on all like units to prevent the enemy from constructing a complete unit from undamaged parts.

(4) Spare parts and accessories must be given the same priority as parts installed on the equipment.

c. Methods. To destroy equipment adequately and uniformly, all personnel of the unit must know the plan and priority of destruction and be trained in the methods of destruction.

d. References. Read TM 750-244-6 for information on destruction of mechanical equipment. Read TM 750-244-5-1 for information on destruction of ammunition.

1-4. PREPARATION FOR STORAGE OR SHIPMENT. Administrative storage is restricted to 90 days and must not be extended. Refer to page 2- for detailed instructions on administrative storage.

1-5. OFFICIAL NOMENCLATURE, NAMES, AND DESIGNATIONS.

Nomenclature Cross-Reference List.

Common Name	*Official Nomenclature*
Arctic traction kit	Track parts kit
Base link	Heater bracket
Base straps	Window assembly to driver's cupola holddown vehicular safety belt
Brake adjustment splined wrench	Remote control lever
Crane operator's window assembly rear seal	Crane operator's window assembly cover assembly
Engine oil dipstick	Liquid level gage (oil) tube and rod
Fuel sending unit liquid transmitter	Fuel sending unit liquid quantity transmitter
Ground strap	Electrical lead
Hinge to base pin assembly	Hinge to base single chain assembly
Hull transmission compartment deck assembly	Hull transmission compartment assembly access cover

Insulation sleeving	Sleeve insulation or sleeving insulation
Lockwire	Nonelectrical wire
Low engine coolant level warning light	Low engine coolant warning indicator light
Magnetic clutch	Vehicular drive
Primary fuel filter	Fluid filter
Roadwheel	Solid rubber wheel
Secondary fuel filter	Fluid filter
Starter control relay	Electromagnetic relay
Starter ground lead	Engine ignition lead
Starter relay	Electromagnetic relay
Track shoe link pin	Threaded-end rod
Water by-pass tube	Metallic bent tube
Water crossover tube	Metallic bent tube
Window assembly chain	Window assembly to driver's cupola chain

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR). If your M578 Recovery Vehicle 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 (Product Quality Deficiency Report). Mail it to us at Commander, US Army Tank-Automotive Command, ATTN: AMSTA-Q, Warren, MI 48397-5000. We will send you a reply.

1-7. CORROSION PREVENTION AND CONTROL **(CPC).**

a. Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in the future.

b. While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

c. If a corrosion problem is identified, it can be reported using SF 368, Product Quality Deficiency Report. Use of key words such as "corrosion," "rust," "deterioration," or "cracking" will assure that the information is identified as a CPC problem.

d. The form should be submitted to: Commander, US Army Tank-Automotive Command, ATTN: AMSTA-Q/Customer Feedback Center, Warren, MI 48397-5000.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-8. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

a. *Purpose.* The M578 Recovery Vehicle is a weapon which provides support to other vehicles in the field.

b. *Capabilities and Features.*

CAUTION

Do not ford water which exceeds 42.0 in. (106.7 cm) in depth. Check for soft mud or sandy bottoms.

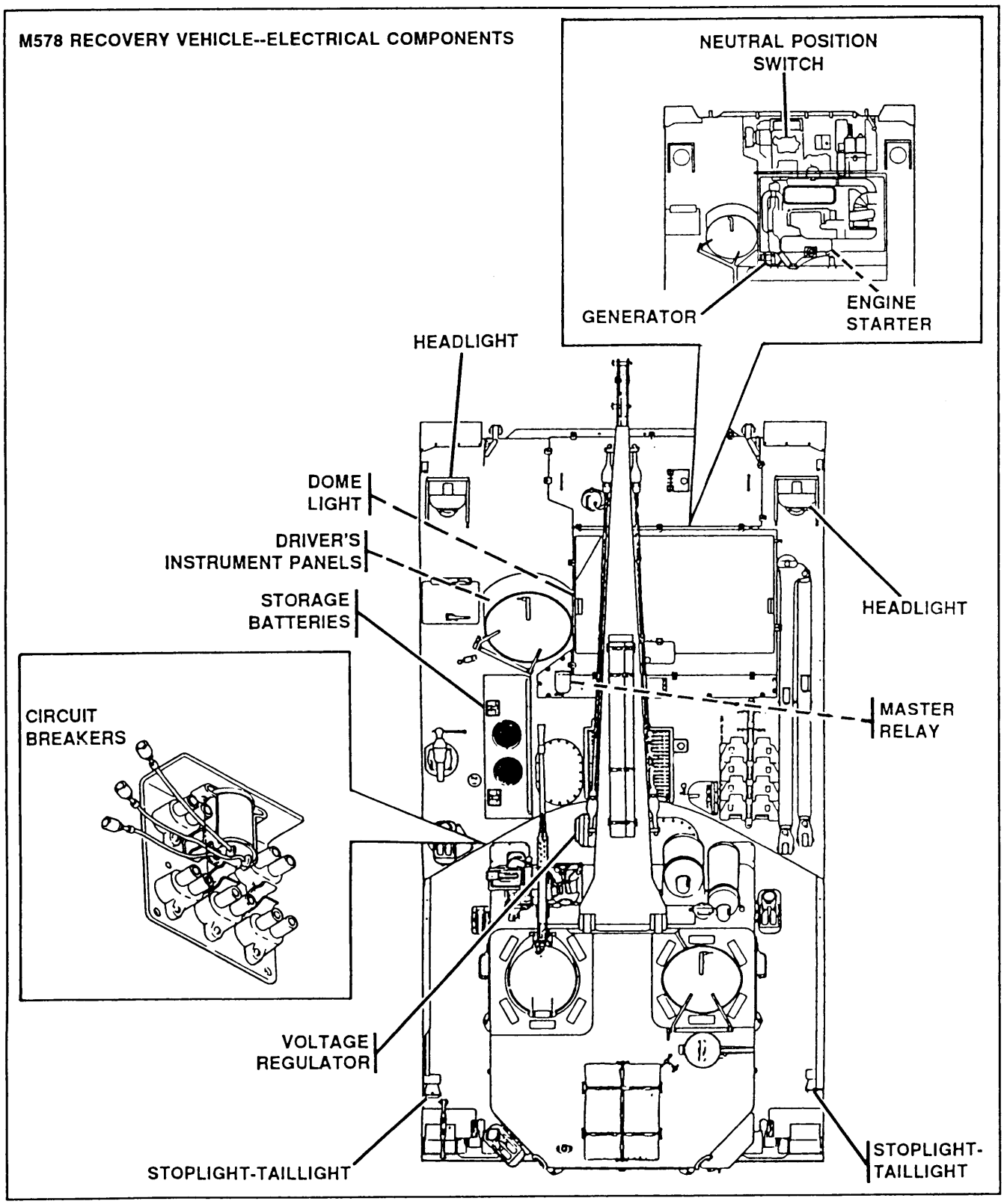
(1) The M578 Recovery Vehicle is a light, armored, full-tracked recovery vehicle. It tows other vehicles and lifts and pulls heavy loads. This diesel-powered vehicle is highly mobile, maneuverable, and may be air transported. The vehicle is capable of long-range, high-speed operation on improved roads. It can traverse rough terrain, muddy or marshy ground, sand, and snow or ice. The M578 Recovery Vehicle can ford streams up to 42.0 in. (106.7 cm) deep.

(2) A hydraulic suspension lockout system and spade assembly instantly transform the vehicle into a stable platform.

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. Refer to TM 9-2350-238-20-2.

ELECTRICAL COMPONENTS

Electrical power is provided by a 24-volt, 300-ampere generator and four storage batteries. Output of the generator is controlled by a solid state voltage regulator. A master relay regulates battery power. An electric pump powers the hydraulic system. Electrical components are controlled by switches located in the driver's compartment. Leads and wiring harnesses distribute current to all electrical components. A slave receptacle allows connection of the vehicle electrical system to another power source. Electrical components are connected by wiring harnesses, electrical leads, and circuit breakers.


M578 RECOVERY VEHICLE--ELECTRICAL COMPONENTS
NEUTRAL POSITION SWITCH
GENERATOR
ENGINE STARTER
HEADLIGHT
DOME LIGHT
DRIVER'S INSTRUMENT PANELS
STORAGE BATTERIES
CIRCUIT BREAKERS
HEADLIGHT
MASTER RELAY
VOLTAGE REGULATOR
STOPLIGHT-TAILLIGHT
STOPLIGHT-TAILLIGHT

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (CONT).

a. *Generator.* The 300-ampere, 24-volt dc generator operates whenever the engine is running. It provides electrical power to recharge the batteries and operate the vehicle.

b. *Batteries.* Four 12-volt batteries are connected in series-parallel to produce 24 volts, and to provide electrical power to start and operate the vehicle.

c. *Master relay.* The batteries transmit power through contacts in the master relay. When the master switch is on, the master relay is energized and power is available to all circuits in the vehicle.

d. *Voltage regulator.* The voltage regulator controls the output voltage and current of the generator. It is a solid state unit and is not adjustable. Circuit breakers protect the generator from electrical overload.

e. *Starter and solenoid.* The starter is a direct cranking, nonreversible, 24-volt unit. It is actuated by a two-coil starter motor solenoid mounted on the starter.

f. *Neutral position switch and starter control relay.* The neutral position switch closes when the transmission shift lever is in neutral position. This completes the circuit for the starter control relay to supply battery power to the two starter windings when the start switch is pressed.

g. *Driver's instrument and switch panel.* The instrument and switch panels contain the switches, indicator lights, and gages required for operation of the vehicle. Refer to TM 9-2350-238-10 for description of the separate items on each panel.

h. *Vehicle lighting.* The service and infrared headlights are set for high or low beam by the dimmer switch. The two headlights are combination units. Each headlight consists of an incandescent driving lamp, infrared driving lamp, blackout driving lamp, and blackout marker lamp. The taillights are combination units. The right taillight consists of a blackout stoplight and marker light. The left taillight consists of a service taillight, service stoplight, and blackout marker light. The dome light is a standard combination blackout and service light.

i. *Warning switches and transmitters.* When the brake foot pedal is depressed, the brake warning sensitive switch roller guide is released, causing the switch contacts to close. Closing the switch contacts causes the service stoplight or blackout stoplight to light.

(1) The engine low oil pressure warning switch opens at 9 to 13 psi (62 to 90 kPa) on increasing pressure. When the switch is closed, a circuit is completed to light the warning light and cause the warning horn to sound.

(2) The engine oil pressure transmitter is a variable resistance unit. It gives a reading on the engine oil pressure indicator.

(3) The engine oil temperature warning switch closes at 300 °F to 310 °F (149 °C to 155 °C) on increasing temperature. When the switch is closed, a circuit is completed that causes the warning light to light and the warning horn to sound.

(4) The transmission oil temperature transmitter is a variable resistance unit. It gives a reading on the transmission oil temperature indicator.

(5) The transmission oil pressure transmitter is a variable resistance unit. It gives a reading on the transmission oil pressure indicator.

(6) The fuel sending unit liquid transmitter is a sparkproof, float-operated variable resistance unit. It gives a reading on the fuel level indicator.

NOTE

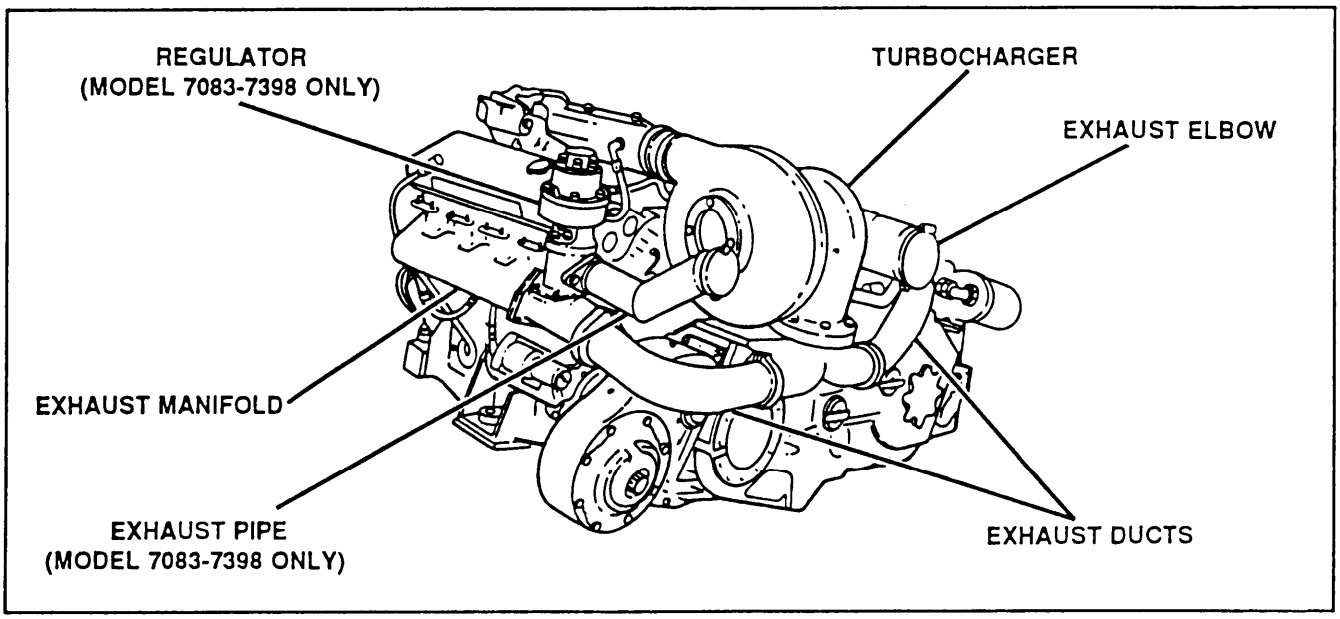
This illustration cannot show all wiring, electrical leads, and circuit breakers on the M578 recovery vehicle. For complete vehicle schematic diagrams, refer to FO-1 and FO-2.

j. *Wiring.* Vehicle components are connected with single wire leads or multiple lead wiring harnesses. All wiring is standard ordnance waterproof cable. Connections are made by waterproof, rubber, single wire quick-disconnect connectors, plug-receptacle connectors, or solderless waterproof terminals.

k. *Leads.* All leads are identified by a marker band attached to the wire and stamped with a circuit number. The socket and pin contacts of the connectors are identified by upper case letters of the alphabet, stamped on the connector insert.

l. *Circuit breakers.* Thermal break, automatic reset, 15A and 20A circuit breakers protect the vehicle components and circuits.

EXHAUST SYSTEM



1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (CONT).

ENGINE MODEL 7083-7395. Engine exhaust gas is routed through two exhaust manifolds and two exhaust ducts to the turbocharger. The exhaust gas passes through the turbocharger (driving it) and out through the exhaust elbow.

ENGINE MODEL 7083-7398. Exhaust gases are discharged through two exhaust manifolds and ducts to the turbocharger. Gases from the right manifold discharge into the turbocharger turbine. Gases from the left manifold discharge through the turbocharger regulator in the turbocharger.

a. *Turbocharger regulator.* The regulator is controlled by the pressure difference between intake and outlet air of the turbocharger blower section. When the outlet pressure is greater than the inlet pressure, the regulator vents part of the exhaust gases through its exhaust pipe to bypass the turbocharger. This reduces the turbocharger speed and output of air, thus preventing turbocharger overspeed.

b. *Exhaust elbow.* Exhaust gases are expelled from the turbocharger through an exhaust elbow.

FIRE EXTINGUISHER SYSTEM

The fixed fire extinguisher system is a carbon dioxide gas system with two release handles. When either release handle is pulled, two cylinders discharge carbon dioxide gas through nozzles over the engine and into the powerplant compartment.

FUEL SYSTEM

The engine takes fuel from the cell to the low-pressure fuel filter on the engine. Fuel flows from the low-pressure fuel filter to the engine fuel pump. The fuel pump delivers fuel through a high-pressure fuel filter to the injectors at high pressure. Excess fuel is used to cool the injectors and is returned to the fuel cell through a return line. Fuel that leaks past moving parts in the engine is collected in the powerplant reservoir.

a. *Fuel cells.* A steel fuel cell is part of the hull. It is lined with a two-piece fabric fuel cell filled with foam filler blocks. The fabric fuel cell prevents fuel leakage. The foam filler blocks prevent sloshing of fuel in the cell.

b. *Air box pump and fuel prime solenoid.* The air box pump and fuel prime solenoid valve, when energized, allow the pump to draw fuel from the low-pressure filter and force it through the high-pressure filter to the injectors. This prime and purge system forces out any air trapped in the high-pressure fuel filter and lines.

HYDRAULIC SYSTEM

The M578 Recovery Vehicle has an open-center type hydraulic system. This means that the hydraulic fluid continuously circulates through the main hydraulic supply lines. When no hydraulic subsystem is being used, the hydraulic fluid pressure in the main supply lines is near zero. When a subsystem is used, hydraulic fluid from the main supply lines is diverted through the subsystem. Hydraulic fluid pressure builds up within the subsystem to a level high enough for the subsystem to function. Preset pressure relief or pressure reducing valves protect the subsystem from too much pressure.

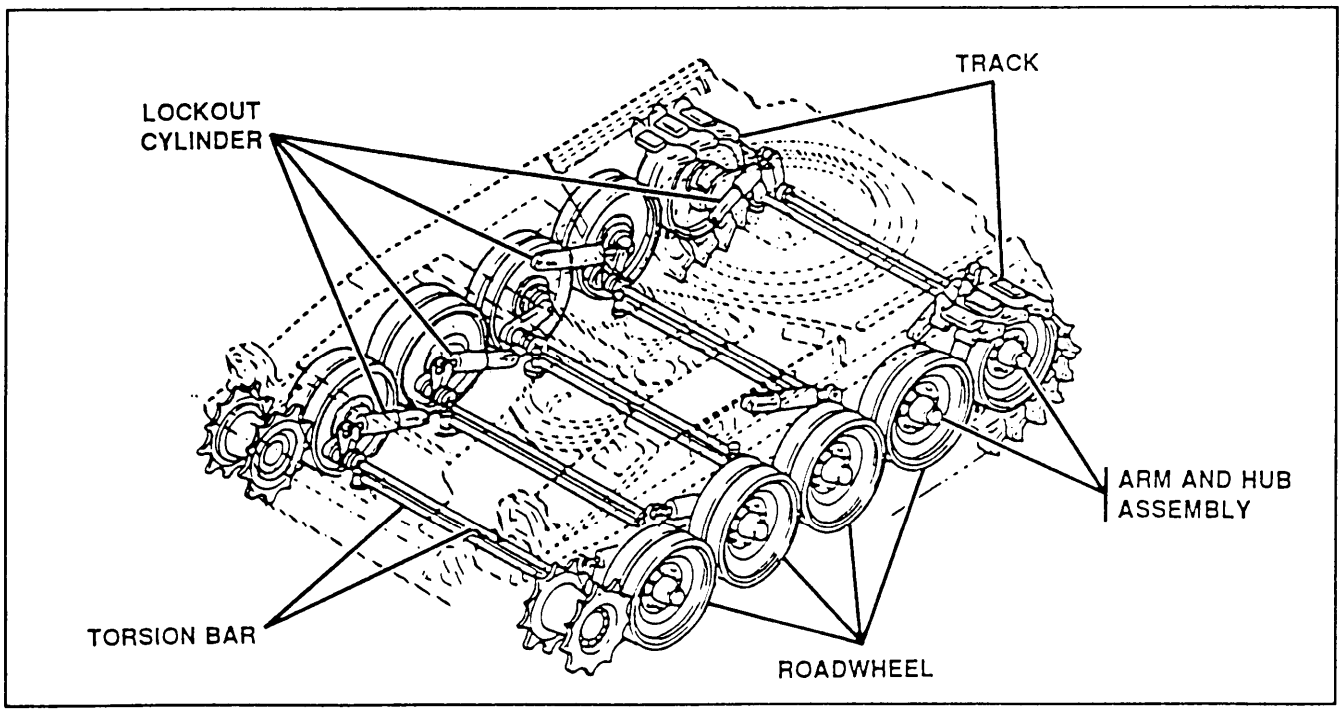
The hydraulic system consists of eight basic subsystems:

- The hydraulic power, impact wrench, suspension, and spade subsystems in the hull.
- The boom winch, traversing, boom cylinder, and tow winch in the cab.

GAS-PARTICULATE FILTER

The gas-particulate filter is used with face masks to protect crew members from toxic gases and dusty conditions. One filter is mounted in the cab on the boom cylinder and a second filter is mounted on the floor board in the driver's compartment.

SUSPENSION SYSTEM



The suspension system is a torsion bar, flat-tracked, front-drive type. Ten pairs of roadwheels support the vehicle and guide the two track assemblies. Each pair of roadwheels is mounted to an arm and hub assembly that is linked to a torsion bar and lockout cylinder (some vehicles only use eight lockout cylinders).

a. *Tracks.* Each track consists of shoes with a steel body, built in grousers and center guide, and removable rubber pad. The offset of the roadwheel arms and torsion bars require 76 track shoes on the right and 75 track shoes on the left.

b. *Roadwheels.* Rubber-tired, solid disk roadwheels support the vehicle. Each pair of wheels is secured to the hub by 10 ribbed neck bolts and self-locking nuts. The wheels roll on the tracks, one on either side of the track center guide. The tracks are driven by the final drive sprockets.

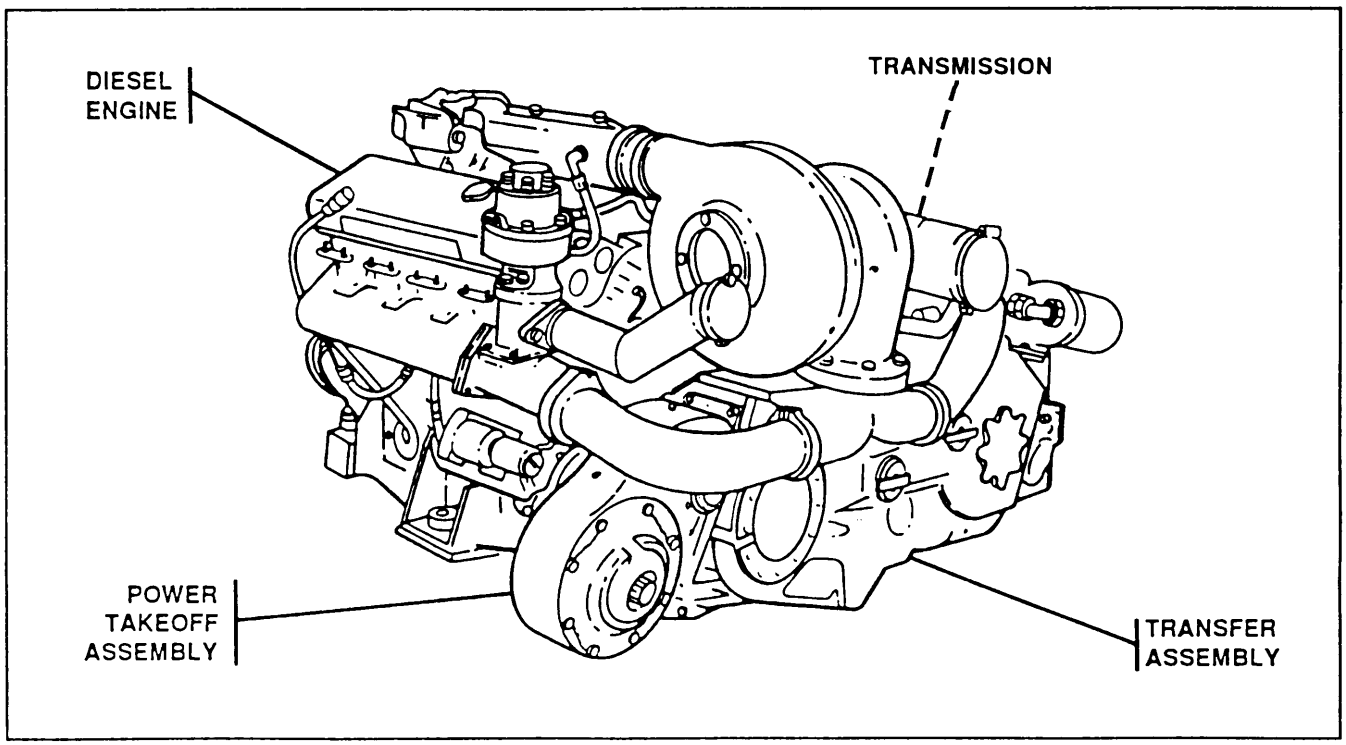
1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (CONT).

c. *Arm and hub assemblies.* Roadwheel arm and hub assemblies are sprung by torsion bars and lockout cylinders. The right and left rear arms (trailing idler arms) have an eccentric spindle that permits moving the arm lengthwise to adjust track tension.

d. *Lockout cylinders.* Lockout cylinders serve as shock absorbers and bump stops. They can be locked in position with hydraulic pressure to make a stable platform for lifting.

e. *Torsion bars.* Torsion bars absorb road shocks and provide vehicle spring support. Each torsion bar is connected to a roadwheel arm at one end and an anchor at the other end.

POWERPLANT



The powerplant consists of a diesel engine, transmission and transfer assembly, and power takeoff assembly. The powerplant is removed-and installed as a unit. It must be removed before the engine, transmission, transfer unit, and power takeoff can be separated. Engine power is transferred to the transmission and power takeoff by the transfer assembly. Refer to TM 9-2520-234-35 for a detailed description of the transmission and transfer assembly. Refer to TM 9-2815-202-24P for engine breakdown and repair parts.

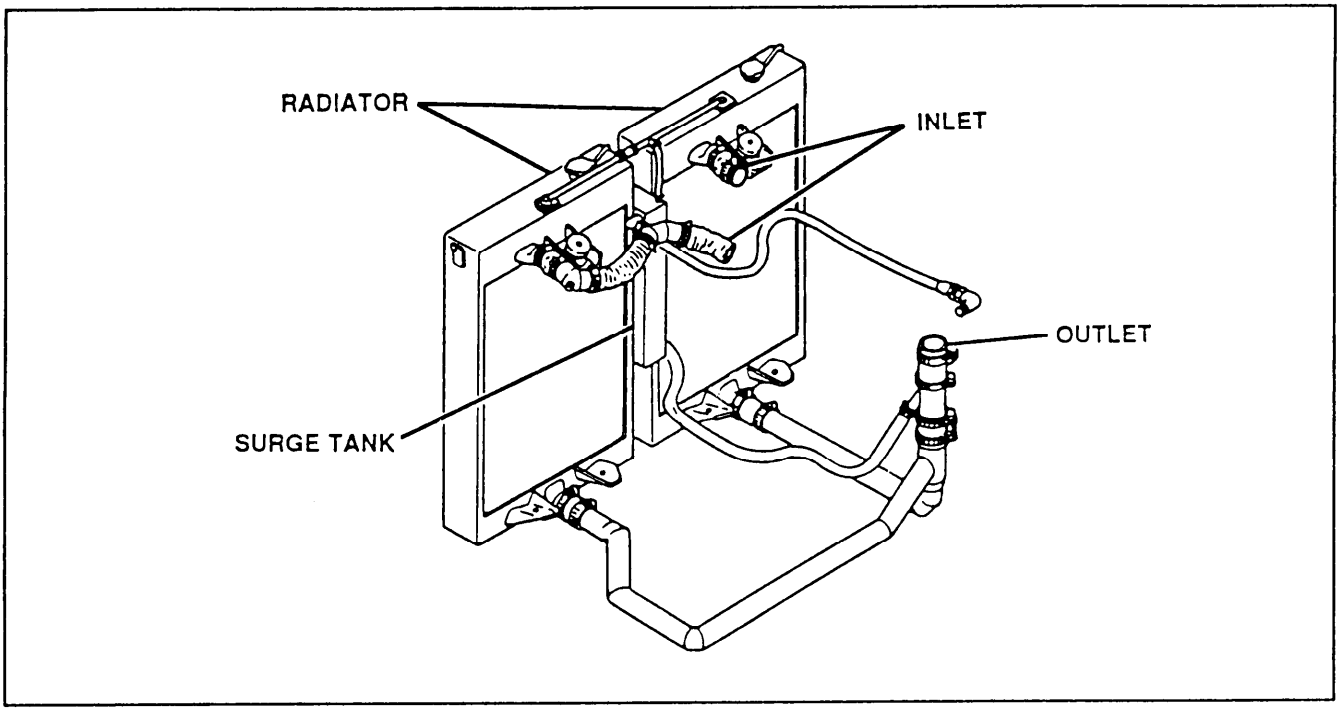
a. *Transfer assembly.* The transfer assembly transfers engine power to the transmission and power takeoff. The transmission transfers power through the final drives to the tracks. The power takeoff transfers power through the auxiliary drive to the generator, fan, and hydraulic pumps.

b. *Diesel engine.* The engine is a General Motors 8V71T turbocharged 8-cylinder, V-type, 2-cycle diesel. Refer to TM 9-2815-202-34 for a detailed description of the engine.

c. *Transmission.* The transmission is an Allison XTG-41 -2A crossdrive that combines transmission, steering, and braking. Steering is controlled by linkage from the steering bar that moves hydraulic controls in the transmission. Braking is controlled by the service brake pedal and linkage that moves disks in the transmission.

d. Power *takeoff assembly.* The power takeoff transfers power from the transfer assembly to the auxiliary drive. An idler gear mates with the transfer gear and drives the output gear. The output gear is connected to a drive shaft connected to the auxiliary drive.

COOLING SYSTEM



The engine is liquid-cooled by a cooling system with two radiators. The engine and powerplant components are also cooled by exhaust air from the radiator vaneaxial fan. The generator is cooled by an air intake assembly. Drawing air from the driver's compartment, the fan forces air through the generator into the powerplant compartment.

a. *Coolant (water) pump.* The coolant (water) pump takes coolant from the bottom of both radiators and the surge tank and forces it around the oil cooler core into the engine water jackets. At normal operating temperatures, the coolant passes through the thermostats to the radiators and surge tank. Below normal operating temperature, the thermostats close, causing coolant to flow through the by-pass tube back to the water pump intake.

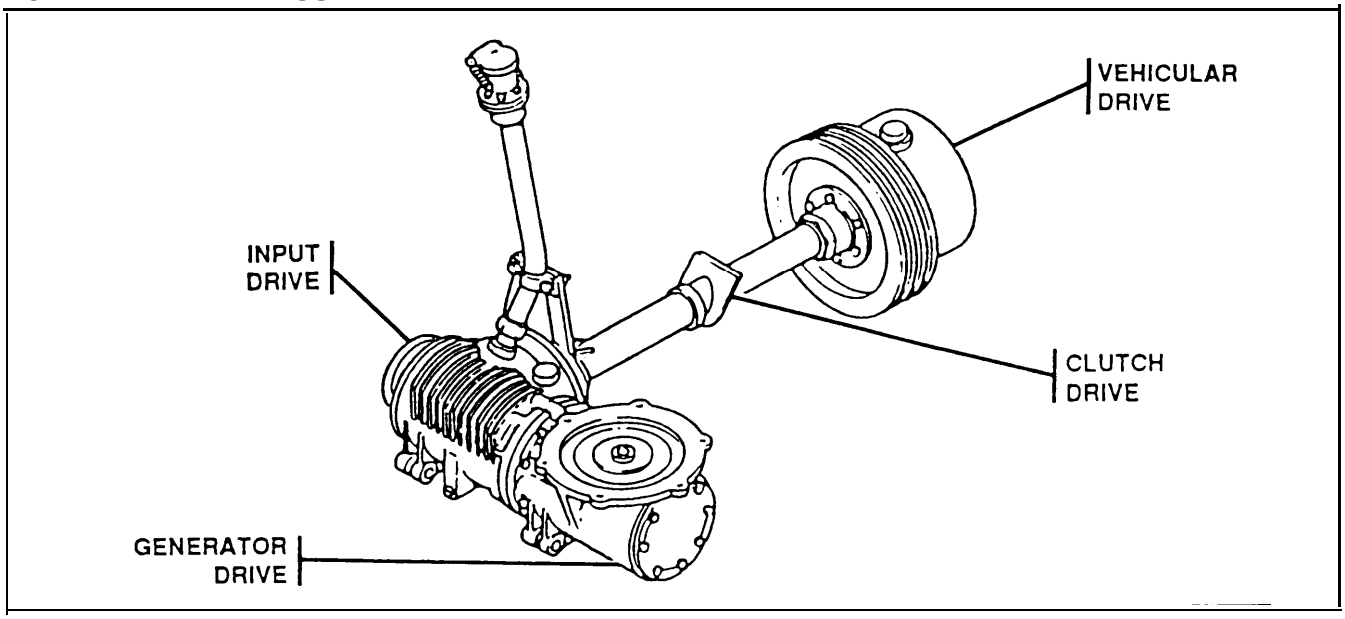
b. *Surge tank.* Air is collected in the surge tank from the radiators and engine water pump elbow. Air is vented through the surge tank cap at 14 psi (97 kPa). Air is vented through the radiator caps at 20 psi (138 kPa).

c. *Aeration detector.* An aeration detector, by means of a float-operated switch, senses low coolant level in the cooling system. It lights a warning light in the driver's compartment and sounds the warning horn to alert the driver.

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (CONT).

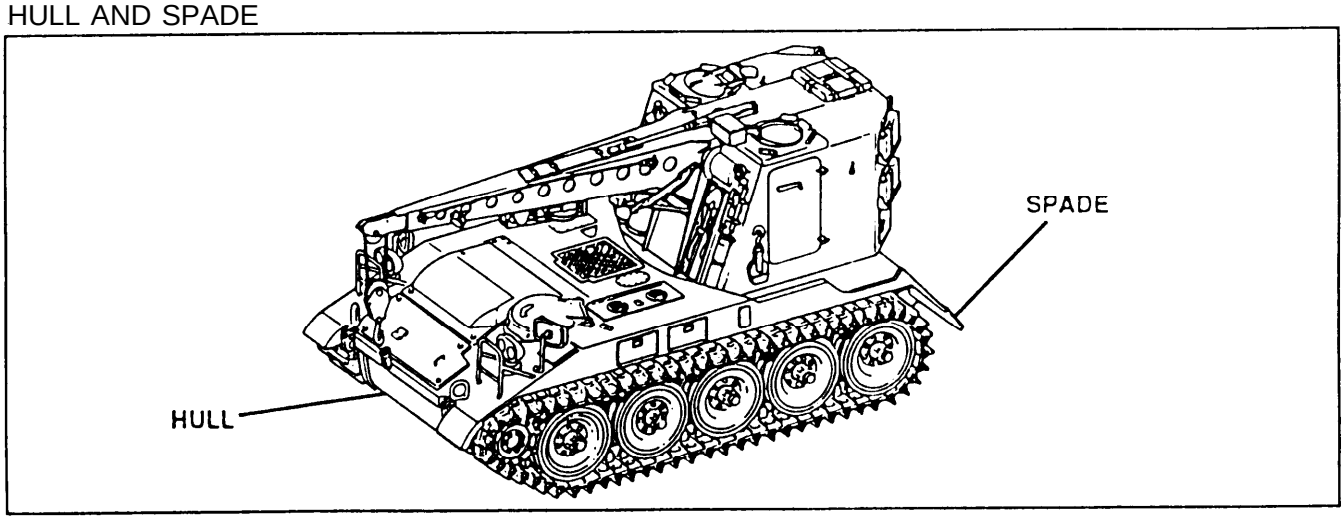
d. *Radiator vaneaxial fan.* Cooling air is drawn through the fan well cover and forced through two radiators into the powerplant compartment by the radiator vaneaxial fan. Air flows around the powerplant and is exhausted through grilles on the right side of the vehicle.

AUXILIARY DRIVE ASSEMBLY



The auxiliary drive assembly is a vehicular drive (magnetic clutch), clutch drive, and differential-type gearbox consisting of an input drive and a generator drive. It transfers engine power to the generator, cooling fan, and hydraulic pumps. Power is transferred to the generator and fan through the auxiliary drive whenever the engine is running. Power is applied to the hydraulic pumps when the magnetic drive clutch is energized.

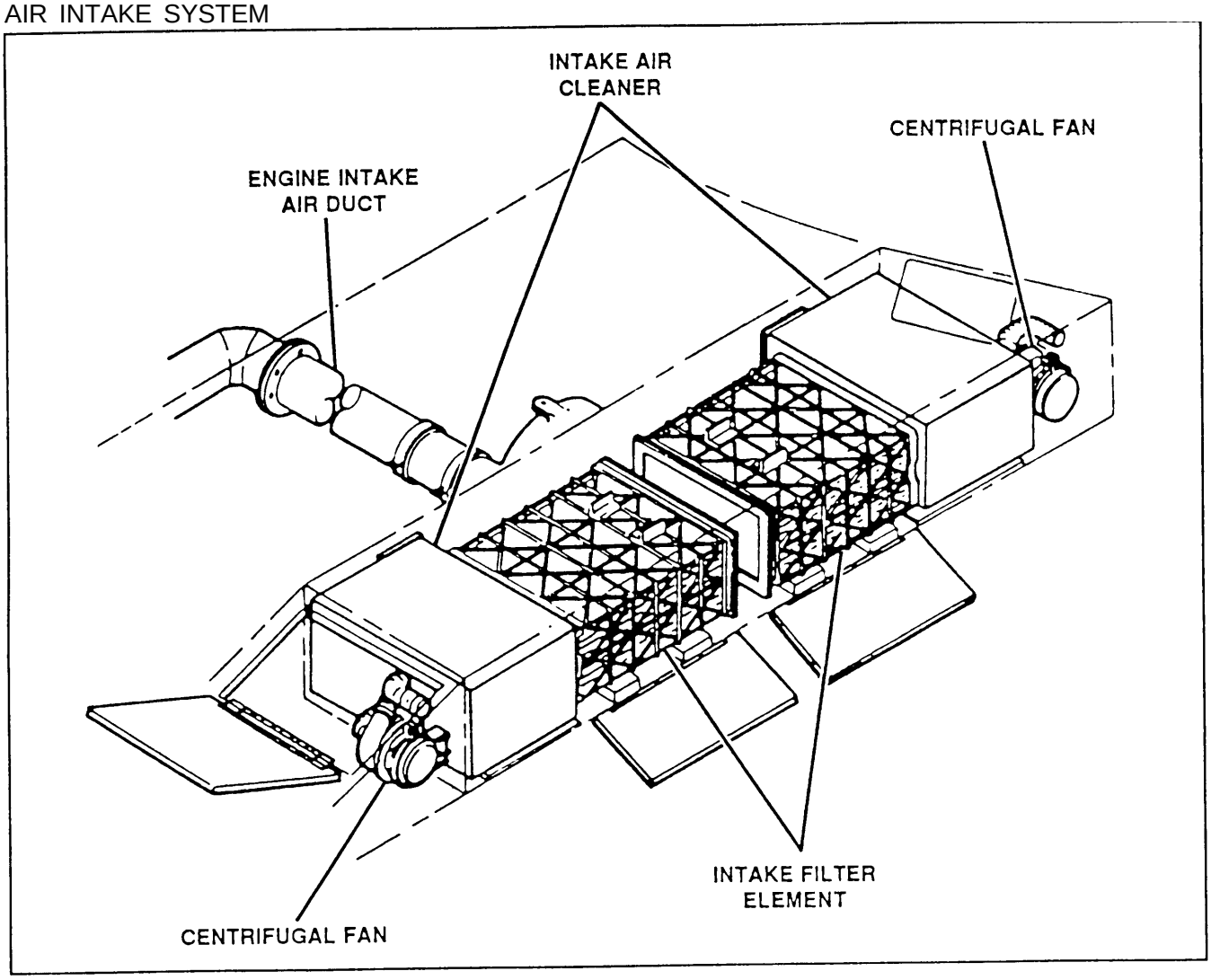
HULL AND SPADE



The hull and spade are welded steel assemblies. Most covers and access plates on the hull are steel. The cupola cover is armored steel plate. The engine deck, transmission deck, and battery compartment cover are aluminum alloy.

The spade is a welded steel structure used to prevent sliding when winching heavy loads. It is raised and lowered by two double-acting hydraulic cylinders.

AIR INTAKE SYSTEM



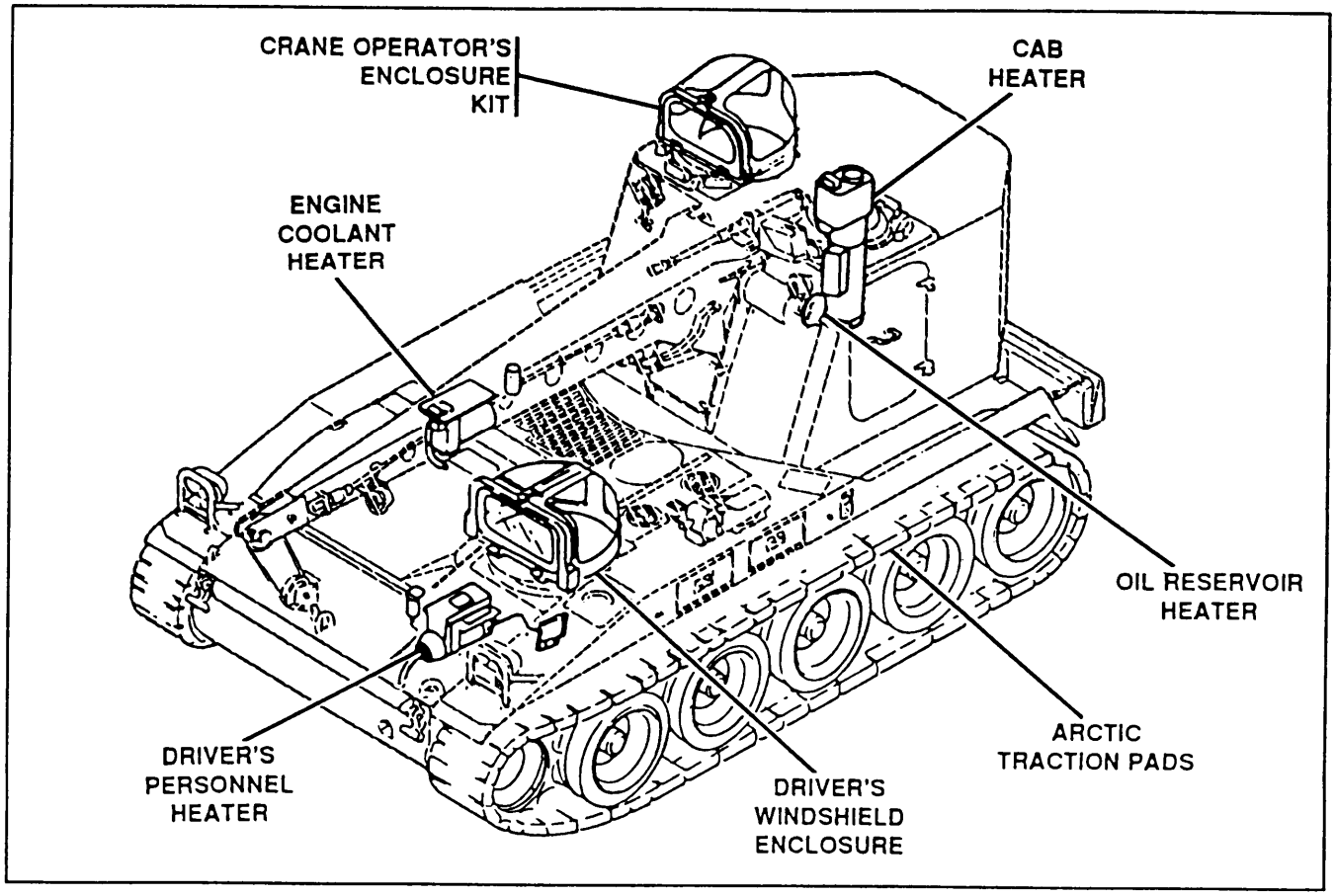
Engine air is filtered by a two-stage process that takes outside air through the battery access door grilles into two intake air cleaners, and then through two filter elements.

a. *Intake air cleaners.* The intake air cleaners are a system of tubes and deflector vanes that give a swirling motion to the incoming air. This swirling action forces large dust particles against the walls of the tubes. The dust falls into the dust chamber. Centrifugal fans exhaust the dust to the outside air through ports on the left side of the vehicle.

b. *Intake filter elements.* The intake air then passes through fabric filters that collect the remaining dust. The clean air is routed through engine intake air ducts and the turbocharger to the engine blower and combustion chambers.

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (CONT).

SPECIAL PURPOSE KITS



a. *Arctic traction kit.* The arctic traction kit consists of insert pads and nuts that replace the track shoe pads. These arctic traction pads provide improved traction of the vehicle for operation on ice or snow.

b. *Winterization kit.* The winterization kit consists of the heater installation kit, crane operator's enclosure kit, vehicular parts kit, oil reservoir heater kit, and driver's windshield enclosure kit. These kits protect the vehicle and crew in cold weather to -65 °F (-54 °C).

(1) The heater installation kit consists of the following components: engine coolant heater to keep the engine and batteries warm; driver's personnel heater to keep the driver's compartment warm; and canvas covers to keep snow and ice out of the hull.

(2) The crane operator's enclosure kit consists of a cover and windshield to enclose the crane operator's opening.

(3) The vehicular parts kit consists of a heater and ducts to keep the crew warm.

(4) The oil reservoir heater kit consists of an oil immersion heater to heat the oil in the hydraulic reservoir.

(5) The driver's windshield enclosure kit consists of a cover and windshield to enclose the driver's compartment.

1-10. EQUIPMENT DATA. The following tabulated data is for guidance of unit maintenance. Refer to TM 9-2350-238-10 for information concerning the general characteristics and performance of the M578 Recovery Vehicle.

a. *Crew.*

(1) Number 3

b. *Engine.*

(1) Manufacturer . . . . . Detroit Diesel Engine Division - GMC
(2) Type . . . . Two cycle. V-8, turbocharged. compression-ignition, diesel, liquid cooled
(3) Model (7083-7398) or (7083-7395) 8V71T
(4) Weight, dry (as installed) . . . . . 2442.01b(1107.7 kg)
(5) Number of cylinders 8
(6) Displacement . . . .568 in^3 (9308 Cm^3)
(7) Bore . . . . . 4.25 in. (10.80 cm)
(8) Stroke . . . . . 5.0 in. (12.7 cm)
(9) Compression ratio 17.1
(Io) Maximum, gross brake horsepower (at 2300 rpm) . . . . . 405(302 kW)
(11) Maximum, net brake horsepower . . . .345 (257 kW)
(12) Maximum, rpm (governed)
a. No load . . . . 2500 rpm
b. Fullload . . . . . 2300 rpm
(13) Idle speed . . . .550 - 600 rpm
(14) Cylinder cooling . . . .Liquid
(15) Crankshaft rotation (viewed from front of engine) . . . . Clockwise
(16) Firing order 1L-3R-3L-4R-4L-2R-2L-1R
(17) Fuel type . . . . . Diesel oil, 40 cetane, Fed W-F-800 DF
a. Regular grade (DG-2)(NAT0 F-54) . . . . . +20 ° to+115°F (-7° to +46 °C)
b. Wintergrade(DF-1) . . . .-25 °to +20°F (-32° to -7°C)
c. Arctic grade (DF-A)(NATO F-56) . . . . . -65 ° to -25°F (-54° to -32 °C)
(18) Engine oi lpressure (minimum) . . . . . 5.0 psi (34.5 kPa) at idle (30 -50 rpm)
30 - 50 psi (207-345 kPa) at 1000 rpm
50 - 70psi (345-483 kPa) at 2100 rpm

c. *Fuel System.*

(1) Capacity . . . . . 260.0 USgal. (984.21)
(2) Fuel tank filter
al location . . . . . Below fuel tank filler cap
b. Type . . . . Reusable element
(3) Low pressure (primary) fuel filter
al location . . . . . On engine
b. Type . . . . . Replaceable, disposable element

1-10. EQUIPMENT DATA (CONT).

(4) High pressure (secondary) fuel filter
al location . . . . . On engine
b. Type . . . . . Replaceable, disposable element

d. *Air Intake System.*

Filtering system
a. Type . . . . . Dry
b. Number of blowers 2
c. Number of filter bags 2

e. *Exhaust System.*

(1) Engine mode1 7083-7398 . . . . . Dual manifold routed through turbocharger with turbocharger regulator bypass
(2) Engine model 7083-7395 . . . . . Dual manifold routed through turbocharger
(3) Turbocharger regulator (on model 7083-7398 only)
al location . . . . . On engine
b. Controlled by . . . . Differential air pressure

f. *Cooling System.*

(1) Radiators 2
(2) Capacity . . . .24.0 US gal. (90.81)
(3) Thermostats 2
(4) Cooling fan 1
(5) V-belts
a. Number 4
b. Adjustment . . . . Spring-loaded belt tensioner
(6) Coolant (water) pump . . . . . Engine mounted, gear-driven

g. *Oil pumps.*

(1) Number . . . .2 pumps
(2) Type . . . . . Spur gear, positive displacement

h. *Final Drives.*

(1) Manufacturer . . . . AIlison Division of GMC
(2) Type . . . . . Front drive sprocket
(3) Final drive ratio 5.35:1
(4) Weight, dry
a. Left . . . . . 718.0 lb (325.7 kg)
b. Right . . . .633.0 lb (287.1 kg)

i. *Auxiliary Drive System.*

(1) Drive shafts 2
(2) Universal joints
a. Number 4
b. Type . . . .Cross
(3) Clutch . . . . . Magnetic

j. *Tracks and Suspension.*

(1) Tracks . . . . Steel grouser type
(2) Number of shoes
a. Left track 75
b. Right track 76
(3) Road and trailing idler wheels
a. Number . . . . 10 pairs
b. Type . . . . Solid-disk rubber-tired
(4) Suspension . . . . . Torsion bar with shock absorber

k. *Vehicle Hydraulic System.*

(1) System pressure . . . .0 - 2000 psi (0 - 13,800 kpa)
(2) 8 GPM pump
a. Type . . . . Dual vane
b. Output (1350 to 1450 rpm) . . . . . 7.6 gpm at 2000 psi (28.91/min at 13,800 kPa)
(3) 80 GPM pump (dual section)
a. Type . . . . Dual vane
b. Output (each section at 1350 to 1450 rpm)
Maximum . . . . . 52.0 gpm at 0 psi (197.6 1/min at 0 psi)
Minimum . . . . . 42.0 gpm at 2000 psi (159.61/min at 13,800 psi)
(4) Suspension lockout cylinders
a. Number 8
b. Type . . . . . Double-acting dual-purpose, with hydraulic lock
(5) Spade cylinders
a. Number 2
b. Type . . . . . Double-acting

l. *Driver's Controls and Linkage.*

(1) Steering control . . . . . Steering bar and pushrod linkage
(2) Shifting control . . . . . Hand lever and pushrod linkage
(3) Throttle control . . . . Foot pedal and pushrod linkage, hand throttle and flexible cable to foot pedal
(4) Brake control . . . . . Foot pedal and splined shaft hand brake lever
(5) Suspension lockout cylinder . . . . . Manually operated hydraulic valve
(6) Spade control . . . . . Manually operated hydraulic valve

Section III. PRINCIPLES OF OPERATION

1-11. GENERAL.

a. The M578 Recovery Vehicle is a full-tracked, self-propelled recovery vehicle with a 30,000 lb (13,620 kg) boom winch and a 60,000 lb (27,240 kg) tow winch mounted in an armored cab. The vehicle is used to pick up or tow disabled mechanical equipment, such as a crane at repair bases; and as a carrying platform for spare parts and maintenance personnel. The vehicle is highly mobile and maneuverable and may be transported in a large cargo aircraft.

b. The M578 Recovery Vehicle is capable of long-range, high-speed operation on improved roads. It can traverse rough terrain, muddy and marsh ground, snow or ice, and it can ford streams to a depth of 42 in. (107 cm). The vehicle has: 1) a low, all-welded steel structure with a turret-mounted cab; 2) a suspension lockout system; and 3) a spade assembly. The spade assembly provides a stable platform to increase the lifting capabilities of the winch. The suspension lockout system, boom, winches, cab, and spade are hydraulically powered. Power is supplied by a V-8 diesel engine and a gearsteer transmission.

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Section 1. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

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.

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

Tools, special tools, and test equipment necessary to maintain the M578 recovery vehicle are listed in TM 9-2350-238-24P-1, TM 9-2815-202-24P, and the Maintenance Allocation Chart (MAC), appendix B of this manual. For an illustrated list of special tools and equipment, refer to appendix G of this manual.

2-3. REPAIR PARTS.

Repair parts are listed and illustrated in TM 9-2350-238-24P-1 and TM 9-285-202-24P covering unit maintenance for this equipment.

Section II. SERVICE UPON RECEIPT

2-4. SERVICE UPON RECEIPT OF MATERIEL.

a. When you receive a vehicle, you must determine if the supplying agency has properly prepared it for service and if it is in condition to perform any mission.

b. Perform a run-in road test of at least 5 mi (8 km) on all vehicles to completely check their operation.

2-4. SERVICE UPON RECEIPT OF MATERIEL (CONT).

WARNING

Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated areas.

c. Most armament parts received from storage are coated with rust-preventive compound. Clean these parts thoroughly with shop rags or a brush that is saturated with dry cleaning solvent (item 16, appx C). Then lubricate the parts as specified in TM 9-2350-238-10 and the PMCS/lubrication table, page 2-13.

NOTE

Component parts of each vehicle should be cleaned separately whenever possible. Although like parts are interchangeable, the parts originally assembled work best together.

d. Whenever possible, the vehicle crew will help do these services.

e. Follow all precautions to tag DD Form 1397 (Processing and Reprocessing Record for Shipment, Storage, and Issue of Vehicle and Spare Engines). This tag is in the driver's compartment attached to the steering bar,- shift lever, or MASTER switch. For vehicles from administrative storage, check DA forms in vehicle log book to determine vehicle readiness. Deprocess vehicle in accordance with TM 740-90-1. Fill fuel cell and radiators. Lubricate vehicles as specified in TM 9-2350-238-10 and the PMCS/lubrication table, page 2-13.

NOTE

Engine, transmission, and final drives will not be drained unless expected temperatures require different viscosity oil. New engines and transmissions contain lubricant preservative cleaner (item 8, appx C). This lubricant preservative cleaner will be used until the next regularly scheduled oil change. Refer to the PMCS/lubrication table, page 2-13.

f. Vehicles prepared for shipment by the manufacturer require additional services. Refer to Table 2-1.

Table 2-1. SERVICE UPON RECEIPT—M578 RECOVERY VEHICLE

LOCATION	ITEM	ACTION	REMARKS
Hull	Protective Covers	a. Remove vehicle closure kit. b. Remove seal securing driver's cupola cover and open cover. c. Check tag DD Form 1397 (Processing and Reprocessing Record for Shipment, Storage, and Issue Vehicle and Spare Engines) to determine level of processing, and follow all precautions.	

Table 2-1. SERVICE UPON RECEIPT-M578 RECOVERY VEHICLE (CONT)

LOCATION	ITEM	ACTION	REMARKS
		d. Remove securing fastenings from: impact wrench access door, engine air cleaner access doors, rigger's door, stowage compartment access door, tool locker door, crane operator's door, tow winch access door, crane operator's cupola cover, and rigger/gunner cupola cover. e. Remove securing straps from: portable fire extinguishers, outside and inside of cab; snatch block on left front of cab; tow winch snatch block in tray or bottom of boom; level wind; two tow-cables, one each side of boom; tow bar on right fender; track shoes on right deck; acetylene and oxygen cylinders on right front of cab; and all chains in exterior cab stowage compartment. f. Remove tape and barrier material from machine gun pintle support. g. Remove machine gun mount from cab. Remove tape and barrier material and install mount on pintle support. h. Remove Ml 7 periscopes from inside cab stowage compartment. Remove tape, paper, and cushioning material. Install periscopes in driver's, crane operator's, and rigger/gunner cupolas. i. Remove tape and protective cover from headlamps, taillights, flasher, and floodlights. j. Remove tape and protective cover from all seats, backrests, and crash pads. k. Remove screen from turret hull cleanout cover opening. Remove wire securing cover and close cover. l. Remove screens from transmission and radiator access cover openings.	

2-4. SERVICE UPON RECEIPT OF MATERIEL (CONT).

Table 2-1. SERVICE UPON RECEIPT—M578 RECOVERY VEHICLE (CONT)

LOCATION	ITEM	ACTION	REMARKS
Hull (cont)	Protective Covers (cent)	m. Remove access covers from box in cab well and install in access openings.	
		n. Remove pipe plug from engine oil reservoir access cover.	
Driver's Compartment	General Services	a. Attach tag to plug and hang on hand throttle control in driver's compartment.	
		b. Remove tow hooks from box in cab and install on vehicle.	
OVE Rack		c. Remove basic issue items shipping containers from OVE rack.	
		d. Open containers, unpack items, and inventory contents with packing list.	
		e. Record missing or damaged items.	
Hull and Cab		f. Clean basic issue items as required and install in stowage provisions on hull and cab. Refer to TM 9-2350-238-10 for location.	
Battery Compartment	Batteries	WARNING Do not connect battery cables before activating batteries with electrolyte to avoid battery blow-up.	
		a. Remove dry charged batteries and electrolyte from shipping containers.	
		b. Install batteries in battery compartment.	
		c. Add electrolyte and charge batteries.	
		d. Connect all battery cables.	
Machine Gun Mount	Machine Gun	Install and set up M2 .50 caliber machine gun on machine gun mount. Refer to TM 9-2350-238-10.	

Table 2-1. SERVICE UPON RECEIPT-M578 RECOVERY VEHICLE (CONT)

LOCATION	ITEM	ACTION	REMARKS
Fan Well	Fan Drive Belts	a. Remove fan well deck. b. Adjust tension of fan drive belts. Refer to TM 9-2350-238-10.	
Engine Compartment	Engine	a Remove engine cover. b. Remove plastic caps from engine crankcase breathers. c. Remove tape from turbocharger regulator exhaust pipe valve and engine exhaust manifold elbow valve. d. Remove plug or tape from air duct opening into driver's compartment. e. Connect hose to opening and generator air duct. f. Remove tape from engine oil filler cap and auxiliary drive fill and level caps. g. Check lubricant level in engine, transmission, and auxiliary drive. h. Check DD Form 1397 for oil viscosity used. i. Install engine cover.	
Driver's Compartment	Engine	To test engine for hydrostatic lock: a. Set MASTER and INST switches to ON. b. Hold ENGINE SHUTDOWN handle all the way out and press START push-button switch. c. Turn engine over at least two revolutions. If engine does not turn over, refer to troubleshooting. d. Release ENGINE SHUTDOWN handle. e. Set MASTER and INST switches to OFF.	

2-4. SERVICE UPON RECEIPT OF MATERIEL (CONT).

Table 2-1. SERVICE UPON RECEIPT—M578 RECOVERY VEHICLE (CONT)

LOCATION	ITEM	ACTION	REMARKS
Driver's Compartment	Fuel System	To prime fuel system: a. Set MASTER and INST switches to ON. b. Hold PUMP AND HEATER IGNITER and PRIME ENGINE FUEL FILTERS switches in ON for 1 minute. c. Release PUMP AND HEATER IGNITER and PRIME ENGINE FUEL FILTERS switches and set MASTER and INST switches to OFF.	
Driver's Compartment		Start and run engine until lubricant preservative cleaner is out of combustion chambers and engine is operating smoothly. Immediately check for fuel and oil leaks. Troubleshoot engine if it does not develop full power in 5 minutes.	

2-5. CHECKING UNPACKED EQUIPMENT.

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on SF 364, Report of Discrepancy.

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.

Section III. UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) AND LUBRICATION INSTRUCTIONS

2-6. SCOPE. This section details the preventive maintenance checks and services (PMCS) and the lubrication instructions for the hull at the unit level. Preventive maintenance is the care, inspection, and service of the M578 Recovery Vehicle to keep it operating and to find troubles before repairs or replacements are needed. Preventive maintenance is performed at crew and unit levels.

a. *Crew.* All crew PMCS and lubrication tasks must be completed before unit PMCS is begun, refer to TM 9-2350-238-10.

b. *Unit.* This section tells what preventive maintenance tasks are done by unit maintenance mechanics. Always start at the front and follow it in order, to the back.

2-7. INTERVALS.

a. *Unit Preventive Maintenance Tasks.* PMCS tasks will normally be done semiannually; every 6 months, 2400 kilometers (1500 miles), or 150 hours of operation, whichever comes first.

(1) *Annually.* Once a year, as specified.

(2) *Eighteen (18) months.* As specified.

b. *Column 7.* The "Item No." column contains the item number which shall be used as a source of item numbers for the TM Number Column on the DA Form 2404, Equipment inspections and Maintenance Worksheet, in recording results of PMCS.

c. *Column 2.* The "Interval" column lists the specific interval at which the PMCS will be performed. They are as follows:

S - Semiannually
A - Annually
18-18 Months
AR - As Required

d. *Column 3.* The "Item to Check/Service column identifies the item to be checked, serviced, or lubricated.

e. *Column 4.* The "Procedure" column describes the check, service, or lubrication to be performed.

f. Colunm 5. The "Not Fully Mission Capable If" column contains the criteria which will render the system incapable of performing its primary mission.

NOTE

- All semiannual preventive maintenance tasks are also done during annual maintenance.
- High temperature is more than 100 °F (38 °C). Low temperature is less than 0 °F (-18 °C).
- Salt water is present during fording, sea spray, and morning mist in coastal areas.
- Dust conditions are high when oil level in hubcaps cannot be seen.

Operating the M578 Recovery Vehicle in very high or very low temperatures, in dust, mud, or salt water may require additional preventive maintenance.

2-8. GENERAL PROCEDURES.

a. *General Cleaning Instructions.*

WARNING

Dry cleaning solvent (SD2) (item 16, appx C) is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated areas.

(1) Use dry cleaning solvent (item 16, appx C) to clean grease, oil, or dirt from all metal parts. If a water hose is available, it may be used to take off heavy dirt. If a steam cleaner is available, it may be used to take off any remaining dirt. Make sure steam or water does not enter roadwheel bearings, shock absorbers, optics, hatches, and powerpack openings. After water or steam cleaning, lubricate vehicle. If water is found, drain and refill. Clean grease, oil, or dirt from all metal parts with dry cleaning solvent, cleaning compound, or equivalent.

(2) Use mild soap and water to clean or wash parts not made of metal. Rinse thoroughly after cleaning with water and then dry.

(3) Remove rust or dirt from fine-machined surfaces with dry cleaning solvent (item 16, appx C) and crocus cloth (item 10, appx C), if necessary. Do not use any other material. Be careful not to change the dimensions of parts when rubbing off rust. Coat bare metal surfaces, after cleaning, with CLP (item 8, appx c).

(4) Nameplates, caution plates, and instruction plates may rust quickly. When they are rusty, clean parts and coat them with CLP (item 8, appx C).

b. *Precautions.* The following precautions will help prevent personal injury or damage to equipment.

(1) Do not spill solvent, fuel, or lubricants on rubber parts. Solvent, fuel, and lubricants may damage rubber parts.

(2) Do not use turbine fuel, diesel fuel, gasoline, paint thinner, or benzene (benzol) for cleaning. These liquids may cause personal injury.

(3) Always wear protective clothing when using solvent. Solvent may dry skin.

CAUTION

Improper use of high pressure water hose or steam cleaner can damage seals and electrical components resulting in equipment failure. Use high pressure water only on suspension system.

(4) Do not clean inside hull with high pressure steam or air. Some parts inside hull may rust or be damaged.

(5) When washing outside of vehicle, close and lock all hatches. Cover periscope with plastic sheets. Remove covers after washing.

(6) Do not use polishing cloths, liquids, pastes, or other rough cleaners to clean instrument lenses or periscope lenses. Use lens paper to clean lenses. Take off fingerprints, oil, and dirt with lens cleaning compound and lens paper.

(7) If anything looks wrong and cannot be fixed, report it on DA Form 2404. If something looks dangerous or may cause equipment damage, report it to the maintenance supervisor right away.

c. *Services. Services* performed by the unit maintenance mechanic consist of the following tasks:

(1) *Adjusting.* Make all necessary adjustments and alinements.

(2) *Servicing.* This usually means draining and refilling units with oil and changing or cleaning oil filters, fuel filters, and air cleaners.

(3) *Tightening.* Tighten nuts, bolts, screws, and other types of fasteners with a torque wrench to the value listed in the maintenance manual. Do not over tighten; this may strip threads and break off the part being tightened.

(4) *Repairing.* Repair includes inspecting, cleaning, preserving, adjusting, replacing, welding, riveting, strengthening, and other tasks associated with putting parts in working condition.

(a) Inspect for burrs, cracks, gouges, or nicks.

(b) Replace bent, broken, or stripped bolts, nuts, screws, and washers. Bolts, screws, and nuts may be loose if rust, chipped paint, or bare metal is around them. Tighten loose screws, bolts, and nuts. Replace missing parts.

(c) Look for bad welds where chipped paint, rust, or gaps are present. Have bad welds repaired.

(d) Look at electric wires for cracked, frayed, loose, discolored, or broken insulation. Replace bad parts and tighten loose clamps and connectors.

NOTE

When tightening fittings, always hold fitting adapter with one wrench and tighten nut with another wrench until snug. Tighten nut around 1/6-turn to 1/3-turn. If fitting leaks, unscrew nut a full turn and retighten it. If still leaking, replace leaking parts.

(e) Look at hose, fluid lines, and tubes for bends, wear, cracks, or leaks. Replace bad parts. Make sure all clamps and fittings are tight. If a fitting leaks, tighten it.

CAUTION

Equipment operation is allowable with minor leakages (Class I or II). Of course, you must consider the fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor. When operating with Class I or Class II leaks, continue to check fluid levels as required in your PMCS. Class Ill leaks must be repaired.

NOTE

Fluid leaks affect vehicle status. Learn the following classes of fluid leaks for unit PMCS.

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

Class II- Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked.

Class Ill-Leakage of fluid great enough to form drops that fall from the item being checked. Class Ill leaks should be reported to your supervisor or direct support maintenance.

(5) *Corrosion.* Check for signs of deterioration, rust, unusual cracking, softening, swelling, or breaking on entire M578 Recovery Vehicle. Become familiar with the four stages of corrosion listed below, and take the appropriate required maintenance action outlined below.

Stage 1- Red, black, or white corrosion deposits on surface with etching or pitting. However, base metal is sound.

Stage 2- Powdered granular or scaled condition. Base metal is sound.

2-8. GENERAL PROCEDURES (CONT).

Stage *3*- Surface condition is similar to stage 2 except that metal in the corroded area is unsound and pin holes may be present.

Stage 4- No metal remaining at point of severest corrosion. Corrosion holes in the area or metal completely worn away.

Stage 1 & *2*- Areas are to be cleaned, primed, and painted IAW TB 43-0213.

Stage 3 & 4- Try to repair metal. If not economical or repairable, replace with new parts.

d. *Modification Work Order (MWO) Application.* Check the list of current MWOs in DA PAM 25-30. Do not make any modifications except as ordered by official Army directive.

2-9. SPECIAL PROCEDURES **FOR SEMIANNUAL (2400 KILOMETER) PREVENTIVE MAINTENANCE.** Semiannual preventive maintenance includes complete inspection to make sure adjustment, securing, and assembly of all parts of vehicle are right. All cleaning, replacement, lubrication, and protection of parts and/or assemblies must be done as stated for trouble-free operation until the next preventive maintenance is performed.

Maintenance Forms and Records. Refer to DA PAM 738-750.

b. *Publications.* Be sure all needed publications are on hand before starting task.

c. *Special Tools.* Be sure all special tools are on hand.

d. *Supplies.* Be sure all parts and supplies are on hand.

e. *Tools.* Be sure all common tools are on hand.

2-10. TOOLS AND SUPPLIES. The following list identifies common tools, special tools, and supplies needed to perform PMCS on the M578 Recovery Vehicle.

a. *Tools.*

Shop equipment automotive maintenance and repair: organizational maintenance, common no. 1 (less power) (item 80, appx B)
Sprocket wear gage (item 7, appx G)

b. *Supplies.*

Baking soda (item 7, appx C)
Cleaner, lubricant, and preservative (CLP) (item 8, appx C)
Cloth, crocus (item 10, appx C)
Dry cleaning solvent (SD2) (item 16, appx c)
Grease, automotive and artillery (GAA) (item 20, appx C)
Oil, lubricating (OE/HDO) (item 28, appx c)
Oil, lubricating (OEA) (item 29 appx c)
Paper, lens (item 30, appx C)
Rag, wiping (item 33, appx C)

c. *Mandatory Replacement Parts* The following table reflects the mandatory replacement parts that must be replaced during PMCS whether they have failed or not.

MANDATORY REPLACEMENT PARTS

Item No.	Part Number	National Stock Number	Nomenclature	Qty
			Semiannually	
1	5571024	5330-00-290-7860	Filter adapter nonmetallic washer	2
2	MS35802-3	2940-00-580-6283	Fluid pressure filter element	2
3	MS35338-46	5310-00-637-9541	Lockwasher	9
4	7374386	5330-00-599-2180	Preformed packing	1
5	10908813	5330-00-991-8401	Transmission oil filter element	2
6	5703114	2940-00-740-3108	(Part of fluid pressure parts kit)	1

d. Lubrication. The lubrication procedures identified in the PMCS table are for unit maintenance. Lubrication intervals (on-condition or hard time) are based on normal operation. Lubricate more often during constant use or in severe conditions.

(1) Use only authorized lubricants identified in the lubricant table.

(2) Hydraulic samples must be taken annually by all units. All samples are sent to Army Oil Analysis Program (AOAP) laboratory as prescribed by TB 43-0210 and DA PAM 738-750. No other systems are subject to AOAP.

(3) Dispose of used lubricants in accordance with local Standing Operating Procedures (SOP).

(4) For arctic operation, see FM 9-207.

(5) For desert operation, see FM 90-3.

(6) Clean all grease fittings before attaching grease gun.

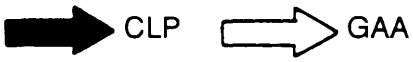
(7) When using grease gun, operate until grease appears around seals or out of relief valve and check escaping grease for contamination. If contamination is found, replace the grease.

NOTE

- If no other treatment is directed, coat unprotected metal surfaces with CLP (item 8, appx C) after cleaning.
- Clean around filler necks/drain plugs/openings before servicing to keep dirt from entering system.

(8) Perform a semiannual lubrication as soon as possible after water fording operation.

(9) Type of lubricants used at each point are identified by arrow as follows:



(10) Observe the following:

- Never use wrong type of grease.
- Never use too much lubrication.
- Always clean grease fittings before lubrication.
- Always use the Lubrication instructions.

2-10. TOOLS AND SUPPLIES (CONT).

WARNING

Dry cleaning solvent (item 16, appx C) is toxic and flammable. To avoid injury, wear protective goggles and gloves and use only in well-ventilated area. Avoid contact with skin or eyes and do not breathe vapors. Do not use near open fire or excessive heat. The flash point for Type I dry cleaning solvent is 100 °F (38 °C), and for Type II is 140 °F (60 °C). If you feel dizzy while using dry cleaning solvent, get fresh air immediately and get medical aid. If contact with eye is made, wash your eyes with water and get medical aid immediately.

(11) *Cleaning.* Use clean rag (item 33, appx C) and dry cleaning solvent (item 16, appx C) to clean grease or oil from all metal surfaces except those exposed to powder fouling. For powder fouled surfaces, use CLP (item 8, appx C).

LUBRICANT TABLE

LUBRICANT/COMPONENTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURE	INTERVALS
Oil, Lubricating, OE/HDO (item 28, appx C)	Engine Crankcase (Add 3 qt (2.8 1) for filters)	Refill 28 qt (26.5 l) Dry 38 qt (35.9 l)	Above 0 °F (Above -18 °C)	On Condition
Oil, Lubricating, OE/HDO (item 28, appx C)	Auxiliary Drive	Refill 4 qt (3.8 l) Dry 4.5 qt (4.2 l)	Above 0 °F (Above -18 °C)	Semiannually
Oil, Lubricating, OE/HDO (item 28, appx C)	Auxiliary Drive Clutch Housing	Refill 0.75 pt (0.35 l) Dry 0.875 pt (0.40 l)	Above 0 °F (Above -18 °C)	Semiannually/ Annually

LUBRICANT TABLE (CONT)

LUBRICANT/COMPONENTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURE	INTERVALS
Oil, Lubricating, OE/HDO (item 28, appx C)	Transmission	Refill 12 gal. (45.4 l) Dry 19 gal. (72 l)	Above 0°F (Above -18 °C)	On Condition
Oil, Lubricating, OE/HDO (item 28, appx C)	Final Drive (Left)	13 qt (12.35 l)	Above 0 °F (Above -18 °C)	Semiannually
Oil, Lubricating, OE/HDO (item 28, appx C)	Final Drive (Right)	7 qt (6.65 l)	Above 0 °F (Above -18 °C)	Semiannually
Oil, Lubricating, OEA (item 28, appx C)	Engine Crankcase (Add 3 qt (2.8 l) for filters)	Refill 28 qt (26.5 l) Dry 38 qt (35.9 l)	Below +40 °F (Below +4 °C)	On Condition
Oil, Lubricating, OEA (item 29, appx C)	Auxiliary Drive	Refill 4 qt (3.8 l) Dry 4.5 qt (4.2 l)	Below +40 °F (Below +4 °C)	Semiannually
Oil, Lubricating, OEA (item 29, appx C)	Auxiliary Drive Clutch Housing	Refill 0.75 pt (0.35 l) Dry 0.875 pt (0.40 l)	Below +40 °F (Below +4 °C)	Semiannually/ Annually
Oil, Lubricating, OEA (item 29, appx C)	Transmission	Refill 12 gal. (45.4 l) Dry 19 gal. (72 l)	0 °F to +40 °F (-18 °C to +4 °C)	On Condition

2-10. TOOLS AND SUPPLIES (CONT).

LUBRICANT TABLE (CONT)

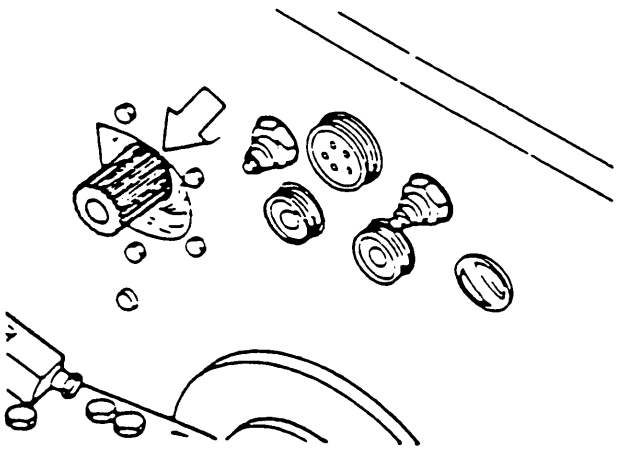
LUBRICANT/COMPONENTS		REFILL CAPACITY (APPROX)	EXPECTED TEMPERATURE	INTERVALS
Oil, Lubricating, OEA (item 29, appx C)	Final Drive (Left)	13 qt (12.35 l)	Below +40 °F (Below +4 °C)	Semiannually
Oil, Lubricating, OEA (item 29, appx C)	Final Drive (Right)	7 qt (6.65 l)	Below +40 °F (Below +4 °C)	Semiannually
Grease, Automotive and Artillery (GAA) (item 20, appx C)		NA	All Temperatures	Semiannually
Grease, Automotive and Artillery (GAA) (item 20, appx C)	Road Wheel Hub Bearing and Trailing Idler Wheel Hub Bearing	NA	0 °F to +44 °F (-18 °C to +4 °C)	Weekly/ Semiannually
Cleaner, Lubricant Preservative (item 8, appx C)	Oil Can Points	NA	0 °F to +4.4 °F (-18 °C to +4 °C)	Semiannually
Dry Cleaning Solvent (item 16, appx C)		NA	All Temperatures	Semiannually

FOR ARCTIC OPERATIONS, REFER TO FM 9-207

e. *Total Man-Hour Requirements.* Total man-hour requirements required to perform lubrication requirements:

Total Man-Hours	
Interval	**Man-Hours**
Semiannually	30
Annually	110
On Condition	25

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE

Item No.	Interval	Item To Check/ Service	Procedure	Not Fully Mission Capable If:
1	S	Brake Control Shaft	 a. Service at time of powerplant removal. b. Clean with CLP (item 8, appx C) and coat splines with grease (item 20, appx C).	

2-10. TOOLS AND SUPPLIES (CONT).

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

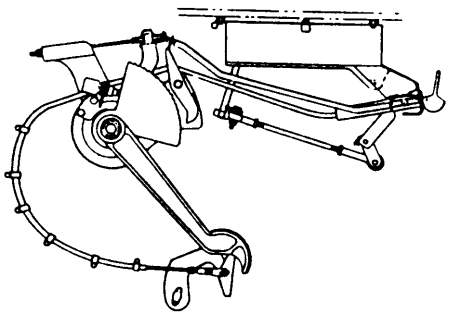
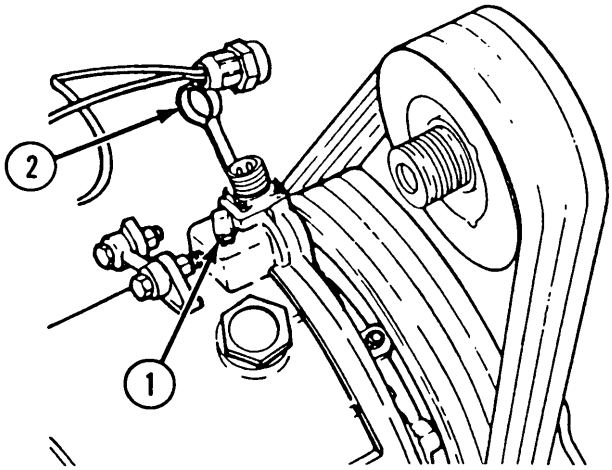
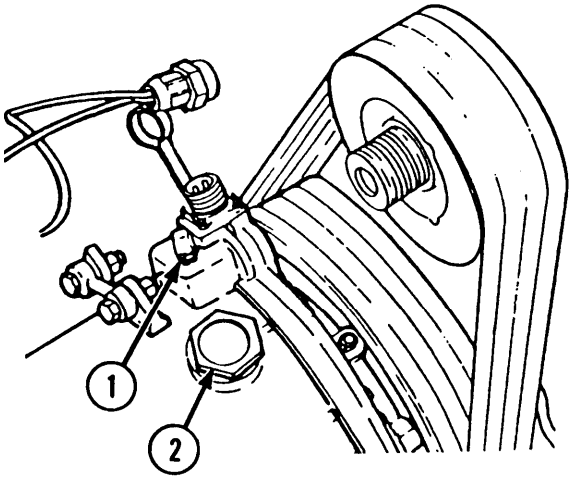
Item No.	Interval	Item To Check Service	Procedure	Not Fully Mission Capable If:
2	S	Parking Brake	 **WARNING** Brake pedal is spring-loaded. Before working in driver's compartment, block vehicle tracks and release parking brake. Coat ratchet teeth with grease (item 20, appx C) and lubricate controls with CLP (item 8, appx C).	
3	S	Auxiliary Drive Clutch Housing Breather, Oil Level, and Fill	 Clean breather and check oil level. a. Remove fan deck grille. **WARNING** Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated area.	

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

Item No.	Interval	Item To Check/ Service	Procedure	Not Fully Mission Capable If:
3 (cont)		Auxiliary Drive Clutch Housing Breather, Oil Level, and Fill (cont)	 b. Remove breather (1), clean with dry cleaning solvent (item 16, appx C), and install. c. Check that oil level is at FULL mark on gage (2). d. Remove fill plug (3) and fill with OE/HDO or OEA (item 28 or 29, appx C) as necessary. e. Clean fill plug (3) with dry cleaning solvent (item 16, appx C) and install.	
4	S	Fixed Fire Extinguisher System	**WARNING** High pressure CO_2 gas is used in this equipment. Keep face and body clear of release valves. Failure to observe safety precautions may result in injury or death. a Inspect fire extinguisher cylinder data plate to ensure that a hydrostatic test has been performed within the past 12 years. Faulty extinguishers or those beyond the test time limit (12 years) shall be declared unserviceable and replaced.	

2-10. TOOLS AND SUPPLIES (CONT).

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

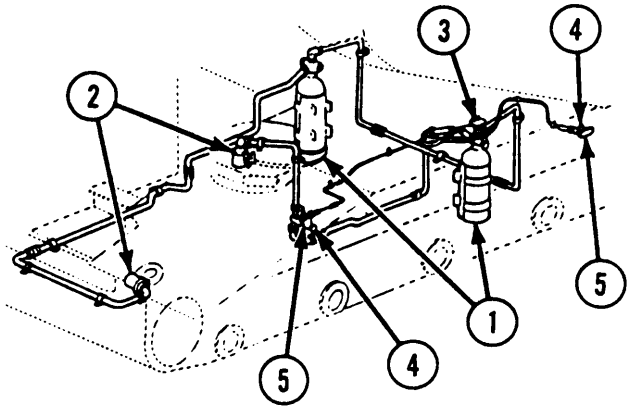
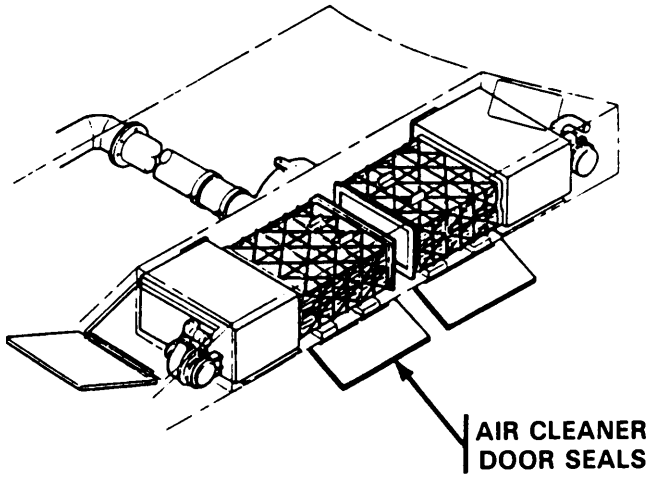
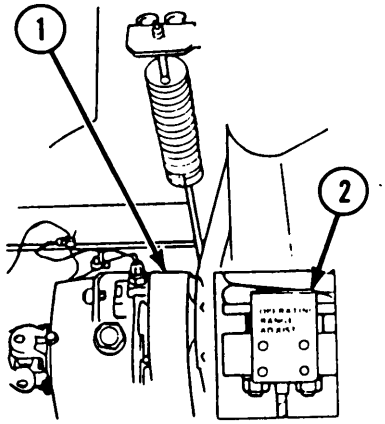
Item No.	Interval	Item To Check Service	Procedure	Not Fully Mission Capable If:
4 (cont)		Fixed Fire Extinguisher System (cont)		
			b. Remove CO_2 cylinders (1).	
			c. Weigh cylinders. Replace cylinders if they have lost more than 1 lb (0.45 kg) from their fully charged weight as recorded on inspection tag. If charged weight is within allowable limits, record date and weight on inspection tag.	Any cylinders have lost 1 lb (0.45 kg) or more of their weight or any missing cylinder.
			d. Clean and check discharge nozzles (2) and control valve (3).	
			e. Pull discharge handles (4) to ensure that cables and controls operate smoothly.	Cable damaged or inoperative.
			f. Install wire seals (5).	Lead seal not properly sealed.
			g. Install CO_2 cylinders (1).	
5	S	Fuel System	a. Check all fuel lines and tighten connections if loose or leaking, Replace damaged lines and fittings.	Any fuel leaks, loose lines or fittings. Any damaged lines.
			b. Replace elements in low-pressure **and** high-pressure fuel filters. Replace fuel filter for driver's personnel heater. Refer to page 2-1098. Replace fuel filter for coolant heater assembly. Refer to page 2-1056.	Any damaged or logged fuel filter.

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

Item No.	Interval	Item To Check/ Service	Procedure	Not Fully Mission Capable If:
6	S	Air Intake System		
			a. Check air cleaner door seals for damage. If seals are damaged, notify direct support maintenance.	Any door seals are damaged or missing.
			b. Check operation of forward and aft centrifugal fans. If not operating, troubleshoot air cleaner blower circuit. Refer to page 2-92.	Either fan is inoperative.
7	S	Cooling System		
			a. Inspect condition of fan belt (1). Replace fan belt if damaged. Refer to page 2-543.	Fan belt frayed, missing, or too tight.
			b. Check for proper fan belt tension (2). Adjust fan belt tension if indicator is at or near ADJUST mark. Refer to page 2-543.	Fan belt tension out of adjustment.

2-10. TOOLS AND SUPPLIES (CONT).

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

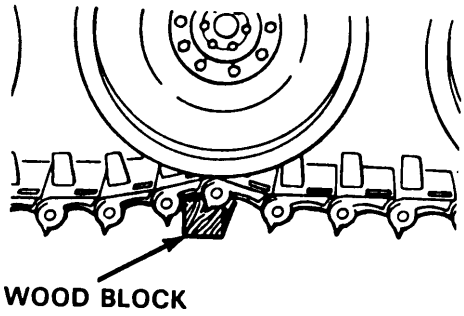
Item No.	Interval	Item To Check Service	Procedure	Not Fully Mission Capable If:
7 (cont)		Cooling System (cont)	c. Check and tighten hose clamps, lines, and fittings if loose or leaking. Replace damaged parts.	
			d. Check radiator and surge tank for leaks. Replace if damaged. Refer to pages 2-515 and 2-528.	Any coolant leaks.
			e. Check generator cooling fan for operation. If not operating, troubleshoot generator "cooling fan circuit. Refer to page 2-92.	Generator cooling fan inoperable.
			NOTE When antifreeze tests green, it should not be drained and replaced with new coolant. Add antifreeze extender to the cooling system, 1.0 pt (0.5 l) per 17.0 qt (16.1 l).	
			f. Test coolant for proper antifreeze protection. Refer to TB 750-651.	System is not protected to -20 °F (-7 °C), any coolant leaks, or alkalinity color is not proper.
8	S	Engine Oil Lines and Fittings	Check and tighten connections if loose or leaking, Replace damaged lines and fittings.	Any loose lines or connections. Frayed or broken lines.
9	S	Lockout Cylinders	 **NOTE** Some vehicles do not have lockout cylinders installed on middle road wheels.	

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH **LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)**

Item No.	Interval	Item To Check/ Service	Procedure	Not Fully Mission Capable If:
9 (cont)		Lockout Cylinders (cont)	Drive vehicle over 4 x 4 x 24-in. (10 x 10 x 61-cm) wood block with suspension locked. Lockout cylinder is damaged if roadwheel arm moves upward as roadwheel rides over block. Replace damaged lockout cylinders. Refer to page 2-883.	Class Ill leaks. Lockout cylinder is damaged or moves upward as wheel rides over block.
10	S	Wheels, Arms, and Hubs	Inspect for leaks or damage. Replace leaking seals or gaskets. Replace worn or damaged wheels. Refer to page 2-848. Tighten wheel attaching nuts (1) to 325 ft-lb (440 N-m) dry.	Class Ill leaks. Any loose attaching wheel nuts or damaged wheels.
11	S	Electrical Wiring	Inspect, tighten, or connect wiring terminals and connections. Tape cables or harnesses that are frayed or have broken insulation. Repair damaged connectors. Refer to page 2-373.	Any broken wiring terminals or frayed wires and broken connector.
12	S	Starting System	Start engine and listen for unusual noises, such as clicking or laboring. If unusual noises are heard, troubleshoot starter motor circuit. Refer to page 2-92.	Engine starter will not engage, any unusual noises.
13	S	Generator or Voltage Control System	Check generator voltage and amperage output. If generator warning light on instrument panel lights, troubleshoot generator charging circuit. Refer to page 2-92.	Generator voltage and amperage output exceeds limits, or generator warning light comes on.
14	S	Engine Oil Filter and Crankcase Drain	**WARNING** Oil will be hot after operation. **NOTE** • Drain only after operation. • Drain when notified by the Army Oil Analysis Program (AOAP) laboratory. • If AOAP laboratory support is not available, drain every 1500 mi (241 4 km), 150 hr, or semiannually, whichever occurs first.	

2-10. TOOLS AND SUPPLIES (CONT).

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

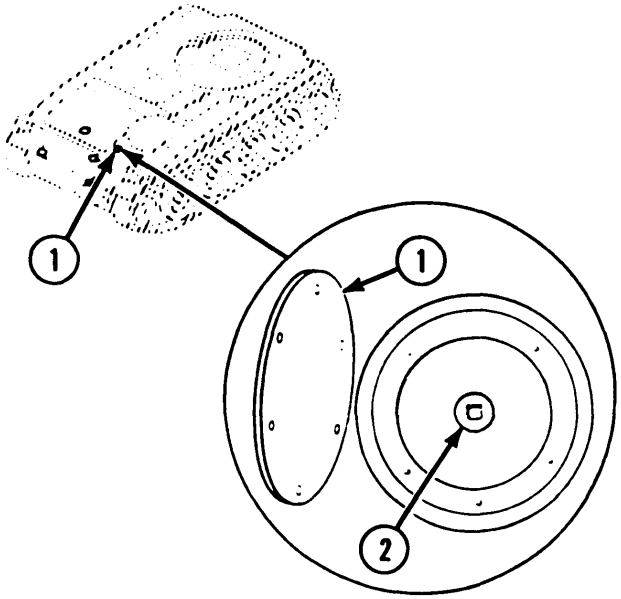
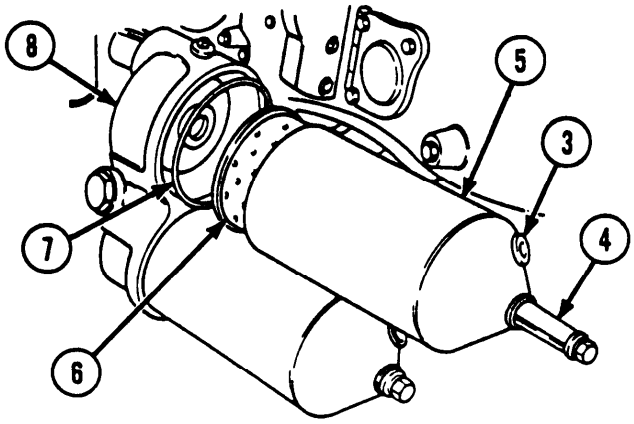
Item No.	Interval	Item To Check/ Service	Procedure	Not Fully Mission Capable if:
14 (cont)		Engine Oil Filter and Crankcase Drain (cont)	 a. Move vehicle to level ground. b. Remove crankcase drain cover (1) from bottom of hull and remove drain plug (2) from engine. c. Drain oil into a suitable container. **WARNING** Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated area. d. Clean crankcase drain plug (2) with dry cleaning solvent (item 16, appx C) and install drain plug and cover (1). e. Replace both engine oil fitter elements semiannually, every 1500 mi (2414 km), every 150 hr, or when engine oil is drained (TM 9-2815-202-24P). **NOTE** The following steps are written for one engine oil filter but apply to both.	Class III leaks

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

Item No.	Interval	Item To Check/ Service	Procedure	Not Fully Mission Capable If:
14 (cont)		Engine Oil Filter and Crankcase Drain (cont)	 (1) Remove oil filter drain plug (3) and drain oil into a suitable container. (2) Loosen shoulder bolt (4) and remove shell (5), filter element (6), and nonmetallic washer (7). (3) Discard filter element and nonmetallic washer. (4) Clean drain plug (3) and shell (5) with dry cleaning solvent (item 16, appx C). Dry thoroughly and install drain plug in shell. (5) Place new nonmetallic washer (7) in adapter (8) and press into place. (6) Place new filter element in shell (5) and install shell on adapter (8) with drain plug (3) down. (7) Refill engine crankcase. Refer to TM 9-2350-238-10. (8) Tighten shoulder bolt (4) securely and run engine for a few minutes. (9) Shut off engine and check oil level. Add oil as necessary.	Class II leaks.

2-10. TOOLS AND SUPPLIES (CONT).

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

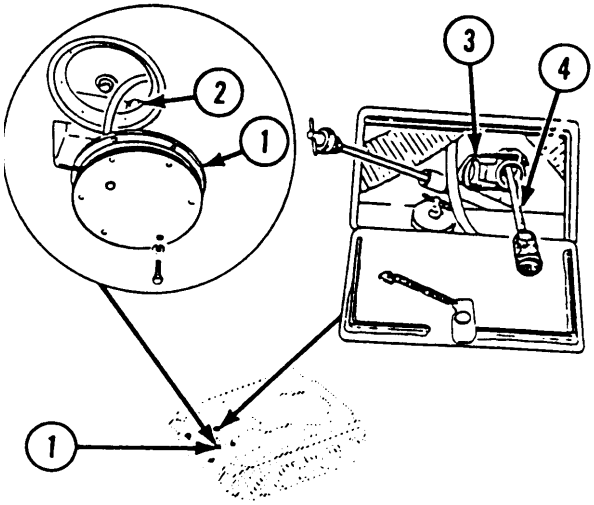
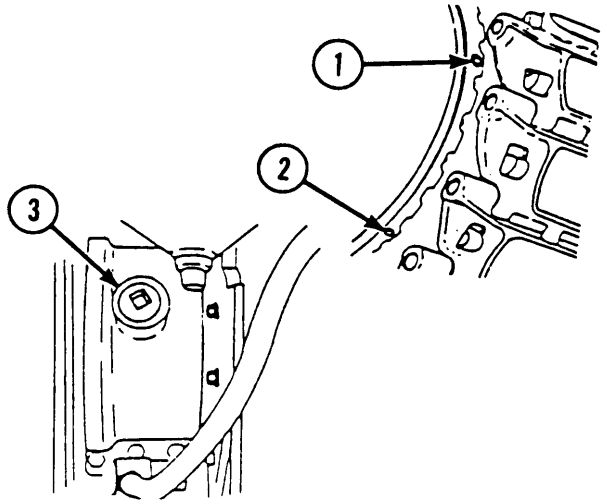
Item No.	Interval	Item To Check/ Service	Procedure	Not Fully Mission Capable If:
15	S	Auxiliary Drive Drain and Fill	 **WARNING** Oil will be hot after operation. **NOTE** Drain only after operation. a. Remove engine crankcase drain cover (1) from bottom of hull. b. Remove auxiliary drive drain cap (2) and drain oil into a suitable container. **WARNING** Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated area. c. Clean auxiliary drive drain cap (2) with dry cleaning solvent (item 16, appx C) and install engine crankcase drain cover (1). d. Open fill cap (3). Fill with OE/HDO or OEA (item 28 or 29, appx C) until oil level is within FULL and ADD marks on gage (4). e. Clean and close fill cap (3).	Class III leaks

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

Item No.	Interval	Item To Check/ Service	Procedure	Not Fully Mission Capable If:
16	S	Final Drive Drain and Fill	 **WARNING** Oil will be hot after operation. **NOTE** Drain only after operation. a. Remove level plug (1) and drain plug (2) and drain oil into a suitable container. **WARNING** Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated area. b. Clean drain plug with dry cleaning solvent (item 16, appx C) and install. c. Remove fill plug (3) in final drive saddle (left and right sides). d. Slowly add OE/HDO or OEA (item 28 or 29, appx C) through fill plug hole (3) until oil flows from level plug hole (1). e. Clean plugs (1) and (3) with dry cleaning solvent (item 16, appx C) and install. f. Repeat steps for other side.	Class Ill leaks

2-10. TOOLS AND SUPPLIES (CONT)

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

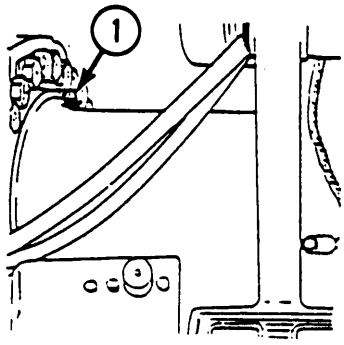
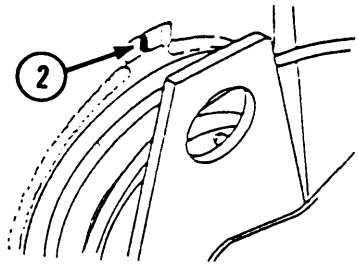
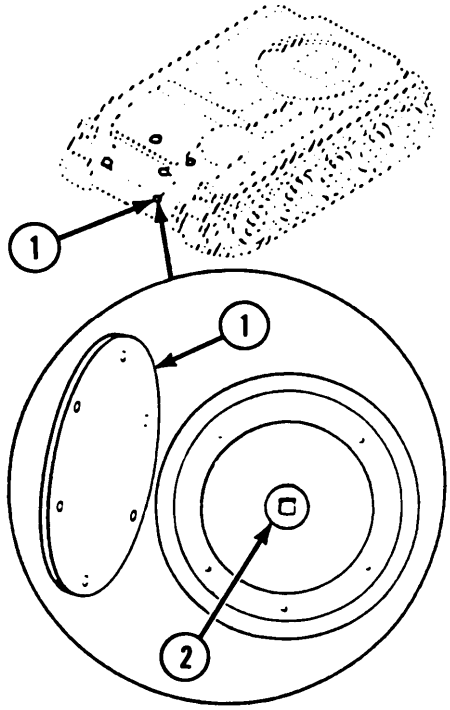
Item No.	Interval	Item To Check Service	Procedure	Not Fully Mission Capable if:
17	S	Final Drive Breathers	 LH FINAL DRIVE BREATHER  RH FINAL DRIVE BREATHER **WARNING** • Brake pedal is spring-loaded. Before working in driver's compartment, block vehicle tracks and release parking brake. • Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated area. **NOTE** Access to left-hand (LH) final drive breather (1) is through driver's compartment. Access to right-hand (RH) final drive breather (2) is through transmission deck. a. Remove breathers (1) and (2) and clean with dry cleaning solvent (item 16, appx C). b. Dip in OE/HDO or OEA (item 28 or 29, appx C) and install.	

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

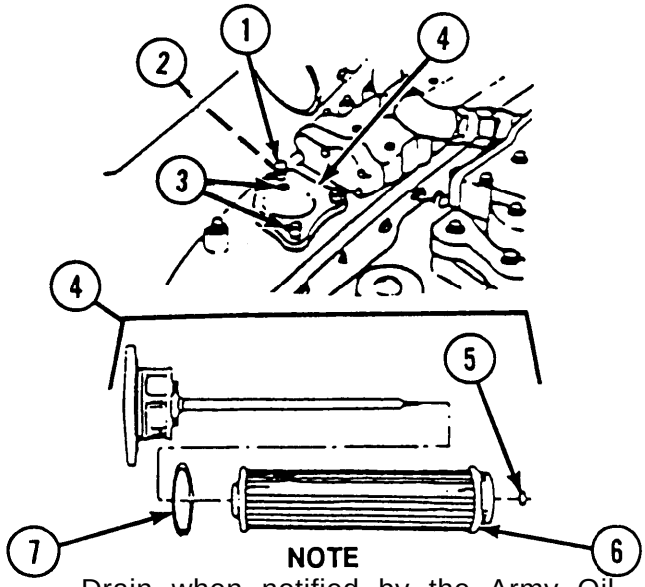
Item No.	Interval	Item To Check/ Service	Procedure	Not Fully Mission Capable If:
18	S	Transmission Drain and Fill	 **WARNING** Oil will be hot after operation. **NOTE** • Drain when notified by the Army Oil Analysis Program (AOAP) laboratory. • If AOAP laboratory support is not available, drain every 1500 mi (2414 km), 150 hr, or semiannually, whichever occurs first. If OEA is used, drain every 750 mi (1207 km), 75 hr, or semiannually, whichever occurs first. Drain only after operation. a. Move vehicle to level ground. b. Remove transmission drain access cover (1) from bottom of hull, remove transmission drain plug (2) from transmission, and drain oil into a suitable container.	Inoperable as received from AOAP.

2-10. TOOLS AND SUPPLIES (CONT).

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

Item No.	Interval	Item To Check/ Service	Procedure	Not Fully Mission Capable If:
18 (cont)		Transmission Drain and Fill (cont)	**WARNING** Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated area. c. Clean transmission drain plug (2) with dry cleaning solvent (item 16, appx C) and install drain plug and access cover (1). d. Replace transmission oil filter. **CAUTION** Do not check oil with engine running. Do not overfill. e. Add OEA (item 29, appx C) at transmission fill (3) until oil level is within OPERATING RANGE on gage (4). f. After filling, run engine at 1600 to 1900 rpm with brakes applied and transmission in fourth gear. Run until oil temperature gage reads 180 °F (82 °C). g. Run engine at 1200 to 1600 rpm for 1 to 3 minutes with transmission in neutral to stabilize oil temperature between 180 °F (82 °C) and 200 °F (93 °C). h. Stop engine and wait 3 to 5 minutes. Check that oil level is within OPERATING RANGE on gage (4). Do not add or drain oil if in this range. Add oil only when below ADD mark.	Class III leaks

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

Item No.	Interval	Item To Check/ Service	Procedure	Not Fully Mission Capable If:
19	S	Transmission Oil Filter		

NOTE

- Drain when notified by the Army Oil Analysis Program (AOAP) laboratory.
- If AOAP laboratory support is not available, drain every 1500 mi (2414 km), 150 hr, or semiannually, whichever occurs first. If OEA is used, drain every 750 mi (1207 km), 75 hr, or semiannually, whichever occurs first. Drain only after operation.
- Replace filter element every 1500 mi (2414 km), every 150 hr, or semiannually, whichever occurs first, and each time the transmission oil is drained.

a. Remove three screws (1) and three lockwashers (2).

b. Install two screws (1) in jack screw holes (3).

c. Tighten screws (1) until filter assembly (4) is loose and remove filter and screws (1).

d. Remove nut (5), element (6), and preformed packing (7). Discard element and preformed packing.

2-10. TOOLS AND SUPPLIES (CONT).

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

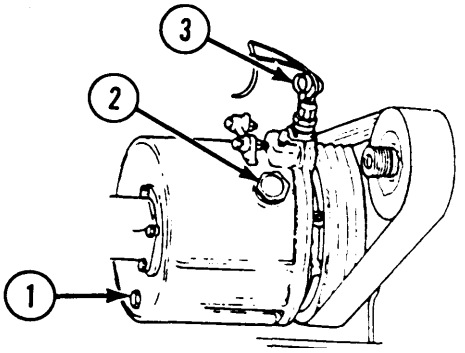
Item No.	Interval	Item To Check/ Service	Procedure	Not Fully Mission Capable If:
19 (cont)		Transmission Oil Filter (cont)	**WARNING** Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated area. e. Clean parts with dry cleaning solvent (item 16, appx C) and allow to dry thoroughly. f. Install new preformed packing (7), new element (6), and nut (5). g. Install filter assembly (4), using three new lockwashers (2) and three screws (1). h. Run engine and shift transmission several times to check for leaks.	
20	S	Transmission Breather	**WARNING** Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated area, Remove breather and clean with dry cleaning solvent (item 16, appx C). Dry, dip in oil, and install.	
21	S	Auxiliary Drive Clutch Housing Drain and Fill	 Drain oil from clutch housing. a. Remove drain plug (1) and drain into a suitable container.	Class Ill leaks or any missing plugs.

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

Item No.	Interval	Item To Check/ Service	Procedure	Not Fully Mission Capable If:
21 (cont)		Auxiliary Drive Clutch Housing Drain and Fill (cont)	**WARNING** Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated area. b. Clean drain plug (1) with dry cleaning solvent (item 16, appx C) and install. c. Remove fill plug (2) and add OE/HDO or OEA (item 28 or 29, appx C) to full mark on gage (3). d. Clean fill plug with dry cleaning solvent (item 16, appx C) and install.	
22	S	Battery Electrical System	**WARNING** • Do not smoke, have open flames, or make sparks around the batteries, especially if the caps are off. Batteries can explode and cause injury or death. • Remove all jewelry such as rings, dog tags, bracelets, etc. if jewelry or tools contact battery terminal, a direct short may occur resulting in instant heating, damage to equipment and injury to personnel. **NOTE** Refer to TM 9-6140-200-14 for more specific details on battery maintenance. a. Inspect battery box for corrosion and debris.	Corrosion has made holes in metal battery box.
			b. Clean slave receptacle and coat with corrosion preventive sealant (item 35, appx C).	Terminals corroded.
			c. Check and record specific gravity of each cell.	If cell is below 1.225 specific gravity.

2-10. TOOLS AND SUPPLIES (CONT).

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

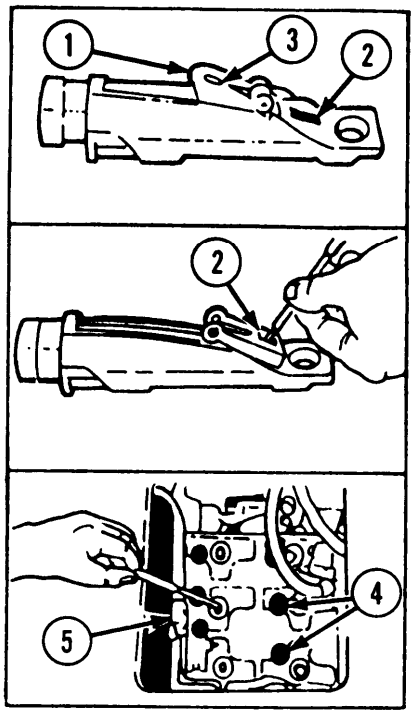
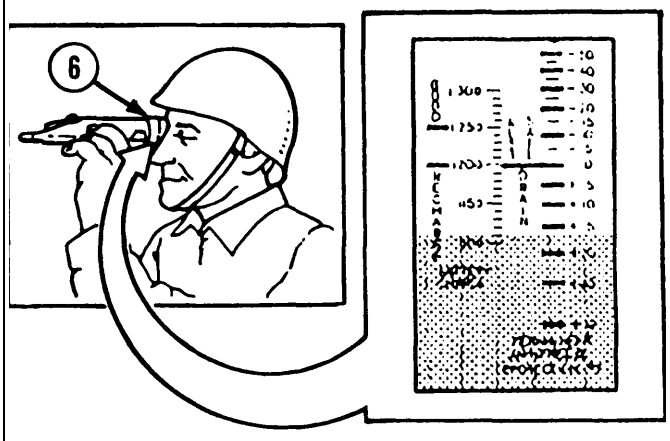
Item No.	Interval	Item To Check Service	Procedure	Not Fully Mission Capable If:
22 (cont)		Battery Electrical System (cont)	 (1) Swing plastic cover (1) back on duo-check coolant and battery to clean the measuring surface (2) and the bottom cover (3) with a clean soft cloth. Close cover plate. (2) Remove battery caps (4) from all cells. Repeat steps (3) through (5) for each cell. (3) Use dipstick (5) to obtain a small sample of battery acid. (4) Place a few drops of acid onto measuring surface (2) through opening in cover plate.	

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

Item No.	Interval	Item To Check/ Service	Procedure	Not Fully Mission Capable If:
22 (cont)		Battery Electrical System (cont)	 (5) Point the instrument toward any light source (headlight) and look into eyepiece (6). The battery charge is at a point on the left part of the scale where the dividing line between light and dark (shadow) crosses the scale. The illustration shows a reading of 1.120 specific gravity points, which indicates that the battery requires recharging. **NOTE** A little experience will enable you to quickly obtain the best contrast between light and dark portions of the field of view. Tilt the instrument toward the light source until the best results are obtained. If the edge of the shadow is not sharp, the measuring surface was not sufficiently cleaned or dried. d. Inspect battery cables for frays, splits, and looseness.	Cables frayed, split, or loose.

2-10. TOOLS AND SUPPLIES (CONT).

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

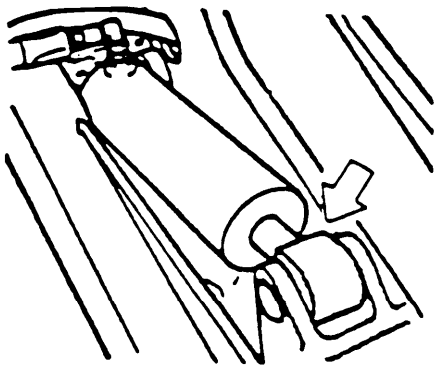
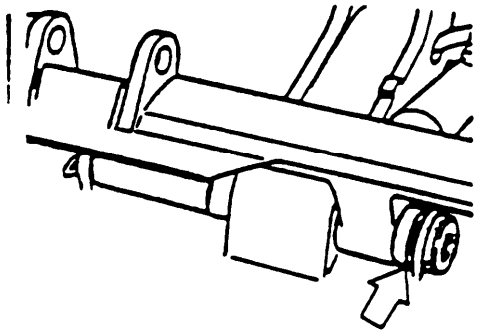
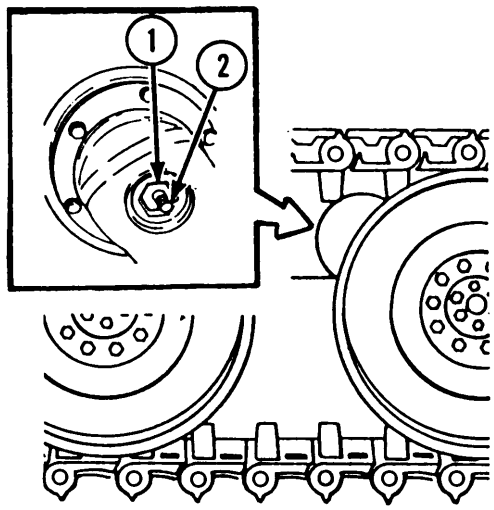
Item No.	Interval	Item To Check Service	Procedure	Not Fully Mission Capable If:
23	S	Spade Controls	**WARNING** Hydraulic system is under high pressure. Follow safety procedures to prevent injury. Wipe up any spilled hydraulic fluid. a. Start engine and operate hydraulic pumps to pressurize hydraulic system. b. Remove lock from spade cylinder and check operation for smoothness. If jerky or slow, notify direct support maintenance. c. Check all hydraulic components for leaks. Tighten all loose or leaking connections.	Spade locks missing, spade will not raise or lower, or jerky movement. Spade cylinder leaking. Any loose or leaking connection.
24	S	Spade Cylinder Hinge Pins	 **SPACE CYLINDER HINGE PINS** a. Remove pins. **WARNING** Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated area. b. Clean pins with dry cleaning solvent (item 16, appx C). c. Lubricate with grease (item 20, appx C) and install. d. Wipe off excess grease.	

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

Item No.	Interval	Item To Check/ Service	Procedure	Not Fully Mission Capable If:
25	S	Spade Moldboard Pins	 a. Remove pins. **WARNING** Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated area. b. Clean pins with dry cleaning solvent (item 16, appx C). c. Lubricate with grease (item 20, appx C) and install. d. Wipe off excess grease.	
			FINAL (SEMIANNUAL) ROAD TEST	
26	S	Steering Controls	Drive vehicle at 15 to 20 mph (24 to 32 km/h), holding steering crossbar horizontal. Vehicle should not wander or pull to either side. Turn steering crossbar full right, full left, then back to horizontal position. Steering response should be smooth and positive throughout entire range. Troubleshoot if required. Refer to page 2-43.	Vehicle pulls to one side, wanders, or does not respond when crossbar is in either direction.
27	S	Transmission and Shifting Controls	Drive vehicle, shifting through all forward and reverse ranges. Transmission should shift from one range to another without vibrating, jerking, or sticking. Troubleshoot if required. Refer to page 2-43.	No response from shifter controls in any range.

2-10. TOOLS AND SUPPLIES (CONT).

Table 2-2. PREVENTIVE MAINTENANCE CHECKS AND SERVICES WITH LUBRICATION INSTRUCTIONS FOR M578 RECOVERY VEHICLE (CONT)

Item No.	Interval	Item To Check/ Service	Procedure	Not Fully Mission Capable If:
28	S	Brakes	Drive vehicle at 15 to 20 mph (24 to 32 km/h), release accelerator pedal, and apply brakes. Vehicle should stop smoothly without pulling to either side. Stop vehicle on a steep downgrade of solid ground or pavement. Set parking brake and shift transmission to neutral. Brake must hold vehicle in place. Repeat with vehicle stopped on a steep upgrade. Troubleshoot if required. Refer to page 2-43.	Brake will not stop the vehicle, brake pedal goes to the floor. Brake will not hold vehicle.
29	S	Acceleration and Top Speed	**CAUTION** Do not allow engine to exceed 2450 rpm for more than 2 or 3 seconds. Allowing engine to exceed 2450 rpm for more than 2 or 3 seconds may damage engine. Accelerate with full throttle through all forward ranges to top speed (34.0 mph (54.7 km/h)). Engine governed speed under load should reach, but not exteed, 2450 rpm. Listen for unusual noises that could be from loose or damaged parts. If necessary, lighten or repair parts.	Vehicle will not accelerate to top speed (34 mph). Engine governed speed under load exceeds 2450 rpm. Any unusual noises.
30	A	Torsion Bar Plugs	 Check if torsion bar plugs (1) are fully seated and retaining screws (2) are in place. If necessary, tighten plugs and screws.	
31	A	Driver's and Crew Seats	Repair or replace torn or damaged seat cushion.	

Section IV. UNIT TROUBLESHOOTING

2-11. TROUBLESHOOTING INFORMATION.

a. The symptom index can be used as a quick guide to troubleshooting. Common malfunctions are listed in alphabetical order under each major assembly, which occur in MAC order, with a page number reference to the troubleshooting table where a test or inspection and corrective action are provided.

b. The unit troubleshooting table lists the malfunction, the test or inspection indicating the malfunction, and the necessary corrective action.

c. If the malfunction still exists after all listed unit maintenance corrective actions have been performed, notify direct support maintenance.

d. The electrical circuit troubleshooting table lists the procedures necessary to inspect/repair the applicable electrical circuits.

e. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

UNIT TROUBLESHOOTING INDEX

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Table 2-3. UNIT TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
ENGINE
1. ENGINE DOES NOT CRANK.
Step 1. BATTERY-GENERATOR indicator is in red. Electrical circuits are not operating.
a. Check batteries with tester. Charge batteries, refer to TM 9-6140-200-14; or replace batteries, refer to page 2-640.
b. Troubleshoot battery power circuit. Refer to Electrical Circuit Symptom Index, page 2-92.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
Step 2.	MASTER IND light is off. Electrical circuits are not operating. Troubleshoot master switch circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
Step 3.	MASTER IND light is on. Electrical circuits are not operating. **NOTE** Screws holding master relay on bulkhead also ground relay. a. Check master relay ground for bad connections. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections. b. Troubleshoot master relay circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
Step 4.	MASTER IND light is on. Vehicle lights are not operating and instruments are not operating. Troubleshoot instrument switch circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
Step 5.	Vehicle lights are operating. a. Check neutral position switch on transmission for proper adjustment. Adjust switch if required. Refer to page 2-562. b. Check starter lead for bad connections. Tighten connections. c. Troubleshoot starter circuits. Refer to Electrical Circuit Symptom Index, page 2-92.

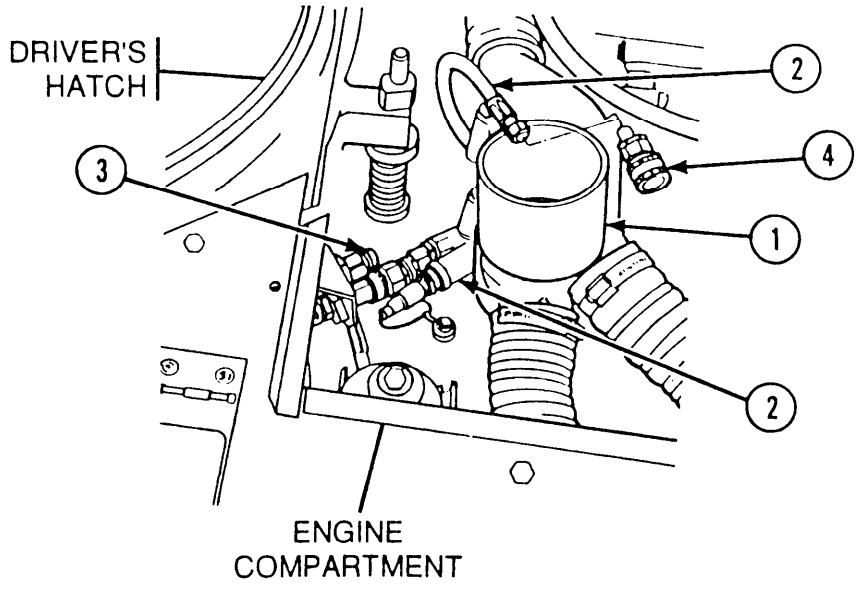
2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
2. ENGINE CRANKS SLOWLY AND LIGHTS DIM WHILE CRANKING.
Step 1. Check battery terminals and grounds for bad connections. Tighten connections.
Step 2. Check batteries with tester. Charge batteries, refer to TM 9-6140-200-14; or replace batteries, refer to page 2-640.
Step 3. Check BATTERY-GENERATOR indicator needle. If reading is in red (0- to 22-volt range), troubleshoot battery power circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
Step 4. Check starter leads for bad connections. Tighten connections.
Step 5. Troubleshoot starter circuits for bad wiring and/or damaged components. Refer to Electrical Circuit Symptom Index, page 2-92.
3. ENGINE CRANKS BUT DOES NOT START; AND ELECTRICAL CIRCUITS ARE OPERATING.
Step 1. Check fuel level indicator for fuel level. Fill fabric fuel cell. Refer to TM 9-2350-238-10.
Step 2. Check engine shutdown handle. Push engine shutdown handle against hull.
Step 3. Check fabric fuel cell drain plugs and fabric fuel cells for leaks. If leaks exist, notify direct support maintenance.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
Step 4.	Check fuel cap for open vent valve. If closed, set vent valve to OPEN.
Step 5.	Check fuel lines, quick-disconnects, and fittings for leaks. Tighten loose connections and fittings. Replace damaged parts. Refer to page 2-440, page 2-462, and page 2-466.
Step 6.	Check for plugged secondary fuel filter. If fuel filter is plugged, refer to page 2-475.
Step 7.	Check for plugged primary fuel filter. If fuel filter is plugged, refer to page 2-471.
Step 8.	Check for damaged engine fuel pump and plugged fue lines. Perform fuel flow test as follows:



a. Use 1-gal. (4-l) container (1) to catch fuel.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
3. ENGINE CRANKS BUT DOES NOT START; AND ELECTRICAL CIRCUITS ARE OPERATING (CONT).
b. Remove hull engine compartment deck assembly lid for access to engine. Refer to page 2-935. Disconnect fuel return line (2) at quick-disconnect (3). Remove quick-disconnect (check valve) (4) from fuel return line (2) in container (1).
c. Start engine and run for 1 minute at 650 rpm. Submerge fuel return line (2) in container (1). Check for air bubbles. If bubbles are present, check for air leaks in low pressure system. Stop engine.
NOTE Amount of fuel collected should be 0.5 to 0.8 gal. (1.9 to 3.0 l).
d. If fuel collected is less than 0.5 gal. (1.9 l), inspect engine fuel pump and check for plugged fuel lines. If fuel pump is damaged or fuel lines are plugged, refer to page 2-438 and page 2-440.
e. Connect quick-disconnect (check valve) (4) to fuel return line (2). Connect fuel return line (2) at quick-disconnect (3).
Step 9. Check for water in primary and secondary fuel filters. Drain water from fuel filters, refer to TM 9-2350-238-10. Replace dirty fuel filters, refer to page 2-471 and page 2-475.
Step 10. For cold weather starts, check purge and prime solenoid valve for operation. If valve does not click, replace valve. Refer to page 2-479.
Step 11. Check for damaged intake air cleaner and filter element. If damaged, repair as required. Refer to page 2-446.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
Step 12. Check air cleaner centrifugal fans (both forward and aft) for operation. a. If not operating, check air cleaner blower ground leads for bad connection. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections. b. If still not operating, troubleshoot air cleaner blower circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
Step 13. Check for plugged engine intake air duct. Clean, repair, or replace as required. Refer to page 2-457.
Step 14. Check for plugged or damaged intake air separators. Clean, repair, or replace as required. Refer to page 2-446.
Step 15. Check for plugged turbocharger air intake duct and screen. Clean, repair, or replace as required. Refer to page 2-459 or page 2-460.
Step 16. Check operation of air box heater by feeling air box heater on top of engine. a. If air box heater is not warm, troubleshoot air box heater. Refer to page 2-582. b. If air box heater is warm, notify direct support maintenance.
Step 17. Check turbocharger regulator for damaged bypass valve. If bypass valve is damaged, notify direct support maintenance.
Step 18. Check for faulty engine parts. If problem exists, notify direct support maintenance.
4. ENGINE DOES NOT DEVELOP FULL POWER, RUNS UNEVENLY, STALLS, OR LABORS.
Step 1. Check brakes for proper adjustment. Adjust as required. Refer to page 2-820.

2-110 TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
4. ENGINE DOES NOT DEVELOP FULL POWER, RUNS UNEVENLY, STALLS, OR LABORS (CONT). *Step 2.* Check throttle controls and linkage for proper adjustment. Adjust as required. Refer to page 2-496 and page 2-499. *Step* 3. Check fuel cap for open vent valve. If closed, set vent valve to OPEN. *Step 4.* Check for leakage from fuel lines, quick-disconnects, and fittings. Tighten loose disconnects and fittings. Replace damaged parts. Refer to page 2-440, page 2-462, and page 2-465. *Step 5.* Check for plugged secondary fuel filter or damaged gaskets. If plugged or damaged, refer to page 2-475. *Step 6.* Check for plugged primary fuel filter or damaged gaskets. If plugged or damaged, refer to page 2-471. *Step 7.* Check for plugged fuel lines. Clean or replace as required. Refer to page 2-440, page 2-462, and page 2-465. *Step 8.* Check for damaged intake air cleaner and filter element. If damaged, repair as required. Refer to page 2-446. *Step* 9. Check air cleaner centrifugal fans (both forward and aft) for operation. a. If not operating, check air cleaner blower ground leads for bad connection. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections. b. If still not operating, troubleshoot air cleaner blower circuit. Refer to Electrical Circuit Symptom Index, page 2-92.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
Step 10. Check for plugged engine intake air duct. Clean, repair, or replace as required. Refer to page 2-457.
Step *11.* Check for plugged or damaged intake air separators. Clean, repair, or replace as required. Refer to page 2-446.
Step 12. Check for plugged turbocharger air intake duct and screen. Clean, repair, or replace as required. Refer to page 2-459 or page 2-460.
Step *13.* If problem still exists, notify direct support maintenance.
5. ENGINE OVERHEATS.
Step 1. Check cooling system for leaks. Check drain cocks, hoses, tubes, manifolds, and fittings for loose connections and damage. Tighten connections or replace damaged parts as required. Refer to page 2-529.
Step 2. Check radiator exterior for air blockage. Clean radiators. Refer to page 2-515.
Step 3. Check fan power source (magnetic clutch sheave) for operation. If magnetic clutch sheave is not rotating when engine is running, notify direct support maintenance.
Step 4. Check fan belts and fan assembly for damage. Replace fan belts or fan assembly as required. Refer to page 2-543.
Step 5. Check fan belt tensioner for adjustment. Adjust tensioner as required. Refer to page 2-543.
Step 6. Check coolant (water) pump for leaks and noise. If problem exists, notify direct support maintenance.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
5. ENGINE OVERHEATS (CONT).
Step 7. Remove, inspect, and test thermostats. Refer to page 2-534. Replace thermostats as required. Refer to page 2-534.
Step 8. Check exterior of radiators for damage. Replace radiators as required. Refer to page 2-515.
Step 9. Flush cooling system. Refer to TM 750-254. Check for faulty engine coolant temperature indicator and transmitter. Troubleshoot engine coolant temperature indicator circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
Step 10. If problem still exists, notify direct support maintenance.
6. EXCESSIVE EXHAUST SMOKE (BLACK SMOKE) AFTER ENGINE WARMUP.
Step 1. Check for stuck or damaged exhaust valves. Replace stuck or damaged exhaust valves. Refer to page 2-514.
Step 2. Check for plugged engine intake air duct. Clean, repair, or replace as required. Refer to page 2-457.
Step 3. Check for plugged or damaged intake air separators. Clean, repair, or replace as required. Refer to page 2-446.
Step 4. Check for plugged turbocharger air intake duct and screen. Clean, repair, or replace as required. Refer to page 2-459 or page 2-460.
Step 5. Check for damaged intake air cleaner and filter element. If damaged, repair as required. Refer to page 2-446.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
Step 6. Check air cleaner centrifugal fans (both forward and aft) for operation. a. If not operating, check air cleaner blower ground leads for bad connection. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections. b. If still not operating, troubleshoot air cleaner blower circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
Step 7. If problem still exists, notify direct support maintenance.
7. EXCESSIVE EXHAUST SMOKE (WHITE SMOKE) AFTER ENGINE WARMUP.
Step 1. Check radiator for presence of oil and engine oil for presence of coolant. If problem exists, notify direct support maintenance.
Step 2. Check for plugged or damaged primary and secondary fuel filters. Drain water from fuel filters, refer to TM 9-2350-238-10. Replace dirty or damaged fuel filters, refer to page 2-471 and page 2-475.
Step 3. Drain and refill fabric fuel cell. Refer to TM 9-2350-238-10.
Step 4. If problem still exists, notify direct support maintenance.
8. ENGINE HAS LOW OIL PRESSURE.
Step 1. Check engine oil hoses and fittings for leaks. Tighten loose connections and replace hoses or fittings as required. Refer to page 2-418 and page 2-427.
Step 2. Check for plugged or damaged oil filter. Replace oil filter. Refer to page 2-418.
Step 3. Check for damaged oil gage or transmitter. Troubleshoot engine oil pressure indicator circuit; refer to Electrical Circuit Symptom-Index, page 2-92.
Step 4. If problem still exists, notify direct support maintenance.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
9. ENGINE HAS HIGH OIL PRESSURE.
Step 1. Check for plugged engine oil reservoir breather. Clean or replace breather as required. Refer to page 2-427.
Step 2. Check for bad oil gage or transmitter. Troubleshoot engine oil pressure indicator circuit. Refer to Electrical Circuit Troubleshooting Index, page 2-92.
Step 3. If problem still exists, notify direct support maintenance.
10. ENGINE CONSUMES TOO MUCH OIL.
Step 1. Check engine oil hoses and fittings for leaks. Tighten loose connections and replace hoses or fittings as required. Refer to page 2-418 and page 2-427.
Step 2. Check for plugged engine oil reservoir breather. Clean or repair breather as required. Refer to page 2-427.
Step 3. Check for oil leaks. Check for oil in engine coolant or for blue exhaust smoke after engine warmup. If oil leaks are found, notify direct support maintenance.
Step 4. If problem still exists, notify direct support maintenance.
11. ENGINE CONSUMES TOO MUCH FUEL.
Step 1. Check for leakage from fuel lines, quick-disconnects, and fittings. Tighten loose disconnects and fittings. Replace damaged parts. Refer to page 2-462 and page 2-465.
Step 2. Check for dirty intake air cleaner filter elements. Replace intake air cleaner filter element. Refer to page 2-446.

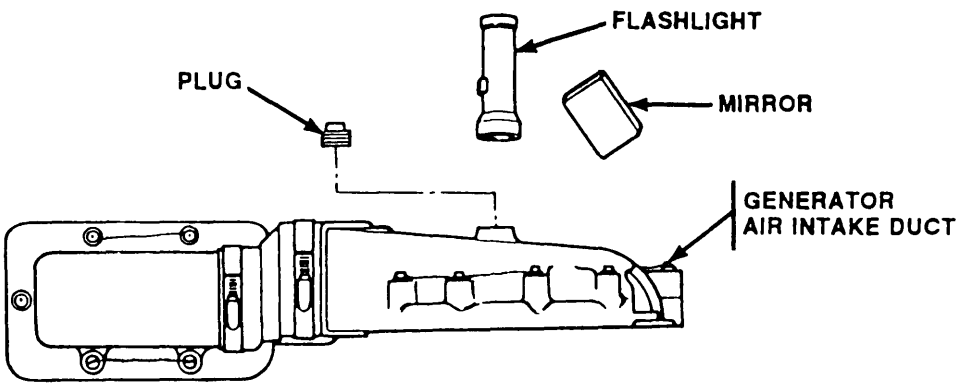
Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
Step 3. If problem still exists, notify direct support maintenance.
COOLING SYSTEM
12. RADIATOR COOLING VANEAXIAL FAN DOES NOT OPERATE.
Step 1. Check for broken cooling fan V-belt. If cooling fan V-belt is broken, go to step 2. If cooling fan V-belt is not broken, go to step 5.
Step 2. Check for damaged radiator cooling vaneaxial fan. If radiator cooling vaneaxial fan is damaged, notify direct support maintenance.
Step 3. Install and adjust new cooling fan V-belt. Refer to page 2-543.
Step 4. Check for damaged fan belt tensioner. Repair fan belt tensioner as required. Refer to page 2-543.
Step 5. Remove cooling fan V-belt. Start engine. Check for rotation of clutch fan sheave. Stop engine. If clutch fan sheave does not rotate, notify direct support maintenance.
GENERATOR
13. GENERATOR DOES NOT OPERATE.
Step 1. Check for faulty or damaged voltage regulator. Repair voltage regulator. Refer to page 2-557.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
13. GENERATOR DOES NOT OPERATE (CONT).
Step 2. Check for faulty or damaged generator.



Remove hull engine compartment deck assembly lid. Remove plug from generator air intake duct. Start engine. Using mirror and flashlight, look through air duct hole and check if generator is turning. Stop engine.

If generator turned, notify direct support maintenance.

Step 3. Install plug in generator air intake duct. Check for worn or damaged drive shaft or universal joints. Enter right hull tunnel and turn power takeoff to auxiliary drive shaft back and forth.

If play exists in drive line, repair worn or damaged universal joints. Refer to page 2-806.

Step 4. Check for damaged or faulty power source. Start engine. Check power takeoff to auxiliary drive shaft for rotation. Stop engine.

a. If power takeoff to auxiliary drive shaft rotated, remove auxiliary drive. Refer to page 2-766. Notify direct support maintenance.

b. If power takeoff to auxiliary drive shaft did not rotate, remove powerplant. Refer to page 2-384. Notify direct support maintenance.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
ELECTRICAL—BATTERY POWER
14. MASTER IND LIGHT IS ON AND ELECTRICAL CIRCUITS ARE NOT OPERATING. **NOTE** Screws holding master relay on bulkhead also ground relay. *Step 1.* Check master relay ground for bad connection. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections. *Step 2.* Troubleshoot master relay circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
15. ELECTRICAL CIRCUITS ARE NOT OPERATING OR BATTERY-GENERATOR INDICATOR IS IN RED (0-TO 22-VOLT RANGE). *Step 1.* If BATTERY-GENERATOR indicator light is in red, troubleshoot BATTERY-GENERATOR indicator circuit. Refer to Electrical Circuit Symptom Index, page 2-92. *Step 2.* Check batteries with tester. Charge batteries, refer to TM 9-6140-200-14; or replace batteries, refer to page 2-92. *Step 3.* Troubleshoot battery power circuit. Refer to Electrical Circuit Symptom Index, page 2-92. *Step 4.* Troubleshoot master switch circuit. Refer to Electrical Circuit Symptom Index, page 2-92.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
ELECTRICAL—GENERATOR
16. GENERATOR COOLING FAN DOES NOT OPERATE. **NOTE** To access generator ground lead 3, open fuel filter access door in driver's compartment. *Step 1.* Check generator ground lead 3 and generator cooling ground lead GND, on bulkhead near fan, for bad connections. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections. *Step* 2. Troubleshoot generator cooling fan circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
17. GEN WARNING LIGHT IS OFF WHILE STARTING ENGINE AND BATTERIES DO NOT CHARGE. **NOTE** To access generator ground lead 3, open fuel filter access door in driver's compartment. *Step 1.* Check generator ground lead 3 for bad connection. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections. *Step 2.* Troubleshoot generator output circuit; refer to Electrical Circuit Symptom Index, page 2-92.
18. GEN WARNING LIGHT IS ON WHILE ENGINE IS RUNNING, OR SYSTEM FAILS GENERATOR-REGULATOR CHARGING CIRCUIT TEST. **NOTE** To access generator ground lead 3, open fuel filter access door in driver's compartment.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
Step 1. Check generator ground lead 3 and voltage regulator ground strap for bad connections. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections.
Step 2. Remove aft air cleaner blower access cover for access. Refer to page 2-923. Check slave receptacle ground lead 50 for bad connection.
Step 3. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections. Perform generator-regulator charging circuit test. Refer to Electrical Circuit Symptom Index, page 2-92.
Step 4. Troubleshoot generator charging circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
19. BATTERY-GENERATOR INDICATOR IS IN RED AND GENERATOR IS OVERCHARGING. **NOTE** To access generator ground lead 3, open fuel filter access door in driver's compartment.
Step 1. Check generator ground lead 3 for bad connection. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections.
Step 2. Remove left CO_2 cylinder access cover for access to voltage regulator. Refer to page 2-557. Check voltage regulator ground strap for bad connection. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections.
Step 3. Replace voltage regulator. Refer to page 2-557.
Step 4. Perform generator-regulator charging circuit test. Refer to Electrical Circuit Symptom Index, page 2-92.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
ELECTRICAL—INDICATORS
20. BATTERY-GENERATOR INDICATOR NEEDLE DOES NOT MOVE, IS NOT STEADY, OR DOES NOT READ CORRECTLY.
Step 1. Check instrument panel ground strap for bad connection near FUEL LEVEL indicator.
Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections.
Step 2. Troubleshoot BATTERY-GENERATOR indicator circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
21. ENGINE OIL PRESS INDICATOR NEEDLE DOES NOT MOVE, IS NOT STEADY, OR DOES NOT READ CORRECTLY.
Troubleshoot engine oil pressure indicator circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
22. ENGINE WATER (COOLANT) TEMP INDICATOR NEEDLE DOES NOT MOVE, IS NOT STEADY, OR DOES NOT READ CORRECTLY.
Step 1. If needle does not move, open radiator filler cap and feel top of radiator for heat.
If radiator is cool, check thermostats. Refer to page 2-534.
Step 2. Troubleshoot engine coolant temperature indicator circuit. Refer to Electrical circuit Symptom Index, page 2-92.
23. XMSN OIL PRESS INDICATOR NEEDLE DOES NOT MOVE, IS NOT STEADY, OR DOES NOT READ CORRECTLY.
Troubleshoot transmission oil pressure indicator circuit. Refer to Electrical Circuit Symptom Index, page 2-92.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
24. XMSN OIL TEMP INDICATOR NEEDLE DOES NOT MOVE, IS NOT STEADY, OR DOES NOT READ CORRECTLY. Troubleshoot transmission oil temperature indicator circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
25. FUEL LEVEL INDICATOR NEEDLE DOES NOT MOVE, IS NOT STEADY, OR DOES NOT READ CORRECTLY. Troubleshoot fuel level indicator circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
26. SPEEDOMETER OR TACHOMETER NEEDLE DOES NOT MOVE, IS NOT STEADY, OR DOES NOT READ CORRECTLY. *Step 1.* Disconnect shaft assembly at speedometer or tachometer. Check shaft core for rotation with engine running. a. If core is rotating, replace speedometer or tachometer. Refer to page 2-1149. b. If core is not rotating, go to step 2 or 3. Connect shaft assembly to speedometer or tachometer. **NOTE** To gain access to shaft assemblies, remove hull engine compartment deck assembly lid, refer to page 2-935; and hull transmission compartment assembly access cover, refer to page 2-938. *Step 2.* Disconnect speedometer shaft assembly from adapter at transmission. Check rotation in adapter with engine running. a. If rotation exists in adapter, go to step 4. b. If no rotation exists in adapter, replace damaged parts. Refer to page 2-1149. Connect speedometer shaft assembly to adapter. *Step 3.* Disconnect tachometer shaft assembly from adapter at engine. Check rotation in adapter with engine running. If no rotation exists in adapter, notify direct support maintenance.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
26. SPEEDOMETER OR TACHOMETER NEEDLE DOES NOT MOVE, IS NOT STEADY, OR DOES NOT READ CORRECTLY (CONT).
Step 4. On engine side of driver's compartment bulkhead, disconnect speedometer shaft assembly or tachometer shaft assembly at adapter. Check shaft core rotation with engine running.
a. If core is rotating, go to step 5.
b. If core is not rotating, replace tachometer shaft assembly or speedometer shaft assembly between adapter and engine or transmission. Refer to page 2-1149. Connect speedometer shaft assembly or tachometer shaft assembly to adapter.
Step 5. On driver's side of driver's compartment bulkhead, disconnect speedometer shaft assembly or tachometer shaft assembly from adapter. Check rotation in adapter with engine running.
a. If rotation exists in adapter, replace speedometer shaft assembly or tachometer shaft assembly between adapter and speedometer or tachometer. Refer to page 2-1149.
b. If no rotation exists in adapter, replace adapter. Refer to page 2-1149. Connect speedometer shaft assembly or tachometer shaft assembly at adapter.
ELECTRICAL—WARNING LIGHTS AND HORN
27. MASTER IND WARNING LIGHT IS OFF AND ELECTRICAL CIRCUITS ARE OPERATING.
Step 1. Check ground lead at left headlight disconnect for bad connection.
Tighten loose connection.
Step 2. Troubleshoot master indicator warning light circuit. Refer to Electrical Circuit Symptom Index, page 2-92.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

28. SUSPENSION LOCKED WARNING LIGHT IS OFF AND SUSPENSION IS IN LOCKED POSITION.

Step 1. Check warning light ground lead for bad connection.

Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections.

Step 2. Troubleshoot SUSPENSION LOCKED warning light circuit. Refer to Electrical Circuit Symptom Index, page 2-92.

29. GEN WARNING LIGHT IS OFF WHILE STARTING ENGINE AND GENERATOR COOLING FAN OPERATES.

Troubleshoot generator warning light circuit. Refer to Electrical Circuit Symptom Index, page 2-92.

30. WARNING HORN SOUNDS CONTINUOUSLY WHEN ENGINE-XMSN TEMP-PRESS WARNING LIGHT IS OFF DURING NORMAL OPERATION.

Troubleshoot warning horn relay. Refer to Electrical Circuit Symptom Index, page 2-92.

31. WARNING HORN FAILS TO SOUND WHEN ENGINE-XMSN TEMP-PRESS WARNING LIGHT IS ON DURING NORMAL OPERATION.

WARNING

Brake foot pedal is spring-loaded. Block tracks and release parking brake before working on warning horn.

Step 1. Remove driver's seat. Refer to page 2-952. Check warning horn ground lead for bad connection.

Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections.

Step 2. Troubleshoot warning horn circuit. Refer to Electrical Circuit Symptom Index, page 2-92.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
32. WARNING HORN AND ENGINE-XMSN TEMP-PRESS WARNING LIGHT ARE OFF DURING STARTING OPERATION WHILE MASTER AND INST SWITCHES ARE ON. Troubleshoot warning switch circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
33. ENGINE-XMSN TEMP-PRESS WARNING LIGHT IS OFF WHEN HORN SOUNDS DURING NORMAL OPERATION. Troubleshoot ENGINE-XMSN TEMP-PRESS warning light circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
34. WARNING HORN AND ENGINE-XMSN TEMP-PRESS WARNING LIGHT ARE ON CONTINUOUSLY DURING NORMAL OPERATION. Troubleshoot warning horn and ENGINE-XMSN TEMP-PRESS warning light circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
ELECTRICAL—WARNING HORN AND AERATION DETECTOR
35. WARNING HORN SOUNDS AND AERATION DETECTOR WARNING LIGHT IS OFF WHILE ALL OTHER CIRCUITS OPERATE. *Step 1.* Fill radiators to capacity. *Step 2.* Troubleshoot aeration detector circuit. Refer to Electrical Circuit syrnptom Index, page 2-92.
ELECTRICAL—SERVICE HEADLAMP, TAILLIGHT, AND STOPLIGHT
36. TAILLIGHT AND BOTH SERVICE HEADLAMPS ARE OFF WHEN VEHICULAR LIGHT SWITCH IS TURNED TO SER DRIVE AND MASTER SWITCH IS ON. Troubleshoot service headlamp, taillight, and stoplight circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
37. BOTH HIGH BEAM SERVICE HEADLAMPS OPERATE WHILE BOTH LOW BEAM SERVICE HEADLAMPS ARE INOPERATIVE. Troubleshoot service headlamp circuit (low beam). Refer to Electrical Circuit Symptom Index, page 2-92.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
38. BOTH LOW BEAM SERVICE HEADLAMPS OPERATE WHILE BOTH HIGH BEAM SERVICE HEADLAMPS ARE INOPERATIVE. Troubleshoot service headlamp circuit (hi beam). Refer to Electrical Circuit Symptom Index, page 2-92.
39. EITHER LEFT OR RIGHT HIGH BEAM SERVICE HEADLAMP IS INOPERATIVE. Troubleshoot service headlamp circuit (lead 17). Refer to Electrical Circuit Symptom Index, page 2-92.
40. EITHER LEFT OR RIGHT LOW BEAM SERVICE HEADLAMP IS INOPERATIVE. Troubleshoot service headlamp circuit (lead 18). Refer to Electrical Circuit Symptom Index, page 2-92.
41. HI BEAM IND LIGHT IS INOPERATIVE, BUT BOTH HIGH BEAM SERVICE HEADLAMPS OPERATE NORMALLY. Troubleshoot HI BEAM IND light circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
42. STOPLIGHT IS OFF WHEN BRAKES ARE APPLIED. *Step 1.* Check adjustment of brake warning sensitive switch. Refer to page 2-626. *Step* 2. Troubleshoot left stoplight-taillight circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
ELECTRICAL—TRAILER RECEPTACLE
43. TRAILER RECEPTACLE DOES NOT PROVIDE POWER FOR AUXILIARY VEHICLE SERVICE LIGHTS, BUT STOPLIGHT-TAILLIGHT ASSEMBLIES OPERATE NORMALLY. Troubleshoot trailer receptacle circuit. Refer to Electrical Circuit Symptom Index, page 2-92.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
ELECTRICAL—BLACKOUT MARKER
44. HEADLAMP AND TAILLIGHT BUCKOUT MARKERS ARE OFF WHEN MASTER SWITCH IS ON AND VEHICULAR LIGHT SWITCH IS TURNED TO BO MARKER. Troubleshoot blackout marker circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
45. TAILLIGHT BLACKOUT MARKER IS OFF AND HEADLAMP BLACKOUT MARKER IS ON. Troubleshoot taillight blackout marker circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
46. HEADLAMP BLACKOUT MARKER IS OFF AND TAILLIGHT BLACKOUT MARKER IS ON. Troubleshoot headlamp blackout marker circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
47. BOTH BLACKOUT DRIVE HEADLAMPS ARE OFF WHEN MASTER SWITCH IS ON, VEHICULAR LIGHT SWITCH IS TURNED TO BO DRIVE, AND BO-IR SWITCH IS SET TO BO. Troubleshoot blackout drive headlamp circuit (vehicular light switch). Refer to Electrical Circuit Symptom Index, page 2-92.
48. EITHER LEFT OR RIGHT BLACKOUT DRIVE HEADLAMP IS INOPERATIVE. Troubleshoot blackout drive headlamp circuit (headlamp assembly). Refer to Electrical Circuit Symptom Index, page 2-92.
49. BLACKOUT STOPLIGHT IS OFF WHEN BRAKES ARE APPLIED. *Step 1.* Check adjustment of brake warning sensitive switch. Refer to page 2-626. *Step 2.* Troubleshoot blackout stoplight circuit. Refer to Electrical Circuit Symptom Index, page 2-92.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
50. TRAILER RECEPTACLE DOES NOT PROVIDE POWER FOR AUXILIARY VEHICLE BLACKOUT LIGHTS. Troubleshoot trailer receptacle blackout circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
51. HIGH BEAM AND LOW BEAM BLACKOUT (INFRARED) HEADLAMPS AND HI BEAM IND LIGHT ARE OFF WHEN MASTER SWITCH IS ON, VEHICULAR LIGHT SWITCH IS TURNED TO BO DRIVE, AND BO-IR SWITCH IS SET TO IR. Troubleshoot service blackout (infrared) headlamp circuit (BO-IR and vehicular light switches). Refer to Electrical Circuit Symptom Index, page 2-92.
52. BOTH HIGH BEAM SERVICE BLACKOUT (INFRARED) HEADLAMPS ARE OFF, OR BOTH LOW BEAM SERVICE BLACKOUT (INFRARED) HEADLAMPS ARE OFF. Troubleshoot service blackout (infrared) headlamp circuit (headlamp dimmer switch). Refer to Electrical Circuit Symptom Index, page 2-92.
53. EITHER LEFT OR RIGHT LOW BEAM SERVICE BLACKOUT (INFRARED) HEADLAMP IS OFF. Troubleshoot service blackout (infrared) headlamp circuit (lead 515). Refer to Electrical Circuit Symptom Index, page 2-92.
54. EITHER LEFT OR RIGHT HIGH BEAM SERVICE BLACKOUT (INFRARED) HEADLAMP IS OFF. Troubleshoot service blackout (infrared) headlamp circuit (lead 514). Refer to Electrical Circuit Symptom Index, page 2-92.
ELECTRICAL—LIGHTS
55. HI BEAM IND LIGHT IS OFF AND HIGH BEAM SERVICE BLACKOUT (INFRARED) HEADLAMPS ARE ON. Troubleshoot HI BEAM IND light (blackout) circuit. Refer to Electrical Circuit Symptom Index, page 2-92.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
56. INSTRUMENT (SWITCH) PANEL LIGHT IS OFF AND ALL OTHER LIGHTING SYSTEMS OPERATE NORMALLY. Troubleshoot instrument (switch) panel light circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
ELECTRICAL—DRIVER'S COMPARTMENT DOME LIGHT
57. BOTH RED AND WHITE LAMPS ARE NOT OPERATING NORMALLY, OR EITHER RED OR WHITE LAMP IS NOT OPERATING NORMALLY. Troubleshoot driver's compartment dome light circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
ELECTRICAL—UTILITY OUTLET
58. UTILITY OUTLET DOES NOT PROVIDE POWER FOR AUXILIARY EQUIPMENT. Troubleshoot utility outlet circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
ELECTRICAL—MAGNETIC CLUTCH AND BYPASS SOLENOID CIRCUIT
59. CLUTCH ENGAGED INDICATOR LIGHT IS OFF WHEN ENGINE SPEED IS 1350 RPM, VEHICLE HYDRAULIC SYSTEM IS OPERATING, AND MASTER AND HYD PUMP/PTO CLUTCH SWITCHES ARE ON. Troubleshoot magnetic clutch and bypass solenoid circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
ELECTRICAL—MAGNETIC CLUTCH AND BYPASS SOLENOID VALVE CIRCUIT
60. VEHICLE HYDRAULIC SYSTEM DOES NOT OPERATE, ENGINE SPEED WILL NOT HOLD AT 1350 RPM, AND CLUTCH ENGAGED INDICATOR LIGHT IS OFF WHILE MASTER AND HYD PUMP/PTO CLUTCH SWITCHES ARE ON. *Step 1.* Check magnetic clutch and bypass solenoid valve ground leads for bad connections. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
Step 2. Troubleshoot magnetic clutch and bypass solenoid valve circuit (HYD PUMP/PTO CLUTCH switch). Refer to Electrical Circuit Symptom Index, page 2-92.
61. HYDRAULIC SYSTEM DOES NOT OPERATE WHILE ENGINE IS RUNNING AT 1350 RPM, CLUTCH ENGAGED INDICATOR LIGHT IS ON, AND MASTER AND HYD PUMP/PTO CLUTCH SWITCHES ARE ON.
Step 1. Check magnetic clutch ground lead for bad connection. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections.
Step 2. Troubleshoot magnetic clutch and bypass solenoid valve circuit (magnetic clutch). Refer to Electrical Circuit Symptom Index, page 2-92.
62. ENGINE SPEED WILL NOT HOLD 1350 RPM WHILE HYDRAULIC SYSTEM IS OPERATING, CLUTCH ENGAGED INDICATOR LIGHT IS ON, AND MASTER AND HYD PUMP/PTO CLUTCH SWITCHES ARE ON.
Step 1. Check bypass solenoid valve ground lead for bad connection. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections.
Step 2. Troubleshoot magnetic clutch and bypass solenoid valve circuit (bypass solenoid valve). Refer to Electrical Circuit Symptom Index, page 2-92.
ELECTRICAL—RADIO
63. CONSTANT CLICKING SOUND WHEN ENGINE IS OPERATING FASTER THAN IDLING SPEED.
Step 1. Check voltage regulator ground strap for bad connection. Clean voltage regulator ground strap with crocus cloth (item 10, appx C). Tighten ground connection.
Step 2. If problem still exists, notify direct support maintenance.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
64. WHINING NOISE THAT CHANGES IN PITCH WITH ENGINE SPEED WHILE VEHICLE IS NOT MOVING.
Step 1. Check voltage regulator ground strap for bad connection.
Clean voltage regulator ground strap with crocus cloth (item 10, appx C). Tighten ground connection.
Step 2. If problem still exists, notify direct support maintenance.
65. CLICKING SOUND WHEN VEHICLE IS MOVING.
Inspect radio static suppression spring in each roadwheel hub cap for broken or missing helical springs.
Replace radio static suppression springs as required. Refer to page 2-842.
66. TOO MUCH RADIO INTERFERENCE WHEN ENGINE IS NOT OPERATING
Notify direct support maintenance.
ELECTRICAL—AIR BOX HEATER
67. AIR BOX HEATER PUMP MOTOR DOES NOT OPERATE WHEN MASTER SWITCH IS ON AND PUMP AND HEATER IGNITER SWITCH IS ON.
Troubleshoot air box heater circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
68. AIR BOX HEATER DOES NOT BECOME WARM.
Troubleshoot air box heater. Refer to Electrical Circuit Symptom Index, page 2-92.
TRANSMISSION
69. TRANSMISSION CONSUMES TOO MUCH OIL.
Step 1. Check all gaskets, joints, and plugs for signs of leakage.
Tighten all plugs and screws as required.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
Step 2. If problem still exists, notify direct support maintenance.
70. OIL PRESSURE IS TOO LOW.
Step 1. Check transmission oil level. Add or drain oil to proper level. Refer to the PMCS/lubrication table, page 2-13.
Step 2. Check all gaskets, joints, and plugs for signs of leakage. Tighten all plugs and screws as required.
Step 3. Check for damaged gage and sending unit. Troubleshoot transmission oil pressure indicator circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
Step 4. If problem still exists, notify direct support maintenance.
71. OIL PRESSURE IS TOO HIGH.
Step 7. Check for clogged oil lines. Clean or replace oil lines as required. Refer to page 2-418 and page 2-427.
Step 2. Check for damaged gage and sending unit. Troubleshoot transmission oil pressure indicator circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
Step 3. If problem still exists, notify direct support maintenance.
72. OIL TEMPERATURE IS TOO HIGH.
Step 1. Check transmission oil level. Add or drain oil to proper level. Refer to the PMCS/lubrication table, page 2-13.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
72. OIL TEMPERATURE IS TOO HIGH (CONT).
Step 2. Check for clogged oil lines. Clean or replace oil lines as required. Refer to page 2-418 and page 2-427.
Step 3. Check for dirty or clogged transmission oil screen. Clean transmission oil screen. Refer to page 2-758.
Step 4. Check for damaged gage and sending unit. Troubleshoot transmission oil temperature indicator circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
Step 5. If problem still exists, notify direct support maintenance.
73, VEHICLE DOES NOT STOP PROPERLY.
Step 1. Check for faulty brake adjustment. Adjust brakes. Refer to page 2-820.
Step 2. Check for damaged brake components. Repair or replace damaged brake controls and linkages. Refer to page 2-820.
Step 3. If problem still exists, notify direct support maintenance.
74. VEHICLE DOES NOT STEER PROPERLY.
Step 1. Check transmission oil level. Add or drain oil to proper level. Refer to the PMCS/lubrication table, page 2-13.
Step 2. Check for unequal track tension. Adjust track tension. Refer to TM 9-2350-238-10.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
Step 3. Check for damaged suspension components. a. Repair or replace damaged suspension components as required. Refer to page 2-887. b. Adjust, repair, or replace steering controls and linkage. Refer to page 2-878.
Step 4. If problem still exists, notify direct support maintenance.
75. VEHICLE DOES NOT SHIFT PROPERLY.
Step 1. Check transmission oil level. Add or drain oil to proper level. Refer to the PMCS/lubrication table, page 2-13.
Step 2. Check shift controls and linkage for damaged components. Adjust, repair, or replace shift controls and linkage as required. Refer to page 2-775.
Step 3. If problem still exists, notify direct support maintenance.
AUXILIARY DRIVE AND POWER TAKEOFF
76. VEHICULAR DRIVE DOES NOT OPERATE.
Step 1. Start engine. Set HYD PUMP/PTO CLUTCH switch ON. Check radiator cooling vaneaxial fan and vehicular drive drive shaft for rotation. Set HYD PUMP/PTO CLUTCH switch OFF. Stop engine. a. If radiator cooling vaneaxial fan rotated and vehicular drive did not, repair HYD PUMP/PTO CLUTCH switch. Refer to page 2-566. b. If radiator cooling vaneaxial fan did not rotate, troubleshoot GENERATOR, steps 3 and *4.* Refer to page 2-60.
Step 2. Remove auxiliary drive. Refer to page 2-766. Check for damaged drive shaft between auxiliary drive and vehicular drive. If drive shaft is damaged, notify direct support maintenance.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

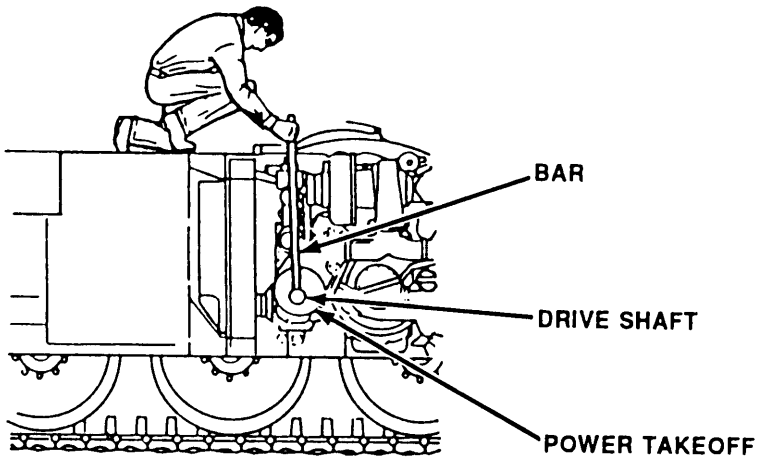
MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
77. AUXILIARY DRIVE OR POWER TAKEOFF MAKES TOO MUCH NOISE.
Step 1. Check auxiliary drive oil level. Add oil to FULL mark on gage. Refer to the PMCS/lubrication table, page 2-13.
Step 2. Check for worn or damaged universal joints in drive shaft. Enter right hull tunnel and turn power takeoff to auxiliary drive shaft back and forth. If any play is in drive line, replace auxiliary drive shaft. Refer to page 2-766.

Step 3. Isolate noise in auxiliary drive or power takeoff. Remove exhaust pipes. Refer to page 2-514. Disconnect drive shaft at power takeoff. Pull drive shaft coupling from power takeoff and lower drive shaft to hull bottom. Install exhaust pipes. Start engine. Listen for noise. Stop engine. a. If noise was not present, replace auxiliary drive, refer to page 2-766; or notify direct support maintenance for repair. b. If noise was present, notify direct support maintenance.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
IMPACT WRENCH
78. IMPACT WRENCH DOES NOT OPERATE.
Step 1. Check for open impact wrench manual shut-off valve. If open, close impact wrench manual shut-off valve.
Step 2. Check for damaged or faulty impact wrench manual shut-off valve. Replace impact wrench manual shut-off valve. Refer to page 2-771.
TRACKS AND SUSPENSION
79. VEHICLE DOES NOT STEER PROPERLY OR PULLS TO ONE SIDE.
NOTE Avoid driving on a crowned road. Drive close to center of road if possible.
Step 1. Check for unequal track tension. Adjust track tension as required. Refer to TM 9-2350-238-10.
Step 2. Check for worn drive hub sprocket teeth. Replace or repair parts as required. Refer to page 2-869.
Step 3. Check for damaged final drive. Disconnect track, transmission, and final drive. Turn drive hub sprocket. If drive hub sprocket is difficult to turn, inspect final drive. Refer to page 2-869.
Step 4. Check brake adjustment. Adjust brakes. Refer to page 2-820.
Step 5. If problem still exists, notify direct support maintenance.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
80. VEHICLE THROWS TRACK OR TRACK JUMPS SPROCKET TEETH.
Step 1. Inspect drive hub sprocket teeth.
a. Adjust tension. Refer to TM 9-2350-238-10.
b. Replace worn or damaged parts. Refer to page 2-869.
Step 2. Check that vehicle is being operated properly. Refer to TM 9-2350-238-10 and FM 21-17.
81. TRACKS REQUIRE REPEATED ADJUSTMENT.
Step 1. Check for proper adjustment of tracks.
Eccentric spindle nuts must be torqued to 575 to 600 ft-lb (780 to 814 N-m). Refer to TM9-2350-238-10.
Step 2. Inspect tracks, drive hub sprockets, and idler wheel arm and hub.
Replace worn or damaged parts as required. Refer to page 2-873, page 2-869, and page 2-855.
82. VEHICLE LEANS TO ONE SIDE OR VEHICLE PITCHES.
Check for broken torsion bar. Refer to TM 9-2350-238-10.
Replace broken torsion bars. Refer to page 2-834.
83. TRACK CENTER GUIDES RIDE ON TOP OF ROADWHEEL.
Step 1. Check track tension.
Adjust track tension. Refer to TM 9-2350-238-10.
Step 2. Check for bent roadwheels and arms.
Replace roadwheels and arms as required. Refer to page 2-848 and page 2-836.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
84. LOCKOUT CYLINDERS DO NOT LOCK WHEN SUSP LOCKED/UNLOCKED VALVE IS TURNED TO LOCKED.
Step 1. Check lockout cylinder lines and fittings for leaks.
a. Tighten loose plugs and fittings.
b. Replace worn or damaged parts as required. Refer to page 2-894 and page 2-905.
Step 2. Check for damaged lockout cylinder.
Replace as required. Refer to page 2-883.
Step 3. Check for air in lockout system. Cycle SUSP LOCKED/UNLOCKED valve several times to force out air.
If problem still exists, bleed suspension hydraulic system. Refer to TM 9-2350-238-10.
Step 4. Check for worn or damaged pressure reducer and relief valve assembly.
Replace reducer and/or relief valve assembly as required. Refer to page 2-887.
Step 5. Check for restriction in hydraulic line or SUSP LOCKED/UNLOCKED valve.
Remove restriction or replace hydraulic line or SUSP LOCKED/ UNLOCKED valve. Refer to page 2-894, page 2-905, and page 2-887.
Step 6. Check for low hydraulic pressure in lockout cylinder. Refer to page 2-883.
If hydraulic pressure is low, notify direct support maintenance.
85. LOCKOUT CYLINDERS DO NOT RELEASE WHEN SUSP LOCKED/UNLOCKED VALVE IS TURNED TO UNLOCKED.
Step 1. Check for damaged lockout cylinder.
Replace lockout cylinder as required. Refer to page 2-883.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
85. LOCKOUT CYLINDERS DO NOT RELEASE WHEN SUSP LOCKED/UNLOCKED VALVE IS TURNED TO UNLOCKED (CONT).
Step 2. Check hydraulic return lines and SUSP LOCKED/UNLOCKED valve for damage.
Replace damaged hydraulic line. Refer to page 2-894 and page 2-905. Replace damaged SUSP LOCKED/UNLOCKED valve. Refer to page 2-887.
DRIVER'S CONTROLS AND LINKAGES
66. VEHICLE DOES NOT STEER PROPERLY.
Step 1. Check adjustment of steering control rod.
Adjust steering control rod. Refer to page 2-878.
Step 2. Check for damaged steering control rods.
Repair or replace bent or damaged steering control rods. Refer to page 2-878.
Step 3. If problem still exists, notify direct support maintenance.
67. VEHICLE DOES NOT SHIFT PROPERLY.
Step 1. Check adjustment of shifting control.
Adjust shifting control linkage. Refer to page 2-775.
Step 2. Check for damaged shifting control linkage components.
Repair or replace bent or damaged shifting control linkage. Refer to page 2-775.
Step 3. If problem still exists, notify direct support maintenance.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
88. VEHICLE DOES NOT STOP PROPERLY.
Step 1. Check brake linkage adjustment. Adjust brake linkage. Refer to page 2-820.
Step 2. If problem still exists, notify direct support maintenance.
89. PARKING BRAKE DOES NOT HOLD.
Step 1. Check adjustment of parking brake. Adjust parking brake linkage. Refer to page 2-814.
Step 2. If problem still exists, notify direct support maintenance.
90. HAND THROTTLE DOES NOT MAINTAIN CONSTANT SPEED.
Step 1. Check throttle adjustment. Adjust throttle linkage. Refer to page 2-496.
Step 2. If problem still exists, notify direct support maintenance.
91. ENGINE DOES NOT REACT PROPERLY TO ACCELERATOR PEDAL OR HAND THROTTLE.
Step 1. Check accelerator and hand throttle adjustment. Adjust accelerator and hand throttle linkages. Refer to page 2-496.
Step 2. If problem still exists, notify direct support maintenance.
92. ENGINE DOES NOT SHUT DOWN.
Step 1. Check engine shutdown adjustment. Adjust or tighten engine shutdown linkage. Refer to page 2-499.
Step 2. If problem still exists, notify direct support maintenance.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
HYDRAULIC SUSPENSION LOCKOUT CYLINDER ASSEMBLY
93. HYDRAULIC SUSPENSION LOCKOUT CYLINDER ASSEMBLY DOES NOT ACTUATE.
Step 1. Check for low hydraulic pressure near pump and slip ring using pressure gage. Start engine and set HYD PUMP/PTO CLUTCH switch ON. a. If pressure gage indicates about 450 psi, go to step 7. b. If pressure gage indicates less than 450 psi, go to step 2. Set HYD PUMP/PTO CLUTCH switch OFF. Stop engine. Remove pressure gage.
Step 2. Check for open impact wrench manual shut-off valve. If open, close impact wrench manual shut-off valve.
Step 3. Check for damaged or faulty impact wrench manual shut-off valve. Replace impact wrench manual shut-off valve. Refer to page 2-781.
Step 4. Check for damaged or faulty impact wrench control check valve. Replace impact wrench control check valve. Refer to page 2-781.
Step 5. Check for damaged or faulty hull hydraulic relief valve. Replace hull hydraulic relief valve. Refer to page 2-797.
Step 6. If problem still exists, notify direct support maintenance.
Step 7. Install pressure gage to lockout cylinder manifold test port. Start engine and set HYD PUMP/PTO CLUTCH switch ON. If pressure gage indicates a minimum of 450 psi, replace lockout pressure reducing valve. Refer to page 2-887. Set HYD PUMP/PTO CLUTCH switch OFF. Stop engine. Remove pressure gage.
Step 8. Check for damaged or faulty lockout cylinder check valve. Replace lockout cylinder check valve. Refer to page 2-887.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
94. HYDRAULIC SUSPENSION LOCKOUT CYLINDER ASSEMBLY DOES NOT LOCK.
Step 1. Check for leaks and damaged or clogged tubes, hoses, and fittings.
a. Tighten loose connections.
b. Replace leaking or damaged components. Refer to page 2-894 and page 2-905.
Step 2. If problem still exists, notify direct support maintenance.
95. HYDRAULIC SUSPENSION LOCKOUT CYLINDER ASSEMBLY DOES NOT UNLOCK.
Step 1. Check for damaged or faulty lockout cylinder manifold check valve.
Replace lockout cylinder manifold check valve. Refer to page 2-887.
Step 2. If problem still exists, notify direct support maintenance.
HYDRAULIC SYSTEM
96. HYDRAULIC SYSTEM PRESSURE TOO LOW.
Step 1. Check HYD PUMP/PTO CLUTCH switch.
Set HYD PUMP/PTO CLUTCH switch ON with engine at idle speed.
Step 2. Check hydraulic system pressure valve.
Close valve if open.
Step 3. Check hydraulic fluid level.
Fill hydraulic system with proper fluid. Refer to TM 9-2350-238-20-2.
Step 4. Check for any hydraulic leaks.
Repair hydraulic leaks. Refer to page 2-781, page 2-797, and page 2-790.
Step 5. If problem still exists, notify direct support maintenance.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
SPADE
97. SPADE DOES NOT RAISE OR LOWER.
Step 1. Start engine. Check that spade cylinder locks are unlocked. Set HYD PUMP/PTO CLUTCH switch to ON. Open spade hydraulic system shutoff valve.
Step 2. Remove rear hydraulic access cover for access to spade hydraulic components. Refer to page 2-979. Check for leaks and damaged or clogged hoses and fittings. a. Tighten loose connections. b. Replace all leaking or damaged components. Refer to page 2-979.
Step 3. Check for damaged or faulty pressure reducer or hull hydraulic relief valve. Replace pressure reducer or hull hydraulic relief valve. Refer to page 2-979.
Step 4. Check for damaged or faulty spade control valve. Replace spade control valve. Refer to page 2-979.
Step 5. Check for damaged or faulty spade relief valve. Replace spade relief valve. Refer to page 2-979.
Step 6. Check hydraulic cylinder assembly for leaks. If leaks exist, replace hydraulic cylinder assembly. Refer to page 2-967.
Step 7. If problem still exists, notify direct support maintenance.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
98. SPADE RAISES OR LOWERS UNEVENLY.
Step 1. Check for damaged or faulty pressure reducer or hull hydraulic relief valve. Replace pressure reducer or hull hydraulic relief valve. Refer to page 2-979.
Step 2. Check hydraulic cylinder assembly for leaks. If leaks exist, replace hydraulic cylinder assembly. Refer to page 2-967.
Step 3. If problem still exists, notify direct support maintenance.
HEATER INSTALLATION KIT
99. FUEL FILTER HEATERS DO NOT HEAT.
Step 1. Check fuel filter heater ground leads for bad connection. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections.
Step 2. Troubleshoot fuel filter heater circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
100. AIR INTAKE FAN AND SOLENOID DO NOT OPERATE.
Step 1. Check ground leads on fan and solenoid for bad connections. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections.
Step 2. Troubleshoot air intake fan and solenoid circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
101. COOLANT HEATER CONTROL BOX LIGHT DOES NOT OPERATE WHEN PRESS-TESTED.
Step 1. Check coolant heater ground lead for bad connection. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
Step 2. Troubleshoot coolant heater control box light circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
Step 3. Troubleshoot coolant heater circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
102. DRIVER'S HEATER CONTROL BOX LIGHT DOES NOT OPERATE WHEN PRESS-TESTED.
Troubleshoot driver's heater control box light circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
103. DRIVER'S HEATER FUEL PUMP DOES NOT OPERATE AND DRIVER'S HEATER CONTROL BOX LIGHT IS ON.
Troubleshoot driver's heater fuel pump circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
104. DRIVER'S HEATER DOES NOT OPERATE AND DRIVER'S HEATER CONTROL BOX LIGHT IS ON.
Step 1. Check driver's heater ground for bad connection.
Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections.
Step 2. Troubleshoot driver's heater circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
105. PYROMETER INDICATES NO TEMPERATURE GAIN AND AIR BOX HEATER OPERATES NORMALLY.
Troubleshoot pyrometer circuit. Refer to Electrical Circuit Symptom Index, page 2-92.

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
DRIVER'S WINDSHIELD ENCLOSURE KIT
106. WINDSHIELD WIPER MOTOR DOES NOT OPERATE WHEN MASTER SWITCH AND WINDSHIELD WIPER SWITCH ARE ON. *Step 1.* Check windshield wiper motor ground lead for bad connection. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections. *Step 2.* Troubleshoot windshield wiper circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
107. WINDSHIELD DEFROSTER DOES NOT OPERATE WHEN MASTER SWITCH AND WINDSHIELD DEFROSTER SWITCH ARE ON. *Step 1.* Check windshield defroster ground lead for bad connection. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connections. *Step 2.* Troubleshoot windshield defroster circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
OIL RESERVOIR HEATER KIT
108. OIL RESERVOIR HEATER DOES NOT OPERATE. **NOTE** Remove 24-volt power source from slave receptacle after problem has been solved. Connect 24-volt power source to slave receptacle near oil reservoir heater exhaust. Troubleshoot oil reservoir heater circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
PERSONNEL VEHICULAR HEATER ASSEMBLY
109. PERSONNEL HEATER CONTROL BOX LIGHT DOES NOT OPERATE WHEN PRESS-TESTED. Troubleshoot personnel heater control box light circuit. Refer to Electrical Circuit Symptom Index, page 2-92.

2-11. TROUBLESHOOTING INFORMATION (CONT).

Table 2-3. UNIT TROUBLESHOOTING (CONT)

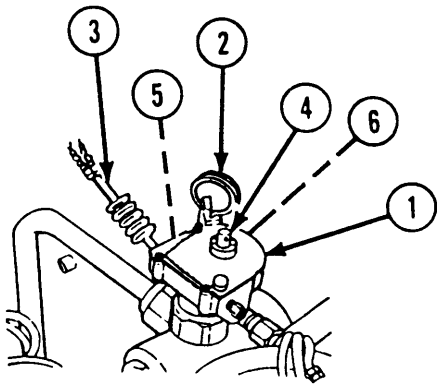
MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
110. PERSONNEL HEATER DOES NOT OPERATE AND PERSONNEL HEATER CONTROL BOX LIGHT IS ON.
Step 1. Check fabric fuel cell fuel level. Fill fabric fuel cell. Refer to TM 9-2350-238-10.
Step 2. Check personnel heater ground lead for bad connection. Clean ground connections with crocus cloth (item 10, appx C). Tighten ground connection.
Step 3. Troubleshoot personnel heater circuit. Refer to Electrical Circuit Symptom Index, page 2-92.
FIXED FIRE EXTINGUISHER
111. SYSTEM DOES NOT DISCHARGE.
Step 1. Check weight of fire extinguisher. If needed, charge fire extinguisher, Refer to page 2-13.
Step 2. Check CO_2 cylinder control valve. 

Table 2-3. UNIT TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION	
	a. Remove left and right $C0_2$ access covers. Refer to page 2-923.
	b. Hold CO_2 cylinder control valve (1) and remove safety pin (2).
	c. Pull release harness (3). Check for internal binding. If binding, replace CO_2 cylinder control valve. Refer to page 2-1155. Firing pin (4) should extend about 5/32 in. (4 mm). If not, notify direct support maintenance.
	d. Reset CO_2 cylinder control valve (1) by rotating control handle (5) in direction of reset arrow on cover (6). Rotate control handle (5) until safety pin hole alines with safety pin hole in cylinder control valve (1). Install safety pin (2).
112. DRIVER'S AIR PURIFIER UNIT DOES NOT OPERATE.	
Step 1.	Check motor ground lead for bad connection. Clean ground connections with crocus cloth (item 10, a.ppx C). Tighten ground connections.
Step 2.	Troubleshoot driver's air purifier circuit. Refer to Electrical Circuit Symptom Index, page 2-92.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING.

a. Before performing any electrical circuit troubleshooting, refer to page 2-43 and ensure that all mechanical troubleshooting procedures have been performed.

b. The electrical circuit troubleshooting table lists the procedures necessary to inspect/repair applicable electrical circuits.

c. If you have a problem with an electrical circuit which is not covered in the steps below, notify your supevisor.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

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Driver’s heater control box light circuit	2-332
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ELECTRICAL CIRCUIT SYMPTOM INDEX (CONT)

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Windshield defroster circuit	2-349
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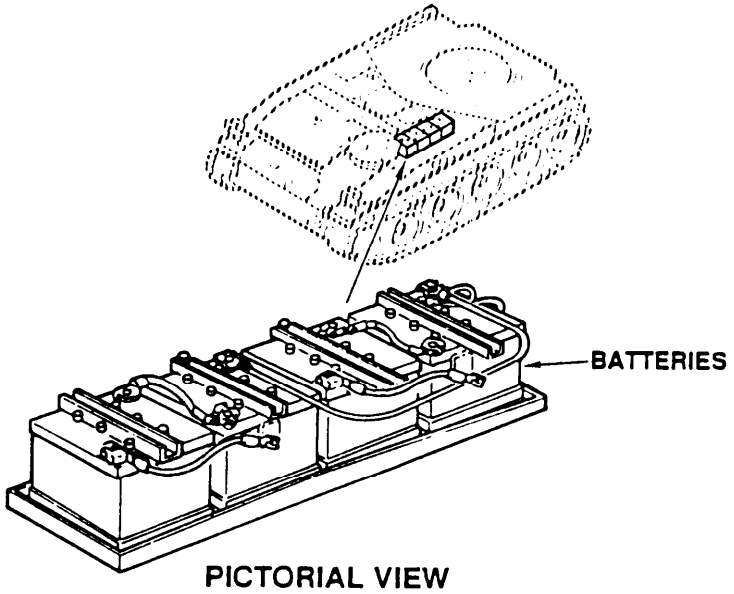
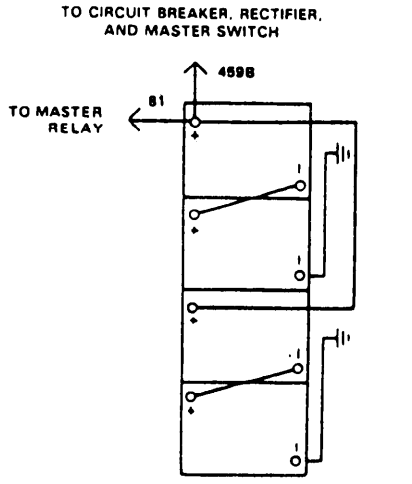
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

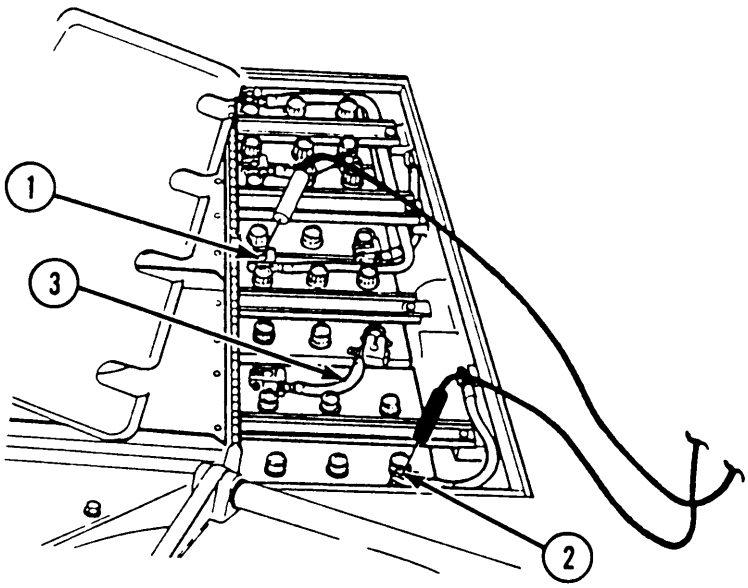
A. BATTERY POWER CIRCUIT.



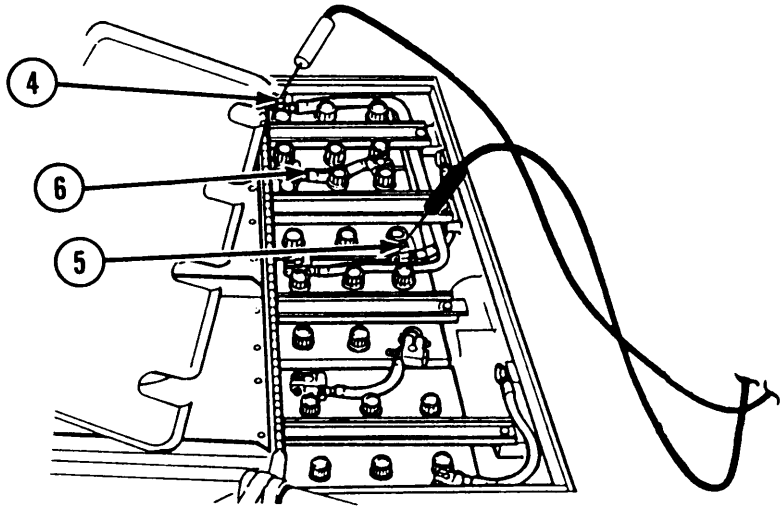
PICTORIAL VIEW



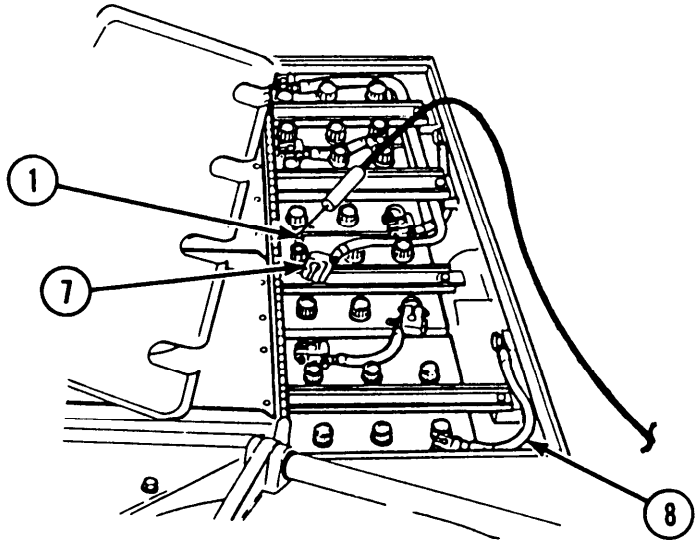
ELECTRICAL DIAGRAM



Step 1. To access batteries, open battery compartment access door and protection cover. Place red probe on battery post (1). Place black probe on battery post (2). If multimeter indicates less than about 24 volts, replace cable (3). Refer to page 2-640. If multimeter indicates about 24 volts, go to step 2.

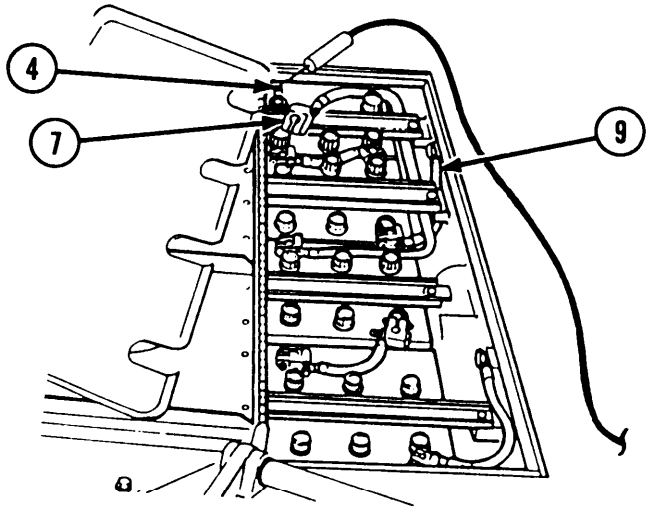


Step 2. Place red probe on battery post *(4).* Place black probe on battery post (5). If multimeter indicates less than about 24 volts, replace cable (6). Refer to page 2-640. If multimeter indicates about 24 volts, go to step 3.

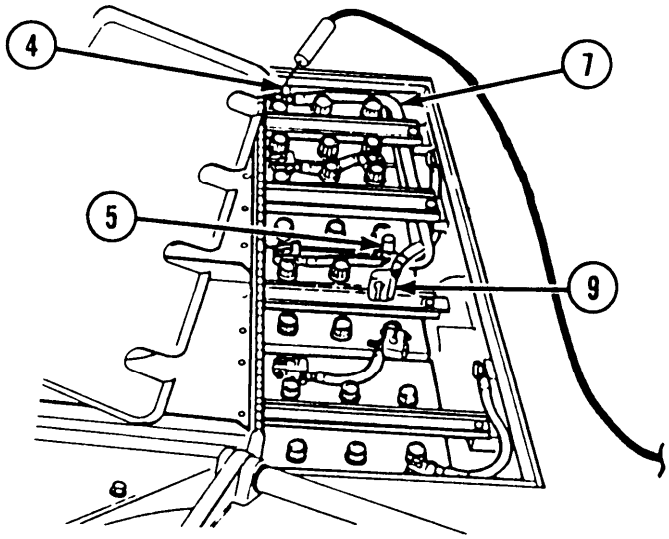


Step 3. Disconnect cable (7) from battery post (1). Place red probe on battery post (1). Ground black probe. If multimeter indicates less than about 24 volts, replace cable (8). Refer to page 2-640. If multimeter indicates about 24 volts, go to step 4. Connect cable (7) to battery post (1).

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

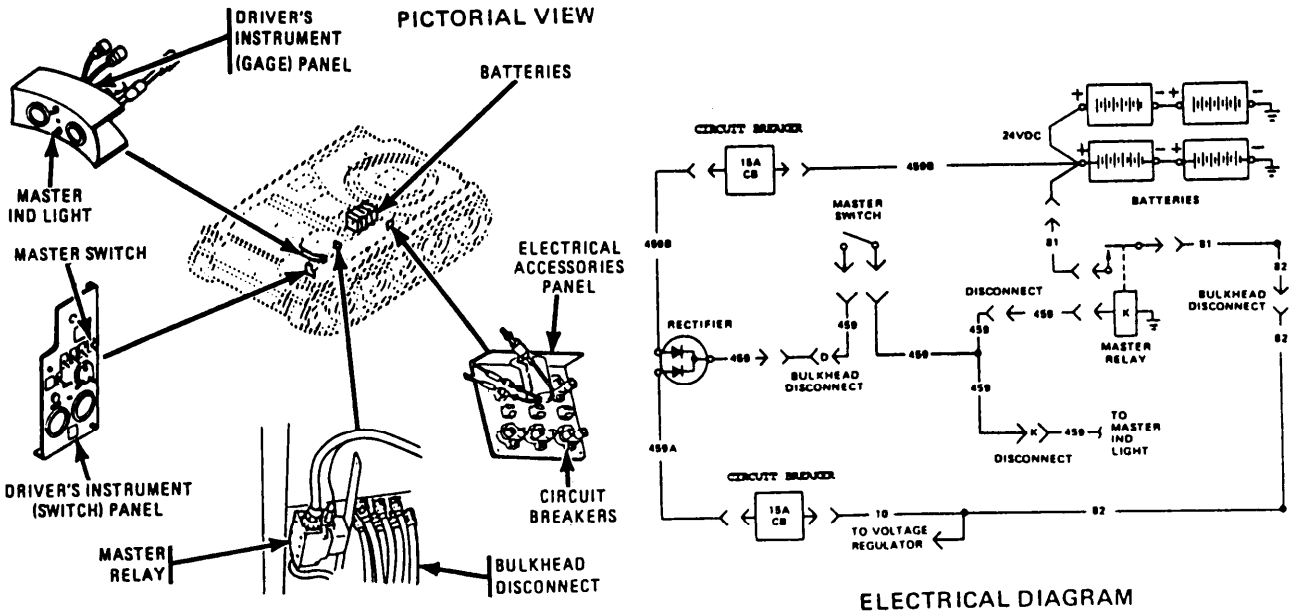


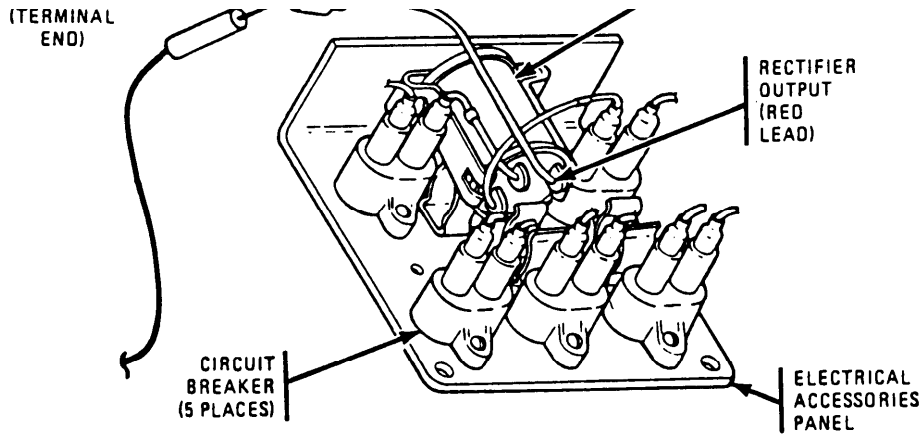
Step 4. Disconnect cable (7) from battery post (4). Place red probe on battery post (4). Ground black probe. If multimeter indicates less than about 24 volts, replace cable (9). Refer to page 2-640. If multimeter indicates about 24 volts, go to step 5. Connect cable (7) to battery post (4).



Step 5. Disconnect cable (9) from battery post (5). Place red probe on battery post (4). Ground black probe. If multimeter indicates less than about 24 volts, replace cable (7). Refer to page 2-640. If multimeter indicates about 24 volts and problem still exists, troubleshoot master switch circuit. Refer to page 2-97. Connect cable (9) to battery post (5).

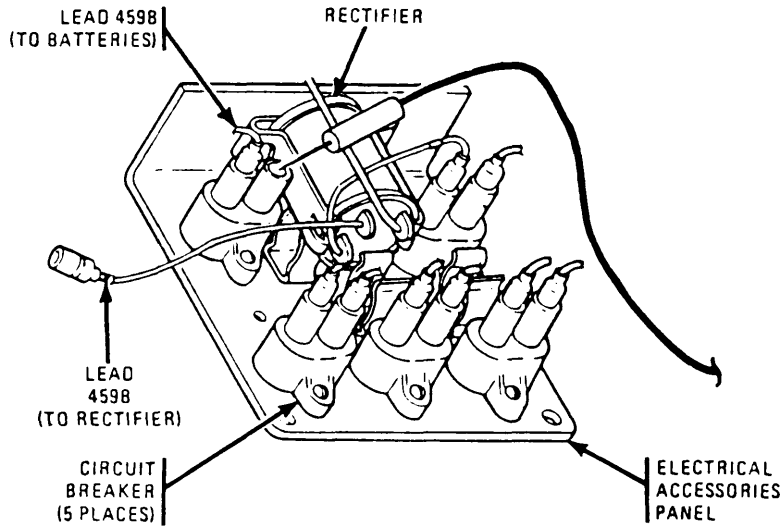
B. MASTER SWITCH CIRCUIT.



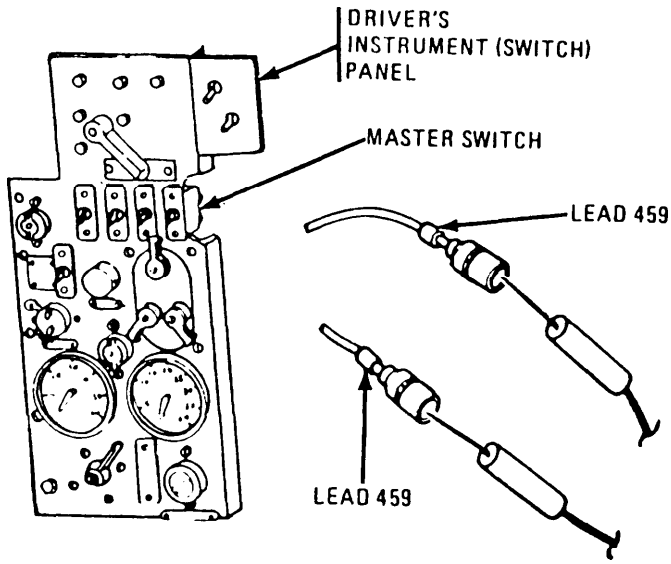


Step 1. To access electrical accessories panel, remove left CO_2 cylinder access cover. Refer to page 2-923. Disconnect lead 459 from rectifier output (red lead) at disconnect. Place red probe in lead 459 (pin end) and ground black probe. If multimeter indicates no voltage, go to step 2. If multimeter indicates about 24 volts, go to step 3. Connect lead 459.

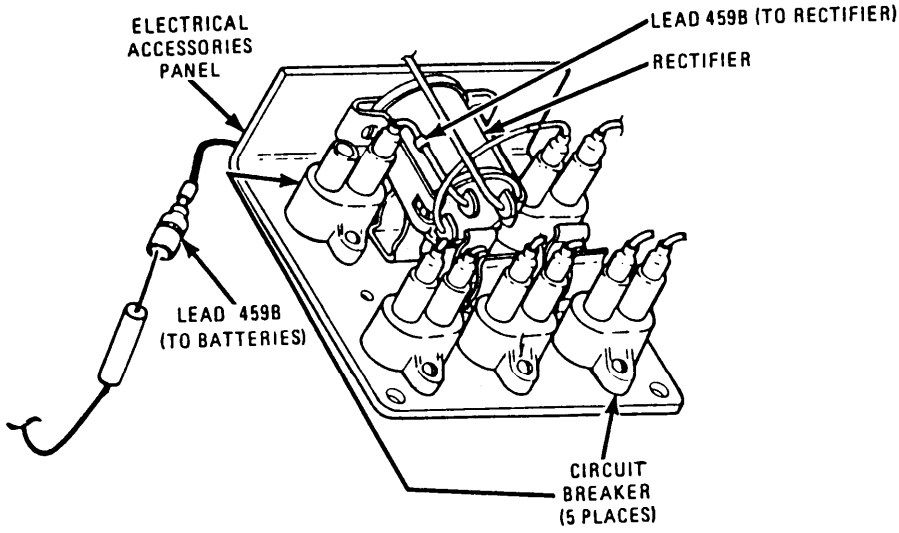
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



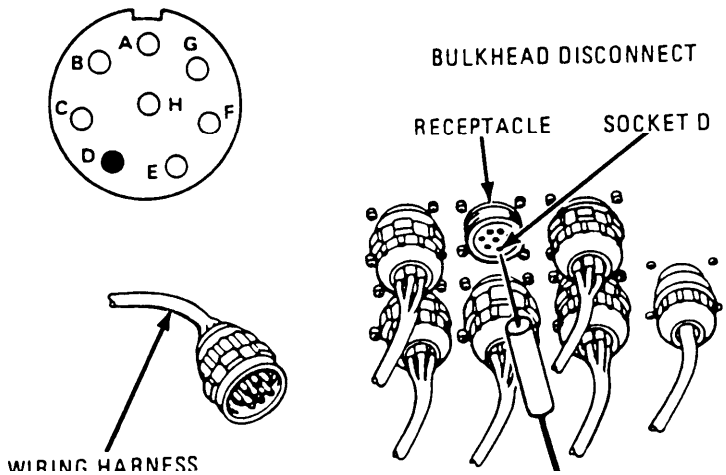
Step 2. Disconnect lead 459B (to rectifier) from circuit breaker. Place red probe in circuit breaker and ground black probe. If multimeter indicates no voltage, go to step 4. If multimeter indicates about 24 volts, replace rectifier. Refer to page 2-590. Connect lead 459B to circuit breaker.



Step 3. Disconnect both leads 459 from MASTER switch. Place red probe in lead *459* and ground black probe. Check voltage in both leads 459. If multimeter indicates no voltage in either lead, connect leads 459 to MASTER switch and go to step 5. If multimeter indicates about 24 volts in one lead, connect the lead 459 that measures about 24 volts to MASTER switch and go to step 6.

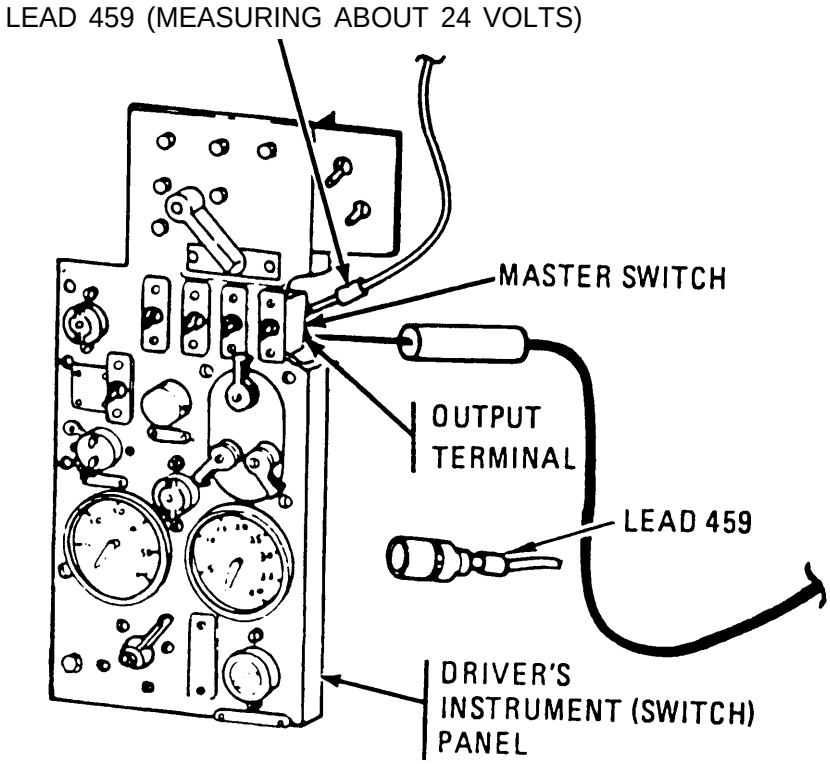


Step 4. Disconnect lead 459B (to batteries) from circuit breaker. Place red probe in input lead 459B and ground black probe. If multimeter indicates no voltage, repair input lead 459B from circuit breaker to batteries. If multimeter indicates about 24 volts, replace circuit breaker. Refer to page 2-590. Connect lead 459B to circuit breaker.



Step 5. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness at bulkhead disconnect. Place red probe in socket D (lead *459)* of receptacle and ground black probe. if multimeter indicates no voltage, repair lead 459 from bulkhead disconnect to rectifier. Refer to page 2-371. If multimeter indicates about 24 volts, repair lead 459 from MASTER switch to bulkhead disconnect. Refer to page 2-371. Connect wiring harness at bulkhead disconnect.

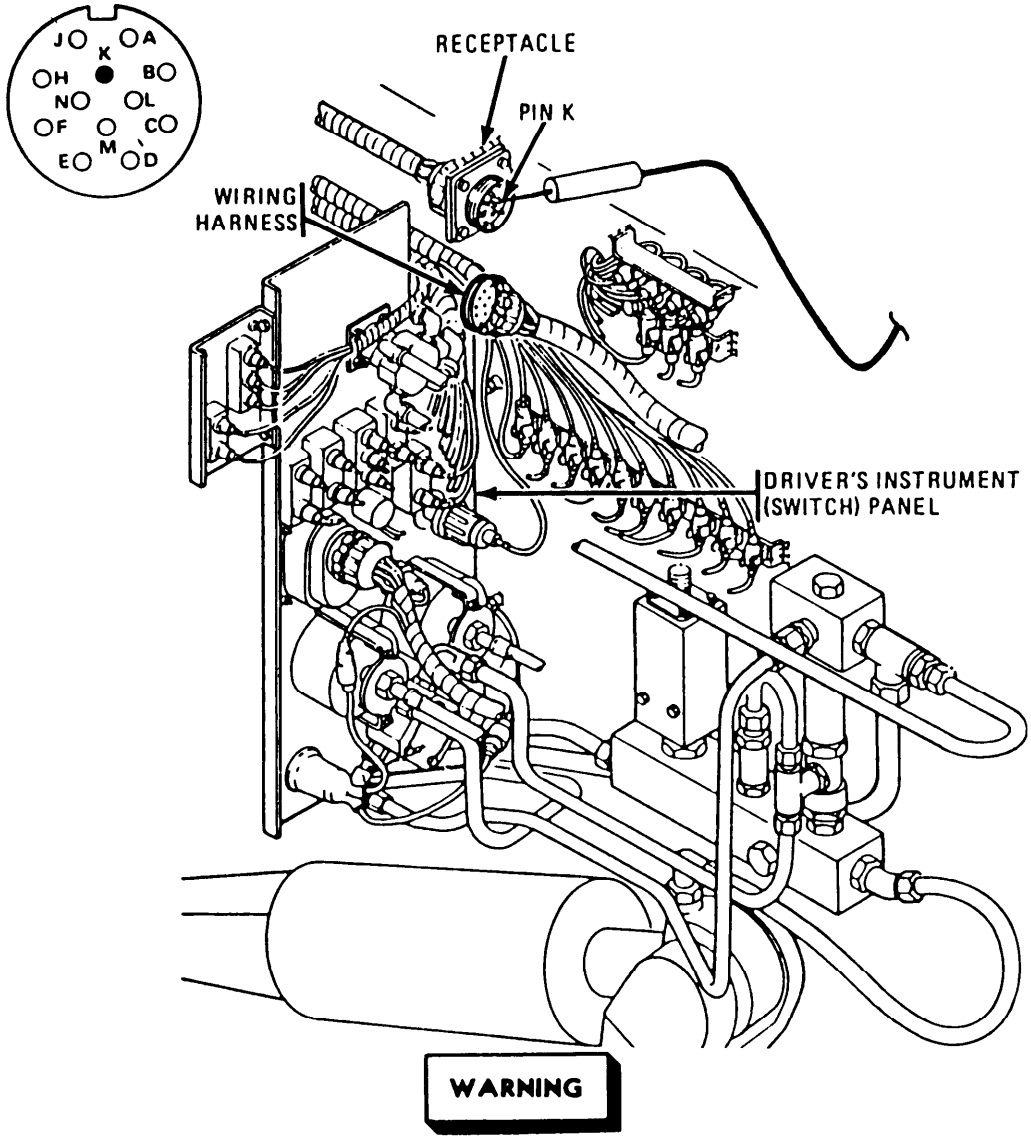
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT)



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 6. Place red probe on MASTER switch output terminal and ground black probe. Set MASTER switch ON. If multimeter indicates no voltage, replace MASTER switch. Refer to page 2-566. If multimeter indicates about 24 volts, go to step 7. Connect remaining lead 459 to MASTER switch. Set MASTER switch OFF.



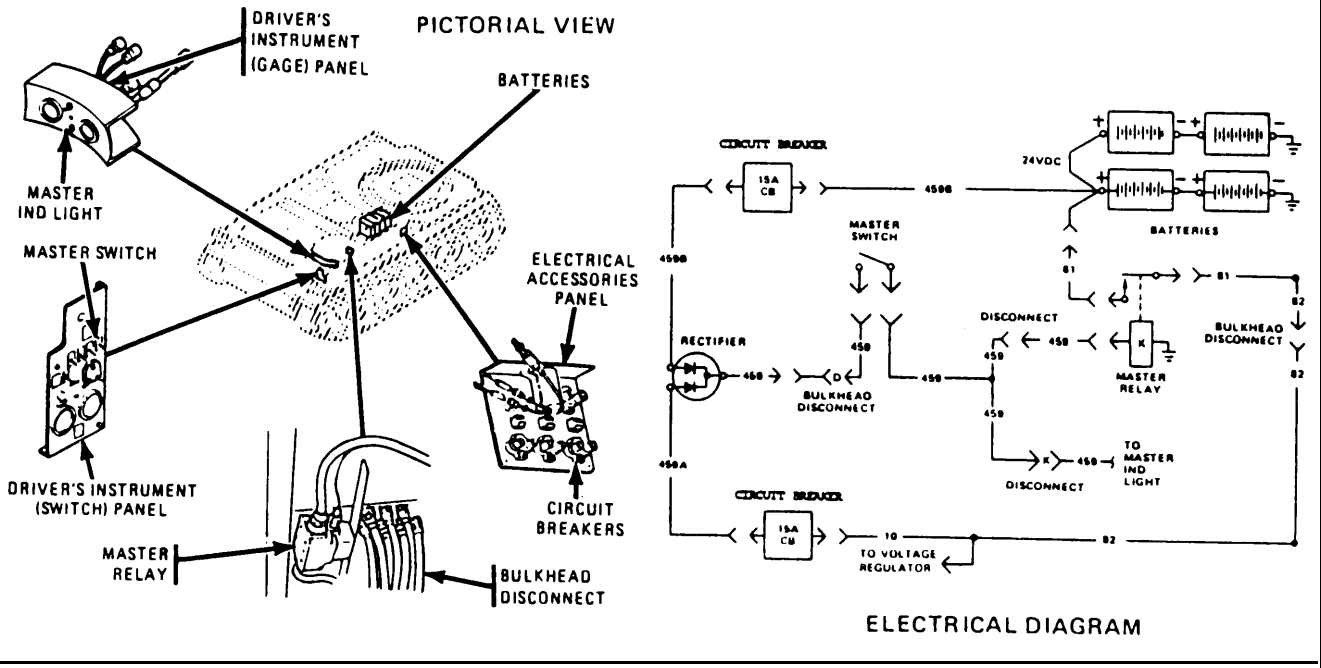
WARNING

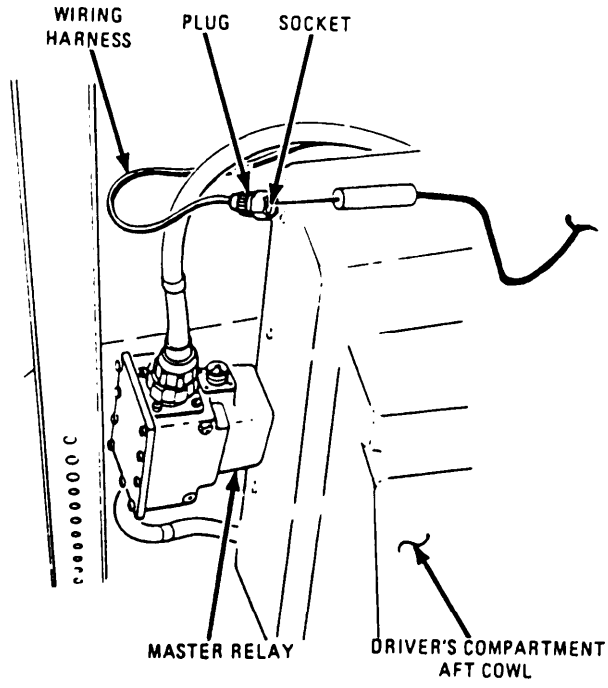
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 7. Disconnect wiring harness. Place red probe on pin K (lead 459) of receptacle and ground black probe. Set MASTER switch ON. If multimeter indicates no voltage, repair lead 459 from MASTER switch to receptacle. Refer to page 2-371. If multimeter indicates about 24 volts and problem still exists, troubleshoot master relay circuit, refer to page 2-102; and troubleshoot MASTER indicator warning light circuit, refer to page 2-171. Set MASTER switch OFF. Connect wiring harness to receptacle.

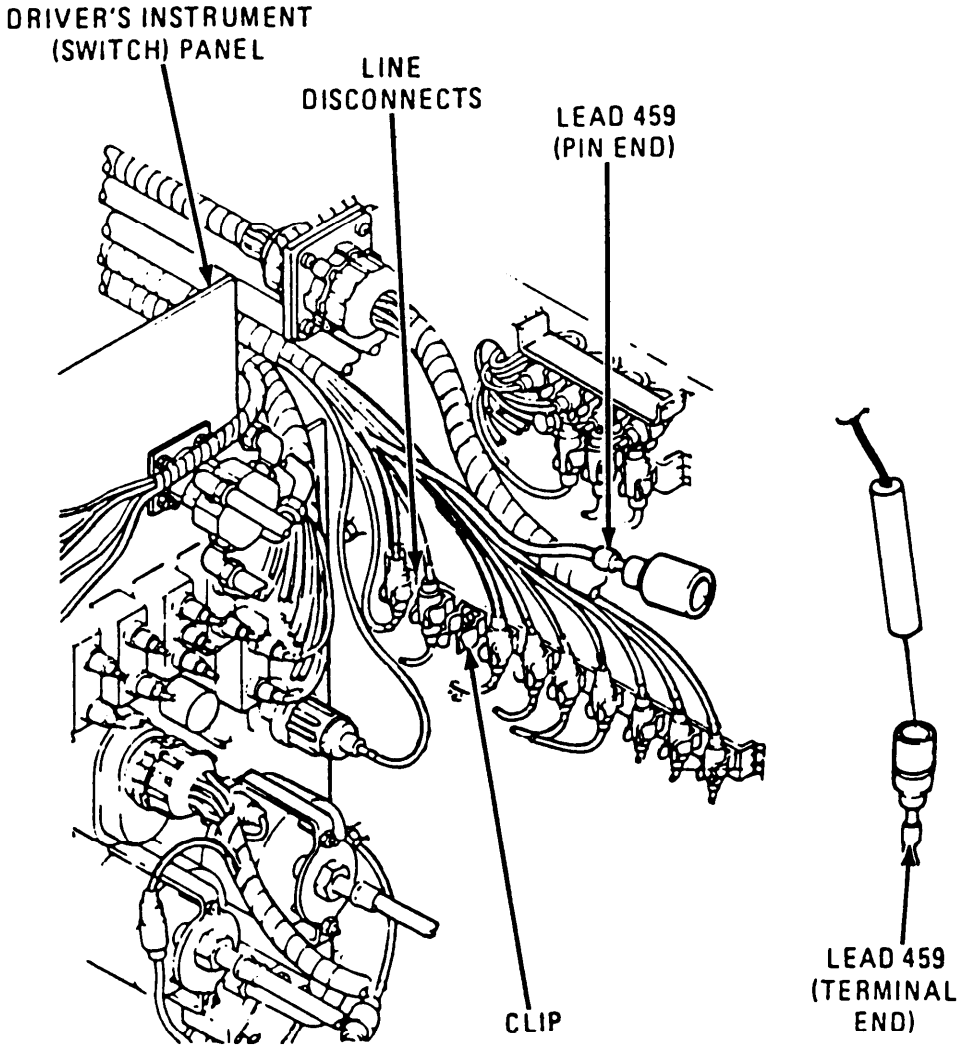
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

C. MASTER RELAY CIRCUIT.





Step 1. Disconnect wiring harness from amaster relay. Place red probe in plug socket (lead 459) and ground black probe. Set MASTER switch ON. If multimeter indicates no voltage, go to step 2. If multimeter indicates abott 24 volts, go to step 3. Set MASTER switch OFF. Connect harness to master relay.

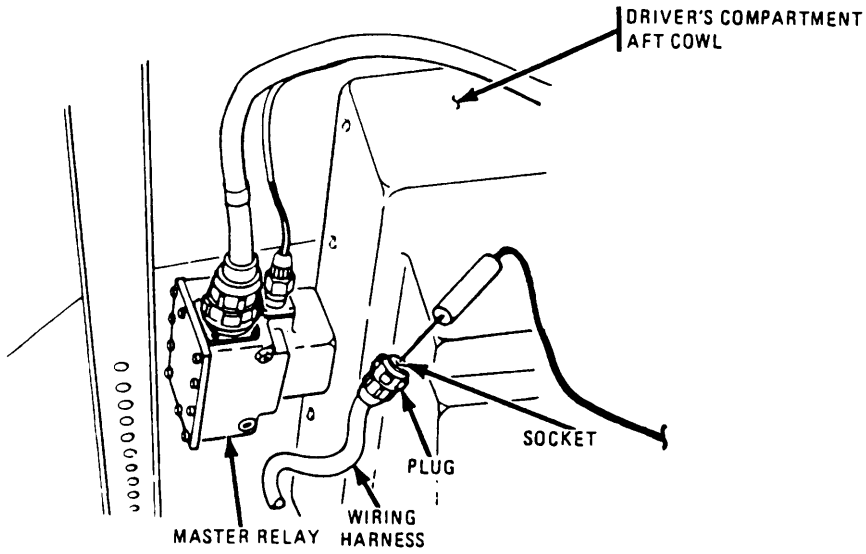


WARNING

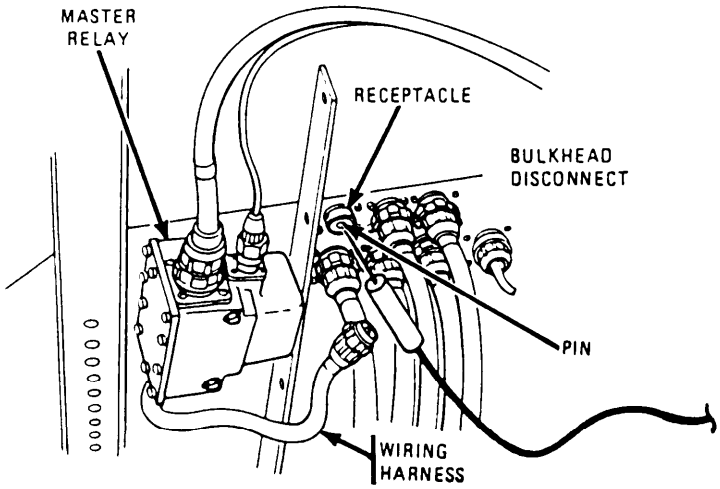
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Disconnect leads 459 at disconnect behind driver's instrument (switch) panel. Place red probe in lead 459 (terminal end) and ground black probe. Set MASTER switch ON. If multimeter indicates no voltage, repair lead 459 (terminal end) from MASTER switch to disconnect. Refer to page 2-371. Set MASTER switch OFF. Connect leads 459 at disconnect behind driver's instrument (switch) panel.

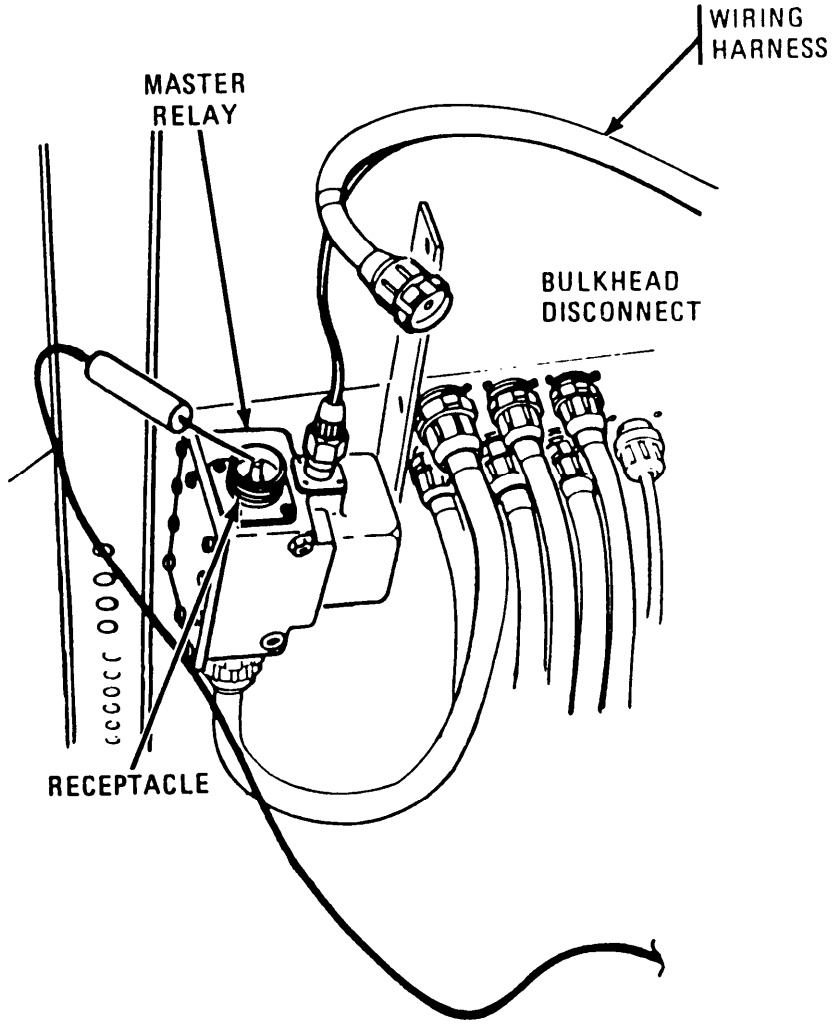
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 3. Disconnect wiring harness from master relay. Place red probe in plug socket (lead 81) and ground black probe. If multimeter indicates no voltage, go to step 4. If multimeter indicates about 24 volts, go to step 5. Connect wiring harness to master relay.



Step 4. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness (lead 81) at bulkhead disconnect. Place red probe on receptacle pin and ground black probe. If multimeter indicates no voltage, repair lead 81 from bulkhead disconnect to battery. Refer to page 2-371. If multimeter indicates about 24 volts, repair lead 81 from bulkhead disconnect to master relay. Refer to page 2-371. Connect wiring harness at bulkhead disconnect.

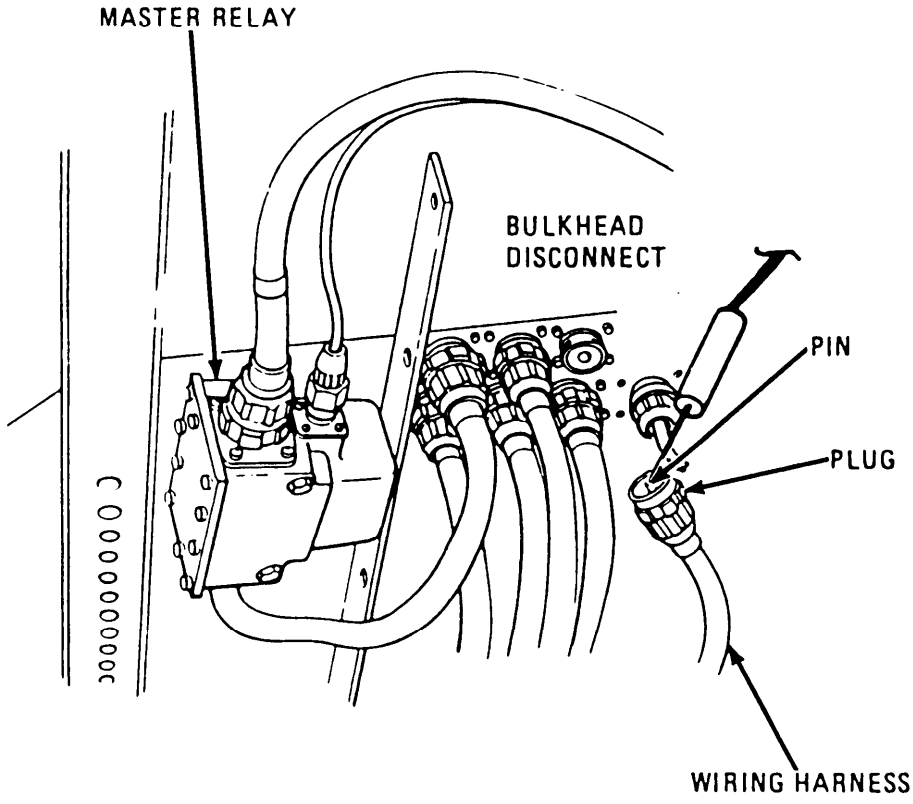


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 5. Disconnect wiring harness from master relay. Place red probe on master relay receptacle pin (lead 81) and ground black probe. Set MASTER switch ON. If multimeter indicates no voltage, replace master relay. Refer to page 2-584. If multimeter indicates about 24 volts, go to step 6. Set MASTER switch OFF. Connect wiring harness to master relay.

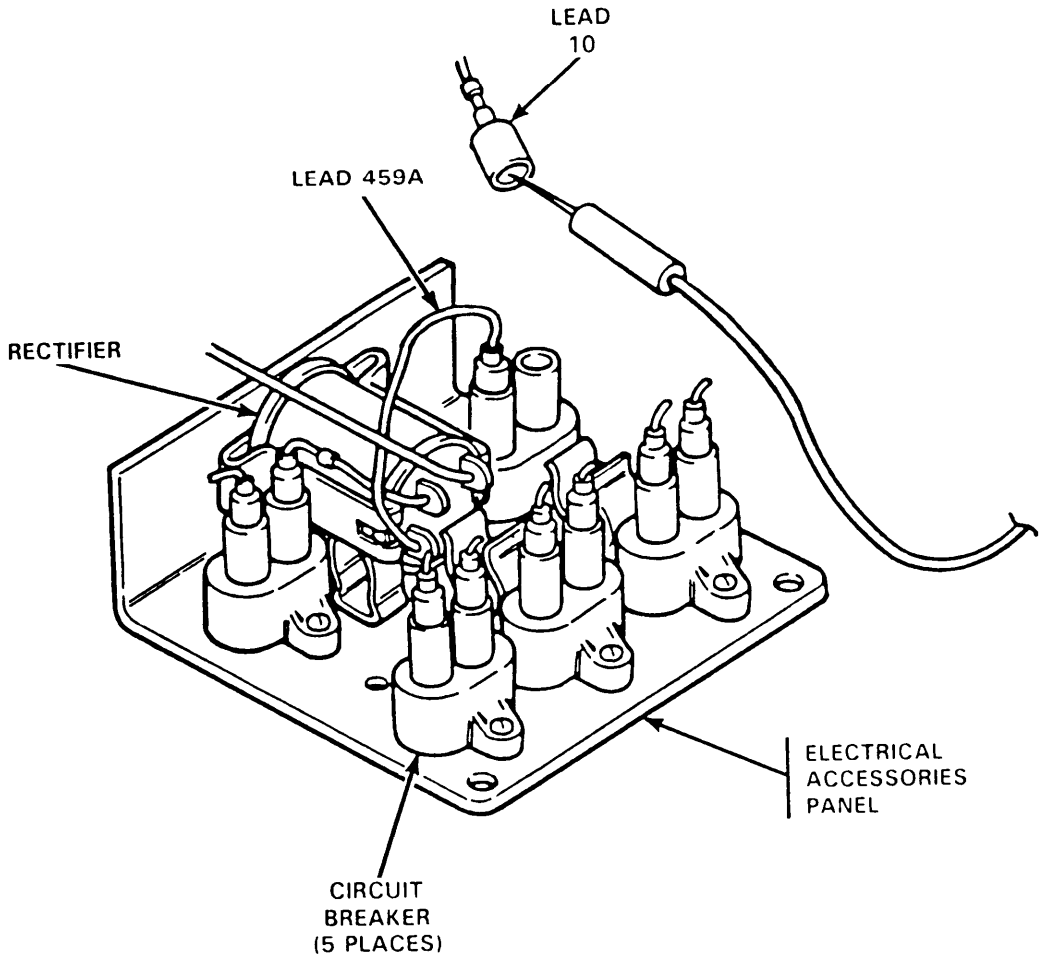
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 6. Disconnect wiring harness at bulkhead disconnect. Place red probe on plug pin (lead 82) and ground black probe. Set MASTER switch ON. If multimeter indicates no voltage, repair lead 82 between bulkhead disconnect and master relay. Refer to page 2-371. If multimeter indicates about 24 volts, go to step 7. Set MASTER switch OFF. Connect wiring harness at bulkhead disconnect.

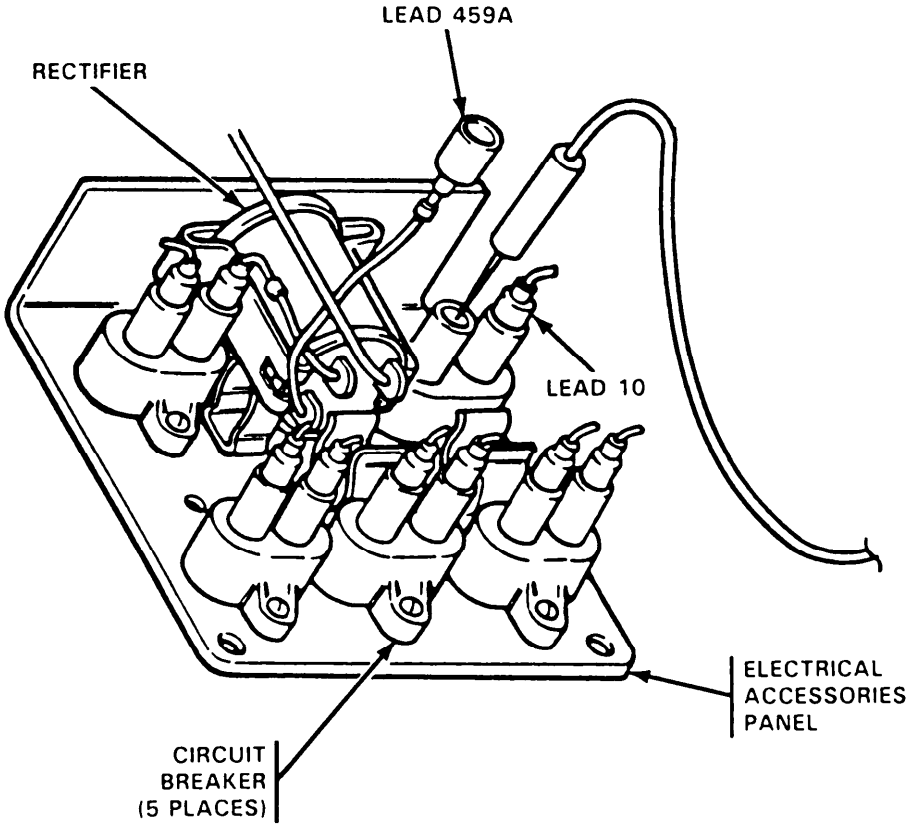


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 7. To access electrical accessories panel, remove left CO_2 cylinder access cover. Refer to page 2-923. Disconnect lead 10 from circuit breaker. Place red probe in lead 10 and ground black probe. Set MASTER switch ON. If multimeter indicates no voltage, repair lead 10 between circuit breaker and bulkhead disconnect. Refer to page 2-371. If multimeter indicates about 24 volts, go to step 8. Set MASTER switch OFF. Connect lead 10 to circuit breaker.

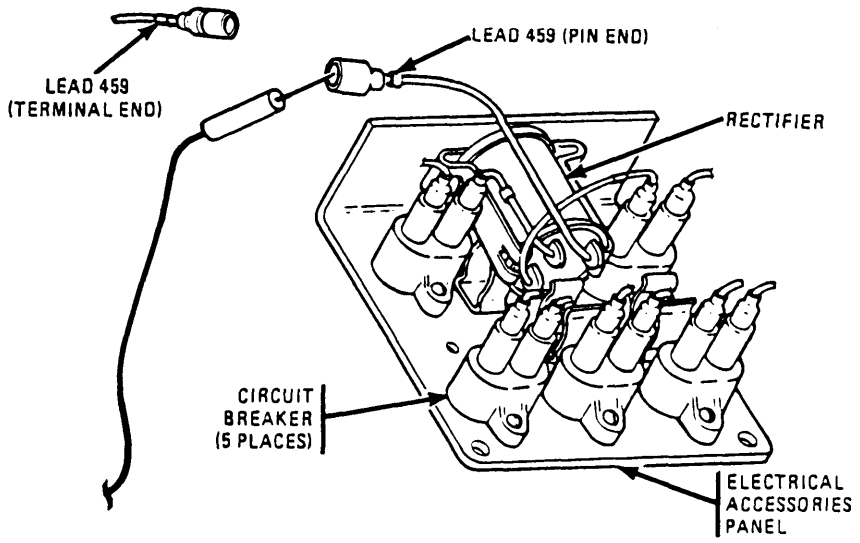
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



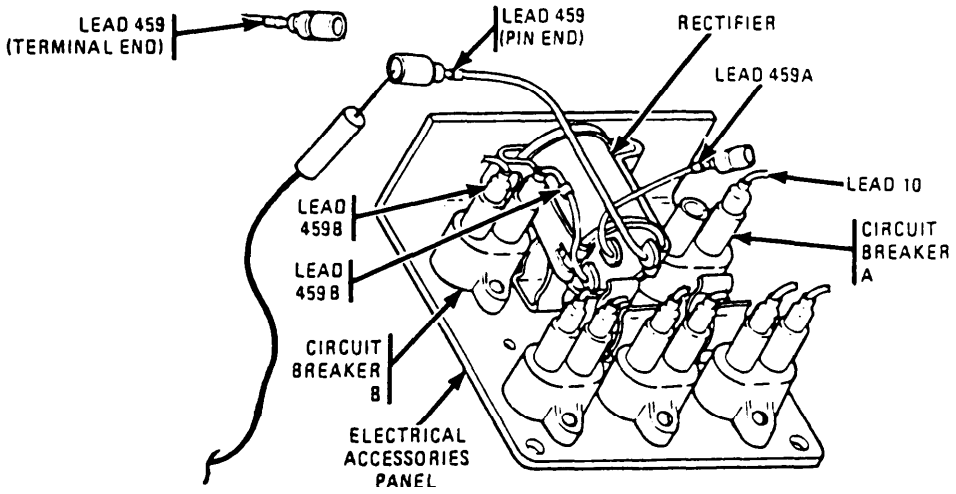
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 8. Disconnect lead 459A from circuit breaker. Place red probe in circuit breaker terminal and ground black probe. Set MASTER switch ON. If multimeter indicates no voltage, replace circuit breaker. Refer to page 2-590. If multimeter indicates about 24 volts, go to step 9. Set MASTER switch OFF. Connect lead 459A to circuit breaker.



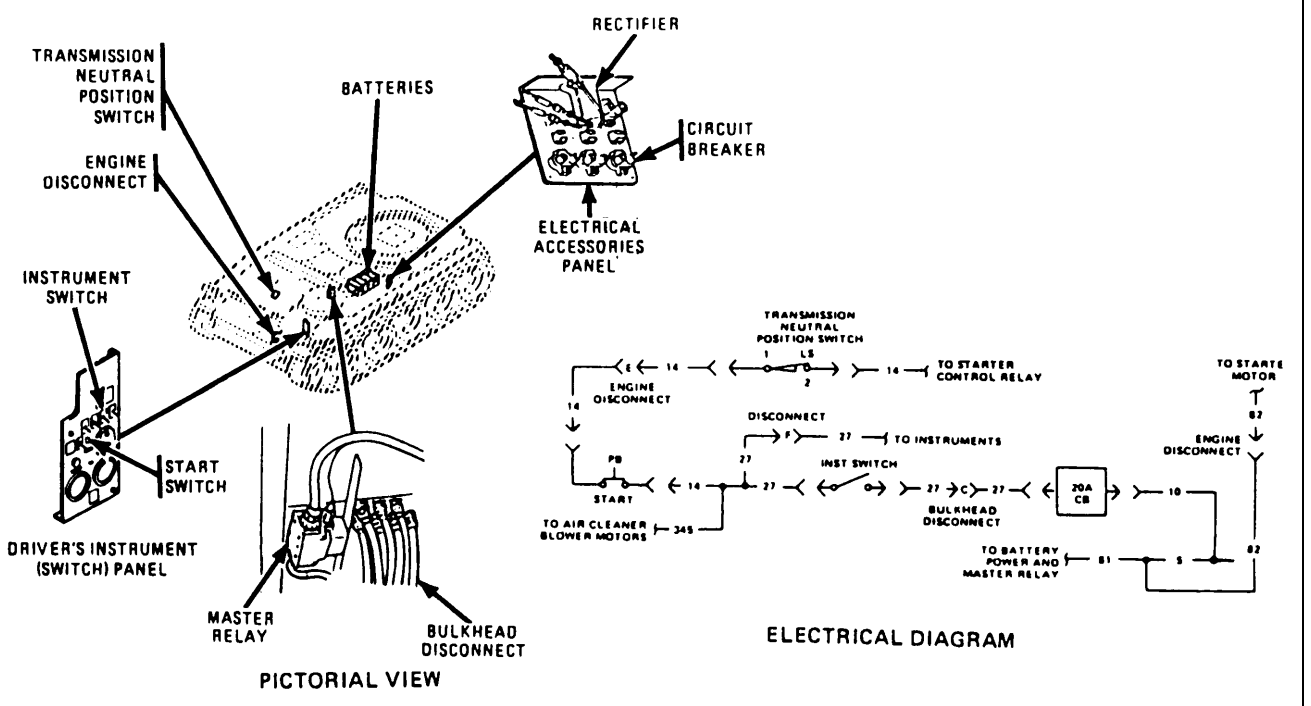
Step 9. Disconnect leads 459 at rectifier. Place red probe in lead 459 (pin end) and ground black probe. If multimeter indicates no voltage, replace rectifier. Refer to page 2-590. If multimeter indicates about 24 volts, go to step 10. Do not connect leads 459 (at this time.)

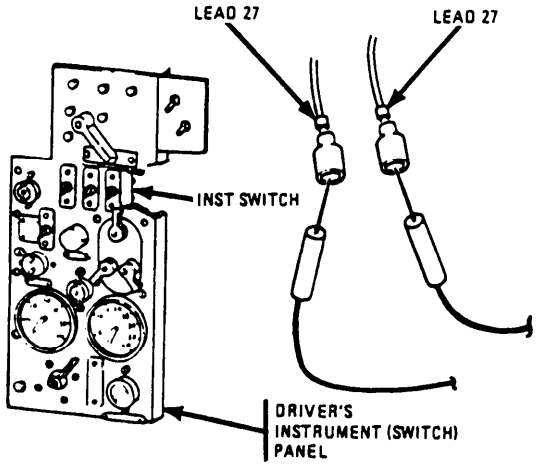


Step 10. Disconnect lead 459A from circuit breaker A. Disconnect lead 459B from circuit breaker B. Connect lead 459A to circuit breaker B. Place red probe in lead 459 (pin end) and ground black probe. If multimeter indicates no voltage, replace rectifier. Refer to page 2-590. Disconnect lead 459A from circuit breaker B and connect to circuit breaker A. Connect lead 459B to circuit breaker B. Connect leads 459 at rectifier. If problem still exists, troubleshoot instrument switch circuit. Refer to page 2-110.

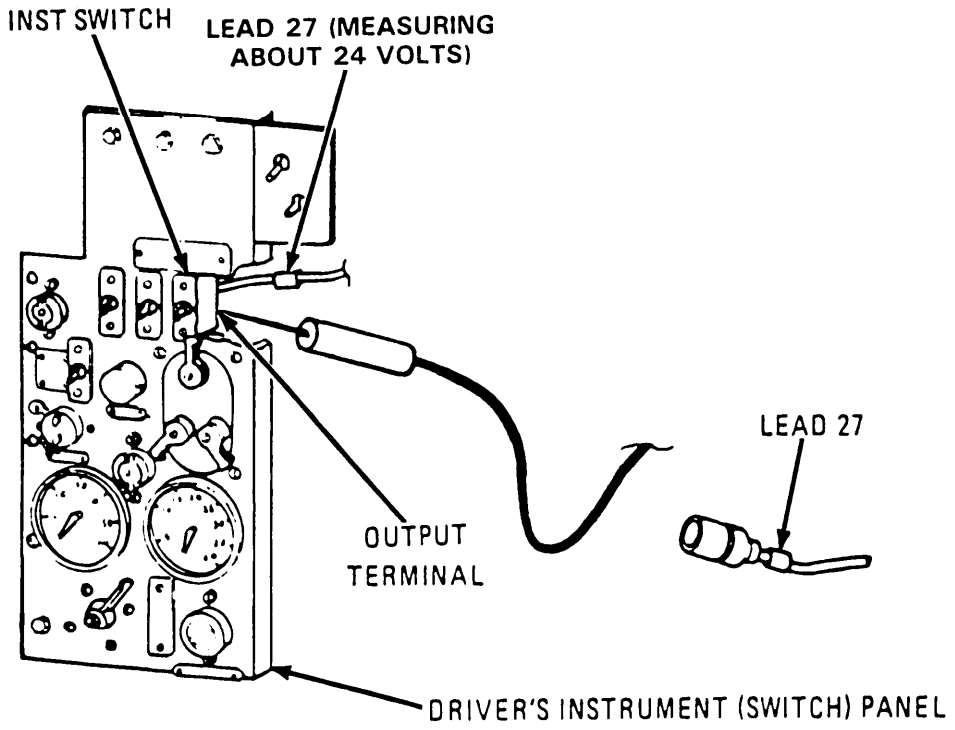
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

D. INSTRUMENT SWITCH CIRCUIT.





Step 1. Disconnect both leads 27 from INST switch. Place red probe in lead 27 and ground black probe. Set MASTER switch ON. Check voltage in both leads 27. If multimeter indicates no voltage in both leads 27, go to step 4 and connect leads 27 to INST switch. If multimeter indicates about 24 volts in one lead, connect lead 27 measuring about 24 volts to INST switch and go to step 2. Set MASTER switch OFF.

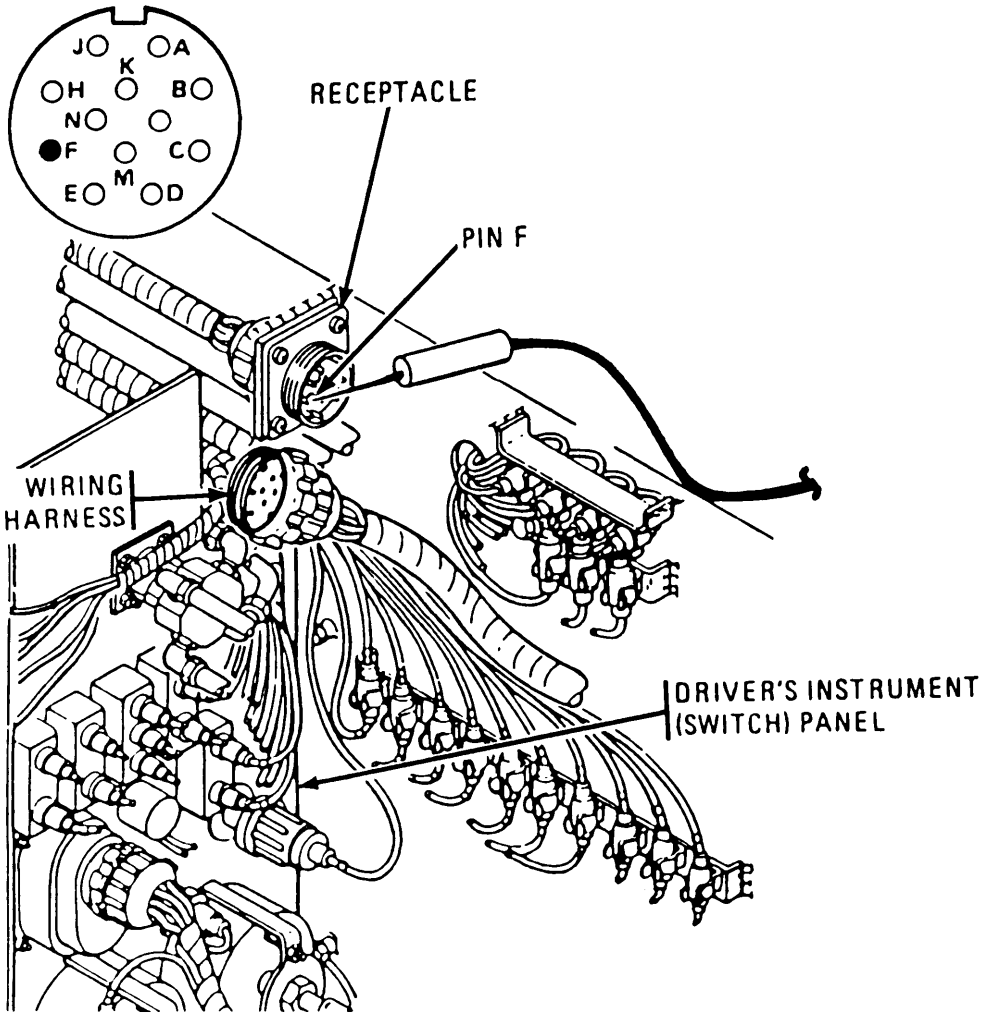


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Place red probe on INST switch output terminal. Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, replace INST switch. Refer to page 2-566. If multimeter indicates about 24 volts, go to step 3. Set MASTER and INST switches OFF. Connect remaining lead 27 to INST switch.

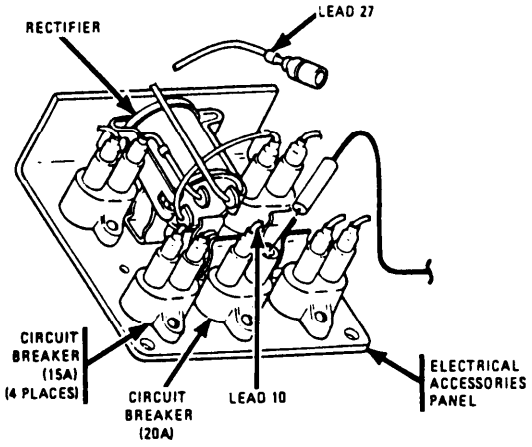
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



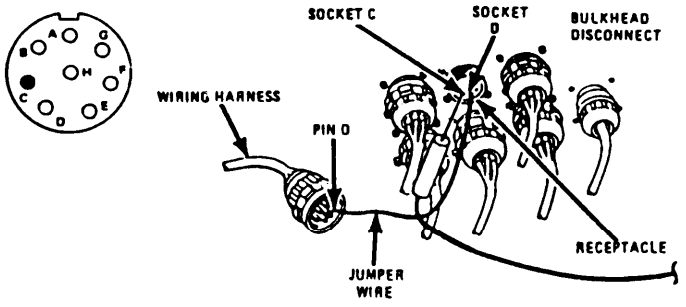
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. Disconnect instrument (gage) panel wiring harness. Place red probe on pin F (lead 27) of receptacle. Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, repair lead 27 from INST switch to receptacle. Refer to page 2-371. If multimeter indicates about 24 volts, repair lead 27 from disconnect to instruments. Refer to page 2-371. Set MASTER and INST switches OFF. Connect wiring harness.



Step 4. To access electrical accessories panel, remove left CO_2 cylinder access cover. Refer to page 2-923. Disconnect lead 27 from 20A circuit breaker on electrical accessories panel. Place red probe in circuit breaker terminal. Ground black probe. Set MASTER switch ON. If multimeter indicates no voltage, go to step 6. If multimeter indicates about 24 volts, go to step 5. Set MASTER switch OFF. Connect lead 27 to 20A circuit breaker on electrical accessories panel.

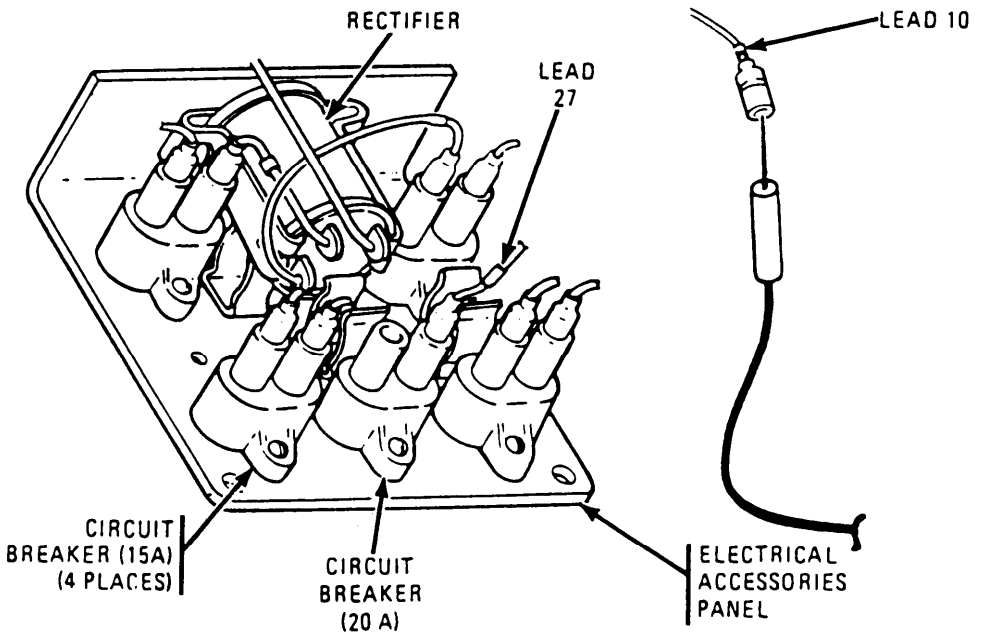


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 5. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness at bulkhead disconnect. Place jumper wire to pin D and socket D (lead 459). Place red probe in socket C (lead 27) of receptacle. Ground black probe. Set MASTER switch ON. If multimeter indicates no voltage, repair lead 27 from circuit breaker to bulkhead disconnect. Refer to page 2-371. If multimeter indicates about 24 volts, repair lead 27 from bulkhead disconnect to INST switch. Refer to page 2-371. Set MASTER switch OFF. Connect wiring harness at bulkhead disconnect.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

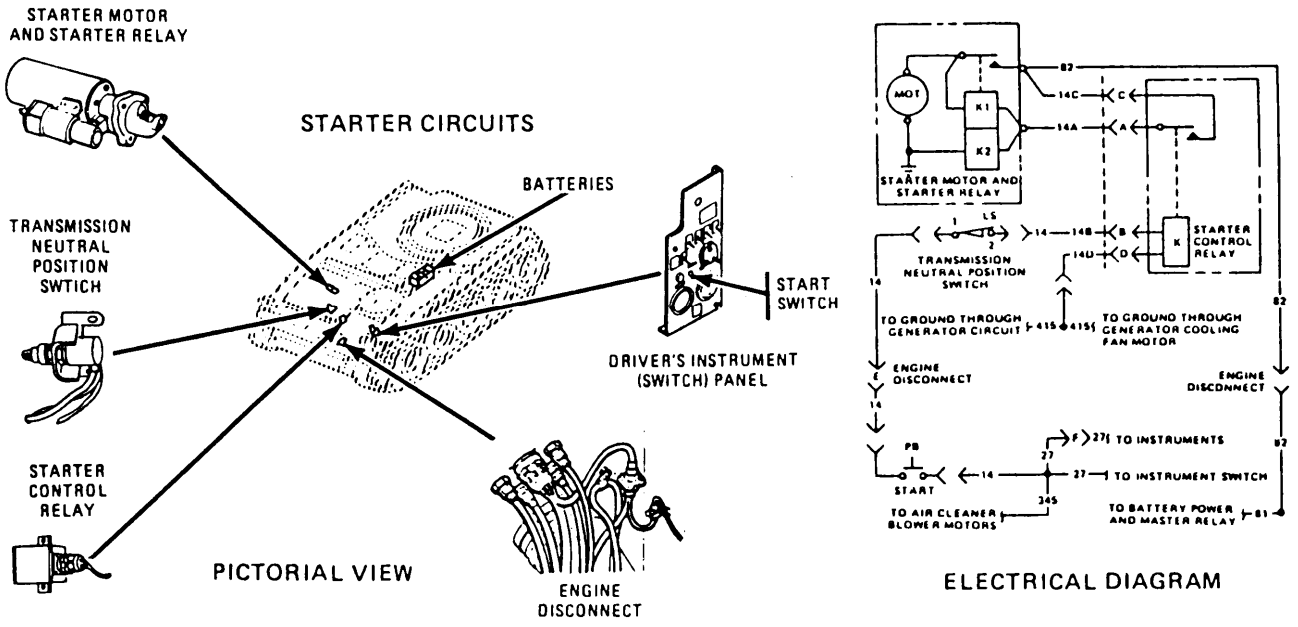


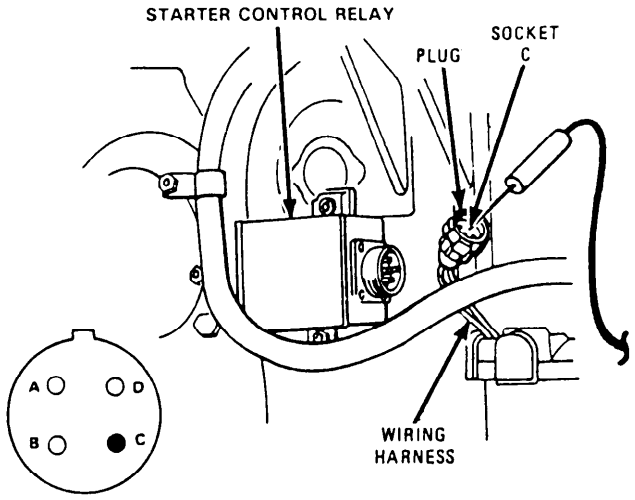
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 6. Disconnect lead 10 from 20A circuit breaker on electrical accessories panel. Place red probe in lead 10. Ground black probe. Set MASTER switch ON. If multimeter indicates no voltage, repair lead 10. Refer to page 2-371. If multimeter indicates about 24 volts, replace circuit breaker. Refer to page 2-590. Set MASTER switch OFF. Connect lead 10 to 20A circuit breaker on electrical accessories panel.

E. STARTER CIRCUITS.

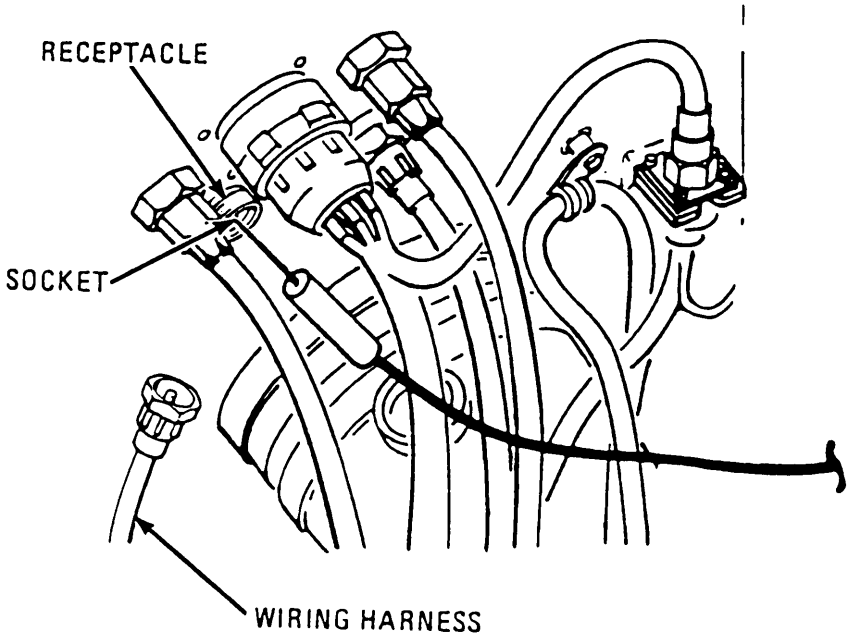




Step 1. To access engine, remove hull engine compartment deck assembly lid. Refer to page 2-935. Disconnect wiring harness from starter control relay. Place red probe in socket C (lead 14C) of plug. Ground black probe. Set MASTER switch ON. If multimeter indicates no voltage, connect wiring harness to starter control relay and go to step 2. If multimeter indicates about 24 volts, go to step 3. Set MASTER switch OFF.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

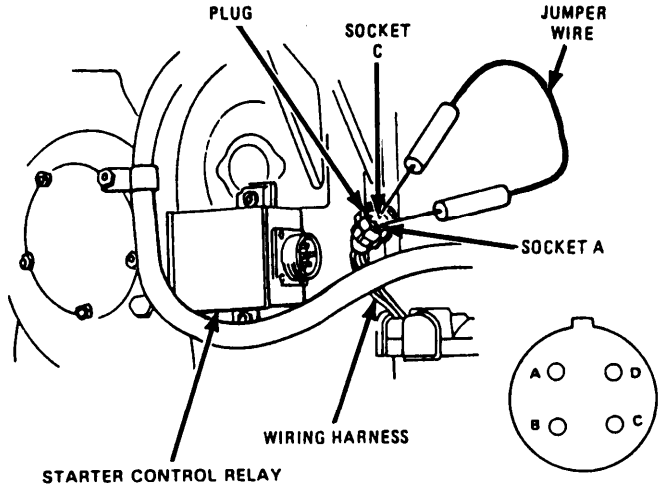
ENGINE DISCONNECT



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

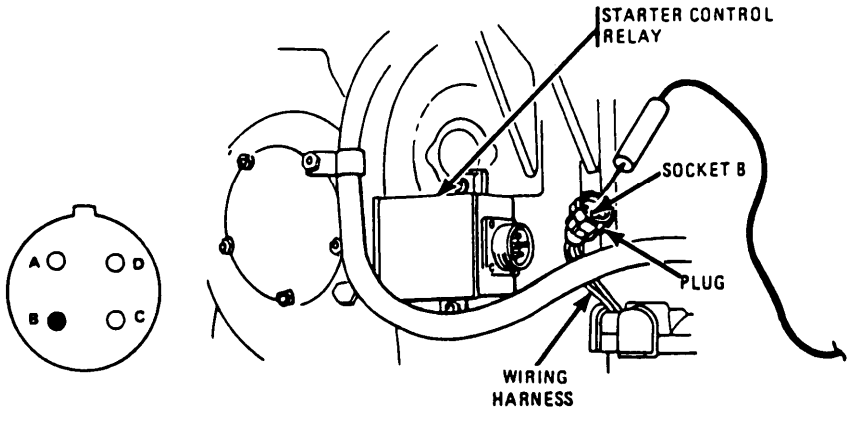
Step 2. To access engine disconnect and transmission, remove hull transmission compartment deck assembly. Refer to page 2-938. Disconnect wiring harness at engine disconnect. Place red probe in receptacle socket (lead 82). Ground black probe. Set MASTER switch ON. If multimeter indicates no voltage, repair lead 82 from master relay to engine disconnect. Refer to page 2-371. If multimeter indicates about 24 volts, repair lead 82 or 14C from engine disconnect to starter control relay. Refer to page 2-371. Set MASTER switch OFF. Connect wiring harness at engine disconnect.



WARNING

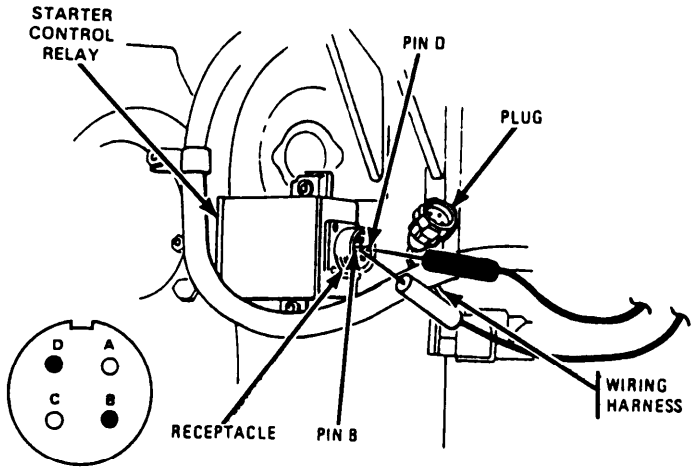
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injufy to personnel.

Step 3. Place jumper wire between sockets A (lead 14A) and C (lead 14C) of plug. Set MASTER switch ON. Engine should crank. If engine does not crank, redate starter and/or starter control relay, refer to page 2-559 and page 2-561; or repair lead 14A from starter control relay to starter, refer to page 2-371. If engine cranks, go to step 4. Remove jumper wire. Set MASTER switch OFF. Connect wiring harness to starter control relay if engine does not crank.

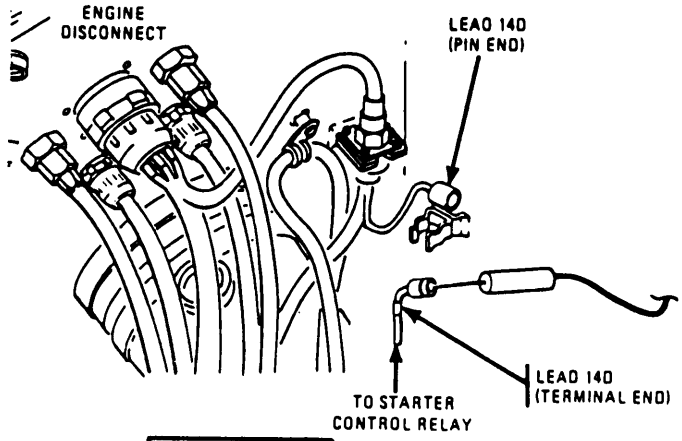


Step 4. Place red probe in socket B (lead 14B-14) of plug. Ground black probe. Set MASTER and INST switches ON. Press START switch. If multimeter indicates no voltage, go to step 8. If multimeter indicates about 24 volts, go to step 5. Set MASTER and INST switches OFF.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



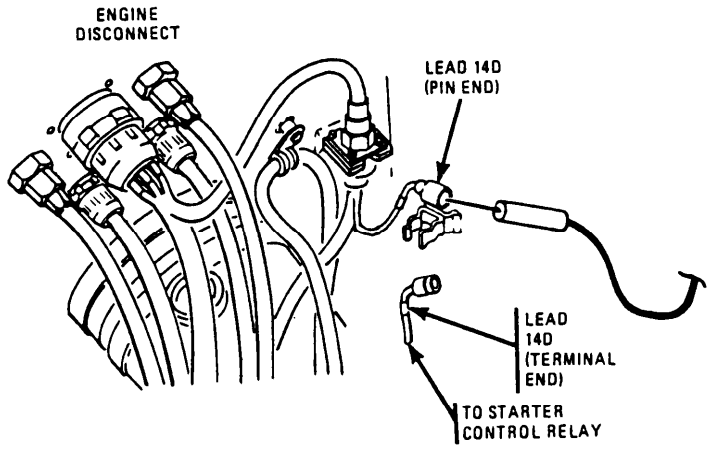
Step 5. Check resistance between pins B and D of receptacle on starter control relay. If no resistance exists, replace starter control relay. Refer to page 2-561. If resistance exists, go to step 6. Connect wiring harness to starter control relay.



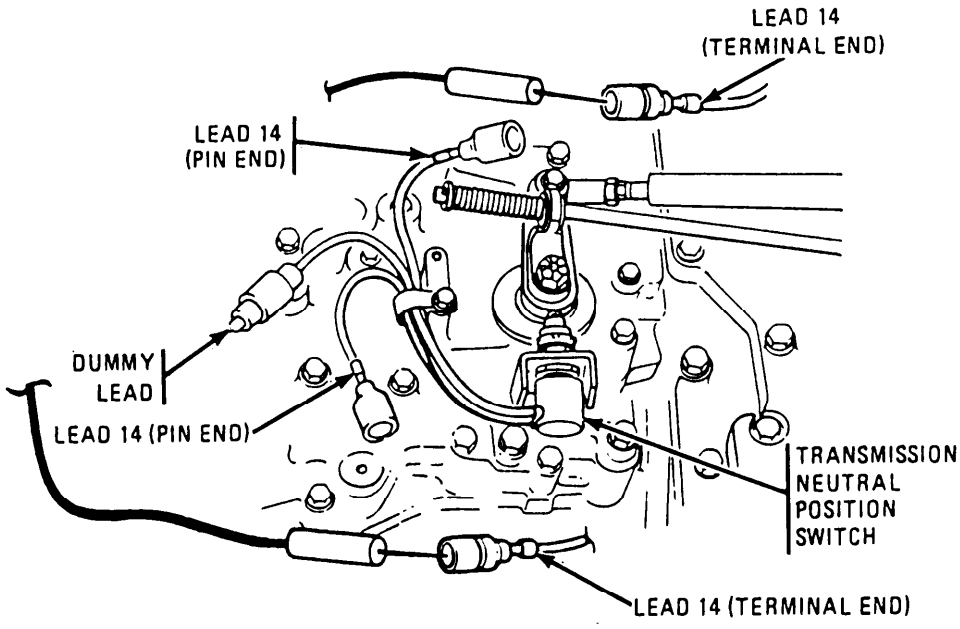
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 6. Disconnect leads 14D near engine disconnect. Place red probe in lead 14D (terminal end) and ground black probe. Set MASTER and INST switches ON. Press START switch. If multimeter indicates no voltage, repair lead 14D between disconnect and starter control relay. Refer to page 2-371. Connect leads 14D. If multimeter indicates about 24 volts, go to step 7. Set MASTER and INST switches OFF.

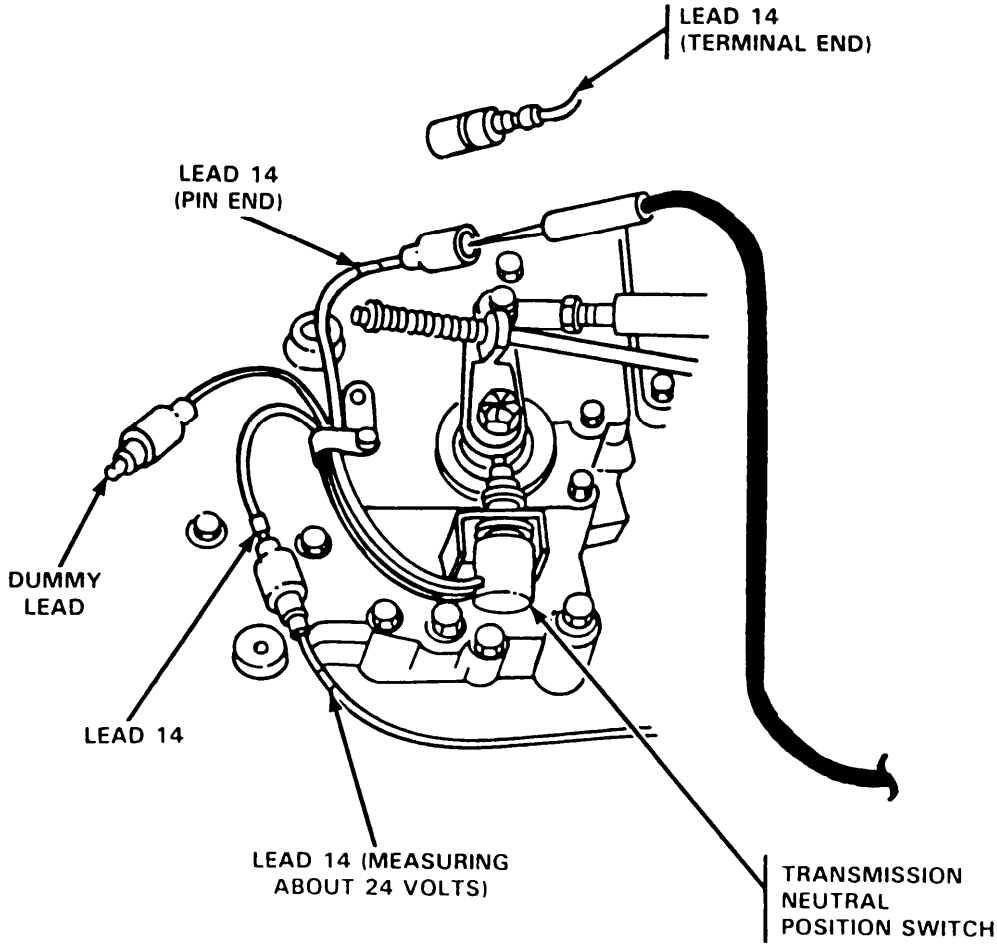


Step 7. Check resistance between lead 14D (pin end) and ground. If multimeter indicates more than 4 ohms, repair lead 14D between disconnect and generator ground. Refer to page 2-371. If multimeter indicates 0 to 4 ohms, troubleshoot generator output circuit. Refer to page 2-133. Connect leads 14D to disconnect.



Step 8. Disconnect leads 14 from neutral position switch. Place red probe in lead 14 (terminal end). Ground black probe. Check voltage in both 14 leads (terminal ends). Set MASTER and INST switches ON. Press START switch. If multimeter indicates no voltage in both leads 14, connect leads 14 to neutral position switch and go to step 10. If multimeter indicates about 24 volts in one lead 14, connect the lead 14 that measures about 24 volts to neutral position switch and go to step 9. Set MASTER and INST switches OFF.

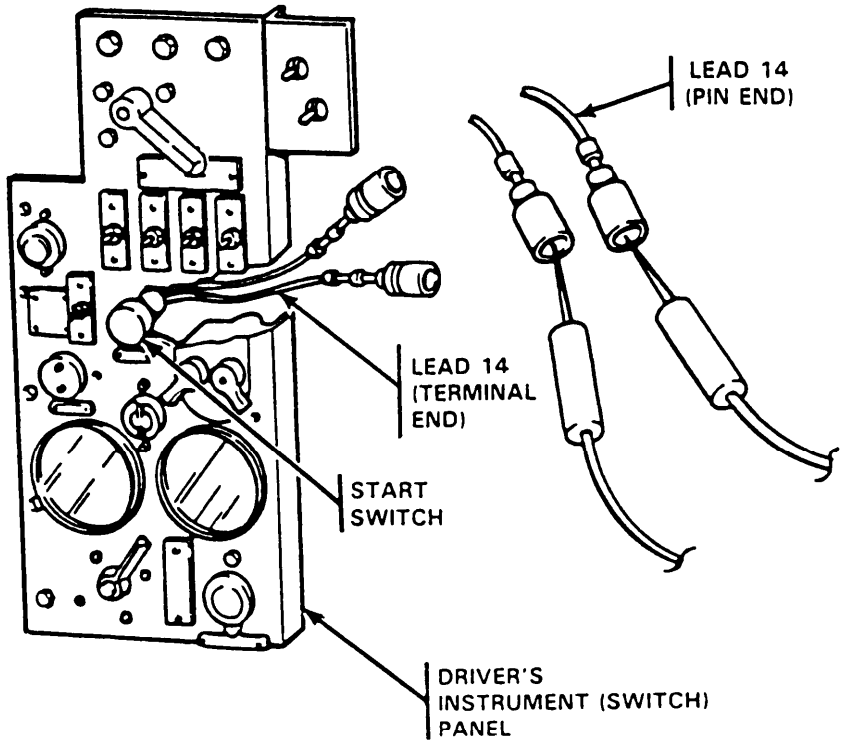
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 9. Place red probe in lead 14 (pin end) of neutral position switch. Ground black probe. Set MASTER and INST switches ON. Press START switch. If multimeter indicates no voltage, replace neutral position switch. Refer to page 2-562. If multimeter indicates about 24 volts, repair lead 14-14B between neutral position switch and starter control relay. Refer to page 2-371. Set MASTER and INST switches OFF. Connect leads 14 at neutral position switch.

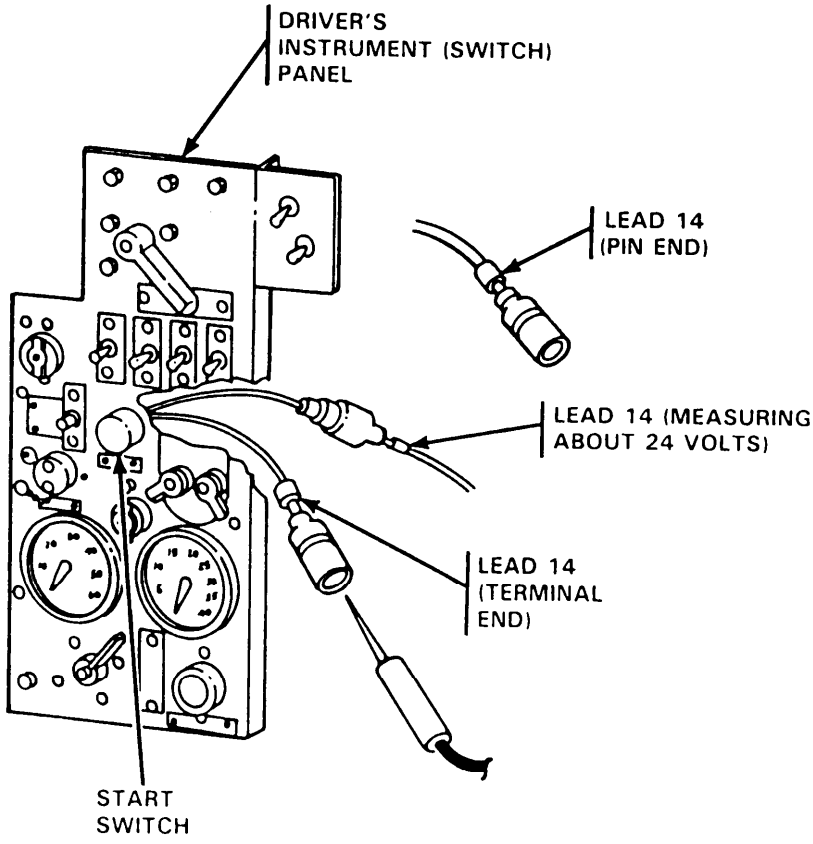


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

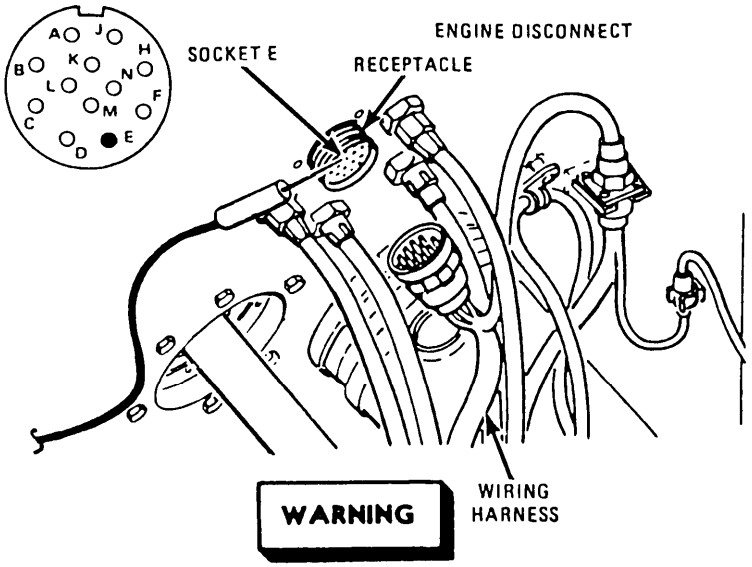
Step 10. Disconnect leads 14 from START switch. Place red probe in lead 14 (pin end). Ground black probe. Check voltage in both leads 14 (pin end). Set MASTER and INST switches ON. If multimeter indicates no voltage in both leads 14, repair lead 14-27 from INST switch to START switch. Refer to page 2-371. If multimeter indicates about 24 volts in one lead 14, connect lead 14 measuring about 24 volts to INST switch and go to step 11. Set MASTER and INST switches OFF.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 11. Place red probe in lead 14 (terminal end) of START switch. Ground black probe. Set MASTER and INST switches ON. Press START switch. If multimeter indicates no voltage, replace START switch. Refer to page 2-566. If multimeter indicates about 24 volts, go to step 12. Set MASTER and INST switches OFF. Connect lead 14 to START switch.

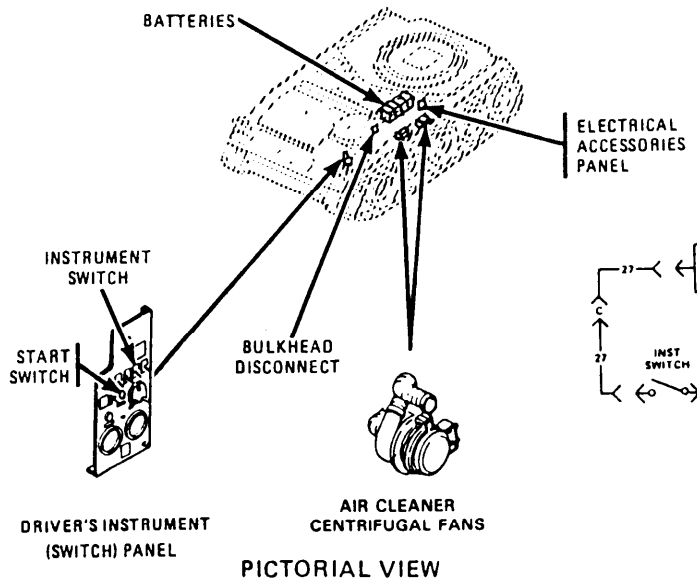


WARNING

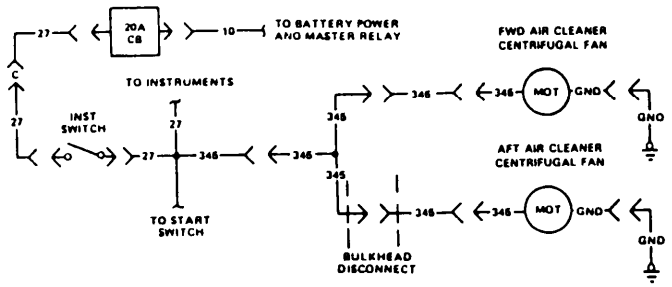
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 12. Disconnect wiring harness at engine disconnect. Place red probe in socket E (lead 14) of receptacle. Ground black probe. Set MASTER and INST switches ON. Push START switch. If multimeter indicates no voltage, repair lead 14 from engine disconnect to START switch. Refer to page 2-371. If multimeter indicates about 24 volts, repair lead 14 from engine disconnect to neutral position switch. Refer to page 2-371. Set MASTER and INST switches OFF. Connect wiring harness at engine disconnect.

F. AIR CLEANER BLOWER CIRCUIT.

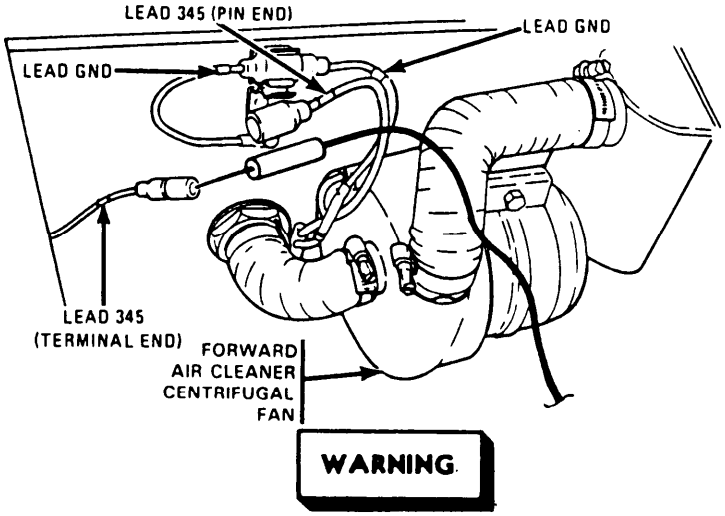


PICTORIAL VIEW



ELECTRICAL DIAGRAM

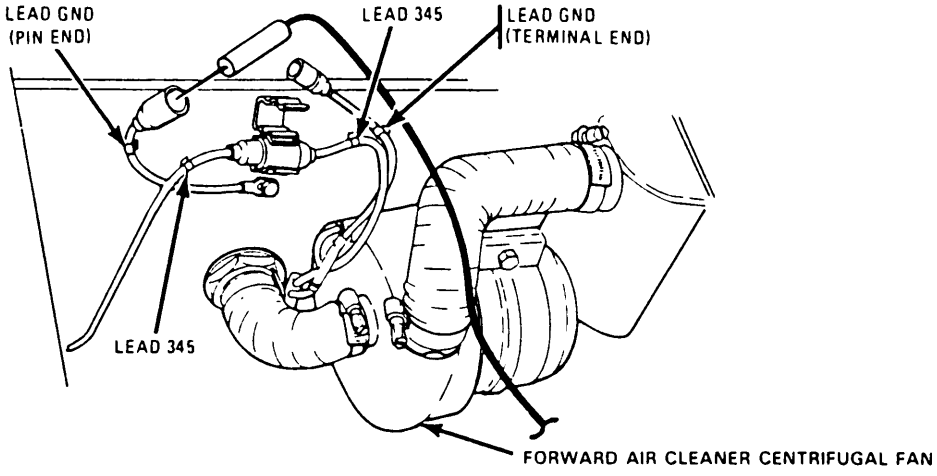
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



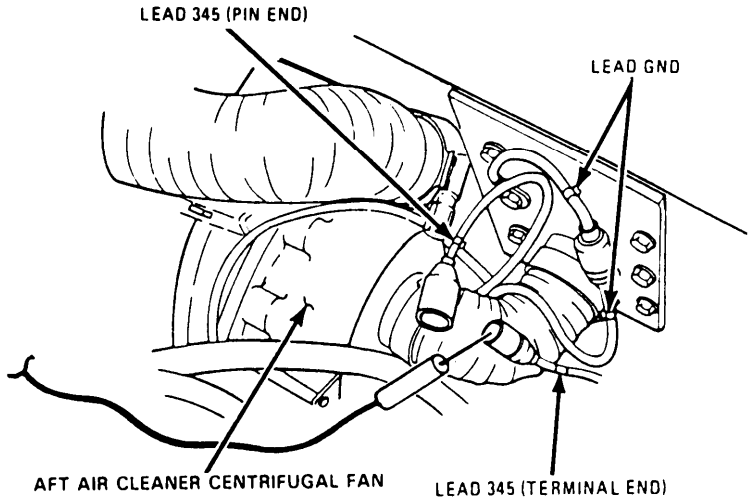
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

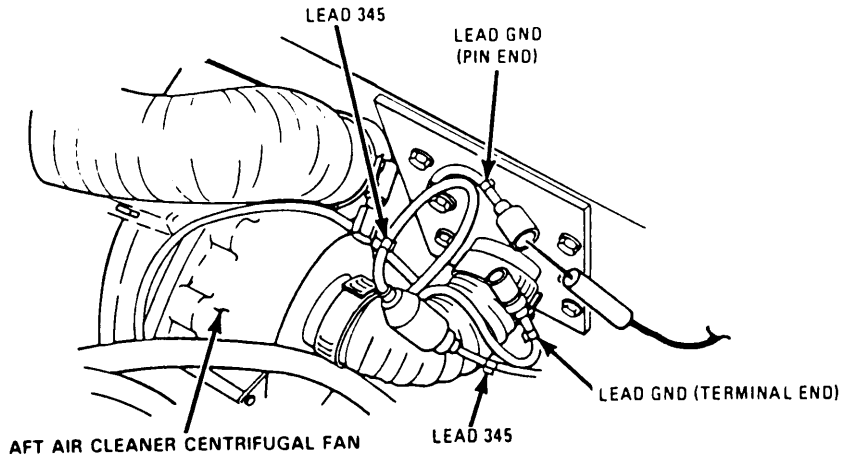
Step 1. To access electrical leads, open forward air cleaner blower access cover. Disconnect lead 345 from forward air cleaner centrifugal fan. Place red probe in lead 345 (terminal end). Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, repair lead 345 from centrifugal fan to INST switch. Refer to page 2-371. If multimeter indicates about 24 volts, go to step 2. Set MASTER and INST switches OFF. Connect lead 345 to forward air cleaner centrifugal fan.



Step 2. Disconnect lead GND from forward air cleaner centrifugal fan. Check continuity between lead GND (pin end) and chassis ground. If no continuity exists, repair lead GND. Refer to page 2-371. If continuity exists, repair or replace forward air cleaner centrifugal fan. Refer to page 2-446. Connect lead GND to forward air cleaner centrifugal fan GND.

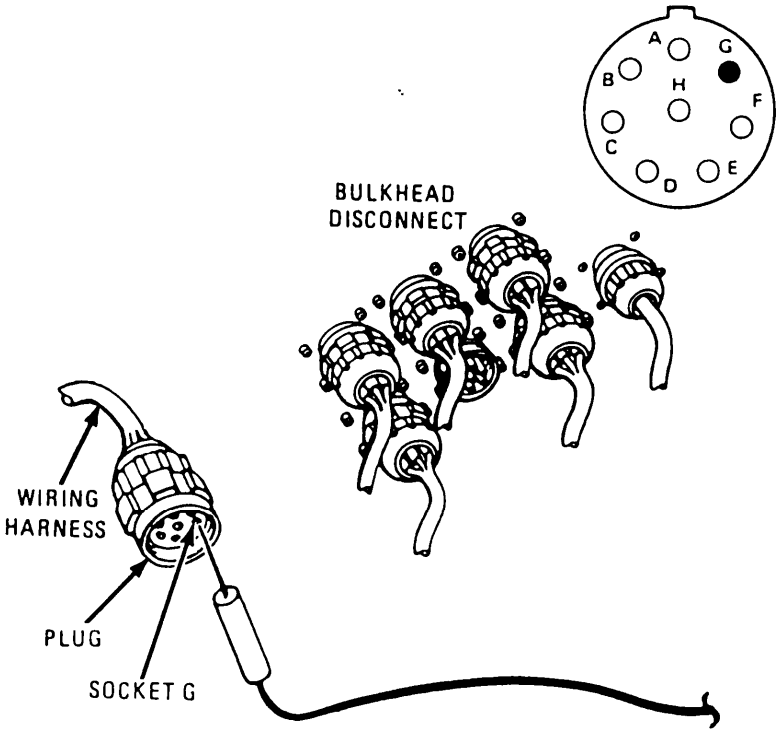


Step 3. To access electrical leads, open aft air cleaner blower door assembly. Disconnect lead 345 from aft air cleaner centrifugal fan. Place red probe in lead 345 (terminal end). Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, go to step 5. If multimeter indicates about 24 volts, go to step 4. Set MASTER and INST switches OFF. Connect lead 345 to aft air cleaner centrifugal fan.



Step 4. Disconnect lead GND from aft air cleaner centrifugal fan. Check continuity between lead GND (pin end) and chassis ground. If no continuity exists, repair ground lead. Refer to page 2-371. If continuity exists, repair or replace aft air cleaner centrifugal fan. Refer to page 2-446. Connect lead GND to aft air cleaner centrifugal fan.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

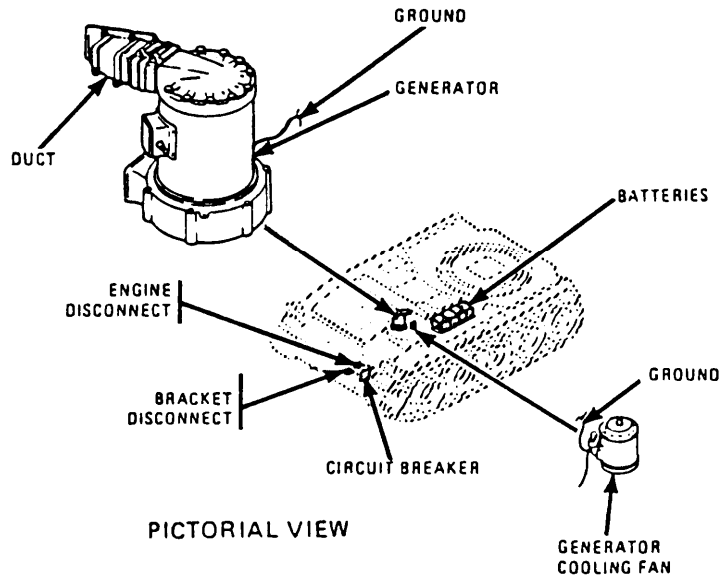


WARNING

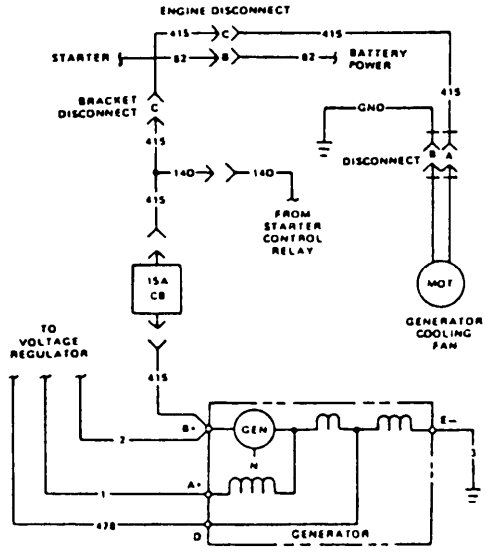
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 5. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness at bulkhead disconnect. Place red probe in socket G (lead 345) of plug. Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, repair lead 345 from bulkhead disconnect to INST switch. Refer to page 2-371. If multimeter indicates about 24 volts, repair lead 345 from bulkhead disconnect to aft air cleaner centrifugal fan. Refer to page 2-371. Set MASTER and INST switches OFF. Connect wiring harness at bulkhead disconnect.

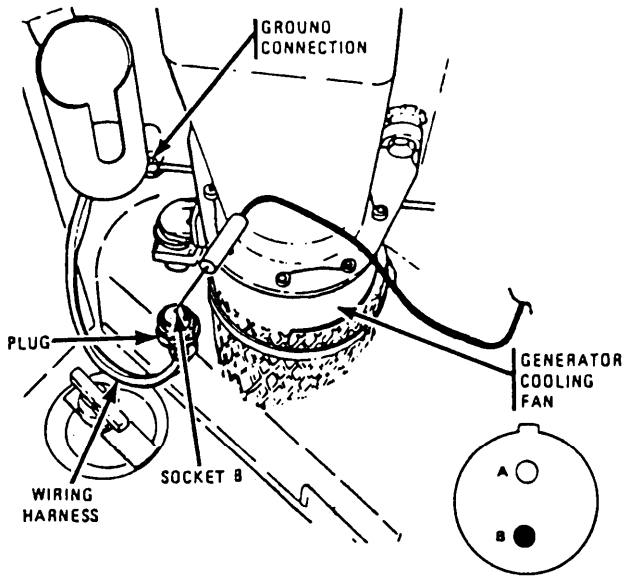
G. GENERATOR COOLING FAN CIRCUIT.



PICTORIAL VIEW

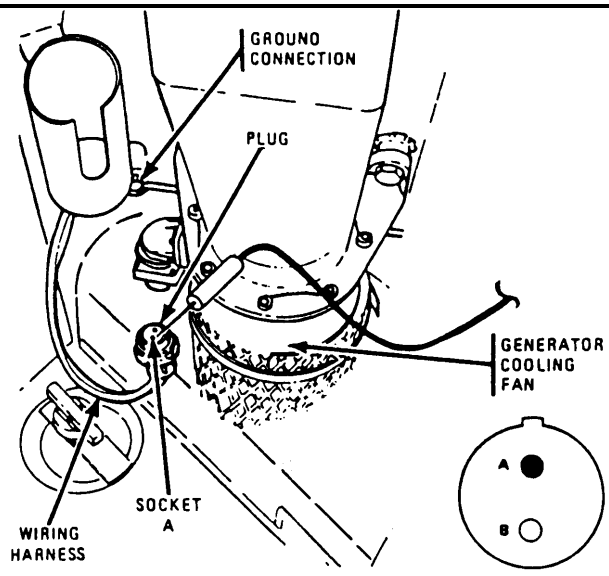


ELECTRICAL DIAGRAM

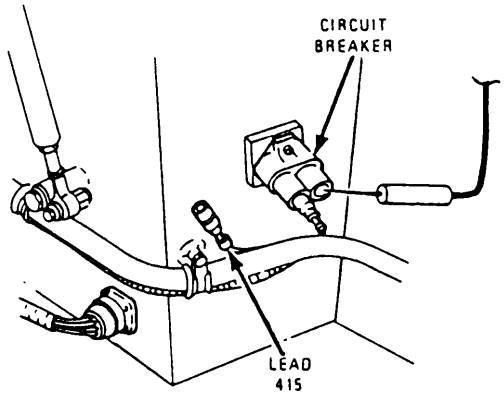


Step 1. Disconnect wiring harness from generator cooling fan. Check continuity between plug socket B (lead GND) and ground. If no continuity exists, repair lead GND between plug and ground. Refer to page 2-371. If continuity exists, go to step 2. Connect wiring harness to generator cooling fan.

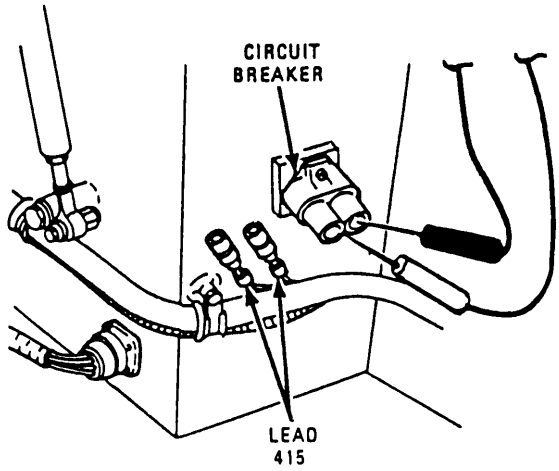
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



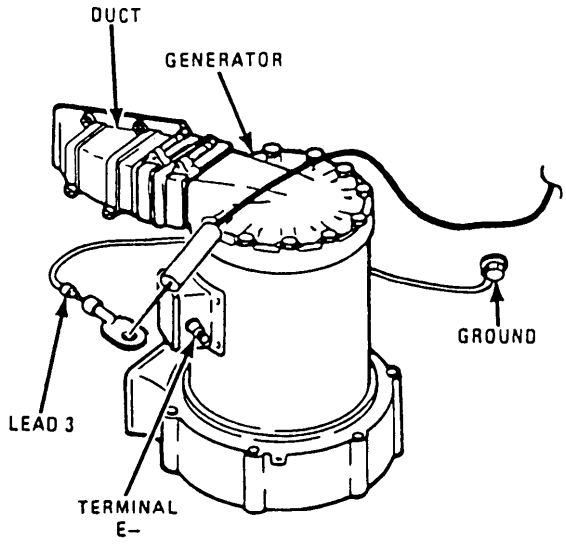
Step 2. Disconnect wiring harness from generator cooling fan. Place red probe in plug socket A (lead 415). Ground black probe. Start engine and run at 650 rpm. Check voltage and stop engine. If multimeter indicates about 24 volts, replace generator cooling fan. Refer to page 2-552. If multimeter does not indicate about 24 volts, go to step 3. Connect wiring harness to generator cooling fan.



Step 3. To access circuit breaker, remove hull transmission compartment deck assembly. Refer to page 2-938. Disconnect leads 415 from circuit breaker (near engine disconnect). Start engine and run at 650 rpm. Check voltage and stop engine. If multimeter indicates about 24 volts, go to step 4. If multimeter indicates no voltage, repair lead 415 from generator to circuit breaker. Refer to page 2-371.

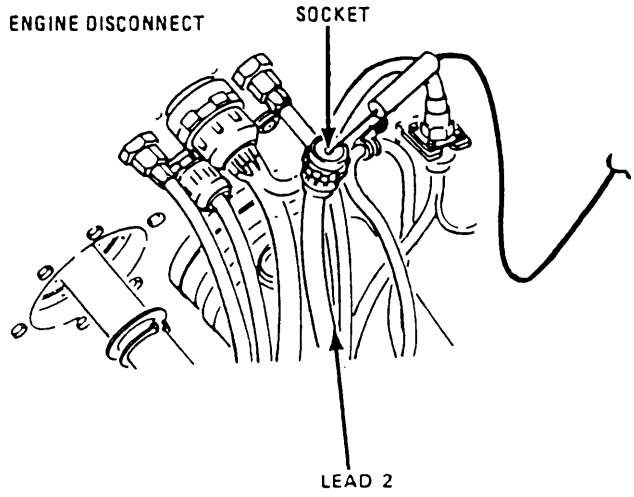


Step 4. Disconnect leads 415 from circuit breaker. Connect multimeter to circuit breaker receptacles. If multimeter indicates continuity, go to step 5. If multimeter indicates infinity, replace circuit breaker. Refer to page 2-584. Connect leads.

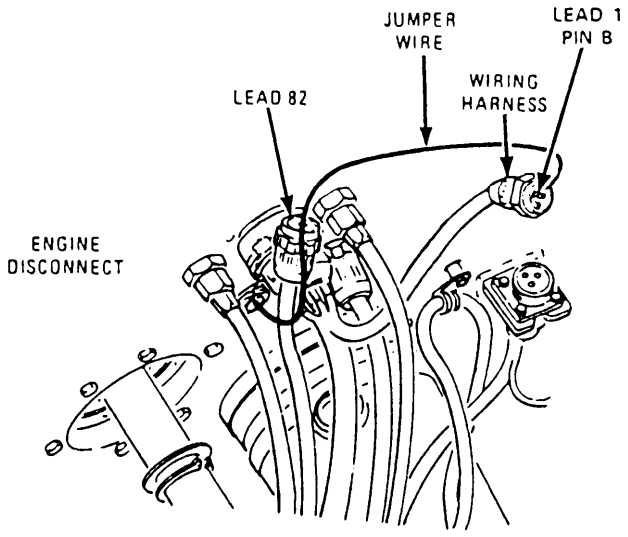


Step 5. To access generator, remove hull engine compartment deck assembly lid, refer to page 2-935; and remove radiator support beam, refer to page 2-525. Disconnect lead 3 from generator terminal E-. Check continuity between lead 3 and ground. If continuity exists, go to step 6. If no continuity exists, repair or replace lead 3 between generator and ground. Refer to page 2-371. Connect lead 3 to generator terminal E-.

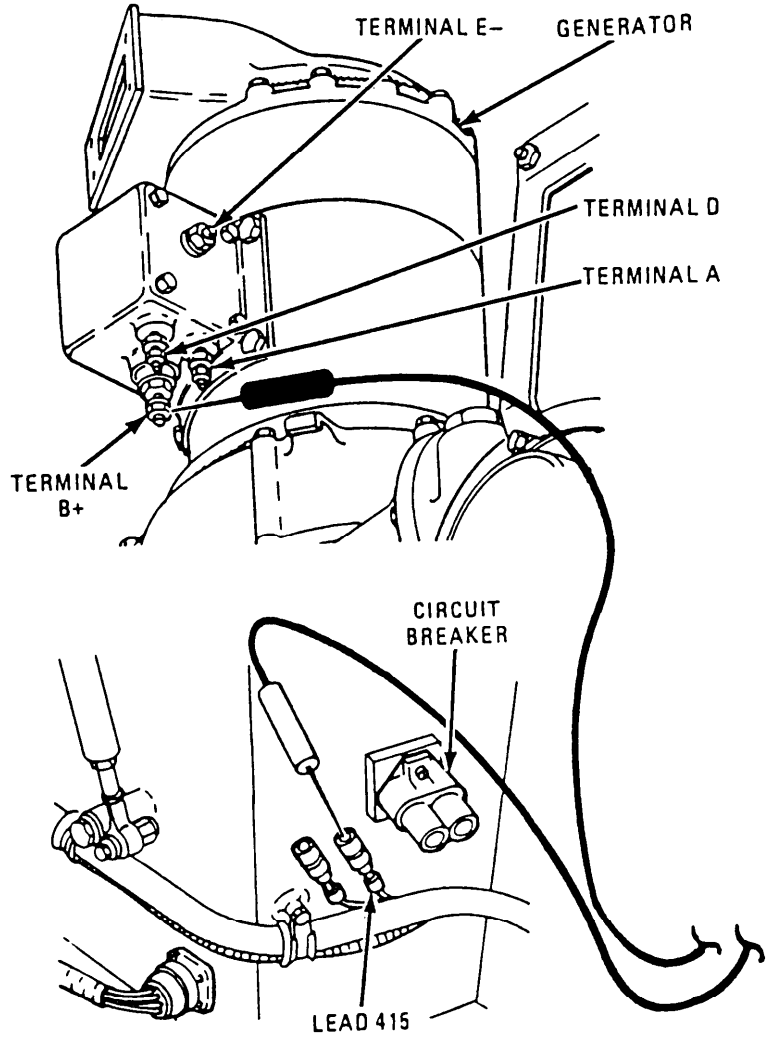
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 6. Disconnect electrical lead (lead 2) at engine disconnect. Place red probe in socket. Ground black probe. Start engine and run at 650 rpm. Check voltage and stop engine. If multimeter indicates 24 to 29 volts, go to step 8. If multimeter indicates no or low voltage, go to step *7.* Connect lead.

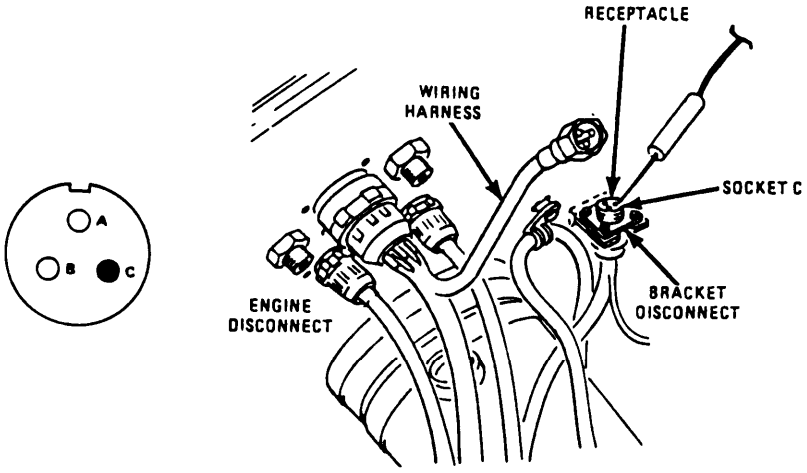


Step 7. Disconnect electrical lead (lead 82) and wiring harness at engine disconnect. Place insulated jumper wire to pin B (lead 1). Set MASTER switch ON. Strike jumper wire to socket (lead 82). Connect leads and go back to step 6. Set MASTER switch OFF.

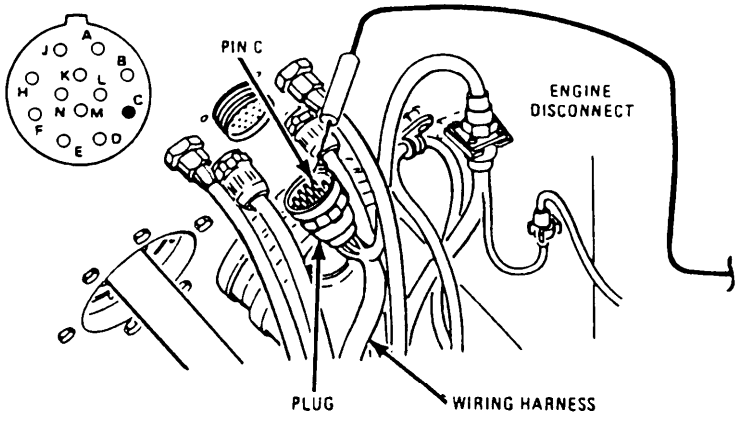


Step 8. Disconnect leads 415 from circuit breaker (near engine disconnect). Check continuity between generator terminal B+ and each lead 415. If continuity exists in one lead 415, go to step 9. If no continuity exists in one lead 415, repair lead 415 between circuit breaker and generator. Refer to page 2-371. Connect leads 415 to circuit breaker (near engine disconnect).

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

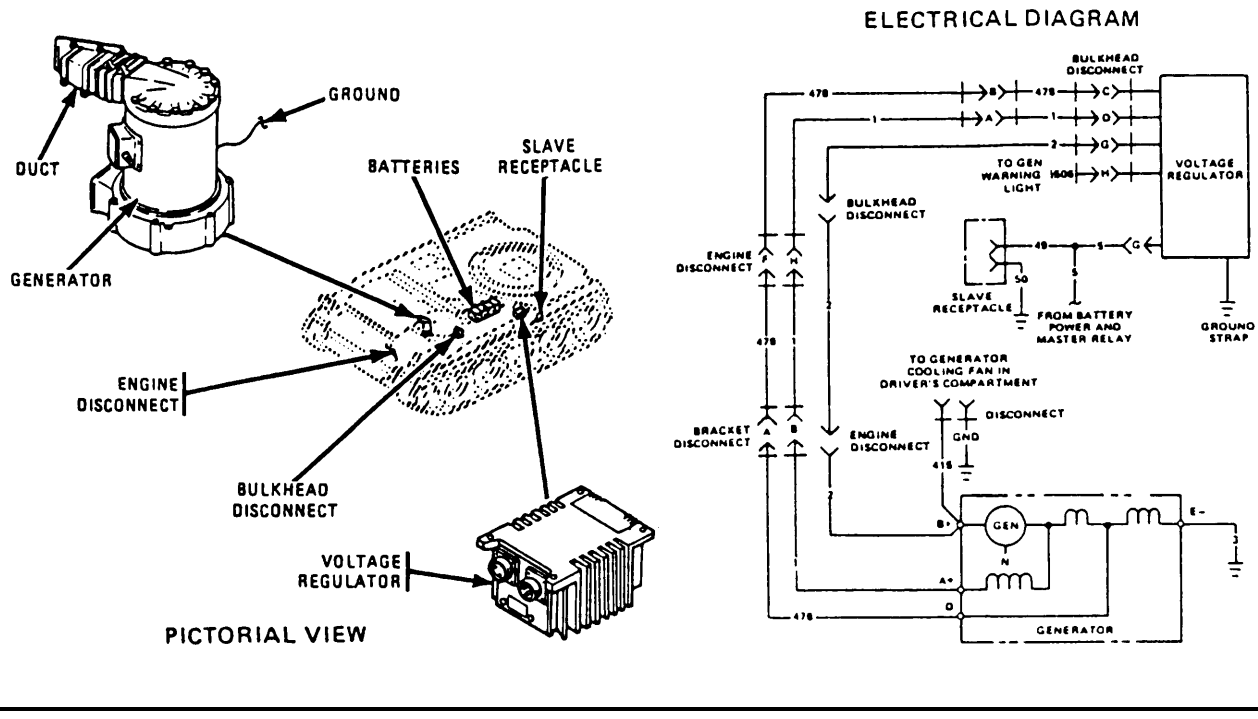


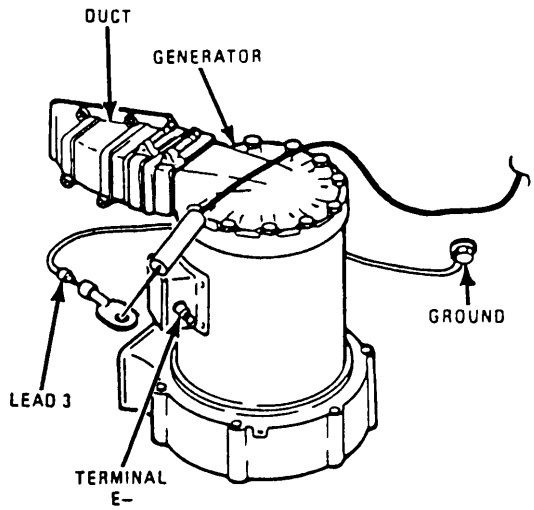
Step 9. Disconnect wiring harness at bracket disconnect (near engine disconnect). Check resistance between receptacle socket C (lead 415) and ground. If multimeter indicates 0 to 4 ohms, go to step 10. If multimeter indicates more than 4 ohms, repair lead 415 between circuit breaker and bracket disconnect, refer to page 2-371; or replace generator cooling fan, refer to page 2-552. Connect wiring harness at bracket disconnect (near engine disconnect).



Step 10. Disconnect wiring harness at engine disconnect. Check resistance between plug pin C (lead 415) and ground. If multimeter indicates 0 to 4 ohms, repair lead 415 between engine disconnect and generator cooling fan. Refer to page 2-371. If multimeter indicates more than 4 ohms, repair lead 415 between engine disconnect and bracket disconnect, refer to page 2-371; or replace generator cooling fan, refer to page 2-552. Connect wiring harness at engine disconnect.

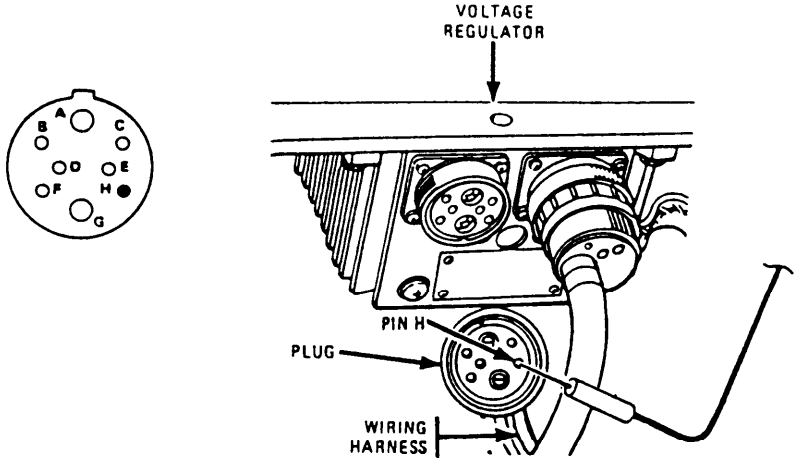
H. GENERATOR OUTPUT CIRCUIT.



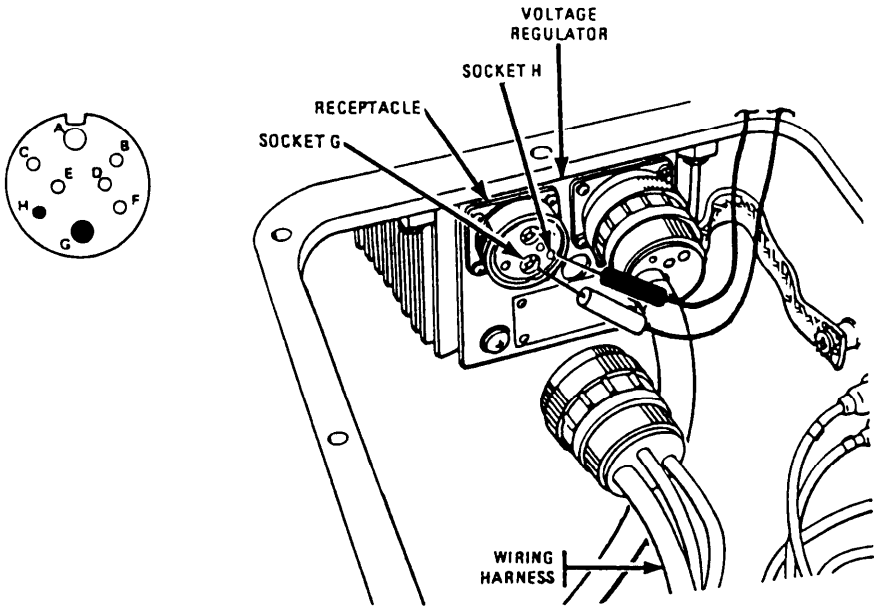


Step 1. To access generator, remove hull engine compartment deck assembly lid, refer to page 2-935; and remove radiator support beam, refer to page 2-525. Disconnect lead 3 from generator terminal E-. Check continuity between lead 3 and ground. If continuity exists, go to step 2. If no continuity exists, repair lead 3 between generator and ground. Connect lead 3 to generator terminal E-.

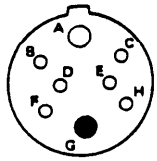
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

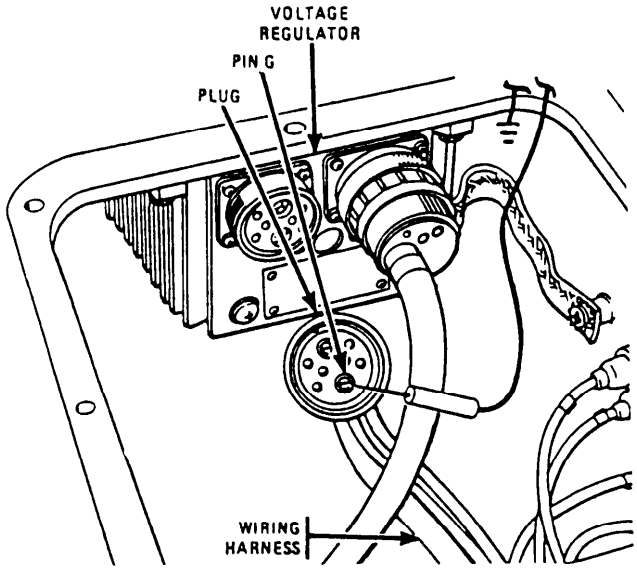


Step 2. To access voltage regulator, remove left CO_2 cylinder access cover. Refer to page 2-923. Disconnect wiring harness from voltage regulator. Place red probe on plug pin H (lead 506). Ground black probe. Set MASTER and INST switches ON. If multimeter indicates about 24 volts, go to step 3. If multimeter indicates no voltage, troubleshoot generator warning light circuit. Refer to page 2-177. Connect wiring harness to voltage regulator. Set MASTER and INST switches OFF.

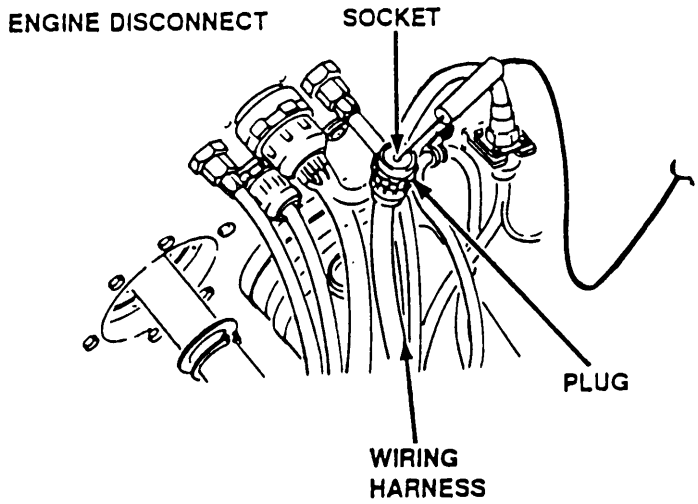


Step 3. Check continuity between receptacle sockets G (lead 2) and H (lead 506) on voltage regulator. If continuity exists, go to step 4. If no continuity exists, replace voltage regulator. Refer to page 2-557.



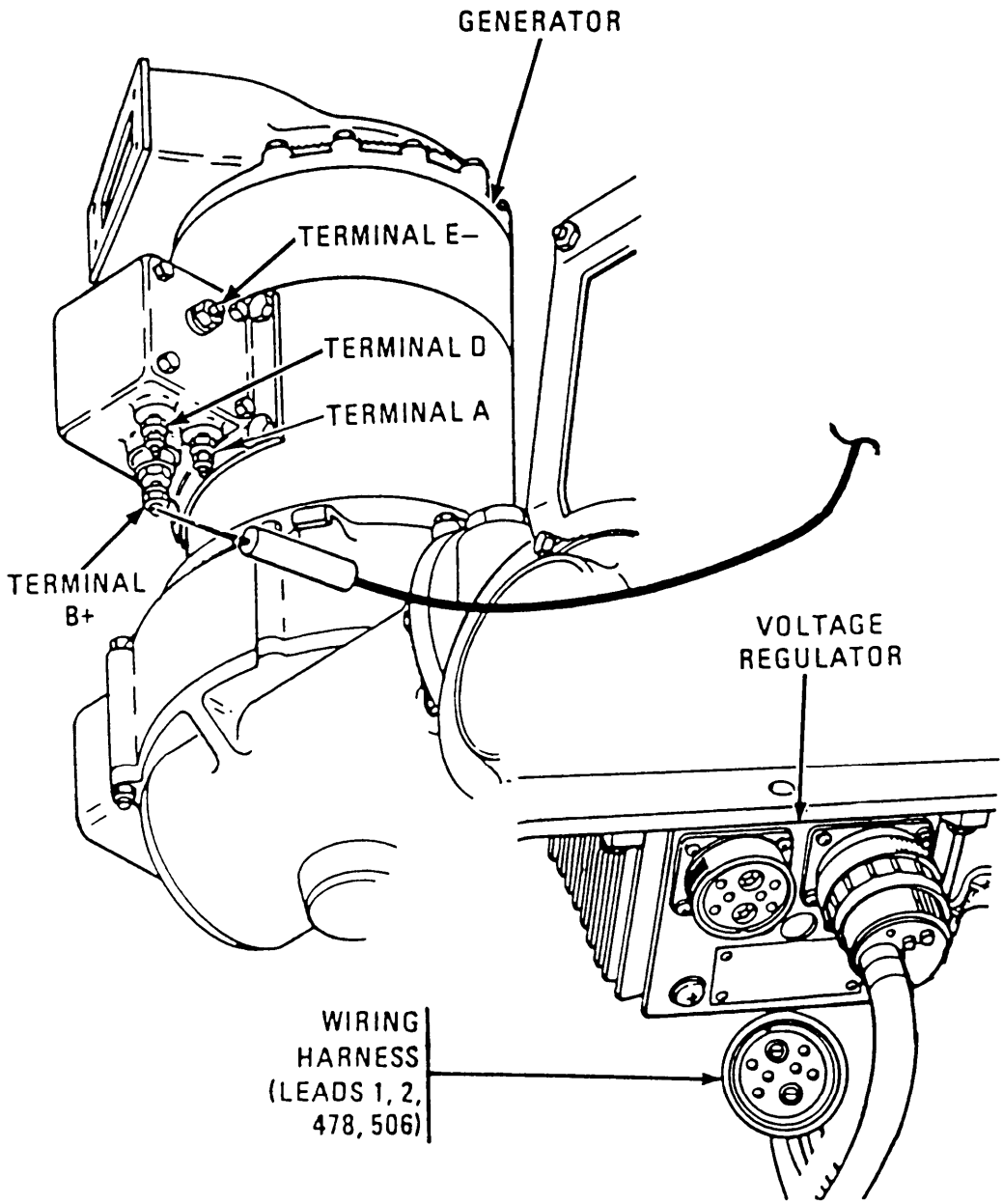


Step 4. Check resistance between plug pin G (lead 2) and ground. If multimeter indicates 0 to 4 ohms, go to step 8. If multimeter indicates more than 4 ohms, go to step 5. Connect wiring harness to voltage regulator.

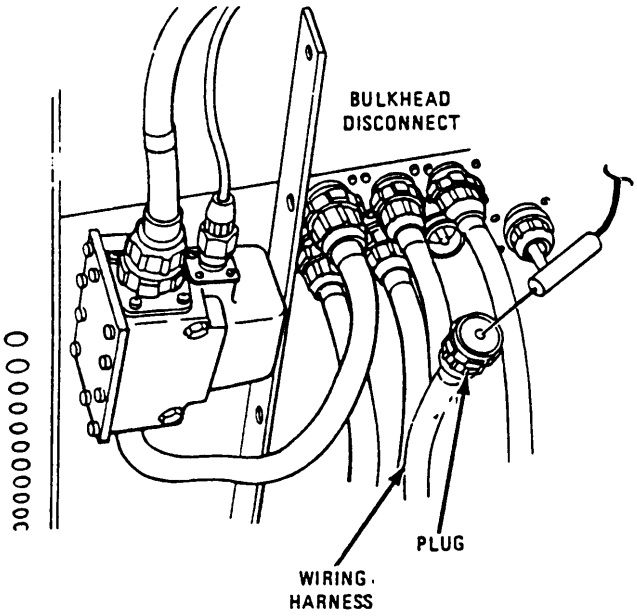


Step 5. To access engine disconnect, remove hull transmission compartment deck assembly. Refer to page 2-938. Disconnect wiring harness at engine disconnect. Check resistance between plug socket (lead 2) and ground. If multimeter indicates 0 to 4 ohms, go to step 6. If multimeter indicates more than 4 ohms, go to step 7. Connect wiring harness at engine disconnect.

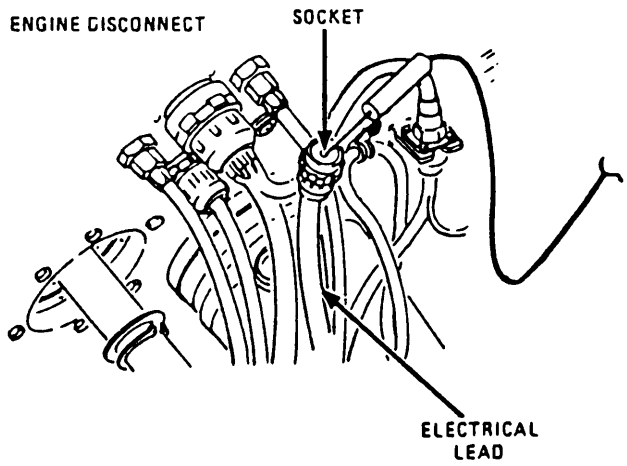
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 6. Disconnect wiring harness (leads 1, 2, 478, and 506) from voltage regulator. Disconnect leads 415 and GND from generator cooling fan at disconnect in driver's compartment. Check resistance between generator terminal B+ and ground. If multimeter indicates 0 to 4 ohms, go to step 8. If multimeter indicates more than 4 ohms, replace generator. Refer to page 2-552. Connect leads 415 and GND to generator cooling fan at disconnect in driver's compartment. Connect wiring harness to voltage regulator.

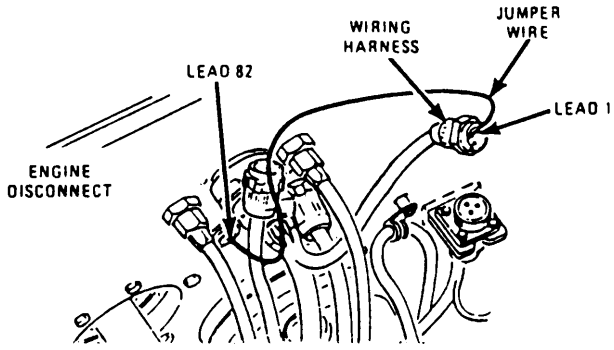


Step 7. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness at bulkhead disconnect. Check resistance between plug socket (lead 2) and ground. If multimeter indicates 0 to 4 ohms, repair lead 2 between bulkhead disconnect and voltage regulator. Refer to page 2-371. If multimeter indicates more than 4 ohms, repair lead 2 between bulkhead disconnect and engine disconnect. Refer to page 2-371. Connect wiring harness at bulkhead disconnect.



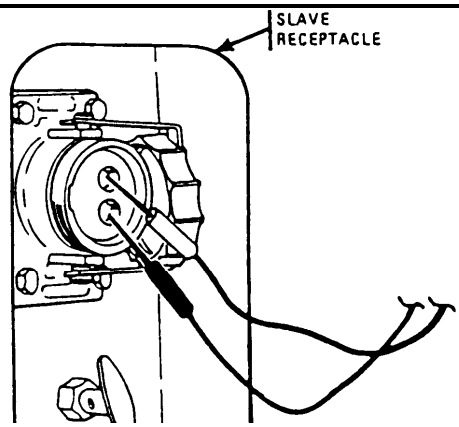
Step 8. Disconnect electrical lead at engine disconnect. Place red probe in socket. Ground black probe. Start engine and run at 650 rpm. Check voltage and stop engine. If multimeter indicates 24 to 29 volts, go back to step 7. If multimeter indicates no or low voltage, go to step 9. Connect lead.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 9. Disconnect electrical lead (lead 82) and wiring harness at engine disconnect. Place insulated jumper wire to pin B (lead 1). Set MASTER switch ON. Strike jumper wire to socket (lead 82). Connect leads and go back to step 8. Set MASTER switch OFF.

I. GENERATOR-REGULATOR CHARGING CIRCUIT TEST.



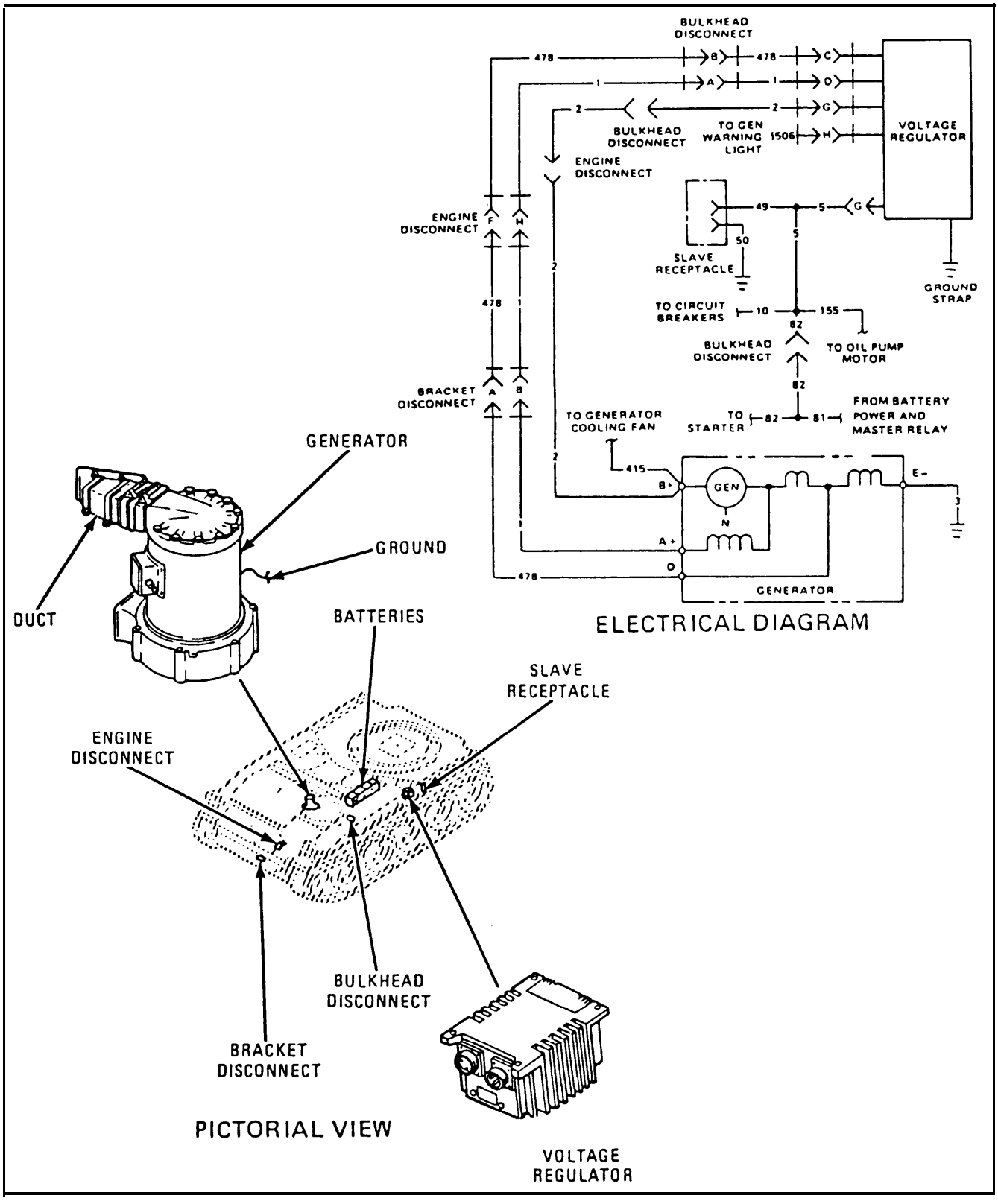
Step 1. Check voltage at slave receptacle terminals with engine running. Multimeter should indicate about 27 volts. If multimeter indicates less than 22 volts, stop engine. Troubleshoot battery power circuit. Refer to page 2-94.

Step 2. With engine running at 1000 to 1200 rpm, set vehicular light switch to SER DRIVE. Press headlight dimmer switch until HI BEAM IND light is on.

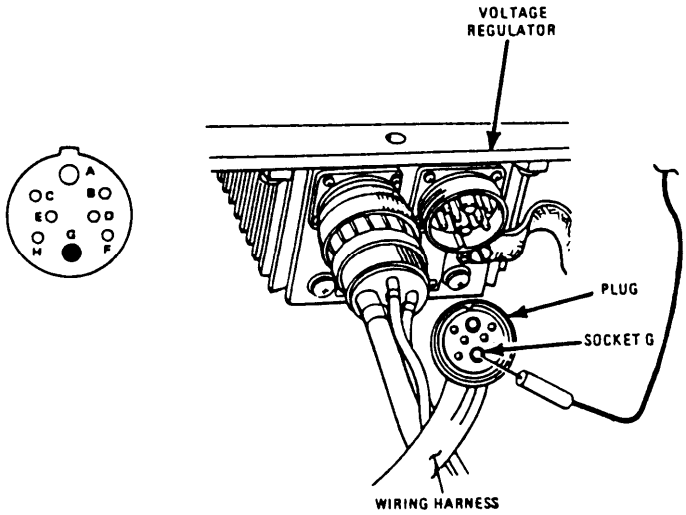
Step 3. Check voltage at slave receptacle with engine running. Multimeter reading should increase 1 to 3 volts above reading in step 1. If voltage increases above 29 volts, stop engine and troubleshoot generator output circuit for overcharging. Refer to page 2-133.

Step 4. If voltage increases momentarily and then drops back to first reading, generator-regulator charging circuit is not operating properly. Stop engine, turn vehicular light switch OFF, and troubleshoot generator charging circuit. Refer to page 2-139.

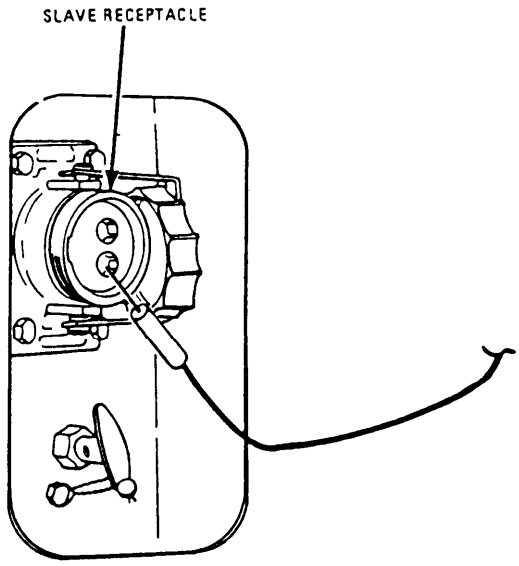
J. GENERATOR CHARGING CIRCUIT.



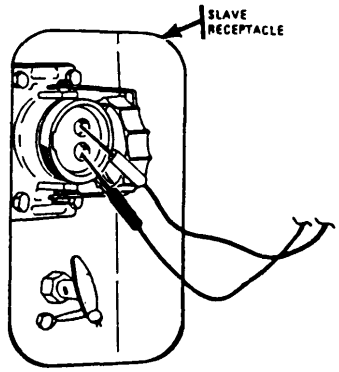
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 1. To access voltage regulator, remove left CO_2 cylinder access cover. Refer to page 2-923. Disconnect wiring harness from voltage regulator. Place red probe in plug socket G (lead 5). Ground black probe. Set MASTER switch ON. If multimeter indicates no voltage, go to step 2. If multimeter indicates about 24 volts, go to step 5. Set MASTER switch OFF. Connect wiring harness to voltage regulator.



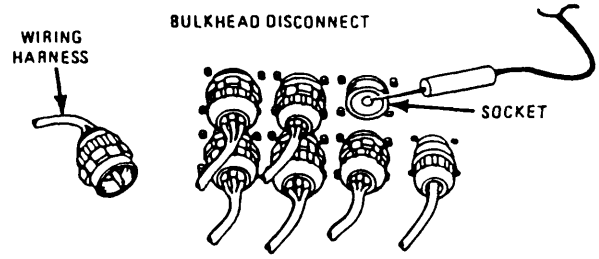
Step 2. Place red probe in socket (-) of slave receptacle. Ground black probe. If multimeter indicates continuity, go to step 3. If multimeter indicates no continuity, repair lead 50 between slave receptacle and ground (located above aft air cleaner centrifugal fan). Refer to page 2-371.



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. Place red probe in socket (+) of slave receptacle. Place black probe in socket (-) of slave receptacle. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 4. If multimeter indicates no voltage, repair lead 49 between slave receptacle and voltage regulator. Refer to page 2-371. Set MASTER switch OFF.

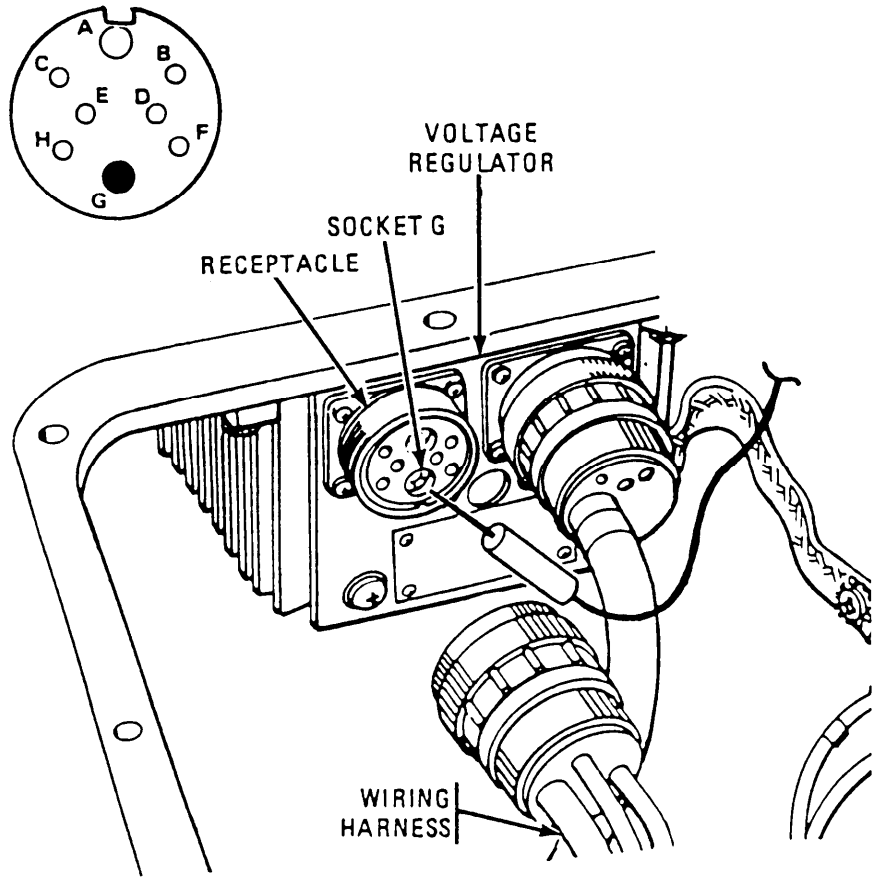


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 4. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness at bulkhead disconnect. Place red probe in socket (lead 2). Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 5. If multimeter indicates no voltage, repair lead 2 between bulkhead disconnect and generator-regulator. Refer to page 2-371. Set MASTER switch OFF. Connect wiring harness at bulkhead disconnect.

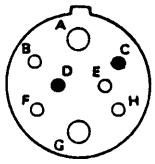
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

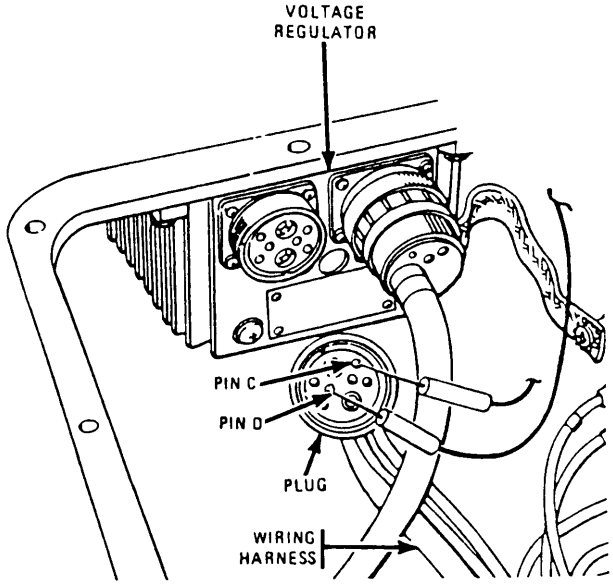


WARNING

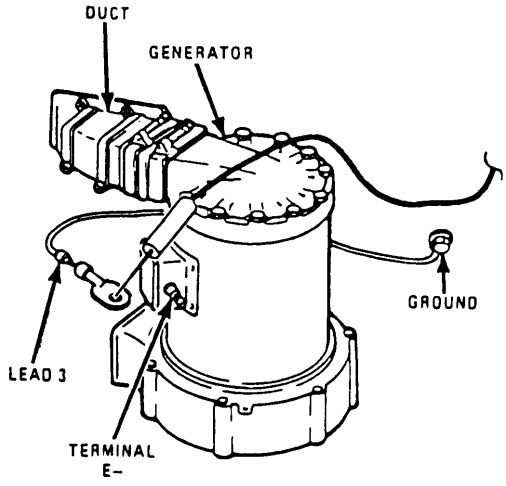
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 5. Disconnect wiring harness from voltage regulator. Place red probe in receptacle socket G (lead 2) of voltage regulator and ground black probe. Set MASTER switch ON. If multimeter indicates 0 to 2 volts, go to step 6. If multimeter indicates 3 or more volts, replace voltage regulator. Refer to page 2-557. Set MASTER switch OFF. If voltage regulator is replaced, connect wiring harness to voltage regulator and perform generator-regulator charging circuit test. Refer to page 2-138.



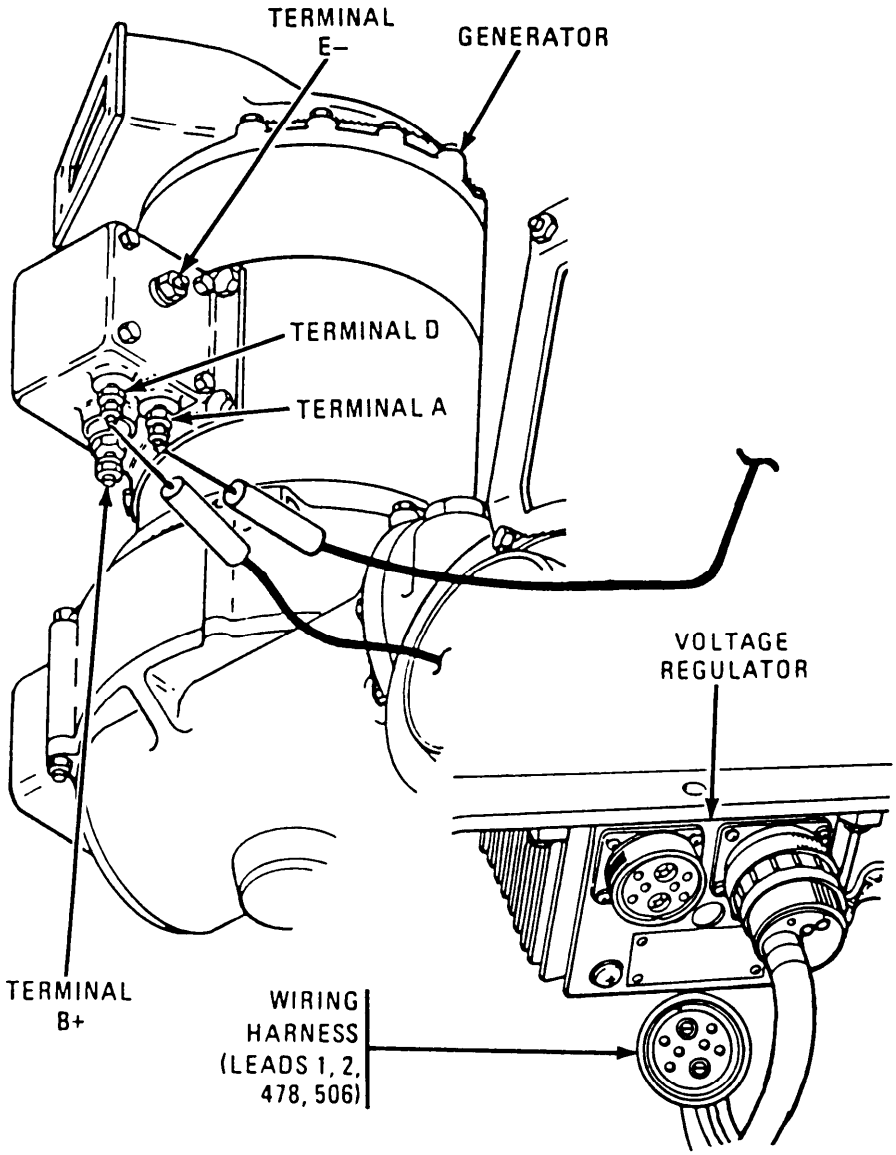


Step 6. Check resistance between plug pin C (lead 478) and ground. Check resistance between plug pin D (lead 1) and ground. If multimeter indicates 0 to 4 ohms on each pin, go to step 12. If multimeter indicates more than 4 ohms on one or both pins, go to step 7. Connect wiring harness to voltage regulator.

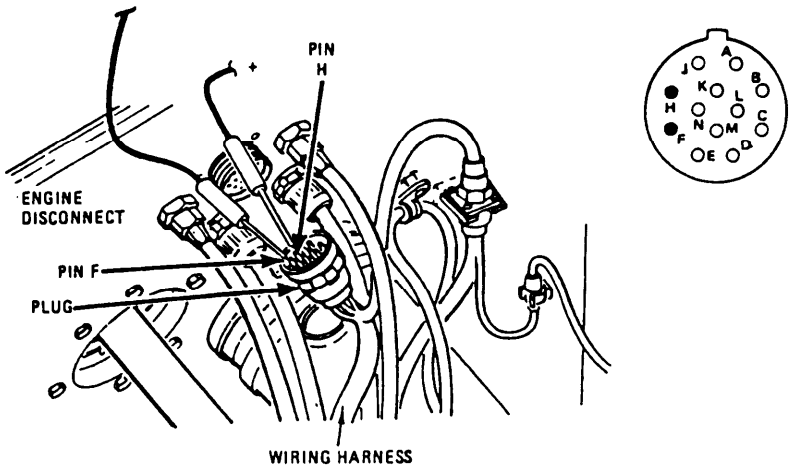


Step 7. To access generator, remove hull engine compartment deck assembly lid, refer to page 2-935; and remove radiator support beam, refer to page 2-525. Disconnect lead 3 from generator terminal E-. Check continuity between lead 3 and ground. If continuity exists, go to step 8. If no continuity exists, repair lead 3 between generator and ground. Refer to page 2-371. Connect lead 3 to generator terminal E-.

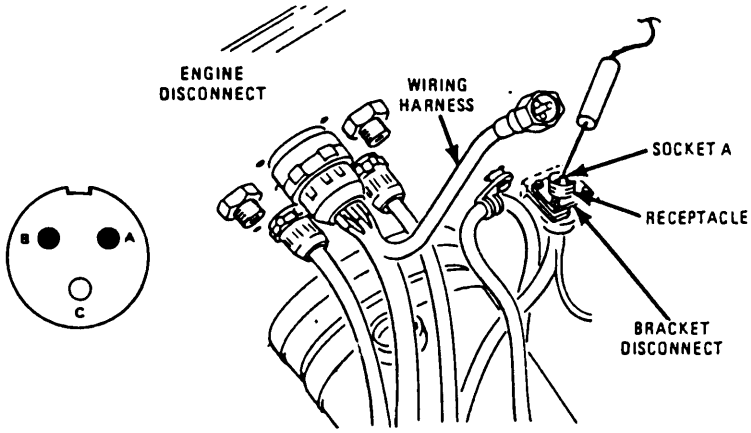
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 8. Disconnect wiring harness (leads 1, 2, 478, and 506) from voltage regulator. Check resistance between generator terminal A and ground, and between generator terminal D and ground. If multimeter indicates 0 to 4 ohms on both terminals, go to step 9. If multimeter indicates more than 4 ohms on one or both terminals, replace generator. Refer to page 2-552. Connect wiring harness to voltage regulator.

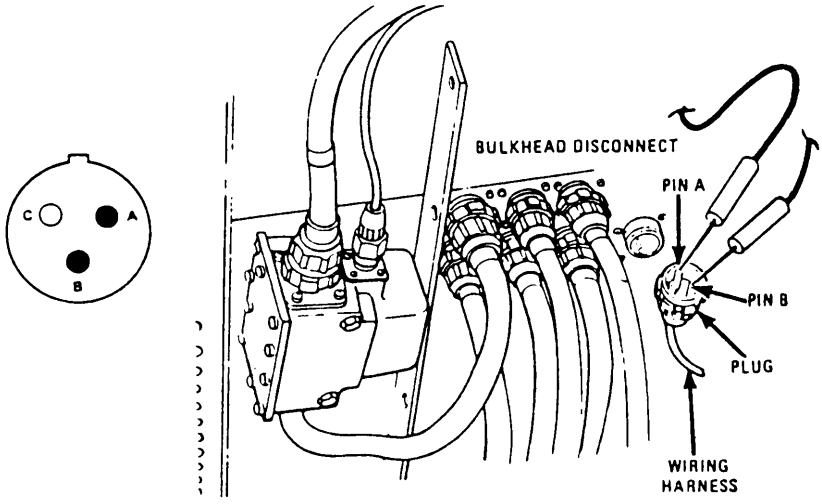


Step 9. To access engine disconnect, remove hull transmission compartment deck assembly. Refer to page 2-938. Disconnect wiring harness at engine disconnect. Check resistance between plug pin F (lead 478) and ground. Check resistance between plug pin H (lead 1) and ground. If multimeter indicates 0 to 4 ohms on both pins, go to step 11. If multimeter indicates more than 4 ohms on one or both pins, go to step 10. Connect wiring harness at engine disconnect.

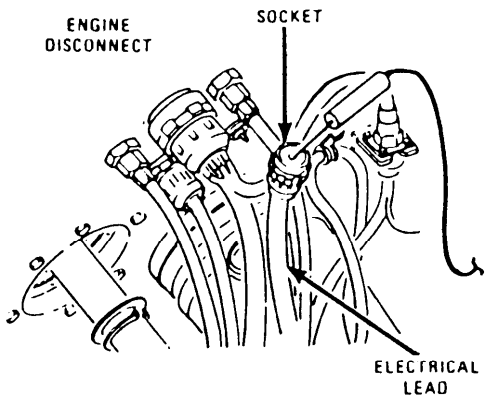


Step 10. Disconnect wiring harness at bracket disconnect (near engine disconnect). Check resistance between receptacle socket A (lead 478) and ground. Check resistance between receptacle socket B (lead 1) and ground. If multimeter indicates 0 to 4 ohms on pin A, repair lead 478 between bracket disconnect and engine disconnect. Refer to page 2-371. If multimeter indicates 0 to 4 ohms on pin B, repair lead 1 between bracket disconnect and engine disconnect. If multimeter indicates more than 4 ohms on pin A, repair lead 478 between bracket disconnect and generator. Refer to page 2-371. If multimeter indicates more than 4 ohms on pin B, repair lead 1 between bracket disconnect and generator. Refer to page 2-371. Connect wiring harness at bracket disconnect (near engine disconnect).

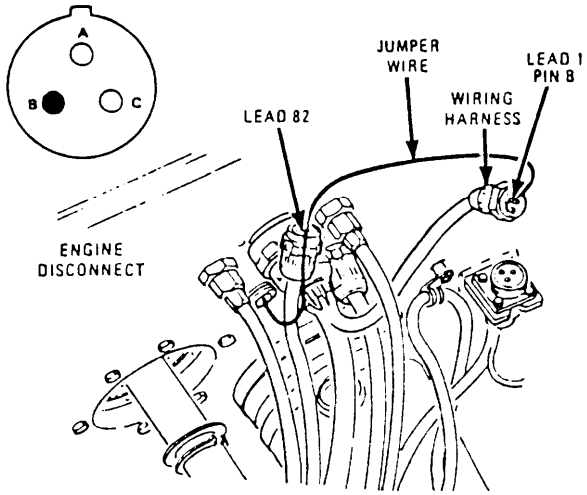
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



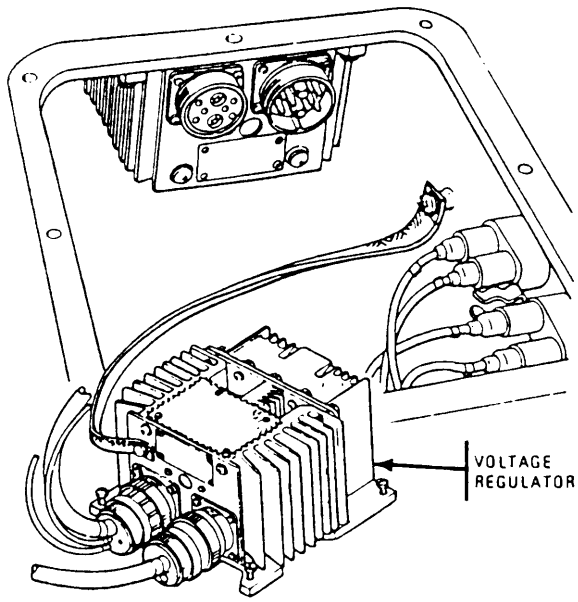
Step 11. Disconnect wiring harness at bulkhead disconnect. Check resistance between plug pin A (lead 1) and ground. Check resistance between plug pin B (lead 478) and ground. If multimeter indicates 0 to 4 ohms on pin A, repair lead 1 between bulkhead disconnect and voltage regulator. Refer to page 2-371. If multimeter indicates 0 to 4 ohms on pin B, repair lead 478 between bulkhead disconnect and voltage regulator. Refer to page 2-371. If multimeter indicates more than 4 ohms on pin A, repair lead 1 between bulkhead disconnect and engine disconnect. Refer to page 2-371. If multimeter indicates more than 4 ohms on pin B, repair lead 478 between bulkhead disconnect and engine disconnect. Refer to page 2-371. Connect wiring harness at bulkhead disconnect.



Step 12. Disconnect electrical lead at engine disconnect. Place red probe in socket. Ground black probe. Start engine and run at 650 rpm. Check voltage and stop engine. If multimeter indicates 24 to 29 volts, go back to step 7. If multimeter indicates no or low voltage, go to step 13. Connect lead.



Step 13. Disconnect electrical lead (lead 82) and wiring harness at engine disconnect. Place insulated jumper wire to pin B (lead 1). Set MASTER switch ON. Strike jumper wire to socket (lead 82). Connect leads and go back to step 12.

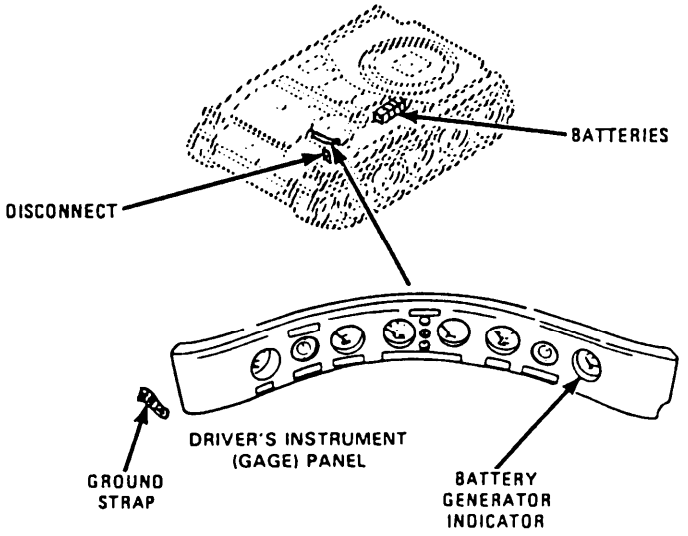


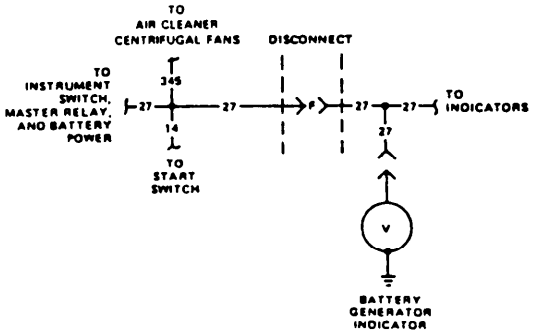
Step 14. Temporarily replace voltage regulator. Refer to page 2-557. Perform generator-regulator charging circuit test. Refer to page 2-138. If generator-regulator charging circuit operates properly, permanently replace voltage regulator. Refer to page 2-557. If generator-regulator charging circuit does not operate properly, remove temporary voltage regulator and replace generator. Refer to page 2-552. After replacing generator, perform generator-regulator charging circuit test. Refer to page 2-138.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

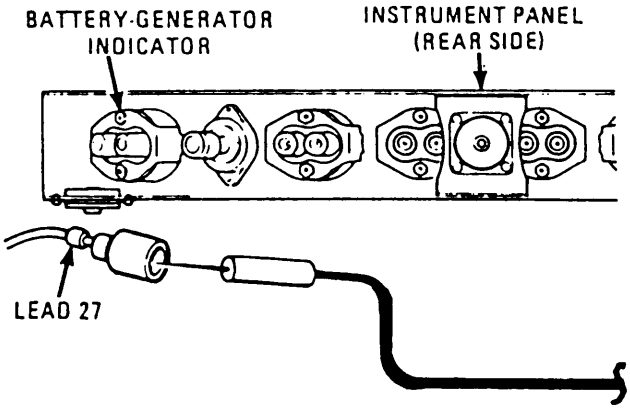
K. BATTERY-GENERATOR INDICATOR CIRCUIT.

PICTORIAL VIEW

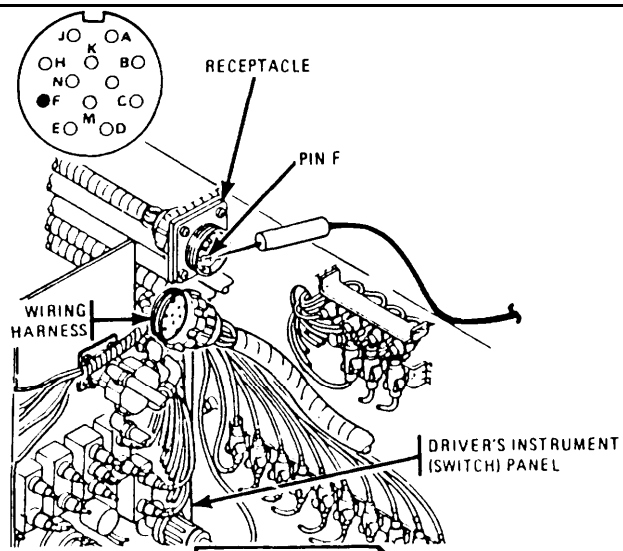




ELECTRICAL DIAGRAM



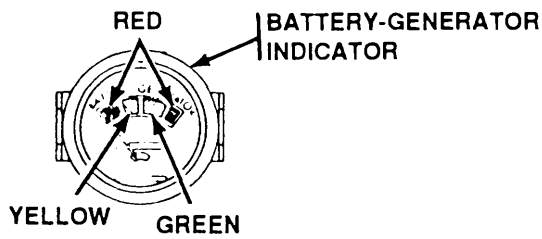
Step 1. To access indicators, remove driver's instrument (gage) panel. Refer to page 2-571. Disconnect lead 27 from BATTERY-GENERATOR indicator. Place red probe in lead 27. Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, connect lead 27 to BATTERY-GENERATOR indicator and go to step 2. If multimeter indicates about 24 volts, go to step 3. Set MASTER and INST switches OFF.



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Disconnect instrument (gage) panel wiring harness. Place red probe on pin F (lead 27) of receptacle. Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, repair lead 27 from INST switch to plug. Refer to page 2-371. If multimeter indicates about 24 volts, repair lead 27 from receptacle to instruments. Refer to page 2-371. Set MASTER and INST switches OFF. Connect wiring harness.



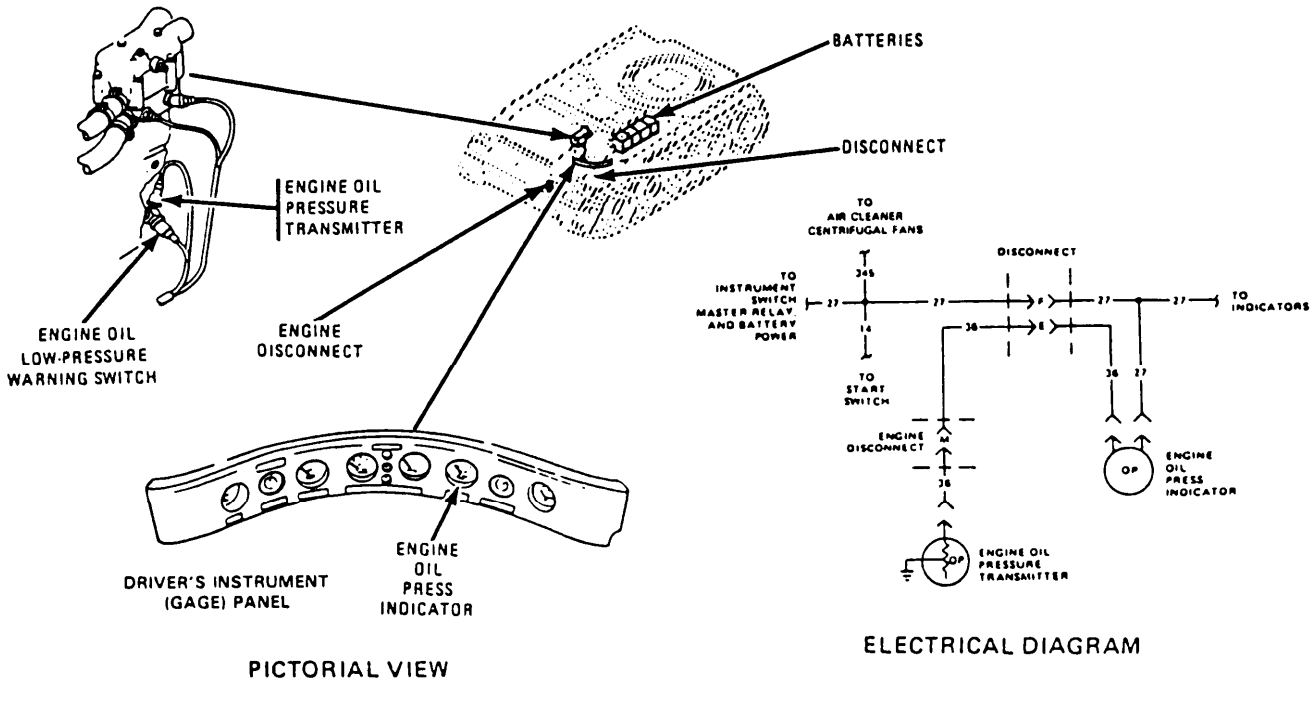
WARNING

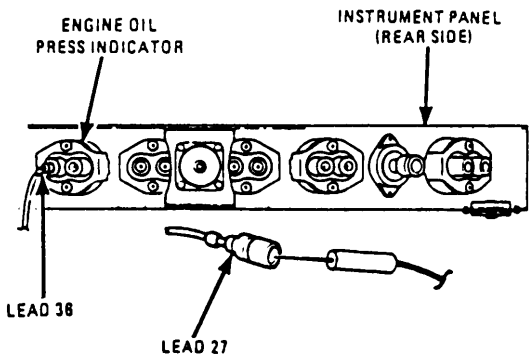
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. Connect lead 27 to BATTERY-GENERATOR indicator. Set MASTER and INST switches ON. If BATTERY-GENERATOR indicator needle is in yellow or green, BATTERY-GENERATOR indicator is reading correctly. If BATTERY-GENERATOR indicator needle is in red, replace BATTERY-GENERATOR indicator. Refer to page 2-571. Set MASTER and INST switches OFF.

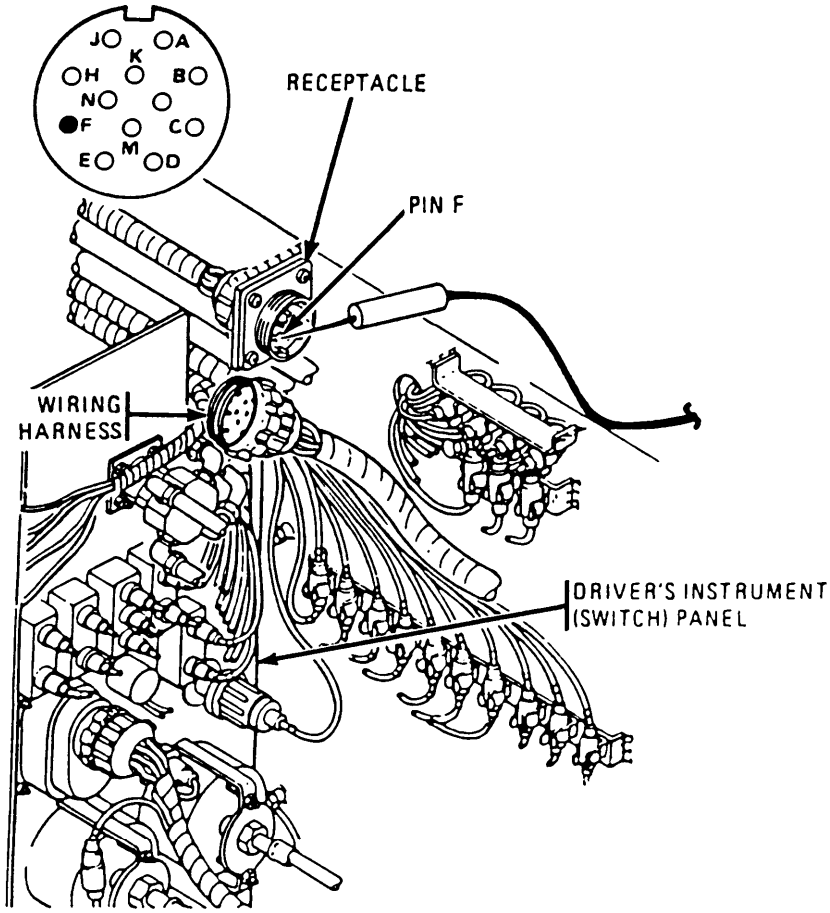
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

L. ENGINE OIL PRESSURE INDICATOR CIRCUIT.





Step 1. To access indicators, remove driver's instrument (gage) panel. Refer to page 2-571. Disconnect lead 27 from ENGINE OIL PRESS indicator. Place red probe in lead 27. Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, go to step 2. If multimeter indicates about 24 volts, go to step 3. Set MASTER and INST switches OFF. Connect lead 27 to ENGINE OIL PRESS indicator.

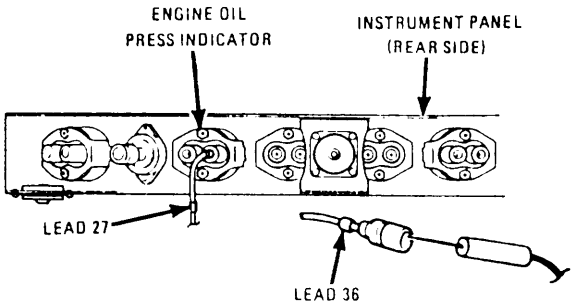


WARNING

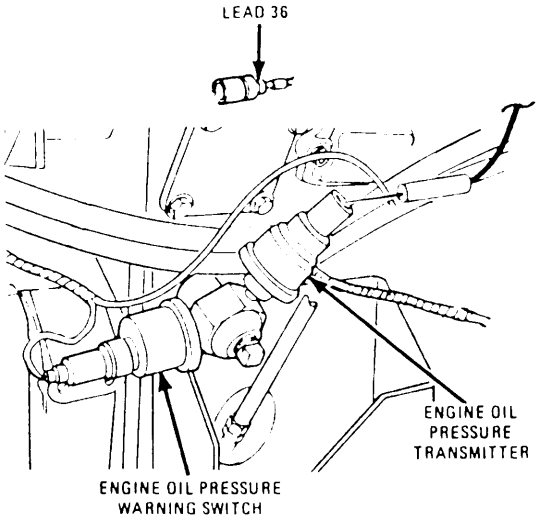
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Disconnect instrument (gage) panel wiring harness. Place red probe on pin F (lead 27) of receptacle. Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, repair lead 27 from INST switch to plug. Refer to page 2-371. If multimeter indicates about 24 volts, repair lead 27 from receptacle to instruments. Refer to page 2-371. Set MASTER and INST switches OFF. Connect wiring harness.

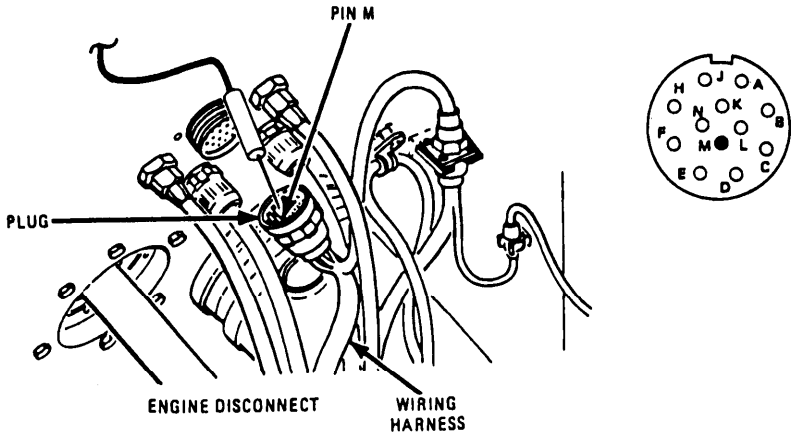
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



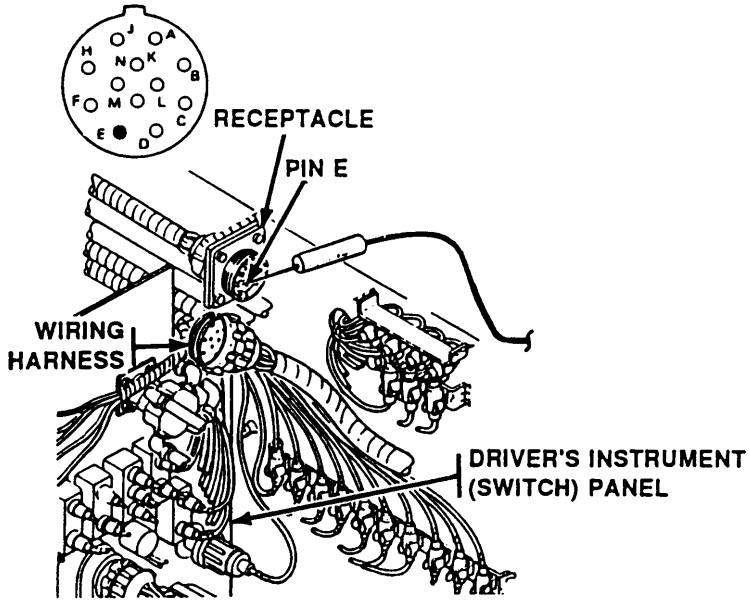
Step 3. Disconnect lead 36 from ENGINE OIL PRESS indicator. Place red probe in lead 36. Ground black probe. Start engine and run at 1000 to 1200 rpm. Check resistance and stop engine. If multimeter indicates about 0 ohms and then increases 10 to 16 ohms, replace ENGINE OIL PRESS indicator. Refer to page 2-571. If multimeter indicates 0 ohms, or increases to less than 10 ohms, go to step 4. Connect lead 36 to ENGINE OIL PRESS indicator.



Step 4. To access engine oil pressure transmitter, open engine fuel filter access door. Disconnect lead 36 from engine oil pressure transmitter. Place red probe in input terminal of engine oil pressure transmitter. Ground black probe. Start engine and run at 1000 to 1200 rpm. Check resistance and stop engine. If multimeter indicates 10 to 16 ohms, go to step 5. If multimeter indicates less than 10 ohms or more than 16 ohms, replace engine oil pressure transmitter. Refer to page 2-626. Connect lead 36 to engine oil pressure transmitter.



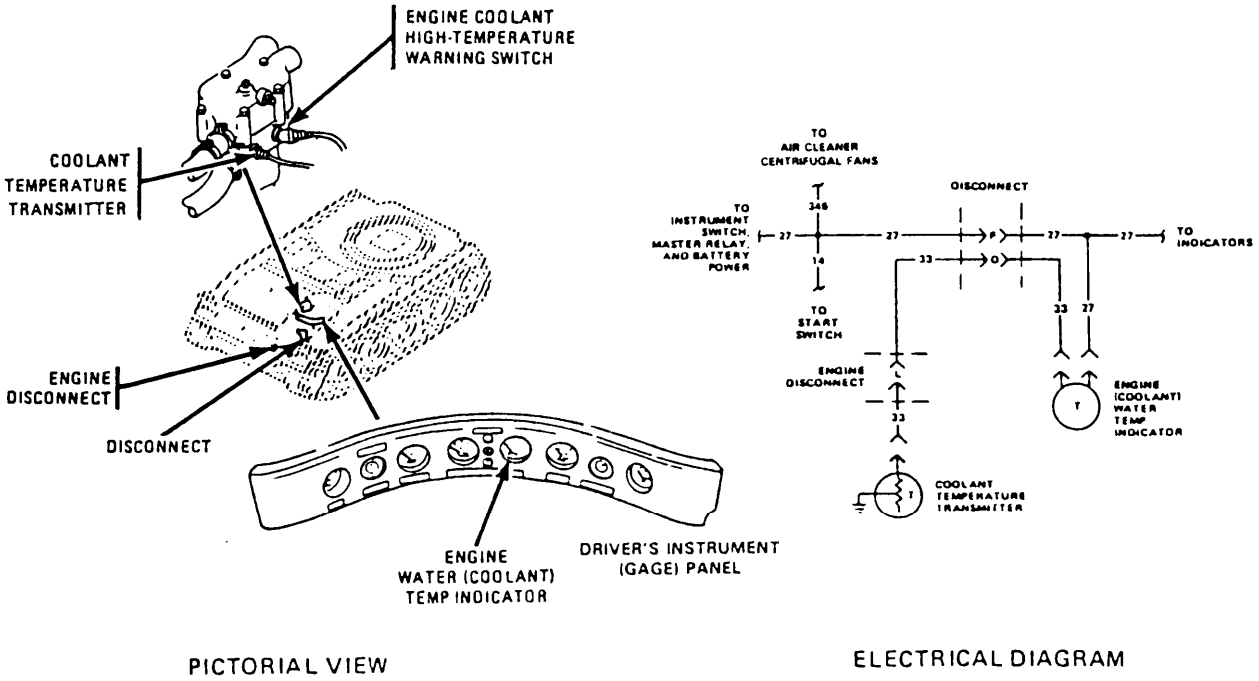
Step 5. To access engine disconnect, remove hull transmission compartment deck assembly. Refer to page 2-938. Disconnect wiring harness at engine disconnect. Place red probe on pin M (lead 36) of plug. Ground black probe. Start engine and run at 1000 to 1200 rpm. Check resistance and stop engine. If multimeter indicates less than 10 or more than 16 ohms, repair lead 36 between engine disconnect and engine oil pressure transmitter. Refer to page 2-371. If multimeter indicates 10 to 16 ohms, go to step 6. Connect wiring harness at engine disconnect.

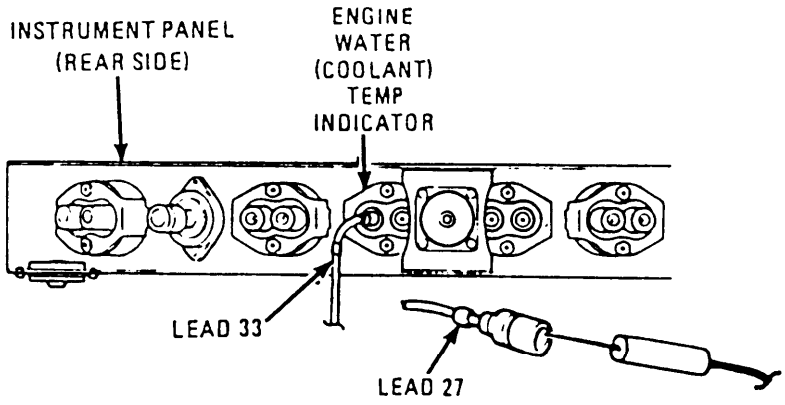


Step 6. Disconnect instrument (gage) panel wiring harness. Place red probe on pin E (lead 36) of receptacle. Ground black probe. Start engine and run at 1000 to 1200 rpm. Check resistance and stop engine. If multimeter indicates 10 to 16 ohms, repair lead 36 from receptacle to ENGINE OIL PRESS indicator. Refer to page 2-371. If multimeter indicates less than 10 ohms or more than 16 ohms, repair lead 36 from plug to engine disconnect. Refer to page 2-371. Connect wiring harness.

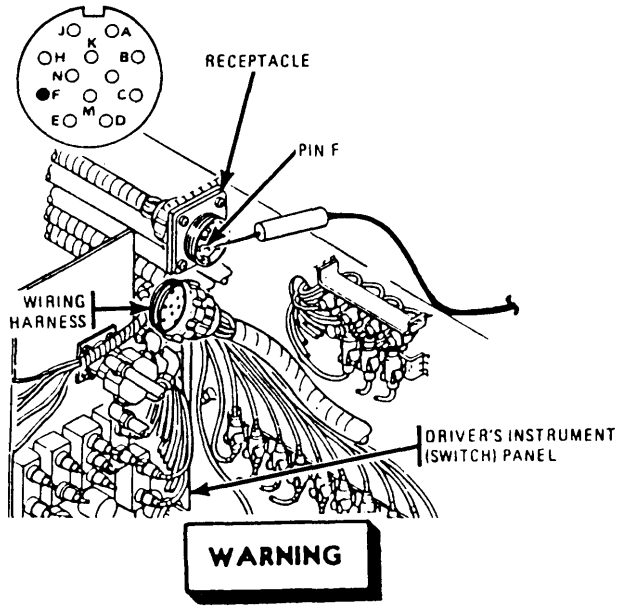
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

M. ENGINE COOLANT TEMPERATURE INDICATOR CIRCUIT.





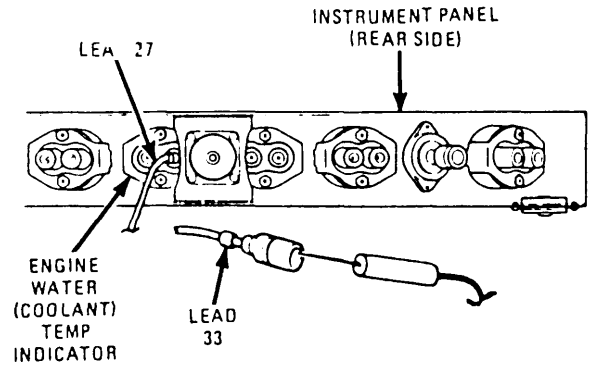
Step 1. To access indicators, remove driver's instrument (gage) panel. Refer to page 2-571. Disconnect lead 27 from ENGINE WATER (COOLANT) TEMP indicator. Place red probe in lead 27. Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, go to step 2. If multimeter indicates about 24 volts, go to step 3. Set MASTER and INST switches OFF. Connect lead 27 to ENGINE WATER (COOLANT) TEMP indicator.



WARNING

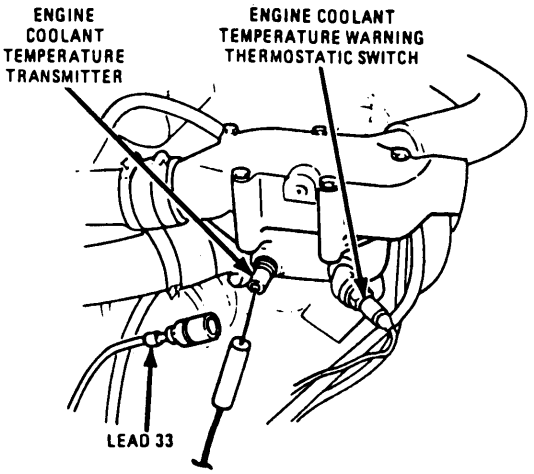
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Disconnect instrument (gage) panel wiring harness. Place red probe on pin F (lead 27) of receptacle. Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, repair lead 27 from INST switch to receptacle. Refer to page 2-371. If multimeter indicates about 24 volts, repair lead 27 from plug to instruments. Refer to page 2-371. Set MASTER and INST switches OFF. Connect wiring harness.

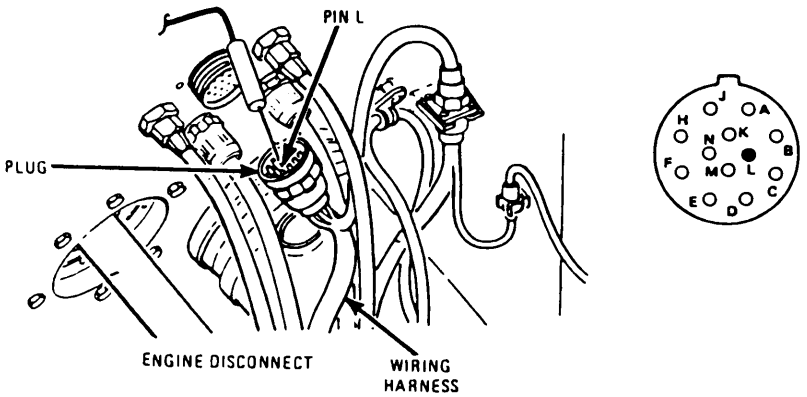


Step 3. Start engine and run at 1000 to 1200 rpm for 15 minutes or until engine reaches operating temperature. Stop engine. Disconnect lead 33 from ENGINE WATER (COOLANT) TEMP indicator. Place red probe in lead 33. Ground black probe. If multimeter indicates between 900 and 1000 ohms, replace ENGINE WATER (COOLANT) TEMP indicator. Refer to page 2-571. If multimeter indicates less than 900 ohms or more than 1000 ohms, go to step 4. Connect lead 33 to ENGINE WATER (COOLANT) TEMP indicator.

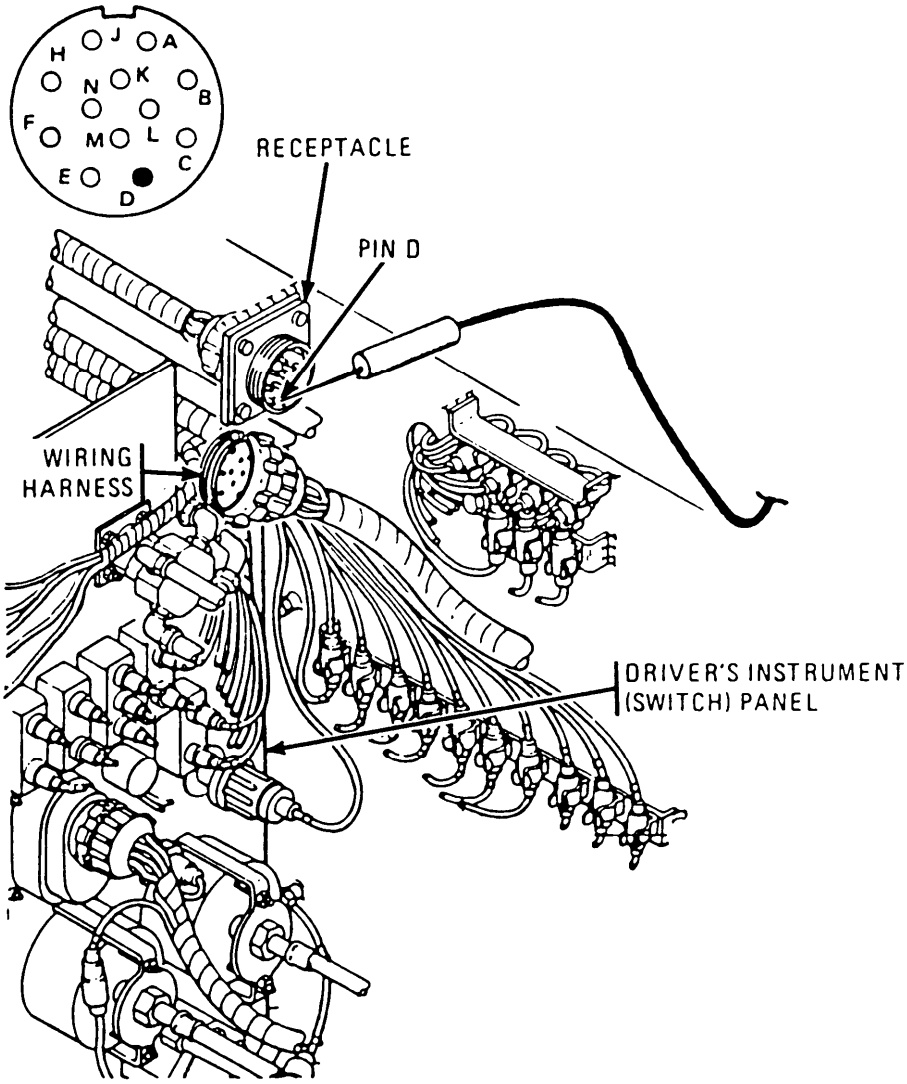
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 4. To access engine, remove hull engine compartment deck assembly lid. Refer to page 2-935. Disconnect lead 33 from engine coolant temperature transmitter. Engine must be at operating temperature. Place red probe in input terminal of engine coolant temperature transmitter. Ground black probe. If multimeter indicates between 900 and 1000 ohms, go to step 5. If multimeter indicates less than 900 ohms or more than 1000 ohms, replace engine coolant temperature transmitter. Refer to page 2-626. Connect lead 33 to engine coolant temperature transmitter.



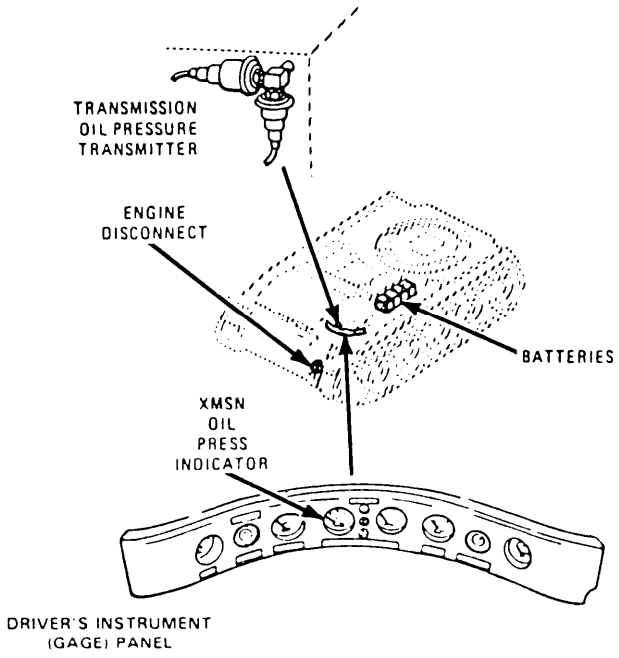
Step 5. To access engine disconnect, remove hull transmission compartment deck assembly. Refer to page 2-938. Disconnect wiring harness at engine disconnect. Engine must be at operating temperature. Place red probe on pin L (lead 33) of plug. Ground black probe. If multimeter indicates between 900 and 1000 ohms, go to step 6. If multimeter indicates less than 900 ohms or more than 1000 ohms, repair lead 33 between engine disconnect and engine coolant temperature transmitter. Refer to page 2-371. Connect wiring harness at engine disconnect.



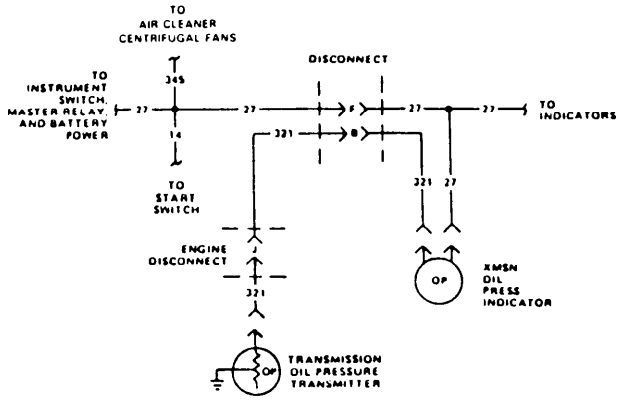
Step 6. Disconnect wiring harness from instrument (gage) panel. Engine must be at operating temperature. Place red probe on pin D (lead 33) of receptacle. Ground black probe. If multimeter indicates between 900 and 1000 ohms, repair lead 33 between plug and ENGINE WATER (COOLANT) TEMP indicator. Refer to page 2-371. If multimeter indicates less than 900 ohms or more than 1000 ohms, repair lead 33 between engine disconnect and receptacle. Refer to page 2-371. Connect wiring harness at disconnect to instrument (gage) panel.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

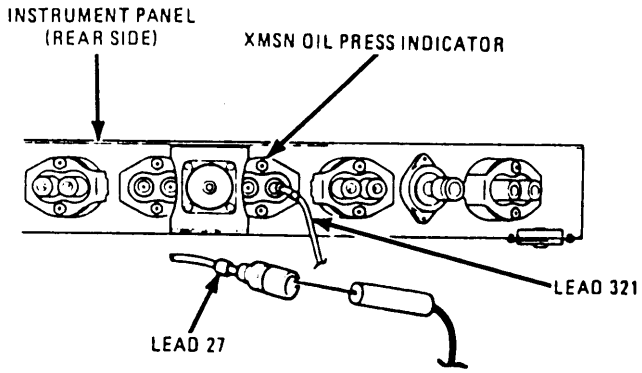
N. TRANSMISSION OIL PRESSURE INDICATOR CIRCUIT.



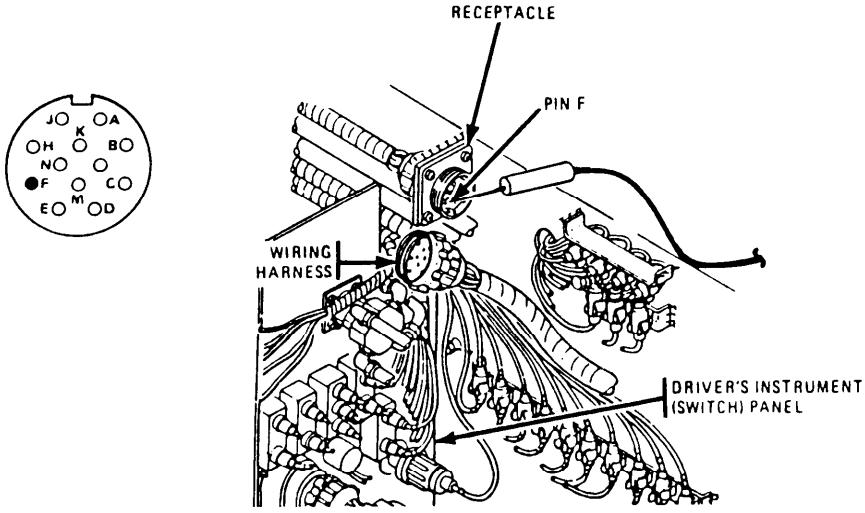
PICTORIAL VIEW



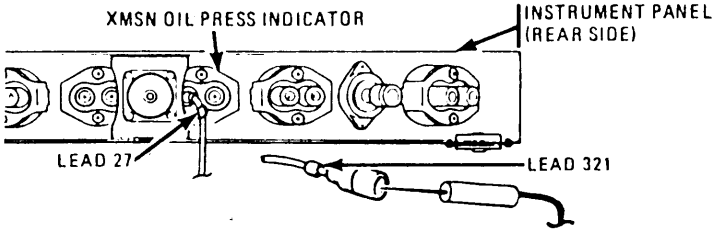
ELECTRICAL DIAGRAM



Step 1. To access indicators, remove driver's instrument (gage) panel. Refer to page 2-571. Disconnect lead 27 from XMSN OIL PRESS indicator. Place red probe in lead 27. Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, go to step 2. If multimeter indicates about 24 volts, go to step 3. Set MASTER and INST switches OFF. Connect lead 27 to XMSN OIL PRESS indicator.

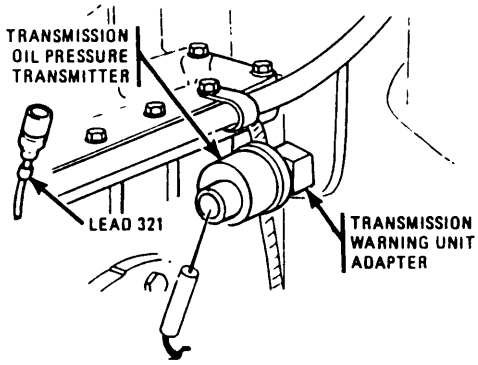


Step 2. Disconnect wiring harness from instrument (gage) panel. Place red probe on pin F (lead 27) of receptacle. Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, repair lead 27 from INST switch to plug. Refer to page 2-371. If multimeter indicates about 24 volts, repair lead 27 from receptacle to instruments. Refer to page 2-371. Set MASTER and INST switches OFF. Connect wiring harness to instrument (gage) panel.

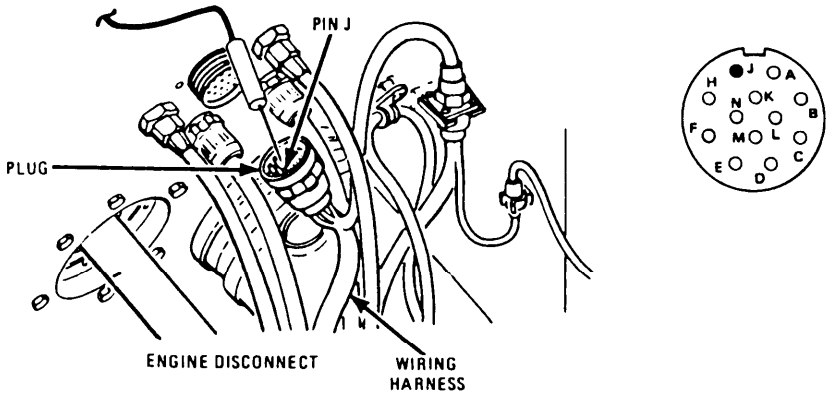


Step 3. Disconnect lead 321 from XMSN OIL PRESS indicator. Place red probe in lead 321. Ground black probe. Start engine and run at 1000 to 1200 rpm. If multimeter indicates 0 ohms and does not increase, or increases to more than 9 ohms, stop engine and go to step 4. If multimeter indicates 0 ohms and then increases 4 to 9 ohms, increase engine rpm to 1800. Check resistance and stop engine. If multimeter indicates 9 to 22 ohms, replace XMSN OIL PRESS indicator. Refer to page 2-571. If multimeter indicates less than 9 ohms or more than 22 ohms, go to step 4. Connect lead 321 to XMSN OIL PRESS indicator.

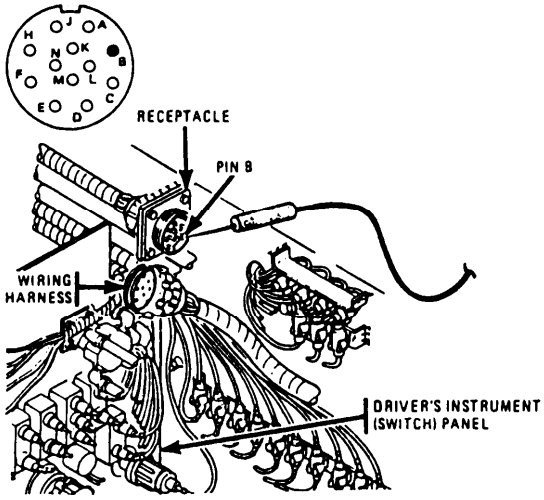
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 4. To access transmission and engine disconnect, remove hull transmission compartment deck assembly. Refer to page 2-938. Disconnect lead 321 from transmission oil pressure transmitter. Place red probe in input terminal of transmission oil pressure transmitter. Ground black probe. Start engine and run at 1000 to 1200 rpm. If multimeter indicates 0 ohms and does not increase, or increases to more than 9 ohms, stop engine and replace transmission oil pressure transmitter. Refer to page 2-626. If multimeter indicates 0 ohms and then increases 4 to 9 ohms, increase engine rpm to 1800. Check resistance and stop engine. If multimeter indicates 9 to 22 ohms, go to step 5. If multimeter indicates less than 9 ohms or more than 22 ohms, replace transmission oil pressure transmitter. Refer to page 2-626. Connect lead 321 to transmission oil pressure transmitter.

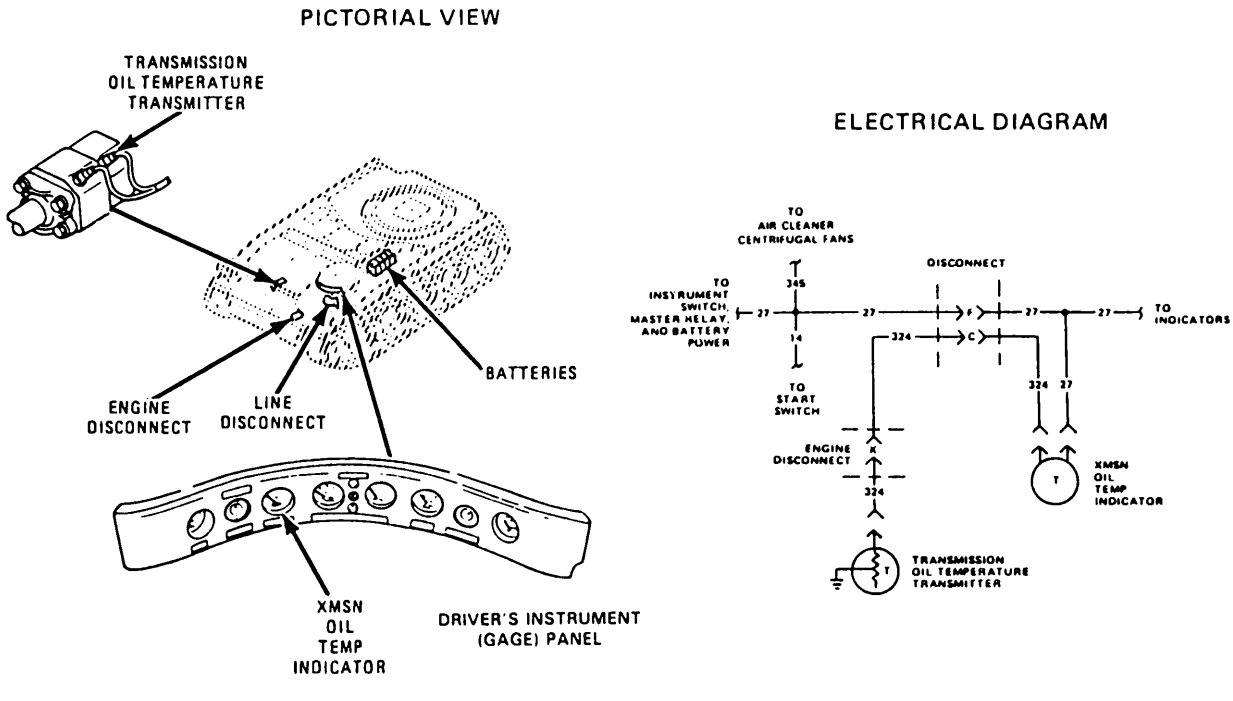


Step 5. Disconnect wiring harness at engine disconnect. Place red probe on pin J (lead 321) of plug. Ground black probe. Start engine and run at 1000 to 1200 rpm. Check resistance and stop engine. If multimeter indicates 4 to 9 ohms, go to step 6. If multimeter indicates less than 4 ohms or more than 9 ohms, repair lead 321 between engine disconnect and transmission oil pressure transmitter. Refer to page 2-371. Connect wiring harness at engine disconnect.

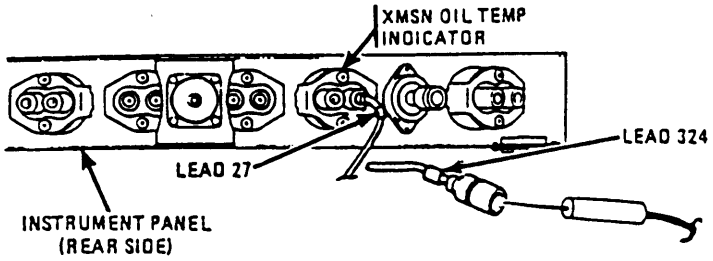


Step 6. Disconnect wiring harness from instrument (gage) panel. Place red probe on pin B (lead 321) of receptacle. Ground black probe. Start engine and run at 1000 to 1200 rpm. Check resistance and stop engine. If multimeter indicates 4 to 9 ohms, repair lead 321 between plug and XMSN OIL PRESS indicator. Refer to page 2-371. If multimeter indicates less than 4 ohms or more than 9 ohms, repair lead 321 between receptacle and engine disconnect. Refer to page 2-371. Connect wiring harness to instrument (gage) panel.

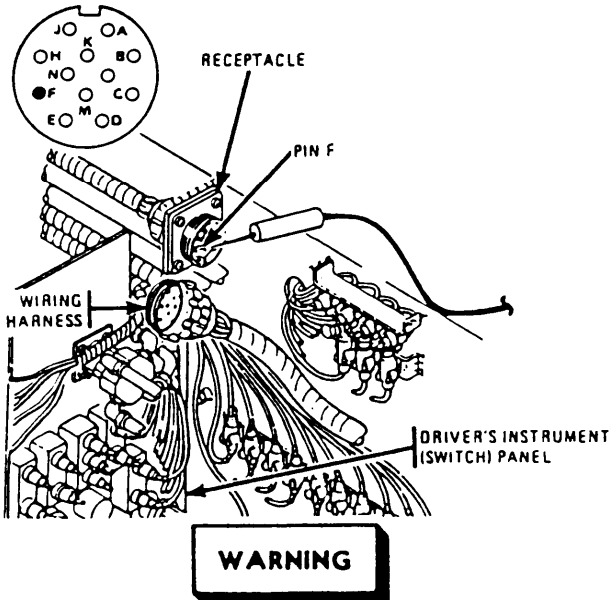
O. TRANSMISSION OIL TEMPERATURE INDICATOR CIRCUIT.



2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



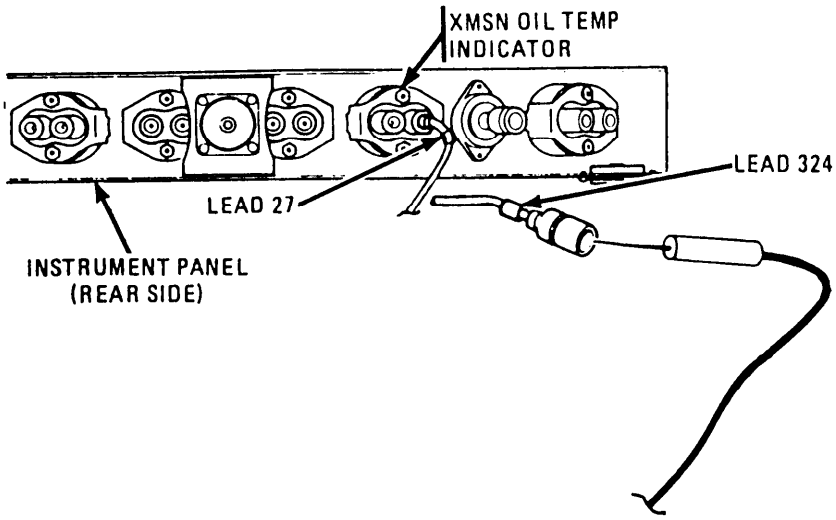
Step 1. To access indicators, remove driver's instrument (gage) panel. Refer to page 2-571. Disconnect lead 27 from XMSN OIL TEMP indicator. Place red probe in lead 27. Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, go to step 2. If multimeter indicates about 24 volts, go to step 3. Set MASTER and INST switches OFF. Connect lead 27 to XMSN OIL TEMP indicator.



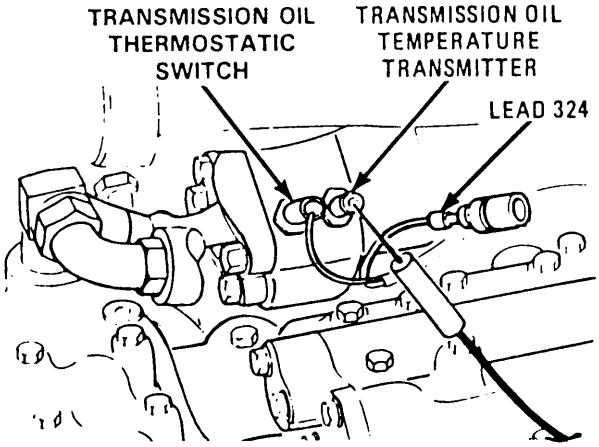
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Disconnect wiring harness from instrument (gage) panel. Place red probe on pin F (lead 27) of receptacle. Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, repair lead 27 from INST switch to receptacle. Refer to page 2-371. If multimeter indicates about 24 volts, repair lead 27 from plug to instruments. Refer to page 2-371. Set MASTER and INST switches OFF. Connect wiring harness to instrument (gage) panel.

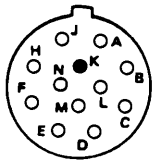


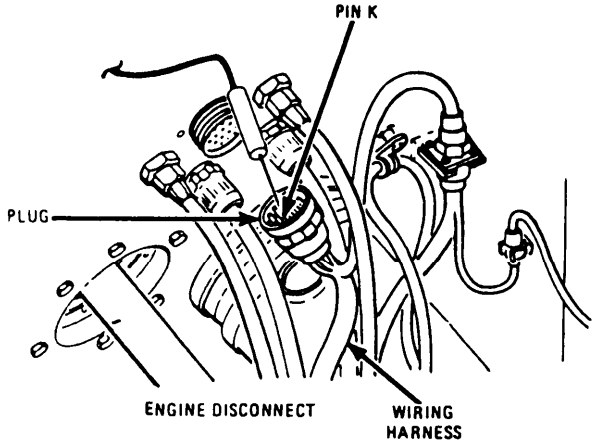
Step 3. Start engine and run at 1000 to 1200 rpm for 15 minutes or until engine reaches operating temperature. Stop engine. Disconnect lead 324 from XMSN OIL TEMP indicator. Place red probe in lead 324. Ground black probe. If multimeter indicates 600 to 900 ohms, replace XMSN OIL TEMP indicator. Refer to page 2-571. If multimeter indicates less than 600 ohms or more than 900 ohms, go to step 4. Connect lead 324 to XMSN OIL TEMP indicator.



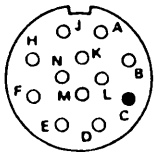
Step 4. To access transmission and engine disconnect, remove hull transmission compartment deck assembly. Refer to page 2-938. Disconnect lead 324 from transmission oil temperature transmitter. Engine must be at operating temperature. Place red probe in input terminal of transmission oil temperature transmitter. Ground black probe. If multimeter indicates 600 to 900 ohms, go to step 5. If multimeter indicates less than 600 ohms or more than 900 ohms, replace transmission oil temperature transmitter. Refer to page 2-626. Connect lead 324 to transmission oil temperature transmitter.

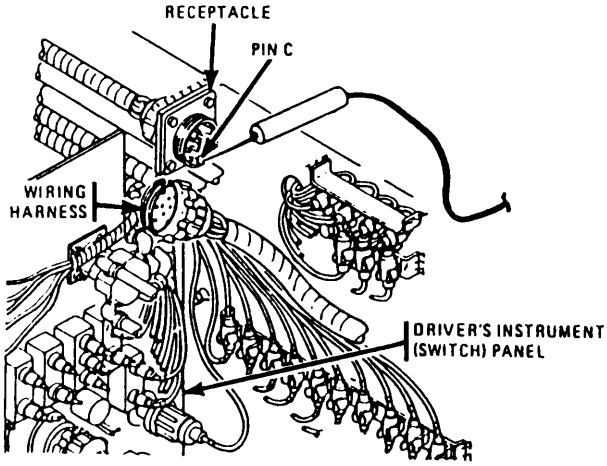
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).





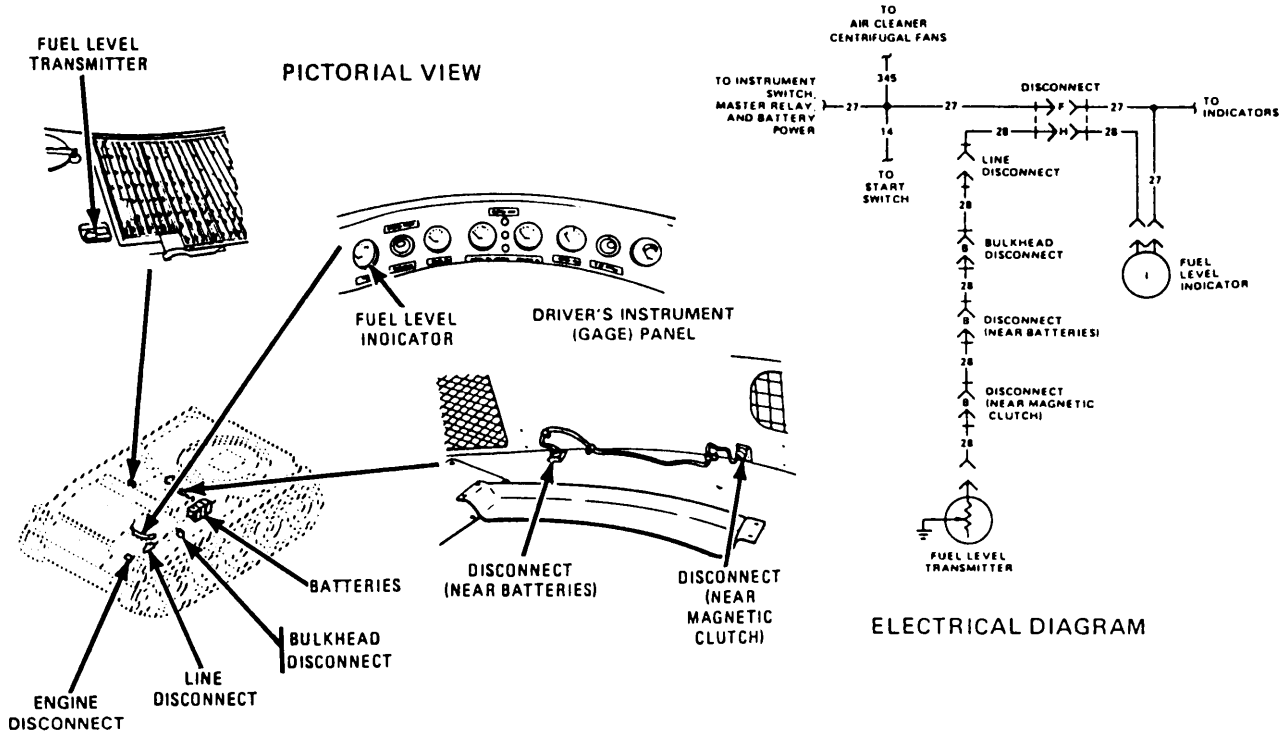
Step 5. Disconnect wiring harness at engine disconnect. Engine must be at operating temperature. Place red probe on pin K (lead 324) of plug. Ground black probe. If multimeter indicates 600 to 900 ohms, go to step 6. If multimeter indicates less than 600 ohms or more than 900 ohms, repair lead 324 between engine disconnect and transmission oil temperature transmitter. Refer to page 2-371. Connect wiring harness at engine disconnect.

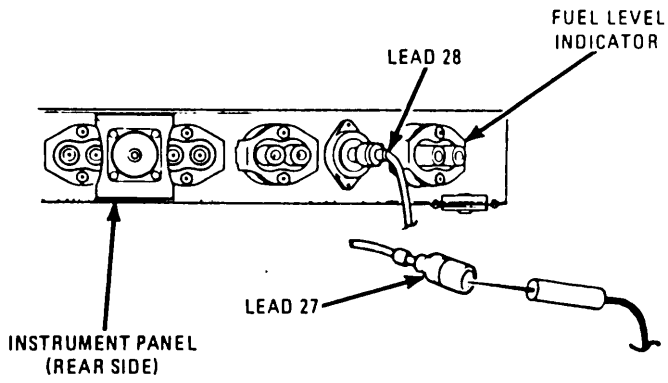




Step 6. Disconnect wiring harness from instrument (gage) panel. Engine must be at operating temperature. Place red probe on pin C (lead 324) of receptacle. Ground black probe. If multimeter indicates 600 to 900 ohms, repair lead 324 between receptacle and XMSN OIL TEMP indicator. Refer to page 2-371. If multimeter indicates less than 600 ohms or more than 900 ohms, repair lead 324 between plug and engine disconnect. Refer to page 2-371. Connect wiring harness to driver's instrument (gage) panel.

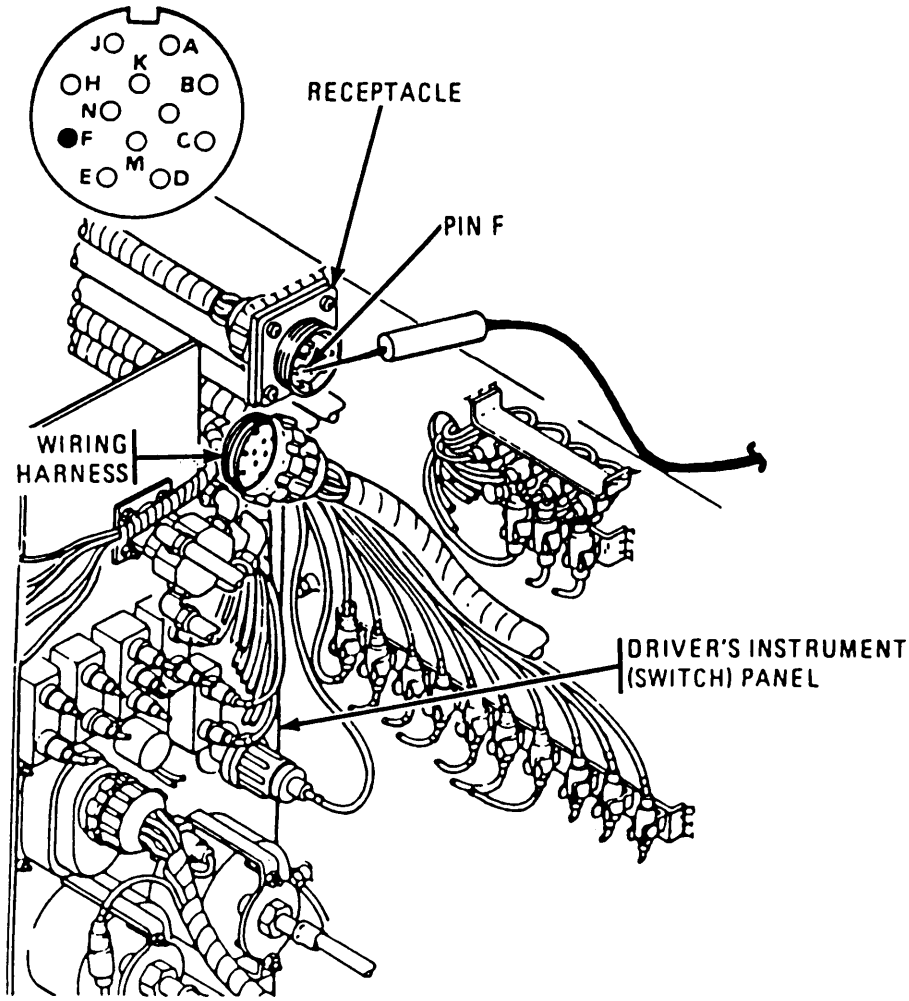
P. FUEL LEVEL INDICATOR CIRCUIT.





Step 1. To access indicators, remove driver's instrument (gage) panel. Refer to page 2-571. Disconnect lead 27 from FUEL LEVEL indicator. Place red probe in lead 27. Ground black probe. Set MASTER and INST switches, ON. If multimeter indicates no voltage, go to step 2. If multimeter indicates about 24 volts, go to step 3. Set MASTER and INST switches OFF. Connect lead 27 to FUEL LEVEL indicator.

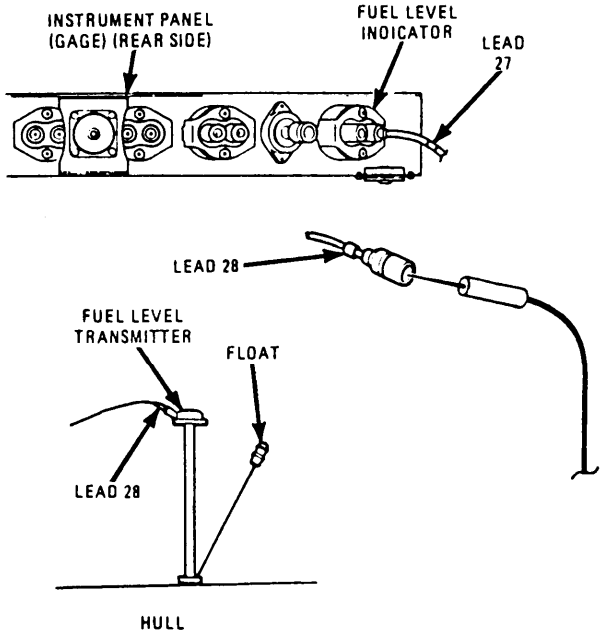
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



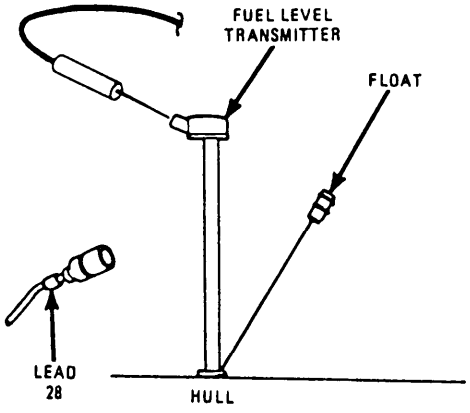
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Disconnect wiring harness from instrument (gage) panel. Place red probe on pin F (lead 27) of receptacle. Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, repair lead 27 from INST switch to receptacle. Refer to page 2-371. If multimeter indicates about *24* volts, repair lead 27 from plug to instruments. Refer to page 2-371. Set MASTER and INST switches OFF. Connect wiring harness to instrument (gage) panel.

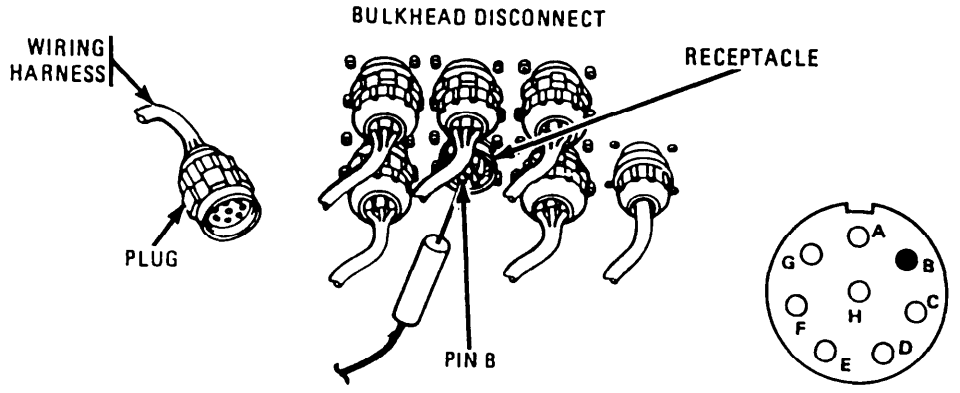


Step 3. Remove fuel level transmitter. Refer to page 2-626. Connect lead 28 to fuel level transmitter. Ground fuel level transmitter to hull. Rotate fuel level transmitter float to full position (close to top of fuel level transmitter). Disconnect lead 28 from FUEL LEVEL indicator. Place red probe in lead 28. Ground black probe. If multimeter indicates about 30 ohms, replace FUEL LEVEL indicator, refer to page 2-571; and install fuel level transmitter, refer to page 2-626. If multimeter indicates less than 25 ohms, connect lead 28 to FUEL LEVEL indicator and go to step 4.

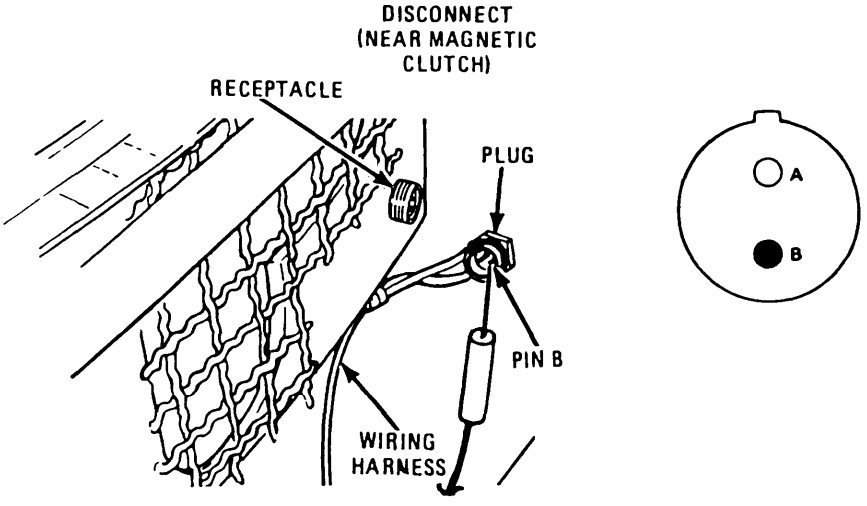


Step 4. Disconnect lead 28 from fuel level transmitter. Place red probe in input terminal of fuel level transmitter. Ground black probe. Fuel level transmitter must be in filled position. If multimeter indicates less than 25 ohms, replace fuel level transmitter. Refer to page 2-626. Connect lead 28 to fuel level transmitter.

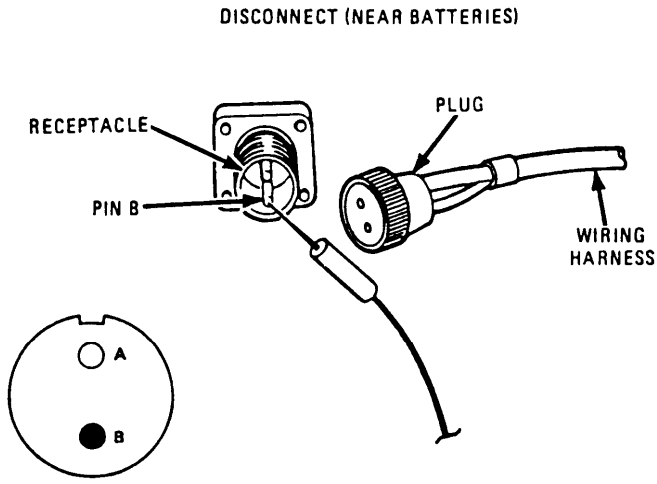
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



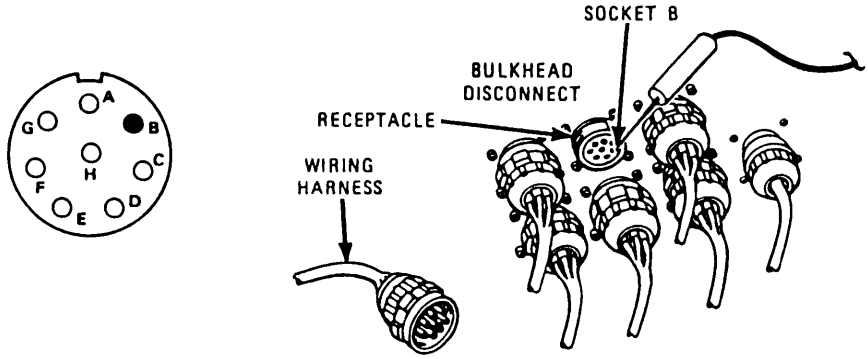
Step 5. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness at bulkhead disconnect. Place red probe on pin B (lead 28) of receptacle. Ground black probe. If multimeter does not indicate about 30 ohms, go to step 6. If multimeter indicates about 30 ohms, go to step 8. Connect wiring harness at bulkhead disconnect.



Step 6. To access disconnect near magnetic clutch, remove fan well deck grille. Refer to page 2-928. Disconnect wiring harness at disconnect near magnetic clutch. Place red probe on pin B (lead 28) of plug. Ground black probe. If multimeter indicates about 30 ohms, go to step 7. If multimeter does not indicate about 30 ohms, repair lead 28 between disconnect and fuel level transmitter, refer to page 2-371; and install fuel level transmitter, refer to page 2-626. Connect wiring harness at disconnect.

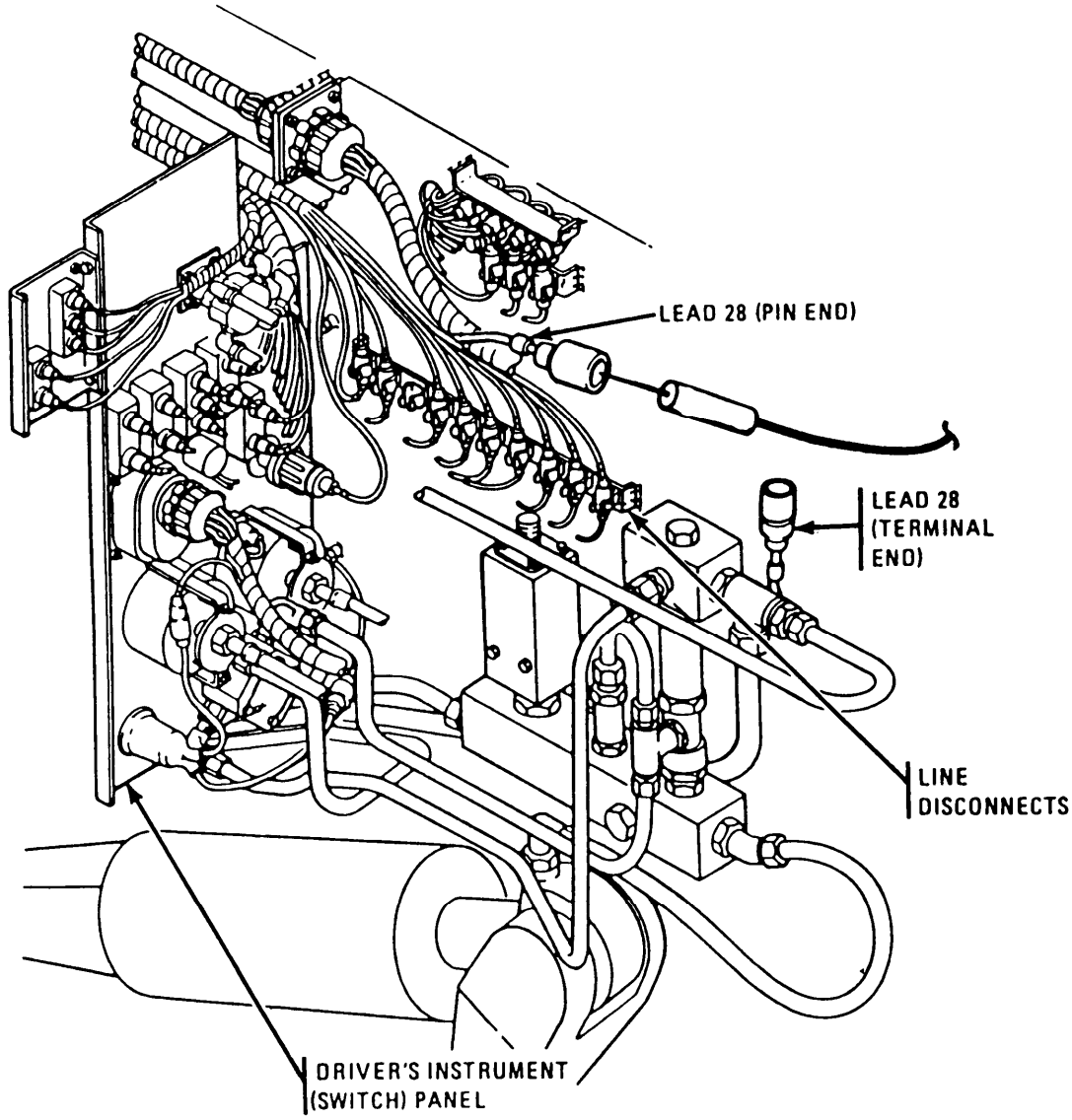


Step 7. Disconnect wiring harness to instrument (gage) panel. Place red probe on pin B (lead 28) of receptacle. Ground black probe. If multimeter indicates about 30 ohms, repair lead 28 between plug and FUEL LEVEL indicator, refer to page 2-371; and install fuel level transmitter, refer to page 2-626. If multimeter does not indicate about 30 ohms, go to step 9. Connect wiring harness to instrument (gage) panel.



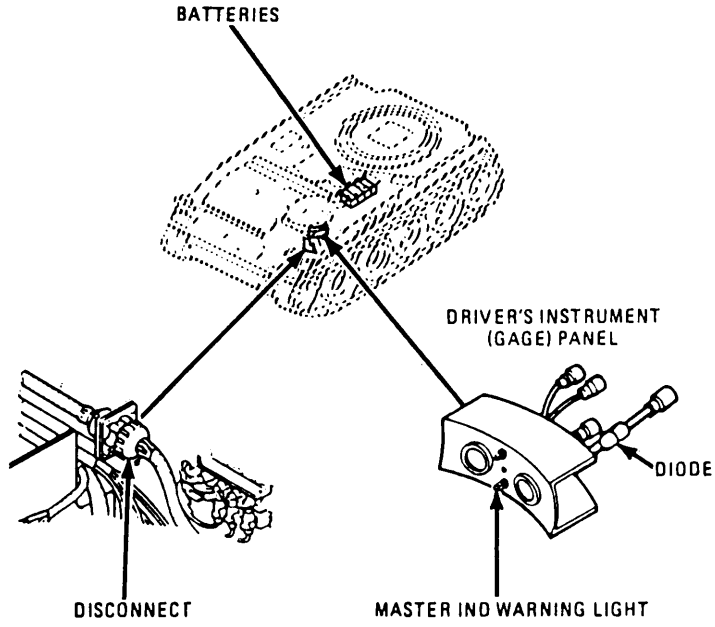
Step 8. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness at bulkhead disconnect. Place red probe in socket B (lead 28) of receptacle. Ground black probe. If multimeter indicates about 30 ohms, repair lead 28 between disconnect and bulkhead disconnect. Refer to page 2-371. If multimeter does not indicate about 30 ohms, repair lead 28 between bulkhead disconnect and disconnect near magnetic clutch. Refer to page 2-371. Connect wiring harness. Install fuel level transmitter. Refer to page 2-626.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

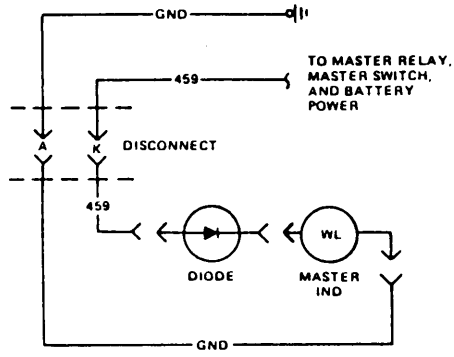


Step 9. Disconnect lead 28 at line disconnect behind driver's instrument (switch) panel. Place red probe in lead 28 (pin end). Ground black probe. Fuel cell must be full. If multimeter indicates about 30 ohms, repair lead 28 between line disconnect and disconnect to instruments. Refer to page 2-371. If multimeter does not indicate about 30 ohms, repair lead 28 between line disconnect and bulkhead disconnect. Refer to page 2-371. Connect lead 28 at line disconnect. Install fuel level transmitter. Refer to page 2-626.

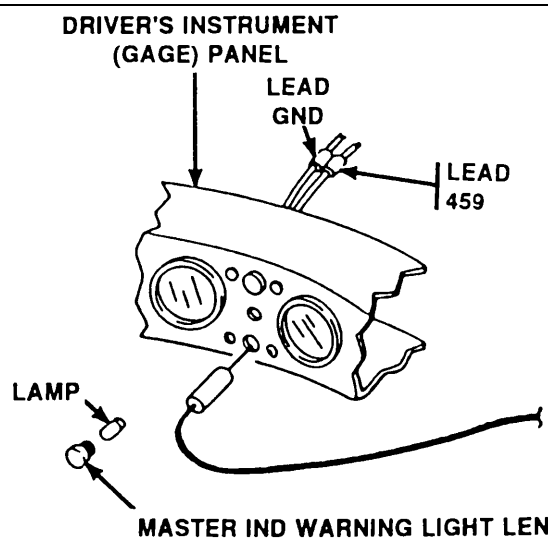
Q. MASTER INDICATOR WARNING LIGHT CIRCUIT.



PICTORIAL VIEW

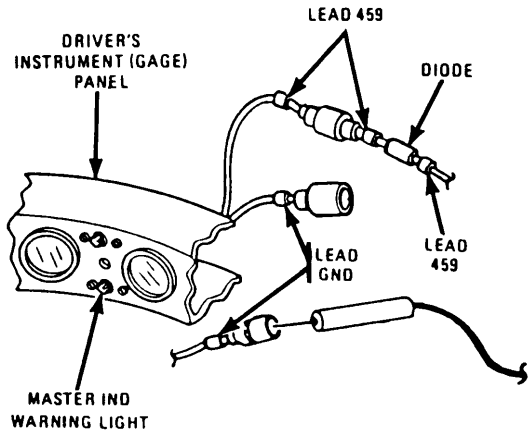


ELECTRICAL DIAGRAM

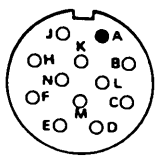


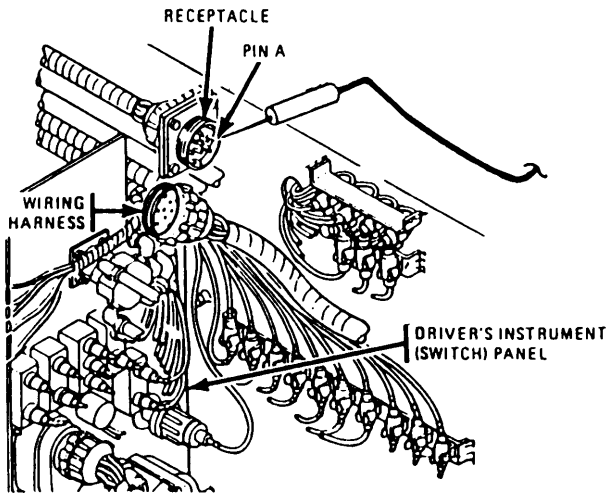
Step 1. To access indicators and lights, remove driver's instrument (gage) panel. Refer to page 2-571. Remove lamp from MASTER IND warning light. Set MASTER switch ON. Place BO infrared selector switch in infrared position and infrared receiver switch in ON position. Place instrument switch in ON position. Place red probe in socket. Ground black probe. If multimeter indicates about 24 volts, replace lamp. If multimeter indicates no voltage, set MASTER switch OFF, install lamp, and go to step 2.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

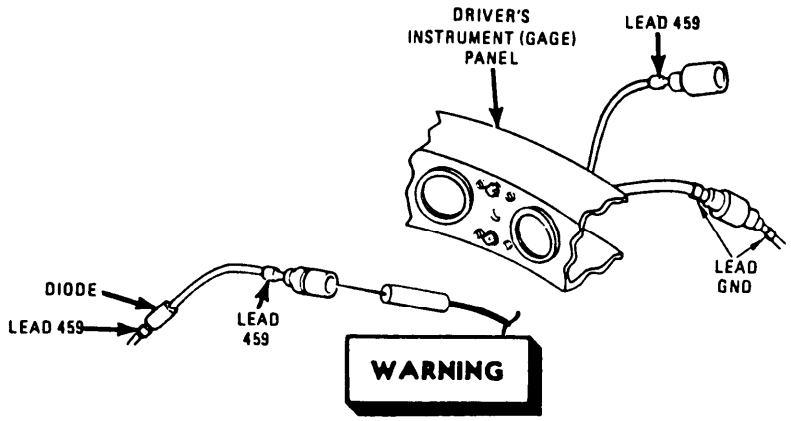


Step 2. Disconnect lead GND from MASTER IND warning light. Connect multimeter between lead GND and ground. If multimeter indicates continuity, go to step 4. If multimeter indicates no continuity, go to step 3. If multimeter indicates 0 ohms, replace lamp. Refer to page 2-571.



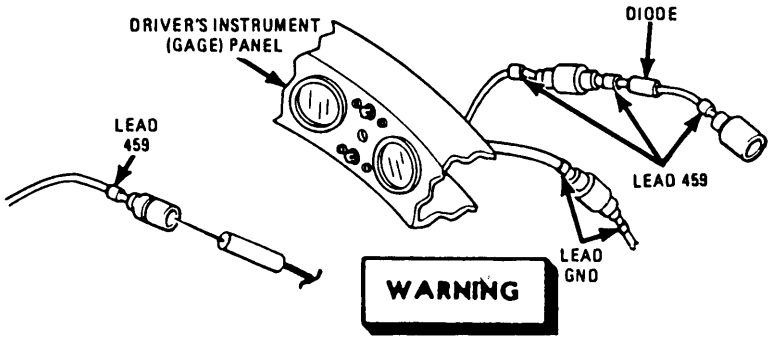


Step 3. Disconnect wiring harness from instrument (gage) panel. Connect multimeter between pin A (lead GND) of receptacle and ground. If multimeter indicates continuity, repair lead GND between plug and MASTER IND warning light. Refer to page 2-371. If multimeter does not indicate continuity, repair lead GND between receptacle and ground. Refer to page 2-371. Connect wiring harness to instrument (gage) panel.



Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

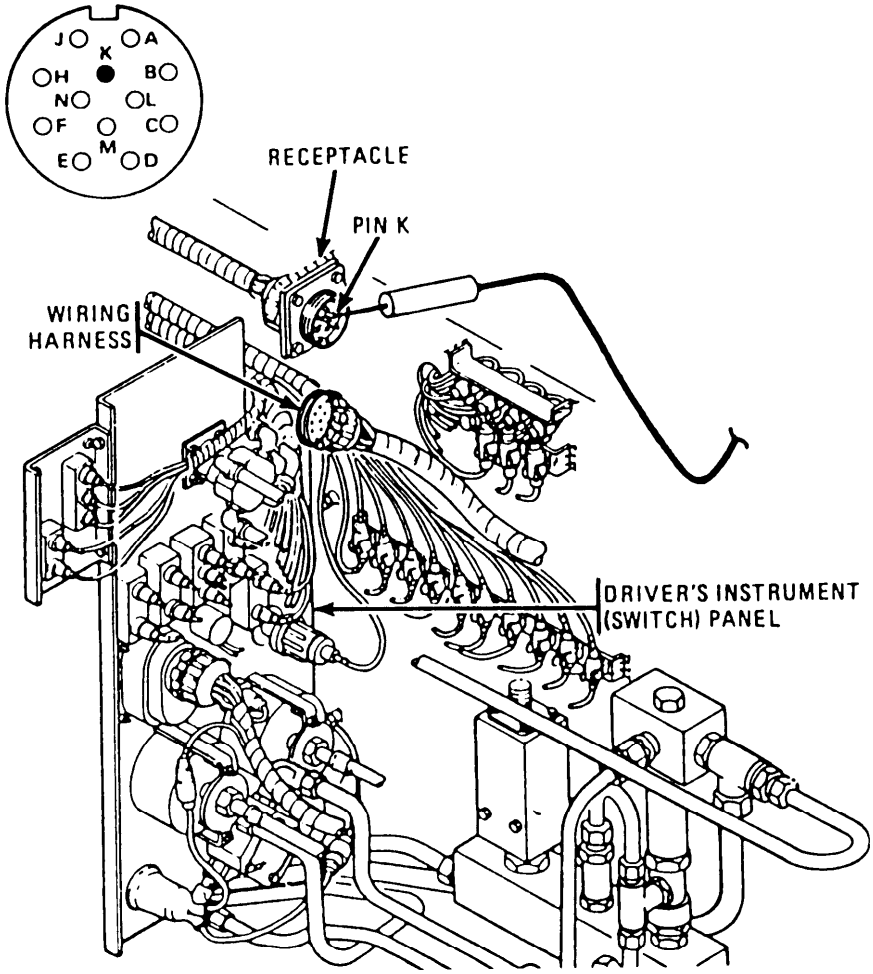
Step 4. Disconnect lead 459 from MASTER IND warning light. Place red probe in lead 459. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, replace MASTER IND warning light. Refer to page 2-571. If multimeter does not indicate about 24 volts, go to step 5. Set MASTER switch OFF. Connect lead 459 to MASTER IND warning light.



Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 5. Disconnect lead 459 to diode. Place red probe in lead 459. Ground black probe. Set MASTER switch ON. If multimeter indicates no voltage, go to step 6 and connect lead 459 to diode. If multimeter indicates about 24 volts, remove diode from circuit and connect lead 459 directly to MASTER IND warning light. If MASTER IND warning light is on, replace diode. Refer to page 2-371. If MASTER IND warning light is off, replace MASTER IND warning light. Refer to page 2-571. Set MASTER switch OFF. Connect diode to MASTER IND warning light. Connect lead 459 to

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

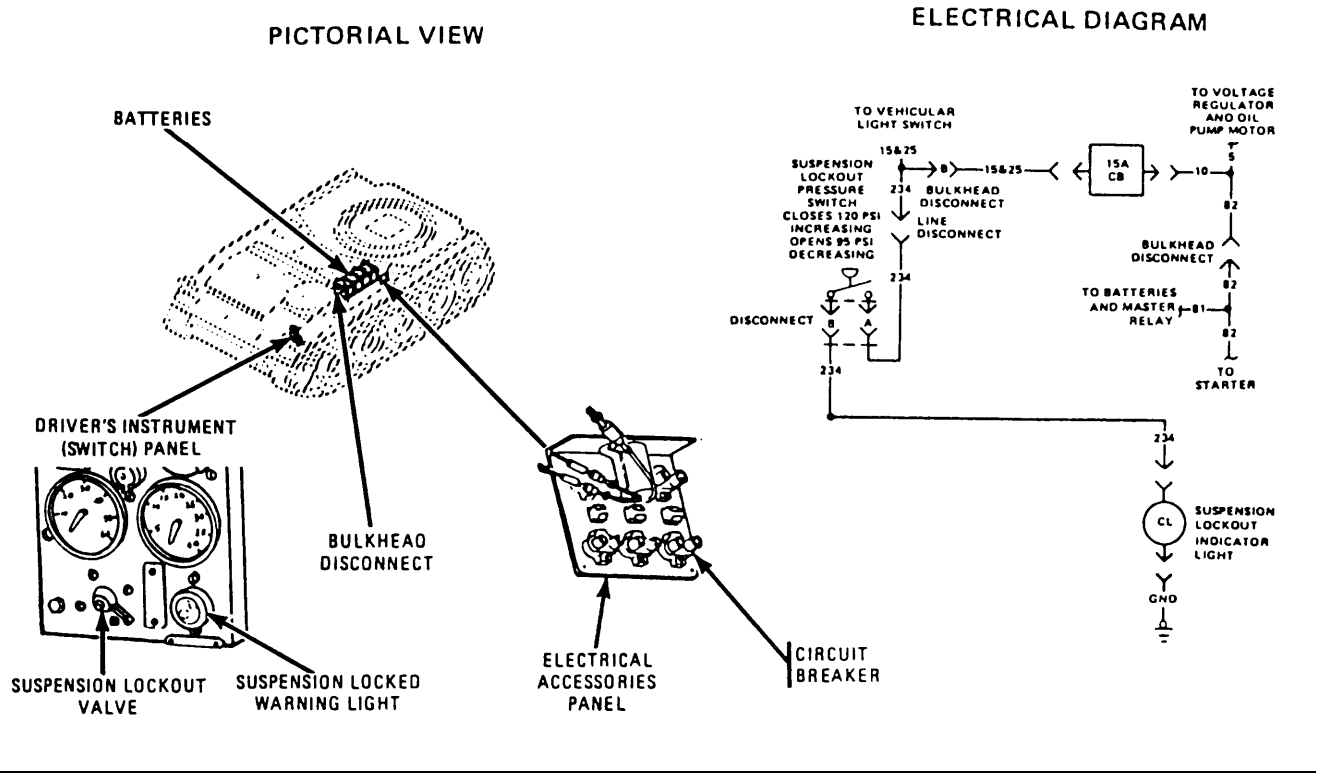


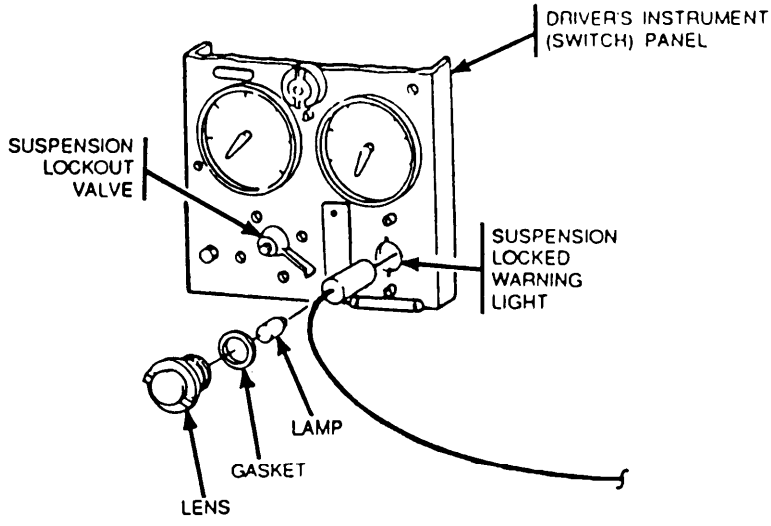
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 6. Disconnect wiring harness from instrument (gage) panel. Place red probe on pin K (lead 459) of receptacle. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, repair lead 459 between plug and diode. Refer to page 2-371. If multimeter indicates no voltage, repair lead 459 between receptacle and MASTER switch. Refer to page 2-371. Set MASTER switch OFF. Connect wiring harness to instrument (gage) panel.

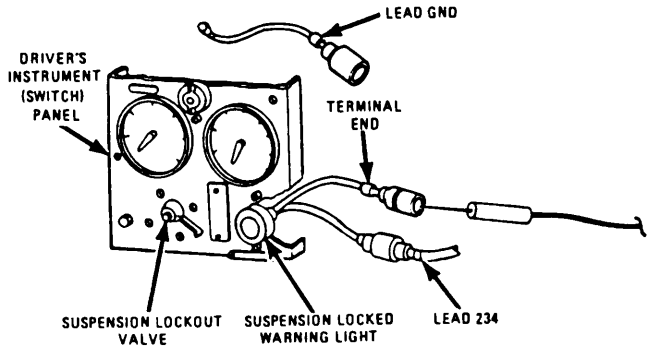
R. SUSPENSION LOCKED WARNING LIGHT CIRCUIT.



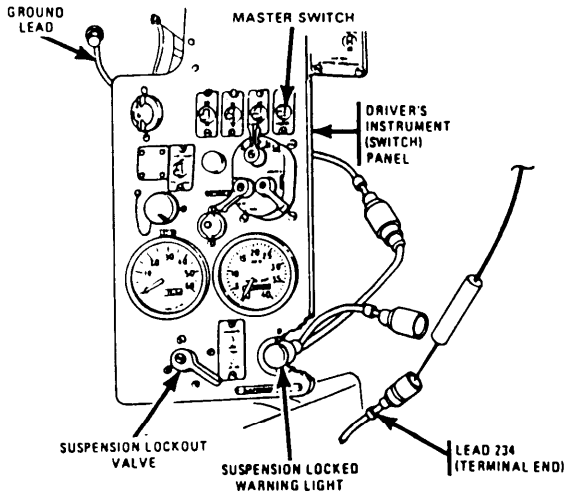


Step 1. Remove lamp from SUSPENSION LOCKED warning light. Refer to page 2-580. Set MASTER switch ON. Place suspension lockout control valve handle in locked position. Place oil pump motor switch in ON position. Place red probe in socket. Ground black probe. If multimeter indicates about 24 volts, replace lamp. If multimeter indicates no voltage, set MASTER switch OFF, install lamp, and go to step 2.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 2. Disconnect lead GND from SUSPENSION LOCKED warning light. Connect multimeter between lead GND (terminal end) and ground. If multimeter indicates continuity, go to step 3. If multimeter indicates no continuity, repair lead GND. Refer to page 2-371. Connect lead GND to SUSPENSION LOCKED warning light.

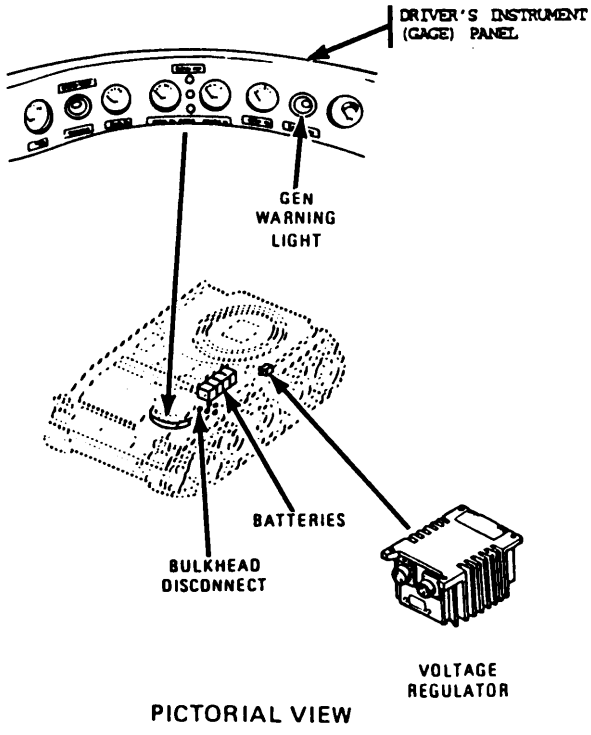


WARNING

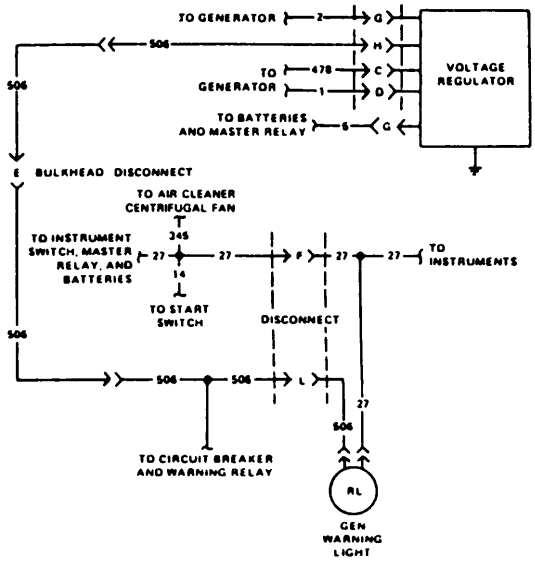
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. Disconnect lead 234 from SUSPENSION LOCKED warning light. Place red probe in lead 234 (terminal end) and ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, replace SUSPENSION LOCKED warning light assembly. Refer to page 2-571. If multimeter indicates no voltage, repair lead 234 between SUSPENSION LOCKED warning light and suspension lockout pressure switch. Refer to page 2-371. Set MASTER switch OFF. Connect lead 234 to SUSPENSION LOCKED warning light.

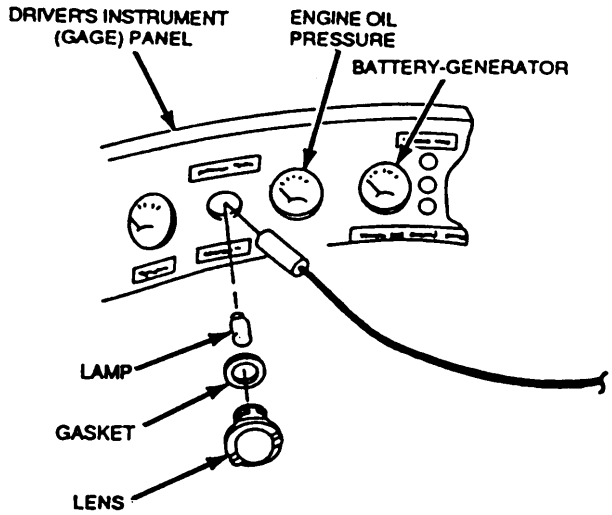
S. GENERATOR WARNING LIGHT CIRCUIT.



PICTORIAL VIEW

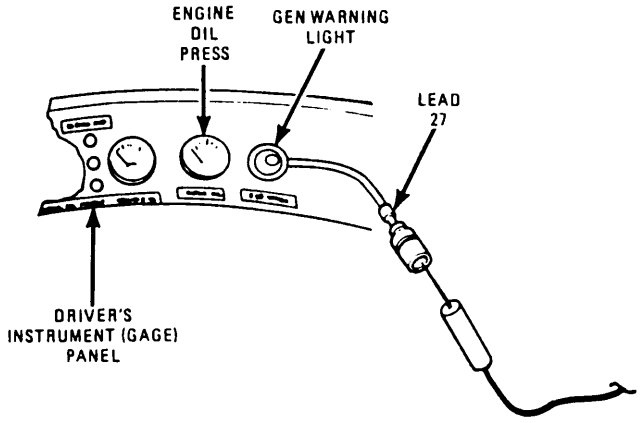


ELECTRICAL DIAGRAM

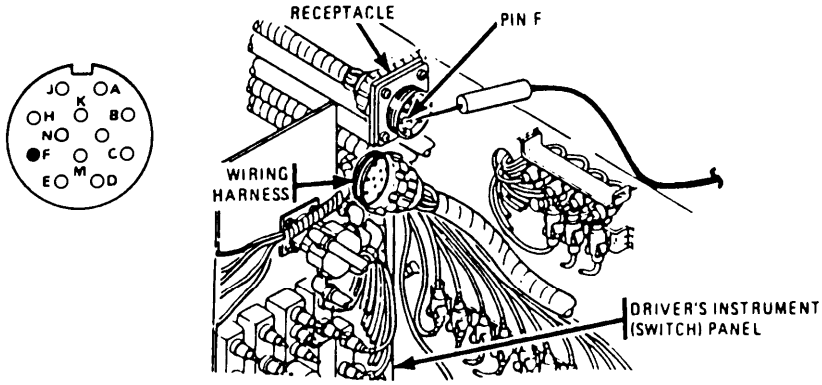


Step 1. Remove lamp from GEN WARNING light. Refer to page 2-580. Set MASTER switch ON. Place BO infrared selector switch in infrared position and infrared receiver switch in ON position. Place instrument switch in ON position. Place red probe in socket. Ground black probe. If multimeter indicates about 24 volts, replace lamp. If multimeter indicates no voltage, set MASTER switch OFF, install lamp assembly, and go to step 2.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



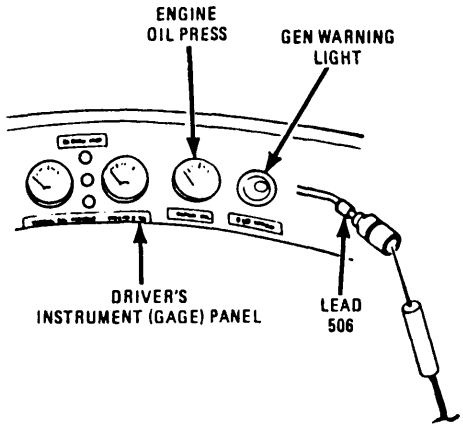
Step 2. To access electrical leads, remove driver's instrument (gage) panel. Refer to page 2-571. Disconnect lead 27 from GEN WARNING light. Place red probe in lead 27. Ground black probe. Set MASTER and INST switches ON. If multimeter indicates no voltage, connect lead 27 to GEN WARNING light and go to step 3. If multimeter indicates about 24 volts, set MASTER and INST switches OFF and go to step 4.



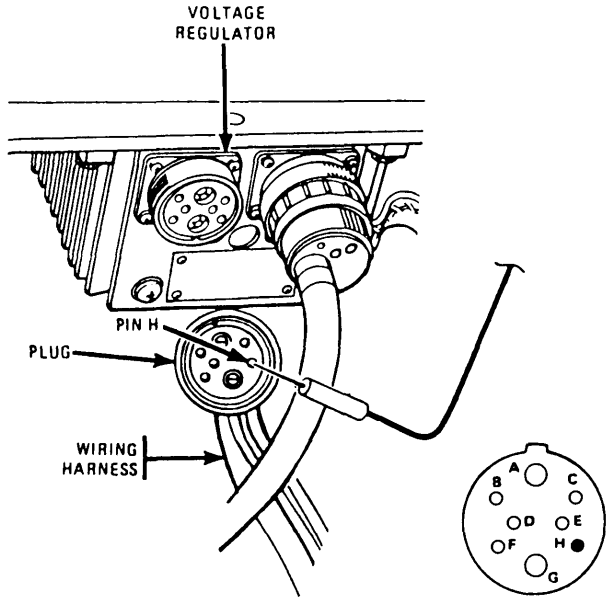
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. Disconnect instrument (gage) panel wiring harness. Place red probe on receptacle pin F (lead 27). Ground black probe. Set MASTER and INST switches ON. If multimeter indicates about 24 volts, repair lead 27 between plug and GEN WARNING light. Refer to page 2-371. If multimeter indicates no voltage, repair lead 27 between receptacle and INST switch. Refer to page 2-371. Set MASTER and INST switches OFF. Connect wiring harness.

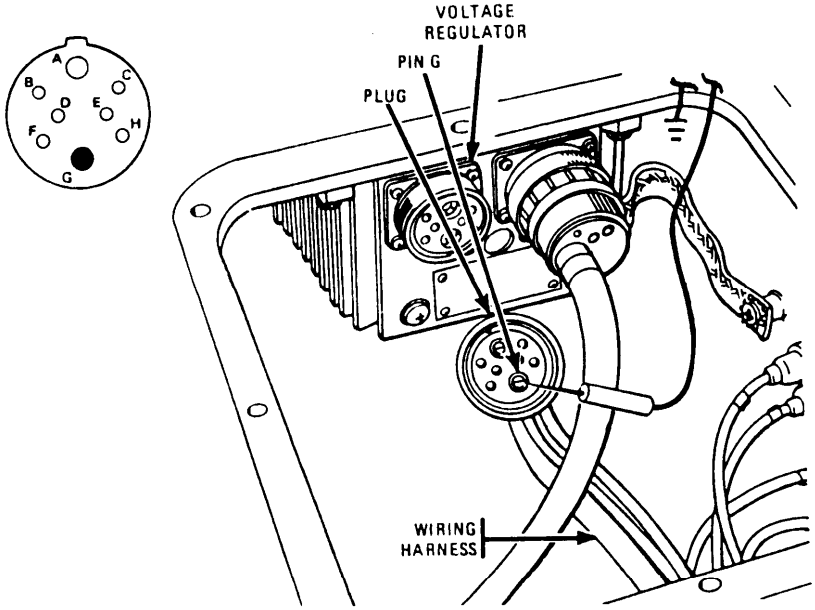


Step 4. Disconnect lead 506 from GEN WARNING light. Place red probe on lead 506 (pin end). Ground black probe. Start engine and run at 1000 to 1200 rpm. Check voltage and stop engine. If multimeter indicates about 24 volts, replace GEN WARNING light assembly. Refer to page 2-571. If multimeter indicates no voltage, connect lead 506 to GEN WARNING light and go to step 5.

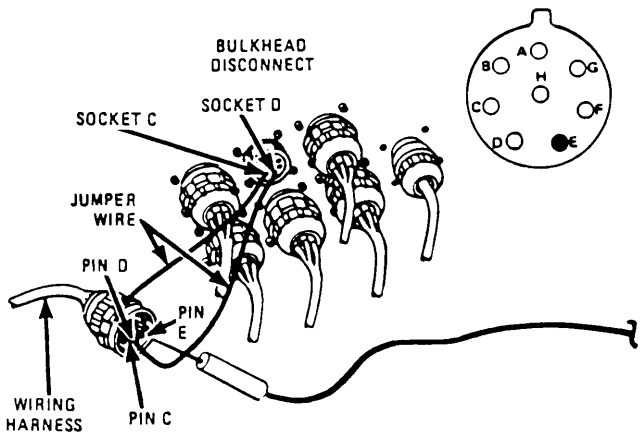


Step 5. To access voltage regulator, remove left CO_2 cylinder access cover. Refer to page 2-923. Disconnect wiring harness from voltage regulator. Place red probe on plug pin H (lead 506). Ground black probe. Set MASTER and INST switches ON. Start engine. If multimeter indicates about 24 volts, go to step 6. If multimeter indicates no voltage, connect wiring harness to voltage regulator and go to step 7. Stop engine. Set MASTER and INST switches OFF.

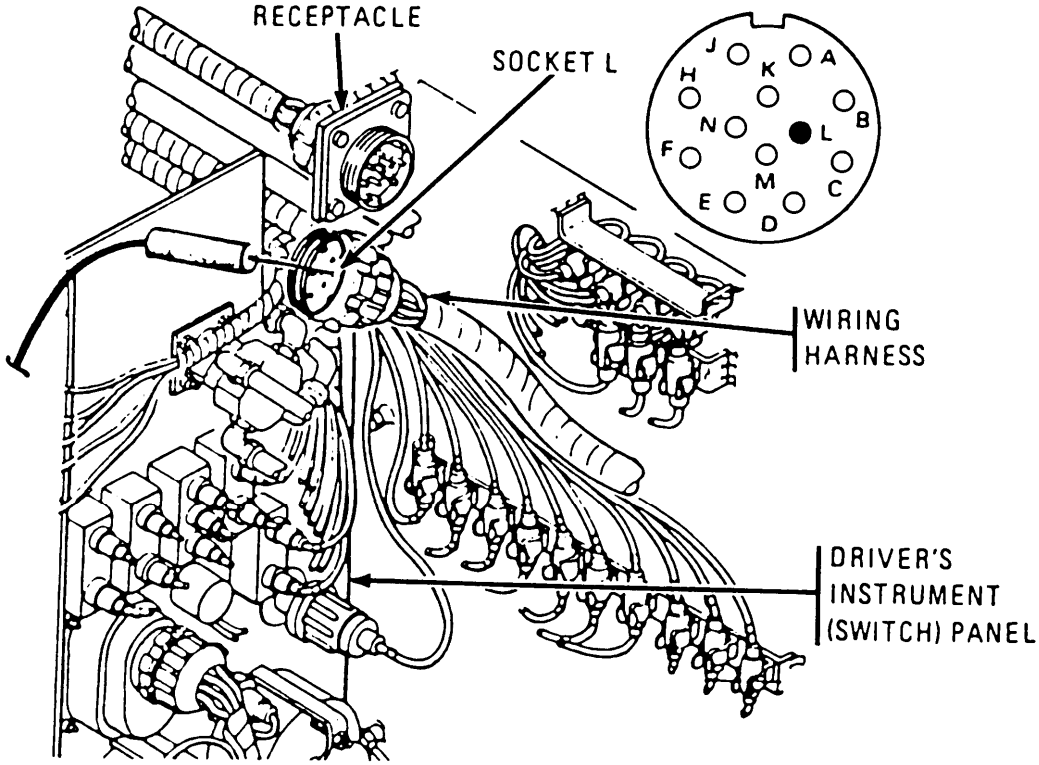
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 6. Place red probe in plug pin G (lead 2). Ground black probe. Start engine and run at 1000 to 1200 rpm. Check voltage and stop engine. If multimeter indicates about 24 volts, replace voltage regulator. Refer to page 2-557. If multimeter indicates no voltage, connect wiring harness to voltage regulator and troubleshoot generator. Refer to page 2-43.



Step 7. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness at bulkhead disconnect. Place jumper wire to pin D and socket D (lead 459). Place jumper wire to pin C and socket C (lead 27). Place red probe on pin E (lead 506). Ground black probe. Set MASTER and INST switches ON. If multimeter indicates about 24 volts, go to step 8. If multimeter indicates no voltage, remove jumper wire (lead 459) and connect wiring harness to bulkhead disconnect and go to step 9. Set MASTER and INST switches OFF.

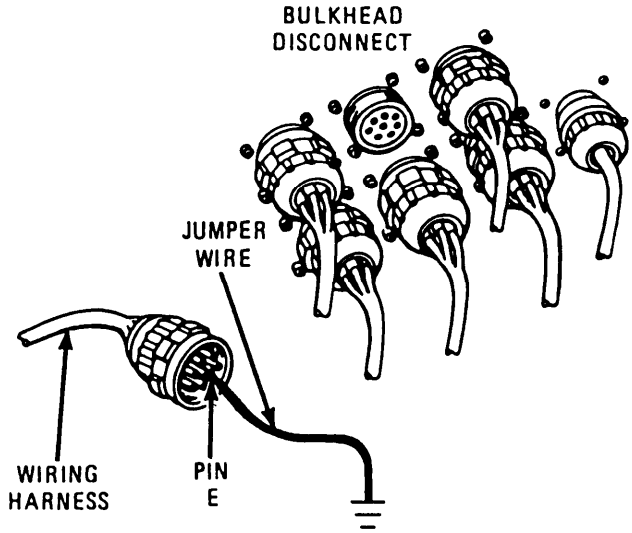


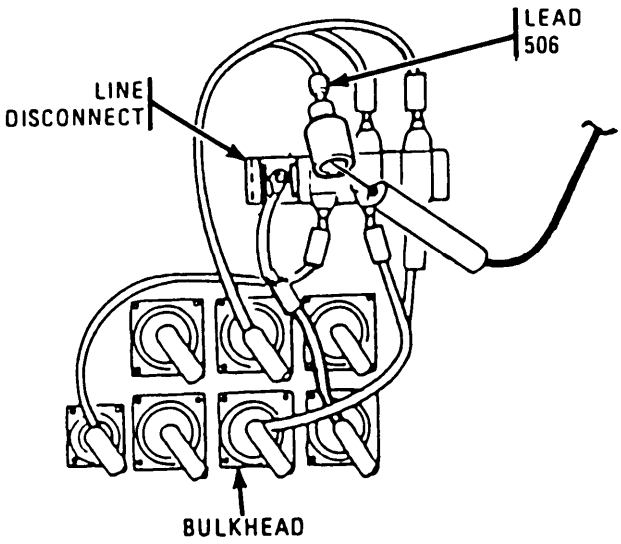
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

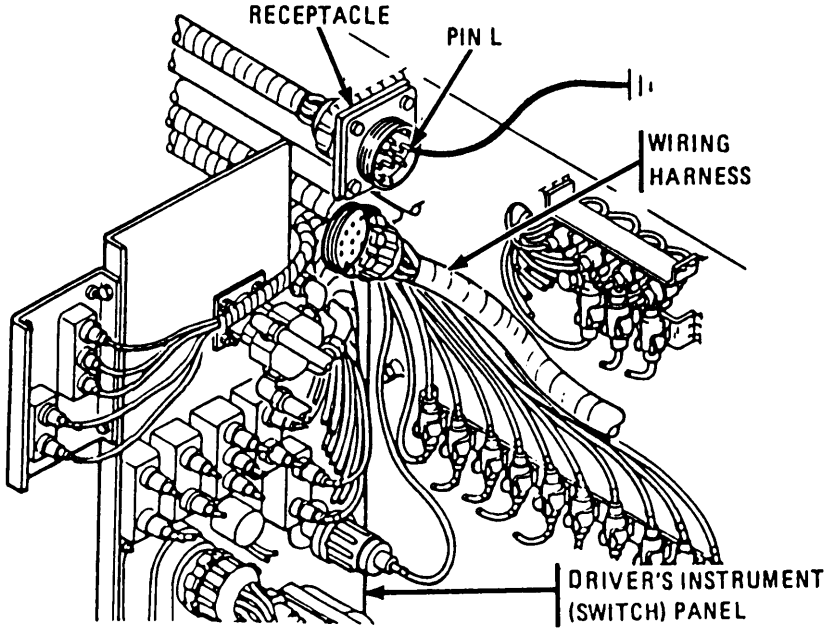
Step 8. Disconnect wiring harness. Place red probe in plug socket L (lead 506). Ground black probe. Set MASTER and INST switches ON. If multimeter indicates about 24 volts, repair lead 506 between receptacle and line disconnect behind driver's instrument (switch) panel. Refer to page 2-371. If multimeter indicates no voltage, go to step 9. Connect wiring harness. Set MASTER and INST switches OFF.

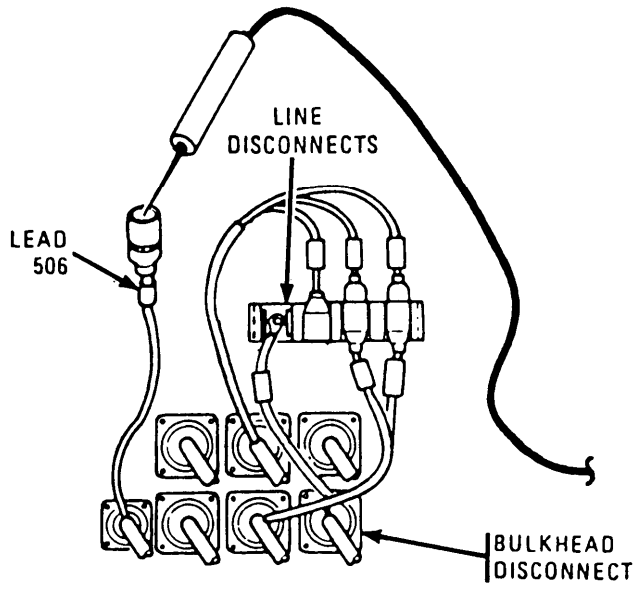
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).





Step 9. To access electrical leads, open battery compartment access door. Remove batteries and battery tray. Refer to page 2-640. Disconnect wiring harness at bulkhead disconnect. Place jumper wire to pin E (lead 506) and ground. Disconnect lead 506 at line disconnect near bulkhead disconnect (aft side). Place red probe in lead 506. Ground black probe. If multimeter indicates continuity, go to step 10. If multimeter indicates infinity, repair lead 506 between bulkhead disconnect and line disconnect. Refer to page 2-371. Remove jumper wire. Connect wiring harness. Connect line disconnect.

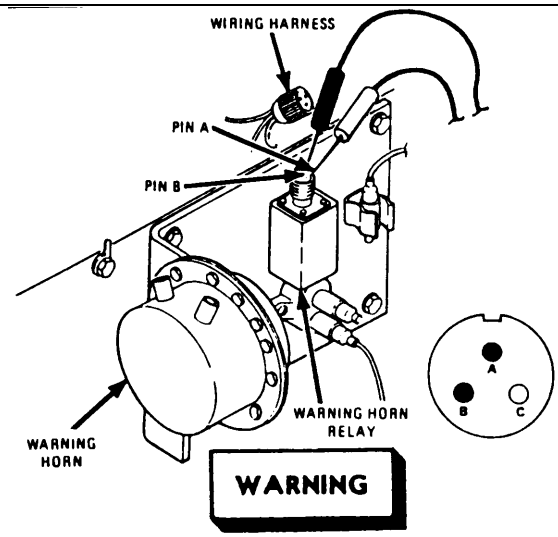




Step 7. Disconnect wiring harness. Place jumper wire to pin L (lead 506) and ground. Disconnect lead 506 at line disconnect. Place red probe in lead 506. Ground black probe. If multimeter indicates continuity, circuit is operating normally. If multimeter indicates infinity, repair lead 506 between receptacle and line disconnect. Refer to page 2-371. Remove jumper wire. Connect wiring harness. Connect line disconnect.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

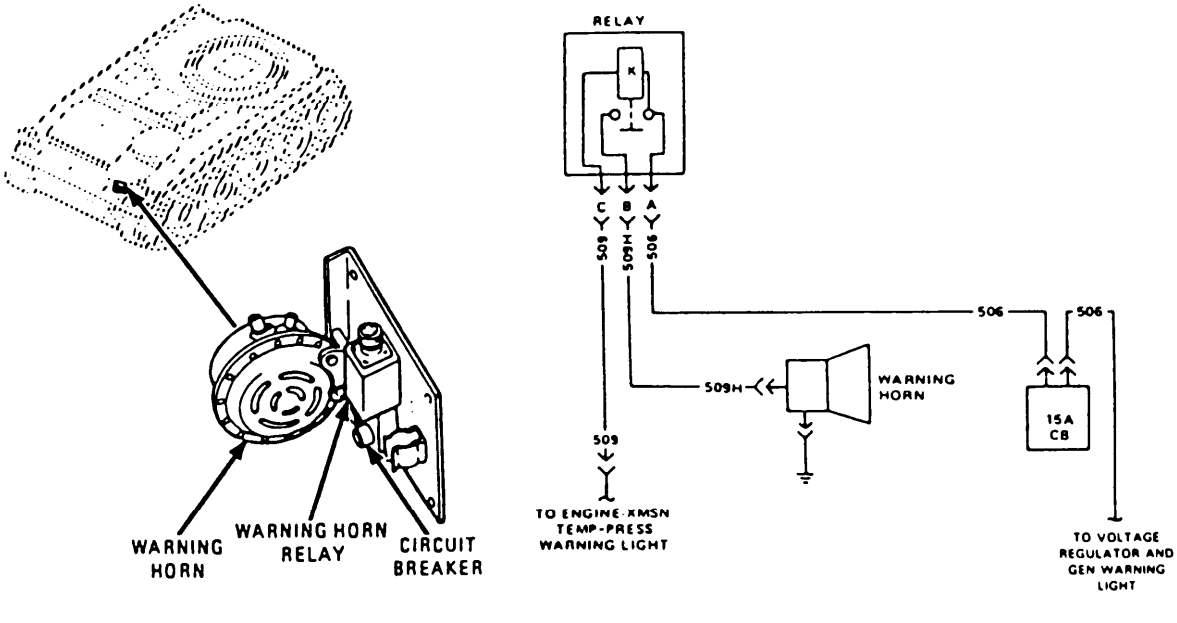
T. WARNING HORN RELAY.

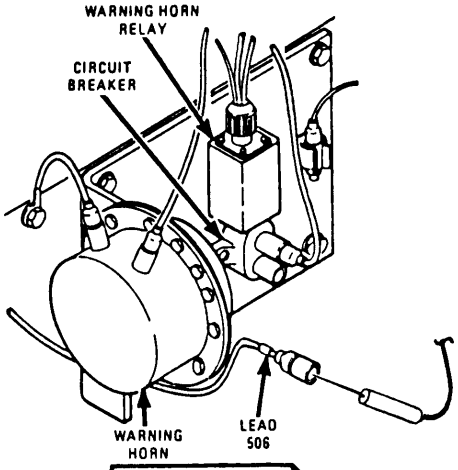


Brake foot pedal is spring-loaded. Block tracks and release parking brake before working on warning horn.

Remove driver's seat. Refer to page 2-952. To access warning horn relay, remove hull transmission compartment deck assembly. Refer to page 2-938. Disconnect wiring harness from warning horn relay. Place red probe on receptacle pin A. Place black probe on receptacle pin B. If multimeter indicates 0 ohms, replace warning horn relay. Refer to page 2-637. Connect wiring harness.

U. WARNING HORN CIRCUIT.

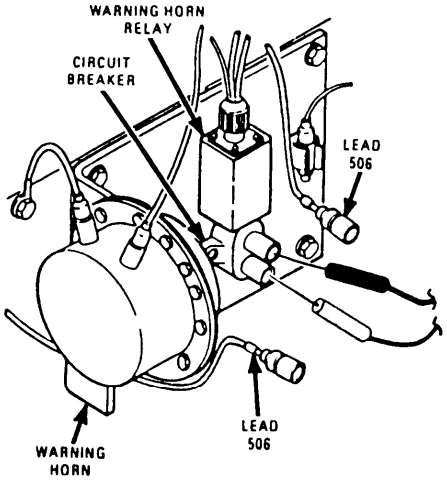




WARNING

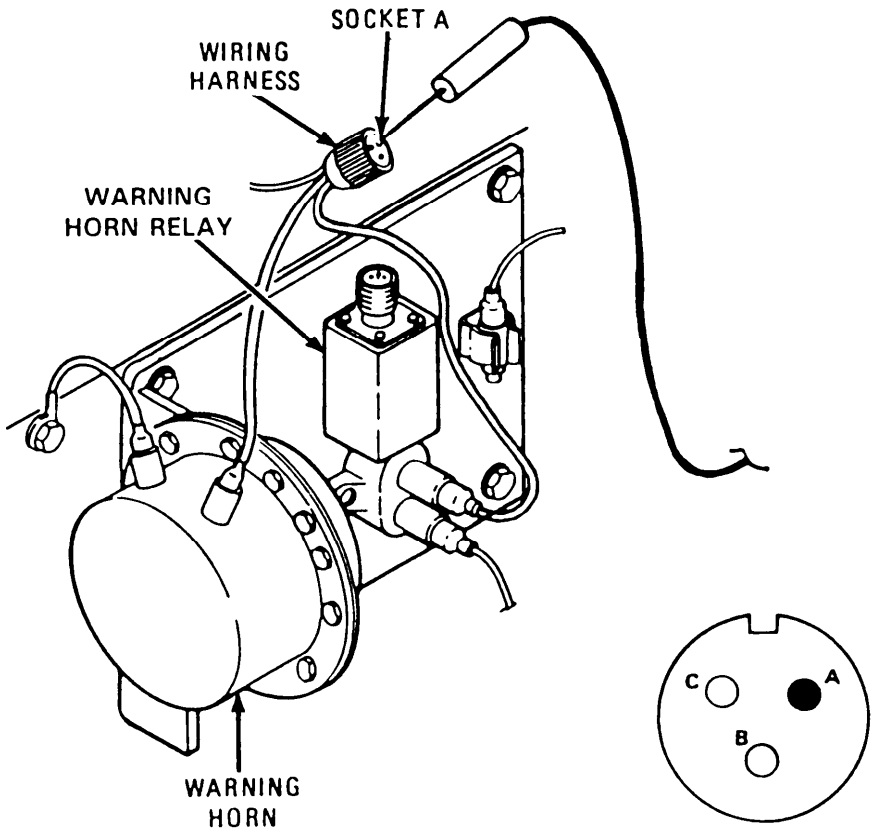
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 1. To access warning horn and circuit breaker, remove driver's seat. Refer to page 2-952. Disconnect lead 506 from circuit breaker input. Place red probe in lead 506. Ground black probe. Set MASTER switch ON. Set INST switch ON. If multimeter indicates about 24 volts, go to step 2. If multimeter indicates no voltage, repair lead 506 between GEN WARNING light and circuit breaker. Refer to page 2-371. Set MASTER switch OFF. Set INST switch OFF.



Step 2. Disconnect lead 506 from circuit breaker output. Place red probe in input side of circuit breaker. Place black probe in output side of circuit breaker. If multimeter indicates 0 ohms, connect leads 506 to circuit breaker and go to step 3. If multimeter does not indicate 0 ohms, replace circuit breaker. Refer to page 2-637.

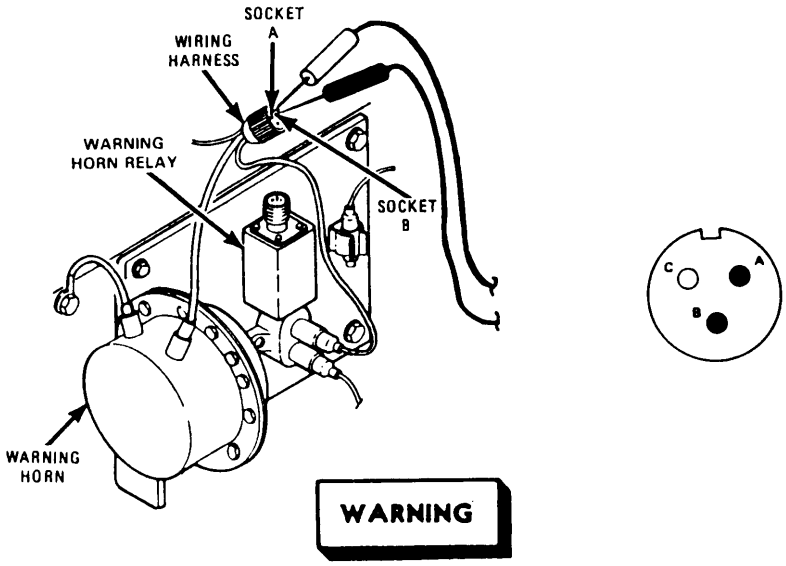
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

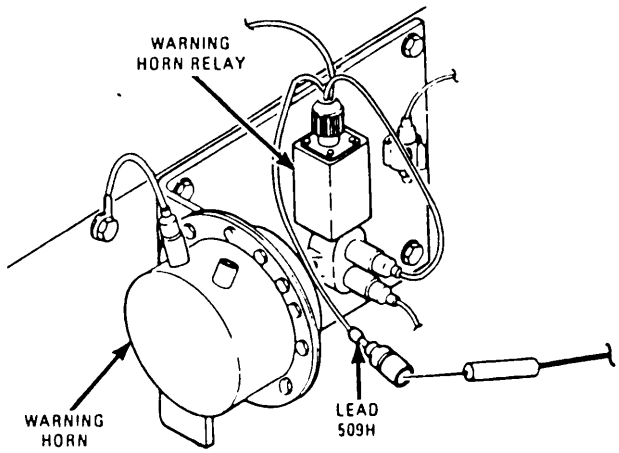
Step 3. Disconnect wiring harness from warning horn relay. Place red probe in plug socket A. Ground black probe. Set MASTER switch ON. Set INST switch ON. If multimeter indicates about 24 volts, go to step 4. If multimeter indicates no voltage, repair lead 506 between plug socket A and circuit breaker. Refer to page 2-371. Connect wiring harness. Set MASTER switch OFF. Set INST switch OFF.



WARNING

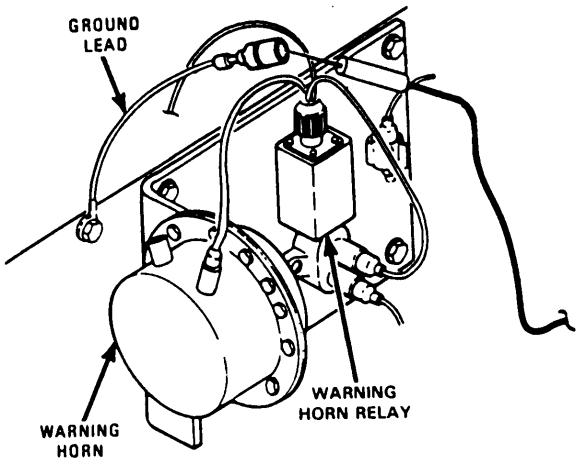
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 4. Place red probe in plug socket A. Place black probe in plug socket B. Set MASTER switch ON. Set INST switch ON. If multimeter indicates about 24 volts, go to step 5. If multimeter indicates no voltage, replace warning horn relay. Refer to page 2-637. Connect wiring harness. Set MASTER switch OFF. Set INST switch OFF.



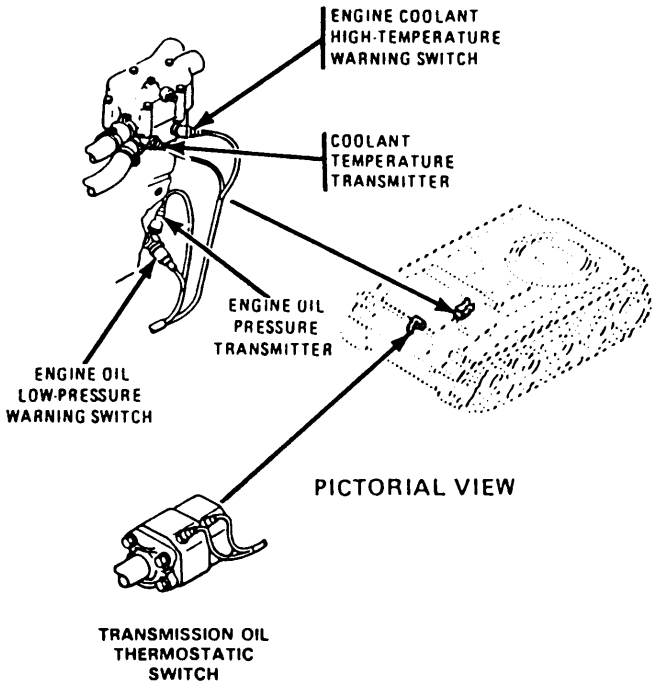
Step 5. Disconnect lead 509H from warning horn. Place red probe in lead 509H. Ground black probe. Start engine and run at 1000 to 1200 rpm. Check voltage and stop engine. If multimeter indicates about 24 volts, connect lead 509H to warning horn and go to step 6. If multimeter indicates no voltage, repair lead 509H between warning horn and relay. Refer to page 2-371.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

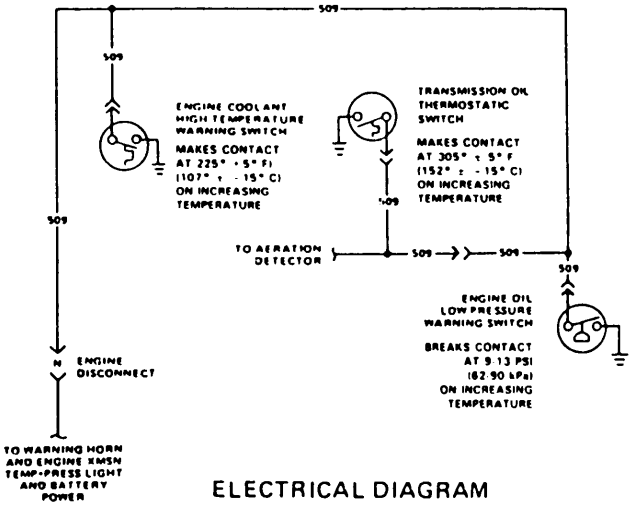


Step 6. Disconnect warning horn ground lead. Place red probe in ground lead. Ground black probe. If multimeter indicates 0 ohms, replace warning horn. Refer to page 2-637. If multimeter does not indicate 0 ohms, repair ground lead. Refer to page 2-371.

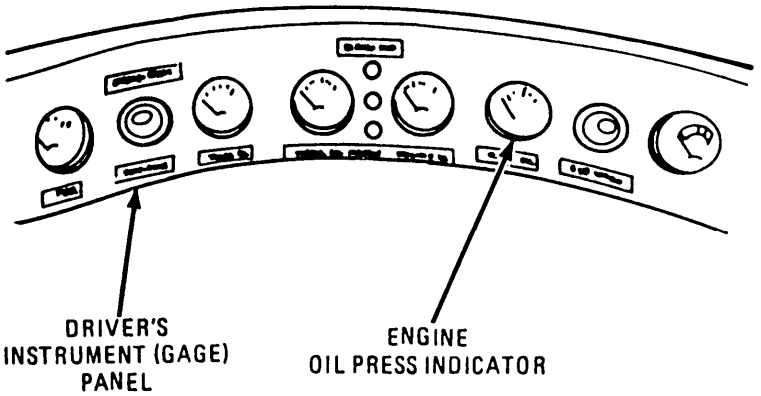
V. WARNING SWITCH CIRCUIT.



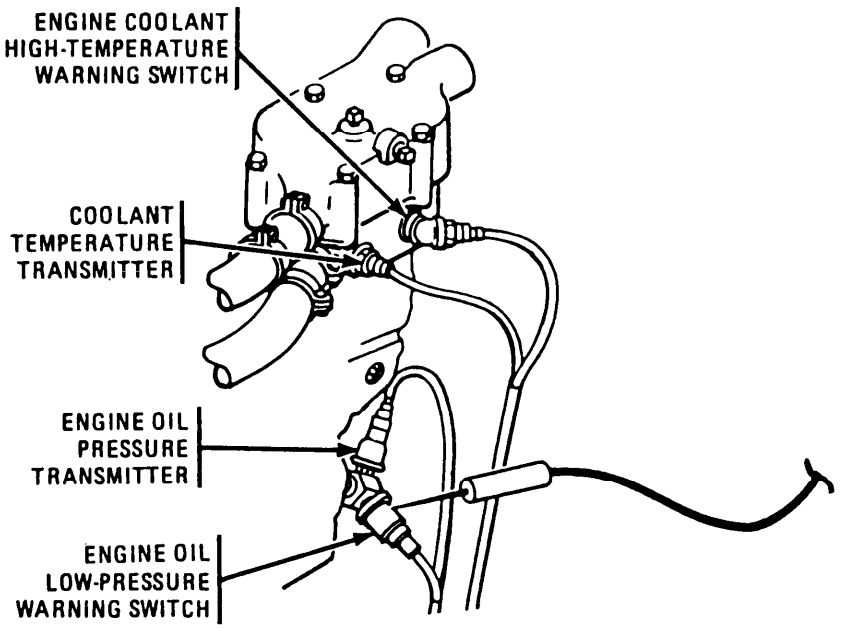
PICTORIAL VIEW



ELECTRICAL DIAGRAM

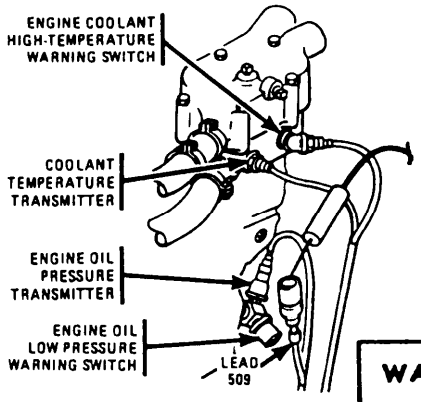


Step 1. Start engine and run at 1000 to 1200 rpm. Note pressure reading on ENGINE OIL PRESS indicator and stop engine. If ENGINE OIL PRESS indicator reads at or near 0 psi (0 kPa), go to step 2. If ENGINE OIL PRESS indicator reads about 40 psi (276 kPa), go to step 5.



Step 2. To access engine oil low-pressure warning switch, open fuel filter access door. Set MASTER switch OFF. Place red probe on engine oil low-pressure warning switch metal case. Ground black probe. If multimeter indicates resistance, go to step 3. If multimeter indicates infinity, clean surface area between engine oil low-pressure warning switch and engine for a good metal-to-metal contact.

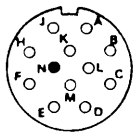
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

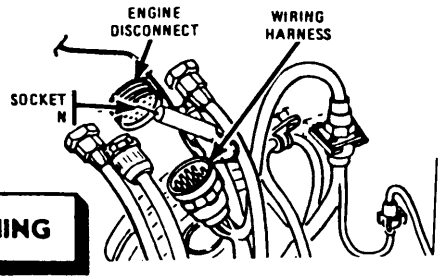


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. Disconnect lead 509 from engine oil low-pressure warning switch. Place red probe in lead 509. Ground black probe. Set MASTER switch ON. Set INST switch ON. If multimeter indicates about 24 volts, replace engine oil low-pressure warning switch. Refer to page 2-626. If multimeter indicates no voltage, go to step 4. Set MASTER switch OFF. Set INST switch OFF.

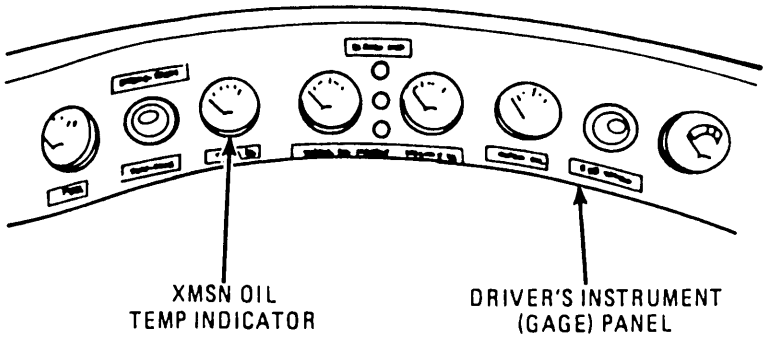




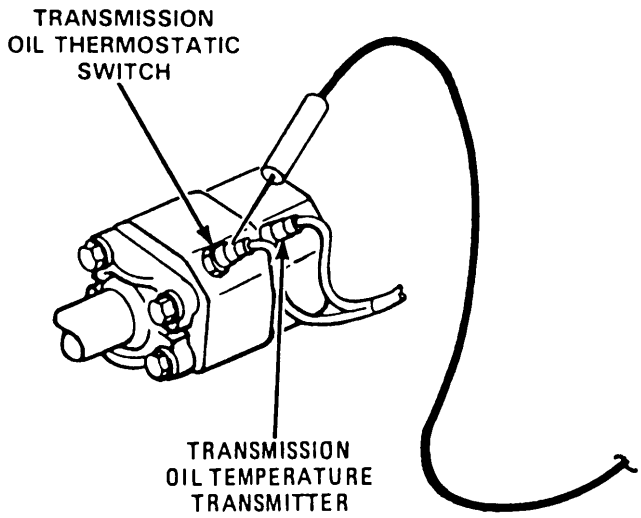
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 4. To access engine disconnect, remove hull transmission compartment deck assembly. Refer to page 2-938. Disconnect wiring harness at engine disconnect. Place red probe in plug socket N. Ground black probe. Set MASTER switch ON. Set INST switch ON. If multimeter indicates about 24 volts, repair lead 509 between engine disconnect and engine oil low-pressure warning switch. Refer to page 2-371. If multimeter indicates no voltage, repair lead 509 from engine disconnect to driver's instrument (switch) panel disconnect. Refer to page 2-371. Set MASTER switch OFF. Set INST switch OFF.

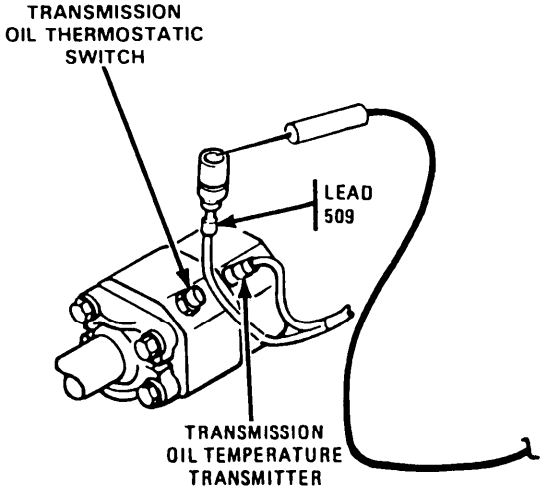


Step 5. Start engine and run at 1000 to 1200 rpm for 15 minutes and stop engine. If XMSN OIL TEMP indicator reads about 320 °F (160 °C), go to step 6. If XMSN OIL TEMP indicator reads about 180 °F (82 °C), go to step 8.



Step 6. Set MASTER switch OFF. Set INST switch OFF. Place red probe on transmission oil thermostatic switch metal case. Ground black probe. If multimeter indicates resistance, go to step 7. If multimeter indicates infinity, clean surface area between transmission oil thermostatic switch and oil cooler inlet for good metal-to-metal contact.

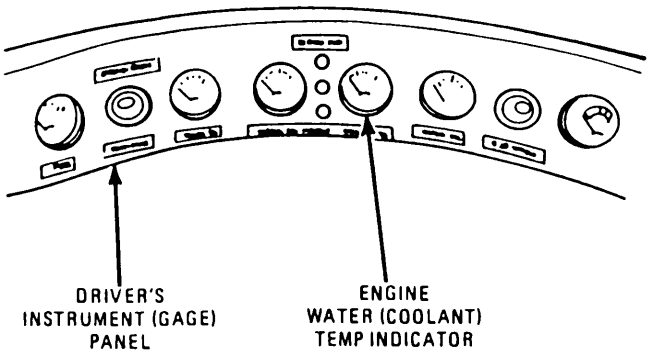
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



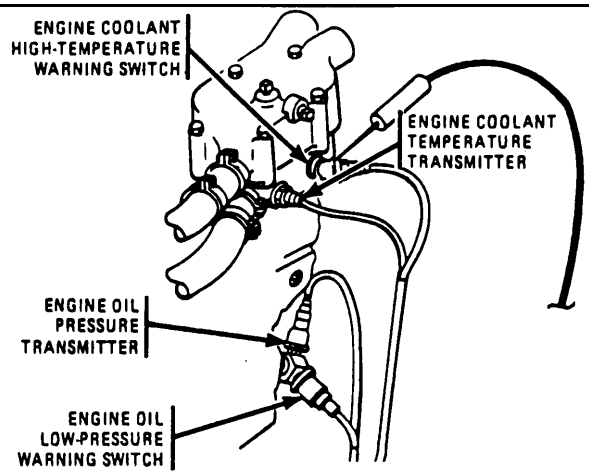
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

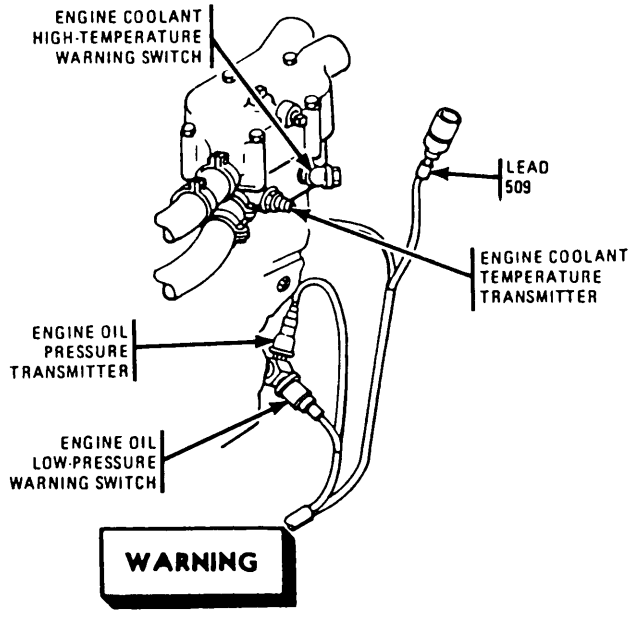
Step 7. Disconnect lead 509 from transmission oil thermostatic switch. Place red probe in lead 509. Ground black probe. Set MASTER switch ON. Set INST switch ON. If multimeter indicates about 24 volts, replace transmission oil thermostatic switch. Refer to page 2-626. If multimeter indicates no voltage, repair lead 509. Refer to page 2-371. Set MASTER switch OFF. Set INST switch OFF.



Step 8. Set MASTER switch ON. Set INST switch ON. If ENGINE WATER (COOLANT) TEMP indicator reads about 240 °F(116 °C), go to step 9. If ENGINE WATER (COOLANT) TEMP indicator does not read about 240 °F (116 °C), start engine and run at 1000 to 1200 rpm for 15 minutes or until ENGINE WATER (COOLANT) TEMP indicator reads about 240 °F (116 °C). Stop engine and go to step 9.



Step 9. Set MASTER switch OFF. Set INST switch OFF. Place red probe on engine coolant high-temperature warning switch metal case. Ground black probe. If multimeter indicates resistance, go to step 10. If multimeter indicates infinity, clean surface area between engine coolant high-temperature warning switch and thermostat housing for good metal-to-metal contact.

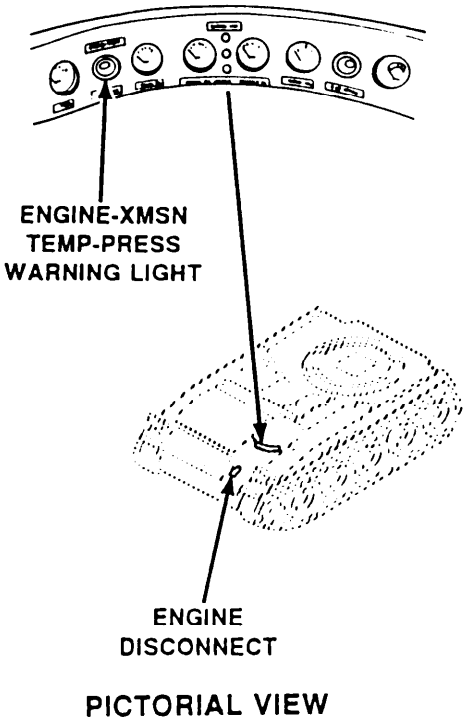


Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

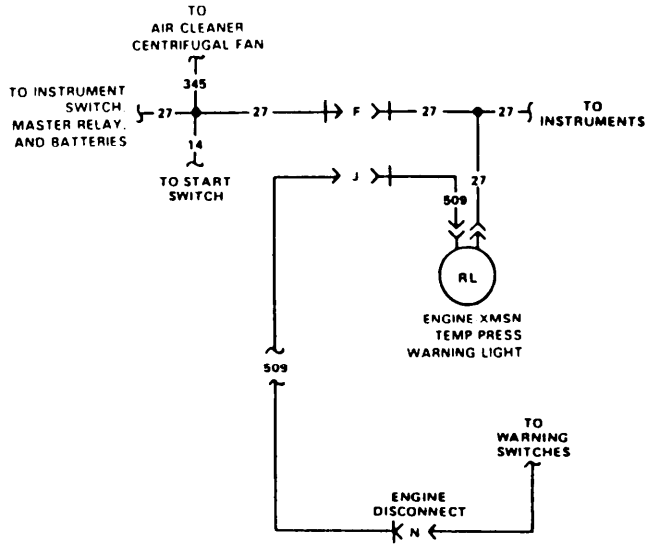
Step 10. Disconnect lead 509 from engine coolant high-temperature warning switch. Place red probe in lead 509. Ground black probe. Set MASTER switch ON. Set INST switch ON. If multimeter indicates about 24 volts, replace engine coolant high-temperature warning switch. Refer to page 2-626. If multimeter indicates no voltage, repair lead 509. Refer to page 2-371. Set MASTER switch OFF. Set INST switch OFF.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

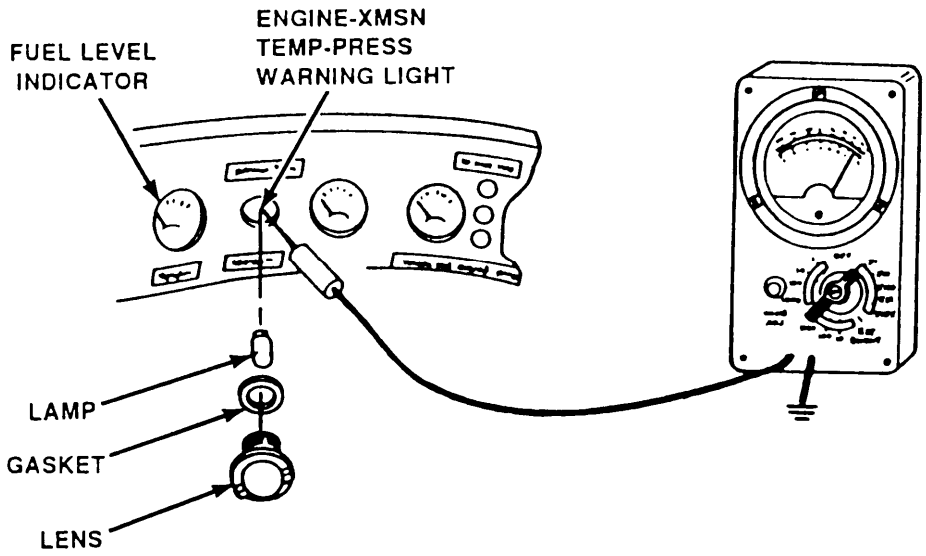
W. ENGINE-XMSN TEMP-PRESS WARNING LIGHT CIRCUIT.



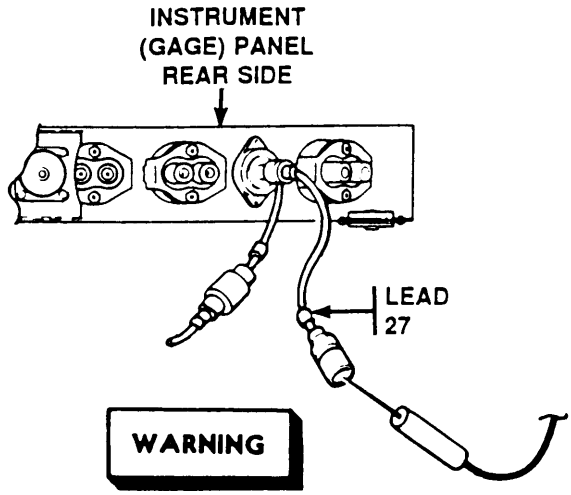
PICTORIAL VIEW



ELECTRICAL DIAGRAM

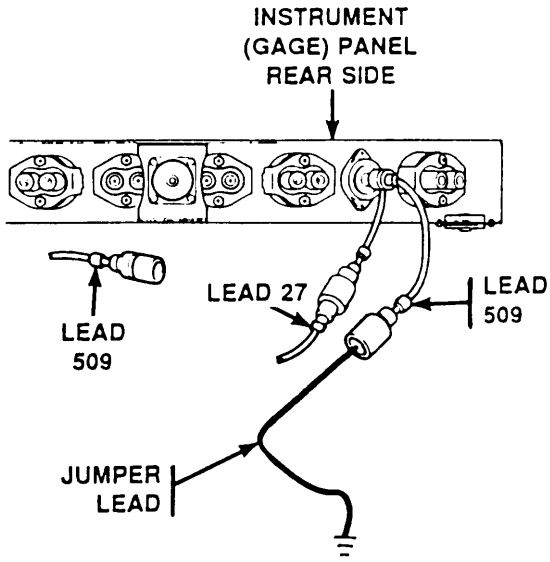


Step 1. Remove lamp from pressure line filter indicator light. Refer to page 2-580. Set MASTER switch ON. Place oil pump motor switch in ON position. Place red probe in socket. Ground black probe. If multimeter indicates about 24 volts, replace lamp. If multimeter indicates no voltage, set MASTER switch OFF, install lamp and go to step 2.



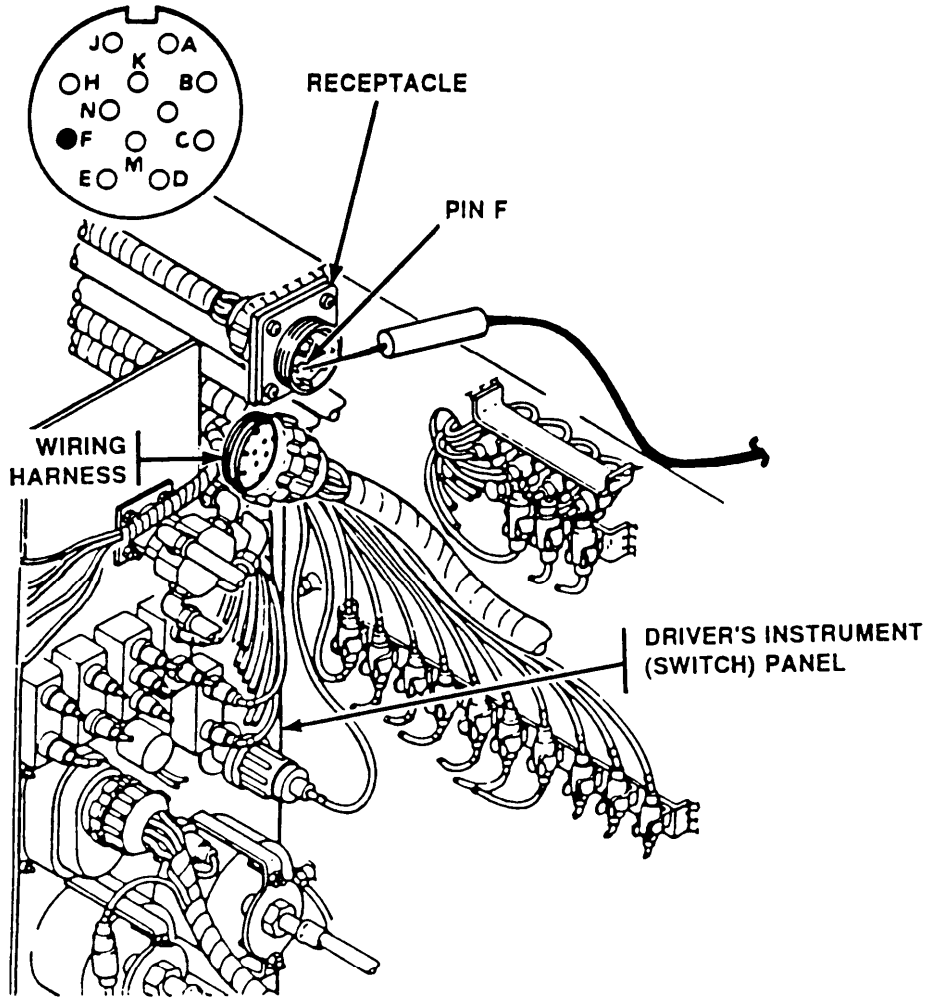
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Disconnect lead 27 from ENGINE-XMSN TEMP-PRESS warning light. Place red probe in lead 27. Ground black probe. Set MASTER switch ON. Set INST switch ON. If multimeter indicates about 24 volts, connect lead 27 and go to step 3. If multimeter indicates no voltage, repair lead 27. Refer to page 2-371. Set MASTER switch OFF. Set INST switch OFF.



Step 3. Disconnect lead 509 from ENGINE-XMSN TEMP-PRESS warning light. Connect a jumper lead between ENGINE-XMSN TEMP-PRESS connector pin and ground. If ENGINE-XMSN TEMP-PRESS warning light comes on, go to step 4. If ENGINE-XMSN TEMP-PRESS warning light does not come on, replace ENGINE-XMSN TEMP-PRESS warning light assembly. Refer to page 2-571.

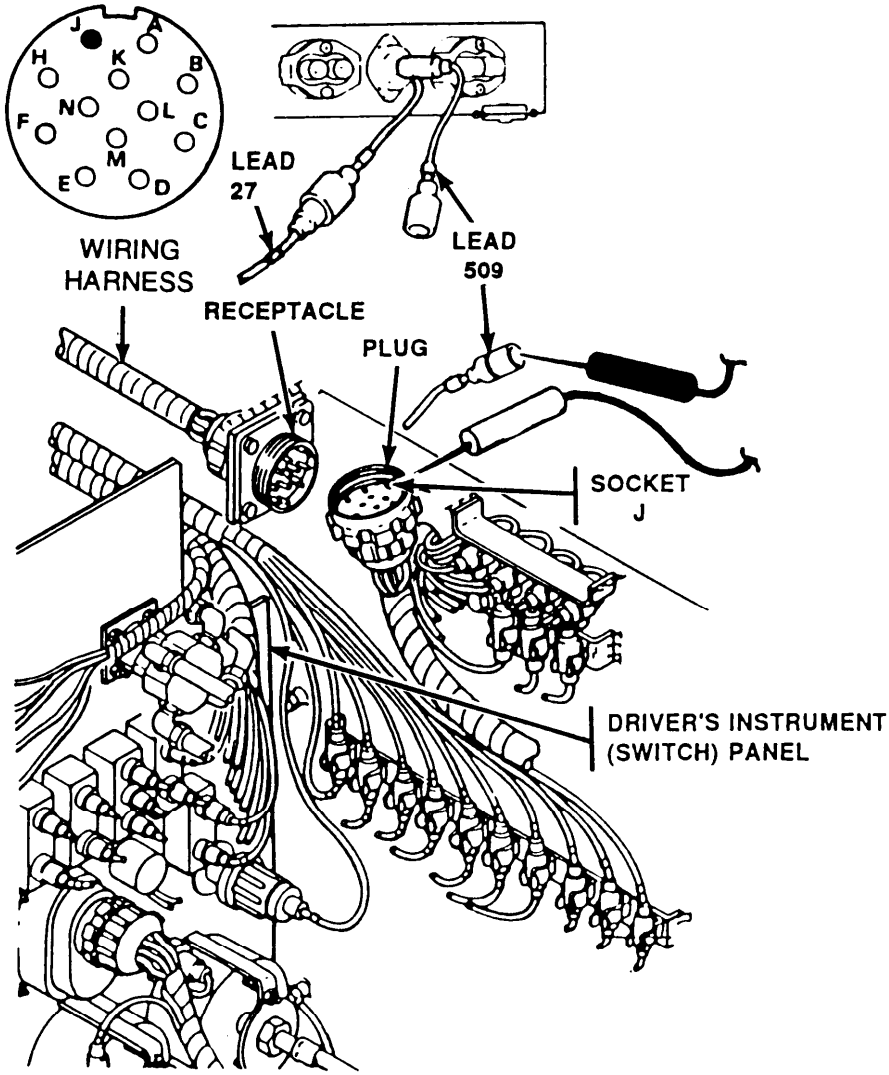
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

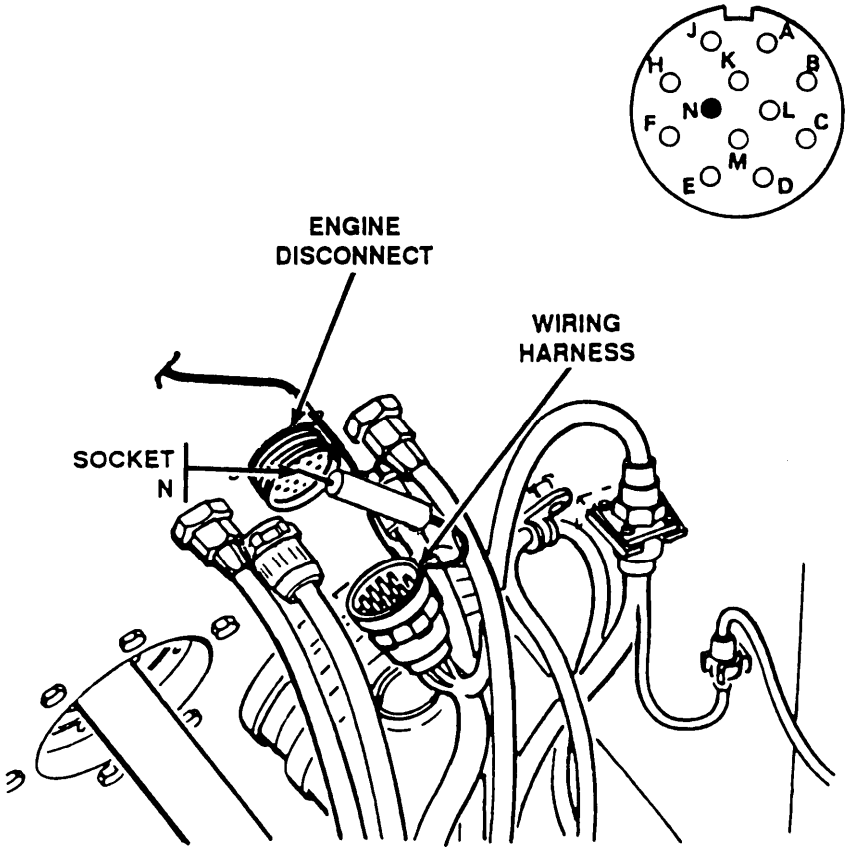
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 4. Disconnect instrument (gage) panel wiring harness. Place red probe on pin F (lead 27). Ground black lead. Set MASTER switch ON. Set INST switch ON. If multimeter indicates about 24 volts, repair lead 27 between receptacle and ENGINE-XMSN TEMP-PRESS warning light. Refer to page 2-371. If multimeter indicates no voltage, go to step 5. Set MASTER switch OFF. Set INST switch OFF.



Step 5. Place red probe in socket J (lead 509). Place black probe on lead 509 at light. If multimeter indicates no continuity, repair lead 509 from plug to ENGINE-XMSN TEMP-PRESS warning light. Refer to page 2-371. If multimeter indicates continuity, go to step 6. Connect wiring harness.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

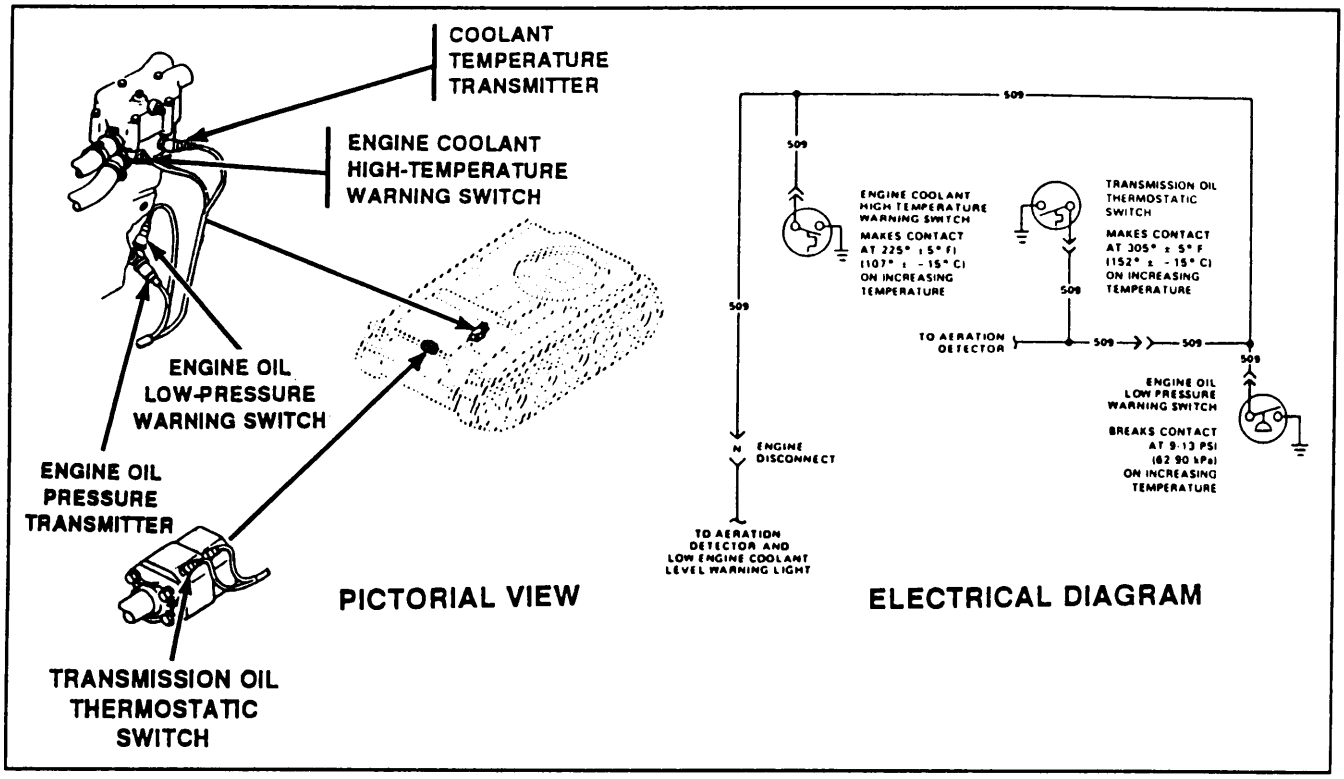


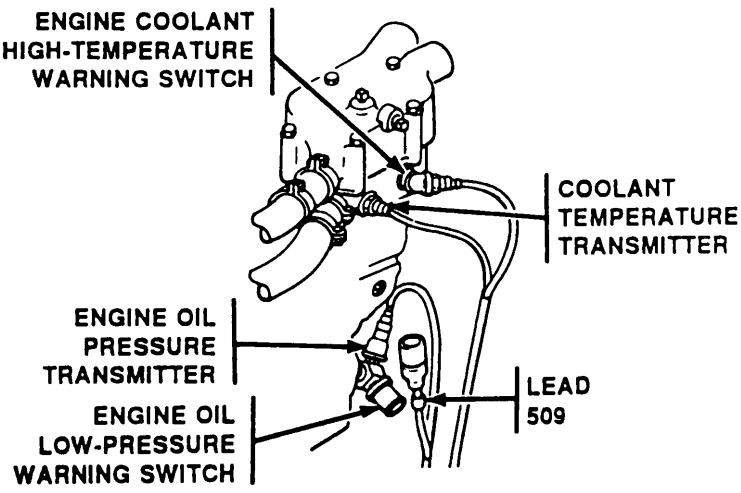
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 6. To access engine disconnect, remove transmission deck lid assembly. Refer to page 2-938. Disconnect wiring harness at engine disconnect. Place red probe in socket N (lead 509). Ground black probe. Set MASTER switch ON. Set INST switch ON. If multimeter indicates about 24 volts, system is operating normally. If multimeter indicates no voltage, repair lead 509 from engine disconnect to warning switches. Refer to page 2-371. Set MASTER switch OFF. Set INST switch OFF. Connect wiring harness.

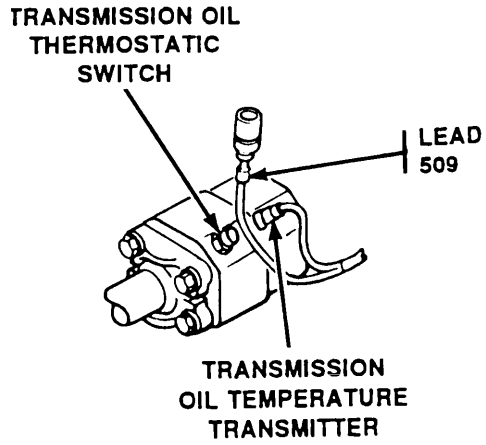
X. WARNING HORN AND ENGINE-XMSN TTEMP-PRESS WARNING LIGHT CIRCUIT.



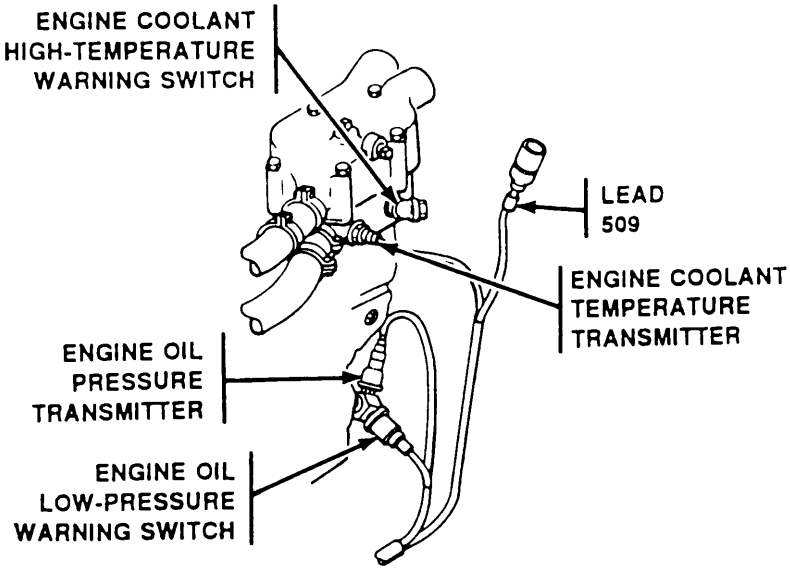


Step 1. To access engine oil low-pressure warning switch, open fuel filter access door. Disconnect lead 509 from engine oil low-pressure warning switch. Start engine and run at 800 rpm. If warning horn and ENGINE-XMSN TEMP-PRESS warning light stop operating, stop engine and replace engine oil low-pressure warning switch. Refer to page 2-626. If warning horn and ENGINE-XMSN TEMP-PRESS warning light do not stop operating, go to step 2. Connect lead 509 to engine oil low-pressure switch.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

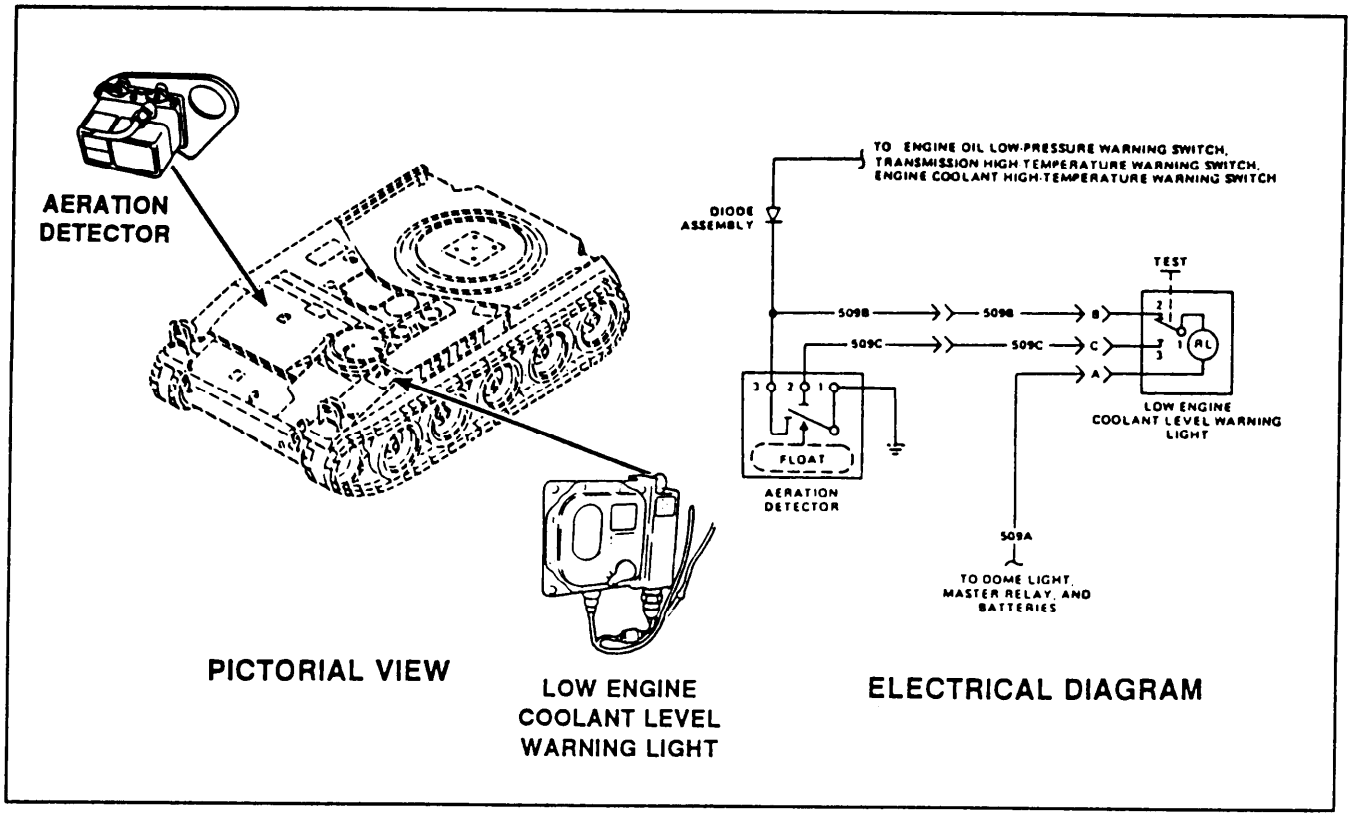


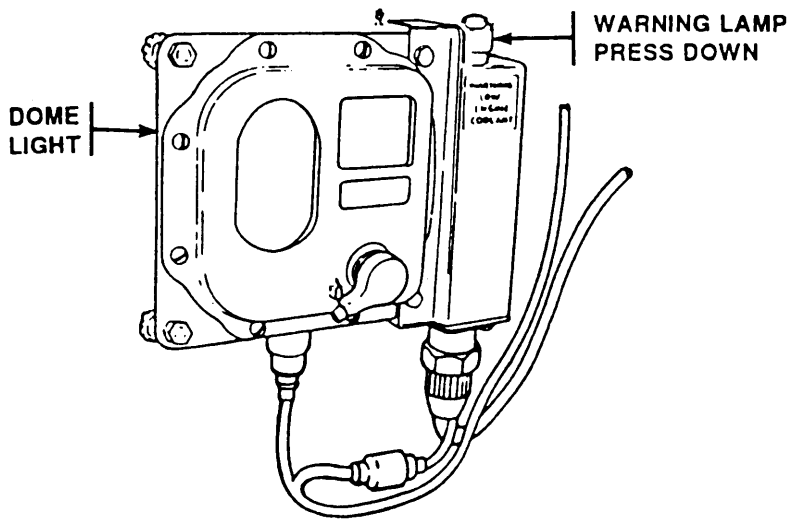
Step 2. To access transmission oil thermostatic switch, remove transmission deck lid assembly. Refer to page 2-938. Disconnect lead 509 from transmission oil thermostatic switch. Start engine and run at 800 rpm. If warning horn and ENGINE-XMSN TEMP-PRESS warning light stop operating, stop engine and replace transmission oil thermostatic switch. Refer to page 2-626. If warning horn and ENGINE-XMSN TEMP-PRESS warning light do not stop operating, go to step 3. Connect lead 509 to transmission oil thermostatic switch.



Step 3. Disconnect lead 509 from engine coolant high-temperature warning switch. Start engine and run at 800 rpm. If warning horn and ENGINE-XMSN TEMP-PRESS warning light stop operating, stop engine and replace engine coolant high-temperature warning switch. Refer to page 2-626. If warning horn and ENGINE-XMSN TEMP-PRESS warning light do not stop operating, repair lead 509. Refer to page 2-371. Connect lead 509 to engine coolant high-temperature warning switch.

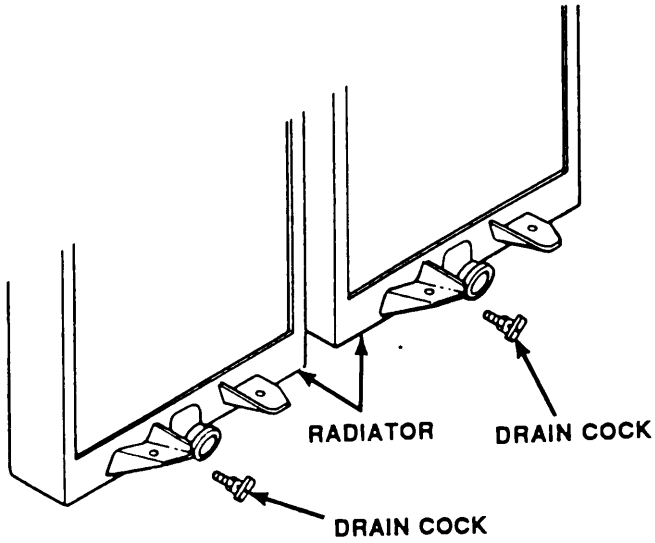
Y. AERATION DETECTOR CIRCUIT.



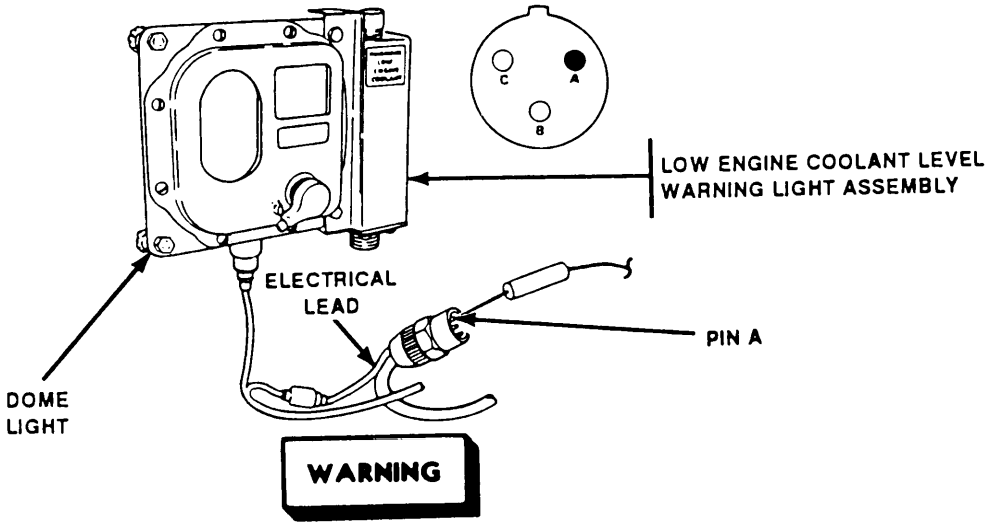


Step 1. Set MASTER switch ON. Press low engine coolant level warning light lens. If low engine coolant level warning light operates, go to step 2. If low engine coolant level warning light fails to operate, go to step 3. Set MASTER switch OFF.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



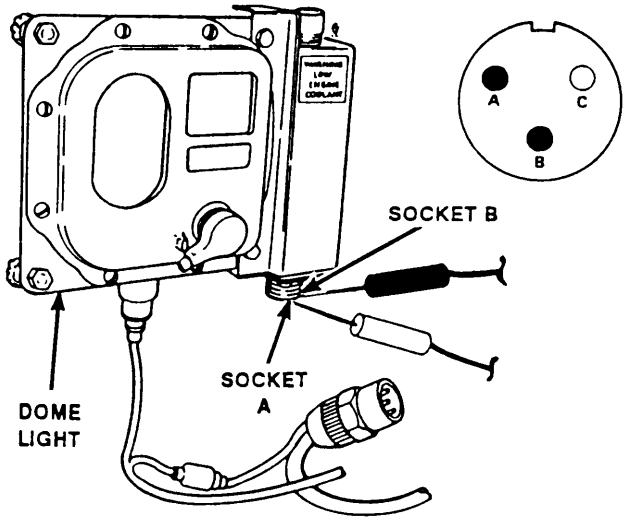
Step 2. Drain coolant from radiators to lower coolant below the safe level. Set MASTER switch ON. If low engine coolant level warning light operates, go to step 3. If low engine coolant level warning light fails to operate, replace aeration detector unit. Refer to page 2-539. Set MASTER switch OFF. Fill radiators with coolant.



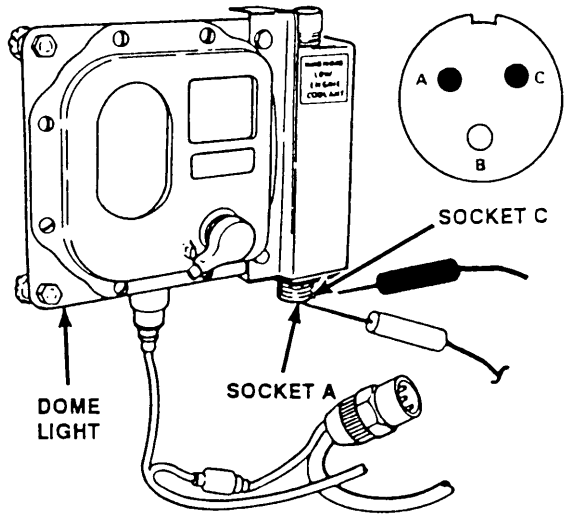
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. Disconnect electrical lead from low engine coolant level warning light. Place red probe on pin A. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 4. If multimeter indicates no voltage, repair lead 509A. Refer to page 2-371. Set MASTER switch OFF.

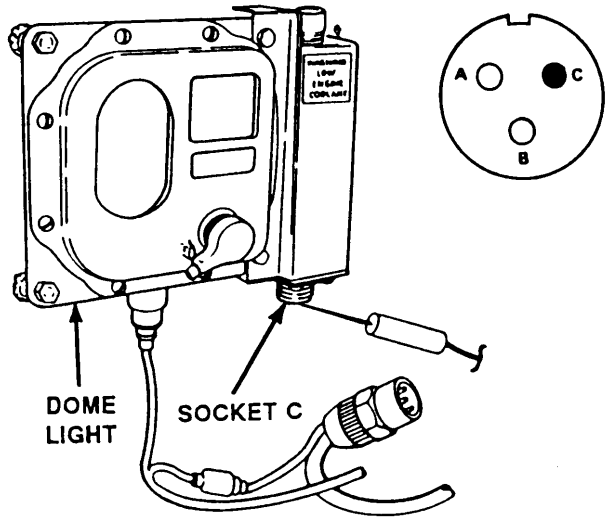


Step 4. Place red probe in socket A. Place black probe in socket B. If multimeter indicates about 20 ohms, go to step 5. If multimeter does not indicate about 20 ohms, replace low engine coolant level warning light assembly. Refer to page 2-626.

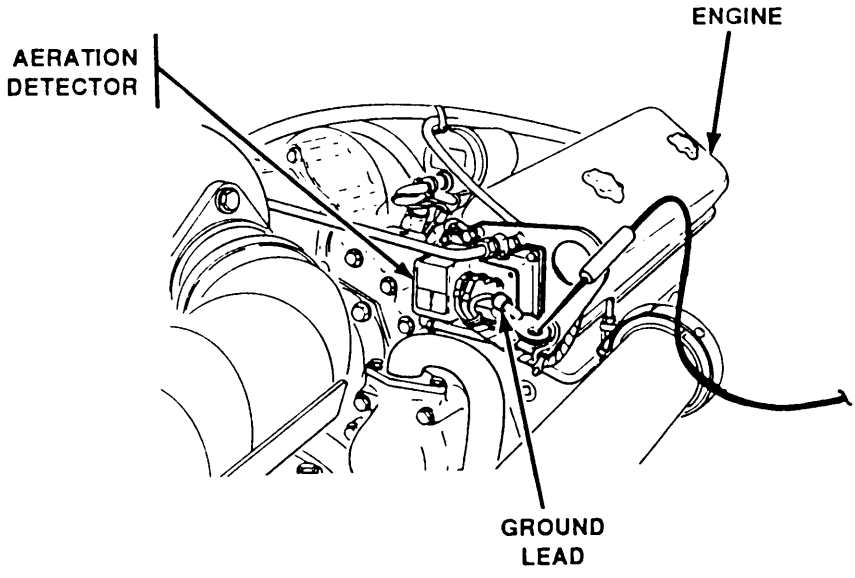


Step 5. Place red probe in pin socket A. Place black probe in pin socket C. Press down on low engine coolant level warning light. If multimeter indicates about 20 ohms, go to step 6. If multimeter does not indicate about 20 ohms, replace low engine coolant level warning light assembly. Refer to page 2-626.

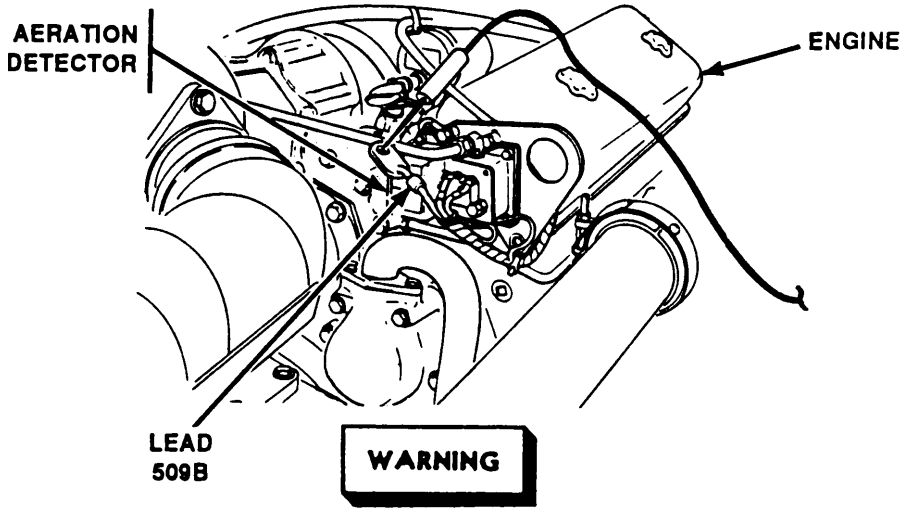
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 6. Place red probe in pin socket C. Ground black probe. indicates 0 ohms, connect electrical lead to low engine coolant level warning light and go to step 7. If multimeter does not indicate 0 ohms, low engine coolant level warning switch is operating properly.



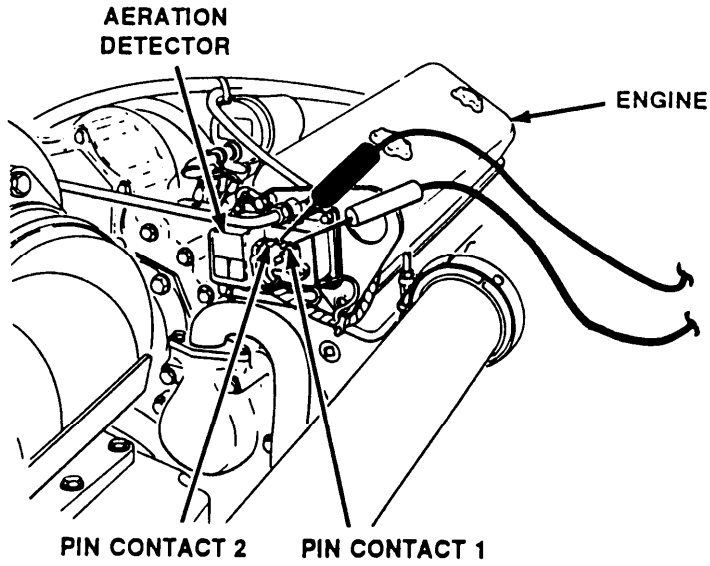
Step 7. To access aeration detector, remove engine deck assembly. Refer to page 2-935. Disconnect ground lead from aeration detector. Place red probe on ground lead. Ground black probe. If multimeter indicates 0 ohms, go to step 9. If multimeter does not indicate 0 ohms, repair ground lead. Refer to page 2-371. Connect ground lead.



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

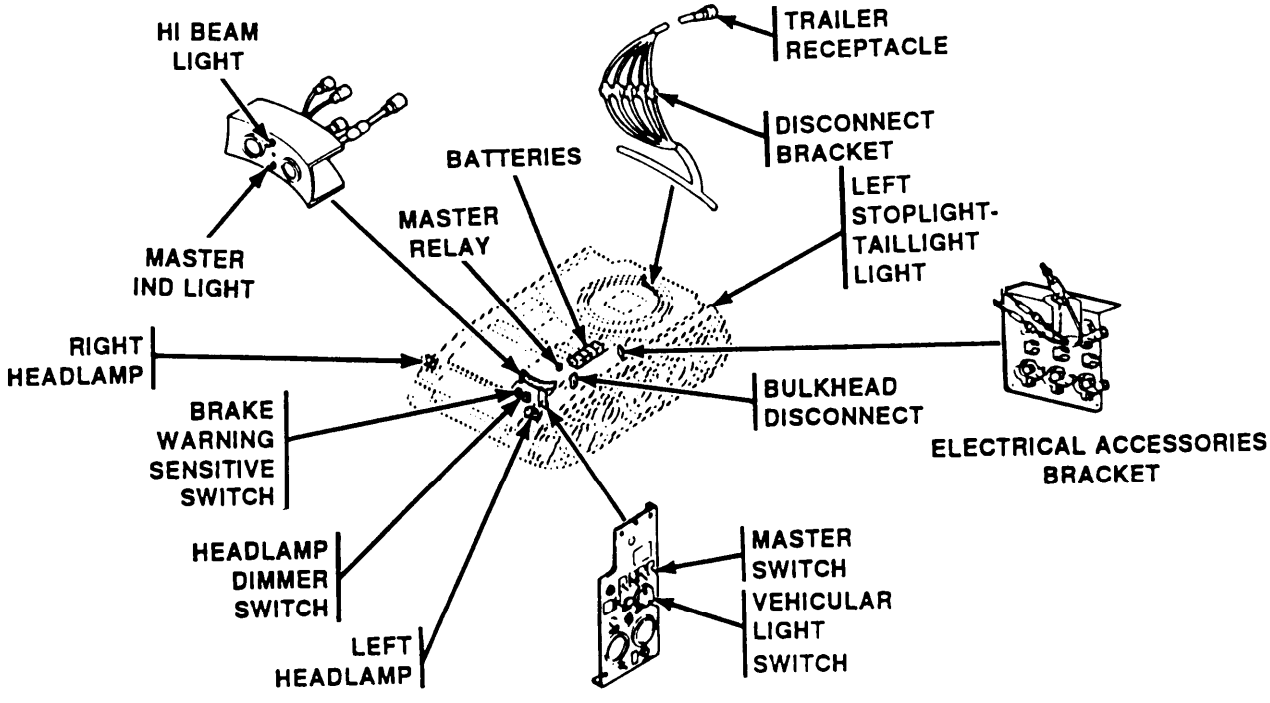
Step 8. Disconnect lead 509B from aeration detector. Place red probe on lead 509B. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 9. If multimeter indicates no voltage, repair lead 509B. Refer to page 2-371. Set MASTER switch OFF.



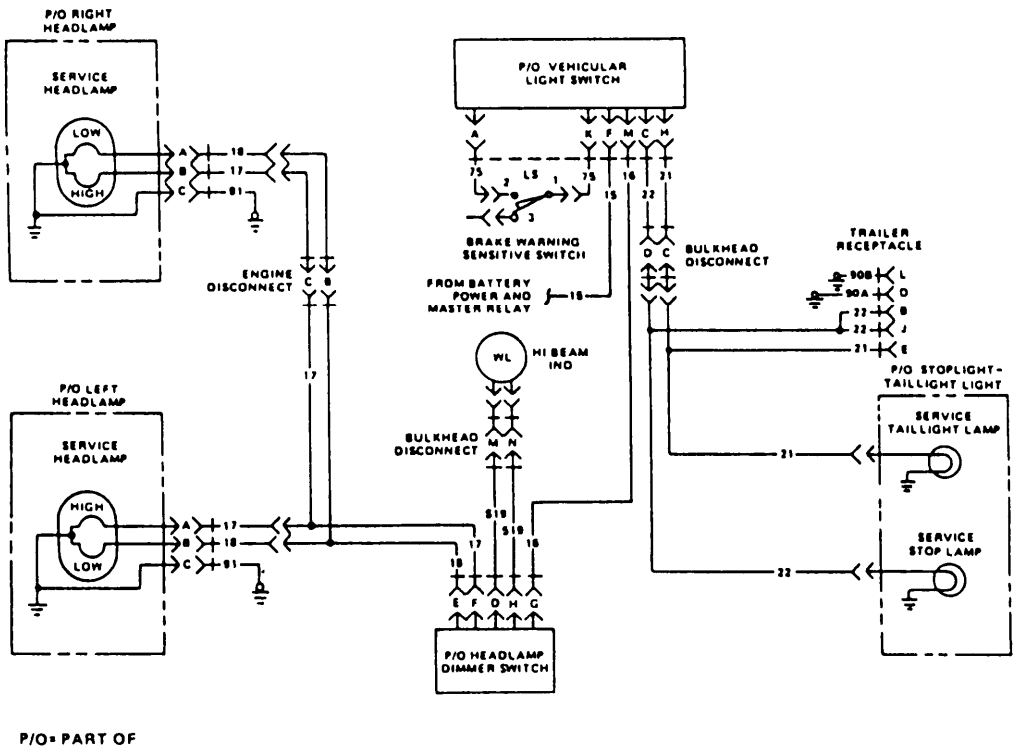
Step 9. Place red probe on aeration detector switch contact 1. Place black probe on aeration detector switch contact 2. Coolant in radiators must be at full level. If multimeter indicates 0 ohms, replace aeration detector. Refer to page 2-539. If multimeter indicates infinity, repair lead 509C between aeration detector and low engine coolant level warning light. Refer to page 2-371.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

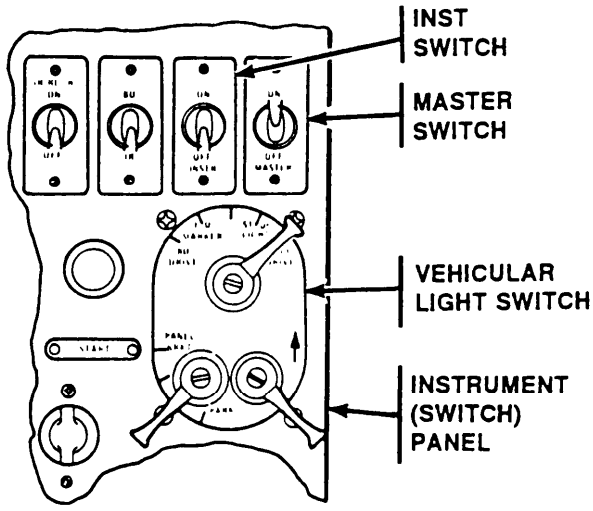
Z. SERVICE HEADLAMP, TAILLIGHT, AND STOPLIGHT CIRCUIT.



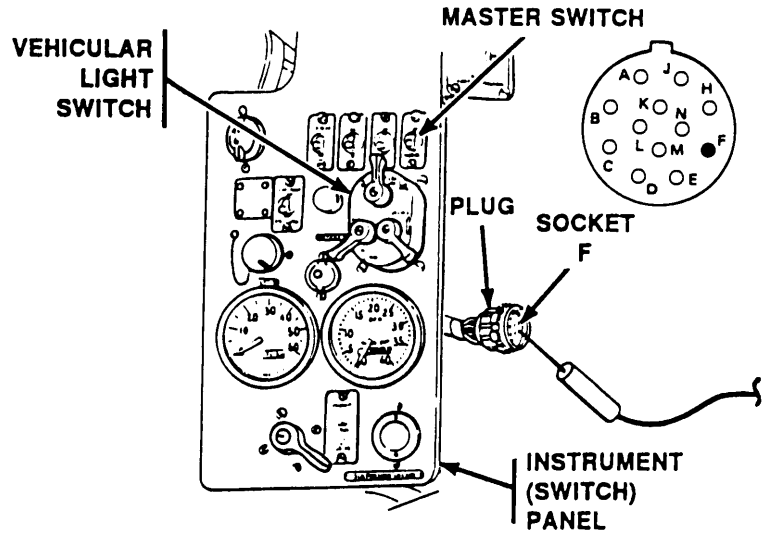
PICTORIAL VIEW



ELECTRICAL DIAGRAM

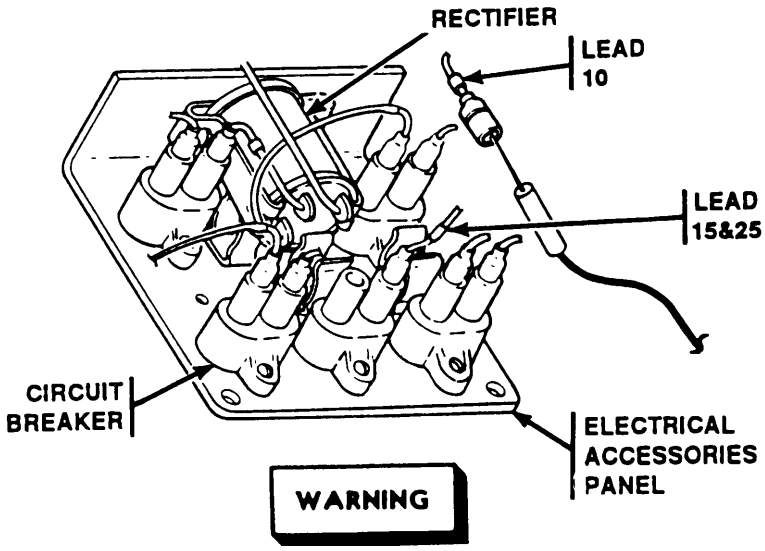


Step 1. Set MASTER switch ON. Turn vehicular light switch to SER DRIVE. If both taillight and service headlamps are off, go to step 2. If both service headlamps are on and taillight is off, go to step 6. If taillight is on and both service headlamps are off, go to step 10.



Step 2. Set MASTER switch OFF. Disconnect connector from vehicular light switch. Place red probe in socket F of receptacle. Ground black probe, If multimeter indicates about 24 volts, replace vehicular light switch. Refer to page 2-566. If multimeter indicates no voltage, go to step 3. Connect connector to vehicular light switch.

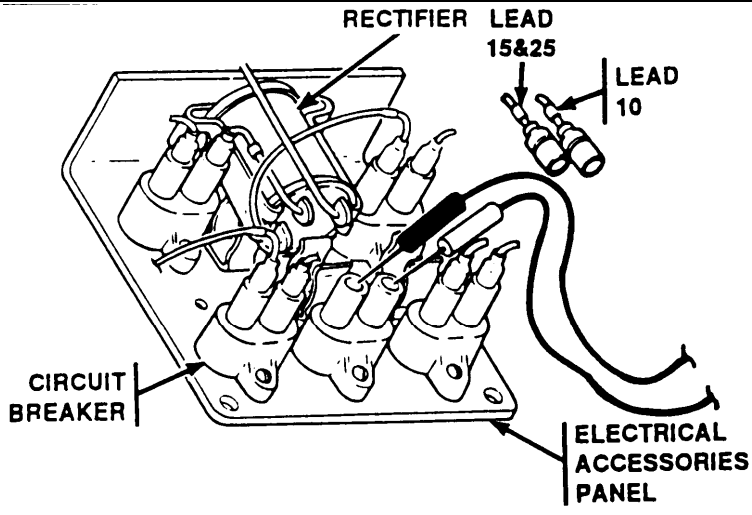
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



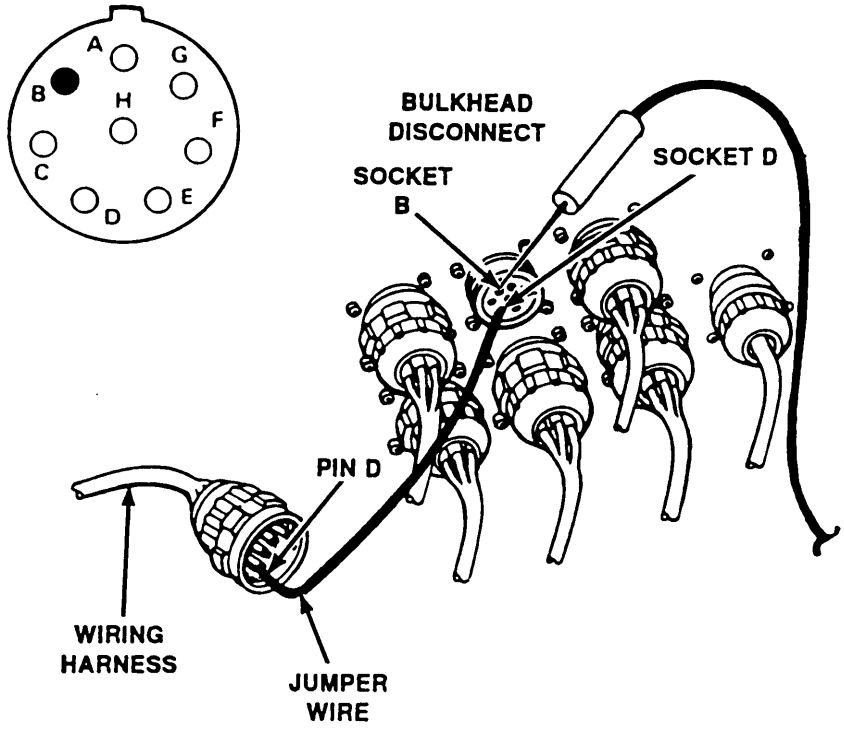
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. To access electrical accessories panel, remove left CO_2 cylinder access cover. Refer to page 2-923. Disconnect lead 10 from circuit breaker. Place red probe in lead 10. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 4. If multimeter indicates no voltage, repair lead 10. Refer to page 2-371. Set MASTER switch OFF and connect lead.



Step 4. Disconnect leads 15&25 and 10 from circuit breaker. Check continuity between circuit breaker terminals. If multimeter indicates continuity, repair lead 15&25. Refer to page 2-371. If multimeter does not indicate continuity, replace circuit breaker. Refer to page 2-590. Connect leads.

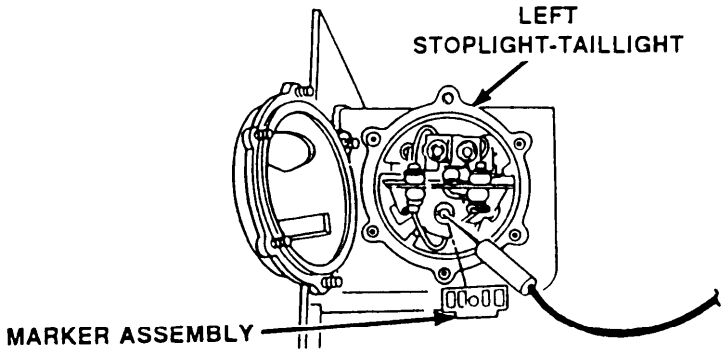


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 5. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness at bulkhead disconnect. Place jumper wire on pin D of wiring harness and socket D. Place red probe in socket B of lead 15&25. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, repair lead 15&25 between vehicular light switch and bulkhead disconnect. Refer to page 2-371. If multimeter indicates no voltage, repair lead 15&25 between bulkhead disconnect and circuit breaker. Refer to page 2-371. Remove jumper wire. Set MASTER switch OFF and connect lead.

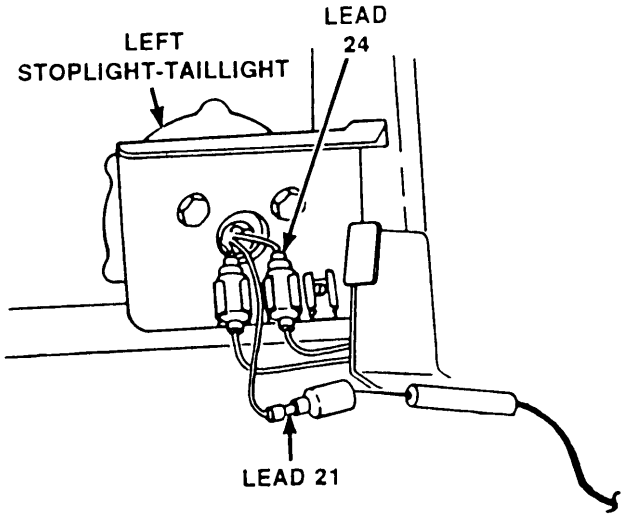
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



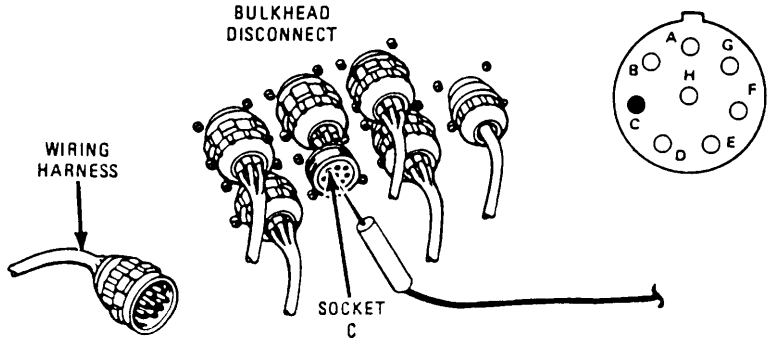
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 6. Remove marker assembly from left stoplight-taillight. Refer to page 2-614. Set MASTER switch ON. Place panel light switch in ON position. Unlock main light switch and place in blackout drive position. Place blackout infrared selection switch in blackout drive position. Place red probe in socket. Ground black probe. If multimeter indicates about 24 volts, replace marker assembly. If multimeter indicates no voltage, set MASTER switch OFF, install marker assembly and go to step 7.



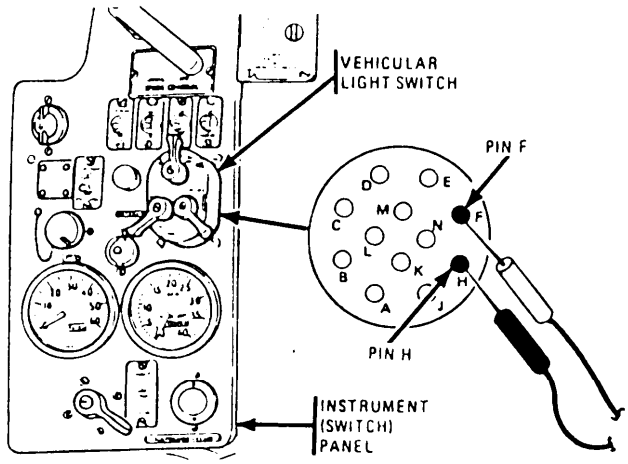
Step 7. Disconnect lead 21 from left stoplight-taillight. Place red probe in lead 21. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, repair left stoplight-taillight. Refer to page 2-614. If multimeter indicates no voltage, go to step 8. Set MASTER switch OFF and connect lead.



WARNING

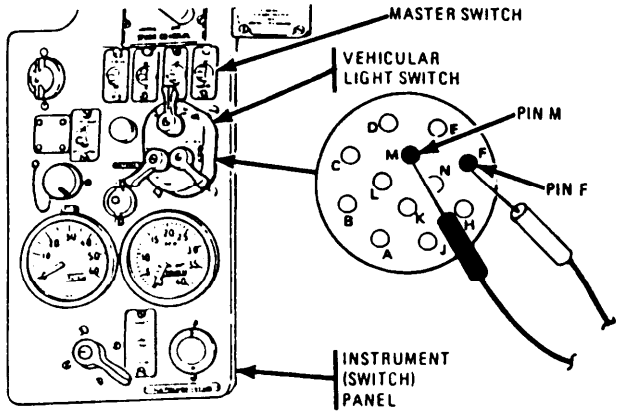
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 8. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness, Place red probe in socket C. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 9. If multimeter indicates no voltage, repair lead 21 between bulkhead disconnect and left stoplight-taillight. Refer to page 2-371. Set MASTER switch OFF and connect wiring harness.

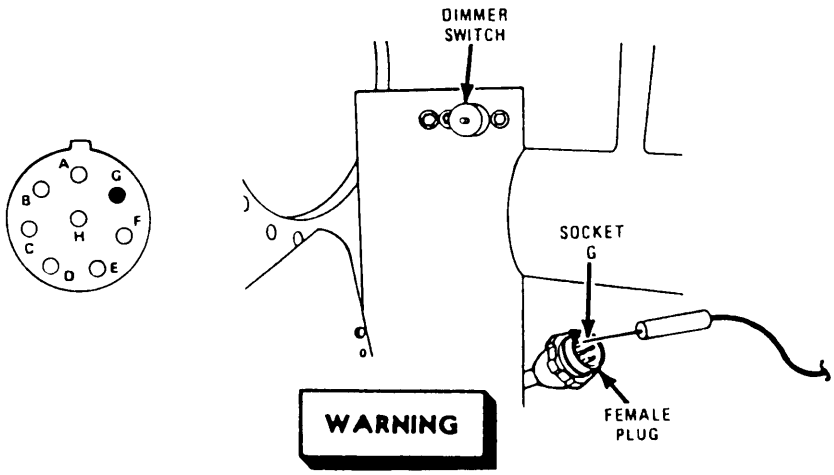


Step 9. Disconnect connector from vehicular light switch. Place red probe on pin F. Place black probe on pin H. If multimeter indicates 0 ohms, repair lead 21 between vehicular light switch and bulkhead disconnect. Refer to page 2-371. If multimeter does not indicate 0 ohms, replace vehicular light switch. Refer to page 2-566. Connect connector to vehicular light switch.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 10. Set MASTER switch OFF. Disconnect connector from vehicular light switch. Place red probe on pin F. Place black probe on pin M. If multimeter indicates 0 ohms, go to step 11. If multimeter does not indicate 0 ohms, replace vehicular light switch. Refer to page 2-566. Connect connector to vehicular light switch.

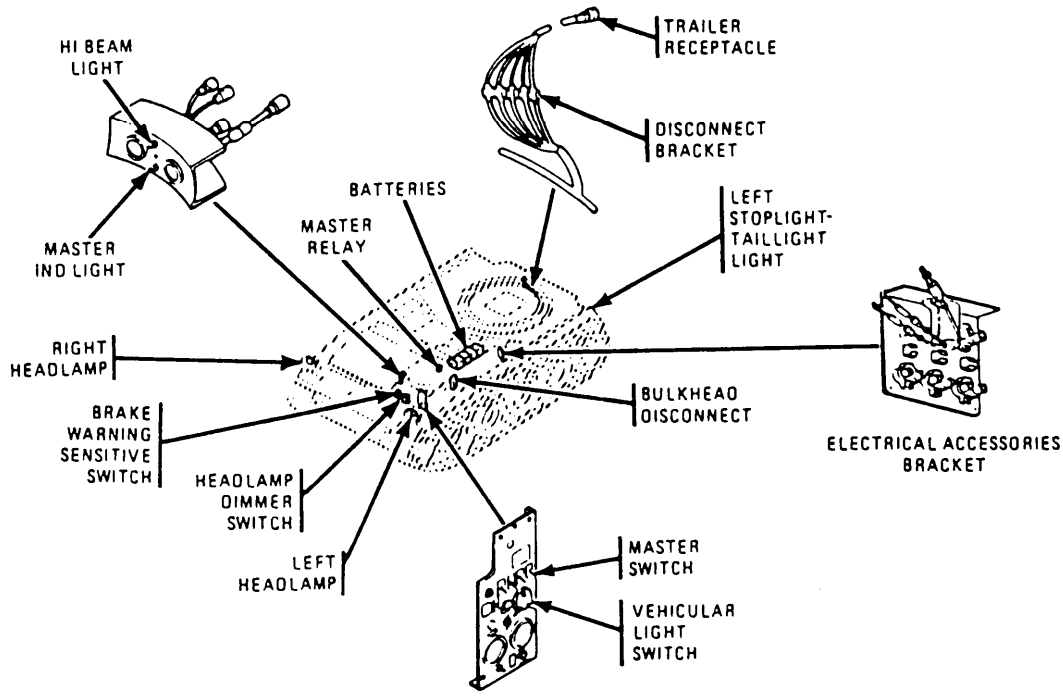


- Brake foot pedal is spring-loaded. Block tracks and release parking brake before working on headlamp dimmer switch.

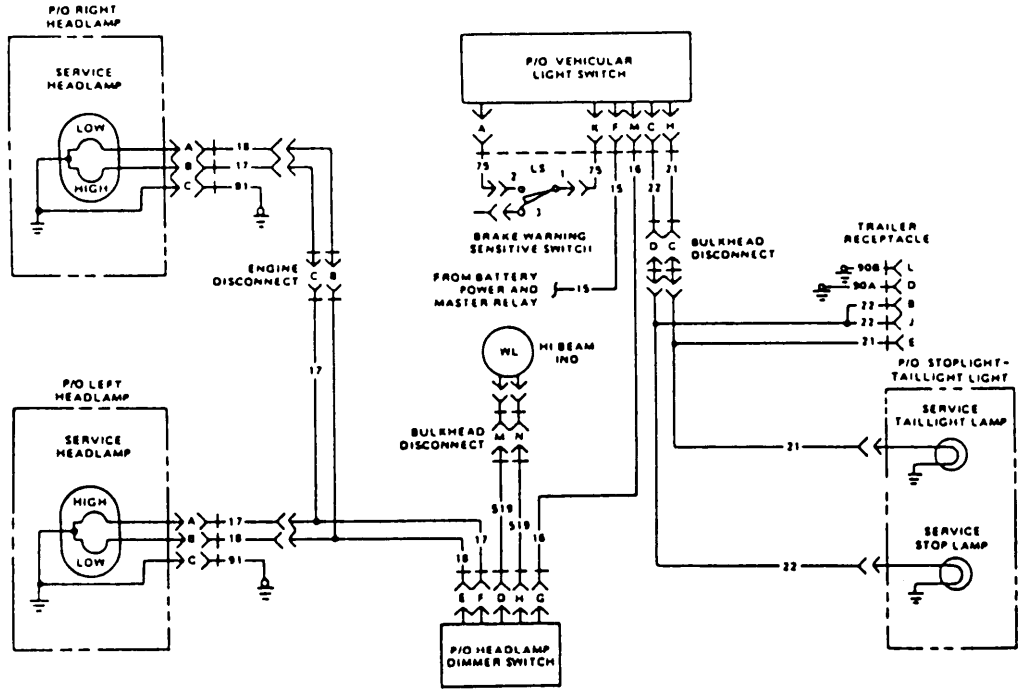
- Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 7. Disconnect connector from headlamp dimmer switch. Place red probe in socket G. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, replace headlamp dimmer switch. Refer to page 2-564. If multimeter indicates no voltage, repair lead 16 from vehicular light switch. Refer to page 2-371. Set MASTER switch OFF. Connect connector to headlamp dimmer switch.

AA. SERVICE HEADLAMP CIRCUIT (LOW BEAM).



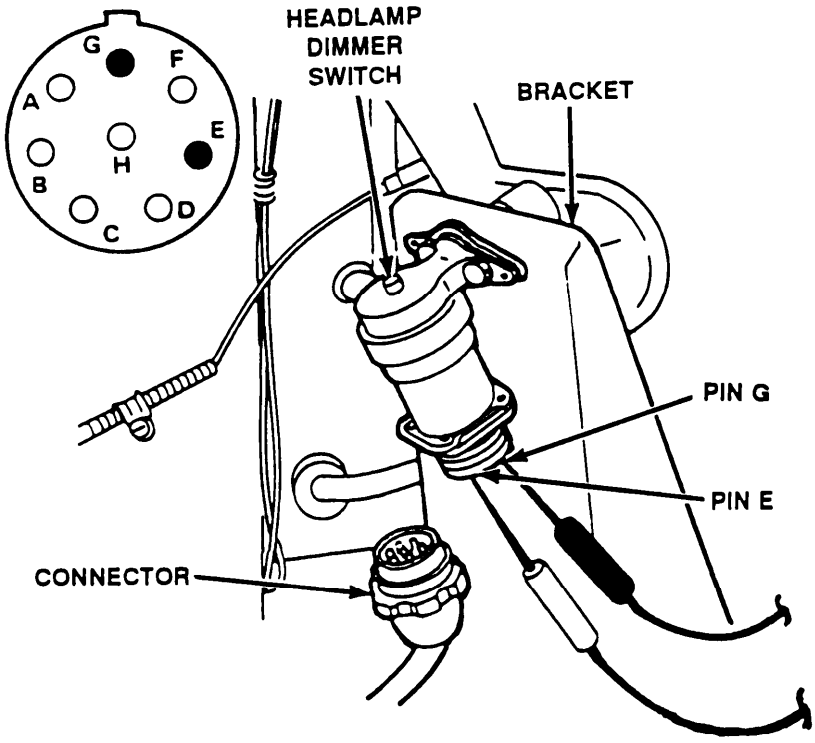
PICTORIAL VIEW



ELECTRICAL DIAGRAM

P/O = PART OF

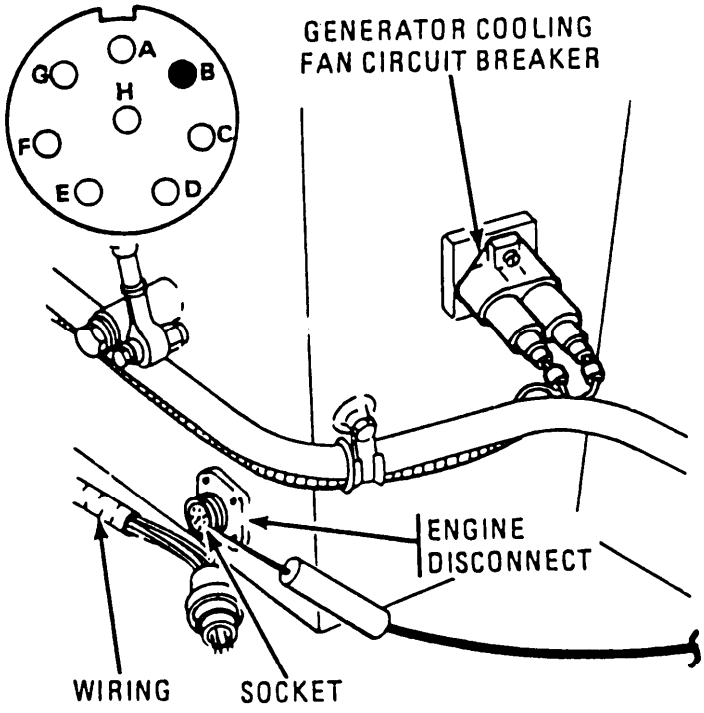
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 1. Press headlamp dimmer switch for low beam operation. Set MASTER switch OFF. Disconnect connector from headlamp dimmer switch. Place red probe on pin E. Place black probe on pin G. If multimeter indicates 0 ohms, go to step 2. If multimeter does not indicate 0 ohms, replace headlamp dimmer switch. Refer to page 2-584. Connect connector to headlamp dimmer switch.



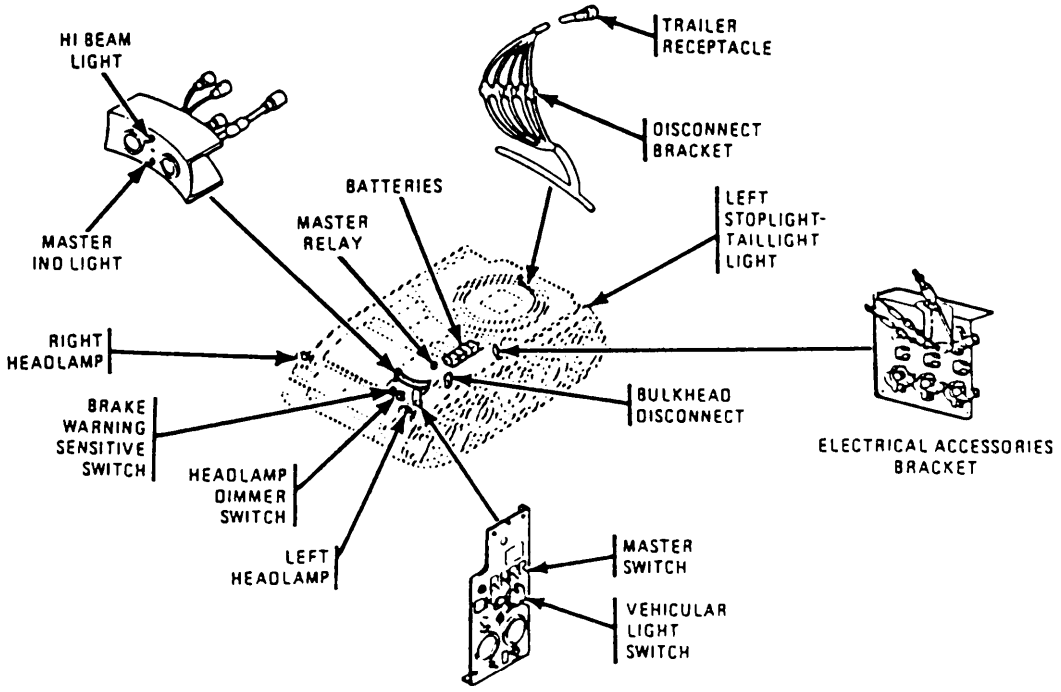
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

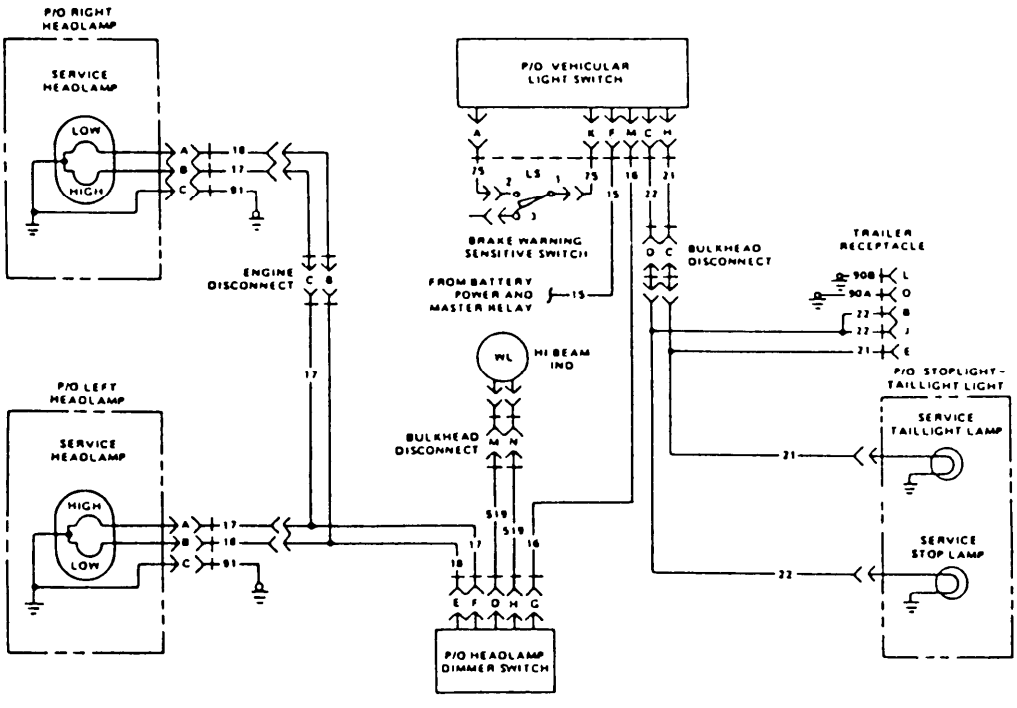
Step 2. To access engine disconnect, remove hull transmission compartment deck assembly. Refer to page 2-938. Disconnect wiring harness from engine disconnect. Place red probe in pin socket B. Ground black probe. Press headlamp dimmer switch for low beam operation. Set MASTER switch ON. Turn vehicular light switch to SER DRIVE. If multimeter indicates about 24 volts, repair lead 18 between service headlamp and engine disconnect. Refer to page 2-371. If multimeter indicates no voltage, repair lead 18 between engine disconnect and headlamp dimmer switch. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF. Connect wiring harness.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

AB. SERVICE HEADLAMP CIRCUIT (HI BEAM).

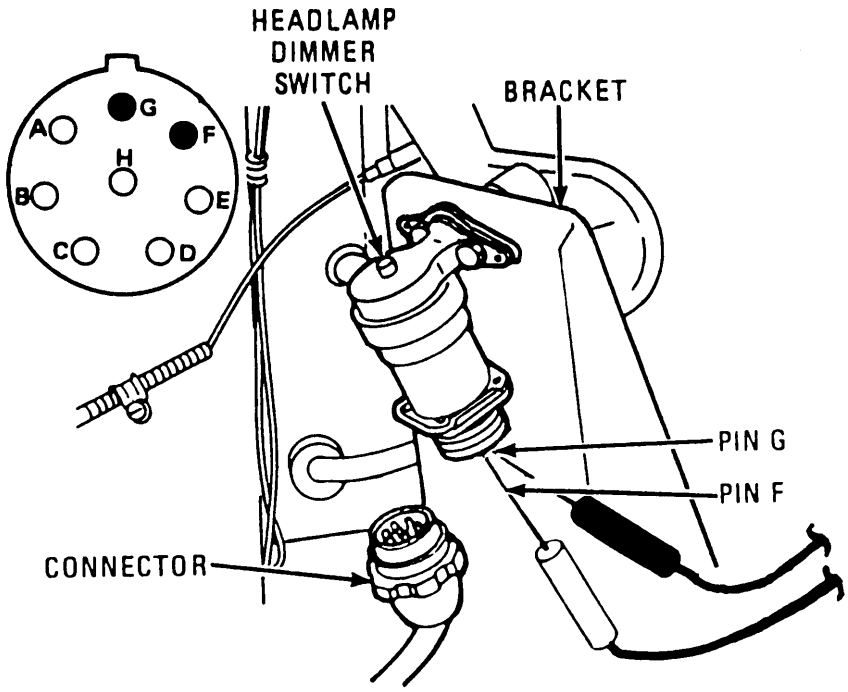


PICTORIAL VIEW



P/O = PART OF

ELECTRICAL DIAGRAM

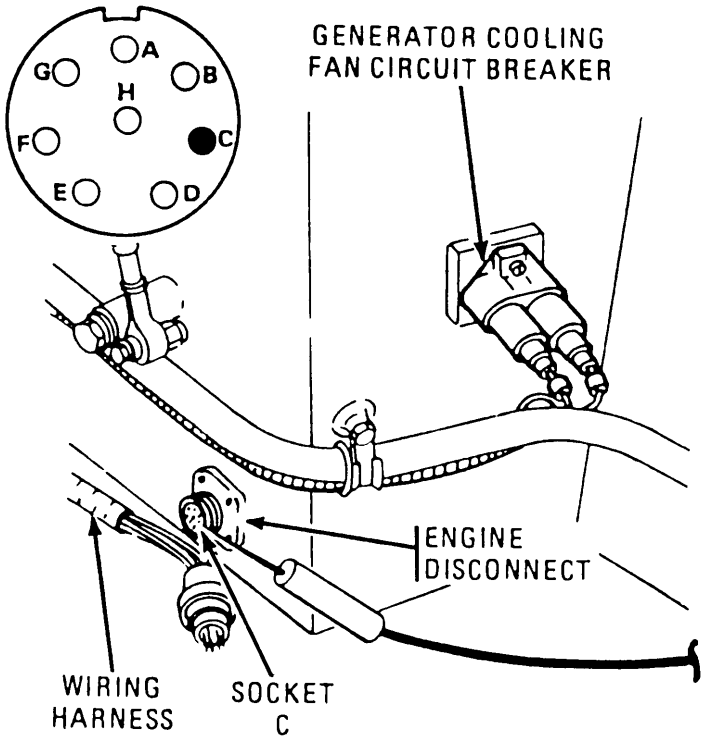


WARNING

- Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.
- Brake foot pedal is spring-loaded. Block tracks and release parking brake before working on headlamp dimmer switch.

Step 1. Press headlamp dimmer switch for high beam operation. Set MASTER switch OFF. Disconnect connector from headlamp dimmer switch. Place red probe in pin socket F. Place black probe in pin socket G. If multimeter indicates 0 ohms, go to step 2. If multimeter indicates infinity, replace headlamp dimmer switch. Refer to page 2-584. Connect connector to headlamp dimmer switch.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

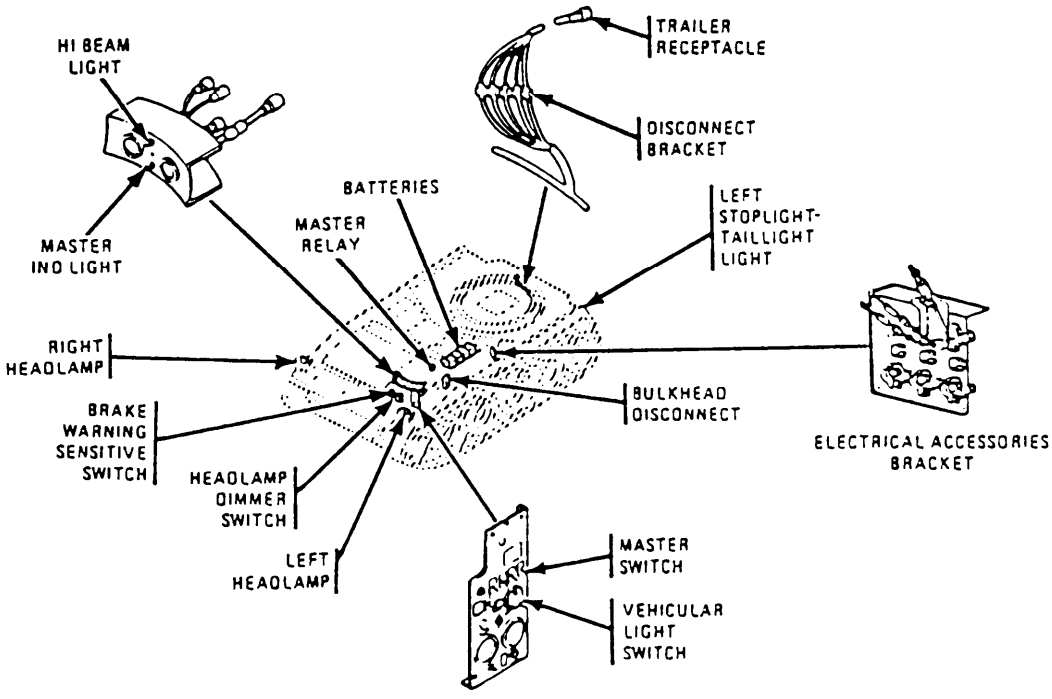


WARNING

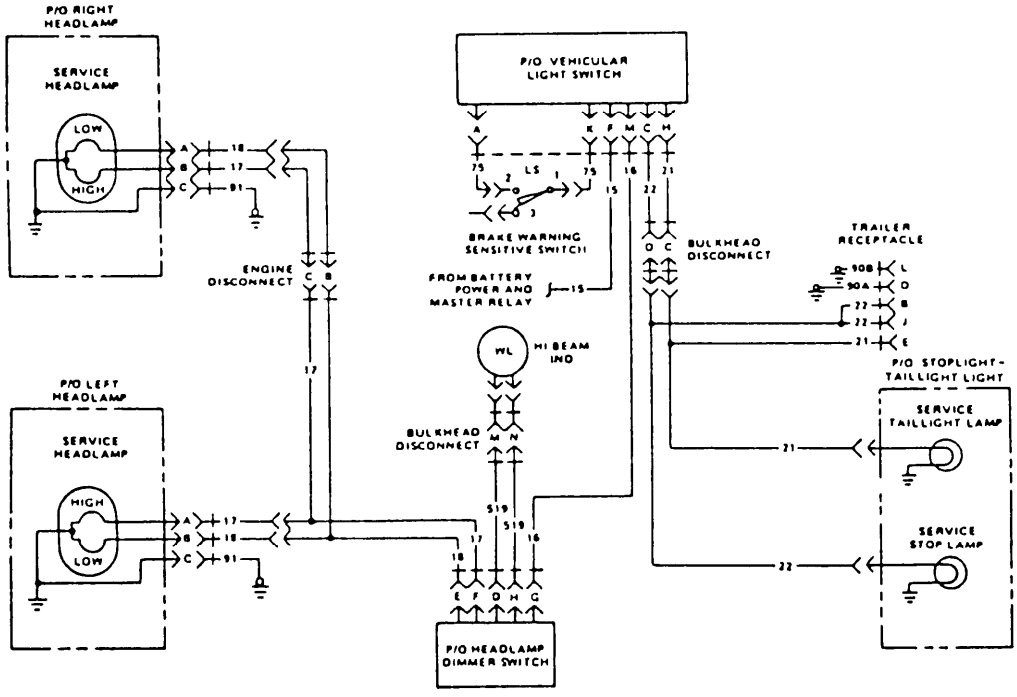
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. To access engine disconnect, remove transmission deck lid assembly. Refer to page 2-938. Disconnect wiring harness from engine disconnect. Place red probe in pin socket C. Ground black probe. Press headlamp dimmer switch for high beam operation. Set MASTER switch ON. Turn vehicular light switch to SER DRIVE. If multimeter indicates about 24 volts, repair lead 17 between service headlamp and engine disconnect. Refer to page 2-371. If multimeter indicates no voltage, repair lead 17 between engine disconnect and headlamp dimmer switch. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF. Connect wiring harness.

AC. SERVICE HEADLAMP CIRCUIT (LEAD 17).



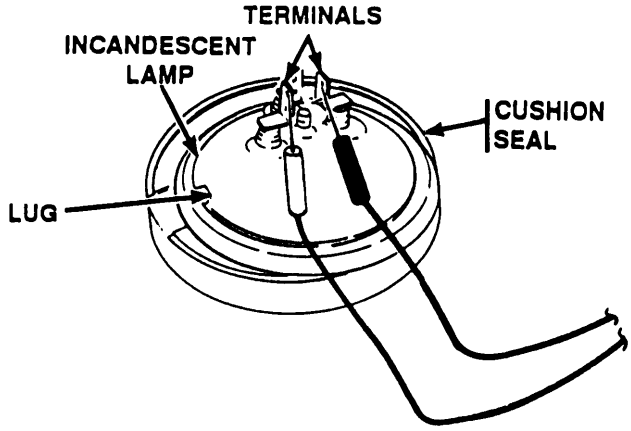
PICTORIAL VIEW



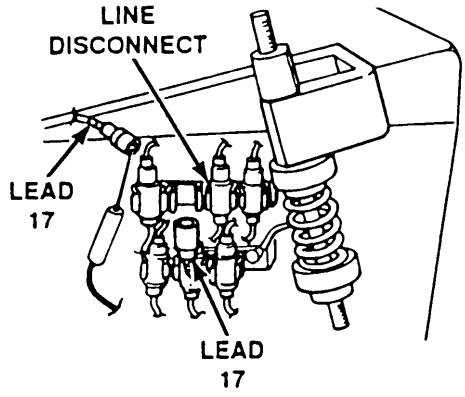
P/O = PART OF

ELECTRICAL DIAGRAM

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 1. Set MASTER switch OFF. Remove lamp from inoperative service headlamp. Refer to page 2-601. Connect multimeter to the parallel lamp terminals. If multimeter indicates about 1 ohm, install lamp in service headlamp and go to step 2. If multimeter indicates infinity, replace lamp. Refer to page 2-601.

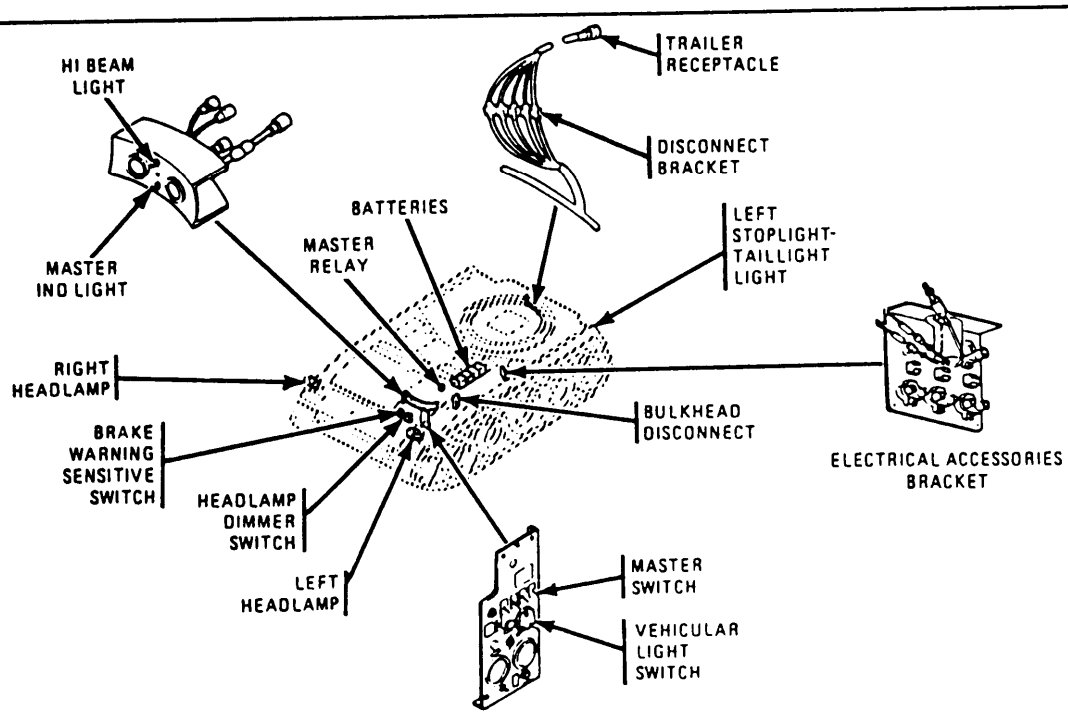


WARNING

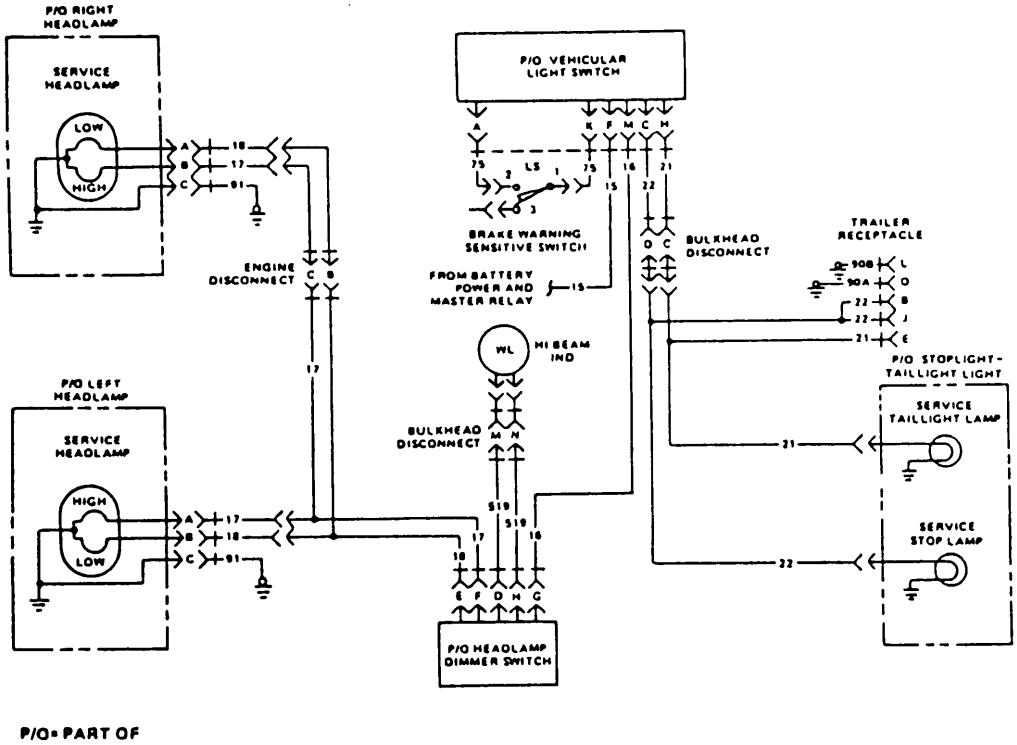
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. To access line disconnect, remove transmission deck lid assembly. Refer to page 2-938. Disconnect lead 17. Place red probe in lead 17. Ground black probe. Press headlamp dimmer switch for high beam operation. Set MASTER switch ON. Turn vehicular light switch to SER DRIVE. If multimeter indicates about 24 volts, repair service headlamp assembly. Refer to page 2-601. If multimeter indicates no voltage, repair lead 17 from line disconnect to service headlamp. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF.

AD. SERVICE HEADLAMP CIRCUIT (LEAD 18).



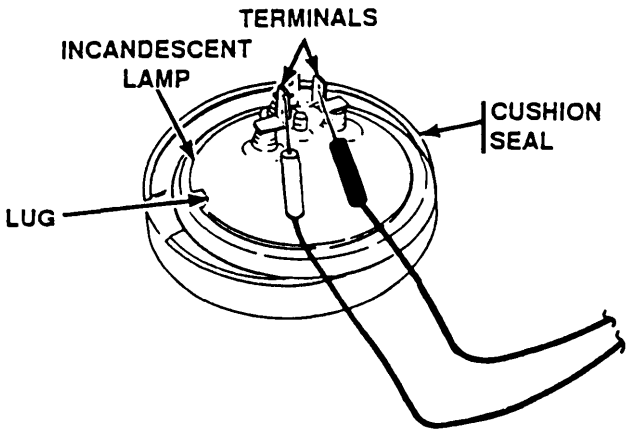
PICTORIAL VIEW



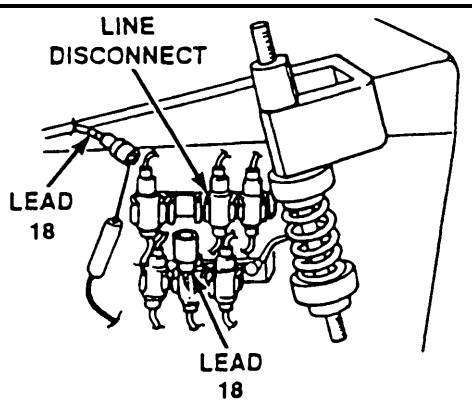
P/O = PART OF

ELECTRICAL DIAGRAM

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 1. Set MASTER switch OFF. Remove lamp from inoperative service headlamp. Refer to page 2-601. Connect multimeter to the parallel lamp terminals. If multimeter indicates about 2 ohms, go to step 2. If multimeter indicates infinity, replace lamp. Refer to page 2-601.

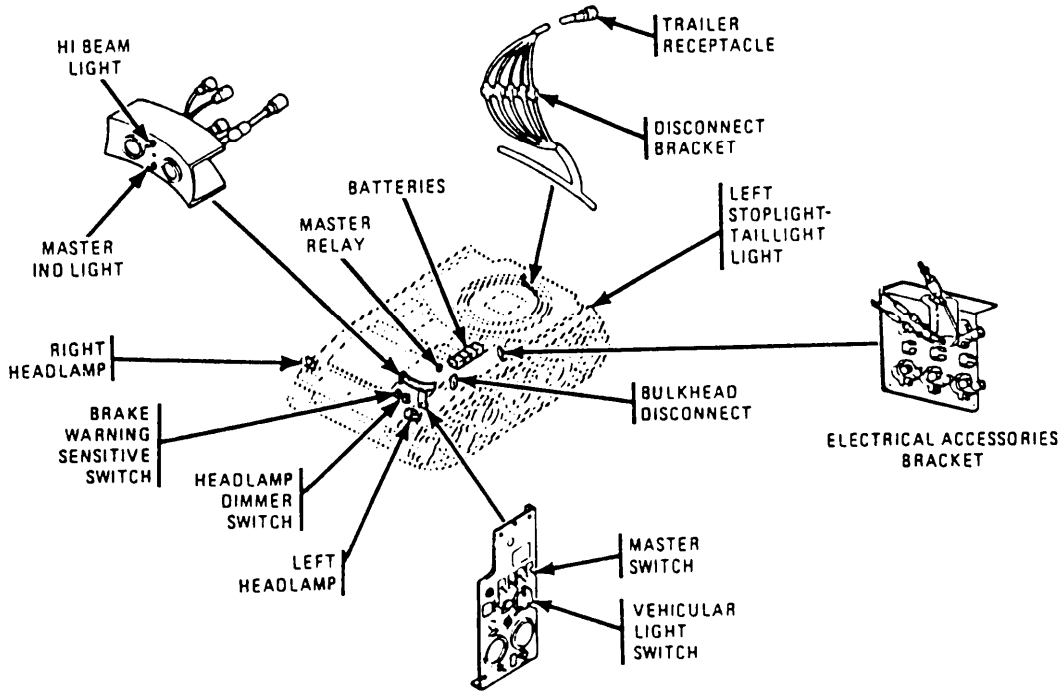


WARNING

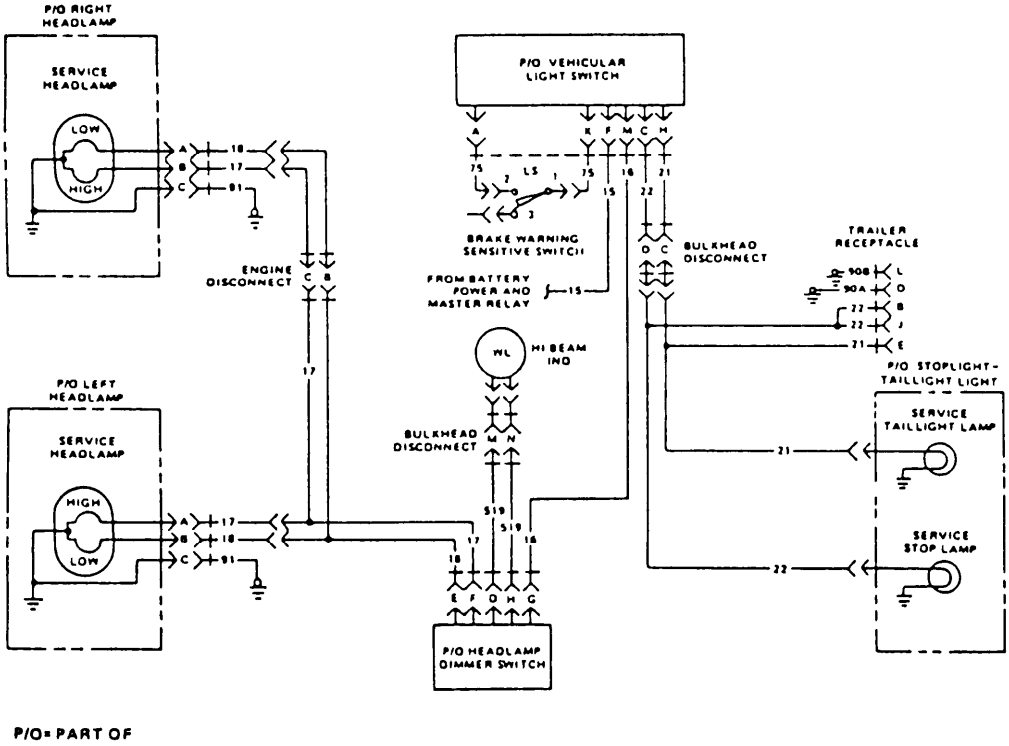
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. To access line disconnect, remove transmission deck lid assembly. Refer to page 2-938. Disconnect lead 18. Place red probe in lead 18. Ground black probe. Press headlamp dimmer switch for high beam operation. Set MASTER switch ON. Turn vehicular light switch to SER DRIVE. If multimeter indicates about 24 volts, repair service headlamp assembly. Refer to page 2-601. If multimeter indicates no voltage, repair lead 18 from line disconnect to service headlamp. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF. Connect lead.

AE. HI BEAM IND LIGHT CIRCUIT.



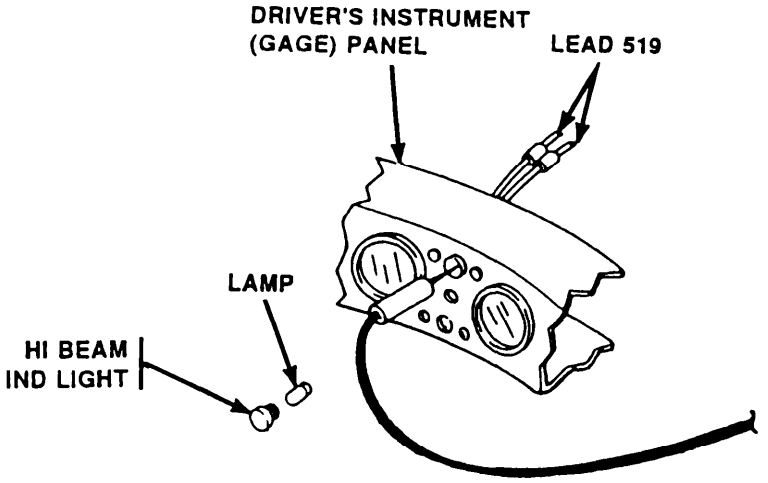
PICTORIAL VIEW



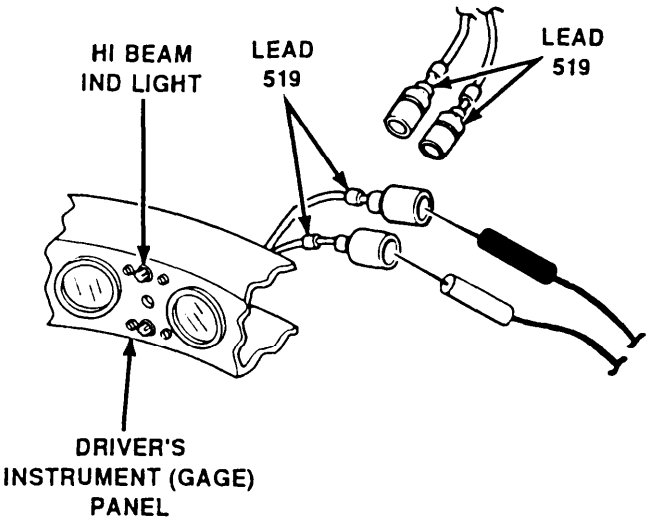
P/O= PART OF

ELECTRICAL DIAGRAM

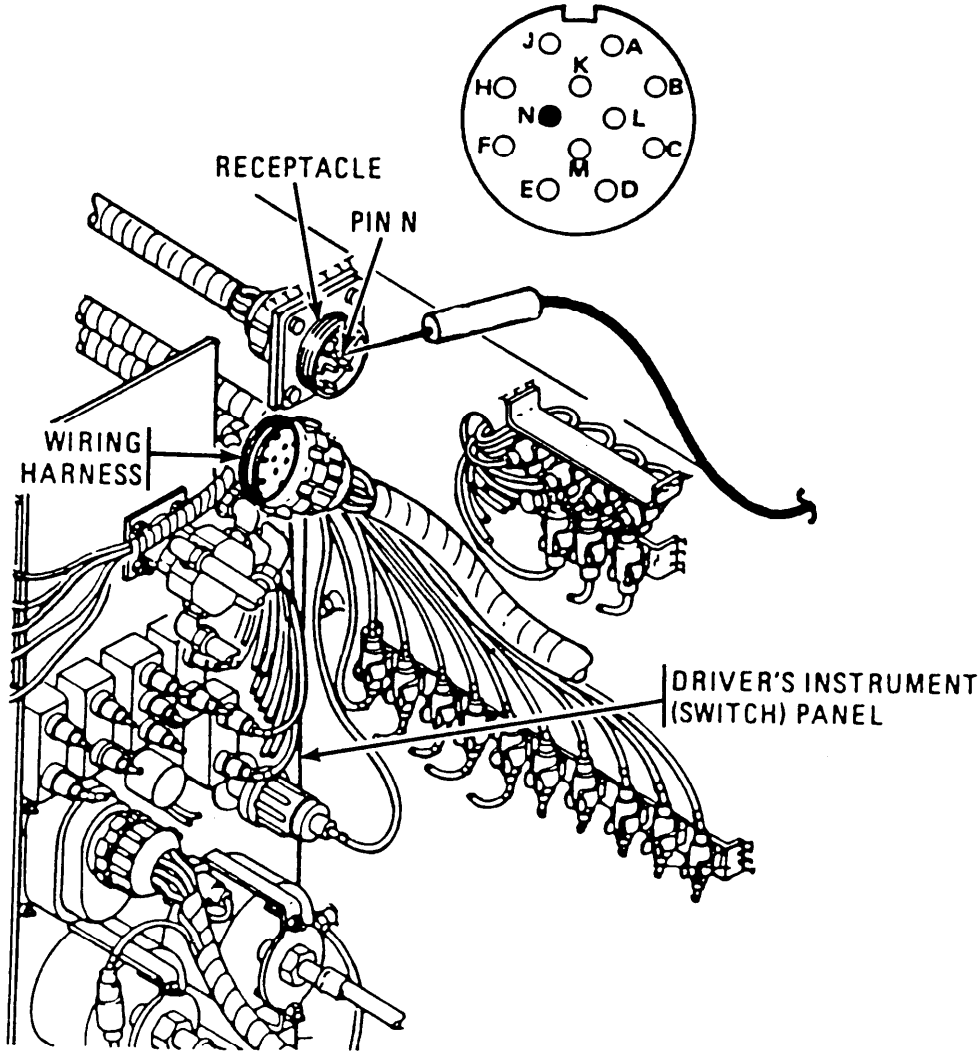
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 1. Remove HI BEAM IND lamp. Refer to page 2-571. Set MASTER switch ON. Place blackout-infrared selector switch in infrared position and infrared receiver switch in ON position. Press dimmer switch on floor. Place instrument switch in ON position. Place red probe in socket. Ground black probe. If multimeter indicates about 24 volts, replace lamp. If multimeter indicates no voltage, set MASTER switch OFF, install lamp and go to step 2.



Step 2. To access electrical leads, remove driver's instrument (gage) panel. Refer to page 2-571. Disconnect leads 519 from HI BEAM IND light. Place multimeter probes in leads 519 at light. If multimeter indicates 100 ohms, go to step 3. If multimeter indicates infinity, replace HI BEAM IND lamp assembly. Refer to page 2-571.

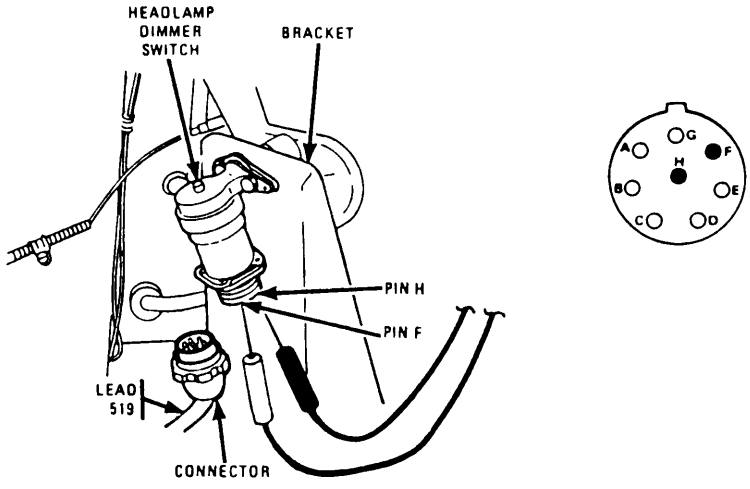


WARNING

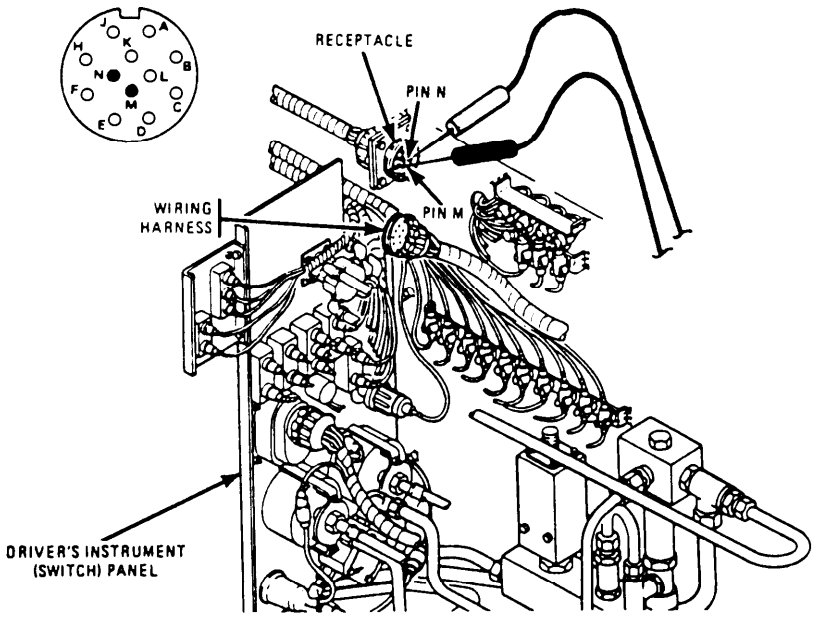
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. Disconnect instrument (gage) panel wiring harness. Place red probe on pin N (lead 519). Ground black probe. Set MASTER switch ON. Turn vehicular light switch to SER DRIVE. Press headlamp dimmer switch for high beam operation. If multimeter indicates about 24 volts, go to step 5. If multimeter indicates no voltage, connect wiring harness and go to step 4. Set MASTER switch OFF. Turn vehicular light switch OFF.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

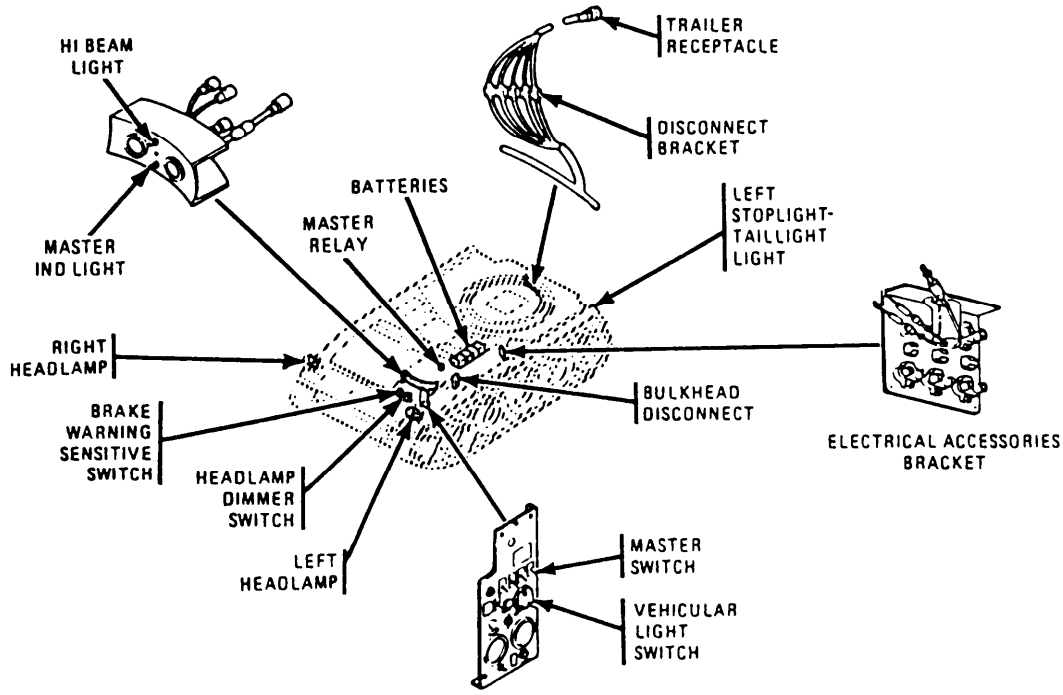


Step 4. Disconnect connector from headlamp dimmer switch. Place red probe on pin F. Place black probe on pin H. If multimeter indicates 0 ohms, repair lead 519 from headlamp dimmer switch to HI BEAM IND light. Refer to page 2-371. If multimeter indicates infinity, replace headlamp dimmer switch. Refer to page 2-584.

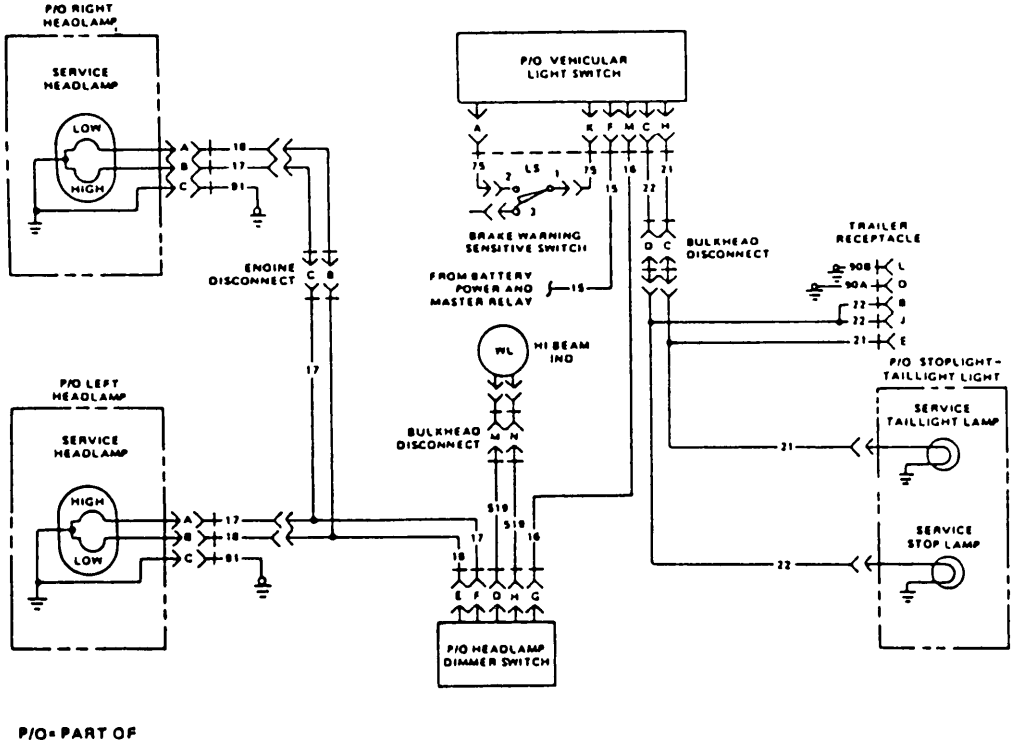


Step 5. Place red probe on pin N (lead 519). Place black probe on pin M (lead 519). If multimeter indicates infinity, repair lead 51-9 from disconnect plug to HI BEAM IND light. Refer to page 2-371. If multimeter indicates 100 ohms, replace headlamp dimmer switch. Refer to page 2-584. Connect wiring harness.

AF. LEFT STOPLIGHT-TAILLIGHT CIRCUIT.

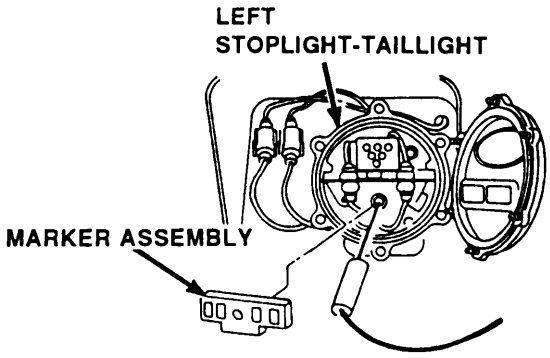


PICTORIAL VIEW



ELECTRICAL DIAGRAM

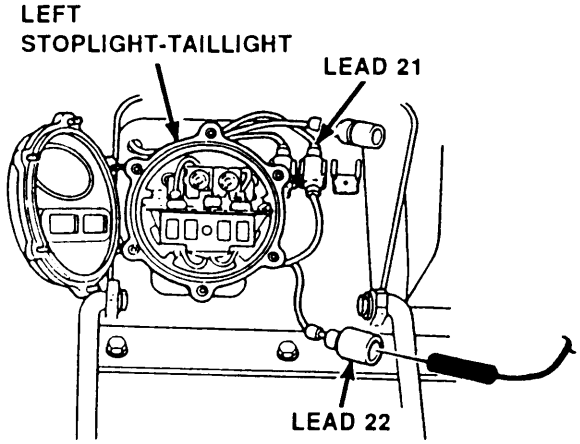
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



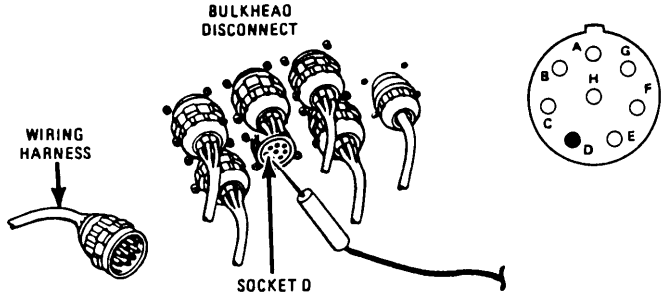
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 1. Remove marker assembly from left stoplight-taillight. Refer to page 2-614. Set MASTER switch ON. Set panel light switch ON. Unlock main light switch and place in blackout drive position. Place blackout-infrared selection switch in blackout position. Place red probe in socket. Ground black probe. If multimeter indicates about 24 volts, replace marker assembly. If multimeter indicates no voltage, set MASTER switch OFF, install marker assembly and go to step 2.



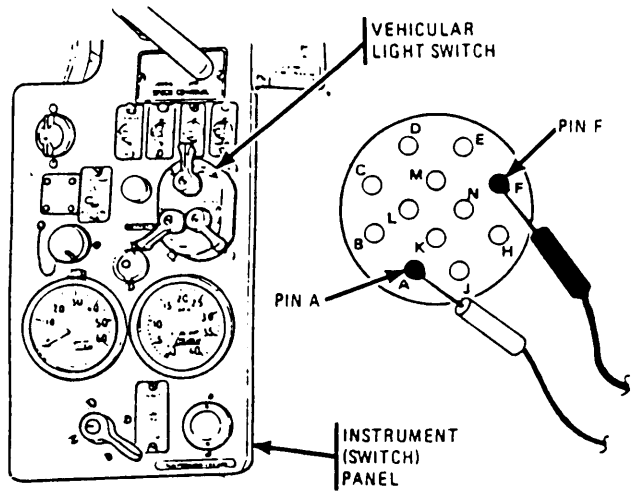
Step 2. Disconnect lead 22 from left stoplight-taillight. Place red probe in lead 22. Ground black probe. Set MASTER switch ON. Turn vehicular light switch to STOPLIGHT. Apply brakes. If multimeter indicates about 24 volts, repair left stoplight-taillight. Refer to page 2-614. If multimeter indicates no voltage, connect lead 22 and go to step 3. Set MASTER switch OFF. Turn vehicular light switch OFF.



WARNING

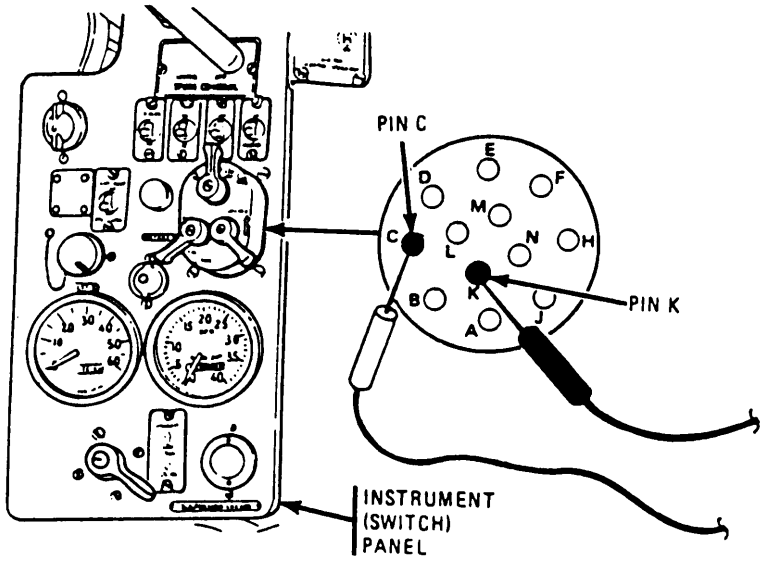
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to rvbsewe this warning could result in injury to personnel.

Step 3. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness. Place red probe in socket D. Ground black probe. Set MASTER switch ON. Turn vehicular light switch to STOPLIGHT. If multimeter indicates about 24 volts, go to step 4. If multimeter indicates no voltage, repair lead 22 between bulkhead disconnect and left stoplight-taillight. Refer to page 2-371. Set MASTER switch OFF and connect wiring harness. Turn vehicular light switch OFF.

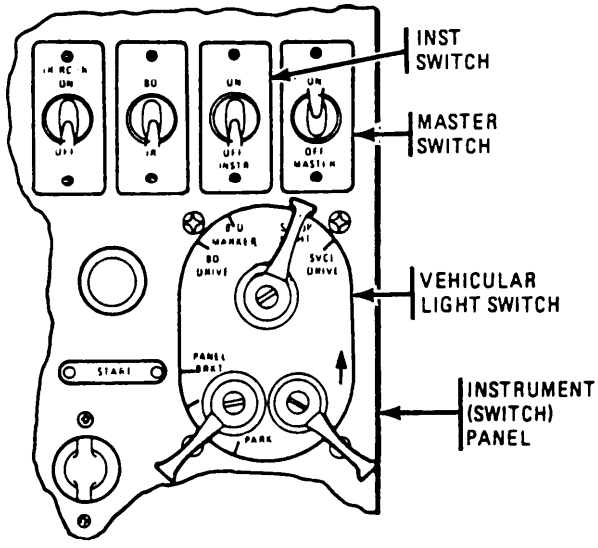


Step 4. Disconnect connector from vehicular light switch. Place red probe on pin A. Pace black probe on pin F of vehicular light switch. Turn vehicular light switch to STOPLIGHT. If multimeter indicates 0 ohms, go to step 5. If multimeter indicates infinity, replace vehicular light switch. Refer to page 2-566. Connect connector to vehicular light switch. Turn vehicular light switch OFF.

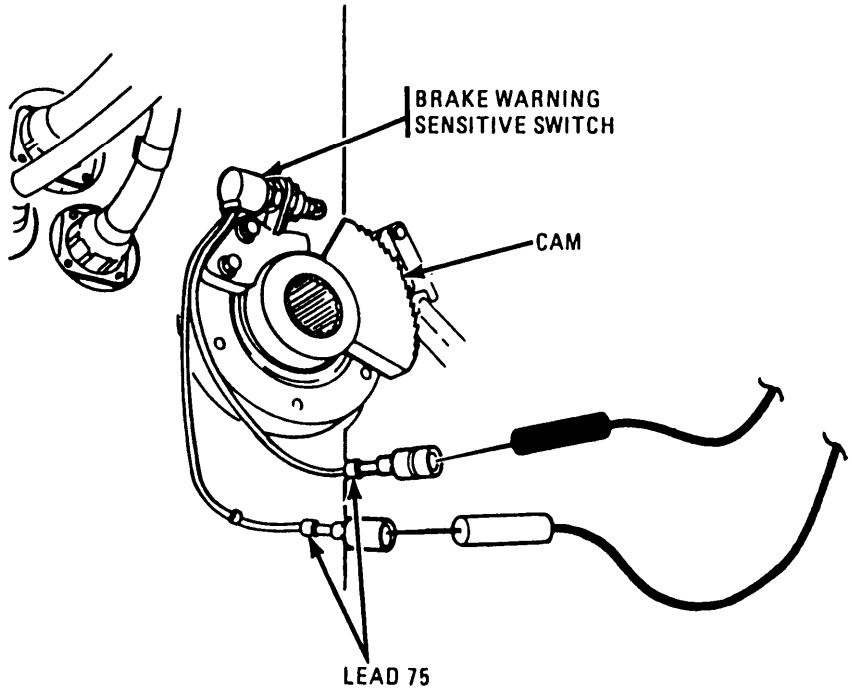
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 5. Place red probe on pin C of vehicular light switch. Place black probe on pin K. If multimeter indicates 0 ohms, go to step 6. If multimeter indicates infinity, replace vehicular light switch. Refer to page 2-566. Connect connector to vehicular light switch.



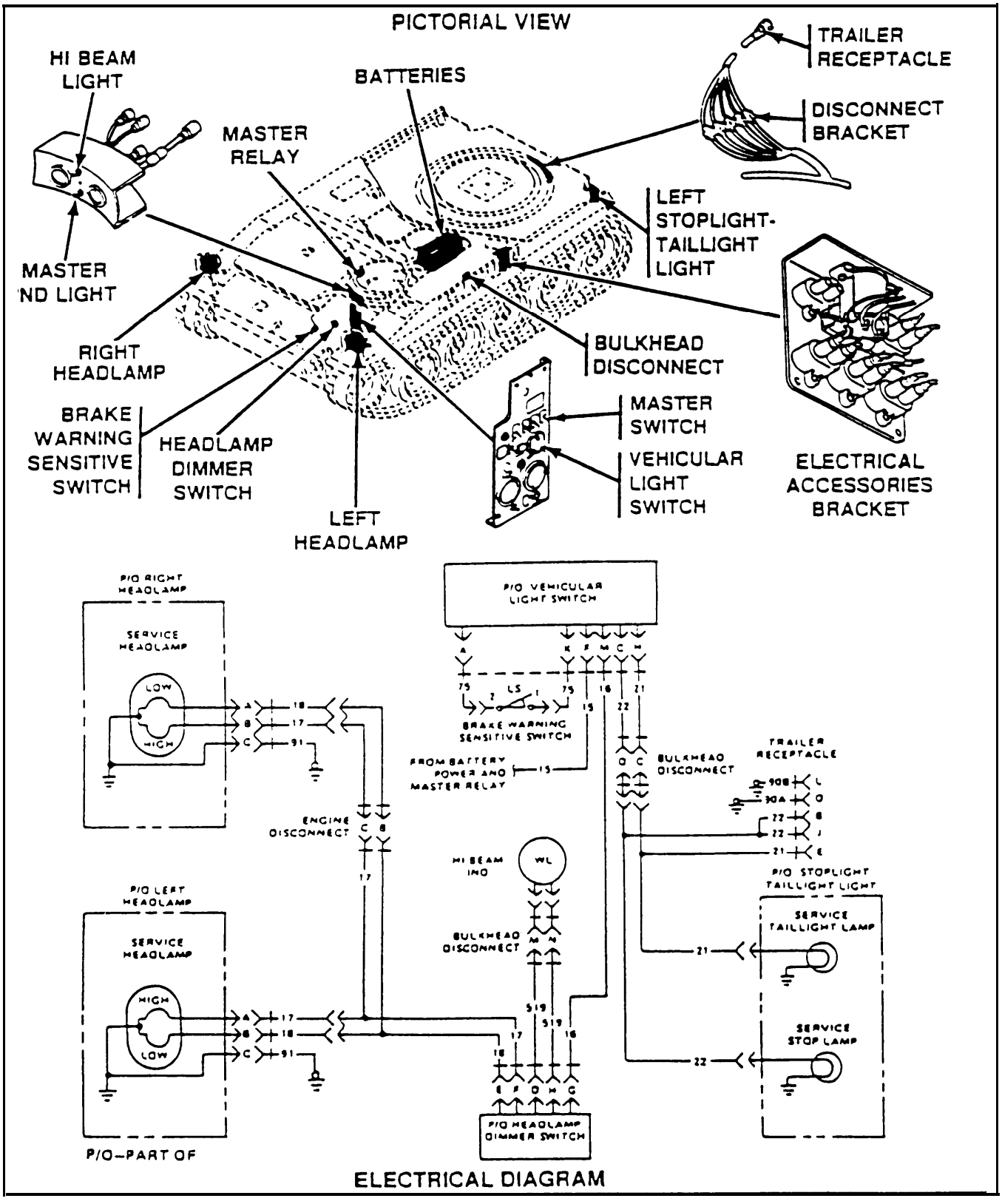
Step 6. Set MASTER switch ON. Turn vehicular light switch to STOPLIGHT. Apply brakes. If stoplight does not operate, go to step 7. If stoplight is operating, repair lead 22 from bulkhead disconnect to vehicular light switch. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF.

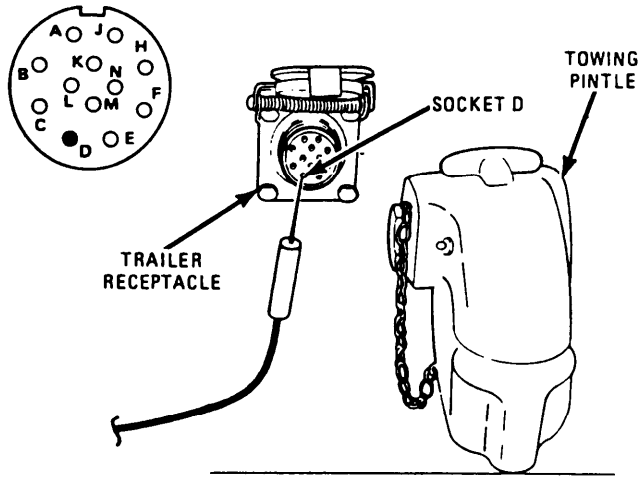


Step 7. Disconnect both leads 75 from brake warning sensitive switch. Connect multimeter to brake warning sensitive switch leads. Apply brakes. If multimeter indicates 0 ohms, repair lead 75 between brake warning sensitive switch and vehicular light switch. Refer to page 2-371. If multimeter indicates infinity, replace brake warning sensitive switch. Refer to page 2-626. Connect leads to brake warning sensitive switch.

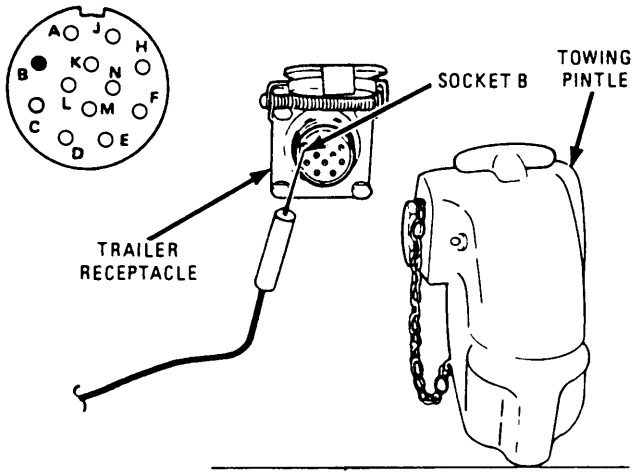
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

AG. TRAILER RECEPTACLE CIRCUIT.





Step 1. Set MASTER switch OFF. Place red probe in socket D of trailer receptacle (lead 90A). Ground black probe. If multimeter indicates 0 ohms, go to step 2. If multimeter does not indicate 0 ohms, repair lead 90A. Refer to page 2-371.

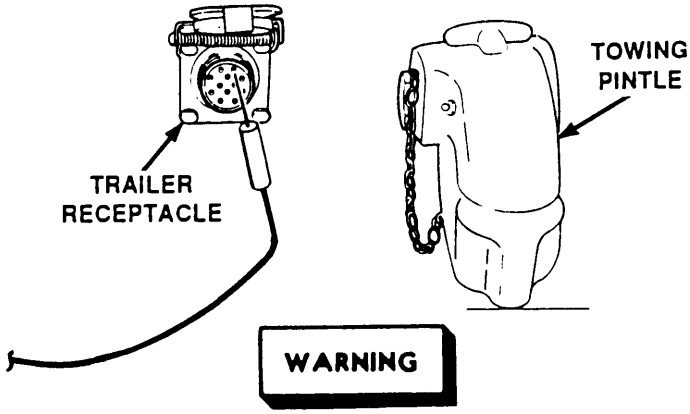


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Place red probe in socket B (lead 22). Ground black probe. Set MASTER switch ON. Turn vehicular light switch to STOPLIGHT. Apply brakes. If multimeter indicates about 24 volts, go to step 3. If multimeter indicates no voltage, repair lead 22. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF.

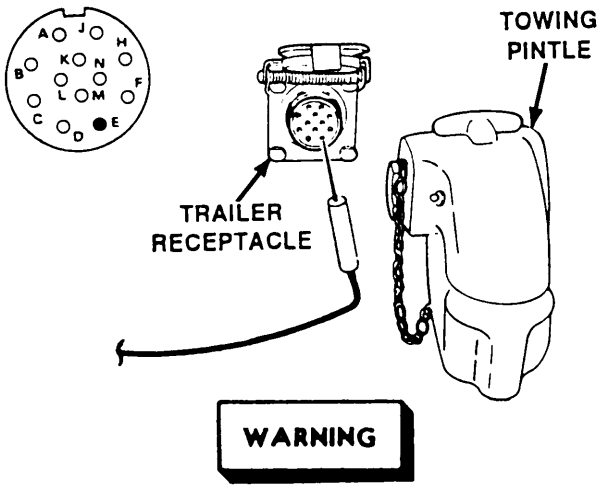
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

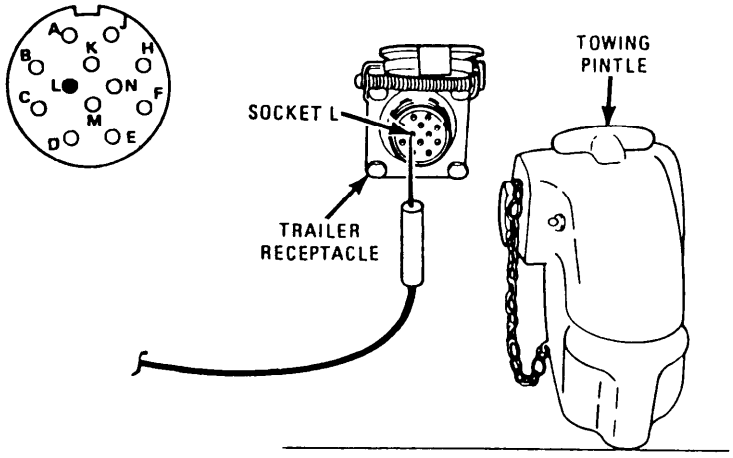
Step 3. Place red probe in socket J (lead 22). Ground black probe. Set MASTER switch ON. Turn vehicular light switch to STOPLIGHT. Apply brakes. If multimeter indicates about 24 volts, go to step 4. If multimeter indicates no voltage, repair lead 22. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF.



WARNING

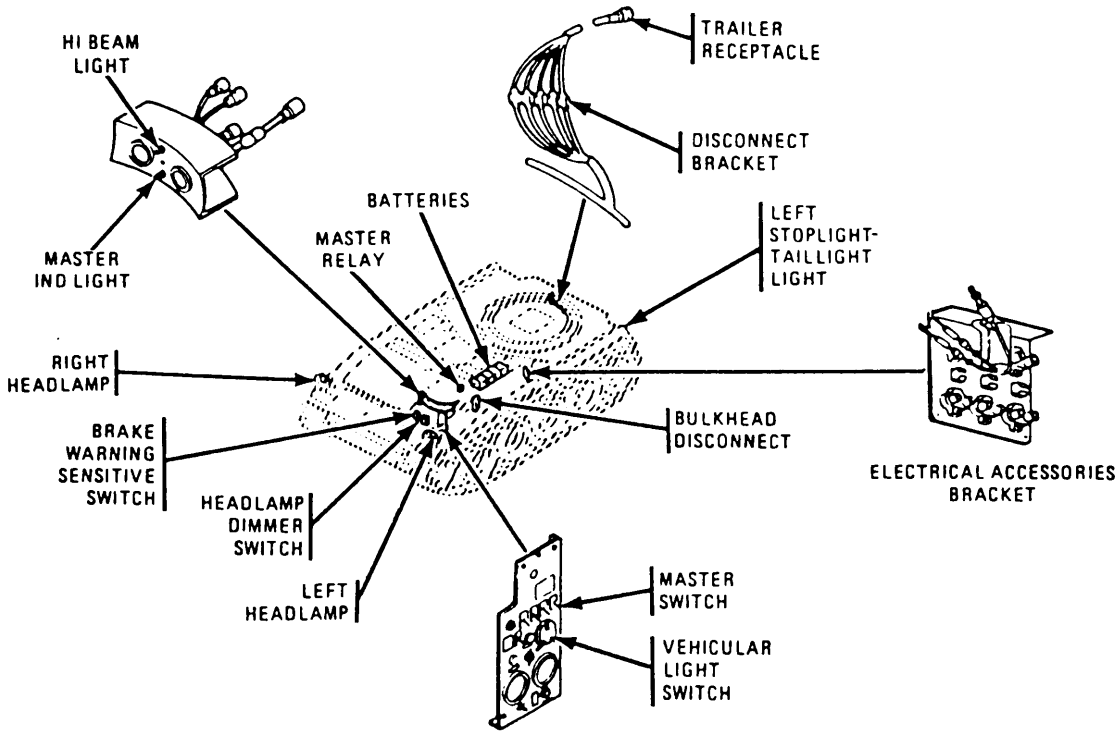
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 4. Place red probe in socket E (lead 21). Ground black probe. Set MASTER switch ON. Turn vehicular light switch to SER DRIVE. If multimeter indicates about 24 volts, go to step 5. If multimeter indicates no voltage, repair lead 21. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF.



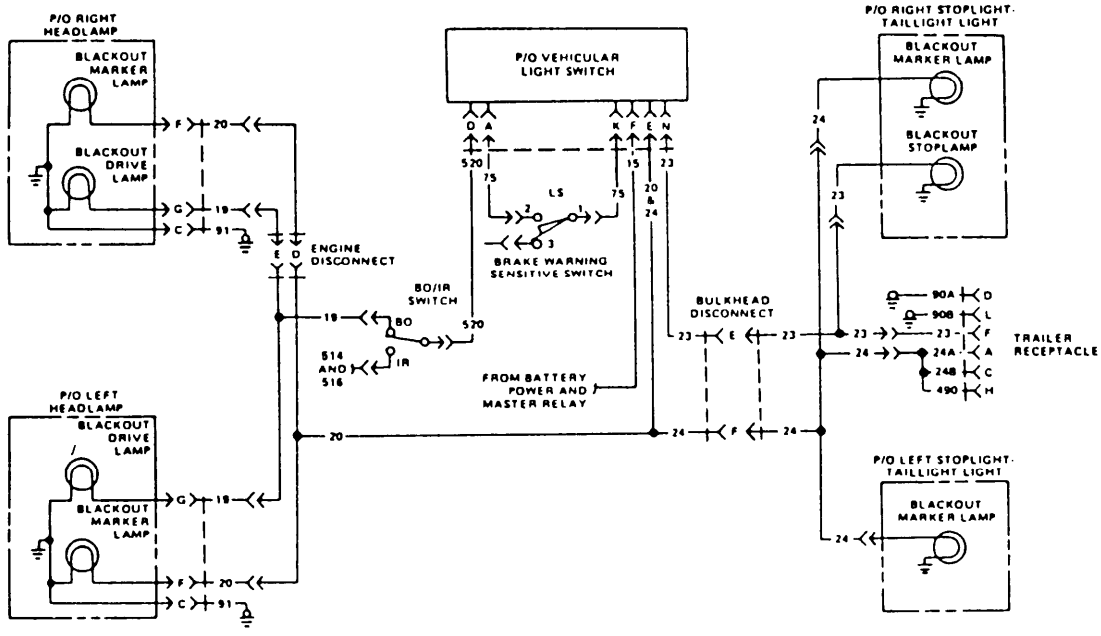
Step 5. Place red probe in socket L (lead 90 B). Ground black probe. If multimeter indicates 0 ohms, trailer receptacle is operating normally. If multimeter does not indicate 0 ohms, repair lead 90B. Refer to page 2-371.

AH. BLACKOUT MARKER CIRCUIT.

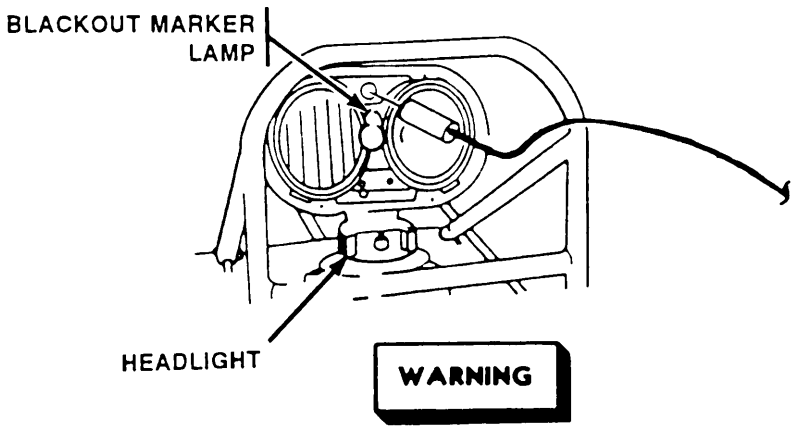


PICTORIAL VIEW

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



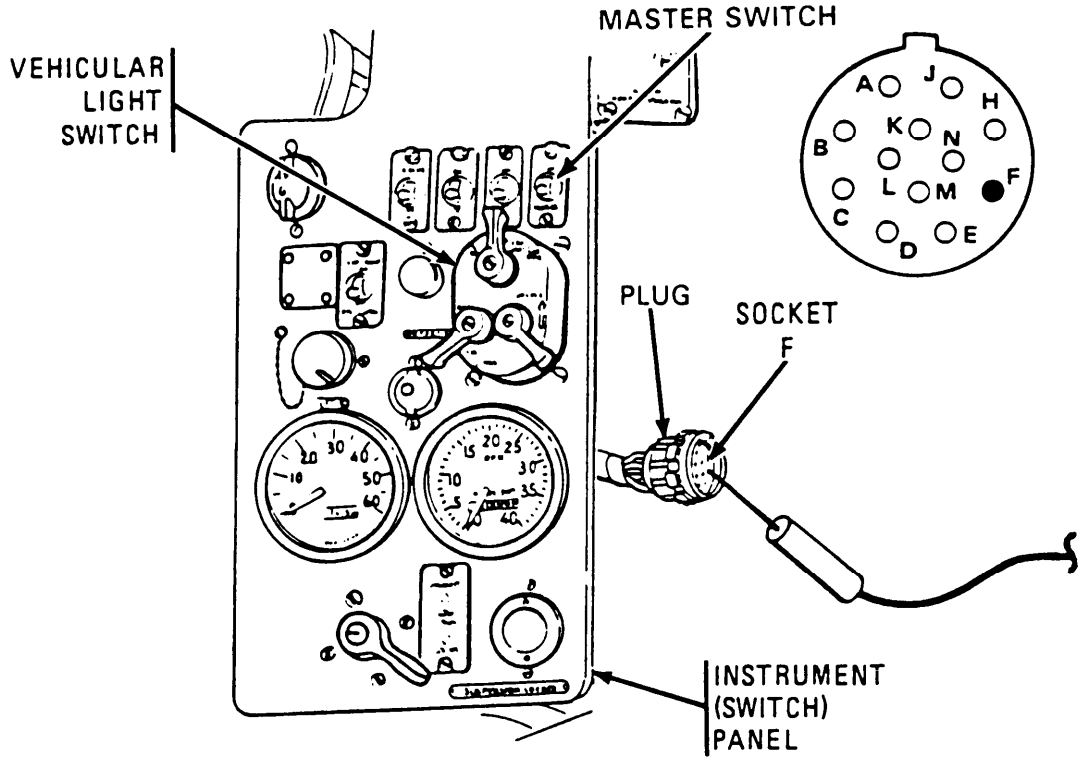
ELECTRICAL DIAGRAM



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 1. Remove inoperative blackout marker lamp from service headlamp. Refer to page 2-601. Set MASTER switch ON. Set panel light switch ON. Unlock main light switch and place in blackout drive position. Place blackout-infrared selector switch in blackout position. Place red probe in socket. Ground black probe. If multimeter indicates about 24 volts, replace lamp. If multimeter indicates no voltage, set MASTER switch OFF, install lamp and go to step 2.

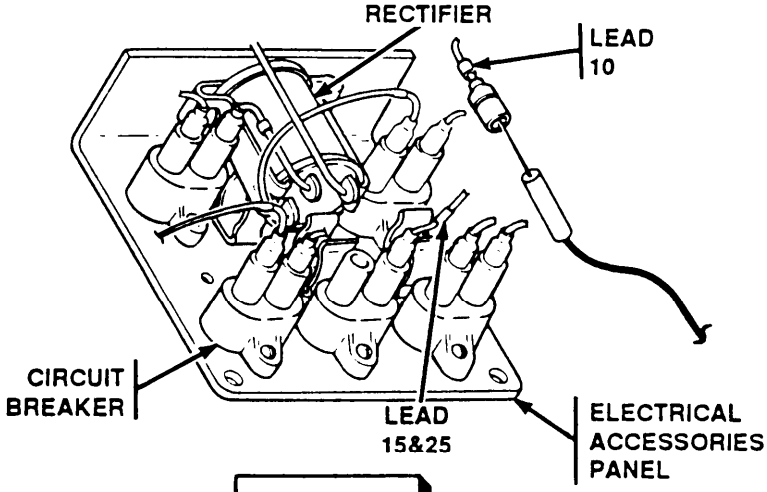


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step *2.* Disconnect connector from vehicular light switch. Place red probe in pin socket F (lead 15) of plug. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, replace vehicular light switch. Refer to page 2-566. If multimeter indicates no voltage, go to step 3. Set MASTER switch OFF. Connect connector to vehicular light switch.

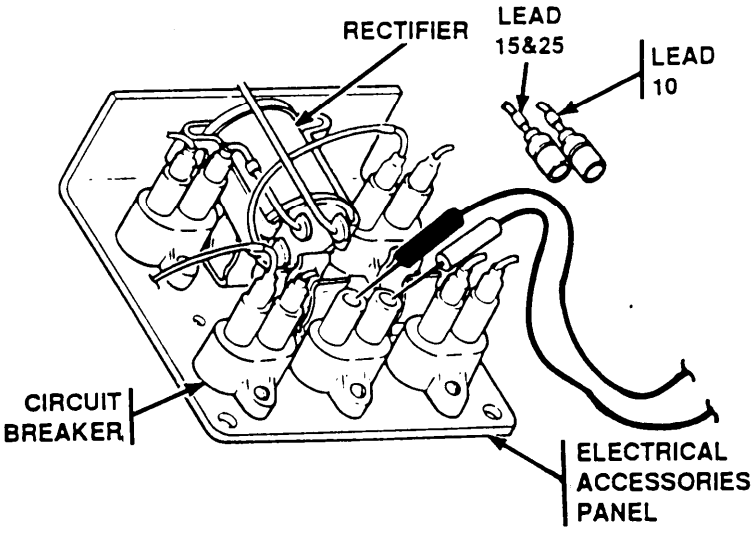
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



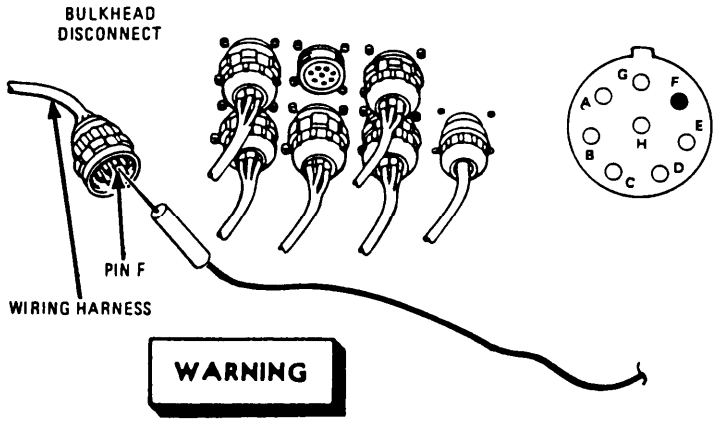
WARNING

Make sure MASTER switch is off before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. To access electrical accessories panel, remove left CO_2 cylinder access cover. Refer to page 2-923. Disconnect lead 10 from circuit breaker. Place red probe in lead 10. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 4. If multimeter indicates no voltage, repair lead 10. Refer to page 2-371. Set MASTER switch OFF and connect lead.



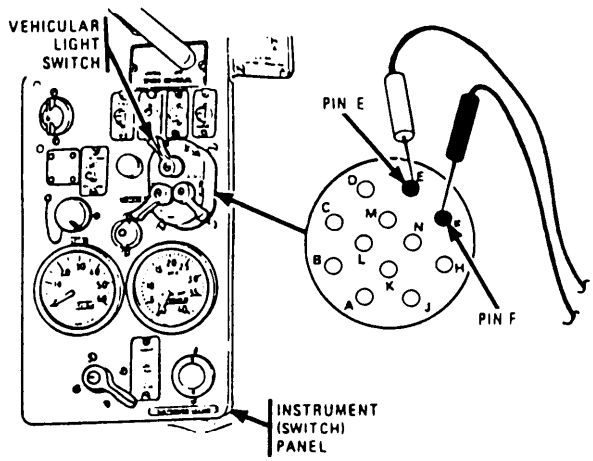
Step 4. Disconnect leads 15&25 and 10 from circuit breaker. Check continuity between circuit breaker terminals. If multimeter indicates continuity, repair lead 15&25. Refer to page 2-371. If multimeter does not indicate continuity, replace circuit breaker. Refer to page 2-590. Connect leads.



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

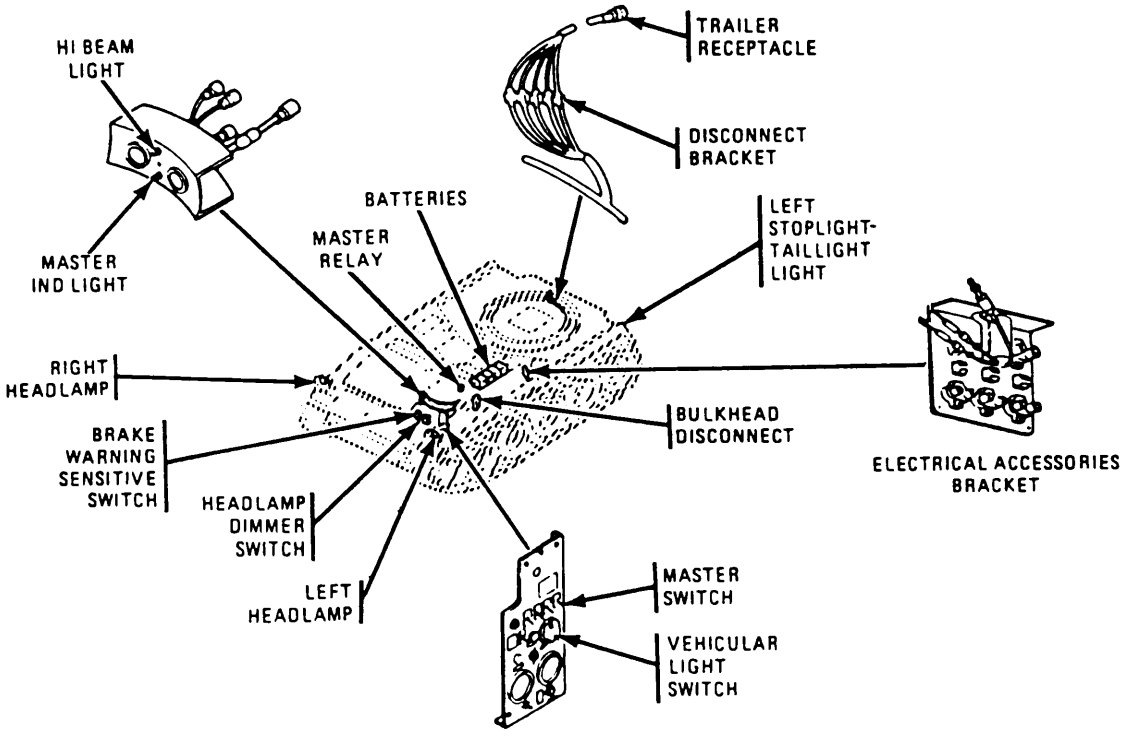
Step 5. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness at bulkhead disconnect. Place red probe on pin F (lead 24). Ground black probe. Set MASTER switch ON. Turn vehicular light switch to BO MARKER. If multimeter indicates about 24 volts, go to step 6. If multimeter indicates no voltage, repair lead 24 between bulkhead disconnect and light switch. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF. Connect lead.



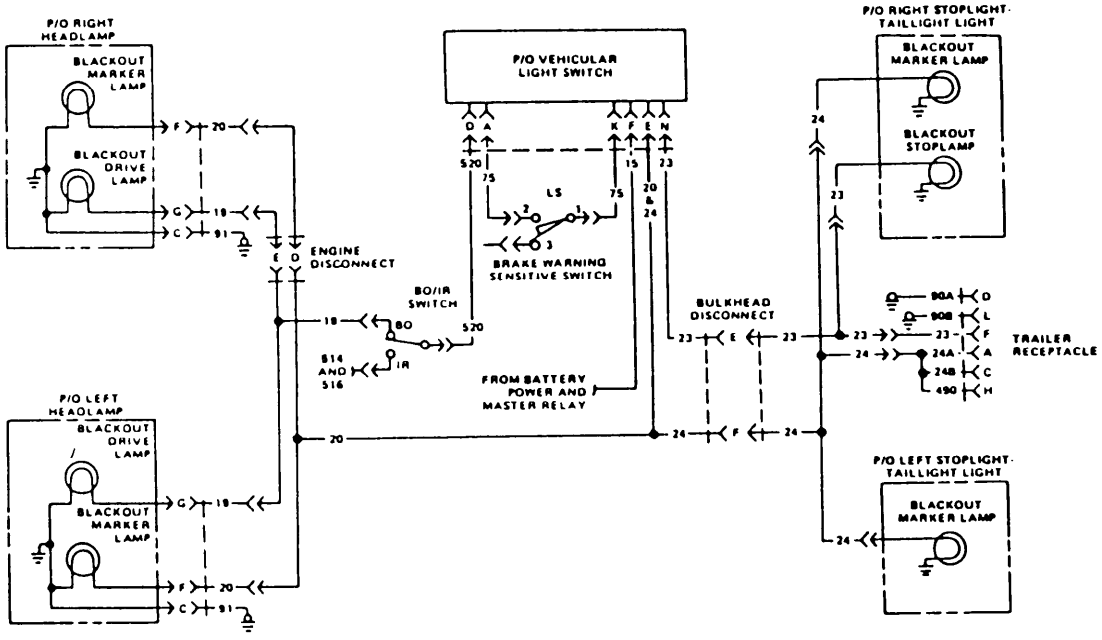
Step 6. Disconnect connector from vehicular light switch. Place red probe on pin E of vehicular light switch. Place black probe on pin F. Turn vehicular light switch to BO MARKER. If multimeter indicates 0 ohms, repair lead 20&24. Refer to page 2-371. If multimeter indicates infinity, replace vehicular light switch. Refer to page 2-566. Connect connector to vehicular light switch. Turn vehicular light switch OFF.

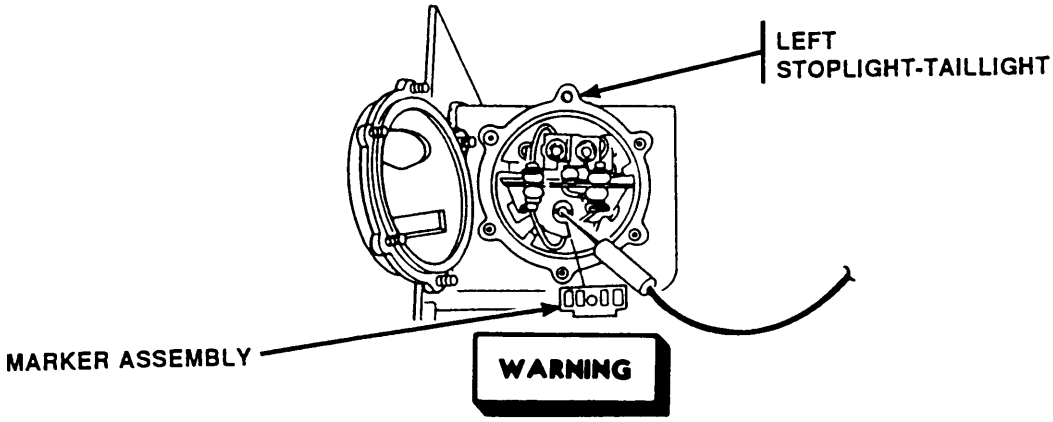
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

AI. TAILLIGHT BLACKOUT MARKER CIRCUIT.



PICTORIAL VIEW

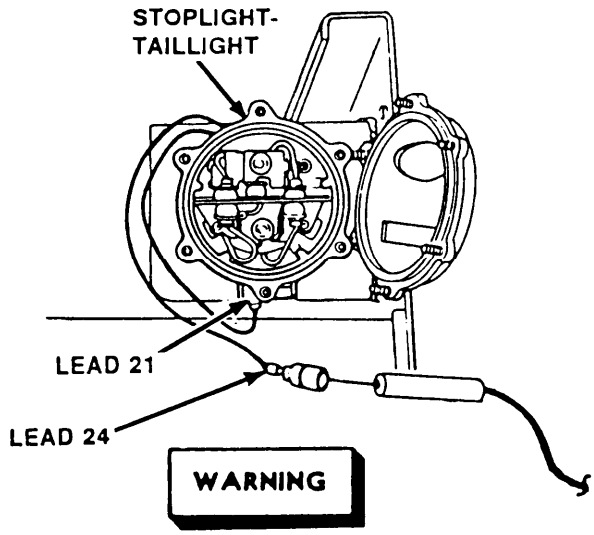




WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 1. Remove marker assembly from left stoplight-taillight. Refer to page 2-614. Set MASTER switch ON. Set panel light switch ON. Unlock main light switch and place in blackout drive position. Place blackout-infrared selection switch in blackout position. Place red probe in socket. Ground black probe. If multimeter indicates about *24* volts, replace marker assembly. If multimeter indicates no voltage, set MASTER switch OFF, install marker assembly and go to step 2.

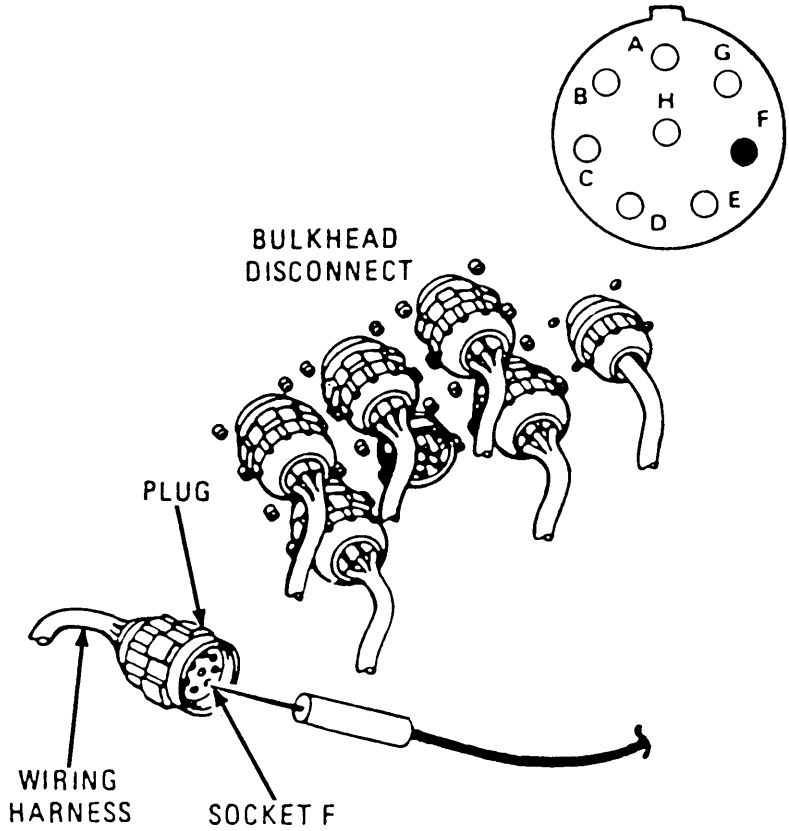


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Disconnect lead 24 from stoplight-taillight. Place red probe in lead 24. Ground black probe. Set MASTER switch ON. Turn vehicular light switch to BO MARKER. If multimeter indicates about 24 volts, repair stoplight-taillight. Refer to page 2-614. If multimeter indicates no voltage, go to step 3. Set MASTER switch OFF. Turn vehicular light switch OFF.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

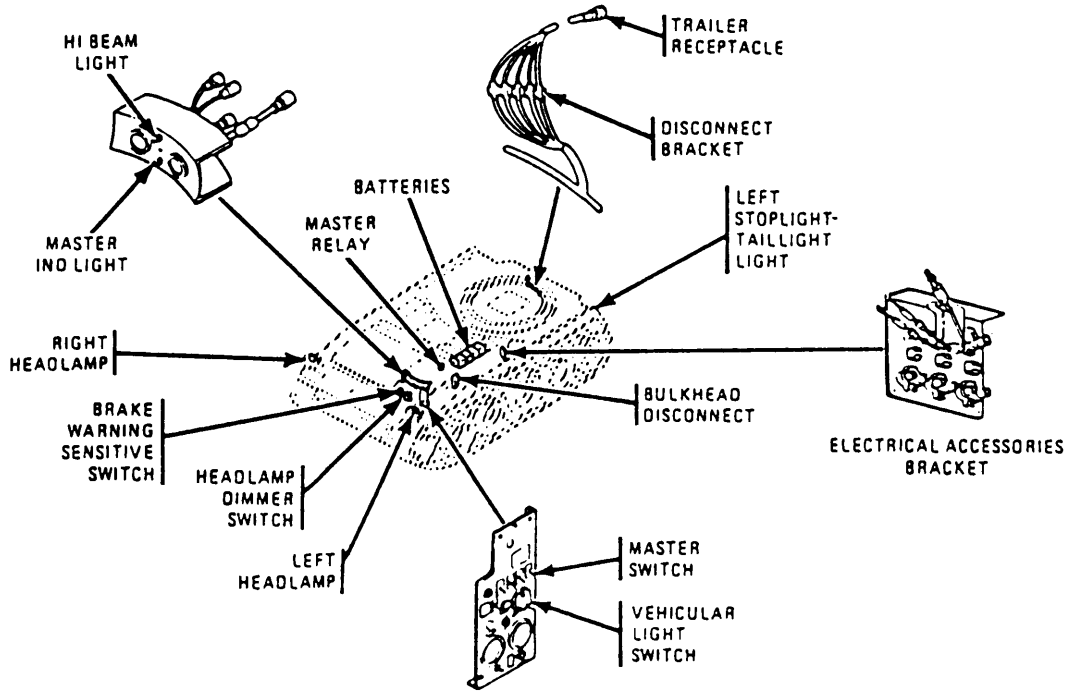


WARNING

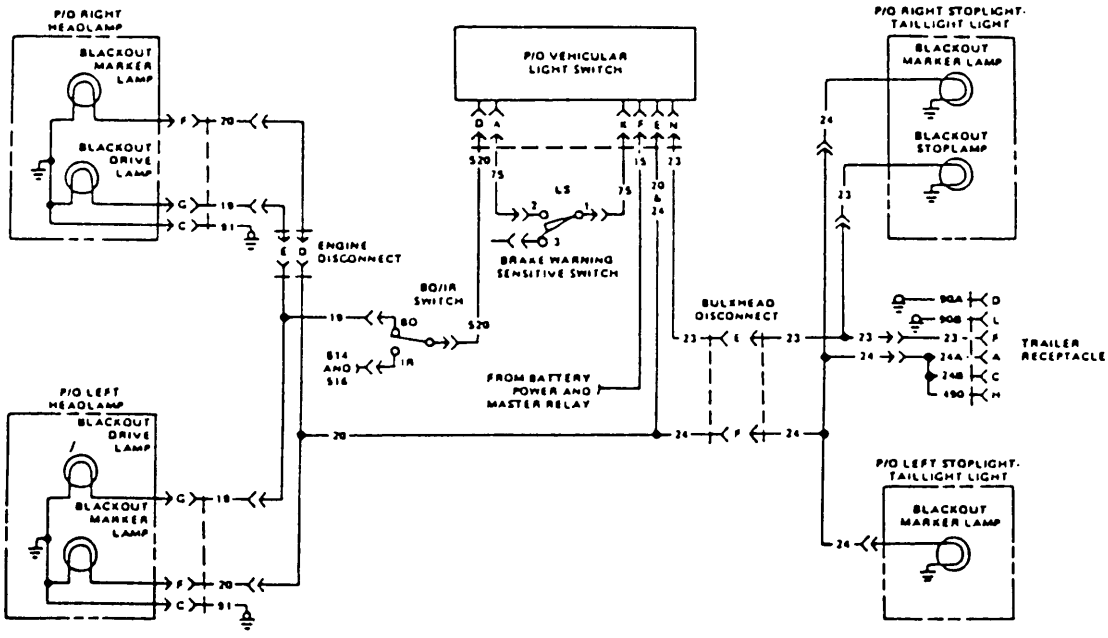
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness. Place red probe in socket F (lead 24). Ground black probe. Set MASTER switch ON. Turn vehicular light switch to BO MARKER. If multimeter indicates about 24 volts, repair lead 24 between bulkhead disconnect and stoplight-taillight. Refer to page 2-371. If multimeter indicates no voltage, repair lead 24 between bulkhead disconnect and vehicular light switch. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF. Connect wiring harness.

AJ. HEADLAMP BLACKOUT MARKER CIRCUIT.



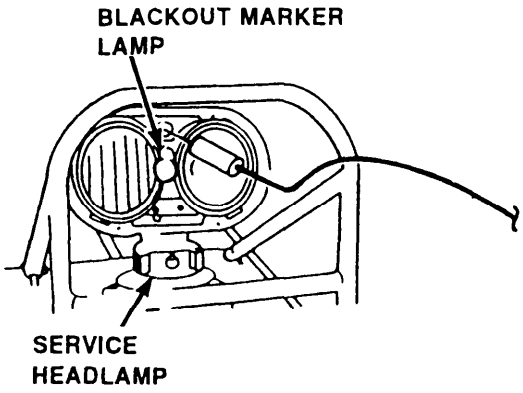
PICTORIAL VIEW



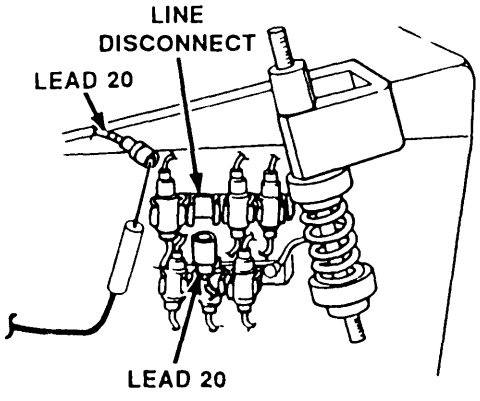
P/O - PART OF

ELECTRICAL DIAGRAM

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 1. Remove inoperative blackout marker lamp from service headlamp. Refer to page 2-601. Set MASTER switch ON. Set panel light switch ON. Unlock main light switch and place in blackout drive position. Place blackout infrared selection switch in blackout position. Place red probe in socket. Ground black probe. If multimeter indicates about 24 volts, replace lamp. If multimeter indicates no voltage, set MASTER switch OFF, install lamp and go to step 2.

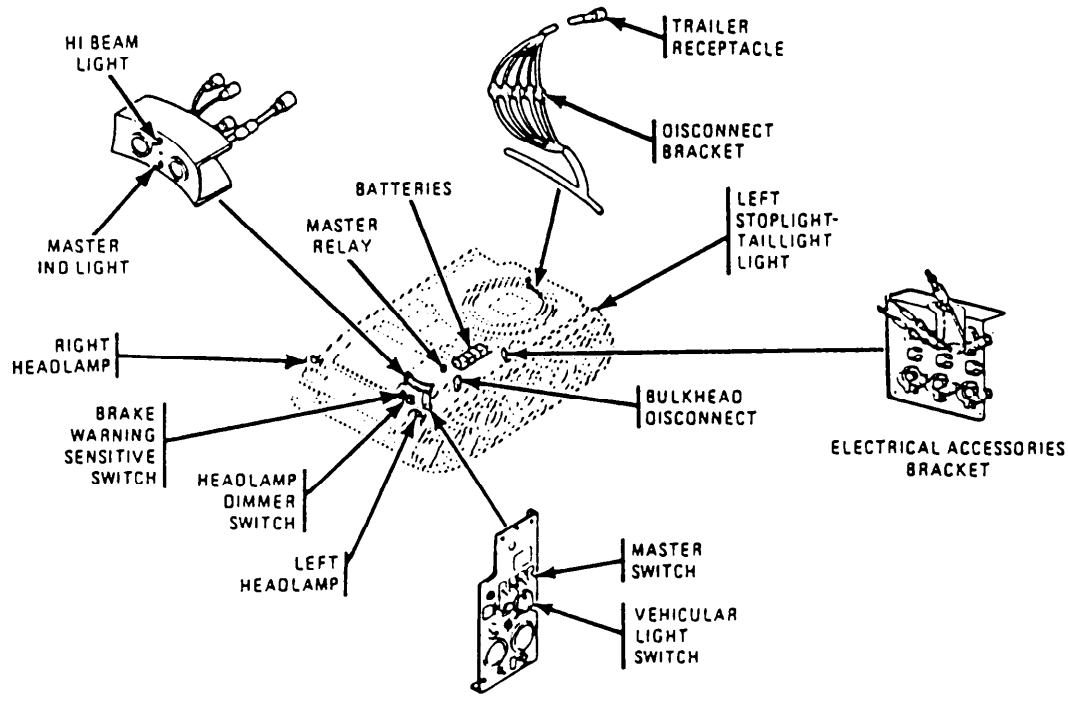


WARNING

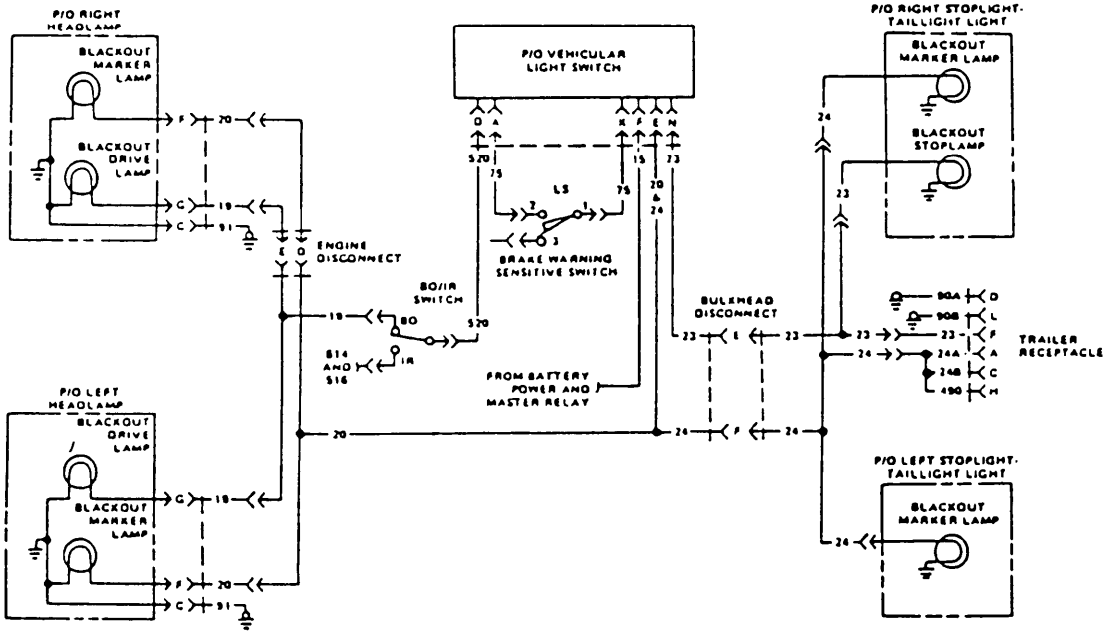
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. To access line disconnect, remove transmission deck lid assembly. Refer to page 2-938. Disconnect lead 20. Place red probe in lead 20. Ground black probe. Set MASTER switch ON. Turn vehicular light switch to 60 MARKER. If multimeter indicates about 24 volts, repair service headlamp assembly. Refer to page 2-601. If multimeter indicates no voltage, repair lead 20 between line disconnect and vehicular light switch. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF. Connect lead.

AK. BLACKOUT DRIVE HEADLAMP CIRCUIT (VEHICULAR LIGHT SWITCH).



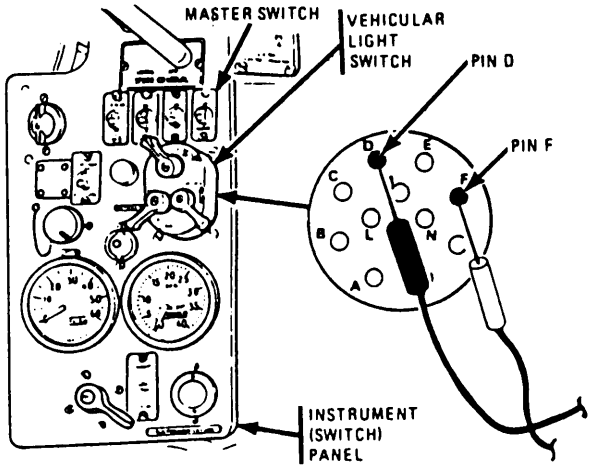
PICTORIAL VIEW



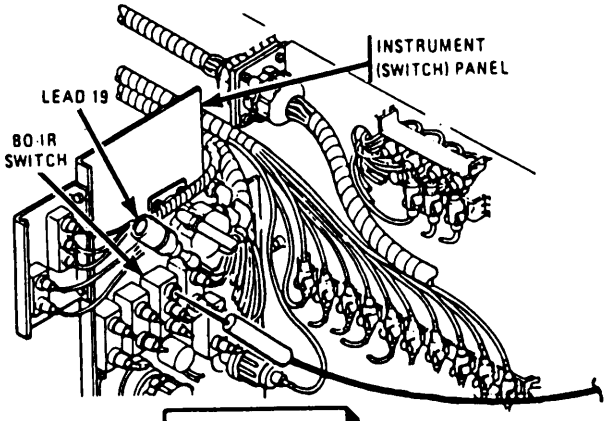
P/O = PART OF

ELECTRICAL DIAGRAM

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



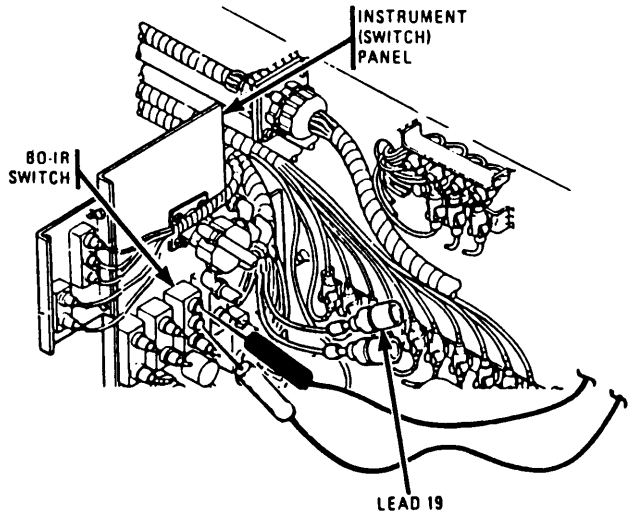
Step 1. Set MASTER switch OFF. Disconnect connector from vehicular light switch. Place red probe on pin F of vehicular light switch. Place black probe on pin D. If multimeter indicates 0 ohms, go to step 2. If multimeter indicates infinity, replace vehicular light switch. Refer to page 2-566. Connect connector to vehicular light switch.



WARNING

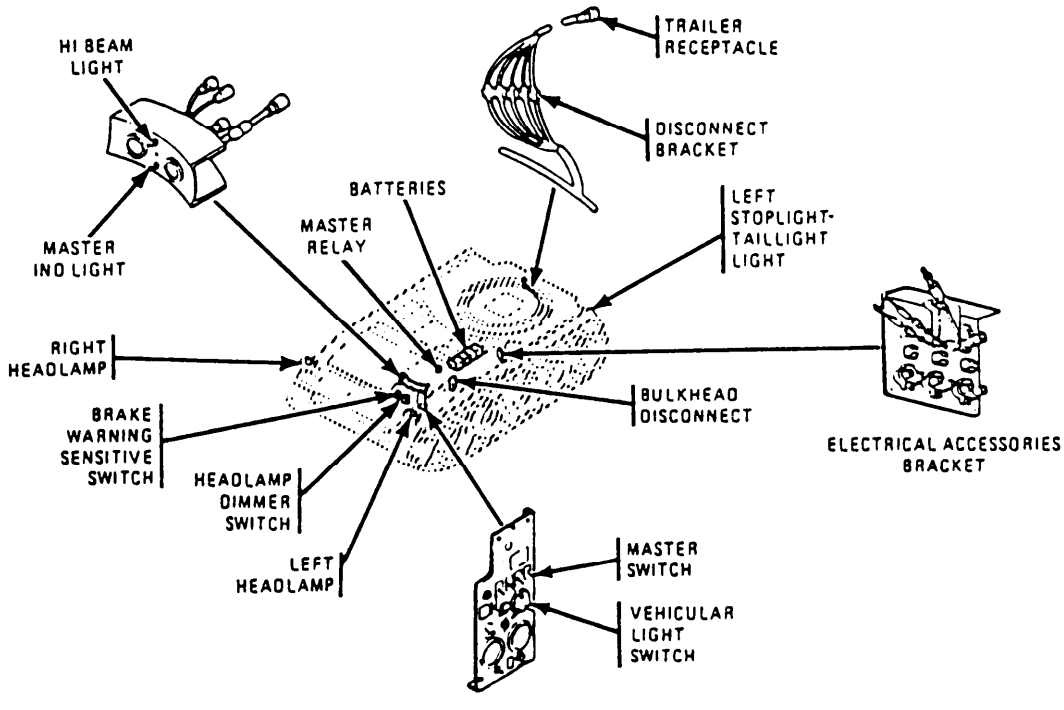
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Disconnect lead 19 from BO-IR switch. Place red probe in BO-IR switch connector. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, repair lead 19. Refer to page 2-371. If multimeter indicates no voltage, go to step 3. Set MASTER switch OFF. Connect lead.



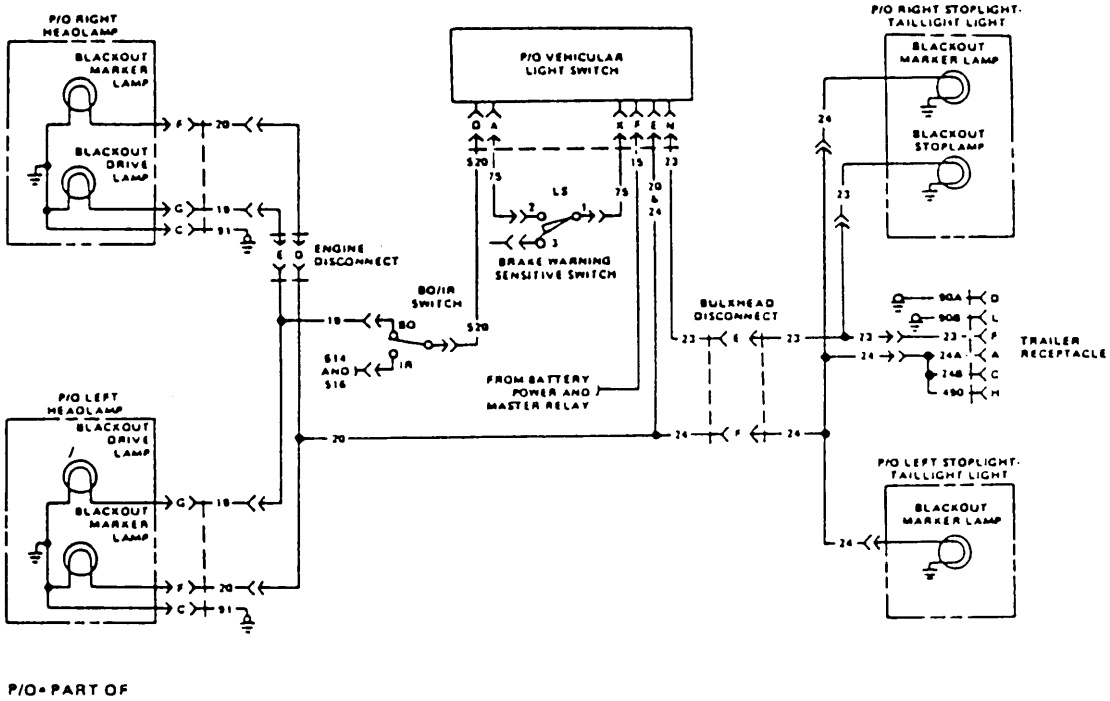
Step 3. Disconnect lead 19 and lead 520 from BO-IR switch. Connect multimeter between connector 19 and 520 on switch. If multimeter indicates 0 ohms, repair lead 520 between BO-IR switch and vehicular light switch. Refer to page 2-371. If multimeter indicates infinity, replace BO-IR switch. Refer to page 2-566. Connect leads.

AL. BLACKOUT DRIVE HEADLAMP CIRCUIT (HEADLAMP ASSEMBLY).

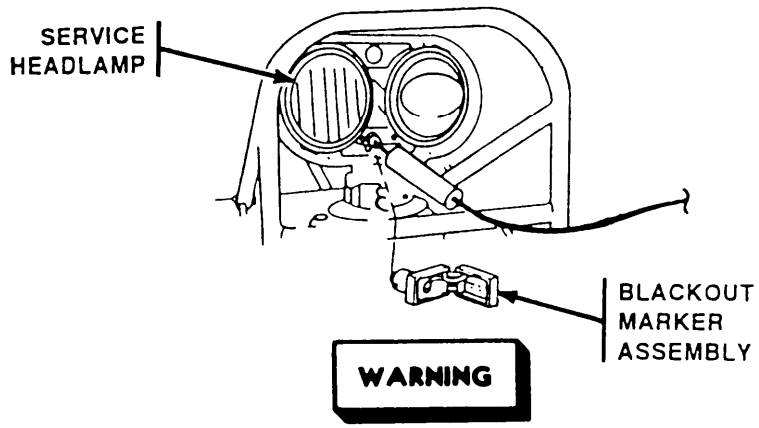


PICTORIAL VIEW

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



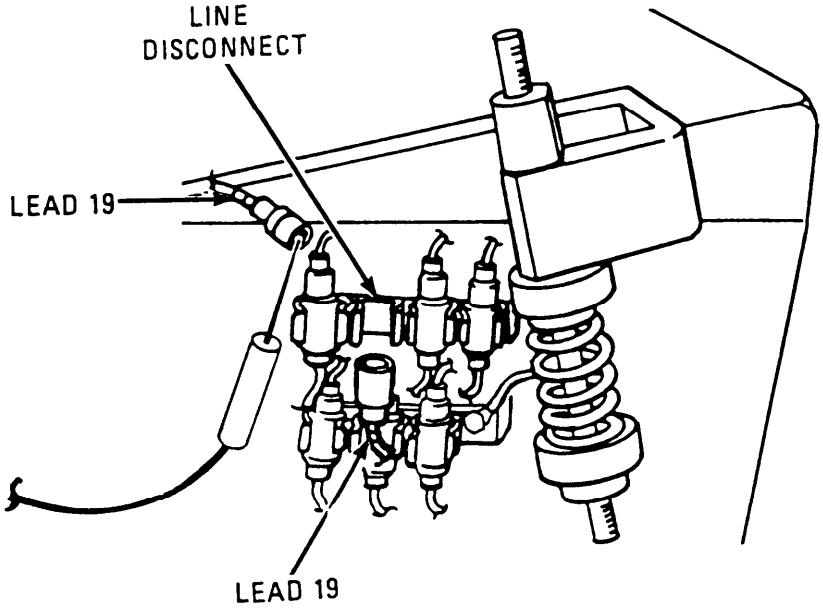
ELECTRICAL DIAGRAM



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 1. Remove blackout marker assembly from service headlamp. Refer to page 2-601. Set MASTER switch ON. Set panel light switch ON. Unlock main light switch and place in blackout drive position. Place blackout-infrared selection switch in blackout position. Place red probe in socket. Ground black probe. If multimeter indicates about 24 volts, replace blackout marker assembly. If multimeter indicates no voltage, set MASTER switch OFF, install blackout marker assembly and go to step 2.



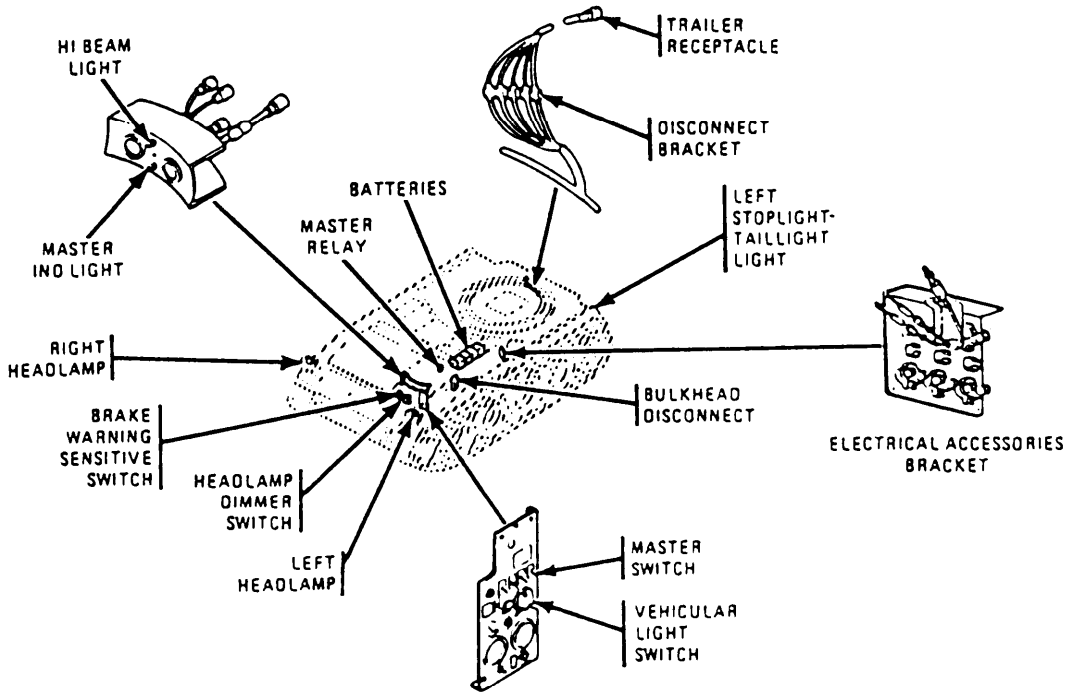
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

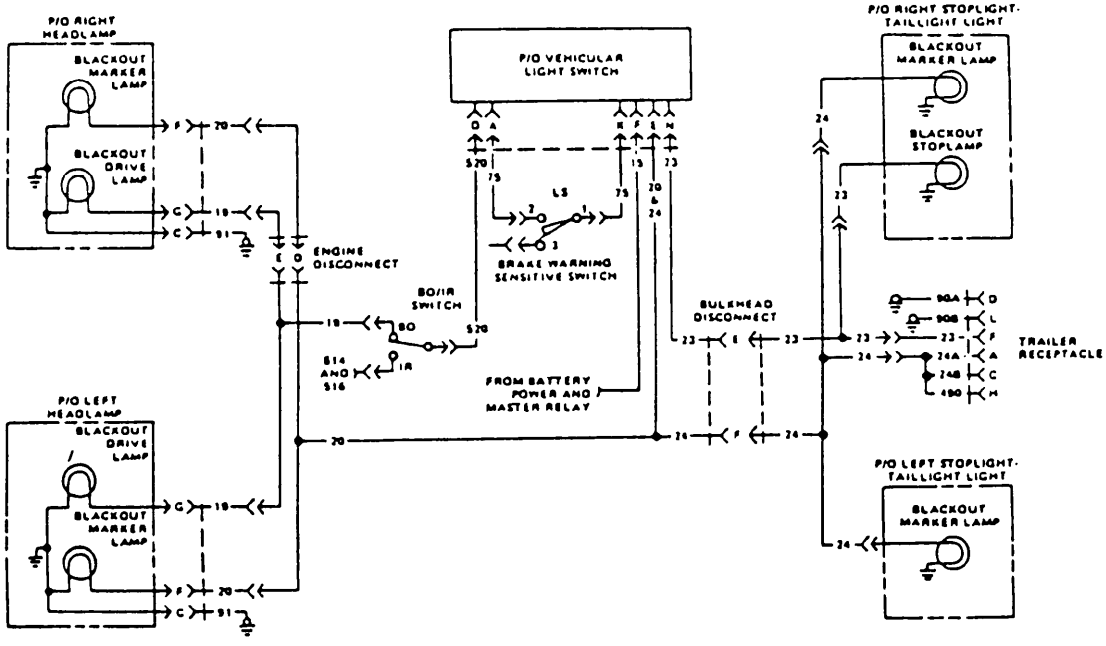
Step 2. To access line disconnect, remove transmission deck lid assembly. Refer to page 2-938. Disconnect lead 19. Place red probe in lead 19. Ground black probe. Set MASTER switch ON. Turn vehicular light switch to BO DRIVE. Set BO-IR switch to BO. If multimeter indicates about 24 volts, repair service headlamp assembly. Refer to page 2-601. If multimeter indicates no voltage, repair lead 19 between line disconnect and vehicular light switch. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF. Connect lead.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

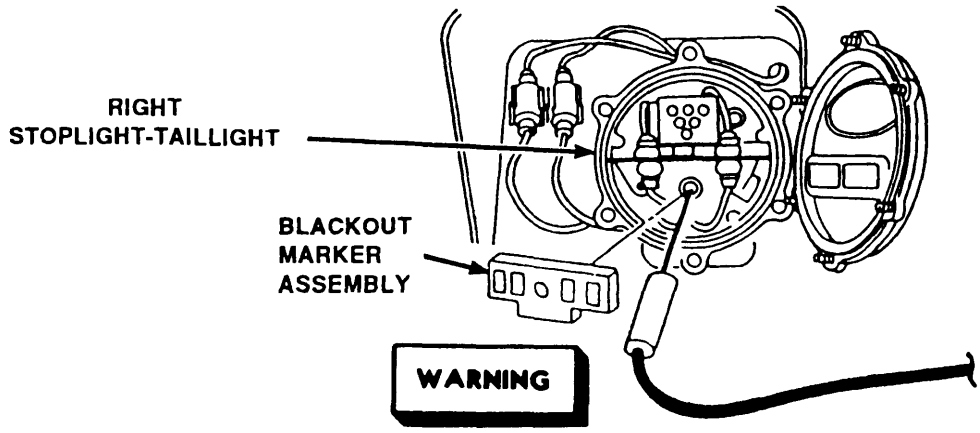
AM. BLACKOUT STOPLIGHT CIRCUIT.



PICTORIAL VIEW



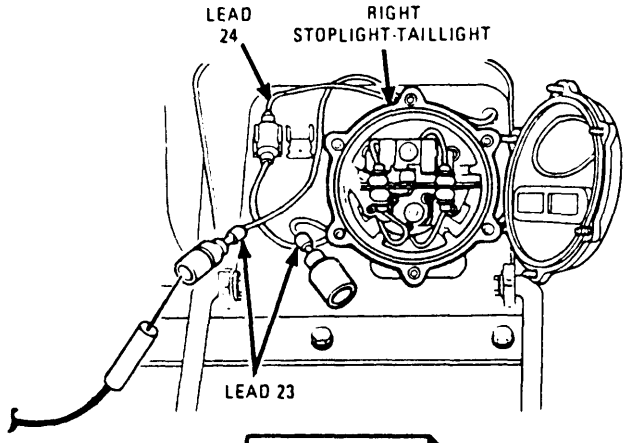
ELECTRICAL DIAGRAM



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 1. Remove blackout marker assembly from fight stoplight-taillight. Refer to page 2-617. Set MASTER switch ON. Set panel light switch ON. Unlock main light switch and place in blackout drive position. Place blackout-infrared selection switch in blackout position. Place red probe in socket. Ground black probe. If multimeter indicates about 24 volts, replace blackout marker assembly. If multimeter indicates no voltage, set MASTER switch OFF, install marker assembly and go to step 2.

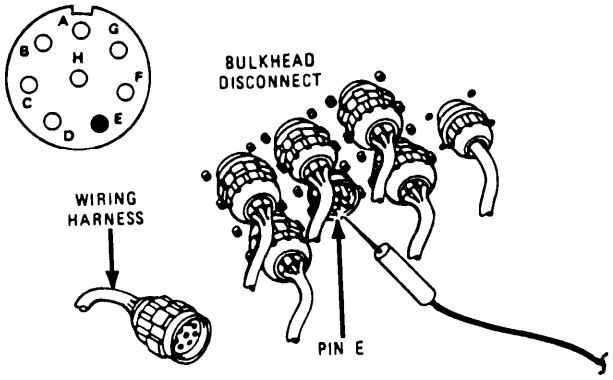


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Disconnect lead 23 from right stoplight-taillight. Place red probe in lead 23. Ground black probe. Set MASTER switch ON. Turn vehicular light switch to BO STOP. Apply brakes. If multimeter indicates about 24 volts, repair right stoplight-taillight. Refer to page 2-617. If multimeter indicates no voltage, go to step 3. Set MASTER switch OFF. Turn vehicular light switch OFF. Connect lead.

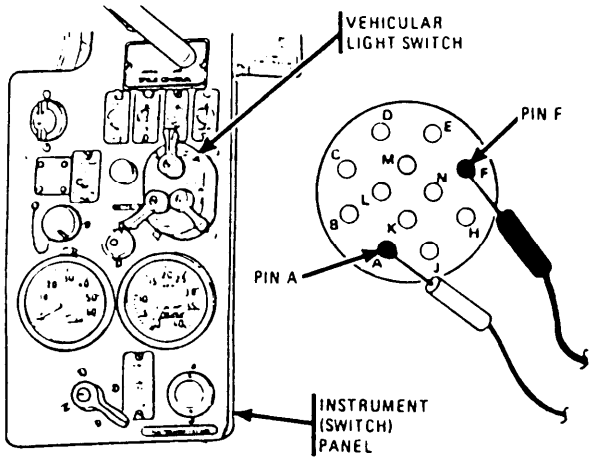
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



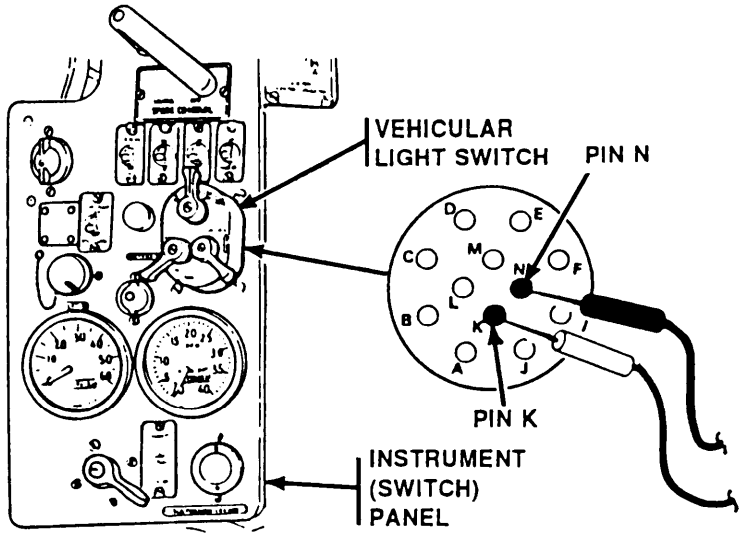
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

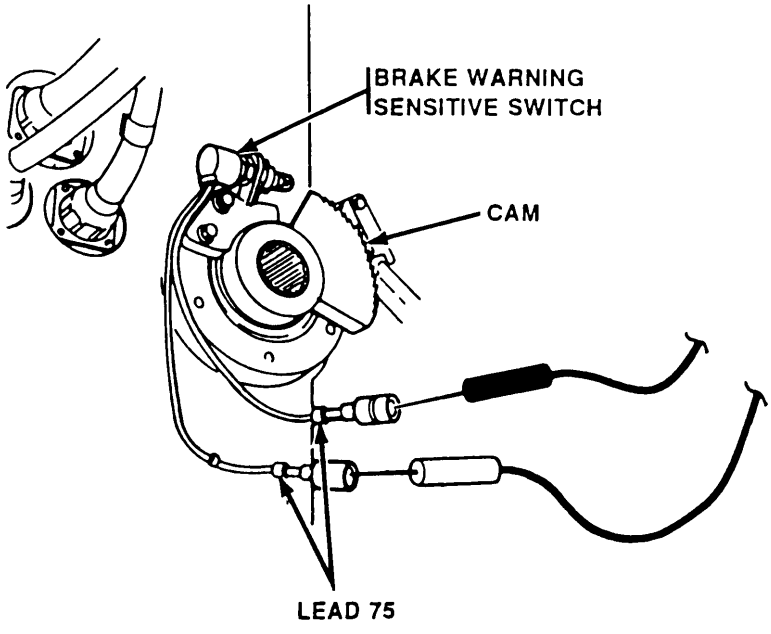
Step 3. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness. Place red probe in pin E (lead 23). Ground black probe. Set MASTER switch ON. Turn vehicular light switch to BO STOP. Apply brakes. If multimeter indicates about 24 volts, repair lead 23 between bulkhead disconnect and right stoplight-taillight. Refer to page 2-371. If multimeter indicates no voltage, go to step 4. Set MASTER switch OFF. Turn vehicular light switch OFF. Connect wiring harness.



Step 4. Place red probe on pin A. Place black probe on pin F. Turn vehicular light switch to BO STOP. If multimeter indicates 0 ohms, go to step 5. If multimeter indicates infinity, replace vehicular light switch. Refer to page 2-566. Connect connector to vehicular light switch.



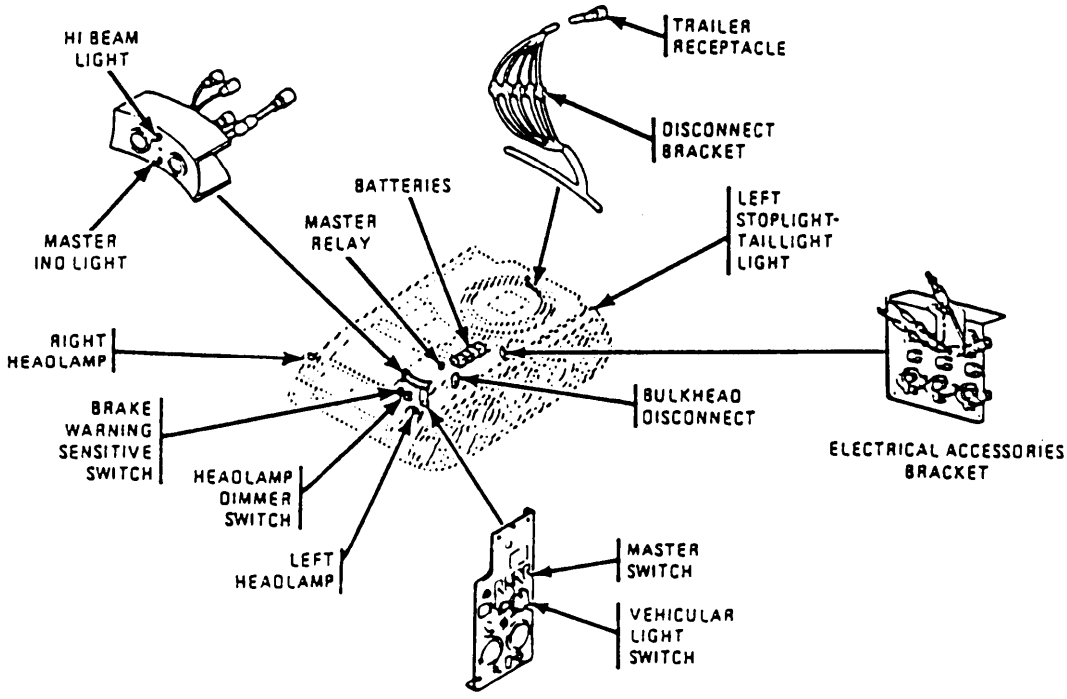
Step 5. Place red probe on pin K. Place black probe on pin N. If multimeter indicates 0 ohms, go to step 6. If multimeter indicates infinity, replace vehicular light switch. Refer to page 2-566. Connect connector to vehicular light switch.



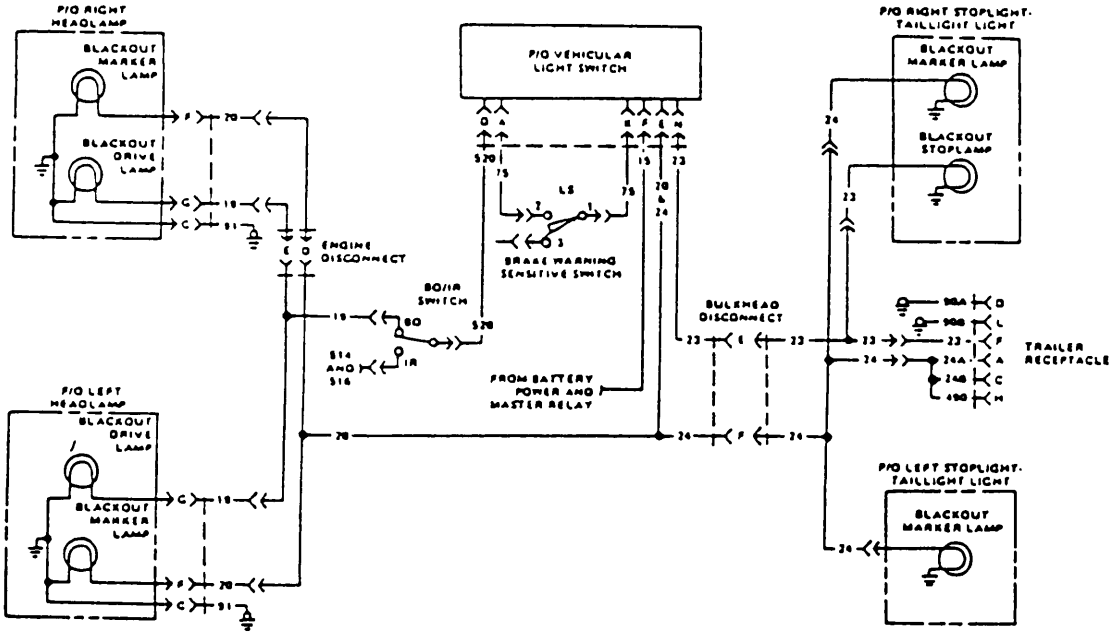
Step 6. Disconnect both leads 75 from brake warning sensitive switch. Connect multimeter to brake warning sensitive switch leads. Apply brakes. If multimeter indicates 0 ohms, repair lead 75 between brake warning sensitive switch and vehicular light switch. If multimeter indicates infinity, replace brake warning sensitive switch. Refer to page 2-626. Connect leads to brake warning sensitive switch.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

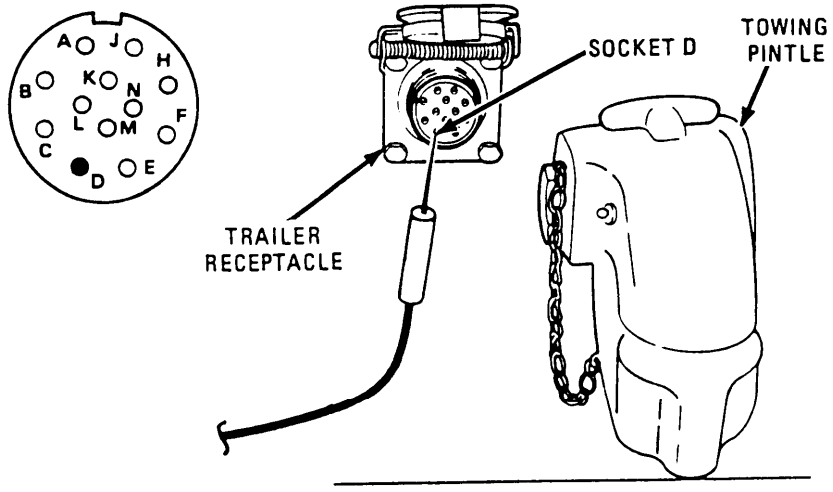
AN. TRAILER RECEPTACLE BLACKOUT CIRCUIT.



PICTORIAL VIEW



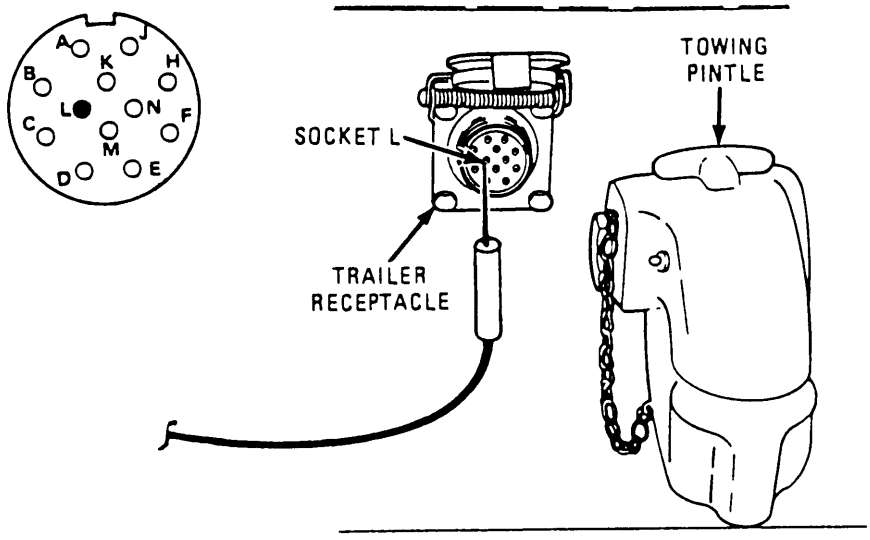
ELECTRICAL DIAGRAM



WARNING

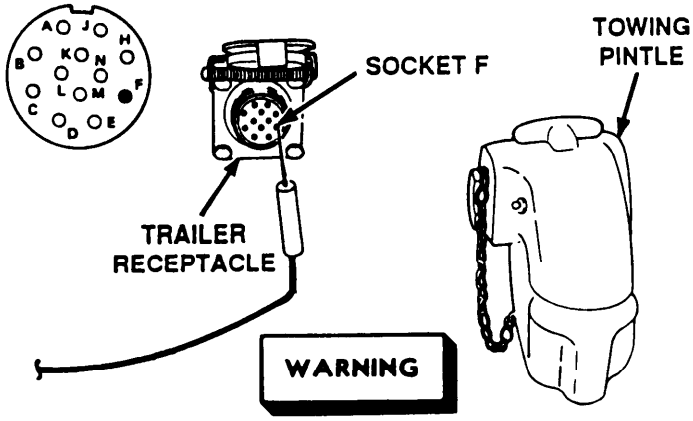
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 1. Place red probe in socket D (lead 90A) of trailer receptacle. Ground black probe. If multimeter indicates 0 ohms, go to step 2. If multimeter indicates infinity, repair lead 90A. Refer to page 2-371.



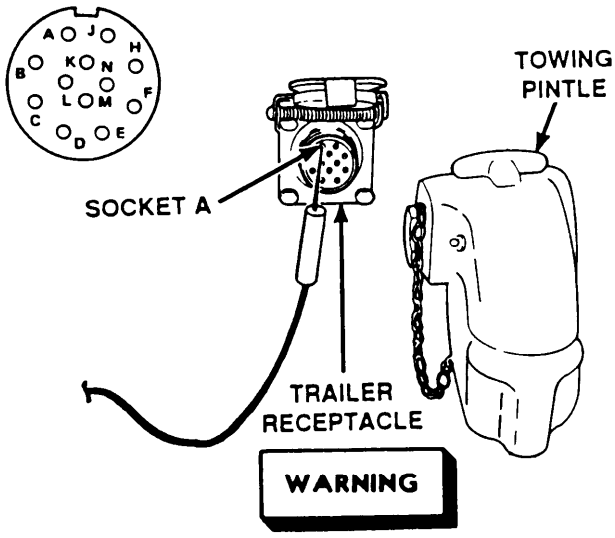
Step 2. Place red probe in socket L (lead 90 B). Ground black probe. If multimeter indicates 0 ohms, go to step 3. If multimeter indicates infinity, repair lead 90B. Refer to page 2-371.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



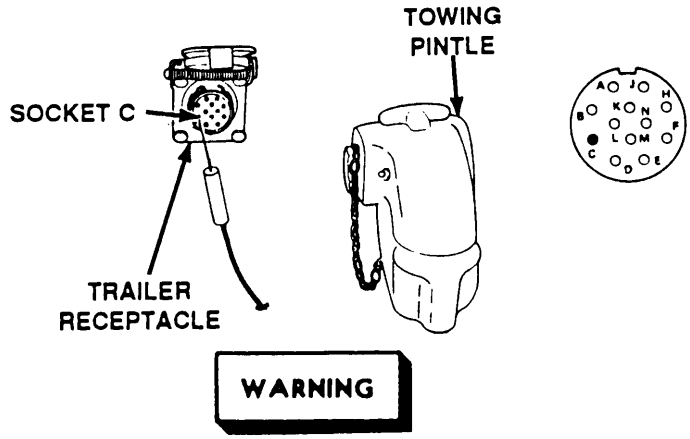
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. Place red probe in socket F (lead 23). Ground black probe. Set MASTER switch ON. Turn vehicular light switch to BO DRIVE. Apply brakes. If multimeter indicates about 24 volts, go to step 4. If multimeter indicates no voltage, repair lead 23. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF.



Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 4. Place red probe in socket A (lead 24A). Ground black probe. Set MASTER switch ON. Turn vehicular light switch to BO MARKER. If multimeter indicates about 24 volts, go to step 5. If multimeter indicates no voltage, repair lead 24A. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF.

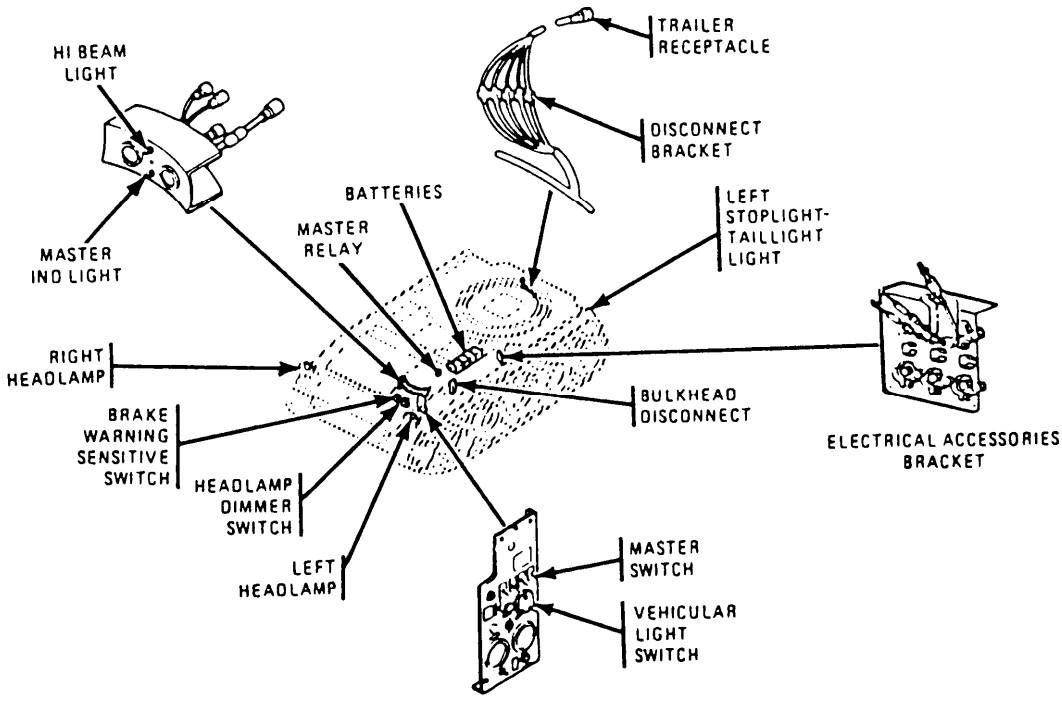


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

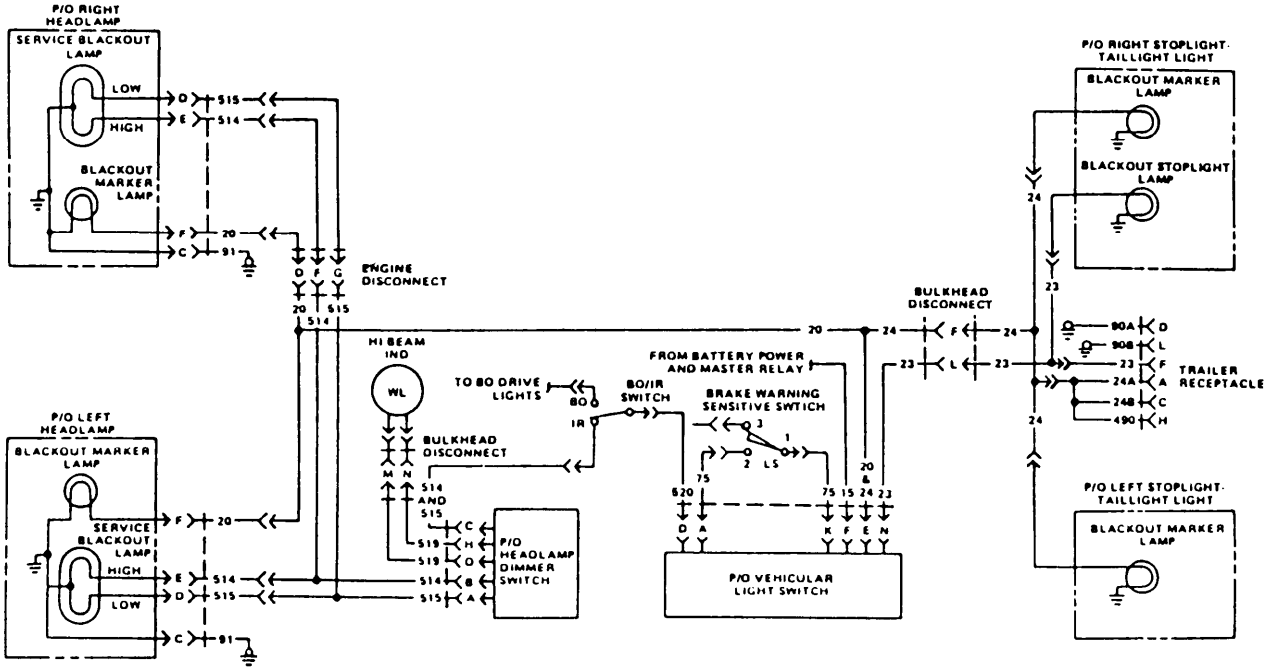
Step 5. Place red probe in socket C (lead 24 B). Ground black probe. Set MASTER switch ON. Turn vehicular light switch to BO MARKER. If multimeter indicates about 24 volts, trailer receptacle is operating normally. If multimeter indicates no voltage, repair lead 24B. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF.

AO. SERVICE BLACKOUT (INFRARED) HEADLAMP CIRCUIT (B0-1R AND VEHICULAR LIGHT SWITCHES).

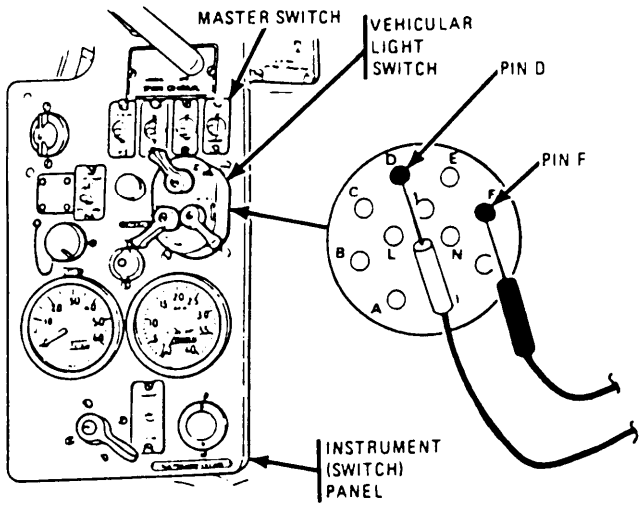


PICTORIAL VIEW

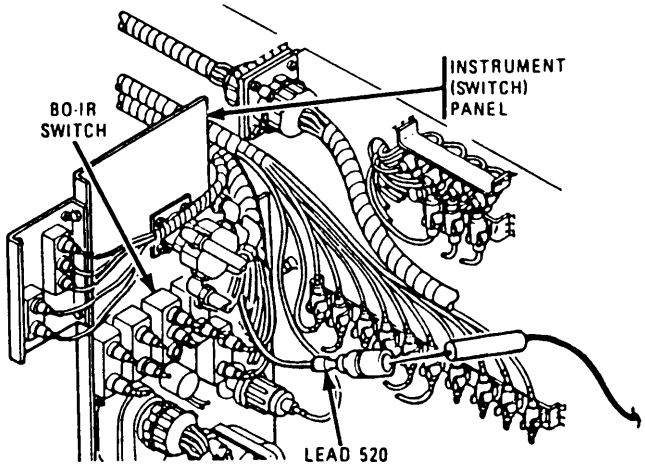
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



ELECTRICAL DIAGRAM



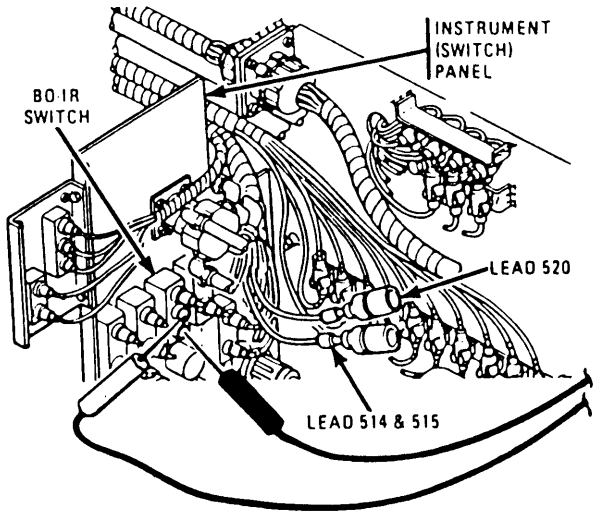
Step 1. Disconnect connector from vehicular light switch. Place red probe on pin D. Place black probe on pin F. Turn vehicular light switch to BO DRIVE. If multimeter indicates 0 ohms, go to step 2. If multimeter indicates infinity, replace vehicular light switch. Refer to page 2-566. Turn vehicular light switch OFF. Connect connector to vehicular light switch.



WARNING

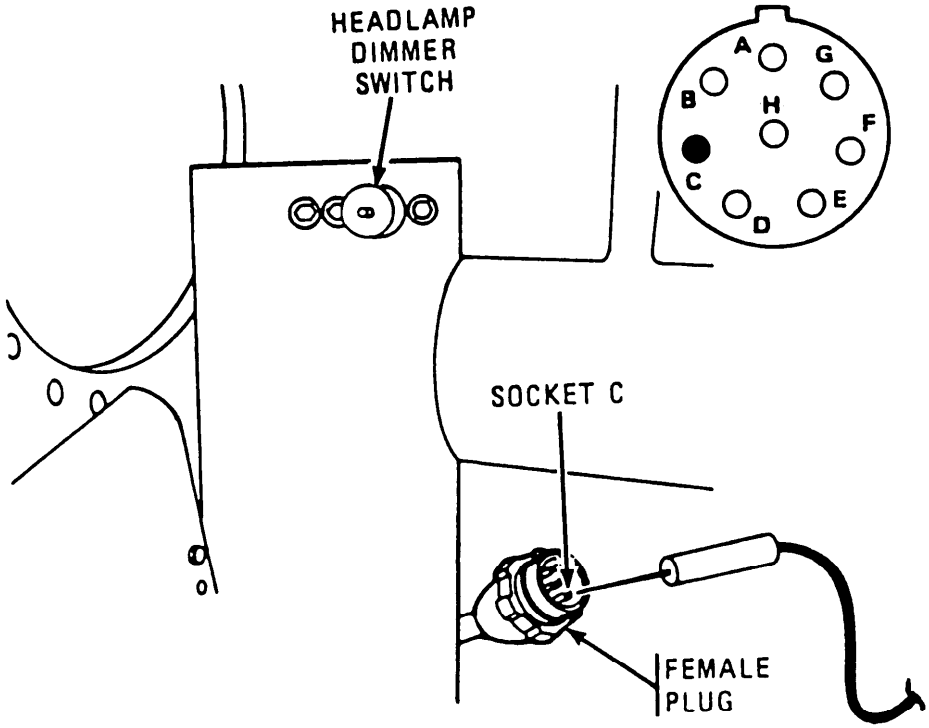
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Disconnect lead 520 from BO-IR switch. Place red probe in lead 520. Ground black probe. Set MASTER switch ON. Turn vehicular light switch to BO DRIVE. Set BO-IR switch to IR. If multimeter indicates about 24 volts, connect lead and go to step 3. If multimeter indicates no voltage, repair lead 520 between BO-IR switch and vehicular light switch. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF.



Step 3. Disconnect lead 514&51 5 and 520 from BO-IR switch. Place both probes in switch. If multimeter indicates 0 ohms, go to step 4. If multimeter indicates infinity, replace BO-IR switch. Refer to page 2-566. Connect leads.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

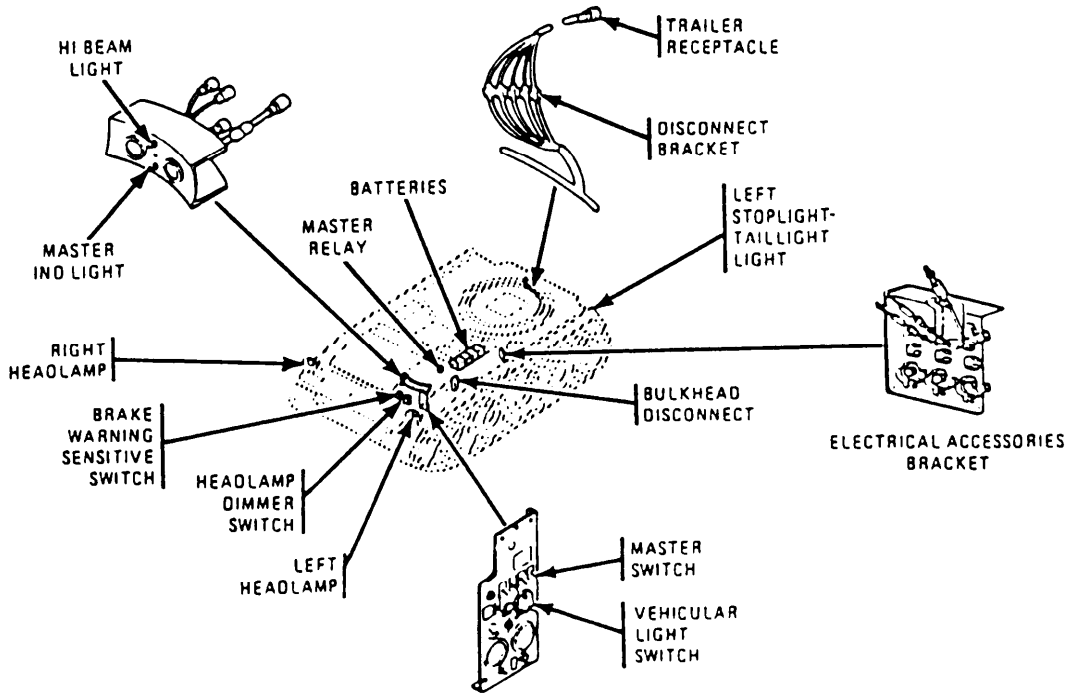


WARNING

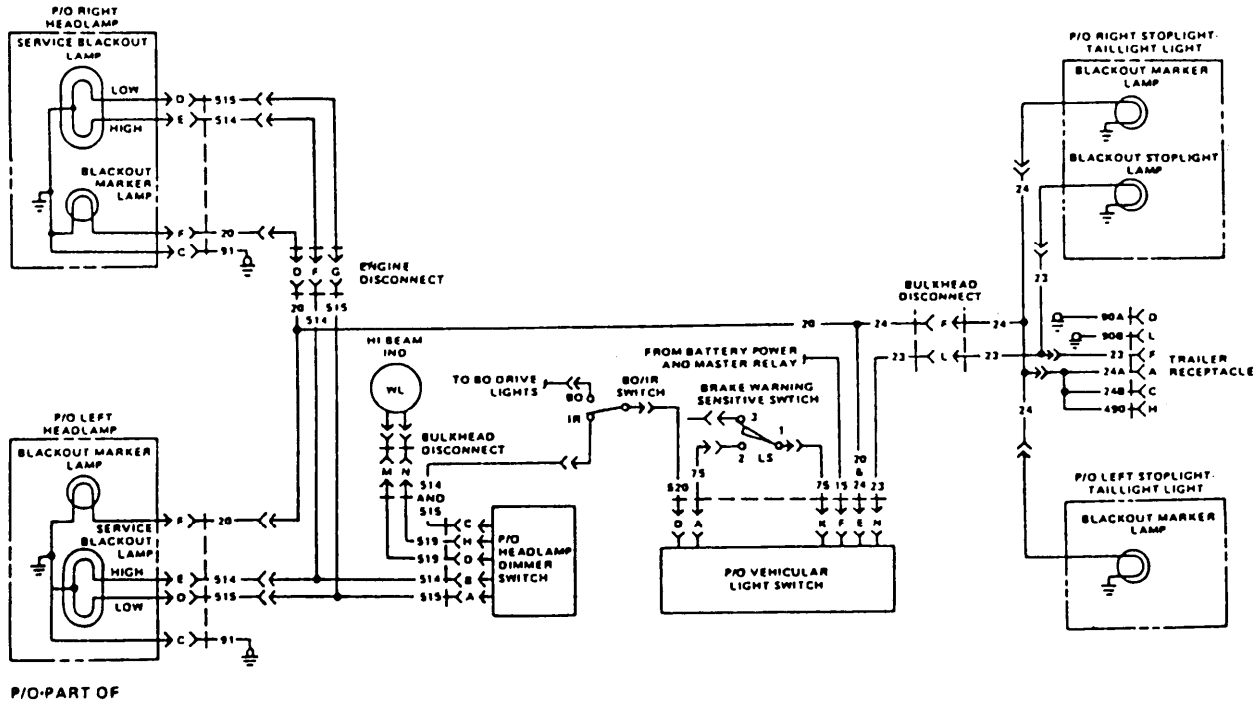
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 4. Disconnect connector to headlamp dimmer switch. Place red probe in pin socket C (lead 514&515). Ground black probe. Set MASTER switch ON. Turn vehicular light switch to BO DRIVE. If multimeter indicates about 24 volts, replace headlamp dimmer switch. Refer to page 2-584. If multimeter indicates no voltage, repair lead 514&515 between BO-IR switch and headlamp dimmer switch. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF. Connect connector to headlamp dimmer switch.

AP. SERVICE BLACKOUT (INFRARED) HEADLAMP CIRCUIT (HEADLAMP DIMMER SWITCH).

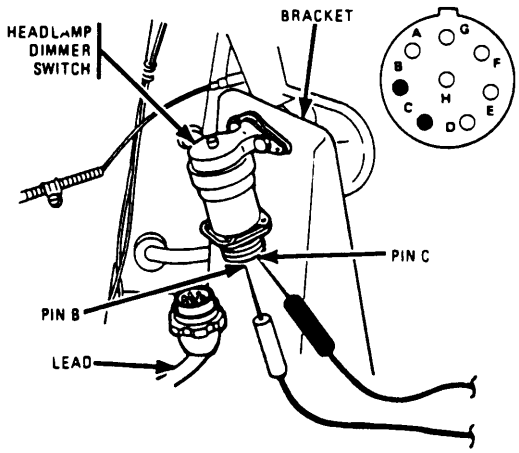


PICTORIAL VIEW

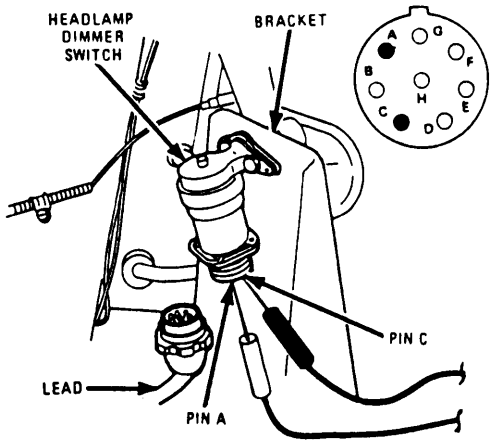


ELECTRICAL DIAGRAM

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

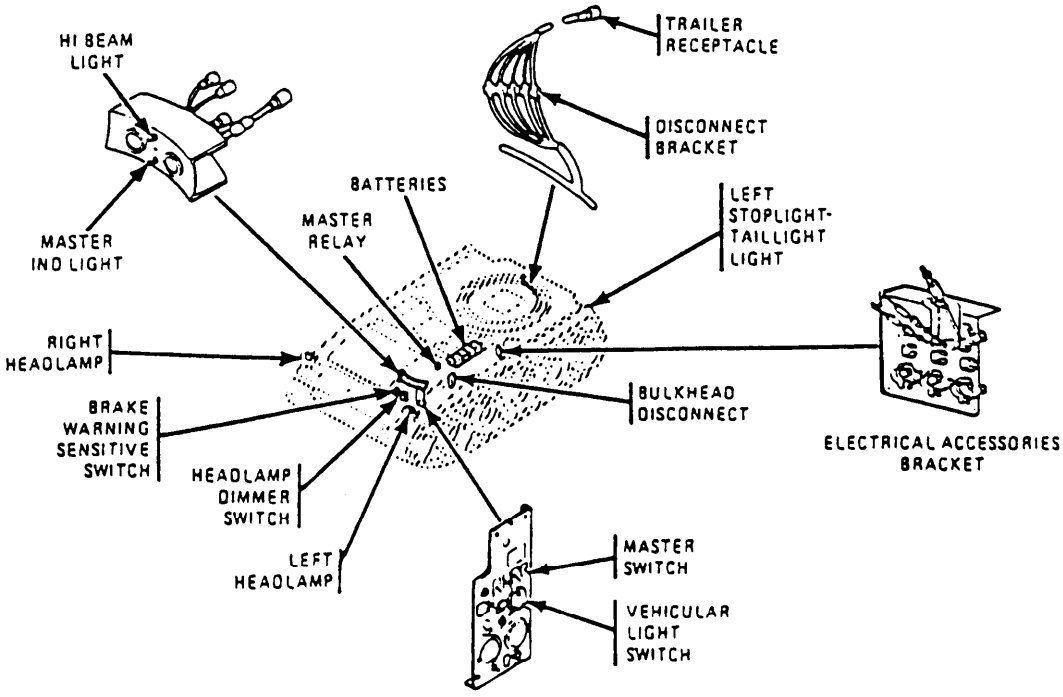


Step 1. Set MASTER switch OFF. Set headlamp dimmer switch for high beam operation. Disconnect connector from headlamp dimmer switch. Place red probe on pin B. Place black probe on pin C. If multimeter indicates 0 ohms, repair lead 514 between headlamp line disconnect and headlamp dimmer switch. Refer to page 2-371. If multimeter indicates infinity, replace headlamp dimmer switch. Refer to page 2-584. Connect connector to headlamp dimmer switch.

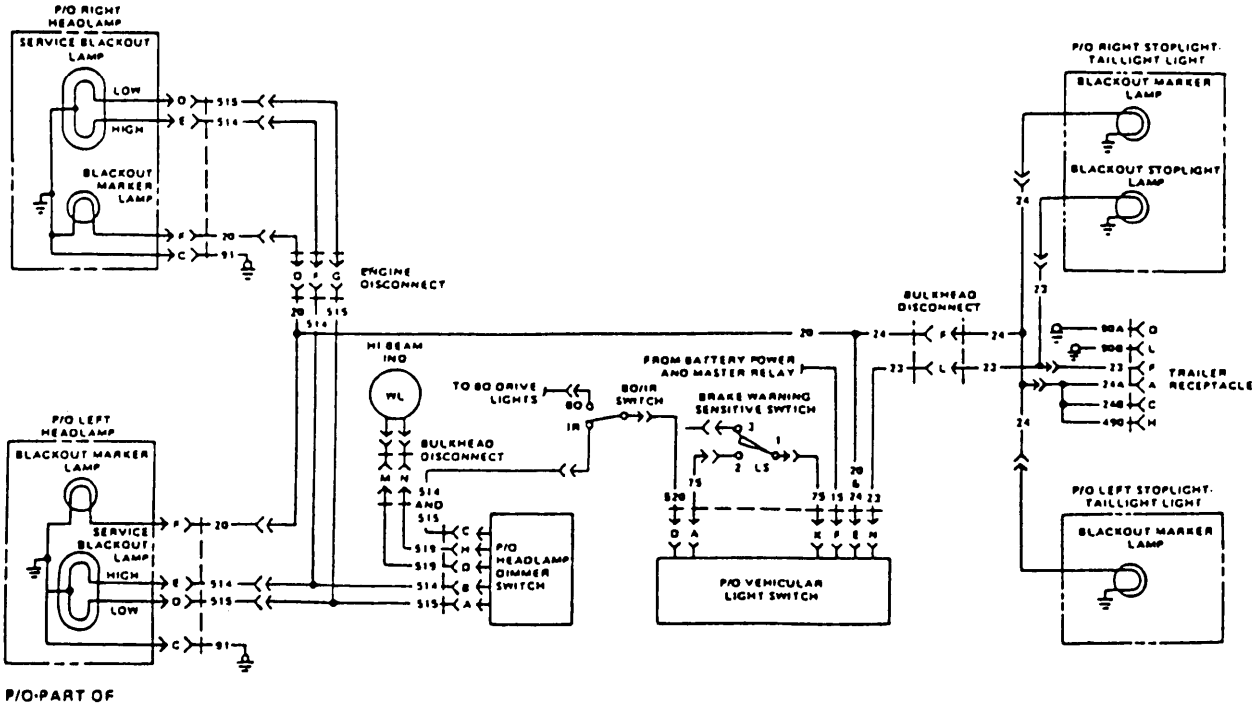


Step 2. Set MASTER switch OFF. Set headlamp dimmer switch for low beam operation. Disconnect connector from headlamp dimmer switch. Place red probe on pin A. place black probe on pin C. If multimeter indicates 0 ohms, repair lead 515 between headlamp line disconnect and headlamp dimmer switch. Refer to page 2-371. If multimeter indicates infinity, replace headlamp dimmer switch. Refer to page 2-584. Connect connector to headlamp dimmer switch.

AQ. SERVICE BLACKOUT (INFRARED) HEADLAMP CIRCUIT (LEAD 515).

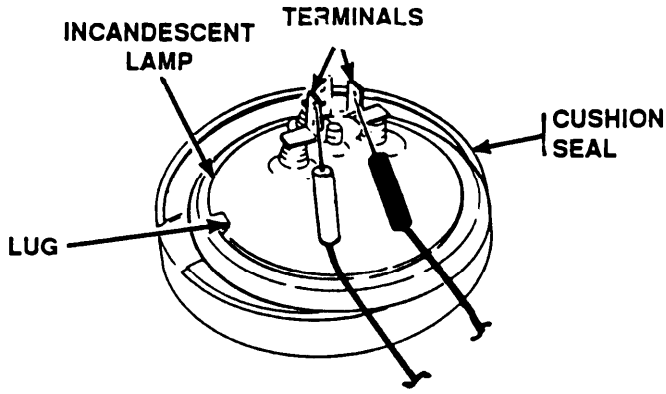


PICTORIAL VIEW

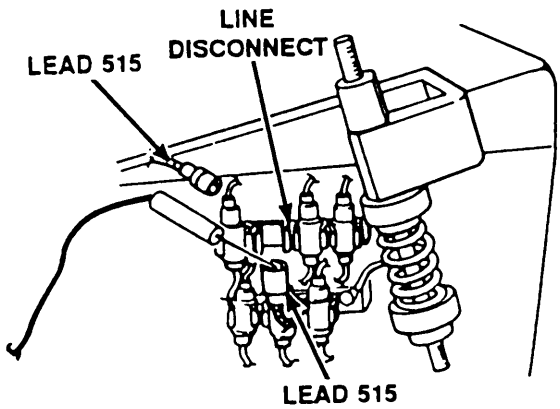


ELECTRICAL DIAGRAM

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 1. Set MASTER switch OFF. Remove inoperative lamp from service headlamp. Refer to page 2-601. Connect multimeter to the parallel lamp terminals. If multimeter indicates about 2 ohms, go to step 2. If multimeter indicates infinity, replace lamp. Refer to page 2-601.

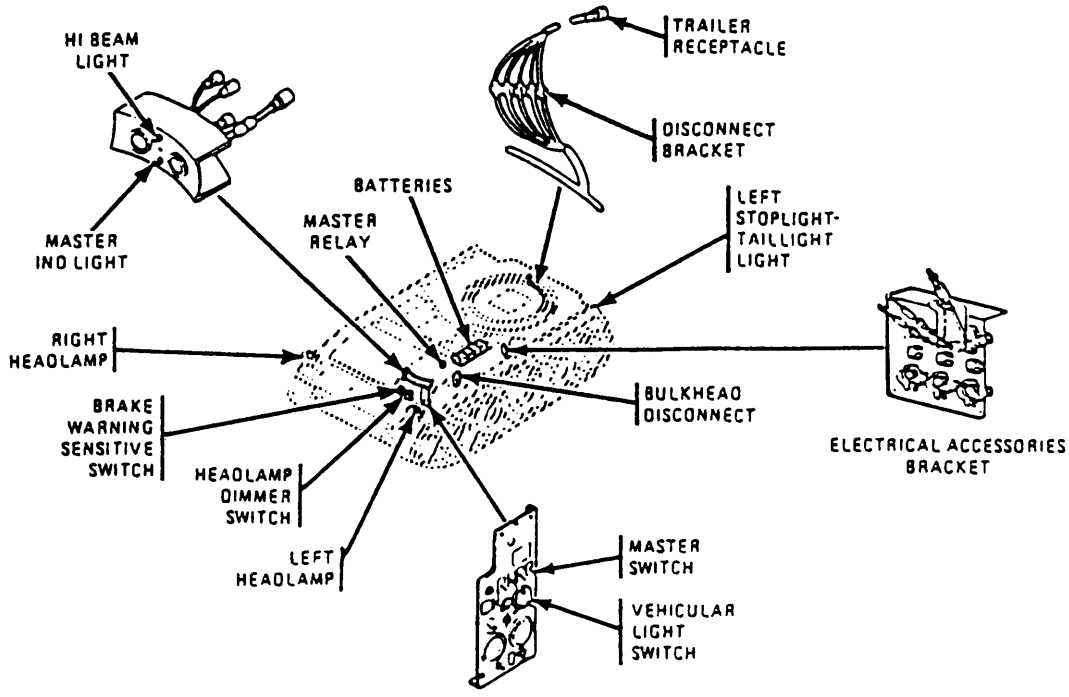


WARNING

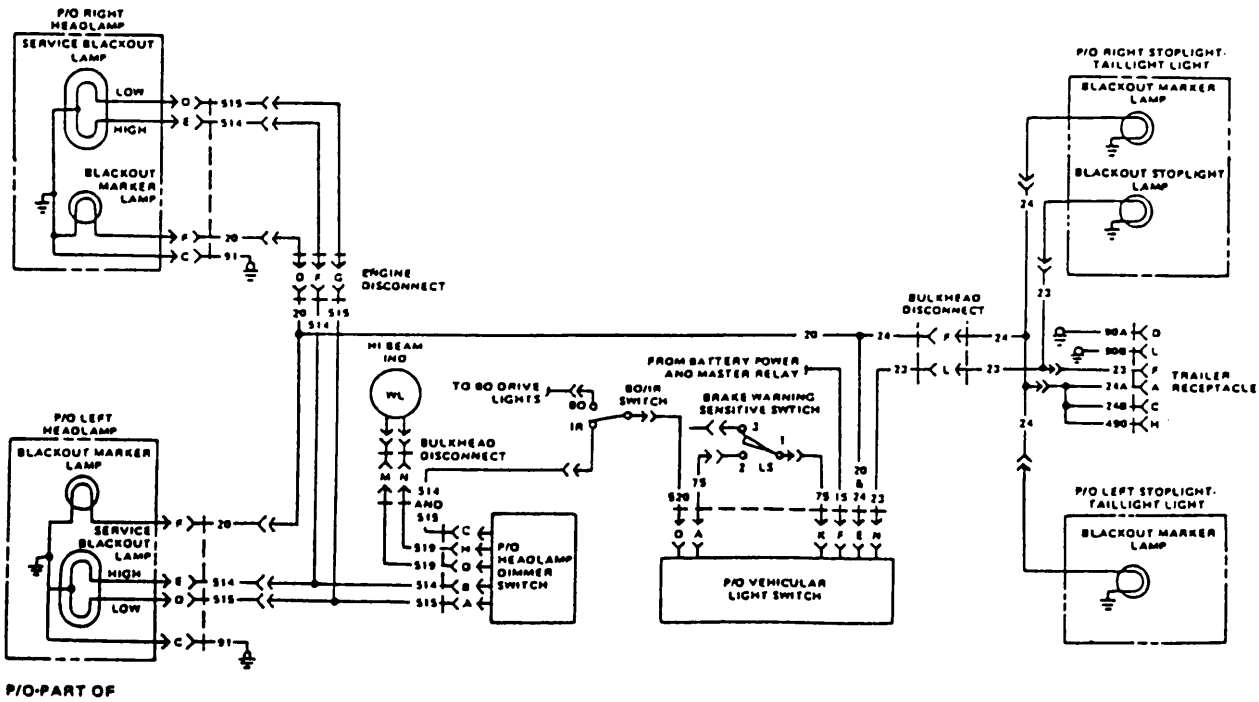
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. To access line disconnect, remove hull transmission compartment deck assembly. Refer to page 2-938. Disconnect lead 515. Place red probe in lead 515. Ground black probe. Press headlamp dimmer switch for low beam operation. Set MASTER switch ON. Turn vehicular light switch to BO DRIVE. Set BO-IR switch to IR. If multimeter indicates about 24 volts, repair service headlamp assembly. Refer to page 2-601. If multimeter indicates no voltage, repair lead 515 from line disconnect to headlamp dimmer switch. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF.

AR. SERVICE BLACKOUT (INFRARED) HEADLAMP CIRCUIT (LEAD 514).

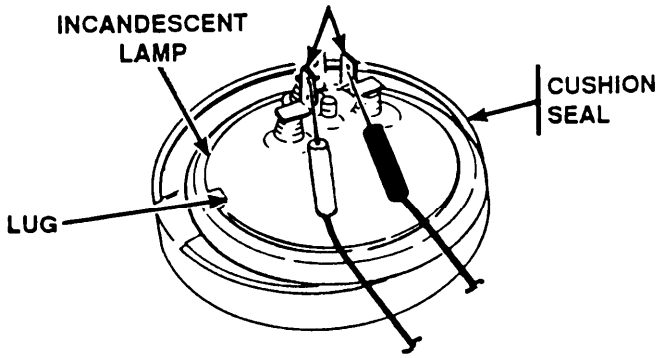


PICTORIAL VIEW

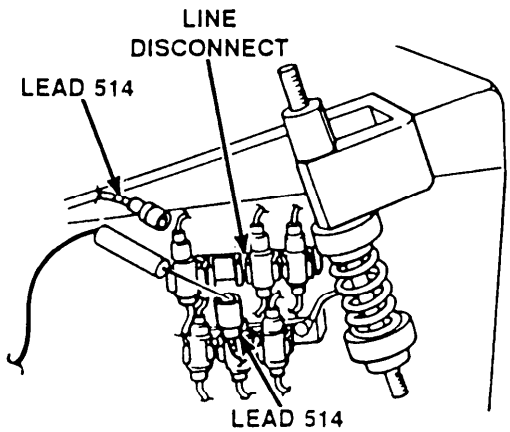


ELECTRICAL DIAGRAM

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 1. Set MASTER switch OFF. Remove inoperative lamp from service headlamp. Refer to page 2-601. Connect multimeter to the parallel lamp terminals. If multimeter indicates about 1 ohm, go to step 2. If multimeter indicates infinity, replace lamp. Refer to page 2-601.

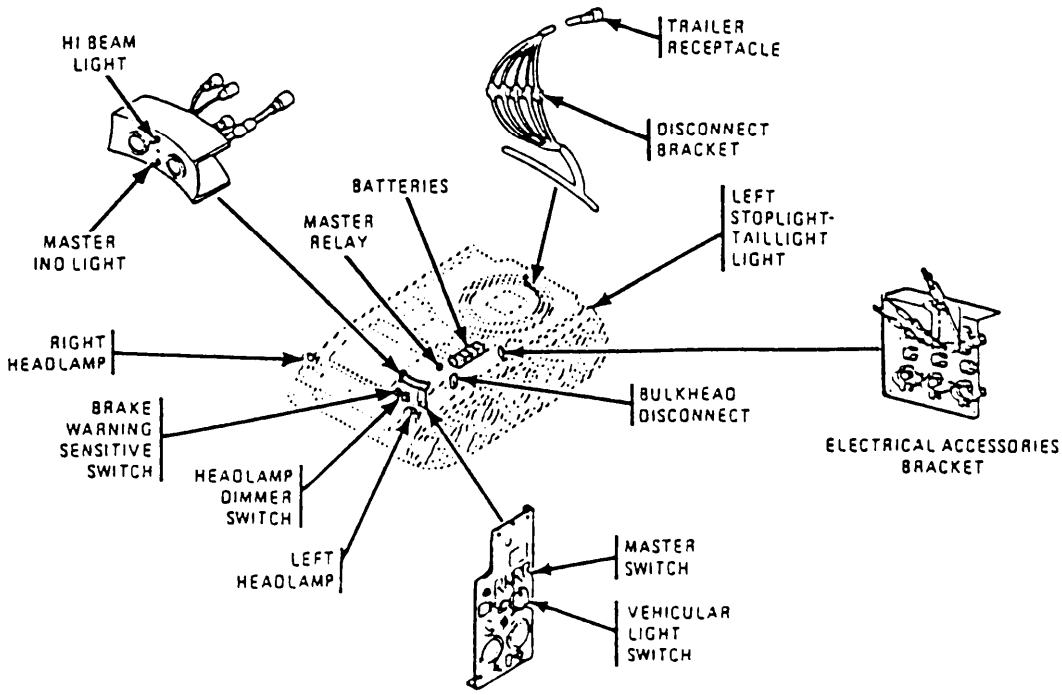


WARNING

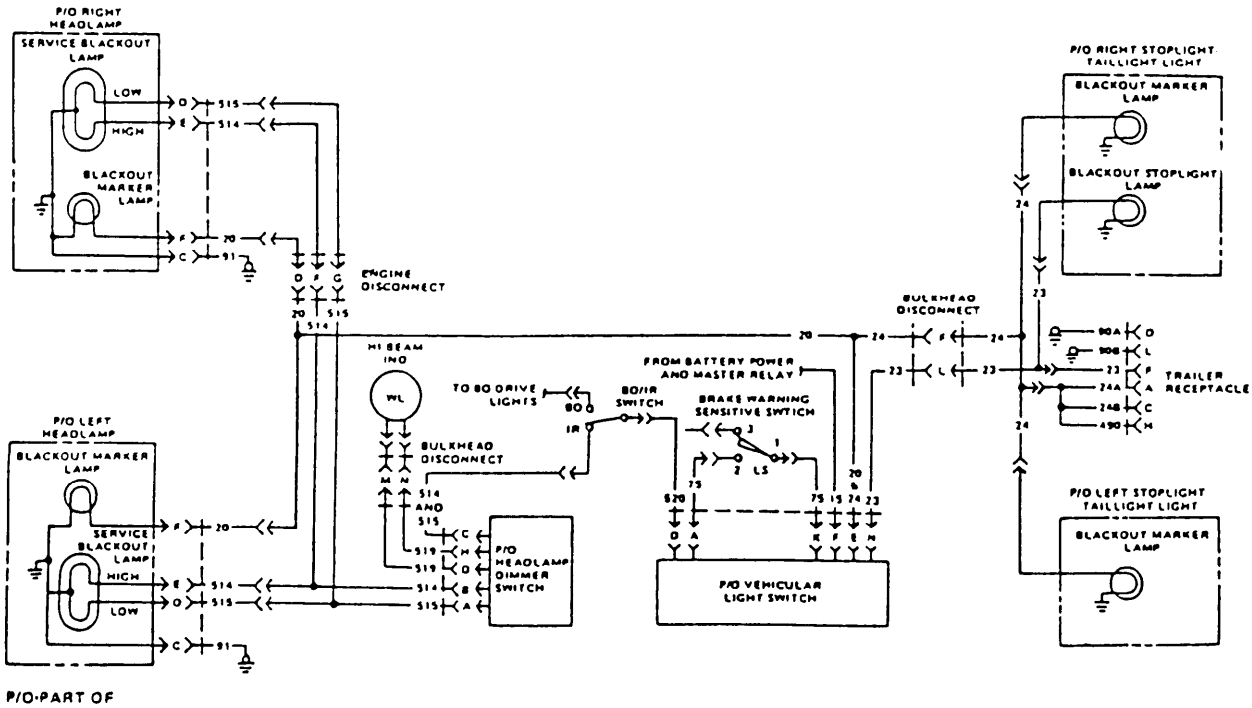
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. To access line disconnect, remove hull transmission compartment deck assembly. Refer to page 2-938. Disconnect lead 514. Place red probe in lead 514. Ground black probe. Press headlamp dimmer switch for high beam operation. Set MASTER switch ON. Turn vehicular light switch to BO DRIVE. Set BO-IR switch to IR. If multimeter indicates about 24 volts, repair service headlamp assembly. Refer to page 2-601. If multimeter indicates no voltage, repair lead 514 from line disconnect to headlamp dimmer switch. Refer to page 2-371. Set MASTER switch OFF. Turn vehicular light switch OFF. Connect lead.

AS. HI BEAM IND LIGHT (BLACKOUT) CIRCUIT.

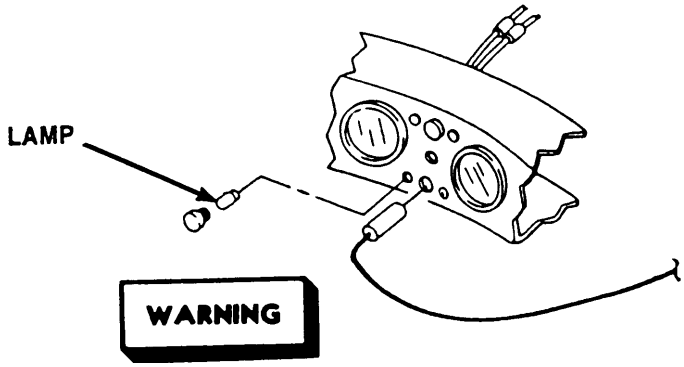


PICTORIAL VIEW



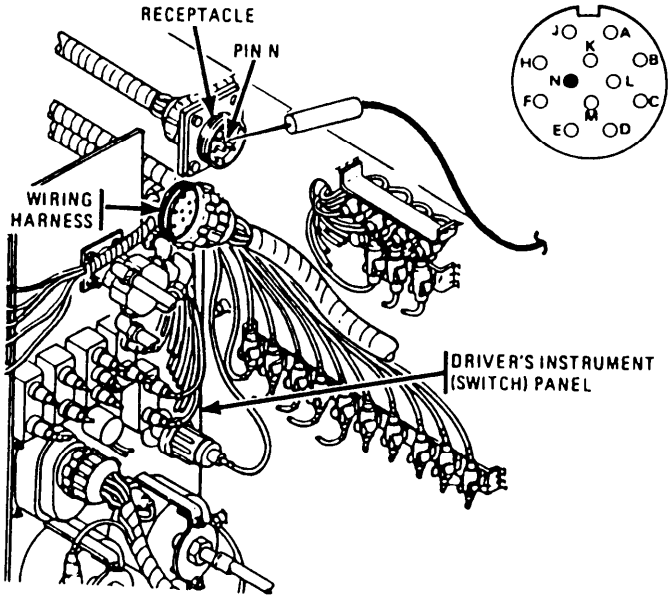
ELECTRICAL DIAGRAM

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

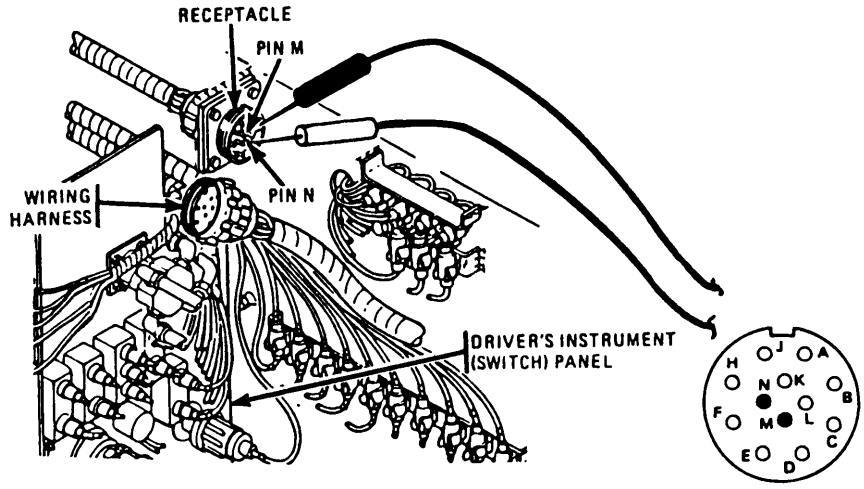


Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

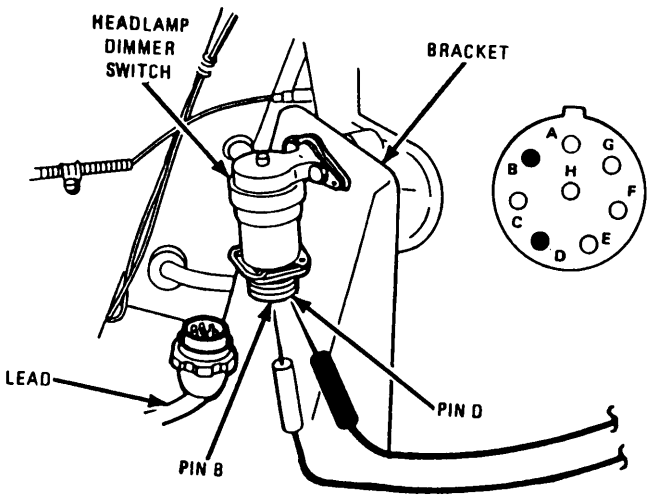
Step 1. Remove lamp from HI BEAM IND light. Refer to page 2-571. Set MASTER switch ON. Place blackout-infrared selection switch in infrared position and infrared receiver switch in ON position. Press dimmer switch on floor. Place instrument switch in ON position. Place red probe in socket. Ground black probe. If multimeter indicates about 24 volts, replace lamp. If multimeter indicates no voltage, set MASTER switch OFF, install lamp and go to step 2.



Step 2. Disconnect instrument (gage) panel wiring harness. Place red probe on receptacle pin N (lead 519). Ground black probe. Set MASTER switch ON. Turn vehicular light switch to SER DRIVE. Press headlamp dimmer switch for high beam operation. If multimeter indicates about 24 volts, connect wiring harness and go to step 4. If multimeter indicates no voltage, go to step 3.



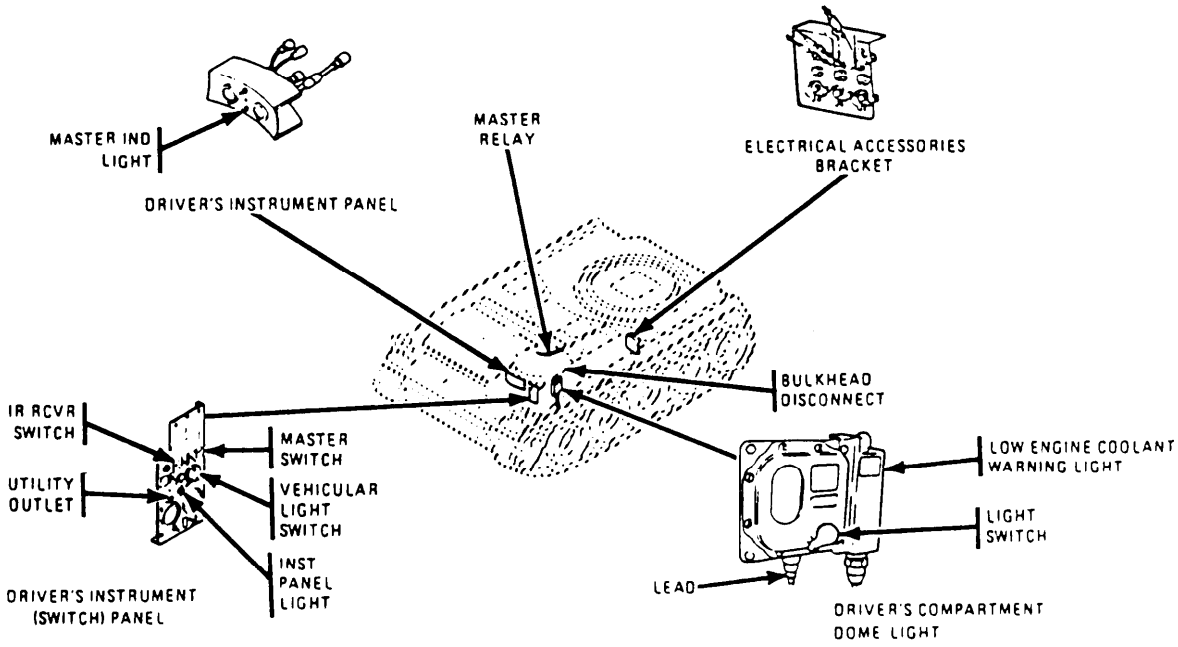
Step 3. Place red probe on receptacle pin N (lead 519). Place black probe on receptacle pin M (lead 519). If multimeter indicates about 100 ohms, replace headlamp dimmer switch. Refer to page 2-584. If multimeter does not indicate about 100 ohms, repair HI BEAM IND light. Refer to page 2-571. Connect wiring harness.



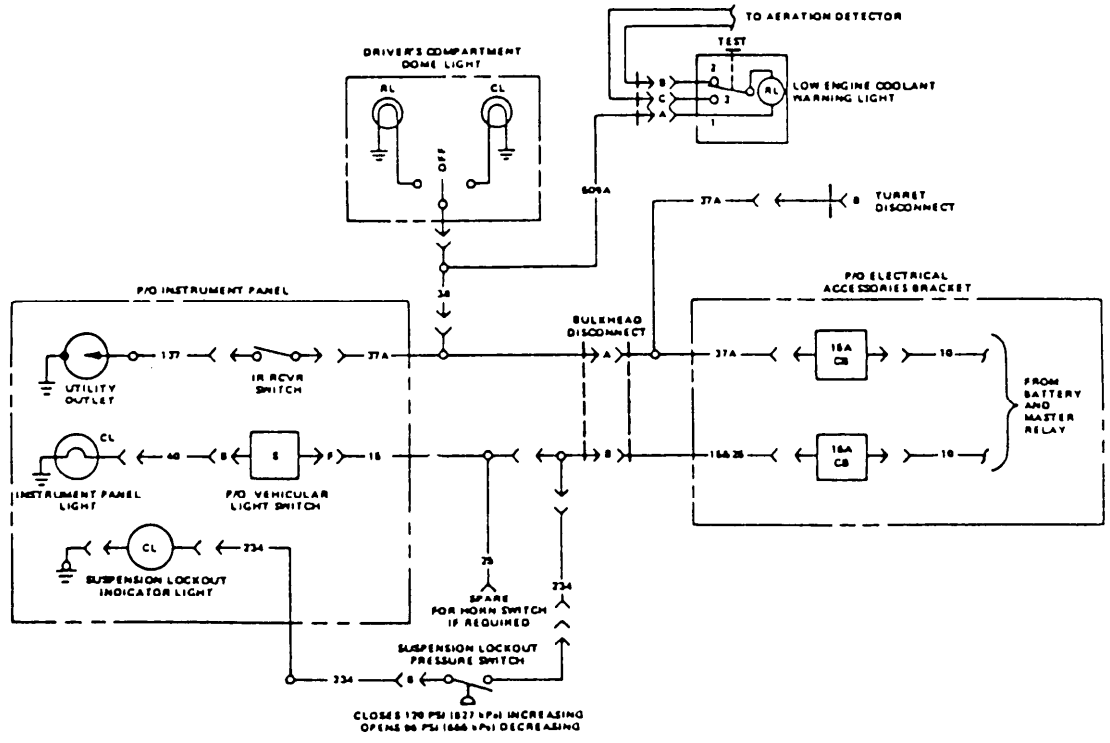
Step 4. Disconnect connector from headlamp dimmer switch. Place red probe on pin B. Place black probe on pin D. If multimeter indicates 0 ohms, repair lead 519 between headlamp dimmer switch and instrument (gage) panel wiring harness receptacle. Refer to page 2-371. If multimeter indicates infinity, replace headlamp dimmer switch. Refer to page 2-584. Connect connector to headlamp dimmer switch.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

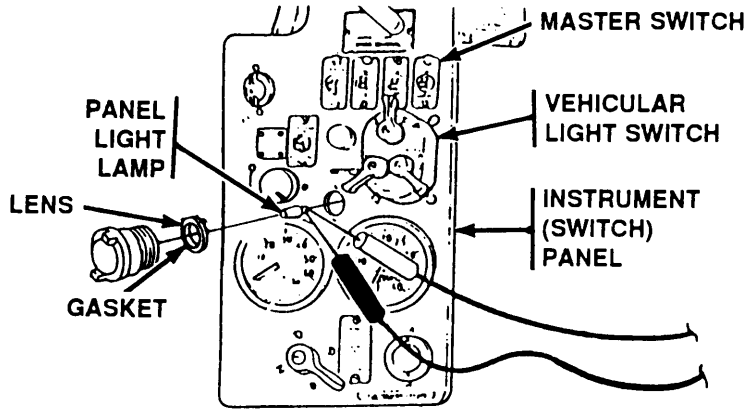
AT. INSTRUMENT (SWITCH) PANEL LIGHT CIRCUIT.



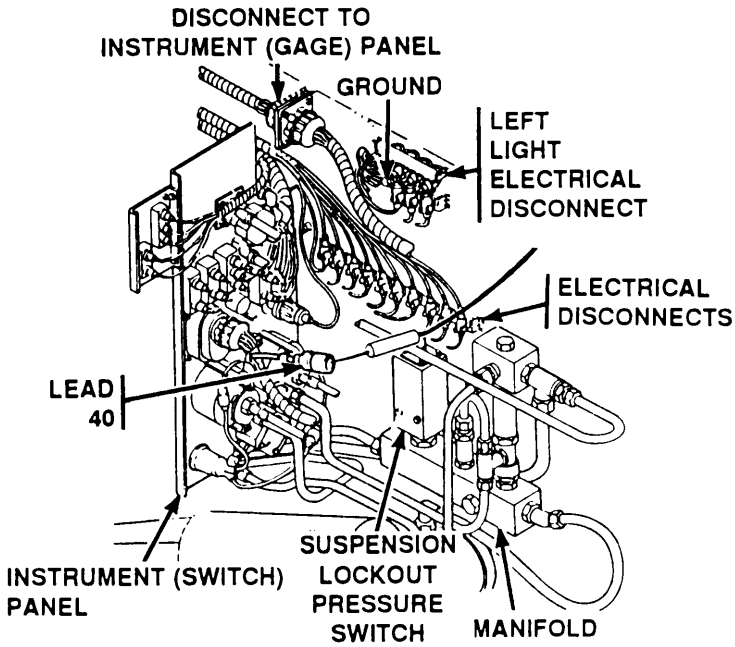
PICTORIAL VIEW



ELECTRICAL DIAGRAM



Step 1. Set MASTER switch OFF. Remove lamp from instrument (switch) panel light. Refer to page 2-578. Connect multimeter to contacts of lamp. If multimeter indicates about 70 ohms, go to step 2. If multimeter indicates infinity, replace lamp. Refer to page 2-578.

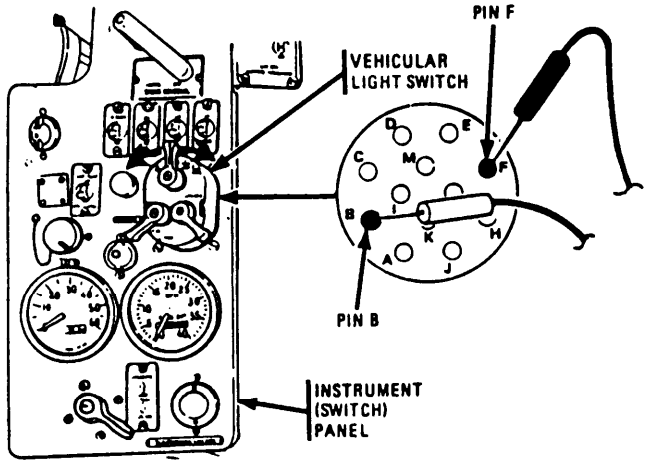


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

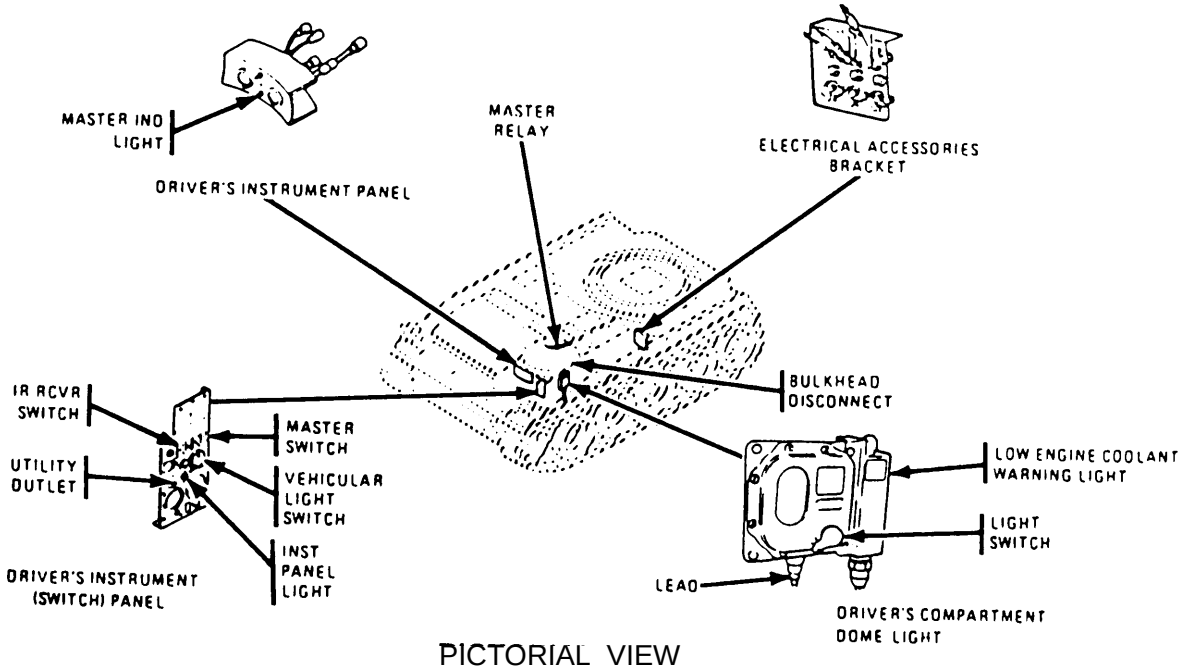
Step 2. Disconnect lead 40 from instrument (switch) panel light. Place red probe in lead 40. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, repair instrument (switch) panel light assembly. Refer to page 2-566. If multimeter indicates no voltage, go to step 3. Set MASTER switch OFF. Connect lead.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

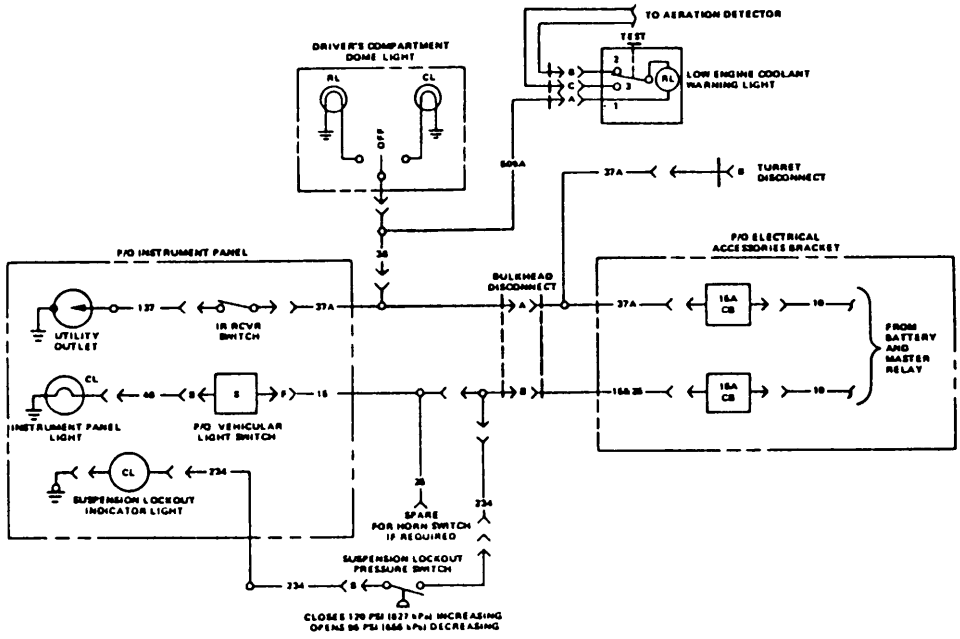


Step 3. Disconnect connector from vehicular light switch. Place red probe on pin B. Place black probe on pin F. Turn vehicular light switch to SER DRIVE, STOP LIGHT, BO MARKER, and BO DRIVE. If multimeter indicates 0 ohms at each position of the vehicular light switch, repair lead 40 between vehicular light switch and instrument (switch) panel light. Refer to page 2-371. If multimeter indicates infinity in one of the positions, replace vehicular light switch. Refer to page 2-566.

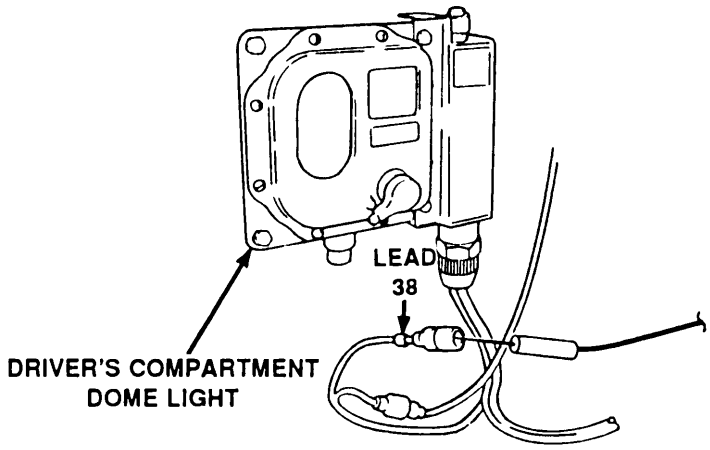
AU. DRIVER'S COMPARTMENT DOME LIGHT CIRCUIT.



PICTORIAL VIEW



ELECTRICAL DIAGRAM

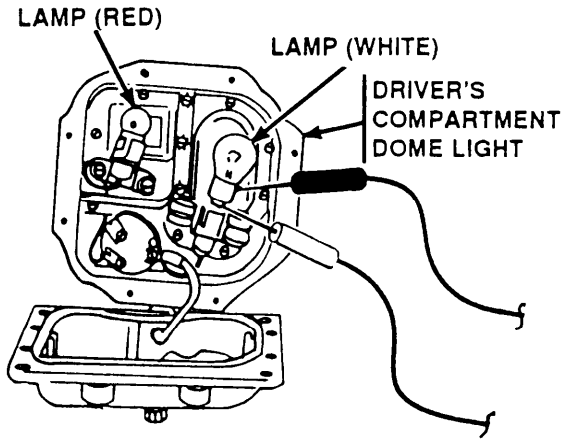


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

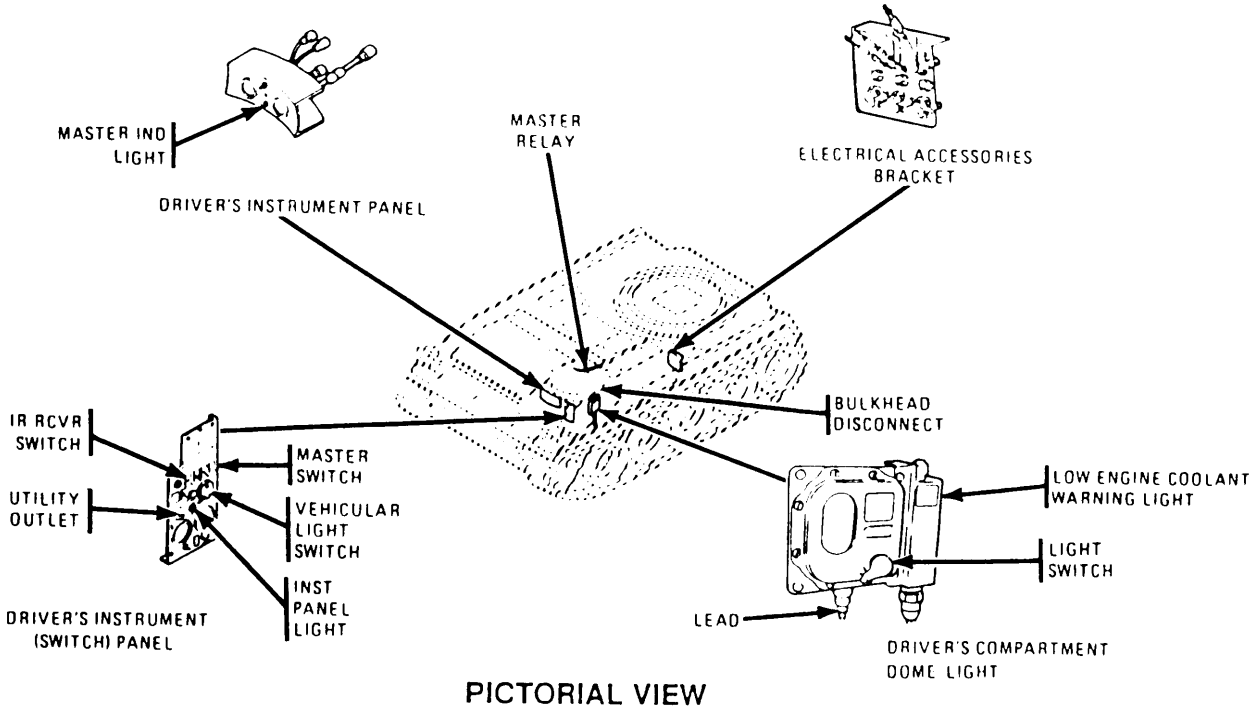
Step 1. Disconnect lead 38 from driver's compartment dome light. Place red probe in lead 38. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, repair driver's compartment dome light. Refer to page 2-620. If multimeter indicates no voltage, repair lead 38. Refer to page 2-371. Set MASTER switch OFF. Connect lead.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



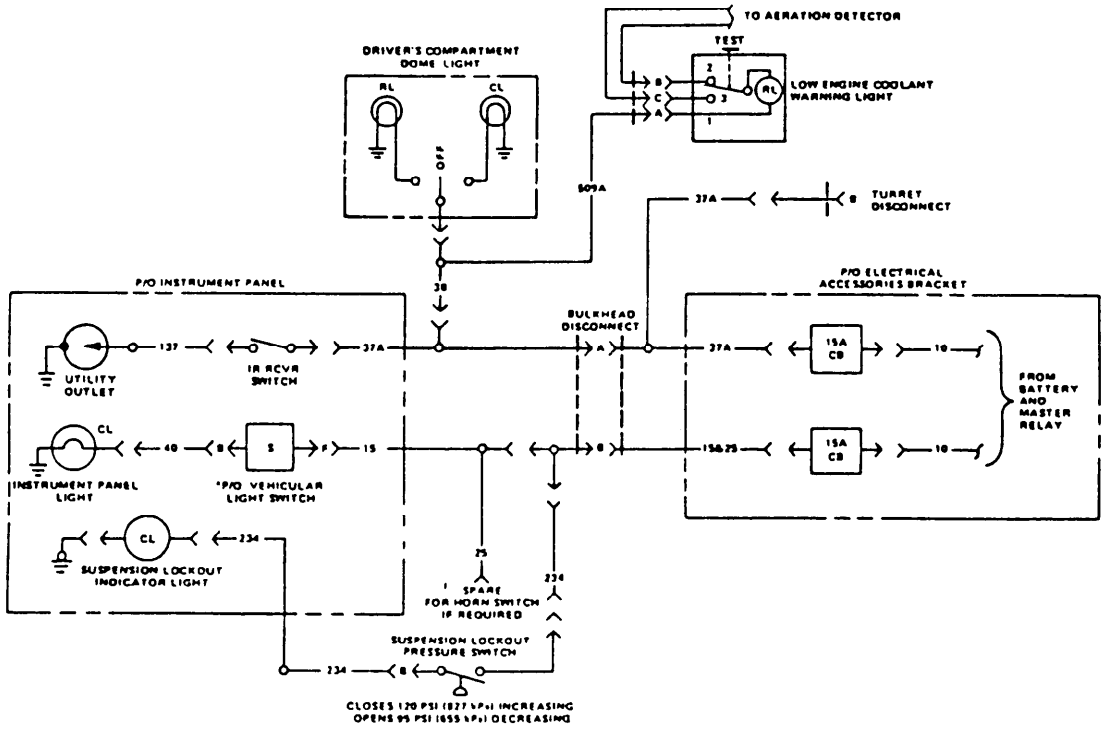
Step 2. Remove inoperative lamp from driver's compartment dome light. Refer to page 2-620. Connect multimeter to contacts of lamp. If multimeter indicates about 3 ohms for red lamp or about 10 ohms for white lamp, repair driver's compartment dome light. Refer to page 2-620. If multimeter indicates infinity, replace lamp. Refer to page 2-620.

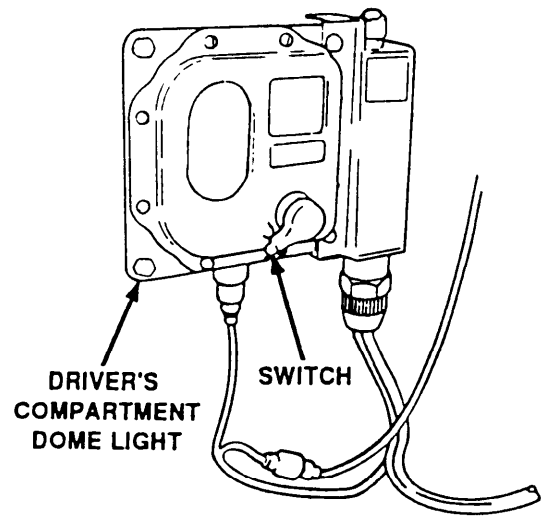
AV. UTILITY OUTLET CIRCUIT.



PICTORIAL VIEW

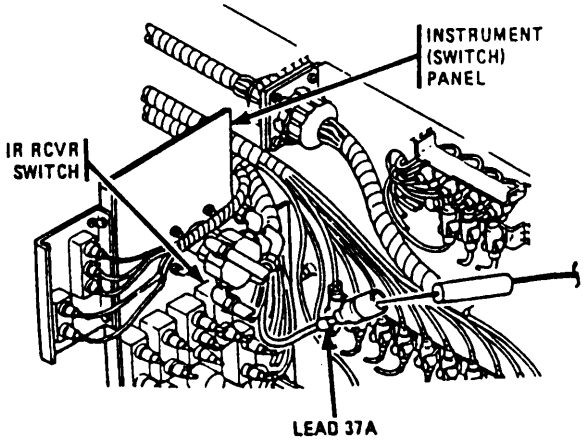
ELECTRICAL DIAGRAM





Step 1. Set MASTER switch ON. Turn driver's compartment dome light switch either red or white ON position. If driver's compartment dome light operates, go to step 2. If driver's compartment dome light does not operate, go to step 4. Turn driver's compartment dome light switch OFF. Set MASTER switch OFF.

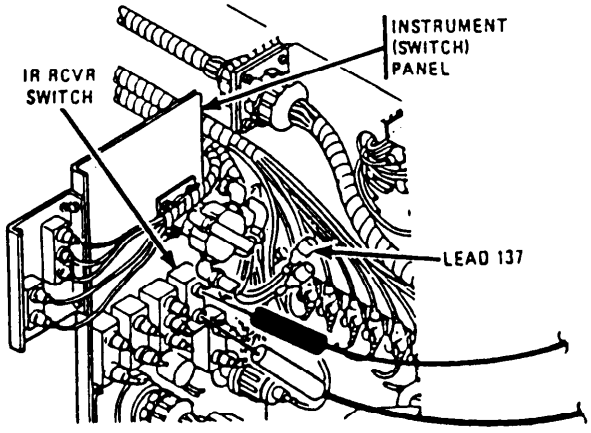
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



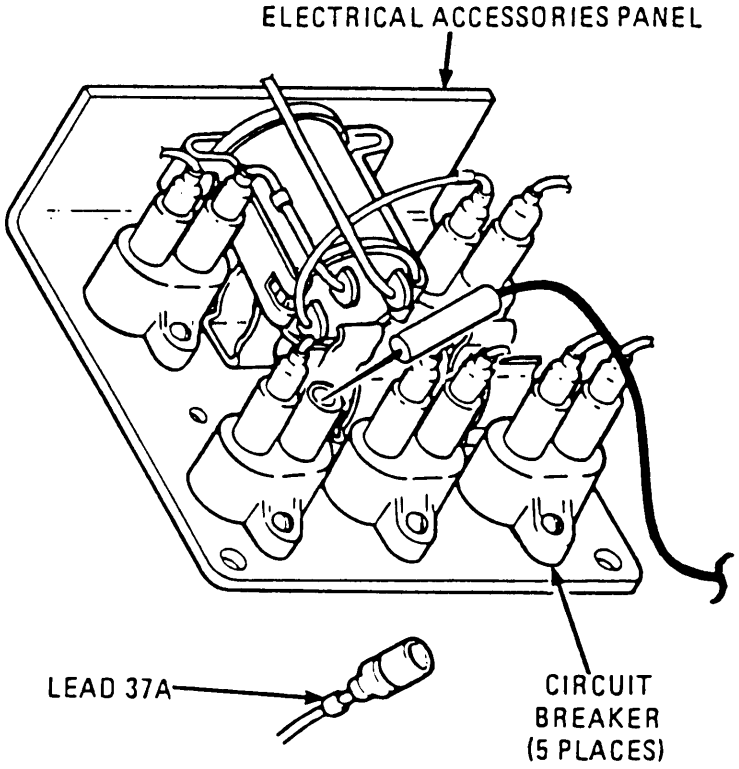
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Disconnect lead 37A from IR RCVR switch. Place red probe in lead 37A. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, connect lead and go to step 3. If multimeter indicates no voltage, repair lead 37A between driver's compartment dome light and IR RCVR switch. Refer to page 2-371. Set MASTER switch OFF.



Step 3. Disconnect lead 137 from IR RCVR switch. Connect multimeter to IR RCVR switch connector pins. If multimeter indicates 0 ohms, repair lead 137 between IR RCVR switch and utility outlet. Refer to page 2-371. If multimeter indicates infinity, replace IR RCVR switch. Refer to page 2-566. Connect leads (137 and 37A).

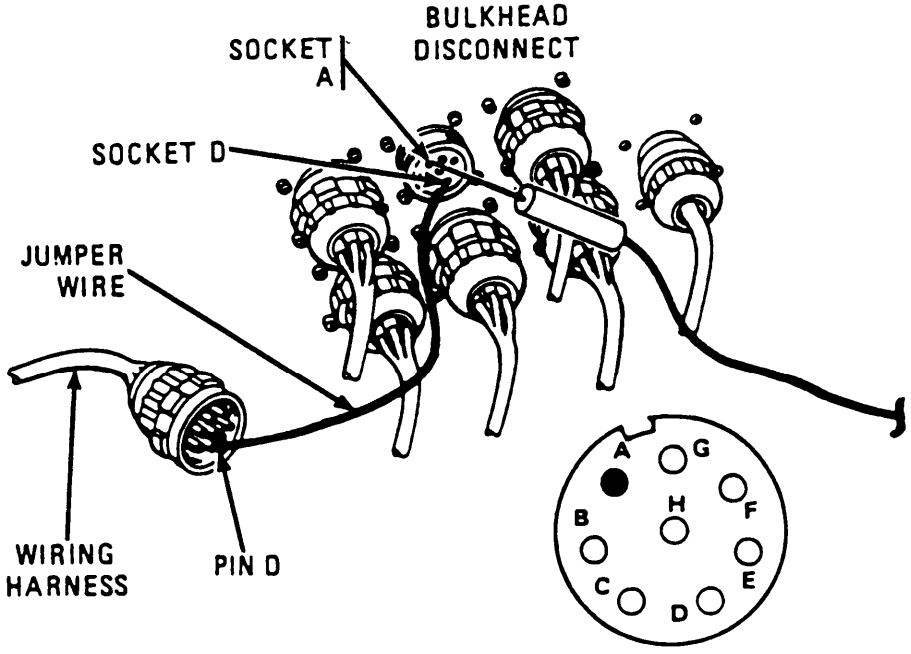


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 4. To access electrical accessories panel, remove left $C0_2$ cylinder access cover. Refer to page 2-923. Disconnect lead 37A from circuit breaker. Place red probe in circuit breaker receptacle. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 5. If multimeter indicates no voltage, replace circuit breaker. Refer to page 2-590. Set MASTER switch OFF. Connect lead.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

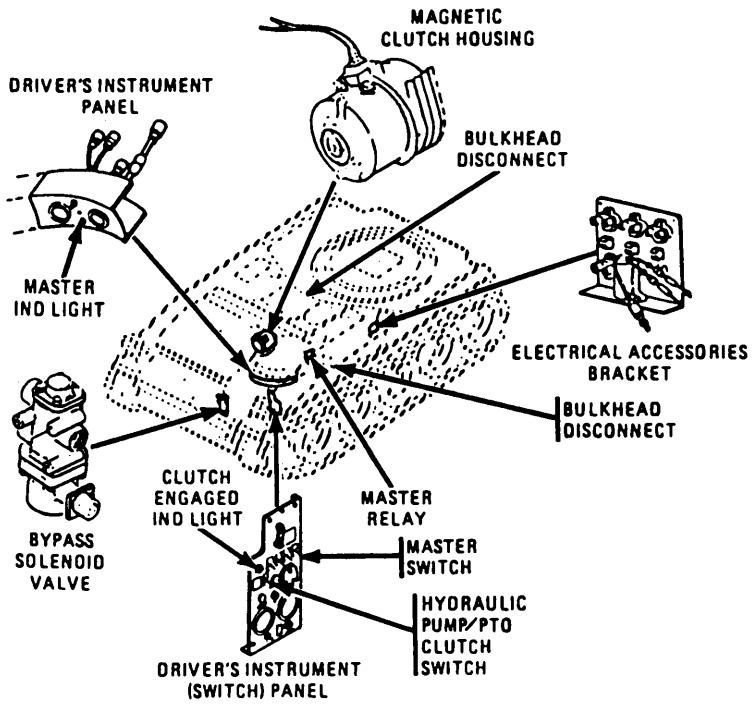


WARNING

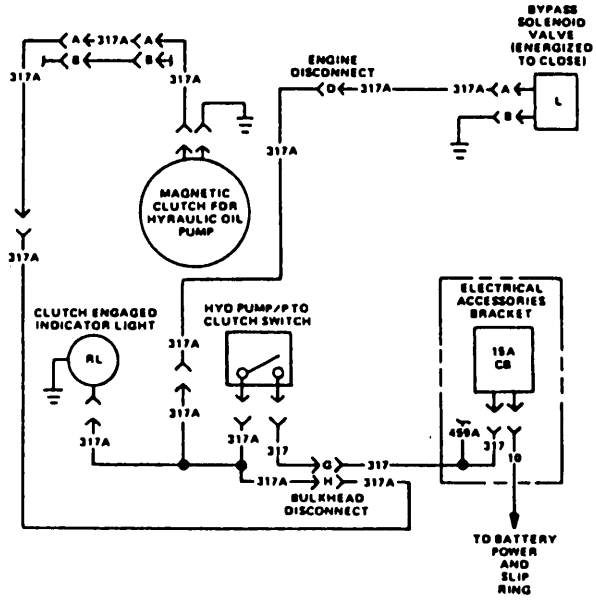
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 5. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness at bulkhead disconnect. Place jumper wire to pin D and socket D (lead 459). Place red probe in plug socket A (lead 37A). Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 *volts,* repair lead 37A between IR RCVR switch and bulkhead disconnect. Refer to page 2-371. If multimeter indicates no voltage, repair lead 37A between bulkhead disconnect and circuit breaker. Refer to page 2-371. Set MASTER switch OFF. Remove jumper wire (lead 459). Connect wiring harness.

AW. MAGNETIC CLUTCH AND BYPASS SOLENOID CIRCUIT.

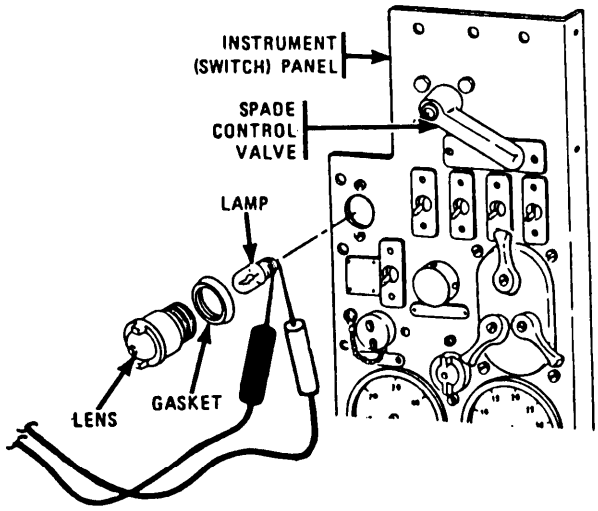


PICTORIAL VIEW

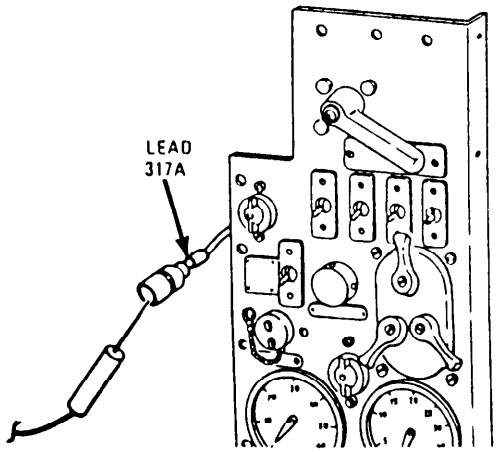


ELECTRICAL DIAGRAM

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 1. Remove lamp from clutch engaged indicator light. Refer to page 2-566. Connect multimeter to contacts of lamp. If multimeter indicates about 1 ohm, install lamp and go to step 2. If multimeter indicates infinity, replace lamp. Refer to page 2-566.

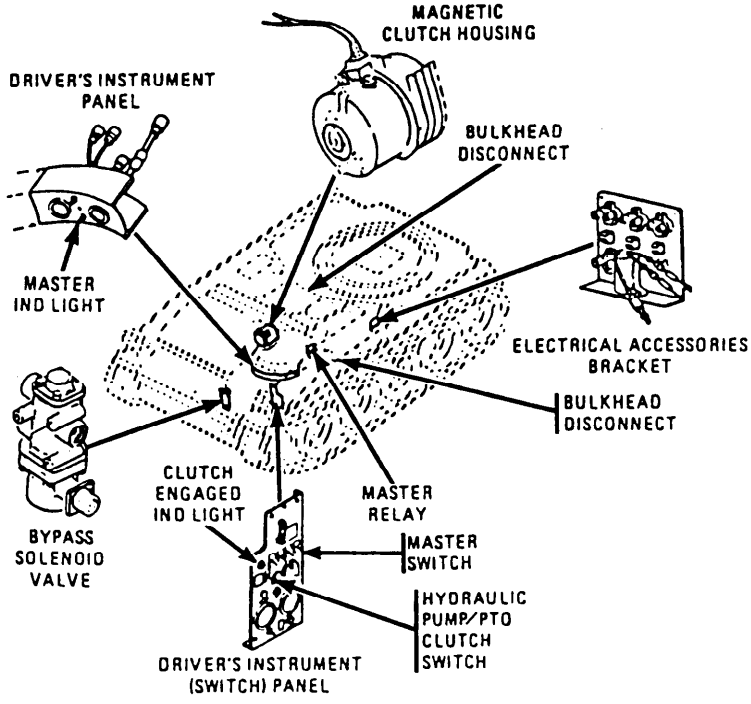


WARNING

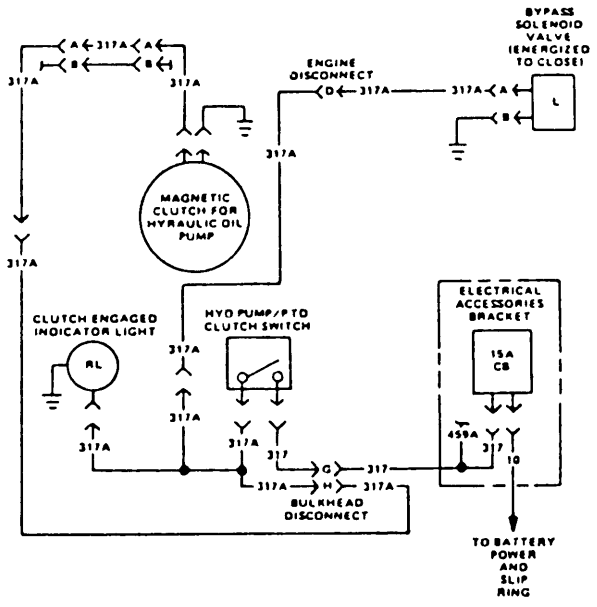
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Disconnect lead 317A from clutch engaged indicator light. Place red probe in lead 317A. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, replace clutch engaged indicator light. Refer to page 2-566. If multimeter indicates no voltage, repair lead 317A between HYD PUMP/PTO CLUTCH switch and clutch engaged indicator light. Refer to page 2-371. Set MASTER switch OFF. Connect lead.

AX. MAGNETIC CLUTCH AND BYPASS SOLENOID VALVE CIRCUIT (HYD PUMP/PTO CLUTCH SWITCH).

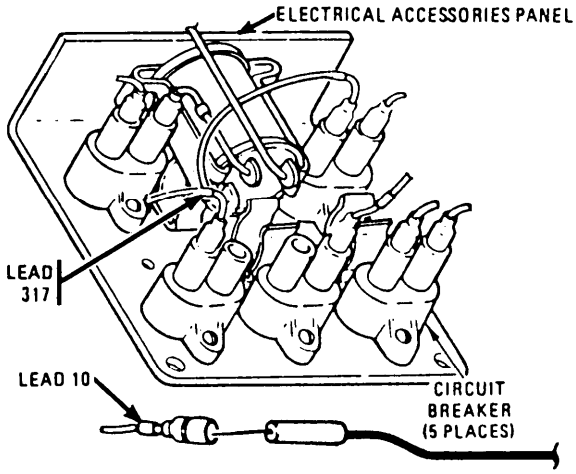


PICTORIAL VIEW

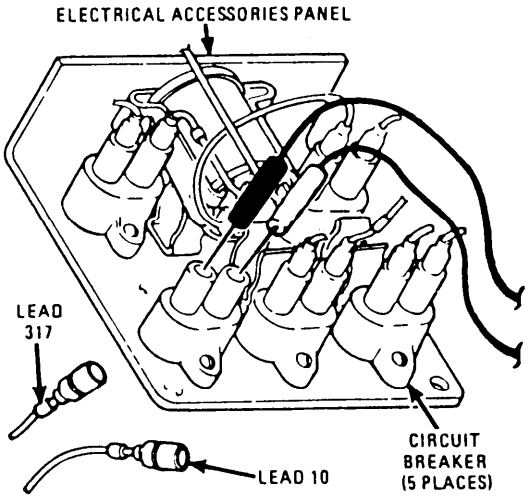


ELECTRICAL DIAGRAM

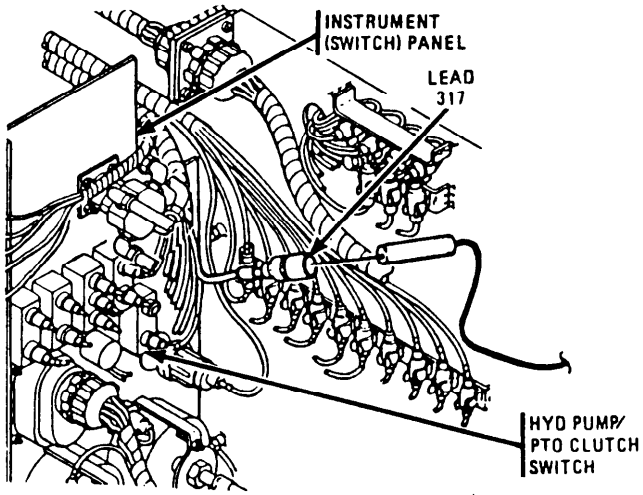
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



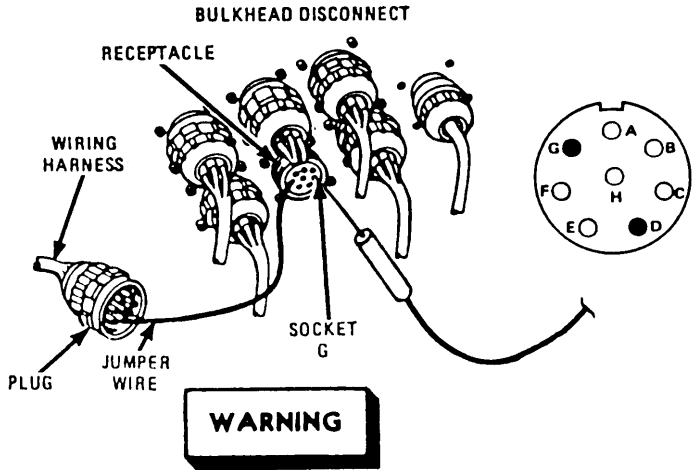
Step 1. To access electrical accessories panel, remove left CO_2 cylinder access cover. Refer to page 2-923. Disconnect lead 10 from circuit breaker. Place red probe in lead 10. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 2. If multimeter indicates no voltage, troubleshoot master relay circuit. Refer to page 2-90. Set MASTER switch OFF. Connect lead.



Step 2. Disconnect leads 10 and 317 from circuit breaker. Connect multimeter to receptacles of circuit breaker. If multimeter indicates continuity, go to step 3. If multimeter indicates infinity, replace circuit breaker. Refer to page 2-590. Connect leads.



Step 3. Disconnect lead 317 from HYD PUMP/PTO CLUTCH switch. Place red probe in lead 317. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 5. If multimeter indicates no voltage, go to step 4. Set MASTER switch OFF. Connect lead.

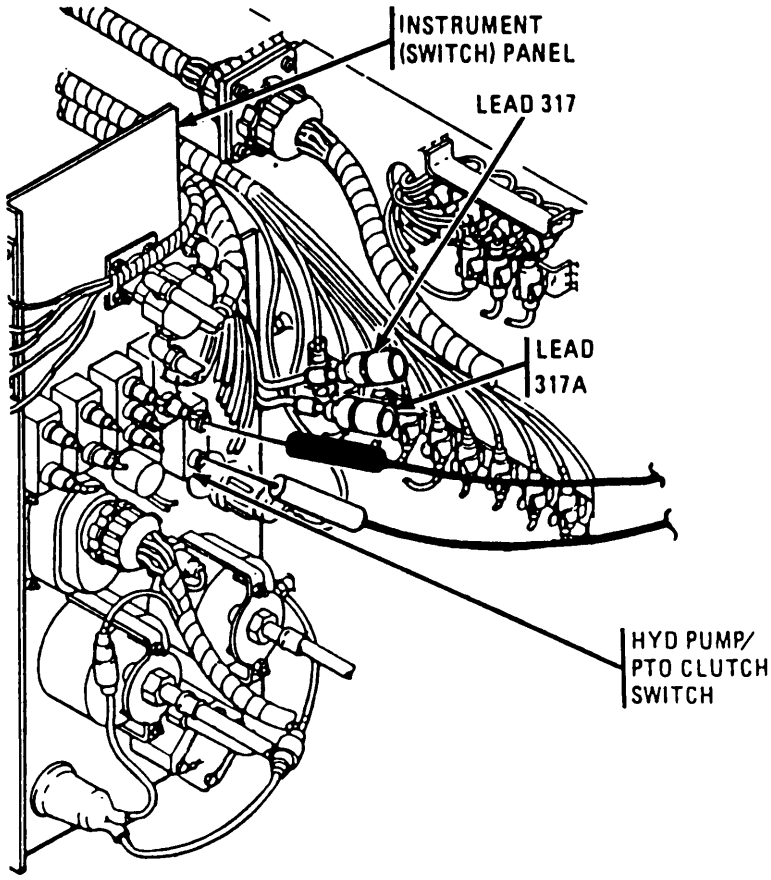


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 4. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness at bulkhead disconnect. Install jumper wire to pin D and plug socket D (lead 459). Place red probe in socket G (lead 317). Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, repair lead 317 between HYD PUMP/PTO CLUTCH switch and bulkhead disconnect. Refer to page 2-371. If multimeter indicates no voltage, repair lead 317 between bulkhead disconnect and circuit breaker. Refer to page 2-371. Set MASTER switch OFF. Remove jumper wire. Connect wiring harness.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

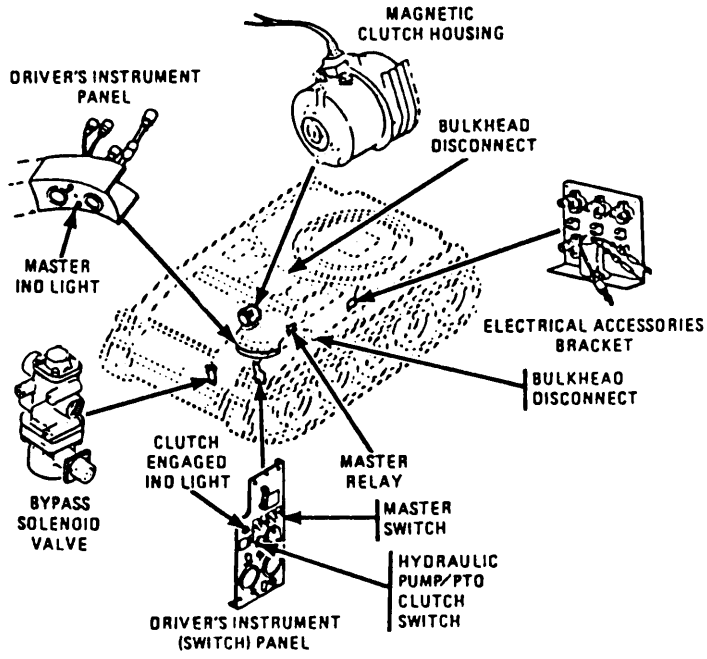


WARNING

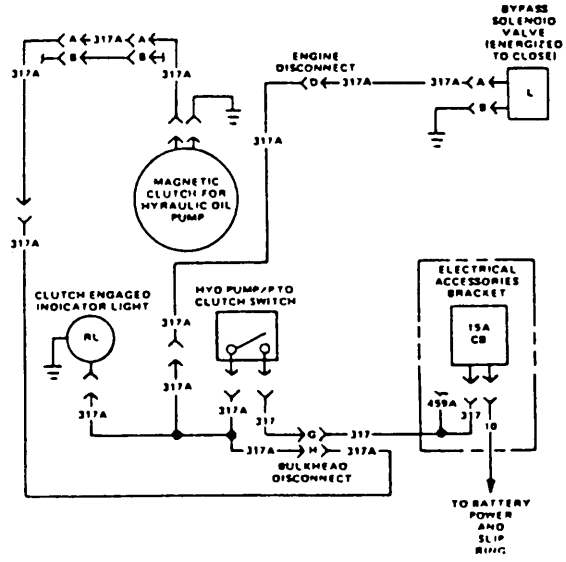
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 5. Disconnect lead 317A from HYD PUMP/PTO CLUTCH switch. Connect multimeter to HYD PUMP/PTO CLUTCH switch. Set HYD PUMP/PTO CLUTCH switch ON. If multimeter indicates continuity, repair lead 317A. Refer to page 2-371. If multimeter indicates infinity, replace HYD PUMP/ PTO CLUTCH switch. Refer to page 2-566. Set HYD PUMP/PTO CLUTCH switch OFF. Connect lead.

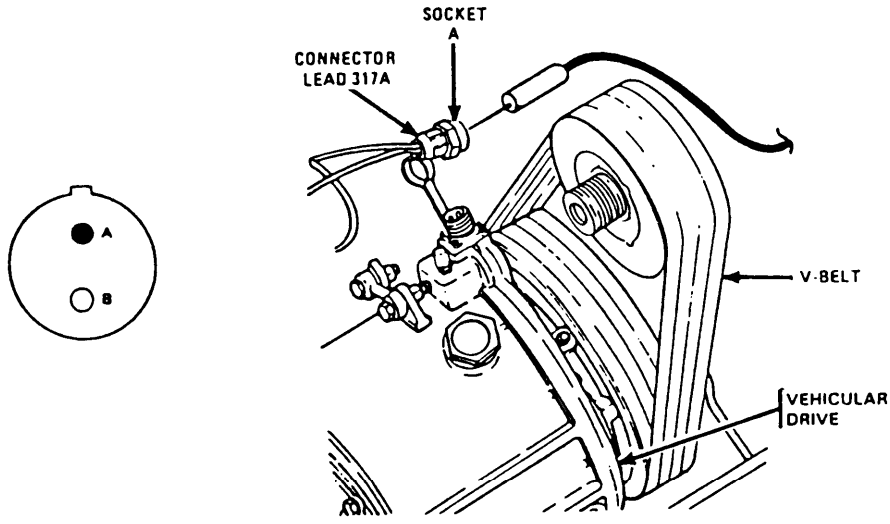
AY. MAGNETIC CLUTCH AND BYPASS SOLENOID VALVE CIRCUIT (MAGNETIC CLUTCH).



PICTORIAL VIEW

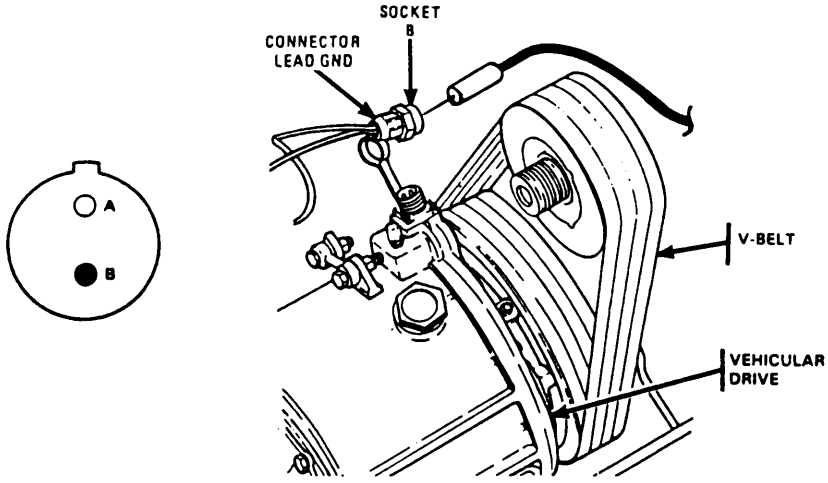


ELECTRICAL DIAGRAM

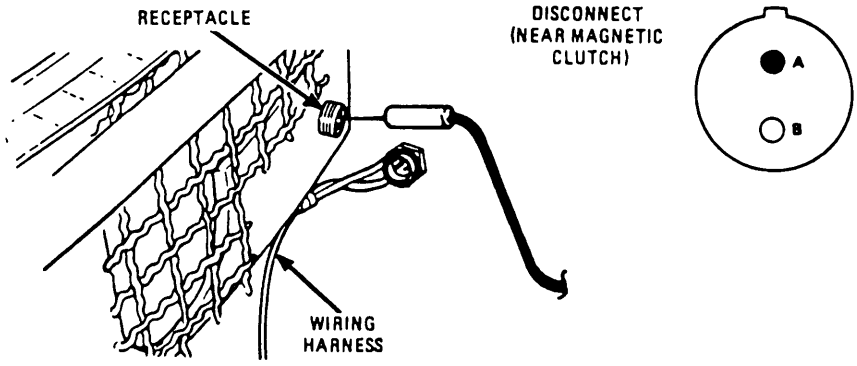


Step 1. Disconnect connector from vehicular drive. Place red probe in socket A (lead 317A). Ground black probe. Set MASTER switch ON. Set HYD PUMP/PTO CLUTCH switch ON. If multimeter indicates about 24 volts, go to step 2. If multimeter indicates no voltage, go to step 3. Set MASTER switch OFF. Set HYD PUMP/PTO CLUTCH switch OFF. Connect connector.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



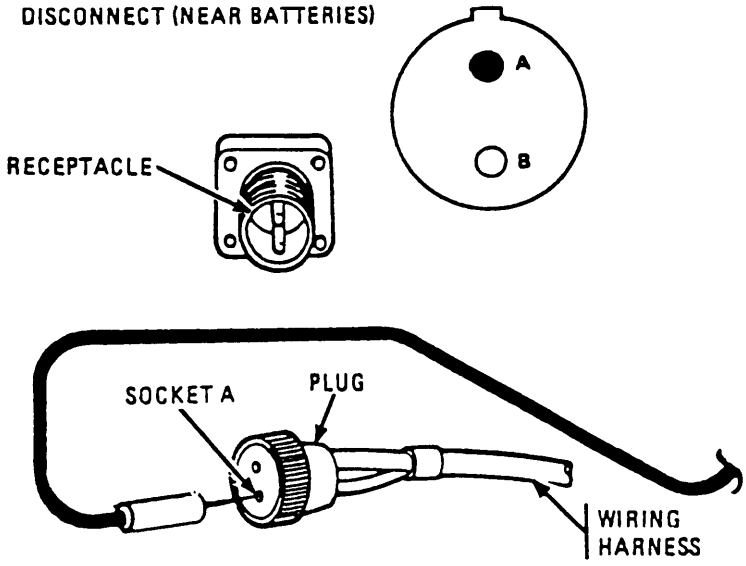
Step 2. Place red probe in socket B (GND). Ground black probe. If multimeter indicates continuity, notify direct support maintenance for replacement of vehicular drive. If multimeter indicates infinity, repair GND lead. Refer to page 2-371. Connect connector.



WARNING

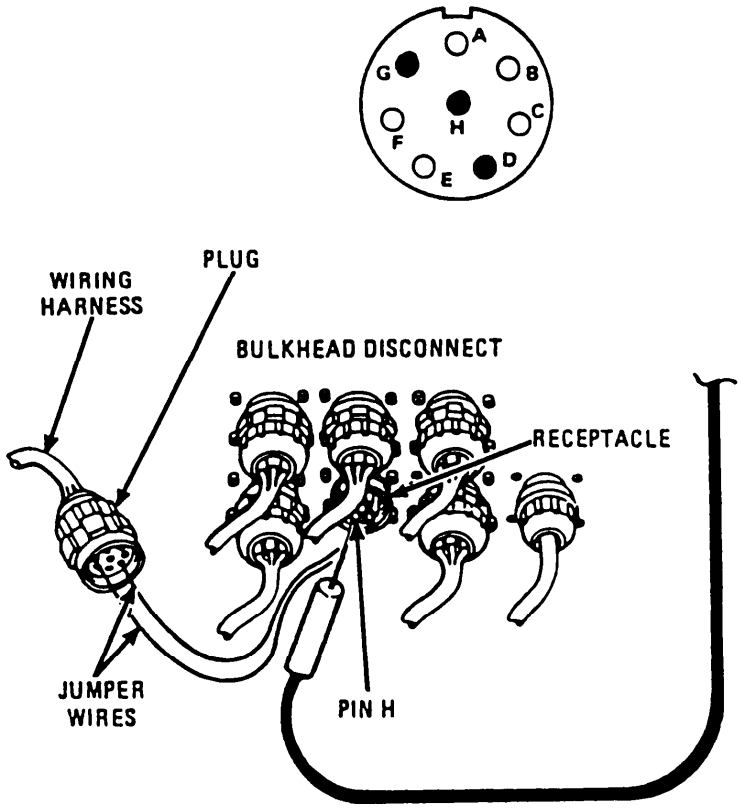
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. To access disconnect near magnetic clutch, remove fan well deck grille. Refer to page 2-928. Disconnect wiring harness. Place red probe in socket A (lead 317A) of receptacle. Ground black probe. Set MASTER switch ON. Set HYD PUMP/PTO CLUTCH switch ON. If multimeter indicates about 24 volts, repair lead 317A between disconnect and vehicular drive. Refer to page 2-371. If multimeter indicates no voltage, go to step 4. Set MASTER switch OFF. Set HYD PUMP/PTO CLUTCH switch OFF. Connect wiring harness.



Step 4. To access disconnect near batteries, remove left $C0_2$ cylinder access cover. Refer to page 2-918. Disconnect wiring harness. place red probe in socket A (lead 317A). Ground black probe. Set MASTER switch ON. Set HYD PUMP/PTO CLUTCH switch ON. If multimeter indicates about 24 volts, repair lead 317A between disconnect near batteries and disconnect near vehicular drive. Refer to page 2-371. Set MASTER switch OFF. Set HYD PUMP/PTO CLUTCH switch OFF. Connect wiring harness.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

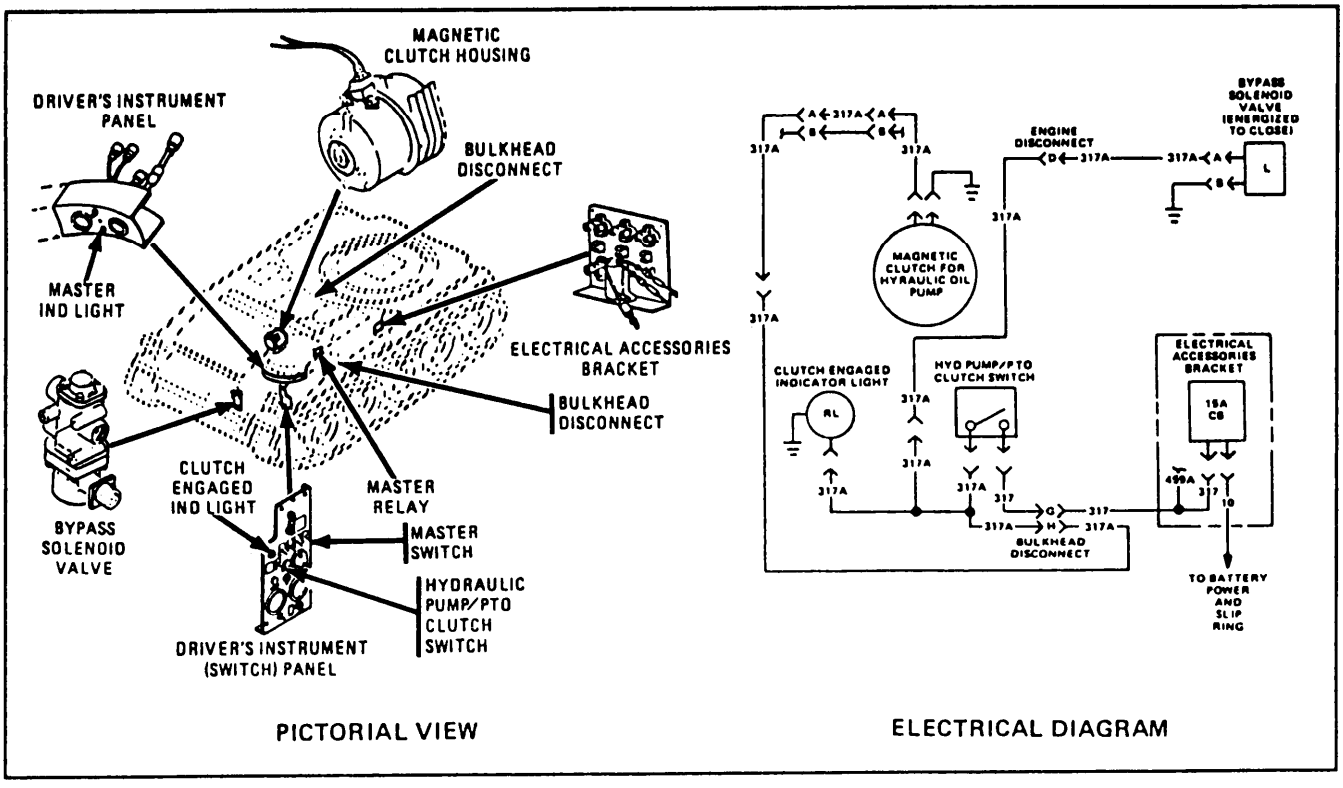


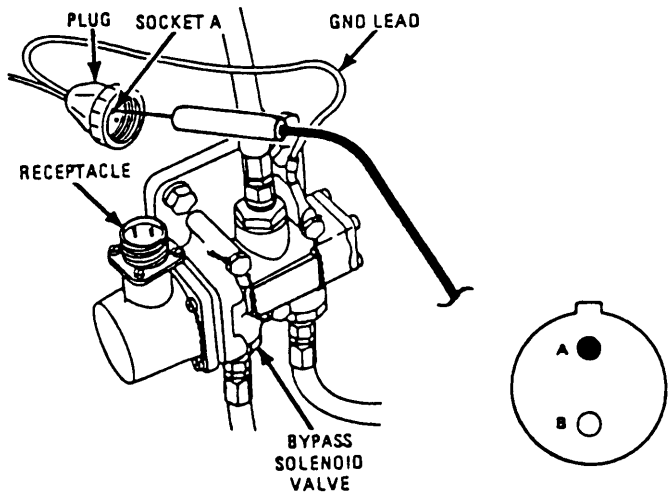
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 5. To access bulkhead disconnect, remove driver's seat, refer to page 2-952; and remove driver's compartment aft cowl, refer to page 2-928. Disconnect wiring harness at bulkhead disconnect. Install jumper wires to pin G and plug socket G (lead 317) and pin D and plug socket D (lead 459). Place red probe on pin H (lead 317A). Ground black probe. Set MASTER switch ON. Set HYD PUMP/PTO CLUTCH switch ON. If multimeter indicates about 24 volts, repair lead 317A between disconnect near batteries and bulkhead disconnect. Refer to page 2-371. If multimeter indicates no voltage, repair lead 317A between bulkhead disconnect and HYD PUMP/PTO CLUTCH switch. Refer to page 2-371. Remove jumper wires. Set MASTER switch OFF. Set HYD PUMP/PTO CLUTCH switch OFF. Connect wiring harness.

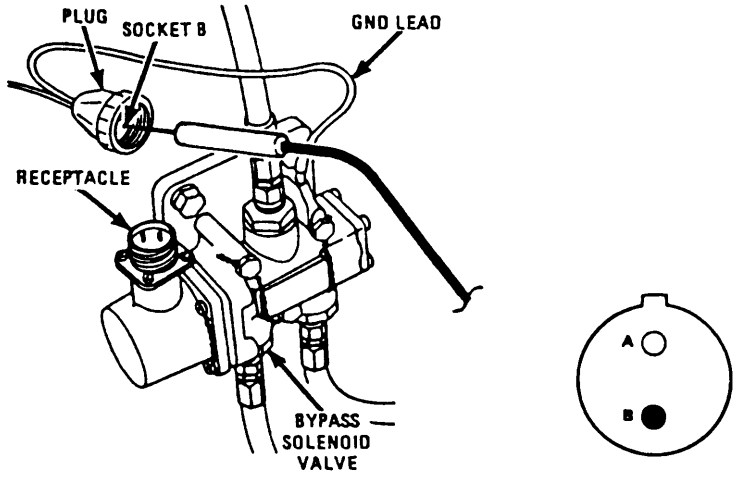
AZ. MAGNETIC CLUTCH AND BYPASS SOLENOID VALVE CIRCUIT (BYPASS SOLENOID VALVE).



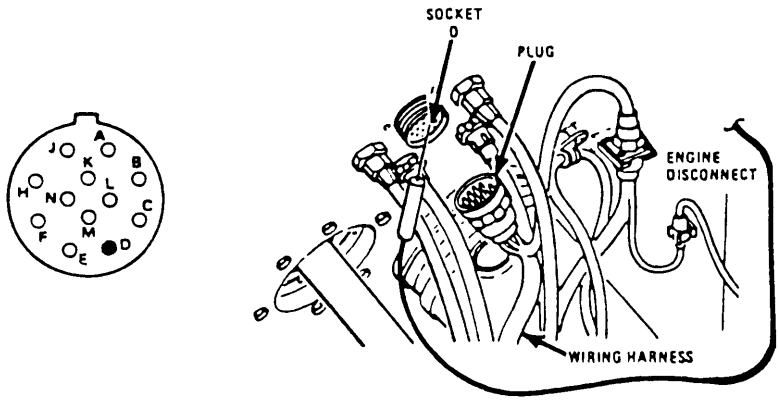


Step 1. To access bypass solenoid valve, remove hull engine compartment deck assembly lid. Refer to page 2-935. Disconnect connector from bypass solenoid valve. Place red probe in socket A (lead 317A). Ground black probe. Set MASTER switch ON. Set HYD PUMP/PTO CLUTCH switch ON. If multimeter indicates about 24 volts, go to step 2. If multimeter indicates no voltage, go to step 3. Set MASTER switch OFF. Set HYD PUMP/PTO CLUTCH switch OFF. Connect connector.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



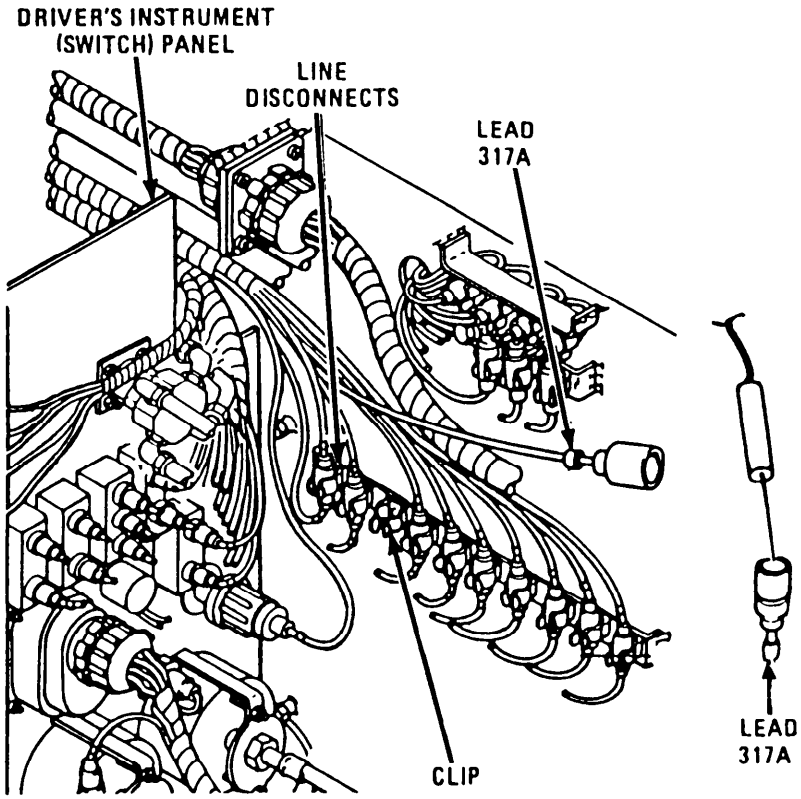
Step 2. Place red probe in socket B (GND). Ground black probe. If multimeter indicates continuity, notify direct support maintenance for replacement of bypass solenoid valve. If multimeter indicates infinity, repair GND lead. Refer to page 2-371. Connect connector.



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. To access engine disconnect, remove hull transmission compartment deck assembly. Refer to page 2-938. Disconnect wiring harness at engine disconnect. Place red probe in socket D (lead 317A). Ground black probe. Set MASTER switch ON. Set HYD PUMP/PTO CLUTCH switch ON. If multimeter indicates about 24 volts, go to step 4. If multimeter indicates no voltage, repair lead 317A between engine disconnect and bypass solenoid valve. Refer to page 2-371. Set MASTER switch OFF. Set HYD PUMP/PTO CLUTCH switch OFF. Connect wiring harness.



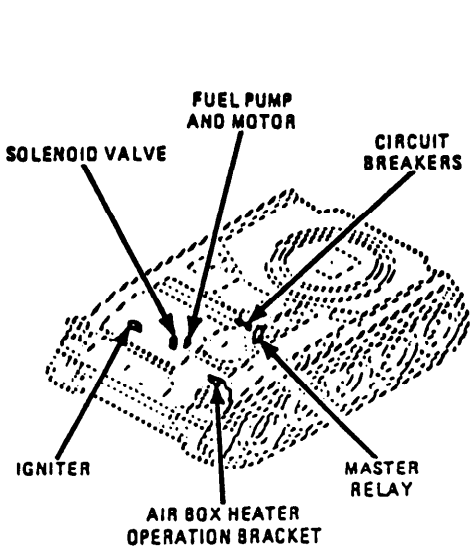
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

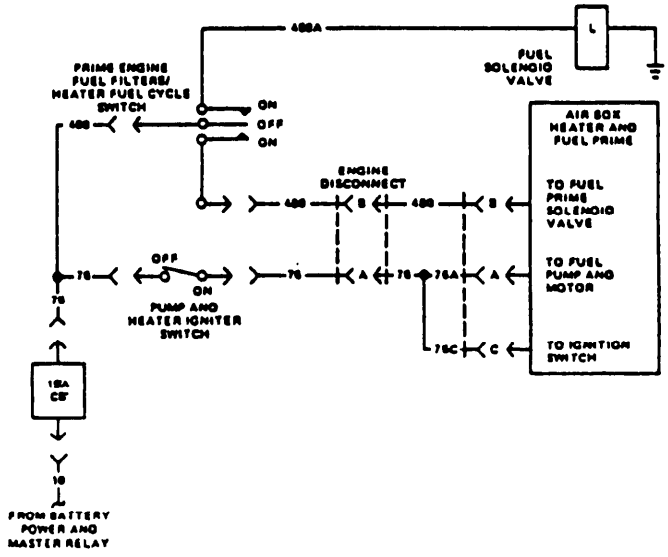
Step 4. Disconnect line disconnect (lead 317A) behind driver's instrument (switch) panel. Place red probe in lead 317A. Ground black probe. Set MASTER switch ON. Set HYD PUMP/PTO CLUTCH switch ON. If multimeter indicates about 24 volts, repair lead 317A between line disconnect and engine disconnect. Refer to page 2-371. If multimeter indicates no voltage, repair lead 317A between line disconnect and HYD PUMP/PTO CLUTCH switch. Refer to page 2-371. Set MASTER switch OFF. Set HYD PUMP/PTO CLUTCH switch OFF. Connect lead.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

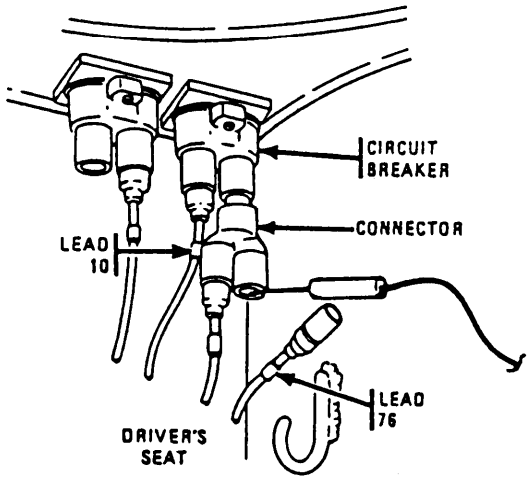
BA. AIR BOX HEATER CIRCUIT.



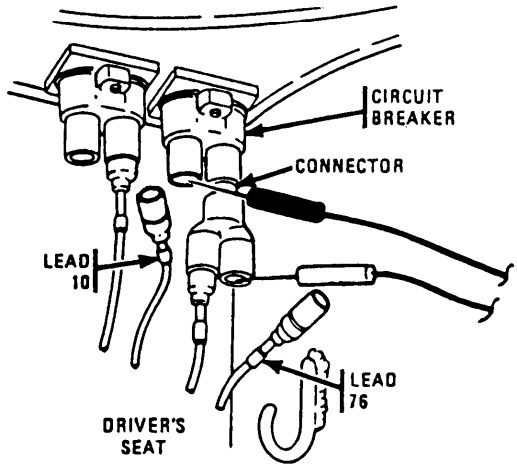
PICTORIAL VIEW



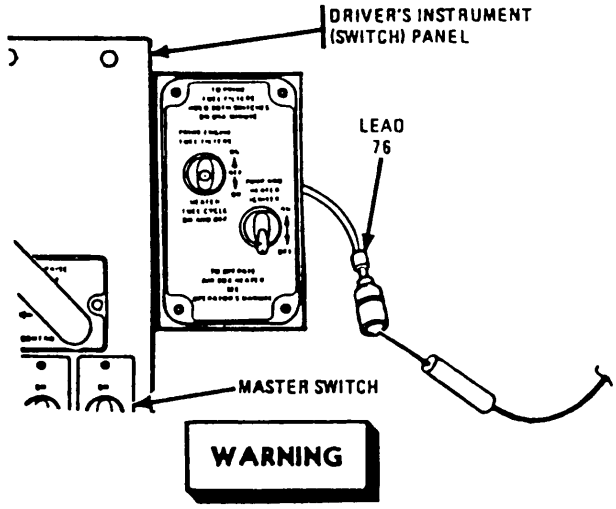
ELECTRICAL DIAGRAM



Step 1. Set PUMP AND HEATER INGNITER and MASTER switches OFF. Disconnect lead 76 from connector near driver's seat. Place red probe on connector or receptacle. Ground black probe. Set MASTER Switch ON. If multimeter indicates about 24 volts, connect lead and go to step 3. If multimeter indicates no voltage, go to step 2. Set MASTER switch OFF.



Step 2. Disconnect lead 10 from 15A circuit breaker near driver's seat. Connect multimeter to receptacles of 15A circuit breaker and connector. If multimeter indicates 0 ohms, go to step 3. If multimeter indicates infinity, replace 15A circuit breaker, refer to page 2-564; or connector, refer to page 2-371. Connect leads 76 and 10 to 15A circuit breaker and connector.

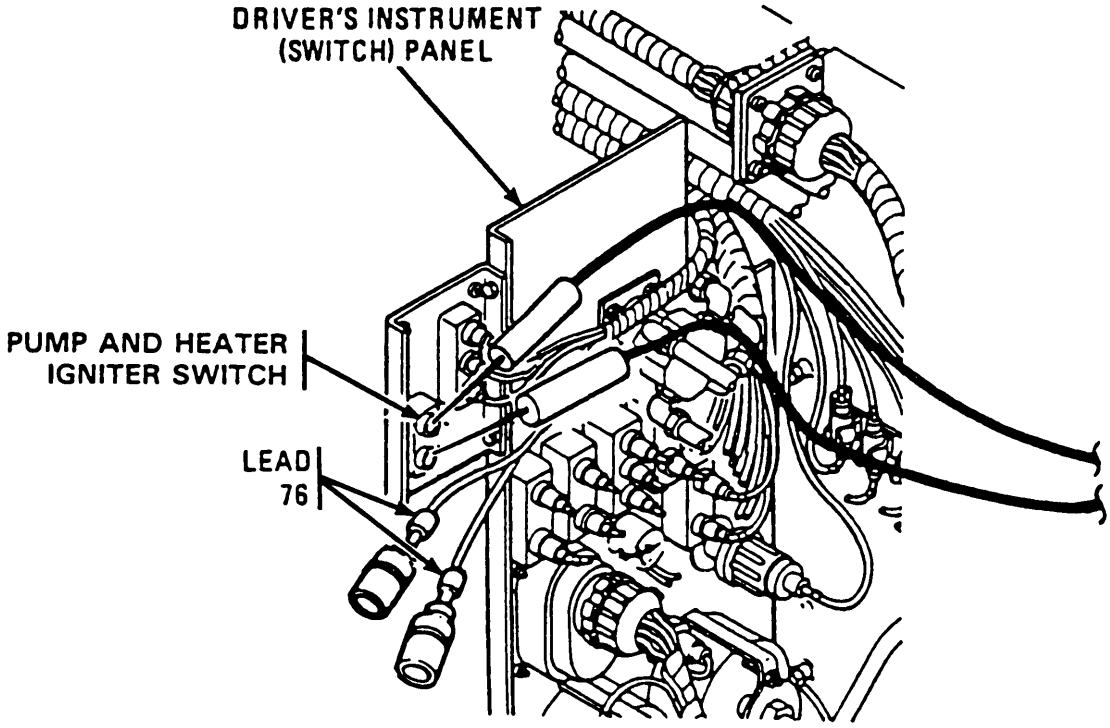


WARNING

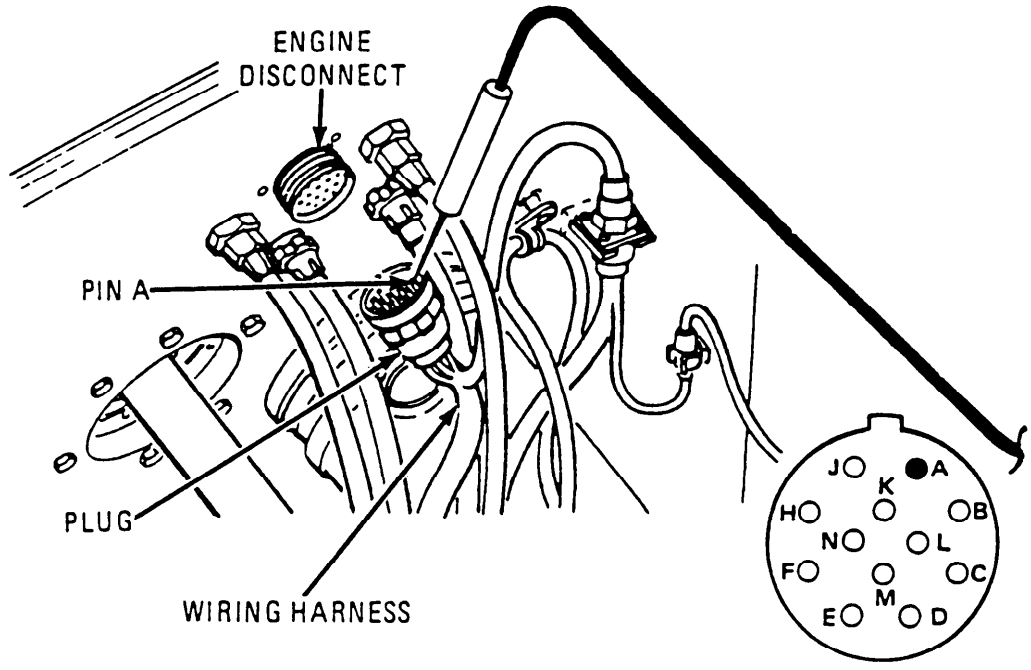
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. Disconnect lead 76 from PUMP AND HEATER IGNITER switch. Place red probe in lead 76. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 4. If multimeter indicates no voltage, repair lead 76 between PUMP AND HEATER IGNITER switch and 15A circuit breaker. Refer to page 2-371. Set MASTER switch OFF. Connect lead.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 4. Disconnect the other lead 76 from PUMP AND HEATER IGNITER switch. Connect multimeter to PUMP AND HEATER IGNITER switch pins. Hold PUMP AND HEATER IGNITER switch ON. If multimeter indicates 0 ohms, go to step 5. If multimeter indicates infinity, replace PUMP AND HEATER IGNITER switch. Refer to page 2-582. Release PUMP AND HEATER IGNITER switch. Connect leads.

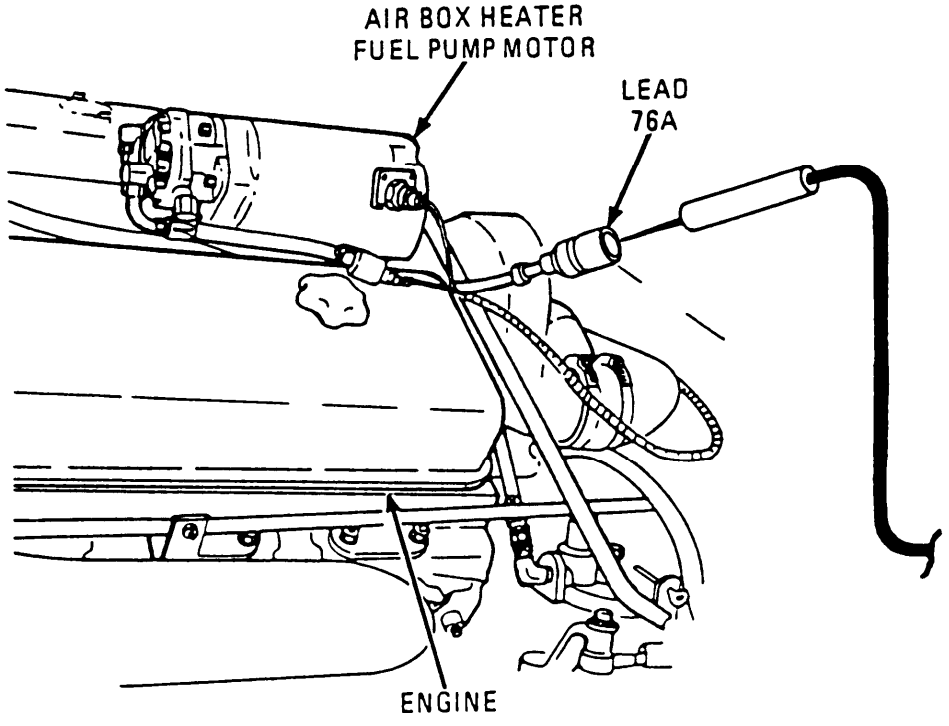


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 5. To access engine disconnect, remove hull transmission compartment deck assembly. Refer to page 2-938. Disconnect wiring harness at engine disconnect. Place red probe on plug pin A (lead 76A). Ground black probe. Set MASTER switch ON. Hold PUMP AND HEATER IGNITER switch ON. If multimeter indicates about 24 volts, go to step 6. If multimeter indicates no voltage, repair lead 76A between PUMP AND HEATER IGNITER switch and engine disconnect. Refer to page 2-371. Release PUMP AND HEATER IGNITER switch. Set MASTER switch OFF. Connect wiring harness.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

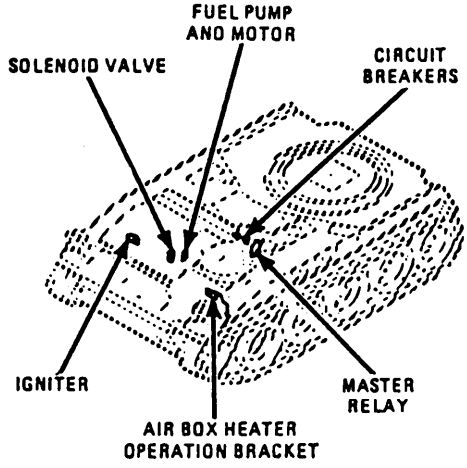


WARNING

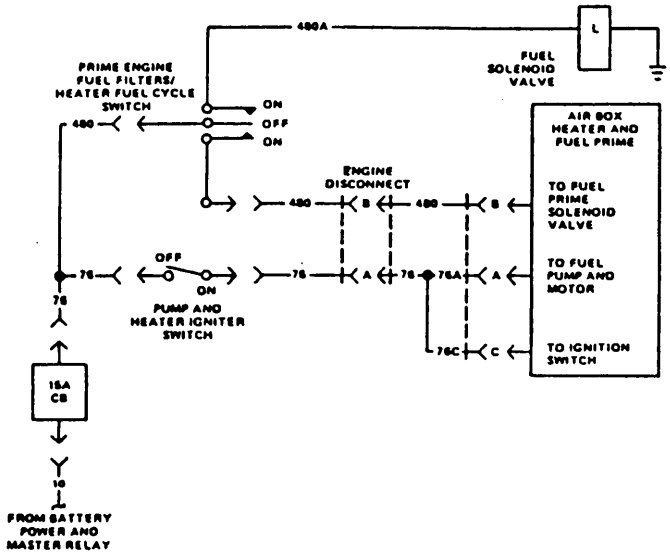
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 6. To access air box heater fuel pump motor, remove hull engine compartment deck assembly lid. Refer to page 2-935. Disconnect lead 76A from air box heater fuel pump motor. Place red probe in lead 76A. Ground black probe. Set MASTER switch ON. Hold PUMP AND HEATER IGNITER switch ON. If multimeter indicates about 24 volts, notify direct support maintenance. If multimeter indicates no voltage, repair lead 76A between air box heater fuel pump motor and engine disconnect. Refer to page 2-371. Release PUMP AND HEATER IGNITER switch. Set MASTER switch OFF. Connect lead.

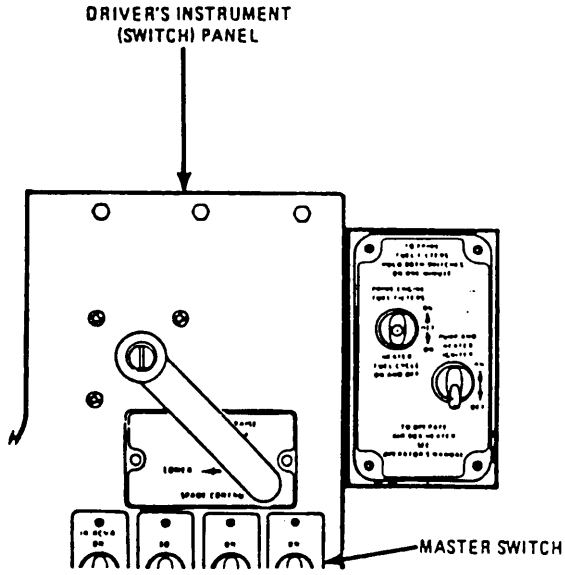
BB. AIR BOX HEATER.



PICTORIAL VIEW

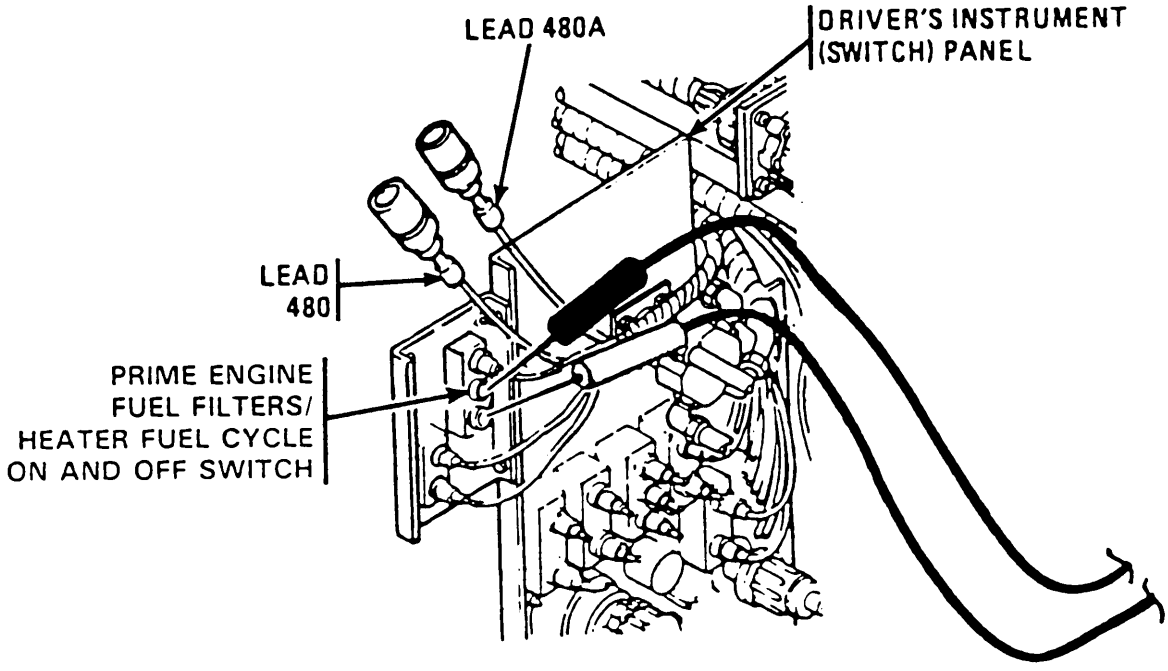


ELECTRICAL DIAGRAM

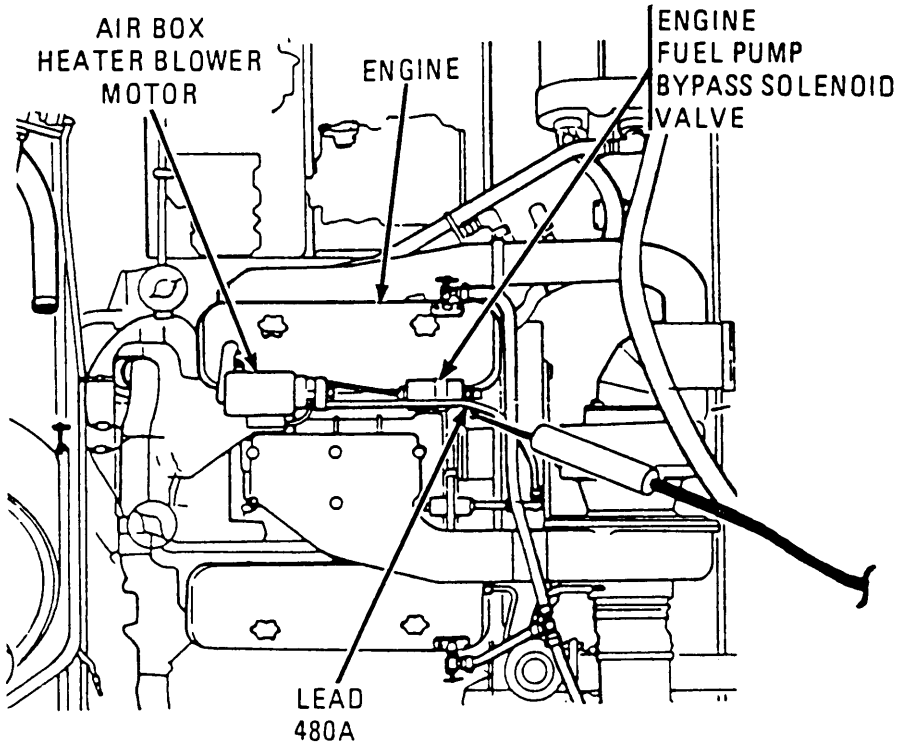


Step 1. Set MASTER switch ON. Hold PUMP AND HEATER IGNITER switch ON while cycling PRIME ENGINE FUEL FILTERS/HEATER FUEL CYCLE ON AND OFF switch ON and OFF for 10 seconds. If fuel pump bypass solenoid valve does not become energized, go to step 2. If air box heater fuel supply solenoid valve does not become energized, go to step 4. If air box heater fuel supply solenoid becomes energized, go to step 7. Set MASTER switch OFF. Release PUMP AND HEATER IGNIITER switch. Release PRIME ENGINE FUEL FILTERS/HEATER FUEL CYCLE ON AND OFF switch.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 2. Disconnect leads 480 and 480A from PRIME ENGINE FUEL FILTERS/ HEATER FUEL CYCLE ON AND OFF switch. Connect multimeter to connector pins 1 and 3. Hold PRIME ENGINE FUEL FILTERS/HEATER FUEL CYCLE ON AND OFF switch ON. If multimeter indicates 0 ohms, go to step 3. If multimeter indicates infinity, replace PRIME ENGINE FUEL FILTERS/HEATER FUEL CYCLE ON AND OFF switch. Refer to page 2-582. Release PRIME ENGINE FUEL FILTERS/HEATER FUEL CYCLE ON AND OFF switch. Connect leads.

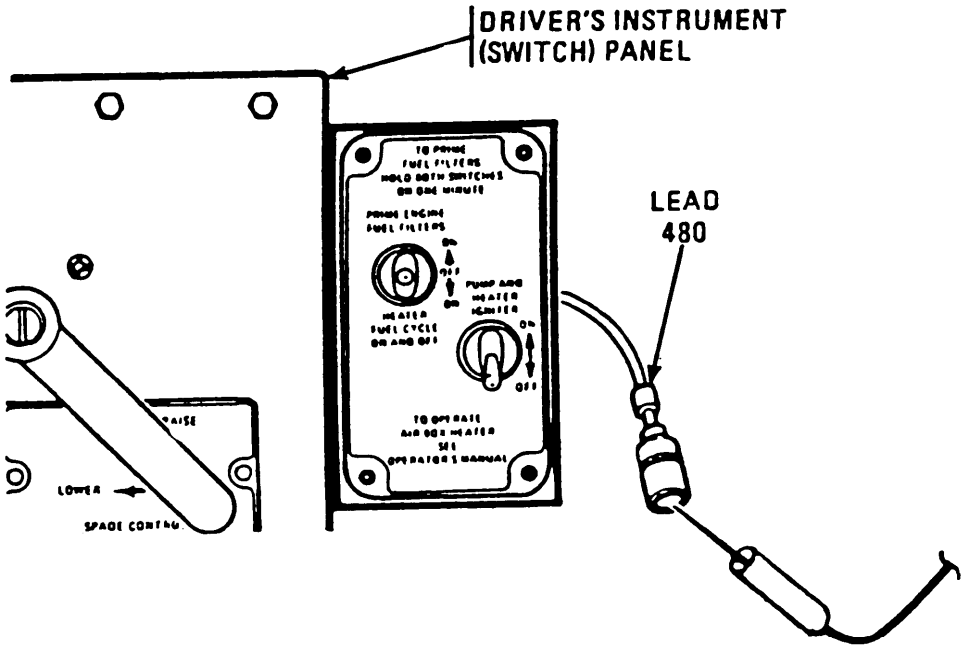


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. Disconnect lead 480A from fuel pump bypass solenoid valve. Place red probe in lead 480A. Ground black probe. Set MASTER switch ON. Hold PRIME ENGINE FUEL FILTERS/HEATER FUEL CYCLE ON AND OFF switch ON. If multimeter indicates about 24 volts, notify direct support maintenance. If multimeter indicates no voltage, repair lead 480A between PRIME ENGINE FUEL FILTERS/HEATER FUEL CYCLE ON AND OFF switch and solenoid. Refer to page 2-371. Set MASTER switch OFF. Release PRIME ENGINE FUEL FILTERS/HEATER FUEL CYCLE ON AND OFF switch. Connect lead.

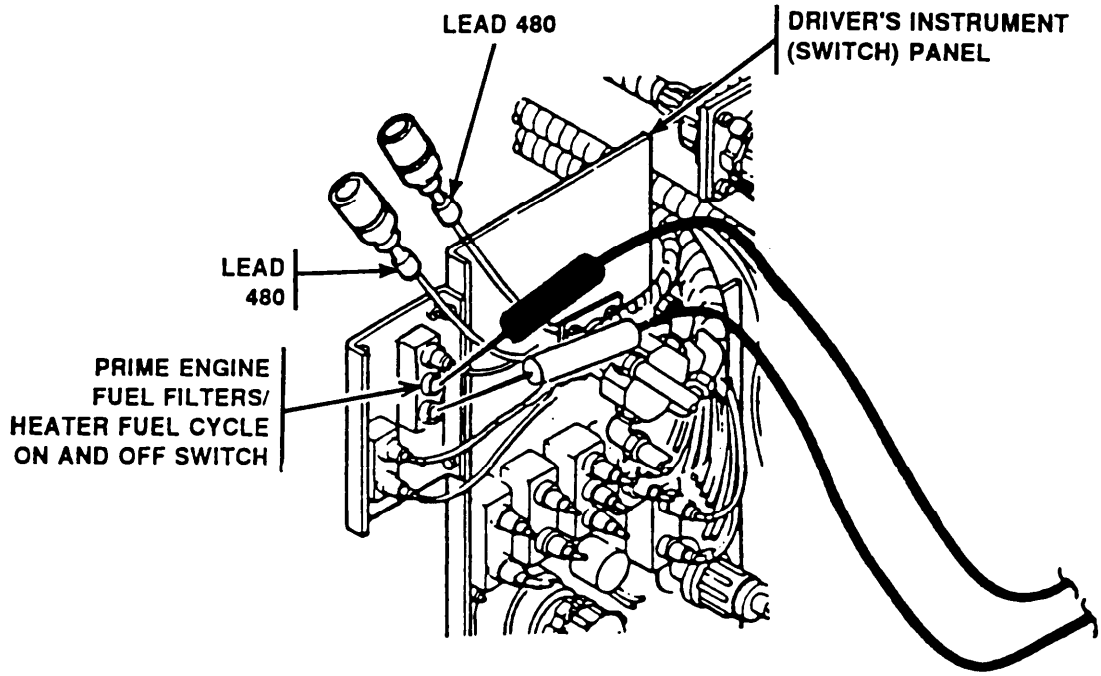
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

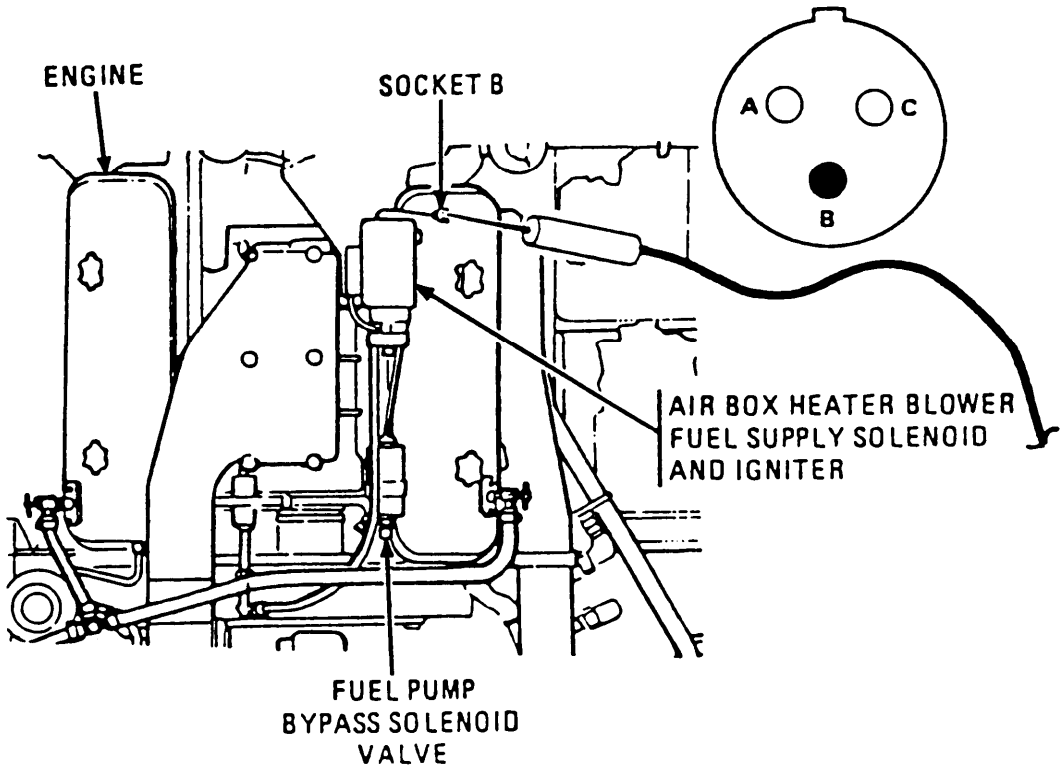
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 4. Disconnect lead 480 from purge and PRIME ENGINE FUEL FILTERS/ HEATER FUEL CYCLE ON AND OFF switch. Place red probe in lead 480. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 5. If multimeter indicates no voltage, repair lead 480 between circuit breaker and PRIME ENGINE FUEL FILTERS/HEATER FUEL CYCLE ON AND OFF switch. Refer to page 2-371. Set MASTER switch OFF. Connect lead.



Step 5. Disconnect the other lead 480 from PRIME ENGINE FUEL FILTERS/ HEATER FUEL CYCLE ON AND OFF switch. Connect multimeter to switch pins 2 and 3. Hold PRIME ENGINE FUEL FILTERS/HEATER FUEL CYCLE ON AND OFF switch ON. If multimeter indicates 0 ohms, go to step 6. If multimeter indicates infinity, replace PRIME ENGINE FUEL FILTERS/HEATER FUEL CYCLE ON AND OFF switch. Refer to page 2-582. Release PRIME ENGINE FUEL FILTERS/HEATER FUEL CYCLE ON AND OFF switch. Connect leads.

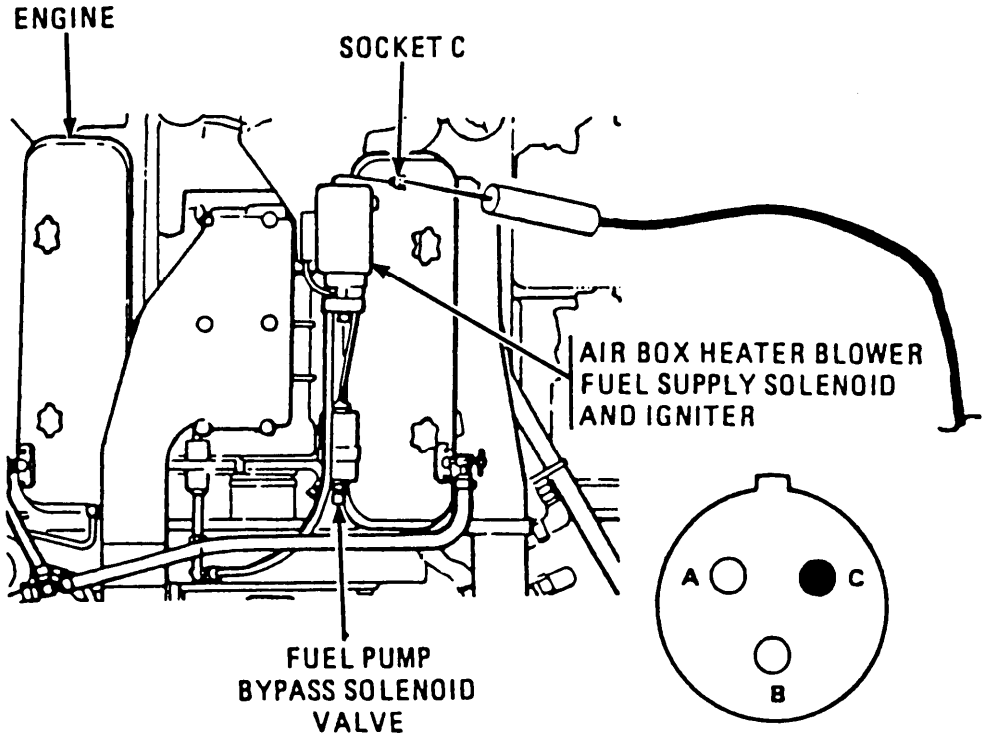
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 6. Disconnect lead from air box heater fuel supply solenoid valve. Place red probe in plug socket B (lead 480). Ground black probe. Set MASTER switch ON. Hold PRIME ENGINE FUEL FILTERS/HEATER FUEL CYCLE ON AND OFF switch ON. It multimeter indicates about 24 volts, notify direct support maintenance. If multimeter indicates no voltage, repair lead 480 between PRIME ENGINE FUEL FILTERS/HEATER FUEL CYCLE ON AND OFF switch and solenoid. Refer to page 2-371. Set MASTER switch OFF. Release PRIME ENGINE FUEL FILTERS/HEATER FUEL CYCLE ON AND OFF switch. Connect lead.



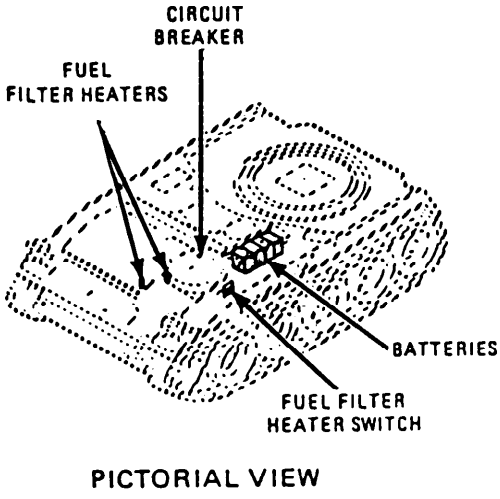
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

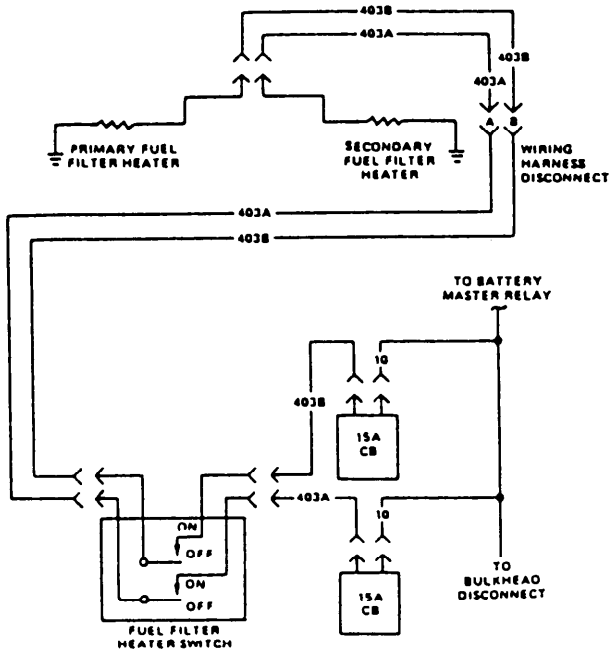
Step 7. Disconnect lead from air box heater igniter. Place red probe in plug socket C (lead 76C). Ground black probe. Set MASTER switch ON. Hold PUMP AND HEATER IGNITER switch ON. If multimeter indicates about 24 volts, notify direct support maintenance. If multimeter indicates no voltage, repair lead 76C between engine disconnect and air box heater igniter switch. Refer to page 2-371. Set MASTER switch OFF. Release PUMP AND HEATER IGNITER switch. Connect lead.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

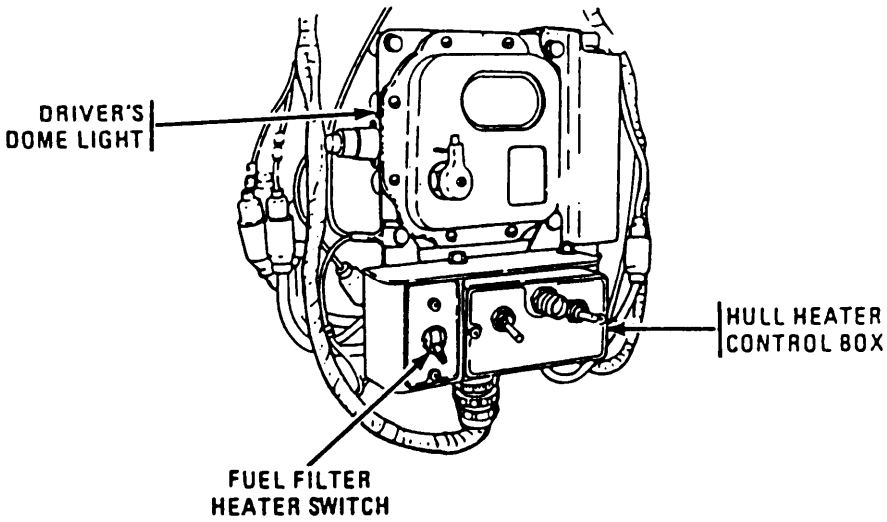
BC. FUEL FILTER HEATER CIRCUIT.



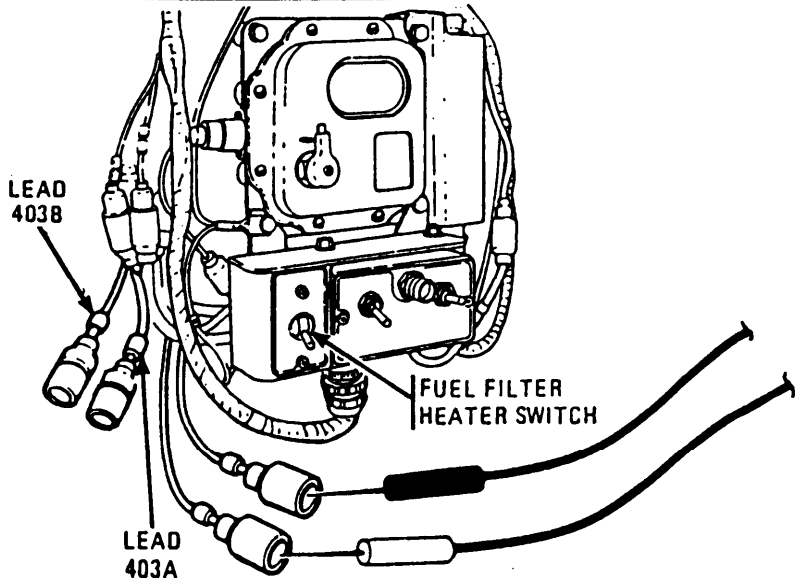
PICTORIAL VIEW



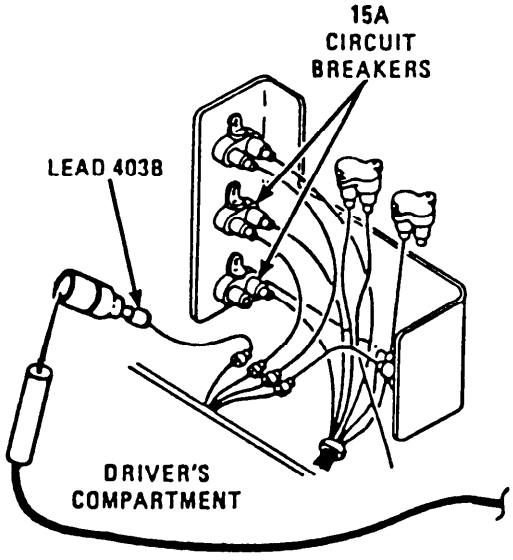
ELECTRICAL DIAGRAM



Step 1. Set MASTER switch ON. Set fuel filter heater switch ON. If both primary fuel filter heater and secondary fuel filter heater do not get warm, go to step 2. If primary fuel filter heater does not get warm, go to step 3. If secondary fuel filter does not get warm, go to step 10. Set MASTER switch OFF. Set fuel filter heater switch OFF.

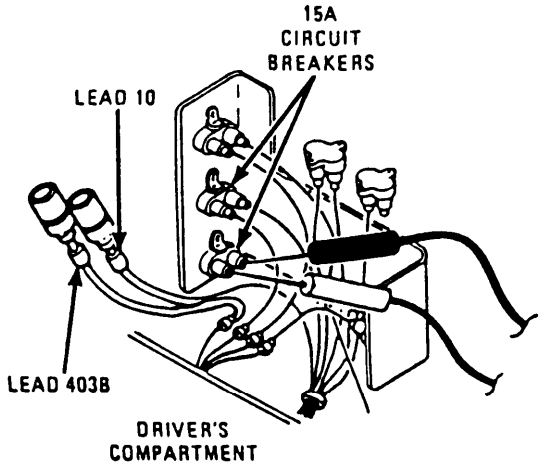


Step 2. Disconnect leads 403A and 403B from fuel filter heater switch. Connect multimeter to fuel filter heater switch leads. Set fuel filter heater switch ON. If multimeter indicates 0 ohms, troubleshoot battery power circuit and master relay circuit. Refer to page 2-82 and page 2-90. If multimeter indicates infinity, replace fuel filter heater switch. Refer to page 2-1029. Set fuel filter heater switch OFF. Connect leads.

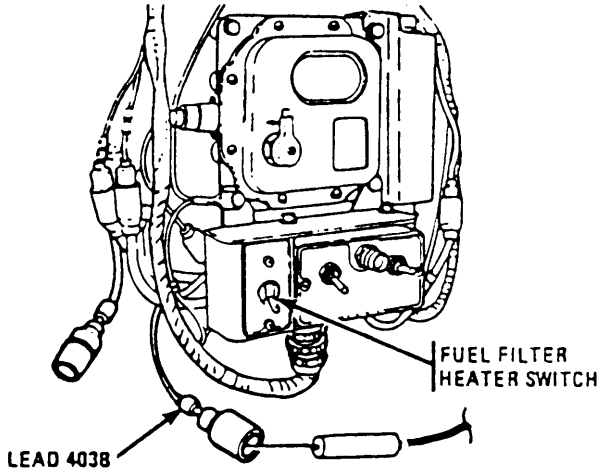


Step 3. Disconnect lead 403B from 15A circuit breaker (near driver's seat). Place red probe in 15A circuit breaker receptacle. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 5. If multimeter indicates no voltage, go to step 4. Set MASTER switch OFF.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



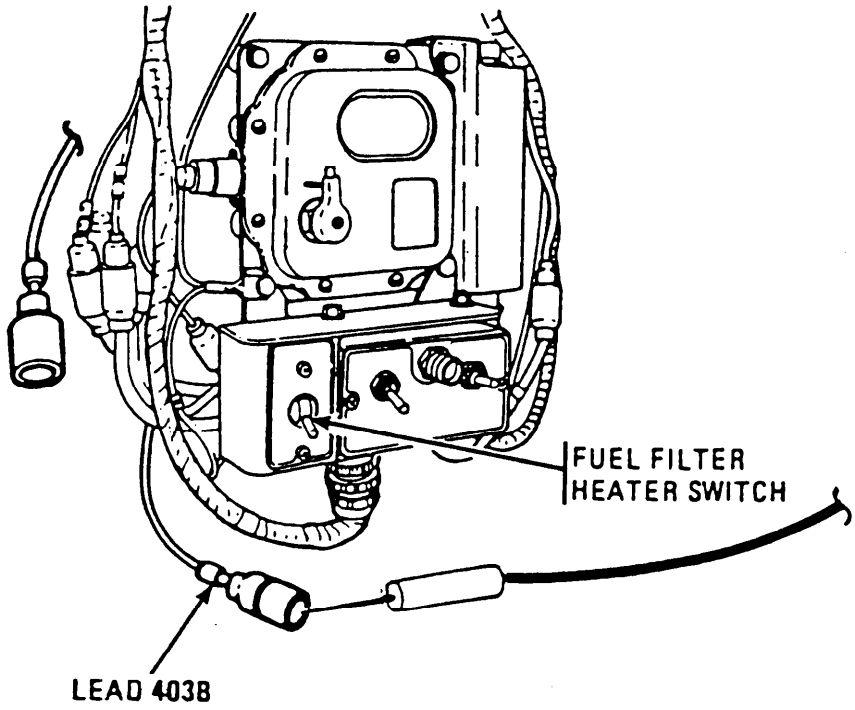
Step 4. Remove lead 10 from 15A circuit breaker. Connect multimeter to 15A circuit breaker receptacles. If multimeter indicates 0 ohms, repair lead 10. Refer to page 2-371. If multimeter indicates infinity, replace 15A circuit breaker. Refer to page 2-1029. Connect leads.



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 5. Disconnect lead 403B from fuel filter heater switch. Place red probe in lead 403B. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 6. If multimeter indicates no voltage, repair lead 403B between fuel filter heater switch and 15A circuit breaker. Refer to page 2-371. Set MASTER switch OFF. Connect lead.

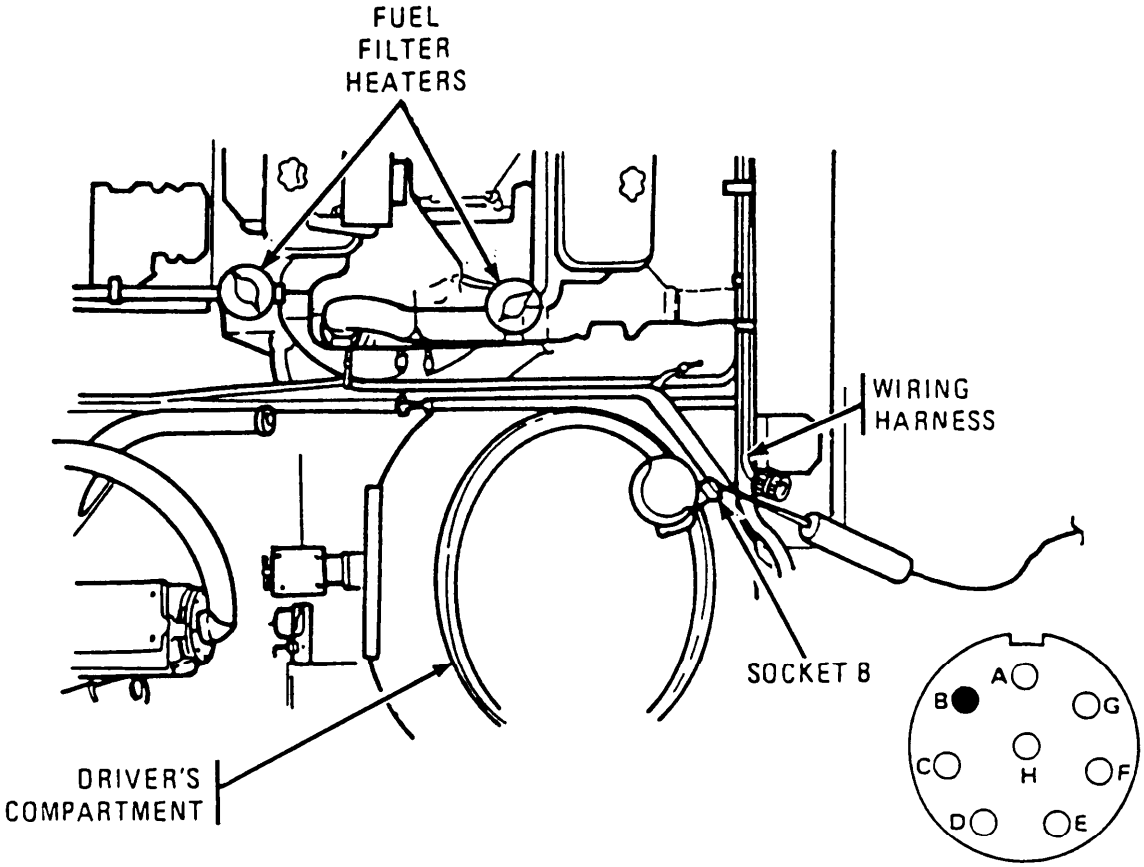


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 6. Disconnect lead 403B from fuel filter heater switch. Place red probe in lead 403B. Ground black probe. Set MASTER switch ON. Set fuel filter heater switch ON. If multimeter indicates about 24 volts, go to step 7. If multimeter indicates no voltage, replace fuel filter heater switch. Refer to page 2-1029. Set MASTER switch OFF. Set fuel filter heater switch OFF. Connect lead.

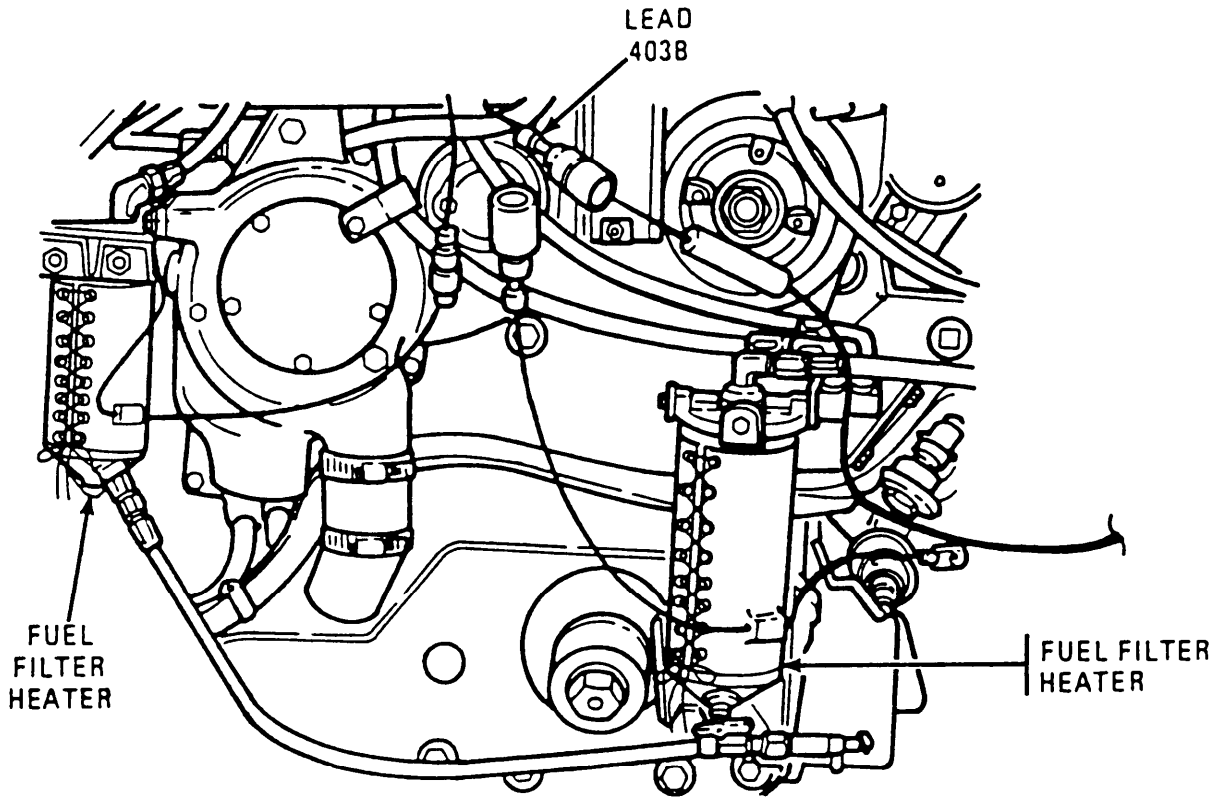
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 7. To access wiring harness, remove hull engine compartment deck assembly lid. Refer to page 2-935. Disconnect wiring harness. Place red probe in socket B (lead 403 B). Ground black probe. Set MASTER switch ON. Set fuel filter heater switch ON. If multimeter indicates about 24 volts, go to step 8. If multimeter indicates no voltage, repair lead 403B between wiring harness disconnect and fuel filter heater switch. Refer to page 2-371. Set MASTER switch OFF. Set fuel filter heater switch OFF. Connect wiring harness.

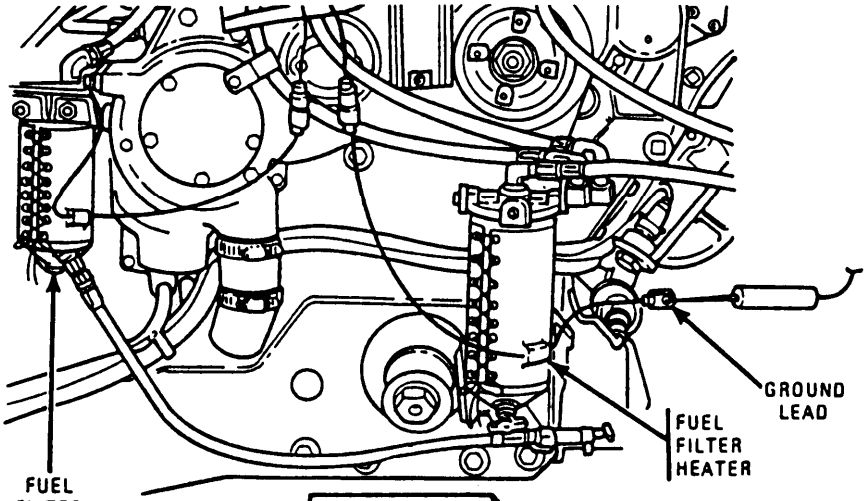


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 8. Disconnect lead 403B from fuel filter heater. Place red probe in lead 403B. Ground black probe. Set MASTER switch ON. Set fuel filter heater switch ON. If multimeter indicates about 24 volts, go to step 9. If multimeter indicates no voltage, repair lead 403B between wiring harness and fuel filter heater. Refer to page 2-371. Set MASTER switch OFF. Set fuel filter heater switch OFF. Connect lead.

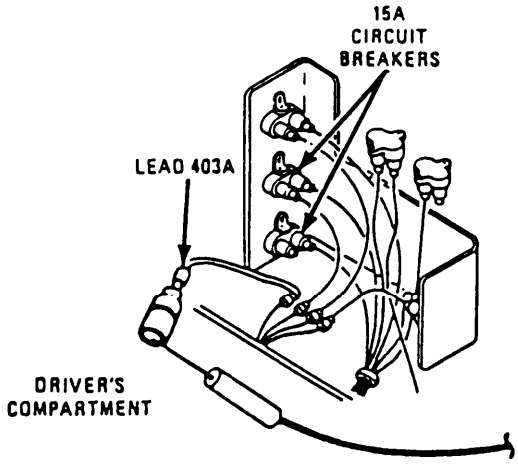
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



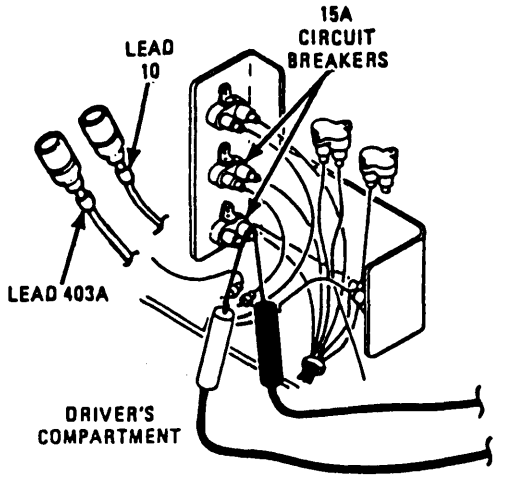
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

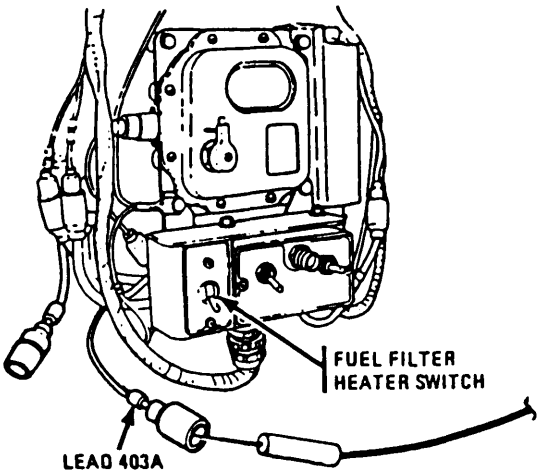
Step 9. Disconnect fuel filter heater ground lead. Place red probe in ground lead terminal. Ground black probe. Set MASTER switch ON. Set fuel filter heater switch ON. If multimeter indicates about 24 volts, repair ground lead. Refer to page 2-371. If multimeter indicates no voltage, repair fuel filter heater. Refer to page 2-1025. Set MASTER switch OFF. Set fuel filter heater switch OFF. Connect lead.



Step 10. Disconnect lead 403A from 15A circuit breaker (near driver's seat). Place red probe in 15A circuit breaker receptacle. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 12. If multimeter indicates no voltage, go to step 11. Set MASTER switch OFF.



Step 11. Disconnect lead 10 from 15A circuit breaker. Connect multimeter to 15A circuit breaker receptacles. If multimeter indicates 0 ohms, repair lead 10. Refer to page 2-371. If multimeter indicates infinity, replace 15A circuit breaker. Refer to page 2-1029. Connect leads.

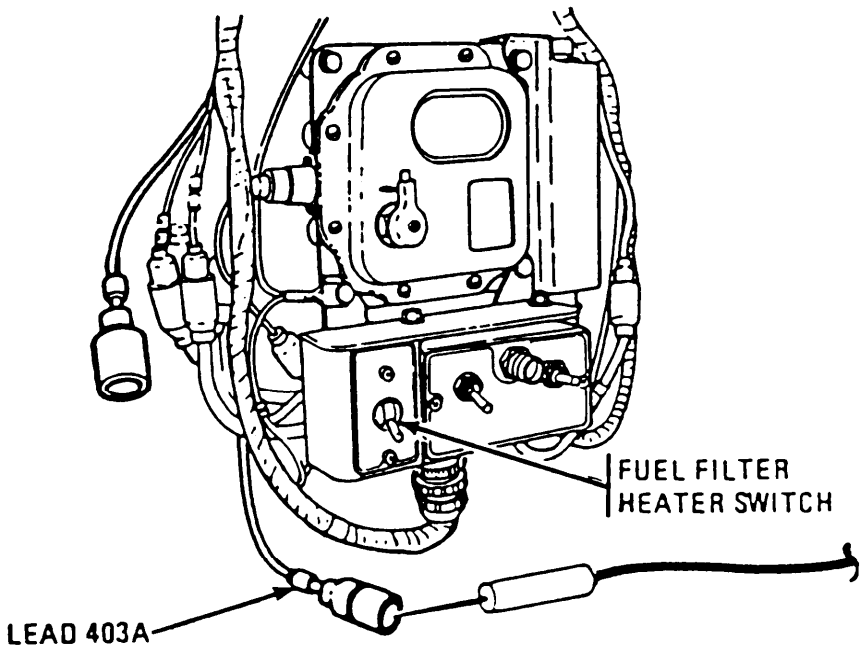


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 12. Disconnect lead 403A from fuel filter heater switch. Place red probe in lead 403A. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 13. If multimeter indicates no voltage, repair lead 403A between fuel filter heater switch and 15A circuit breaker. Refer to page 2-371. Set MASTER switch OFF. Connect lead.

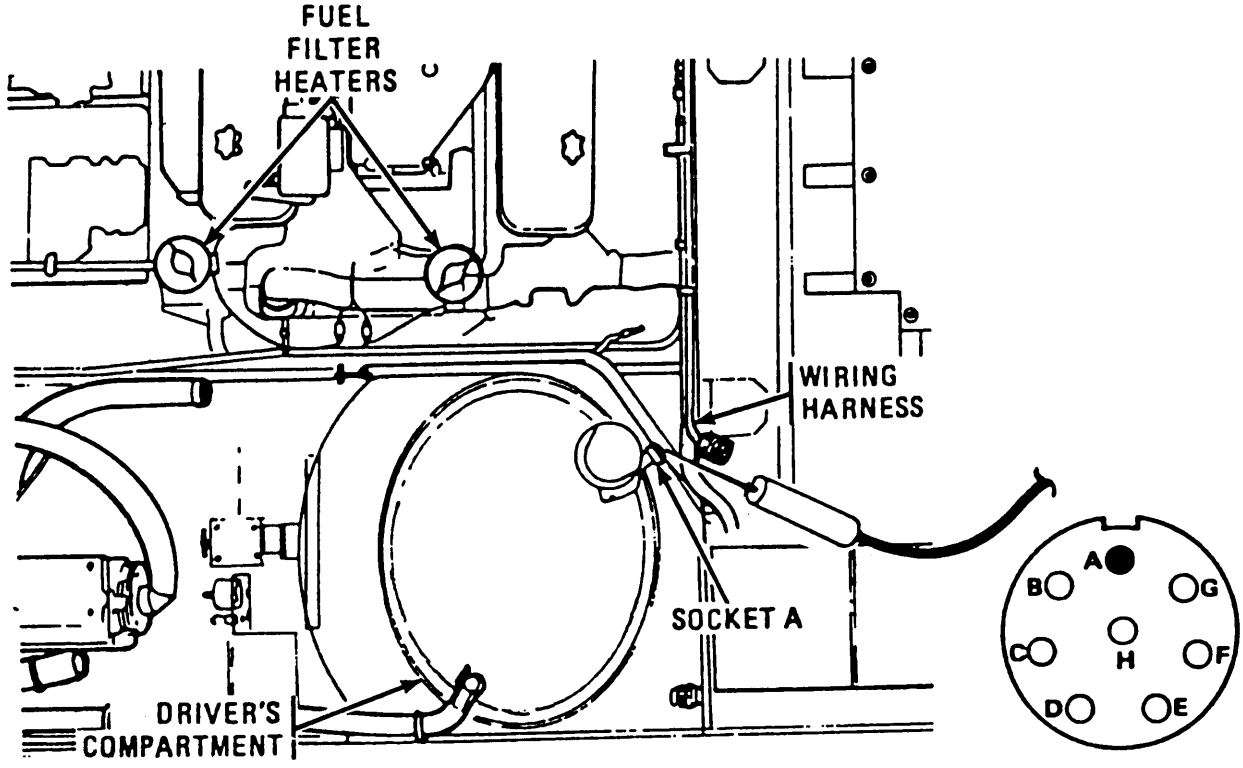
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 13. Disconnect lead 403A from fuel filter heater switch. Place red probe in lead 403A. Ground black probe. Set MASTER switch ON. Set fuel filter heater switch ON. If multimeter indicates about 24 volts, go to step 14. If multimeter indicates no voltage, replace fuel filter heater switch. Refer to page 2-1029. Set MASTER switch OFF. Set fuel filter heater switch OFF. Connect lead.

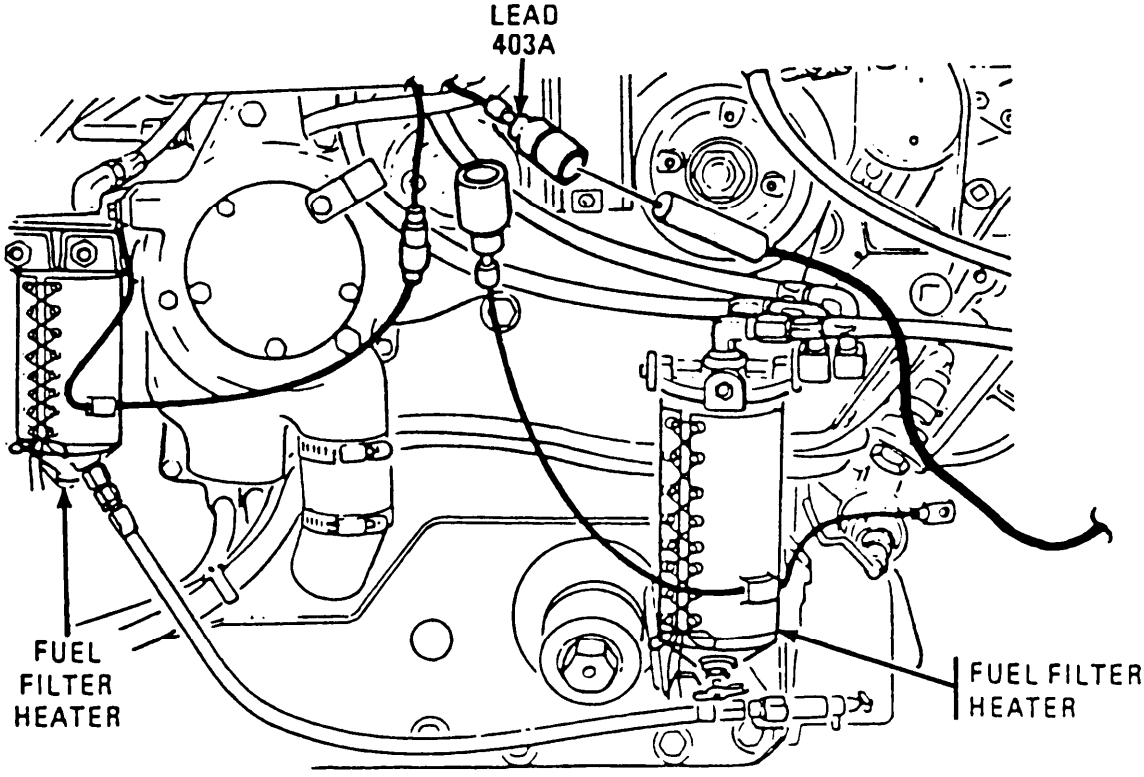


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 14. To access wiring harness, remove hull engine compartment deck assembly lid. Refer to page 2-935. Disconnect wiring harness. Place red probe in socket A (lead 403A). Ground black probe. Set MASTER switch ON. Set fuel filter heater switch ON. If multimeter indicates about 24 volts, go to step 15. If multimeter indicates no voltage, repair lead 403A between wiring harness disconnect and fuel filter heater. Refer to page 2-371. Set MASTER switch OFF. Set fuel filter heater switch OFF. Connect wiring harness.

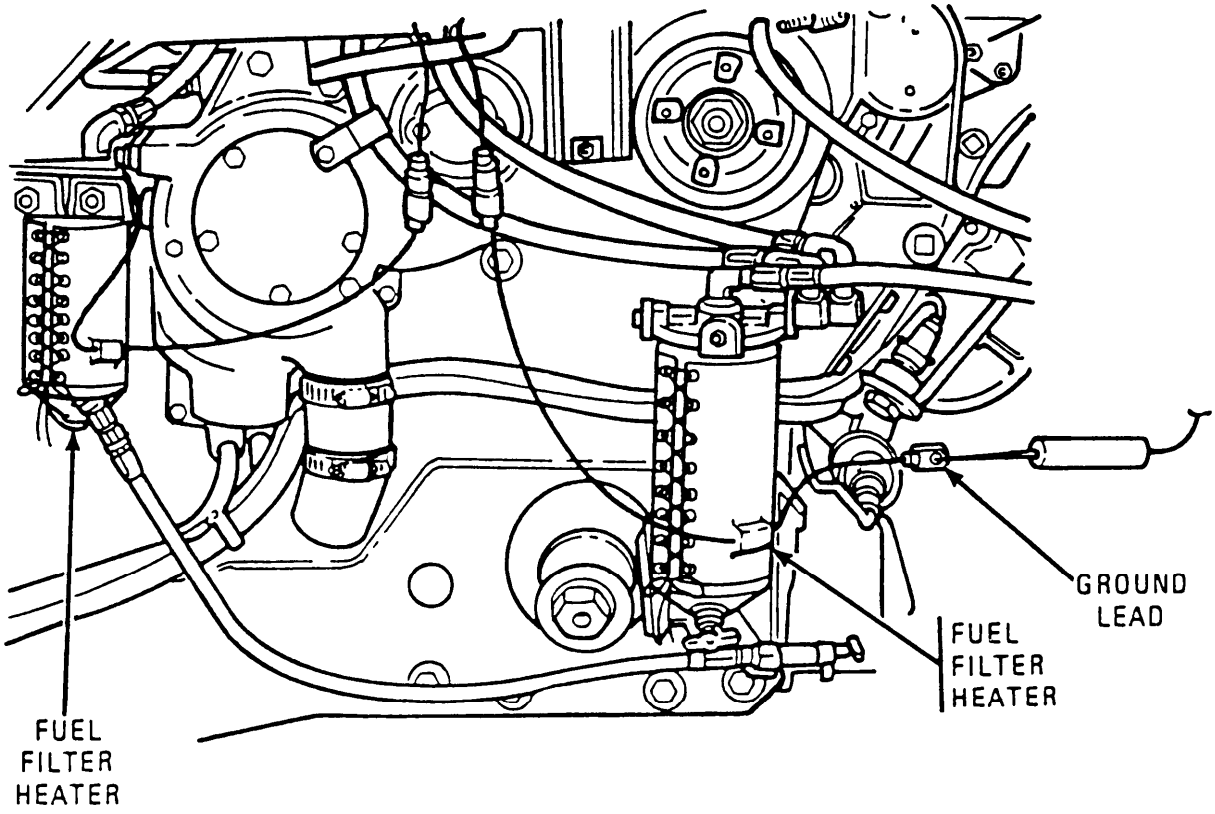
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 15. Disconnect lead 403A from fuel filter heater. Place red probe in lead 403A. Ground black probe. Set MASTER switch ON. Set fuel filter heater switch ON. If multimeter indicates about 24 volts, go to step 16. If multimeter indicates no voltage, repair lead 403A between wiring harness disconnect and fuel filter heater. Refer to page 2-371. Set MASTER switch OFF. Set fuel filter heater switch OFF. Connect lead.



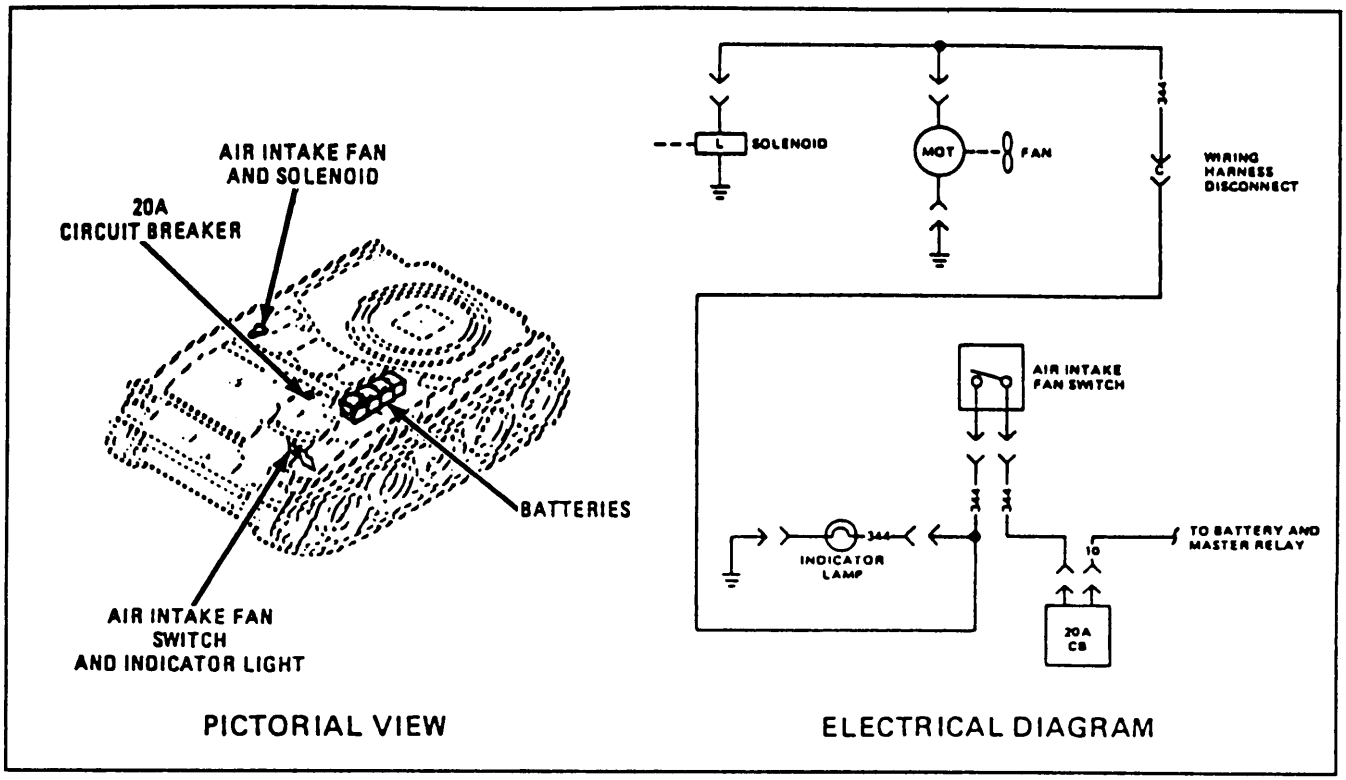
WARNING

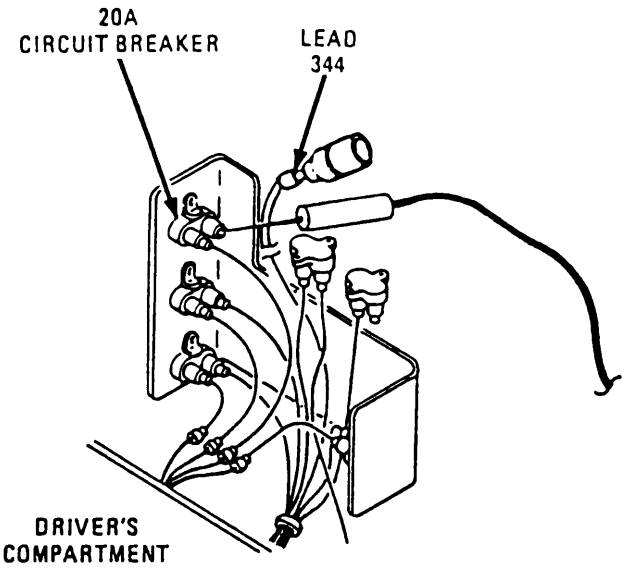
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 16. Disconnect ground lead. Place red probe in ground lead terminal. Ground black probe. Set MASTER switch ON. Set fuel filter heater switch ON. If multimeter indicates about 24 volts, repair ground lead. Refer to page 2-371. If multimeter indicates no voltage, replace fuel filter heater. Refer to page 2-1025. Set MASTER switch OFF. Set fuel filter heater switch OFF. Connect lead.

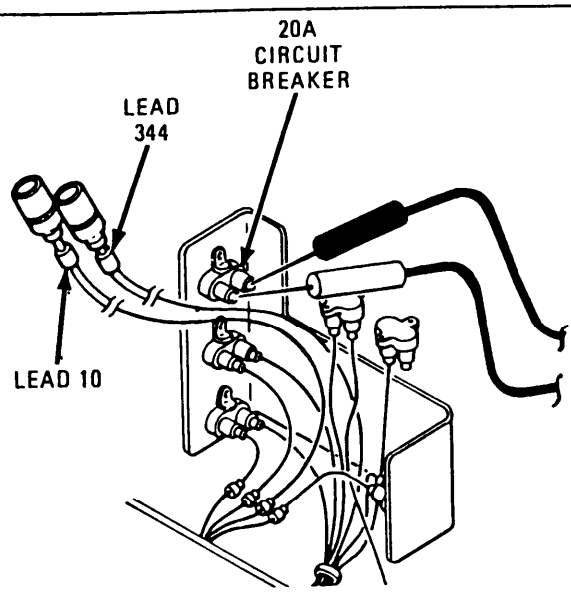
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

BD. AIR INTAKE FAN AND SOLENOID CIRCUIT.

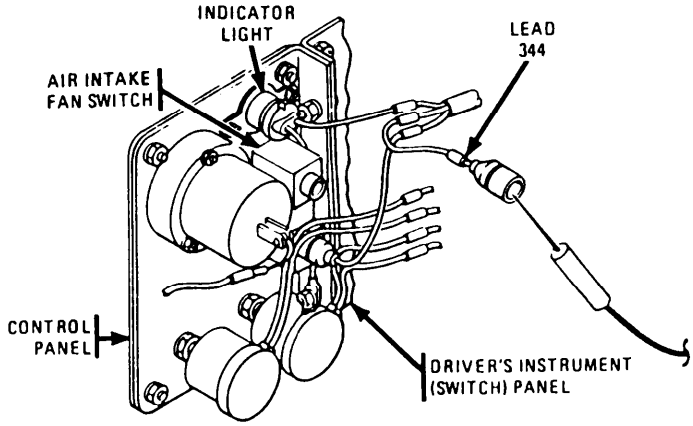




Step 1. Remove lead 344 from 20A circuit breaker (near driver's seat). Place red probe in circuit breaker receptacle. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 3. If multimeter indicates no voltage, go to step 2. Set MASTER switch OFF.



Step 2. Remove lead 10 from 20A circuit breaker. Connect multimeter to 20A circuit breaker receptacles. If multimeter indicates 0 ohms, repair lead 10. Refer to page 2-371. If multimeter indicates infinity, replace 20A circuit breaker. Refer to page 2-1029. Connect leads.

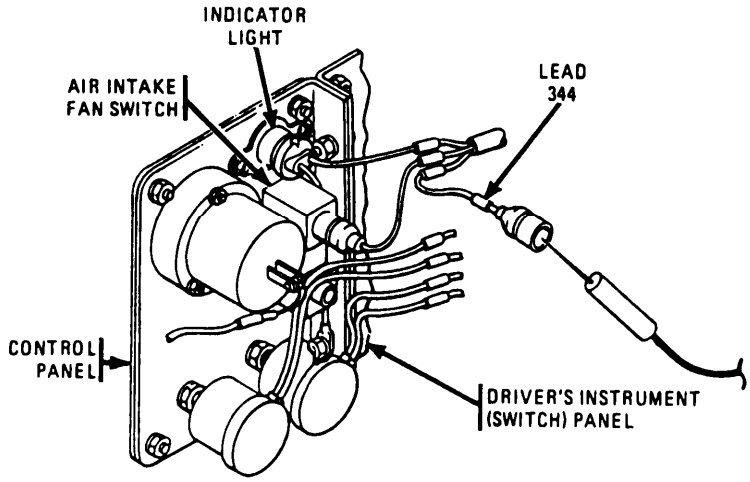


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. Disconnect lead 344 from AIR INTAKE FAN switch. Place red probe in lead 344. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 4. If multimeter indicates no voltage, repair lead 344 between AIR INTAKE FAN switch and 20A circuit breaker. Refer to page 2-371. Connect lead.

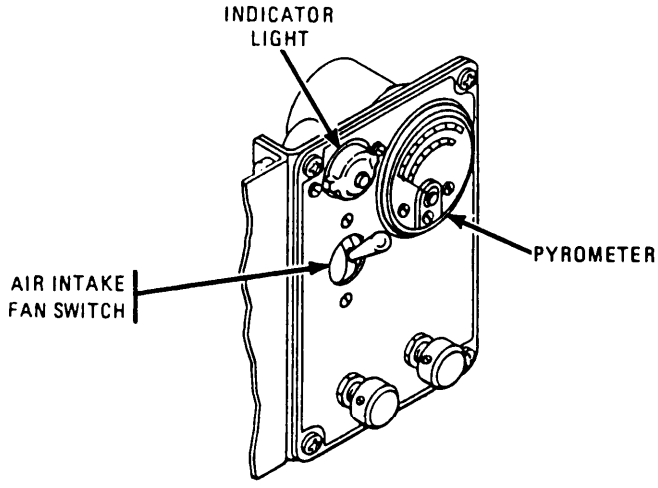
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



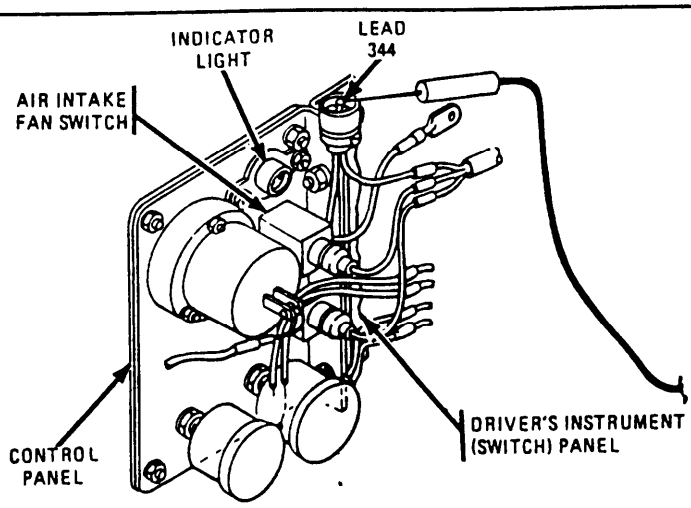
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 4. Disconnect the other lead 344 from AIR INTAKE FAN switch. Place red probe in lead 344. Ground black probe. Set MASTER switch ON. Set AIR INTAKE FAN switch ON. If multimeter indicates about 24 volts, go to step 5. If multimeter indicates no voltage, replace AIR INTAKE FAN switch. Refer to page 2-1053. Set MASTER switch OFF. Set AIR INTAKE FAN switch OFF. Connect lead.



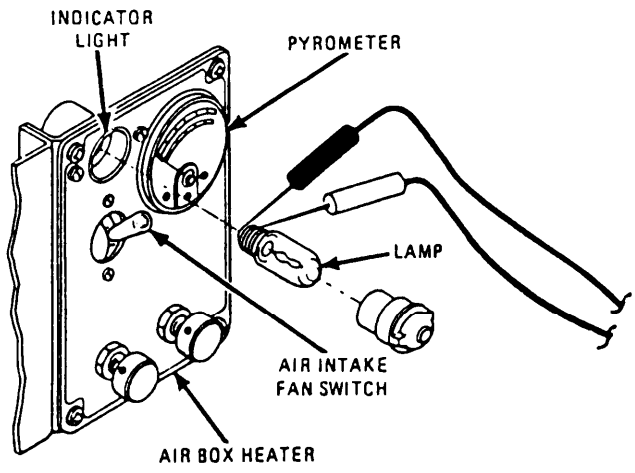
Step 5. Set MASTER switch ON. Set AIR INTAKE FAN switch ON. If indicator light operates, go to step 9. if indicator light does not operate, go to step 6. Set MASTER switch OFF. Set AIR INTAKE FAN switch OFF.



WARNING

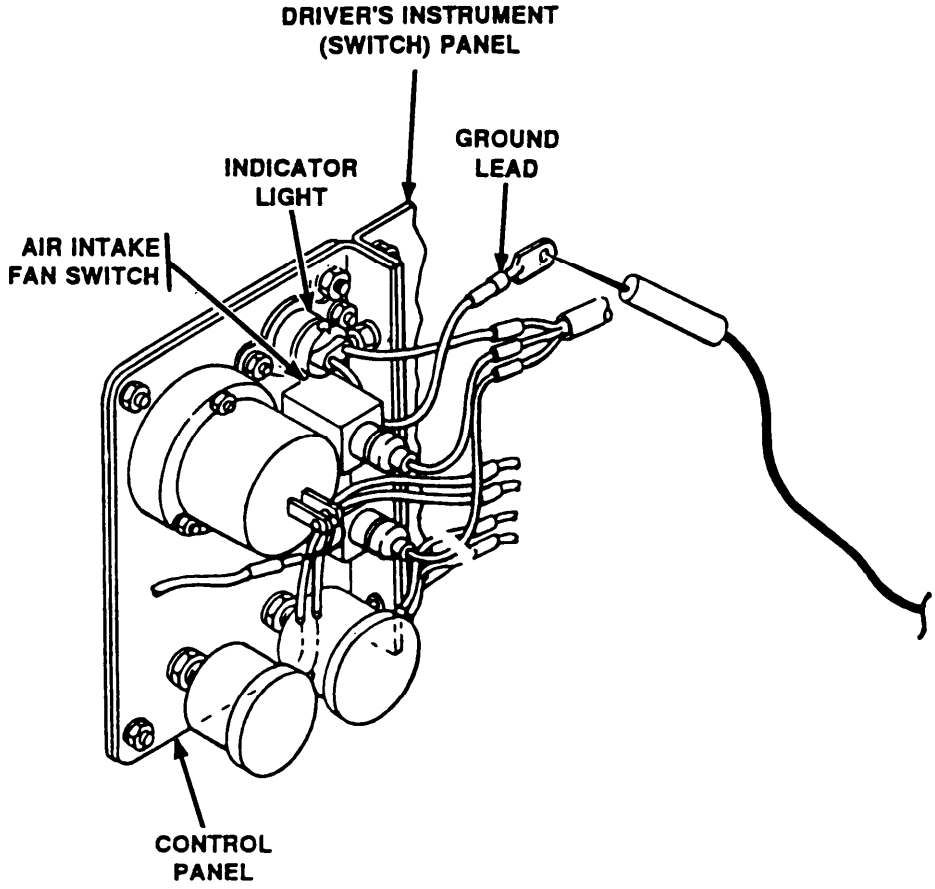
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 6. Remove lead 344 from indicator light. Place red probe in lead 344. Ground black probe. Set MASTER switch ON. Set AIR INTAKE FAN switch ON. If multimeter indicates about 24 volts, go to step 7. If multimeter indicates no voltage, repair lead 344 between indicator light and AIR INTAKE FAN switch. Refer to page 2-371. Set MASTER switch OFF. Set AIR INTAKE FAN switch OFF. Connect lead.



Step 7. Remove lamp from indicator light. Refer to page 2-1053. Connect multimeter to contacts of lamp. If multimeter indicates about 26 ohms, go to step 8. If multimeter indicates infinity, replace lamp. Refer to page 2-1053.

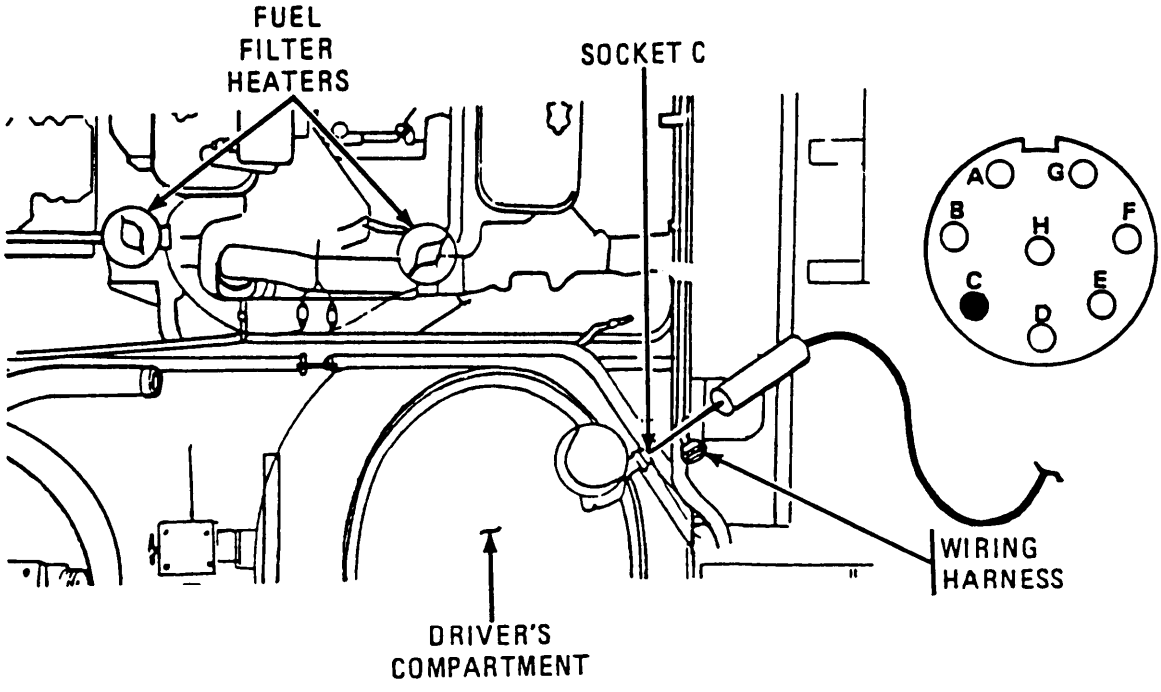
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 8. Disconnect indicator light ground lead. Place red probe in indicator light ground lead terminal. Ground black probe. Set MASTER switch ON. Set AIR INTAKE FAN switch ON. If multimeter indicates about 24 volts, repair indicator light ground lead. Refer to page 2-371. If multimeter indicates no voltage, replace indicator light. Refer to page 2-1053. Set MASTER switch OFF. Set AIR INTAKE FAN switch OFF. Connect ground lead.

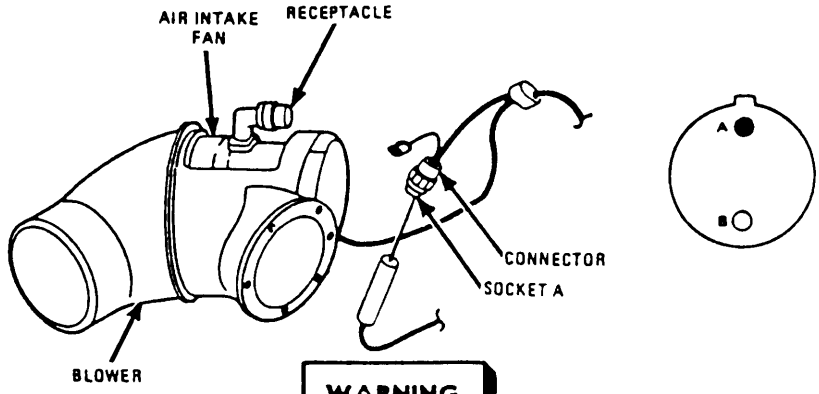


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 9. To access wiring harness, remove hull engine compartment deck assembly lid. Refer to page 2-935. Disconnect wiring harness. Place red probe in socket C (lead 344). Ground black probe. Set MASTER switch ON. Set AIR INTAKE FAN switch ON. If multimeter indicates about 24 volts, go to step 10. If multimeter indicates no voltage, repair lead 344 between AIR INTAKE FAN switch and wiring harness disconnect. Refer to page 2-1053. Set MASTER switch OFF. Set AIR INTAKE FAN switch OFF. Connect wiring harness.

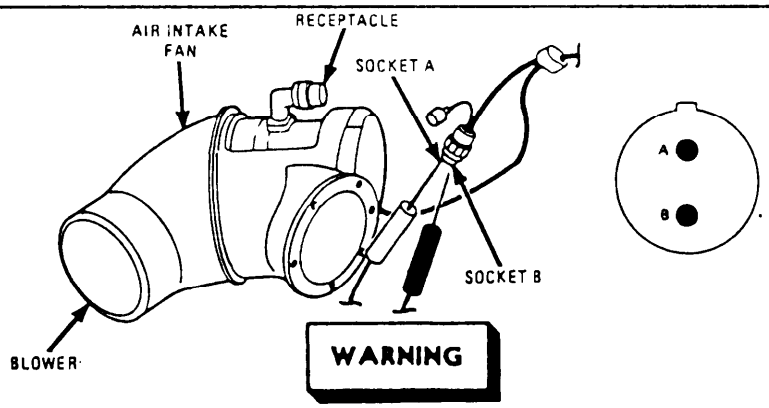
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

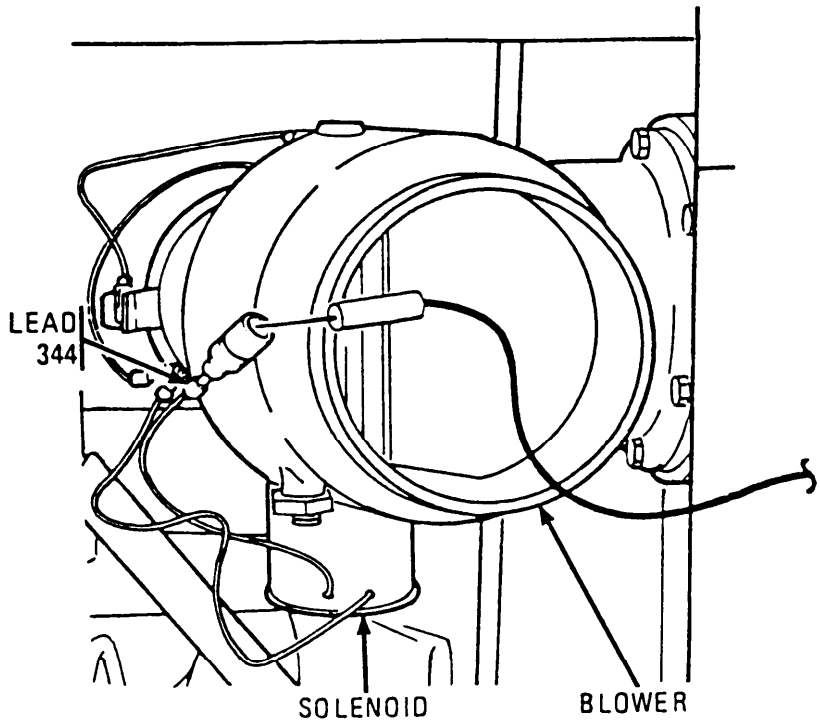
Step 10. Disconnect connector from air intake fan. Place red probe in socket A (lead 344). Ground black probe. Set MASTER switch ON. Set AIR INTAKE FAN switch ON. If multimeter indicates about 24 volts, go to step 11. If multimeter indicates no voltage, repair lead 344 between wiring harness disconnect and air intake fan. Refer to page 2-371. Set MASTER switch OFF. Set AIR INTAKE FAN switch OFF. Connect connector to air intake fan.



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 11. Place red probe in socket A (lead 314). Place black probe in socket B (ground) of air intake fan. Set MASTER switch ON. Set AIR INTAKE FAN switch ON. If multimeter indicates about 24 volts, notify direct support maintenance. If multimeter indicates no voltage, repair air intake fan ground lead. Refer to page 2-371. Set MASTER switch OFF. Set AIR INTAKE FAN switch OFF. Connect connector to air intake fan.

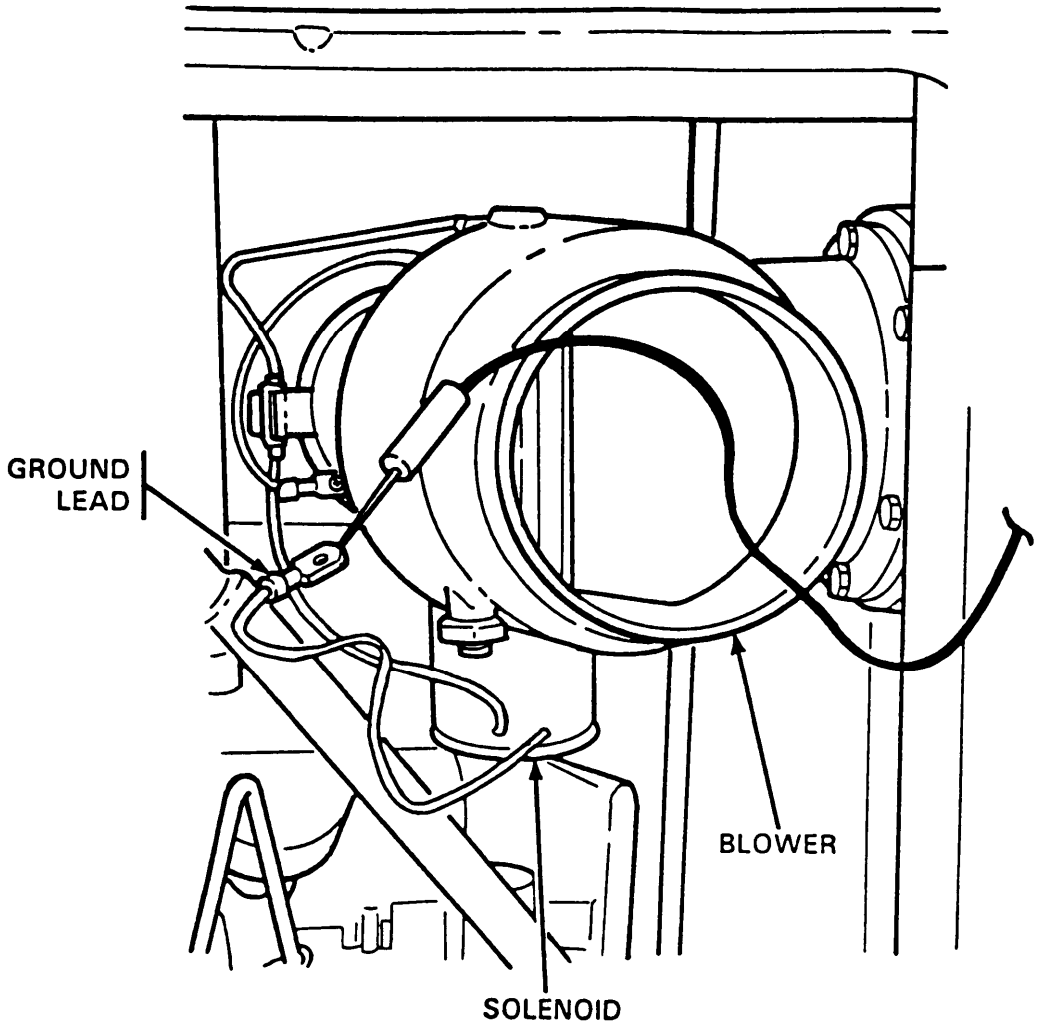


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step *12.* Disconnect lead 344 from blower solenoid. Place red probe in lead 344. Ground black probe. Set MASTER switch ON. Set AIR INTAKE FAN switch ON. If multimeter indicates about 24 volts, go to step 13. If multimeter indicates no voltage, repair lead 344 between air intake fan and blower solenoid. Refer to page 2-371. Set MASTER switch OFF. Set AIR lNTAKE FAN switch OFF. Connect lead.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

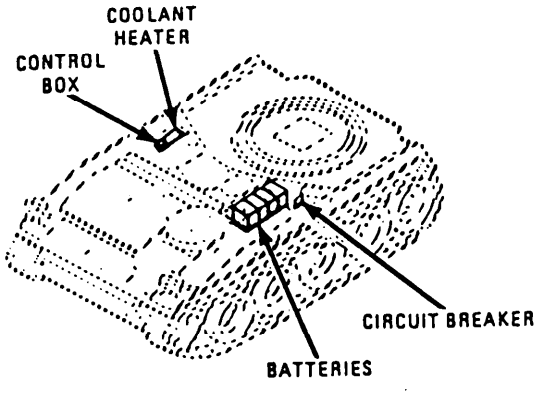


WARNING

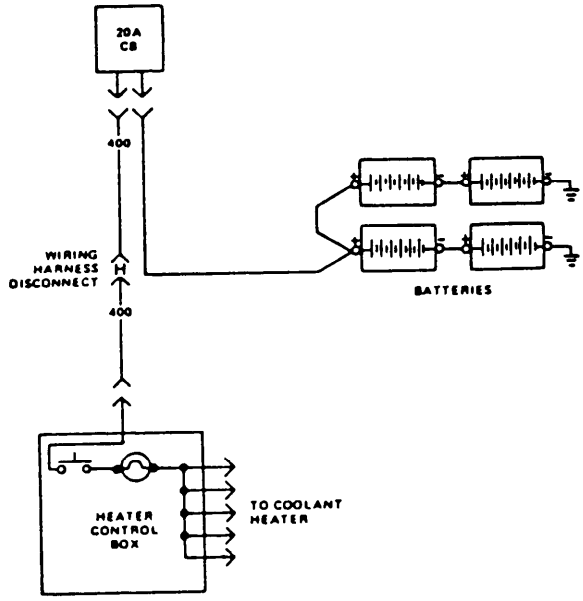
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 13. Disconnect blower solenoid ground lead. Place red probe in blower solenoid ground lead terminal. Ground black probe. Set MASTER switch ON. Set AIR INTAKE FAN switch ON. If multimeter indicates about 24 volts, repair blower solenoid ground lead. Refer to page 2-371. If multimeter indicates no voltage, notify direct support maintenance. Set MASTER switch OFF. Set AIR INTAKE FAN switch OFF. Connect blower solenoid ground lead.

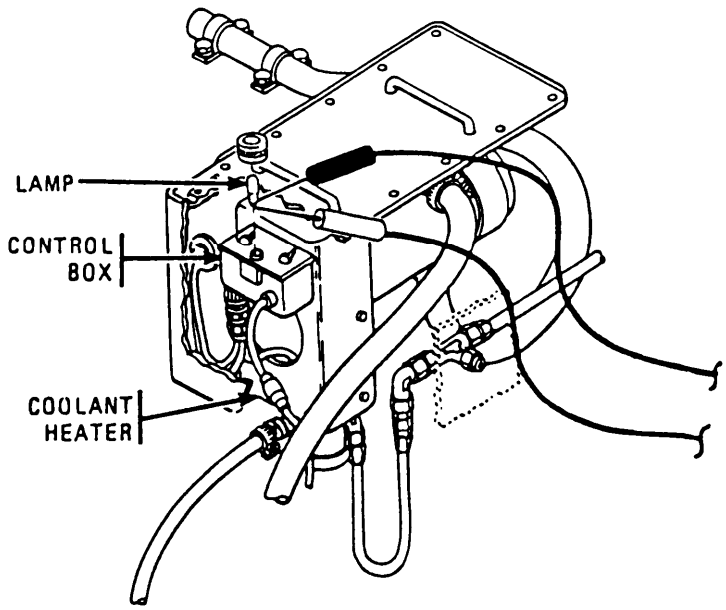
BE. COOLANT HEATER CONTROL BOX LIGHT CIRCUIT.



PICTORIAL VIEW

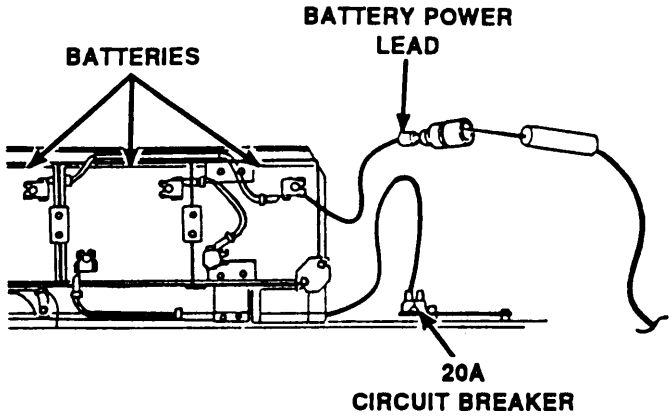


ELECTRICAL DIAGRAM



Step 1. Remove lamp from coolant heater control box. Refer to page 2-1055. Connect multimeter to contacts of lamp. If multimeter indicates about 75 ohms, go to step 2. If multimeter indicates 0 ohms, replace lamp. Refer to page 2-1055.

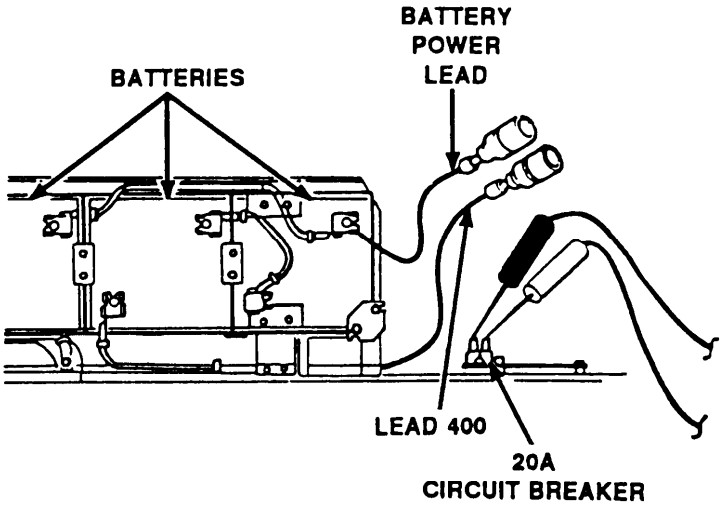
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



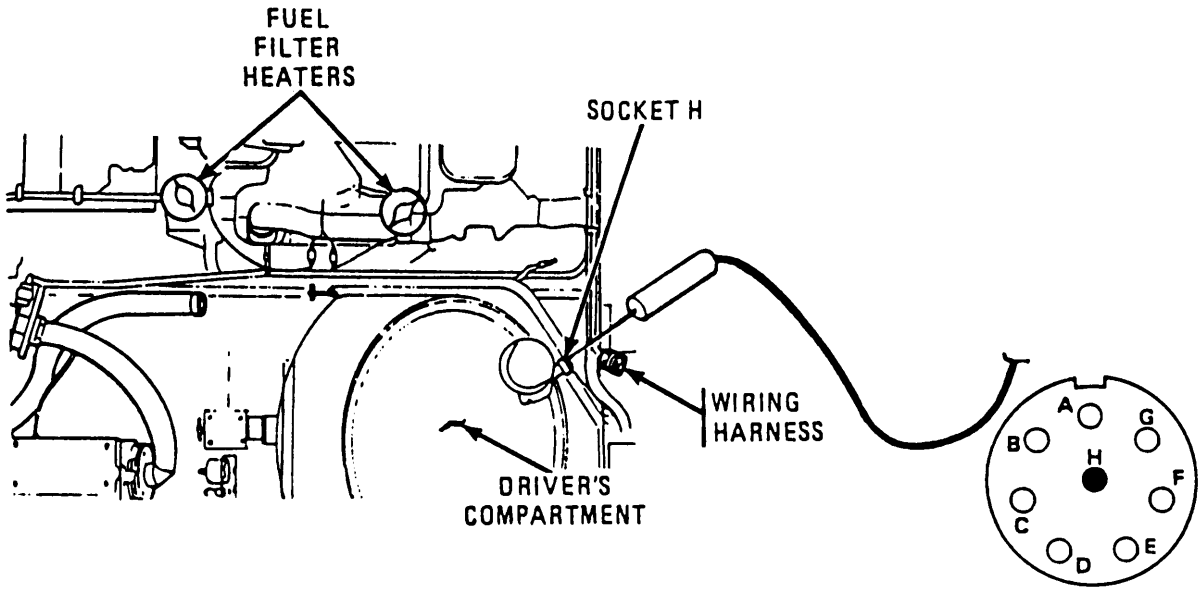
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. To access coolant heater circuit breaker, remove right $C0_2$ cylinder access cover. Refer to page 2-923. Disconnect battery power lead from 20A circuit breaker. Place red probe in battery power lead. Ground black probe. If multimeter indicates about 24 volts, go to step 3. If multimeter indicates no voltage, repair battery power lead. Refer to page 2-371. If problem still exists, troubleshoot battery power circuit. Refer to page 2-82. Connect lead.



Step 3. Disconnect lead 400 from 20A circuit breaker. Connect multimeter to 20A circuit breaker receptacles. If multimeter indicates 0 ohms, go to step 4. If multimeter indicates infinity, replace 20A circuit breaker. Refer to page 2-1029. Connect leads.

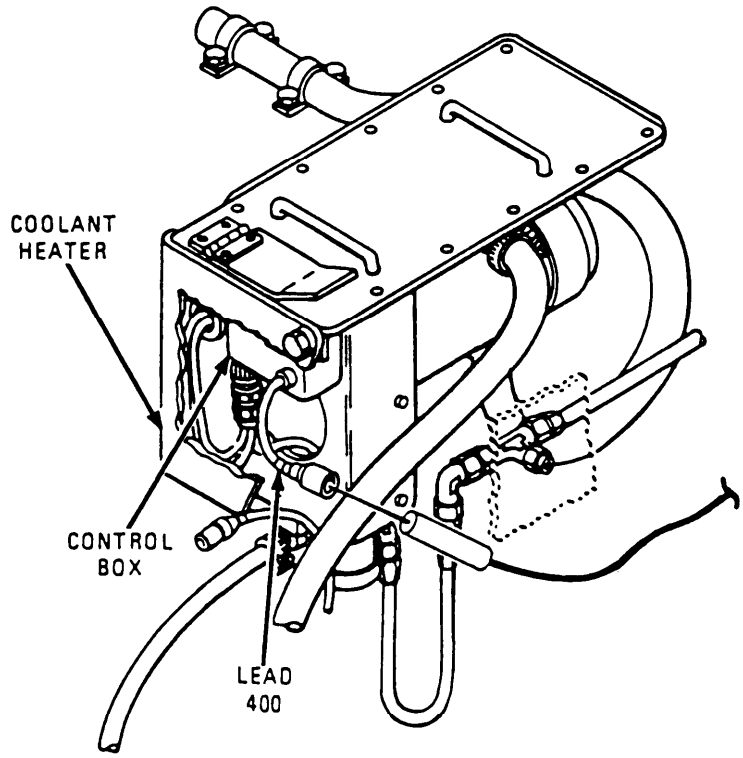


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 4. To access wiring harness, remove hull engine compartment deck assembly lid. Refer to page 2-935. Disconnect wiring harness. Place red probe in socket H (lead 400). Ground black probe. If multimeter indicates about 24 volts, go to step 5. If multimeter indicates no voltage, repair lead 400 between 20A circuit breaker and wiring harness disconnect. Refer to page 2-371. Connect wiring harness.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

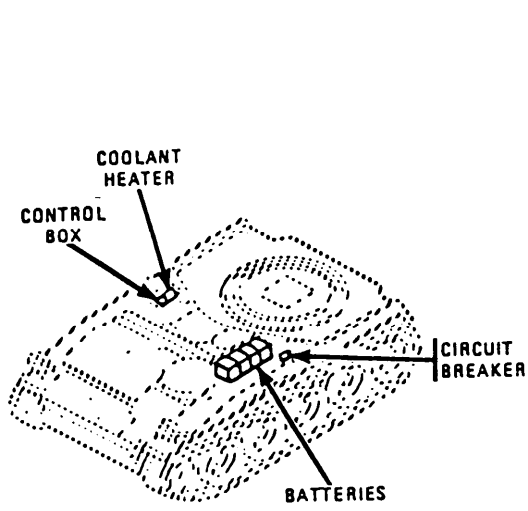


WARNING

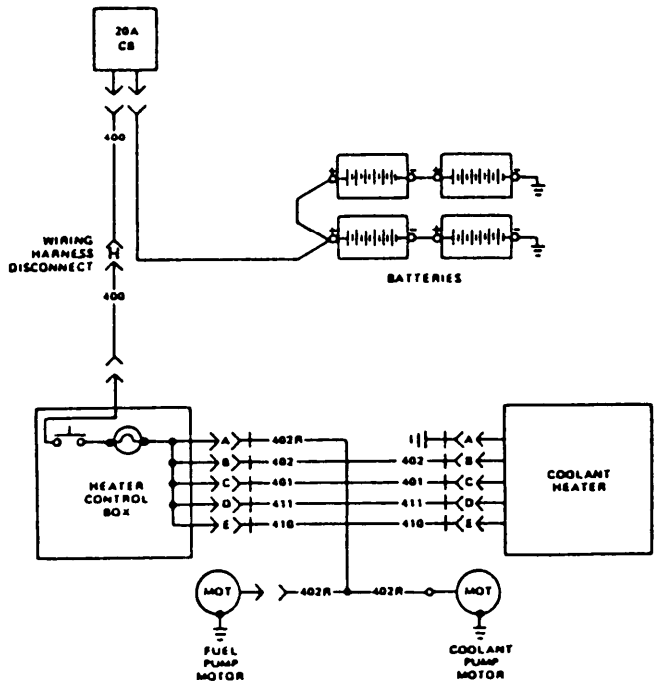
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe his warning could result in injury to personnel.

Step 5. Disconnect lead 400 from coolant heater control box. Place red probe in lead 400. Ground black probe. If multimeter indicates about 24 volts, replace coolant heater control box. Refer to page 2-1056. If multimeter indicates no voltage, repair lead 400 between wiring harness disconnect and coolant heater control box. Refer to page 2-371. Connect lead.

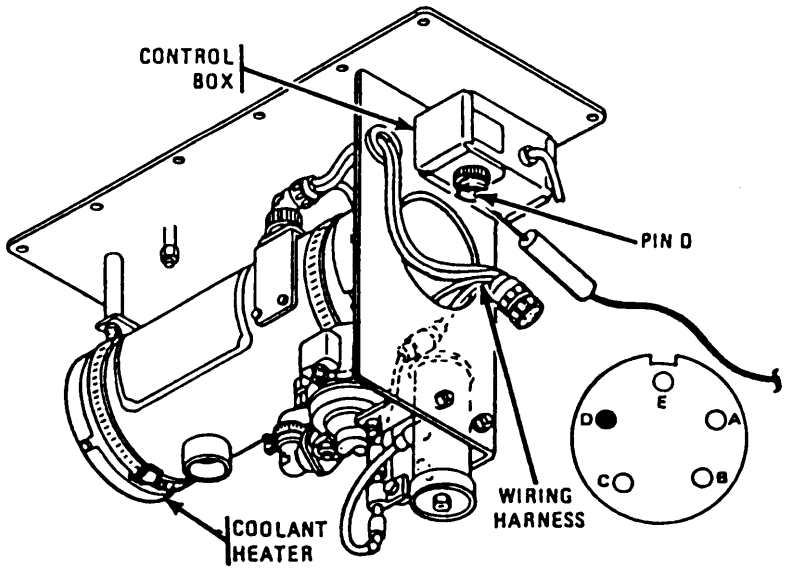
BF. COOLANT HEATER CIRCUIT.



PICTORIAL VIEW

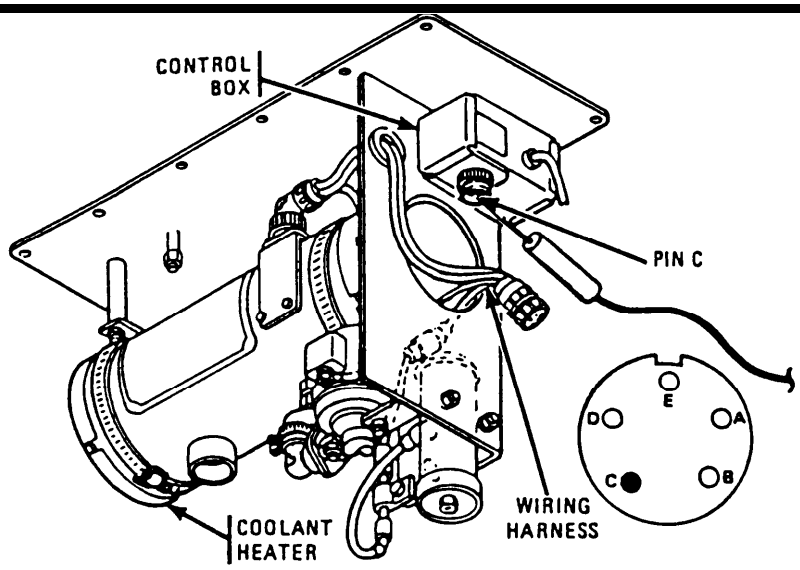


ELECTRICAL DIAGRAM

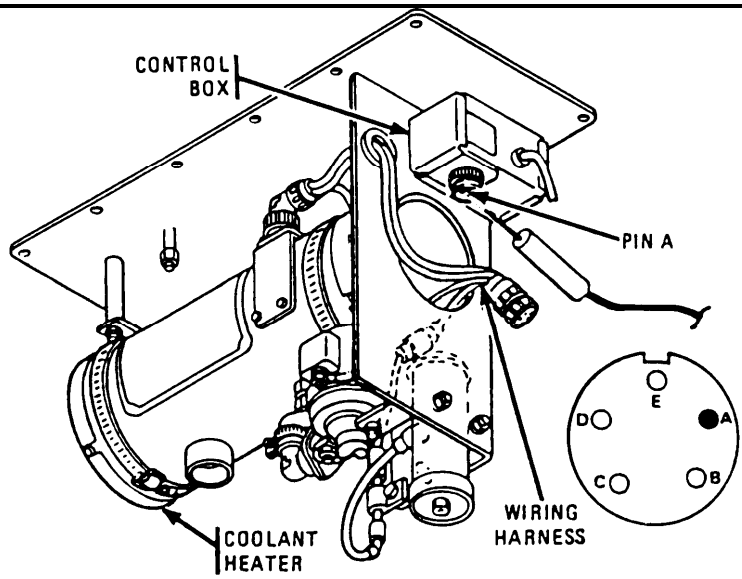


Step 1. Disconnect wiring harness from coolant heater control box. Place red probe on pin D (lead 411). Ground black probe. Set START-OFF-RUN switch to START. If multimeter indicates about 24 volts, go to step 2. If multimeter indicates no voltage, replace coolant heater control box. Refer to page 2-1056. Set START-OFF-RUN switch OFF. Connect wiring harness.

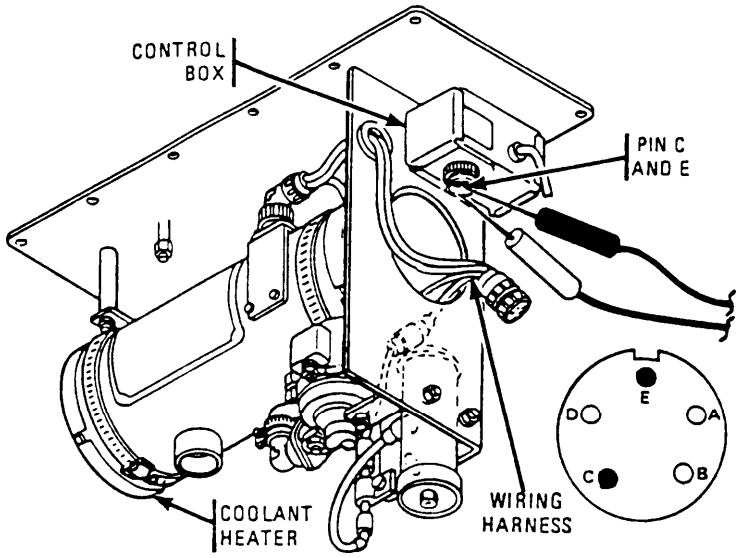
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



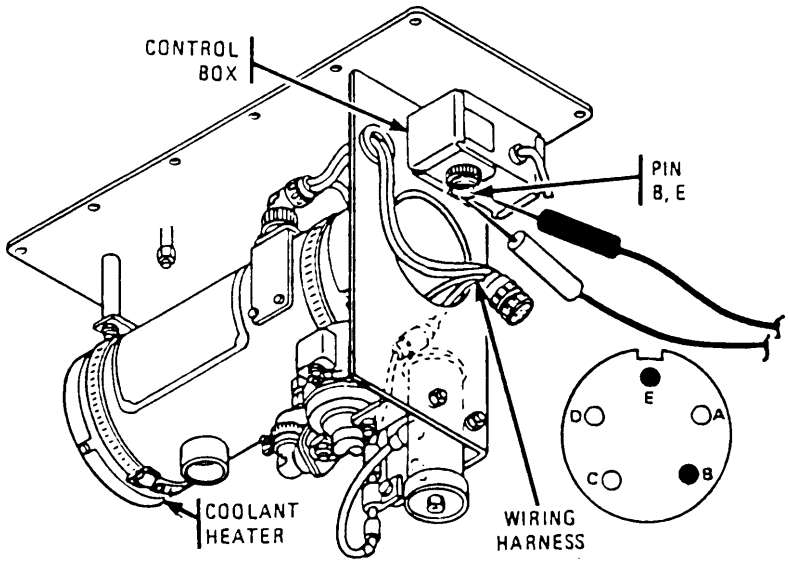
Step 2. Place red probe on pin C (lead 401). Ground black probe. Set START-OFF-RUN switch to START. If multimeter indicates about 24 volts, go to step 3. If multimeter indicates no voltage, replace coolant heater control box. Refer to page 2-1056. Set START-OFF-RUN switch OFF. Connect wiring harness.



Step 3. Place. red probe on pin A (lead 402R). Ground black probe. Set START-OFF-RUN switch to START, then to RUN. If multimeter indicates about 24 volts in both switch settings, go to step 4. If multimeter indicates no voltage in both switch settings, replace coolant heater control box. Refer to page 2-1056. Set START-OFF-RUN switch OFF. Connect wiring harness.

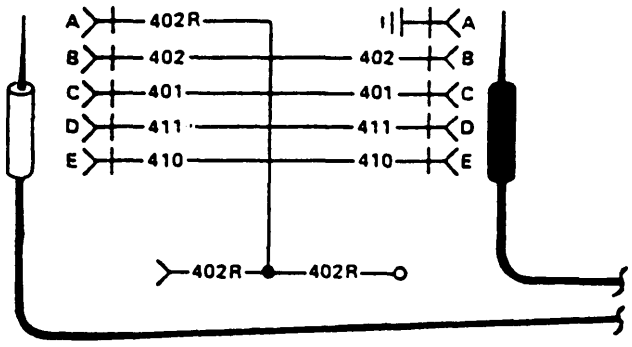


Step 4. Place red probe on pin E (lead 410). Place black probe on pin C (lead 401). Set START-OFF-RUN switch to RUN. If multimeter indicates 0 ohms, go to step 5. If multimeter indicates infinity, replace coolant heater control box. Refer to page 2-1056. Set START-OFF-RUN switch OFF. Connect wiring harness.



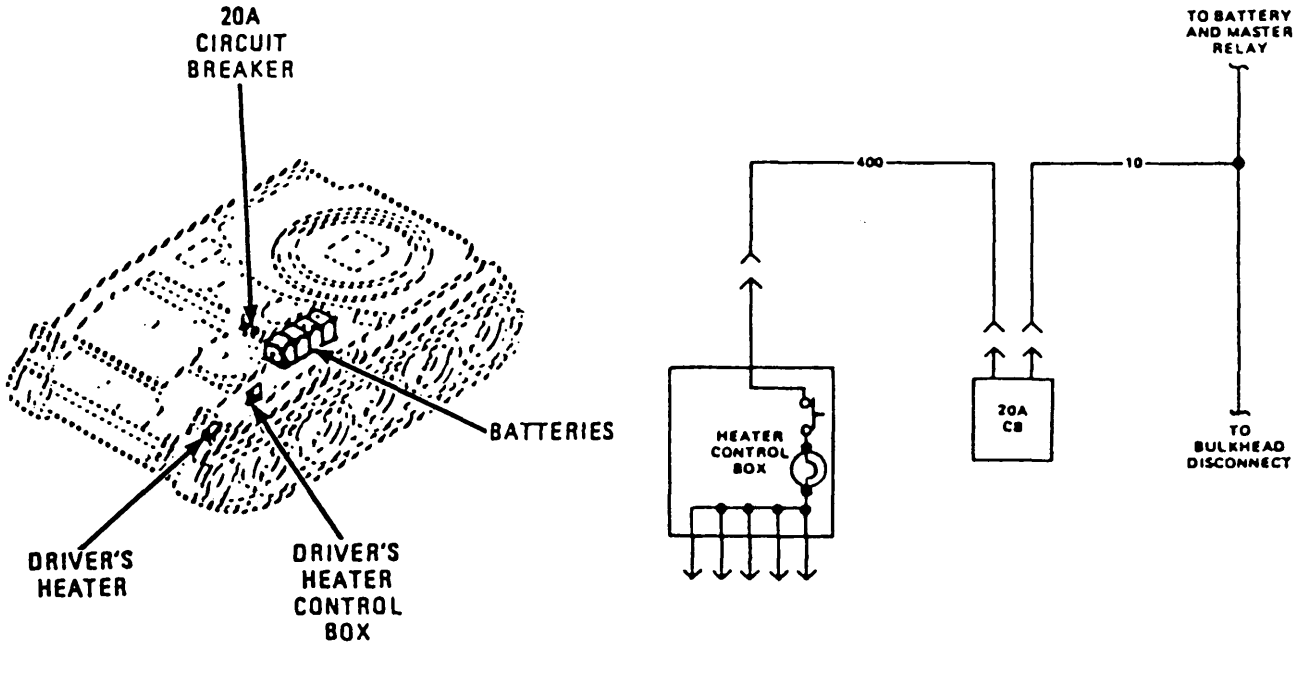
Step 5. Place red probe on pin E (lead 410). Place black probe on pin B (lead 402). Set HI-LO switch to H I. If multimeter indicates 0 ohms, go to step 6. If muitimeter indicates infinity, replace coolant heater control box. Refer to page 2-1056. Connect wiring harness.

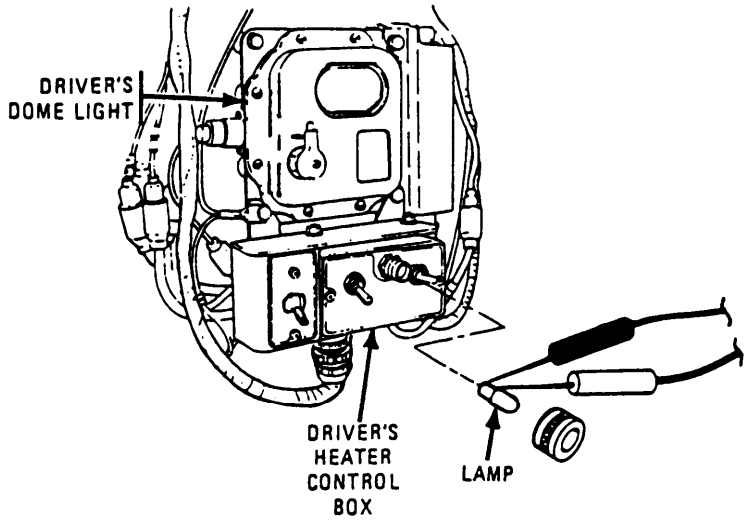
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



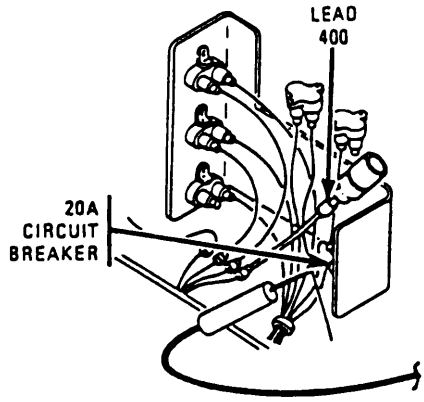
Step 6. Disconnect wiring harness from coolant heater assembly. Check continuity on each lead in wiring harness. If multimeter indicates 0 ohms at each lead in wiring harness, replace coolant heater assembly. Refer to page 2-1055. If multimeter indicates infinity at each lead in wiring harness, repair wiring harness. Refer to page 2-371. Connect wiring harness.

BG. DRIVER'S HEATER CONTROL BOX LIGHT CIRCUIT.



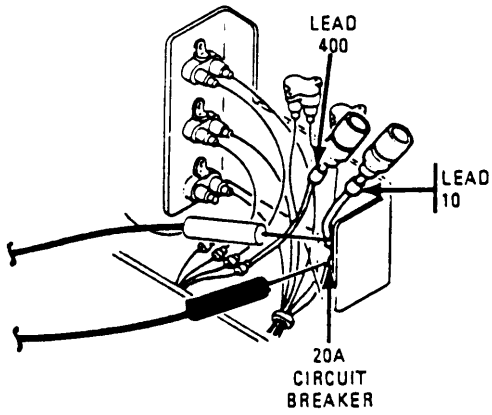


Step 1. Remove lamp from driver's heater control box. Refer to page 2-1056. Connect multimeter to contacts of lamp. If multimeter indicates about 75 ohms, go to step 2. If multimeter indicates infinity, replace lamp. Refer to page 2-1055.

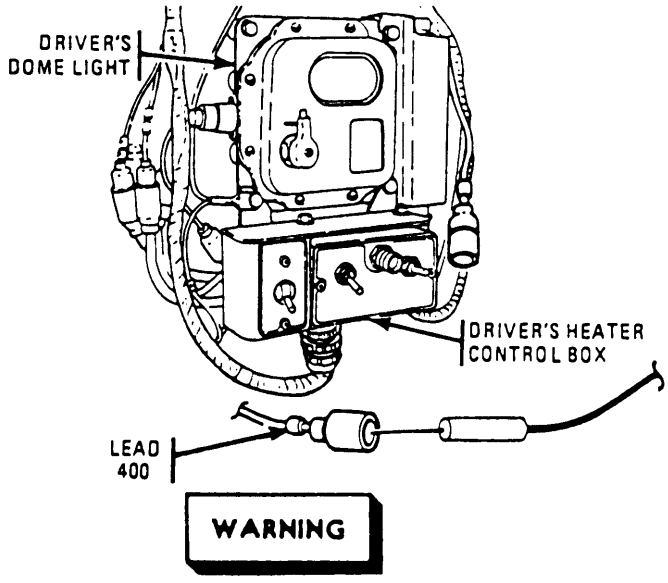


Step 2. Disconnect lead 400 from 20A circuit breaker (near driver's seat). Place red probe in 20A circuit breaker receptacle. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 4. If multimeter indicates no voltage, go to step 3. Set MASTER switch OFF.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 3. Disconnect lead 10 from 20A circuit breaker. Connect multimeter to 20A circuit breaker receptacles. If multimeter indicates 0 ohms, repair lead 10. Refer to page 2-371. If multimeter indicates infinity, replace 20A circuit breaker. Refer to page 2-1029. Connect leads.

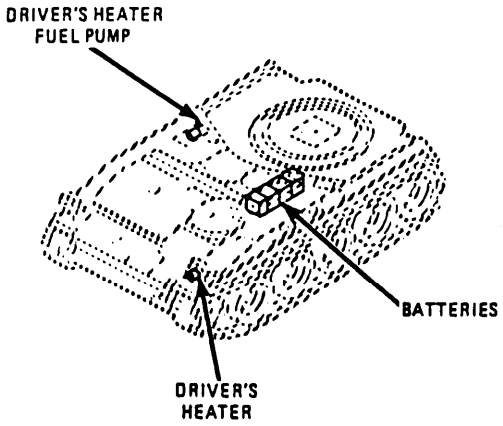


WARNING

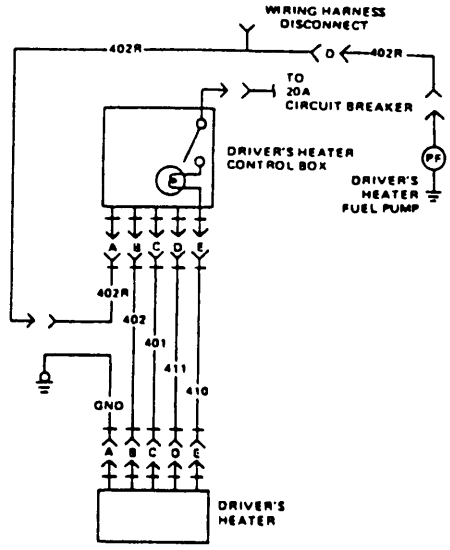
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 4. Disconnect lead 400 from driver's heater control box. Place red probe in lead 400. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, replace driver's heater control box. Refer to page 2-1029. If multimeter indicates no voltage, repair lead 400 between 20A circuit breaker and driver's heater control box. Refer to page 2-371. Set MASTER switch OFF. Connect lead.

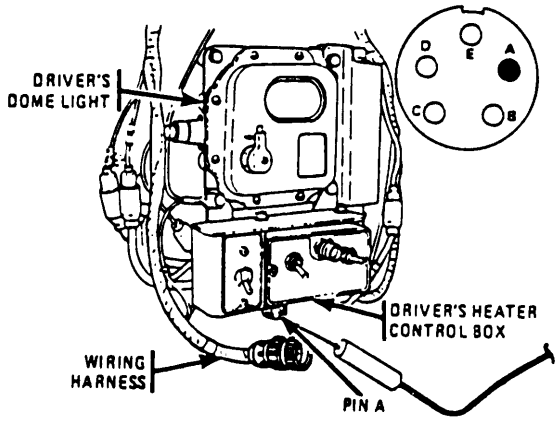
BH. DRIVER'S HEATER FUEL PUMP CIRCUIT.



PICTORIAL VIEW



ELECTRICAL DIAGRAM

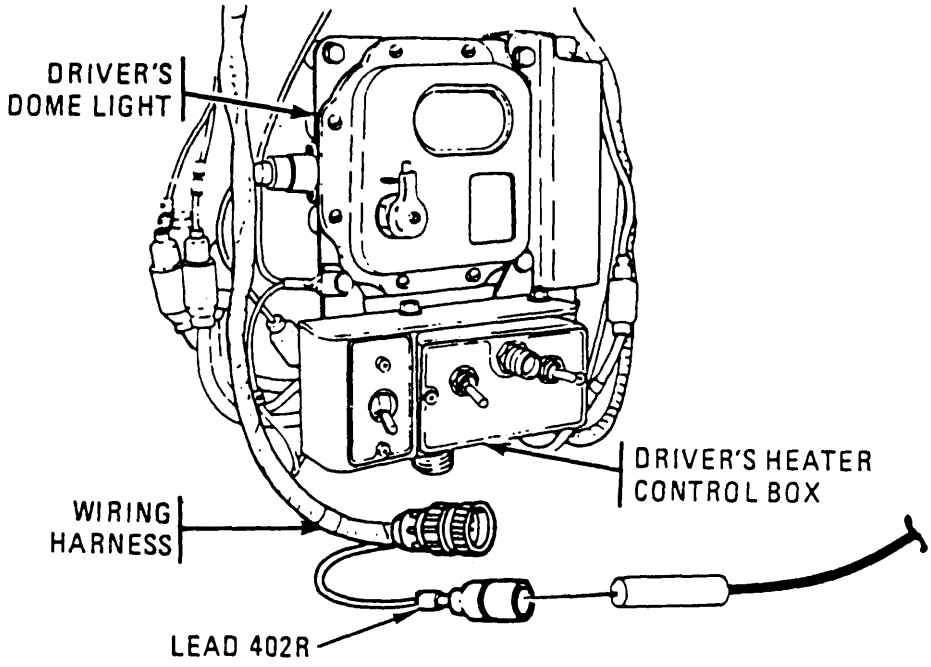


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 1. Disconnect wiring harness from driver's heater control box. Place red probe on pin A (lead 402 R). Ground black probe. Set MASTER switch ON. Set START-OFF-RUN switch to START. If multimeter indicates about 24 volts, go to step 2. If multimeter indicates no voltage, replace driver's heater control box. Refer to page 2-1029. Set MASTER switch OFF. Set START-OFF-RUN switch OFF. Connect wiring harness.

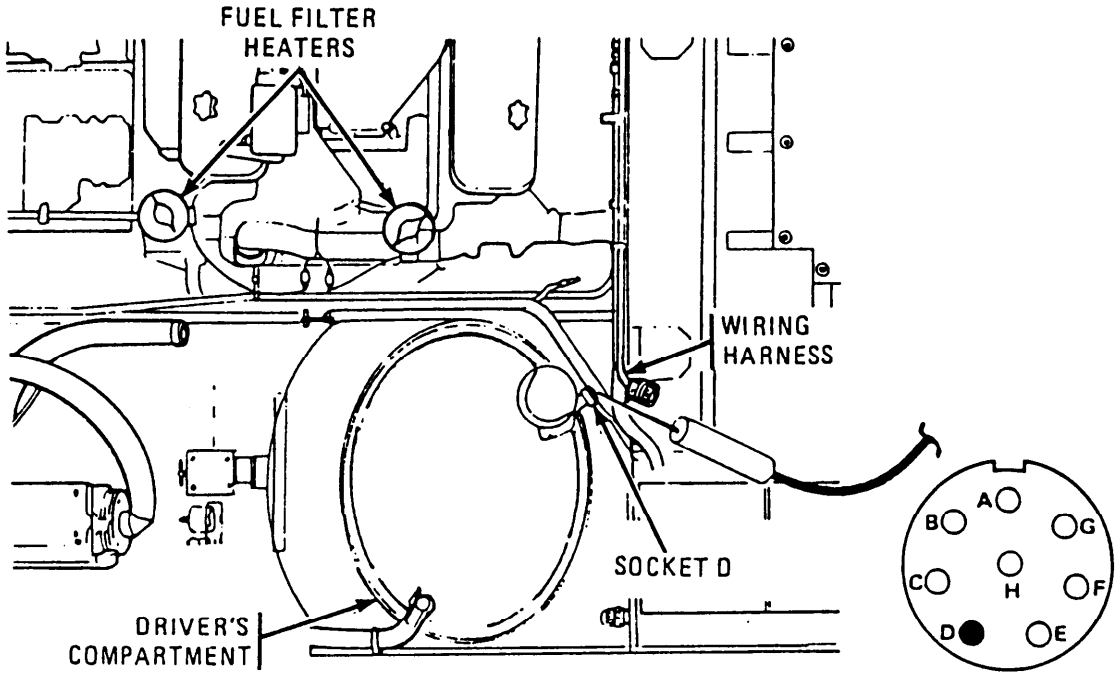
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Disconnect lead 402R from driver's heater control box wiring harness. Place red probe in lead 402R. Ground black probe. Set MASTER switch ON. Set START-OFF-RUN switch to START. If multimeter indicates about 24 volts, go to step 3. If multimeter indicates no voltage, repair lead 402R between disconnect and driver's heater control box wiring harness. Refer to page 2-371. Set MASTER switch OFF. Set START-OFF-RUN switch OFF. Connect lead.

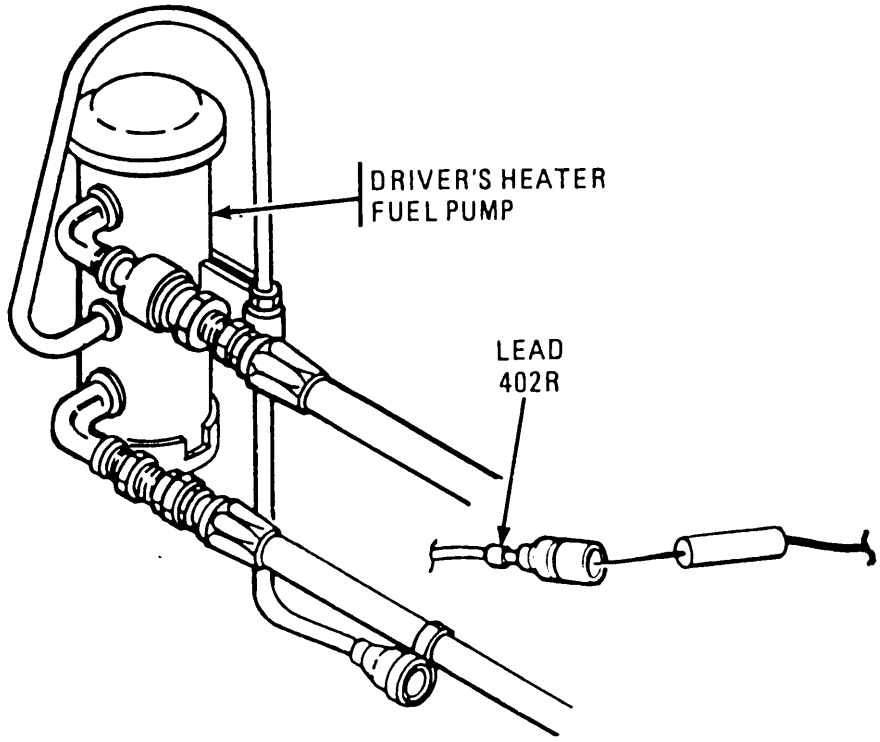


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. To access wiring harness, remove hull engine compartment deck assembly lid. Refer to page 2-935. Disconnect wiring harness. Place red probe in socket D (lead 402 R). Ground black probe. Set MASTER switch ON. Set START-OFF-RUN switch to START. If multimeter indicates about 24 volts, go to step 4. If multimeter indicates no voltage, repair lead 402R between disconnect and wiring harness disconnect. Refer to page 2-371. Set MASTER switch OFF. Set START-OFF-RUN switch OFF. Connect wiring harness.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

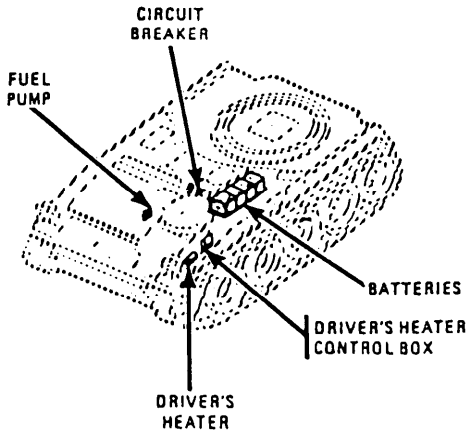


WARNING

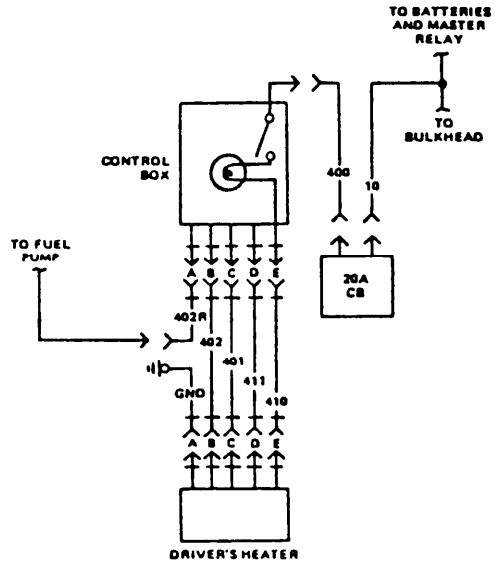
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 4. Disconnect lead 402R from driver's heater fuel pump. Place red probe in lead 402R. Ground black probe. Set MASTER switch ON. Set START-OFF-RUN switch to START. If multimeter indicates about 24 volts, replace driver's heater fuel pump. Refer to page 2-1016. If multimeter indicates no voltage, repair lead 402R between wiring harness disconnect and driver's heater fuel pump disconnect. Refer to page 2-371. Set MASTER switch OFF. Set START-OFF-RUN switch OFF. Connect lead.

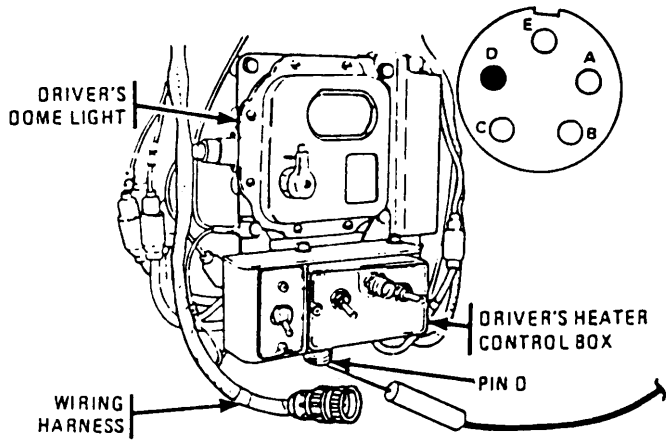
BI. DRIVER'S HEATER CIRCUIT.



PICTORIAL VIEW



ELECTRICAL DIAGRAM

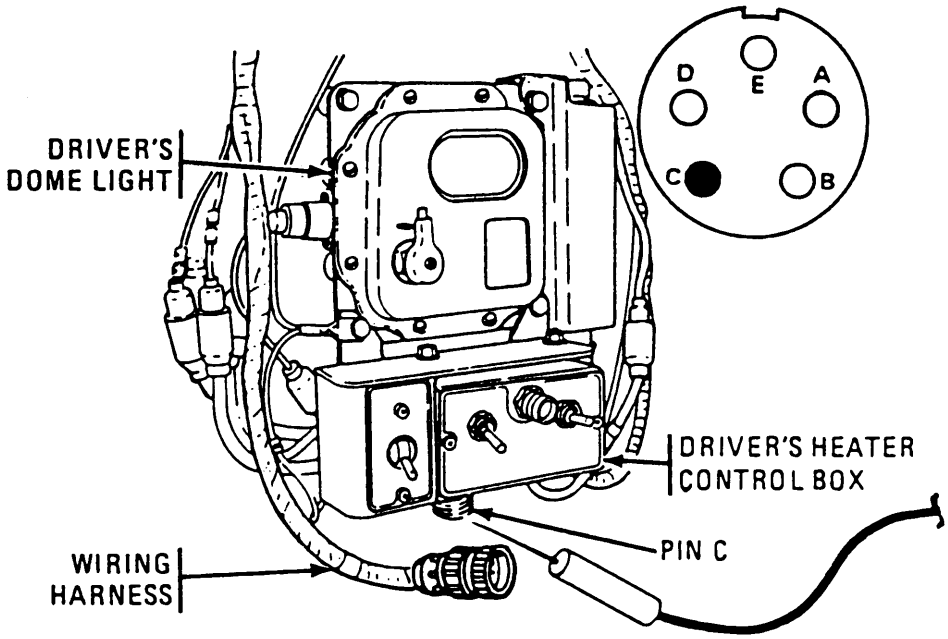


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 1. Disconnect wiring harness from driver's heater control box. Place red probe on pin D (lead 411). Ground black probe. Set MASTER switch ON. Set START-OFF-RUN switch to START. If multimeter indicates about 24 volts, go to step 2. If multimeter indicates no voltage, replace driver's heater control box. Refer to page 2-1029. Set MASTER switch OFF. Set START-OFF-RUN switch OFF. Connect wiring harness.

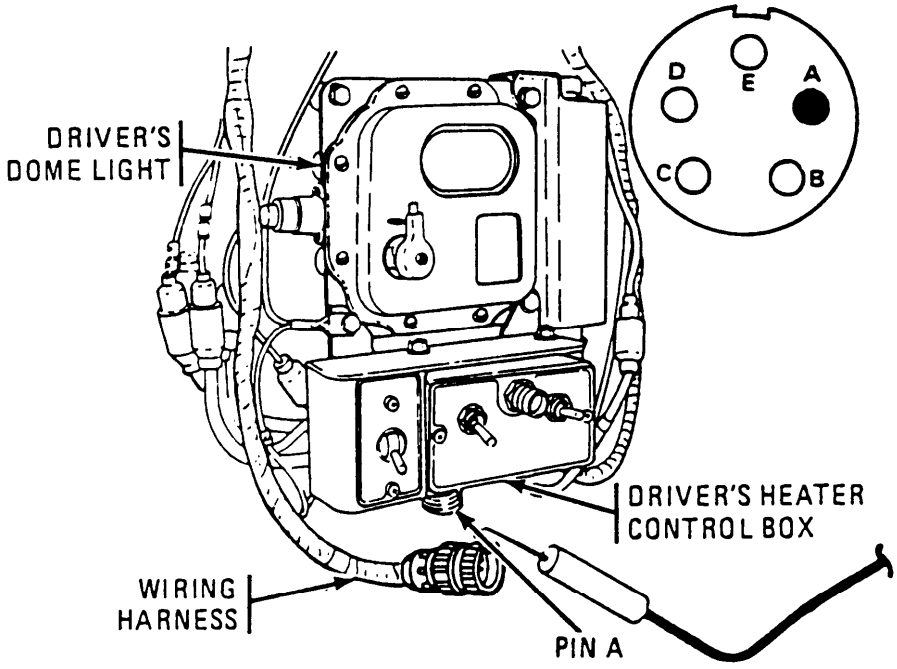
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Place red probe on pin C (lead 401). Ground black probe. Set MASTER switch ON. Set START-OFF-RUN switch to START. If multimeter indicates about 24 volts, go to step 3. If multimeter indicates no voltage, replace driver's heater control box. Refer to page 2-1029. Set MASTER switch OFF. Set START-OFF-RUN switch OFF. Connect wiring harness.

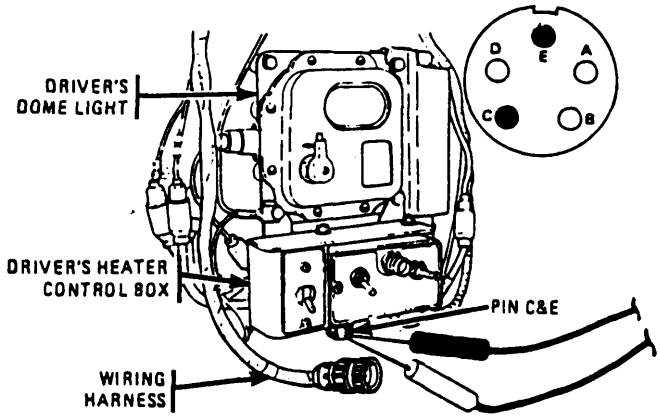


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. Place red probe on pin A (lead 402 R). Ground black probe. Set MASTER switch ON. Set START-OFF-RUN switch to START, then to RUN. If multimeter indicates about 24 volts in both switch settings, go to step 4. If multimeter indicates no voltage in both switch settings, replace driver's heater control box. Refer to page 2-1029. Set MASTER switch OFF. Set START-OFF-RUN switch OFF. Connect wiring harness.

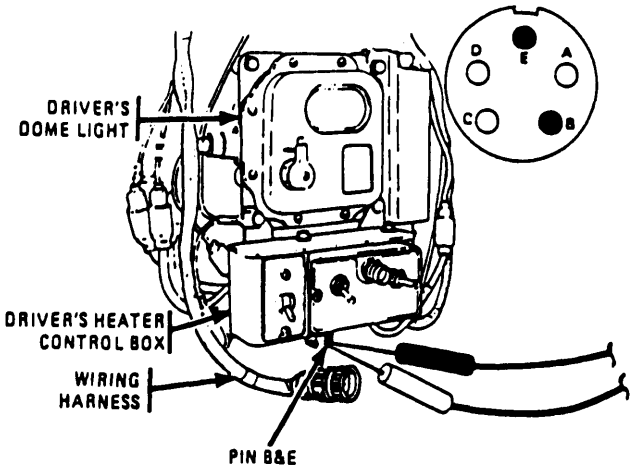
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



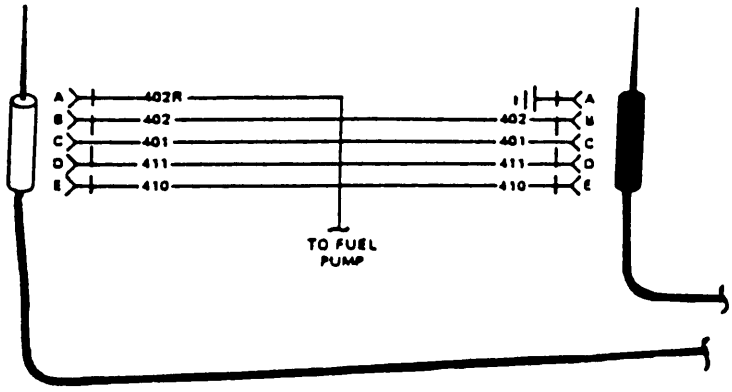
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 4. Place red probe on pin E (lead 410). Place black probe on pin C (lead 401). Set MASTER switch ON. Set START-OFF-RUN switch to RUN. If multimeter indicates 0 ohms, go to step 5. If multimeter indicates infinity, replace driver's heater control box. Refer to page 2-1029. Set MASTER switch OFF. Set START-OFF-RUN switch OFF. Connect wiring harness.

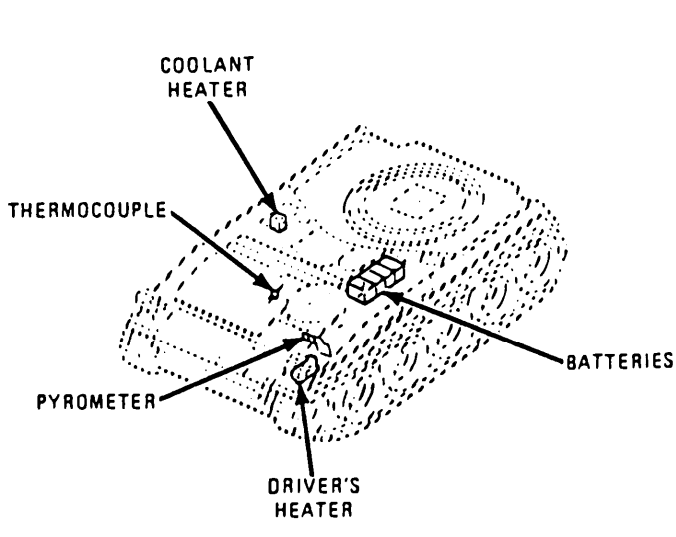


Step 5. Place red probe on pin E (lead 410). Place black probe on pin B (lead 402). Set HI-LO switch to Hl. If multimeter indicates 0 ohms, go to step 6. If multimeter indicates infinity, replace driver's heater control box. Refer to page 2-1029. Connect wiring harness.

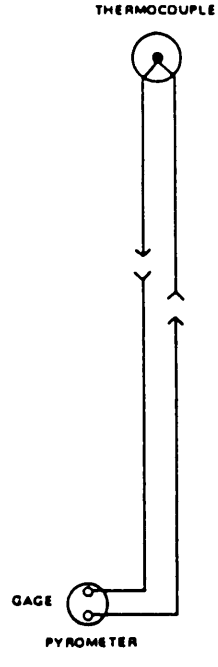


Step 6. Disconnect wiring harness from driver's heater. Check continuity on each lead in wiring harness. If multimeter indicates 0 ohms at each lead in wiring harness, replace driver's heater. Refer to page 2-1068. If multimeter indicates infinity at any lead in wiring harness, repair wiring harness. Refer to page 2-371. Connect wiring harness.

BJ. PYROMETER CIRCUIT.

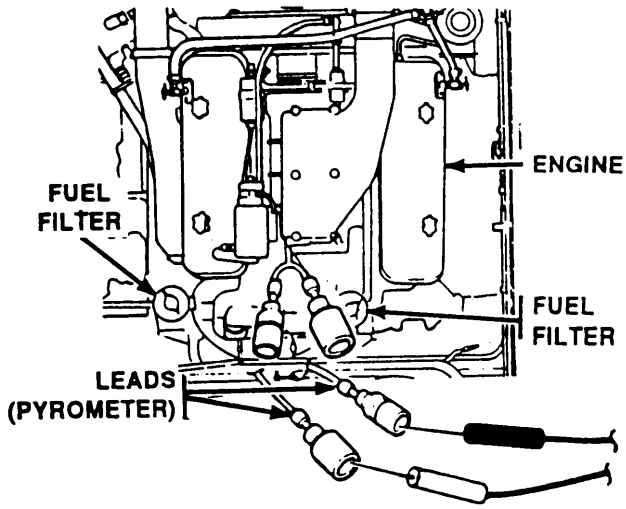


PICTORIAL VIEW

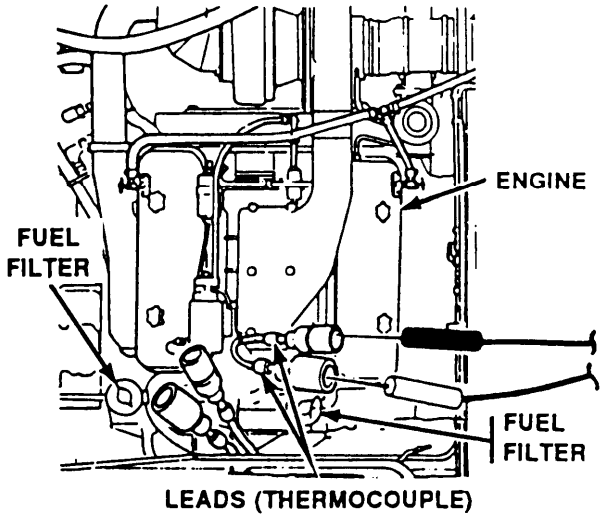


ELECTRICAL DIAGRAM

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

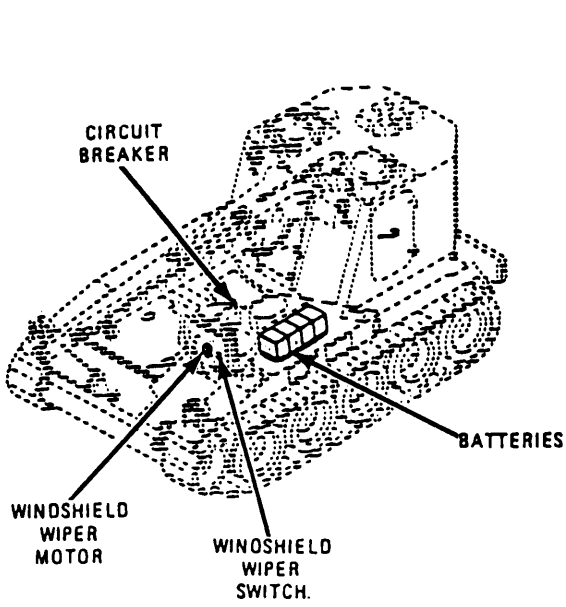


Step 1. Disconnect leads from pyrometer and thermocouple. Connect multimeter to pyrometer leads. If multimeter indicates 0 ohms, go to step 2. If multimeter indicates infinity, replace pyrometer. Refer to page 2-1053. Connect leads.

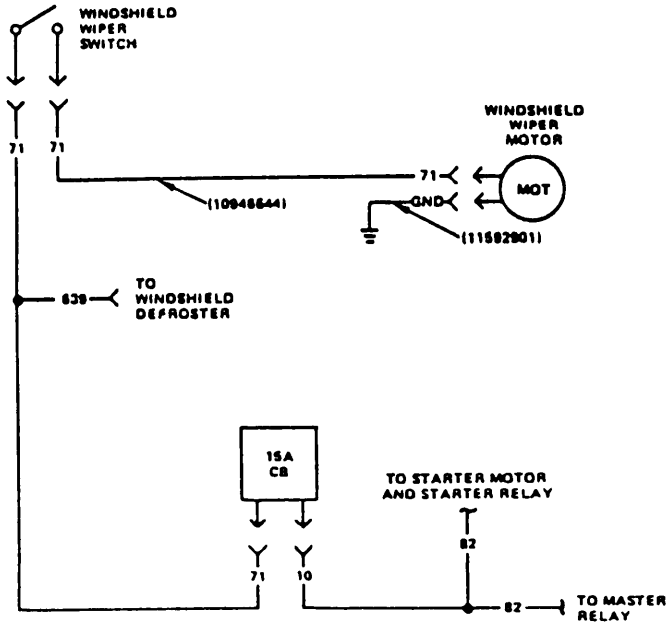


Step 2. Connect multimeter to thermocouple leads. If multimeter indicates 0 ohms, the pyrometer circuit is operating normally. If multimeter indicates infinity, replace thermocouple. Refer to page 2-1029. Connect leads.

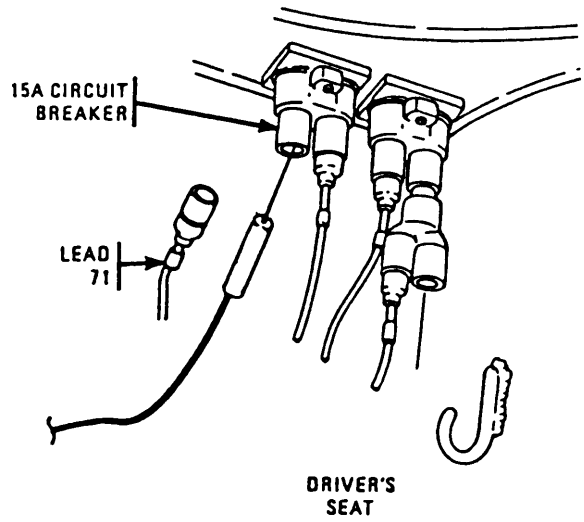
BK. WINDSHIELD WIPER CIRCUIT.



PICTORIAL VIEW

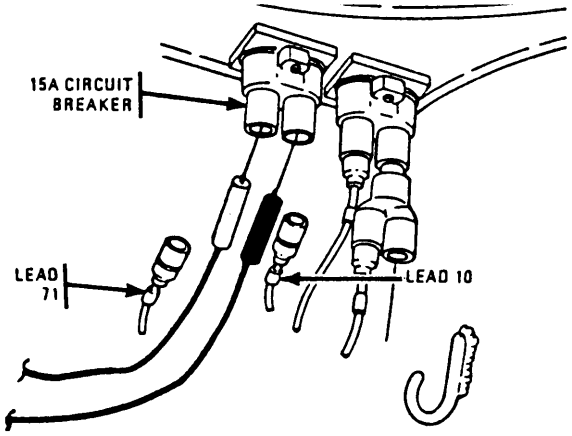


ELECTRICAL DIAGRAM

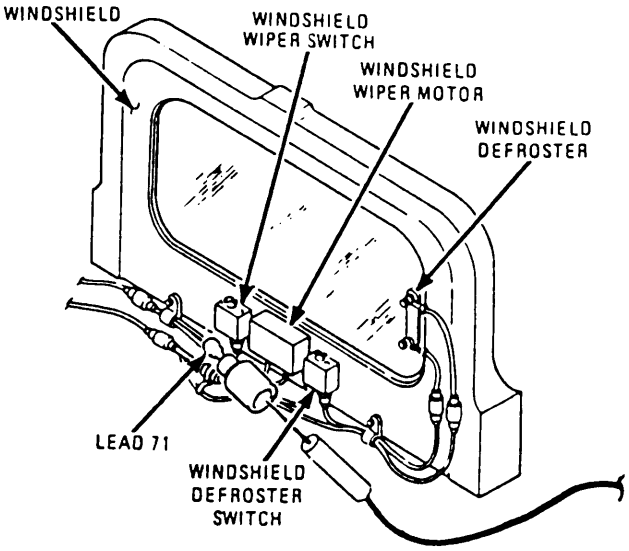


Step 1. Remove lead 71 from circuit breaker (near driver's seat). Place red probe in circuit breaker receptacle. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 3. If multimeter indicates no voltage, go to step 2. Set MASTER switch OFF. Connect lead.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



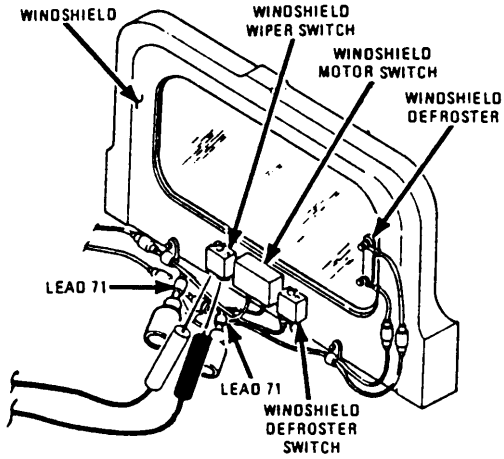
Step 2. Remove lead 10 from circuit breaker. Connect multimeter to circuit breaker receptacles. If multimeter indicates 0 ohms, go to step 3. If multimeter indicates infinity, replace circuit breaker. Refer to page 2-584. Connect leads.



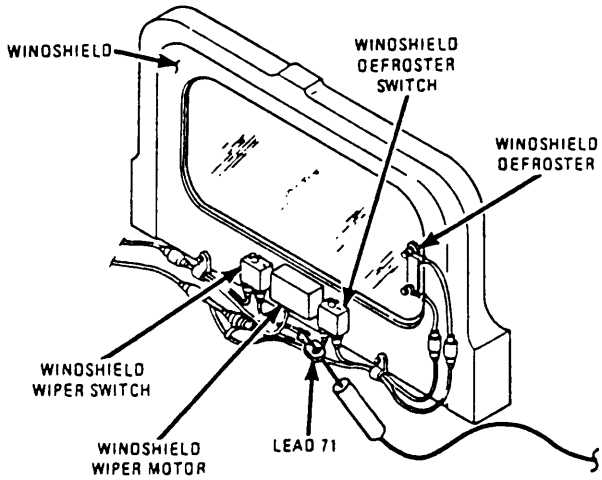
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. Disconnect lead 71 from windshield wiper switch. Place red probe in lead 71. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 4. If multimeter indicates no voltage, repair lead 71 between 15A circuit breaker and windshield wiper switch. Refer to page 2-371. Set MASTER switch OFF. Connect lead.



Step 4. Disconnect other lead 71 from windshield wiper switch. Connect multimeter to windshield wiper switch. Set windshield wiper switch ON. If multimeter indicates 0 ohms, go to step 5. If multimeter indicates infinity, replace windshield wiper switch. Refer to page 2-1073. Set windshield wiper switch OFF. Connect leads.

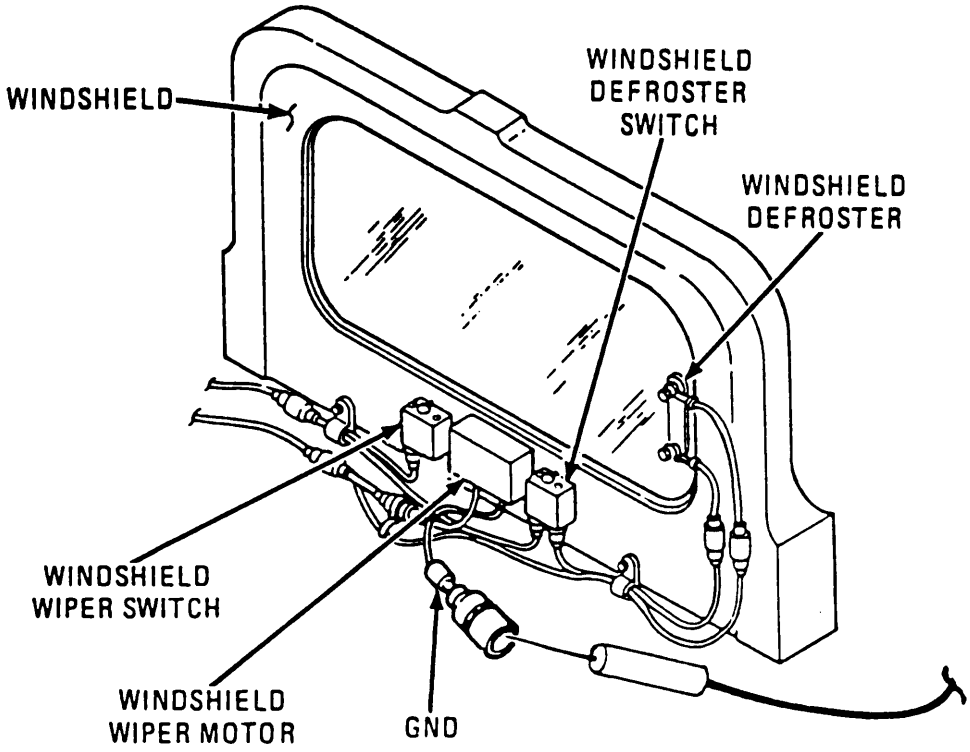


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 5. Disconnect lead 71 from windshield wiper motor. Place red probe in windshield wiper motor lead. Ground black probe. Set MASTER switch ON. Set windshield wiper switch ON. If multimeter indicates about 24 volts, go to step 6. If multimeter indicates no voltage, repair lead 71 between windshield wiper motor and windshield wiper switch. Refer to page 2-371. Set MASTER switch OFF. Set windshield wiper switch OFF. Connect lead.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

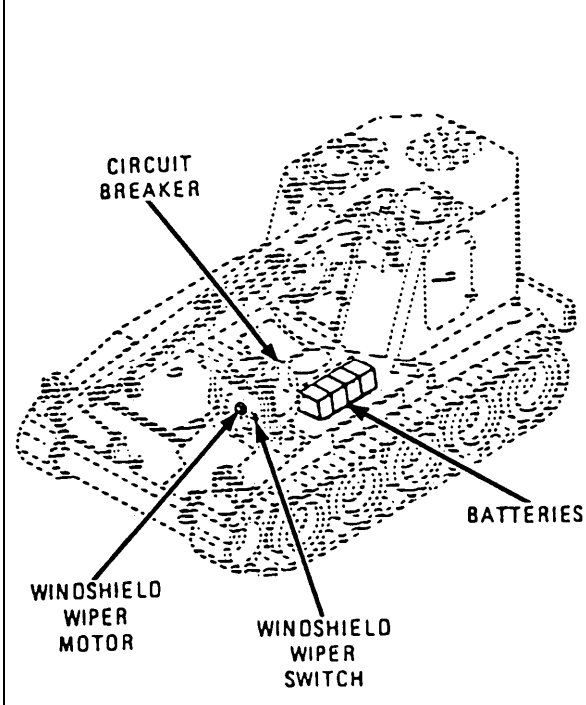


WARNING

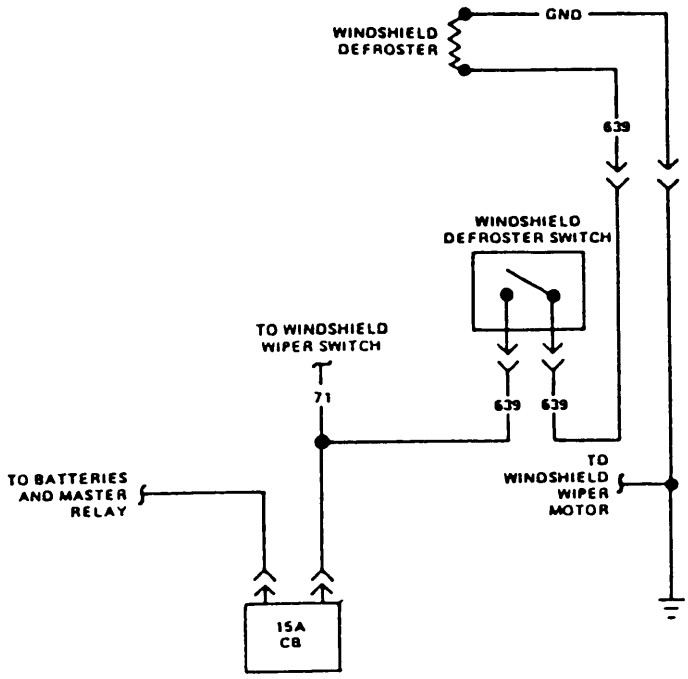
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 6. Disconnect windshield wiper motor ground lead (GND) from windshield wiper motor plug. Place red probe on windshield motor ground connection. Ground black probe. Set MASTER switch ON. Set windshield wiper switch ON. If multimeter indicates about 24 volts, replace windshield wiper motor. Refer to page 2-1073. If multimeter indicates no voltage, repair windshield motor ground lead. Refer to page 2-371. Set MASTER switch OFF. Set windshield wiper switch OFF. Connect lead.

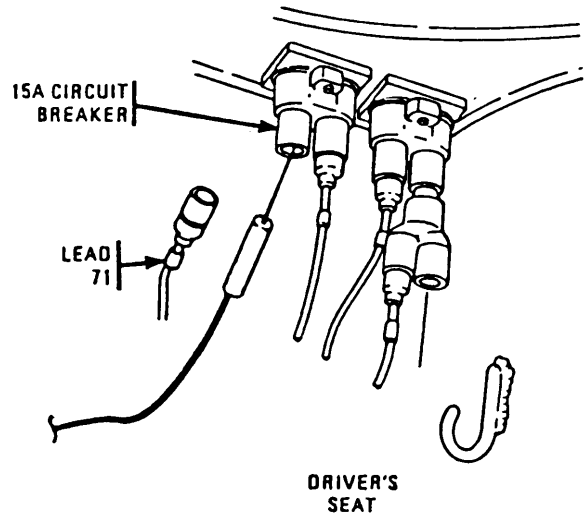
BL. WINDSHIELD DEFROSTER CIRCUIT.



PICTORIAL VIEW

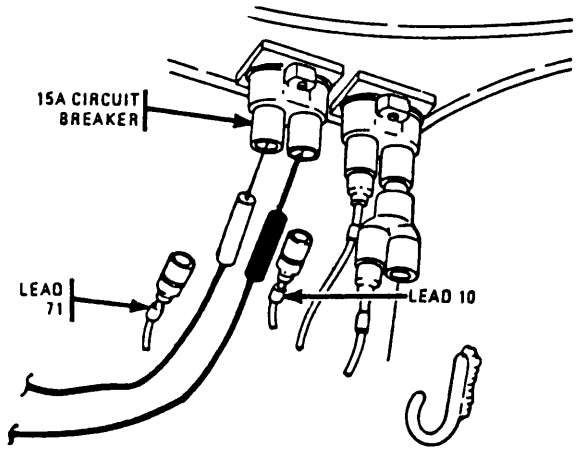


ELECTRICAL DIAGRAM

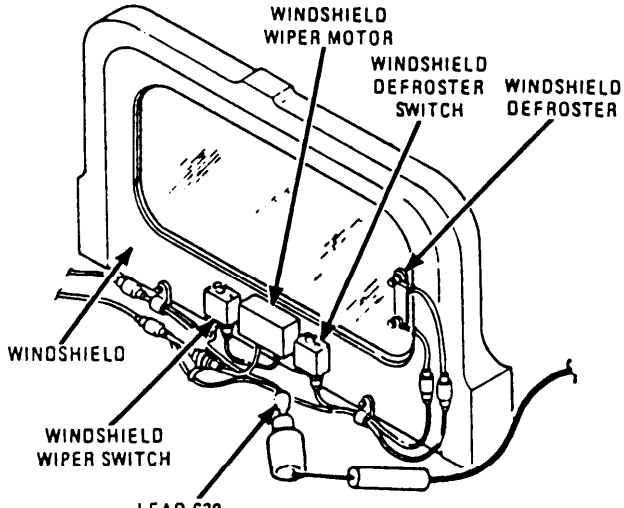


Step 1. Remove lead 71 from 15A circuit breaker (near driver's seat). Place red probe in 15A circuit breaker receptacle. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 3. If multimeter indicates no voltage, go to step 2. Set MASTER switch OFF. Connect lead.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



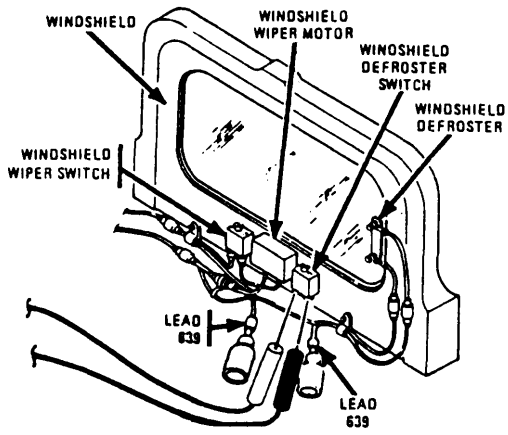
Step 2. Remove lead 10 from 15A circuit breaker. Connect multimeter to 15A circuit breaker receptacles. If multimeter indicates 0 ohms, go to step 3. If multimeter indicates infinity, replace 15A circuit breaker. Refer to page 2-584. Connect leads.



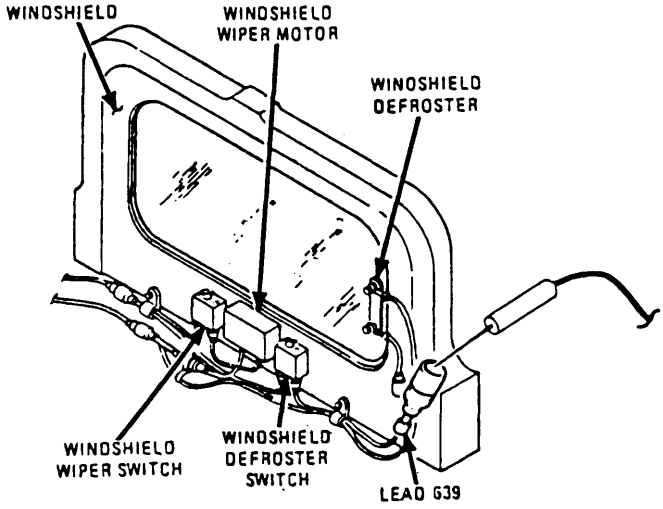
WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 3. Disconnect lead 639 from windshield defroster switch. Place red probe in lead 639. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 4. If multimeter indicates no voltage, repair lead 639 between 15A circuit breaker and windshield defroster switch. Refer to page 2-371. Set MASTER switch OFF. Connect lead.



Step 4. Disconnect other lead 639 from windshield defroster switch. Connect multimeter to windshield defroster switch. Set windshield defroster switch ON. If multimeter indicates 0 ohms, go to step 5. If multimeter indicates infinity, replace windshield defroster switch. Refer to page 2-1073. Set windshield defroster switch OFF. Connect leads.

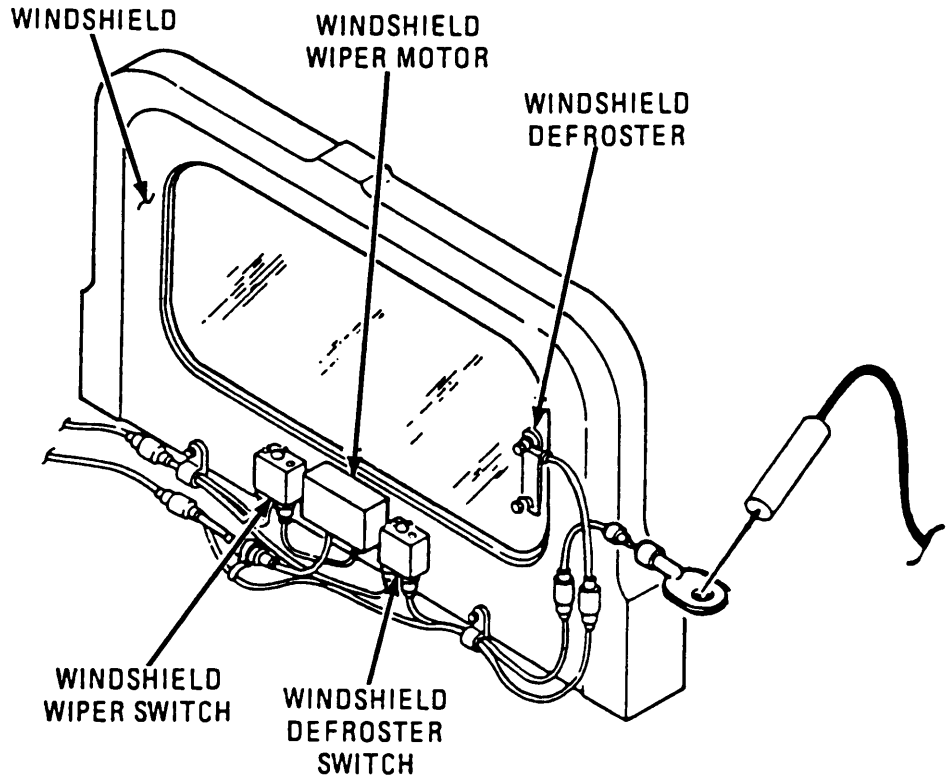


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 5. Disconnect lead 639 from windshield defroster disconnect. Place red probe in lead 639. Ground black probe. Set MASTER switch ON. Set windshield defroster switch ON. If multimeter indicates about 24 volts, go to step 6. If multimeter indicates no voltage, repair lead ,639 between windshield defroster switch and windshield defroster disconnect. Refer to page 2-371. Set MASTER switch OFF. Set windshield defroster switch OFF. Connect lead.

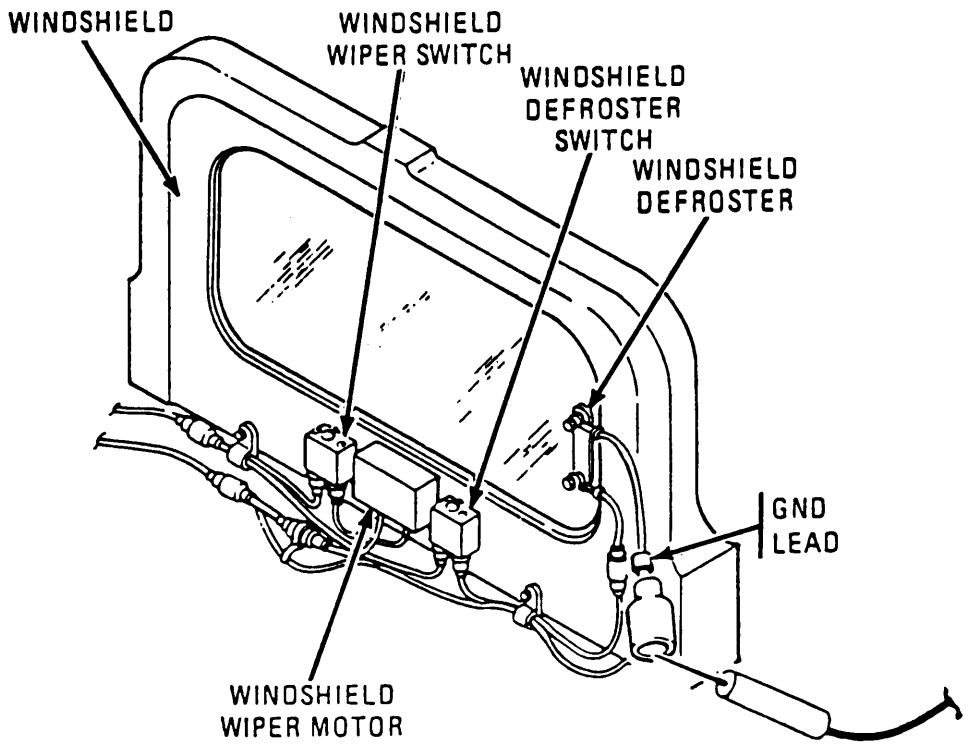
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 6. Disconnect lead 639 from windshield defroster. Place red probe in lead 639. Ground black probe. Set MASTER switch ON. Set windshield defroster switch ON. If multimeter indicates about 24 volts, go to step 7. If multimeter indicates no voltage, repair lead 639 between windshield defroster and windshield defroster disconnect. Refer to page 2-371. Set MASTER switch OFF. Set windshield defroster switch OFF. Connect lead.

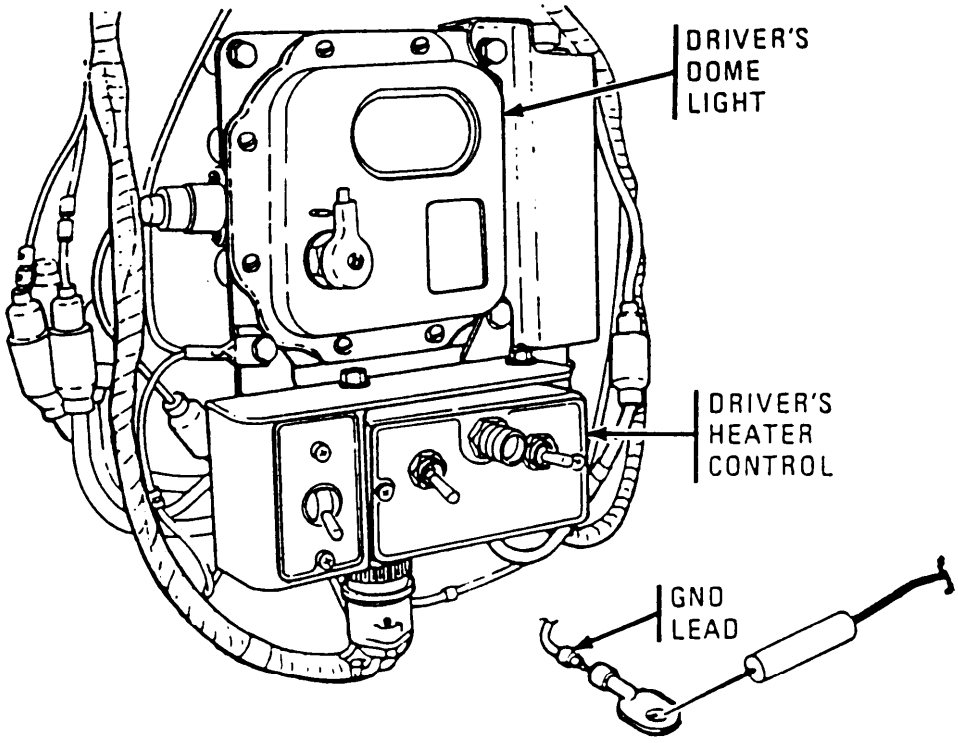


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 7. Disconnect GND lead from windshield defroster disconnect. Place red probe in GND lead. Ground black probe. Set MASTER switch ON. Set windshield defroster switch ON. If multimeter indicates about 24 volts, go to step 8. If multimeter indicates no voltage, repair GND lead between windshield defroster and windshield defroster disconnect. Refer to page 2-371. If multimeter still indicates no voltage, replace windshield. Refer to page 2-1073. Set MASTER switch OFF. Set windshield defroster switch OFF. Connect lead.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

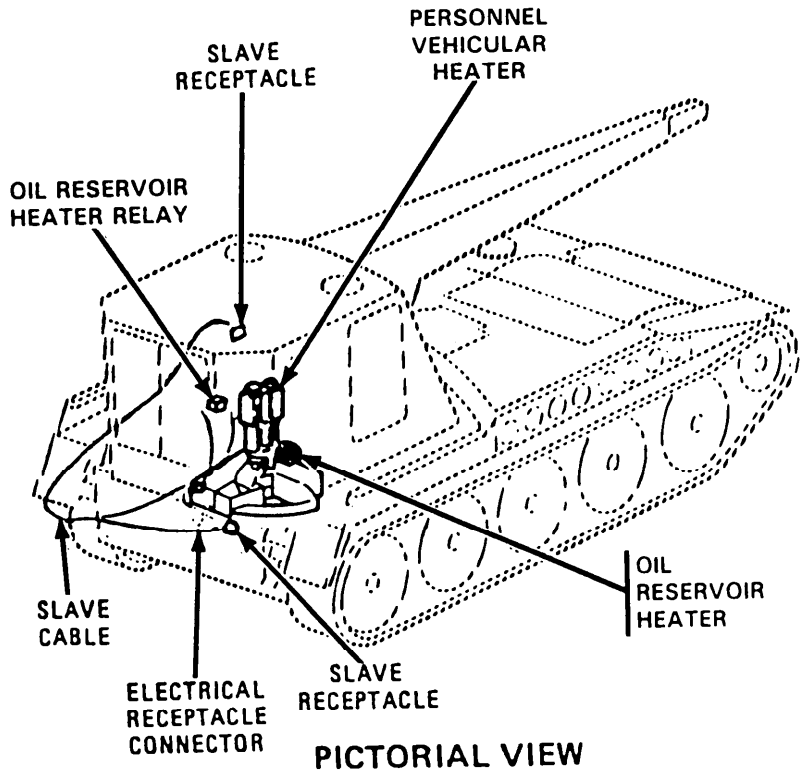


WARNING

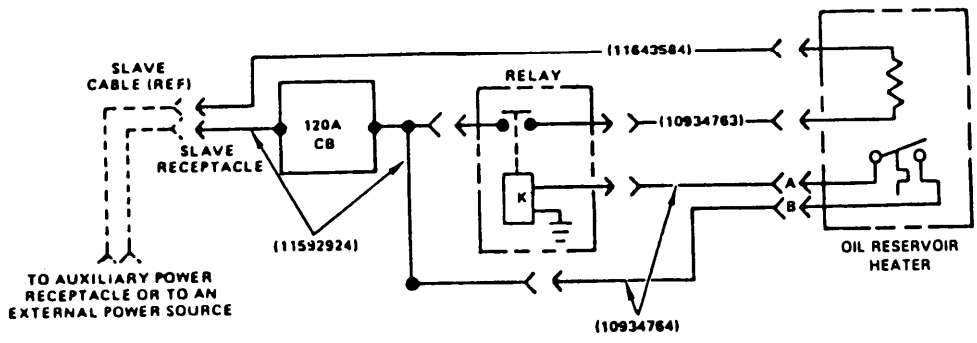
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 8. Disconnect GND lead from driver's dome light. Place red probe in GND lead. Ground black probe. Set MASTER switch ON. Set windshield defroster switch ON. If multimeter indicates about 24 volts, windshield defroster circuit is operating normally. If multimeter indicates no voltage, repair GND lead between windshield defroster disconnect and driver's dome light. Refer to page 2-371. Set MASTER switch OFF. Set windshield defroster switch OFF. Connect lead.

BM. OIL RESERVOIR HEATER KIT.

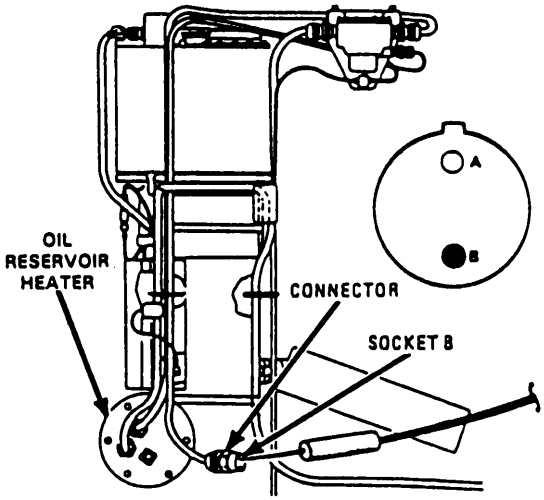


PICTORIAL VIEW

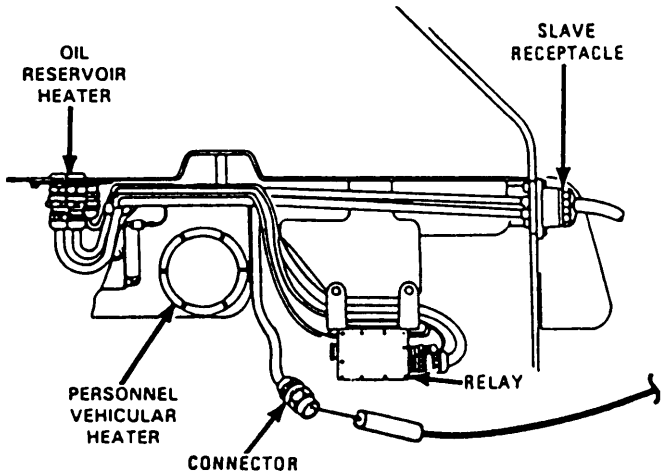


ELECTRICAL DIAGRAM

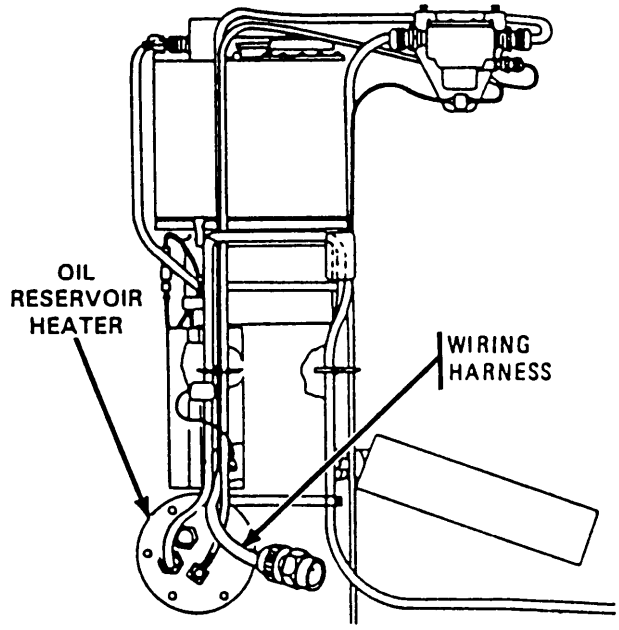
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



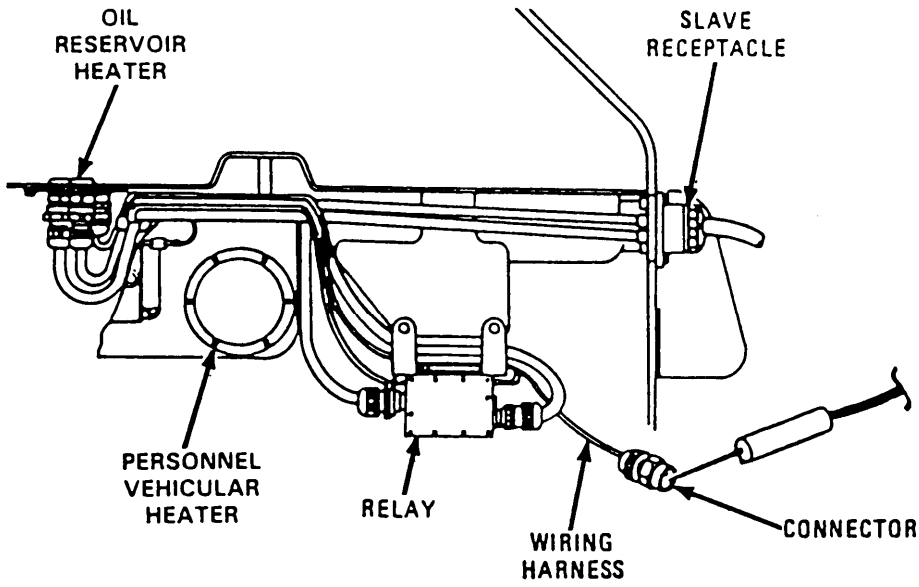
Step 1. Connect 24-volt power source to oil reservoir heater slave receptacle. Disconnect overheat thermostat to relay branched wiring harness from oil reservoir heater. Place red probe in socket B. Ground black probe. If multimeter indicates about 24 volts, go to step 2. If multimeter indicates no voltage, repair overheat thermostat to relay branched wiring harness. Refer to page 2-371. Connect wiring harness.



Step 2. Disconnect relay and disconnect to slave receptacle special cable assembly from relay. Place red probe in connector. Ground black probe. If multimeter indicates about 24 volts, go to step 3. If multimeter indicates no voltage, repair relay and disconnect to slave receptacle special cable assembly between relay and circuit breaker. Refer to page 2-584. Connect lead.

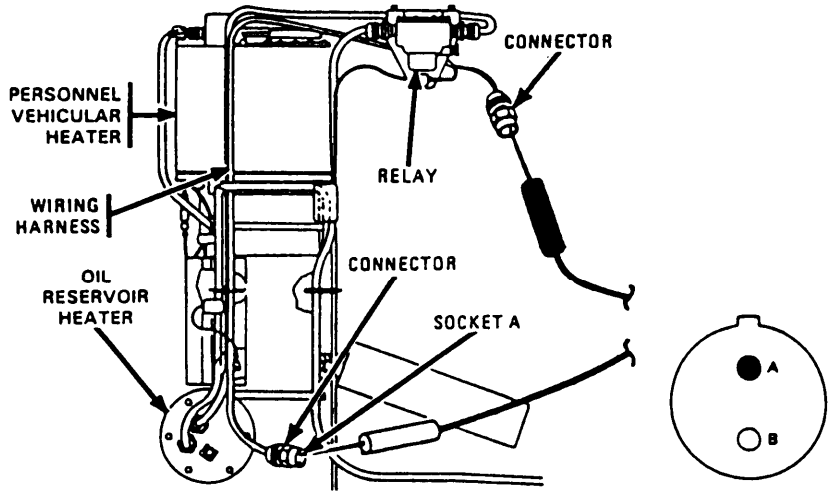


Step 3. Disconnect overheat thermostat to relay branched wiring harness from oil reservoir heater. Connect overheat thermostat to relay branched wiring harness to oil reservoir heater. If relay actuates, go to step 4. If relay does not actuate, go to step 6.

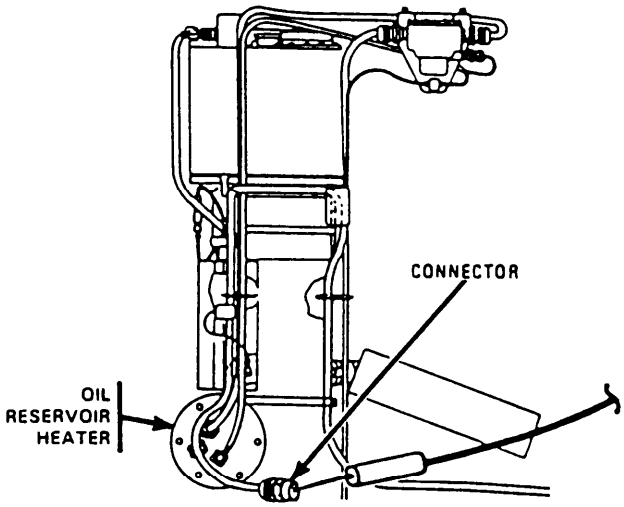


Step 4. Disconnect overheat thermostat to relay branched wiring harness from relay. Place red probe in connector. Ground black probe. If multimeter indicates about 24 volts, go to step 5. If multimeter indicates no voltage, replace relay. Refer to page 2-1088. Connect wiring harness.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

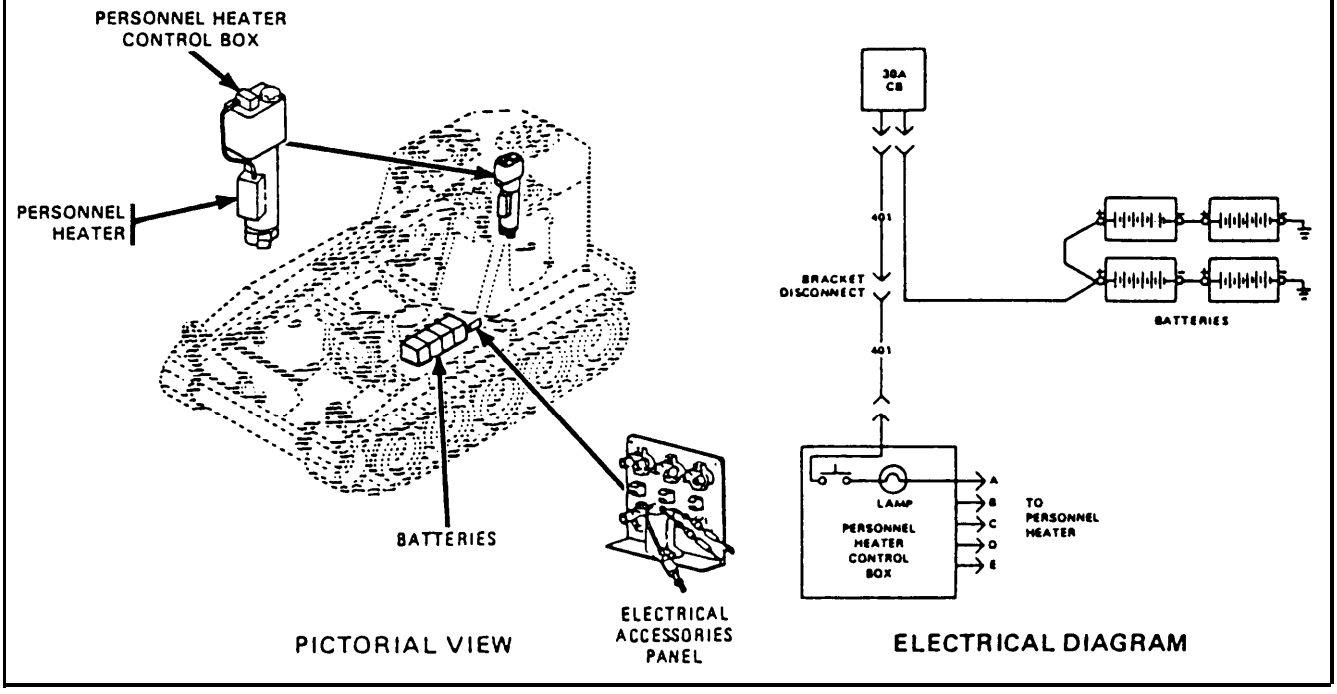


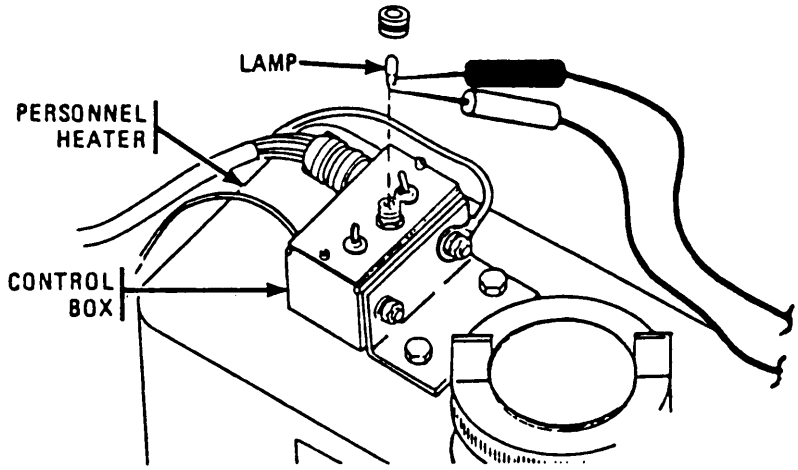
Step 5. Disconnect overheat thermostat to relay branched wiring harness from oil reservoir heater and relay. Place red probe in socket A (from oil reservoir heater). Place black probe in connector (from relay). If multimeter indicates continuity, replace oil reservoir heater. Refer to page 2-1088. If multimeter indicates infinity, repair wiring harness 10934784 between oil reservoir heater and relay. Refer to page 2-371. Connect wiring harness.



Step 6. Disconnect heating element to slave electrical lead from oil reservoir heater. Place red probe in connector. Ground black probe. If multimeter indicates about 24 volts, replace oil reservoir heater. Refer to page 2-1088. If multimeter indicates no voltage, repair heating element to slave electrical lead between oil reservoir heater and slave receptacle. Refer to page 2-371. Connect lead.

BN. PERSONNEL HEATER CONTROL BOX LIGHT CIRCUIT.



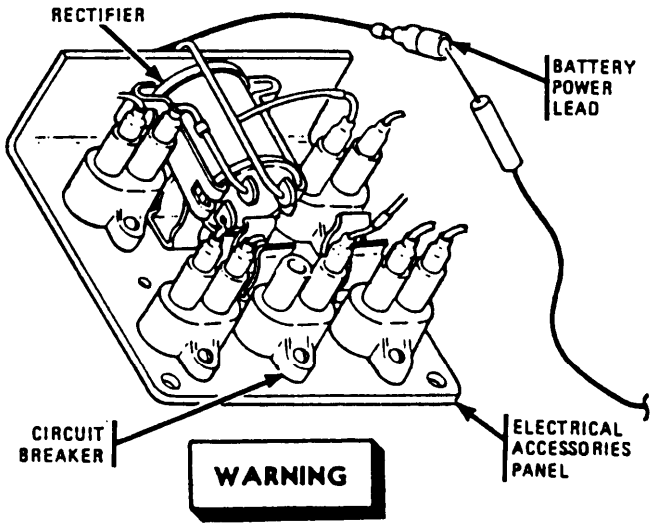


WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

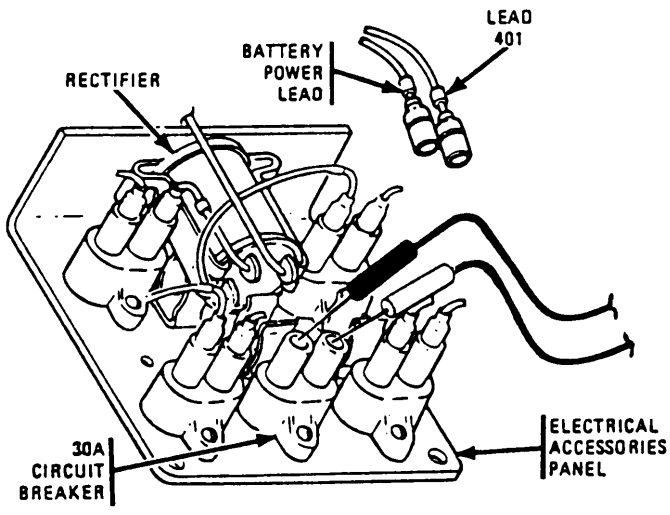
Step 1. Remove lamp from personnel heater control box. Refer to page 2-1055. Connect multimeter to contacts of lamp. If multimeter indicates about 75 ohms, go to step 2. If multimeter indicates 0 ohms, replace lamp. Refer to page 2-1055.

2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

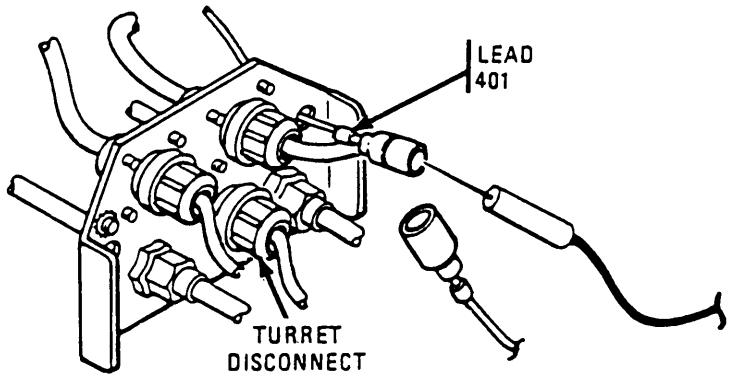


Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. To access personnel heater circuit breaker, remove left CO_2 cylinder cover. Refer to page 2-923. Disconnect battery power lead from circuit breaker. Place red probe in battery power lead. Ground black probe. If multimeter indicates about 24 volts, go to step 3. If multimeter indicates no voltage, repair battery power lead. Refer to page 2-371. If problem still exists, troubleshoot battery power circuit. Refer to page 2-82. Connect lead.



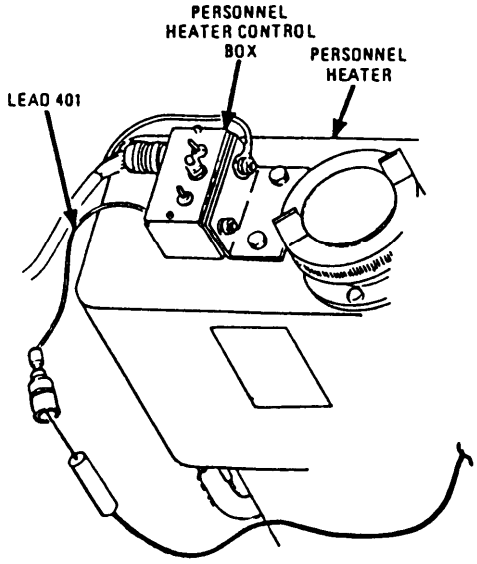
Step 3. Disconnect lead 401 from 30A circuit breaker. Connect multimeter to 30A circuit breaker receptacles. If multimeter indicates 0 ohms, go to step 4. If multimeter indicates infinity, replace 30A circuit breaker. Refer to page 2-590. Connect leads.



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

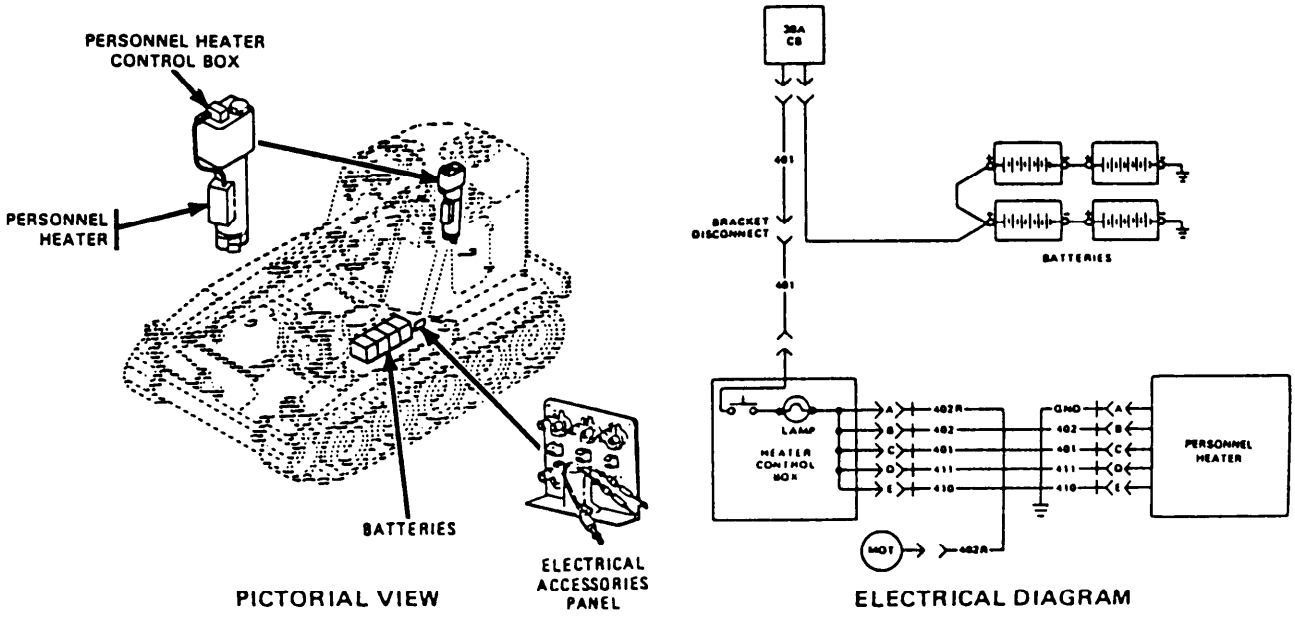
Step 4. Disconnect lead 401 at turret disconnect. Set MASTER switch ON. Place red probe in lead 401. Ground black probe. If multimeter indicates about 24 volts, go to step 5. If multimeter indicates no voltage, repair lead 401 between 30A circuit breaker and turret disconnect. Refer to page 2-371. Set MASTER switch OFF. Connect lead.

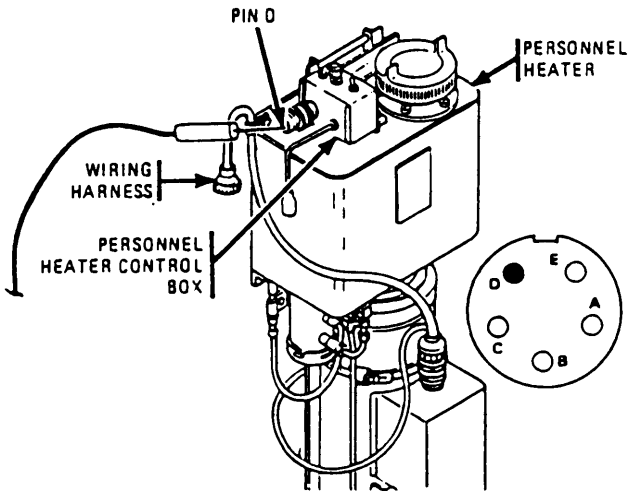


Step 5. Disconnect lead 401 from personnel heater control box. Set MASTER switch ON. Place red probe in lead 401. Ground black probe. If multimeter indicates about 24 volts, replace personnel heater control box. Refer to page 2-1103. If multimeter indicates no voltage, repair lead 401 between turret disconnect and personnel heater control box. Refer to page 2-371. Set MASTER switch OFF. Connect lead.

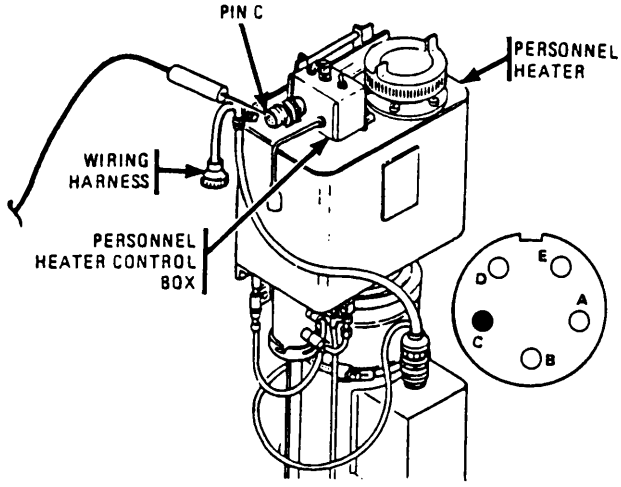
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).

BO. PERSONNEL HEATER CIRCUIT.

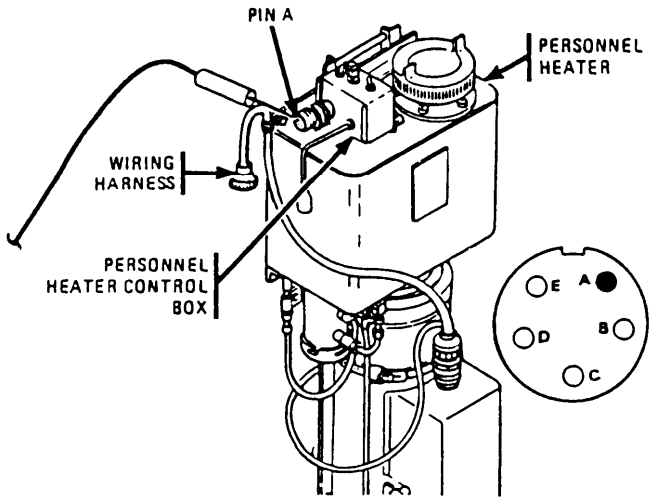




Step 1. Disconnect wiring harness from personnel heater control box. Place red probe on pin D (lead 411). Ground black probe. Set START-OFF-RUN switch to START. If multimeter indicates about 24 volts, go to step 2. If multimeter indicates no voltage, replace personnel heater control box. Refer to page 2-1103. Set START-OFF-RUN switch OFF. Connect wiring harness.

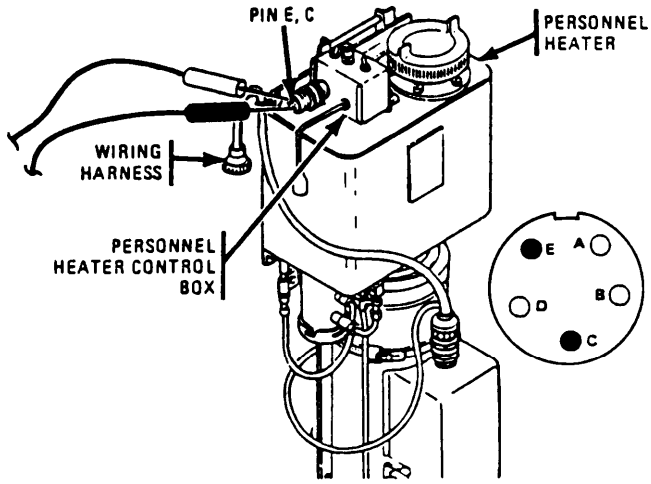


Step 2. Place red probe on pin C (lead 401). Ground black probe. Set START-OFF-RUN switch to START. If multimeter indicates about 24 volts, go to step 3. If multimeter indicates no voltage, replace personnel heater control box. Refer to page 2-1103. Set START-OFF-RUN switch OFF. Connect wiring harness.

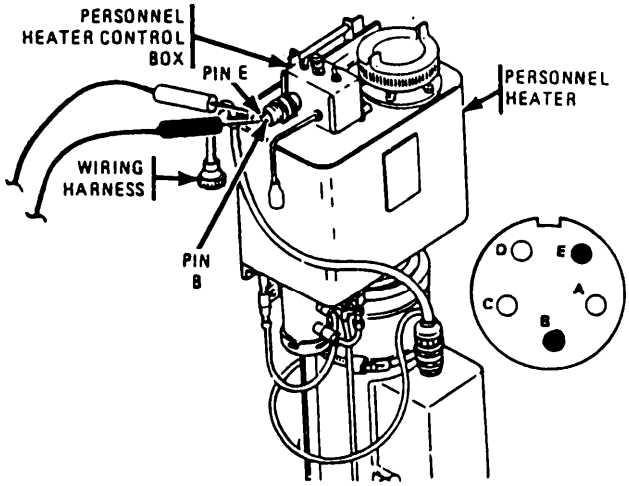


Step 3. Place red probe on pin A (lead 402 R). Ground black probe. Set START-OFF-RUN switch to START, then to RUN. If multimeter indicates about 24 volts in both switch settings, go to step 4. If multimeter indicates no voltage in both switch settings, replace personnel heater control box. Refer to page 2-1103. Set START-OFF-RUN switch OFF. Connect wiring harness.

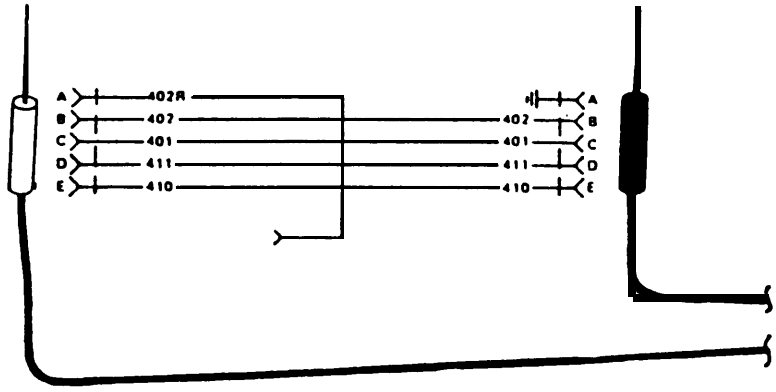
2-120 ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step **4.** Place red probe on pin E (lead 410). Place black probe on pin C (lead 401). Set START-OFF-RUN switch to RUN. If multimeter indicates 0 ohms, go to step 5. If multimeter indicates infinity, replace personnel heater control box. Refer to page 2-1103. Set START-OFF-RUN switch OFF. Connect wiring harness.

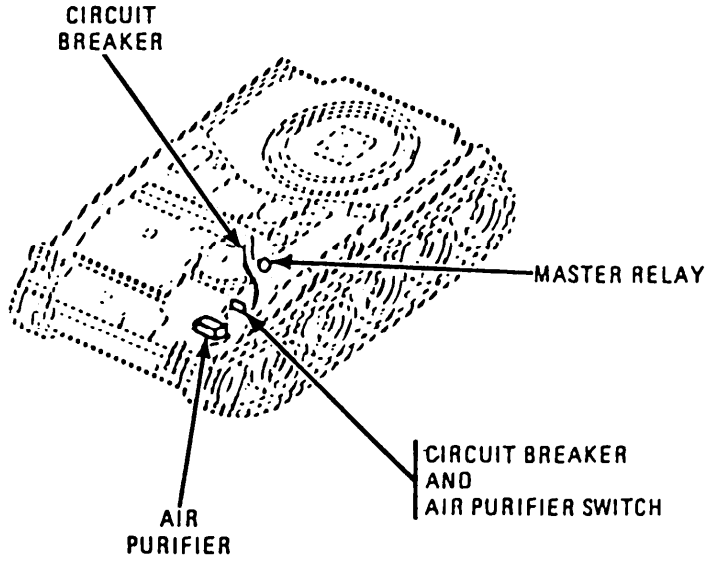


Step 5. Place red probe on pin E (lead 410). Place black probe on pin B (lead 402). Set HI-LO switch to HI. If multimeter indicates 0 ohms, go to step 6. If multimeter indicates infinity, replace personnel heater control box. Refer to page 2-1103. Connect wiring harness.



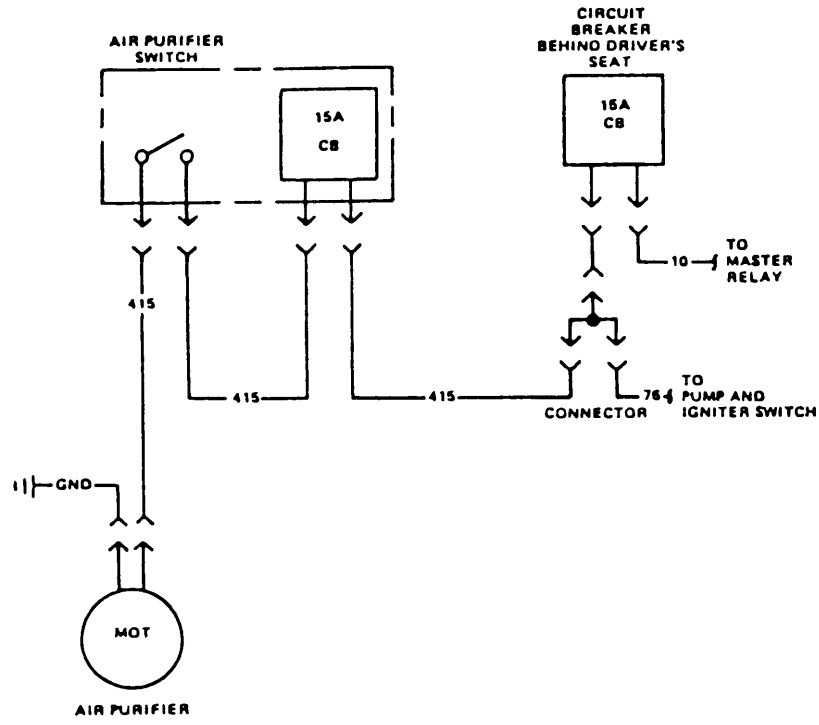
Step 6. Disconnect wiring harness from personnel heater. Check continuity on each lead in wiring harness. If multimeter indicates 0 ohms at each lead in wiring harness, replace personnel heater. Refer to page 2-1103. If multimeter indicates infinity at any lead in wiring harness, repair wiring harness. Refer to page 2-371. Connect wiring harness.

BP. DRIVER'S AIR PURIFIER CIRCUIT.

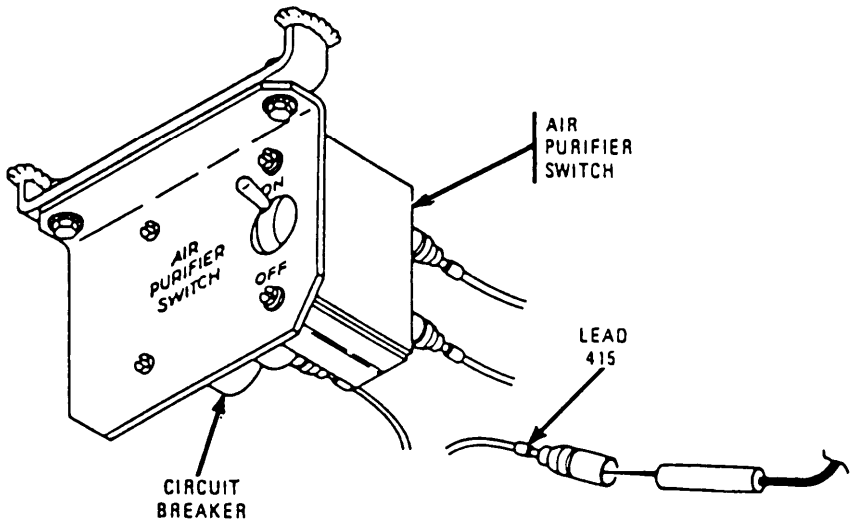


PICTORIAL VIEW

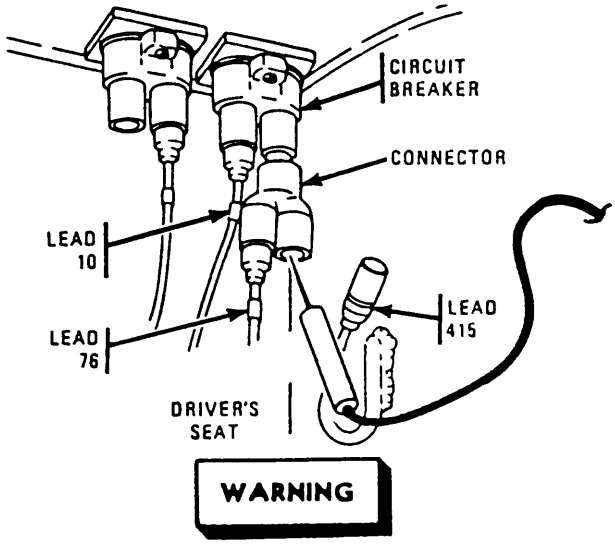
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



ELECTRICAL DIAGRAM



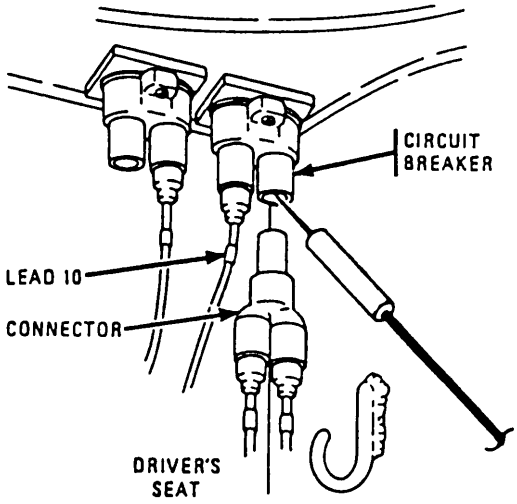
Step 1. Disconnect lead 415 from input side of circuit breaker. Place red probe in lead 415. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 5. If multimeter indicates no voltage, go to step 2. Set MASTER switch OFF. Connect lead.



WARNING

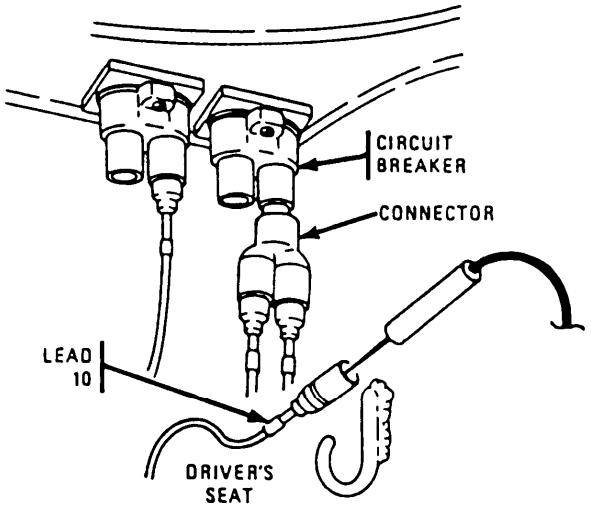
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 2. Disconnect lead 415 from circuit breaker connector (behind driver's seat). Place red probe in circuit breaker connector. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, repair lead 415 between circuit breaker connector and circuit breaker. Refer to page 2-371. If multimeter indicates no voltage, go to step 3. Set MASTER switch OFF. Connect lead.

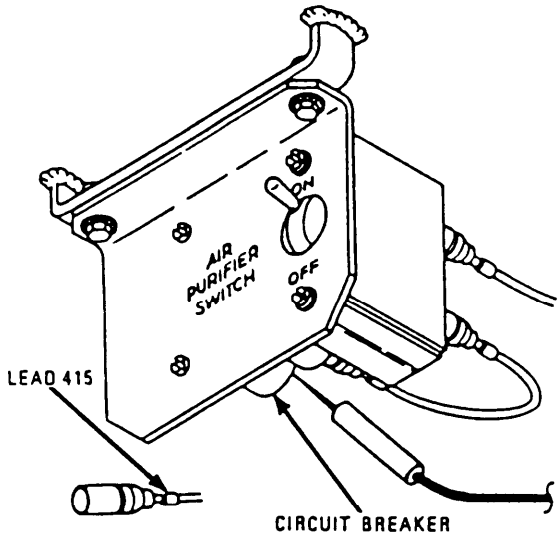


Step 3. Disconnect circuit breaker connector from circuit breaker. Place red probe in circuit breaker. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, replace circuit breaker connector. Refer to page 2-371. If multimeter indicates no voltage, go to step 4. Set MASTER switch OFF. Connect lead.

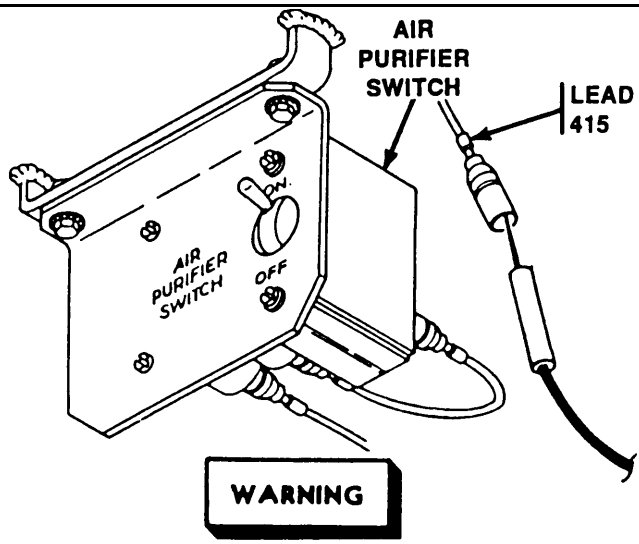
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



Step 4. Disconnect lead 10 from circuit breaker. Place red probe in lead 10. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, replace circuit breaker. Refer to page 2-584. If multimeter indicates no voltage, troubleshoot master switch circuit. Refer to page 2-85. Set MASTER switch OFF. Connect lead.



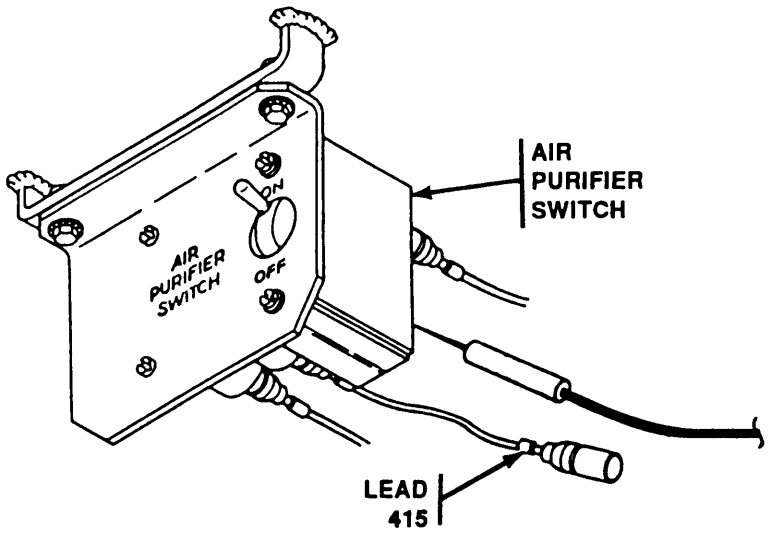
Step 5. Disconnect lead 415 from output side of circuit breaker. Place red probe in circuit breaker. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 6. If multimeter indicates no voltage, replace circuit breaker. Refer to page 2-584. Set MASTER switch OFF. Connect lead.



WARNING

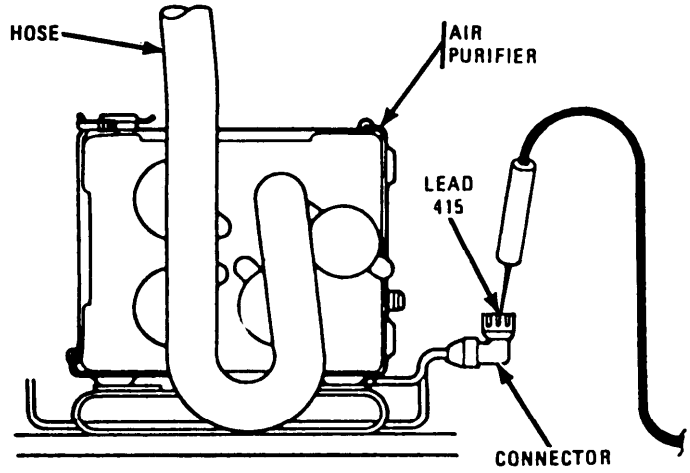
Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 6. Disconnect lead 415 from input side of AIR PURIFIER SWITCH. Place red probe in lead 415. Ground black probe. Set MASTER switch ON. If multimeter indicates about 24 volts, go to step 7. If multimeter indicates no voltage, repair lead 415 between circuit breaker and AIR PURIFIER SWITCH. Refer to page 2-371. Set MASTER switch OFF. Connect lead.



Step 7. Disconnect lead 415 from output side of AIR PURIFIER SWITCH. Place red probe in AIR PURIFIER SWITCH. Ground black probe. Set MASTER switch ON. Set AIR PURIFIER SWITCH ON. If multimeter indicates about 24 volts, go to step 8. If multimeter indicates no voltage, replace AIR PURIFIER SWITCH. Refer to page 2-1176. Set MASTER switch OFF. Set AIR PURIFIER SWITCH OFF. Connect lead.

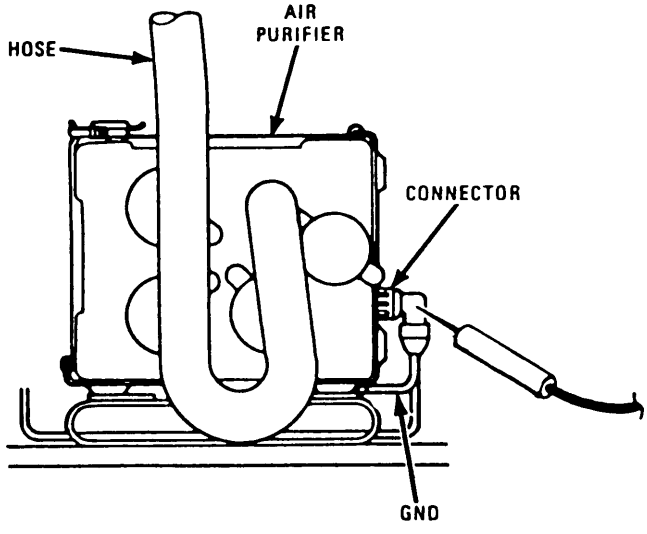
2-12. ELECTRICAL CIRCUIT TROUBLESHOOTING (CONT).



WARNING

Make sure MASTER switch is OFF before repairing electrical circuits. Failure to observe this warning could result in injury to personnel.

Step 8. Disconnect connector (lead 415) from air purifier motor. Place red probe in connector. Ground black probe. Set MASTER switch ON. Set AIR PURIFIER SWITCH ON. If multimeter indicates about 24 volts, go to step 9. If multimeter indicates no voltage, repair lead 415 between air purifier and AIR PURIFIER SWITCH. Refer to page 2-371. Set MASTER switch OFF. Set AIR PURIFIER SWITCH OFF. Connect connector.



Step 9. Place red probe on air purifier connector. Ground black probe. If multimeter indicates continuity, replace air purifier. Refer to page 2-1176. If multimeter indicates infinity, repair GND lead. Refer to page 2-371.

Section V. WIRING HARNESS AND CABLE REPAIR

2-13. GENERAL. This section contains instructions on repair of wiring harnesses and cables (leads). Repair of wiring harnesses and cables consists of replacement of defective connectors, shells, and terminals, or taping cut or worn insulation and exposed wire conductors. Pages 2-371 thru 2-377 show exploded views of typical harness and cable connectors used on the vehicle, and give procedures for disassembly and reassembly of connectors. When soldering is required, procedures in TB SIG-222 must be followed.

NOTE

Label cables on multiple receptacles during disassembly to ensure proper order during reassembly.

INITIAL SETUP

Tools and Special Tools

Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
- Electrical connector repair tool kit
- Hand wire stripper
- Soldering gun

Materials/Parts

Solder (item 43, appx C)

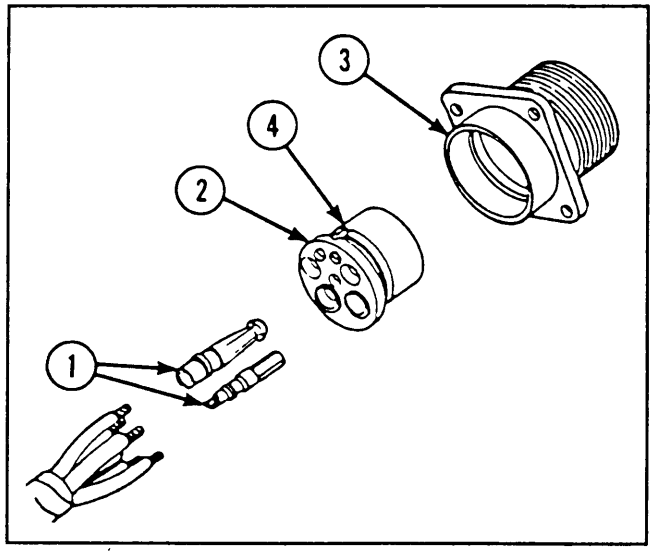
2-14. TYPICAL FEMALE-TYPE PANEL MOUNTING RECEPTACLE CONNECTOR.

DISASSEMBLY

1 Drive socket contacts (1) out through rear of insert (2) with pin extractor.

2 Unsolder cable leads from solder wells on socket contacts (1).

3 Slide insert out through rear of shell assembly (3).



REASSEMBLY

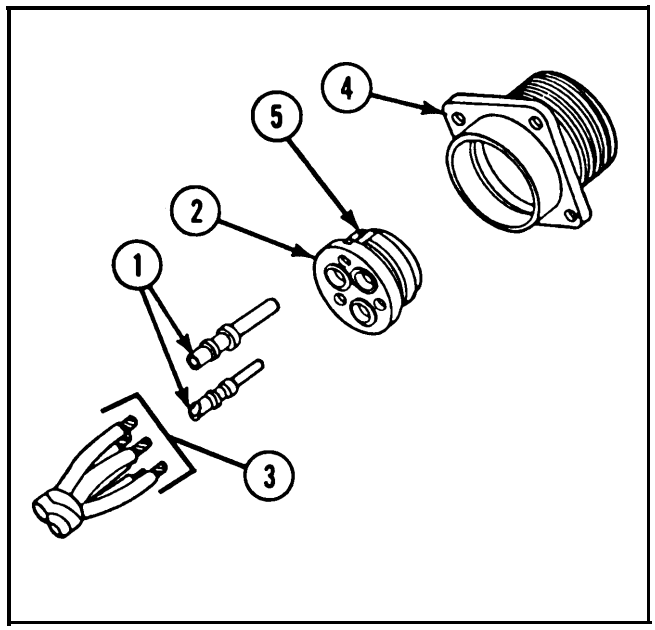
1 Strip cable insulation equal to depth of solder wells of socket contacts (1).

2 Insert cable leads into solder wells of socket contacts (1) and solder.

3 Push insert (2) into shell assembly (3) from rear until seated. Groove (4) in insert must be aligned with guide in shell assembly (3) to ensure proper fit.

4 Push socket contacts (1) into insert (2) from rear until seated.

2-15. TYPICAL MALE-TYPE PANEL MOUNTING RECEPTACLE CONNECTOR.



DISASSEMBLY

1 Drive pin contacts (1) out through rear of insert (2) with pin extractor.

2 Unsolder cable leads (3) from solder wells on pin contacts (1).

3 Slide insert (2) out through rear of shell assembly (4).

REASSEMBLY

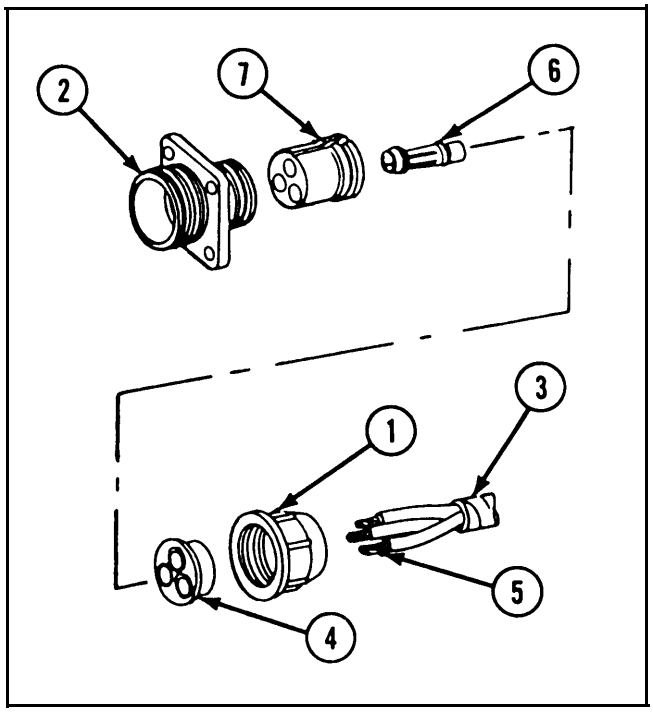
1 Strip cable insulation equal to depth of solder wells of pin contacts (1).

2 Insert cable leads (3) into solder wells of pin contacts (1) and solder.

3 Push insert (2) into shell assembly (4) from rear until seated. Groove (5) in insert must be aligned with guide in shell assembly (4) to ensure proper fit.

4 Push pin contacts (1) into insert (2) from rear until seated.

2-16. TYPICAL FEMALE-TYPE PANEL MOUNTING RECEPTACLE CONNECTOR.



DISASSEMBLY

1 Unscrew nut (1) from shell assembly (2) and slide back on cable (3).

2 Slide grommet (4) back on cable leads (5).

3 Drive socket contacts (6) out through front of insert (7) with pin extractor.

4 Unsolder lead from socket contacts (6).

5 Push insert (7) out through rear of shell assembly (2).

REASSEMBLY

1 Strip cable insulation to depth of solder wells of socket contacts (1).

2 Slide nut (2) over cable (3).

3 Slide grommet (4) over cable leads (5).

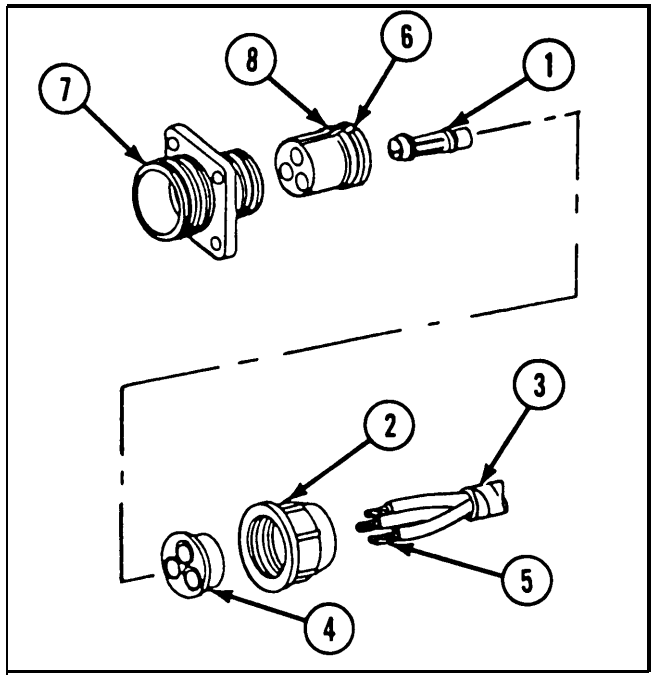
4 Insert cable leads (5) into solder wells of socket contacts (1) and solder.

5 Push insert (6) into shell assembly (7) from rear until seated. Groove (8) in insert (6) must be aligned with guide in shell assembly (7) to ensure proper fit.

6 Push socket contacts (1) into insert (6) from rear until seated.

7 Push grommet (4) down cable leads (5) and over solder wells of socket contacts (1).

8 Screw nut (2) onto shell assembly (7).



2-17. TYPICAL MALE-TYPE PANEL MOUNTING RECEPTACLE CONNECTOR.

DISASSEMBLY

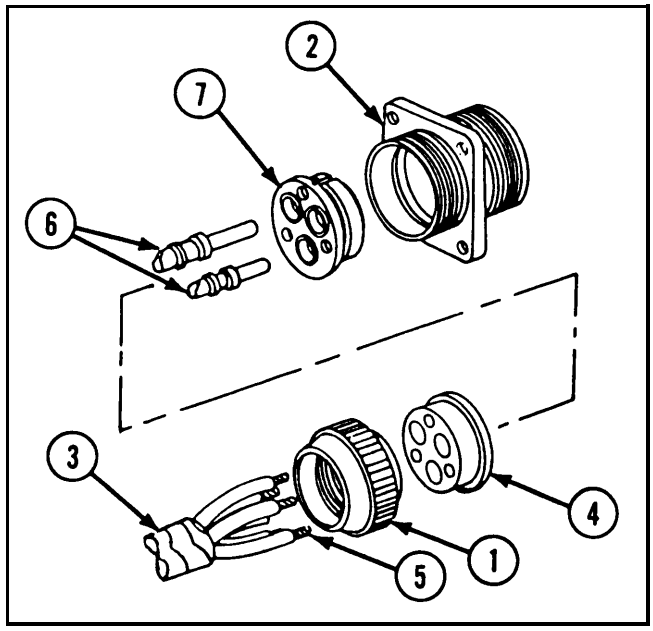
1 Unscrew nut (1) from shell assembly (2) and slide back on cable (3).

2 Push grommet (4) back on cable leads (5).

3 Drive pin contacts (6) out through rear of insert (7) with pin extractor.

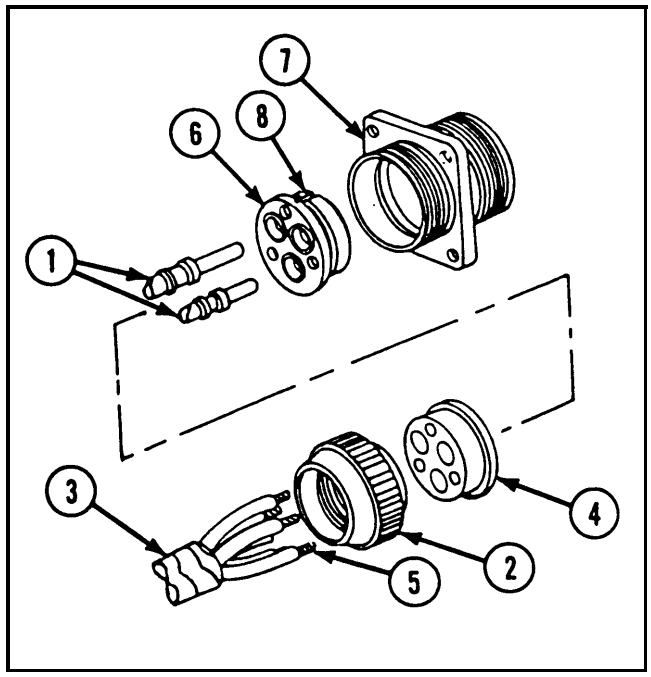
4 Push insert (7) out through rear of shell assembly (2).

5 Unsolder cable leads (5) from pin contacts (6).



2-17. TYPICAL MALE-TYPE PANEL MOUNTING RECEPTACLE CONNECTOR (CONT).

REASSEMBLY



1 Strip cable insulation equal to depth of solder wells of pin contacts (1).

2 Slide nut (2) onto cable (3).

3 Slide grommet (4) over cable leads (5).

4 Insert cable leads (5) into solder wells of pin contacts (1) and solder.

5 Push insert (6) into shell assembly (7) from rear until seated. Groove (8) in insert (6) must be aligned with guide in shell assembly (7) to ensure proper fit.

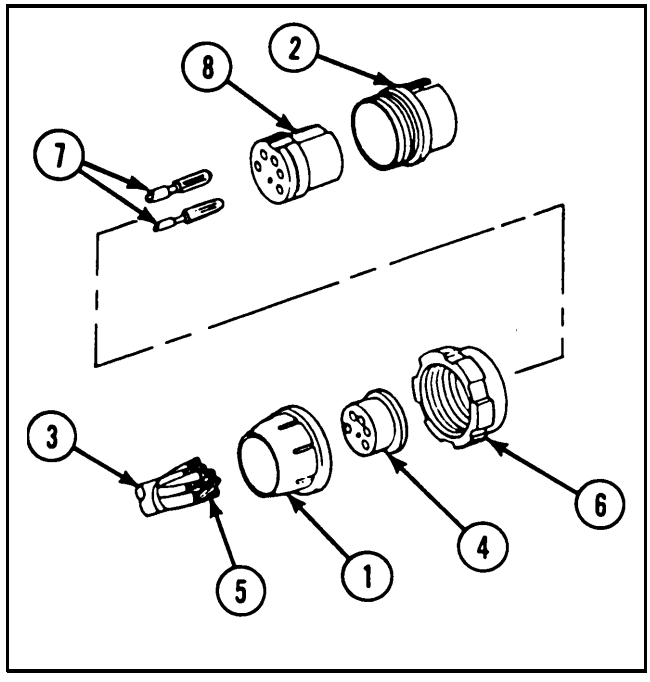
6 Push pin contacts (1) into insert (6) from rear until seated.

7 Push grommet (4) down cable leads (5) and over solder wells of pin contacts (1).

8 Screw nut (2) onto shell assembly (7).

2-18. TYPICAL FEMALE-TYPE PLUG CONNECTOR.

DISASSEMBLY



1 Unscrew nut (1) from shell assembly (2) and slide back on cable (3).

2 Slide grommet (4) back on cable leads (5).

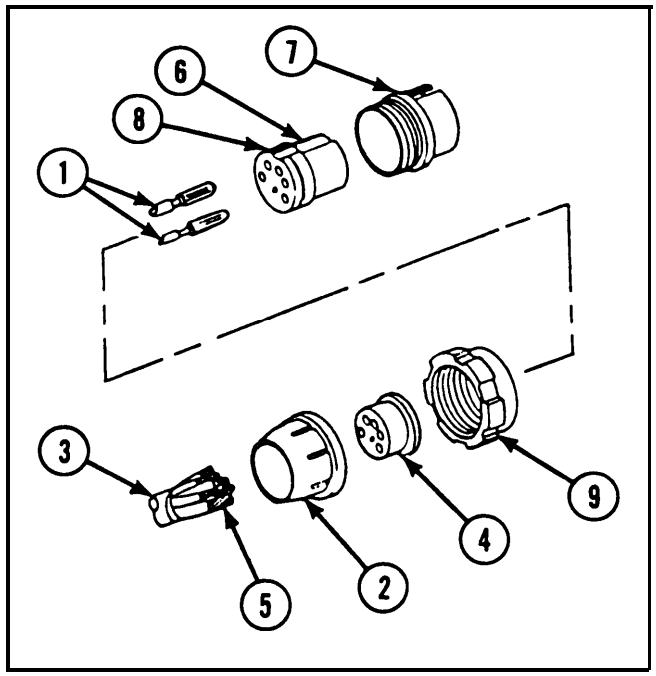
3 Slide coupling (6) off shell assembly (2).

4 Drive socket contacts (7) out through rear of insert (8) with pin extractor.

5 Push insert (8) out through rear of shell assembly (2).

6 Unsolder cable leads (5) from socket contacts (7).

REASSEMBLY



1 Strip cable insulation equal to depth of solder wells of socket contacts (1).

2 Slide nut (2) over cable (3).

3 Slide grommet (4) over cable leads (5).

4 insert cable leads (5) into solder wells of socket contacts (1) and solder.

5 Push insert (6) into shell assembly (7) from rear until seated. Groove (8) in insert (6) must be aligned with guide in shell assembly (7) to ensure proper fit.

6 Push socket contacts (1) into insert (6) from rear until seated.

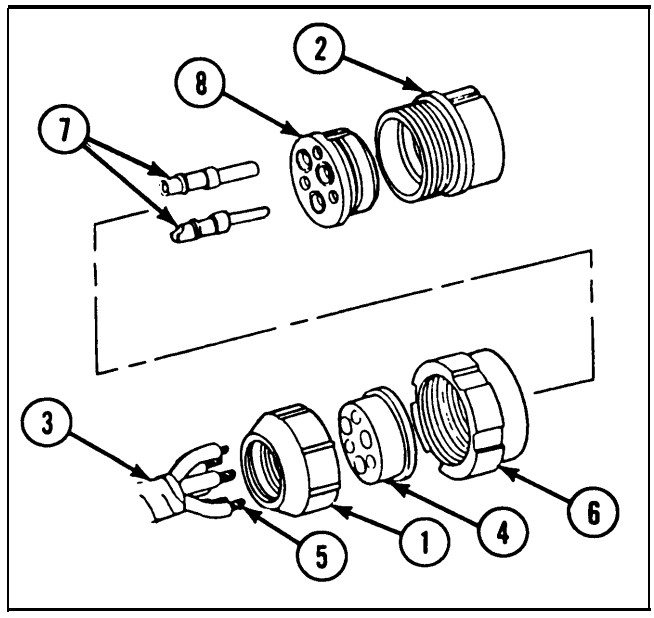
7 Slide coupling (9) onto shell assembly (7).

8 Push grommet (4) down cable leads (5) and over solder wells of socket contacts (1).

9 Screw nut (2) onto shell assembly (7).

2-19. TYPICAL MALE-TYPE PLUG CONNECTOR.

DISASSEMBLY



1 Unscrew nut (1) from shell assembly (2) and slide back on cable (3).

2 Slide grommet (4) back on cable leads (5).

3 Slide coupling (6) off shell assembly (2).

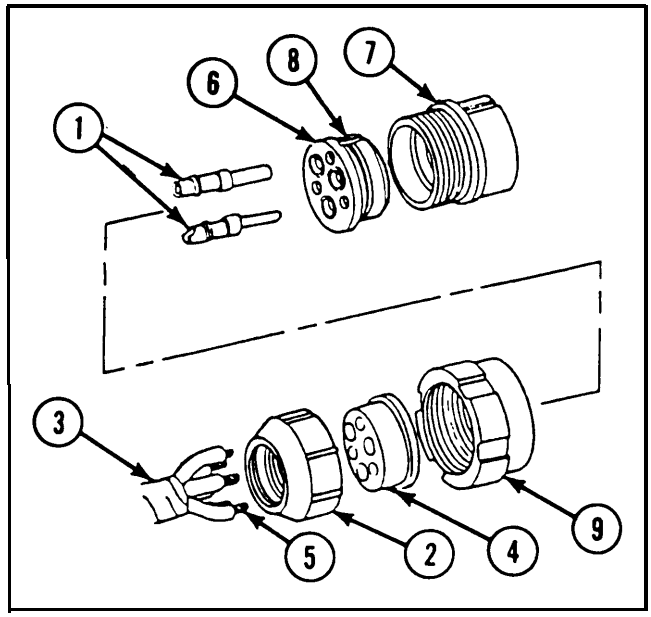
4 Drive pin contacts (7) out through rear of insert (8) with pin extractor.

5 Push insert (8) out through rear of shell assembly (2).

6 Unsolder cable leads (5) from pin contacts (7).

2-19. TYPICAL MALE-TYPE PLUG CONNECTOR (CONT).

REASSEMBLY



1 Strip cable of insulation equal to depth of solder wells of pin contacts (1).

2 Slide nut (2) over cable (3).

3 Slide grommet (4) over cable leads (5).

4 Insert cable leads (5) into solder wells of pin contacts (1) and solder.

5 Push insert (6) into shell assembly (7) from rear until seated. Groove (8) in insert (6) must be aligned with guide in shell assembly (7) to ensure proper fit.

6 Push pin contacts (1) into insert (6) from rear until seated.

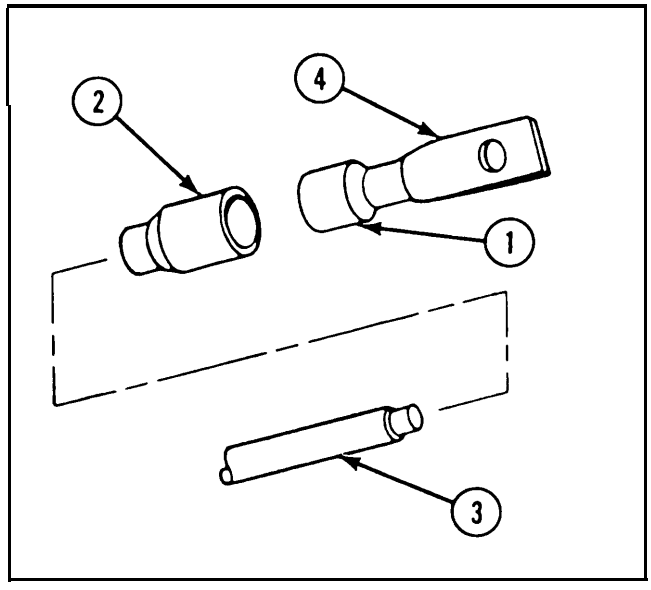
7 Slide coupling (9) onto shell assembly (7).

8 Push grommet (4) down cable leads (5) and over solder wells of pin contacts (1).

9 Screw nut (2) onto shell assembly (7).

2-20. REPLACING CABLE TERMINALS AND SHELL CONNECTORS.

CABLE TERMINALS



1 Strip cable insulation equal to depth of terminal well (1).

2 Slide insulator (2) over cable (3).

3 Insert cable (3) into terminal well (1) and crimp.

4 Slide insulator (2) over crimped end of terminal (4).

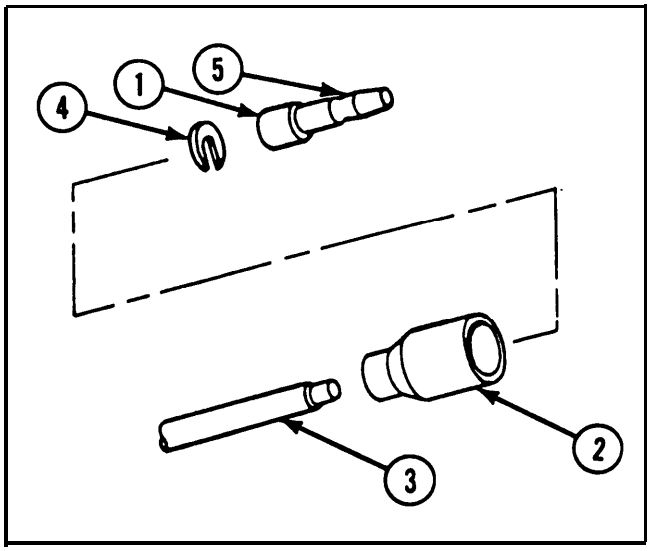
MALE CABLE SHELL CONNECTOR

1 Strip cable insulation equal to depth of ferrule well (1).

2 Slide shell assembly (2) over cable (3).

3 Insert cable (3) into ferrule well (1) and crimp.

4 Place C-washer (4) over cable (3) at crimped junction and slide shell assembly (2) over C-washer (4) and ferrule (5).



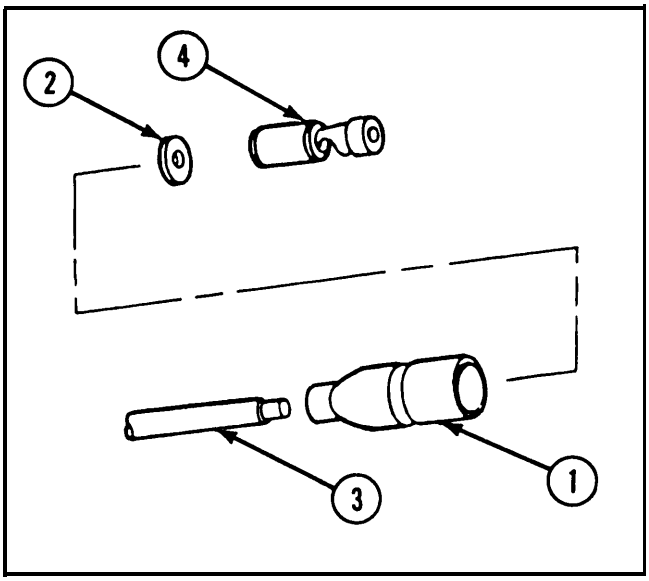
FEMALE CABLE SHELL CONNECTOR (WITH WASHER)

1 Strip cable insulation approximately 1/8 in. (0.318 cm).

2 Slide shell assembly (1) and washer (2) over cable (3).

3 Place cable (3) in cylindrical end of terminal (4) and crimp.

4 Slide shell assembly (1) and washer (2) over terminal (4).



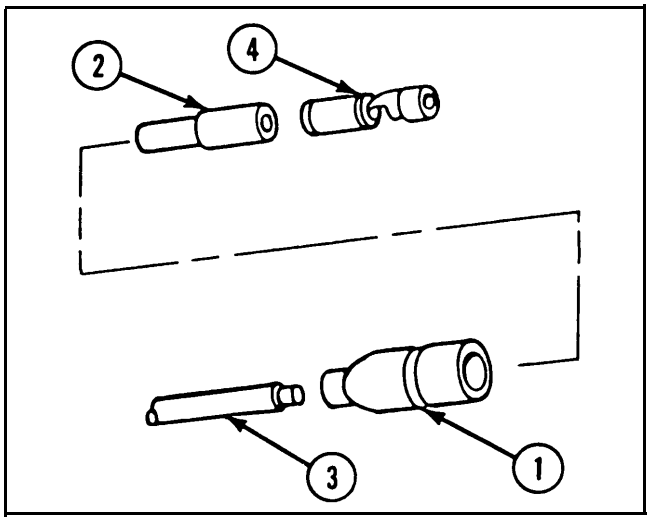
FEMALE CABLE SHELL CONNECTOR (WITH SLEEVE)

1 Strip cable insulation approximately 1/8 in. (0.318 cm).

2 Slide shell assembly (1) and sleeve (2) over cable (3).

3 Place cable (3) in cylindrical end of terminal (4) and crimp.

4 Slide shell assembly (1) and sleeve (2) over terminal (4).



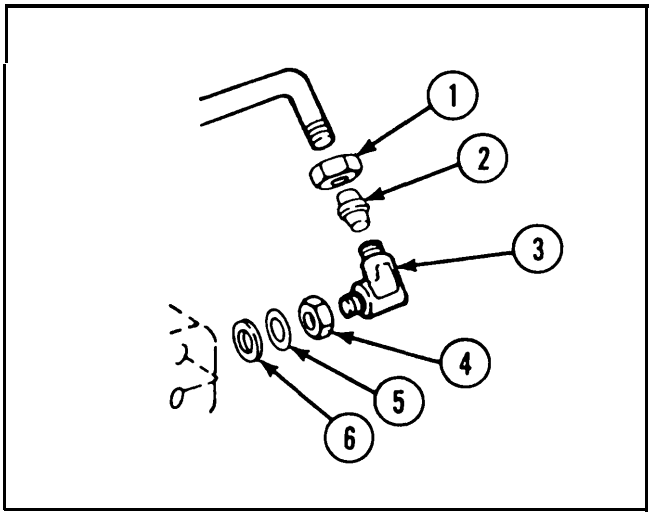
Section VI. MAINTENANCE OF HYDRAULIC LINES AND FITTINGS

2-21. GENERAL.

a. This section contains instructions on repair of hydraulic lines and fittings. Repair of hydraulic lines and fittings consists of replacement of preformed packings, tube fitting locknuts, lockwashers, loop clamps, tube clamps, and defective sleeve spacers and washers. Pages 2-378 and 2-379 show exploded views of typical hydraulic lines and fittings used on the vehicle, and give procedures for disassembly and reassembly of fittings. For complete inspection procedures, refer to b. below. Refer to TM 9-2350-238-24P-1 for ordering of authorized parts. Ensure hydraulic pressure is relieved before performing any disassembly of hydraulic lines and fittings.

b. Inspect all unions, nipples, tees, reducers, plugs, elbows, loop clamps, tube clamps, and parts on which end fittings are used for thread damage, fractures, corrosion, distortion, slivers, restrictions, sealing surface scratches, or mutilation. Hex corners shall not be rounded. Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet above criteria.

2-22. TUBE ELBOW TO TUBE FITTING.



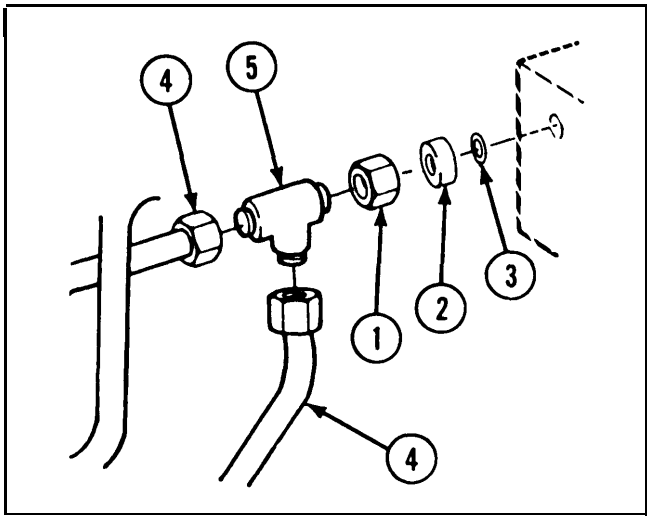
DISASSEMBLY

Remove tube fitting locknut (1), sleeve spacer (2), tube elbow (3), tube fitting locknut (4), flat washer (5), and preformed packing (6).

REASSEMBLY

Install new preformed packing (6), flat washer (5), new tube fitting locknut (4), tube elbow (3), sleeve spacer (2), and new tube fitting locknut (1).

2-23. TUBE TEE TO TUBE FITTING.



DISASSEMBLY

1 Remove tube fitting locknut (1), flat washer (2), and preformed packing (3).

2 Disconnect tube assemblies (4) from tube tee (5), and remove tube tee.

REASSEMBLY

Install tube tee (5) in tube assembly (4) before installing new preformed packing (3), fiat washer (2), and new tube fitting locknut (1).

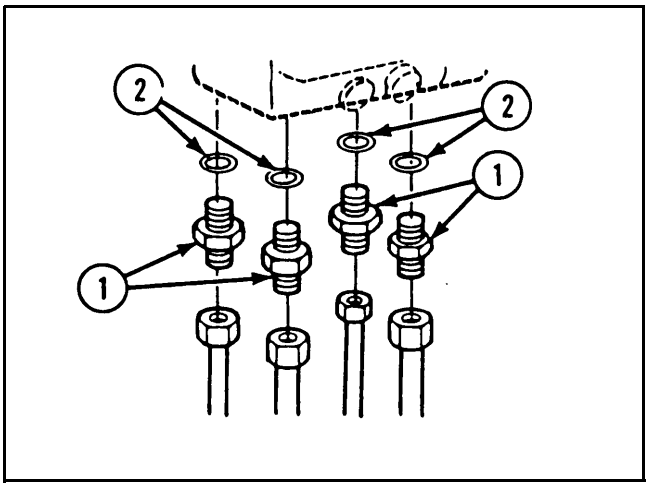
2-24. TUBE REDUCER TO TUBE FITTING.

DISASSEMBLY

Disconnect tube assembly, and remove tube reducer (1) and preformed packing (2).

REASSEMBLY

Install new preformed packing (2) and tube reducer (1), and connect tube assembly.



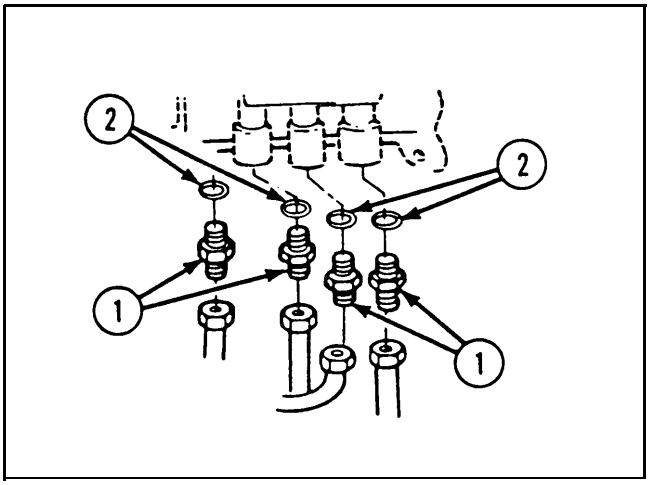
2-25. TUBE NIPPLE TO TUBE FITTING.

DISASSEMBLY

Disconnect tube fitting, and remove tube nipple (1) and preformed packing (2).

REASSEMBLY

Install new preformed packing (2) and tube nipple (1), and connect tube fitting.



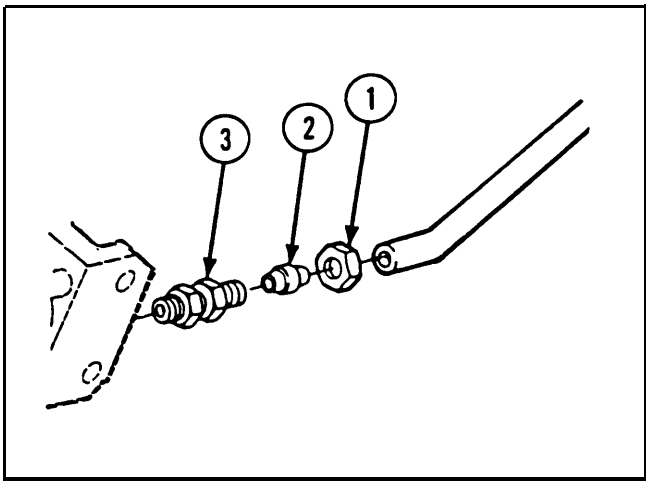
2-26. STRAIGHT ADAPTER TO TUBE FITTINGS.

DISASSEMBLY

Remove tube fitting locknut (1), sleeve spacer (2), and straight adapter (3).

REASSEMBLY

Install straight adapter (3), sleeve spacer (2), and new tube fitting locknut (1).



Section VII. UNIT MAINTENANCE INSTRUCTIONS

2-27. GENERAL. This section provides general repair methods and cleaning procedures. Special repair and cleaning procedures are provided, as required, in the individual maintenance instructions.

2-28. REPAIR METHODS.

1 Complete disassembly is not always necessary to make a repair. Exercise good judgment to keep disassembly and reassembly to a minimum.

2 Repair or replace unserviceable parts and hardware. Always replace packings, gaskets, and seals with new parts.

3 Remove burrs with a stone or file. Remove burrs on closely fitted mating surfaces by lapping the surfaces with abrasive compound (item 1, appx C).

4 Remove corrosion or rust with crocus cloth (item 10, appx C) or emery cloth (item 11, appx C). Use the method that will not damage the surface being cleaned. Crocus cloth (item 10, appx C) should be used to remove corrosion and rust from polished surfaces. Make sure that critical dimensions are not altered when using crocus cloth.

5 Repair damaged threads with a thread chaser or die.

6 When welding is authorized, procedures in TM 9-237 must be followed. Welds must be inspected for cracks.

7 Bearings should be inspected and maintained following procedures in TM 9-214.

8 Clean electrical ground contacts with crocus cloth (item 10, appx C) or emery cloth (item 11, appx C). Make sure ground connections are tight.

9 Repair chafed, broken, or damaged electrical wiring with insulation tape (item 44, appx C). When soldering is required, procedures in TB SIG-222 must be followed.

10 After locating the malfunction and repairing the component, test it for proper function.

2-29. CLEANING.

1 Wire brush metal parts to remove rust and corrosion.

WARNING

Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated area.

2 Clean metal parts with dry cleaning solvent (SD2) (item 16, appx C). Metal or fiber brushes may be used to apply cleaning solvent and to remove softened or dissolved material. Hand scraping with metal scrapers may be used to remove soft coatings or deposits.

3 Soak oily or greasy metal parts in a tank containing dry cleaning solvent (SD2) (item 16, appx C). The time parts must be in solvent varies with the type and amount of material to be removed.

4 Do not use solvent to clean electrical insulation, wires, cables, or wiring harnesses. Clean these parts by wiping with a damp cloth. Use a mild soap solution if necessary. Dry immediately with clean dry cloths. Clean contact points with flint abrasive paper (item 2, appx C) and dust thoroughly after cleaning.

5 Do not use solvent to clean rubber parts. Clean rubber parts by washing with mild solution of soap and water.

6 Dry parts by blowing with low-pressure compressed air or wiping with clean, lint-free cloths (item 12, appx C).

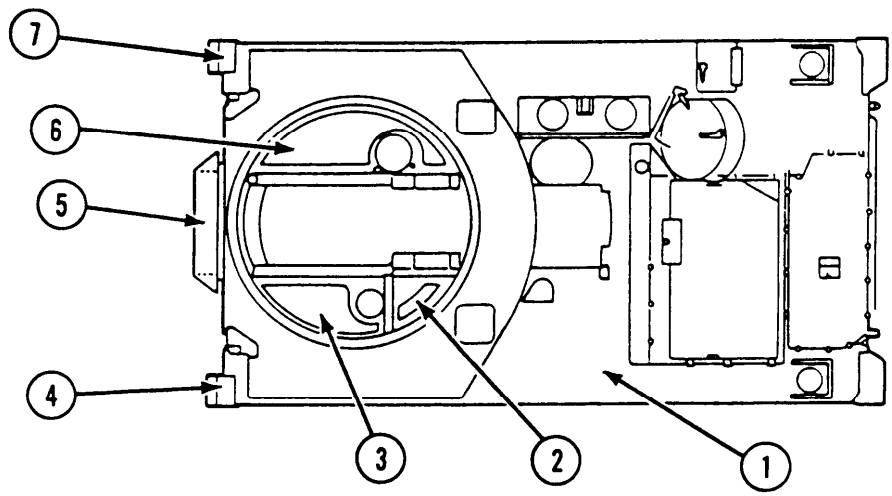
7 Bearings should be cleaned by procedures in TM 9-214.

8 Spot paint metal surfaces after repairs, as required. Sand damaged areas, clean with solvent, and rinse with water. Surface must be clean and dry. Paint with CARC to match existing color, refer to TM 43-0139.

2-30. LUBRICATION. Keep a light coat of preservative lubricant cleaner (CLP) (item 8, appx C) on parts during repair procedures to prevent rusting. Lubricate parts during repair and assembly as required by PMCS/lubrication table, page 2-13.

2-31. PAINTING INSTRUCTIONS. Complete painting is authorized for and done by general support maintenance personnel or higher. Spot painting and restenciling vehicle markings is done by unit maintenance personnel. Instructions for materiel preparation, priming, and finish are given in TM 43-0139.

2-32. NONSKID AREAS.



Walkway compound (item 46, appx C) will be used to coat deck areas where personnel walk. The seven areas (1 thru 7) to be coated with nonslip paint are shown in the above illustration.

2-33. TOUCHUP AND RECOATING.

WARNING

- Chemical Agent Resistant Coating (CARC) Paint: CARC paint contains isocyanate, a constituent that can cause respiratory effects during and after the application of the material. During the application of CARC paint, coughing, shortness of breath, pain on

respiration, increased sputum, and chest tightness may occur. CARC paint also produces itching and reddening of the skin, a burning sensation of the throat and nose, and watering of the eyes.

- An allergic reaction may occur after initial exposure (ranging from a few days to a few months later), producing asthmatic symptoms including coughing, wheezing, tightness in the chest, or shortness of breath.

- The following precautions must be observed to ensure the safety of personnel when CARC paint is applied:

  For brush/roller painting in confined spaces, an airline respirator is required, unless an air sampling shows exposure to be below standards. If the air sampling is below standards, either chemical cartridge or airline respirators are required.

  Spot painters applying CARC paint by brush or roller must wear clothing and gloves affording full coverage.

  Do not use water, alcohol, or amine based solvents to thin or remove CARC paints. Use of these solvents with CARC paints can produce chemical reactions resulting in nausea, disease, burns, or severe illness to personnel.

  Do not use paint solvents to remove paint/coating from your skin.

  Mix paint/coating in a well-ventilated mixing room or spraying area away from open flames. Personnel mixing paint/coating should wear eye protection.

  Use paint/coating with adequate ventilation.

  Unusable CARC mixtures may be considered hazardous waste and may require disposal IAW Federal, state, DOD, and DA hazardous waste regulations. Consult the installation environmental office for proper disposal guidance. Mixed CARC is extremely flammable-use only in well-ventilated areas, keep away from open flames, heat, sparks, and other ignition sources.

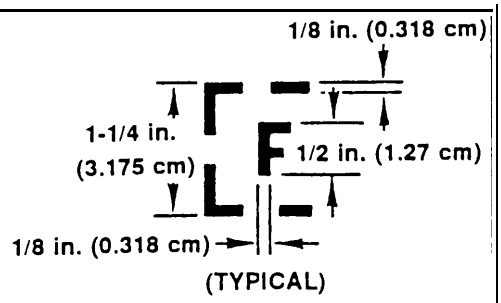
  Personnel grinding or sanding on painted equipment should use high efficiency air purifying respirators.

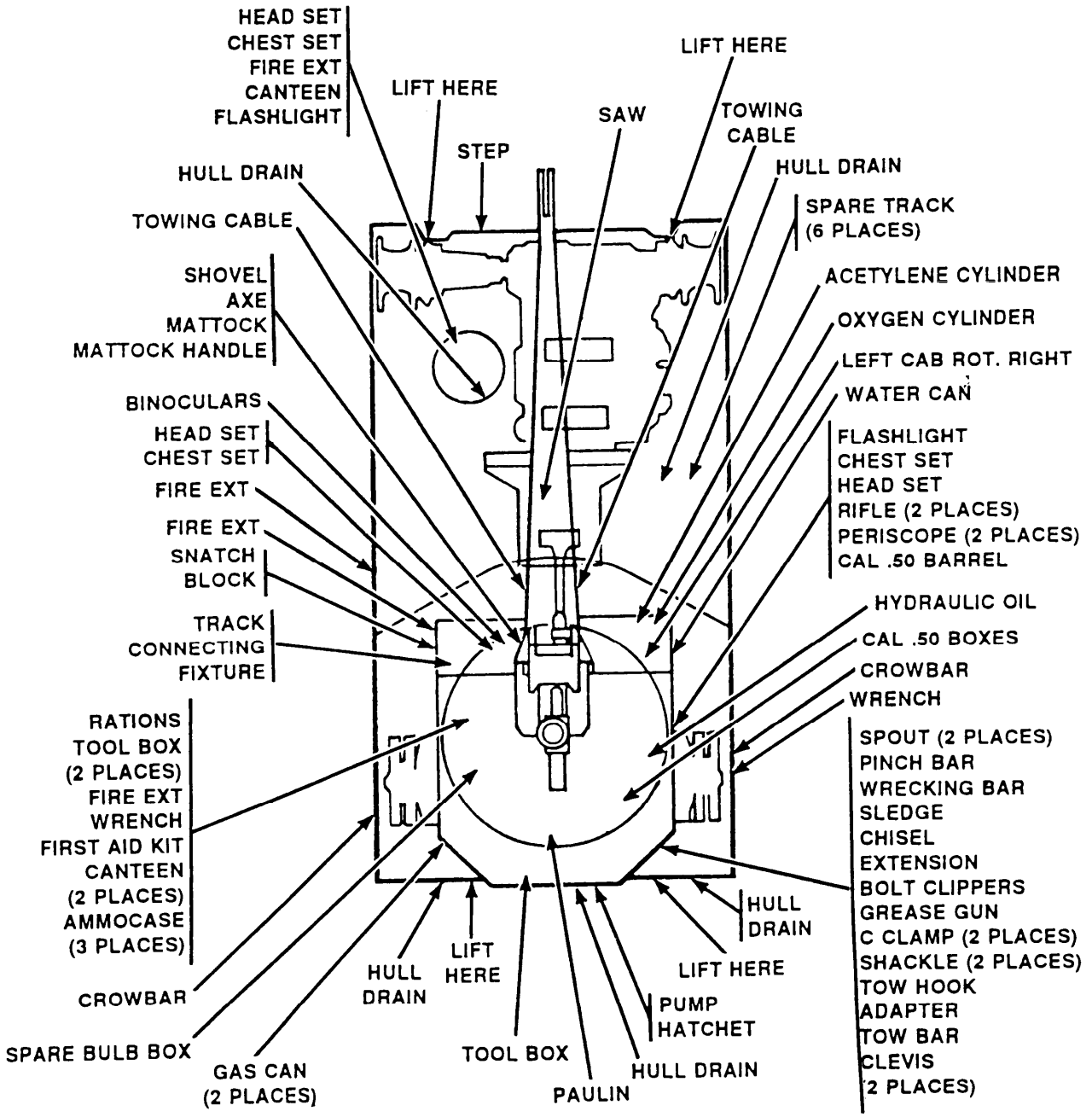
  Do not weld or cut CARC-coated metal. Substances causing skin or respiratory irritation may be released. Before applying heat, sand or grind paint down to bare metal on area four inches to either side of the area you plan to weld or cut.

When touching up damaged areas, the procedure should be as similar to the original method of finishing as possible; a clean surface is imperative. Where general disintegration of the surface is evident, or the under surface is corroded, the coating must be stripped clean from the part. Corrosion must be removed or neutralized by mechanical or chemical treatment, or both, and the surface metal must be pre-treated, primed, and then topcoated.

2-34. RESTENCILING VEHICLE MARKINGS.

Apply stencils to clean, painted surfaces only. Use black enamel (item 17, appx C). When possible, position the stencil so that it is covered by the item named when the item is stowed in its proper place. Stencil dimensions and locations are shown below and to the right.





2-35. MAINTENANCE OF POWERPLANT.

This task covers: a. *Removal* b. *Inspection/Repair* *c. Installation*

INITIAL SETUP

Tools and Special Tools

Automotive maintenance and repair shop equipment: organizational maintenance, common no. 2 (less power) (item 81, appx B)
- Breaking bar (3/4 in. sq dr)
- Socket (1-1/2 in.)
- Torque wrench (0 to 600 ft-lb)
- Wrecking bar

5-ton hoist
Powerplant lifting sling (item 26, appx G)
Plier wire twister (item 30, appx G)

Materials/Parts

Cotter pin (2)
Dry cleaning solvent (item 16, appx C)
Gasket (3)
Lockwasher(12)
Lockwasher
Lockwasher (3)
Lockwasher (18)
Lockwasher (4)
Lockwire (item 23, appx C)
Lockwire (item 26, appx C)
Preformed packing (4)
Seal (2)
Self-locking nut

Personnel Required

Three

References

TM 9-2350-238-24P-1

Equipment Conditions

Prepare a safe, solid stand of heavy wooden blocks or a suitable metal stand on which to set the powerplant after removal. Place the stand on a level 8 x 10-ft (2 *x* 3-m) area near the vehicle. Ensure there is enough head and side room around the vehicle to work the hoisting equipment. The hoisting equipment must have at least a 5.0-ton (4.5-metric ton) rating, a 9.0-ft (2.7-m) reach, and a 10.0-ft (3.0-m) lift.

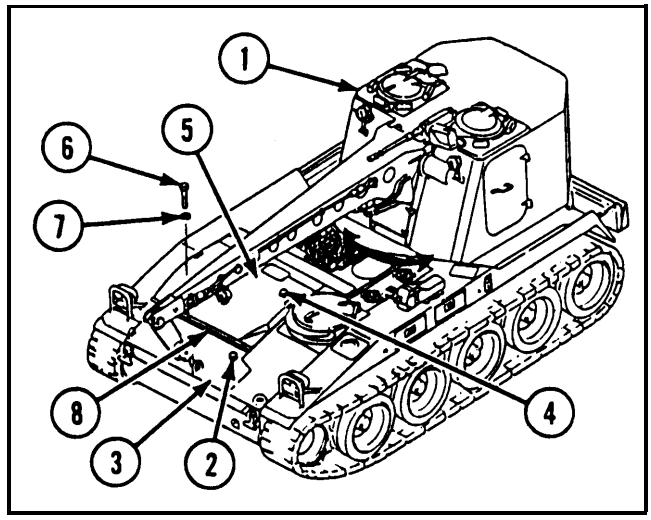
General Safety Instructions

WARNING

Vehicle has no brakes when powerplant is disconnected. Failure to securely block front and rear vehicle tracks could cause injury to personnel or damage to vehicle or other equipment if vehicle is free to roll out of control.

REMOVAL

1 Traverse cab (1) as far as it will go, either left or right. Remove four plain cap nuts (2) and hull transmission compartment deck assembly (3). Remove four plain cap nuts (4) and hull engine compartment deck assembly lid (5). Remove two hexagon head capscrews (6), two lockwashers (7), and floor support beam (8) from hull of vehicle.

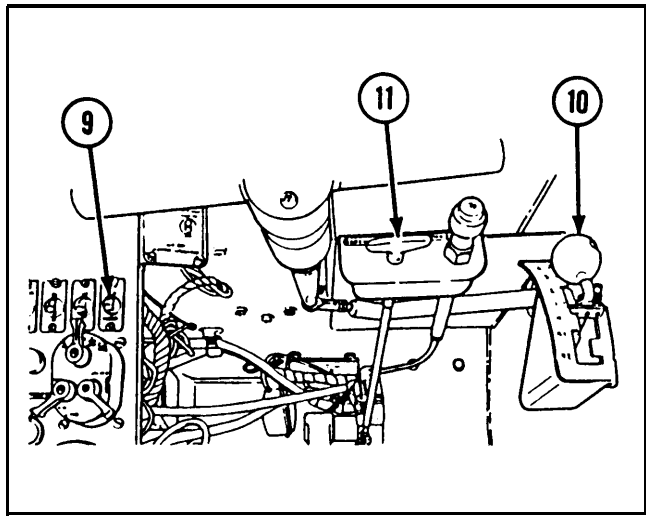


WARNING

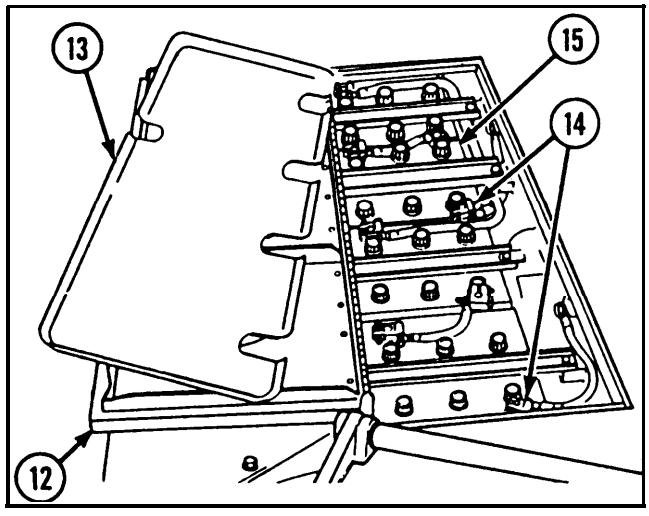
Vehicle has no brakes when power-plant is disconnected. Failure to securely block front and rear vehicle tracks could cause injury to personnel or damage to vehicle or other equipment if vehicle is free to roll out of control.

2 Ensure that vehicle cannot roll out of control. Block vehicle with 12 x 24 in. (30 x 61 cm) wood blocks placed under front and rear of each track.

3 Set MASTER switch (9) to OFF position. Place driver shift control latch (10) in N (neutral), and pull parking brake handle (11) to release parking brake.

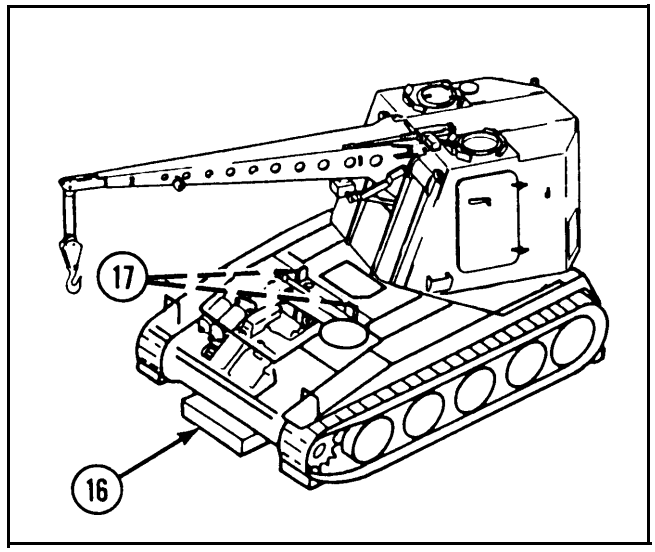


4 Open battery access cover (12) and remove battery protection liner (13). Disconnect two electrical ground leads (14) from storage batteries (15).

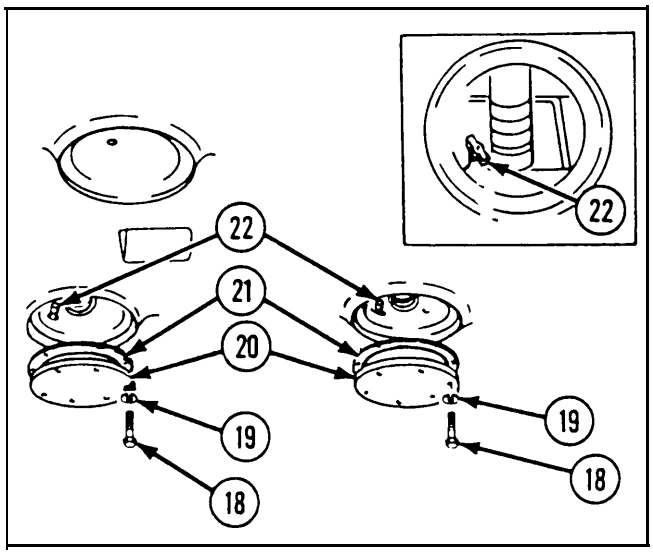


2-35. MAINTENANCE OF POWERPLANT (CONT).

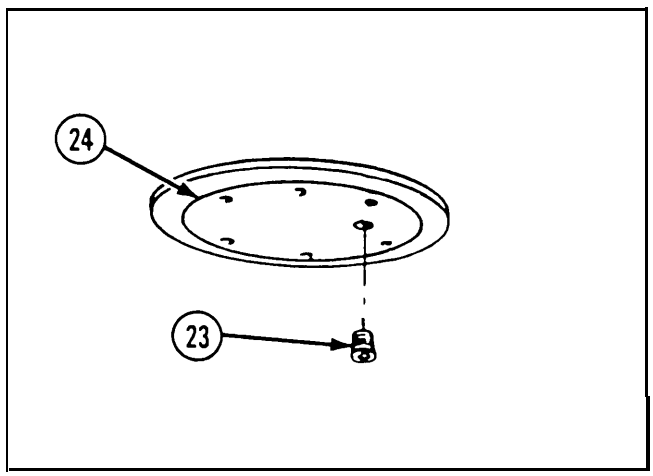
REMOVAL (CONT)



5 Place 30-gal. (114-l) container (16) under front of vehicle. Loosen both radiator caps (17).

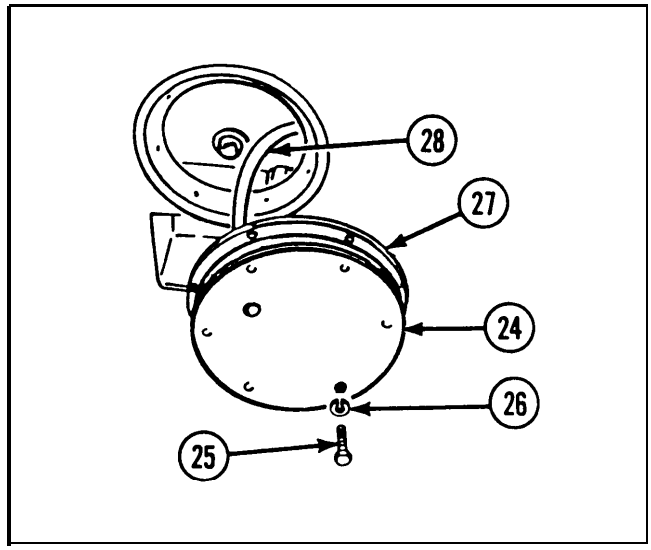


6 Remove 12 hexagon head capscrews (18), 12 lockwashers (19), 2 access covers (20), and 2 gaskets (21) from underside of hull. Open both radiator drain cocks (22), and drain coolant into container.

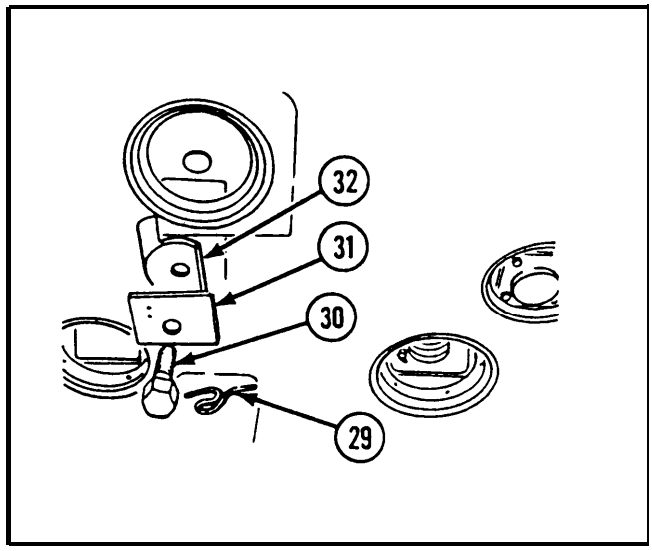


7 Remove pipe plug (23) from engine oil reservoir access cover (24), and drain fluid into container.

8 Remove six hexagon head capscrews (25), six lockwashers (26), and gasket (27) from engine oil reservoir access cover (24). Remove engine oil reservoir access cover. Disconnect reservoir drain hose (28) from engine oil reservoir access cover.



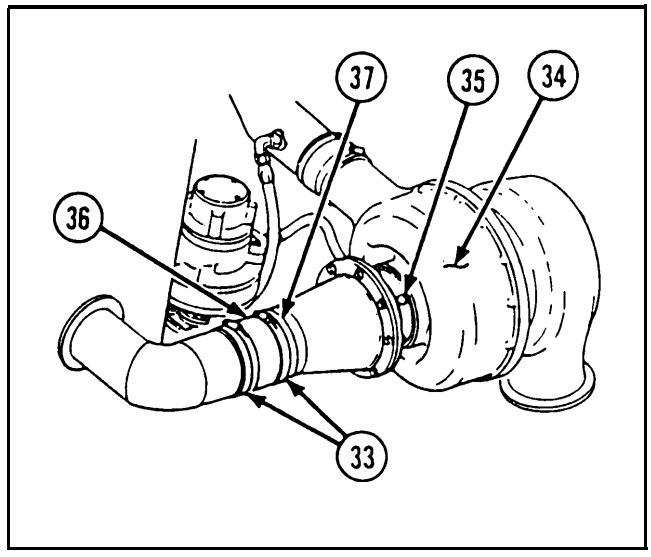
9 Remove lockwire (29) from hexagon head capscrew (30). Remove hexagon head capscrew, engine mount washer (31), and cushioning pad (32) from underside of hull.



NOTE

Steps 10 and 11 apply to engine model 7083-7398.

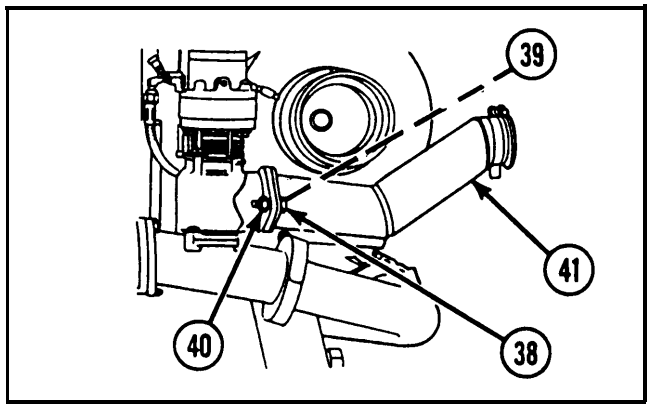
10 Loosen two hose clamps (33), and remove lockwire (34) and four hexagon head capscrews (35). Remove air duct hose (36) and intake screen (37).



2-35. MAINTENANCE OF POWERPLANT (CONT).

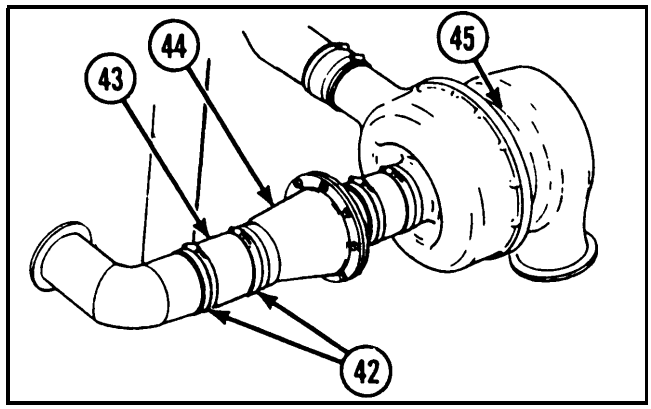
REMOVAL (CONT)

11 Remove two hexagon head capscrews (38), two lockwashers (39), two hexagon plain nuts (40), and exhaust pipe (41).

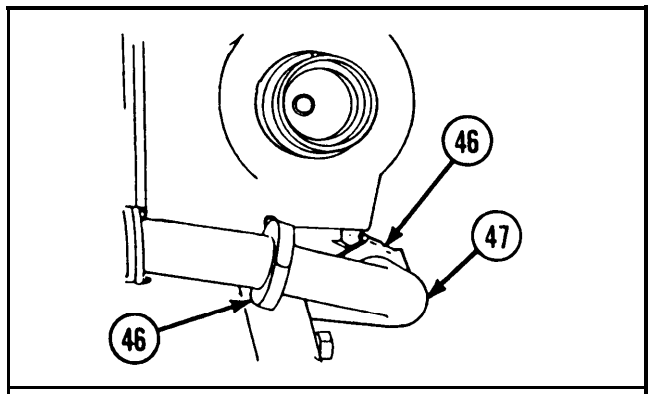


NOTE
Steps 12 and 13 apply to engine model 7083-7395.

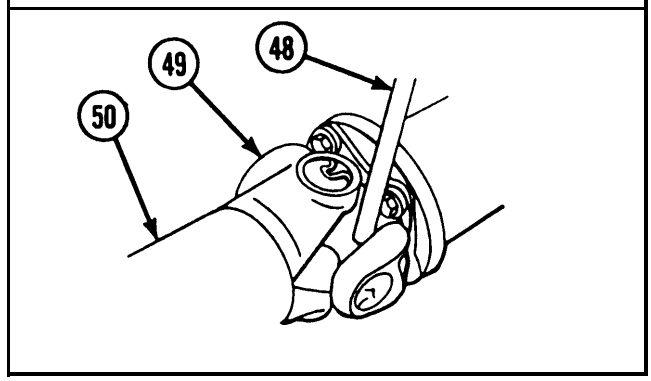
12 Loosen two hose clamps (42), and remove air duct hose (43) from elbow. Remove two hose clamps (42), air duct hose (43), and air screen assembly (44) from turbocharger (45).

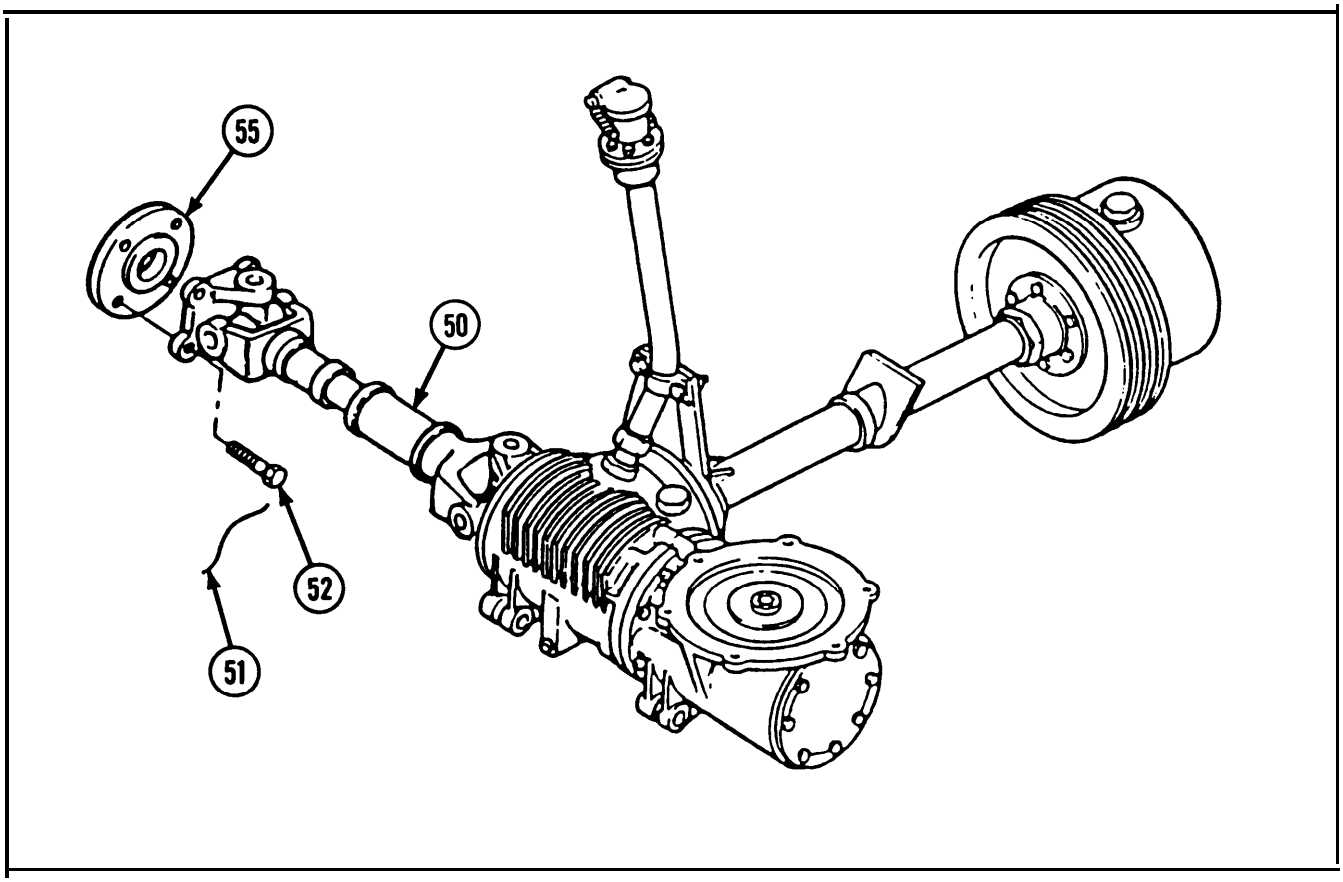


13 Remove two coupling clamps (46) and engine exhaust elbow (47).



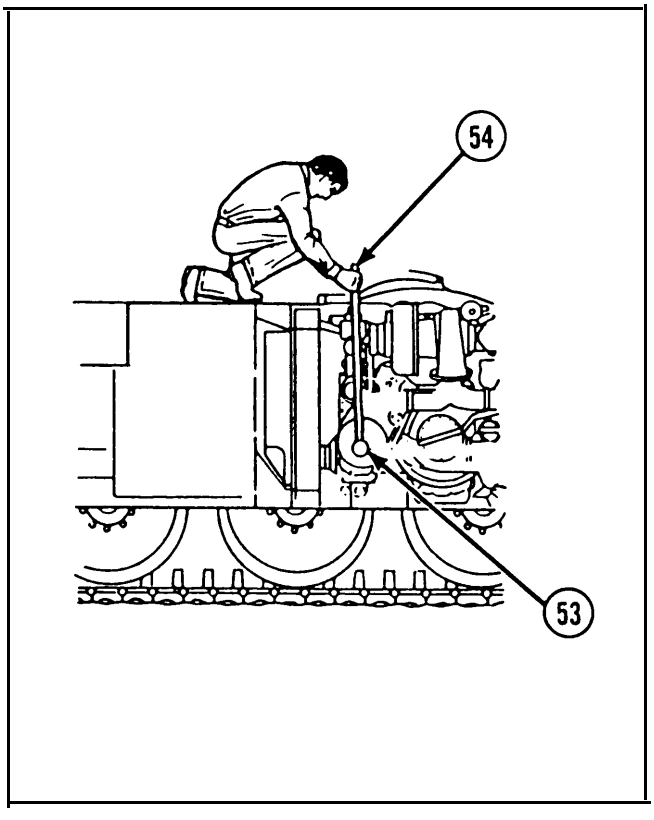
14 Insert end of bar (48) in U-joint (49) of power takeoff drive shaft (50) to prevent power takeoff drive shaft from turning.





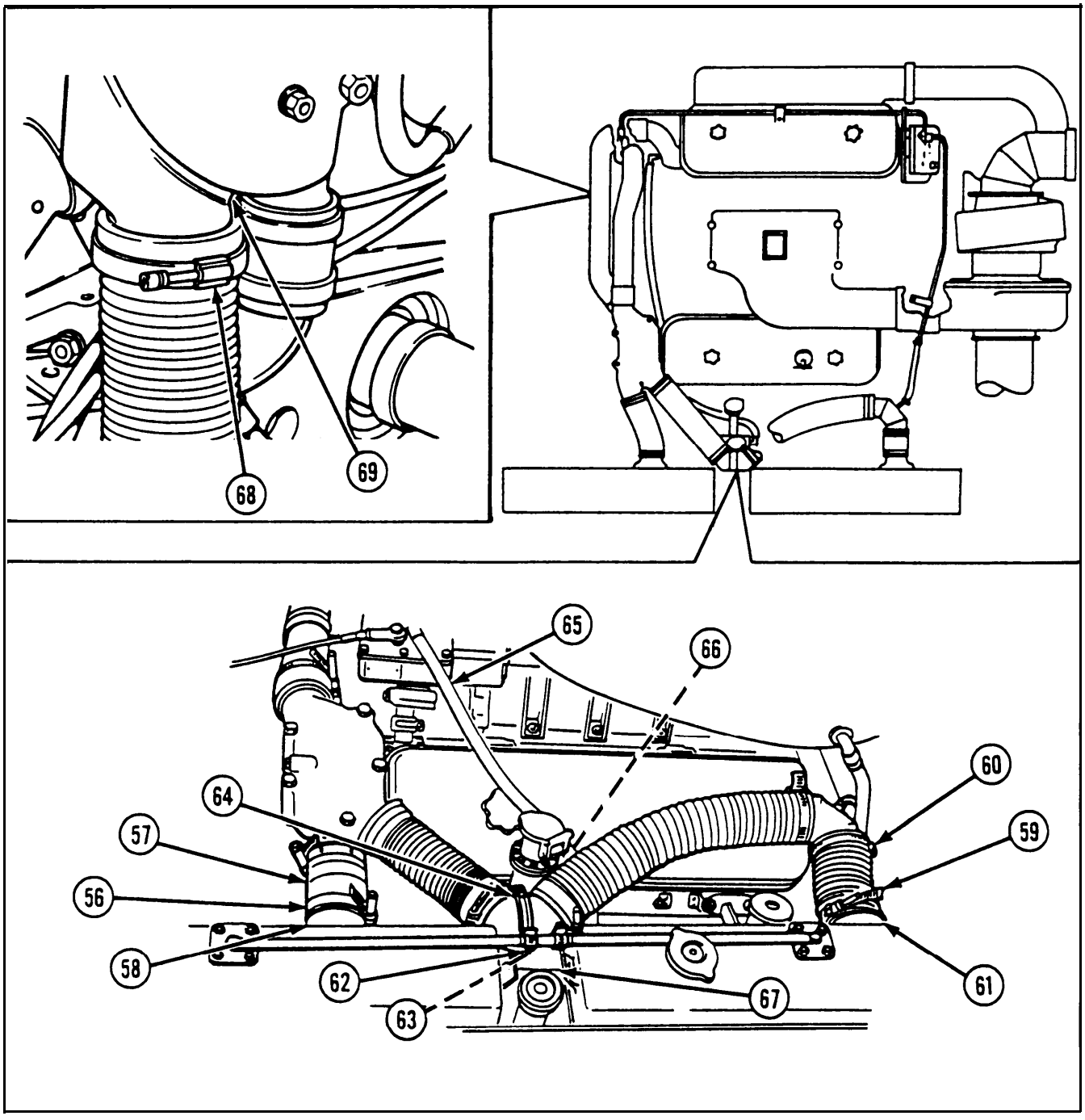
15 Remove lockwire (51) and four hexagon head capscrews (52) from power takeoff drive shaft (50).

16 Enter through access hole in hull and loosen externally released bolt (53), using long breaking bar (54). (Externally released bolt is tightened to 450-500 ft-lb (610-678 N-m).) Remove bar from U-joint of power takeoff drive shaft (50). Pull internal gear shaft coupling (55) from power takeoff assembly and lower power takeoff drive shaft (50) to hull bottom.



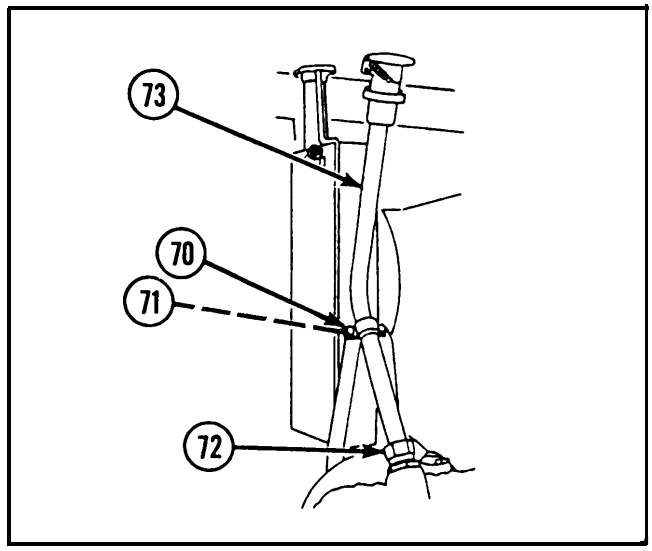
2-35. MAINTENANCE OF POWERPLANT (CONT).

REMOVAL (CONT)

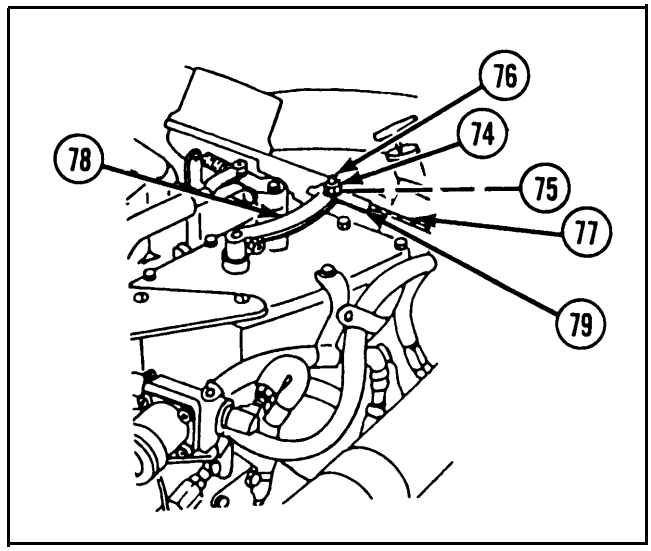


17 Loosen hose clamp (56) and disconnect nonmetallic hose (57) from left radiator inlet (58). Loosen hose clamp (59) and disconnect nonmetallic hose (60) from right radiator inlet (61). Remove machine screw (62), lockwasher (63), and cushioned loop clamp (64). Disconnect rubber hose (65) from pipe to tube elbow (66) at surge tank (67). Loosen hose clamp (68) from coolant (water) pump (69) inlet.

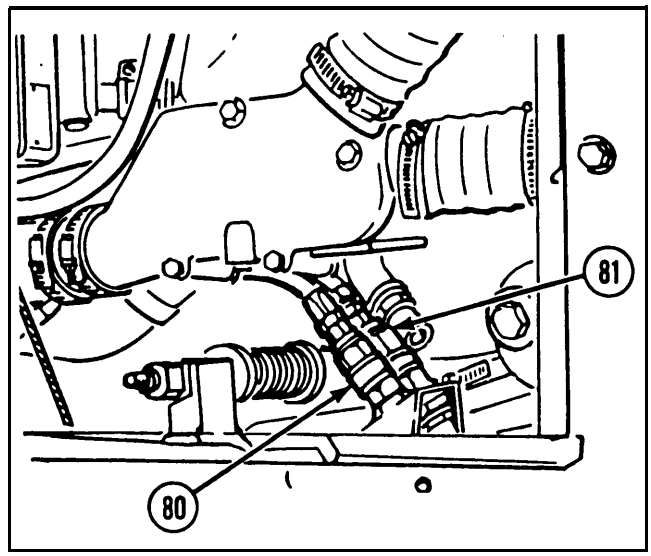
18 Loosen hexagon head capscrew (70) and self-locking nut (71). Loosen nut (72) at base of oil filler neck (73). Turn oil filler neck 90 degrees counterclockwise.



19 Remove hexagon plain nut (74), lockwasher (75), and hexagon head capscrew (76) securing engine shutdown wire rope assembly (77) to engine shutdown manual control lever (78). Assemble hexagon head capscrew (76), lockwasher (75), and hexagon plain nut (74) on plain rod end bearing (79) of engine shutdown wire rope assembly to prevent loss. Lay engine shutdown wire rope assembly over hull with plain rod end bearing in driver's compartment.

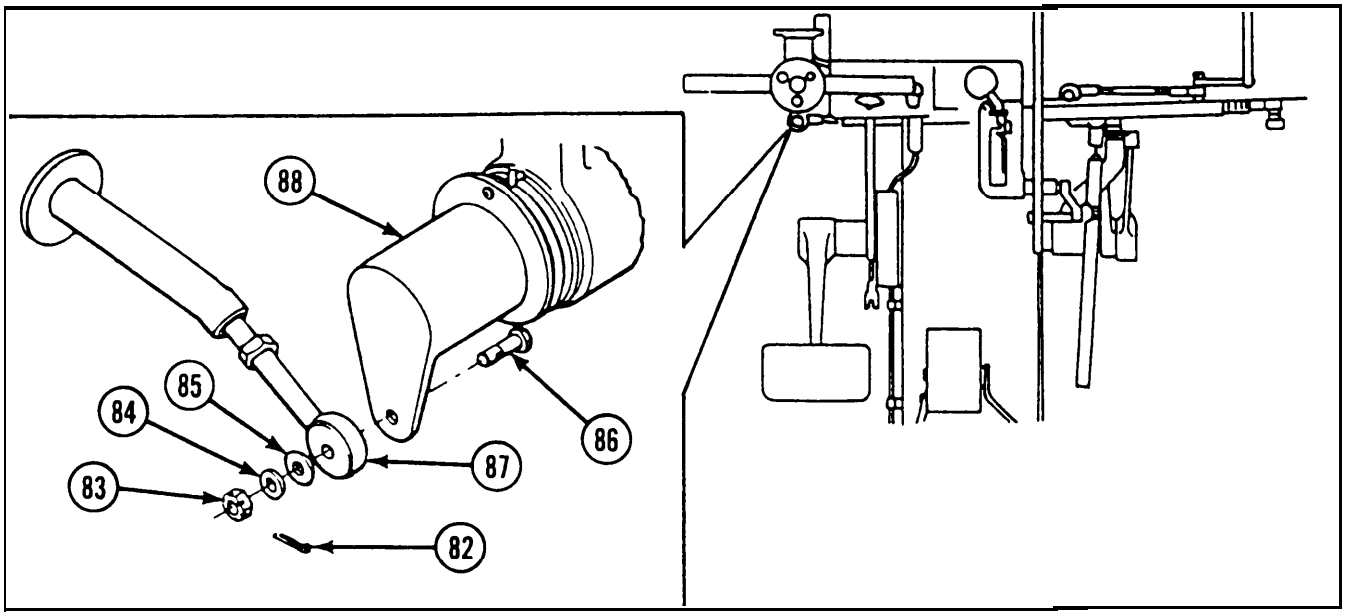


20 Disconnect fuel return hose (80) and fuel supply hose (81) at quick disconnects located in right rear engine compartment near driver's compartment. Place fuel hoses on engine to prevent damage.

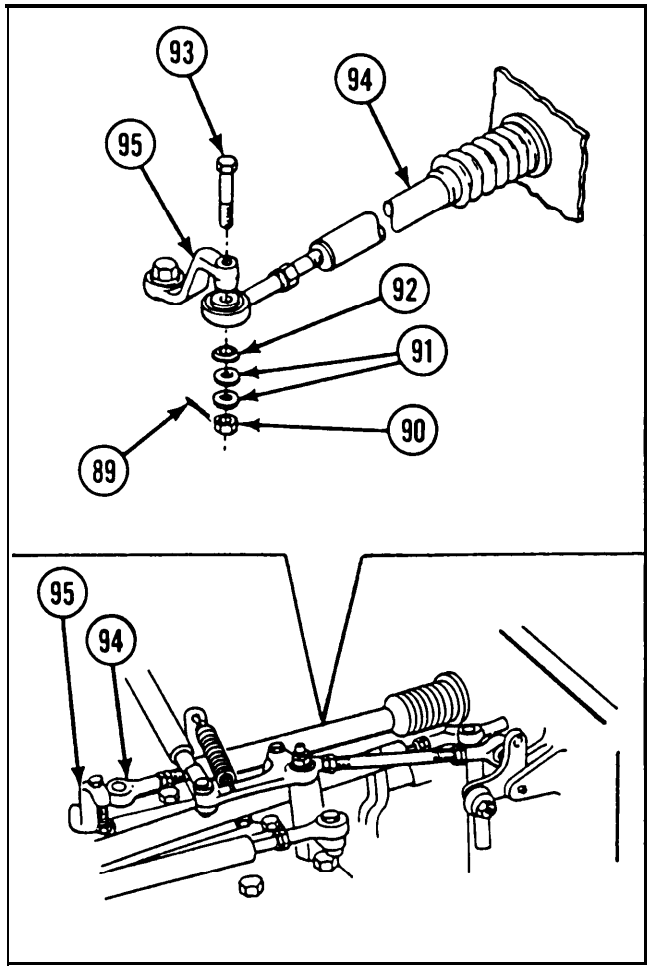


2-35. MAINTENANCE OF POWERPLANT (CONT).

REMOVAL (CONT)

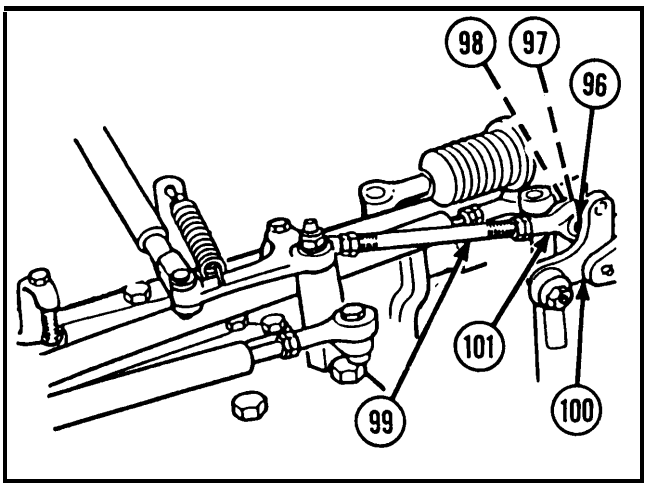


21 Remove cotter pin (82), plain slotted nut (83), flat washer (84), beveled washer (85), and hexagon head capscrew (86) securing steering rod assembly (87) to pivoting wheel control linkage arm (88). Assemble hexagon head capscrew, beveled washer, flat washer, plain slotted nut, and cotter pin on steering rod assembly to prevent loss.

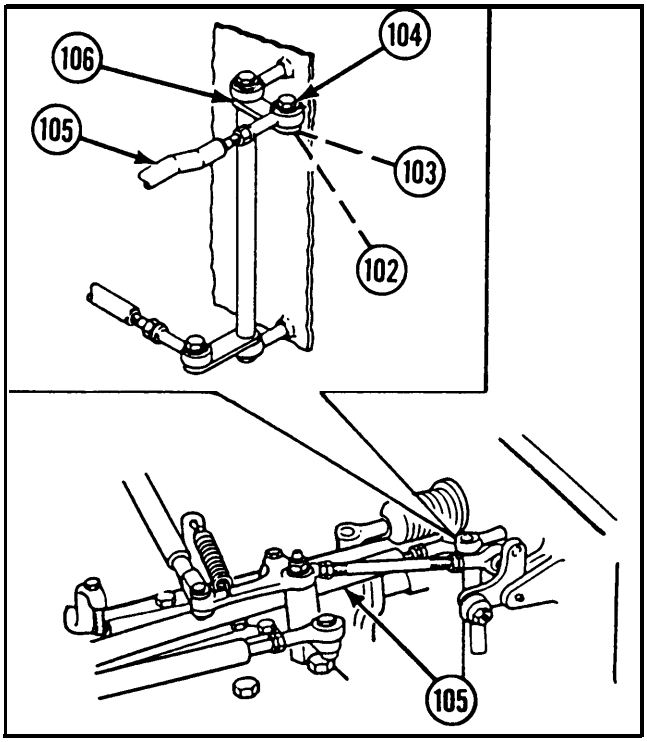


22 Remove cotter pin (89), plain slotted nut (90), two flat washers (91), beveled washer (92), and hexagon head capscrew (93) securing steering rod assembly (94) to steering gear arm (95). Assemble hexagon head capscrew, beveled washer, two flat washers, plain slotted nut, and cotter pin on steering gear arm to prevent loss. Push steering rod assembly into driver's compartment.

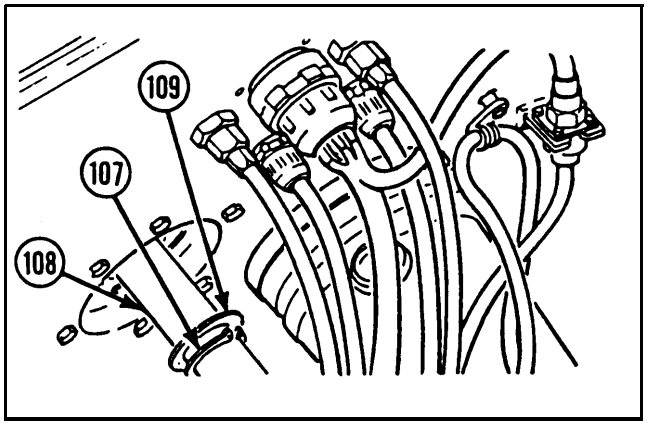
23 Remove hexagon plain nut (96), lockwasher (97), and hexagon head capscrew (98) securing plain throttle linkage stud (99) to throttle linkage bell crank (100). Assemble hexagon head capscrew, lockwasher, and hexagon plain nut to plain rod end bearing (101) to prevent loss.



24 Remove hexagon plain nut (102), lockwasher (103), and hexagon head capscrew (104) securing shift control rod (105) to shift control linkage bell crank (106). Assemble hexagon head capscrew, lockwasher, and hexagon plain nut on shift control rod to prevent loss.

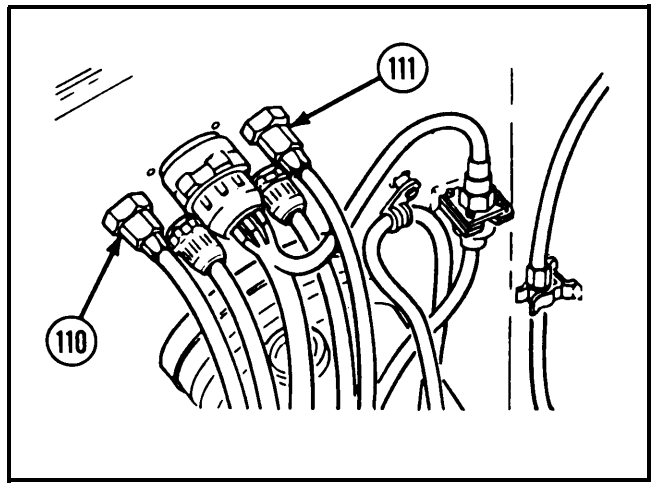


25 Disengage retaining ring (107) from groove in brake control shaft (108). Remove retaining ring and ring spacer (109), and slide brake control shaft into driver's compartment.

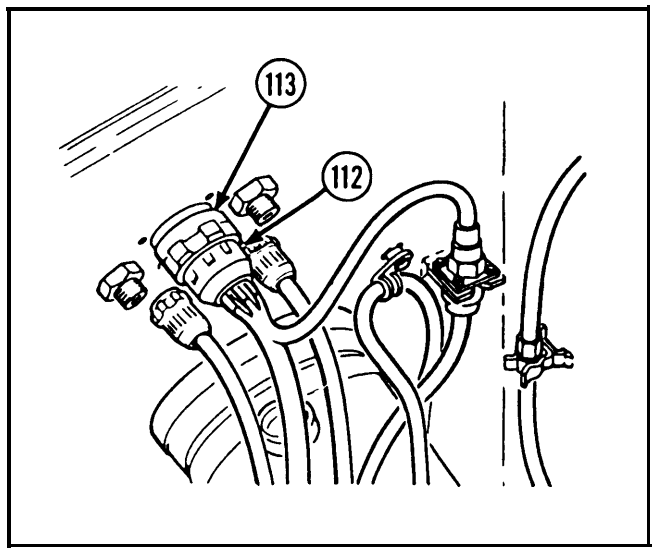


2-35. MAINTENANCE OF POWERPLANT (CONT)

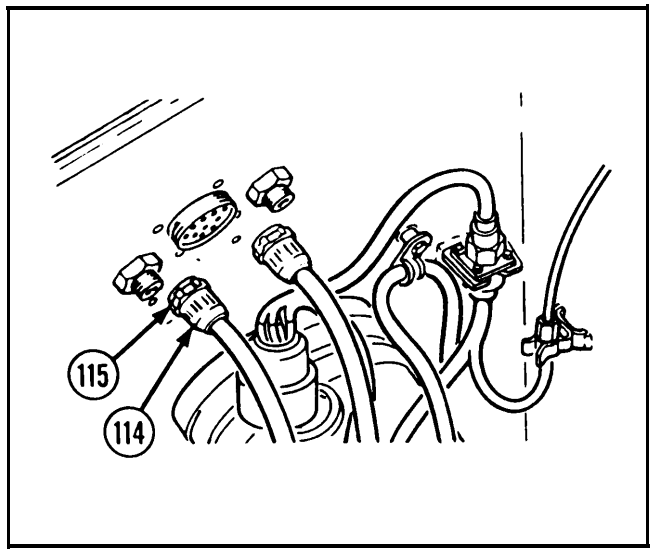
REMOVAL (CONT)



26 Disconnect tachometer drive shaft assembly (110) and speedometer drive shaft assembly (111) from adapters on bulkhead.

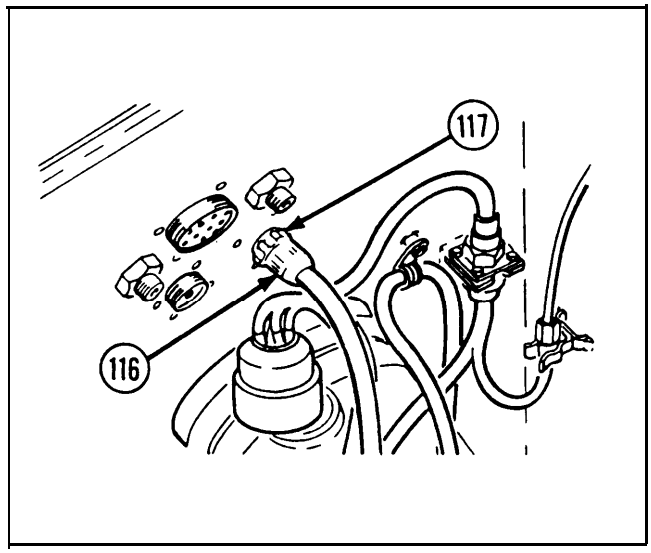


27 Disconnect engine electrical harness plug (112) from receptacle (113) on bulkhead.

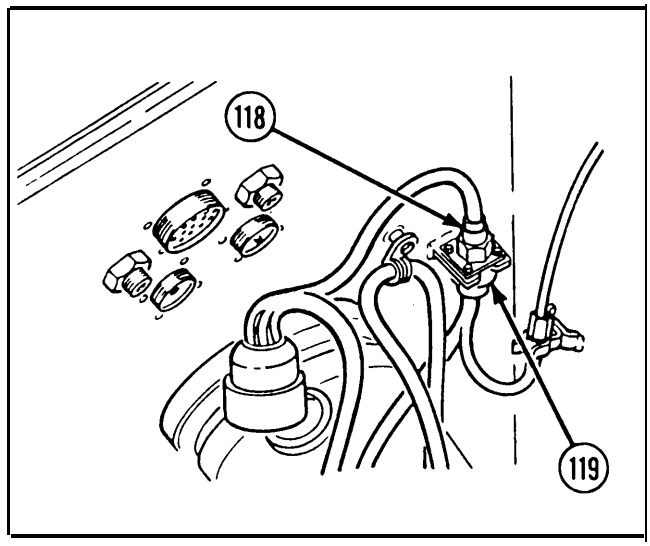


28 Disconnect starter lead plug (114) from receptacle (115) on bulkhead.

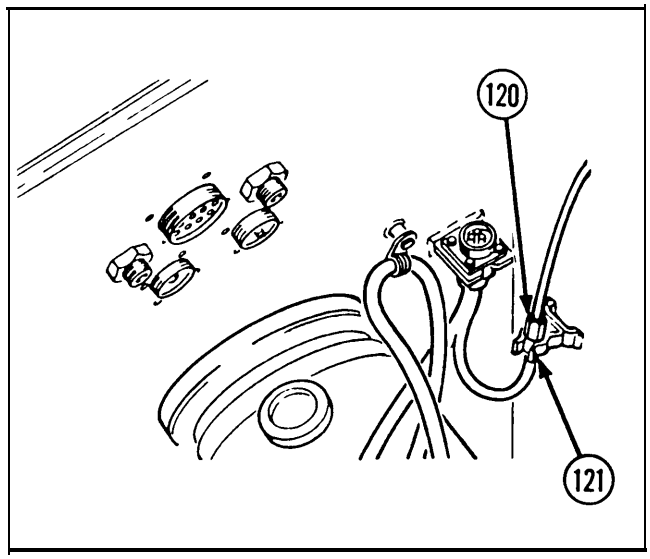
29 Disconnect generator lead plug (116) from receptacle (117) on bulkhead.



30 Disconnect generator control harness plug (118) from receptacle (119) on bulkhead.

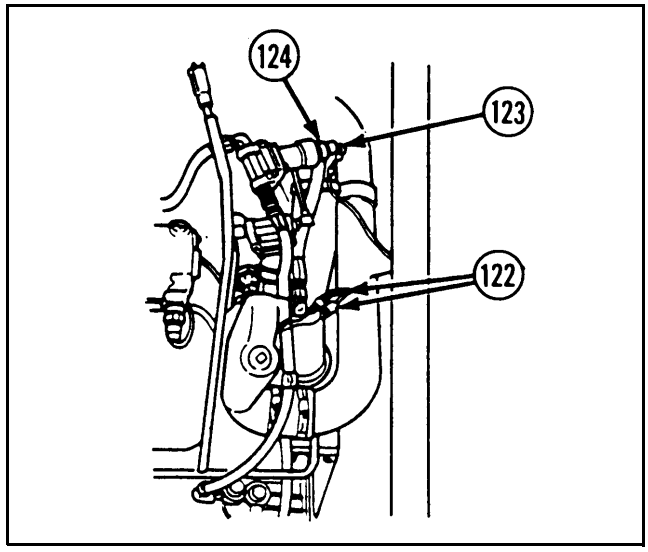


31 Disconnect neutral position switch lead (120) at connector (121) on left front of powerplant compartment.



2-35. MAINTENANCE OF POWERPLANT (CONT).

REMOVAL (CONT)

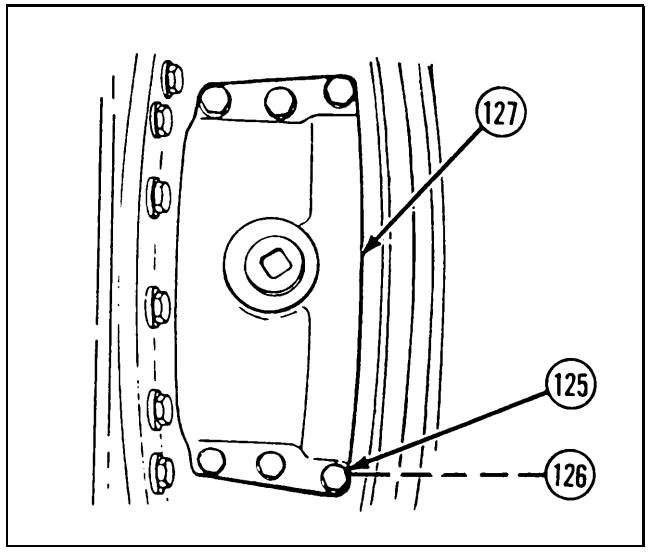


NOTE
Step 32 applies to engine model 7083-7398.

32 Disconnect two low coolant warning light leads from connectors (122) on engine. Disconnect lead (123) from purge and prime solenoid valve receptacle (124).

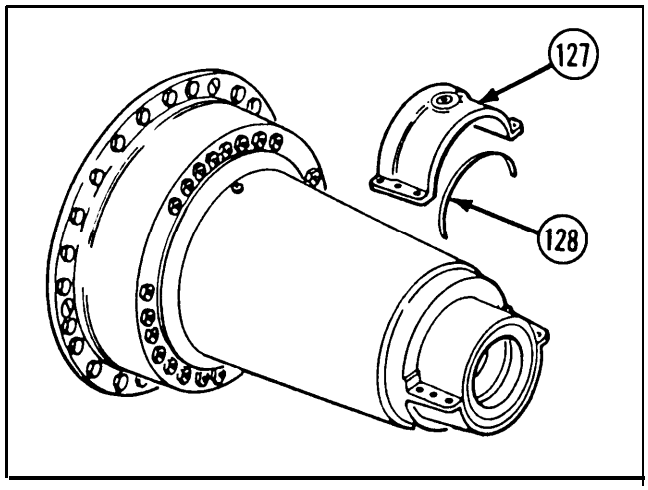
NOTE
Step 33 applies to engine model 7083-7395.

33 Disconnect two low coolant warning light leads from connectors (122) on engine.



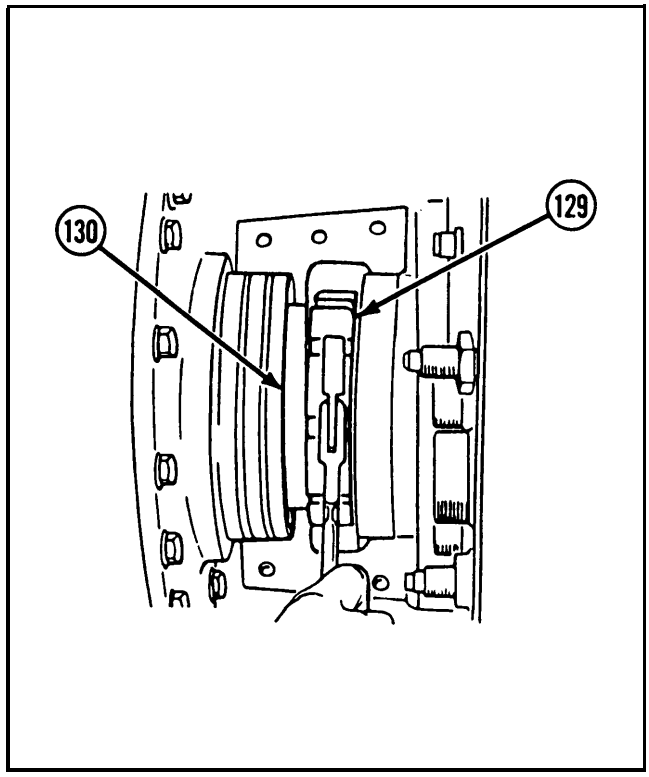
NOTE
Steps 34 thru 37 are written for left-hand final drive removal, but also apply to right-hand final drive removal.

34 Remove six screws (125) and six lock-washers (126) from left output drive cap (127).

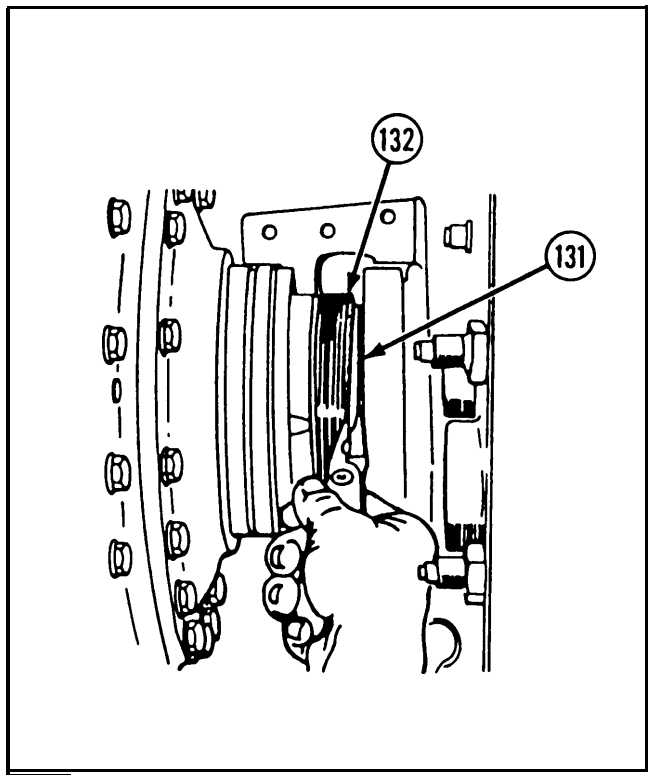


35 Lift off left output drive cap (127) and remove seal (128).

36 Unscrew final drive coupling nut (129) from transmission shaft (130), using drift and hammer or spanner wrench. Push final drive coupling nut (129) into final drive housing.

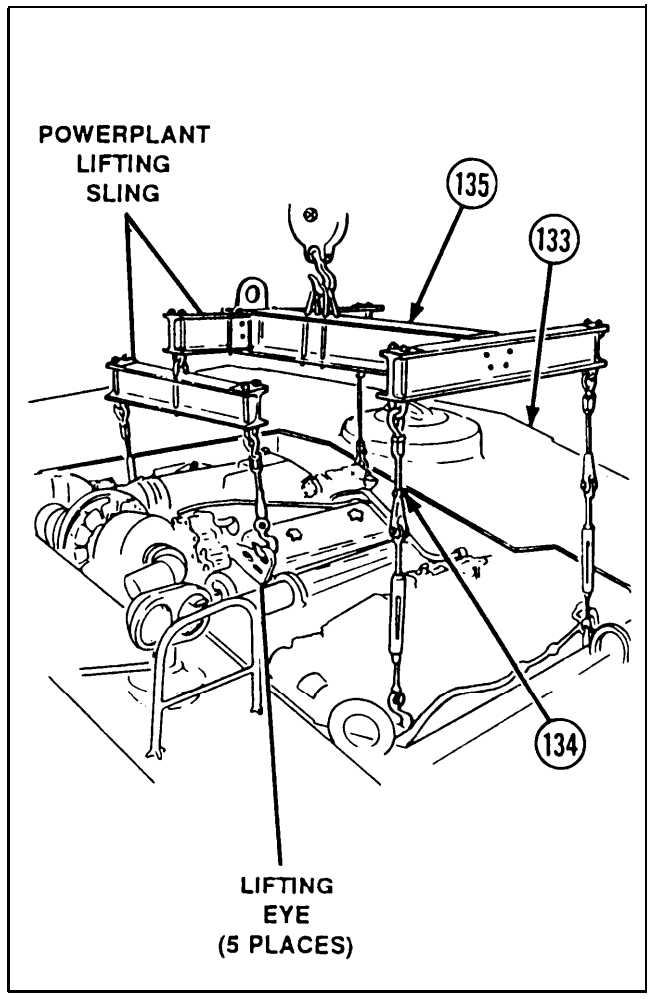


37 Remove output shaft retaining ring (131) from final drive pinion shaft (132). Push final drive pinion shaft into final drive housing until clear of transmission.

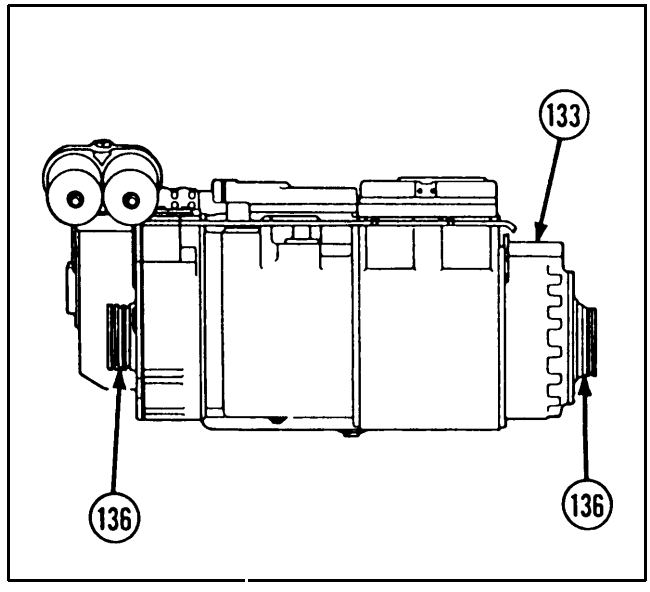


2-35. MAINTENANCE OF POWERPLANT (CONT).

REMOVAL (CONT)



38 Attach powerplant lifting sling to hoist. Hoist powerplant sling over powerplant (133), and position two longest cables (134) toward front of vehicle. Attach powerplant lifting sling to powerplant at five lifting eyes. Slowly lift powerplant sling and adjust turnbuckles until all cables are taut and carrying about equal weight. Keep top beam (135) level. Continue lifting while watching all sides of powerplant to ensure that it clears all components and hull structure. Lower powerplant and place on stand or blocks.

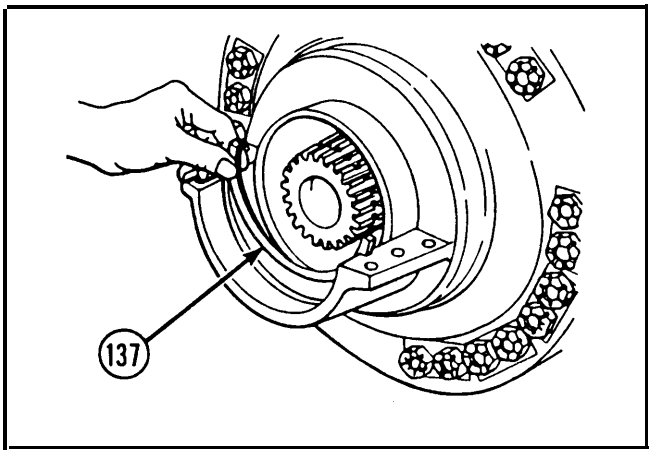


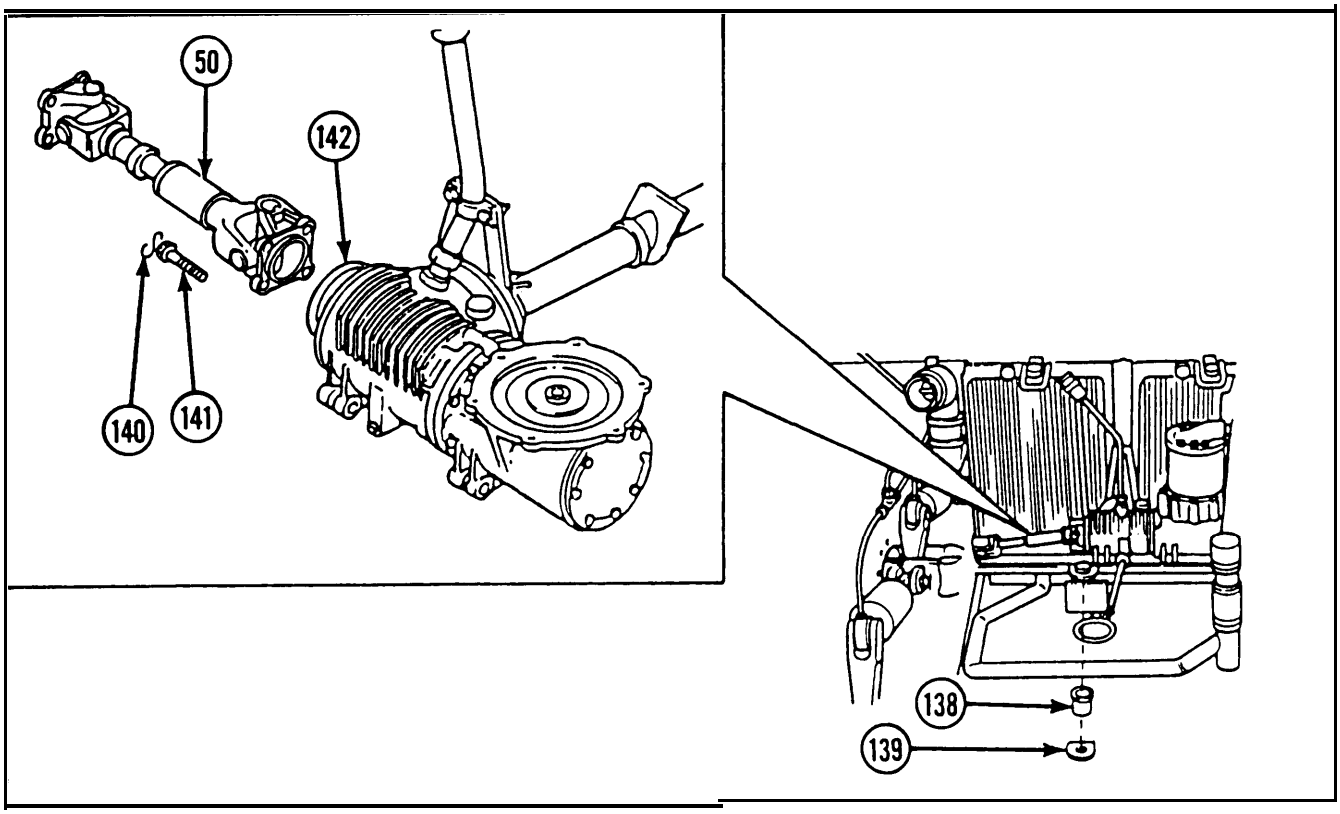
39 Remove four preformed packings (136) from powerplant (133).

NOTE

- Step 40 is written for removal of left alignment ring, but also applies to removal of right alignment ring.
- Alignment rings may release and be removed when powerplant is removed from vehicle.

40 Remove alignment ring (137) from left-hand final drive housing.





41 Remove spacer tube (138) and cushioning pad (139) from hull bottom.

NOTE

Step 42 applies to removal of the power takeoff drive shaft. Perform step 42 only if necessary to repair the power takeoff drive shaft.

42 Remove lockwire (140), four hexagon head capscrews (141), and power takeoff drive shaft (50) from auxiliary drive assembly (142).

2-35. MAINTENANCE OF POWERPLANT (CONT).

INSPECTION/REPAIR

POWERPLANT INSPECTION

1 Inspect warning switches and transmitters, electrical wiring, connectors, and fittings for deterioration and damage. Replace damaged or unserviceable components.

2 Inspect oil, fuel, and coolant hoses, tubes, and fittings for leaks, damage, and secure mounting Replace damaged or unserviceable components.

3 Inspect oil and fuel filters for leaks and secure mounting hardware.

4 Check that tachometer and speedometer drive shaft connections are secure.

5 Inspect engine mount for cracks, hardening, and deterioration.

6 Powerplant components that are authorized for replacement by unit maintenance personnel are as follows:

Starter relay (p 2-561)
Starter (p 2-559)
Neutral position switch (p 2-562)
Low oil pressure warning switch (p 2-626)
Engine oil pressure transmitter (p 2-626)
Engine coolant temperature warning thermostatic switch (p 2-626)
Engine coolant temperature transmitter (p 2-626)
Transmission oil thermostatic switch (p 2-626)
Transmission oil pressure transmitter (p 2-626)
Transmission oil temperature transmitter (p 2-626)
Powerplant reservoir breather (p 2-427)
Engine condensation hose (p 2-427)
Transmission drain hose (p 2-427)
Engine block drain hose (p 2-427)
Reservoir drain hose (p 2-427)
PowerPlant reservoir (p 2-427)
Engine oil filter (p 2-418)
Engine oil filter hoses (p 2-418)
Aeration detector (p 2-539)
Thermostats (p 2-534)
Purge and prime solenoid valve and lines (p 2-479)
Secondary fuel filter (p 2-475)
Primary fuel filter (p 2-471)
Fuel filter-to-fuel pump hose (p 2-440)
Airbox heater pump inlet hose (p 2-486)
Fuel return hose (p 2-465)
Fuel supply-to-filter hose (p 2-462)
Fuel pump-to-reservoir drain hose (p 2-475)
Fuel filter drain hose (p 2-475)
Fuel filter to solenoid valve hose (p 2-479)
Turbocharger air intake duct and screen (p 2-459 and p 2-460)
Engine exhaust system (p 2-511 and p 2-514)
Oil sampling drain cock (p 2-758)
Brakes (p 2-816)
Engine mount (p 2-416)
Fuel pump (p 2-438)
Transmission oil filter (p 2-758)

7 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1 and TM 9-2815-202-24P) which do not meet inspection criteria.

POWERPLANT COMPARTMENT INSPECTION

1 Inspect electrical wiring, connectors, and fittings for damage. Replace damaged components.

2 Inspect hydraulic hoses, tubes, and fittings for damage. Replace damaged components.

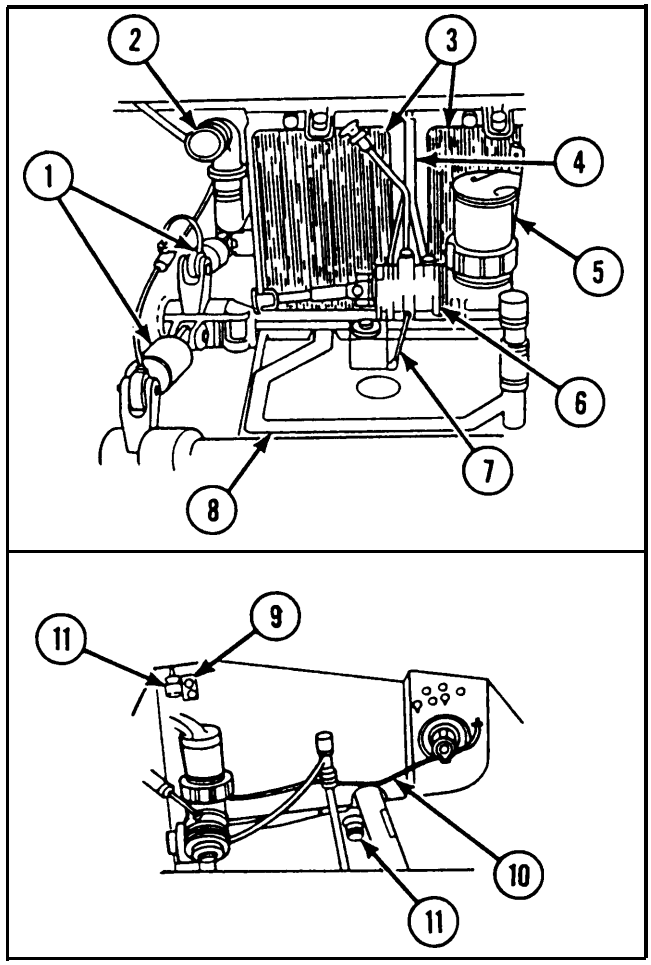
3 Inspect cooling system hoses, tubes, and fittings for damage. Replace damaged components.

4 Inspect fire extinguisher discharge nozzles for damage. Repair or replace damaged nozzles.

5 Clean inside of powerplant compartment using rags and soft-bristled brush dipped in dry cleaning solvent (SD2) (item 16, appx C).

6 Unit maintenance shall replace only the following powerplant compartment components:

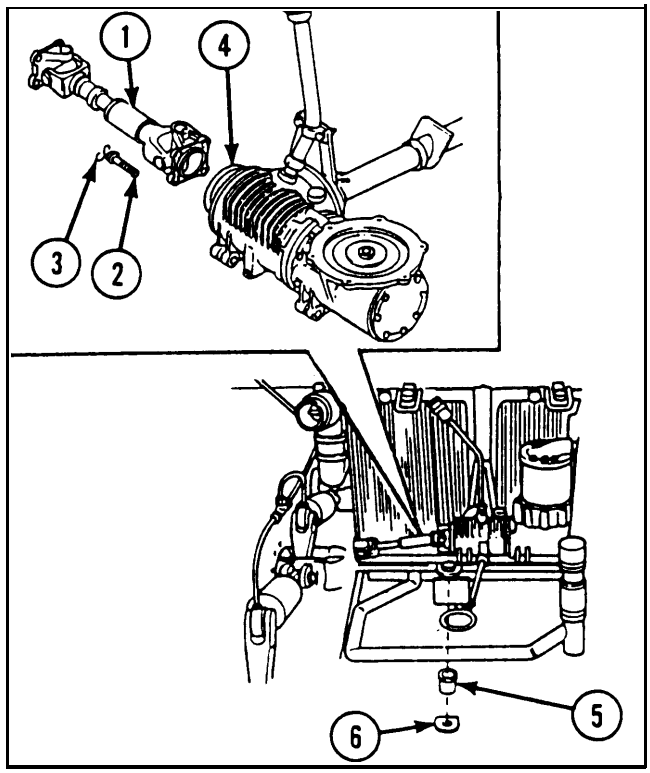
- **a.** Lockout cylinders (1) (p 2-883)
- **b.** Engine air outlet duct (2) (p 2-459)
- **c.** Radiators (3) (p 2-515)
- **d.** Surge tank (4) (p 2-528)
- **e.** Generator (5) (p 2-552)
- **f.** Auxiliary drive (6) (p 2-769)
- **9.** Auxiliary drive oil drain tube assembly (7) (p 2-773)
- **h.** Radiator coolant tube assembly (8) (p 2-515)
- **i.** Fuel line quick-disconnect couplings (9) (p 2-465)
- **j.** Electrical wiring (10) (p 2-668)
- **k.** Fire extinguisher discharge nozzles (11) (p 2-1169 and 2-1172)



7 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

2-35. MAINTENANCE OF POWERPLANT (CONT).

INSTALLATION

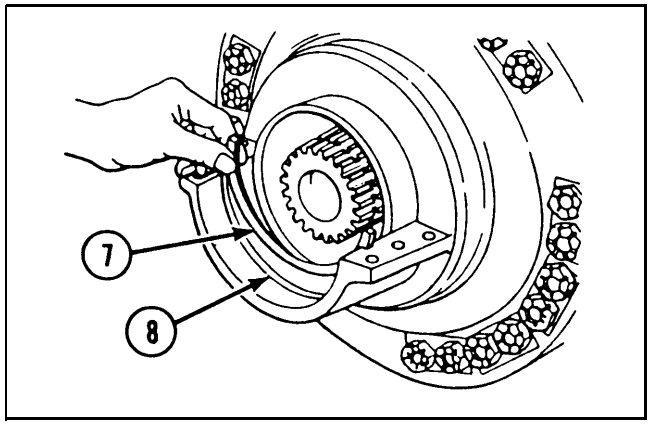


NOTE

Step 1 applies to the installation of the power takeoff drive shaft. Perform step 1 only if necessary to repair the power takeoff drive shaft.

1 Install power takeoff drive shaft (1), four hexagon head capscrews (2), and new lockwire (3) (item 26, appx C) on auxiliary drive assembly (4).

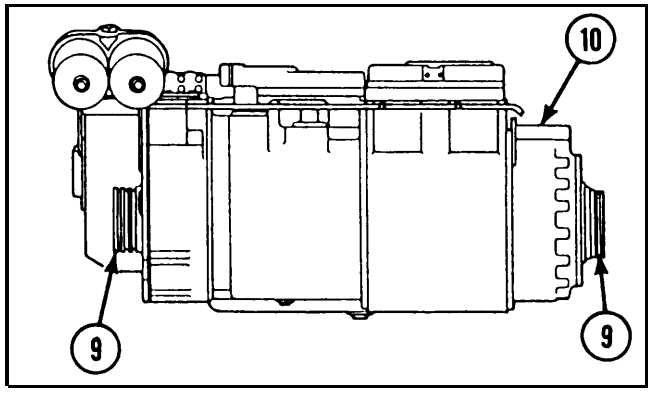
2 Install cushioning pad (5) and spacer tube (6) to hull bottom.



NOTE

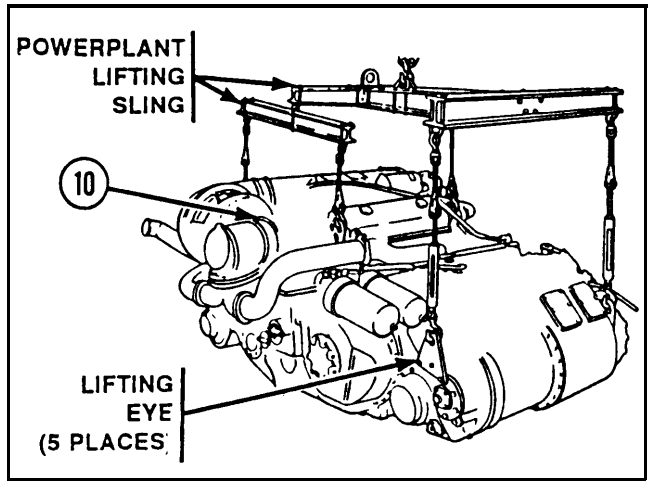
Step 3 is written for installation of left alignment ring, but also applies to right alignment ring.

3 Install left alignment ring (7) in slot (8) in final drive housing.



4 Install four new preformed packings (9) on powerplant (10).

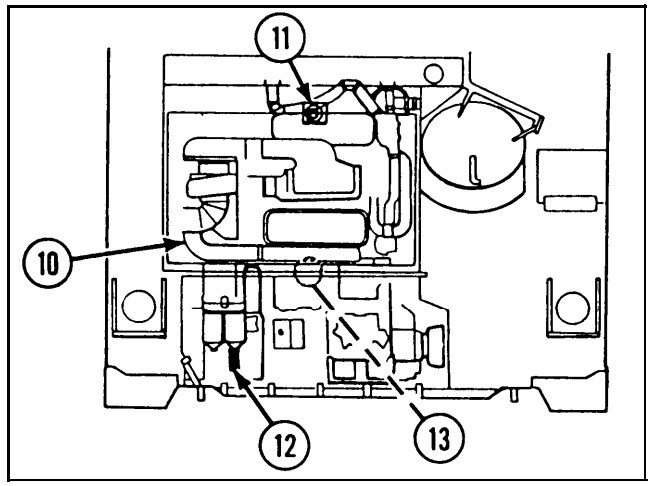
5 Install powerplant lifting sling to five lifting eyes on powerplant (10).



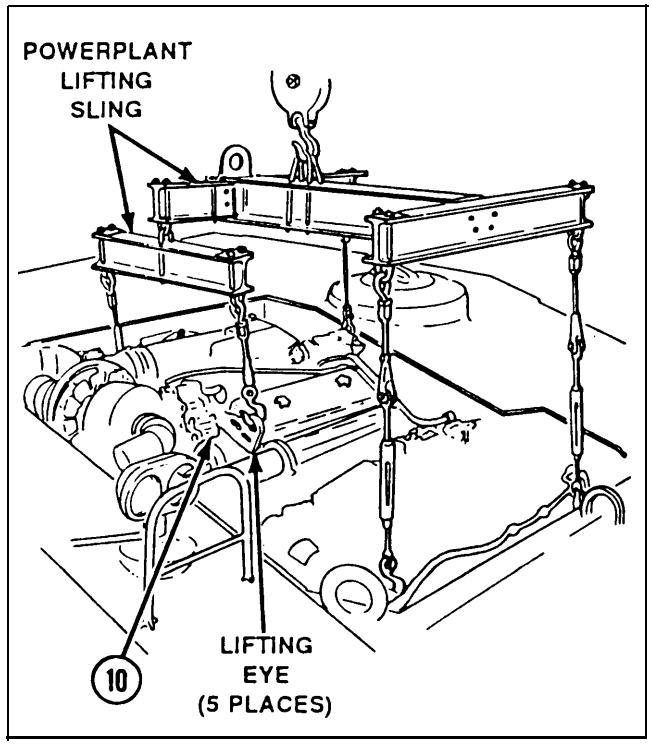
CAUTION

Do not let powerplant hit hull or other parts during installation to the vehicle.

6 Lower powerplant (10) into hull. Ensure that engine mount hole aligns with hole (11) in hull bottom, that transmission engages alignment ring (12), and that reservoir drain hose sticks out of access hole (13) in hull bottom.

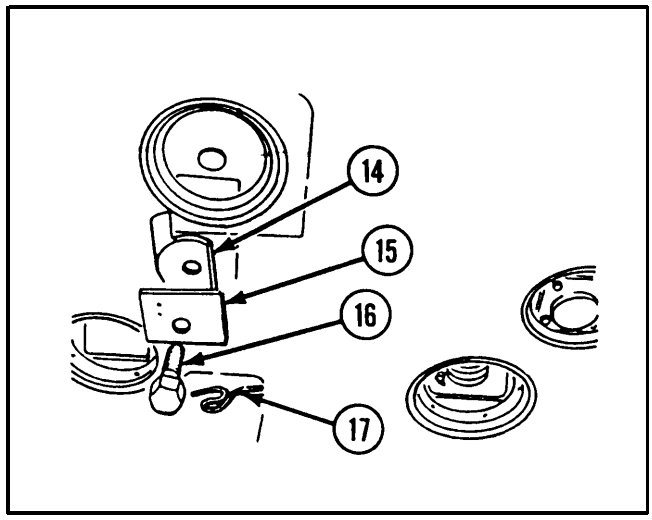


7 Remove powerplant lifting sling from lifting eyes on powerplant (10).

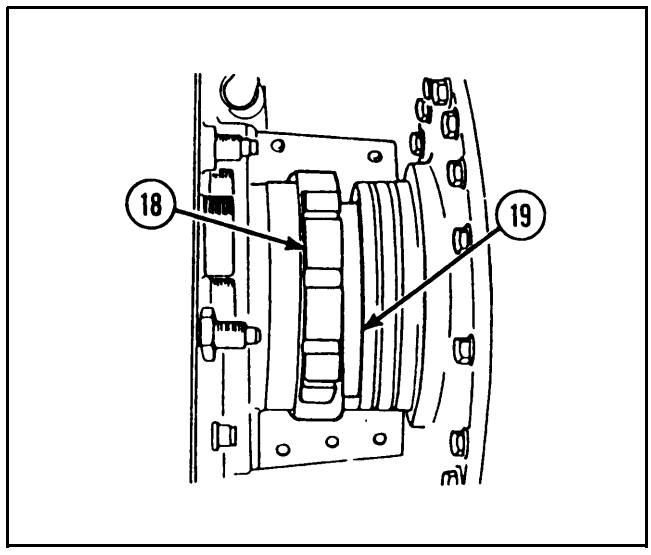


2-35. MAINTENANCE OF POWERPLANT (CONT).

INSTALLATION (CONT)



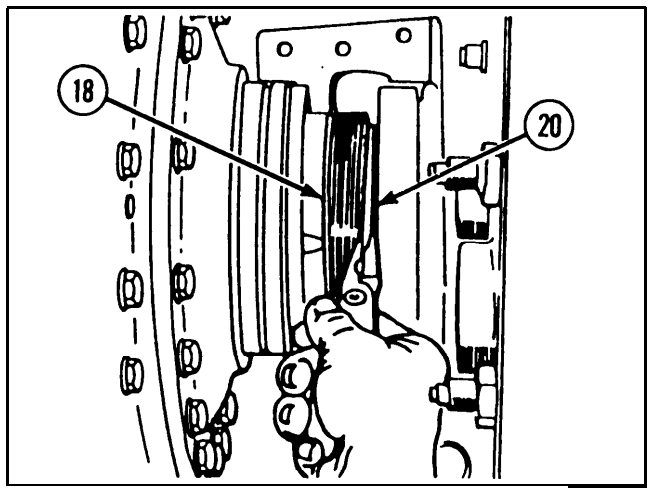
8 Install cushioning pad (14), engine mount washer (15), and hexagon head capscrew (16) to underside of hull. Secure hexagon head capscrew with new lockwire (17) (item 23, appx C).



NOTE

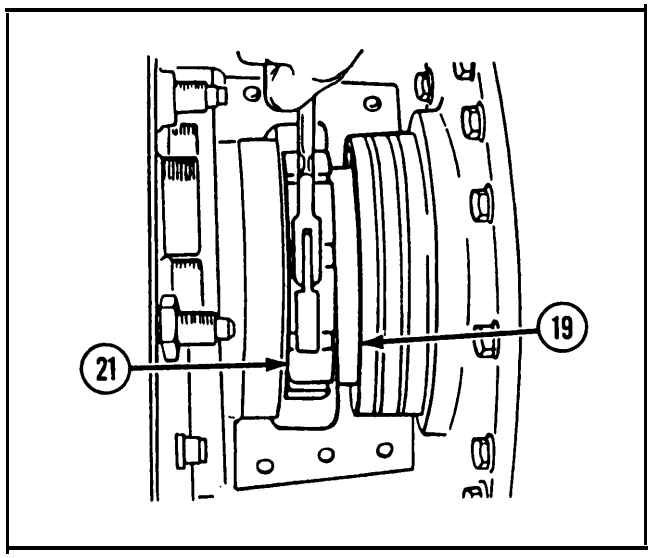
Steps 9 thru 14 are written for right final drive installation, but also apply to left final drive installation.

9 Slide final drive pinion shaft (18) from inside of right final drive and engage with transmission shaft (19).

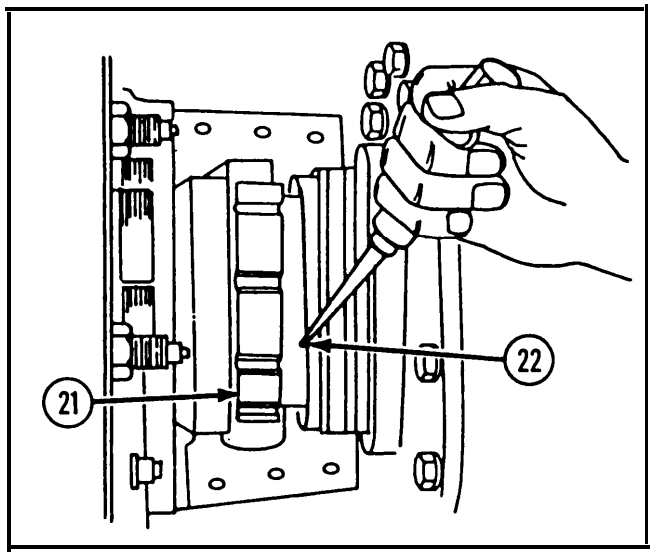


10 Install output shaft retaining ring (20) to final drive pinion shaft (18).

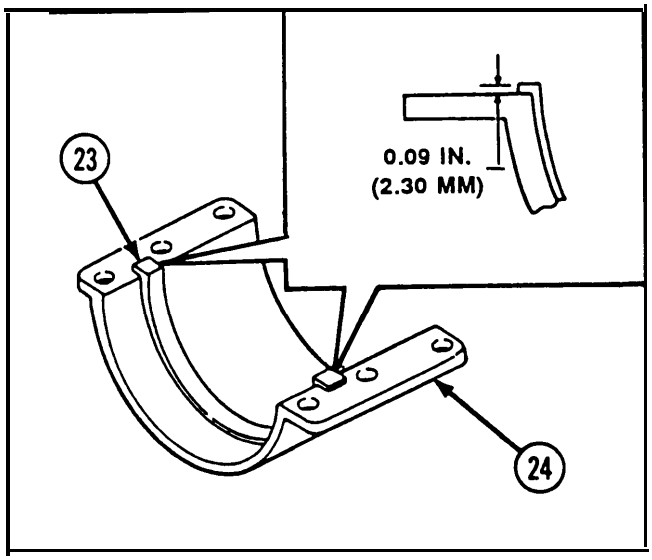
11 Slide final drive coupling nut (21) onto transmission shaft (19). Tighten coupling nut, using drift and hammer or spanner wrench.



12 Punch a dent in edge of final drive coupling nut (21) about 1/32 in. (0.8 mm) into two of four notches (22), using small punch. Replace final drive coupling nut if dents cannot be punched in undented surface.

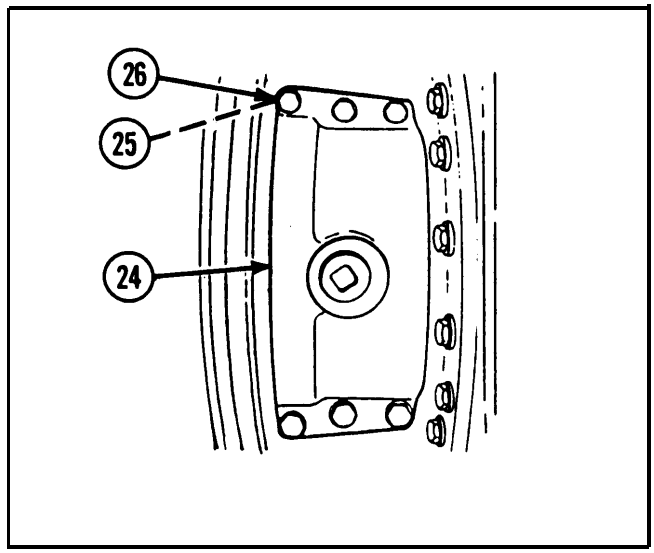


13 Install new seal (23) in groove in right output drive cap (24). Trim seal (23) to stick out 0.09 in. (2.30 mm) past mating surface of right output drive cap (24).

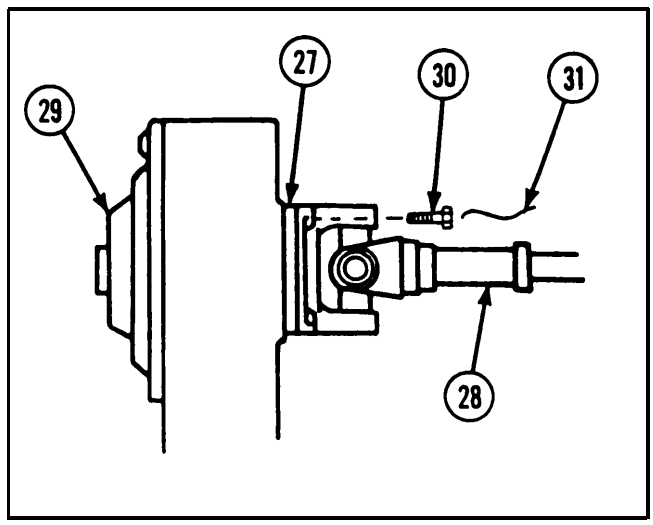


2-35. MAINTENANCE OF POWERPLANT (CONT).

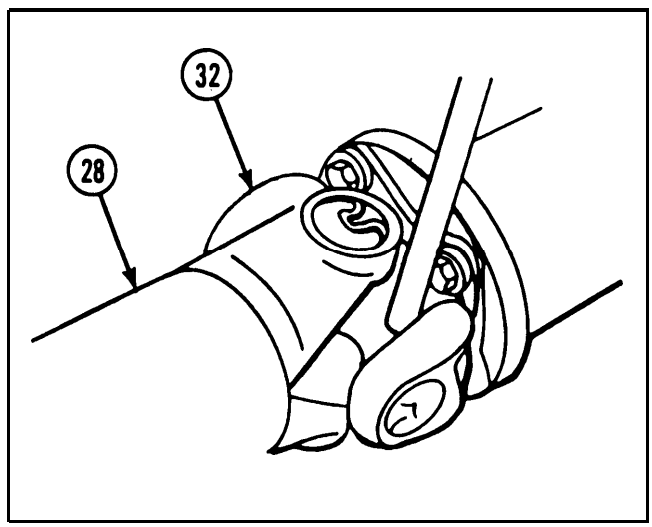
INSTALLATION (CONT)



14 Install right output drive cap (24), six new lockwashers (25), and six screws (26). Tighten six screws (26) to 36 ft-lb (49 N-m).

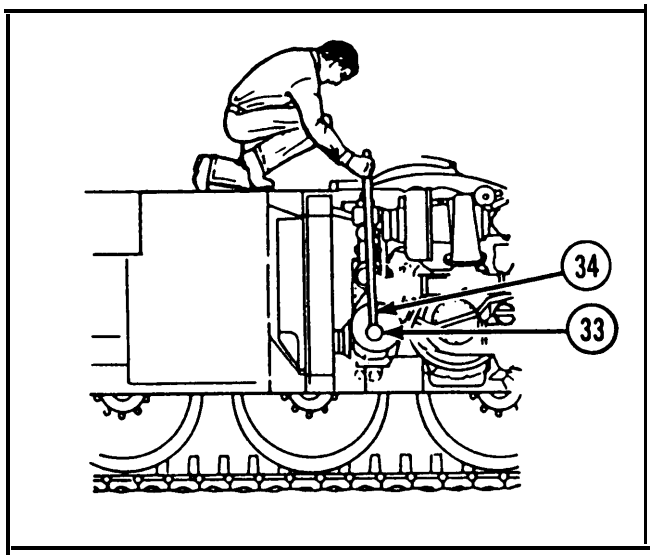


15 Mate internal gear shaft coupling (27) and power takeoff drive shaft (28) with power takeoff assembly (29). Install four hexagon head capscrews (30) and new lockwire (31) (item 26, appx C).



16 Insert end of bar in U-joint (32) of power takeoff drive shaft (28) to prevent power takeoff drive shaft (28) from turning.

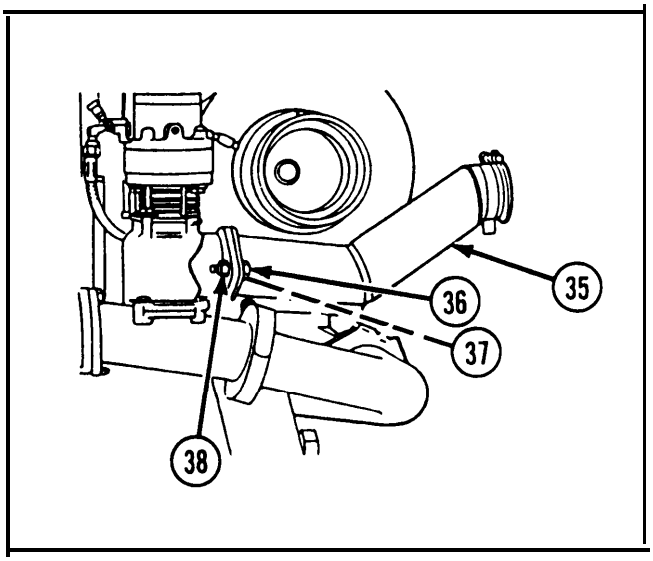
17 Tighten externally released bolt (33) to 475 ft-lb (641 N-m) using long breaking bar (34). Remove bar from U-joint.



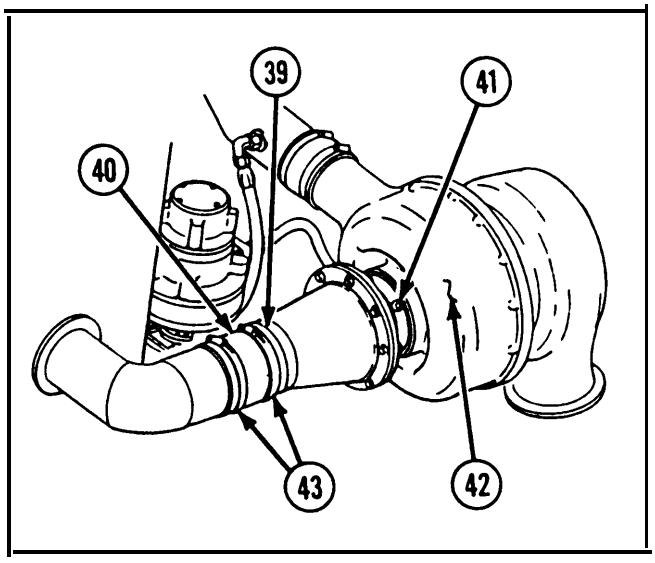
NOTE

Steps 18 and 19 apply to engine model 7083-7398.

18 Install exhaust pipe (35) and secure with two hexagon head capscrews (36), two new lockwashers (37), and two hexagon plain nuts (38).



19 Install intake screen (39) and air duct hose (40). Secure intake screen (39) with four hexagon head capscrews (41) and new lockwire (42) (item 26, appx C). Position and tighten two hose clamps (43).

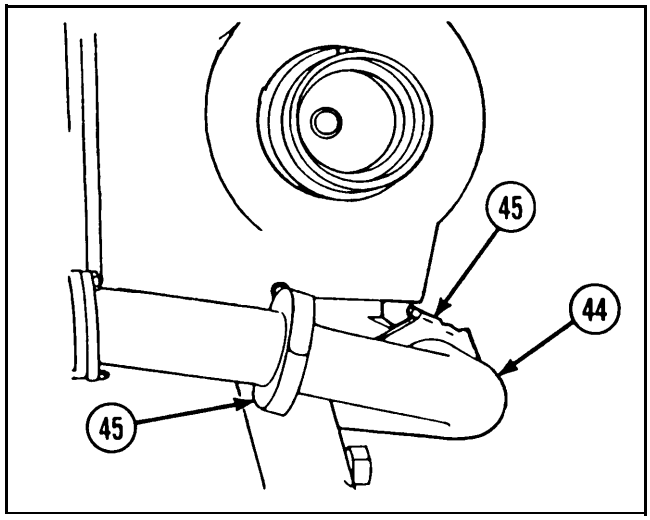


2-35. MAINTENANCE OF POWERPLANT (CONT).

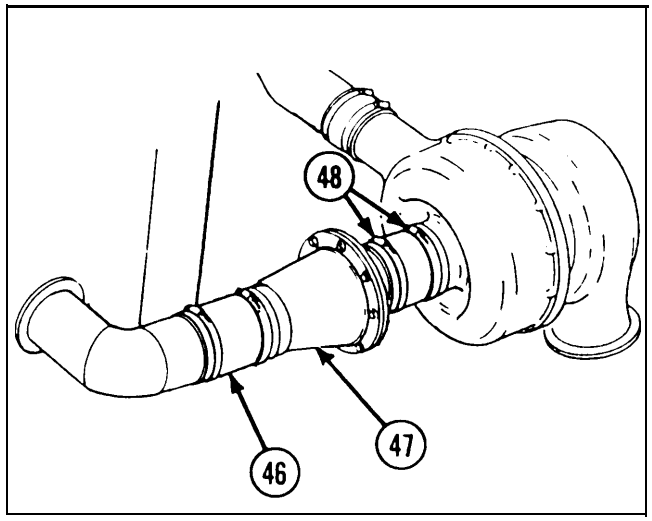
INSTALLATION (CONT)

NOTE
Steps 20 and 21 apply to engine model 7083-7395.

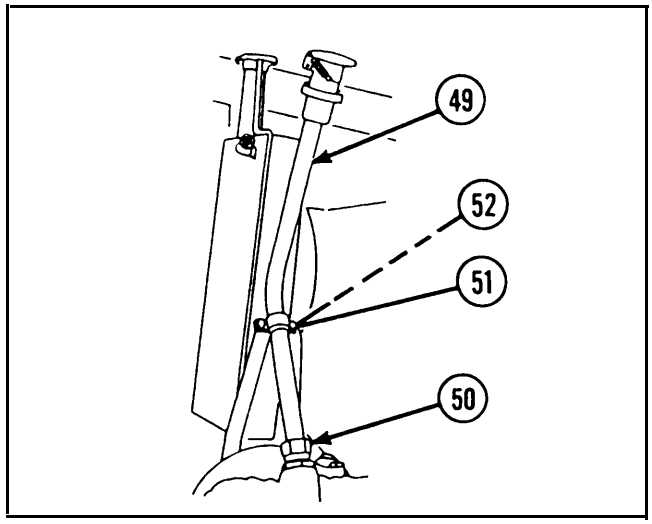
20 Install engine exhaust elbow (44) and secure with two coupling clamps (45).



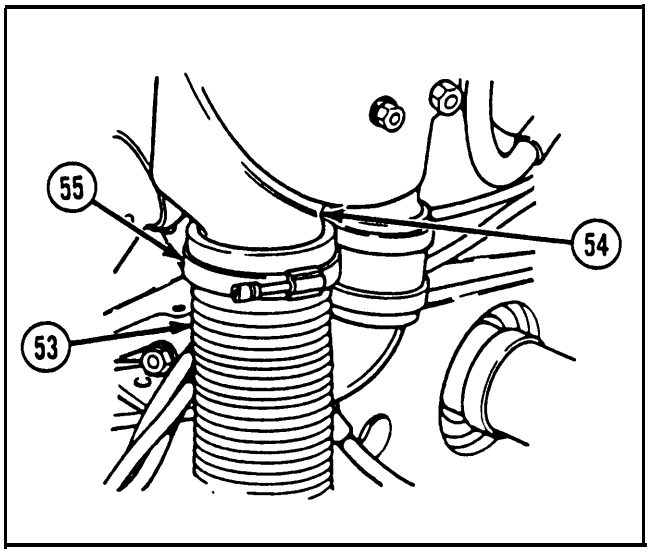
21 Install air duct hose (46) and air screen assembly (47). Position and tighten four hose clamps (48).



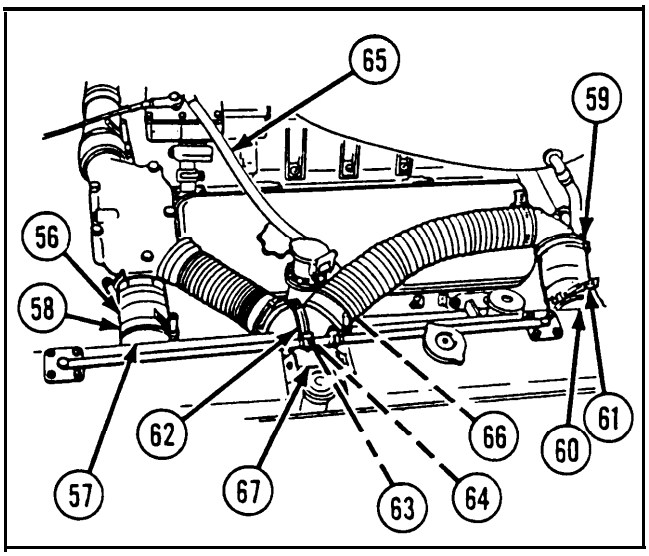
22 Turn oil filler neck (49) 90 degrees clockwise. Tighten nut (50) at base of oil filler neck. Tighten hexagon head cpscrew (51) and new self-locking nut (52).



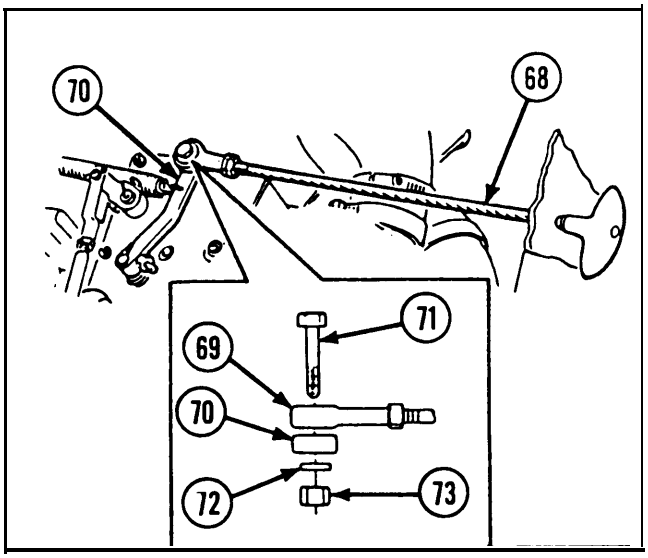
23 Install nonmetallic hose (53) onto coolant (water) pump (54) inlet. Tighten hose clamp (55).



24 Install nonmetallic hose (56) on left radiator inlet (57) and tighten hose clamp (58). Install nonmetallic hose (59) on right radiator inlet (60) and tighten hose clamp (61). Install cushioned loop clamp (62), and secure with new lckwasher (63) and machine screw (64). Connect rubber hose (65) to pipe to tube elbow (66) at surge tank (67).

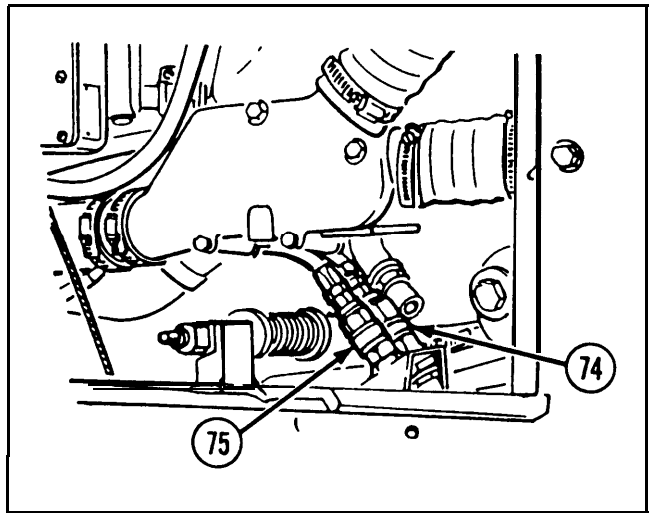


25 Pull engine shutdown wire rope assembly (68) from driver's compartment and align plain rod end bearing (69) hole with hole in engine shutdown manual control lever (70). Secure with hexagon head capscrew (71), new lckwasher (72), and hexagon plain nut (73).

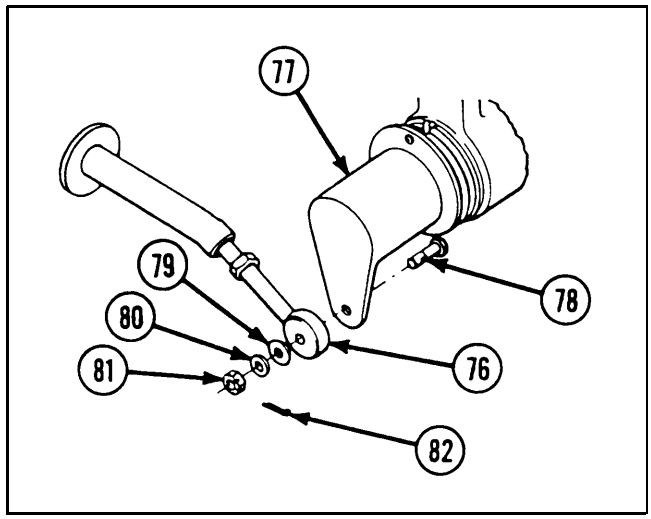


2-35. MAINTENANCE OF POWERPLANT (CONT).

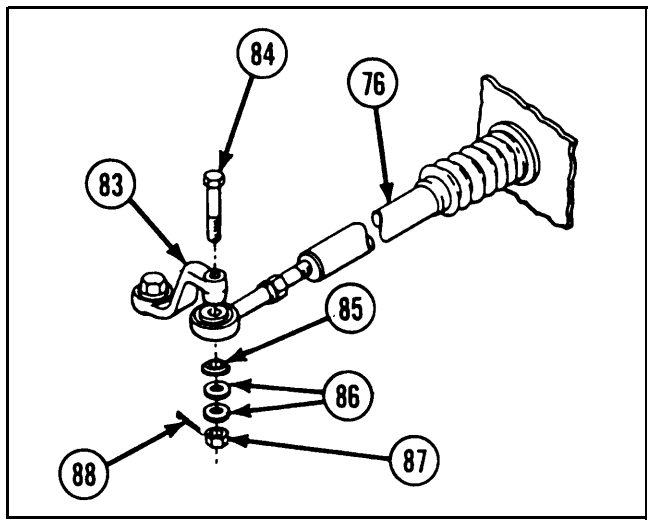
INSTALLATION (CONT)



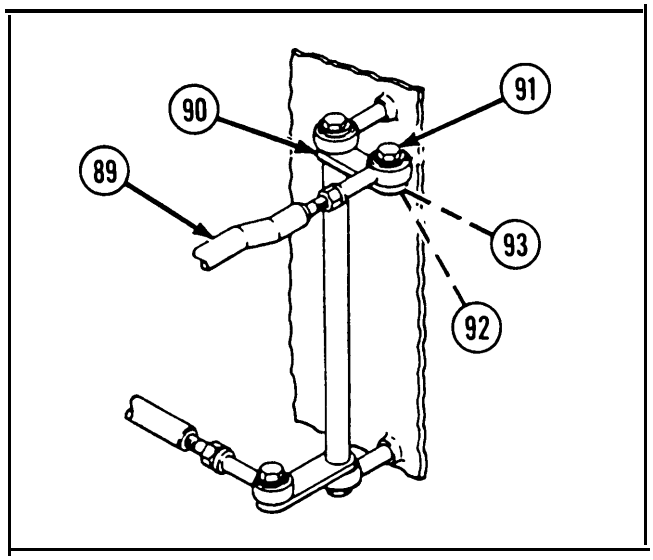
26 Install fuel supply hose (74) and fuel return hose (75) at quick disconnects located in right rear engine compartment near driver's compartment.



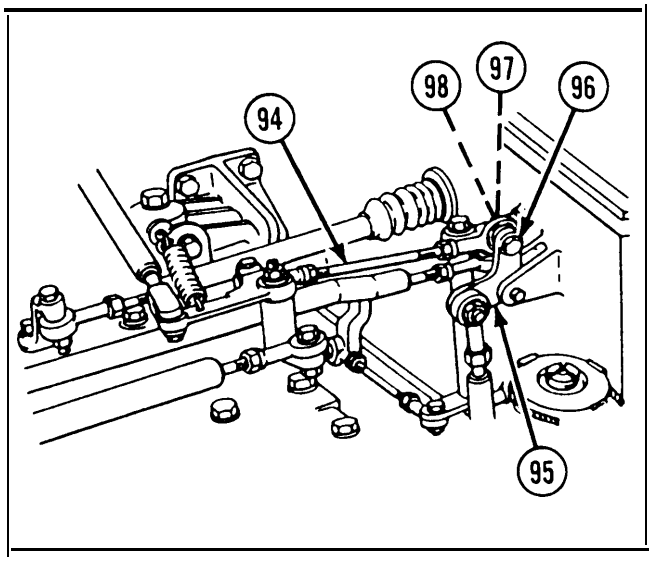
27 Position and install steering rod assembly (76) to pivoting wheel control linkage arm (77), and secure with hexagon head capscrew (78), beveled washer (79), flat washer (80), plain slotted nut (81), and new cotter pin (82).



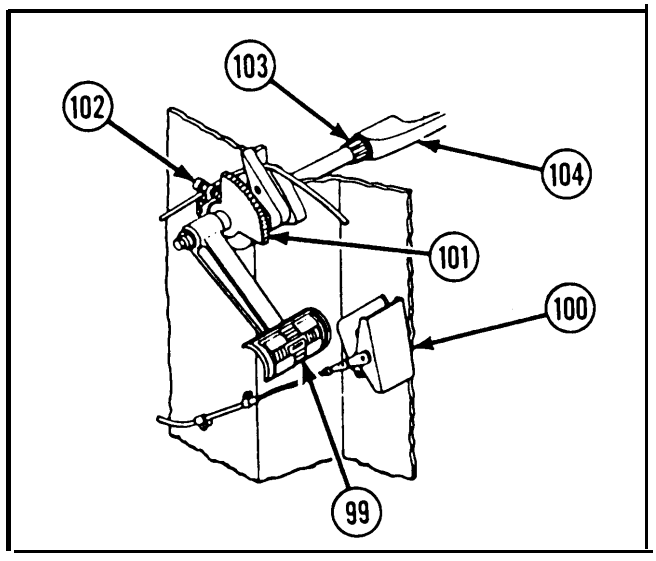
28 Install steering rod assembly (76) to steering gear arm (83) and secure with hexagon head capscrew (84), beveled washer (85), two flat washers (86), plain slotted nut (87), and new cotter pin (88).



29 Install shift control rod (89) to shift control linkage bell crank (90), and secure with hexagon head capscrew (91), new lockwasher (92), and hexagon plain nut (93).



30 Install plain throttle linkage stud (94) to throttle linkage bell crank (95), and secure with hexagon head capscrew (96), new lockwasher (97), and hexagon plain nut (98).



NOTE

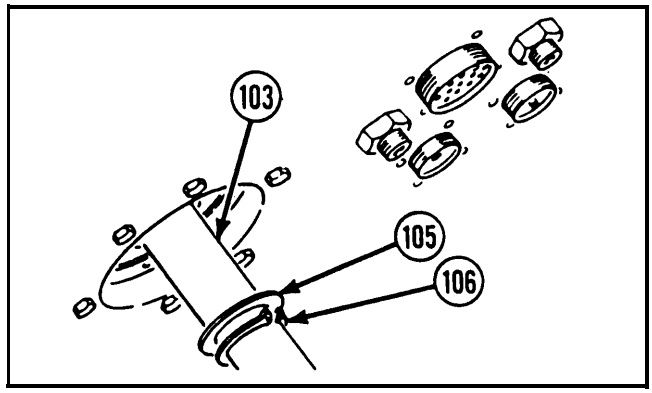
Raise lower brake pedal to engage splines.

31 Lift brake pedal (99) until about level with foot throttle control pedal (100). Hold parking brake ratchet (101) against brake warning sensitive switch (102), and slide brake control shaft (103) until engaged with manual control lever (104).

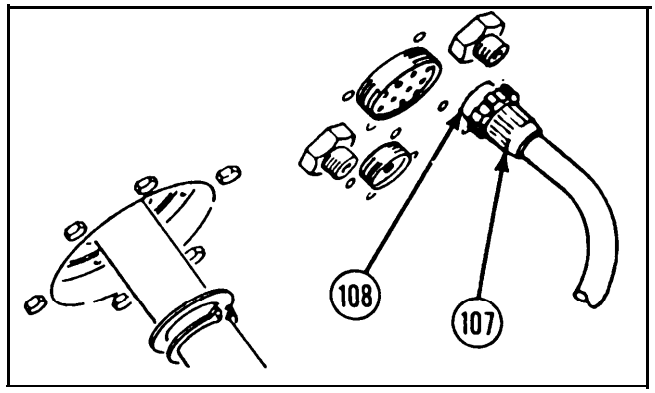
2-35. MAINTENANCE OF POWERPLANT (CONT).

INSTALLATION (CONT)

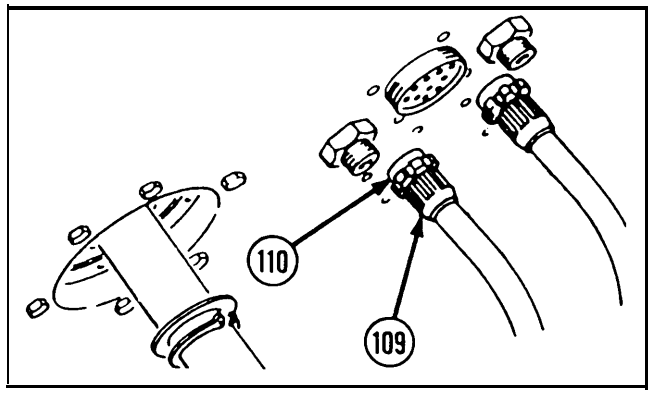
32 Install ring spacer (105) and retaining ring (106) on brake control shaft (103). Install retaining ring in groove in brake control shaft.



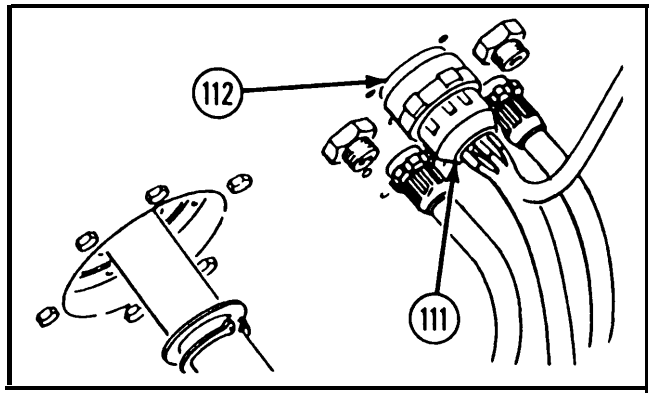
33 Connect generator lead plug (107) to receptacle (108) on bulkhead.



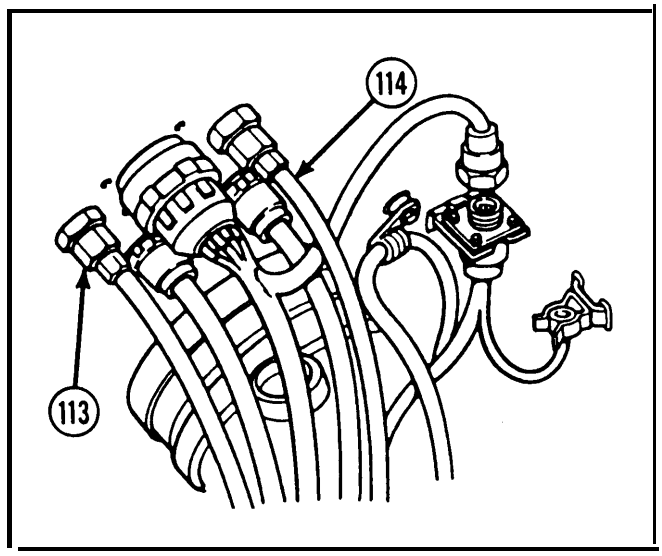
34 Connect starter lead plug (109) to receptacle (110) on bulkhead.



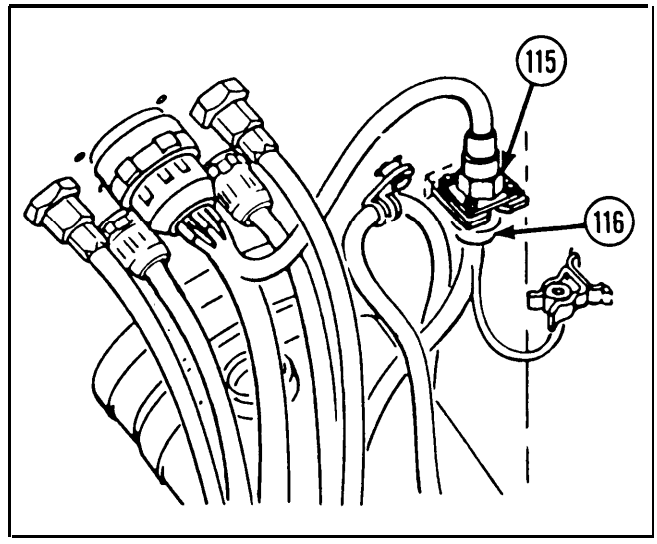
35 Connect engine electrical harness plug (111) to receptacle (112) on bulkhead.



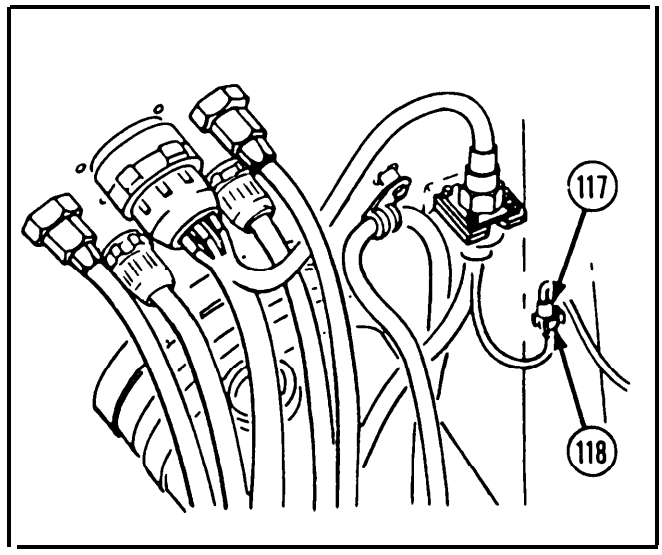
36 Connect tachometer drive shaft assembly (113) and speedometer drive shaft assembly (114) to adapters on bulkhead.



37 Connect generator control harness plug (115) to receptacle (116) on left front of powerplant compartment.



38 Connect neutral position switch lead (117) to connector (118) on left front of powerplant compartment.

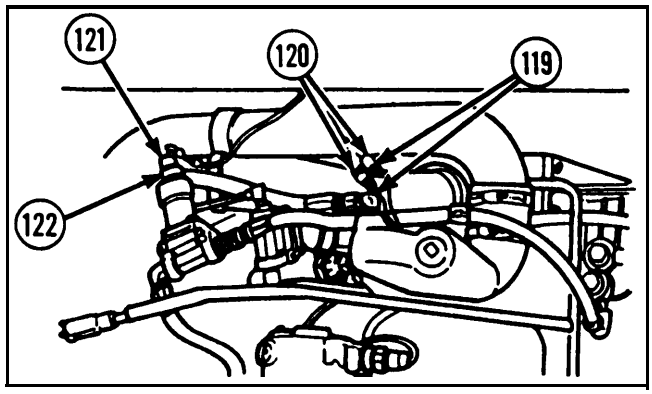


2-35. MAINTENANCE OF POWERPLANT (CONT).

INSTALLATION (CONT)

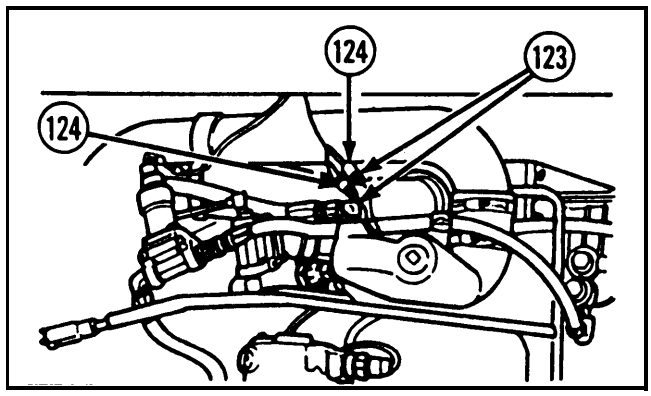
NOTE
Step 39 applies to engine model 7083-7398.

39 Connect two low coolant warning light leads (119) to connectors (120) on engine. Connect lead (121) to purge and prime solenoid valve receptacle (122).

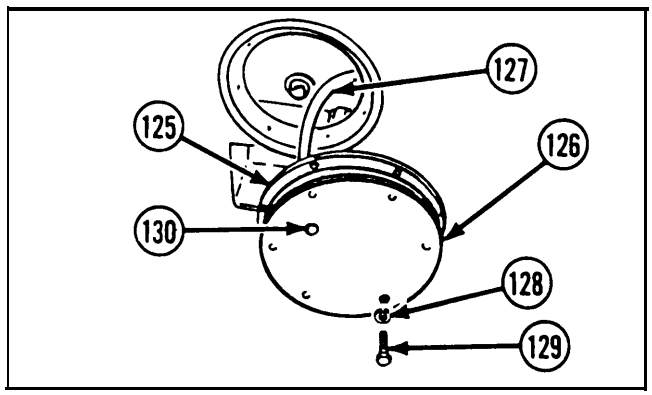


NOTE
Step 40 applies to engine model 7083-7395.

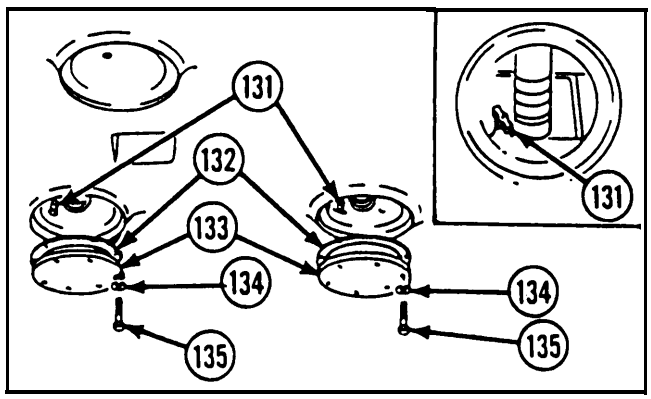
40 Connect two low coolant warning light leads (123) to connectors (124) on engine.

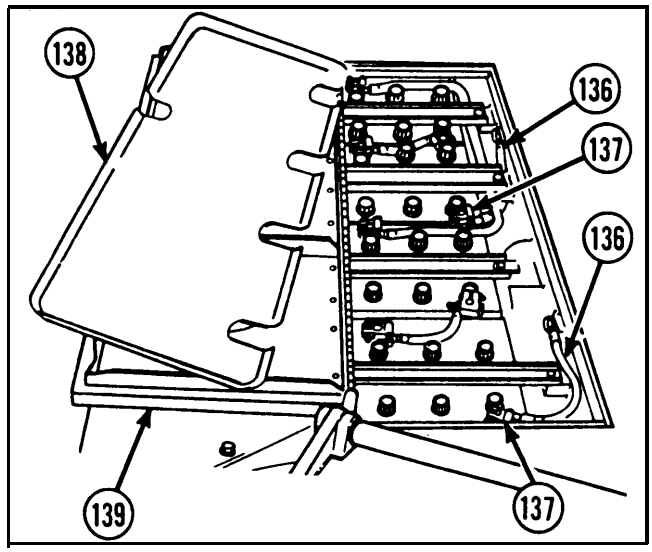


41 Install new gasket (125) on engine oil reservoir access cover (126). Connect reservoir drain hose (127) to fitting on engine oil reservoir access cover (126). Install engine oil reservoir access cover to underside of hull, and secure with six new lockwashers (128) and six hexagon head capscrews (129). Install pipe plug (130) in engine oil reservoir access cover (126).



42 Close 2 radiator drain cocks (131) on underside of hull. Install 2 new gaskets (132), 2 access covers (133), 12 new lockwashers (134), and 12 hexagon head capscrews (135).





43 Connect two electrical ground leads (136) to storage battery terminals (137). Install battery protection liner (138). Close battery access cover (139).

44 Fill cooling system with water. Refer to TM 9-2350-238-10.

45 Fill fuel cell as necessary. Refer to TM 9-2350-238-10.

46 Check engine shutdown cable adjustment. Refer to page 2-499.

47 Check shift linkage adjustment. Refer to page 2-775.

48 Check brake adjustment. Refer to page 2-816.

49 Check throttle linkage adjustment. Refer to page 2-499.

50 Check that electrical connections are secure and tight.

51 Purge and prime fuel system. Refer to TM 9-2350-238-10.

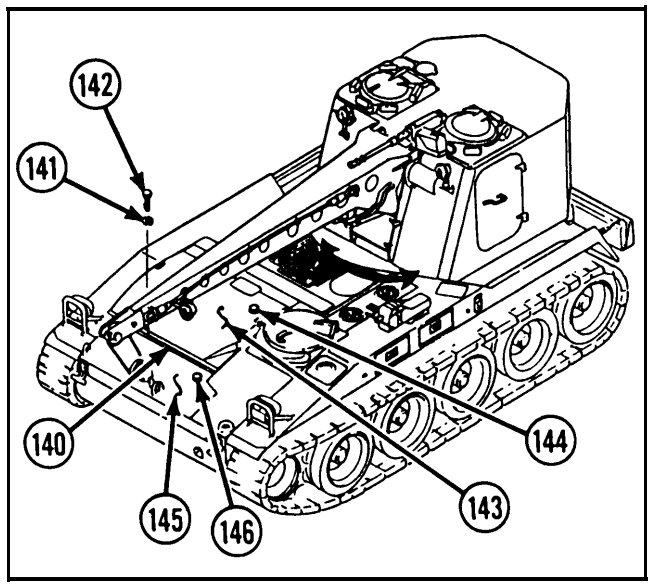
52 Check for leaks.

53 Repair all leaks that are found.

54 Run engine until operating temperature is reached. Refer to TM 9-2350-238-10. Check for proper operation.

55 Install floor support beam (140) on hull, and secure with two new lockwashers (141) and two hexagon head capscrews (142).

56 Install hull engine compartment deck assembly lid (143) on hull and secure with four plain cap nuts (144). Torque plain cap nuts to 50 ft-lb (67.5 N-m). Install hull transmission compartment deck assembly (145) on hull and secure with four plain cap nuts (146). Torque plain cap nuts to 50 ft-lb (67.5 N-m).



2-36. MAINTENANCE OF ENGINE MOUNT.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

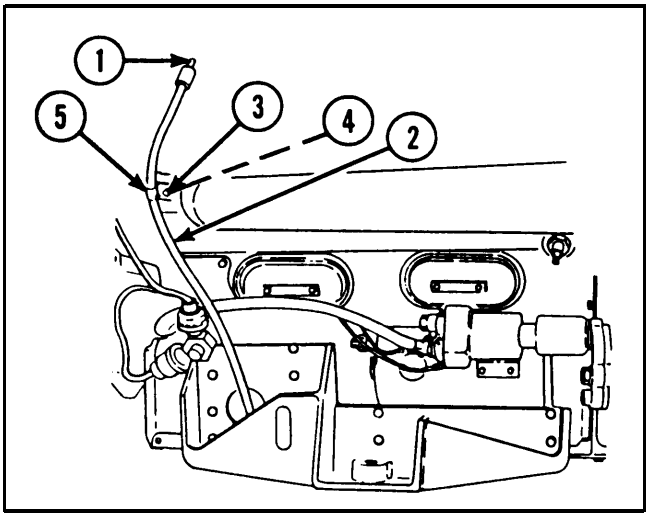
INITIAL SETUP

Materials/Parts
Lockwasher (12)

References
TM 9-2350-238-24P-1

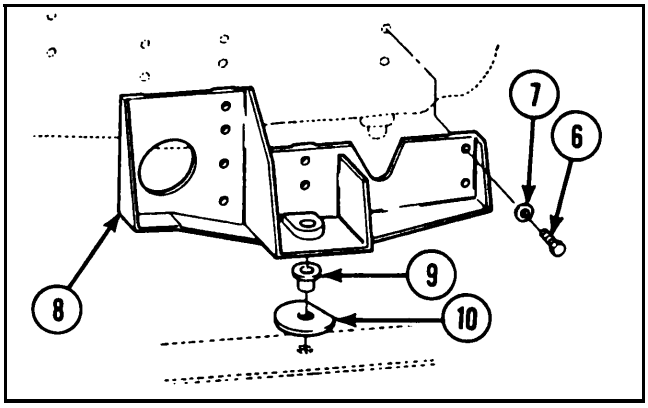
Equipment Conditions
2-384 Powerplant removed, supported by hoist, and blocked

REMOVAL



1 Remove oil level dipstick (1) from dipstick tube (2).

2 Remove screw (3) and washer (4) securing clamp (5) to powerplant. Remove dipstick tube (2).



3 Remove 12 hexagon head capscrews (6), 12 Iockwashers (7), and mounting bracket (8) from powerplant.

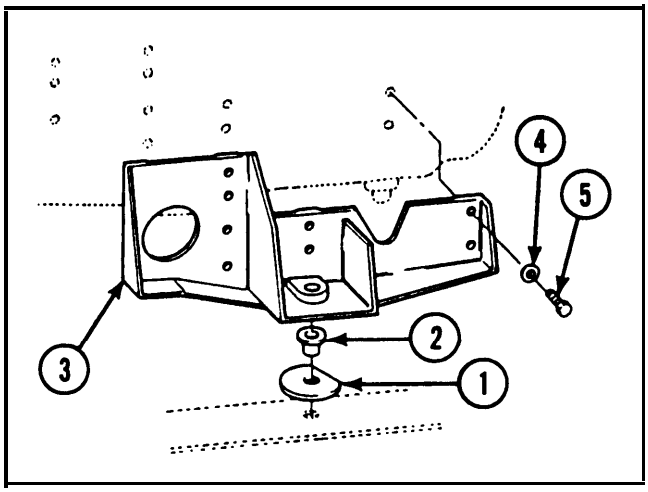
4 Remove mount tube spacer (9) and cushioning pad (10) from frame of vehicle.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

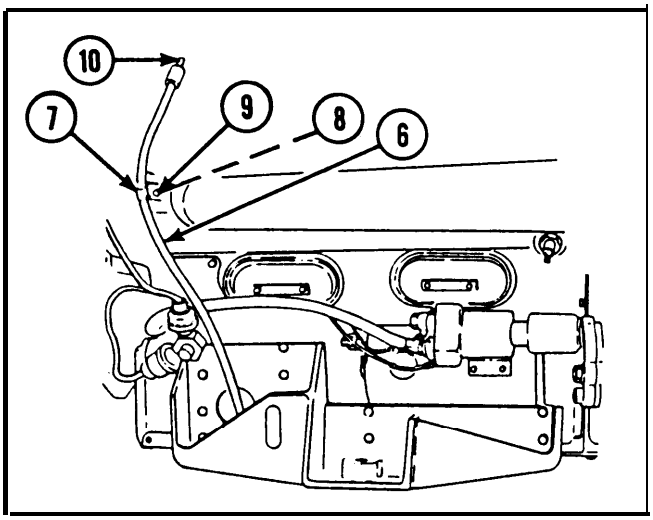
2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



1 Install cushioning pad (1) and mount tube spacer (2) on frame of vehicle.

2 Install mounting bracket (3) to powerplant and secure with 12 new lockwashers (4) and 12 hexagon head capscrews (5).



3 Install dipstick tube (6) to powerplant and secure with clamp (7), washer (8), and screw (9).

4 Install oil level dipstick (10) in dipstick tube (6).

2-37. MAINTENANCE OF EXTERNAL OIL LINES AND FITTINGS (UPPER ENGINE).

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Materials/Parts
- Filter element (2)
- Lockwasher (4)
- Lockwasher (3)
- Lockwasher (8)
- Lockwasher (4)
- Preformed packing (2)
- Preformed packing (3)
- Self-locking nut (4)

References
- TM 9-2350-238-10
- TM 9-2350-238-24P-1
- TM 9-2815-202-24P

Equipment Conditions
- 2-384 Powerplant removed
- 2-938 Hull transmission compartment deck assembly removed
- 2-935 Hull engine compartment deck assembly lid removed

REMOVAL

1 Place suitable container under fluid filter (1).

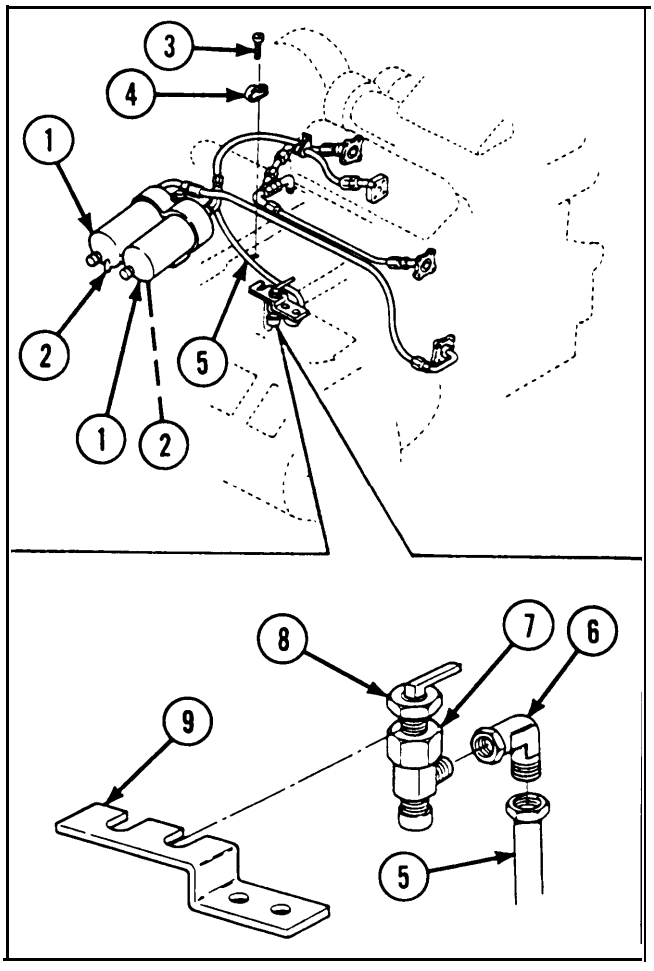
2 Remove two drain plugs (2) and drain oil into container.

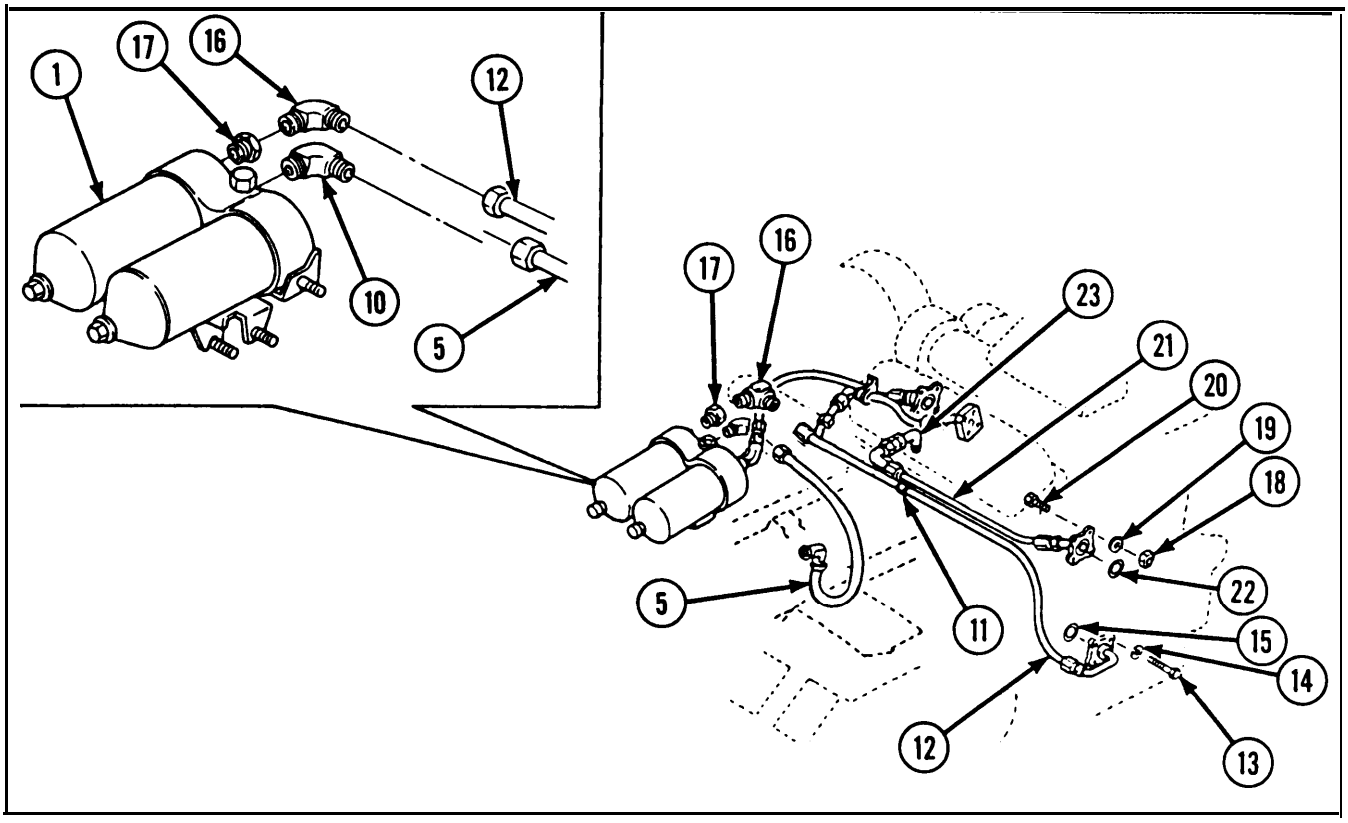
3 Remove capscrew (3) from loop clamp (4), and remove loop clamp from nonmetallic hose assembly (5).

4 Disconnect nonmetallic hose assembly (5) from pipe to tube elbow (6).

5 Remove pipe to tube elbow (6) from drain cock (7).

6 Loosen nut (8) on drain cock (7), and remove drain cock from angle bracket (9).





7 Remove nonmetallic hose assembly (5) from pipe to tube elbow (10). Remove pipe to tube elbow (10) from fluid filter (1).

8 Remove marker band (11) from engine oil filter nonmetallic hose assembly (12).

9 Remove four hexagon head capscrews (13) and four Iockwashers (14) from engine oil filter nonmetallic hose assembly (12).

10 Remove engine oil filter nonmetallic hose assembly (12) and preformed packing (15) from engine.

11 Remove engine oil filter nonmetallic hose assembly (12) from pipe to tube elbow (16).

12 Remove pipe to tube elbow (16) and pipe bushing (17) from fluid filter (1).

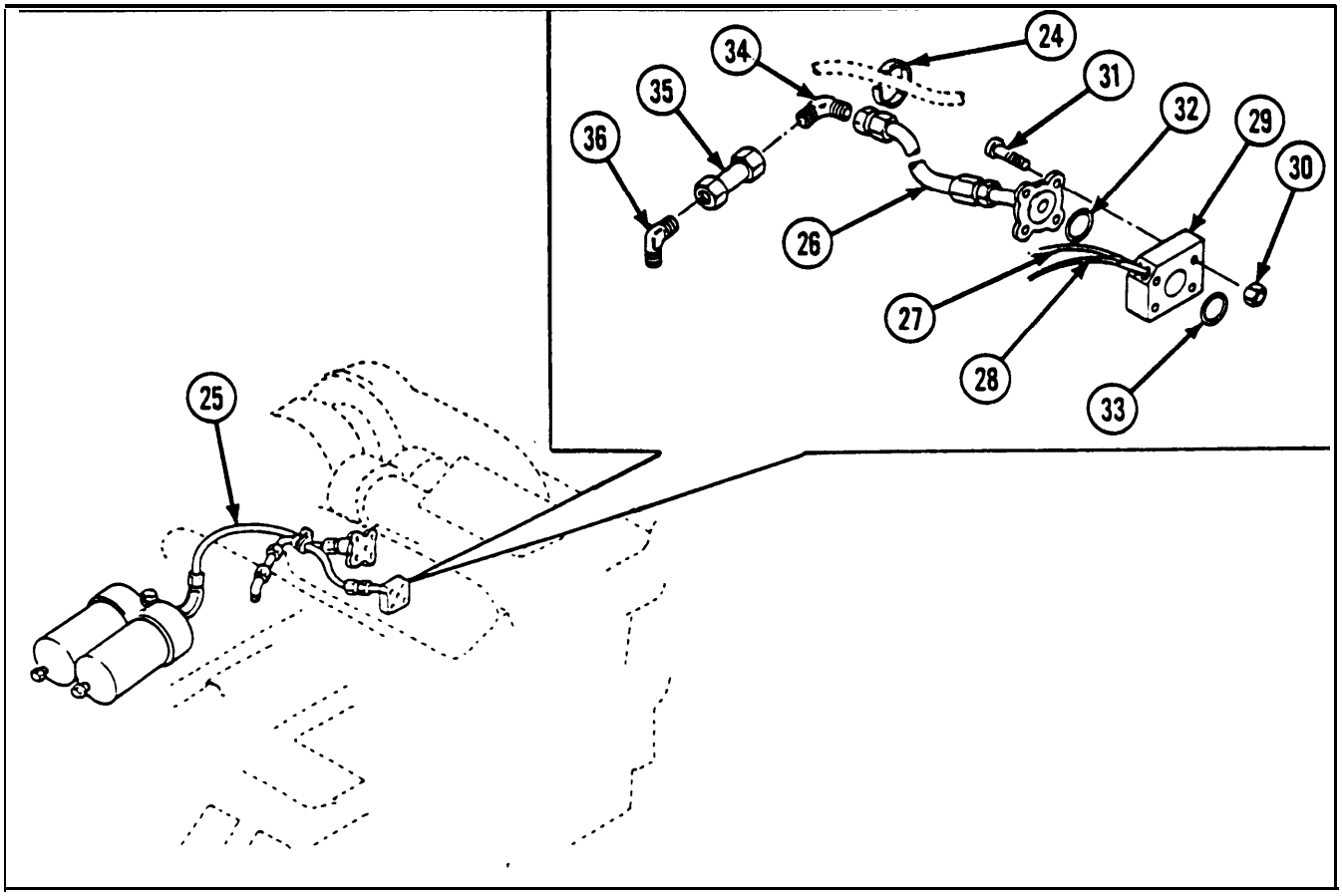
13 Remove four hexagon plain nuts (18), four Iockwashers (19), and four hexagon head capscrews (20) from transmission to oil cooler nonmetallic hose assembly (21). Remove transmission to oil cooler nonmetallic hose assembly (21) and preformed packing (22) from engine.

14 Remove transmission to oil cooler nonmetallic hose assembly (21) from pipe to tube elbow (23).

15 Remove pipe to tube elbow (23) from engine.

2-37. MAINTENANCE OF EXTERNAL OIL LINES AND FITTINGS (UPPER ENGINE) (CONT).

REMOVAL (CONT)



16 Remove marker band (24) from oil filter cooler nonmetallic hose assembly (25) and transmission to oil cooler rubber hose assembly (26).

17 Disconnect switch (27) and transmitter (28) electrical leads from oil reservoir manifold (29).

18 Remove four self-locking nuts (30) and four hexagon head capscrews (31) from oil reservoir manifold (29).

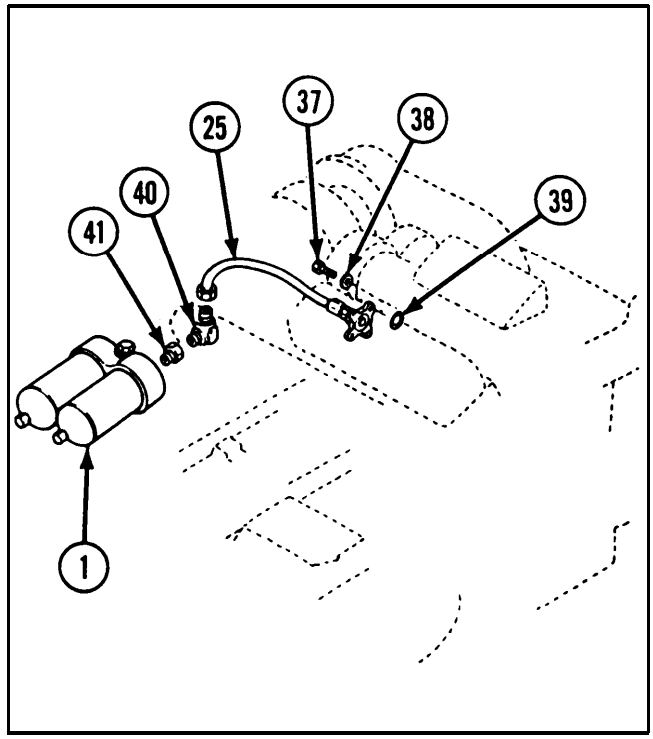
19 Remove transmission to oil cooler rubber hose assembly (26), preformed packing (32), oil reservoir manifold (29), and preformed packing (33) from engine.

20 Remove transmission to oil cooler rubber hose assembly (26) from tube elbow (34).

21 Remove tube elbow (34) from transmission to oil cooler preformed metal tube assembly (35).

22 Remove transmission to oil cooler preformed metal tube assembly (35) from pipe to tube elbow (36).

23 Remove pipe to tube elbow (36) from engine.



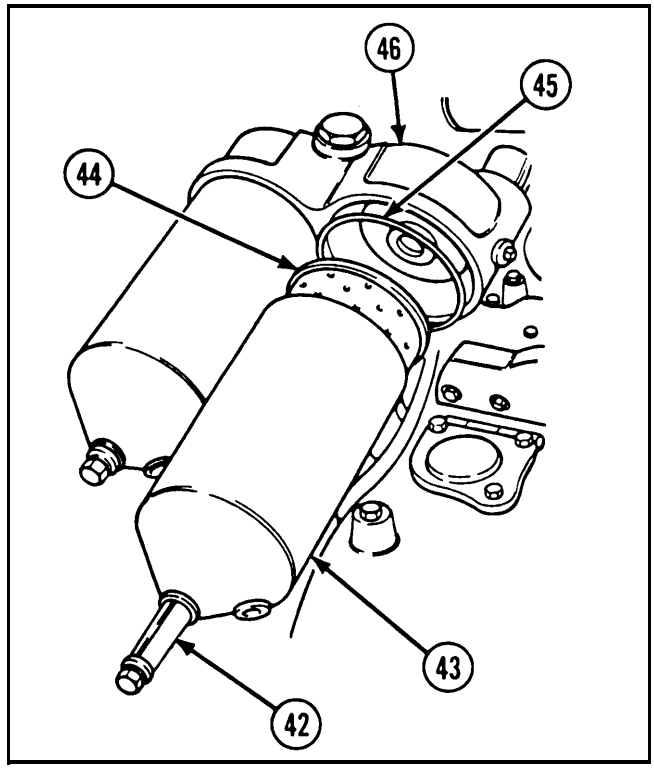
24 Remove four hexagon head capscrews (37) and four lockwashers (38) from oil filter cooler nonmetallic hose assembly (25).

25 Remove oil filter cooler nonmetallic hose assembly (25) and preformed packing (39) from engine.

26 Remove oil filter cooler nonmetallic hose assembly (25) from oil filter cooler hose pipe to tube elbow (40).

27 Remove oil filter cooler hose pipe to tube elbow (40) from pipe reducer (41).

28 Remove pipe reducer (41) from fluid filter (1).



NOTE

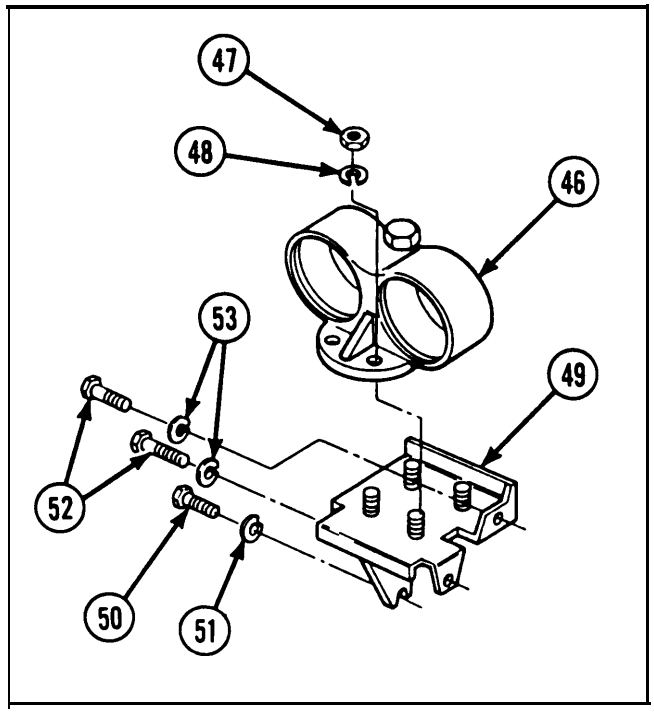
There are two filter elements housed in the fluid filter. The following procedure is written for the removal of one, but applies to both.

29 Loosen and remove shoulder bolt (42). Remove shell (43), filter element (44), and washer (45) from oil filter adapter (46).

30 Remove filter element (44) from shell (43).

2-37. MAINTENANCE OF EXTERNAL OIL LINES AND FITTINGS (UPPER ENGINE) (CONT).

REMOVAL (CONT)



31 Remove four hexagon plain nuts (47), four lockwashers (48), and oil filter adapter (46) from oil filter bracket (49).

32 Remove hexagon head capscrew (50) and lockwasher (51) from oil filter bracket (49).

33 Remove two hexagon head capscrews (52) and two lockwashers (53) from oil filter bracket (49).

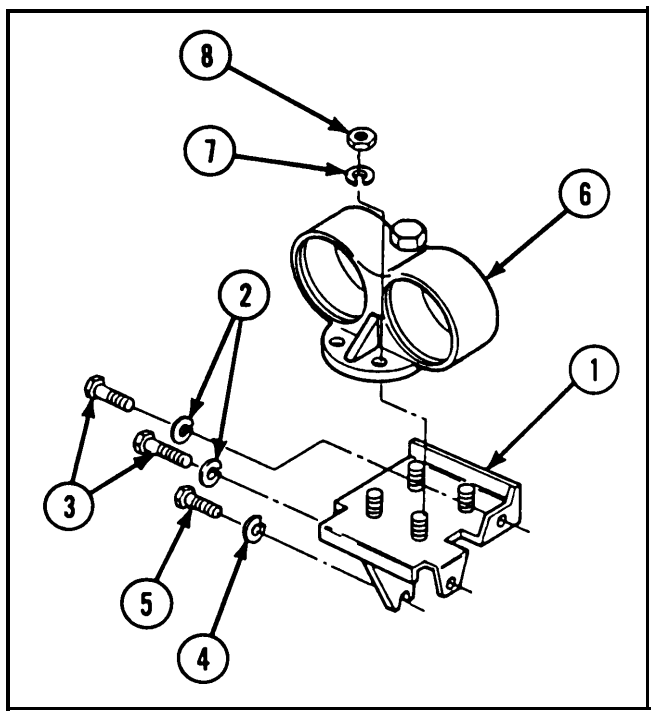
34 Remove oil filter bracket (49) from transmission.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1 and TM 9-2815-202-24P).

INSTALLATION



1 Install oil filter bracket (1) on transmission, and secure with two new lockwashers (2) and two hexagon head capscrews (3).

2 Install new lockwasher (4) and hexagon head capscrew (5) on oil filter bracket (1).

3 Install oil filter adapter (6) on oil filter bracket (1), and secure with four new lockwashers (7) and four hexagon plain nuts (8).

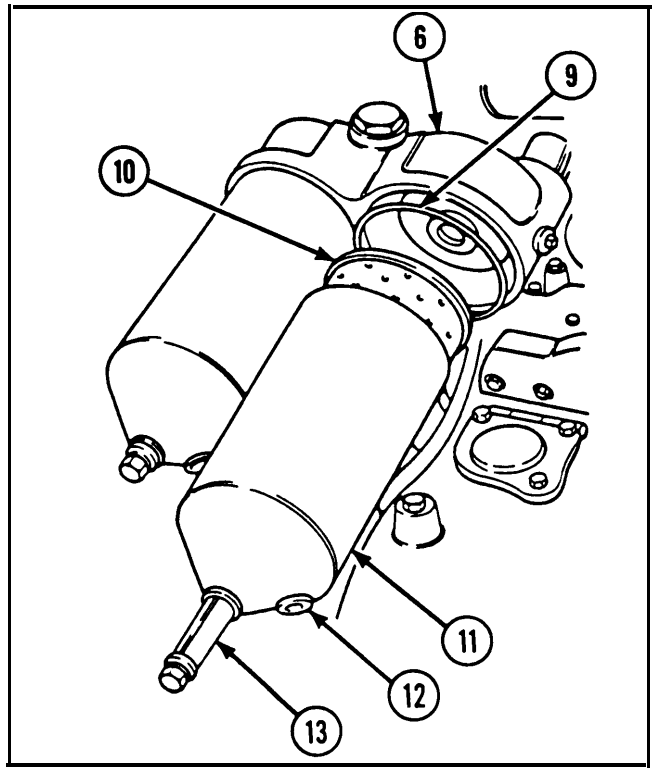
NOTE

There are two filter elements housed in the fluid filter. The following procedure is written for the installation of one, but applies to both.

4 Install washer (9) in oil filter adapter (6).

5 Install new filter element (10) in shell (11).

6 Install shell (11) on oil filter adapter (6) with drain plug hole (12) at lowest point, and tighten shoulder bolt (13).

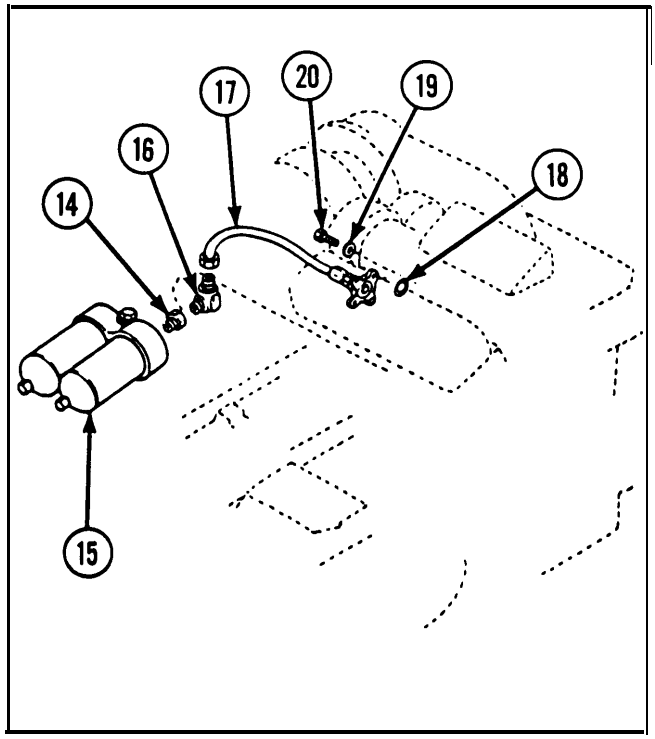


7 Install pipe bushing (14) on fluid filter (15).

8 Install oil filter cooler hose pipe to tube elbow (16) on pipe bushing (14).

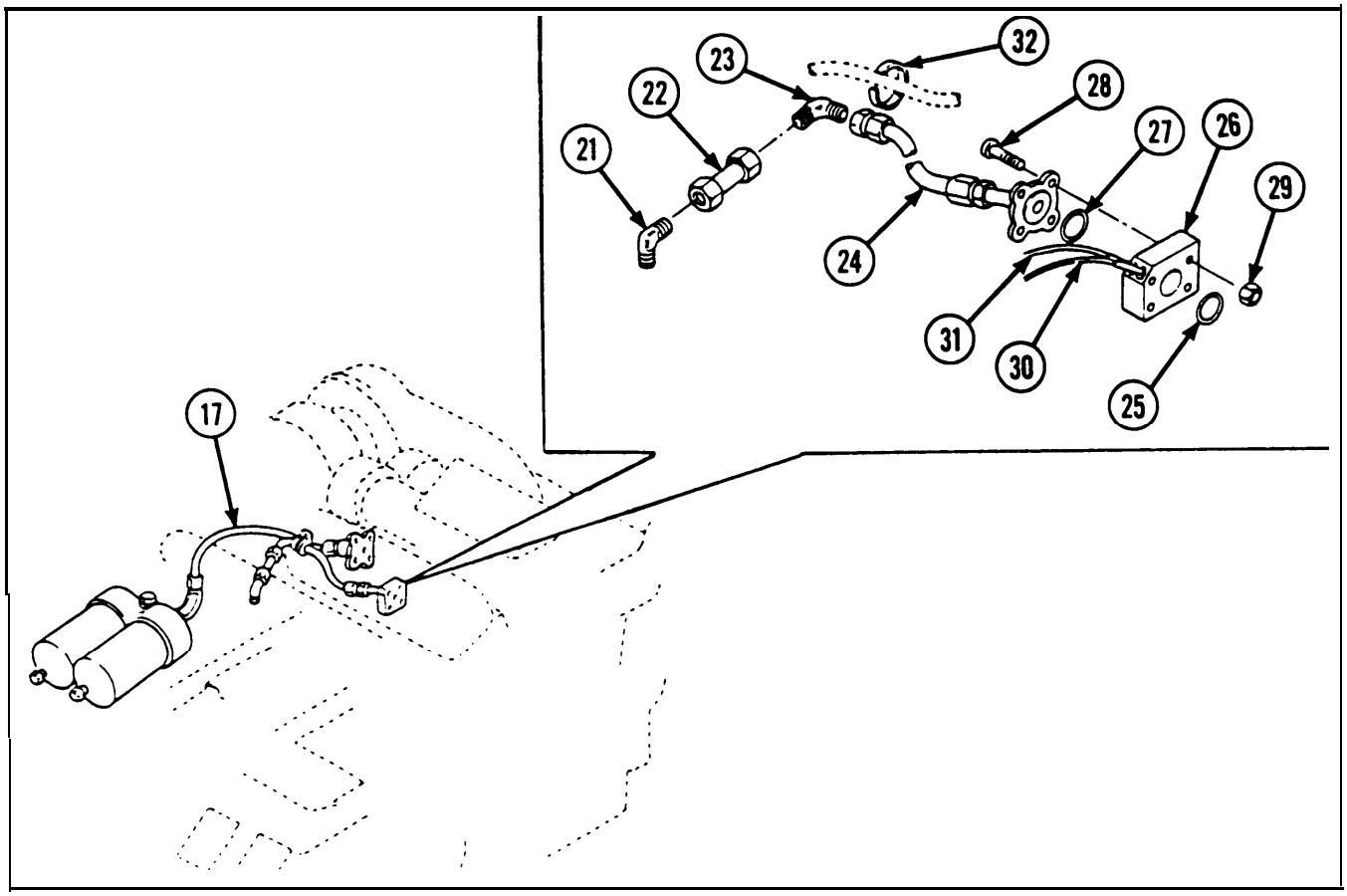
9 Install oil filter cooler nonmetallic hose assembly (17) on oil filter cooler hose pipe to tube elbow (16).

10 Install new preformed packing (18) and oil filter cooler nonmetallic hose assembly (17) on engine, and secure with four new lockwashers (19) and four hexagon head capscrews (20).



2-37. MAINTENANCE OF EXTERNAL OIL LINES AND FITTINGS (UPPER ENGINE) (CONT).

INSTALLATION (CONT)



11 Install pipe to tube elbow (21) on engine.

12 Install transmission to oil cooler preformed metal tube assembly (22) on pipe to tube elbow (21).

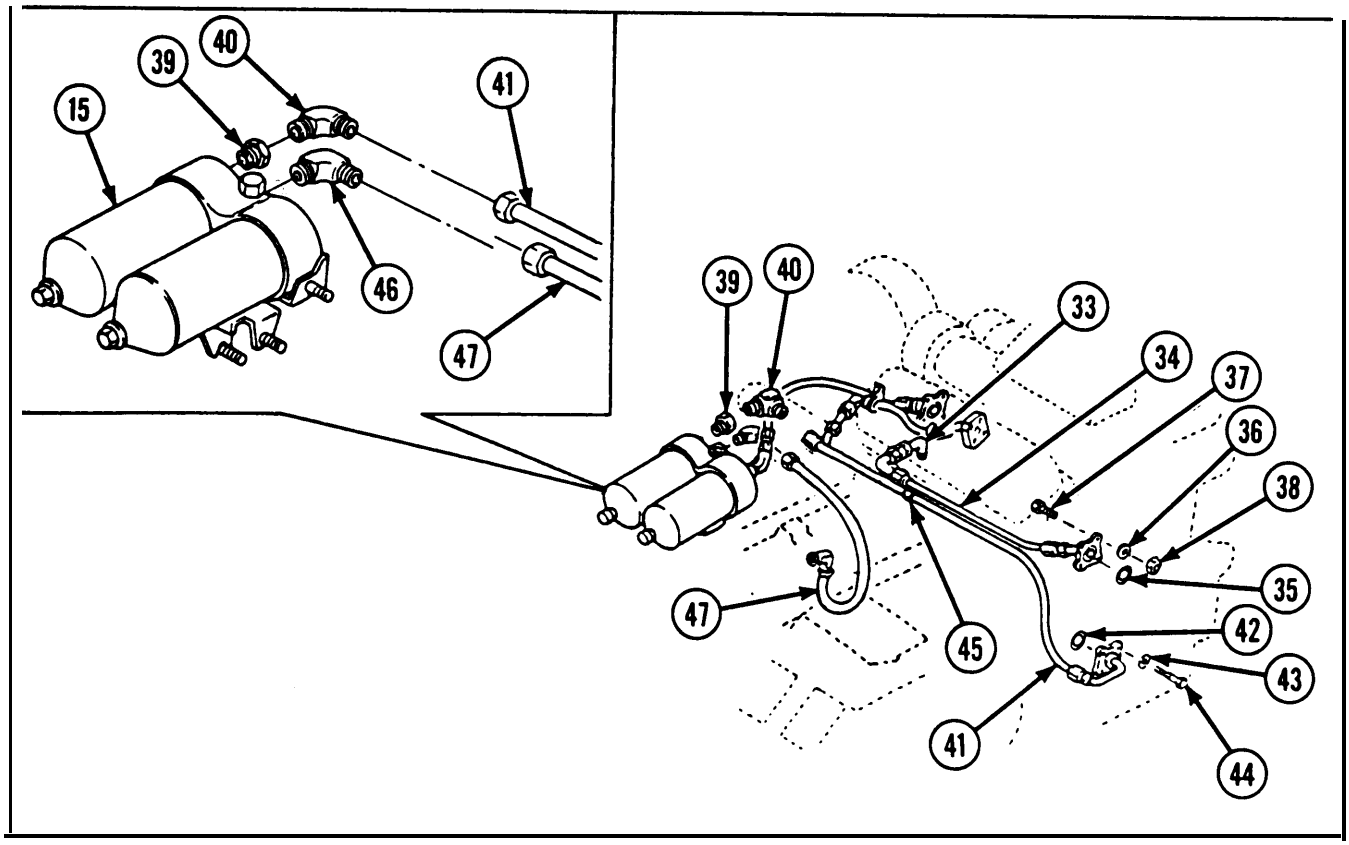
13 Install tube elbow (23) on transmission to oil cooler preformed metal tube assembly (22).

14 Install transmission to oil cooler rubber hose assembly (24) on tube elbow (23).

15 Install new preformed packing (25), oil reservoir manifold (26), new preformed packing (27), and transmission to oil cooler rubber hose assembly (24) on engine, and secure with four hexagon head capscrews (28) and four new self-locking nuts (29).

16 Connect transmitter (30) and switch *(31)* electrical leads to oil reservoir manifold (26).

17 Install marker band (32) on oil filter cooler nonmetallic hose assembly (17) and transmission to oil cooler rubber hose assembly (24).



18 Install pipe to tube elbow (33) on engine.

19 Install transmission to oil cooler nonmetallic hose assembly (34) on pipe to tube elbow (33).

20 Install new preformed packing (35) and transmission to oil cooler nonmetallic hose assembly (34) on engine. Install four new lockwashers (36), four hexagon head capscrews (37), and four hexagon plain nuts (38) on transmission to oil cooler nonmetallic hose assembly (34).

21 Install pipe reducer (39) and pipe to tube elbow (40) on fluid filter (15).

22 Install engine oil filter nonmetallic hose assembly (41) on pipe to tube elbow (40).

23 Install new preformed packing (42) and engine oil filter nonmetallic hose assembly (41) on engine, and secure with four new lockwashers (43) and four hexagon head capscrews (44).

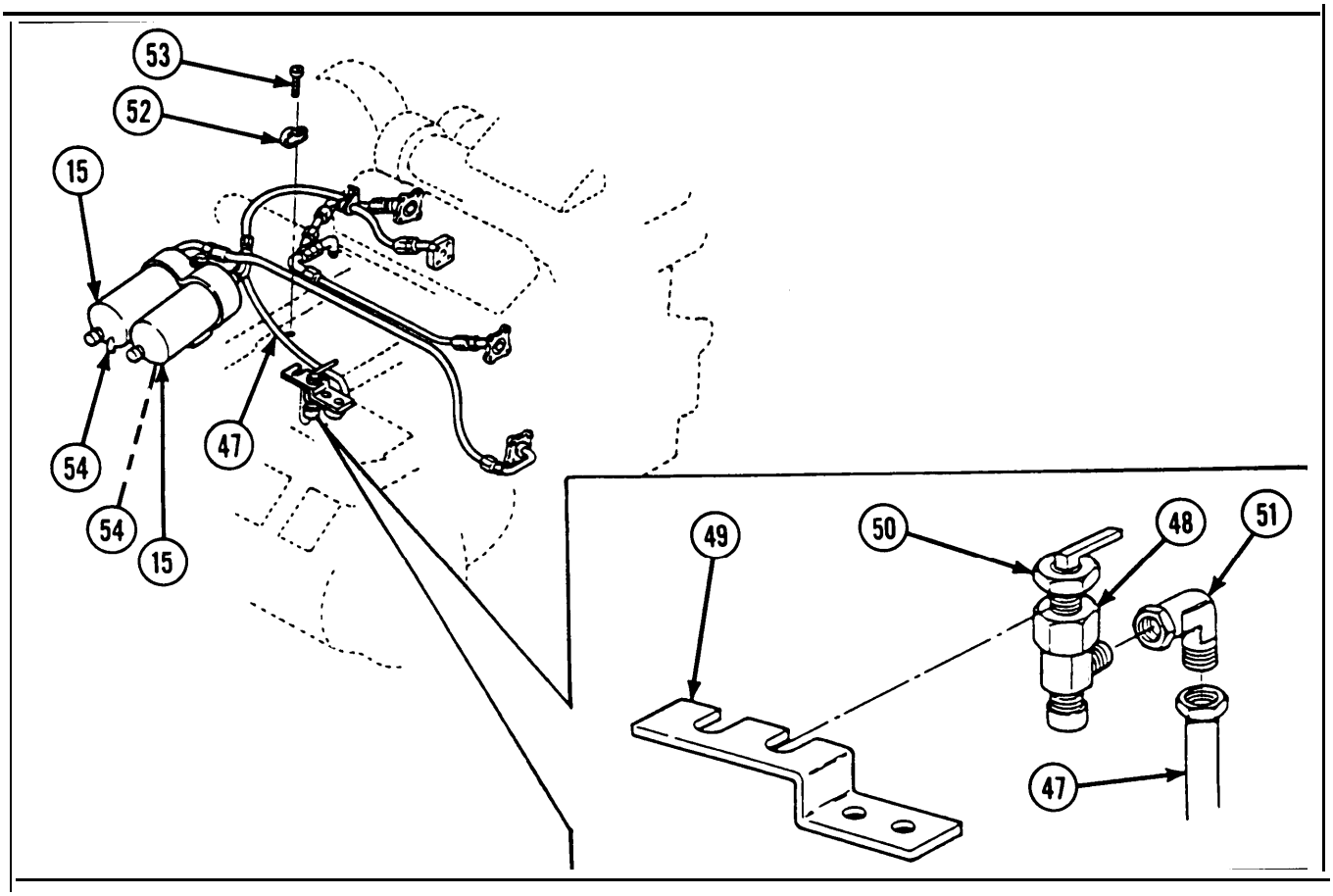
24 Install marker band (45) on engine oil filter nonmetallic hose assembly (41).

25 Install pipe to tube elbow (46) on fluid filter (15).

26 Install nonmetallic hose assembly (47) on pipe to tube elbow (46).

2-37. MAINTENANCE OF EXTERNAL OIL LINES AND FITTINGS (UPPER ENGINE) (CONT).

INSTALLATION (CONT)



27 Install drain cock (48) on angle bracket (49). Tighten nut (50) on drain cock.

28 Install pipe to tube elbow (51) on drain cock (48).

29 Connect nonmetallic hose assembly (47) to pipe to tube elbow (51).

30 Install loop clamp (52) on nonmetallic hose assembly (47). Install capscrew (53) on loop clamp.

31 Install two drain plugs (54) in fluid filter (15).

32 Run engine until operating temperature is reached. Refer to TM 9-2350-238-10. Check for oil leaks.

33 Repair all leaks.

34 Check engine oil level.

35 Add engine oil as required. Refer to TM 9-2350-238-10.

2-38. MAINTENANCE OF EXTERNAL OIL LINES AND FITTINGS (LOWER ENGINE) AND SCAVENGER RESERVOIR.

This task covers: a. *Removal* b. *Inspection/Repair* *c. Insta//ation*

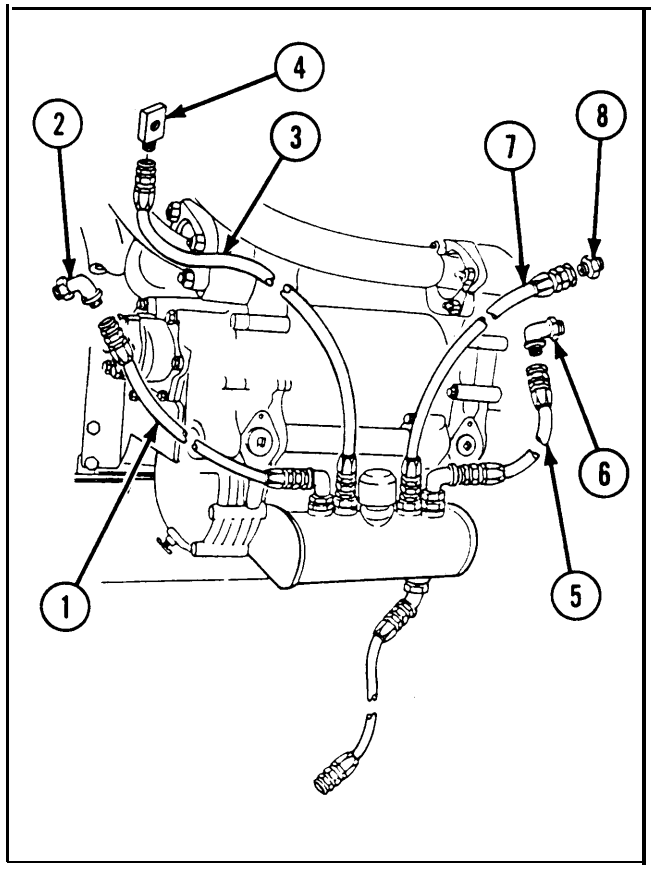
INITIAL SETUP

Materials/Parts
Gasket
Lockwasher (10)
Preformed packing (6)
Preformed packing (3)
Tube fitting locknut (3)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-384 Powerplant removed

REMOVAL



1 Disconnect engine condensation hose assembly (1) from pipe to tube elbow (2).

2 Remove pipe to tube elbow (2) from engine.

3 Disconnect transmission drain hose assembly (3) from solenoid hose adapter (4).

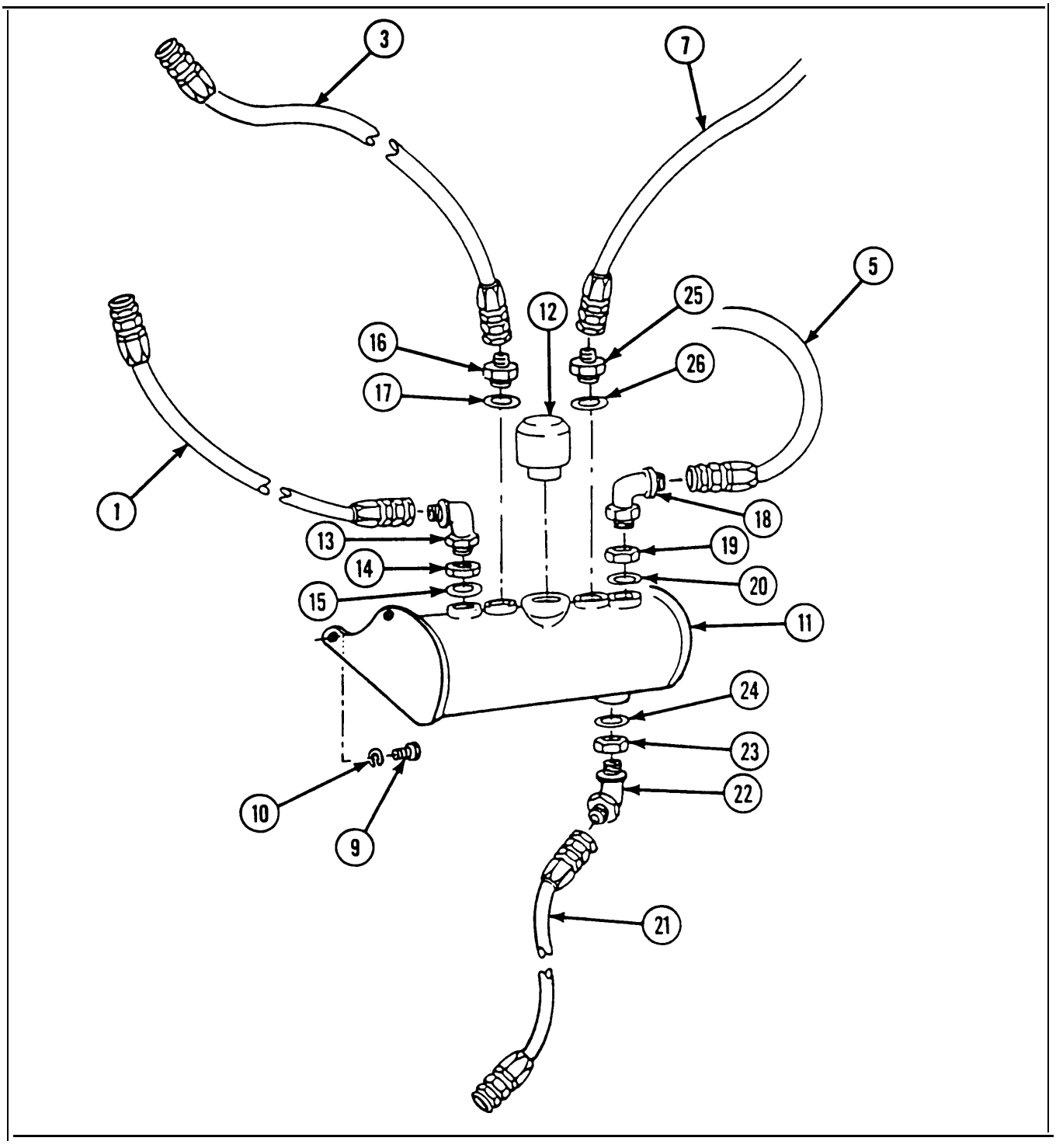
4 Disconnect engine block drain hose assembly (5) from pipe to tube elbow (6).

5 Remove pipe to tube elbow (6) from engine.

6 Disconnect fuel pump to reservoir drain hose assembly (7) from pipe straight adapter (8) on fuel pump.

2-38. MAINTENANCE OF EXTERNAL OIL LINES AND FITTINGS (LOWER ENGINE) AND SCAVENGER RESERVOIR (CONT).

REMOVAL (CONT)



7 Remove four capscrews (9) and four lockwashers (10) from engine oil reservoir (11).

8 Remove engine oil reservoir (11) and attached drain lines from engine.

9 Remove powerplant reservoir breather (12) from engine oil reservoir (11).

10 Remove engine condensation hose assembly (1) from tube elbow (13).

11 Loosen tube fitting locknut (14) on tube elbow (13).

12 Remove tube elbow (13) with tube fitting locknut (14) and preformed packing (15) from engine oil reservoir (11).

13 Remove preformed packing (15) and tube fitting locknut (14) from tube elbow (13).

14 Remove transmission drain hose assembly (3) from tube nipple (16).

15 Remove tube nipple (16) with preformed packing (17) from engine oil reservoir (11).

16 Remove preformed packing (17) from tube nipple (16).

17 Remove engine block drain hose assembly (5) from tube elbow (18).

18 Loosen tube fitting locknut (19) on tube elbow (18).

19 Remove tube elbow (18) with tube fitting locknut (19) and preformed packing (20) from engine oil reservoir (11).

20 Remove preformed packing (20) and tube fitting locknut (19) from tube elbow (18).

21 Remove reservoir drain hose assembly (21) from tube elbow (22).

22 Loosen tube fitting locknut (23) on tube elbow (22).

23 Remove tube elbow (22) with tube fitting locknut (23) and preformed packing (24) from engine oil reservoir (11).

24 Remove preformed packing (24) and tube fitting locknut (23) from tube elbow (22).

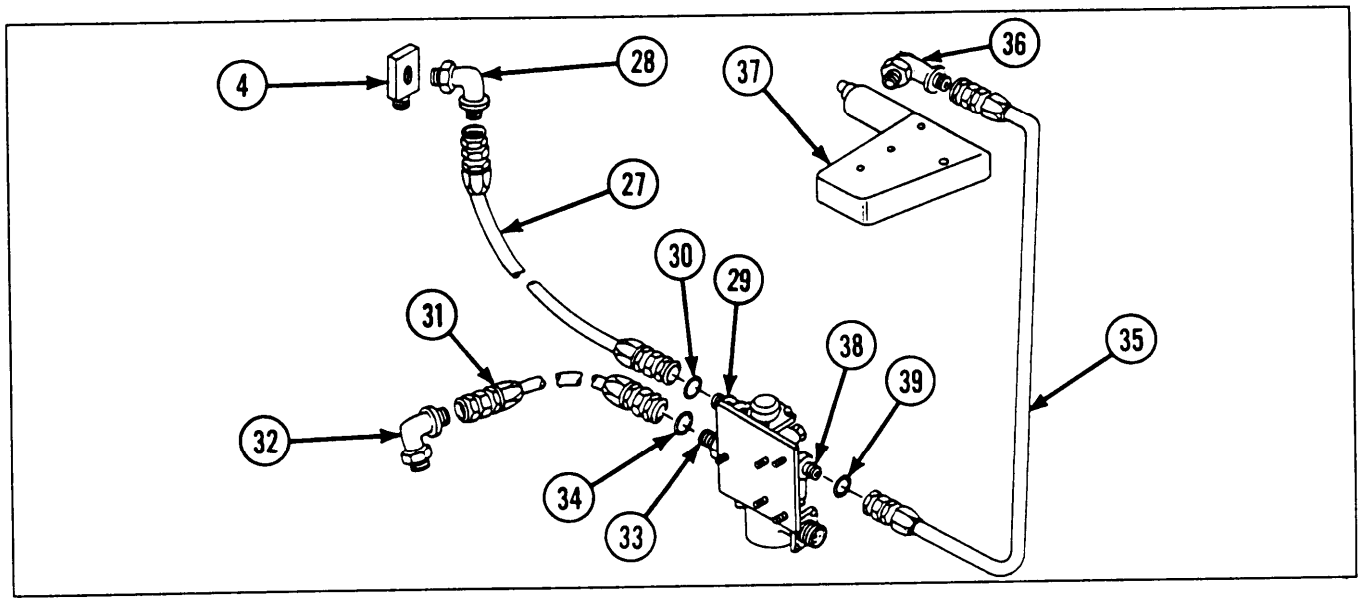
25 Remove fuel pump to reservoir drain hose assembly (7) from tube nipple (25).

26 Remove tube nipple (25) and preformed packing (26) from engine oil reservoir (11).

27 Remove preformed packing (26) from tube nipple (25).

2-38. MAINTENANCE OF EXTERNAL OIL LINES AND FITTINGS (LOWER ENGINE) AND SCAVENGER RESERVOIR (CONT).

REMOVAL (CONT)



28 Disconnect transmission to solenoid hose assembly (27) from pipe to tube elbow (28).

29 Remove transmission to solenoid hose assembly (27) from tube reducer (29).

30 Remove preformed packing (30) from tube reducer (29).

31 Remove pipe to tube elbow (28) from solenoid hose adapter (4).

32 Remove solenoid hose adapter (4) from engine.

33 Disconnect transmission to solenoid hose assembly (31) from pipe to tube elbow (32).

34 Remove pipe to tube elbow (32) from transmission.

35 Remove transmission to solenoid hose assembly (31) from tube reducer (33).

36 Remove preformed packing (34) from tube reducer (33).

37 Disconnect governor to bypass solenoid hose assembly (35) from pipe to tube elbow (36).

38 Remove pipe to tube elbow (36) from governor (37).

39 Remove governor to bypass solenoid hose assembly (35) from tube reducer (38).

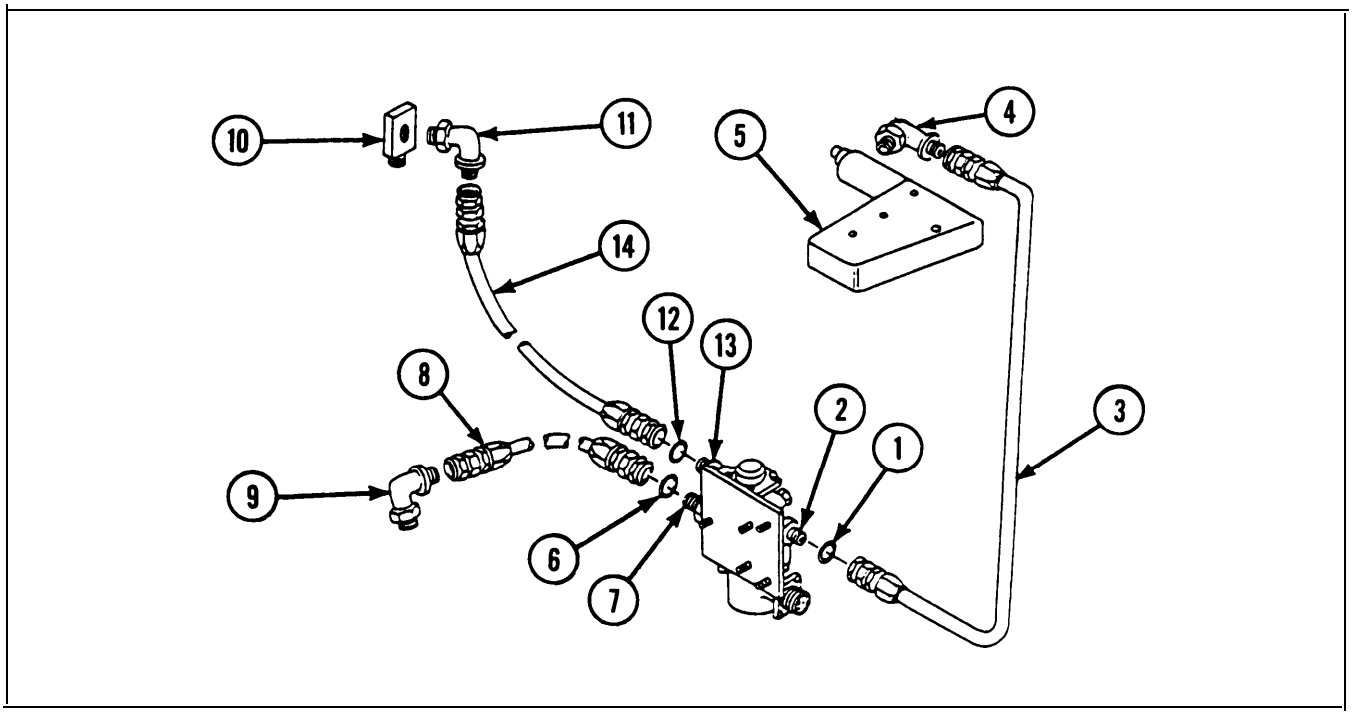
40 Remove preformed packing (39) from tube reducer (38).

INSPECT/ON/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



1 Install new preformed packing (1) on tube reducer (2).

2 Install governor to bypass solenoid hose assembly (3) on tube reducer (2).

3 Install pipe to tube elbow (4) on governor (5).

4 Connect governor to bypass solenoid hose assembly (3) to pipe to tube elbow (4).

5 Install new preformed packing (6) on tube reducer (7).

6 Install transmission to solenoid hose assembly (8) on tube reducer (7).

7 Install pipe to tube elbow (9) on transmission.

8 Connect transmission to solenoid hose assembly (8) to pipe to tube elbow (9).

9 Install solenoid hose adapter (10) on engine.

10 Install pipe to tube elbow (11) on solenoid hose adapter (10).

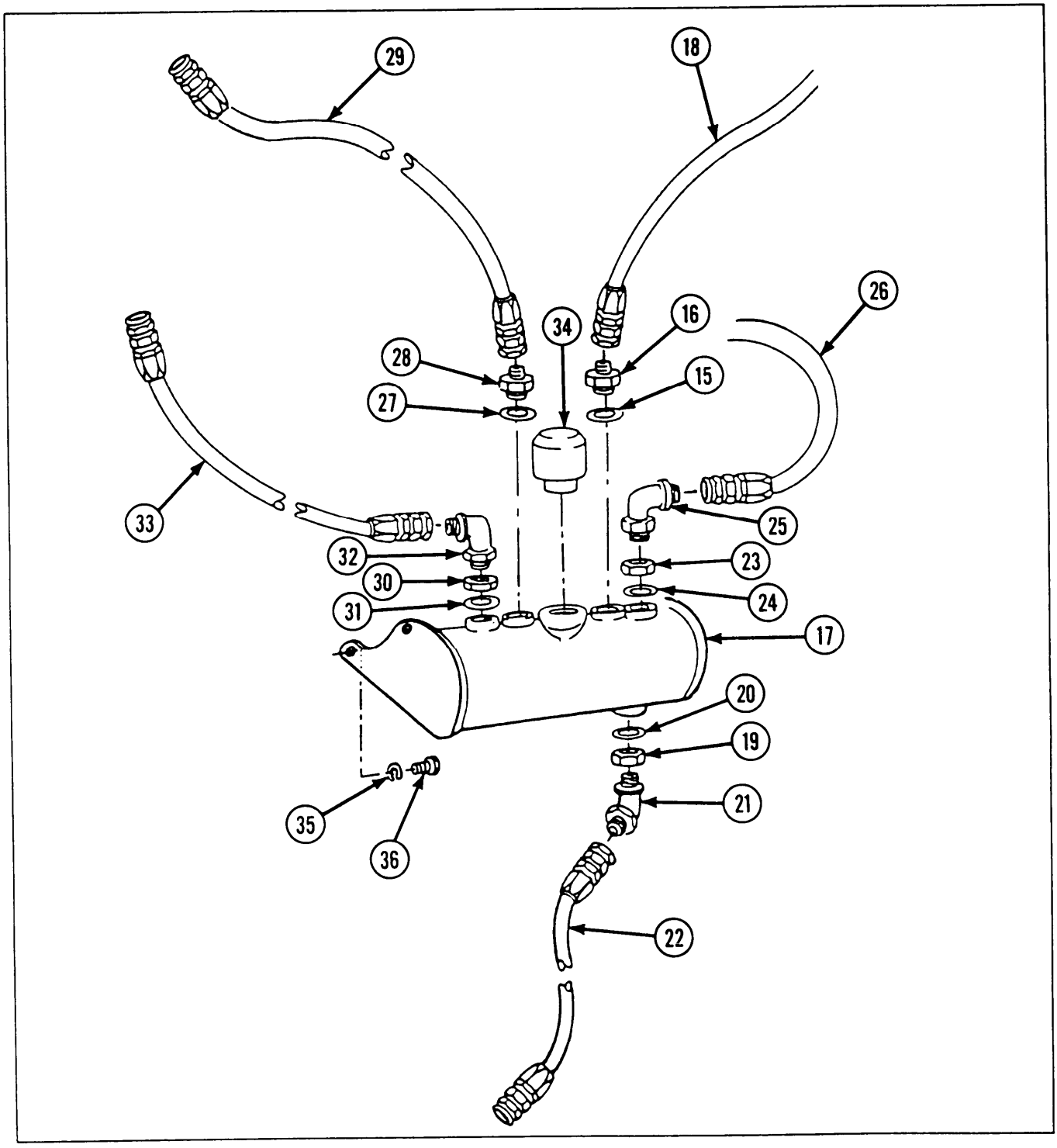
11 Install new preformed packing (12) on tube reducer (13).

12 Install transmission to solenoid hose assembly (14) on tube reducer (13).

13 Connect transmission to solenoid hose assembly (14) to pipe to tube elbow (11)

2-38. MAINTENANCE OF EXTERNAL OIL LINES AND FITTINGS (LOWER ENGINE) AND SCAVENGER RESERVOIR (CONT)

INSTALLATION (CONT)



14 Install new preformed packing (15) on tube nipple (16).

15 Install tube nipple (16) with new preformed packing (15) on engine oil reservoir (17).

16 Install fuel pump to reservoir drain hose assembly (18) on tube nipple (16).

17 Install new tube fitting locknut (19) and new preformed packing (20) on tube elbow (21).

18 Install tube elbow (21) with new tube fitting locknut (19) and new preformed packing (20) on engine oil reservoir (17).

19 Tighten new tube fitting locknut (19) on tube elbow (21).

20 Install reservoir drain hose assembly (22) on tube elbow (21).

21 Install new tube fitting locknut (23) and new preformed packing (24) on tube elbow (25).

22 Install tube elbow (25) with new tube fitting locknut (23) and new preformed packing (24) on engine oil reservoir (17).

23 Tighten new tube fitting locknut (23) on tube elbow (25).

24 Install engine block drain hose assembly (26) on tube elbow (25).

25 install new preformed packing (27) on tube nipple (28).

26 Install tube nipple (28) with new preformed packing (27) on engine oil reservoir (17).

27 Install transmission drain hose assembly (29) on tube nipple (28).

28 Install new tube fitting locknut (30) and new preformed packing (31) on tube elbow (32).

29 Install tube elbow (32) with new tube fitting locknut (30) and new preformed packing (31) on engine oil reservoir (17).

30 Tighten new tube fitting locknut (30) on tube elbow (32).

31 Install engine condensation hose assembly (33) on tube elbow (32).

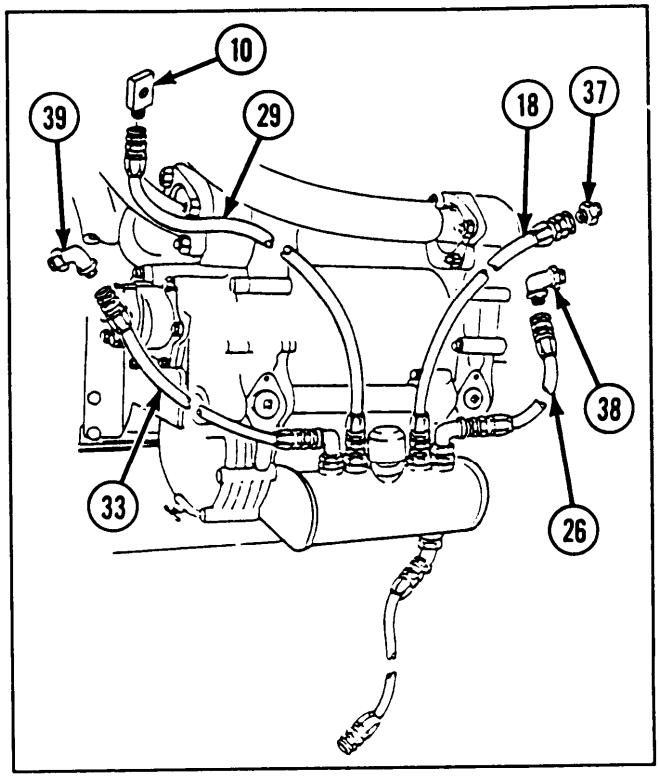
32 Install powerplant reservoir breather (34) on engine oil reservoir (17).

33 Install engine oil reservoir (17) and attached drain lines on engine.

34 Install four new lockwashers (35) and four capscrews (36) on engine oil reservoir (17).

2-38. MAINTENANCE OF EXTERNAL OIL LINES AND FITTINGS (LOWER ENGINE) AND SCAVENGER RESERVOIR (CONT).

INSTALLATION (CONT)



35 Connect fuel pump to reservoir drain hose assembly (18) to pipe straight adapter (37).

36 Install pipe to tube elbow (38) on engine.

37 Connect engine block drain hose assembly (26) to pipe to tube elbow (38).

38 Connect transmission drain hose assembly (29) to solenoid hose adapter (10).

39 Install pipe to hose elbow (39) on engine.

40 Connect engine condensation hose assembly (33) to pipe to hose elbow (39).

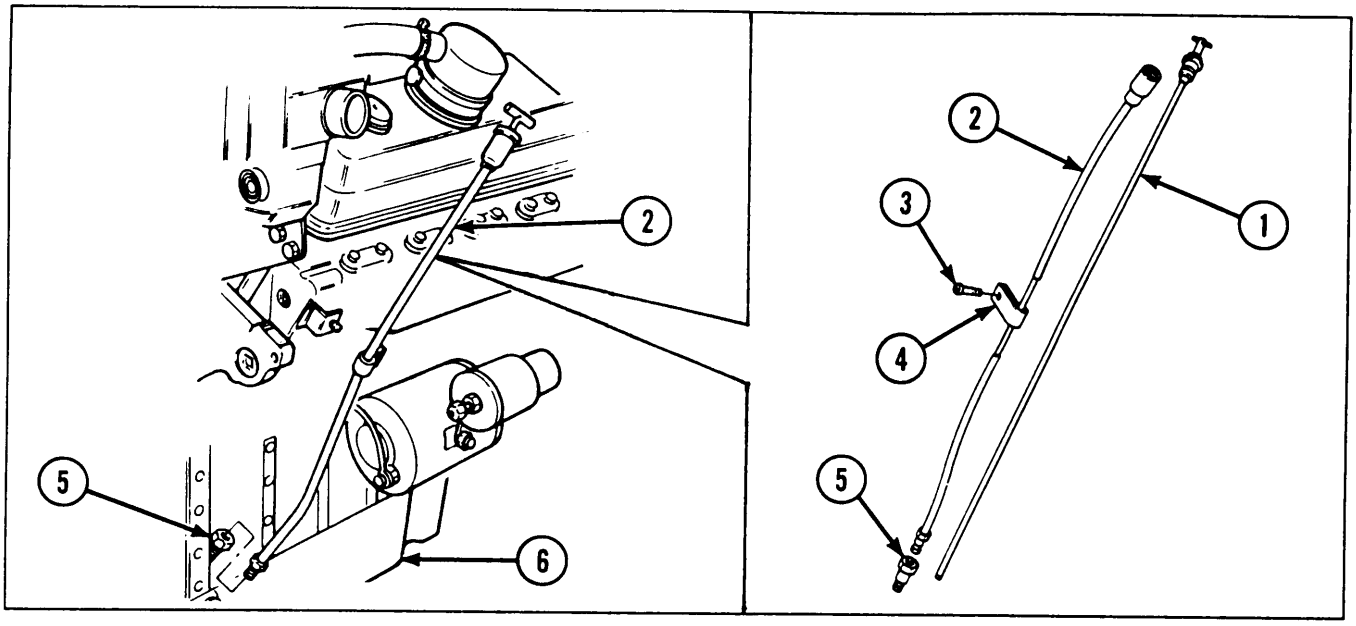
2-39. MAINTENANCE OF ENGINE OIL DIPSTICK.

This task covers:	a. *Removal*	b. *Inspection/Repair*	c. *Installation*

INITIAL SETUP

References
TM 9-2815-202-24P

Equipment Conditions
2-384 Powerplant removed



REMOVAL

1 Remove liquid level gage rod (1) from filler neck (2).

2 Remove capscrew (3) from loop clamp (4).

3 Remove filler neck (2) with loop clamp (4) from straight adapter (5).

4 Remove loop clamp (4) from filler neck (2).

5 Remove straight adapter (5) from engine (6).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2815-202-24P).

INSTALLATION

1 Install straight adapter (5) on engine (6).

2 Install loop clamp (4) on filler neck (2).

3 Install filler neck (2) with loop clamp (4) on straight adapter (5).

4 Secure loop clamp (4) with capscrew (3).

5 Install liquid level gage rod (1) in filler neck (2).

2-40. MAINTENANCE OF OIL PAN.

This task covers: a. *Removal* b. *Inspection/Repair* *c. Installation*

INITIAL SETUP

References
TM 9-2815-202-24P

Equipment Conditions
2-384 Powerplant reservoir drain access cover removed

REMOVAL

if damaged, remove magnetic pipe plug (1) from oil pan (2). Drain engine oil into suitable container. Refer to the PMCS/lubrication table, page 2-13.

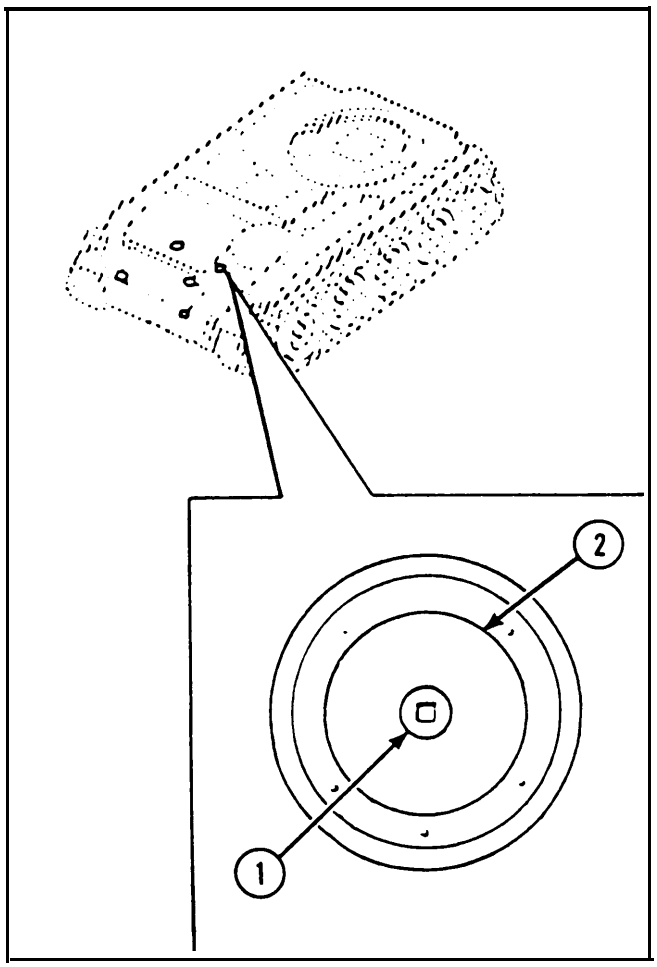
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2815-202-24P).

INSTALLATION

If removed, install new magnetic pipe plug (1) in oil pan (2). Fill crankcase with engine oil. Refer to the PMCS/lubrication table, page 2-13.



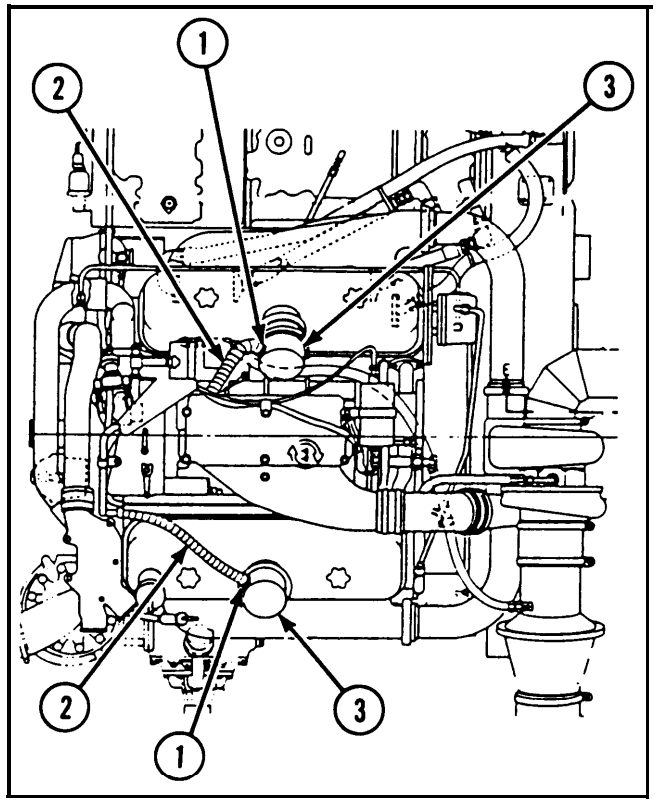
2-41. MAINTENANCE OF CRANKCASE BREATHER TUBES (ENGINE MODEL 7083-7395).

This task covers: a. *Removal* b. *Inspect/on/Repair* c. *Installation*

INITIAL SETUP

References
TM 9-2815-202-24P

Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed



NOTE
Procedure is written for one breather assembly, but applies to both.

1 Loosen hose clamp (1) on air duct hose (2).

2 Remove air duct hose (2) and hose clamp (1) from breather assembly cover (3).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2815-202-24P).

INSTALLATION

1 Install hose clamp (1) and air duct hose (2) on breather assembly cover (3).

2 Tighten hose clamp (1) on air duct hose (2).

2-42. MAINTENANCE OF FUEL PUMP.

This task covers:	a. *Removal*	b. *Inspectbn/Reps/r*	*c. Installation*

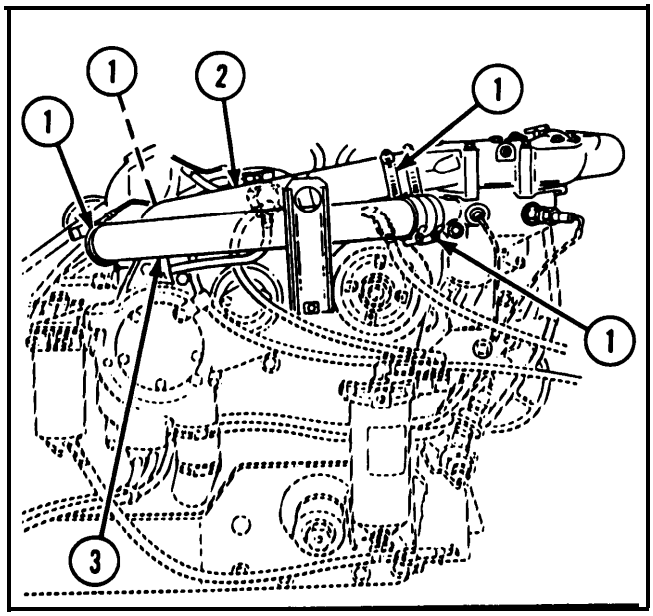
INITIAL SETUP

Materials/Pads
Gasket

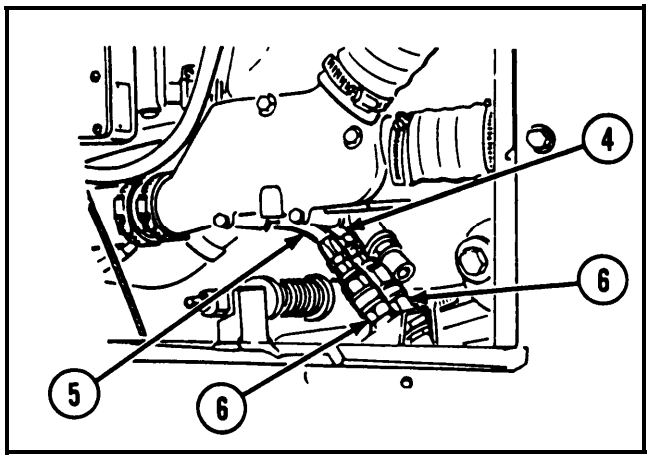
References
TM 9-2350-238-10
TM 9-2815-202-24P

Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed
Cooling system drained (TM 9-2350-238-1O)

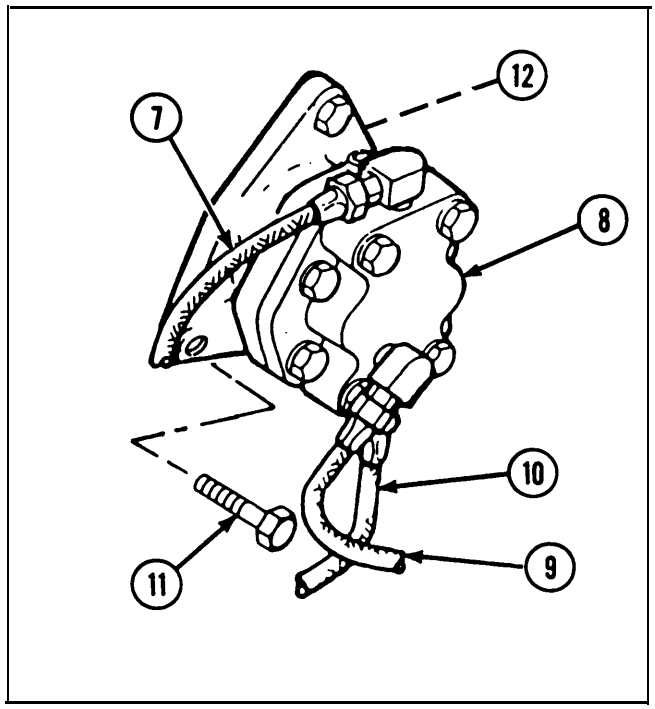
REMOVAL



1 Loosen four hose clamps (1). Remove water by-pass tube (2) and crossover tube (3).



2 Disconnect fuel supply metal tube assembly (4) and fuel return metal tube assemblv (5) from quick-disconnect couplings (6) to prevent siphoning fuel from fuel cell.



3 Disconnect nonmetallic hose assembly (7) from fuel pump (8).

4 Disconnect nonmetallic hose assembly (9) from fuel pump (8).

5 Disconnect fuel pump to reservoir drain nonmetallic hose assembly (10) from fuel pump (8).

6 Remove three machine bolts (11), fuel pump (8), and gasket (12).

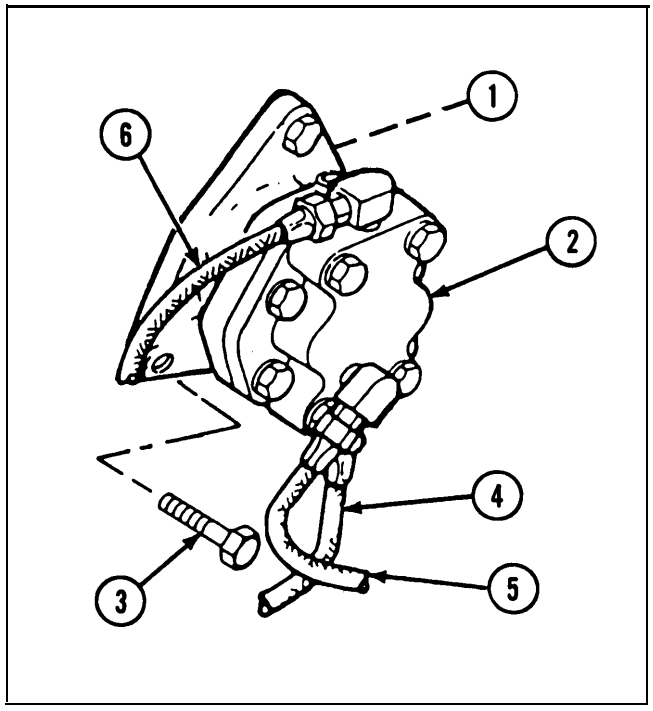
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Fuel pump is a repairable assembly. Notify direct support maintenance.

3 Repair is by replacement of authorized parts (TM 9-2815-202-24P).

INSTALLATION



1 Install new gasket (1), fuel pump (2), and three machine bolts (3).

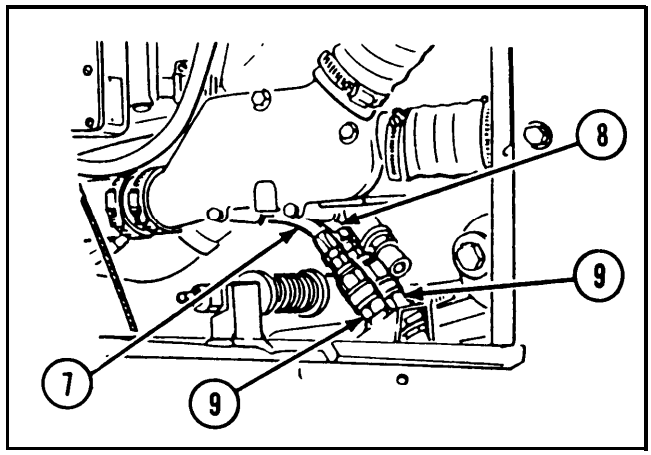
2 Connect fuel pump to reservoir drain nonmetallic hose assembly (4) to fuel pump (2).

3 Connect nonmetallic hose assembly (5) to fuel pump (2).

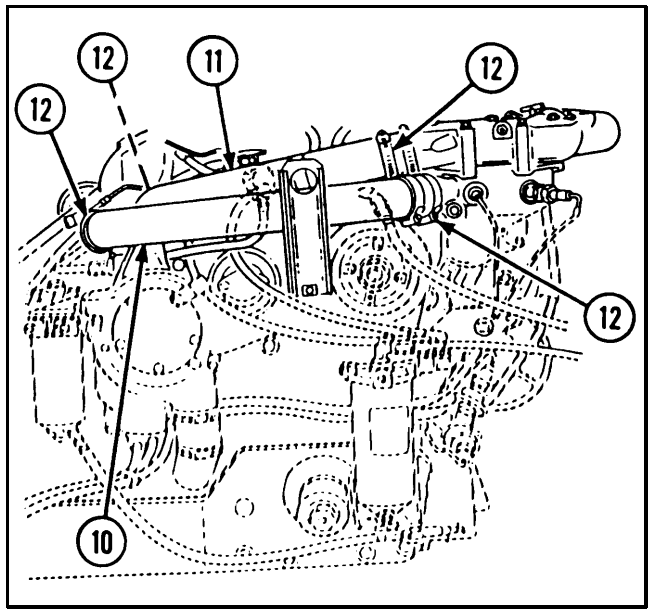
4 Connect nonmetallic hose assembly (6) to fuel pump (2).

2-42. MAINTENANCE OF FUEL PUMP (CONT).

INSTALLATION (CONT)



5 Connect fuel return metal tube assembly (7) and fuel supply metal tube assembly (8) to quick-disconnect couplings (9).



6 Install crossover tube (10) and water by-pass tube (11). Tighten four hose clamps (12).

7 Fill cooling system. Refer to TM 9-2350-238-10.

8 Purge and prime fuel system. Refer to TM 9-2350-238-10.

9 Check for and repair all leaks.

10 Run engine until operating temperature is reached. Refer to TM 9-2350-238-10. Check for proper operation.

2-43. MAINTENANCE OF ENGINE FUEL LINES.

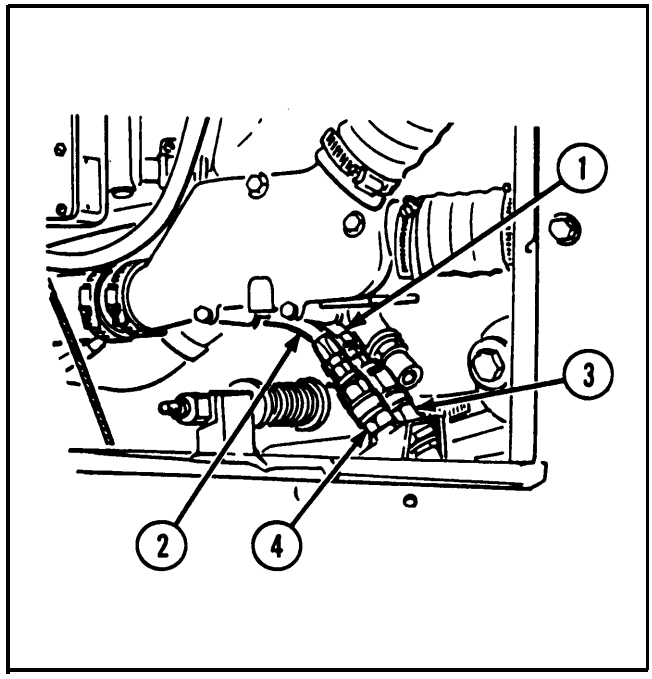
This task covers: a. *Removal* b. *Inspection/RepaIr* *c. Installation*

INITIAL SETUP

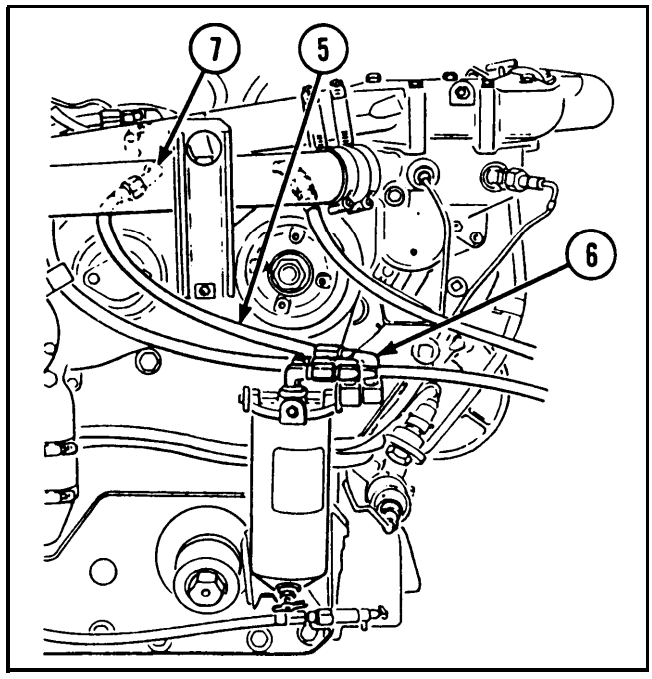
References
TM 9-2350-238-10
TM 9-2815-202-24P

Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed

REMOVAL



1 Disconnect fuel supply metal tube assembly (1) and fuel return metal tube assembly (2) at quick-disconnect couplings (3 and 4) to prevent siphoning fuel from fuel cell.



2 Disconnect end of nonmetallic hose assembly (5) from hose elbow (6).

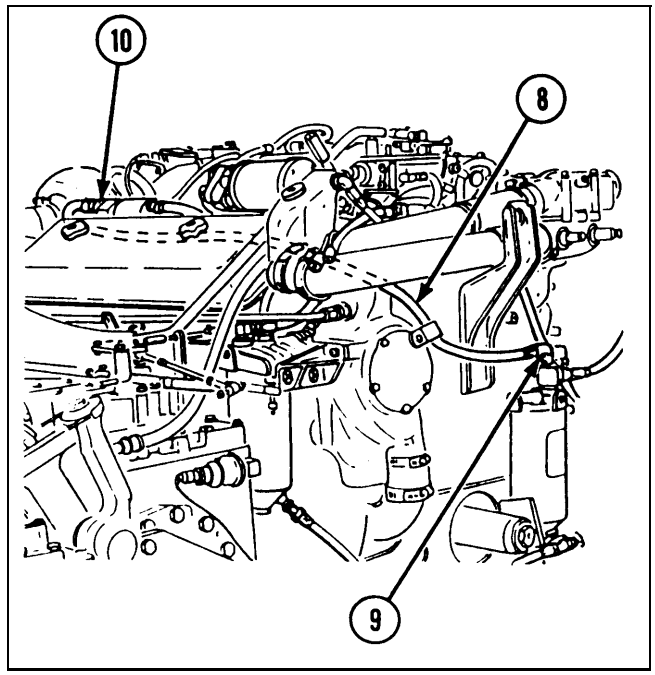
3 Disconnect end of nonmetallic hose assembly (5) from hose elbow (7).

4 Remove nonmetallic hose assembly (5).

5 Cover hose elbows (6 and 7) to keep dirt out.

2-43. MAINTENANCE OF ENGINE FUEL LINES (CONT).

REMOVAL (CONT)

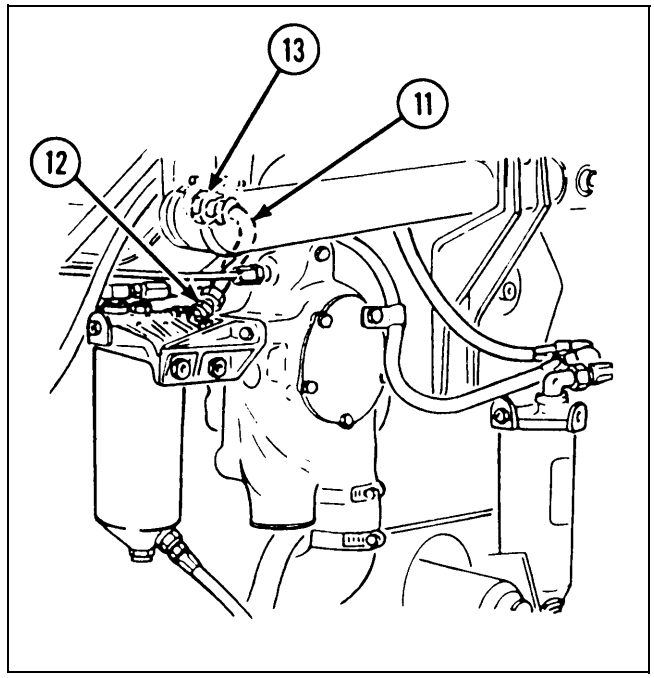


6 Disconnect end of nonmetallic hose assembly (8) from pipe tee' (9).

7 Disconnect end of nonmetallic hose assembly (8) from hose elbow (10).

8 Remove nonmetallic hose assembly (8).

9 Cover pipe tee (9) and hose elbow (10) to keep dirt out.

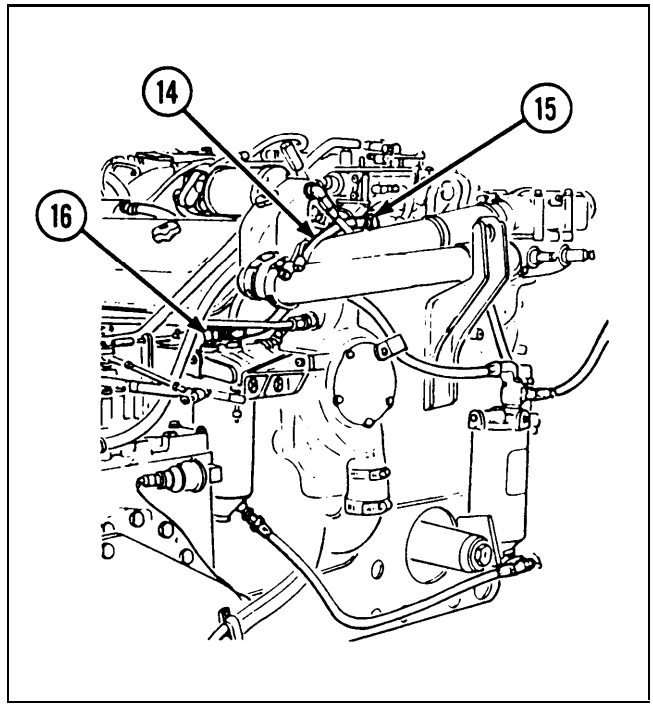


10 Disconnect end of nonmetallic hose assembly (11) from hose elbow (12).

11 Disconnect end of nonmetallic hose assembly (11) from pipe elbow (13).

12 Remove nonmetallic hose assembly (11).

13 Cover hose elbow (12) and pipe elbow (13) to keep dirt out.



14 Disconnect end of nonmetallic hose assembly (14) from hose elbow (15).

15 Disconnect end of nonmetallic hose assembly (14) from hose elbow (16).

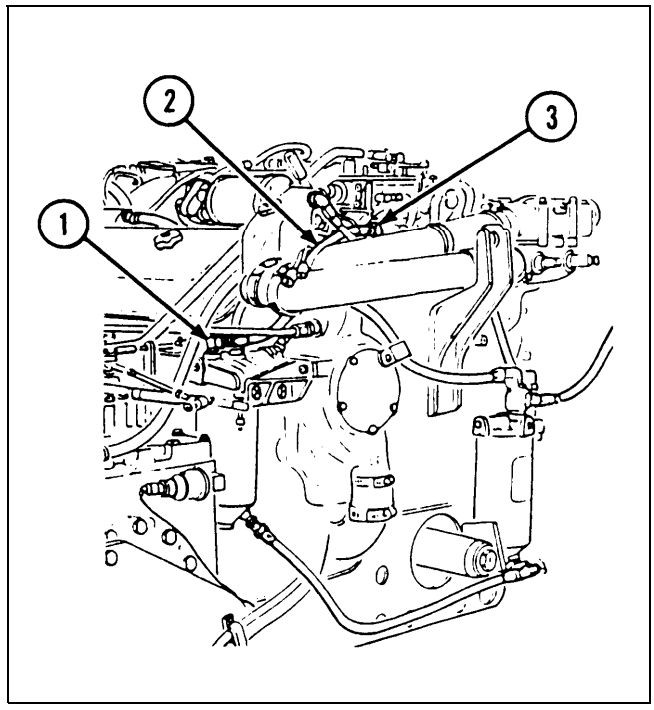
16 Remove nonmetallic hose assembly (14).

17 Cover hose elbows (15 and 16) to keep dirt out.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2815-202-24P).



1 Remove cover from hose elbow (1).

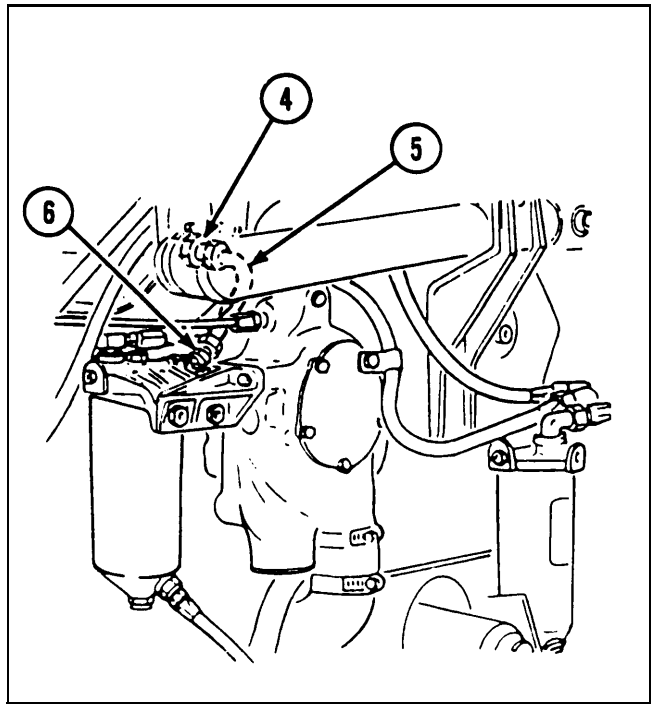
2 Install and connect nonmetallic hose assembly (2) to hose elbow (1).

3 Remove cover from hose elbow (3).

4 Connect end of nonmetallic hose assembly (2) to hose elbow (3).

2-43. MAINTENANCE OF ENGINE FUEL LINES (CONT).

INSTALLATION (CONT)

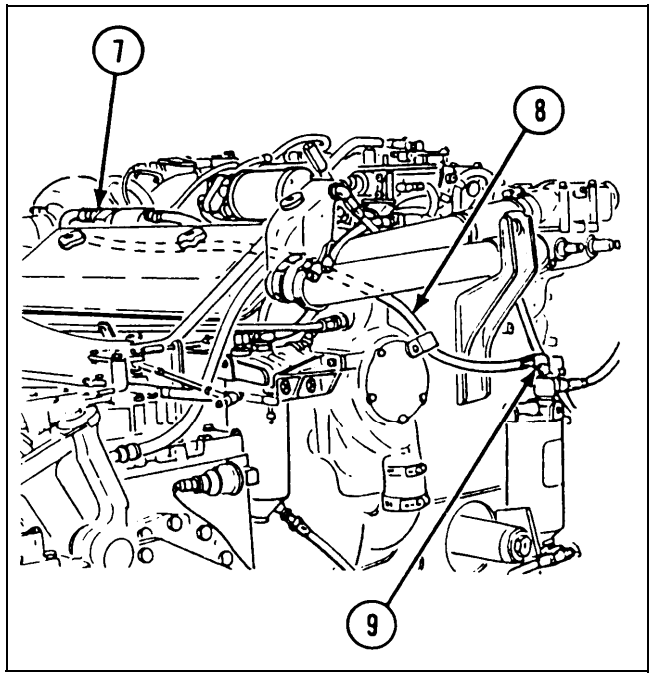


5 Remove cover from pipe elbow (4).

6 Install and connect nonmetallic hose assembly (5) to pipe elbow (4).

7 Remove cover from hose elbow (6).

8 Connect nonmetallic hose assembly (5) to hose elbow (6).

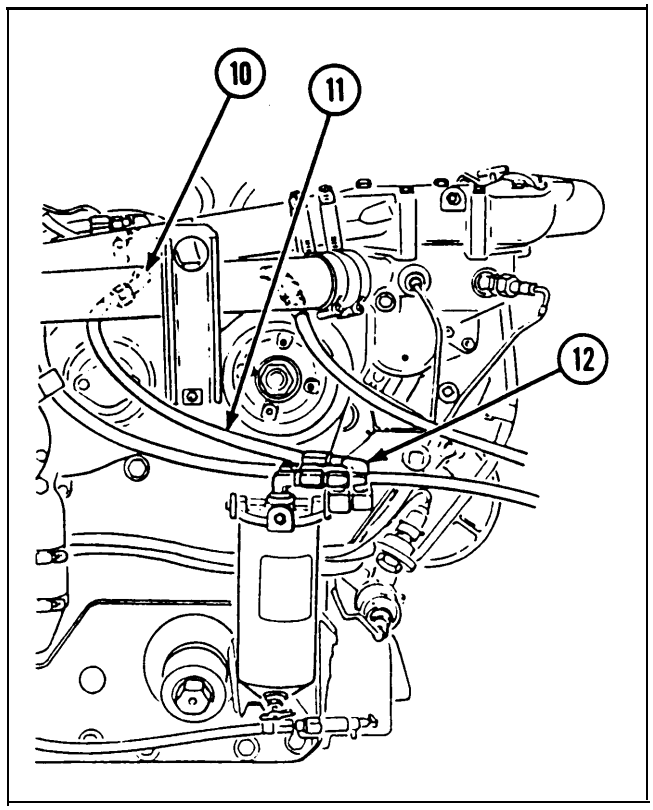


9 Remove cover from hose elbow (7).

10 Install and connect nonmetallic hose assembly (8) to hose elbow (7).

11 Remove cover from pipe tee (9).

12 Connect nonmetallic hose assembly (8) to pipe tee (9).

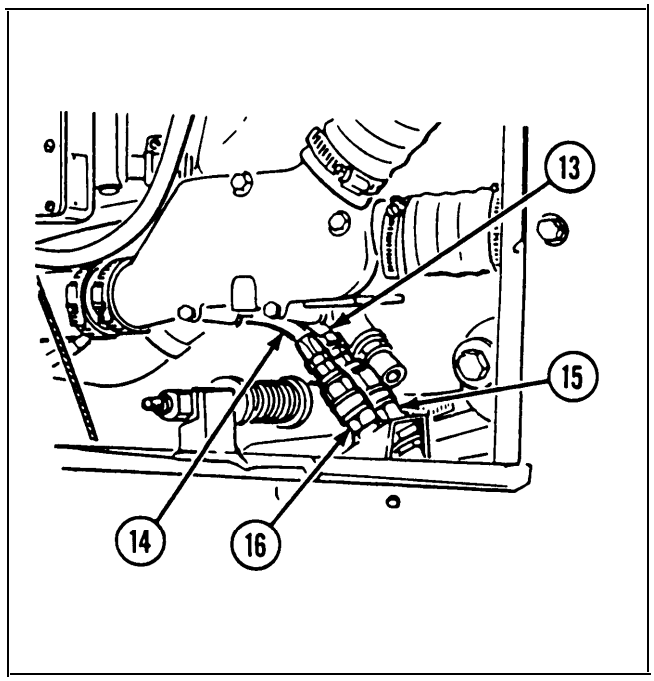


13 Remove cover from hose elbow (10).

14 Install and connect nonmetallic hose assembly (11) to hose elbow (10).

15 Remove cover from hose elbow (12).

16 Connect nonmetallic hose assembly (11) to hose elbow (12).



17 Connect fuel supply metal tube assembly (13) and fuel return metal tube assembly (14) at quick-disconnect couplings (15 and 16).

18 Purge and prime fuel system. Refer to TM 9-2350-238-10.

19 Check for and stop all leaks.

20 Run engine until operating temperature is reached. Refer to TM 9-2350-238-10. Check for proper operation.

2-44. MAINTENANCE OF ENGINE AIR CLEANER SYSTEM.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Matetials/Parts
- Blower inlet air duct hose (figure D-26, appx D)
- Blower outlet air duct hose (figure D-26, appx D)
- Duct gasket (2)
- Forward air separator outlet adapter gasket
- Gasket
- Gasket
- Lockwasher(16)
- Lockwasher (30)
- Seal assembly (2)
- Self-locking nut (2)

References
- FM 21-40
- TM 9-2350-238-24P-1

General Safety Instructions

WARNING

Contaminated intake filter elements must be handled using adequate precautions (refer to FM 21-40) and must be disposed of by authorized personnel.

REMOVAL

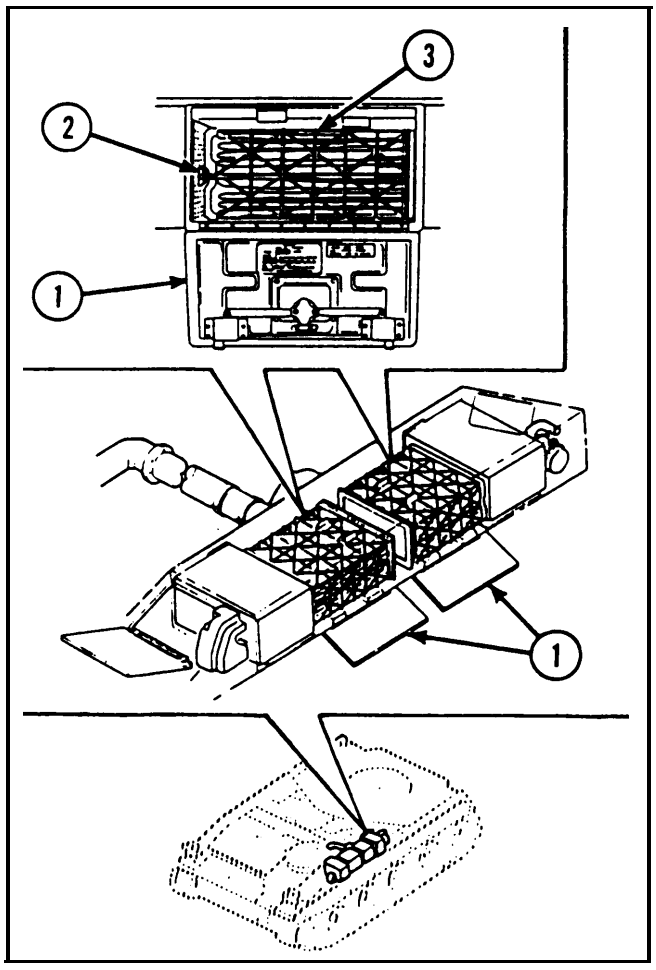
WARNING

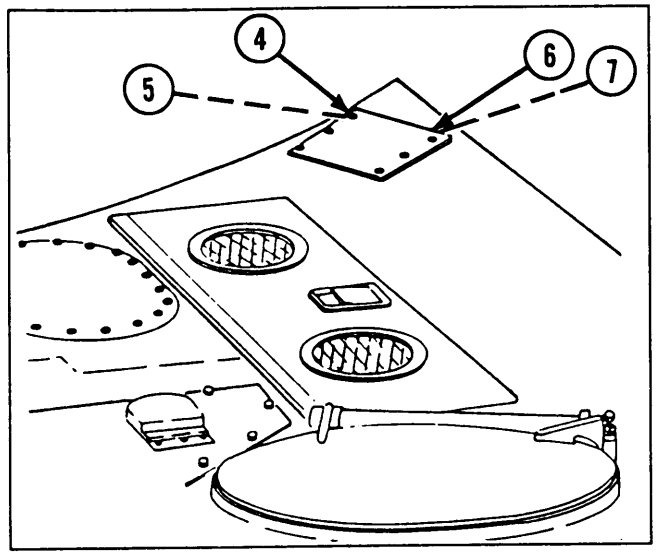
Contaminated intake filter elements must be handled using adequate precautions (refer to FM 21-40) and must be disposed of by authorized personnel.

1 Open two air cleaner access doors (1).

2 Set retainer assembly levers (2) to vertical position.

3 Pull two intake filter elements (3) from compartments.





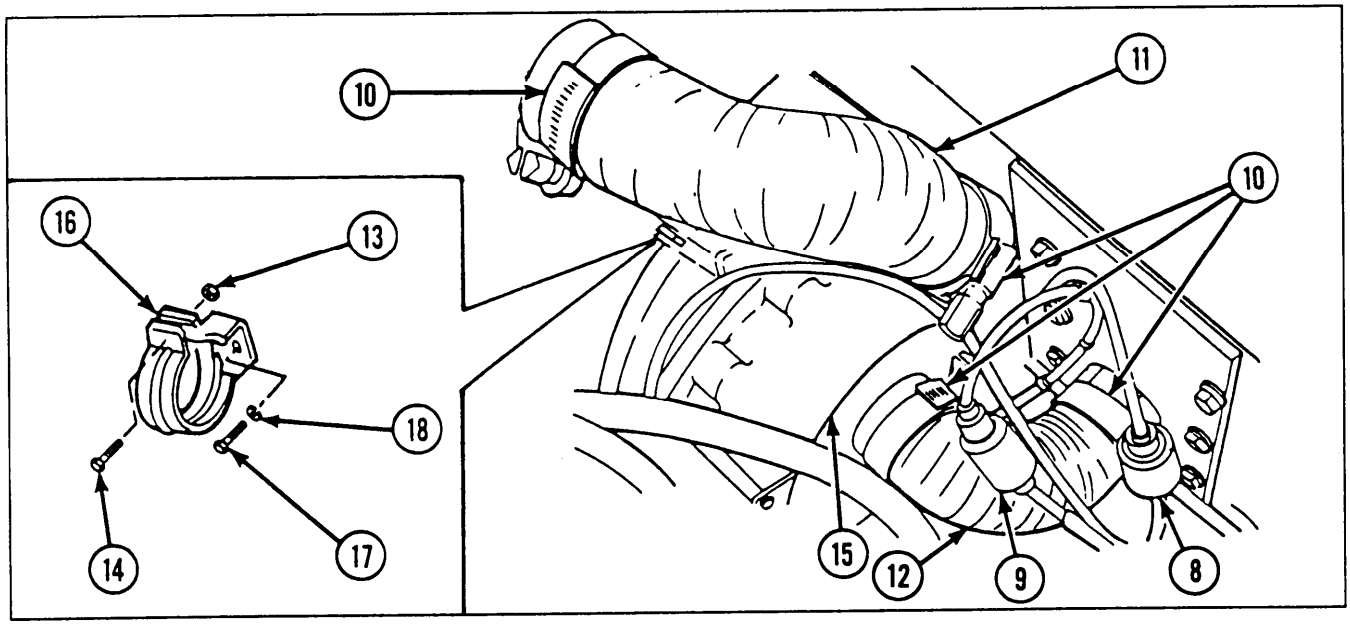
NOTE

Steps *4* thru 12 apply to the aft air cleaner centrifugal fan.

4 Set MASTER and INST switches to OFF.

5 Remove six hexagon head capscrews (4) and six lockwashers (5).

6 Remove access cover (6) and gasket (7).



7 Disconnect connectors (8 and 9).

8 Loosen four hose clamps (10).

9 Remove blower inlet air duct hose (11) and blower outlet air duct hose (12).

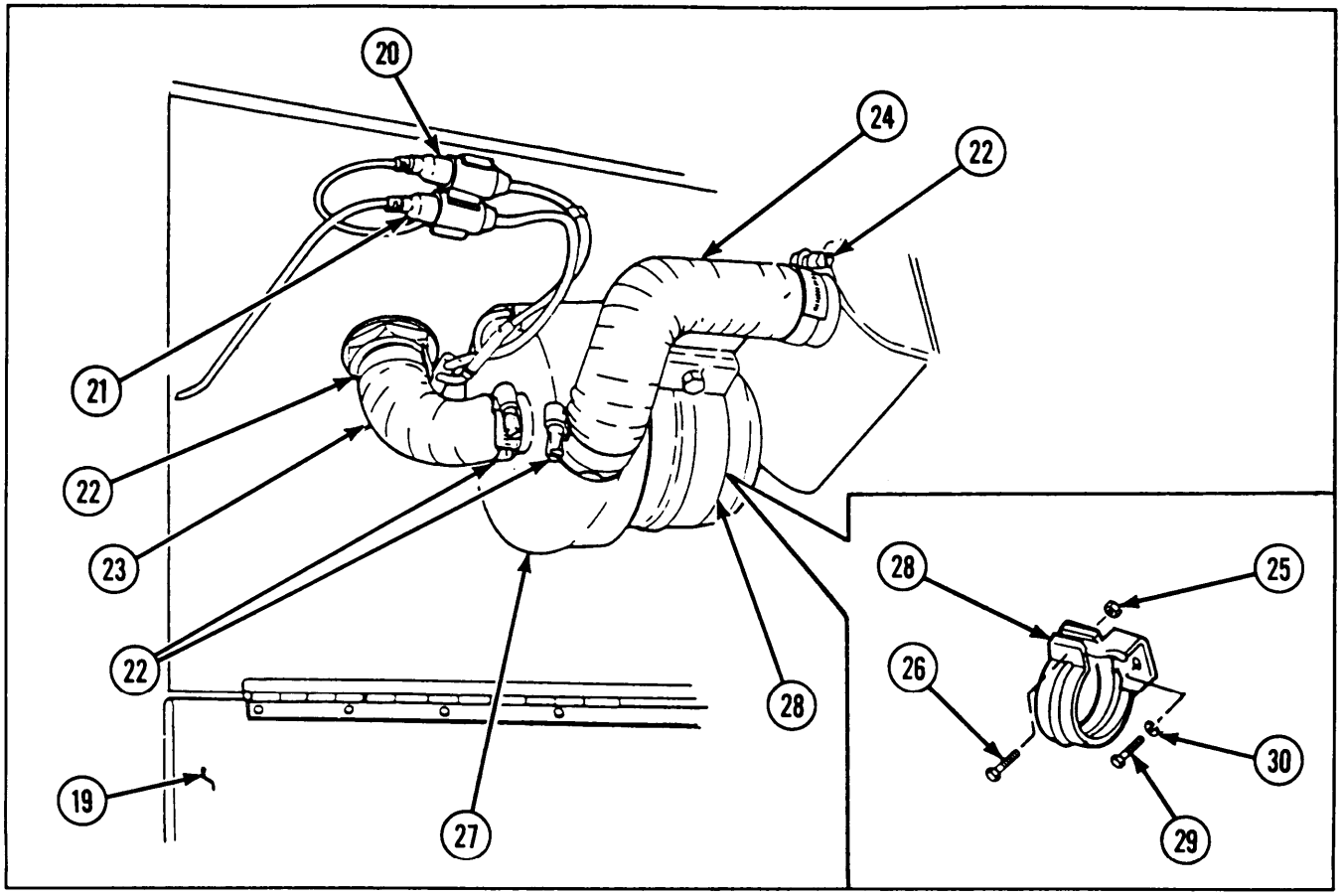
10 Loosen self-locking nut (13) and hexagon head capscrew (14) until aft air cleaner centrifugal fan (15) can be removed.

11 Remove aft air cleaner centrifugal fan (15), self-locking nut (13), and hexagon head capscrew (14) from air cleaner blower clamp bracket (16).

12 Remove two hexagon head capscrews (17), two lockwashers (18), and air cleaner blower clamp bracket (16).

2-44. MAINTENANCE OF ENGINE AIR CLEANER SYSTEM (CONT).

REMOVAL (CONT)



NOTE
Steps 13 thru 20 apply to the forward air cleaner centrifugal fan.

13 Open blower access door (19).

14 Disconnect connectors (20 and 21).

15 Loosen four hose clamps (22).

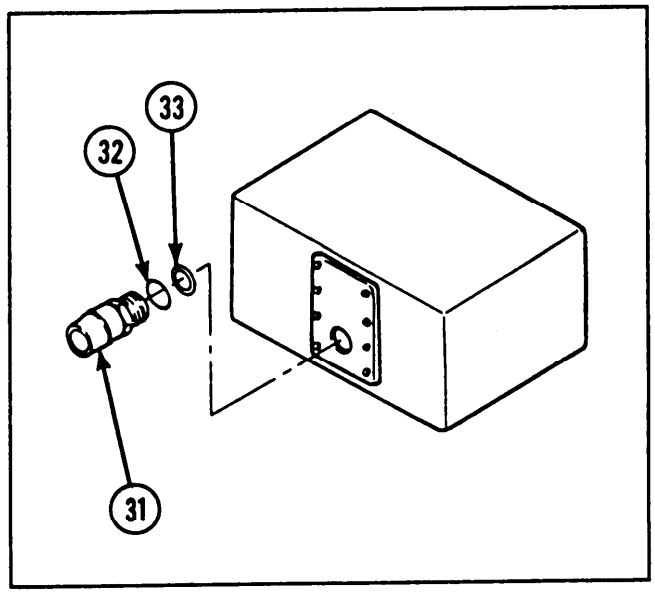
16 Remove blower inlet air duct hose (23) and blower outlet air duct hose (24).

17 Loosen self-locking nut (25) and hexagon head capscrew (26) until forward air cleaner centrifugal fan (27) can be removed.

18 Remove forward air cleaner centrifugal fan (27), self-locking nut (25), and hexagon head capscrew (26) from air cleaner blower clamp bracket (28).

19 Remove two hexagon head capscrews (29), two lockwashers (30), and air cleaner blower clamp bracket (28).

20 Remove hose to boss straight adapter (31), forward air separator outlet adapter gasket (32), and flat washer (33) from hull.



NOTE

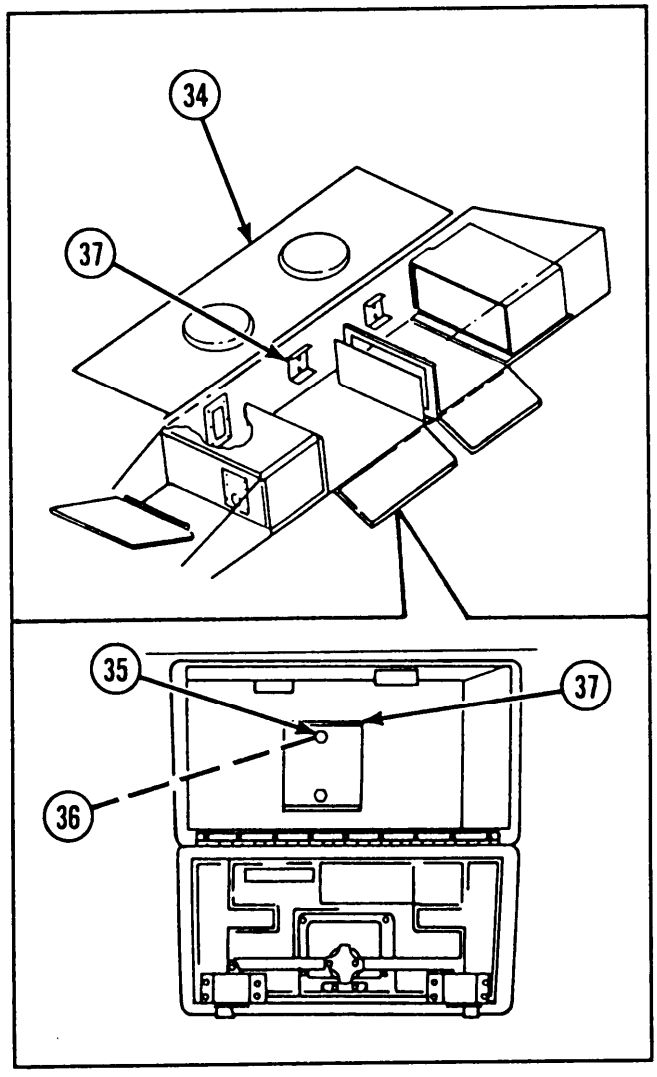
Steps 21 thru 32 apply to the forward intake air cleaner.

21 Open battery access cover (34).

22 Remove batteries. Refer to page 2-640.

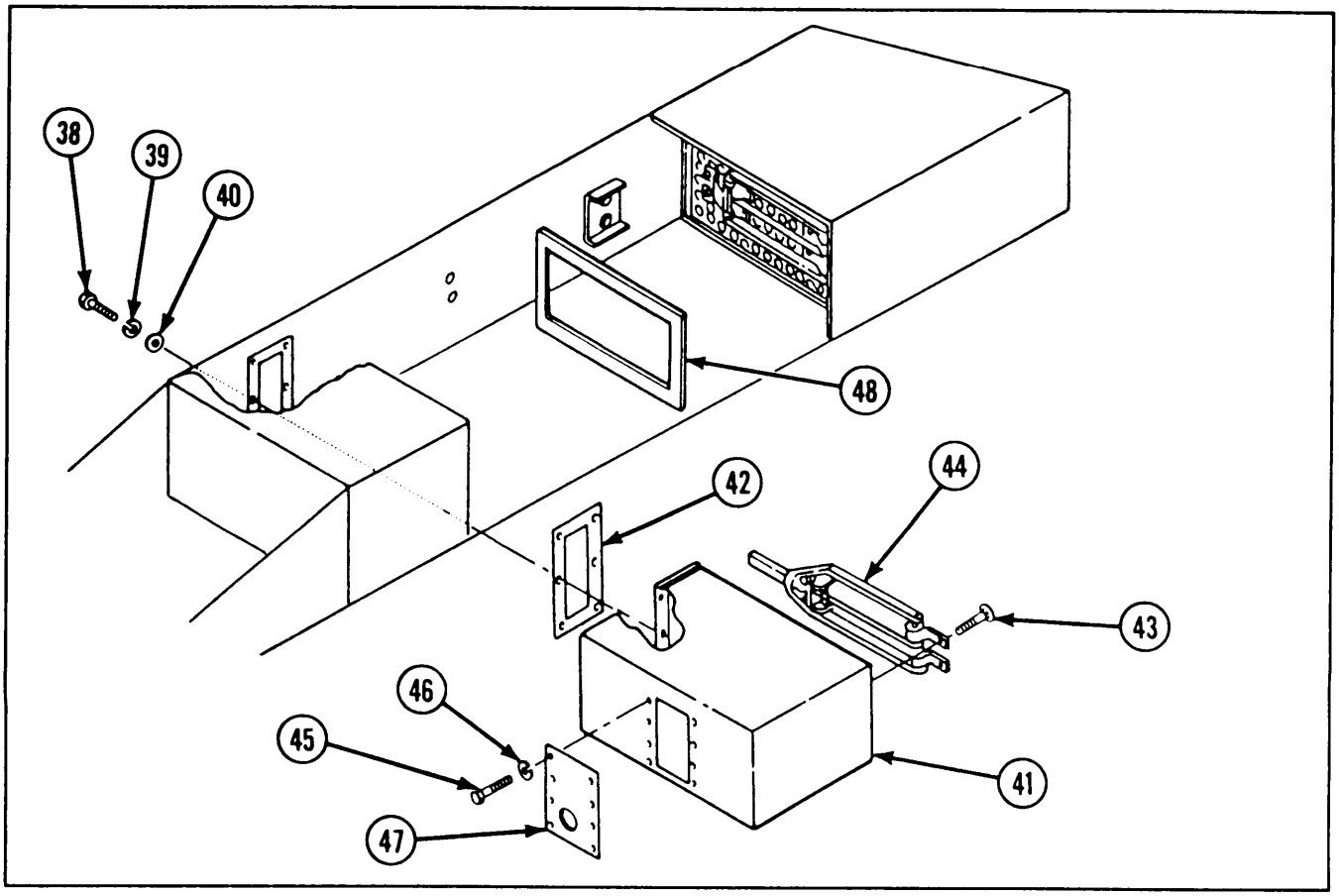
23 Remove battery tray. Refer to page 2-640.

24 Remove two hexagon head capscrews (35), two lockwashers (36), and cleaner basket mounting bracket (37) from hull.



2-44. MAINTENANCE OF ENGINE AIR CLEANER SYSTEM (CONT).

REMOVAL (CONT)



25 Remove six hexagon head capscrews (38), six lockwashers (39), and six flat washers (40) from hull.

26 Pull forward intake air cleaner (41) outward until there is 1/4 in. (0.64 cm) clearance between forward intake air cleaner and hull.

27 Slide forward intake air cleaner (41) into space normally occupied by intake filter element.

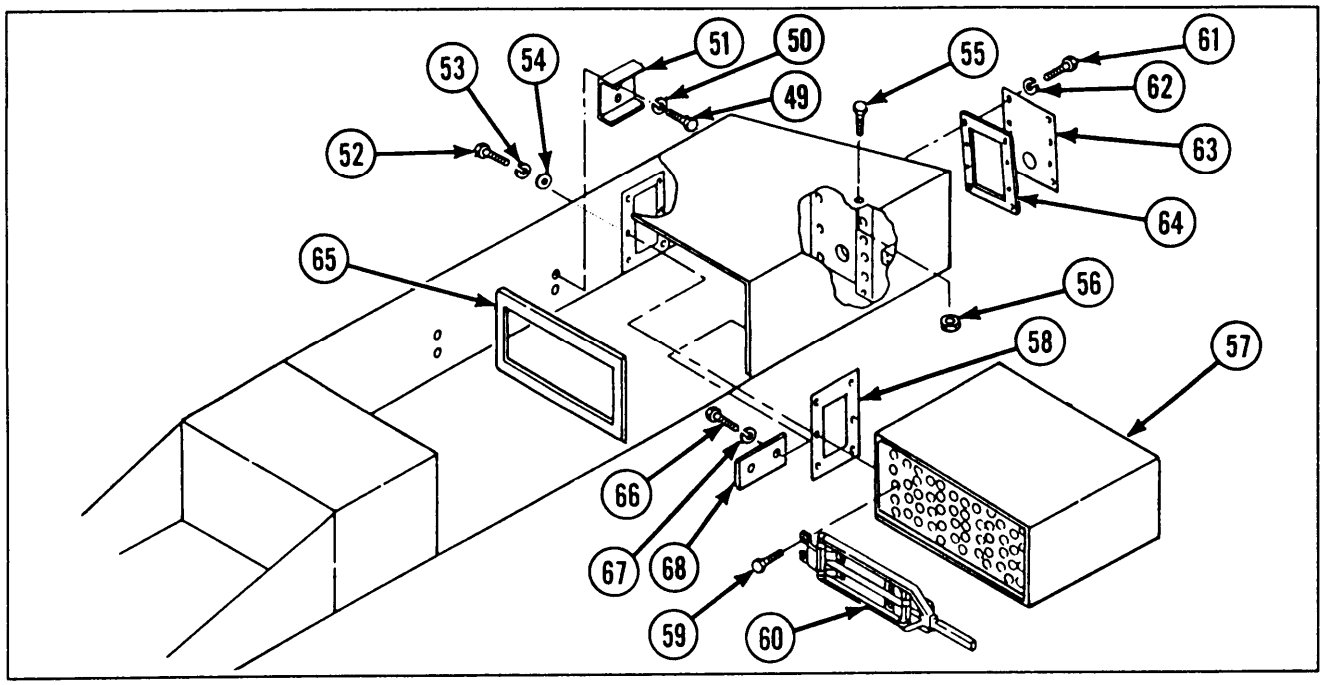
28 Remove forward intake air cleaner (41) and duct gasket (42).

29 Remove eight assembled bolts (43) and retainer assembly (44) from forward intake air cleaner (41).

30 Remove duct gasket (42) from forward intake air cleaner (41).

31 If necessary, remove eight hexagon head capscrews (45), eight lockwashers (46), and blower adapter access cover (47) from forward intake air cleaner (41).

32 If damaged, remove seal assembly (48).



NOTE
Steps 33 thru 43 apply to the aft intake air cleaner.

33 Remove two hexagon head capscrews (49), two lockwashers (50), and cleaner basket mounting bracket (51) from hull.

34 Remove six hexagon head capscrews (52), six lockwashers (53), and six flat washers (54) from hull.

35 Loosen hexagon head capscrew (55) and slotted plain nut (56).

36 Pull aft intake air cleaner (57) outward until there is 0.25 in. (0.64 cm) clearance between aft intake air cleaner and hull.

37 Slide aft intake air cleaner (57) into space normally occupied by intake filter element.

38 Remove aft intake air cleaner (57) with duct gasket (58).

39 Remove eight assembled bolts (59) and retainer assembly (60) from aft intake air cleaner (57).

40 Remove duct gasket (58) from aft intake air cleaner (57).

41 If necessary, remove eight hexagon head capscrews (61), eight lockwashers (62), blower adapter air cleaner door (63), and gasket (64) from aft intake air cleaner (57).

42 If damaged, remove seal assembly (65).

43 If damaged, remove four hexagon head capscrews (66), four lockwashers (67), and two placement guide mounting brackets (68) from hull.

2-44. MAINTENANCE OF ENGINE AIR CLEANER SYSTEM (CONT).

INSPECTIONREPAIR

1 Inspect for broken, damaged, or missing parts.

2 Air cleaner centrifugal fans are repairable assemblies. Notify direct support maintenance.

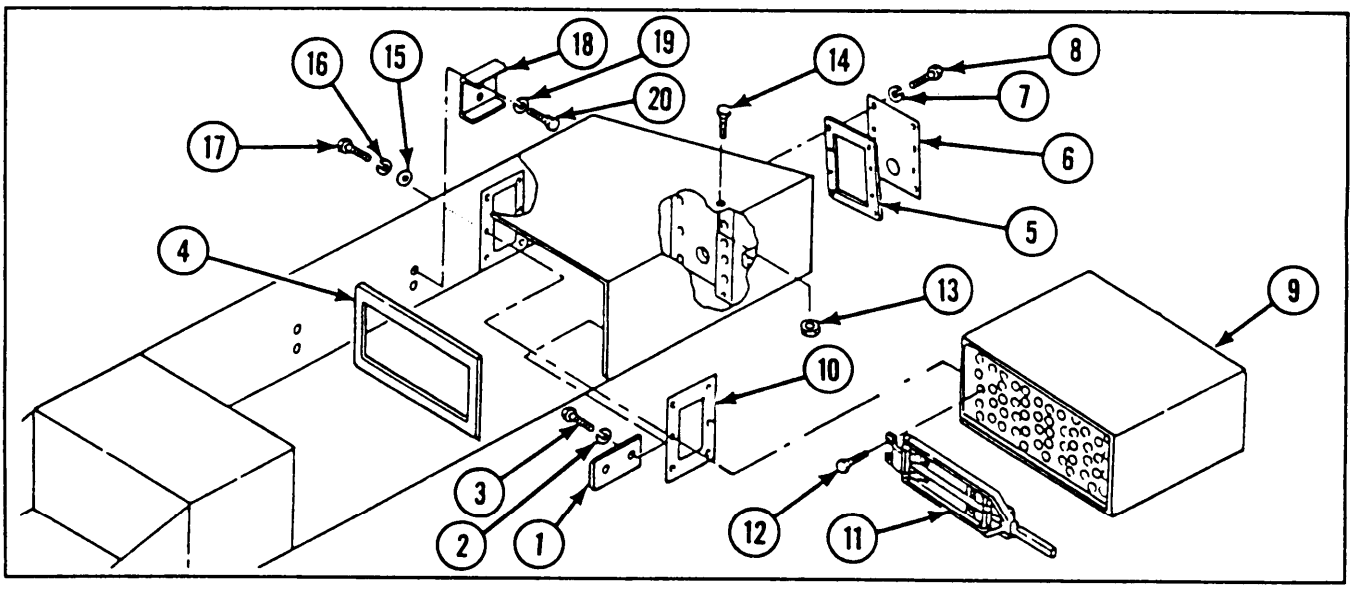
3 Blower outlet air duct hose and blower inlet air duct hose are manufactured items, refer to appendix D.

4 Intake air cleaners require special handling. Refer to general repair methods, page 2-379.

5 Intake filter elements require special disposition. Refer to general repair methods, page 2-379.

6 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

INSTALLATION



NOTE
Steps 1 thru 9 apply to the aft intake air cleaner.

1 If removed, install two placement guide mounting brackets (1), four new lockwashers (2), and four hexagon head capscrews (3) to hull.

2 If removed, install new seal assembly (4).

3 If removed, install new gasket (5), blower adapter air cleaner door (6), eight new lockwashers (7), and eight hexagon head capscrews (8) to aft intake air cleaner (9).

4 Install new duct gasket (10) to aft intake air cleaner (9).

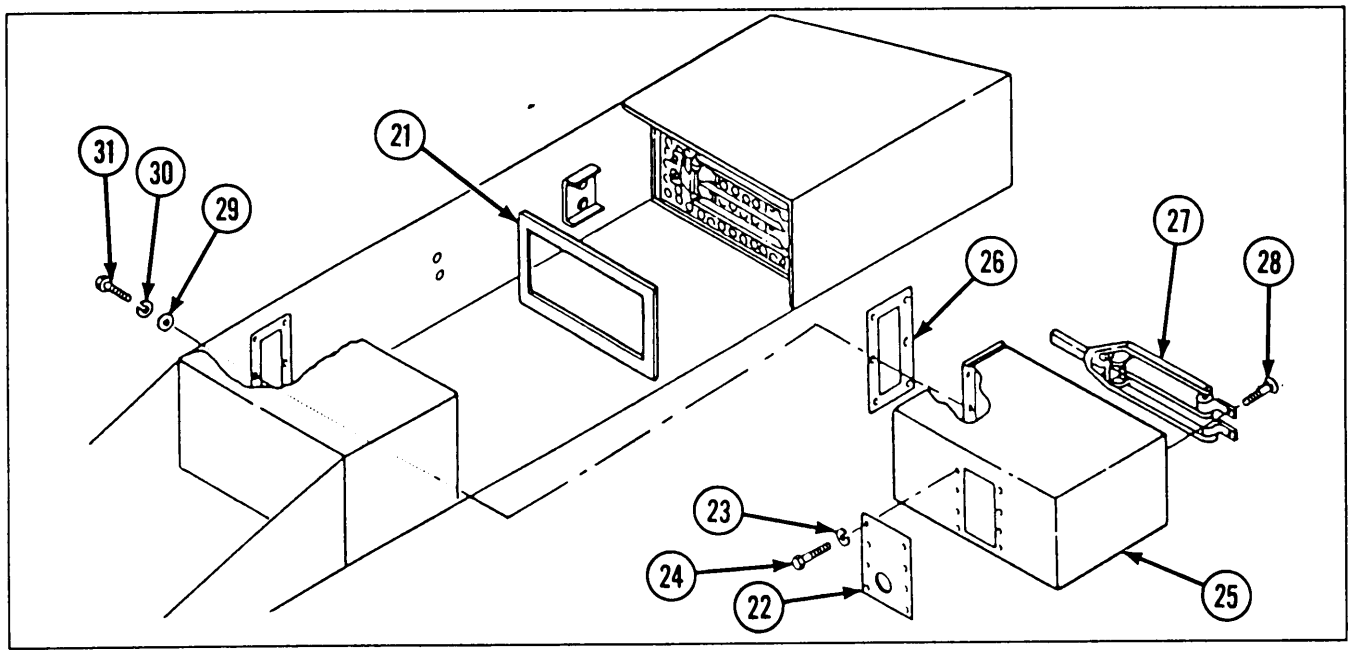
5 Install retainer assembly (11) and eight assembled bolts (12) to aft intake air cleaner (9).

6 Install aft intake air cleaner (9).

7 Install slotted plain nut (13) on hexagon head capscrew (14).

8 Install six flat washers (15), six new lockwashers (16), and six hexagon head capscrews (17) to hull.

9 Install cleaner basket mounting bracket (18), two new lockwashers (19), and two hexagon head capscrews (20) to hull.



NOTE

Steps 10 thru 19 apply to the forward intake air cleaner.

10 If removed, install new seal assembly (21).

11 If removed, install blower adapter access cover (22), eight new lockwashers (23), and eight hexagon head capscrews (24) to forward intake air cleaner (25).

12 Install new duct gasket (26) to forward intake air cleaner (25).

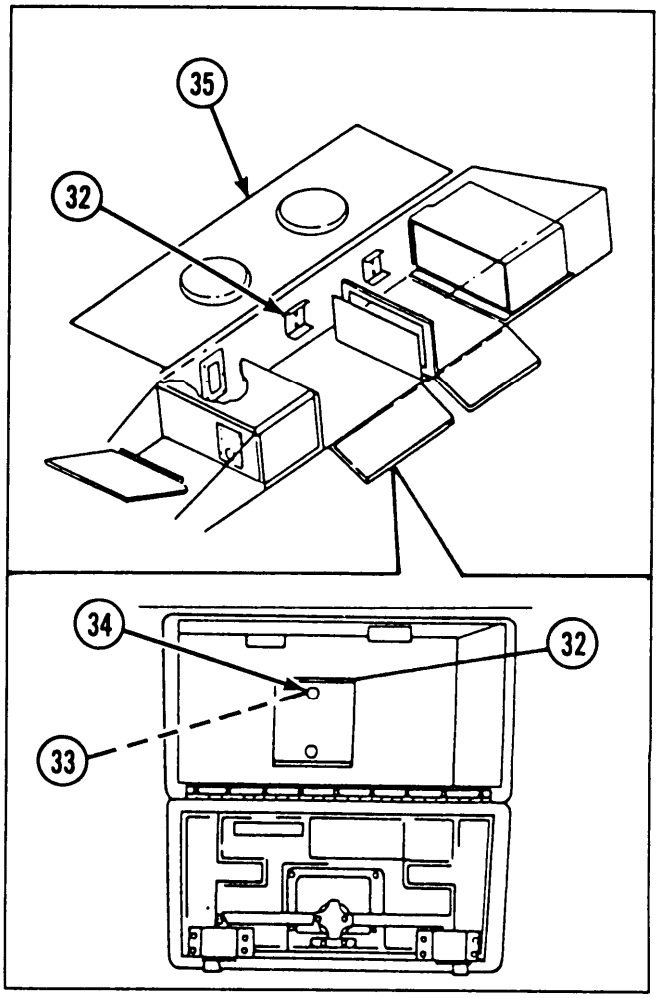
13 Install retainer assembly (27) and eight assembled bolts (28) to forward intake air cleaner (25).

14 Install forward intake air cleaner (25).

15 Install six flat washers (29), six new lockwashers (30), and six hexagon head capscrews (31) to hull.

2-44. MAINTENANCE OF ENGINE AIR CLEANER SYSTEM (CONT).

INSTALLATION (CONT)



16 Install cleaner basket mounting bracket (32), two new lockwashers (33), and two hexagon head capscrews (34) to hull.

17 Install battery tray. Refer to page 2-840.

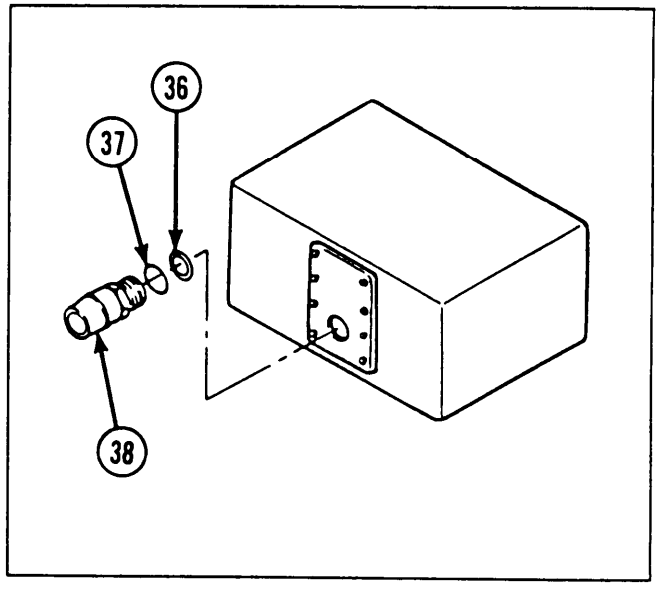
18 Install batteries. Refer to page 2-840.

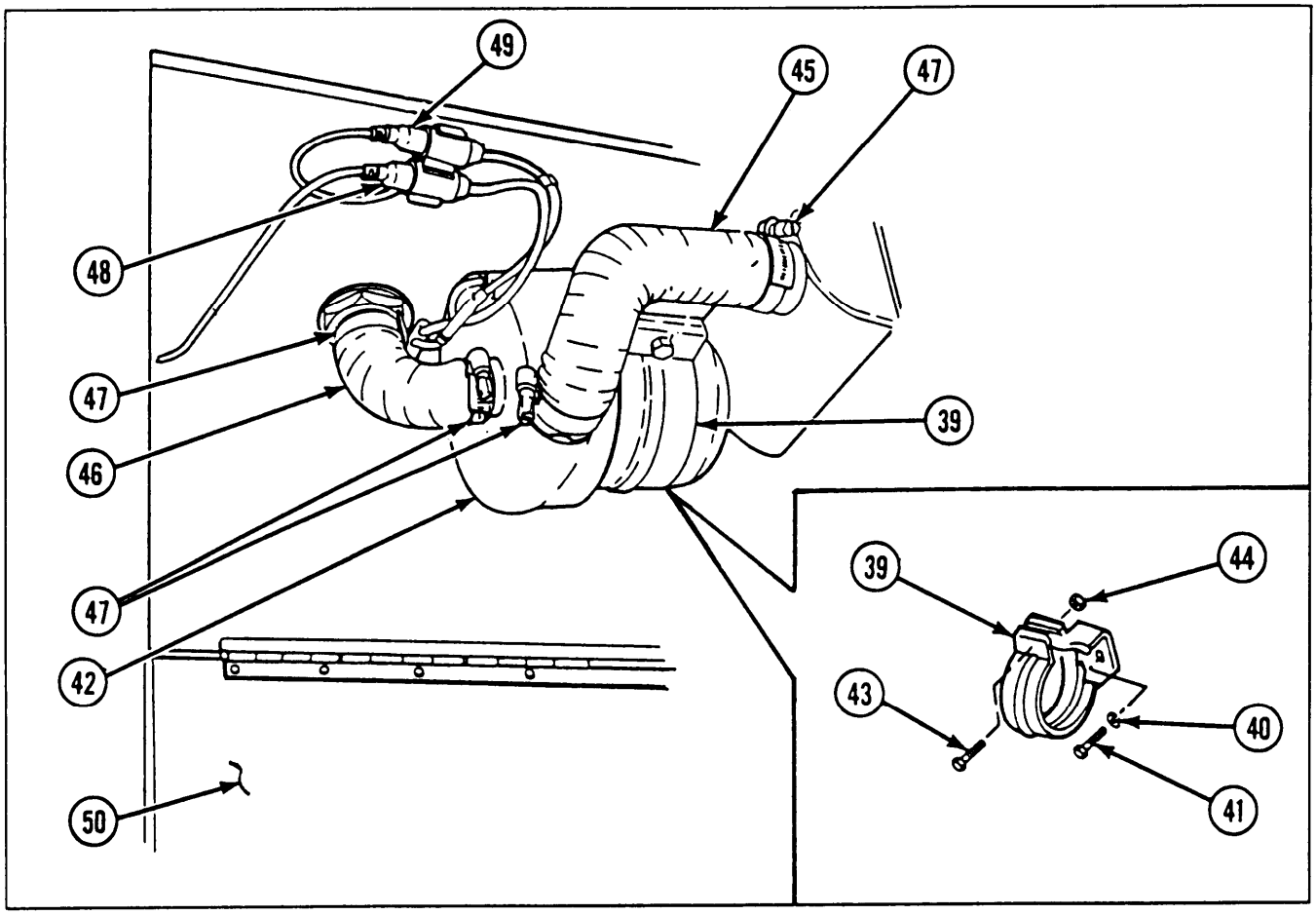
19 Close battery access cover (35).

NOTE

Steps 20 thru 28 apply to the forward air cleaner centrifugal fan.

20 Install flat washer (36), new forward air separator outlet adapter gasket (37), and hose to boss straight adapter (38).





21 Install air cleaner blower clamp bracket (39), two new lockwashers (40), and two hexagon head capscrews (41).

22 Install forward air cleaner centrifugal fan (42) in air cleaner blower clamp bracket (39).

23 Install and tighten hexagon head capscrew (43) and new self-locking nut (44) until forward air cleaner centrifugal fan (42) is secure.

24 Install blower outlet air duct hose (45) and blower inlet air duct hose (46).

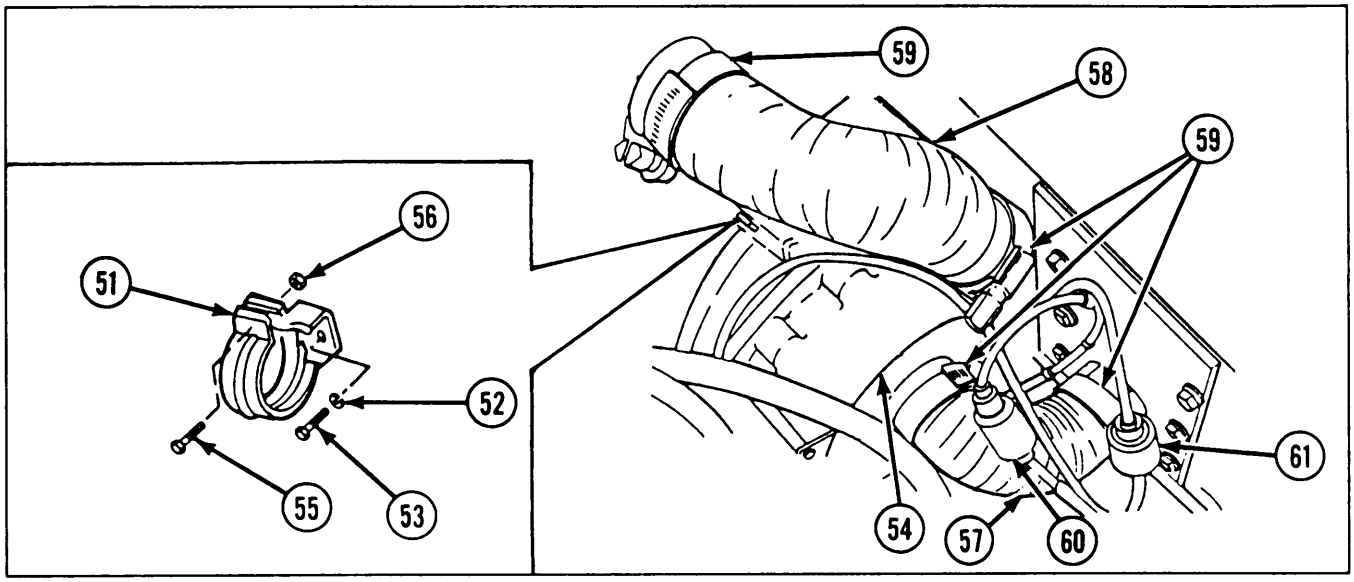
25 Tighten four hose clamps (47).

26 Connect connectors (48 and 49).

27 Close blower access door (50).

2-44. MAINTENANCE OF ENGINE AIR CLEANER SYSTEM (CONT).

INSTALLATION (CONT)



NOTE

Steps 28 thru 36 apply to the aft air cleaner centrifugal fan.

28 Install air cleaner blower clamp bracket (51), two new lockwashers (52), and two hexagon head capscrews (53).

29 Install aft air cleaner centrifugal fan (54) in air cleaner blower clamp bracket (51).

30 Install and tighten hexagon head capscrew (55) and new self-locking nut (56) until aft air cleaner centrifugal fan (54) is secure.

31 Install blower outlet air duct hose (57) and blower inlet air duct hose (58).

32 Tighten four hose clamps (59).

33 Connect connectors (60 and 61).

34 Install new gasket (62) and access cover (63).

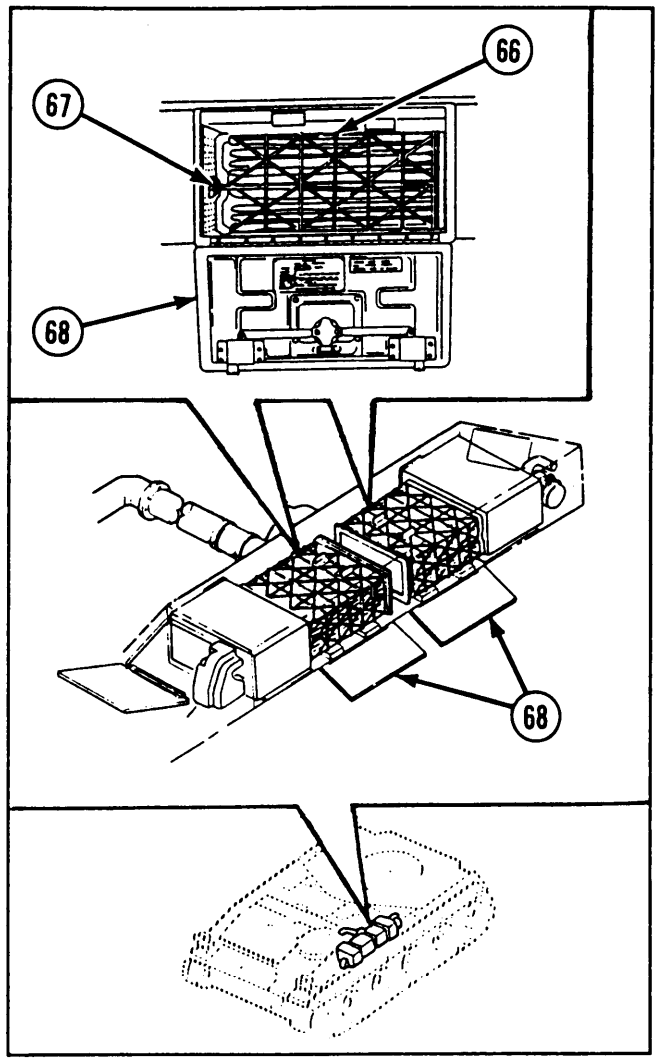
35 Install six new lockwashers (64) and six hexagon head capscrews (65).

36 Set MASTER and INST switch to ON.

37 Install two intake filter elements (66) to compartments.

38 Set retainer assembly levers (67) to horizontal position.

39 Close two air cleaner access doors (68).



2-45. MAINTENANCE OF ENGINE INTAKE AIR DUCTS.

This task covers:	a. *Removal*	b. *Inspection/Repair*	*c. Installation*

INITIAL SETUP

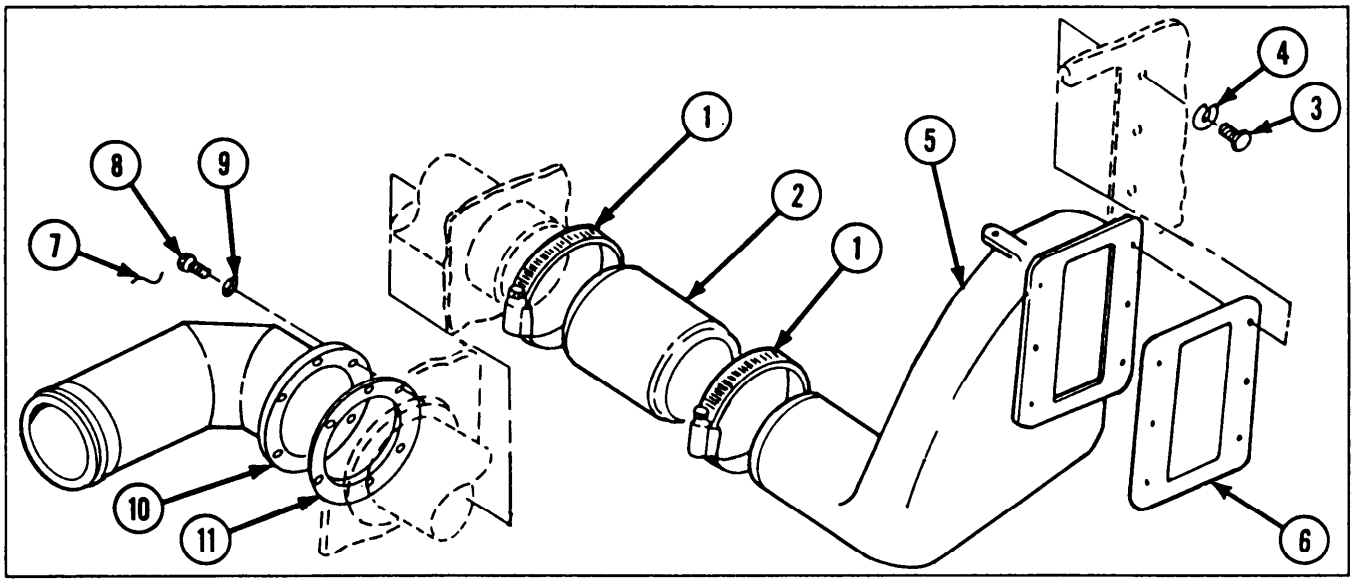
Tools and Special Tools
Plier wire twister (item 30, appx G)

Materials/Parts
Duct elbow gasket
Duct gasket
Lockwasher (6)
Lockwire (item 22, appx C)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-640 Batteries and battery tray removed
2-935 Hull engine compartment deck assembly lid removed
2-446 Air cleaner baskets removed

2-45. MAINTENANCE OF ENGINE INTAKE AIR DUCTS (CONT).



REMOVAL

1 Remove two hose clamps (1) and air duct hose (2).

2 Remove six hexagon head capscrews (3) and six lockwashers (4).

3 Remove air intake duct (5) and duct gasket (6).

4 Remove lockwire (7), six hexagon head capscrews (8), and six flat washers (9).

5 Remove air outlet duct (10) and duct elbow gasket (11).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install new duct elbow gasket (11) and air outlet duct (10).

2 Install six flat washers (9), six hexagon head capscrews (8), and new lockwire (7).

3 Install new duct gasket (6) and air intake duct (5).

4 Install six new lockwashers (4) and six hexagon head capscrews (3).

5 Install air duct hose (2) and two hose clamps (1).

2-46. MAINTENANCE OF TURBOCHARGER AIR INTAKE FILTER AND RELATED ITEMS (ENGINE MODEL 7083-7398).

This task covers: a. *Removal* b. *Inspection/Repair* *c. Installation*

INITIAL SETUP

Tools and Special Tools
Plier wire twister (item 30, appx G)

Materials/Parts
Air inlet adapter gasket
Lockwire (item 27, appx C)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed

REMOVAL

1 Loosen two hose clamps (1) on air duct hose (2). Remove air duct hose and two hose clamps from intake filter element (3).

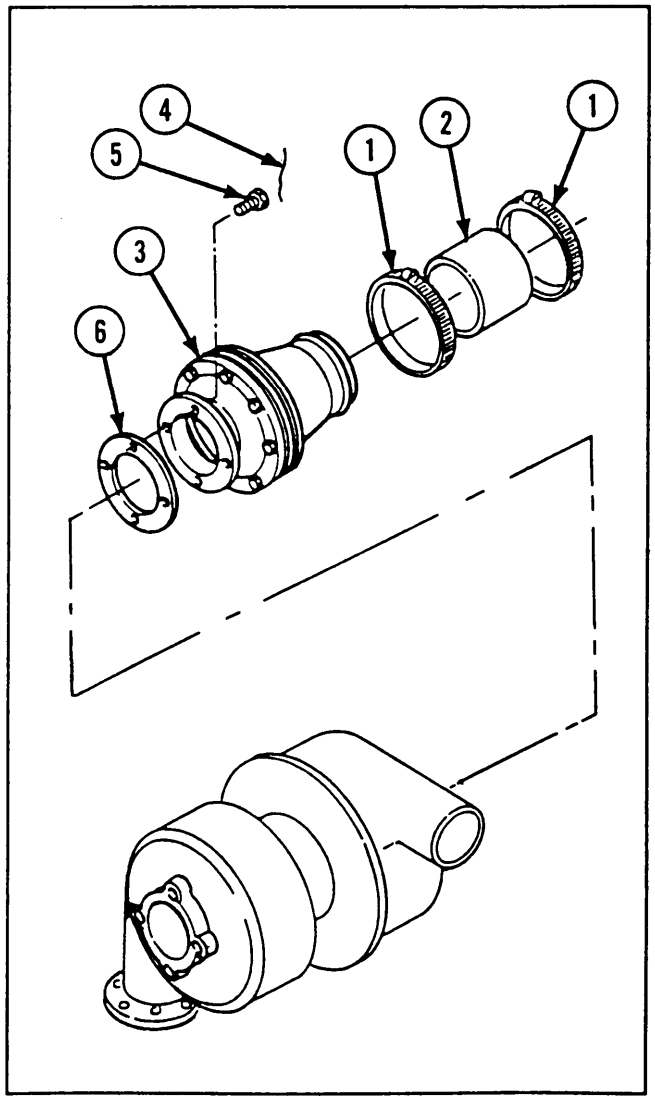
2 Remove lockwire (4) and four hexagon head capscrews (5).

3 Remove intake filter element (3) and air inlet adapter gasket (6).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).



1 Install new air inlet adapter gasket (6) and intake filter element (3).

2 Install four hexagon head capscrews (5) and new lockwire (4).

3 Install two hose clamps (1) and air duct hose (2) on intake filter element (3). Tighten hose clamps (1) on air duct hose (2).

2-47. MAINTENANCE OF TURBOCHARGER AIR INTAKE SCREEN AND RELATED ITEMS (ENGINE MODEL 7083-7395).

This task covers:	a. *Removal* b. *Disassembly* *c. Inspection/Repair*	d. *Reassembly* *e. Installation*

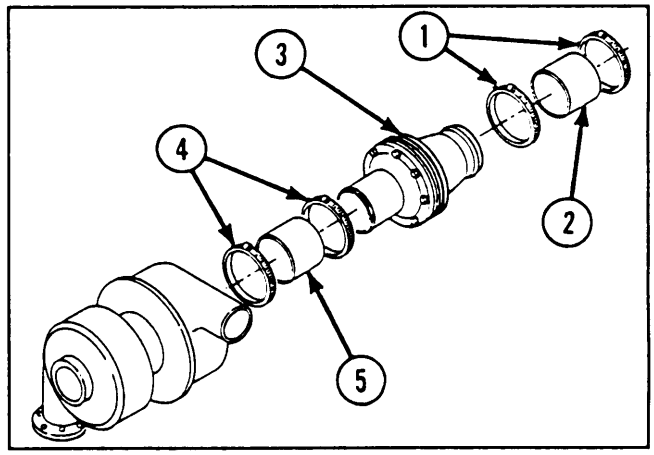
INITIAL SETUP

Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 2 (less power) (item 81, appx B)
• Torque wrench (0 to 170 ft-lb)

Materials/Parts
Gasket (2)
Lockwasher (8)
Turbocharger air intake screen

References
TM 9-2350-238-24P-1

Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed

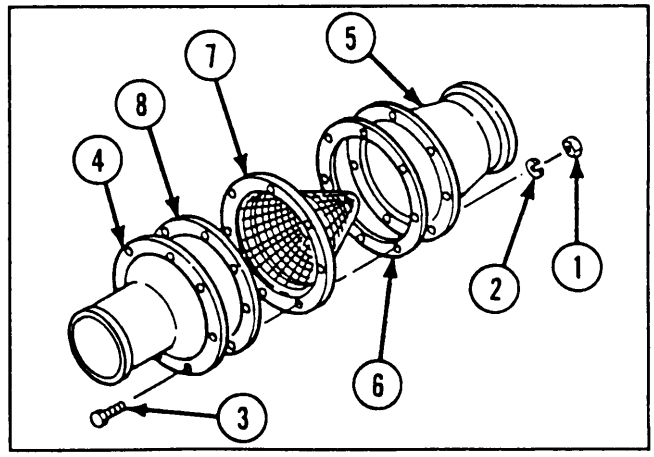


1 Loosen two hose clamps (1) on air duct inlet hose (2). Remove air duct inlet hose and two hose clamps from air screen assembly (3).

2 Loosen two hose clamps (4) and slide back air duct inlet hose (5).

3 Remove air screen assembly (3), air duct inlet hose (5), and two hose clamps (4).

DISASSEMBLY



1 Remove eight hexagon plain nuts (1), eight lockwashers (2), and eight hexagon head capscrews (3). Separate screw case (4) from hose connection case (5).

2 Remove gasket (6) and turbocharger air intake screen (7) from hose connection case (5).

3 Remove gasket (8) from screw case (4).

INSPECTION/REPAIR

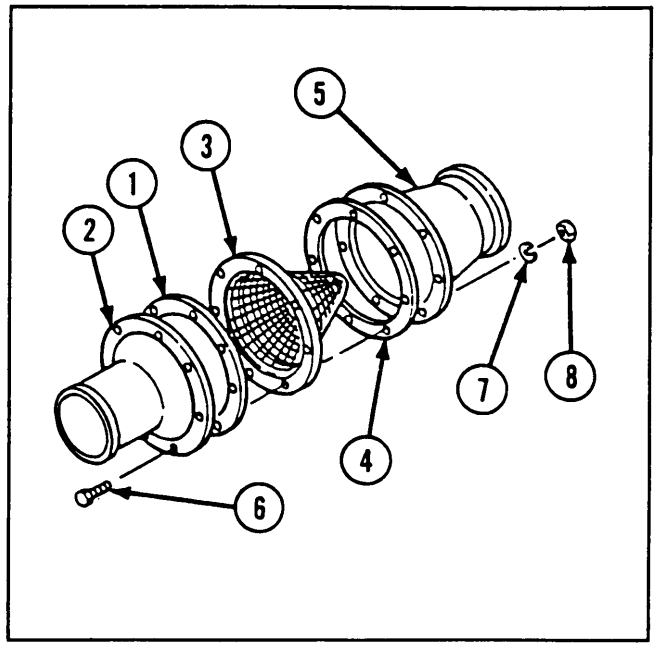
1 Inspect for broken, damaged, or missing parts.

2 If screw case is broken, damaged, or missing, repair is by replacement of next higher assembly.

3 If hose connection case is broken, damaged, or missing, repair is by replacement of next higher assembly.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

REASSEMBLY



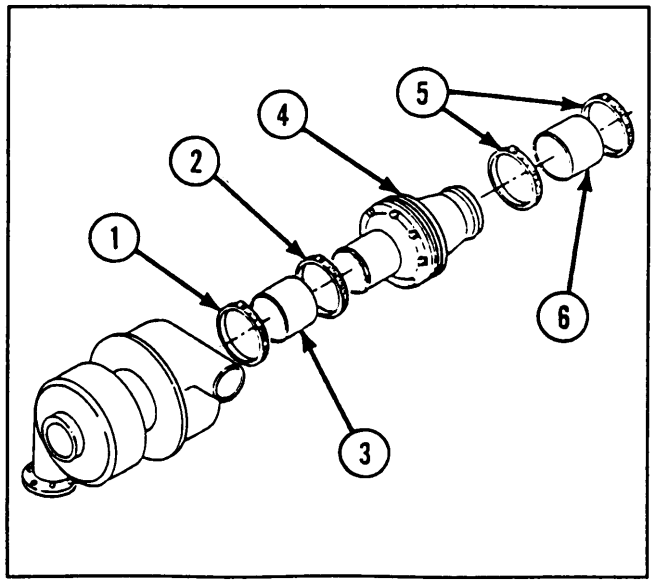
1 Install new gasket (1) to screw case (2).

2 Install new turbocharger air intake screen (3), and new gasket (4), to hose connection case (5).

3 Install screw case (2) and hose connection case (5) together. Install eight hexagon head capscrews (6), eight new lockwashers (7), and eight hexagon plain nuts (8).

4 Torque hexagon plain nuts (8) to 9.0 to 10.0 ft-lb (12.2 to 13.6 N-m) (dry) or 6.2 to 7.2 ft-lb (8.4 to 9.8 N-m) (lubed).

INSTALLATION



1 Install two hose clamps (1 and 2) on air duct inlet hose (3). Install air duct inlet hose and tighten one hose clamp (1).

2 Install air screen assembly (4) and tighten hose clamp (2).

3 Install two hose clamps (5) and air duct inlet hose (6) on air screen assembly (4). Tighten two hose clamps on air duct inlet hose.

2-48. MAINTENANCE OF FUEL LINES AND FITTINGS (LOW PRESSURE) COUPLINGS TO ENGINE.

This task covers:	a. *Removal*	b. *Inspection/Repair*	c. *Installation*

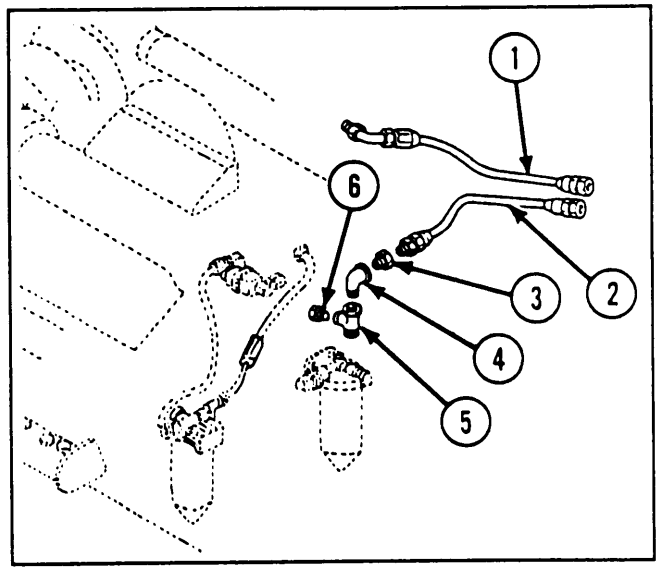
INITIAL SETUP

Materials/Parts
Lockwasher (3)
Preformed packing

Equipment Conditions
2-384 Powerplant removed

References
TM 9-2350-238-24P-1

REMOVAL



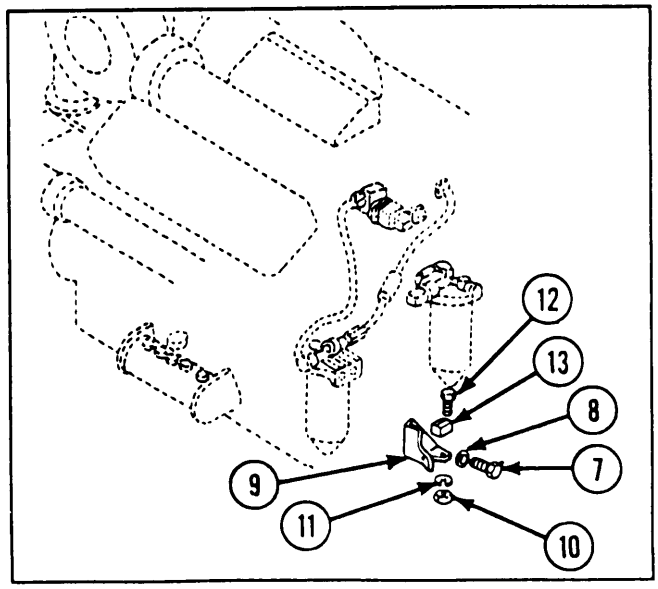
1 Disconnect fuel return hose assembly (1) at both ends and remove.

2 Disconnect fuel supply to filter hose assembly (2) at both ends and remove.

3 Remove straight adapter (3) from pipe elbow (4).

4 Remove pipe elbow *(4)* from pipe tee (5).

5 Remove pipe tee (5). If damaged, remove pipe plug (6).



6 Remove two hexagon head capscrews (7) and two lockwashers (8) from fuel filter bracket (9).

7 Remove hexagon plain nut (10), lockwasher (11), hexagon head capscrew (12), and spring tension clip (13). Remove fuel filter bracket (9).

8 Disconnect and remove fuel filter drain hose assembly (14).

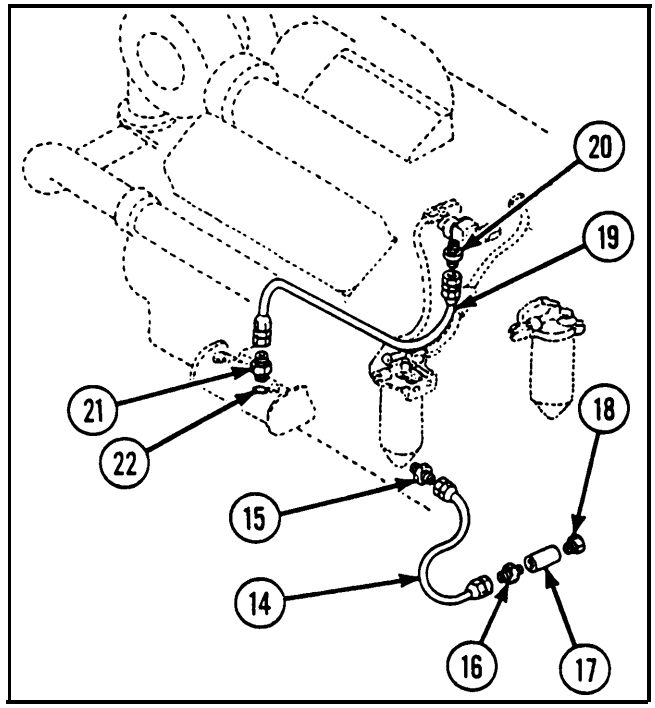
9 Remove two straight adapters (15 and 16) and assembled parts.

10 Remove straight adapter (16) from pipe coupling (17).

11 Remove drain cock (18) from pipe coupling (17).

12 Disconnect fuel pump to reservoir drain hose assembly (19) at both ends and remove.

13 Remove straight adapter (20), tube nipple (21), and preformed packing (22).



INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install new preformed packing (1), tube nipple (2), and straight adapter (3).

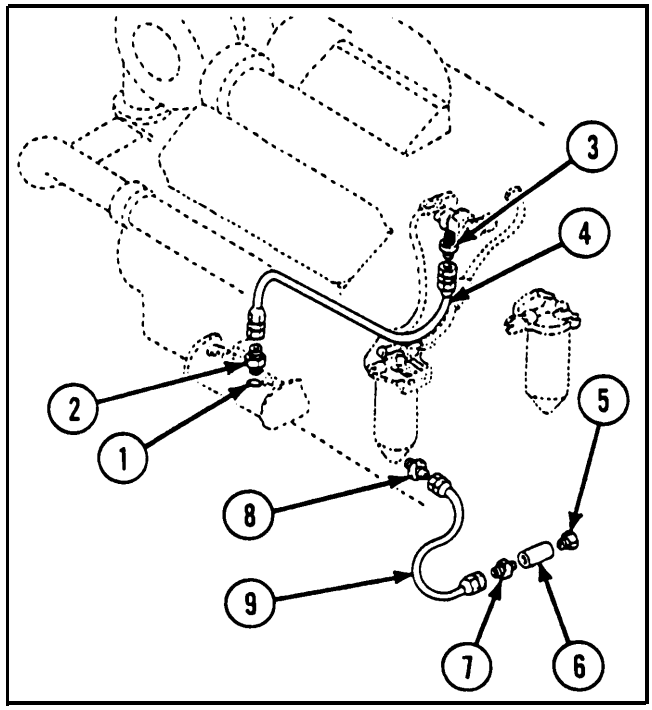
2 Install fuel pump to reservoir drain hose assembly (4) and connect at both ends.

3 Install drain cock (5) in pipe coupling (6).

4 Install straight adapter (7) in pipe coupling (6).

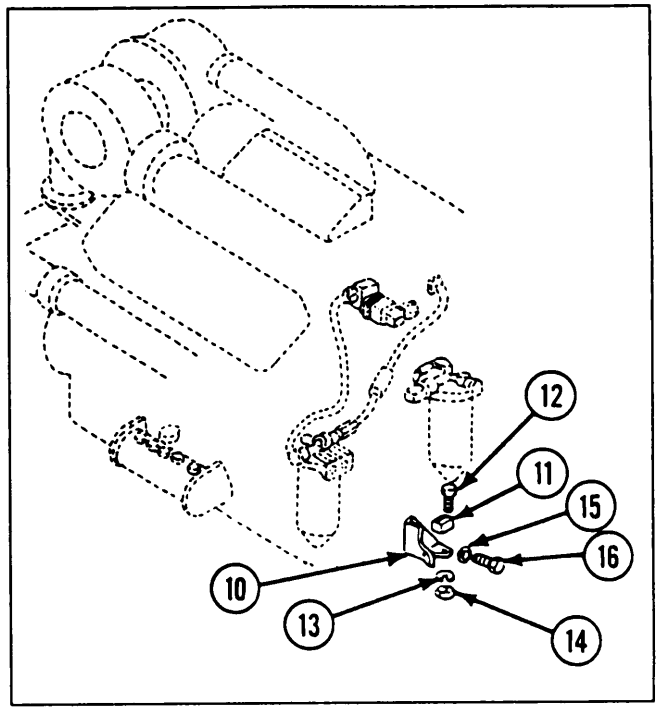
5 Install two straight adapters (7 and 8) and assembled parts.

6 Install and connect fuel filter drain hose assembly (9).



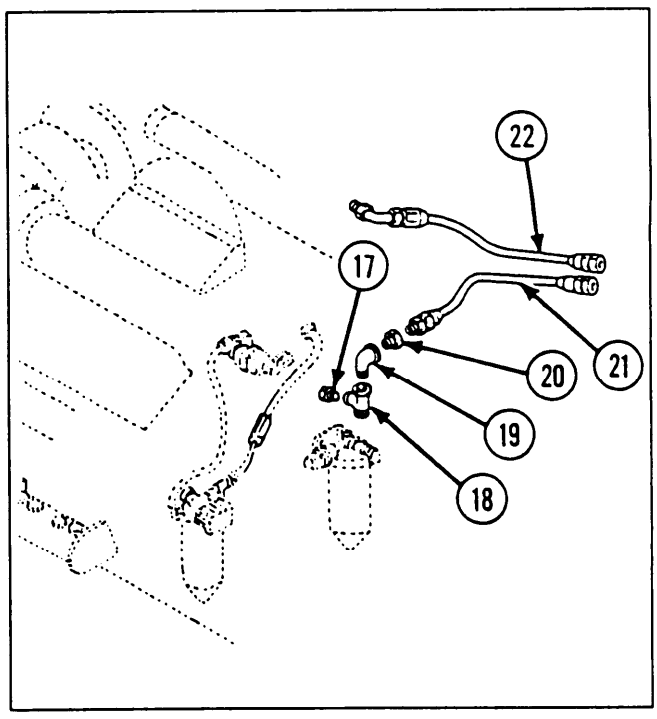
2-48. MAINTENANCE OF FUEL LINES AND FITTINGS (LOW PRESSURE) COUPLINGS TO ENGINE (CONT).

INSTALLATION (CONT)



7 Install fuel filter bracket (10). Install spring tension clip (11), hexagon head capscrew (12), new lockwasher (13), and hexagon plain nut (14).

8 Install two new lockwashers (15) and two hexagon head capscrews (16) in fuel filter bracket (10).



9 If removed, install pipe plug (17). Install pipe tee (18).

10 Install pipe elbow (19) in pipe tee (18).

11 Install straight adapter (20) in pipe elbow (19).

12 Install fuel supply to filter hose assembly (21) and connect at both ends.

13 Install fuel return hose assembly (22) and connect at both ends.

2-49. MAINTENANCE OF FUEL LINES AND FITTINGS (LOW PRESSURE) COUPLINGS TO FUEL CELLS.

This task covers: a. *Removal* b. *Inspection/Repair* *c. Installation*

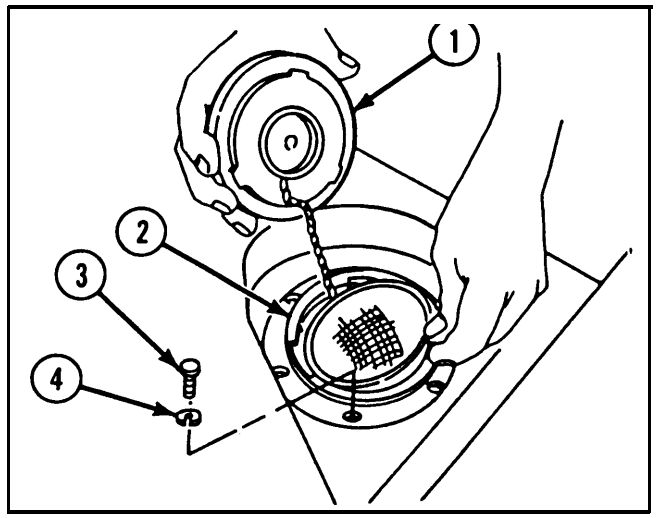
INITIAL SETUP

Materials/Parts
Fuel filler neck gasket
Gasket (2)
Hand pump
Lockwasher (6)
Lockwasher (2)
Preformed packing
Preformed packing
Tube fitting locknut
Tube fitting locknut

References
TM 9-2350-238-10
TM 9-2350-238-24P-1

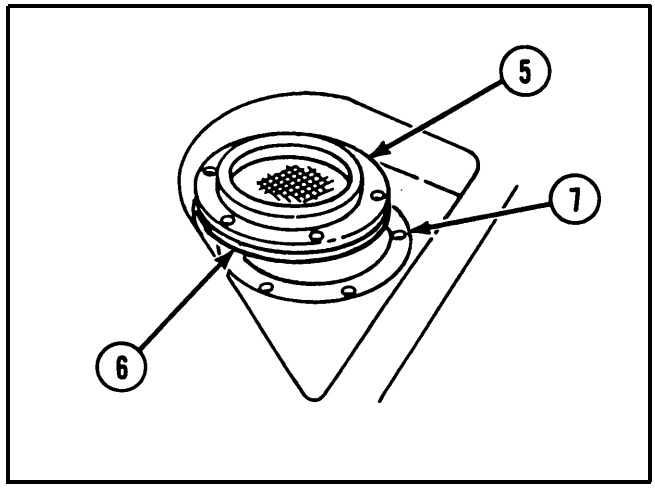
Equipment Conditions
2-384 Powerplant removed

REMOVAL



1 Remove fuel filler neck cap (1) and fuel filler neck ring (2).

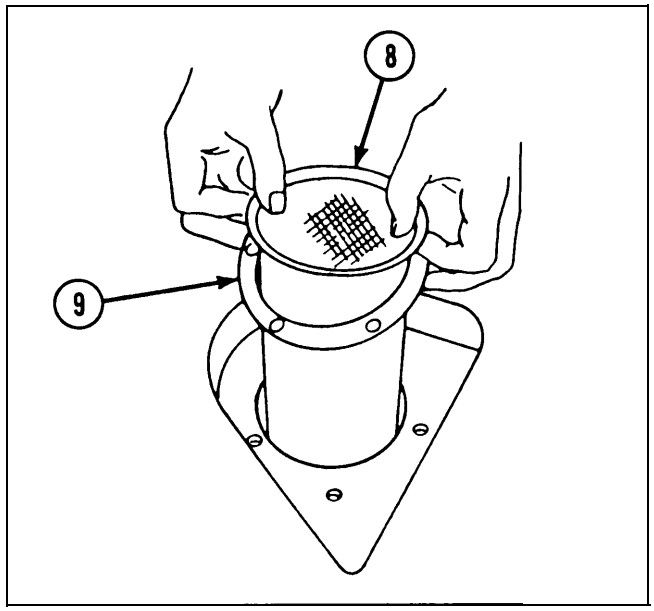
2 Remove six machine screws (3) and six lockwashers (4).



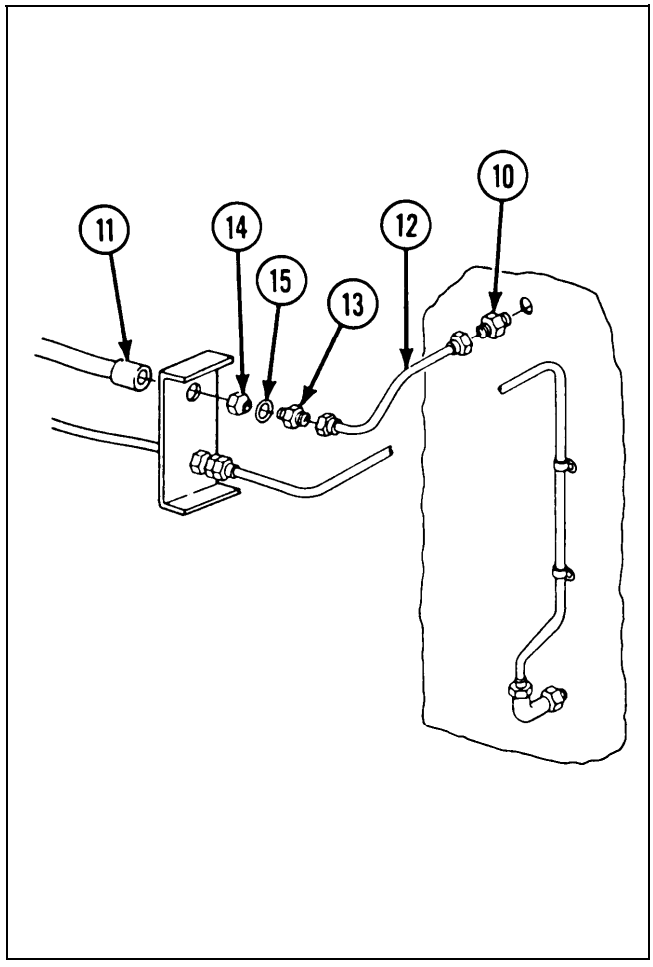
3 Remove fuel tank filler ring (5), gasket (6), and fuel filler neck gasket (7).

2-49. MAINTENANCE OF FUEL LINES AND FITTINGS (LOW PRESSURE) COUPLINGS TO FUEL CELLS (CONT).

REMOVAL (CONT)



4 Remove strainer element (8) and gasket (9).

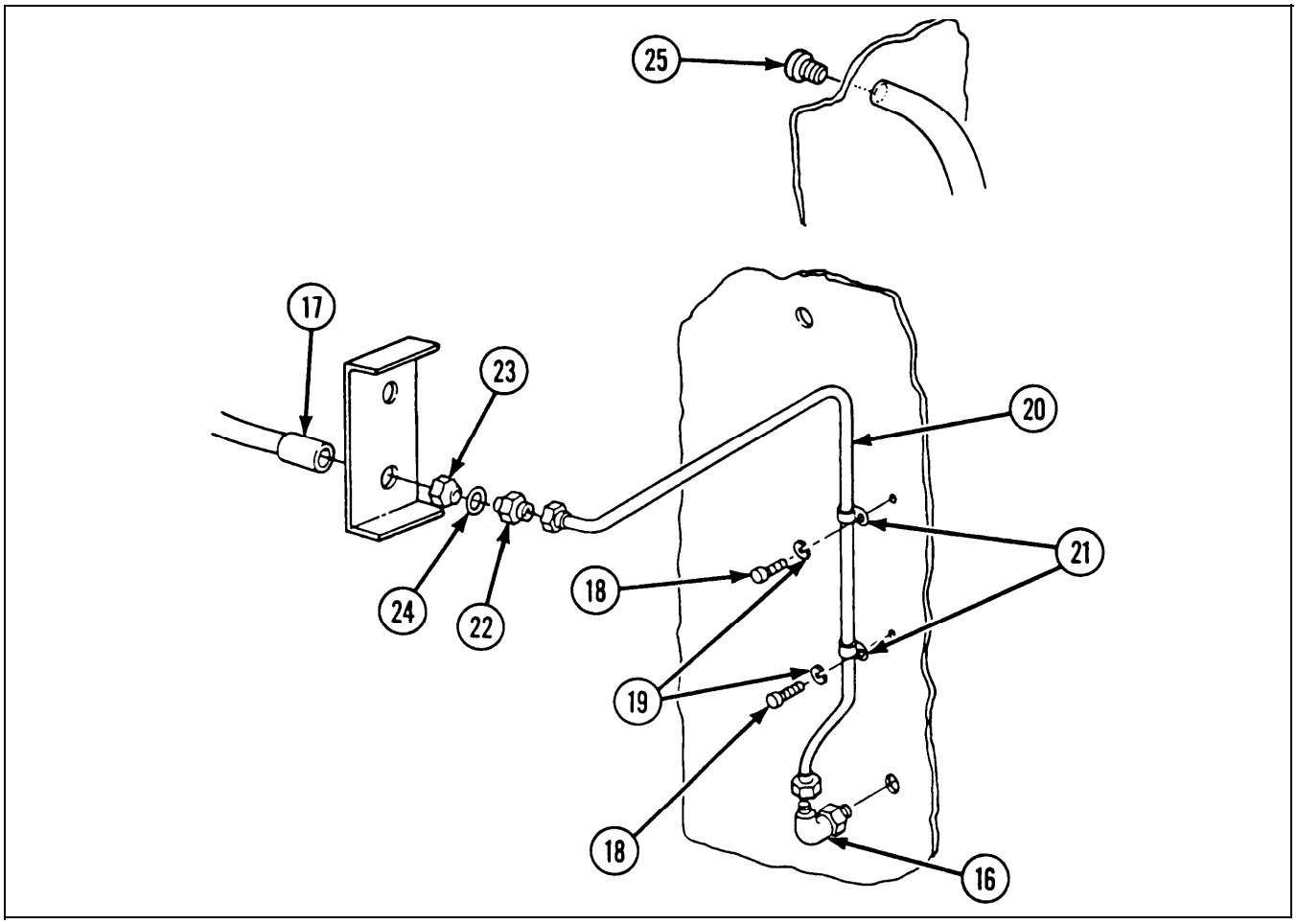


5 Drain fuel from fuel cells to level below pipe straight adapter (10).

6 Disconnect coupling assembly (11).

7 Disconnect fuel return metal tube assembly (12) at both ends and remove.

8 Remove tube nipple (13), tube fitting locknut (14), preformed packing (15), and pipe straight adapter (10).



9 Drain fuel cells to level below pipe to tube elbow (16).

10 Disconnect coupling assembly (17).

11 Remove two hexagon head capscrews (18) and two lockwashers (19).

12 Disconnect and remove fuel supply metal tube assembly (20) and two loop clamps (21).

13 Remove tube nipple (22), tube fitting locknut (23), preformed packing (24), and pipe to tube elbow (16).

14 If damaged, remove pipe plug (25).

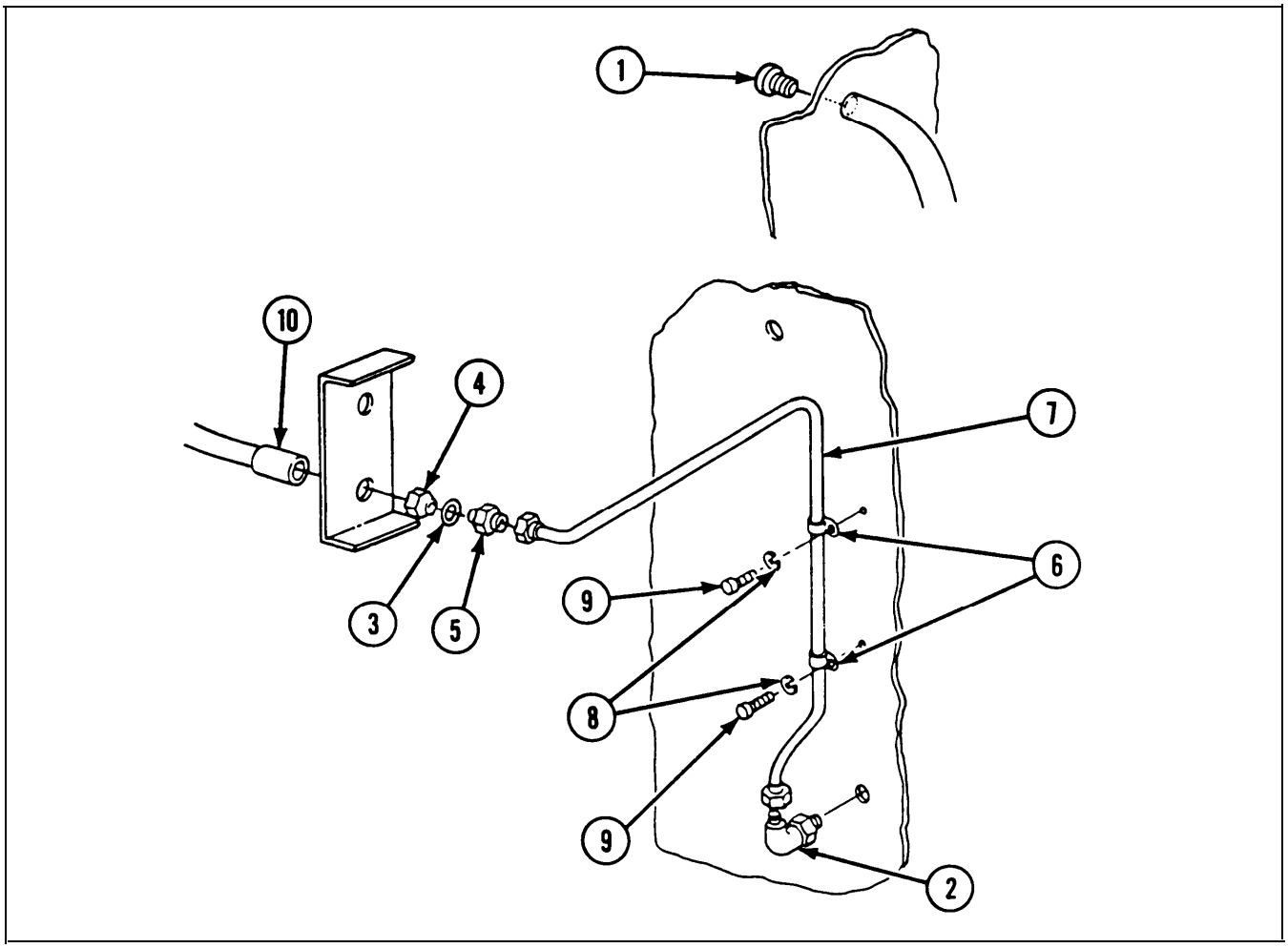
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-49. MAINTENANCE OF FUEL LINES AND FITTINGS (LOW PRESSURE) COUPLINGS TO FUEL CELLS (CONT).

INSTALLATION



1 If removed, install pipe plug (1).

2 Install pipe to tube elbow (2), new preformed packing (3), new tube fitting locknut (4), and tube nipple (5).

3 Install two loop clamps (6) on fuel supply metal tube assembly (7). Install and connect fuel supply metal tube assembly.

4 Install two new lockwashers (8) and two hexagon head capscrews (9).

5 Connect coupling assembly (10).

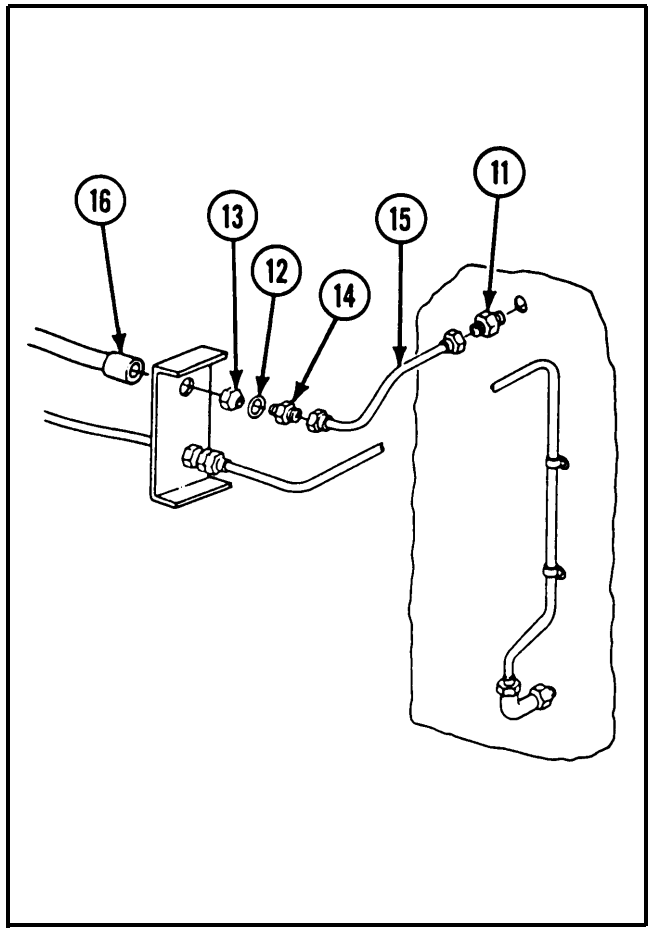
6 Install pipe straight adapter (11), new preformed packing (12), new tube fitting locknut (13), and tube nipple (14).

7 Install fuel return metal tube assembly (15), and connect fuel return metal tube assembly at both ends.

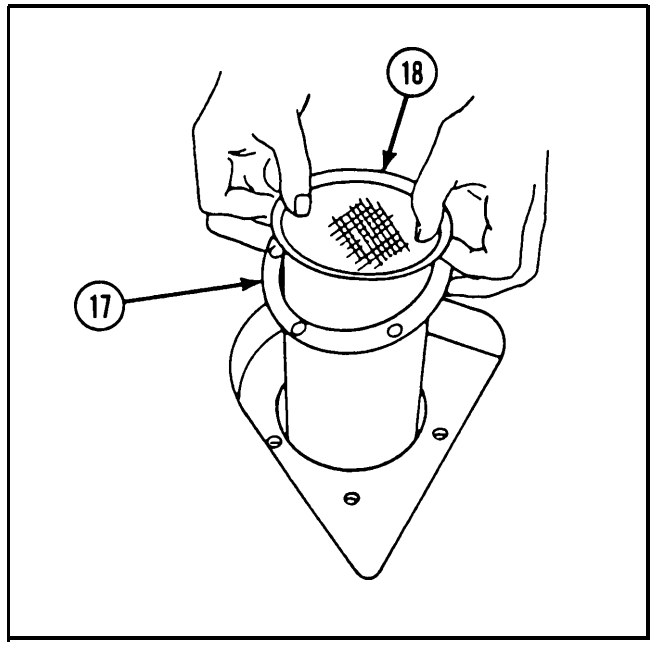
8 Connect coupling assembly (16).

9 Fill fuel cells and purge and prime fuel system. Refer to TM 9-2350-238-10.

10 Check for leaks. If leaks exist, ensure all parts have been installed correctly. If leaks still exist, inspect for defective parts.

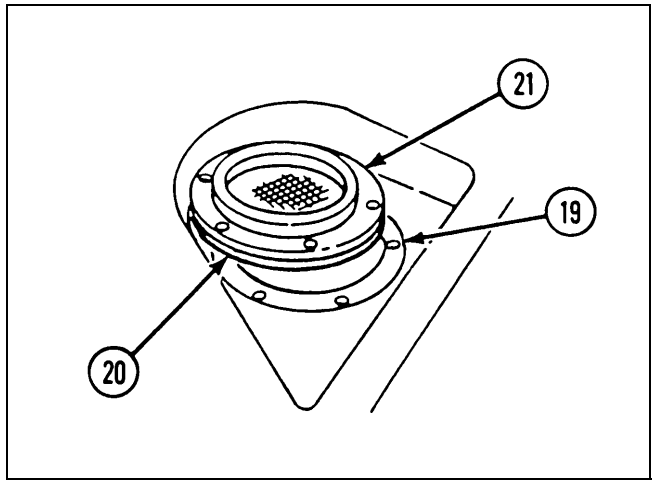


11 Install new gasket (17) and strainer element (18).

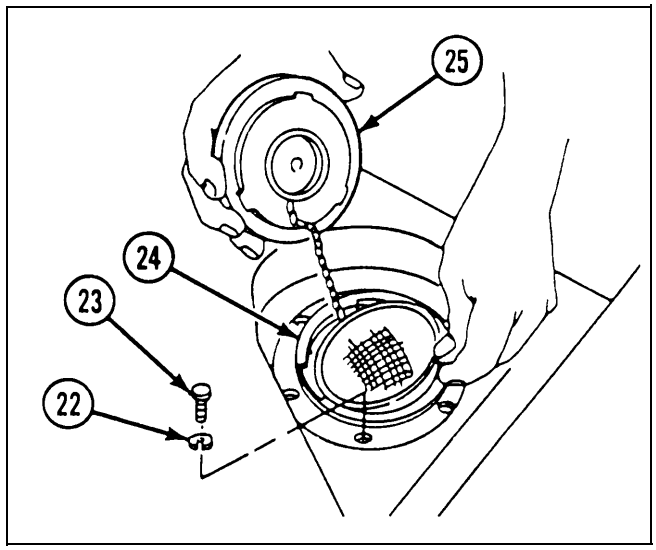


2-49. MAINTENANCE OF FUEL LINES AND FITTINGS (LOW PRESSURE) COUPLINGS TO FUEL CELLS (CONT).

INSTALLATION (CONT)



12 Install new fuel filler neck gasket (19), new gasket (20), and fuel tank filler ring (21).



13 Install six new lockwashers (22) and six machine screws (23).

14 Install fuel filler neck ring (24).

15 Install fuel filler neck cap (25).

2-50. MAINTENANCE OF PRIMARY FUEL FILTER.

This task covers:
a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. Installation

INITIAL SETUP

Materials/Parts
Container
Dry cleaning solvent (item 16, appx C)
Filter element
Gasket
Gasket
Lockwasher (4)

References
TM 9-2350-238-10
TM 9-2815-202-24P

Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed
2-923 Fuel filter access door in driver's compartment removed

General Safety Instructions

WARNING

Do not drain water and fuel from primary fuel filter into engine compartment. A fire hazard may result and cause serious injury to personnel.

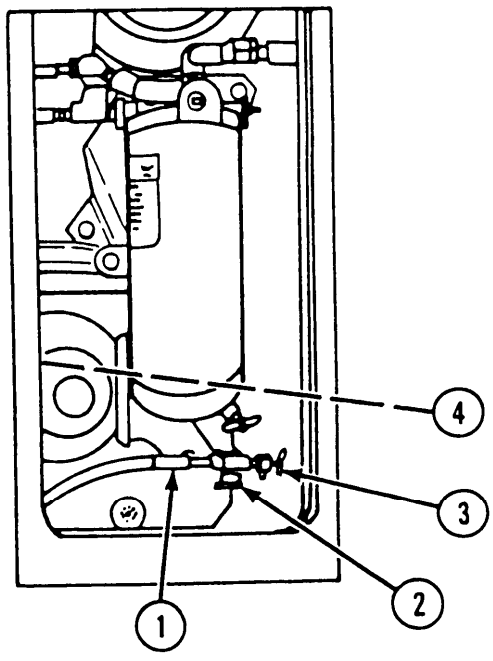
REMOVAL

1 Remove fuel filter drain nonmetallic hose assembly (1) from spring tension clip (2).

Do not drain water and fuel from primary fuel filter into engine compartment. A fire hazard may result and cause serious injury to personnel.

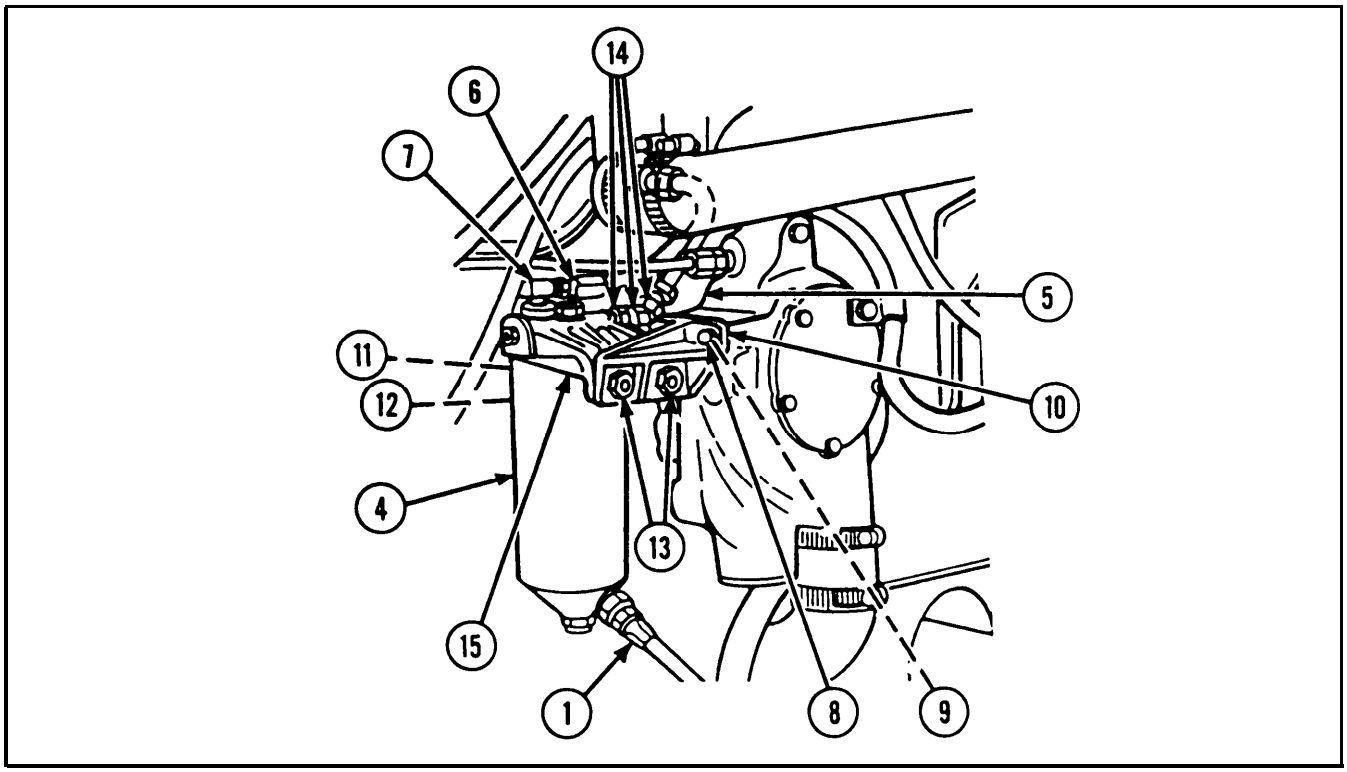
2 Place end of fuel filter drain nonmetallic hose assembly (1) over suitable container.

3 Open drain cock (3) and drain fluid filter (4). Close drain cock.



2-50. MAINTENANCE OF PRIMARY FUEL FILTER (CONT).

REMOVAL (CONT)



4 Disconnect fuel filter to cylinder head nonmetallic hose assembly (5).

5 Disconnect fuel pump to fuel filter nonmetallic hose assembly (6).

6 Disconnect fuel filter to solenoid valve nonmetallic hose assembly (7).

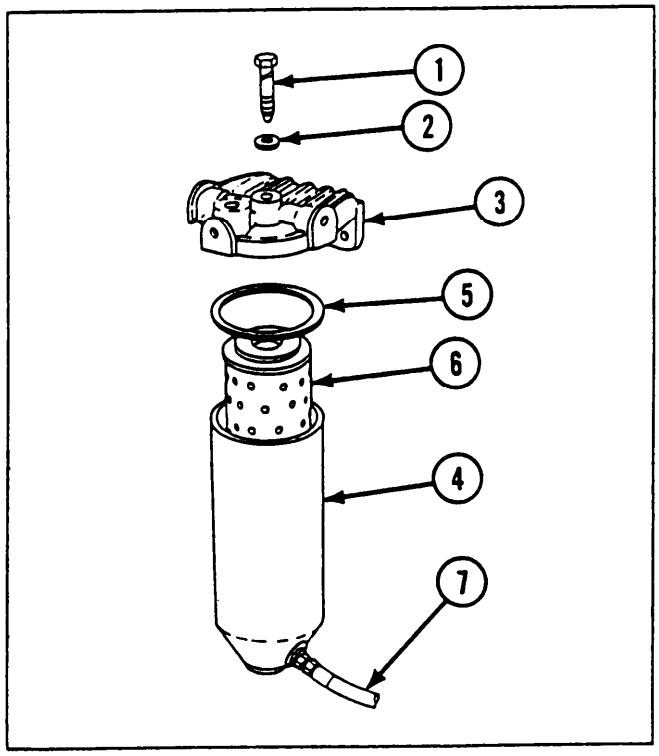
7 Remove two hexagon head capscrews (8) and two lockwashers (9) from filter mounting bracket (10).

8 Remove filter mounting bracket (10) with fluid filter (4), and fuel filter drain nonmetallic hose assembly (1).

9 Remove fluid filter *(4)* from filter mounting bracket (10) by removing two hexagon plain nuts (11), two lockwashers (12), and two hexagon head capscrews (13).

10 Remove three hose elbows (14) from fuel filter head (15).

DISASSEMBLY



1 Remove shoulder bolt (1) and gasket (2) from fuel filter head (3).

2 Remove fluid filter body (4).

3 Remove and discard gasket (5) and filter element (6) from fluid filter body (4).

4 Remove fluid filter drain nonmetallic hose assembly (7) from fluid filter body (4).

INSPECTION/REPAIR

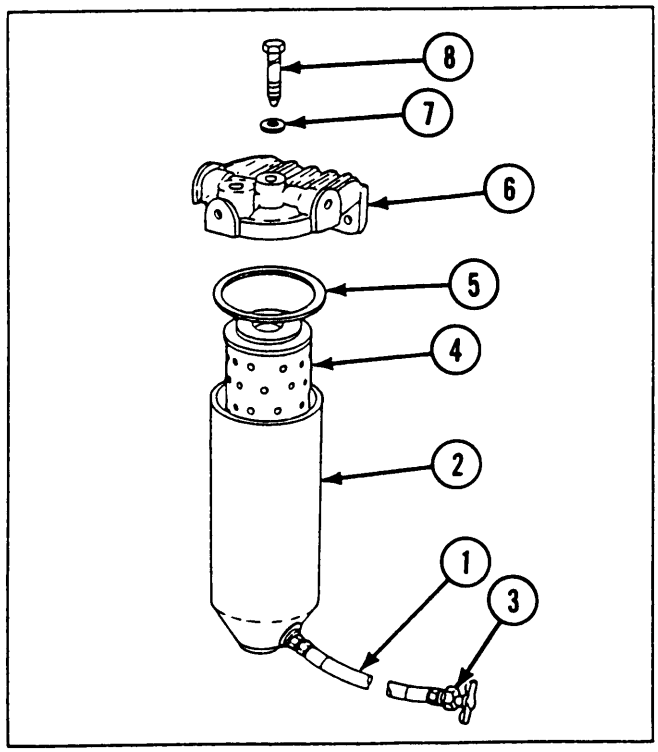
1 Inspect for broken, damaged, or missing parts.

2 Clean fluid filter body and fluid filter head with dry cleaning solvent.

3 Dry parts with low-pressure compressed air.

4 Repair is by replacement of authorized parts (TM 9-2815-202-24P).

REASSEMBLY



1 Install fuel filter drain nonmetallic hose assembly (1) on fluid filter body (2).

2 Close drain cock (3).

3 Fill fluid filter body (2) with fuel to within approximately 1.0 in. (2.5 cm) from top.

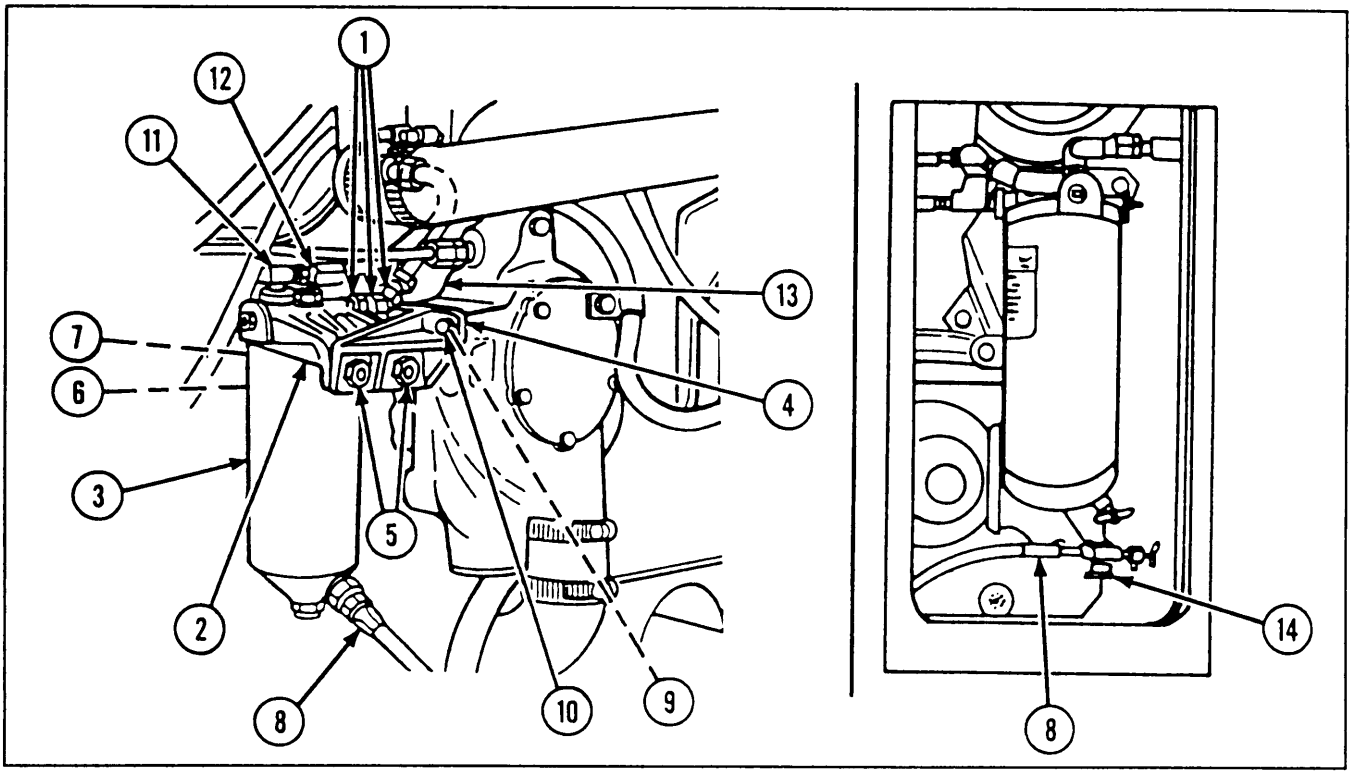
4 Install new filter element (4) in fluid filter body (2).

5 Install new gasket (5) in fluid filter head (6).

6 Install fluid filter body (2) on fluid filter head (6) using new gasket (7) and shoulder bolt (8).

2-50. MAINTENANCE OF PRIMARY FUEL FILTER (CONT).

INSTALLATION



1 Install three hose elbows (1) on fluid filter head (2),

2 Install fluid filter (3) on filter mounting bracket (4) and secure with two hexagon head capscrews (5), two new lockwashers (6), and two hexagon plain nuts (7).

3 Install filter mounting bracket (4) with fluid filter (3) and fuel filter drain nonmetallic hose assembly (8) and secure with two new lockwashers (9) and two hexagon head capscrews (10).

4 Connect fuel filter to solenoid valve nonmetallic hose assembly (11).

5 Connect fuel pump to fuel filter nonmetallic hose assembly (12).

6 Connect fuel filter to cylinder head nonmetallic hose assembly (13).

7 Install fuel filter drain nonmetallic hose assembly (8) to spring tension clip (14).

8 Purge and prime fuel system. Refer to TM 9-2350-238-10.

9 Check for and repair any leaks.

2-51. MAINTENANCE OF SECONDARY FUEL FILTER.

This task covers:
a. *Removal*
b. *Disassembly*
c. Inspection/Repair
d. *Reassembly*
e. *Installation*

INITIAL SETUP

Materials/Parts
Container
Dry cleaning solvent (item 16, appx C)
Filter element
Gasket
Gasket
Lockwasher (2)
LockWasher (2)

References
TM 9-2350-238-10
TM 9-2815-202-24P

Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed
2-923 Fuel filter access door in driver's compartment removed

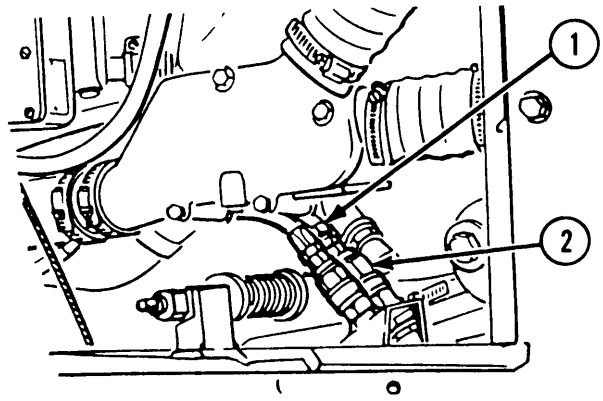
General Safety Instructions

WARNING

Do not drain water and fuel from secondary fuel filter into engine compartment. A fire hazard may result and cause serious injury to personnel.

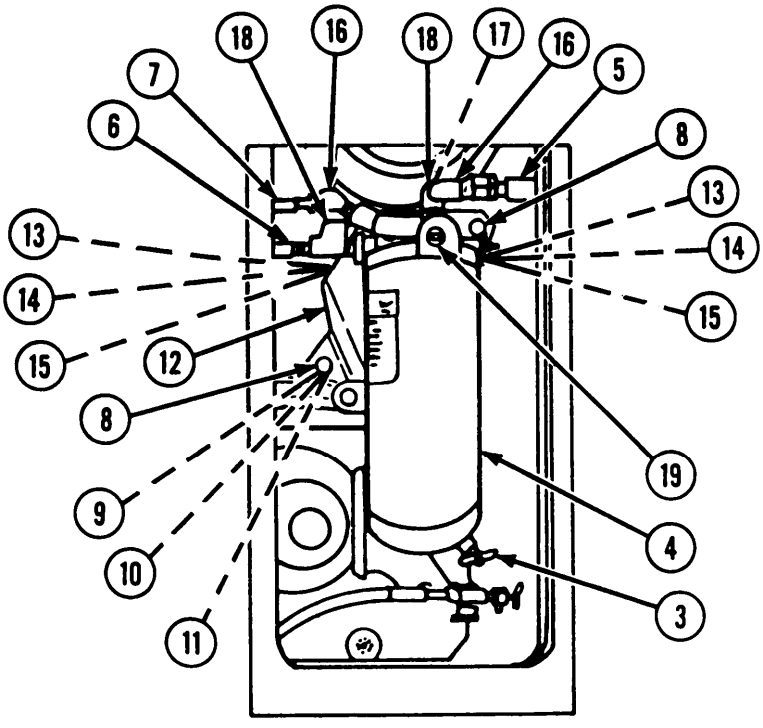
REMOVAL

1 Disconnect fuel supply to filter hose assembly (1) at quick-disconnect coupling (2) to prevent siphoning fuel from fuel cell.



2-51. MAINTENANCE OF SECONDARY FUEL FILTER (CONT).

REMOVAL (CONT)



WARNING

Do not drain water and fuel from secondary fuel filter into engine compartment. A fire hazard may result and cause serious injury to personnel.

2 Place suitable container under drain cock (3).

3 Open drain cock (3) and drain fluid filter (4). Close drain cock.

4 Disconnect fuel supply to filter nonmetallic hose assembly (5).

5 Disconnect fuel filter to fuel pump nonmetallic hose assembly (6).

6 Disconnect air heater pump nonmetallic hose assembly (7).

7 Remove three hexagon head capscrews (8), two lockwashers (9), one flat washer (10), and one ring spacer (11) from mounting bracket (12).

8 Remove mounting bracket (12) with fluid filter (4).

9 Remove fluid filter (4) from mounting bracket (12) by removing two hexagon plain nuts (13), two lockwashers (14), and two hexagon head capscrews (15).

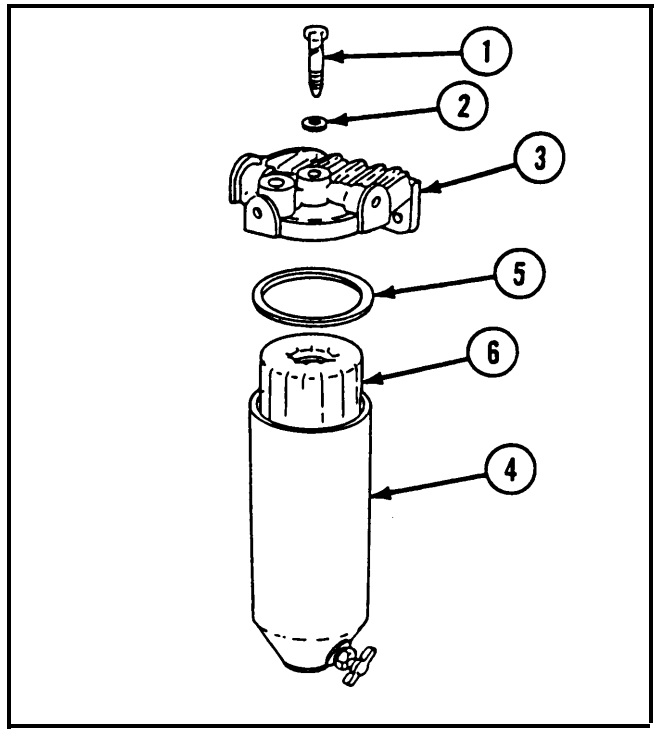
10 Remove two hose elbows (16), plug (17), and two tube tees (18) from filter cover (19).

DISASSEMBLY

1 Remove fuel filter cover bolt (1) and gasket (2) from filter cover (3).

2 Remove filter shell assembly (4).

3 Remove and discard gasket (5) and filter element (6) from filter shell assembly (4).



INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Clean filter shell assembly and filter cover with dry cleaning solvent.

3 Dry parts with low-pressure compressed air.

4 Repair is by replacement of authorized parts (TM 9-281 5-202-24P).

REASSEMBLY

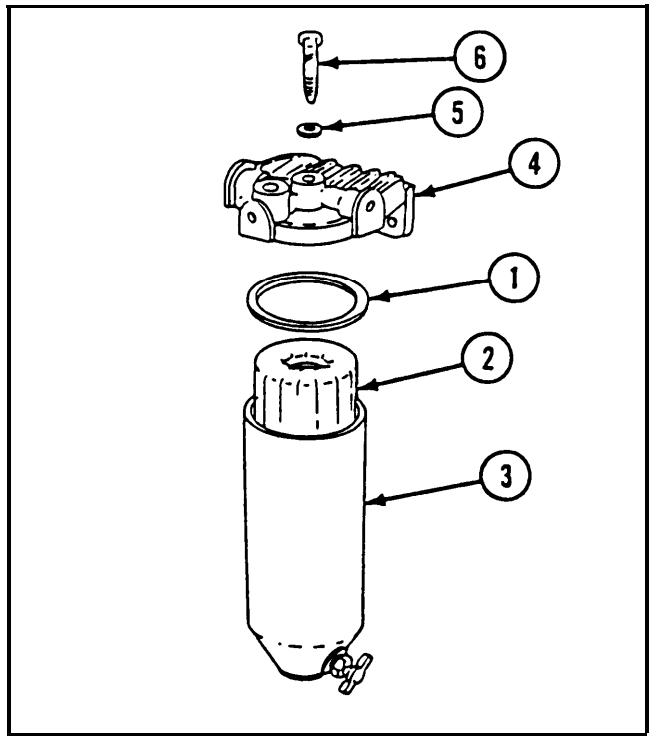
1 Install new gasket (1) and new filter element (2) in filter shell assembly (3).

NOTE

Ensure that drain cock is closed.

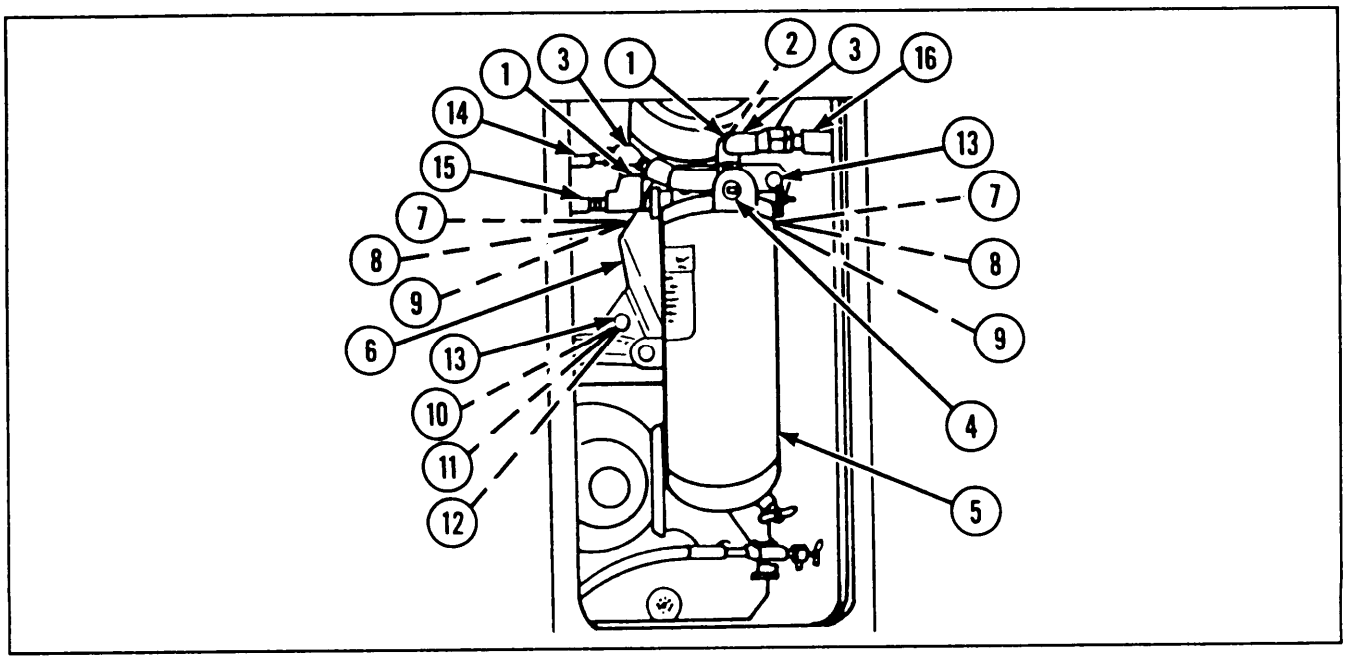
2 Fill filter shell assembly (3) approximately 1.0 in. (2.5 cm) from top with fuel.

3 Install filter shell assembly (3) on filter cover (4) using new gasket (5) and fuel filter cover bolt (6).



2-51. MAINTENANCE OF SECONDARY FUEL FILTER (CONT).

INSTALLATION



1 Install two tube tees (1), plug (2), and two hose elbows (3) on filter cover (4).

2 Install fluid filter (5) on mounting bracket (6) and secure with two hexagon head capscrews (7), two new lockwashers (8), and two hexagon plain nuts (9).

3 Install mounting bracket (6) with fluid filter (5) and secure with one ring spacer (10), one flat washer (11), two new lockwashers (12), and three hexagon head capscrews (13).

4 Connect air heater pump nonmetallic hose assembly (14).

5 Connect fuel filter to fuel pump nonmetallic hose assembly (15).

6 Connect fuel supply to filter nonmetallic hose assembly (16).

7 Connect fuel supply to filter hose assembly (17) at quick-disconnect coupling (18).

8 Purge and prime fuel system. Refer to TM 9-2350-238-10.

9 Check for and repair any leaks.

2-52. MAINTENANCE OF FUEL AND PURGE-AND-PRIME LINES AND FITTINGS (ENGINE MODEL 7083-7398).

This task covers:	a. *Removal*	*c. Installation*
	b. *Inspection/Repair*	d. *Testing*

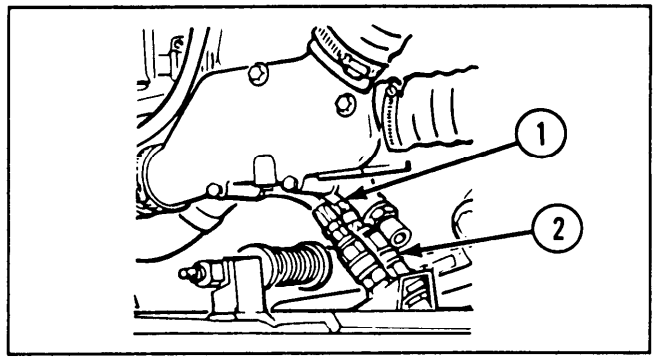
INITIAL SETUP

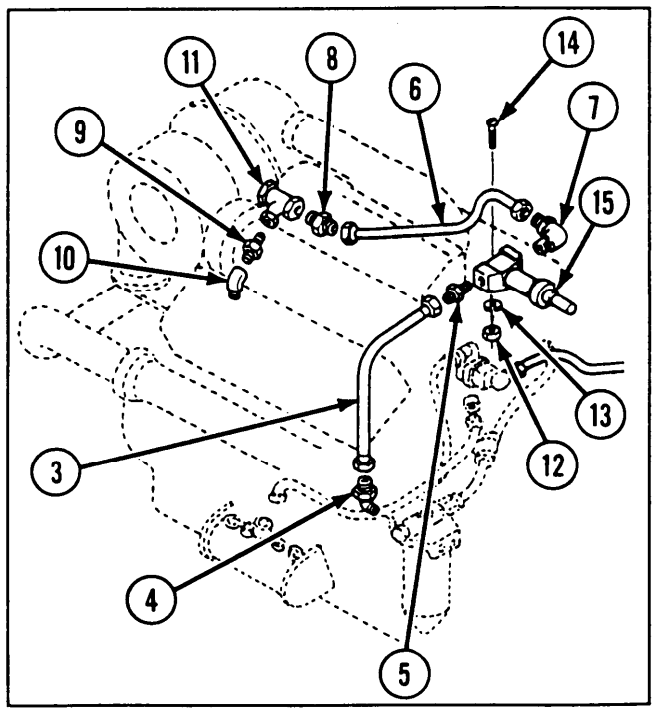
Materials/Parts
LockWasher (2)
Preformed packing (4)

Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed

References
TM 9-2350-238-10
TM 9-2350-238-24P-1

REMOVAL





1 Disconnect fuel supply to filter hose assembly (1) at quick-disconnect coupling (2).

2 Disconnect fuel filter to solenoid valve hose assembly (3) from pipe to tube elbow (4).

3 Disconnect fuel filter to solenoid valve hose assembly (3) from straight adapter (5), and remove fuel filter to solenoid valve hose assembly.

4 Remove pipe to tube elbow (4) and straight adapter (5).

5 Disconnect solenoid valve hose assembly (6) from pipe to tube elbow (7).

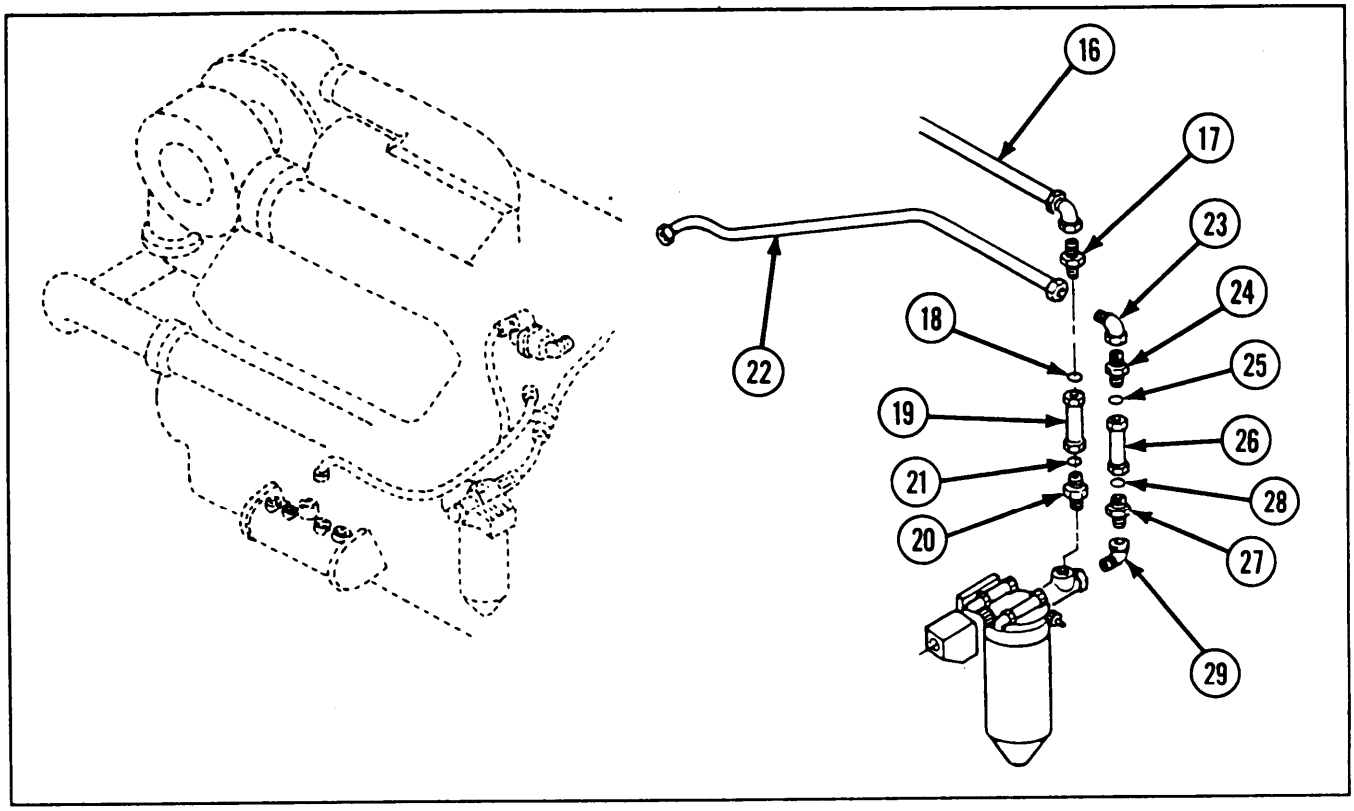
6 Disconnect solenoid valve hose assembly (6) from straight adapter (8), and remove solenoid valve hose assembly.

7 Remove straight adapter (8), pipe nipple (9), pipe elbow (10), pipe tee (11), and pipe to tube elbow (7).

8 Remove two hexagon plain nuts (12), two lockwashers (13), and two machine screws (14) from solenoid valve (15). Remove solenoid valve (15).

2-52. MAINTENANCE OF FUEL AND PURGE-AND-PRIME LINES AND FITTINGS (ENGINE MODEL 7083-7398) (CONT).

REMOVAL (CONT)



9 Disconnect hose assembly (16) from straight adapter (17).

10 Remove straight adapter (17), preformed packing (18), check valve (19), straight adapter (20), and preformed packing (21).

11 Disconnect hose assembly (22) from pipe elbow (23).

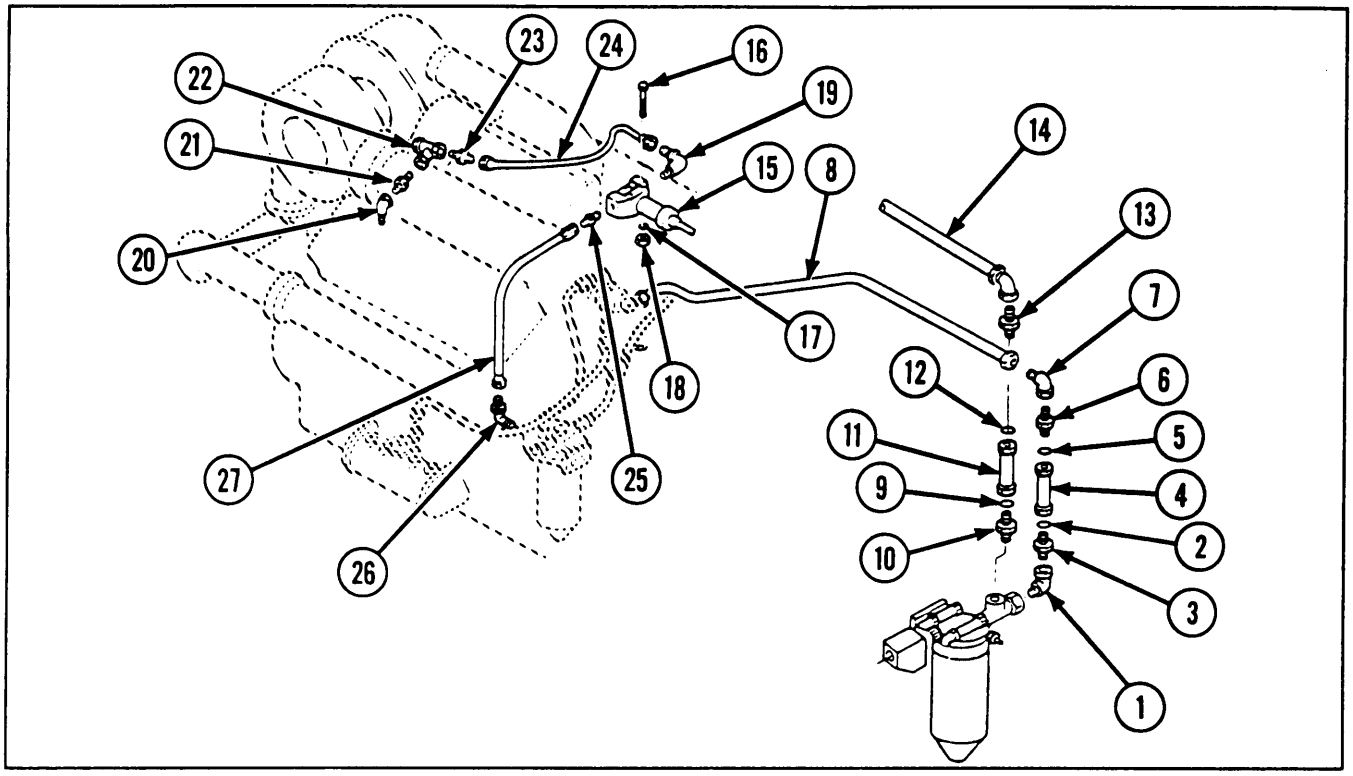
12 Remove pipe elbow (23), straight adapter (24), preformed packing (25), check valve (26), straight adapter (27), preformed packing (28), and pipe elbow (29).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



1 Install pipe elbow (1), new preformed packing (2), straight adapter (3), check valve (4), new preformed packing (5), straight adapter (6), and pipe elbow (7).

2 Connect hose assembly (8) to pipe elbow (7).

3 Install new preformed packing (9), straight adapter (10), check valve (11), new preformed packing (12), and straight adapter (13).

4 Connect hose assembly (14) to straight adapter (13).

5 Install solenoid valve (15). Install two machine screws (16), two new lockwashers (17), and two hexagon plain nuts (18).

6 Install pipe to tube elbow (19) on solenoid valve (15). Install pipe elbow (20), pipe nipple (21), pipe tee (22), and straight adapter (23).

7 Install solenoid valve hose assembly (24), and connect to straight adapter (23).

8 Connect solenoid valve hose assembly (24) to pipe to tube elbow (19).

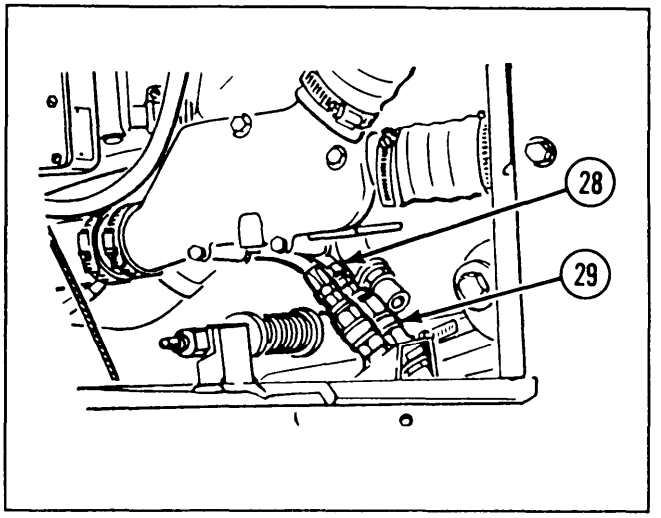
9 Install straight adapter (25) and pipe to tube elbow (26).

10 Install fuel filter to solenoid valve hose assembly (27), and connect to straight adapter (25).

11 Connect fuel filter to solenoid valve hose assembly (27) to pipe to tube elbow (26).

2-52. MAINTENANCE OF FUEL AND PURGE-AND-PRIME LINES AND FITTINGS (ENGINE MODEL 7083-7398) (CONT).

INSTALLATION (CONT)



12 Connect fuel supply to filter hose (28) at quick-disconnect coupling (29).

TESTING

1 Purge and prime fuel system. Refer to TM 9-2350-238-10.

2 Check for and repair any leaks.

3 operate engine until operating temperature is reached. Refer to TM 9-2350-238-10,

2-53. MAINTENANCE OF FUEL AND PURGE-AND-PRIME LINES AND FITTINGS (ENGINE MODEL 7083-7395).

This task covers:	a. *Removal*	*c. Installation*
	b. *Inspection/Repair*	d. *Testing*

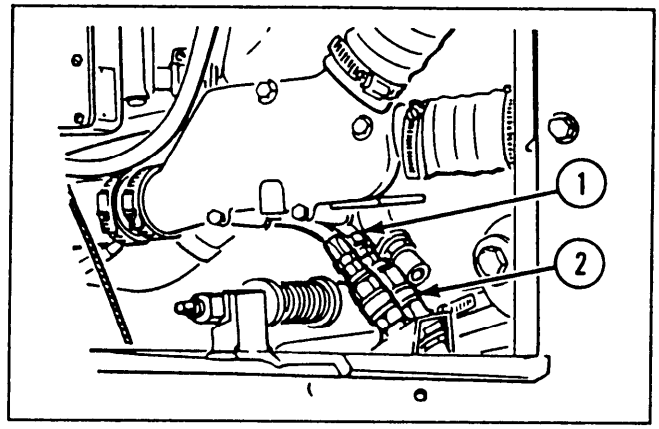
INITIAL SETUP

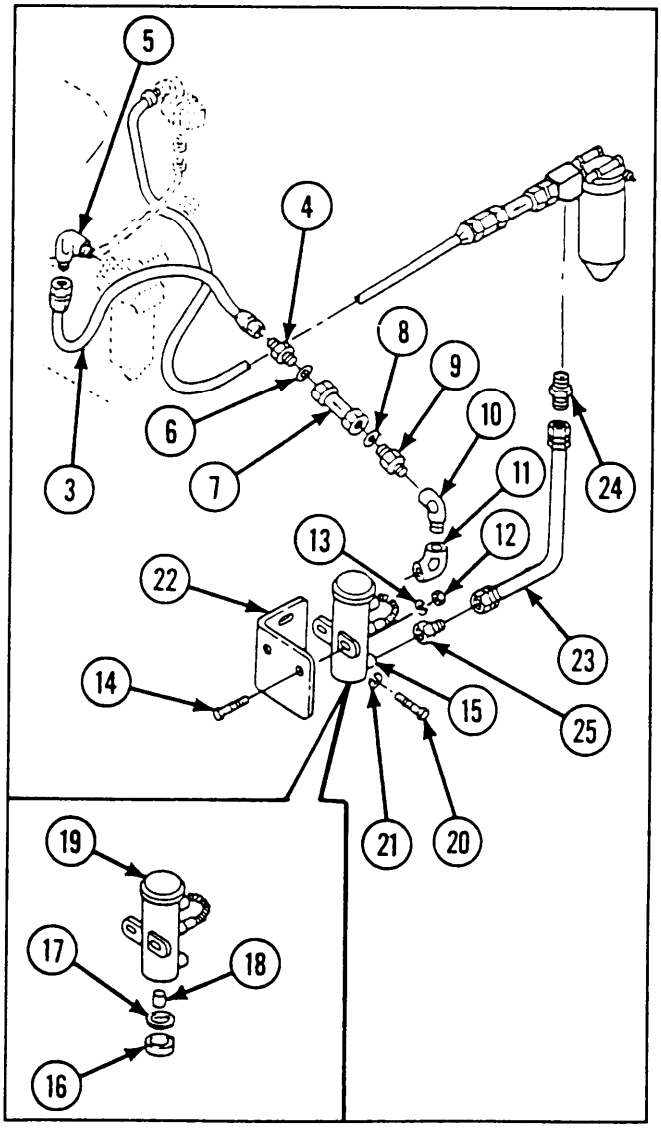
Materials/Parts
Gasket
Lockwasher (4)
Preformed packing (4)
Self-locking nut (2)

References
TM 9-2350-238-10
TM 9-2350-238-24P-1

Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed

REMOVAL





1 Disconnect fuel supply to filter hose assembly (1) from quick-disconnect coupling (2).

2 Disconnect pump to filter hose assembly (3) from tube reducer (4).

3 Disconnect pump to filter hose assembly (3) from pipe to tube elbow (5), and remove pump to filter hose assembly.

4 Remove tube reducer (4), preformed packing (6), check valve (7), preformed packing (8), straight adapter (9), pipe elbow (10), and pipe elbow (11).

5 Remove two self-locking nuts (12), two lockwashers (13), and two hexagon head capscrews (14). Remove electrical fuel pump (15).

NOTE

If fuel pump housing or fuel pump cover is damaged, replace electrical fuel pump.

6 Remove fuel pump cover (16), gasket (17), and fuel filter screen (18) from fuel pump housing (19).

7 Remove two hexagon head capscrews (20) and two lockwashers (21). Remove fuel pump bracket (22).

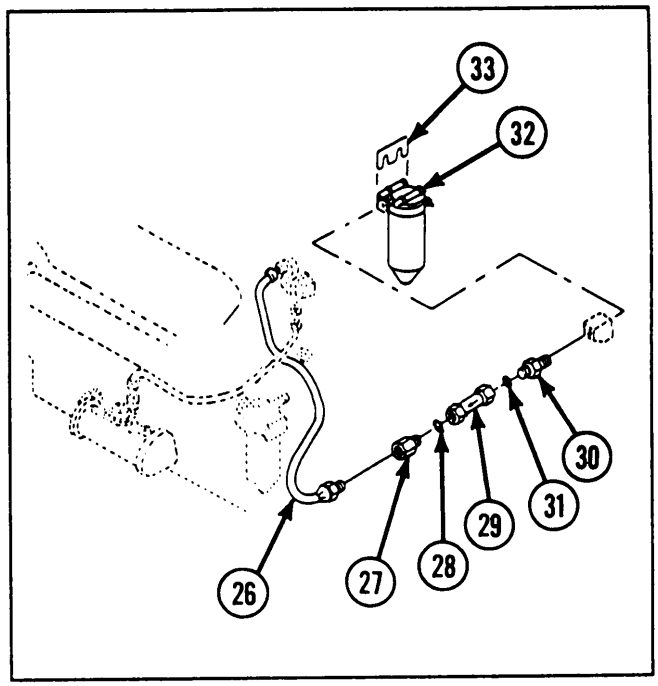
8 Disconnect pump to air filter hose assembly (23) from straight adapter (24).

9 Disconnect pump to air filter hose assembly (23) from straight adapter (25). Remove pump to air filter hose assembly.

10 Remove straight adapters (24 and 25).

2-53. MAINTENANCE OF FUEL AND PURGE-AND-PRIME LINES AND FITTINGS (ENGINE MODEL 7083-7395) (CONT).

REMOVAL (CONT)



11 Remove hose assembly (26) from straight adapter (27).

12 Remove straight adapter (27), preformed packing (28), check valve (29), straight adapter (30), and preformed packing (31).

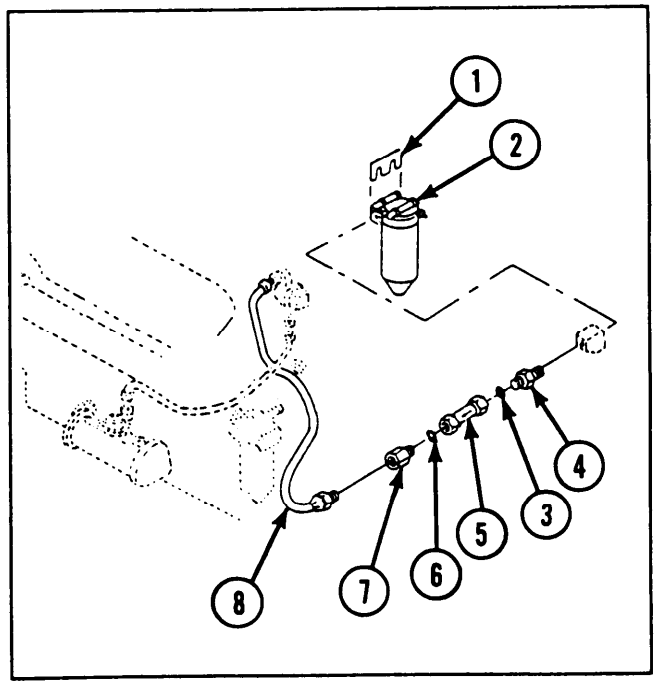
13 Loosen retaining bolts on fuel filter (32) and remove fuel strainer spacer (33).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



1 Install fuel strainer spacer (1) and tighten retaining bolts on fuel filter (2).

2 Install new preformed packing (3), straight adapter (4), check valve (5), new preformed packing (6), and straight adapter (7).

3 Install hose assembly (8) on straight adapter (7).

4 Install straight adapters (9 and 10).

5 Install pump to air filter hose assembly (11). Connect pump to air filter hose assembly to straight adapter (9).

6 Connect pump to air filter hose assembly (11) to straight adapter (10).

7 Install fuel pump bracket (12). Install two new lockwashers (13) and two hexagon head capscrews (14).

8 Install screen (15), new gasket (16), and fuel pump cover (17) in fuel pump housing (18).

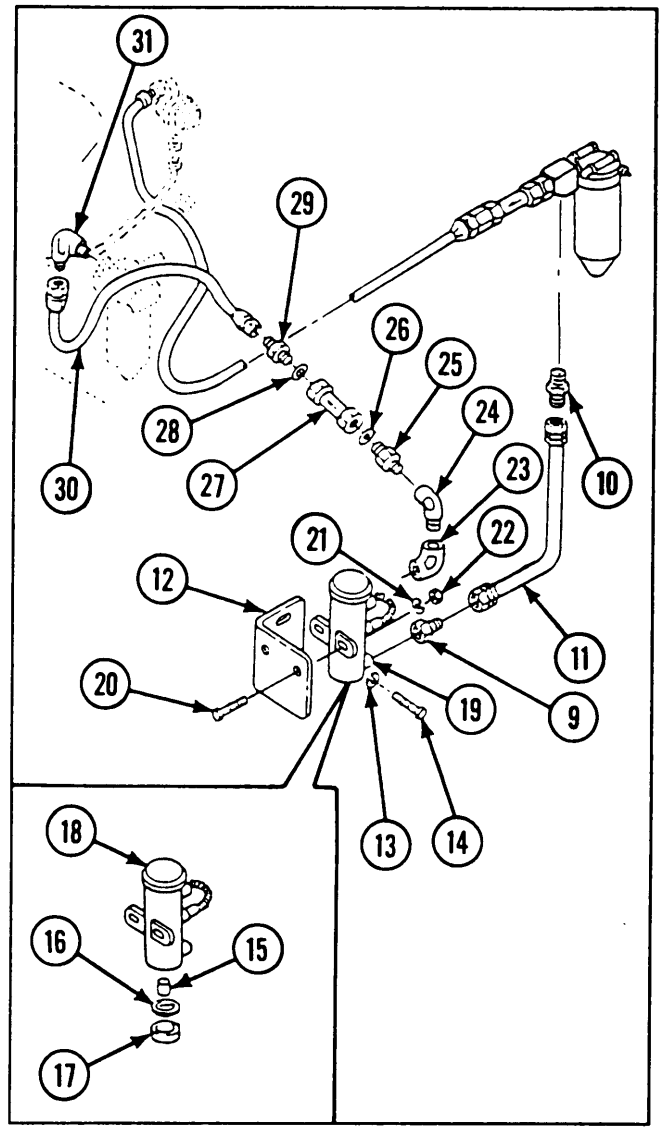
9 Install electrical fuel pump (19). Install two hexagon head capscrews (20), two new lockwashers (21), and two new self-locking nuts (22).

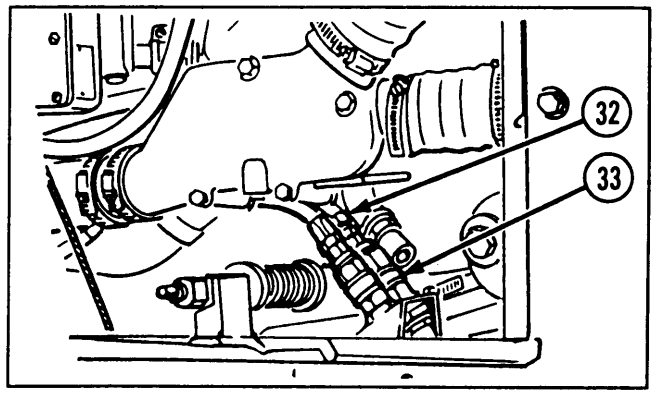
10 Install pipe elbow (23), pipe elbow (24), straight adapter (25), new preformed packing (26), check valve (27), new preformed packing (28), and tube reducer (29).

11 Install pump to filter hose assembly (30) and connect to pipe to tube elbow (31).

12 Connect pump to filter hose assembly (30) to tube reducer (29).

13 Connect fuel supply to filter hose (32) to quick-disconnect coupling (33).





2-53. MAINTENANCE OF FUEL AND PURGE-AND-PRIME LINES AND FITTINGS (ENGINE MODEL 7083-7395) (CONT).

TESTING

1 Purge and prime fuel system. Refer to TM 9-2350-238-10.

2 Check for and repair any leaks.

3 Operate engine until operating temperature is reached. Refer to TM 9-2350-238-10.

2-54. MAINTENANCE OF AIR BOX HEATER INSTALLATION AND AIR BOX HEATER ASSEMBLY.

This task covers:
a. *Removal*
b. Disassembly
c. Inspection/Repair
d. *Reassembly*
e. Installation

INITIAL SETUP

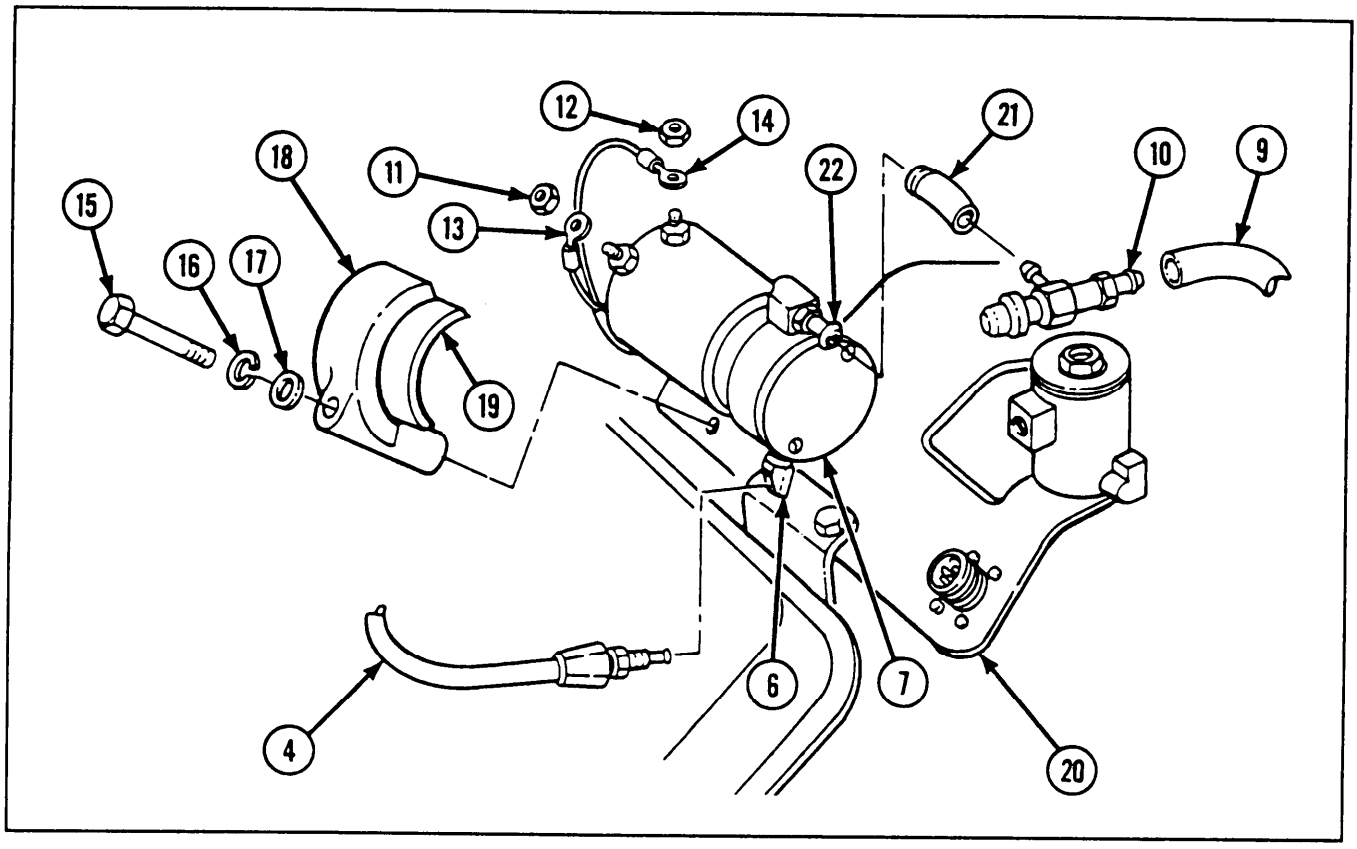
Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
● Torque wrench (0 to 170 ft-lb)

Materials/Parts
Dry cleaning solvent (item 16, appx C)
Gasket
Gasket
Lockwasher
Lockwasher
Lockwasher
Lockwasher (2)
Lockwasher (4)
Lockwasher (4)
Lockwasher (2)
Lockwasher (2)

References
TM 9-2815-202-24P

Equipment Conditions
2-536 Water by-pass and crossover tubes removed

REMOVAL



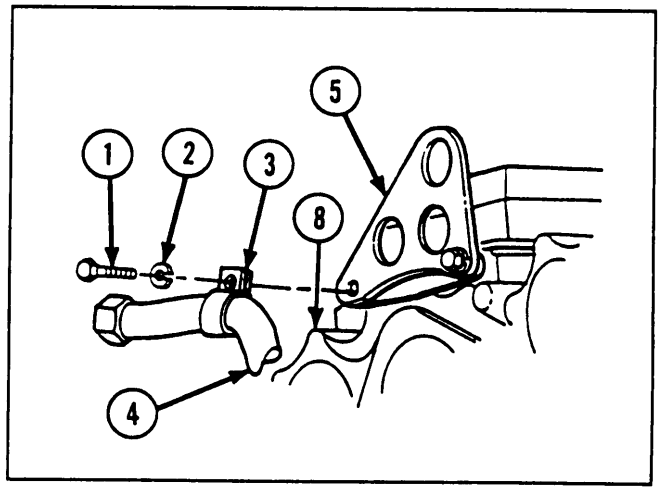
1 Remove bolt (1), lockwasher (2), and hose clamp (3) with attached hose (4) from left rear engine lifting bracket (5).

2 Disconnect hose (4) from elbow (6) on air pump (7) and pipe to tube tee on front of left cylinder head (8) of engine block.

3 Remove hose clamp (3) from hose (4).

4 Disconnect hose (9) from check valve (lo).

5 Remove nuts (11 and 12) and disconnect wiring harness leads (13 and 14) from terminals on air pump (7).

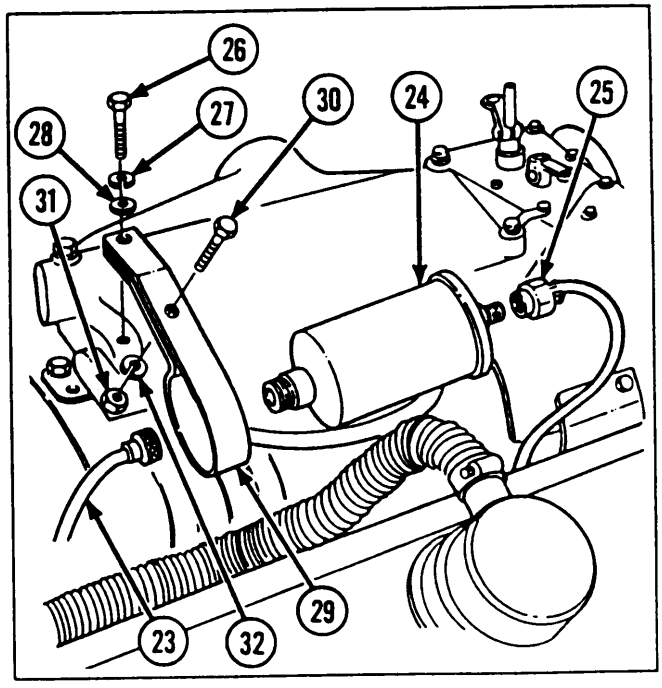


6 Remove bolt (15), lockwasher (16), flat washer (17), air pump clamp (18), cushion (19), and air pump (7) from angle bracket (20).

7 Remove hose (21) and check valve (10) from adapter (22) on air pump (7). Remove hose from check valve.

2-54. MAINTENANCE OF AIR BOX HEATER INSTALLATION AND AIR BOX HEATER ASSEMBLY (CONT).

REMOVAL (CONT)

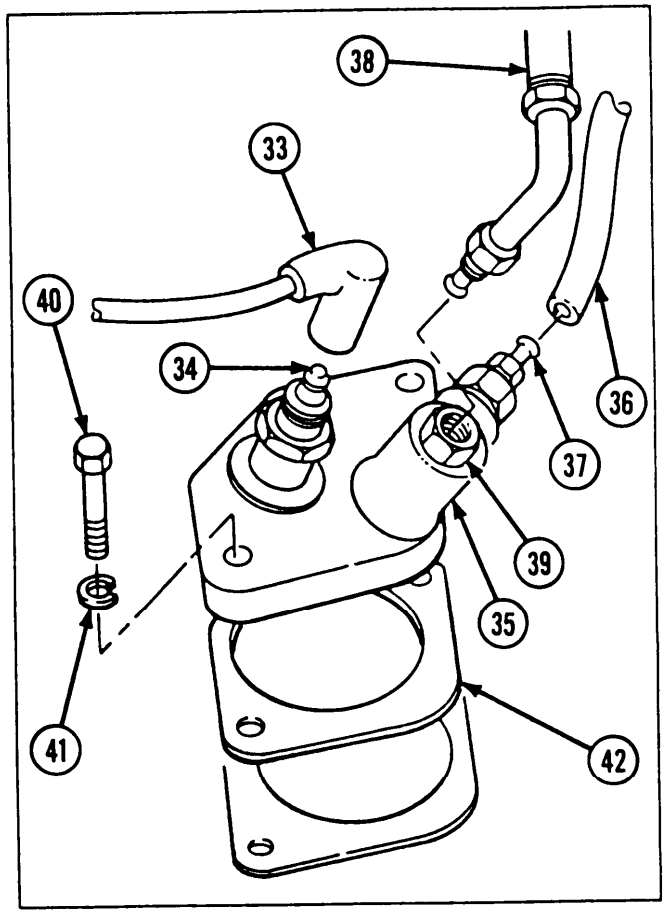


8 Disconnect high tension lead (23) from ignition coil (24). Remove lead.

9 Disconnect wiring harness connector (25) from ignition coil (24).

10 Remove bolt (26), lockwasher (27), and flat washer (28) securing bracket (29) and ignition coil (24) to air inlet housing. Remove coil with attached bracket.

11 Remove bolt (30), nut (31), and lockwasher (32) from bracket (29). Remove ignition coil (24) from bracket.

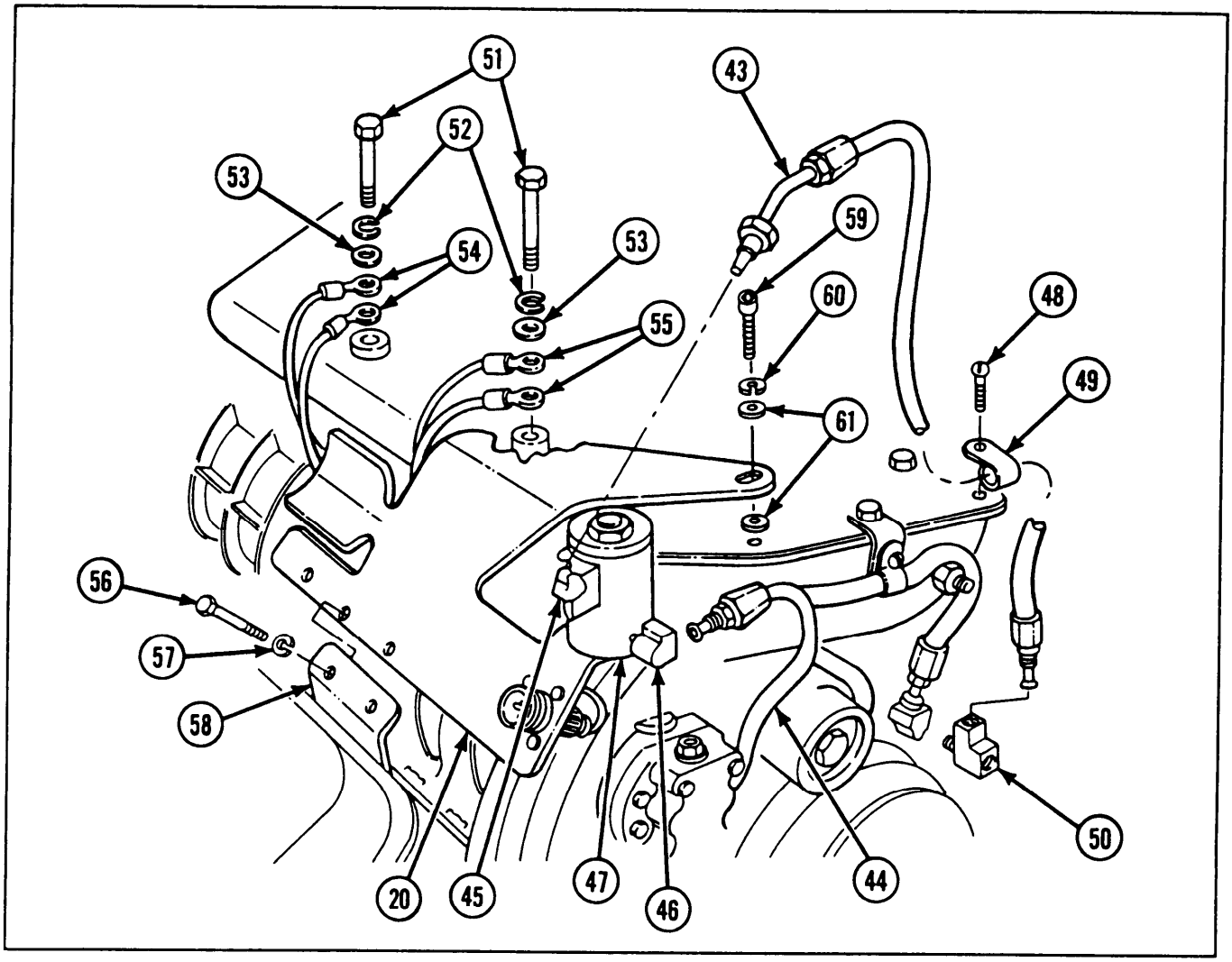


12 Remove high tension lead (33) from fuel spark igniter (34) on air heater assembly (35).

13 Disconnect nonmetallic hose (36) from adapter (37) on air heater assembly (35). Remove nonmetallic hose.

14 Disconnect nonmetallic hose assembly (38) from pipe straight adapter (39) on air heater assembly (35).

15 Remove two machine bolts (40), two lockwashers (41), air heater assembly (35), and gasket (42) from engine block.



16 Disconnect fuel hoses (43 and 44) from elbows (45 and 46) on solenoid valve (47). Remove screw assembly (48) and loop clamp (49) from governor cover. Reinstall screw assembly.

17 Disconnect fuel hose (43) from tee (50) on left cylinder head. If necessary, remove clamp loop (49) from fuel hose. Remove fuel hose.

18 Remove tee (50) from left cylinder head.

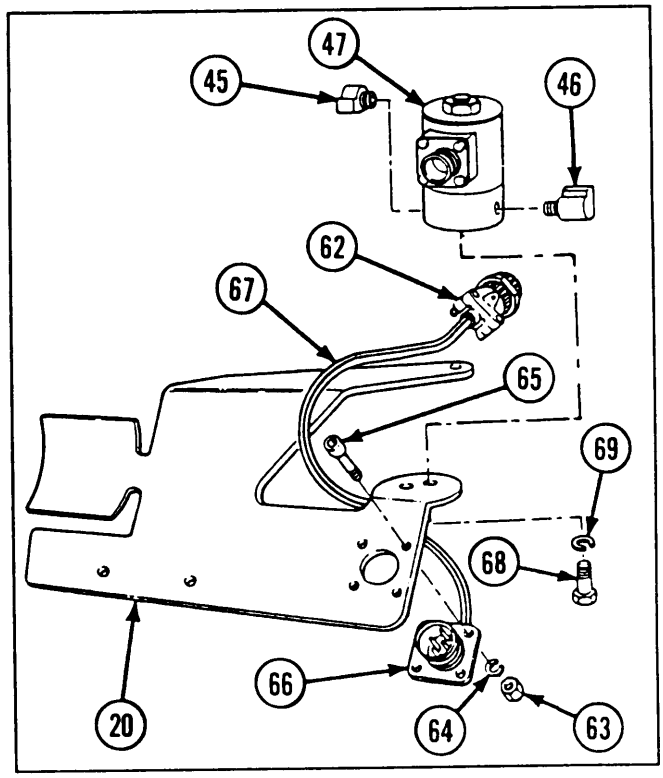
19 Remove two hexagon head capscrews (51), two lockwashers (52), and two flat washers (53) securing wiring harness leads (54 and 55) to air inlet housing. Remove leads.

20 Remove two hexagon head capscrews (56) and two lockwashers (57) securing angle bracket (20) to fuel pump support (58).

21 Remove two machine screws (59), two lockwashers (60), and four flat washers (61) and angle bracket (20) from governor housing.

2-54. MAINTENANCE OF AIR BOX HEATER INSTALLATION AND AIR BOX HEATER ASSEMBLY (CONT).

REMOVAL (CONT)

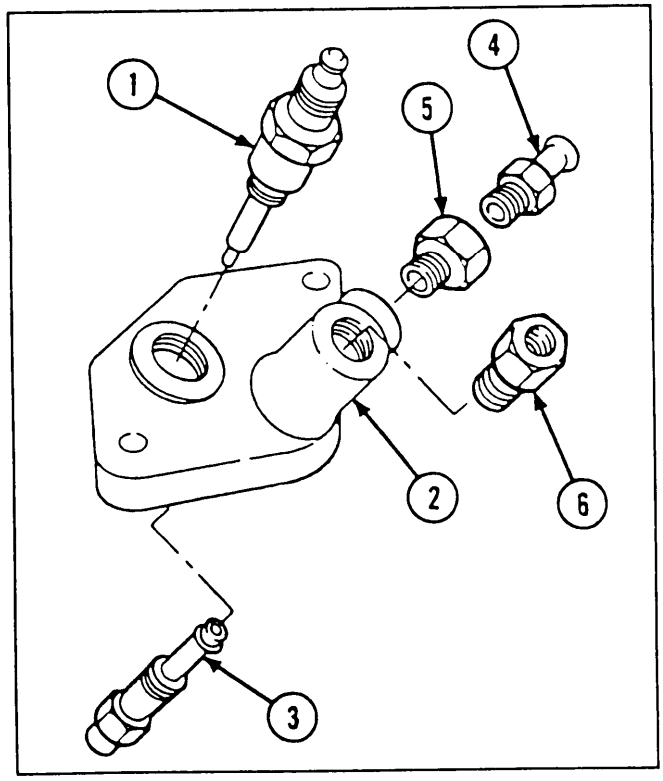


22 Disconnect wiring harness plug connector (62) from solenoid valve (47).

23 Remove four hexagon plain nuts (63), four lockwashers (64), four machine screws (65), and wiring harness receptacle connector (66) from angle bracket (20). Remove wiring harness (67).

24 Remove two machine screws (68) and two lockwashers (69) securing solenoid valve *(47)* to angle bracket (20). Remove solenoid valve.

25 Remove elbows (45 and *46)* from solenoid valve (47).



DISASSEMBLY

1 Unscrew fuel spark igniter (1) from air heater body (2).

2 Remove fuel injection nozzle (3) from air heater body (2).

3 Remove adapter (4) from pipe straight adapter (5).

4 Remove two pipe straight adapters (5 and 6) from air heater body (2).

1 Inspect for broken, missing, or damaged parts.

WARNING

- Dry cleaning solvent is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated areas. Avoid contact with skin, eyes, and clothes. Don't breathe vapors. Do not use near open flames or excessive heat. If you become dizzy while using dry cleaning solvent, get medical aid. If contact is made with eyes, wash your eyes with water and get medical aid immediately.

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

2 Clean outside surface of pump with dry cleaning solvent. Dry with compressed air.

3 Clean air heater body and fuel injector nozzle with dry cleaning solvent. Dry with compressed air.

4 Clean outside surface of ignition coil with dry cleaning solvent. Dry with compressed air.

5 Clean solenoid valve and angle bracket with dry cleaning solvent. Dry with compressed air.

6 For further repair, test, or adjustment, notify direct support maintenance.

7 Repair is by replacement of authorized parts (TM 9-2815-202-24P) which do not meet the inspection criteria.

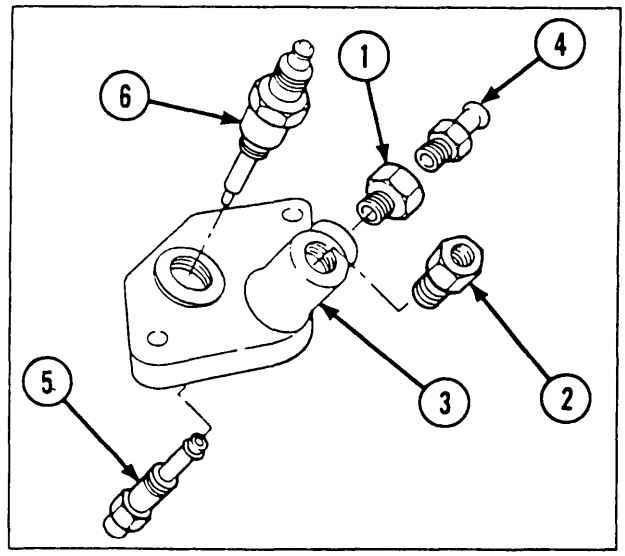
REASSEMBLY

1 Install two pipe straight adapters (1 and 2) into air heater body (3).

2 Install adapter (4) into pipe straight adapter (1).

3 Install fuel injection nozzle (5) into air heater body (3).

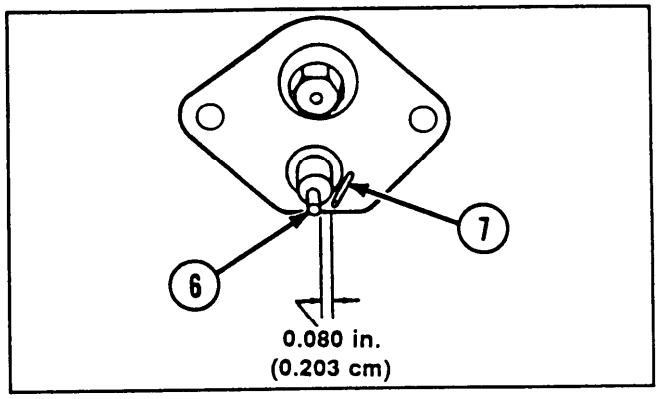
4 Screw fuel spark igniter (6) into air heater body (3).



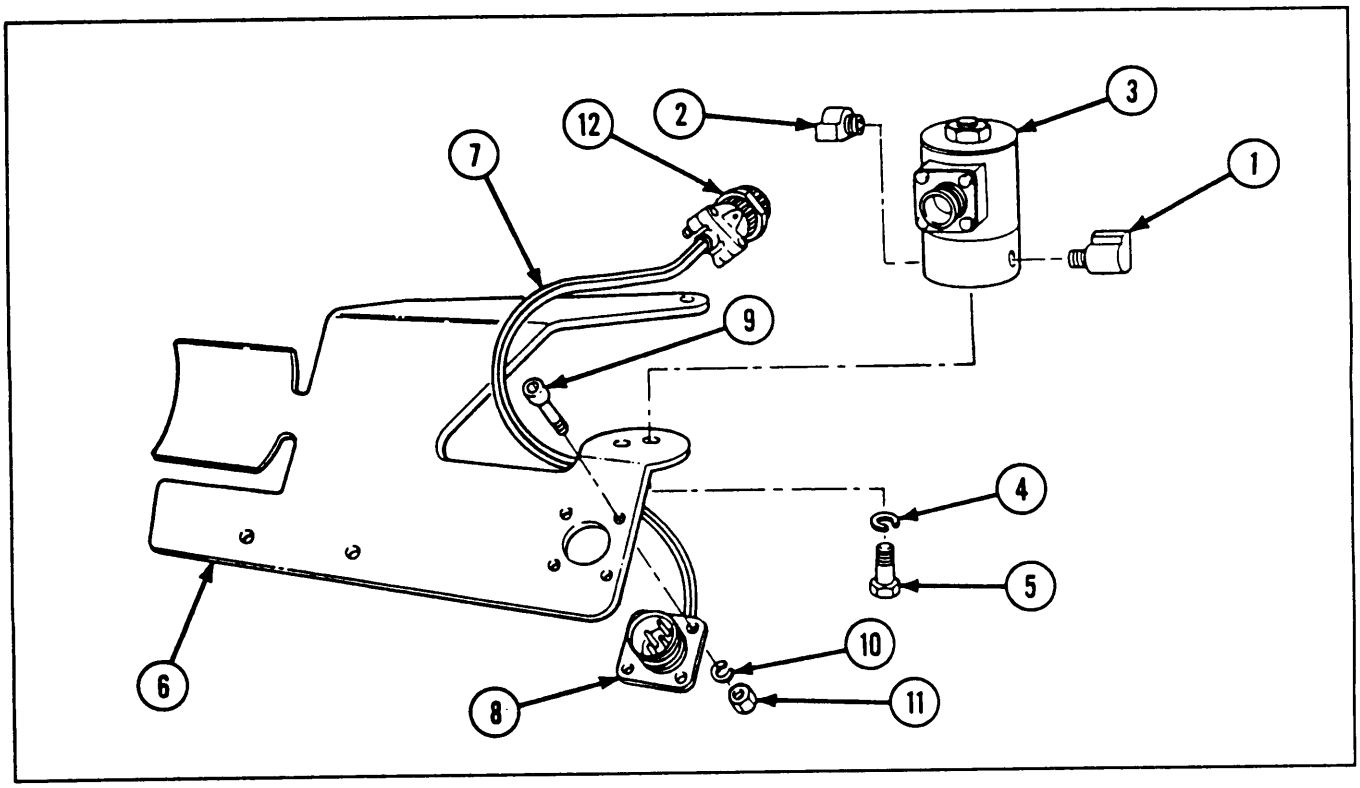
2-54. MAINTENANCE OF AIR BOX HEATER INSTALLATION AND AIR BOX HEATER ASSEMBLY (CONT).

REASSEMBLY (CONT)

5 Using gap gages, adjust wire (7) to fuel spark igniter (6) to obtain air gap of 0.080 in. (0.203 cm).



INSTALLATION



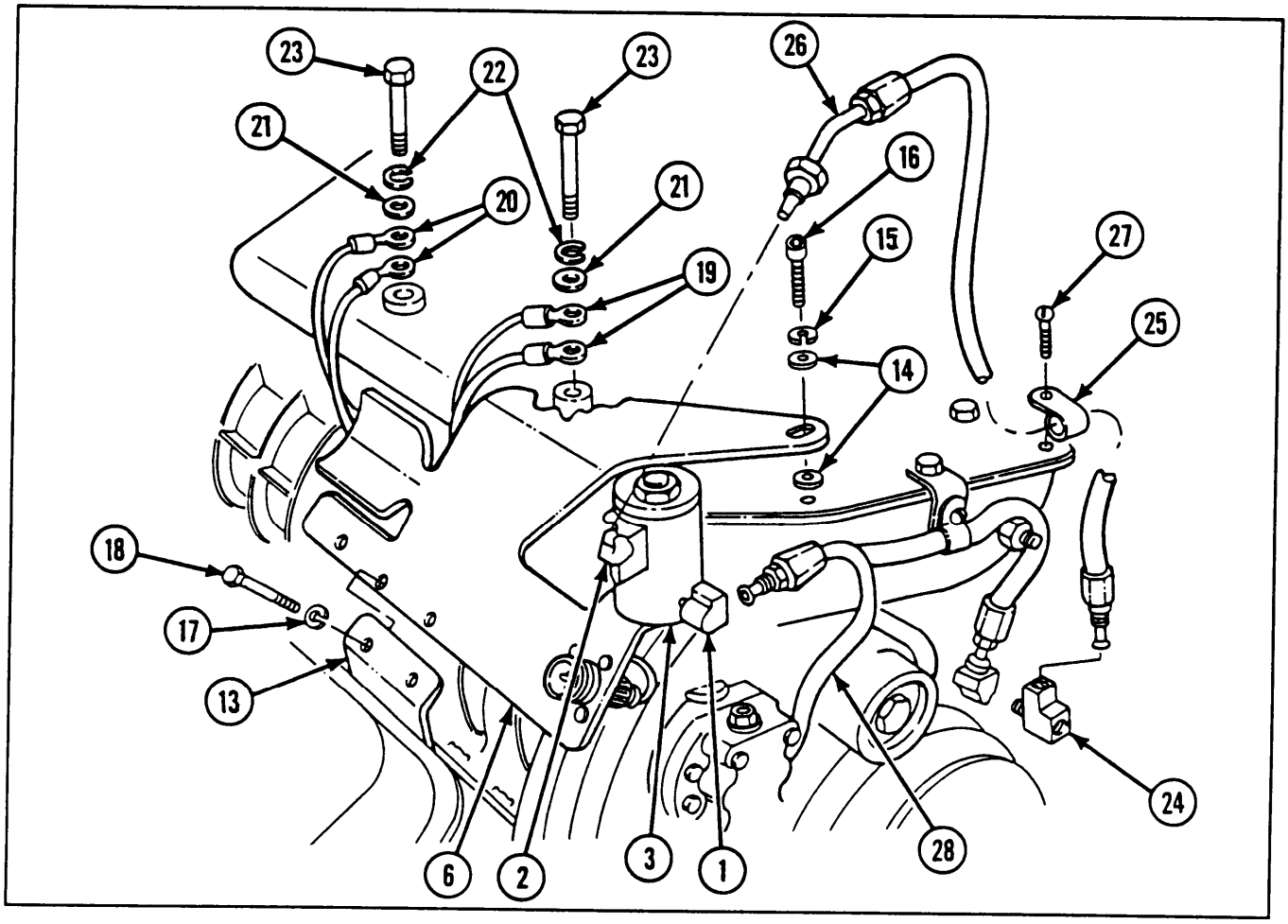
1 Install elbows (1 and 2) on solenoid valve (3). Tighten securely.

2 Install solenoid valve (3), two new Iockwashers (4), and two machine screws (5) to angle bracket (6). Tighten securely.

3 Install wiring harness (7).

4 Install wiring harness receptacle connector (8), four machine screws (9), four new Iockwashers (10), and four hexagon plain nuts (11) on angle bracket (6).

5 Connect wiring harness plug connector (12) to solenoid valve (3).



6 Position angle bracket (6) on governor housing and inboard of fuel pump support (13). Route wiring harness to prevent cuts, chafing, burns, and interference with components. Loosely secure angle bracket to governor housing with four flat washers (14), two new lockwashers (15), and two machine screws (16).

7 Secure angle bracket (6) to fuel pump support (13) with two new lockwashers (17) and two hexagon head capscrews (18). Torque hexagon head capscrews to 30 to 35 ft-lb (41 to 47 N-m). Tighten two machine screws (16).

8 Secure wiring harness leads (19 and 20) to air inlet housing with two flat washers (21), two new lockwashers (22), and two hexagon head capscrews (23). Torque hexagon head capscrews to 16 to 20 ft-lb (22 to 27 N-m).

9 Install tee (24) on left cylinder head.

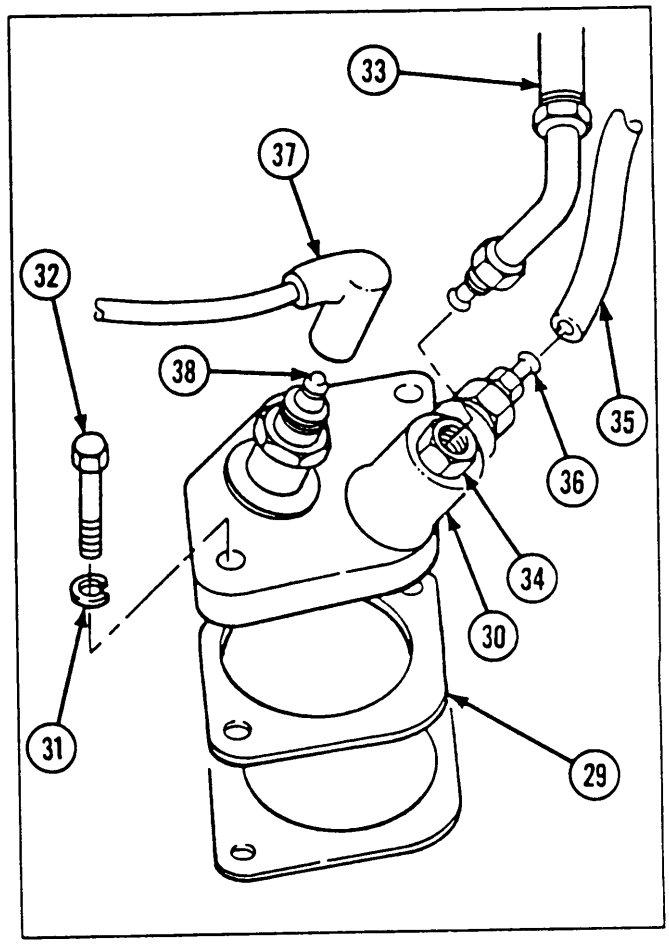
10 If removed, install loop clamp (25) on fuel hose (26) and secure to governor cover using screw assembly (27). Install fuel hose in tee (24).

11 Install fuel hose (28) on elbow (1) on solenoid valve (3).

12 Install fuel hose (26) onto elbow (2) on solenoid valve (3).

2-54. MAINTENANCE OF AIR BOX HEATER INSTALLATION AND AIR BOX HEATER ASSEMBLY (CONT).

INSTALLATION (CONT)

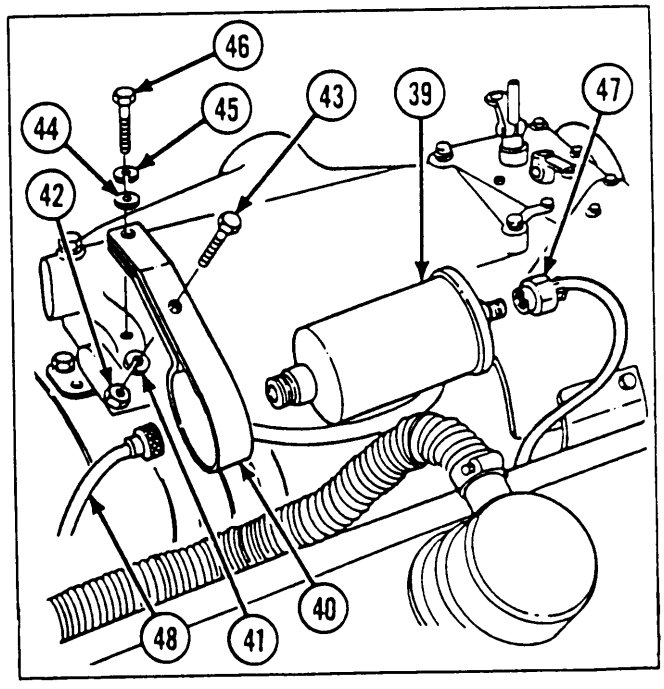


13 Install new gasket (29), air heater assembly (30), two new lockwashers (31), and two machine bolts (32) on engine block. Torque machine bolts to 13 to 17 ft-lb (18 to 23 N-m).

14 Connect nonmetallic hose (33) to pipe straight adapter (34) on air heater assembly (30).

15 Connect nonmetallic hose (35) to adapter (36) on air heater assembly (30).

16 Connect high tension lead (37) to fuel spark igniter (38) on air heater assembly (30).

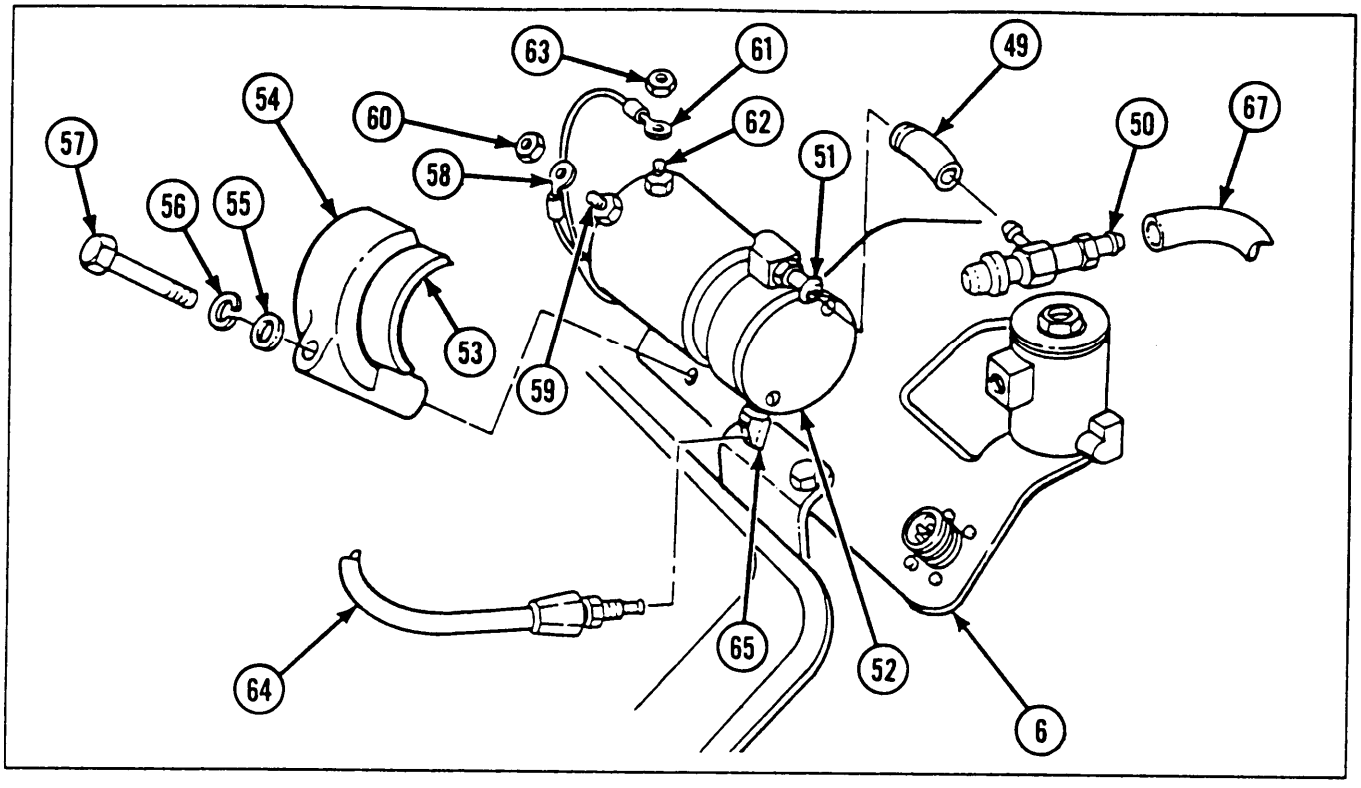


17 Insert ignition coil (39) into bracket (40). Secure with new lockwasher (41), nut (42), and bolt (43). Torque bolt to 7 to 9 ft-lb (9 to 12 N-m).

18 Position ignition coil (39) and attached bracket (40) on air inlet housing. Secure with flat washer (44), new lockwasher (45), and bolt (46). Torque bolt to 16 to 20 ft-lb (22 to 27 N-m).

19 Connect wiring harness connector (47) to ignition coil (39).

20 Connect high tension lead (48) to ignition coil (39).



21 Install hose (49) and check valve (50) onto adapter (51) on air pump (52).

22 Position air pump (52), cushion (53), and air pump clamp (54) on angle bracket (6). Install flat washer (55), new Iockwasher (56), and bolt (57). Torque bolt to 35 to 39 ft-lb (47 to 53 N-m).

23 Connect large wiring harness lead (58) to terminal (59) marked (+) on air pump (52) and secure with nut (60). Connect wiring harness lead (61) to terminal (62) 'on air pump and secure with nut (63).

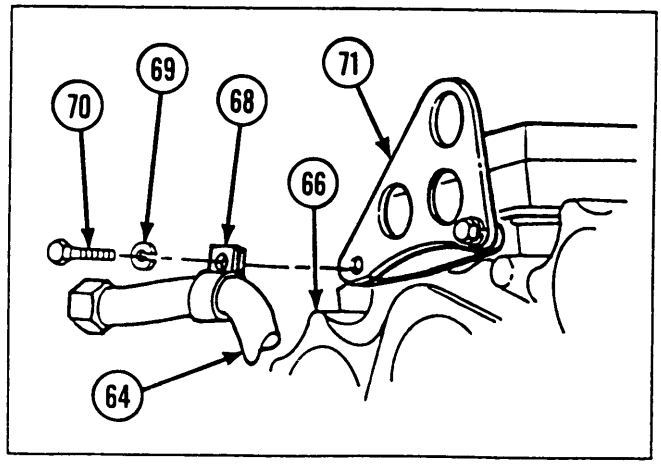
24 Connect hose (64) to elbow (65) on air pump (52) and pipe to tube tee on front of left cylinder head (66) of engine block.

25 Connect hose (67) to check valve (50).

26 Install hose clamp (68) on hose (64).

27 Install hose clamp (68), Iockwasher (69), and bolt (70) with attached hose (64) on left rear engine lifting bracket (71).

28 Torque bolt to 46 to 50 ft-lb (62 to 68 N-m).



2-55. MAINTENANCE OF THROTTLE AND ACCELERATOR CONTROLS AND LINKAGE (DRIVER'S COMPARTMENT).

This task covers:	a. Removal	b. Inspection/Repair	c. *Installation*

INITIAL SETUP

Matenals/Parts
- Cotter pin
- LockWasher (5)
- LockWasher (2)
- Self-locking nut

References
- TM 9-2350-238-24P-1

Equipment Conditions
- 2-938 Hull transmission compartment deck assembly removed
- 2-935 Hull engine compartment deck assembly lid removed

REMOVAL

1 Remove cotter pin (1) and slotted plain nut (2).

NOTE

Use care not to lose or damage cotter pin or pin.

2 Remove cotter pin (3), pin (4), and throttle plate (5).

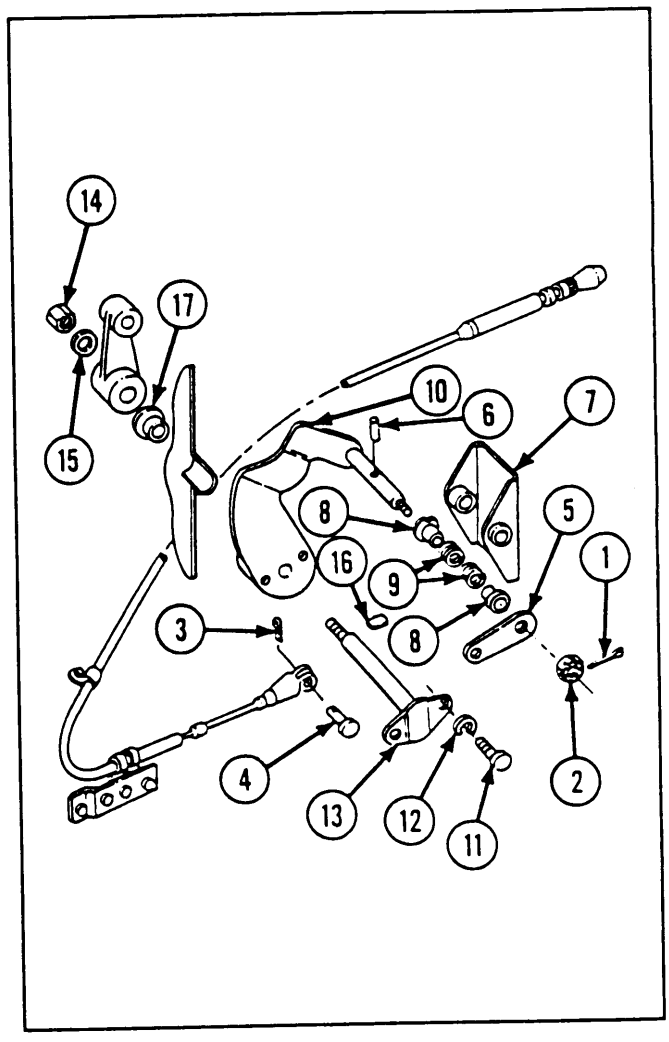
3 Remove spring pin (6), control pedal (7), two sleeve bearings (8), and two helical springs (9) from manual control lever (10).

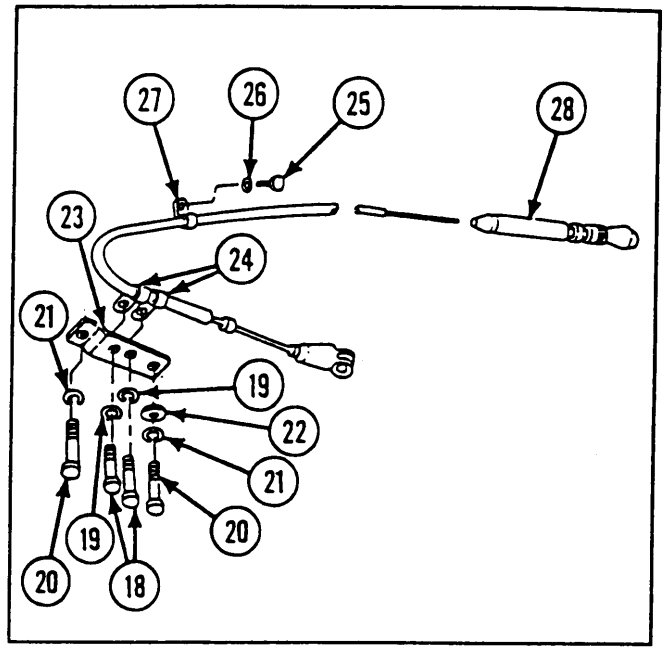
4 Remove two hexagon head capscrews (11) and two lockwashers (12) from accelerator shaft (13).

5 Remove self-locking nut (14) and flat washer (15).

6 Remove machine key (16), accelerator shaft (13), and sleeve bearing (17).

7 Remove manual control lever (10).





8 Remove two hexagon head capscrews (18), two lockwashers (19), two hexagon head capscrews (20), two lockwashers (21), flat washer (22), and bracket (23). Remove two loop clamps (24).

9 Remove hexagon head capscrew (25), lockwasher (26), and loop clamp (27).

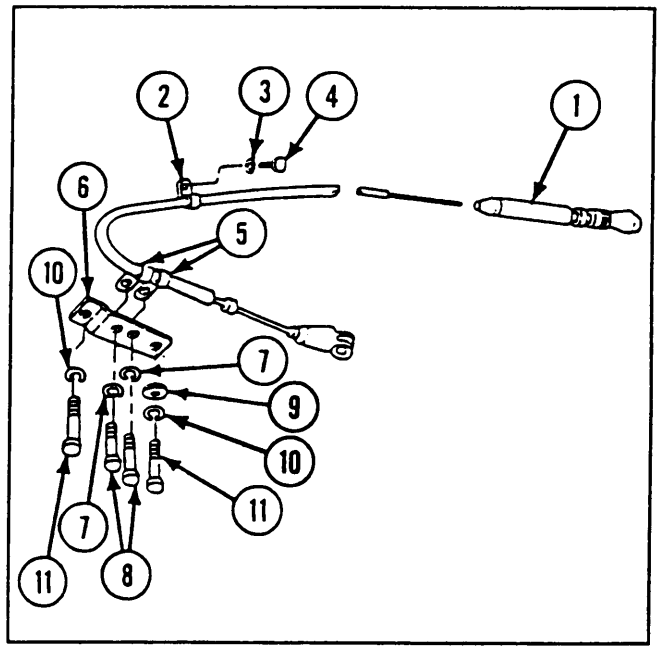
10 Remove control assembly (28).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



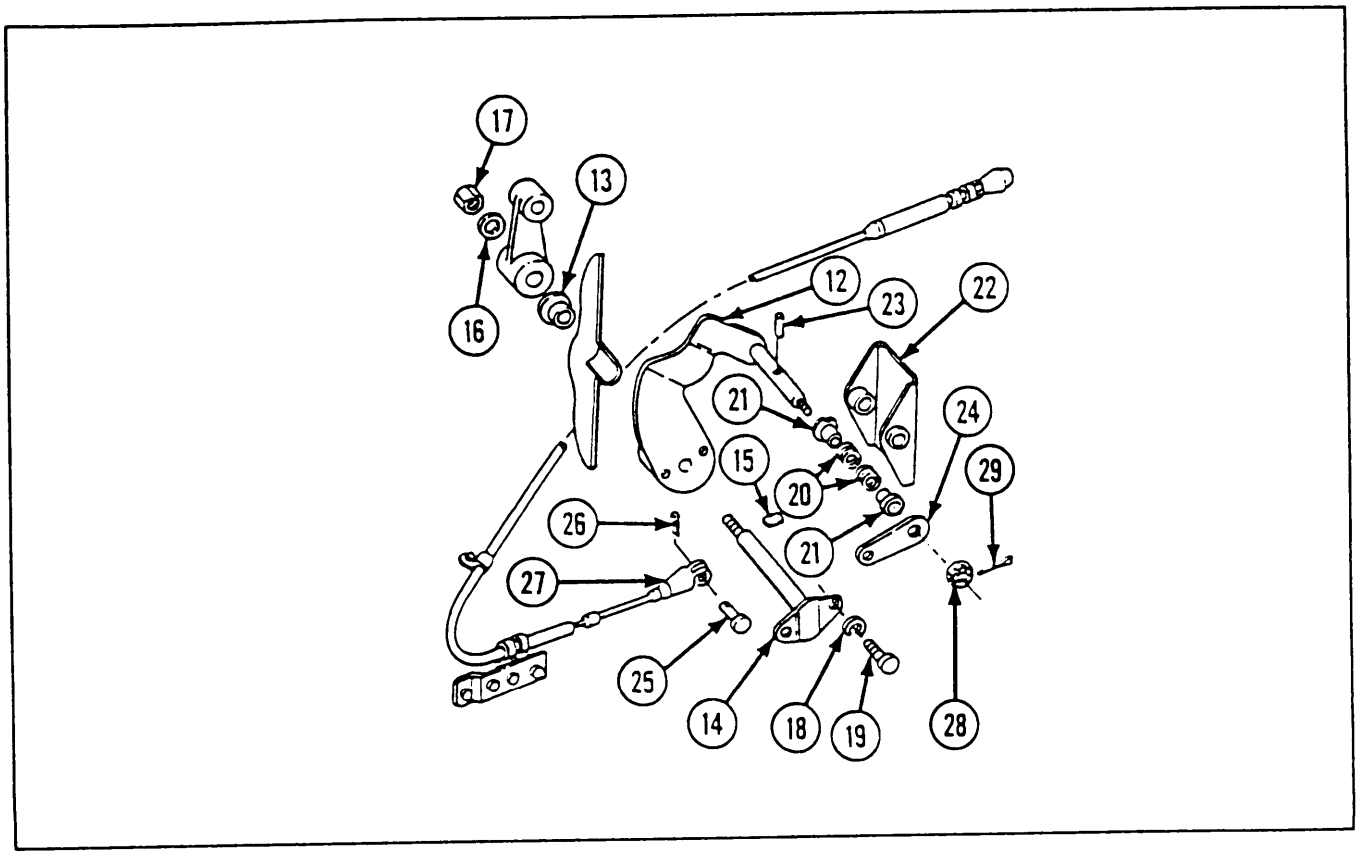
1 Install control assembly (1).

2 Install loop clamp (2), new lockwasher (3), and hexagon head capscrew (4).

3 Install two loop clamps (5). Install bracket (6), two new lockwashers (7), two hexagon head capscrews (8), flat washer (9), two new lockwashers (10), and two hexagon head capscrews (11).

2-55. MAINTENANCE OF THROTTLE AND ACCELERATOR CONTROLS AND LINKAGE (DRIVER'S COMPARTMENT) (CONT).

INSTALLATION (CONT)



4 Install manual control lever (12).

5 Install sleeve bearing (13), accelerator shaft (14), and machine key (15).

6 Install flat washer (16) and new self-locking nut (17).

7 Install two new lockwashers (18) and two hexagon head capscrews (19) on accelerator shaft (14).

8 Install two helical springs (20), two sleeve bearings (21), control pedal (22), and spring pin (23) on manual control lever (12). Allow 0.005 in. (0.013 cm) minimum play.

NOTE

If cotter pin or pin are damaged or missing, a new clevis assembly must be ordered.

9 Install throttle plate (24), pin (25), and cotter pin (26) on clevis assembly (27).

10 Install throttle plate (24), slotted plain nut (28), and new cotter pin (29) on manual control lever (12).

2-56. MAINTENANCE OF THROTTLE AND ACCELERATOR CONTROLS AND LINKAGE (ENGINE COMPARTMENT).

This task covers:
a. Removal
b. Inspection/Repair
c. Installation.
d. Adjustment

INITIAL SETUP

Materials/Parts
Cotter pin (2)
Cotter pin (4)
Lockwasher (8)
Lockwasher
Self-locking nut
Spring pin

References
TM 9-2350-238-24P-1

Equipment Conditions
2-938 Hull transmission *compartment* deck assembly removed
2-935 Hull engine compartment deck assembly lid removed

General Safety Instructions

WARNING

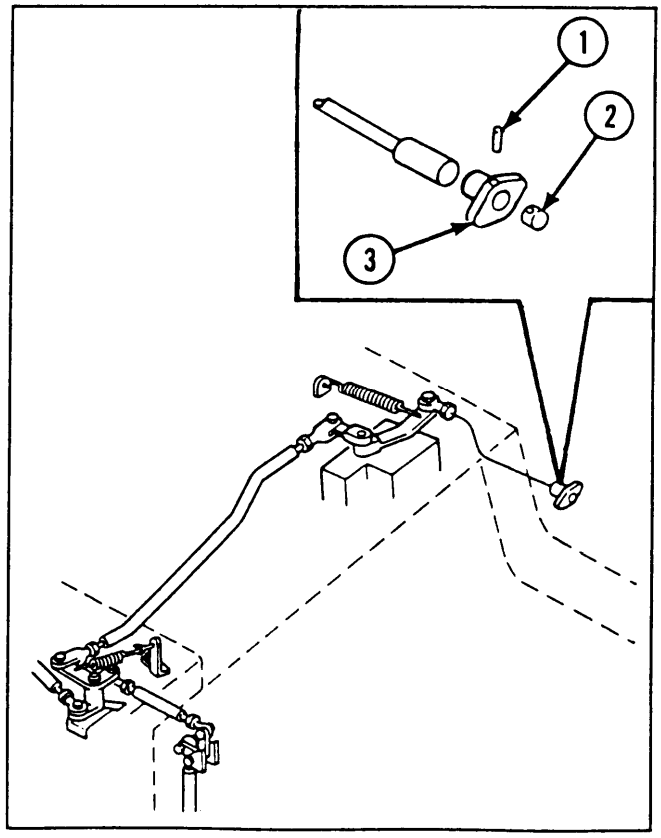
Brake foot lpedal is spring-loaded. Before working in forward area of driver's compartment, ensure vehicle tracks are blocked and parking brake is released.

REMOVAL

NOTE

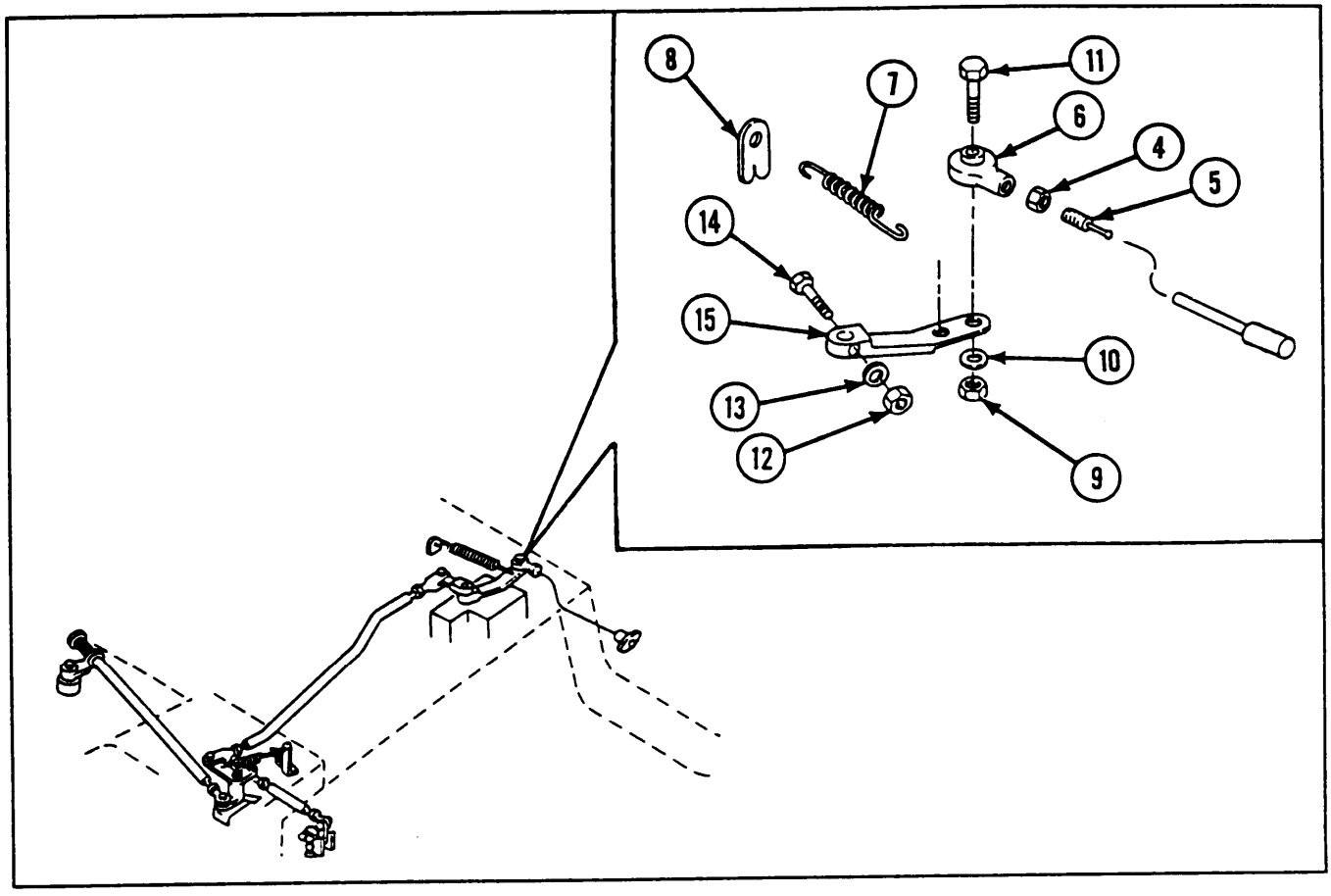
Measure distance from center to center of rod ends on transmission control rod, stud, and foot throttle control rod before removal to aid installation.

1 Remove spring pin (1), cable end (2), and starting handle (3).



2-56. MAINTENANCE OF THROTTLE AND ACCELERATOR CONTROLS AND LINKAGE (ENGINE COMPARTMENT) (CONT).

REMOVAL (CONT)

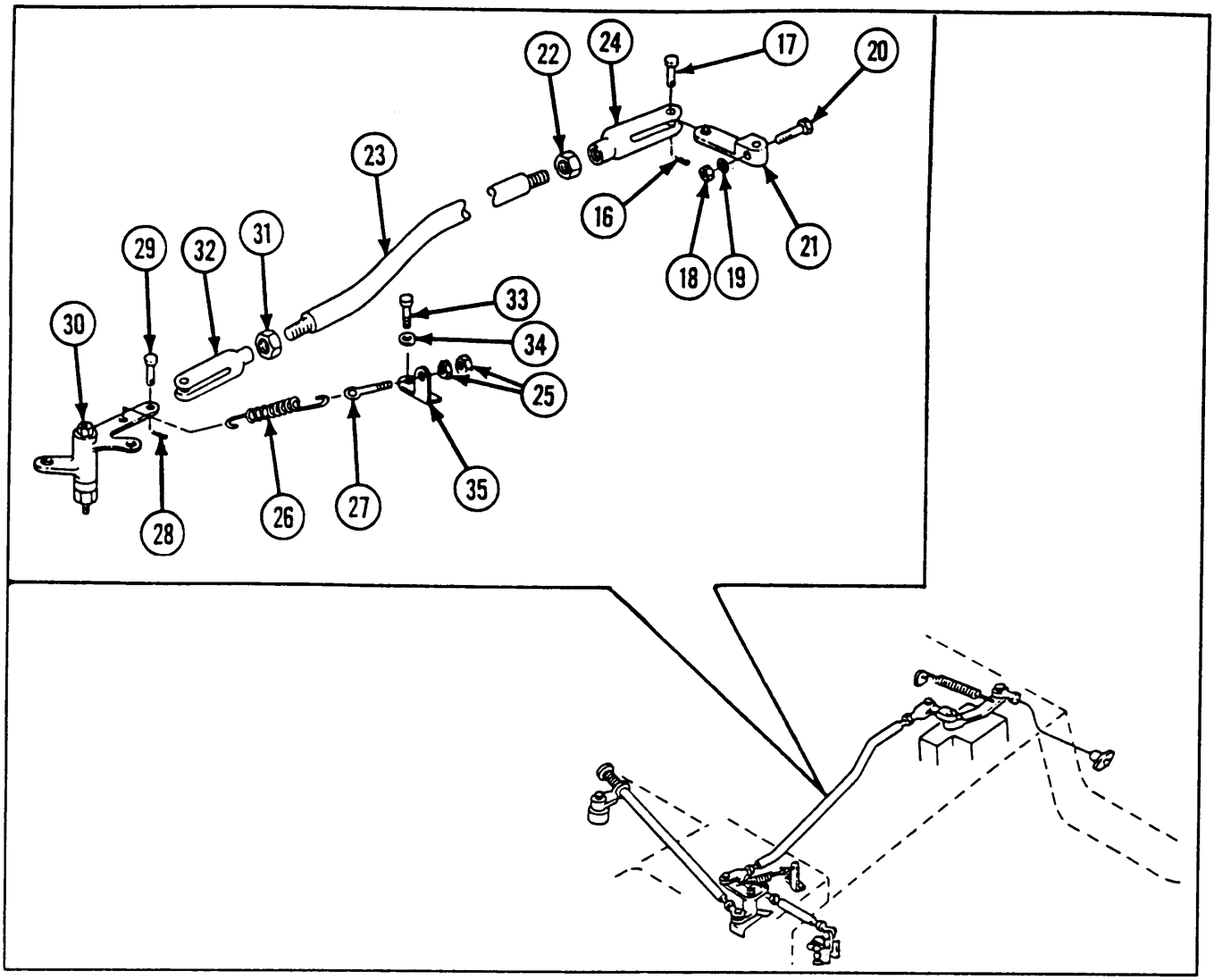


2 Loosen hexagon plain nut (4) and remove wire rope assembly (5) from rod end plain bearing (6). Remove hexagon plain nut from wire rope assembly.

3 Remove helical spring (7) and detent plate (8).

4 Remove hexagon plain nut (9), lockwasher (10), and hexagon head capscrew (11). Remove rod end plain bearing (6).

5 Remove hexagon plain nut (12), lockwasher (13), and hexagon head capscrew (14). Remove engine shutdown manual control lever (15).



6 Remove cotter pin (16) and headed straight pin (17).

7 Remove hexagon plain nut (18), lockwasher (19), and hexagon head capscrew (20). Remove governor throttle control lever (21).

8 Loosen hexagon plain nut (22) at end of governor control rod (23). Remove rod end clevis (24) and hexagon plain nut (22).

9 Remove two hexagon plain nuts (25), helical spring (26), and eye bolt (27).

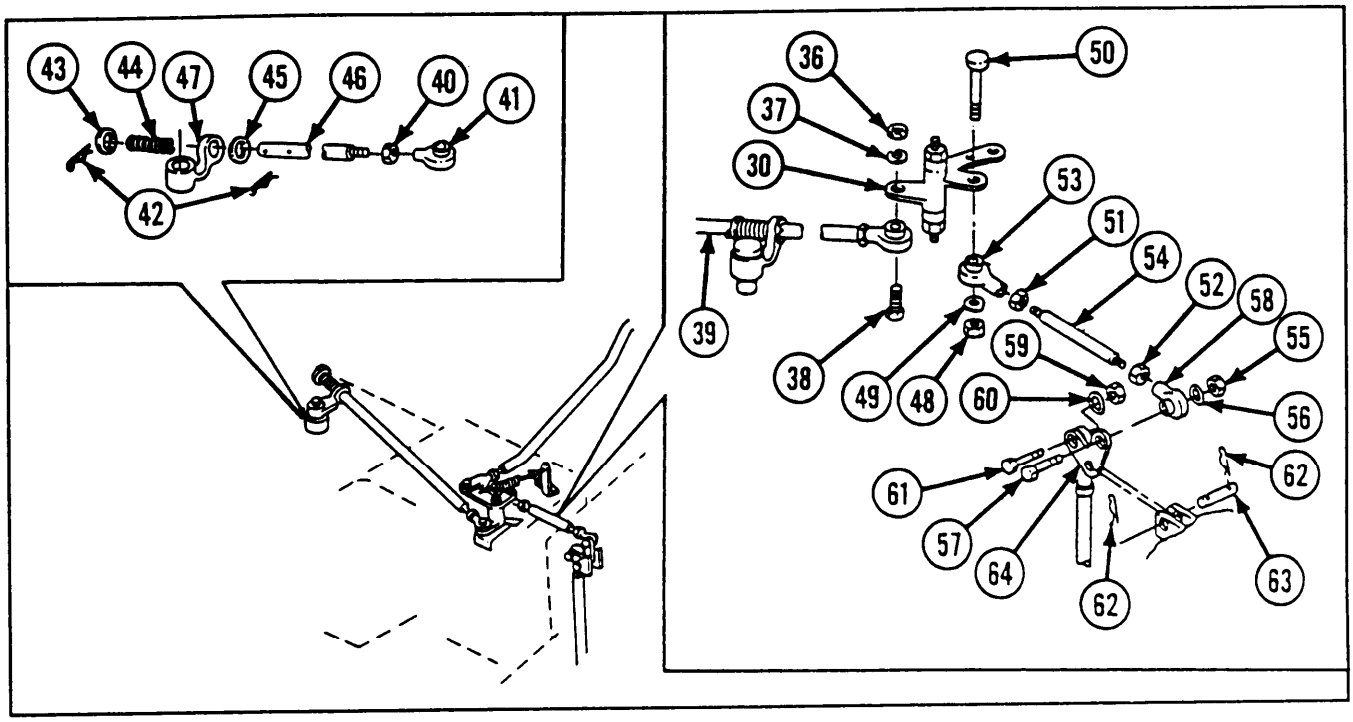
10 Remove cotter pin (28) and headed straight pin (29), and disconnect transmission and governor linkage bell crank (30).

11 Loosen hexagon plain nut (31), and remove rod end clevis (32) and hexagon plain nut from governor control rod (23).

12 Remove hexagon head capscrew (33), lockwasher (34), and angle bracket (35).

2-56. MAINTENANCE OF THROTTLE AND ACCELERATOR CONTROLS AND LINKAGE (ENGINE COMPARTMENT) (CONT).

REMOVAL (CONT)



13 Remove hexagon plain nut (36), lockwasher (37), and hexagon head capscrew (38). Disconnect rod assembly (39) from transmission and governor linkage bell crank (30).

14 Loosen hexagon plain nut (40). Remove rod end plain bearing (41).

15 Remove two cotter pins (42). Remove flat washer (43), helical spring (44), flat washer (45), and threaded end rod (46) from transmission throttle control lever (47).

16 Remove transmission throttle control lever (47).

17 Remove hexagon plain nut (48), lockwasher (49), and hexagon head capscrew (50).

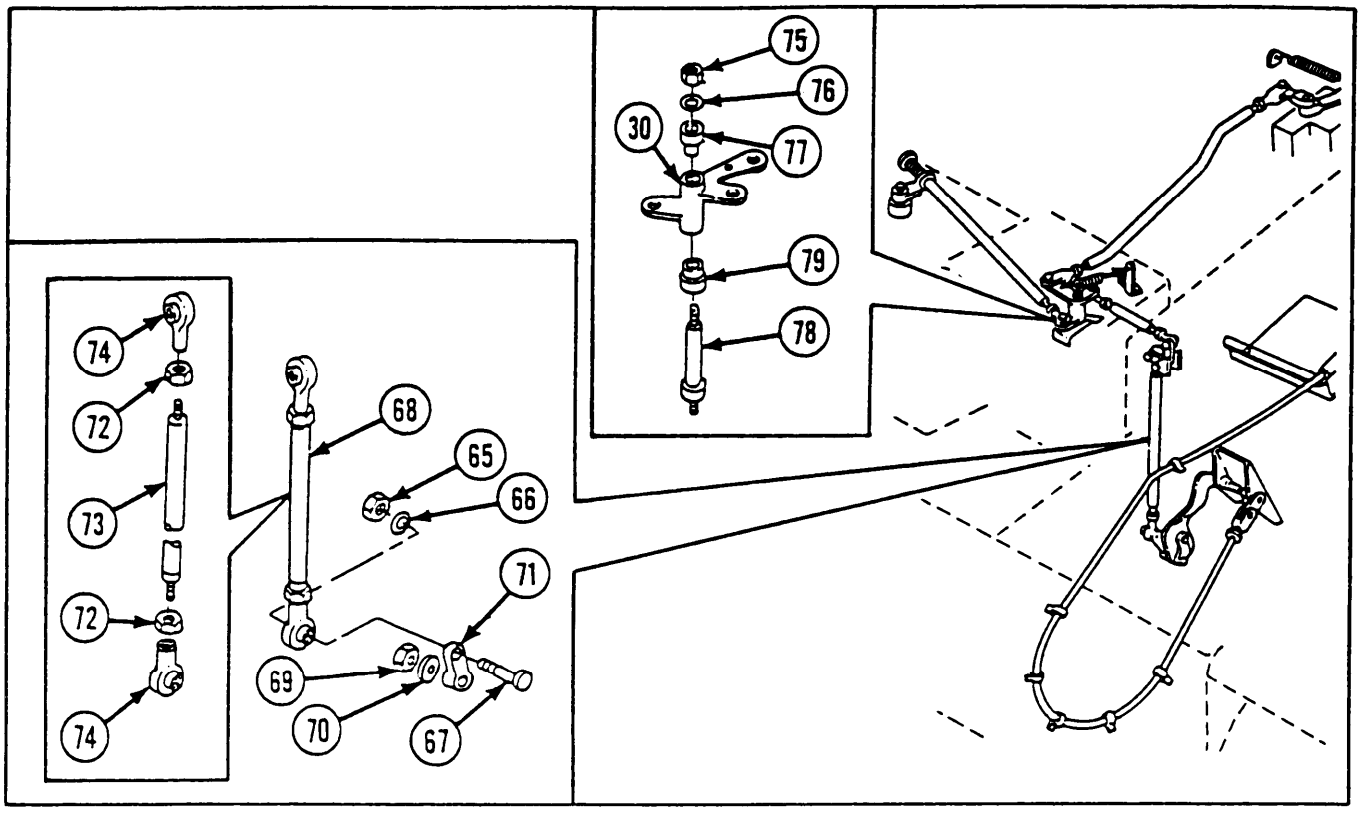
18 Loosen two hexagon plain nuts (51 and 52). Remove rod end plain bearing (53) and hexagon plain nut (51) from throttle linkage plain stud (54).

19 Remove hexagon plain nut (55), lockwasher (56), and hexagon head capscrew (57).

20 Remove rod end plain bearing (58), hexagon plain nut (52), and throttle linkage plain stud (54).

21 Remove hexagon plain nut (59), lockwasher (60), and hexagon head capscrew (61).

22 Remove two cotter pins (62) from headless straight pin (63). Remove headless straight pin and throttle linkage bell crank (64).



23 Remove hexagon plain nut (65), lockwasher (66), and hexagon head capscrew (67), and disconnect rigid connecting link (68).

24 Remove hexagon plain nut (69), flat washer (70), and throttle pedal remote control lever (71).

25 Loosen two hexagon plain nuts (72) at ends of rod tube (73).

26 Remove two hexagon plain nuts (72) and two rod end plain bearings (74) from ends of rod tube (73).

27 Remove self-locking nut (75), flat washer (76), and sleeve bearing (77).

28 Remove shouldered shaft (78) and sleeve bearing (79) from transmission and governor linkage bell crank (30).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

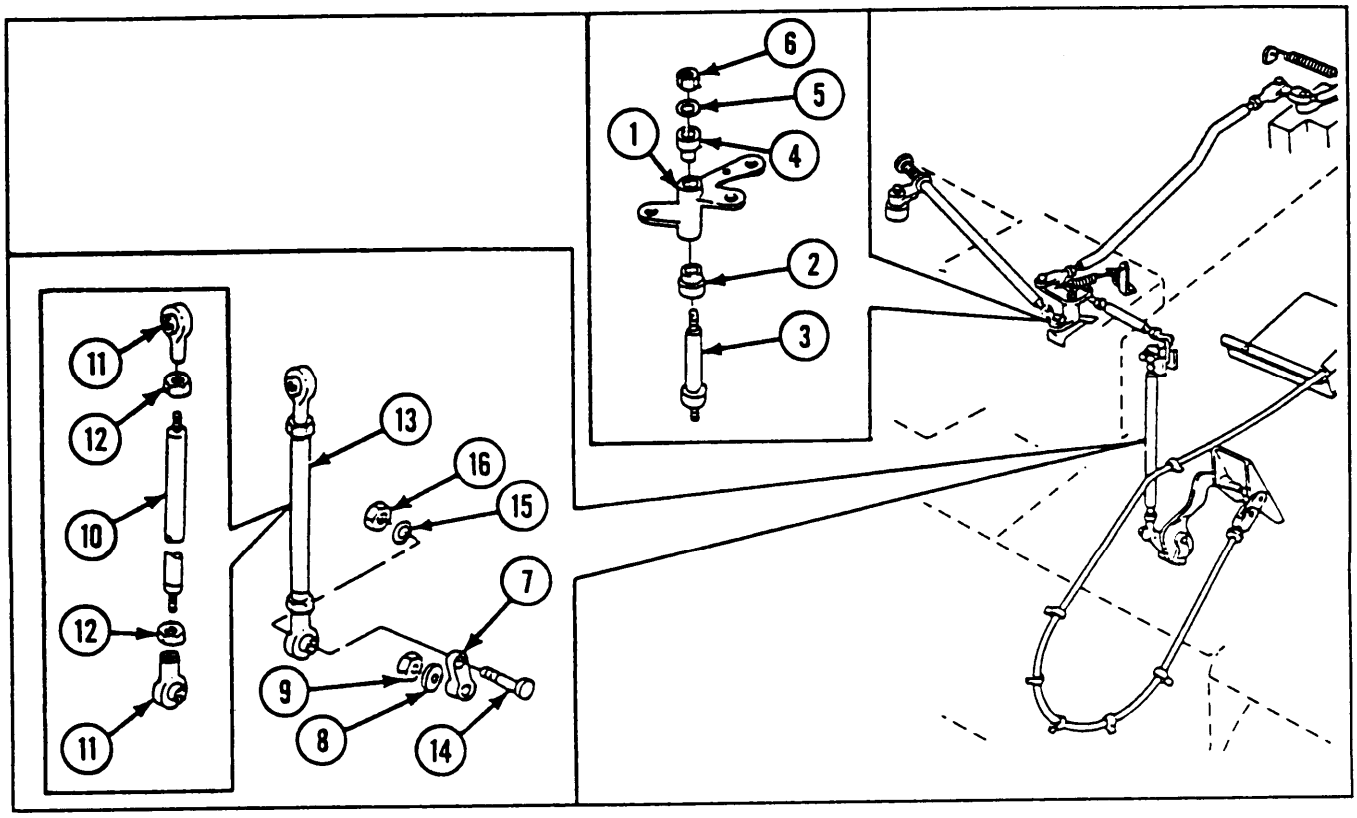
2 If governor control rod is broken, damaged, or missing, repair is by replacement of next higher assembly.

3 If rod tube is broken, damaged, or missing, repair is by replacement of next higher assembly.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-56. MAINTENANCE OF THROTTLE AND ACCELERATOR CONTROLS AND LINKAGE (ENGINE COMPARTMENT) (CONT).

INSTALLATION



1 Install transmission and governor linkage bell crank (1), sleeve bearing (2), and shouldered shaft (3).

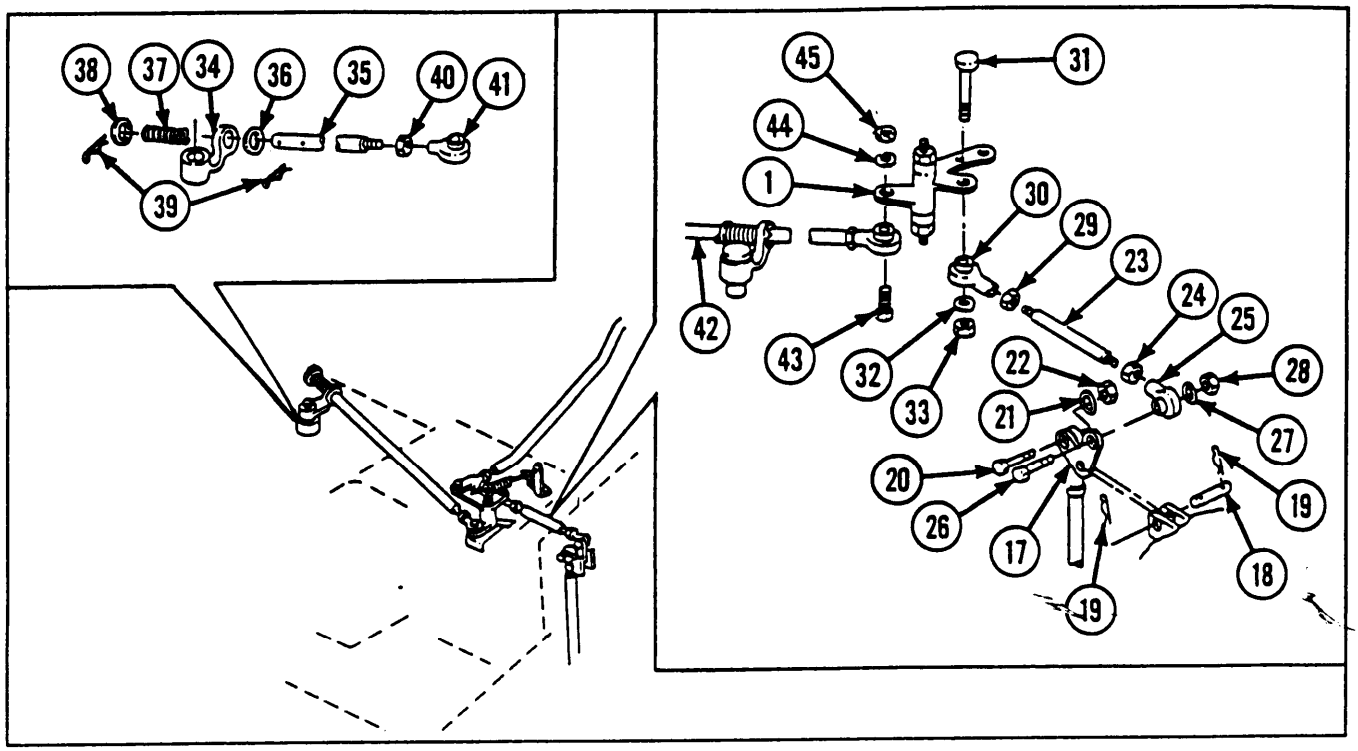
2 Install sleeve bearing (4), flat washer (5), and new self-locking nut (6).

3 Install throttle pedal remote control lever (7), flat washer (8), and hexagon plain nut (9).

4 Install rod tube (10). Install two rod end plain bearings (11) and two hexagon plain nuts (12) to ends of rod tube.

5 Tighten two hexagon plain nuts (12) on ends of rod tube (10).

6 Install rigid connecting link (13) with hexagon head capscrews (14), new lockwasher (15), and hexagon plain nut (16).



7 Install throttle linkage bell crank (17) and headless straight pin (18). Install two new cotter pins (19) in headless straight pin.

8 Install hexagon head capscrew (20), new lockwasher (21), and hexagon plain nut (22).

9 Install throttle linkage plain stud (23), hexagon plain nut (24), and rod end plain bearing (25).

10 Install hexagon head capscrew (26), new lockwasher (27), and hexagon plain nut (28).

11 Install hexagon plain nut (29) and rod end plain bearing (30) on throttle linkage plain stud (23).

12 Install hexagon head capscrew (31), new lockwasher (32), and hexagon plain nut (33).

13 Install transmission throttle control lever (34).

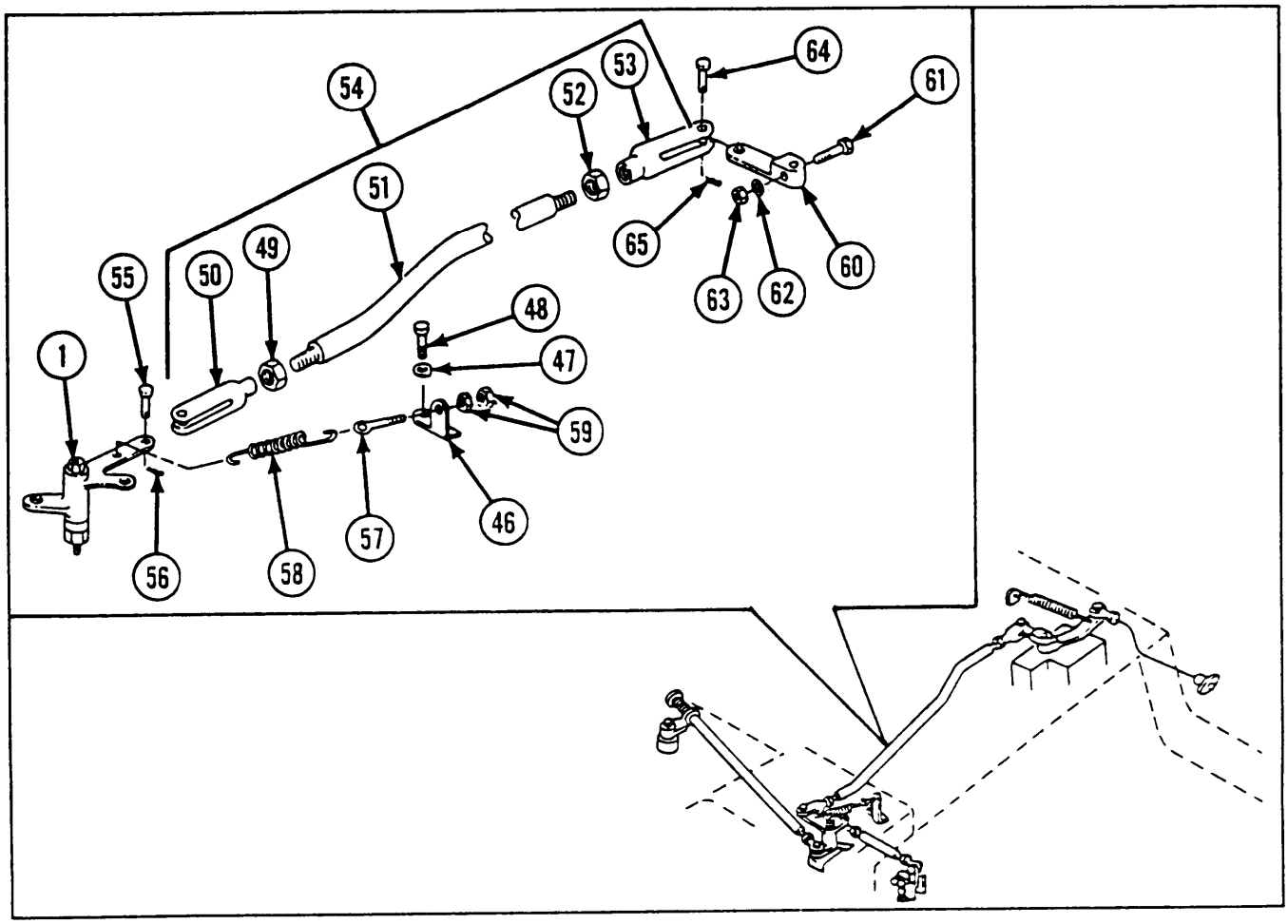
14 Install threaded end rod (35), flat washer (36), helical spring (37), and flat washer (38) on transmission throttle control lever (34). Install two new cotter pins (39).

15 Install hexagon plain nut (40) and rod end plain bearing (41). Tighten hexagon plain nut.

16 Install rod assembly (42). Install hexagon head capscrew (43), new lockwasher (44), and hexagon plain nut (45) on transmission and governor linkage bell crank (1).

2-56. MAINTENANCE OF THROTTLE AND ACCELERATOR CONTROLS AND LINKAGE (ENGINE COMPARTMENT) (CONT).

INSTALLATION (CONT)



17 Install angle bracket (46), new lockwasher (47), and hexagon head capscrew (48).

18 Install hexagon plain nut (49) and rod end clevis (50) on governor control rod (51).

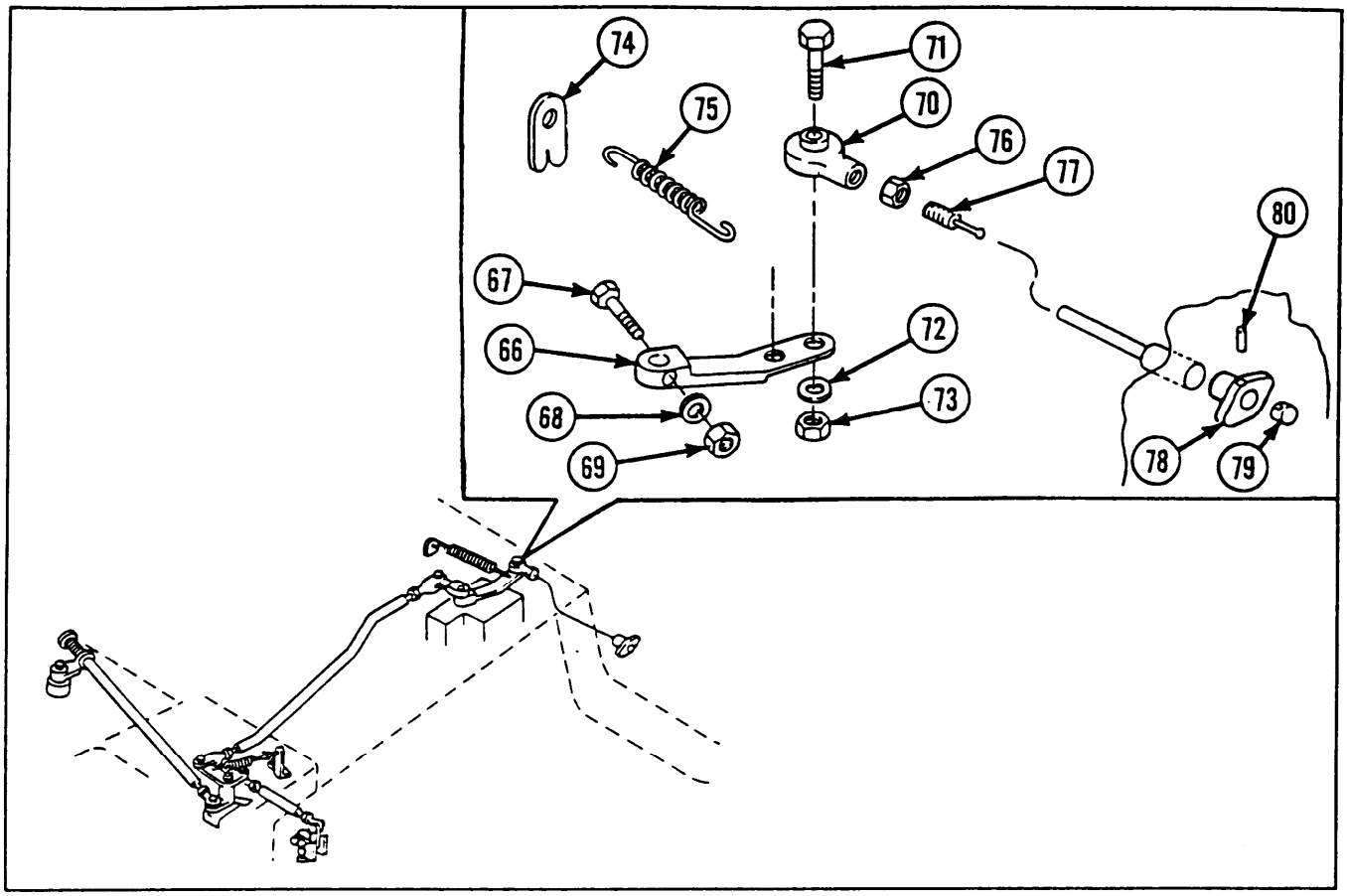
19 Install hexagon plain nut (52) and rod end clevis (53). Tighten hexagon plain nuts (49 and 52) at both ends of governor control rod (51).

20 Install rigid connecting link (54), headed straight pin (55), and new cotter pin (56) on transmission and governor linkage bell crank (1).

21 Install eye bolt (57), helical spring (58), and two hexagon plain nuts (59).

22 Install governor throttle control lever (60). Install hexagon head capscrew (61), new lockwasher (62), and hexagon plain nut (63).

23 Install headed straight pin (64) and new cotter pin (65).



24 Install manual control engine shutdown lever (66). Install hexagon head capscrew (67), new lockwasher (68), and hexagon plain nut (69).

25 Install rod end plain bearing (70). Install hexagon head capscrew (71), new lockwasher (72), and hexagon plain nut (73).

26 Install detent plate (74) and helical spring (75).

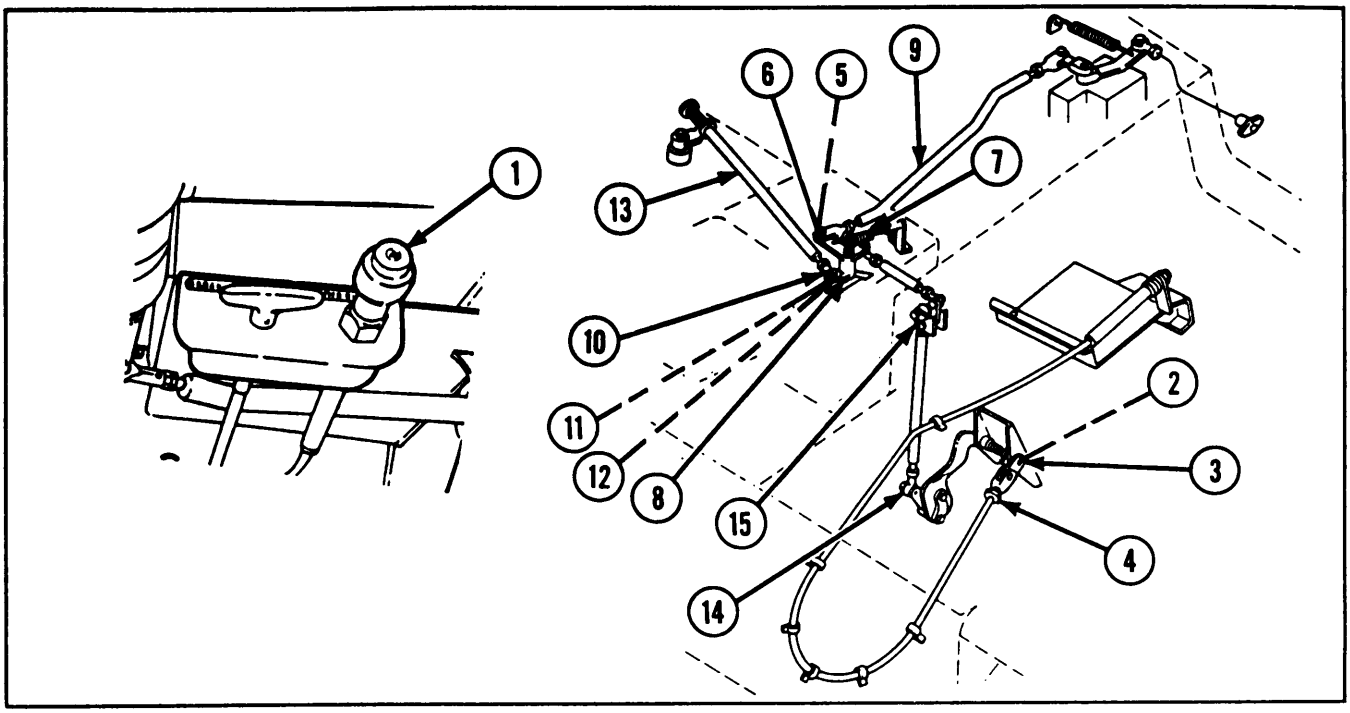
27 Install hexagon plain nut (76) on wire rope assembly (77). Install wire rope assembly on rod end plain bearing (70) and tighten hexagon plain nut.

28 Install starting handle (78), cable end (79), and new spring pin (80).

29 Adjust rod end plain bearing (70) on wire rope assembly (77) until hole in rod end plain bearing aligns with hole in engine shutdown manual control lever (66) when starting handle (78) is in position against bulkhead.

2-56. MAINTENANCE OF THROTTLE AND ACCELERATOR CONTROLS AND LINKAGE (ENGINE COMPARTMENT) (CONT).

ADJUSTMENT



1 Turnoff engine.

2 Block tracks.

WARNING

Brake foot pedal is spring-loaded. Before working in forward area of driver's compartment, ensure vehicle tracks are blocked and parking brake is released.

3 Release foot pedal.

4 Push throttle control (1) in.

5 Remove cotter pin (2) and pin (3).

6 Remove clevis (4).

7 Remove cotter pin (5) and headed straight pin (6).

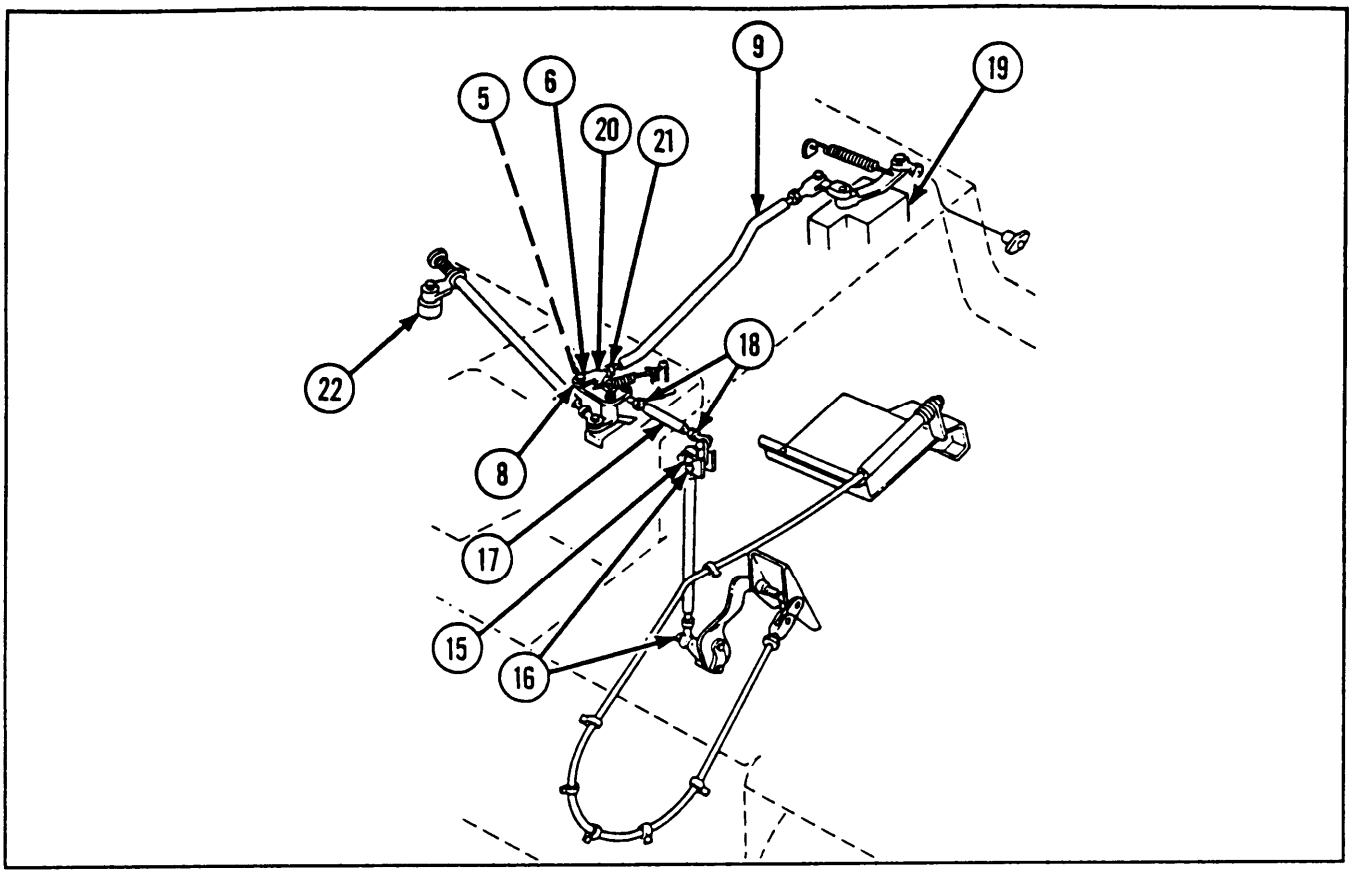
8 Disconnect helical spring (7) from transmission and governor linkage bell crank (8).

9 Position rigid connecting link (9) away from transmission and governor linkage bell crank (8).

10 Remove hexagon plain nut (10), lockwasher (11), and hexagon head capscrew (12) from rod assembly (13) and transmission and governor linkage bell crank (8).

11 Position rod assembly (13) away from transmission and governor linkage bell crank (8).

12 Adjust foot rigid connecting link rod ends (14) to position vertical arm of throttle linkage bell crank (15) parallel to bulkhead.



13 Tighten hexagon plain nuts (16).

14 Position transmission and governor linkage bell crank (8) at right angles to throttle linkage plain stud (17) by holding throttle linkage bell crank (15) in position and adjust throttle linkage plain stud rod ends.

15 Tighten hexagon plain nuts (18).

16 Position rigid connecting link (9) toward governor (19) (idle position).

17 Adjust rod end clevis (20) until hole alines with hole in transmission and governor linkage bell crank (8).

18 Unscrew rod end clevis (20) one more turn.

19 Tighten hexagon plain nut (21).

20 Attach rod end clevis (20) to transmission and governor linkage bell crank (8).

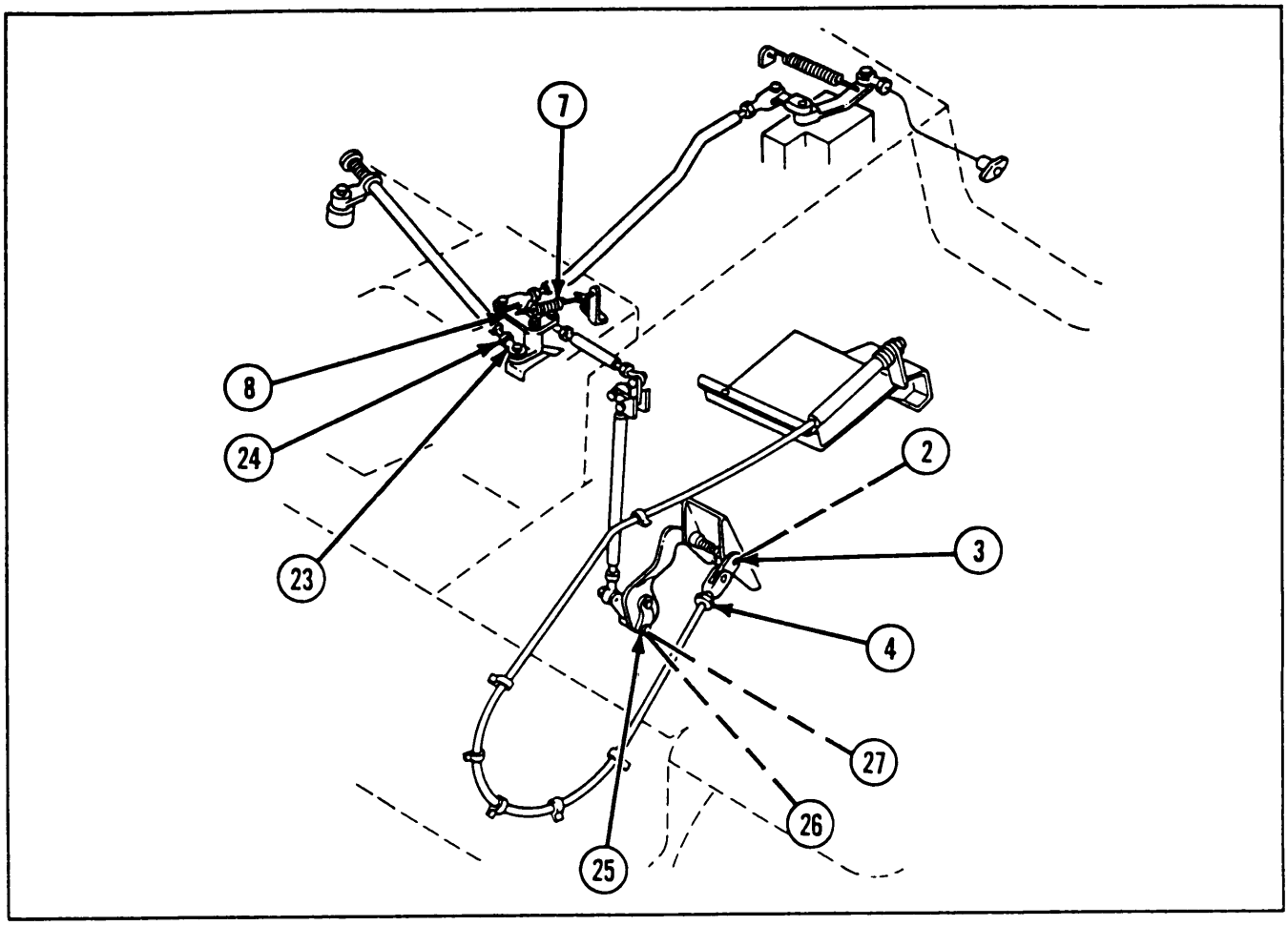
21 Install headed straight pin (6) and cotter pin (5) to rod end clevis (20).

22 Rotate and hold transmission throttle control lever (22) fully clockwise.

23 Position rigid connecting link (9) away from governor (19) (full-throttle position).

2-56. MAINTENANCE OF THROTTLE AND ACCELERATOR CONTROLS AND LINKAGE (ENGINE COMPARTMENT) (CONT).

ADJUSTMENT (CONT)



24 Adjust rod end plain bearing (23) until hole aligns with hole in transmission and governor linkage bell crank (8).

25 Tighten hexagon plain nut (24).

26 Install hexagon head capscrew (25), lockwasher (26), and hexagon plain nut (27).

27 Adjust clevis (4) until hole aligns with hole in brake foot pedal.

28 Unscrew clevis (4) two more turns.

29 Install pin (3) and cotter pin (2).

30 Connect helical spring (7) to transmission and governor linkage bell crank (8).

31 Road test vehicle.

2-57. MAINTENANCE OF EXHAUST SYSTEM (ENGINE MODEL 7083-7398).

This task covers: a. *Removal/Disassembly* b. *inspection/Repak* c. *Reassembly/Installation*

INITIAL SETUP

Tools and Special Tools
Plier wire twister (item 30, appx G)

Materials/Parts
Lockwasher (2)
Lockwire (item 22, appx C)
Self-locking nut (4)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed

REMOVAL/DISASSEMBLY

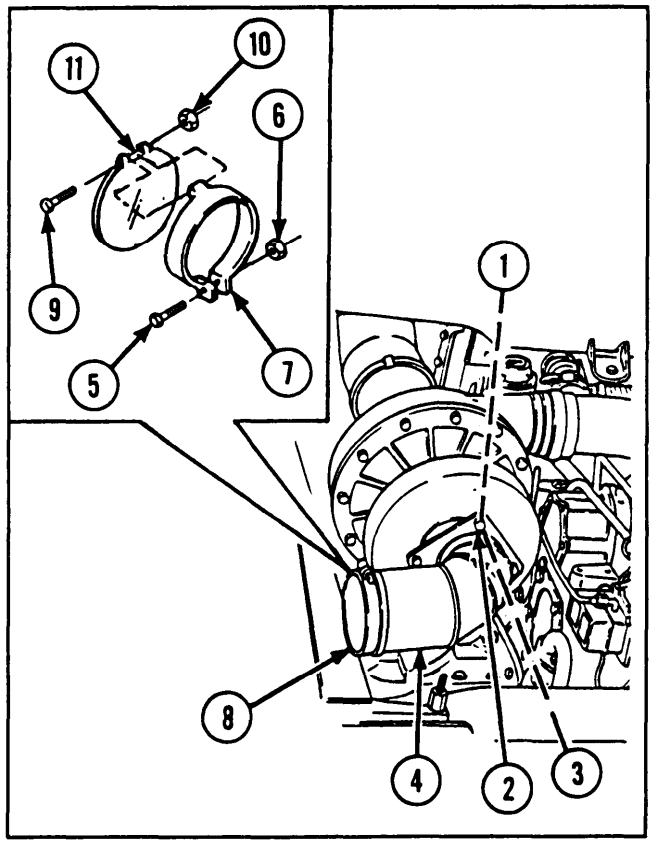
1 Remove lockwire (1).

2 Remove four hexagon head capscrews (2) and four flat washers (3).

3 Remove engine exhaust flange to tube elbow (4).

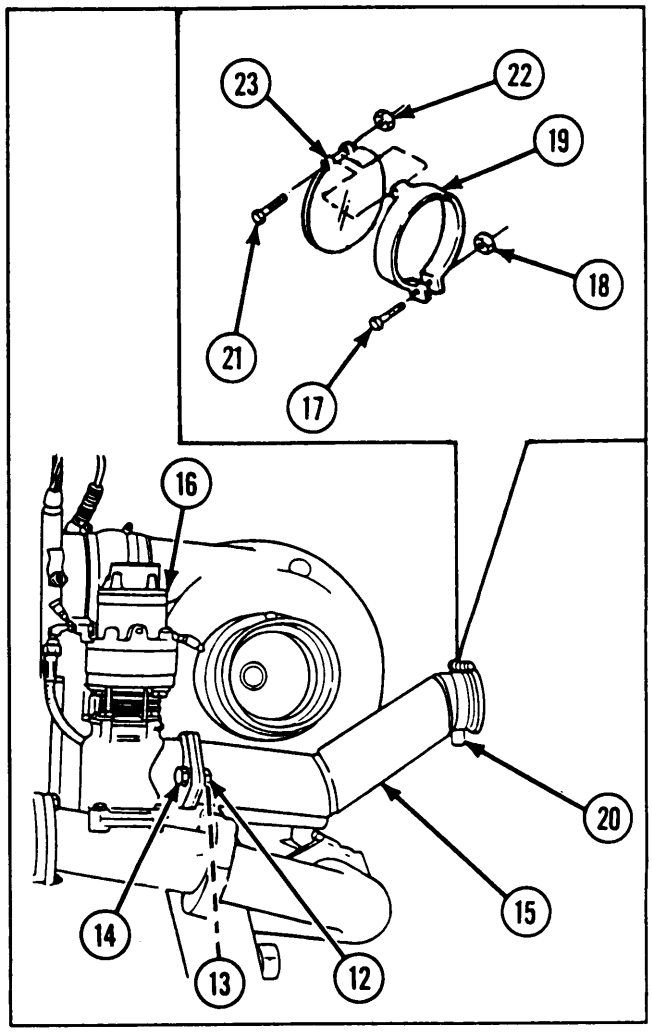
4 Remove hexagon head capscrew (5) and self-locking nut (6) from swing check valve clamp (7). Remove engine exhaust protective cap assembly (8) from engine exhaust flange to tube elbow (4).

5 Remove hexagon head capscrew (9) and self-locking nut (10) from swing check valve disk (11). Remove swing check valve disk from swing check valve clamp (7).



2-57. MAINTENANCE OF EXHAUST SYSTEM (ENGINE MODEL 7083-7398) (CONT).

REMOVAL/DISASSEMBLY (CONT)



6 Remove two hexagon plain nuts (12), two lockwashers (13) and two hexagon head capscrews (14) from exhaust pipe (15). Remove exhaust pipe from turbocharger regulator (16).

7 Remove hexagon head capscrew (17) and self-locking nut (18) from swing check valve clamp (19). Remove exhaust system protective cap assembly (20) from exhaust pipe (15).

8 Remove hexagon head capscrew (21) and self-locking nut (22) from swing check valve disk (23). Remove swing check valve disk from swing check valve clamp (19).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

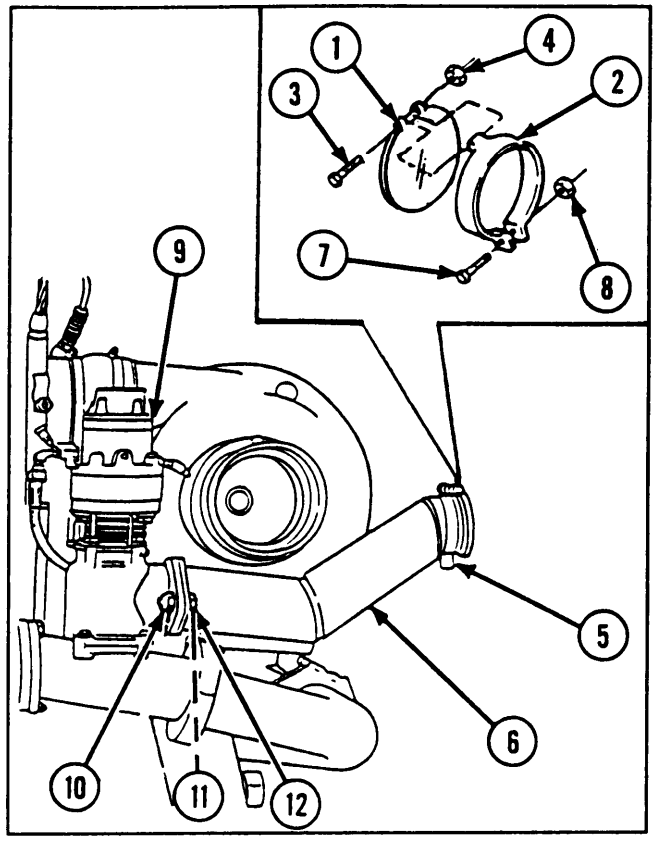
2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY/INSTALLATION

1 Install swing check valve disk (1) and swing check valve clamp (2). Install hexagon head capscrew (3) and new self-locking nut (4) in swing check valve disk.

2 Install exhaust system protective cap assembly (5) on exhaust pipe (6). Install hexagon head capscrew (7) and new self-locking nut (8) in swing check valve clamp (2).

3 Install exhaust pipe (6) on turbocharger regulator (9). Install two hexagon head capscrews (10), two new lockwashers (11), and two hexagon plain nuts (12).



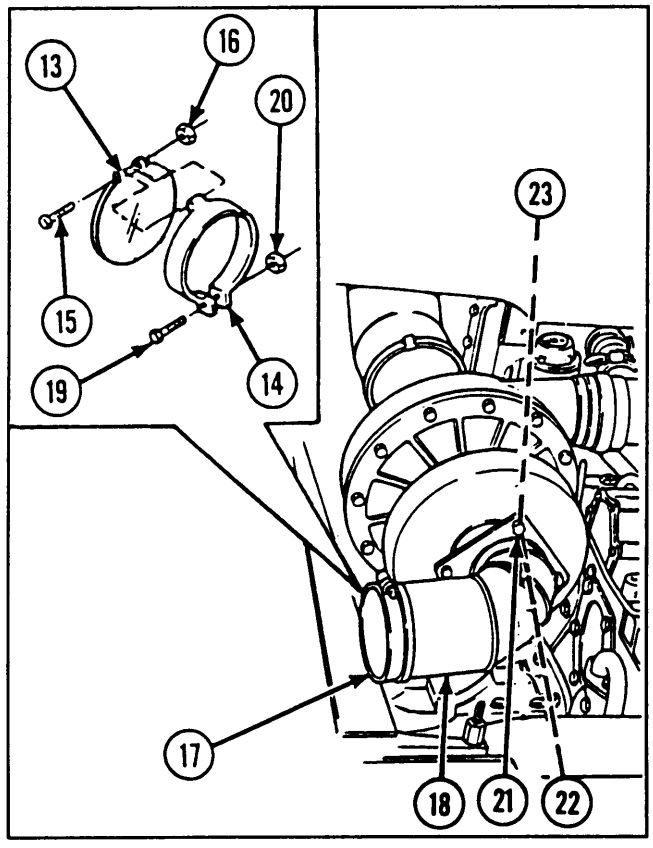
4 Install swing check valve disk (13) on swing check valve clamp (14). Install hexagon head capscrew (15) and new self-locking nut (16) in swing check valve disk.

5 Install engine exhaust protective cap assembly (17) on engine exhaust flange to tube elbow (18). Install hexagon head capscrew (19) and new self-locking nut (20) in swing check valve clamp (14).

6 Install engine exhaust flange to tube elbow (18).

7 Install four flat washers (21) and four hexagon head capscrews (22).

8 Install new lockwire (23).



2-58. MAINTENANCE OF EXHAUST SYSTEM (ENGINE MODEL 7083-7395).

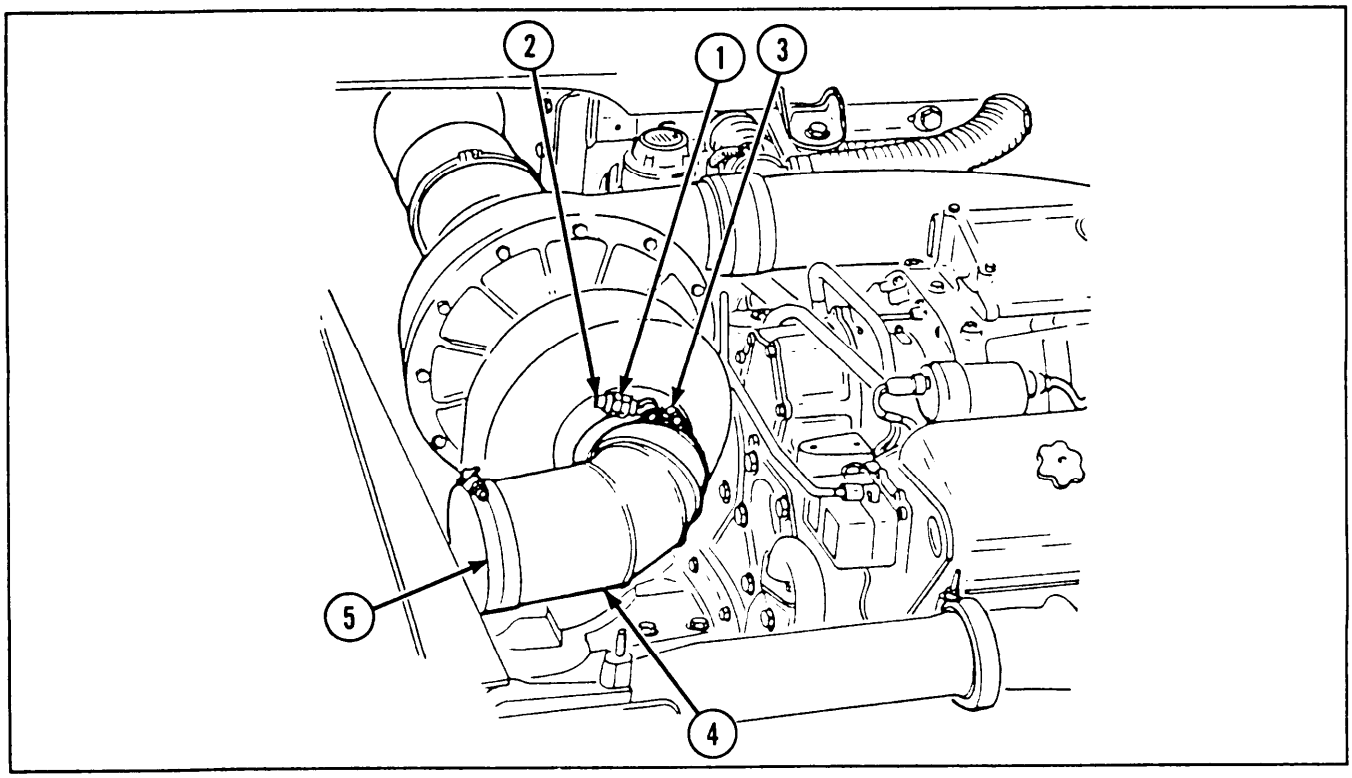
This task covers: *a. Removal* b. *Inspection/Repair* *c. Installation*

INITIAL SETUP

References
TM 9-2350-238-24P-1

Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed

REMOVAL



1 Loosen nut (1) on coupling clamp T-bolt (2).

2 Unhook coupling clamp T-bolt (2) and remove coupling clamp (3), exhaust elbow (4), and swing check valve (5).

INSPECTION/REPAIR

1 inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install exhaust elbow (4), swing check valve (5), and coupling clamp (3).

2 Connect coupling clamp T-bolt (2) to coupling clamp (3).

3 Tighten nut (1) on coupling clamp T-bolt (2).

2-59. MAINTENANCE OF RADIATOR AND RELATED PARTS.

This task covers: a. *Removal* c. *Cleaning* b. *Inspection/Repair* d. *Installation*

INITIAL SETUP

Tools and Special Tools
- Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
  - Torque wrench (0 to 170 ft-lb)
  - Wire brush
- Hoist
- Sling

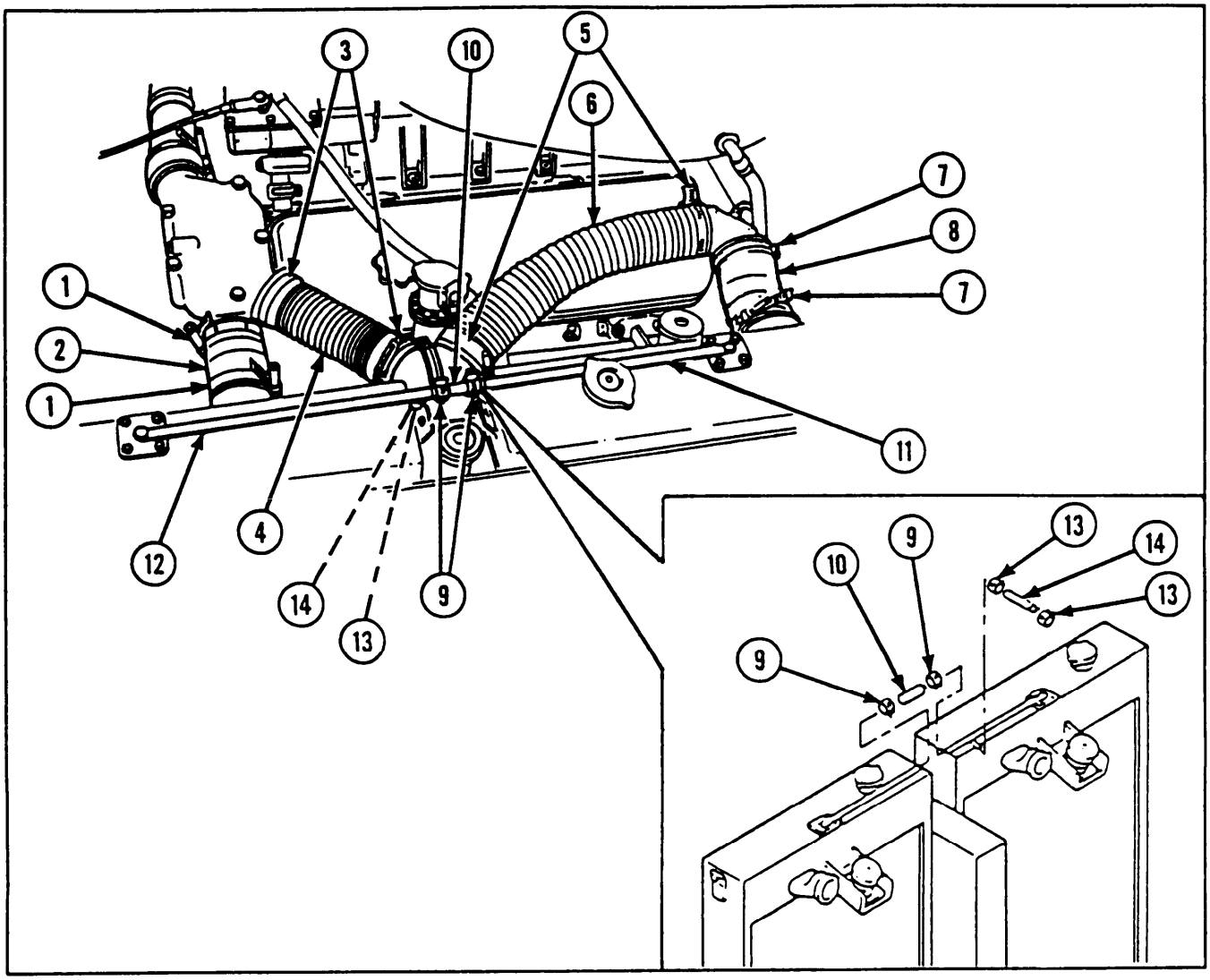
Materials/Parts
- Adhesive (item 4, appx C)
- Dry cleaning solvent (item 16, appx C)
- Emery cloth (item 11, appx C)
- Hose (figure D-4, appx D)
- Hose (figure D-4, appx D)
- Lockwasher (18)
- Lockwasher(12)
- Lockwasher (6)
- Packings with retainer (8)
- Radiator bulkhead rubber strip (4)
- Radiator bulkhead seal (4)
- Radiator drain gasket (2)
- Radiator tube assembly gasket (2)

References
- TM 9-2350-238-10
- TM 9-2350-238-24P-1
- TM 750-254

Equipment Conditions
- Cooling system drained (TM 9-2350-238-10)
- 2-935 Hull engine compartment deck assembly lid removed
- 2-525 Radiator support beam removed

2-59. MAINTENANCE OF RADIATOR AND RELATED PARTS (CONT).

REMOVAL



1 Loosen two hose clamps (1), and remove with nonmetallic hose (2).

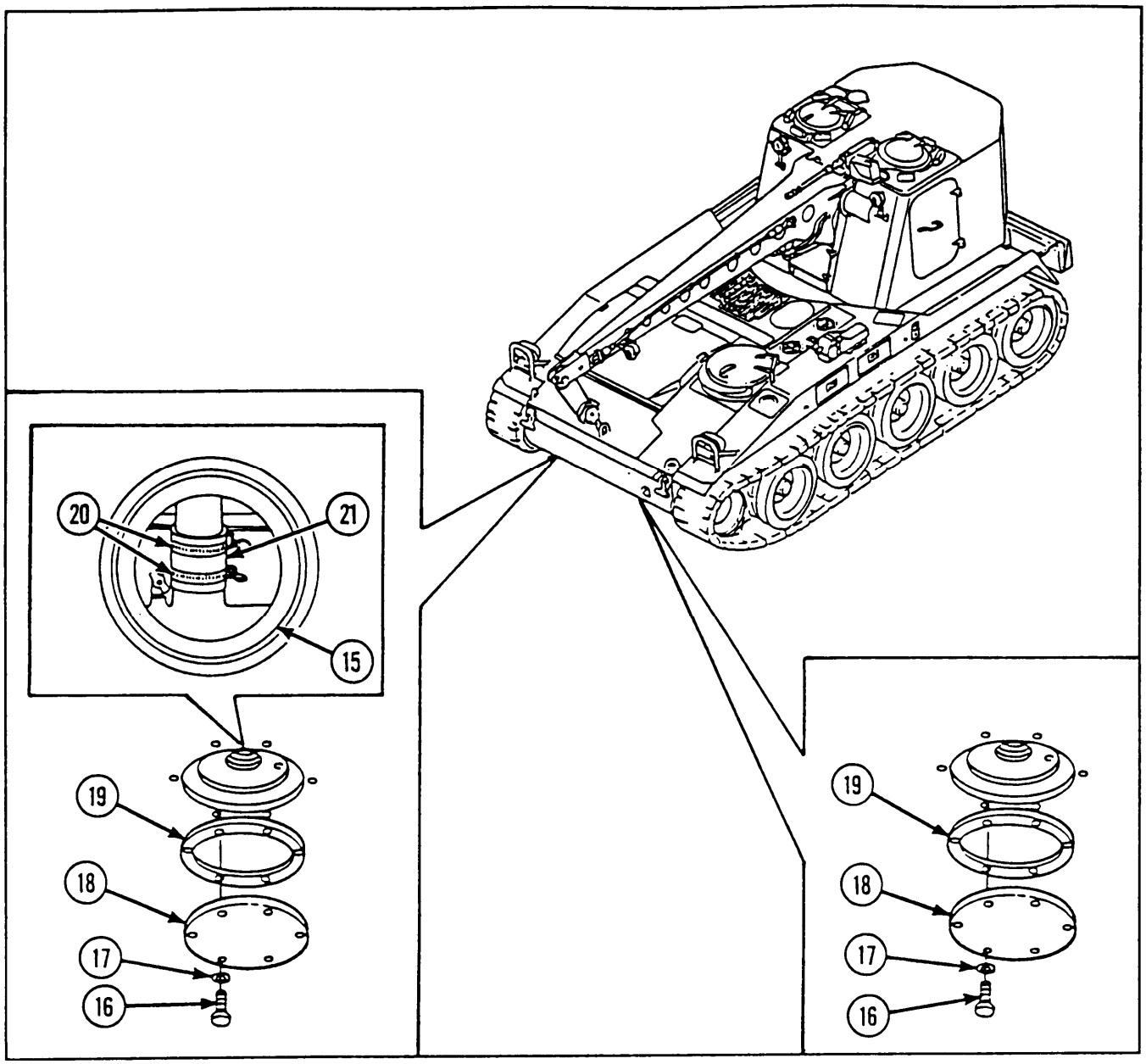
2 Loosen two hose clamps (3) and remove with preformed hose (4).

3 Loosen two hose clamps (5) and remove with preformed hose (6).

4 Loosen two hose clamps (7) and remove with preformed hose (8).

5 Loosen two hose clamps (9) and remove with hose (10) from radiator pressure equalizing metallic tube (11) and radiator to surge tank metal tube assembly (12).

6 Loosen two clamps (13) and remove with hose (14).



NOTE

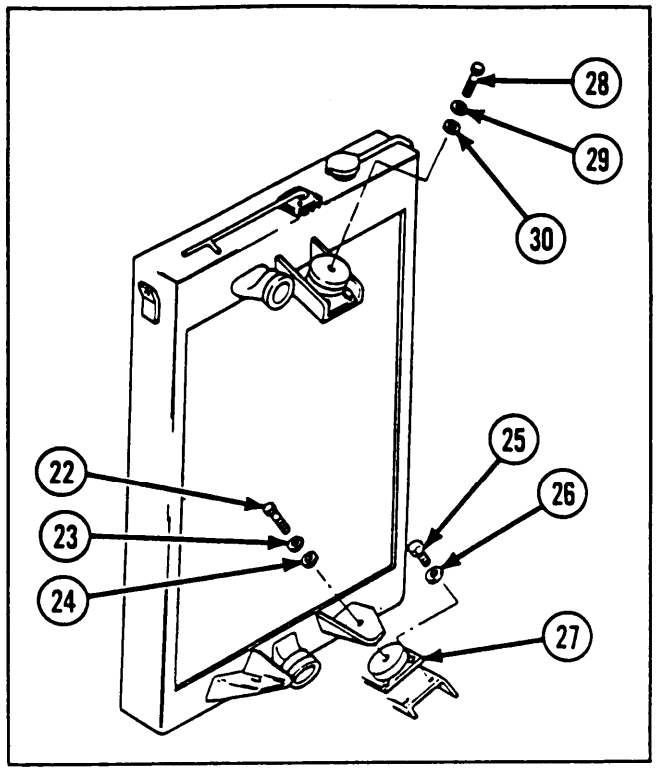
- Gain access to radiator drain access covers from underside of hull.
- Work through radiator drain access hole (15) for steps 7 thru 10.
- Steps 7 thru 13 are written for removal of the right-hand engine coolant radiator, but also apply to removal of left-hand engine coolant radiator.

7 Remove six hexagon head capscrews (16), six lockwashers (17), radiator drain access cover. (18), and radiator drain gasket (19).

8 Loosen two hose clamps (20) and remove withnon metallic hose (21).

2-59. MAINTENANCE OF RADIATOR AND RELATED PARTS (CONT).

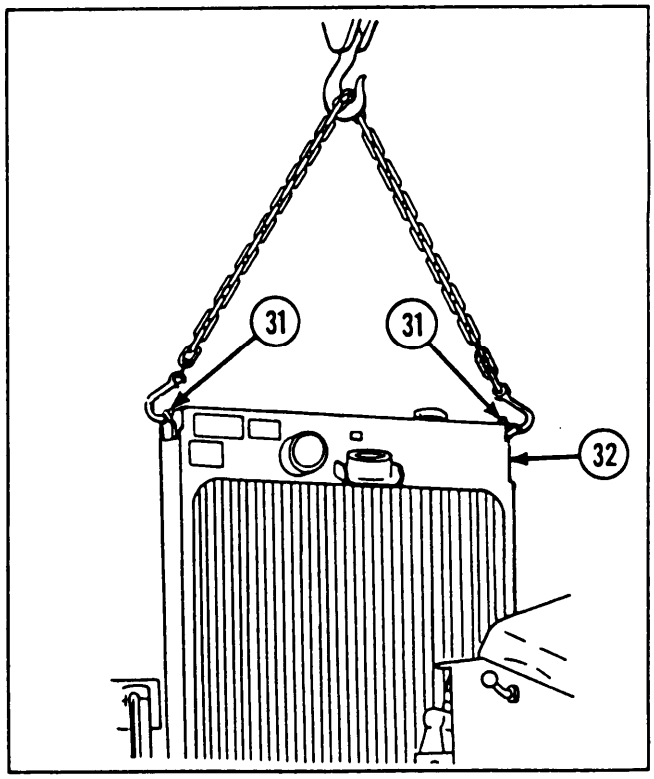
REMOVAL (CONT)



9 Remove two hexagon head capscrews (22), two lockwashers (23), and two flat washers (24).

10 Remove six machine bolts (25), six lockwashers (26), and two radiator base resilient mounts (27).

11 Remove hexagon head capscrew (28), lockwasher (29), and flat washer (30).

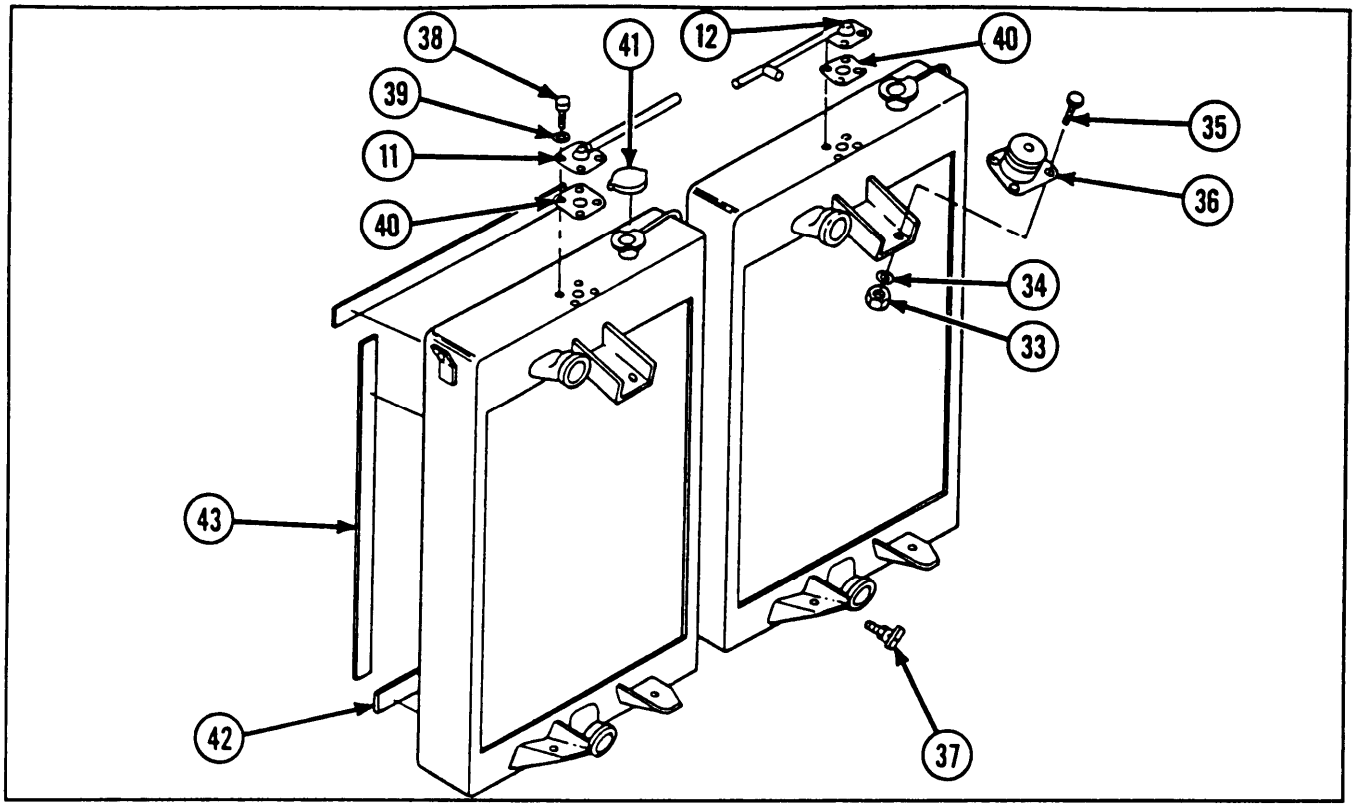


12 Connect hoist and sling to lifting eyes (31) on each side of engine coolant radiator (32).

CAUTION

Use extreme caution when lifting left-hand engine coolant radiator to prevent damage to core and generator air ducting.

13 Lift engine coolant radiator (32) carefully out of engine compartment.



14 Remove six hexagon plain nuts (33), six lockwashers (34), six machine bolts (35), and two radiator base resilient mounts (36).

15 Remove two drain cocks (37).

16 Remove eight hexagon head capscrews (38) and eight packings with retainers (39).

17 Remove radiator pressure equalizing metallic tube (11), radiator to surge tank metal tube assembly (12), and two radiator tube assembly gaskets (40).

18 Remove two filler opening caps (41).

19 Remove four radiator bulkhead rubber strips (42) and four radiator bulkhead seals (43) only if damaged.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

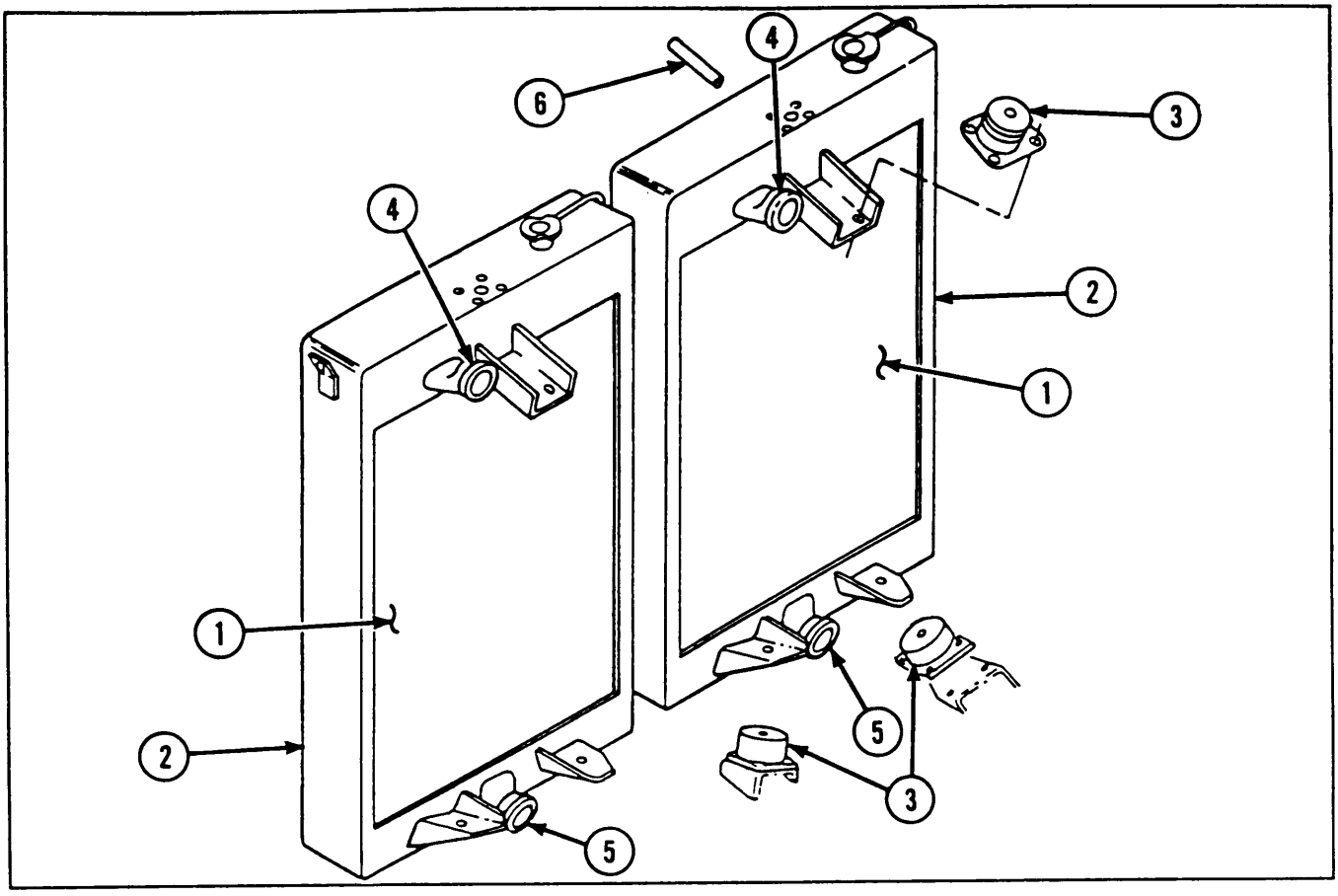
2 Hoses are manufactured items; refer to appendix D.

3 If engine coolant radiator is damaged, notify direct support maintenance.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-59. MAINTENANCE OF RADIATOR AND RELATED PARTS (CONT).

CLEANING



1 Remove dirt from radiator cores (1) with low-pressure compressed air.

2 Clean outside of engine coolant radiator (2), six radiator base resilient mounts (3), and all metal parts with dry cleaning solvent.

3 Dry with low-pressure compressed air.

4 Clean inlet and outlet radiator pipes (4 and 5) with wire brush or emery cloth.

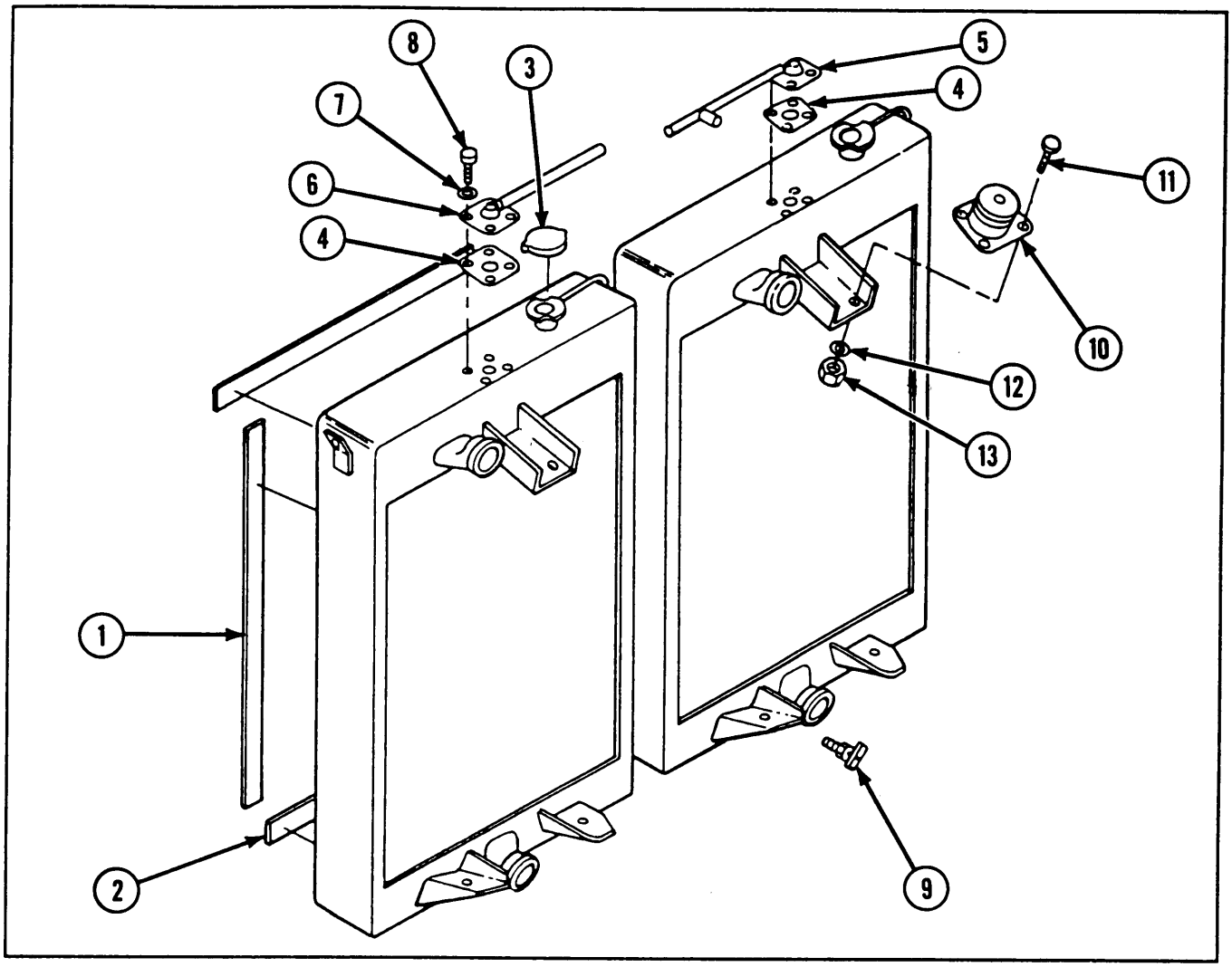
5 Clean inside and outside of overflow hose (6) with soap and water.

6 Flush with clean water and allow to dry.

7 Flush inside of engine coolant radiator (2) with clean, fresh water. If clogged, notify direct support maintenance.

8 Refer to TM 750-254 for general cleaning procedures.

INSTALLATION



1 If removed, apply adhesive to four new radiator bulkhead seals (1) and four new radiator bulkhead rubber strips (2) and install.

2 Install two filler opening caps (3).

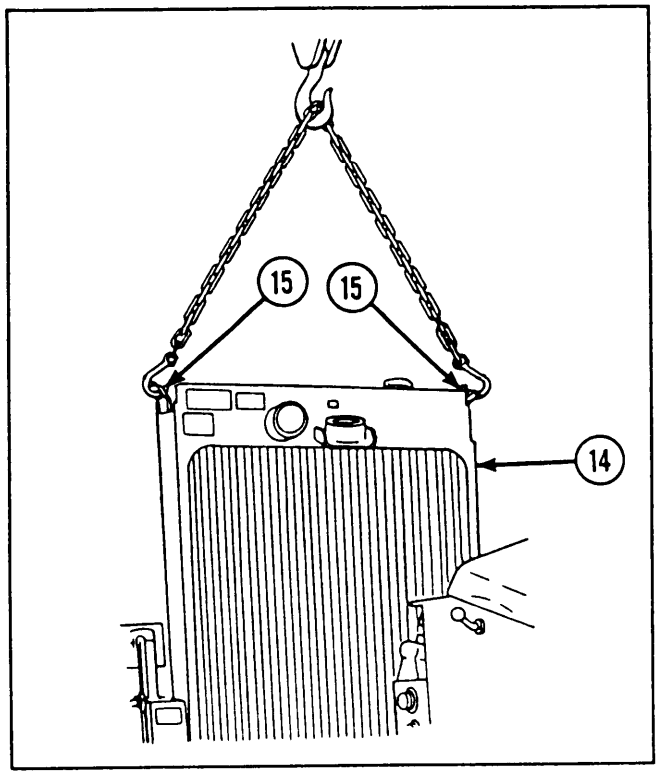
3 Install two new radiator tube assembly gaskets (4), radiator surge tank metal tube assembly (5), and radiator pressure equalizing metallic tube (6), and secure with eight new packings with retainers (7) and eight hexagon head capscrews (8). Torque hexagon head capscrews to 1.2 to 1.5 ft-lb (1.6 to 2.0 N-m).

4 Install two drain cocks (9).

5 Install two radiator base resilient mounts (10) and secure with six machine bolts (11), six new lockwashers (12), and six hexagon plain nuts (13). Torque hexagon plain nuts to 17 to 19 ft-lb (23 to 26 N-m).

2-59. MAINTENANCE OF RADIATOR AND RELATED PARTS (CONT).

INSTALLATION (CONT)

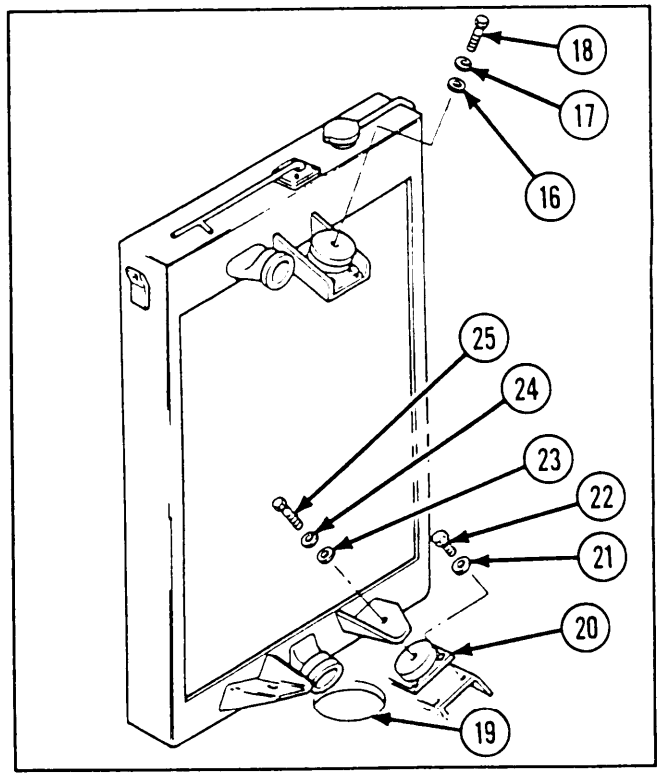


NOTE

Steps 6 thru 12 are written for installation of the right-hand engine coolant radiator, but also apply to installation of left-hand engine coolant radiator.

6 Using hoist and sling, lower engine coolant radiator (14) carefully into engine compartment.

7 Disconnect hoist and sling from lifting eyes (15) on each side of engine coolant radiator (14).



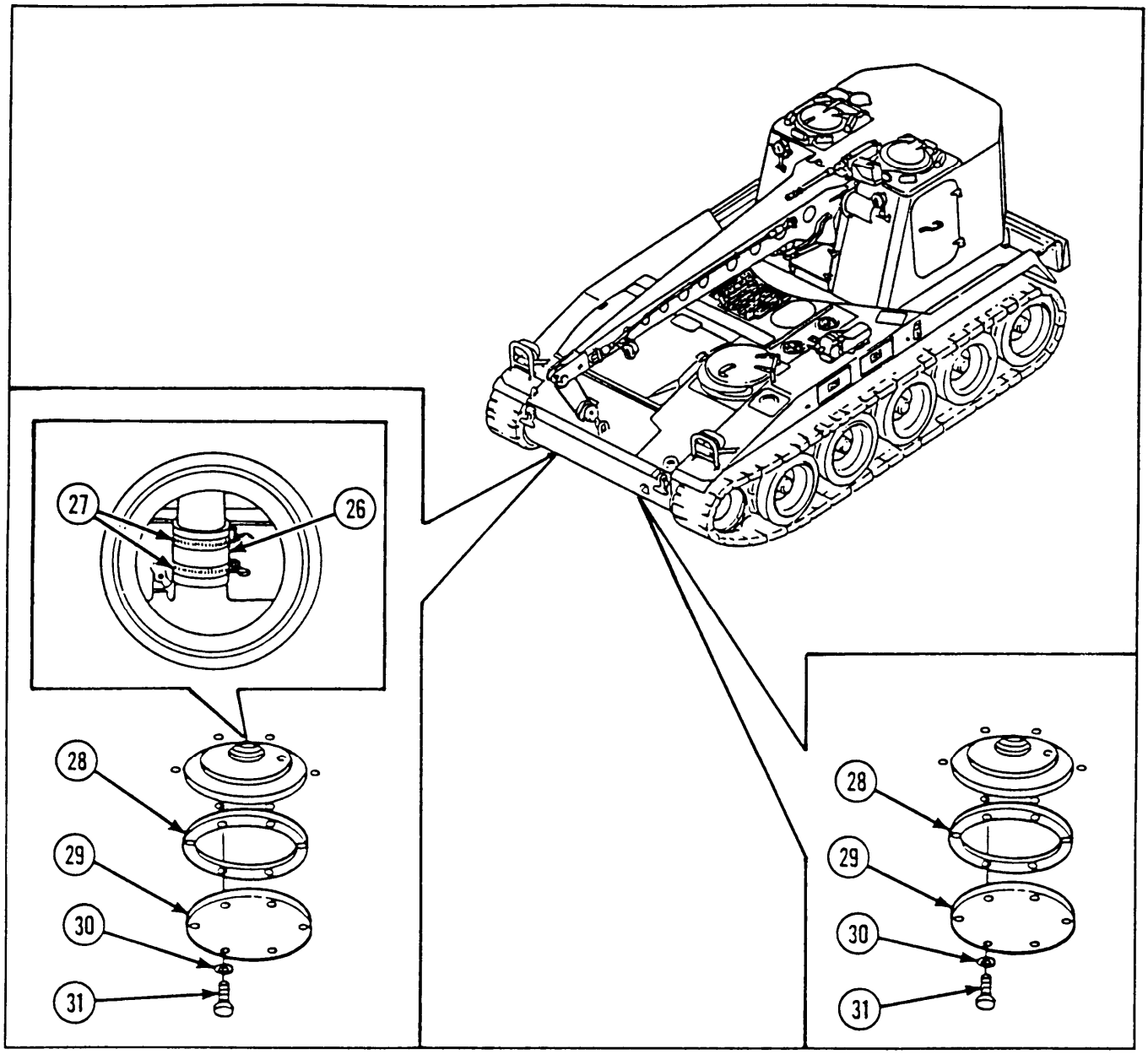
8 Install flat washer (16), new lockwasher (17), and hexagon head capscrew (18).

NOTE

Work through radiator drain access hole (19) on underside of hull for steps 9 thru 12.

9 Install two radiator base resilient mounts (20) and secure with six new lockwashers (21) and six machine bolts (22). Torque machine bolts to 10 to 12 ft-lb (13 to 16 N-m).

10 Install two flat washers (23), two new lockwashers (24), and two hexagon head capscrews (25).

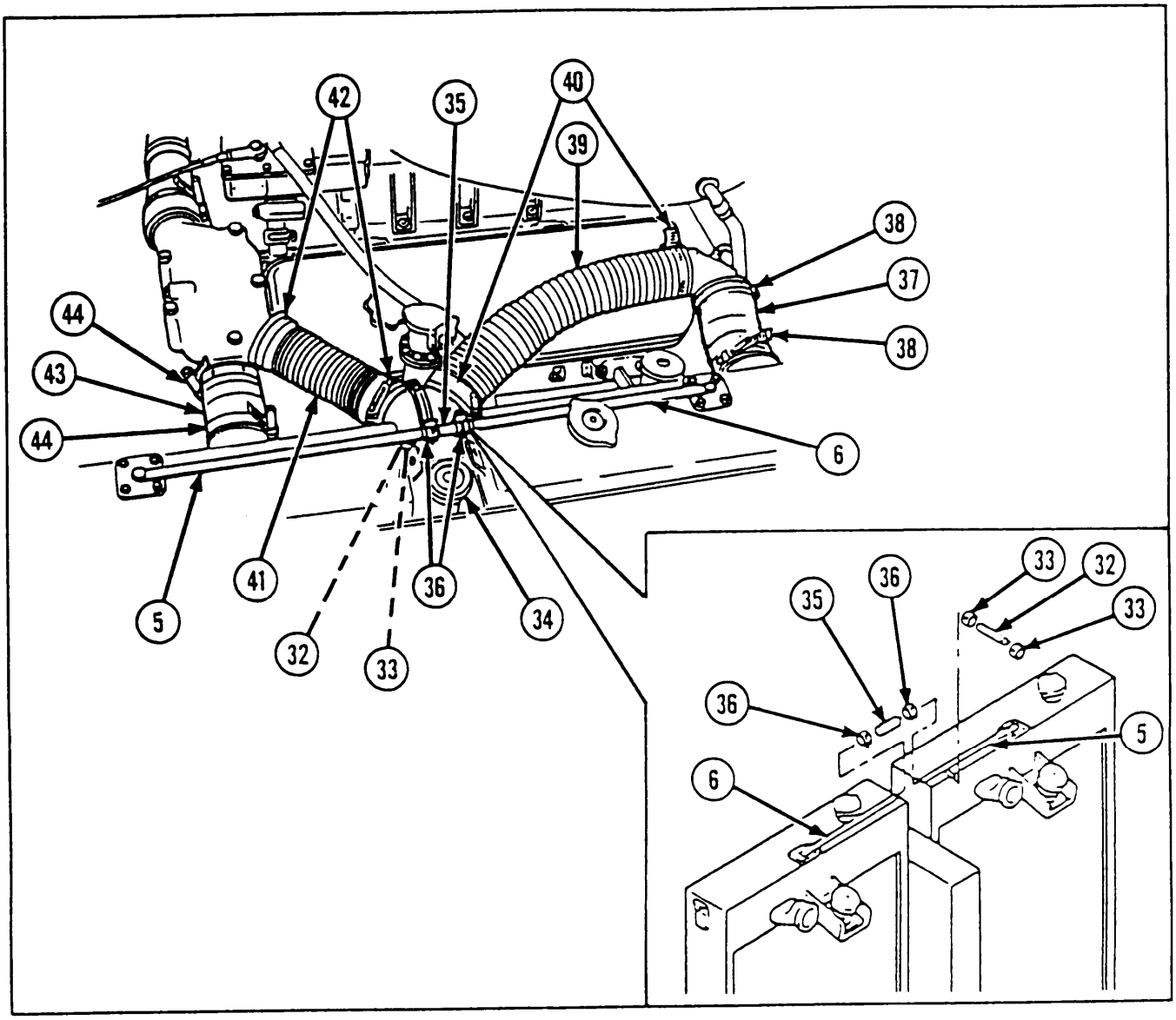


11 Install nonmetallic hose (26) with two hose clamps (27) and tighten hose clamps.

12 Install new radiator drain gasket (28), radiator drain access cover (29), six new lockwashers (30), and six hexagon head capscrews (31).

2-59. MAINTENANCE OFRADATOR AND RELATED PARTS (CONT).

INSTALLATION (CONT)



13 Connect hose (32) with two hose clamps (33) to radiator to surge tank metal tube assembly (5) and surge tank assembly (34). Tighten hose clamps.

14 Slide hose (35) with two clamps (36) on radiator to surge tank metal tube assembly (5) between surge tank tube and radiator pressure equalizing metallic tube (6).

15 Slide hose (35) with two hose clamps (36) onto radiator pressure equalizing metallic tube (6) so that hose is evenly positioned on the radiator to surge tank metal tube assembly (5) and radiator pressure equalizing metallic tube. Tighten hose clamps.

16 Install preformed hose (37) with two hose clamps (38) and tighten hose clamps.

17 Install preformed hose (39) with two hose clamps (40) and tighten hose clamps.

18 Install preformed hose (41) with two hose clamps (42) and tighten hose clamps.

19 Install nonmetallic hose (43) with two hose clamps (44) and tighten hose clamps.

20 Install radiator support beam. Refer to page 2-525.

21 Install hull engine compartment deck assembly lid. Refer to page 2-935.

22 Fill cooling system. Refer to TM 9-2350-238-10.

23 Run engine long enough to check for leaks. If leaks exist, check that all parts are correctly installed. If leaks still exist, inspect for defective parts.

2-60. MAINTENANCE OF RADIATOR SUPPORT BEAM AND RELATED PARTS.

This task covers:
a. Removal
b. Disassembly
c. Inspection/Repair
d. Reassembly
e. Installation

INITIAL SETUP

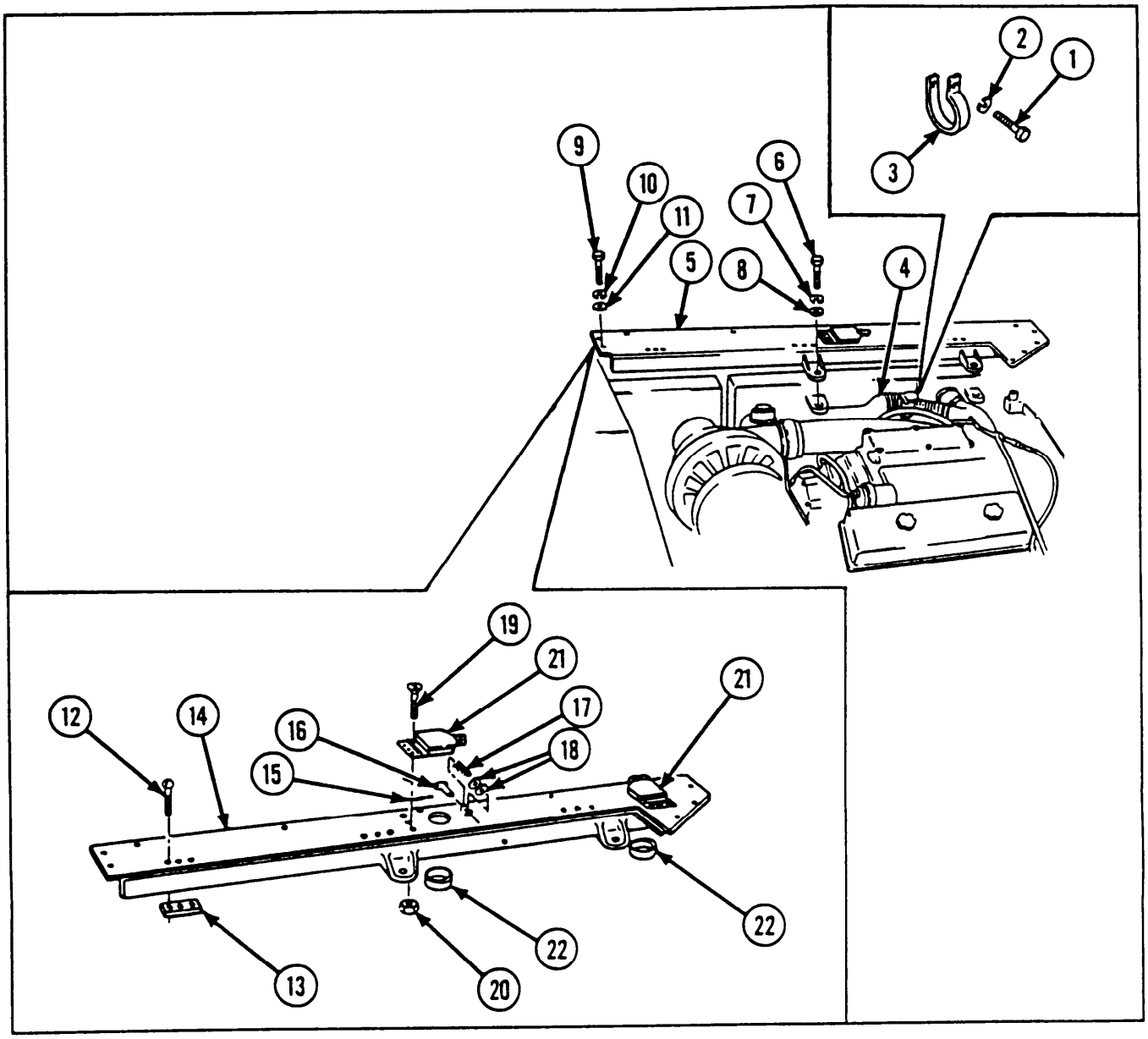
Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1(less power) (item 80, appx B)
• Torque wrench (0 to 170 ft-lb)

Materials/Parts
Adhesive (item 4, appx C)
Lockwasher
Lockwasher (2)
Lockwasher (10)
Nonmetallic seal (2)
Self-locking nut (6)
Spring pin (2)

References
TM 9-23350-238-24P-1

Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed

2-60. MAINTENANCE OF RADIATOR SUPPORT BEAM AND RELATED PARTS (CONT).



REMOVAL

1 Remove machine screw (1), lockwasher (2), and cushioned loop clamp (3) securing engine coolant elbow (4) to radiator beam assembly (5).

2 Remove two screws (6), two lockwashers (7), and two washers (8).

3 Remove ten hexagon head capscrews (9), ten lockwashers (10), and ten flat washers (11).

4 Remove radiator beam assembly (5).

DISASSEMBLY

1 Remove six machine screws (12) and three retaining plates (13) from hull deck support beam (14).

2 Remove two spring pins (15), two radiator filler cover pins (16), two helical springs (17), and four flat washers (18).

3 Remove six machine screws (19), six self-locking nuts (20), two radiator filler cap covers (21) from hull deck support beam (14).

4 Remove two nonmetallic seals (22) from hull deck support beam (14).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

1 Apply adhesive to two new nonmetallic seals (22). Install nonmetallic seals to hull deck support beam (14).

2 Install two radiator filler cap covers (21) to hull deck support beam (14), and secure with six machine screws (19) and six new self-locking nuts (20).

3 Install four flat washers (18), two helical springs (17), two radiator filler cover pins (16), and two new spring pins (15).

4 Install three retaining plates (13) to underside of hull deck support beam (14), and secure with six machine screws (12).

INSTALLATION

1 Install radiator beam assembly (5).

2 Install ten flat washers (11), ten new lockwashers (10), and ten hexagon head capscrews (9). Torque hexagon head capscrews to 21 to 23 ft-lb (28 to 31 N-m).

3 Install two flat washers (8), two new lockwashers (7), and two machine screws (6).

4 Install cushioned loop clamp (3) around engine coolant elbow (4). Secure to radiator beam assembly (5) with new lockwasher (2) and machine screw (1).

2-61. MAINTENANCE OF SURGE TANK AND RELATED PARTS.

This task covers: a. *Removal/Disassembly* b. *Inspection/Repair* c. *Reassembly/Installation*

INITIAL SETUP

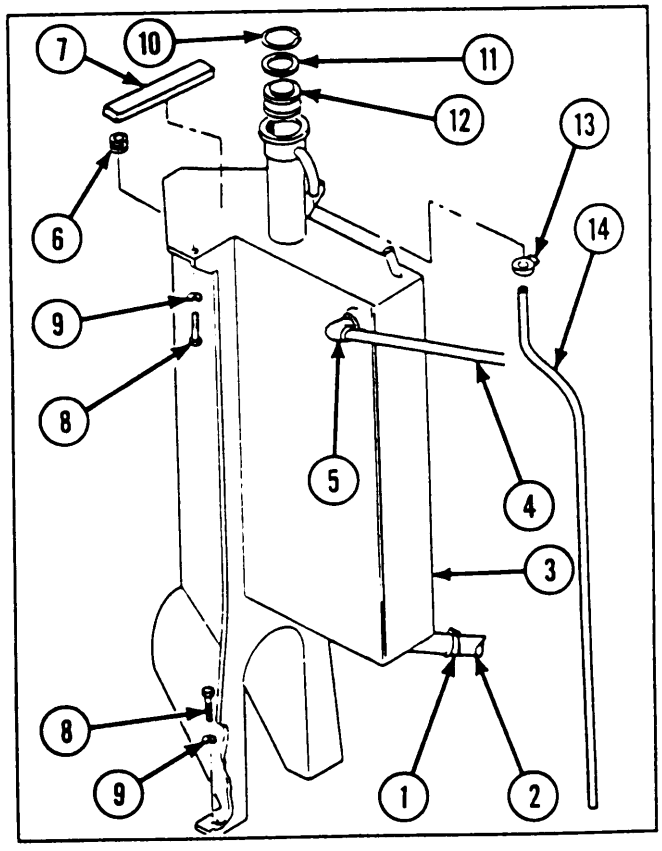
Tools and special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
• Torque wrench (0 to 170 ft-lb)

Materials/Parts
Adhesive (item 4, appx C)
Lockwasher (4)
Rubber hhose (figure D-21, apx D)
Support beam rubber strip
Surge tank parts kit

References
TM 9-2350-238-10
TM 9-2350-238-24P-1

Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed
2-515 Radiator removed
Cooling system drained (TM 9-2350-238-10)

REMOVAL/DISASSEMBLY



1 Remove hose clamp (1).

2 Disconnect rubber hose (2) from surge tank assembly (3).

3 Disconnect surge tank to engine manifold nonmetallic hose assembly (4) from pipe to tube elbow (5).

4 Remove pipe to tube elbow (5) from surge tank assembly (3).

5 Remove pipe plug (6).

6 If damaged, remove support beam rubber strip (7).

7 Remove four hexagon head capscrews (8) and four lockwashers (9).

8 Remove surge tank assembly (3).

9 Remove retaining ring (10), gasket (11), and valve assembly (12).

10 Remove clamp (13) and rubber hose (14).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Rubber hose is a manufactured item; refer to appendix D.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY/INSTALLATION

1 Install surge tank assembly (3) and secure with four new lockwashers (9), and four hexagon head capscrews (8). Torque hexagon head capscrews to 20 to 23 ft-lb (27 to 31 N-m).

2 If removed, apply adhesive to new support beam rubber strip (7) and install.

3 Install pipe plug (6) and tighten.

4 Install pipe to tube elbow (5) to surge tank assembly (3).

5 Connect surge tank to engine manifold nonmetallic hose assembly *(4)* to pipe to tube elbow (5) on surge tank assembly (3).

6 Connect rubber hose (2) to surge tank assembly (3) and install hose clamp (1).

7 Install new valve assembly (12), new gasket (11), and new retaining ring (10).

8 Install new rubber hose (14) with clamp (13).

2-62. MAINTENANCE OF COOLING SYSTEM HOSES, PIPES, AND RELATED PARTS.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

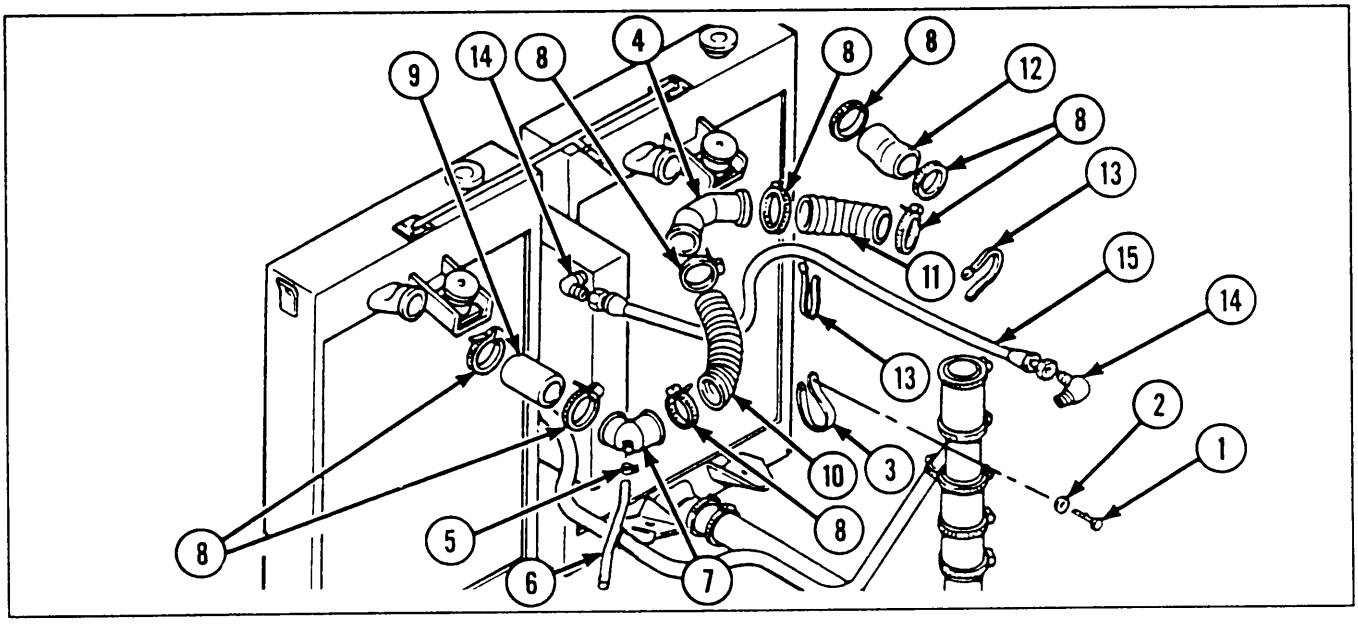
Materials/Parts
Adhesive (item 3, appx C)
Hose (figure D-4, appx D)
Lockwasher
Lockwasher (8)
Nonmetallic hose (figure D-5, appx D)
Nonmetallic hose (figure D-5, appx D)
Sealing compound (item 39, appx C)

References
TM 9-2350-238-10
TM 9-2350-238-24P-1

Equipment Conditions
Cooling system drained
(TM 9-2350-238-10)

2-62. MAINTENANCE OF COOLING SYSTEM HOSES, PIPES, AND RELATED PARTS (CONT).

REMOVAL



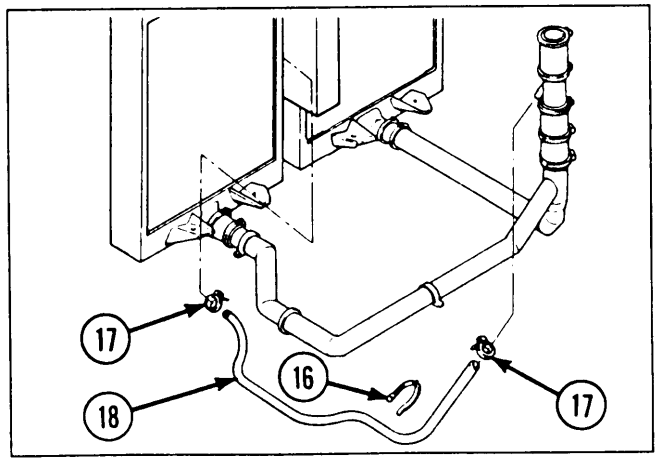
1 Remove machine screw (1), lockwasher (2), and cushioned loop clamp (3) from engine coolant elbow (4).

2 Remove hose clamp (5) and hose (6) from engine coolant detector take-off elbow (7).

3 Loosen and remove eight hose clamps (8), preformed hose (9), engine coolant detector take-off elbow (7), preformed hose (10), engine coolant elbow (4), preformed hose (11), and nonmetallic hose (12).

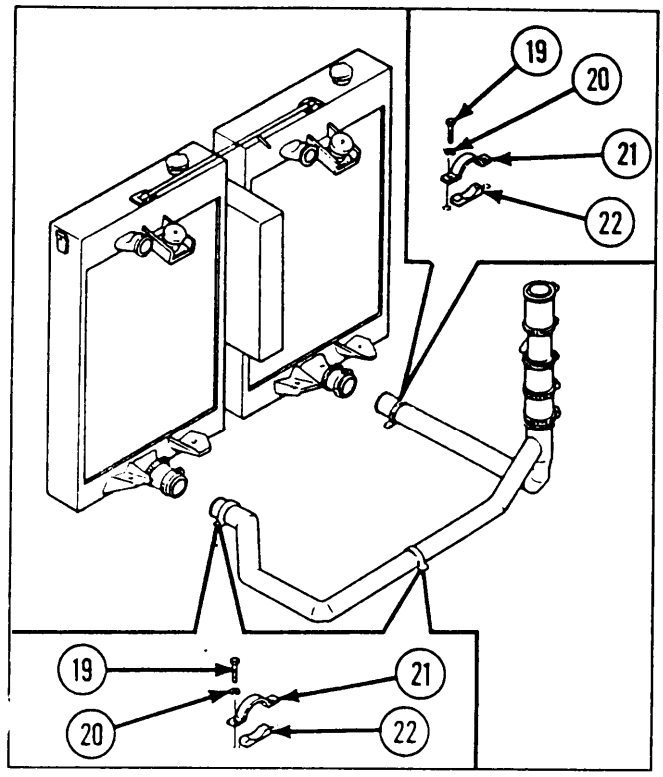
4 Cut and discard two marker bands (13).

5 Remove two pipe to tube elbows (14) and surge tank to engine manifold nonmetallic hose assembly (15).

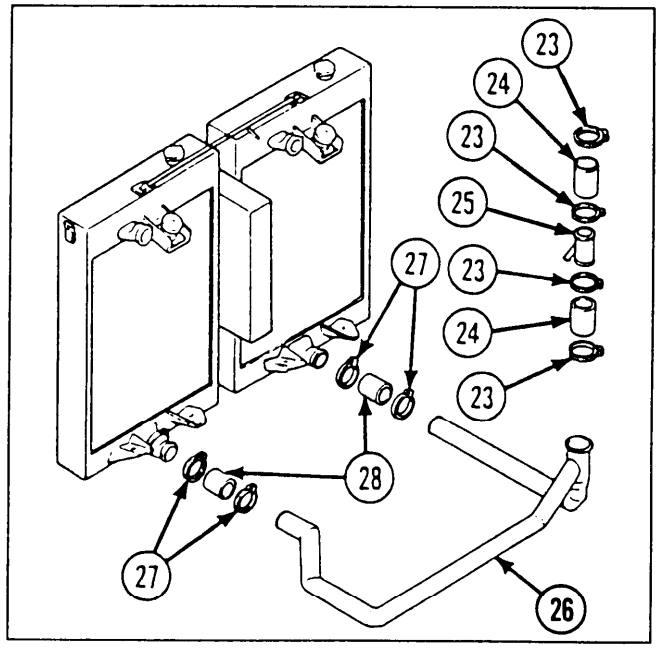


6 Cut and discard marker band (16).

7 Loosen and remove two hose clamps (17) and rubber hose (18).



8 Remove eight hexagon head capscrews (19), eight lockwashers (20), four manifold retaining straps (21), and four rubber strips (22).



9 Loosen and remove four hose clamps (23), two nonmetallic hoses (24), and radiator manifold lateral tube (25) from radiator coolant manifold (26).

10 Loosen and remove four hose clamps (27), two nonmetallic hoses (28), and radiator coolant manifold (26).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Hose is a manufactured item, refer to appendix D.

3 Nonmetallic hoses are manufactured items, refer to appendix D.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

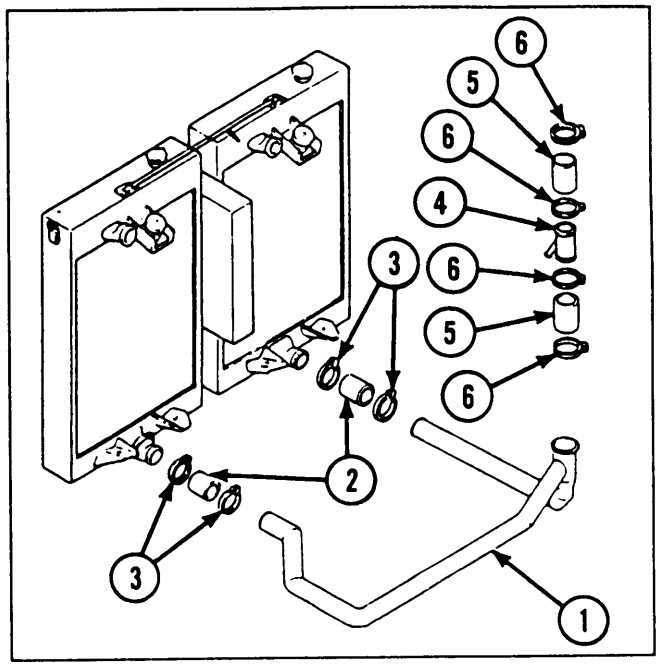
2-62. MAINTENANCE OF COOLING SYSTEM HOSES, PIPES, AND RELATED PARTS (C0NT).

NOTE

Apply sealing compound to hose connections before installing hoses.

1 Install radiator coolant manifold (1), two nonmetallic hoses (2), and four hose clamps (3). Tighten hose clamps.

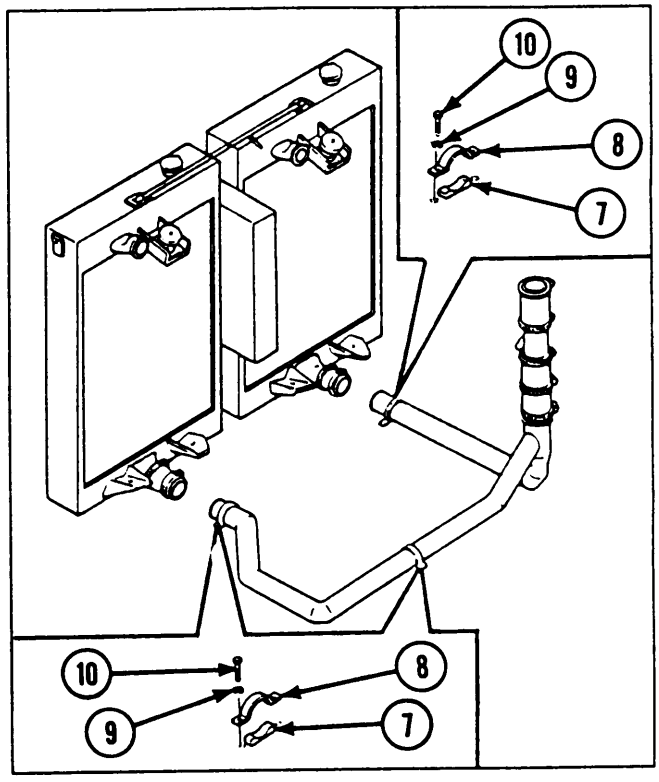
2 Install radiator manifold lateral tube (4), two nonmetallic hoses (5), and four hose clamps (6) on radiator coolant manifold (1). Tighten hose clamps.



NOTE

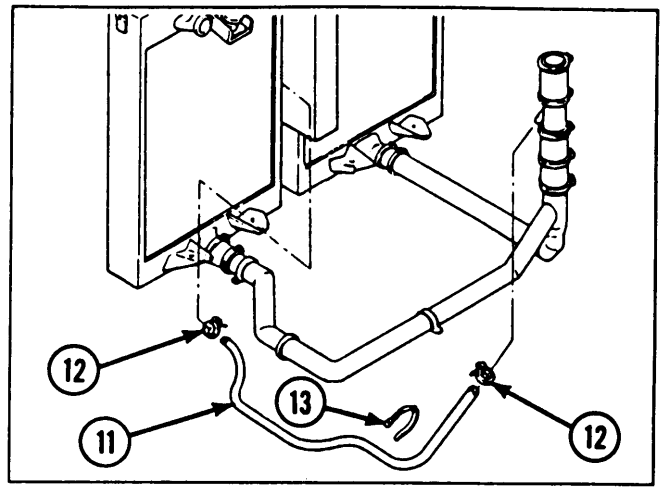
Apply adhesive to rubber strip and position on floor between pads.

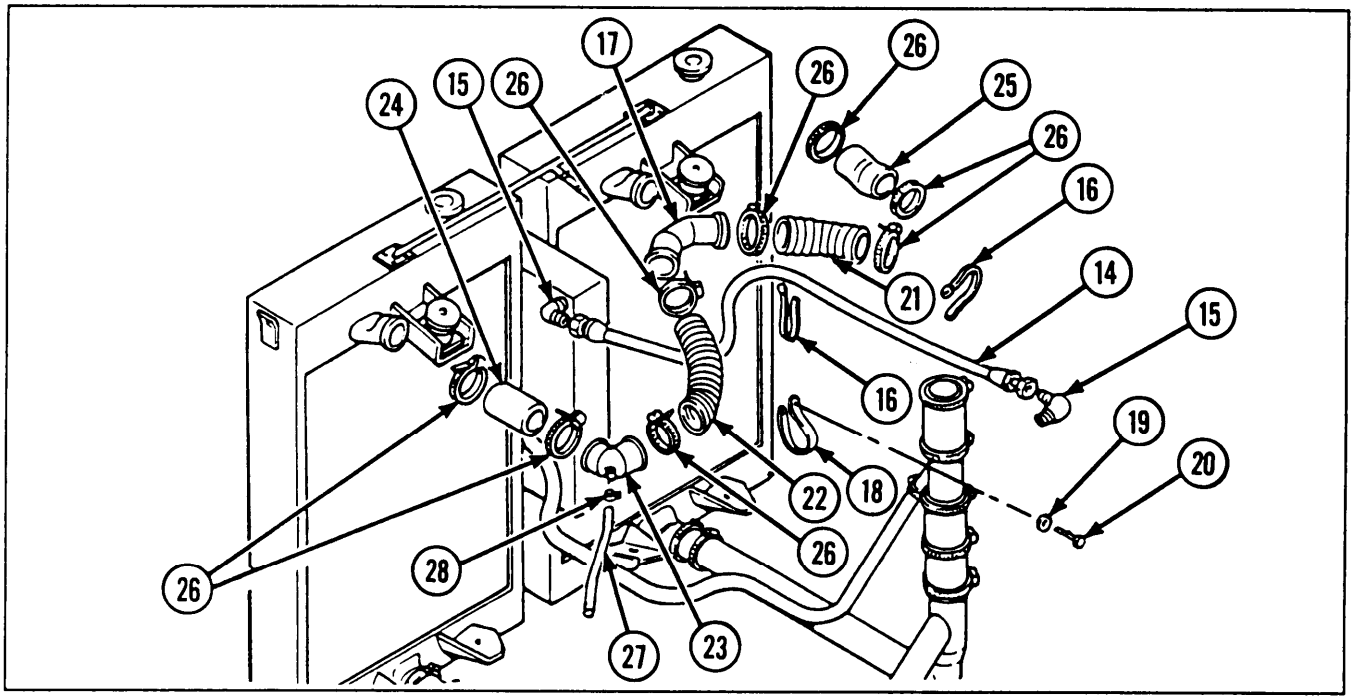
3 Install four rubber strips (7), four manifold retaining straps (8), eight new lockwashers (9), and eight hexagon head capscrews (10).



4 Install rubber hose (11) and two hose clamps (12).

5 Install new marker band (13).





6 Install surge tank to engine manifold nonmetallic hose assembly (14) and two pipe to tube elbows (15).

7 install two new marker bands (16).

8 Install engine coolant elbow (17), cushioned loop clamps (18), lockwasher (19), and machine screw (20).

9 Install preformed hose (21), preformed hose (22), engine coolant detector take-off elbow (23), preformed hose (24), nonmetallic hose (25), and eight hose clamps (26). Tighten hose clamps.

10 Install hose (27) and hose clamp (28) on engine coolant detector take-off elbow (23).

2-63. MAINTENANCE OF THERMOSTATS.

This task covers: a. Removal b. Inspection/Repair c. Installation

INITIAL SETUP

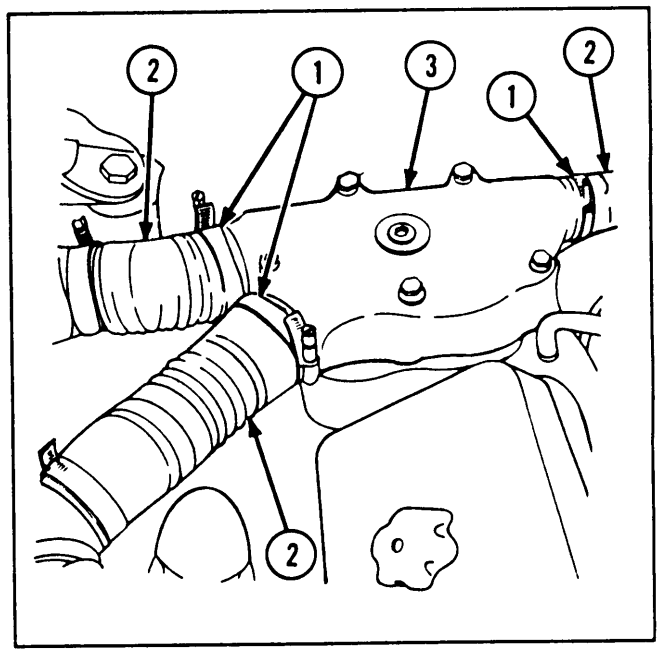
Tools and Special Tools
- Automotive maintenance and repair shop equipment: common no. 1 (less power) (item 80, appx B)
  - Torque wrench (0 to 170 ft-lb)
- Driver handle (item 26, appx B)
- Thfermostat seal installer (item 40, appx B)

Materials/Parts
- Gasket
- Lockwassher (5)
- Plain seal (2)

References
- TM 9-2350-238-10
- TM 9-2815-202-24P

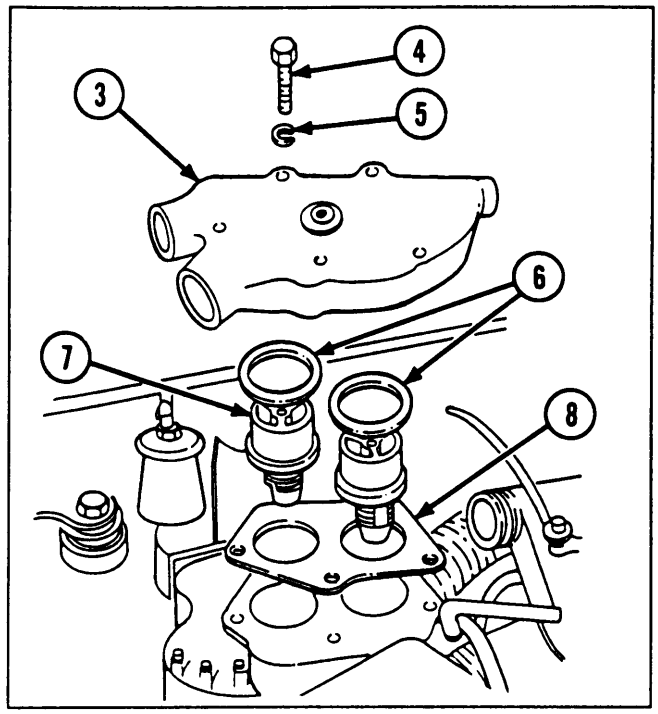
Equipment conditions
- 2-935 Hull engine coompartment deck assembly lid removed
- Cooling system drained (TM 9-2350-238-10)

REMOVAL



1 Loosen three hose clamps (1).

2 Disconnect hoses (2) from thermostat cover (3).



3 Remove five hexagon head capscrews (4) and lockwashers (5).

4 Remove thermostat cover (3), two plain seals (6), two thermostats (7), and gasket (8).

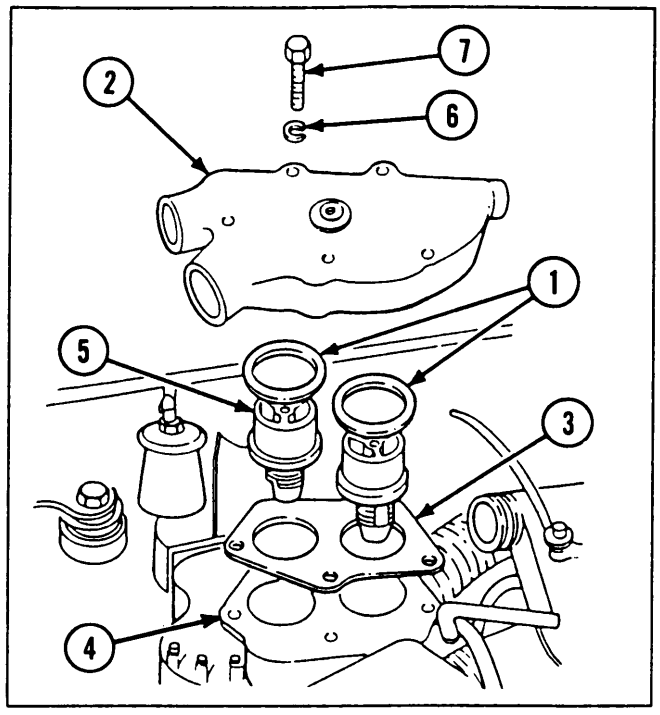
INSPECTION/REPAIR

1 Check for broken, damaged, or missing parts.

2 Check thermostat for corrosion and freedom of spring movement.

3 Repair is by replacement of authorized parts (TM 9-2815-202-24P) which do not meet inspection criteria.

INSTALLATION



1 Install two new plain seals (1) in thermostat cover (2) using thermostat seal installer and driver handle. Position seals so lip of seal faces toward top of thermostat cover.

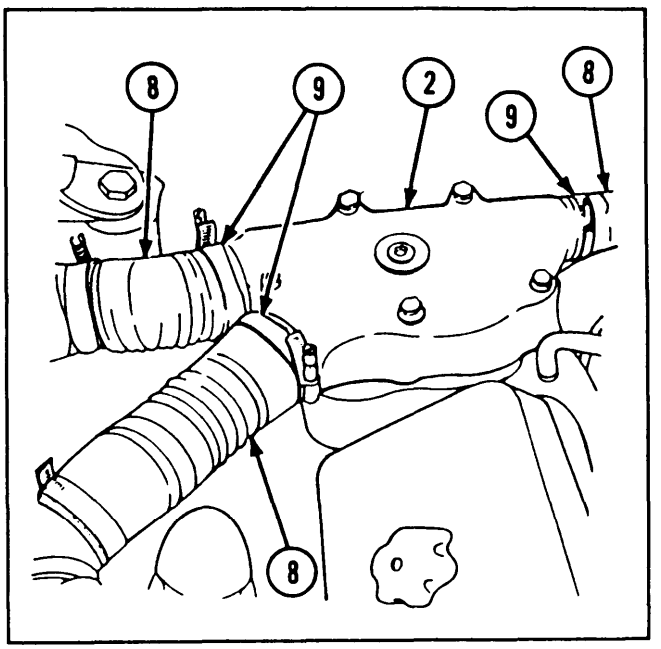
2 Place new gasket (3) on engine water outlet (4).

3 Install two thermostats (5) in engine water outlet (4).

4 Install thermostat cover (2) using five new lockwashers (6) and hexagon head capscrews (7). Torque capscrews to 30 to 35 ft-lb (41 to 47 N-m).

2-63. MAINTENANCE OF THERMOSTATS (CONT).

INSTALLATION (CONT)



5 Connect three hoses (8) to thermostat cover (2).

6 Tighten three hose clamps (9).

7 Fill cooling system (TM 9-2350-238-10).

8 Operate engine until operating temperature is reached. Check for leaks and proper operation of thermostats.

9 Repair all leaks.

2-64. MAINTENANCE OF WATER BY-PASS AND CROSSOVER TUBES.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

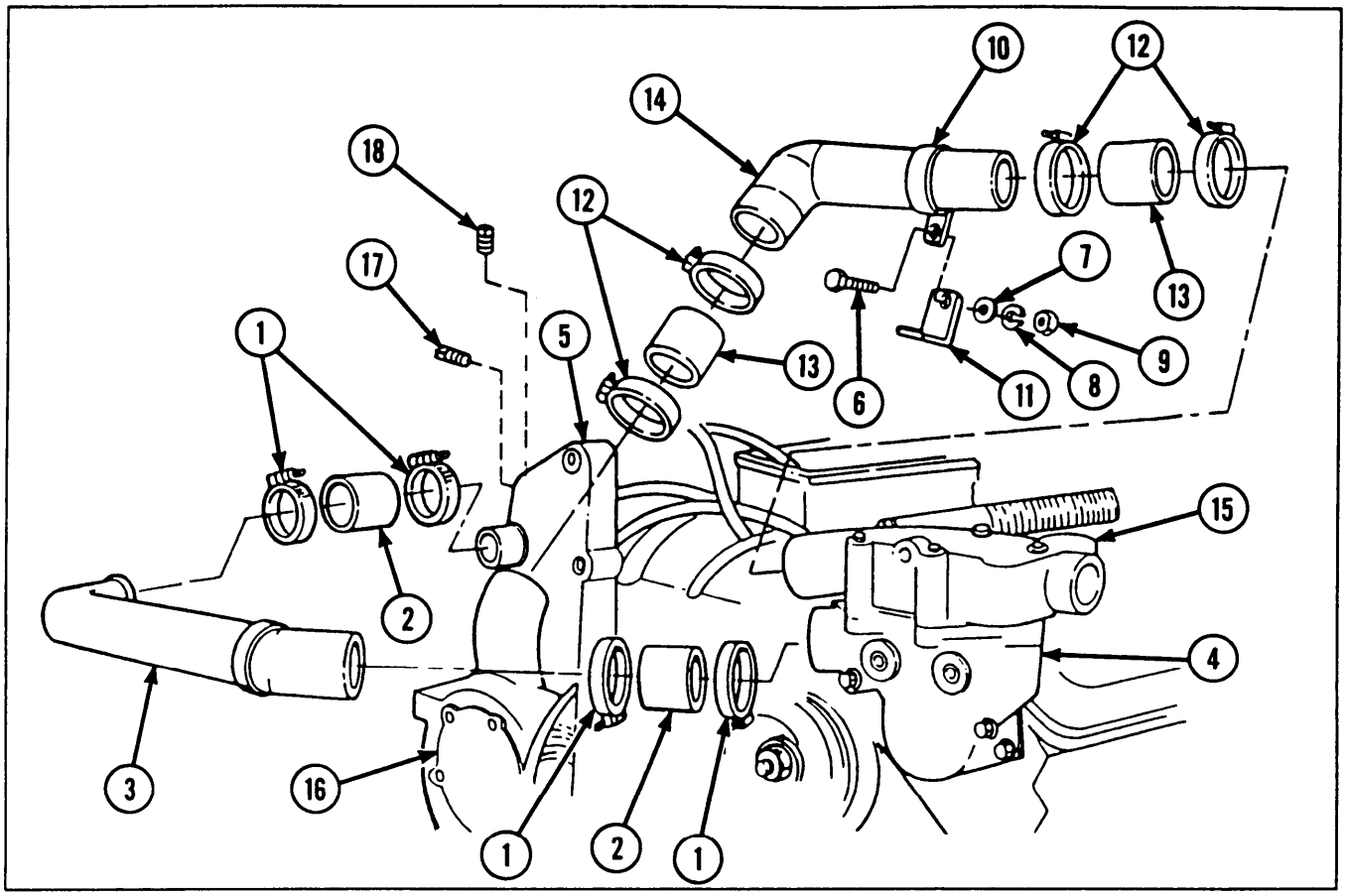
INITIAL SETUP

Materials/Parts
Crossover tube parts kit
Lockwasher
Nonmetallic hose (4)

References
TM 9-2815-202-24P

Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed

REMOVAL



1 Loosen four hose clamps (1) and two nonmetallic hoses (2) securing water crossover tube (3) to engine water outlet (4) and flange to tube elbow (5).

2 Slide hose clamps (1) and nonmetallic hoses (2) onto water crossover tube (3). Remove water crossover tube.

3 Remove hose clamps (1) and nonmetallic hoses (2) from water crossover tube (3).

4 Remove machine bolt (6), flat washer (7), lockwasher (8), and hexagon plain nut (9) securing loop clamp (10) to angle bracket (11).

5 Loosen four hose clamps (12) and two nonmetallic hoses (13) securing water by-pass loop (14) to thermostat cover (15) and water pump (16).

6 Slide hose clamps (12) and nonmetallic hoses (13) onto water by-pass tube (14). Remove water by-pass tube.

7 Remove hose clamps (12) and nonmetallic hoses (13) from water by-pass tube (14).

8 Remove pipe plug (17) and pipe plug (18).

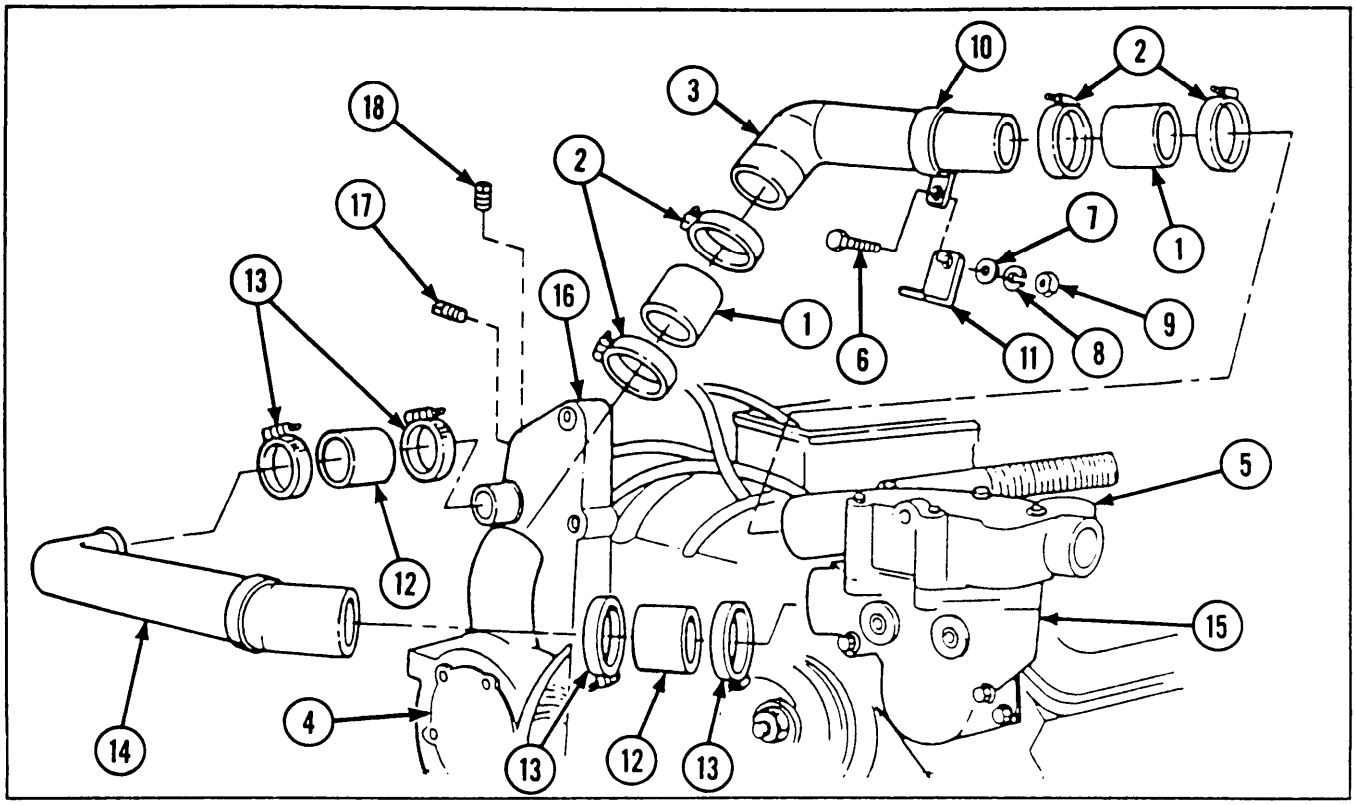
2-64. MAINTENANCE OF WATER BY-PASS AND CROSSOVER TUBES (CONT).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2815-202-24P).

INSTALLATION



1 Slide two nonmetallic hoses (1) and four hose clamps (2) onto ends of water by-pass tube (3).

2 Install water by-pass tube (3) between water pump (4) and thermostat cover (5). Slide nonmetallic hoses (1) onto water pump and thermostat cover and secure with hose clamps (2).

3 Install machine bolt (6), flat washer (7), new lockwasher (8), and hexagon plain nut (9) securing loop clamp (10) to angle bracket (11).

4 Slide two nonmetallic hoses (12) and four hose clamps (13) onto ends of water crossover tube (14).

5 Install water crossover tube (14) between engine water outlet (15) and flange to tube elbow (16) and secure with hose clamps (13).

6 Install pipe plug (17) and pipe plug (18).

2-65. MAINTENANCE OF AERATION DETECTOR.

This task covers:

a. *Removal* b. Inspection/Repair c. *Installation* d. **Testing**

INITIAL SETUP

Materials/Parts
Lockwasher (5)
Lockwasher

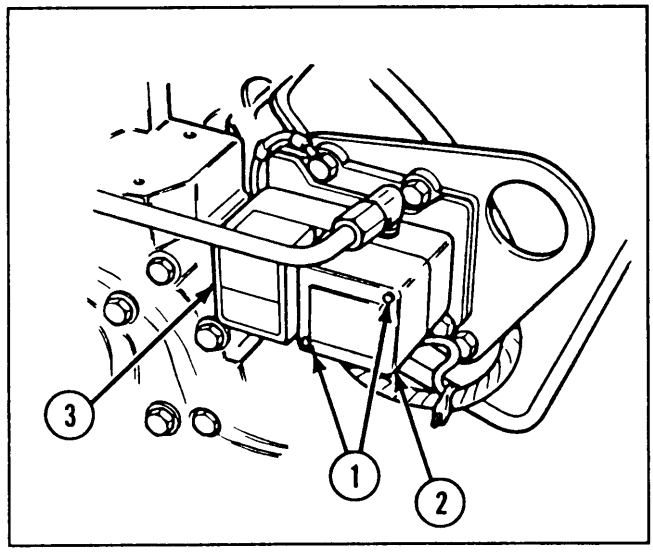
References
TM 9-2350-238-10
TM 9-2350-238-24P-1

Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed
Cooling system drained (TM 9-2350-238-10)

REMOVAL

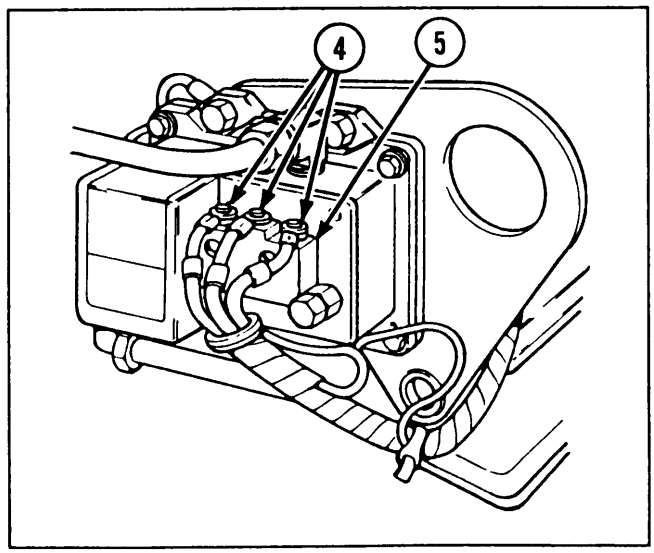
NOTE
Retain screws removed from access cover.

1 Remove two existing screws (1) and access cover (2) from rate of flow control (3).



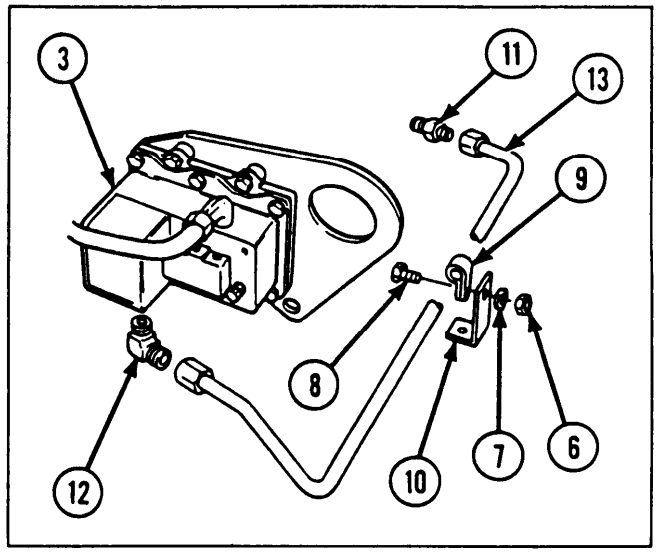
NOTE
Tag all electrical leads to aid in identification.

2 Disconnect three electrical leads (4) from terminal (5).



2-65. MAINTENANCE OF AERATION DETECTOR (CONT).

REMOVAL (CONT)

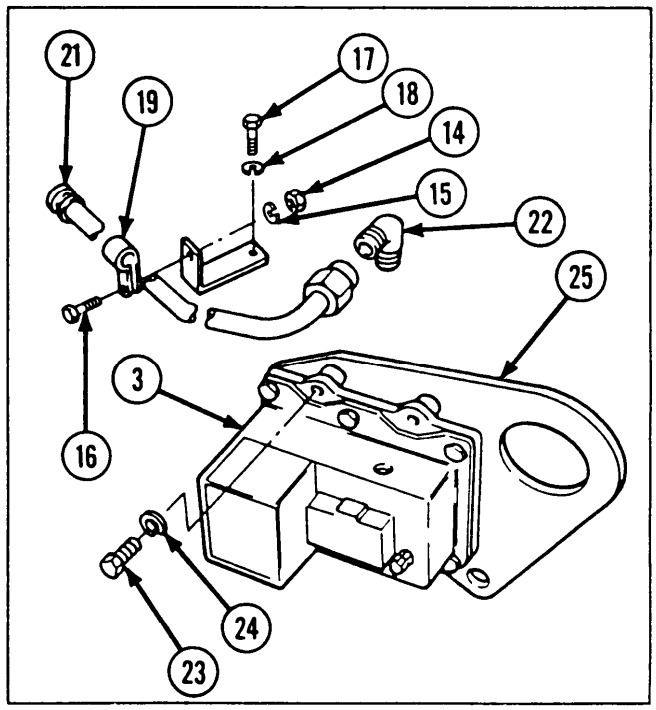


3 Remove hexagon plain nut (6), lockwasher (7), hexagon head capscrew (8), and loop clamp (9) from tube support angle bracket (10).

4 Disconnect pipe straight adapter (11) and pipe to tube elbow (12) from rate of flow control (3).

5 Remove pipe straight adapter (11) and pipe to tube elbow (12) from metal tube assembly (13).

6 Remove hexagon plain nut (14), lockwasher (15), hexagon head capscrew (16), hexagon head capscrew (17), lockwasher (18), loop clamp (19), and tube support angle bracket (20) from rate of flow control (3).



7 Disconnect metal tube assembly (21) from pipe to tube elbow (22).

8 Remove pipe to tube elbow (22) from rate of flow control (3).

9 Remove three hexagon head capscrews (23), three lockwashers (24), and rate of flow control (3) from detector mounting and engine lifting plate (25).

NOTE

Retain screws removed from detector mounting and engine lifting plate.

10 Remove detector mounting and engine lifting plate (25) and existing screws from engine.

INSPECTION/REPAIR

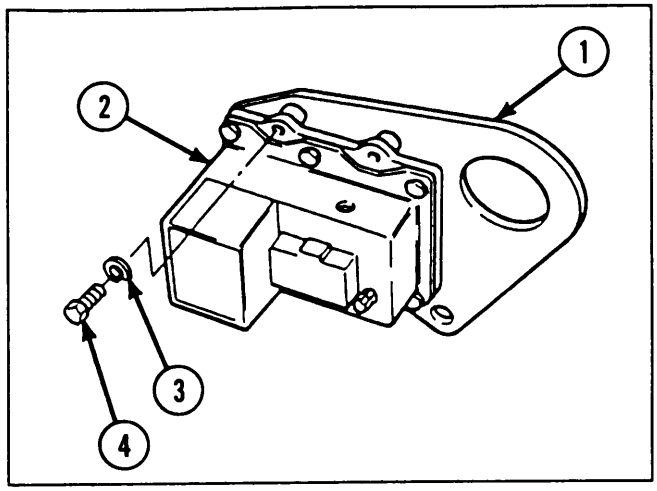
1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install detector mounting and engine lifting plate (1) on engine, and secure with retained screws. Torque screws, refer to appendix E.

2 Position rate of flow control (2) on detector mounting and engine lifting plate (1). Secure with three new lockwashers (3) and three hexagon head capscrews (4).

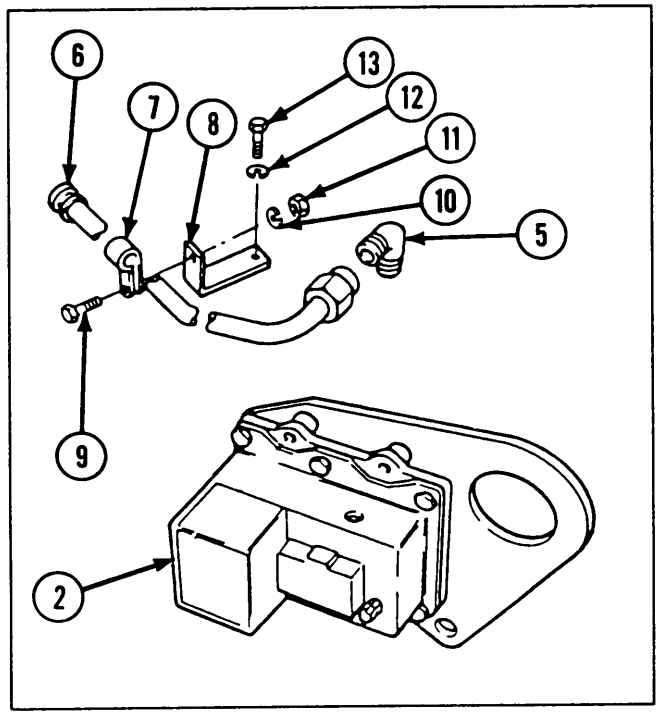


3 Install pipe to tube elbow (5) to rate of flow control (2).

4 Connect metal tube assembly (6) to pipe to tube elbow (5).

5 Install loop clamp (7) to metal tube assembly (6).

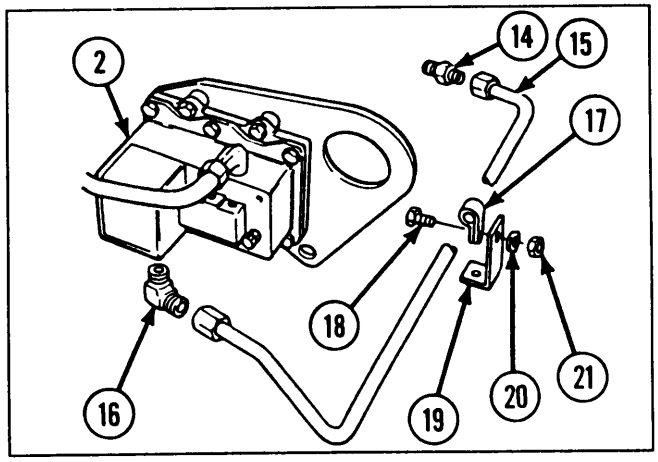
6 Install tube support angle bracket (8). Secure with hexagon head capscrew (9), new lockwasher (10), hexagon plain nut (11), new lockwasher (12), and hexagon head capscrew (13).



7 Install pipe straight adapter (14) to metal tube assembly (15).

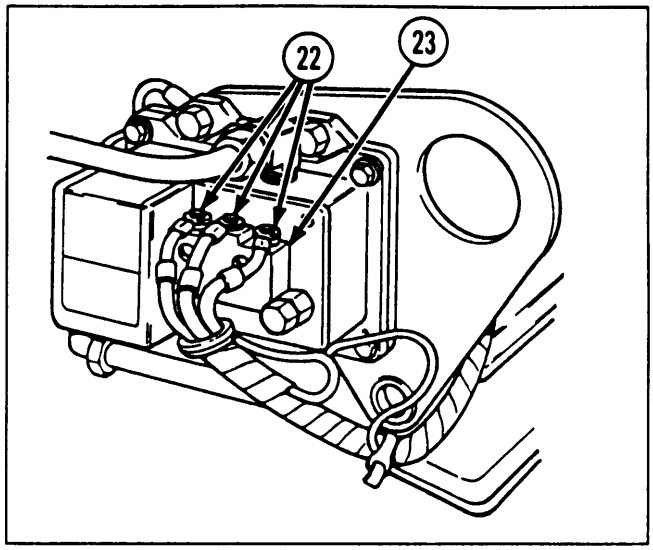
8 Install pipe to tube elbow (16) to rate of flow control (2).

9 Install metal tube assembly (15), loop clamp (17), hexagon head capscrew (18), tube support angle bracket (19), new lockwasher (20), and hexagon plain nut (21).

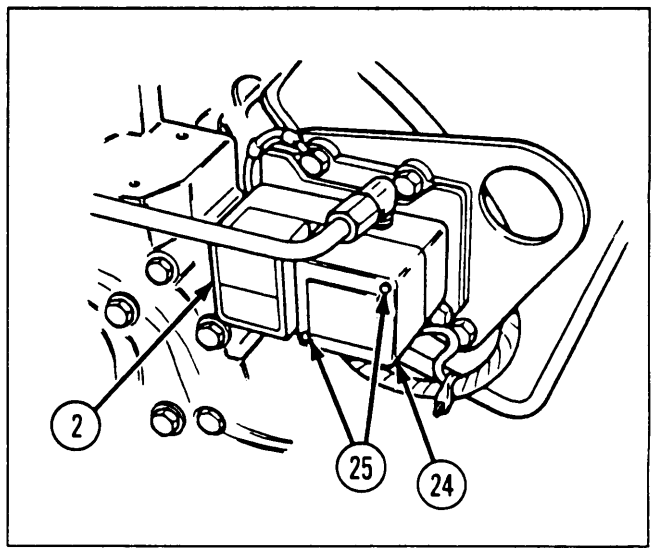


2-65. MAINTENANCE OF AERATION DETECTOR (CONT).

INSTALLATION (CONT)



10 Connect three electrical leads (22) to terminal (23).



11 Install access cover (24) on rate of flow control (2). Secure with two retained screws (25).

TESTING

1 Fill cooling system. Refer to TM 9-2350-238-10.

2 Operate engine until operating temperature is reached. Check for leaks.

3 Repair all leaks.

2-66. MAINTENANCE OF COOLING SYSTEM FAN TENSIONER AND RELATED PARTS.

This task covers:
a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. *Installation/Alignment*
f. *Adjustment*

INITIAL SETUP

Tools and Special Tools
Automotive maintenance and reair shop equiipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
• Torque wrench (0 to 170 ft-lb)
Sling (item 82, appx B)

Materials/Parts
Cooling fan mounting gasket
Cotter pin
Hydraulic fluid (item 21, appx C)
Lockwasher (2)
Lockwassher 91)
Lockwasher (12)
Masking tape (iitem 45, appx C)
Self locking nut
Self locking nut
V-belt

References
TM 9-2350-238-10
TM 9-2350-238-24P-1

Equipment Conditions
2-938 Fan well deck grille removed
2-935 Hull engine compartment dedck assembly lid removed
2-938 Hull transmission compartment deck assembly removed
2-515 Radiator removed
Cooling system drained (TM 9-2350-238-10)

General Safety Instructions

Fan belt tensioner is under tension. When removing nuts, care should be taken to ensure safety of personnel.

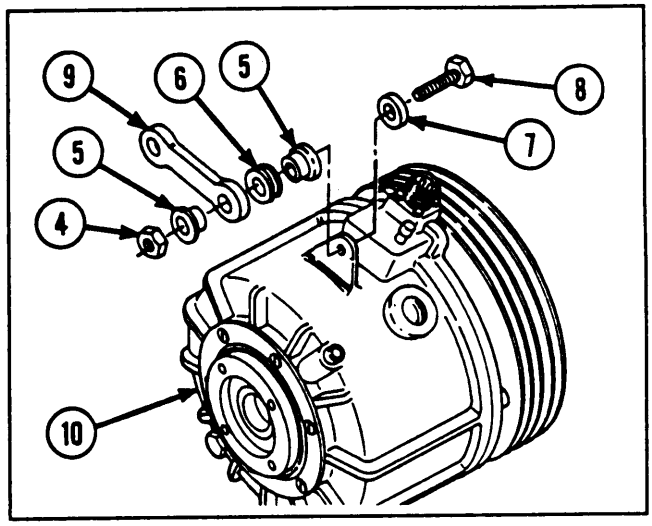
REMOVAL

1 Loosen hexagon plain nut (1).

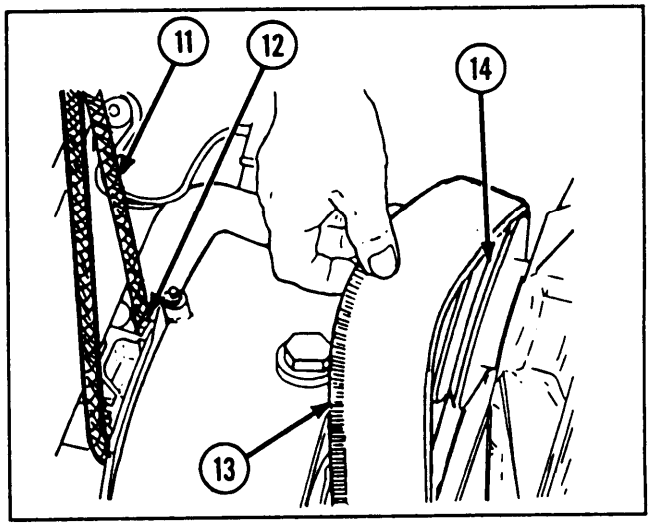
2 Loosen self-locking nut (2) to release fan belt tensioner (3).

2-66. MAINTENANCE OF COOLING SYSTEM FAN TENSIONER AND RELATED PARTS (CONT).

REMOVAL (CONT)



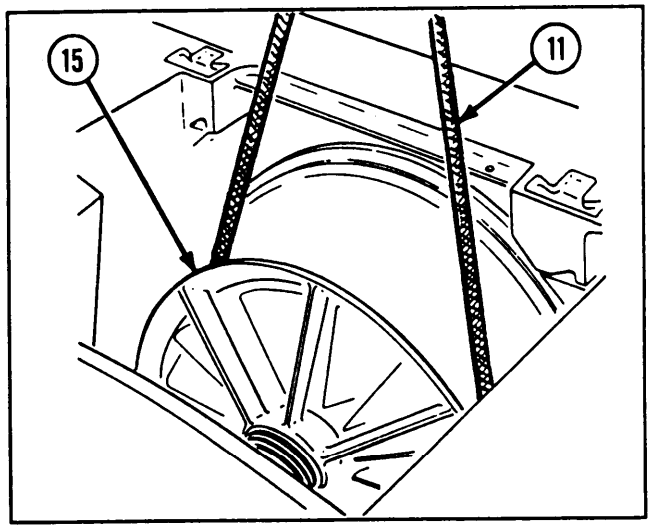
3 Remove self-locking nut (4), two sleeve spacers (5), nonmetallic grommet (6), flat washer (7), and screw (8) securing connecting link (9) to vehicular drive (10).



4 Place sling (11) under bearing unit drive shaft (12).

5 Lift bearing unit drive shaft (12) just enough to allow slack in V-belt (13).

6 Slide V-belt (13) off groove pulley (14). Remove sling (11).



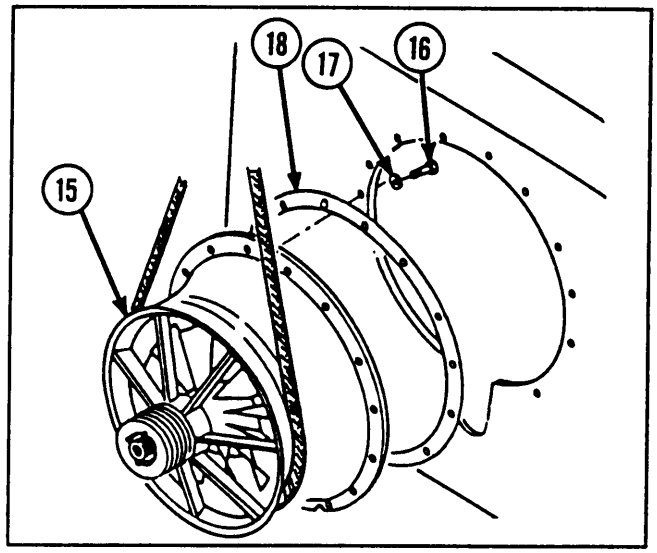
7 Place sling (11) around radiator cooling vaneaxial fan (15).

NOTE

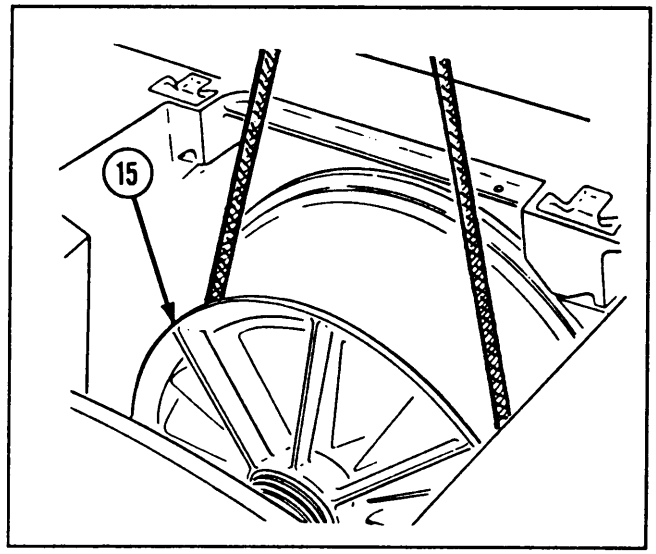
Tighten sling to support radiator cooling vaneaxial fan when removing attaching hardware.

8 Remove 12 hexagon head capscrews (16) and 12 lockwashers (17) from radiator cooling vaneaxial fan (15).

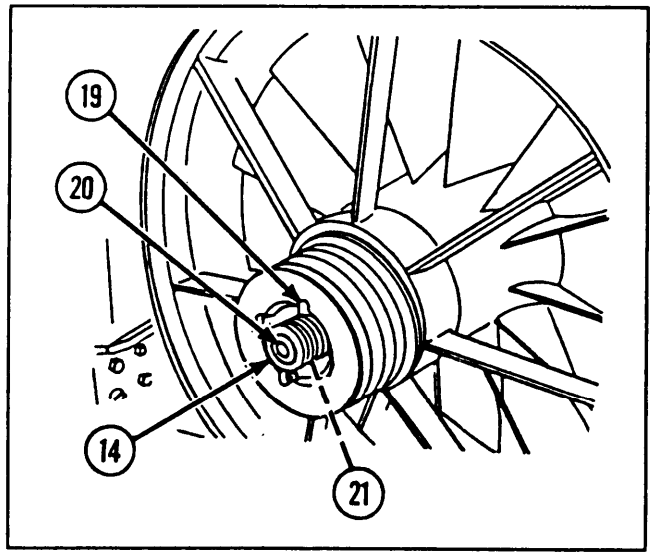
9 Remove cooling fan mounting gasket (18).



10 Remove radiator cooling vaneaxial fan (15) from vehicle.



11 Remove two socket head capscrews (19), groove pulley (14), cooling fan pulley tapered bushing (20), and machine key (21) from key shaft.



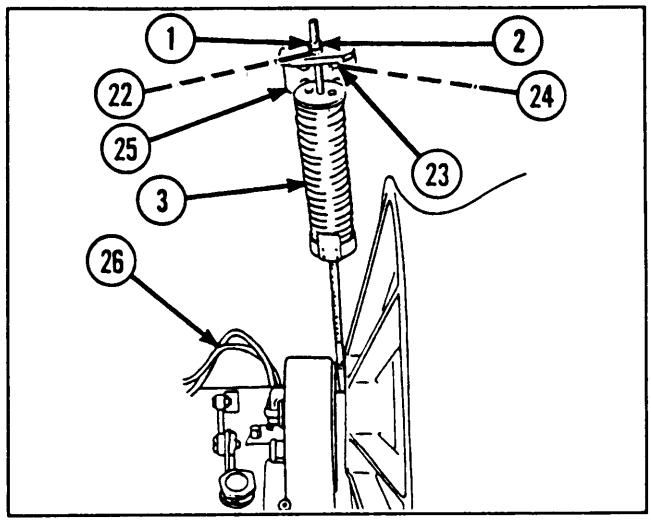
2-66. MAINTENANCE OF COOLING SYSTEM FAN TENSIONER AND RELATED PARTS (CONT).

REMOVAL (CONT)

WARNING

Fan belt tensioner is under tension. When removing nuts, care should be taken to ensure safety of personnel.

12 Remove hexagon plain nut (1), self-locking nut (2), concave washer (22), fan belt tensioner (3), four hexagon head capscrews (23), four lockwashers (24), and angle bracket (25).

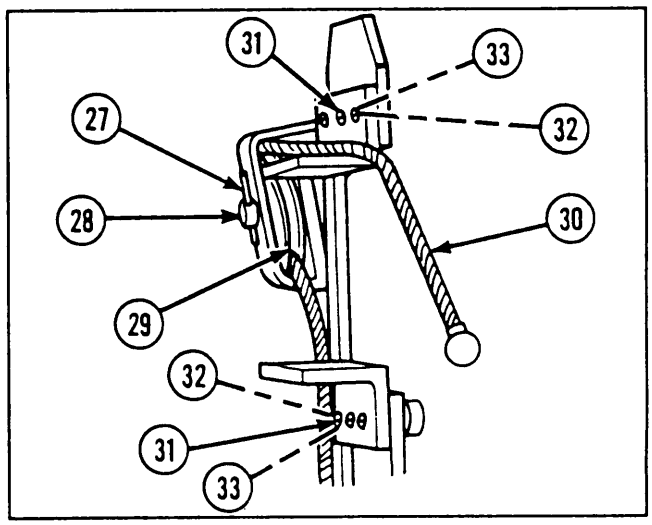


13 Disconnect electrical connector (26).

14 Remove cotter pin (27), headed straight pin (28), fan cable pulley (29), and control assembly (30).

NOTE

Do not remove two angle brackets. If angle brackets are damaged or missing, notify direct support maintenance.



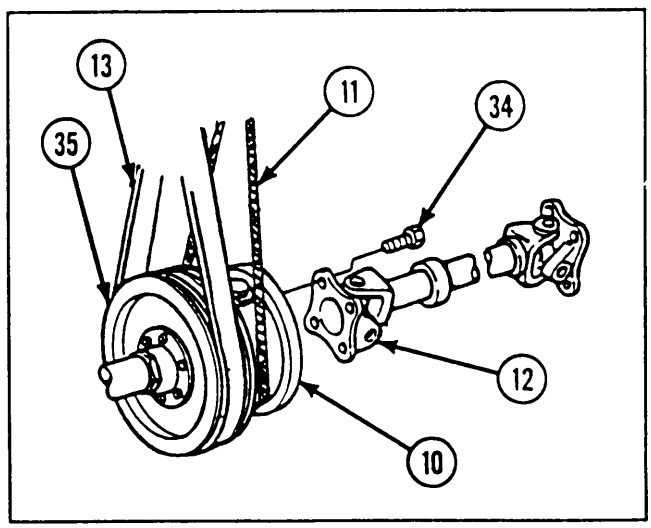
15 If damaged, remove six setscrews (31), six lockwashers (32), and six flat washers (33).

16 Remove four screws (34) from bearing unit drive shaft (12).

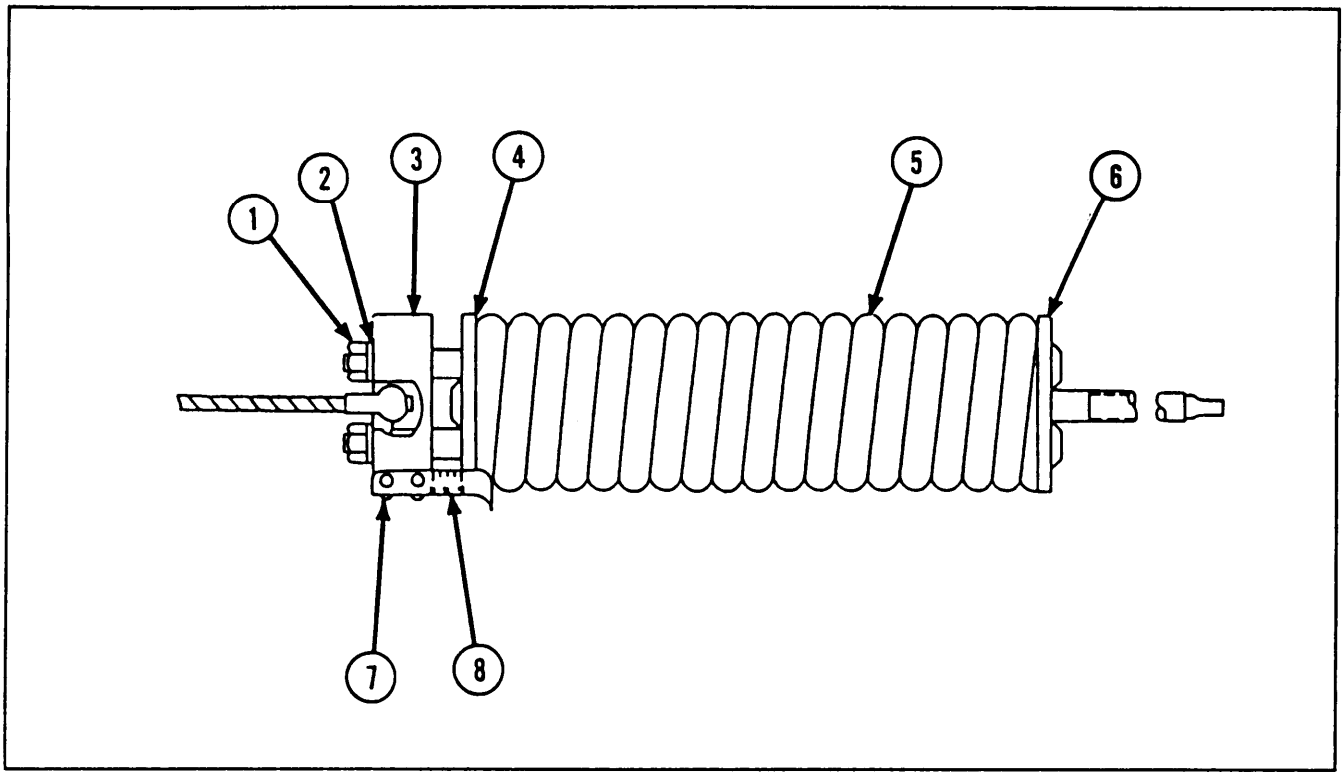
17 Lower bearing unit drive shaft (12) out of way.

18 Place sling (11) under vehicular drive (10) and lift.

19 Remove V-belt (13) from clutch groove pulley (35).



DISASSEMBLY



1 Remove two hexagon plain nuts (1), two lockwashers (2), fan tensioner coupling plate (3), spring retainer (4), and helical spring (5) from spring retainer (6).

2 Remove four drive screws (7) and instruction plate (8) from fan tensioner coupling plate (3).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Radiator cooling vaneaxial fan is a repairable assembly. For repair, notify direct support maintenance.

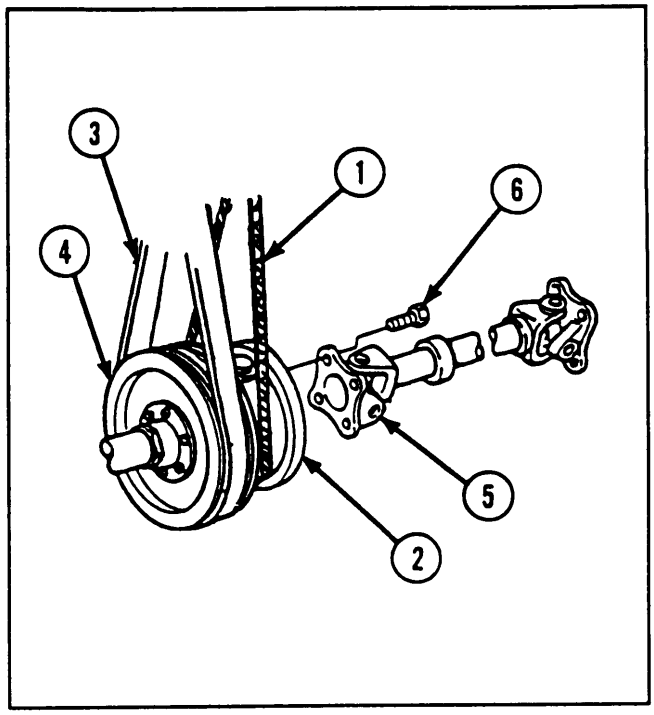
3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

1 Install helical spring (5), spring retainer (4), and fan tensioner coupling plate (3) on spring retainer (6), and secure with two new lockwashers (2) and two hexagon plain nuts (1).

2 Install instruction plate (8) on fan tensioner coupling plate (3), and secure with four drive screws (7).

2-66. MAINTENANCE OF COOLING SYSTEM FAN TENSIONER AND RELATED PARTS (CONT)



1 Place sling (1) under vehicular drive (2).

2 Lift vehicular drive (2) and install new V-belt (3) on clutch groove pulley (4).

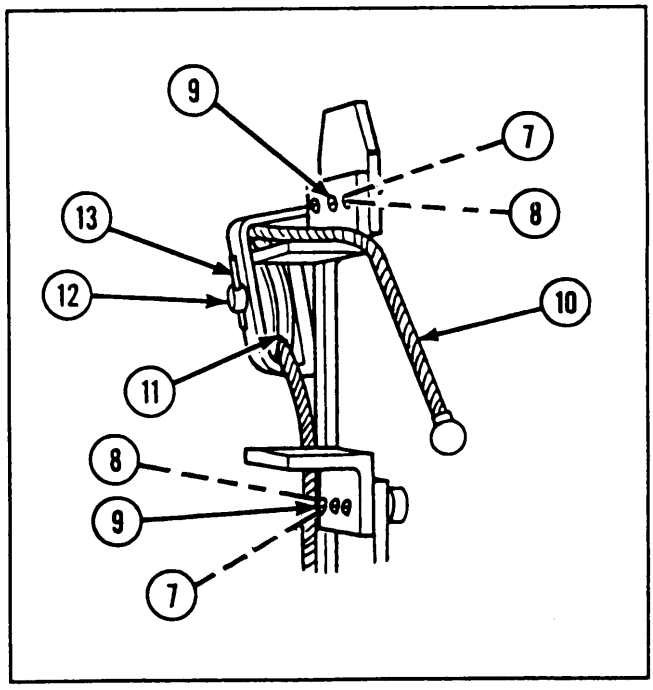
3 Connect bearing unit drive shaft (5) to vehicular drive (2).

4 Install four screws (6) in bearing unit drive shaft (5).

NOTE

Secure bearing unit drive shaft with crowbar when torqueing screws.

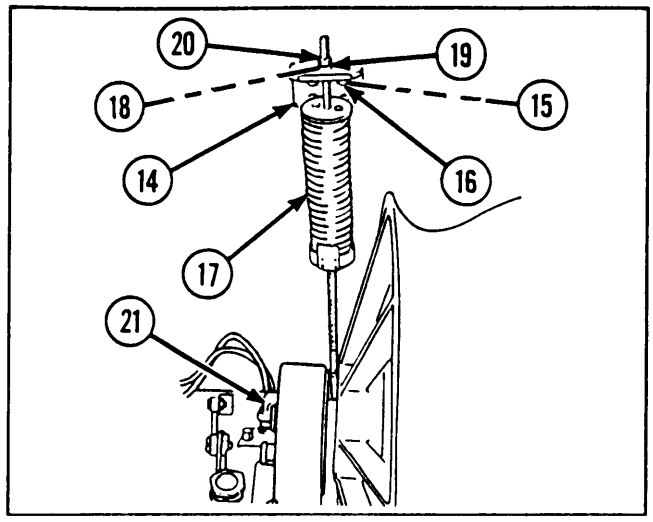
5 Torque screws (6) to 78 ft-lb (105 N-m).



6 If removed, install six flat washers (7), six new lockwashers (8), and six setscrews (9).

7 Install control assembly (10) and fan cable pulley (11), and secure with headed straight pin (12) and new cotter pin (13).

8 Install angle bracket (14) on vehicle and secure with four new lockwashers (15) and four hexagon head capscrews (16).



WARNING

Fan belt tensioner is under tension. When installing the nuts, use care to ensure safety of personnel.

9 Install fan belt tensioner (17), and secure with concave washer (18), new self-locking nut (19), and hexagon plain nut (20).

10 Connect electrical connector (21).

11 Lubricate cooling fan pulley tapered bushing (22) with hydraulic fluid.

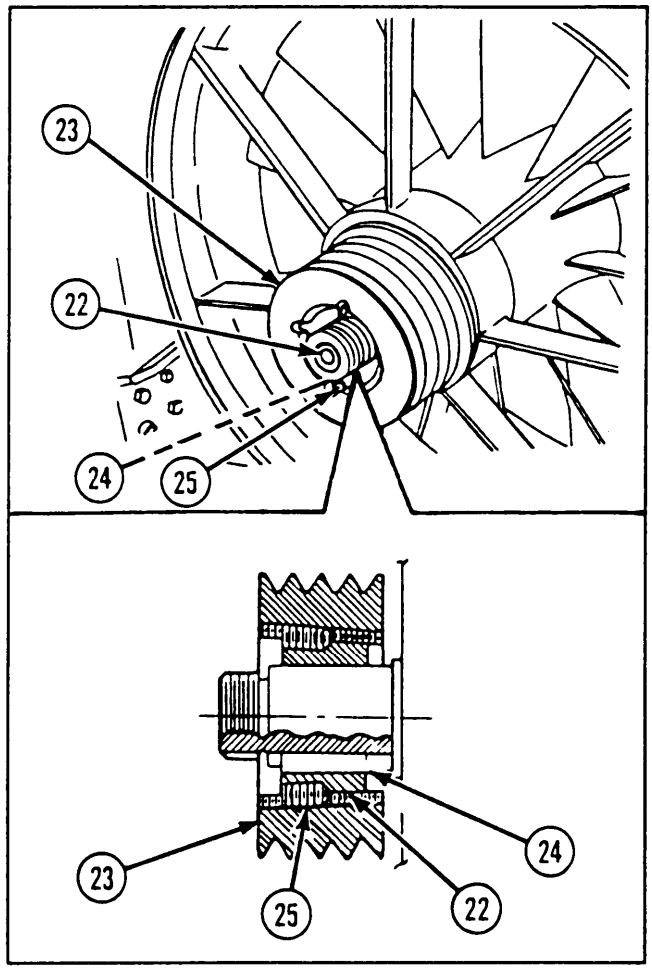
CAUTION

Do not pound cooling fan pulley tapered bushing onto shaft. Fan bearings may be damaged.

12 Install cooling fan pulley tapered bushing (22) in groove pulley (23).

13 Install groove pulley (23), cooling fan pulley tapered bushing (22), and machine key (24) on fan shaft.

14 Secure groove pulley (23) in place with two socket head capscrews (25). Do not tighten socket head capscrews.



2-66. MAINTENANCE OF COOLING SYSTEM FAN TENSIONER AND RELATED PARTS (CONT).

INSTALLATION/ALIGNMENT (CONT)

15 Place sling (1) around radiator cooling vaneaxial fan (26).

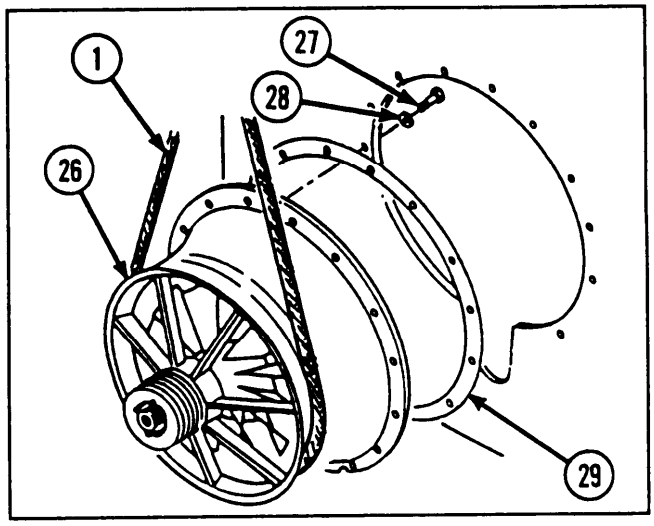
16 Install enough hexagon head capscrews (27) and new lockwashers (28) in fan mounting holes to hold new cooling fan mounting gasket (29) in place.

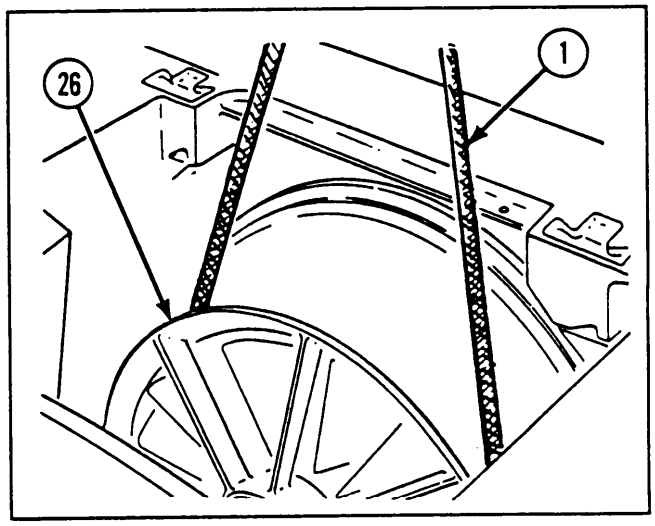
NOTE

It maybe necessary to secure gasket to radiator cooling vaneaxial fan with masking tape.

17 Place new cooling fan mounting gasket (29) over hexagon head capscrews (27).

18 Use sling (1) to lower radiator cooling vaneaxial fan (26) through fan well deck opening.





NOTE

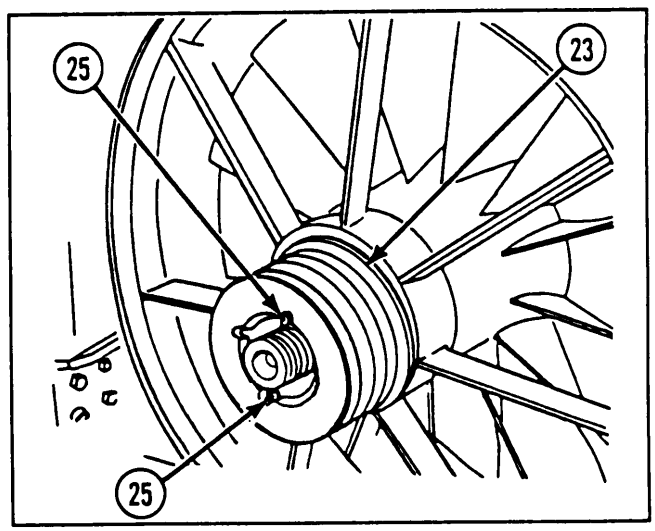
Ensure that identification plate is at top of radiator cooling vaneaxial fan.

19 Align mounting holes in radiator cooling vaneaxial fan (26) with hexagon head capscrews (27) installed in step 16.

20 Install the remaining hexagon head capscrews and new lockwashers (28). Tighten hexagon head capscrews (27).

21 Remove sling (1) from radiator cooling vaneaxial fan (26).

22 Loosen two socket head capscrews (25) until groove pulley (23) can be moved on shaft by tapping face of groove pulley with soft-faced mallet.



23 Place straightedge between outside face of groove pulley (23) and outside face of clutch groove pulley (4).

24 Tap groove pulley (23) lightly toward radiator cooling vaneaxial fan with soft-faced mallet.

25 Position groove pulley (23) about 1/16 in. (1.59 mm) forward of clutch groove pulley (4).

26 Tighten two socket head capscrews (25) to 20 ft-lb (27 N-m) evenly in 5 ft-lb (7 N-m) increments.

27 Recheck alignment of groove pulley (23) and clutch groove pulley (4) with straightedge.

NOTE

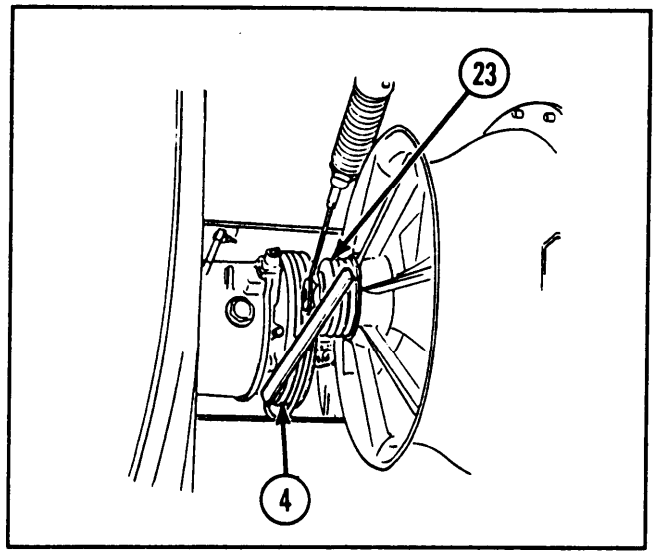
- Faces of groove pulley and clutch groove pulley should be parallel and in same plane.
- It may be necessary to loosen two socket head capscrews in groove pulley and readjust as in steps 24 thru 27. Repeat as required to achieve proper alignment.

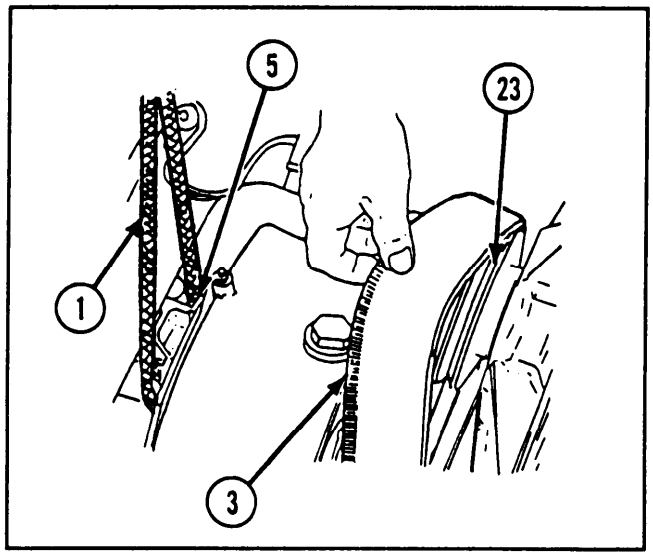
28 Place sling (1) under bearing unit drive shaft (5).

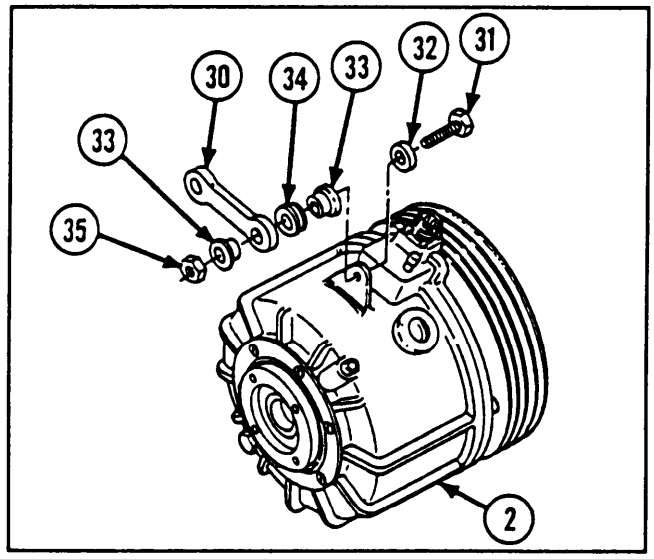
29 Lift bearing unit drive shaft (5) enough to slide V-belt (3) on groove pulley (23).

30 Install connecting link (30) to vehicular drive (2), and secure with screw (31), flat washer (32), two sleeve spacers (33), nonmetallic grommet (34), and new self-locking nut (35).

31 Remove sling (1).

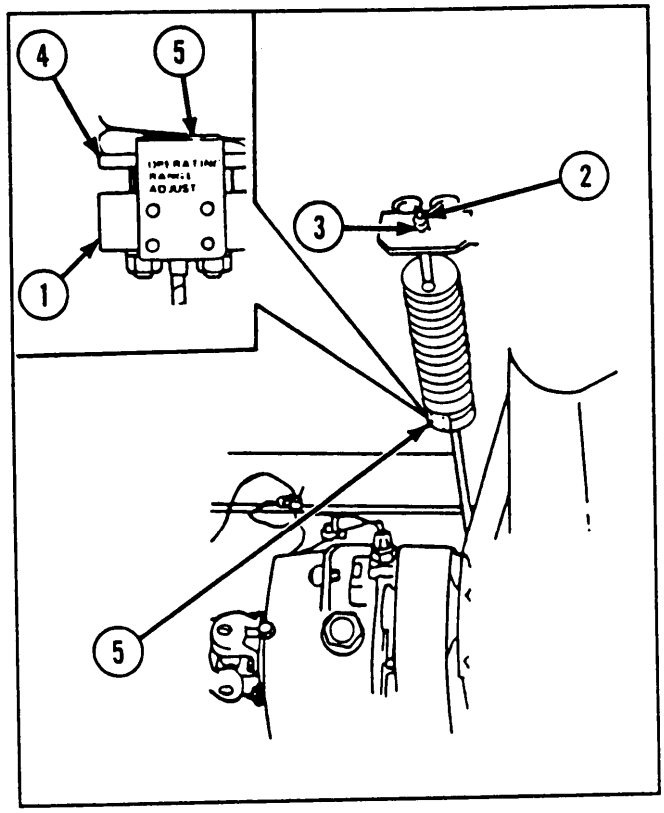






2-66. MAINTENANCE OF COOLING SYSTEM FAN TENSIONER AND RELATED PARTS (CONT).

ADJUSTMENT



NOTE

There must be a distance of 0.50 in. (1.27 cm) between bottom of spring retainer and top of fan tensioner coupling plate (1).

1 Loosen hexagon plain nut (2), then tighten self-locking nut (3) to bring bottom of spring retainer (4) to top line on instruction plate (5).

2 Tighten hexagon plain nut (2).

2-67. MAINTENANCE OF GENERATOR AND COOLING AIR INTAKE SYSTEM.

This task covers:
a. *Removal*
b. *Inspection/Repair*
c. *Installation*

INITIAL SETUP

Tools and Special Tools
Plier wire twister (item 30, appx G)

Materials/Parts
Duct to bulkhead gasket
Elbow to bulkhead gasket
Gasket
Gasket
Lockwire (item 26, appx C)
Lockwire (item 27, appx C)
Preformed packing
Self-locking nut
Self-locking nut (6)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-384 Powerplant removed

REMOVAL

1 Tag and disconnect four electrical leads (1) from generator (2).

2 Remove two hose clamps (3) and, preformed hose (4) from generator intake duct elbow (5) and air intake (6) of generator (2).

3 Remove lockwire (7), six hexagon head capscrews (8), and six flat washers (9) securing mechanical housing (10) to generator drive (11).

4 Lift generator (2) and mechanical housing (10) straight up from generator drive (11).

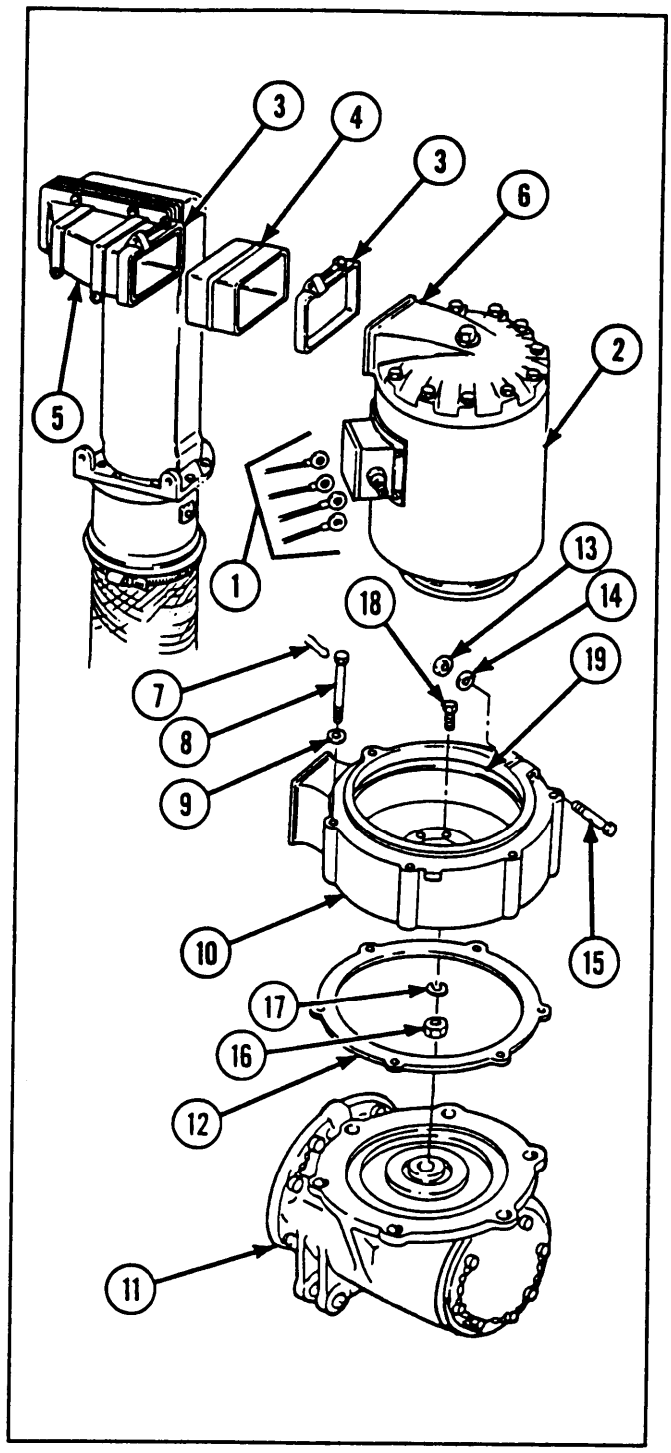
5 Remove gasket (12).

6 Loosen self-locking nut (13).

7 If damaged, remove self-locking nut (13), flat washer (14), and screw (15) from mechanical housing (10).

8 Separate generator (2) and mechanical housing (10).

9 Remove six self-locking nuts (16), six flat washers (17), six key head bolts (18), and preformed packing (19).



2-67. MAINTENANCE OF GENERATOR AND COOLING AIR INTAKE SYSTEM (CONT).

REMOVAL (CONT)

10 Remove four socket head capscrews (20) and four flat washers (21).

11 Remove lockwire (22), two machine screws (23 and 24), and two flat washers (25).

12 Remove generator intake duct elbow (5) and elbow to bulkhead gasket (26).

13 Remove lockwire (27), eight socket head capscrews (28), and eight flat washers (29).

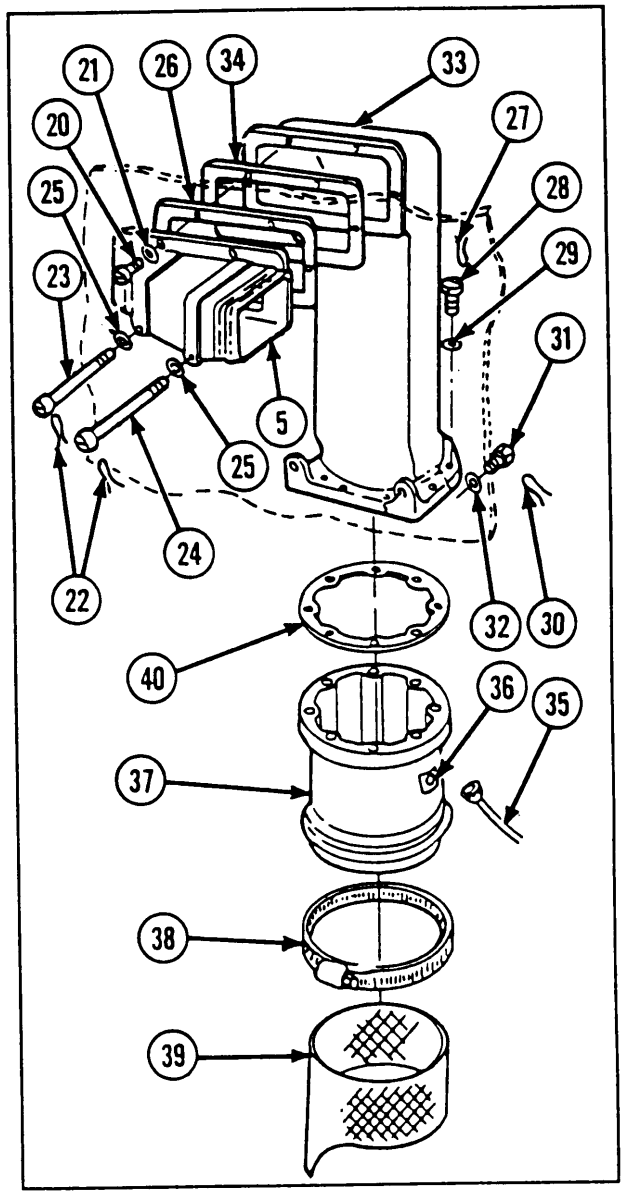
14 Remove lockwire (30), two hexagon head capscrews (31), and two flat washers (32).

15 Remove generator air intake duct (33) and duct to bulkhead gasket (34).

16 Disconnect electrical connector (35) from receptacle (36) on tube axial fan (37).

17 Remove hose clamp (38), tube axial fan (37), and generator fan guard (39).

18 Remove gasket (40).



INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Generator is a repairable assembly. Notify direct support maintenance.

3 Tube axial fan is a repairable assembly. Notify direct support maintenance.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install new gasket (1), generator fan guard (2), tube axial fan (3), and hose clamp (4). Adjust generator fan guard until it contacts cover. Place open side of guard inboard.

2 Connect electrical connector (5) to receptacle (6) on tube axial fan (3).

3 Install new duct to bulkhead gasket (7) and generator air intake duct (8).

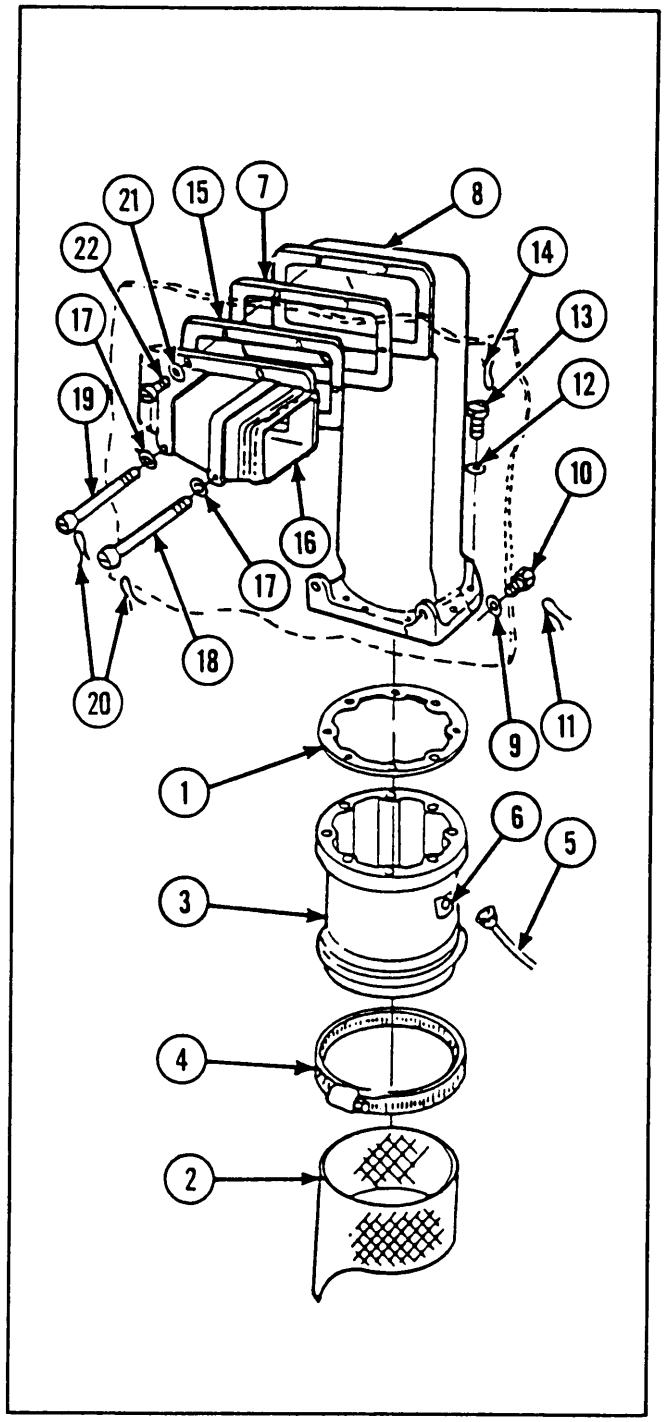
4 Install two flat washers (9), two hexagon head capscrews (10), and new lockwire (11) (item 27, appx C).

5 Install eight flat washers (12), eight socket head capscrews (13), and new lockwire (14) (item 26, appx C).

6 Install new elbow to bulkhead gasket (15) and generator intake duct elbow (16).

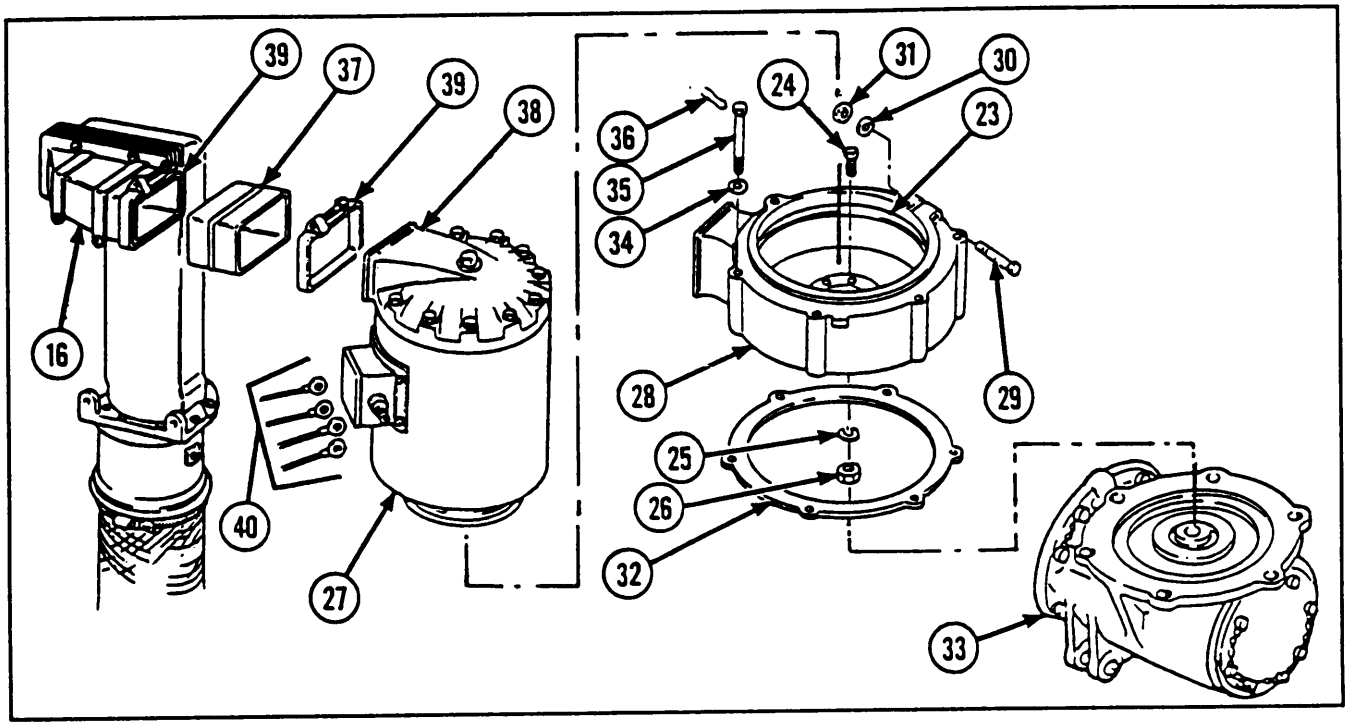
7 Install two flat washers (17), two machine screws (18 and 19), and new lockwire (20) (item 26, appx C).

8 Install four flat washers (21) and four socket head capscrews (22).



2-67. MAINTENANCE OF GENERATOR AND COOLING AIR INTAKE SYSTEM (CONT).

INSTALLATION (CONT)



9 Install new preformed packing (23). Install six key head bolts (24), six flat washers (25), and six new self-locking nuts (26).

10 Attach generator (27) and mechanical housing (28).

11 If removed, install screw (29), flat washer (30), and new self-locking nut (31) to mechanical housing (28).

NOTE

If the hardware in step 11 was not removed during removal procedure, tighten self-locking nut (31).

12 Install new gasket (32).

13 Lower generator (27) and mechanical housing (28) straight down onto generator drive (33) to engage shaft.

14 Install six flat washers (34), six hexagon head capscrews (35), and new lockwire (36) (item 27, appx C).

15 Install preformed hose (37) on air intake (38) of generator (27) and generator intake duct elbow (16) and secure with two hose clamps (39).

16 Untag and connect four electrical leads (40) to generator (27).

2-68. MAINTENANCE OF VOLTAGE REGULATOR AND RELATED PARTS.

This task covers:
a. *Removal/Disassembly*
b. *Inspection/Repair*
c. *Reassembly/Installation*

INITIAL SETUP

Materials/Parts
Lockwasher (2)
Lockwasher (2)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-923 CO_2 cylinder access cover removed
2-640 Batteries disconnected

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL/DISASSEMBLY

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

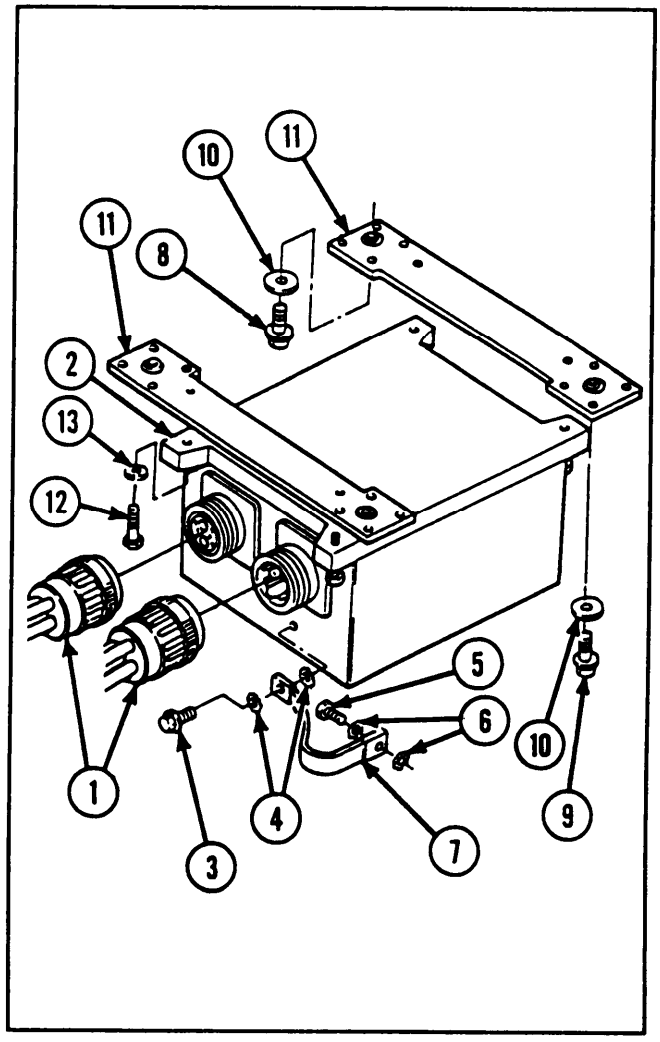
1 Disconnect two electrical connectors (1) from voltage regulator (2).

2 Remove assembled washer screw (3), two lockwashers (4), hexagon head capscrew (5), two lockwashers (6), and electrical grounding lead (7).

3 Remove three assembled washer bolts (8), assembled washer bolt (9), and four flat washers (10) from two regulator mounting brackets (11).

4 Remove voltage regulator (2) with attached mounting brackets.

5 Remove four screws (12), four washers (13), and two regulator mounting brackets (11) from voltage regulator (2).



2-68. MAINTENANCE OF VOLTAGE REGULATOR AND RELATED PARTS (CONT).

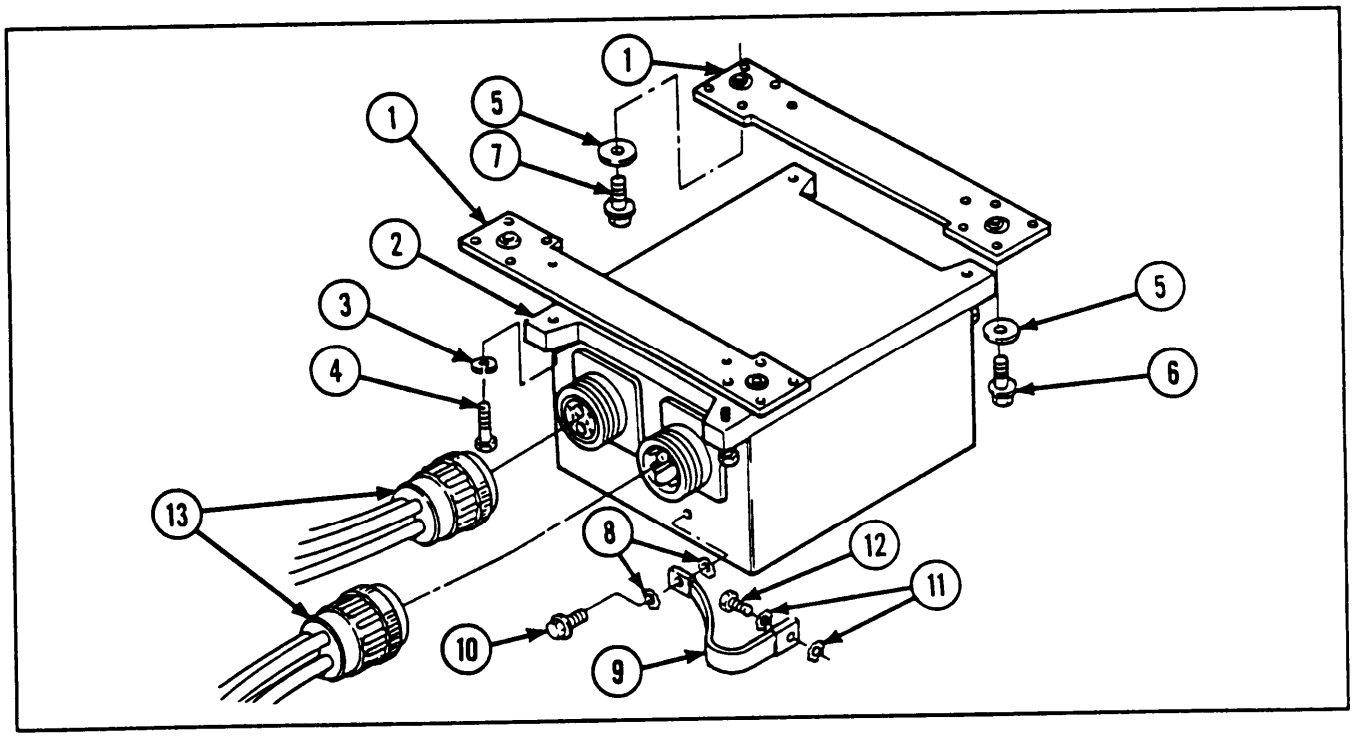
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If voltage regulator is broken, damaged, or missing, repair is by replacement of next higher assembly.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

REASSEMBLY/INSTALLATION



1 Install two regulator mounting brackets (1) on voltage regulator (2) and secure with four washers (3) and four screws (4).

2 Install voltage regulator (2) with attached mounting brackets, and secure with four flat washers (5), assembled washer bolt (6), and three assembled washer bolts (7).

3 Install new lockwasher (8), electrical grounding lead (9), new lockwasher (8), and assembled washer screw (10) on voltage regulator (2). Secure new lockwasher (11), electrical grounding lead (9), new lockwasher (11), and hexagon head capscrew (12) to ground.

4 Connect two electrical connectors (13) to voltage regulator (2).

2-69. MAINTENANCE OF STARTER AND MOUNTING HARDWARE.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Materials/Parts
Gasket
Lockwasher
Lockwasher (2)
Lockwasheer (3)

References
TM 9-2815-202-24P

Equipment Conditions
2-384 Powerplant removed

General Safety Instructions

WARNING

Starter weighs 80.0 lb (36.3 kg). Be careful when removing it or installing it.

REMOVAL

1 Remove hexagon head capscrew (1) and two lockwashers (2) securing starter ground lead (3) to engine block.

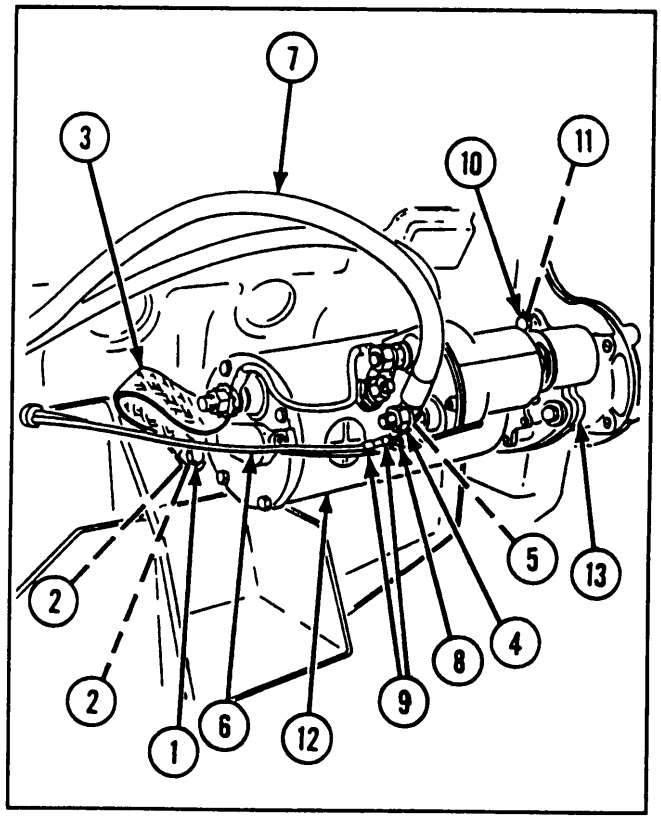
2 Remove nut (4) and lockwasher (5), electrical lead (6), and starter cable (7). Reinstall lockwasher and nut.

3 Remove screw (8) and electrical lead (9) at solenoid relay.

4 Remove three machine bolts (10) and lockwashers (11).

5 Carefully pull engine starter (12) from flywheel housing.

6 Remove gasket (13).



2-69. MAINTENANCE OF STARTER AND MOUNTING HARDWARE (CONT).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Engine starter is a repairable assembly. Notify direct support maintenance.

3 Repair is by replacement of authorized parts (TM 9-2815-202-24P).

INSTALLATION

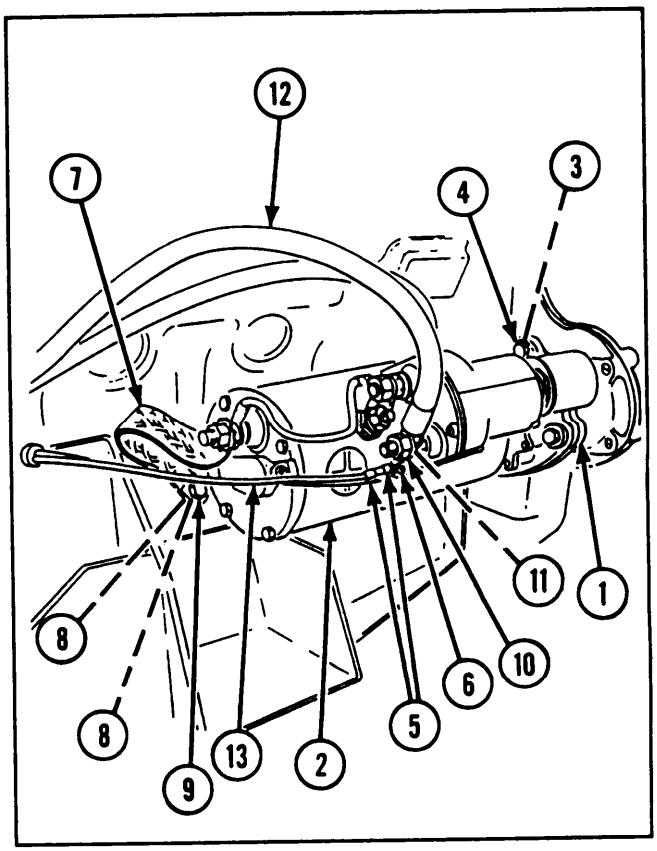
1 Install new gasket (1) on starter mounting flange.

2 Install engine starter (2) using three new lockwashers (3) and three machine bolts (4).

3 Install electrical lead (5) and screw (6) on solenoid relay.

4 Install starter ground lead (7) using two new lockwashers (8) and hexagon head capscrew (9).

5 Remove nut (10) and lockwasher (11) and install starter cable (12) and electrical lead (13). Install new lockwasher (11) and nut (10).



2-70. MAINTENANCE OF STARTER RELAY AND RELATED ITEMS.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

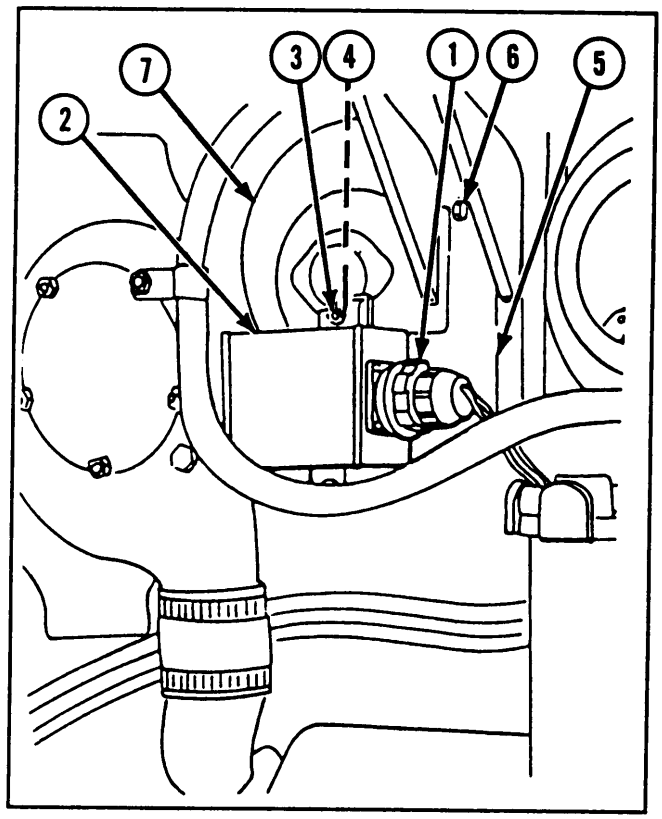
Materials/Parts
Lockwasher (2)

References
TM 9-22350-238-24P-1

Equipment Conditions
MASTER switch in OFF position
2-923 Engine fuel filter access door removed

REMOVAL

NOTE
Instructions are written for removal of electromagnetic relay which is mounted on engine. The second electromagnetic relay is attached to the hull, near the audible warning horn, without use of starter relay mounting bracket.



1 Disconnect electrical lead (1) from electromagnetic relay (2).

2 Remove two hexagon head capscrews (3), two lockwashers (4), and electromagnetic relay (2) from starter relay mounting bracket (5).

3 Remove two screws (6) and starter relay mounting bracket (5) from engine (7).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

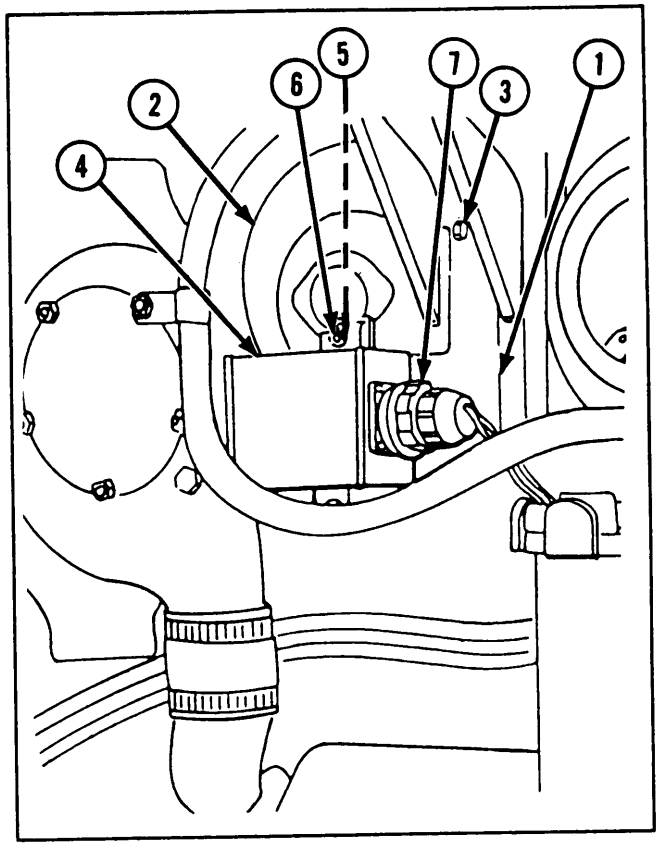
2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-70. MAINTENANCE OF STARTER RELAY AND RELATED ITEMS (CONT).

INSTALLATION

NOTE

Instructions are written for installation of electromagnetic relay which is mounted on engine. The second electromagnetic relay is attached to the hull, near the audible warning horn, without use of starter relay mounting bracket.



1 Install starter relay mounting bracket (1) to engine (2), and secure with two screws (3).

2 Install electromagnetic relay (4) on starter relay mounting bracket (1), and secure with two new lockwashers (5) and two hexagon head capscrews (6).

3 Connect electrical lead (7) to

2-71. MAINTENANCE OF NEUTRAL POSITION SWITCH AND RELATED PARTS.

This task covers:
a. *Removal*
b. *Inspection/Repair*
c. *Installation/Adjustment*

INITIAL SETUP

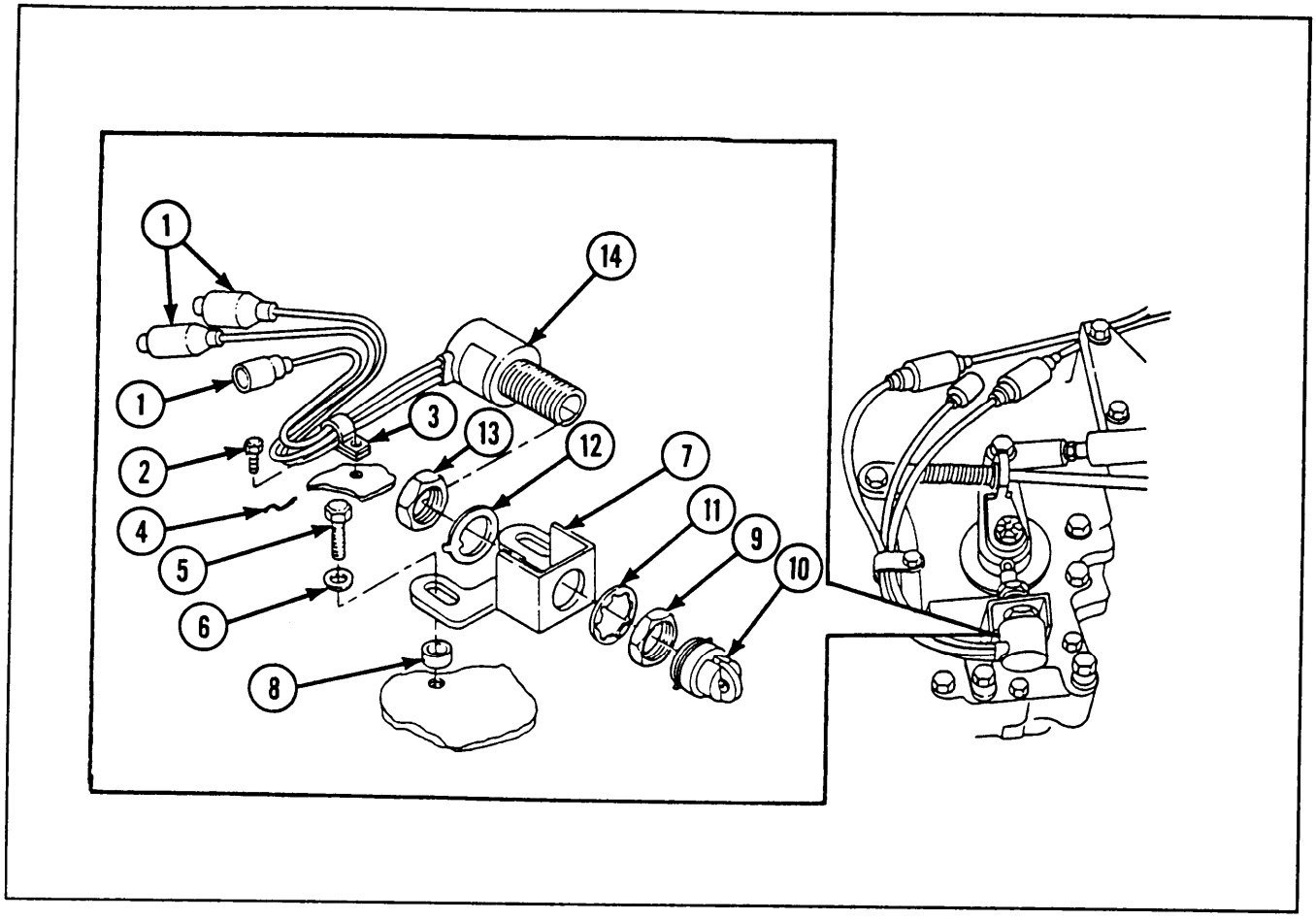
Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
• Multimeter
Plier wire twister (item 30, appx G)

Materials/Parts
Lockwire (item 24, appx C)

References
TM 9-2350-238-24P-1

Equipment Conditions
MASTER switch in OFF position
2-938 Hull transmission compartment deck assembly removed

REMOVAL



1 Tag and disconnect three shell connectors (1) at line connections.

2 Remove assembled washer bolt (2) and loop clamp (3).

3 Remove lockwire (4) from two hexagon head capscrews (5). Remove two hexagon head capscrews, two flat washers (6), and bracket (7) from mounting surface. Remove two sleeve spacers (8).

NOTE

Adjusting nut (9), roller guide (10), lockwasher (11), key washer (12), and mounting nut (13) are supplied with neutral position sensitive switch (14); use care not to lose them. If lost or damaged, replace neutral position sensitive switch.

4 Back off adjusting nut (9) until roller guide (10) can be removed, and remove roller guide.

5 Remove adjusting nut (9) and lockwasher (11) from neutral position sensitive switch (14), allowing neutral position sensitive switch to be removed from bracket (7). Remove key washer (12) and mounting nut (13) from neutral position sensitive switch.

2-71. MAINTENANCE OF NEUTRAL POSITION SWITCH AND RELATED PARTS (CONT).

INSPECTION/REPAIR

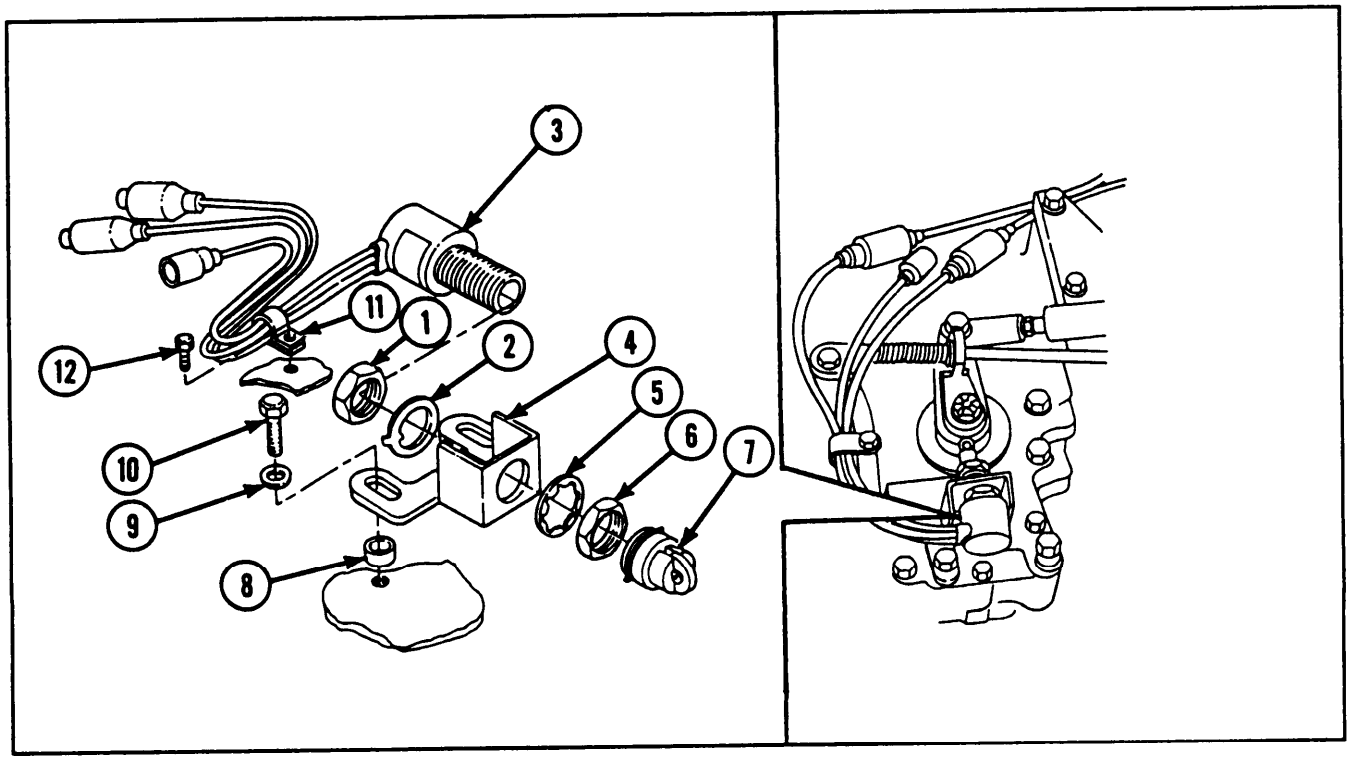
1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of electrical shell connectors, refer to general maintenance, page 2-371.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION/ADJUSTMENT



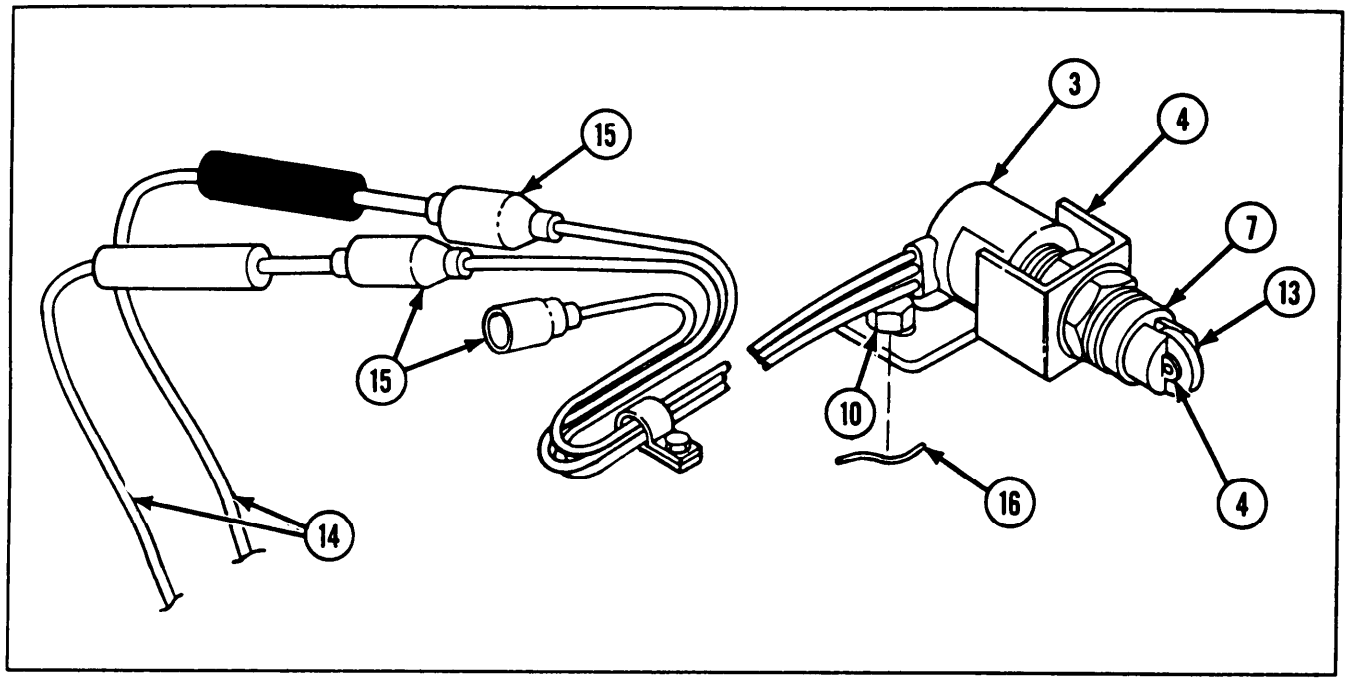
1 Install mounting nut (1) and key washer (2) on neutral position sensitive switch (3).

2 Insert neutral position sensitive switch (3) through mounting hole in bracket (4).

3 Install lockwasher (5), adjusting nut (6), and roller guide (7) on neutral position sensitive switch (3).

4 Install two sleeve spacers (8) and bracket (4) to mounting surface. Secure with two flat washers (9) and two hexagon capscrews (10).

5 Install loop clamp (11) and assembled washer bolt (12).



NOTE
Steps 6 thru 14 pertain to adjustment of neutral position switch.

6 Set transmission shift control lever to N.

7 Loosen two hexagon head capscrews (10) and move bracket (4) to position roller guide (7) in shift rod lever detent (13) with roller guide just touching lever.

8 Set multimeter to OH MS-RX I scale and zero the multimeter. Connect multimeter leads (14) to two neutral position sensitive switch shell connectors (15).

9 Multimeter must indicate 0 ohms with neutral position sensitive switch (3) closed. If not, move bracket (4) until multimeter indicates 0 ohms. Tighten hexagon head capscrews (10).

10 Set transmission shift control lever to 1. Multimeter must indicate infinity with neutral position sensitive switch (3) open. If not, loosen hexagon head capscrews (10) and move bracket (4) until multimeter indicates infinity. Tighten hexagon head capscrews.

11 Set transmission shift control lever to N. Multimeter must indicate 0 ohms. If not, repeat steps 9 and 10.

12 Set transmission shift control lever to every shift position. Check multimeter indication at each position. Multimeter must indicate infinity at positions 1, 2, 3, 4, R1, and R2, and must indicate 0 ohms at N. If not, repeat steps 9 thru 11.

13 Remove multimeter leads (14) and connect three shell connectors (15) at line connections.

14 Install new lockwire (16) on two hexagon head capscrews (10).

2-72. MAINTENANCE OF DRIVER'S INSTRUMENT PANEL (SWITCH).

This task covers:
a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. *Installation*

INITIAL SETUP

Materials/Parts
Lockwasher (14)
Lockwasher (4)
Lockwasher (5)
Setscrew (2)

References
TM 9-2350-238-24P-1

Equipment Conditions
MASTER switch in OFF position

General Safety Instructions

WARNING

Brake foot pedal is spring-loaded. Block tracks and release parking brake befoer working on driver's instrument panel. Disconnect battery ground leads from battery before working at rear of instrument panel.

REMOVAL

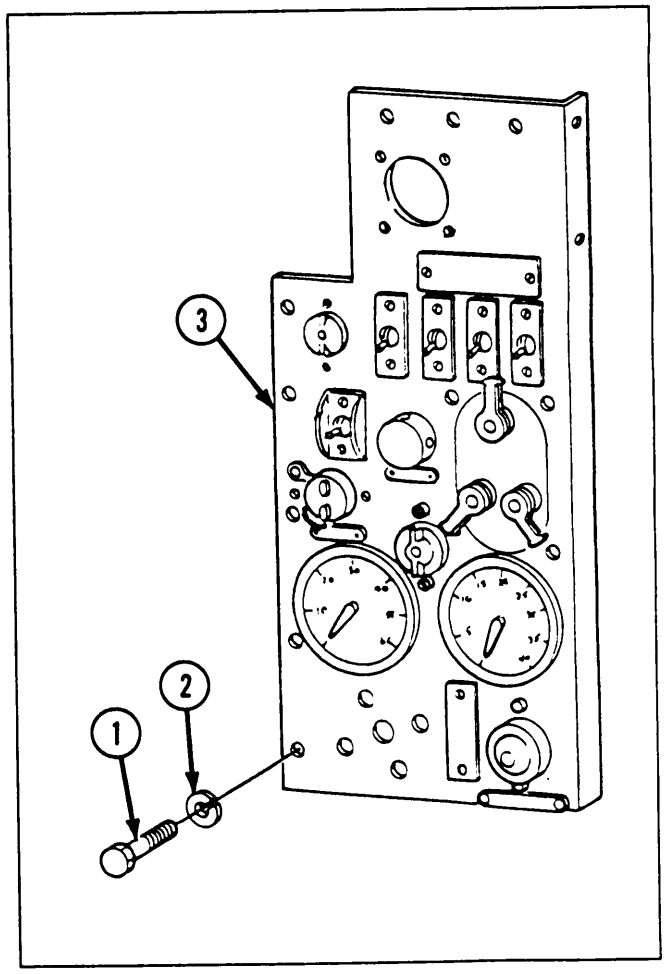
WARNING

Brake foot pedal is spring-loaded. Block tracks and release parking brake before working on driver's instrument panel. Disconnect battery ground leads from battery before working at rear of instrument panel.

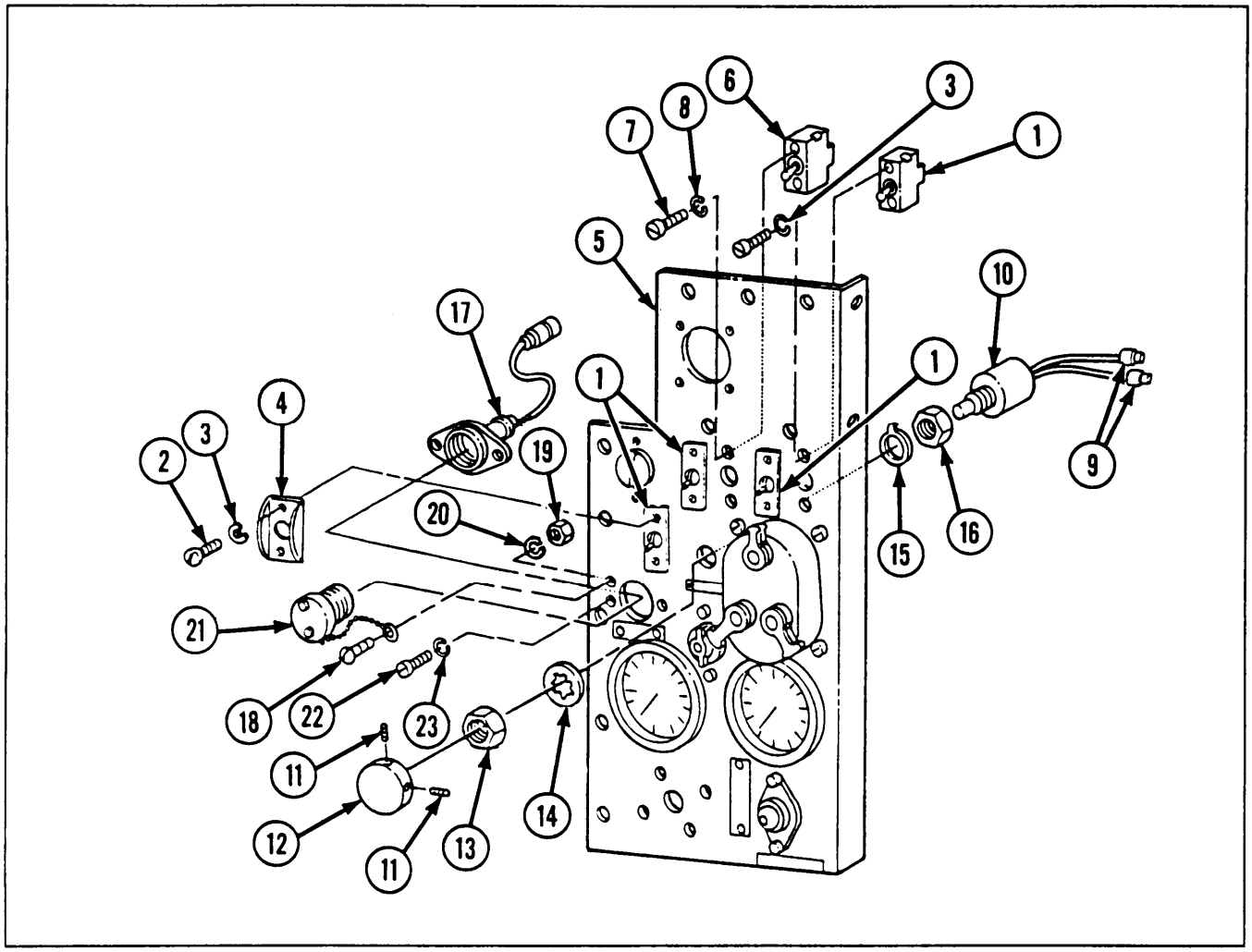
NOTE

Electrical leads are labeled with circuit numbers for identification.

Remove eight hexagon head capscrews (1) and eight lockwashers (2). Remove driver's instrument panel (3).



DISASSEMBLY



1 Disconnect electrical leads from four toggle switches (1). Remove eight machine screws (2) and eight lockwashers (3). Remove guard (4) and four toggle switches from vehicular panel (5).

2 Disconnect electrical leads from toggle switch (6). Remove two machine screws (7) and two lockwashers (8). Remove toggle switch from vehicular panel (5).

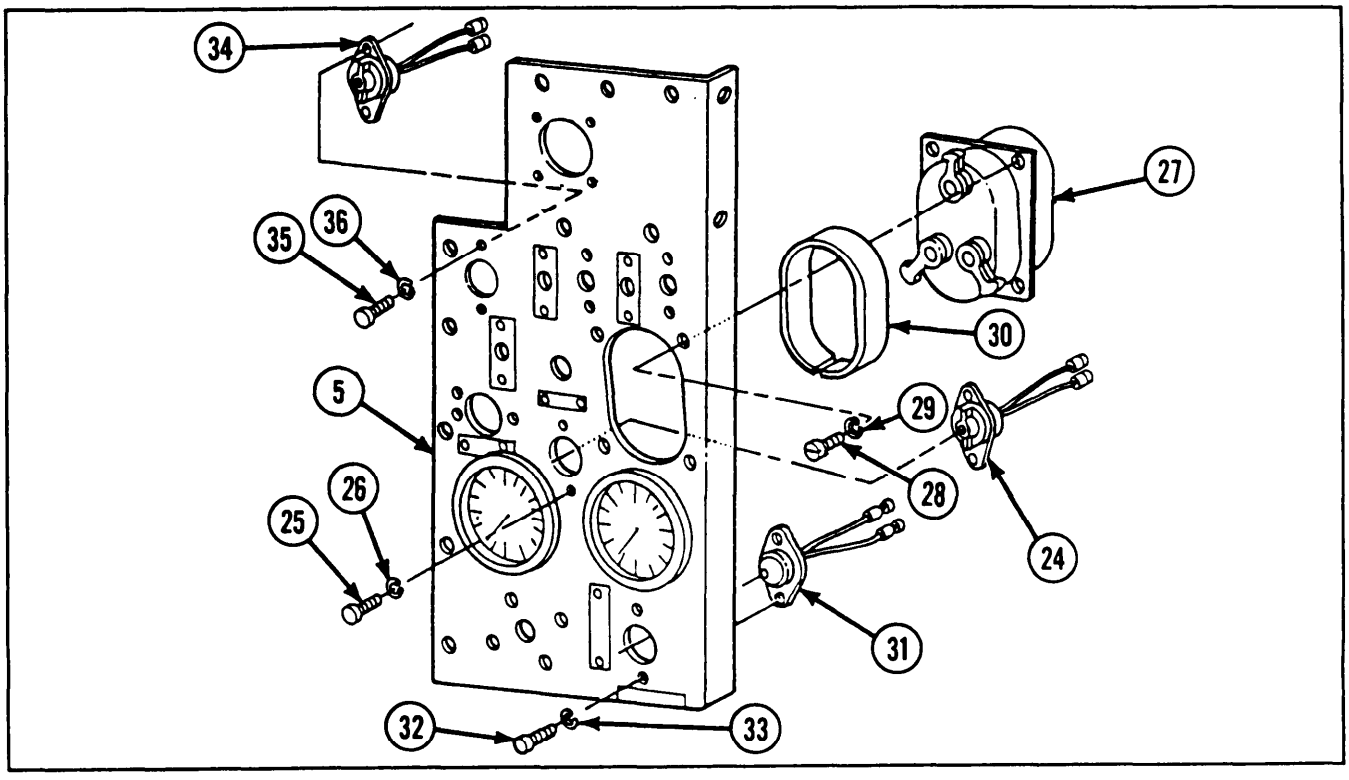
3 Disconnect electrical leads at shell connectors (9) of START push switch (10). Remove two setscrews (11) and START switch knob (12). Remove nut (13), lockwasher (14), and START push switch from vehicular panel (5). Remove key washer (15) and nut (16) from START push switch.

4 Disconnect shell connector of utility electrical lead (17). Remove machine screw (18), hexagon plain nut (19), lockwasher (20), and plug and chain assembly (21).

5 Remove two machine screws (22), two lockwashers (23), and utility electrical lead (17) from vehicular panel (5).

2-72. MAINTENANCE OF DRIVER'S INSTRUMENT PANEL (SWITCH) (CONT).

DISASSEMBLY (CONT)



6 Disconnect shell connectors of indicator light (24). Remove two machine screws (25), two lockwashers (26), and indicator light from vehicular panel (5).

7 Disconnect electrical lead from vehicular light switch (27). Remove four machine screws (28), four lockwashers (29), vehicular light switch, and ring spacer (30) from vehicular panel (5).

8 Disconnect shell connectors of warning light (31). Remove two machine screws (32), two lockwashers (33), and warning light from vehicular panel (5).

9 Disconnect shell connectors of indicator light (34). Remove two machine screws (35), two lockwashers (36), and indicator light from vehicular panel (5).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Indicator lights are repairable assemblies. Refer to page 2-580.

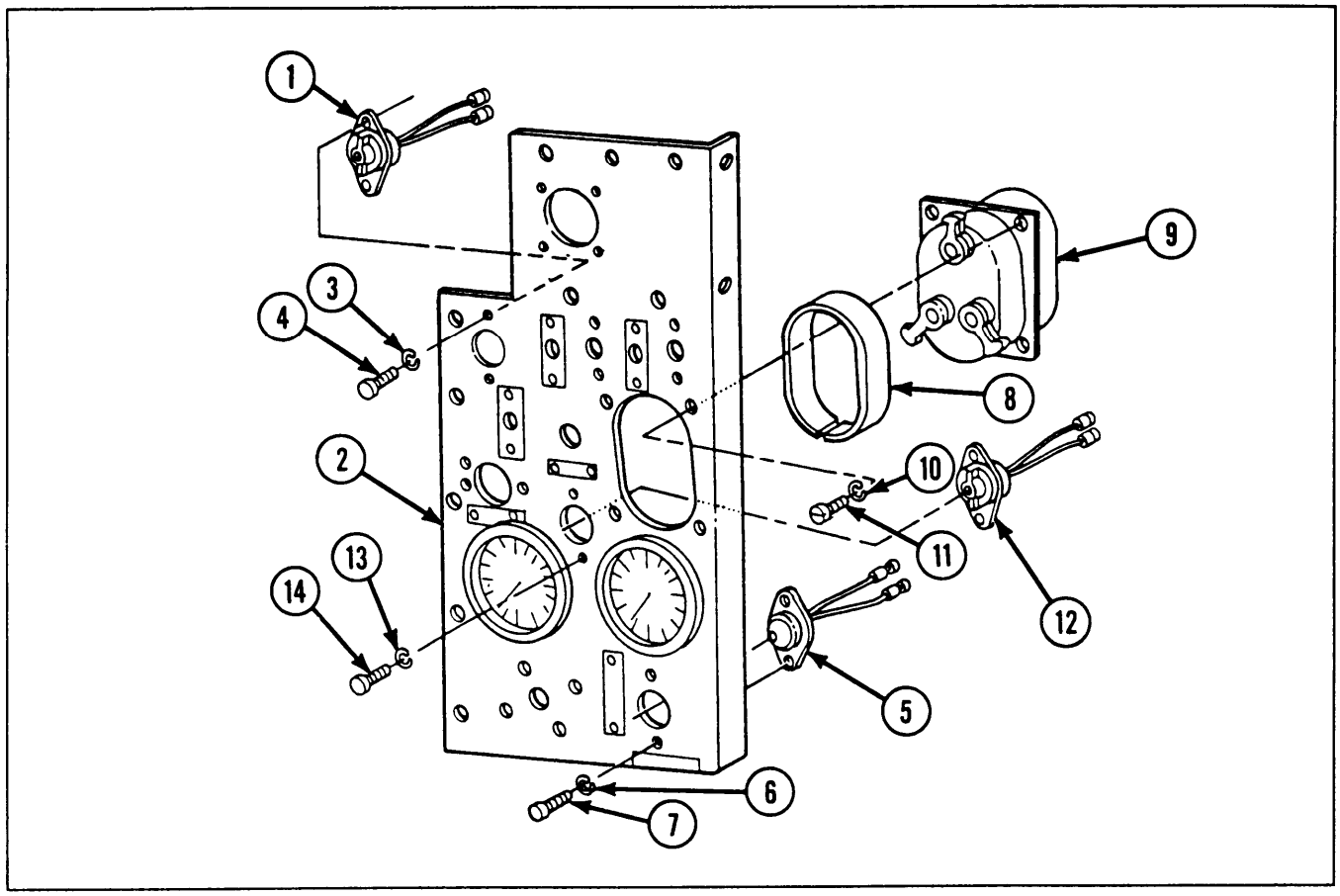
3 Warning light is a repairable assembly. Refer to page 2-579.

4 For repair of electrical shell connectors, refer to general maintenance, page 2-371.

5 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

6 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

REASSEMBLY



1 Install indicator light (1) in vehicular panel (2) and secure with two new lockwashers (3) and two machine screws (4). Connect electrical leads to indicator light.

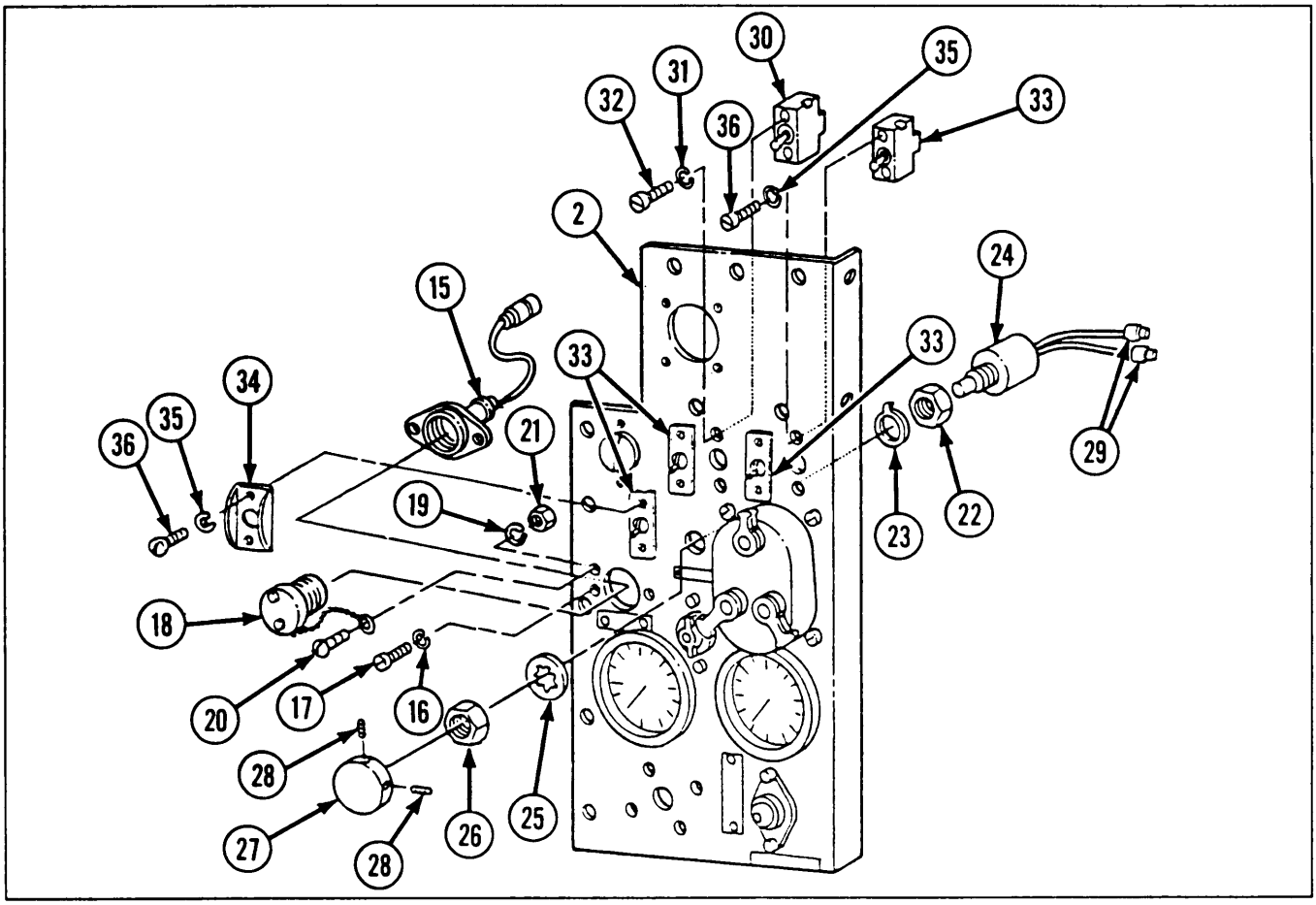
2 Install warning light (5) in vehicular panel (2) and secure with two new lockwashers (6) and two machine screws (7). Connect electrical leads to warning light.

3 Install ring spacer (8) and vehicular light switch (9) on vehicular panel (2) and secure with four new lockwashers (10) and four machine screws (11). Connect electrical leads to vehicular light switch.

4 Install indicator light (12) on vehicular panel (2) and secure with two new lockwashers (13) and two machine screws (14). Connect electrical lead to indicator light.

2-72. MAINTENANCE OF DRIVER'S INSTRUMENT PANEL (SWITCH) (CONT).

REASSEMBLY (CONT)



5 Install utility electrical lead (15) on vehicular panel (2) and secure with two new lockwashers (16) and two machine screws (17).

6 Install plug and chain assembly (18) on vehicular panel (2) and secure with new lockwasher (19), machine screw (20), and hexagon plain nut (21). Connect electrical lead to utility electrical lead.

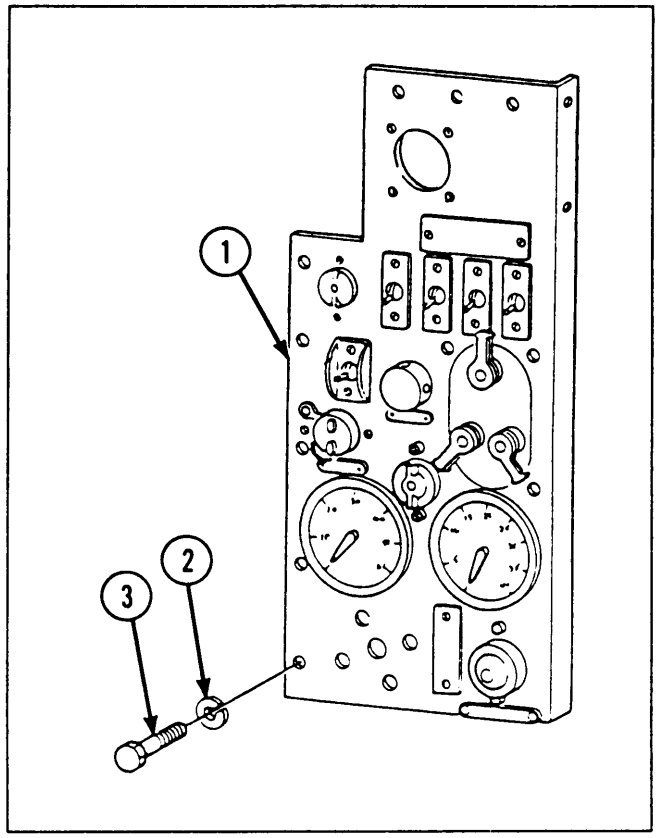
7 Install nut (22) and key washer (23) on START push switch (24). Install START push switch in vehicular panel (2) and secure with new lockwasher (25) and nut (26). Install START switch knob (27) on START push switch and secure with two new setscrews (28). Connect electrical leads to shell connectors (29) of START push switch.

8 Install toggle switch (30) on vehicular panel (2) and secure with two new lockwashers (31) and two machine screws (32). Connect electrical leads to toggle switch.

9 Install four toggle switches (33) and guard (34) on vehicular panel (2), and secure with eight new lockwashers (35) and eight machine screws (36). Connect electrical leads to four toggle switches.

INSTALLATION

Install driver's instrument panel (1) and secure with eight new lockwashers (2) and eight hexagon head capscrews (3).



2-73. MAINTENANCE OF DRIVER'S INSTRUMENT PANEL (GAGE).

This task covers:

a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Lockwasher (7)
Lockwasher (8)

References
TM 9-2350-238-24P-1

Equipment Conditions
MASTER switch set to OFF position

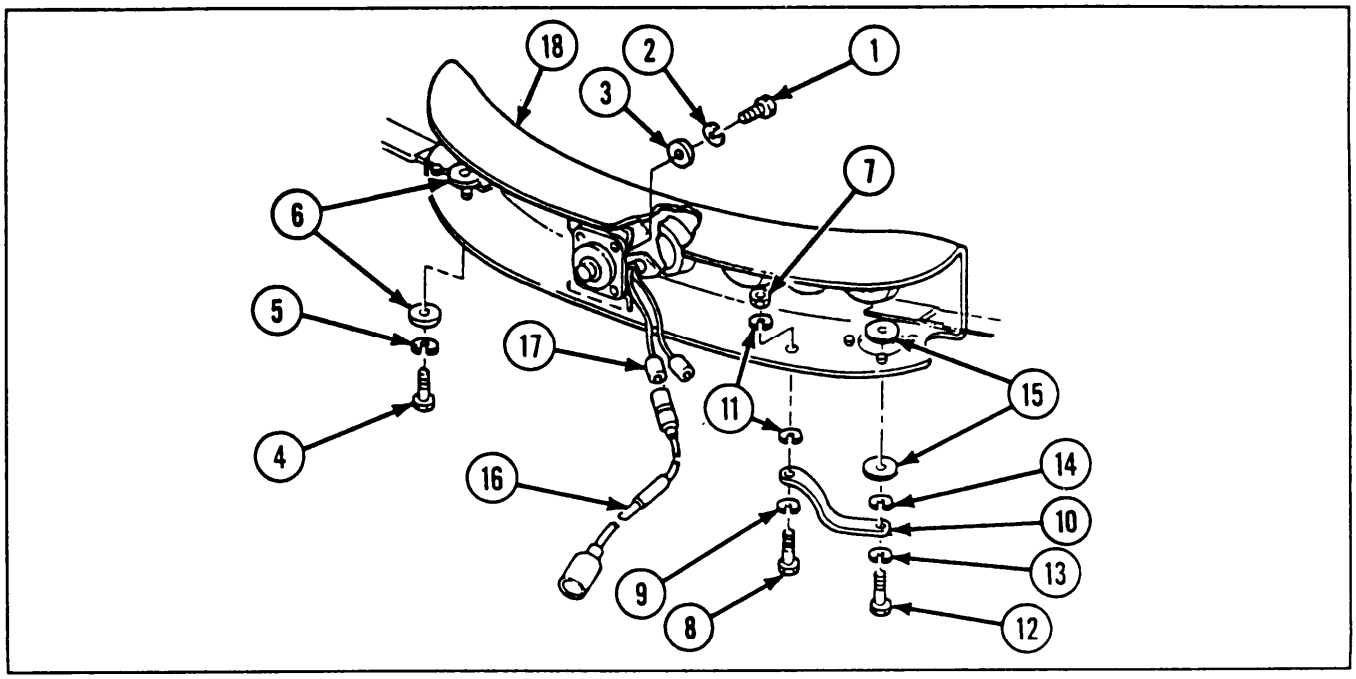
General Safety Instructions

WARNING

Block vehicle tracks and release parking brack before working in driver's compartment. Disconnect battery ground leads from battery before working at rear of insrument panel.

2-73. MAINTENANCE OF DRIVER'S INSTRUMENT PANEL (GAGE) (CONT).

REMOVAL



WARNING

Block vehicle tracks and release parking brake before working in driver's compartment. Disconnect battery ground leads from battery before working at rear of instrument panel.

1 Remove machine screw (1), lockwasher (2), and flat washer (3).

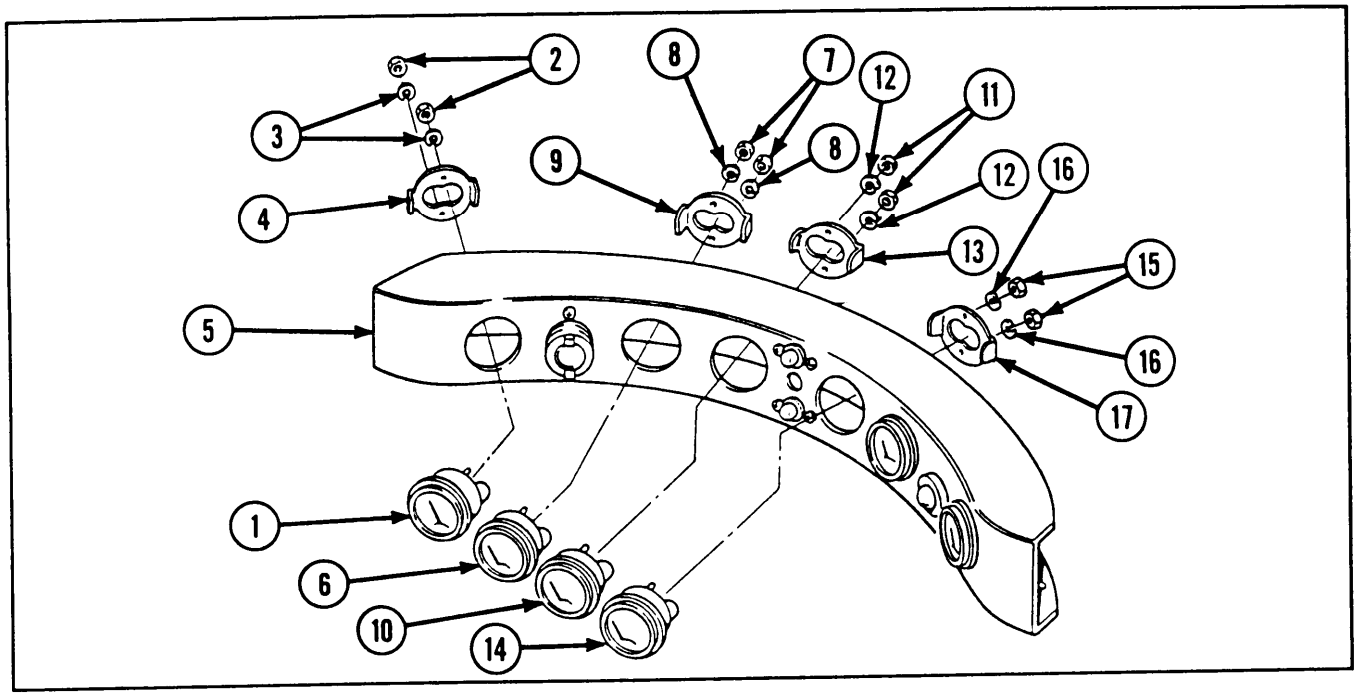
2 Remove machine screw (4), lockwasher (5), and two flat washers (6).

3 Remove hexagon plain nut (7), machine screw (8), lockwasher (9), one end of instrument panel ground electrical lead (10), and two lockwashers (11).

4 Remove machine screw (12), lockwasher (13), other end of instrument panel ground electrical lead (10), lockwasher (14), and two flat washers (15).

5 Disconnect master switch light lead and diode assembly (16) at panel light connector (17). Remove driver's instrument panel (18) as far as connecting electrical leads will allow.

DISASSEMBLY



1 Tag and disconnect two electrical leads from connectors on back side of fuel level indicator(1).

NOTE

Hexagon plain nuts, lockwashers, and mounting clamp are supplied with indicators; use care not to lose them. If lost or damaged, order a new indicator assembly.

2 Remove two hexagon plain nuts (2), two lockwashers (3), mounting clamp (4), and fuel level indicator (1) from instrument panel (5).

3 Tag and disconnect two electrical leads from connectors on back side of transmission oil temperature indicator (6).

4 Remove two hexagon plain nuts (7), two lockwashers (8), mounting clamp (9), and transmission oil temperature indicator (6) from instrument panel (5).

5 Tag and disconnect two electrical leads from connectors on back side of transmission oil pressure indicator (10).

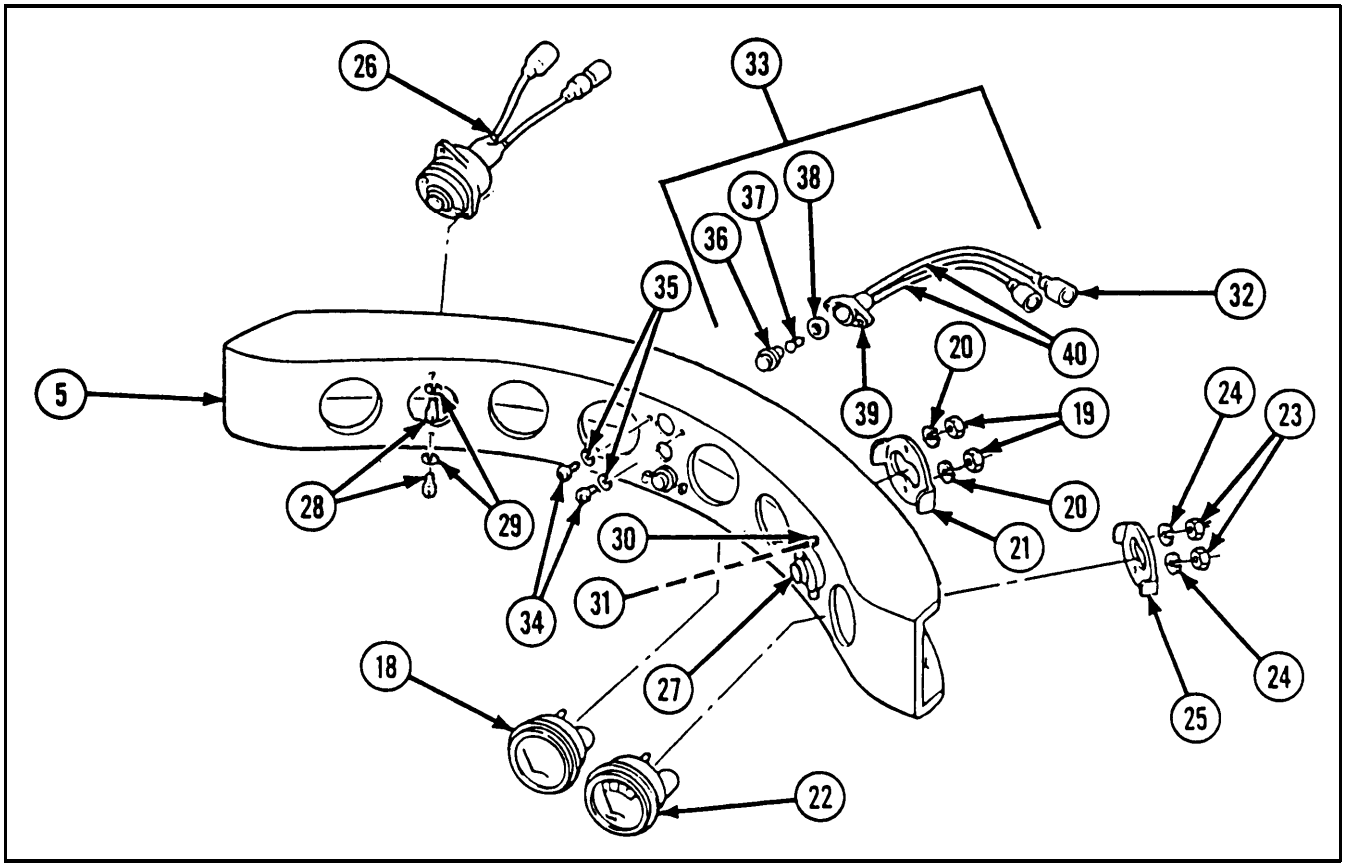
6 Remove two hexagon plain nuts (11), two lockwashers (12), mounting clamp (13), and transmission oil pressure indicator (10) from instrument panel (5).

7 Tag and disconnect two electrical leads from connectors on back side of engine coolant temperature indicator (14).

8 Remove two hexagon plain nuts (15), two lockwashers (16), mounting clamp (17), and engine coolant temperature indicator (14) from instrument panel (5).

2-73. MAINTENANCE OF DRIVER'S INSTRUMENT PANEL (GAGE) (CONT).

DISASSEMBLY (CONT)



9 Tag and disconnect two electrical leads from connectors on back side of engine oil pressure gage (18).

10 Remove two hexagon plain nuts (19), two lockwashers (20), mounting clamp (21), and engine oil pressure gage (18) from instrument panel (5).

11 Tag and disconnect electrical lead from connector on back side of battery/generator voltmeter (22).

12 Remove two hexagon plain nuts (23), two lockwashers (24), mounting clamp (25), and battery generator voltmeter (22) from instrument panel (5).

13 Tag and disconnect electrical leads from connectors of engine and transmission warning light (26).

14 Tag and disconnect electrical leads from connectors of generator charge warning light (27).

15 Remove two machine screws (28), two lockwashers (29), and engine and transmission warning light (26) from instrument panel (5).

16 Remove two machine screws (30), two lockwashers (31), and generator charge warning light (27) from instrument panel (5).

NOTE

Steps 17 thru 20 are written for one panel light, but apply to both panel lights.

17 Tag and disconnect electrical leads at connectors (32) of panel light (33).

18 Remove two machine screws (34), two lockwashers (35), and panel light (33) from instrument panel (5).

19 Remove cap (36), light emitting diode (LED) (37), and flat washer (38) from socket housing (39).

20 If damaged, remove electrical wires (40).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Warning lights are repairable assemblies. Refer to page 2-579.

3 For repair of electrical shell connectors, refer to general maintenance, page 2-371.

4 Electrical wire is a manufactured item, refer to appendix D.

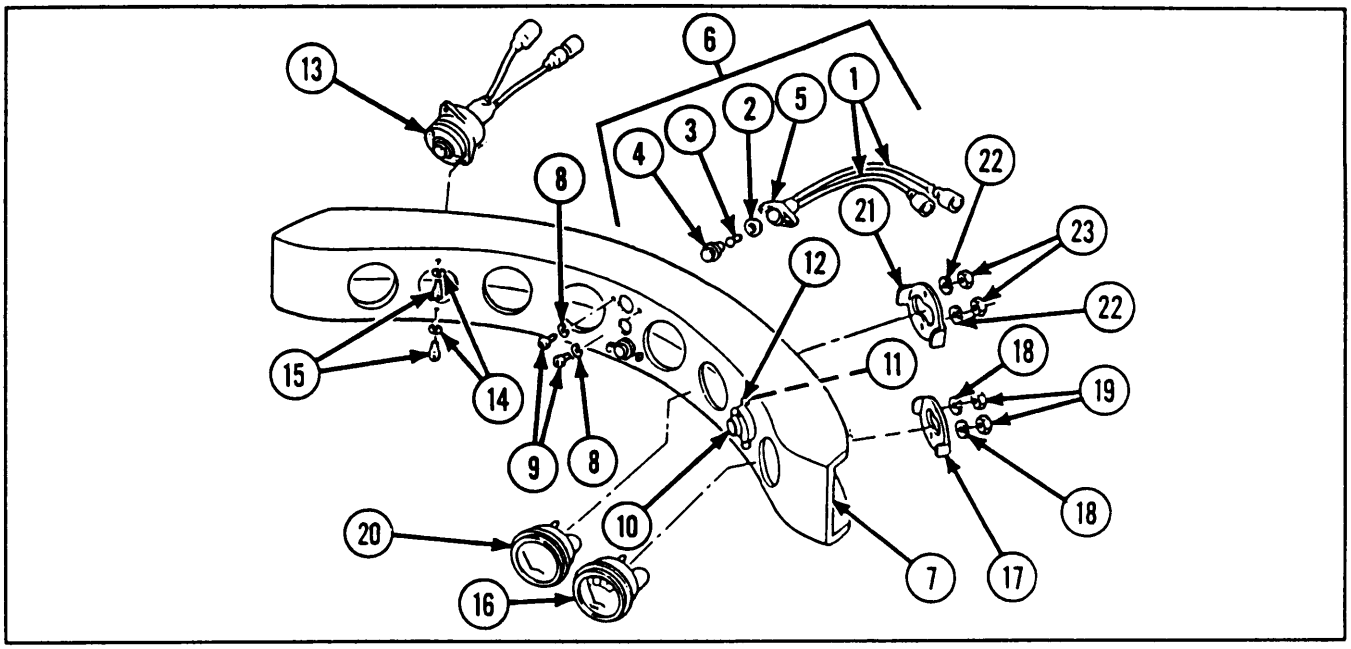
5 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

6 For further disassembly, notify direct support maintenance.

7 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

2-73. MAINTENANCE OF DRIVER'S INSTRUMENT PANEL (GAGE) (CONT).

REASSEMBLY



NOTE

Steps 1 thru 3 are written for one panel light, but apply to both.

1 If removed, install new electrical wires (1).

2 Install flat washer (2), LED (3), and cap (4) in socket housing (5).

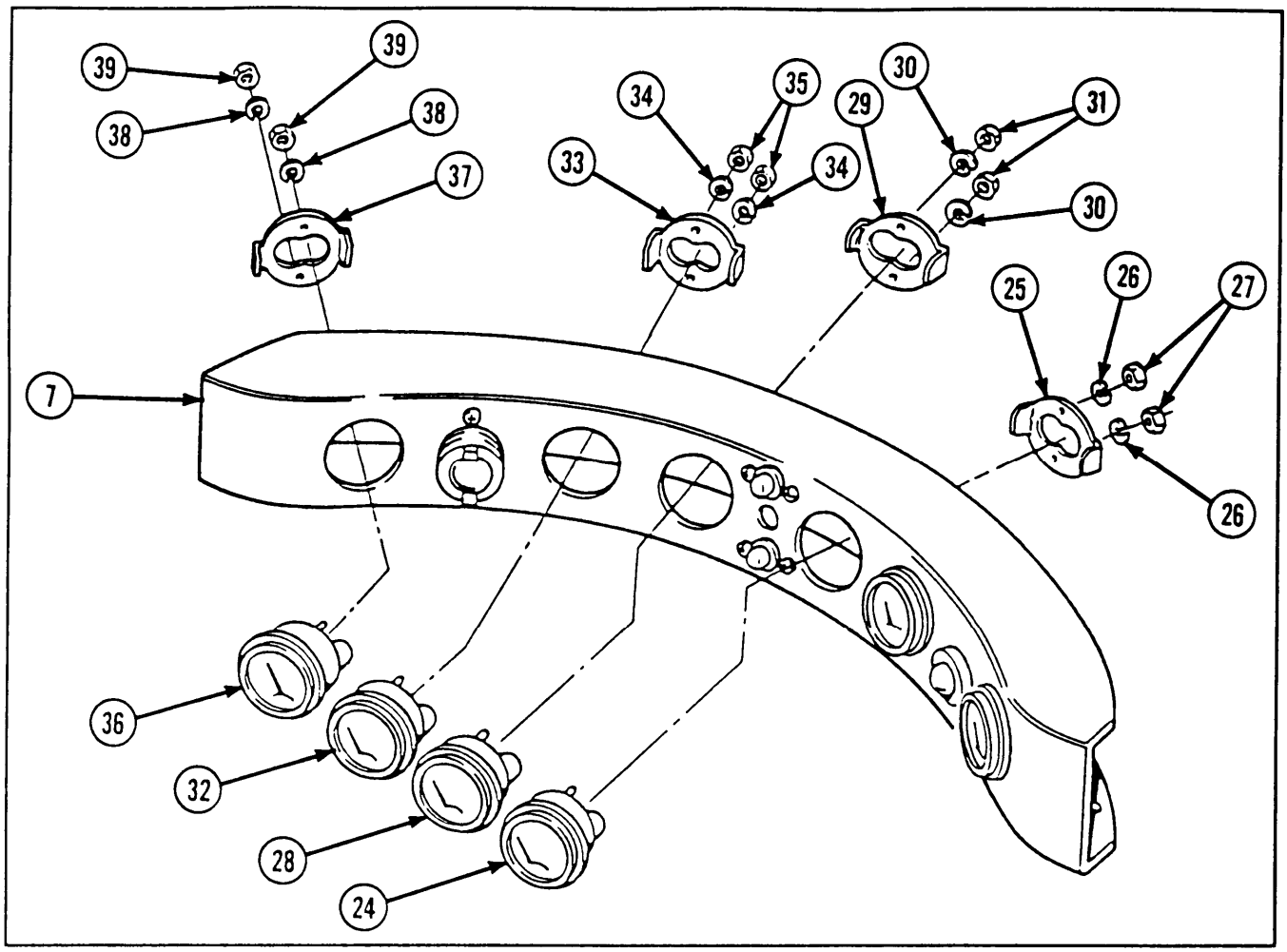
3 Install panel light (6) in instrument panel (7), and secure with two new lockwashers (8) and two machine screws (9).

4 Install generator charge warning light (1 0) in instrument panel (7), and secure with two new lockwashers (11) and two machine screws (12). Untag and connect electrical leads to connectors of generator charge warning light.

5 Install engine and transmission warning light (13) in instrument panel (7), and secure with two new Iockwashers (14) and two machine screws (15). Untag and connect electrical leads to connectors of engine and transmission warning light.

6 Install battery/generator voltmeter (1 6) in instrument panel (7), and secure with mounting clamp (17), two lockwashers (18), and two hexagon plain nuts (19). Untag and connect electrical lead to connector on back side of battery/generator voltmeter.

7 Install engine oil pressure gage (20) in instrument panel (7), and secure with mounting clamp (21), two lockwashers (22), and two hexagon plain nuts (23). Untag and connect two electrical leads to connectors on back side of engine oil pressure gage.



8 Install engine coolant temperature indicator *(24)* in instrument panel (7), and secure with mounting clamp (25), two lockwashers (26), and two hexagon plain nuts (27). Untag and connect two electrical leads to connectors on back side of engine coolant temperature indicator.

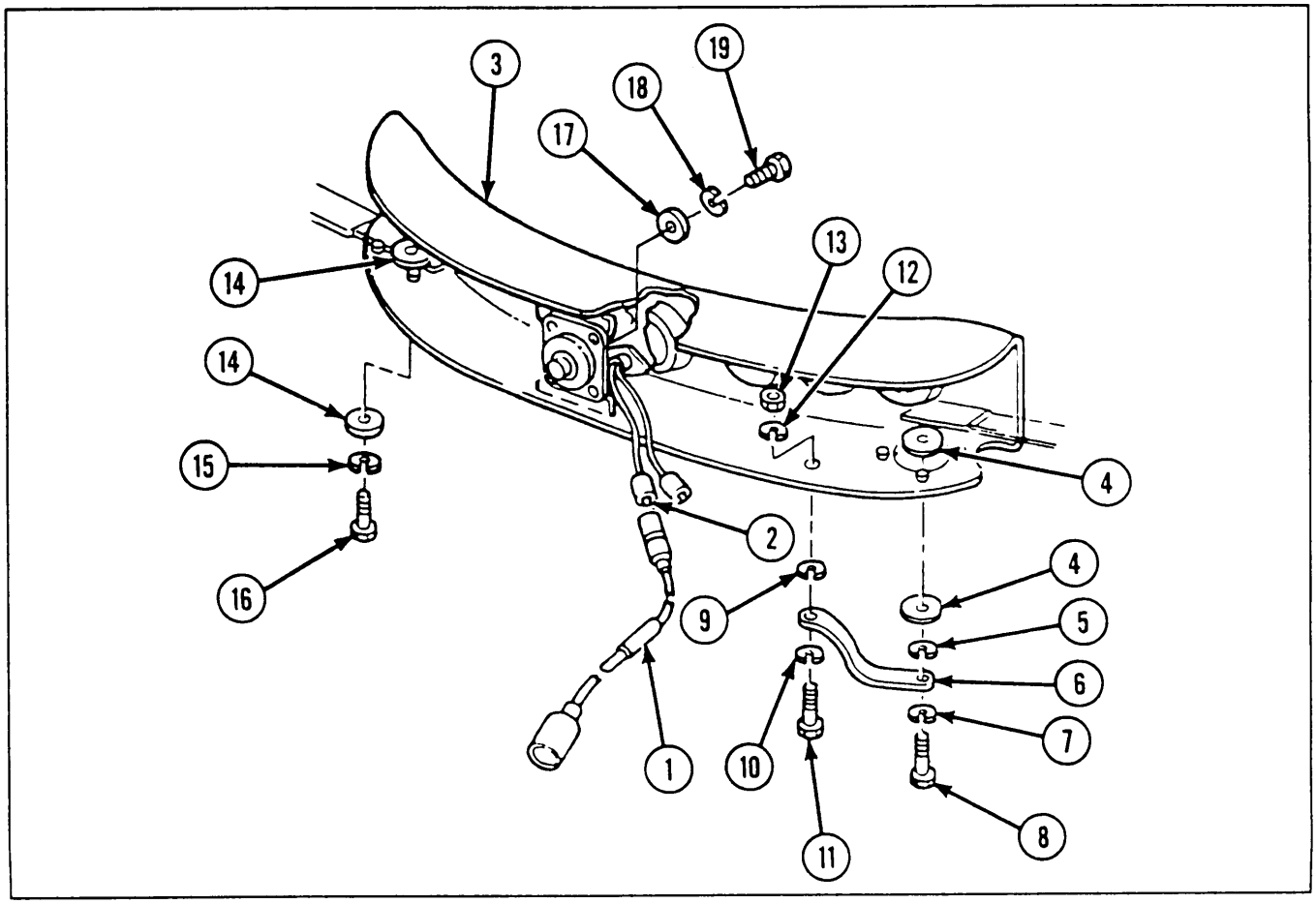
9 Install transmission oil pressure indicator (28) in instrument panel (7), and secure with mounting clamp (29), two lockwashers (30), and two hexagon plain nuts (31). Untag and connect two electrical leads to connectors on back side of transmission oil pressure indicator.

10 Install transmission oil temperature indicator (32) in instrument panel (7), and secure with mounting clamp (33), two lockwashers (34), and two hexagon plain nuts (35). Untag and connect two electrical leads to connectors on back side of transmission oil temperature indicator.

11 Install fuel level indicator (36) in instrument panel (7), and secure with mounting clamp (37), two lockwashers (38), and two hexagon plain nuts (39). Untag and connect two electrical leads to connectors on back side of fuel level indicator.

2-73. MAINTENANCE OF DRIVER'S INSTRUMENT PANEL (GAGE) (CONT).

INSTALLATION



1 Connect master switch light lead and diode assembly (1) at panel light connector (2).

2 Install driver's instrument panel (3). Install two flat washers (4), new lockwasher (5), one end of instrument panel ground electrical lead (6), new lockwasher (7), and machine screw (8).

3 Install new lockwasher (9), other end of instrument panel ground electrical lead (6), new lockwasher (10), machine screw (11), new lockwasher (12), and plain hexagon nut (13).

4 Install two flat washers (14), new lockwasher (15), and machine screw (16).

5 Install flat washer (17), new lockwasher (18), and machine screw (19).

2-74. MAINTENANCE OF WARNING LIGHT.

This task covers:	a. *Disassembly*	b. *Inspection/Repair*	c. *Reassembly*

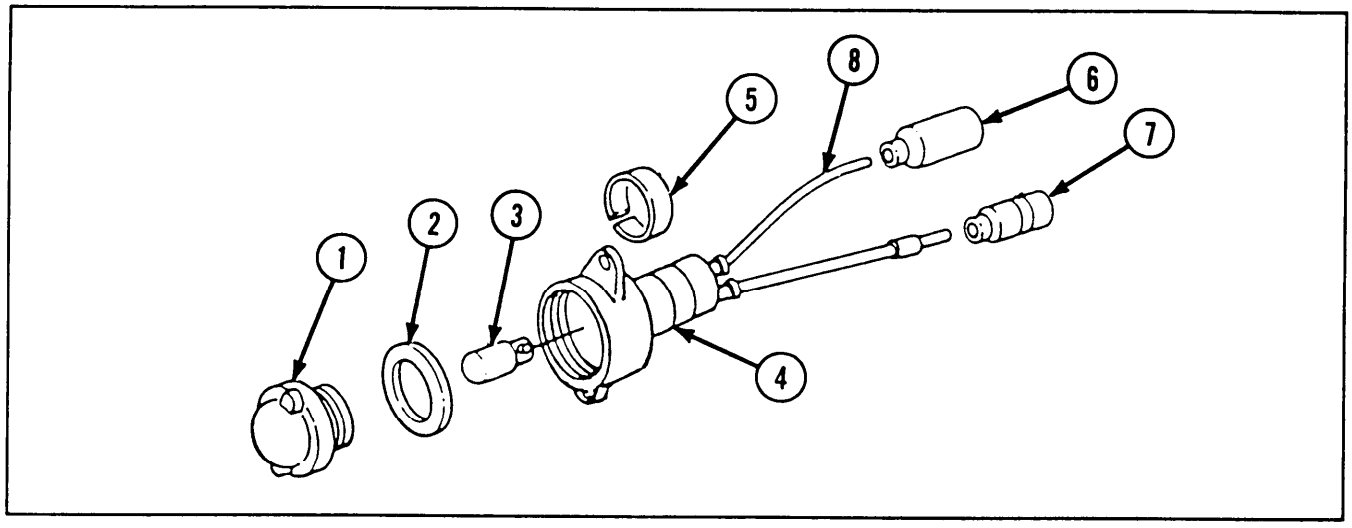
INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
LED

References
TM 9-2350-238-24P-1

Equipment Conditions
2-566 Warning light removed
2-571 Warning light removed
2-593 Warning light removed

DISASSEMBLY



1 Remove light lens (1), flat washer (2), and light emitting diode (LED) (3) from light socket (4).

2 If damaged, remove band (5) from light socket (4).

3 If damaged, remove two connectors (6 and 7) and electrical wire (8) from light socket (4).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

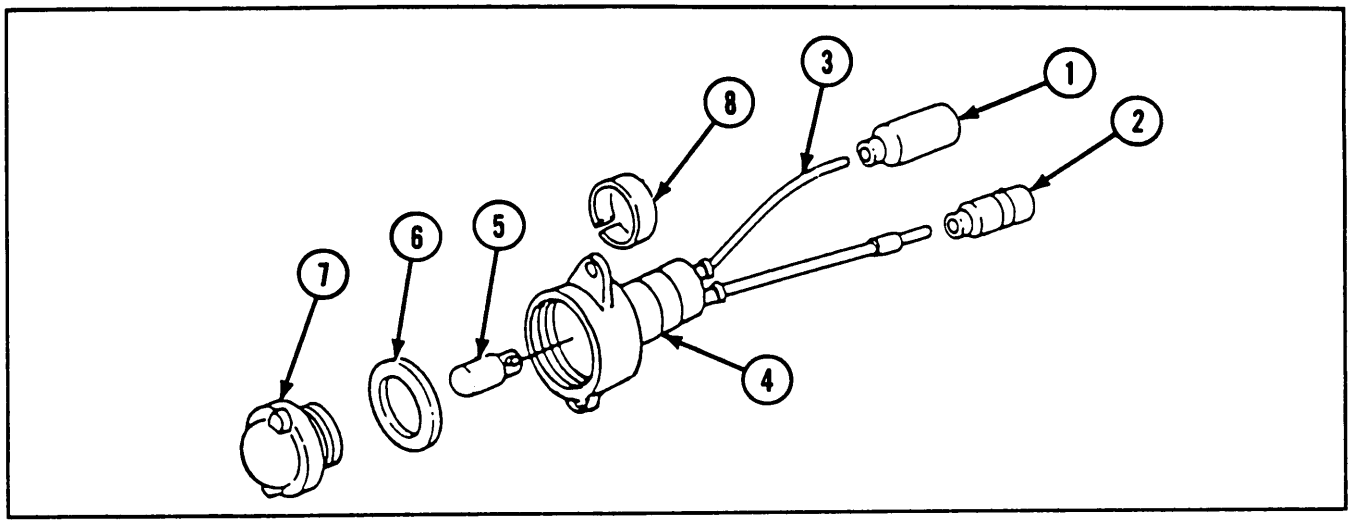
2 If light socket is damaged, repair is by replacement of next higher assembly.

3 Electrical wire is a manufactured item, refer to appendix D.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

2-74. MAINTENANCE OF WARNING LIGHT (CONT).

REASSEMBLY



1 If removed, install two new connectors (1 and 2) and electrical wire (3) on light socket (4).

2 Install new LED (5), flat washer (6), and light lens (7) in light socket (4).

3 If removed, install new band (8) on light socket (4).

2-75. MAINTENANCE OF INDICATOR LIGHT AND INDICATOR LIGHT.

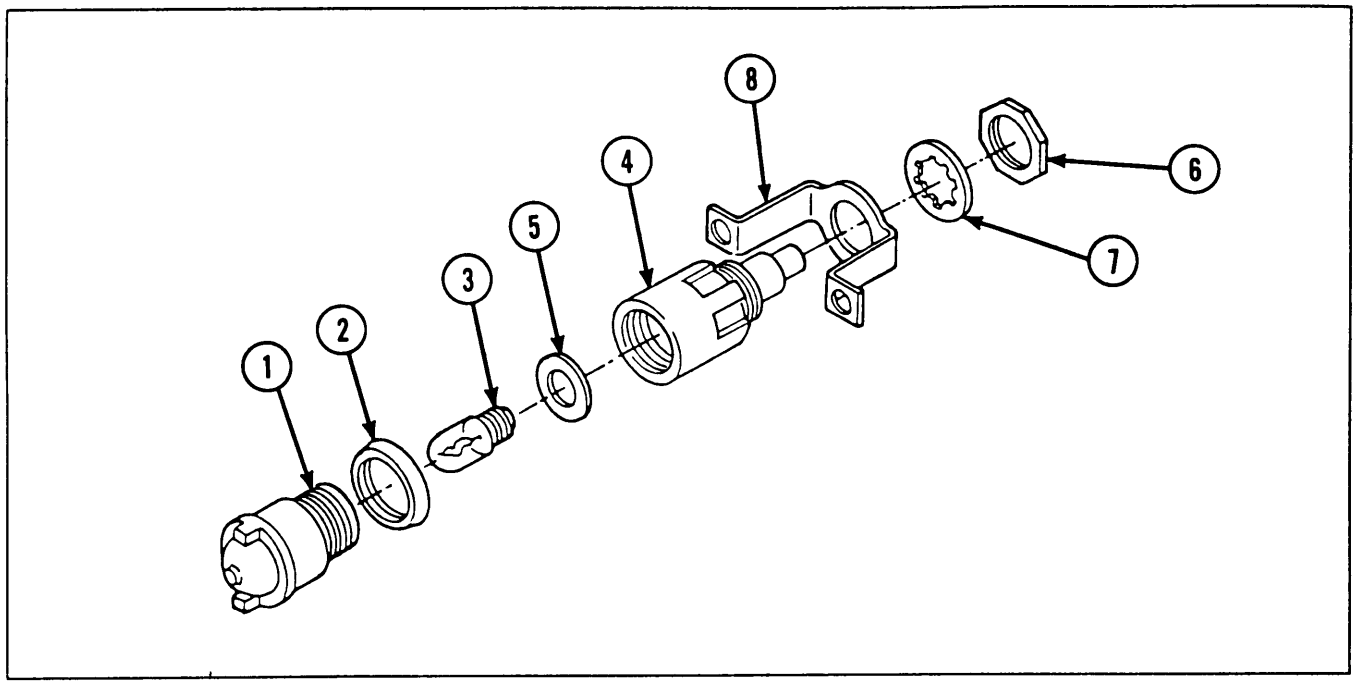
This task covers:	a. *Disassembly*	b. *Inspection/Repair*	*c. Reassembly*

INITIAL SETUP

Mateials/Parts
Gasket
LockWasher
Preformed packing

References
TM 9-2350-238-24P-1

Equipment Conditions
2-566 Indicator light removed



DISASSEMBLY

1 Remove light lens (1), preformed packing (2), and incandescent lamp (3) from light socket (4).

2 Remove gasket (5) from light socket (4).

3 Remove electrical bondnut (6), lockwasher (7), and retaining strap (8) from light socket (4).

1 Inspect for broken, damaged, or missing parts.

2 If light socket is damaged, repair is by replacement of next higher assembly.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

REASSEMBLY

1 Install retaining strap (8), new lockwasher (7), and electrical bondnut (6) on light socket (4).

2 Install new gasket (5) in light socket (4).

3 Install incandescent lamp (3), new preformed packing (2), and light lens (1) in light socket (4).

2-76. MAINTENANCE OF AIR BOX HEATER CONTROLS BRACKET ASSEMBLY.

This task covers: a. *Removal* b. *Inspection/Repair* *c. Installation*

INITIAL SETUP

Matenals/Parts
Lockwasher (2)

References
TM 9-2350-238-24P-1

Equipment Conditions
MASTER switch set to OFF
2-640 Battery ground leads disconnected

General Safety Instructoins

WARNING

Brake foot pedal is spring-loaded. Block tracks and release parking brake before working on drivets instrument panel. Disconnect battery ground leads from battery before working at rear of panel.

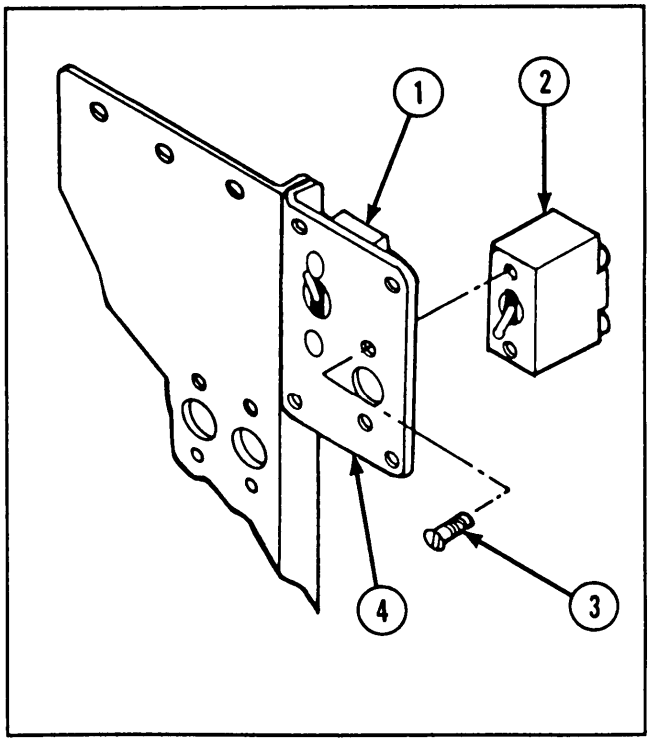
REMOVAL

WARNING

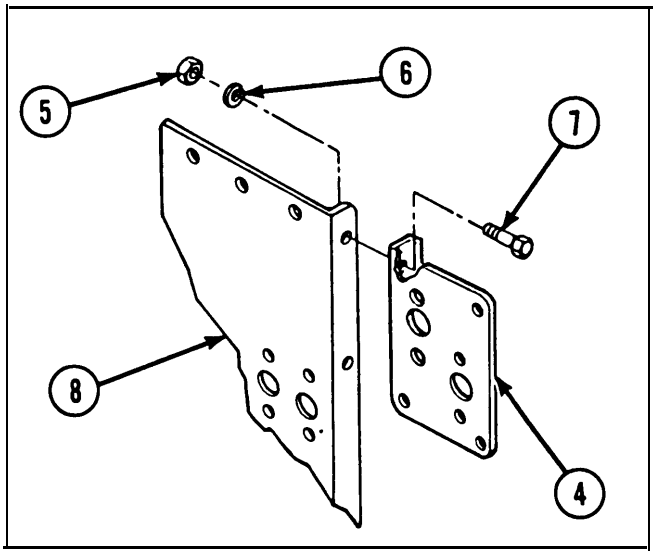
Brake foot pedal is spring-loaded. Block tracks and release parking brake before working on driver's instrument panel. Disconnect battery ground leads from battery before working at rear of panel.

1 Tag and disconnect all electrical leads from air box heater toggle switch (1) and pump and igniter toggle switch (2).

2 Remove four machine screws (3), air box heater toggle switch (1), and pump and igniter toggle switch (2) from angle bracket (4).



3 Remove two hexagon plain nuts (5), two lockwashers (6), two hexagon head capscrews (7), and angle bracket (4) from driver's instrument panel (8).



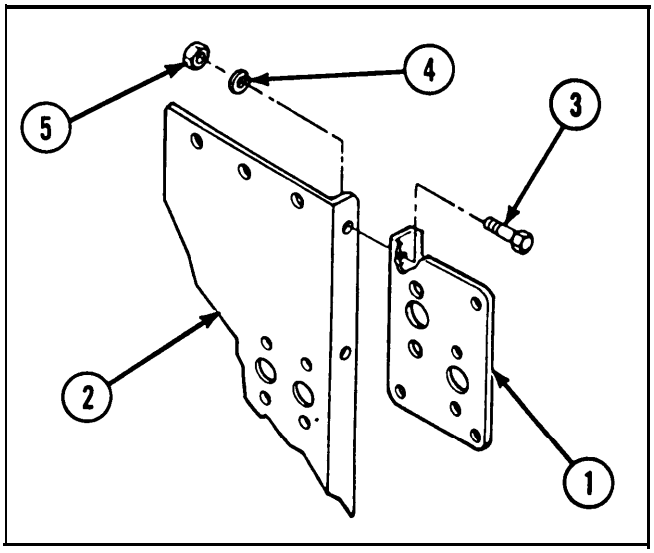
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

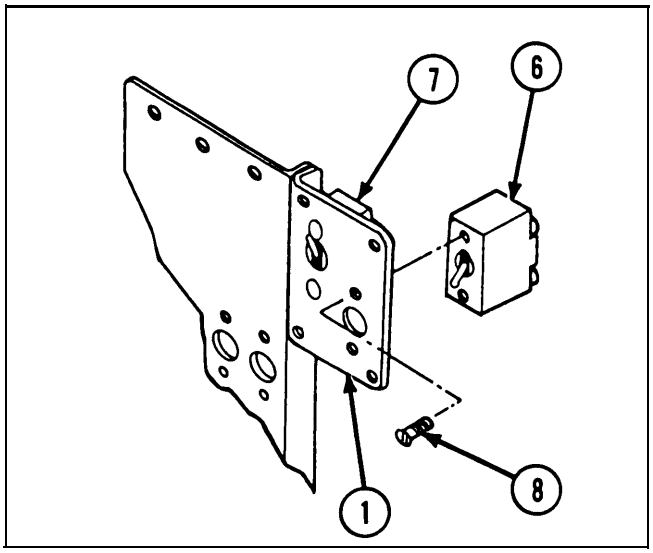
INSTALLATION

1 Position angle bracket (1) on driver's instrument panel (2) and secure with two hexagon head capscrews (3), two new lockwashers (4), and two hexagon plain nuts (5).



2 Position pump and igniter toggle switch (6) and air box heater toggle switch (7) on angle bracket (1) and secure with four machine screws (8).

3 Untag and connect all electrical leads.



2-77. MAINTENANCE OF MISCELLANEOUS ELECTRICAL COMPONENTS.

This task covers: a. *Removal* b. *Inspection/Repair* *c. Installation*

INITIAL SETUP

Materials/Parts
LockWasher (4)
LockWasher (6)
LockWasher (2)

References
TM 9-2350-238-24P-1

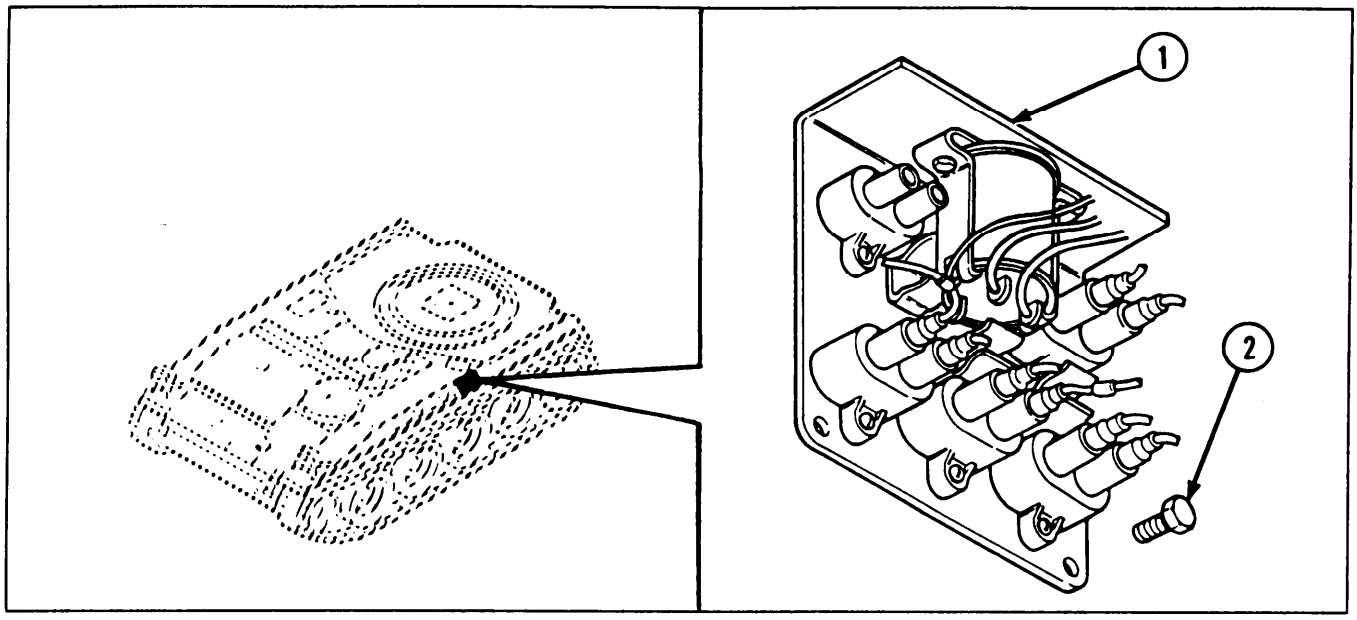
Equipment Conditions
2-923 $C0_2$ access cover removed
2-928 Driver's compartment aft cowl removed
2-952 Driver's seat removed
2-640 Batteries disconnected

General Safety Instructions

WARNING

- Make sure MASTER switch is OFF before repairing electrical components or circuits. Failure to observe this warning could result in injury to personnel.
- Failure to remove or disconnect the batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.
- Brake foot pedal is spring-loaded. Block tracks and release parking brake before working on headlight beam selection switch.

REMOVAL

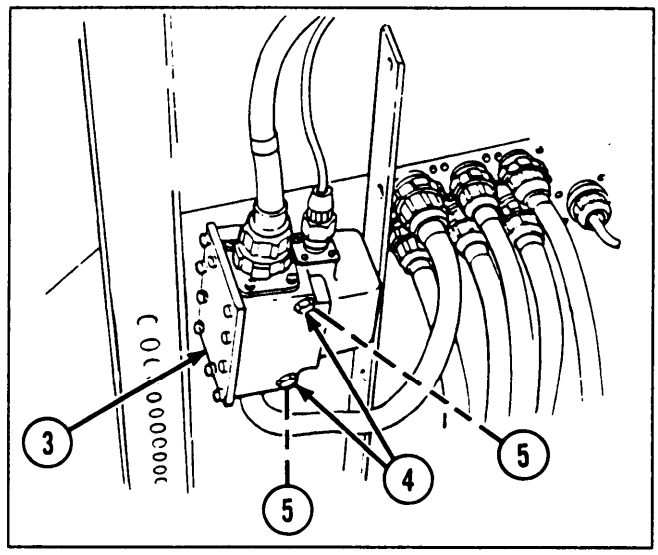


WARNING

- Make sure MASTER switch is OFF before repairing electrical components. Failure to observe this warning could result in injury to personnel.
- Failure to remove or disconnect the batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Tag and disconnect all electrical leads from electrical accessories power bus panel (1).

2 Remove four assembled washer bolts (2) and electrical accessories power bus panel (1) from vehicle.

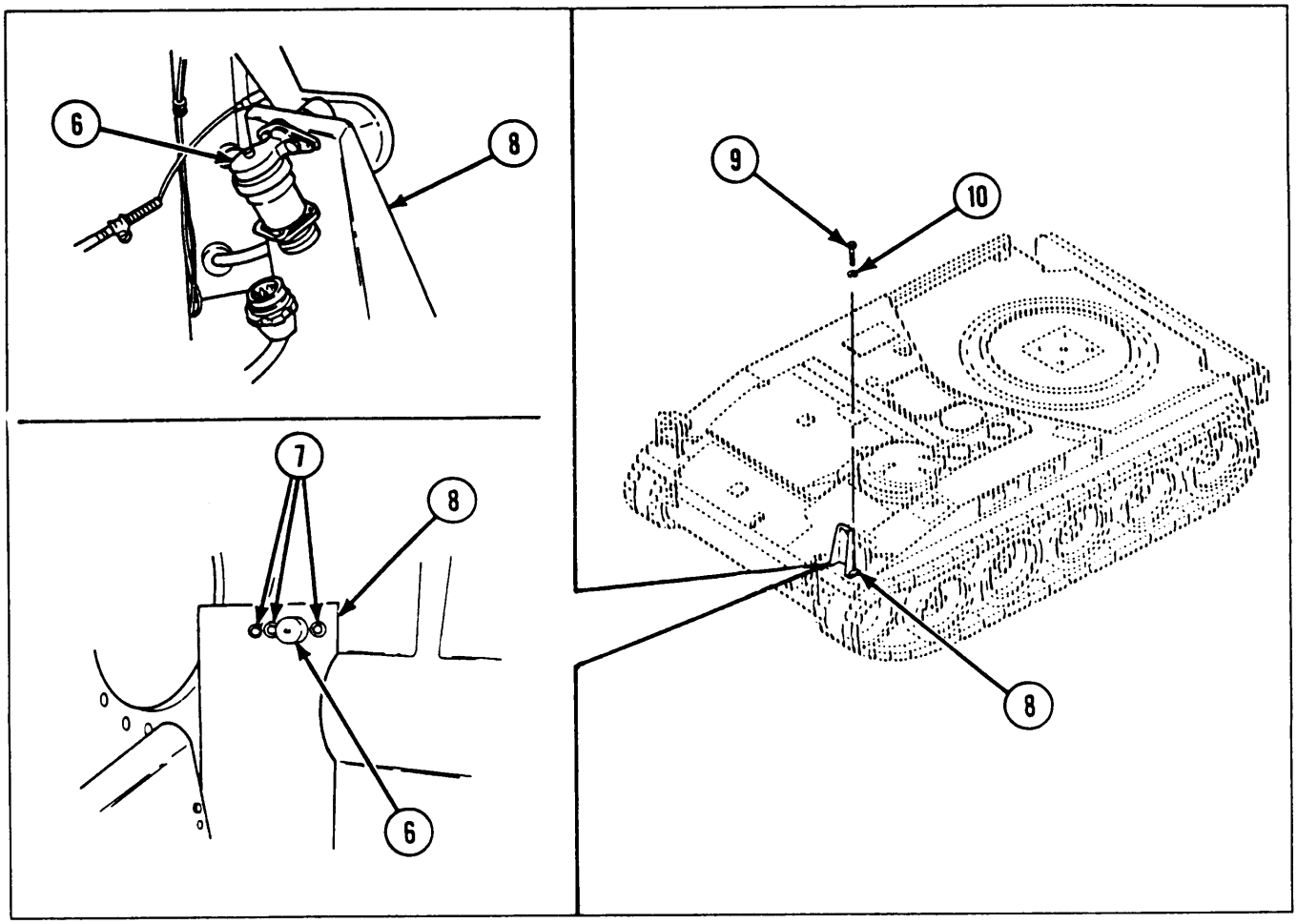


3 Tag and disconnect all electrical leads from battery disconnect relay (3).

4 Remove two hexagon head capscrews (4), two lockwashers (5), and battery disconnect relay (3) from driver's compartment.

2-77. MAINTENANCE OF MISCELLANEOUS ELECTRICAL COMPONENTS (CONT).

REMOVAL (CONT)



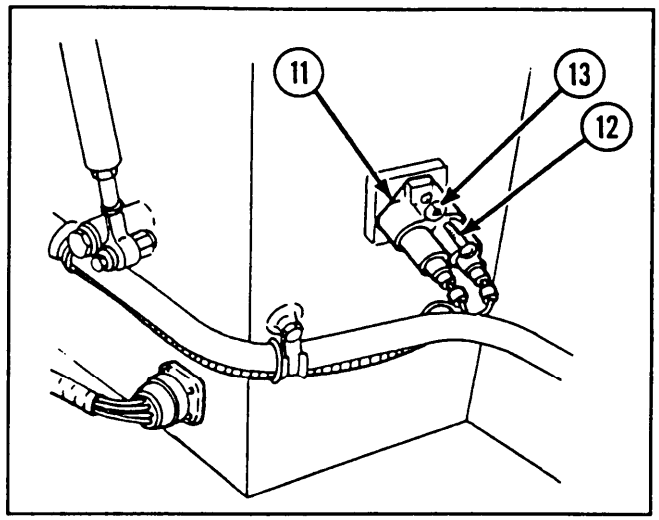
WARNING

Brake foot pedal is spring-loaded. Block tracks and release parking brake before working on headlight beam selection switch.

5 Tag and disconnect all electrical leads from headlight beam selection switch (6).

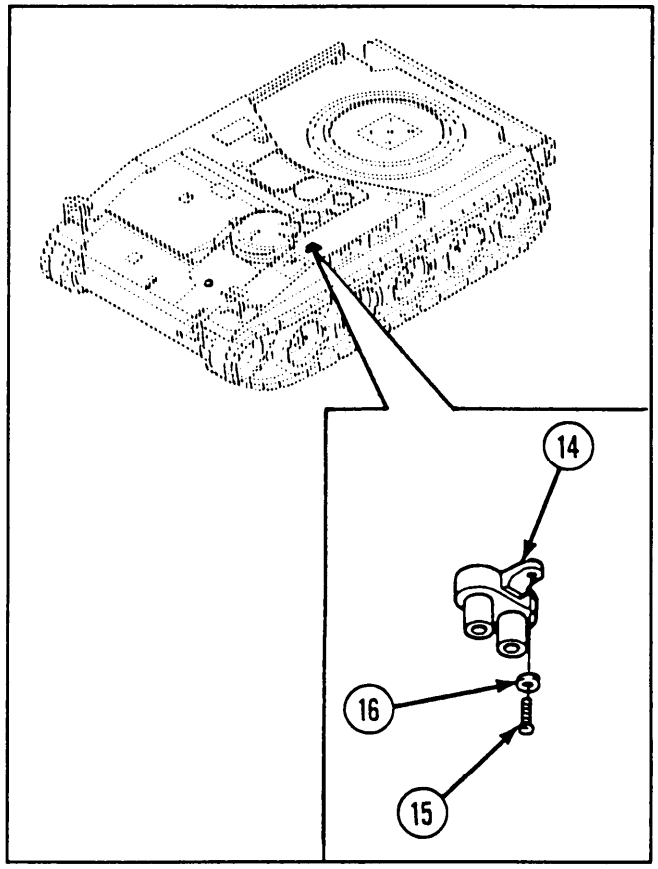
6 Remove three assembled washer bolts (7) and headlight beam selection switch (6) from dimmer switch electrical bracket (8).

7 Remove four hexagon head capscrews (9), four lockwashers (10), and dimmer switch electrical bracket (8) from vehicle.



8 Tag and disconnect all electrical leads from generator cooling fan circuit breaker (11).

9 Remove two socket head capscrews (12), two lockwashers (13), and generator cooling fan circuit breaker (11) from left front engine/driver's bulkhead side.



10 Tag and disconnect all electrical leads from two air box heater circuit breakers (14).

11 Remove four socket head capscrews (15), four lockwashers (16), and two air box heater circuit breakers (14) from top of driver's compartment.

INSPECTION/REPAIR

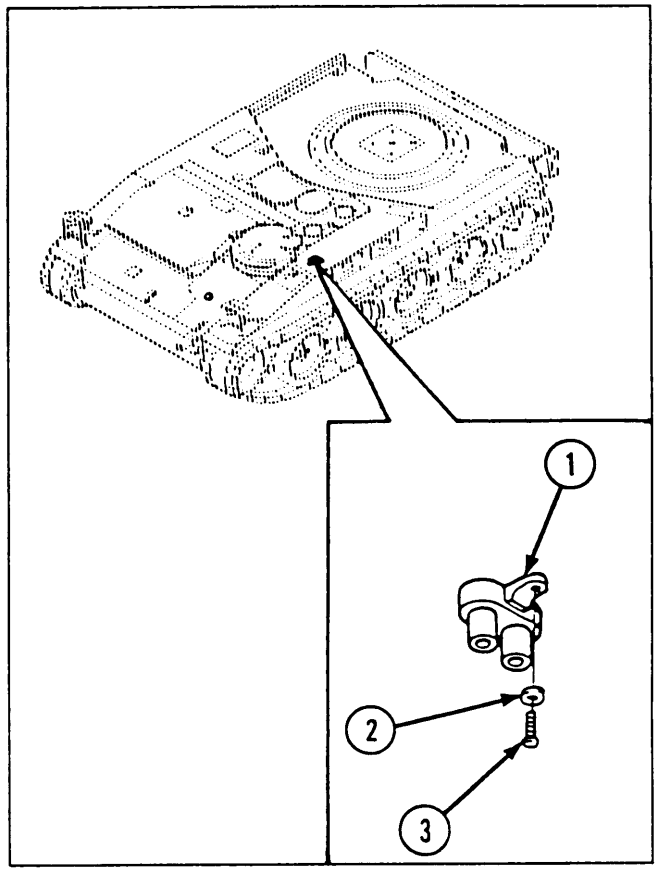
1 Inspect for broken, damaged, or missing pads.

2 Electrical accessories power bus panel is a repairable assembly. Refer to page 2-590.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

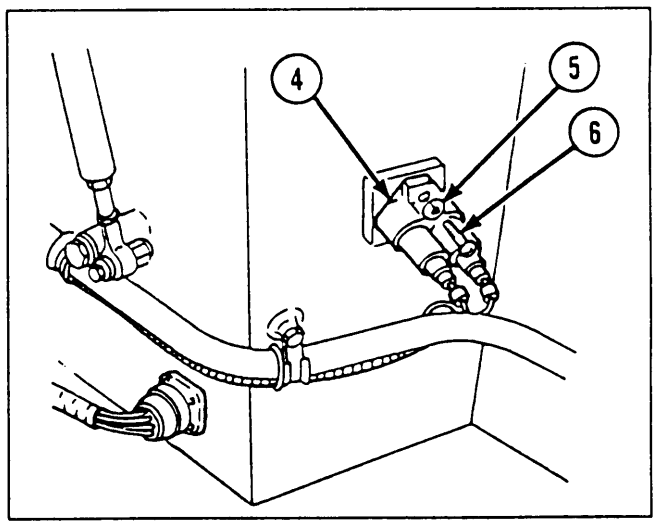
2-77. MAINTENANCE OF MISCELLANEOUS ELECTRICAL COMPONENTS (CONT).

INSTALLATION



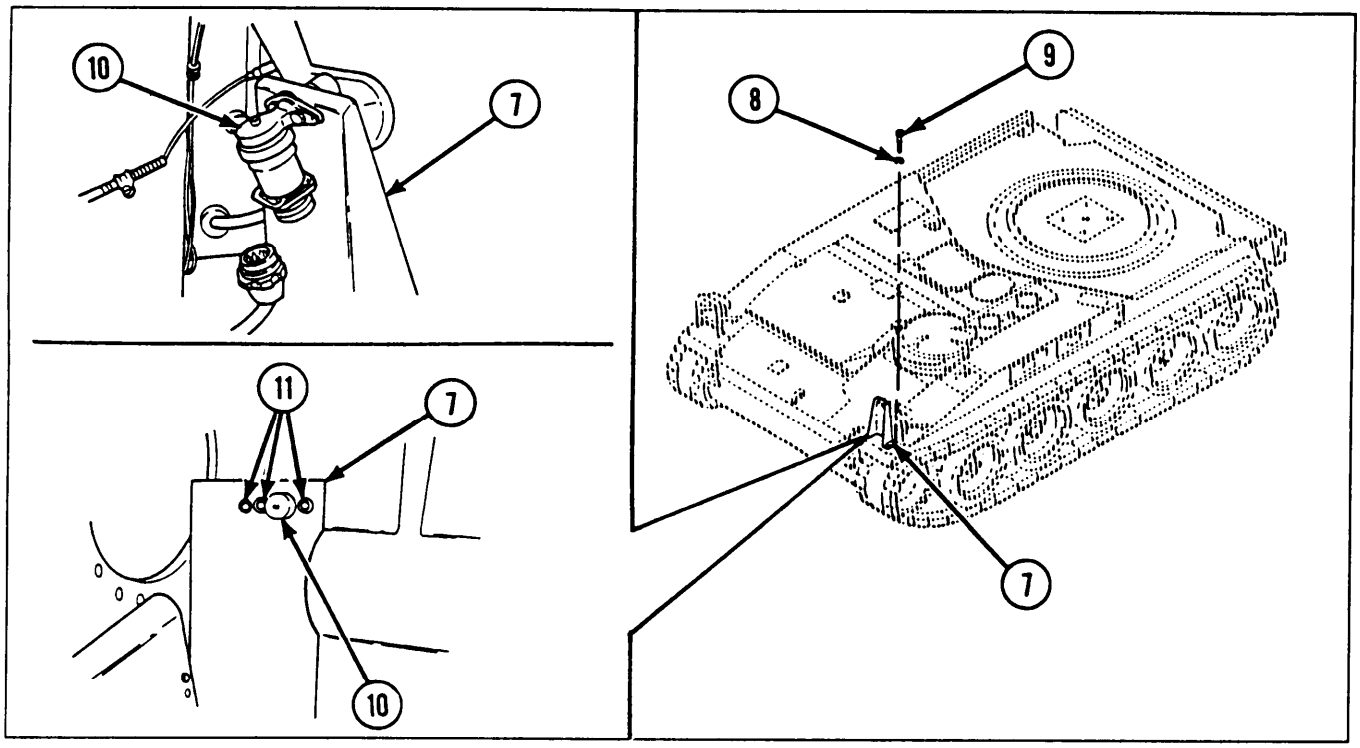
1 Position two air box heater circuit breakers (1) at top of driver's compartment, and secure with four new lockwashers (2) and four socket head capscrews (3).

2 Untag and connect electrical leads to two air box heater circuit breakers (1).



3 Position generator cooling fan circuit breaker (4) in left front engine/driver's bulkhead side, and secure with two new lockwashers (5) and two socket head capscrews (6).

4 Untag and connect electrical leads to generator cooling fan circuit breaker (4).



WARNING

Brake foot pedal is spring-loaded. Block tracks and release parking brake before working on headlight beam selection switch.

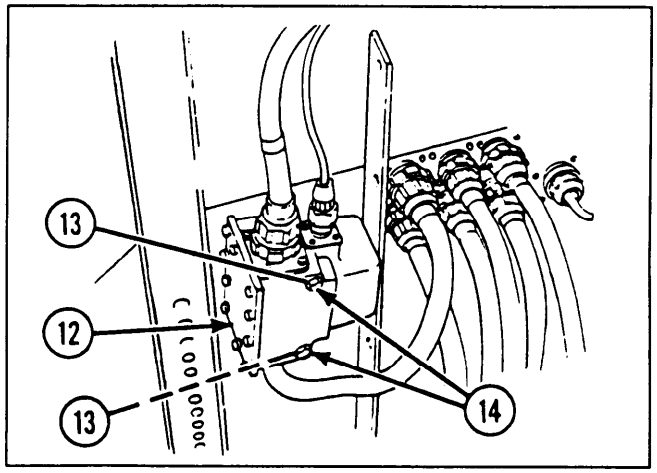
5 Position dimmer switch electrical bracket (7) on vehicle, and secure with four new lockwashers (8) and four hexagon head capscrews (9).

6 Position headlight beam selection switch (10) on dimmer switch electrical bracket (7), and secure with three assembled washer bolts (11).

7 Untag and connect electrical leads to headlight beam selection switch (10).

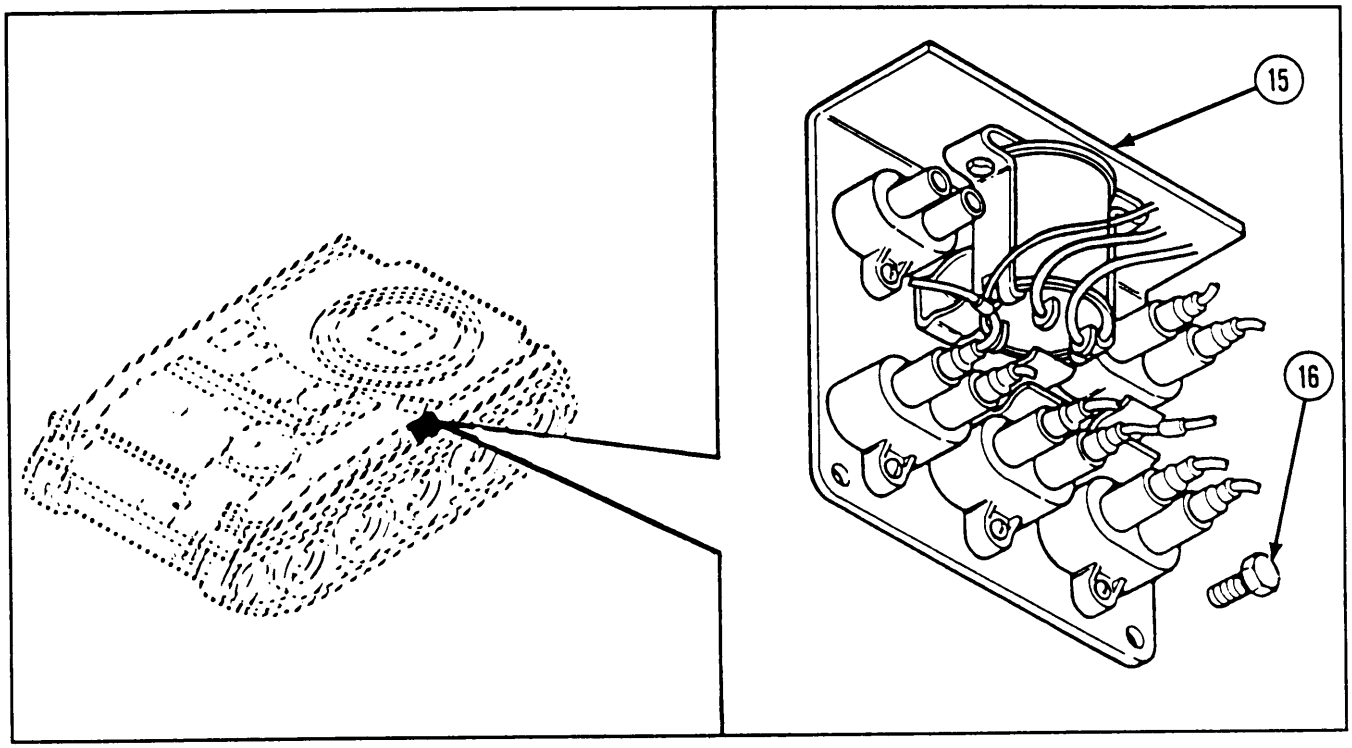
8 Position battery disconnect relay (12) on vehicle, and secure with two new lockwashers (13) and two hexagon head capscrews (14).

9 Untag and connect electrical leads to battery disconnect relay (12).



2-77. MAINTENANCE OF MISCELLANEOUS ELECTRICAL COMPONENTS (CONT).

INSTALLATION (CONT)



10 Position electrical accessories power bus panel (15) on vehicle, and secure with four assembled washer bolts (16).

11 Untag and connect electrical leads to electrical accessories power bus panel (15).

2-78. MAINTENANCE OF ELECTRICAL ACCESSORIES POWER BUS PANEL.

This task covers:	a. *Disassembly*	b. *Inspection/Repair*	*c. Reassembly*

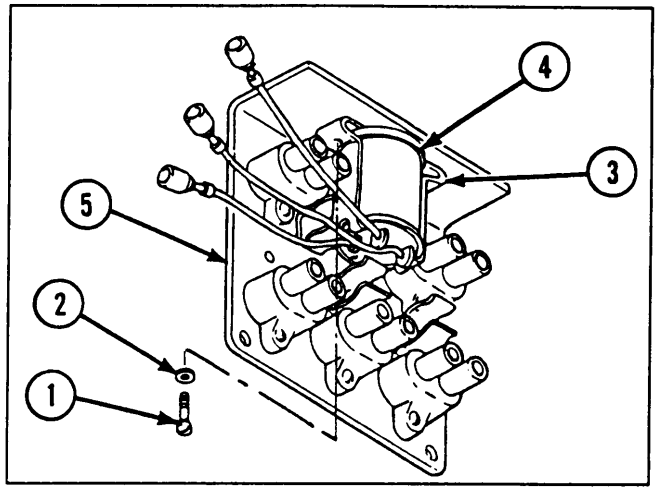
INITIAL SETUP

Materials/Parts
Corrosion preventive sealant (item 35, appx C)
Lockwasher (10)
Sealant (item 36, appx C)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-584 Electrical accessories power bus panel removed

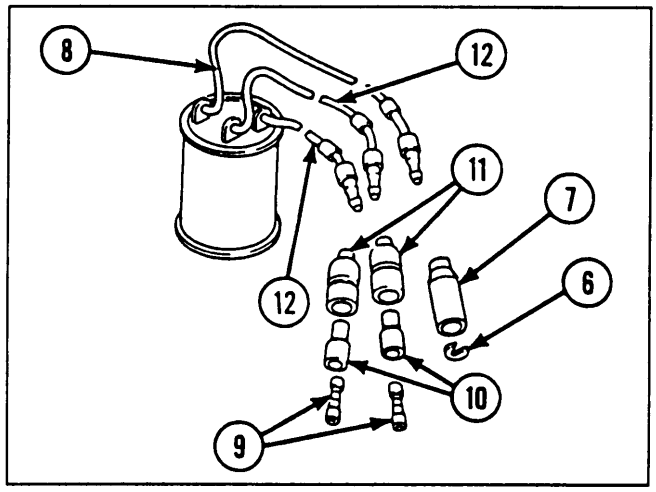
DISASSEMBLY



NOTE

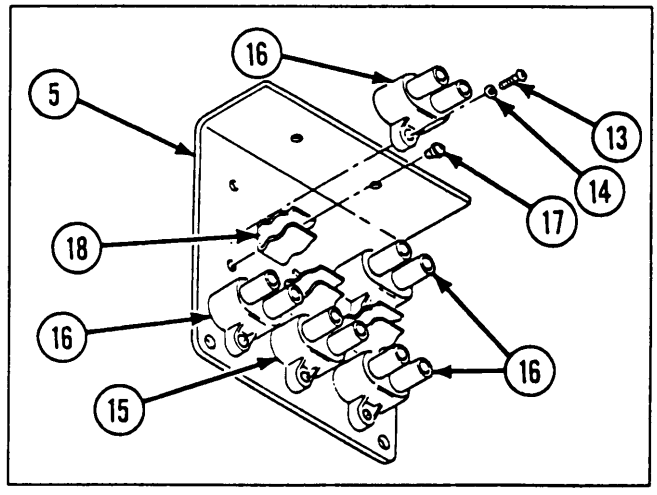
Tag all electrical leads and cables during disassembly to aid in reassembly.

1 Remove two machine screws (1), two flat washers (2), two rectifier mounting brackets (3), and rectifier and lead (4) from angle bracket (5).



2 Remove slotted washer (6) and electrical shell (7) from attached electrical cable (8).

3 Remove two terminal assemblies (9), two bushing insulators (10), and two electrical shells (11) from two attached electrical cables (12).



4 Remove ten machine screws (13), ten lockwashers (14), 20-amp circuit breaker (15), and four 15-amp circuit breakers (16) from angle bracket (5).

5 Remove three assembled washer screws (17) and three spring tension clips (18) from angle bracket (5).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Inspect rectifier for signs of overheating.

3 Inspect contact pin for corrosion.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

2-78. MAINTENANCE OF ELECTRICAL ACCESSORIES POWER BUS PANEL (CONT).

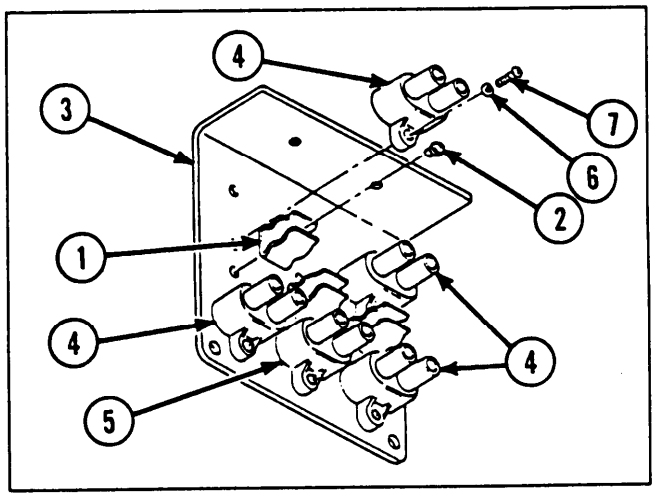
REASSEMBLY

1 Install three spring tension clips (1) and three assembled washer screws (2) on angle bracket (3).

CAUTION

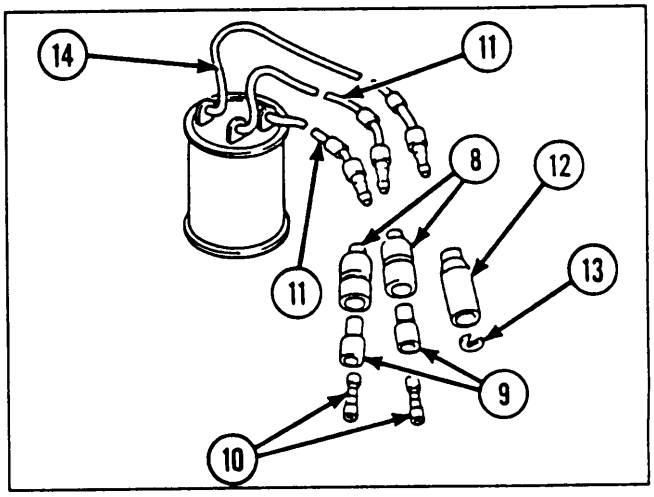
Ensure circuit breaker is installed in correct position.

2 Install four 15-amp circuit breakers (4), 20-amp circuit breaker (5), ten new lockwashers (6), and ten machine screws (7) to angle bracket (3).



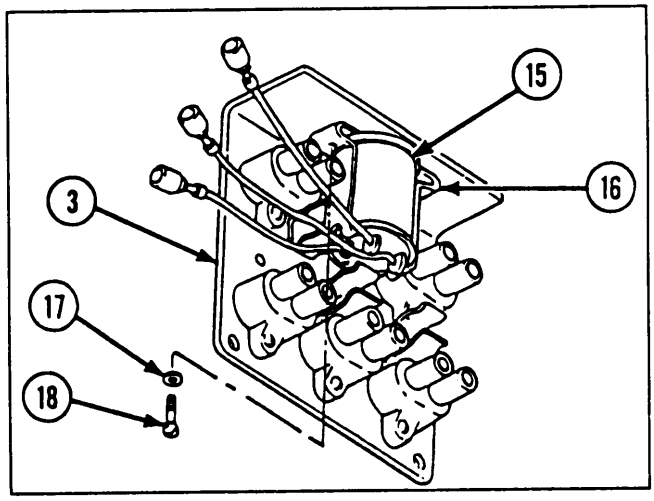
3 Install two electrical shells (8), two bushing insulators (9), and two terminal assemblies (10) to two attached electrical cables (11).

4 Install electrical shell (12) and slotted washer (13) to attached electrical cable (14).



5 install rectifier and lead (15), two rectifier mounting brackets (16), two flat washers (17), and two machine screws (18) to angle bracket (3).

6 Apply corrosion preventive sealant to soldered terminals of rectifier. Fill recess in top of rectifier with sealant, rounding off surface so moisture cannot accumulate.



2-79. MAINTENANCE OF HEADLIGHT, DOME LIGHT, WARNING LIGHT, AND STOPLIGHT-TAILLIGHT INSTALLATION.

This task covers:	a. *Removal* b. *Inspection/Repair* *c. Installation*	d. *Alignment check* *e. Alignment*

INITIAL SETUP

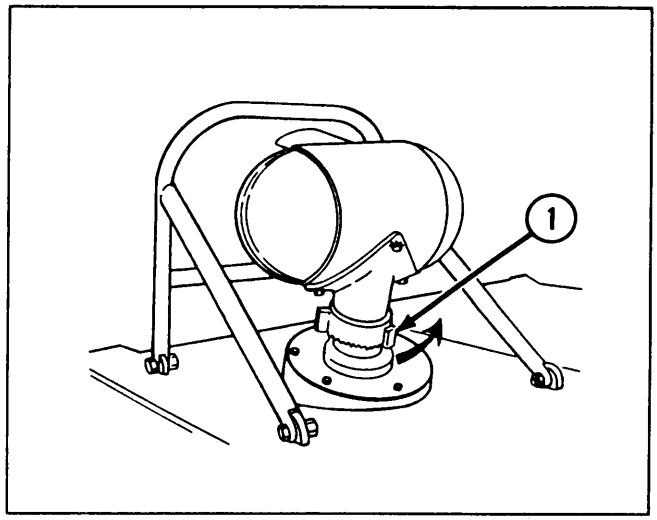
Materials/Parts
Adhesive (item 4, appx C)
LockWasher (2)
LockWasher (4)
LockWasher (2)
Lockwasher (4)

References
TM 9-2350-238-24P-1

REMOVAL

NOTE
Steps 1 and 2 are written for one headlight assembly, but apply to both headlight assemblies.

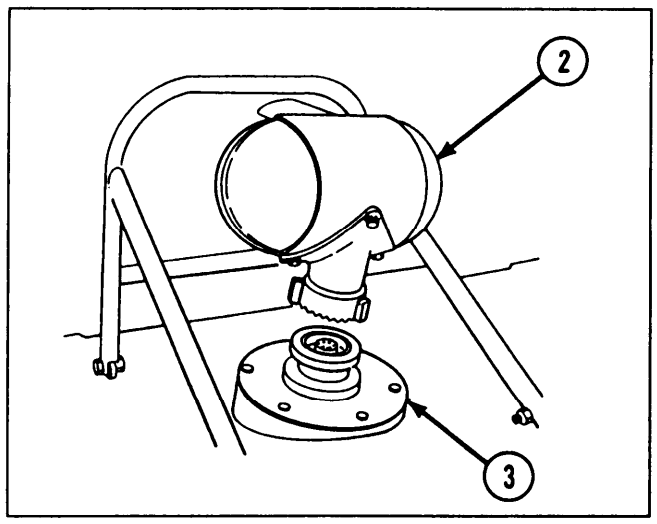
1 Loosen headlamp mounting adjusting nut (1).



CAUTION

Twisting headlight assembly can damage headlight-to-base electrical connector.

2 Lift straight upon headlight assembly (2) and remove from base (3).



2-79. MAINTENANCE OF HEADLIGHT, DOME LIGHT, WARNING LIGHT, AND STOPLIGHT-TAILLIGHT INSTALLATION (CONT).

REMOVAL (CONT)

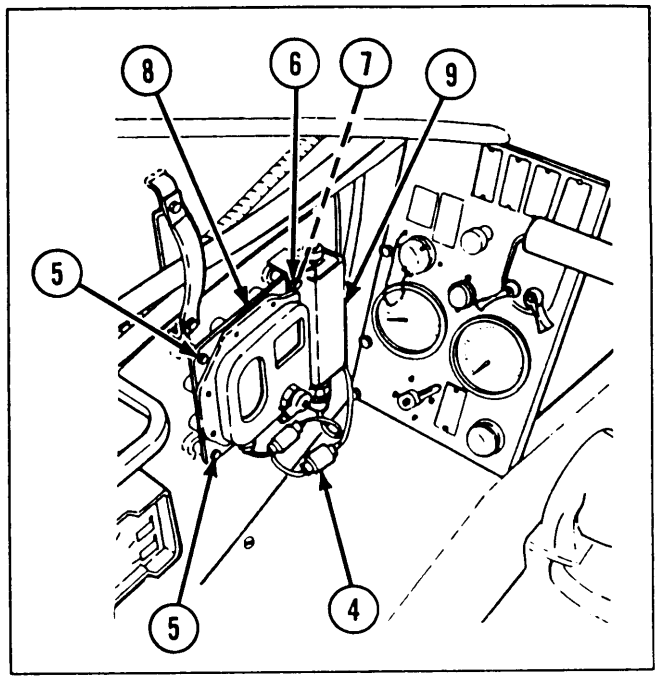
3 Disconnect electrical connector (4).

4 Remove two assembled washer bolts (5).

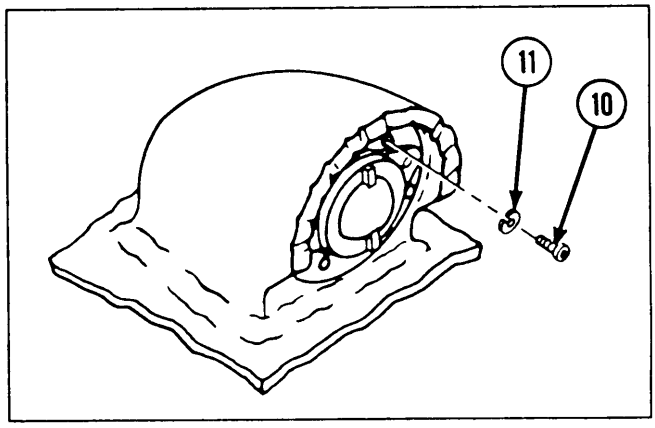
NOTE

Hexagon head capscrews and lockwashers removed in step 5 are also used to secure LOW ENGINE COOLANT warning indicator light to panel on forward side of driver's compartment dome light.

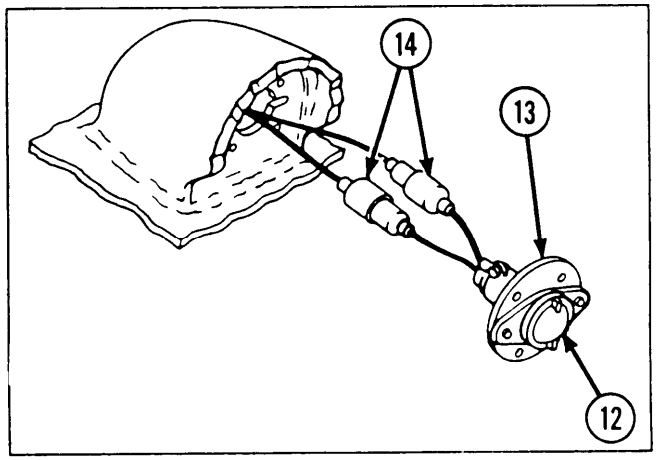
5 Remove two hexagon head capscrews (6) and two lockwashers (7). Remove driver's compartment dome light (8) and allow LOW ENGINE COOLANT warning indicator light (9) to hang on its electrical lead.



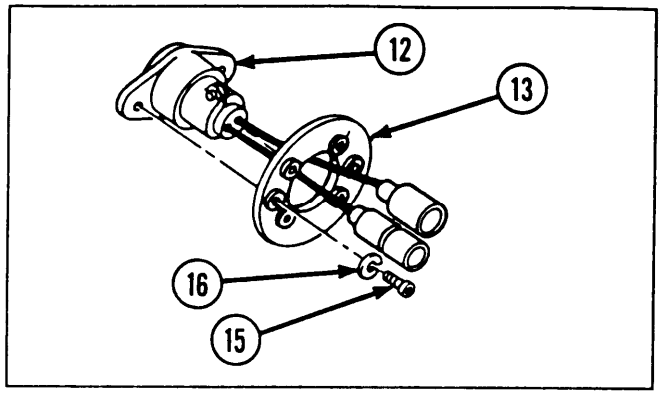
6 Remove four socket head capscrews (10) and four lockwashers (11).



7 Pull out warning light (12) and warning light resilient mount (13). Disconnect two electrical connectors (14).



8 Remove two socket head capscrews (15), two lockwashers (16), and warning light (12) from warning light resilient mount (13).

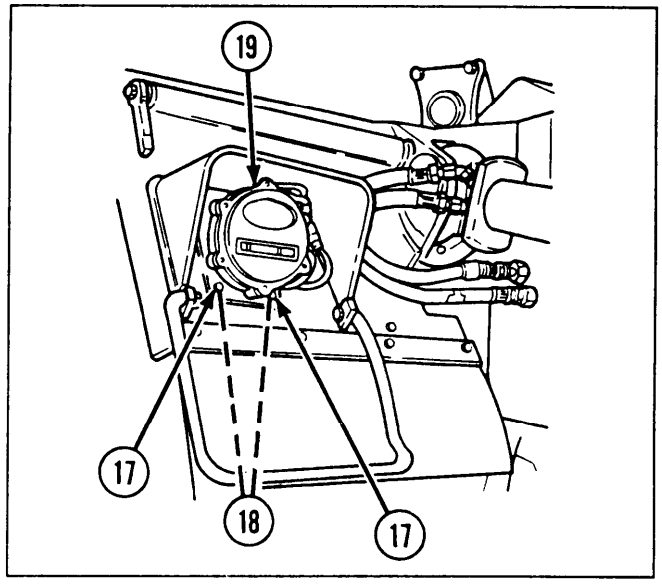


NOTE

Steps 9 and 10 are written and illustrated for the left stoplight-taillight, but also apply to the right stoplight-taillight.

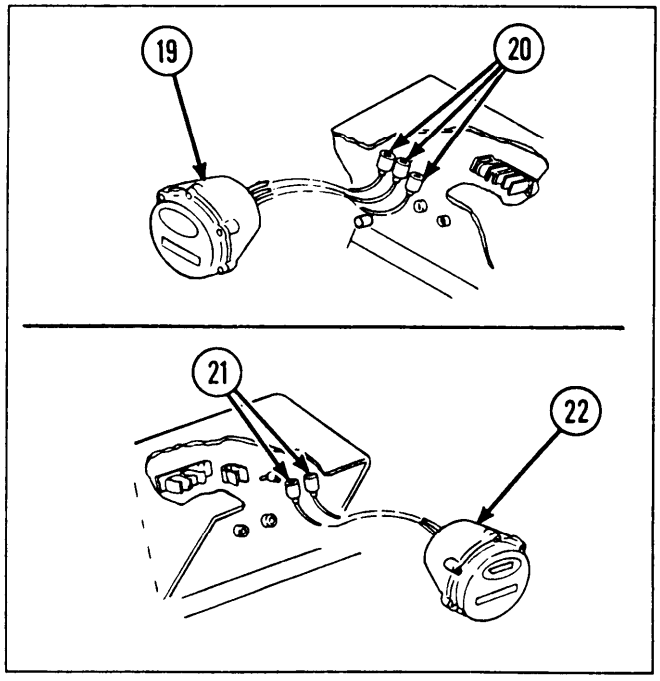
9 Remove two hexagon head capscrews (17) and two lockwashers (18).

10 Pull left stoplight-taillight (19) away from vehicle.



11 Disconnect three electrical connectors (20) and remove left stoplight-taillight (19).

12 Disconnect two electrical connectors (21) and remove right stoplight-taillight (22).



2-79. MAINTENANCE OF HEADLIGHT, DOME LIGHT, WARNING LIGHT, AND STOPLIGHT-TAILLIGHT INSTALLATION (CONT).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Headlight assembly is a repairable assembly. Refer to page 2-601.

3 Driver's compartment dome light is a repairable assembly. Refer to page 2-620.

4 Warning light is a repairable assembly. Refer to page 2-579.

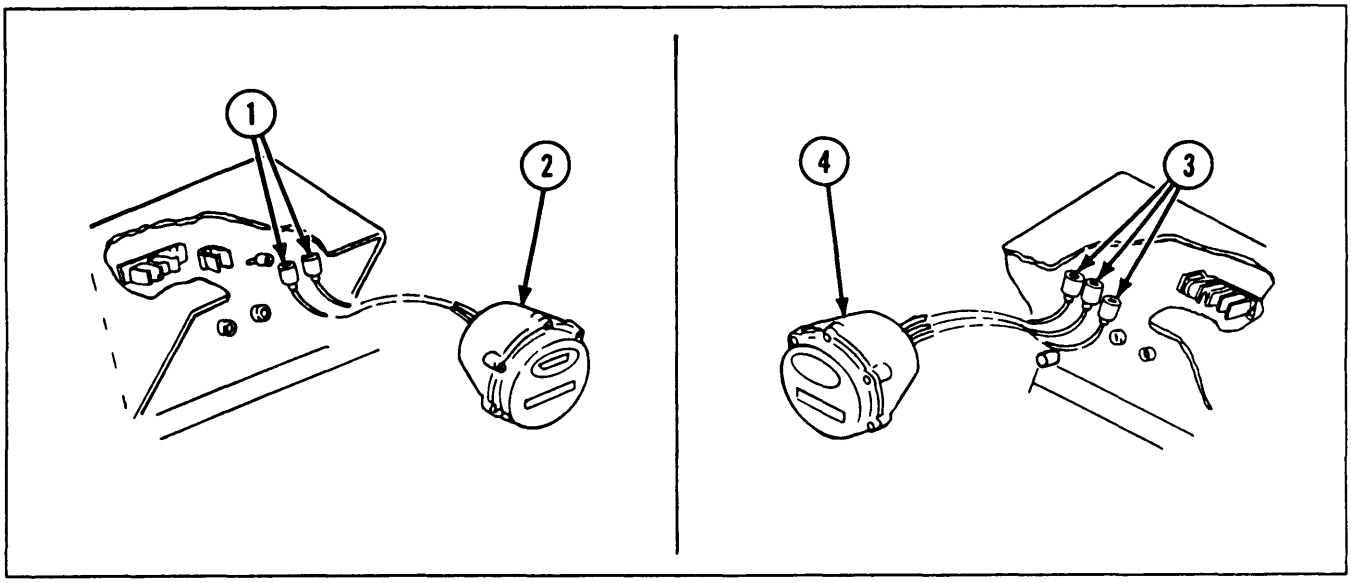
5 Left stoplight-taillight is a repairable assembly. Refer to page 2-614.

6 Right stoplight-taillight is a repairable assembly. Refer to page 2-617.

7 For repair of shell connectors, refer to general maintenance, page 2-371.

8 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



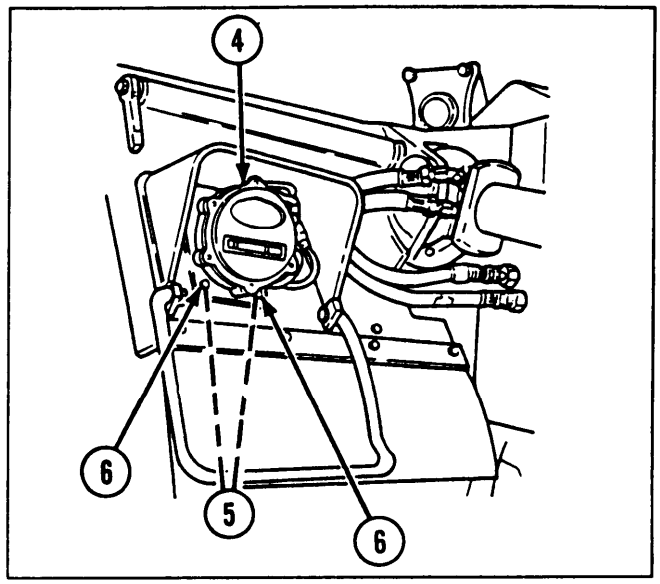
1 Connect two electrical connectors (1) of right stoplight-taillight (2) to line connections.

2 Connect three electrical connectors (3) of left stoplight-taillight (4) to line connections.

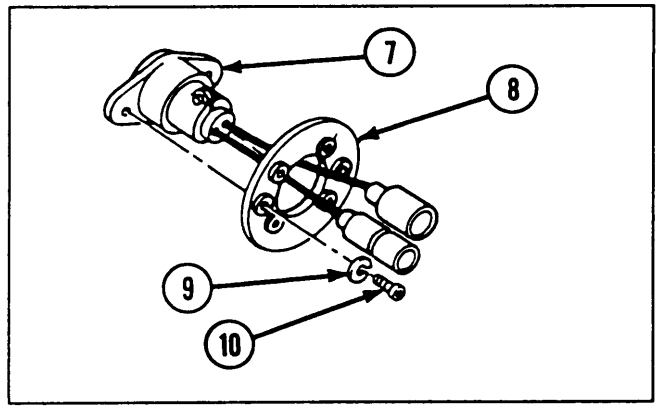
NOTE

Step 3 is written and illustrated for the left stoplight-taillight, but also applies to the right stoplight-taillight.

3 Position left stoplight-taillight (4) on vehicle, and secure with two new lockwashers (5) and two hexagon head capscrews (6).

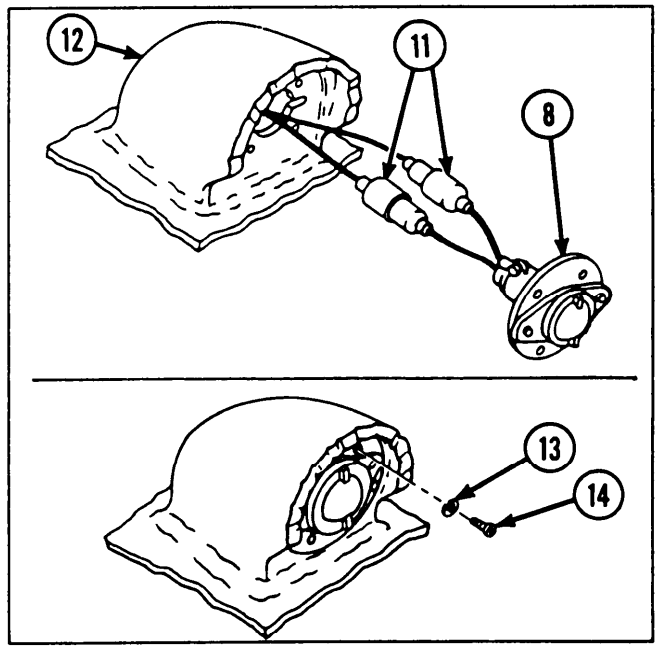


4 Position warning light (7) on warning light resilient mount (8), and secure with two new lockwashers (9) and two socket head capscrews (10).



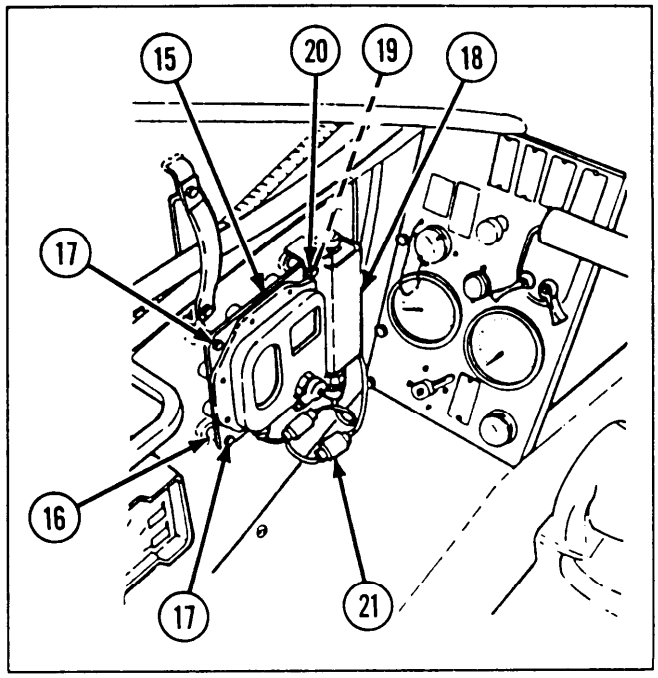
5 Connect two electrical connectors (11).

6 Apply adhesive to back of warning light resilient mount (8), attach warning light resilient mount to housing (12), and secure with four new lockwashers (13) and four socket head capscrews (14).



2-79. MAINTENANCE OF HEADLIGHT, DOME LIGHT, WARNING LIGHT, AND STOPLIGHT-TAILLIGHT INSTALLATION (CONT).

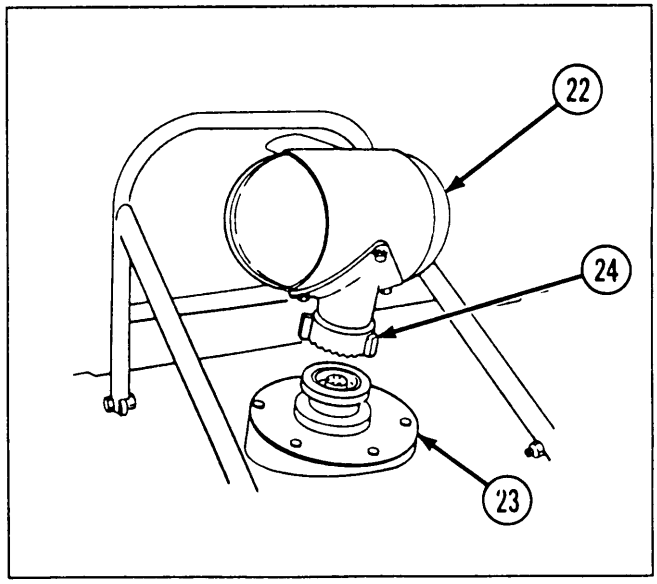
INSTALLATION (CONT)



7 Position driver's compartment dome light (15) on lugs (16), and secure with two assembled washer bolts (17).

8 Position LOW ENGINE COOLANT warning indicator light (18) on forward side of driver's compartment dome light (15), and secure with two new lockwashers (19) and two hexagon head capscrews (20).

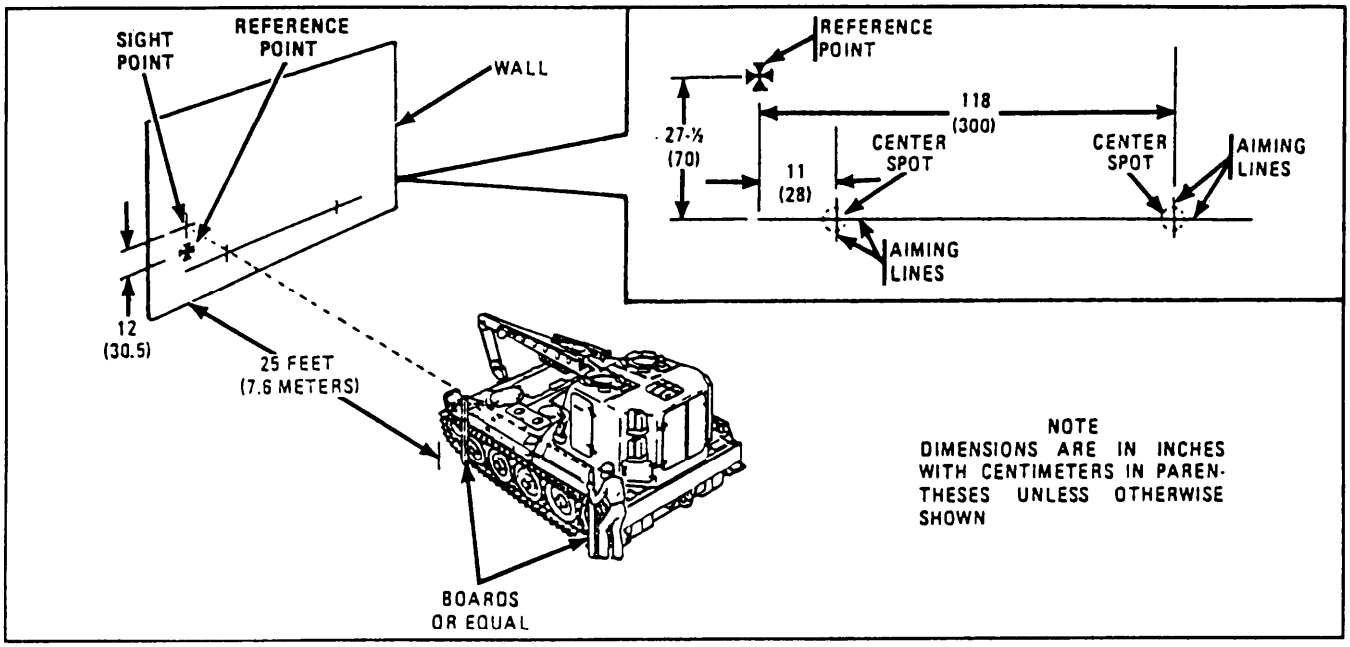
9 Connect electrical connector (21).



10 Position headlight assembly (22) on base (23), and secure by tightening headlamp mounting adjusting nut (24).

11 Perform alignment check.

ALIGNMENT CHECK



1 Park vehicle on level ground or pavement facing wall or screen 25 feet (7.6 meters) away.

2 Measure distance between center of headlight and ground.

3 Cut two 2-in. x 2-in. (5-cm x 5-cm) boards to length 12 in. (30.5 cm) longer than distance between center of headlight and ground.

4 Hold or tape boards upright against side of vehicle.

5 Sight along upper inner edge of boards and mark wall or screen at point in alignment with boards. Measure straight down 12 in. *(30.5* cm) from this point and make another mark. This is the reference point, which represents left-hand edge of vehicle at same height above ground as center of headlight.

6 Draw horizontal line approximately 125 in. (318 cm) long, 27-1/2 in. (70 cm) below and extending to the right of reference point.

7 Draw two vertical lines crossing horizontal line: one at 11 in. (28 cm) and the other at 118 in. (300 cm) to the right of reference point.

8 Turn on service drive headlights and dim to low beam.

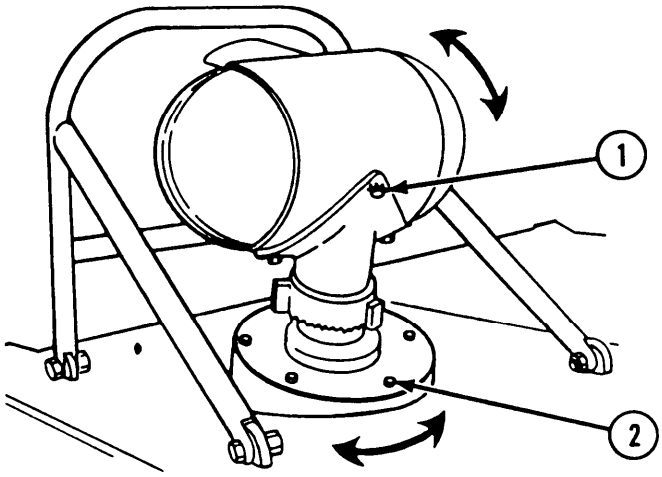
9 Check that center spot (brightest light) of each low beam is centered on aiming lines.

10 Align headlights as required.

11 If headlight alignment is correct, turn off service drive headlights.

2-79. MAINTENANCE OF HEADLIGHT, DOME LIGHT, WARNING LIGHT, AND STOPLIGHT-TAILLIGHT INSTALLATION (CONT).

ALIGNMENT



1 Perform vertical (up and down) alignment as follows:

a. Loosen three screws (1).

b. Adjust headlight upward or downward until center spot of low beam is centered on aiming line.

c. Hold headlight in adjustment and tighten three screws (1).

2 Perform horizontal (side-to-side) alignment as follows:

a. Loosen six screws (2).

b. Adjust headlight from side to side until center spot of low beam is centered on aiming line.

c. Hold headlight in adjustment and tighten six screws (2).

2-80. MAINTENANCE OF HEADLIGHT ASSEMBLY.

This task covers: a. *Disassembly* b. *Inspection/Repair* *c. Reassembly*

INITIAL SETUP

Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
- Soldering gun

Materials/Parts
Adhesive (item 4, appx C
Aircraft grease (item 19, appx C)
Antiseize compound (item 6, appx C)
Blackout marker inner nonmetallic seal
Blackout shield nonmetallic seal
Gasket
Gasket (2)
Headlamp cover nonmetallic seal
LockWasher (4)
LockWasher (2)
LockWasher (2)
LockWasher(15)
LockWasher(3)
Nonmetallic seal
Nonmetallic seal
Rubber headlight seal (2)
Sealant (item 36, appx C)
Sealing compound (item 37, appx C)
Sealing compound (item 38, appx C)
Shock cushion gasket (2)
Silicone compound (item 40, appx C)
Solder (item 43, appx C)
Solid rivet
Spring pin
Tubular rivet (2)

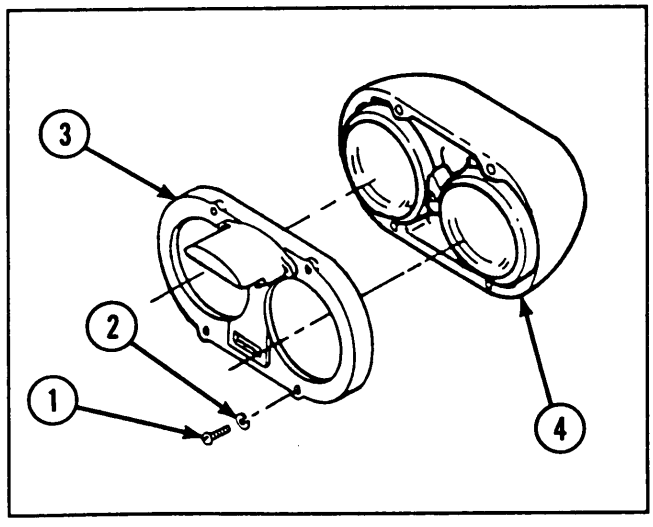
References
TB SIG-22
TM 9-2350-238-24P-1

Equipment Conditions
2-593 Headlight assembly removed

DISASSEMBLY

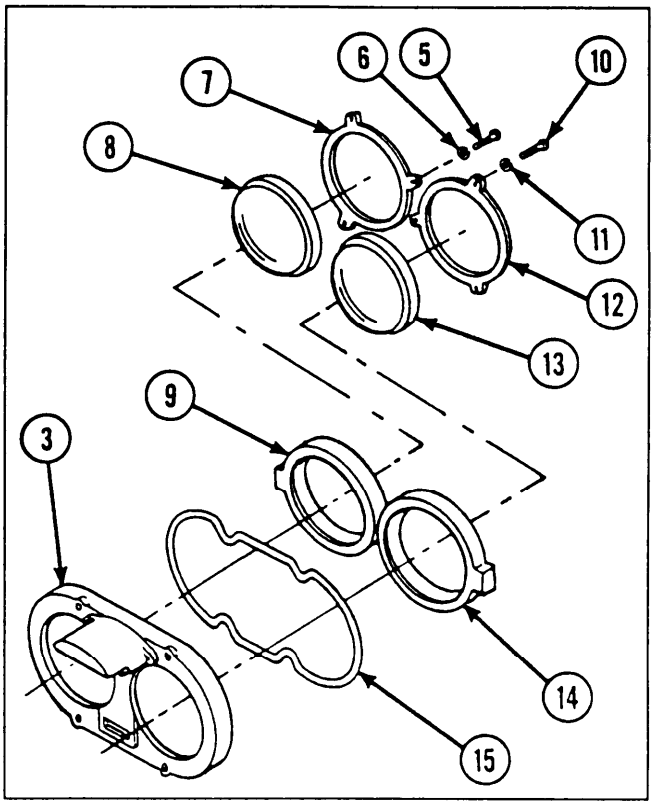
1 Remove four fillister head screws (1) and four lockwashers (2) from headlamp cover (3).

2 Remove headlamp cover (3) from light housing (4).



2-80. MAINTENANCE OF HEADLIGHT ASSEMBLY (CONT).

DISASSEMBLY (CONT)



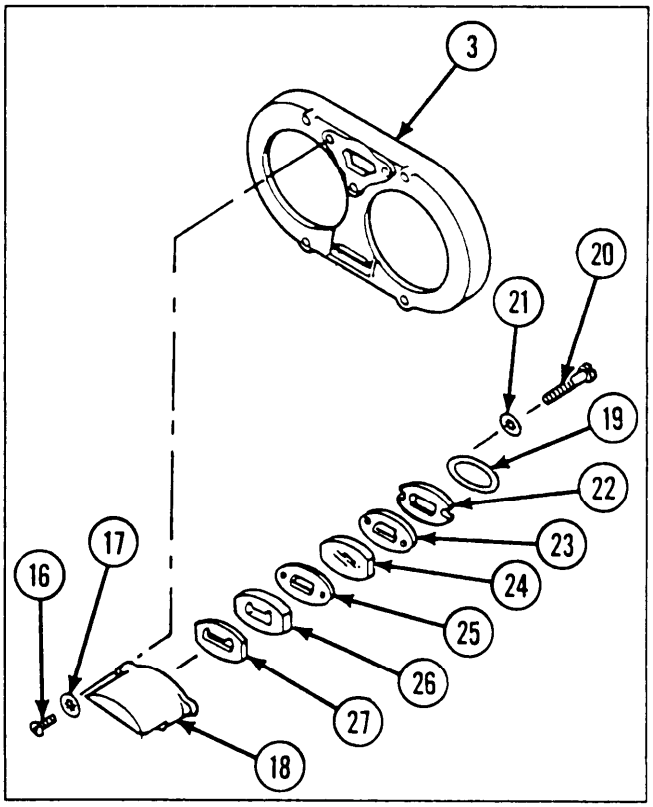
3 Remove three machine screws (5), three lockwashers (6), lens retainer (7), and clear light lens (8) with attached rubber headlight seal (9) from headlamp cover (3).

4 Remove rubber headlight seal (9) from clear light lens (8).

5 Remove three machine screws (10), three lockwashers (11), lens retainer (12), and infrared filter light lens (13) with attached rubber headlight seal (14) from headlamp cover (3).

6 Remove rubber headlight seal (14) from infrared filter light lens (13).

7 Remove headlamp cover nonmetallic seal (15) from headlamp cover (3).

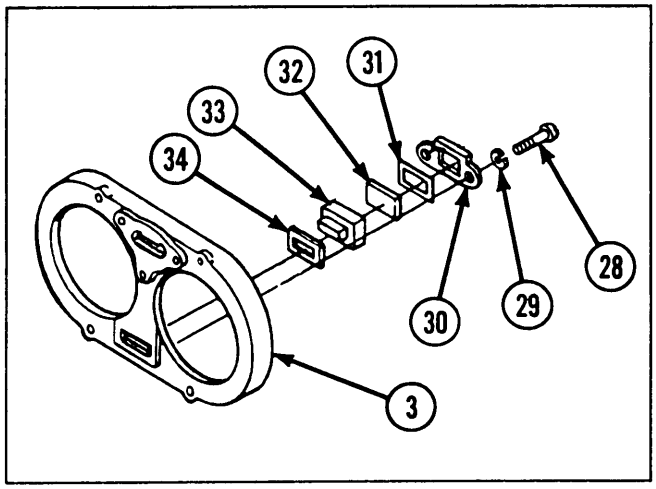


8 Remove three machine screws (16), three lockwashers (17), and headlamp blackout lamp guard (18) from headlamp cover (3).

9 Remove blackout shield nonmetallic seal (19) from headlamp blackout lamp guard (18).

10 Remove two machine screws (20), two lockwashers (21), blackout lens retainer (22), gasket (23), light filter (24), gasket (25), headlamp blackout light lens (26), and gasket (27) from headlamp blackout lamp guard (18).

11 Remove two machine screws (28), two lockwashers (29), blackout marker light instrument bezel (30), blackout marker inner nonmetallic seal (31), blackout marker lamp filter (32), blackout marker clearance light lens (33), and nonmetallic seal (34) from headlamp cover (3).

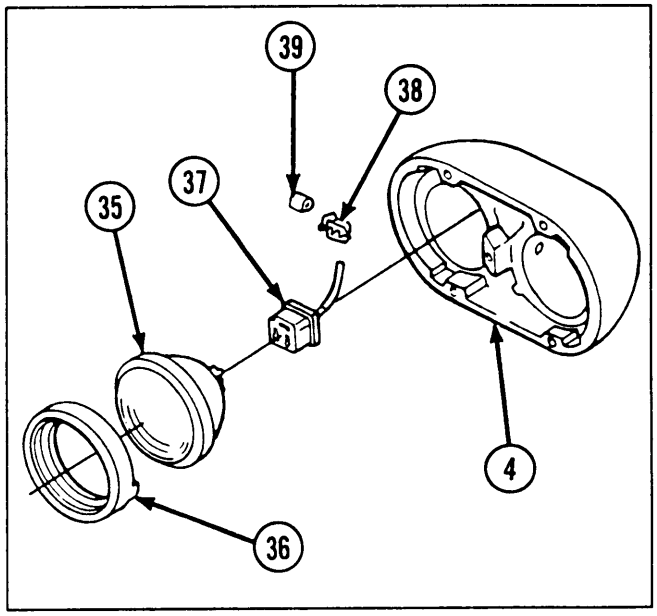


12 Pull two incandescent lamps (35) with shock cushion gaskets (36) from light housing (4). Disconnect each incandescent lamp from each lamp electrical insert (37).

13 Remove two shock cushion gaskets (36) from two incandescent lamps (35).

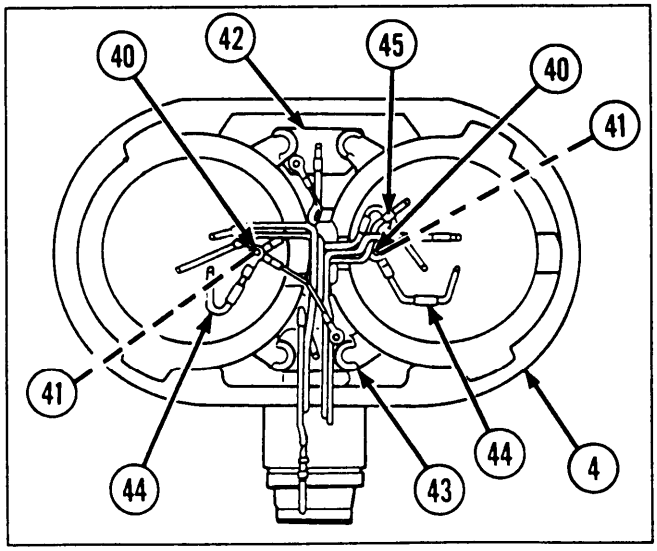
NOTE

- Before disconnecting electrical leads, ensure that they are adequately identified for reassembly.
- Step 14 is written for one lamp electrical insert, but applies to both lamp electrical inserts.



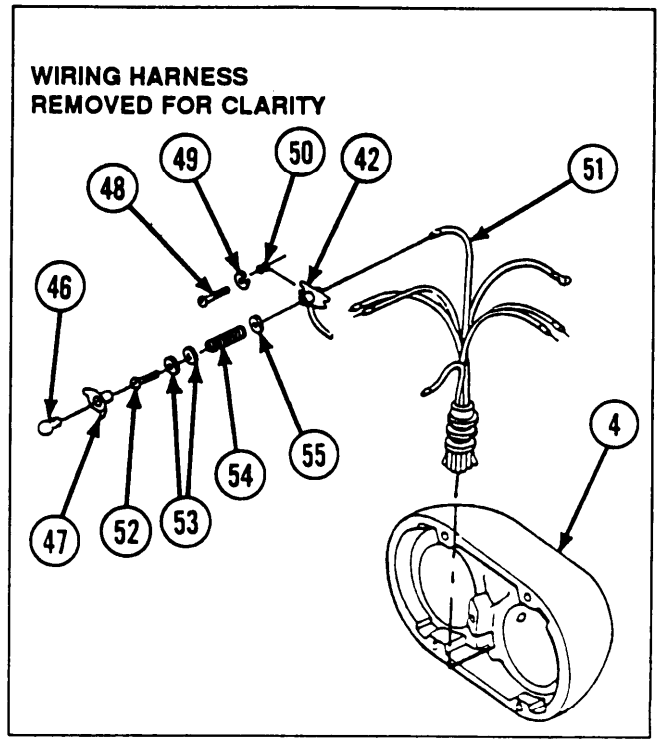
14 Disconnect electrical leads from three electrical clips (38). Remove three electrical clips and three headlamp connector electrical clips (39) from lamp electrical insert (37). Remove lamp electrical insert.

15 Remove two machine screws (40) and two lockwashers (41) connecting ground leads of two blackout lamp socket assemblies (42 and 43), two cable assemblies (44), and electrical lead 91 (45) to light housing (4). Remove two cable assemblies.



2-80. MAINTENANCE OF HEADLIGHT ASSEMBLY (CONT).

DISASSEMBLY (CONT)



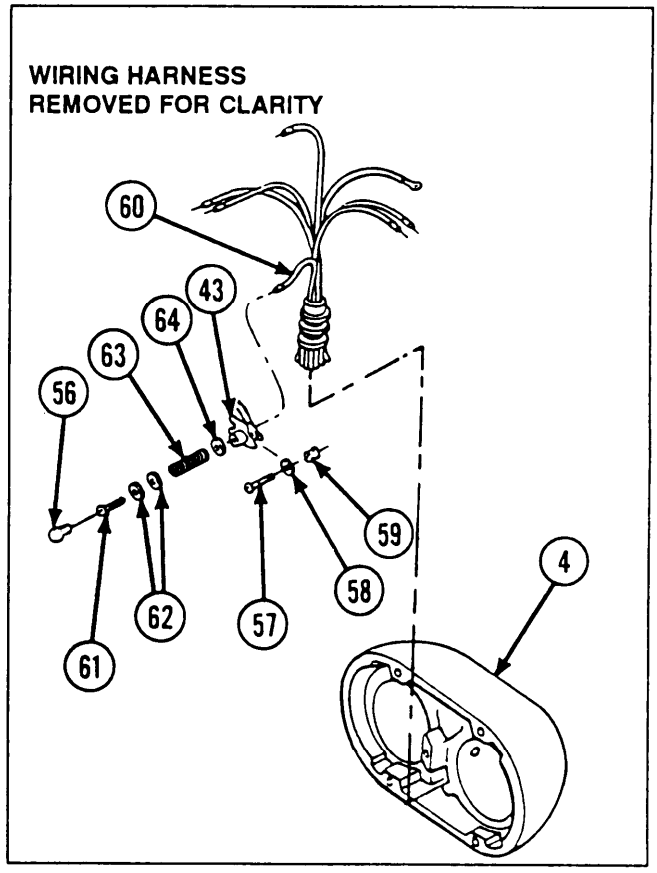
16 Remove incandescent lamp (46) from blackout lamp socket assembly (42) by pressing in and turning counterclockwise.

17 Remove light reflector (47) from blackout lamp socket assembly (42).

18 Remove two machine screws (48), two lockwashers (49), and two metallic eyelets (50) from light housing (4).

19 Pull electrical lead 19 (51) to rear of blackout lamp socket assembly (42) and cut lead close to socket. Tag electrical lead 19. Remove blackout lamp socket assembly from light housing (4).

20 Remove tubular rivet (52), two flat washers (53), helical spring (54), and flat washer (55) from blackout lamp socket assembly (42).



21 Remove marker light (56) from blackout lamp socket assembly (43) by pressing in and turning counterclockwise.

22 Remove two machine screws (57), two lockwashers (58), and two metallic eyelets (59) from light housing (4).

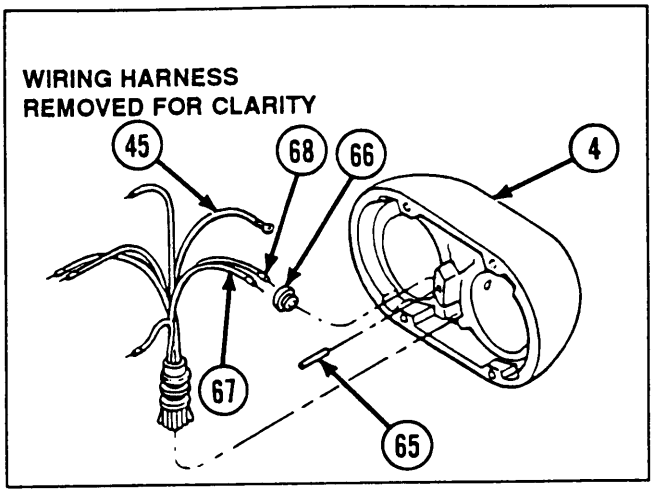
23 Pull electrical lead 20 (60) to rear of blackout lamp socket assembly (43) and cut lead close to socket. Tag electrical lead 20. Remove blackout lamp socket assembly from light housing (4).

24 Remove tubular rivet (61), two flat washers (62), helical spring (63), and flat washer (64) from blackout lamp socket assembly (43).

25 Remove spring pin (65).

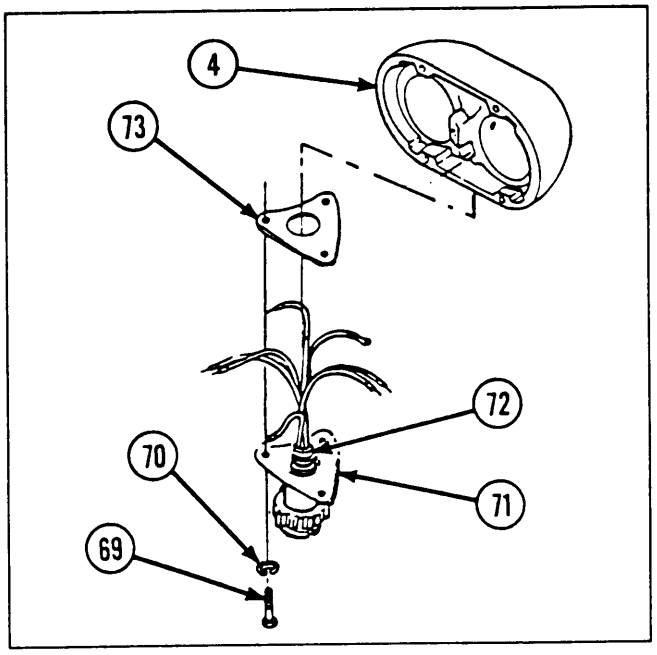
26 Remove nonmetallic grommet (66) from light housing (4).

27 Pull electrical lead 91 (45), electrical lead 514 (67), and electrical lead 515 (68) from slits in nonmetallic grommet (66).



28 Remove three hexagon head capscrews (69), three lockwashers (70), and holder (71) from light housing (4), pulling leads of electrical lead assembly (72) through opening in light housing.

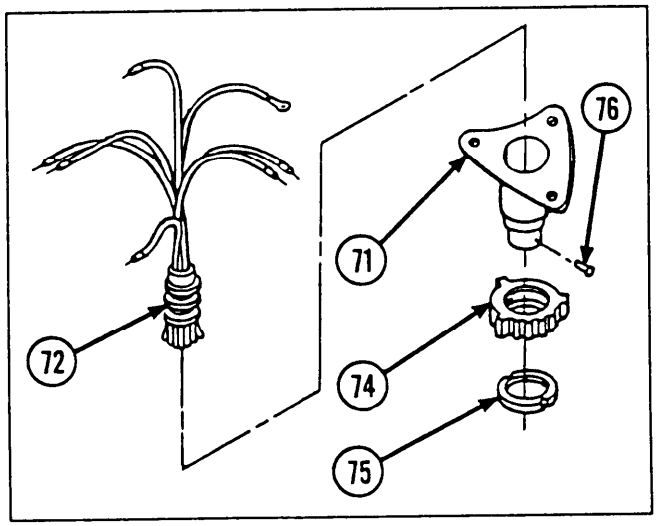
29 Remove nonmetallic seal (73) from holder (71).



30 Position holder (71) upright, with bottom resting on wood block.

31 Using soft-faced hammer, tap headlamp mounting adjustment nut (74), and remove headlamp mounting lens retainer (75) and adjustment nut.

32 Remove solid rivet (76) and electrical lead assembly (72) from holder (71).



2-80. MAINTENANCE OF HEADLIGHT ASSEMBLY (CONT).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Inspect electrical lead assembly for damaged insulation, and inspect cable assemblies and electrical leads for corroded terminals and damaged insulation.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

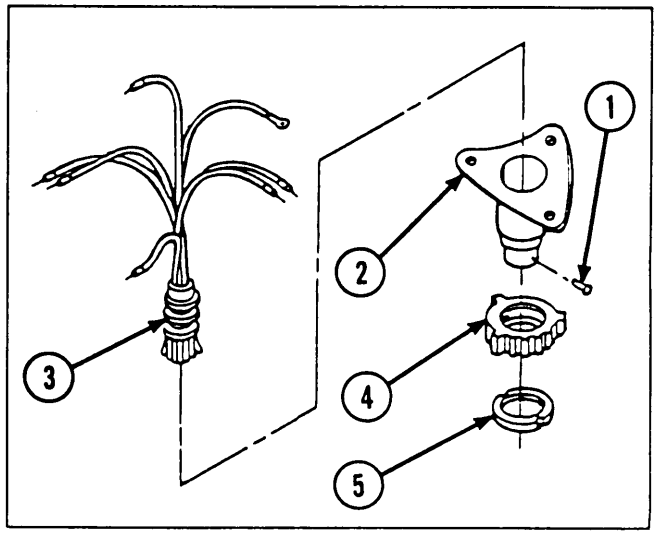
REASSEMBLY

1 Install new solid rivet (1) in holder (2).

2 Align slot in electrical lead assembly (3) with solid rivet (1) inside holder (2), and push electrical lead assembly into holder until it seats against inner flange.

3 Apply sealing compound (item 38, appx C). Install headlamp mounting adjustment nut (4) and headlamp mounting lens retainer (5) on holder (2).

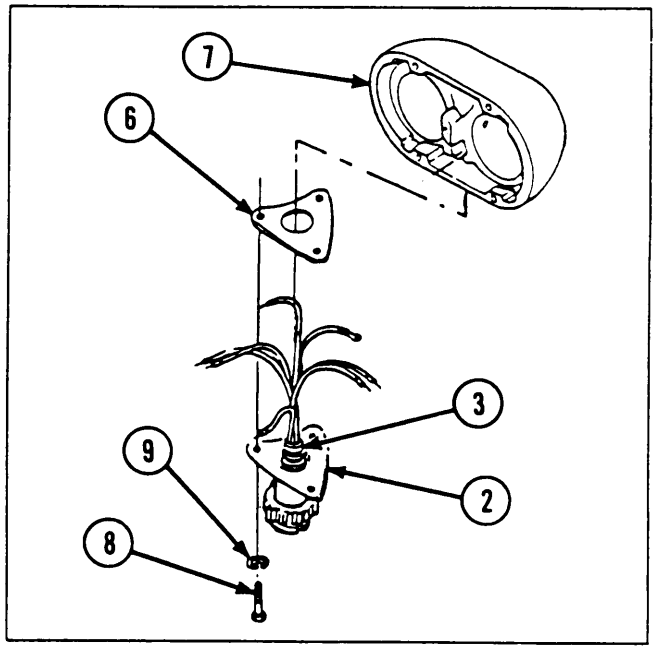
4 Stake headlamp mounting lens retainer (5) in three places. Do not use existing holes.

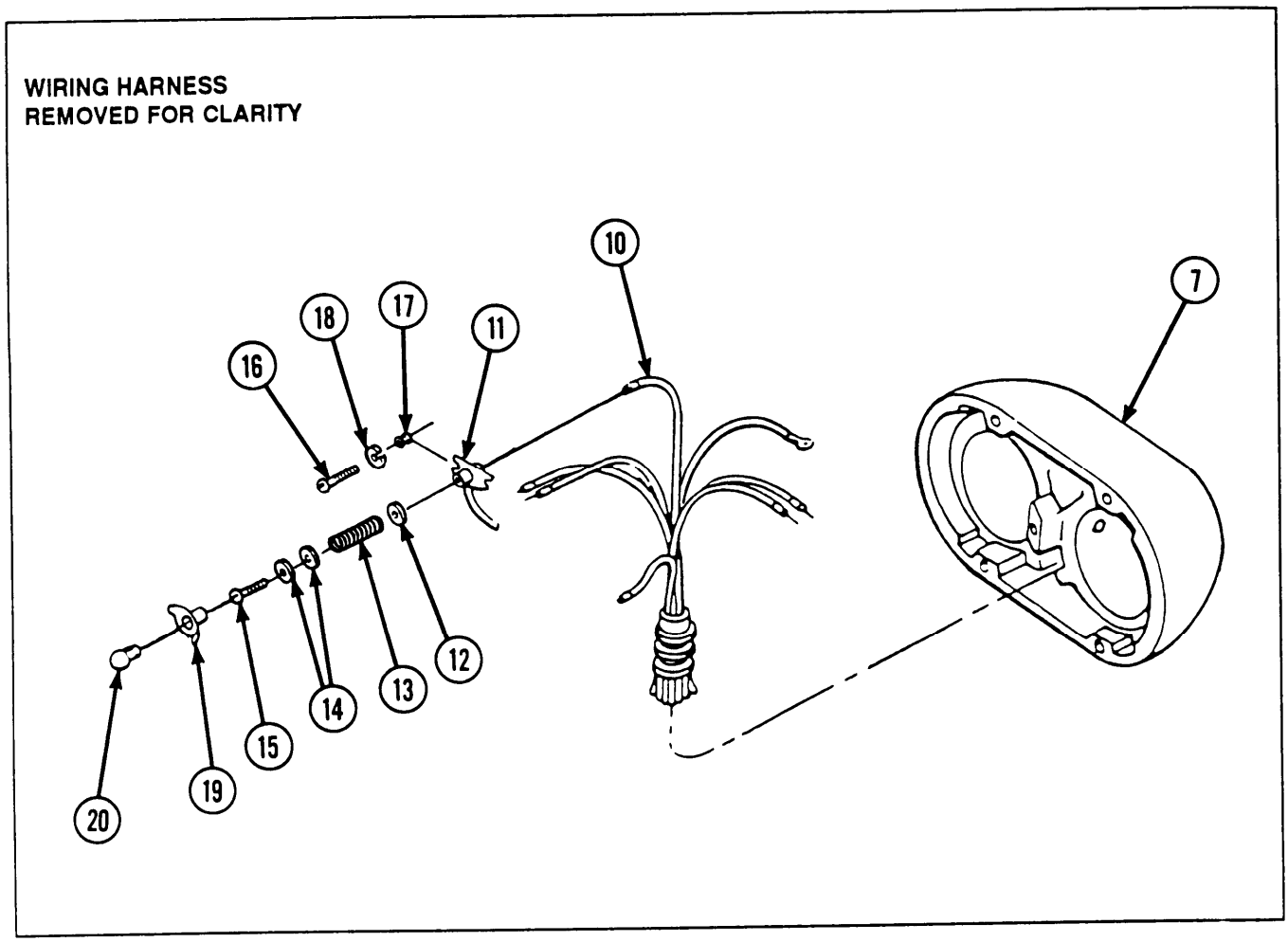


5 Bond new nonmetallic seal (6) to holder (2), using sealant.

6 Position light housing (7) on holder (2), pulling leads of electrical lead assembly (3) into light housing.

7 Apply antiseize compound to threads of three hexagon head capscrews (8). Secure holder (2) to light housing (7) with three new lockwashers (9) and three hexagon head capscrews.





8 Insert electrical lead 19 (10) through blackout lamp socket assembly (11), and install flat washer (12), helical spring (13), and two flat washers (14).

9 Insert electrical lead 19 (10) into new tubular rivet (15) and crimp tubular rivet on lead. Pull tubular rivet back into blackout lamp socket assembly (11).

10 Apply antiseize compound to threads of two machine screws (16). Install blackout lamp socket assembly (11) in light housing (7), and secure with two metallic eyelets (17), two new lock-washers (18), and two machine screws.

11 Install light reflector (19) on blackout lamp socket assembly (11).

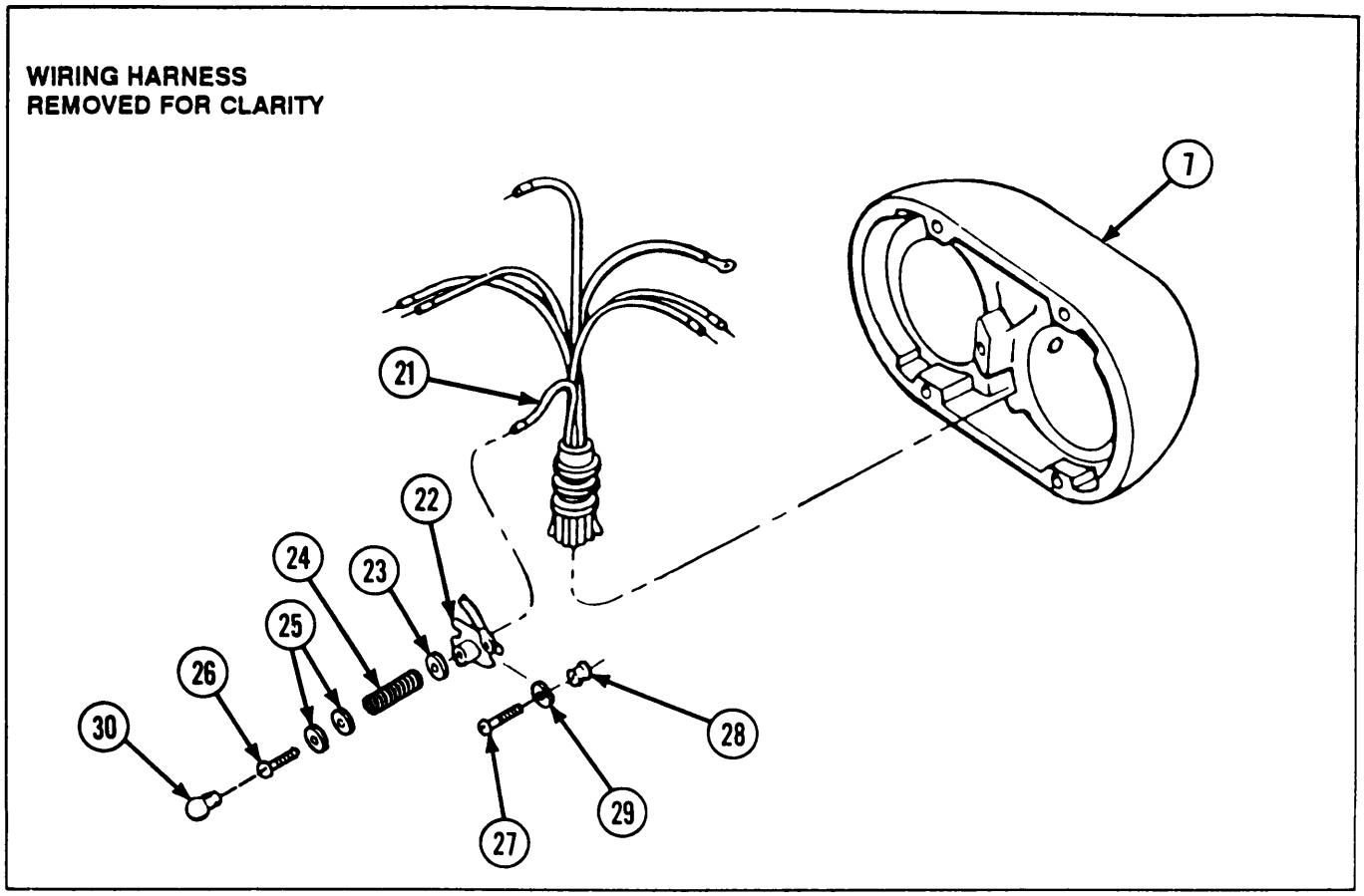
NOTE

Keep incandescent lamp free of all foreign materiel, such as dirt, oil, grease, fingerprints, etc.

12 Apply a light coat of silicone compound to socket, and install incandescent lamp (20) by pressing into blackout lamp socket assembly (11) and turning clockwise.

2-80. MAINTENANCE OF HEADLIGHT ASSEMBLY (CONT).

REASSEMBLY (CONT)

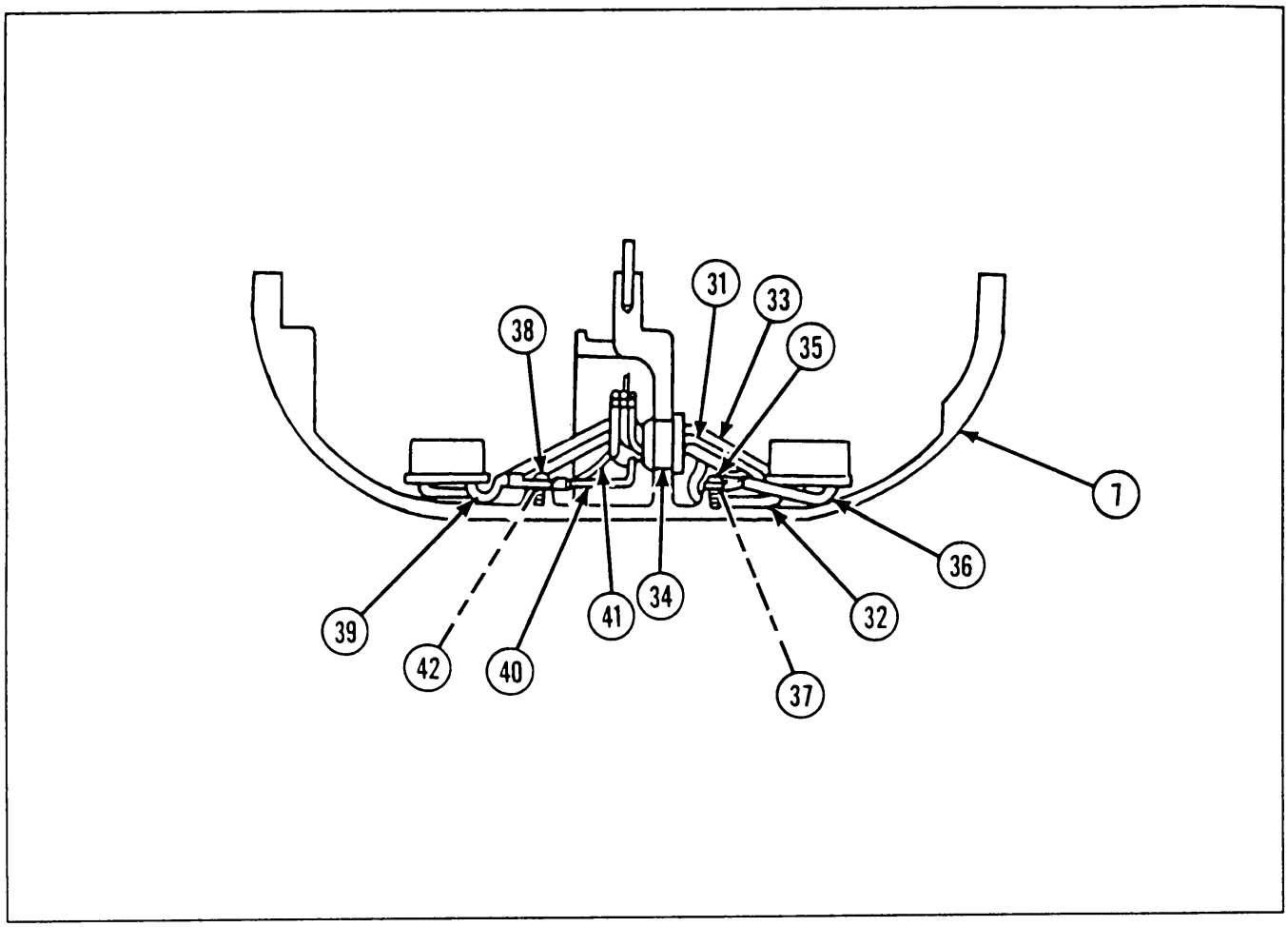


13 Insert electrical lead 20 (21) through blackout lamp socket assembly (22), and install flat washer (23), helical spring (24), and two flat washers (25).

14 Insert electrical lead 20 (21) into new tubular rivet (26), and crimp tubular rivet on lead. Pull tubular rivet back into blackout lamp socket assembly (22).

15 Apply antiseize compound to threads of two machine screws (27). Install blackout lamp socket assembly (22) in light housing (7), and secure with two metallic eyelets (28), two new lock-washers (29), and two machine screws.

16 Apply a light coat of silicone compound to socket, and install marker light (30) by pressing into blackout lamp socket assembly (22) and turning clockwise.



17 Insert electrical lead 91 (31), electrical lead 514 (32), and electrical lead 515 (33) through slits in nonmetallic grommet (34).

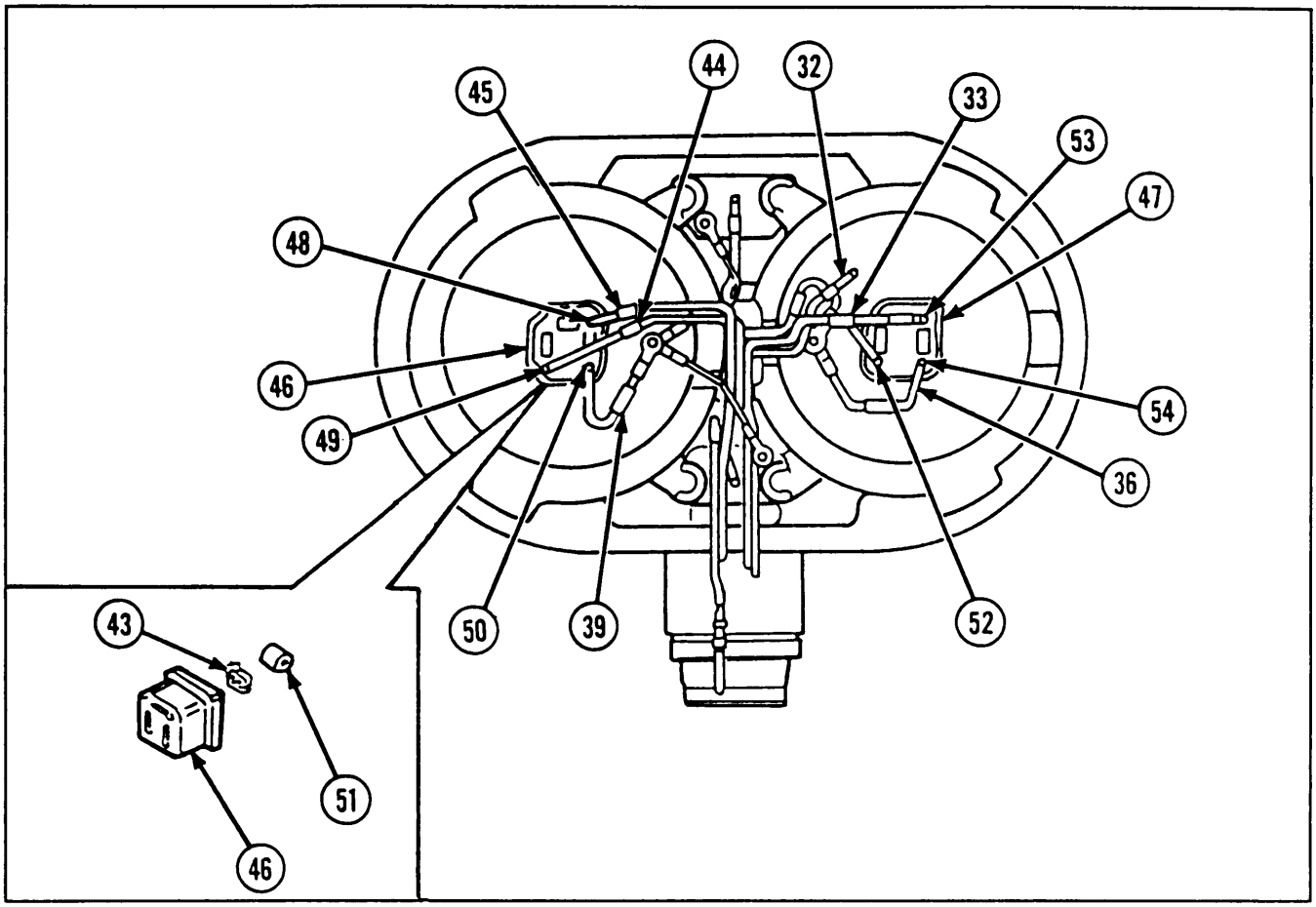
18 Install nonmetallic grommet (34) in light housing (7).

19 Apply antiseize compound to threads of machine screw (35). Connect cable assembly (36) and electrical lead 91 (31) to light housing (7), using new lockwasher (37) and machine screw.

20 Apply 1ntiseize compound to threads of machine screw (38). Connect cable assembly (39) and ground leads (40 and 41) of blackout lamp socket assemblies to light housing (7), using new lockwasher (42) and machine screw.

2-80. MAINTENANCE OF HEADLIGHT ASSEMBLY (CONT).

REASSEMBLY (CONT)



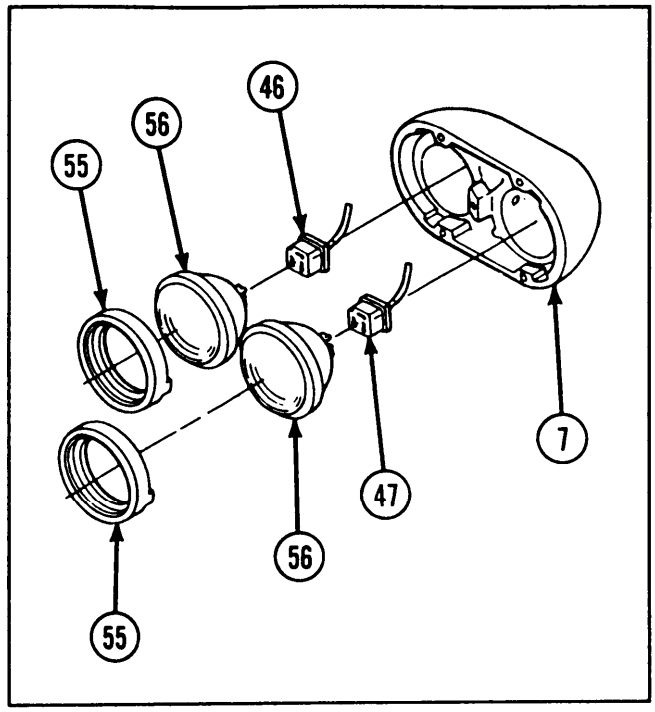
21 Install six electrical clips (43) on two cable assemblies (36 and 39), electrical lead 514 (32), electrical lead 515 (33), electrical lead 17 (44), and electrical lead 18 (45). Connect electrical leads to two electrical inserts (46 and 47) as follows:

a. Install electrical lead 18 (45) into socket 2 (48), electrical lead 17 (44) into socket 1 (49), and cable assembly (39) into socket 3 (50) of electrical insert (46). Secure each electrical lead with a headlamp connector electrical clip (51). Solder clips to electrical insert per TB SIG-222.

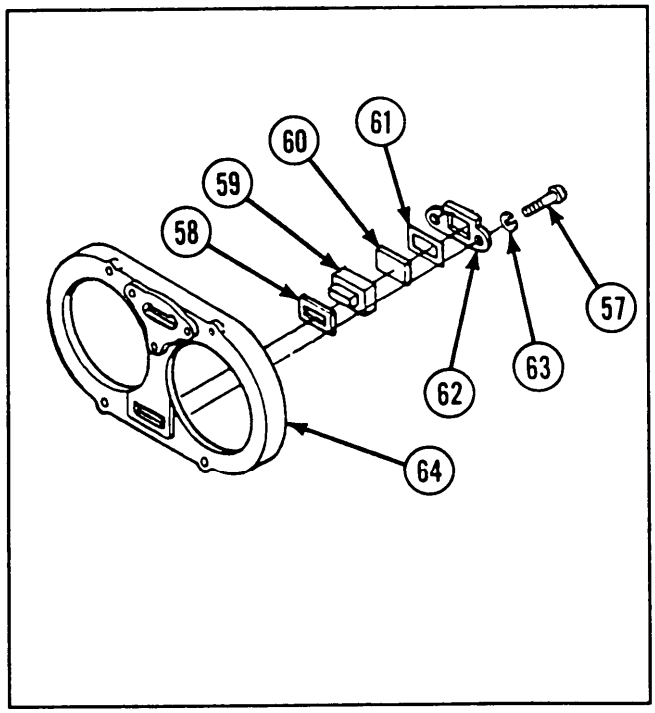
b. Install electrical lead 514 (32) into socket 1 (52), electrical lead 515 (33) into socket 2 (53), and cable assembly (36) into socket 3 (54) of electrical insert (47). Secure each electrical lead with a headlamp connector electrical clip (51). Solder clips to electrical insert per TB SIG-222.

22 Install two new shock cushion gaskets (55) on two incandescent lamps (56), ensuring that cutout in each gasket is over the lug on each incandescent lamp.

23 Connect two incandescent lamps (56) and two electrical inserts (46 and 47), and install lamps with attached shock cushion gaskets to light housing (7).

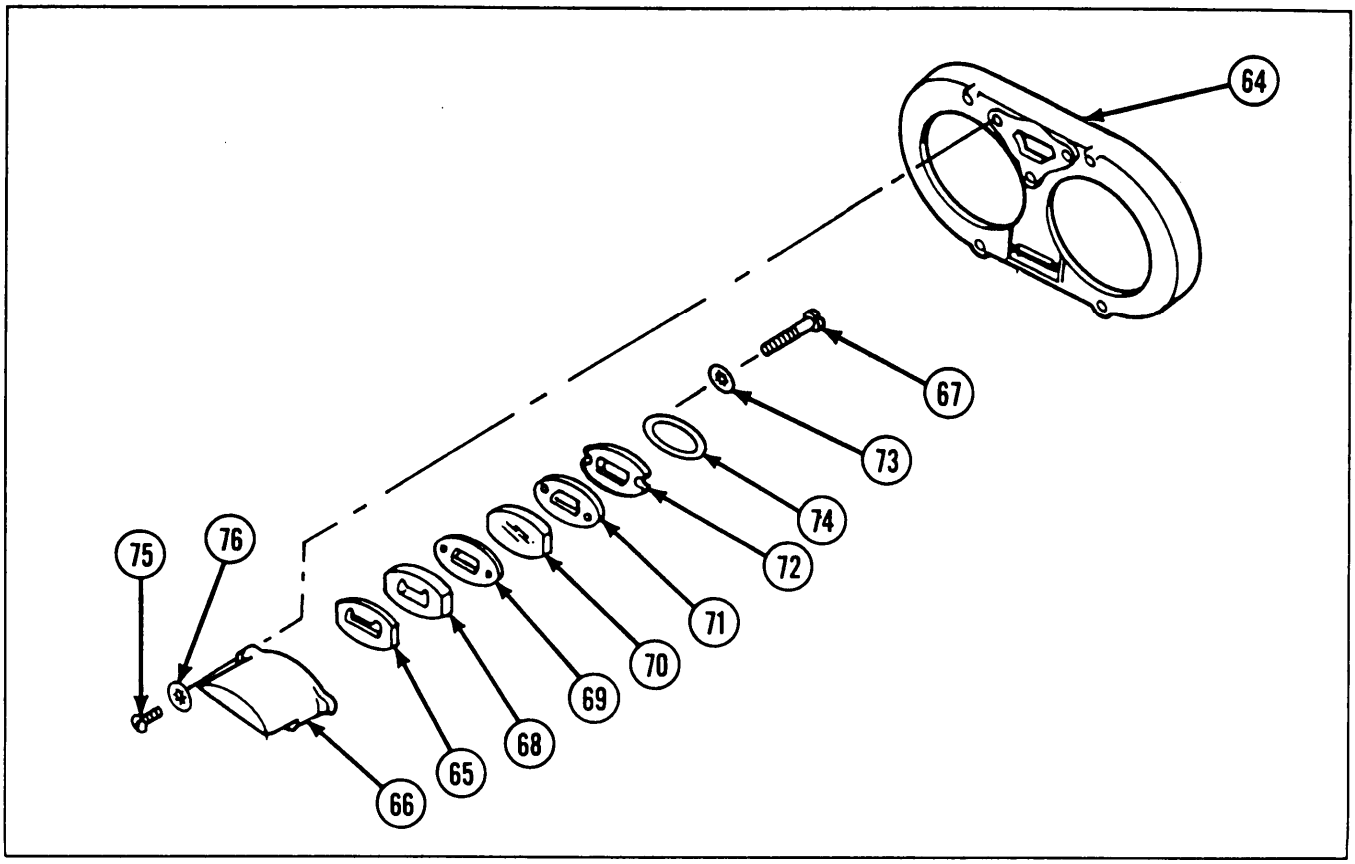


24 Apply antiseize compound to threads of two machine screws (57). Apply a coat of sealing compound (item 37, appx C) to mounting surface of new nonmetallic seal (58), and install new nonmetallic seal, blackout marker clearance light lens (59), blackout marker lamp filter (60), new blackout marker inner nonmetallic seal (61), blackout marker light instrument bezel (62), new lockwasher (63), and two machine screws (57) on headlamp cover (64).



2-80. MAINTENANCE OF HEADLIGHT ASSEMBLY (CONT).

REASSEMBLY (CONT)



25 Apply a coat of sealing compound (item 37, appx C) to mounting surface of new gasket (65), and install gasket on headlamp blackout lamp guard (66).

NOTE

Carefully position gaskets to prevent light leakage around headlamp blackout light lens.

26 Apply antiseize compound to threads of two machine screws (67). Install headlamp blackout light lens (68), new gasket (69), light filter (70), new gasket (71), blackout lens retainer (72), two new lockwashers (73), and two machine screws on headlamp blackout lamp guard (66).

27 Bond new blackout shield nonmetallic seal (74) in groove of headlamp blackout lamp guard (66) using adhesive.

28 Apply antiseize compound to threads of three machine screws (75). Apply a light coat of to mounting surface of headlamp blackout lamp guard (66), and install headlamp blackout lamp guard, three new lockwashers (76), and three machine screws on headlamp cover (64).

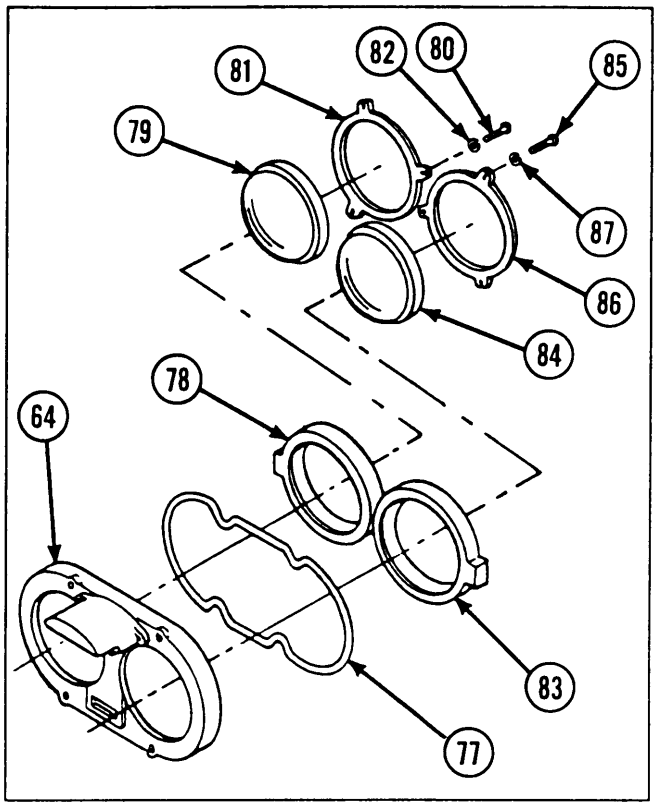
29 Bond new headlamp cover nonmetallic seal (77) in groove of headlamp cover (64), using adhesive.

30 Install new rubber headlight seal (78) on clear light lens (79).

31 Apply antiseize compound to threads of three machine screws (80). Install clear light lens (79) with attached rubber headlight seal, lens retainer (81), three new lockwashers (82), and three machine screws in headlamp cover (64).

32 Install new rubber headlight seal (83) on infrared filter light lens (84).

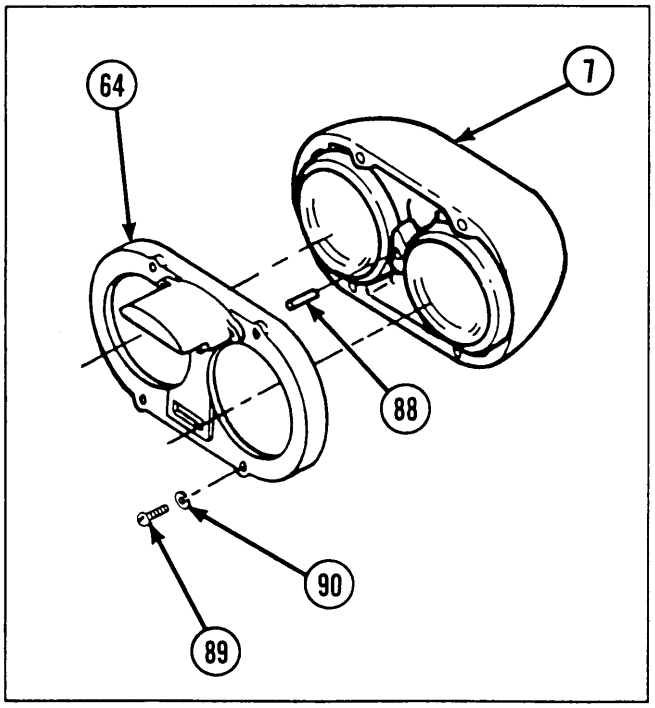
33 Apply antiseize compound to threads of three machine screws (85). Install infrared filter light lens (84) with attached rubber headlight seal, lens retainer (86), three new lockwashers (87), and three machine screws in headlamp cover (64).



34 Install new spring pin (88) in light housing (7).

35 Apply a light coat of aircraft grease to mounting surface of headlamp cover (64), and install headlamp cover on light housing (7), using spring pin (88) as a guide.

36 Apply antiseize compound to threads of four fillister head screws (89). Install four new lockwashers (90) and four fillister head screws.



2-81. MAINTENANCE OF LEFT STOPLIGHT-TAILLIGHT.

This task covers:	a. *Disassembly*	b. *Inspection/Repair*	*c. Reassembly*

INITIAL SETUP

Materials/Parts
Antiseize compound (item 6, appx C)
LockWasher (2)
Lower lens nonmetallic seal
Preformed packing
Screw retaining ring (6)
Silicone compound (item 41, appx C)
Upper lens gasket
Upper lens nonmetallic seal

References
TM 9-2350-238-24P-1

Equipment Conditions
2-593 Left stoplight-taillight removed

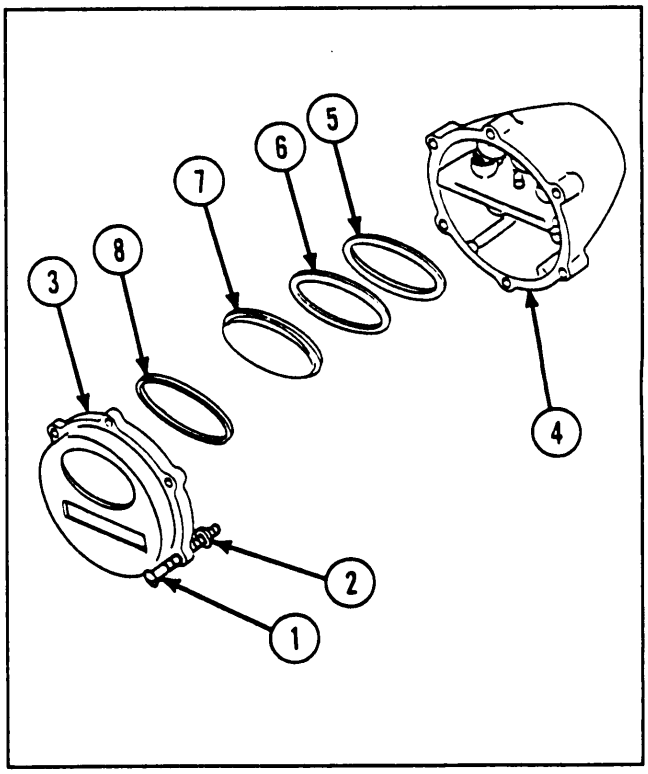
DISASSEMBLY

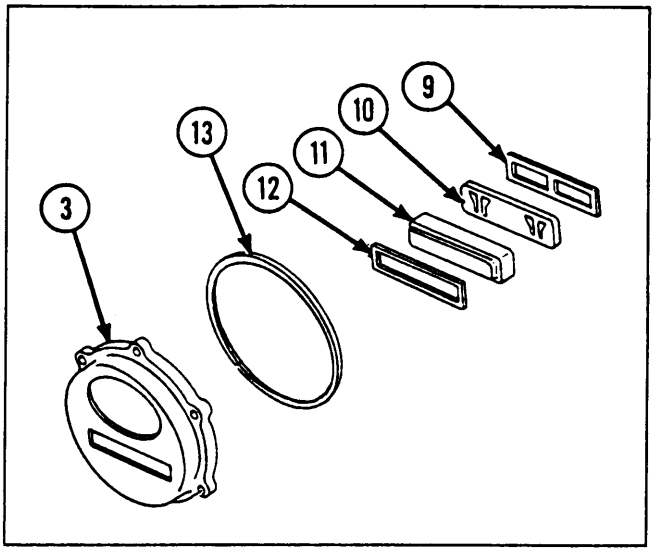
1 Loosen six machine screws (1). Do not separate screw retaining rings (2) from machine screws or remove machine screws from headlight door (3), unless damaged.

2 Remove headlight door (3) from parking light (4).

3 Remove lens retainer (5) from headlight door (3).

4 Remove upper lens gasket (6), upper light lens (7), and upper lens nonmetallic seal (8) from headlight door (3).

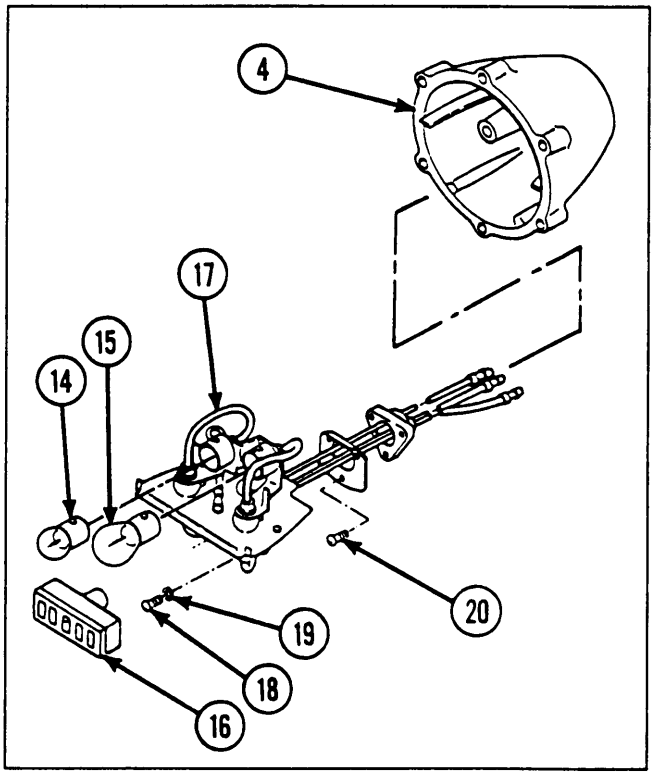




5 Remove light retention bracket (9) from headlight door (3).

6 Remove lower light lens (10), light lens (11), and lower lens nonmetallic seal (12) from headlight door (3).

7 Remove preformed packing (13) from headlight door (3).



8 Remove two incandescent lamps (14 and 15) and clearance marker light (16) from wiring harness (17).

9 Remove two machine screws (18) and two lockwashers (19).

10 Remove three machine screws (20) securing wiring harness (17) to parking light (4). Remove wiring harness.

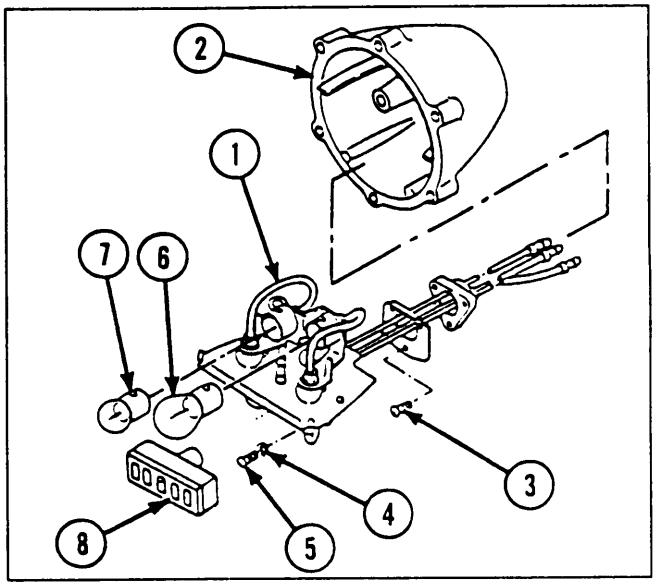
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Inspect sockets for corrosion.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

2-81. MAINTENANCE OF LEFT STOPLIGHT-TAILLIGHT (CONT).

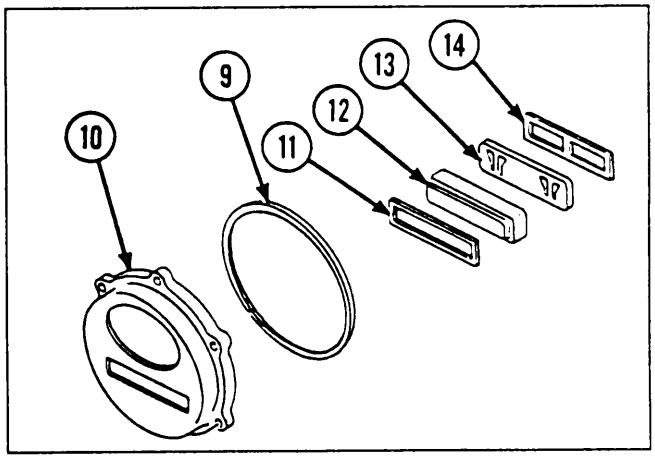


1 Apply a light coat of silicone compound to two lamp sockets of wiring harness (1).

2 Install wiring harness (1) in parking light (2) and secure with three machine screws (3).

3 Install two new lockwashers (4) and two machine screws (5).

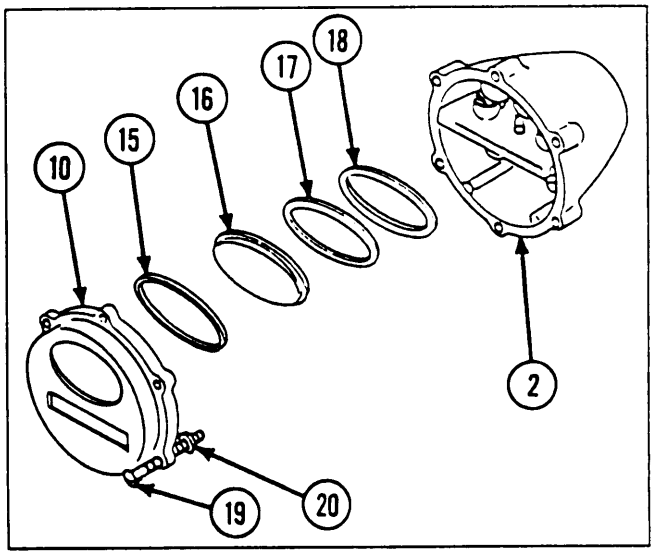
4 Install two incandescent lamps (6 and 7) and clearance marker light (8) on wiring harness (1).



5 Install new preformed packing (9) on headlight door (10).

6 Install new lower lens nonmetallic seal (11), light lens (12), and lower light lens (13) on headlight door (10).

7 Press light retention bracket (14) into headlight door (10).



8 Install new upper lens nonmetallic seal (15), upper light lens (16), and new upper lens gasket (17) on headlight door (10).

9 Press lens retainer (18) into headlight door (10).

10 Apply antiseize compound to threads of six machine screws (19).

11 If removed, install six new screw retaining rings (20) and six machine screws (19) on headlight door (10).

12 Install headlight door (10) on parking light (2). Tighten six machine screws (19).

2-82. MAINTENANCE OF RIGHT STOPLIGHT-TAILLIGHT.

This task covers:	a. *Disassembly*	b. *Inspection/Repair*	*c. Reassembly*

INITIAL SETUP

Materials/Parts
- Antiseize compound (item 6, appx C)
- LockWasher (2)
- Lower lens nonmetallic seal
- Preformed packing
- Screw retaining ring (6)
- Silicone compound (item 41, appx C)
- Upper lens gasket
- Upper lens nonmetallic seal

References
- TM 9-2350-238-24P-1

Equipment Conditions
- 2-593 Right stoplight-taillight removed

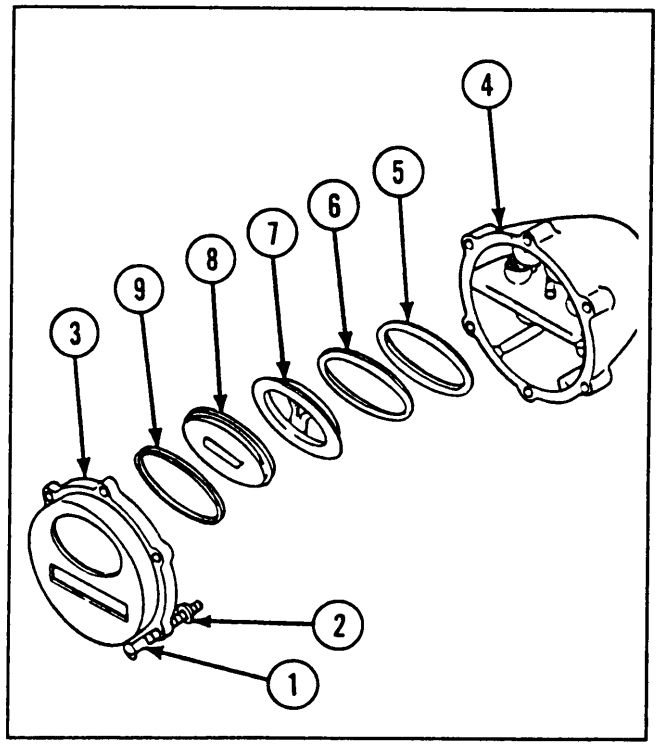
DISASSEMBLY

1 Loosen six machine screws (1). Do not separate screw retaining rings (2) from machine screws or remove machine screws from door (3), unless damaged.

2 Remove door (3) from parking light (4).

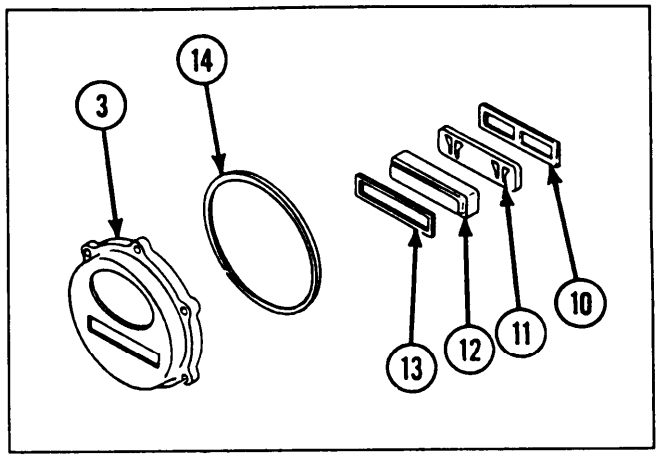
3 Remove lens retainer (5) from door (3).

4 Remove upper lens gasket (6), blackout filter (7), light lens (8), and upper lens nonmetallic seal (9) from door (3).



2-82. MAINTENANCE OF RIGHT STOPLIGHT-TAILLIGHT (CONT).

DISASSEMBLY (CONT)



5 Remove light retention bracket (10) from door (3).

6 Remove lower light lens (11), lower light lens (12), and lower lens nonmetallic seal (13) from door (3).

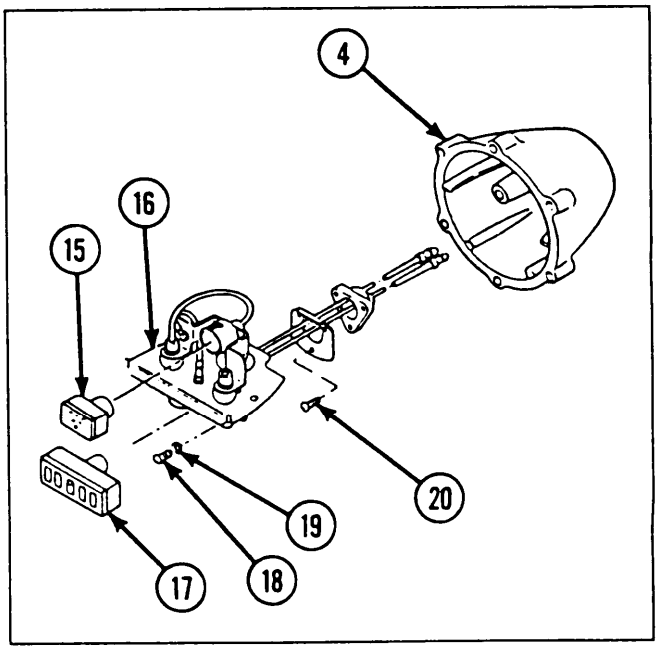
7 Remove preformed packing (14) from door (3).

8 To remove vehicular stop light (15) from lampholder assembly (16), snap open cover of vehicular stop light, insert screwdriver into center slot, push in, and turn counterclockwise.

9 To remove clearance marker light (17) from lampholder assembly (16), insert screwdriver into center slot of clearance marker light, push in, and turn counter-clockwise.

10 Remove two machine screws (18) and two lockwashers (19).

11 Remove three machine screws (20) securing lampholder assembly (16) to parking light (4). Remove lampholder assembly.



INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Inspect sockets for corrosion.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

REASSEMBLY

1 Apply a light coat of silicone compound to two sockets of lampholder assembly (1).

2 Install lampholder assembly (1) in parking light (2) and secure using three machine screws (3).

3 Install two new lockwashers (4) and two machine screws (5).

4 Install clearance marker light (6) on lampholder assembly (1). Insert screwdriver into center slot of clearance marker light, push in, and turn clockwise to secure.

5 Install vehicular stop light (7) on lampholder assembly (1). Open cover of vehicular stop light, push in, and turn clockwise to secure. Close cover.

6 Install new preformed packing (8) to door (9).

7 Install new lower lens nonmetallic seal (10), lower light lens (11), and lower light lens (12) on door (9).

8 Press light retention bracket (13) into door (9).

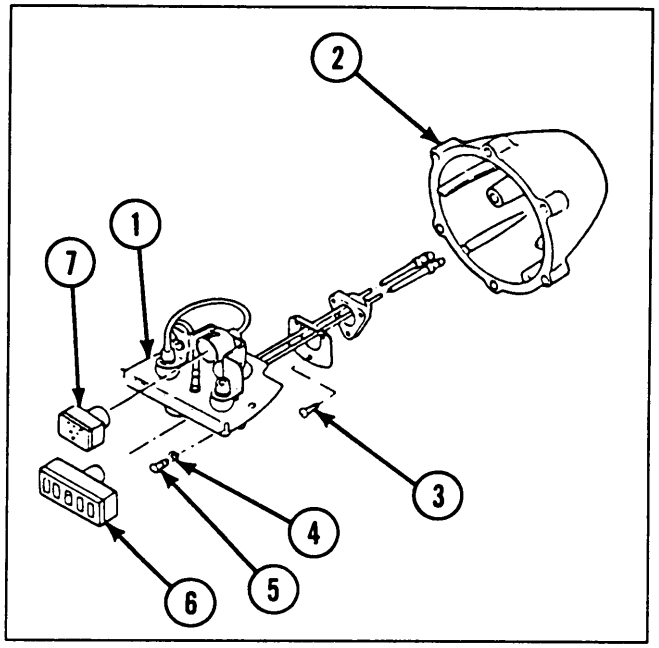
9 Install new upper lens nonmetallic seal (14), light lens (15), blackout filter (16), and new upper lens gasket (17) on door (9).

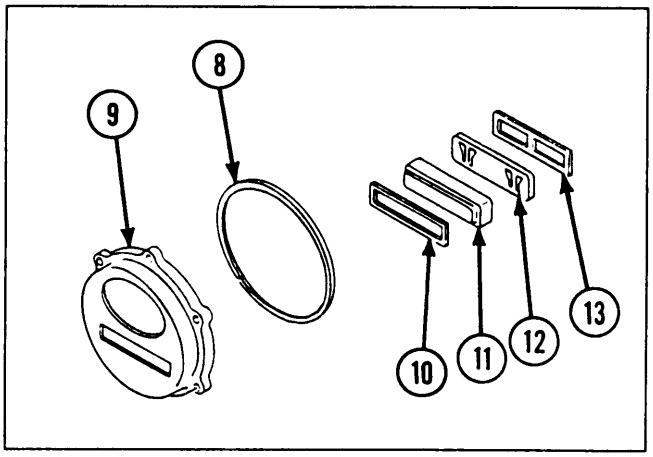
10 Press lens retainer (18) into door (9).

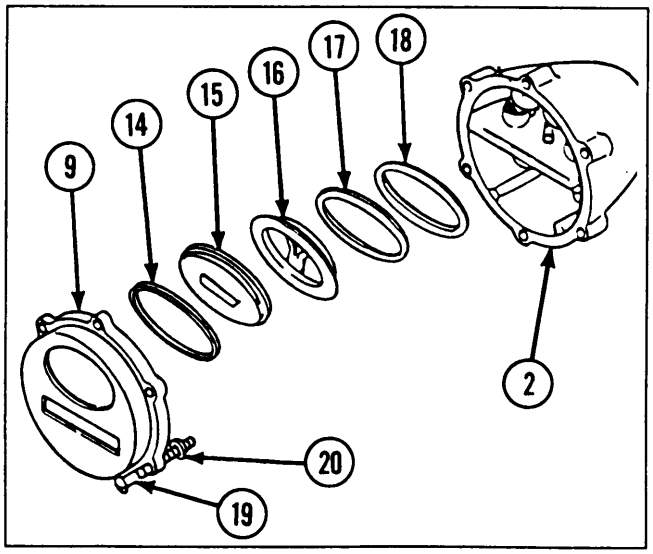
11 Apply antiseize compound to threads of six machine screws (19).

12 If removed, install six new screw retaining rings (20) and six machine screws (19) in door (9).

13 Install door (9) on parking light (2). Tighten six machine screws (19).







2-83. MAINTENANCE OF DRIVER'S COMPARTMENT DOME LIGHT.

This task covers: a. *Disassembly* b. *Inspection/Repair* *c. Reassembly*

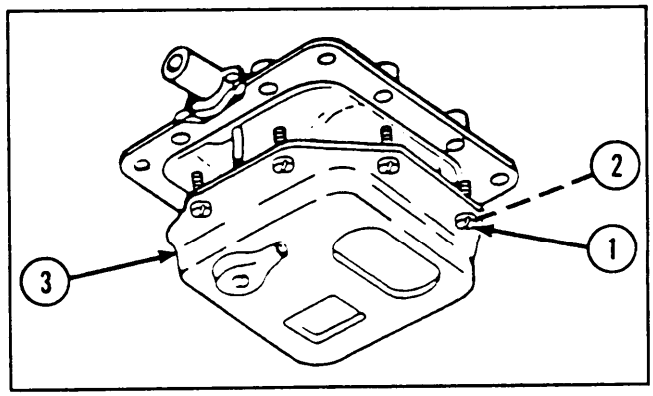
INITIAL SETUP

Materials/Parts
Gasket
Gasket
Lockwasher (5)
LockWasher (4)
Nonmetallic seal
Nonmetallic seal
Preformed packing
Switch knob gasket

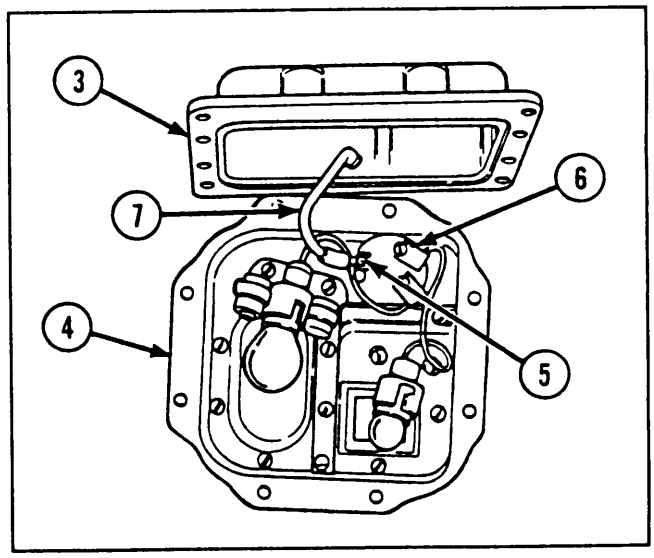
References
TM 9-2350-238-24P-1

Equipment Conditions
2-593 Driver's compartment dome light removed

DISASSEMBLY



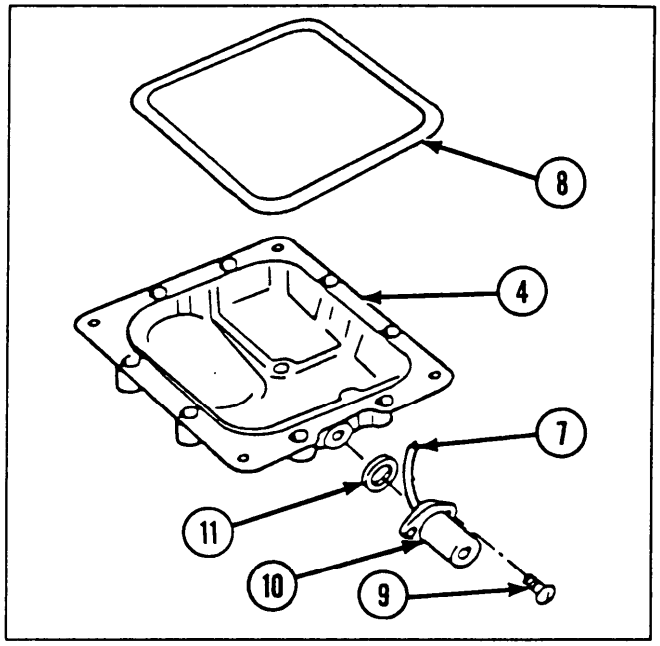
1 Loosen eight machine screws (1). Do not separate eight retaining rings (2) from eight machine screws, or remove eight machine screws from lens retainer (3) unless damaged.



2 Separate lens retainer (3) from body (4). Loosen terminal screw B (5) from rotary switch (6). Disconnect electrical lead (7) and remove lens retainer from body.

3 Remove nonmetallic seal (8) from body (4).

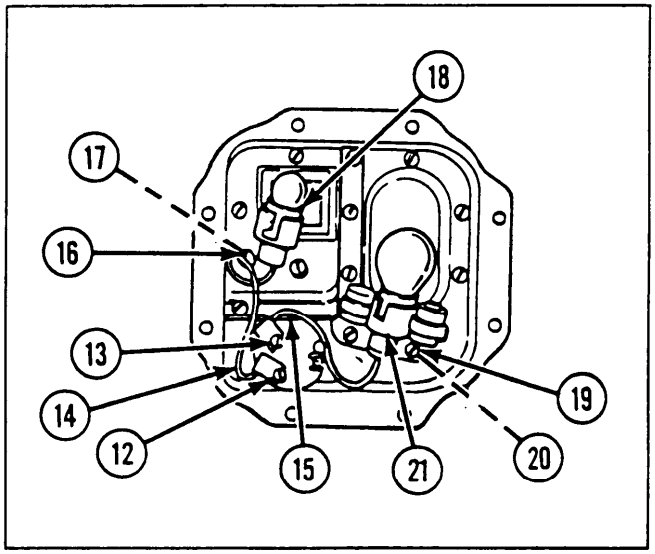
4 Remove two machine screws (9), receptacle connector (10), preformed packing (11), and electrical lead (7) from body (4).



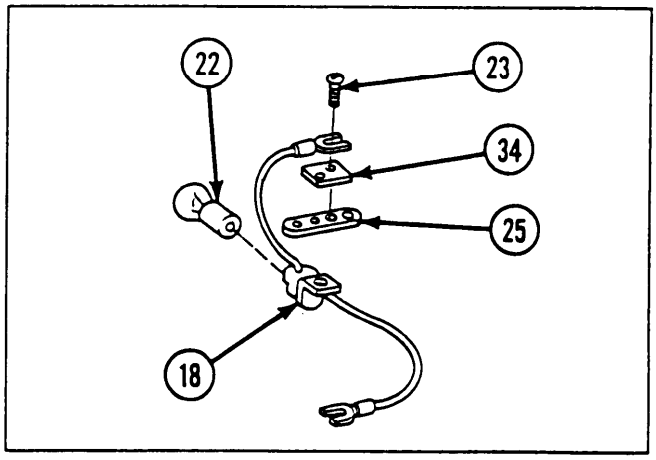
5 Loosen terminal screws R and W (12 and 13) and disconnect electrical leads (14 and 15). Do not remove terminal screws R and W.

6 Remove two machine screws (16), two flat washers (17), and lampholder (18).

7 Remove two machine screws (19), two lockwashers (20), and lampholder (21).

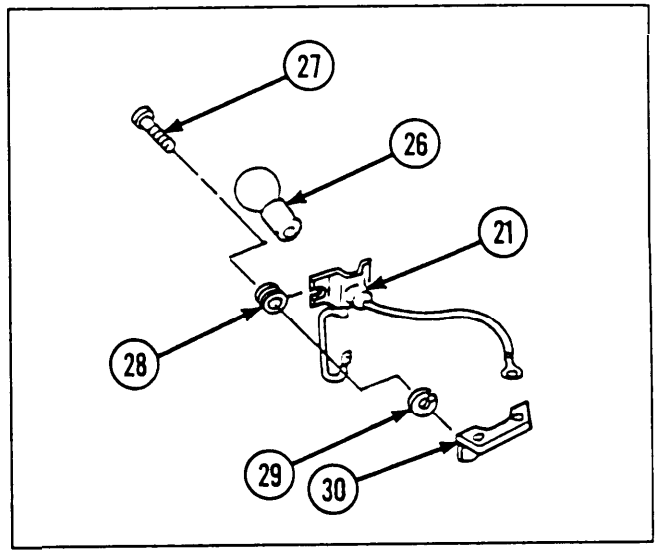


8 Remove incandescent lamp (22), two shoulder screws (23), lamp mounting plate (24), and gasket (25) from lampholder (18).

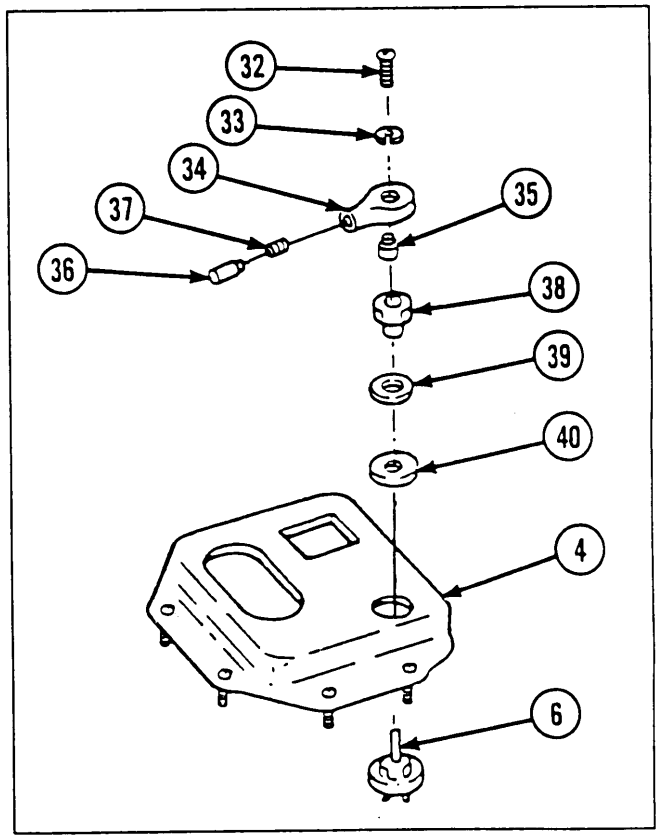


2-83. MAINTENANCE OF DRIVER'S COMPARTMENT DOME LIGHT (CONT).

DISASSEMBLY (CONT)



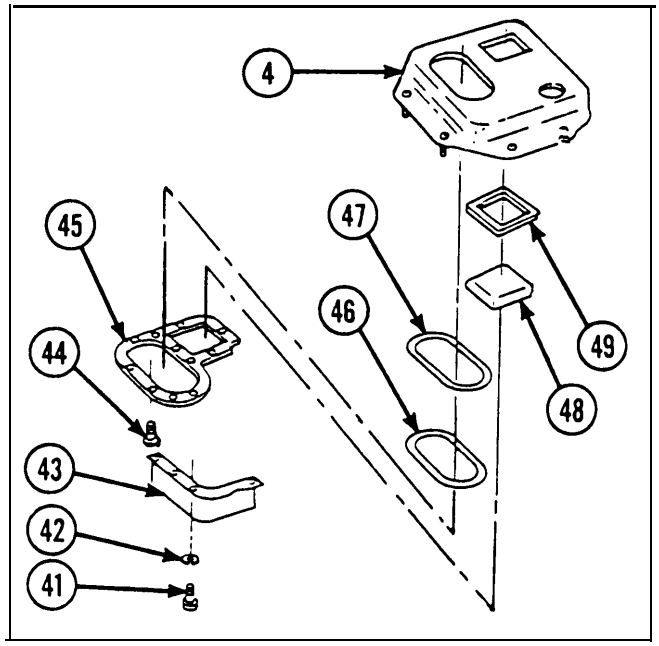
9 Remove incandescent lamp (26), two shoulder screws (27), two rubber grommets (28), two lockwashers (29), and mounting plate (30) from lampholder (21).



10 Remove machine screw (32), lockwasher (33), and switch stop knob (34).

11 Remove setscrew (35), switch stop knob push button (36), and helical spring (37) from switch stop knob (34).

12 Remove mounting nut assembly (38), switch knob gasket (39), flat washer (40), and rotary switch (6) from body (4).



13 Remove four machine screws (41), four lockwashers (42), and partition (43).

14 Remove seven machine screws (44) and retaining plate (45).

15 Remove light lens (46) and nonmetallic seal (47).

16 Remove light lens (48) and gasket (49) from body (4).

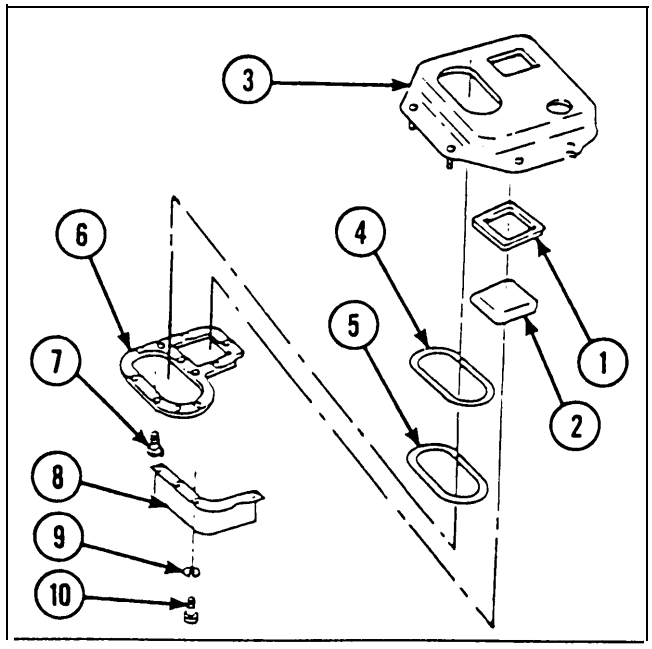
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If body is broken, damaged, or missing, repair is by replacement of next higher assembly.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

REASSEMBLY



1 Install new gasket (1) and light lens (2) on body (3).

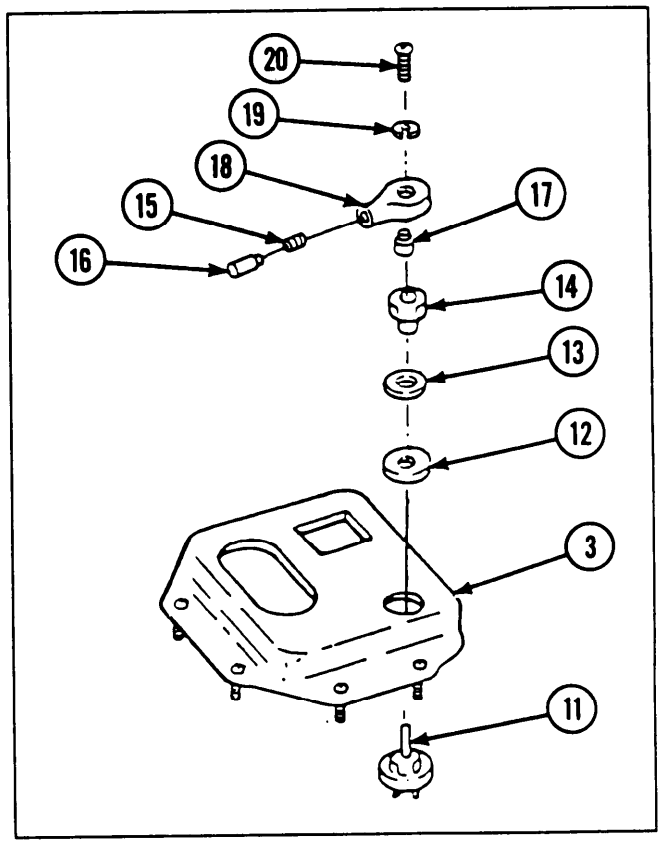
2 Install new nonmetallic seal (4) and light lens (5).

3 Install retaining plate (6) and seven machine screws (7).

4 Install partition (8), four new lockwashers (9), and four machine screws (10).

2-83. MAINTENANCE OF DRIVER'S COMPARTMENT DOME LIGHT (CONT).

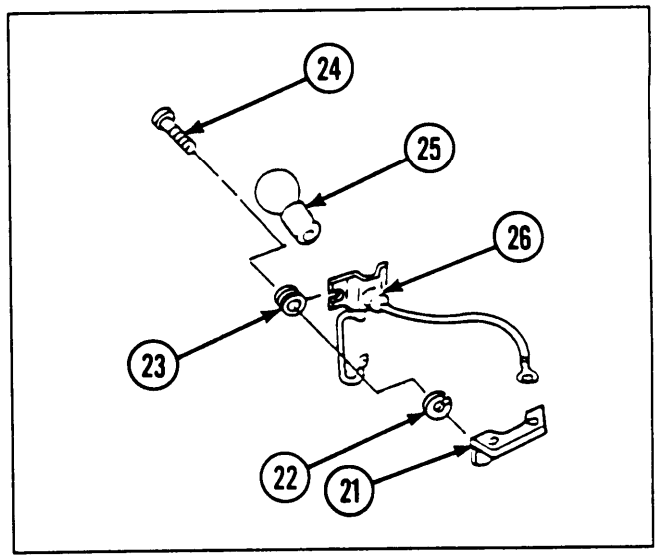
REASSEMBLY (CONT)



5 Install rotary switch (11), flat washer (12), new switch knob gasket (13), and mounting nut assembly (14) on body (3).

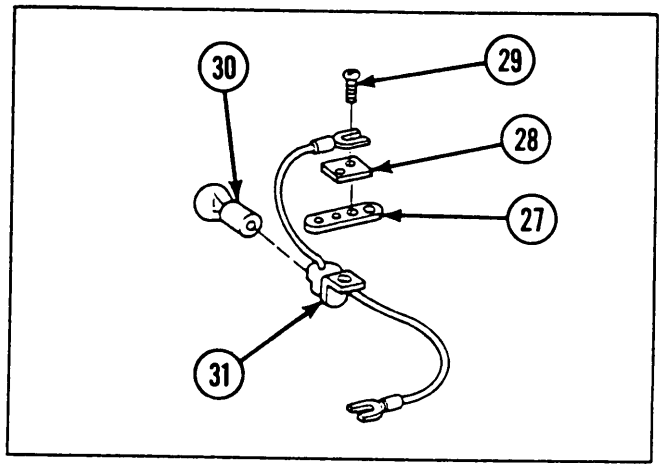
6 Install helical spring (15), switch stop knob push button (16), and setscrew (17) to switch stop knob (18).

7 Install switch stop knob (18), new lockwasher (19), and machine screw (20).



8 Install mounting plate (21), two new lockwashers (22), two rubber grommets (23), two shoulder screws (24), and incandescent lamp (25) to lampholder (26).

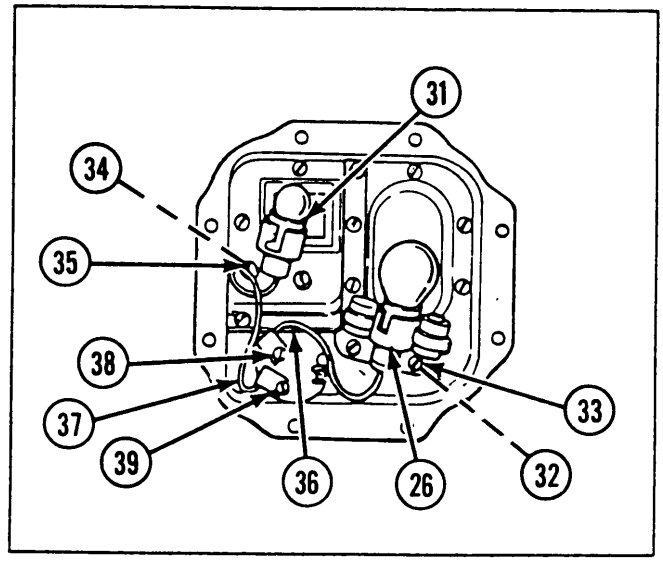
9 Install new gasket (27), lamp mounting plate (28), two shoulder screws (29), and incandescent lamp (30) to lampholder (31).



10 Install lampholder (26), two new lockwashers (32), and two machine screws (33).

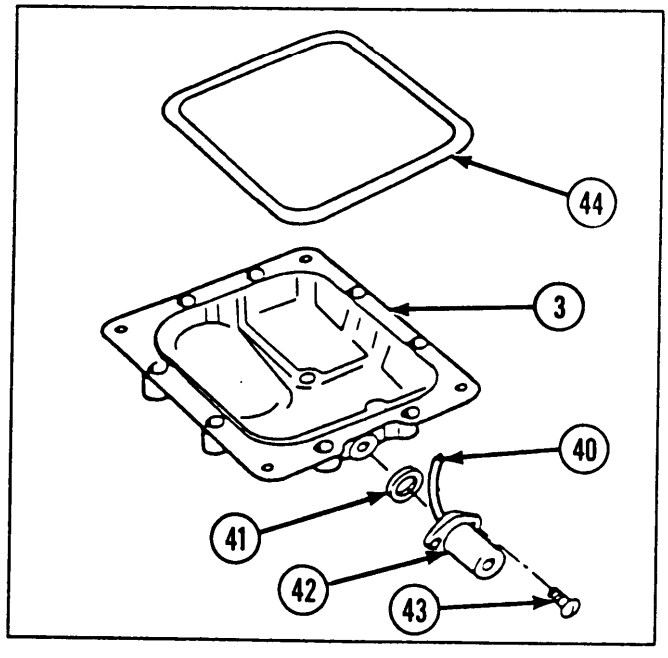
11 Install lampholder (31), two flat washers (34), and two machine screws (35).

12 Connect electrical leads (36 and 37) to terminal screws W and R (38 and 39). Tighten terminal screws.



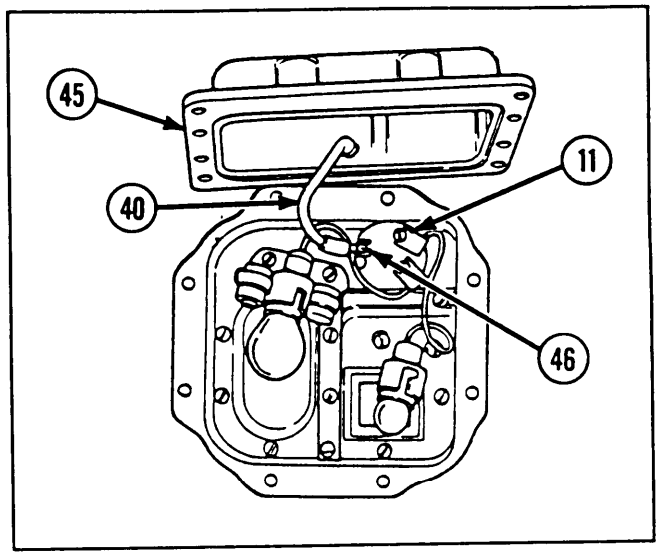
13 Install electrical lead (40), new preformed packing (41), receptacle connector (42), and two machine screws (43) to body (3).

14 Install new nonmetallic seal (44) to body (3).

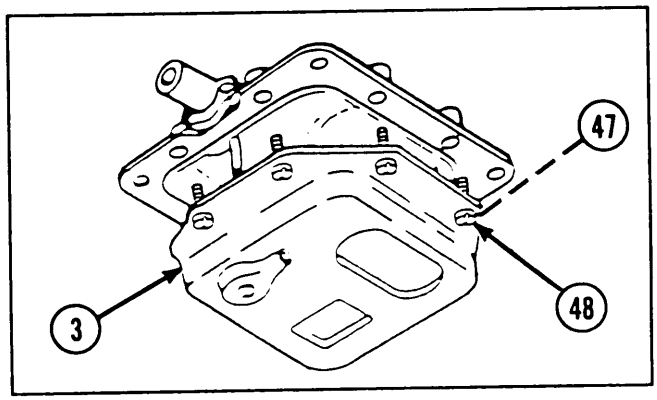


2-83. MAINTENANCE OF DRIVER'S COMPARTMENT DOME LIGHT (CONT).

REASSEMBLY (CONT)



15 Install lens retainer (45). Connect electrical lead (40) to rotary switch (11) and tighten terminal screw B (46).



16 Tighten eight retaining rings (47) and eight machine screws (48) to body (3).

2-84. MAINTENANCE OF SENDING UNITS, WARNING SWITCHES, AND INDICATOR LIGHTS.

This task covers:	a. *Removal* b. *Inspection/Repair*	*c. Installation* d. *Adjustment*

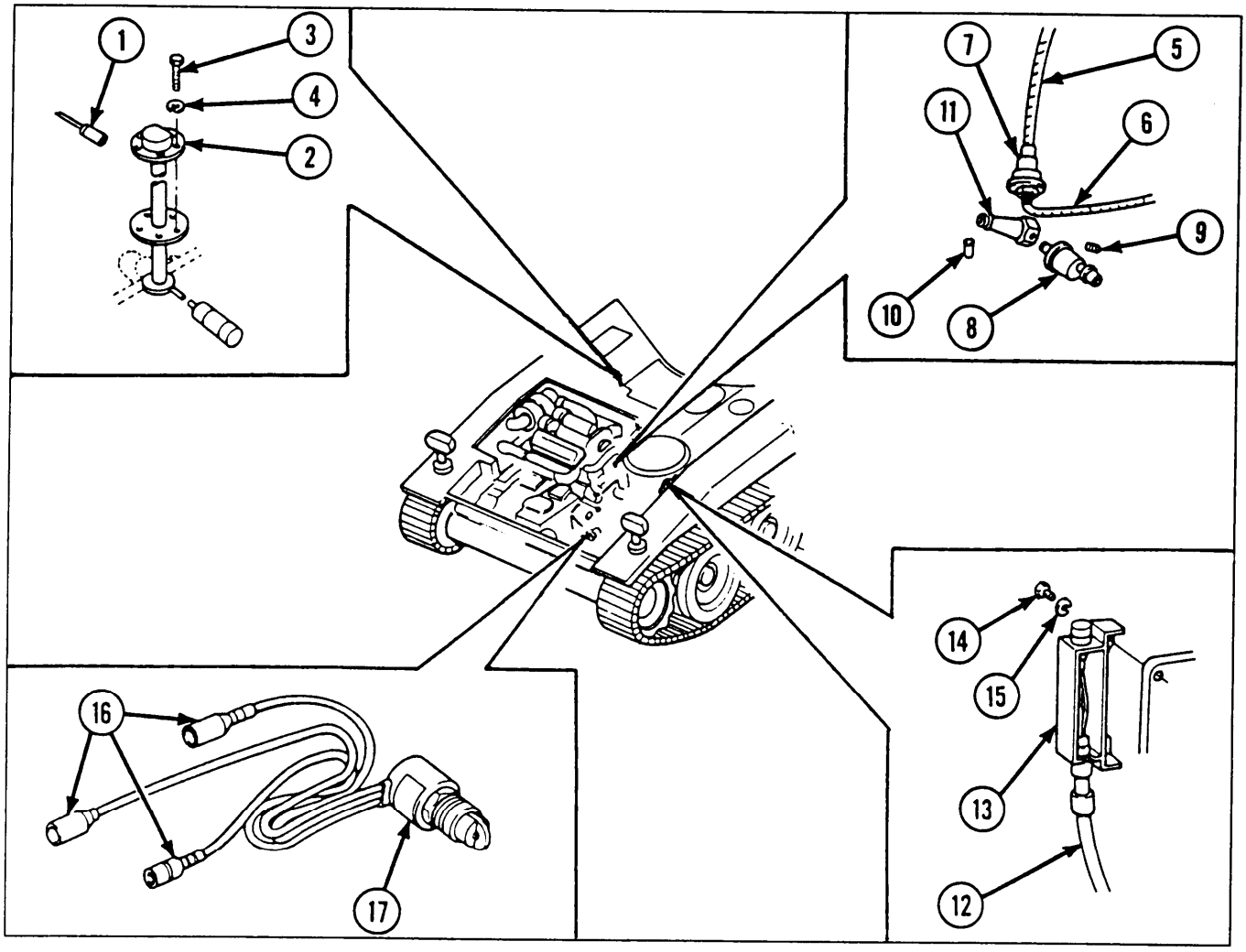
INITIAL SETUP

Materials/Parts
- Lockwasher (2)
- Lockwasher (5)
- Sealing compound (item 37, appx c)

References
- TM 9-2350-238-24P-1

Equipment Conditions
- Low pressure fuel filter element removed
- 2-938 Transmission compartment deck assembly removed
- 2-935 Hull engine compartment deck assembly lid removed

REMOVAL



1 Disconnect electrical lead (1) from fuel sending unit liquid transmitter (2).

2 Remove five machine screws (3), five lockwashers (4), and fuel sending unit liquid transmitter (2).

3 Disconnect two electrical leads (5 and 6) from engine oil pressure transmitter (7).

4 Remove engine oil pressure transmitter (7), pressure switch (8), and two pipe plugs (9 and 10) from engine warning unit pipe adapter (11).

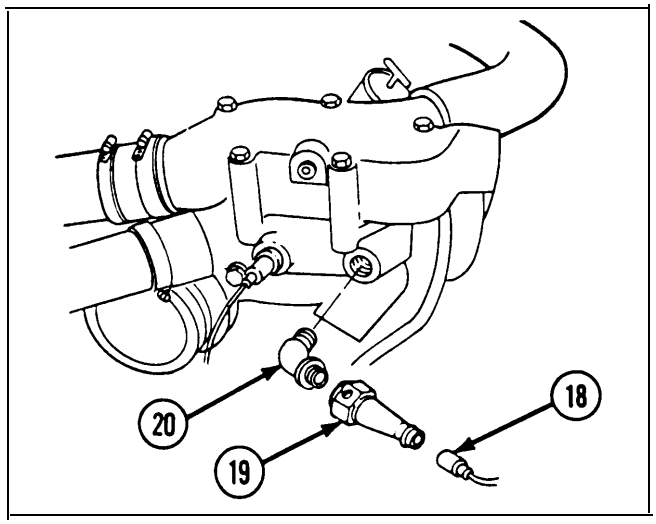
5 Disconnect wiring harness (12) from low engine coolant warning indicator light (13).

6 Remove two hexagon head capscrews (14) and two lockwashers (15). Remove low engine coolant warning indicator light (13).

7 Disconnect shell connectors (16) and remove brake warning sensitive switch (17).

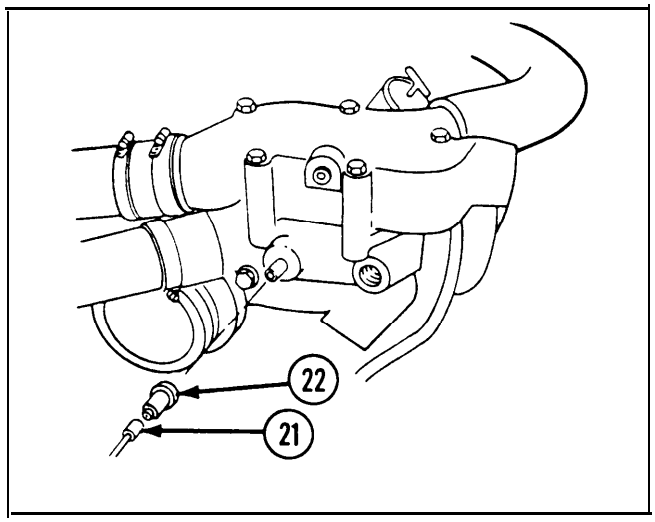
2-84. MAINTENANCE OF SENDING UNITS, WARNING SWITCHES, AND INDICATOR LIGHTS (CONT).

REMOVAL (CONT)

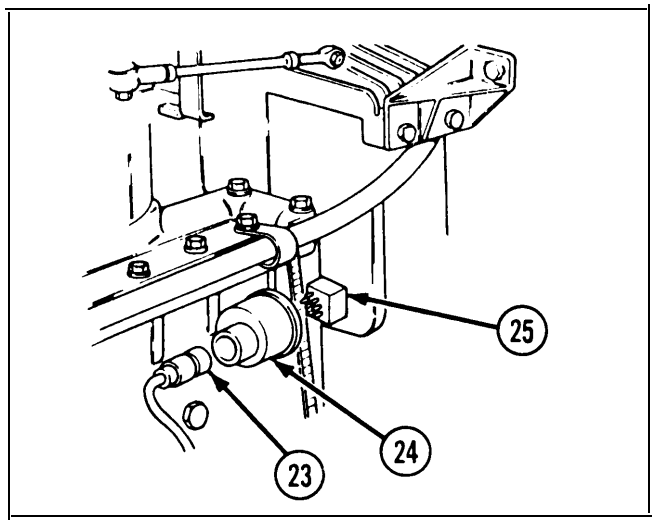


8 Disconnect electrical lead (18) and remove engine coolant temperature warning thermostatic switch (19) from pipe elbow (20).

9 Remove pipe elbow (20).

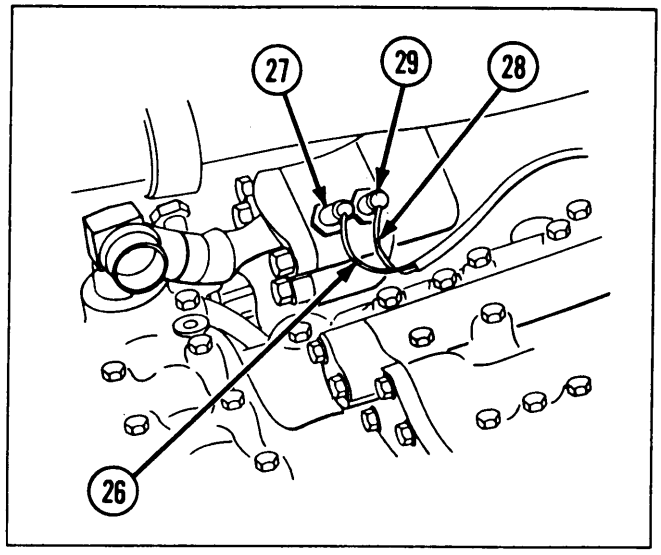


10 Disconnect electrical lead (21) and remove engine coolant temperature transmitter (22).



11 Disconnect electrical lead (23) and remove transmission oil pressure transmitter (24) from transmission warning unit adapter (25).

12 Remove transmission warning unit adapter (25).



13 Disconnect electrical lead (26) and remove transmission oil thermostatic switch (27).

14 Disconnect electrical lead (28) and remove transmission oil temperature transmitter (29).

INSPECTION/REPAIR

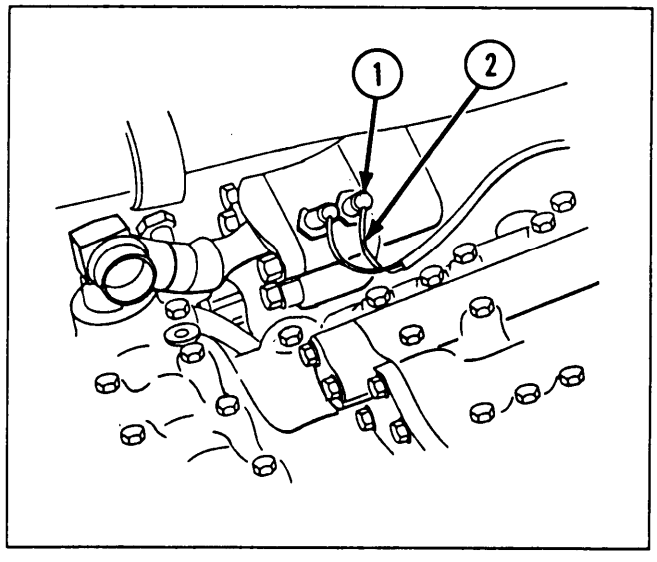
1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors, refer to general maintenance, page 2-371.

4 The low engine coolant warning indicator light is a repairable assembly. Refer to page 2-634.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).



1 Apply sealing compound to transmission oil temperature transmitter threads.

2 Install transmission oil temperature transmitter (1).

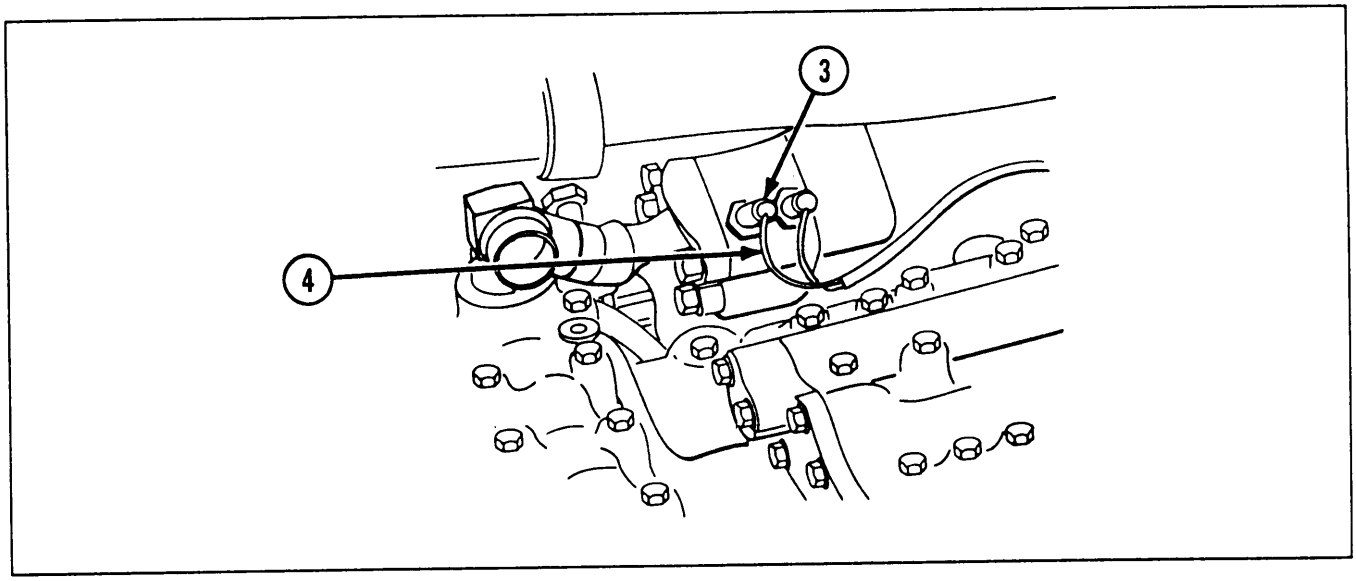
3 Install electrical lead (2).

4 Run engine long enough to ensure transmission oil temperature transmitter (1) operates properly and does not leak.

5 If leaks exist, ensure all parts have been installed correctly, If leaks still exist, inspect for defective parts.

2-84. MAINTENANCE OF SENDING UNITS, WARNING SWITCHES, AND INDICATOR LIGHTS (CONT).

INSTALLATION (CONT)



6 Apply sealing compound to transmission oil thermostatic switch threads.

7 Install transmission oil thermostatic switch (3) and connect electrical lead (4).

8 Run engine long enough to ensure transmission oil thermostatic switch (3) operates properly and does not leak.

9 If leaks exist, ensure all parts have been installed correctly. If leaks still exist, inspect for defective parts.

10 Apply sealing compound to transmission oil pressure transmitter threads.

11 Install transmission warning unit adapter (5).

12 Install transmission oil pressure transmitter (6) to transmission warning unit adapter (5) and connect electrical lead (7).

13 Run engine long enough to ensure transmission oil pressure transmitter (6) operates properly and does not leak.

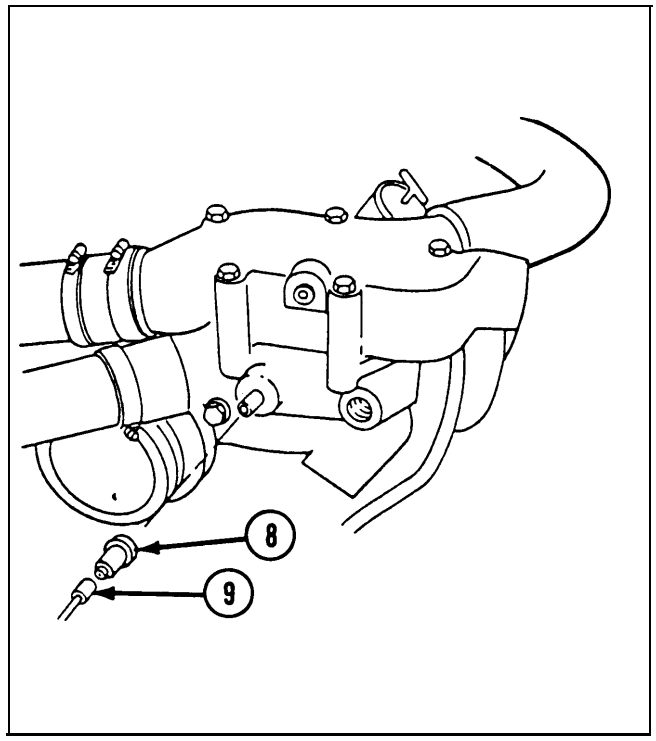
14 If leaks exist, ensure all parts have been installed correctly. If leaks still exist, inspect for defective parts.

15 Apply sealing compound to engine coolant temperature transmitter threads.

16 Install engine coolant temperature transmitter (8) and connect electrical lead (9).

17 Run engine long enough to ensure engine coolant temperature transmitter (8) operates properly and does not leak.

18 If leaks exist, ensure all parts have been installed correctly. If leaks still exist, inspect for defective parts.

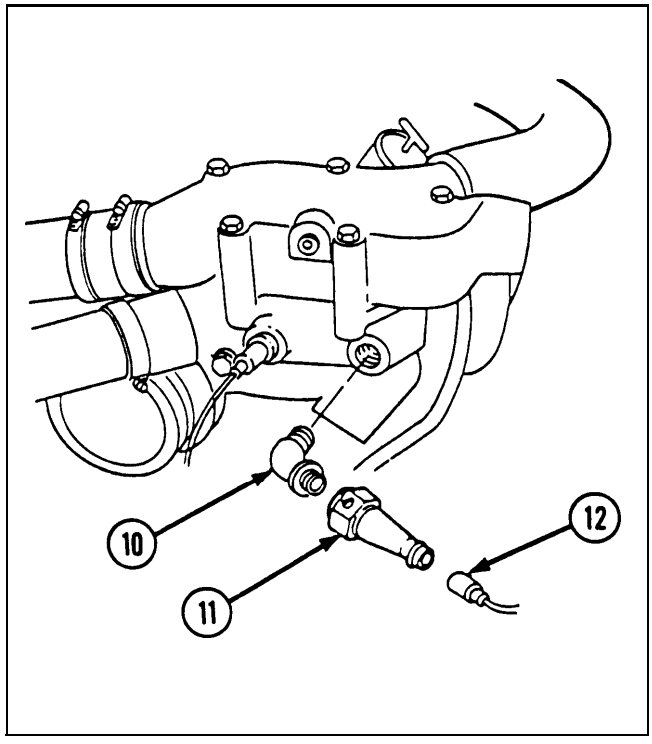


19 Apply sealing compound to engine coolant temperature warning thermostatic switch threads.

20 Install pipe elbow (10).

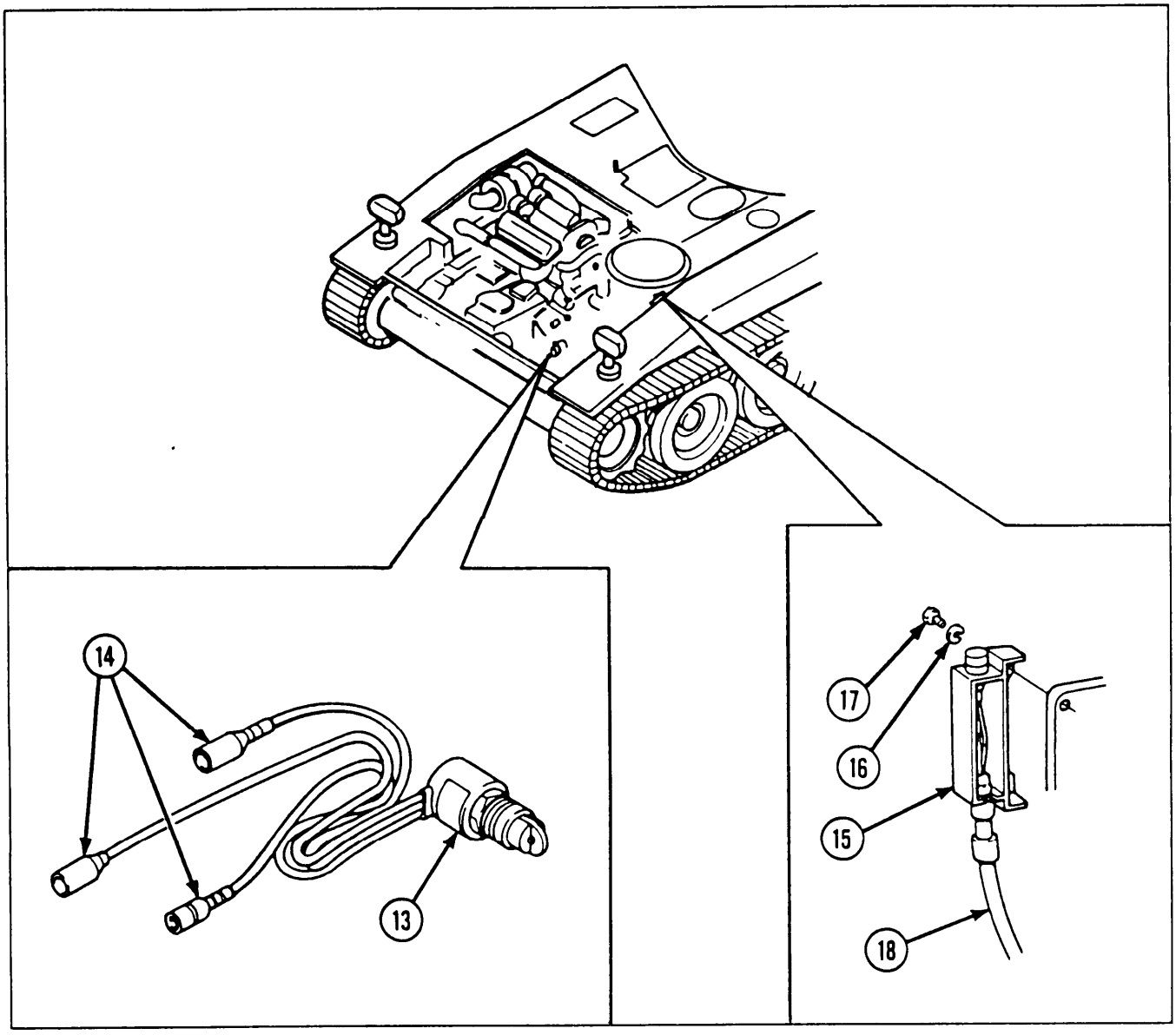
21 Install engine coolant temperature warning thermostatic switch (11) and connect electrical lead (12).

22 Run engine long enough to ensure engine coolant temperature warning thermostatic switch (11) operates properly and does not leak.



2-84. MAINTENANCE OF SENDING UNITS, WARNING SWITCHES, AND INDICATOR LIGHTS (CONT).

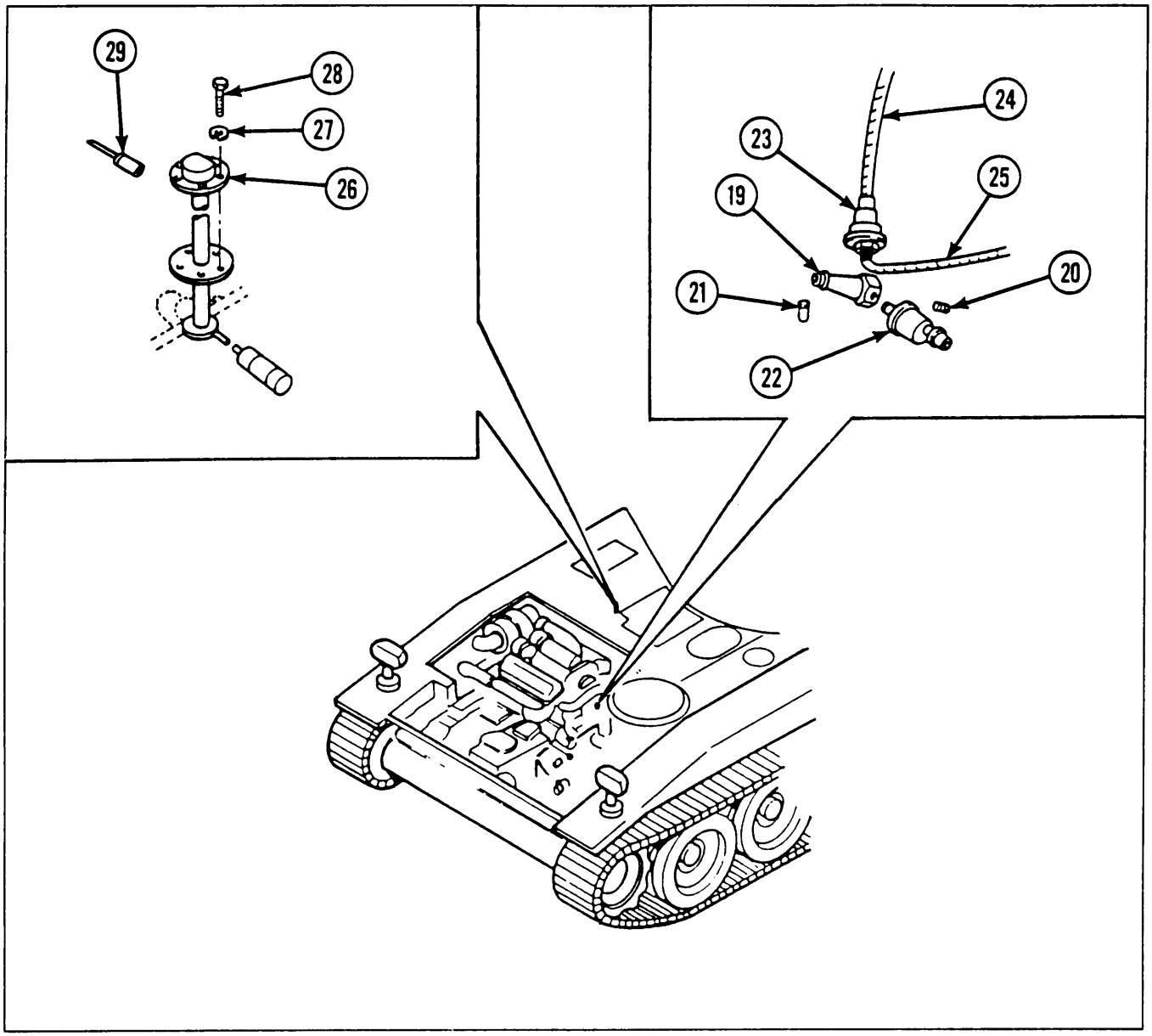
INSTALLATION (CONT)



23 If leaks exist, ensure all parts have been installed correctly. If leaks still exist, inspect for defective parts.

24 Install brake warning sensitive switch (13) and connect shell connectors (14) to line connections.

25 Install low engine coolant warning indicator light (15), two new lockwashers (16), and two hexagon head capscrews (17). Connect wiring harness (18).



26 Install engine warning unit pipe adapter (19).

27 Install two pipe plugs (20 and 21), pressure switch (22), and engine oil pressure transmitter (23). Connect two electrical leads (24 and 25).

28 Install fuel sending unit liquid transmitter (26), five new lockwashers (27), and five machine screws (28). Connect electrical lead (29).

2-84. MAINTENANCE OF SENDING UNITS, WARNING SWITCHES, AND INDICATOR LIGHTS (CONT).

ADJUSTMENT

1 Release parking brake.

2 Loosen nut (1).

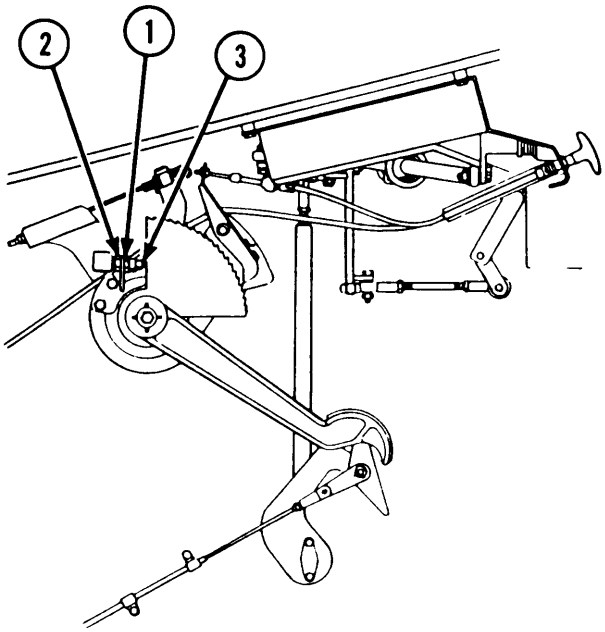
3 Adjust nut (2) until roller (3) is fully depressed.

4 Hold nut (2) from turning and tighten nut (1).

5 Set MASTER switch ON.

6 Apply brakes. Stoplight will light.

7 Release brakes. Stoplight will go out.



2-85. MAINTENANCE OF LOW ENGINE COOLANT WARNING INDICATOR LIGHT.

This task covers: a. *Disassembly* b. *Inspection/Repair* *c. Reassembly*

INITIAL SETUP

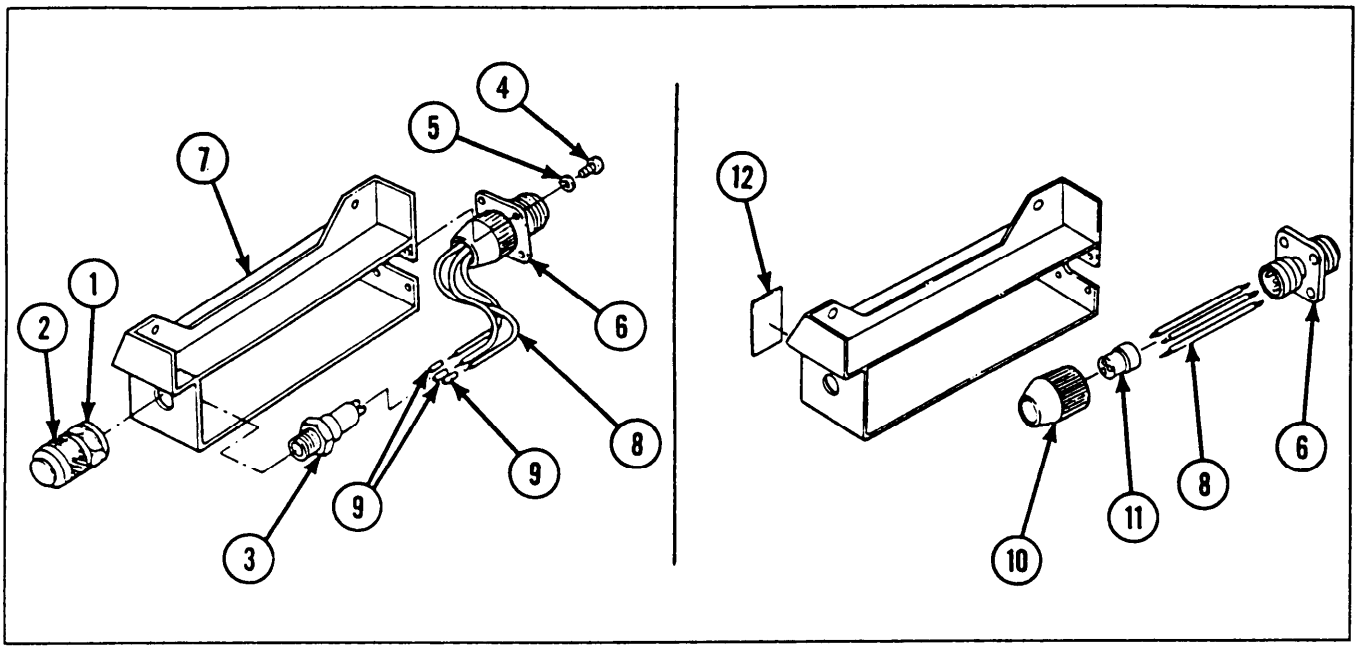
Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
• Soldering gun

Materials/Parts
Electrical wire (figure D-2, appx D)
Insulation sleeving (figure D-20, appx D)
Lockwasher (4)
Solder (item 43, appx C)

References
TB SIG-222
TM 9-2350-238-24P-1

Equipment Conditions
2-626 Low engine coolant warning indicator light removed

DISASSEMBLY



1 Loosen nut (1) and remove indicator light (2) from indicator light socket (3).

2 Remove four machine screws (4) and four lockwashers (5).

3 Remove receptacle connector (6) with attached parts from enclosure (7).

4 Unsolder and remove electrical wires (8) from indicator light socket (3). Remove insulation sleeving (9) from electrical wires (8).

5 Remove bushing retainer nut (10) from receptacle connector (6).

6 Remove electrical insert (11) from receptacle connector (6) and electrical wires (8).

7 if damaged, unsolder and remove electrical wires (8) from receptacle connector (6).

8 If damaged, remove sign (12).

2-85. MAINTENANCE OF LOW ENGINE COOLANT WARNING INDICATOR LILGHT (CONT)

INSPECTION/REPAIR

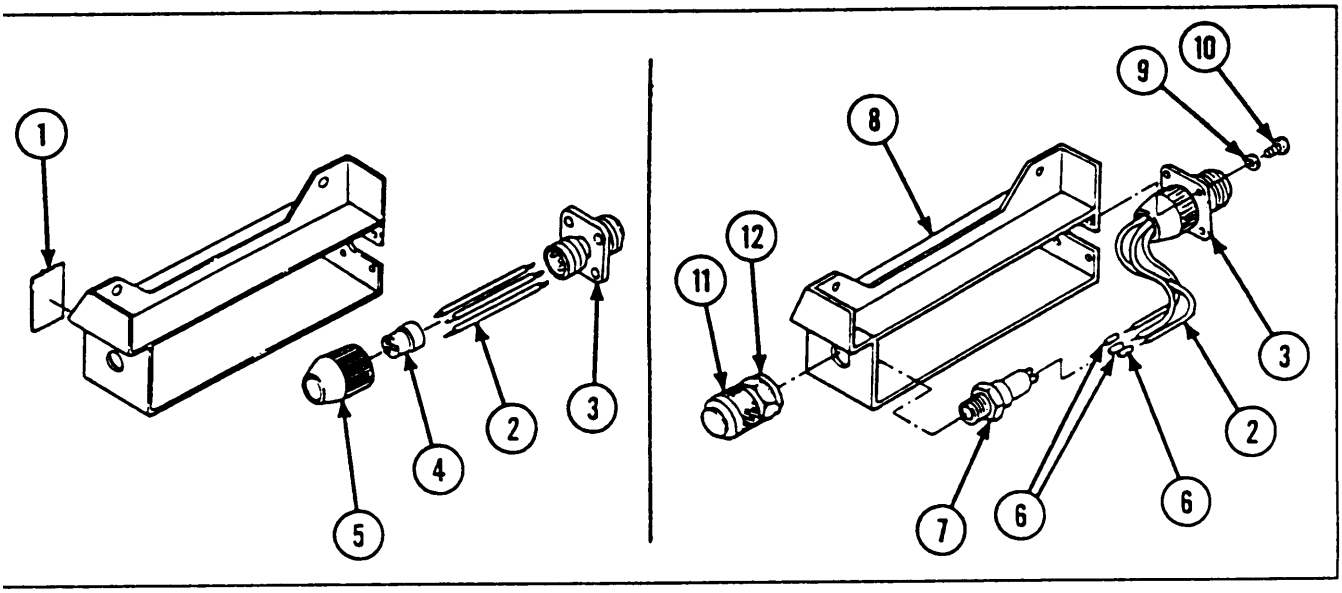
1 Inspect for broken, damaged, or missing parts.

2 If enclosure is damaged, repair is by replacement of next higher assembly.

3 Electrical wire and insulation sleeving are manufactured items, refer to appendix D.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY



1 If removed, install new sign (1).

2 Using solder, solder electrical wires (2) to receptacle connector (3) per TB SIG-222.

3 Install electrical insert (4) on electrical wires (2).

4 Install bushing retainer nut (5) on receptacle connector (3).

5 install insulation sleeving (6) on electrical wires (2). Using solder, solder electrical wires to indicator light socket (7).

6 Install receptacle connector (3) with attached parts in enclosure

7 Install four new lockwashers (9) and four machine screws (10).

8 Install indicator light (11) on indicator light socket (7), and tighten nut (12).

2-86. MAINTENANCE OF AUDIBLE WARNING HORN AND RELATED PARTS.

This task covers: a. *Removal* b. *Inspection/Repair* *c. Installation*

INITIAL SETUP

Materia/s/Parts
Lockwasher (2)
Lockwasher (4)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-952 Driver's seat removed
2-566 Driver's instrument panel removed
MASTER switch in OFF position

General Safety Instructions

Brake foot pedal is spring-loaded. Block tracks and release parking brake before working on audible warning horn.

NOTE
Tag electrical leads before removing them to aid in installation.

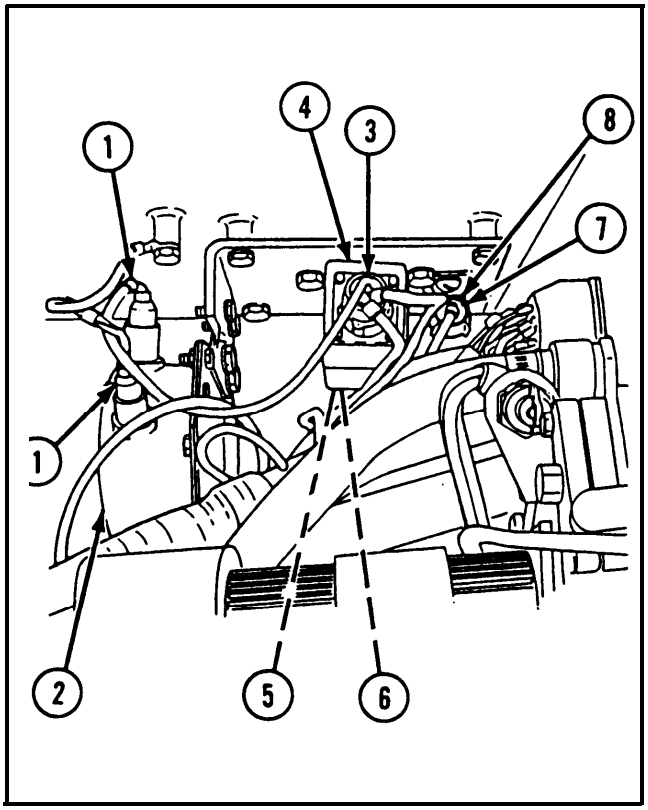
1 Disconnect two electrical leads (1) from electrical horn (2).

2 Disconnect electrical connector (3) from audible warning system relay (4).

3 Disconnect two electrical leads (5) from circuit breaker (6).

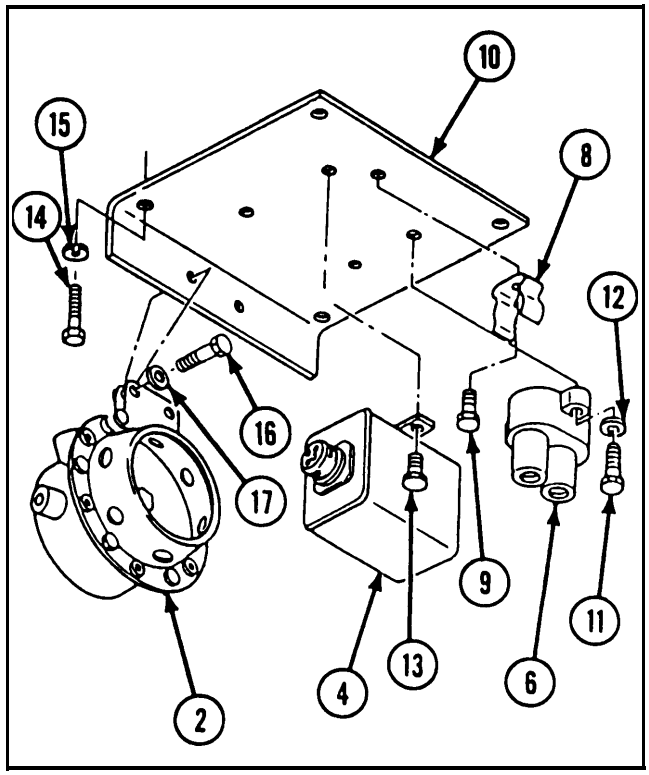
4 Disconnect electrical connector (7).

5 Remove electrical connector (7) from spring tension clip (8).



2-86 MAINTENANCE OF AUDIBLE WARNING HORN AND RELATED PARTS (CONT).

REMOVAL (CONT)



6 Remove assembled washer screw (9) and spring tension clip (8) from angle bracket (10).

7 Remove two machine screws (11), two lockwashers (12), and circuit breaker (6).

8 Remove two assembled washer bolts (13) and audible warning system relay (4).

9 Remove four hexagon head capscrews (14) and four lockwashers (15). Remove angle bracket (10) with electrical horn (2).

NOTE

Two screws and washers are supplied with electrical horn. Use care not to lose them. If lost or damaged, replace electrical horn.

10 Remove two screws (16), two washers (17), and electrical horn (2) from angle bracket (10).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

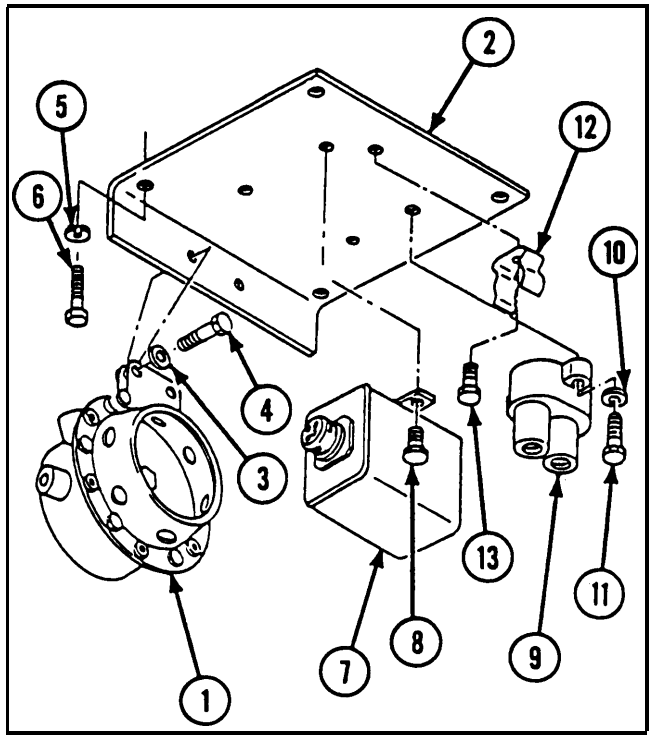
1 Install electrical horn (1) on angle bracket (2) and secure with two washers (3) and two screws (4).

2 Install electrical horn (1) and angle bracket (2) and secure with four new lockwashers (5) and four hexagon head capscrews (6).

3 Install audible warning system relay (7) and two assembled washer bolts (8) on angle bracket (2).

4 Install circuit breaker (9), two new lockwashers (10), and two machine screws (11).

5 Install spring tension clip (12). Install assembled washer screw (13).



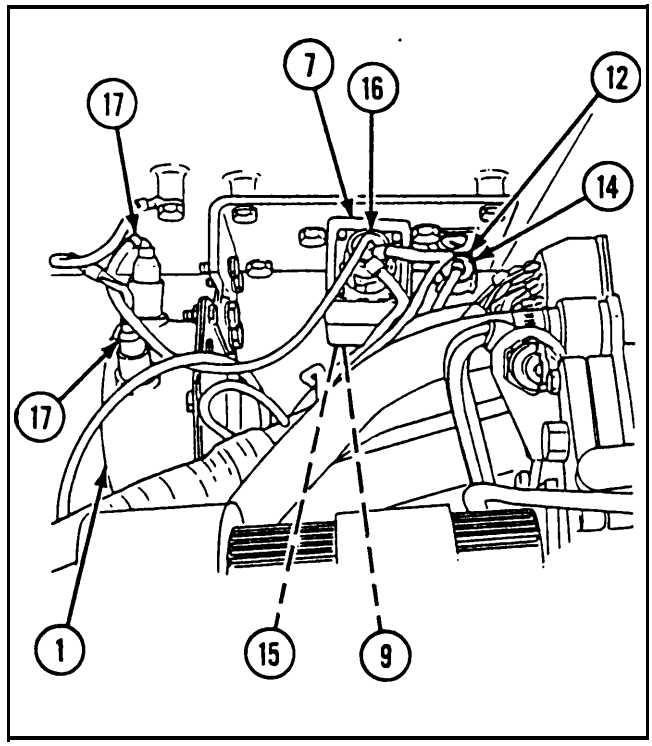
6 Connect electrical connector (14).

7 Install electrical connector (14) in spring tension clip (12).

8 Connect two electrical leads (15) to circuit breaker (9).

9 Connect electrical connector (16) to audible warning system relay (7).

10 Connect two electrical leads (17) to electrical horn (1).



2-87. MAINTENANCE OF BATTERIES, ELECTRICAL LEADS, AND RELATED PARTS.

This task covers: a. Removal b. *Inspection/Repair* *c. Installatbn*

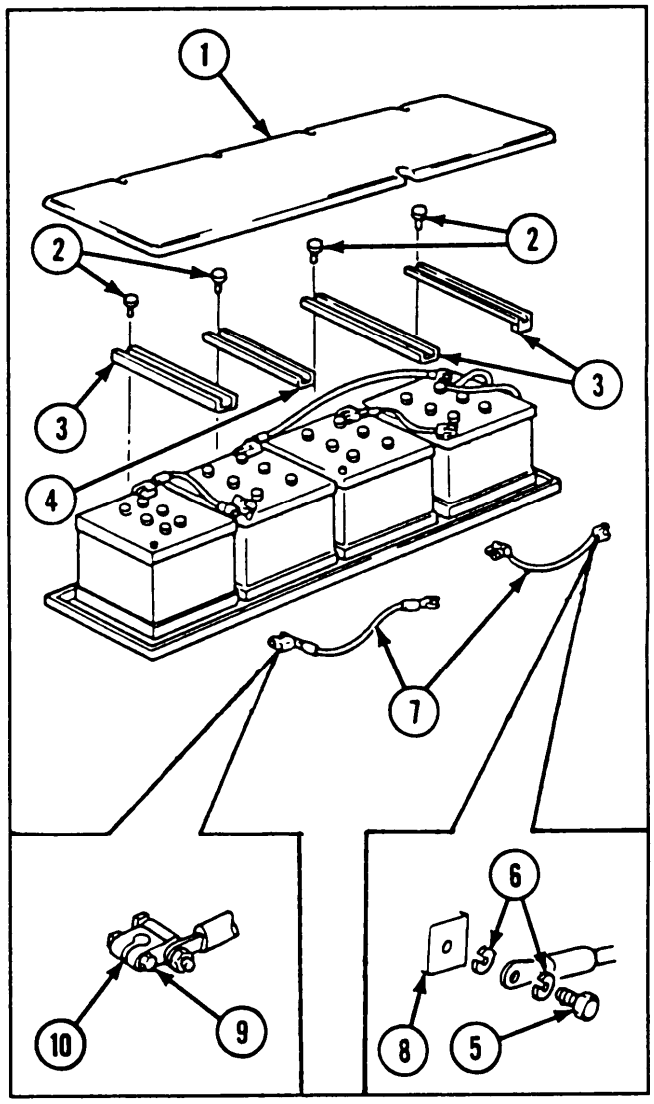
INITIAL SETUP

Matetials/Parts
Lockwasher (4)

References
TM 9-2350-238-24P-1

Equipment Conditions
Battery access door open

REMOVAL



1 Remove battery protection liner (1).

2 Remove eight hexagon head capscrews (2) from three battery hold-down channel assemblies (3) and one battery holddown channel assembly (4).

NOTE

- There maybe more leads attached to a lug terminal than those illustrated. Ensure all leads are properly identified.
- Tag all electrical leads to aid in identification during installation.

3 Remove two hexagon head capscrews (5), four Iockwashers (6), and two battery cables (7) from hull (8).

4 Loosen screws (9) and remove two lug terminals (10) from negative battery terminals. Remove two battery cables (7).

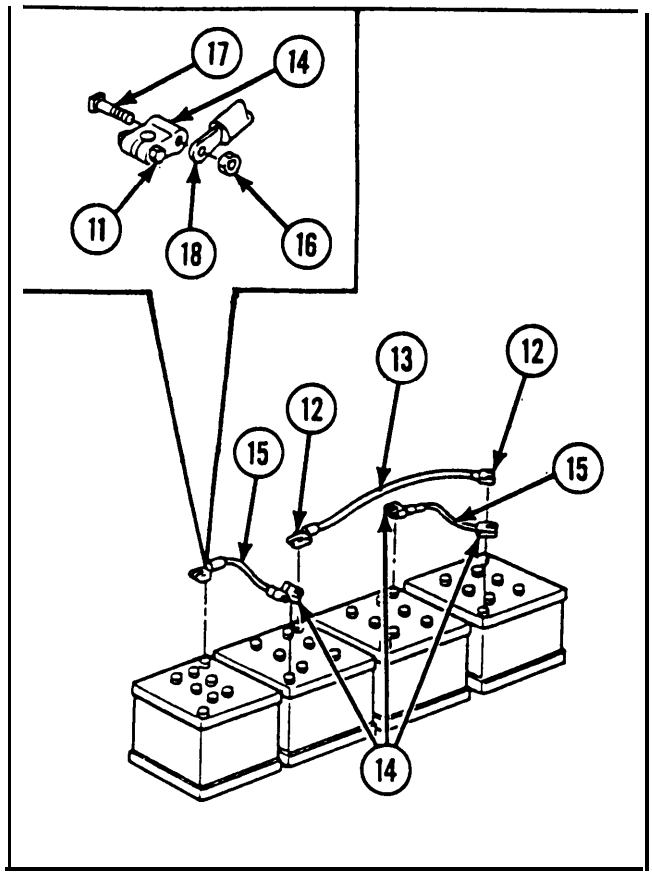
5 Loosen screws (11) and remove two lug terminals (12) from positive battery terminals. Remove battery cable (13).

6 Loosen screws (11) and remove four lug terminals (14) from battery terminals. Remove two battery cables (15).

NOTE

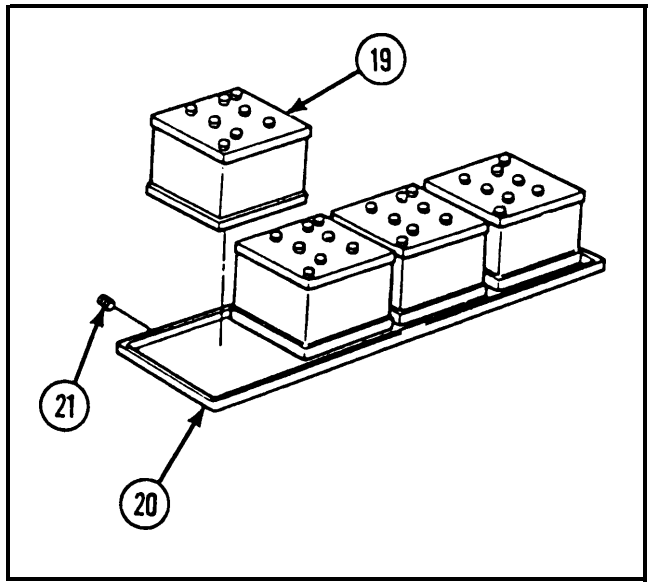
- Step 7 is written and illustrated for one lug terminal and electrical lead, but applies to all lug terminals and electrical leads.
- Screws and nuts are supplied with lug terminals. Use care not to lose them. If lost or damaged, replace lug terminal.

7 Remove nut (16), screw (17), and electrical lead (18) from lug terminal (14).



8 Remove four storage batteries (19).

9 Remove battery tray (20) and two dust protective plugs (21).



2-87. MAINTENANCE OF BATTERIES, ELECTRICAL LEADS, AND RELATED PARTS (CONT).

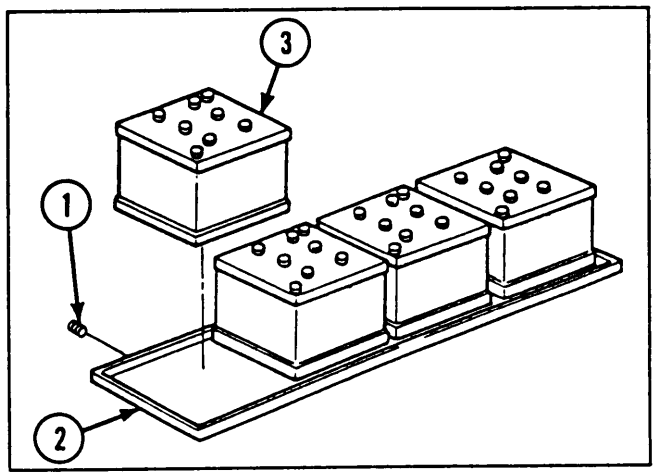
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 For repair and disposition of storage batteries, notify direct support maintenance.

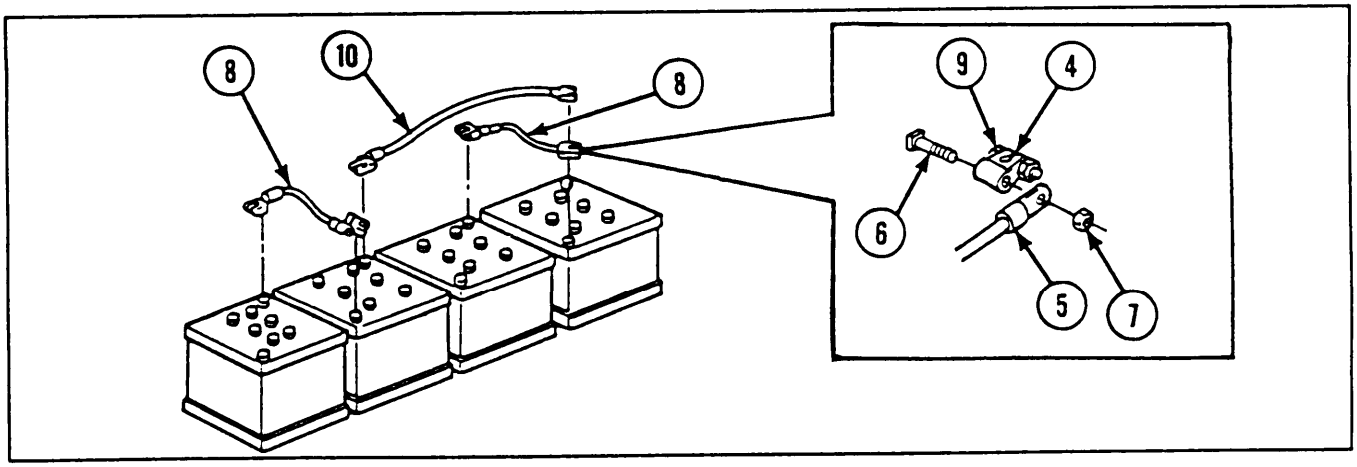
3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



1 Install two dust protective plugs (1) and battery tray (2).

2 Install four storage batteries (3) in battery tray (2).



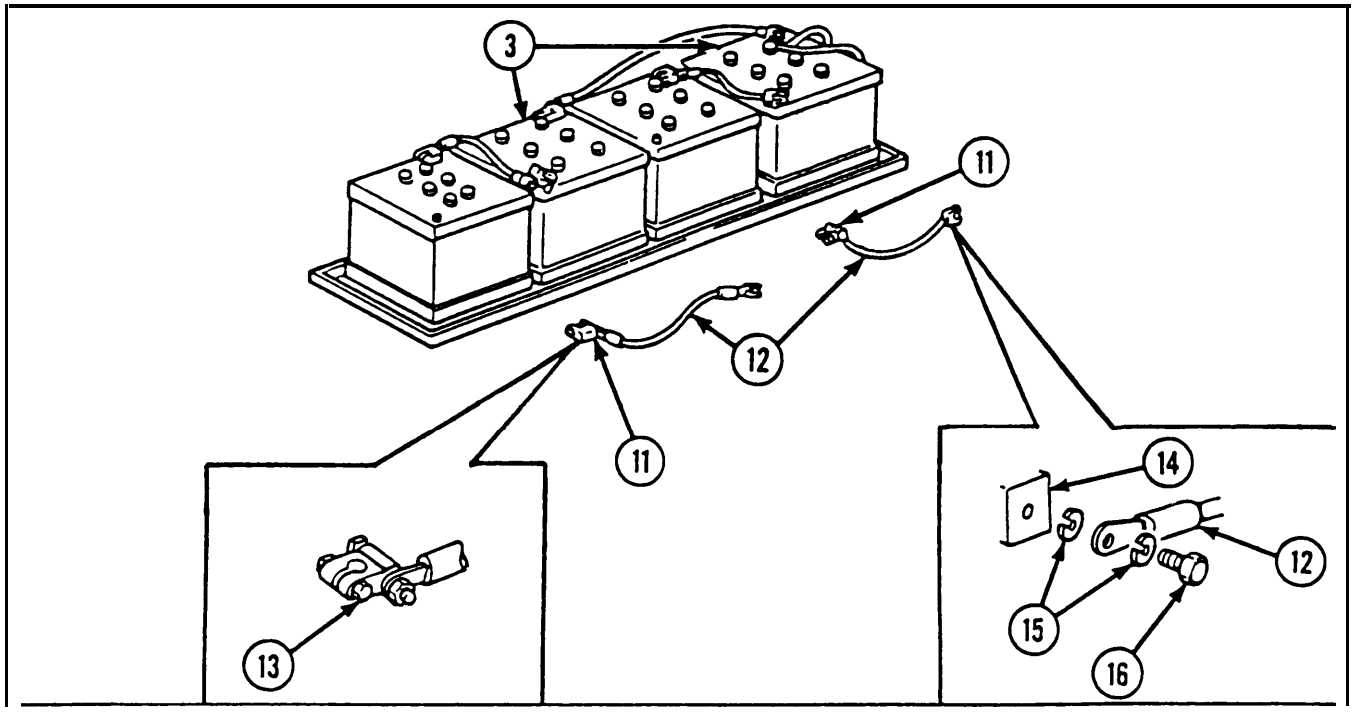
NOTE

Step 3 is written and illustrated for one lug terminal and electrical lead but applies to all lug terminals and electrical leads.

3 Install lug terminal (4) on electrical lead (5) and secure with screw (6) and nut (7).

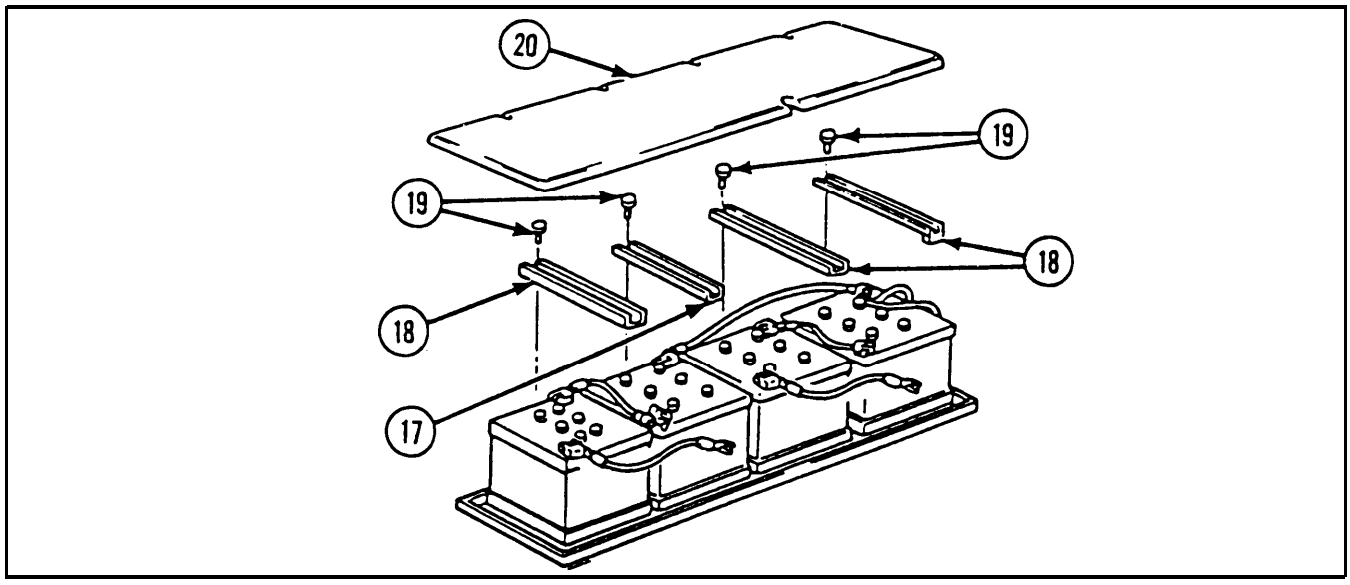
4 Install lug terminals (4) of two battery cables (8) on battery terminals. Tighten screws (9) to secure lug terminals to battery terminals.

5 Install lug terminals (4) of battery cable (10) on positive battery terminals. Tighten screws (9) to secure lug terminals to battery terminals.



6 Install lug terminals (11) of two battery cables (12) on negative battery terminals. Tighten screws (13) to secure lug terminals to battery terminals.

7 Connect two battery cables (12) to hull (14) with four new lockwashers (15) and two hexagon head capscrews (16).



8 Install battery hold-down channel assembly (17), three battery hold-down channel assemblies (18), and eight hexagon head capscrews (19).

9 Install battery protection liner (20).

2-88. MAINTENANCE OF BULKHEAD DISCONNECT TO SWITCH PANEL BRANCHED WIRING HARNESS.

This task covers:
a. *Removal*
b. *Disassembly*
c. Inspection/Repair
d. *Reassembly*
e. Installation

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Nonmetallic rod (figure D-24, appx D)

References
TM 9-2350-238-24P-1

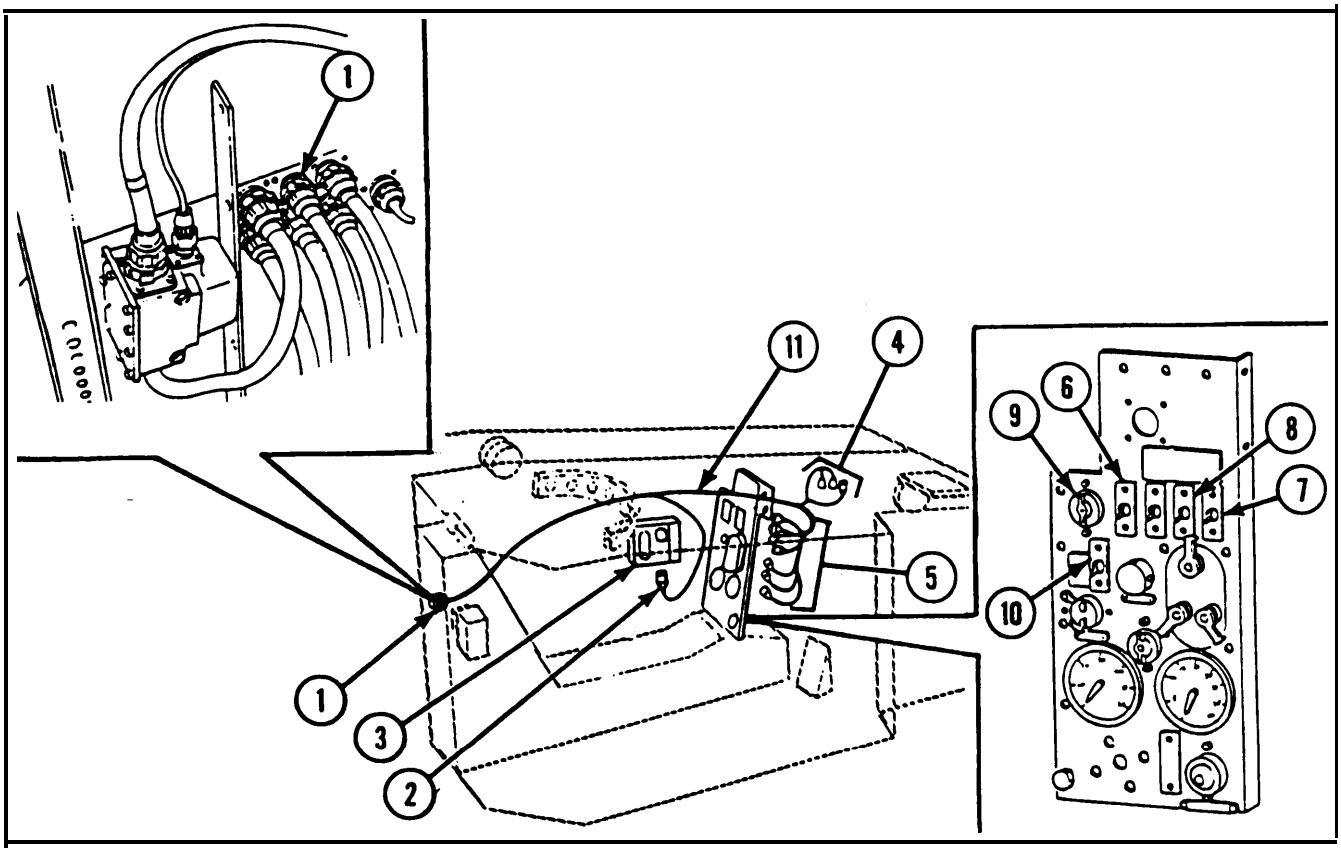
Equipment Condtions
2-840 Batteries disconnected
2-952 Driver's seat removed
2-928 Driver's compartment forward cowl removed
2-928 Driver's compartment aft cowl removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead which is being removed.

2 Disconnect plug connector (1) from bulkhead disconnect.

3 Tag and disconnect shell connector (2) from dome light assembly (3).

4 Tag and disconnect three shell connectors (4) from line connections.

5 Disconnect seven shell connectors (5) at the following points:

a. Tag and disconnect shell connector from infrared receiver switch (6).

b. Tag and disconnect shell connector from master switch (7).

c. Tag and disconnect shell connector from instrument switch (8).

d. Tag and disconnect shell connector from line connection.

e. Tag and disconnect shell connector from driver's indicator light (9) (clutch engaged).

f. Tag and disconnect two shell connectors from hydraulic pump switch (10) (clutch operation).

DISASSEMBLY

For disassembly of wiring harness plug connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors, refer to general maintenance, page 2-371.

4 Electrical wire and rod are manufactured items, refer to appendix D.

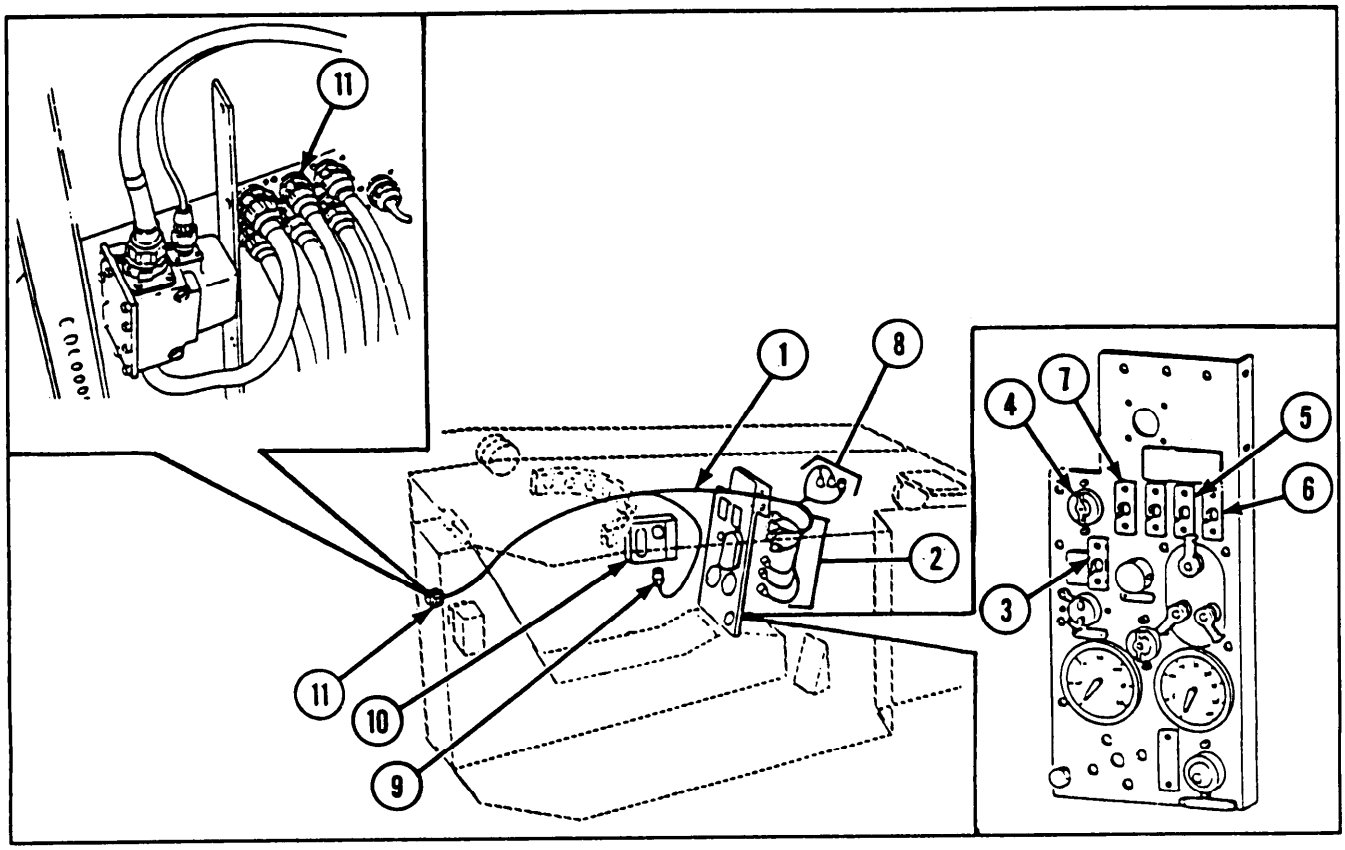
5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-88. MAINTENANCE OF BULKHEAD DISCONNECT TO SWITCH PANEL BRANCHED WIRING HARNESS (CONT).

REASSEMBLY

For reassembly of wiring harness plug connector, refer to general maintenance, page 2-371.

INSTALLATION



1 Install bulkhead disconnect to switch panel branched wiring harness (1) in hull through driver's compartment.

2 Connect seven shell connectors (2) at the following points:

a. Untag and connect two shell connectors to hydraulic pump switch (3) (clutch operation).

b. Untag and connect shell connector to driver's indicator light (4) (clutch engaged).

c. Untag and connect shell connector to line connection.

d. Untag and connect shell connector to instrument switch (5).

e. Untag and connect shell connector to master switch (6).

f. Untag and connect shell connector to infrared receiver switch (7).

3 Untag and connect three shell connectors (8) to line connections.

4 Untag and connect shell connector (9) to dome light assembly (10).

5 Connect plug connector (11) to bulkhead disconnect.

6 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-89. MAINTENANCE OF BULKHEAD DISCONNECT TO ENGINE COMPONENTS AND WARNING UNITS BRANCHED WIRING HARNESS.

This task covers:	a. *Removal* b. *Disassembly* *c. Inspection/Repair*	d. *Reassembly* *e. Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-640 Batteries disconnected
2-384 Powerplant removed

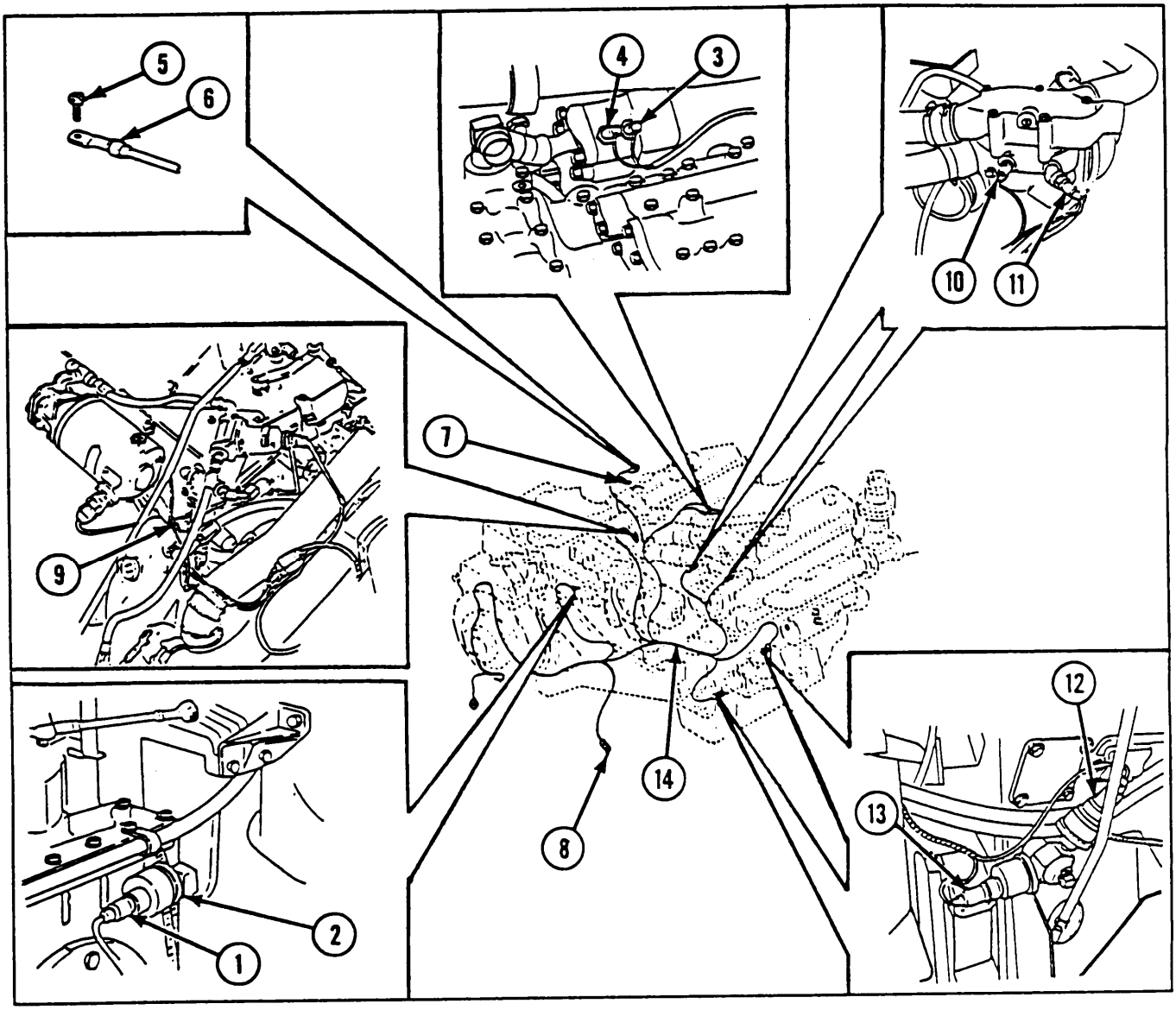
General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing *any* electrical wiring harness or lead may result in injury or damaged equipment.

2-89. MAINTENANCE OF BULKHEAD DISCONNECT TO ENGINE COMPONENTS AND WARNING UNITS BRANCHED WIRING HARNESS (CONT).

REMOVAL



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead which is being removed.

2 Tag and disconnect shell connector (1) from transmission oil pressure sending unit (2).

3 Tag and disconnect shell connector (3) from transmission oil temperature sending unit.

4 Tag and disconnect shell connector (4) from transmission oil high temperature warning switch.

5 Remove screw (5) and ground cable terminal (6) from bulkhead.

6 Tag and disconnect plug connector (7) from throttle limiting solenoid valve.

7 Tag and disconnect shell connector (8) from line connection.

8 Tag and disconnect plug connector (9) from air box heater bracket receptacle connector.

9 Tag and disconnect shell connector (10) from engine water temperature sending unit.

10 Tag and disconnect shell connector (11) from engine water temperature warning switch.

11 Tag and disconnect shell connector (12) from engine low oil pressure warning switch.

12 Tag and disconnect shell connector (13) from engine oil pressure sending unit.

13 Remove bulkhead disconnect to engine components and warning units branched wiring harness (14) from powerplant.

DISASSEMBLY

For disassembly of wiring harness plug connectors, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors and cable terminals, refer to general maintenance, page 2-371.

4 Electrical wire is a manufactured item, refer to appendix D.

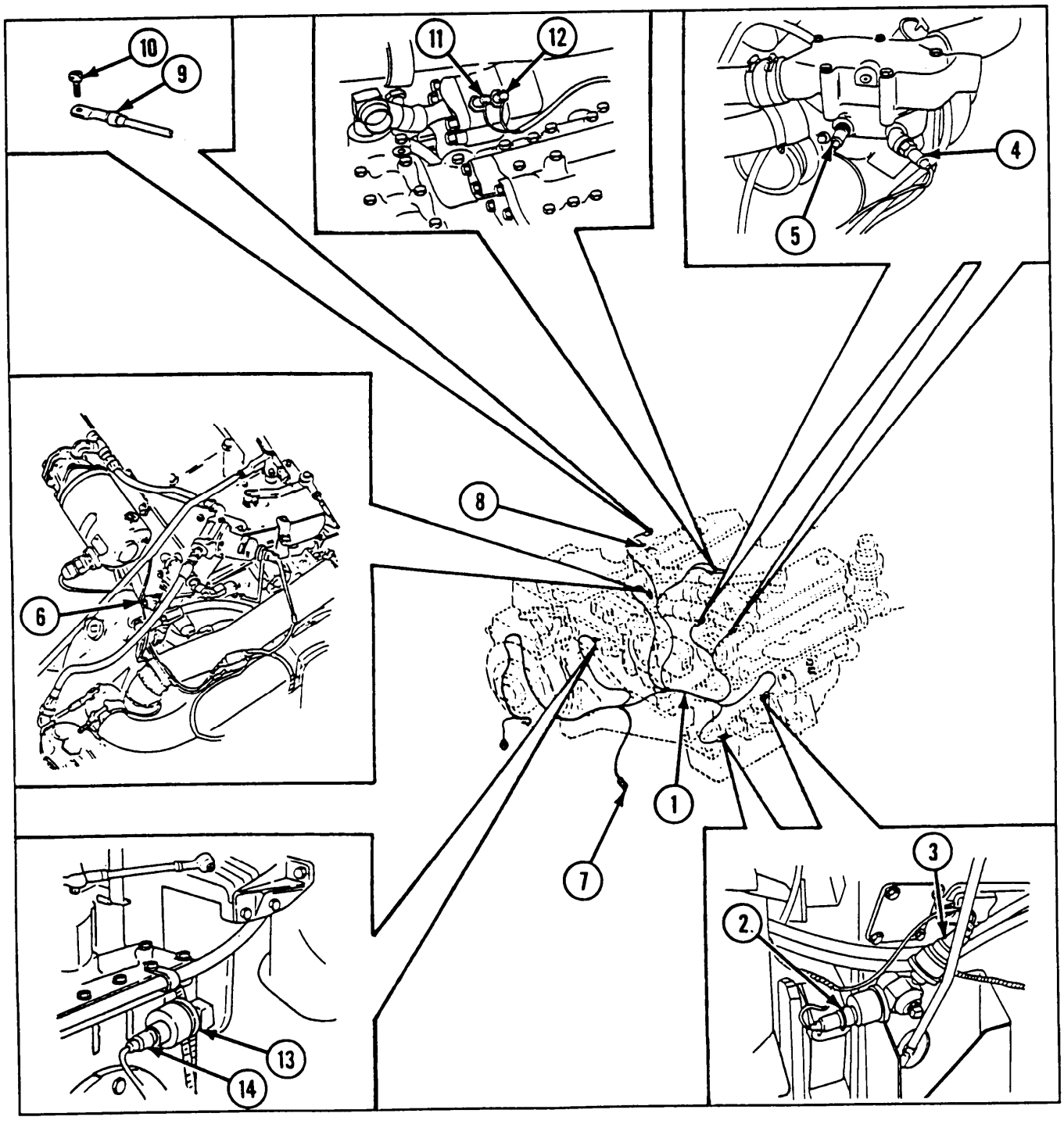
5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-89. MAINTENANCE OF BULKHEAD DISCONNECT TO ENGINE COMPONENTS AND WARNING UNITS BRANCHED WIRING HARNESS (CONT).

REASSEMBLY

For reassembly of wiring harness plug connectors, refer to general maintenance, page 2-371.

INSTALLATION



1 Install bulkhead disconnect to engine components and warning units branched wiring harness (1) on powerplant.

2 Untag and connect shell connector (2) to engine oil pressure sending unit.

3 Untag and connect shell connector (3) to engine low oil pressure warning switch.

4 Untag and connect shell connector (4) to engine water temperature warning switch.

5 Untag and connect shell connector (5) to engine water temperature sending unit.

6 Untag and connect plug connector (6) to air box heater bracket receptacle connector.

7 Untag and connect shell connector (7) to line connection.

8 Untag and connect plug connector (8) to throttle limiting solenoid valve.

9 Install ground cable terminal (9) and screw (10) on bulkhead.

10 Untag and connect shell connector (11) to transmission oil high temperature warning switch.

11 Untag and connect shell connector (12) to transmission oil temperature sending unit (13).

12 Untag and connect shell connector (14) to transmission oil pressure sending unit.

13 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-90. MAINTENANCE OF BULKHEAD DISCONNECT TO DRIVER'S CONTROL BRANCHED WIRING HARNESS.

This task covers:	a. *Removal* b. *Disassembly* *c. Inspection/Repair*	d. *Reassembly* *e. Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D
Rod (figure D-24, appx D)

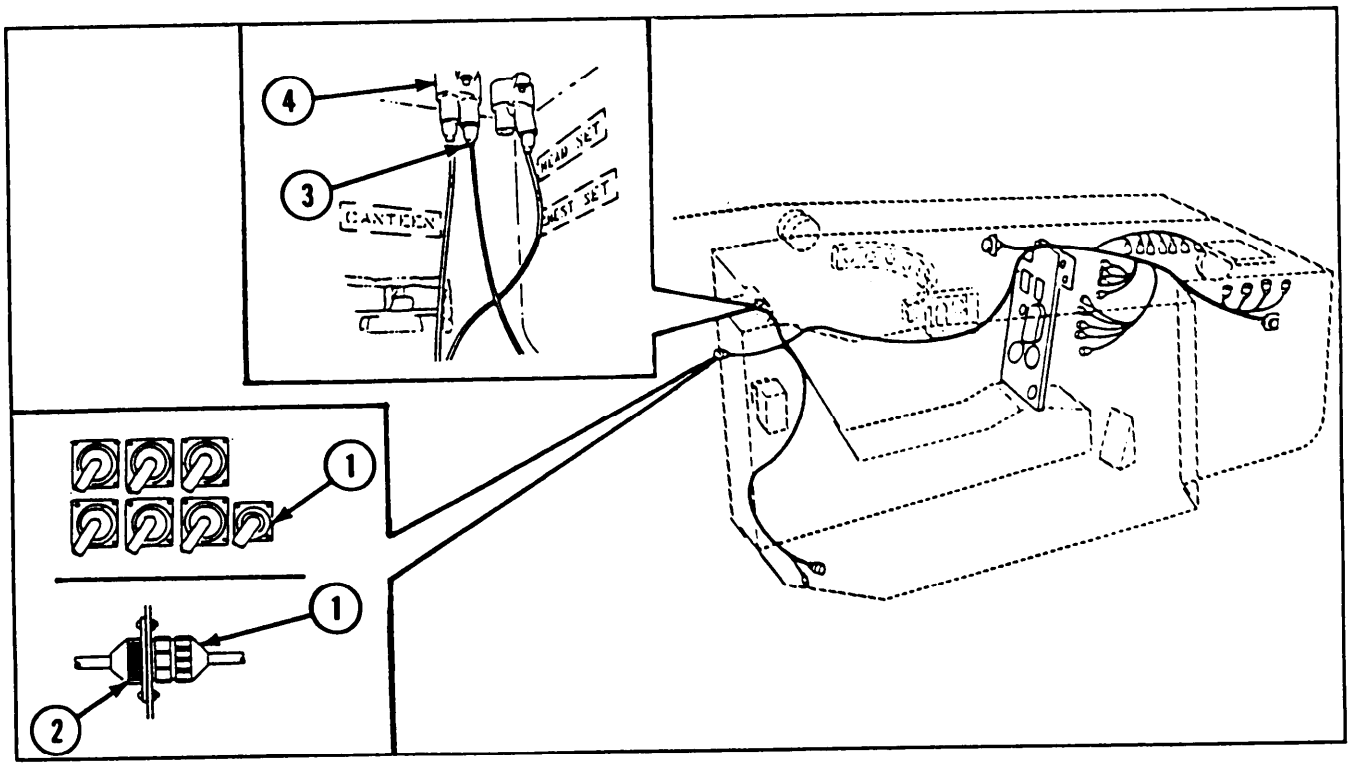
References
TM 9-2350-238-24P-1

Equipment Conditions
2-840 Batteries disconnected
2-952 Driver's seat removed
2-928 Driver's compartment forward cowl removed
2-928 Driver's compartment aft cowl removed
2-820 Brake pedal removed

General Safety Instructions

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL



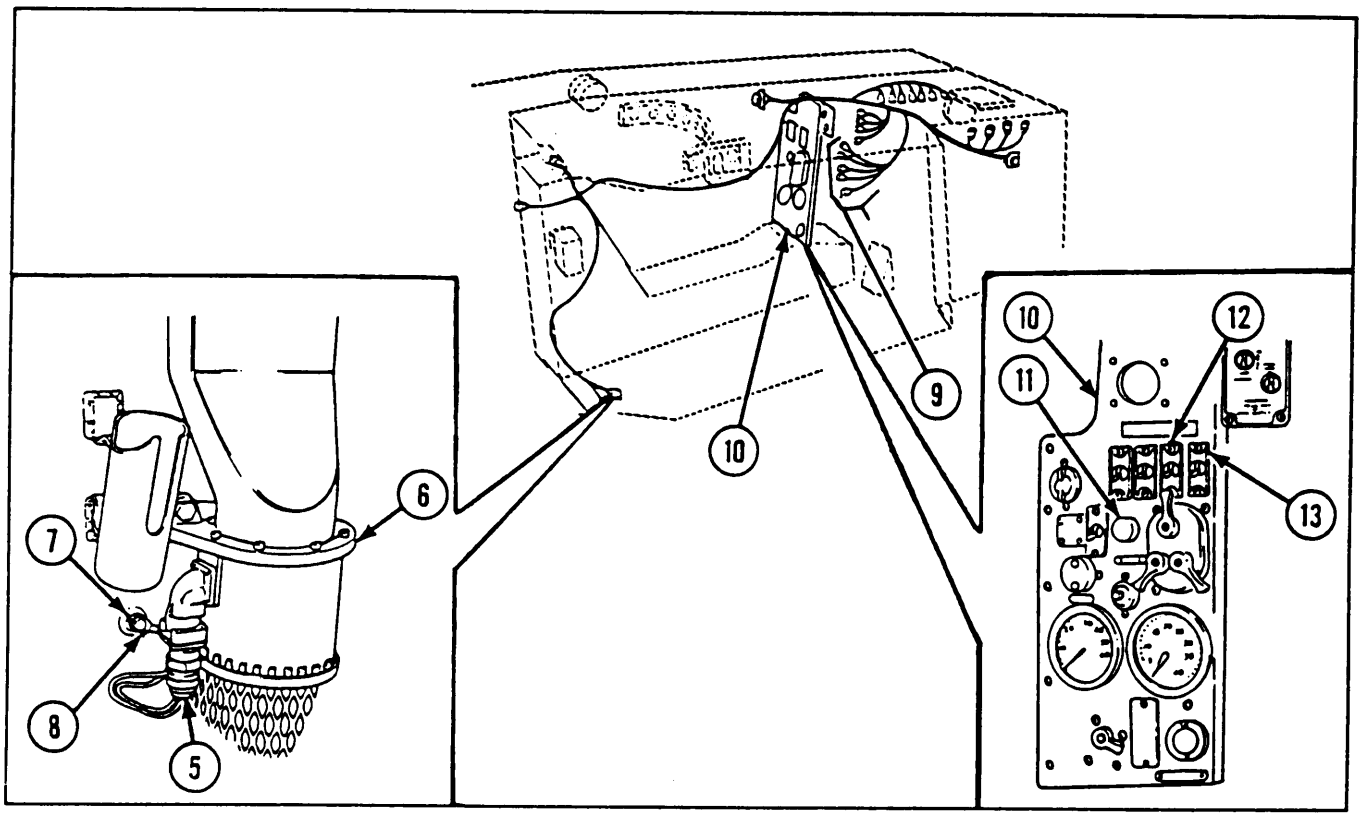
WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead which is being removed.

2 Tag and disconnect plug connector (1) from receptacle connector (2).

3 Tag and disconnect shell connector (3) from 15 AMP circuit breaker (4).



4 Tag and disconnect plug connector (5) from fan (6).

5 Remove screw (7) and ground cable terminal (8) from bulkhead.

6 Disconnect five shell connectors (9) from driver's instrument panel (10) at the following points:

a. Tag and disconnect shell connector from line connection.

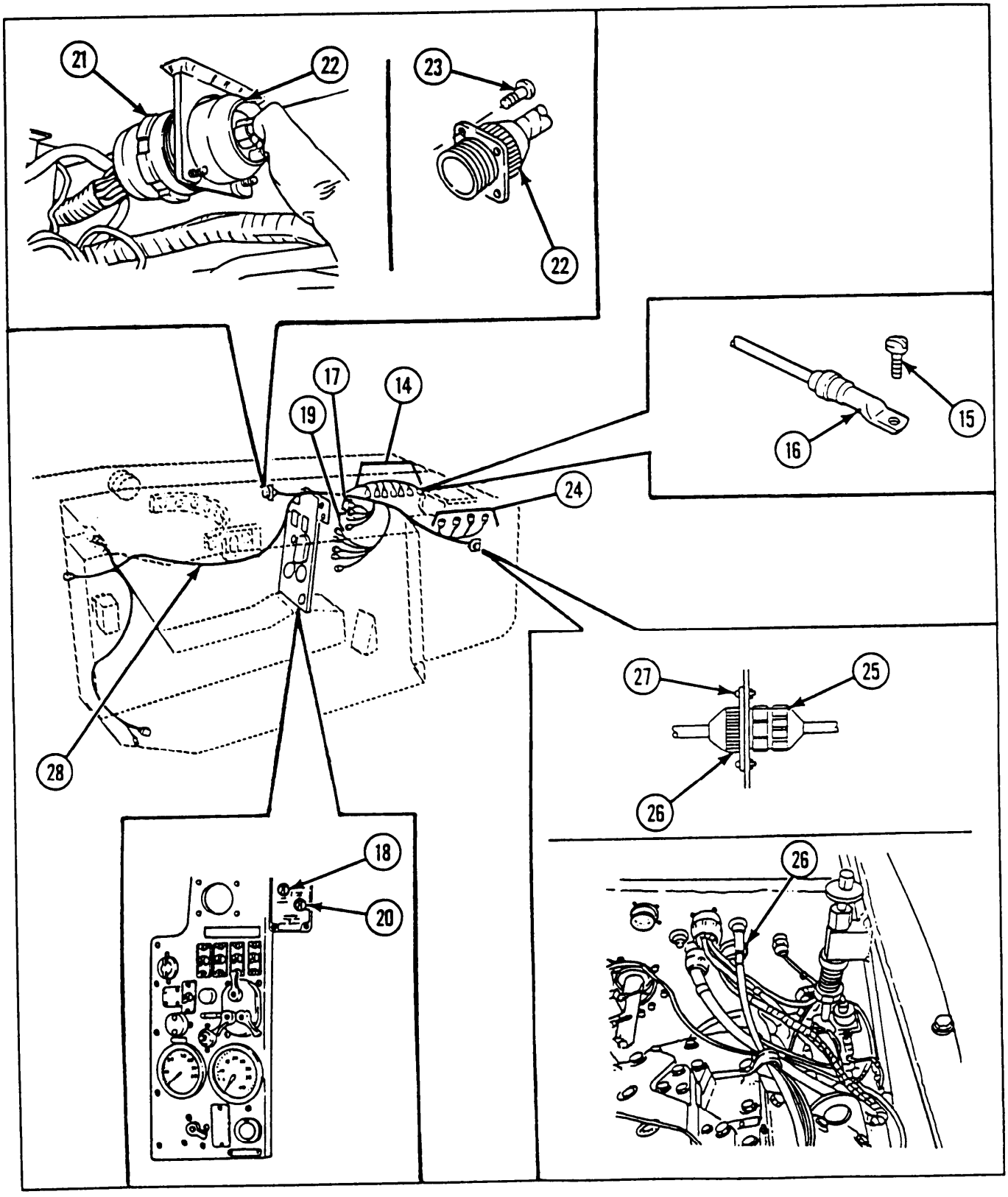
b. Tag and disconnect shell connectors from starter switch (11).

c. Tag and disconnect shell connector from instrument switch (12).

d. Tag and disconnect shell connector from master switch (13).

2-90. MAINTENANCE OF BULKHEAD DISCONNECT TO DRIVER'S CONTROL BRANCHED WIRING HARNESS (CONT).

REMOVAL (CONT)



7 Tag and disconnect six shell connectors (14) from line connections.

8 Remove screw (15) and ground cable terminal (16) from bulkhead.

9 Tag and disconnect two shell connectors (17) from fuel pump switch (18).

10 Tag and disconnect two shell connectors (19) from pump and igniter switch (20).

11 Disconnect plug connector (21) from receptacle connector (22).

12 Remove four screws (23) and receptacle connector (22) from bulkhead.

13 Disconnect four shell connectors (24) at the following points:

a. Tag and disconnect shell connector from line connection.

b. Tag and disconnect shell connector from 15 AMP circuit breaker.

c. Tag and disconnect two shell connectors from driver's external engine and XMSN warning light.

14 Disconnect plug connector (25) from receptacle connector (26).

15 Remove four screws (27) and receptacle connector (26) from bulkhead.

16 Remove bulkhead disconnect to driver's control branched wiring harness (28) from hull.

DISASSEMBLY

For disassembly of wiring harness plug connectors and receptacle connectors, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of cable terminals and shell connectors, refer to general maintenance, page 2-371.

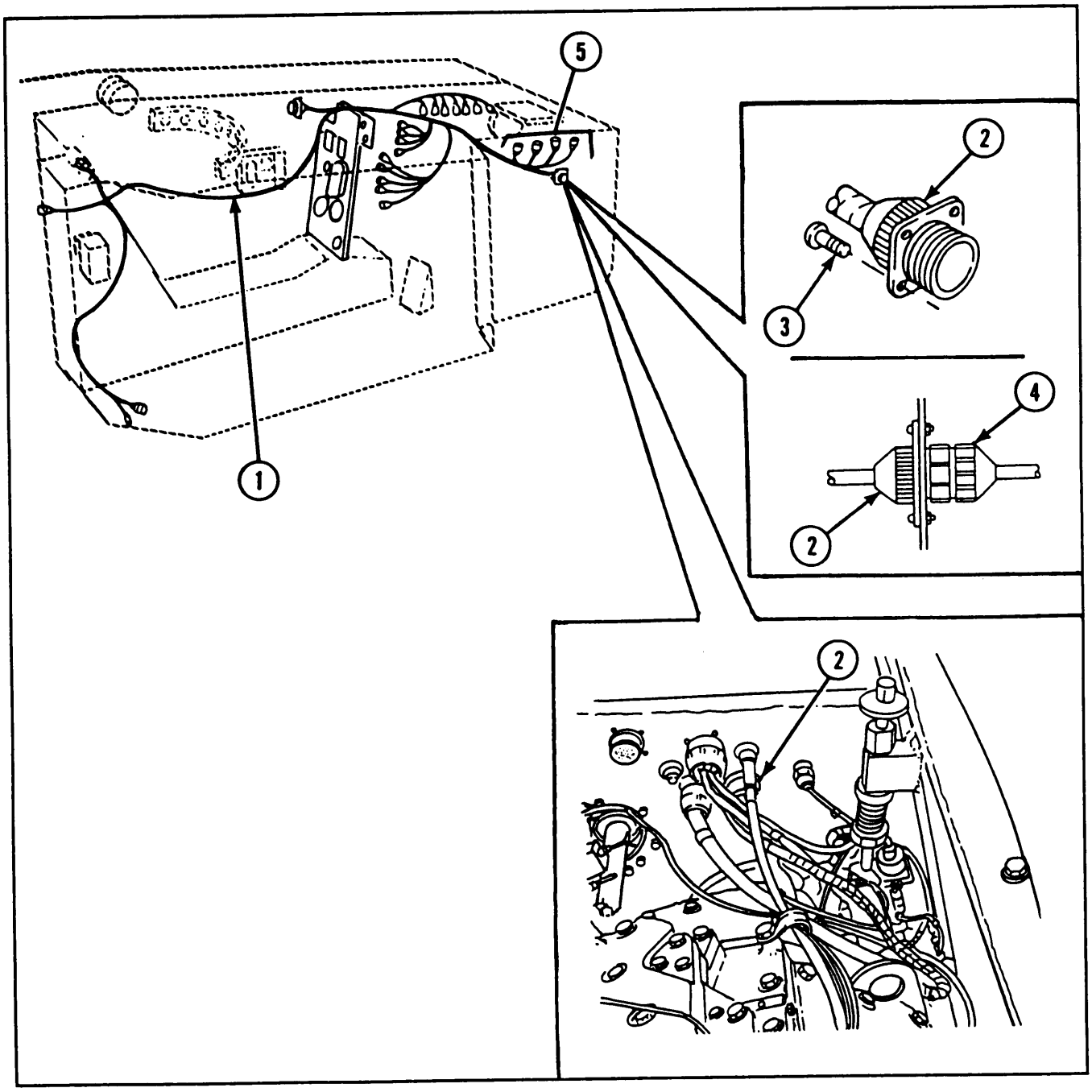
4 Electrical wire and rod are manufactured items, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-90. MAINTENANCE OF BULKHEAD DISCONNECT TO DRIVER'S CONTROL BRANCHED WIRING HARNESS (CONT)

For reassembly of wiring harness plug connectors and receptacle connectors, refer to general maintenance, page 2-371.

INSTALLATION



1 Install bulkhead disconnect to driver's control branched wiring harness (1) in hull.

2 Install receptacle connector (2) and four screws (3) on bulkhead.

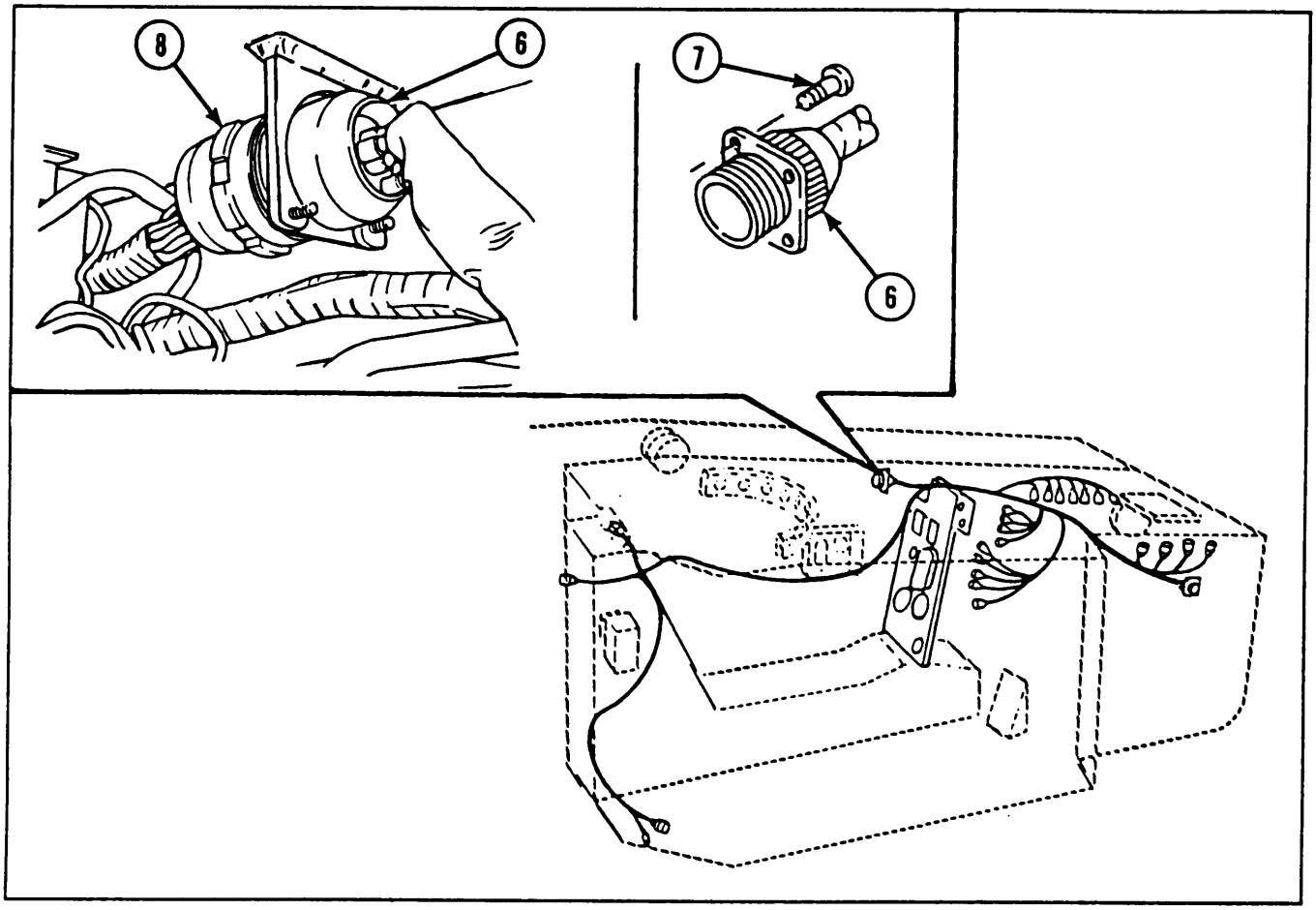
3 Connect plug connector (4) to receptacle connector (2).

4 Connect four shell connectors (5) at the following points:

a. Untag and connect two shell connectors to driver's external engine and XMSN warning light.

b. Untag and connect shell connector to 15 AMP circuit breaker.

c. Untag and connect shell connector to line connection.

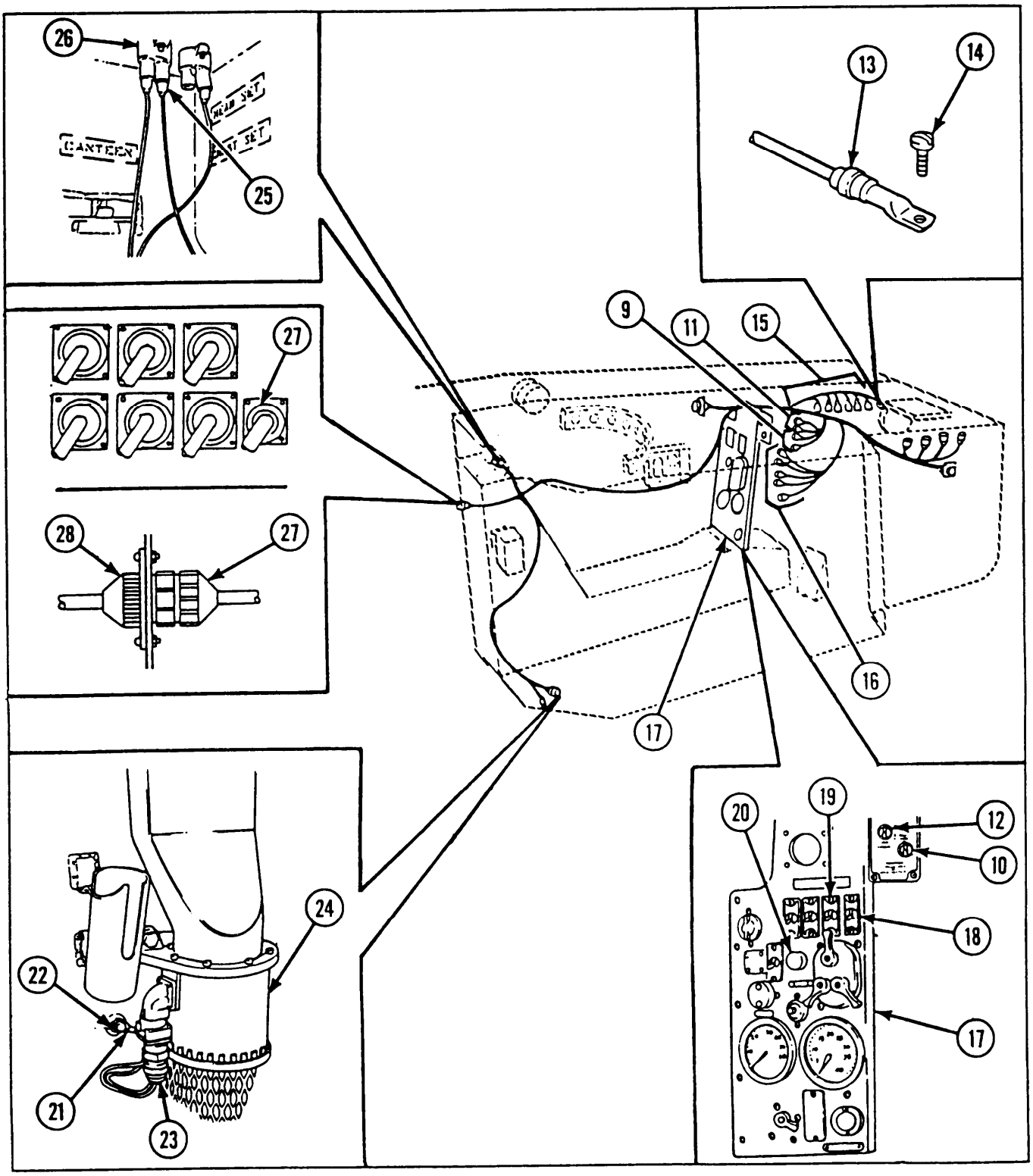


5 Install receptacle connector (6) and four screws (7) on bulkhead.

6 Connect plug connector (8) to receptacle connector (6).

2-90. MAINTENANCE OF BULKHEAD DISCONNECT TO DRIVER'S CONTROL BRANCHED WIRING HARNESS (CONT).

INSTALLATION (CONT)



7 Untag and connect two shell connectors (9) to pump and igniter switch (10).

8 Untag and connect two shell connectors (11) to fuel pump switch (12).

9 Install ground cable terminal (13) and screw (14) on bulkhead.

10 Untag and connect six shell connectors (15) to line connection.

11 Connect five shell connectors (16) to driver's instrument panel (17) at the following points:

a. Untag and connect shell connector to master switch (18).

b. Untag and connect shell connector to instrument switch (19).

c. Untag and connect two shell connectors to starter switch (20).

d. Untag and connect shell connector to line connection.

12 Install ground cable terminal (21) and screw (22) on bulkhead.

13 Untag and connect plug connector (23) to fan (24).

14 Untag and connect shell connector (25) to 15 AMP circuit breaker (26).

15 Untag and connect plug connector (27) to receptacle connector (28).

16 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-91. MAINTENANCE OF SUSPENSION LOCKOUT SYSTEM WARNING LIGHT GROUND AND HORN GROUND ELECTRICAL LEADS.

This task covers:	a. *Removal*	b. *Inspection/Repair*	*c. Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)

References
TM 9-2350-238-24P-1

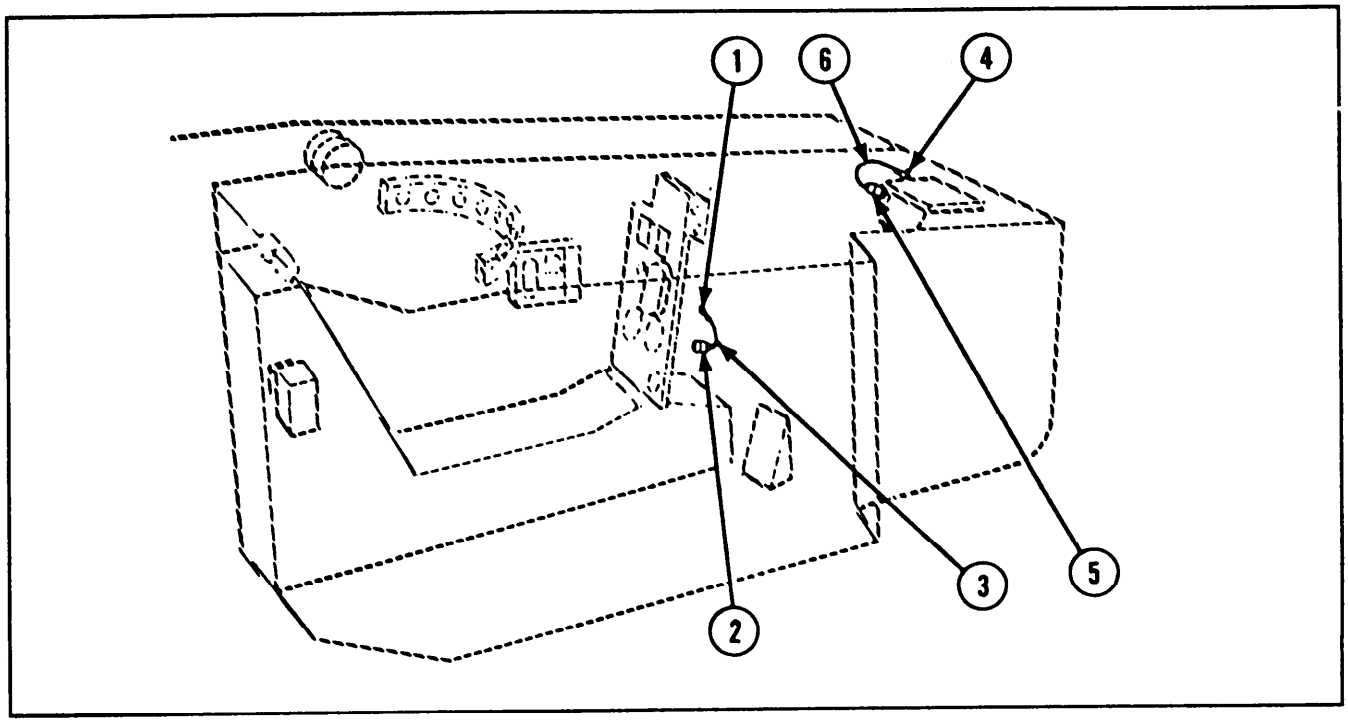
Equipment Conditions
2-640 Batteries disconnected
2-952 Driver's seat removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

2-91. MAINTENANCE OF SUSPENSION LOCKOUT SYSTEM WARNING LIGHT GROUND AND HORN GROUND ELECTRICAL LEADS (CONT).



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Disconnect cable terminal (1) from driver's instrument panel ground.

3 Tag and disconnect shell connector (2) from suspension lockout system warning light.

4 Remove suspension lockout system warning light ground electrical lead (3) from hull through driver's compartment.

5 Disconnect cable terminal (4) from horn ground.

6 Tag and disconnect shell connector (5) from horn.

7 Remove horn ground electrical lead (6) from hull through driver's compartment.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of cable terminals and shell connectors, refer to general maintenance, page 2-371.

4 Electrical wire is a manufactured item, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install horn ground electrical lead (6) to hull through driver's compartment.

2 Untag and connect shell connector (5) to horn.

3 Connect cable terminal (4) to horn ground.

4 Install suspension lockout system warning light ground electrical lead (3) in hull through driver's compartment.

5 Untag and connect shell connector (2) to suspension lockout system warning light.

6 Connect cable terminal (1) to driver's instrument panel ground.

7 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-92. MAINTENANCE OF LINE CONNECTION TO RIGHT HEADLAMP DISCONNECT BRANCHED WIRING HARNESS.

This task covers:
a. *Removal*
b. *Disassembly*
c. Inspection/Repair
d. *Reassembly*
e. Installation

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Gasket
Rod (figure D-24, appx D)

References
TM 9-2350-238-24P-1

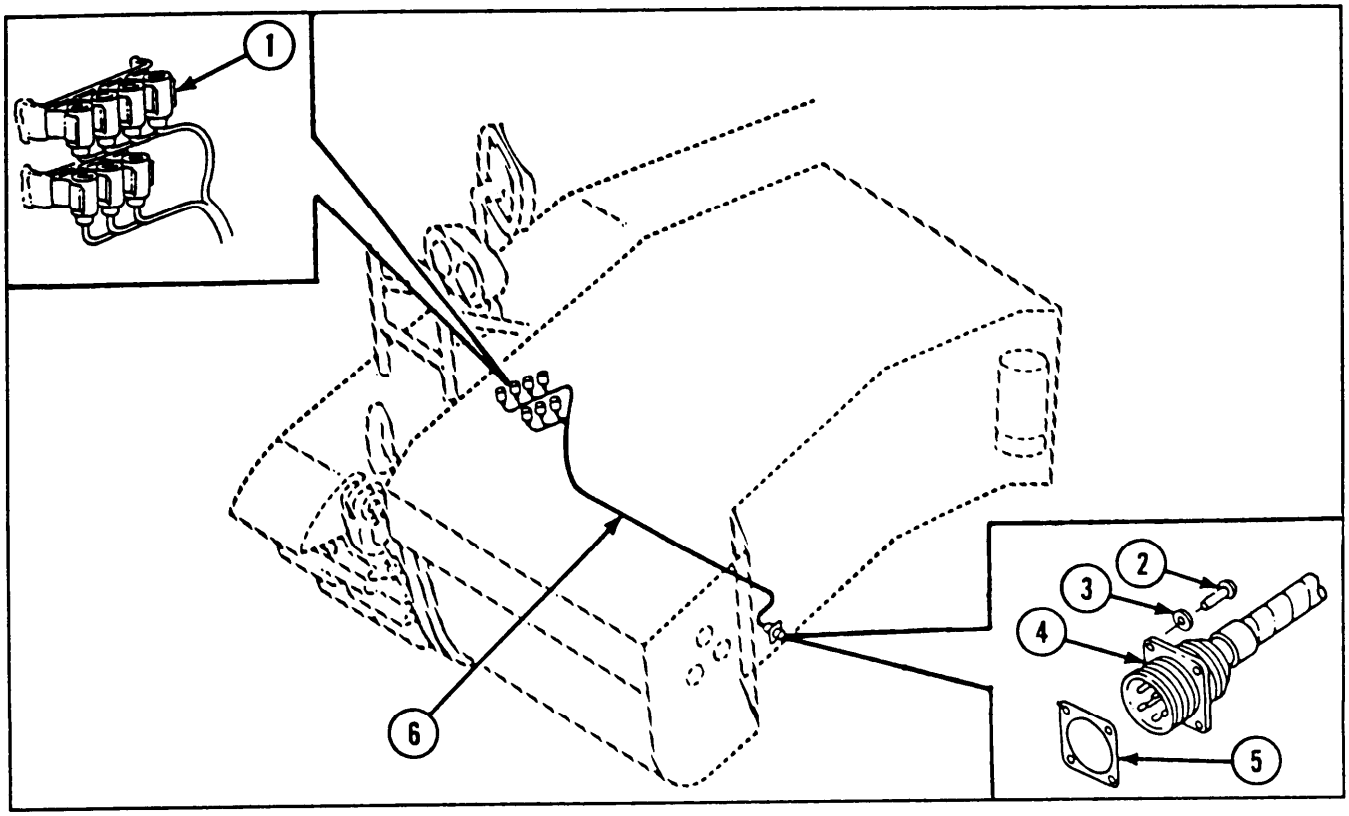
Equipment Conditions
2-640 Batteries disconnected
2-384 Powerplant removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

2-92. MAINTENANCE OF LINE CONNECTION TO RIGHT HEADLAMP DISCONNECT BRANCHED WIRING HARNESS (CONT).



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Tag and disconnect seven shell connectors (1) from line connections of right headlamp disconnect branched wiring harness.

3 Remove four screws (2) and four washers (3) and disconnect receptacle connector (4) from light harness connector.

4 If damaged, remove gasket (5) from receptacle connector (4).

5 Remove line connection to right headlamp disconnect branched wiring harness (6) from hull.

DISASSEMBLY

For disassembly of wiring harness receptacle connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors, refer to general maintenance, page 2-371.

4 Rod and electrical wire are manufactured items, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness receptacle connector, refer to general maintenance, page 2-371.

INSTALLATION

1 Install line connection to right headlamp disconnect branched wiring harness (6) to hull.

2 If removed, install new gasket (5) to receptacle connector (4).

3 Connect receptacle connector (4) to light harness connector and install four washers (3) and four screws (2).

4 Untag and connect seven shell connectors (1) to line connections of right headlamp disconnect branched wiring harness.

5 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-93. MAINTENANCE OF TRAILER RECEPTACLE ASSEMBLY TO DISCONNECT BRANCHED WIRING HARNESS.

This task covers:
a. *Removal*
b. *Disassembly*
c. Inspection/Repair
d. *Reassembly*
e. Installation

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Rod (figure D-24, appx D)

References
TM 9-2350-238-24P-1

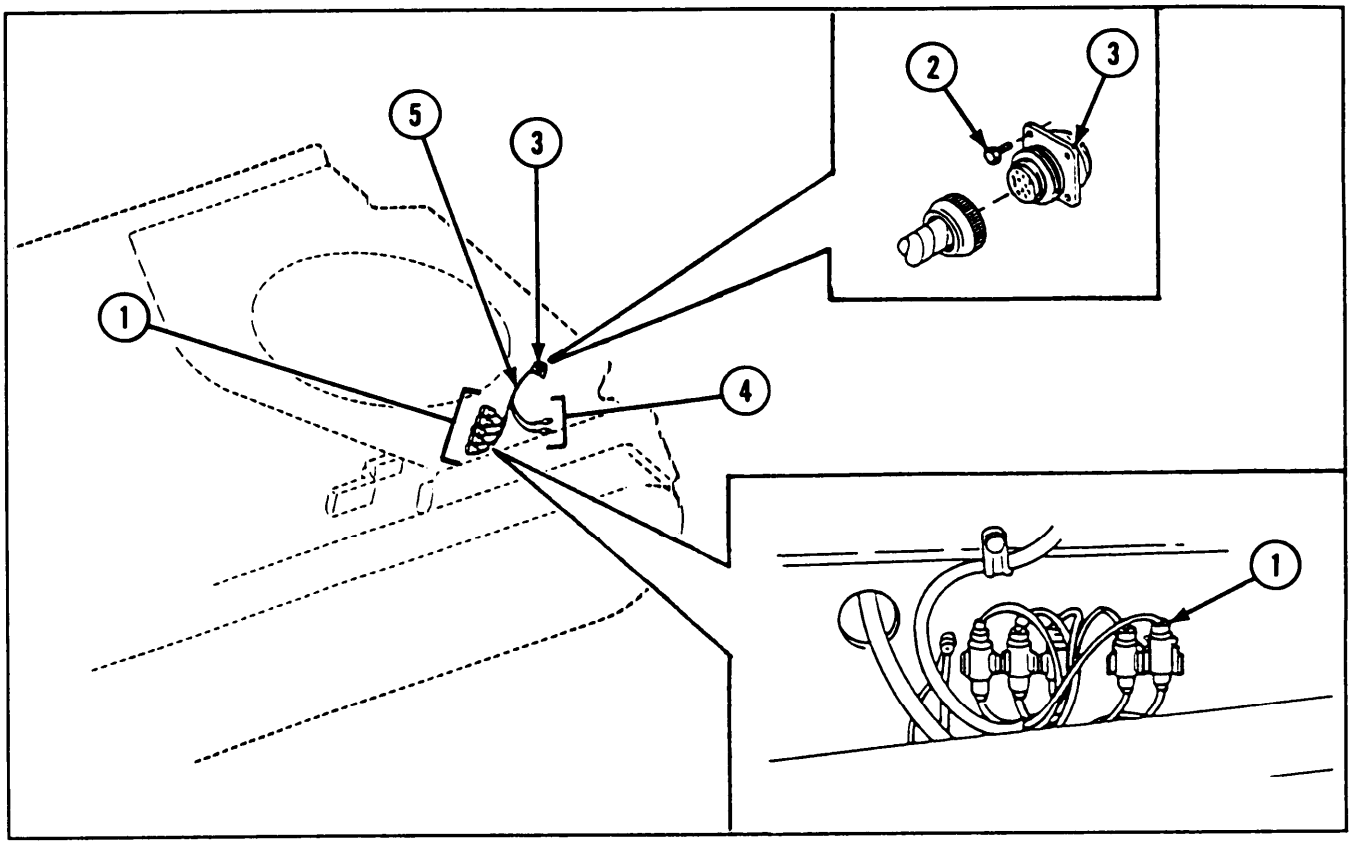
Equipment Conditions
2-640 Batteries disconnected

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

2-93. MAINTENANCE OF TRAILER RECEPTACLE ASSEMBLY TO DISCONNECT BRANCHED WIRING HARNESS (CONT).



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Enter rear hull well and disconnect five shell connectors (1) from bulkhead disconnect to trailer receptacle disconnect branched wiring harness.

3 Remove four screws (2) and disconnect receptacle connector (3) from trailer receptacle.

4 Disconnect two cable terminals (4) from ground.

5 Remove trailer receptacle assembly to disconnect wiring harness (5) from hull through rear hull well.

DISASSEMBLY

For disassembly of wiring harness receptacle connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors and cable terminals, refer to general maintenance, page 2-371.

4 Electrical wire and rod are manufactured items, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

For reassembly of wiring harness receptacle connector, refer to general maintenance, page 2-371.

INSTALLATION

1 Enter rear hull well and install trailer receptacle assembly to disconnect wiring harness (5) to hull.

2 Connect two cable terminals (4) to ground.

3 Connect receptacle connector (3) to trailer receptacle and install four screws (2).

4 Connect five shell connectors (1) to bulkhead disconnect to trailer receptacle disconnect branched wiring harness.

5 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-94. MAINTENANCE OF BATTERY TO CIRCUIT BREAKER ELECTRICAL LEAD.

This task covers:	a. *Removal*	b. *Inspection/Repair*	c. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Insulation sleeving (figure D-22, appx D)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-840 Batteries disconnected
2-918 Hull access cover removed

General Safety Instructions

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

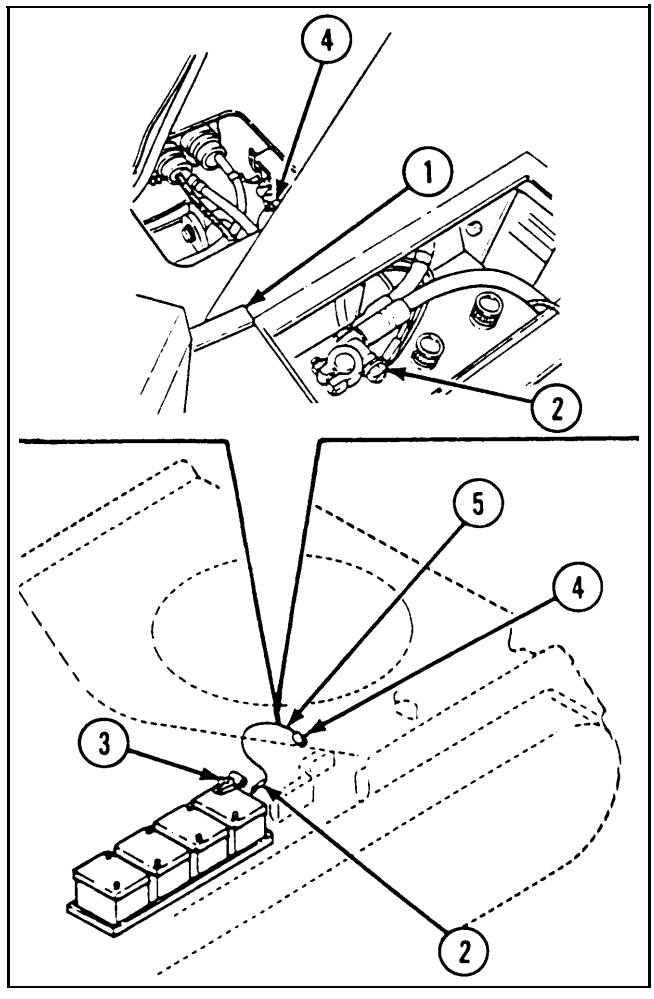
1 Open battery access cover (1).

2 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

3 Disconnect cable terminal (2) from battery terminal (3).

4 Disconnect shell connector (4) from circuit breaker.

5 Remove battery to circuit breaker electrical lead (5) from hull.



INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of cable terminal and shell connector, refer to general maintenance, page 2-371.

4 Electrical wire and insulation sleeving are manufactured items, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

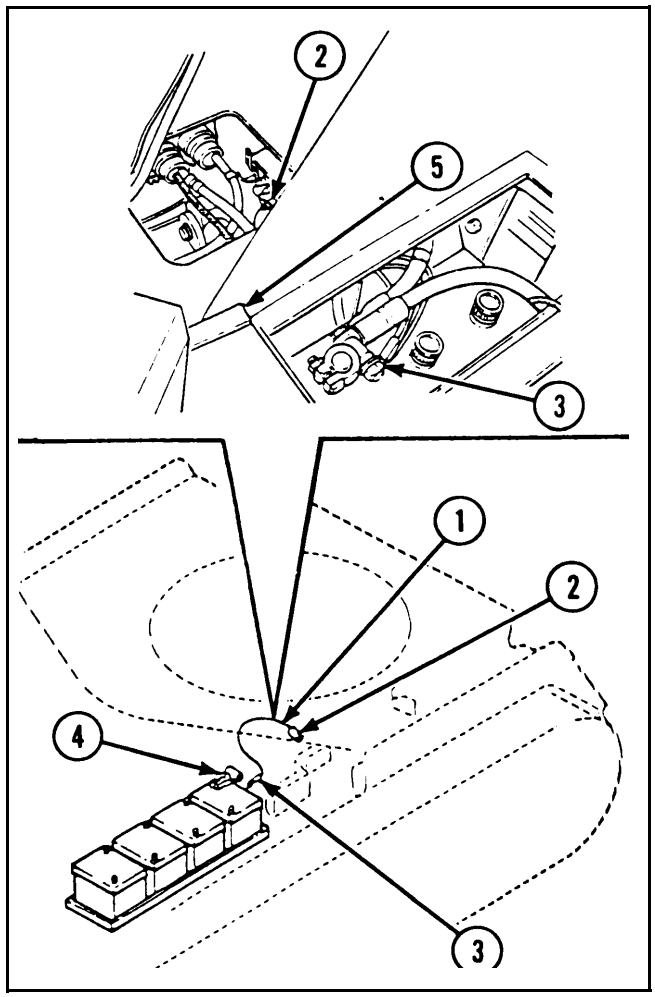
1 Install battery to circuit breaker electrical lead (1) to hull.

2 Connect shell connector (2) to circuit breaker.

3 Connect cable terminal (3) to battery terminal (4).

4 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

5 Close battery access cover (5).



2-95. MAINTENANCE OF BULKHEAD DISCONNECT TO GENERATOR ARMATURE ELECTRICAL LEAD.

This task covers:
a. *Removal*
b. *Disassembly*
c. inspection/Repair
d. *Reassembly*
e. Installation

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Insulation sleeving (figure D-1, appx D)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-640 Batteries disconnected
2-384 Powerplant removed
2-766 Auxiliary drive removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL

WARNING

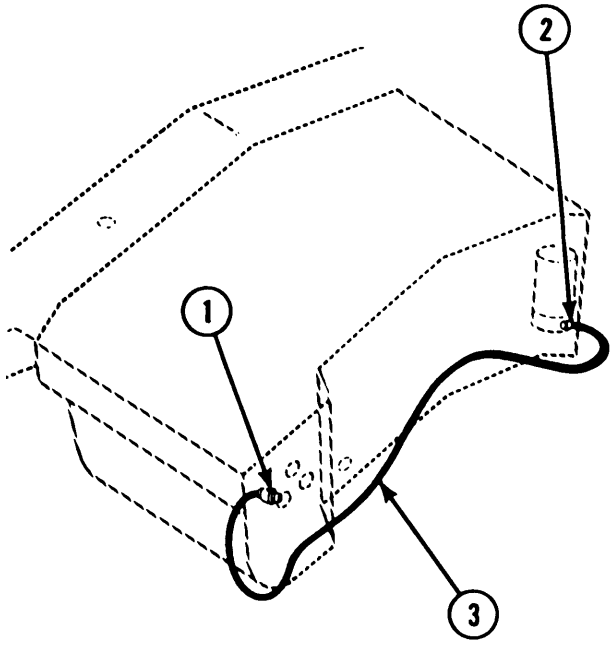
Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Tag and disconnect plug connector (1) from voltage regulator.

3 Tag and disconnect cable terminal (2) from generator armature, terminal B.

4 Remove bulkhead disconnect to generator armature electrical lead (3) from hull.



DISASSEMBLY

For disassembly of wiring harness plug connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of cable terminal, refer to general maintenance, page 2-371.

4 Electrical wire and insulation sleeving are manufactured items, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness plug connector, refer to general maintenance, page 2-371.

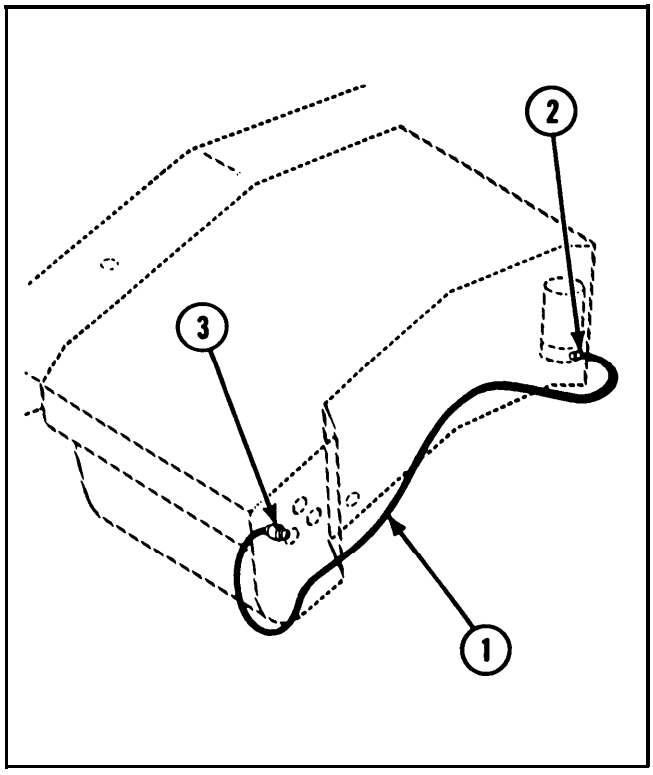
INSTALLATION

1 Install bulkhead disconnect to generator armature electrical lead (1) to hull.

2 Untag and connect cable terminal (2) to generator armature, terminal B.

3 Connect plug connector (3) to voltage regulator.

4 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.



2-96. MAINTENANCE OF BULKHEAD DISCONNECT TO STARTER ELECTRICAL LEAD.

This task covers:
a. *Removal*
b. *Disassembly*
c. Inspection/Repair
d. *Reassembly*
e. Installation

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Insulation sleeving (figure D-1, appx D)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-840 Batteries disconnected
2-384 Powerplant removed

General Safety Instructions

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL

WARNING

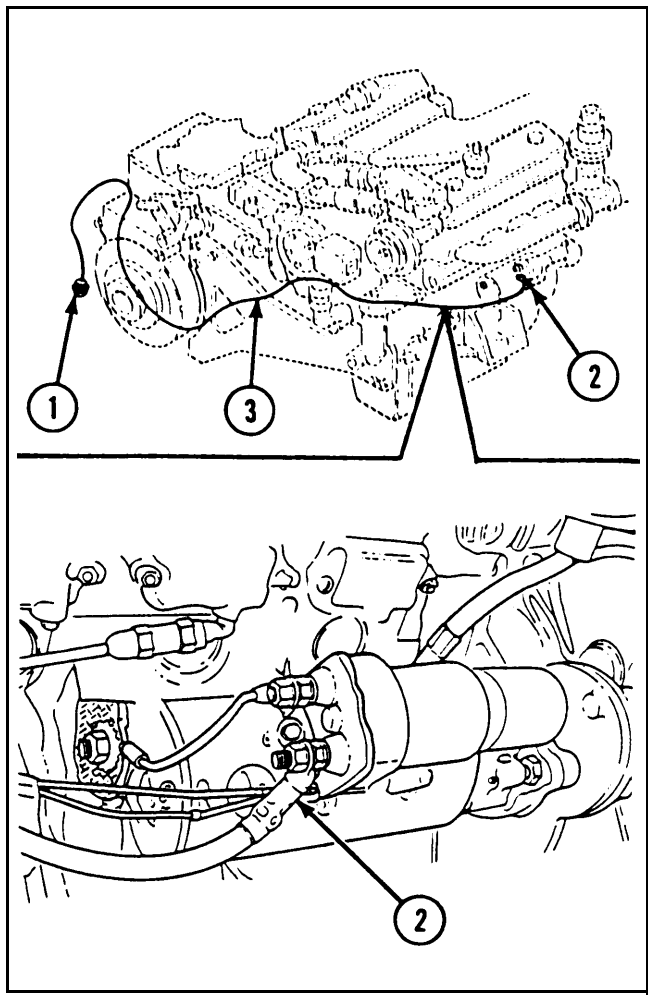
Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the engine with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Tag and disconnect plug connector (1) from bulkhead disconnect.

3 Tag and disconnect cable terminal (2) from starter.

4 Remove bulkhead disconnect to starter electrical lead (3) from engine.



DISASSEMBLY

For disassembly of wiring harness plug connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of cable terminal, refer to general maintenance, page 2-371.

4 Electrical wire and insulation sleeving are manufactured items, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness plug connector, refer to general maintenance, page 2-371.

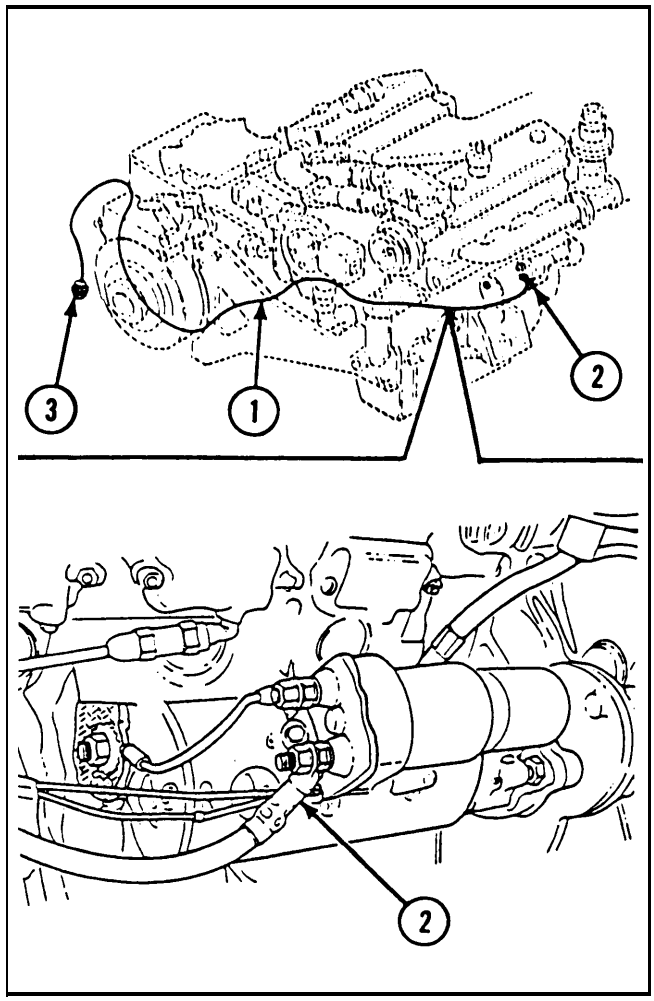
INSTALLATION

1 Install bulkhead disconnect to starter electrical lead (1) to engine.

2 Connect cable terminal *(2)* to starter.

3 Connect plug. connector (3) to bulkhead disconnect.

4 Wiring harnesses and leads are secured to the engine with loop clamps, straps, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.



2-97. MAINTENANCE OF BULKHEAD TO BULKHEAD GENERATOR CIRCUIT ELECTRICAL LEAD.

This task covers:
a. *Removal*
b. *Disassembly*
c. Inspection/Repair
d. *Reassembly*
e. Installation

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Gasket

References
TM 9-2350-238-24P-1

Equipment Conditions
2-840 Batteries disconnected
2-952 Driver's seat removed
2-928 Driver's compartment forward cowl removed
2-928 Driver's compartment aft cowl removed

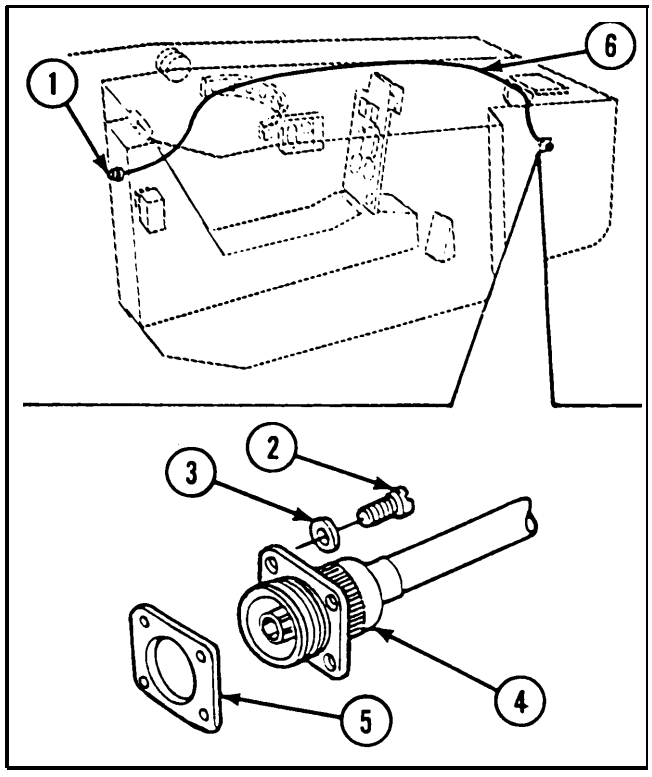
General Safety Instructions

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.



1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Tag and disconnect plug connector (1) from voltage regulator.

3 Remove four screws (2) and four washers (3), and tag and disconnect receptacle connector *(4)* from front bulkhead receptacle.

4 If damaged, remove gasket (5) from receptacle connector (4).

5 Remove bulkhead to bulkhead generator circuit electrical lead (6) from hull through driver's compartment.

DISASSEMBLY

For disassembly of wiring harness receptacle connector and plug connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 Electrical wire is a manufactured item, refer to appendix D.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness receptacle connector and plug connector, refer to general maintenance, page 2-371.

INSTALLATION

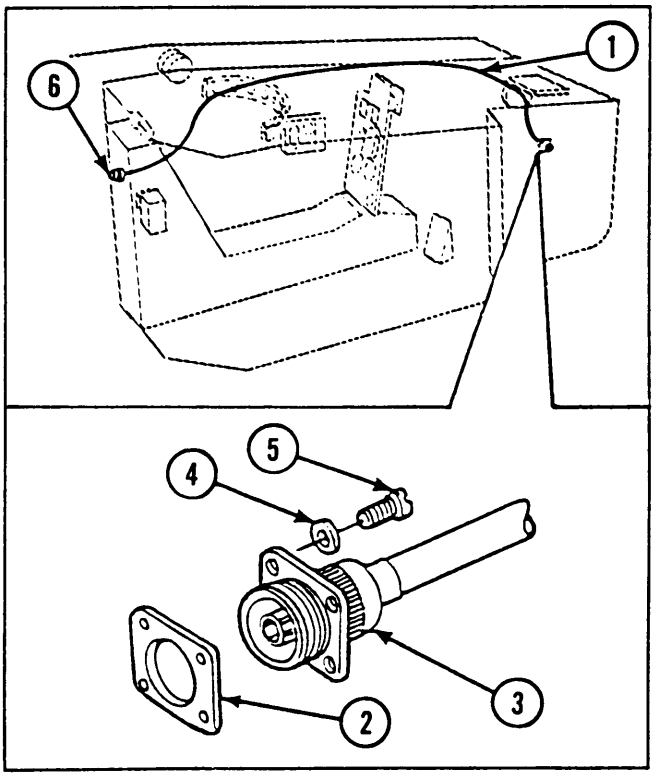
1 Install bulkhead to bulkhead generator circuit electrical lead (1) to hull through driver's compartment.

2 If removed, install new gasket (2) to receptacle connector (3).

3 Untag and connect receptacle connector (3) to front bulkhead receptacle and install four washers (4) and four screws (5).

4 Untag and connect plug connector (6) to voltage regulator.

5 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.



2-98. MAINTENANCE OF BULKHEAD DISCONNECT TO VOLTAGE REGULATOR ASSEMBLY WIRING HARNESS.

This task covers:
a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. *Installation*

INITIAL SETUP

Materials/Parls
Electrical wire (figure D-2, appx D)
Electrical wire (figure D-2, appx D)
Gasket (2)
Rod (figure D-24, appx D)
Rod (figure D-25, appx D)

References
TM 9-2350-238-24P-1

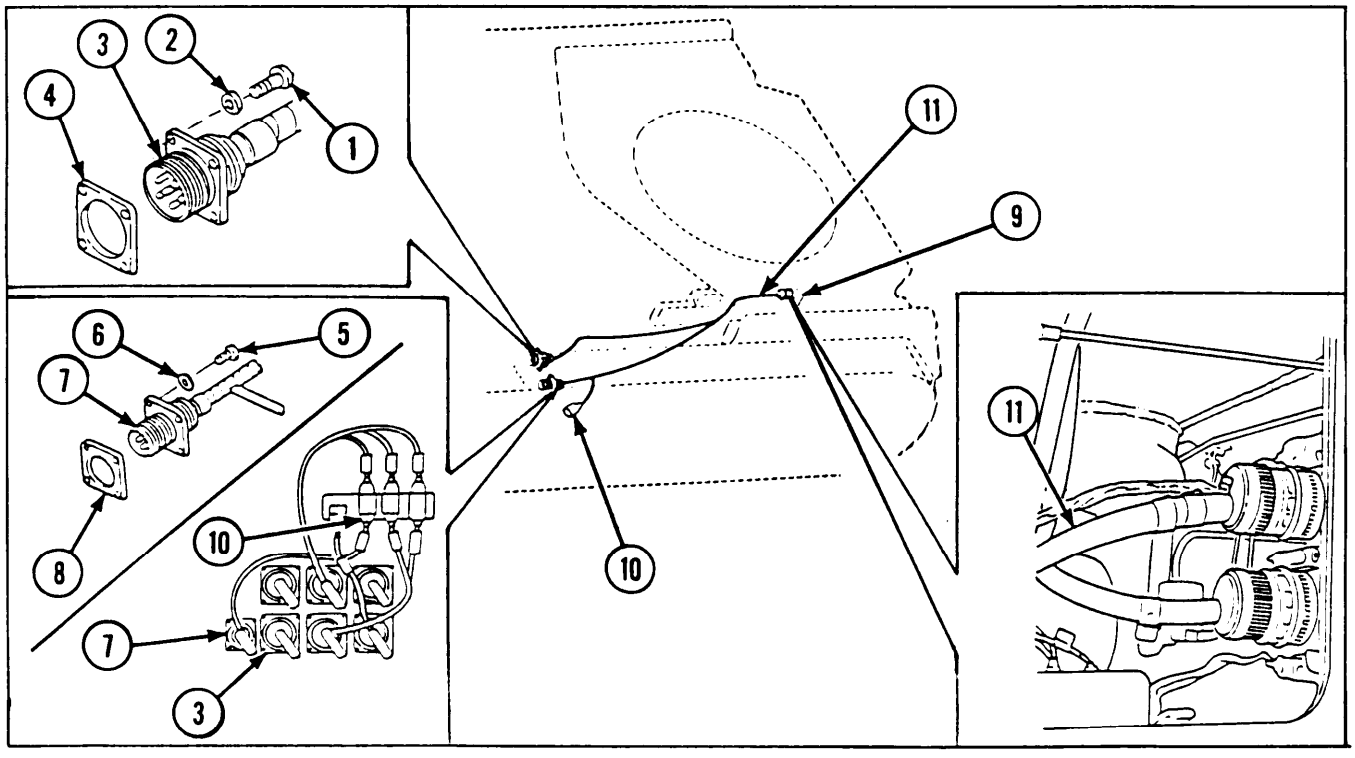
Equipment Conditions
2-640 Batteries disconnected
2-918 Hull access cover removed
2-640 Battery access cover open and all batteries removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Remove four screws (1) and four washers (2), and tag and disconnect bulkhead receptacle connector (3) from bulkhead disconnect to generator armature.

3 If damaged, remove gasket (4) from bulkhead receptacle connector (3).

4 Remove four screws (5) and four washers (6), and tag and disconnect bulkhead receptacle connector (7) from bulkhead disconnect to generator field.

5 If damaged, remove gasket (8) from bulkhead receptacle connector (7).

6 Tag and disconnect plug connector (9) from voltage regulator.

7 Tag and disconnect shell connector (10) from generator charge indicator light line connection.

8 Remove bulkhead disconnect to voltage regulator assembly wiring harness (11) from hull through battery compartment.

DISASSEMBLY

For disassembly of wiring harness receptacle connectors and plug connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connector, refer to general maintenance, page 2-371.

4 Electrical wires and rods are manufactured items, refer to appendix D.

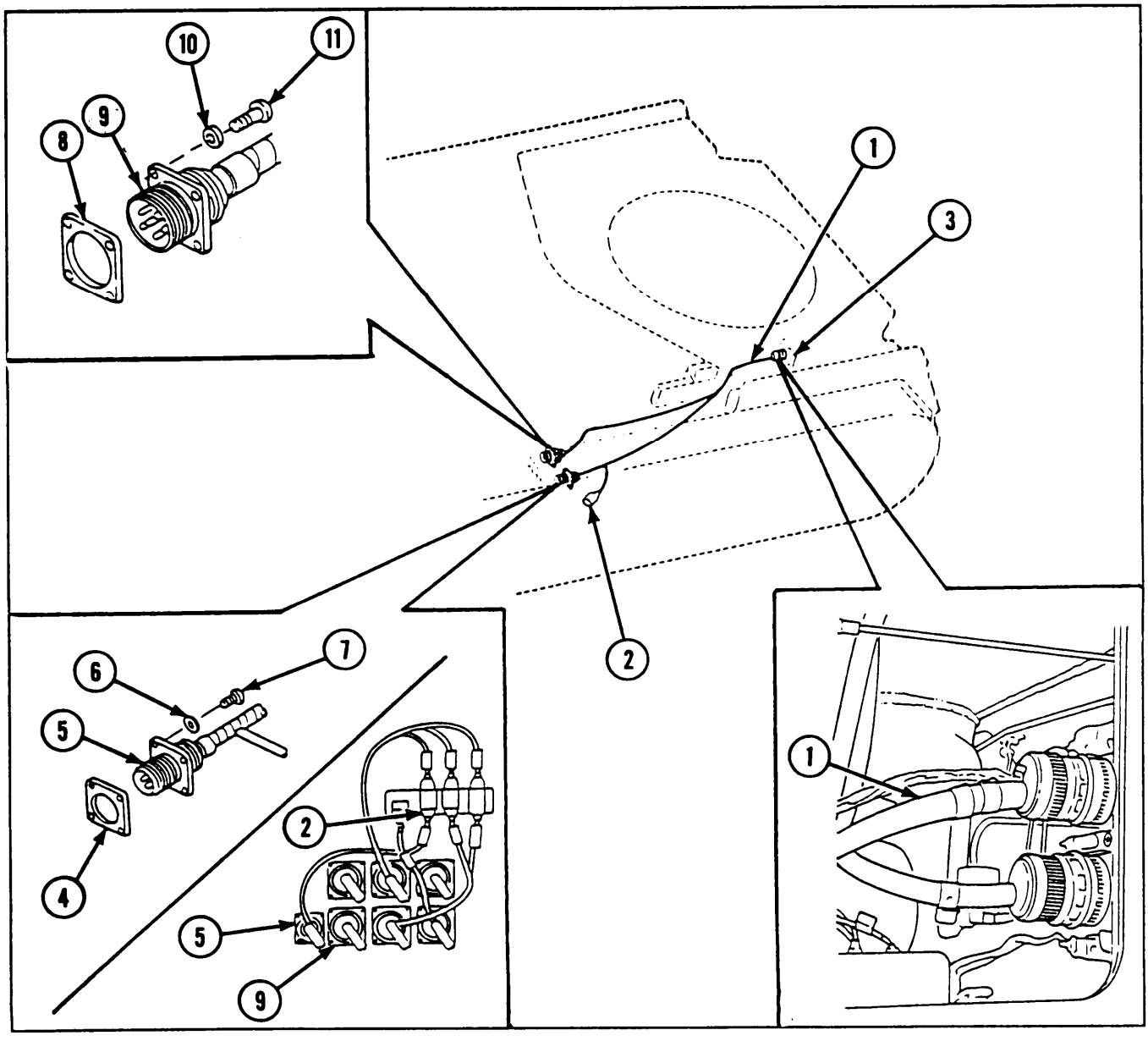
5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-98. MAINTENANCE OF BULKHEAD DISCONNECT TO VOLTAGE REGULATOR ASSEMBLY WIRING HARNESS (CONT).

REASSEMBLY

For reassembly of wiring harness receptacle connectors and plug connector, refer to general maintenance, page 2-371.

INSTALLATION



1 Install bulkhead disconnect to voltage regulator assembly wiring harness (1) in hull through battery compartment.

2 Untag and connect shell connector (2) to generator charge indicator light line connection.

3 Untag and connect plug connector (3) to voltage regulator.

4 If removed, install new gasket (4) to bulkhead receptacle connector (5).

5 Untag and connect bulkhead receptacle connector (5) to bulkhead disconnect to generator field, and install four washers (6) and four screws (7).

6 If removed, install new gasket (8) to bulkhead receptacle connector (9).

7 Untag and connect bulkhead receptacle connector (9) to bulkhead disconnect to generator armature, and install four washers (10) and four screws (11).

8 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-99. MAINTENANCE OF FLOOR DISCONNECT TO BULKHEAD DISCONNECT WIRING HARNESS.

This task covers:
a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Gasket (2)
Lockwasher (4)

References
TM 9-2350-238-24P-1

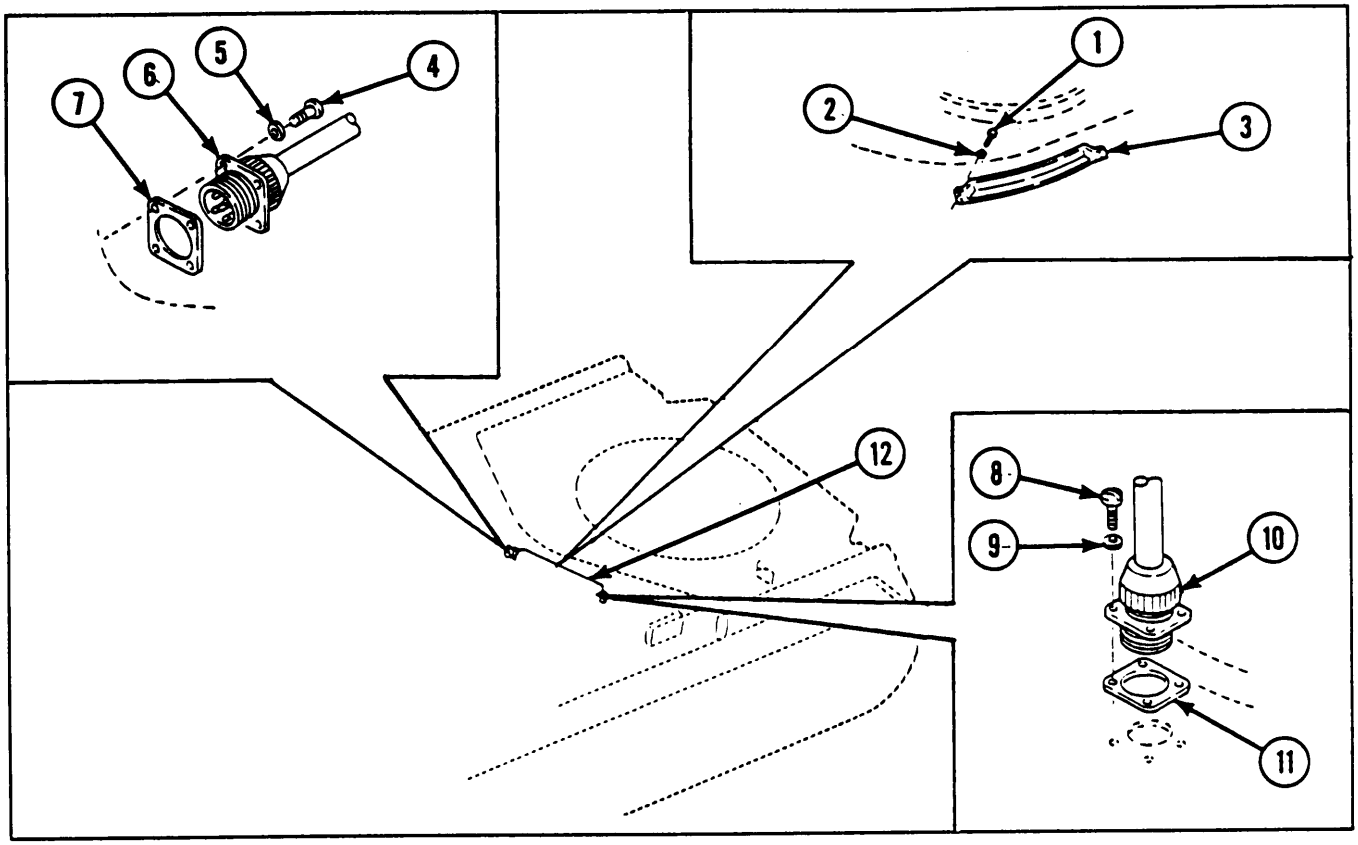
Equipment Conditions
2-640 Batteries disconnected

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

2-99. MAINTENANCE OF FLOOR DISCONNECT TO BULKHEAD DISCONNECT WIRING HARNESS (CONT).



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Remove four hexagon head capscrews (1), four lockwashers (2), and wiring harness protection access cover (3) from hull.

3 Remove four screws (4) and four washers (5), and tag and disconnect receptacle connector (6) from bulkhead receptacle.

4 If damaged, remove gasket (7) from receptacle connector (6).

5 Remove four screws (8) and four washers (9), and tag and disconnect receptacle connector (10) from floor disconnect receptacle.

6 If damaged, remove gasket (11) from receptacle connector (10).

7 Remove floor disconnect to bulkhead disconnect wiring harness (12) from hull.

DISASSEMBLY

For disassembly of wiring harness receptacle connectors, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 Electrical wire is a manufactured item, refer to appendix D.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness receptacle connectors, refer to general maintenance, page 2-371.

INSTALLATION

1 Install floor disconnect to bulkhead disconnect wiring harness (12).

2 If removed, install new gasket (11) on receptacle connector (10).

3 Untag and connect receptacle connector (10) to floor disconnect receptacle, and install four washers (9) and four screws (8).

4 If removed, install new gasket (7) on receptacle connector (6).

5 Untag and connect receptacle connector (6) to bulkhead receptacle, and install four washers (5) and four screws (4).

6 Install wiring harnesses protection access cover (3), four new lockwashers (2), and four hexagon head capscrews (1) to hull.

7 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-100. MAINTENANCE OF BULKHEAD DISCONNECT TO MAGNETIC CLUTCH BRANCHED WIRING HARNESS.

This task covers:	a. *Removal* b. *Disassembly* c. *Inspection/Repair*	d. *Reassembly* e. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)

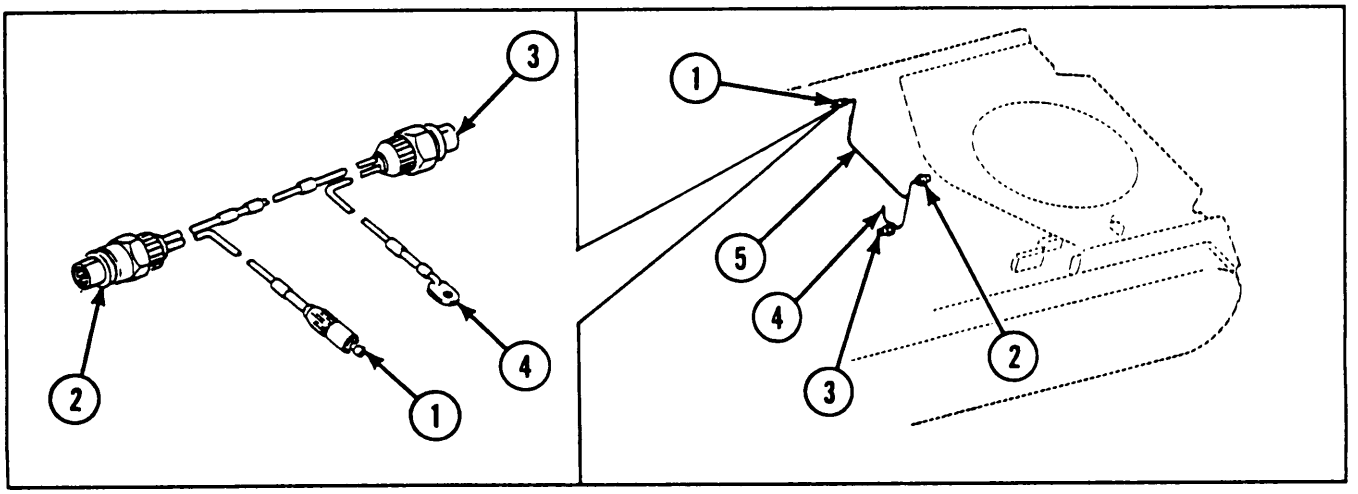
References
TM 9-2350-238-24P-1

Equipment Conditions
2-640 Batteries disconnected
2-928 Hull fan well deck grille removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

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

3 Disconnect plug connector (2) from bulkhead disconnect.

4 Disconnect magnetic clutch connector from plug connector (3).

5 Disconnect cable terminal (4) from ground.

6 Remove bulkhead disconnect to magnetic clutch branched wiring harness (5) from hull well.

DISASSEMBLY

For disassembly of wiring harness plug connectors, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connector and cable terminal, refer to general maintenance, page 2-371.

4 Electrical wire is a manufactured item, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness plug connectors, refer to general maintenance, page 2-371.

INSTALLATION

1 Install bulkhead disconnect to magnetic clutch branched wiring harness (5) to hull well.

2 Connect cable terminal (4) to ground.

3 Connect magnetic clutch connector to plug connector (3).

4 Connect plug connector (2) to bulkhead disconnect.

5 Connect shell connector (1) to fuel level sending unit.

6 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-101. MAINTENANCE OF BULKHEAD DISCONNECT TO CIRCUIT BREAKER BRANCHED WIRING HARNESS.

This task covers:
a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Gasket
Nonmetallic rod (figure D-24, appx D)

References
TM 9-2350-238-24P-1

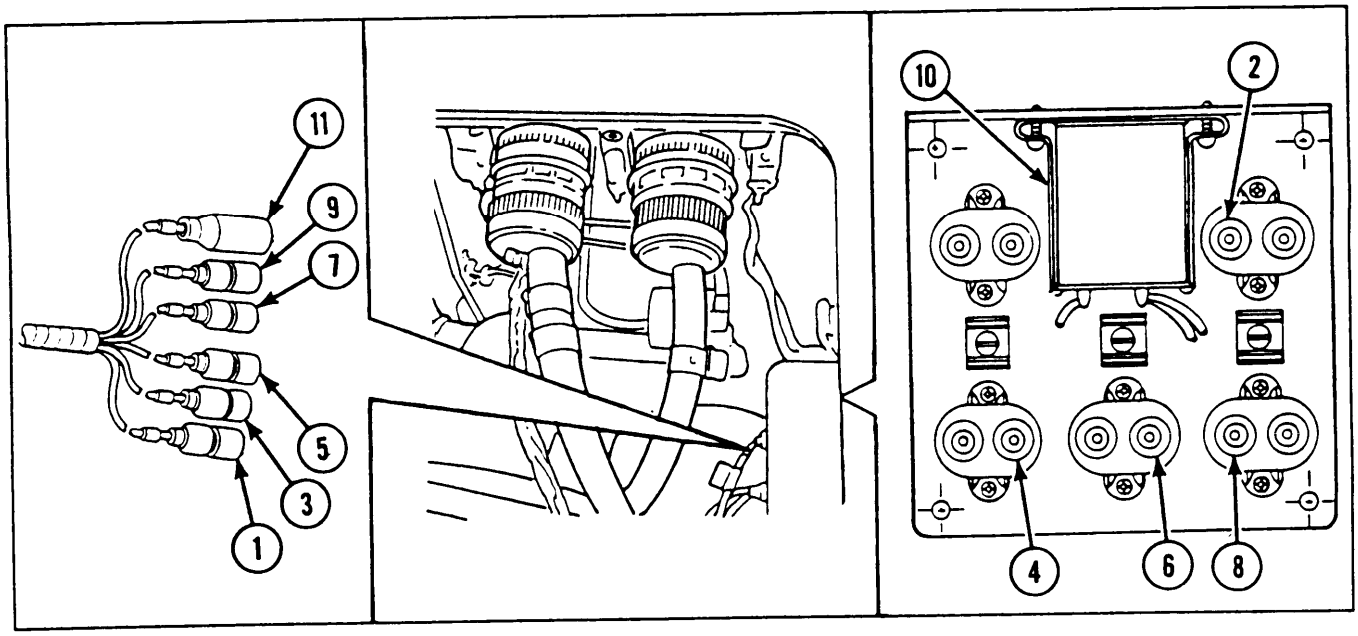
Equipment Conditions
2-840 Batteries disconnected and removed
2-384 Hull access cover removed

Genera/ Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead which is being removed.

2 Tag and disconnect shell connector (1) from 15 AMP circuit breaker (2).

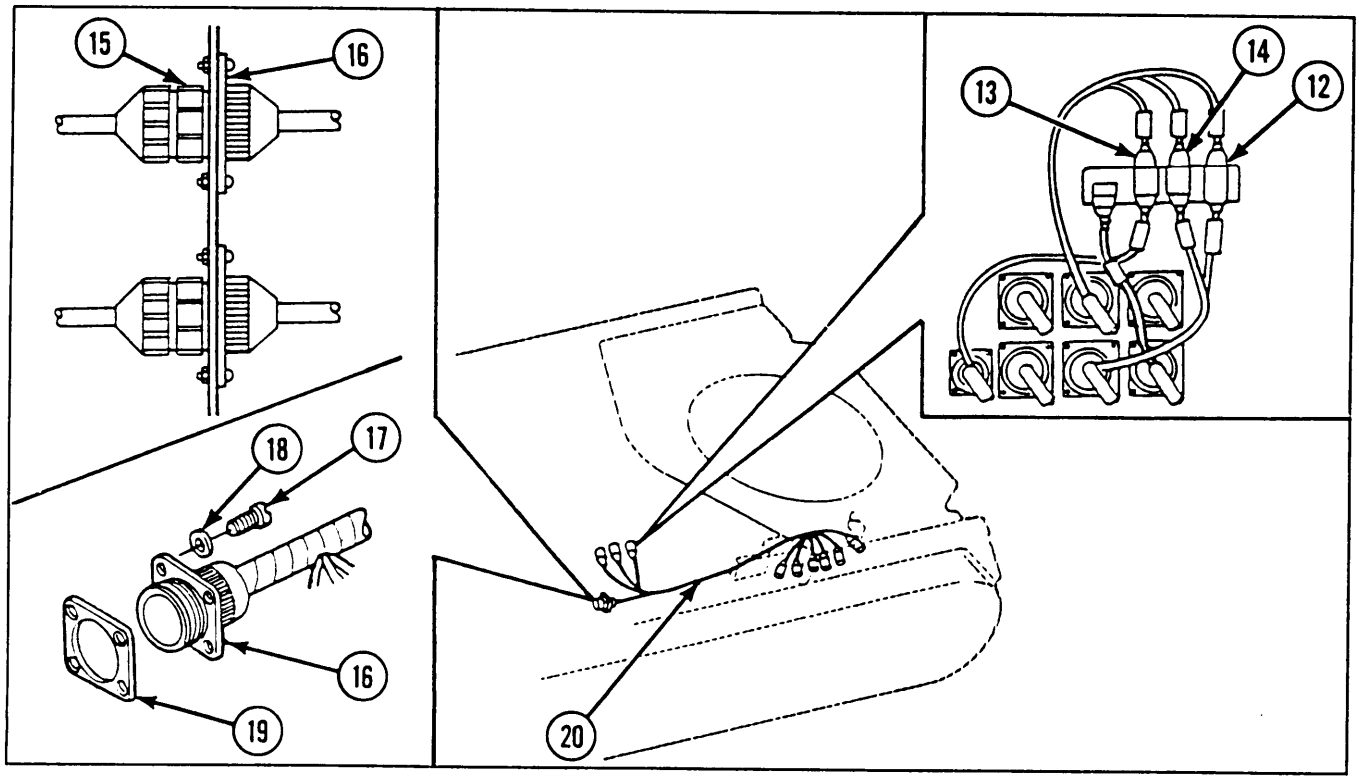
3 Tag and disconnect shell connector (3) from 15 AMP circuit breaker (4).

4 Tag and disconnect shell connector (5) from 20 AMP circuit breaker (6).

5 Tag and disconnect shell connector (7) from 15 AMP circuit breaker (8).

6 Tag and disconnect shell connector (9) from rectifier (10).

7 Tag and disconnect shell connector (11) from rectifier (10).



8 Tag and disconnect shell connector (12) from line connection.

9 Tag and disconnect shell connector (13) from line connection.

10 Tag and disconnect shell connector (14) from line connection.

11 Disconnect plug connector (15) from receptacle connector (16).

12 Remove four socket head capscrews (17), four washers (18), receptacle connector (16), and gasket (19) from bulkhead.

13 Remove gasket (19) from receptacle connector (16).

14 Remove bulkhead disconnect to circuit breaker branched wiring harness (20) from hull through battery compartment.

2-101. MAINTENANCE OF BULKHEAD DISCONNECT TO CIRCUIT BREAKER BRANCHED WIRING HARNESS (CONT).

DISASSEMBLY

For disassembly of wiring harness receptacle connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors, refer to general maintenance, page 2-371.

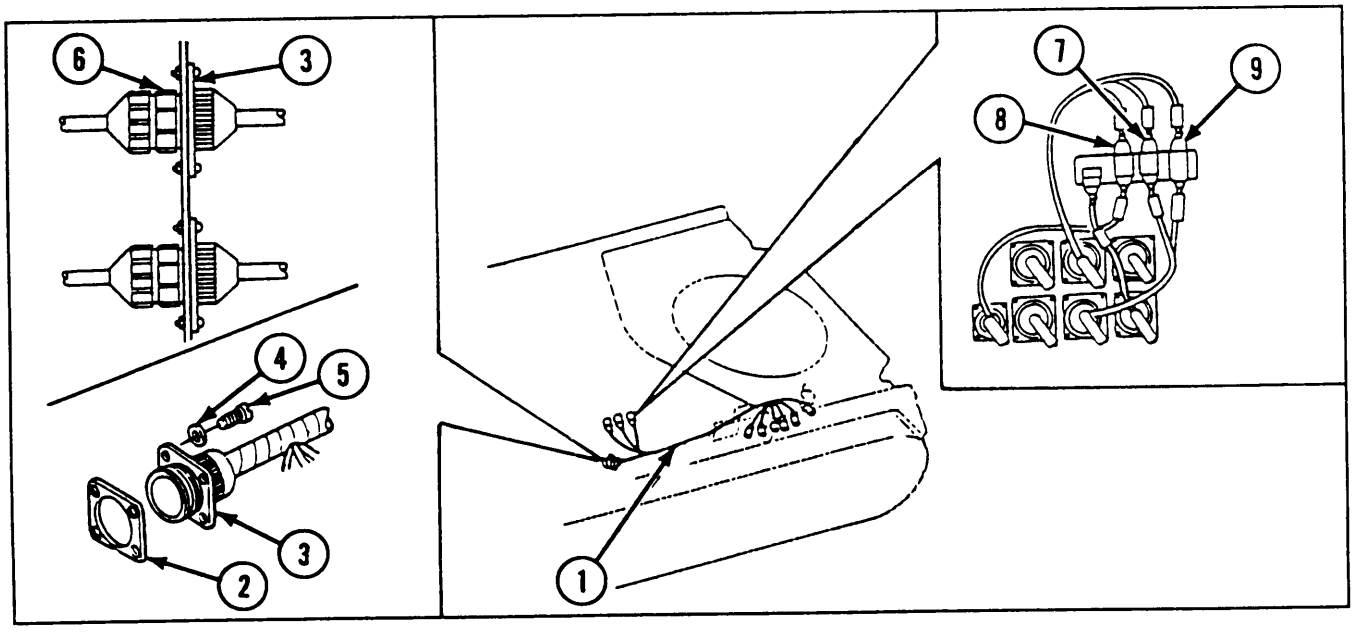
4 Electrical wire and rod are manufactured items, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness receptacle connector, refer to general maintenance, page 2-371.

INSTALLATION



1 Install bulkhead disconnect to circuit breaker branched wiring harness (1) in hull through battery compartment.

2 Install gasket (2) on receptacle connector (3).

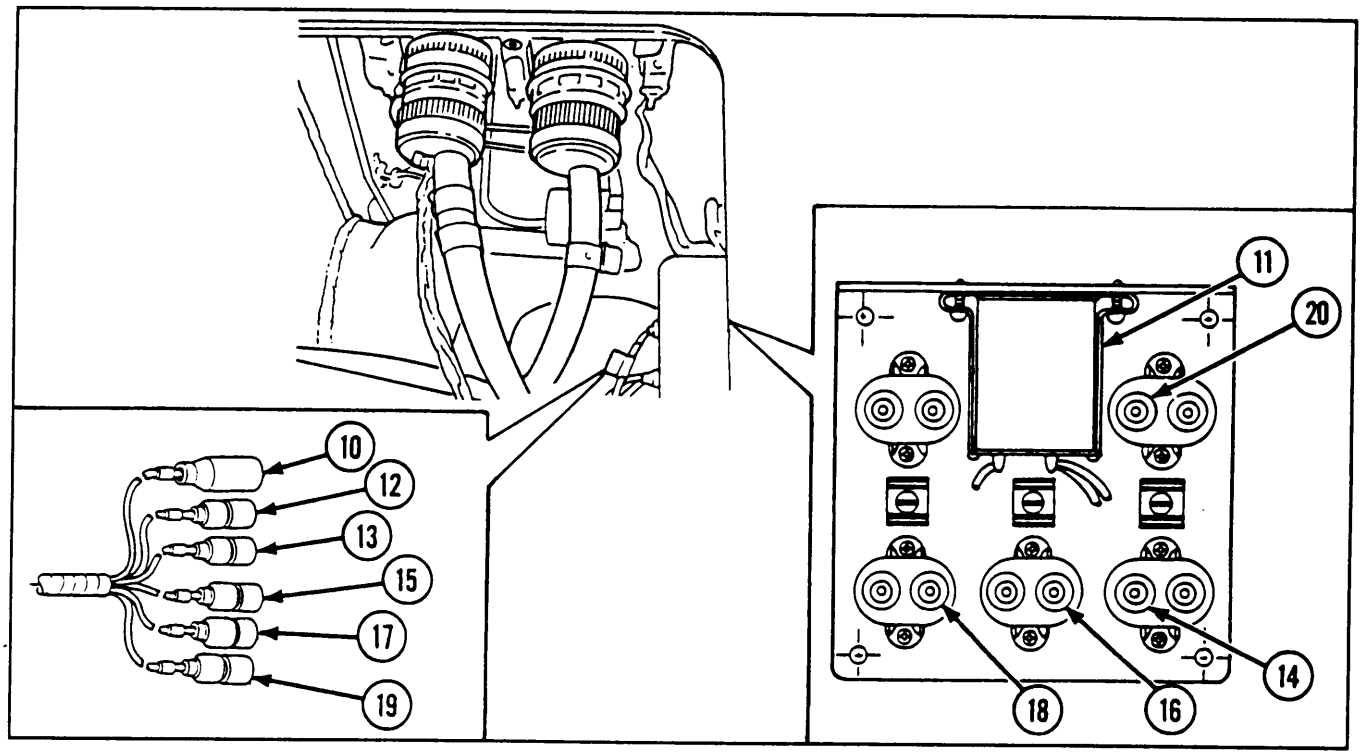
3 Install receptacle connector (3) with gasket (2), four washers (4), and four socket head capscrews (5) on bulkhead.

4 Connect plug connector (6) to receptacle connector (3).

5 Untag and connect shell connector (7) to line connection.

6 Untag and connect shell connector (8) to line connection.

7 Untag and connect shell connector (9) to line connection.



8 Untag and connect shell connector (10) to rectifier (11).

9 Untag and connect shell connector (12) to rectifier (11).

10 Untag and connect shell connector (13) to 15 AMP circuit breaker (14).

11 Untag and connect shell connector (15) to 20 AMP circuit breaker (16).

12 Untag and connect shell connector (17) to 15 AMP circuit breaker (18).

13 Untag and connect shell connector (19) to 15 AMP circuit breaker (20).

14 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-102. MAINTENANCE OF HULL DISCONNECT TO SLIP RING LEAD AND CIRCUIT BREAKER.

This task covers:
a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Electrical wire (figure D-2, appx D)

References
TM 9-2350-238-20-2
TM 9-2350-238-24P-1

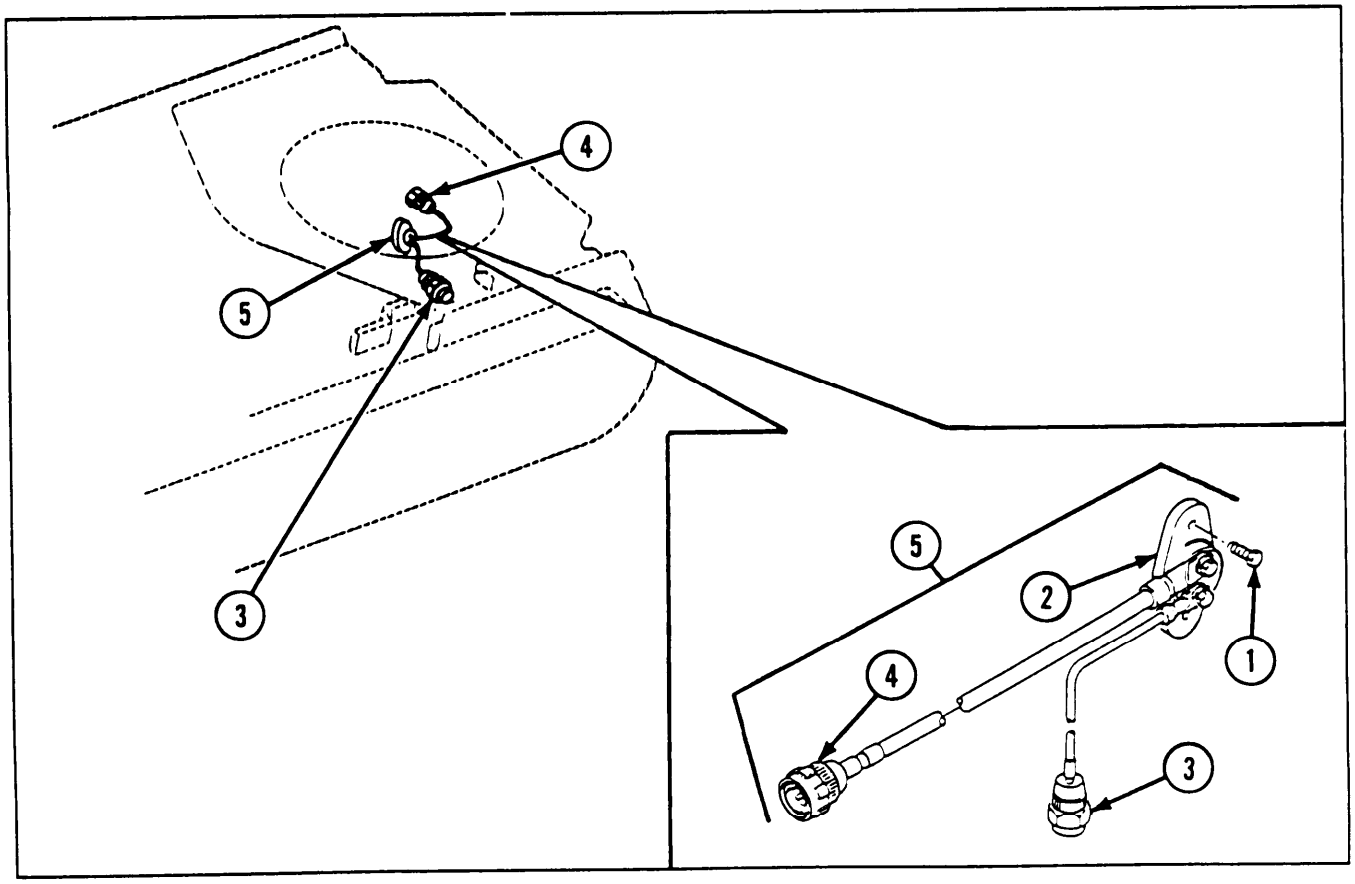
Equipment Conditions
2-640 Batteries disconnected
Accessory storage box removed (TM 9-2350-238-20-2)

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead which is being removed.

2 Remove two screws (1) and circuit breaker (2) from bulkhead.

3 Tag and disconnect plug connector (3) from slip ring.

4 Tag and disconnect plug connector (4) from hull disconnect.

5 Remove hull disconnect to slip ring lead and circuit breaker (5) from hull.

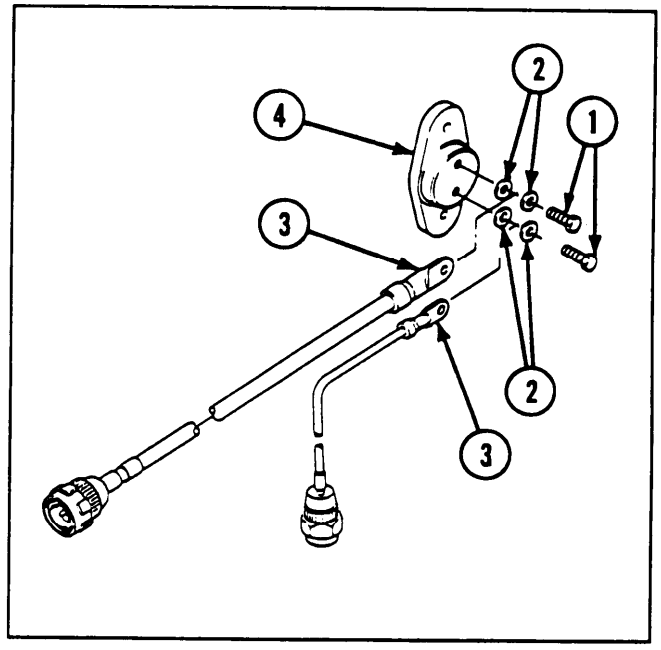
DISASSEMBLY

NOTE

Two screws and four washers are supplied with circuit breaker; use care not to lose them. If lost or damaged, order a new circuit breaker.

1 Remove two screws (1), four washers (2), and two cable terminals (3) from circuit breaker (4).

2 For disassembly of wiring harness plug connectors, refer to general maintenance, page 2-371.



2-102. MAINTENANCE OF HULL DISCONNECT TO SLIP RING LEAD AND CIRCUIT BREAKER (CONT).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

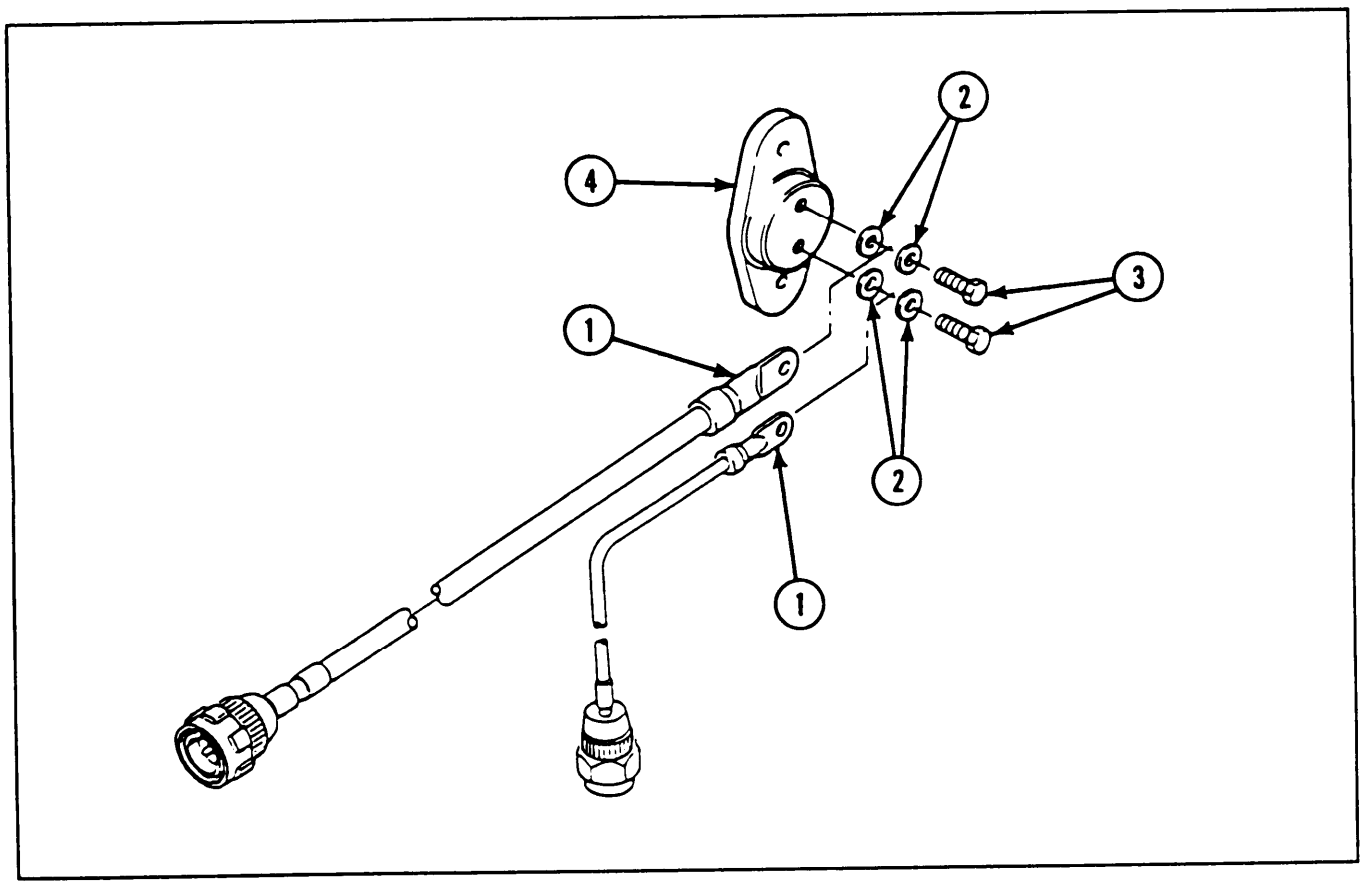
2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of cable terminals, refer to general maintenance, page 2-371.

4 Electrical wires are manufactured items, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

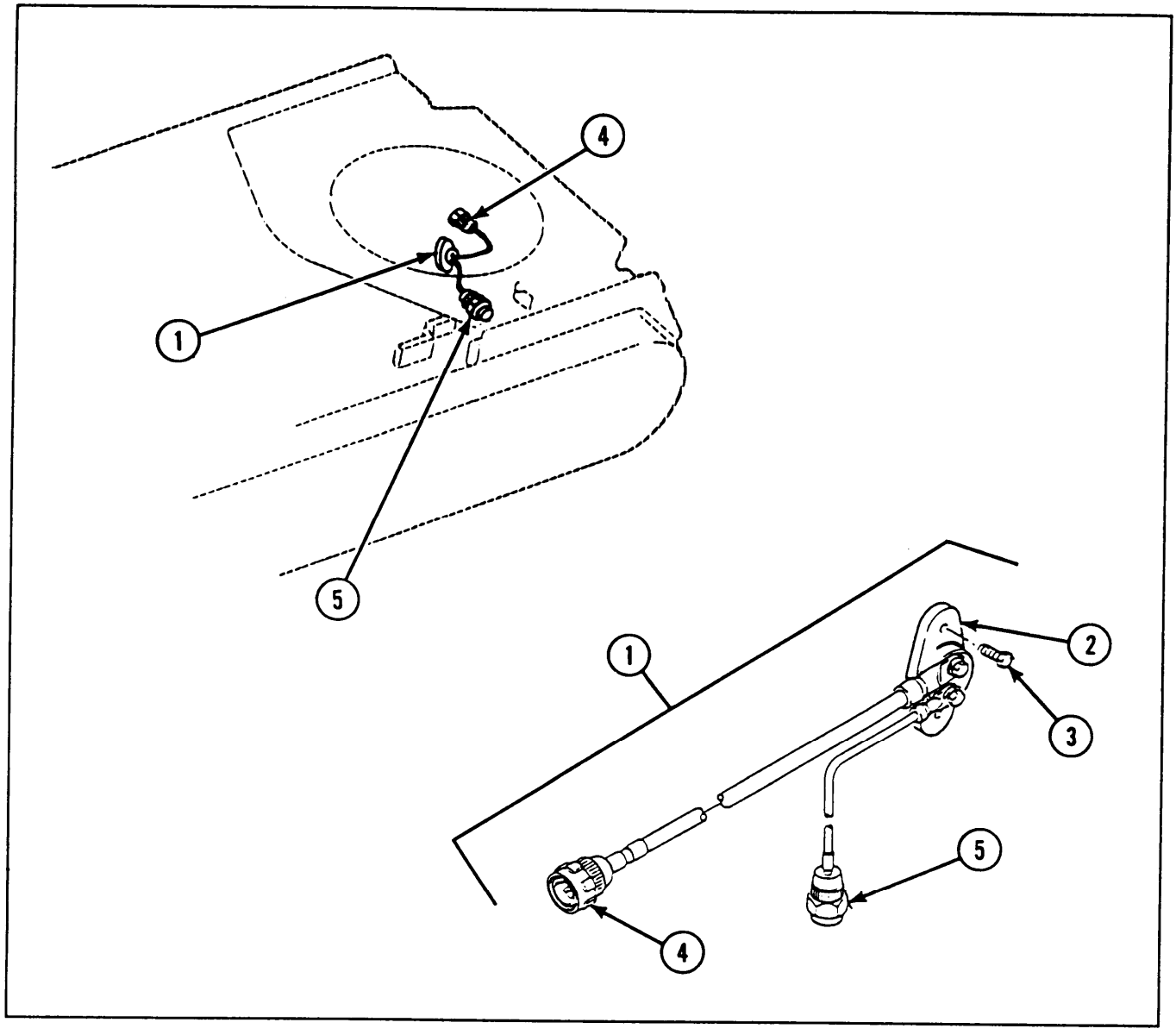
REASSEMBLY



1 For reassembly of wiring harness plug connectors, refer to general maintenance, page 2-371.

2 Install two cable terminals (1), four washers (2), and two screws (3) on circuit breaker (4).

INSTALLATION



1 Install hull disconnect to slip ring lead and circuit breaker (1) in hull.

2 Install circuit breaker (2) and two screws (3) on bulkhead.

3 Untag and connect plug connector (4) to hull disconnect.

4 Untag and connect plug connector (5) to slip ring.

5 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-103. MAINTENANCE OF BLOWER TO GROUND ELECTRICAL LEAD.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)

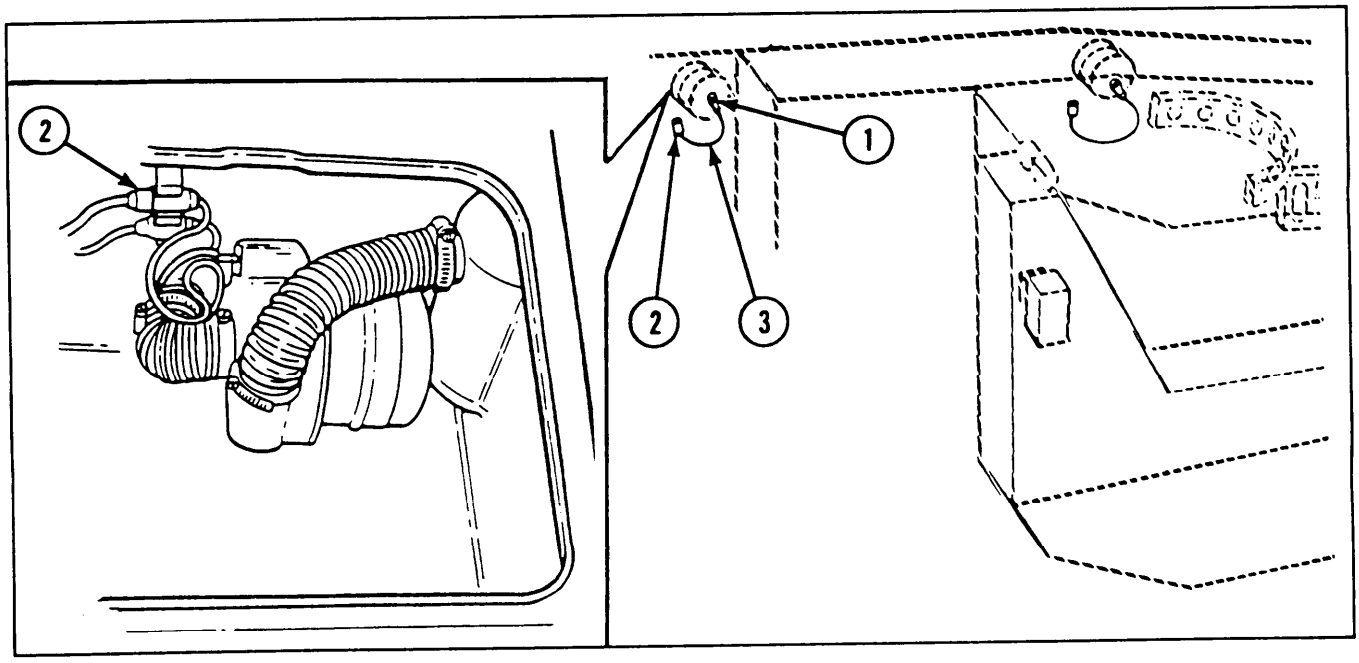
References
TM 9-2350-238-24P-1

Equipment Conditions
2-840 Batteries disconnected

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

NOTE

- There are two blower to ground electrical leads. The following steps are written for one electrical lead, but apply to both.
- To remove the forward blower to ground electrical lead, the air cleaner blower motor access door must be open.
- To remove the aft blower to ground electrical lead, the air cleaner blower access cover must be removed (page 2-918).

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Disconnect cable terminal (1) from air cleaner centrifugal fan.

3 Disconnect shell connector (2) from air cleaner centrifugal fan.

4 Remove blower to ground electrical lead (3) from hull.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of cable terminal and shell connector, refer to general maintenance, page 2-371.

4 Electrical wire is a manufactured item, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

NOTE

There are two blower to ground electrical leads. The following steps are written for one electrical lead but apply to both.

1 Install blower to ground electrical lead (3) in hull.

2 Connect shell connector (2) to air cleaner centrifugal fan.

3 Connect cable terminal (1) to air cleaner centrifugal fan.

4 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-104. MAINTENANCE OF INTERCOM CIRCUIT BULKHEAD DISCONNECT TO SLIP RING BRANCHED WIRING HARNESS.

This task covers:
a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. *Installation*

INITIAL SETUP

Materials/Parts
Electrical cable (figure D-3, appx D)
Electrical wire (figure D-2, appx D)
Electrical wire (figure D-2, appx D)
Gasket

References
TM 9-2350-238-24P-1

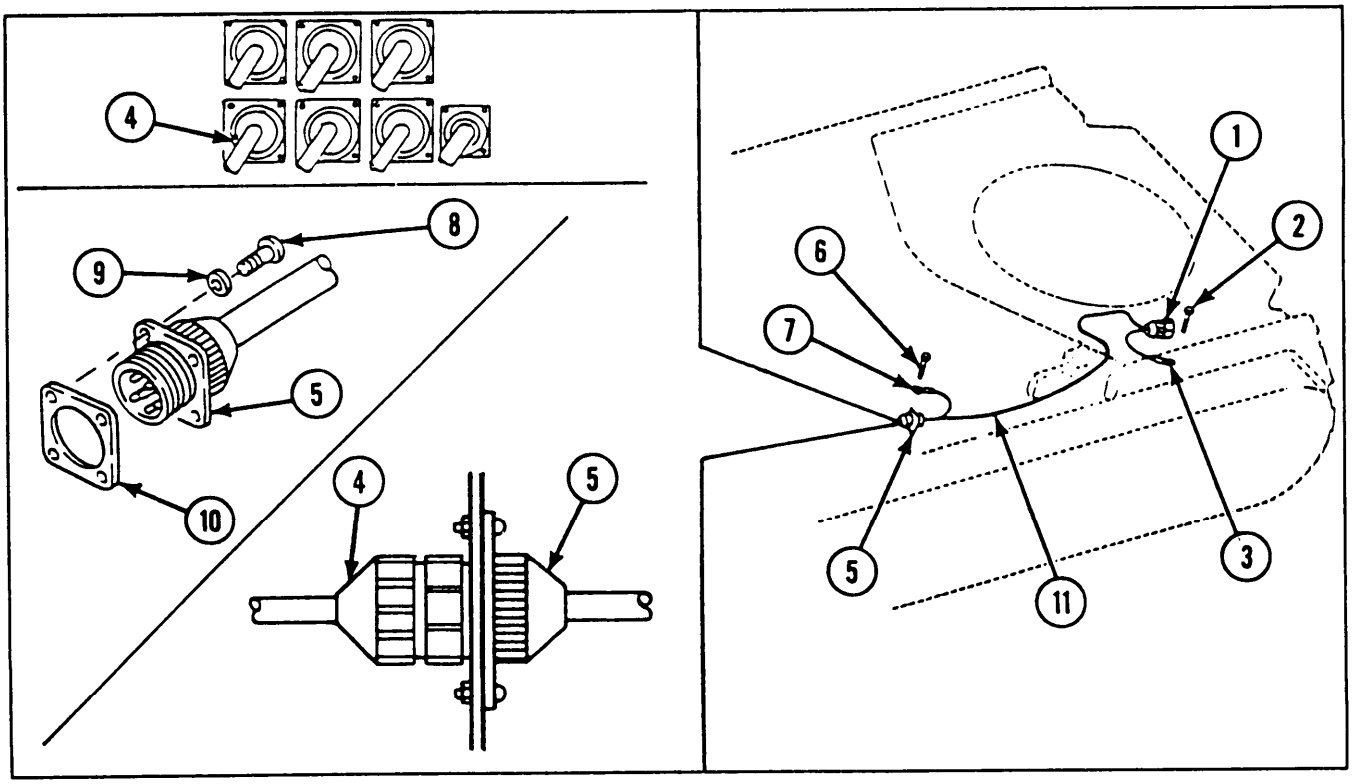
Equipment Conditions
2-840 Battery access door assembly open and all batteries removed
2-840 Battery compartment tray removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead which is being removed.

2 Disconnect plug connector (1) from slip ring.

3 Remove screw (2) and ground cable terminal (3) from bulkhead.

4 Disconnect driver's control box wiring harness plug connector (4) from receptacle connector (5).

5 Remove screw (6) and ground cable terminal (7) from bulkhead.

6 Remove four socket head capscrews (8), four washers (9), gasket (10), and receptacle connector (5) from bulkhead.

7 Remove gasket (10) from receptacle connector (5).

8 Remove intercom circuit bulkhead disconnect to slip ring branched wiring harness (11) from hull.

DISASSEMBLY

For disassembly of wiring harness plug connector and receptacle connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of cable terminals, refer to general maintenance, page 2-371.

4 Electrical cable and electrical wires are manufactured items, refer to appendix D.

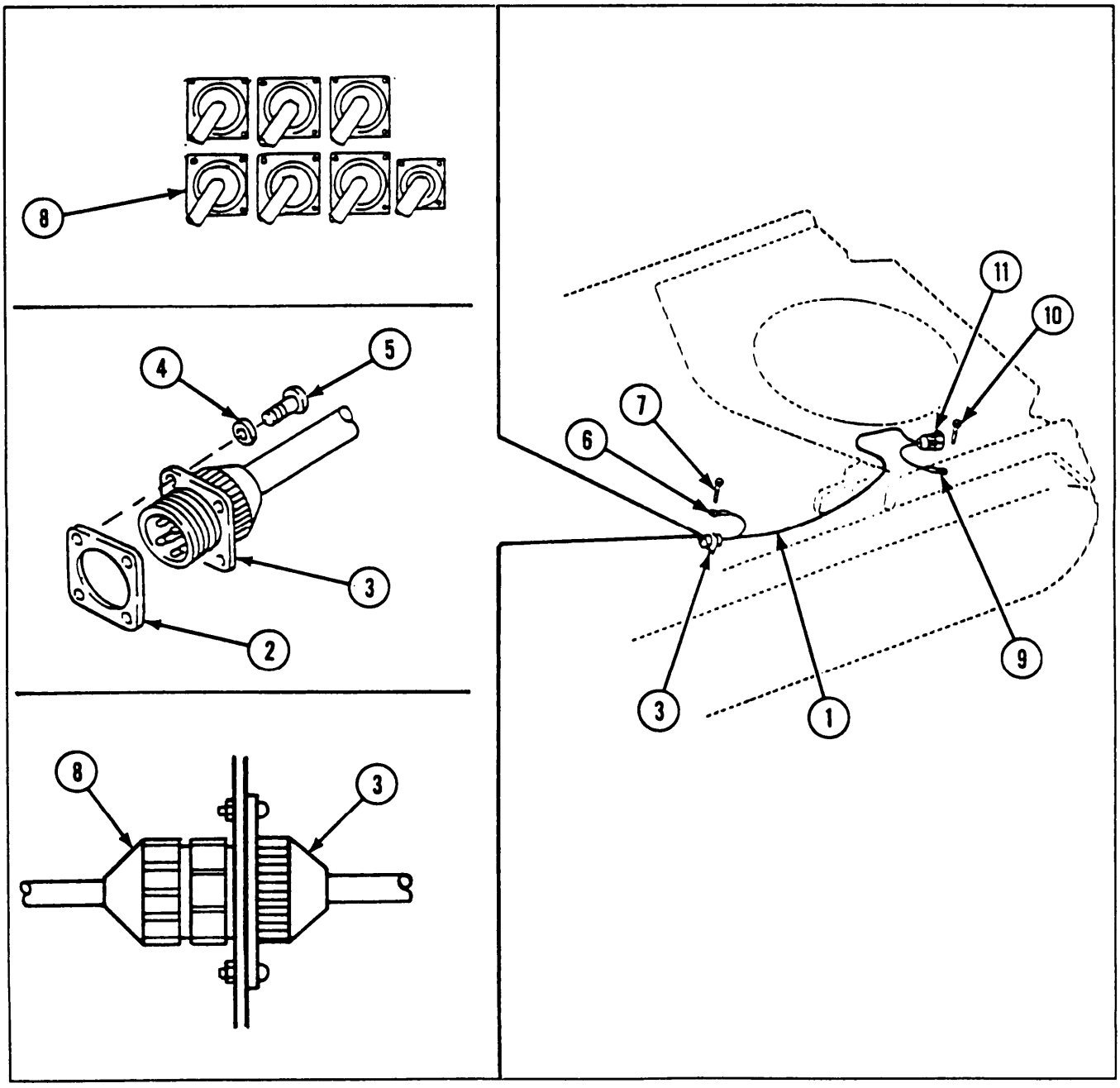
5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-104. MAINTENANCE OF INTERCOM CIRCUIT BULKHEAD DISCONNECT TO SLIP RING BRANCHED WIRING HARNESS (CONT).

REASSEMBLY

For reassembly of wiring harness plug connector and receptacle connector, refer to general maintenance, page 2-371.

INSTALLATION



1 Install intercom circuit bulkhead disconnect to slip ring branched wiring harness (1) in hull.

2 Install new gasket (2) on receptacle connector (3).

3 Install receptacle connector (3) with new gasket (2), washers (4), and four socket head capscrews (5) on bulkhead.

4 Install ground cable terminal (6) and screw (7) on bulkhead.

5 Connect driver's control box wiring harness plug connector (8) to receptacle connector (3).

6 Install ground cable terminal (9) and screw (10) on bulkhead.

7 Connect plug connector (11) to slip ring.

8 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-105. MAINTENANCE OF HORN TO WARNING RELAY WIRING HARNESS.

This task covers:	a. *Removal* b. *Disassembly* c. *Inspection/Repair*	d. *Reassembly* e. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)

References
TM 9-2350-238-24P-1

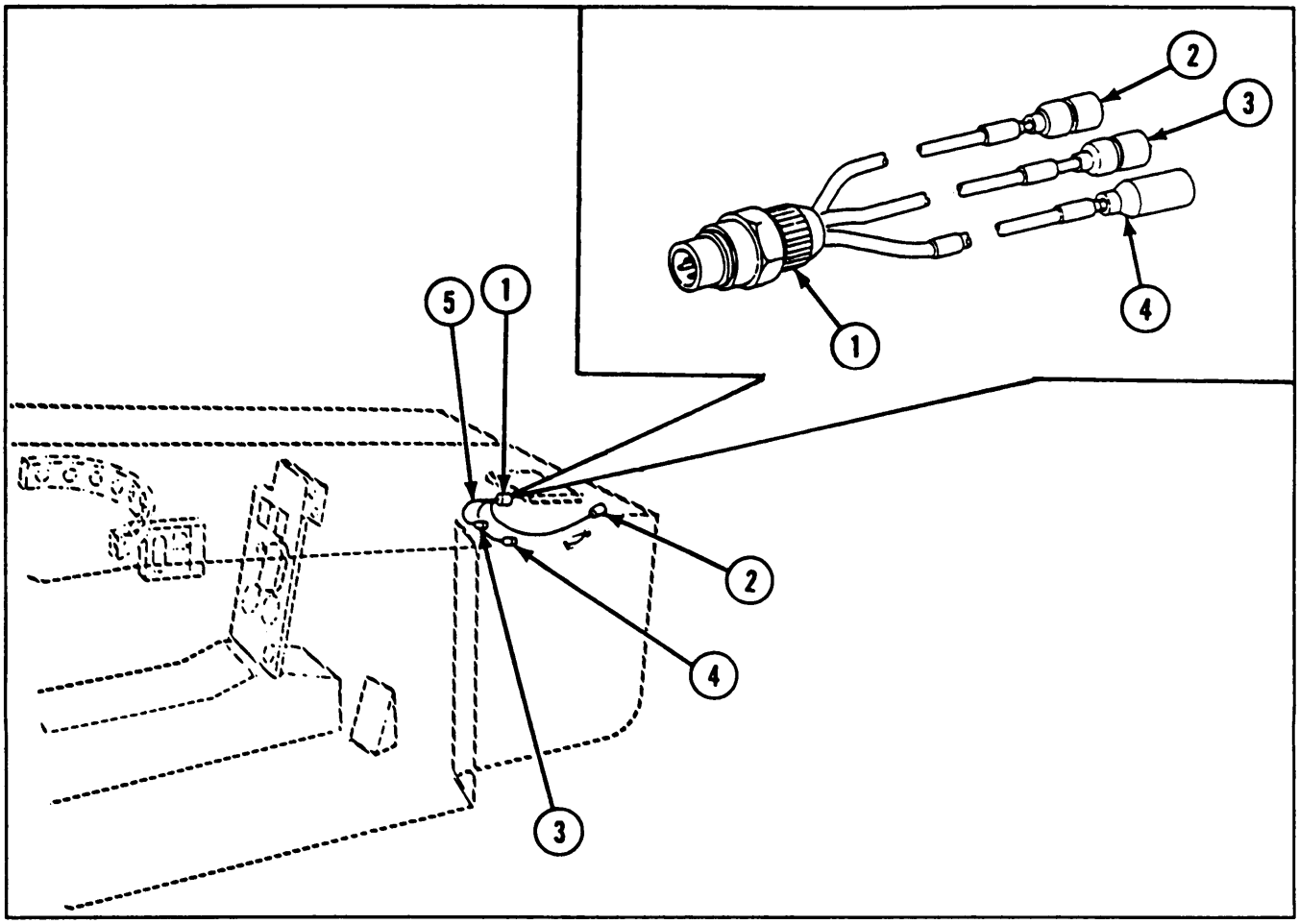
Equipment Conditions
2-640 Batteries disconnected
2-952 Driver's seat removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

2-105. MAINTENANCE OF HORN TO WARNING RELAY WIRING HARNESS (CONT).



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Tag and disconnect plug connector (1) from warning relay.

3 Tag and disconnect shell connector (2) from circuit breaker.

4 Tag and disconnect shell connector (3) from electrical horn.

5 Tag and disconnect shell connector (4) from line connection disconnect.

6 Remove horn to warning relay wiring harness (5) from hull through driver's compartment.

DISASSEMBLY

For disassembly of wiring harness plug connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors, refer to general maintenance, page 2-371.

4 Electrical wire is a manufactured item, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness plug connector, refer to general maintenance, page 2-371.

INSTALLATION

1 Install horn to warning relay wiring harness (5) to hull through driver's compartment.

2 Untag and connect shell connector (4) to line connection disconnect.

3 Untag and connect shell connector (3) to electrical horn.

4 Untag and connect shell connector (2) to circuit breaker.

5 Untag and connect plug connector (1) to warning relay.

6 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-106. MAINTENANCE OF GENERATOR CONTROL CIRCUITS TO BRACKET DISCONNECT BRANCHED WIRING HARNESS.

This task covers:
a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Insulation sleeving (figure D-22, appx D)

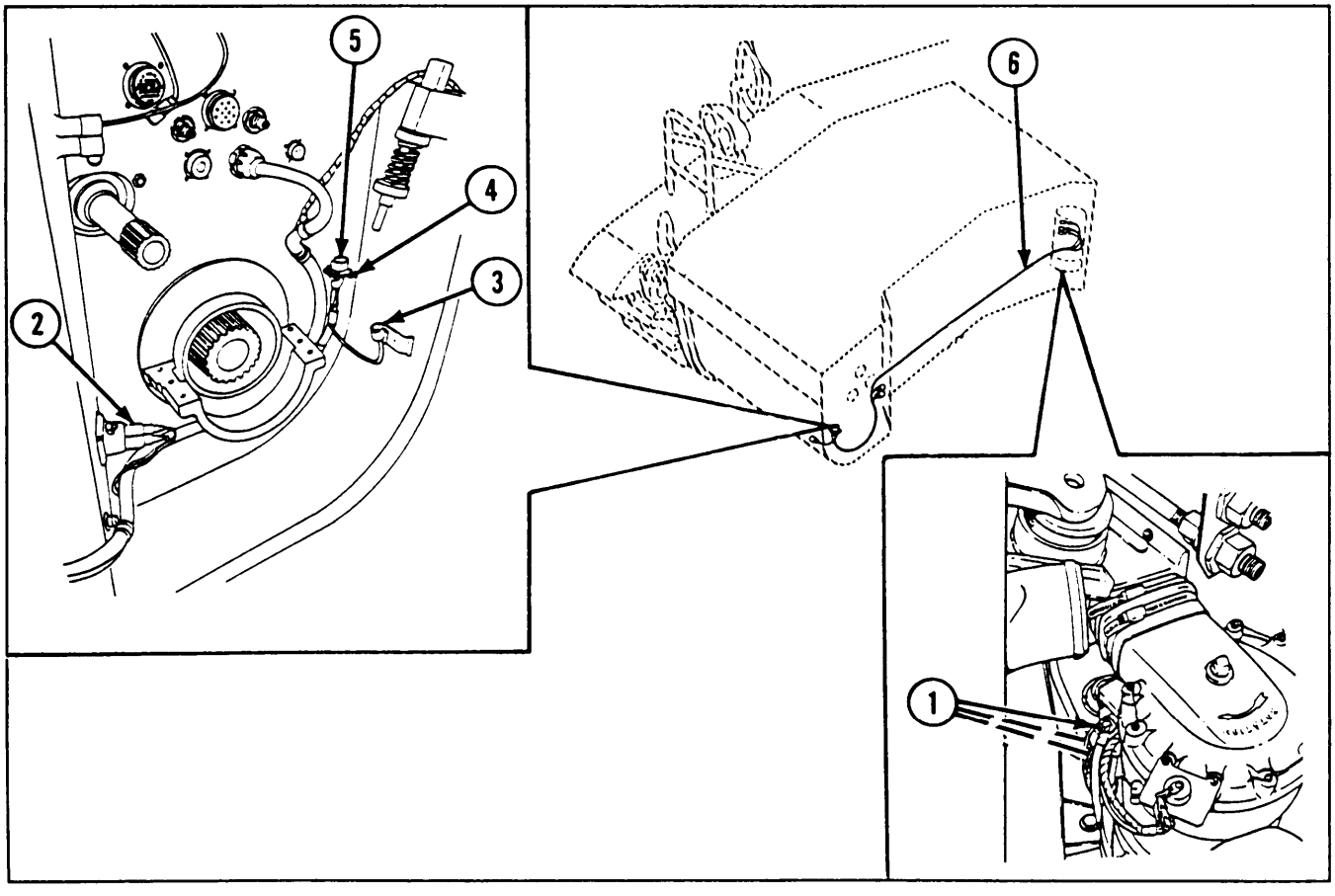
References
TM 9-2350-238-24P-1

Equipment Conditions
2-640 Batteries disconnected
2-384 Powerplant removed
2-766 Auxiliary drive removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Tag and disconnect three cable terminals (1) from three generator control circuits, terminals A, B, and D.

3 Tag and disconnect two shell connectors (2) from circuit breaker.

4 Tag and disconnect shell connector (3) from line connection.

5 Remove four screws (4) and disconnect receptacle connector (5) from bracket receptacle.

6 Remove generator control circuits to bracket disconnect branched wiring harness (6) from hull.

DISASSEMBLY

For disassembly of wiring harness receptacle connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of cable terminals and shell connectors, refer to general maintenance, page 2-371.

4 Electrical wire and insulation sleeving are manufactured items, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness receptacle connector, refer to general maintenance, page 2-371.

INSTALLATION

1 Install generator control circuits to bracket disconnect branched wiring harness (6) to hull.

2 Connect receptacle connector (5) to bracket receptacle and install four screws (4).

3 Untag and connect shell connector (3) to line connection.

4 Untag and connect two shell connectors (2) to circuit breaker.

5 Untag and connect three cable terminals (1) to three generator control circuits, terminals A, B, and D.

6 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-107. MAINTENANCE OF DISCONNECT TO INSTRUMENT PANEL BRANCHED WIRING HARNESS.

This task covers:

a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)

References
TM 9-2350-238-24P-1

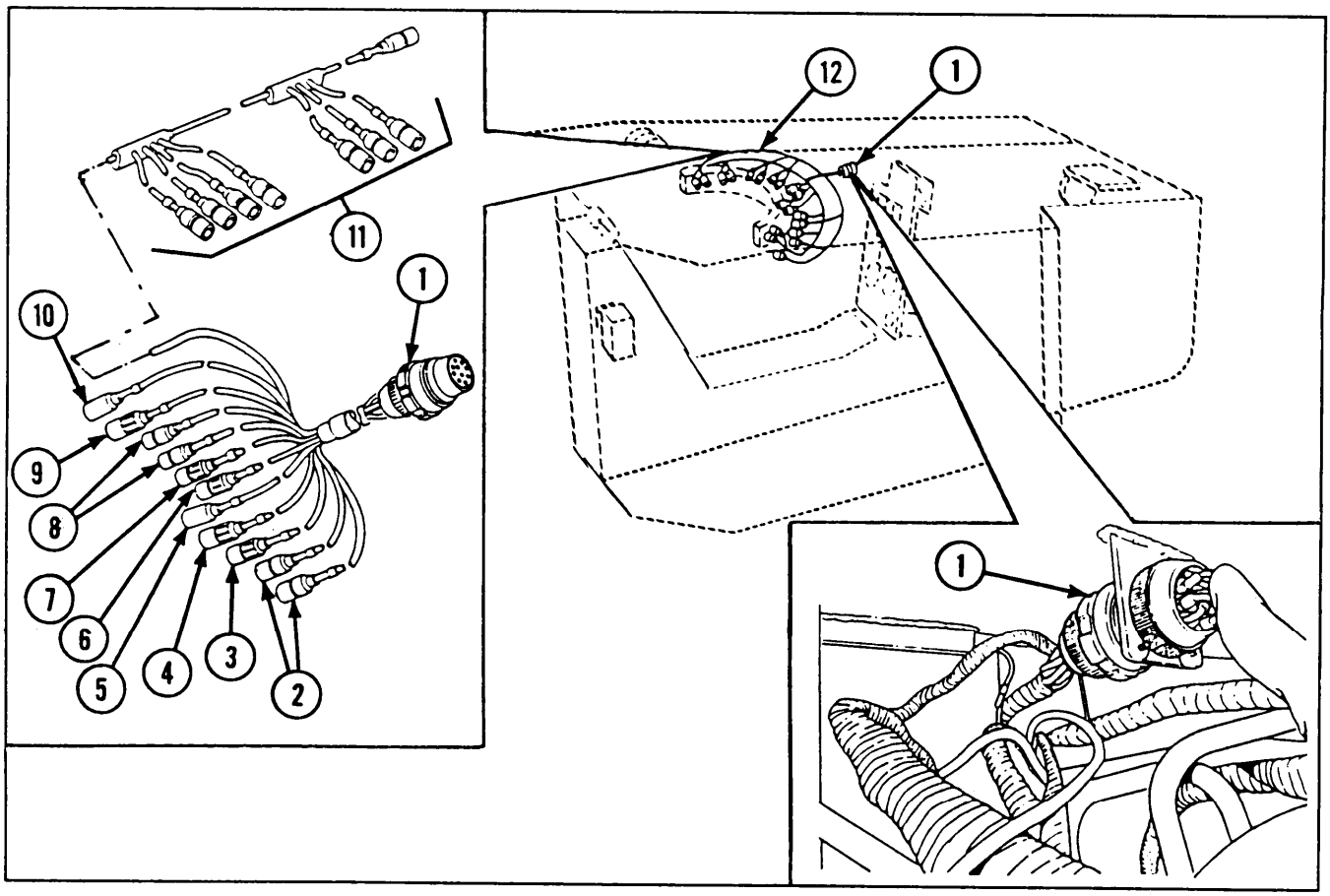
Equipment Conditions
2-640 Batteries disconnected
2-952 Driver's seat removed
2-566 Driver's instrument panel dropped from hull

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Tag and disconnect plug connector (1) from engine sending units connector.

3 Disconnect 19 shell connectors from instrument panel at the following points:

a. Tag and disconnect two shell connectors (2) from master switch panel light.

b. Tag and disconnect shell connector (3) from engine oil pressure gage.

c. Tag and disconnect shell connector (4) from engine coolant temperature indicator.

d. Tag and disconnect shell connector (5) from generator charge warning light.

e. Tag and disconnect shell connector (6) from transmission oil pressure indicator.

f. Tag and disconnect shell connector (7) from transmission oil temperature indicator.

g. Tag and disconnect two shell connectors (8) from high beam panel light.

h. Tag and disconnect shell connector (9) from fuel level indicator.

i. Tag and disconnect shell connector (10) from engine and transmission warning light.

j. Tag and disconnect eight shell connectors (11) from 24-volt feed.

4 Remove disconnect to instrument panel branched wiring harness (12) from hull through driver's compartment.

DISASSEMBLY

For disassembly of wiring harness plug connector, refer to general maintenance, page 2-371.

2-107. MAINTENANCE OF DISCONNECT TO INSTRUMENT PANEL BRANCHED WIRING HARNESS (CONT).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors, refer to general maintenance, page 2-371.

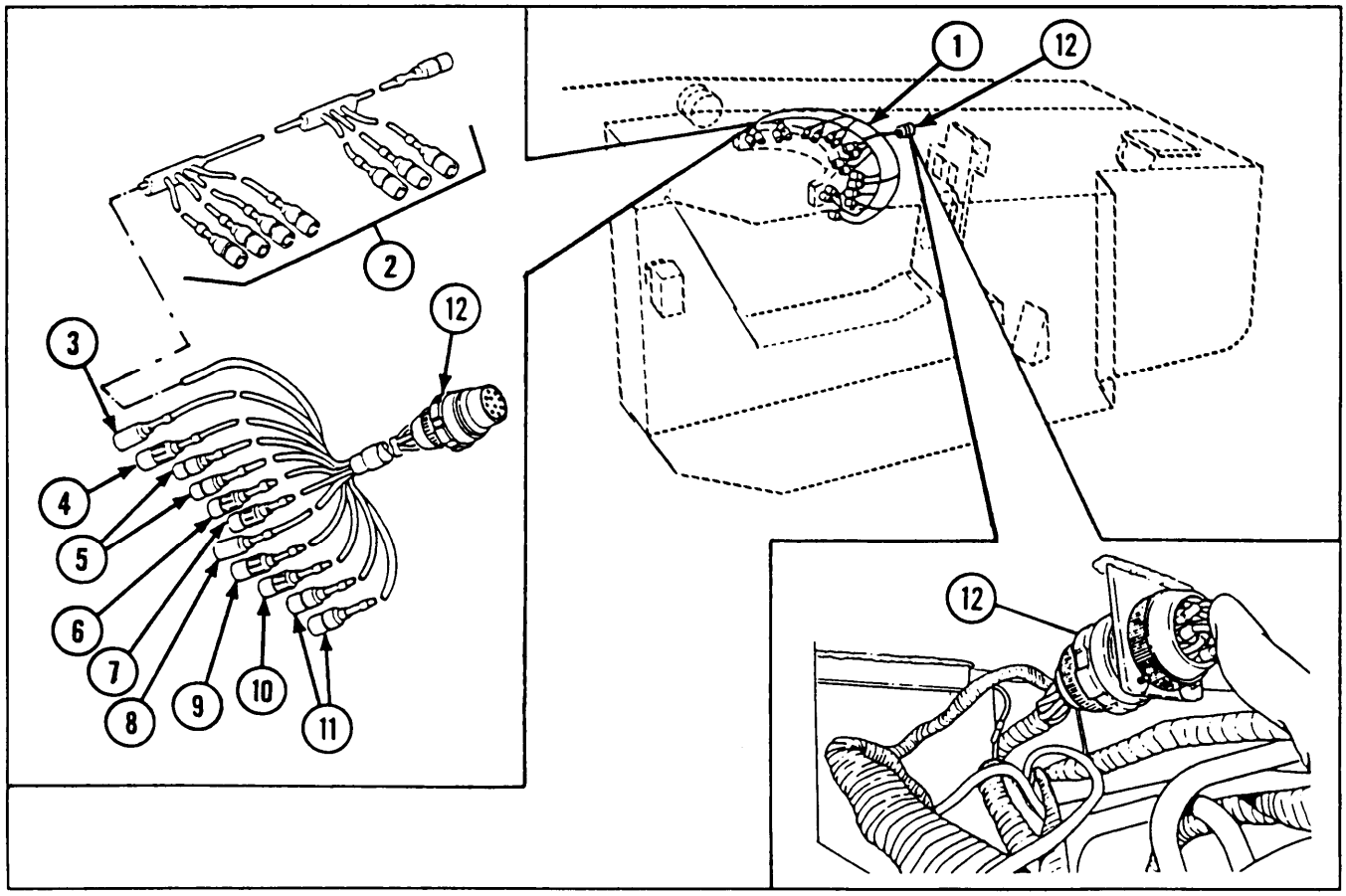
4 Electrical wire is a manufactured item, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness plug connector, refer to general maintenance, page 2-371.

INSTALLATION



1 Install disconnect to instrument panel branched wiring harness (1) to hull through driver's compartment.

2 Connect 19 shell connectors to instrument panel at the following points:

a. Untag and connect eight shell connectors (2) to 24-volt feed.

b. Untag and connect shell connector (3) to engine and transmission warning light.

c. Untag and connect shell connector (4) to fuel level indicator.

d. Untag and connect two shell connectors (5) to high beam panel light.

e. Untag and connect shell connector (6) to transmission oil temperature indicator.

f. Untag and connect shell connector (7) to transmission oil pressure indicator.

g. Untag and connect shell connector (8) to generator charge warning light.

h. Untag and connect shell connector (9) to engine coolant temperature indicator.

i. Untag and connect shell connector (10) to engine oil pressure gage.

j. Untag and connect two shell connectors (11) to master switch panel light.

3 Untag and connect plug connector (12) to engine sending units connector.

4 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-108. MAINTENANCE OF DISCONNECT TO FORWARD AIR CLEANER BLOWER MOTOR ELECTRICAL LEAD.

This task covers:	a. *Removal*	b. *Inspection/Repair*	c. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)

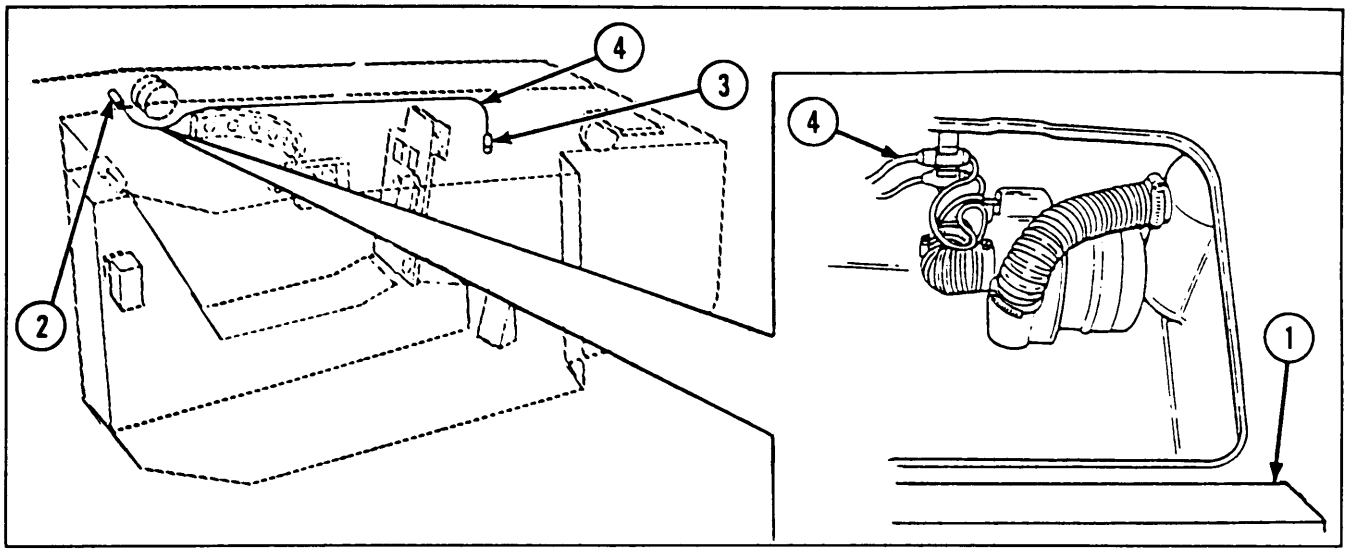
References
TM 9-2350-238-24P-1

Equipment Conditions
2-640 Batteries disconnected
2-952 Driver's seat removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Open air cleaner blower motor access door (1).

3 Tag and disconnect shell connector (2) from forward air cleaner centrifugal fan.

4 Tag and disconnect shell connector (3) from line connection disconnect.

5 Remove disconnect to forward air cleaner blower motor electrical lead (4) from hull through driver's compartment.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors, refer to general maintenance, page 2-371.

4 Electrical wire is a manufactured item, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install disconnect to forward air cleaner blower motor electrical lead (4) to hull through driver's compartment.

2 Untag and connect shell connector (3) to line connection disconnect.

3 Untag and connect shell connector (2) to forward air cleaner centrifugal fan.

4 Close air cleaner blower motor access door (1).

5 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-109. MAINTENANCE OF FUEL PURGE-AND-PRIME SWITCH TO SOLENOID ELECTRICAL LEAD (ENGINE MODEL 7083-7395).

This task covers: a. *Removal* b.. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)

References
TM 9-2350-238-24P-1

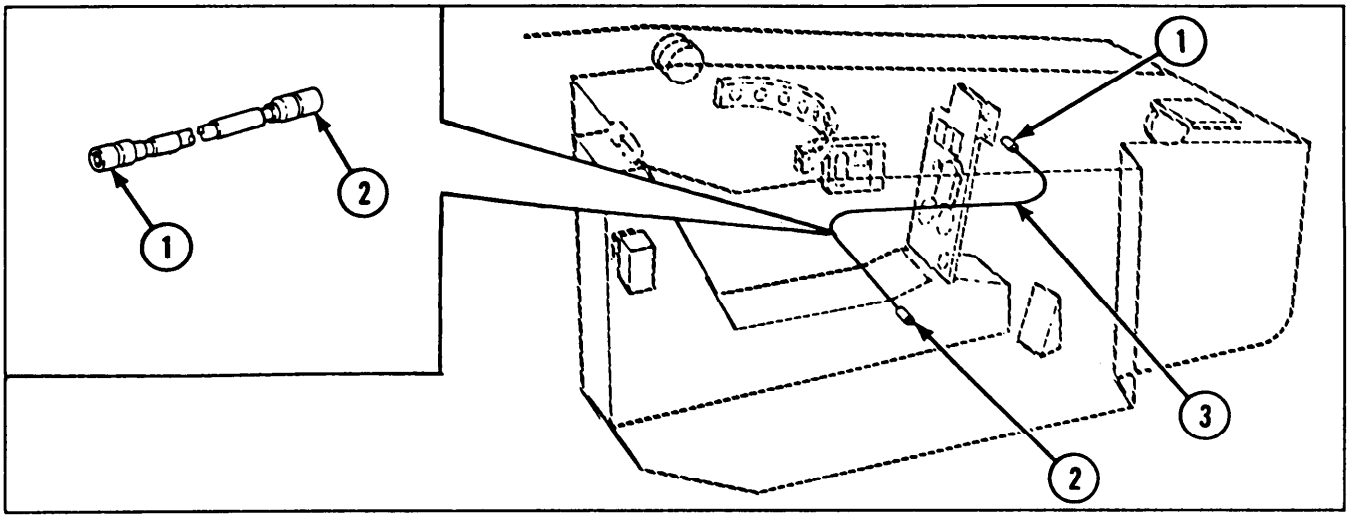
Equipment Conditions
2-640 Batteries disconnected
2-952 Driver's seat removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

2-109. MAINTENANCE OF FUEL PURGE-AND-PRIME SWITCH TO FILTER PRIMING PUMP ELECTRICAL LEAD (ENGINE MODEL 7083-7395) (CONT).



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Disconnect shell connector (1) from prime switch.

3 Disconnect shell connector (2) from pump.

4 Remove fuel purge-and-prime switch to solenoid electrical lead (3) from hull through driver's compartment.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors, refer to general maintenance, page 2-371.

4 Electrical wire is a manufactured item, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install fuel purge-and-prime switch to solenoid electrical lead (1) in hull through driver's compartment.

2 Connect shell connector (2) to pump.

3 Connect shell connector (3) to prime switch.

4 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-110. MAINTENANCE OF BULKHEAD DISCONNECT TO TRAILER RECEPTACLE DISCONNECT, AFT BLOWER MOTOR, AND TAILLIGHTS BRANCHED WIRING HARNESS.

This task covers:	a. *Removal* b. *Disassembly* c. *Inspection/Repair*	d. *Reassembly* e. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Rod (figure D-24, appx D)

References
TM 9-2350-238-20-2
TM 9-2350-238-24P-1

Equipment Conditions
2-640 Batteries disconnected
2-918 Battery access door assembly open and all batteries removed
2-640 Battery compartment tray removed
Accessory stowage box removed (TM 9-2350-238-20-2)

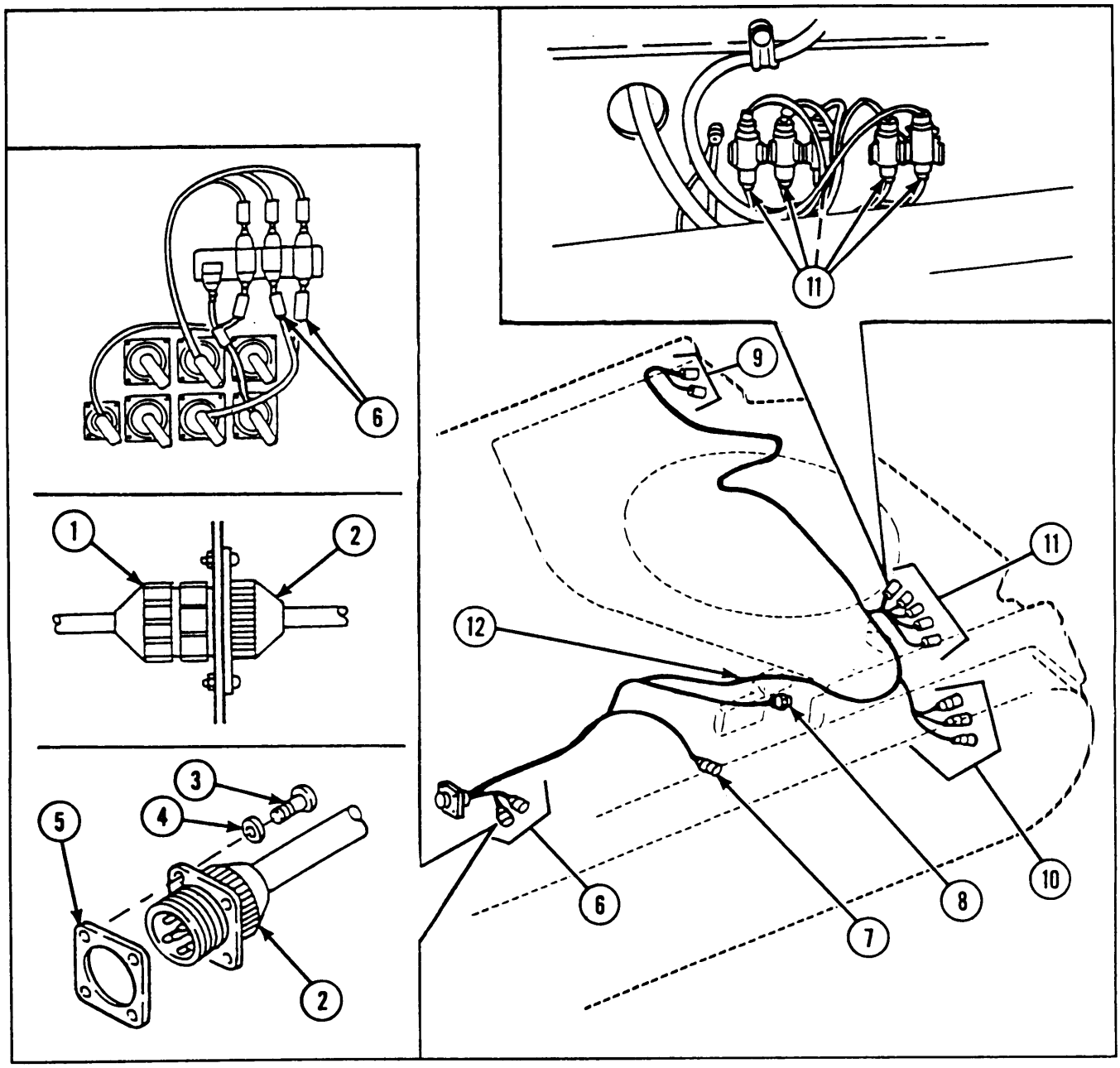
General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

2-110. MAINTENANCE OF BULKHEAD DISCONNECT TO TRAILER RECEPTACLE DISCONNECT, AFT BLOWER MOTOR, AND TAILLIGHTS BRANCHED WIRING HARNESS (CONT).

REMOVAL



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead which is being removed.

2 Disconnect plug connector (1) from receptacle connector (2).

3 Remove four socket head capscrews (3), four washers (4), receptacle connector (2), and gasket (5) from bulkhead.

4 Remove gasket (5) from receptacle connector (2).

5 Tag and disconnect two shell connectors (6) from line connections.

6 Tag and disconnect shell connector (7) from air cleaner blower motor.

7 Disconnect plug connector (8) from bulkhead disconnect.

8 Tag and disconnect two shell connectors (9) from right taillight.

9 Tag and disconnect three shell connectors (10) from left taillight.

NOTE

Access to the remaining electrical leads is gained through the rear hull well.

10 Tag and disconnect five shell connectors (11) from trailer receptacle disconnect.

11 Remove bulkhead disconnect to trailer receptacle disconnect aft blower motor, and taillights branched wiring harness (12) from hull.

DISASSEMBLY

For disassembly of wiring harness plug connector and receptacle connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors, refer to general maintenance, page 2-371.

4 Electrical wire and rod are manufactured items, refer to appendix D.

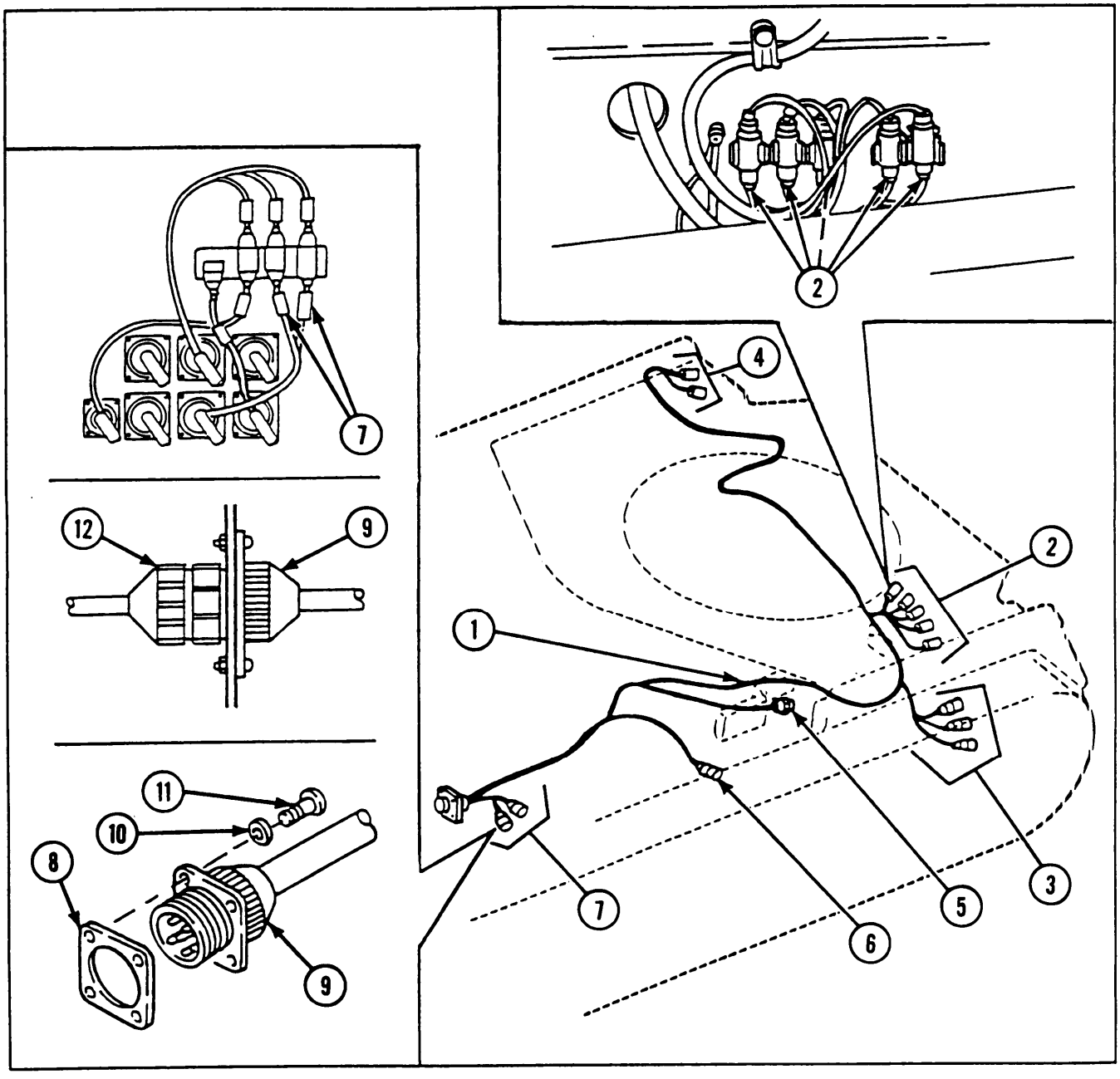
5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-110. MAINTENANCE OF BULKHEAD DISCONNECT TO TRAILER RECEPTACLE DISCONNECT, AFT BLOWER MOTOR, AND TAILLIGHTS BRANCHED WIRING HARNESS (CONT.

REASSEMBLY

For reassembly of wiring harness plug connector and receptacle connector, refer to general maintenance, page 2-371.

INSTALLATION



1 Install bulkhead disconnect to trailer receptacle disconnect, aft blower motor, and taillights branched wiring harness (1) in hull.

2 Untag and connect five shell connectors (2) to trailer receptacle disconnect.

3 Untag and connect three shell connectors (3) to left taillight.

4 Untag and connect two shell connectors (4) to right taillight.

5 Connect plug connector (5) to bulkhead disconnect.

6 Untag and connect shell connector (6) to air cleaner blower motor.

7 Untag and connect two shell connectors (7) to line connections.

8 Install gasket (8) on receptacle connector (9).

9 Install receptacle connector (9) with gasket (8), four washers (10), and four socket head capscrews (11) on bulkhead.

10 Connect plug connector (12) to receptacle connector (9).

11 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-111. MAINTENANCE OF LIGHTING SWITCH TO VEHICLE ACCESSORIES AND DISCONNECT BRANCHED WIRING HARNESS.

This task covers:	a. *Removal* b. *Disassembly* c. *Inspection/Repair*	d. *Reassembly* e. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Rod (figure D-24, appx D)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-640 Batteries disconnected
2-952 Driver's seat removed
2-928 Driver's compartment forward cowl removed
2-928 Driver's compartment aft cowl removed

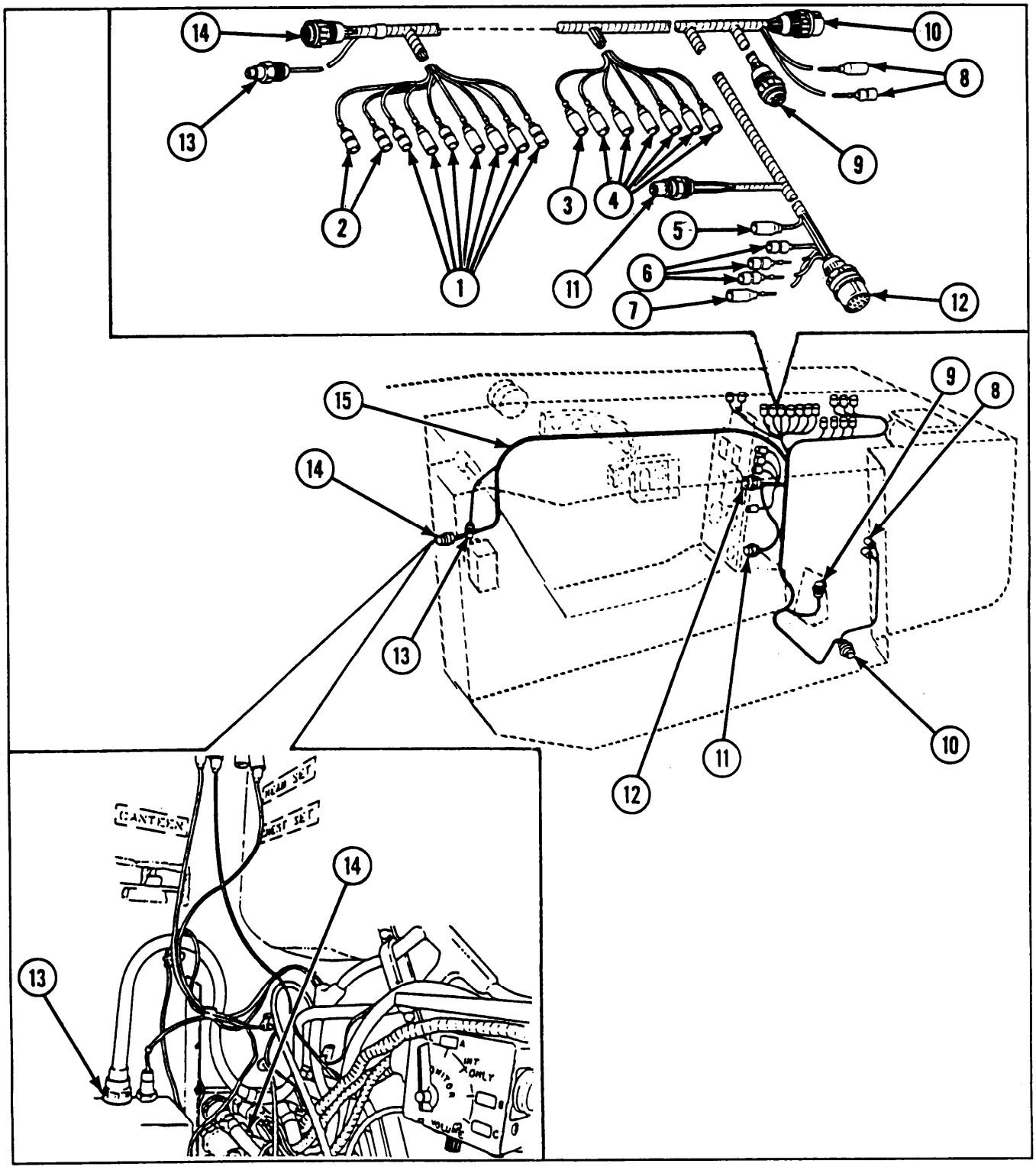
General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

2-111. MAINTENANCE OF LIGHTING SWITCH TO VEHICLE ACCESSORIES AND DISCONNECT BRANCHED WIRING HARNESS (CONT).

REMOVAL



WARNING

Failure to remove or disconnect the batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Disconnect 23 shell connectors at the following points:

a. Tag and disconnect seven shell connectors (1) from line connections.

b. Tag and disconnect two shell connectors (2) from horn switch.

c. Tag and disconnect shell connector (3) from forward air cleaner.

d. Tag and disconnect six shell connectors (4) from left headlight.

e. Tag and disconnect shell connector (5) from panel light.

f. Tag and disconnect three shell connectors (6) from infrared and blackout drive selector switch.

g. Tag and disconnect shell connector (7) from suspension lockout system indicator light.

h. Tag and disconnect two shell connectors (8) from stoplight switch.

3 Tag and disconnect plug connector (9) from dimmer switch.

4 Tag and disconnect plug connector (10) from right headlight.

5 Tag and disconnect plug connector (11) from pressure switch.

6 Tag and disconnect plug connector (12) from lighting switch.

7 Tag and disconnect plug connector (13) from master relay.

8 Tag and disconnect plug connector (14) from taillights.

9 Remove lighting switch to vehicle accessories and disconnect branched wiring harness (15) from hull through driver's compartment.

DISASSEMBLY

For disassembly of wiring harness plug connectors, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors, refer to general maintenance, page 2-371.

4 Electrical wire and rod are manufactured items, refer to appendix D.

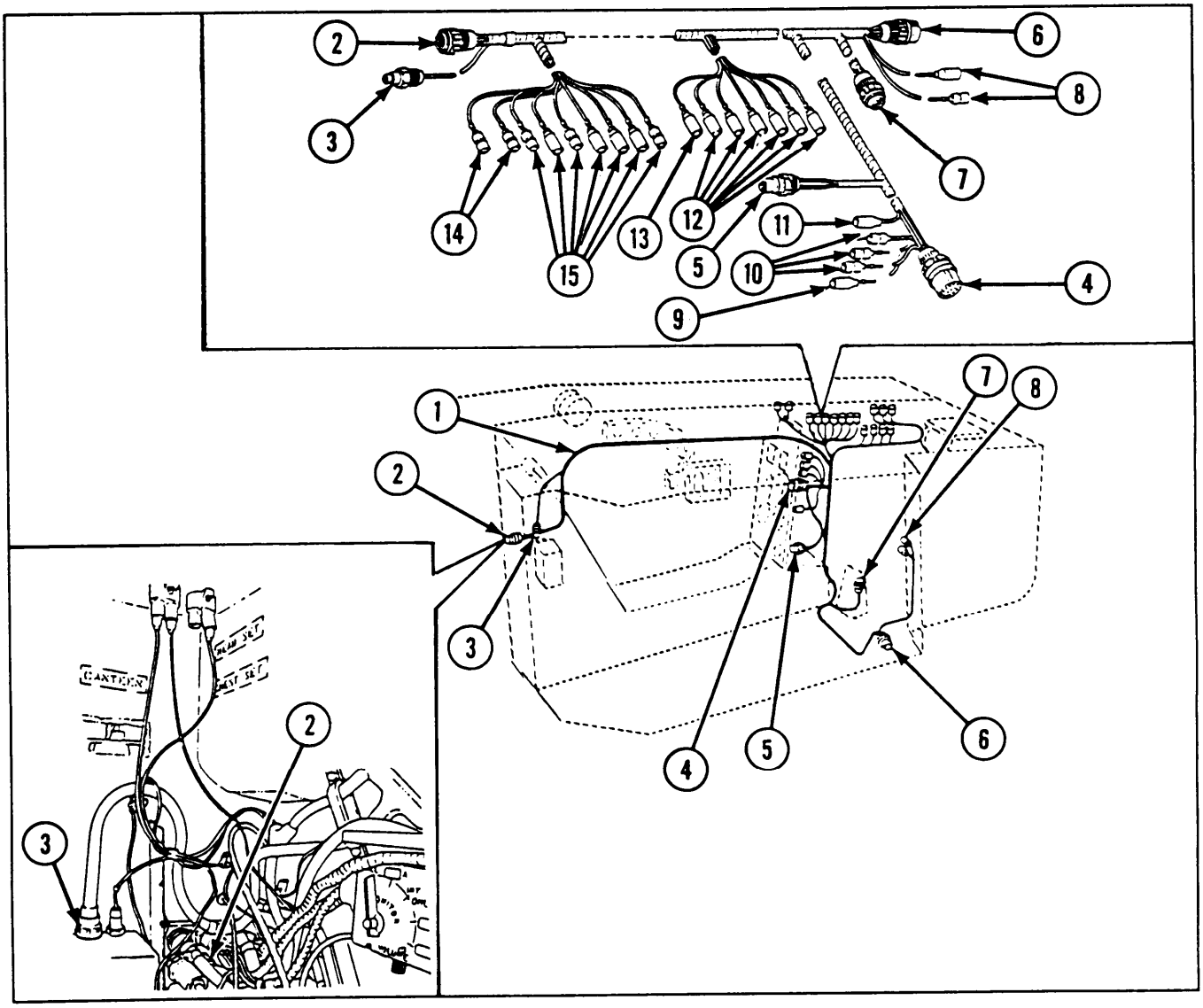
5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-111. MAINTENANCE OF LIGHTING SWITCH TO VEHICLE ACCESSORIES AND DISCONNECT BRANCHED WIRING HARNESS (CONT).

REASSEMBLY

For reassembly of wiring harness plug connectors, refer to general maintenance, page 2-371.

INSTALLATION



1 Install lighting switch to vehicle accessories and disconnect wiring harness (1) in hull through driver's compartment.

2 Untag and connect plug connector (2) to taillights.

3 Untag and connect plug connector (3) to master relay.

4 Untag and connect plug connector (4) to lighting switch.

5 Untag and connect plug connector (5) to pressure switch.

6 Untag and connect plug connector (6) to right headlight.

7 Untag and connect plug connector (7) to dimmer switch.

8 Connect 23 shell connectors at the following points:

a. Untag and connect two shell connectors (8) to stoplight switch.

b. Untag and connect shell connector (9) to suspension lockout system indicator light.

c. Untag and connect three shell connectors (10) to infrared and blackout drive selector switch.

d. Untag and connect shell connector (11) to panel light.

e. Untag and connect six shell connectors (12) to left headlight.

f. Untag and connect shell connector (13) to forward air cleaner.

g. Untag and connect two shell connectors (14) to horn switch.

h. Untag and connect seven shell connectors (15) to line connection.

9 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-112. MAINTENANCE OF BATTERY TO BULKHEAD DISCONNECT CABLE ASSEMBLY.

This task covers:
a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Gasket
Insulation sleeving (figure D-1, appx D)

References
TM 9-2350-238-24P-1

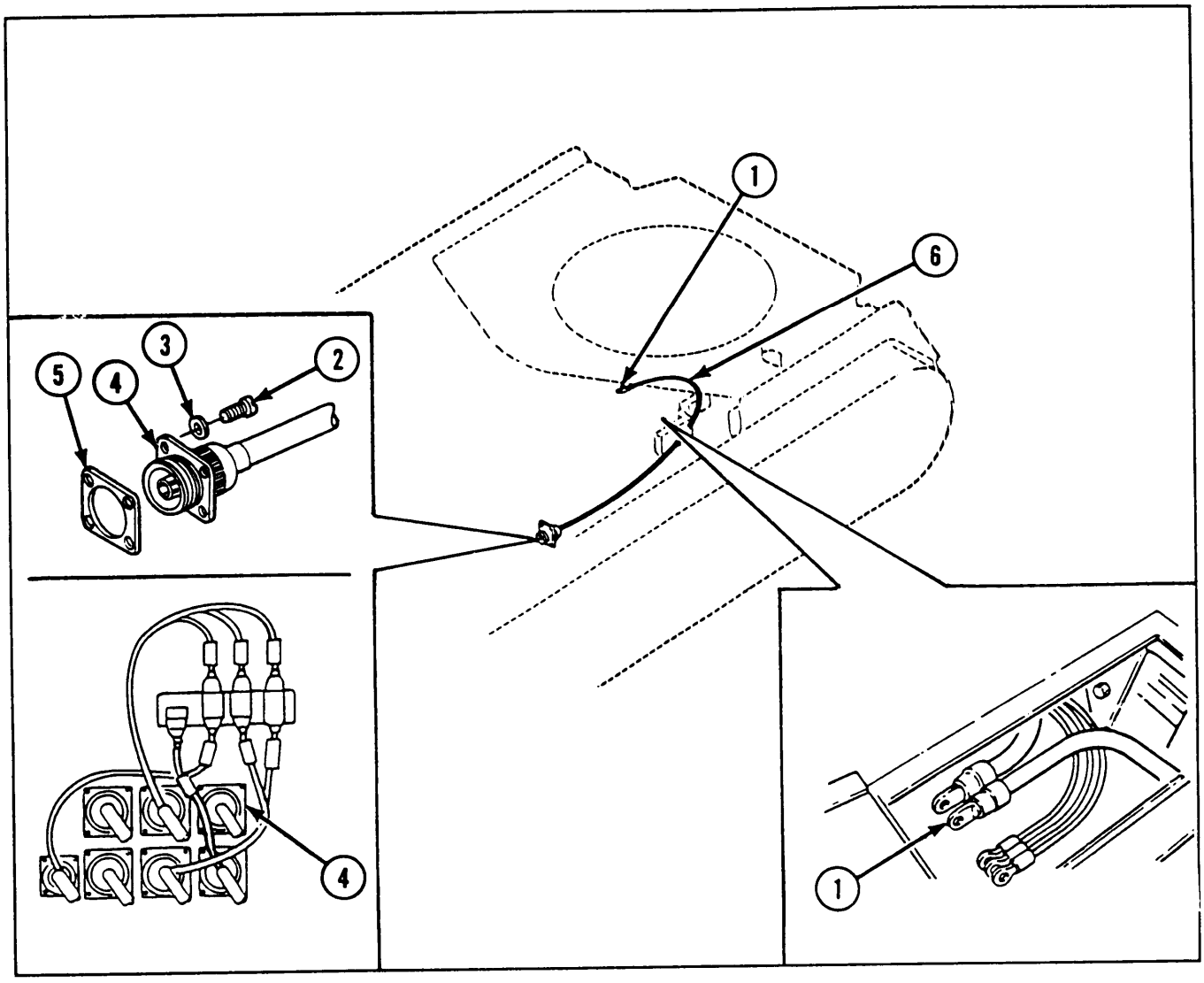
Equipment Conditions
2-918 Hull access cover removed
2-640 Battery access cover open and all batteries removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

2-112. MAINTENANCE OF BATTERY TO BULKHEAD DISCONNECT CABLE ASSEMBLY (CONT).



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Disconnect cable terminal (1) from battery terminal lug.

3 Remove four screws (2) and four washers (3), and disconnect receptacle connector (4) from bulkhead disconnect to master relay.

4 If damaged, remove gasket (5) from receptacle connector (4).

5 Remove battery to bulkhead disconnect cable assembly (6) from hull through battery compartment.

DISASSEMBLY

For disassembly of wiring harness receptacle connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of cable terminal, refer to general maintenance, page 2-371.

4 Electrical wire and insulation sleeving are manufactured items, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness receptacle connector, refer to general maintenance, page 2-371.

INSTALLATION

1 Install battery to bulkhead disconnect cable assembly (6) in hull through battery compartment.

2 If removed, install new gasket (5) on receptacle connector (4).

3 Connect receptacle connector (4) to bulkhead disconnect to master relay, and install four washers (3) and four screws (2).

4 Connect cable terminal (1) to battery lug terminal.

5 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-113. MAINTENANCE OF BULKHEAD TO BULKHEAD STARTER CIRCUIT BRANCHED WIRING HARNESS.

This task covers: a. *Removal* b. *Disassembly* c. *Inspection/Repair* d. *Reassembly* e. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Electrical wire (figure D-2, appx D)
Gasket

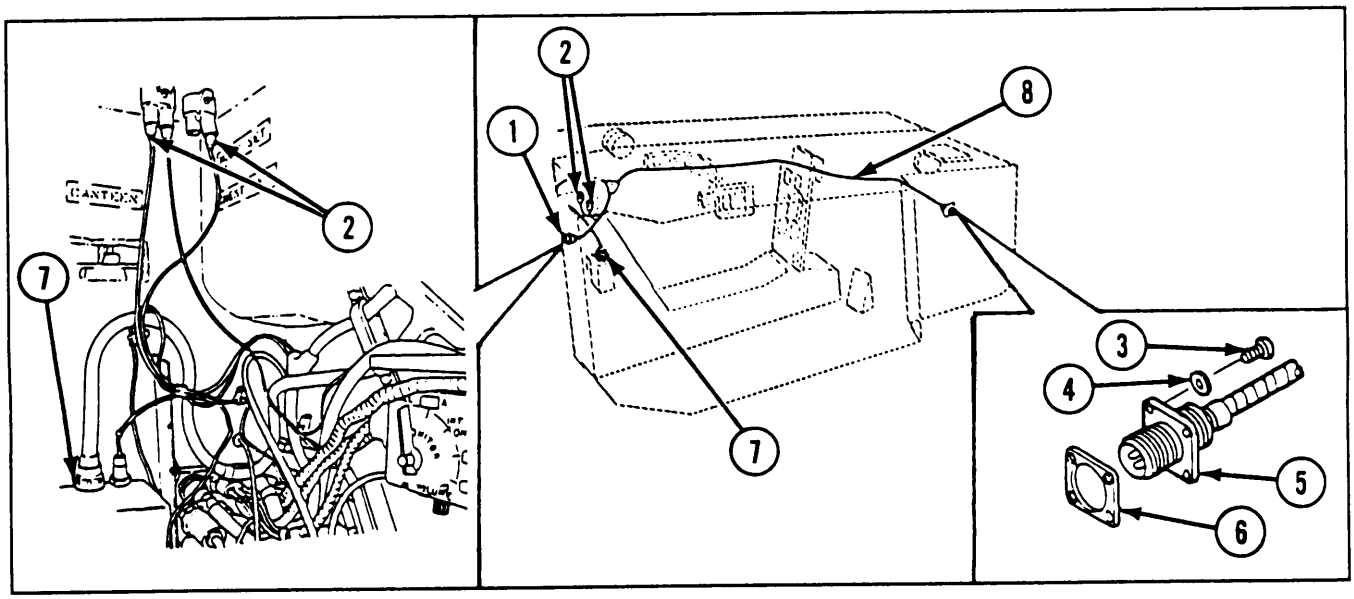
References
TM 9-2350-238-24P-1

Equipment Conditions
2-840 Batteries disconnected
2-952 Driver's seat removed
2-928 Driver's compartment forward cowl removed
2-928 Driver's compartment aft cowl removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Tag and disconnect plug connector (1) from rear bulkhead.

3 Tag and disconnect two shell connectors (2) from circuit breakers.

4 Remove four screws (3), four washers (4), and receptacle connector (5) from front bulkhead disconnect to starter.

5 If damaged, remove gasket (6) from receptacle connector (5).

6 Tag and disconnect plug connector (7) from master relay.

7 Remove bulkhead to bulkhead starter circuit branched wiring harness (8) from hull through driver's compartment.

DISASSEMBLY

For disassembly of wiring harness receptacle connector and plug connectors, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors, refer to general maintenance, page 2-371.

4 Electrical wires are manufactured items, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness receptacle connector and plug connectors, refer to general maintenance, page 2-371.

INSTALLATION

1 Install bulkhead to bulkhead starter circuit branched wiring harness (8) to hull through driver's compartment.

2 Untag and connect plug connector (7) to master relay.

3 If removed, install new gasket (6) to receptacle connector (5).

4 Connect receptacle connector (5) to front bulkhead disconnect to starter, and install four washers (4) and four screws (3).

5 Untag and connect two shell connectors (2) to circuit breakers.

6 Untag and connect plug connector (1) to rear bulkhead.

7 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-114. MAINTENANCE OF RIGHT AND LEFT DISCONNECT TO HEADLAMP WIRING HARNESS.

This task covers:
a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. *Installation*

INITIAL SETUP

Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
- Soldering gun

Materials/Parts
Electrical wire (figure D-2, appx D)
Insulation tape (item 43, appx C)
Lockwasher (2)
Nonmetallic seal
Rod (figure D-23, appx D)
Solder (item 43, appx C)

References
MIL-STD-202
TB SIG-222
TM 9-2350-238-24P-1

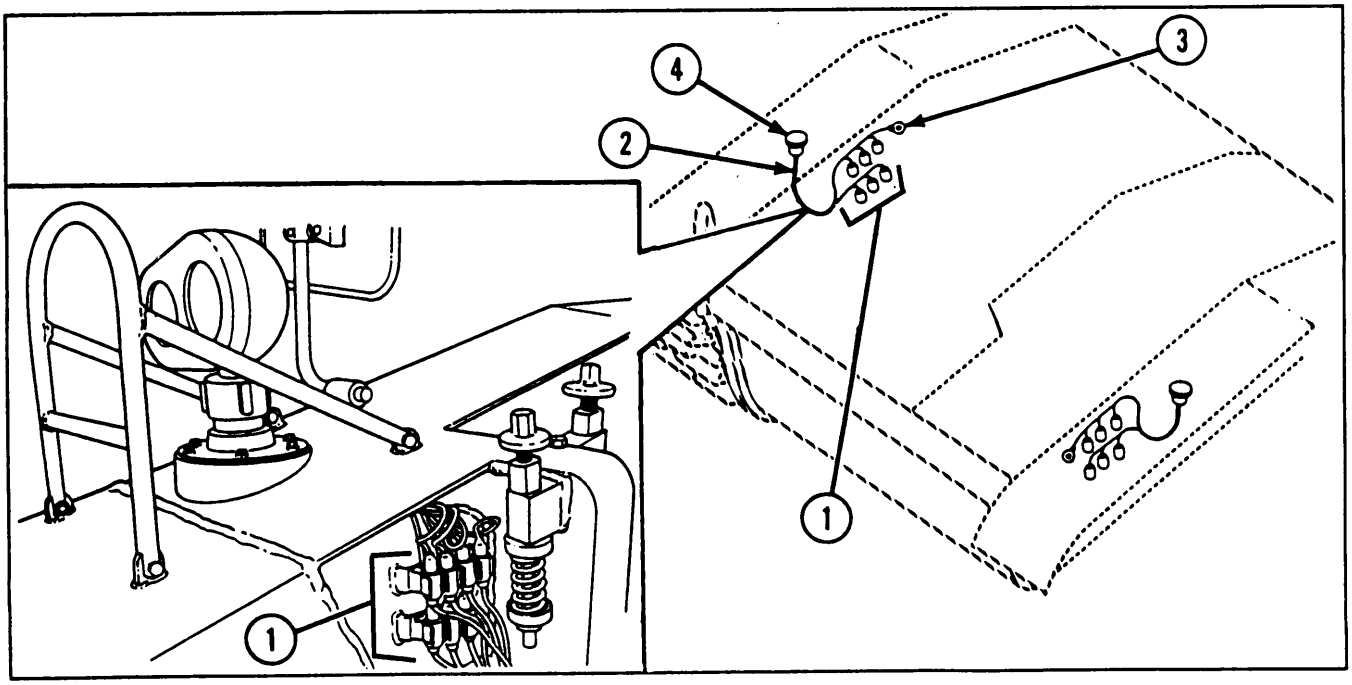
Equipment Conditions
2-840 Batteries disconnected
2-593 Right and left headlamps removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

NOTE

Procedures to remove disconnect to headlamp wiring harness are written for the right side, but apply to both the right and left sides.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

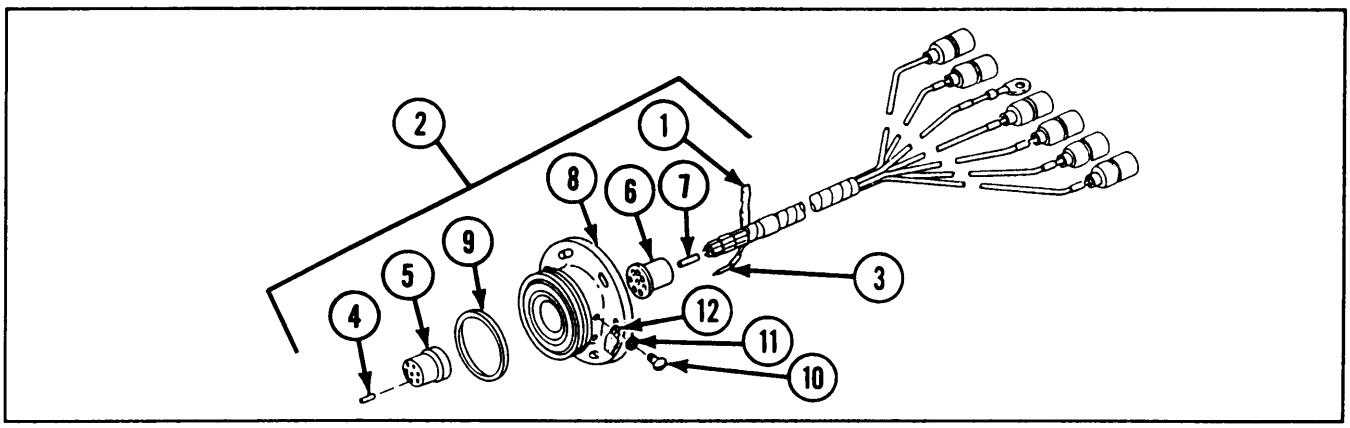
2 Tag and disconnect six shell connectors (1) from line connection on right disconnect to headlamp wiring harness (2).

3 Disconnect cable terminal (3) from ground on right disconnect to headlamp wiring harness (2).

4 Remove headless connectors base assembly (4) from hull.

5 Remove right disconnect to headlamp wiring harness (2) from hull.

DISASSEMBLY



1 Strip insulation (1) back from headless connectors base assembly (2).

NOTE

The following steps are written for the removal of one electrical lead, but apply to all electrical leads.

2 Remove electrical wire (3) and electrical contact (4) from rubber bushing (5) and electrical insert (6).

3 Remove electrical contact (4) from electrical wire (3).

4 Remove rod (7) from electrical insert (6).

5 Remove electrical insert (6) from threaded base (8).

6 Remove rubber bushing (5) from threaded base (8).

7 Remove nonmetallic seal (9) from threaded base (8).

8 Remove two machine screws (10), two lockwashers (11), and spring tension clip (12) from threaded base (8).

2-114. MAINTENANCE OF RIGHT AND LEFT DISCONNECT TO HEADLAMP WIRING HARNESSES (CONT).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

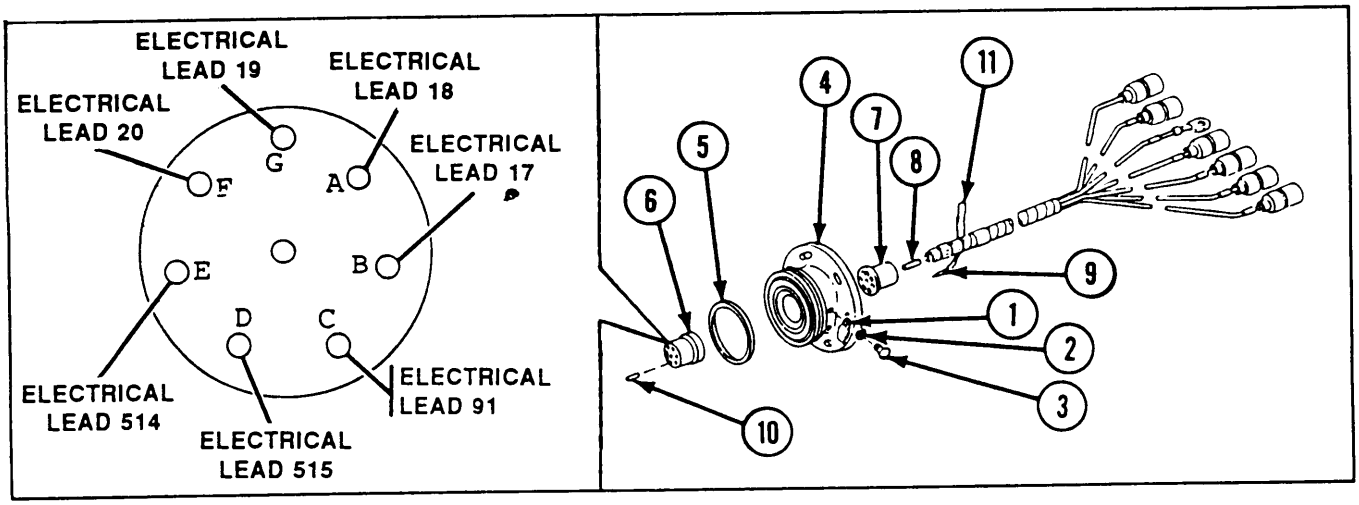
2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of cable terminal and shell connectors, refer to general maintenance, page 2-371.

4 Electrical wire and rod are manufactured items, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY



1 Install spring tension clip (1), two new lockwashers (2), and two machine screws (3) on threaded base (4).

2 Install new nonmetallic seal (5) on threaded base (4).

3 Align rubber bushing (6) with keyway in threaded base (4), and install rubber bushing in threaded base.

4 Install electrical insert (7) in threaded base (4). Install rod (8) in electrical insert.

5 Solder electrical wire (9) to electrical contacts (10) with solder per TB SIG-222.

6 Install electrical lead 19 through pin hole G in electrical insert (7) and rubber bushing (6).

7 Install electrical lead 18 through pin hole A in electrical insert (7) and rubber bushing (6).

8 Install electrical lead 17 through pin hole B in electrical insert (7) and rubber bushing (6).

9 Install electrical lead 91 through pin hole C in electrical insert (7) and rubber bushing (6).

10 Install electrical lead 515 through pin hole D in electrical insert (7) and rubber bushing (6).

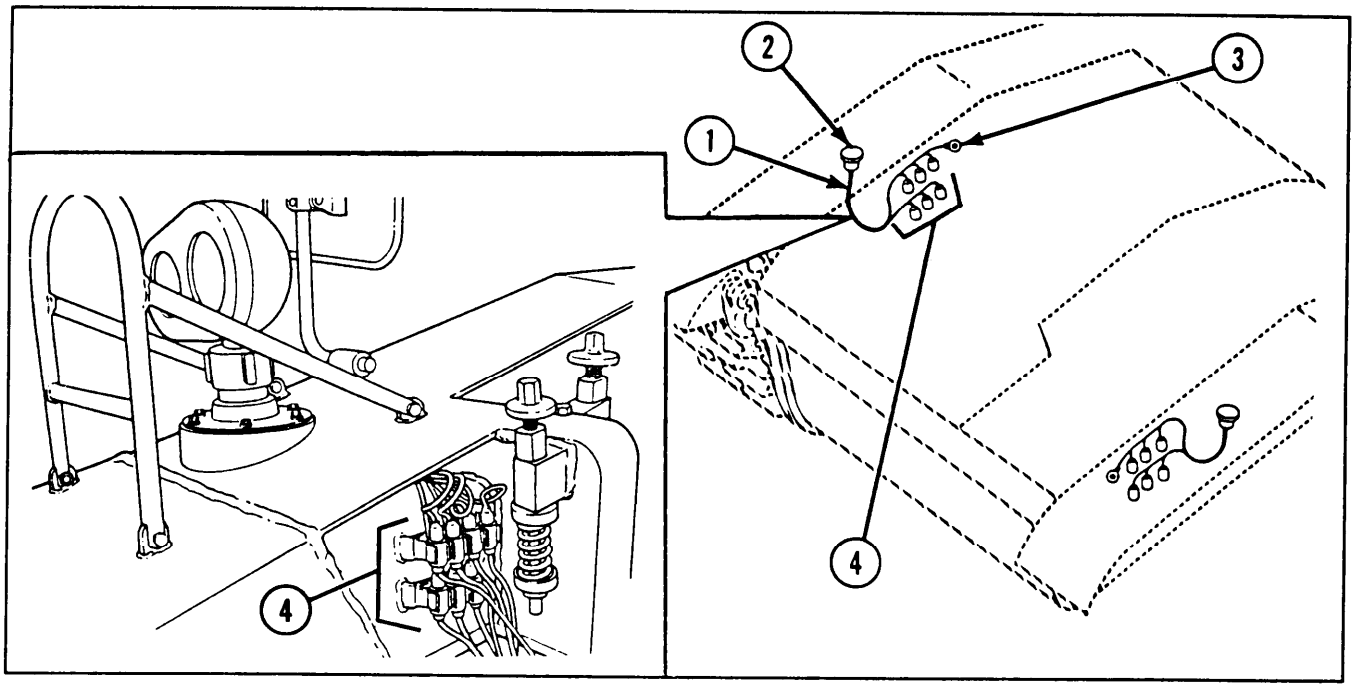
11 Install electrical lead 514 through pin hole E in electrical insert (7) and rubber bushing (6).

12 Install electrical lead 20 through pin hole F in electrical insert (7) and rubber bushing (6).

13 Check continuity of each electrical lead in disconnect to headlamp wiring harness per MIL-STD-202, method 303.

14 Install insulation tape (11) on electrical wires (9) where insulation was stripped back. Make 0.5 in. (1.27 cm) overlapping turns to ensure that leads are adequately covered.

INSTALLATION



NOTE

Procedures to install disconnect to headlamp wiring harness are written for the right side, but apply to both the right and left sides.

1 Install right disconnect to headlamp wiring harness (1) to hull.

2 Slide headless connectors base assembly (2) into hull.

3 Connect cable terminal (3) to ground on right disconnect to headlamp wiring harness (1).

4 Untag and connect six shell connectors (4) to line connections on right disconnect to headlamp wiring harness (1).

5 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-115. MAINTENANCE OF RELAY TO STARTER AND NEUTRAL POSITION SWITCH BRANCHED WIRING HARNESS.

This task covers:	a. *Removal* b. *Disassembly* *c. Inspection/Repair*	d. *Reassembly* *e. Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Insulation sleeving (figure D-22, appx D)

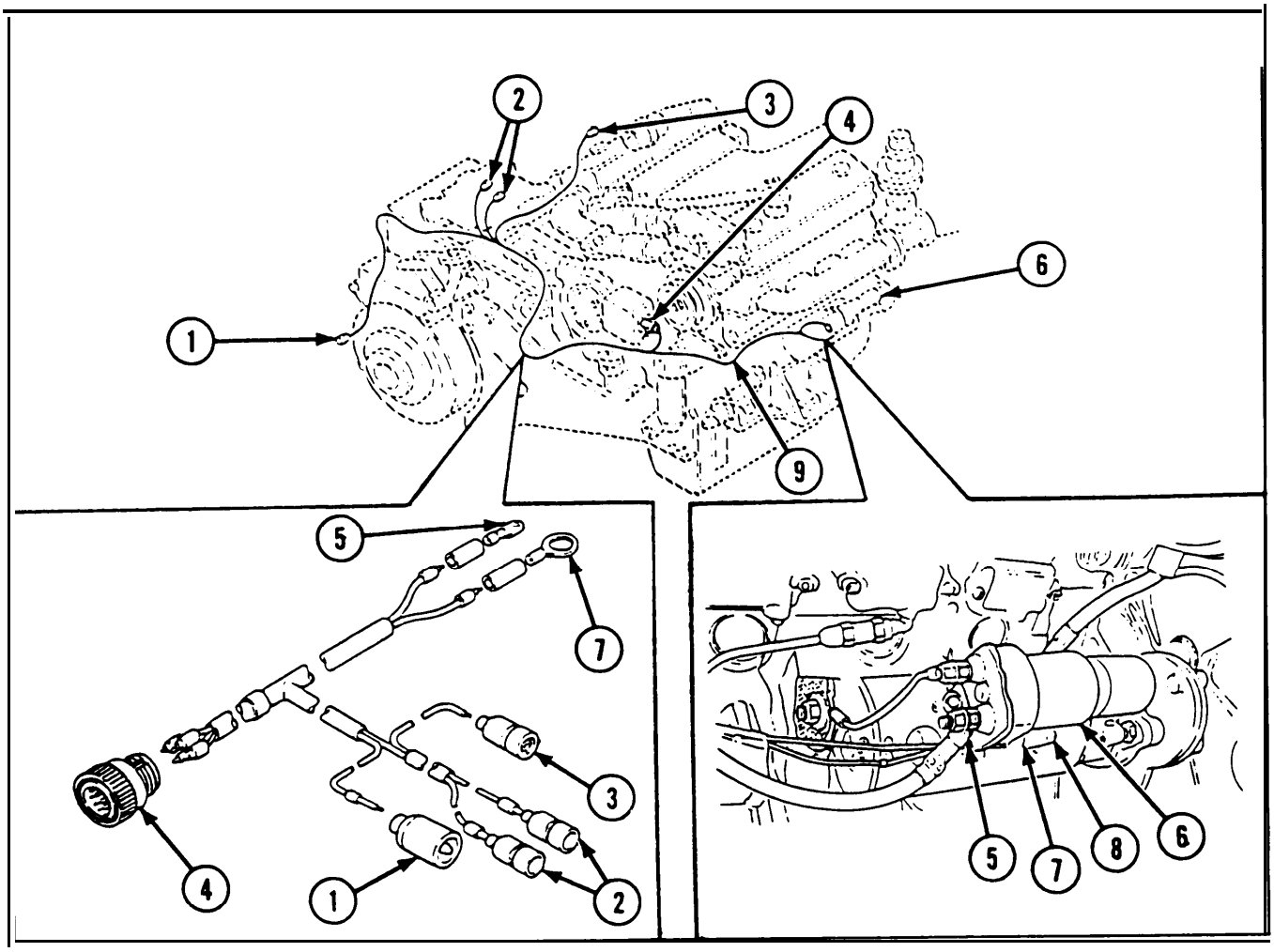
References
TM 9-2350-238-24P-1

Equipment Conditions
2-640 Batteries disconnected
2-384 Powerplant removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the powerplant with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Tag and disconnect shell connector (1) from line connection.

3 Tag and disconnect two shell connectors (2) from neutral position switch.

4 Tag and disconnect shell connector (3) from line connection.

5 Disconnect plug connector (4) from relay.

6 Tag and disconnect cable terminal (5) from starter coil (6).

7 Tag and disconnect cable terminal (7) from 24-volt feed starter terminal (8).

8 Remove relay to starter and neutral position switch branched wiring harness (9) from powerplant.

DISASSEMBLY

For disassembly of wiring harness plug connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of cable terminals and shell connectors, refer to general maintenance, page 2-371.

4 Electrical wire and insulation sleeving are manufactured items, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness plug connector, refer to general maintenance, page 2-371.

1 Install relay to starter and neutral position switch branched wiring harness (9) to powerplant.

2 Untag and connect cable terminal (7) to 24-volt feed starter terminal (8).

3 Untag and connect cable terminal (5) to starter coil (6).

4 Connect plug connector (4) to relay.

5 Untag and connect shell connector (3) to line connection.

6 Untag and connect two shell connectors (2) to neutral position switch.

7 Untag and connect shell connector (1) to line connection.

8 Wiring harnesses and leads are secured to the powerplant with loop clamps, straps, ground screws, etc. During installation, make sure the wiring harness or lead is secure and ail hardware is tight.

2-116. MAINTENANCE OF FUEL PURGE-AND-PRIME SWITCH TO SOLENOID ELECTRICAL LEAD (ENGINE MODEL 7083-7398).

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)

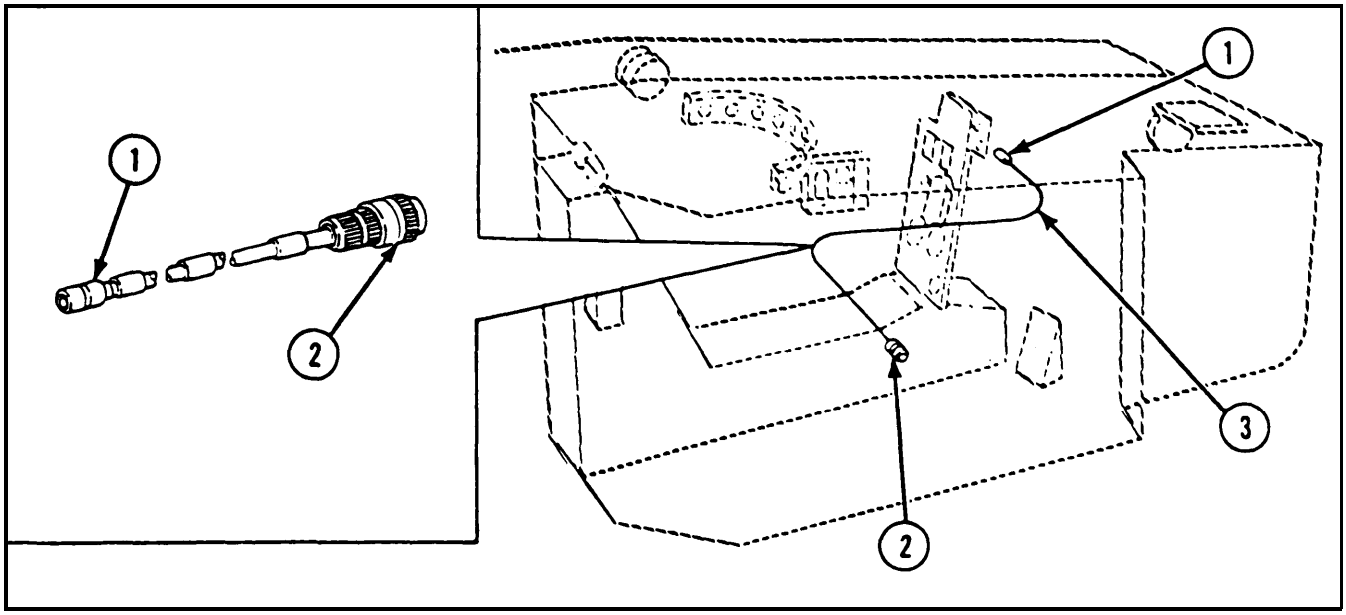
References
TM 9-2350-238-24P-1

Equipment Conditions
2-840 Batteries disconnected
2-952 Driver's seat removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Disconnect shell connector (1) from prime switch.

3 Disconnect plug connector (2) from solenoid valve.

4 Remove fuel purge-and-prime switch to solenoid electrical lead (3) from hull through driver's compartment.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connector, refer to general maintenance, page 2-371.

4 Electrical wire is a manufactured item, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install fuel purge-and-prime switch to solenoid electrical lead (3) in hull through driver's compartment.

2 Connect plug connector (2) to solenoid valve.

3 Connect shell connector (1) to prime switch.

4 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-117. MAINTENANCE OF WARNING LIGHT LOW COOLANT DETECTOR TO BULKHEAD DISCONNECT BRANCHED WIRING HARNESS.

This task covers: a. *Removal* b. *Inspection/Repair* *c. Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-640 Batteries disconnected

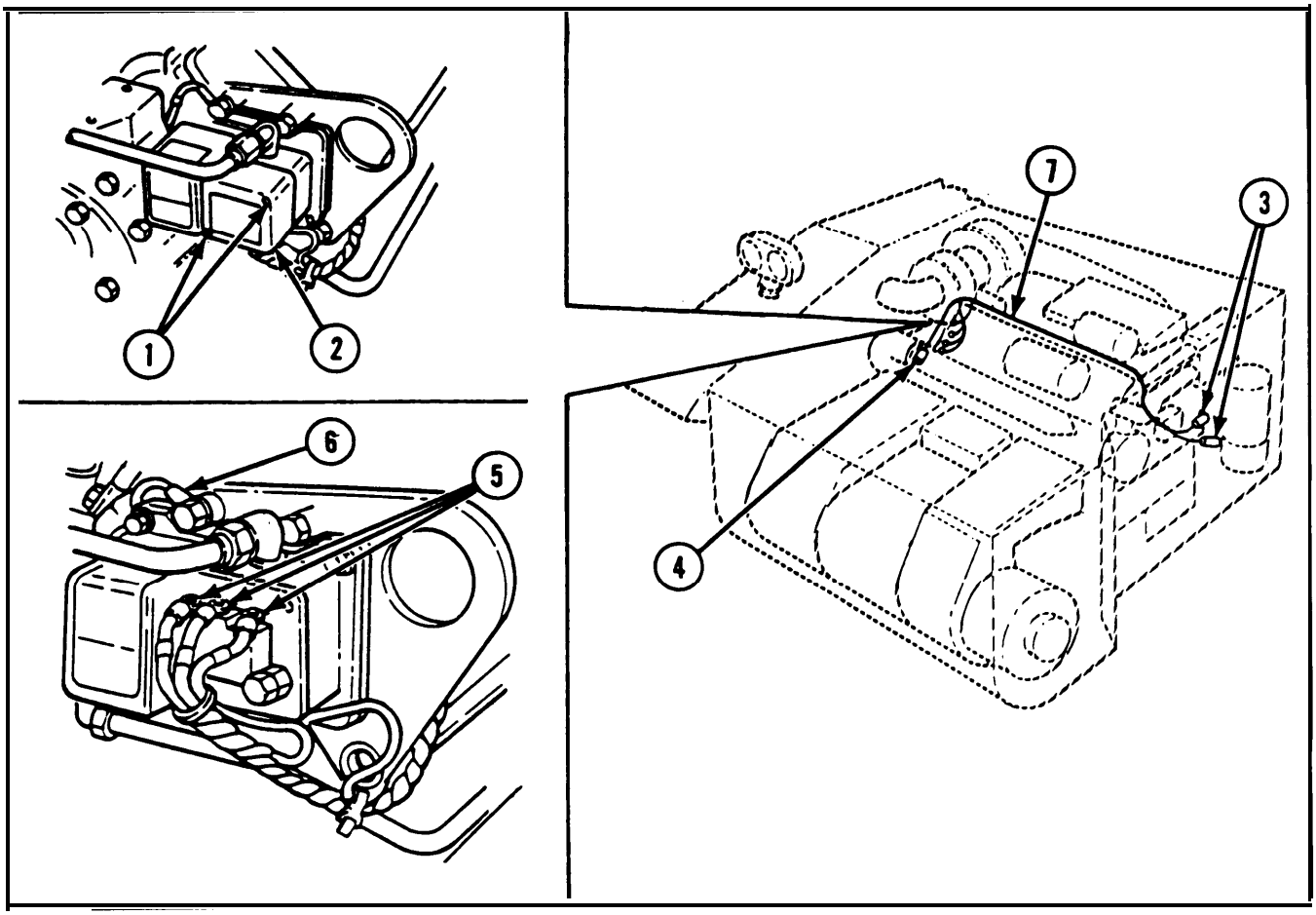
General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

2-117. MAINTENANCE OF WARNING LIGHT LOW COOLANT DETECTOR TO BULKHEAD DISCONNECT BRANCHED WIRING HARNESS (CONT).

REMOVAL



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the engine with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Remove two screws (1) and aeration detection cover (2).

3 Tag and disconnect two shell connectors (3) from line disconnects to warning light.

4 Tag and disconnect shell connector (4) from diode assembly and transmission temperature warning switch.

5 Tag and disconnect three cable terminals (5) from aeration detector.

6 Tag and disconnect cable terminal (6) from ground.

7 Remove warning light low coolant detector to bulkhead disconnect branched wiring harness (7) from powerplant.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors and cable terminals, refer to page 2-371.

4 Electrical wire is a manufactured item, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install warning light low coolant detector to bulkhead disconnect branched wiring harness (1) on powerplant.

2 Untag and connect cable terminal (2) to ground.

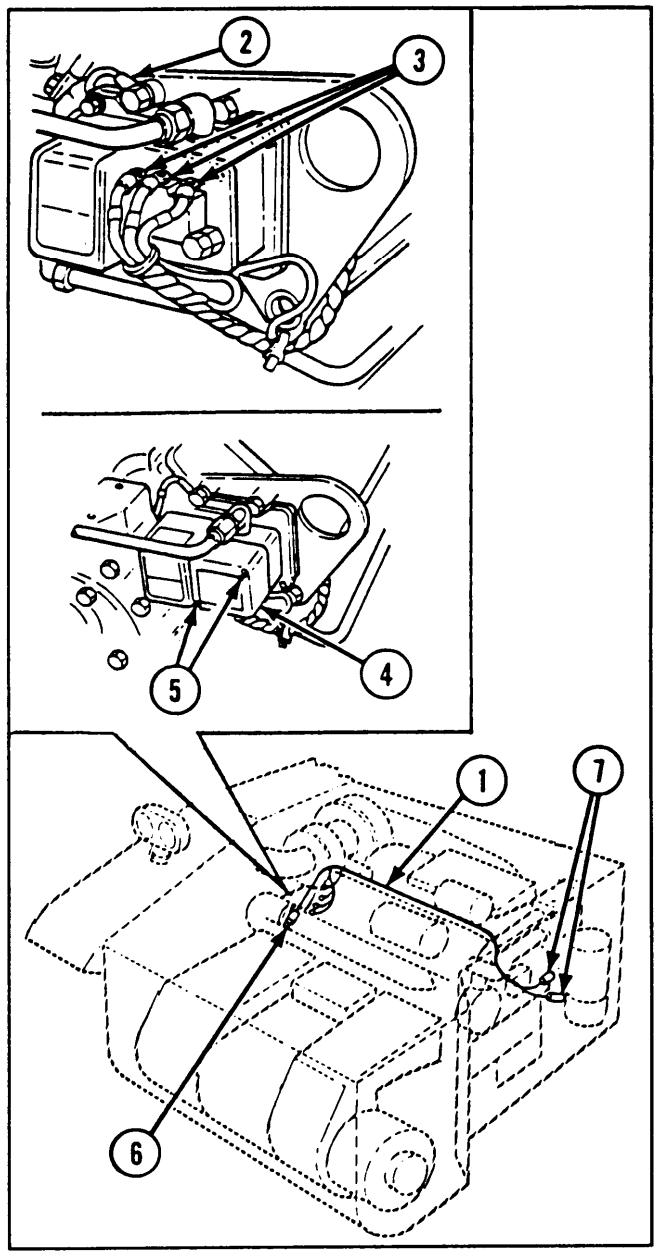
3 Untag and connect three cable terminals (3) to aeration detector.

4 Install aeration detector cover (4) and two screws (5).

5 Untag and connect shell connector (6) to diode assembly and transmission temperature warning switch.

6 Untag and connect two shell connectors (7) to line disconnects to warning light.

7 Wiring harnesses and leads are secured to the engine with loop clamps, straps, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.



2-118. MAINTENANCE OF AERATION DETECTOR BRANCHED WIRING HARNESS.

This task covers: a. *Removal* b. *Inspection/Repair* *c. Installation*

INITIAL SETUP

Matetials/Parts
Electrical wire (figure D-2, appx D)

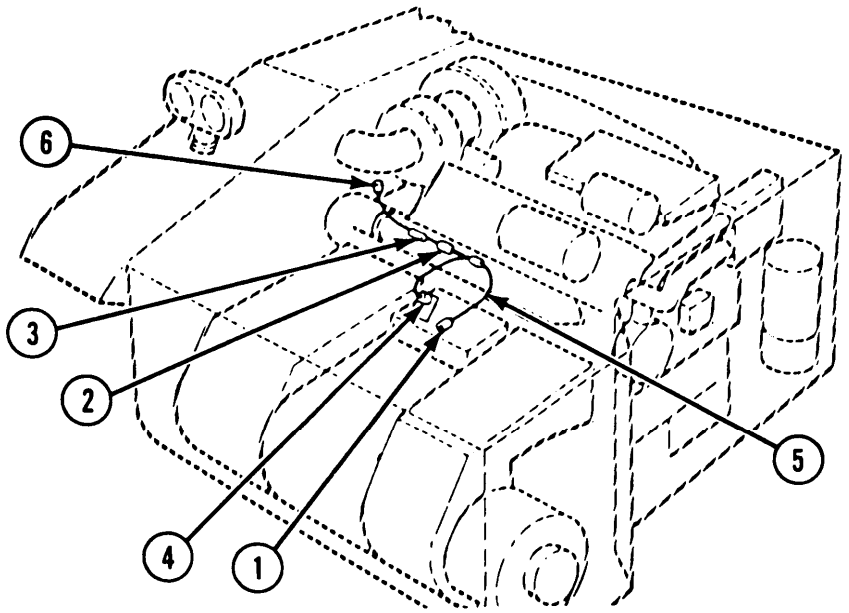
References
TM 9-2350-238-24P-1

Equipment Conditions
2-640 Batteries disconnected
2-384 Powerplant removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the powerplant with loop clamps, straps, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Tag and disconnect shell connector (1) from horn relay.

3 Tag and disconnect shell connector (2) from aeration detector lead and diode assembly (3).

4 Disconnect shell connector (4) from transmission oil thermostatic switch.

5 Remove aeration detector branched wiring harness (5) from powerplant.

6 Disconnect shell connector (6) from line connection.

7 Remove aeration detector lead and diode assembly (3) from powerplant.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors, refer to general maintenance, page 2-371.

4 Electrical wire is a manufactured item, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24 P-1).

INSTALLATION

1 Install aeration detector lead and diode assembly (3) in powerplant.

2 Connect shell connector (6) to line connection.

3 Install aeration detector branched wiring harness (5) to powerplant.

4 Connect shell connector (4) to transmission oil thermostatic switch.

5 Connect shell connector (2) to aeration detector lead and diode assembly (3).

6 Connect shell connector (1) to horn relay.

7 Wiring harnesses and leads are secured to the powerplant with loop clamps, straps, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-119. MAINTENANCE OF LOW COOLANT WARNING LIGHT TO BULKHEAD DISCONNECT BRANCHED WIRING HARNESS.

This task covers:
a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. Installation

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)

References
TM 9-2350 -238-24P-1

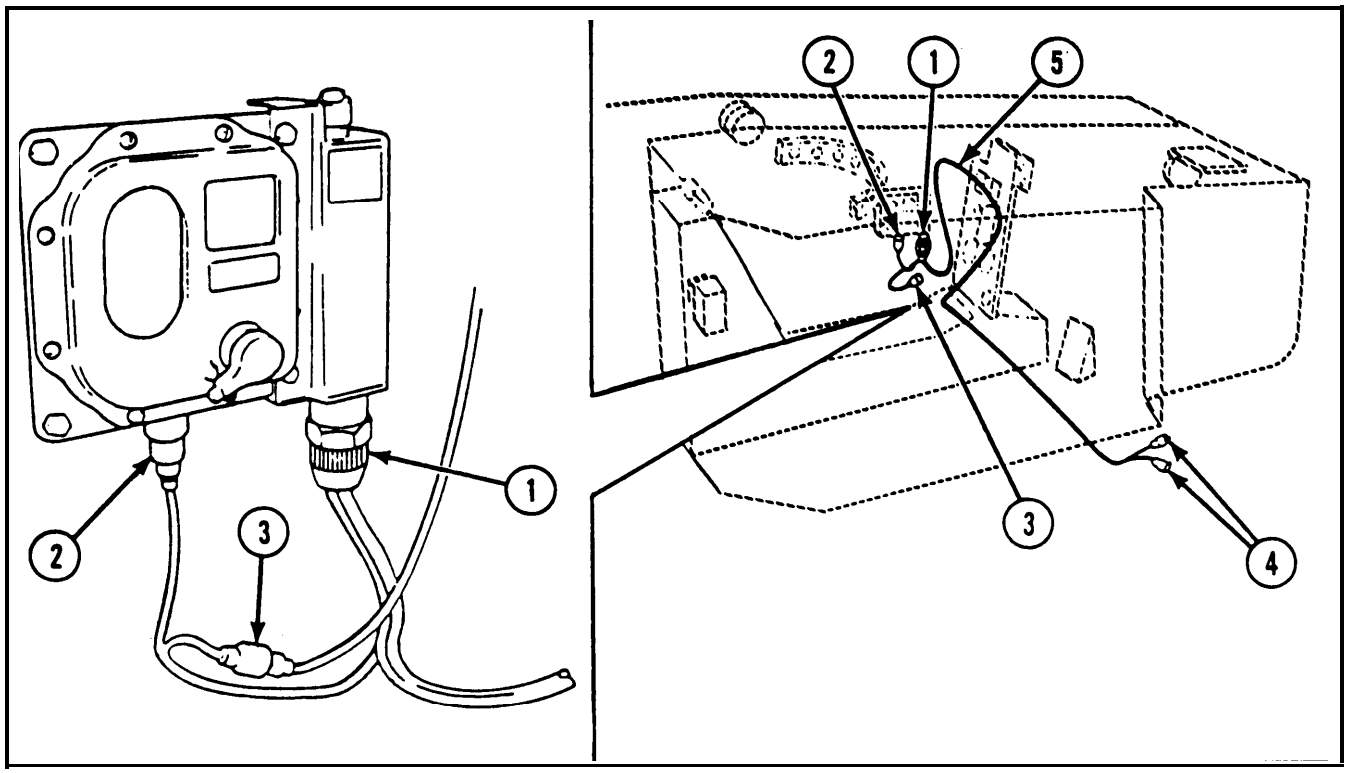
Equipment Conditions
2-640 Batteries disconnected
2-952 Driver's seat removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

2-119. MAINTENANCE OF LOW COOLANT WARNING LIGHT TO BULKHEAD DISCONNECT BRANCHED WIRING HARNESS (CONT).



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Disconnect plug connector (1) from low engine coolant warning indicator light.

3 Disconnect shell connector (2) from driver's compartment dome light.

4 Disconnect shell connector (3) from line disconnect to circuit breaker.

5 Disconnect two shell connectors (4) from line disconnects to aeration detector.

6 Remove low coolant warning light to bulkhead disconnect branched wiring harness (5) from hull through driver's compartment.

DISASSEMBLY

For disassembly of wiring harness plug connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors, refer to general maintenance, page 2-371.

4 Electrical wire is a manufactured item, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness plug connector, refer to general maintenance, page 2-371.

INSTALLATION

1 Install low coolant warning light to bulk-head disconnect branched wiring hanress (5) in hull through driver's compartment.

2 Connect two shell connectors (4) to line disconnects to aeration detector.

3 Connect shell connector (3) to line disconnect to circuit breaker.

4 Connect shell connector (3) to driver's compartment dome light.

5 Connect plug connector (1) to low engine coolant warning indicator light.

6 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-120. MAINTENANCE OF MASTER RELAY TO BULKHEAD DISCONNECT SPECIAL CABLE ASSEMBLY.

This task covers: a. *Removal* b. *Disassembly* c. *Inspection/Repair* d. *Reassembly* e. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)

References
TM 9-2350-238-24P-1

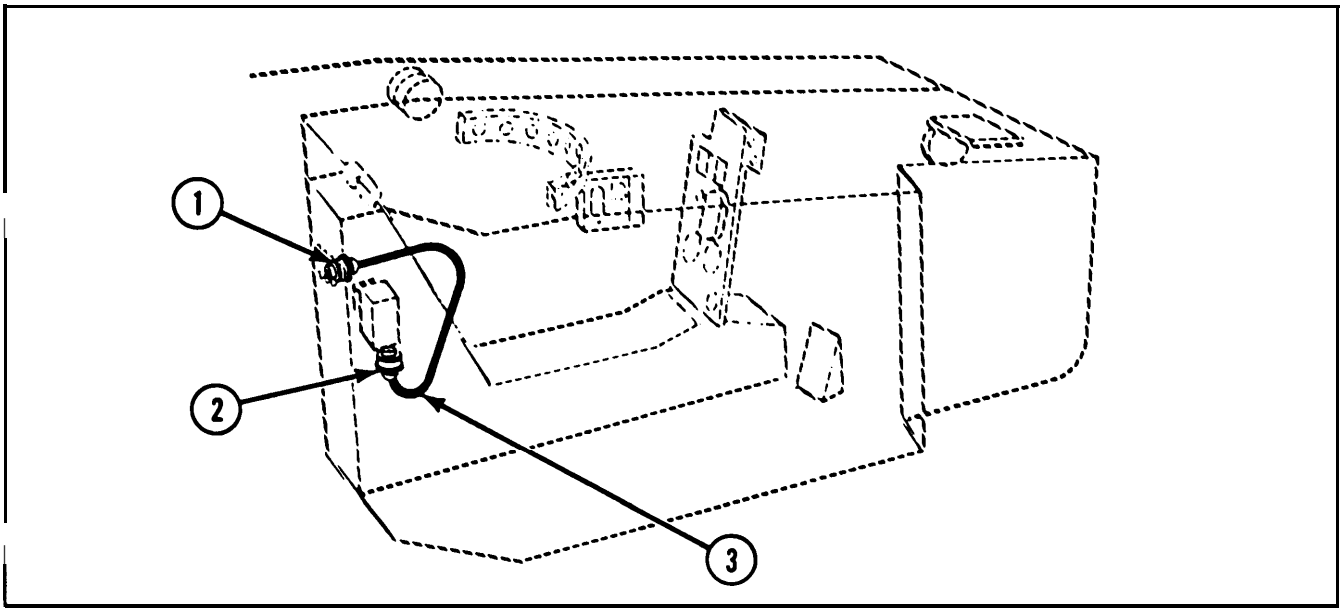
Equipment Conditions
2-640 Batteries disconnected
2-952 Driver's seat removed
2-928 Driver's compartment forward cowl removed
2-928 Driver's compartment aft cowl removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

2-120. MAINTENANCE OF MASTER RELAY TO BULKHEAD DISCONNECT SPECIAL CABLE ASSEMBLY (CONT).



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Tag and disconnect plug connector (1) from bulkhead disconnect to batteries.

3 Tag and disconnect plug connector (2) from master relay.

4 Remove master relay to bulkhead disconnect electrical lead (3) from hull through driver's compartment.

DISASSEMBLY

For disassembly of wiring harness plug connectors, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 Electrical wire is a manufactured item, refer to appendix D.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24 P-1).

REASSEMBLY

For reassembly of wiring harness plug connectors, refer to general maintenance, page 2-371.

INSTALLATION

1 Install master relay to bulkhead disconnect electrical lead (3) to hull through driver's compartment.

2 Untag and connect plug connector (2) to master relay.

3 Untag and connect plug connector (1) to bulkhead disconnect to batteries.

4 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-121. MAINTENANCE OF VOLTAGE REGULATOR TO BULKHEAD DISCONNECT, SLAVE RECEPTACLE, AND ACCESSORIES PANEL SPECIAL CABLE ASSEMBLY; AND SLAVE RECEPTACLE AND GROUND ELECTRICAL LEAD.

This task covers:
a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Electrical wire (figure D-2, appx D)
Electrical wire (figure D-2, appx D)
Electrical wire (figure D-2, appx D)
Rod (figure D-24, appx D)
Rod (figure D-25, appx D)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-918 Hull access cover removed
2-840 Battery access cover open and all batteries removed

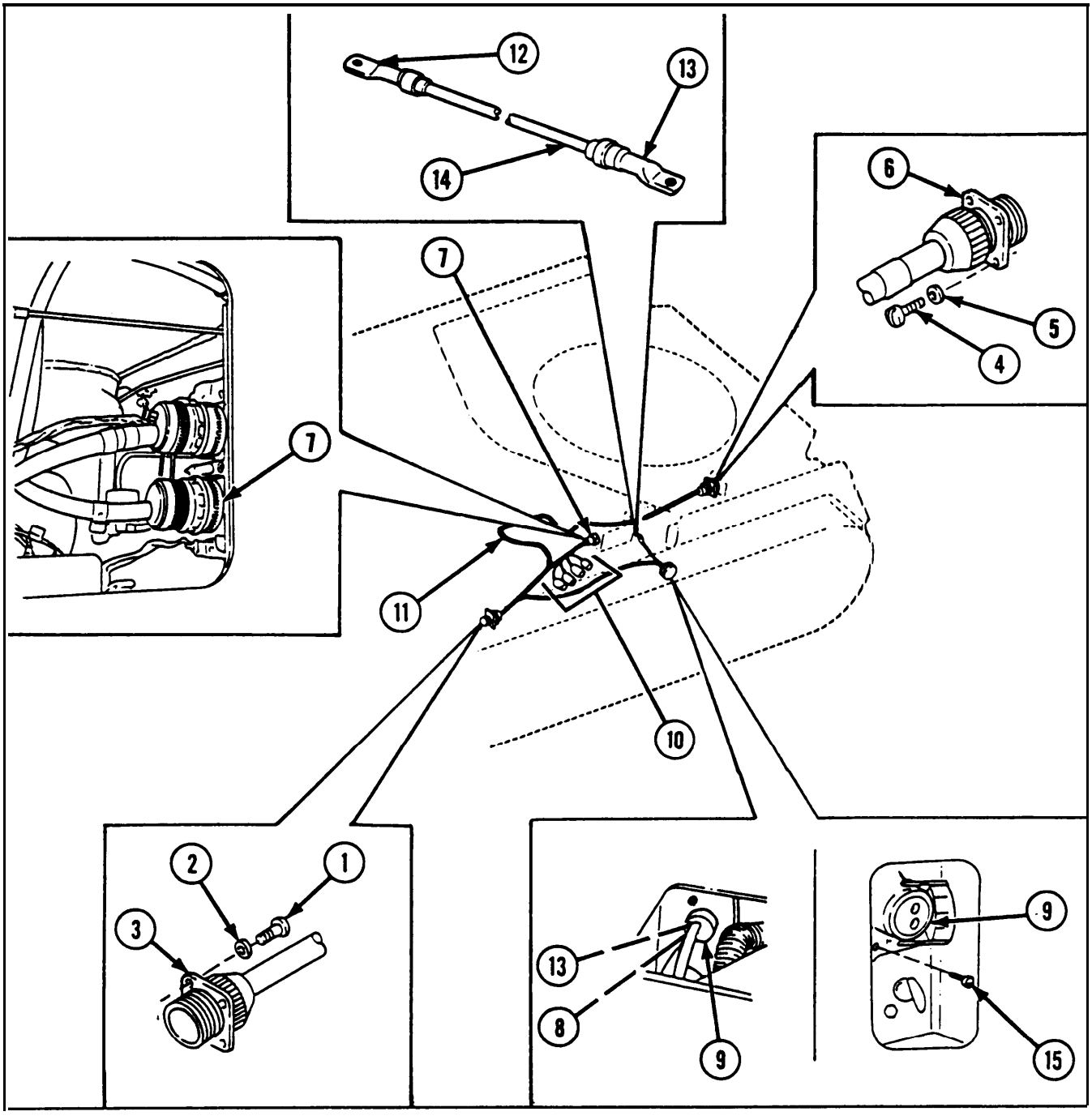
General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

2-121. MAINTENANCE OF VOLTAGE REGULATOR TO BULKHEAD DISCONNECT, SLAVE RECEPTACLE, AND ACCESSORIES PANEL SPECIAL CABLE ASSEMBLY, AND SLAVE RECEPTACLE AND GROUND ELECTRICAL LEAD (CONT).

REMOVAL



Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Remove four screws (1) and four washers (2), and tag and disconnect receptacle connector (3) from bulkhead disconnect.

3 Remove four screws (4) and four washers (5), and tag and disconnect receptacle connector (6) from hull disconnect.

4 Disconnect plug connector (7) from voltage regulator.

5 Disconnect cable terminal (8) of voltage regulator to bulkhead disconnect, slave receptacle, and accessories panel special cable assembly from slave receptacle connector (9).

6 Tag and disconnect four shell connectors (10) from circuit breakers.

7 Remove voltage regulator to bulkhead disconnect, slave receptacle, and accessories panel special cable assembly (11) from hull.

8 Tag and disconnect cable terminal (12) of slave receptacle and ground electrical lead from hull.

9 Tag and disconnect cable terminal (13) of slave receptacle and ground electrical lead from slave receptacle connector (9).

10 Remove slave receptacle and ground electrical lead (14) from hull.

11 Remove four screws (15) and slave receptacle connector (9) from hull.

DISASSEMBLY

For disassembly of wiring harness plug connector and receptacle connectors, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number to new band.

3 For repair of shell connectors and cable terminals, refer to general maintenance, page 2-371.

4 Electrical wires and rods are manufactured items, refer to appendix D.

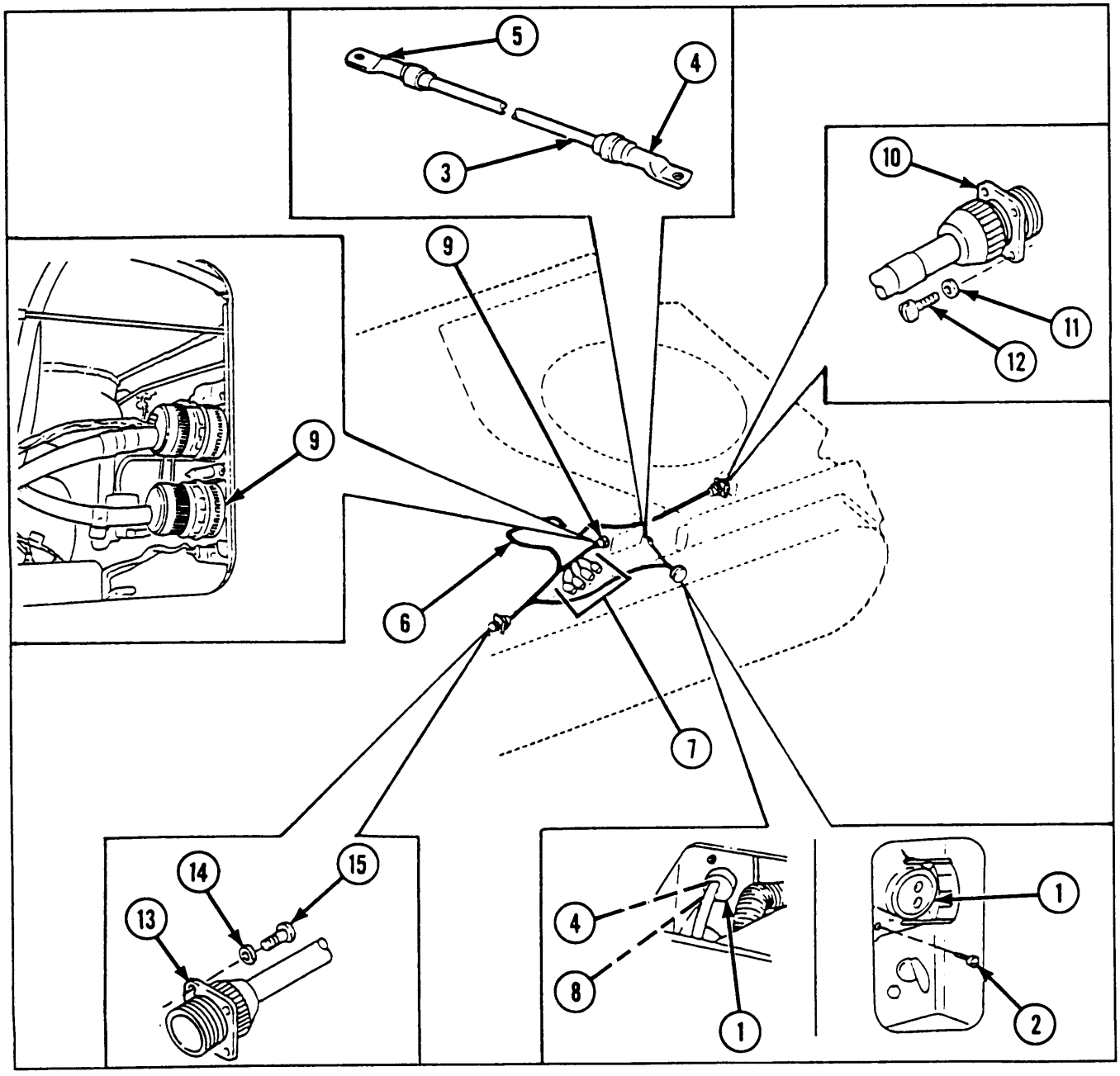
5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-121. MAINTENANCE OF VOLTAGE REGULATOR TO BULKHEAD DISCONNECT, SLAVE RECEPTACLE, AND ACCESSORIES PANEL SPECIAL CABLE ASSEMBLY, AND SLAVE RECEPTACLE AND GROUND ELECTRICAL LEAD (CONT).

REASSEMBLY

For reassembly of wiring harness plug connector and receptacle connectors, refer to general maintenance, page 2-371.

INSTALLATION



1 Install slave receptacle connector (1) and four screws (2) in hull.

2 Install slave receptacle and ground electrical lead (3) in hull.

3 Untag and connect cable terminal (4) of slave receptacle and ground electrical lead to slave receptacle connector (1).

4 Untag and connect cable terminal (5) of slave receptacle and ground electrical lead to hull.

5 Install voltage regulator to bulkhead disconnect, slave receptacle, and accessories panel special cable assembly (6) in hull.

6 Untag and connect four shell connectors (7) to circuit breakers.

7 Connect cable terminal (8) of voltage regulator to bulkhead disconnect, slave receptacle, and accessories panel special cable assembly to slave receptacle connector (1).

8 Connect plug connector (9) to voltage regulator.

9 Untag and connect receptacle connector (10), and install four washers (11) and four screws (12).

10 Untag and connect receptacle connector (13), and install four washers (14) and four screws (15).

11 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-122. MAINTENANCE OF AIR CLEANER BLOWER RELAY TO BULKHEAD DISCONNECT BRANCHED WIRING HARNESS.

This task covers:
a. *Removal*
b. *Disassembly*
c. Inspection/Repair
d. *Reassembly*
e. Installation

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)
Nonmetallic rod (figure D-24, appx D)

References
TM 9-2350-238-24P-1

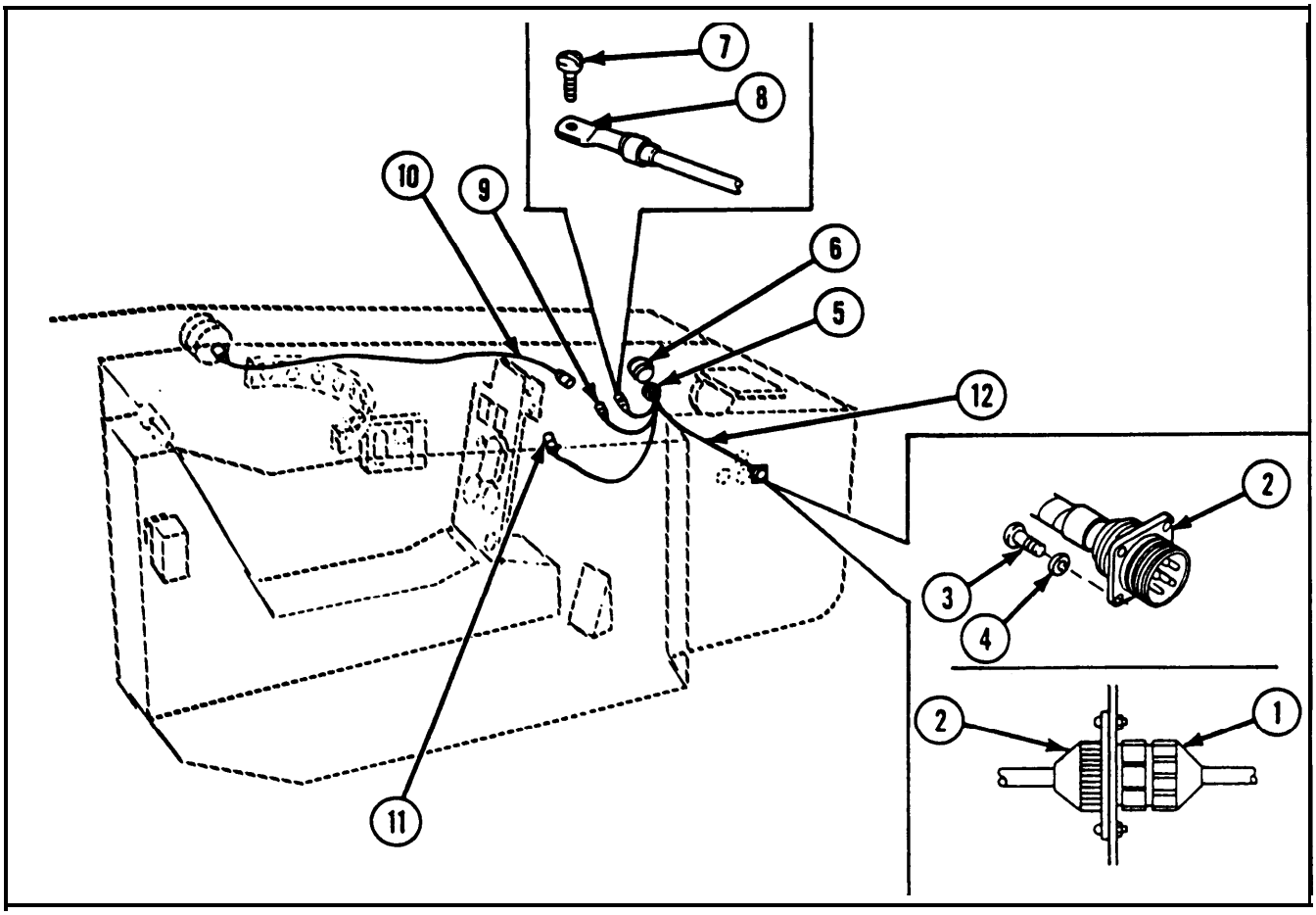
Equipment Conditions
2-640 Batteries disconnected
2-952 Driver's seat removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

2-122. MAINTENANCE OF AIR CLEANER BLOWER RELAY TO BULKHEAD DISCONNECT BRANCHED WIRING HARNESS (CONT).



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead which is being removed.

2 Disconnect plug connector (1) from receptacle connector (2).

3 Remove four screws (3), four washers (4), and receptacle connector (2) from bulkhead.

4 Disconnect plug connector (5) from air cleaner blower relay (6).

5 Remove screw (7) and cable terminal (8) from bulkhead.

6 Tag and disconnect shell connector (9) from disconnect to forward air cleaner blower motor electrical lead (10).

7 Tag and disconnect shell connector (11) from line connection.

8 Remove air cleaner blower relay to bulkhead disconnect branched wiring harness (12) from driver's compartment.

DISASSEMBLY

For disassembly of wiring harness plug connector and receptacle connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors and cable terminal, refer to general maintenance, page 2-371.

4 Electrical wire and nonmetallic rod are manufactured items, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness plug connector and receptacle connector, refer to general maintenance, page 2-371.

INSTALLATION

1 Install air cleaner blower relay to bulkhead disconnect branched wiring harness (12) in driver's compartment.

2 Untag and connect shell connector (11) to line connection.

3 Untag and connect shell connector (9) to disconnect to forward air cleaner blower motor electrical lead (10).

4 Install cable terminal (8) and screw (7) on bulkhead.

5 Connect plug connector (5) to air cleaner blower relay (6).

6 Install receptacle connector (2), four washers (4), and four screws (3) on bulkhead.

7 Connect plug connector (1) to receptacle connector (2).

8 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-123. MAINTENANCE OF NEUTRAL POSITION SAFETY SWITCH TO ENGINE DISCONNECT ELECTRICAL LEAD.

This task covers:

a. *Removal*
b. *Disassembly*
c. Inspection/Repair
d. *Reassembly*
e. Installation

INITIAL SETUP

Materials/Part
Electrical wire (figure D-2, appx D)
Nonmetallic rod (figure D-24, appx D)

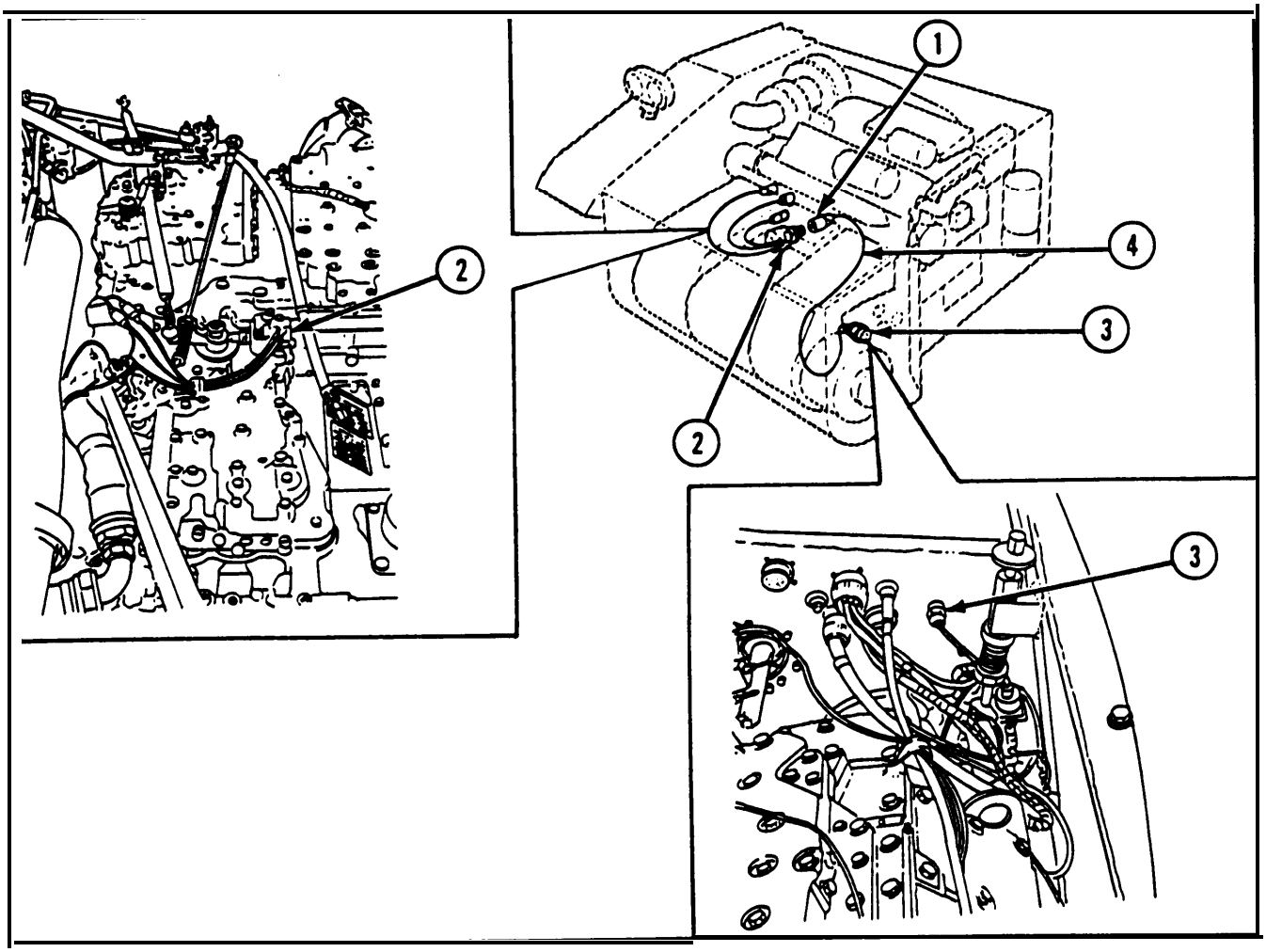
References
TM 9-2350-238-24P-1

Equipment Conditions
2-640 Batteries disconnected
2-384 Powerplant removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead which is being removed.

2 Disconnect shell connector (1) from neutral position safety switch (2).

3 Disconnect plug connector (3) from bulkhead disconnect.

4 Remove neutral position safety switch to engine disconnect electrical lead (4) from powerplant.

DISASSEMBLY

For disassembly of wiring harness plug connector, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connector, refer to general maintenance, page 2-371.

4 Electrical wire and nonmetallic rod are manufactured items, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness plug connector, refer to general maintenance, page 2-371.

INSTALLATION

1 Install neutral position safety switch to engine disconnect electrical lead (4) on powerplant.

2 Connect plug connector (3) to bulkhead disconnect.

3 Connect shell connector (1) to neutral position safety switch (2).

4 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-124. MAINTENANCE OF GENERATOR TO GROUND ENGINE IGNITION LEAD.

This task covers:	a. *Removal*	b. *Inspection/Repair*	*c. Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)

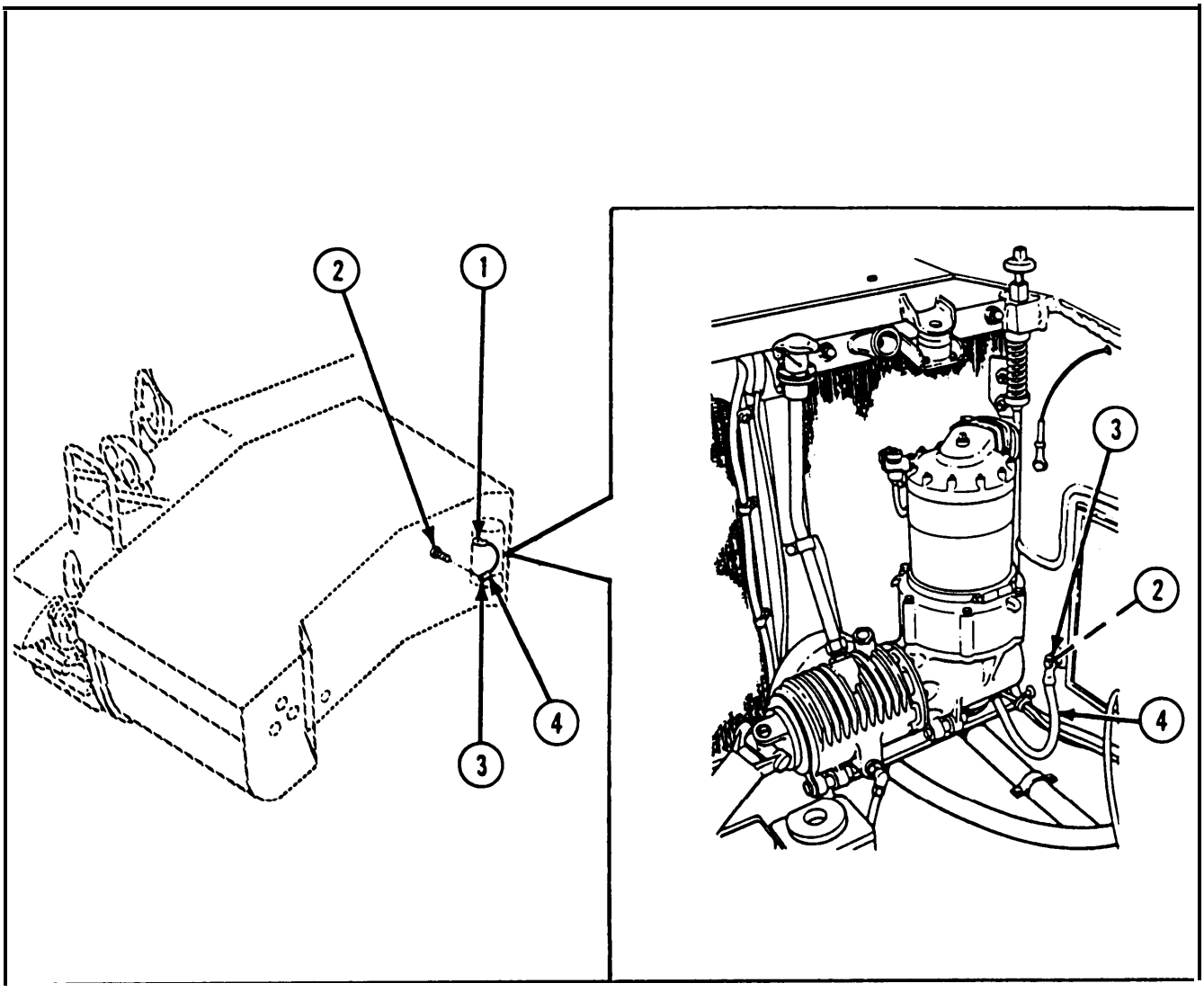
References
TM 9-2350-238-24P-1

Equipment Conditions
2-840 Batteries disconnected
2-384 Powerplant removed

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Tag and disconnect cable terminal (1) from generator terminal E.

3 Loosen screw (2) and disconnect cable terminal (3) from hull.

4 Remove generator to ground engine ignition lead (4) from generator.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of cable terminals, refer to general maintenance, page 2-371.

4 Electrical wire is a manufactured item, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install generator to ground engine ignition lead (4) to generator.

2 Connect cable terminal (3) to hull and tighten screw (2).

3 Untag and connect cable terminal (1) to generator terminal E.

4 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-125. MAINTENANCE OF STARTER TO GROUND ELECTRICAL LEAD.

This task covers: a. *Removal* b. *Inspection/Repair* *c. Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D)

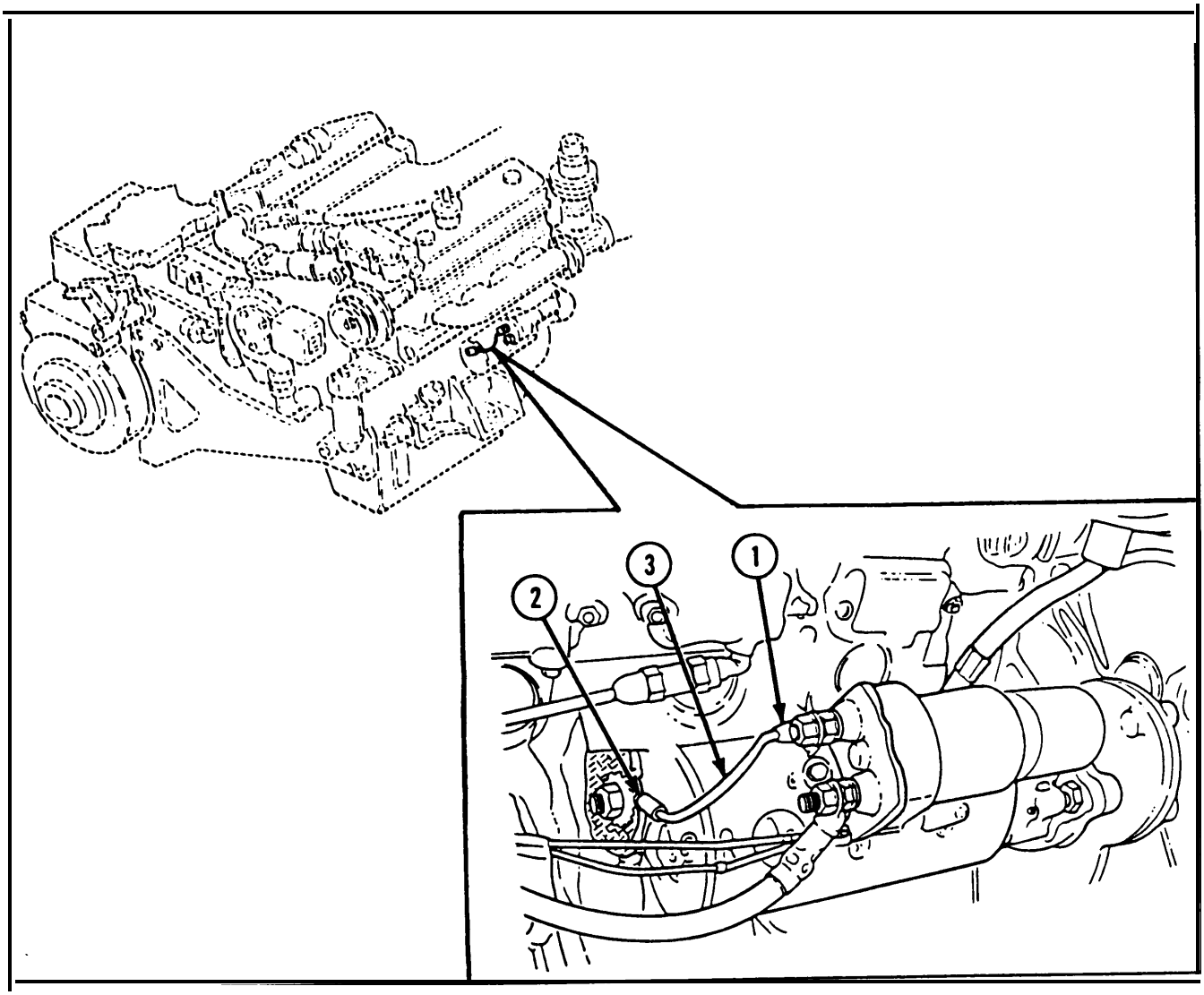
References
TM 9-2350-238-24P-1

Equipment Conditions
2-840 Batteries disconnected
2-384 Powerplant removed

Genera/ Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.



REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the engine with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Tag and disconnect cable terminal (1) from starter.

3 Tag and disconnect cable terminal (2) from starter ground.

4 Remove starter to ground electrical lead (3) from engine.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of cable terminals, refer to general maintenance, page 2-371.

4 Electrical wire is a manufactured item, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install starter to ground electrical lead (3) to engine.

2 Untag and connect cable terminal (2) to starter ground.

3 Untag and connect cable terminal (1) to starter.

4 Wiring harnesses and leads are secured to the engine with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-126. MAINTENANCE OF TRANSMISSION COMPONENTS.

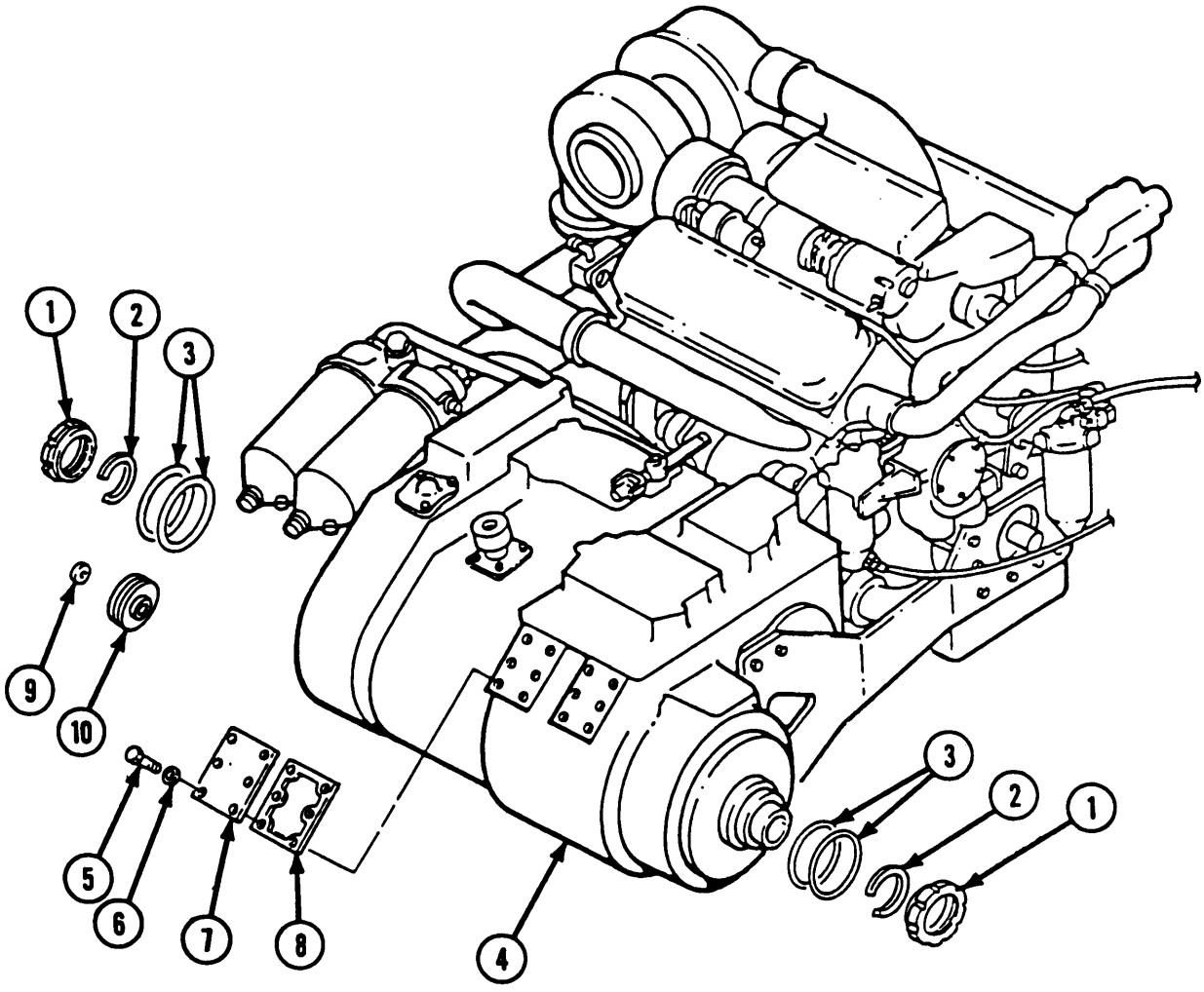
This task covers:	a. *Removal*	b. *Inspection/Repair*	*c. Installation*

INITIAL SETUP

MaterialsParts
Gasket
Lockwasher (4)
Preformed packing
Preformed packing (4)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-384 Powerplant removed



REMOVAL

1 Remove two plain nuts (1), two output shaft retainers (2), and four preformed packings (3) from transmission (4).

2 Remove 12 hexagon head capscrews (5) and 4 lockwashers (6) from 2 brake adjustment covers (7).

3 Remove two brake adjustment covers (7) and two gaskets (8) from transmission (4).

4 Remove preformed packing (9) from speedometer adapter (10).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install new preformed packing (9) in speedometer adapter (10).

2 Install two new gaskets (8) and two brake adjustment covers (7) to transmission (4).

3 Secure 2 brake adjustment covers (7) to transmission (4) with 4 new lockwashers (6) and 12 hexagon head capscrews (5).

4 Install four new preformed packings (3), two output shaft retainers (2), and two plain nuts (1) to transmission (4).

2-127. MAINTENANCE OF TRANSMISSION AND TRANSMISSION PLUGS.

This task covers:	a. *Removal* b. *Inspection/Repair*	c. *Installlation* d. *Test*

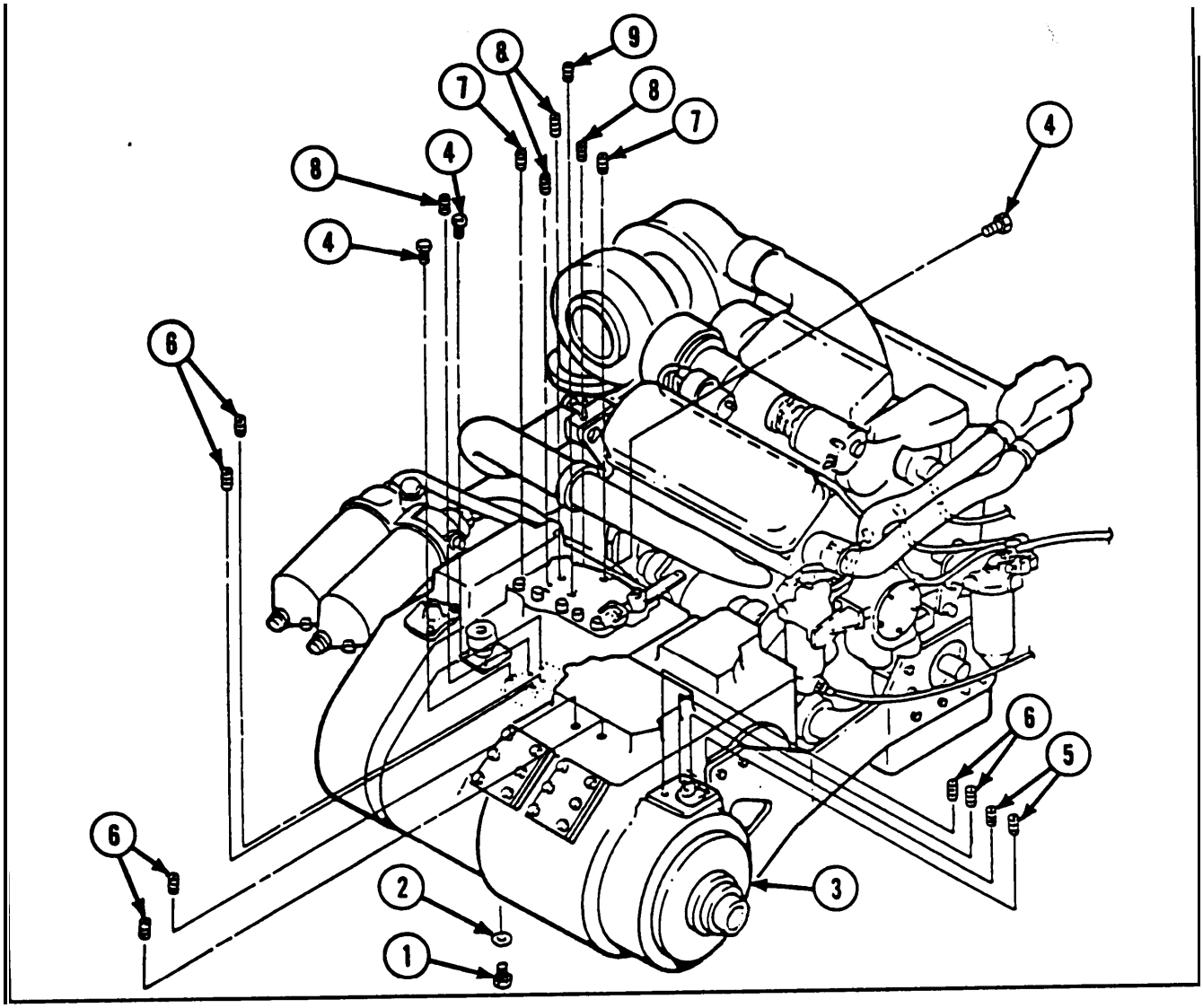
INITIAL SETUP

Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
• Torque wrench (0 to 170 ft-lb)
Pressure gage tester (item 28, appx G)

Materials/Parts
Lockwasher (6)
Metallic-encased gasket

References
TM 9-2350-238-24P-1

2-127. MAINTENANCE OF TRANSMISSION AND TRANSMISSION PLUGS (CONT).



REMOVAL

1 Perform transmission pressure test. Refer to page 2-751.

2 Remove powerplant. Refer to page 2-384.

3 Remove oil drain machine threaded plug (1) and metallic-encased gasket (2) from transmission (3).

4 Remove three pipe plugs (4) from transmission (3).

5 Remove two hexagon socket pipe plugs (5) from transmission (3).

6 Remove six clutch and brake pressure check point pipe plugs (6) from transmission (3).

7 Remove two hexagon socket pipe plugs (7) from transmission (3).

8 Remove four lube pressure check pipe plugs (8) from transmission (3).

9 Remove pipe plug (9) from transmission (3).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

1 Install pipe plug (9) to transmission (3).

2 Install four lube pressure check pipe plugs (8) to transmission (3).

3 Install two hexagon socket pipe plugs (7) to transmission (3).

4 Install six clutch and brake pressure check point pipe plugs (6) to transmission (3).

5 Install two hexagon socket pipe plugs (5) to transmission (3).

6 Install three pipe plugs (4) to transmission (3).

7 Install new metallic-encased gasket (2) and oil drain machine threaded plug (1) to transmission (3).

8 Install powerplant. Refer to page 2-384.

TEST

WARNING

Vehicle has no brakes when final drives are disconnected. Failure to securely block vehicle tracks could injure personnel or damage vehicle or other equipment if vehicle rolls out of control.

1 Park vehicle on level ground. Place 12.0 x 12.0 x 24. 0-in. (30.5 x 30.5 x 61.0 cm) wood block (or equivalent) under front and rear of each track.

2 Remove hull transmission compartment deck assembly. Refer to page 2-938.

2-127. MAINTENANCE OF TRANSMISSION AND TRANSMISSION PLUGS (CONT).

TEST (CONT)

CAUTION

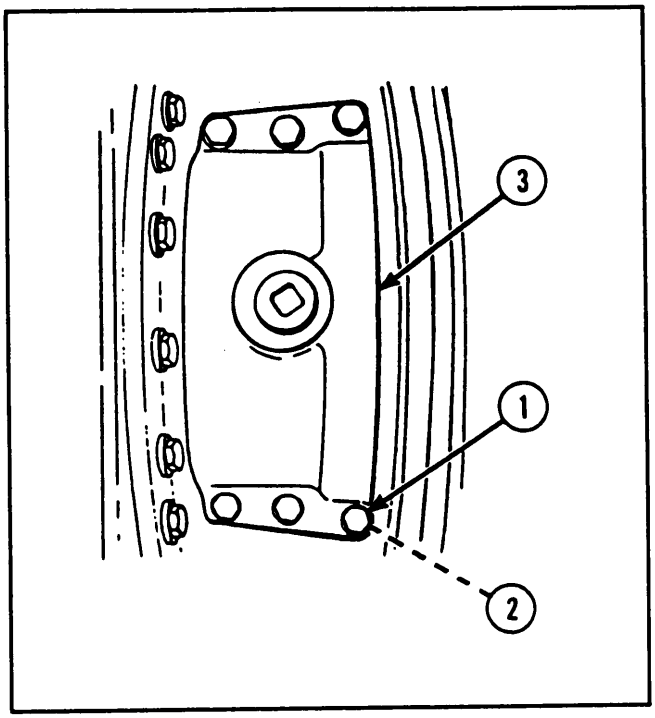
Do not overfill transmission.

3 Check transmission oil level. Oil level must be between ADD and FULL marks on dipstick. Add or drain oil as necessary. Refer to the PMCS/lubrication table, page 2-13.

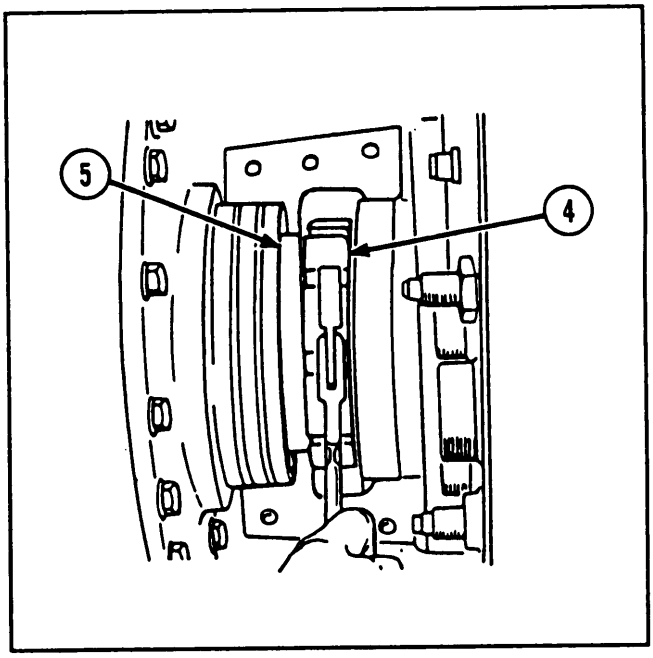
NOTE

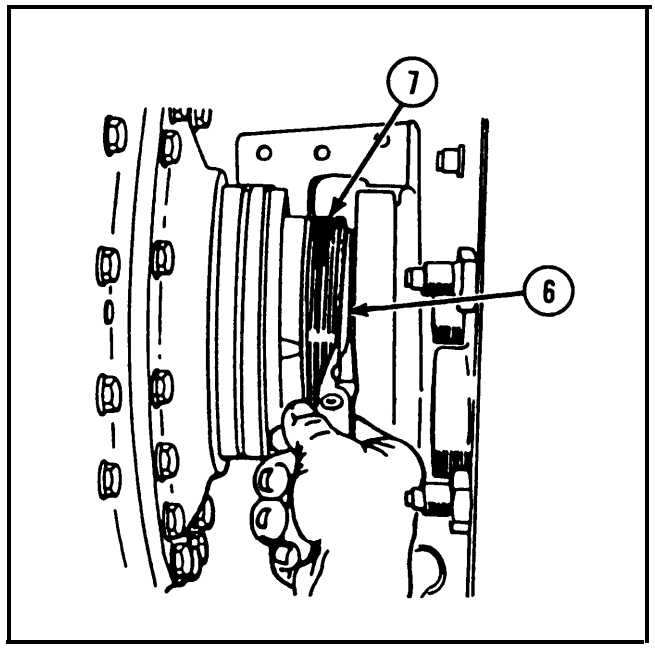
Steps 4 thru 6 are written for one final drive but apply to both final drives. Disconnect both right and left final drives before performing transmission pressure test.

4 Remove six screws (1), six lockwashers (2), and output drive cap (3).



5 Unscrew final drive coupling nut (4) from transmission shaft (5), using drift and hammer, or spanner wrench. Push final drive coupling nut into final drive housing.





6 Remove output shaft retaining ring (6) from final drive pinion shaft (7). Push final drive pinion shaft into final drive housing until clear of transmission.

7 Apply brakes and apply parking brake.

8 Start engine and shift transmission into 4th gear.

CAUTION

If transmission oil temperature gets over 300 °F (149 °C) during any test, stop engine and troubleshoot transmission. Refer to page 2-43.

9 Run engine at 1600 to 1900 rpm for 3 to 8 minutes, or until transmission reaches about 220 °F (140 °C).

10 Shift transmission through all ranges several times.

11 Shift transmission to neutral (N). Increase engine speed to 1350 (1200 to 1500) rpm.

12 During warmup period, check transmission for leaks. Tighten loose bolts, plugs, and hose fittings. Replace damaged or missing parts. Refer to page 2-748 and page 2-749. If leakage cannot be stopped, notify direct support maintenance and stop pressure tests.

13 Check transmission oil level. Oil level must beat FULL mark on dipstick. Add or drain oil as necessary. Refer to the PMCS/lubrication table, page 2-13.

2-127. MAINTENANCE OF TRANSMISSION AND TRANSMISSION PLUGS (CONT).

TEST (CONT)

WARNING

Transmission contains hot oil under high pressure. Stop engine before removing or installing pipe plugs or pressure gage tester in pressure test points. Install pipe plug as soon as pressure gage tester is removed. Remove only pipe plug at test point.

NOTE

- Steps 14 thru 17 apply to all transmission test points except as noted.
- When making steer clutch pressure tests, move steering bar slowly from horizontal to full steer in desired direction while watching pressure gage tester. Note pressure rise to maximum as steering bar moves to full steer.
- When making lockup engagement tests, increase engine speed slowly until lockup apply pressure is indicated on pressure gage. Record pressure and engine speed. Record governor pressure at lockup engagement.
- When making lockup release tests, first increase engine speed higher than lockup engagement speed, then slowly reduce engine speed while watching pressure gage tester. When pressure drops quickly, record governor pressure and engine speed.

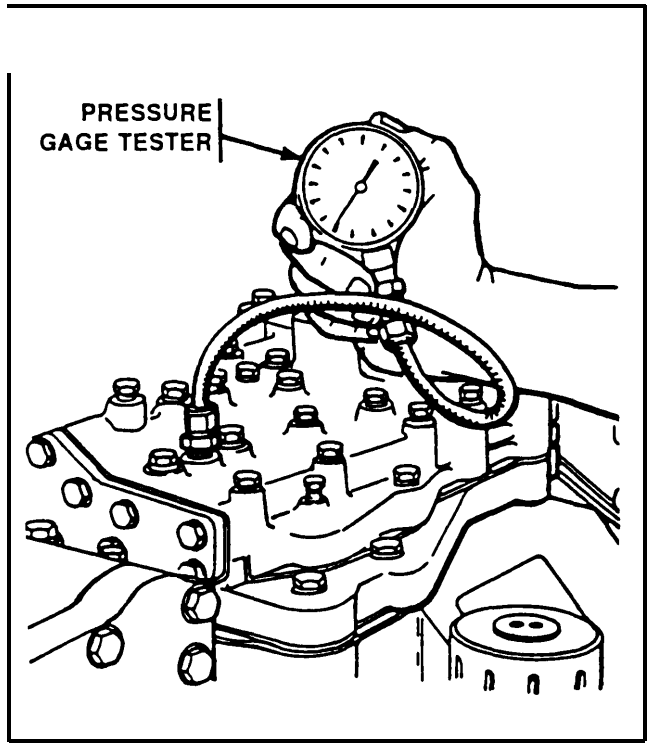
14 Stop engine. Remove pipe plug from test point to be pressure-tested (see fig. 2-1).

15 Install pressure gage tester and start engine.

16 Reduce engine speed to idle. Shift transmission to desired range (see fig. 2-1).

17 Slowly increase engine speed to desired rpm (see fig. 2-2). Record readings for each test point.

18 If transmission readings are not within normal range (see fig. 2-2), notify direct support maintenance.

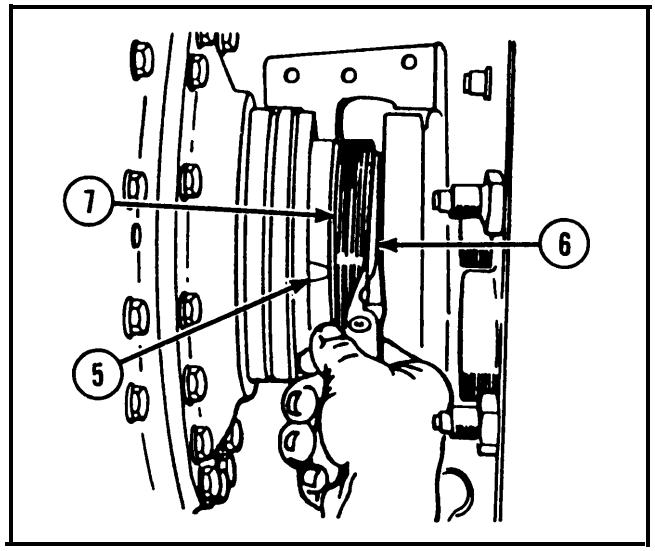


NOTE

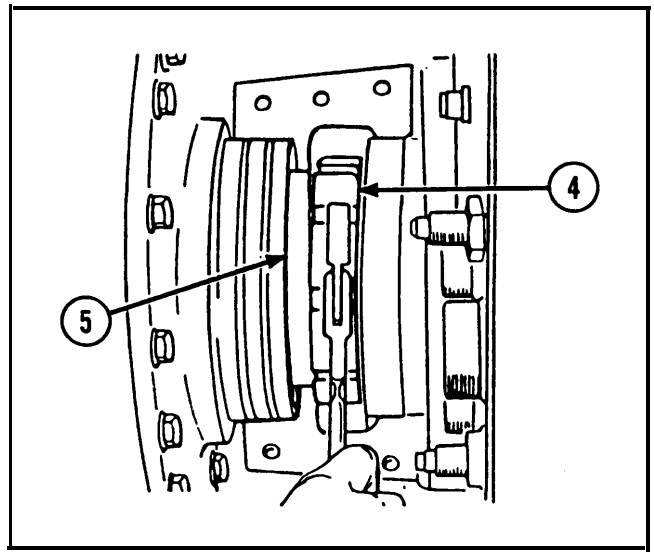
Steps 19 thru 22 are written for one final drive but apply to both final drives.

19 Slide final drive pinion shaft (7) from inside of final drive and engage with transmission shaft (5).

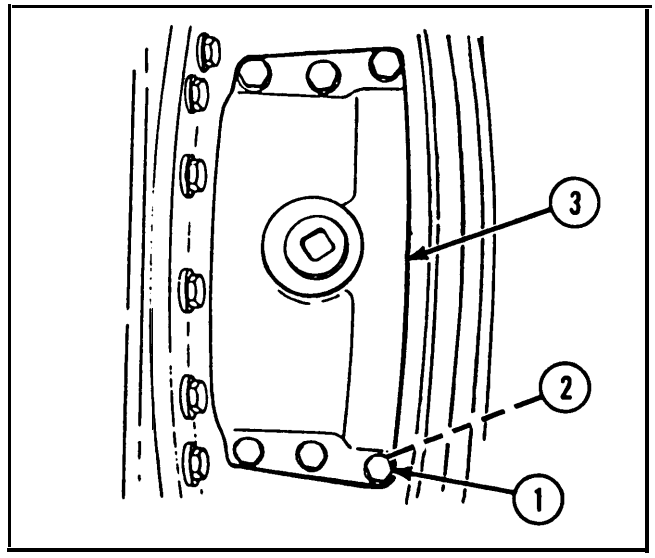
20 Install output shaft retaining ring (6) on final drive pinion shaft (7).



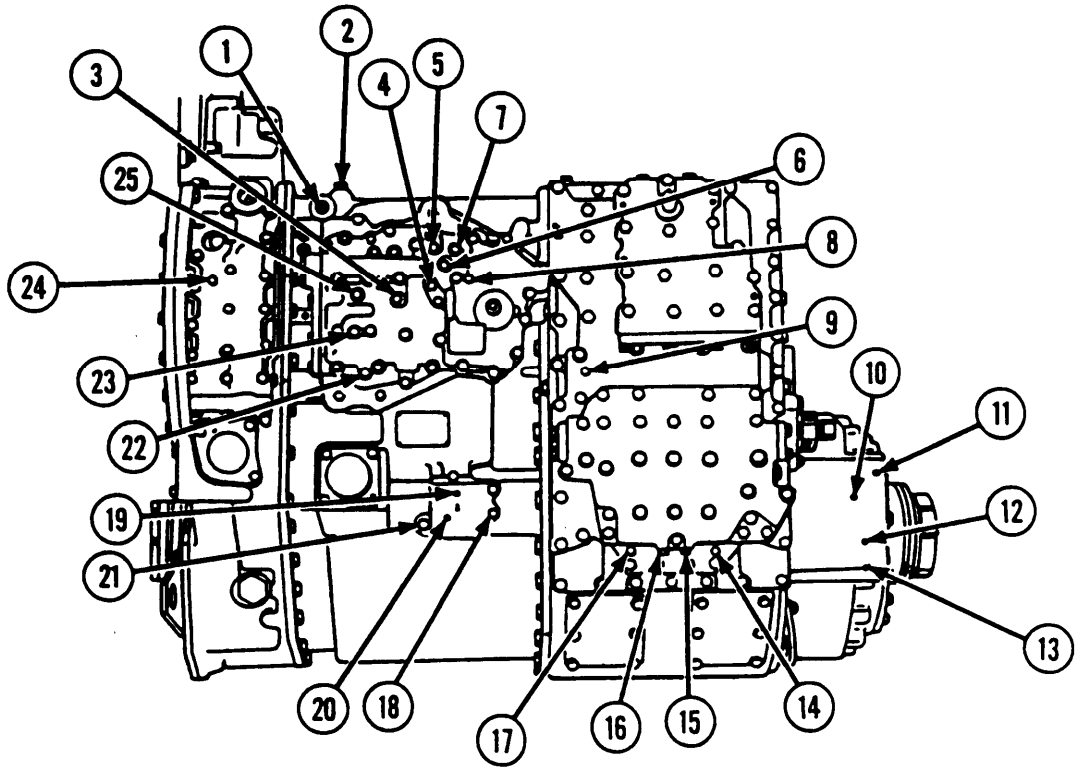
21 Slide final drive coupling nut (4) onto transmission shaft (5). Tighten coupling nut using drift and hammer, or spanner wrench.



22 Install output drive cap (3), six new lockwashers (2), and six screws (1). Tighten screws to 36 ft-lb (49 N-m).



2-127. MAINTENANCE OF TRANSMISSION AND TRANSMISSION PLUGS (CONT).



1 Transmission lubrication
2 Transmission lubrication
3 Main
4 Third gear
5 Fourth gear
6 First and second gear
7 First, neutral, and reverse 1 signal pressure
8 Reverse
9 Reverse 2, third, and fourth signal pressure
10 Geared steer clutch
11 Transmission lubrication
12 Geared steer coolant
13 Output clutch
14 Brake coolant
15 Brake
16 Brake
17 Brake coolant
18 Geared steer clutch
19 Geared steer coolant
20 Transmission lubrication
21 Output clutch
22 Throttle
23 Throttle valve
24 Lockup
25 Governor (pitot)

Figure 2-1. *Transmission Pressure Test Points.*

TRANSMISSION OIL PRESSURES

Test	Test Point No.	RPM	Reading lb/in² (kPa)	Neutral	1st Gear	2nd Gear	3rd Gear	4th Gear	Reverse 1	Reverse 2	Right steer	Left steer
Main pressure in converter	3	1000 to 1500	Normal	210 - 230 (1448 - 1586)	210 - 230 (1448 - 1586)	210 - 230 (1448 - 1586)	210 - 230 (1448 - 1586)	118 - 160 (814 - 1103)	300 - 320 (2069 - 2206)	300 - 320 (2069 - 2206)	Same as range reading	
			Actual									
Main pressure in lockup	3	1000 to 1500	Normal	118 - 160 (814 - 1103)	118 - 160 (814 - 1103)	118 - 160 (814 - 1103)	118 - 160 (814 - 1103)	160 - 190 (1103 - 1310)	160 - 190 (1103 - 1310)	160 - 190 (1103 - 1310)	Same as Range reading	
			Actual									
Lockup and range clutch apply pressure	24	1000 to 1500	Normal		Same as main pressure for applicable range							
			Actual									
1st, neutral, and reverse 1 signal pressure	7	1000 to 1500	Normal		Same as main pressure for applicable range							
			Actual									
3rd, 4th, and reverse 2 signal pressure	9	1000 to 1500	Normal		Same as main pressure for applicable range							
			Actual									
Geared steer apply pressure (no steer)	10, 18	1000 to 1500	Normal	210 (1448)	210 (1448)	0	0	0	210 (1448)	0	0	0
			Actual									
Geared steer apply pressure (during steer)	10, 18	1000 to 1500	Normal	0	0	0	0	0	0	0	74 - 127 (510 - 876)	74 - 127 (510 - 876)
			Actual									
Brake apply pressure	15, 16	1000 to 1500	Normal	0	0	0	0	0	0	0	74 - 127 (510 - 876)	74 - 127 (510 - 876)
			Actual									
Geared steer and brake coolant pressure	12, 19, 14, 17, 9	1000 to 1500	Normal	0	0	0	0	0	0	0	8 - 12	8 - 12
			Actual									
Output clutch pressure	21	1000 to 1500	Normal	0	0	210 (1448)	210 (1448)	118 - 160 (814 - 1103)	0	210 (1448)	0*	0*
			Actual									
Governor pressure (pitot) at lockup engagement	25	Full throttle	Normal	82 - 88 (565 - 607)	82 - 88 (565 - 607)	82 - 88 (565 - 607)	82 - 88 (565 - 607)	82 - 88 (565 - 607)	82 - 88 (565 - 607)	82 - 88 (565 - 607)	82 - 88 (565 - 607)	82 - 88 (565 - 607)
			Actual									
Lubrication pressure	1, 2, 11 20	1835 to 1900	Normal	18 - 45 (124 - 310)	18 - 45 (124 - 310)	18 - 45 (124 - 310)	18 - 45 (124 - 310)	18 - 45 (124 - 310)	18 - 45 (124 - 310)	18 - 45 (124 - 310)	18 - 45 (124 - 310)	18 - 45 (124 - 310)
			Actual									
Throttle (T) pressure	22	Full throttle	Normal	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)
			Actual									
Throttle valve (TV) pressure	23	Full throttle	Normal	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)	32 - 40 (221 - 276)
			Actual									

*Clutch pressure can be measured only when steering bar is turned toward side being tested

Figure 2-2. Transmission Pressure Test Readings.

2-128. MAINTENANCE OF OIL SAMPLING DRAIN COCK AND RELATED ITEMS.

This task covers:	a. *Removal*	b. *Inspection/Repair*	c. *Installation*

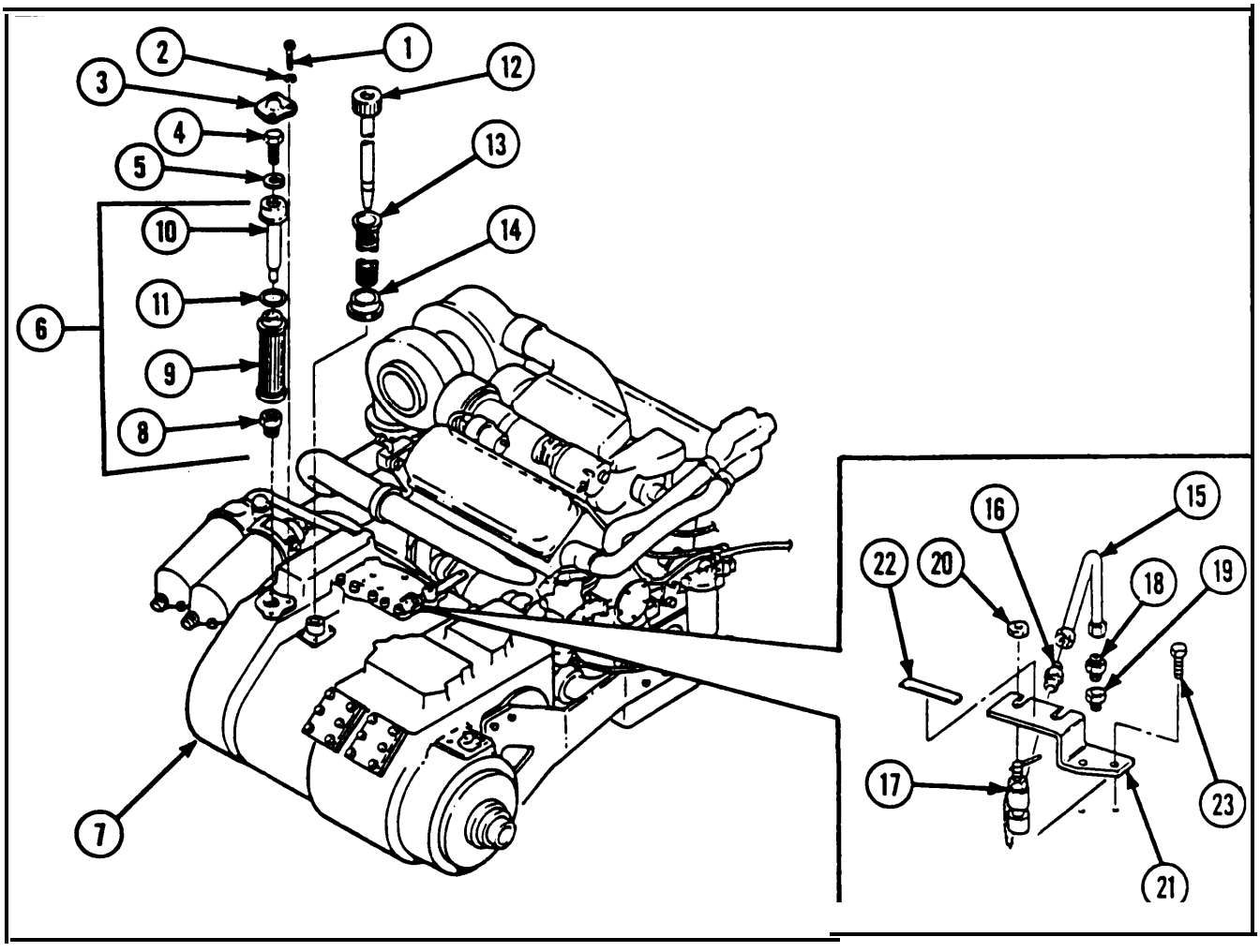
INITIAL SETUP

Materials/Parts
- Lockwasher (4)
- Nonmetallic seal
- Preformed packing
- Transmission oil pressure fluid filter parts kit

References
- TM 9-2350-238-24P-1

Equipment Conditions
- 2-938 Hull transmission compartment deck assembly removed
- Engine oil filter sampling line, drain cock, and related hardware and fittings removed

REMOVAL



NOTE
Cover is not an authorized repair part. Use care not to lose or damage.

1 Remove three hexagon head capscrews (1), three lockwashers (2), and cover (3).

2 Remove hexagon head capscrew (4), lockasher (5), and transmission oil pressure fluid filter (6) from transmission (7).

3 Remove self-locking nut (8) and filter element (9) from transmission filter cap (10).

4 Remove preformed packing (11) from filter element (9).

5 Remove oil filler gage rod-cap (12), oil filler strainer element (13), and nonmetallic seal (14) from transmission (7).

6 Disconnect metal tube assembly (15) from straight adapter (16) in drain cock (17).

7 Disconnect metal tube assembly (15) from adapter (18) and remove metal tube assembly.

8 Remove straight adapter (16) from drain cock (17).

9 Remove adapter (18) from bushing (19).

10 Remove bushing (19) from transmission (7).

NOTE
Hexagon plain nut is supplied with drain cock. Use care not to lose or damage hexagon plain nut. If lost or damaged, replace drain cock.

11 Loosen hexagon plain nut (20) on drain cock (17), and remove drain cock and nut from double angle bracket (21).

12 If damaged, remove identification marker (22) from double angle bracket (21).

13 Remove two machine bolts (23) and double angle bracket (21) from transmission (7).

INSPECTION/REPAIR

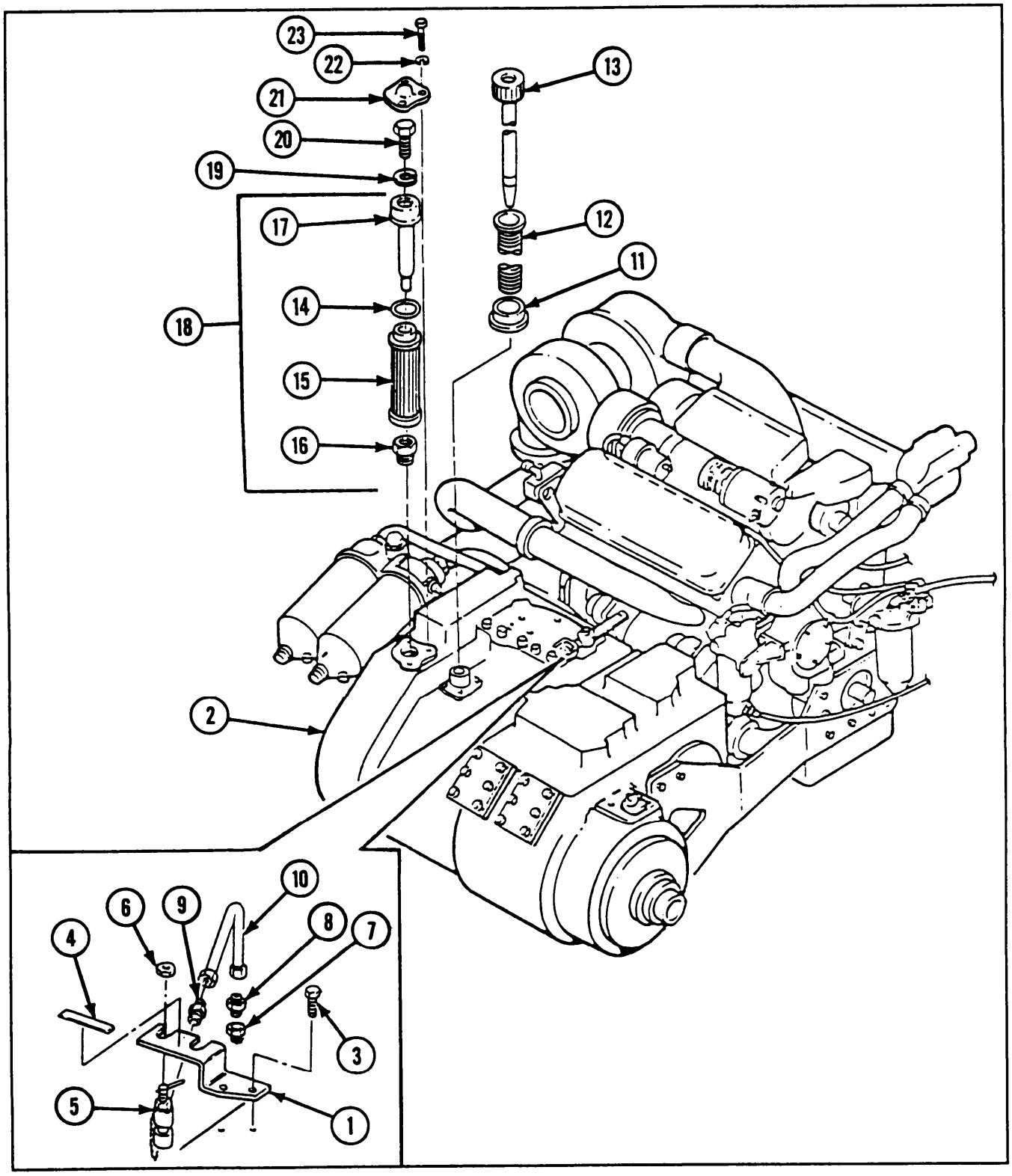
1 Inspect for broken, damaged, or missing parts.

2 Inspect and clean filter element. Replace filter element only if damaged.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

2-128. MAINTENANCE OF OIL SAMPLING DRAIN COCK AND RELATED ITEMS (CONT).

INSTALLATION



1 Install double angle bracket (1) on transmission (2) and secure with two machine bolts (3).

2 If removed, install new identification marker (4) on double angle bracket (1).

3 Install drain cock (5) and hexagon plain nut (6) on double angle bracket (1). Tighten nut.

4 Install bushing (7) in transmission (2).

5 Install adapter (8) in bushing (7).

6 Install straight adapter (9) in drain cock (5).

7 Install metal tube assembly (10) and connect to adapter (8).

8 Connect metal tube assembly (10) to straight adapter (9) in drain cock (5).

9 Install new nonmetallic seal (11), oil filler strainer element (12), and oil filler gage rod-cap (13) in transmission (2).

10 Install new preformed packing (14) on filter element (15).

11 Install filter element (15) and new self-locking nut (16) on transmission filter cap (17).

12 Install transmission oil pressure fluid filter (18), new lockwasher (19), and hexagon head capscrew (20) in transmission (2).

13 Install cover (21), and secure with three new lockwashers (22) and three hexagon head capscrews (23).

2-129. MAINTENANCE OF FINAL DRIVE ASSEMBLY.

This task covers: a. *Removal/Disassembly* b. *Inspection/Repair* c. *Reassembly/Installation*

INITIAL SETUP

Tools and Special Tools
- Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
  - Socket (3/4 in. drive, 1 in.)
  - Torque wrench (0 to 600 ft-lb)
  - Wire brush
- Final drive lifting sling (item 24, appx G)
- Headless shoulder pin (2) (item 16, appx G)
- Hexagon head capscrew (3) (item 22, appx G)
- Hoist
- Sling (item 82, appx B)

Matetials/Parts
- Compressed air
- Dry cleaning solvent (item 16, appx C)
- Sealing compound (item 39, appx C)
- Self-locking bolt (24)

References
- TM 9-2350-238-24P-1

Equipment Conditions
- *2-873* Tracks removed
- 2-384 Powerplant removed

2-129. MAINTENANCE OF FINAL DRIVE ASSEMBLY (CONT).

REMOVAL/DISASSEMBLY

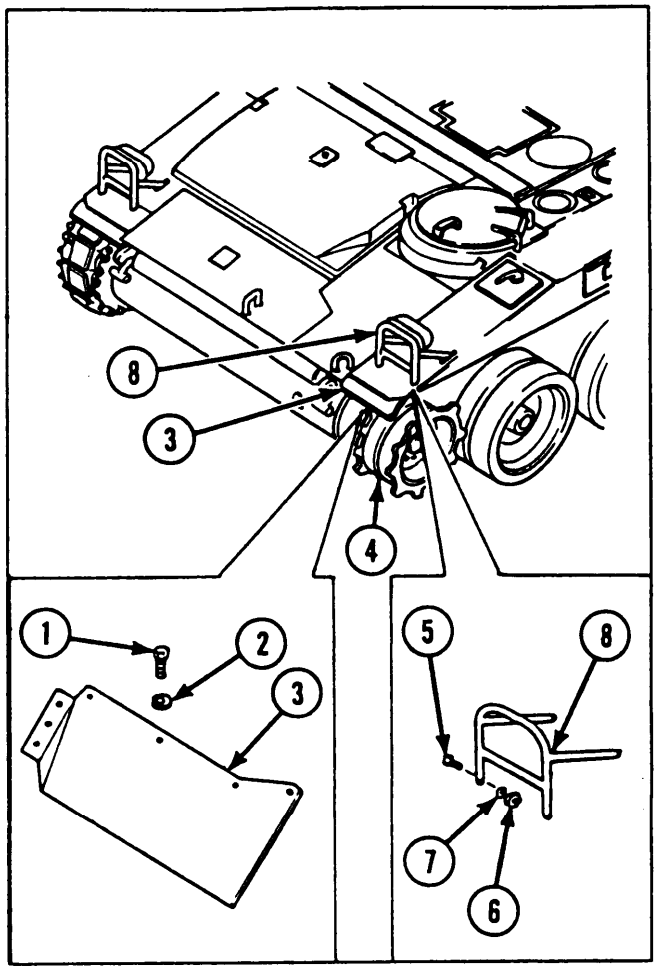
NOTE

The following steps are written and illustrated for the left hand final drive assembly, but apply to both the left and right final drive assemblies.

1 Remove seven screws (1), seven washers (2), and fender extension (3).

2 Remove drive sprocket hub assembly (4), refer to page 2-869.

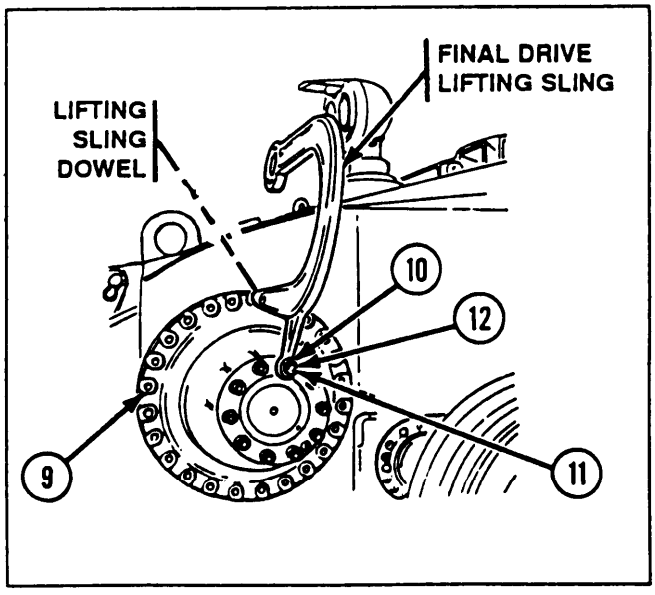
3 Remove four screws (5), four nuts (6), four washers (7), and headlamp guard (8).

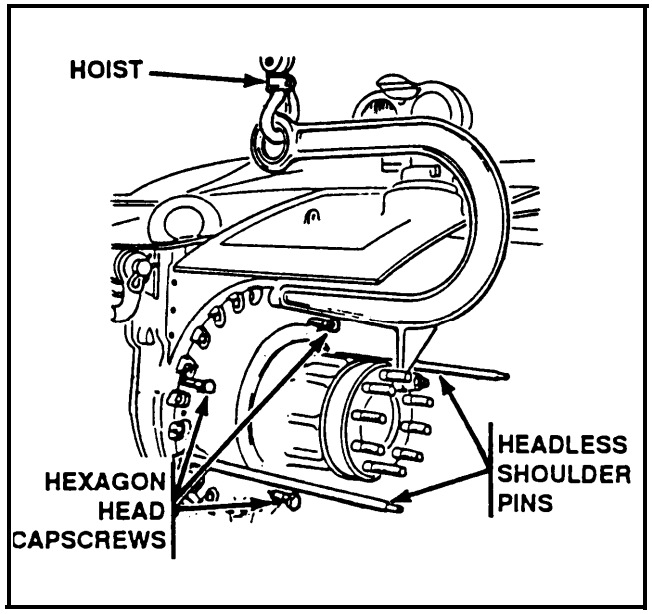


4 Remove 24 self-locking bolts (9).

5 Install final drive lifting sling by inserting lifting sling dowel into bolt mounting hole and placing lifting eye (10) over stud (11).

6 Install nut (12) on stud (11).





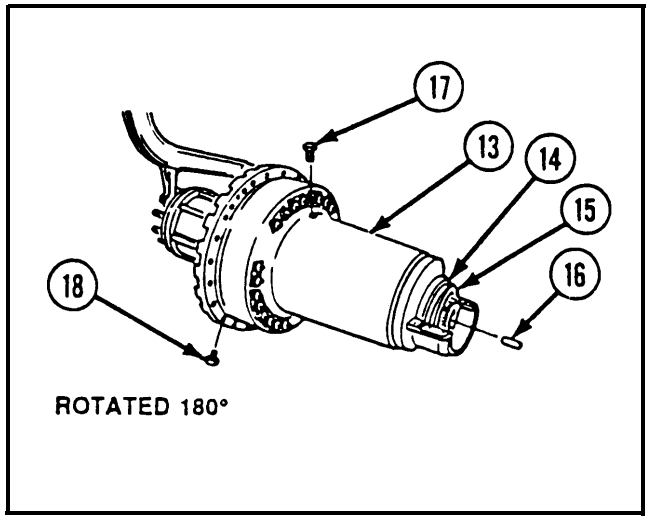
7 Attach hoist to final drive lifting sling.

8 Take up slack in hoist.

9 Install two headless shoulder pins into holes located 180 degrees apart.

10 Install three hexagon head capscrews into jacking holes.

11 lighten three hexagon head capscrews evenly until final drive breaks loose.



12 Hoist final drive (13) and remove from hull.

13 Remove shaft nut (14) and lock ring (15) from final drive (13).

14 Remove three hexagon head capscrews.

15 Remove two headless shoulder pins.

16 Disconnect hoist and final drive lifting sling.

17 Remove pin (16), bolt (17), and two plugs (18).

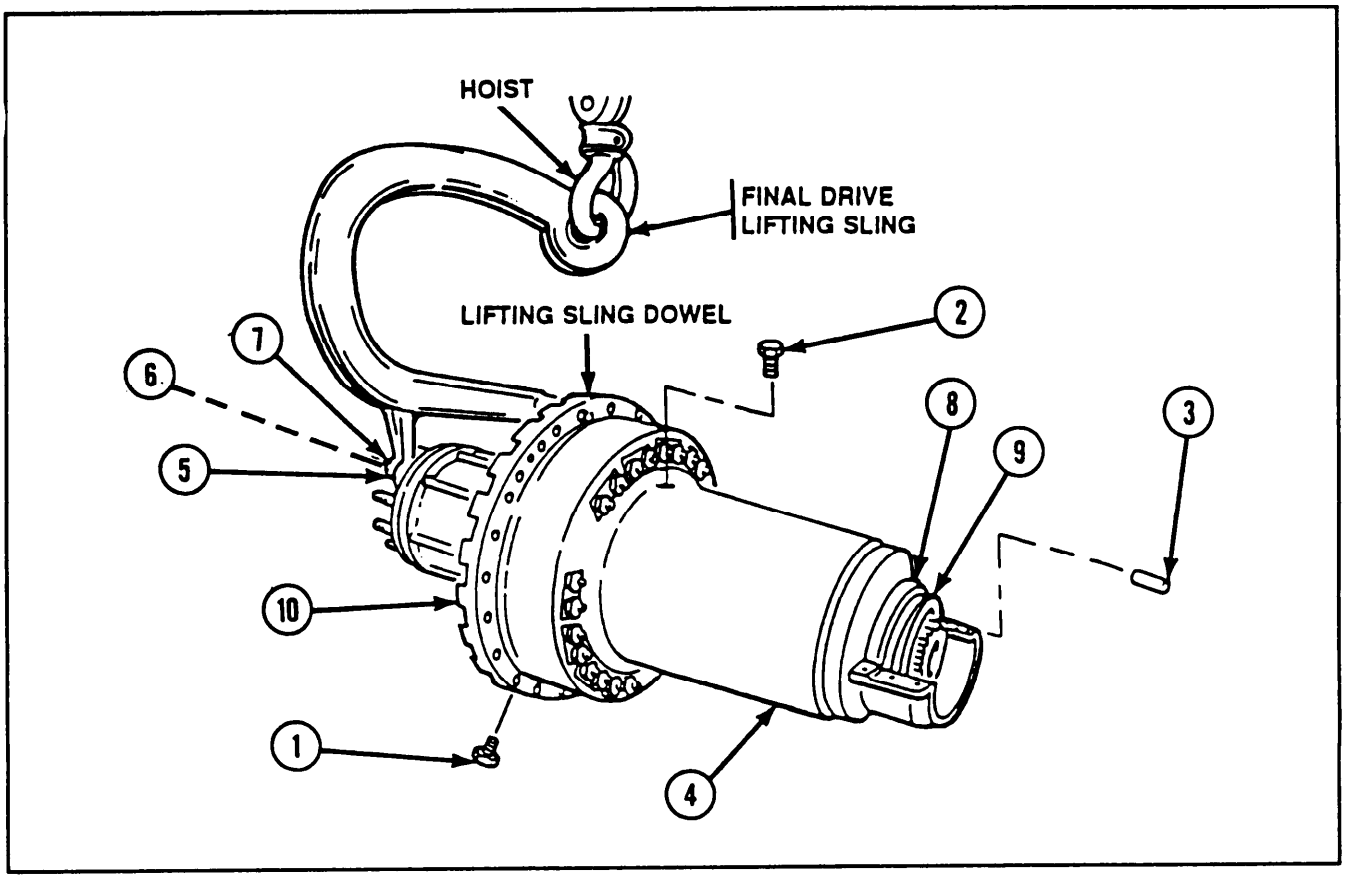
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair by replacement of authorized parts (TM 9-2350-238-24P-1).

2-129. MAINTENANCE OF FINAL DRIVE ASSEMBLY (CONT).

REASSEMBLY/INSTALLATION



1 Install two plugs (1), bolt (2), and pin (3) in final drive assembly (4).

2 Install two headless shoulder pins into holes located 180 degrees apart.

3 Install final drive lifting sling by inserting sling dowel into bolt mounting hole and placing lifting eye (5) over stud (6). Install nut (7) on stud (6).

4 Install shaft nut (8) and lock ring (9).

5 Clean hull-to-final drive mating surfaces (10) with dry cleaning solvent and wire brush. Dry with low-pressure compressed air.

6 Coat mating surfaces (10) with sealing compound.

7 Attach hoist to final drive lifting sling.

8 Install final drive (4) using hoist. Guide into position on hull using headless shoulder pins.

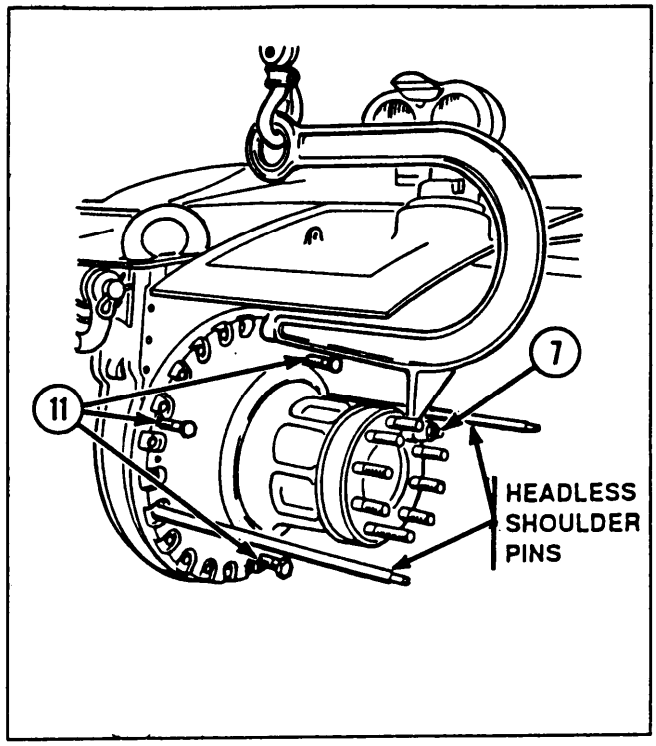
9 Install 21 new self-locking bolts (11).

10 Remove nut (7), final drive lifting sling, and hoist.

11 Remove two headless shoulder pins.

12 Install three new self-locking bolts (11).

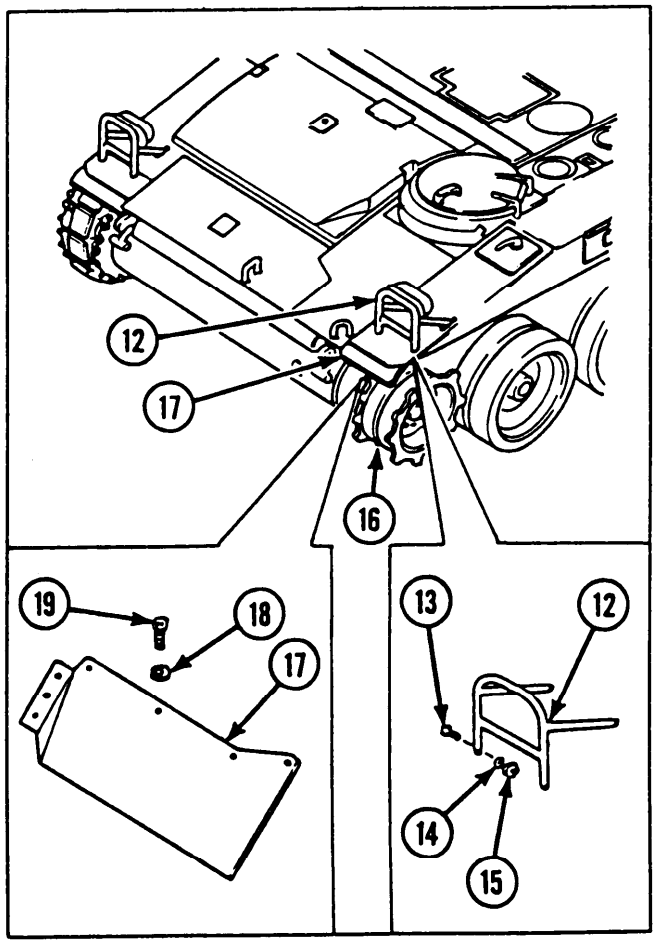
13 Tighten 24 self-locking bolts (11) to 305 ft-lb (423 N-m) in cross pattern sequence.



14 Position headlamp guard (12), and install four screws (13), four washers (14), and four nuts (15).

15 Install drive sprocket hub assembly (16), refer to page 2-869.

16 Position fender extension (17) and install seven washers (18) and seven screws (19).



2-130. MAINTENANCE OF AUXILIARY DRIVE INSTALLATION.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

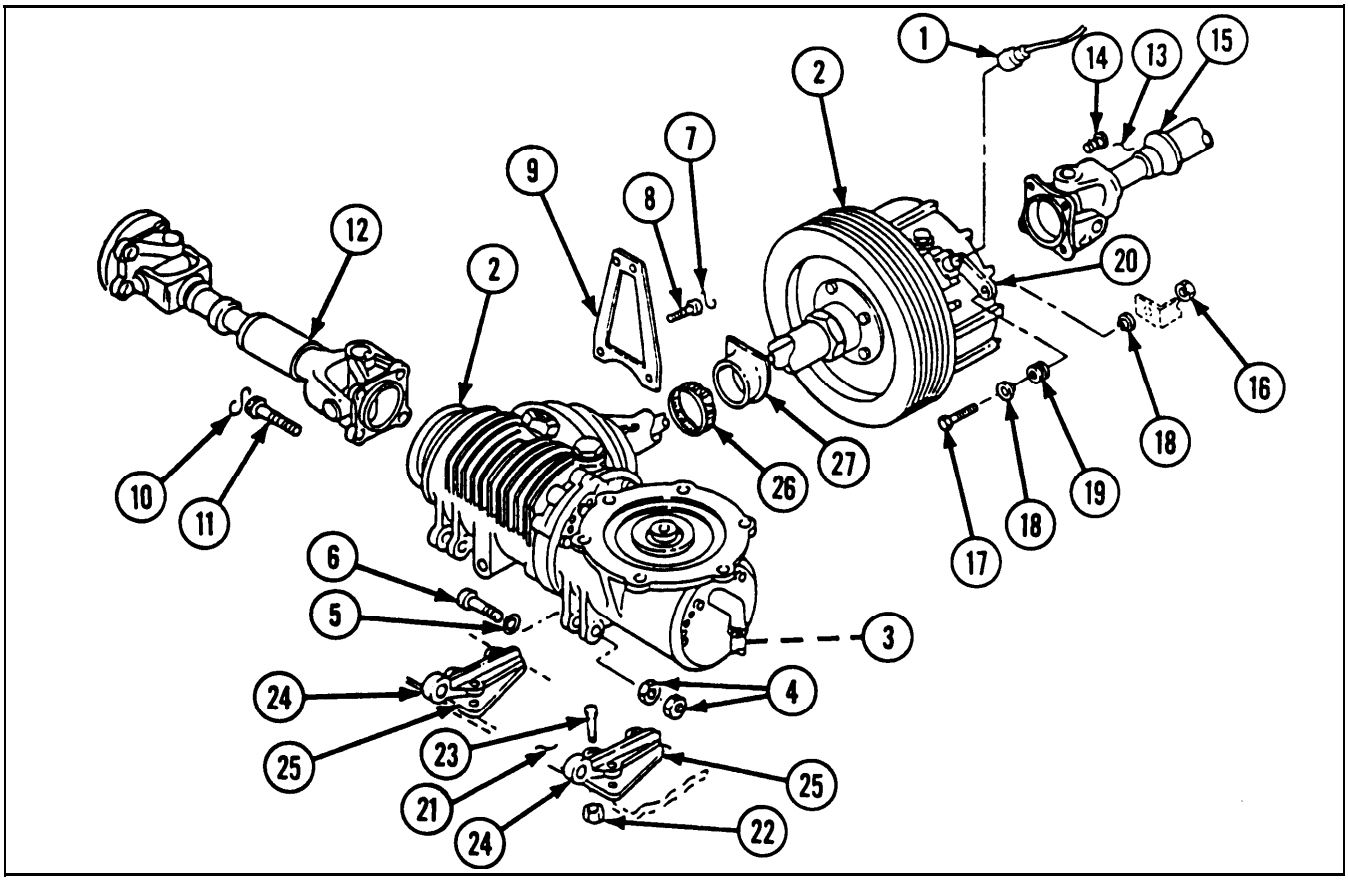
INITIAL SETUP

Tools and Special Tools
- Hoist
- Plier wire twister (item 30, appx G)
- Sling (item 82, appx B)

Materials/Parts
- Boot
- Hydraulic fluid (item 21, appx C)
- Lockwire (item 27, appx C)
- Self-locking nut

References
- TM 9-2350-238-24P-1

Equipment Conditions
- 2-384 Powerplant removed
- 2-771 Oil filler neck removed
- 2-773 Oil drain tube assembly removed
- 2-515 Radiator removed
- 2-528 Surge tank removed
- 2-552 Generator removed
- 2-543 Fan tensioner V-belt and radiator cooling vaneaxial fan removed



1 Disconnect electrical connector (1) from auxiliary drive assembly (2).

2 Tag and disconnect four electrical leads (3).

3 Remove four hexagon plain nuts (4), two flat washers (5), and two shoulder screws (6).

4 Remove lockwire (7), two hexagon head capscrews (8), and angle bracket (9).

5 Remove lockwire (10) and four hexagon head capscrews (11). Disconnect power takeoff drive shaft (12) from auxiliary drive assembly (2).

6 Remove lockwire (13) and four hexagon head capscrews (14). Disconnect magnetic clutch to bearing unit drive shaft (15) from auxiliary drive assembly (2).

7 Remove self-locking nut (16), hexagon head capscrew (17), two sleeve spacers (18), and rubber grommet (19) from connecting link (20).

8 Attach sling and carefully remove auxiliary drive assembly (2) and attached parts from hull using hoist.

9 If damaged, remove lockwire (21), six hexagon plain nuts (22), six hexagon head capscrews (23), two mounting brackets (24), and two mounting plates (25).

10 Loosen screw and remove flat hose clamp (26). If damaged, remove boot (27).

INSPECTION/REPAIR

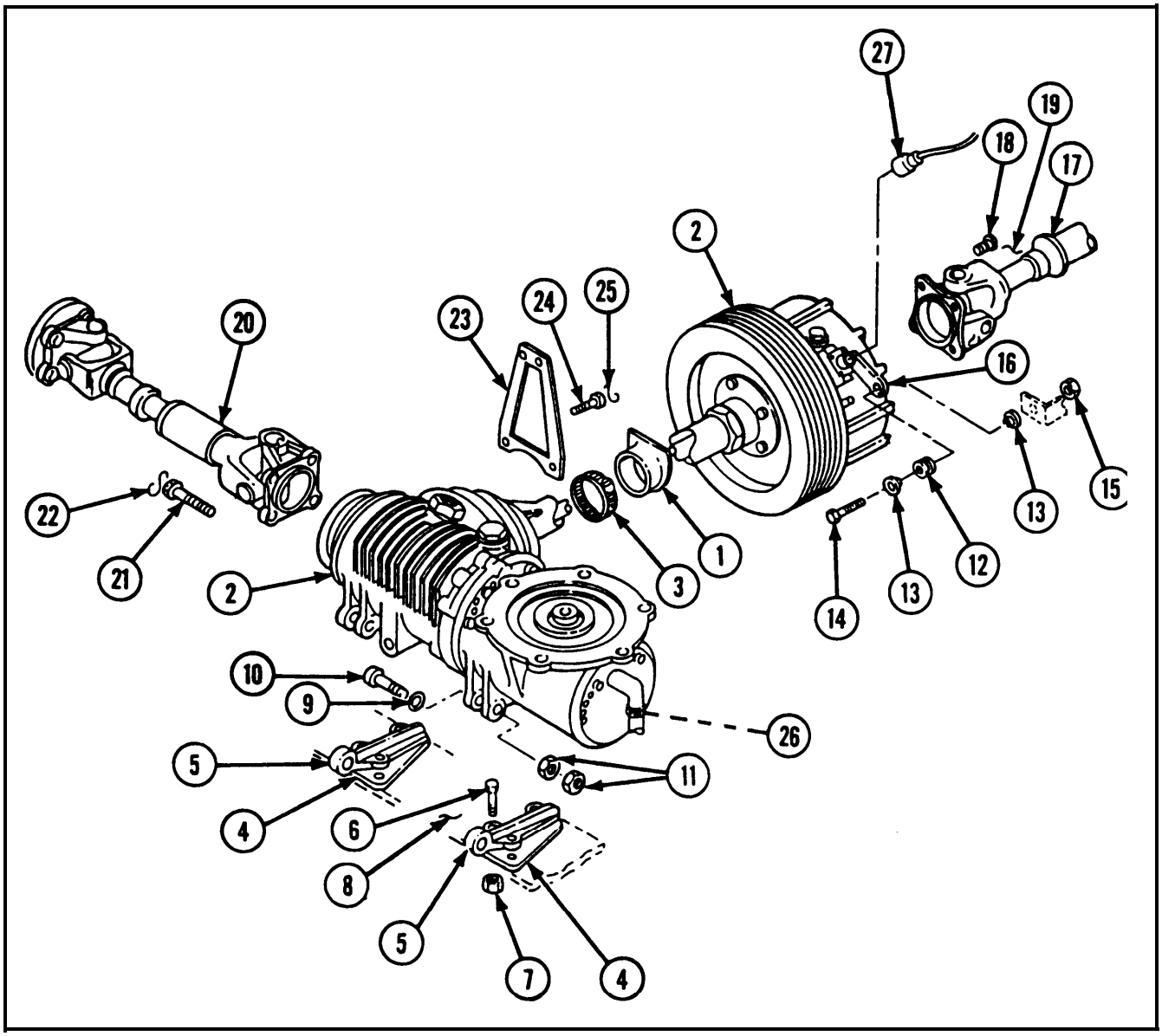
1 Inspect for broken, damaged, or missing parts.

2 Auxiliary drive assembly is a repairable assembly. Refer to page 2-769.

3 For further disassembly, notify direct support maintenance.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-130. MAINTENANCE OF AUXILIARY DRIVE INSTALLATION (CONT).



1 If removed, split new boot (1) and install over clutch drive housing of auxiliary drive assembly (2). Install flat hose clamp (3), and tighten screw to secure boot.

2 If removed, install two mounting plates (4), two mounting brackets (5), six hexagon head capscrews (6), six hexagon plain nuts (7), and new lockwire (8).

3 Attach sling and carefully install auxiliary drive assembly (2), using hoist.

4 Install two flat washers (9), two shoulder screws (10), and four hexagon plain nuts (11).

5 Install rubber grommet (12), two sleeve spacers (13), hexagon head capscrew (14), and new self-locking nut (15) to connecting link (16).

6 Connect magnetic clutch to bearing unit drive shaft (17) to auxiliary drive assembly (2) by installing four hexagon head capscrews (18) and new Iockwire (19).

7 Connect power takeoff drive shaft (20) to auxiliary drive assembly (2) with four hexagon head capscrews (21) and new Iockwire (22).

8 Install angle bracket (23), two hexagon head capscrews (24), and new Iockwire (25).

9 Untag and connect four electrical leads (26).

10 Connect electrical connector (27) to auxiliary drive assembly (2).

11 Fill auxiliary drive gearcase with hydraulic fluid. Refer to the PMCS/lubrication table, page 2-13.

2-131. MAINTENANCE OF AUXILIARY DRIVE ASSEMBLY (VEHICULAR DRIVE).

This task covers: a. *Disassembly* b. *Inspection/Repair* c. *Reassembly*

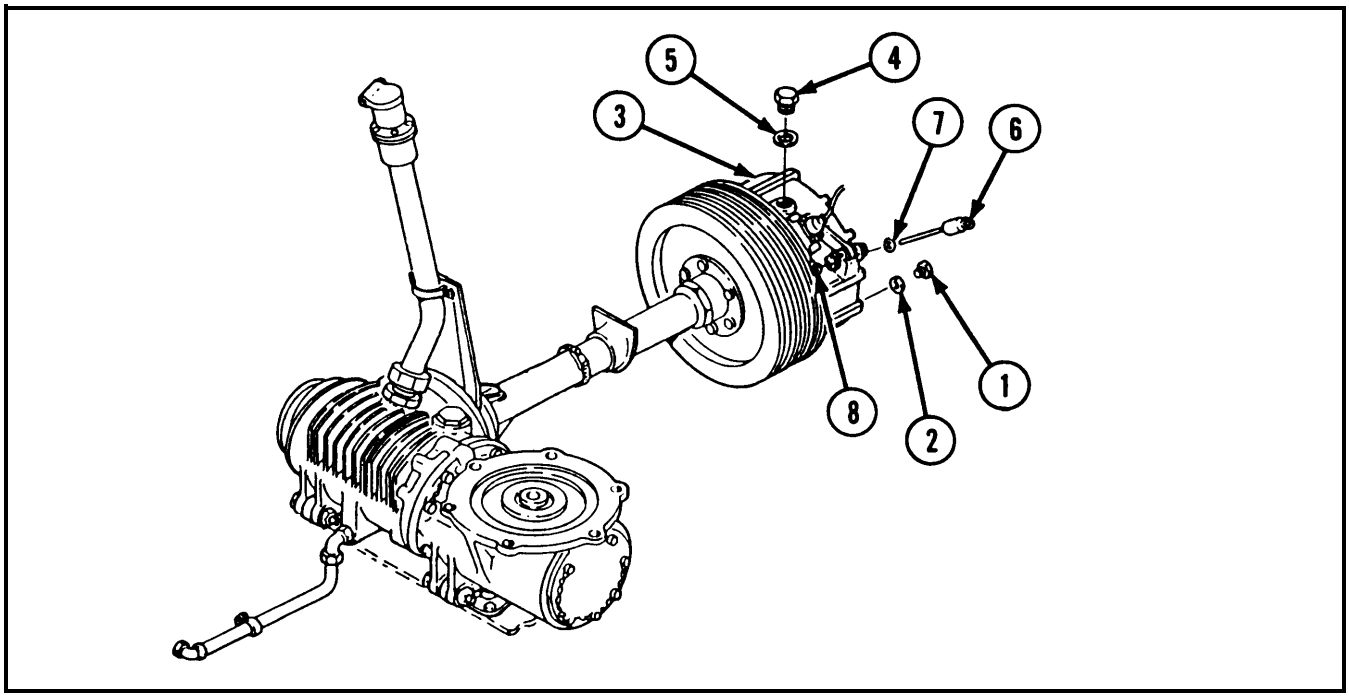
INITIAL SETUP

Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance common no. 1 (less power) (item 80, appx B)
• Drain pan

Materials/Parts
Hydraulic fluid (item 21, appx C)
Preformed packing
Preformed packing
Preformed packing

References
TM 9-2350-238-24P-1

2-131. MAINTENANCE OF AUXILIARY DRIVE ASSEMBLY (VEHICULAR DRIVE) (CONT).



DISASSEMBLY

1 Remove machine plug (1) and preformed packing (2) from vehicular drive (3). Drain hydraulic fluid from clutch into drain pan.

2 Remove machine plug (4) and preformed packing (5) from vehicular drive (3).

3 Remove liquid gage rod-cap (6) and preformed packing (7) from attached gage rod clutch tube (8).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 For further disassembly, notify direct support maintenance.

3 Repair by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

1 Install new preformed packing (7) and liquid gage rod-cap (6) into attached gage rod clutch tube (8).

2 Install new preformed packing (5) and machine plug (4) in vehicular drive (3).

3 Fill clutch housing with hydraulic fluid. Refer to the PMCS/lubrication table, page 2-13. Install new preformed packing (2) and machine plug (1) in vehicular drive (3).

2-132. MAINTENANCE OF OIL FILLER NECK.

This task covers:	a. *Removal/Disassembly* b. *Inspection/Repair*	c. *Reassembly/Installation*

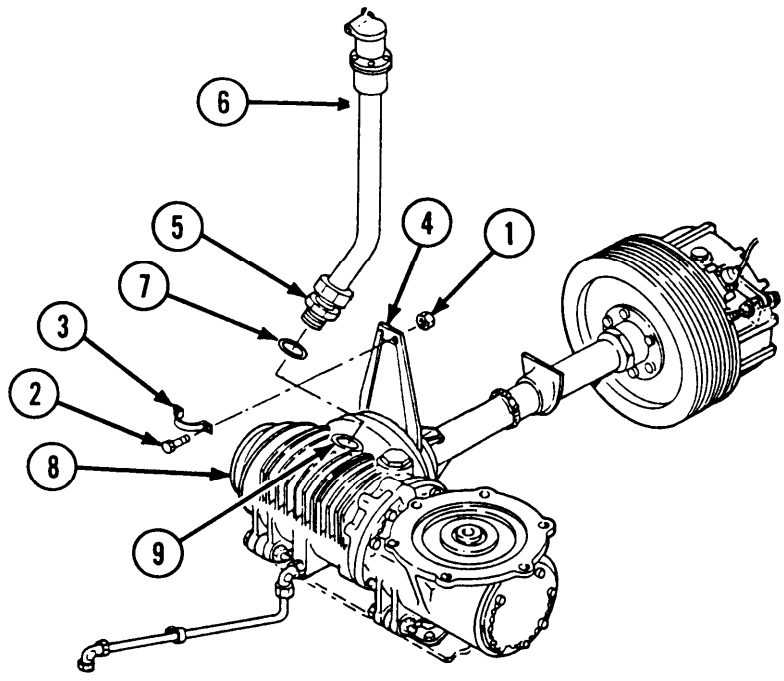
INITIAL SETUP

Materials/Parts
Preformed packing
Self-locking nut (2)

Equipment Conditions
2-384 Powerplant removed

References
TM 9-2350-238-24P-1

REMOVAL/DISASSEMBLY



1 Remove two self-locking nuts (1), two hexagon head capscrews (2), and cover assembly (3) from angle bracket (4).

2 Loosen tube nipple (5) of oil filler neck (6).

3 Remove oil filler neck (6) and preformed packing (7) from auxiliary drive assembly (8).

4 Plug or cover port (9) to keep dirt out.

2-132. MAINTENANCE OF OIL FILLER NECK (CONT).

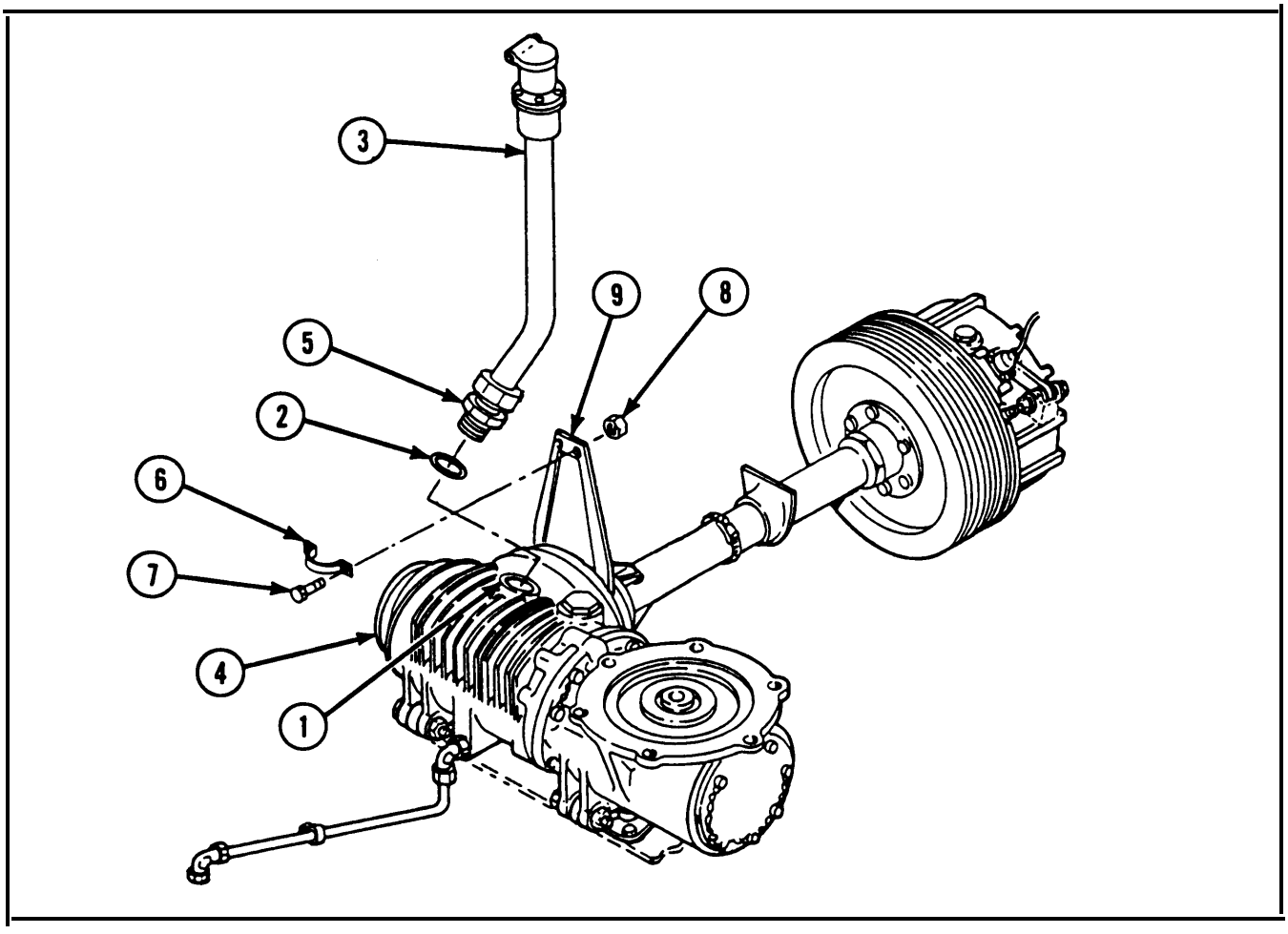
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 For further disassembly, notify direct support maintenance.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY/INSTALLATION



1 Remove plug or cover from port (1).

2 Install new preformed packing (2) and oil filler neck (3) on auxiliary drive assembly (4).

3 Tighten tube nipple (5) securely.

4 Install cover assembly (6), two hexagon head capscrews (7), and two new self-locking nuts (8) on angle bracket (9).

2-133. MAINTENANCE OF OIL DRAIN TUBE ASSEMBLY.

This task covers:	a. *Removal/Disassembly* b. *Inspection/Repair*	c. *Reassembly/Installation*

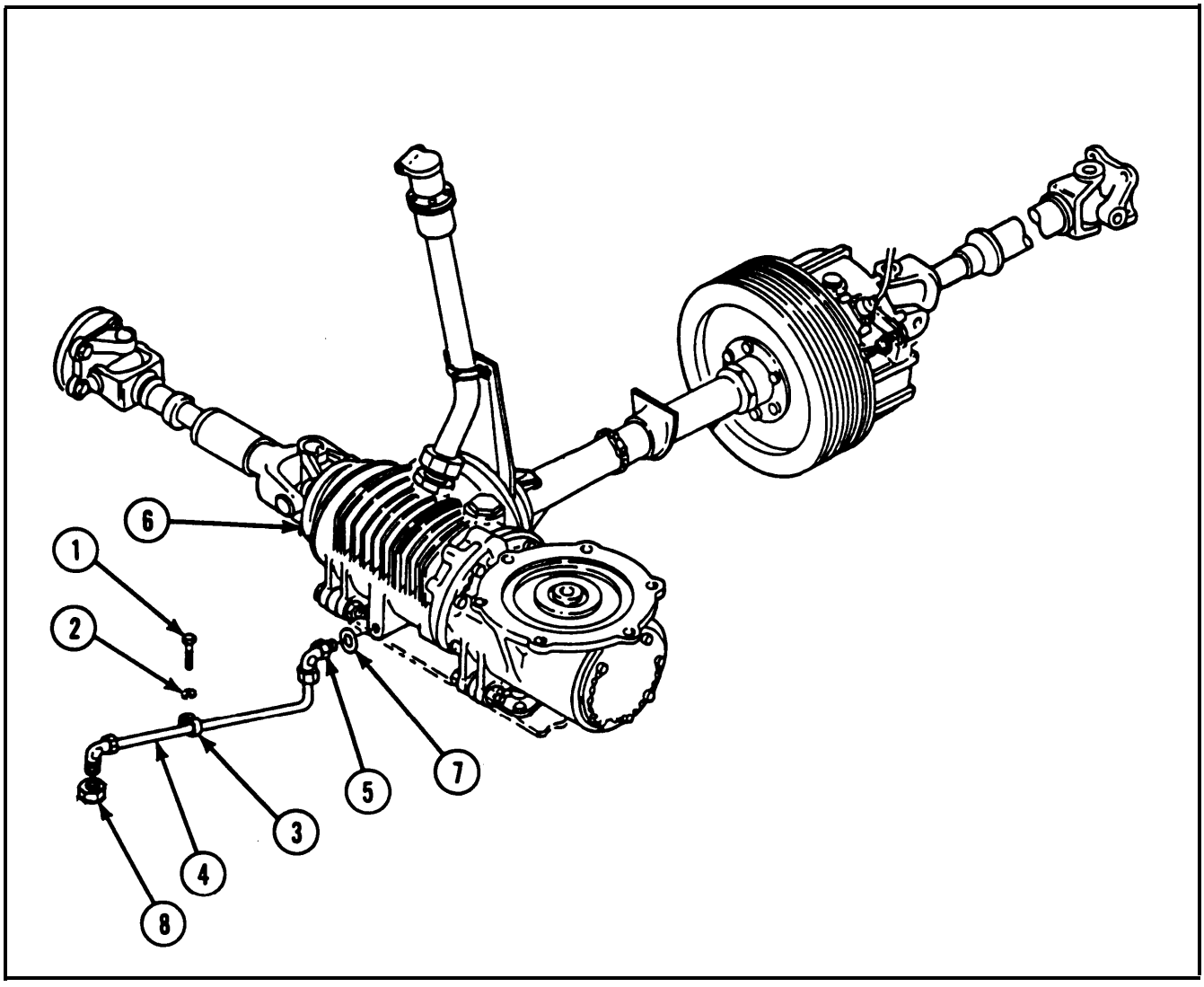
INITIAL SETUP

Materials/Parts
Lockwasher
Preformed packing

References
TM 9-2350-238-24P-1

Equipment Conditions
2-384 Powerplant removed
2-13 Oil drained from auxiliary drive assembly

2-133. MAINTENANCE OF OIL DRAIN TUBE ASSEMBLY (CONT).



REMOVAL/DISASSEMBLY

1 Remove hexagon head capscrew (1), lockwasher (2), and loop clamp (3) from oil drain tube assembly (4).

2 Loosen tube fitting locknut (5) and remove oil drain tube assembly (4) from auxiliary drive assembly (6).

3 Remove preformed packing (7) from oil drain tube assembly (4). Cover port to keep out dirt.

4 Remove tube cap (8) from oil drain tube assembly (4).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 For further disassembly, notify direct support maintenance.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY/INSTALLATION

1 Install tube cap (8) on oil drain tube assembly (4).

2 Install new preformed packing (7) on oil drain tube assembly (4).

3 Install oil drain tube assembly (4) on auxiliary drive assembly (6) and tighten tube fitting locknut (5).

4 Install loop clamp (3) on oil drain tube assembly (4) and secure with new lockwasher (2) and hexagon head capscrew (1).

2-134. MAINTENANCE OF SHIFTING CONTROL AND LINKAGE.

This task covers:	a. *Removal/Disassembly* b. *Inspection/Repair*	c. *Reassembly/Installation* d. *Adjustment*

INITIAL SETUP

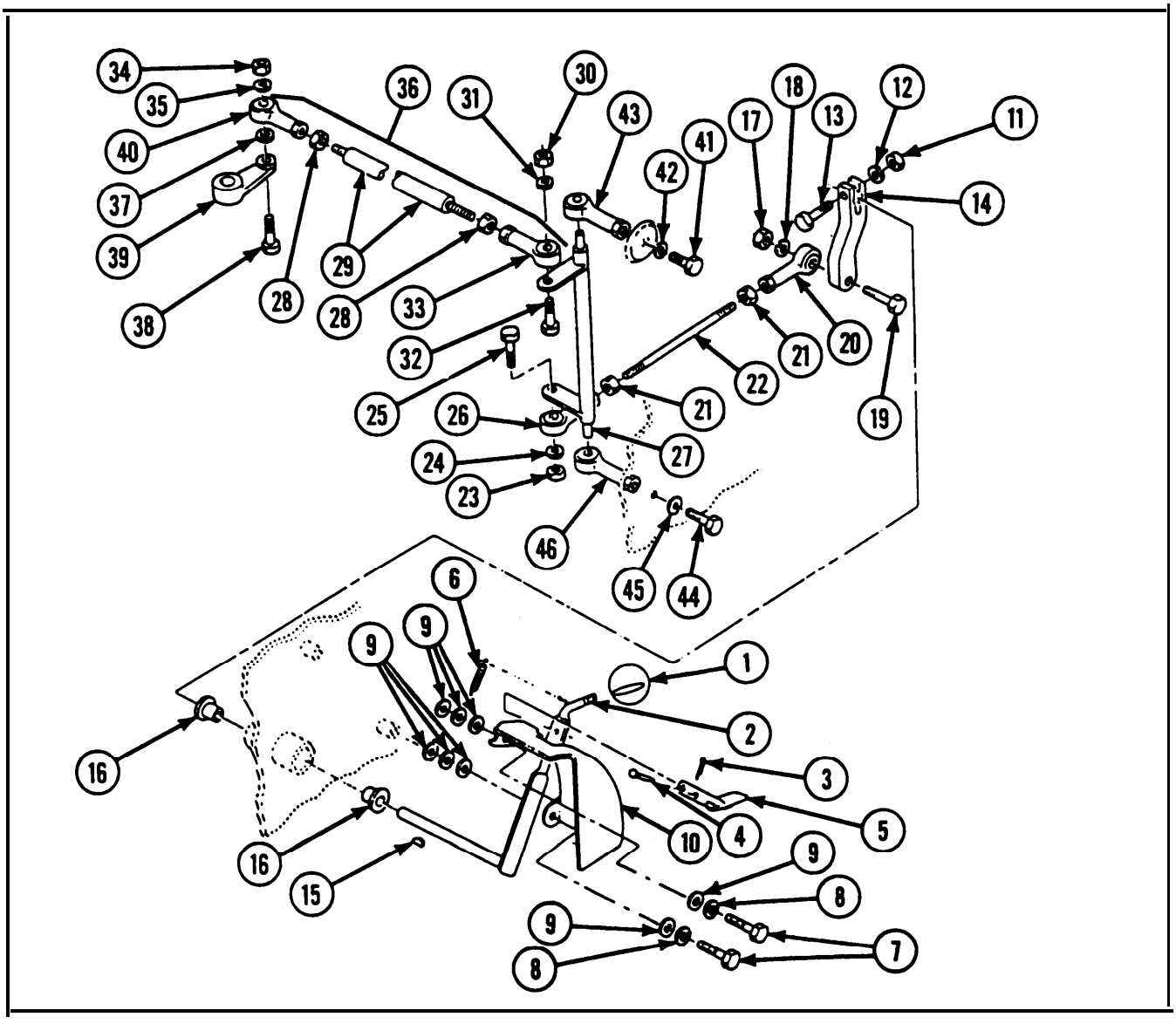
Materials/Parts
Cotter pin (2)
Lockwasher (7)
Lockwasher (2)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-938 Hull transmission compartment deck assembly removed
2-935 Hull engine compartment deck assembly lid removed

2-134. MAINTENANCE OF SHIFTING CONTROL AND LINKAGE (CONT).

REMOVAL/DISASSEMBLY



NOTE

Measure distance from center-to-center of rod ends on shift linkage control rod and shift linkage plain stud before removal to aid in installation.

1 Remove knob (1) from driver shift control manual control lever (2).

2 Remove two cotter pins (3) from two headed straight pins (4).

3 Remove two headed straight pins (4) from shift control latch (5). Remove shift control latch.

4 Remove helical spring (6) from driver shift control manual control lever (2).

5 Remove two hexagon head capscrews (7), two lockwashers (8), and eight flat washers (9) from access cover (10).

6 Remove access cover (10) from bulkhead.

7 Remove hexagon plain nut (11), lockwasher (12), and hexagon head capscrew (13) from linkage shift control shift arm lever (14).

8 Remove driver shift control manual lever (2), woodruff key (15), and two sleeve bearings (16).

9 Remove hexagon plain nut (17), lockwasher (18), and hexagon head capscrew (19) from linkage shift control shift arm lever (14) and rod end plain bearing (20). Remove linkage shift control shift arm lever.

10 Loosen two hexagon plain nuts (21) at ends of shift linkage plain stud (22).

11 Remove hexagon plain nut (23), lockwasher (24), and hexagon head capscrew (25) from rod end plain bearing (26) and shift control linkage bellcrank (27).

12 Remove two rod end plain bearings (20 and 26) and two hexagon plain nuts (21) from shift linkage plain stud (22).

13 Loosen hexagon plain nuts (28) at ends of shift linkage control rod (29).

14 Remove hexagon plain nut (30), lockwasher (31), and hexagon head capscrew (32) from rod end plain bearing (33) and shift control linkage bellcrank (27).

15 Remove hexagon plain nut (34), lockwasher (35), rigid shift linkage connecting link (36), flat washer (37), and hexagon head capscrew (38) from shift linkage rod remote control lever (39).

16 Remove two rod end plain bearings (33 and 40) and two hexagon plain nuts (28) from shift linkage control rod (29).

17 Remove machine bolt (41), lockwasher (42), and rod end plain bearing (43) from top of shift control linkage bellcrank (27).

18 Remove shift control linkage bellcrank (27).

19 Remove machine bolt (44), lockwasher (45), and rod end plain bearing (46) from hull.

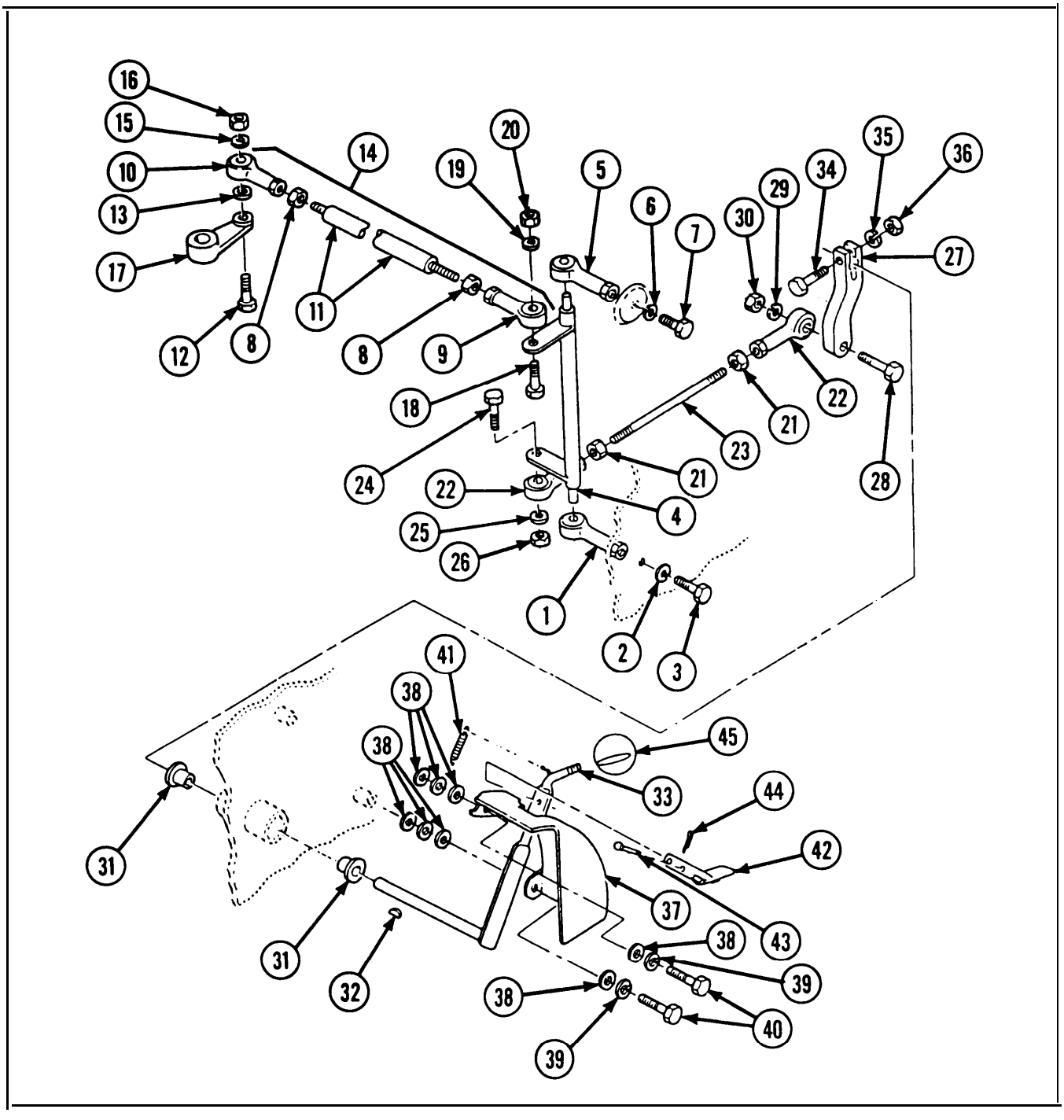
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-134. MAINTENANCE OF SHIFTING CONTROL AND LINKAGE (CONT).

REASSEMBLY/INSTALLATION



1 Install rod end plain bearing (1), new lockwasher (2), and machine bolt (3) in hull.

2 Install shift control linkage bellcrank (4) in rod end plain bearing (1).

3 Install rod end plain bearing (5) on shift control linkage bellcrank (4). Secure to hull with new lockwasher (6) and machine bolt (7).

4 Install two hexagon plain nuts (8), and two rod end plain bearings (9 and 10) on ends of shift linkage control rod (11).

5 Install hexagon head capscrew (12), flat washer (13), rigid shift linkage connecting link (14), new lockwasher (15), and hexagon plain nut (16) on shift linkage rod remote control lever (17).

6 Install hexagon head capscrew (18), new lockwasher (19), and hexagon plain nut (20) through shift control linkage bellcrank (4) and rod end plain bearing (9).

7 Tighten two hexagon plain nuts (8) at ends of shift linkage control rod (11).

8 Install two hexagon plain nuts (21) and two rod end plain bearings (22) on shift linkage plain stud (23).

9 Install hexagon head capscrew (24), new lockwasher (25), and hexagon plain nut (26) through rod end plain bearing (22) and shift control linkage bellcrank (4).

10 Tighten two hexagon plain nuts (21) at ends of shift linkage plain stud (23).

11 Install linkage shift control shift arm lever (27). Install hexagon head capscrew (28), new lockwasher (29), and hexagon plain nut (30) through rod end plain bearing (22) and linkage shift control shift arm lever.

12 Install two sleeve bearings (31), woodruff key (32), and driver shift control manual control lever (33).

13 Install hexagon head capscrew (34), new lockwasher (35), and hexagon plain nut (36) through linkage shift control shift arm lever (27).

14 Install access cover (37) on bulkhead.

15 Install eight flat washers (38), two new lockwashers (39), and two hexagon head capscrews (40) through access cover (37).

16 Install helical spring (41) on driver shift control manual control lever (33).

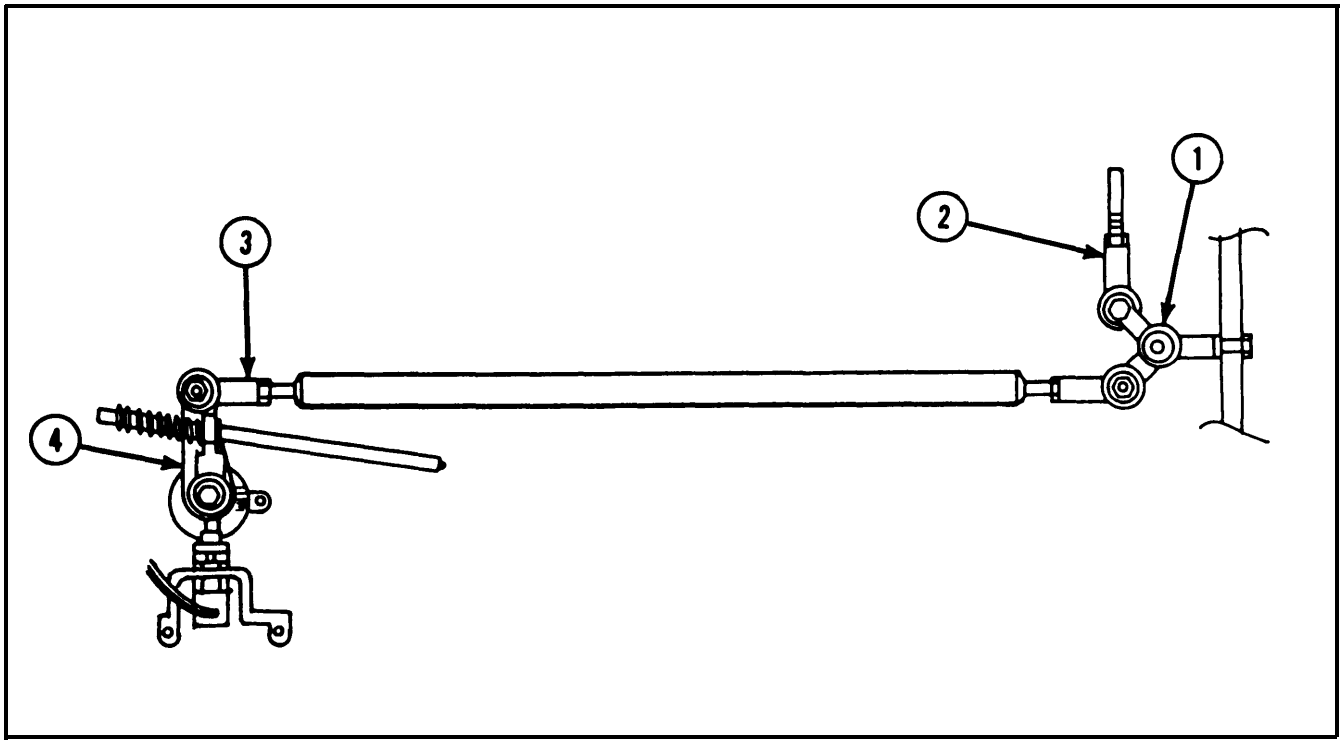
17 Install shift control latch (42). Install two headed straight pins (43) in shift control latch.

18 Install two new cotter pins (44) in two headed straight pins (43).

19 Install knob (45) on driver shift control manual control lever (33).

2-134. MAINTENANCE OF SHIFTING CONTROL AND LINKAGE (CONT).

ADJUSTMENT



1 Turn off engine.

2 Block tracks.

3 Shift transmission into first gear.

4 Measure distance from bulkhead to center of hole in upper lever of shift control linkage bellcrank (1). Distance must be 1.56 to 1.69 in. (3.96 to 4.29 cm). If not, disconnect rod end plain bearing (2) from shift control linkage bellcrank and adjust rod end plain bearing until distance is within tolerance. Connect rod end plain bearing to shift control linkage bellcrank.

5 Check shift position indicator on transmission. Number 1 must be aligned with index hole. If not, disconnect rod end plain bearing (3) from linkage shift control shift arm lever (4). Align number 1 on indicator with index hole, as shown, then adjust rod end plain bearing until holes in rod end plain bearing and linkage shift control shift arm lever are aligned. Connect rod end plain bearing to linkage shift control shift arm lever.

6 Shift transmission through all positions. Stop at each position and check that shift position indicator on transmission is aligned with index hole and agrees with driver shift control manual control lever in driver's compartment.

7 Road test vehicle.

2-135. MAINTENANCE OF IMPACT WRENCH CONTROL HYDRAULIC LINES AND FITTINGS AND IMPACT WRENCH REGULATOR BALL VALVE.

This task covers:	a. *Removal/Disassembly*	c. *Reassembly/Installation*
	b. *Inspection/Repair*	

INITIAL SETUP

Tools and Special Tools

Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)

- Torque wrench (0 to 170 ft-lb)

Materials/Parts

Locknut (6)
Lockwasher (4)
Lockwasher (2)
Lockwasher (4)
Preformed packing (8)
Preformed packing (2)

References

TM 9-2350-238-24P-1

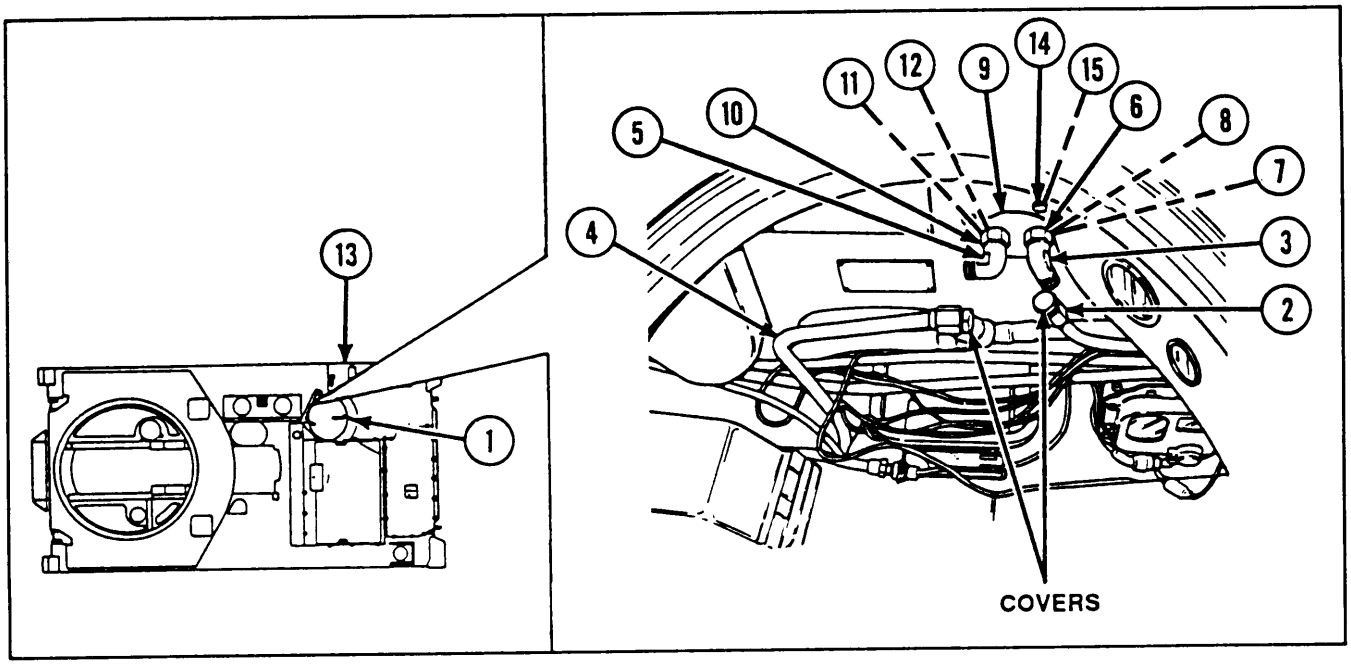
General Safety Instructions

WARNING

- To avoid injury to personnel, do not tighten or loosen hydraulic fittings when system is pressurized.
- Lower the boom to stowed position before doing any maintenance on hydraulic system.
- Wipe up spilled hydraulic fluid to prevent injury to personnel.

2-135. MAINTENANCE OF IMPACT WRENCH CONTROL HYDRAULIC LINES AND FITTINGS AND IMPACT WRENCH REGULATOR BALL VALVE (CONT).

REMOVAL/DISASSEMBLY



WARNING

- To avoid injury to personnel, do not tighten or loosen hydraulic fittings when system is pressurized.
- Lower the boom to stowed position before doing any maintenance on hydraulic system.
- Wipe up spilled hydraulic fluid to prevent injury to personnel.

CAUTION

Install covers on open hydraulic ports, tubes, and hoses immediately after disconnecting them to keep dirt out of hydraulic system.

1 Open driver's hatch cover (1).

2 Disconnect metal hose assembly (2) from tube elbow (3).

3 Disconnect metal hose assembly (4) from tube elbow (5).

4 Loosen locknut (6) on tube elbow (3). Remove tube elbow with locknut, packing retainer (7), and preformed packing (8) from impact wrench control (9).

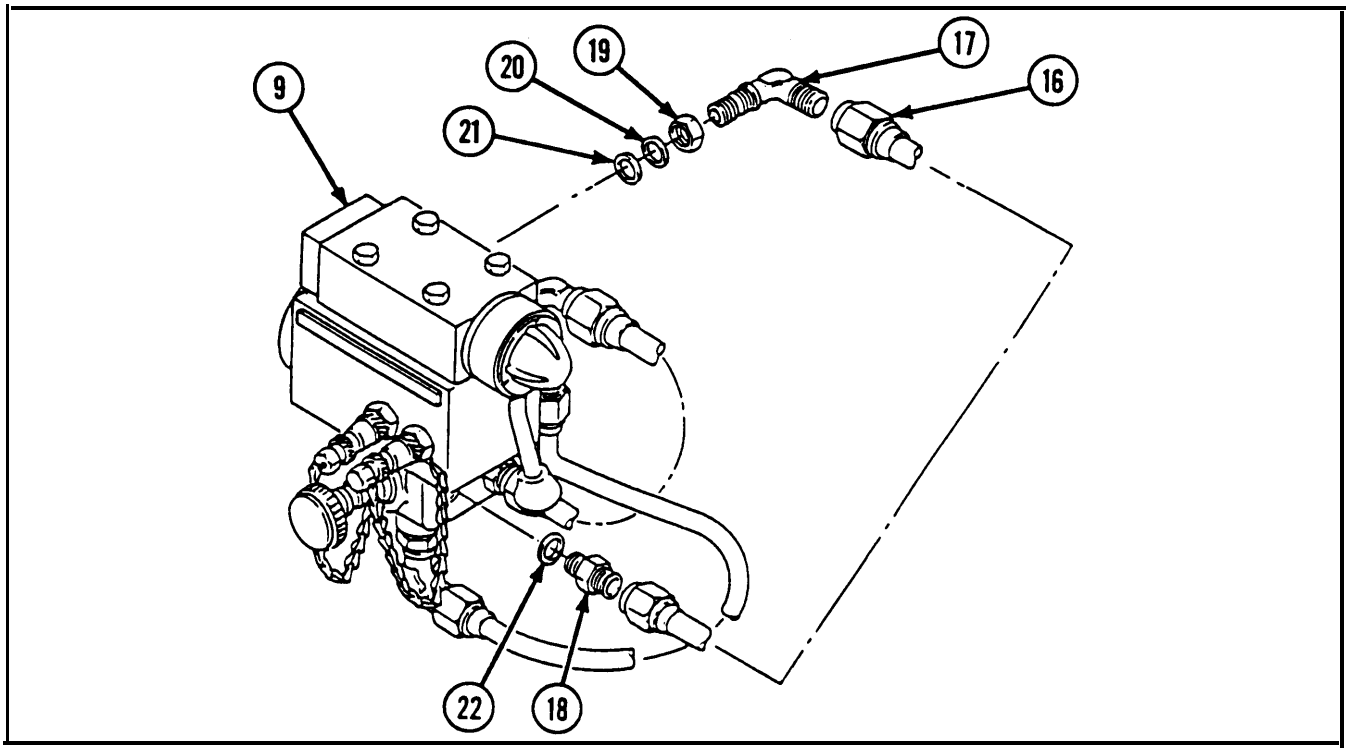
5 Remove preformed packing (8), packing retainer (7), and locknut (6) from tube elbow (3).

6 Loosen locknut (10) on tube elbow (5). Remove tube elbow with locknut, packing retainer (11), and preformed packing (12) from impact wrench control (9).

7 Remove preformed packing (12), packing retainer (11), and locknut (10) from tube elbow (5).

8 Open air cleaner blower motor access door assembly (13).

9 Support impact wrench control (9), and remove four hexagon head capscrews (14), four lockwashers (15), and impact wrench control from firewall. Lift impact wrench control out of vehicle through air cleaner blower motor access door assembly (13).



10 Disconnect metal tube assembly (16) from tube elbow (17).

11 Remove metal tube assembly (16) from tube nipple (18).

12 Loosen locknut (19) on tube elbow (17). Remove tube elbow with locknut, packing retainer (20), and preformed packing (21) from impact wrench control (9).

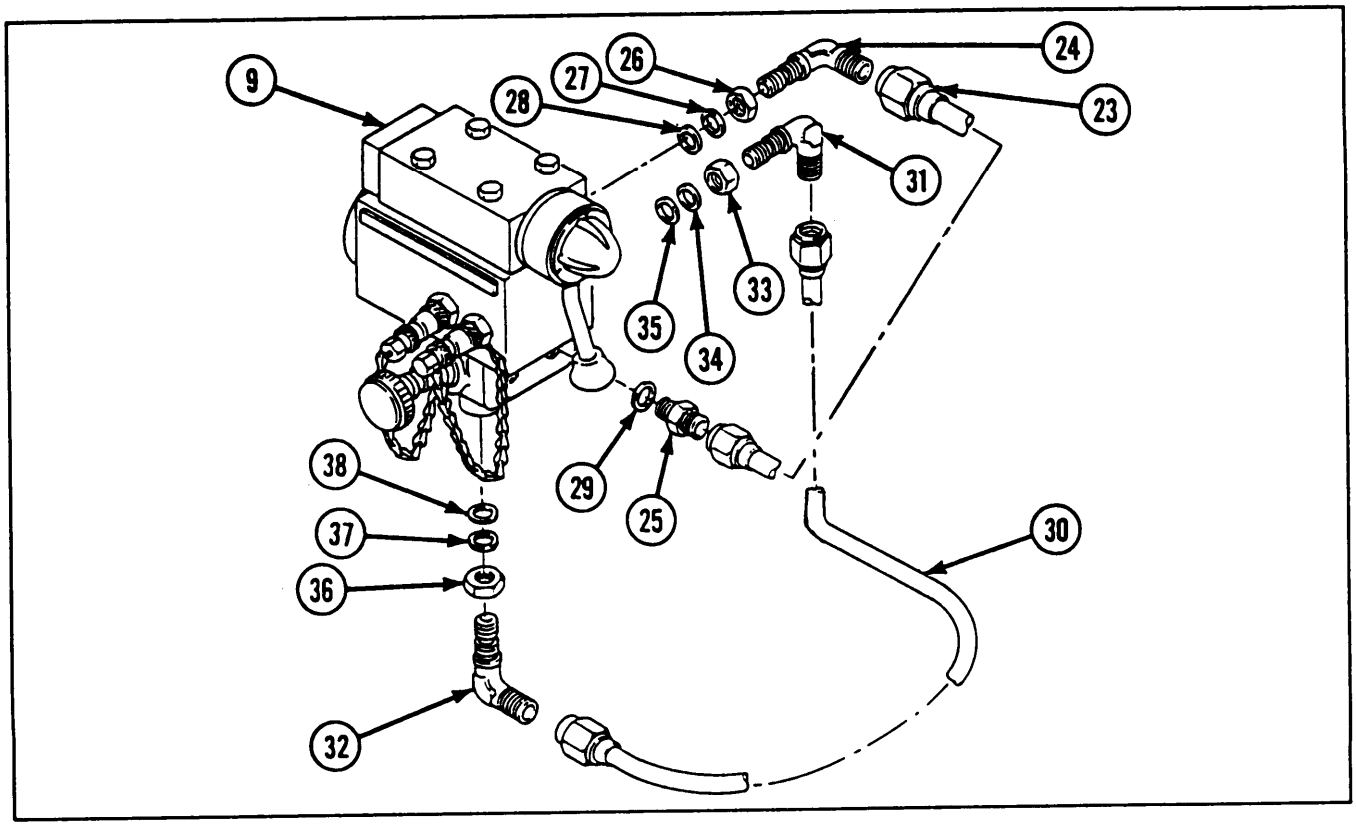
13 Remove preformed packing (21), packing retainer (20), and locknut (19) from tube elbow (17).

14 Remove tube nipple (18) with preformed packing (22) from impact wrench control (9).

15 Remove preformed packing (22) from tube nipple (18).

2-135. MAINTENANCE OF IMPACT WRENCH CONTROL HYDRAULIC LINES AND FITTINGS AND IMPACT WRENCH REGULATOR BALL VALVE (CONT).

REMOVAL/DISASSEMBLY (CONT)



16 Disconnect metal tube assembly (23) from tube elbow (24).

17 Remove metal tube assembly (23) from check valve (25).

18 Loosen locknut (26) on tube elbow (24). Remove tube elbow with locknut, packing retainer (27), and preformed packing (28) from impact wrench control (9).

19 Remove preformed packing (28), packing retainer (27), and locknut (26) from tube elbow (24).

20 Remove check valve (25) with preformed packing (29) from impact wrench control (9).

21 Remove preformed packing (29) from check valve (25).

22 Disconnect metal tube assembly (30) from tube elbow (31).

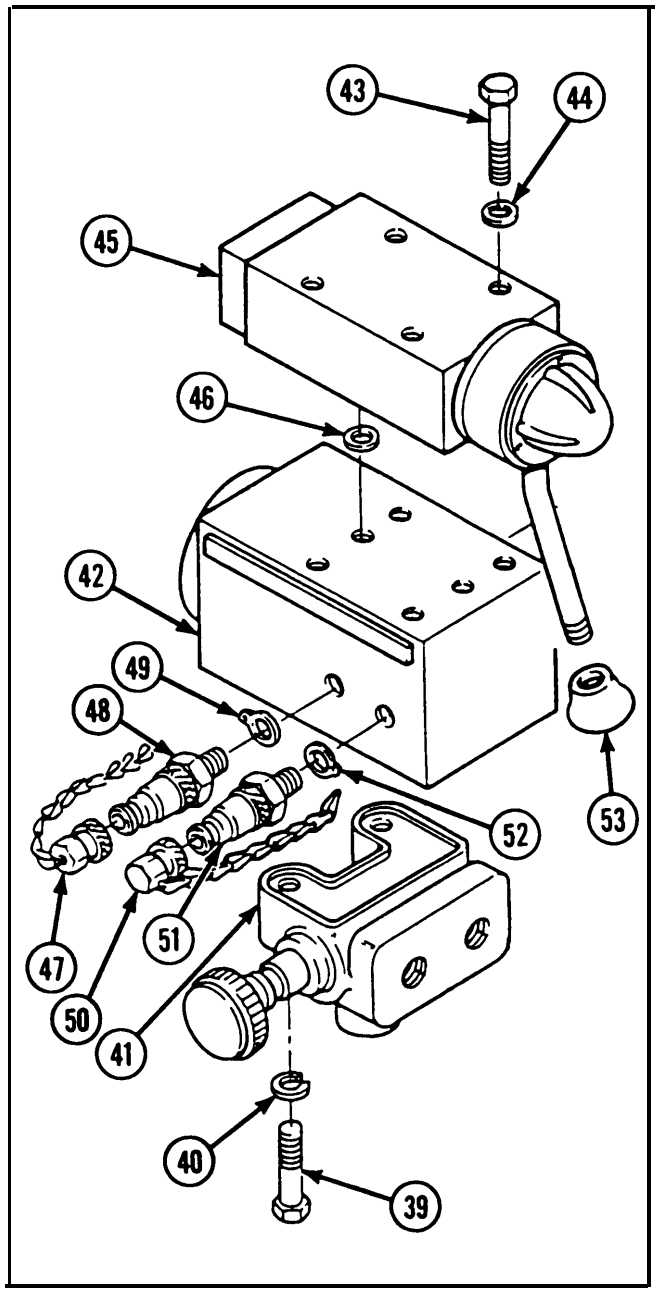
23 Remove metal tube assembly (30) from tube elbow (32).

24 Loosen locknut (33) on tube elbow (31). Remove tube elbow with locknut, packing retainer (34), and preformed packing (35) from impact wrench control (9).

25 Remove preformed packing (35), packing retainer (34), and locknut (33) from tube elbow (31).

26 Loosen locknut (36) on tube elbow (32). Remove tube elbow with locknut, packing retainer (37), and preformed packing (38) from impact wrench control (9).

27 Remove preformed packing (38), packing retainer (37), and locknut (36) from tube elbow (32).



28 Remove two hexagon head capscrews (39), two lockwashers (40), and spade control direct linear valve (41) from flow regulator manifold (42).

29 Remove four hexagon head capscrews (43), four lockwashers (44), impact wrench regulator ball valve (45), and two preformed packings (46) from flow regulator manifold (42).

30 Remove quick disconnect cap (47) from coupling half (48).

31 Remove coupling half (48) and retaining ring (49) from flow regulator manifold (42).

32 Remove retaining ring (49) from chain on quick disconnect cap (47).

33 Remove quick disconnect cap (50) from coupling half (51).

34 Remove coupling half (51) and retaining ring (52) from flow regulator manifold (42).

35 Remove retaining ring (52) from chain on quick disconnect cap (50).

36 Remove regulator valve knob (53) from impact wrench regulator ball valve (45).

2-135. MAINTENANCE OF IMPACT WRENCH CONTROL HYDRAULIC LINES AND FITTINGS AND IMPACT WRENCH REGULATOR BALL VALVE (CONT).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 For further disassembly of impact wrench regulator ball valve, notify direct support maintenance.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY/INSTALLATION

1 Install retaining ring (1) on chain of quick disconnect cap (2).

2 Install retaining ring (1) and coupling half (3) on flow regulator manifold (4).

3 Install quick disconnect cap (2) on coupling half (3).

4 Install retaining ring (5) on chain of quick disconnect cap (6).

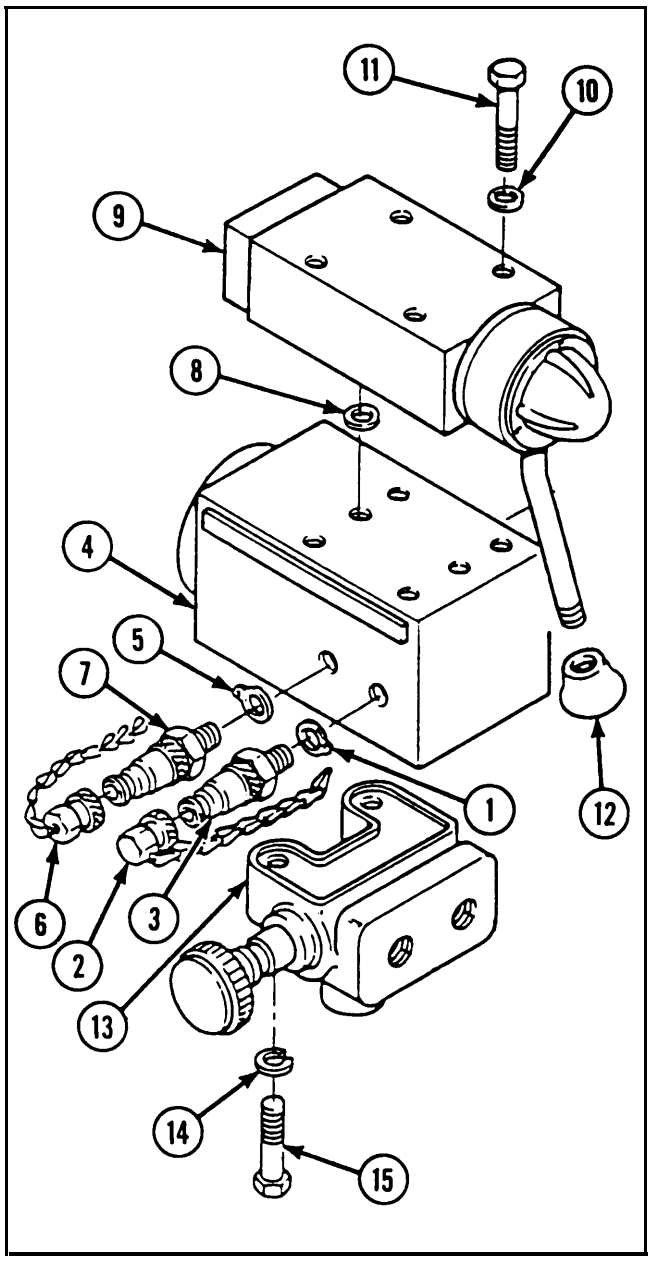
5 Install retaining ring (5) and coupling half (7) on flow regulator manifold (4).

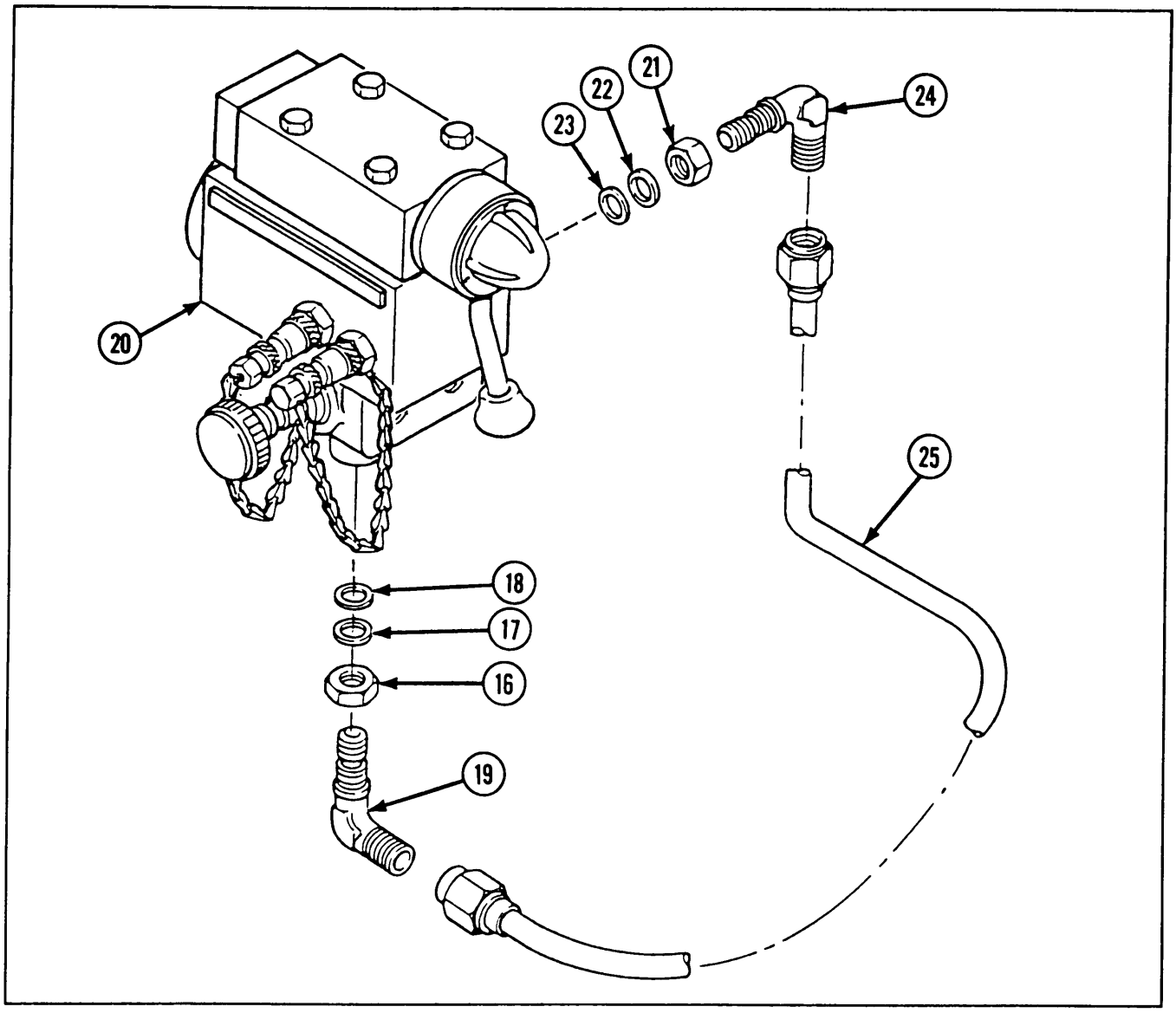
6 Install quick disconnect cap (6) on coupling half (7).

7 Install two new preformed packings (8), impact wrench regulator ball valve (9), four new lockwashers (10), and four hexagon head capscrews (11) on flow regulator manifold (4). Torque four hexagon head capscrews 32 to 35 ft-lb (43 to 48 N-m).

8 Install regulator valve knob (12) on impact wrench regulator ball valve (9).

9 Install spade control direct linear valve (13), two new lockwashers (14), and two hexagon head capscrews (15) on flow regulator manifold (4).





10 Install new locknut (16), packing retainer (17), and new preformed packing (18) on tube elbow (19).

11 Install tube elbow (19) with attached parts on impact wrench control (20). Tighten locknut (16) on tube elbow.

12 Install new locknut (21), packing retainer (22), and new preformed packing (23) on tube elbow (24).

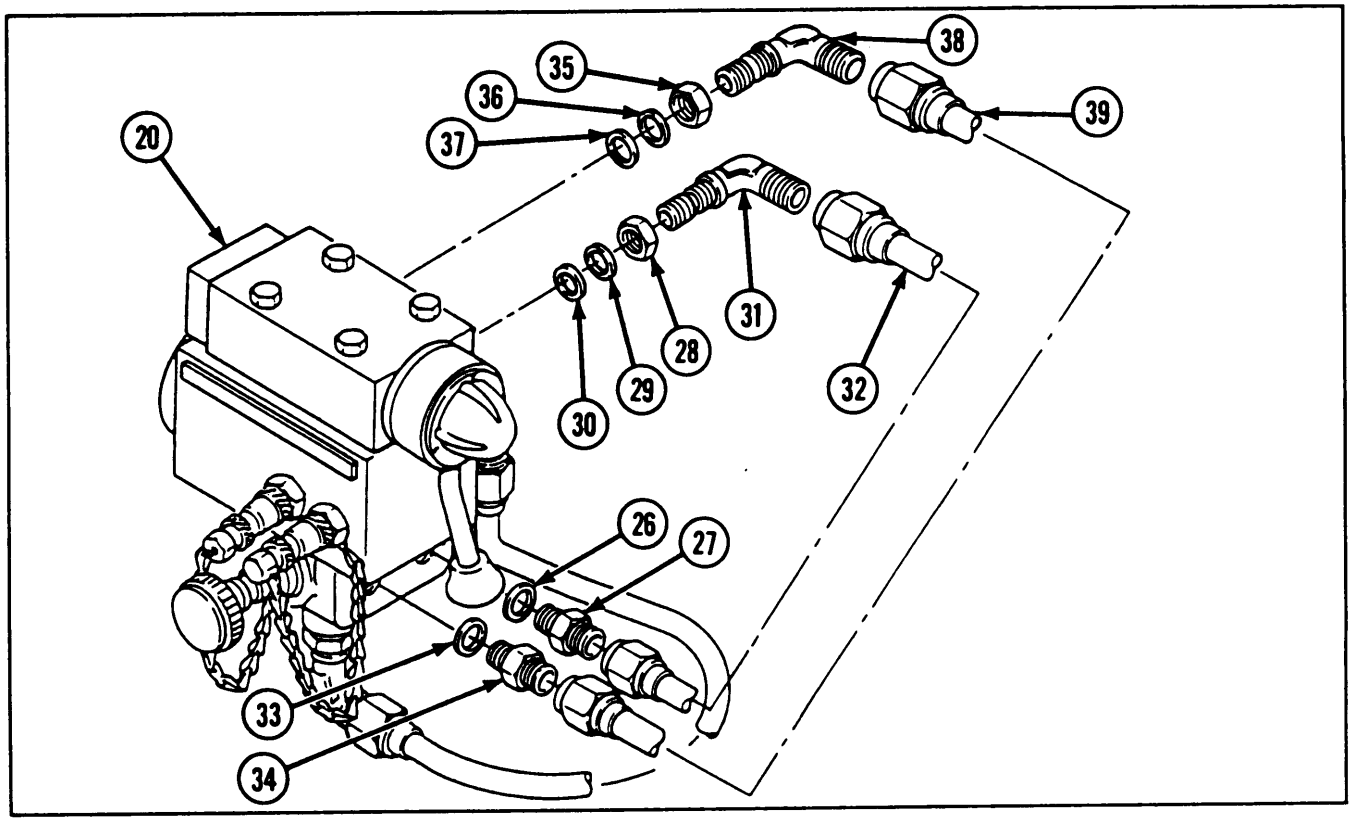
13 Install tube elbow (24) with attached parts on impact wrench control (20). Tighten locknut (21) on tube elbow.

14 Install metal tube assembly (25) on tube elbow (19).

15 Connect metal tube assembly (25) to tube elbow (24).

2-135. MAINTENANCE OF IMPACT WRENCH CONTROL HYDRAULIC LINES AND FITTINGS AND IMPACT WRENCH REGULATOR BALL VALVE (CONT).

REASSEMBLY/INSTALLATION (CONT)



16 Install new preformed packing (26) on check valve (27).

17 Install check valve (27) with preformed packing (26) on impact wrench control (20).

18 Install new locknut (28), packing retainer (29), and new preformed packing (30) on tube elbow (31).

19 Install tube elbow (31) with attached parts on impact wrench control (20). Tighten locknut (28) on tube elbow.

20 Install metal tube assembly (32) on check valve (27).

21 Connect metal tube assembly (32) to tube elbow (31).

22 Install new preformed packing (33) on tube nipple (34).

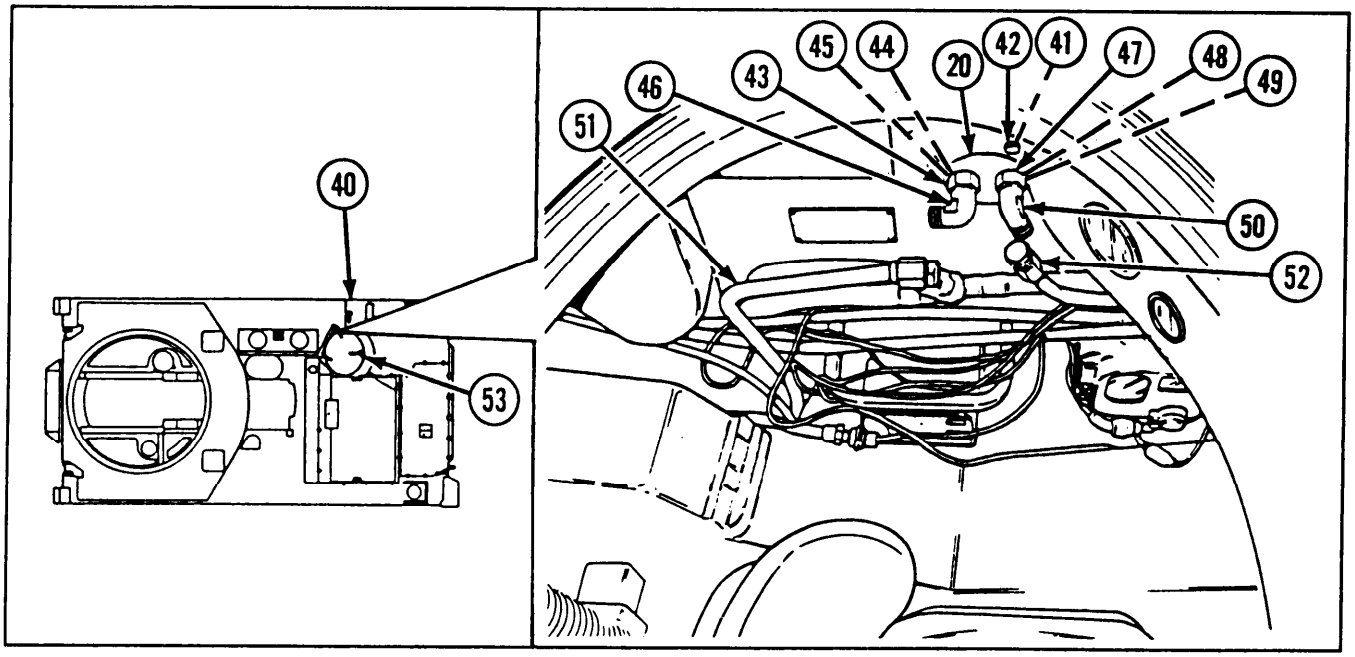
23 Install tube nipple (34) with new preformed packing (33) on impact wrench control (20).

24 Install new locknut (35), packing retainer (36), and new preformed packing (37) on tube elbow (38).

25 Install tube elbow (38) with attached parts on impact wrench control (20). Tighten locknut (35) on tube elbow.

26 Install metal tube assembly (39) on tube nipple (34).

27 Connect metal tube assembly (39) to tube elbow (38).



28 Open air cleaner blower motor access door assembly (40). Place impact wrench control (20) into vehicle through air cleaner blower motor access door assembly.

29 Support and install impact wrench control (20) on firewall, using four new lockwashers (41) and four hexagon head capscrews (42).

30 Install new locknut (43), packing retainer (44), and new preformed packing (45) on tube elbow (46).

31 Install tube elbow (46) with attached parts on impact wrench control (20). Tighten locknut (43) on tube elbow.

32 Install new locknut (47), packing retainer (48), and new preformed packing (49) on tube elbow (50).

33 Install tube elbow (50) with attached parts on impact wrench control (20). Tighten locknut (47) on tube elbow.

34 Connect metal hose assembly (51) to tube elbow (46).

35 Connect metal hose assembly (52) to tube elbow (50).

36 Close driver's hatch cover (53).

2-136. MAINTENANCE OF HYDRAULIC POWER SUPPLY LINES AND FITTINGS (FORWARD SECTION).

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Materials/Parts
Locknut (2)
Lockwasher (10)
Preformed packing (2)
Preformed packing (2)
Tube locknut (3)

References
TM 9-2350-238-24P-1

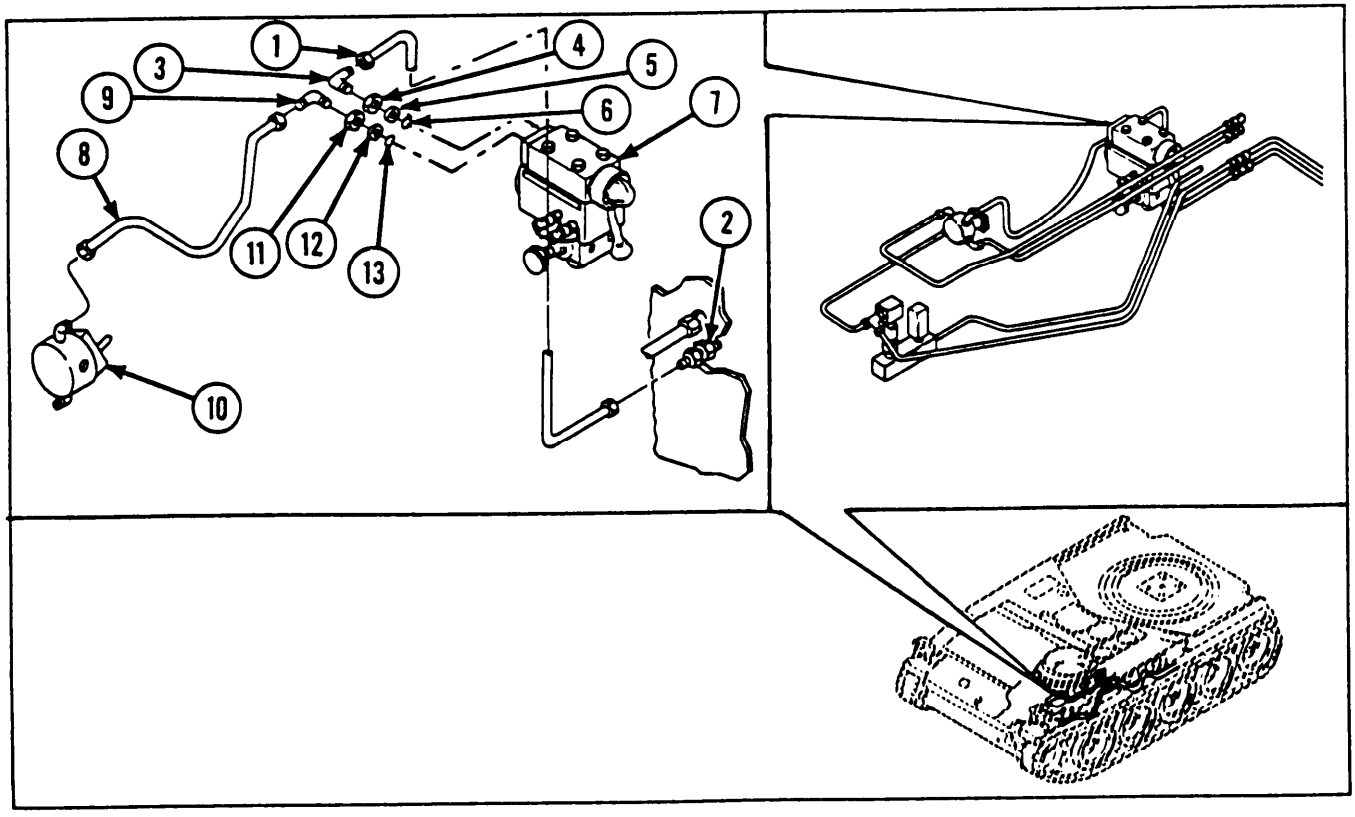
Equipment Conditions
2-952 Driver's seat removed
2-928 Driver's compartment forward and aft cowls removed

General Safety Instructions

WARNING

- To avoid injury to personnel, do not tighten or loosen hydraulic fittings when system is pressurized.
- Lower the boom to stowed position before doing any maintenance on hydraulic system.
- Wipe up any spilled hydraulic fluid to prevent injury to personnel.

REMOVAL



WARNING

- To avoid injury to personnel, do not tighten or loosen hydraulic fittings when system is pressurized.
- Lower the boom to stowed position before doing any maintenance on hydraulic system.
- Wipe up any spilled hydraulic fluid to prevent injury to personnel.

CAUTION

Install covers on open hydraulic ports, tubes, and hoses immediately after disconnecting them to keep dirt out of hydraulic system.

NOTE

Gain access to hydraulic power supply fittings through the hull well.

1 Disconnect flow regulator metal tube assembly (1) from tube nipple (2).

2 Disconnect flow regulator metal tube assembly (1) from tube elbow (3).

3 Loosen tube locknut (4) on tube elbow (3). Remove tube elbow with tube locknut, packing retainer (5), and preformed packing (6) from impact wrench control (7).

4 Remove preformed packing (6), packing retainer (5), and tube locknut (4) from tube elbow (3).

5 Disconnect spade control valve metal tube assembly (8) from tube elbow (9).

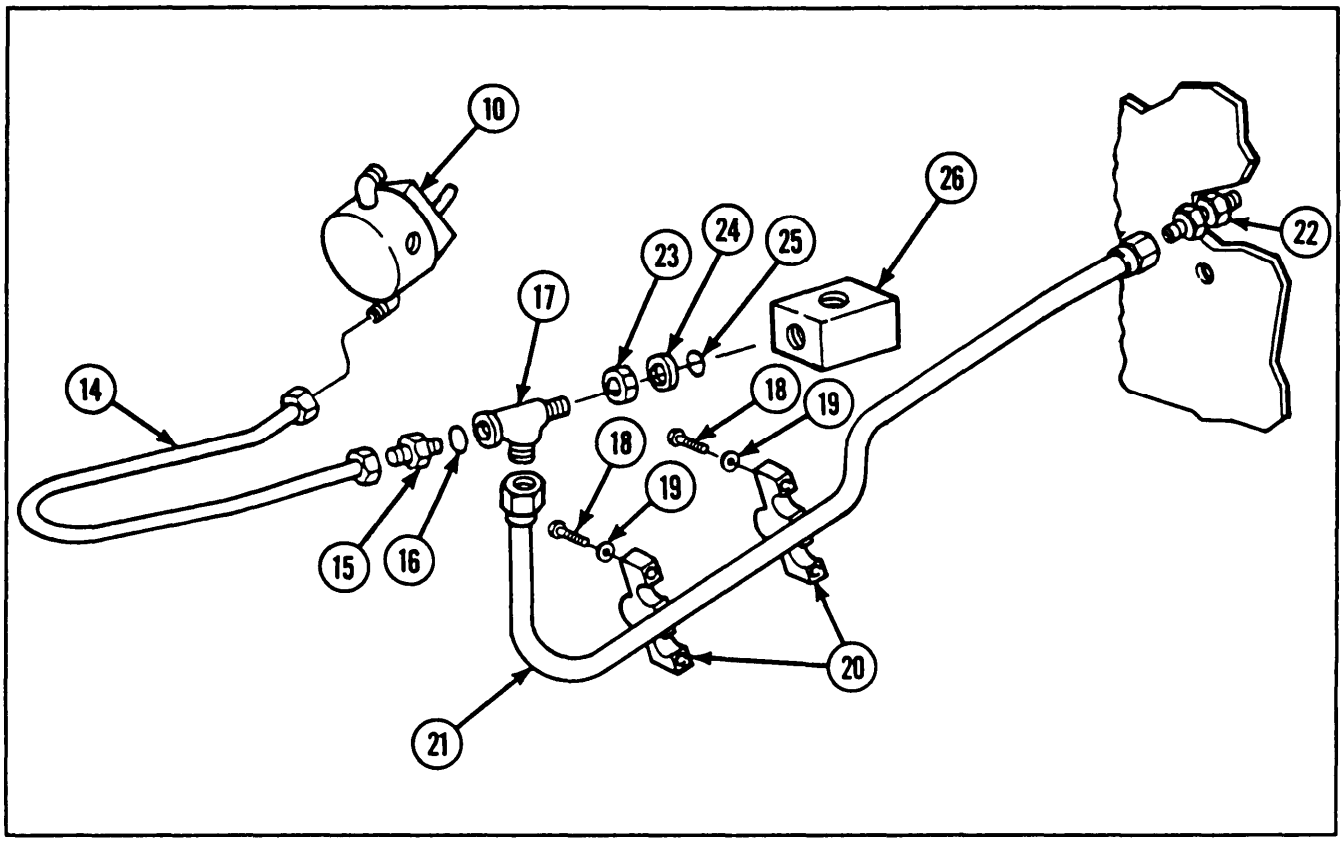
6 Disconnect spade control valve metal tube assembly (8) from valve (10).

7 Loosen tube locknut (11) on tube elbow (9). Remove tube elbow with tube locknut, packing retainer (12), and preformed packing (13) from impact wrench control (7).

8 Remove preformed packing (13), packing retainer (12), and tube locknut (11) from tube elbow (9).

2-136. MAINTENANCE OF HYDRAULIC POWER SUPPLY LINES AND FITTINGS (FORWARD SECTION) (CONT).

REMOVAL (CONT)



9 Disconnect lockout manifold metal tube assembly (14) from valve (10).

10 Disconnect lockout manifold metal tube assembly (14) from tube reducer (15).

11 Remove tube reducer (15) and preformed packing (16) from tube to boss tee (17).

12 Remove preformed packing (16) from tube reducer (15).

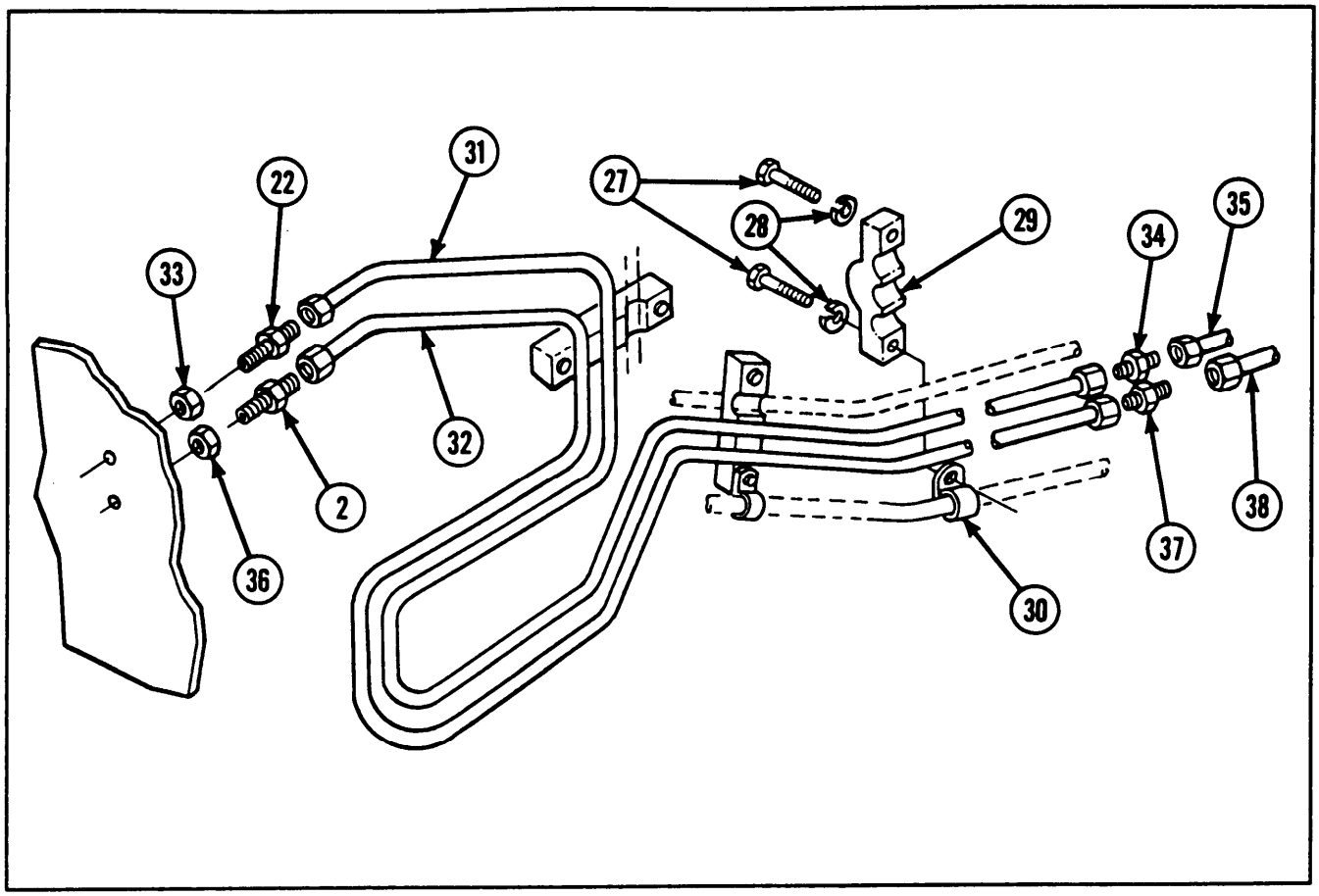
13 Remove four screws (18), four lockwashers (19), and two retaining straps (20) from lockout manifold metal tube assembly (21).

14 Disconnect lockout manifold metal tube assembly (21) from tube to boss tee (17).

15 Disconnect lockout manifold metal tube assembly (21) from tube nipple (22).

16 Loosen locknut (23) on tube to boss tee (17). Remove tube to boss tee with locknut, packing retainer (24), and preformed packing (25) from manifold (26).

17 Remove preformed packing (25), packing retainer (24), and locknut (23) from tube to boss tee (17).



18 Remove six hexagon head capscrews (27), six lockwashers (28), three clamps (29), and three loop clamps (30) from nipple to bulkhead metal tube assembly (31) and union to bulkhead metal tube assembly (32).

19 Remove tube nipple (22) with locknut (33) from nipple to bulkhead metal tube assembly (31).

20 Remove locknut (33) from tube nipple (22).

21 Disconnect nipple to bulkhead metal tube assembly (31) from tube nipple (34).

22 Remove tube nipple (34) from metal tube assembly (35).

23 Remove tube nipple (2) with tube locknut (36) from union to bulkhead metal tube assembly (32).

24 Remove tube locknut (36) from tube nipple (2).

25 Disconnect union to bulkhead metal tube assembly (32) from tube nipple (37).

26 Remove tube nipple (37) from metal tube assembly (38).

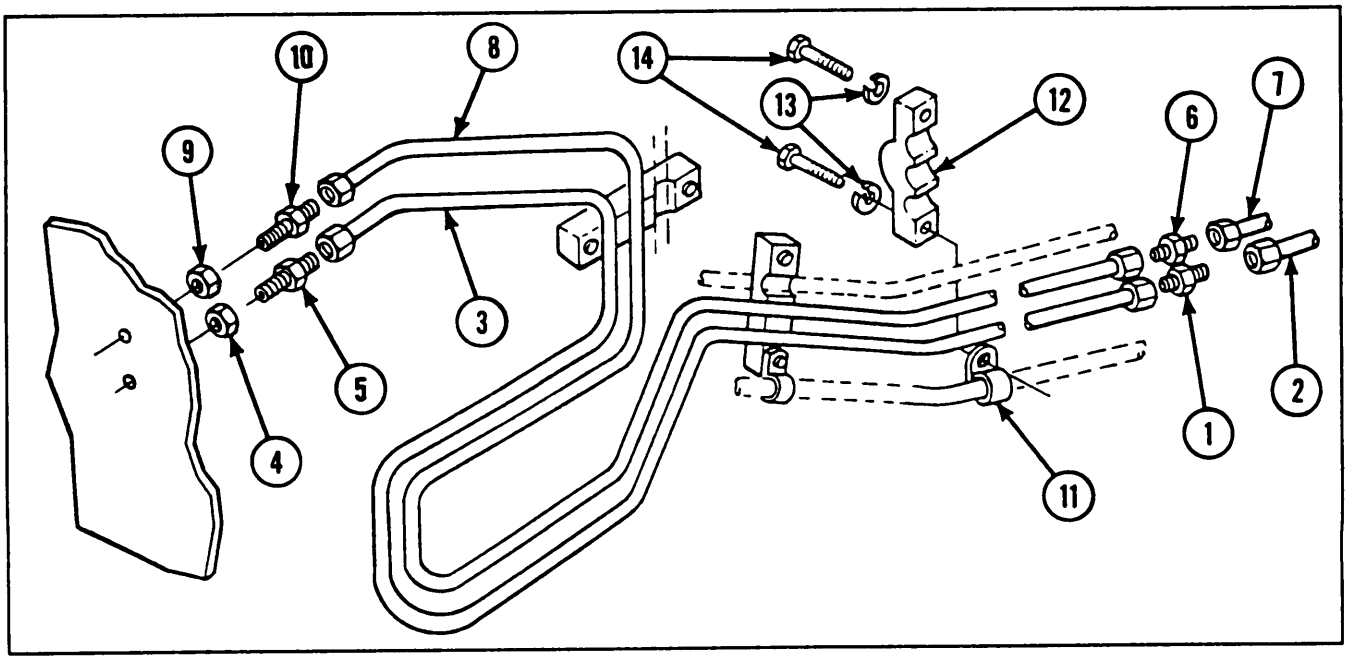
2-136. MAINTENANCE OF HYDRAULIC POWER SUPPLY LINES AND FITTINGS (FORWARD SECTION) (CONT).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



1 Install tube nipple (1) on metal tube assembly (2).

2 Connect union to bulkhead metal tube assembly (3) to tube nipple (1).

3 Install new tube locknut (4) on tube nipple (5).

4 Install tube nipple (5) with tube locknut (4) on union to bulkhead metal tube assembly (3).

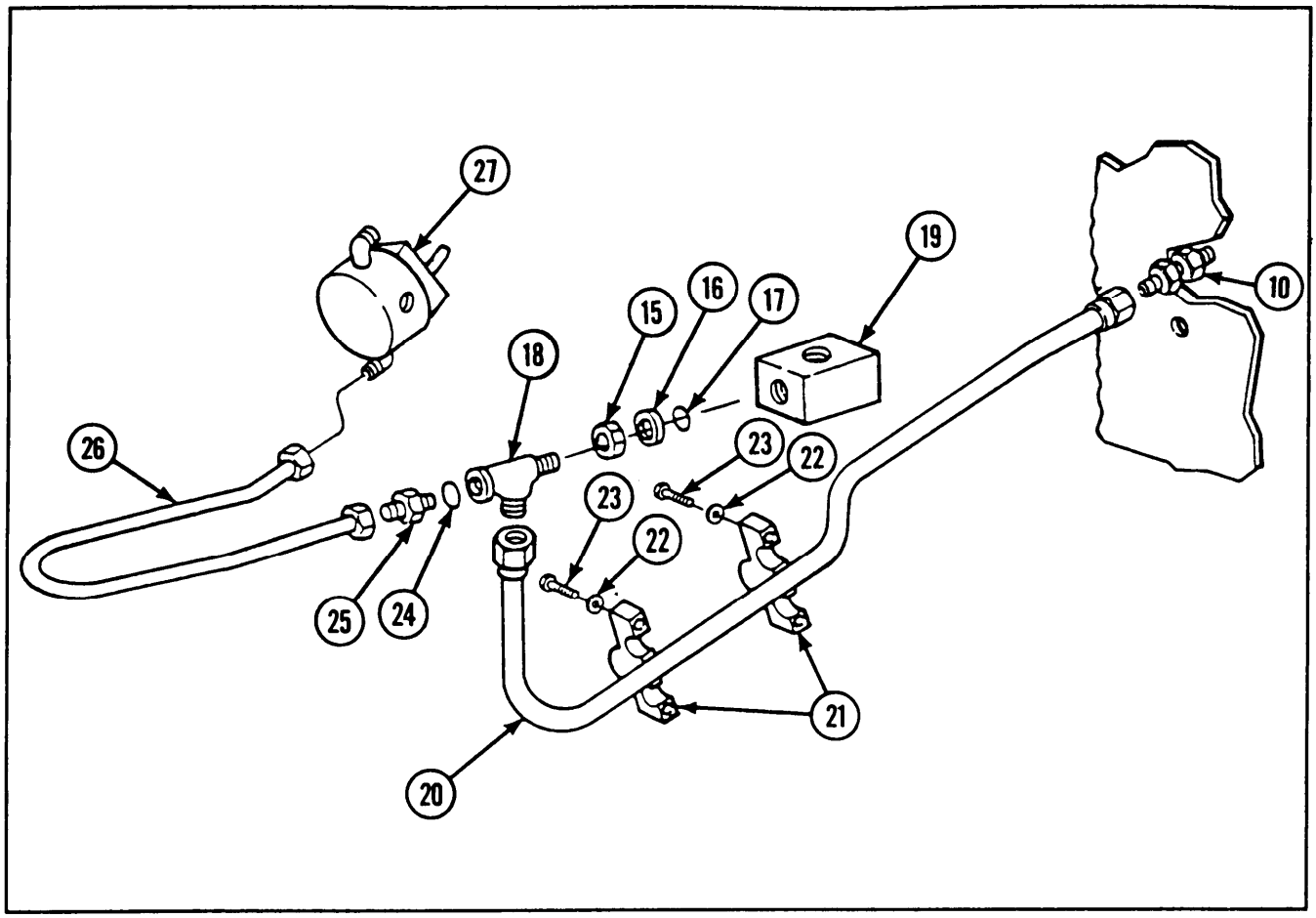
5 Install tube nipple (6) on metal tube assembly (7).

6 Connect nipple to bulkhead metal tube assembly (8) to tube nipple (6).

7 Install new locknut (9) on tube nipple (10).

8 Install tube nipple (10) with locknut (9) on nipple to bulkhead metal tube assembly (8).

9 Install three loop clamps (11), three clamps (12), six new lockwashers (13), and six hexagon head capscrews (14) to secure nipple to bulkhead metal tube assembly (8) and union to bulkhead metal tube assembly (3).



10 Install new locknut (15), packing retainer (16), and new preformed packing (17) on tube to boss tee (18).

11 Install tube to boss tee (18) with attached parts on manifold (19) of suspension lockout system control valve.

12 Tighten locknut (15) on tube to boss tee (18).

13 Connect lockout manifold metal tube assembly (20) to tube nipple (10).

14 Connect lockout manifold metal tube assembly (20) to tube to boss tee (18).

15 Install two retaining straps (21), four new lockwashers (22), and four screws (23) to secure lockout manifold metal tube assembly (20).

16 Install new preformed packing (24) on tube reducer (25).

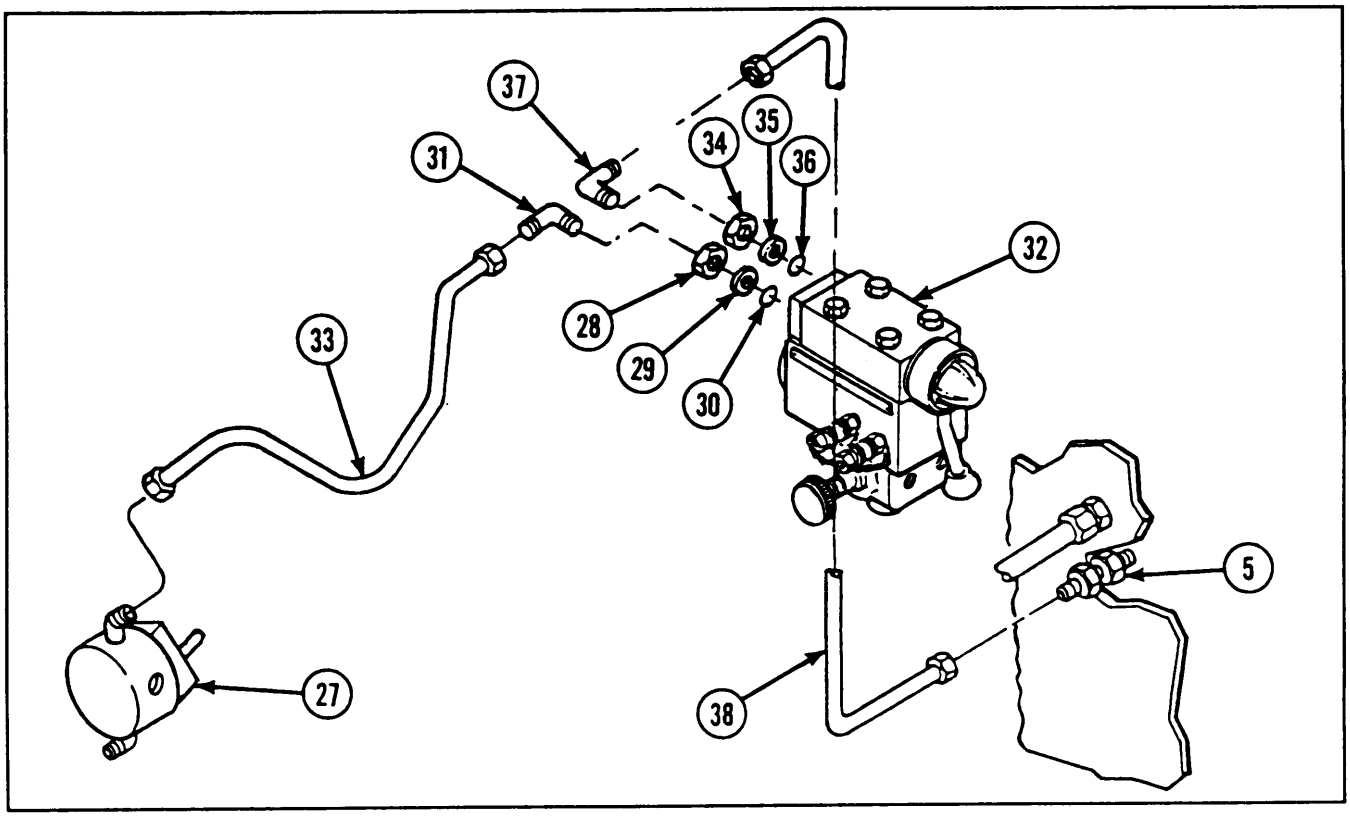
17 Install tube reducer (25) with preformed packing (24) on tube to boss tee (18).

18 Connect lockout manifold metal tube assembly (26) to tube reducer (25).

19 Connect lockout manifold metal tube assembly (26) to valve (27).

2-136. MAINTENANCE OF HYDRAULIC POWER SUPPLY LINES AND FITTINGS (FORWARD SECTION) (CONT).

INSTALLATION (CONT)



20 Install new tube locknut (28), packing retainer (29), and new preformed packing (30) on tube elbow (31).

21 Install tube elbow (31) with attached parts on impact wrench control (32).

22 Tighten tube locknut (28) on tube elbow (31).

23 Connect spade control valve metal tube assembly (33) to valve (27).

24 Connect spade control valve metal tube assembly (33) to tube elbow (31).

25 Install new tube locknut (34), packing retainer (35), and new preformed packing (36) on tube elbow (37).

26 Install tube elbow (37) with attached parts on impact wrench control (32).

27 Tighten tube locknut (34) on tube elbow (37).

28 Connect flow regulator metal tube assembly (38) to tube elbow (37).

29 Connect flow regulator metal tube assembly (38) to tube nipple (5).

2-137. MAINTENANCE OF HYDRAULIC POWER SUPPLY LINES AND FITTINGS (AFT SECTION).

This task covers: a. *Removal* b. *hspection/Repair* c. *Installation*

INITIAL SETUP

Materials/Parts
Locknut
Locknut
Lockwasher (6)
Preformed packing (2)
Preformed packing (5)

References
TM 9-2350-238-24P-1

General Safety Instructions

WARNING

- To avoid injury to personnel, do not tighten or loosen hydraulic fittings when system is pressurized.
- Lower the boom to stowed position before doing any maintenance on hydraulic system.
- Wipe up any spilled hydraulic fluid to prevent injury to personnel.

REMOVAL

WARNING

- To avoid injury to personnel, do not tighten or loosen hydraulic fittings when system is pressurized.
- Lower the boom to stowed position before doing any maintenance on hydraulic system.
- Wipe up any spilled hydraulic fluid to prevent injury to personnel.

CAUTION

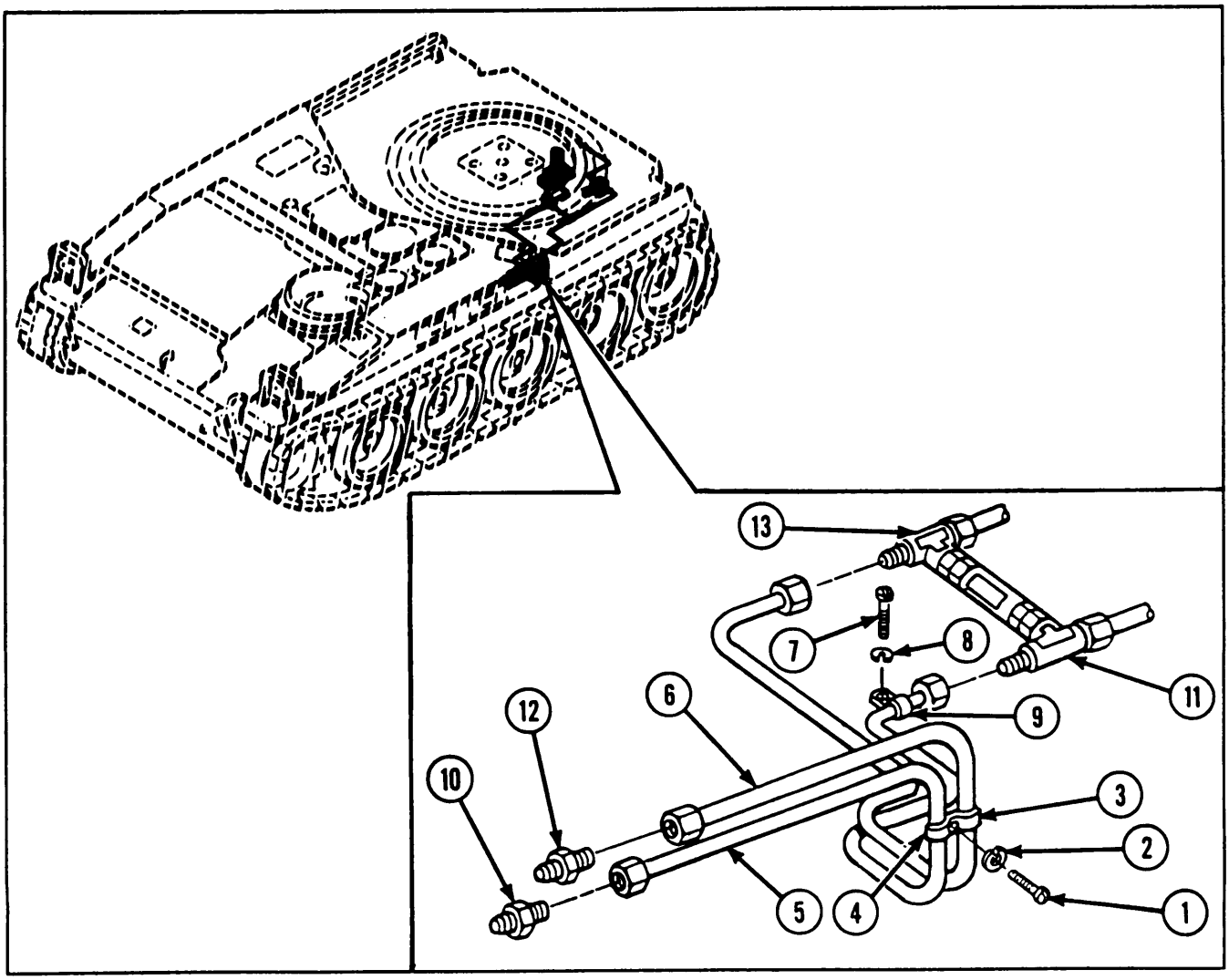
Install covers on open hydraulic ports, tubes, and hoses immediately after disconnecting them to keep dirt out of hydraulic system.

NOTE

Access to aft hydraulic power supply fittings is gained through the cab well.

2-137. MAINTENANCE OF HYDRAULIC POWER SUPPLY LINES AND FITTINGS (AFT SECTION) (CONT).

REMOVAL (CONT)



1 Remove hexagon head capscrew (1), lockwasher (2), loop clamp (3), and loop clamp (4) from pressure line metal tube assembly (5) and nipple to tee metal tube assembly (6).

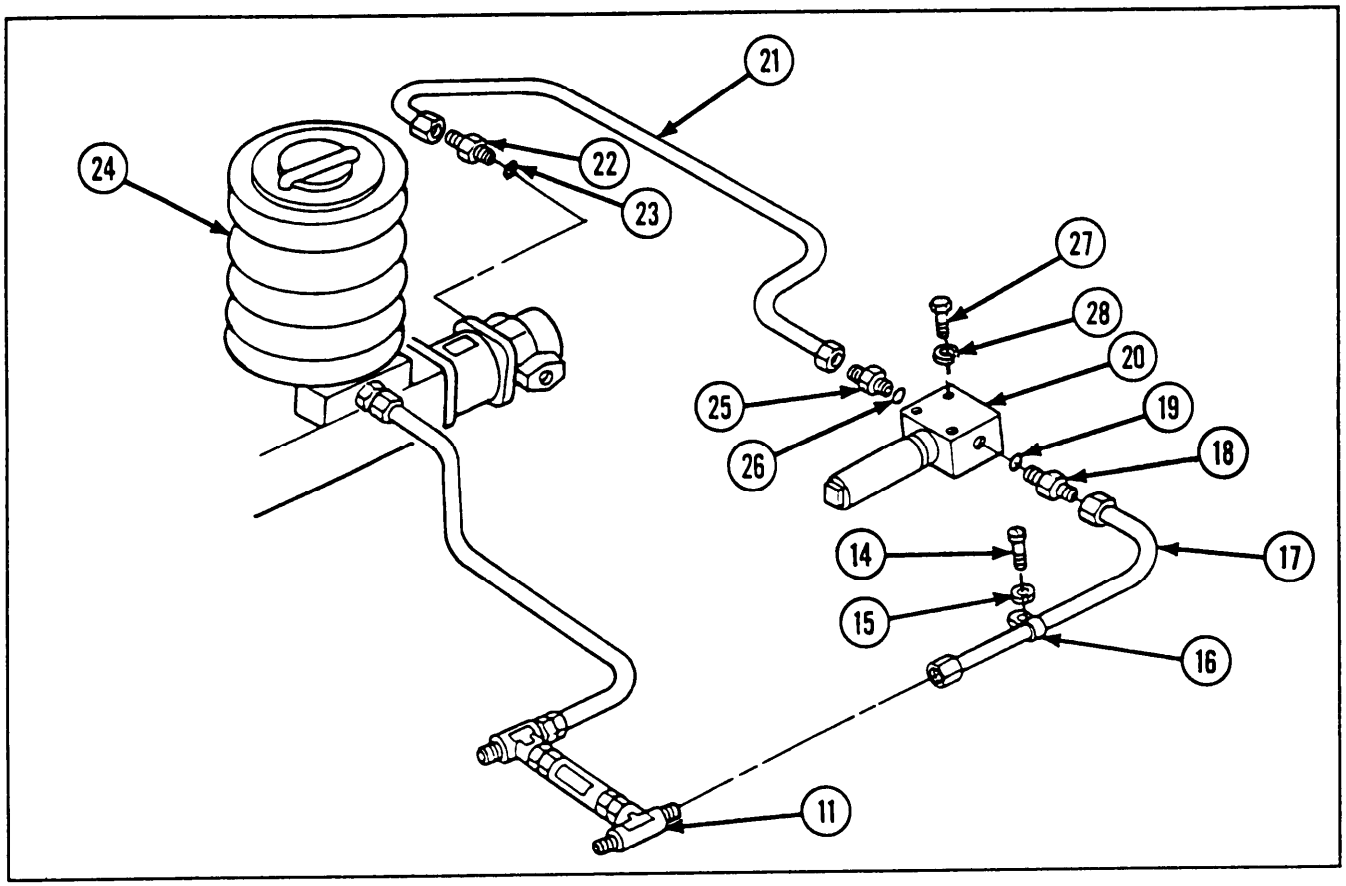
2 Remove hexagon head capscrew (7), lockwasher (8), and loop clamp (9) from pressure line metal tube assembly (5).

3 Disconnect pressure line metal tube assembly (5) from tube nipple (10).

4 Disconnect pressure line metal tube assembly (5) from tube tee (11).

5 Disconnect nipple to tee metal tube assembly (6) from tube nipple (12).

6 Disconnect nipple to tee metal tube assembly (6) from tee (13).



7 Remove hexagon head capscrew (14), lockwasher (15), and loop clamp (16) from filter to tee metal tube assembly (17).

8 Disconnect filter to tee metal tube assembly (17) from tube tee (11).

9 Disconnect metal tube assembly (17) from tube reducer (18).

10 Remove tube reducer (18) with preformed packing (19) from fluid filter (20).

11 Remove preformed packing (19) from tube reducer (18).

12 Disconnect pump to filter metal tube assembly (21) from tube nipple (22).

13 Disconnect tube nipple (22) with preformed packing (23) from slip ring and pump assembly (24).

14 Remove preformed packing (23) from tube nipple (22).

15 Disconnect pump to filter metal tube assembly (21) from tube nipple (25).

16 Disconnect tube nipple (25) with preformed packing (26) from fluid filter (20).

17 Remove preformed packing (26) from tube nipple (25).

18 Remove three screws (27), three lockwashers (28), and fluid filter (20) from bulkhead.

2-137. MAINTENANCE OF HYDRAULIC POWER SUPPLY LINES AND FITTINGS (AFT SECTION) (CONT).

REMOVAL (CONT)

19 Disconnect tee to pump metal tube assembly (29) from tube nipple (30).

20 Remove tube nipple (30) with preformed packing (31) from slip ring and pump assembly (24).

21 Remove preformed packing (31) from tube nipple (30).

22 Loosen locknut (32) on tee (13), and disconnect tee to pump metal tube assembly (29) from tee.

23 Loosen locknut (33) on tube tee (11), and remove safety relief valve (34) from tube reducer (35) and tube tee.

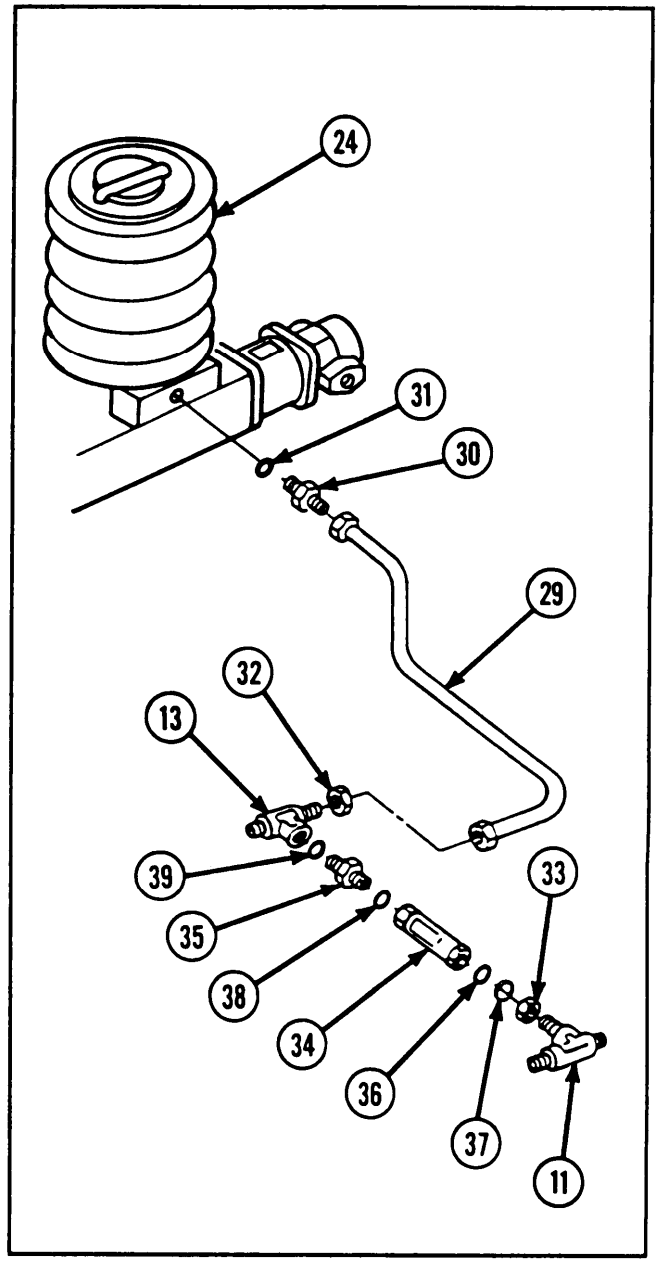
24 Remove tube tee (11) with attached parts from hull.

25 Remove preformed packing (36), packing retainer (37), and locknut (33) from tube tee (11).

26 Remove tube reducer (35), preformed packing (38), and preformed packing (39) from tee (13).

27 Remove preformed packing (38) and preformed packing (39) from tube reducer (35).

28 Remove locknut (32) from tee (13).



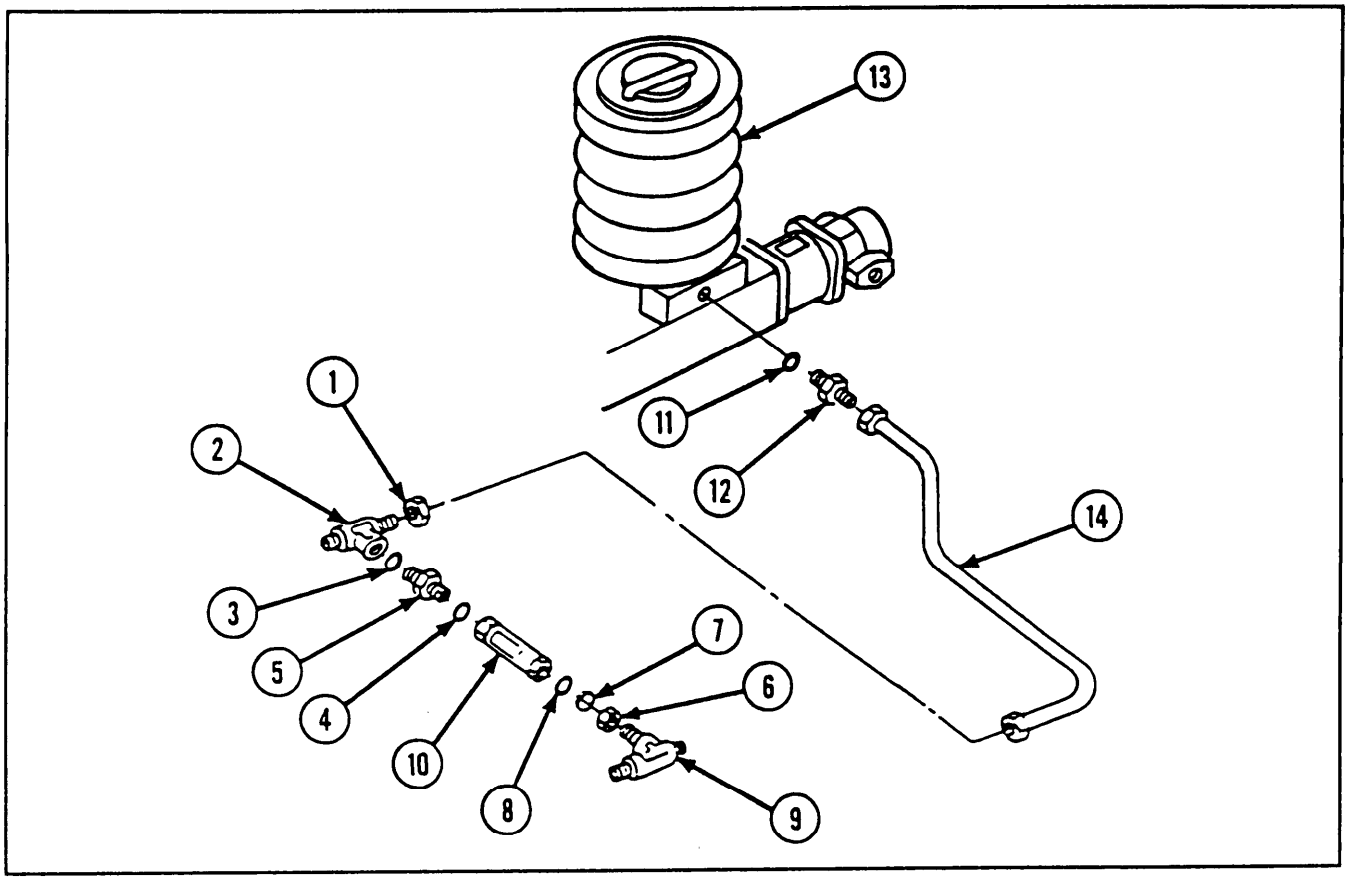
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Fluid filter is a repairable assembly. Refer to page 2-803.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



1 Install new locknut (1) on tee (2).

2 Install new preformed packing (3) and new preformed packing (4) on tube reducer (5).

3 Install tube reducer (5) with attached packings on tee (2).

4 Install new locknut (6), packing retainer (7), and new preformed packing (8) on tube tee (9).

5 Install tube tee (9) with attached parts in hull.

6 Install safety relief valve (10) on tube reducer (5) and tube tee (9), and tighten locknut (6) on tube tee.

7 Install new preformed packing (11) on tube nipple (12).

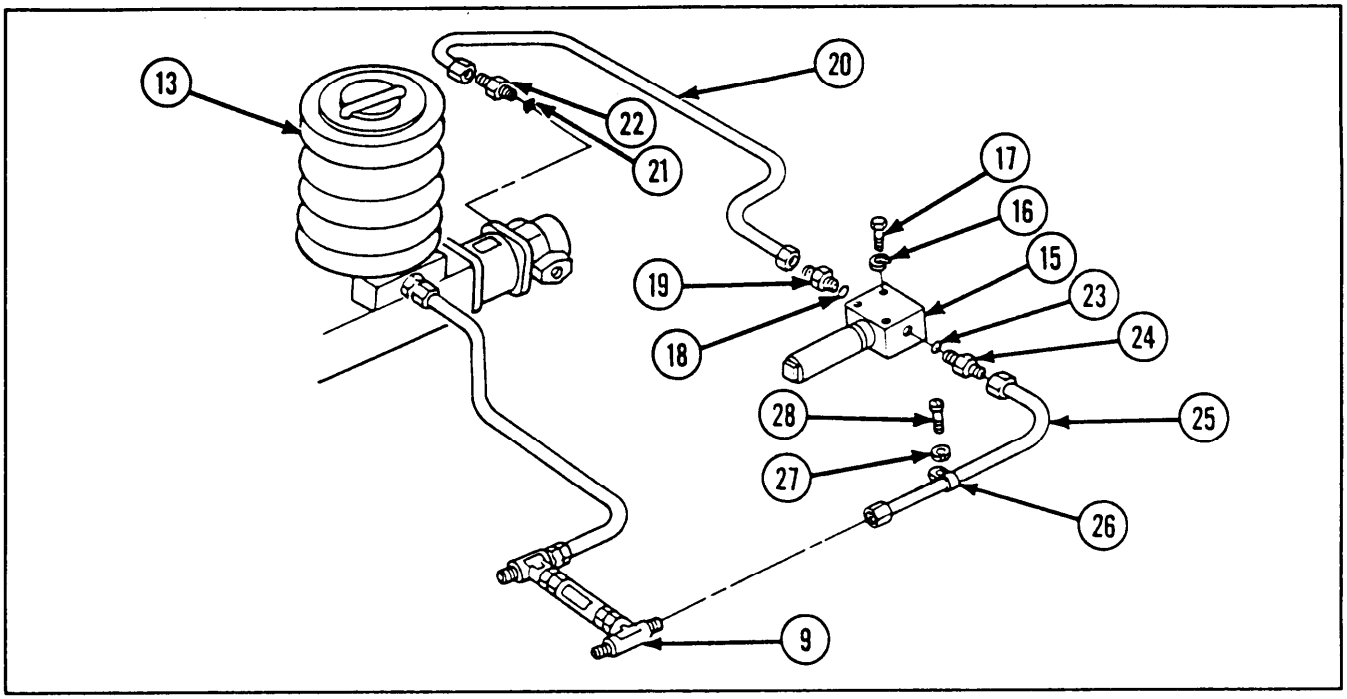
8 Install tube nipple (12) with preformed packing (11) on slip ring and pump assembly (13).

9 Connect tee to pump metal tube assembly (14) to tube nipple (12).

10 Connect tee to pump metal tube assembly (14) to tee (2), and tighten locknut (1) on tee.

2-137. MAINTENANCE OF HYDRAULIC POWER SUPPLY LINES AND FITTINGS (AFT SECTION) (CONT).

INSTALLATION (CONT)



11 Install fluid filter (15), three new lockwashers (16), and three hexagon head capscrews (17) on bulkhead.

12 Install new preformed packing (18) on tube nipple (19).

13 Install tube nipple (19) with preformed packing (18) on fluid filter (15).

14 Connect pump to filter metal tube assembly (20) to tube nipple (19).

15 Install new preformed packing (21) on tube nipple (22).

16 Install tube nipple (22) with preformed packing (21) on slip ring and pump assembly (13).

17 Connect pump to filter metal tube assembly (20) to tube nipple (22).

18 Install new preformed packing (23) on tube reducer (24).

19 Install tube reducer (24) with preformed packing (23) on fluid filter (15).

20 Connect filter to tee metal tube assembly (25) to tube reducer (24).

21 Connect filter to tee metal tube assembly (25) to tube tee (9).

22 Install loop clamp (26), new lockwasher (27), and hexagon head capscrew (28) on filter to tee metal tube assembly (25).

Connect nipple to tee metal tube assembly (29) to tee (2).

24 Connect nipple to tee metal tube assembly (29) to tube nipple (30).

25 Connect pressure line metal tube assembly (31) to tube tee (9).

26 Connect pressure line metal tube assembly (31) to tube nipple (32).

27 Install loop clamp (33), new lockwasher (34), and hexagon head capscrew (35) on pressure line metal tube assembly (31).

28 Install loop clamp (36), loop clamp (37), new lockwasher (38), and hexagon head capscrew (39) on pressure line metal tube assembly (31) and nipple to tee metal tube assembly (29).

2-138. MAINTENANCE OF FLUID FILTER.

This task covers: a. *Disassembly* b. *Inspection/Repair* c. *Reassembly*

INITIAL SETUP

Tools and Special Tools
Plier wire twister (item 30, appx G)

Materials/Parts
Hydraulic filter parts kit

References
TM 9-2350-238-20-2
TM 9-2350-238-24P-1

Equipment Conditions
Vehicle equipment stowage box removed (TM 9-2350-238-20-2)

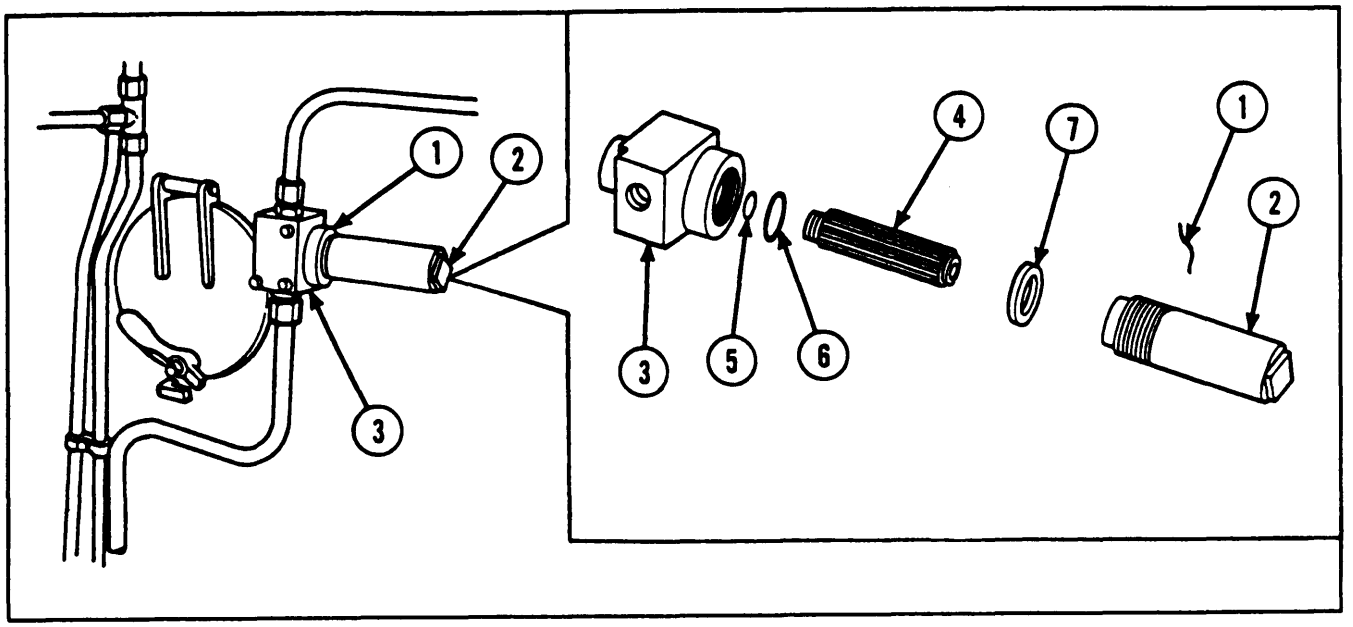
General Safety Instructions

WARNING

Wipe up any spilled hydraulic fluid to prevent injury to personnel.

2-138. MAINTENANCE OF FLUID FILTER (CONT).

DISASSEMBLY



WARNING

Wipe up any spilled hydraulic fluid to prevent injury to personnel.

NOTE

- Hydraulic filter parts kit contains two different sets of preformed packings and packing retainers. Check manufacturers part number and refer to TM 9-2350-238-24P-1 when replacing preformed packing and packing retainer in fluid filter.
- Repair of the fluid filter may be performed while the filter is installed, or after it has been removed. For removal of the fluid filter, refer to page 2-797.
- Gain access to fluid filter through hull well.

1 Set MASTER switch to OFF.

2 Remove lockwire (1).

3 Remove filter bowl (2) from filter head (3).

4 Remove filter element (4) from filter bowl (2).

5 Remove preformed packing (5) from filter element (4).

6 Remove preformed packing (6) and packing retainer (7) from filter head (3).

7 Discard preformed packings (5 and 6), packing retainer (7), and filter element (4).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

CAUTION

Filter bowl must be tightened securely in filter head. Do not back off filter bowl to align lockwire holes because this will cause shutoff valve in filter head to partly close, limiting oil flow through filter.

NOTE

Filter kit contains two different sets of preformed packings and packing retainers. Check manufacturer's part number and refer to TM 9-2350-238-24P-1 when replacing preformed packing and packing retainer in fluid filter.

1 Install new preformed packing (1) and new packing retainer (2) in filter head (3).

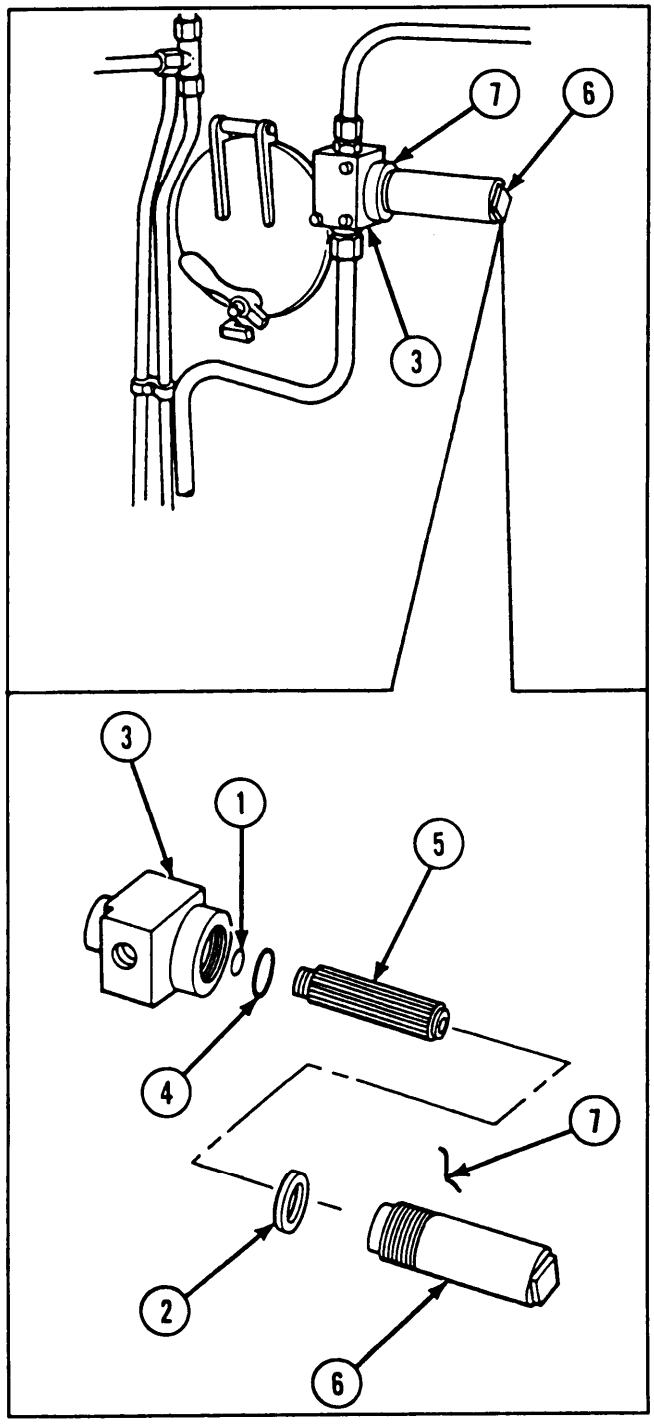
2 Install new preformed packing (4) on new filter element (5).

3 Install new filter element (5) in filter bowl (6).

4 Install filter bowl (6) on filter head (3).

5 Install new lockwire (7).

6 Set MASTER switch to ON.



2-139. MAINTENANCE OF AUXILIARY DRIVE SHAFTS, UNIVERSAL JOINTS, AND RELATED PARTS.

This task covers:	a. *Removal* b. *Disassembly* c. *Inspection/Repair*	d. *Reassembly* e. *Installation*

INITIAL SETUP

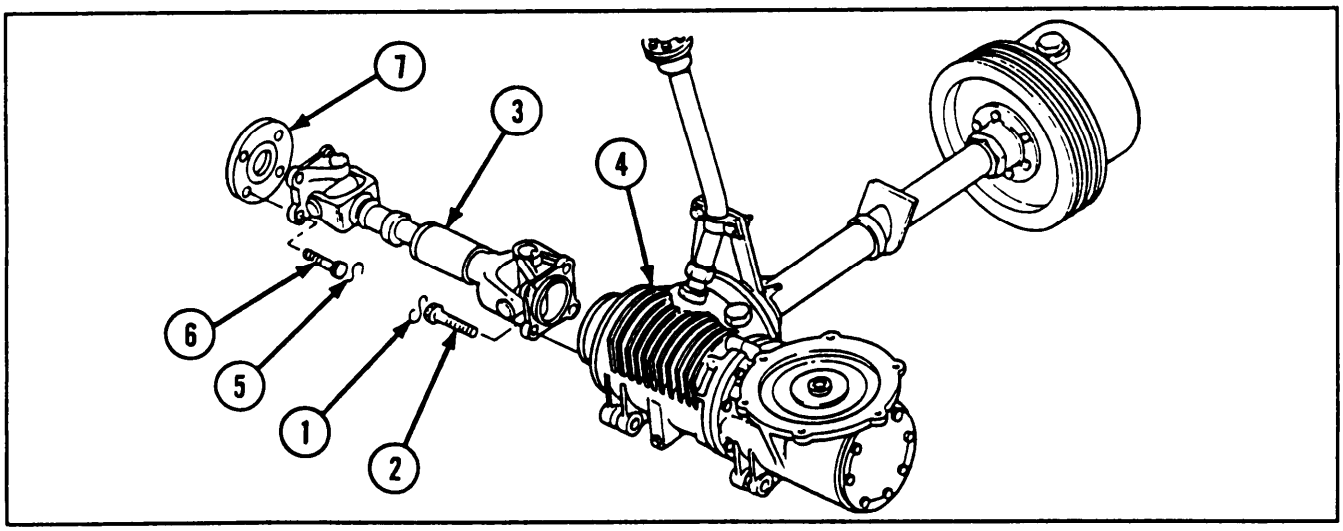
Tools and Special Tools
- Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
  - • Torque wrench (0 to 170 ft-lb)
- Plier wire twister (item 30, appx G)
- Wood block

Materials/Parts
- Gasket
- Hydraulic fluid (item 21, appx C)
- Lockwire (item 27, appx C)
- Self-locking bolt (4)
- Universal joint parts kit (6)

References
- TM 9-2350-238-10
- TM 9-2350-238-20-2
- TM 9-2350-238-24P-1

Equipment Conditions
- 2-384 Powerplant removed
- 2-928 Fan well deck removed
- Equipment stowage box removed from cab well (TM 9-2350-238-20-2)

REMOVAL



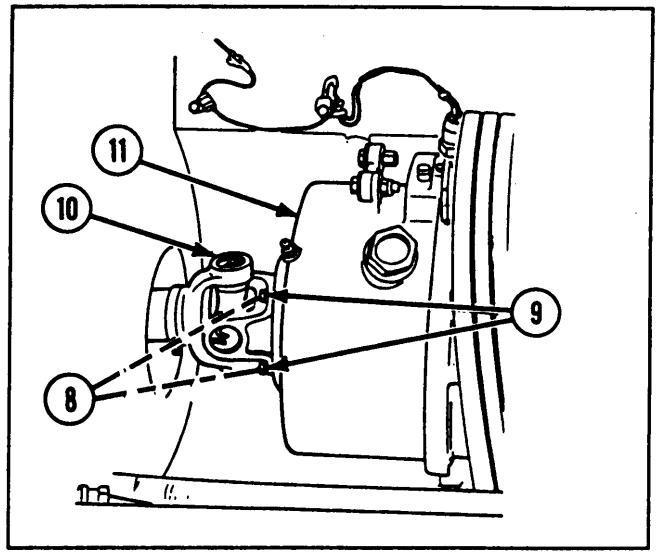
1 Remove lockwire (1) and four hexagon head capscrews (2). Remove PTO to propeller shaft (3) from auxiliary drive assembly input drive (4).

2 Remove lockwire (5) and four hexagon head capscrews (6) from PTO to propeller shaft (3) and internal gear (7).

3 Remove PTO to propeller shaft (3) from vehicle.

NOTE
Gain access to clutch to line bearing unit propeller shaft through fan well.

4 Remove lockwire (8) and four self-locking bolts (9). Disconnect clutch to line bearing unit propeller shaft (10) from auxiliary drive assembly vehicular drive (11).



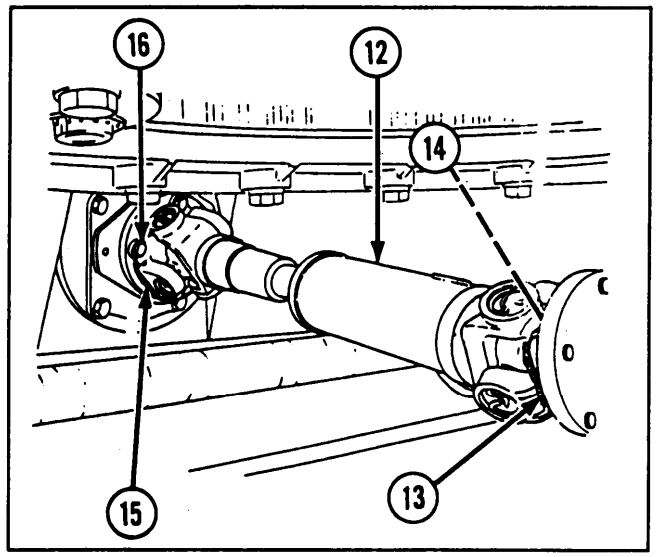
NOTE
Gain access to line bearing unit to hydraulic pump propeller shaft through opening in cab deck.

5 Traverse cab until opening in cab deck is centered over line bearing unit to hydraulic pump propeller shaft (12).

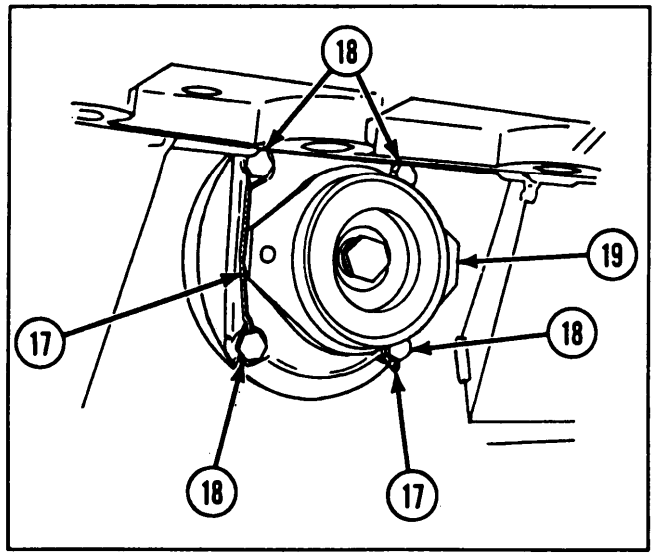
6 Remove lockwire (13) and four hexagon head capscrews (14).

7 Remove lockwire (15) and four hexagon head capscrews (16).

8 Remove line bearing unit to hydraulic pump propeller shaft (12) from vehicle.



9 Remove lockwire (17) and four hexagon head capscrews (18) from auxiliary drive line ball bearing unit (19).



2-139. MAINTENANCE OF AUXILIARY DRIVE SHAFTS, UNIVERSAL JOINTS, AND RELATED PARTS (CONT).

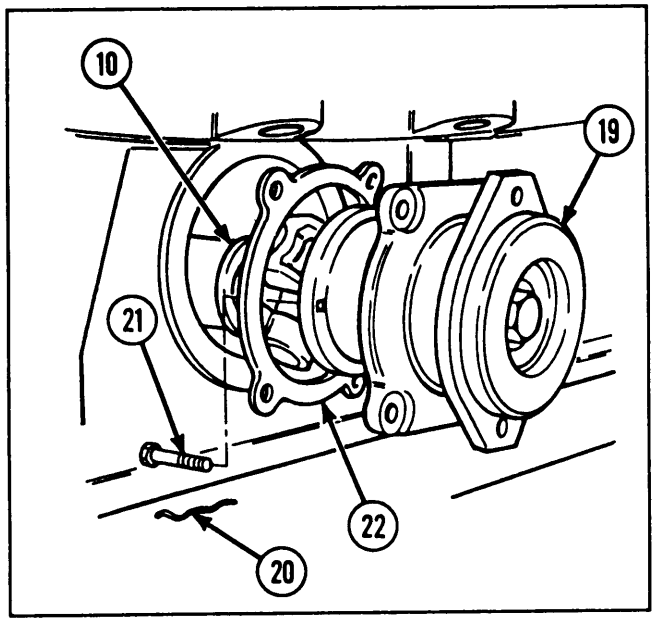
REMOVAL (CONT)

10 Pull auxiliary drive line ball bearing unit (19) and clutch to line bearing unit propeller shaft (10) partly from hull recess.

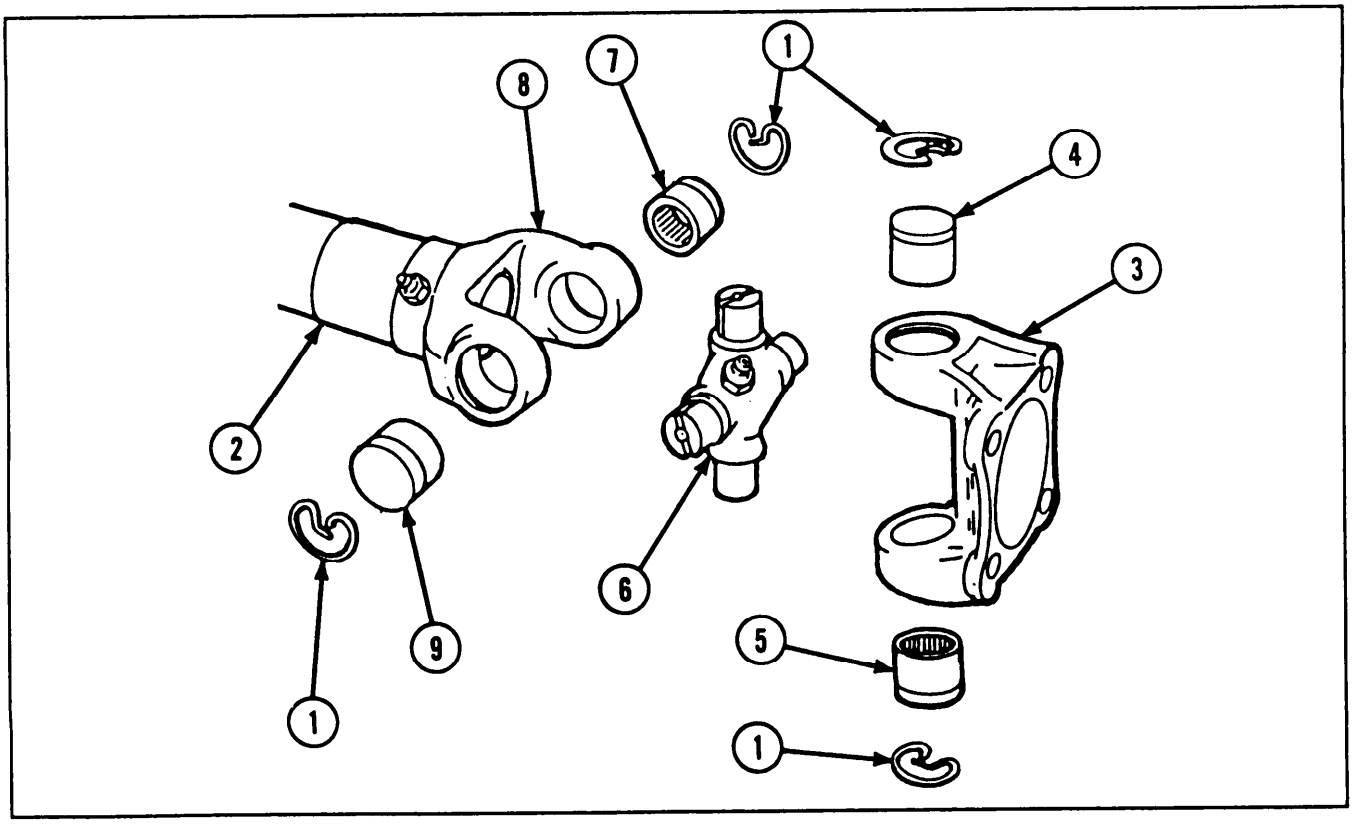
11 Remove lockwire (20) and four hexagon head capscrews (21) attaching clutch to line bearing unit propeller shaft (10) to auxiliary drive line ball bearing unit (19).

12 Remove auxiliary drive line ball bearing unit (19) and gasket (22) from clutch to line bearing unit propeller shaft (10).

13 Remove clutch to line bearing unit propeller shaft (10) from vehicle.



DISASSEMBLY



NOTE

Disassembly steps are written for one universal joint but apply to all six universal joints.

1 Remove four retaining rings (1).

2 Support propeller shaft (2) with wood block placed under propeller shaft close to universal joint.

3 Rotate propeller shaft (2) so yoke (3) is positioned with bearing (4) facing up.

4 Tap yoke (3) with soft-faced hammer forcing bearing (4) from yoke. Remove bearing.

5 Rotate propeller shaft (2) 180 degrees so yoke (3) is positioned with bearing (5) facing up.

6 Tap yoke (3) with soft-faced hammer forcing bearing (5) from yoke. Remove bearing.

7 Remove yoke (3) from cross assembly (6).

8 Rotate and position propeller shaft (2) with bearing (7) in shaft yoke (8) facing up. Remove bearing.

9 Rotate shaft yoke (8) 180 degrees and remove bearing (7).

10 Remove cross assembly (6) from shaft yoke (8).

INSPECTION/REPAIR

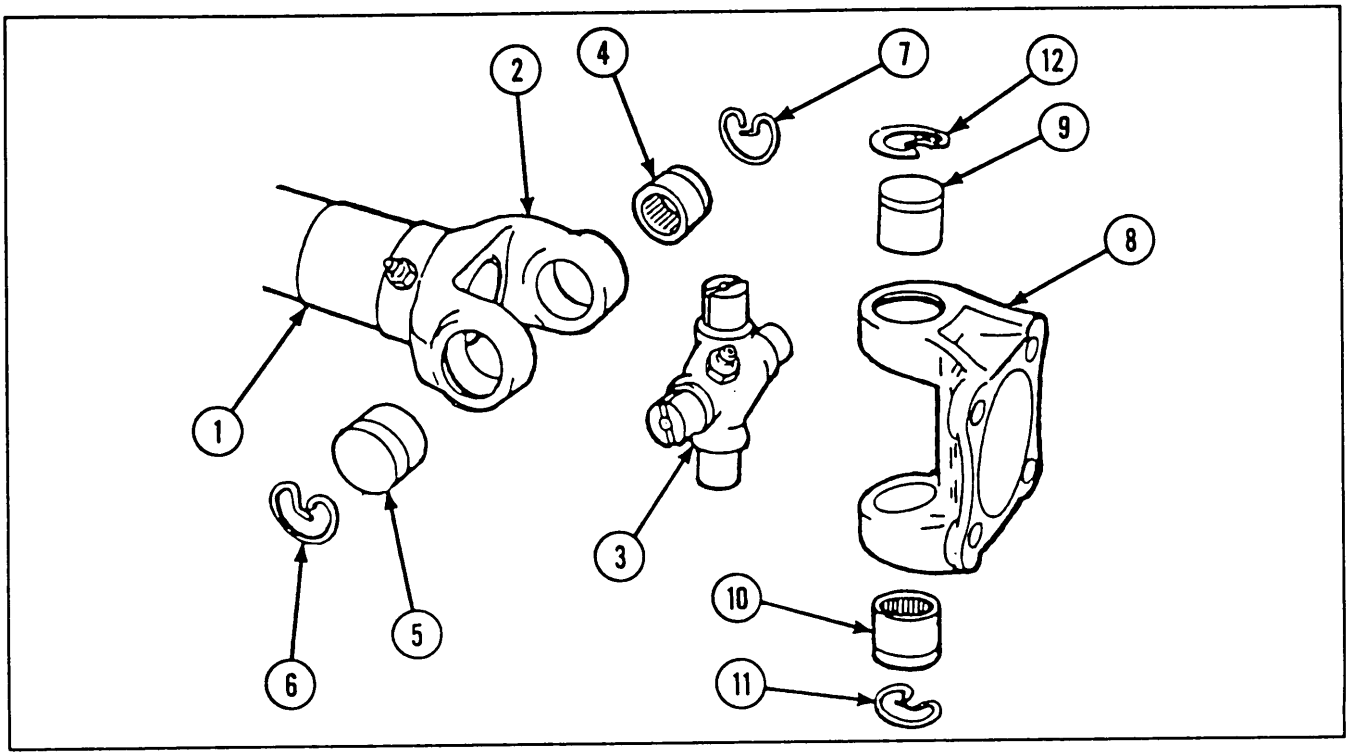
1 Inspect for broken, damaged, or missing parts.

2 Auxiliary drive line ball bearing unit is a repairable assembly. Notify direct support maintenance.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-139. MAINTENANCE OF AUXILIARY DRIVE SHAFTS, UNIVERSAL JOINTS, AND RELATED PARTS (CONT).

REASSEMBLY



Do not clean lubricant from new bearings; keep new bearings wrapped until ready for installation.

NOTE

Installation steps are written for one universal joint but apply to all six universal joints.

1 Place a wood block under propeller shaft (1) adjacent to shaft yoke (2).

2 Rotate propeller shaft (1) until ends of shaft yoke (2) are vertical.

3 Install cross assembly (3) into shaft yoke (2).

4 Place bearing (4) in position in top opening of shaft yoke (2).

5 Engage bearing surface of cross assembly (3) into bearing (4) and hold in position. Seat bearing.

6 Rotate propeller shaft (1) 180 degrees.

7 Place bearing (5) in position in opening of shaft yoke (2).

8 Engage bearing surface of cross assembly (3) into bearing (5) and hold in position. Seat bearing.

9 Install retaining ring (6) into groove in shaft yoke (2) to secure bearing (5).

10 Rotate propeller shaft (1) 180 degrees.

11 Install retaining ring (7) into groove in shaft yoke (2) to secure bearing (4). Seat retaining ring.

12 Place yoke (8) on cross assembly (3) with bearing surfaces of cross inside yoke.

13 Rotate propeller shaft (1) until ends of yoke (8) are vertical.

14 Place bearing (9) in position in top opening of yoke (8).

15 Engage bearing surface of cross assembly (3) into bearing (9) and hold in position. Seat bearing.

16 Rotate propeller shaft (1) 180 degrees.

17 Place bearing (10) in position in opening of yoke (8).

18 Engage bearing surface of cross assembly (3) into bearing (10) and hold in position. Seat bearing.

19 Install retaining ring (11) into groove in yoke (8) to secure bearing (10).

20 Rotate propeller shaft (1) 180 degrees.

21 Install retaining ring (12) into groove in yoke (8) to secure bearing (9). Seat retaining ring.

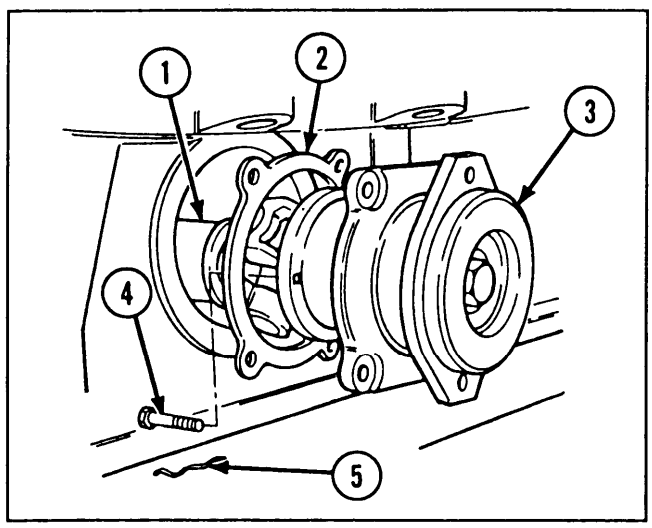
22 Lubricate universal joint and propeller shaft (1) with hydraulic fluid per TM 9-2350-238-10 before installation in vehicle.

INSTALLATION

1 Install clutch to line bearing unit propeller shaft (1) in vehicle.

2 Install new gasket (2) and auxiliary drive line ball bearing unit (3) on clutch to line bearing unit propeller shaft (1).

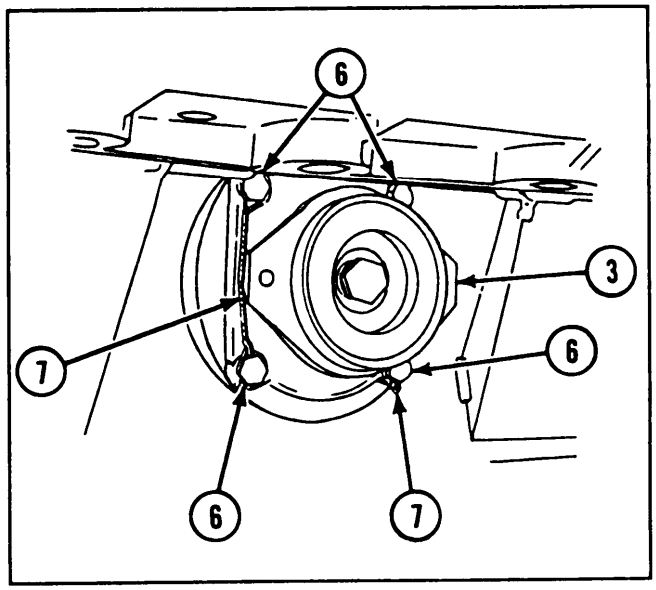
3 Install four hexagon head capscrews (4) and new lockwire (5) to secure auxiliary drive line ball bearing unit (3) to clutch to line bearing unit propeller shaft (1).



2-139. MAINTENANCE OF AUXILIARY DRIVE SHAFTS, UNIVERSAL JOINTS, AND RELATED PARTS (CONT).

INSTALLATION (CONT)

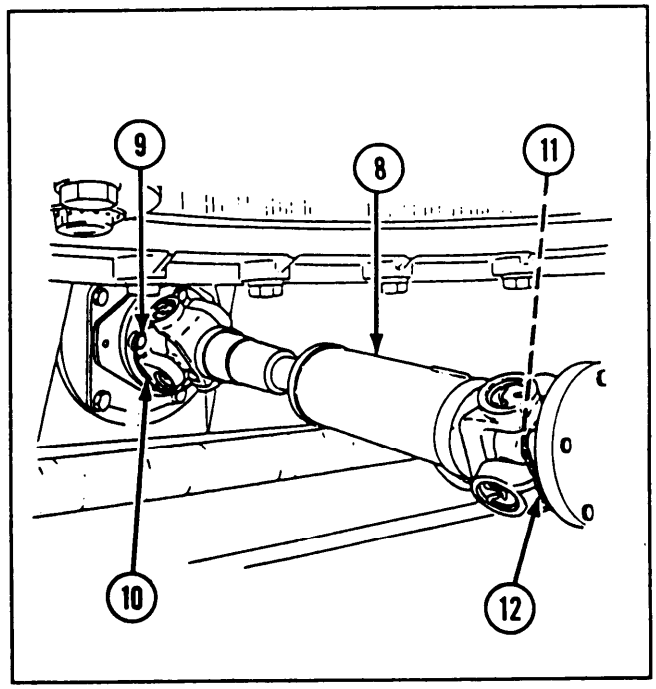
4 Seat auxiliary drive line ball bearing unit (3) in hull recess. Secure unit using four hexagon head capscrews (6) and new lockwire (7).



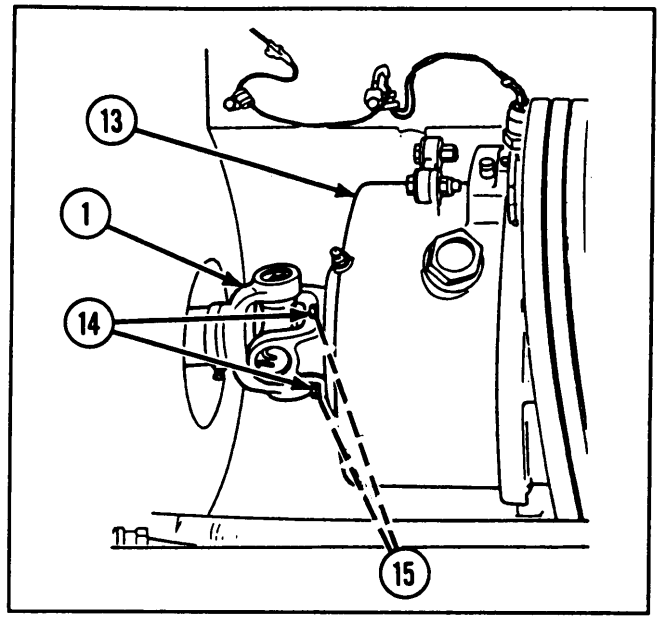
5 Install line bearing unit to hydraulic pump propeller shaft (8) in vehicle.

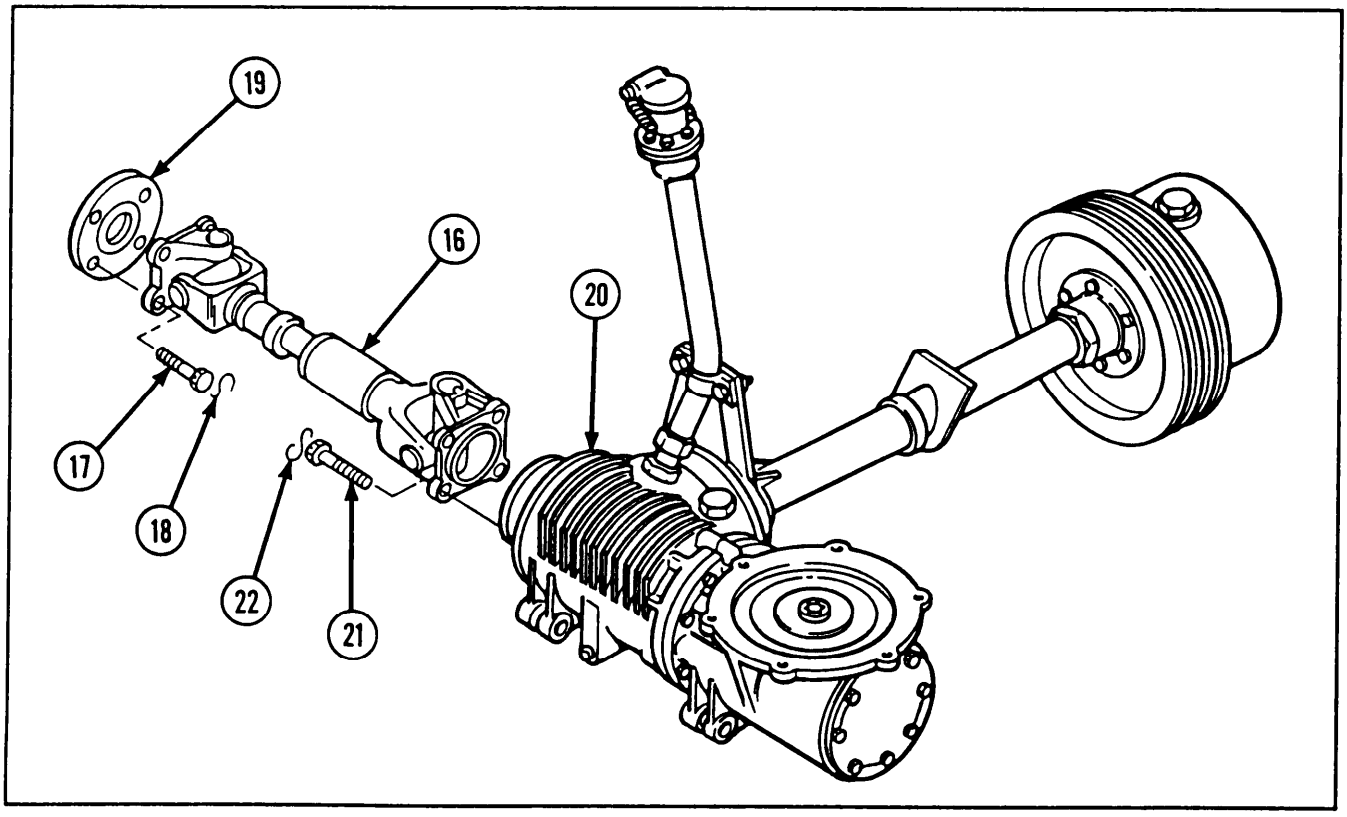
6 Install four hexagon head capscrews (9) and new lockwire (10).

7 Install four hexagon head capscrews (11) and new lockwire (12).



8 Connect clutch to line bearing unit propeller shaft (1) to auxiliary drive assembly vehicular drive (13). Secure with four new self-locking bolts (14) and new lockwire (15).





9 Install PTO to propeller shaft (16) in vehicle.

10 Install four hexagon head capscrews (17) and new lockwire (18) to PTO to propeller shaft (16) and internal gear (19).

11 Connect PTO to propeller shaft (16) to auxiliary drive assembly input drive (20). Secure with four hexagon head capscrews (21) and new lockwire (22).

2-140. MAINTENANCE OF PARKING BRAKE CONTROL AND LINKAGE.

This task covers:
a. *Removal*
b. *Inspection/Repair*
c. *Installation*
d. *Adjustment*

INITIAL SETUP

Materials/Parts
Lockwasher
Lockwasher (4)
Self-locking nut
Spring pin

References
TM 9-2350-238-24P-1

Equipment Conditions
2-938 Hull transmission compartment deck assembly removed
2-820 Brake pedal, controls, and linkage removed

General Safety Instructions

WARNING

Brake foot pedal is spring-loaded. Before working in driver's compartment, block vehicle tracks and release parking brake.

REMOVAL

1 Remove spring pin (1) from brake handle (2), and remove brake handle.

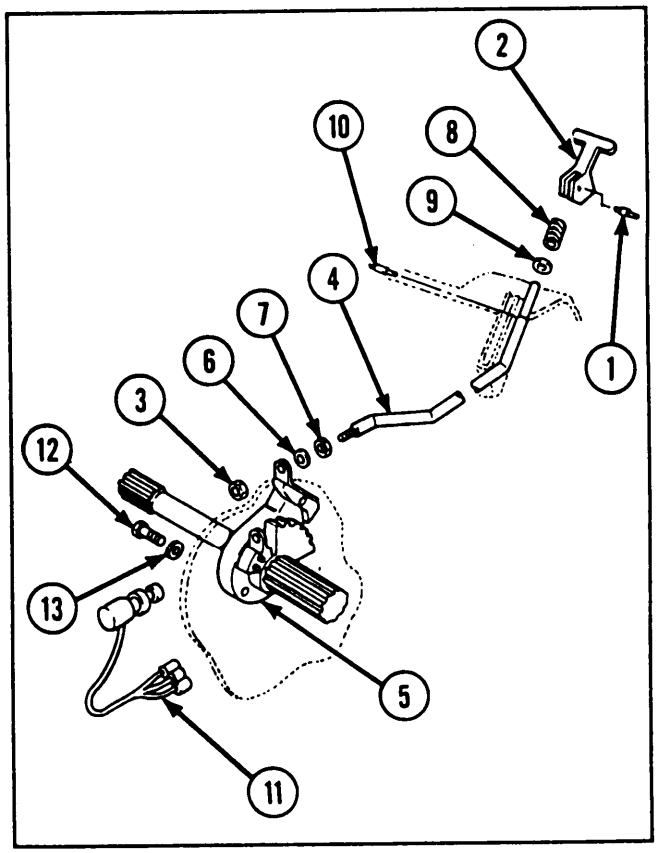
2 Remove self-locking nut (3) from parking shoulder rod (4).

3 Remove parking shoulder rod (4) from parking brake assembly (5).

4 Remove lockwasher (6), hexagon plain nut (7), helical spring (8), flat washer (9), and headless grooved pin (10) from parking shoulder rod (4).

5 Disconnect three electrical connectors (11) of brake warning sensitive switch.

6 Remove four machine bolts (12) and four lockwashers (13). Remove parking brake assembly (5).



INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Parking brake assembly is a repairable assembly. Refer to page 2-816.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install parking brake assembly (1). Install four new lockwashers (2) and four machine bolts (3).

2 Connect three electrical connectors (4) of brake warning sensitive switch.

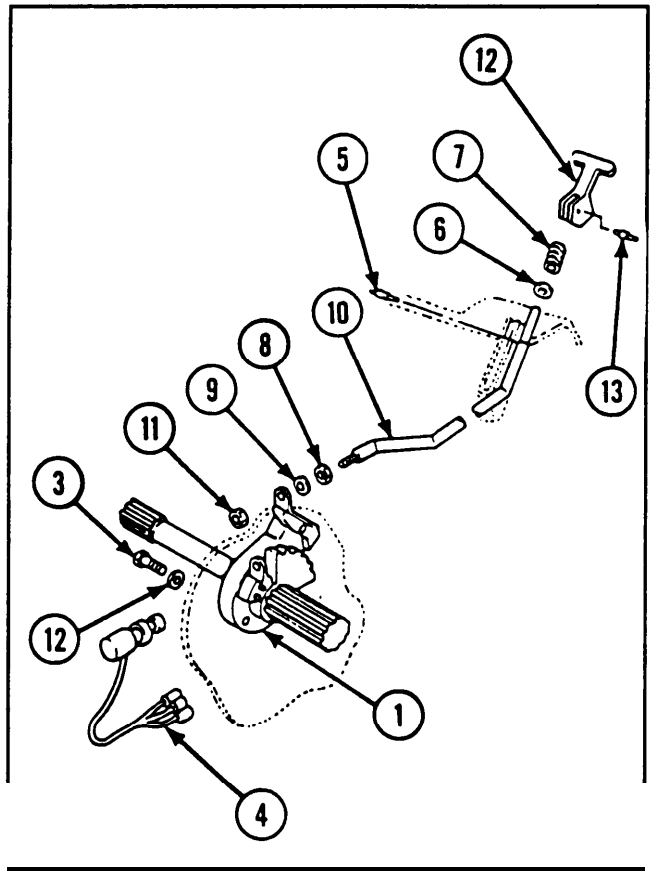
3 Install headless grooved pin (5), flat washer (6), helical spring (7), hexagon plain nut (8), and new lockwasher (9) on parking shoulder rod (10).

4 Install parking shoulder rod (10) on parking brake assembly (1).

5 Install new self-locking nut (11) on parking shoulder rod (10).

6 Install brake handle (12).

7 Install new spring pin (13) in brake handle (12).

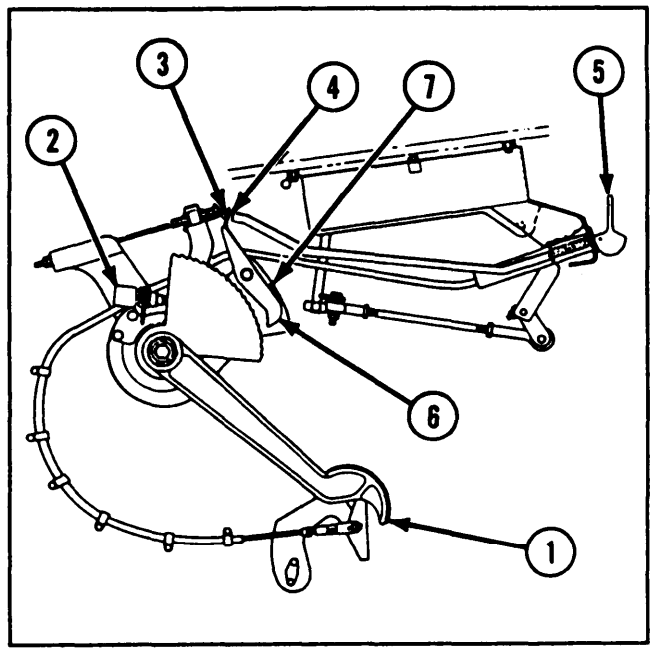


2-140. MAINTENANCE OF PARKING BRAKE CONTROL AND LINKAGE (CONT).

ADJUSTMENT

WARNING

Brake foot pedal is spring-loaded. Before working in driver's compartment, block vehicle tracks.



1 Release brake foot pedal (1).

2 Adjust brake warning sensitive switch (2). Refer to page 2-626.

3 Loosen self-locking nut (3) and hexagon plain nut (4).

4 Release parking brake handle (5).

5 Push pawl (6) against spring pin (7) to disengage parking brake.

6 Tighten hexagon plain nut (4) and self-locking nut (3) to hold pawl (6) against spring pin (7).

2-141. MAINTENANCE OF PARKING BRAKE ASSEMBLY.

This task covers:
a. *Disassembly*
b. *Inspection/Repair*
c. *Reassembly*
d. *Adjustment*

INITIAL SETUP

Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)

Materials/Parts
Lockwasher (2)
Spring pin

References
TM 9-2350-238-24P-1

Equipment Conditions
2-814 Parking brake assembly removed

DISASSEMBLY

1 Remove two machine bolts (1) and two lockwashers (2).

2 Remove parking brake bracket (3).

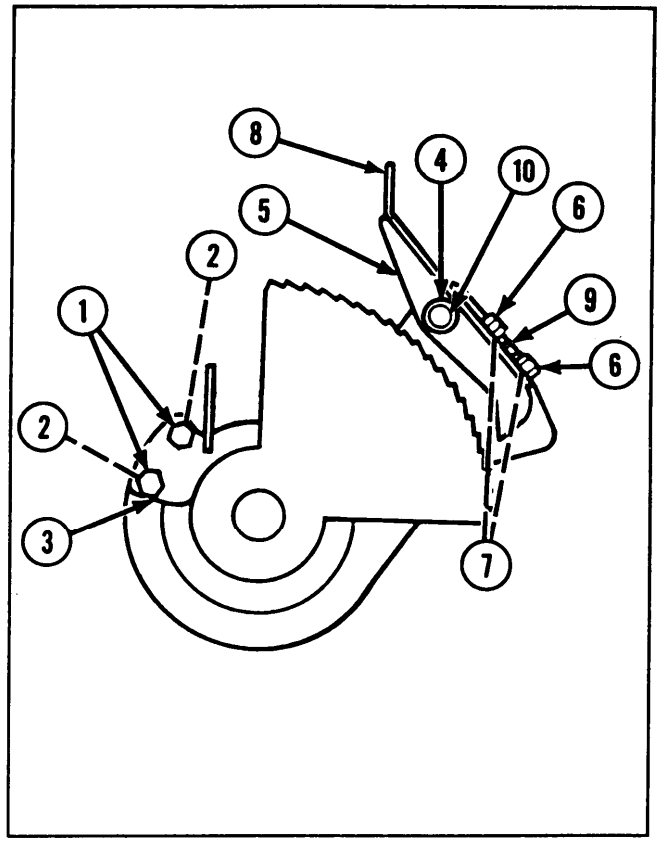
3 Remove retaining ring (4).

4 Remove pawl (5) and attached parts.

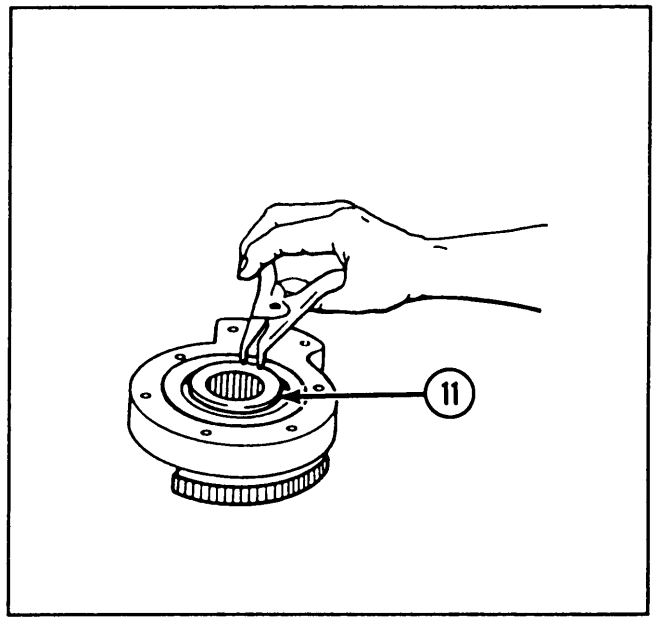
5 Remove two machine screws (6) and two flat washers (7).

6 Remove leaf spring (8).

7 Drive out spring pin (9) and brake support pin (10).



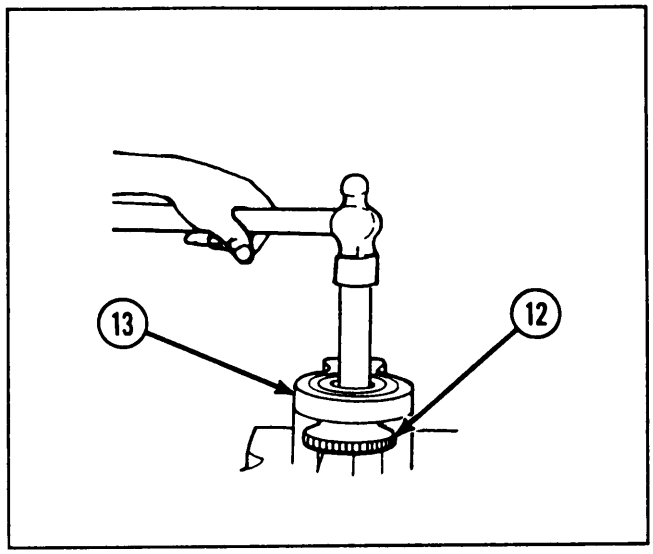
8 Using retaining ring pliers, remove retaining ring (11).



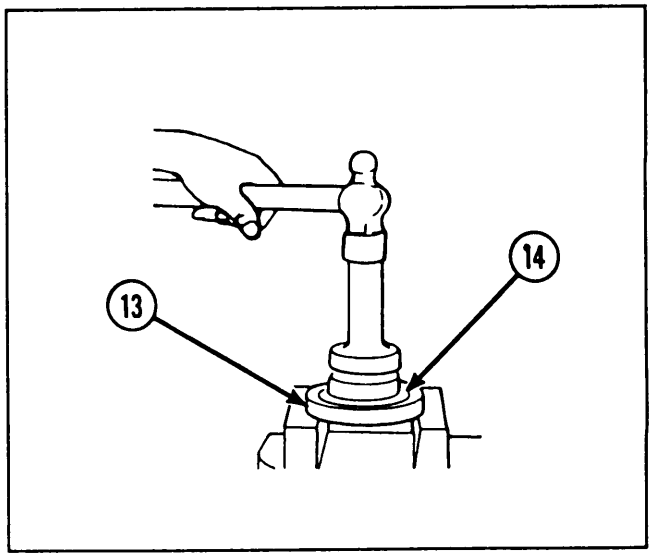
2-141. MAINTENANCE OF PARKING BRAKE ASSEMBLY (CONT).

DISASSEMBLY (CONT)

9 Using hammer and drift, remove bracket ratchet (12) from brake support (13).



10 Using hammer and drift, remove annular ball bearing (14) from brake support (13).



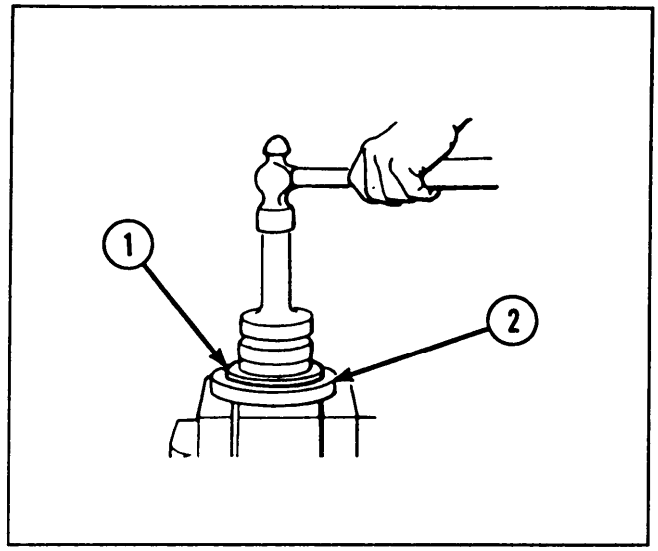
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

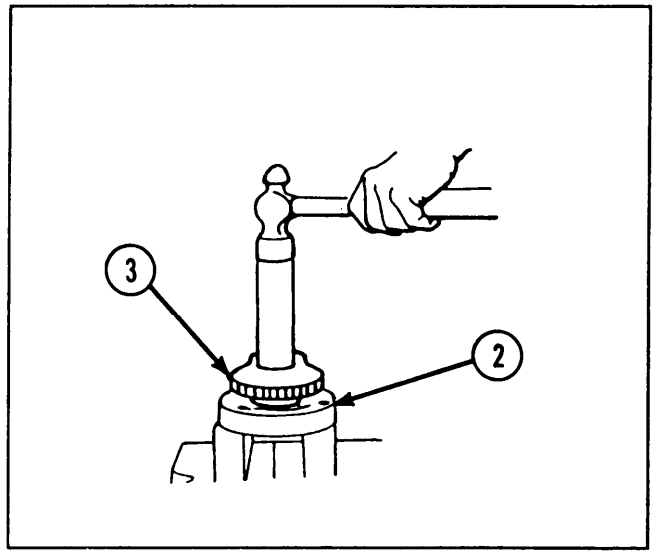
2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

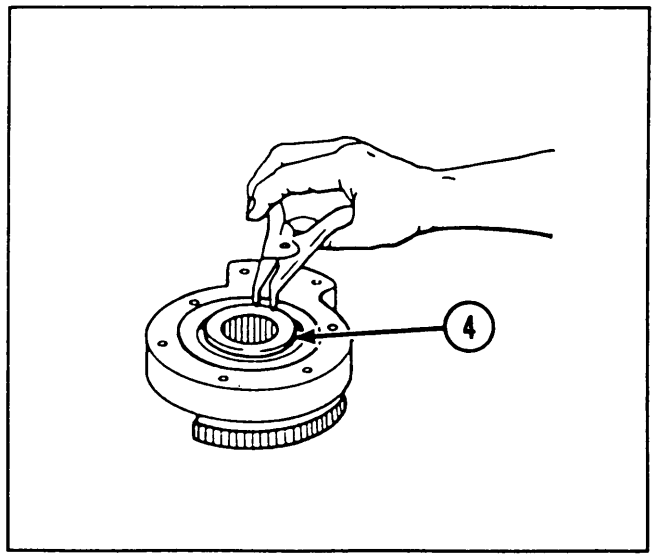
1 Using hammer and drift, install annular ball bearing (1) in brake support (2).



2 Using hammer and drift, install bracket ratchet (3) in brake support (2).



3 Using retaining ring pliers, install retaining ring (4).



2-141. MAINTENANCE OF PARKING BRAKE ASSEMBLY (CONT).

REASSEMBLY (CONT)

4 Install new spring pin (5) and brake support pin (6).

5 Install leaf spring (7).

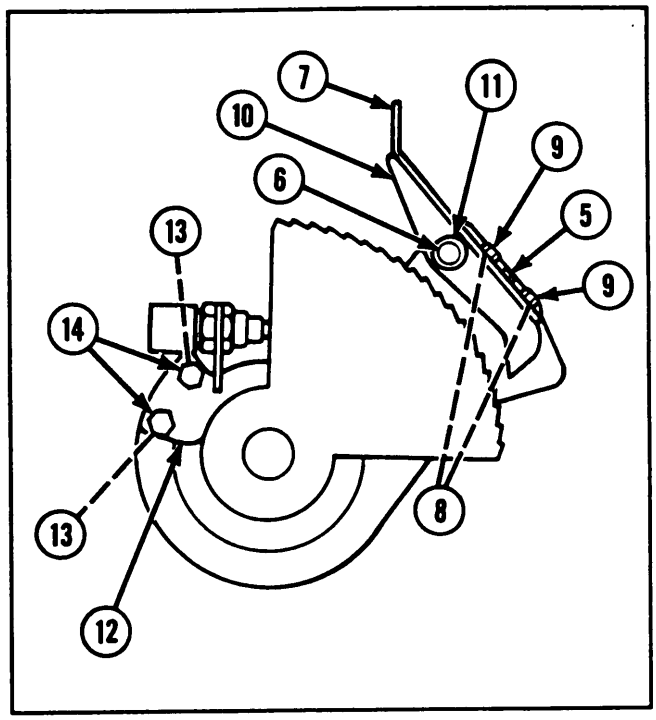
6 Install two flat washers (8) and two machine screws (9).

7 Install pawl (10) with attached parts.

8 Install retaining ring (11).

9 Install parking brake bracket (12).

10 Install two new Iockwashers (13) and two machine bolts (14).



ADJUSTMENT

1 Install parking brake assembly. Refer to page 2-814.

2 Adjust parking brake. Refer to page 2-814.

2-142. MAINTENANCE OF MECHANICAL BRAKE CONTROL AND LINKAGE.

This task covers:
a. *Removal*
b. *Inspector/Repair*
c. *Installation*
d. *Adjustment*

INITIAL SETUP

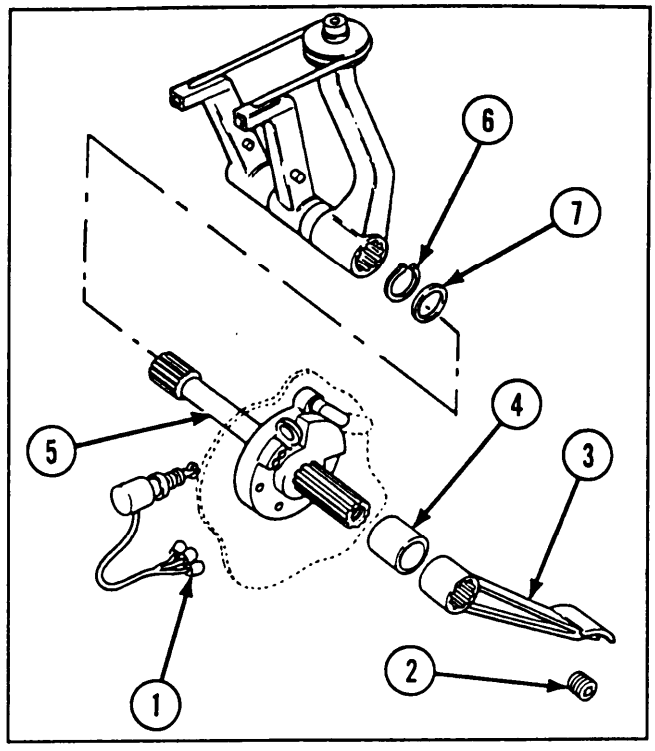
Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
. Torque wrench (0 to 170 ft-lb)
Brake adjustment splined wrench (item 34, appx G)
Brake adjustment splined wrench (item 35, appx G)
Wood blocks

Materials/Parts
Gasket (2)
Lockwasher
Lockwasher (4)
Sealing compound (item 37, appx C)
Sealing compound (item 38, appx C)
Self-locking nut (2)
Spring pin (2)

References
TM 9-2350-238-10
TM 9-2350-238-24P-1

Equipment Conditions
2-938 Hull transmission compartment deck assembly removed
2-816 Braking shaft and ratchet installed
Parking brake released

REMOVAL

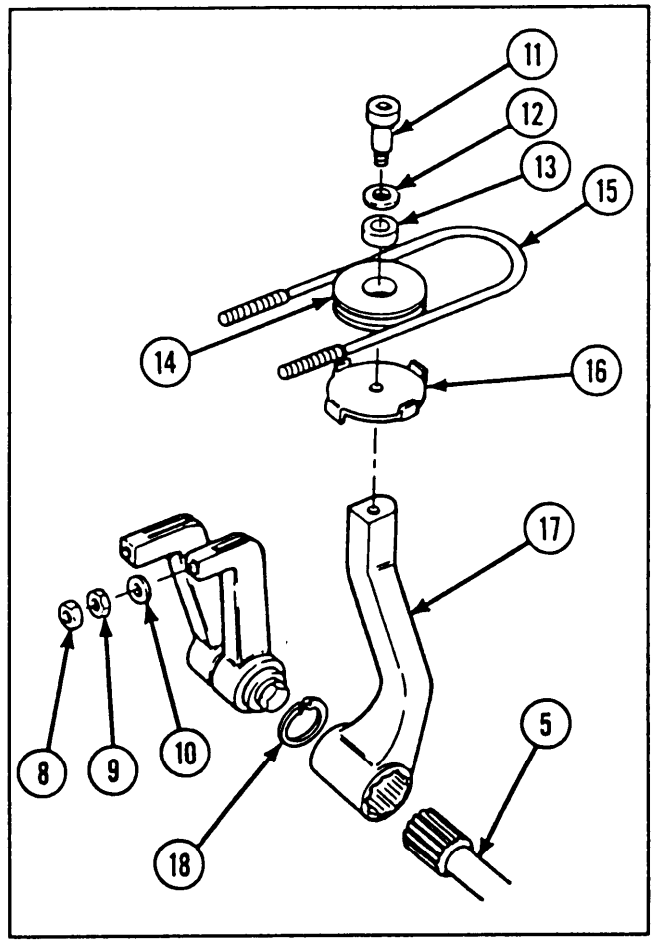


1 Disconnect three electrical connectors (1) of brake warning sensitive switch.

2 Remove pipe plug (2).

3 Remove brake pedal (3) and tube coupling (4) from straight shaft (5).

4 Remove retaining ring (6) and ring spacer (7).



5 Remove two self-locking nuts (8), two hexagon plain nuts (9), and two flat washers (10).

6 Remove shoulder screw (11) and flat washer (12).

7 Remove sleeve bearing (13), groove pulley (14), brake control cable (15), and brake clip assembly (16).

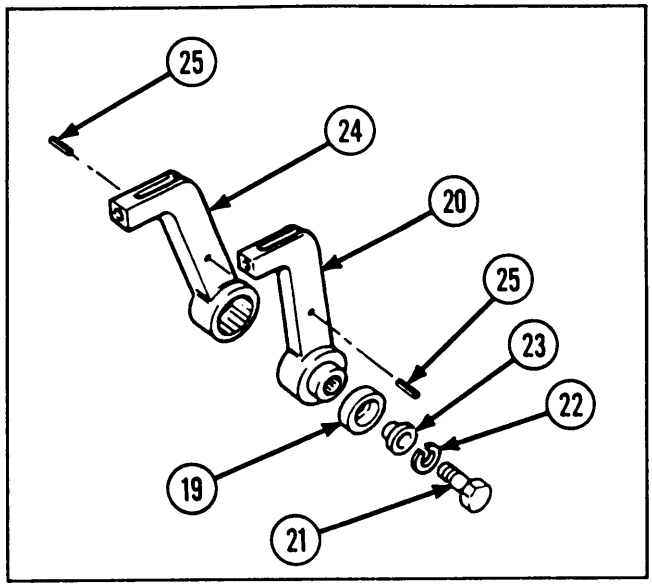
8 Support manual control lever (17) and pull straight shaft (5) into driver's compartment.

9 Remove manual control lever (17).

10 Remove retaining ring (18) from inside manual control lever (17).

2-142. MAINTENANCE OF MECHANICAL BRAKE CONTROL AND LINKAGE (CONT).

REMOVAL (CONT)



11 Remove bushing (19) from remote control lever (20).

12 Remove machine bolt (21), lockwasher (22), and shouldered washer (23) from remote control lever (20).

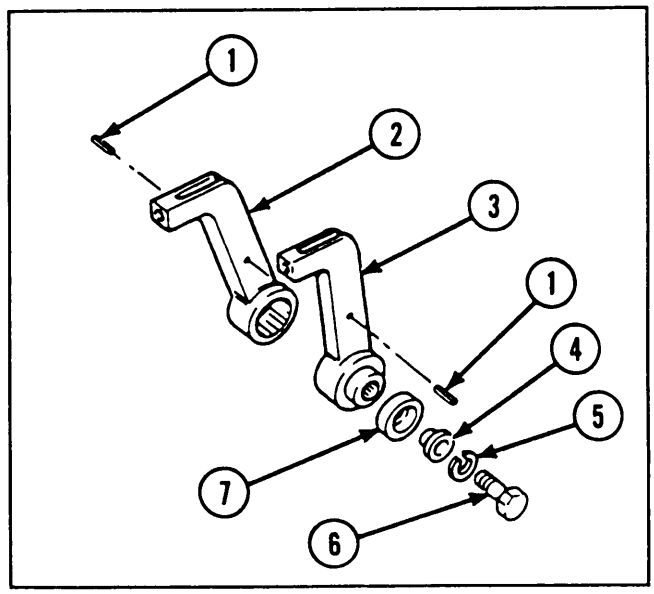
13 Remove two remote control levers (20 and 24) and two spring pins (25).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



1 Install two new spring pins (1) in two remote control levers (2 and 3).

2 Align blind spline in remote control lever (2) with blind spline in transmission, and install remote control lever.

3 Install remote control lever (3) so that spring pins (1) are aligned with each other.

4 Install shouldered washer (4), new lock-washer (5), machine bolt (6), and bushing (7).

5 Partially install straight shaft (8) into driver's compartment.

6 Install ring spacer (9) and retaining ring (10) on straight shaft (8).

7 Install retaining ring (11) inside manual control lever (12).

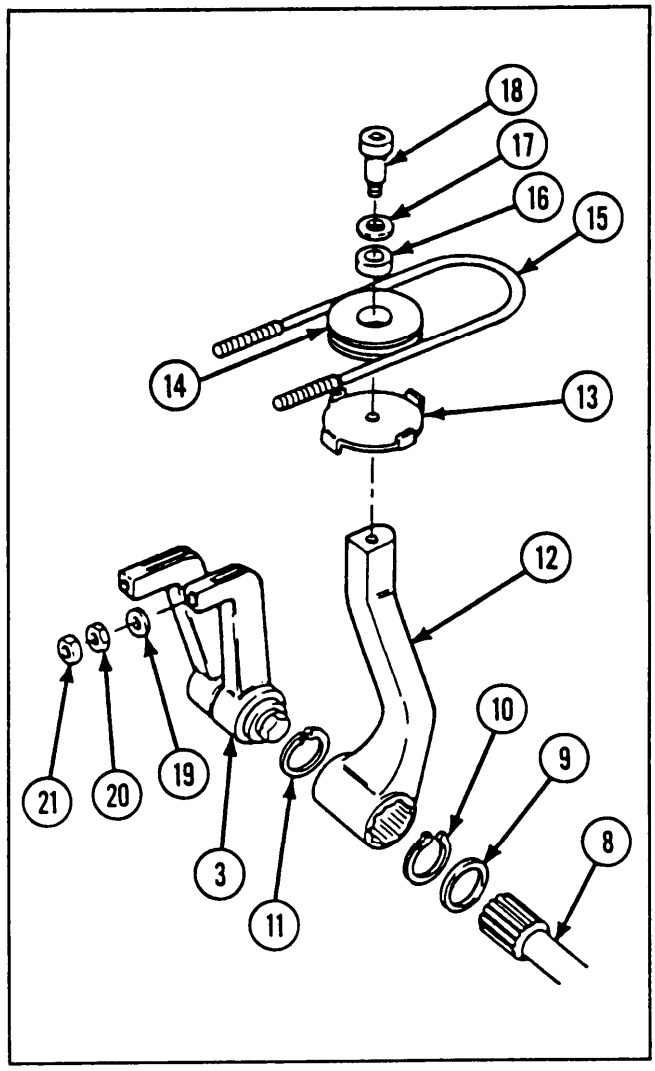
8 Lubricate blind spline of straight shaft (8). Refer to TM 9-2350-238-10. Align with blind spline in manual control lever (12), and install manual control lever.

9 From driver's compartment side, push against straight shaft (8) so that manual control lever (12) is forced flush against remote control lever (3). Ensure that ring spacer (9) and retaining ring (10) are seated on straight shaft (8).

10 Install brake clip assembly (13), groove pulley (14), brake control cable (15), and sleeve bearing (16).

11 Install flat washer (17) and shoulder screw (18).

12 Install two flat washers (19), two hexagon plain nuts (20), and two new self-locking nuts (21) on brake control cable (15).

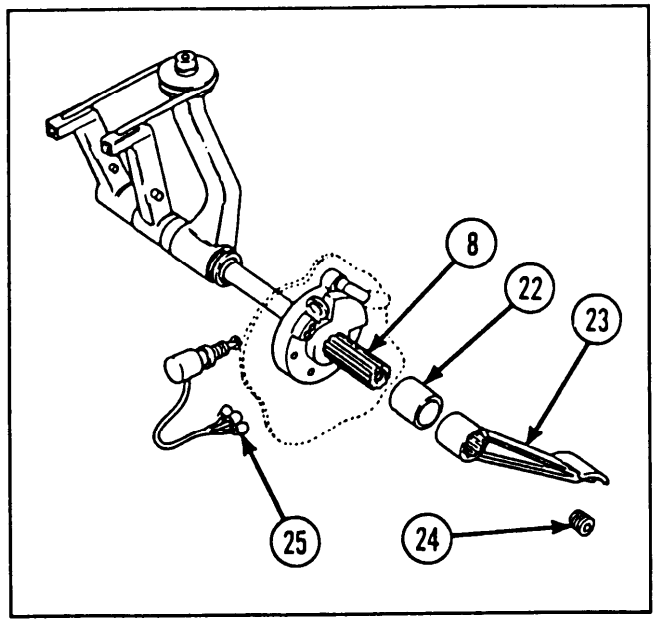


13 Install tube coupling (22) and brake pedal (23) on straight shaft (8).

14 Apply sealing compound (item 37, appx C) to threads of pipe plug (24). Install and torque pipe plug at 20 to 23 ft-lb (27 to 31 N-m).

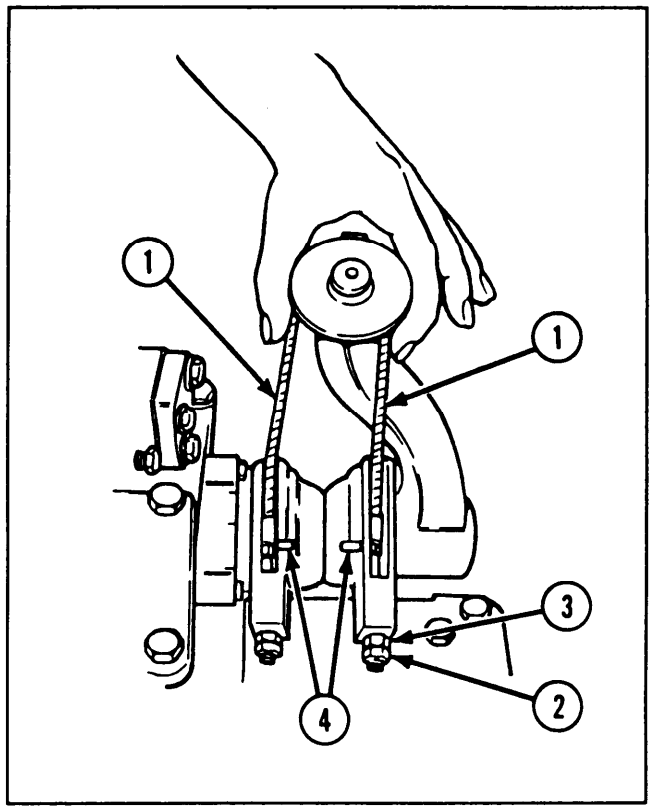
15 Connect three electrical connectors (25) of brake warning sensitive switch.

16 Set parking brake.



2-142. MAINTENANCE OF MECHANICAL BRAKE CONTROL AND LINKAGE (CONT).

ADJUSTMENT



1 Park vehicle on level ground and block with 12 x 12 x 24-in. (30 x 30 x 61-cm) wood blocks (or equivalent) placed under front and rear of each track. Release parking brake.

2 Press brake control cables (1) toward each other using thumb and forefinger.

3 Measure distance between brake control cables (1) with slack removed.

4 If distance between brake control cables (1) is less than 1-3/4 in. (4.45 cm), loosen self-locking nut (2) and tighten hexagon plain nut (3) until distance between brake control cables (1) is 1-3/4 in. (4.45 cm).

5 Hold hexagon plain nut (3) from turning and tighten self-locking nut (2).

6 Check that both spring pins (4) are aligned with RELEASE mark. If not aligned, go to step 14.

7 Apply brakes fully, and check that both spring pins (4) are between APPLY and READJUST marks.

8 If either or both spring pins (4) are aligned with READJUST mark, brakes must be adjusted.

NOTE

Steps 9 thru 13 are written for brake adjustment when powerplant is removed.

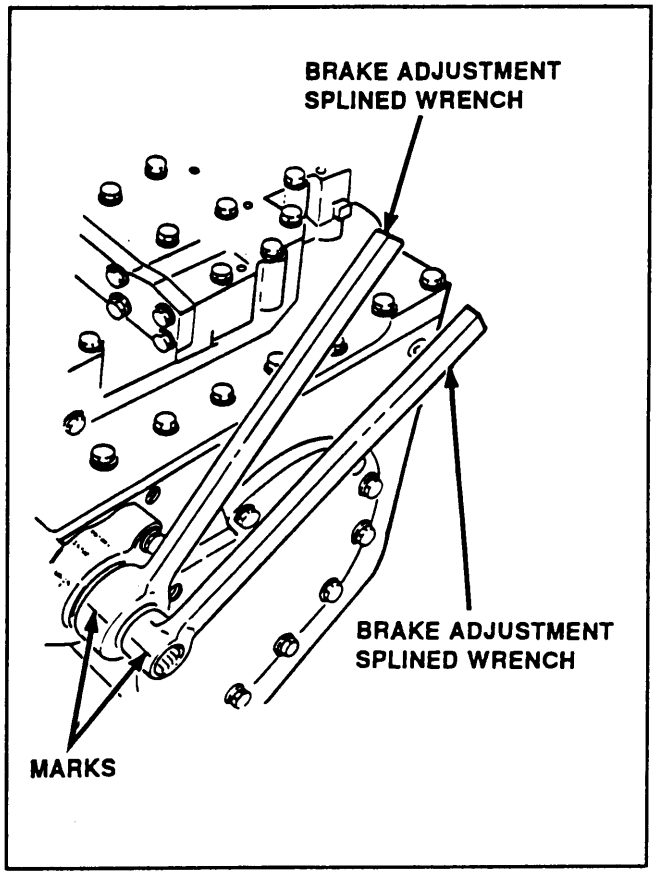
9 Place brake adjustment splined wrench (item 35, appx G) on right brake apply shaft (large shaft).

10 Place brake adjustment splined wrench (item 34, appx G) on left brake apply shaft (small shaft).

11 Mark both brake adjustment splined wrenches so that marks align with RELEASE mark.

12 Using brake adjustment splined wrenches, torque both brake apply shafts to 90 ft-lb (10 N-m).

13 Check that marks are aligned with APPLY mark. If marks do not align with APPLY mark, continue adjustment procedure with powerplant installed.

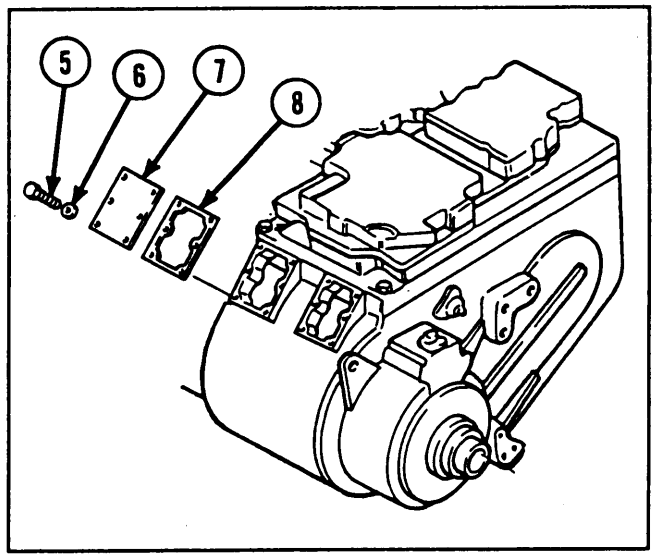


NOTE

Steps 14 thru 19 are written for brake adjustment when powerplant is installed.

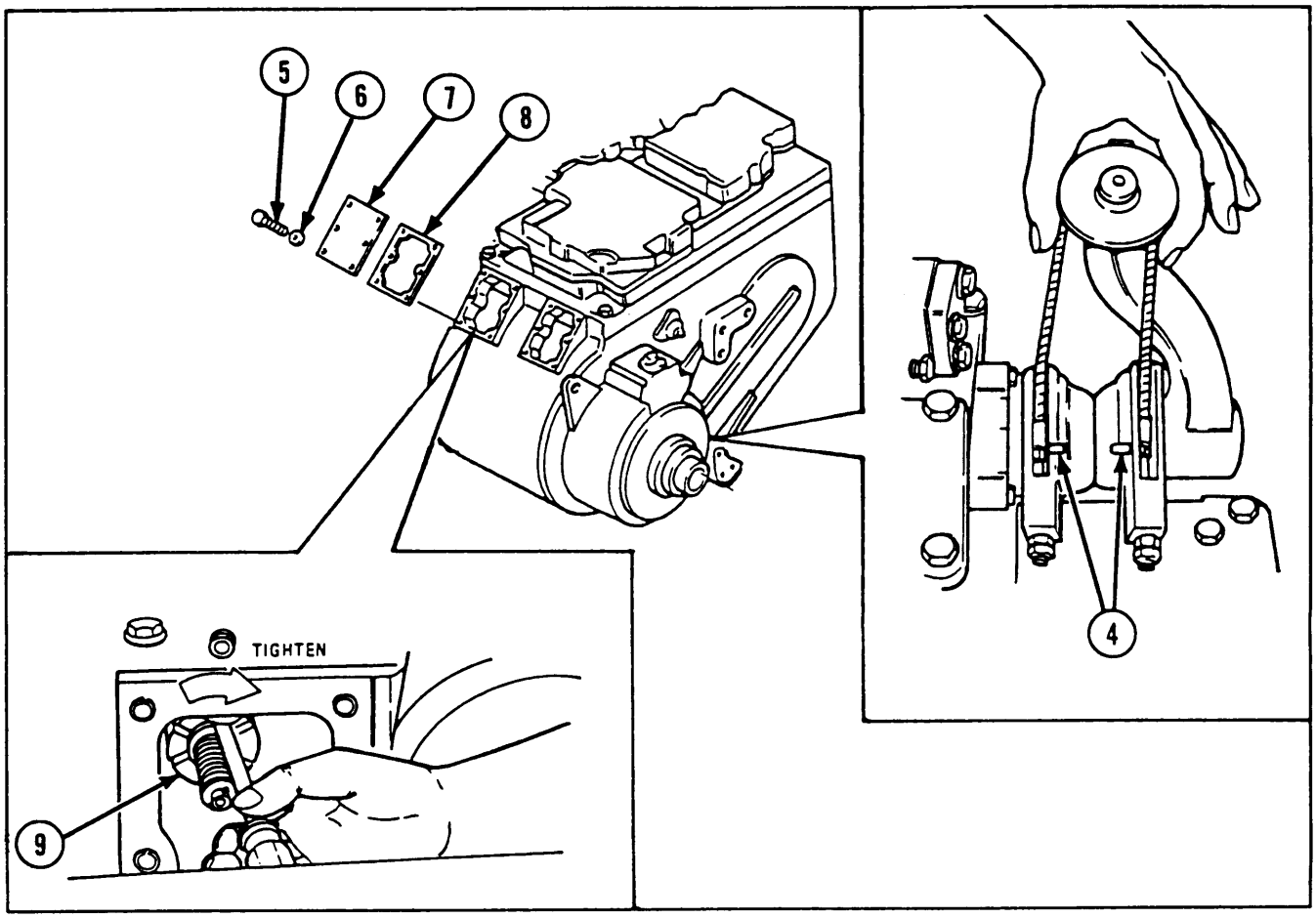
14 Remove 12 hexagon head capscrews (5) and 4 lockwashers (6).

15 Remove two brake adjustment covers (7) and two gaskets (8).



2-142. MAINTENANCE OF MECHANICAL BRAKE CONTROL AND LINKAGE (CONT).

ADJUSTMENT (CONT)



NOTE

Rotating brake adjusting nuts clockwise moves spring pins from READJUST mark toward APPLY mark.

16 Rotate brake adjusting nuts (9) evenly using screwdriver until both spring pins (4) are aligned with APPLY mark.

17 Apply sealing compound (item 38, appx C) to two new gaskets (8).

18 Install 2 new gaskets (8), 2 brake adjustment covers (7), 4 new lockwashers (6), and 12 hexagon head capscrews (5).

19 Remove wood blocks and road test vehicle to ensure that brakes are working properly.

2-143. MAINTENANCE OF TORSION BARS.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
- Jack

Driftpin (item 4, appx G)
Rigid shaft coupling (item 3, appx G)
Slide puller (item 18, appx G)
Sling (item 82, appx B)
Socket wrench (item 31, appx G)

Materials/Parts
Gasket (10)
Grease (item 20, appx C)
Lockwasher (10)

References
TM 9-2350-238-10
TM 9-2350-238-24P-1

Personnel Required
Two

Equipment Conditions
2-848 Roadwheel removed
Suspension unlocked (TM 9-2350-238-10)

NOTE
The following equipment condition applies to gain access to the right side number 2 roadwheel torsion bar socket.

2-952 Driver's seat removed

NOTE
The following equipment condition applies to gain access to the left side number 3 roadwheel torsion bar socket.

2-640 Batteries and battery tray removed

NOTE
The following equipment condition applies to gain access to the left side number 1 and number *2* roadwheel torsion bar sockets.

2-384 Powerplant removed

NOTE
The following equipment condition applies to gain access to the right side number 3 roadwheel torsion bar socket.

2-923 Hull recess cover plate removed

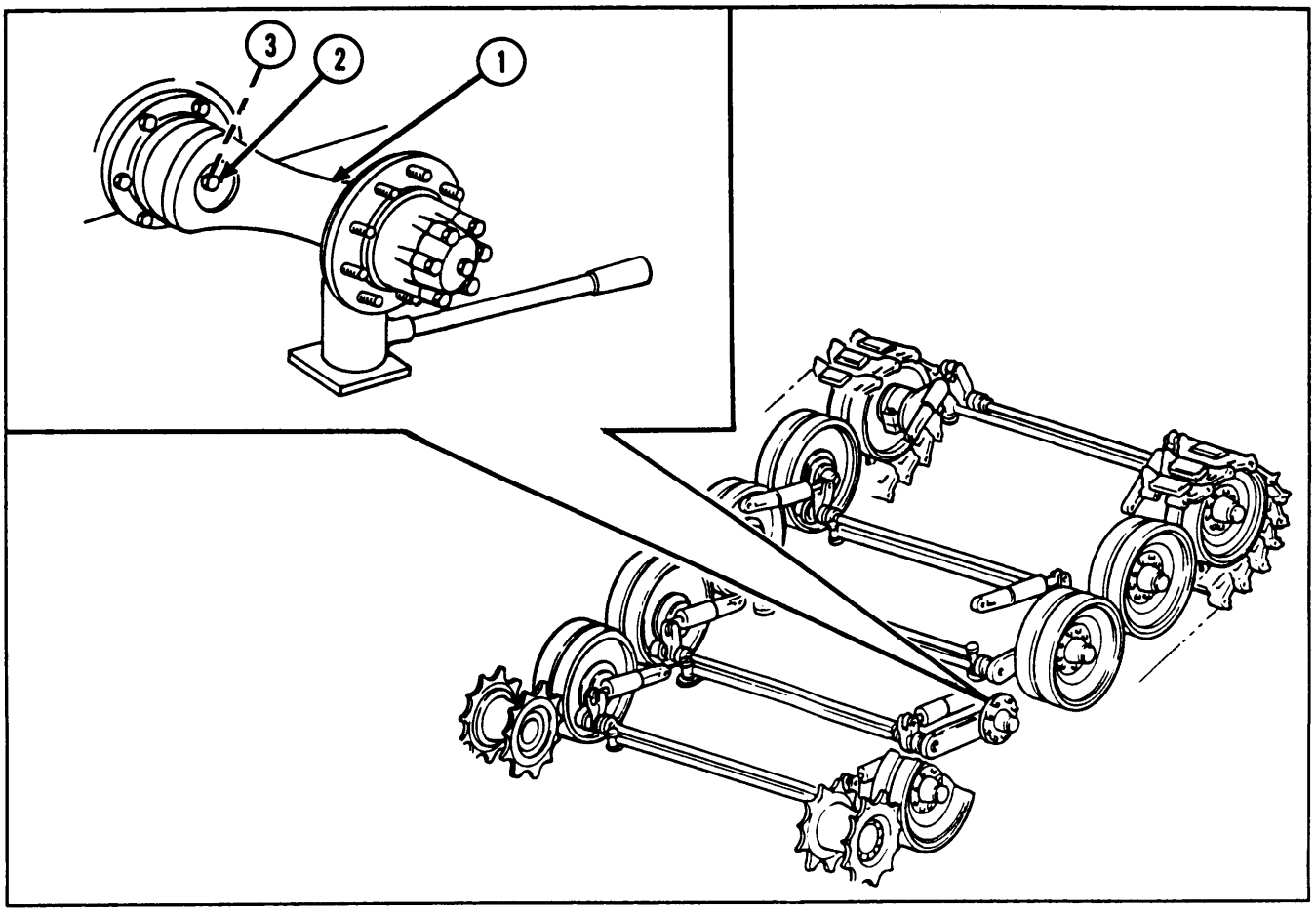
General Safety Instructions

WARNING

Roadwheel arms rotate in an arc when raised or lowered. Ensure jack is properly located and positioned under arm to allow for rotation and to provide a stable support for arm.

2-143. MAINTENANCE OF TORSION BARS (CONT).

REMOVAL



WARNING

Roadwheel arms rotate in an arc when raised or lowered. Ensure jack is properly located and positioned under arm to allow for rotation and to provide a stable support for arm.

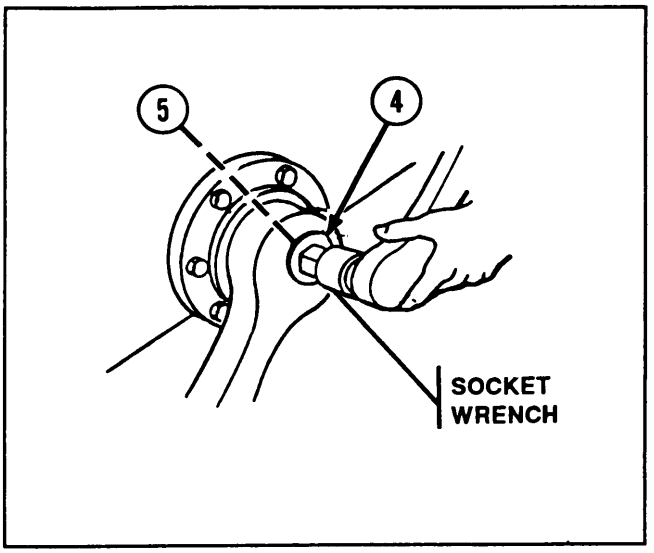
NOTE

- The following procedures are written for one torsion bar, but apply to all ten torsion bars.
- Steps 1 thru 7 apply to the removal of unbroken torsion bar.

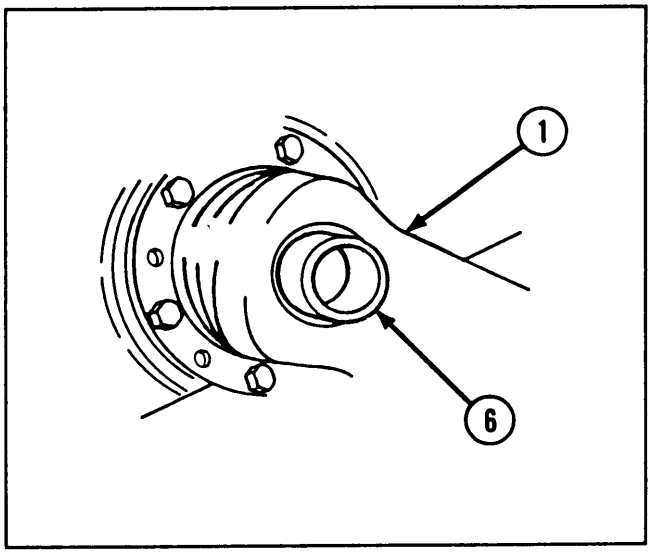
1 Jack up roadwheel arm and hub assembly (1) until load is removed from torsion bar.

2 Remove hexagon head capscrew (2) and lockwasher (3).

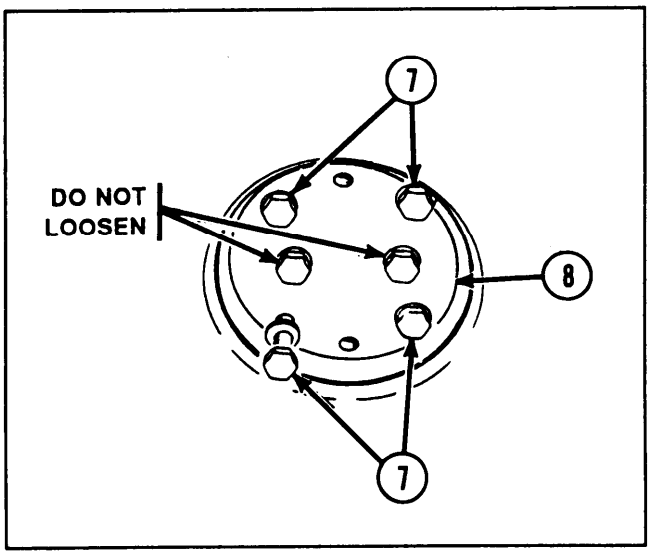
3 Remove machine thread plug (4) and gasket (5), using socket wrench.



4 Remove sleeve spacer (6) from roadwheel arm and hub assembly (1).

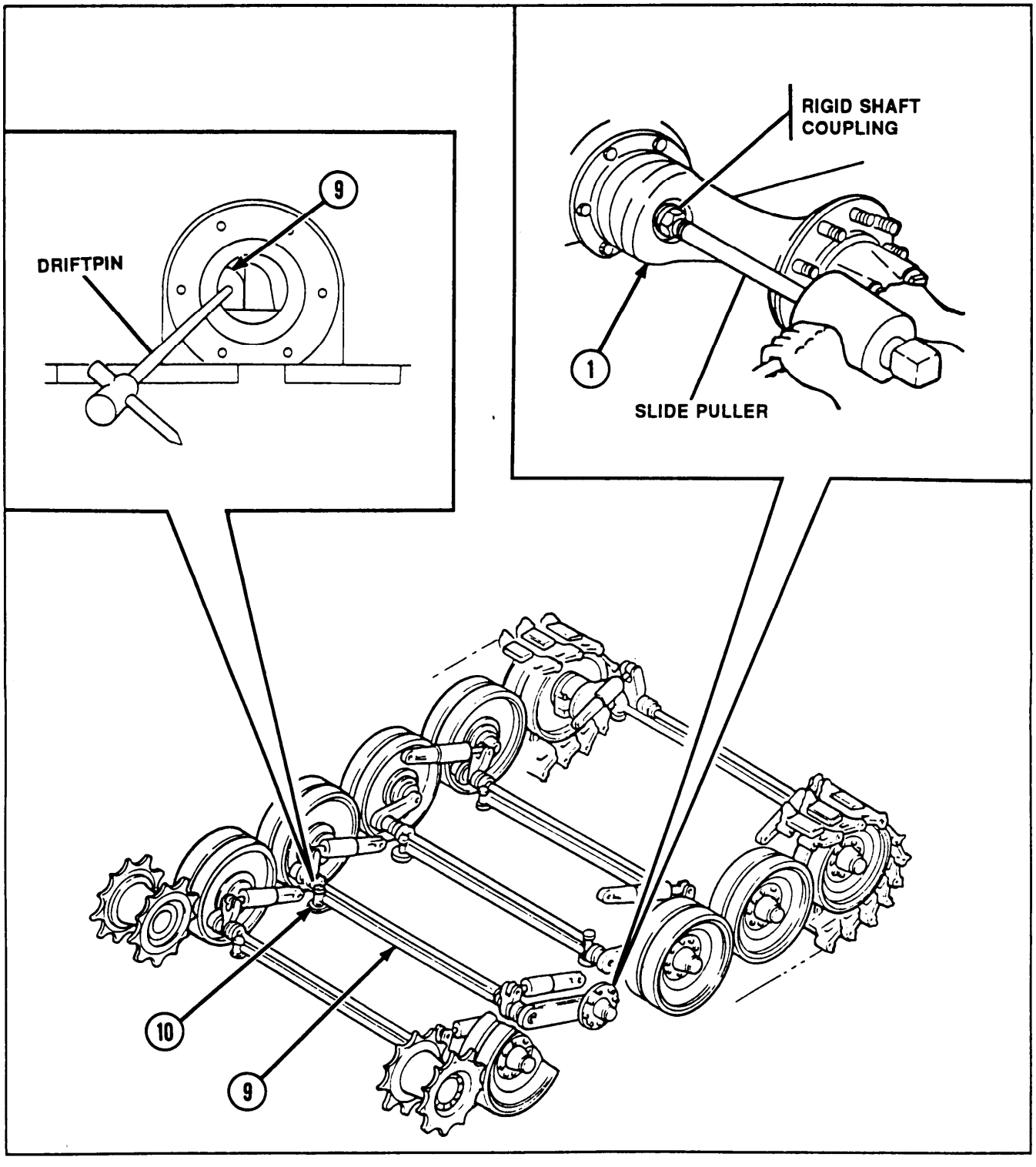


5 Loosen, but do not remove, hexagon head capscrews (7) on torsion bar socket retainer (8) under vehicle.



2-143. MAINTENANCE OF TORSION BARS (CONT).

REMOVAL (CONT)



6 Screw rigid shaft coupling into end of torsion bar (9).

7 Remove torsion bar (9) using slide puller.

NOTE

Steps 8 thru 14 apply to removal of broken torsion bar.

8 To gain access to broken torsion bar, remove idler wheel arm and hub assembly, refer to page 2-855; or remove roadwheel arm and hub assembly, refer to page 2-836.

9 Form a slip loop in one end of sling.

10 Reach through opening in hull where arm and hub assembly (1) was removed.

11 Place slip loop around end of broken torsion bar (9) and remove broken torsion bar through arm and hub assembly opening.

NOTE

- For the right side number 1 roadwheel torsion bar socket, gain access at the bottom front of driver's compartment.
- For the right side number 2 roadwheel torsion bar socket, gain access at the bottom rear of driver's compartment.
- For the right side number 3 roadwheel torsion bar socket, gain access at the bottom of the battery compartment.
- For the right side number 4 roadwheel torsion bar socket, gain access at the bottom left front of the turret well.
- For the right side idler wheel torsion bar socket, gain access at the bottom left rear of the turret well.
- For the left side number 1 and number 2 roadwheel torsion bar sockets, gain access at the right side of the powerplant compartment.
- For the left side number 3 roadwheel torsion bar socket, gain access through the right side hull tunnel.
- For the left side number 4 roadwheel torsion bar socket, gain access at the bottom right front of the turret well.
- For the left side idler wheel torsion bar socket, gain access at the bottom right rear of the turret well.
- Torsion bar socket may not come completely free from hull because of broken torsion bar.

12 If broken torsion bar cannot be reached or does not come loose, gain access to torsion bar socket (10). Remove torsion bar socket, refer to page 2-827.

13 Reach through access to torsion bar socket (10) and turn torsion bar socket and broken torsion bar (9).

14 Tap broken end of torsion bar with driftpin to remove it from torsion bar socket (10). Remove broken torsion bar (9) and torsion bar socket (10) from hull.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-143. MAINTENANCE OF TORSION BARS (CONT).

INSTALLATION

1 If broken torsion bar (1) was removed, install torsion bar socket (2), refer to page 2-834. Install but do not tighten four hexagon head capscrews (3).

2 If removed, install roadwheel arm and hub assembly, refer to page 2-836; or install idler wheel arm and hub assembly, refer to page 2-855.

3 Coat splines at each end of torsion bar (1) with grease.

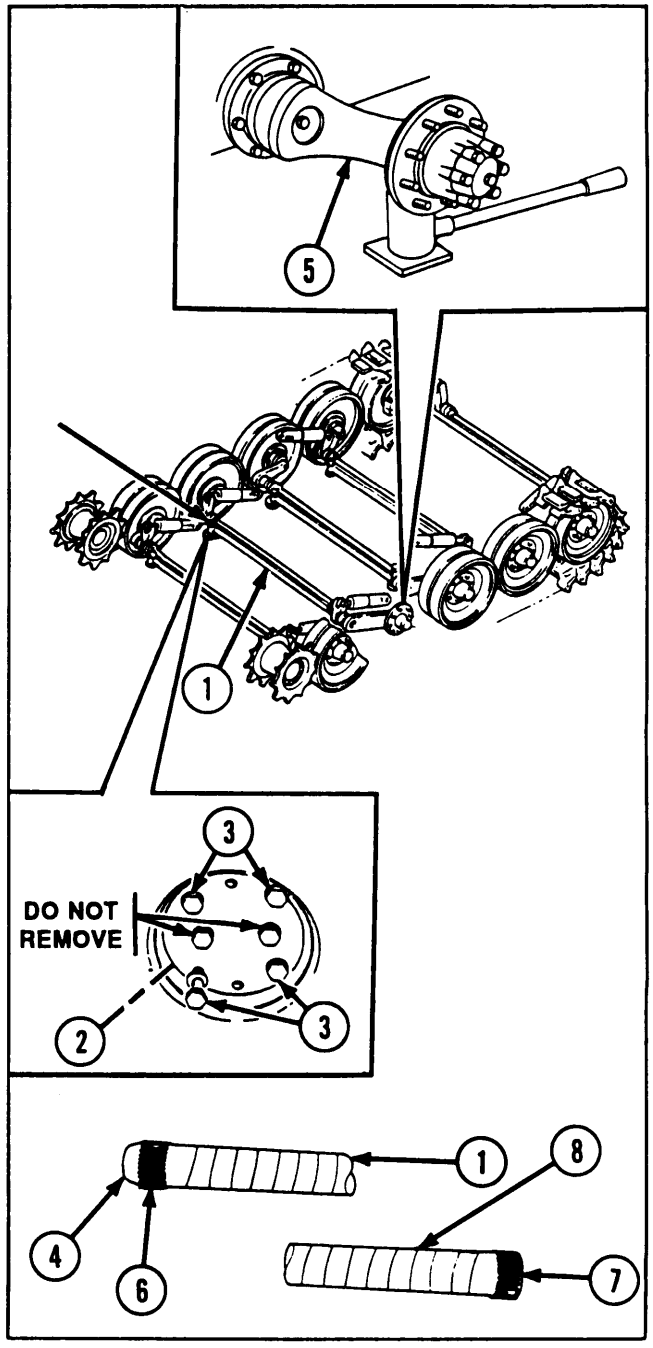
CAUTION

- Torsion bars are not identical. Ensure that torsion bar is correct for installation position. Part number is stamped on large end of torsion bar.
- Do not damage splines during installation.

4 Insert inner end (4) of torsion bar (1) into opening in arm and hub assembly (5). Be sure blind spline (6) is up.

5 Insert torsion bar (1) until spline touches torsion bar socket (2).

6 Rotate torsion bar (1) approximately 1/4 turn clockwise on the right side of the vehicle and approximately 1/4 turn counterclockwise on the left side of the vehicle to align and engage the blind spline on the end of the torsion bar with the blind spline in the torsion bar socket (2).



7 Insert torsion bar (1) only enough to engage blind spline of torsion bar socket (2).

8 Raise arm and hub assembly (5) until blind spline in arm is aligned with blind spline (7) on outer end (8) of torsion bar (1).

9 Push torsion bar (1) in to engage splines.

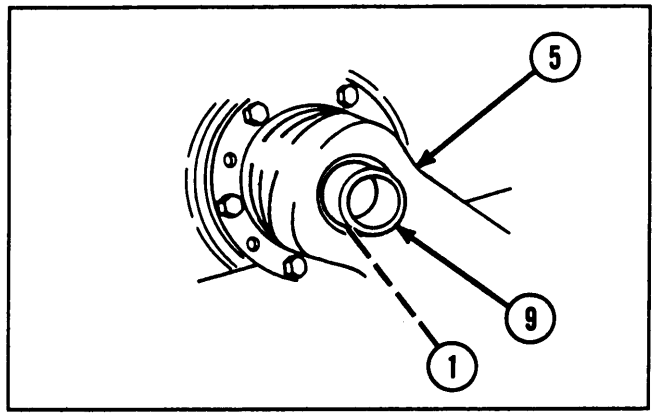
10 Fill cavity at outer end of torsion bar (1) with about 1/4 in. (6 mm) of grease.

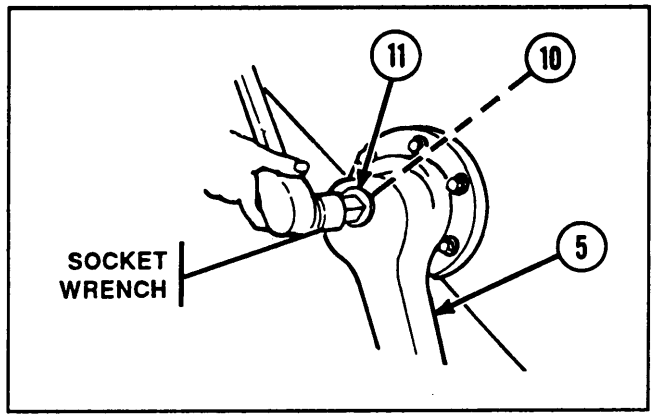
NOTE
The idler wheel arm and hub assembly has no sleeve spacer.

11 Lubricate sleeve spacer (9) with grease.

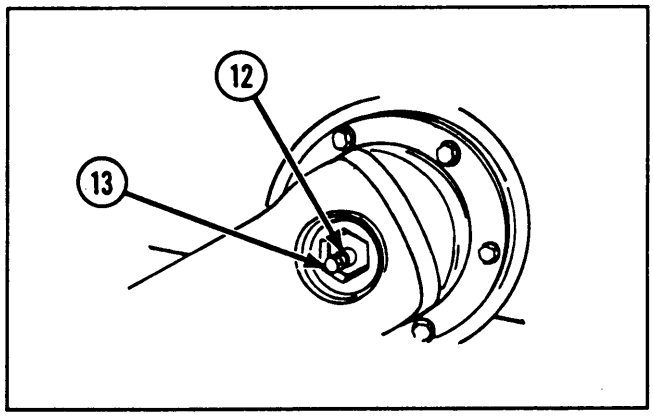
12 Install sleeve spacer (9) in arm and hub assembly (5). Press until sleeve spacer is touching torsion bar (1). Outer end of spacer should be even with the inside of the plug threads in roadwheel arm assembly. If not, pull torsion bar back until even.

13 Install new gasket (10) and machine thread plug (11) in arm and hub assembly (5), using socket wrench.

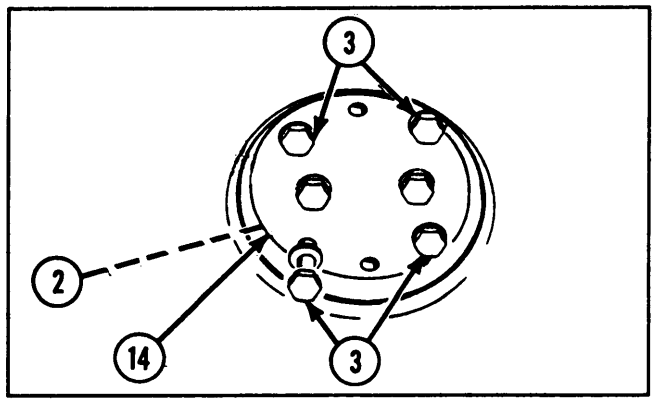




14 Install new lockwasher (12) and hexagon head capscrew (13).



15 Tighten four hexagon head capscrews (3) to secure torsion bar socket (2) and torsion bar socket retainer (14) to bottom of hull.



2-144. MAINTENANCE OF TORSION BAR SOCKETS.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Materials/Pads
Dry cleaning solvent (item 16, appx C)
Gasket
Gasket (9)
Grease (item 20, appx C)
Lockwasher (60)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-848 Roadwheel or idler wheel removed
2-827 Torsion bar removed

REMOVAL

NOTE
Procedure is written for one torsion bar socket, but applies to all ten torsion bar sockets.

1 Remove four hexagon head capscrews (1) and four lockwashers (2).

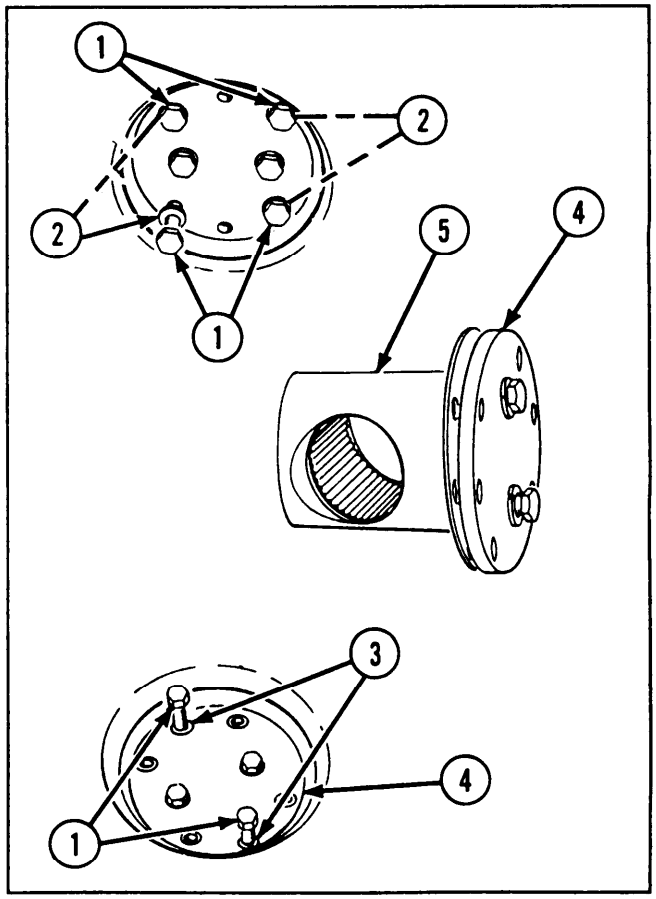
NOTE
Do not remove two hexagon head capscrews and two lockwashers securing anchor retainer to torsion bar socket.

2 Insert two hexagon head capscrews (1) into two jackscrew holes (3).

3 Tighten two hexagon head capscrews (1) evenly to separate anchor retainer (4) from hull.

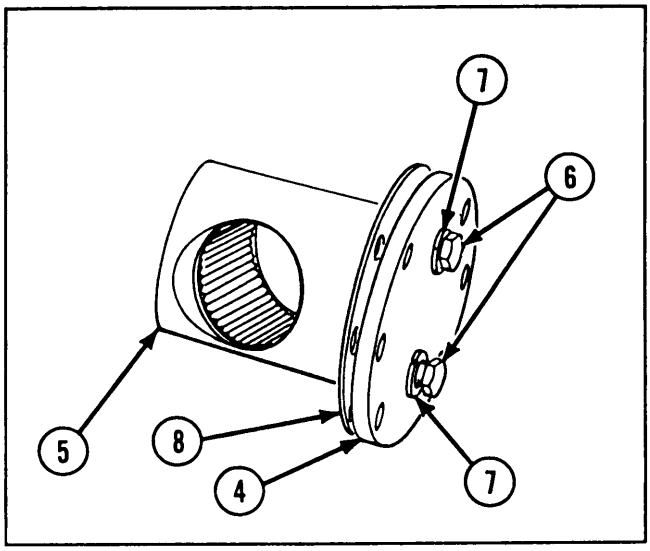
4 Remove anchor retainer (4) with attached torsion bar socket (5).

5 Remove two hexagon head capscrews (1) from jackscrew holes (3).



6 Remove two hexagon head capscrews (6) and two lockwashers (7).

7 Remove anchor retainer (4) and gasket (8) from torsion bar socket (5).



INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Clean surface of anchor retainer with dry cleaning solvent.

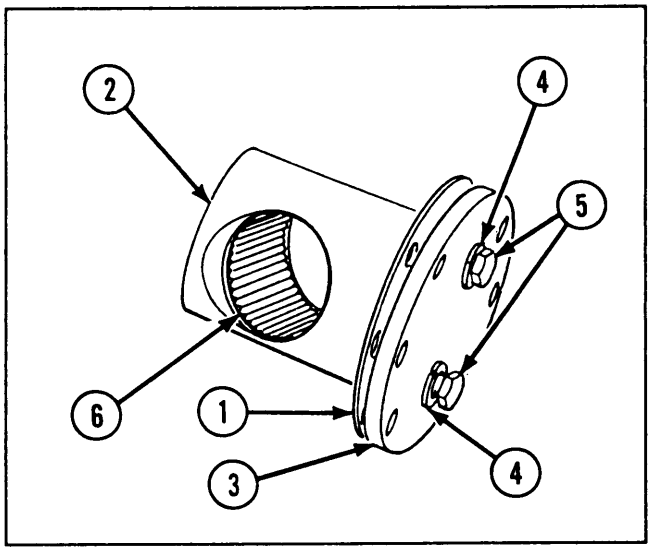
3 Repair is by replacement of authorized parts (TM 9-2350-238-2P-1).

INSTALLATION

1 Install new gasket (1) and torsion bar socket (2) on anchor retainer (3).

2 Install two new lockwashers (4) and two hexagon head capscrews (5).

3 Coat splines (6) with grease.

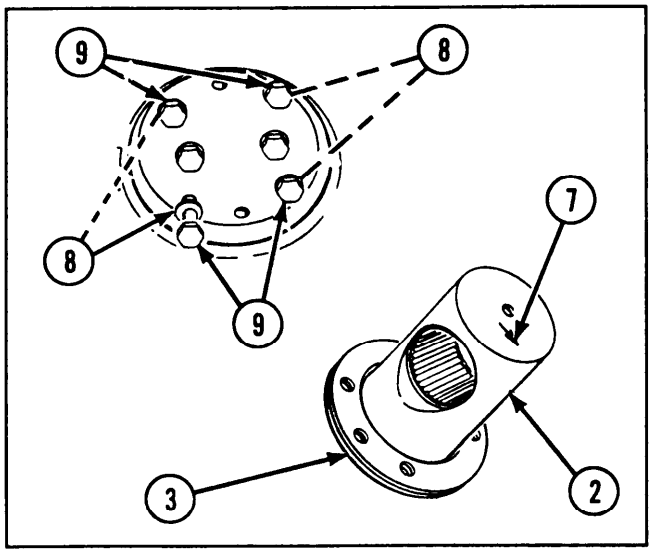


4 Clean mating surfaces on hull with dry cleaning solvent.

5 Install torsion bar socket (2) with attached anchor retainer (3).

6 Ensure arrow (7) points toward front of vehicle.

7 Install four new lockwashers (8) and four hexagon head capscrews (9).



2-145. MAINTENANCE OF ROADWHEEL ARM AND HUB ASSEMBLY AND ATTACHING PARTS; AND ROADWHEEL PIVOT ARM ASSEMBLY.

This task covers: a. *Removal/Disassembly* b. *Inspection/Repa\r* c. *Reassembly/Installation*

INITIAL SETUP

Tools and Special Tools
- Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
  - Mechanical puller kit
- Hexagon head capscrew (3) (item 23, appx G)
- Hub spacer replacer (item 19, appx G)
- Puller adapter (item 2, appx G)
- Remover and replacer handle (item 9, appx G)
- Seal guard replacer (item 21, appx G)
- Seal inserter (item 11, appx G)
- Seal inserter (item 12, appx G)
- Slide puller (item 18, appx G)
- Sling (item 82, appx B)
- Threaded straight pin (2) (item 17, appx G)

Materials/Parts
- Bearing ring
- Connecting arm sleeve spacer
- Cotter pin (2)
- Gasket
- Grease (item 20, appx c)
- Lockwasher (6)
- Plain encased seal
- Plain encased seal
- Preformed packing
- Preformed packing (2)
- Roller bearing
- Roller bearing (2)
- Seal and retainer assembly (2)
- Sealing compound (item 37, appx C)

Personnel Required
- Two

References
- TM 9-2350-238-10
- TM 9-2350-238-24P-1

Equipment Conditions
- 2-848 RoadWheel removed
- 2-827 Torsion bar removed
- 2-842 Roadwheel suspension hub removed

REMOVAL/DISASSEMBLY

NOTE

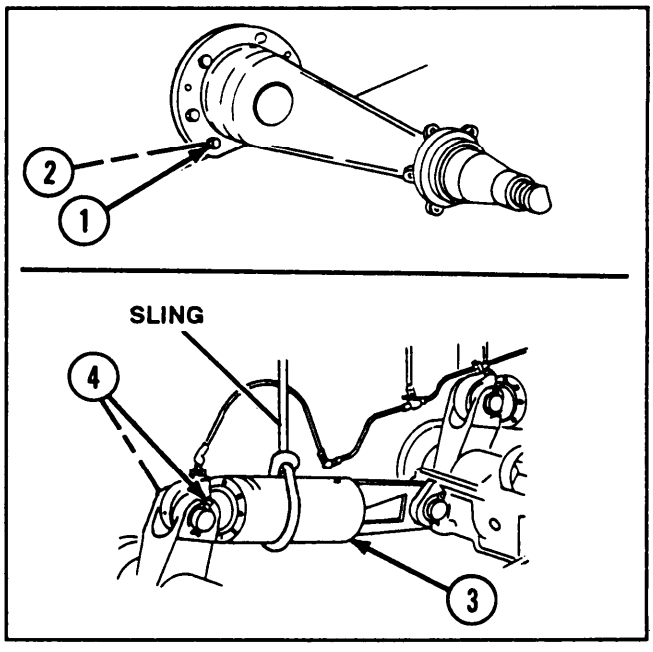
Procedures are written for one roadwheel arm and hub assembly but apply to all roadwheel arm and hub assemblies.

1 Remove six hexagon head capscrews (1) and six lockwashers (2).

2 Refer to page 2-831 to gain access to lock-out cylinder assembly (3) connected to roadwheel pivot arm assembly being removed.

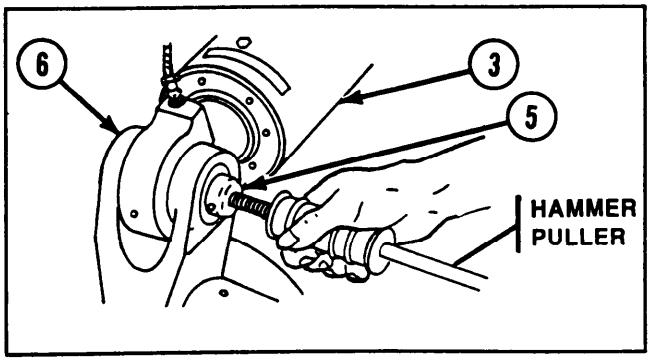
3 Remove two cotter pins (4).

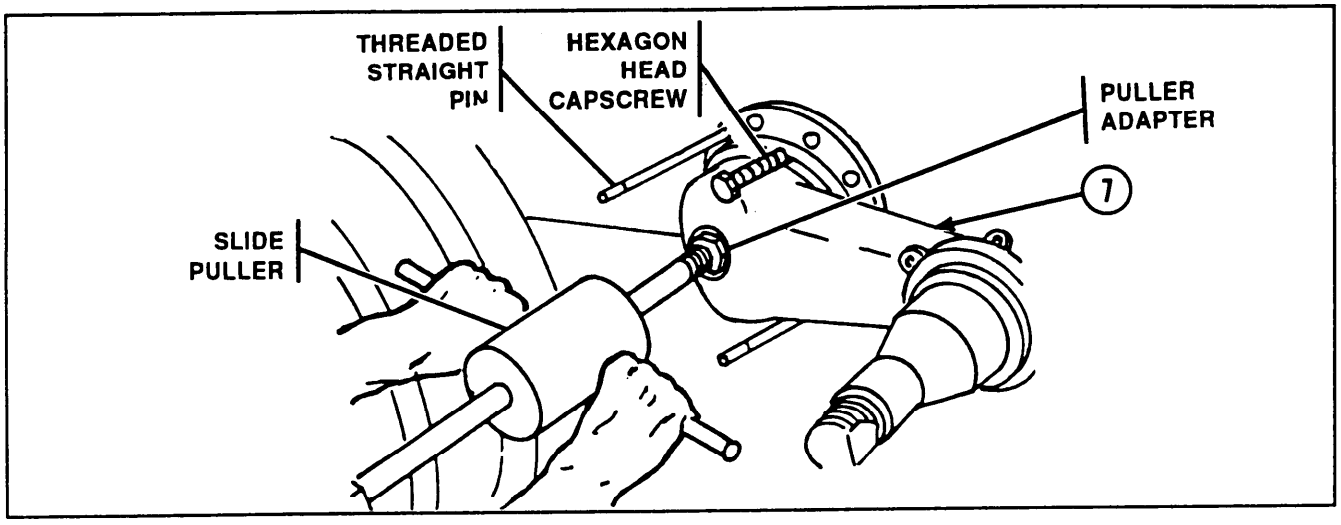
4 Rig a sling to support lockout cylinder assembly (3).



5 Remove headless straight pin (5), using hammer puller.

6 Remove lockout cylinder assembly (3) from roadwheel lever (6).





7 Install two threaded straight pins into opposing capscrew holes.

8 Install three hexagon head capscrews.

9 Screw puller adapter into roadwheel pivot arm assembly (7).

10 Screw slide puller into puller adapter.

11 Tighten three hexagon head capscrews evenly. At the same time, using slide puller, withdraw roadwheel pivot arm assembly (7) about 5 in. (13 cm) from hull.

12 Remove slide puller and puller adapter.

13 Remove three hexagon head capscrews.

14 Remove roadwheel pivot arm assembly (7).

15 Remove threaded straight pins.

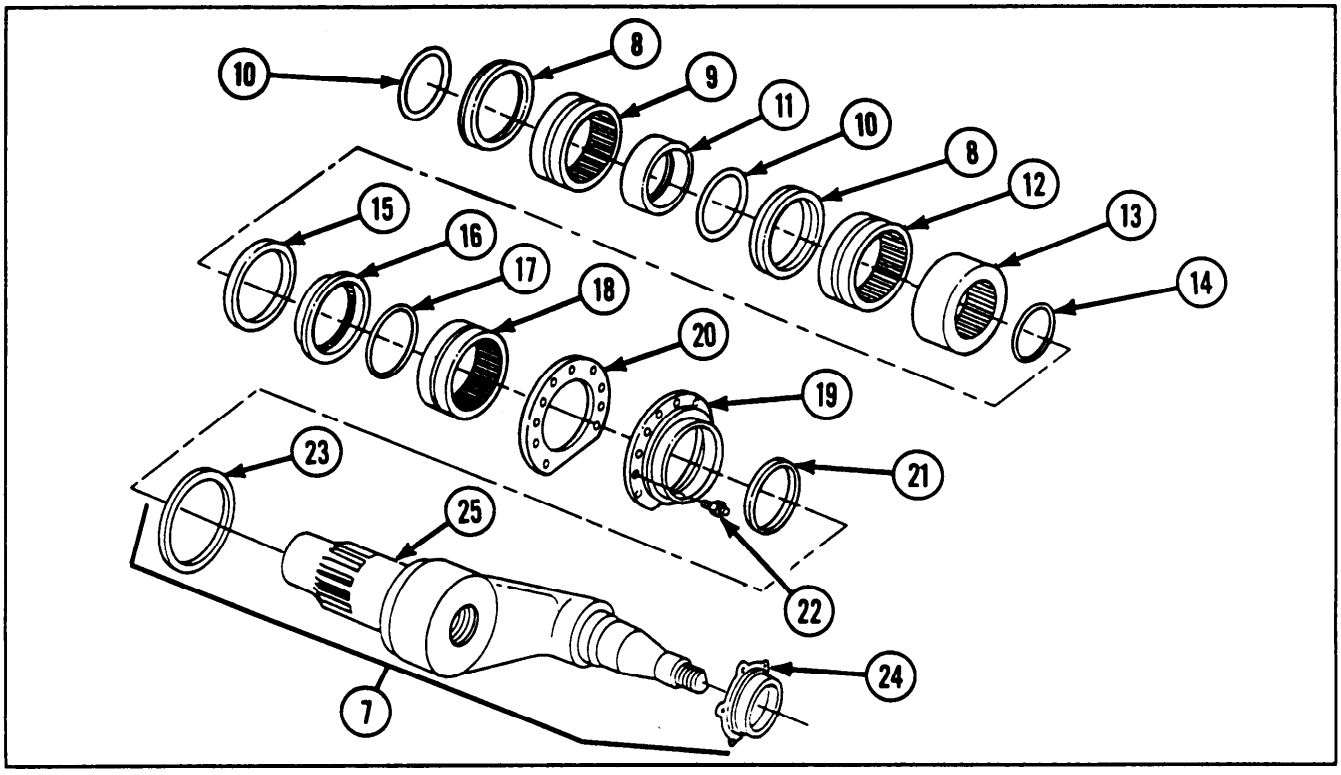
NOTE

On some vehicles, the middle roadwheel on each side is equipped with a sleeve spacer instead of a roadwheel lever.

16 Lift roadwheel lever (6) and remove from cavity in hull.

2-145. MAINTENANCE OF ROADWHEEL ARM AND HUB ASSEMBLY AND ATTACHING PARTS; AND ROADWHEEL PIVOT ARM ASSEMBLY (CONT).

REMOVAL/DISASSEMBLY (CONT)



17 Remove two seal and retainer assemblies (8) and roller bearing (9) from hull, using puller.

18 Remove preformed packings (10) from each seal and retainer assembly (8).

19 Remove bearing ring (11) from roller bearing (9).

20 Remove roller bearing (12).

NOTE
Connecting arm sleeve spacer is found on middle roadwheel arm only.

21 Remove connecting arm sleeve spacer (13), retaining ring (14), plain encased seal (15), oil seal retainer (16), preformed packing (17), and roller bearing (18) from roadwheel pivot arm assembly (7).

22 Remove roadwheel arm retainer (19) from roadwheel arm assembly (7), using puller. Remove gasket (20) from roadwheel arm retainer.

23 Using drift, remove plain encased seal (21) from roadwheel arm retainer (20). Remove two lubrication fittings (22).

24 Remove dirt deflector (23) and inner arm and hub spacer (24) from arm (25).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If arm is damaged, repair is by replacement of next higher assembly.

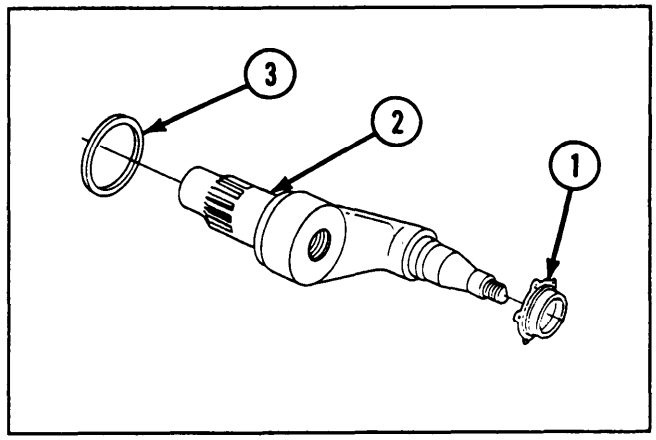
3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY/INSTALLATION

NOTE

Procedures are written for one roadwheel arm and hub assembly but apply to all roadwheel arm and hub assemblies.

1 Using hub spacer replacer, install inner arm and hub spacer (1) to arm (2).

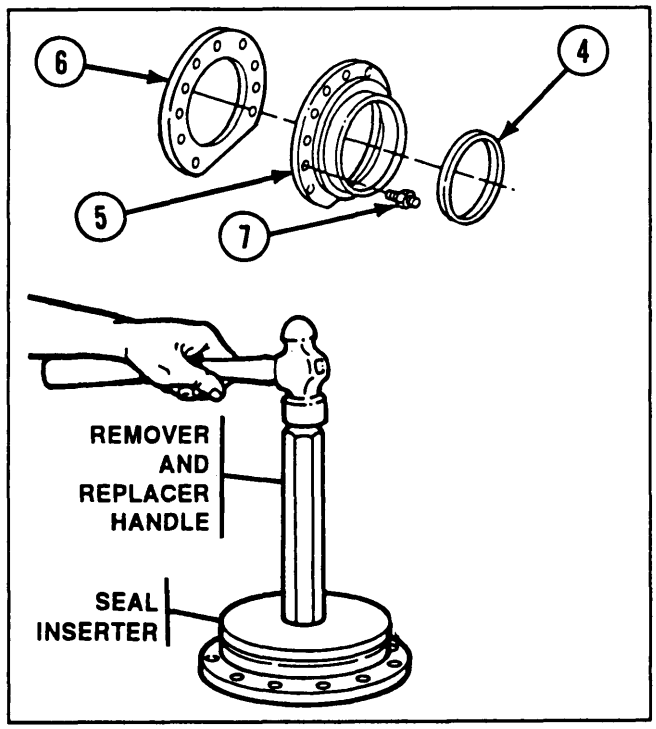


2 Using hammer and seal guard replacer, install dirt deflector (3) on arm (2).

3 Coat all metal-to-metal surfaces of new plain encased seal (4) with sealing compound.

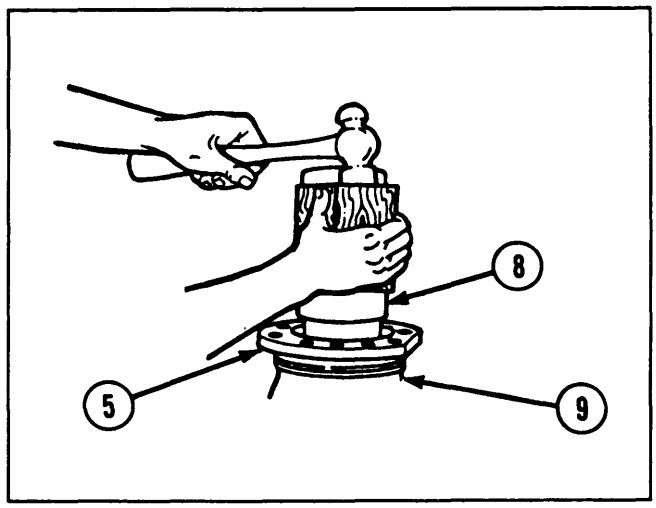
4 Install new plain encased seal (4) in roadwheel arm retainer (5), using seal inserter (item 11, appx G) and remover and replacer handle.

5 Install new gasket (6) and two lubrication fittings (7) in roadwheel arm retainer (5).



6 Install roadwheel arm retainer (5) and new roller bearing race (8) on upper spindle of roadwheel pivot arm assembly (9).

7 Use a feeler gage to maintain clearance of 0.010 to 0.015 in. (0.254 to 0.381 mm) between roller bearing race (8) and face of roadwheel arm retainer (5).



2-145. MAINTENANCE OF ROADWHEEL ARM AND HUB ASSEMBLY AND ATTACHING PARTS; AND ROADWHEEL PIVOT ARM ASSEMBLY (CONT).

REASSEMBLY/INSTALLATION (CONT)

8 Pack new roller bearing (10) with grease. Coat lip and face of new plain encased seal (11) and new preformed packing (12) with grease.

9 Install new roller bearing (10), new preformed packing (12), oil seal retainer (13), new plain encased seal (11), and retaining ring (14).

10 Install connecting arm sleeve spacer (15) (middle roadwheel arm only).

11 Pack two new roller bearings (16 and 17) with grease. Coat lip and face of two new seal and retainer assemblies (18 and 19), two new preformed packings (20), and new bearing ring (21) with grease.

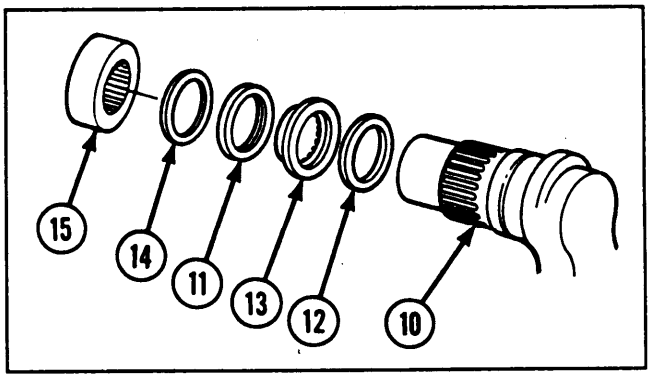
12 Install new preformed packings (20) on new seal and retainer assemblies (18 and 19).

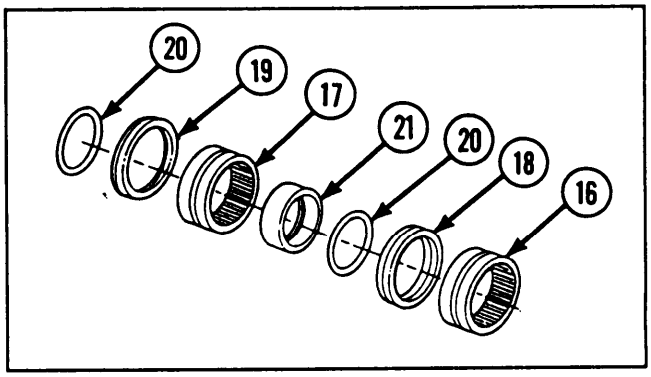
13 Using seal inserter (item 12, appx G) and remover and replacer handle, install new seal and retainer assembly (19) in roadwheel arm opening with seal lip facing inward.

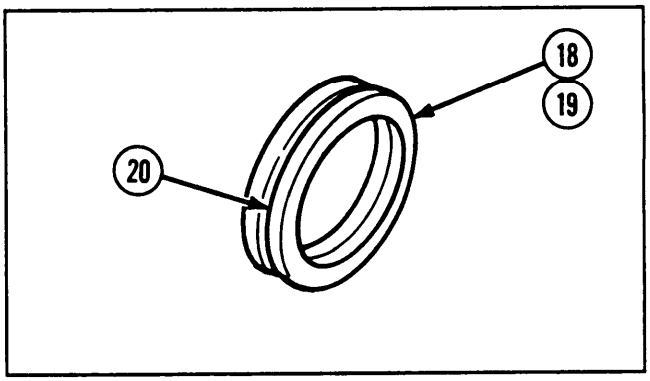
14 Install new roller bearing (17) and new bearing ring (21) in roadwheel arm opening, using seal inserter (item 12, appx G) and remover and replacer handle.

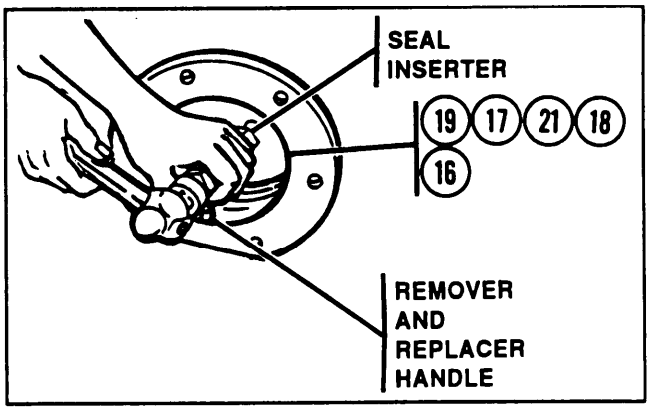
15 Using seal inserter (item 12, appx G) and remover and replacer handle, install second new seal and retainer assembly (18) in roadwheel arm opening with seal lip outward.

16 Install new roller bearing (16), using seal inserter (item 11, appx G) and remover and replacer handle.









17 Install two threaded straight pins in opposing capscrew holes on hull.

18 Coat sealing surfaces of roadwheel pivot arm assembly (9) and hull with sealing compound.

19 Position roadwheel pivot arm assembly (9) on threaded straight pins.

20 Push roadwheel pivot arm assembly (9) into hull until end of spindle is visible in road wheel lever cavity.

21 Insert and position roadwheel lever (22) into road wheel lever cavity.

22 Position roadwheel lever (22) so blind spline on lever arm mates with blind spline on roadwheel arm spindle.

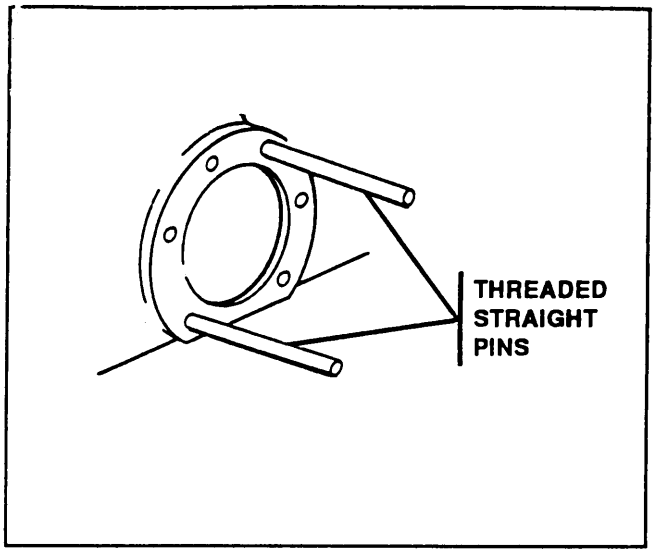
23 Remove two threaded straight pins.

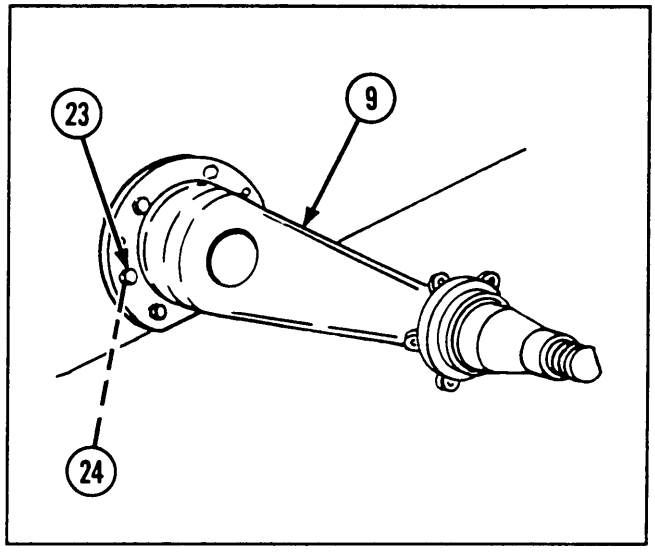
24 Install and tighten six hexagon head capscrews (23) and six new lockwashers (24) in cross-pattern sequence.

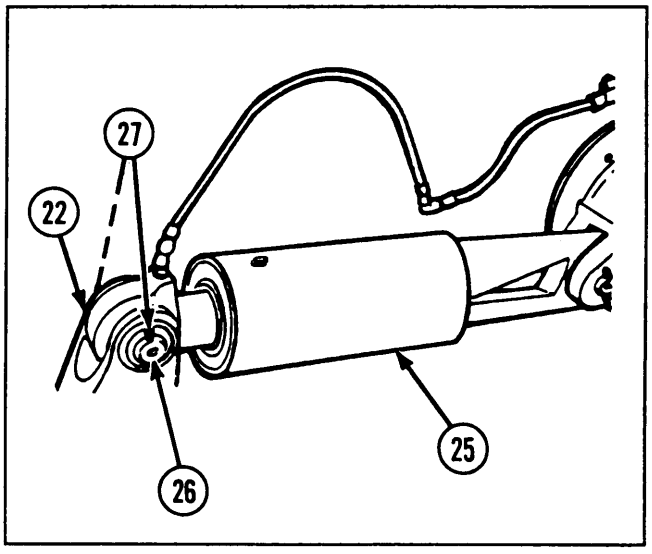
25 Install eye of lockout cylinder assembly (25) into arm of roadwheel lever (22).

26 Install straight headless pin (26) and two new cotter pins (27).

27 Lubricate roadwheel and hub assembly. Refer to TM 9-2350-238-10.







2-146. MAINTENANCE OF ROADWHEEL SUSPENSION HUB AND HUB CAP RADIO STATIC SUPPRESSION SPRING.

This task covers:
a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. *Installation/Adjustment*

INITIAL SETUP

Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
• Torque wrench (0 to 120 ft-lb)
Bearing inserter set (item 14, appx G)
Bearing inserter set (item 15, appx G)
Face wrench socket (item 27, appx G)
Remover and replacer handle (item 9, appx G)

Materials/Parts
Grease (item 20, appx C)
Hub cap gasket (8)
Lock bearing nut (8)
Lockwasher (112)
Seal assembly to hub gasket (8)

Personnel Required
Two

References
TM 9-2350-238-10
TM 9-2350-238-24P-1

Equipment Conditions
2-848 Roadwheel removed

REMOVAL

NOTE

- Procedures are written for one roadwheel arm and hub assembly, but apply to all.
- Steps 1 thru 3 apply to removal of hub cap radio static suppression spring.

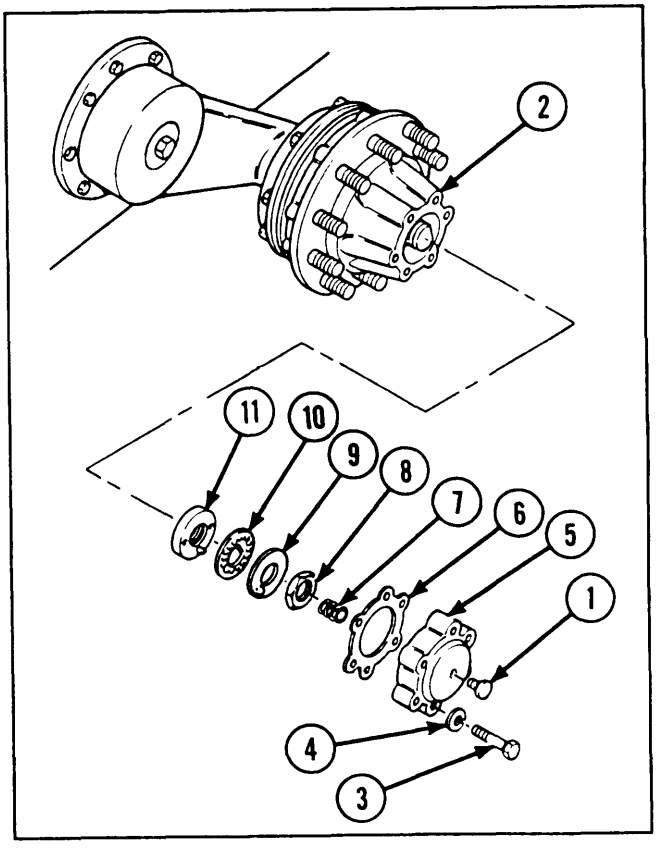
1 Remove pipe plug (1) from roadwheel suspension hub (2) and drain oil from hub.

2 Remove six hexagon head capscrews (3), six lockwashers (4), access cover (5), and hub cap gasket (6).

3 Remove hub cap radio static suppression spring (7).

4 Remove hexagon plain nut (8).

5 Remove lock bearing nut (9) and flat washer (10).

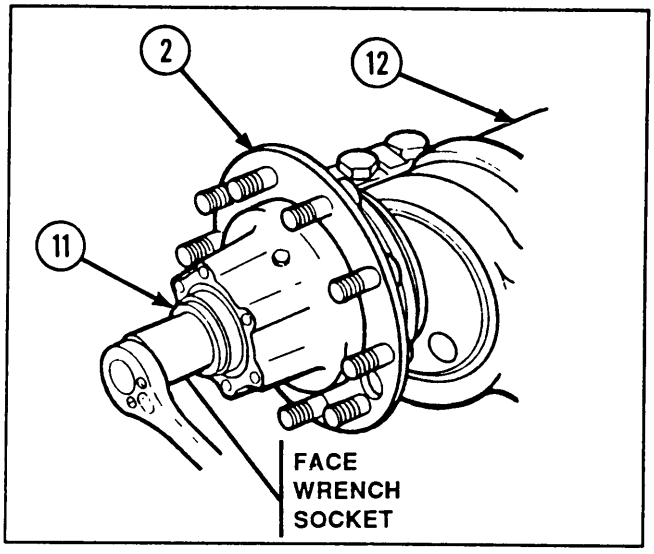


6 Using face wrench socket, remove round plain nut (11).

CAUTION

Ensure that outer roller bearing does not fall on ground.

7 Slide roadwheel suspension hub (2) from arm and guard assembly (12).



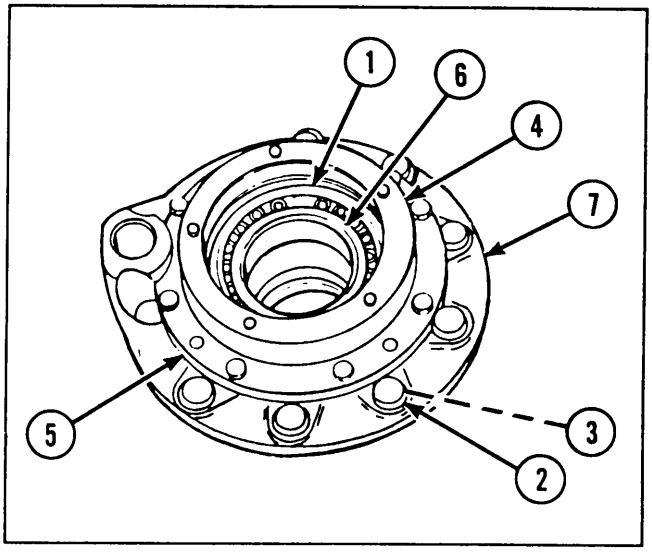
DISASSEMBLY

NOTE

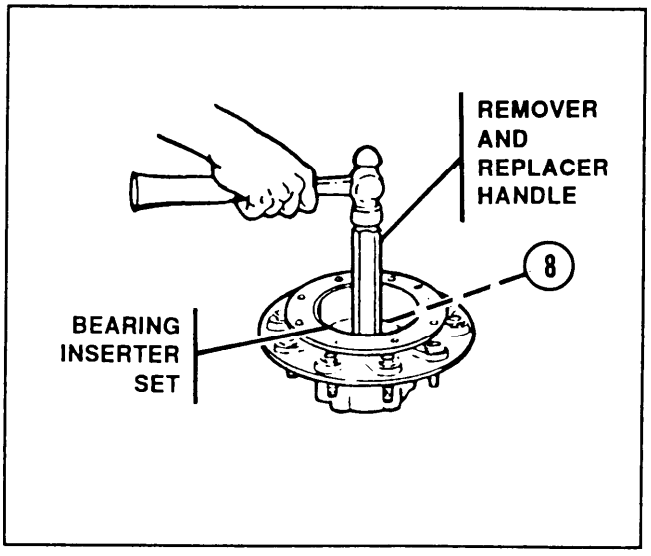
Procedures are written for one road wheel arm and hub assembly, but apply to all.

1 Remove outer roller bearing cone (1).

2 Remove eight hexagon head capscrews (2), eight lockwashers (3), hub seal assembly (4), seal assembly to hub gasket (5), and annular ball bearing cone (6) from roadwheel suspension hub (7).

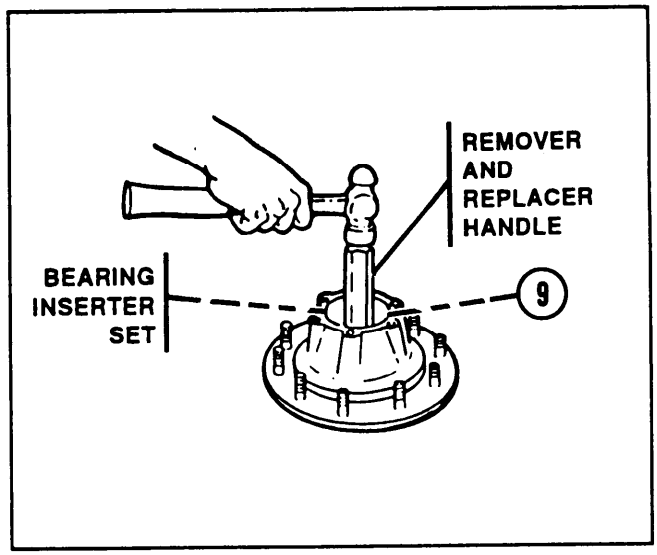


3 Remove outer roller bearing cup (8) from roadwheel suspension hub (7), using bearing inserter set (item 14, appx G) and remover and replacer handle.

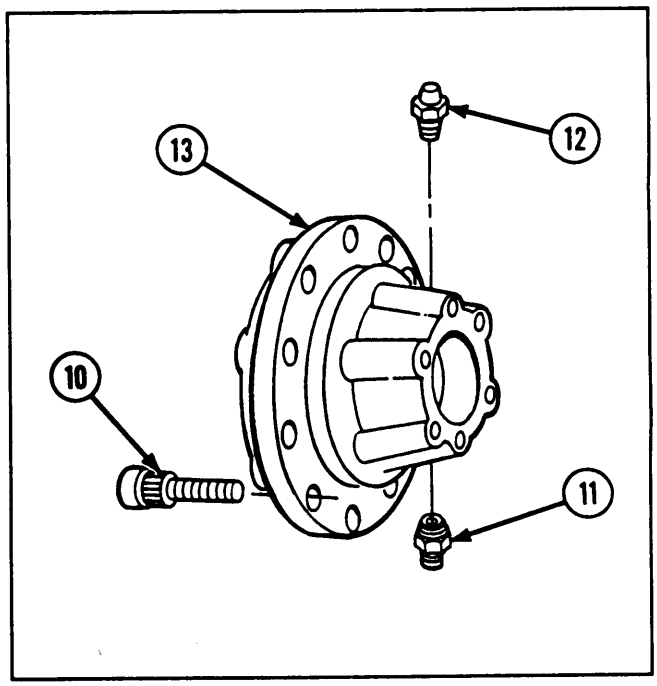


2-146. MAINTENANCE OF ROADWHEEL SUSPENSION HUB AND HUB CAP RADIO STATIC SUPPRESSION SPRING (CONT).

DISASSEMBLY (CONT)



4 Remove annular ball bearing cup (9) from roadwheel suspension hub (7), using bearing inserter set (item 15, appx G) and remover and replacer handle.



5 If damaged, remove ribbed shoulder bolts (10).

6 Remove safety relief valve (11) and lubrication fitting (12) from hub (13).

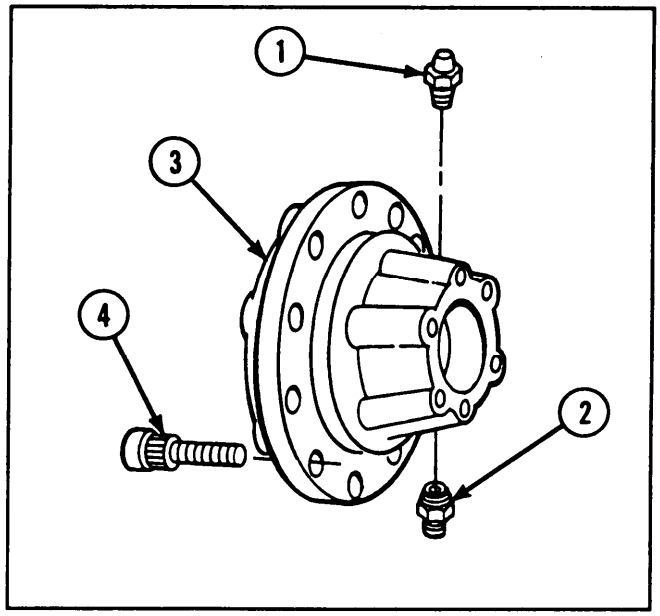
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If hub is broken or damaged, repair is by replacement of next higher assembly.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

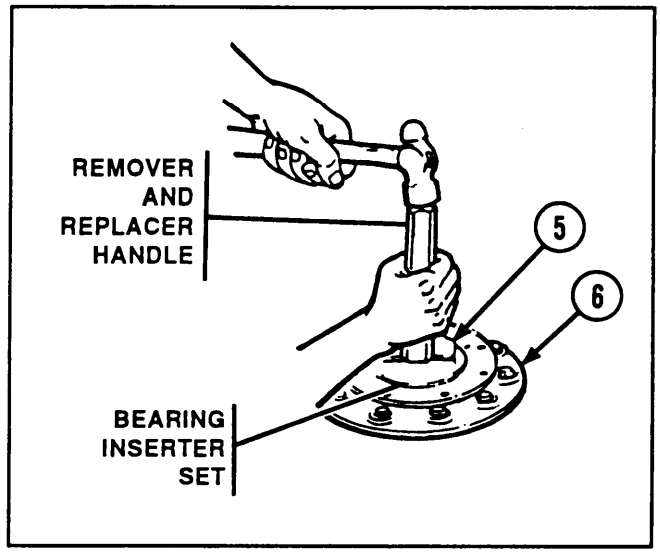


1 Install lubrication fitting (1) and safety relief valve (2) on hub (3).

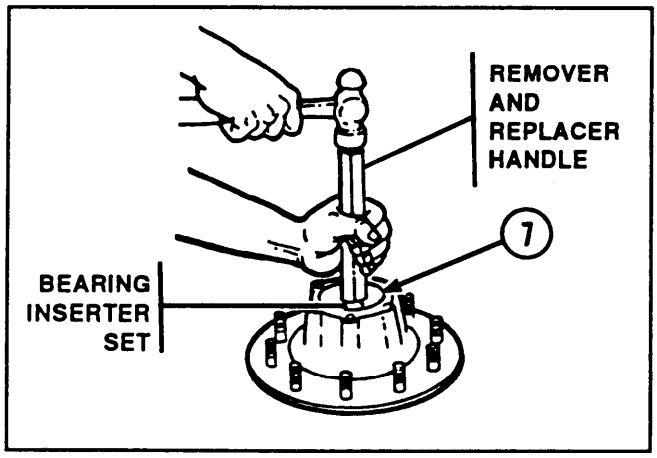
2 If necessary, install new ribbed shoulder bolts (4).

NOTE

- Procedures are written for one roadwheel arm and hub assembly, but apply to all.
- Ensure that bearing cups are firmly seated against interior flanges of roadwheel suspension hub.



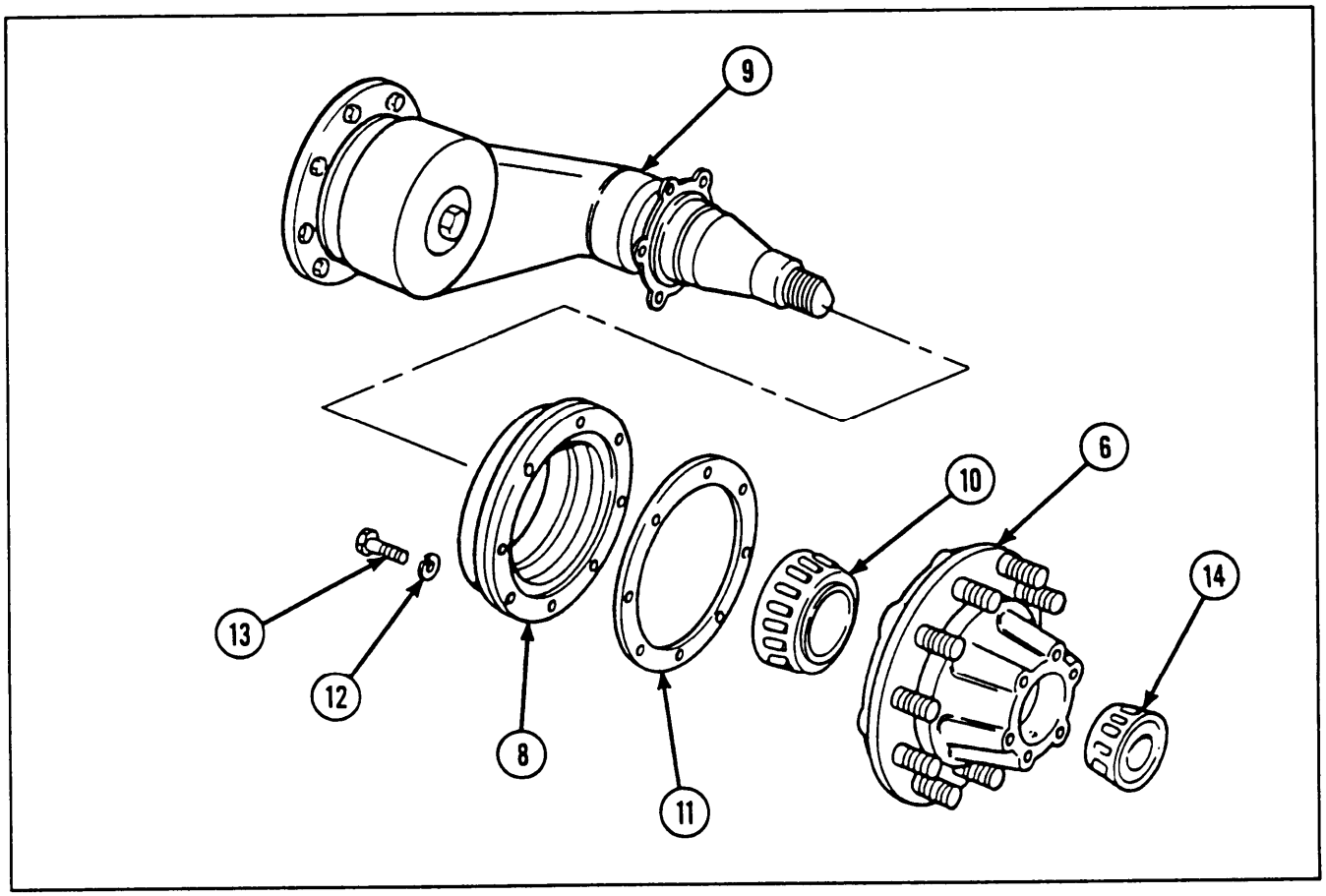
3 Install annular ball bearing cup (5) in roadwheel suspension hub (6), using bearing inserter set (item 15, appx G) and remover and replacer handle.



4 Install outer roller bearing cup (7) in roadwheel suspension hub (6), using bearing inserter set (item 14, appx G) and remover and replacer handle.

2-146. MAINTENANCE OF ROADWHEEL SUSPENSION HUB AND HUB CAP RADIO STATIC SUPPRESSION SPRING (CONT).

REASSEMBLY (CONT)



5 Install hub seal assembly (8) on roadwheel pivot arm assembly (9). Ensure that drive pins on seal mate with holes on spindle flange.

6 Pack annular ball bearing cone (10) with grease. Seat annular ball bearing cone firmly against collar of roadwheel pivot arm assembly (9).

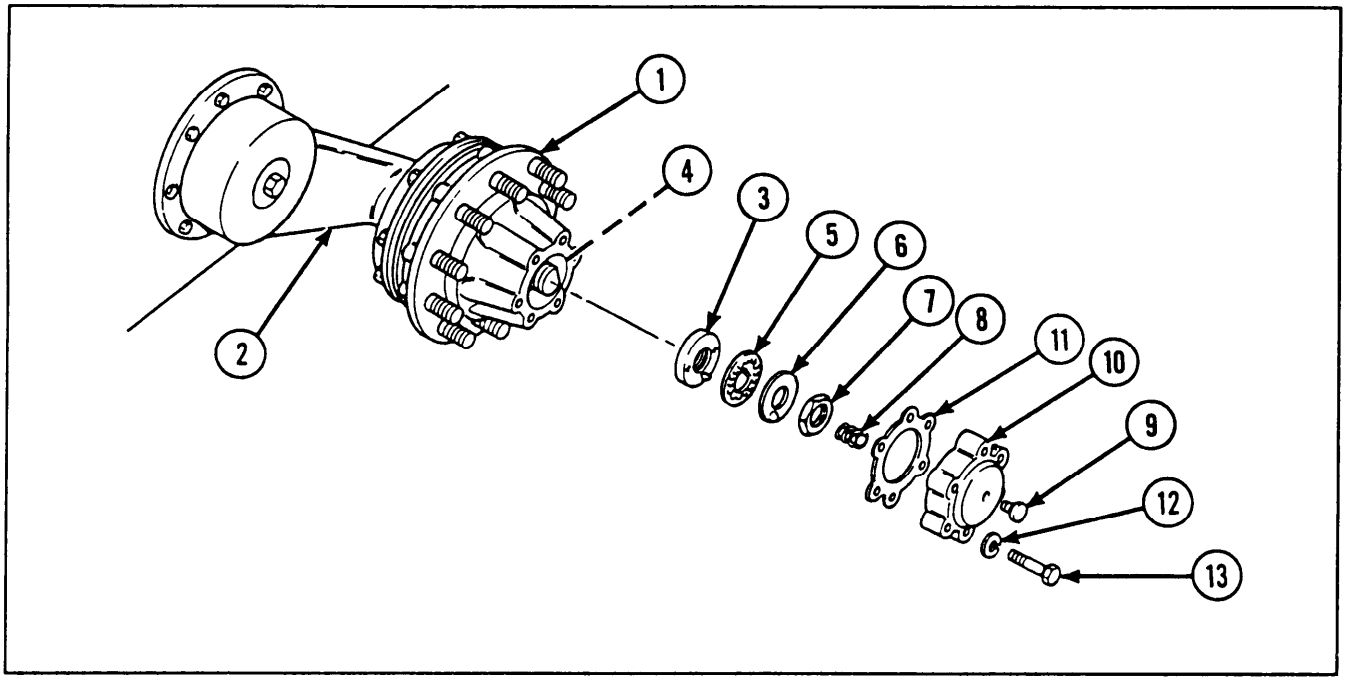
7 Install new seal assembly to hub gasket (11), eight new lockwashers (12), and eight hexagon head capscrews (13) on roadwheel suspension hub (6).

NOTE

Torque eight hexagon head capscrews to 32 to 35 ft-lb (43 to 47 N-m) (dry) or 23 to 25 ft-lb (31 to 34 N-m) (lubricated).

8 Pack outer roller bearing cone (14) with grease. Install outer roller bearing cone on roadwheel pivot arm assembly (9).

INSTALLATION/ADJUSTMENT



1 Install roadwheel suspension hub (1) and assembled parts on roadwheel pivot arm assembly (2).

2 Install round plain nut (3).

NOTE

The completed wheel assembly must have between 0.0005 and 0.0050 in. (0.0013 and 0.0130 cm) actual end play.

3 To adjust outer roller bearing (4), perform the following.

a. Using face wrench socket, turn round plain nut (3) clockwise, and at the same time, rotate roadwheel suspension hub (1), first in one direction, and then the other, until there is a slight bind.

b. Back off round plain nut (3) 1/6 to 1/4 turn.

c. Install flat washer (5).

4 Install new lock bearing nut (6) and hexagon plain nut (7), and tighten hexagon plain nut.

NOTE

Steps 5 and 6 apply to installation of hub cap radio static suppression spring.

5 Install hub cap radio static suppression spring (8) and pipe plug (9) in access cover (10).

6 Install new hub cap gasket (11), access cover (10), six new lockwashers (12), and six hexagon head capscrews (13).

7 Torque six hexagon head capscrews (13) to 32 to 35 ft-lb (43 to 47 N-m) (dry) or 23 to 25 ft-lb (31 to 34 N-m) (lubricated).

8 Lubricate roadwheel suspension hub. Refer to TM 9-2350-238-10.

2-147. MAINTENANCE OF IDLER WHEEL, ROADWHEEL WHEEL, AND LEFT LUBRICATION TUBE.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
- Breaker bar
- Socket (1-1/4-in., 3/4-in. drive)
- Torque wrench (0 to 600 ft-lb)
- Jack

Wood blocks

Materials/Parts
Gasket
LockWasher (10)
Preformed packing
Self-locking nut (100)
Tube fitting locknut

References
TM 9-2350-238-10
TM 9-2350-238-24P-1

Personnel Required
Two

REMOVAL

NOTE
- Steps 1 thru 24 are written and illustrated for left side of vehicle but apply to both sides.
- Steps 1 thru 8 apply to removal of idler wheel or number 1 roadwheel.

1 Remove track from top of roadwheels and trailing idler wheel. Refer to page 2-873.

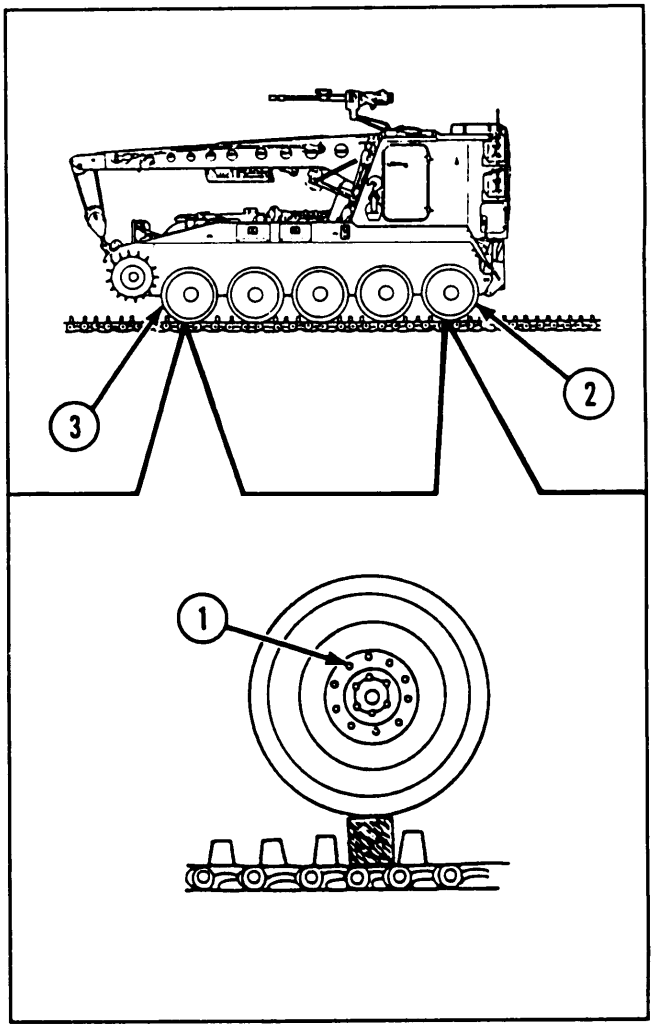
2 Loosen ten self-locking nuts (1) one-half turn.

3 Place 4 x 4 x 24-in. (10 x 10 x 61-cm) wood block between track guides in front of idler wheel (2) or roadwheel (3).

4 Move vehicle forward until idler wheel (2) or roadwheel (3) is on wood block.

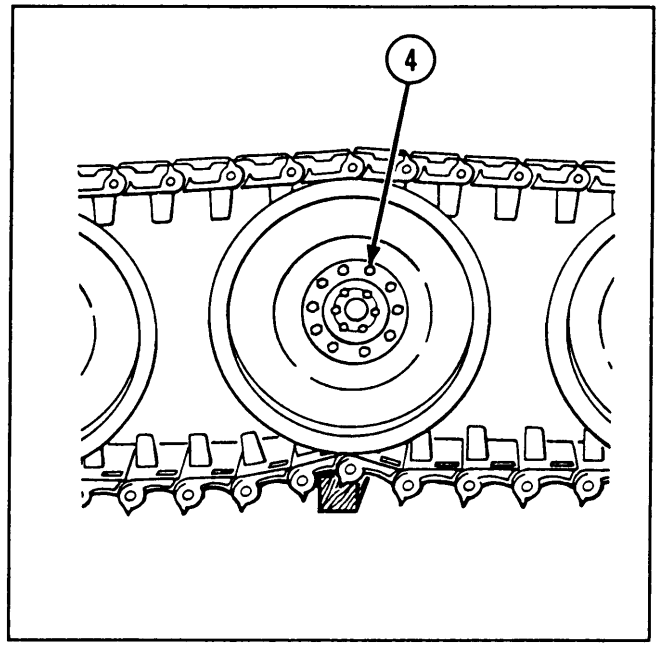
5 Lock suspension.

6 Back vehicle off wood block.



7 Remove ten self-locking nuts (1).

8 Remove idler wheel (2) or roadwheel (3).



NOTE

Steps 9 thru 16 apply to removal of number 2 and 4 roadwheels on all vehicles.

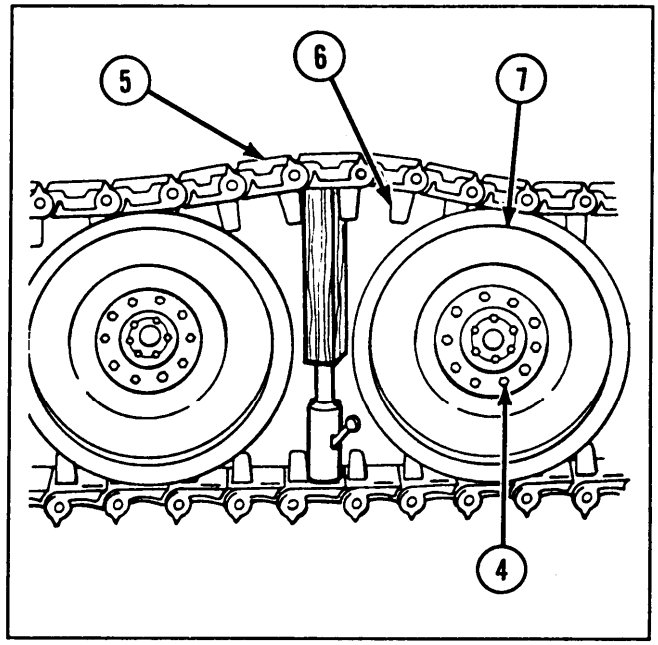
9 Decrease track tension. Refer to TM 9-2350-238-10.

10 Loosen ten self-locking nuts (4) on number 2 or 4 roadwheel one-half turn.

11 Drive vehicle onto 4 x 4 x 24-in. (10 x 10 x 61-cm) wood block.

12 Lock suspension.

13 Drive vehicle off wood block.



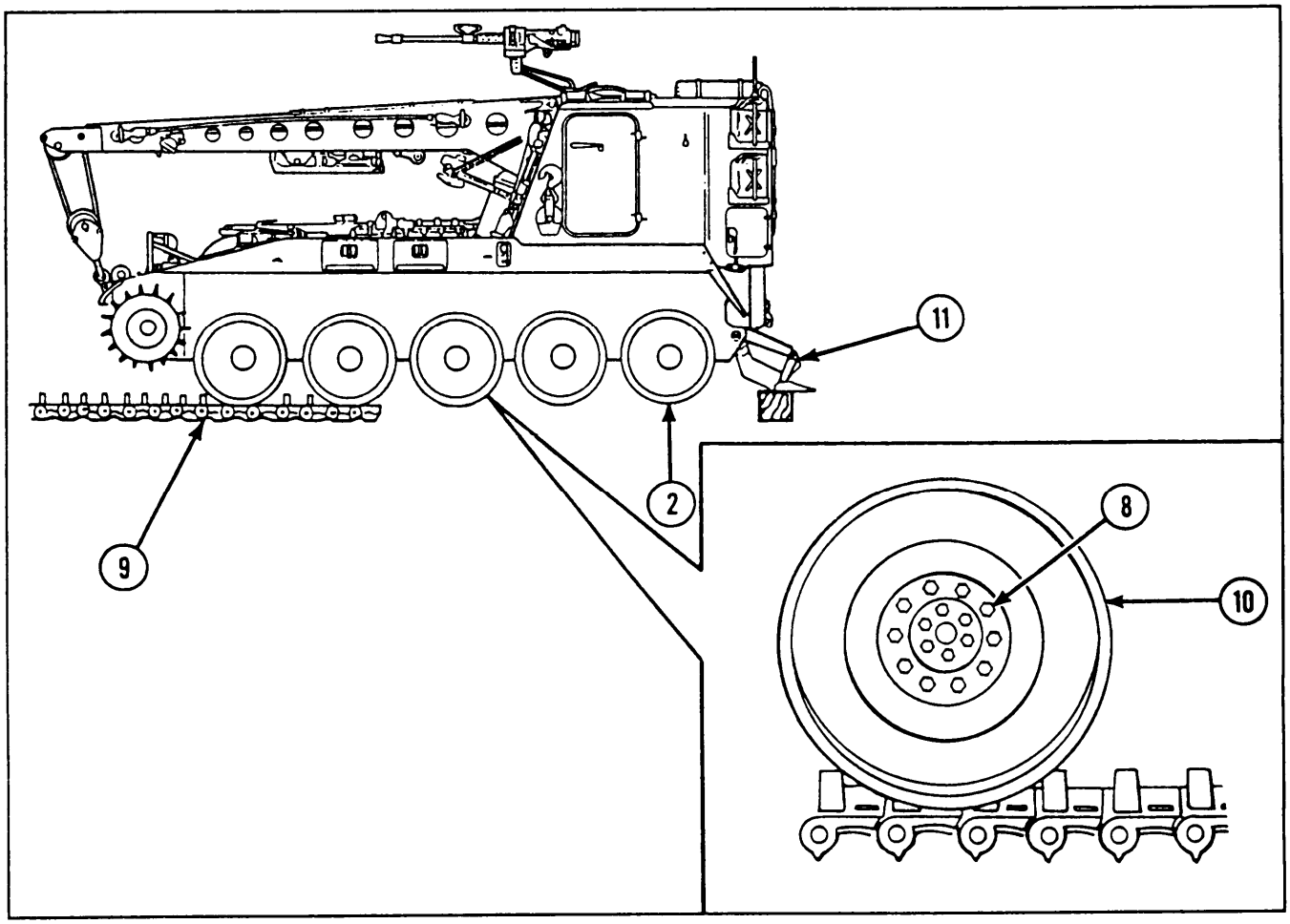
14 Lift track (5) using jack and 4 x 4 x 24-in. (10 x 10 x 61-cm) wood block until track guides (6) clear roadwheel (7).

15 Remove ten self-locking nuts (4).

16 Remove roadwheel (7).

2-147. MAINTENANCE OF IDLER WHEEL, ROADWHEEL WHEEL, AND LEFT LUBRICATION TUBE (CONT).

REMOVAL (CONT)



NOTE

Steps 17 thru 24 apply to removal of number 3 roadwheel and of roadwheels or idler wheel with leaking lockout cylinders.

17 Loosen ten self-locking_nuts (8) one-half turn.

18 Back vehicle off track (9) until idler wheel (2) or roadwheel (10) is off track.

19 Set parking brake.

20 Place two 8 x 8 x 12-in. (20 x 20 x 31-cm) wood blocks behind vehicle.

21 Lower spade (11) onto wood blocks. Position blocks between spade teeth.

22 For roadwheels number 2 thru 4 and for idler wheel (2), continue lowering spade (11) until wheel to be removed is raised off ground. For number 1 roadwheel, place jack under hull near roadwheel. Jack up vehicle until roadwheel is raised off ground.

23 Remove ten self-locking nuts (8).

24 Remove idler wheel (2) or roadwheel.

NOTE

Steps 25 thru 31 apply to removal of left lubrication tube.

25 Lower spade on vehicle. Refer to TM 9-2350-238-10.

26 Remove ten screws (12), ten lockwashers (13), left rear hydraulic access cover (14), and gasket (15).

NOTE

Gain access to fittings from access cover opening and from well.

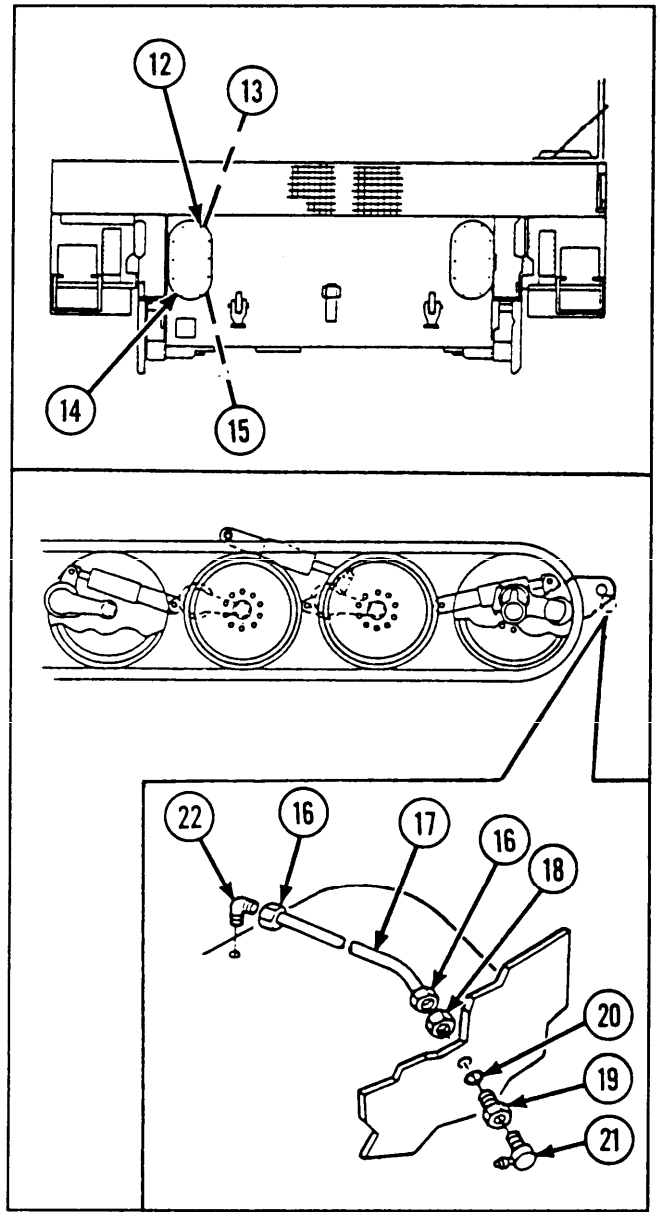
27 Loosen nuts (16) on both ends of idler wheel lubrication tube (17), and remove idler wheel lubrication tube.

28 Remove tube fitting locknut (18) from pipe straight adapter (19).

29 Remove pipe straight adapter (19).

30 Remove preformed packing (20) and lubrication fitting (21) from pipe straight adapter (17).

31 Remove pipe-to-tube elbow (22).



INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Solid rubber wheel requires special handling or disposition. Notify next higher level of maintenance.

3 Repair is by replacement of authorized parts. Refer to TM 9-2350-238-24P-1.

2-147. MAINTENANCE OF IDLER WHEEL, ROADWHEEL WHEEL, AND LEFT LUBRICATION TUBE (CONT).

INSTALLATION

NOTE

- Steps 1 thru 6 apply to installation of left lubrication tube.
- Gain access to fittings from access cover opening and from well.

1 Install pipe-to-tube elbow (1).

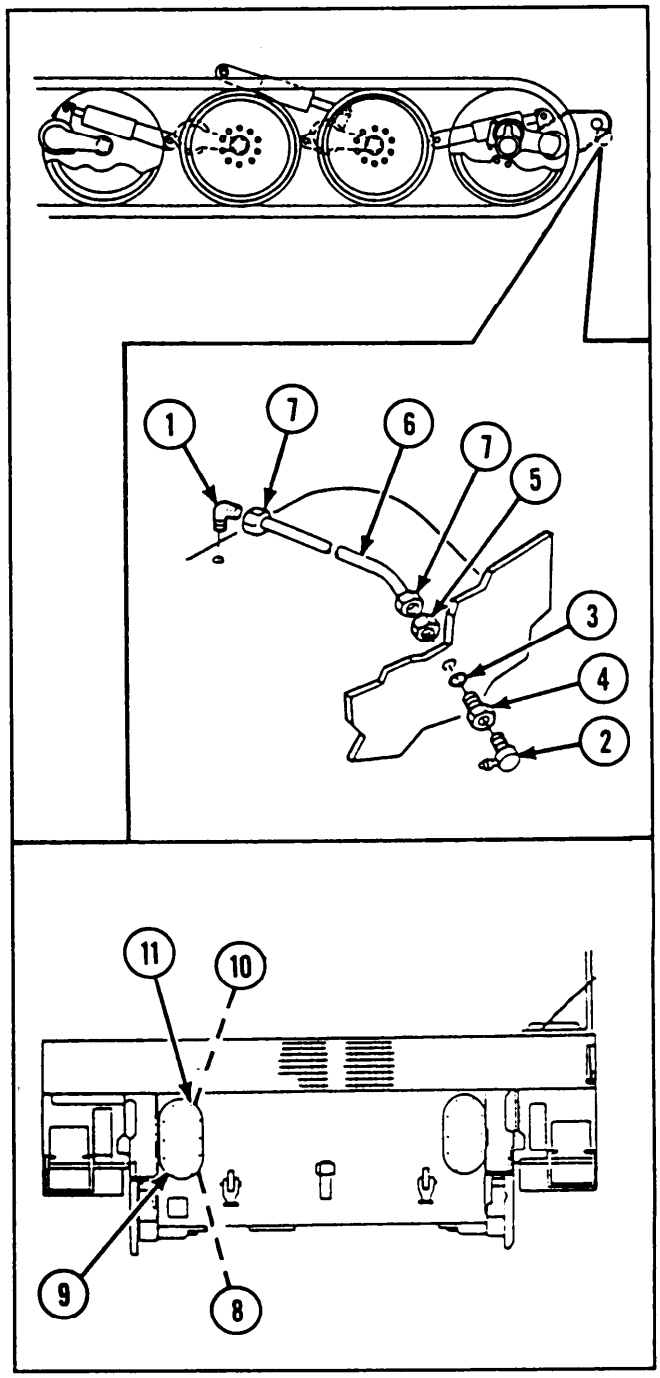
2 Install lubrication fitting (2) and new preformed packing (3) on pipe straight adapter (4).

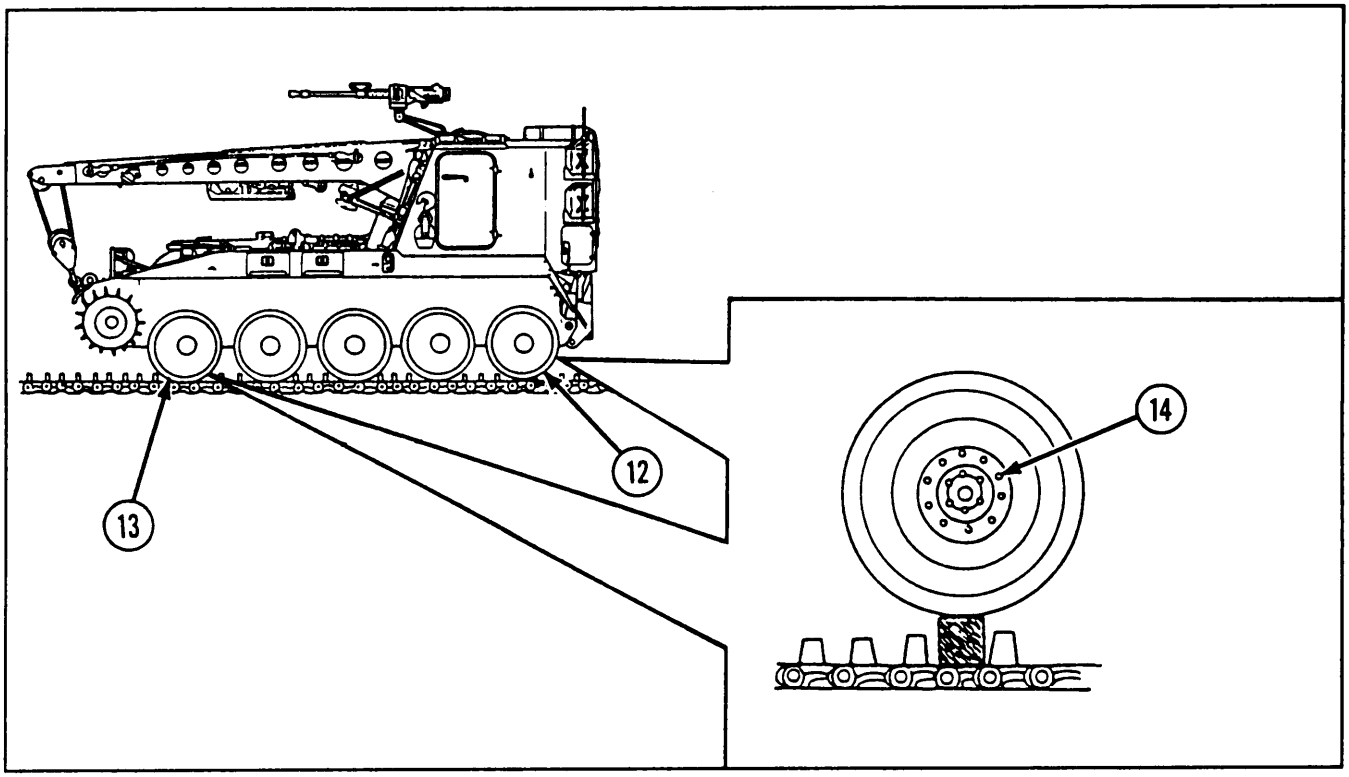
3 Install pipe straight adapter (4).

4 Install new tube fitting locknut (5) on pipe straight adapter (4).

5 Install idler wheel lubrication tube (6) and tighten nuts (7) on both ends of idler wheel lubrication tube.

6 Install new gasket (8), access cover (9), ten new lockwashers (10), and ten screws (11).





NOTE

- Steps 7 thru 28 are written and illustrated for left side of vehicle but apply to both sides.
- Steps 7 thru 13 apply to installation of idler wheel or number 1 roadwheel.

7 Install idler wheel (12) or roadwheel (13).

8 Install ten new self-locking nuts (14).

9 Tighten ten new self-locking nuts (14) to 200 to 220 ft-lb (271 to 298 N-m) (lubricated) or 270 to 300 ft-lb (366 to 407 N-m) (dry).

10 Drive vehicle onto 4 x 4 x 24-in. (10 x 10 x 61-cm) wood block.

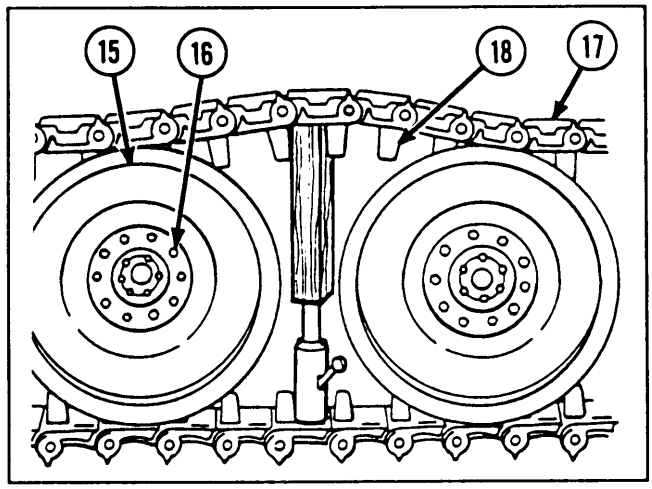
11 Unlock suspension.

12 Drive vehicle backward until idler wheel (12) or roadwheel (13) is off wood block. Remove wood block.

13 Install track on top of roadwheels and trailing idler wheel.

2-147. MAINTENANCE OF IDLER WHEEL, ROADWHEEL WHEEL, AND LEFT LUBRICATION TUBE (CONT).

INSTALLATION (CONT)



NOTE

Steps 14 thru 21 apply to installation of number 2 and 4 roadwheels on all vehicles.

14 Install roadwheel (15).

15 Install ten new self-locking nuts (16).

16 Tighten ten new self-locking nuts (16) to 200 to 220 ft-lb (271 to 298 N-m) lubricated or 270 to 300 ft-lb (366 to 406 N-m) dry.

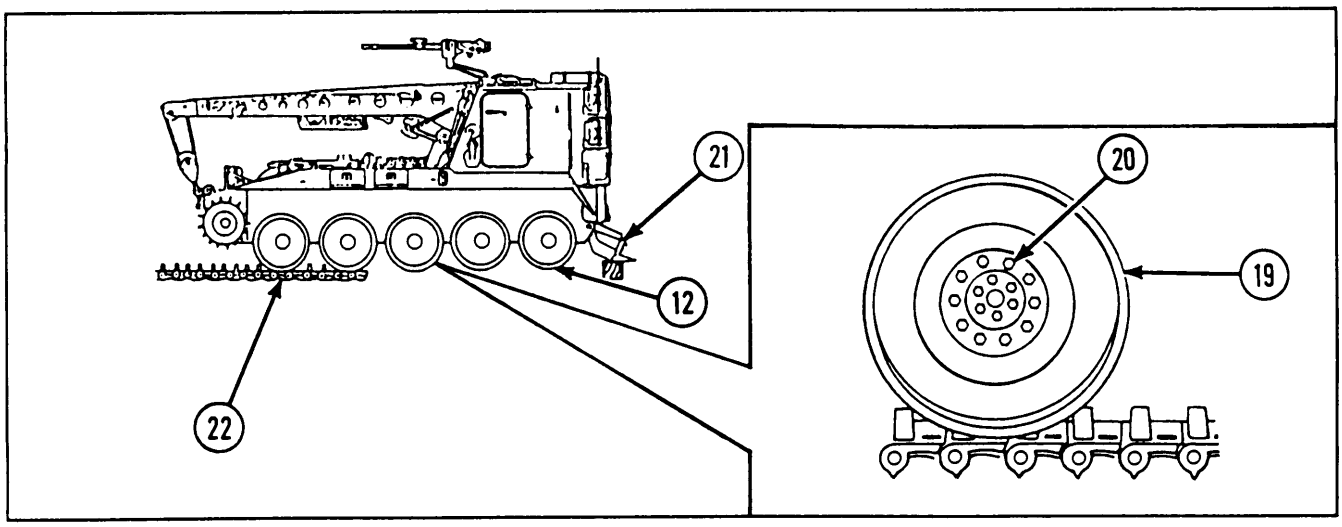
17 Lower track (17) by lowering jack and removing 4 x 4 x 24-in. (10 x 10 x 61-cm) wood block until track guides (18) seat on roadwheel (15).

18 Drive vehicle onto 4 x 4 x 24-in. (10 x 10 x 61-cm) wood block.

19 Unlock suspension.

20 Drive vehicle off wood block.

21 Adjust track tension. Refer to TM 9-2350-238-10.



NOTE

Steps 22 thru 28 apply to installation of number 3 roadwheels and of roadwheels or idler wheels with leaking lockout cylinders.

22 Install idler wheel (12) or roadwheel (19) to vehicle.

23 Install ten new self-locking nuts (20).

24 Tighten ten self-locking nuts (20) to 200 to 220 ft-lb (271 to 298 N-m) (lubricated) or 270 to 300 ft-lb (366 to 407 N-m) (dry).

25 Raise spade (21) until roadwheels 2 thru 4 and idler wheel are on ground. For number 1 roadwheel, lower jack until wheel is on ground. Remove jack.

26 Remove two 8 x 8 x 12-in. (20 x 20 x 31-cm) wood blocks from behind vehicle.

27 Release parking brake.

28 Drive vehicle forward until idler wheel or roadwheel is on track (22).

2-148. MAINTENANCE OF IDLER WHEEL ARM AND HUB ASSEMBLY AND ATTACHING PARTS, AND IDLER WHEEL ARM AND HUB.

This task covers: a. *Removal/Disassembly* b. *Inspection/Repair* c. *Reassembly/Installation*

INITIAL SETUP

Tools and Special Tools
- Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
  - Bar
  - Puller
  - Torque wrench (0 to 600 ft-lb)
- Bearing inserter (item 10, appx G)
- Hexagon head capscrew (3) (item 22, appx G)
- Idler adjustment wedge (item 29, appx G)
- Manual control handle (item 8, appx G)
- Puller adapter (item 2, appx G)
- Race and outer bearing replacer (item 20, appx G)
- Remover and replacer handle (item 9, appx G)
- Seal inserter (item 12, appx G)
- Seal inserter (item 13, appx G)
- Slide puller (item 18, appx G)
- Sling (item 82, appx B)
- Spanner wrench (item 33, appx G)
- Threaded straight pin (2) (item 17, appx G)
- Torque wench extension (item 5, appx G)

Materials/Parts
- Arm bearing seal idler wheel sleeve
- Cotter pin (4)
- Grease (item 20, appx C)
- Inner bearing ring (2)
- Inner bearing ring (2)
- Lockwasher (18)
- Plain encased seal (2)
- Plain encased seal (2)
- Plain encased seal (2)
- Plain encased seal (2)
- Preformed packing (2)
- Roller bearing (2)
- Roller bearing (2)
- Sealing compound (item 39, appx C)
- Self-locking nut (4)
- Wiping rag (item 33, appx C)

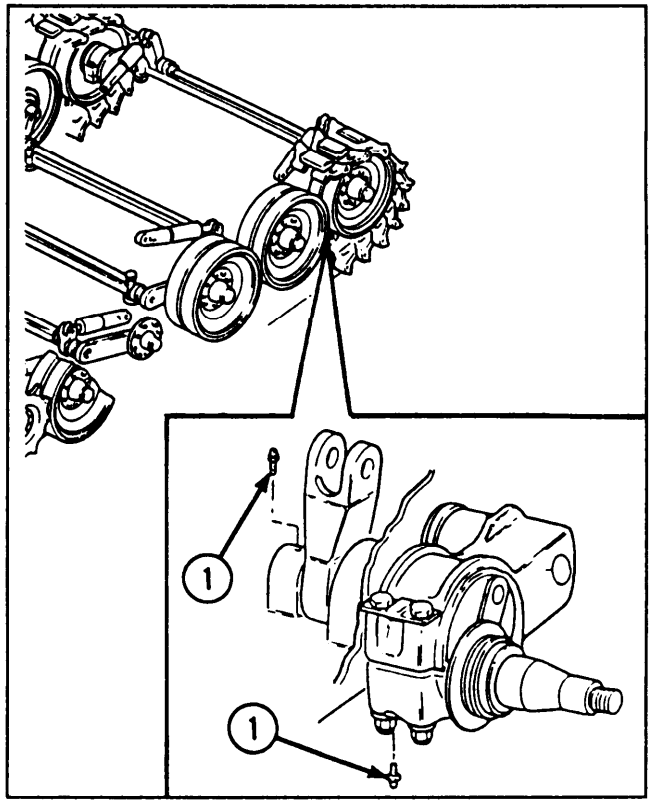
Personnel Required
- Two

References
- TM 9-2350-238-10
- TM 9-2350-238-24P-1

Equipment Conditions
- 2-864 Idler hub removed

2-148. MAINTENANCE OF IDLER WHEEL ARM AND HUB ASSEMBLY AND ATTACHING PARTS, AND IDLER WHEEL ARM AND HUB (CONT).

REMOVAL/DISASSEMBLY



NOTE
Procedures are written for one idler wheel arm and hub assembly, but apply to both.

1 If damaged, remove lubrication fittings (1).

2 Loosen two self-locking nuts (2) completely.

3 Drive idler adjustment wedge into joint.

4 Insert suitable dowel pin into hole in idler wheel spindle (3).

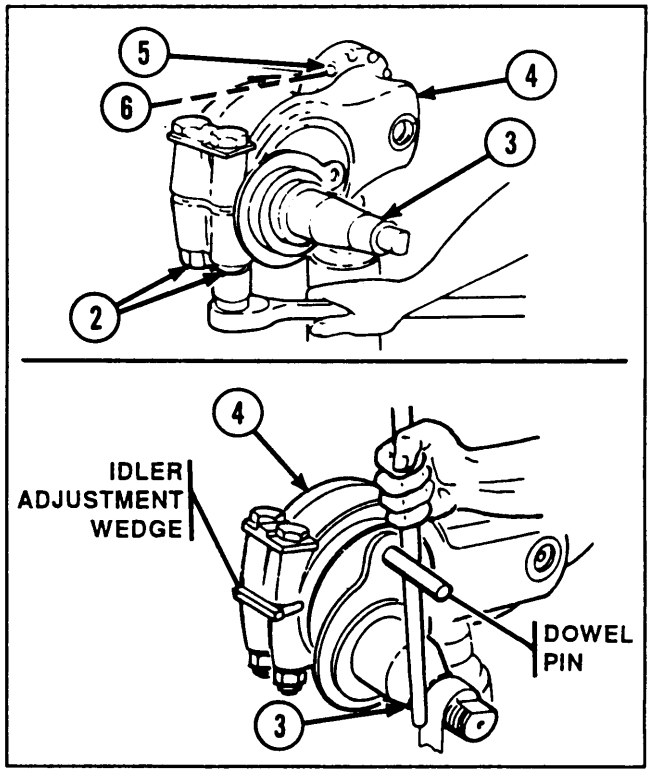
5 Wrap bearing surface of idler wheel spindle (3) with clean wiping rag.

6 Insert a bar between dowel pin and idler wheel spindle (3).

7 Turn bar counterclockwise to unscrew idler wheel spindle (3) from pivot arm assembly (4).

8 Remove torsion bar. Refer to page 2-827.

9 Remove nine hexagon head capscrews (5) and nine lockwashers (6).



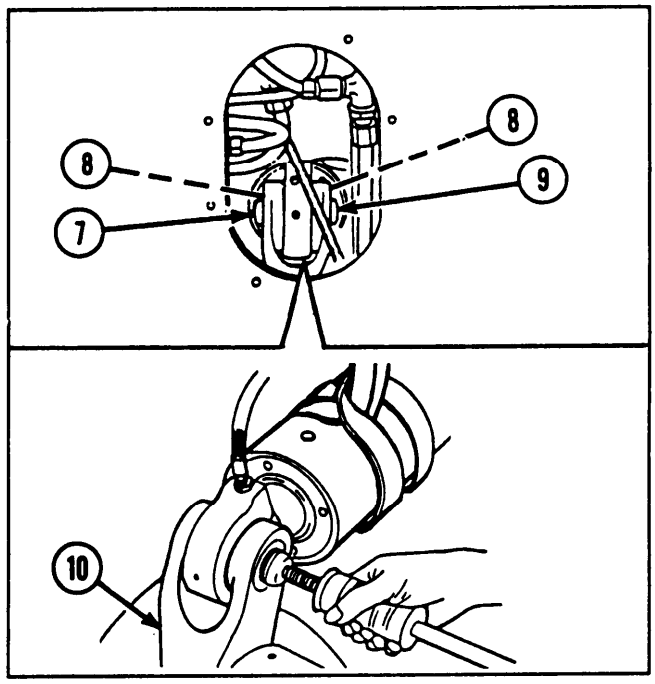
10 To gain access to lockout cylinder assembly, refer to page 2-831.

11 Using sling, support lockout cylinder assembly (7).

12 Remove two cotter pins (8).

13 Remove straight headless pin (9), using puller.

Using sling, remove lockout cylinder assembly (7) from roadwheel lever (10).



15 Install two threaded straight pins into opposing capscrew holes.

16 Install three hexagon head capscrews into capscrew holes.

17 Screw puller adapter into pivot arm assembly (3).

18 Screw slide puller into puller adapter.

19 Tighten three hexagon head capscrews evenly. At the same time, using slide puller, withdraw pivot arm assembly (4) about 5.0 in. (12.7 cm) from hull.

20 Support pivot arm assembly (4).

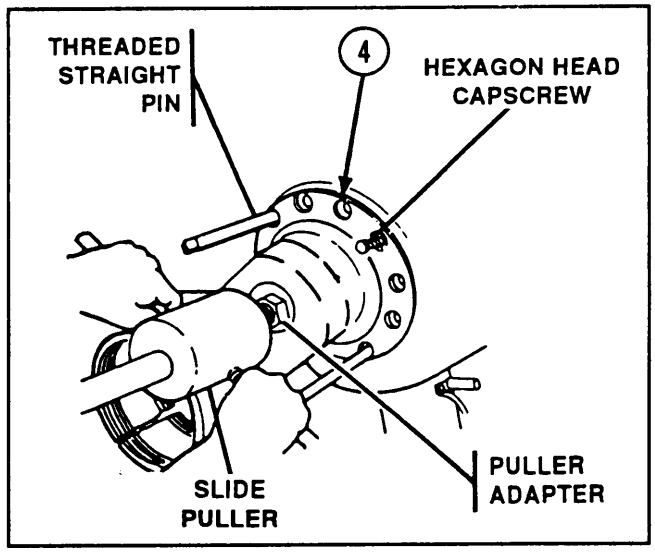
21 Remove slide puller and puller adapter.

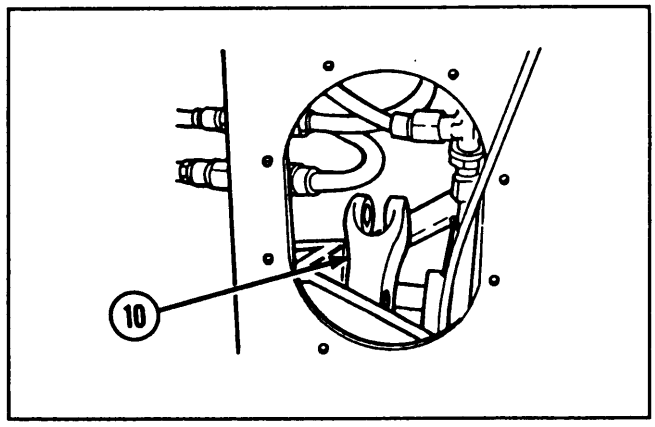
22 Remove three hexagon head capscrews.

23 Remove pivot arm assembly (4).

24 Remove threaded straight pins.

25 Lift roadwheel lever (10), and remove from hull.



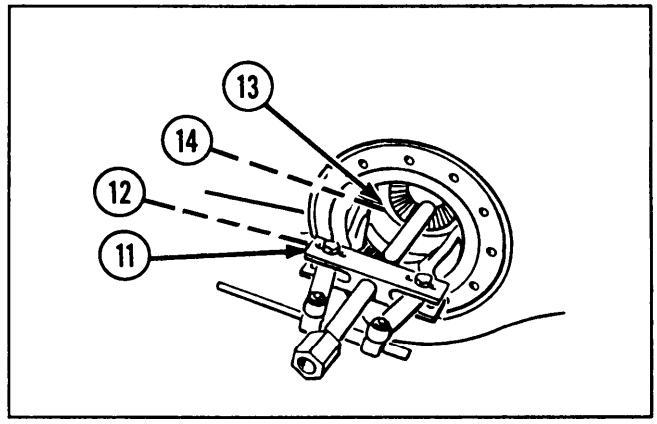


2-148. MAINTENANCE OF IDLER WHEEL ARM AND HUB ASSEMBLY AND ATTACHING PARTS, AND IDLER WHEEL ARM AND HUB (CONT).

REMOVAL/DISASSEMBLY (CONT)

26 Using puller, remove roller bearing (11) and plain encased seal (12) from hull.

27 Using puller, remove inner bearing ring (13) and plain encased seal (14) from hull.

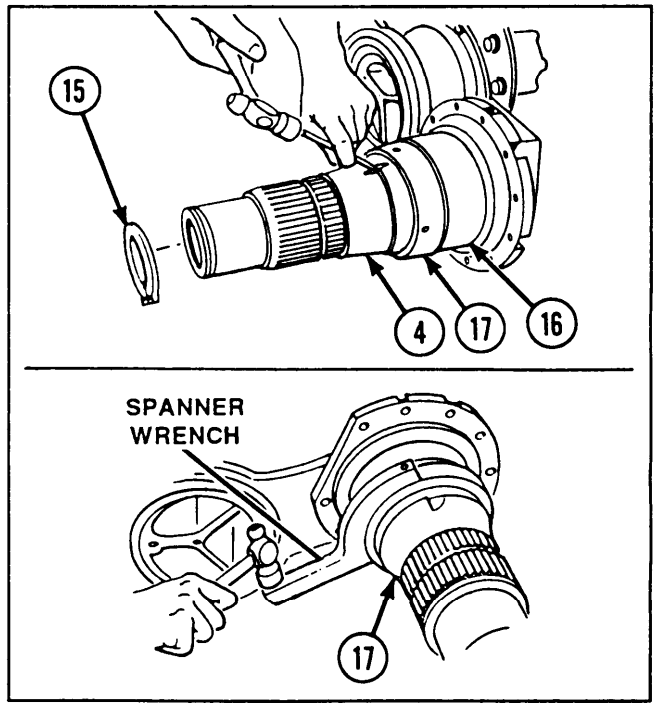


28 Remove retaining ring (15) from pivot arm assembly (4).

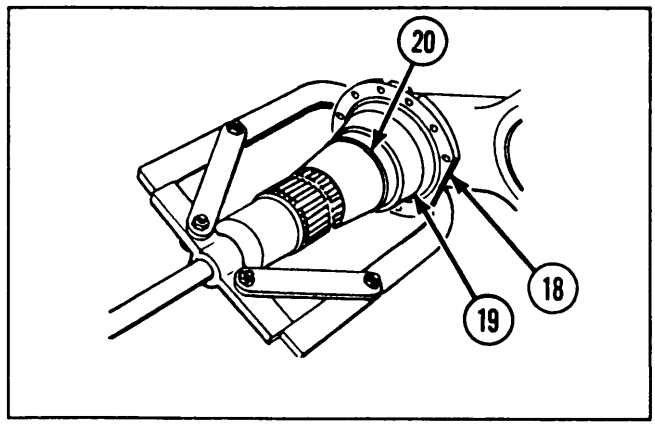
29 Remove plain encased seal (16) from pivot arm assembly (4).

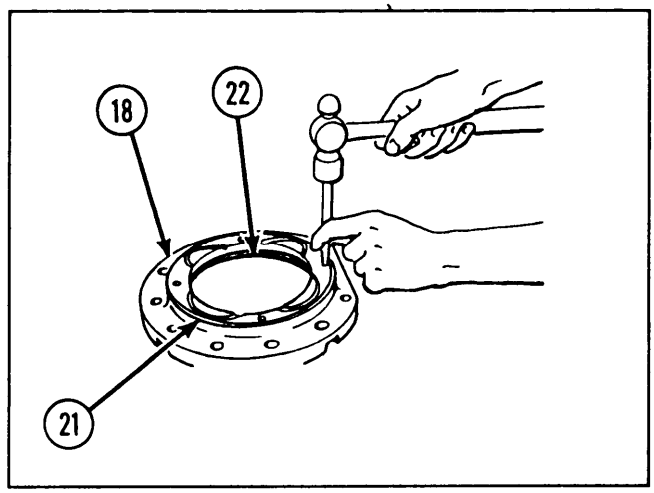
30 Pry up cut lip of arm bearing seal idler wheel sleeve (17) until clear of notch in pivot arm assembly (4).

31 Using spanner wrench, remove arm bearing seal idler wheel sleeve (17).



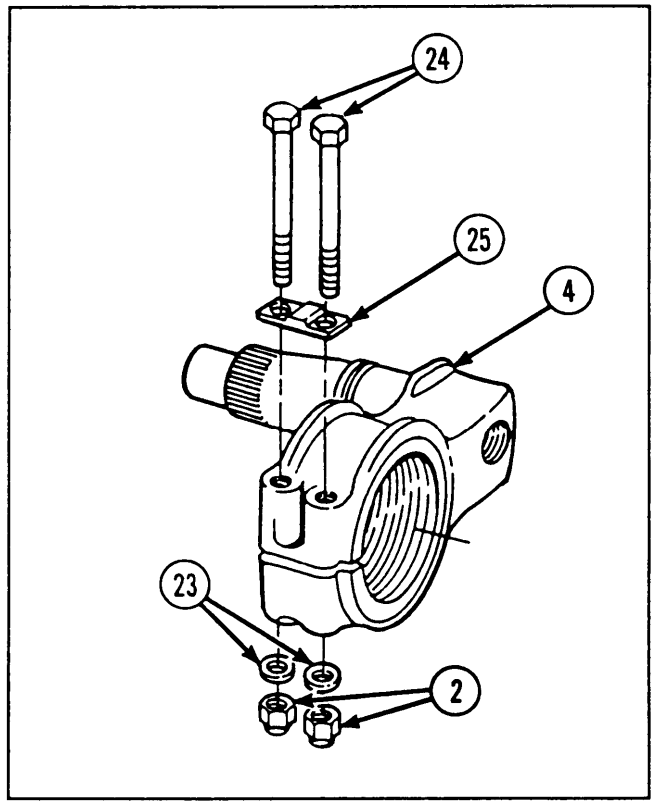
32 Using puller, remove arm to wheel support roadwheel flange (18), roller bearing (19), and inner bearing ring (20).





33 Remove preformed packing (21) from arm to wheel support roadwheel flange (18).

34 Using drift, tap through drift holes in roadwheel arm to wheel support flange (18) and remove plain encased seal (22).



35 Remove two self-locking nuts (2), two flat washers (23), two hexagon head cap-screws (24), and idler wheel bar (25) from pivot arm assembly (4).

36 Remove pivot arm assembly (4) from hull.

INSPECTION/REPAIR

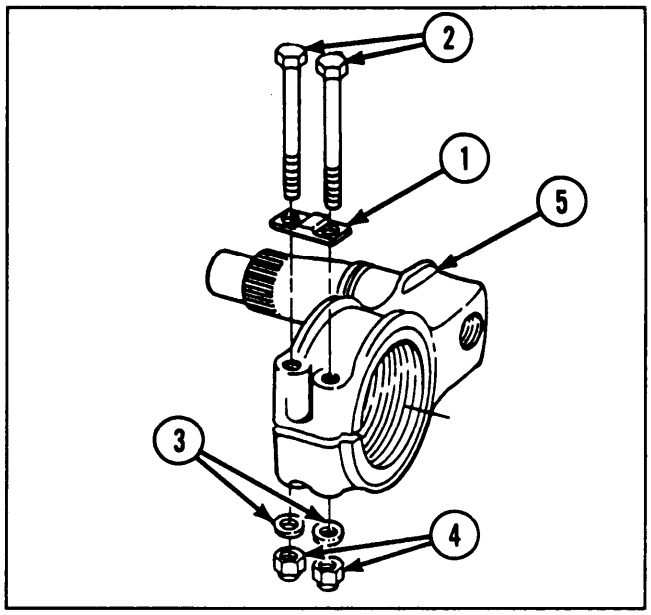
1 Inspect for broken, damaged, or missing parts.

2 If pivot arm assembly or idler wheel spindle is damaged, notify direct support maintenance.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

2-148. MAINTENANCE OF IDLER WHEEL ARM AND HUB ASSEMBLY AND ATTACHING PARTS, AND IDLER WHEEL ARM AND HUB (CONT).

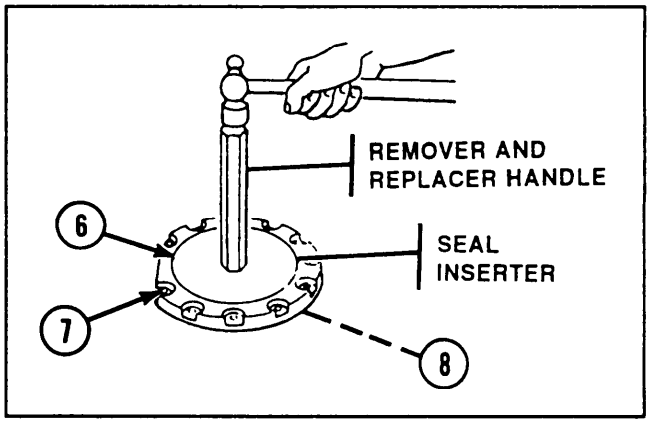
REASSEMBLY/INSTALLATION



1 Install idler wheel bar (1), two hexagon head capscrews (2), two flat washers (3), and two new self-locking nuts (4) to pivot arm assembly (5).

2 Coat outside edge of new plain encased seal (6) with sealing compound.

3 Using seal inserter (item 12, appx G) and remover and replacer handle, install new plain encased seal (6) in arm to wheel support roadwheel flange (7).



4 Lubricate new preformed packing (8) with grease.

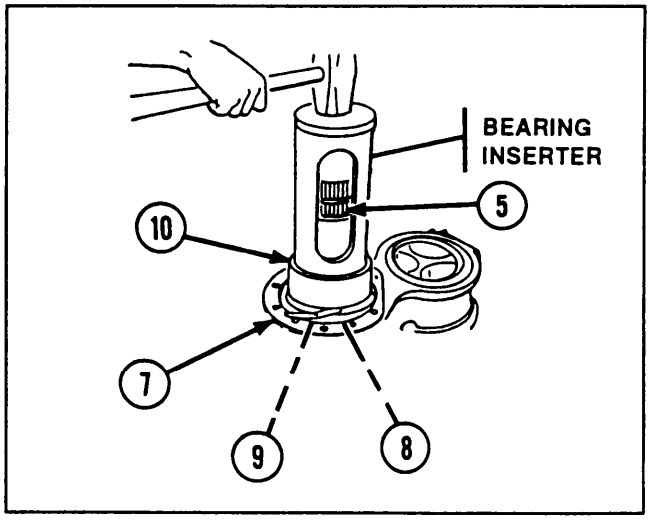
5 Install new preformed packing (8) in groove of arm to wheel support roadwheel flange (7).

6 Coat arm to wheel support roadwheel flange (7) and hull-to-flange mounting surface with sealing compound.

7 Install arm to wheel support roadwheel flange (7) and new plain encased seal (8) on pivot arm assembly (5).

NOTE

Maintain a 0.010 to 0.015 in. (0.254 to 0.381 mm) clearance between roller bearing and arm to wheel support roadwheel flange.



8 Install new inner bearing ring (9) and new roller bearing (10), using bearing inserter.

9 Coat threads of new arm bearing seal idler wheel sleeve (11) with sealing compound.

10 Using spanner wrench, install new arm bearing seal idler wheel sleeve (11).

11 Cut arm bearing seal idler wheel sleeve (11) lip.

12 Using hammer and small chisel, force arm bearing seal idler wheel sleeve (11) into groove in pivot arm assembly (5).

13 Coat outer diameter of new plain encased seals (12, 13, and 14) and all metal-to-metal mating surfaces with sealing compound.

14 Install new plain encased seal (12) on pivot arm assembly (5).

15 Install retaining ring (15) on pivot arm assembly (5).

16 Insert and position new plain encased seal (13) into idler arm housing. Ensure that rubber lip is facing in.

17 Seat new plain encased seal (13) firmly, using seal inserter (item 13, appx G) and handle.

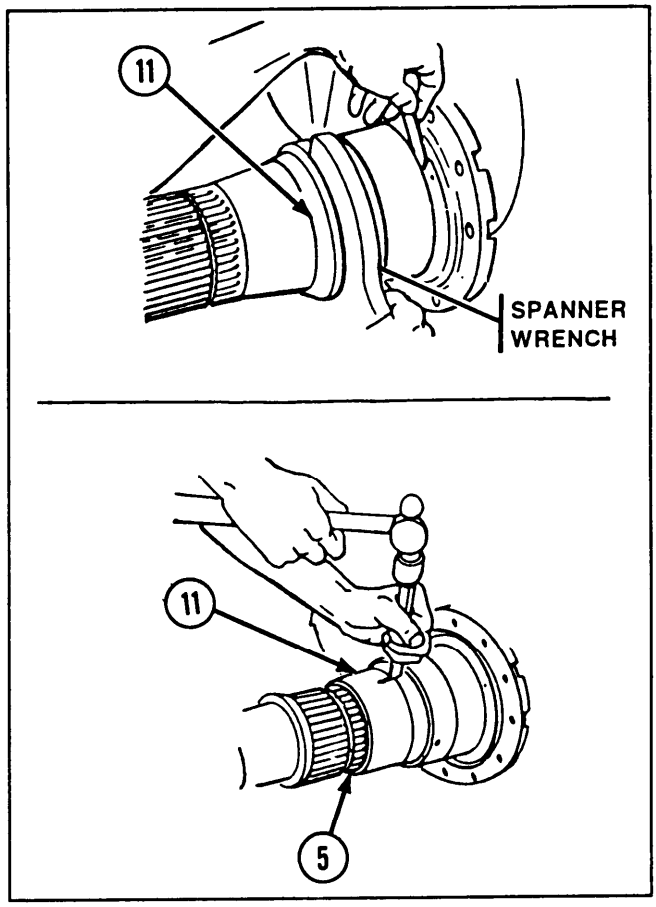
18 Pack new roller bearing (16) with grease.

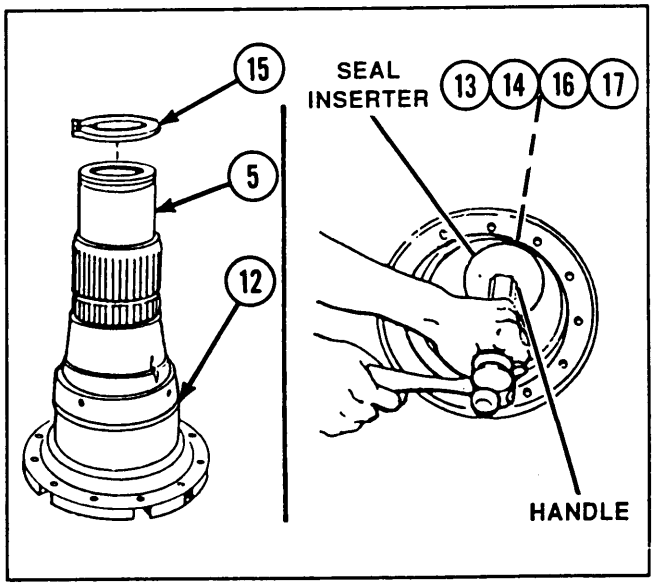
19 Insert and position new roller bearing (16) in idler arm housing, using seal inserter (item 12, appx G) and handle.

20 Install new inner bearing ring (17) in idler arm housing, using seal inserter (item 13, appx G) and handle.

21 Insert and position new plain encased seal (14) into idler arm housing with rubber lip facing out.

22 Seat new plain encased seal (14) firmly, using race and outer bearing replacer and remover and replacer handle.





2-148. MAINTENANCE OF IDLER WHEEL ARM AND HUB ASSEMBLY AND ATTACHING PARTS, AND IDLER WHEEL ARM AND HUB (CONT).

REASSEMBLY/INSTALLATION (CONT)

23 Install two threaded straight pins into opposing capscrew holes of pivot arm assembly (5).

24 Coat sealing surfaces of pivot arm assembly (5) with sealing compound.

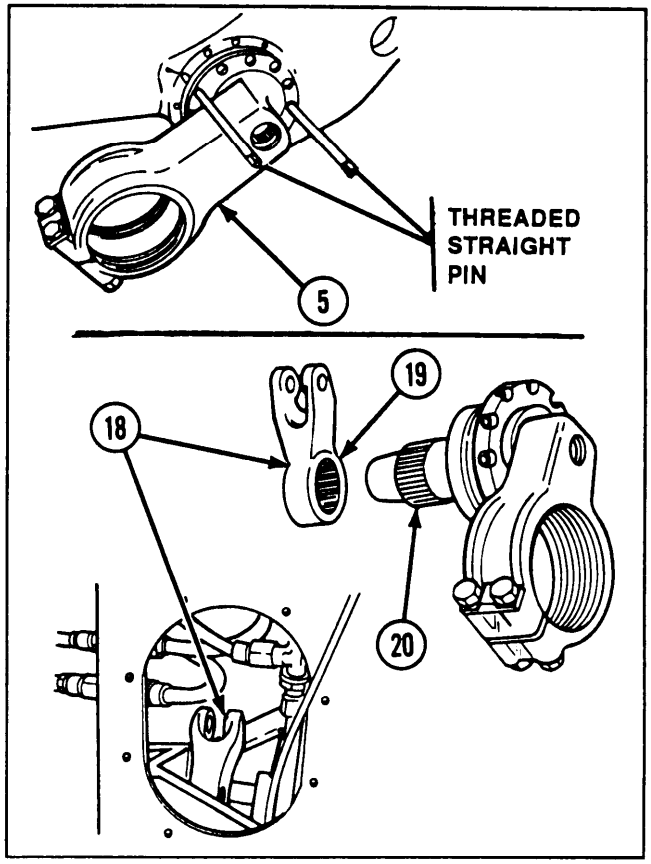
25 Position pivot arm assembly (5) on threaded straight pins.

26 Push pivot arm assembly (5) into housing until end of arm is visible in arm cavity of roadwheel lever (18).

27 Insert and position roadwheel lever (18) into lockout cylinder lever arm cavity.

28 Position roadwheel lever (18) so blind spline (19) on lever arm mates with blind spline (20) on pivot arm assembly.

29 Remove two threaded straight pins.

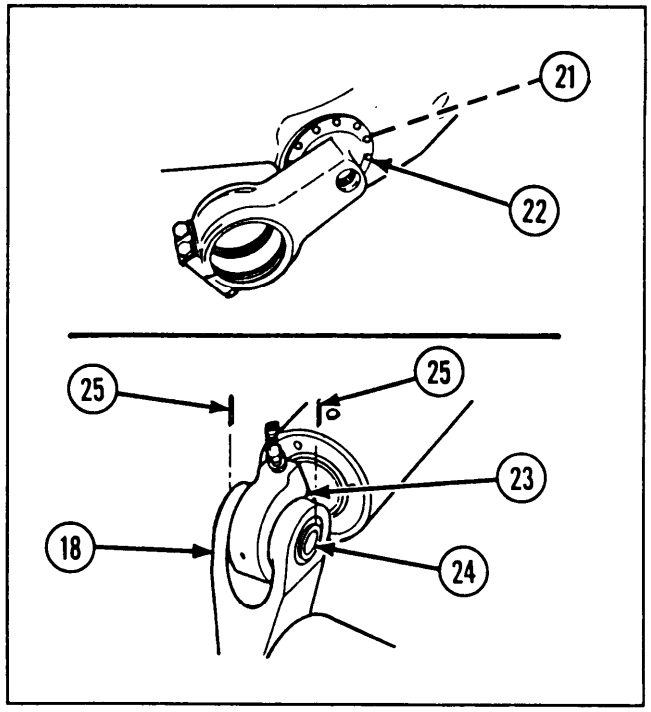


30 Install and tighten nine new lockwashers (21) and nine hexagon head capscrews (22) in cross-pattern sequence,

31 Install lockout cylinder eye (23) in roadwheel lever (18).

32 Install straight headless pin (24) and two new cotter pins (25).

33 Install torsion bar. Refer to page 2-827.



34 Loosen two self-locking nuts (4).

35 Drive in idler adjustment wedge far enough so threads on idler wheel spindle (26) engage threads on pivot arm assembly (5).

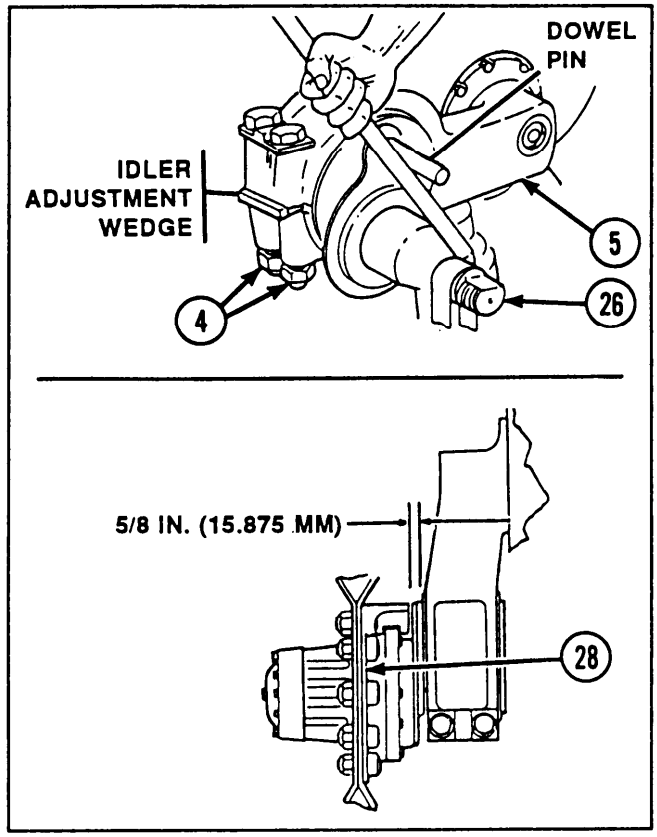
36 Temporarily install suitable dowel pin.

37 Protect idler wheel spindle (26) bearing surface by wrapping with clean wiping rags.

38 Insert bar between dowel pin and idler wheel spindle (26).

39 Screw idler wheel spindle (26) into pivot arm assembly (5) until the outer face of idler wheel spindle is 5/8 in. (15.9 mm) from outer face of pivot arm assembly. Dowel and idler wheel arm spindle should align 90 degrees from the pivot arm assembly center line.

40 Remove idler adjustment wedge and dowel pin.

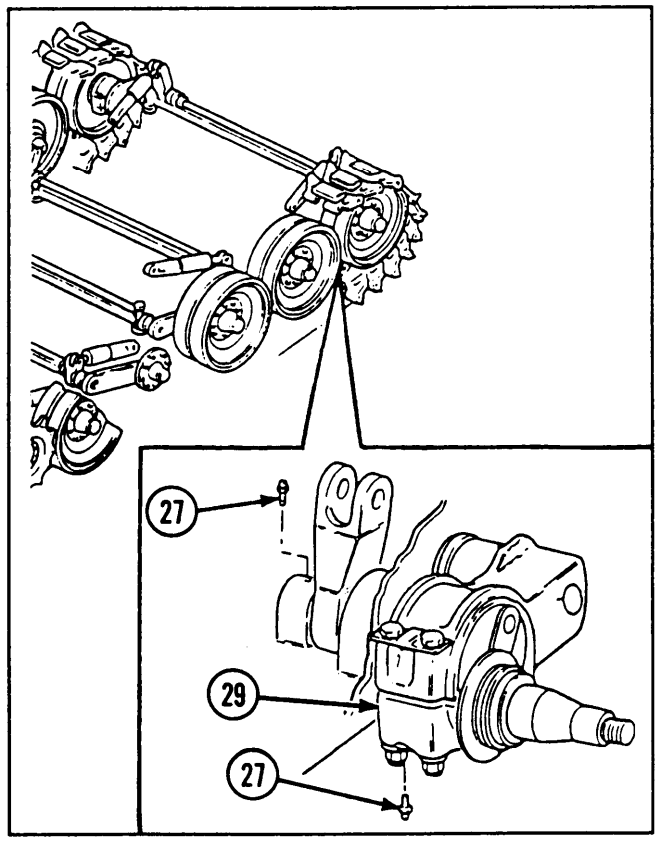


41 If removed, install lubrication fittings (27).

42 Install idler wheel vehicular wheel hub (28). Refer to page 2-884.

43 Lubricate pivot arm assembly (5) and idler wheel arm and hub assembly (29). Refer to TM 9-2350-238-10.

44 Tighten two self-locking nuts (4). Torque to 575 to 600 ft-lb (780 to 848 N-m).



2-149. MAINTENANCE OF IDLER WHEEL VEHICULAR WHEEL HUB AND HUB CAP RADIO STATIC SUPPRESSION SPRING.

This task covers:	a. *Removal* b. *Disassembly* c. *Inspection/Repair*	d. *Reassembly* e. *Installation*

INITIAL SETUP

Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
- Torque wrench (0 to 170 ft-lb)

Bearing inserter set (item 14, appx G)
Bearing inserter set (item 15, appx G)
Face socket wrench (item 27, appx G)
Remover and replacer handle (item 9, appx G)

Materials/Parts
Flat washerGrease (item 20, appx C)
Hub access cap gasket
Hub seal gasket
Lockwasher (14)

References
TM 9-2350-238-10
TM 9-2350-238-24P-1

Equipment Conditions
2-848 Idler wheel removed

REMOVAL

NOTE
- Procedures are written for one idler wheel arm and hub assembly, but apply to both.
- Steps 1 thru 3 apply to removal of hub cap radio static suppression spring.

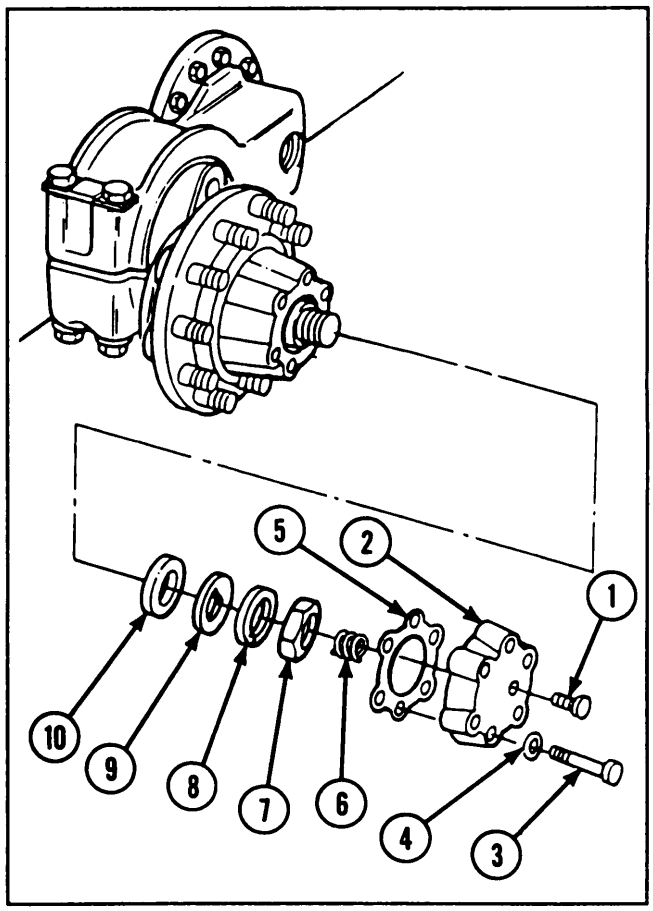
1 Remove pipe plug (1) from access cover (2) and drain oil from hub.

2 Remove six hexagon head capscrews (3), six lockwashers (4), access cover (2), and hub cap access gasket (5).

3 Remove hub cap radio static suppression spring (6).

4 Remove hexagon plain nut (7).

5 Remove lock bearing nut (8) and flat washer (9).

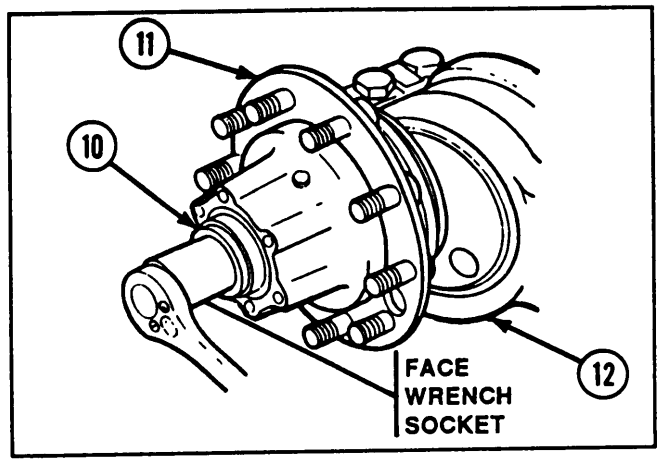


6 Using face wrench socket, remove round plain nut (10).

CAUTION

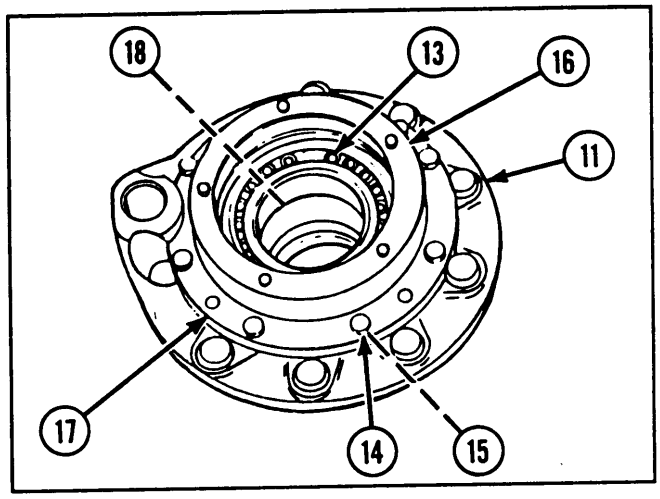
Ensure that outer roller bearing does not fall on ground.

7 Slide idler wheel vehicular wheel hub (11) from idler wheel spindle (12).

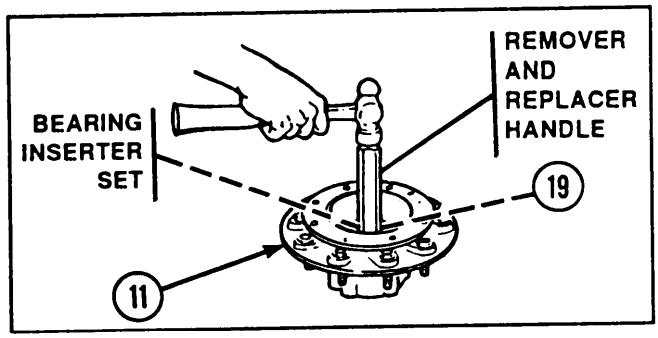


8 Remove outer cone and rollers (13) from idler wheel vehicular wheel hub (11).

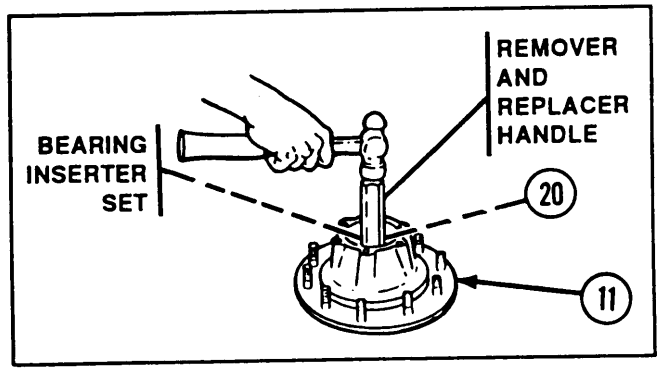
9 Remove eight hexagon head capscrews (14), eight lockwashers (15), seal assembly (16), hub seal gasket (17), and inner cone and rollers (18) from idler wheel vehicular wheel hub (11).



10 Remove outer roller bearing cup (19) from idler wheel vehicular wheel hub (11), using bearing inserter set (item 14, appx G) and remover and replacer handle.

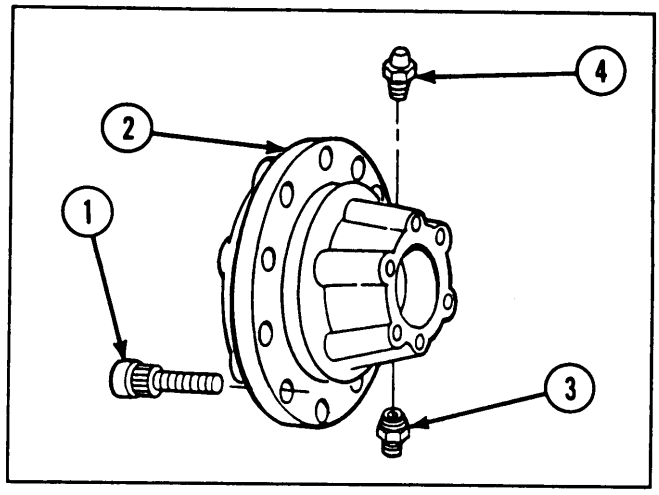


11 Remove inner roller bearing cup (20) from idler wheel vehicular wheel hub (11), using bearing inserter set (item 15, appx G) and remover and replacer handle.



2-149. MAINTENANCE OF IDLER WHEEL VEHICULAR WHEEL HUB AND HUB CAP RADIO STATIC SUPPRESSION SPRING (CONT).

DISASSEMBLY



1 If damaged, remove ten ribbed neck bolts (1) from hub (2).

2 Remove safety relief valve (3) and lubrication fitting (4).

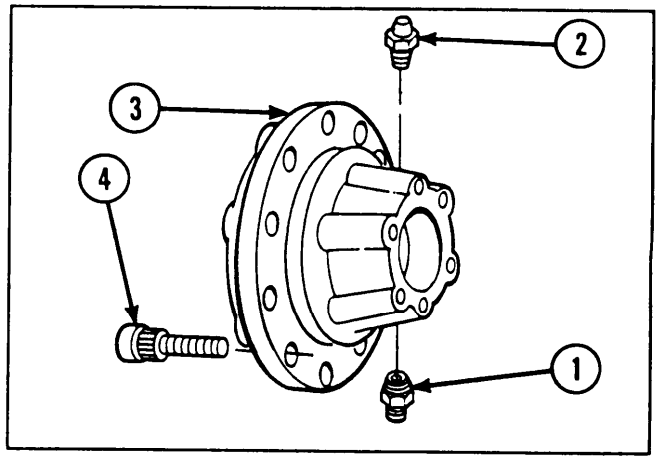
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If hub is damaged, repair is by replacement of next higher assembly.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

REASSEMBLY



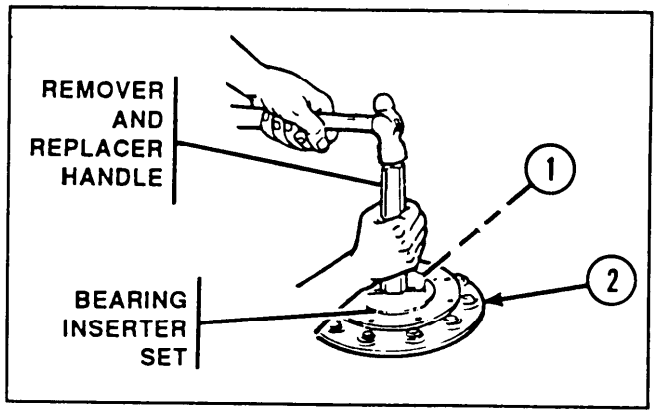
1 Install safety relief valve (1) and lubrication fitting (2) on hub (3).

2 If removed, install ten new ribbed neck bolts (4).

INSTALLATION

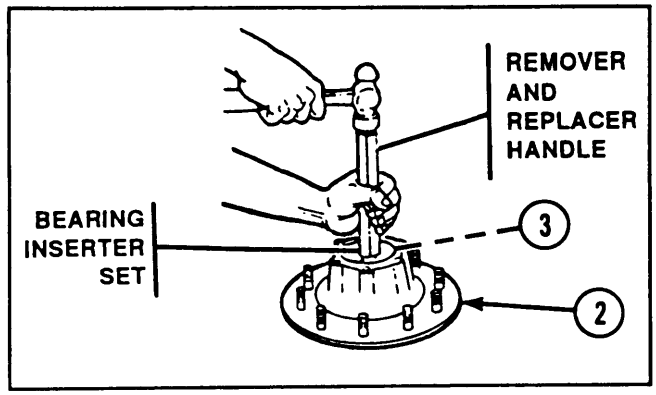
NOTE

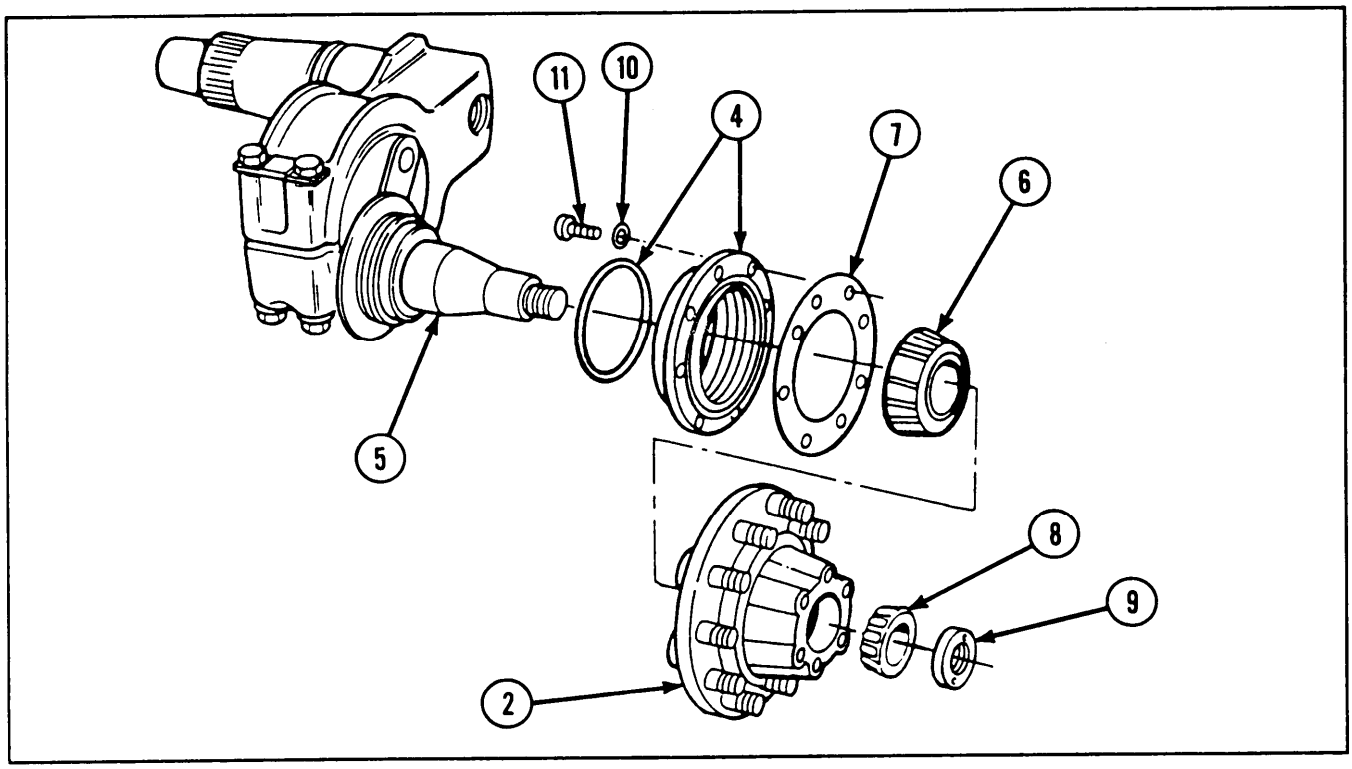
- Procedures are written for one idler wheel arm and hub assembly, but apply to both.
- Ensure that roller bearing cups are firmly seated against interior flanges of idler wheel vehicular wheel hub.



1 Install inner roller bearing cup (1) in idler wheel vehicular wheel hub (2), using bearing inserter set (item 15, appx G) and remover and replacer handle.

2 Install outer roller bearing cup (3) in idler wheel vehicular wheel hub (2), using bearing inserter set (item 14, appx G) and remover and replacer handle.





3 Install seal assembly (4) on idler wheel spindle (5). Ensure that drive pins on seal mate with holes on spindle flange.

4 Pack inner cone and rollers (6) with grease. Seat inner cone and rollers (6) firmly against collar of idler wheel spindle (5).

5 Install new hub seal gasket (7), idler wheel vehicular wheel hub (2), and outer cone and rollers (8) on idler wheel spindle (5).

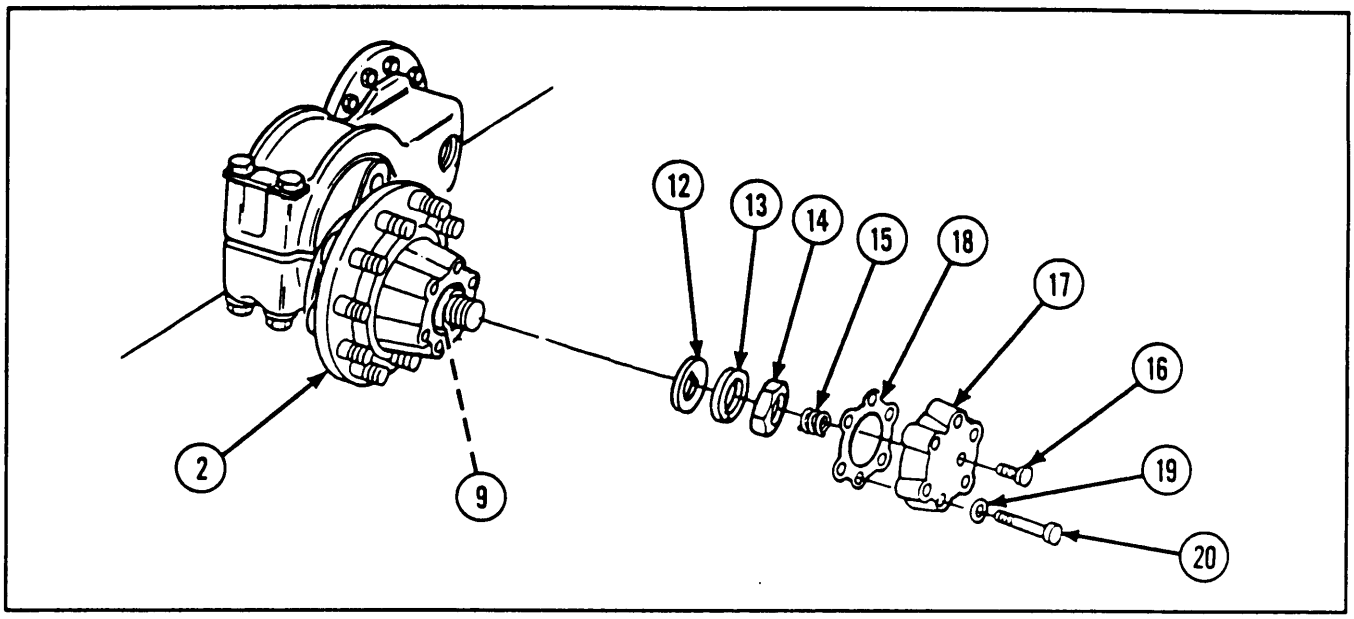
6 Align mounting holes in idler wheel vehicular wheel hub (2), hub seal gasket (7), and seal assembly (4).

7 Screw round plain nut (9) onto idler wheel spindle (5) until it is fingertight.

8 Install eight new lockwashers (10) and hexagon head capscrews (11). Torque capscrews in a cross-pattern sequence to 32 to 35 ft-lb (43 to 47 N-m) (dry) or to 23 to 25 ft-lb (31 to 34 N-m) (lubricated).

2-149. MAINTENANCE OF IDLER WHEEL VEHICULAR WHEEL HUB AND HUB CAP RADIO STATIC SUPPRESSION SPRING (CONT).

INSTALLATION (CONT)



NOTE

The completed wheel assembly must have between 0.0005 and 0.0050 in. (0.0013 to 0.0127 cm) actual end play.

9 Using face socket wrench, turn round plain nut (9) clockwise and, at the same time, rotate idler wheel vehicular wheel hub (2), first in one direction, and then the other, until there is a slight bind.

10 Back off round plain nut (9) 1/6 to 1/4 turn.

11 Lock round plain nut (9) in this position by installing flat washer (12), being sure that hole indexes with pin.

12 Install new flat washer (13) and hexagon plain nut (14).

13 Tighten hexagon plain nut (14).

NOTE

Steps 14 and 15 apply to installation of hub cap radio static suppression spring.

14 Install hub cap radio static suppression spring (15) and pipe plug (16) in access cover (17).

15 Install new hub access cap gasket (18), access cover (17), six new lockwashers (19), and six hexagon head capscrews (20).

16 Torque six hexagon head capscrews (20) to 32 to 35 ft-lb (43 to 47 N-m) (dry) or to 23 to 25 ft-lb (31 to 34 N-m) (lubricated).

17 Lubricate idler wheel vehicular wheel hub (2). Refer to TM 9-2350-238-10.

2-150. MAINTENANCE OF DRIVE HUB SPROCKETS AND RELATED PARTS.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
- Breaker bar (3/4-in. drive)
- Socket (1-1/2-in., 3/4-in. drive)
- Torque wrench (0 to 170 ft-lb)
- Torque wrench 0 to 600 ft-lb)
- Wire brush

Hoist
Hub and sprocket lifting sling (item 25, appx G)
Sprocket wear gage (item 7, appx G)

Materials/Parts
Dry cleaning solvent (item 16, appx C)
Emery cloth (item 11, appx C)
Hydraulic fluid (item 21, appx C)
Lockwasher (22)
Olive drab enamel (item 18, appx C)
Primer (item 31, appx C)

Personnel Required
Two

References
TM 9-2350-238-24P-1

Equipment Conditions
2-873 Tracks removed

REMOVAL

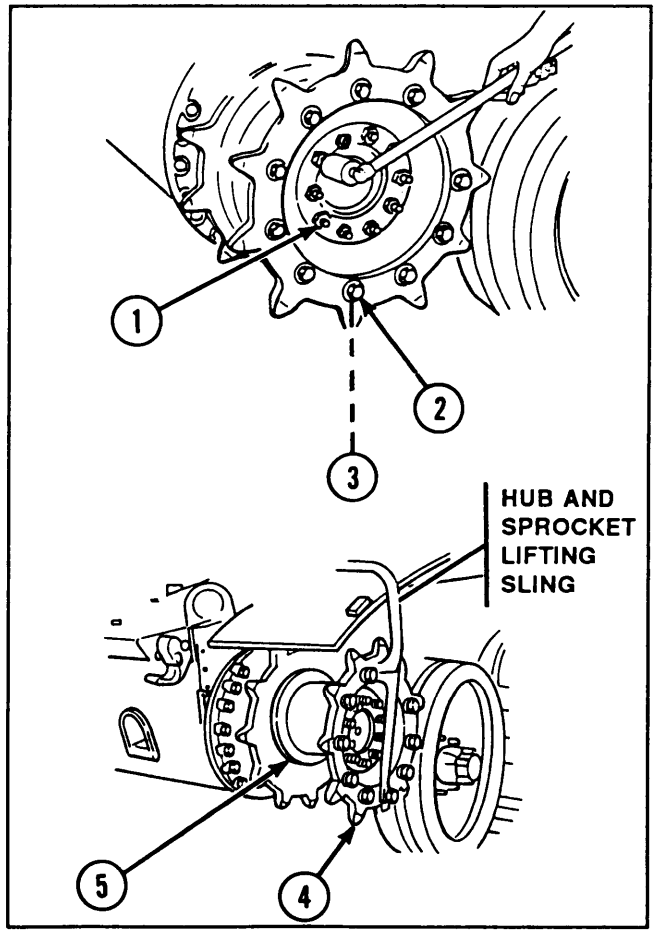
NOTE
The following procedures are written and illustrated for the left drive hub sprocket, but apply to both the left and right drive hub sprockets.

1 Remove ten nuts (1).

2 Remove three hexagon head capscrews (2) and three lockwashers (3) properly spaced to align with mounting holes in hub and sprocket lifting sling.

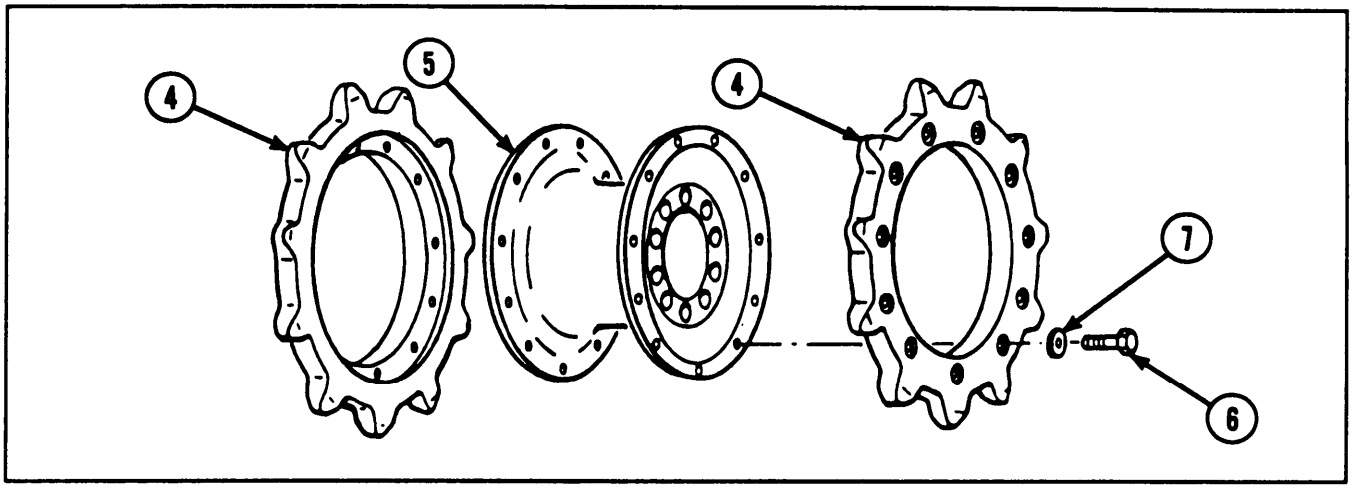
3 Using three removed hexagon head capscrews (2), attach hub and sprocket lifting sling to sprocket wheel (4).

4 Attach hoist to hub and sprocket lifting sling, and remove drive hub sprocket (5). Remove sling from sprocket wheel (4).



2-150. MAINTENANCE OF DRIVE HUB SPROCKETS AND RELATED PARTS (CONT).

REMOVAL (CONT)



5 Remove 19 hexagon head capscrews (6) and 19 Iockwashers (7).

6 Remove two sprocket wheels (4) from sprocket wheel hub (5).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Clean sprocket wheel (1) teeth and attaching hexagon head capscrew heads with wire brush and dry cleaning solvent.

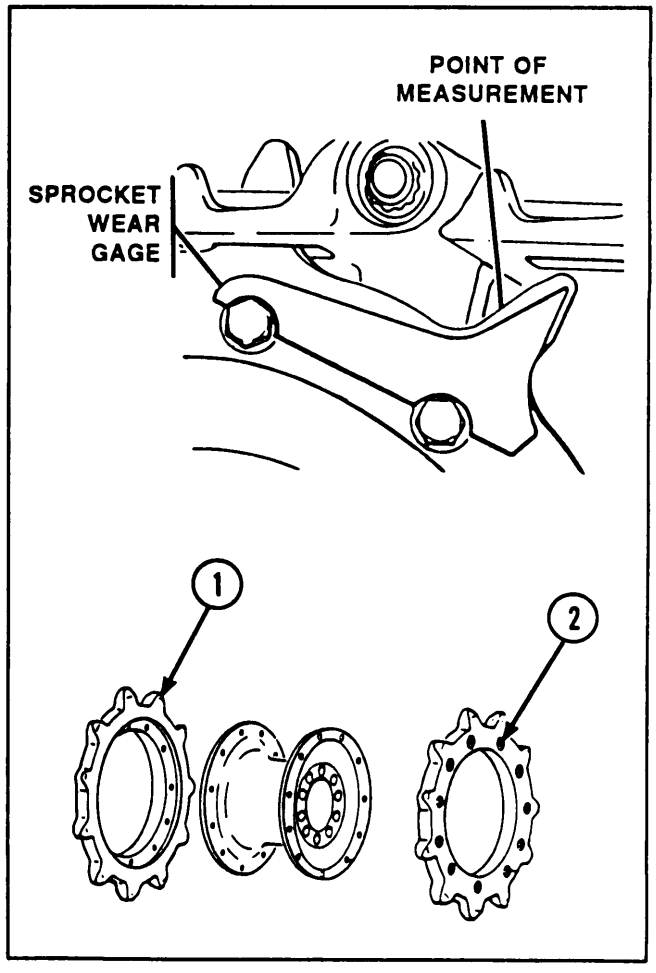
3 Place sprocket wear gage against hexagon head capscrew heads (2).

4 Inspect sprocket wheel (1) tooth wear against sprocket wear gage profile.

5 Remove and rotate sprocket wheels (1) if tooth wear is down to, or beyond, sprocket wear gage profile.

6 If sprocket wheel (1) teeth are worn on both sides or cracked, replace sprocket wheels (1).

7 Remove nicks, burrs, and corrosion with emery cloth.



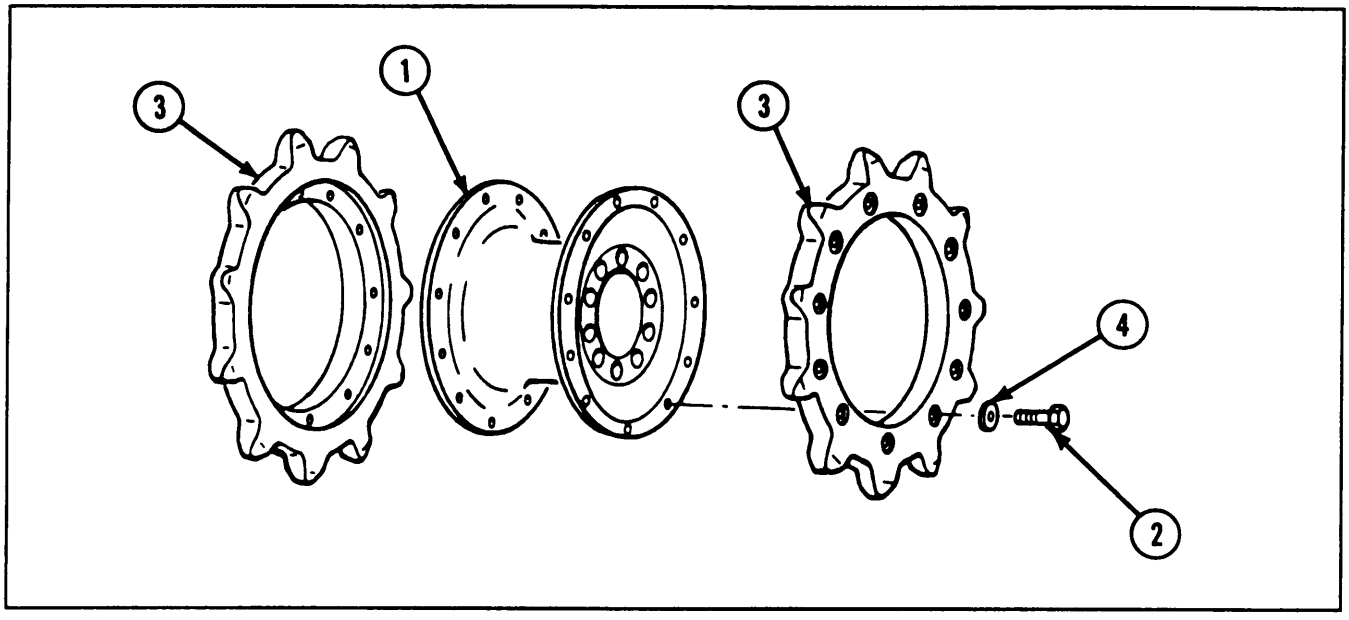
CAUTION

Replace sprocket wheels in pairs. Do not use worn sprocket wheel and new sprocket wheel on the same sprocket wheel hub.

8 Repaint chipped and damaged surfaces using primer and olive drab enamel.

9 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

INSTALLATION



NOTE

The following procedures are written and illustrated for the left drive hub sprocket, but apply to both the right and left drive hub sprockets.

1 Clean mounting surfaces on sprocket wheel hub (1) with dry cleaning solvent and dry with emery cloth.

2 Apply hydraulic fluid to threads of hexagon head capscrews (2).

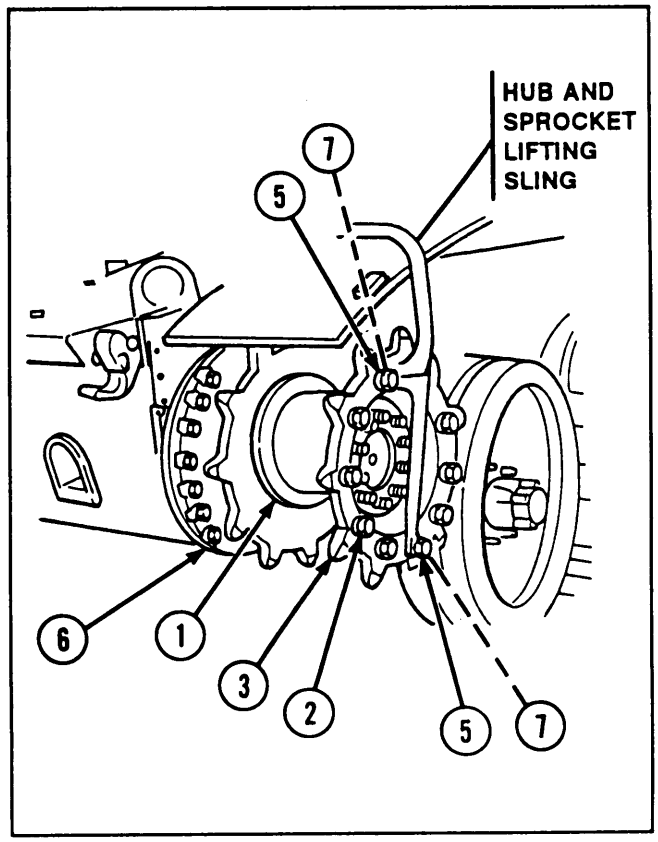
NOTE

Do not install new lockwashers and hexagon head capscrews in three holes that will be used to attach hub and sprocket lifting sling to sprocket wheel.

3 Install 2 sprocket wheels (3) on sprocket wheel hub (1) with 19 new lockwashers (4) and 19 hexagon head capscrews (2). Ensure that unworn parts of sprocket wheel (3) teeth are forward.

2-150. MAINTENANCE OF DRIVE HUB SPROCKETS AND RELATED PARTS (CONT).

INSTALLATION (CONT)

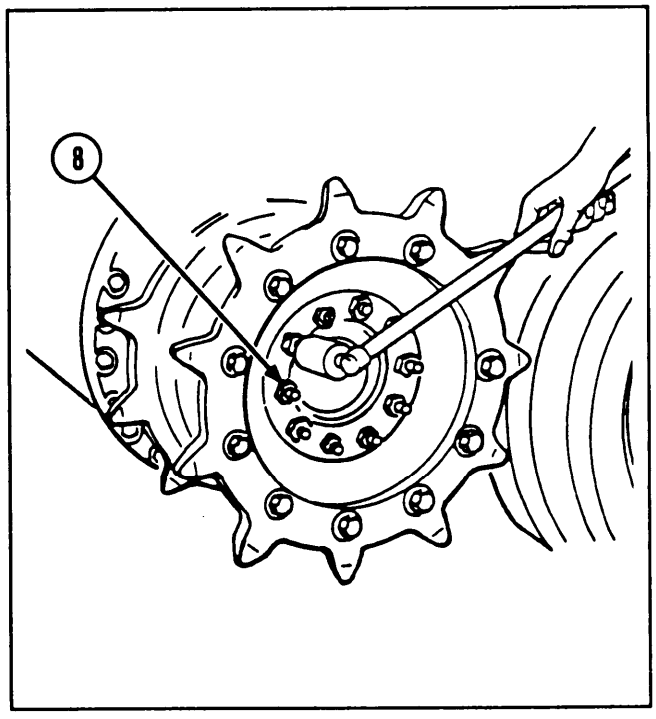


4 Attach hub and sprocket lifting sling to sprocket wheel (3) with three hexagon head capscrews (5).

5 Tighten 19 hexagon head capscrews (2) evenly in a cross-pattern sequence to 120.0 to 130.0 ft-lb (162.7 to 176.3 N-m).

6 Attach hoist to hub and sprocket lifting sling and install sprocket wheel hub (1) on final drive assembly (6).

7 Remove hoist and hub and sprocket lifting sling. Install three new lockwashers (7) and three hexagon head capscrews (5) in sprocket wheel (3). Tighten capscrews to 120.0 to 130.0 ft-lb (162.7 to 176.3 N-m).



8 Clean threads on studs with wire brush and dry cleaning solvent.

9 Apply hydraulic fluid to threads of nuts (8) and studs.

10 Install ten nuts (8) and tighten to 450.0 to 475.0 ft-lb (610.2 to 644.1 N-m).

2-151. MAINTENANCE OF VEHICULAR TRACK SHOE INSTALLATION AND VEHICULAR TRACK SHOE.

This task covers:	a. *Removal*	d. *Reassembly*
	b. *Disassembly*	*e. Installation/Adjustment*
	c. Inspection/Repair	

INITIAL SETUP

Tools and Special Tools

Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
- Torque wrench (0 to 600 ft-lb)
- Wire brush

Drift pin (item 4, appx G)
Impact wire adapter (item 1, appx G)
Slide puller (item 18, appx G)
Track connecting fixture (2) (item 6, appx G)

Materials/Parts

Corrosion preventive sealant (item 35, appx C)
Self-locking nut (2)
Track shoe pad assembly parts kit

Personnel Required

Two

References

TM 9-2350-238-10
TM 9-2350-238-24P-1

Equipment Conditions

2-942 Fender extensions removed
Jacks applied to track
Track tension decreased (TM 9-2350-238-10)

NOTE

- Install one track before removing the other.
- Normally, the right track has 76 track shoes and the left track has 75 shoes. The number of track shoes may vary due to track wear.

Genera/ Safety Instructions

WARNING

Keep personnel away from vehicle. Personnel injury could occur when track falls away from idler wheel.

2-151. MAINTENANCE OF VEHICULAR TRACK SHOE INSTALLATION AND VEHICULAR TRACK SHOE (CONT).

REMOVAL

NOTE

- It is not necessary to remove track from vehicle to replace shoe pad.
- Remove one track at a time.
- Select area large enough to allow vehicle to be driven or towed at least 5 vehicle lengths.
- Procedures are written for one track, but apply to both tracks.

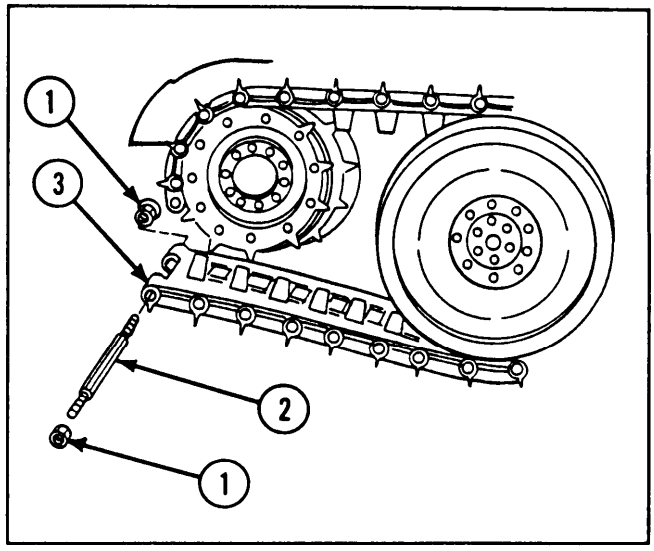
1 Remove two self-locking nuts (1).

WARNING

Keep personnel away from vehicle. Personnel injury could result when track falls away from idler wheel.

NOTE

Step 2 applies to the removal of the track shoe link pin from the top of a roadwheel.



2 Install impact wire adapter on track shoe link pin (2). Attach slide puller to impact wire adapter and remove track shoe link pin (2) from track (3).

3 Using drift pin, drive out track shoe link pin (2).

4 Slowly back vehicle until track is completely lying on ground.

5 Back vehicle off track.

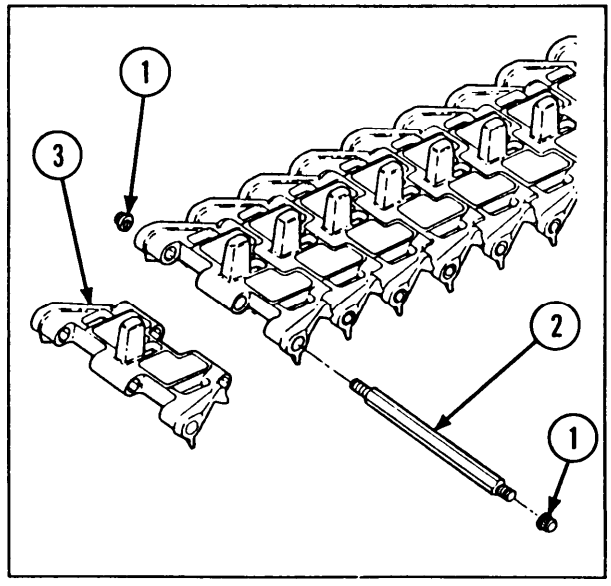
DISASSEMBLY

NOTE

- Procedures are written for one track shoe, but apply to all track shoes.
- Steps 1 and 2 apply to the disassembly of the track shoe when track is removed from vehicle.

1 Remove two self-locking nuts (1).

2 Using drift pin, drive out track shoe link pin (2) to remove track shoe (3).

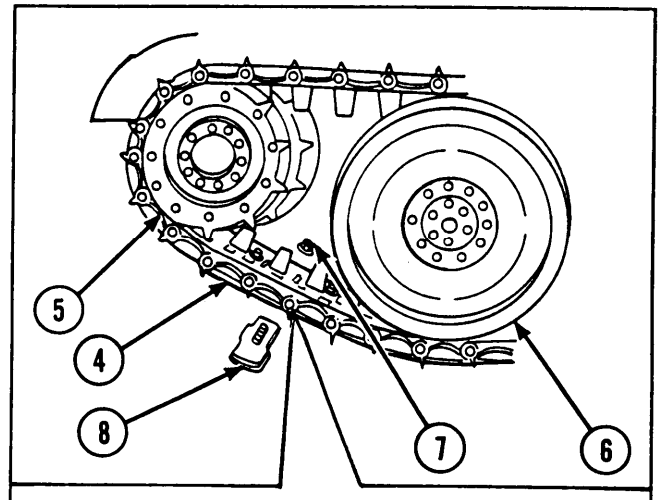


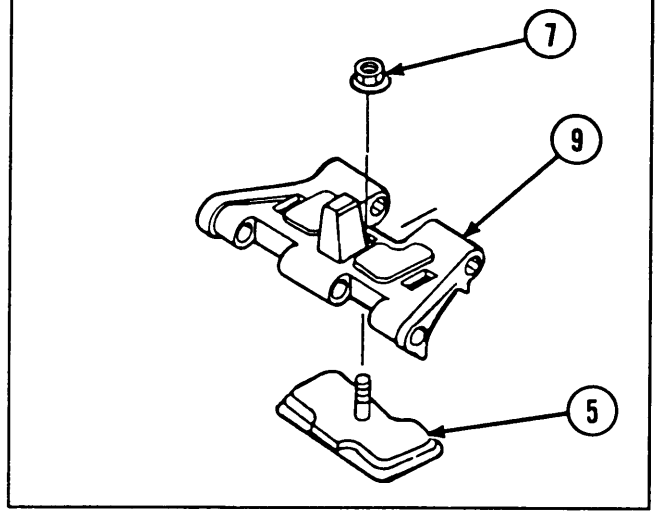
NOTE

Step 3 applies to the removal of the track shoe pad when the track is installed on the vehicle.

3 Position track shoe (4) between drive hub sprocket (5) and roadwheel (6).

4 If damaged, remove self-locking nut (7) and track shoe pad (8) from shoe assembly (9).





INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

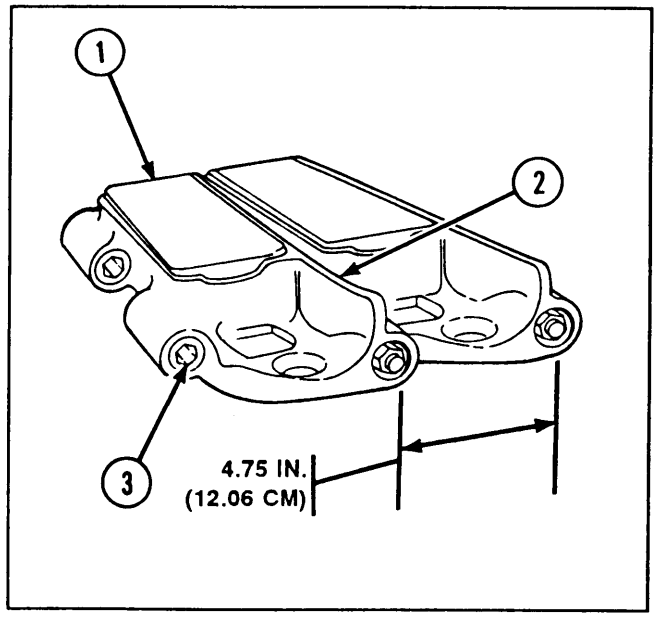
2 Inspect track shoe pads (1) for wear to or below height of grouser lugs (2).

3 Inspect track shoe pads (1) for chunks of rubber gouged out of contact surfaces.

4 Inspect bushing (3) to ensure that track pin is centered. Dimension cannot exceed 4.75 in. (12.06 cm).

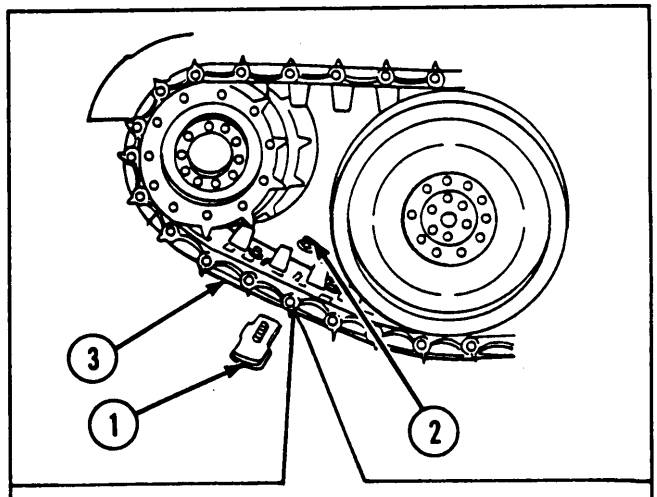
5 Using wire brush, clean and remove old rubber from pad seating area on track shoe.

6 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.



2-151. MAINTENANCE OF VEHICULAR TRACK SHOE INSTALLATION AND VEHICULAR TRACK SHOE (CONT).

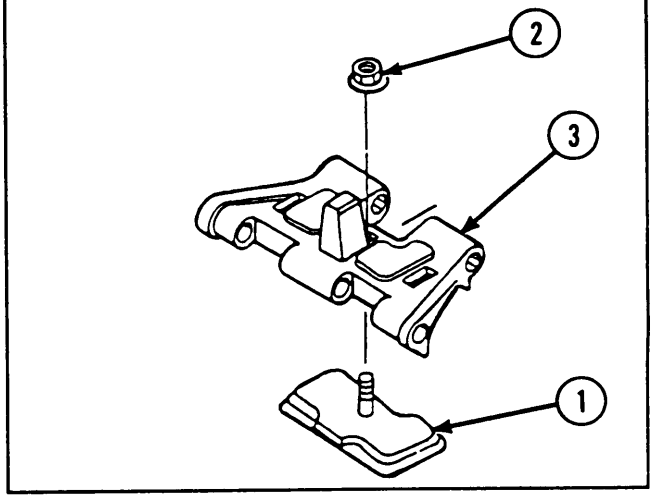
REASSEMBLY



NOTE

Procedures are written for one track shoe, but apply to all track shoes.

1 If removed, install track shoe pad (1) and new self-locking nut (2) on shoe assembly (3). Tighten self-locking nut to 180 ft-lb (244 N-m).

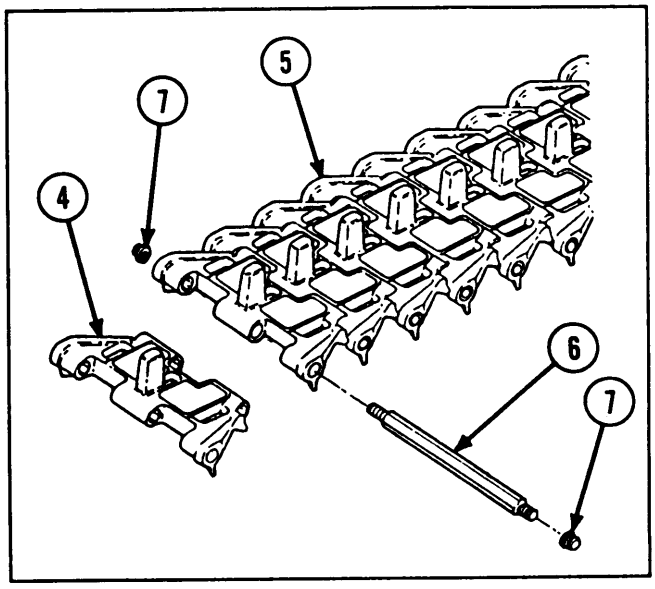


NOTE

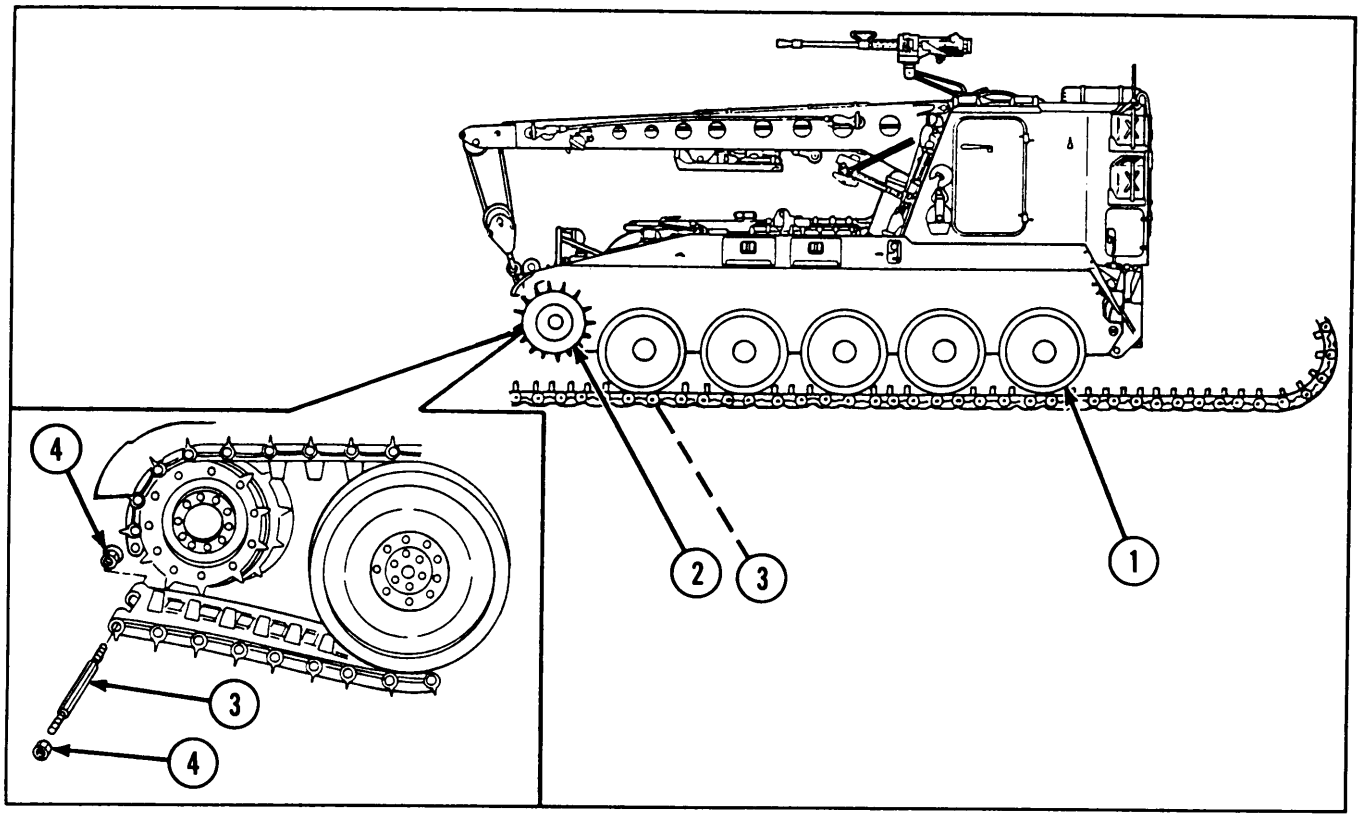
Steps 2 and 3 apply to reassembly of track shoe when track is removed from vehicle.

2 Position track shoe (4) on track (5). Install track shoe link pin (6) in track shoe (4).

3 Install two new self-locking nuts (7) on track shoe link pin (6). Tighten self-locking nuts to 180 to 200 ft-lb (218 to 272 N-m).



INSTALLATION/ADJUSTMENT



NOTE

- Install one track before removing the other.
- Procedures are written for one track, but apply to both tracks.

1 Lay track in straight line in front of vehicle with track shoe grousers forward and track touching first roadwheel.

2 Start engine and slowly drive onto track until 11 track shoes extend past hub of trailing idler wheel (1).

3 Stop engine. Leave parking brake off.

4 Insert drift pin in last track shoe pin hole.

5 Lift end of track over idler wheel (1).

6 Start engine and slowly move vehicle forward. Guide track over roadvvheels to prevent end from getting caught between roadwheels. When track reaches drive hub sprocket (2), pry or lift it over sprocket.

7 Using drive hub sprocket, bring ends of track together.

8 Remove drift pin.

9 Install two track connecting fixtures.

10 Apply corrosion preventive compound to track shoe link pin (3). Install track shoe link pin (3) and two new self-locking nuts (4). Tighten self-locking nuts to 180 to 200 ft-lb (218 to 272 N-m).

2-152. MAINTENANCE OF STEERING CONTROLS AND LINKAGE AND STEERING ROD ASSEMBLY.

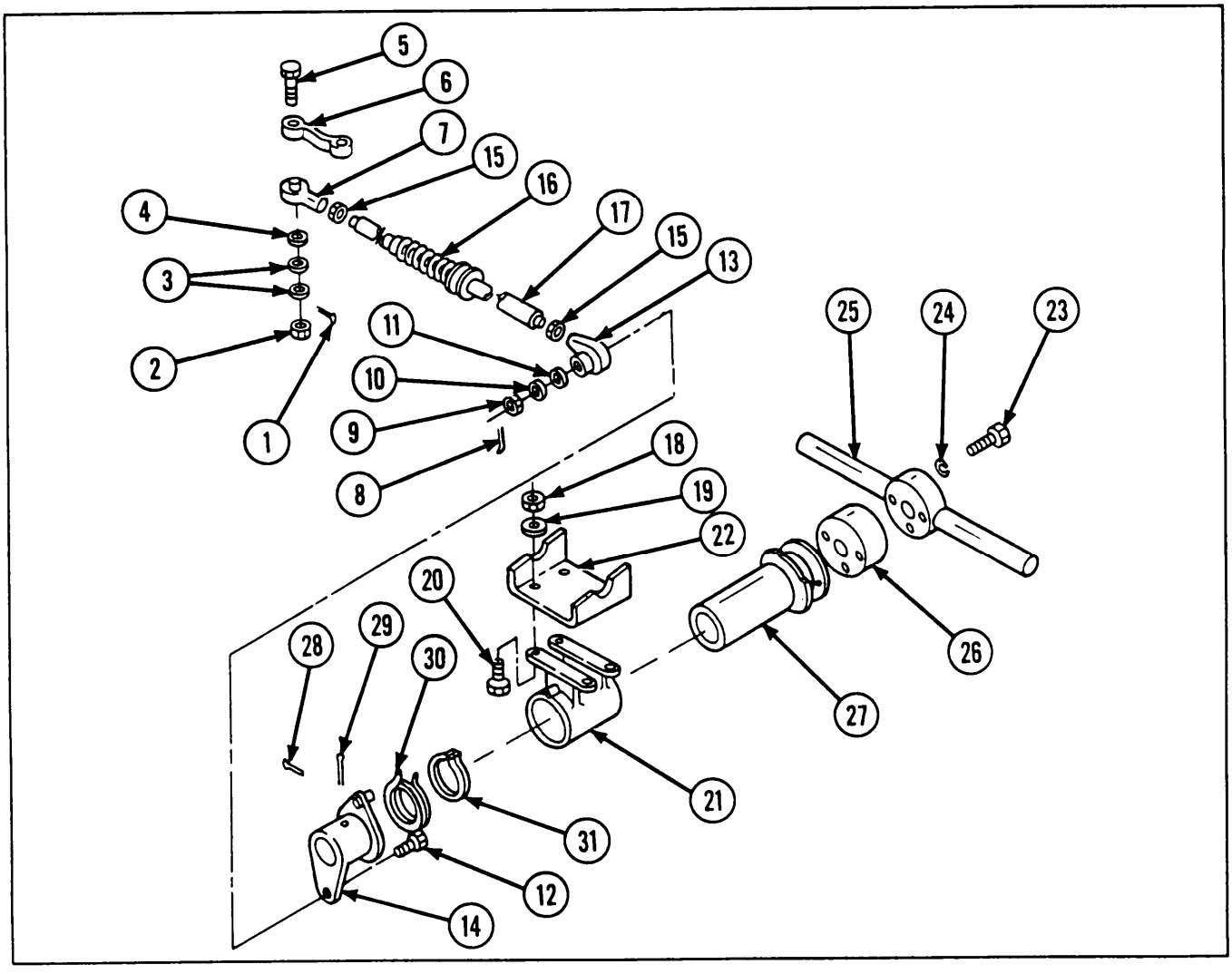
This task covers:	a. *RemovallDisassembly* b. *Inspection/Repair*	c. *Reassembly/installation* *d. Adjustment*

INITIAL SETUP

Material/Parts
Cotter pin
Cotter pin (2)
Lockwasher (3)
Lockwasher (4)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-938 Hull transmission compartment deck assembly removed



REMOVAL/DISASSEMBLY

1 Remove cotter pin (1), slotted plain nut (2), two flat washers (3), rod assembly beveled washer (4), hexagon head capscrew (5), and steering gear arm (6) from rod end plain bearing (7).

2 Remove cotter pin (8), slotted plain nut (9), flat washer (10), beveled washer (11), and hexagon head capscrew (12) from rod end plain bearing (13) and control linkage pivoting wheel arm (14).

3 Remove two rod end plain bearings (7 and 13), two hexagon plain nuts (15), and dust and moist boot (16) from rod (17).

4 Remove four hexagon plain nuts (18), four lockwashers (19), four hexagon head capscrews (20), and steering bar assembly bearing unit housing (21) from bracket (22).

5 Remove three screws (23), three lockwashers (24), steering bar assembly (25), and steering bar to sleeve spacer (26) from steering control sleeve (27).

6 Remove cotter pin (28), straight headed pin (29), control linkage pivoting wheel arm (14), helical spring (30), retaining ring (31), and steering bar assembly bearing unit housing (21) from steering control sleeve (27).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY/INSTALLATION

1 Install steering bar assembly bearing unit housing (21), retaining ring (31), helical spring (30), and control linkage pivoting wheel arm (14) on steering control sleeve (27). Secure with straight headed pin (29) and new cotter pin (28).

2 Install steering bar to sleeve spacer (26) and steering bar assembly (25) on steering control sleeve (27). Secure with three new lockwashers (24) and three screws (23).

3 Install steering bar assembly bearing unit housing (21) on bracket (22). Secure with four hexagon head capscrews (20), four new lockwashers (19), and four hexagon plain nuts (18).

4 Install dust and moist boot (16), two hexagon plain nuts (15), and two rod end plain bearings (13 and 7) on rod (17).

NOTE

Adjust rod assembly to allow rod to move freely through dust and moist boot from one extreme steering position to the other.

5 Install hexagon head capscrew (12) in control linkage pivoting wheel arm (14) and rod end plain bearing (13). Secure with beveled washer (11), flat washer (10), slotted plain nut (9), and new cotter pin (8).

6 Install hexagon head capscrew (6) in steering gear arm (5) and rod end plain bearing (7). Secure with rod assembly beveled washer (4), two flat washers (3), slotted plain nut (2), and new cotter pin (1).

7 Rotate steering gear arm one spline tooth to left side of vehicle.

2-152. MAINTENANCE OF STEERING CONTROLS AND LINKAGE AND STEERING ROD ASSEMBLY (CONT).

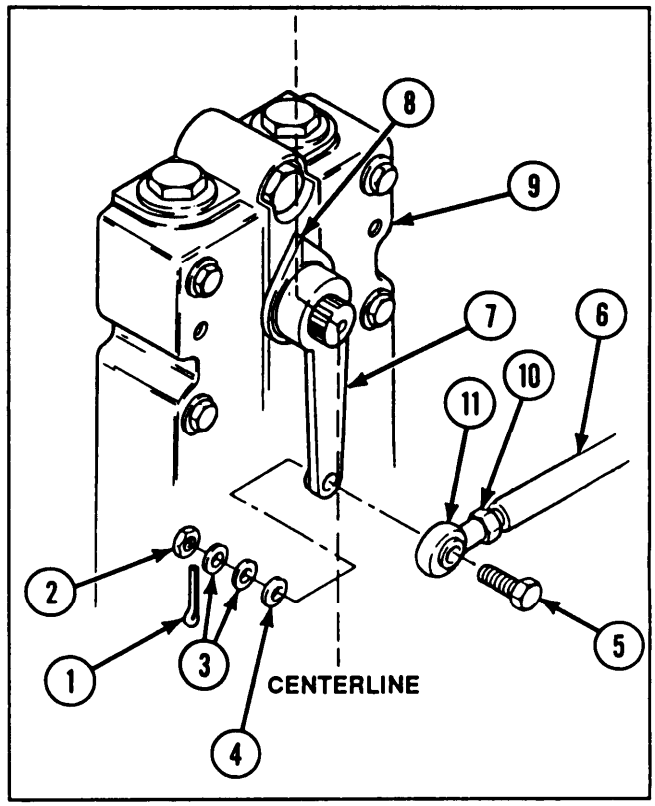
ADJUSTMENT

1 Remove cotter pin (1), slotted plain nut (2), two flat washers (3), beveled washer (4), and hexagon head capscrew (5). Disconnect steering rod assembly (6) from steering gear arm (7).

2 Hold steering bar in no steer (horizontal). Make sure that centerline of steering gear arm (7) aligns with pointer (8) on transmission (9).

3 Loosen hexagon plain nut (10), and turn rod end plain bearing (11) until holes in rod end plain bearing and steering gear arm (7) are aligned.

4 Align steering rod assembly (6) with steering gear arm (7) and install hexagon head capscrew (5), beveled washer (4), two flat washers (3), slotted plain nut (2), and cotter pin (1).



2-153. MAINTENANCE OF TOWING PINTLE ASSEMBLY.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

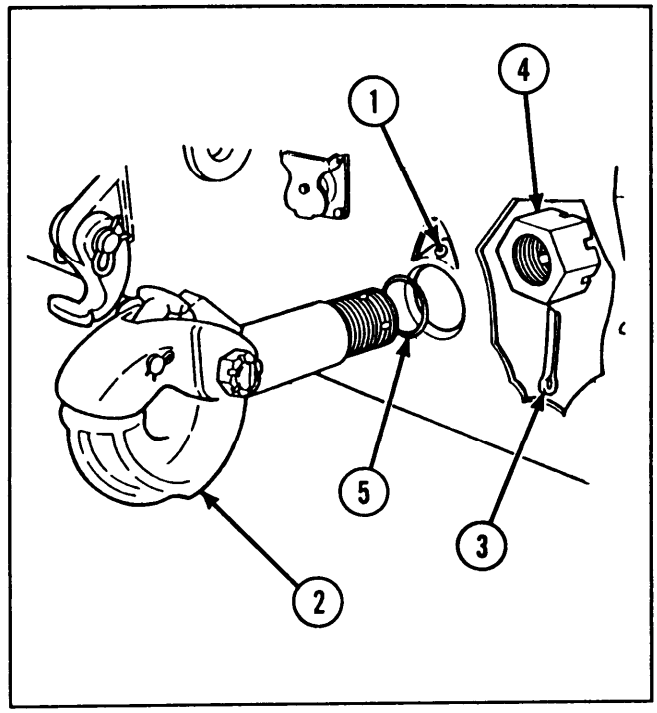
Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
• Bar

Materials/Parts
Cotter pin (3)
Grease (item 20, appx C)
Preformed packing

References
TM 9-2350-238-10
TM 9-2350-238-20-2
TM 9-2350-238-24P-1

Equipment Conditions
Vehicle equipment stowage box removed (TM 9-2350-238-20-2)

REMOVAL



1 If damaged, remove lubrication fitting (1) from hull.

2 Insert bar through towing pintle assembly (2) to prevent it from turning.

NOTE

Enter hull through turret well to gain access to slotted plain nut and cotter pin.

3 Remove cotter pin (3) and slotted plain nut (4) from towing pintle assembly (2) from inside of hull.

4 Remove bar, towing pintle assembly (2), and preformed packing (5) from outside of hull.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Coat threads of shaft of towing pintle assembly (2) and new preformed packing (5) with grease.

2 Install new preformed packing (5) on shaft of towing pintle assembly (2).

3 Install towing pintle assembly (2) with new preformed packing (5), slotted plain nut (4), and new cotter pin (3).

4 Insert bar through towing pintle assembly (2) to prevent it from turning. Tighten slotted plain nut (4) until preformed packing (5) is tight against hull but not compressed. Remove bar.

5 If removed, install lubrication fitting (1) in hull.

6 Lubricate towing pintle assembly. Refer to TM 9-2350-238-10.

2-154. MAINTENANCE OF TOW HOOK AND RELATED PARTS.

This task covers: a. Removal b. Inspection/Repair c. *Installation*

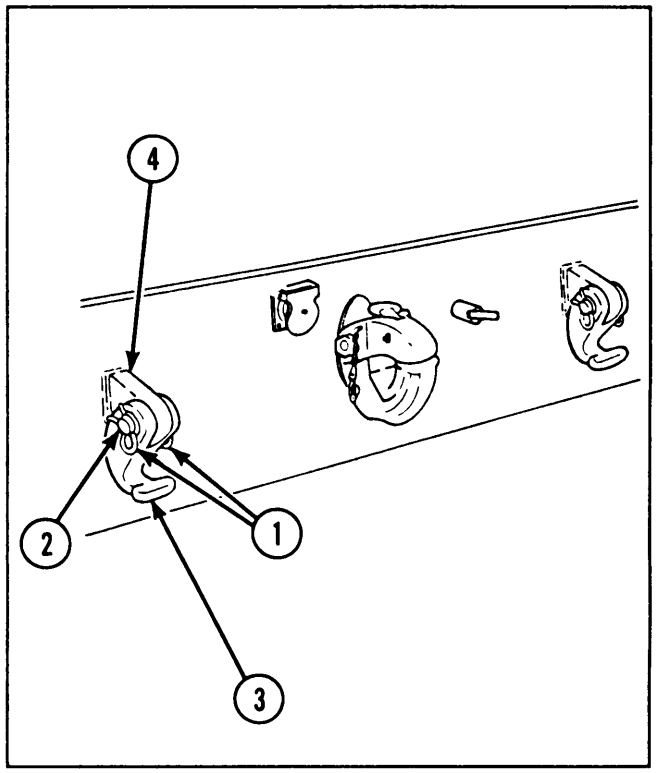
INITIAL SETUP

References
TM 9-2350-238-24P-1

REMOVAL

NOTE
The following procedure is written for one tow hook, but applies to all four tow hooks.

Remove two lock pins (1), headless grooved pin (2), and tow hook (3) from hull bracket (4).



INSPECTION/REPAIR

1 Inspect for broken, missing, or damaged parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

NOTE
The following procedure is written for one tow hook, but applies to all four tow hooks.

Install tow hook (3) and headless grooved pin (2) on hull bracket (4), and secure with two lock pins (l).

2-155. MAINTENANCE OF LOCKOUT CYLINDER AND RELATED PARTS.

This task covers: a. *Removal* b. *Inspection/Repair* *c. Installation*

INITIAL SETUP

Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
• Hammer puller
Plier wire twister (item 30, appx G)
Sling (item 82, appx B)

Materials/Parts
Corrosion preventive sealant (item 35, appx c)
Cotter pin (32)
Hydraulic fluid (item 21, appx C)
Lockwire (item 23, appx C)
Masking tape (item 45, appx C)
Preformed packing (2)

References
TM 9-2350-238-10
TM 9-2350-238-24 P-I

Personnel Required
Two

Equipment Conditions

NOTE
The following equipment condition applies to the right side number 1 and number 2 lockout cylinders.

2-384 Powerplant removed

NOTE
The following equipment condition applies to the right side number 4 lockout cylinder.

Cab traversed to the left (TM 9-2350-238-10)

NOTE
The following equipment conditions apply to the left side number 2 lockout cylinder.

2-952 Driver's seat removed
2-840 Batteries removed
2-840 Battery compartment tray removed

General Safety Instructions

WARNING

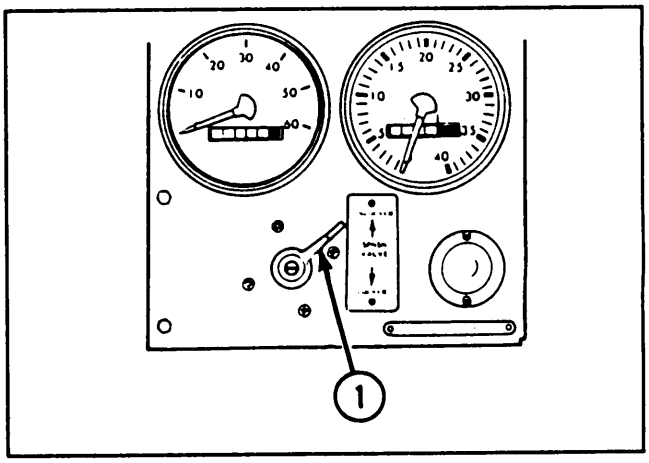
Removing plugs and compressing cylinder may cause hydraulic fluid to spill. Wipe up any spilled hydraulic fluid.

2-155. MAINTENANCE OF LOCKOUT CYLINDER AND RELATED PARTS (CONT).

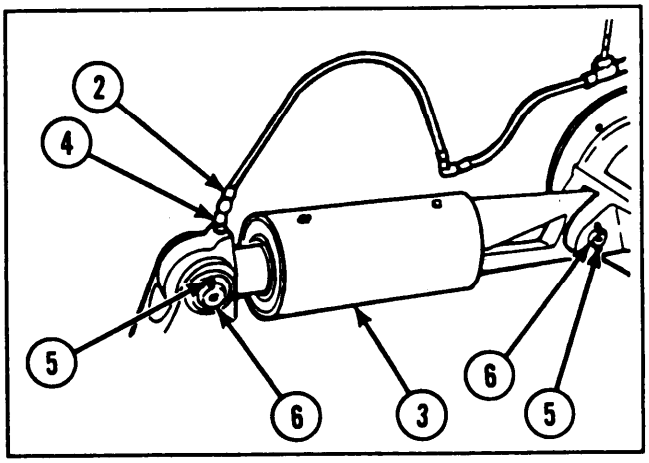
REMOVAL

NOTE

- The following procedures are written for one lockout cylinder, but apply to all lockout cylinders.
- For right side number 1 and number 2 lockout cylinders, gain access through right side of powerplant compartment.
- For right side number 3 and number 4 lockout cylinders, gain access through bottom right front of turret well.
- For left side number 1 and number 2 lockout cylinders, gain access through bottom rear of drivets compartment.
- For left side number 3 lockout cylinder, gain access through bottom left front of turret well.
- For left side number 4 lockout cylinder, gain access through bottom left rear of turret well.



1 Set SPNSN VALVE handle (1) to UNLOCKED.

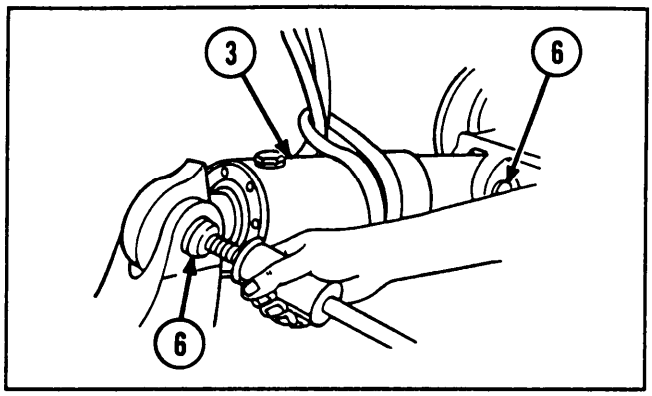


2 Disconnect hydraulic hose connector (2) from lockout cylinder (3).

3 Cover fitting connector (4).

4 Cap hydraulic hose connector (2) with masking tape in upright position against hull to prevent oil drainage.

5 Remove two cotter pins (5) from each headless straight pin (6).



6 Attach sling to support lockout cylinder (3).

7 Using hammer puller, remove two headless straight pins (6).

8 Using sling, lift lockout cylinder (3) from hull.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

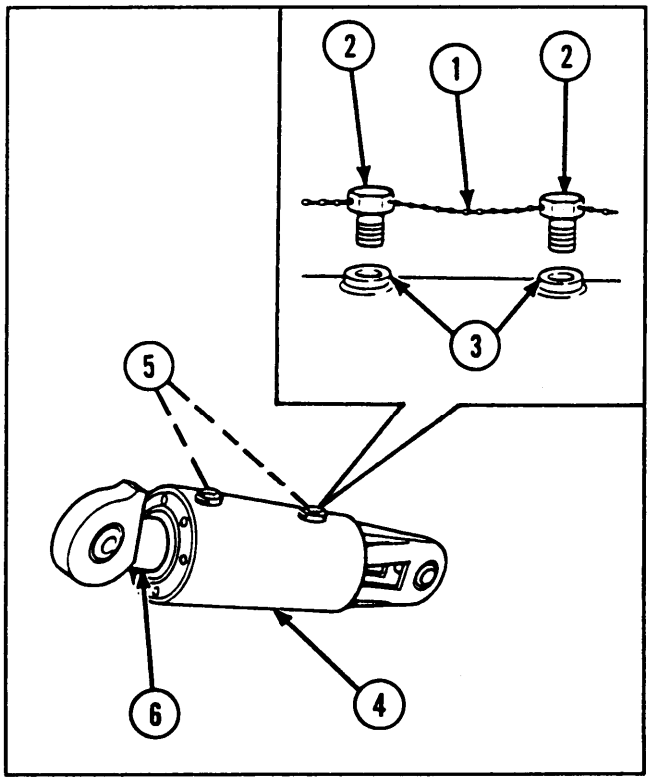
2 Hydraulic suspension lockout cylinder assembly is a repairable assembly. Notify next higher level of maintenance.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

WARNING

Removing plugs and compressing the cylinder may cause hydraulic fluid to spill. Wipe up any spilled hydraulic fluid.



1 Remove lockwire (1), two plugs (2), and two preformed packings (3).

2 Fully compress hydraulic suspension lockout cylinder assembly (4).

3 Fill hydraulic suspension lockout cylinder assembly (4) through two ports (5) with hydraulic fluid.

4 Extend and retract cylinder rod (6) slowly.

5 Add hydraulic fluid as required to completely fill hydraulic suspension lockout cylinder assembly (4).

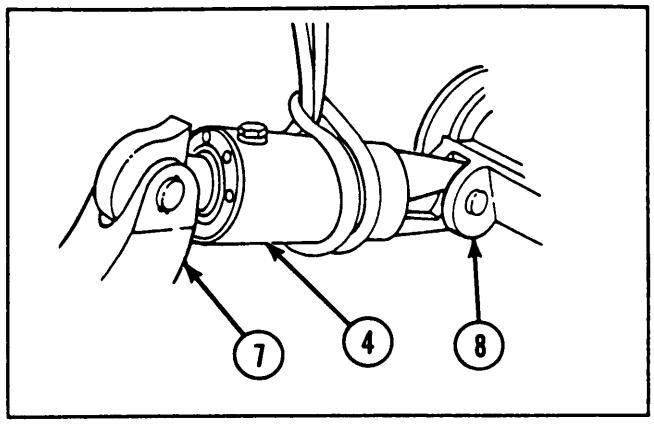
6 Install two new preformed packings (3), two plugs (2), and new lockwire (1).

2-155. MAINTENANCE OF LOCKOUT CYLINDER AND RELATED PARTS (CONT).

INSTALLATION (CONT)

7 Using sling, lower hydraulic suspension lockout cylinder assembly (4) into hull.

8 Install hydraulic suspension lockout cylinder assembly (4) into remote control lever (7) and hull mounting arm (8).



NOTE

Apply corrosion preventive sealant to headless straight pins before installation.

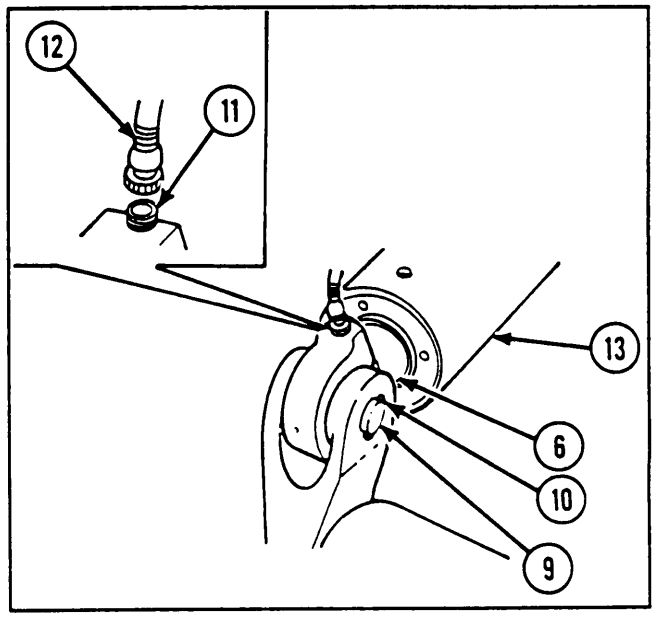
9 Insert two headless straight pins (9).

10 Install four new cotter pins (10) in two-headless straight pins (9).

11 Fully retract cylinder rod (6).

12 Remove cover from fitting connector (11).

13 Connect hydraulic hose connector (12) to fitting connector (11) on lockout cylinder (13). Do not tighten.



14 Start engine, and set HYD/PUMP/PTO CLUTCH switch ON.

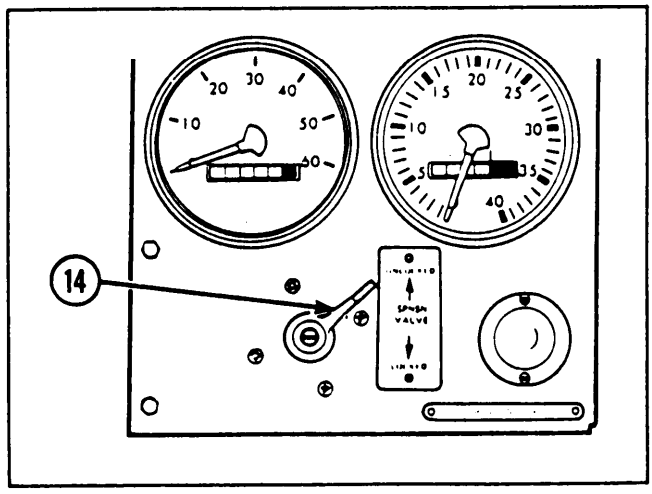
15 Cycle valve handle (14) several times.

16 Tighten hydraulic hose connector (12).

NOTE

After installing right side number 4 lockout cylinder, the cab must be traversed to travel position.

17 Traverse cab to travel position. Refer to TM 9-2350-238-10.



18 Check hydraulic fluid level. Refer to TM 9-2350-238-10.

19 Start engine. Cycle valve handle (14) several times.

20 Check lines and fittings for leaks. If leaks exist, ensure all parts have been installed correctly. if leaks still exist, check for defective parts.

21 Disengage clutch and stop engine.

2-156. MAINTENANCE OF SUSPENSION LOCKOUT SYSTEM CONTROL VALVE AND ASSOCIATED PARTS.

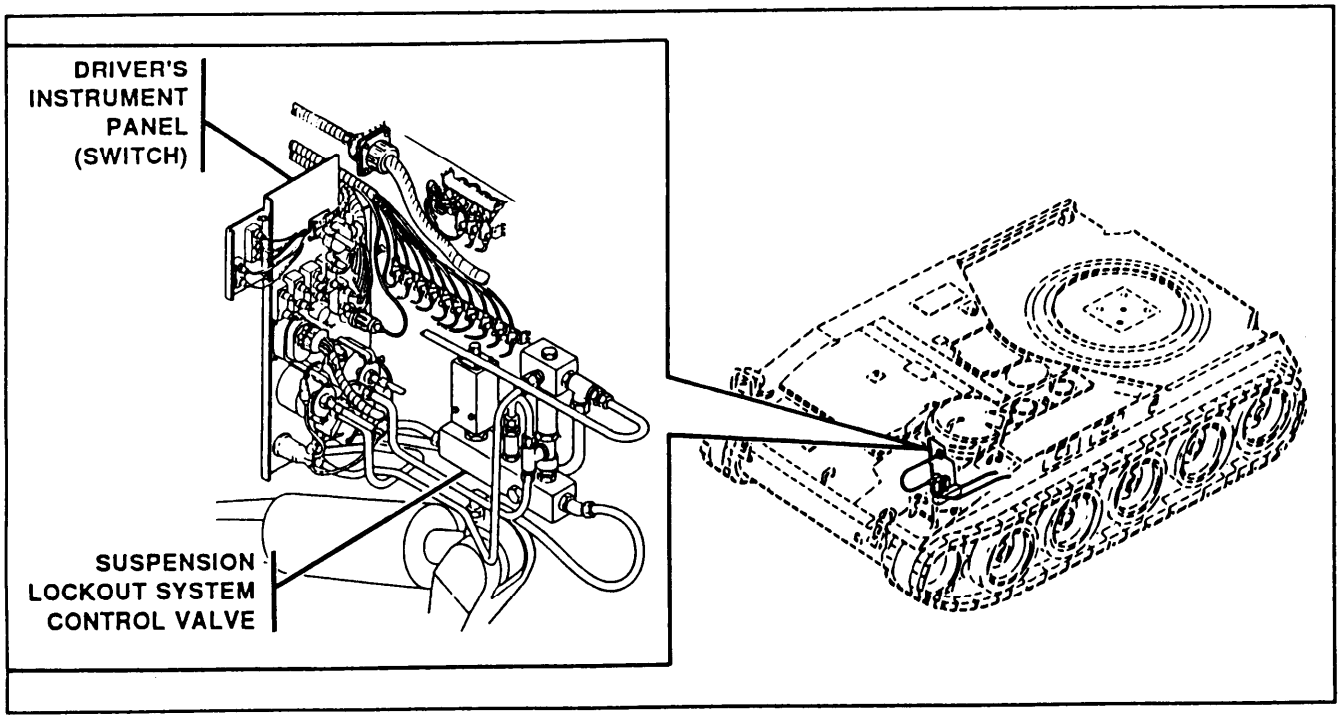
This task covers: a. *Removal* b. *Inspection/Repair* *c. Installation*

INITIAL SETUP

Materials/Parts
- Lockwasher (5)
- Lockwasher (2)
- Preformed packing
- Preformed packing
- Preformed packing (2)
- Preformed packing (2)
- Preformed packing (12)
- Tube fitting locknut
- Tube fitting locknut
- Tube fitting locknut (6)

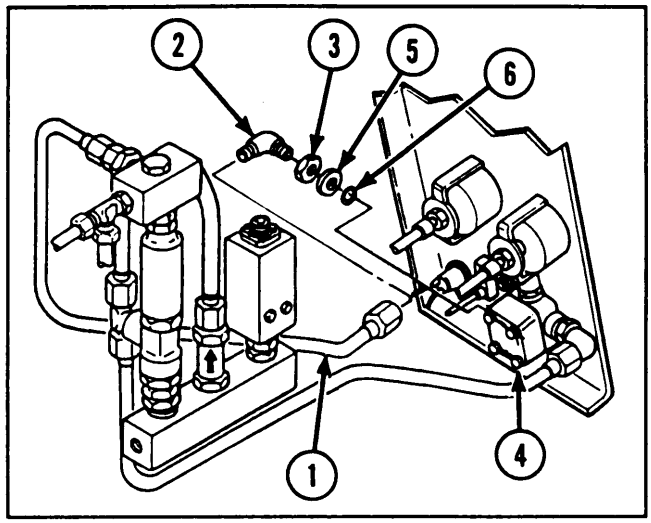
References
- TM 9-2350-238-24P-1

REMOVAL



2-156. MAINTENANCE OF SUSPENSION LOCKOUT SYSTEM CONTROL VALVE AND ASSOCIATED PARTS (CONT).

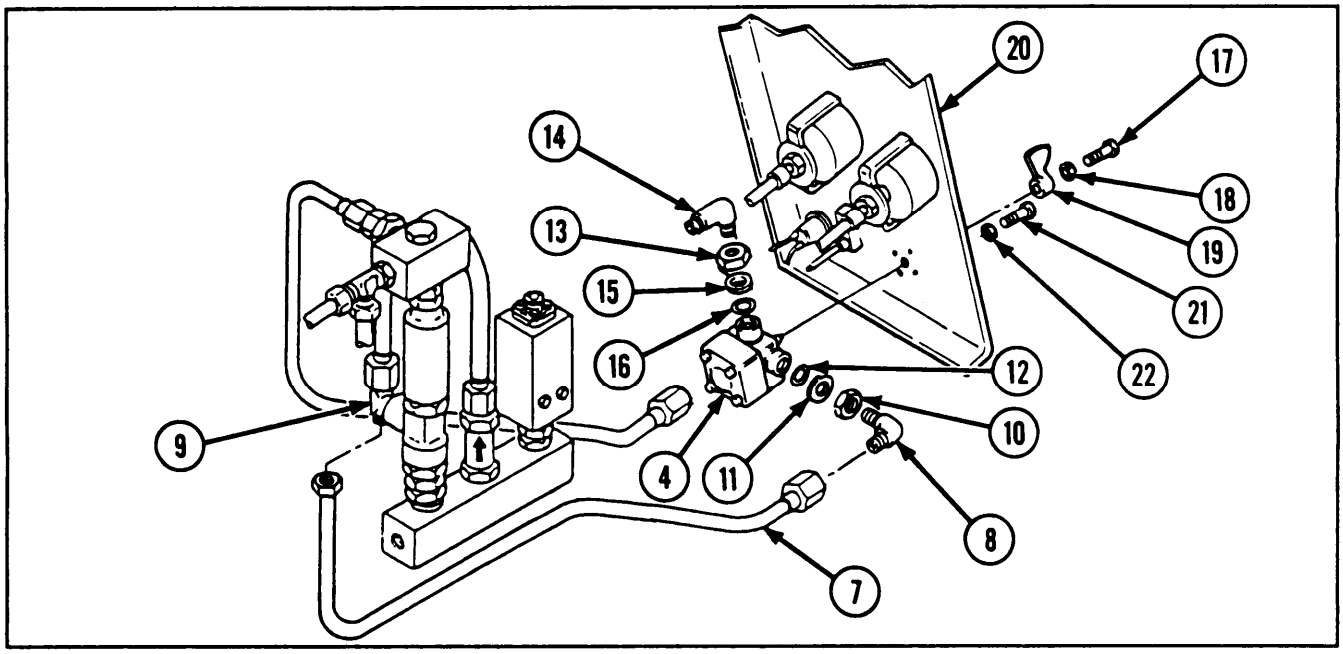
REMOVAL (CONT)



1 Disconnect metal tube assembly (1) from tube elbow (2).

2 Loosen tube fitting locknut (3) and remove tube elbow (2) from selector control plug valve (4). Remove packing retainer (5) and preformed packing (6).

3 Remove tube fitting locknut (3) from tube elbow (2).



4 Disconnect control valve to check valve tee metal tube assembly (7) from tube elbow (8) and tube tee (9). Remove control valve to check valve tee metal tube assembly.

5 Loosen tube fitting locknut (10) and remove tube elbow (8) from selector control plug valve (4). Remove packing retainer (11) and preformed packing (12).

6 Remove tube fitting locknut (10) from tube elbow (8).

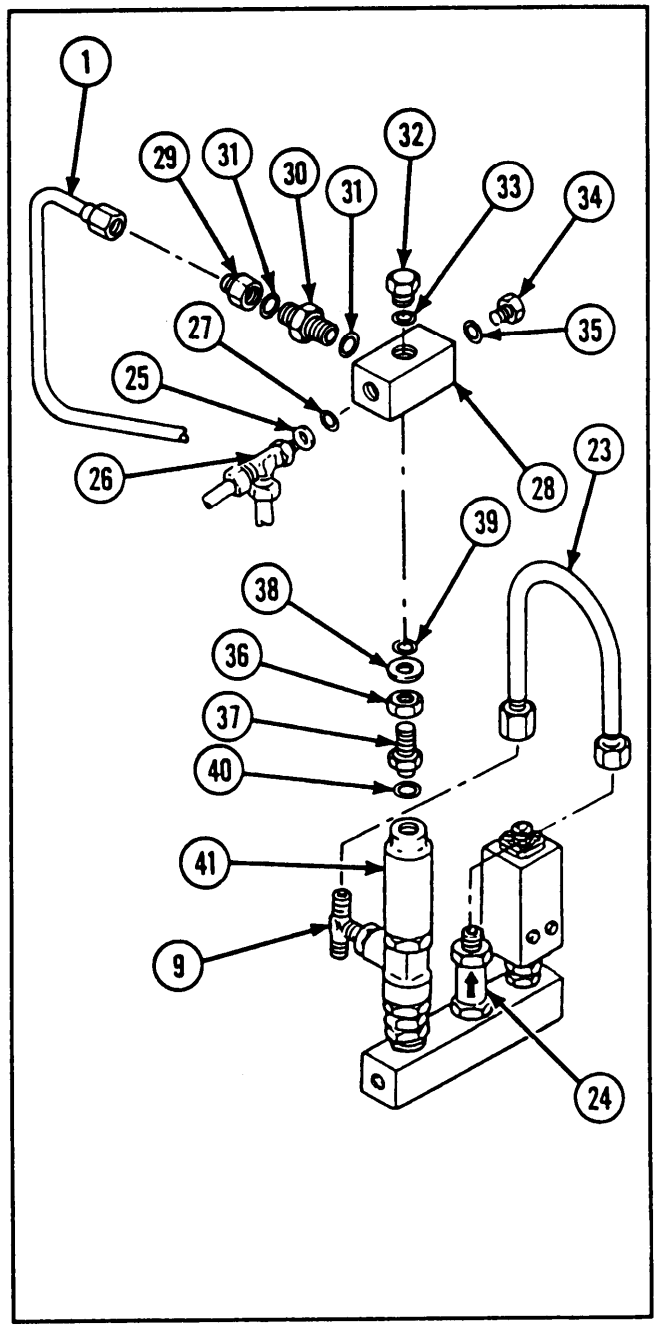
7 Loosen tube fitting locknut (13) and remove tube elbow (14) from selector control plug valve (4). Remove packing retainer (15) and preformed packing (16) from selector control plug valve.

8 Remove tube fitting locknut (13) from tube elbow (14).

9 Remove machine screw (17), lockwasher (18), and control valve handle (19) from driver's instrument panel (20) and selector control plug valve (4).

10 Remove four machine screws (21) and four lockwashers (22) from panel and selector control plug valve (4).

11 Remove selector control plug valve (4).



12 Disconnect manifold check valve metal tube assembly (23) from tube tee (9) and check valve (24). Remove manifold check valve metal tube assembly.

13 Loosen tube fitting locknut (25), and remove tube to boss tee (26) and preformed packing (27) from manifold (28).

14 Disconnect and remove metal tube assembly (1) from straight adapter (29).

15 Remove straight adapter (29) from check valve (30).

16 Remove check valve (30) and two preformed packings (31) from manifold (28).

17 Remove machine plug (32) and preformed packing (33) from manifold (28).

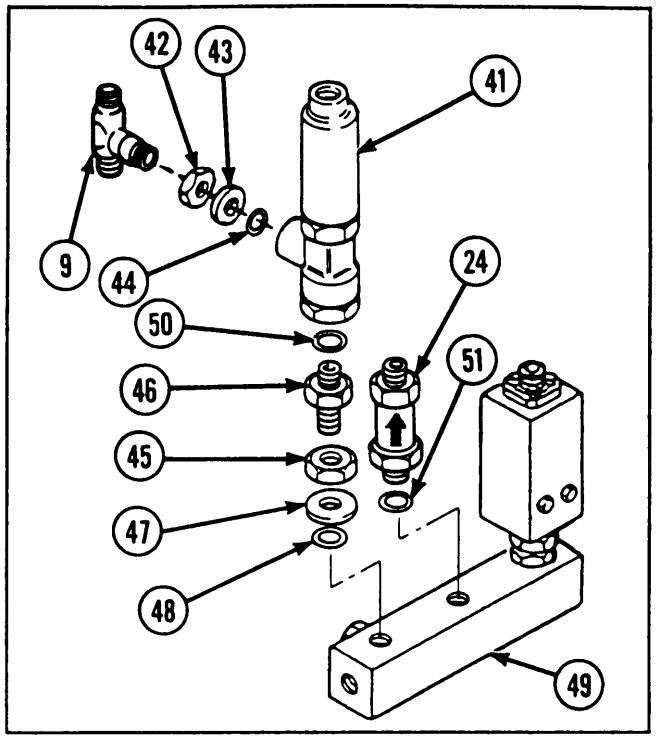
18 Remove machine plug (34) and preformed packing (35) from manifold (28).

19 Loosen tube fitting locknut (36) and remove check valve (37), packing retainer (38), and preformed packing (39) from manifold (28).

20 Remove check valve (37) and preformed packing (40) from pressure reducing valve (41).

2-156. MAINTENANCE OF SUSPENSION LOCKOUT SYSTEM CONTROL VALVE AND ASSOCIATED PARTS (CONT).

REMOVAL (CONT)

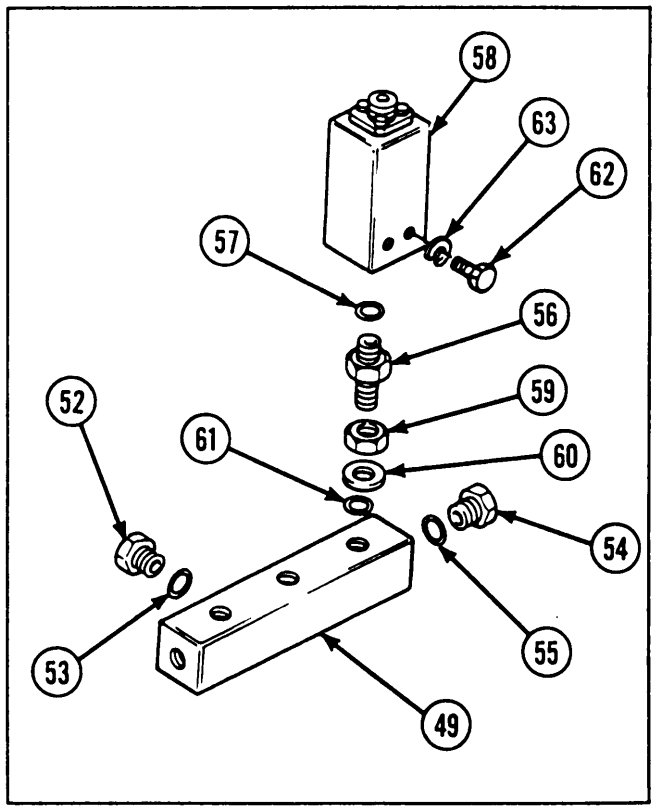


21 Loosen tube fitting locknut (42) and remove tube tee (9), packing retainer (43), and preformed packing (44) from pressure reducing valve (41).

22 Loosen tube fitting locknut (45) on tube nipple (46). Remove tube nipple, packing retainer (47), preformed packing (48), and pressure reducing valve (41) from lockout cylinder control manifold (49).

23 Remove tube nipple (46) and preformed packing (50) from pressure valve (41).

24 Remove check valve (24) and preformed packing (51) from lockout cylinder control manifold (49).



25 Remove machine thread plug (52) and preformed packing (53) from lockout cylinder control manifold (49).

26 Remove tube reducer (54) and preformed packing (55) from lockout cylinder control manifold (49).

27 Remove tube nipple (56) and preformed packing (57) from pressure switch (58).

28 Loosen tube fitting locknut (59) and remove tube nipple (52), flat washer (60), and preformed packing (61) from lockout cylinder control manifold (49).

29 Remove two hexagon head capscrews (62) and two lockwashers (63) from pressure switch (58).

INSPECTION/REPAIR

1 Inspect for broken, darnaged, or missing pads.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install two new lockwashers (1) and two hexagon head capscrews (2) in pressure switch (3).

2 Install new preformed packing (4), flat washer (5), new tube fitting locknut (6), and tube nipple (7) in lockout cylinder control manifold (8). Tighten tube fitting locknut.

3 Install new preformed packing (9) and tube nipple (7) with assembled parts in pressure switch (3).

4 Install new preformed packing (10) and tube reducer (11) in lockout cylinder control manifold (8).

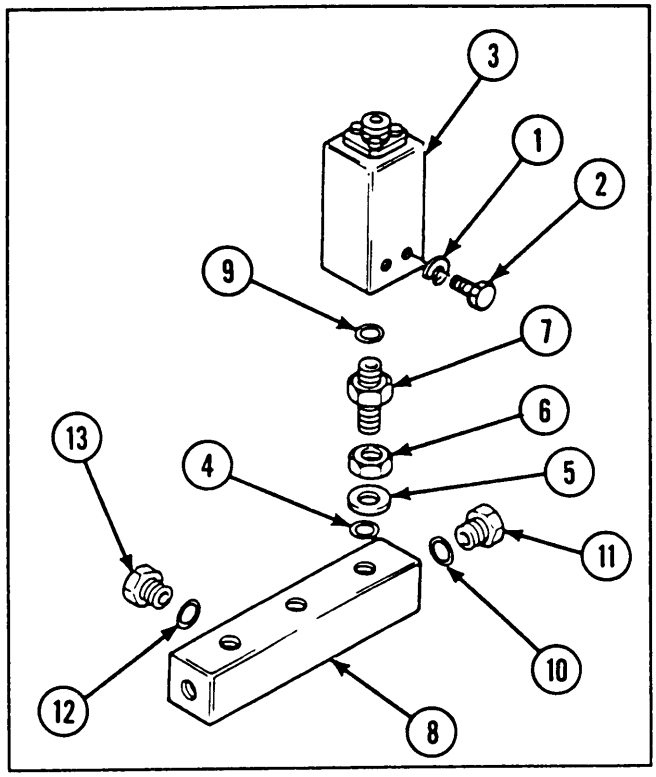
5 Install new preformed packing (12) and machine plug (13) in lockout cylinder control manifold (8).

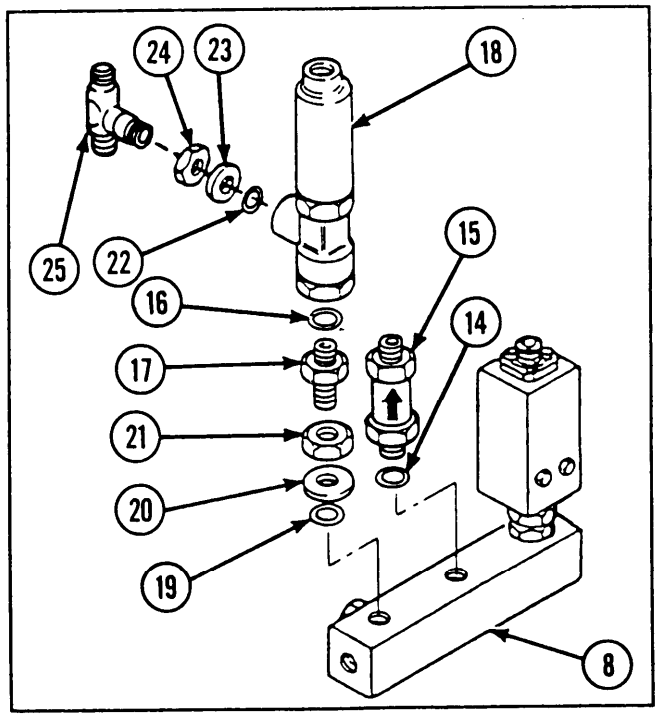
6 Install new preformed packing (14) and check valve (15) in lockout cylinder control manifold (8).

7 Install new preformed packing (16) and tube nipple (17) in pressure reducing valve (18).

8 Install new preformed packing (19), packing retainer (20), new tube fitting locknut (21), and tube nipple (17) in lockout cylinder control manifold (8), and tighten tube fitting locknut.

9 install new preformed packing (22), packing retainer (23), new tube fitting locknut (24), and tube tee (25) in pressure reducing valve (18). Tighten tube fitting locknut.





2-156. MAINTENANCE OF SUSPENSION LOCKOUT SYSTEM CONTROL VALVE AND ASSOCIATED PARTS (CONT).

INSTALLATION (CONT)

10 Install new preformed packing (26) and check valve (27) on pressure reducing valve (18).

11 Install new preformed packing (28), packing retainer (29), new tube fitting locknut (30), and check valve (27) on manifold (31). Tighten tube fitting locknut.

12 Install new preformed packing (32) and machine plug (33) on manifold (31).

13 Install new preformed packing (34) and machine plug (35) on manifold (31).

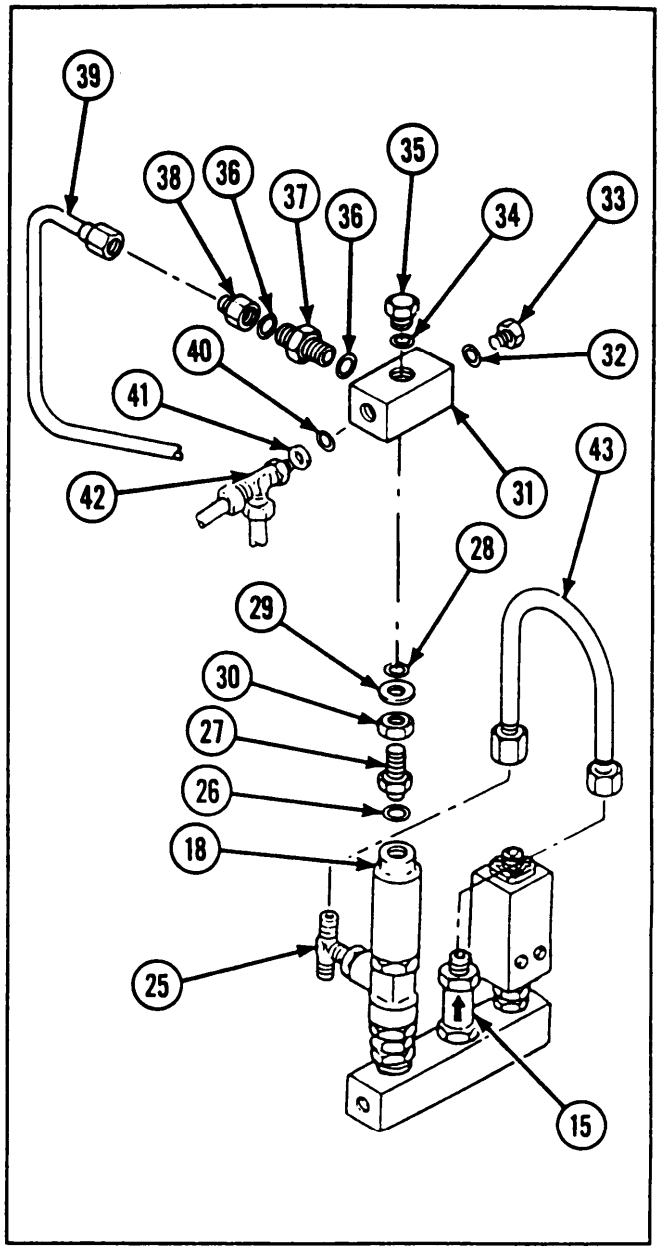
14 Install two new preformed packings (36) and check valve (37) on manifold (31).

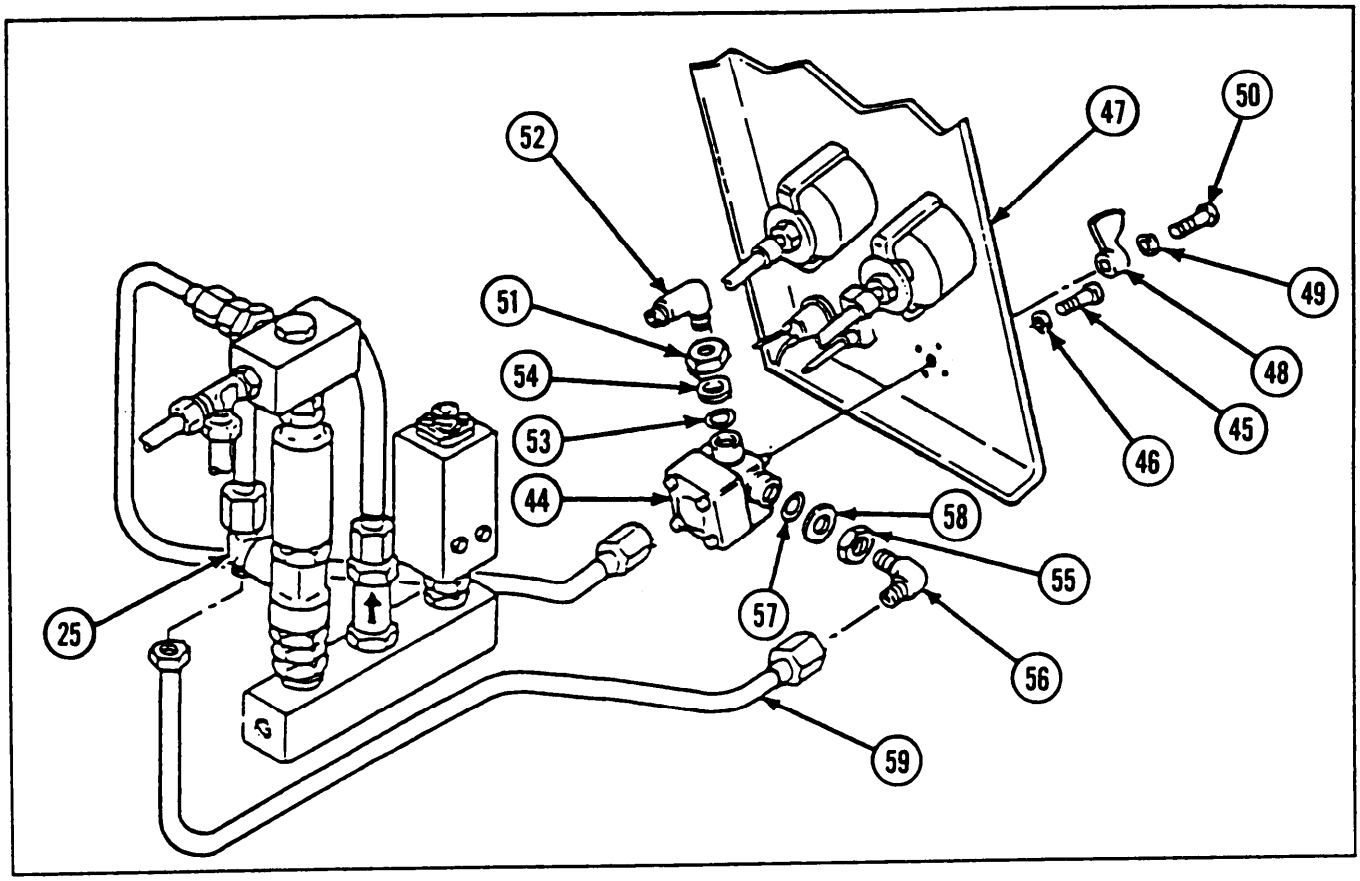
15 Install straight adapter (38) on check valve (37).

16 Install and connect metal tube assembly (39) to straight adapter (38).

17 Install new preformed packing (40), new tube fitting locknut (41), and tube tee (42) in manifold (31). Tighten tube fitting locknut.

18 Install and connect manifold check valve metal tube assembly (43) to check valve (15) and tube tee (25).





19 Install selector control plug valve (44).

20 Install four new Iockvvashers (45) and four machine screws (46) through driver's instrument panel (47) and selector control plug valve (44).

21 Install control valve handle (48), new Iockwasher (49), and machine screw (50) to driver's instrument panel (47) and selector control plug valve (44).

22 Install new tube fitting locknut (51) on tube elbow (52).

23 Install new preformed packing (53) and packing retainer (54) in selector control plug valve (44). Install tube elbow (52) in selector control plug valve (44) and tighten tube fitting locknut (51).

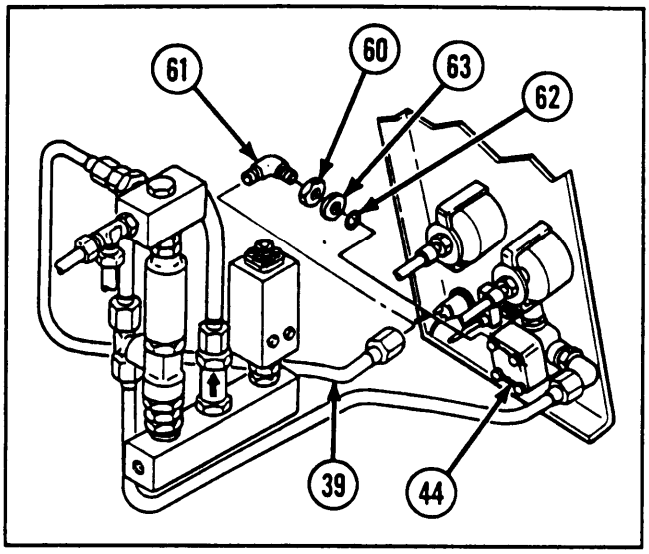
24 Install new tube fitting locknut (55) on tube elbow (56).

25 Install new preformed packing (57) and packing retainer (58) in selector control plug valve (44). Install tube elbow (56) in selector control plug valve, and tighten tube fitting locknut (55).

26 Install and connect control valve to check valve tee metal tube assembly (59) to tube tee (25) and tube elbow (56).

2-156. MAINTENANCE OF SUSPENSION LOCKOUT SYSTEM CONTROL VALVE AND ASSOCIATED PARTS (CONT).

INSTALLATION (CONT)



27 Install new tube fitting locknut (60) on tube elbow (61).

28 Install new preformed packing (62) and packing retainer (63) in selector control plug valve (44). Install tube elbow (61) in selector control plug valve, and tighten tube fitting locknut (60).

29 Connect metal tube assembly (39) to tube elbow (61).

2-157. MAINTENANCE OF SUSPENSION SYSTEM HYDRAULIC LINES AND FITTINGS (RIGHT SIDE) AND ATTACHING HARDWARE.

This task covers: a. *Removal* b. *Inspection/Repair* *c. Installation*

INITIAL SETUP

Materials/Parts
- Locknut (5)
- Locknut (2)
- Lockwasher (9)
- Preformed packing (4)
- Preformed packing (2)

References
- TM 9-2350-238-20-2
- TM 9-2350-238-24P-1

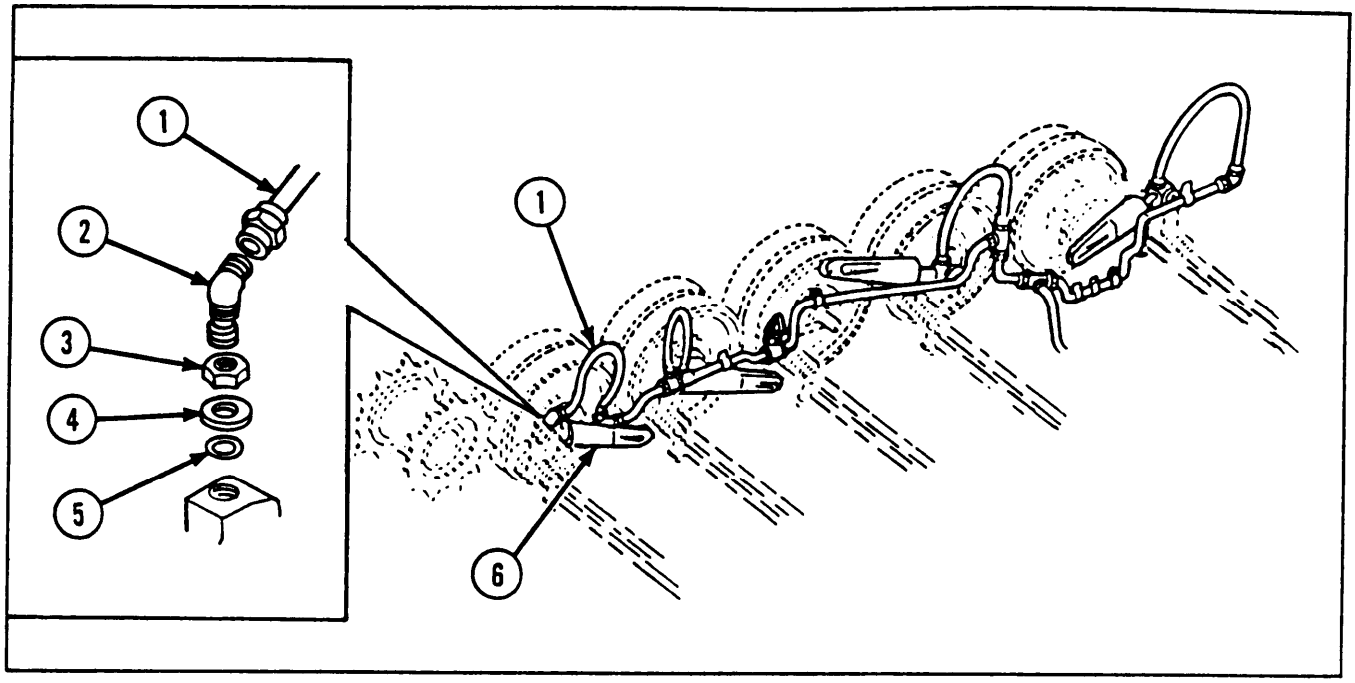
Equipment Conditions
- *2-382* Powerplant removed
- 2-918 Access cover removed
- 2-923 Cover plate removed
- Equipment stowage box removed from cab well (TM 9-2350-238-20-2)

General Safety Instructions

WARNING

- To avoid injury to personnel, do not tighten or loosen hydraulic fittings when system is pressurized.
- Lower the boom to stowed position before doing any maintenance on hydraulic system.
- Wipe up any spilled hydraulic fluid to prevent injury to personnel.

REMOVAL



WARNING

- To avoid injury to personnel, do not tighten or loosen hydraulic fittings when system is pressurized.
- Lower the boom to stowed position before doing any maintenance on hydraulic system.
- Wipe up any spilled hydraulic fluid to prevent injury to personnel.

CAUTION

Install covers on open hydraulic ports, tubes, and hoses immediately after disconnecting them to keep dirt out of hydraulic system.

NOTE

Access to suspension system hydraulic fittings is gained through the cab well.

1 Disconnect nonmetallic hose assembly (1) from tube elbow (2).

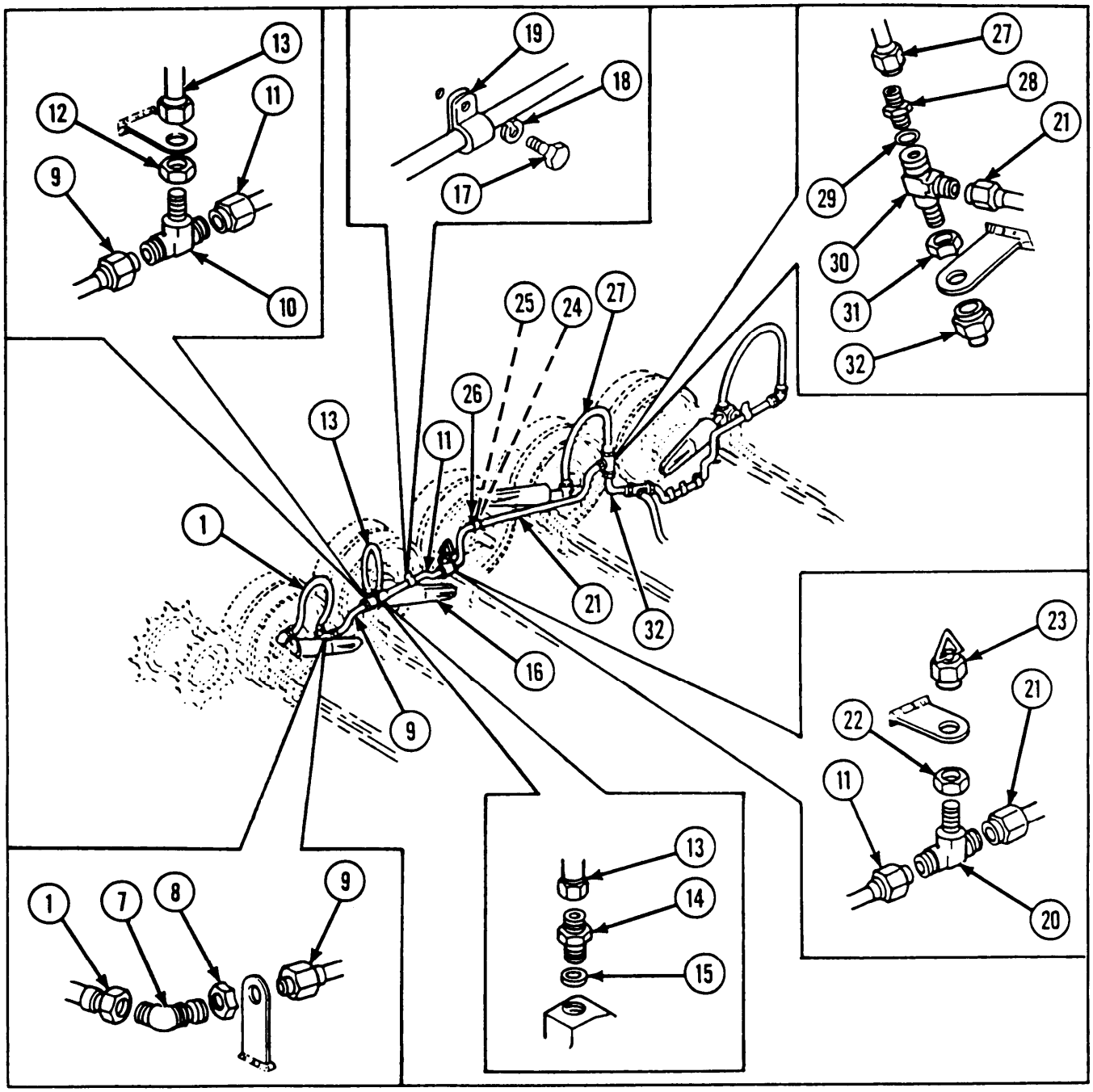
2 Loosen locknut (3) on tube elbow (2).

3 Remove tube elbow (2) with locknut (3), flat washer (4), and preformed packing (5) from lockout cylinder (6).

4 Remove preformed packing (5), flat washer (4), and locknut (3) from tube elbow (2).

2-157. MAINTENANCE OF SUSPENSION SYSTEM HYDRAULIC LINES AND FITTINGS (RIGHT SIDE) AND ATTACHING HARDWARE (CONT).

REMOVAL (CONT)



5 Disconnect nonmetallic hose assembly (1) from tube elbow (7).

6 Loosen locknut (8) on tube elbow (7).

7 Disconnect tube assembly (9) from tube elbow (7).

8 Remove tube elbow (7) with locknut (8) from hull bracket.

9 Remove locknut (8) from tube elbow (7).

10 Disconnect tube assembly (9) from lockout cylinder tee (10).

11 Disconnect tube assembly (11) from lockout cylinder tee (10).

12 Loosen locknut (12) on lockout cylinder tee (10).

13 Disconnect nonmetallic hose assembly (13) from lockout cylinder tee (10).

14 Remove lockout cylinder tee (10) with locknut (12) from hull bracket.

15 Remove locknut (12) from lockout cylinder tee (10).

16 Disconnect nonmetallic hose assembly (13) from tube nipple (14).

17 Remove tube nipple (14) with preformed packing (15) from lockout cylinder (16).

18 Remove preformed packing (15) from tube nipple (14).

19 Remove screw (17), Iockwasher (18), and loop clamp (19) from tube assembly (11).

20 Disconnect tube assembly (11) from lockout switch tee (20).

21 Disconnect tube assembly (21) from lockout switch tee (20).

22 Loosen locknut (22) on lockout switch tee (20).

23 Remove tube cap (23) form lockout switch tee (20).

24 Remove lockout switch tee (20) with locknut (22) from hull bracket.

25 Remove locknut (22) from lockout switch tee (20).

26 Remove screw (24), Iockwasher (25), and loop clamp (26) from tube assembly (21).

27 Disconnect nonmetallic hose assembly (27) from tube reducer (28).

28 Remove tube reducer (28) with preformed packing (29) from tee (30).

29 Remove preformed packing (29) from tube reducer (28).

30 Disconnect tube assembly (21) from tee (30).

31 Loosen locknut (31) on tee (30).

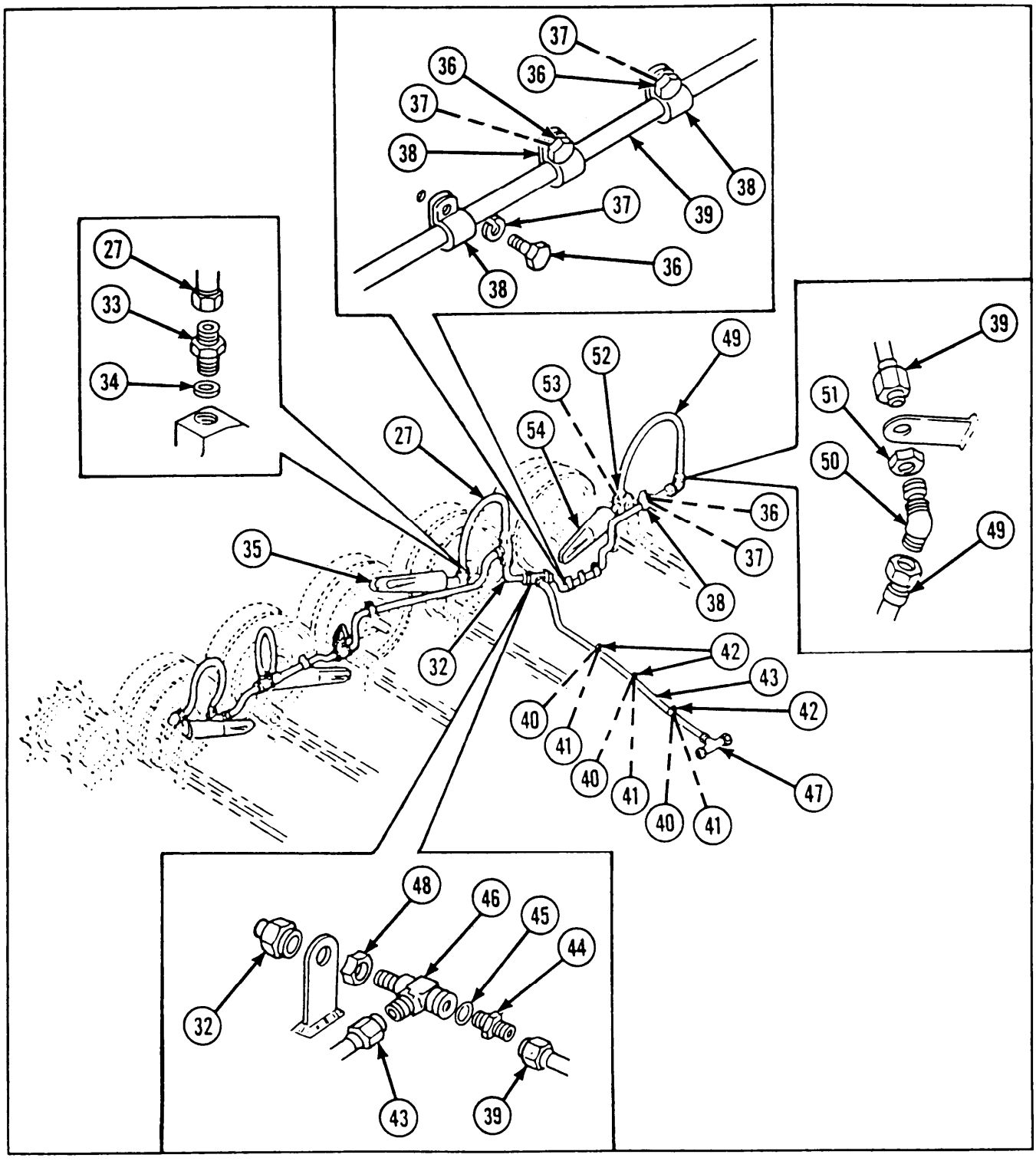
32 Disconnect tube assembly (32) from tee (30).

33 Remove tee (30) with locknut (31) from hull bracket.

34 Remove locknut (31) from tee (30).

2-157. MAINTENANCE OF SUSPENSION SYSTEM HYDRAULIC LINES AND FITTINGS (RIGHT SIDE) AND ATTACHING HARDWARE (CONT).

REMOVAL (CONT)



35 Disconnect nonmetallic hose assembly (27) from tube nipple (33).

36 Remove tube nipple (33) with preformed packing (34) from lockout cylinder (35).

37 Remove preformed packing (34) from tube nipple (33).

38 Remove four screws (36), four lockwashers (37), and four loop clamps (38) from metal tube assembly (39).

39 Remove three screws (40), three lockwashers (41), and three loop clamps (42) from tube assembly (43).

40 Disconnect metal tube assembly (39) from tube reducer (44).

41 Remove tube reducer (44) with preformed packing (45) from tee (46).

42 Remove preformed packing (45) from tube reducer (44).

43 Disconnect tube assembly (43) from tee (46).

44 Disconnect tube assembly (43) from lockout switch tee (47).

45 Loosen locknut (48) on tee (46).

46 Disconnect tube assembly (32) from tee (46).

47 Remove tee (46) with locknut (48) from hull bracket.

48 Remove locknut (48) from tee (46).

49 Disconnect nonmetallic hose assembly (49) from tube elbow (50).

50 Loosen locknut (51) on tube elbow (50).

51 Disconnect metal tube assembly (39) from tube elbow (50).

52 Remove tube elbow (50) with locknut (51) from hull bracket.

53 Remove locknut (51) from tube elbow (50).

54 Disconnect nonmetallic hose assembly (49) from tube nipple (52).

55 Remove tube nipple (52) with preformed packing (53) from lockout cylinder (54).

56 Remove preformed packing (53) from tube nipple (52).

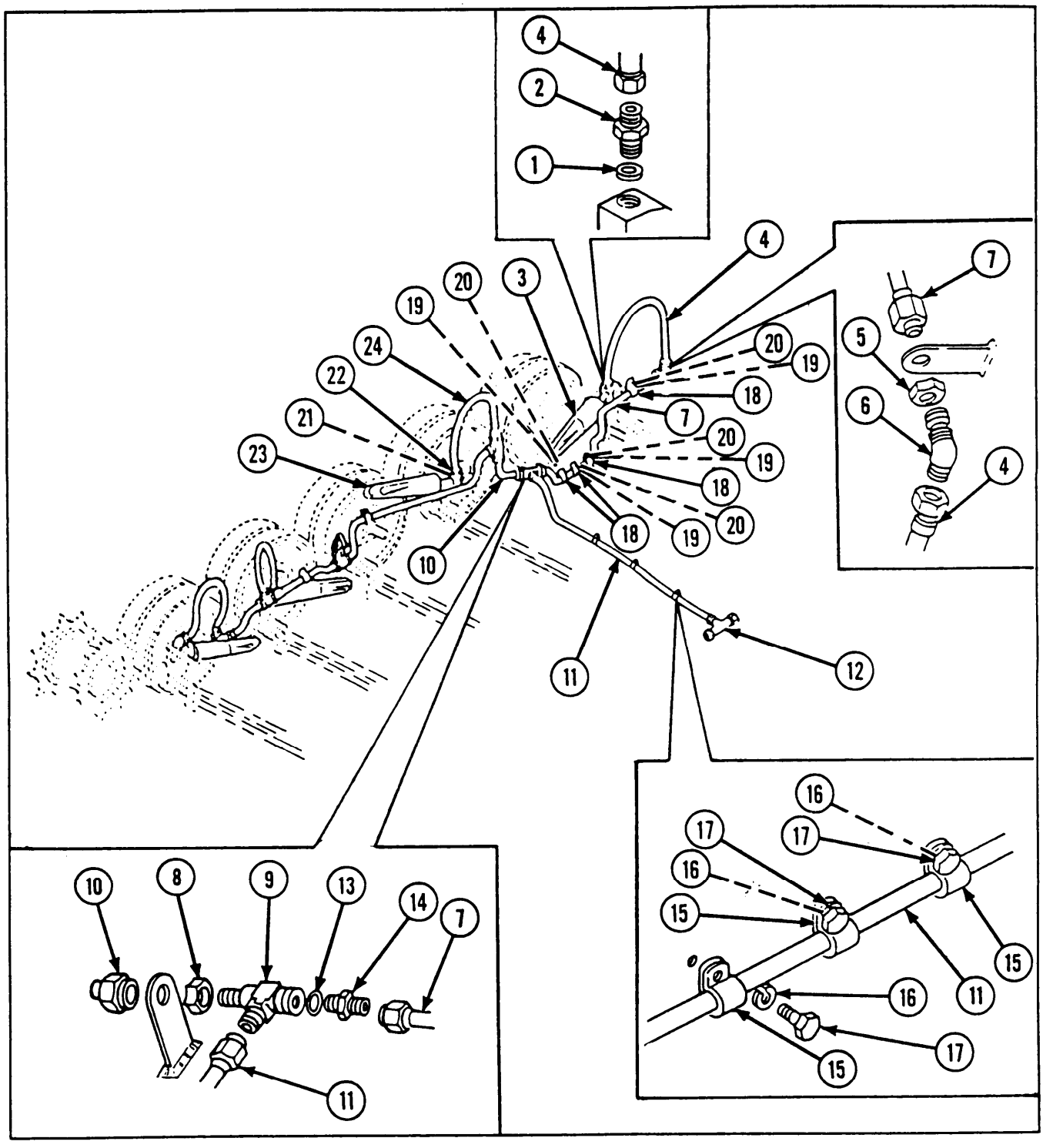
INSPECTION/REPAIR

1 Check for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-157. MAINTENANCE OF SUSPENSION SYSTEM HYDRAULIC LINES AND FITTINGS (RIGHT SIDE) AND ATTACHING HARDWARE (CONT).

INSTALLATION



1 Install new preformed packing (1) on tube nipple (2).

2 Install tube nipple (2) with new preformed packing (1) on lockout cylinder (3).

3 Install nonmetallic hose assembly (4) on tube nipple (2).

4 Install new locknut (5) on tube elbow (6).

5 Install tube elbow (6) with new locknut (5) on hull bracket.

6 Install metal tube assembly (7) on tube elbow (6).

7 Tighten locknut (5) on tube elbow (6).

8 Connect nonmetallic hose assembly (4) to tube elbow (6).

9 Install new locknut (8) on tee (9).

10 Install tee (9) with new locknut (8) on hull bracket.

11 Install tube assembly (10) on tee (9).

12 Tighten locknut (8) on tee (9).

13 Install tube assembly (11) on lockout switch tee (12).

14 Connect tube assembly (11) to tee (9).

15 Install new preformed packing (13) on tube reducer (14).

16 Install tube reducer (14) with new preformed packing (13) on tee (9).

17 Connect metal tube assembly (7) to tube reducer (14).

18 Install three loop clamps (15), three new lockwashers (16), and three screws (17) on tube assembly (11).

19 Install four loop clamps (18), four new lockwashers (19), and four screws (20) on metal tube assembly (7).

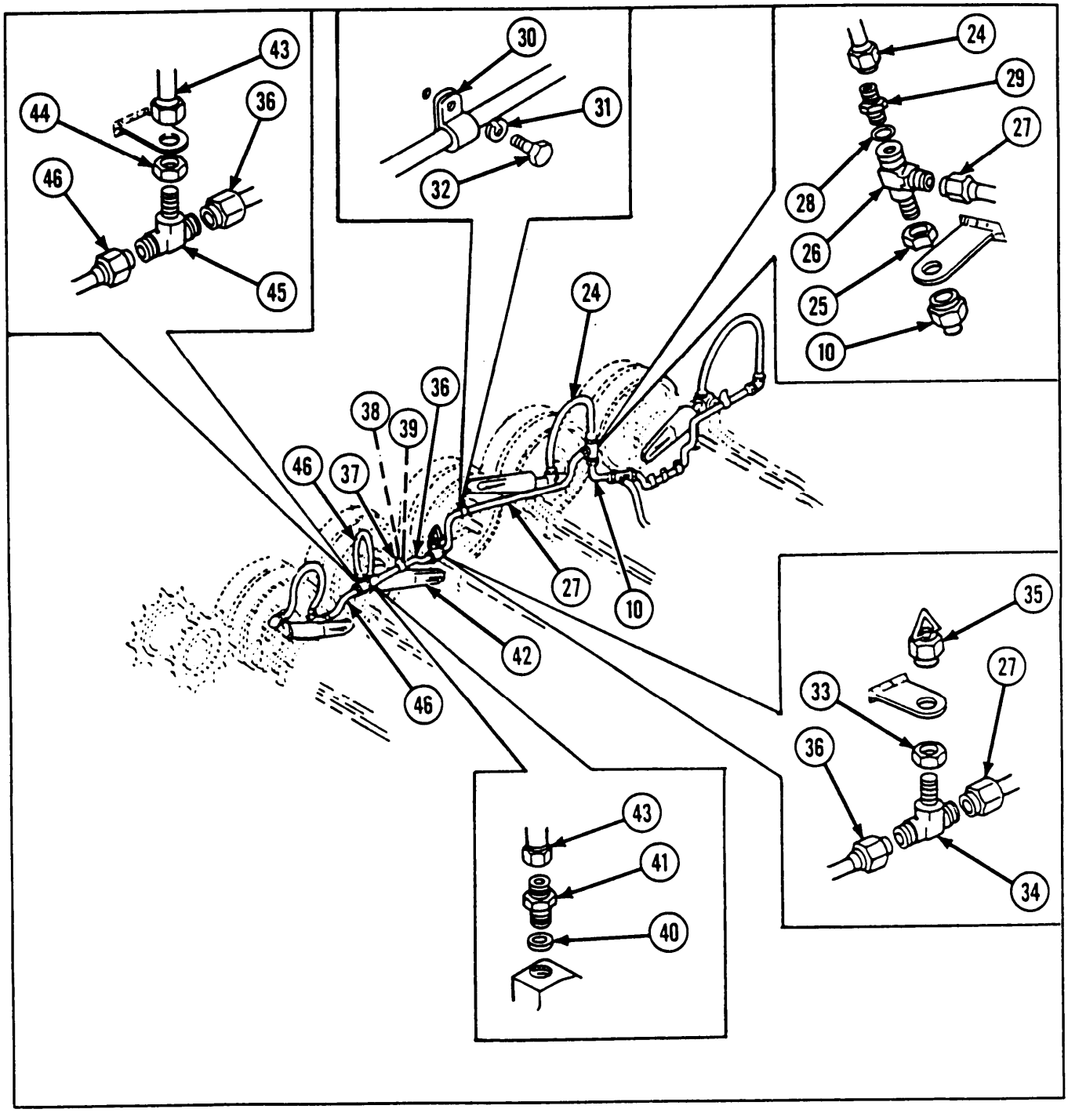
20 Install new preformed packing (21) on tube nipple (22).

21 Install tube nipple (22) with new preformed packing (21) on lockout cylinder (23).

22 Install nonmetallic hose assembly (24) on tube nipple (22).

2-157. MAINTENANCE OF SUSPENSION SYSTEM HYDRAULIC LINES AND FITTINGS (RIGHT SIDE) AND ATTACHING HARDWARE (CONT).

INSTALLATION (CONT)



23 Install new locknut (25) on tee (26).

24 Install tee (26) with new locknut (25) on hull bracket.

25 Connect tube assembly (10) to tee (26).

26 Tighten locknut (25) on tee (26).

27 Install tube assembly (27) on tee (26).

28 Install new preformed packing (28) on tube reducer (29).

29 Install tube reducer (29) with new preformed packing (28) on tee (26).

30 Connect nonmetallic hose assembly (24) to tube reducer (29).

31 Install loop clamp (30), new lockwasher (31), and screw (32) on tube assembly (27).

32 Install new locknut (33) on lockout switch tee (34).

33 Install lockout switch tee (34) with new locknut (33) on hull bracket.

34 Install tube cap (35) on lockout switch tee (34).

35 Tighten locknut (33) on lockout switch tee (34).

36 Connect tube assembly (27) to lockout switch tee (34).

37 Install tube assembly (36) on lockout switch tee (34).

38 Install loop clamp (37), lockwasher (38), and screw (39) on tube assembly (36).

39 Install new preformed packing (40) on tube nipple (41).

40 Install tube nipple (41) with new preformed packing (40) on lockout cylinder (42).

41 Install nonmetallic hose assembly (43) on tube nipple (41).

42 Install new locknut (44) on lockout cylinder tee (45).

43 Install lockout cylinder tee (45) with new locknut (44) on hull bracket.

44 Connect nonmetallic hose assembly (43) to lockout cylinder tee (45).

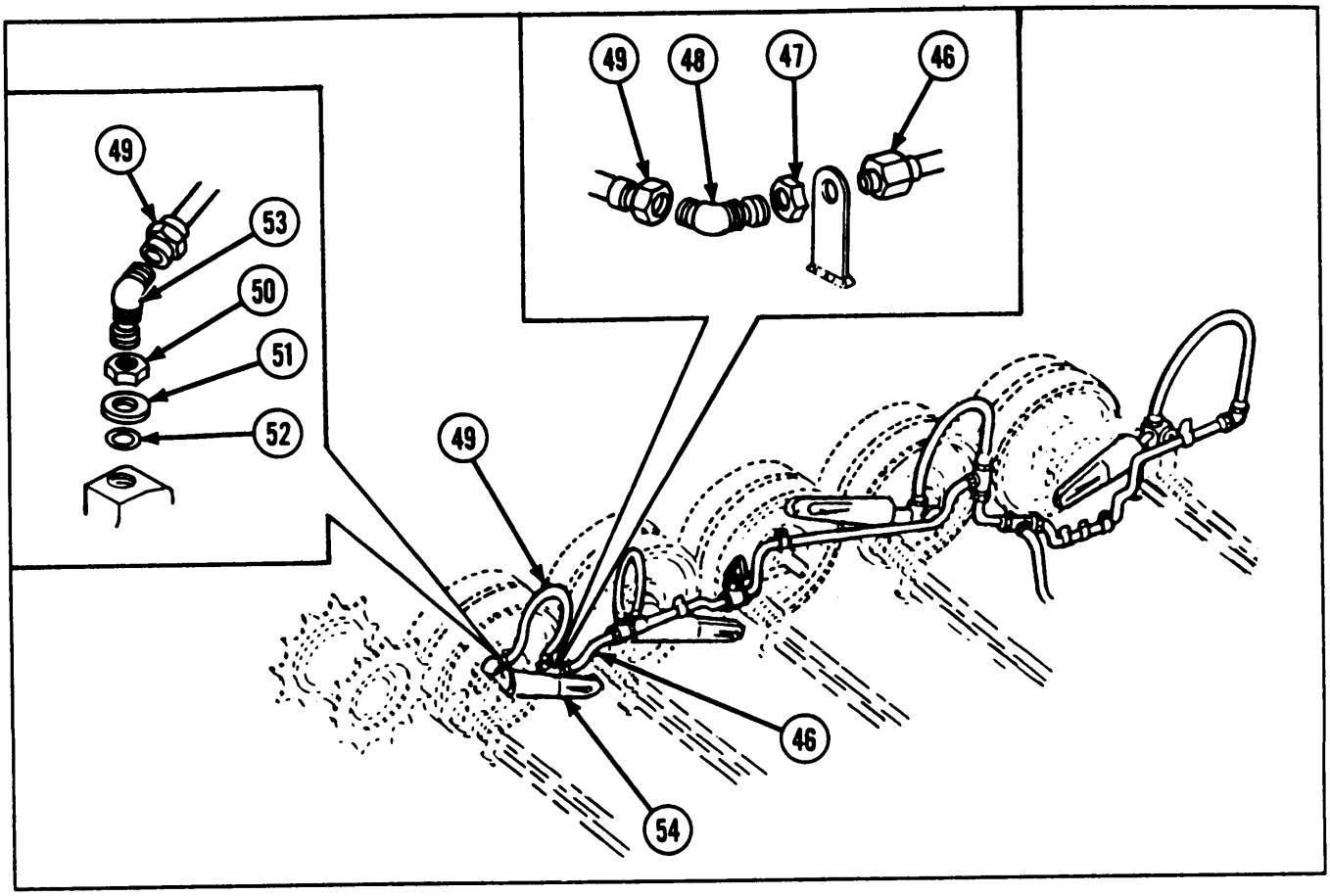
45 Tighten locknut (44) on lockout cylinder tee (45).

46 Connect tube assembly (36) to lockout cylinder tee (45).

47 Install tube assembly (46) on lockout cylinder tee (45).

2-157. MAINTENANCE OF SUSPENSION SYSTEM HYDRAULIC LINES AND FITTINGS (RIGHT SIDE) AND ATTACHING HARDWARE (CONT).

INSTALLATION (CONT)



48 Install new locknut (47) on tube elbow (48).

49 Install tube elbow (48) with new locknut (47) on hull bracket.

50 Connect tube assembly (46) to tube elbow (48).

51 Tighten locknut (47) on tube elbow (48).

52 Install nonmetallic hose assembly (49) on tube elbow (48).

53 Install new locknut (50), flat washer (51), and new preformed packing (52) on tube elbow (53).

54 Install tube elbow (53) with new locknut (50), flat washer (51), and new preformed packing (52) on lockout cylinder (54).

55 Tighten locknut (50) on tube elbow (53).

56 Connect nonmetallic hose assembly (49) to tube elbow (53).

2-158. MAINTENANCE OF SUSPENSION SYSTEM HYDRAULIC LINES AND FITTINGS (LEFT SIDE) AND ATTACHING HARDWARE.

This task covers: a. *Removal/Disassembly* c. *Reassembly/Installation*
b. *Inspection/Repair*

INITIAL SETUP

Materials/Parts
Lockwasher (12)
Preformed packing
Preformed packing (5)
Tube fitting locknut (10)

References
TM 9-2350-238-20-2
TM 9-2350-238-24P-1

Equipment Conditions
2-640 Batteries and battery tray removed
2-952 Drivets seat removed
2-928 Driver's compartment forward and aft cowls removed
Equipment stowage box removed (TM 9-2350-238-20-2)

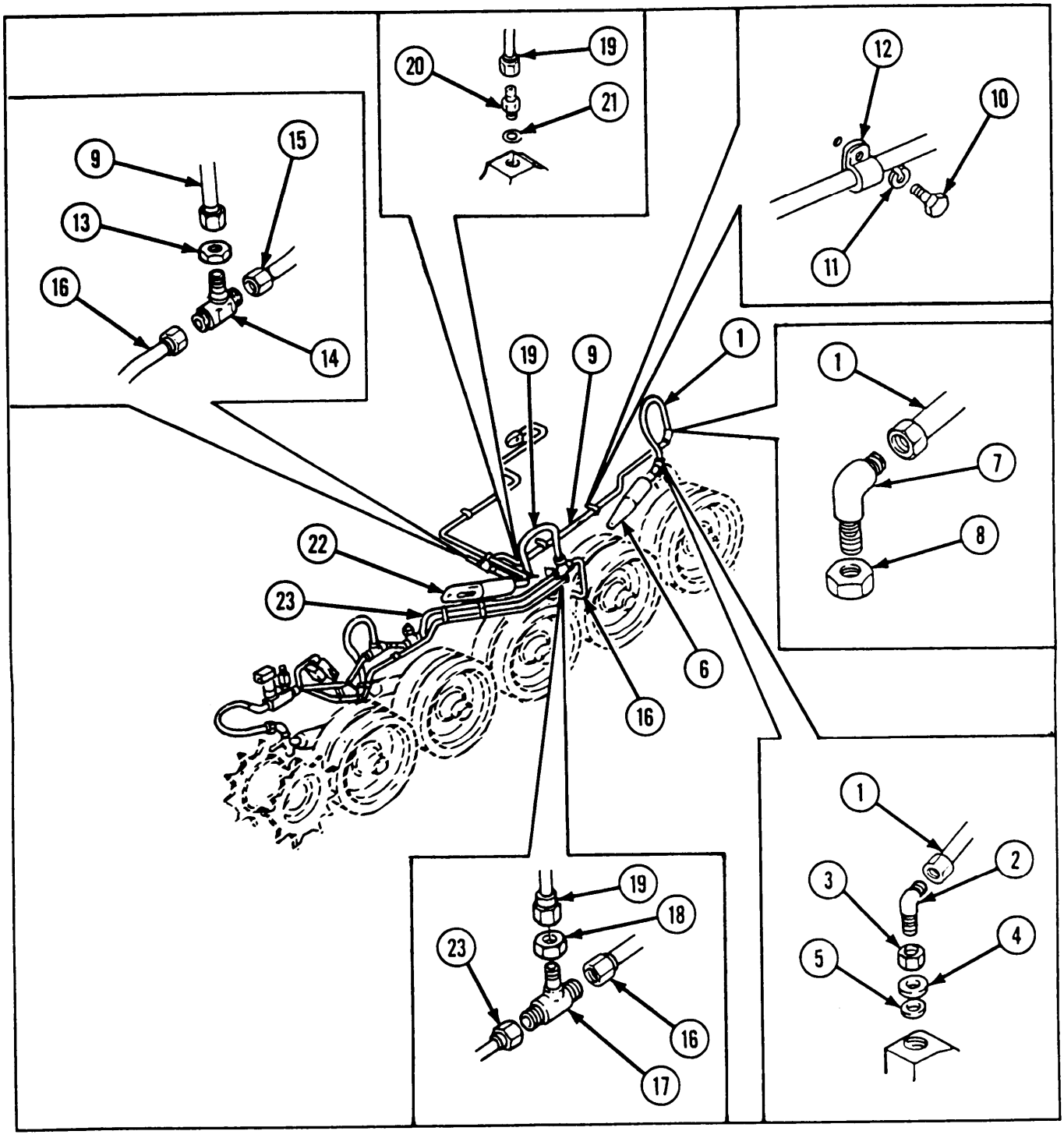
General Safety Instructions

WARNING

- To avoid injury to personnel, do not tighten or loosen hydraulic fittings when system is pressurized.
- Lower the boom to stowed position before doing any maintenance on hydraulic system.
- Wipe up any spilled hydraulic fluid to prevent injury to personnel.

2-158. MAINTENANCE OF SUSPENSION SYSTEM HYDRAULIC LINES AND FITTINGS (LEFT SIDE) AND ATTACHING HARDWARE (CONT).

REMOVAL/DISASSEMBLY



WARNING

- To avoid injury to personnel, do not tighten or loosen hydraulic fittings when system is pressurized.
- Lower the boom to stowed position before doing any maintenance on hydraulic system.
- Wipe up any spilled hydraulic fluid to prevent injury to personnel.

CAUTION

Install covers on open hydraulic ports, tubes, and hoses immediately after disconnecting them to keep dirt out of hydraulic system.

NOTE

Access to suspension system hydraulic fittings is gained through the hull well.

1 Disconnect hose assembly (1) from tube elbow (2).

2 Loosen tube fitting locknut (3) on tube elbow (2).

3 Remove tube elbow (2), tube fitting locknut (3), flat washer (4), and preformed packing (5) from lockout cylinder (6).

4 Remove preformed packing (5), flat washer (4), and tube fitting locknut (3) from tube elbow (2).

5 Remove hose assembly (1) from tube elbow (7).

6 Loosen tube fitting locknut (8) on tube elbow (7).

7 Remove tube elbow (7) with tube fitting locknut (8) from tube assembly (9).

8 Remove two capscrews (10), two lockwashers (11), and two loop clamps (12) from tube assembly (9).

9 Loosen tube fitting locknut (13) on lockout switch tee (14).

10 Remove tube assembly (9) from lockout switch tee (14).

11 Disconnect tube assembly (15) from lockout switch tee (14).

12 Disconnect tube assembly (16) from lockout switch tee (14).

13 Remove lockout switch tee (14) with tube fitting locknut (13) from bulkhead.

14 Remove tube fitting locknut (13) from lockout switch tee (14).

15 Remove tube assembly (16) from lockout switch tee (17).

16 Loosen tube fitting locknut (18) on lockout switch tee (17).

17 Disconnect hose assembly (19) from lockout switch tee (17).

18 Remove hose assembly (19) from tube nipple (20).

19 Remove tube nipple (20) with preformed packing (21) from lockout cylinder (22).

20 Remove preformed packing (21) from tube nipple (20).

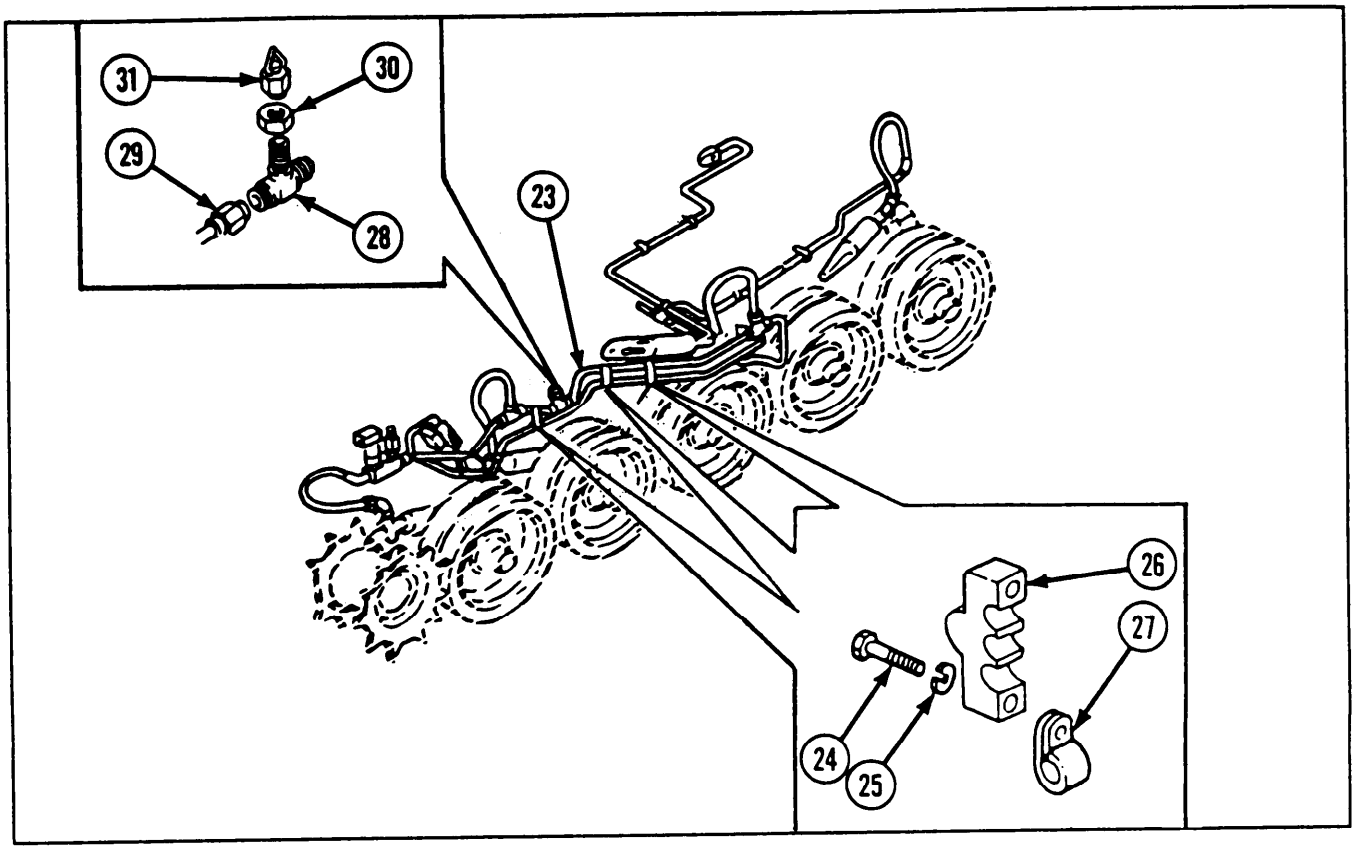
21 Disconnect tube assembly (23) from lockout switch tee (17).

22 Remove lockout switch tee (17) with tube fitting locknut (18) from bulkhead.

23 Remove tube fitting locknut (18) from lockout switch tee (17).

2-158. MAINTENANCE OF SUSPENSION SYSTEM HYDRAULIC LINES AND FITTINGS (LEFT SIDE) AND ATTACHING HARDWARE (CONT).

REMOVAL/DISASSEMBLY (CONT)



24 Remove six screws (24), six lockwashers (25), three retaining straps (26), and three loop clamps (27) from tube assemblies.

25 Remove tube assembly (23) from lockout switch tee (28).

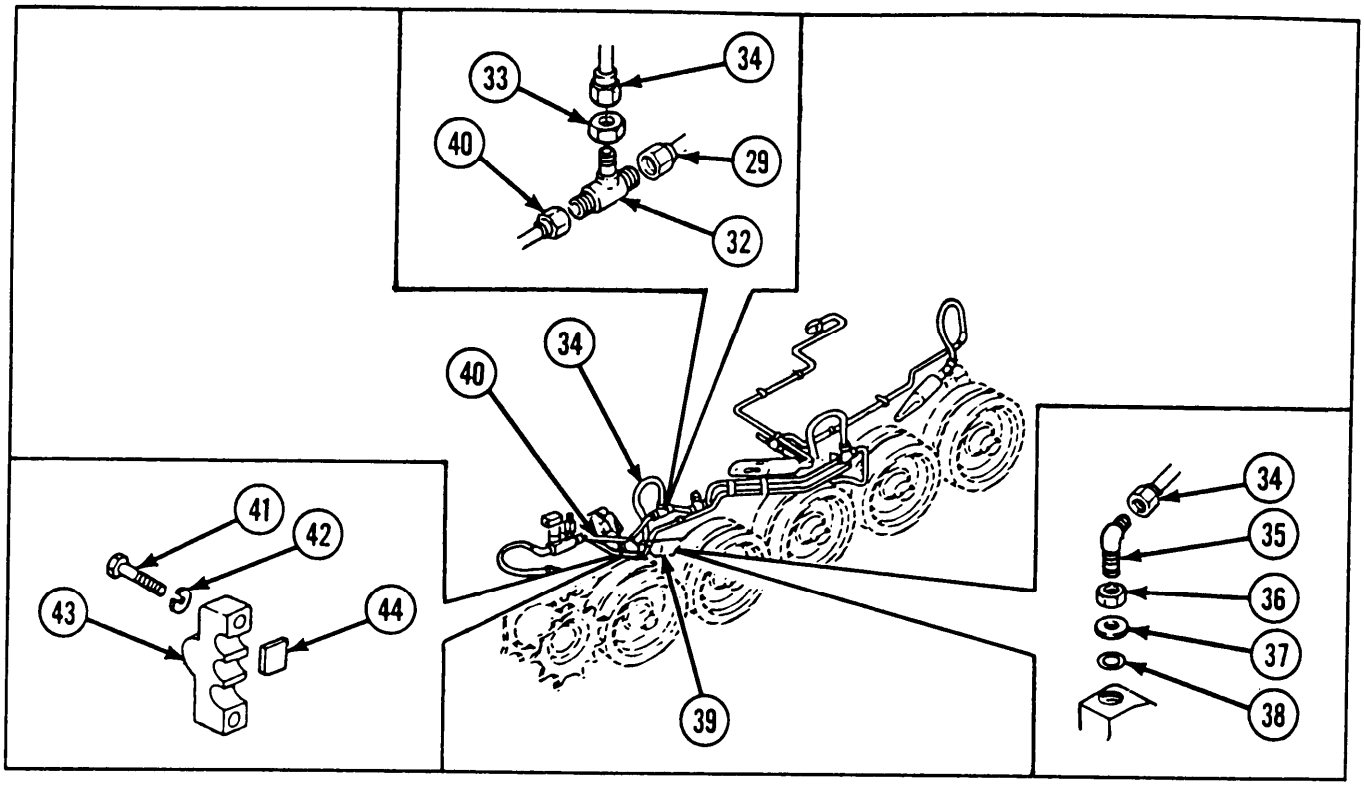
26 Disconnect tube assembly (29) from lockout switch tee (28).

27 Loosen tube fitting locknut (30) on lockout switch tee (28).

28 Remove tube cap (31) from lockout switch tee (28).

29 Remove lockout switch tee (28) with tube fitting locknut (30) from bulkhead.

30 Remove tube fitting locknut (30) from lockout switch tee (28).



31 Remove tube assembly (29) from lockout switch tee (32).

32 Loosen tube fitting locknut (33) on lockout switch tee (32).

33 Disconnect hose assembly (34) from lockout switch tee (32).

34 Remove hose assembly (34) from tube elbow (35).

35 Loosen tube fitting locknut (36) on tube elbow (35).

36 Remove tube elbow (35), tube fitting locknut (36), flat washer (37), and preformed packing (38) from lockout cylinder (39).

37 Remove preformed packing (38), flat washer (37), and tube fitting locknut (36) from tube elbow (35).

38 Disconnect tube assembly (40) from lockout switch tee (32).

39 Remove lockout switch tee (32) and tube fitting locknut (33) from bulkhead.

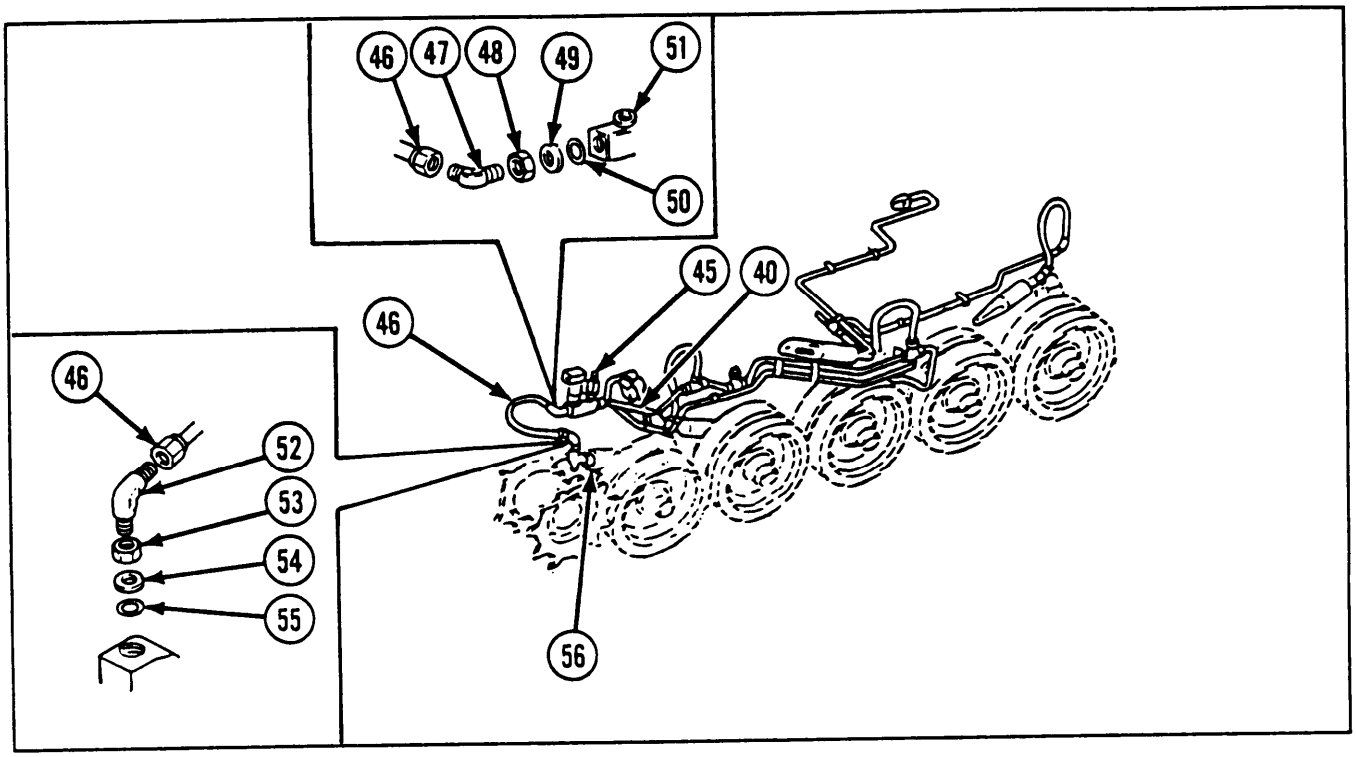
40 Remove tube fitting locknut (33) from lockout switch tee (32).

41 Remove four screws (41), four lockwashers (42), and two retaining straps (43) from tube assemblies.

42 If damaged, remove two spacers (44) from two retaining straps (43).

2-158. MAINTENANCE OF SUSPENSION SYSTEM HYDRAULIC LINES AND FITTINGS (LEFT SIDE) AND ATTACHING HARDWARE (CONT).

REMOVAL/DISASSEMBLY (CONT)



43 Remove tube assembly (40) from pressure switch (45).

44 Disconnect hose assembly (46) from tube elbow (47).

45 Loosen tube fitting locknut (48) on tube elbow (47).

46 Remove tube elbow (47), tube fitting locknut (48), flat washer (49), and preformed packing (50) from manifold (51).

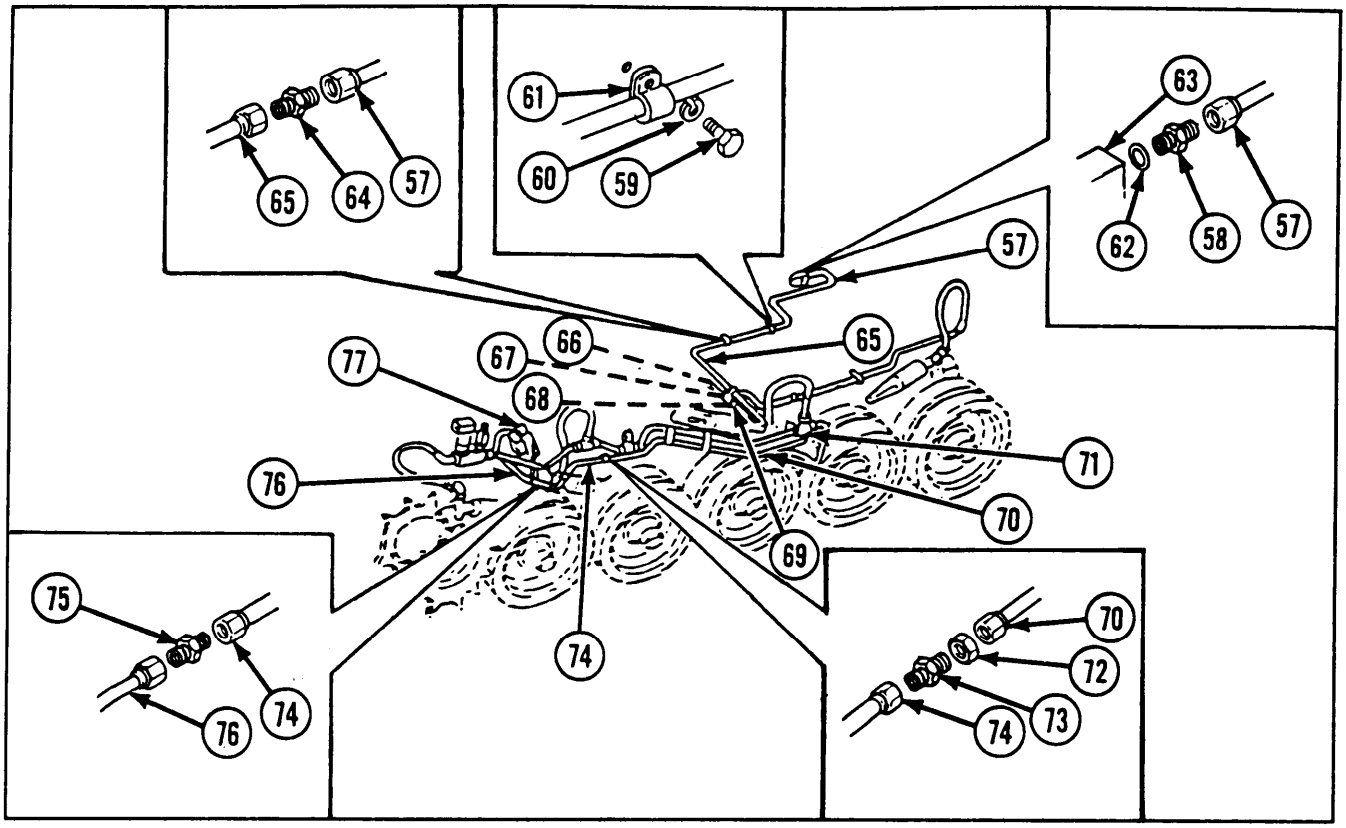
47 Remove preformed packing (50), flat washer (49), and tube fitting locknut (48) from tube elbow (47).

48 Remove hose assembly (46) from tube elbow (52).

49 Loosen tube fitting locknut (53) on tube elbow (52).

50 Remove tube elbow (52), tube fitting locknut (53), flat washer (54), and preformed packing (55) from lockout cylinder (56).

51 Remove preformed packing (55), flat washer (54), and tube fitting locknut (53) from tube elbow (52).



52 Disconnect tube assembly (57) from tube reducer (58).

53 Remove capscrew (59), lockwasher (60), and loop clamp (61) from tube assembly (57).

54 Remove tube reducer (58) and preformed packing (62) from flange (63).

55 Remove tube assembly (57) from tube nipple (64).

56 Remove tube nipple (64) from tube assembly (65).

57 Remove capscrew (66), lockwasher (67), and loop clamp (68) from tube assembly (65).

Remove tube assembly (65) from tube nipple (69).

59 Disconnect tube assembly (70) from tube nipple (71).

60 Loosen tube fitting locknut (72) on tube nipple (73).

61 Remove tube assembly (70) from tube nipple (73).

62 Disconnect tube assembly (74) from tube nipple (73).

63 Remove tube nipple (73) and tube fitting locknut (72) from bulkhead.

64 Remove tube fitting locknut (72) from tube nipple (73).

65 Remove tube assembly (74) from tube reducer (75).

66 Remove tube reducer (75) from tube assembly (76).

67 Remove tube assembly (76) from valve (77).

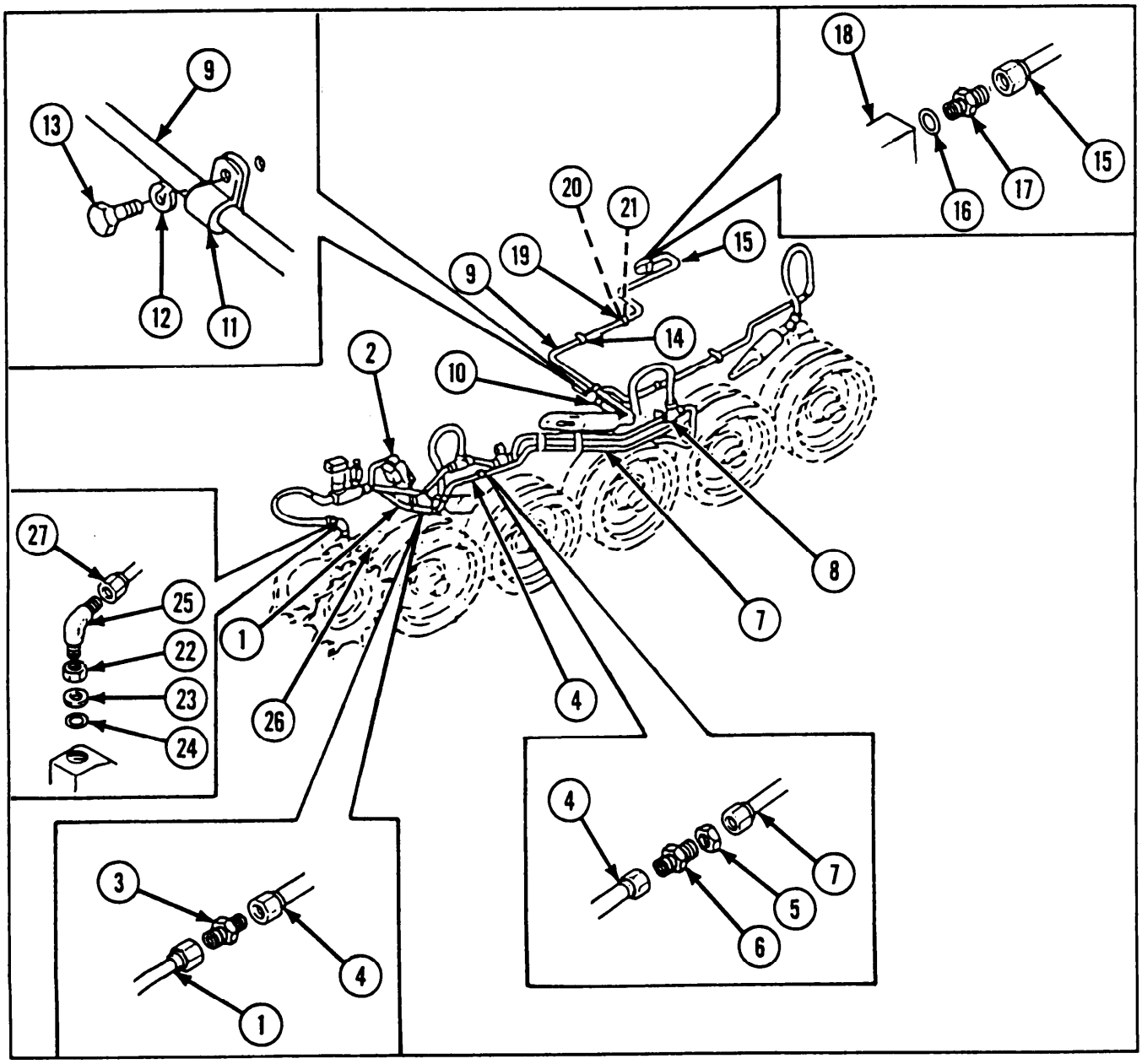
2-158. MAINTENANCE OF SUSPENSION SYSTEM HYDRAULIC LINES AND FITTINGS (LEFT SIDE) AND ATTACHING HARDWARE (CONT).

INSPECTION/REPAIR

1 Check for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY/INSTALLATION



1 Install tube assembly (1) on valve (2).

2 Install tube reducer (3) on tube assembly (1).

3 Install tube assembly (4) on tube reducer (3).

4 Install new tube fitting locknut (5) on tube nipple (6).

5 Install tube nipple (6) with tube fitting locknut (5) on bulkhead.

6 Connect tube assembly (4) to tube nipple (6).

7 Install tube assembly (7) on tube nipple (6).

8 Tighten tube fitting locknut (5) on tube nipple (6).

9 Connect tube assembly (7) to tube nipple (8).

10 Install tube assembly (9) on tube nipple (10).

11 Install loop clamp (11), new lockwasher (12), and capscrew (13) on tube assembly (9).

12 Install tube nipple (14) on tube assembly (9).

13 Install tube assembly (15) on tube nipple (14).

14 Install new preformed packing (16) and tube reducer (17) on flange (18).

15 Install loop clamp (19), new lockwasher (20), and capscrew (21) on tube assembly (15).

16 Connect tube assembly (15) to tube reducer (17).

17 Install new tube fitting locknut (22), flat washer (23), and new preformed packing (24) on tube elbow (25).

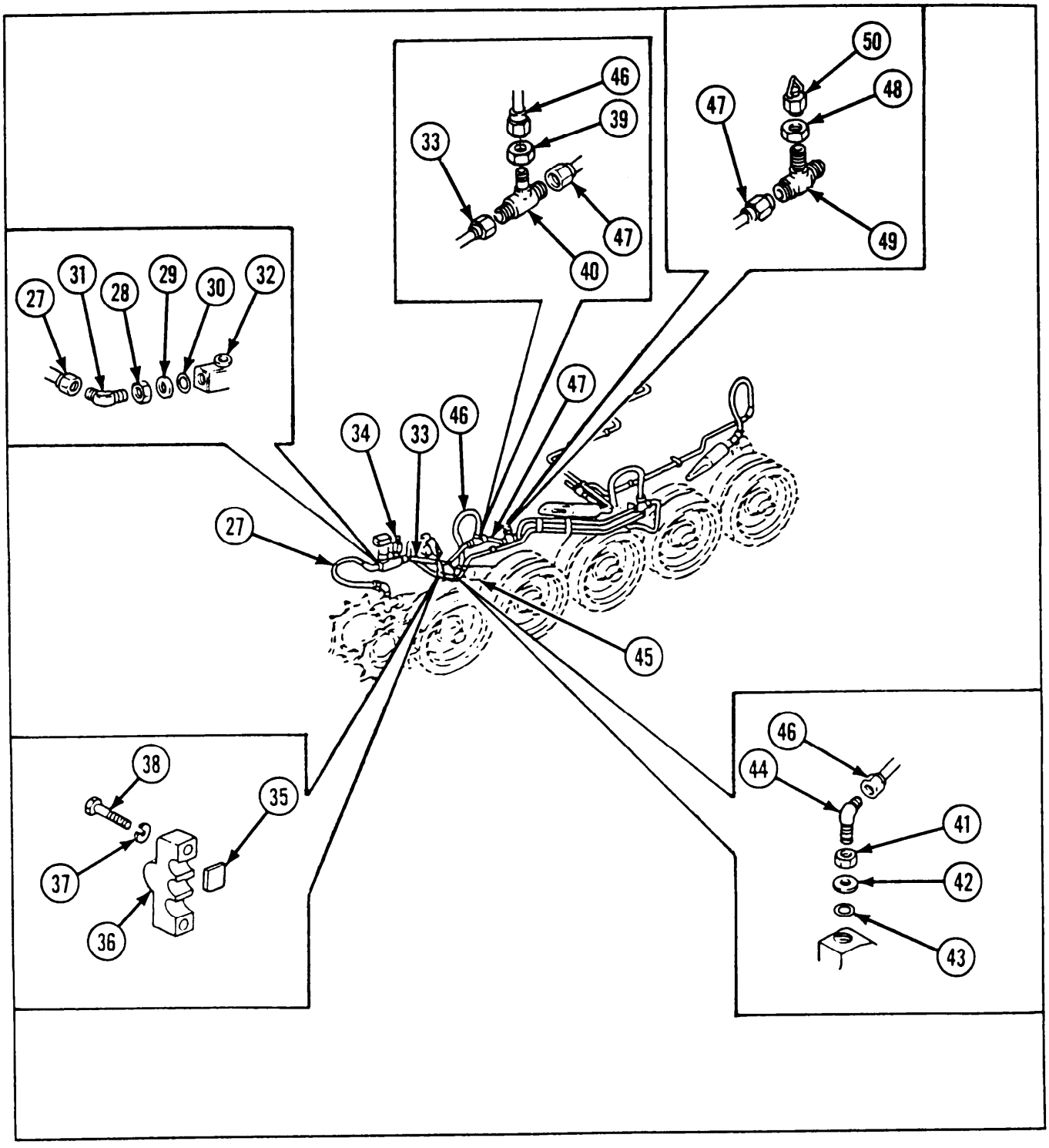
18 Install tube elbow (25) with attached parts on lockout cylinder (26).

19 Tighten tube fitting locknut (22) on tube elbow (25).

20 Install hose assembly (27) on tube elbow (25).

2-158. MAINTENANCE OF SUSPENSION SYSTEM HYDRAULIC LINES AND FITTINGS (LEFT SIDE) AND ATTACHING HARDWARE (CONT).

REASSEMBLY/INSTALLATION (CONT)



21 Install new tube fitting locknut (28), flat washer (29), and new preformed packing (30) on tube elbow (31).

22 Install tube elbow (31) with attached parts on manifold (32).

23 Tighten tube fitting locknut (28) on tube elbow (31).

24 Connect hose assembly (27) to tube elbow (31).

25 Install tube assembly (33) on pressure switch (34).

26 If removed, install two new spacers (35) on two retaining straps (36).

27 Install two retaining straps (36), four new lockwashers (37), and four screws (38) on tube assemblies.

28 Install new tube fitting locknut (39) on lockout switch tee (40).

29 Install lockout switch tee (40) with tube fitting locknut (39) on bulkhead.

30 Connect tube assembly (33) to lockout switch tee (40).

31 Install new tube fitting locknut (41), flat washer (42), and new preformed packing (43) on tube elbow (44).

32 Install tube elbow (44) with attached parts on lockout cylinder (45).

33 Tighten tube fitting locknut (41) on tube elbow (44).

34 Install hose assembly (46) on tube elbow (44).

35 Connect hose assembly (46) to lockout switch tee (40).

36 Tighten tube fitting locknut (39) on lockout switch tee (40).

37 Install tube assembly (47) on lockout switch tee (40).

38 Install new tube fitting locknut (48) on lockout switch tee (49).

39 Install lockout switch tee (49) with tube fitting locknut (48) on bulkhead.

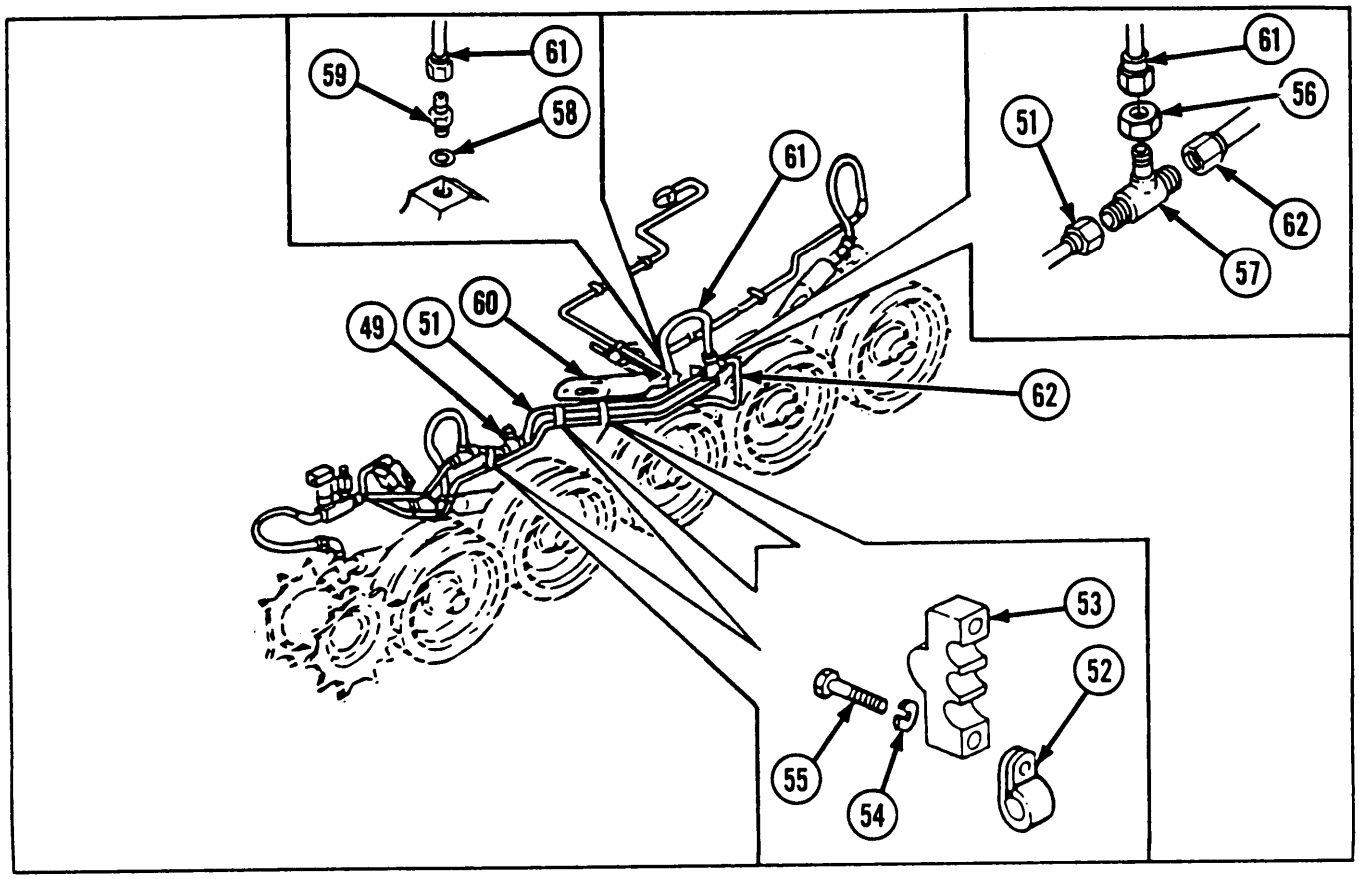
40 Install tube cap (50) on lockout switch tee (49).

41 Tighten tube fitting locknut (48) on lockout switch tee (49).

42 Connect tube assembly (47) to lockout switch tee (49).

2-158. MAINTENANCE OF SUSPENSION SYSTEM HYDRAULIC LINES AND FITTINGS (LEFT SIDE) AND ATTACHING HARDWARE (CONT).

REASSEMBLY/INSTALLATION (CONT)



43 Install tube assembly (51) on lockout switch tee (49).

44 Install three loop clamps (52), three retaining straps (53), six new lockwashers (54), and six screws (55) on tube assemblies.

45 Install new tube fitting locknut (56) on lockout switch tee (57).

46 Install lockout switch tee (57) with tube fitting locknut (56) on bulkhead.

47 Connect tube assembly (51) to lockout swifch tee (57).

48 Install new preformed packing (58) on tube nipple (59).

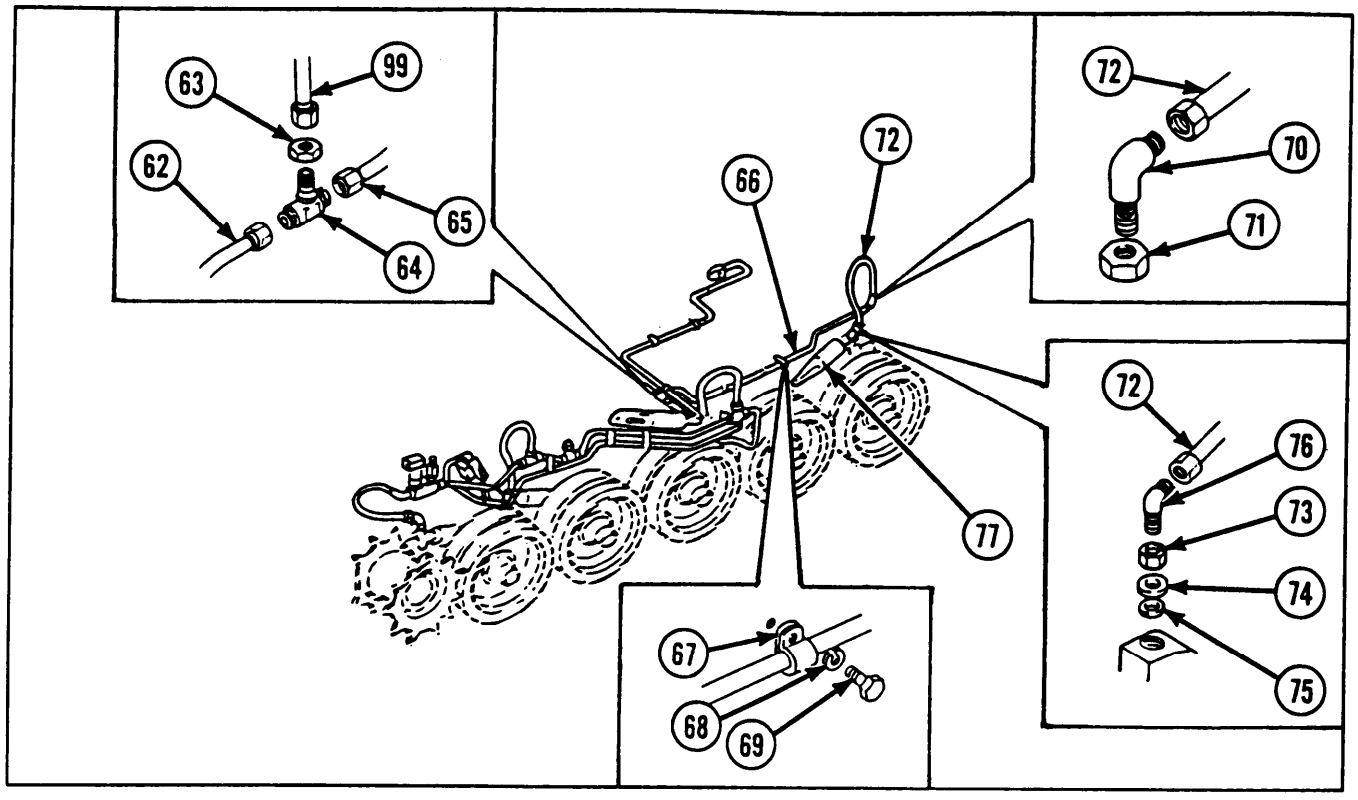
49 Install tube nipple (59) and preformed packing (58) on lockout cylinder (60).

50 Install hose assembly (61) on tube nipple (59).

51 Connect hose assembly (61) to lockout switch tee (57).

52 Tighten tube fitting locknut (56) on lockout switch tee (57).

53 Install tube assembly (62) on lockout switch tee (57).



54 Install new tube fitting locknut (63) on lockout switch tee (64).

55 Install lockout switch tee (64) with tube fitting locknut (63) on bulkhead.

56 Connect tube assembly (62) to lockout switch tee (64).

57 Connect tube assembly (65) to lockout switch tee (64).

58 Install tube assembly (66) on lockout switch tee (64).

59 Tighten tube fitting locknut (63) on lockout switch tee (64).

60 Install two loop clamps (67), two lock-washers (68), and two capscrews (69) on tube assembly (66).

61 Install tube elbow (70) and new tube fitting locknut (71) on tube assembly (66).

62 Tighten tube fitting locknut (71) on tube elbow (70).

63 Install hose assembly (72) on tube elbow (70).

64 Install new tube fitting locknut (73), flat washer (74), and new preformed packing (75) on tube elbow (76).

65 Install tube elbow (76) with attached parts on lockout cylinder (77).

66 Tighten tube fitting locknut (73) on tube elbow (76).

67 Connect hose assembly (72) to tube elbow (76)|

2-159. MAINTENANCE OF HULL COVERS AND ACCESS DOORS.

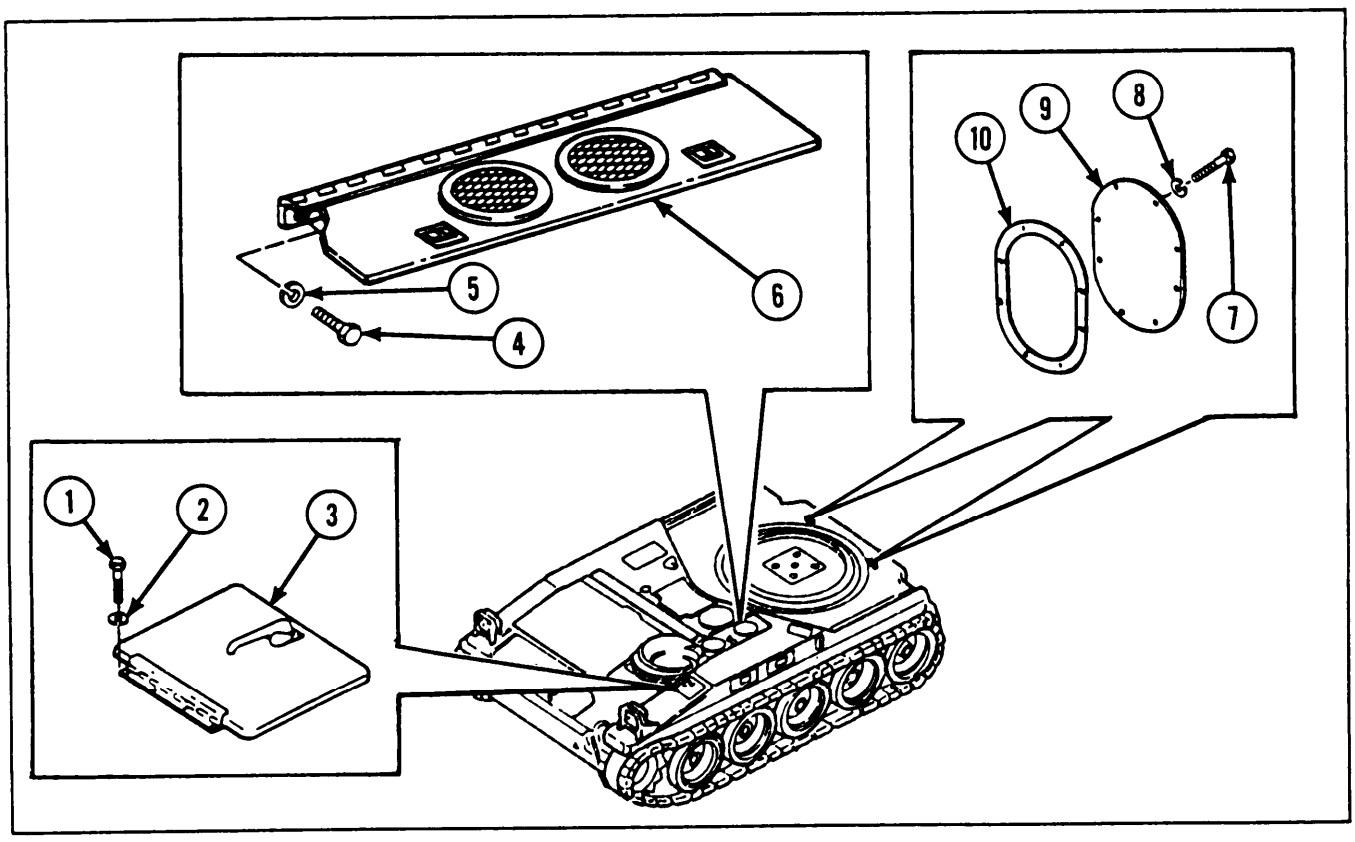
This task covers:
a. *Removal/Disassembly*
b. *Inspection/Repair*
c. *Reassembly/installation*

INITIAL SETUP

Materials/Parts
Cotter pin
Cotter pin (2)
Fan well cleanout access cover gasket
Gasket (3)
Hydraulic access cover gasket (2)
Lockwasher(11)
Lockwasher (42)
Spring tension washer
Turret hull cleanout cover gasket

References
TM 9-2350-238-24P-1

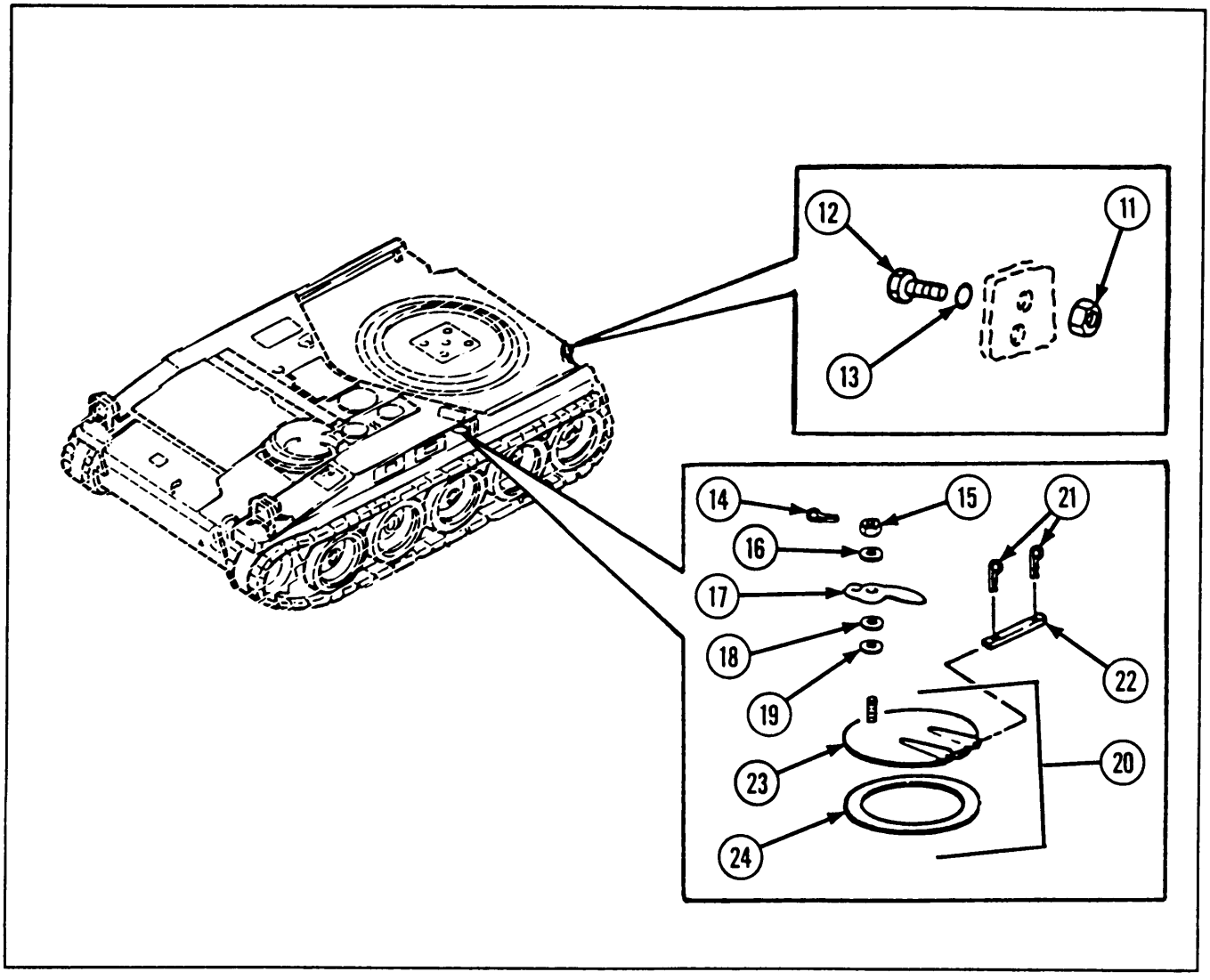
REMOVAL/DISASSEMBLY



1 Remove four hexagon head capscrews (1), four lockwashers (2), and air cleaner blower access door assembly (3) from hull.

2 Remove 11 hexagon head capscrews (4), 11 Iockwashers (5), and battery access cover (6) from hull.

3 Remove 16 hexagon head capscrews (7), 16 Iockwashers (8), 2 rear hydraulic access covers (9), and 2 hydraulic access cover gaskets (10) from hull.

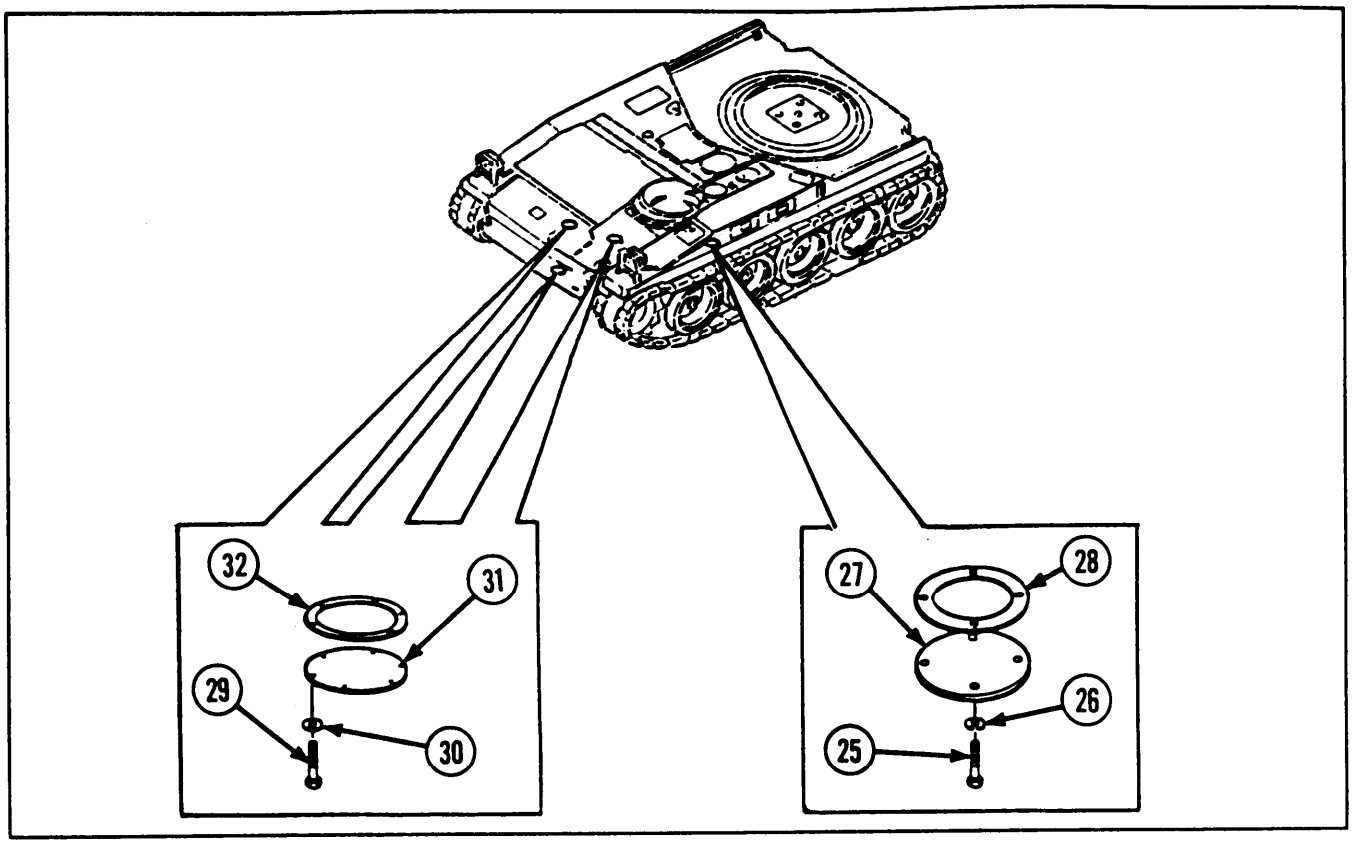


4 Remove two locknuts (11), two screws (12), and two preformed packings (13) from two unused holes in the hull wall.

5 Remove cotter pin (14), slotted plain nut (15), flat washer (16), turret cover handle (17), flat washer (18), and spring tension washer (19) from turret hull cleanout access door (20).

6 Remove two cotter pins (21), headless straight pin (22), turret hull cleanout assembly cover (23), and turret hull cleanout cover gasket (24) from hull.

REMOVAL/DISASSEM8LY (CONT)



7 Remove four hexagon head capscrews (25), four Iockwashers (26), fan well cleanout access cover (27), and fan well cleanout access cover gasket (28) from hull.

8 Remove 18 hexagon head capscrews (29), 18 Iockwashers (30), 1 transmission drain and 2 radiator drain access covers (31), and 2 radiator drain and 1 transmission drain gaskets (32) from hull.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

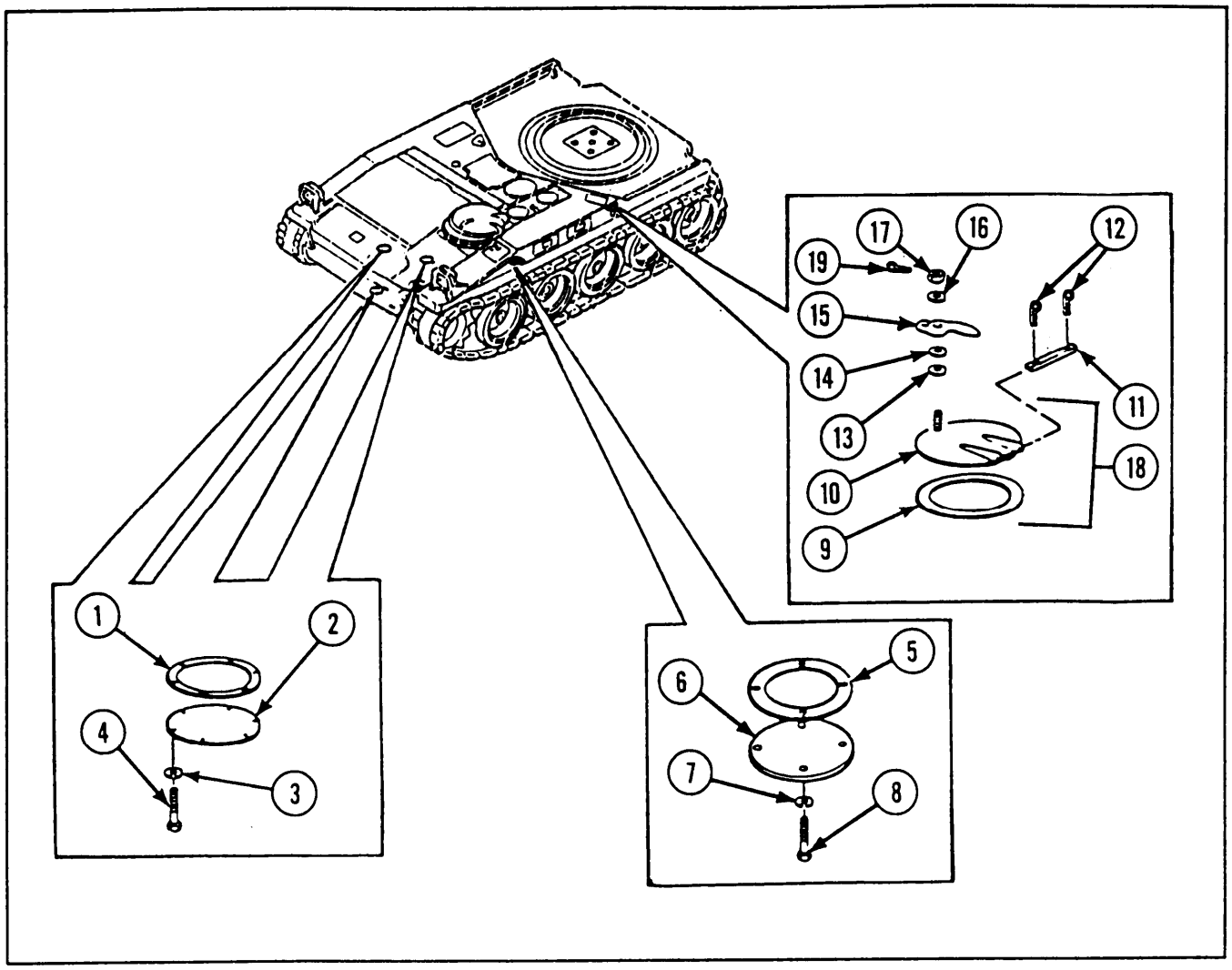
2 if turret hull cleanout assembly cover is broken, damaged, or missing, repair is by replacement of next higher assembly.

3 Air cleaner blower access door assembly is a repairable assembly. Notify direct support maintenance.

4 Battery access cover is a repairable assembly. Notify direct support maintenance.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

REASSEMBLY/INSTALLATION



1 Install three new gaskets (1) on two radiator drain and one transmission drain access covers (2).

2 Install 1 transmission drain and 2 radiator drain access covers (2) on hull. Secure with 18 new lockwashers (3) and 18 hexagon head capscrews (4).

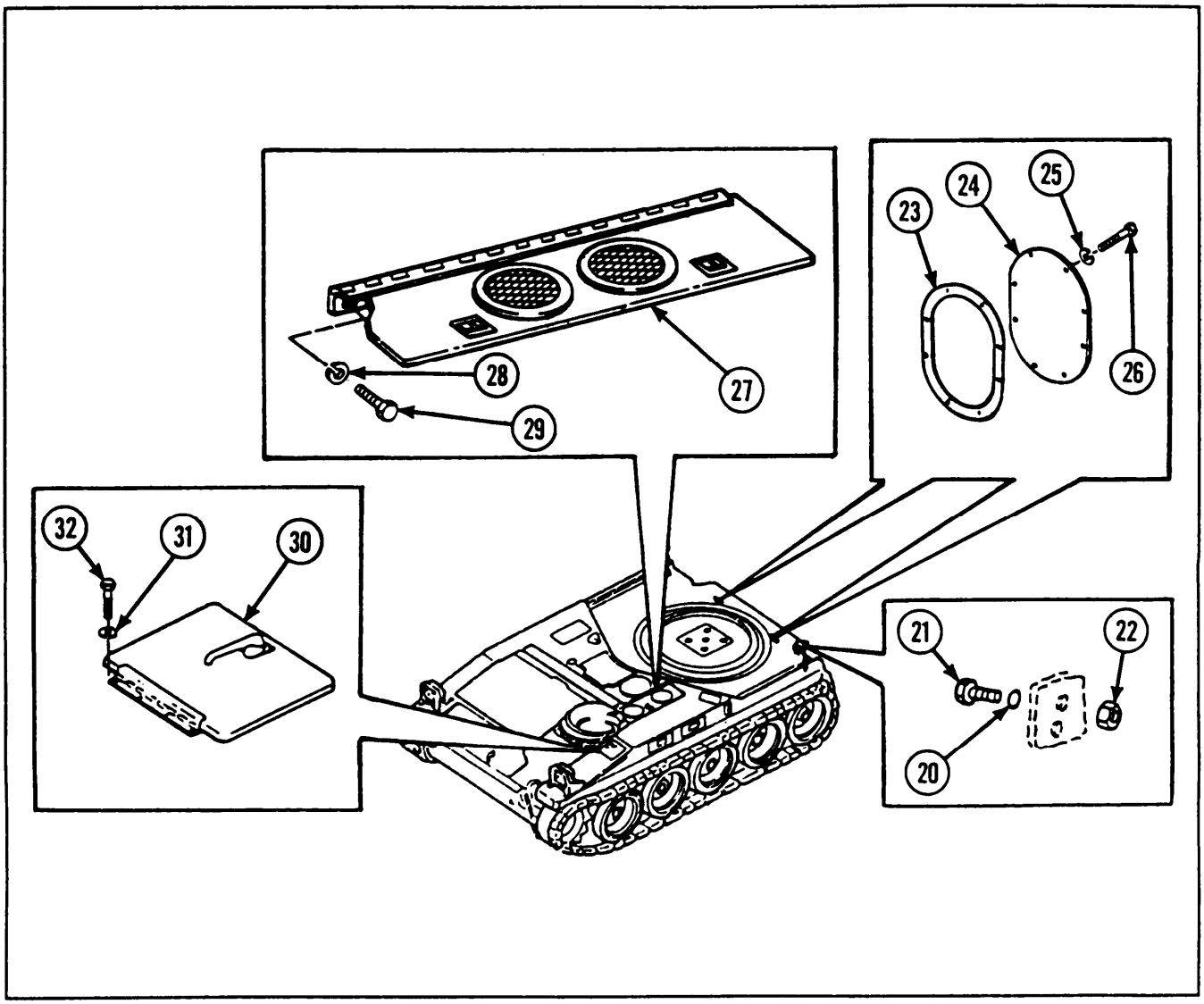
3 Install fan well cleanout access cover gasket (5), fan well cleanout access cover (6), four new lockwashers (7), and four hexagon head capscrews (8) on hull.

4 Install turret hull cleanout cover gasket (9), turret hull cleanout assembly cover (10), headless straight pin (11), and two new cotter pins (12) on hull.

5 Install new spring tension washer (13), flat washer (14), turret cover handle (15), flat washer (16), and slotted plain nut (17) on turret hull cleanout access door (18). Secure with new cotter pin (19).

2-159. MAINTENANCE OF HULL COVERS AND ACCESS DOORS (CONT).

REASSEMBLY/INSTALLATION (CONT)



6 Install two new preformed packings (20), two screws (21), and two new locknuts (22) in two unused holes in the hull wall.

7 Install 2 hydraulic access cover gaskets (23) and 2 rear hydraulic access covers (24) on hull. Secure with 16 new lockwashers (25) and 16 hexagon head capscrews (26).

8 Install battery access cover (27) on hull and secure with 11 new lockwashers (28) and 11 hexagon head capscrews (29).

9 Install air cleaner blower access door assembly (30) on hull and secure with four new lockwashers (31) and four hexagon head capscrews (32).

2-160. MAINTENANCE OF HULL COVERS, DOORS, AND PLATES.

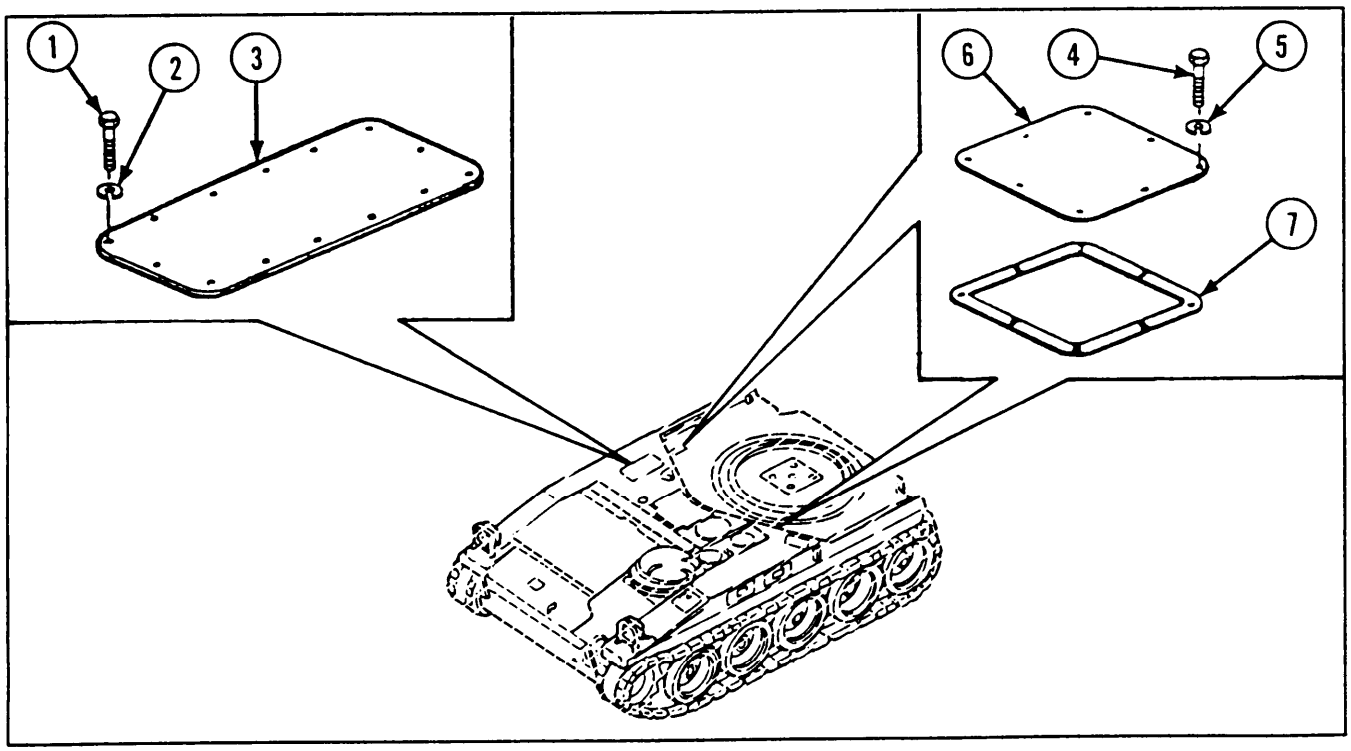
This task covers:	a. *Removal*	b. *Inspection/Repair*	*c. Installation*

INITIAL SETUP

Materials/Parts
- Air cleaner blower access cover gasket
- CO, bottle access cover gasket (2)
- Fuel filter access door seal (figure D-10, appx D)
- Gasket
- Lockwasher (42)
- Self-locking nut (18)

References
- TM 9-2350-238-24P-1

REMOVAL

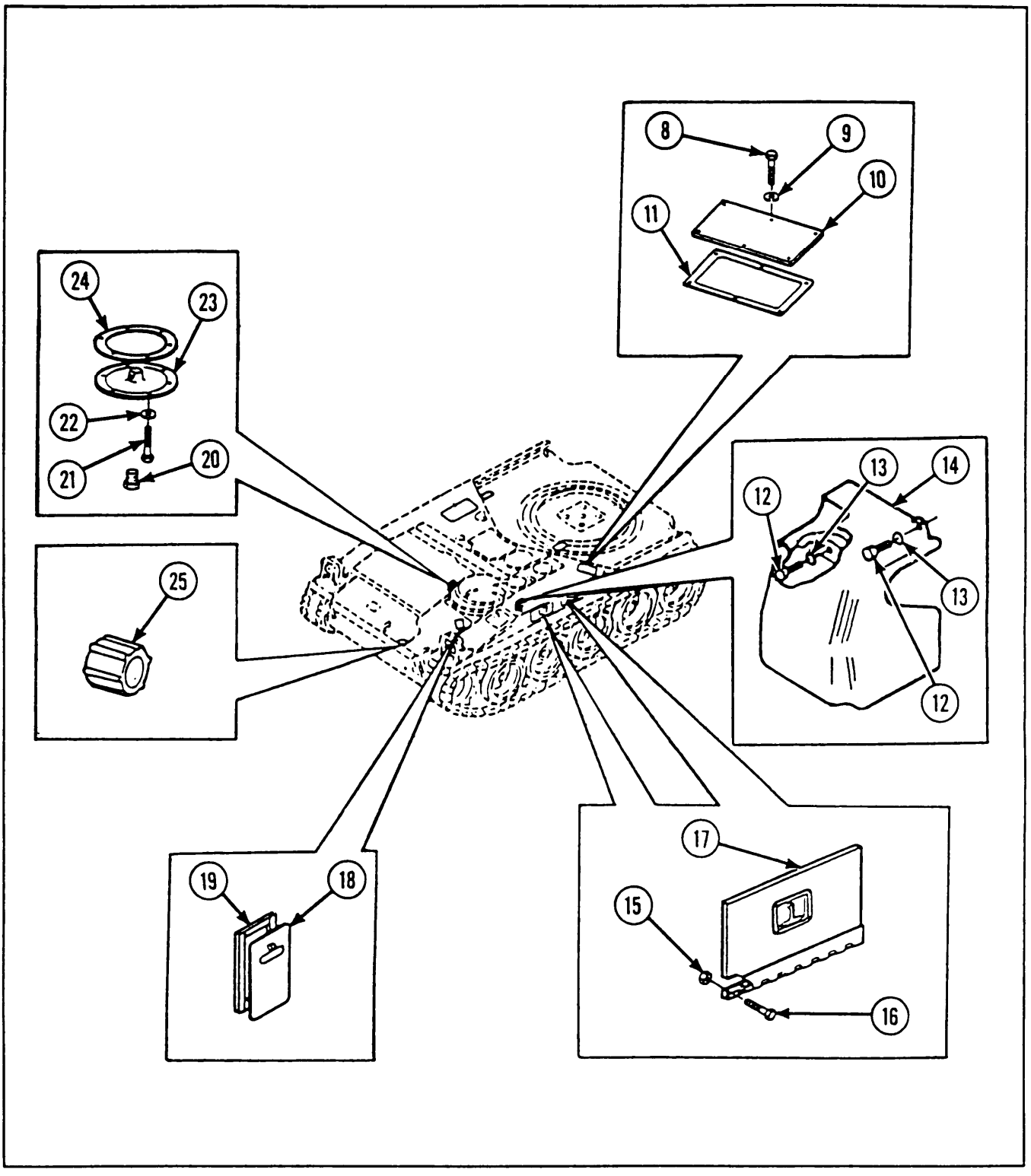


1 Remove 14 hexagon head capscrews (1), 14 lockwashers (2), and hull cover plate (3) from hull.

2 Remove 16 hexagon head capscrews (4), 16 lockwashers (5), 2 access covers (6), and 2 $C0_2$ bottle access cover gaskets (7) from hull.

2-160. MAINTENANCE OF HULL COVERS, DOORS, AND PLATES (CONT).

REMOVAL (CONT)



3 Remove six hexagon head capscrews (8), six Iockwashers (9), air cleaner blower access hull cover assembly (10), and air cleaner blower access cover gasket (11) from hull.

4 Remove two capscrews (12), two Iockwashers (13), and access cover (14) from hull.

5 Remove 18 self-locking nuts (15), 18 machine screws (16), and 2 air cleaner access doors (17) from hull.

6 Remove engine fuel filter access door (18) from hull.

7 If damaged, remove fuel filter access door seal (19).

8 Remove pipe plug (20), six hexagon head capscrews (21), six Iockwashers (22), power plant reservoir drain access cover (23), and gasket (24) from hull.

9 Remove two protective caps (25) from hull.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Fuel filter access door seal is a manufactured item, refer to appendix D.

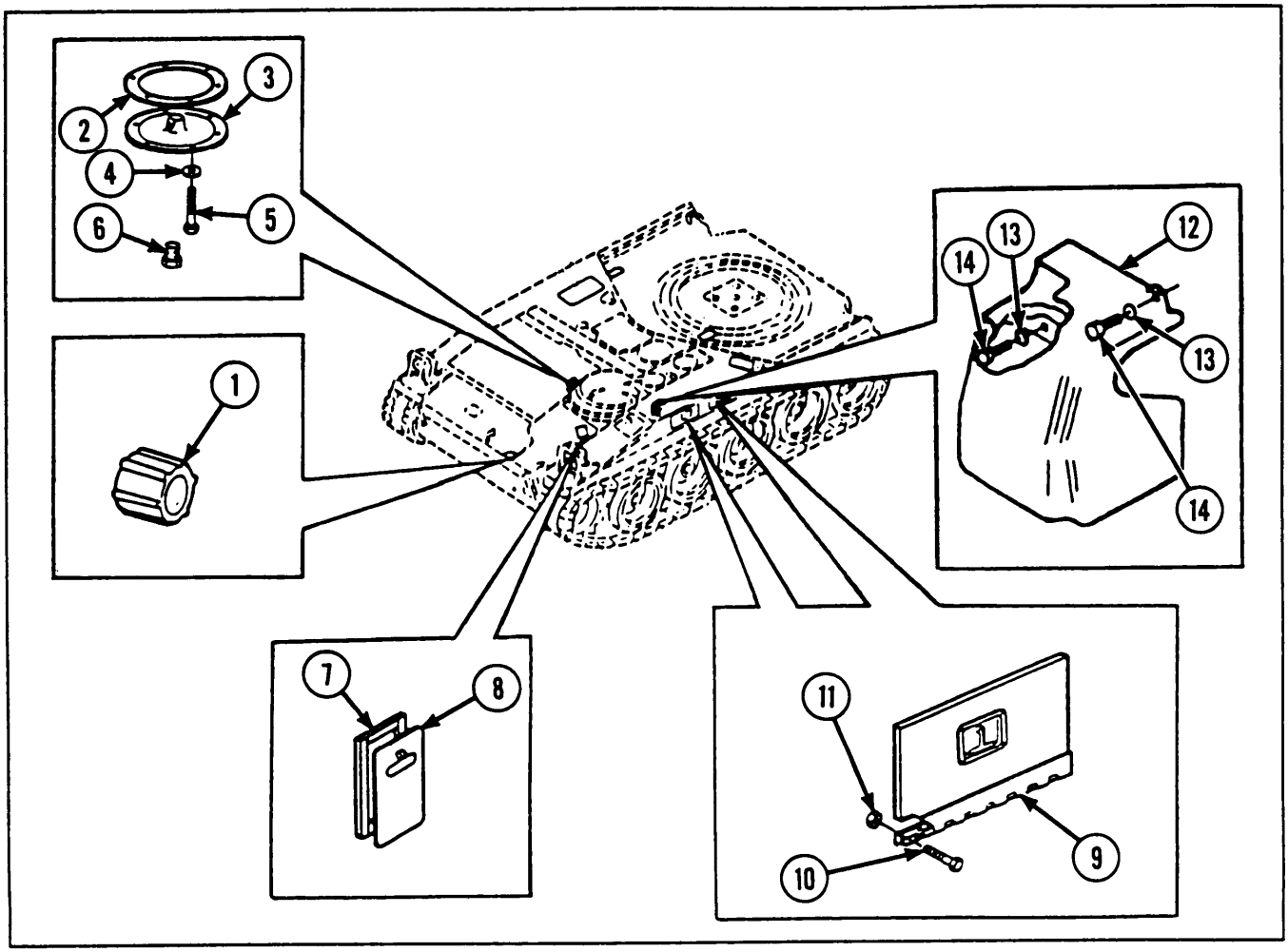
3 Engine fuel filter access door is a repairable assembly. Notify direct support maintenance.

4 Air cleaner access door is a repairable assembly. Notify direct suppoft maintenance.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

2-160. MAINTENANCE OF HULL COVERS, DOORS, AND PLATES (CONT).

INSTALLAT/ON



1 Install two protective caps (1) to hull.

2 Install new gasket (2), power plant reservoir drain access cover (3), six new lockwashers (4), and six hexagon head capscrews (5) to hull.

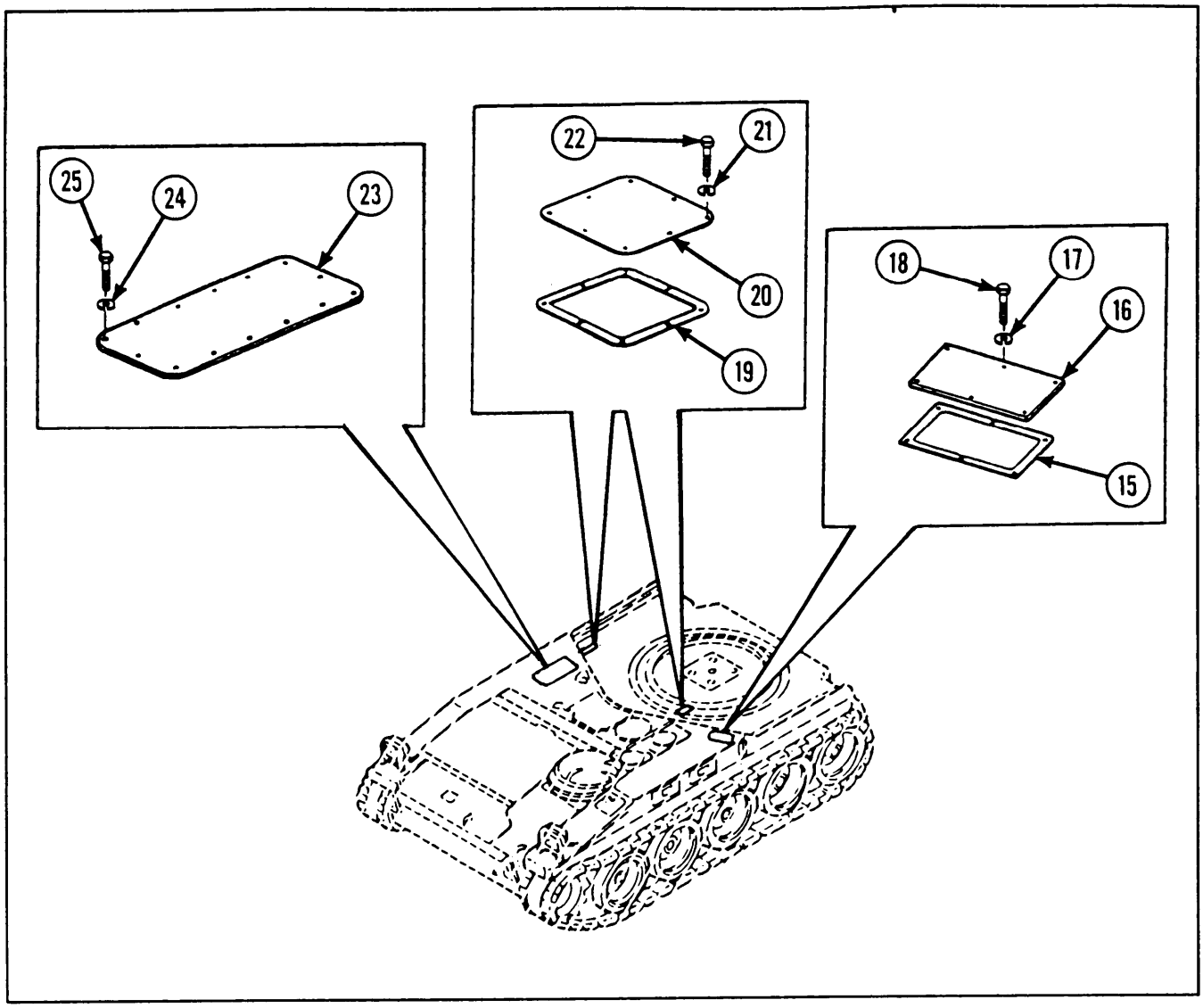
3 Install pipe plug (6) to power plant reservoir drain access cover (3).

4 If removed, install new fuel filter access door seal (7).

5 Install engine fuel filter access door (8) to hull.

6 Install 2 air cleaner access doors (9) to hull and secure with 18 machine screws (10) and 18 new self-locking nuts (11).

7 Install access cover (12), two new lockwashers (13), and two capscrews (14) on hull.



8 Install new air cleaner blower access cover gasket (15), air cleaner blower access hull cover assembly (16), six new lockwashers (17), and six hexagon head capscrews (18) to hull.

9 Install 2 new $C0_2$ bottle access cover gaskets (19) and 2 access covers (20) to hull. Secure with 16 new lockwashers (21) and 16 hexagon head capscrews (22).

10 Install hull cover plate (23), 14 new lockwashers (24), and 14 hexagon head capscrews (25) to hull.

2-161. MAINTENANCE OF HULL DECK AND MISCELLANEOUS COMPONENTS.

This task covers: a. *Removal* b. *Inspection/Repair* *c. Installation*

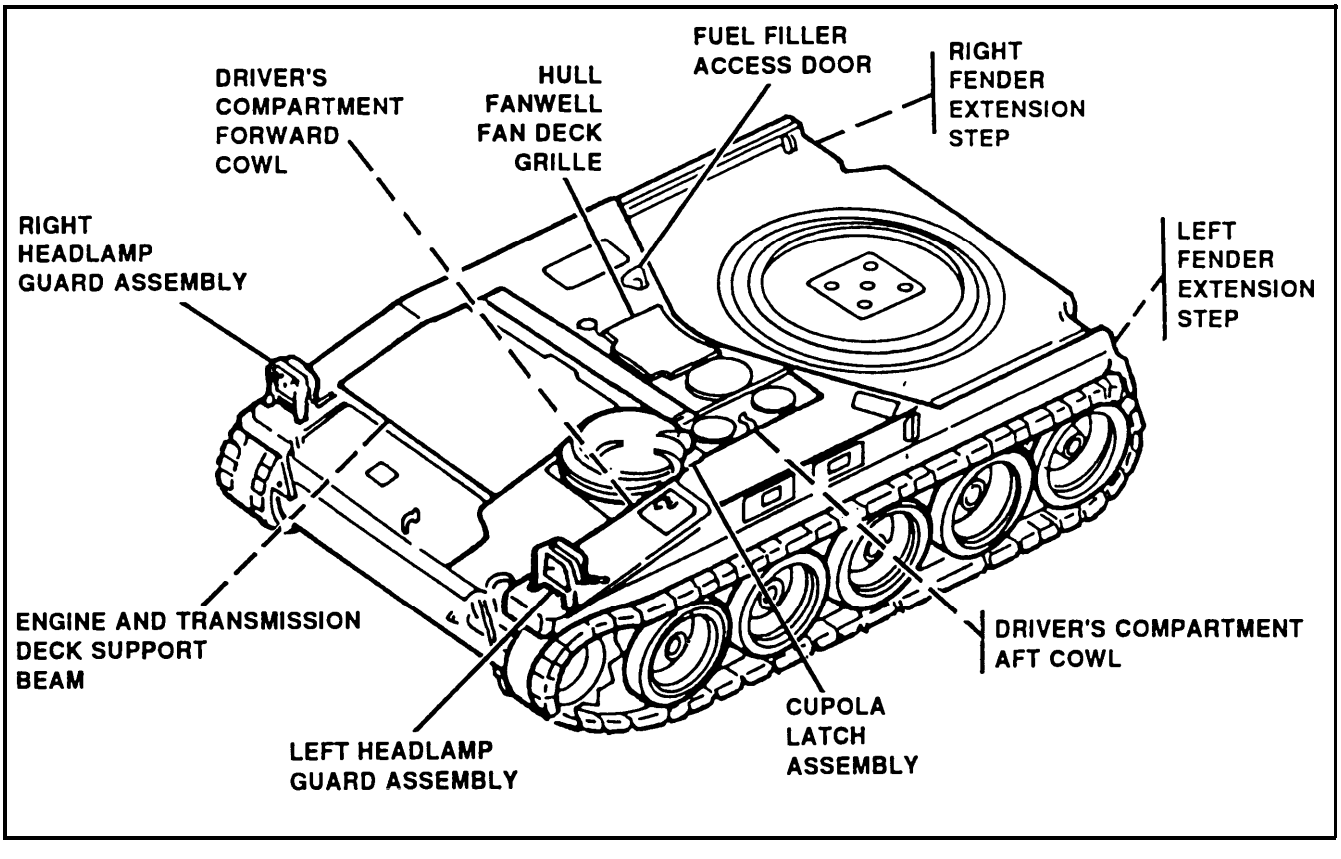
INITIAL SETUP

Materials/Parts
- Antipilferage seal
- Cotter pin (4)
- Grease (item 20, appx C)
- Lockwasher *(4)*
- Lockwasher (4)
- Lockwasher (2)
- Sealing compound (item 37, appx C)
- Self-locking nut (4)
- Spring pin

References
- TM 9-2350-238-10
- TM 9-2350-238-24P-1

Equipment Conditions
- 2-935 Hull engine compartment deck assembly lid removed
- 2-938 Hull transmission compartment deck assembly removed
- 2-561 Master relay removed
- 2-1155 Safety pin installed in control valve handle

REMOVAL

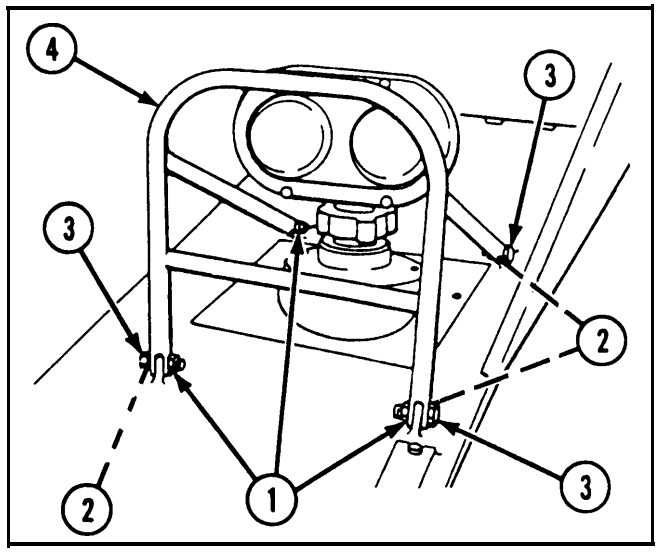


NOTE

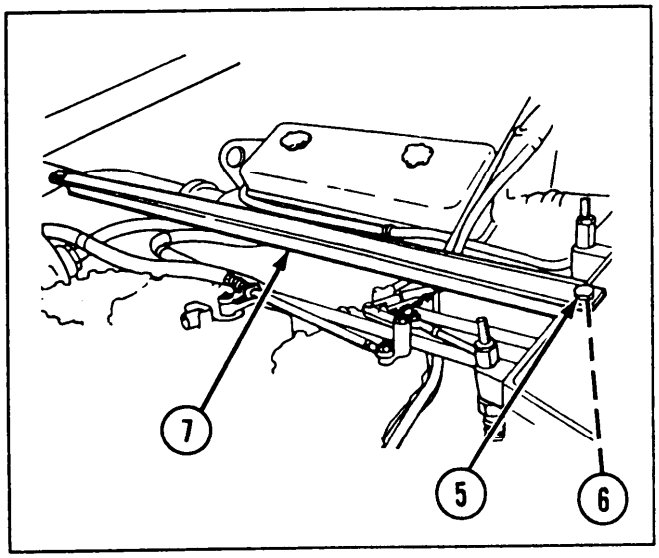
Steps 1 and 2 are written for the left headlamp guard assembly, but apply to both right and left headlamp guard assemblies.

1 Remove four hexagon plain nuts (1), four lockwashers (2), and four hexagon head capscrews (3).

2 Remove left headlamp guard assembly (4).

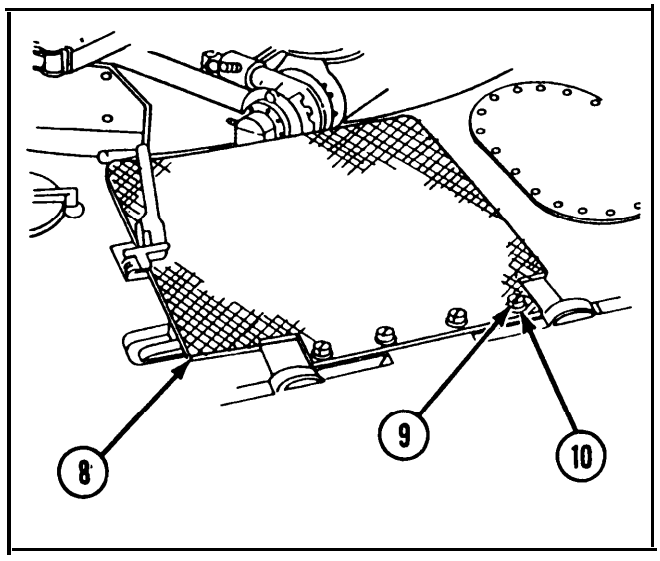


3 Remove two hexagon head capscrews (5). two lockwashers (6), and engine and transmission deck support beam (7).



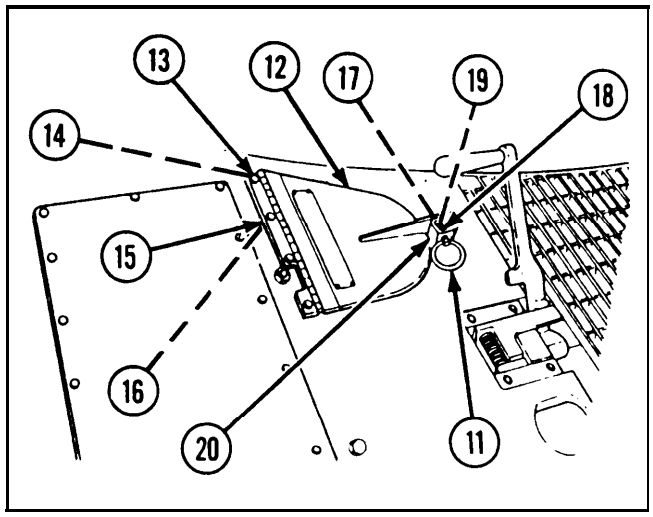
4 Elevate and traverse crane away from hull fanwell fan deck grille (8) area on hull. Refer to TM 9-2350-238-10.

5 Remove four hexagon head capscrews *(9)* four lockwashers (10), and hull fanwell fan deck grille (8).



2-161. MAINTENANCE OF HULL DECK AND MISCELLANEOUS COMPONENTS (CONT).

REMOVAL (CONT)



6 Pull fuel filler cover latch radiator filler pin (11) to release fuel filler access door (12).

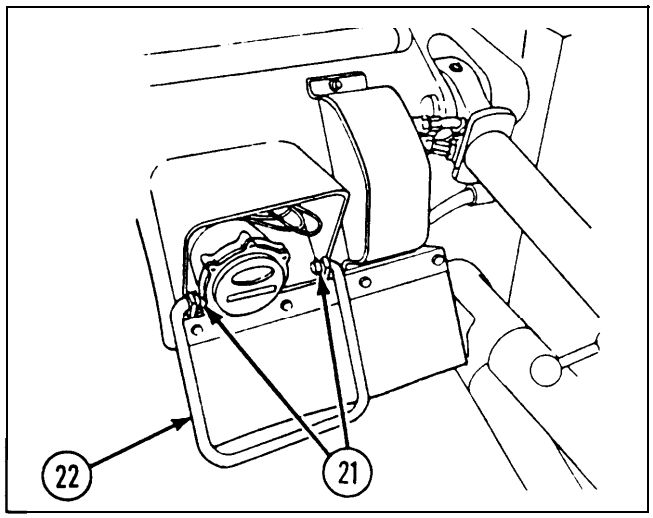
7 Remove four square neck bolts (13), four self-locking nuts (14), fuel filler access door (12), fuel filler cover hinge plate spacer (15), and fuel filler cover hinge stepped spacer (16).

8 Remove spring pin (17) from fuel filler cover latch radiator filler pin (11).

9 Remove fuel filler cover latch radiator filler pin (11), helical compression spring (18), and two flat washers (19) from hull bracket (20).

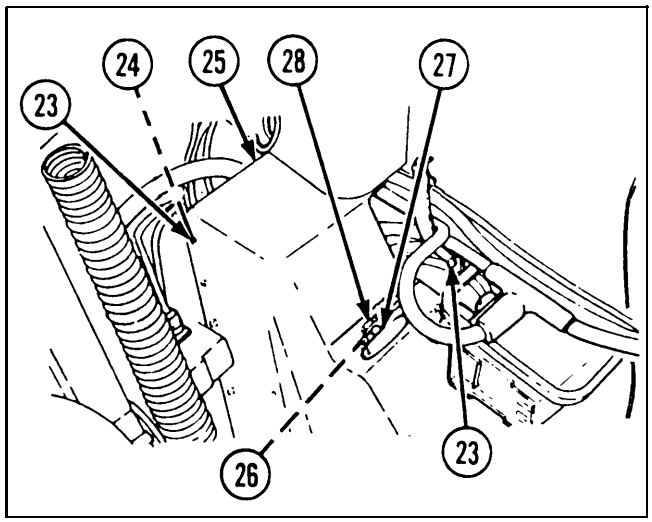
NOTE

Step 10 is written for removal of left fender extension step, but applies to both left and right fender extension steps.



10 Remove two cotter pins (21) and left fender extension step (22).

11 Rotate nine driver's compartment cowl turnlock fastener studs (23) one quarter turn to release.



12 If any of nine driver's compartment cowl turnlock fastener studs (23) or six retaining rings (24) are damaged, remove driver's compartment cowl turnlock fastener studs or retaining rings from driver's compartment aft cowl (25).

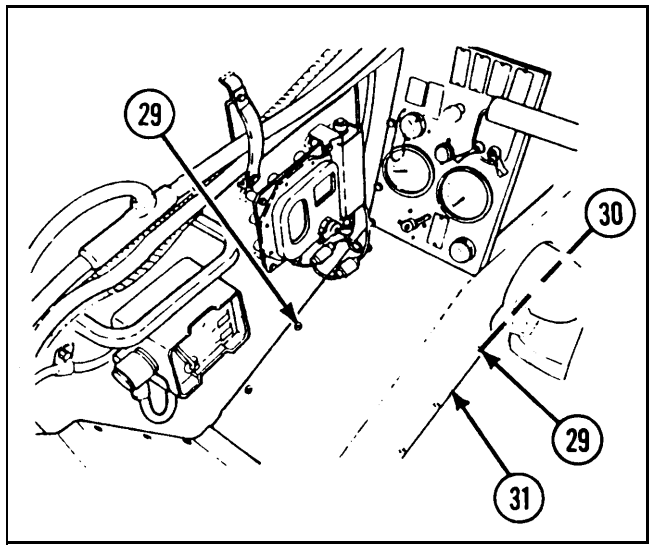
13 Remove antipilferage seal (26) from fire extinguisher cable (27).

14 Loosen and slide nut (28) and fire extinguisher control cable (27) from slot in driver's compartment aft cowl (25), and remove driver's compartment aft cowl.

15 Rotate eight driver's compartment cowl turnlock fastener studs (29) one quarter turn to release.

16 If any of eight driver's compartment cowl turnlock fastener studs (29) or five retaining rings (30) are damaged, remove driver's compartment cowl turnlock fastener studs and retaining rings from driver's compartment forward cowl (31).

17 Remove driver's compartment forward cowl (31).

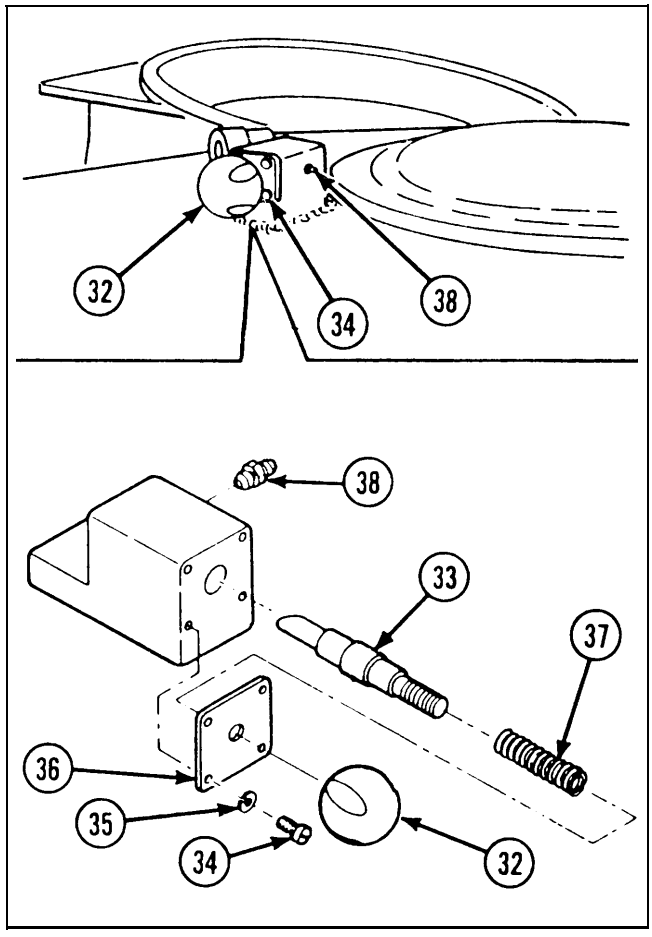


18 Unscrew latch pin knob (32) from cupola latch headless shoulder pin (33).

19 Remove four machine screws (34) and four lockwashers (35).

20 Remove cupola latch access cover (36), helical compression spring (37), and cupola latch headless shoulder pin (33).

21 Remove lubrication fitting (38).



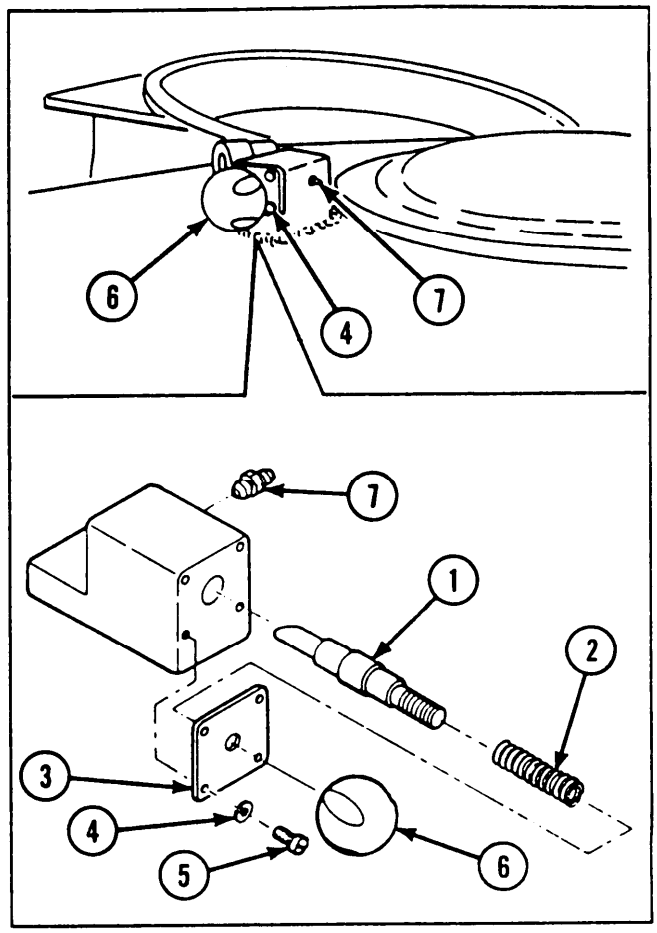
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-161. MAINTENANCE OF HULL DECK AND MISCELLANEOUS COMPONENTS (CONT).

INSTALLATION



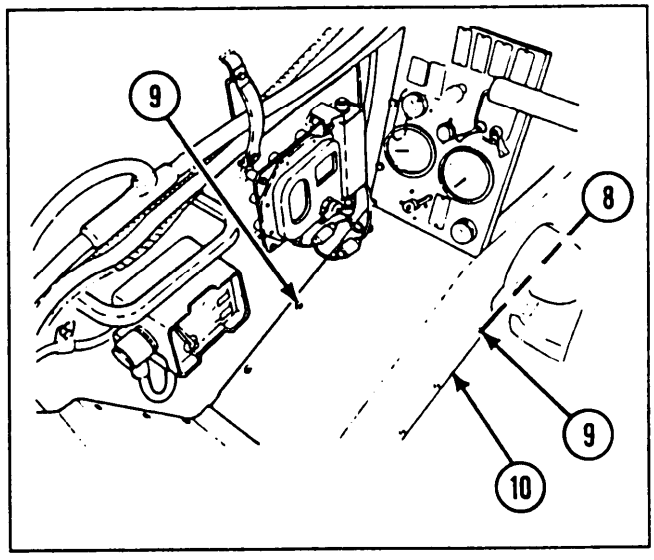
1 Install cupola latch headless shoulder pin (1) and helical compression spring (2).

2 Install cupola latch access cover (3), four new lockwashers (4), and four machine screws (5).

3 Apply sealing compound to threads of cupola latch headless shoulder pin (1) and latch pin knob (6).

4 Install latch pin knob (6) on cupola latch headless shoulder pin (1), and tighten.

5 Install lubrication fitting (7) and lubricate with grease.



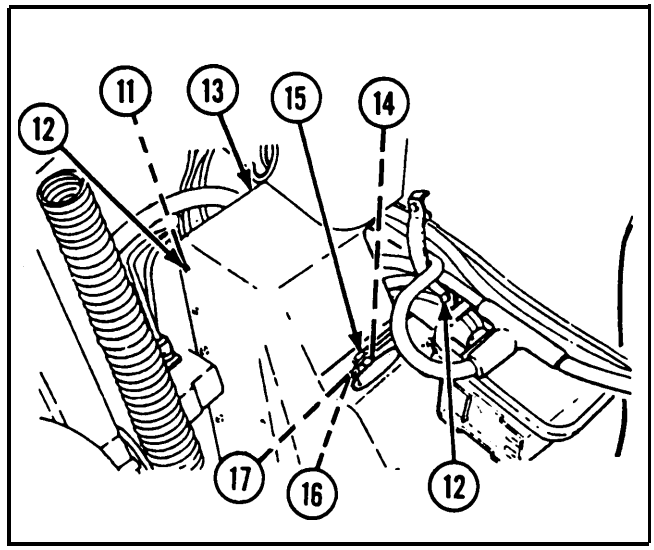
6 If removed, install five retaining rings (8) and eight driver's compartment cowl turnlock fastener studs (9) in driver's compartment forward cowl (10).

7 Install driver's compartment forward cowl (10) and secure eight driver's compartment cowl turnlock fastener studs (9).

8 If removed, install six retaining rings (11) and nine driver's compartment cowl turnlock fastener studs (12) in driver's compartment aft cowl (13).

9 Slide fire extinguisher control cable (14) and nut (15) into slot in driver's compartment aft cowl (13), and install driver's compartment aft cowl. Secure nine driver's compartment cowl turnlock fastener studs (12).

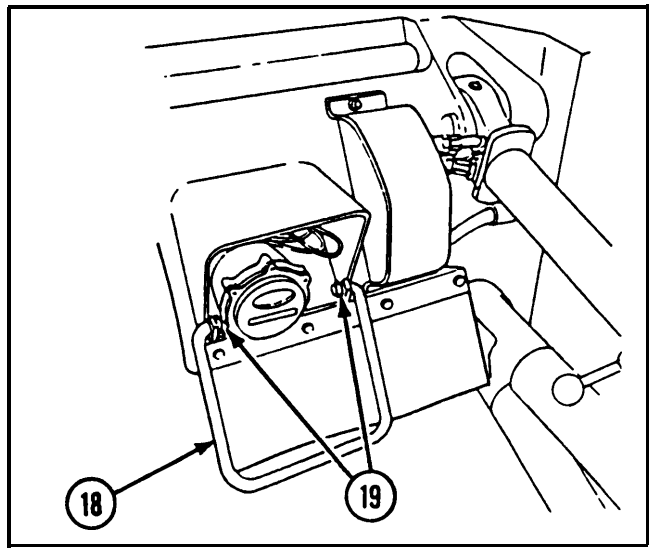
10 Tighten nut (15) and install new antipilferage seal (16) around fire extinguisher control cable (14) and through head of hexagon head capscrew (17).



NOTE

Step 11 is written for installation of left fender extension step, but applies to both left and right fender extension steps.

11 Install left fender extension step (18), and secure with two new cotter pins (19).

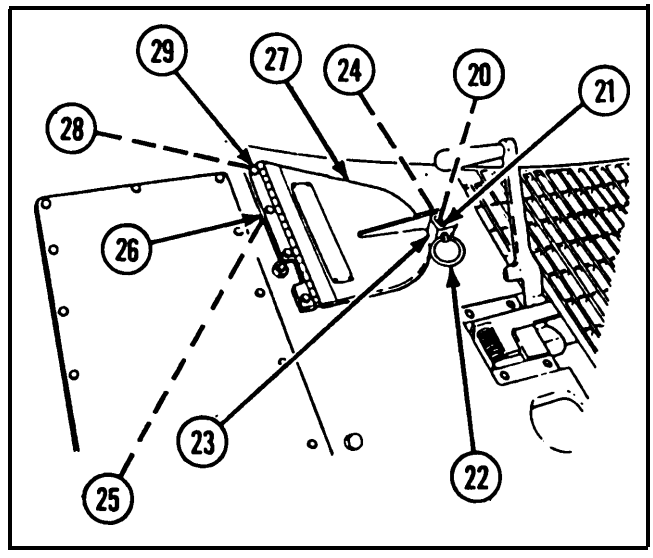


12 Install two flat washers (20), helical compression spring (21), and fuel filler cover latch radiator filler pin (22) in hull bracket (23).

13 Install new spring pin (24) in fuel filler cover latch radiator filler pin (22).

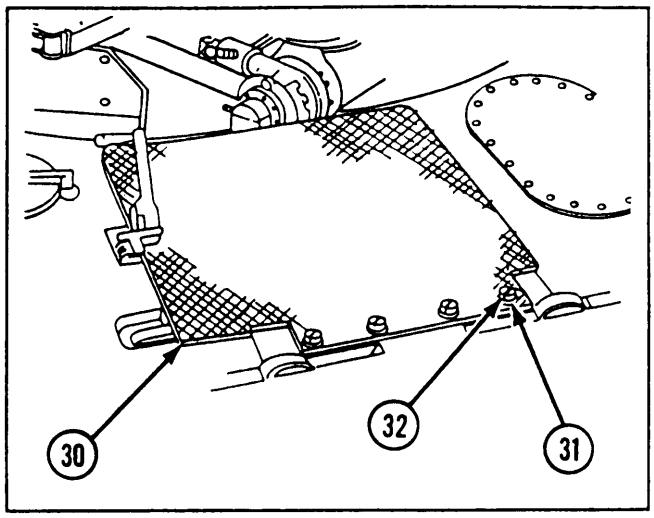
14 Install fuel filler cover hinge stepped spacer (25), fuel filler cover hinge plate spacer (26), and fuel filler access door (27). Secure with four new self-locking nuts (28) and four square neck bolts (29).

15 Pull fuel filler cover latch radiator filler pin (22) to latch, and secure fuel filler access door (27).

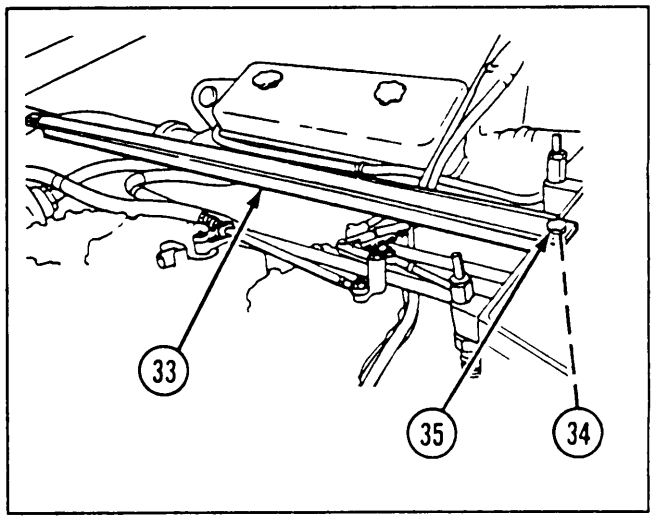


2-161. MAINTENANCE OF HULL DECK AND MISCELLANEOUS COMPONENTS (CONT).

INSTALLATION (CONT)



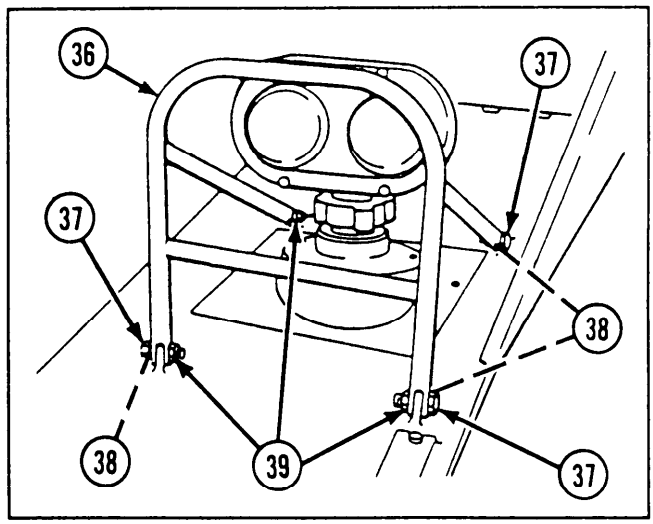
16 Install hull fanwell fan deck grille (30), and secure with four new lockwashers (31) and four hexagon head capscrews (32).



17 Install engine and transmission deck support beam (33), and secure with two new lockwashers (34) and two hexagon head capscrews (35).

NOTE

Step 18 is written for installation of left headlamp guard assembly, but applies to both right and left headlamp guard assemblies.



18 Install left headlamp guard assembly (36), and secure with four hexagon head capscrews (37), four new lockwashers (38), and four hexagon plain nuts (39).

2-162. MAINTENANCE OF HULL ENGINE COMPARTMENT DECK ASSEMBLY LID.

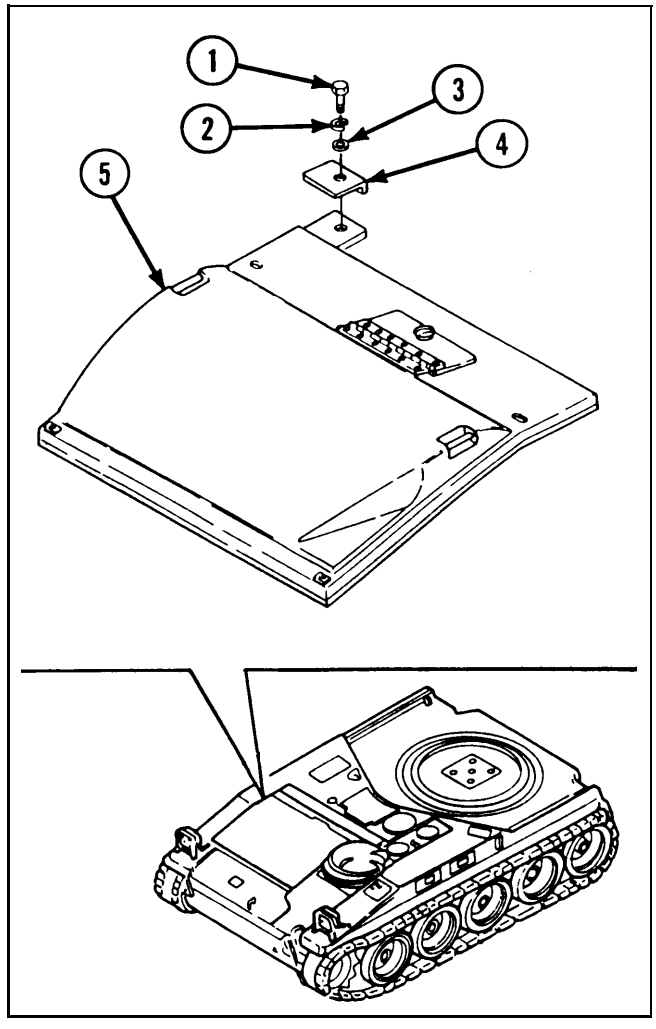
This task covers:	a. *Removal* b. *Disassembly* *c. Inspection/Repair*	d. *Reassembly* e. *Installation*

INITIAL SETUP

Materials/Parts
- Adhesive (item 3, appx C)
- Lockwasher
- Lockwasher (10)
- Rubber strip
- Rubber strip (figure D-8, appx D)
- Self-locking nut (16)

References
- TM 9-2350-238-24P-1

REMOVAL

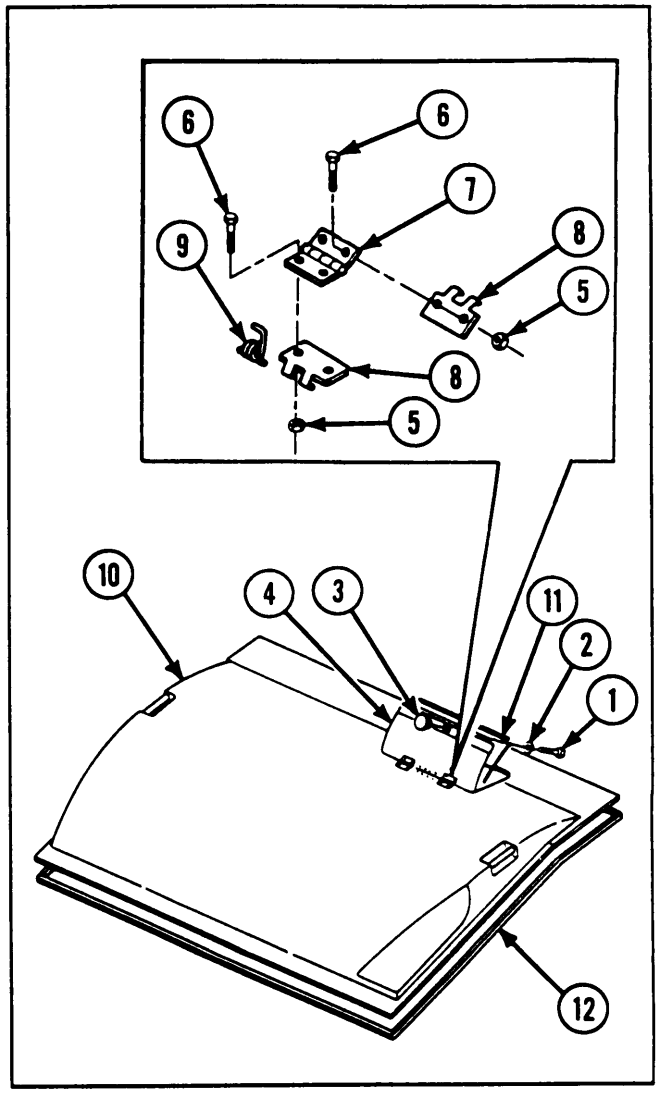


1 Remove ten hexagon head capscrews (1), ten lockwashers (2), ten flat washers (3), and ten rim clenching clamps (4) from hull.

2 Remove hull engine compartment deck assembly lid (5) from hull.

2-162. MAINTENANCE OF HULL ENGINE COMPARTMENT DECK ASSEMBLY LID (CONT).

DISASSEMBLY



1 Remove hexagon head capscrew (1), lockwasher (2), and hand hold (3) from access door (4).

2 Remove 16 self-locking nuts (5), 16 machine screws (6), 2 butt hinges (7), 8 spring retainers (8), 4 helical springs (9), and access door (4) from engine compartment deck (10).

3 If damaged, remove rubber strip (11) from access door (4).

4 If damaged, remove rubber strip (12) from engine compartment deck (10).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Rubber strip is a manufactured part, refer to appendix D.

3 If engine compartment deck is broken, missing, or damaged, repair is by replacement of next higher assembly,

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

REASSEMBLY

1 If removed, install new rubber strip (1) on engine compartment deck (2) using adhesive.

2 If removed, install new rubber strip (3) on access door (4) using adhesive.

3 Install hand hold (5), new lockwasher (6), and hexagon head capscrew (7) on access door (4).

NOTE

Steps 4 thru 6 are written for one butt hinge but apply to both butt hinges.

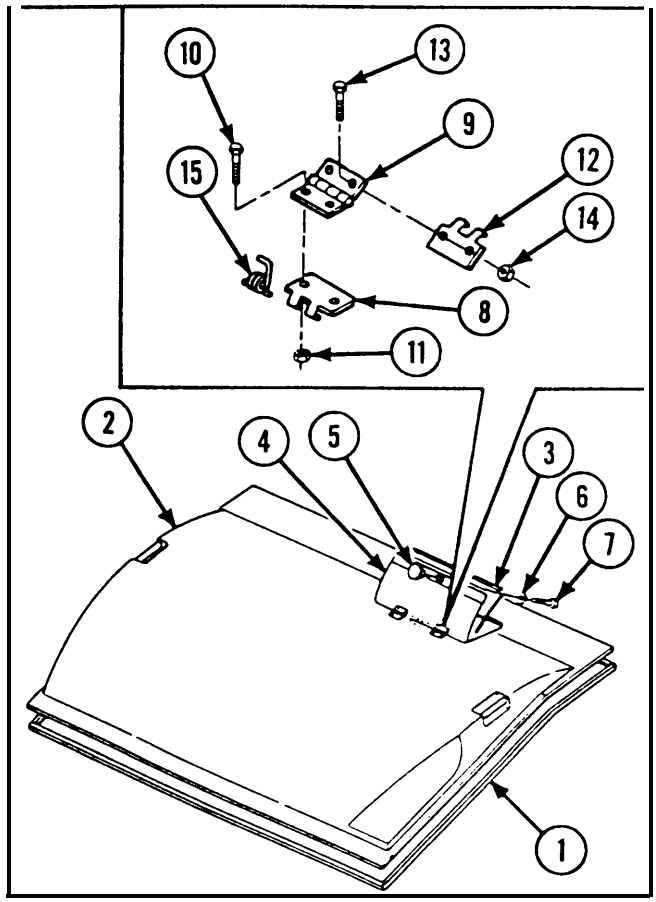
4 Install two spring retainers (8), butt hinge (9), four machine screws (10), and four new self-locking nuts (11) on engine compartment deck (2).

5 Install access door (4), two spring retainers (12), four machine screws (13), and four new self-locking nuts (14) on butt hinge (9).

NOTE

Bend tabs on new spring retainers to hold torsion helical springs.

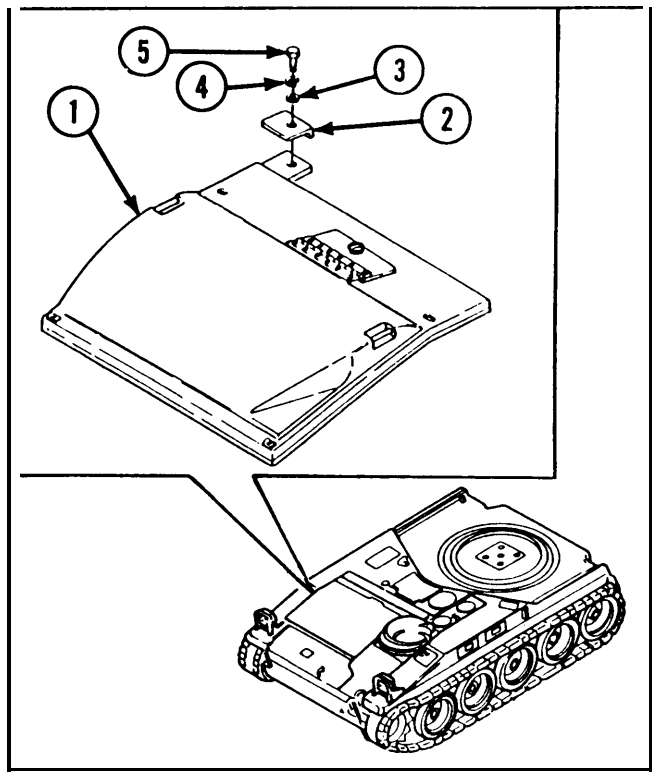
6 Install two torsion helical springs (15). Secure each spring between two spring retainers (8 and 12).



INSTALLATION

1 Install hull engine compartment deck assembly lid (1) on hull.

2 Install ten rim clenching clamps (2), ten flat washers (3), ten new lockwashers (4), and ten hexagon head capscrews (5) on hull.



2-163. MAINTENANCE OF HULL TRANSMISSION COMPARTMENT DECK ASSEMBLY.

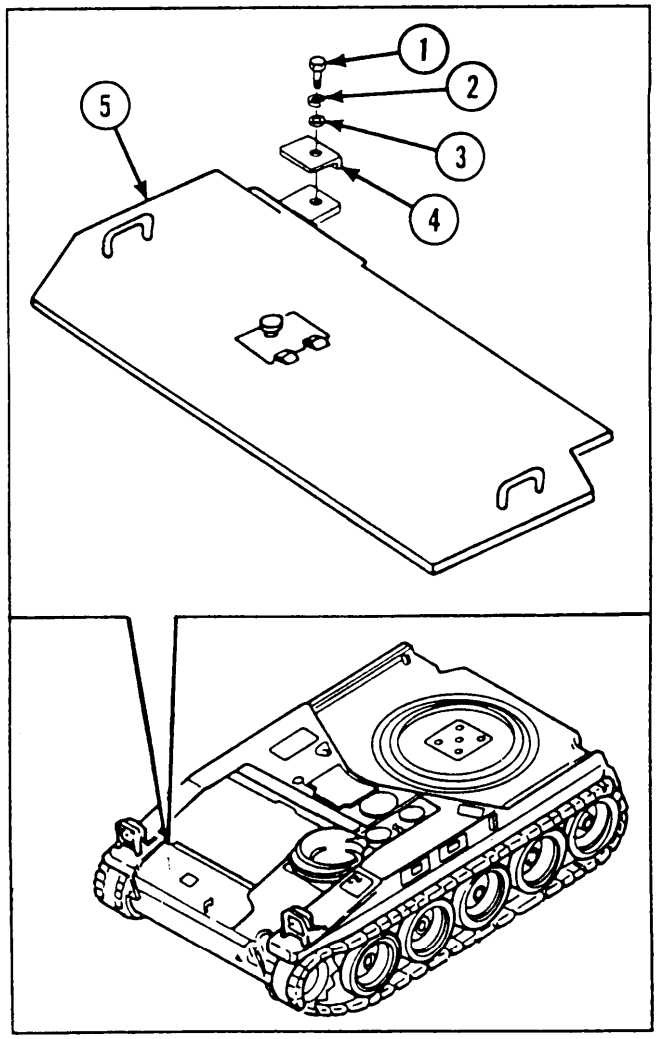
This task covers:	a. *Removal* b. *Disassembly* *c. Inspection/Repair*	d. *Reassembly* *e. Installation*

INITIAL SETUP

Materials/Parts
Adhesive (item 5, appx c)
Lockwasher
Lockwasher (4)
Rubber strip
Rubber strip (figure D-8, appx D)
Self-locking nut (8)

References
TM 9-2350-238-24 P-I

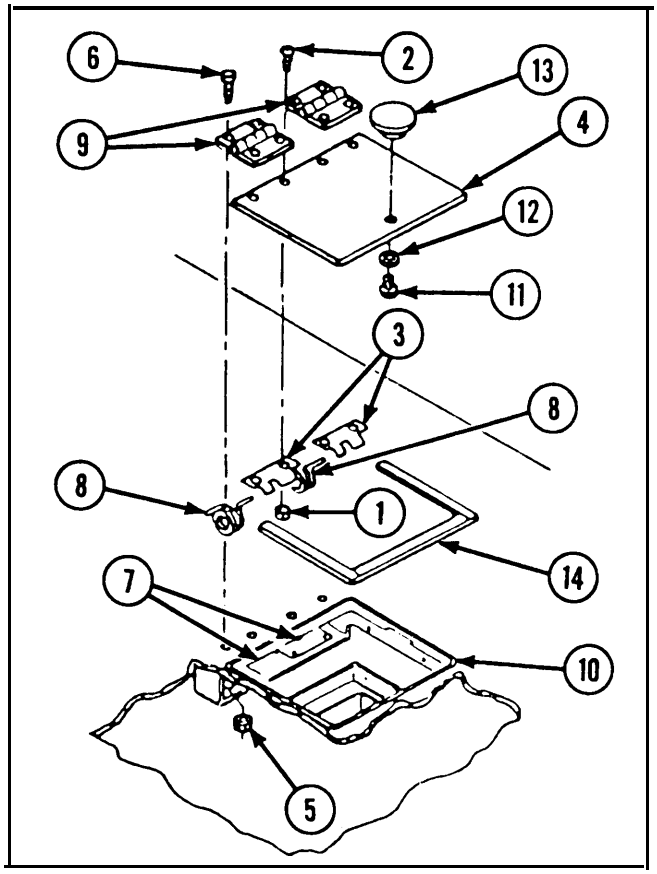
REMOVAL



1 Remove ten hexagon head capscrews (1), ten lockwashers (2), ten flat washers (3), and ten rim clenching clamps (4) from hull.

2 Remove hull transmission compartment deck assembly (5) from hull.

DISASSEMBLY

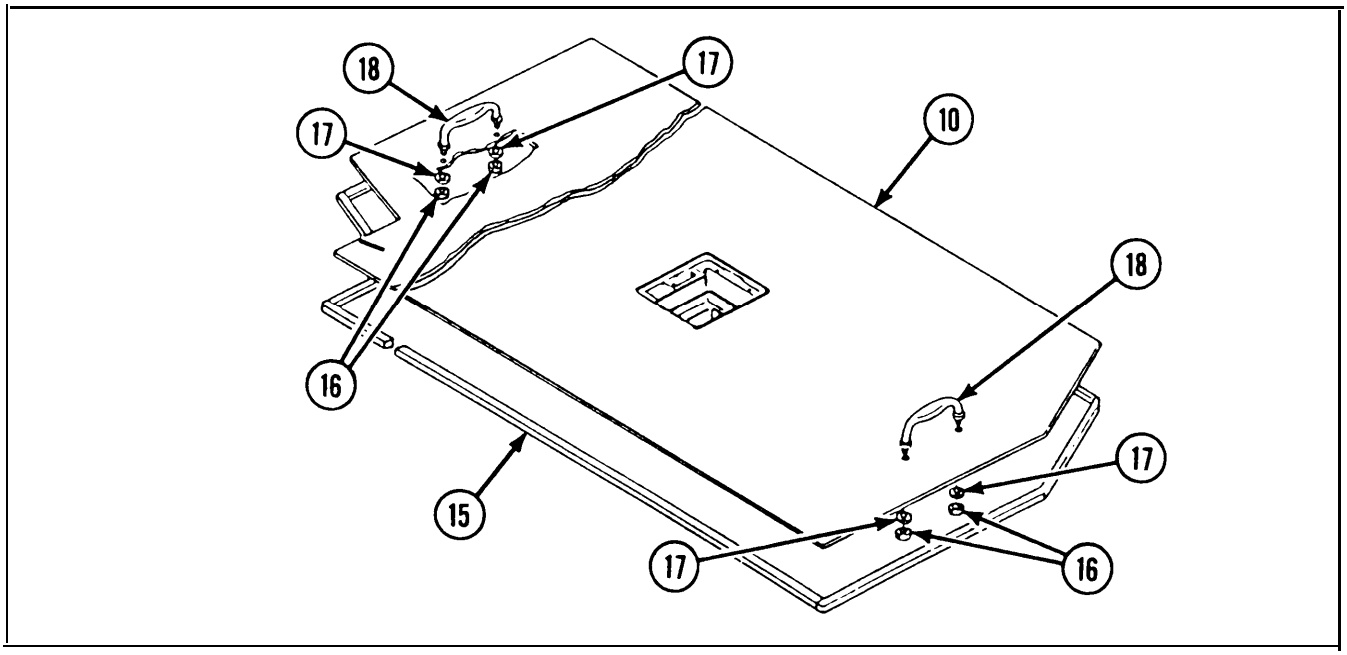


1 Remove four self-locking nuts (1), four machine screws (2), two spring retainers (3), and access door (4).

2 Remove four self-locking nuts (5), four machine screws (6), two spring retainers (7), two torsion helical springs (8), and two butt hinges (9) from transmission deck lid assembly (10).

3 Remove hexagon head capscrew (11), lockwasher (12), and hand hold (13) from access door (4).

4 If damaged, remove rubber strip (14) from access door (4).



5 If damaged, remove rubber strip (15) from transmission deck lid assembly (10).

6 Remove four hexagon plain nuts (16), four lockwashers (17), and two bow handles (18) from transmission deck lid assembly (10).

2-163. MAINTENANCE OF HULL TRANSMISSION COMPARTMENT ASSEMBLY ACCESS COVER (CONT).

INSPECTION/REPAIR

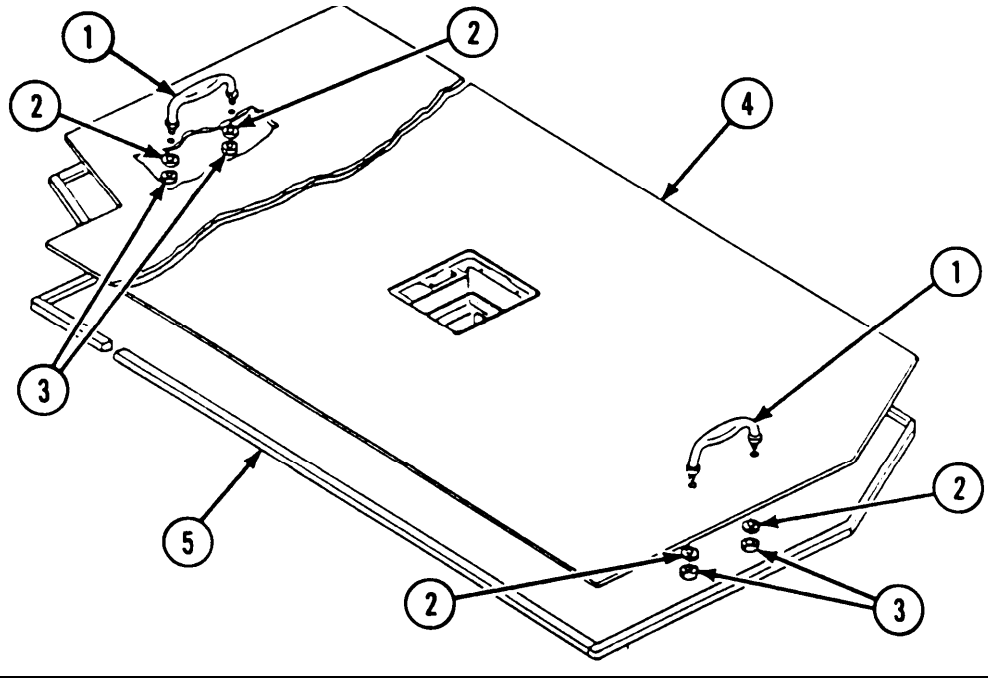
1 Inspect for broken, damaged, or missing parts.

2 If transmission deck lid assembly is broken, damaged, or missing, repair is by replacement of next higher assembly.

3 Rubber strip is a manufactured item, refer to appx D.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

REASSEMBLY



1 Install two bow handles (1), four new lockwashers (2), and four hexagon plain nuts (3) on transmission deck lid assembly (4).

2 If removed, install new rubber strip (5) on transmission deck lid assembly (4) using adhesive.

3 If removed, install new rubber strip (6) on access door (7) using adhesive.

4 Install hand hold (8), new lockwasher (9), and hexagon head capscrew (10) on access door (7).

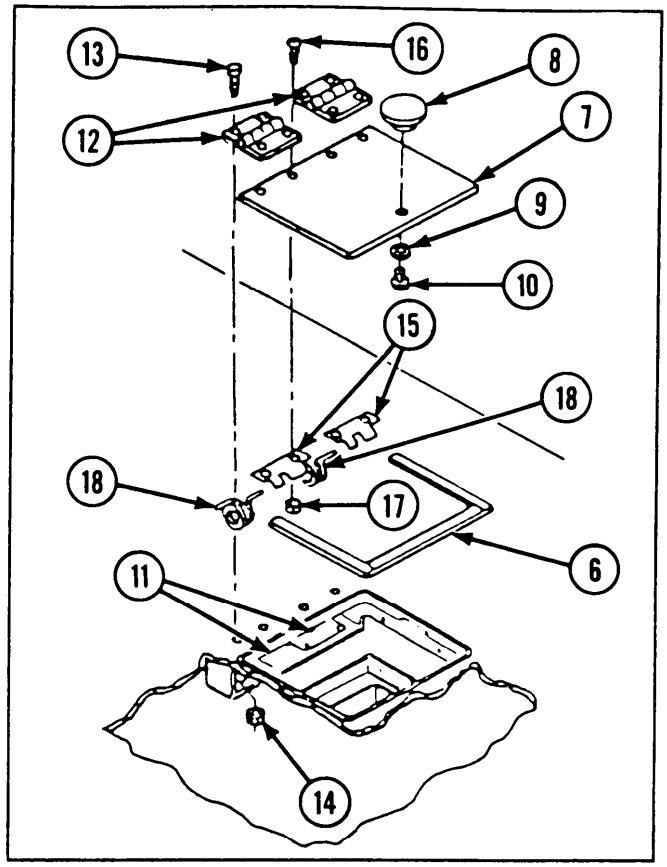
5 Install two spring retainers (11), two butt hinges (12), four machine screws (13), and four new self-locking nuts (14) on transmission deck lid assembly (4).

6 Install access door (7), two spring retainers (15), four machine screws (16), and four new self-locking nuts (17) on two butt hinges (12).

NOTE

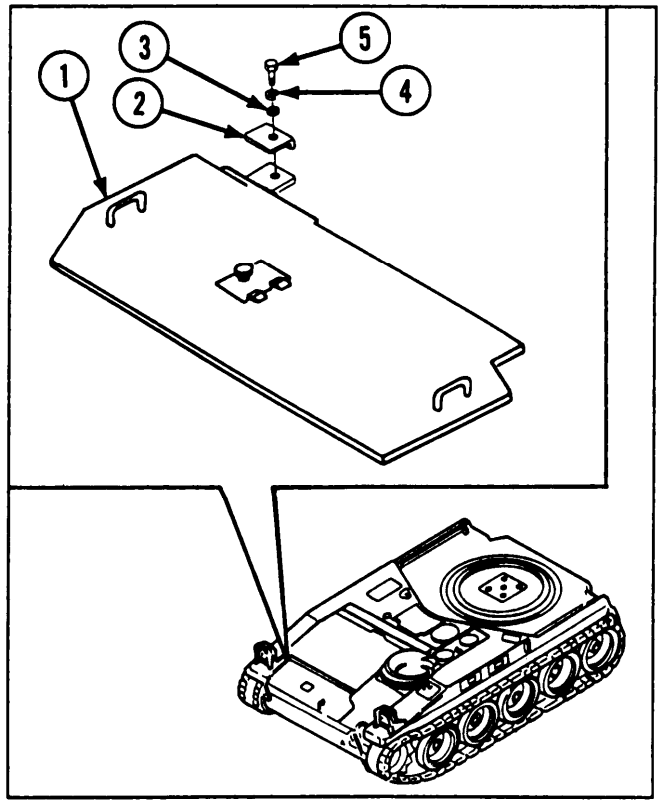
Bend tabs on new spring retainers to hold torsion helical springs.

7 Install two torsion helical springs (18). Secure each spring between two spring retainers (11 and 15).



1 Install hull transmission compartment deck assembly (1) to hull.

2 Install ten rim clenching clamps (2), ten flat washers (3), ten new lockwashers (4), and ten hexagon head capscrews (5) to hull.



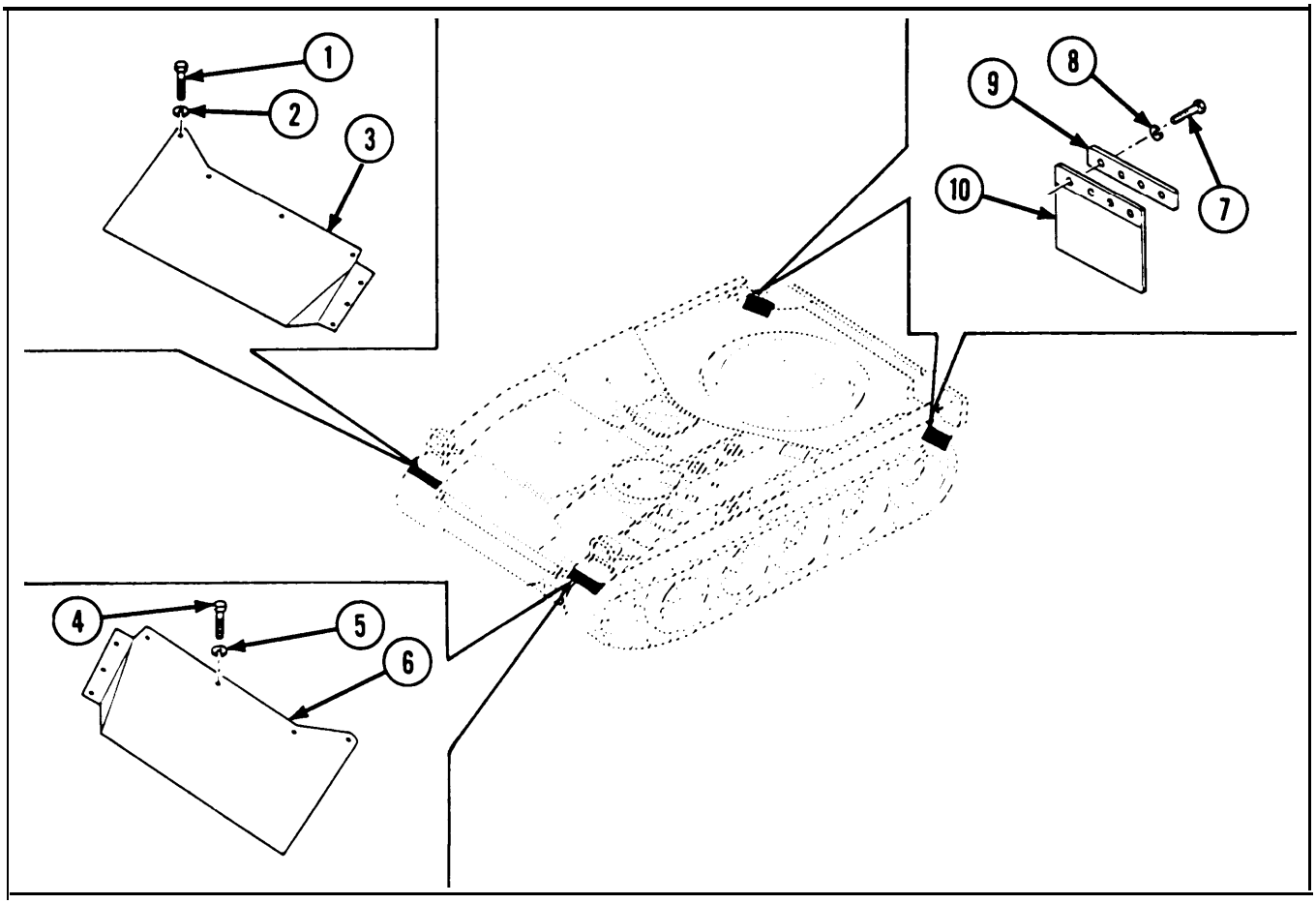
2-164. MAINTENANCE OF MUD GUARDS, FENDER EXTENSIONS, AND ATTACHING PARTS.

This task covers:	a. *Removal*	b. *Inspection/Repair*	*c. Installation*

INITIAL SETUP

Materials/Parts
Lockwasher (22)

References
TM 9-2350-238-24P-1



REMOVAL

1 Remove seven hexagon head capscrews (1), seven lockwashers (2), and right headlamp mud guard front plate assembly (3).

2 Remove seven hexagon head capscrews (4), seven lockwashers (5), and left front fender extension (6).

3 Remove eight hexagon head capscrews (7) and eight lockwashers (8). Remove two mud guard strips (9) and two wheel splash guards (10).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install two wheel splash guards (10) and two mud guard strips (9). Install eight new lockwashers (8) and eight hexagon head capscrews (7).

2 Install left front fender extension (6), seven new lockwashers (5), and seven hexagon head capscrews (4).

3 Install right headlamp mud guard front plate assembly (3), seven new lockwashers (2), and seven hexagon head capscrews (1).

2-165. MAINTENANCE OF DRIVER'S HATCH COVER.

This task covers:	a. *Removal/Disassembly* b. *Inspection/Repair*	*c. Reassembly/Installation*

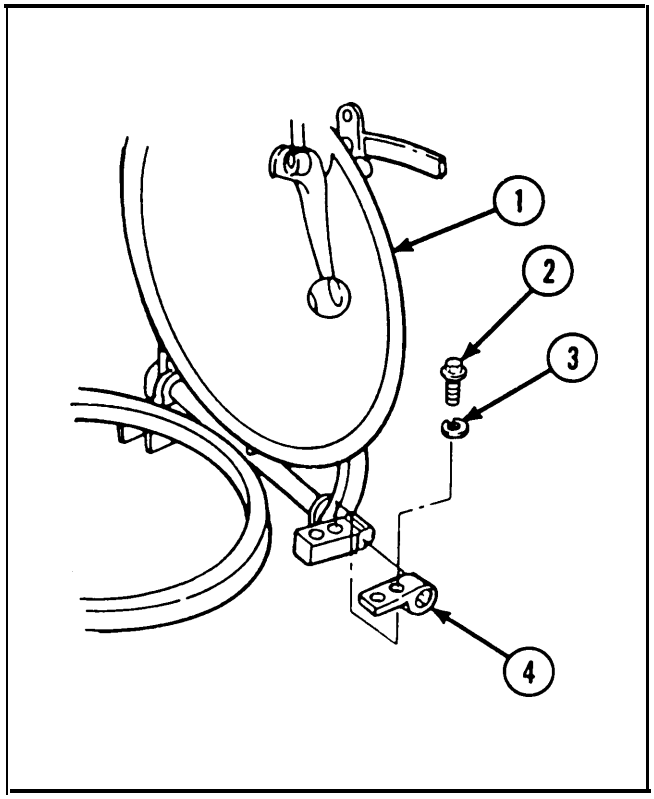
INITIAL SETUP

Materials/Parts
- Cushioning pad
- Cushioning pad
- Grease (item 20, appx C)
- Lockwasher (2)
- Lockwasher (2)
- Rubber adhesive (item 4, appx C)
- Sealing compound (item 39, appx C)
- Self-locking nut
- Spring tension clip

References
- TM 9-2350-238-24P-1

2-165. MAINTENANCE OF DRIVER'S HATCH COVER (CONT).

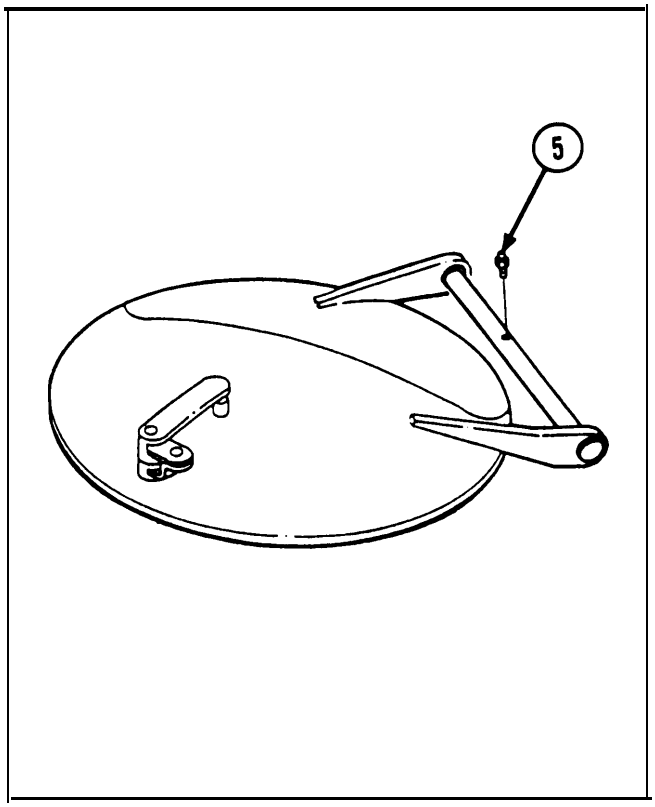
REAMOVAL/DISASSEMBLY



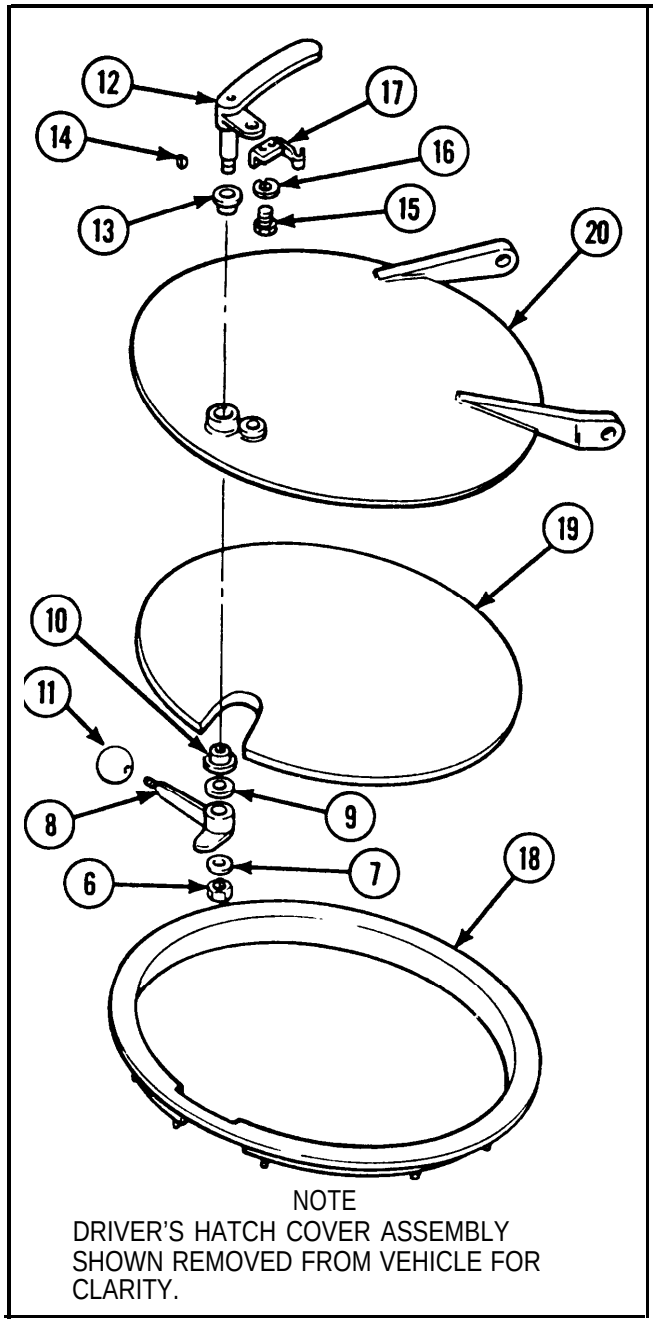
1 Open driver's hatch cover (1) and hold in upright position.

2 Remove two hexagon head capscrews (2) and two lockwashers (3).

3 Remove cupola spring anchor (4).



4 If damaged, remove lubrication fitting (5).



NOTE
DRIVER'S HATCH COVER ASSEMBLY SHOWN REMOVED FROM VEHICLE FOR CLARITY.

5 Remove self-locking nut (6) and flat washer (7).

6 Remove cupola cover inner door handle (8), flat washer (9), and cupola cover handle sleeve bearing (10).

7 Remove cupola cover inner handle knob (11).

8 Remove outer cover door handle (12), cupola cover handle sleeve bearing (13), and woodruff key (14).

9 Remove two machine screws (15) and two lockwashers (16).

10 Remove spring tension clip (17).

NOTE
Do not remove cushioning pads unless they are damaged and replacement is required.

11 Bend back tabs on cushioning pad (18).

12 Remove cushioning pads (18 and 19) from hatch door (20).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 For further repair of driver's hatch cover, notify direct support maintenance.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-165. MAINTENANCE OF DRIVER'S HATCH COVER (CONT).

REASSEMBLY/INSTALLATION

NOTE
Perform steps 1 and 2 only if cushioning pads have been removed.

1 Coat mating surfaces of new cushioning pads (1 and 2) and hatch door (3) with rubber adhesive, if removed.

2 Install new cushioning pads (1 and 2) on hatch door (3). Bend back tabs on cushioning pad (1). Allow to air dry for 1 hour.

3 Install new spring tension clip (4),

4 Install two new lockwashers (5) and two machine screws (6).

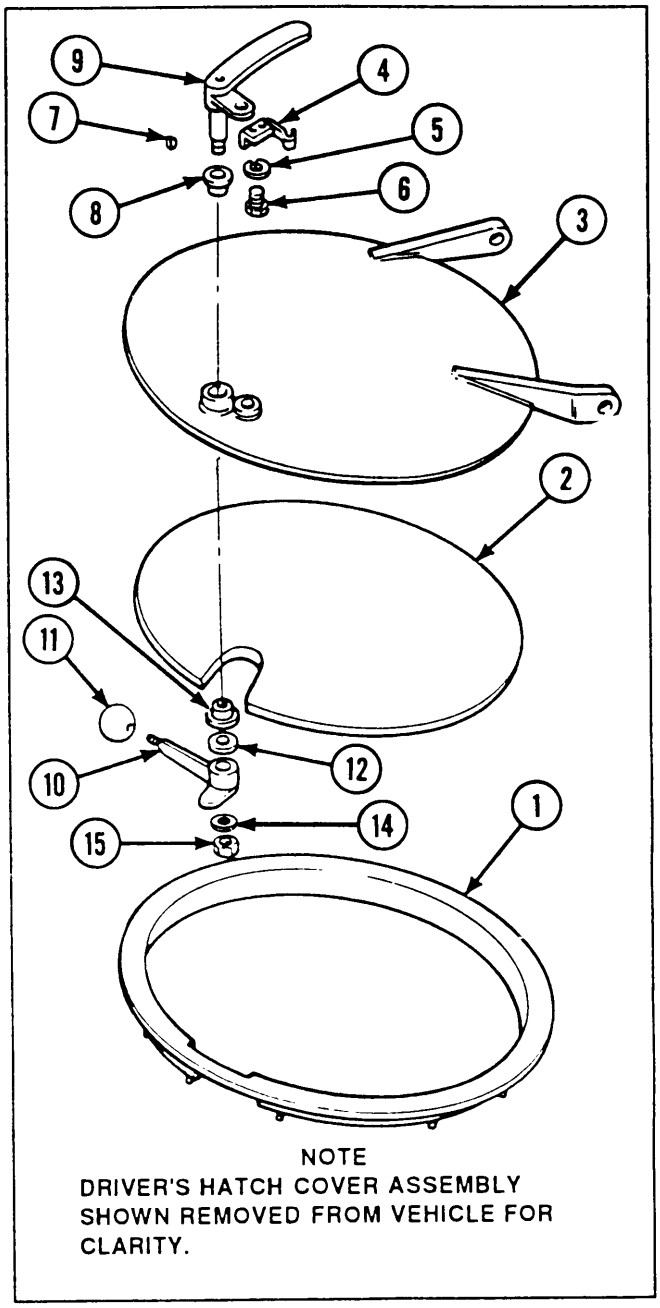
5 Install woodruff key (7), cupola cover handle sleeve bearing (8), and outer cover door handle (9).

6 Apply sealing compound to threads on cupola cover inner door handle (10).

7 Install cupola cover inner handle knob (11) on cupola cover inner door handle (10).

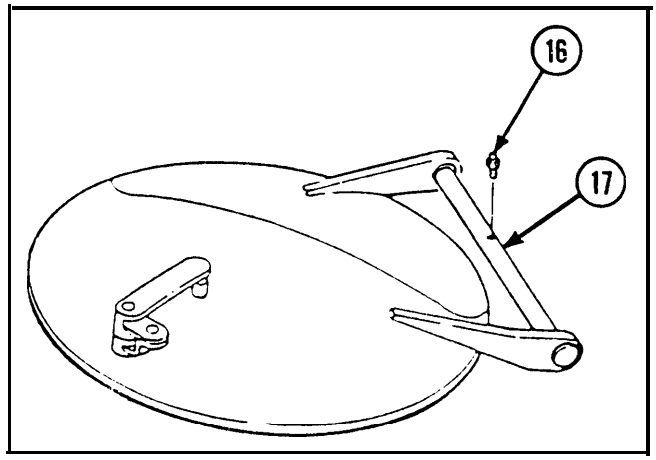
8 Install flat washer (12), cupola cover handle sleeve bearing (13), and cupola cover inner door handle (10).

9 Install flat washer (14) and new self-locking nut (15).



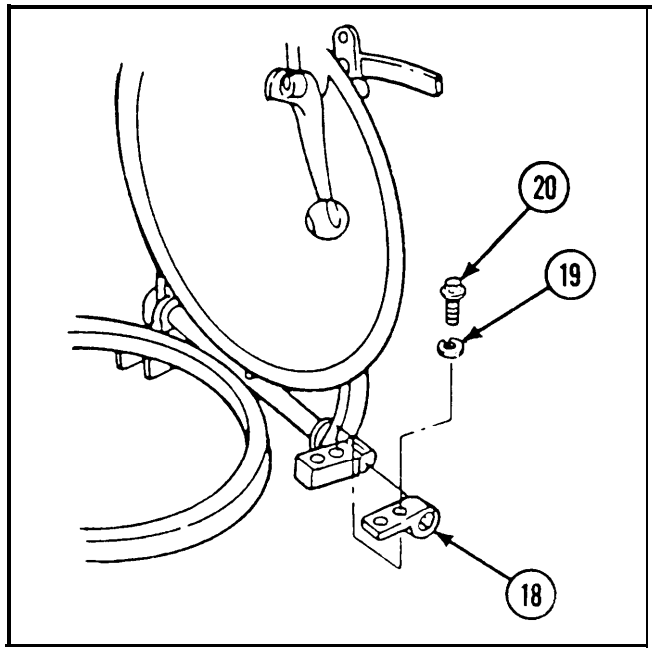
NOTE
DRIVER'S HATCH COVER ASSEMBLY SHOWN REMOVED FROM VEHICLE FOR CLARITY.

10 If removed, install new lubrication fitting (16). Fill cupola hinge torsion bar (17) with grease.



11 Install cupola spring anchor (18).

12 Install two new lockwashers (19) and two hexagon head capscrews (20).



2-166. MAINTENANCE OF HULL DRAIN PLUGS, VALVES, AND RELATED PARTS.

This task covers:	a. *Removal*	b. *Inspection/Repair*	*c. Installation*

INITIAL SETUP

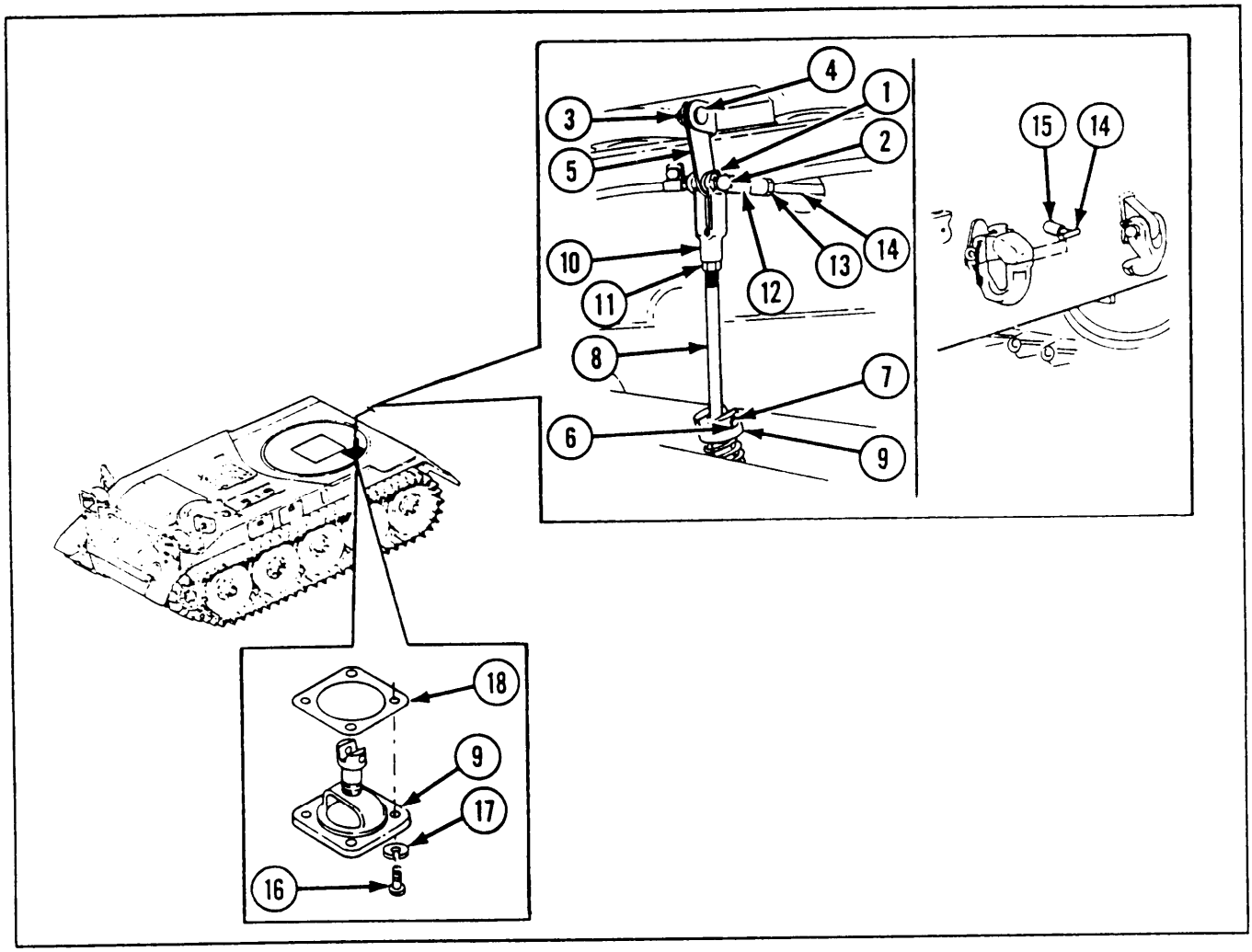
Materials/Parts
Cotter pin (3)
Cotter pin (2)
Gasket (2)
Gasket
Lockwasher(12)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-918 Hull recess cover plate removed

2-166. MAINTENANCE OF HULL DRAIN PLUGS, VALVES, AND RELATED PARTS (CONT).

REMOVAL



1 Remove cotter pin (1) and headed straight pin (2).

2 Remove cotter pin (3), headed straight pin (4), and rigid connecting link (5).

3 Remove cotter pin (6), headed straight pin (7), and drain valve rod (8) from valve assembly (9).

4 Remove rod end clevis (10) and hexagon plain nut (11) from drain valve rod (8).

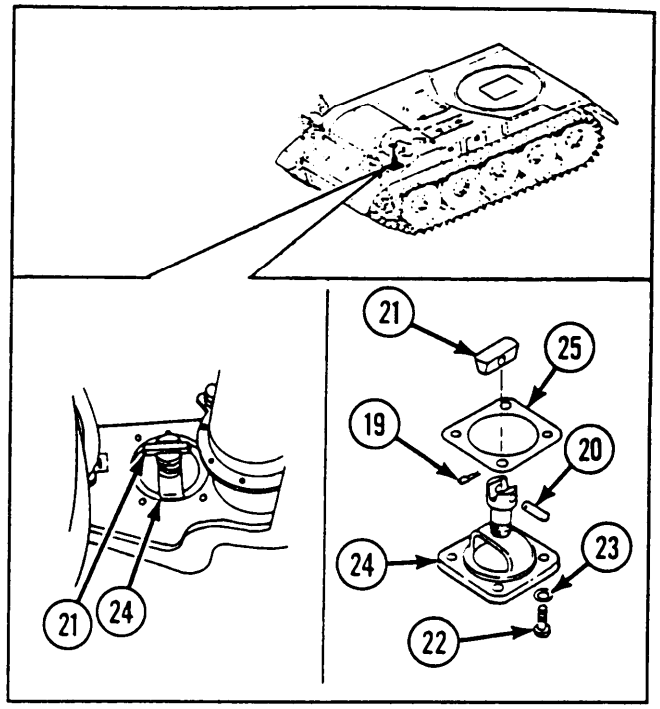
5 Remove rod end clevis (12) and hexagon plain nut (13) from rear drain valve handle (14).

6 Remove rear drain valve handle (14).

7 Remove drain valve handle plug (15).

8 Remove four capscrews (16) and four lockwashers (17).

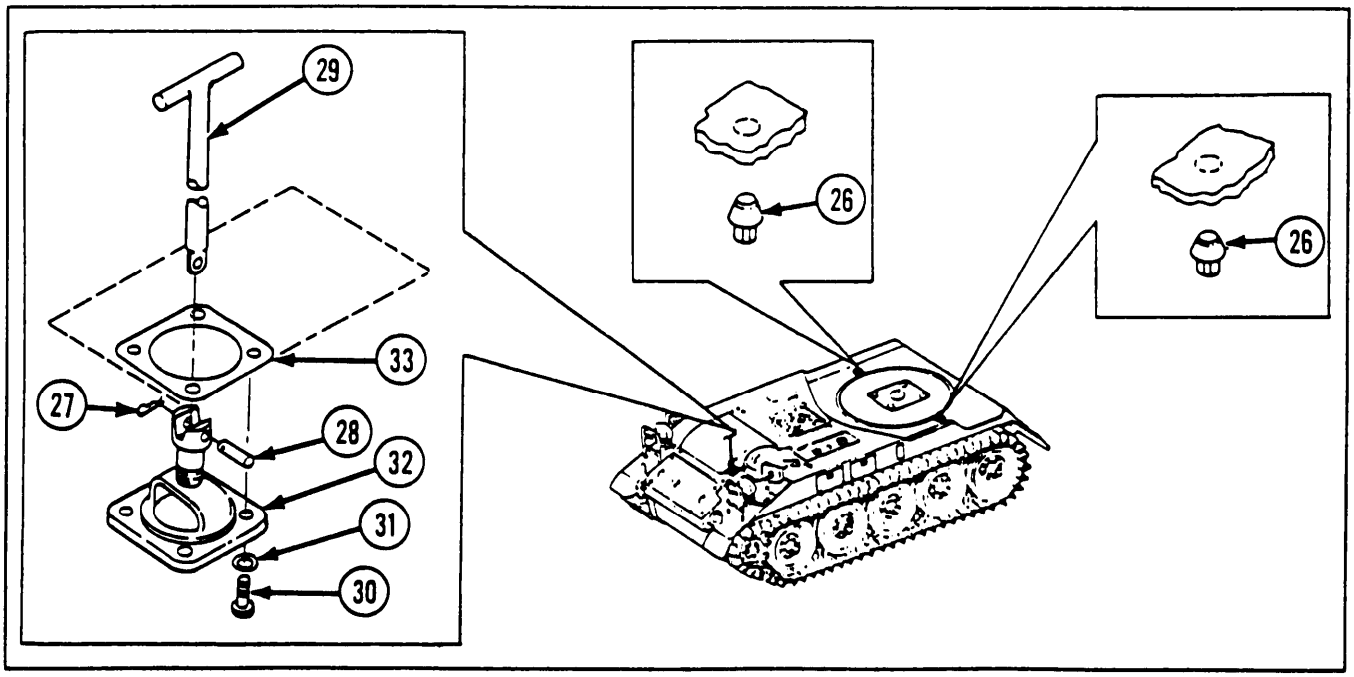
9 Remove valve assembly *(9)* and gasket (18).



10 Remove cotter pin (19), headed straight pin (20), and manual control lever (21).

11 Remove four capscrews (22) and four lockwashers (23).

12 Remove valve assembly (24) and gasket (25).



13 Remove two pipe plugs (26) from the underside of the hull.

14 Remove cotter pin (27), headed straight pin (28), and drain valve handle (29).

15 Remove four capscrews (30) and four lockwashers (31).

16 Remove valve assembly (32) and gasket (33).

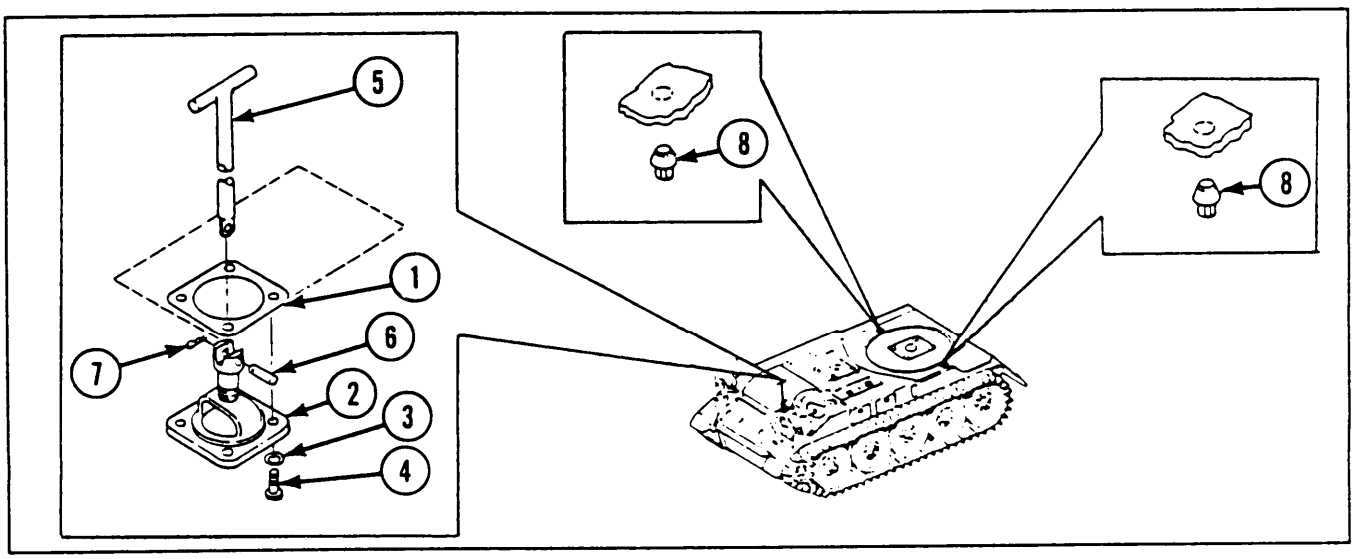
2-166. MAINTENANCE OF HULL DRAIN PLUGS, VALVES, AND RELATED PARTS (CONT).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



1 Install new gasket (1) and valve assembly (2).

2 Install four new lockwashers (3) and four capscrews (4).

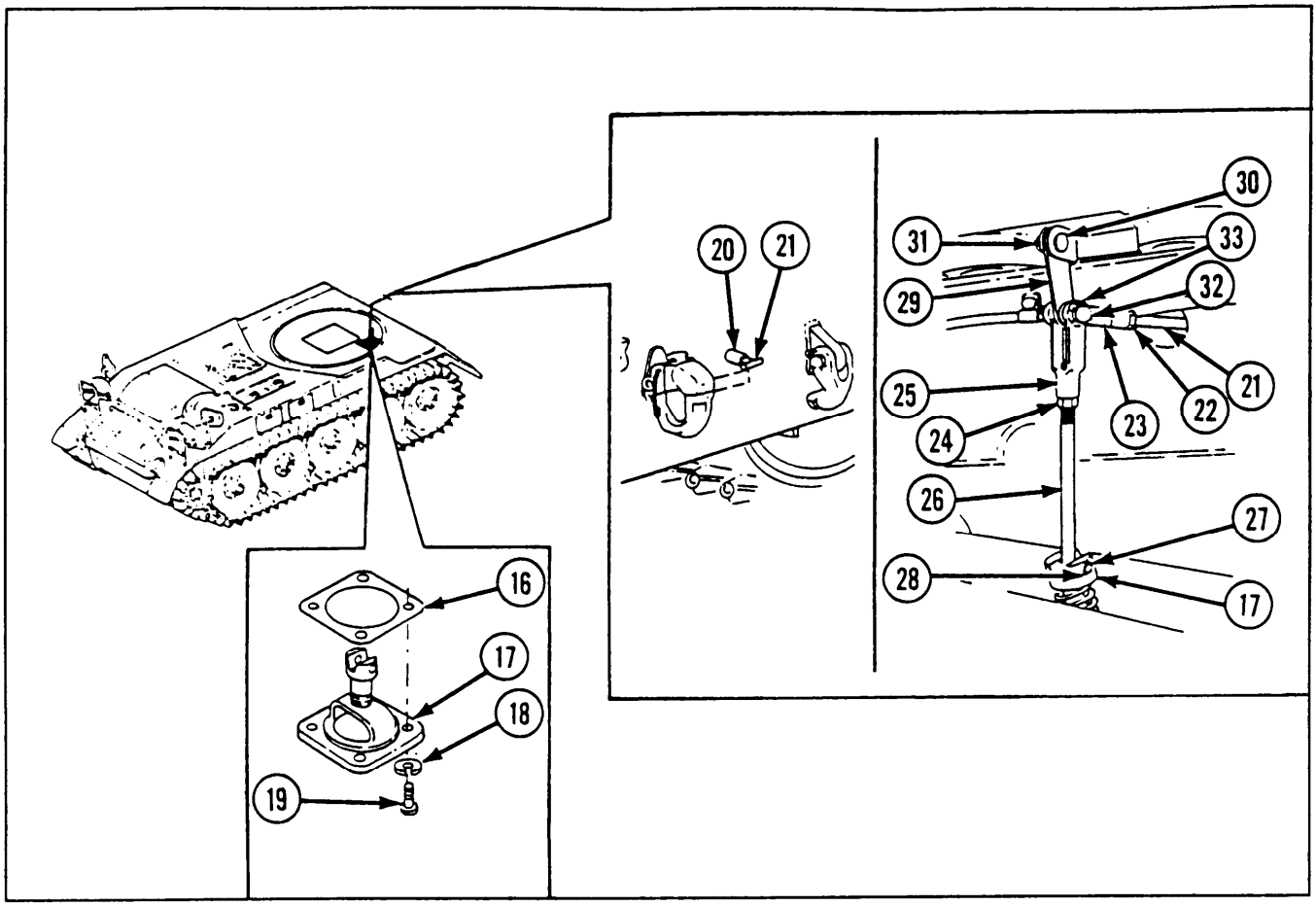
3 Install drain valve handle (5), headed straight pin (6), and new cotter pin (7).

4 Install two pipe plugs (8) in underside of hull.

5 Install new gasket (9) and valve assembly (10).

6 Install four new lockwashers (11) and four capscrews (12).

7 Install manual control lever (13), headed straight pin (14), and new cotter pin (15).



8 Install new gasket (16) and valve assembly (17).

9 Install four new lockwashers (18) and four capscrews (19).

10 Install drain valve handle plug (20) on rear drain valve handle (21).

11 Install rear drain valve handle (21).

12 Install hexagon plain nut (22) and rod end clevis (23) on rear drain valve handle (21).

13 Install hexagon plain nut (24) and rod end clevis (25) on drain valve rod (26).

14 Install drain valve rod (26), headed straight pin (27), and new cotter pin (28) on valve assembly (17).

15 Install connecting link (29), headed straight pin (30), and new cotter pin (31).

16 Install headed straight pin (32) and new cotter pin (33) to connect two rod end clevises (23 and 25) to connecting link (29).

17 Tighten two hexagon plain nuts (22 and 24).

2-167. MAINTENANCE OF DRIVER'S SEAT AND ASSOCIATED PARTS.

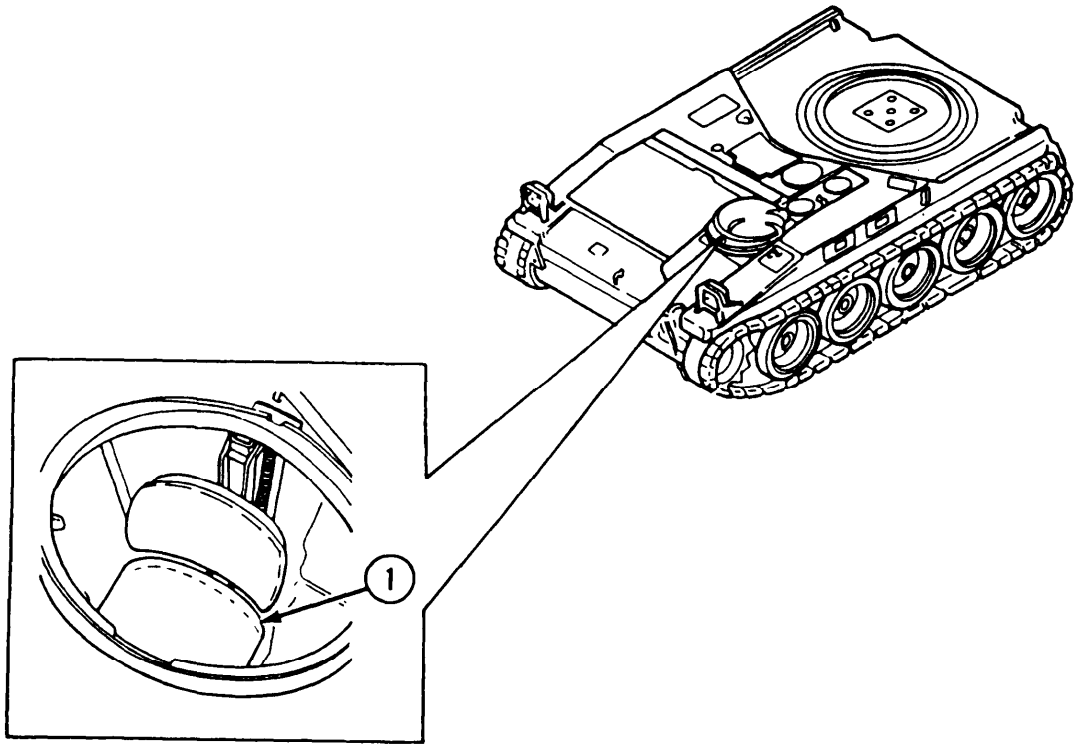
This task covers:	a. *Removal*	b. *Inspection/Repair*	c. *Installation*

INITIAL SETUP

Materials/Parts
Cotter pin (2)
Cotter pin (2)

References
TM 9-2350-238-24P-1

REMOVAL



1 Open driver's hatch cover and lower vehicular seat (1) to full down position.

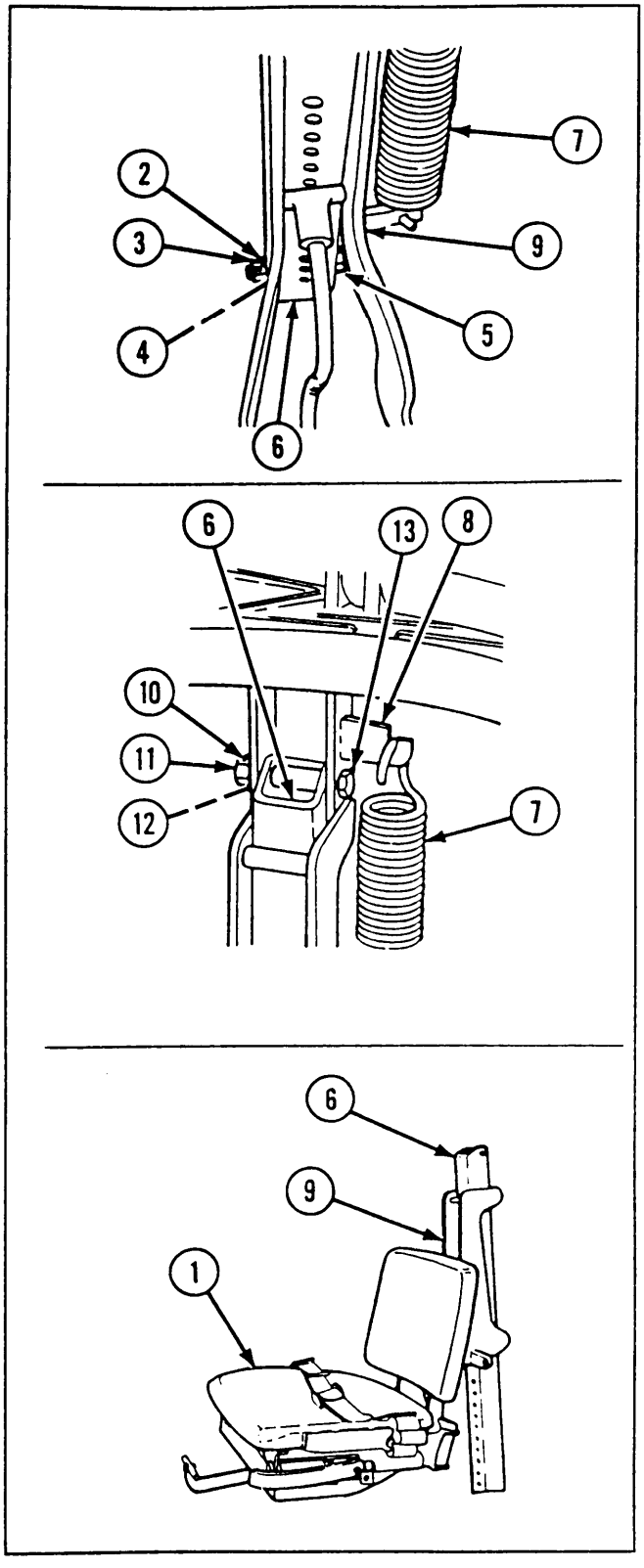
2 Remove cotter pin (2), slotted plain nut (3), flat washer (4), and hexagon head capscrew (5) from lower end of seat supporft post (6).

3 Raise vehicular seat (1) to full up position.

4 Disengage driver's seat suspension helical spring assembly (7) from hull bracket post (8) and driver's seat support (9).

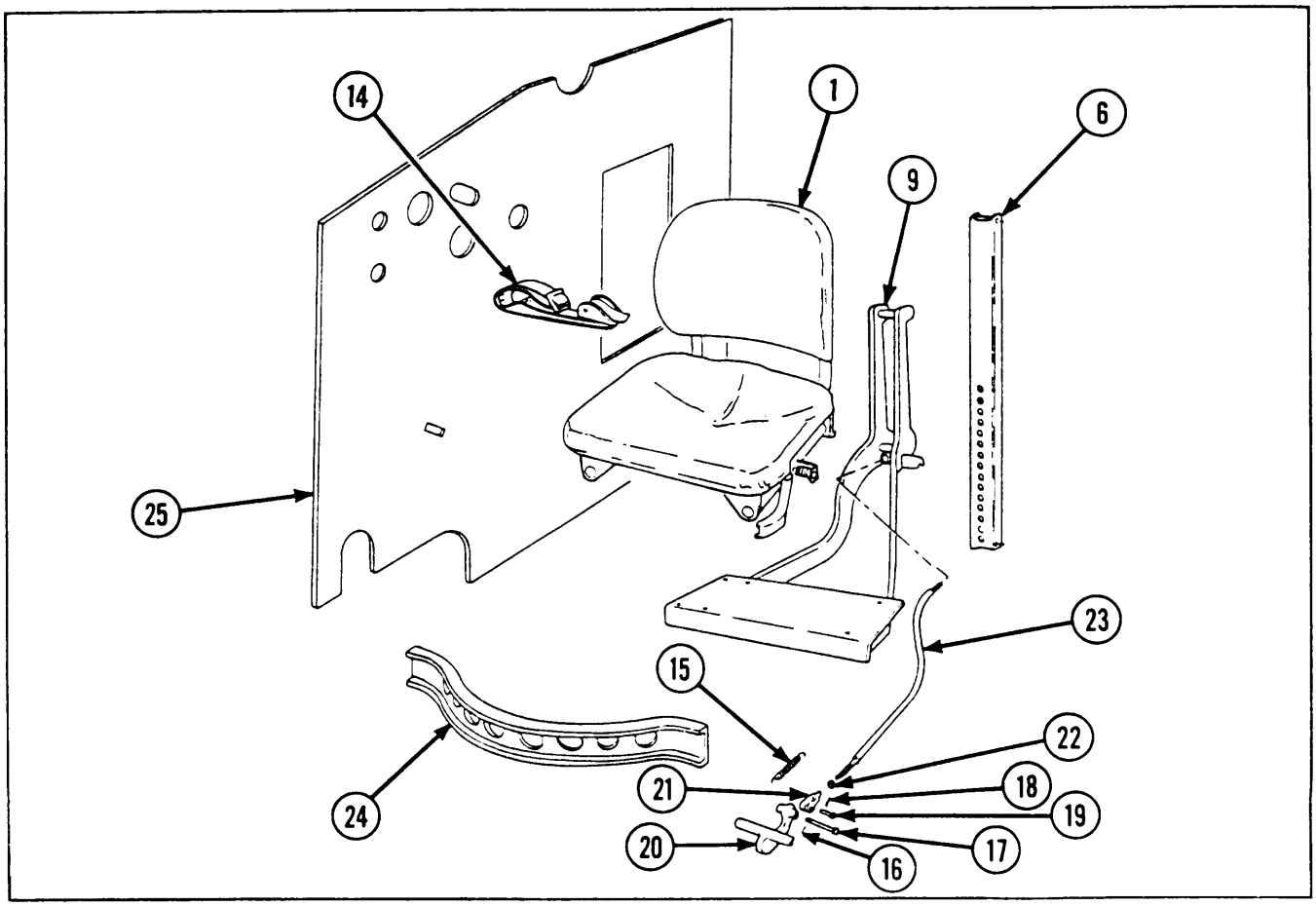
5 Remove cotter pin (10), slotted plain nut (11), flat washer (12), and hexagon head capscrew (13) from upper end of seat support post (6).

Remove vehicular seat (1) and driver's seat support (9) with seat support post (6).



2-167. MAINTENANCE OF DRIVER'S SEAT AND ASSOCIATED PARTS (CONT).

REMOVAL (CONT)



7 Remove vehicular safety belt (14) from vehicular seat (1).

NOTE

To remove vehicular seat from driver's seat support, refer to page 2-957.

8 Remove seat control handle return helical spring (15), cotter pin (16), straight headed pin (17), cotter pin (18), and straight headed pin (19).

9 Remove driver's release handle (20).

10 Remove rod end clevis (21) and hexagon plain nut (22) from adjusting seat rod (23). Remove adjusting seat rod.

11 Remove seat support post (6) from driver's seat support (9).

12 Remove driver's instruments cushioning pad (24) and driver's compartment cushioning pad (25).

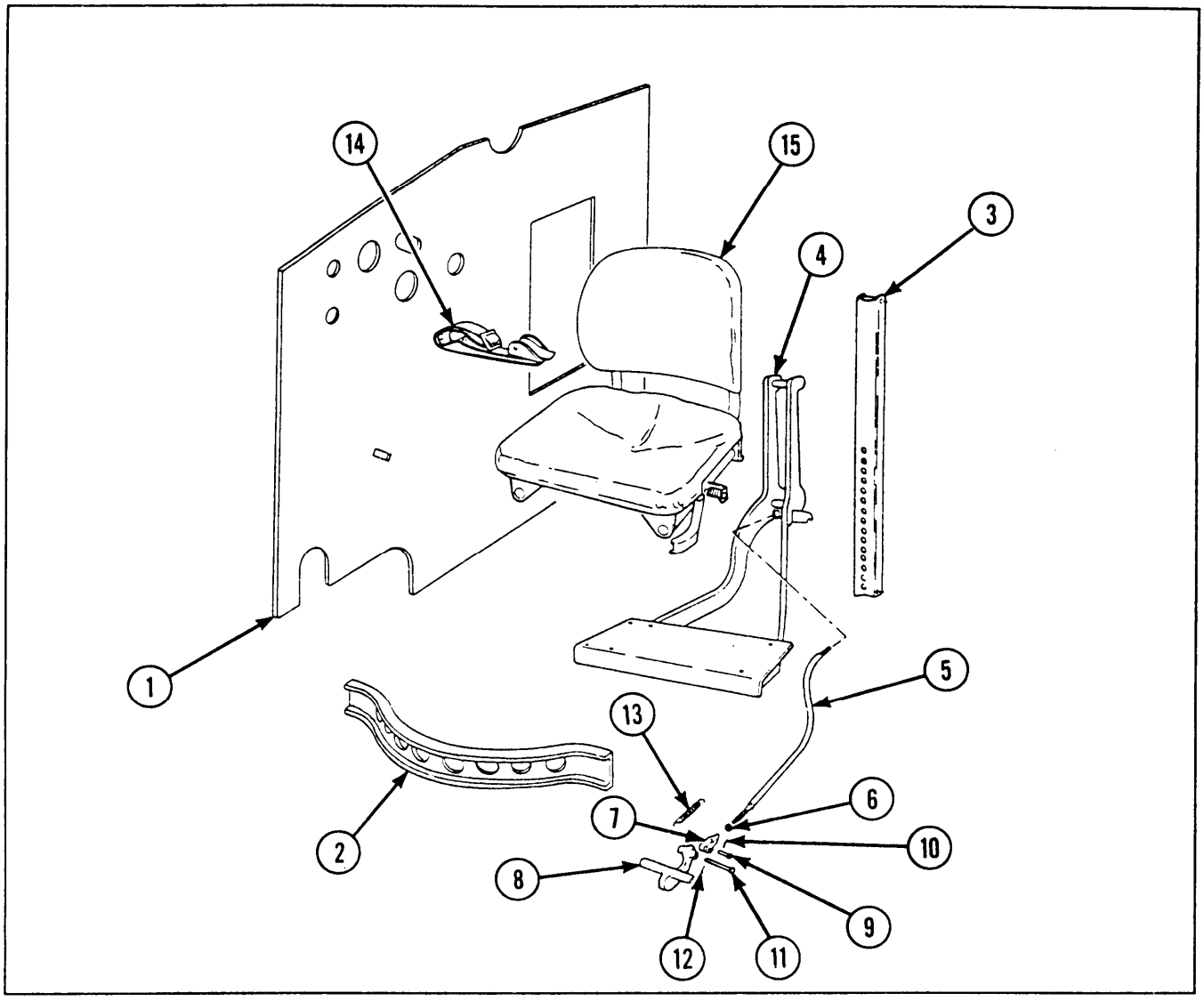
INSPECTION/REPAIR

1 Check for broken, damaged, or missing parts.

2 Vehicular seat is a repairable assembly. Refer to page 2-957.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



1 Install driver's compartment cushioning pad (1) and driver's instruments cushioning pad (2).

2 Install seat support post (3) in driver's seat support (4).

3 Install adjusting seat rod (5). Install hexagon plain nut (6) and rod end clevis (7) on adjusting seat rod.

4 Install driver's release handle (8). Install headed straight pin (9), new cotter pin (10), headed straight pin (11), new cotter pin (12), and seat control handle return helical spring (13).

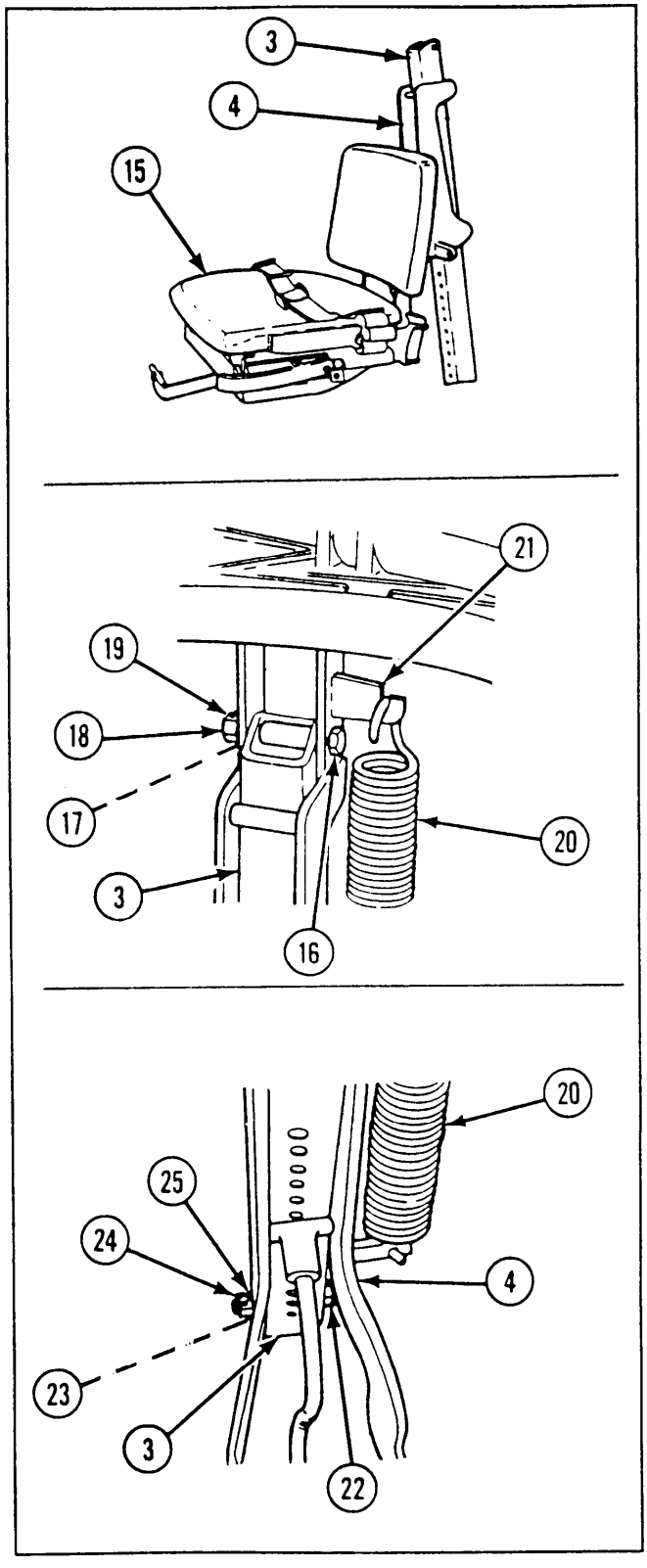
NOTE

To install vehicular seat to driver's seat support, refer to page 2-957.

5 Install vehicular safety belt (14) on vehicular seat (15).

2-167. MAINTENANCE OF DRIVER'S SEAT AND ASSOCIATED PARTS (CONT)

INSTALLATION (CONT)



6 Install vehicular seat (15) and driver's seat support (4) with seat support post (3).

7 Raise vehicular seat (15) to full up position.

8 Install hexagon head capscrew (16), flat washer (17), slotted plain nut (18), and new cotter pin (19) in upper end of seat support post (3).

9 Engage driver's seat suspension helical spring (20) in hull bracket post (21) and driver's seat support (4).

10 Lower vehicular seat (15) to full down position.

11 Install hexagon head capscrew (22), flat washer (23), slotted plain nut (24), and new cotter pin (25) in lower end of seat support post (3).

2-168. MAINTENANCE OF VEHICULAR SEAT.

This task covers: a. *Disassembly* b. *Inspection/Repair* c. *Reassembly*

INITIAL SETUP

Materials/Parts
Cotter pin
Lockwasher (6)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-952 Driver's seat removed

DISASSEMBLY

1 Remove seat back cushion (1) from vehicular seat (2).

2 Remove vehicular seat cushion (3) from vehicular seat (2).

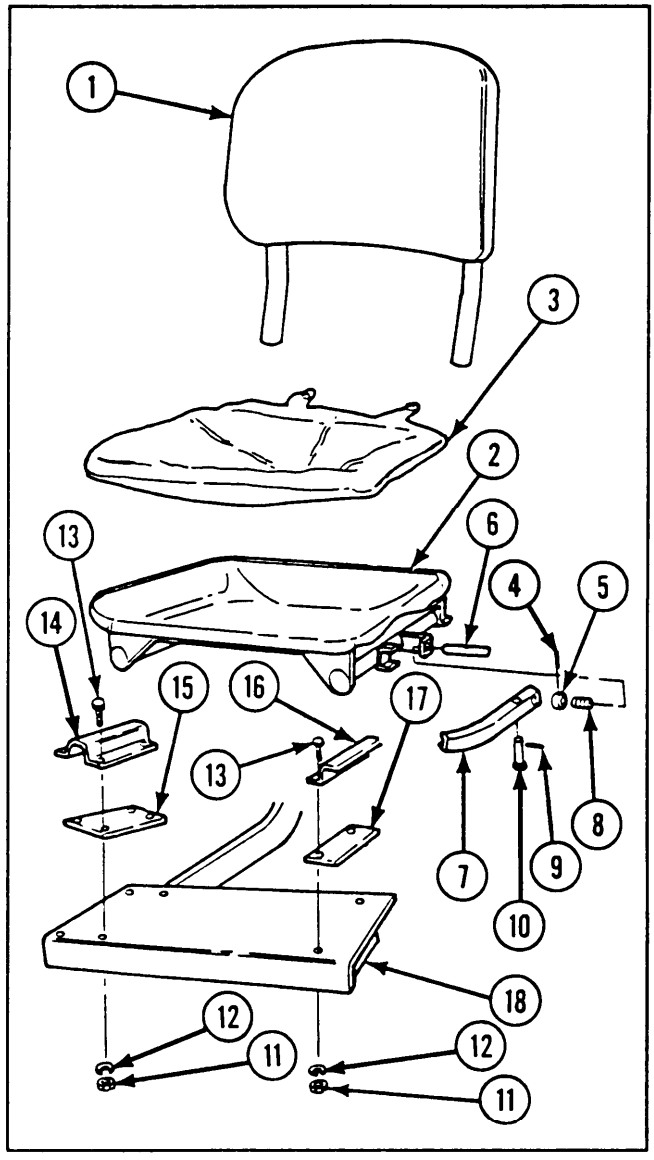
3 Remove headless straight pin (4) from shaft collar (5) and headless straight pin (6).

4 Remove headless straight pin (6) from lock-release lever (7). Remove compression helical spring (8) and shaft collar (5) from vehicular seat (2).

5 Remove cotter pin (9) from headed straight pin (10). Remove headed straight pin from lock-release lever (7). Remove lock-release lever from vehicular seat (2).

6 Remove six hexagon plain nuts (11), six lockwashers (12), and six hexagon head capscrews (13).

7 Remove vehicular seat (2), retaining strap (14), right bearing plate (15), double angle bracket (16), and left bearing plate (17) from vehicular seat support (18).



2-168. MAINTENANCE OF VEHICULAR SEAT (CONT).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

1 Position right bearing plate (1), retaining strap (2), and vehicular seat (3) on vehicular seat support (4). Install four hexagon head capscrews (5), four new lockwashers (6), and four hexagon plain nuts (7).

2 Position left bearing plate (8) and double angle bracket (9) on vehicular seat support (4). Install two hexagon head capscrews (10), two new lockwashers (11), and two hexagon plain nuts (12).

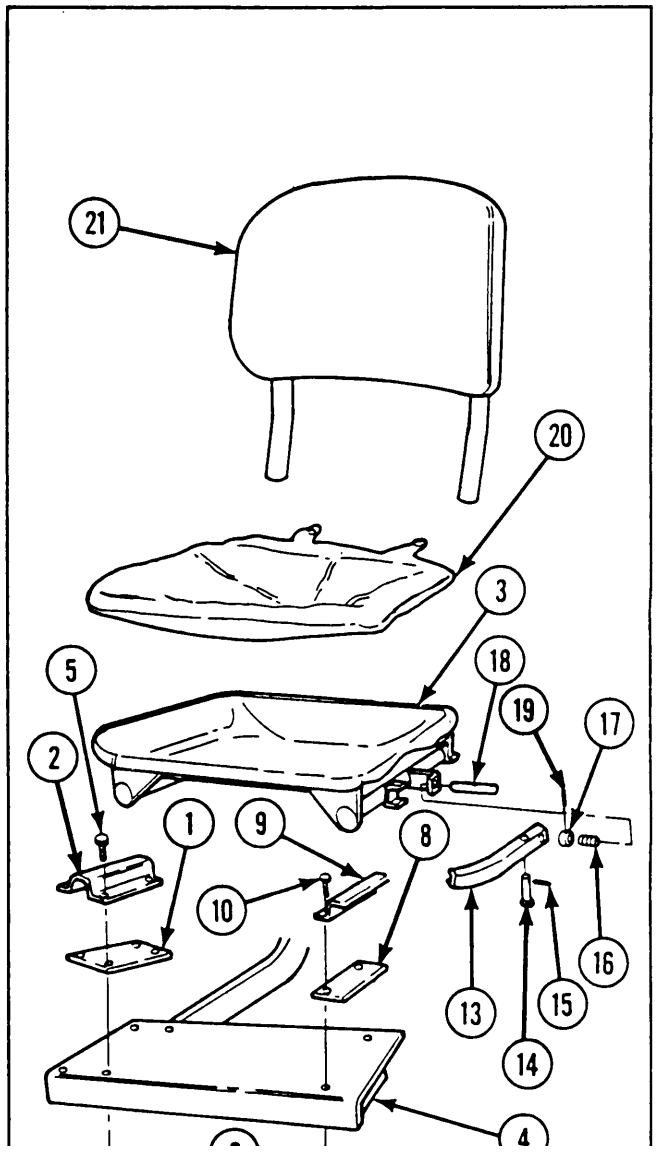
3 Install lock-release lever (13) in vehicular seat (3). Install headed straight pin (14) in lock-release lever to secure lock-release lever. Install new cotter pin (15) in headed straight pin.

4 Install compression helical spring (16) and shaft collar (17) in vehicular seat (13). Install headless straight pin (18) through compression helical spring and shaft collar.

5 Line up holes in shaft collar (17) and headless straight pin (18). Install headless straight pin (19) through shaft collar and headless straight pin.

6 Install vehicular seat cushion (20) on vehicular seat (3).

7 Install seat back cushion (21) in vehicular seat (3).



2-169. MAINTENANCE OF HULL STOWAGE CLAMPS, RETAINERS, AND ASSOCIATED PARTS.

This task covers: a. *Removal* b. *hspection/Repair* *c. Installation*

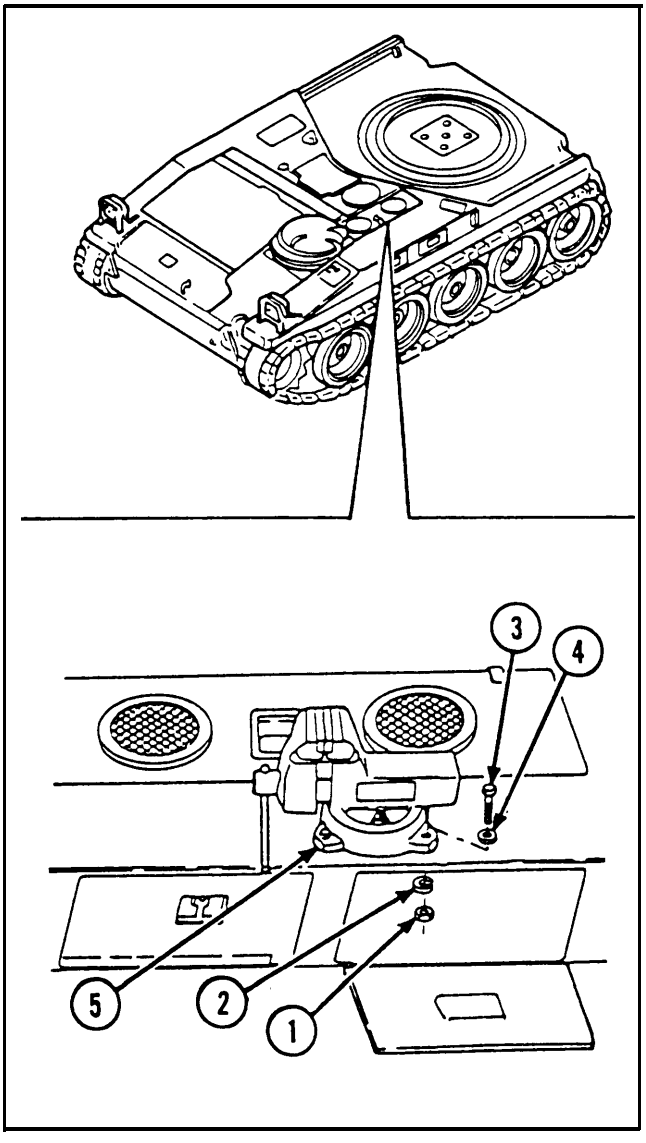
INITIAL SETUP

Materials/Parts
Lockwasher (4)
Lockwasher (2)
Lockwasher (4)
Lockwasher (4)
Lockwasher

References
TM 9-2350-238-24P-1

Equipment Conditions
2-446 Aft air cleaner filter removed
2-952 Driver's seat removed
2-496 Push-pull throttle control removed
2-814 Parking brake control removed

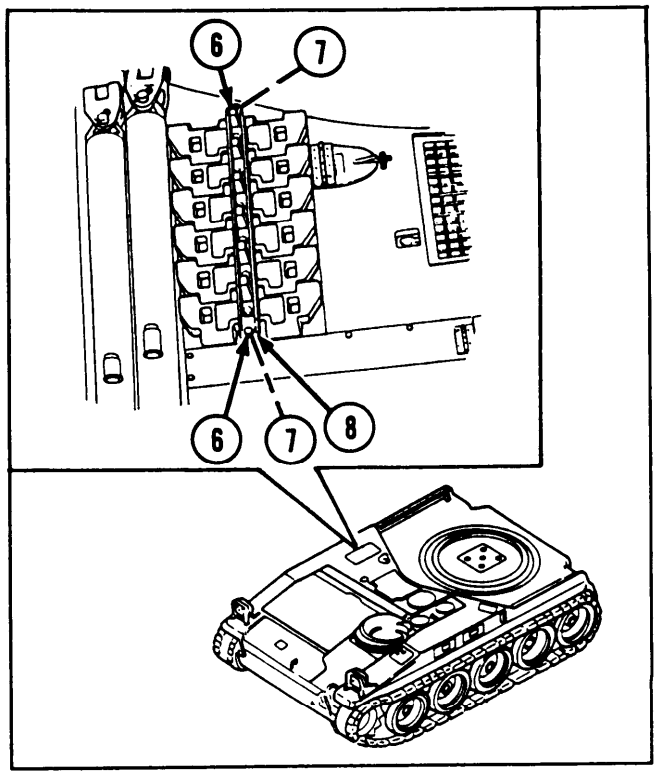
REMOVAL



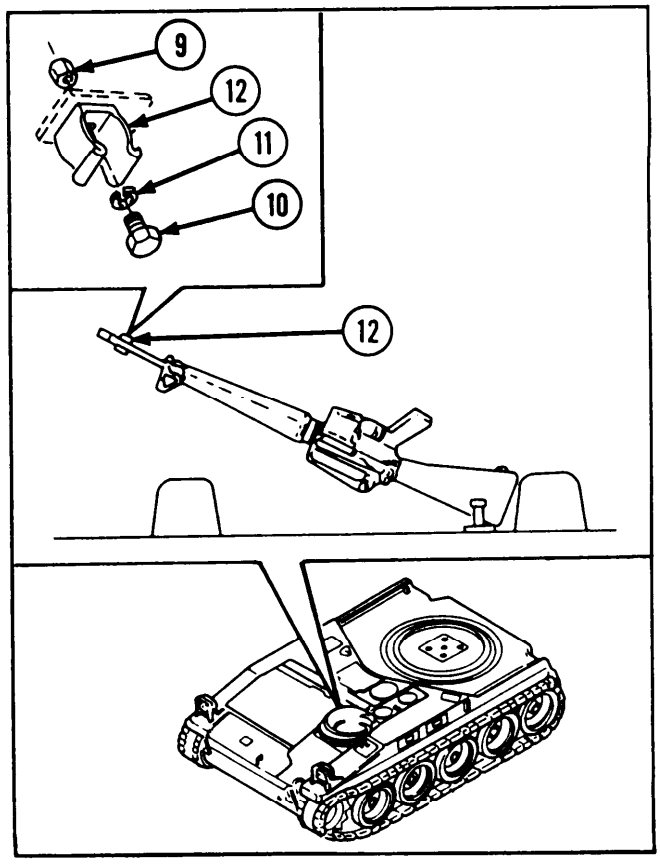
1 Remove four hexagon plain nuts (1), four lockwashers (2), four hexagon head capscrews (3), and four flat washers (4) from vise mount (5).

2-169. MAINTENANCE OF HULL STOWAGE CLAMPS, RETAINERS, AND ASSOCIATED PARTS (CONT).

REMOVAL (CONT)



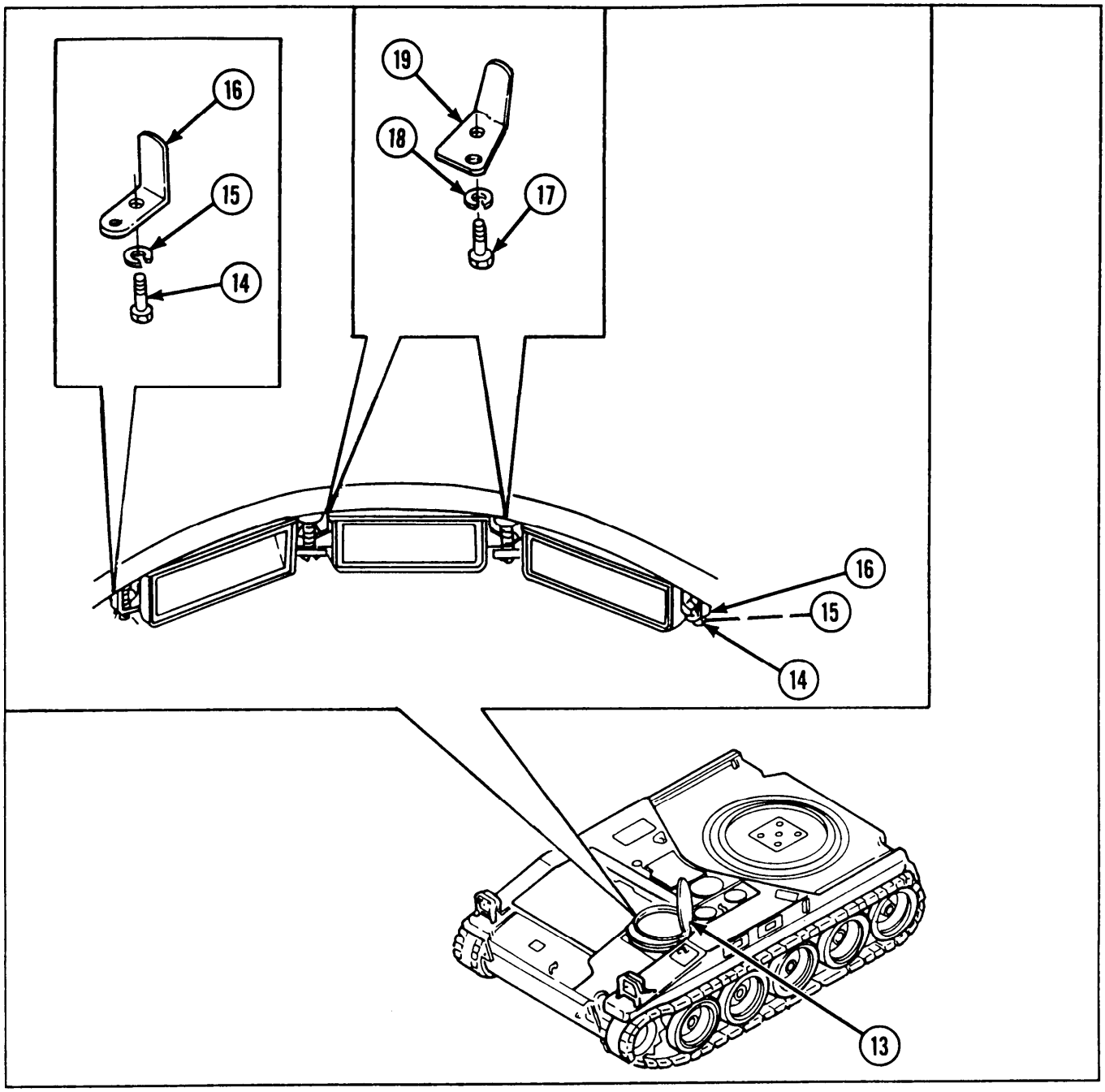
2 Remove two hexagon head capscrews (6), two lockwashers (7), and spare track clamp (8) from bulkhead.



NOTE

Remove rifle from spring tension clip before removing spring tension clip.

3 Remove hexagon plain nut (9), hexagon head capscrew (10), lockwasher (11), and spring tension clip (12) from bulkhead.



4 Open driver's hatch cover (13).

NOTE

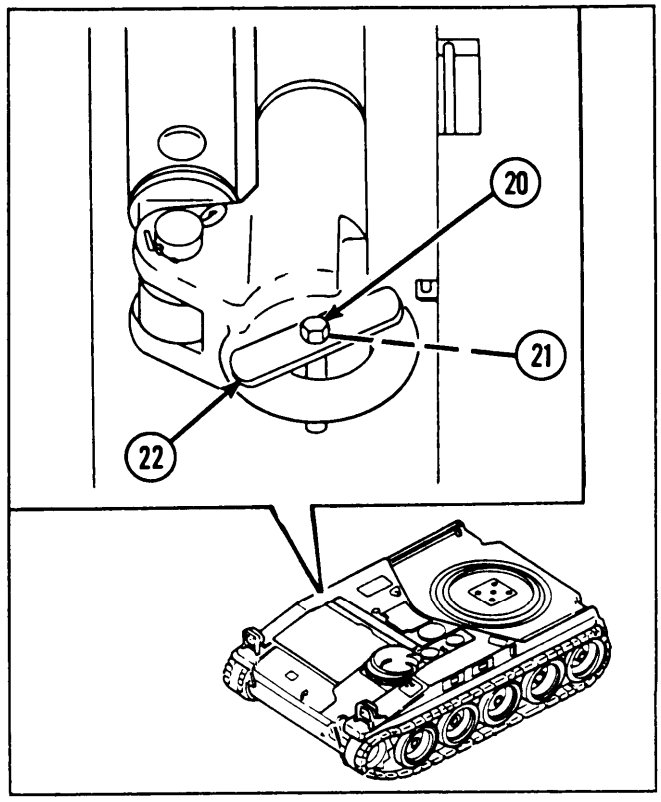
Support periscopes while removing angle brackets from bulkhead.

5 Remove two hexagon head capscrews (14), two lockwashers (15), and two angle brackets (16) from bulkhead.

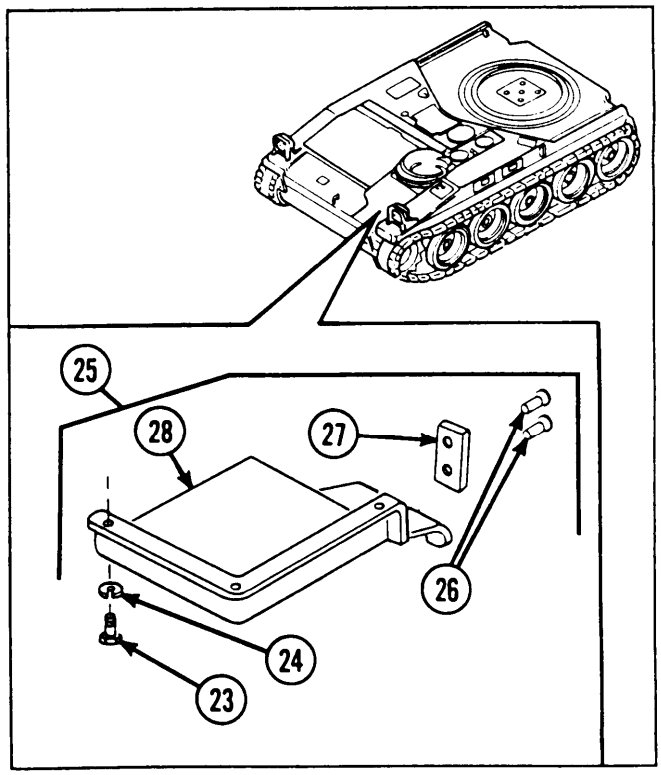
6 Remove two hexagon head capscrews (17), two lockwashers (18), and two angle brackets (19) from bulkhead.

2-169. MAINTENANCE OF HULL STOWAGE CLAMPS, RETAINERS, AND ASSOCIATED PARTS (CONT).

REMOVAL (CONT)



7 Remove hexagon head capscrew (20), lockwasher (21), and stowage box plate (22) from bulkhead.



NOTE

Gain access to bracket assembly from driver's compartment.

8 Remove three hexagon head capscrews (23), three lockwashers (24), and bracket assembly (25) from bulkhead.

9 If damaged, remove two solid rivets (26) and connecting link (27) from bracket (28).

1 Inspect for broken, damaged, or missing parts.

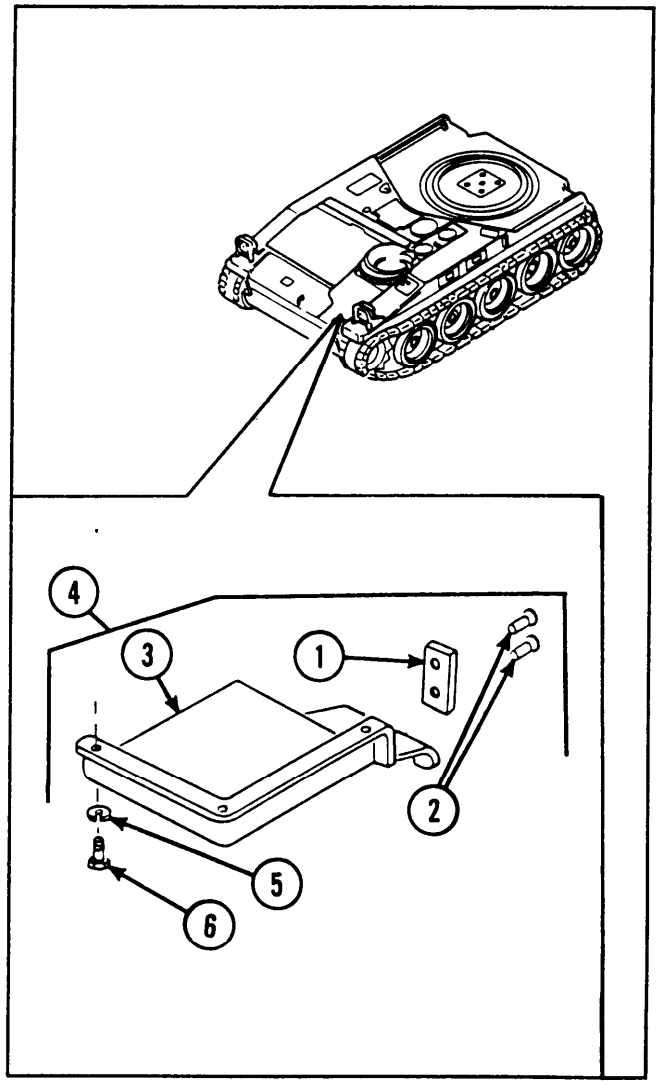
2 If bracket is broken, damaged, or missing, repair is by replacement of next higher assembly.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

INSTALLATION

1 If removed, install connecting link (1) and two new solid rivets (2) on bracket (3).

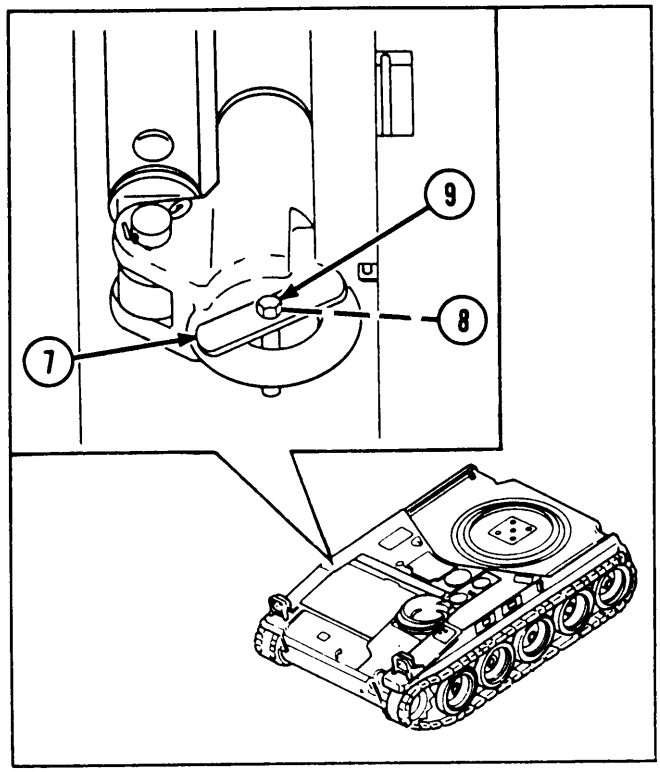
2 Install bracket assembly (4), three new lockwashers (5), and three hexagon head capscrews (6).

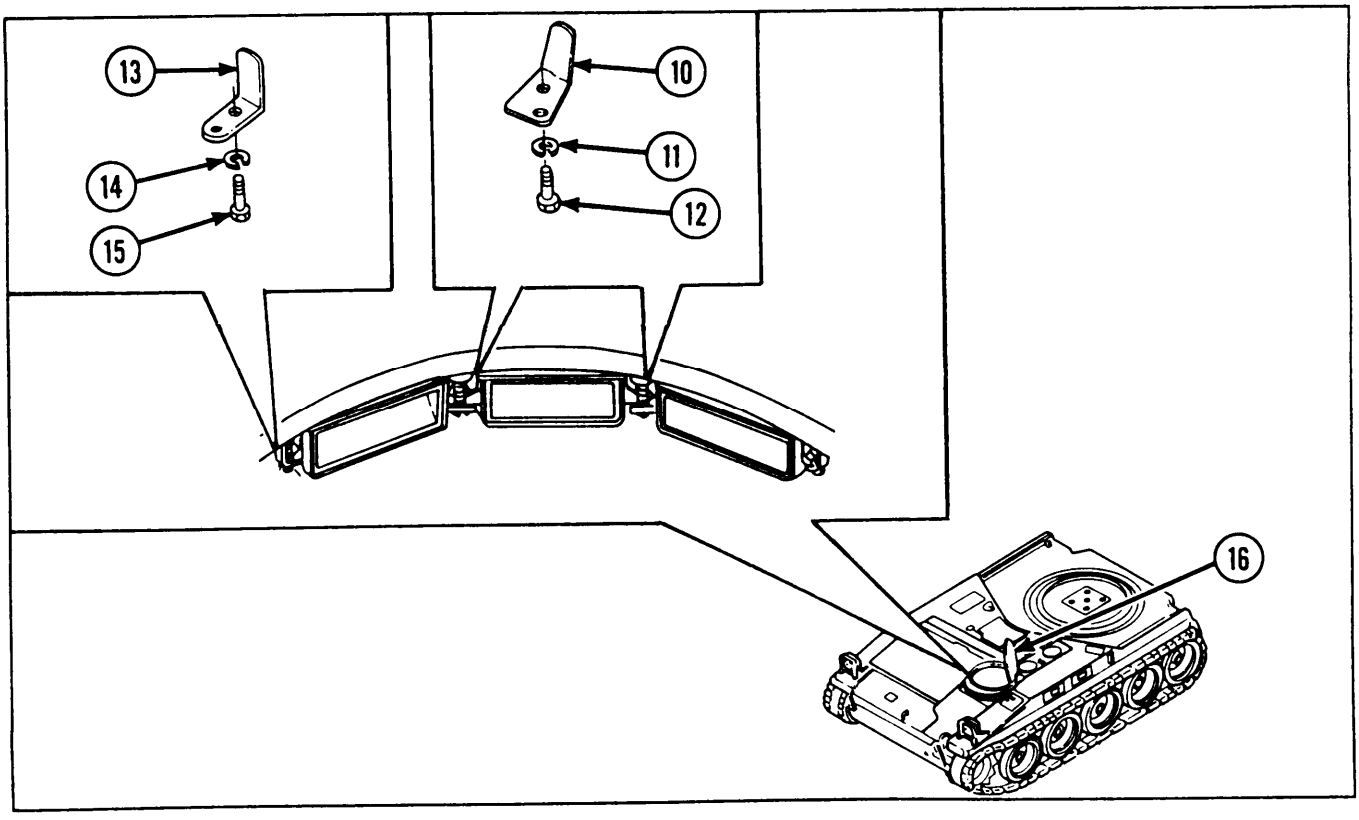


2-169. MAINTENANCE OF HULL STOWAGE CLAMPS, RETAINERS, AND ASSOCIATED PARTS (CONT).

INSTALLATION *(CONT)*

3 Install stowage box plate (7), new lockwasher (8), and hexagon head capscrew (9) to bulkhead.





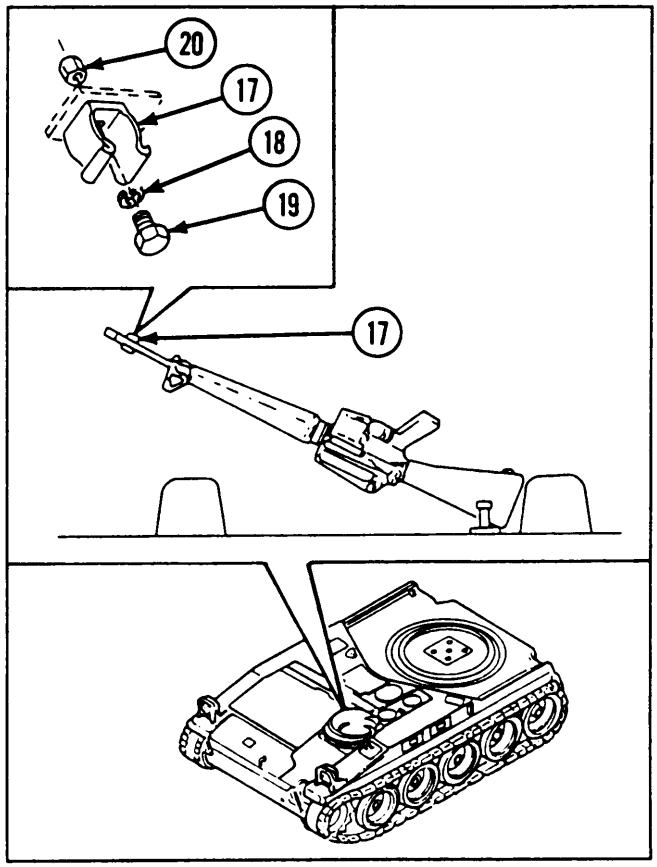
NOTE
Support periscopes while installing angle brackets on bulkhead.

4 Install two angle brackets (10), two new lockwashers (11), and two hexagon head capscrews (12) on bulkhead.

5 Install two angle brackets (13), two new lockwashers (14), and two hexagon head capscrews (15) on bulkhead.

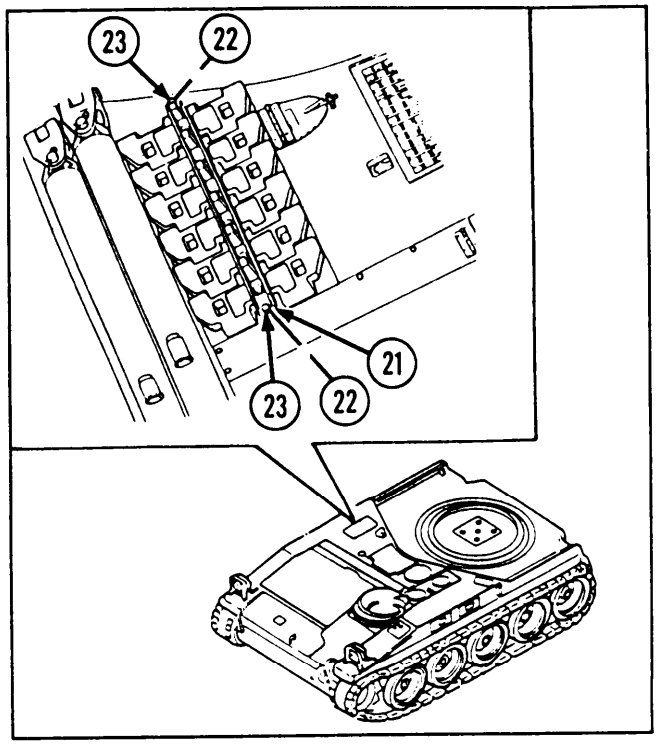
6 Close driver's hatch cover (16).

7 Install spring tension clip (17), new lockwasher (18), hexagon head capscrew (19), and hexagon plain nut (20) on bulkhead.

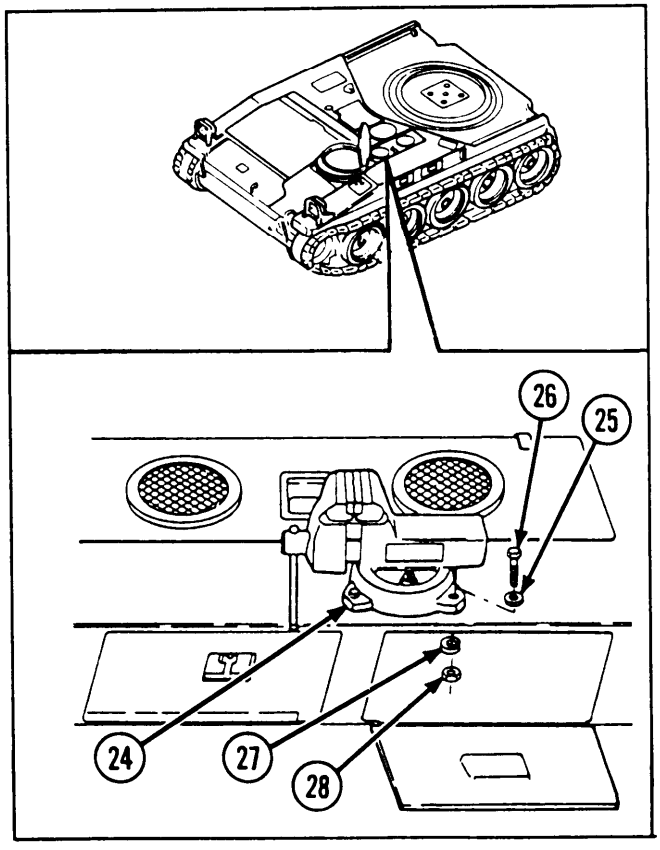


2-169. MAINTENANCE OF HULL STOWAGE CLAMPS, RETAINERS, AND ASSOCIATED PARTS (CONT).

8 Install spare track clamp (21), two new lockwashers (22), and two hexagon head capscrews (23).



9 Install vise mount (24) and secure with four fiat washers (25), four hexagon head capscrews (26), four new lockwashers (27), and four hexagon plain nuts (28).



2-170. MAINTENANCE OF SPADE AND RELATED PARTS.

This task covers:	a. *Removal* b. *Inspection/Repair*	*c. Testing* d. *Installation*

INITIAL SETUP

Tools and Special Tools
Hoist
Sling (item 82, appx B)
Spade pin nut wrench (item 32, appx G)

Materials/Parts
Cotter pin
Cotter pin (2)
Cotter pin (2)
Cotter pin (12)
Gasket (2)
Hydraulic fluid (item 21, appx C)
Lockwasher (2)
Lockwasher (4)
LockWasher (20)

Personnel Required
Two

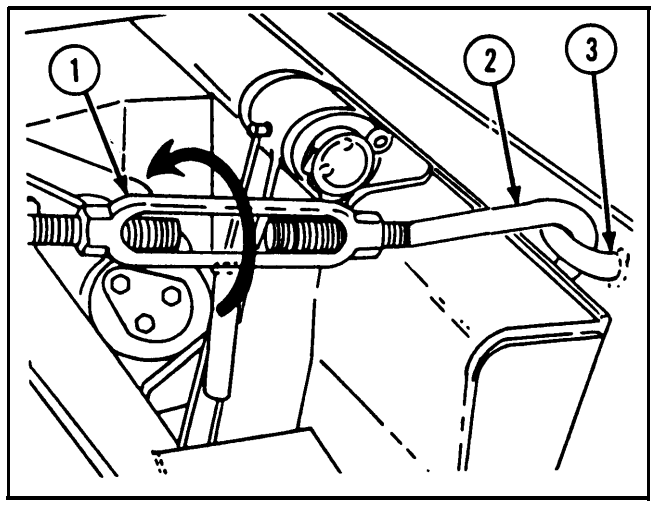
References
TM 9-2350-238-24P-1

General Safety Instructions

WARNING

Wipe up any spilled hydraulic fluid to prevent injury to personnel.

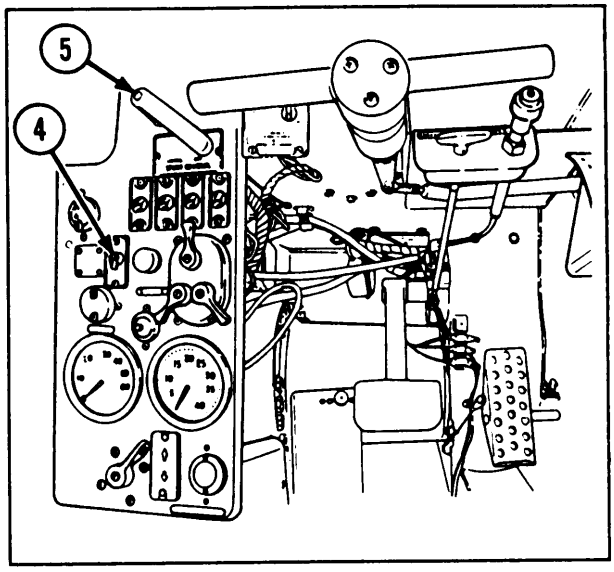
REMOVAL



1 Loosen turnbuckle body (1) and lift hook bolt (2) from eye (3).

2-170. MAINTENANCE OF SPADE AND RELATED PARTS (CONT).

REMOVAL (CONT)



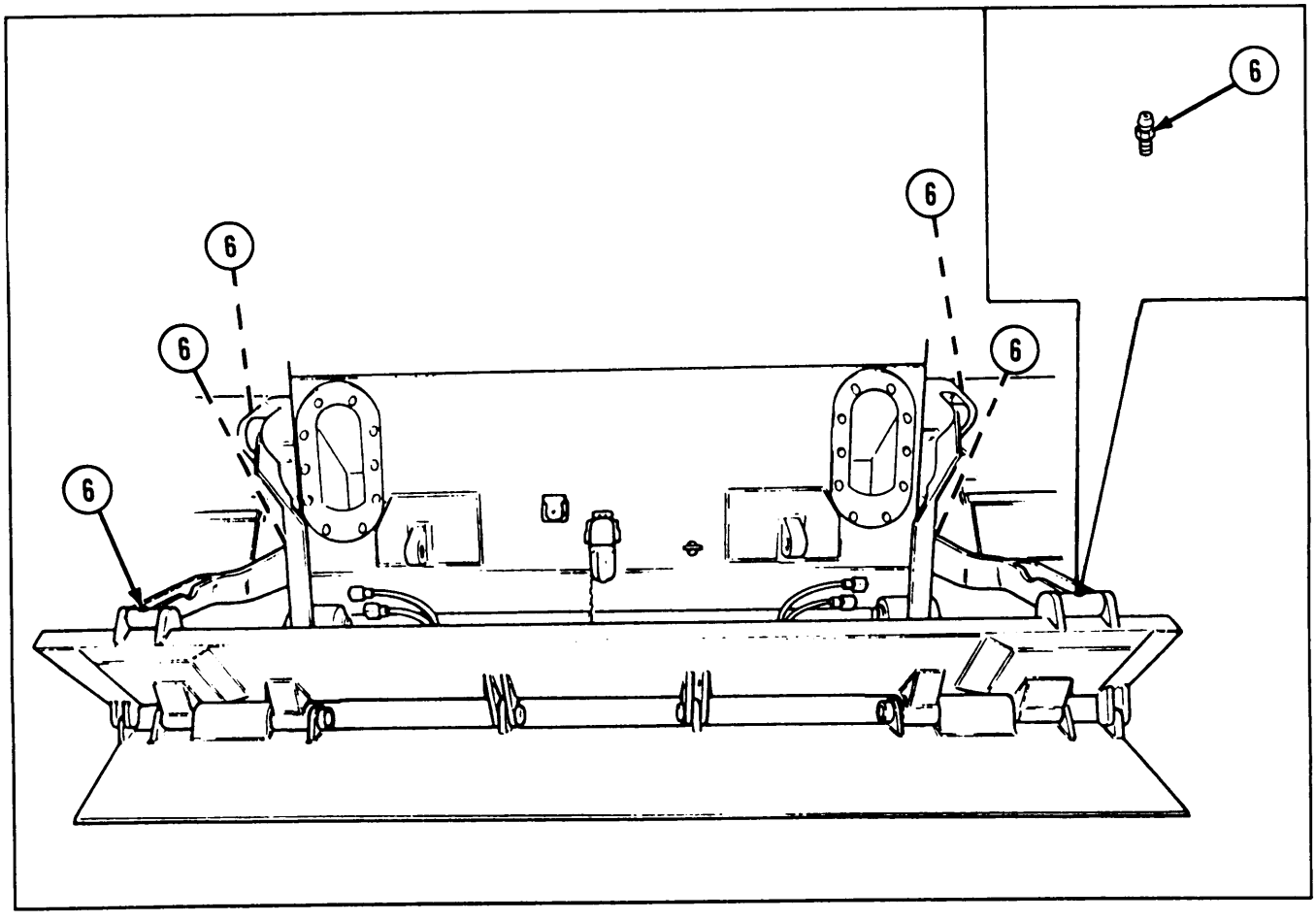
2 Start engine.

3 Set HYD PUMP/PTO CLUTCH switch (4) to ON.

4 Set SPADE CONTROL lever (5) to LOWER.

5 Set HYD PUMP/PTO CLUTCH switch (4) to OFF. Stop engine.

6 Cycle SPADE CONTROL lever (5) between RAISE and LOWER several times to relieve hydraulic pressure.



7 If damaged, remove six lubrication fittings (6).

NOTE

Steps 8 thru 14 are written for one hydraulic cylinder assembly but apply to both.

8 Place suitable container under hydraulic cylinder assembly (7) to catch oil from disconnected hoses.

9 Disconnect hydraulic hoses (8 and 9) from hydraulic cylinder assembly (7).

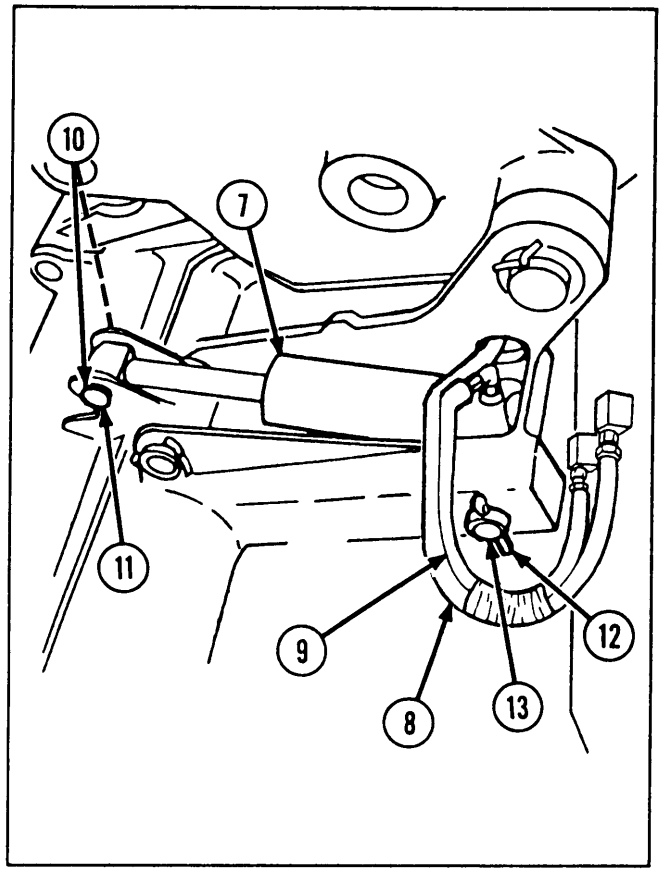
10 Cover ends of hydraulic hoses (8 and 9) to keep dirt out.

11 Remove two retaining rings (10) and headless grooved pin (11).

12 Remove cotter pin (12).

13 Support hydraulic cylinder assembly (7) and remove headless straight pin (13).

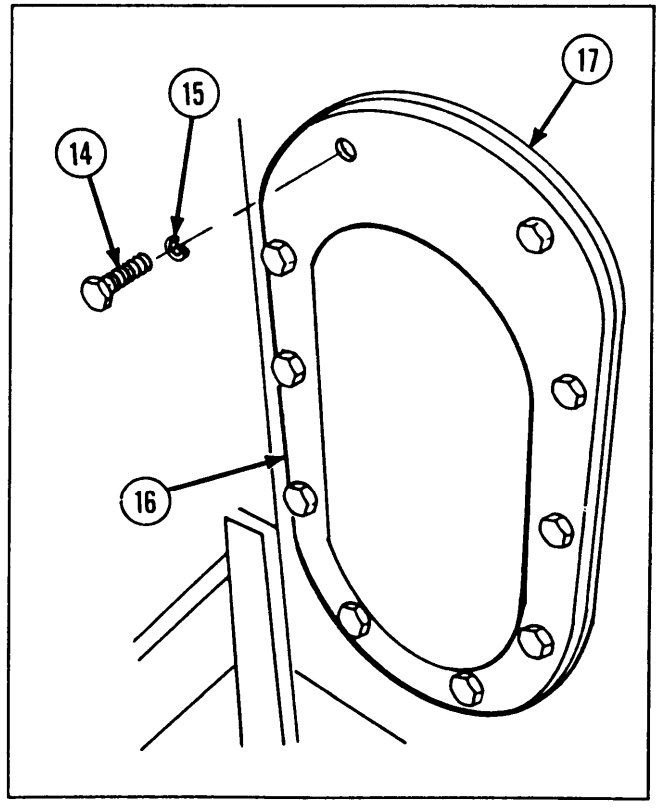
14 Remove hydraulic cylinder assembly (7).



NOTE

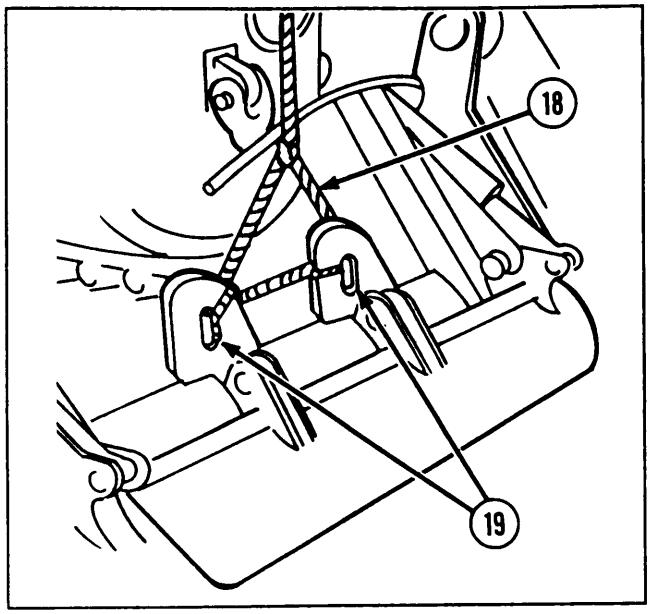
Steps 15 thru 22 are written for one side of the vehicle but apply to both.

15 Remove ten hexagon head capscrews (14), ten lockwashers (15), access cover (16), and gasket (17).

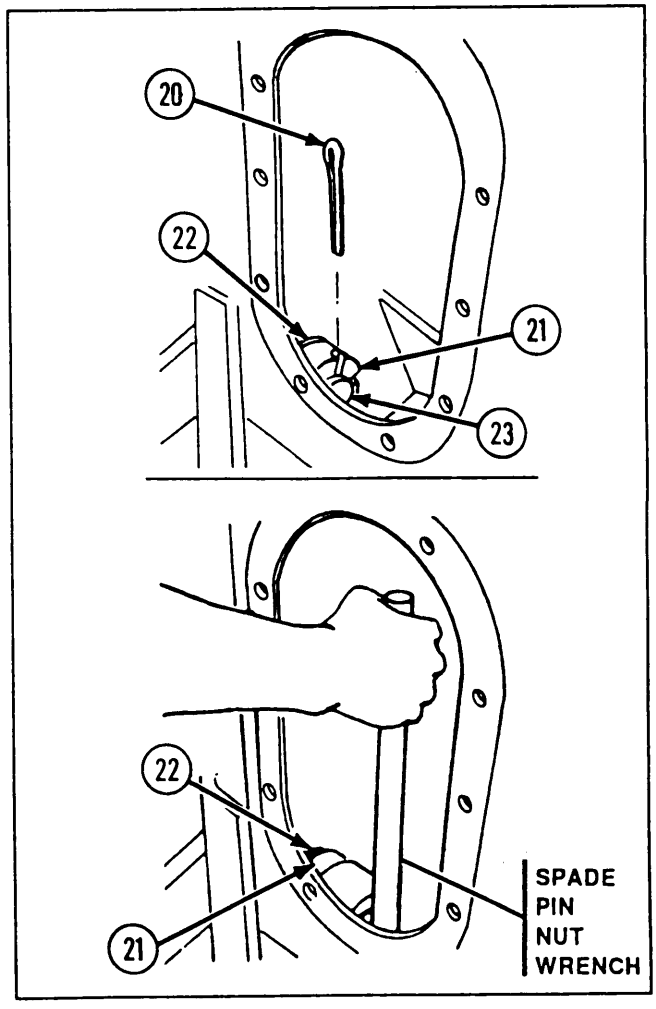


2-170. MAINTENANCE OF SPADE AND RELATED PARTS (CONT).

REMOVAL (CONT)



16 Insert sling (18) through lifting eyes (19). Using hoist, take up slack in sling to support spade firmly.



17 Remove cotter pin (20).

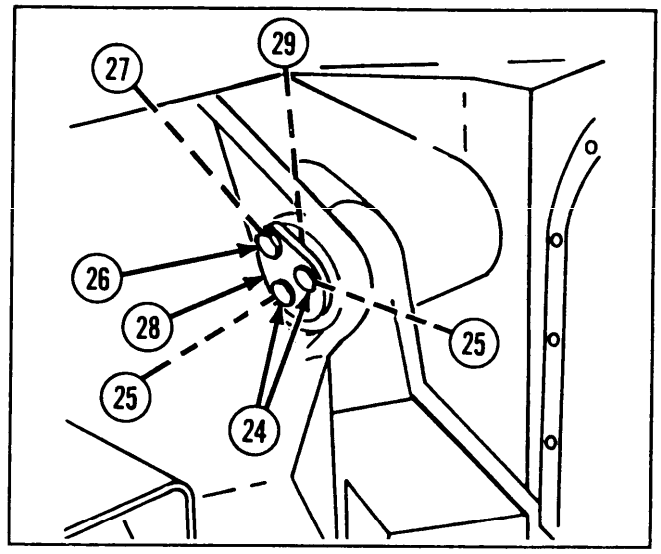
18 Remove round plain nut (21) and flat washer (22) using spade pin nut wrench.

19 Drive spade hinge pin (23) from hull.

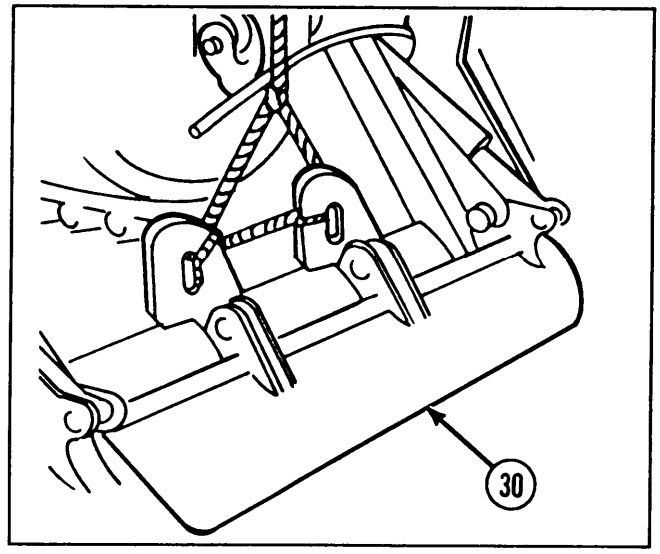
20 Remove two hexagon head capscrews (24) and two lockwashers (25).

21 Remove hexagon head capscrew (26), lockwasher (27), and spade cylinder keeper (28).

22 Using hammer and drift pin, drive out spade cylinder pin (29).



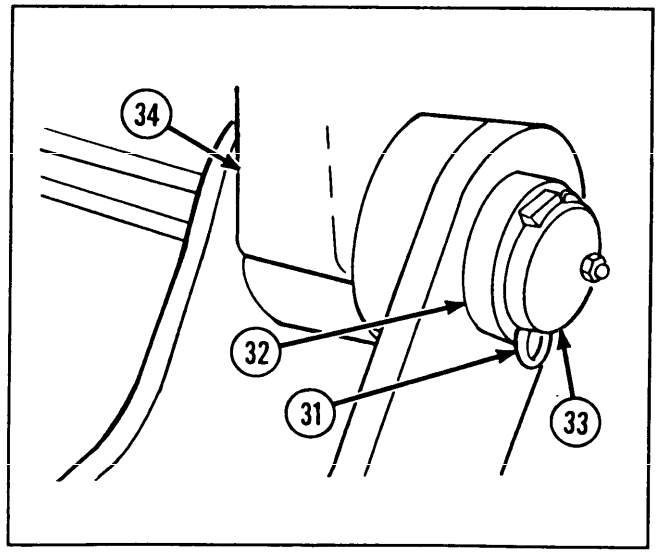
23 Using hoist and sling, raise spade (30) slowly and remove from vehicle.



NOTE

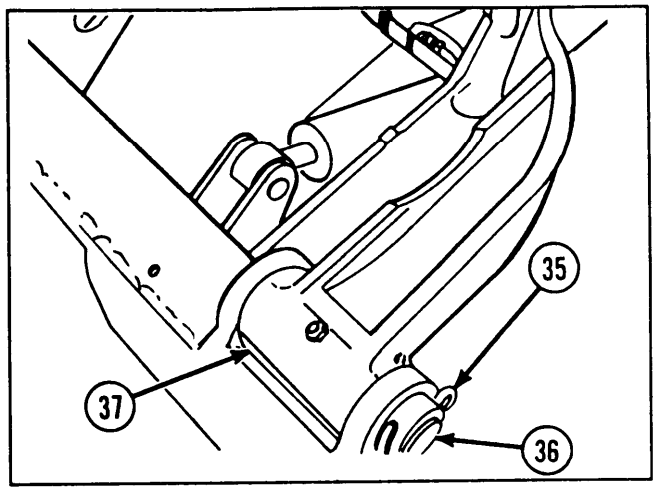
Step 24 is written for the spade hinge lever but also applies to the remote control lever.

24 Remove cotter pin (31), ten ring spacers (32), headed grooved pin (33), and spade hinge lever (34).



2-170. MAINTENANCE OF SPADE AND RELATED PARTS (CONT).

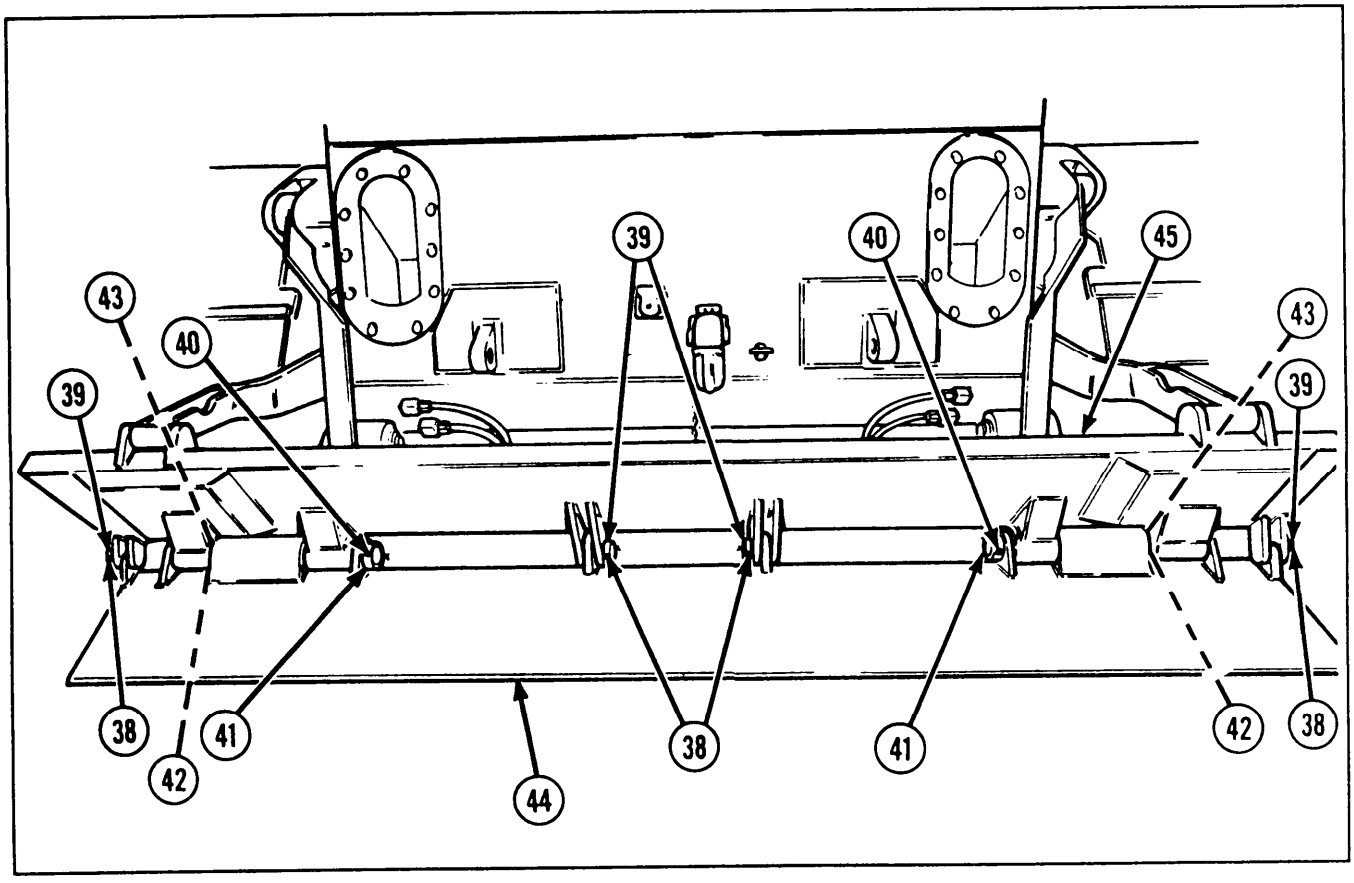
REMOVAL (CONT)



NOTE

Step 25 is written for the moldboard strut but also applies to vehicular bracket.

25 Remove cotter pin (35), headless straight pin (36), and moldboard strut (37).

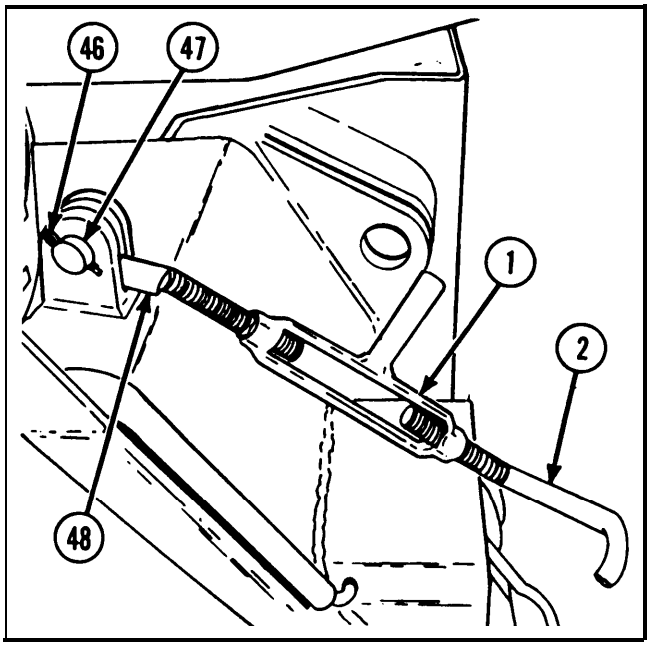


26 Remove four cotter pins (38) and four headless straight pins (39).

27 Remove two cotter pins (40) and two headless straight pins (41).

28 Remove two cotter pins (42) and two headless straight pins (43) separating two spade moldboards (44 and 45).

29 If damaged, remove cotter pin (46), headed straight pin (47), eye bolt (48), turnbuckle body (1), and hook bolt (2).



INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Hydraulic cylinder assembly is a repairable assembly. Notify direct support maintenance.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

TESTING

1 Connect a 3000 psi (20,685 kPa) hydraulic pressure source to port (1).

2 Slowly increase pressure to 3000 psi (20,685 kPa).

3 Allow pressure to remain constant for 5 minutes.

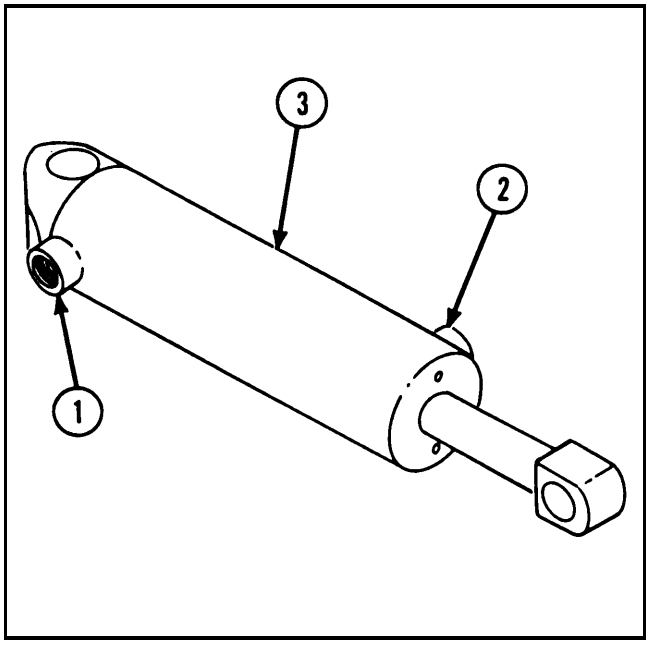
4 Check leakage from port (2). It must not exceed 1/4 teaspoon (1 cc) per minute.

5 Reduce hydraulic pressure to zero.

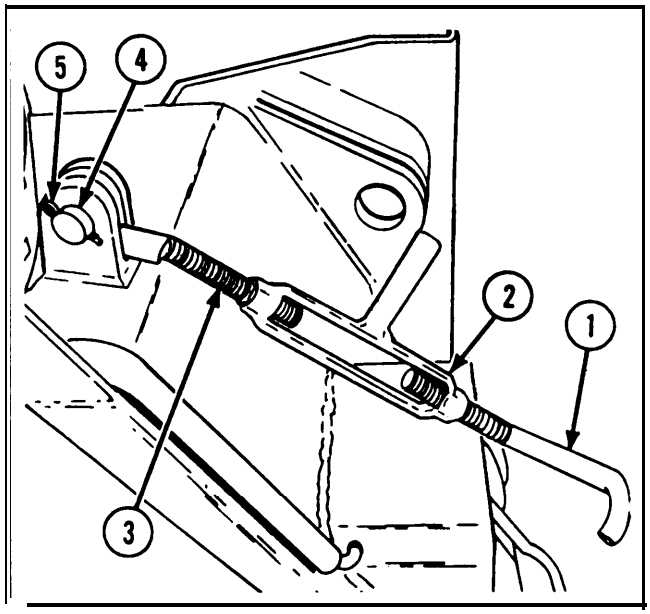
6 Disconnect pressure souce from port (1).

7 Drain hydraulic cylinder assembly (3).

8 Repeat steps 1 thru 7 for port (2).



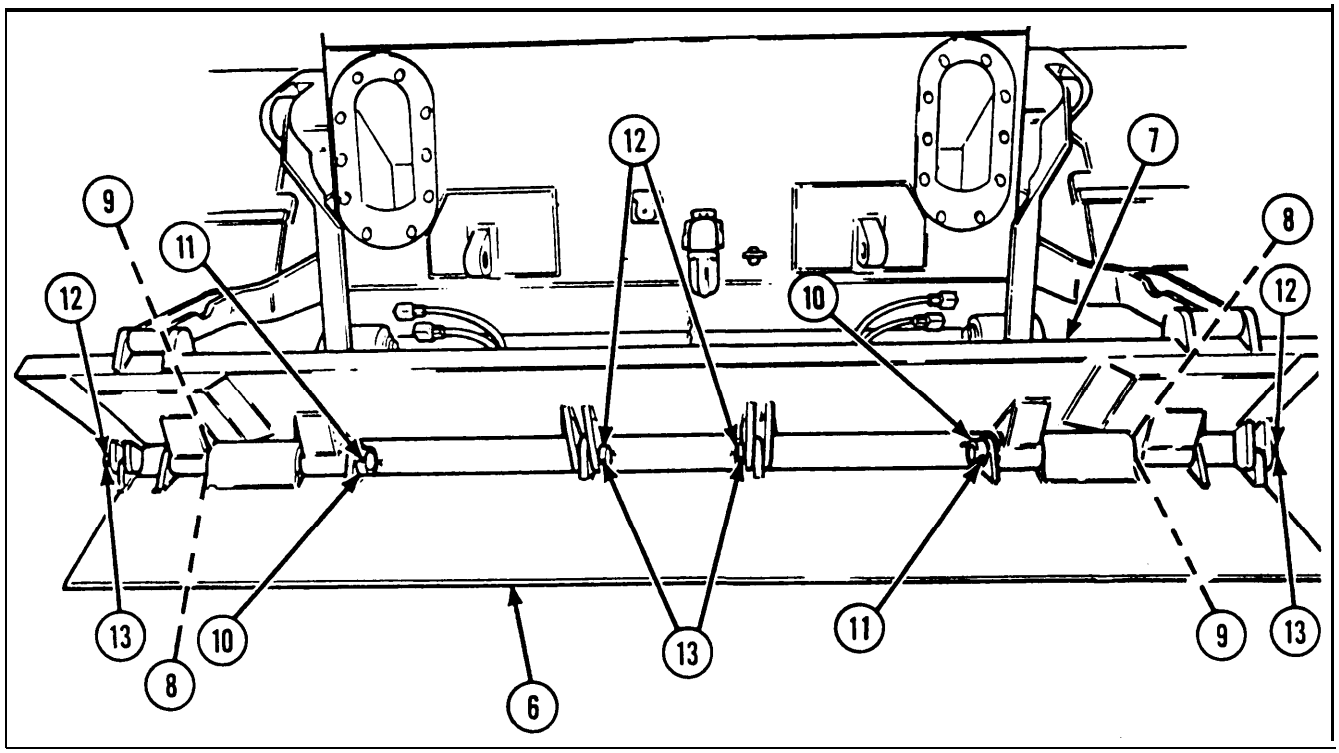
2-170. MAINTENANCE OF SPADE AND RELATED PARTS (CONT).



WARNING

Wipe up any spilled hydraulic fluid to prevent injury to personnel.

1 If removed, install hook bolt (1), turnbuckle body (2), eye bolt (3), headed straight pin (4), and new cotter pin (5).



2 Align two spade moldboards (6 and 7) and install two headless straight pins (8) and two new cotter pins (9).

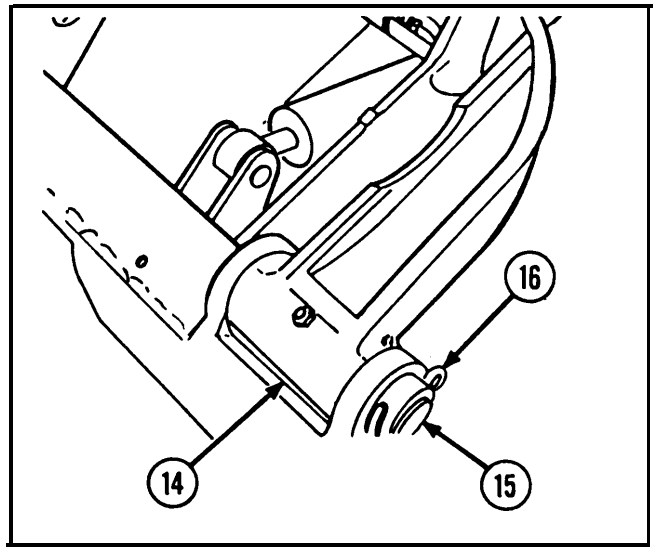
3 Install two headless straight pins (10) and two new cotter pins (11).

4 Install four headless straight pins (12) and four new cotter pins (13).

NOTE

Step 5 is written for the moldboard strut but also applies to vehicular bracket.

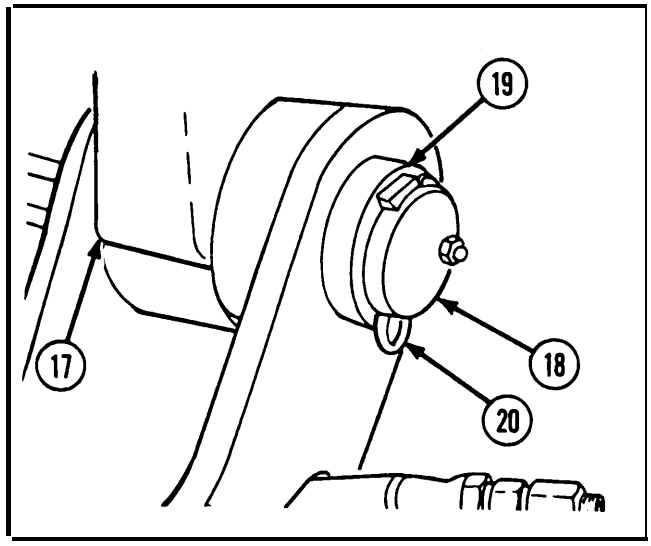
5 Align moldboard strut (14) and install headless straight pin (15) and new cotter pin (16).



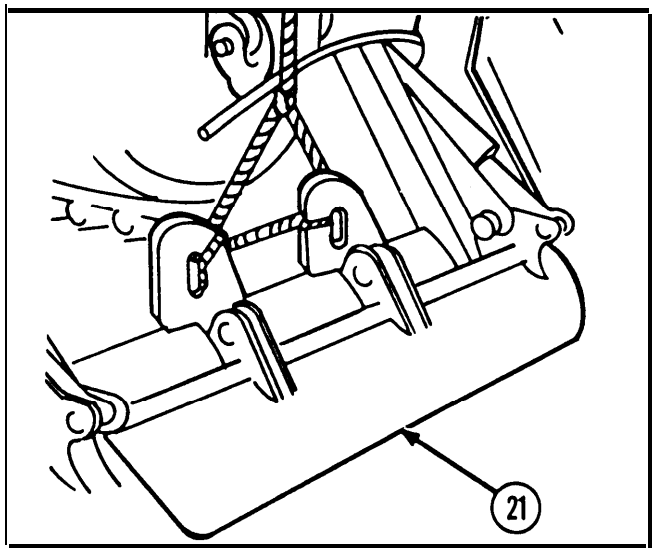
NOTE

Step 6 is written for the spade hinge lever but also applies to the remote control lever.

6 Align spade hinge lever (17) and install headed grooved pin (18), ten ring spacers (19), and new cotter pin (20).



7 Using hoist and sling, raise spade (21) slowly and align on vehicle.



2-170. MAINTENANCE OF SPADE AND RELATED PARTS (CONT).

INSTALLATION (CONT)

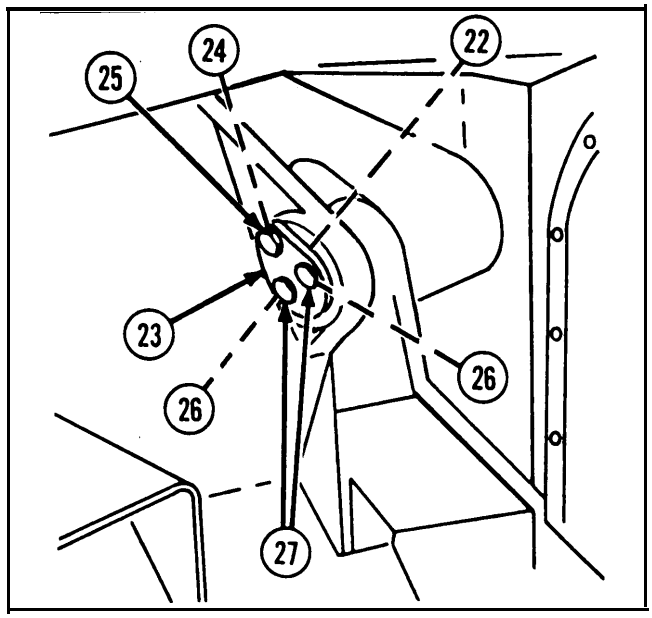
NOTE

Steps 8 thru 15 are written for one side of the vehicle but apply to both.

8 Using hammer and drift pin, install spade cylinder pin (22).

9 Align spade cylinder keeper (23) and install new lockwasher (24) and hexagon head capscrew (25).

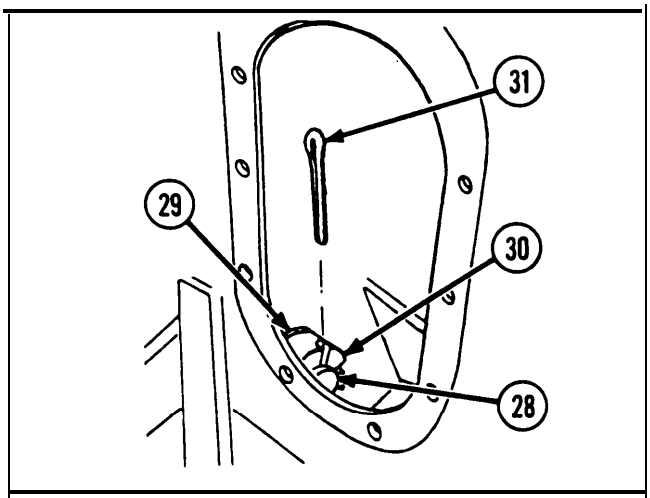
10 Install two new lockwashers (26) and two hexagon head capscrews (27).

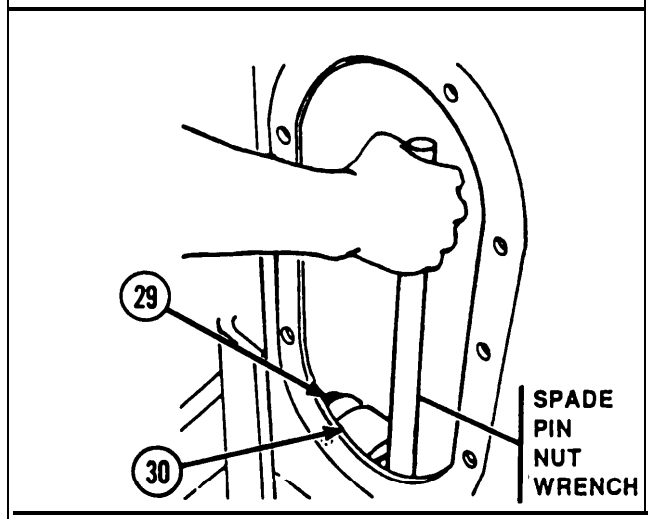


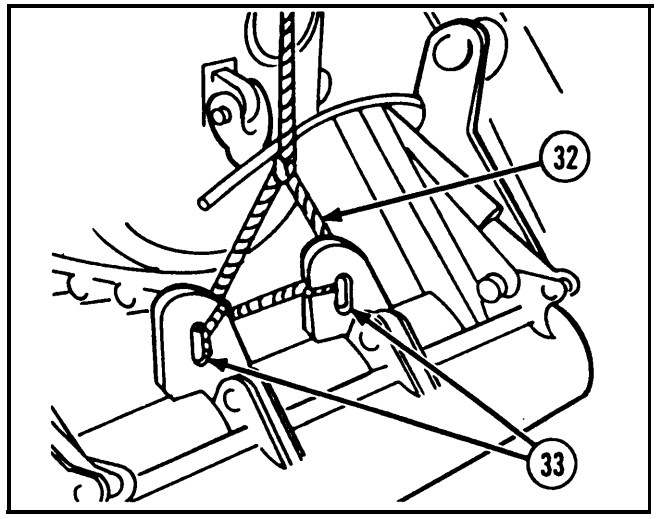
11 Drive spade hinge pin (28) through hull.

12 Using spade pin nut wrench, install flat washer (29) and round plain nut (30).

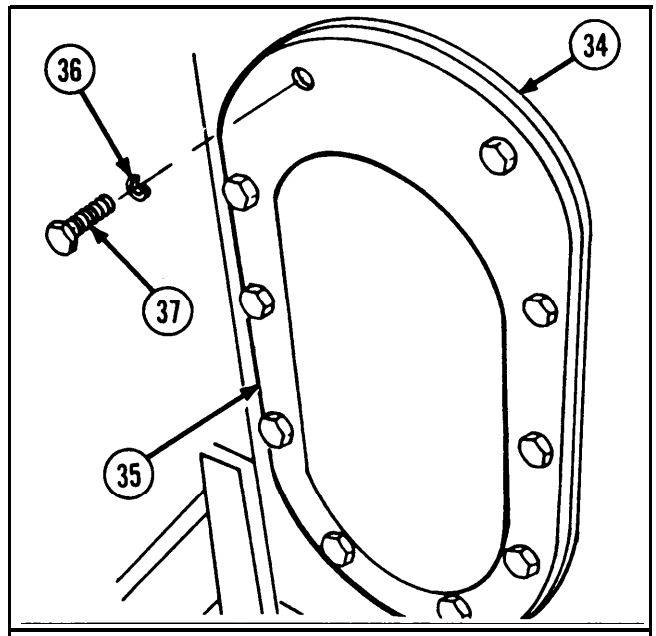
13 Install new cotter pin (31).







14 Remove sling (32) from lifting eyes (33). Remove hoist.



15 Install new gasket (34), access cover (35), ten new lockwashers (36), and ten hexagon head capscrews (37).

NOTE

- Steps 16 thru 21 are written for one hydraulic cylinder assembly but apply to both.
- Ensure that hydraulic cylinder assembly is filled with hydraulic fluid.

16 Install hydraulic cylinder assembly (38) in proper position.

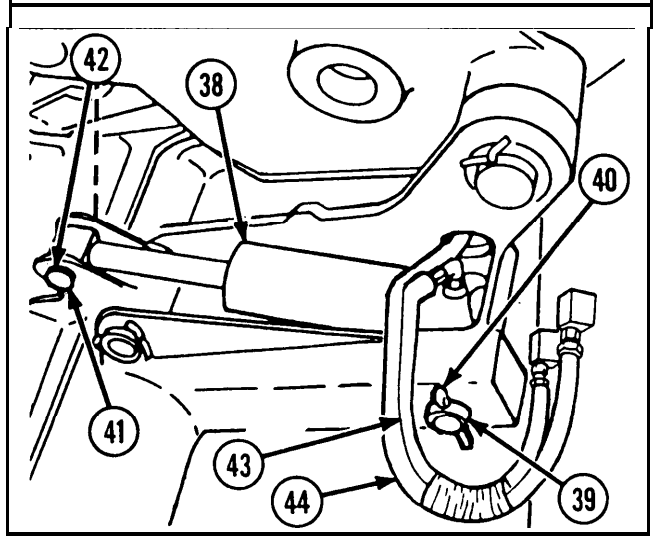
17 Install headless straight pin (39) through hydraulic cylinder assembly (38).

18 Install new cotter pin (40).

19 Install headless grooved pin (41) and two retaining rings (42).

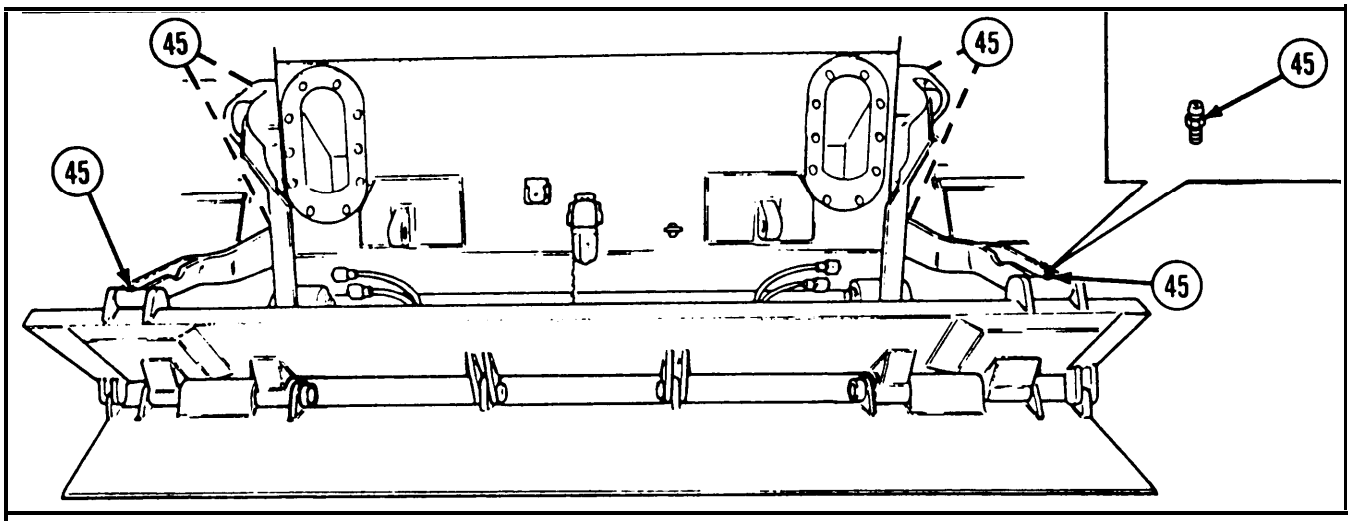
20 Uncover ends of hydraulic hoses (43 and 44).

21 Connect hydraulic hoses (43 and 44) to hydraulic cylinder assembly (38).



2-170. MAINTENANCE OF SPADE AND RELATED PARTS (CONT).

INSTALLATION (CONT)

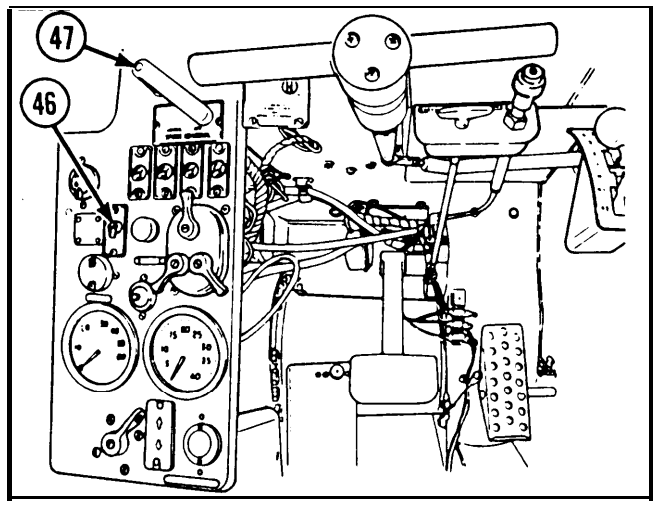


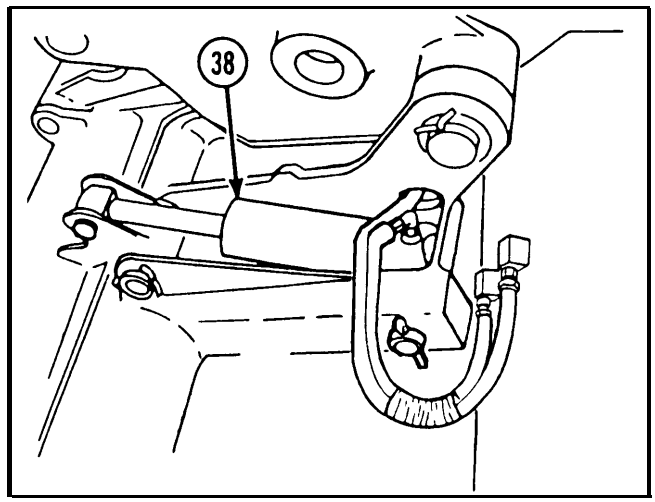
22 If removed, install six lubrication fittings (45).

23 Start engine.

24 Set HYD PUMP/PTO CLUTCH switch (46) to ON.

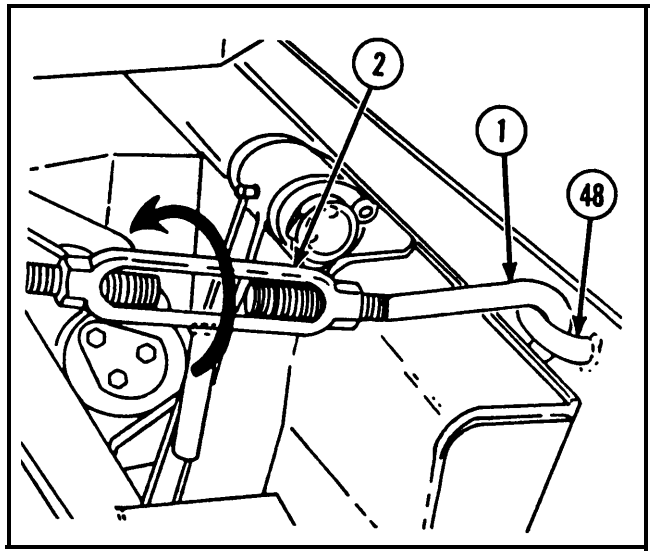
25 Set SPADE CONTROL lever (47) to RAISE.





26 Check hydraulic cylinder assembly (38) for leaks around fittings.

27 If leaks occur, tighten fittings.



28 Install hook bolt (1) in eye (48) and tighten turnbuckle body (2).

29 Set HYD PUMP/PTO CLUTCH switch (46) to OFF.

30 Turn off engine.

2-171. MAINTENANCE OF SPADE HYDRAULIC CONTROL VALVES, LINES, AND FITTINGS.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Materials/Parts
Lockwasher (10)
Preformed packing (4)
Preformed packing (5)
Preformed packing (8)
Tube fitting locknut (11)
Tube fitting locknut (4)

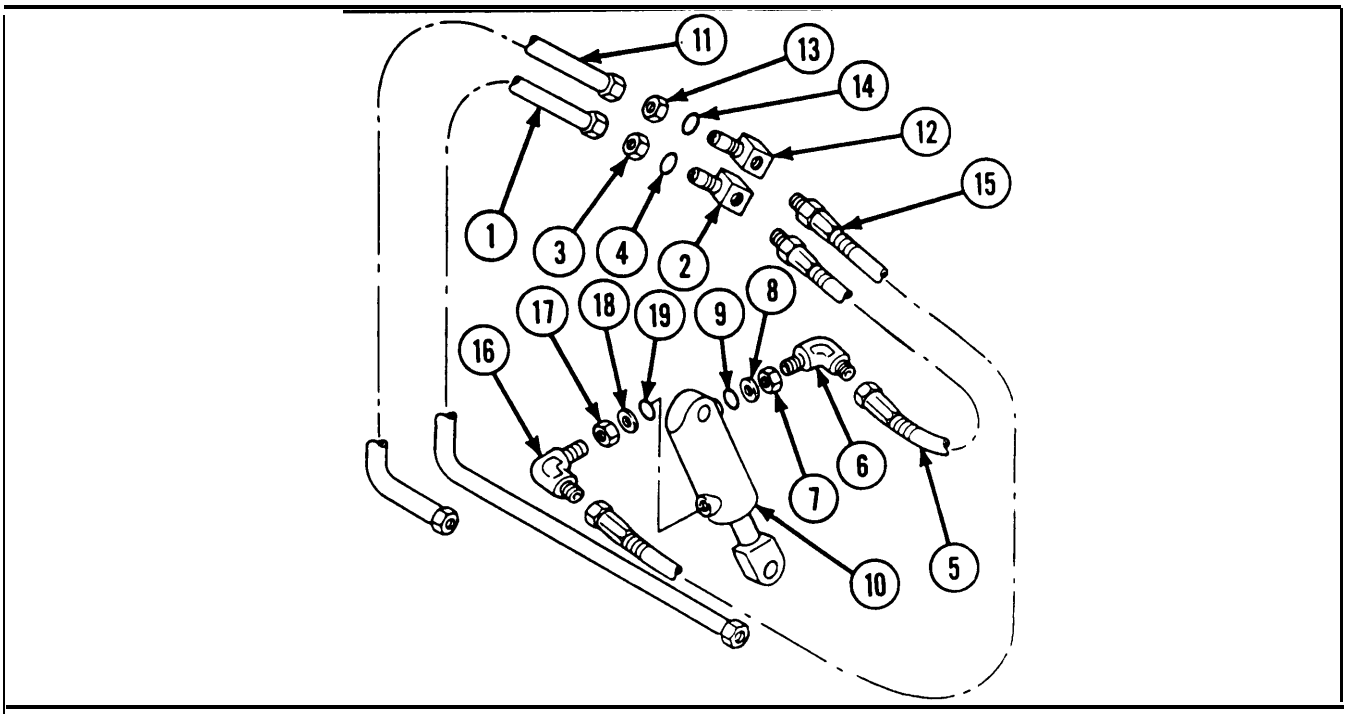
References
TM 9-2350-238-24P-1

General Safety Instructions

- To avoid injury to personnel, do not tighten or loosen hydraulic fittings when system is pressurized.
- Lower the boom to stowed position before doing any maintenance on hydraulic system.
- Wipe up any spilled hydraulic fluid to prevent injury to personnel.

2-171. MAINTENANCE OF SPADE HYDRAULIC CONTROL VALVES, LINES, AND FITTINGS (CONT).

REMOVAL



WARNING

- To avoid injury to personnel, do not tighten or loosen hydraulic fittings when system is pressurized.
- Lower the boom to stowed position before doing any maintenance on hydraulic system.
- Wipe up any spilled hydraulic fluid to prevent injury to personnel.

CAUTION

Install covers on open hydraulic ports, tubes, and hoses immediately after disconnecting them to keep dirt out of hydraulic system.

1 Disconnect metal tube assembly (1) from elbow (2).

2 Remove tube fitting locknut (3) and preformed packing (4) from elbow (2).

3 Disconnect nonmetallic hose assembly (5) and remove elbow (2).

4 Remove nonmetallic hose assembly (5) from tube elbow (6).

5 Loosen tube fitting locknut (7) on tube elbow (6).

6 Remove tube elbow (6), tube fitting locknut (7), packing retainer (8), and preformed packing (9) from port 1 of right hydraulic cylinder assembly (10).

7 Disconnect metal tube assembly (11) from elbow (12).

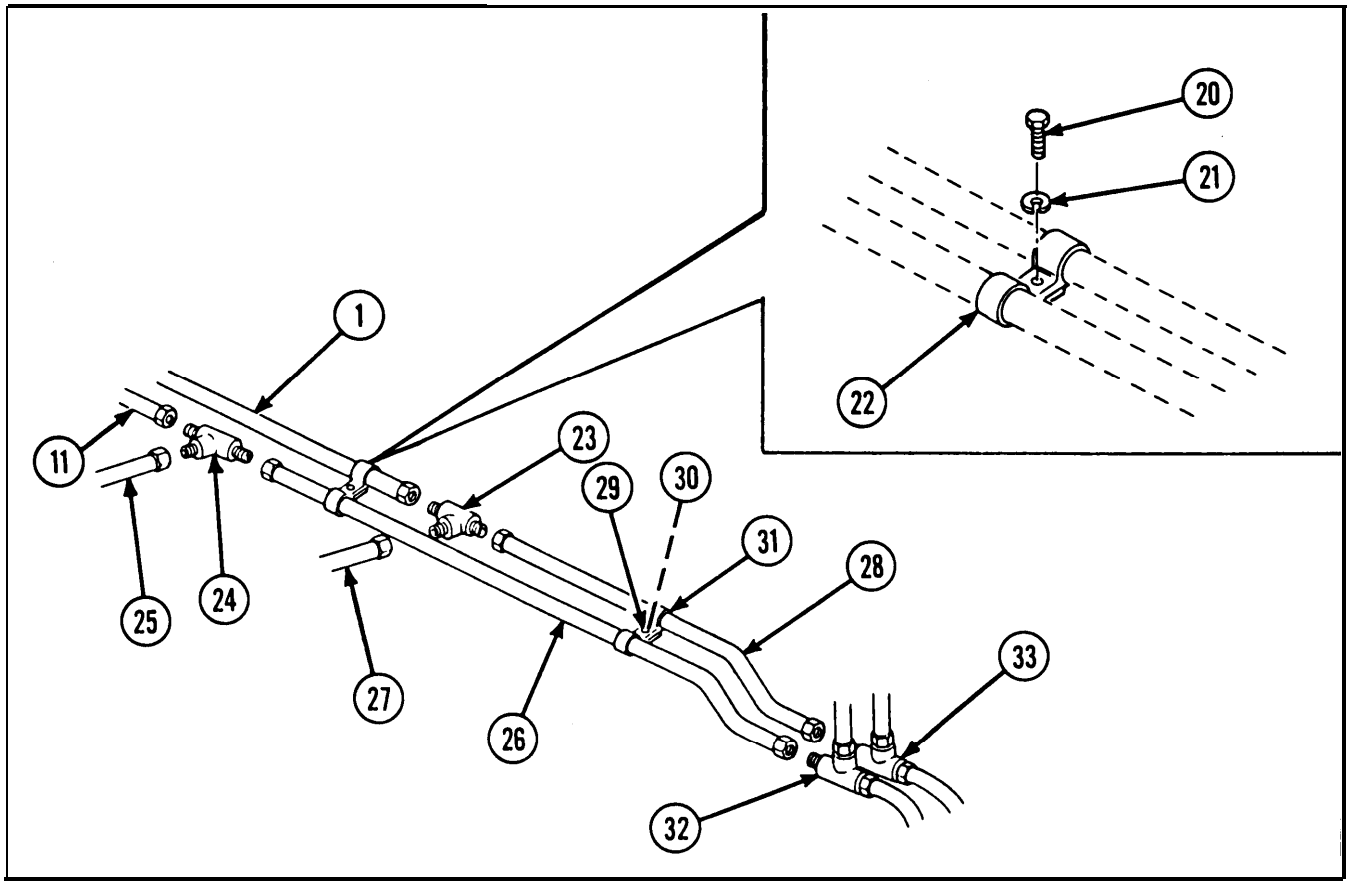
8 Remove tube fitting locknut (13) and preformed packing (14) from elbow (12).

9 Disconnect nonmetallic hose assembly (15) and remove elbow (12).

10 Remove nonmetallic hose assembly (15) from tube elbow (16).

11 Loosen tube fitting locknut (17) on tube elbow (16).

12 Remove tube elbow (16), tube fitting locknut (17), packing retainer (18), and preformed packing (19) from port 2 of right hydraulic cylinder assembly (10).



13 Remove hexagon head capscrew (20), lockwasher (21), and two loop clamps (22).

14 Remove metal tube assembly (1) from tee (23).

15 Remove metal tube assembly (11) from tee (24).

16 Disconnect metal tube assembly (25) and metal tube assembly (26) and remove tee (24).

17 Disconnect metal tube assembly (27) and metal tube assembly (28) and remove tee (23).

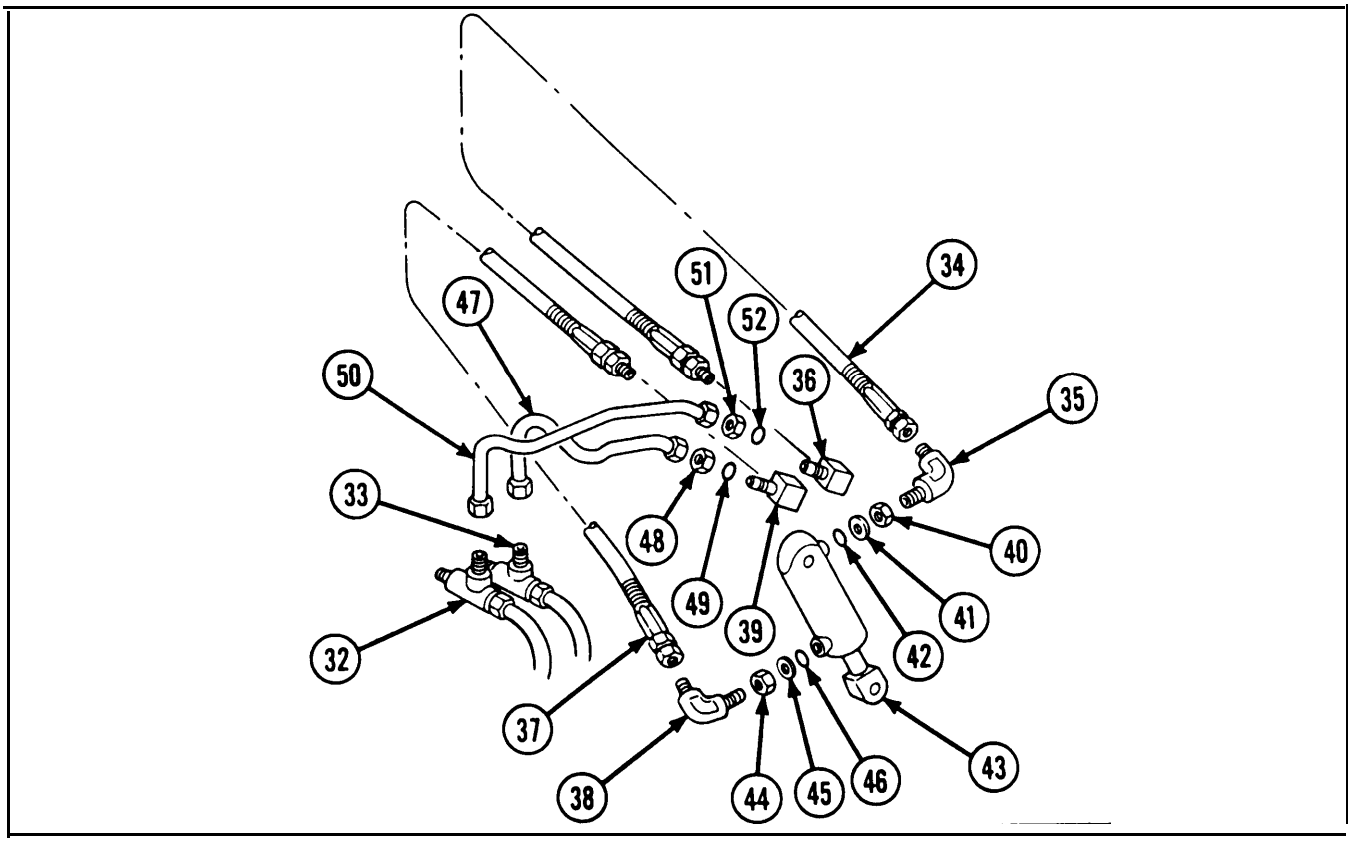
18 Remove hexagon head capscrew (29), lockwasher (30), and two loop clamps (31).

19 Remove metal tube assembly (26) from tee (32).

20 Remove metal tube assembly (28) from tee (33).

2-171. MAINTENANCE OF SPADE HYDRAULIC CONTROL VALVES, LINES, AND FITTINGS (CONT).

REMOVAL (CONT)



21 Disconnect nonmetallic hose assembly (34) from tube elbow (35).

22 Remove nonmetallic hose assembly (34) from elbow (36).

23 Disconnect nonmetallic hose assembly (37) from tube elbow (38).

24 Remove nonmetallic hose assembly (37) from elbow (39).

25 Loosen tube fitting locknut (40) on tube elbow (35).

26 Remove tube elbow (35), tube fitting locknut (40), packing retainer (41), and preformed packing (42) from port 1 of left hydraulic cylinder assembly (43).

27 Loosen tube fitting locknut (44) on tube elbow (38).

28 Remove tube elbow (38), tube fitting locknut (44), packing retainer (45), and preformed packing (46) from port 2 of left hydraulic cylinder assembly (43).

29 Disconnect metal tube assembly (47) from elbow (39) and remove from tee (33).

30 Remove tube fitting locknut (48) and preformed packing (49) from elbow (39).

31 Disconnect metal tube assembly (50) from elbow (36) and remove from tee (32).

32 Remove tube fitting locknut (51) and preformed packing (52) from elbow (36).

33 Remove tee (33) from metal tube assembly (53).

34 Remove tee (32) from metal tube assembly (54).

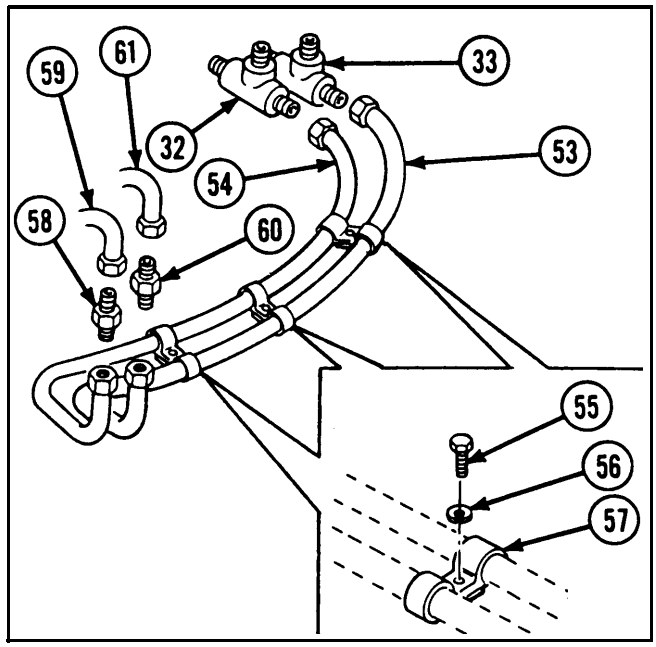
35 Remove three hexagon head capscrews (55), three lockwashers (56), and six loop clamps (57).

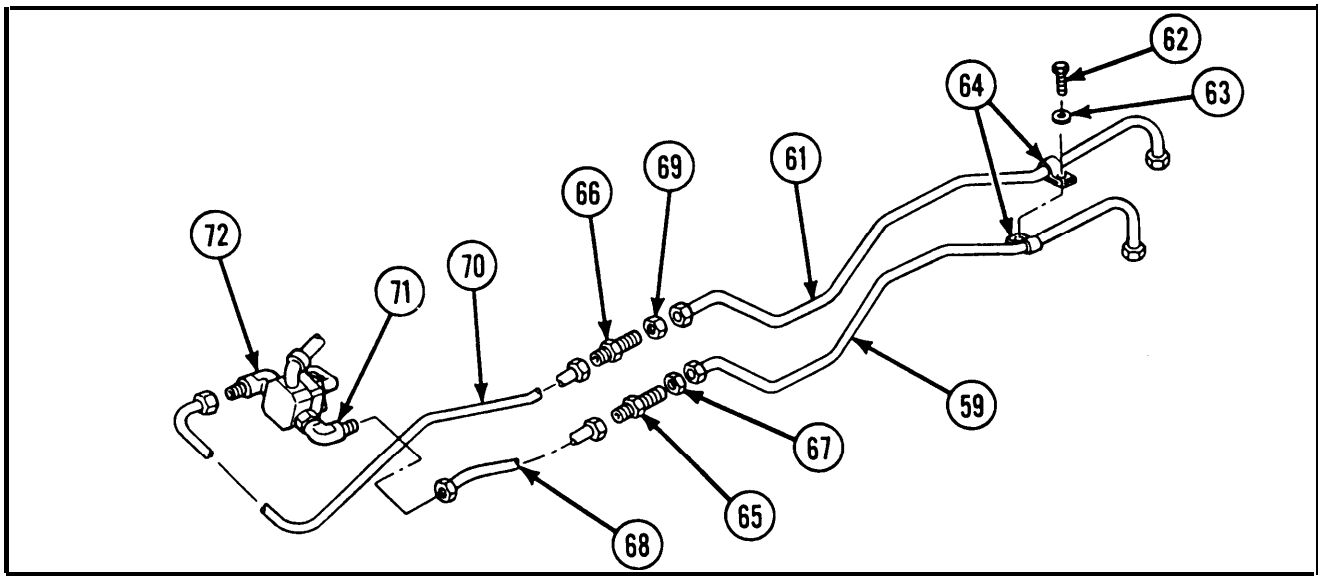
36 Remove metal tube assembly (53) from tube nipple (58).

37 Remove tube nipple (58) from metal tube assembly (59).

38 Remove metal tube assembly (54) from tube nipple (60).

39 Remove tube nipple (60) from metal tube assembly (61).





40 Remove hexagon head capscrew (62), lockwasher (63), and two loop clamps (64).

41 Remove metal tube assembly (59) from straight adapter (65).

42 Remove metal tube assembly (61) from straight adapter (66).

43 Remove tube fitting locknut (67) and straight adapter (65) from metal tube assembly (68).

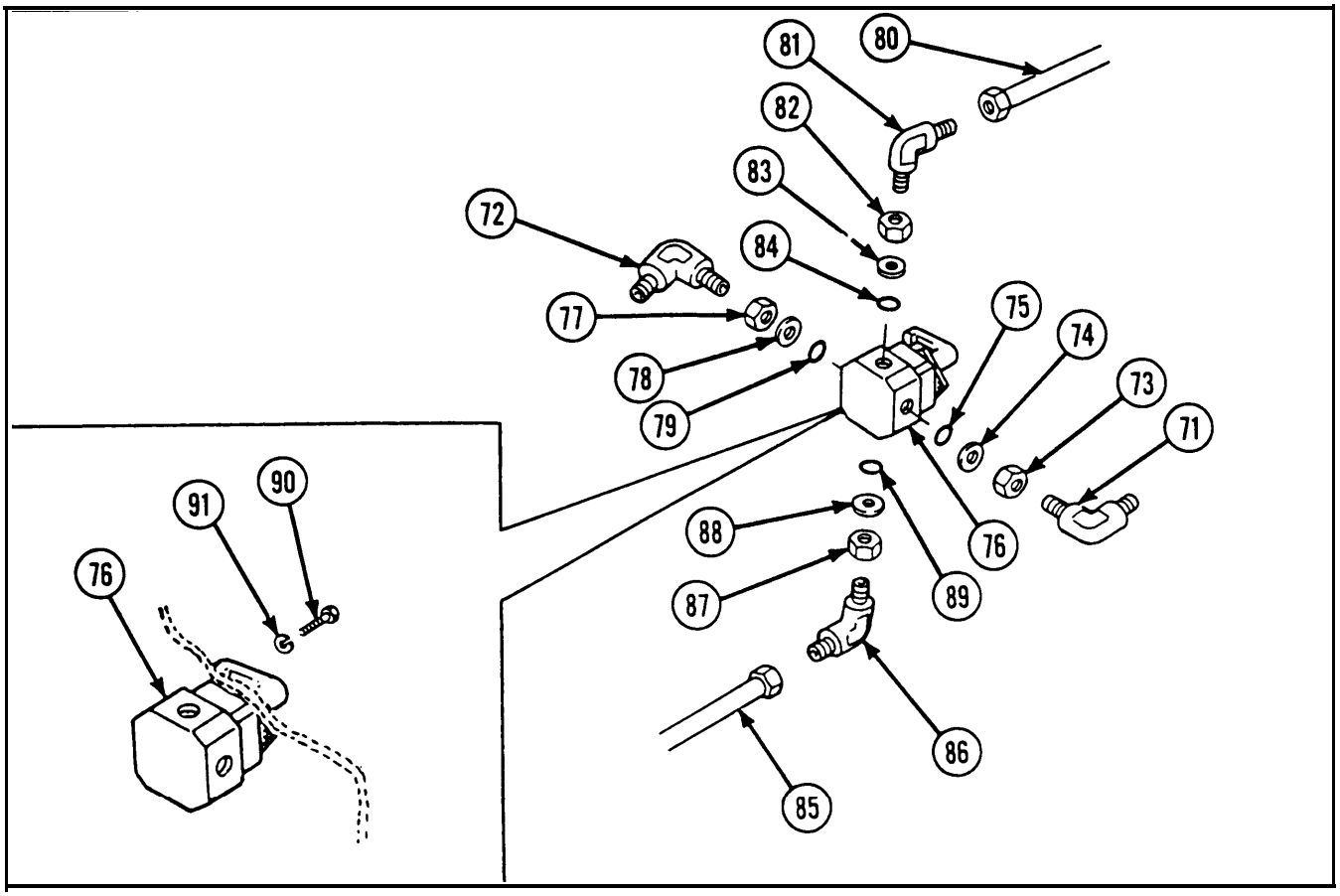
44 Remove tube fitting locknut (69) and straight adapter (66) from metal tube assembly (70).

45 Remove metal tube assembly (68) from tube elbow (71).

46 Remove metal tube assembly (70) from tube elbow (72).

2-171. MAINTENANCE OF SPADE HYDRAULIC CONTROL VALVES, LINES, AND FITTINGS (CONT).

REMOVAL (CONT)



47 Loosen tube fitting locknut (73) on tube elbow (71).

48 Remove tube elbow (71), tube fitting locknut (73), flat washer (74), and preformed packing (75) from spade cylinder rotary valve (76).

49 Loosen tube fitting locknut (77) on tube elbow (72).

50 Remove tube elbow (72), tube fitting locknut (77), flat washer (78), and preformed packing (79) from spade cylinder rotary valve (76).

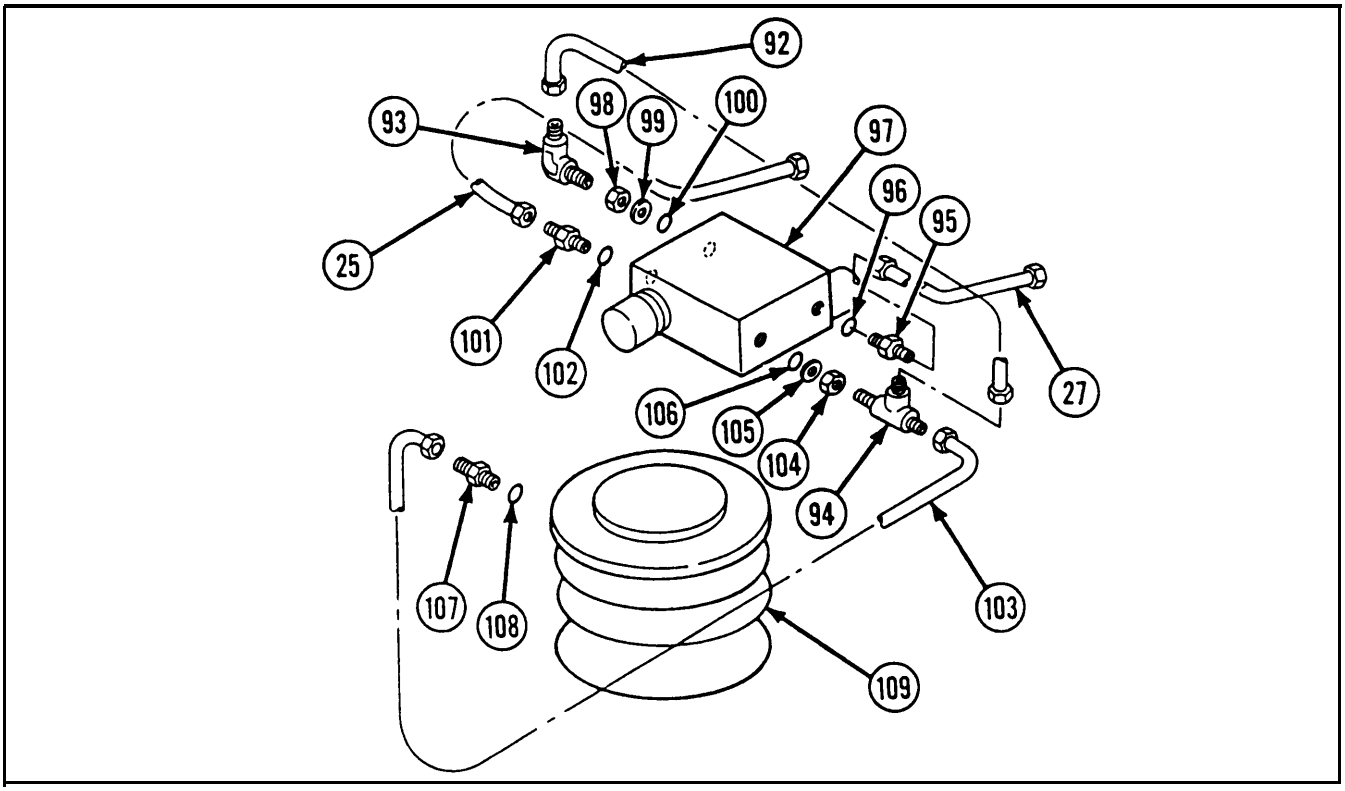
51 Remove metal tube assembly (80) from tube elbow (81).

52 Remove tube elbow (81) with tube fitting locknut (82), flat washer (83), and preformed packing (84) from spade cylinder rotary valve (76).

53 Remove metal tube assembly (85) from tube elbow (86).

54 Remove tube elbow (86), tube fitting locknut (87), flat washer (88), and preformed packing (89) from spade cylinder rotary valve (76).

55 Remove four hexagon head capscrews (90), four lockwashers (91), and spade cylinder rotary valve (76).



56 Disconnect metal tube assembly (92) from tube elbow (93) and remove from tube tee (94).

57 Remove metal tube assembly (27) from tube nipple (95).

58 Remove tube nipple (95) and preformed packing (96) from direct linear valve (97).

59 Loosen tube fitting locknut (98) on tube elbow (93).

60 Remove tube elbow (93), tube fitting locknut (98), flat washer (99), and preformed packing (100) from direct linear valve (97).

61 Remove metal tube assembly (25) from tube nipple (101).

62 Remove tube nipple (101) and preformed packing (102) from direct linear valve (97).

63 Disconnect metal tube assembly (103) from tube tee (94).

64 Loosen tube fitting locknut (104) on tube tee (94).

65 Remove tube tee (94), tube fitting locknut (104), flat washer (105), and preformed packing (106) from direct linear valve (97).

66 Remove metal tube assembly (103) from tube reducer (107).

67 Remove tube reducer (107) and preformed packing (108) from slip ring assembly (109).

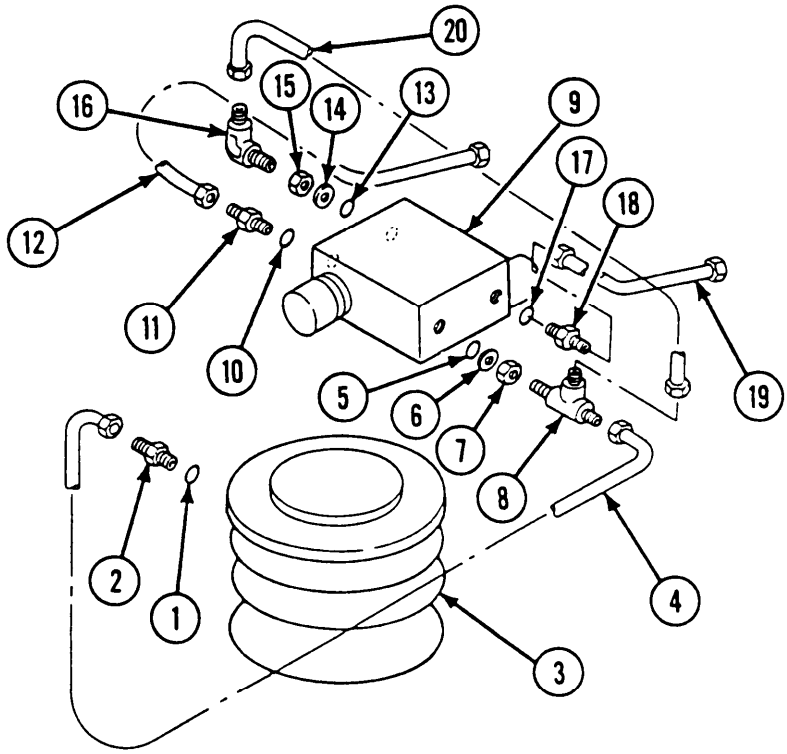
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-171. MAINTENANCE OF SPADE HYDRAULIC CONTROL VALVES, LINES, AND FITTINGS (CONT).

INSTALLATION



1 Install new preformed packing (1) and tube reducer (2) on slip ring assembly (3).

2 Install metal tube assembly (4) on tube reducer (2).

3 Install new preformed packing (5), flat washer (6), new tube fitting locknut (7), and tube tee (8) on direct linear valve (9).

4 Tighten tube fitting locknut (7).

5 Connect metal tube assembly (4) to tube tee (8).

6 Install new preformed packing (10) and tube nipple (11) to direct linear valve (9).

7 Install metal tube assembly (12) on tube nipple (11).

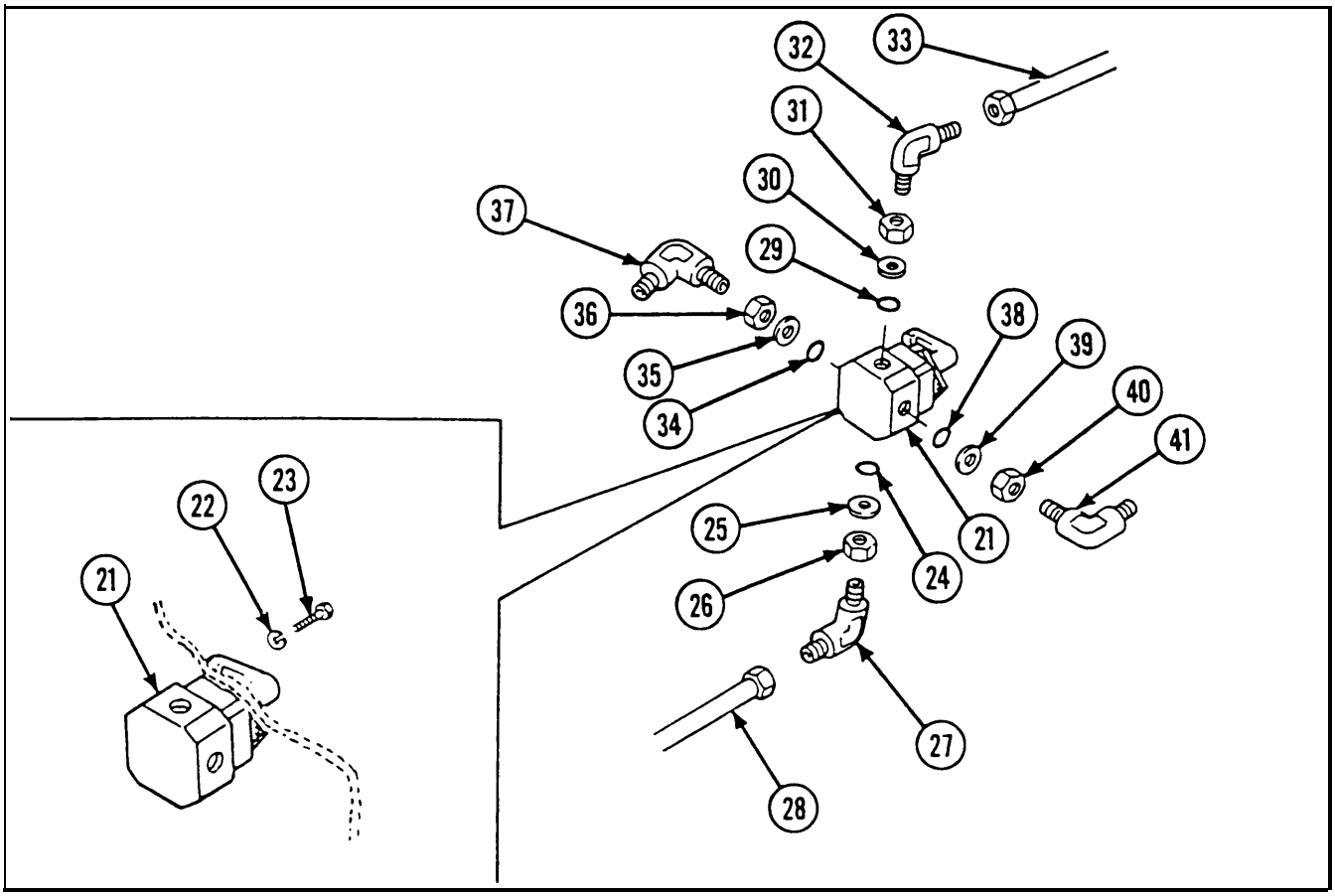
8 Install new preformed packing (13), flat washer (14), new tube fitting locknut (15), and tube elbow (16) to direct linear valve (9).

9 Tighten tube fitting locknut (15).

10 Install new preformed packing (17) and tube nipple (18) to direct linear valve (9).

11 Install metal tube assembly (19) on tube nipple (18).

12 Install metal tube assembly (20) on tube elbow (16) and connect to tube tee (8).



13 Install spade cylinder rotary valve (21), four new lockwashers (22), and four hexagon head capscrews (23).

14 Install new preformed packing (24), flat washer (25), new tube fitting locknut (26), and tube elbow (27) to spade cylinder rotary valve (21).

15 Install metal tube assembly (28) on tube elbow (27).

16 Install new preformed packing (29), flat washer (30), new tube fitting locknut (31), and tube elbow (32) to spade cylinder rotary valve (21).

17 Install metal tube assembly (33) on tube elbow (32).

18 Install new preformed packing (34), flat washer (35), new tube fitting locknut (36), and tube elbow (37) to spade cylinder rotary valve (21).

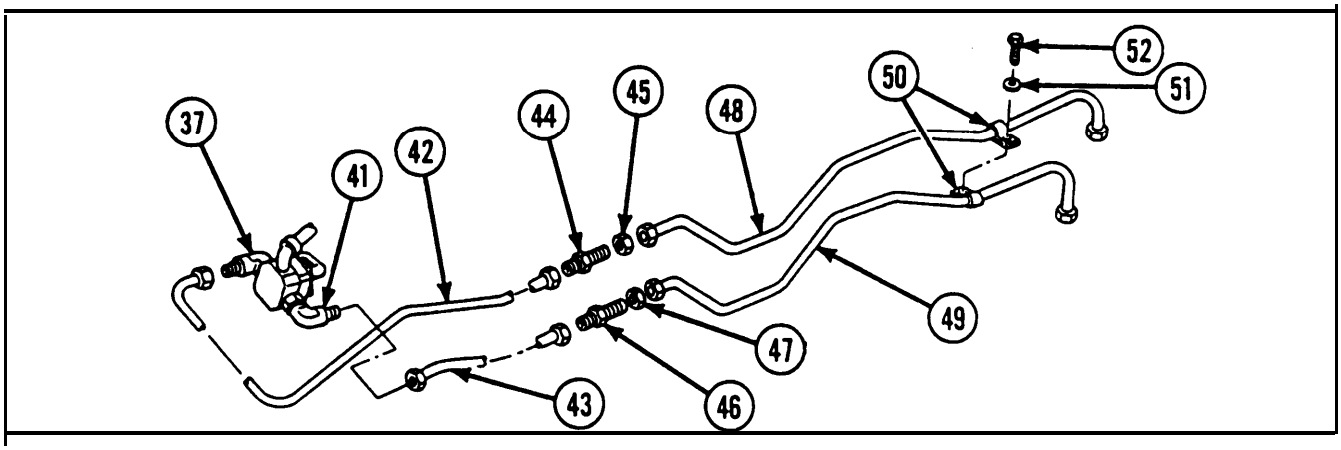
19 Tighten tube fitting locknut (37).

20 Install new preformed packing (38), flat washer (39), new tube fitting locknut (40), and tube elbow (41) to spade cylinder rotary valve (21).

21 Tighten tube fitting locknut (40).

2-171. MAINTENANCE OF SPADE HYDRAULIC CONTROL VALVES, LINES, AND FITTINGS (CONT).

INSTALLATION (CONT)



22 Install metal tube assembly (42) on tube elbow (37).

23 Install metal tube assembly (43) on tube elbow (41).

24 Install straight adapter (44) and new tube fitting locknut (45) to metal tube assembly (42).

25 Install straight adapter (46) and new tube fitting locknut (47) to metal tube assembly (43).

26 Install metal tube assembly (48) on straight adapter (44).

27 Install metal tube assembly (49) on straight adapter (46).

28 Install two loop clamps (50), new lockwasher (51), and hexagon head capscrew (52).

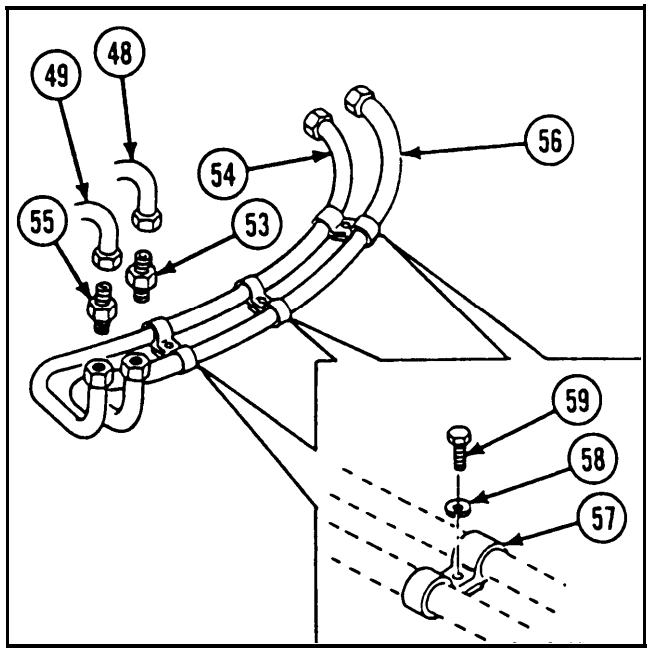
29 Install tube nipple (53) to metal tube assembly (48).

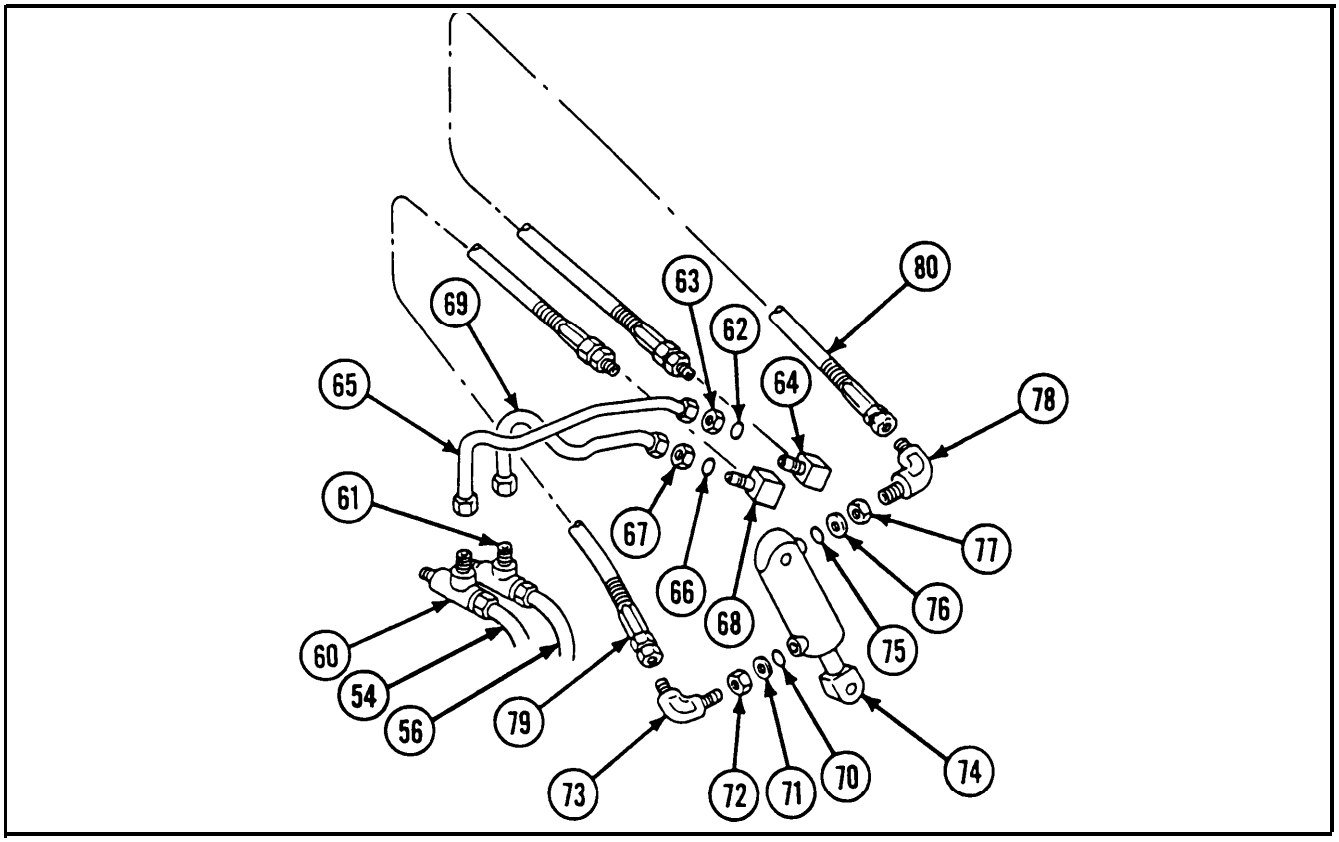
30 Install metal tube assembly (54) on tube nipple (53).

31 Install tube nipple (55) to metal tube assembly (49).

32 Install metal tube assembly (56) to tube nipple (55).

33 Install six loop clamps (57), three new lockwashers (58), and three hexagon head capscrews (59).





34 Install tee (60) on metal tube assembly (54).

35 Install tee (61) on metal tube assembly (56).

36 Install new preformed packing (62) and new tube fitting locknut (63) to elbow (64).

37 Install metal tube assembly (65) to elbow (64) and connect to tee (60).

38 Install new preformed packing (66) and new tube fitting locknut (67) to elbow (68).

39 Install metal tube assembly (69) to elbow (68) and connect to tee (61).

40 Install new preformed packing (70), packing retainer (71), new tube fitting locknut (72), and tube elbow (73) to port 2 of left hydraulic cylinder assembly (74).

41 Tighten tube fitting locknut (72).

42 Install new preformed packing (75), packing retainer (76), new tube fitting locknut (77), and tube elbow (78) to port 1 of left hydraulic cylinder assembly (74).

43 Tighten tube fitting locknut (77).

44 Install nonmetallic hose assembly (79) on elbow (68).

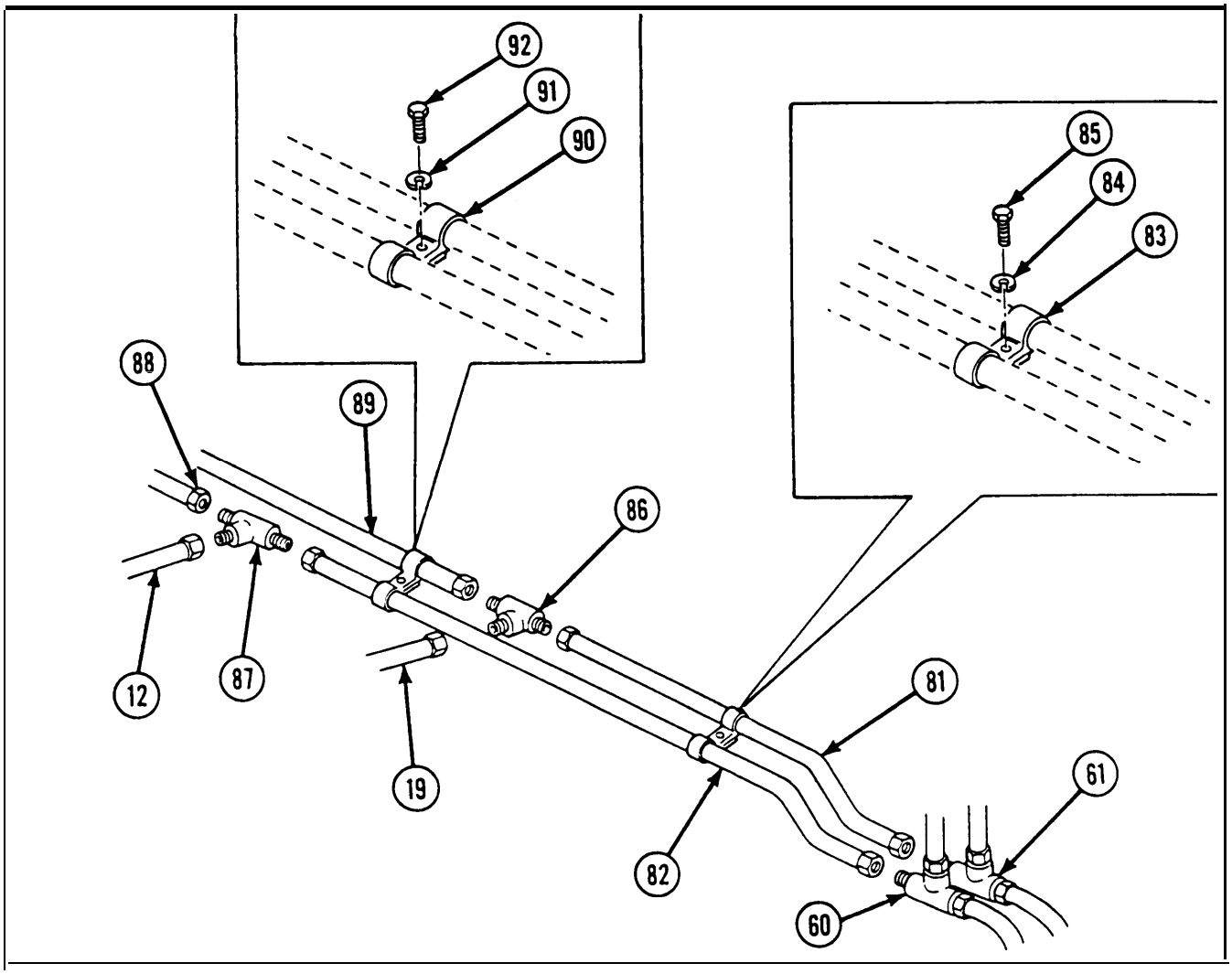
45 Connect nonmetallic hose assembly (79) to tube elbow (73).

46 Install nonmetallic hose assembly (80) on elbow (64).

47 Connect nonmetallic hose assembly (80) to tube elbow (78).

2-171. MAINTENANCE OF SPADE HYDRAULIC CONTROL VALVES, LINES, AND FITTINGS (CONT).

INSTALLATION (CONT)



48 Install metal tube assembly (81) to tee (61).

49 Install metal tube assembly (82) to tee (60).

50 Install two loop clamps (83), new lockwashers (84), and hexagon head capscrew (85).

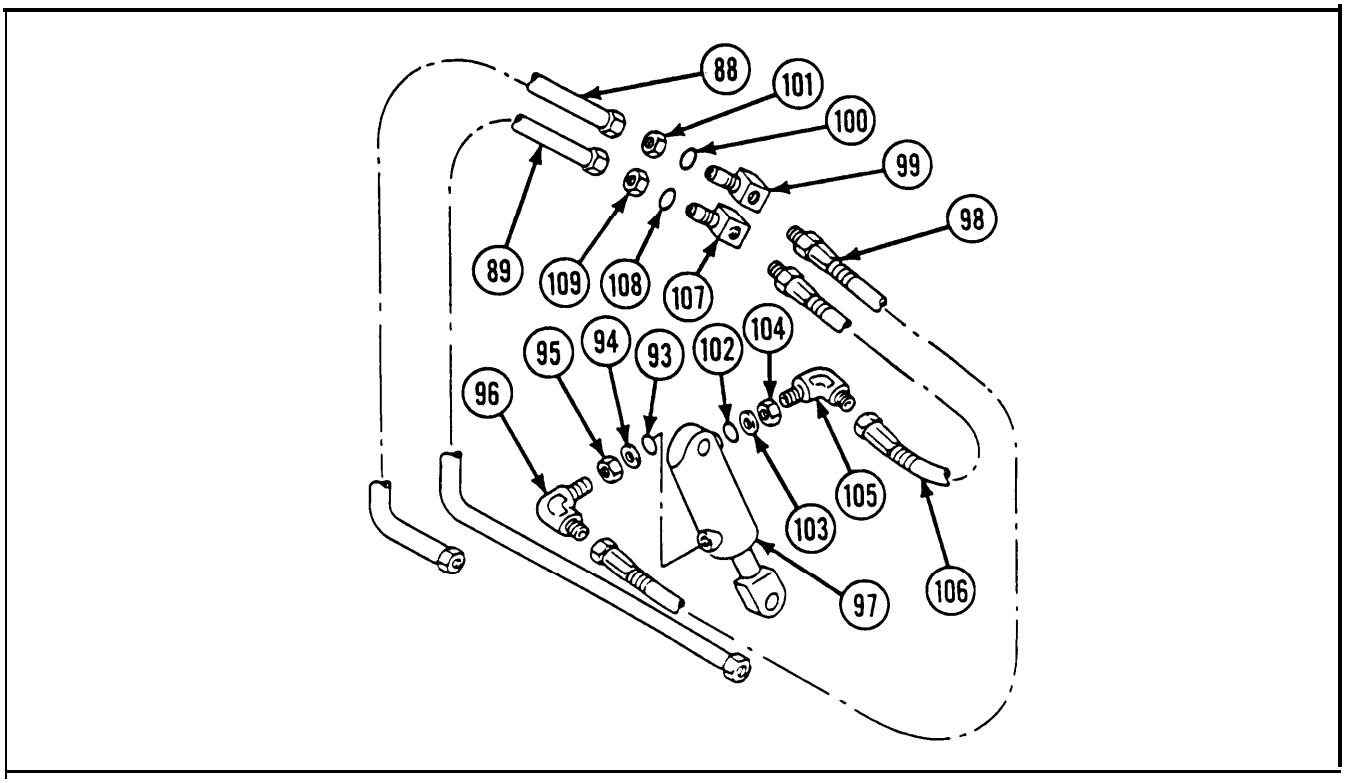
51 Install tee (86) and connect metal tube assembly (19) and metal tube assembly (81).

52 Install tee (87) and connect metal tube assembly (12) and metal tube assembly (82).

53 Install metal tube assembly (88) on tee (87).

54 Install metal tube assembly (89) on tee (86).

55 Install two loop clamps (90), new lockwasher (91), and hexagon head capscrew (92).



56 Install new preformed packing (93), packing retainer (94), new tube fitting locknut (95), and tube elbow (96) to port 2 of right hydraulic cylinder assembly (97).

57 Tighten tube fitting locknut (95).

58 Install nonmetallic hose assembly (98) to tube elbow (96).

59 Install elbow (99) on nonmetallic hose assembly (98).

60 Install new preformed packing (100) and new tube fitting locknut (101) on elbow (99).

61 Connect metal tube assembly (88) to elbow (99).

62 Install new preformed packing (102), packing retainer (103), new tube fitting locknut (104), and tube elbow (105) to port 1 of right hydraulic cylinder assembly (97).

63 Tighten tube fitting locknut (104).

64 Install nonmetallic hose assembly (106) on tube elbow (105).

65 Install elbow (107) on nonmetallic hose assembly (106).

66 Install new preformed packing (108) and new tube fitting locknut (109) to elbow (107).

67 Connect metal tube assembly (89) to elbow (107).

2-172. MAINTENANCE OF VEHICLE DATA PLATES.

This task covers:	a. *Removal*	b. *Inspection/Repair*	c. *Installation*

INITIAL SETUP

Materials/Parts
- Clear lacquer (item 22, appx C)
- Dry cleaning solvent (item 16, appx C)
- Epoxy resin adhesive (item 3, appx C)
- Lockwasher (4)
- Lockwasher (4)
- Self-locking nut (4)

References
- TM 9-2350-238-24P-1

REMOVAL

CAUTION

Do not remove vehicle data plates bonded with adhesive unless absolutely necessary.

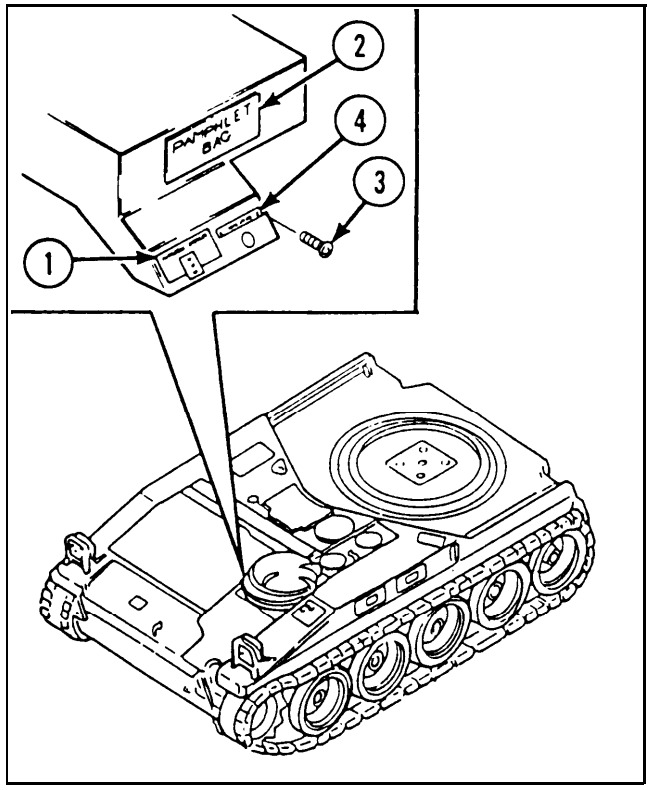
NOTE

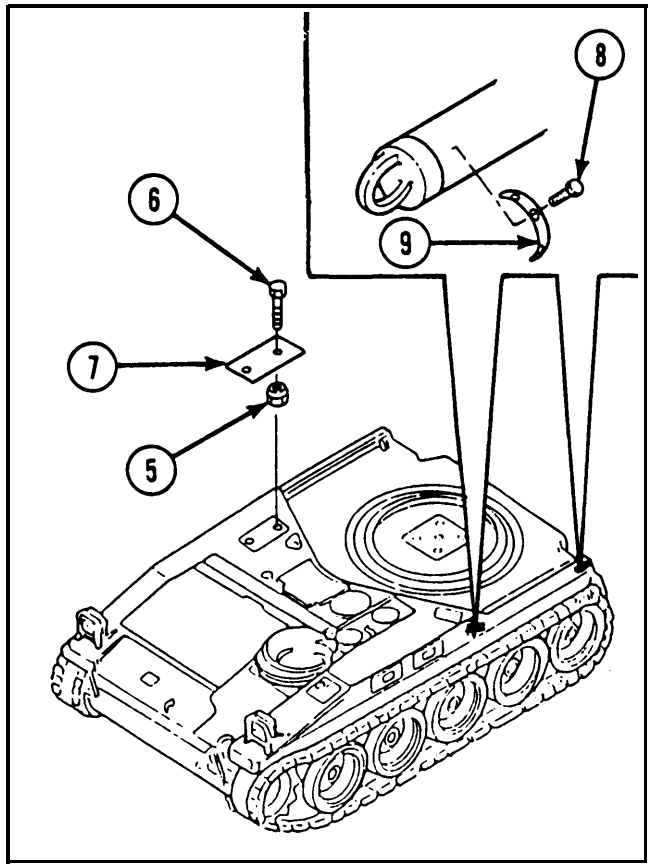
Scrape or pry off bonded vehicle data plates using putty knife.

1 If damaged, remove sign (1).

2 if damaged, remove sign (2).

3 Remove two screws (3) and identification plate (4).



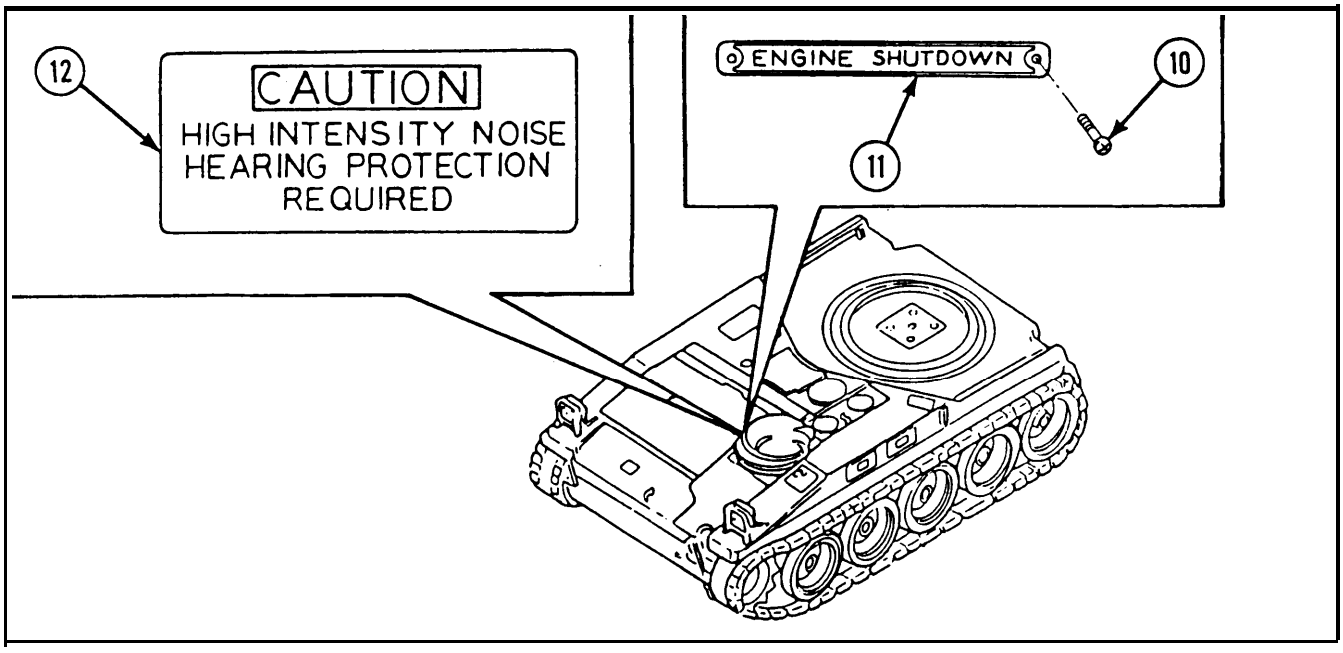


4 Remove four self-locking nuts (5), four machine screws (6), and DIESEL FUEL ONLY identification plate (7) from hull.

NOTE

Step 5 is written for one suspension lockout cylinder but applies to all suspension lockout cylinders and the two hydraulic cylinder assemblies.

5 Remove three drive screws (8) and suspension lockout cylinder identification plate (9).

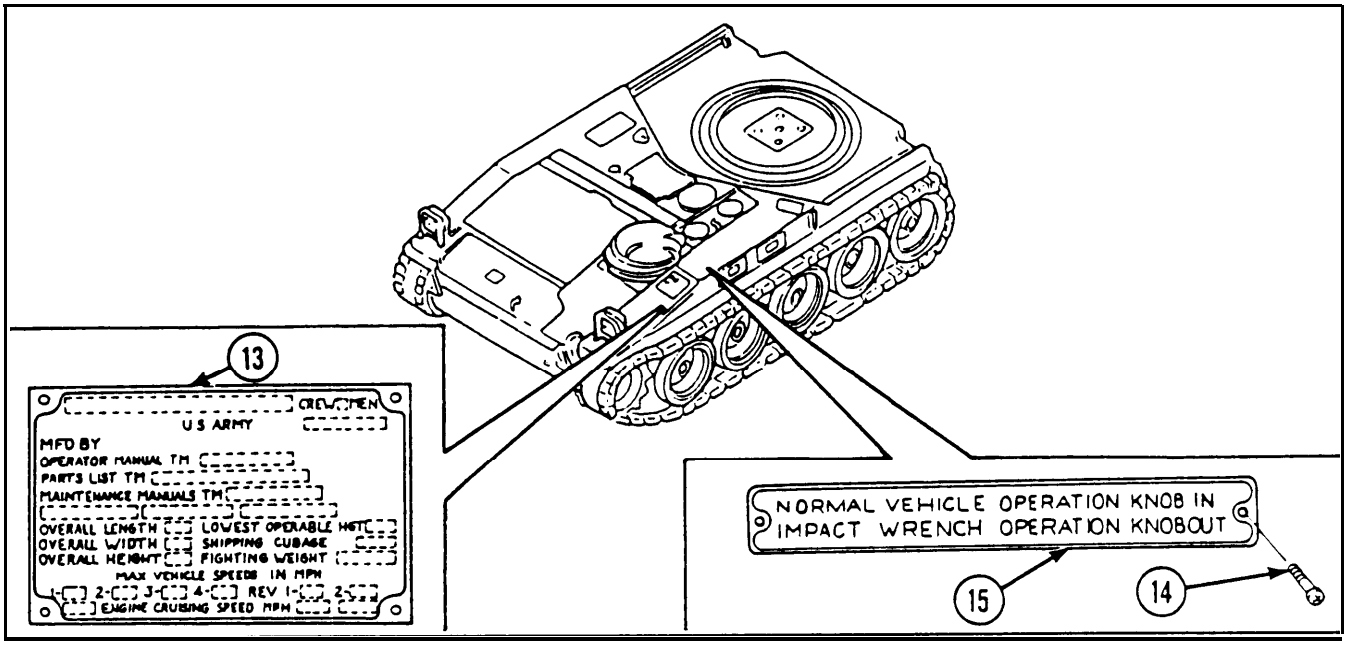


6 Remove two drive screws (10) and ENGINE SHUTDOWN identification plate (11) from driver's compartment wall.

7 If damaged, remove HIGH NOISE LEVEL instruction plate (12) from bulkhead.

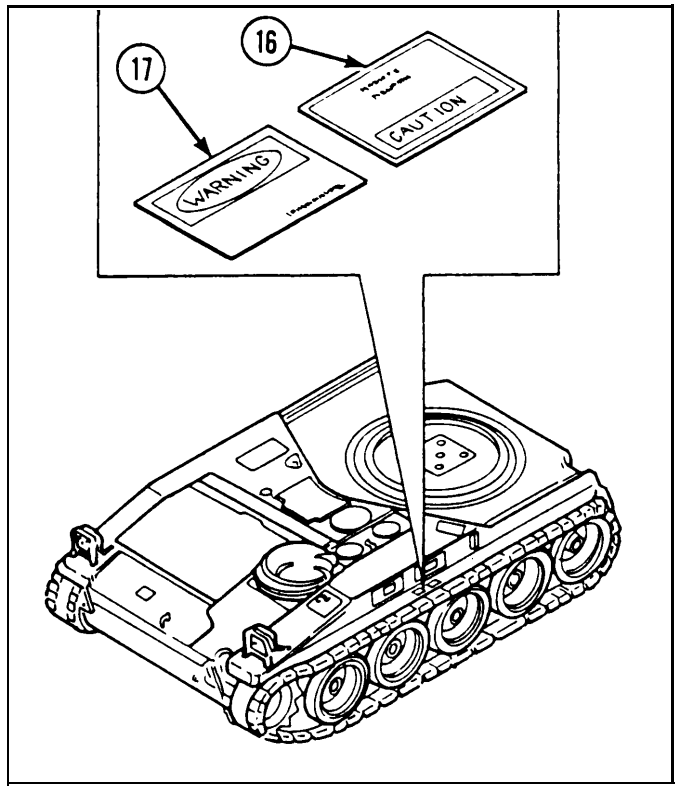
2-172. MAINTENANCE OF VEHICLE DATA PLATES (CONT).

REMOVAL (CONT)

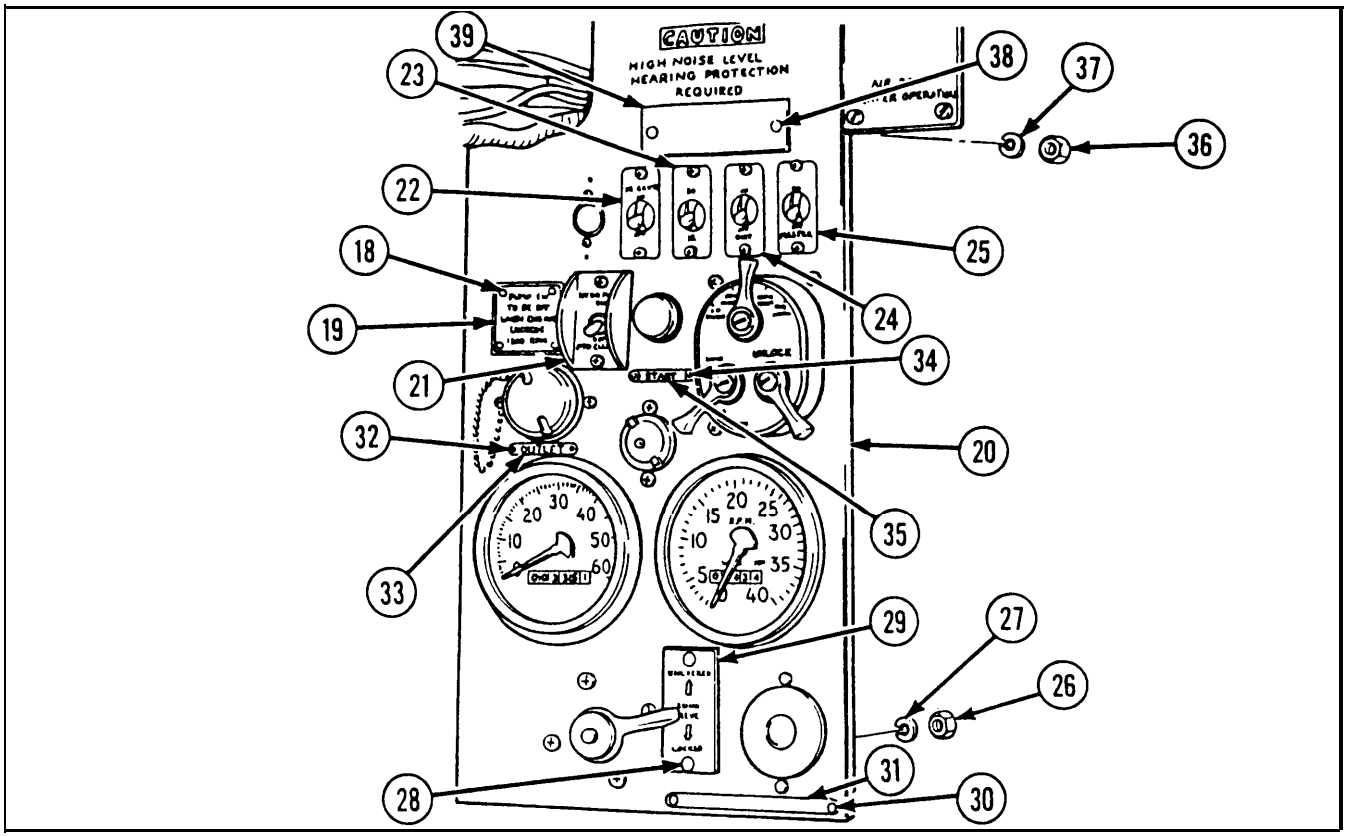


8 If damaged, remove vehicle name and service data identification plate (13).

9 Remove two drive screws (14) and IMPACT WRENCH identification plate (15) from driver's compartment wall.



10 If damaged, remove two identification markers (16) and two decals (17).



11 Remove four drive screws (18) and CLUTCH OPERATION WARNING instruction plate (19) from driver's instrument panel (20).

12 If damaged, remove HYDRAULIC PUMP/PTO CLUTCH identification plate (21) from driver's instrument panel (20).

13 If damaged, remove INFRARED RECEIVER switch instruction plate (22) from driver's instrument panel (20).

14 If damaged, remove BO-IR SELECTOR identification plate (23) from driver's instrument panel (20).

15 If damaged, remove INSTRUMENT switch instruction plate (24) from driver's instrument panel (20).

16 If damaged, remove MASTER switch instruction plate (25) from driver's instrument panel (20).

17 Remove two hexagon plain nuts (26), two lockwashers (27), two machine screws (28), and SUSPENSION VALVE instruction plate (29) from driver's instrument panel (20).

18 Remove two drive screws (30) and SUSPENSION LOCKED indicator lamp instruction plate (31) from driver's instrument panel (20).

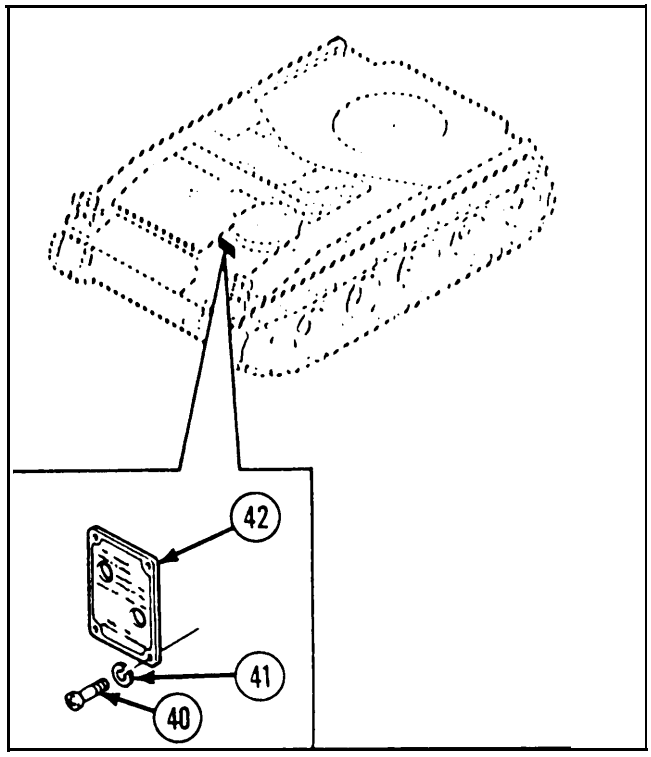
19 Remove two drive screws (32) and UTILITY OUTLET identification plate (33) from driver's instrument panel (20).

20 Remove two drive screws (34) and ENGINE START switch instruction plate (35) from driver's instrument panel (20).

21 Remove two hexagon plain nuts (36), two lockwashers (37), two machine screws (38), and spade control instruction plate (39) from driver's instrument panel (20).

2-172. MAINTENANCE OF VEHICLE DATA PLATES (CONT).

REMOVAL (CONT)



22 Remove four machine screws (40), four lockwashers (41), and prime and pump switches instruction plate (42) from bulkhead.

INSPECTION/REPAIR

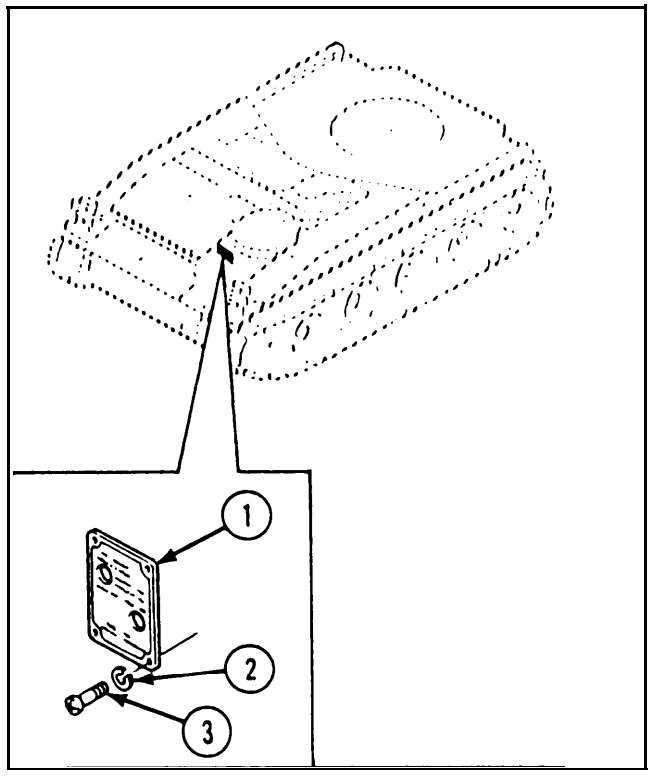
1 Check for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

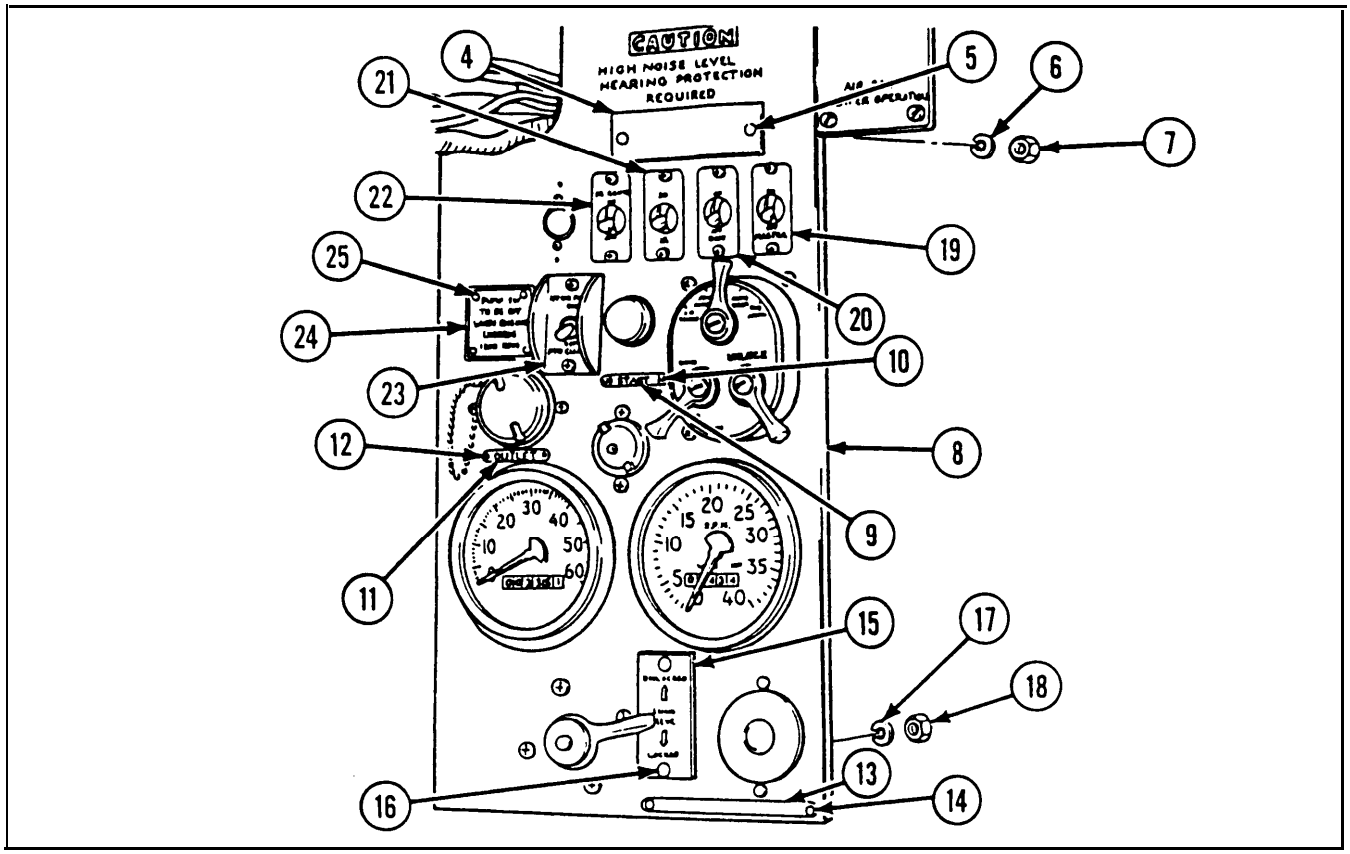
INSTALLATION

NOTE

Clean surface where vehicle data plate is to be installed. Roughen and degrease surface with dry cleaning solvent and dry surface immediately prior to application of adhesive. Bond screwless vehicle data plates to vehicle using epoxy resin adhesive. Spray vehicle data plate with a protective coating of clear lacquer.



1 Install prime and pump switches instruction plate (1), four new lockwashers (2), and four machine screws (3).



2 Install spade control instruction plate (4), two machine screws (5), two new lockwashers (6), and two hexagon plain nuts (7) to driver's instrument panel (8).

3 Install ENGINE START switch instruction plate (9) and two drive screws (10) on driver's instrument panel (8).

4 Install UTILITY OUTLET identification plate (11) and two drive screws (12) on driver's instrument panel (8).

5 Install SUSPENSION LOCKED indicator lamp instruction plate (13) and two drive screws (14) to driver's instrument panel (8).

6 Install SUSPENSION VALVE instruction plate (15), two machine screws (16), two new lockwashers (17), and two hexagon plain nuts (18) on driver's instrument panel (8).

7 If removed, install new MASTER switch instruction plate (19) to driver's instrument panel (8).

8 If removed, install new INSTRUMENT switch instruction plate (20) to driver's instrument panel (8).

9 If removed, install new BO-IR SELECTOR identification plate (21) to driver's instrument panel (8).

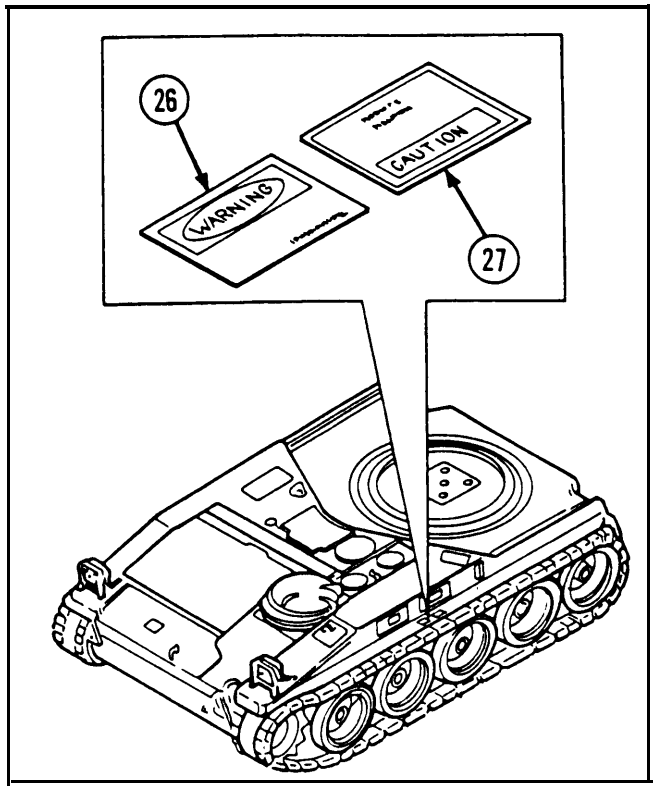
10 If removed, install new INFRARED RECEIVER switch instruction plate (22) to driver's instrument panel (8).

11 If removed, install new HYDRAULIC PUMP/PTO CLUTCH identification plate (23) to driver's instrument panel (8).

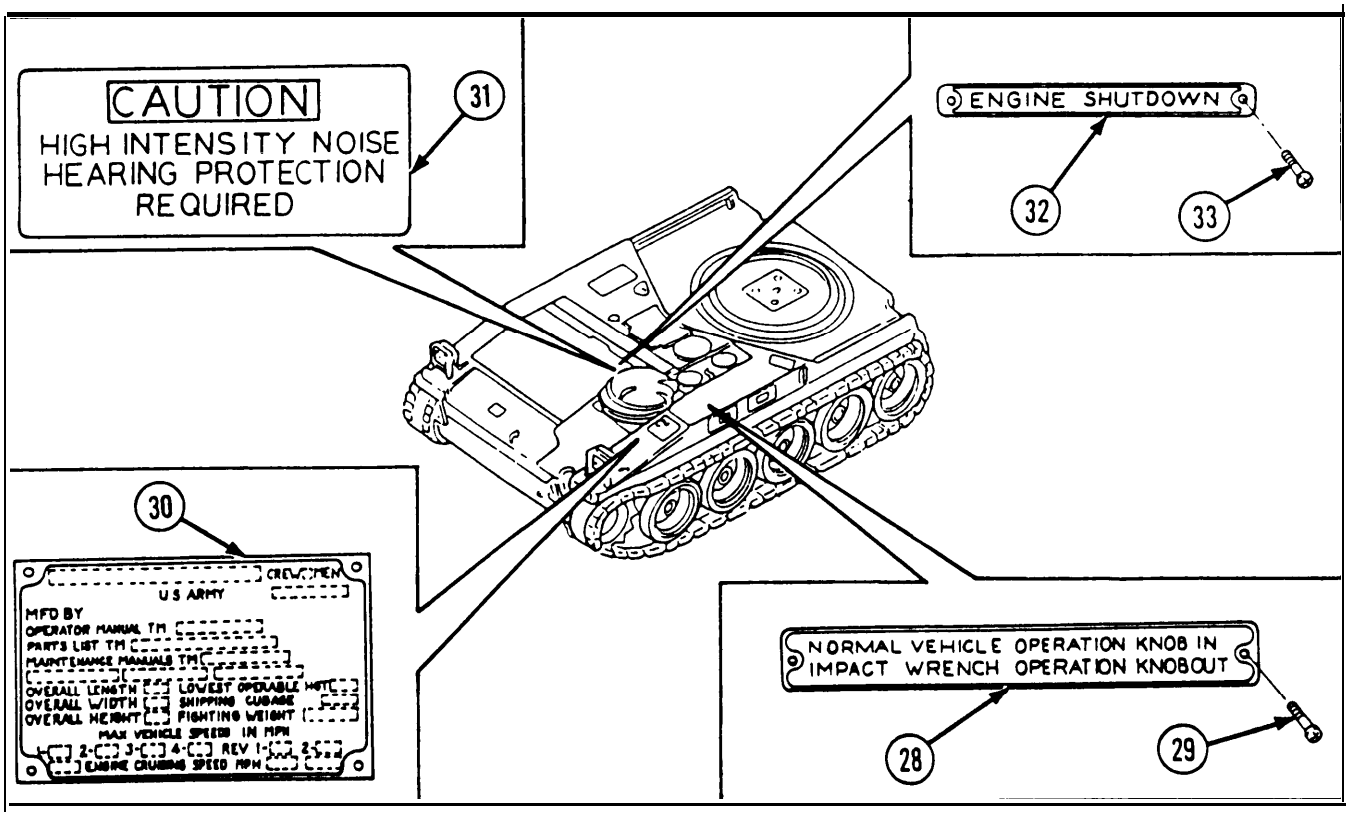
12 Install CLUTCH OPERATION WARNING instruction plate (24) and four drive screws (25) to driver's instrument panel (8).

2-172. MAINTENANCE OF VEHICLE DATA PLATES (CONT).

INSTALLATION (CONT)



13 If removed, install two new decals (26) and two new identification markers (27).

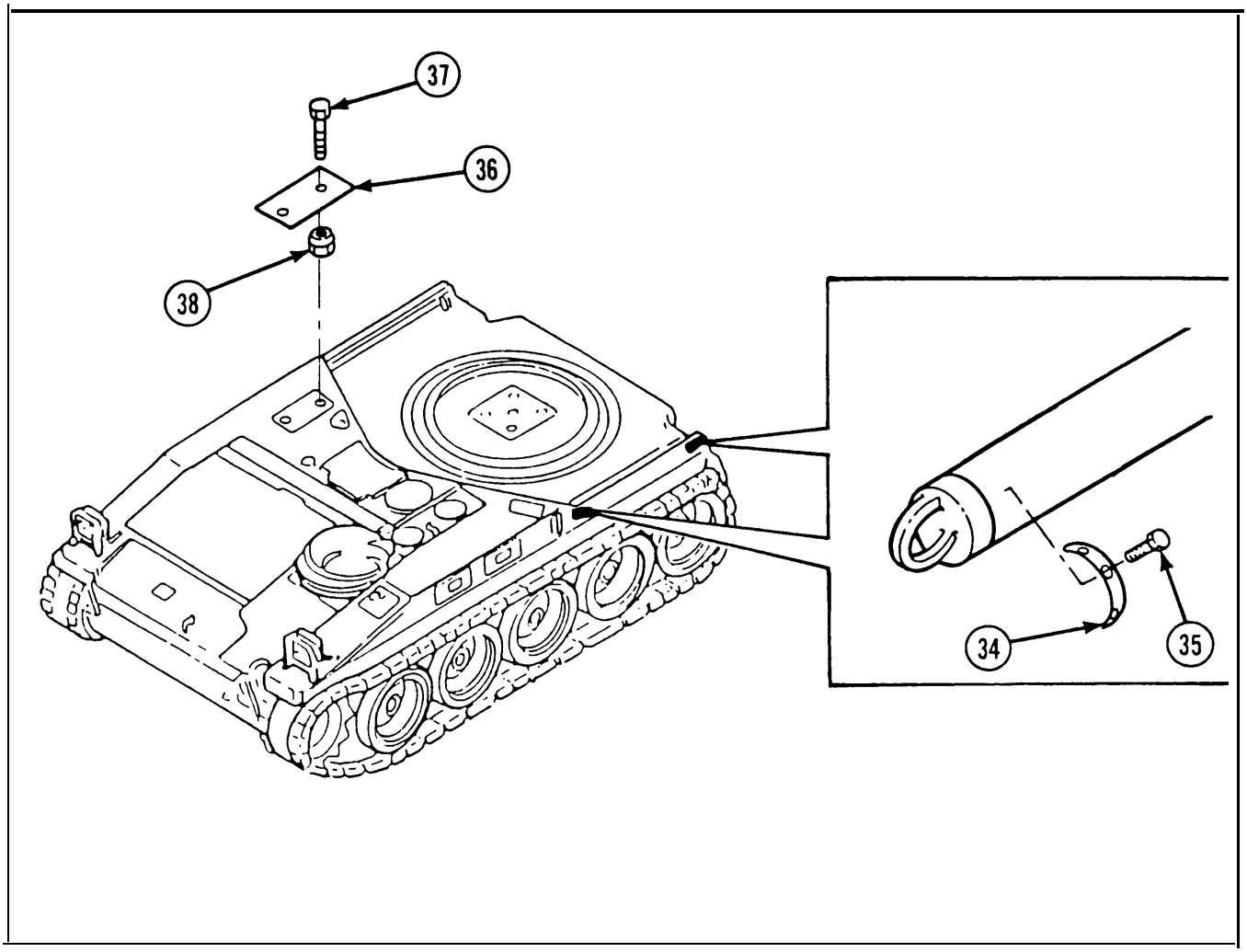


14 Install IMPACT WRENCH identification plate (28) and two drive screws (29).

15 If removed, install new vehicle name and service data identification plate (30).

16 If removed, install new HIGH NOISE LEVEL instruction plate (31) to bulkhead.

17 Install ENGINE SHUTDOWN identification plate (32) and two drive screws (33).



NOTE

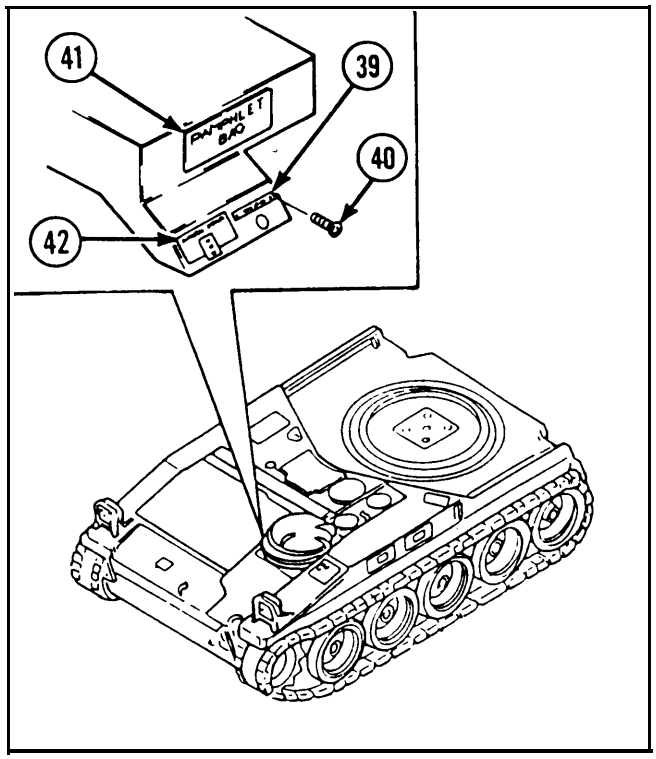
Step 18 is written for one suspension lockout cylinder but applies to all suspension lockout cylinders and the two hydraulic cylinder assemblies.

18 Install suspension lockout cylinder identification plate (34) and three drive screws (35).

19 Install DIESEL FUEL ONLY identification plate (36), four machine screws (37), and four new self-locking nuts (38) to hull.

2-172. MAINTENANCE OF VEHICLE DATA PLATES (CONT).

INSTALLATION (CONT)



20 Install identification plate (39) and two screws (40).

21 If removed, install new sign (41).

22 If removed, install new sign (42).

2-173. MAINTENANCE OF HEATER INSTALLATION KIT.

This task covers: a. *Removal* b. *Inspection/Repair* *c. Installation*

INITIAL SETUP

Materials/Parts
Exhaust hose (figure D-15, appx D)
Gasket
Lockwasher (16)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-1022 Driver's heater hoses removed

REMOVAL

1 Remove four hexagon head capscrews (1), four lockwashers (2), and coolant heater exhaust pipe (3) from engine coolant heater (4).

2 Remove four hexagon head capscrews (5), four lockwashers (6), and coolant heater shield (7) from engine coolant heater (4).

3 Remove 12 screws (8) and 12 washers (9) from coolant heater mounting plate (10).

4 Lift engine coolant heater (4) from hull and support.

5 Disconnect fuel lines, refer to page 2-1016.

6 Disconnect water hoses, refer to page 2-1011.

7 Tag and disconnect electrical leads.

8 Remove hexagon plain nut (11), lockwasher (12), hexagon head capscrew (13), and exhaust clamp (14) from hull.

9 Loosen and remove two hose clamps (15 and 16) and exhaust clamp (14) from exhaust hose (17).

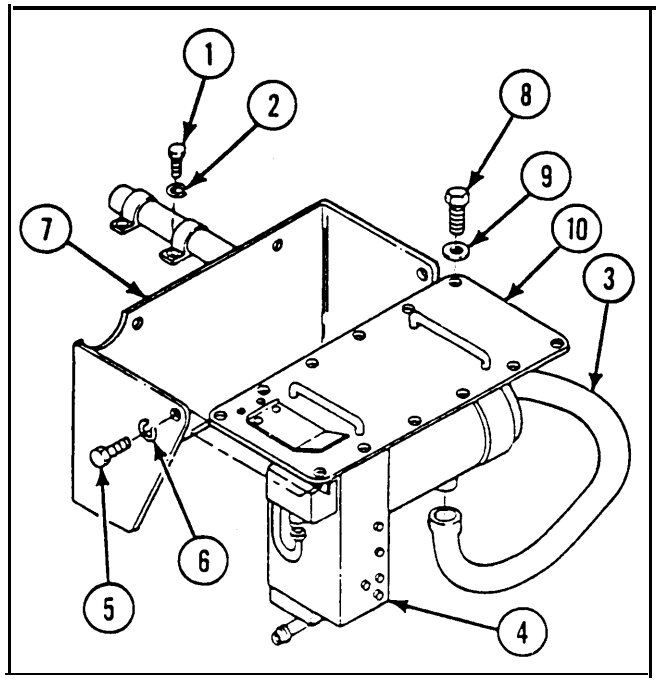
10 Remove two loop clamps (18).

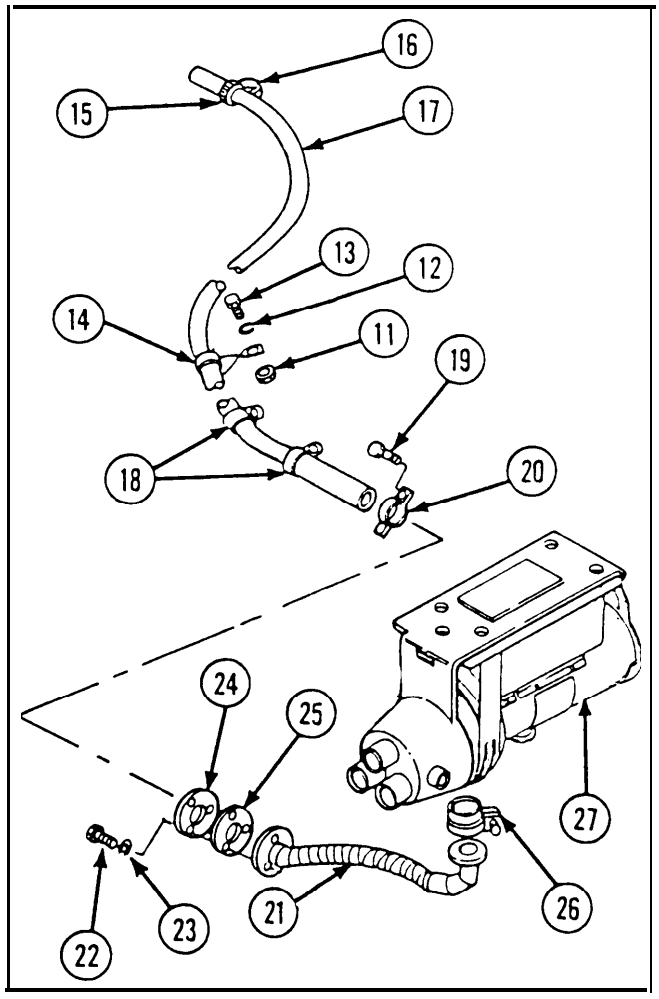
11 Remove two hexagon head capscrews (19) and loop clamp (20) from exhaust hose (17).

12 Remove exhaust hose (17) from driver's heater exhaust assembly (21).

13 Remove three hexagon head capscrews (22), three lockwashers (23), exhaust mount plate (24), gasket (25), and driver's heater exhaust assembly (21).

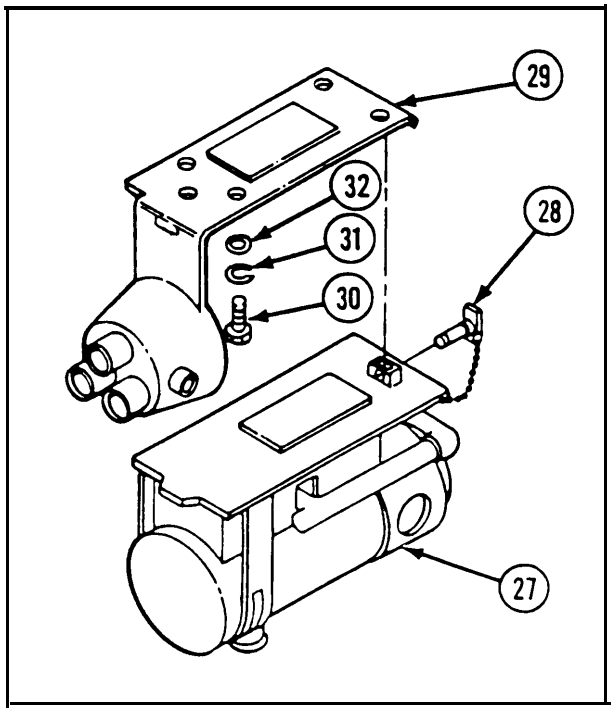
14 Remove heater exhaust coupling (26) from vehicular heater (27).





2-172. MAINTENANCE OF VEHICLE DATA PLATES (CONT).

REMOVAL (CONT)



15 Pull quick release pin (28) and disconnect vehicular heater (27) from electrical bracket (29). Slide vehicular heater out of electrical bracket and remove from hull.

16 Remove four heaxagon head capscrews (30), four lockwashers (31), four flat washers (32), and electrical bracket (29) from hull.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

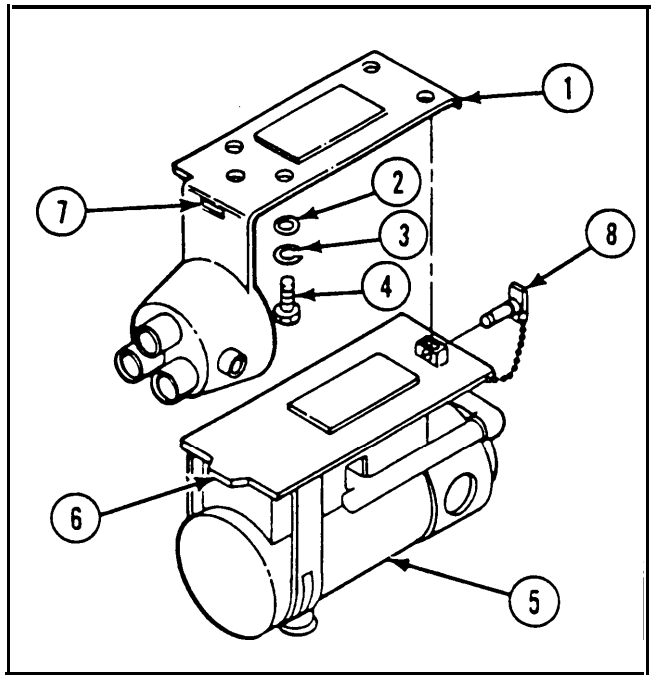
2 Exhaust hose is a manufactured item, refer to appendix D.

3 Engine coolant heater is a repairable assembly. Refer to page 2-1056.

4 Vehicular heater is a repairable assembly. Refer to page 2-1068.

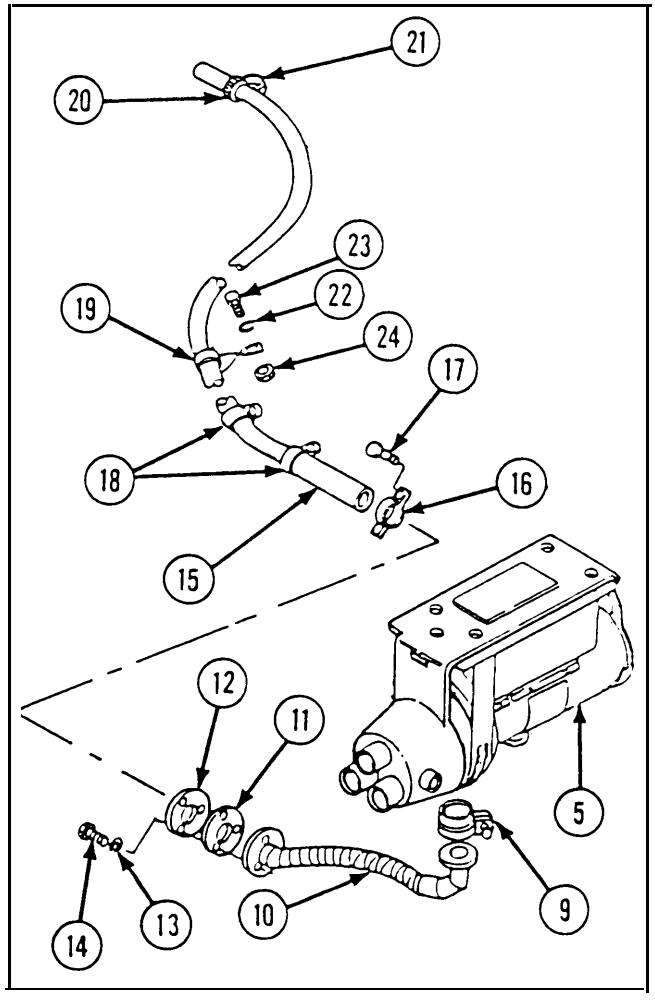
5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

INSTALLATION



1 Install electrical bracket (1), four flat washers (2), four new lockwashers (3), and four hexagon head capscrews (4) in hull.

2 Position vehicular heater (5) in electrical bracket (1). Ensure tab (6) on vehicular heater is securely seated in notch (7) on electrical bracket. Install quick release pin (8) to secure vehicular heater to electrical bracket.



3 Install heater exhaust coupling (9) and driver's heater exhaust assembly (10) on vehicular heater (5).

4 Install new gasket (11), exhaust mount plate (12), three new lockwashers (13), and three hexagon head capscrews (14).

5 Install exhaust hose (15) on driver's heater exhaust assembly (9).

6 Install loop clamp (16) on exhaust hose (15), and secure with two hexagon head capscrews (17).

7 Install two loop clamps (18) on exhaust hose (15).

8 Install and tighten exhaust clamp (19) and two hose clamps (20 and 21) on exhaust hose (15).

9 Install exhaust clamp (19), new lockwasher (22), hexagon head capscrew (23), and hexagon plain nut (24) to hull.

2-173. MAINTENANCE OF HEATER INSTALLATION KIT (CONT).

INSTALLATION (CONT)

10 Untag and disconnect electrical leads.

11 Connect water hoses. Refer to page 2-1011.

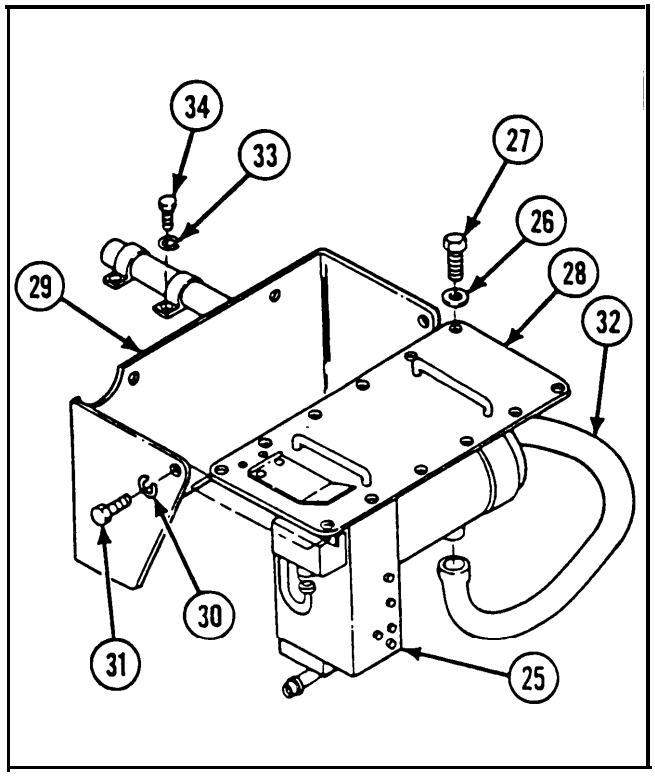
12 Connect fuel lines. Refer to page 2-1016.

13 Lower engine coolant heater (25) into hull.

14 Install 12 washers (26) and 12 screws (27) in coolant heater mounting plate (28).

15 Install coolant heater shield (29) on engine coolant heater (25), and secure with four new lockwashers (30) and four hexagon head capscrews (31).

16 Install coolant heater exhaust pipe (32) on engine coolant heater (25), and secure with four new lockwashers (33) and four hexagon head capscrews (34).



2-174. MAINTENANCE OF HEATER INSTALLATION KIT—BATTERY BOX SUPPORTS AND RELATED ITEMS.

This task covers:	a. *Removal*	b. *Inspection/Repair*	c. *Installation*

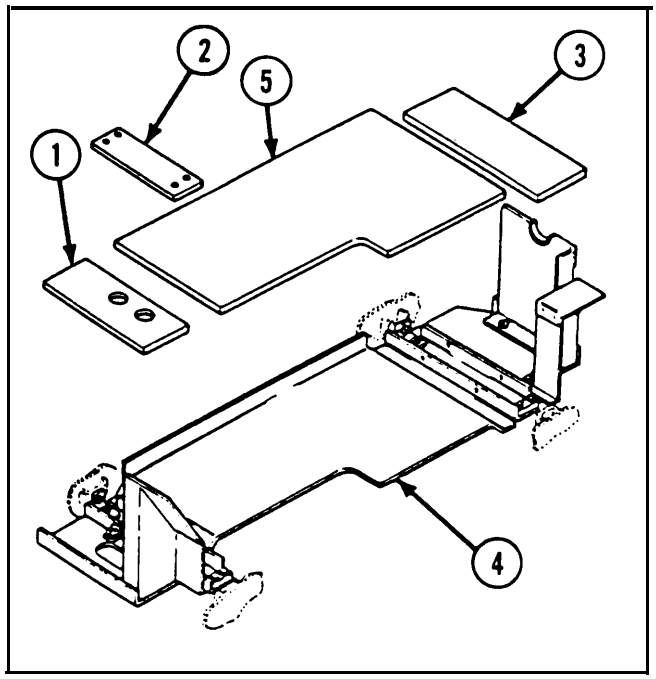
INITIAL SETUP

Materials/Parts
Lockwasher (1)
Lockwasher (8)

References
TM 9-2350-238-24P-1

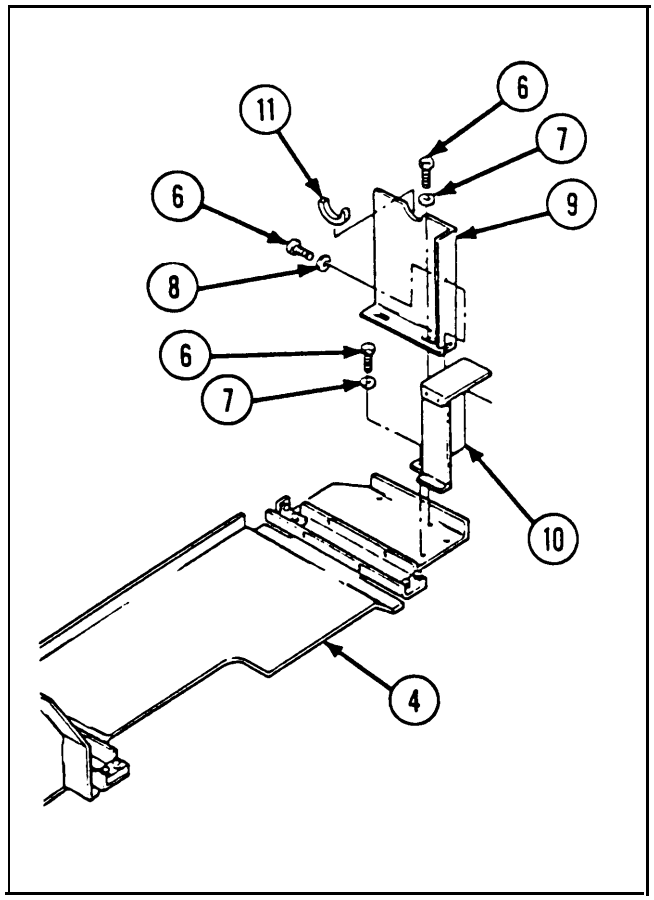
Equipment Conditions
2-640 Batteries removed

REMOVAL



1 Remove battery box insulation pads (1, 2, and 3) from battery bottom plate (4).

2 Remove cushioning pad (5) from battery bottom plate (4).

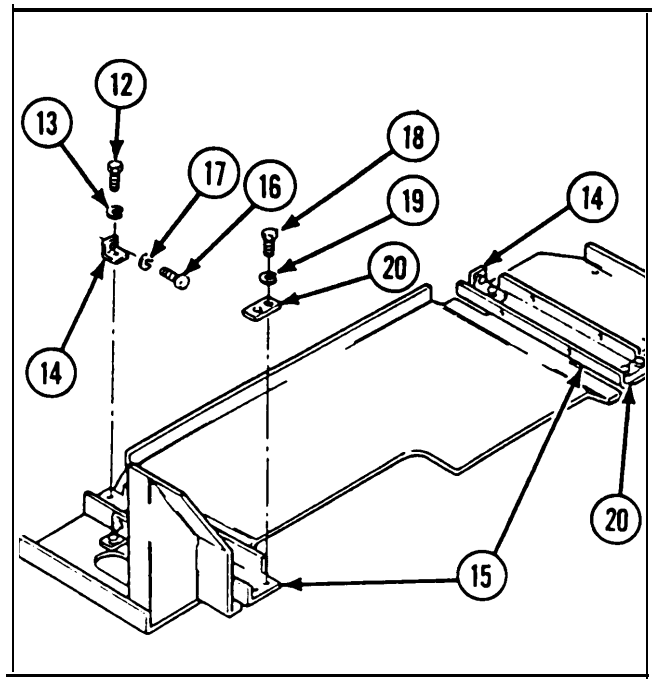


3 Remove five machine screws (6), four flat washers (7), lockwasher (8), battery side support plate (9), and heater air duct (10) from battery bottom plate (4).

4 Remove plastic grommet (11) from battery side support plate (9).

2-174. MAINTENANCE OF HEATER INSTALLATION KIT—BATTERY BOX SUPPORTS AND RELATED ITEMS (CONT).

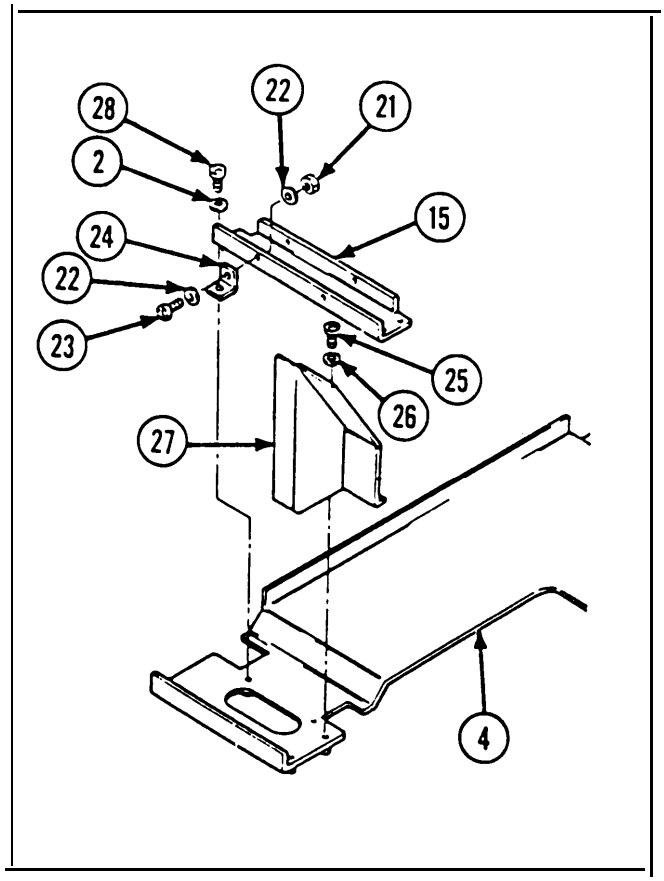
REMOVAL (CONT)



5 Remove machine screw (12), lockwasher (13), and support plate angle bracket (14) from each battery support plate bracket (15).

6 Remove two machine screws (16), two lockwashers (17), and two support plate angle brackets (14) from side of hull.

7 Remove hexagon head capscrew (18), lockwasher (19), and battery box plate (20) from each battery support plate bracket (15).



8 Remove four hexagon plain nuts (21), eight flat washers (22), four machine screws (23), and four angle brackets (24) from two battery support plate brackets (15).

9 Remove two machine screws (25), two flat washers (26), and heater air duct (27) from battery bottom plate (4).

10 Remove machine screw (28), flat washer (29), and battery support plate bracket (15) from battery bottom plate (4).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

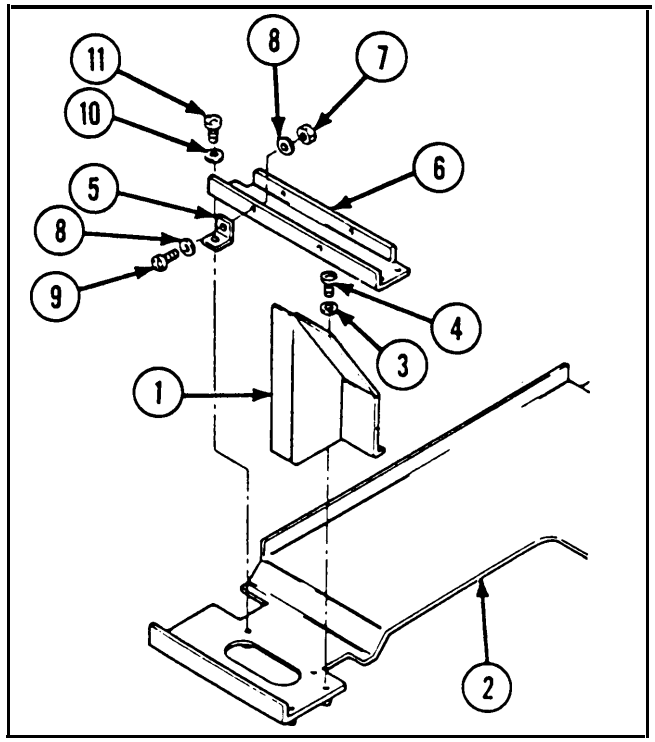
2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Position heater air duct (1) on battery bottom plate (2), and secure with two flat washers (3) and two machine screws (4).

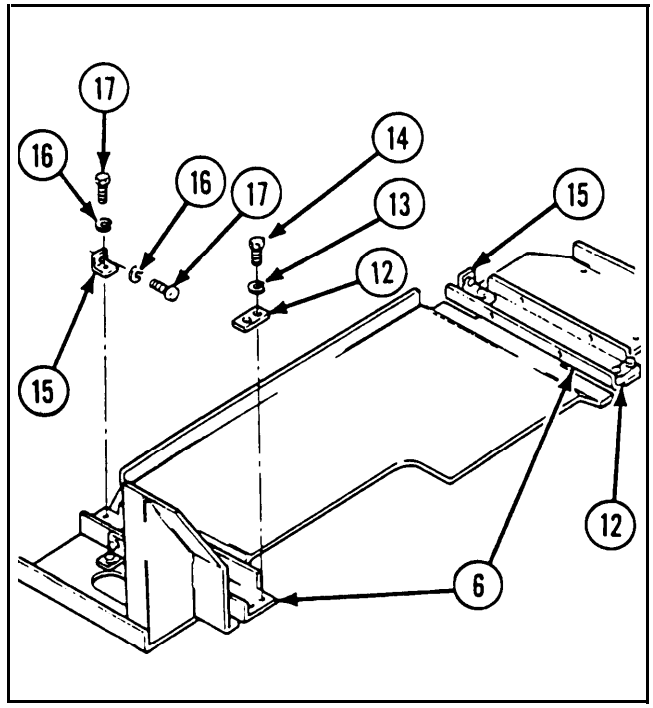
2 Position two angle brackets (5) on each battery support plate bracket (6), and secure with four hexagon plain nuts (7), eight flat washers (8), and four machine screws (9).

3 Position each battery support plate bracket (6) with attached parts on battery bottom plate (2), and secure with four flat washers (10) and four machine screws (11).



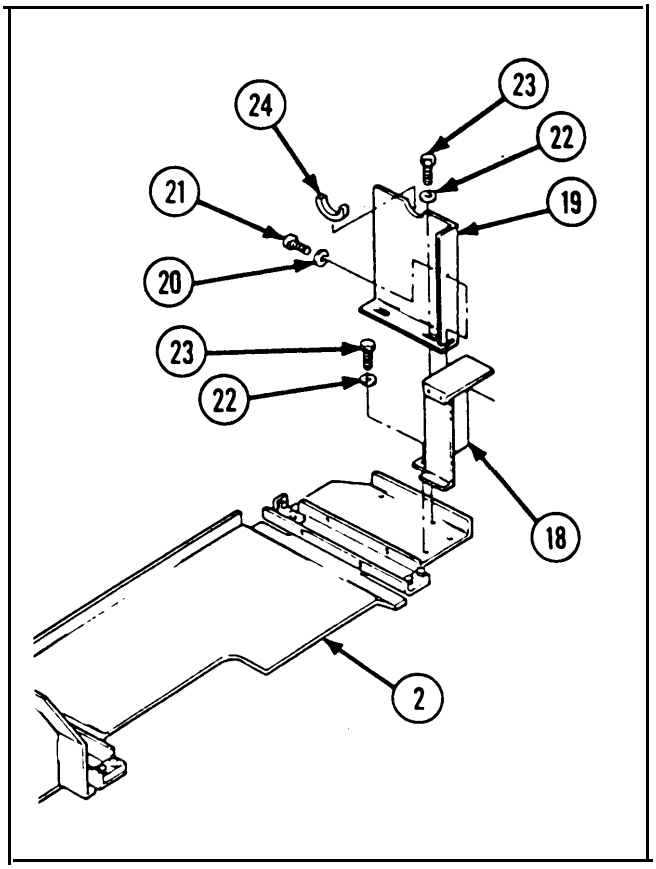
4 Position two battery box plates (12) on two battery support plate brackets (6), and secure with four new lockwashers (13) and four hexagon head capscrews (14).

5 Position two support plate angle brackets (15) against hull and two battery support brackets (6), and secure with four new lockwashers (16) and four machine screws (17).



2-174. MAINTENANCE OF HEATER INSTALLATION KIT—BATTERY BOX SUPPORTS AND RELATED ITEMS (CONT).

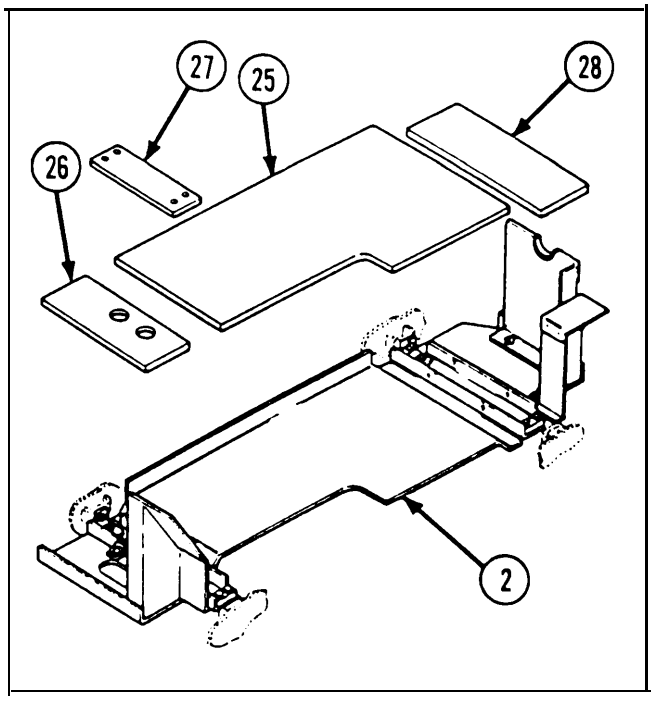
INSTALLATION (CONT)



6 Position heater air duct (18) on battery side support plate (19), and secure with new lockwasher (20) and machine screw (21).

7 Position heater air duct (18) and battery side support plate (19) on battery bottom plate (2), and secure with four flat washers (22) and four machine screws (23).

8 Install plastic grommet (24) to side battery support plate (19).



9 Install cushioning pad (25) to battery bottom plate (2).

10 Install battery box insulation pads (26, 27, and 28) to battery bottom plate (2).

2-175. MAINTENANCE OF HEATER INSTALLATION KIT—BATTERY BOX AND COVERS.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Materials/Parts
Cotter pin (4)

References
TM 9-2350-238-24P-1

Equipment Conditions
Master switch in OFF position

General Safety Instructions

WARNING

Disconnect ground leads first and connect ground leads last when removing or installing electrical leads.

REMOVAL

1 Remove battery insulation pad (1).

WARNING

Disconnect both ground leads first when removing electrical leads from batteries.

2 Remove ten hexagon plain nuts (2), ten flat washers (3), two battery holddown plates (4), and three battery retaining plates (5).

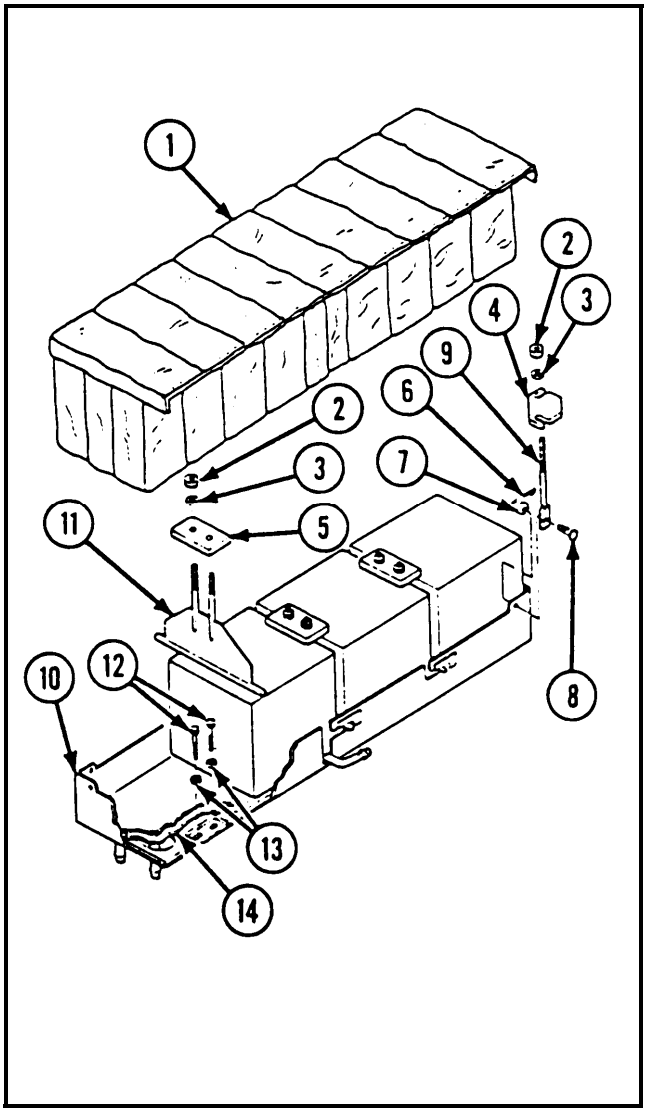
3 Remove four cotter pins (6), four flat washers (7), four headed straight pins (8), and four battery holddown rod end connectors (9) from battery box (10).

4 Remove batteries. Refer to page 2-840.

5 Remove three plate assembly anchors (11) from battery box (10).

6 Remove eight hexagon head capscrews (12), eight flat washers (13), and battery heating pad (14) from battery box (10).

7 Remove battery box (10) from vehicle.



2-175. MAINTENANCE OF HEATER INSTALLATION KIT—BATTERY BOX AND COVERS (CONT).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install battery box (1) and battery heating pad (2) in vehicle, and secure with eight flat washers (3) and eight hexagon head capscrews (4).

2 Install three plate assembly anchors (5) in battery box (1).

3 Install batteries. Refer to page 2-640.

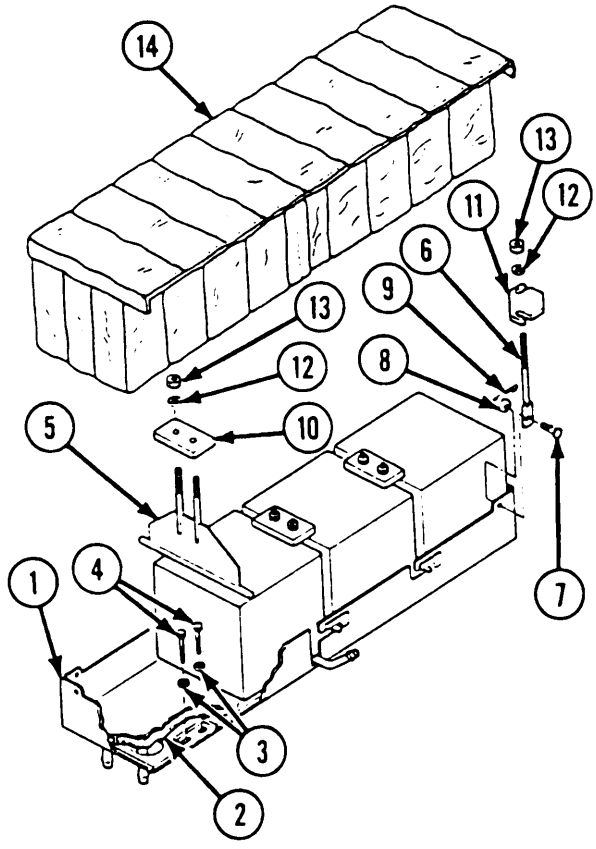
4 Install four battery holddown rod end connectors (6) in battery box (1), and secure with four headed straight pins (7), four flat washers (8), and four new cotter pins (9).

5 Install three battery retaining plates (10) and two battery holddown plates (11), and secure with ten flat washers (12) and ten hexagon plain nuts (13).

WARNING

Connect ground leads last when installing electrical leads to batteries.

6 Install battery insulation pad (14).



2-176. MAINTENANCE OF HEATER INSTALLATION KIT—HOSES AND FITTINGS.

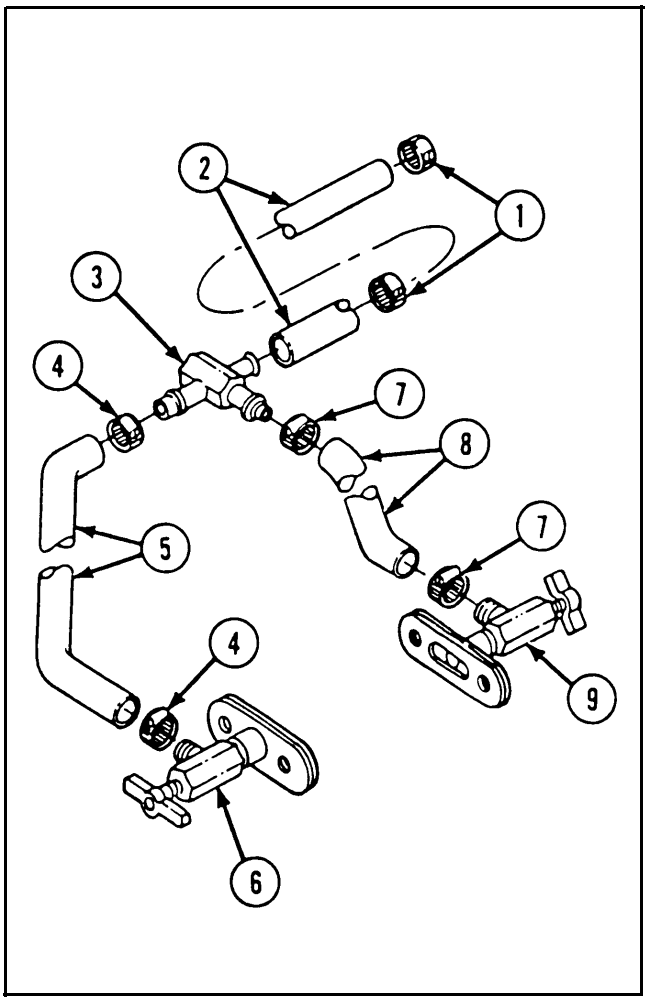
This task covers:	a. *Removal*	b. *Inspection/Repair*	c. *Installation*

INITIAL SETUP

Materials/Parts
Engine water manifold gasket (2)
Lockwasher
Lockwasher (3)
Rubber hose (5) (figure D-17, appx D)

References
TM 9-2350-238-24P-1

REMOVAL



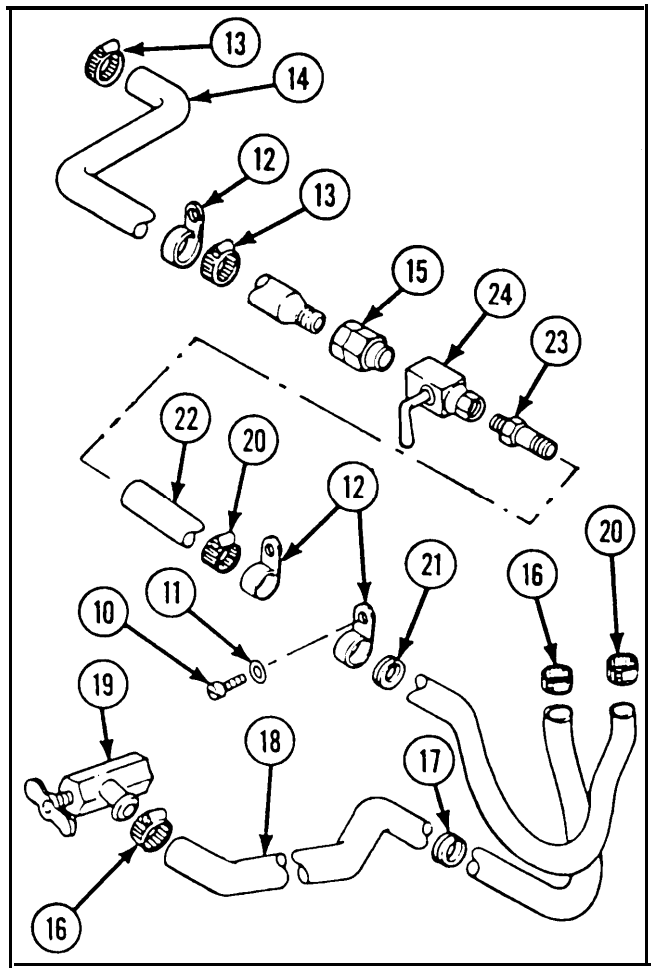
1 Remove two hose clamps (1) and rubber hose (2) from hose tee (3) and engine coolant heater centrifugal pump unit.

2 Remove two hose clamps (4) and rubber hose (5) from hose tee (3) and drain cock (6).

3 Remove two hose clamps (7) and rubber hose (8) from hose tee (3) and drain cock (9).

2-176. MAINTENANCE OF HEATER INSTALLATION KIT—HOSES AND FITTINGS (CONT).

REMOVAL (CONT)



4 Remove three machine screws (10), three lockwashers (11), and three loop clamps (12).

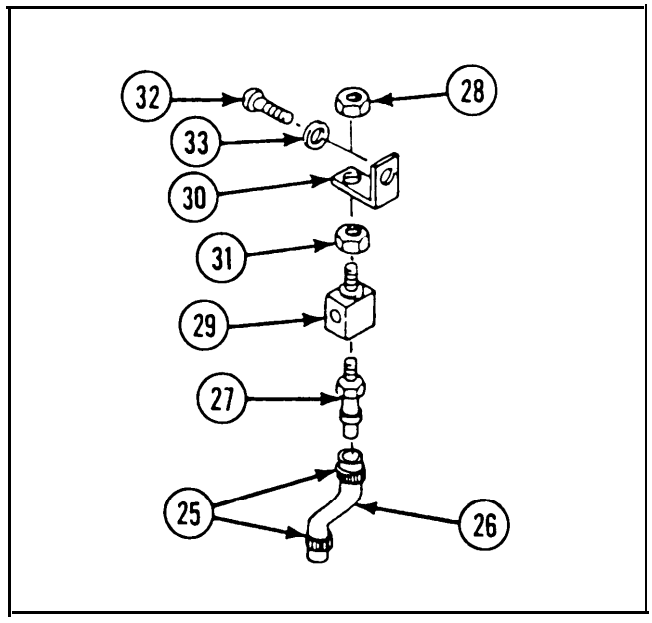
5 Remove two hose clamps (13) and rubber hose (14) from straight adapter (15) and engine coolant heater assembly.

6 Remove two hose clamps (16), nonmetallic grommet (17), and rubber hose (18) from drain cock (19) and battery box.

7 Remove drain cock (19) from engine block behind fuel filter.

8 Remove two hose clamps (20), nonmetallic grommet (21), and rubber hose (22) from straight adapter (23) and battery box.

9 Remove two straight adapters (15 and 23) from plug cock (24).



10 Remove two hose clamps (25) and nonmetallic hose (26) from straight adapter (27).

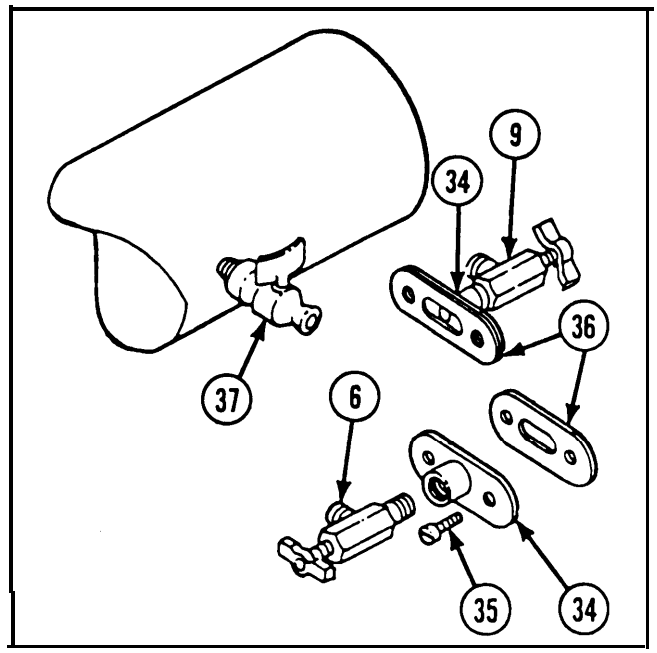
NOTE

Two nuts are supplied with air purge two-way control valve. Use care not to lose or damage nuts.

11 Remove nut (28) and air purge two-way control valve (29) from air purge valve angle bracket (30).

12 Remove nut (31) and straight adapter (27) from air purge two-way control valve (29).

13 Remove machine screw (32), lockwasher (33), and air purge valve angle bracket (30) from wall of battery compartment.



14 Remove two drain cocks (6 and 9) from two engine water manifold adapters (34).

15 Remove four screws (35), two engine water manifold engine adapters (34), and two engine water manifold gaskets (36) from engine block.

16 Remove drain cock (37) from engine manifold.

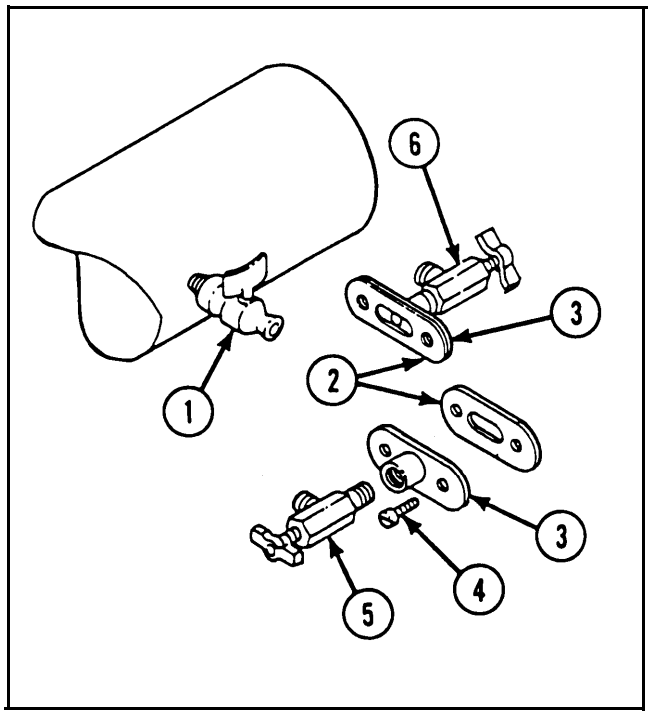
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Rubber hoses and nonmetallic hose are manufactured items, refer to appendix D.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



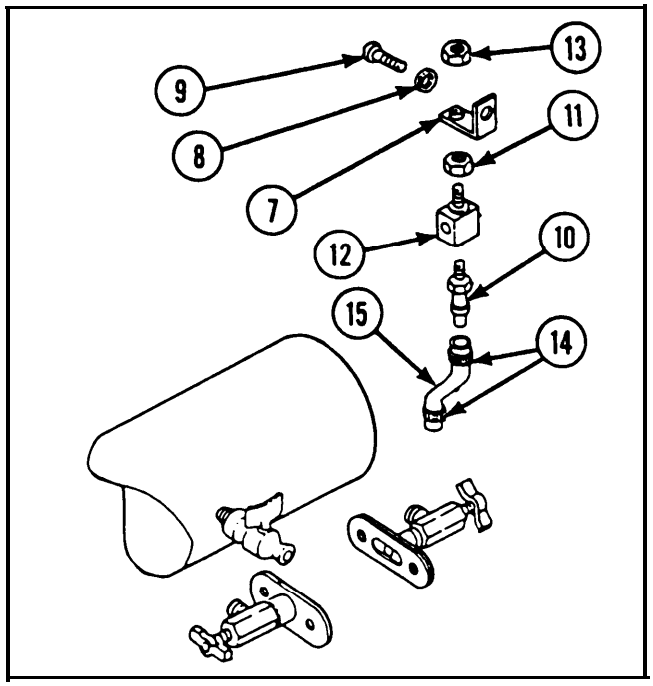
1 Install drain cock (1) on engine manifold.

2 Position two new engine water manifold gaskets (2) and two engine water manifold adapters (3) on engine block, and secure with four screws (4).

3 Install two drain cocks (5 and 6) in two engine water manifold adapters (3).

2-176. MAINTENANCE OF HEATER INSTALLATION KIT—HOSES AND FITTINGS (CONT).

INSTALLATION (CONT)

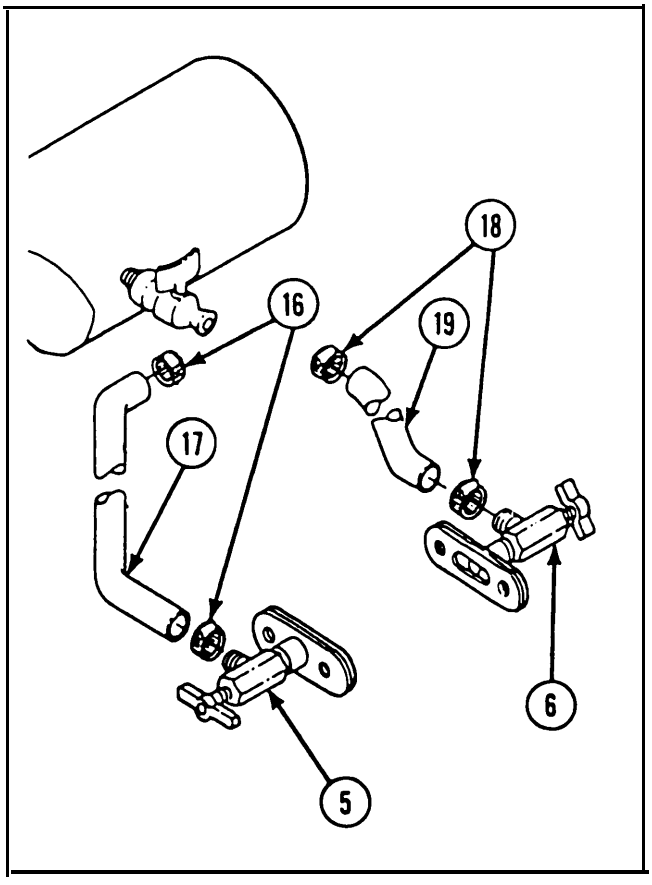


4 Position air purge valve angle bracket (7) on hull heater kit, and secure with new lockwasher (8) and machine screw (9).

5 Install straight adapter (10) and nut (11) on air purge two-way control valve (12).

6 Install air purge two-way control valve (12) on air purge valve angle bracket (7) and secure with nut (13).

7 Install two hose clamps (14) on nonmetallic hose (15), and install nonmetallic hose on straight adapter (10) and bottom of battery compartment.



8 Install two hose clamps (16) on rubber hose (17), and install rubber hose on drain cock (5).

9 Install two hose clamps (18) on rubber hose (19), and install rubber hose on drain cock (6).

10 Install two hose clamps (20) and loop clamp (21) on rubber hose (22).

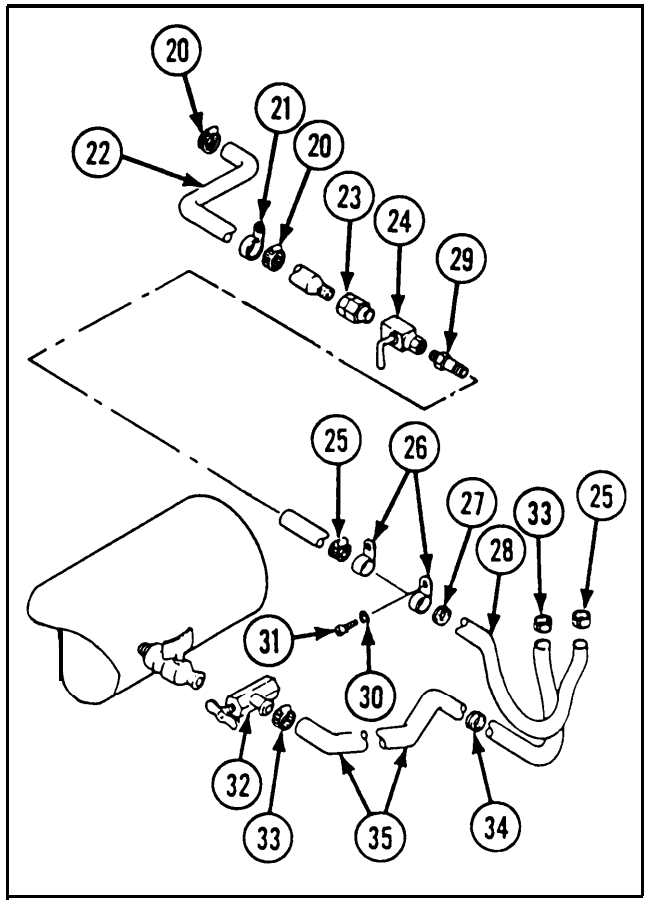
11 Install rubber hose (22) on straight adapter (23) and engine coolant heater assembly, and install straight adapter on plug cock (24).

12 Install two hose clamps (25), two loop clamps (26), and nonmetallic grommet (27) on rubber hose (28). Install rubber hose on straight adapter (29) and battery box.

13 Secure loop clamp (21) and two loop clamps (26) with three new lockwashers (30) and three machine screws (31).

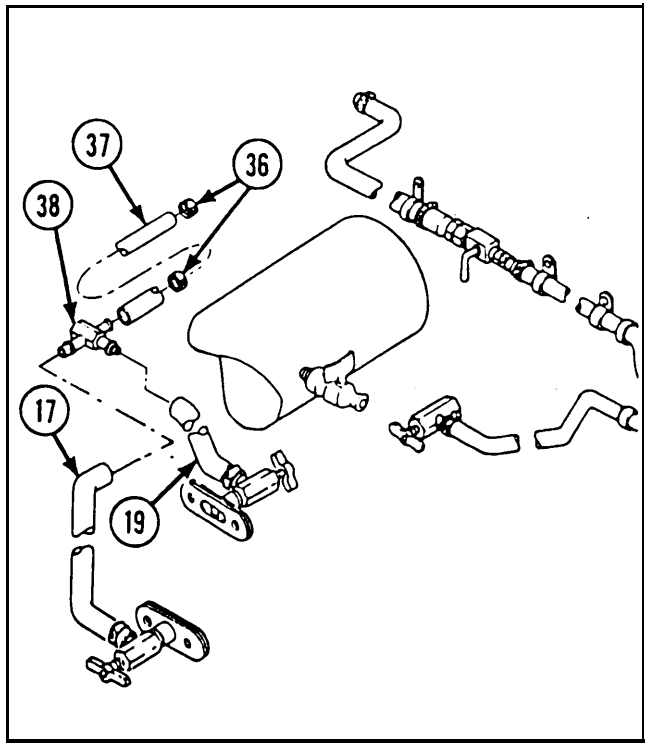
14 Install drain cock (32) on engine block behind fuel filter.

15 Install two loop clamps (33) and nonmetallic grommet (34) on rubber hose (35), and install rubber hose on drain cock (32) and battery box.



16 Install two hose clamps (36) on rubber hose (37). Install rubber hose (37), rubber hose (17), and rubber hose (19) on hose tee (38). Attach other end of rubber hose (37) to engine coolant heater centrifugal pump unit.

17 Tighten 12 hose clamps.



2-177. MAINTENANCE OF HEATER INSTALLATION KIT—FUEL LINES AND FITTINGS.

This task covers:	a. *Removal*	b. *Inspection/Repak*	c. *Installation*

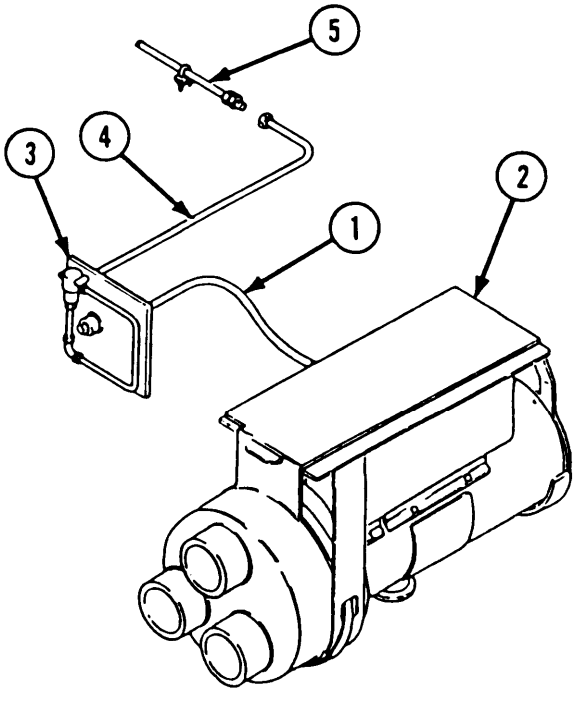
INITIAL SETUP

Materials/Parts
Gasket
Gasket
Lockwasher
Lockwasher (6)
Screen

References
TM 9-2350-238-24P-1

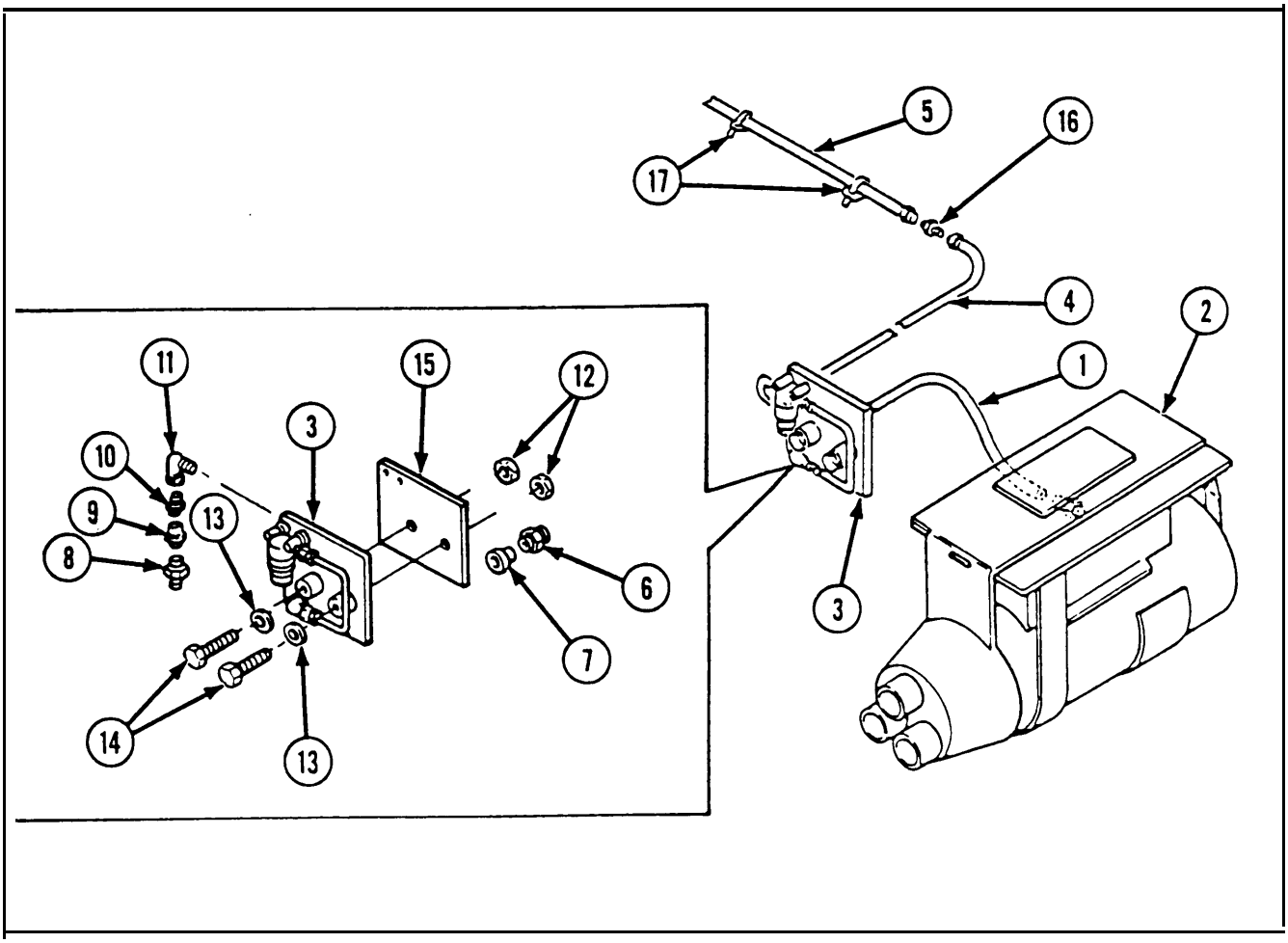
Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed
2-938 Hull transmission compartment deck assembly removed
Fuel tank valve in OFF position

REMOVAL



1 Disconnect fuel cell to coolant heater hose assembly (1) from vehicular heater (2) and filter mounting fluid filter (3).

2 Disconnect and remove fluid filter hose assembly (4) from filter mounting fluid filter (3) and fuel pump connecting hose assembly (5).



3 Remove straight pipe adapter (6) and quick coupling half (7) from filter mounting fluid filter (3).

4 Remove straight pipe adapter (8), pipe reducer (9), and pipe nipple (10) from pipe elbow (11).

5 Remove pipe elbow (11) from filter mounting fluid filter (3).

6 Remove two hexagon plain nuts (12), two lockwashers (13), and two hexagon head capscrews (14) from filter mounting fluid filter (3).

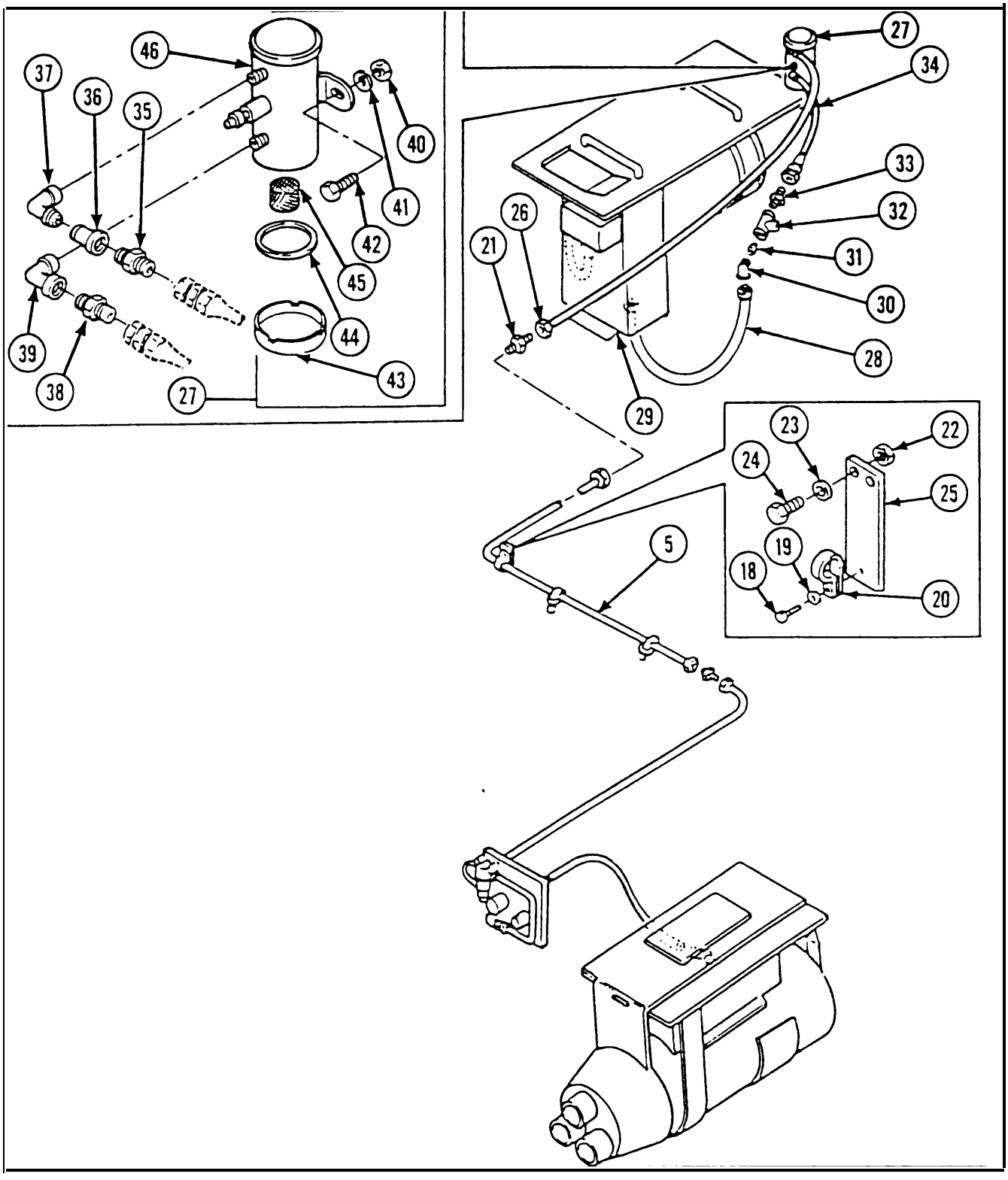
7 Remove filter mounting fluid filter (3) and gasket (15) from bulkhead.

8 Remove boss nipple (16) from fuel pump connecting hose assembly (5).

9 Remove two marker bands (17) from fuel pump connecting hose assembly (5).

2-177. MAINTENANCE OF HEATER INSTALLATION KIT—FUEL LINES AND FITTINGS (CONT).

REMOVAL (CONT)



10 Remove machine screw (18) and lockwasher (19) from loop clamp (20).

11 Disconnect fuel pump connecting hose assembly (5) from tube nipple (21). Remove fuel pump connecting hose assembly (5) and loop clamp (22).

12 Remove loop clamp (20) from fuel pump connecting hose assembly (5).

13 Remove two hexagon plain nuts (22), two lockwashers (23), two hexagon head capscrews (24), and heater hose plate (25).

14 Remove tube nipple (21) from fuel pump to driver's heater hose assembly (26).

15 Disconnect fuel pump to driver's heater hose assembly (26) from electrical fuel pump (27), and remove fuel pump to driver's heater hose assembly (26).

16 Disconnect fuel cell to coolant heater hose assembly (28) from engine coolant heater (29) and pipe elbow (30).

17 Remove pipe elbow (30) and pipe nipple (31) from pipe tee (32).

18 Disconnect pipe tee (32) and straight pipe adapter (33) from fuel cell to fuel pump hose assembly (34).

19 Disconnect and remove fuel cell to fuel pump hose assembly (34) from electrical fuel pump (27).

20 Remove straight pipe adapter (35) and pipe reducer (36) from pipe elbow (37).

21 Remove pipe elbow (37) from electrical fuel pump (27).

22 Remove straight pipe adapter (38) and pipe elbow (39) from electrical fuel pump (27).

23 Remove two hexagon plain nuts (40), two lockwashers (41), two hexagon head capscrews (42), and electrical fuel pump (27).

24 Remove fuel pump cover (43), gasket (44), and screen (45) from fuel pump housing (46).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If fuel pump housing is broken or damaged, repair is by replacement of next higher assembly.

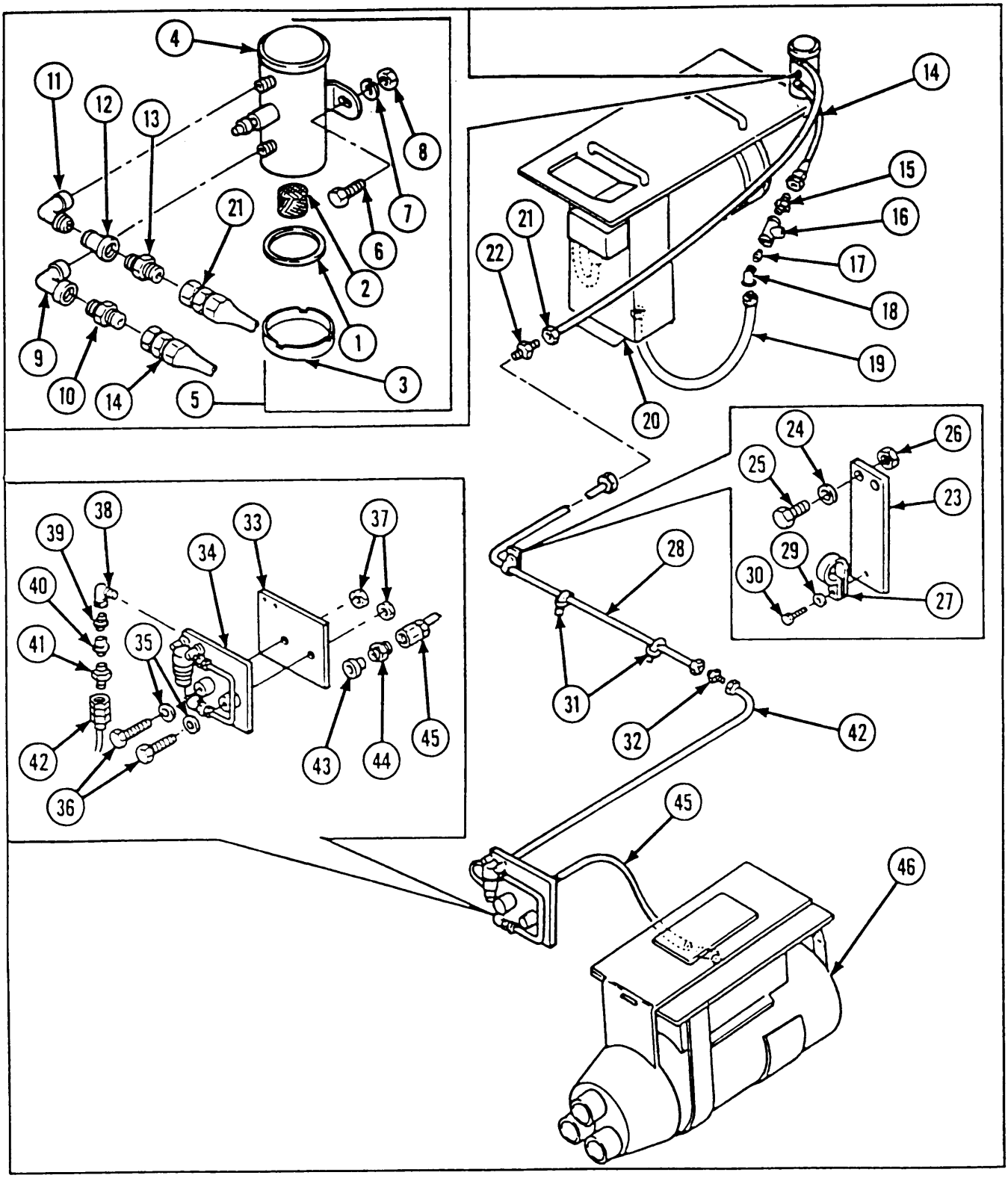
3 If fuel pump cover is broken, damaged, or missing, repair is by replacement of next higher assembly.

4 Filter mounting fluid filter is a repairable assembly. Refer to page 2-1051.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

2-177. MAINTENANCE OF HEATER INSTALLATION KIT—FUEL LINES AND FITTINGS (CONT).

INSTALLATION



1 Install new gasket (1), new screen (2), and fuel pump cover (3) on fuel pump housing (4).

2 Install electrical fuel pump (5), and secure with two hexagon head capscrews (6), two new lockwashers (7), and two hexagon plain nuts (8).

3 Install pipe elbow (9) and straight pipe adapter (10) on electrical fuel pump (5).

4 Install pipe elbow (11) on electrical fuel pump (5).

5 Install pipe reducer (12) and straight pipe adapter (13) on pipe elbow (11).

6 Connect fuel cell to fuel pump hose assembly (14) to straight pipe adapter (10).

7 Install straight pipe adapter (15) and pipe tee (16) on fuel cell to fuel pump hose assembly (14).

8 Install pipe nipple (17) and pipe elbow (18) on pipe tee (16).

9 Connect fuel cell to coolant heater hose (19) to pipe elbow (18) and engine coolant heater (20).

10 Install fuel pump to driver's heater hose assembly (21). Connect fuel pump to driver's heater hose assembly (21) on straight pipe adapter (13).

11 Install tube nipple (22) on fuel pump to driver's heater hose assembly (21).

12 Install heater hose plate (23). Install two new lockwashers (24), two hexagon head capscrews (25), and two hexagon plain nuts (26) on heater hose plate (23).

13 Install loop clamp (27) on fuel pump connecting hose assembly (28).

14 Connect fuel pump connecting hose assembly (28) to tube nipple (22).

15 Install new lockwasher (29) and machine screw (30) on loop clamp (27).

16 Install two marker bands (31) on fuel pump connecting hose assembly (28).

17 Install boss nipple (32) on fuel pump connecting hose assembly (28).

18 Install new gasket (33) and filter mounting fluid filter (34) on bulkhead. Secure with two new lockwashers (35), two hexagon head capscrews (36), and two hexagon plain nuts (37).

19 Install pipe elbow (38) on filter mounting fluid filter (34).

20 Install pipe nipple (39), pipe reducer (40), and straight pipe adapter (41) on pipe elbow (38).

21 Connect fluid filter hose assembly (42) to straight pipe adapter (41).

22 Install quick coupling half (43) and straight pipe adapter (44) on filter mounting fluid filter (34).

23 Install and connect fuel cell to coolant heater hose assembly (45) on straight pipe adapter (44) and vehicular heater (46).

2-178. MAINTENANCE OF HEATER INSTALLATION KIT—DRIVER'S HEATER AIR HOSES.

This task covers:	a. *Removal*	b. *Inspection/Repair*	c. *Installation*

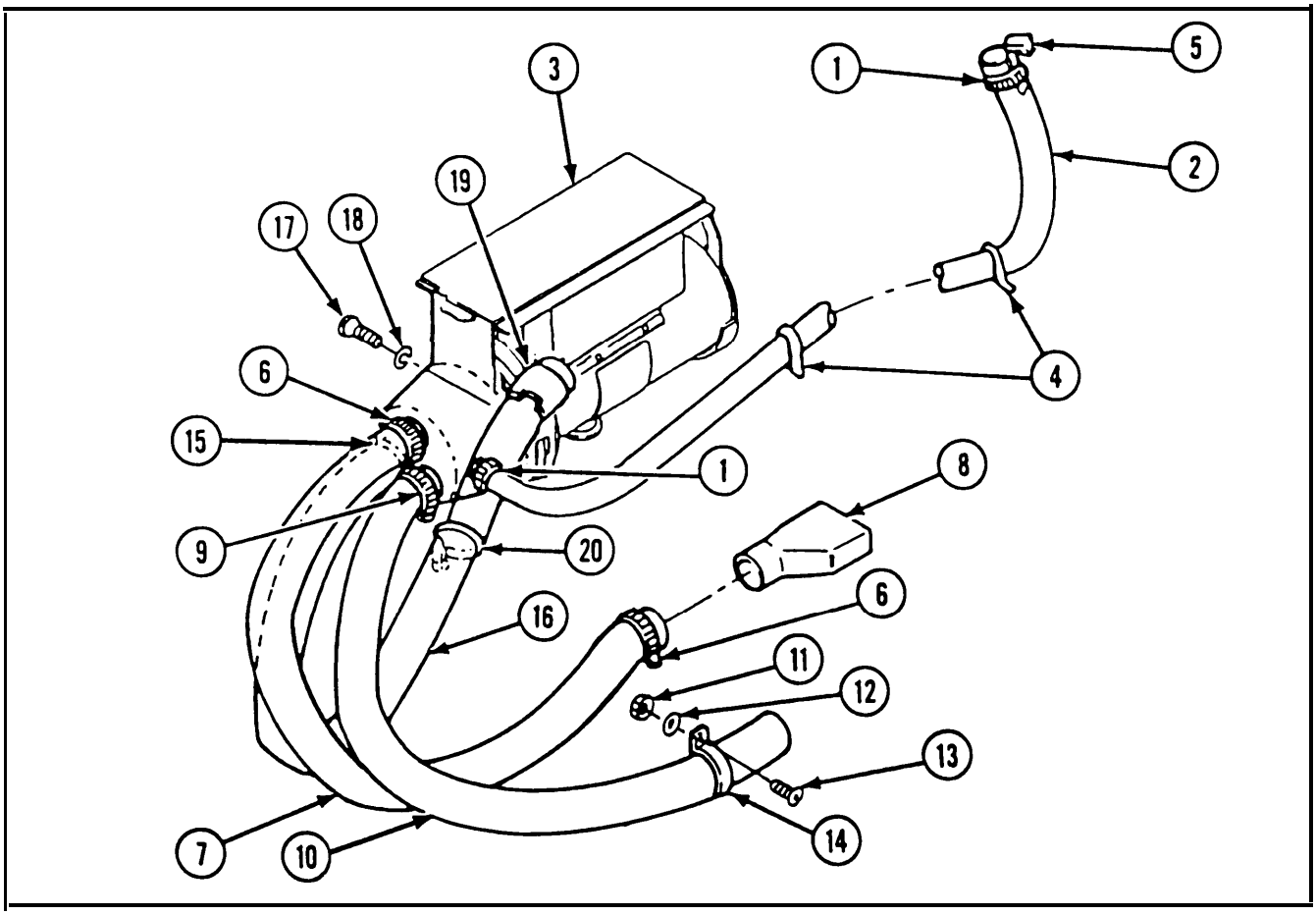
INITIAL SETUP

Materials/Parts
Air duct hose (3) (figure D-27, appx D)
Lockwasher
Lockwasher
Spring tension clip

References
TM 9-2350-238-24P-1

Equipment Conditions
2-1017 Fuel line disconnected

REMOVAL



1 Loosen two hose clamps (1) and remove air duct hose (2) from driver's heater (3).

2 Remove two hose clamps (1), two marker bands (4), and hot air duct spring tension clip (5) from air duct hose (2).

3 Loosen two hose clamps (6), and remove air duct hose (7) from driver's heater (3).

4 Remove hot air center duct (8) and two hose clamps (6) from air duct hose (7).

5 Loosen hose clamp (9) and remove air duct hose (10) from driver's heater (3).

6 Remove hexagon plain nut (11), lockwasher (12), machine screw (13), loop clamp (14), and hose clamp (9) from air duct hose (10).

7 Loosen hose clamp (15), and remove air duct hose (16) from driver's heater (3).

8 Remove hose clamp (15), hexagon head capscrew (17), lockwasher (18), loop clamp (19), and loop clamp (20) from air duct hose (16).

INSPECTION/REPAIR

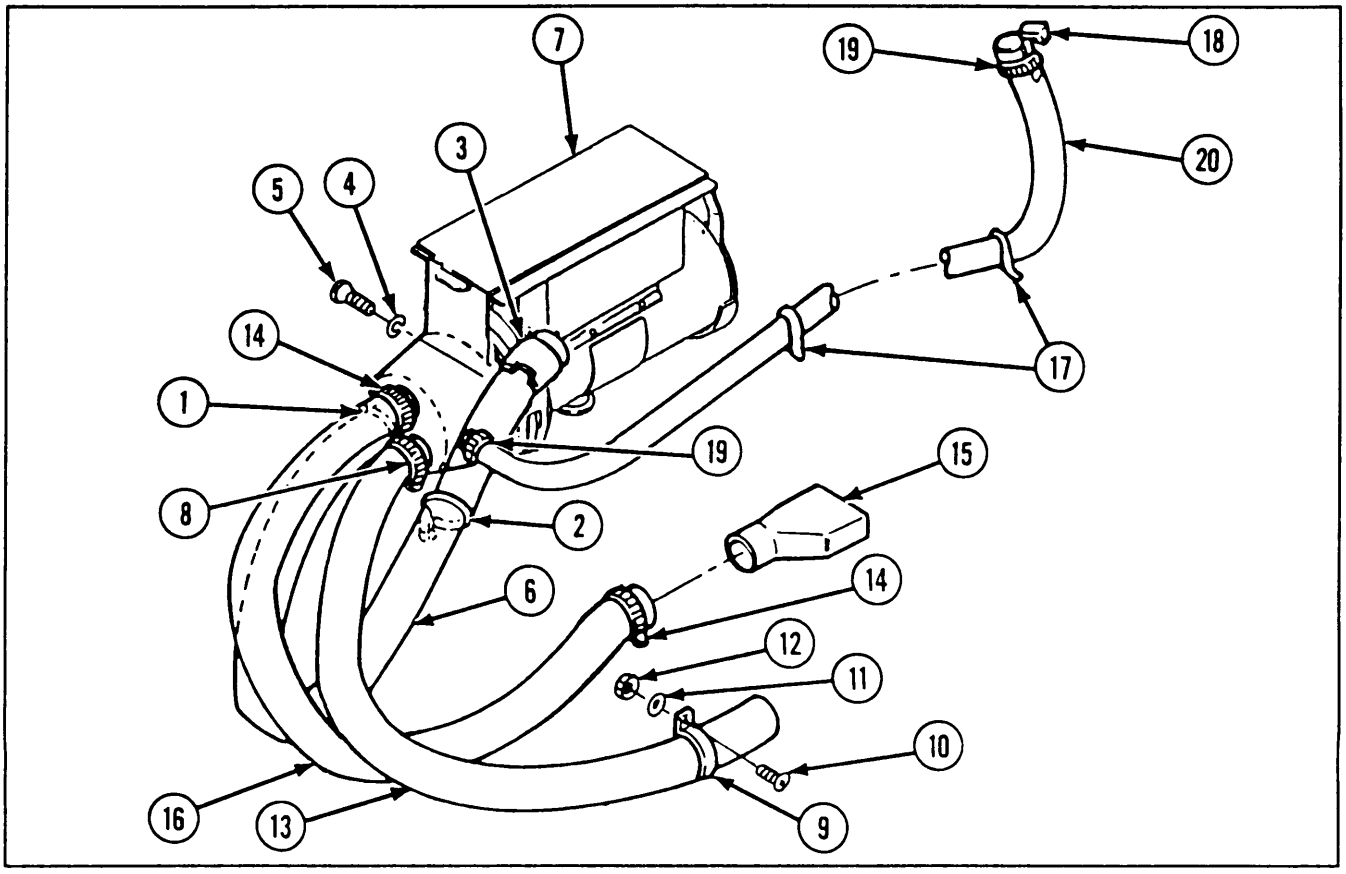
1 Inspect for broken, damaged, or missing parts.

2 Air duct hoses are manufactured items, refer to appendix D.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-178. MAINTENANCE OF HEATER INSTALLATION KIT—DRIVER'S HEATER AIR HOSES (CONT).

INSTALLATION



1 Install hose clamp (1), loop clamp (2), loop clamp (3), new lockwasher (4), and hexagon head capscrew (5) on air duct hose (6).

2 Position air duct hose (6) on driver's heater (7), and secure by tightening hose clamp (1).

3 Install hose clamp (8), loop clamp (9), machine screw (10), new lockwasher (11), and hexagon plain nut (12) on air duct hose (13).

4 Position air duct hose (13) on driver's heater (7), and secure by tightening hose clamp (8).

5 Install two hose clamps (14) and hot air center duct (15) on air duct hose (16),

6 Position air duct hose (16) on driver's heater (9), and secure by tightening two hose clamps (14).

7 Install two marker bands (17), hot air duct spring tension clip (18), and two hose clamps (19) on air duct hose (20).

8 Position air duct hose (20) on driver's heater (7), and secure by tightening two hose clamps (19).

2-179. MAINTENANCE OF HEATER INSTALLATION KIT—AIR INTAKE BLOWER, FUEL FILTER HEATERS, AND CONNECTING HARNESS; AND POWER PLANT COMPARTMENT BRANCHED WIRING HARNESS.

This task covers:
a. Removal
b. Disassembly
c. Inspection/Repair
d. Reassembly
e. Installation

INITIAL SETUP

Tools and Sspecial Tools
Plier wire twister (item 30, appx G)

Materials/parts
Electrical wire (figure D-2, appx D)
Electrical wire (figure D-2 appx D)
Lacing cord (figure D-16 appx D)
Lockwasher (6)
Lockwire (item 23, apx C)
Marker band (6)

References
TM 9-350-238-24P-1

Equipment conditions
2640 Batteries disconnected

General Safety Insructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL

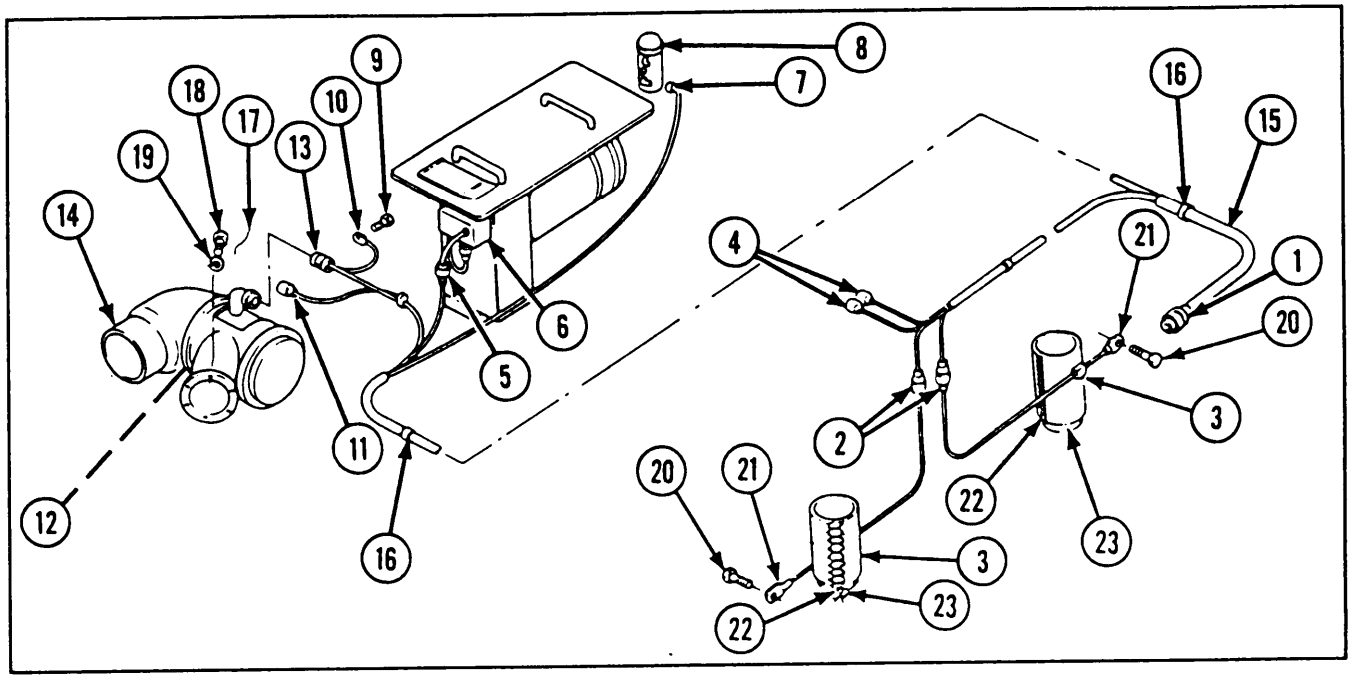
WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harness and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2-179. MAINTENANCE OF HEATER INSTALLATION KIT—AIR INTAKE BLOWER, FUEL FILTER HEATERS, AND CONNECTING HARNESS; AND POWER PLANT COMPARTMENT BRANCHED WIRING HARNESS (CONT).

REMOVAL (CONT)



2 Tag and disconnect plug connector (1) from bulkhead disconnect to circuit breakers and electrical components branched wiring harness at the wall of the driver's compartment.

3 Tag and disconnect two shell connectors (2) from line connections on two fuel filter heaters (3).

4 Tag and disconnect two shell connectors (4) from line connections.

5 Tag and disconnect shell connector (5) from engine coolant heater control box (6).

6 Tag and disconnect shell connector (7) from electrical fuel pump (8).

7 Remove screw (9) and disconnect cable terminal (10) from ground.

8 Tag and disconnect shell connector (11) from line connection on blower assembly electrical solenoid (12).

9 Tag and disconnect plug connector (13) from blower assembly (14), and remove power plant compartment branched wiring harness (15) from hull.

10 If damaged, remove marker bands (16) from power plant compartment branched wiring harness (15).

11 Remove lockwire (17), six screws (18), and six lockwashers (19) from blower assembly (14). Remove blower assembly from hull.

NOTE

Steps 12 and 13 are written for one fuel filter heater but apply to both fuel filter heaters.

12 Remove screw (20) and disconnect ground lead (21) on fuel filter heater (3).

13 If damaged, remove lacing cord (22) and fuel heater filter (3) from fuel filter (23).

DISASSEMBLY

For disassembly of wiring harness plug connectors, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 For repair of cable terminals and shell connectors, refer to general maintenance, page 2-371.

3 Lacing cord is a manufactured item, refer to appendix D.

4 Electrical wires are manufactured items, refer to appendix D.

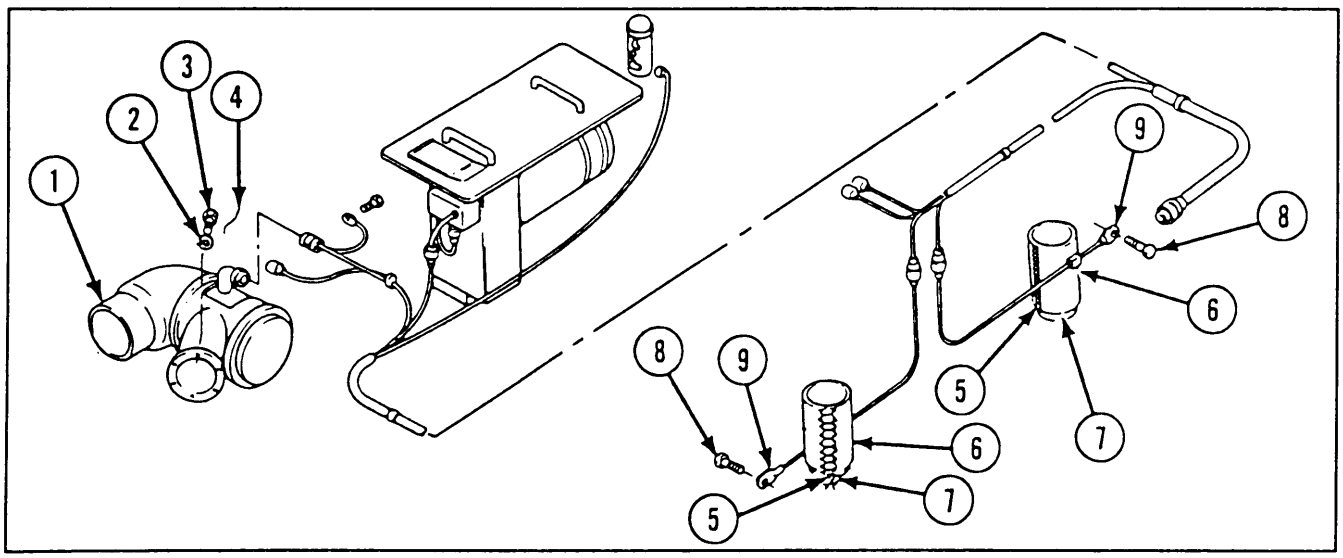
5 Blower assembly is a repairable assembly. Notify direct support maintenance.

6 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

For reassembly of wiring harness plug connectors, refer to general maintenance, page 2-371.

INSTALLATION



1 Position blower assembly (1) in hull, and secure with six new lockwashers (2), six screws (3), and new lockwire (4).

NOTE

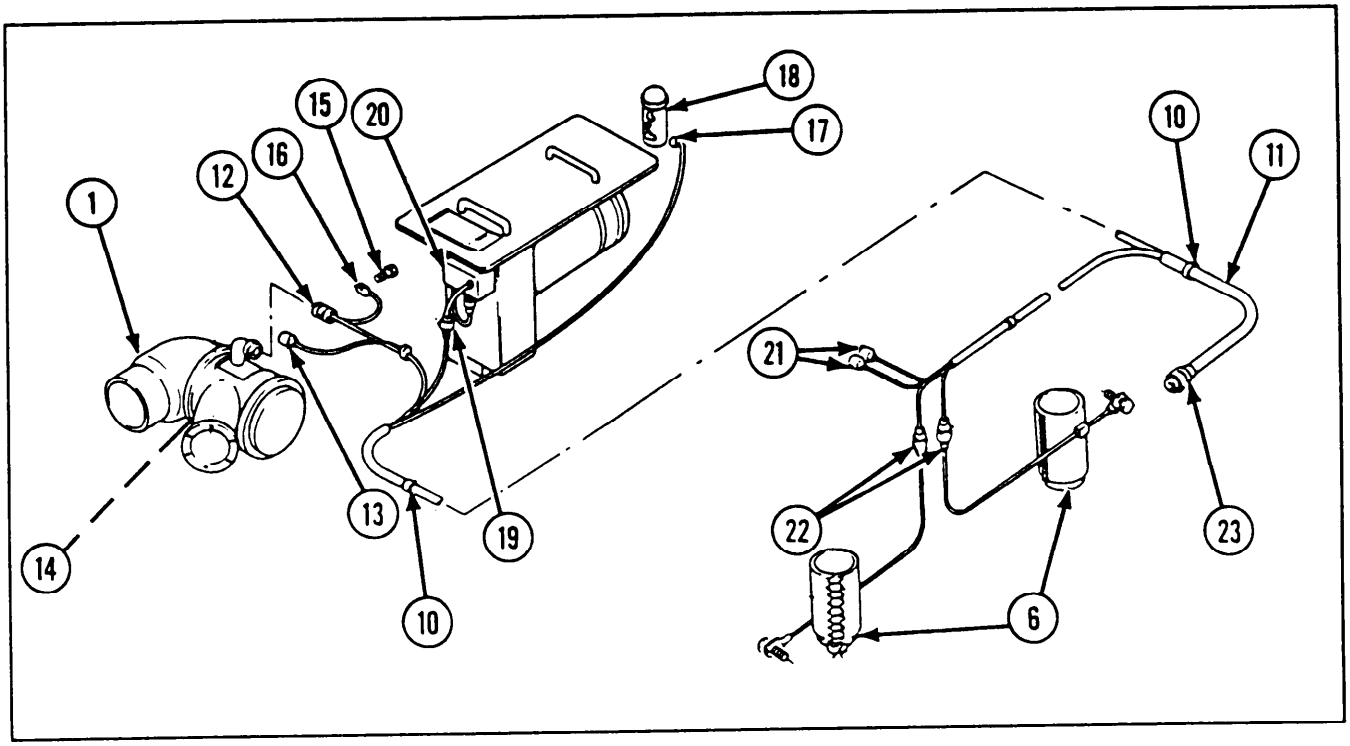
Steps 2 and 3 are written for one fuel filter heater, but apply to both fuel filter heaters.

2 If removed, install new lacing cord (5) in fuel filter heater (6). Install fuel filter heater (6) on fuel filter (7).

3 Install screw (8) to connect ground lead (9) of fuel filter heater (6).

2-179. MAINTENANCE OF HEATER INSTALLATION KIT—AIR INTAKE BLOWER, FUEL FILTER HEATERS, AND CONNECTING HARNESS; AND POWER PLANT COMPARTMENT BRANCHED WIRING HARNESS (CONT).

INSTALLATION (CONT)



4 If removed, install new marker bands (10) on power plant compartment branched wiring harness (11).

5 Install power plant compartment branched wiring harness (11) in hull.

6 Untag and connect plug connector (12) to blower assembly (1).

7 Untag and connect shell connector (13) to line connection on blower assembly electrical solenoid (14).

8 Install screw (15) to connect cable terminal (16) to ground.

9 Untag and connect shell connector (17) to electrical fuel pump (18).

10 Untag and connect shell connector (19) to engine coolant heater control box (20).

11 Untag and connect two shell connectors (21) to line connections.

12 Untag and connect two shell connectors (22) to line connections on two fuel filter heaters (6).

13 Untag and connect plug connector (23) to bulkhead disconnect to circuit breakers and electrical components branched wiring harness at wall of driver's compartment.

14 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure, and all hardware is tight.

2-180. MAINTENANCE OF HEATER INSTALLATION KIT—ELECTRICAL COMPONENTS.

This task covers: a. Removal b. Inspection/Repair c. Installation

INITIAL SETUP

Materials/Parts
- Assembled washer bolt
- Assembled washer screw (2)
- Gasket
- Lockwasher (2)
- Lockwasher (2)
- Lockwasher (18)
- Lockwasher (2)
- Lockwasher (2)

References
- TM 9-2350-238-24P-1

Equipment Conditions
- 2-640 Batteries disconnected

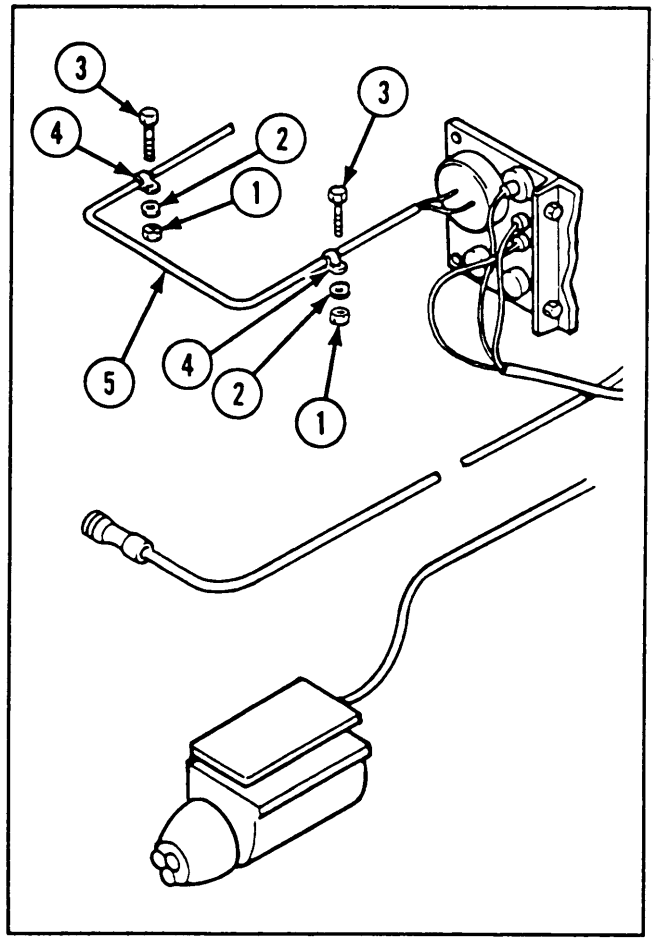
General Safety Insructions

WARNING

Failure to remove or disconnect batteries before connecting or disconnecting any electrical wiring harness or lead may result in injury or damaged equipment.

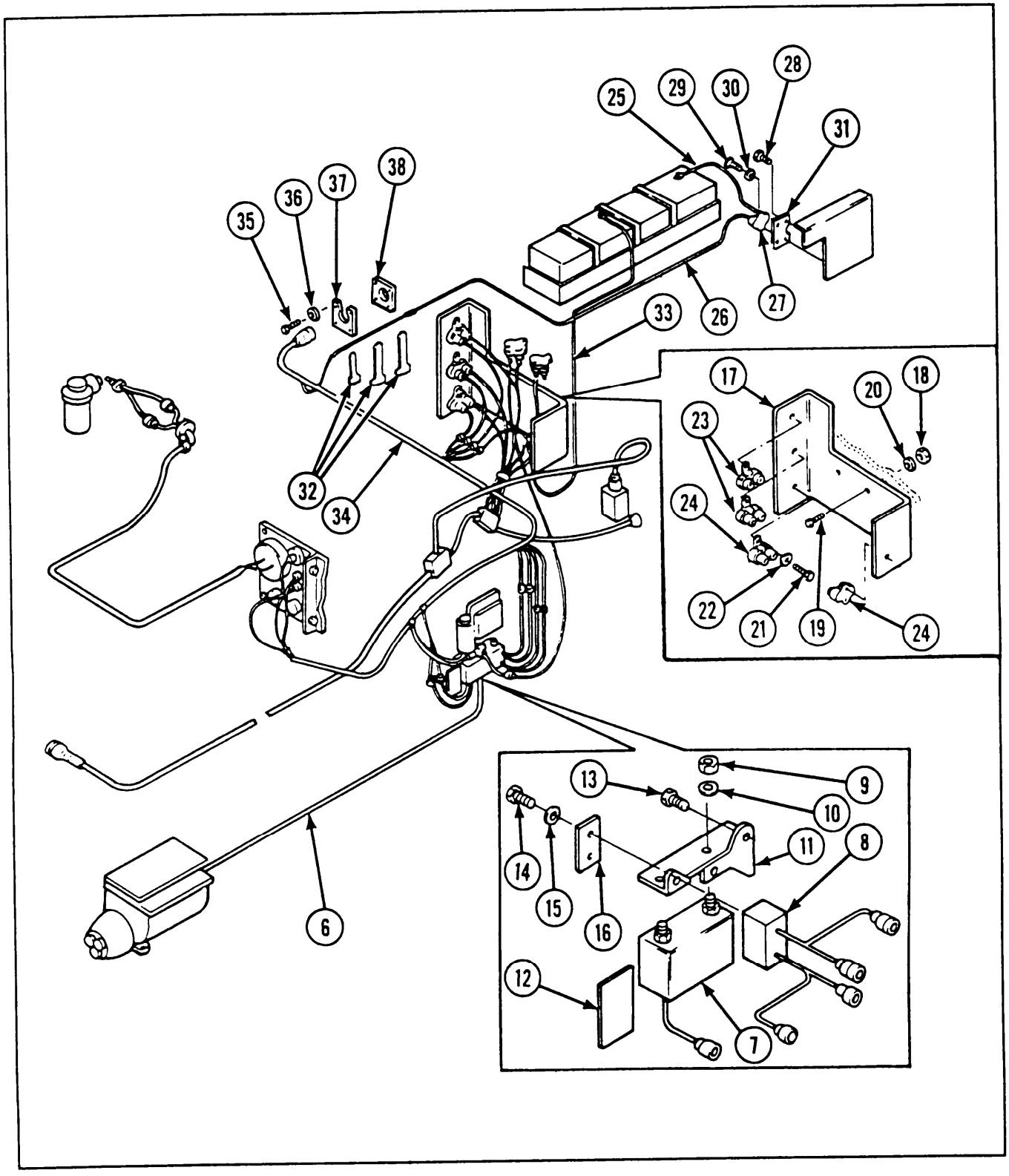
REMOVAL

1 Remove two hexagon plain nuts (1), two lockwashers (2), two socket head capscrews (3), and two loop clamps (4) from pyrometer panel assembly to thermocouple assembly electrical lead (5).



2-180. MAINTENANCE OF HEATER INSTALLATION KIT—ELECTRICAL COMPONENTS (CONT).

REMOVAL (CONT)



WARNING

Failure to remove or disconnect batteries before connecting or disconnecting any electrical wiring harness or lead may result in injury or damaged equipment.

2 Tag and disconnect heater control box to driver's heater wiring harness (6) from driver's heater control box (7).

3 Tag and disconnect all electrical leads from driver's heater electrical control box (7) and fuel filter heater toggle switch (8).

4 Remove two hexagon plain nuts (9), two lockwashers (10), and driver's heater control box (7) from driver's heater control box bracket (11).

5 If damaged, remove instruction plate (12) from wall of driver's compartment.

6 Remove two assembled washer screws (13) and fuel filter heater toggle switch (8) from driver's heater control box bracket (11).

7 If damaged, remove two machine screws (14), two lockwashers (15), and fuel filter heater switch identification plate (16) from fuel filter heater toggle switch (8).

8 Tag and disconnect all electrical leads from circuit breakers on circuit breaker double angle bracket (17).

9 Remove two hexagon plain nuts (18), two hexagon head capscrews (19), two lockwashers (20), and circuit breaker double angle bracket (17).

10 Remove eight machine screws (21), eight lockwashers (22), two circuit breakers (23), and two circuit breakers (24) from circuit breaker double angle bracket (17).

11 Tag and disconnect battery positive terminal to circuit breaker electrical lead (25) and coolant heater circuit breaker to line disconnect cable assembly (26) from coolant heater circuit breaker (27).

12 Remove assembled washer bolt (28), two machine screws (29), two lockwashers (30), coolant heater circuit breaker (27), and circuit breaker bracket (31).

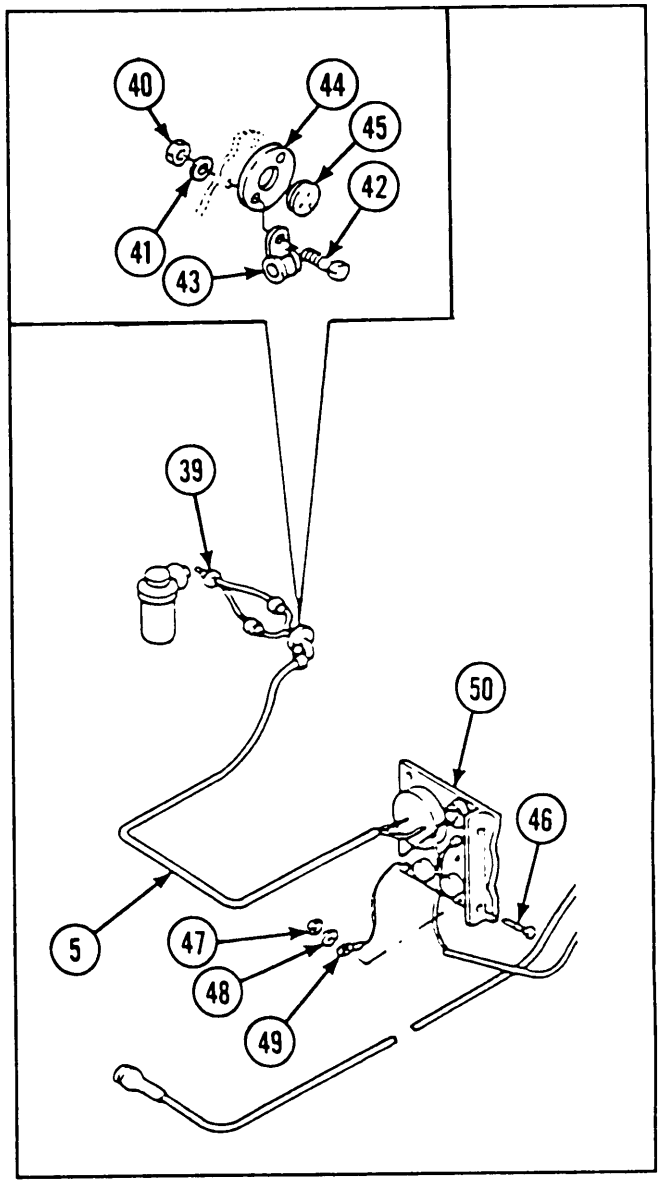
13 Remove three straps (32) from coolant heater circuit breaker to line disconnect cable assembly (26) and electrical lead (33).

14 Tag and disconnect bulkhead disconnect to circuit breakers and electrical components wiring harness (34).

15 Remove four socket head capscrews (35), four lockwashers (36), electrical receptacle retaining plate (37), and gasket (38).

2-180. MAINTENANCE OF HEATER INSTALLATION KIT—ELECTRICAL COMPONENTS (CONT).

REMOVAL (CONT)



16 Tag and disconnect electrical leads from thermocouple assembly (39). Remove thermocouple assembly.

17 Remove two hexagon plain nuts (40), two lockwashers (41), two hexagon head capscrews (42), loop clamp (43), and pyrometer lead retaining plate (44).

18 Remove nonmetallic grommet (45) and pyrometer panel assembly to thermocouple assembly electrical lead (5) from pyrometer lead retaining plate (44).

19 Remove two screws (46), two nuts (47), two lockwashers (48), ground lead (49), and pyrometer panel assembly (50).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Pyrometer panel assembly is a repairable assembly. Refer to page 2-1052.

3 Driver's heater electrical control box is a repairable assembly. Refer to page 2-1036.

4 For repair of electrical leads and wiring harnesses, refer to page 2-371.

5 For repair of shell connectors, refer to general maintenance, page 2-371.

6 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

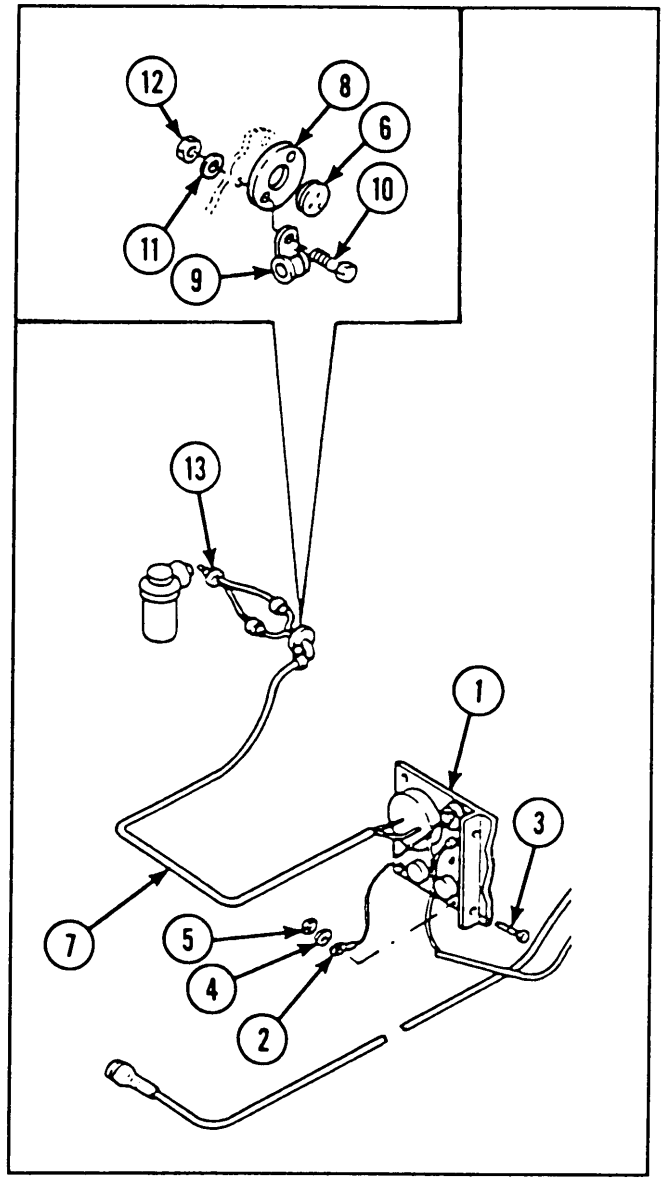
INSTALLATION

1 Install pyrometer panel assembly (1). Secure pyrometer panel assembly and ground lead (2) with two screws (3), two new lockwashers (4), and two nuts (5).

2 Install nonmetallic grommet (6) and pyrometer panel assembly to thermocouple assembly electrical lead (7) in pyrometer lead retaining plate (8).

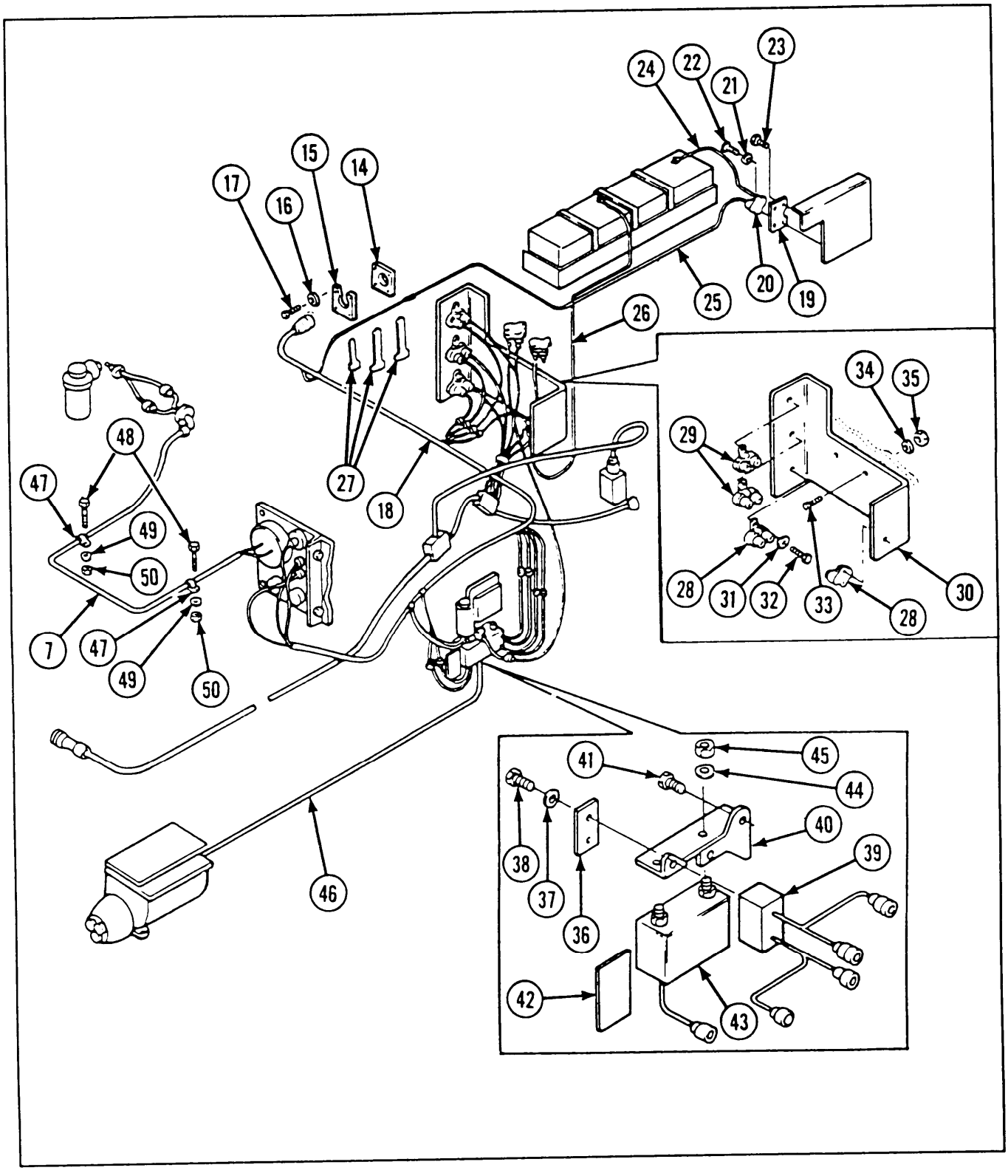
3 Install pyrometer lead retaining plate (8) and loop clamp (9), and secure with two hexagon head capscrews (10), two new lockwashers (11), and two hexagon plain nuts (12).

4 Install thermocouple assembly (13). Untag and connect electrical leads to thermocouple assembly.



2-180. MAINTENANCE OF HEATER INSTALLATION KIT—ELECTRICAL COMPONENTS (CONT).

INSTALLATION (CONT)



5 Install new gasket (14), electrical receptacle retaining plate (15), four new Iockwashers (16), and four socket head capscrews (17).

6 Untag and connect bulkhead disconnect to circuit breakers and electrical components wiring harness (18).

7 Install circuit breaker bracket (19) and coolant heater circuit breaker (20), and secure with two new Iockwashers (21), two machine screws (22), and new assembled washer bolt (23).

8 Untag and connect battery positive terminal to circuit breaker electrical lead (24) and coolant heater circuit breaker to line disconnect cable assembly (25) to coolant heater circuit breaker (20).

9 Secure coolant heater circuit breaker to line disconnect cable assembly (25) and electrical lead (26) with three straps (27).

10 Position two circuit breakers (28) and two circuit breakers (29) on circuit breaker double angle bracket (30), and secure with eight new Iockwashers (31) and eight machine screws (32).

11 Install circuit breaker double angle bracket (30), and secure with two hexagon head capscrews (33), two new Iockwashers (34), and two hexagon plain nuts (35).

12 Untag and connect all applicable electrical leads to circuit breakers on circuit breaker double angle bracket (30).

13 If removed, install new fuel filter heater switch identification plate (36), two new Iockwashers (37), and two machine screws (38) on fuel filter heater toggle switch (39).

14 Position fuel filter heater toggle switch (39) on driver's heater control box bracket (40), and secure with two new assembled washer screws (41).

15 If removed, install new instruction plate (42) on wall of driver's compartment.

16 Position driver's heater control box (43) on drivers heater control box bracket (40), and secure with two new Iockwashers (44) and two hexagon plain nuts (45).

17 Untag and connect all applicable electrical leads to driver's heater electrical control box (43) and fuel filter heater toggle switch (39).

18 Untag and connect heater control box to driver's heater wiring harness (46) to driver's heater electrical control box (43).

19 Install two loop clamps (47), two socket head capscrews (48), two new Iockwashers (49), and two hexagon plain nuts (50) on pyrometer panel assembly to thermocouple assembly electrical lead (7).

2-181. MAINTENANCE OF HEATER INSTALLATION KIT—AIR INTAKE COVERS, PLATES, AND RELATED ITEMS.

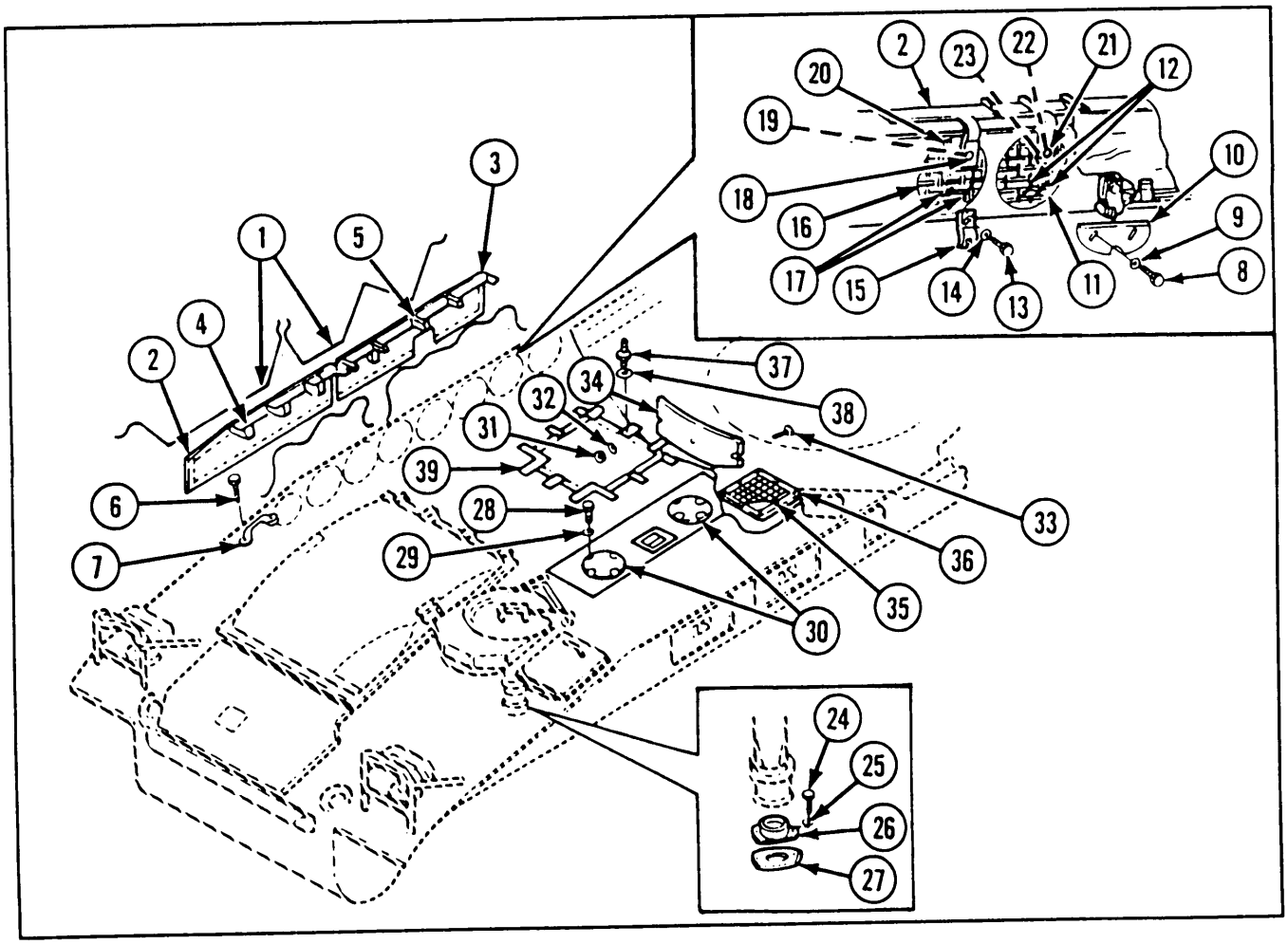
This task covers:	a. Removal	b. Inspection/Repair	c. Installation

INITIAL SETUP

Materials/Parts
Generator air intake gasket
Lockwasher (2)
Lockwasher (8)
Nylon cord (figure D-9, appx D)
Self-locking nut (3)

References
TM 9-2350-238-24P-1

REMOVAL



1 Remove nylon cord (1) from exhaust port cover (2) and exhaust cover assembly (3).

2 Unfasten three clasps (4) and fasten exhaust port cover (2) in rolled-up position.

3 Unfasten four clasps (5) and fasten exhaust cover assembly (3) in rolled-up position.

4 Remove two machine screws (6) and strap fastener loop (7) from vehicle.

5 Remove two hexagon head capscrews (8), two flat washers (9), and heater exhaust outlet cover plate (10). Reach through screen (11) and remove two heater exhaust outlet plate access covers (12).

6 Remove seven hexagon head capscrews (13), seven flat washers (14), and seven hull exhaust port cover brackets (15). Reach through screen (16) and remove seven port cover retaining bracket access covers (17).

7 Remove four hexagon head capscrews (18), four flat washers (19), and exhaust cover assembly (2). Reach through screen and remove four port cover retaining bracket plates (20).

8 Remove three hexagon head capscrews (21), three flat washers (22), and exhaust port cover (3). Reach through screen and remove three port cover retaining bracket plates (23).

9 Remove two machine screws (24), two lockwashers (25), generator air intake (26), and generator air intake gasket (27) from inside of hull.

10 Remove eight hexagon head capscrews (28), eight lockwashers (29), and two battery compartment air intake port access covers (30).

11 Remove three self-locking nuts (31), three flat washers (32), three machine bolts (33), and air intake cover (34) from side of hull.

NOTE
Retain existing screws securing mechanical guard.

12 Remove eight screws (35) and mechanical guard (36).

13 Remove 12 snap fastener studs (37), 36 flat washers (38), and air intake grille radiator fabric cover (39) from vehicle.

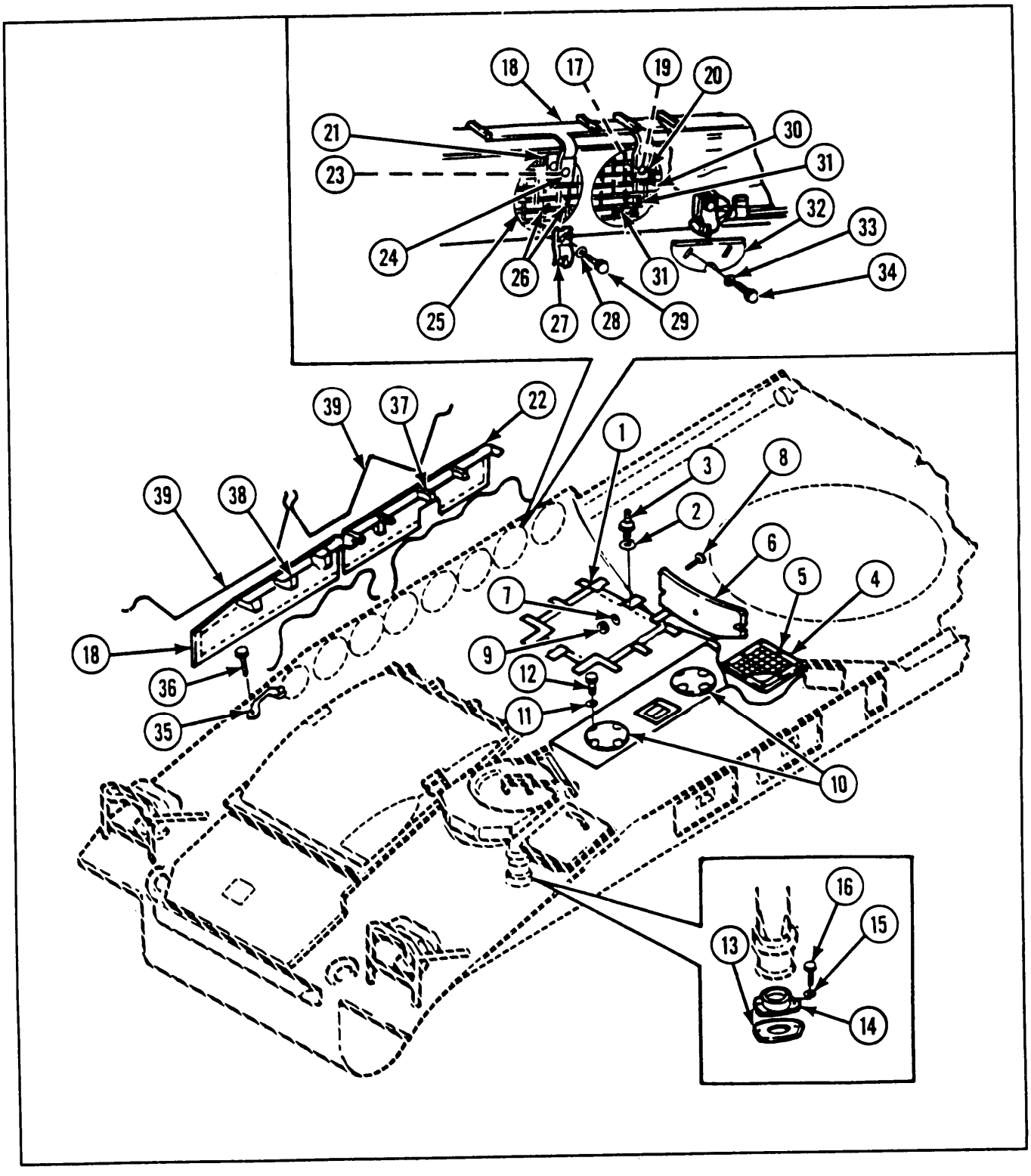
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-181. MAINTENANCE OF HEATER INSTALLATION KIT—AIR INTAKE COVERS, PLATES, AND RELATED ITEMS (CONT).

INSTALLATION



1 Install air intake grille radiator fabric cover (1) on vehicle, and secure with 36 flat washers (2) and 12 snap fastener studs (3).

NOTE

Use screws retained during removal to secure mechanical guard to hull.

2 Install mechanical guard (4) to hull, and secure with eight screws (5).

3 Install air intake cover (6) to side of hull, and secure with three flat washers (7), three machine bolts (8), and three new self-locking nuts (9).

4 Install two battery compartment air intake port access covers (10), and secure with eight new lockwashers (11) and eight hexagon head capscrews (12).

5 Install new generator air intake gasket (13) to generator air intake (14). Install generator air intake, and secure with two new lockwashers (15) and two machine screws (16).

6 Reach through screen and install three port cover retaining bracket plates (17). Secure three port cover retaining bracket plates to exhaust port cover (18) with three flat washers (19) and three hexagon head capscrews (20).

7 Reach through screen and install four port cover retaining bracket plates (21). Secure four port cover retaining bracket plates to exhaust cover assembly (22), using four flat washers (23) and four hexagon head capscrews (24).

8 Reach through screen (25) and install seven port cover retaining bracket access covers (26). Install seven hull exhaust port cover brackets (27), and secure with seven flat washers (28) and seven hexagon head capscrews (29).

9 Reach through screen (30) and install two heater exhaust outlet plate access covers (31), Install two heater exhaust outlet cover plates (32), and secure with two flat washers (33) and two hexagon head capscrews (34).

10 Install strap fastener loop (35), and secure with two machine screws (36).

11 Pull exhaust cover assembly (22) down and fasten four clasps (37).

12 Pull exhaust port cover (18) down and fasten three clamps (38).

13 Secure exhaust port cover (18) and exhaust cover assembly (22) with nylon cord (39).

2-182. MAINTENANCE OF HEATER INSTALLATION KIT—ELECTRICAL WIRING.

This task covers:

a. Removal of Battery Positive Terminal to Circuit Breaker Electrical Leads
b. Removal of Coolant Heater Circuit Breaker to Line Disconnect Special Cable Assembly
c. Removal of Bulkhead Disconnect circuit Breakers and Electrical Components Branched Wiring harness
d. Removal of Bulkhead Dsconnects to Master Relay and Circuit Breaker Special Cable Assembly
e. Removal of Heater Control Box to Driver's Heater Wiring Harness
f. Disassembly
g. Inspection/Repair
h. Reassembly
i. Installatiion of Heater Control Box to Driver's heater Wiring Harness
j. Installation of Bulkhead dsconnects to Master Relay and Cicuit Breaker Special Cable Assembly
k. Installation of Bulkhead Disconnect to Circuit Breakers and and Electrical components Branched Wiring harness.
l. Installation of Coolant Heater Circuit Breaker to Line Disconnect Special Cable Assembly
m. Installation of Battery Positive Terminal to circuit Breaker Elecriical Leads

INITIAL SETUP

Materials/Parts
Gasket (2)
Electrical wire (figure D-2, appx D)
Lockwasher (4)
Lockwasher

References
TM 9-2350-238-24P-1

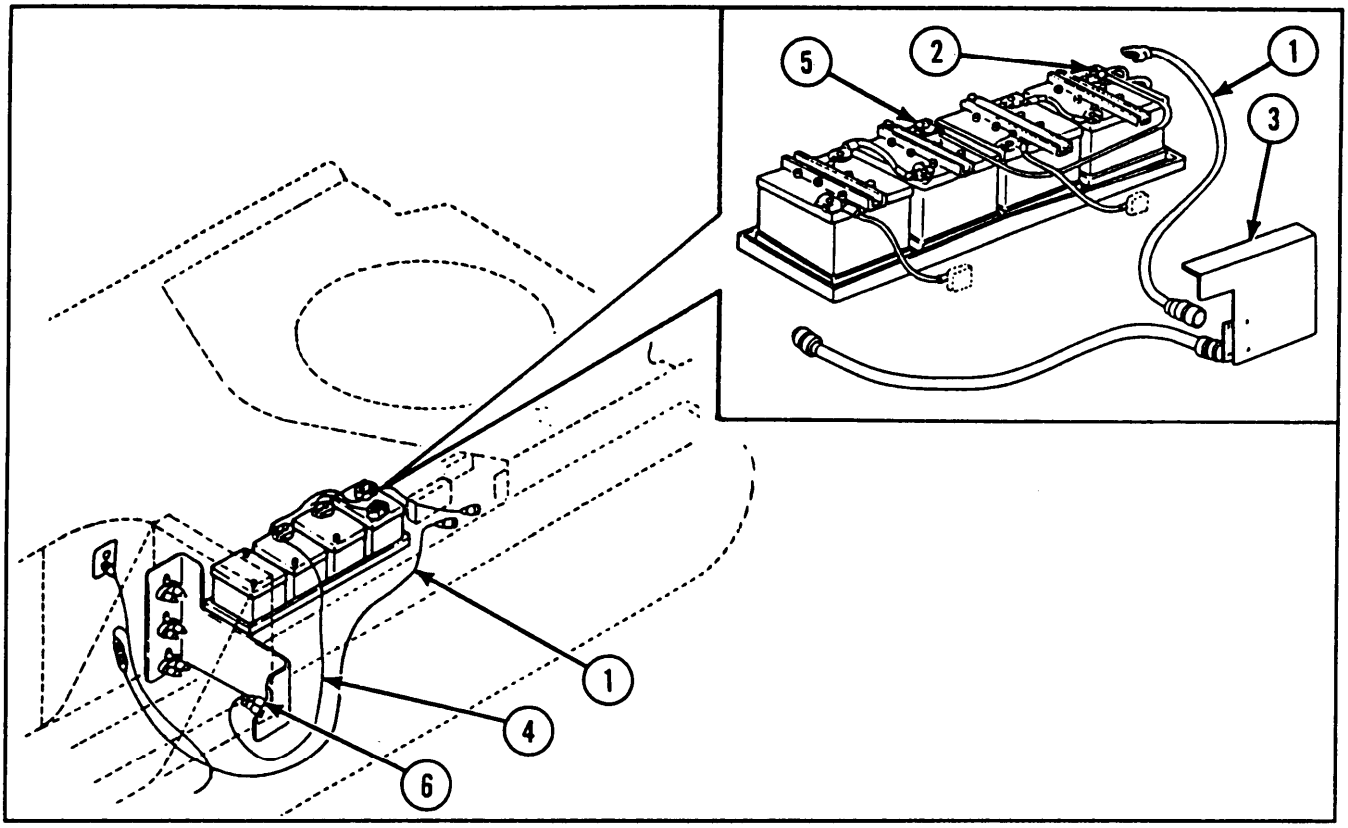
Equipment Conditions
2-640 Batteries disconnected

General Safety Instructionst

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical lead or wiring harness may result in injury or damage to equipment.

REMOVAL OF BATTERY POSITIVE TERMINAL TO CIRCUIT BREAKER ELECTRICAL LEADS



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical lead or wiring harness may result in injury or damage to equipment.

NOTE

Tag all electrical leads during removal to aid in installation.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the harness or lead being removed.

2 Tag and disconnect battery positive terminal to circuit breaker electrical lead (1) from battery positive terminal (2).

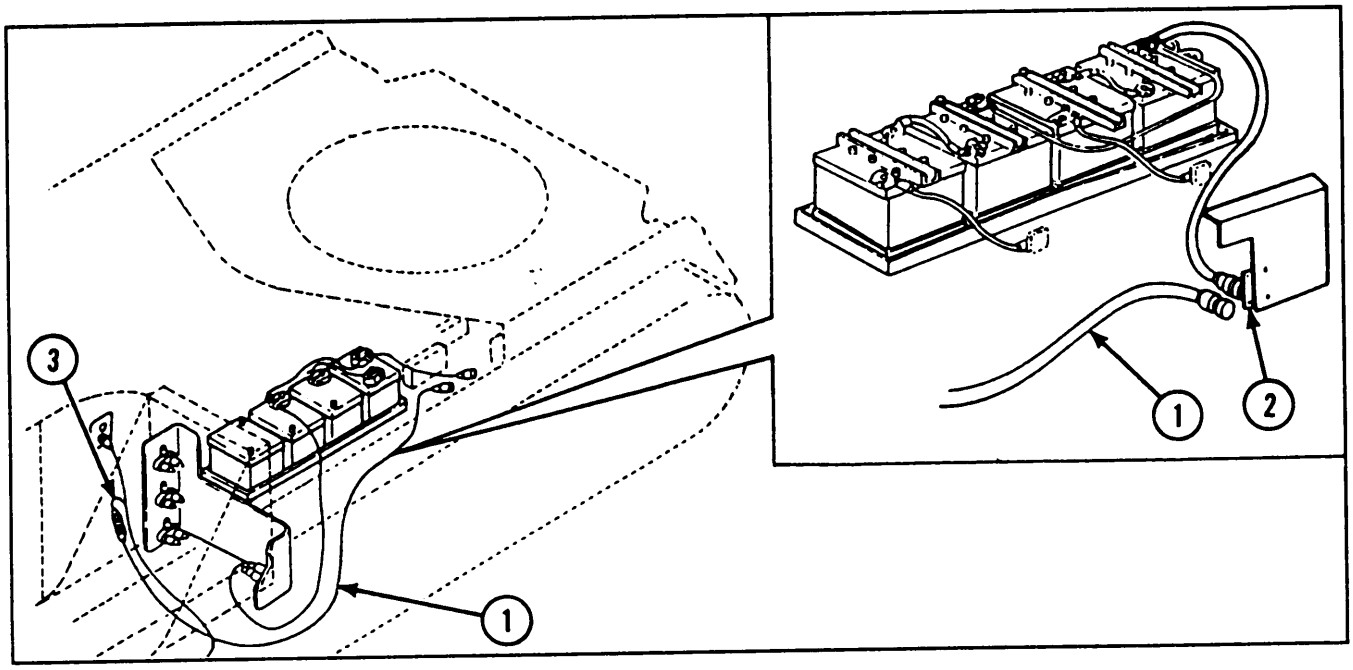
3 Remove battery positive terminal to circuit breaker electrical lead (1) from coolant heater circuit breaker (3).

4 Tag and disconnect battery positive terminal to circuit breaker electrical lead (4) from battery positive terminal (5).

5 Remove battery positive terminal to circuit breaker electrical lead (4) from circuit breaker (6).

2-182. MAINTENANCE OF HEATER INSTALLATION KIT—ELECTRICAL WIRING (CONT).

REMOVAL OF COOLANT HEATER CIRCUIT BREAKER TO LINE DISCONNECT SPECIAL CABLE ASSEMBLY



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical lead or wiring harness may result in injury or damage to equipment.

NOTE

Tag all electrical leads during removal to aid in installation.

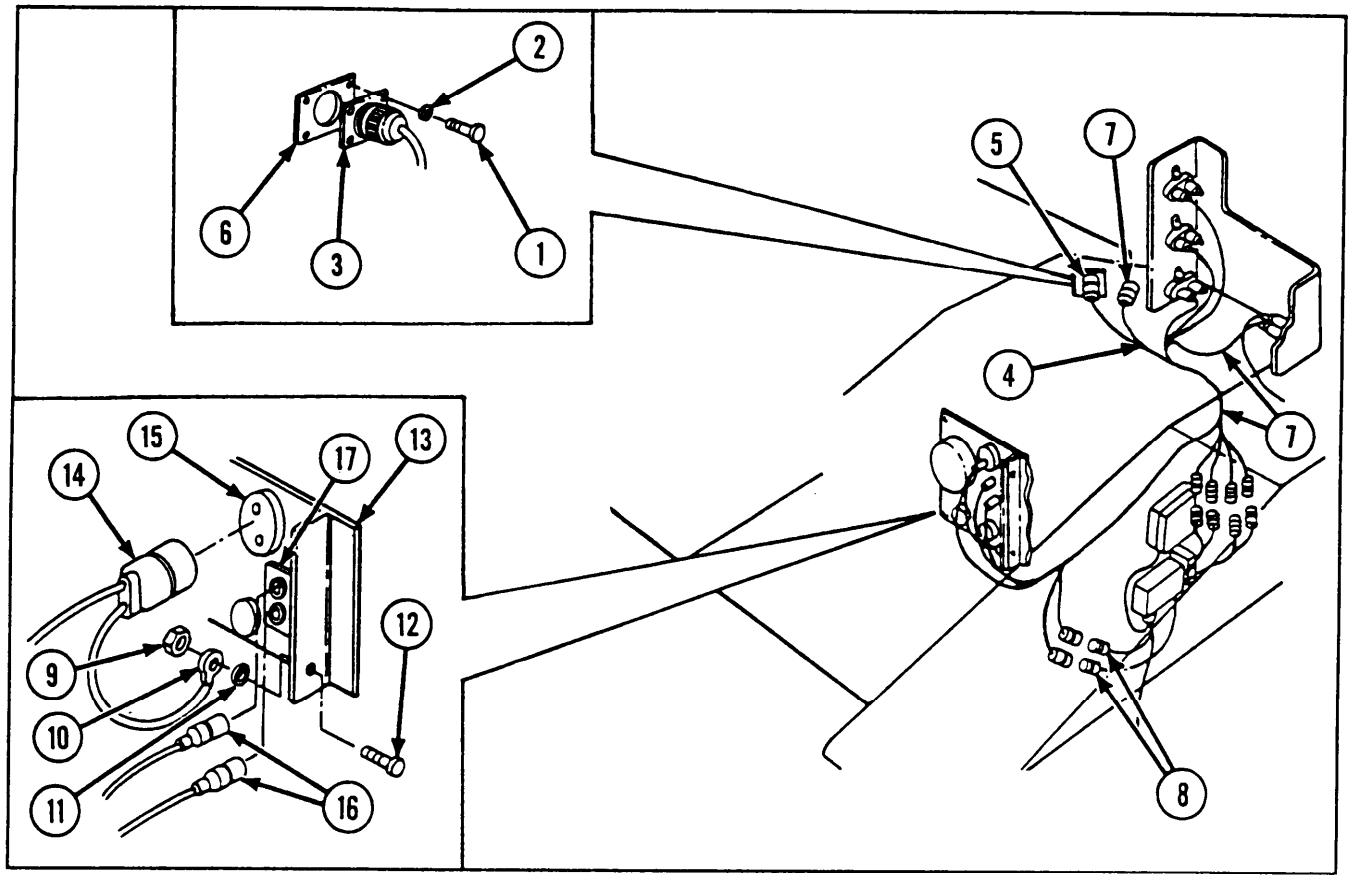
1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the harness or lead being removed.

2 Tag and disconnect coolant heater circuit breaker to line disconnect special cable assembly (1) from coolant heater circuit breaker (2) and bulkhead disconnect to circuit breakers and electrical components branched wiring harness (3).

REMOVAL OF BULKHEAD DISCONNECT TO CIRCUIT BREAKERS AND ELECTRICAL COMPONENTS BRANCHED WIRING HARNESS

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical lead or wiring harness may result in injury or damage to equipment.



NOTE
Tag all electrical leads during removal to aid in installation.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the harness or lead being removed.

2 Remove four screws (1), four lockwashers (2), and receptacle connector (3). Tag and disconnect bulkhead disconnect to circuit breakers and electrical components branched wiring harness (4) from bulkhead receptacle assembly (5), and remove gasket (6).

3 Tag and disconnect nine shell connectors (7) from line connections.

4 Tag and disconnect bulkhead disconnect to circuit breakers and electrical components branched wiring harness (4) from driver's heater electrical control box shell connectors (8).

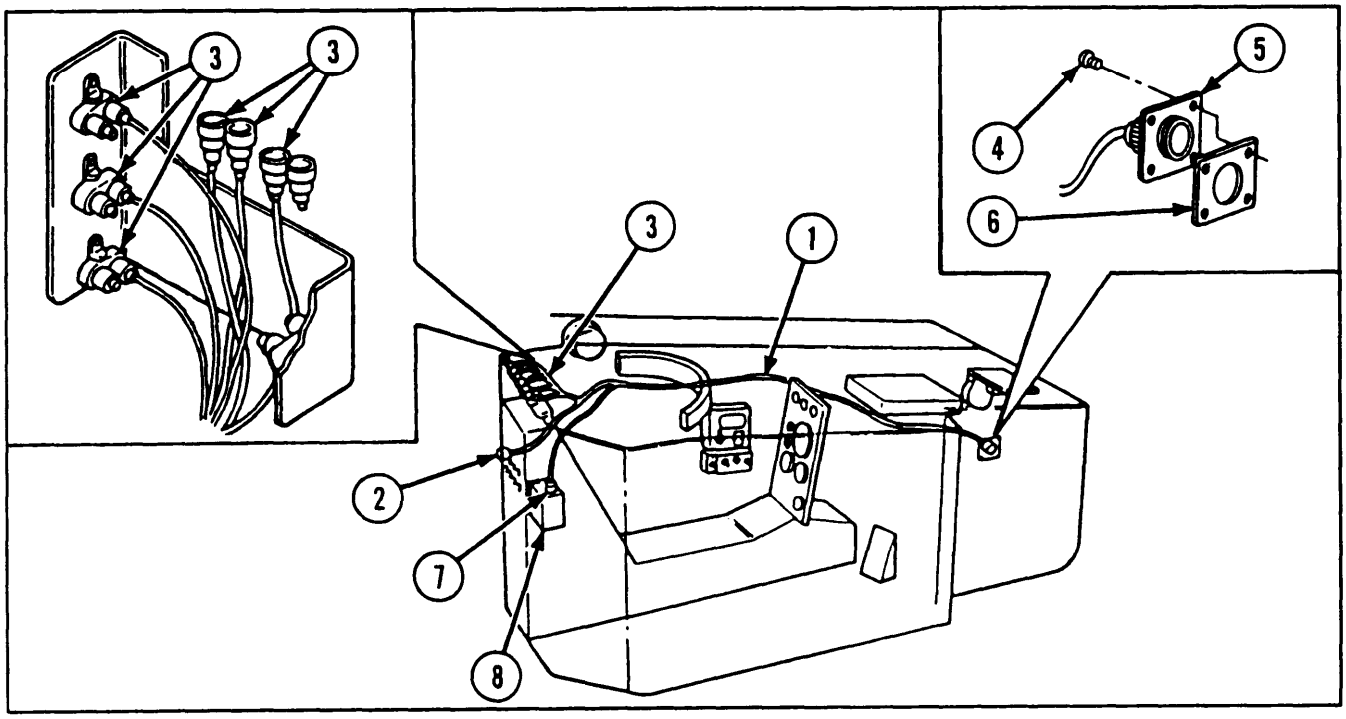
5 Remove hexagon plain nut (9), cable terminal (10), lockwasher (11), and screw (12) from pyrometer panel assembly (13).

6 Tag and disconnect plug connector (14) from pyrometer panel indicator light (15).

7 Tag and disconnect two shell connectors (16) from pyrometer panel toggle switch (17).

2-182. MAINTENANCE OF HEATER INSTALLATION KIT—ELECTRICAL WIRING (CONT).

REMOVAL OF BULKHEAD DISCONNECTS TO MASTER RELAY AND CIRCUIT BREAKER SPECIAL CABLE ASSEMBLY



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical lead or wiring harness may result in injury or damage to equipment.

NOTE

Tag all electrical leads during removal to aid in installation.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the harness or lead being removed.

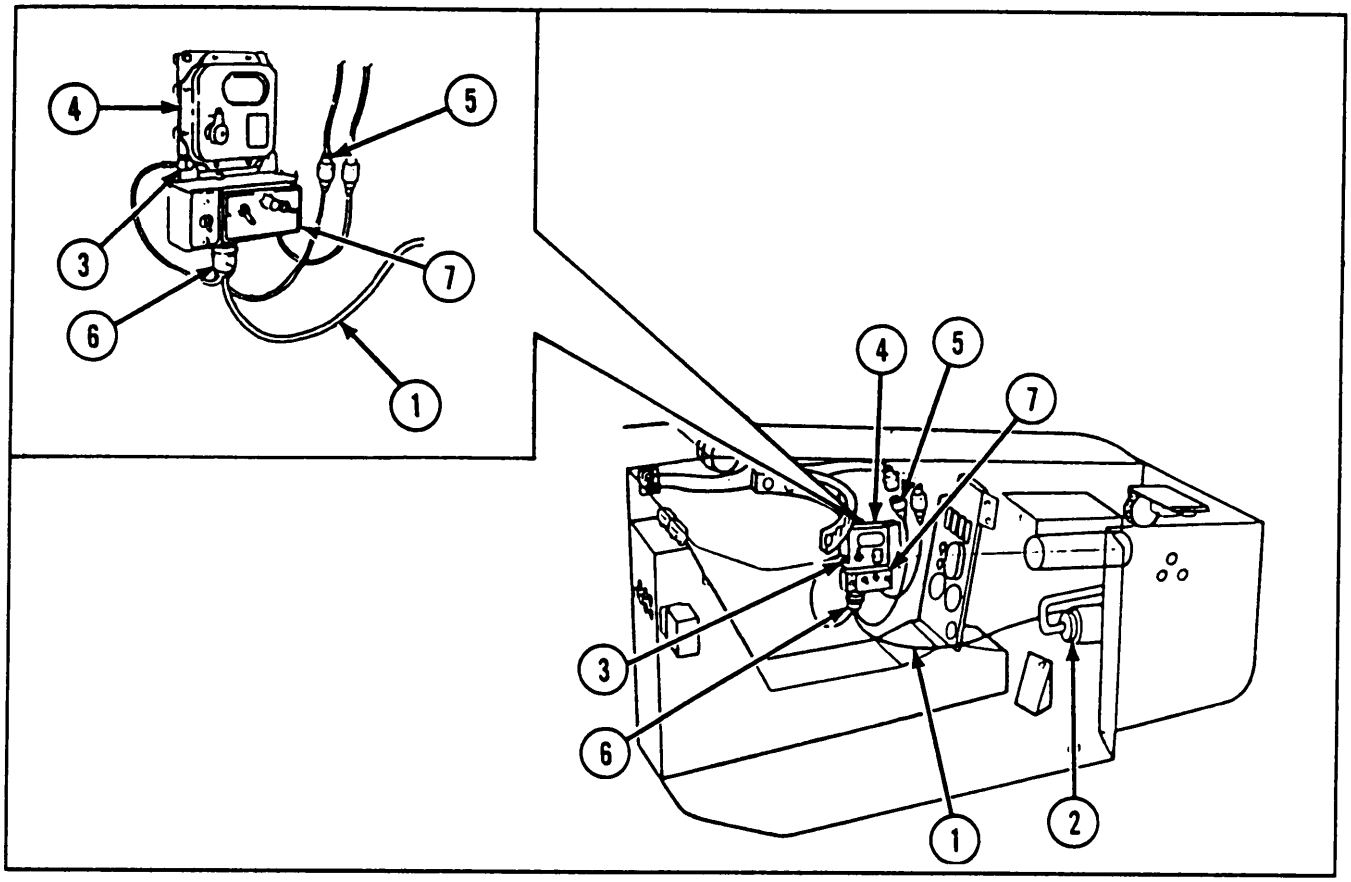
2 Tag and disconnect bulkhead disconnects to master relay and circuit breaker special cable assembly (1) plug connector from vehicle bus receptacle connector (2).

3 Tag and disconnect six shell connectors (3) from line connections.

4 Remove four screws (4) and receptacle connector (5) from bulkhead disconnect. Tag and disconnect bulkhead disconnects to master relay and circuit breaker special cable assembly (8). from bulkhead disconnect and remove gasket (6).

5 Tag and disconnect plug connector (7) from master relay assembly (8).

REMOVAL OF HEATER CONTROL BOX TO DRIVER'S HEATER WIRING HARNESS



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical lead or wiring harness may result in injury or damage to equipment.

NOTE

Tag all electrical leads during removal to aid in installation.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the harness or lead being removed.

2 Tag and disconnect heater control box to driver's heater wiring harness (1) plug connector from vehicular heater (2).

3 Tag and disconnect cable terminal (3) from dome light assembly (4).

4 Tag and disconnect shell connector (5) from line connection.

5 Tag and disconnect plug connector (6) from driver’s heater electrical control box (7).

2-182. MAINTENANCE OF HEATER INSTALLATION KIT—ELECTRICAL WIRING (CONT).

DISASSEMBLY

For disassembly of plug connectors and receptacle connectors, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors and cable terminals, refer to general maintenance, page 2-371.

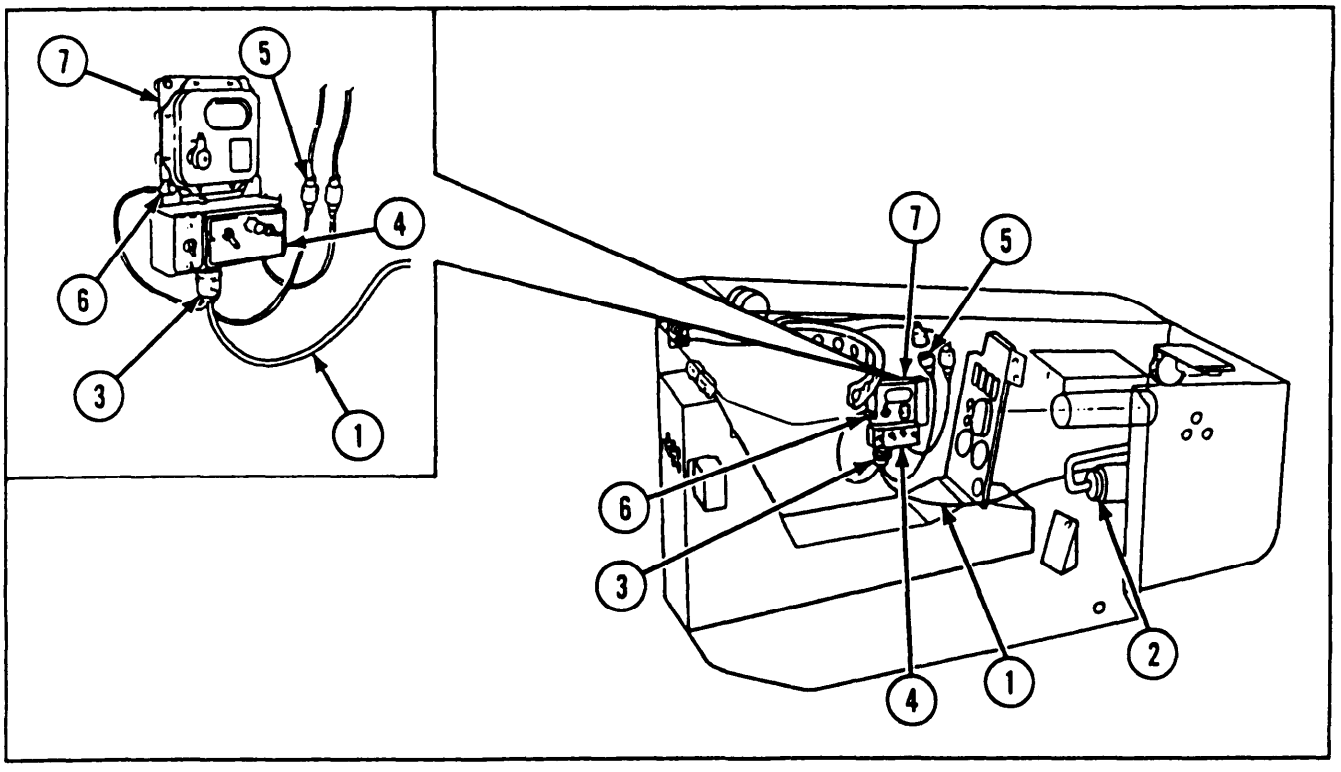
4 Electrical wire is a manufactured item, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

REASSEMBLY

For reassembly of plug connectors and receptacle connectors, refer to general maintenance, page 2-371.

INSTALLATION OF HEATER CONTROL BOX TO DRIVER'S HEATER WIRING HARNESS



1 Untag and connect heater control box to driver's heater wiring harness (1) plug connector to vehicular heater (2).

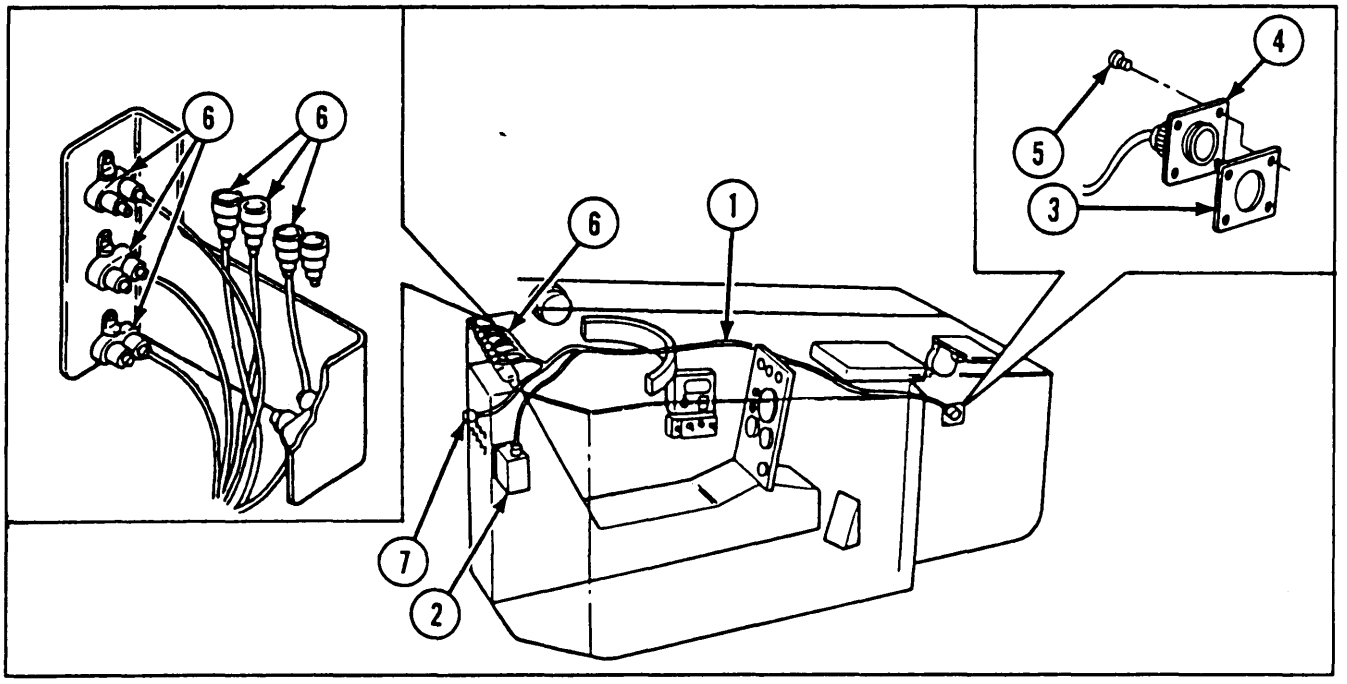
2 Untag and connect plug connector (3) to driver's heater electrical control box (4).

3 Untag and connect shell connector (5) to line connection.

4 Untag and connect cable terminal (6) to dome light assembly (7).

5 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

INSTALLATION OF BULKHEAD DISCONNECTS TO MASTER RELAY AND CIRCUIT BREAKER SPECIAL CABLE ASSEMBLY



1 Untag and connect bulkhead disconnects to master relay and circuit breaker special cable assembly (1) plug connector to master relay assembly (2).

2 Install new gasket (3) and connect bulkhead disconnects to master relay and circuit breaker special cable assembly (1) to bulkhead disconnect. Secure receptacle connector (4) with four screws (5).

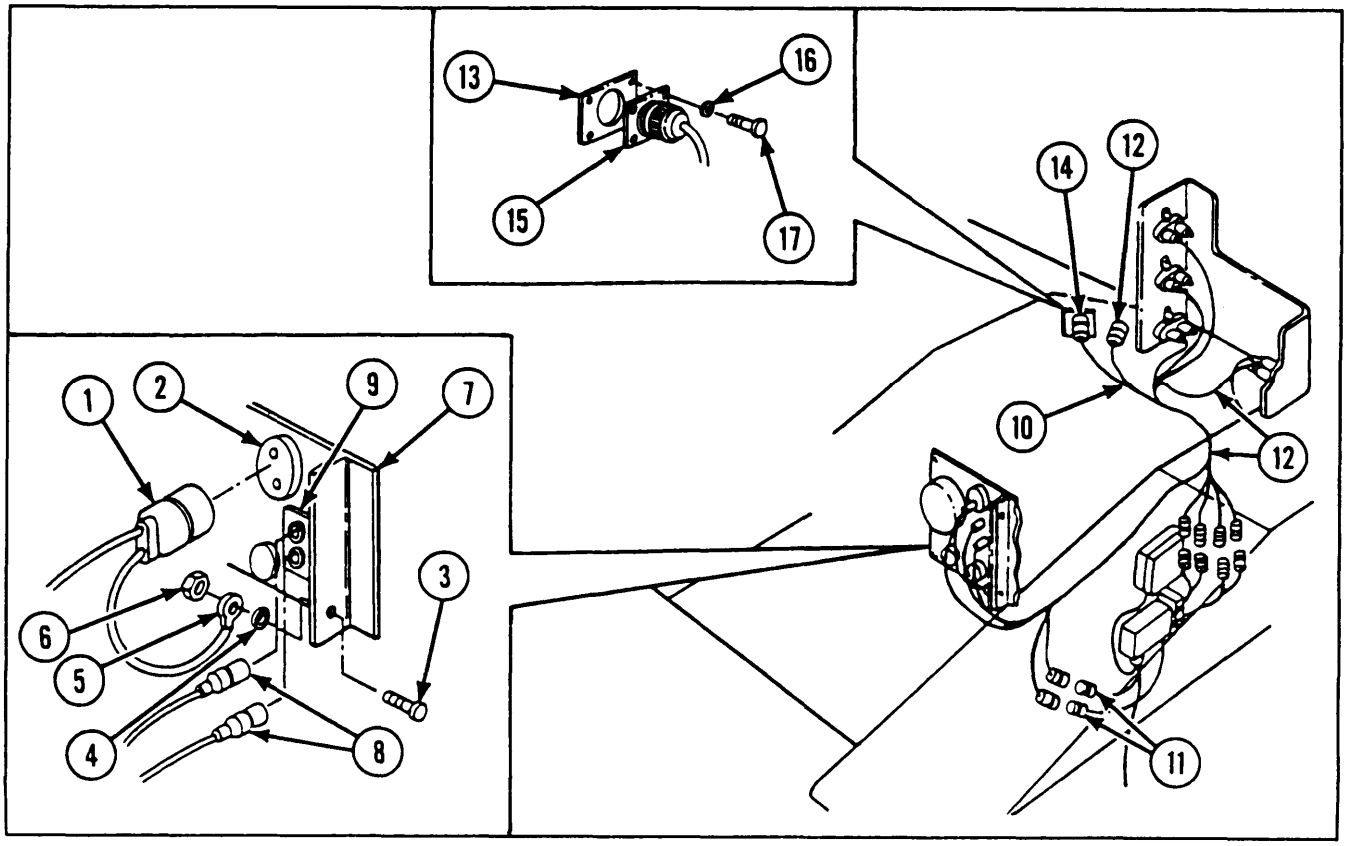
3 Untag and connect six shell connectors (6) to line connections.

4 Untag and connect plug connector (7) to vehicle bus receptacle connector.

5 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-182. MAINTENANCE OF HEATER INSTALLATION KIT—ELECTRICAL WIRING (CONT).

INSTALLATION OF BULKHEAD DISCONNECT TO CIRCUIT BREAKERS AND ELECTRICAL COMPONENTS BRANCHED WIRING HARNESS



1 Untag and connect plug connector (1) to pyrometer panel indicator light (2).

2 Install screw (3), new lockwasher (4), cable terminal (5), and hexagon plain nut (6) on pyrometer panel assembly (7).

3 Untag and connect two shell connectors (8) to pyrometer panel toggle switch (9).

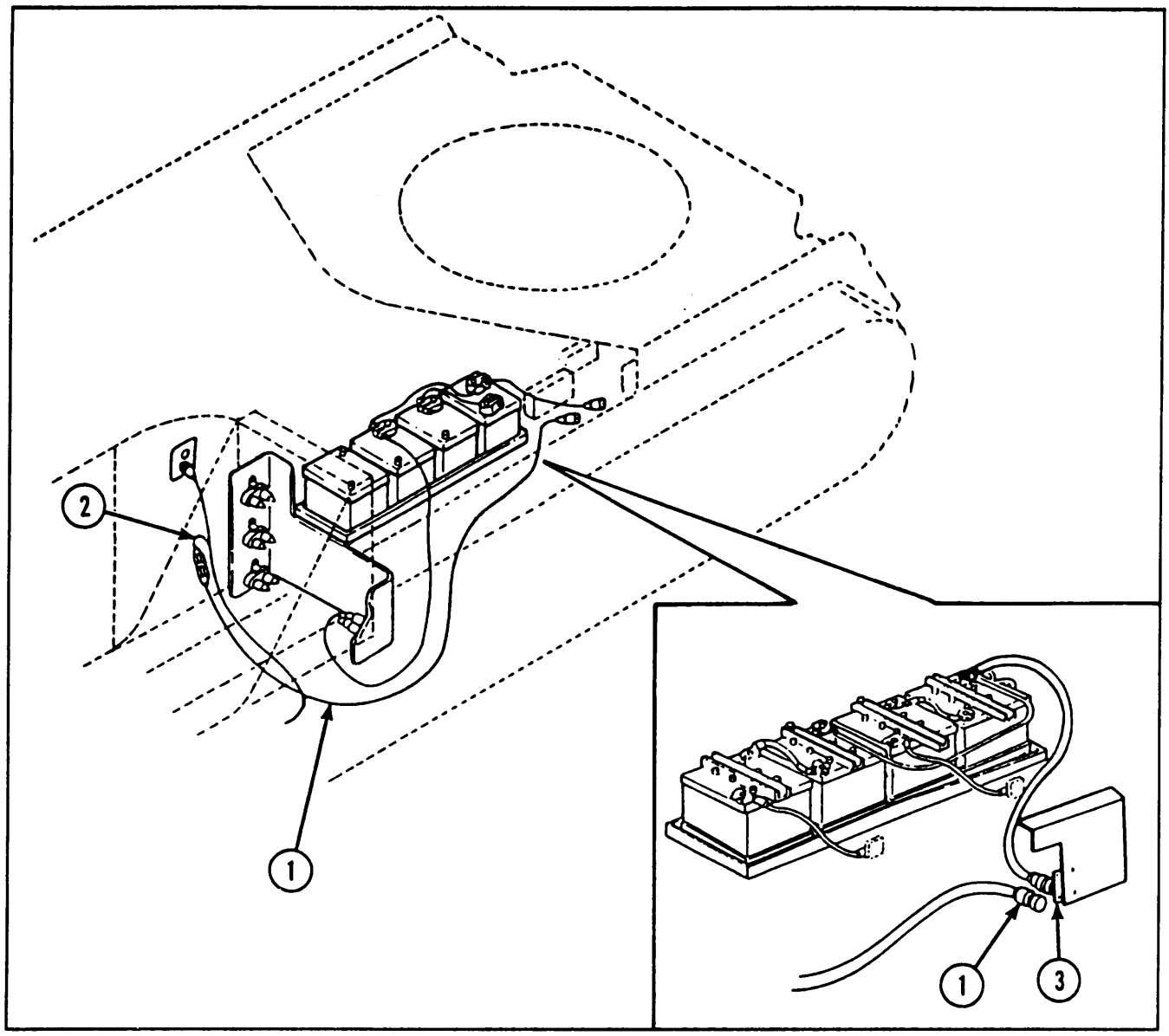
4 Untag and connect bulkhead disconnect to circuit breakers and electrical components branched wiring harness (10) to driver's heater electrical control box shell connectors (11).

5 Untag and connect nine shell connectors (12) to line connections.

6 Install new gasket (13). Untag and connect bulkhead disconnect to circuit breakers and electrical components branched wiring harness (10) to bulkhead receptacle assembly (14). Secure receptacle connector (15) with four new lockwashers (16) and four screws (17).

7 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

INSTALLATION OF COOLANT HEATER CIRCUIT BREAKER TO LINE DISCONNECT SPECIAL CABLE ASSEMBLY

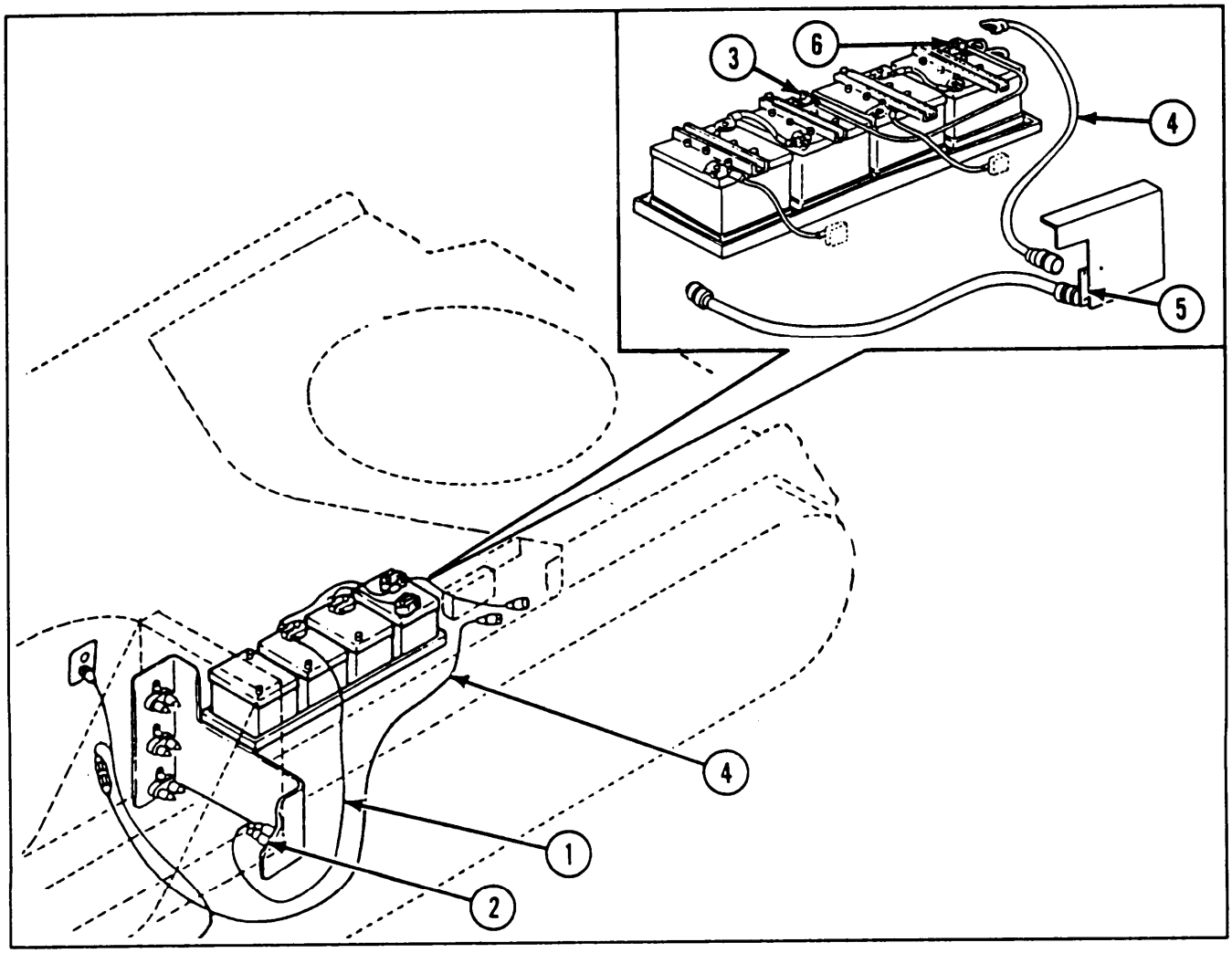


1 Untag and connect coolant heater circuit breaker to line disconnect special cable assembly (1) to bulkhead disconnect to circuit breakers and electrical components branched wiring harness (2) and coolant heater circuit breaker (3).

2 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-182. MAINTENANCE OF HEATER INSTALLATION KIT—ELECTRICALWIRING (CONT).

INSTALLATION OF BATTERY POSITIVE TERMINAL TO CIRCUIT BREAKER ELECTRICAL LEADS



1 Install battery positive terminal to circuit breaker electrical lead (1) to circuit breaker (2).

2 Untag and connect battery positive terminal to circuit breaker electrical lead (1) to battery positive terminal (3).

3 Install battery positive terminal to circuit breaker electrical lead (4) to coolant heater circuit breaker (5).

4 Untag and connect battery positive terminal to circuit breaker electrical lead (4) to battery positive terminal (6).

5 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-183. MAINTENANCE OF FILTER MOUNTING FLUID FILTER (HEATER INSTALLATION KIT).

This task covers:	a. Disassembly	b. Inspection/Repair	c. Reassembly

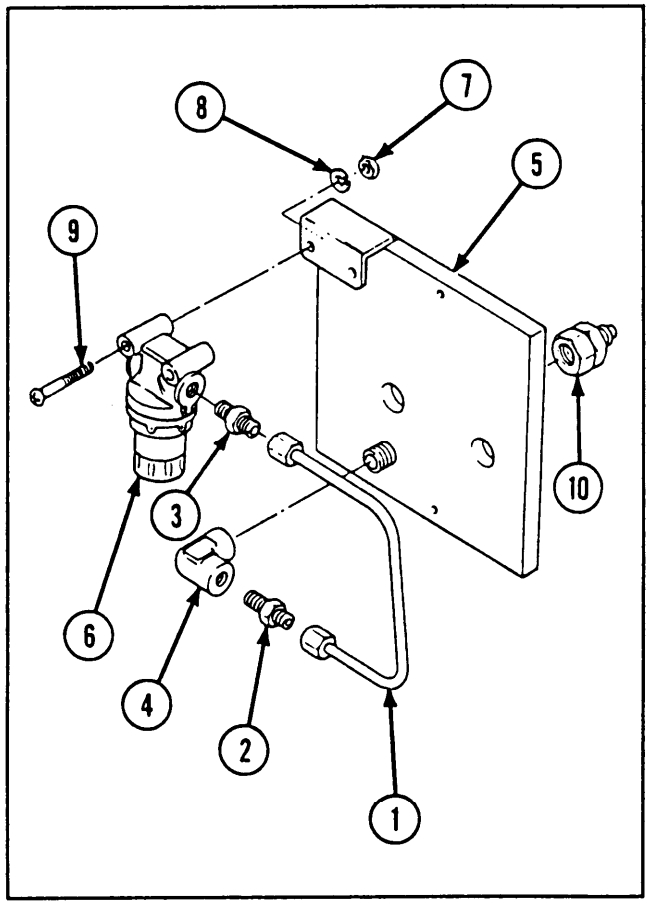
INITIAL SETUP

Materials/Parts
- Lockwasher (2)
- Self-locking nut (2)

References
- TM9-2350-238-24P1

Equipment conditions
- 2-116 Filter mounting fluid filter removed

DISASSEMBLY



1 Remove metal tube assembly (1) from pipe straight adapter (2) and pipe straight adapter (3).

2 Remove pipe straight adapter (2) and pipe elbow (4) from plate (5).

3 Remove pipe straight adapter (3) from fluid filter (6).

4 Remove two self-locking nuts (7), two lockwashers (8), two machine screws (9), and fluid filter (6) from plate (5).

5 Remove quick coupling half (10) from plate (5).

2-183 MAINTENANCE OF FILTER MOUNTING FLUID FILTER (HEATER INSTALLATION KIT) (CONT).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If plate is broken or damaged, repair is by replacement of next higher assembly.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

REASSEMBLY

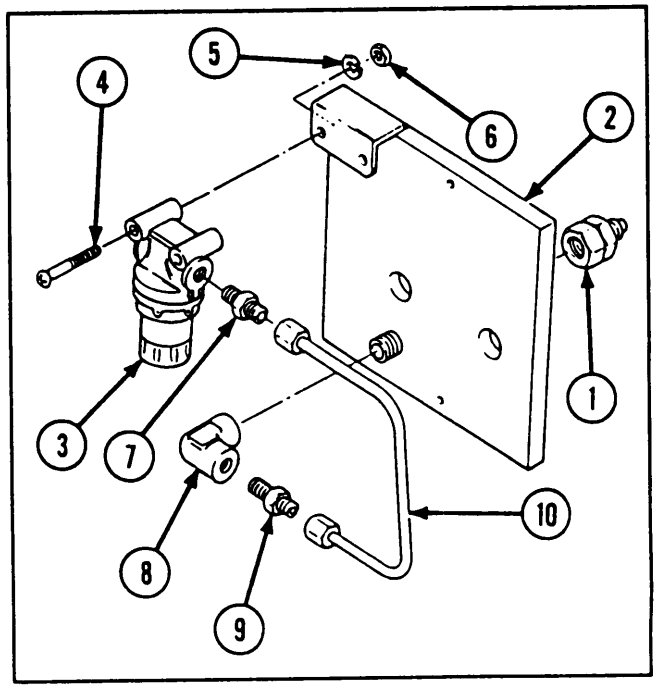
1 Install quick coupling half (1) on plate (2).

2 Install fluid filter (3), two machine screws (4), two new lockwashers (5), and two new self-locking nuts (6) on plate (2).

3 Install pipe straight adapter (7) on fluid filter (3).

4 Install pipe elbow (8) and pipe straight adapter (9) on plate (2).

5 Install metal tube assembly (10) on pipe straight adapter (9) and pipe straight adapter (7).



2-184. MAINTENANCE OF PYROMETER VEHICULAR PANEL AND WARNING INDICATOR LIGHT (HEATER INSTALLATION KIT).

This task covers: a. Disassembly b. Inspection/Repair c. Reassembly

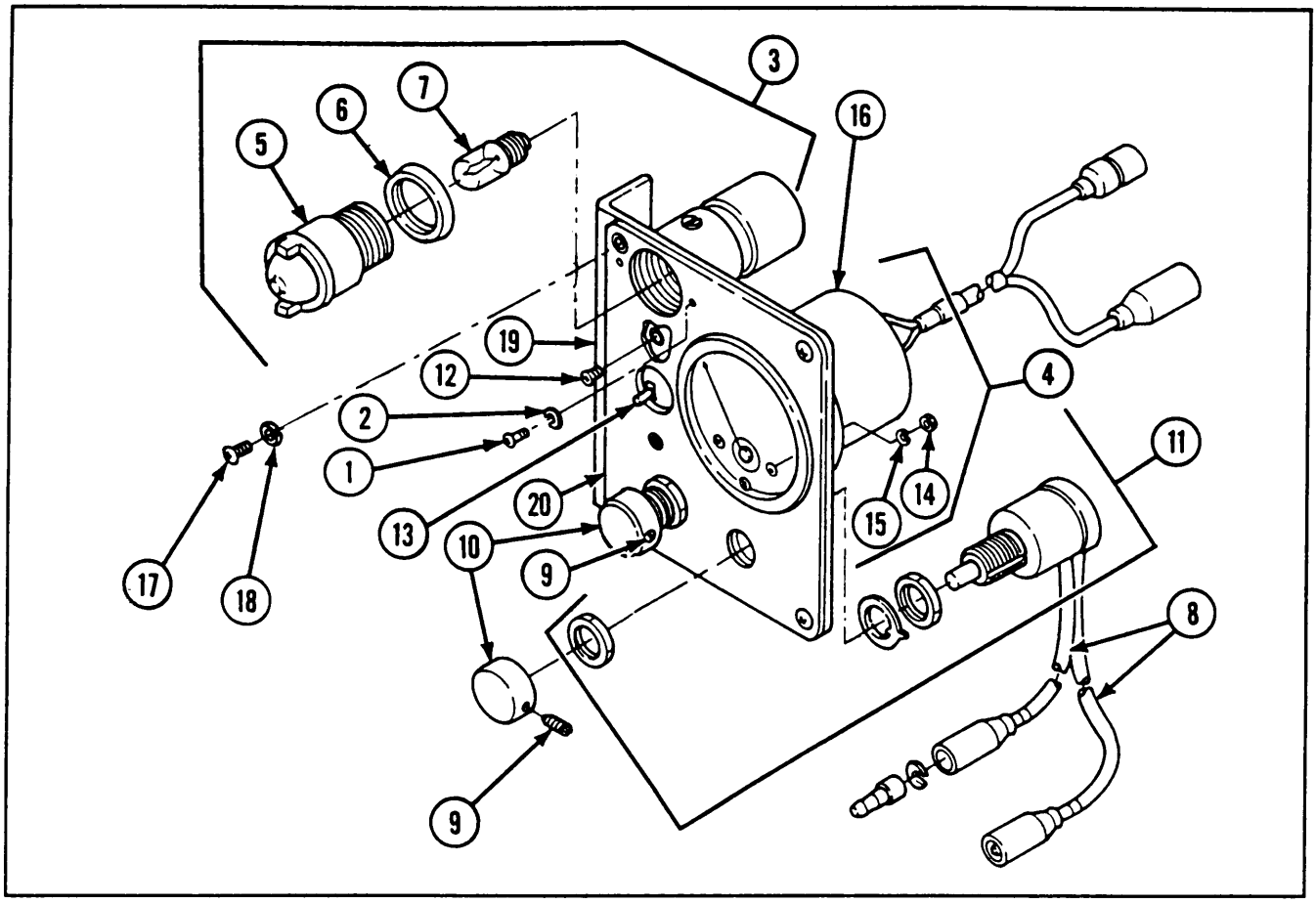
INITIAL SETUP

Materials/Parts
Lockwher (3)
Lockwasher (6)
Preformed packing

References
TM 9-2350-238-24P-1

Equipment conditions
2-1029 Pyrometer panel assembly removed

DISASSEMBLY



1 Remove two machine screws (1), two lockwashers (2), and warning indicator light (3) from pyrometer panel assembly (4).

2 Remove light lens (5), warning light preformed packing (6), and incandescent lamp (7).

3 Disconnect electrical leads (8), and remove four setscrews (9), two knobs (10), and two push switch assemblies (11) from pyrometer panel assembly (4).

4 Remove two machine screws (12) and toggle switch (13) from pyrometer panel assembly (4).

5 Remove three hexagon plain nuts (14), three lockwashers (15), and indicating pyrometer (16) from pyrometer panel assembly (4).

6 Remove four machine screws (17), four lockwashers (18), pyrometer bracket (19), and identification plate (20) from pyrometer panel assembly (4).

1 Inspect for broken, damaged, or missing parts.

2 For repair of push switch shell connectors, refer to general maintenance, page 2-371.

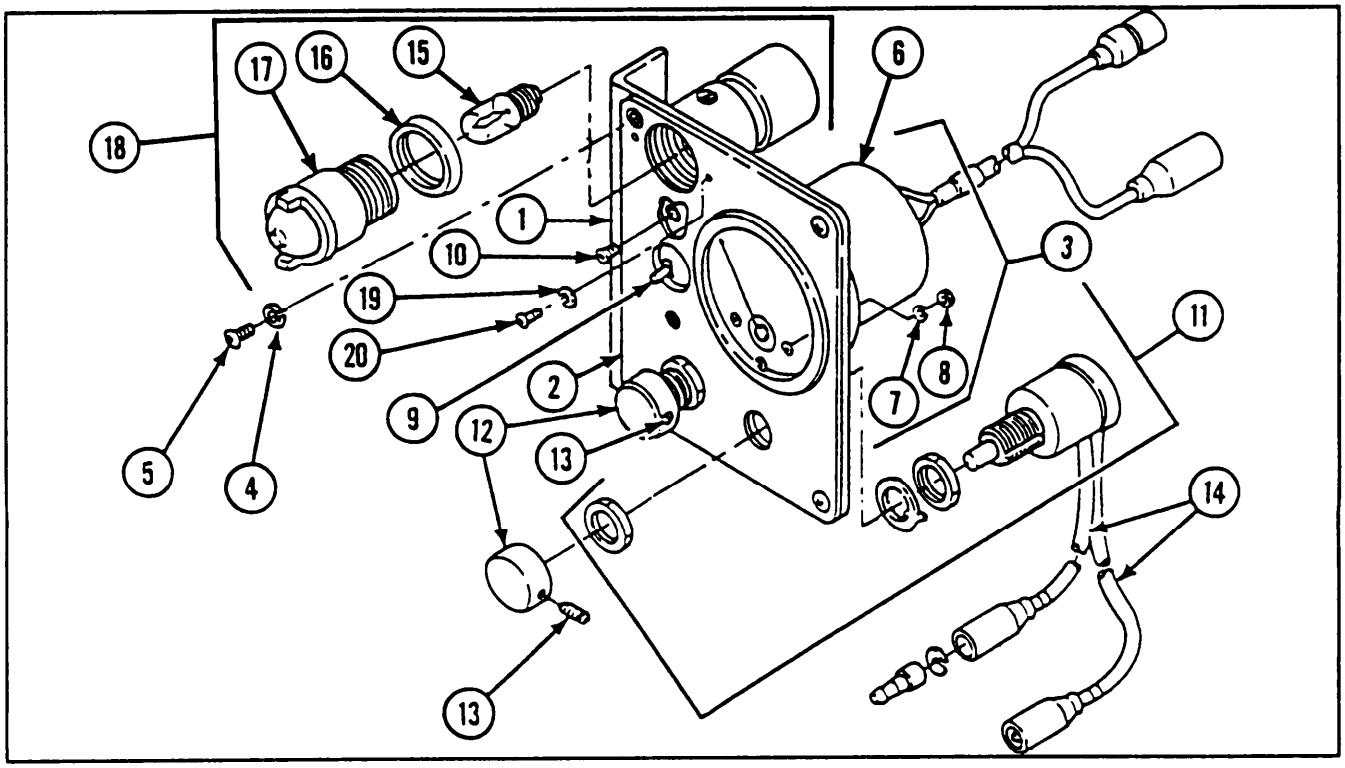
2-184. MAINTENANCE OF PYROMETER VEHICULAR PANEL AND WARNING INDICATOR LIGHT (HEATER INSTALLATION KIT) (CONT).

INSPECTION/REPAIR (CONT)

3 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

REASSEMBLY



1 Install pyrometer bracket (1) and identification plate (2) on pyrometer panel assembly (3), and secure with four new lockwashers (4) and four machine screws (5).

2 Install indicating pyrometer (6) on pyrometer panel assembly (3), and secure with three new lockwashers (7) and three hexagon plain nuts (8).

3 Install toggle switch (9) on pyrometer panel assembly (3), and secure with two machine screws (10).

4 Install two push switch assemblies (11), two knobs (12), and four setscrews (13) on pyrometer panel assembly (3). Connect electrical leads (14) to push switch assembly connectors.

5 Install incandescent lamp (15), new warning light preformed packing (16), and light lens (17) in warning indicator light (1 8).

6 Install warning indicator light (18) on pyrometer panel assembly (3), and secure with two new lockwashers (19) and two machine screws (20).

2-185. MAINTENANCE OF HEATER ELECTRICAL CONTROL BOX (HEATER INSTALLATION KIT).

This task covers:	a. Disassembly	b. Inspection/Repair	c. Reassembly

INITIAL SETUP

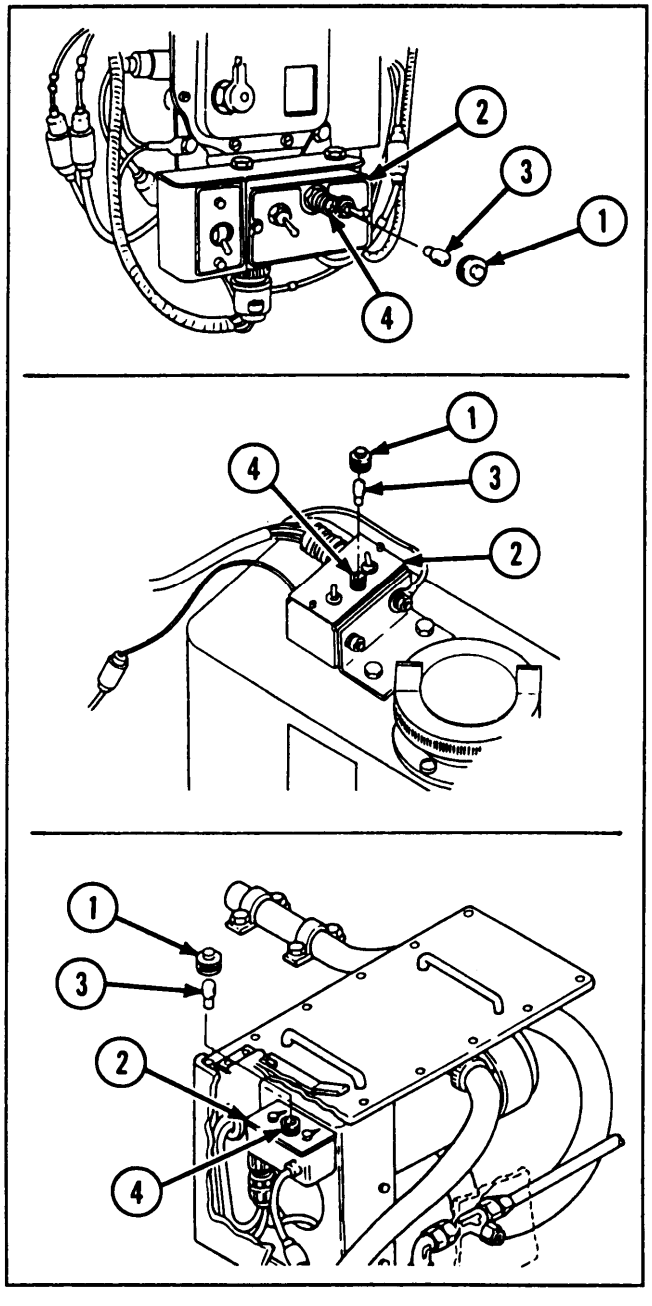
Materials/Parts
Silicone compound(item 40, appx C)
Incandescent lamp

References
TM 9-2350-238-24P-1

DISASSEMBLY

NOTE
There are three heaters in the heater installation kit, and each has a heater electrical control box. The following steps are written for one electrical control box, but illustrated for all three.

Unscrew lens (1) from heater electrical control box (2) and remove incandescent lamp (3).



INSPECTION/REPAIR

1 Check for broken, damaged, or missing parts.

2 For further disassembly of heater electrical control box, notify direct support maintenance.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24 P-1).

REASSEMBLY

Lightly apply silicone compound to lamp socket (4) and install new incandescent lamp (3). Screw lens (1) securely on heater electrical control box (2).

2-186. MAINTENANCE OF ENGINE COOLANT HEATER AND COOLANT HEATER ASSEMBLY BRANCHED WIRING HARNESS (HEATER INSTALLATION KIT).

This task covers:
a. Removal
b. Disasembly
c. Inspection/Repair
d. Reassembly
e. Installation

INITIAL SETUP

Materials/Parts
Adhesive (item 5, appx C)
Electrical wire (figure D-2, appx D)
Gasket
Lockwassher (2)
Lockwasher (11)
Preformed packing
Rubber hhose (figure D-17, appx D)
Self-locking nut (4)
Self-locking nut (4)
Strainer element

References
TM 9-2350-238F-24P-1

Equpupment conditioins
MASTER power switch and instrument swith in Off position
Fuel supply valve at fuel tank in OFF position
2-1036 Exhaust port cover removed
2-938 Hul transmission compartment deck assembly removed
2-935 Hull engine compartment deck assembly lid reoved
2-100 Coolant heater shield removed

REMOVAL

1 Disconnect exhaust tube (1) from engine coolant heater (2).

2 Disconnect nonmetallic hose assembly (3) from electrical fuel pump pipe to hose elbow (4).

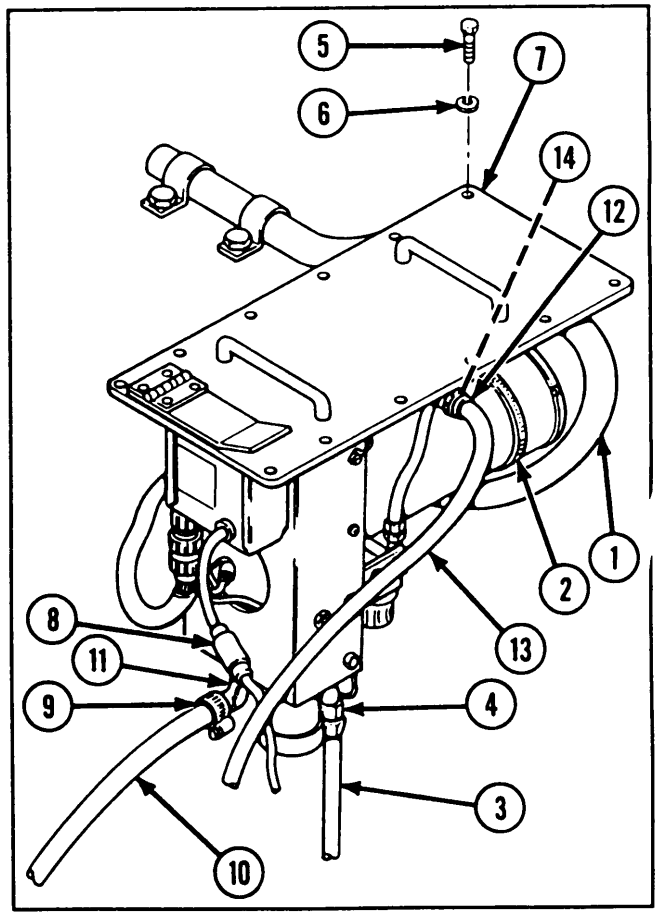
3 Remove 12 screws (5) and 12 washers (6) from coolant heater mounting plate (7).

4 Lift engine coolant heater (2) from hull and Support.

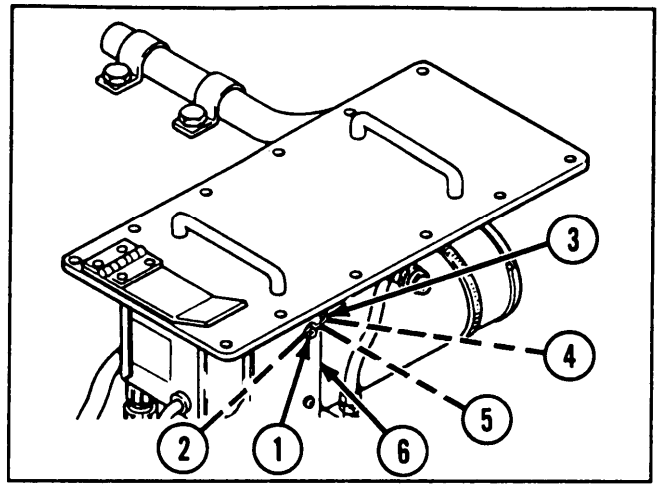
5 Disconnect heater electrical control box electrical connector (8).

6 Loosen hose clamp (9) and disconnect hose (10) from centrifugal pump unit (11).

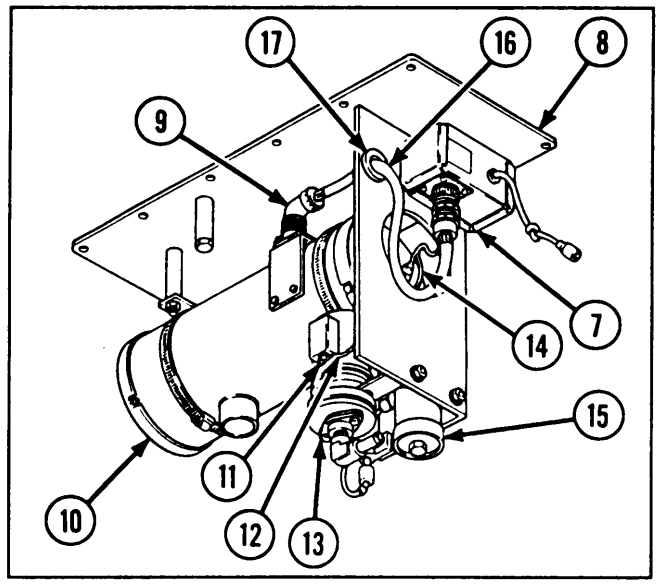
7 Loosen hose clamp (12) and disconnect hose (13) from pipe to hose elbow (14).



DISASSEMBLY



1 Remove hexagon plain nut (1), lockwasher (2), electrical lead (3), lockwasher (4), and hexagon head capscrew (5) from coolant heater mounting plate (6).



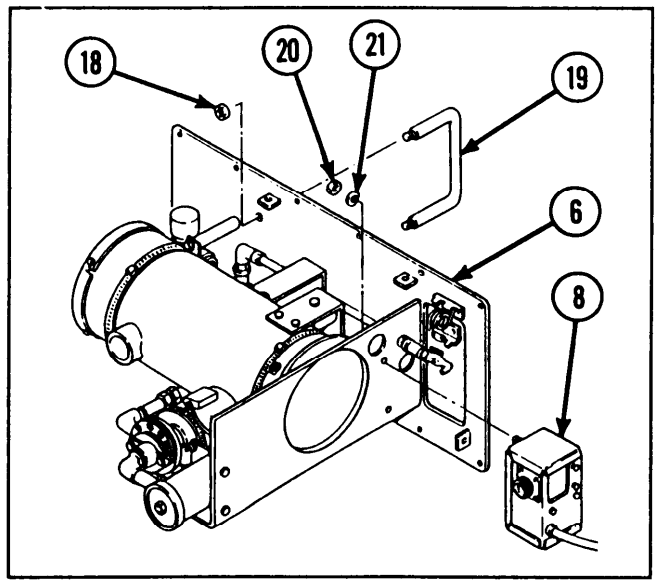
2 Disconnect electrical plug connector (7) from heater electrical control box (8).

3 Disconnect electrical plug connector (9) from coolant heater assembly (10).

4 Remove nut (11) and disconnect lead (12) from centrifugal pump unit (13).

5 Disconnect coolant heater assembly branched wiring harness shell connector (14) from electrical fuel pump (15).

6 Remove coolant heater assembly branched wiring harness (16) and nonmetallic grommet (17).

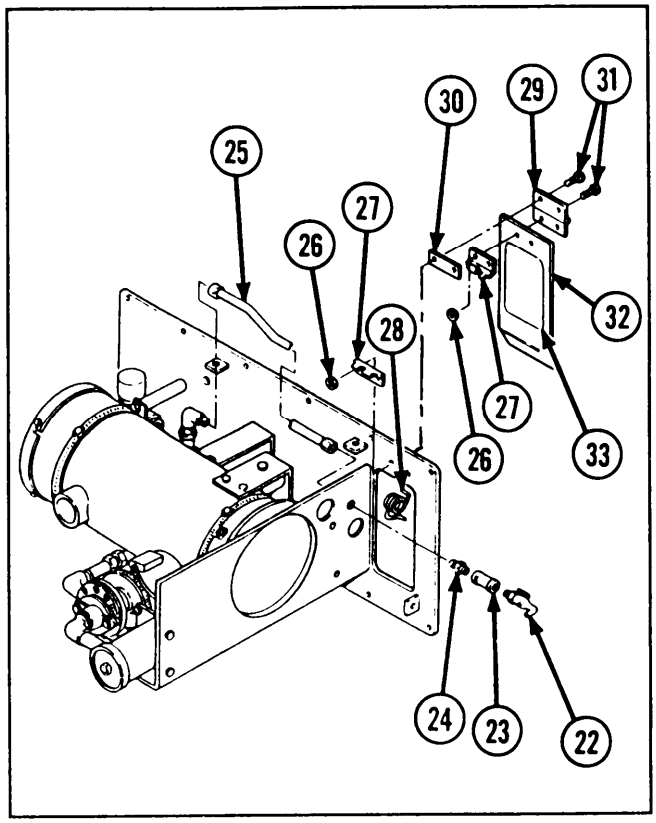


7 Remove four self-locking nuts (18) and two service repair coolant heater assembly bow handles (19) from coolant heater mounting plate (6).

8 Remove two hexagon plain nuts (20), two lockwashers (21), and heater electrical control box (8).

2-186. MAINTENANCE OF ENGINE COOLANT HEATER AND COOLANT HEATER ASSEMBLY BRANCHED WIRING HARNESS (HEATER INSTALLATION KIT) (CONT).

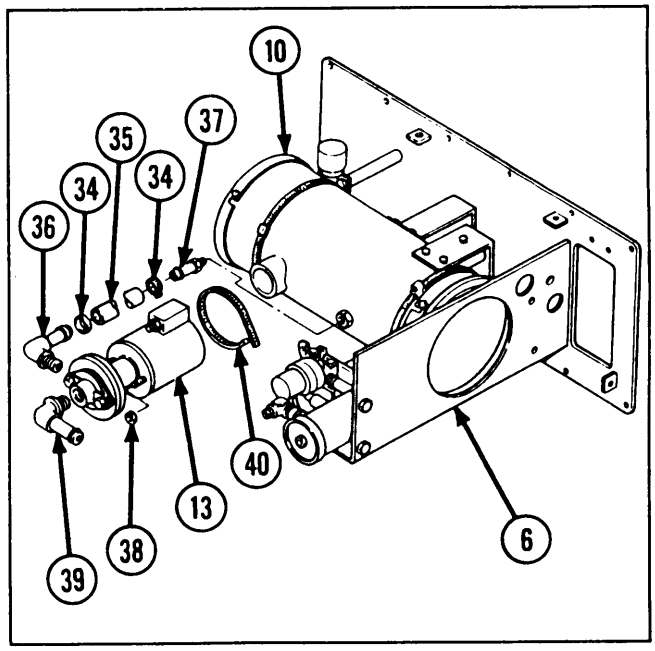
DISASSEMBLY (CONT)



9 Remove drain cock (22), pipe coupling (23), pipe straight adapter (24), and metal tube assembly (25).

10 Remove four self-locking nuts (26), two heater control box cover spring retainers (27), torsion heater control box cover helical spring (28), coolant heater control box cover butt hinge (29), heater control box cover hinge plate (30), four machine screws (31), and access cover (32).

11 If damaged, remove coolant heater instruction plate (33) from access cover (32).



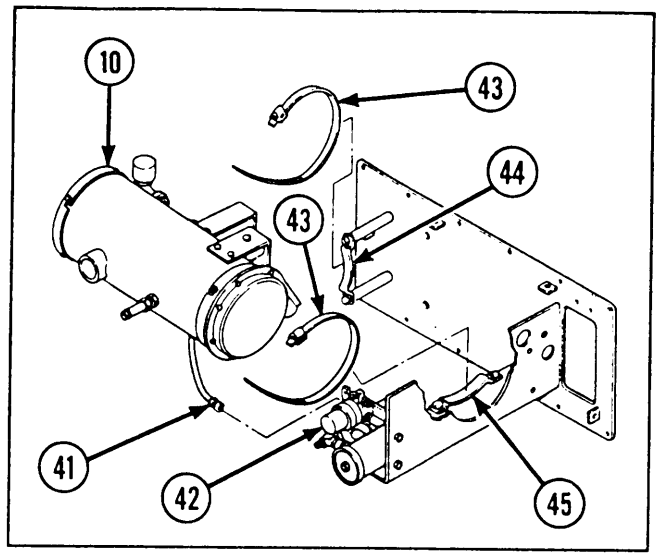
12 Remove two hose clamps (34) and rubber hose (35) from coolant heater assembly (10) and pipe to hose elbow (36). Remove pipe to tube straight adapter (37) from coolant heater assembly.

13 Remove two nuts (38) and centrifugal pump unit (13) from coolant heater mounting plate (6).

14 Remove two pipe to hose elbows (36 and 39) and hose clamp (40).

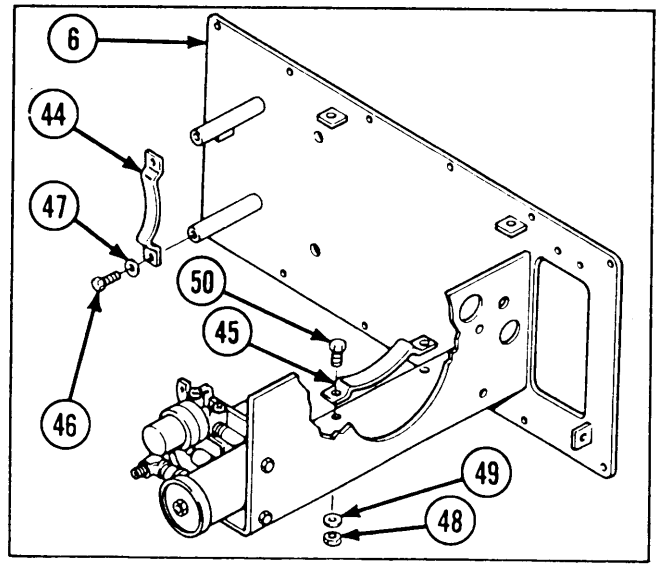
15 Disconnect fuel filter to regulator nonmetallic hose assembly (41) from fluid filter (42).

16 Disconnect two hose clamps (43) and remove coolant heater assembly (10). Remove two hose clamps (43) from two heater mounting brackets (44 and 45).



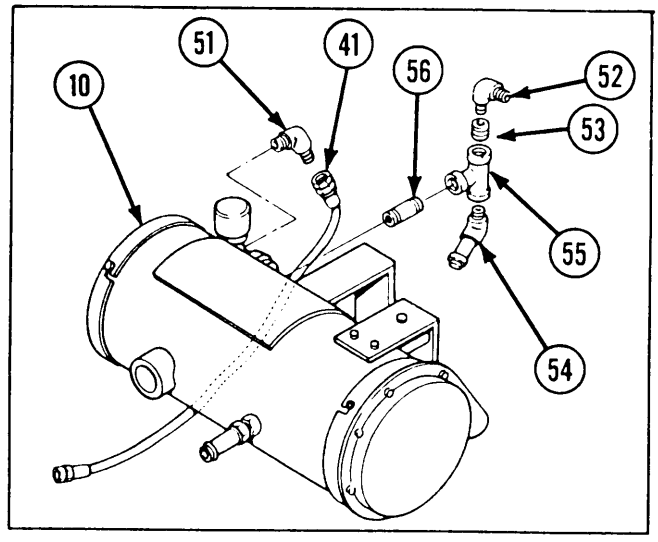
17 Remove two hexagon head capscrews (46), two lockwashers (47), and heater mounting bracket (44) from coolant heater mounting plate (6).

18 Remove hexagon plain nut (48), lockwasher (49), hexagon head capscrew (50), and heater mounting bracket (45) from coolant heater mounting plate (6).



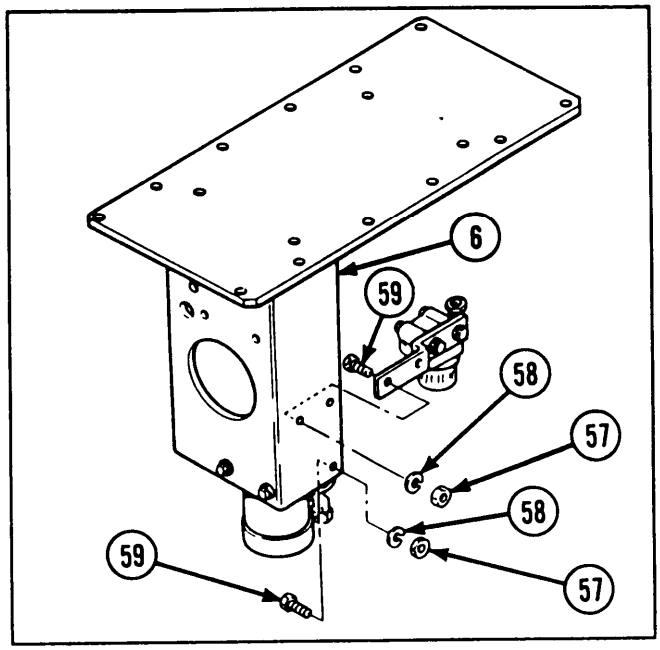
19 Remove fuel filter to regulator nonmetallic hose assembly (41) and pipe to tube elbow (51).

20 Remove pipe to tube elbow (52), pipe bushing (53), pipe to hose elbow (54), pipe tee (55), and pipe nipple (56) from coolant heater assembly (10).

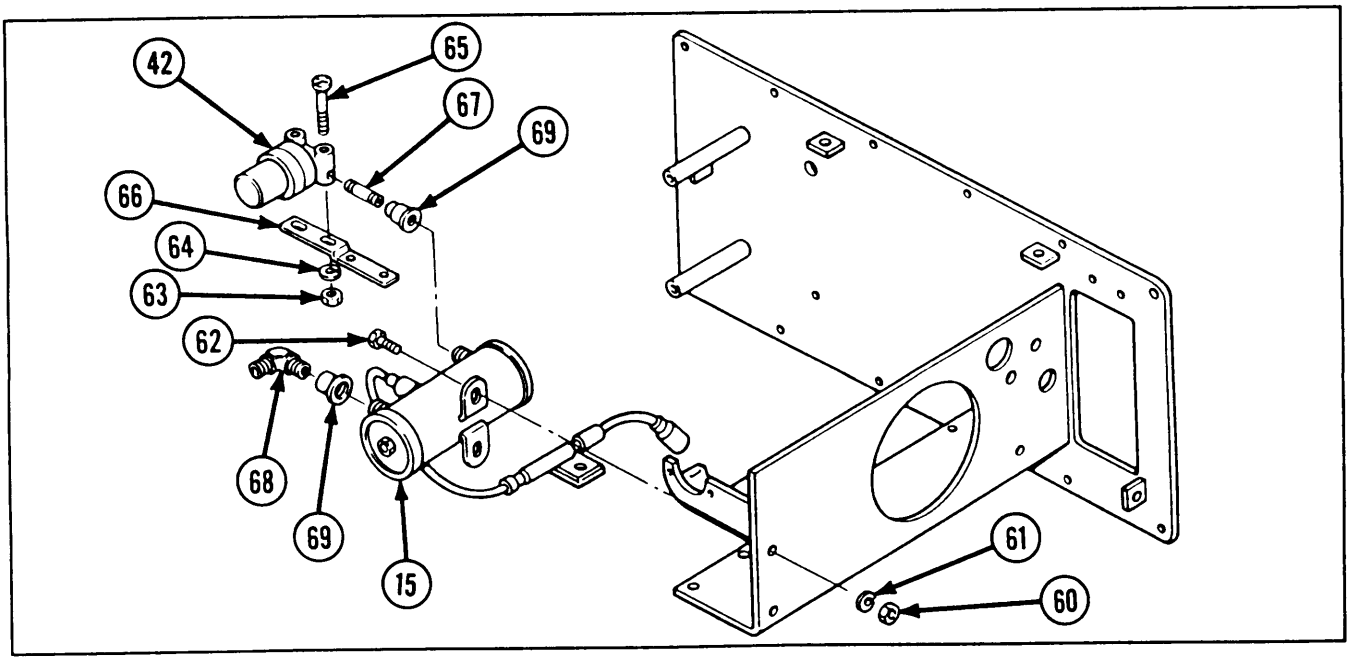


2-186. MAINTENANCE OF ENGINE COOLANT HEATER AND COOLANT HEATER ASSEMBLY BRANCHED WIRING HARNESS (HEATER INSTALLATION KIT) (CONT).

DISASSEMBLY (CONT)



21 Remove three hexagon plain nuts (57), three lockwashers (58), and three hexagon head capscrews (59) from coolant heater mounting plate (6).

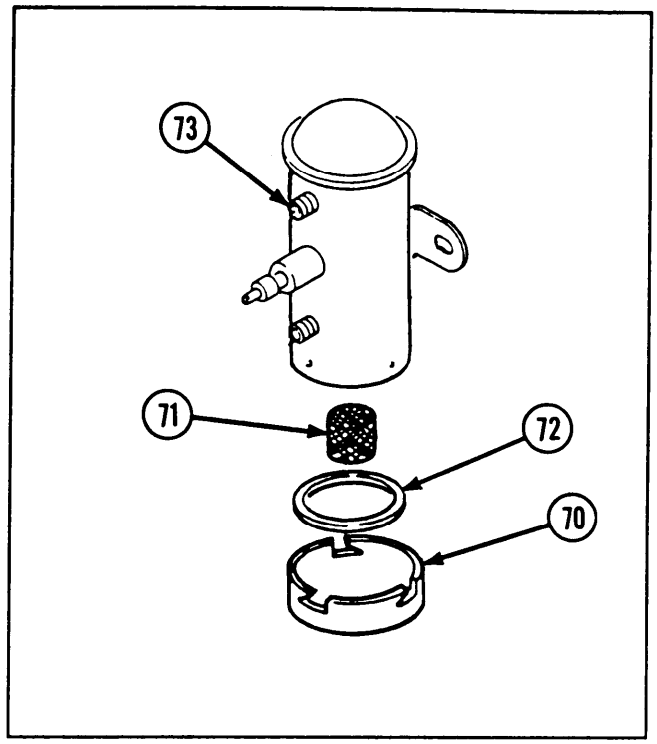


22 Remove two hexagon plain nuts (60), two lockwashers (61), two hexagon head capscrews (62), and electrical fuel pump (15) with fluid filter (42).

23 Remove two hexagon plain nuts (63), two lockwashers (64), two machine screws (65), and heater bracket (66) from fluid filter (42).

24 Remove fluid filter (42), pipe nipple (67), pipe to tube elbow (68), and two pipe reducers (69) from electrical fuel pump (15).

25 Remove fuel pump cover (70), strainer element (71), and gasket (72) from fuel pump housing (73).



INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of wiring harness shell connectors and cable terminals, refer to general maintenance, page 2-371.

4 If damaged or missing, replace nonmetallic bushings on coolant heater assembly branched wiring harness.

5 Heater electrical control box is a repairable assembly. Refer to page 2-1055.

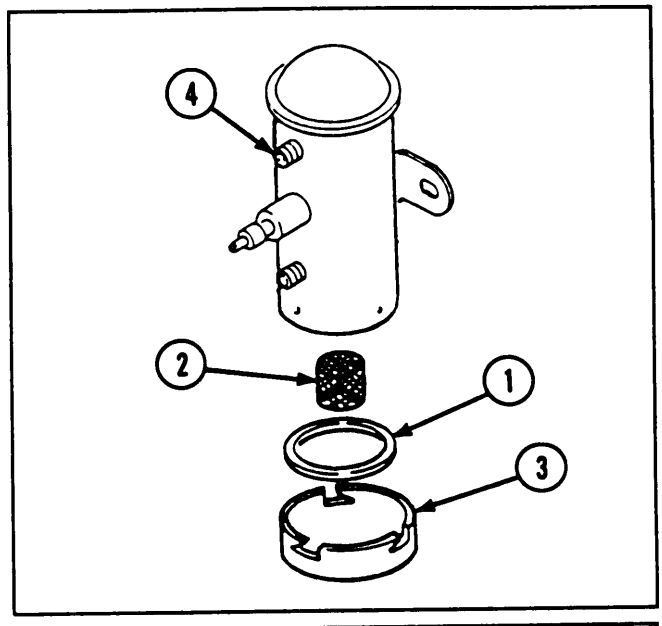
6 Coolant heater assembly is a repairable assembly. Notify direct support maintenance.

7 If fuel pump cover or fuel pump housing is broken or damaged, repair is by replacement of next higher assembly.

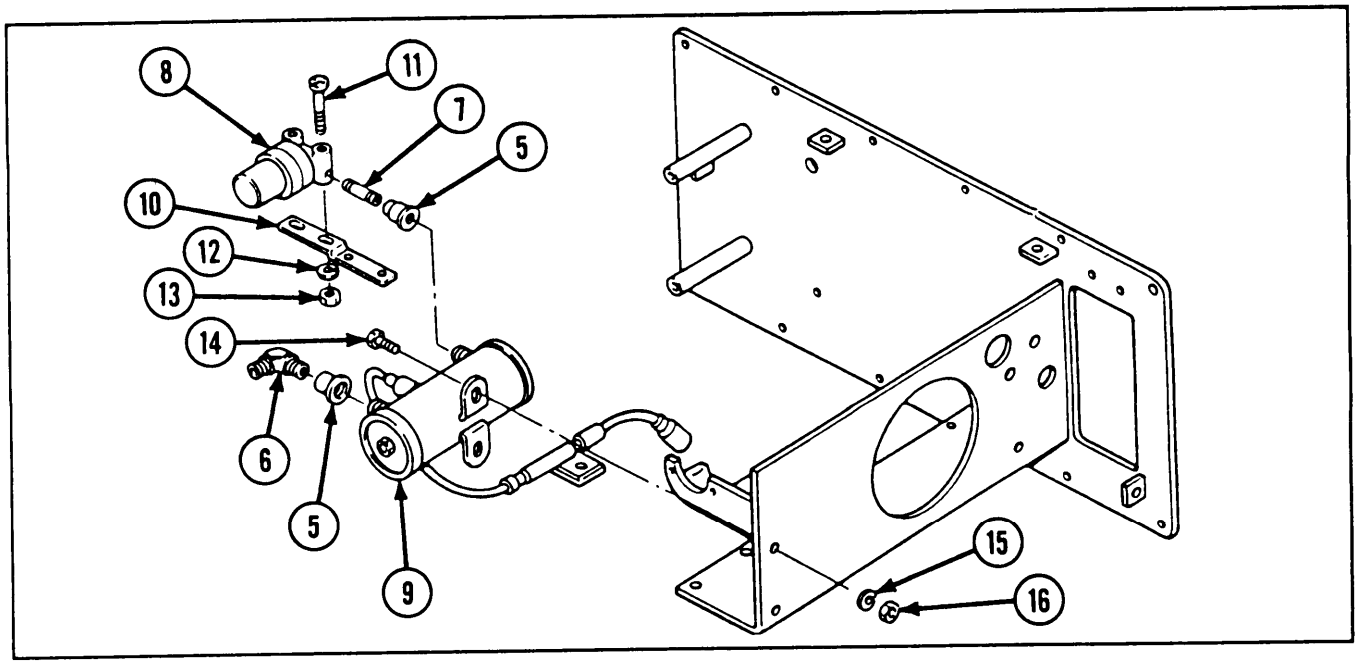
8 Rubber hose and electrical wire are manufactured items. Refer to appendix D.

9 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

2-1 86. MAINTENANCE OF ENGINE COOLANT HEATER AND COOLANT HEATER ASSEMBLY BRANCHED WIRING HARNESS (HEATER INSTALLATION KIT) (CONT).



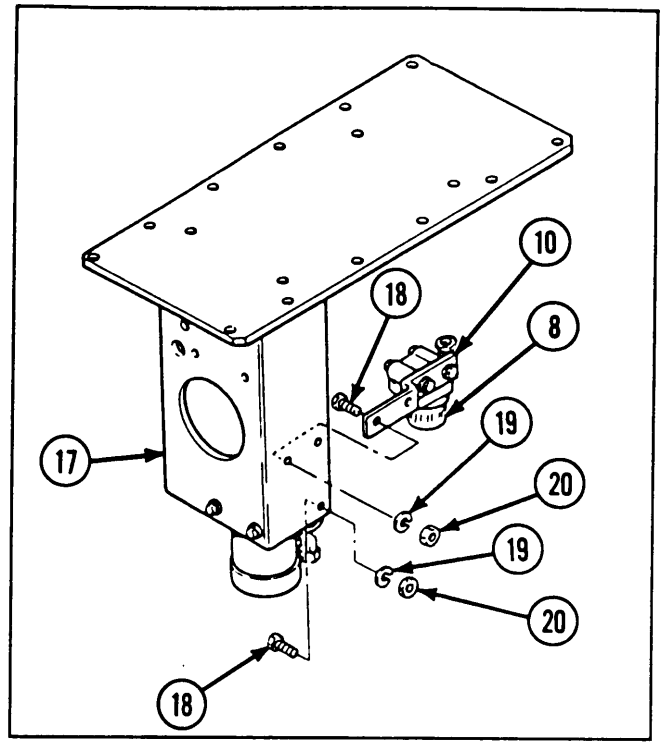
1 Install new gasket (1), new strainer element (2), and fuel pump cover (3) on fuel pump housing (4).



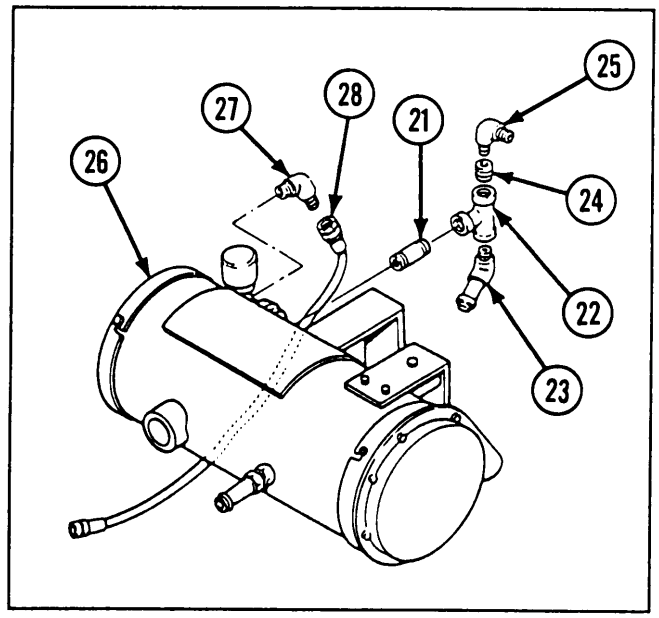
2 Install two pipe reducers (5), pipe to tube elbow (6), pipe nipple (7), and fluid filter (8) on electrical fuel pump (9).

3 Install heater bracket (10), two machine screws (11), two new lockwashers (12), and two hexagon plain nuts (13) on fluid filter (8).

4 Install electrical fuel pump (9) with fluid filter (8), and secure with two hexagon head capscrews (14), two new lockwashers (15), and two hexagon plain nuts (16).



5 Install heater bracket (10) with fluid filter (8) on coolant heater mounting plate (17). Secure with three hexagon head capscrews (18), three new lockwashers (19), and three hexagon plain nuts (20).

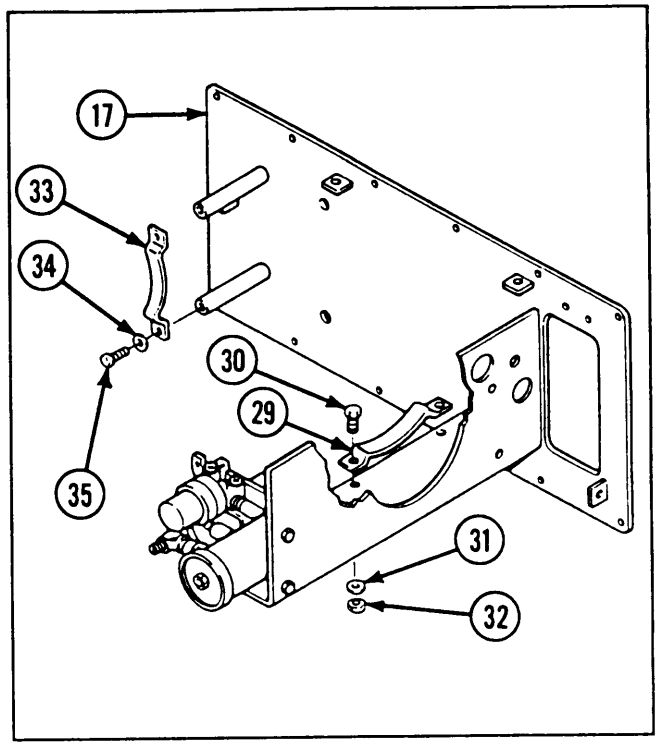


6 Install pipe nipple (21), pipe tee (22), pipe to hose elbow (23), pipe bushing (24), and pipe to tube elbow (25) on coolant heater assembly (26).

7 Install pipe to tube elbow (27) and fuel filter to regulator nonmetallic hose assembly (28).

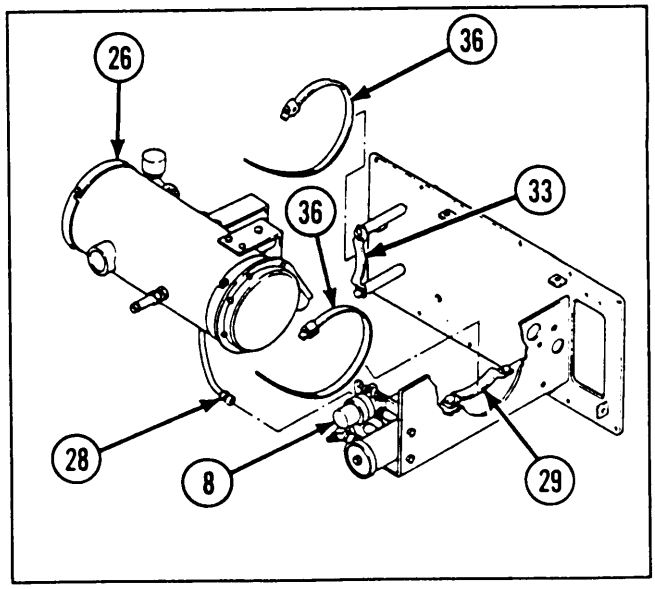
2-186. MAINTENANCE OF ENGINE COOLANT HEATER AND COOLANT HEATER ASSEMBLY BRANCHED WIRING HARNESS (HEATER INSTALLATION KIT) (CONT).

REASSEMBLY (CONT)



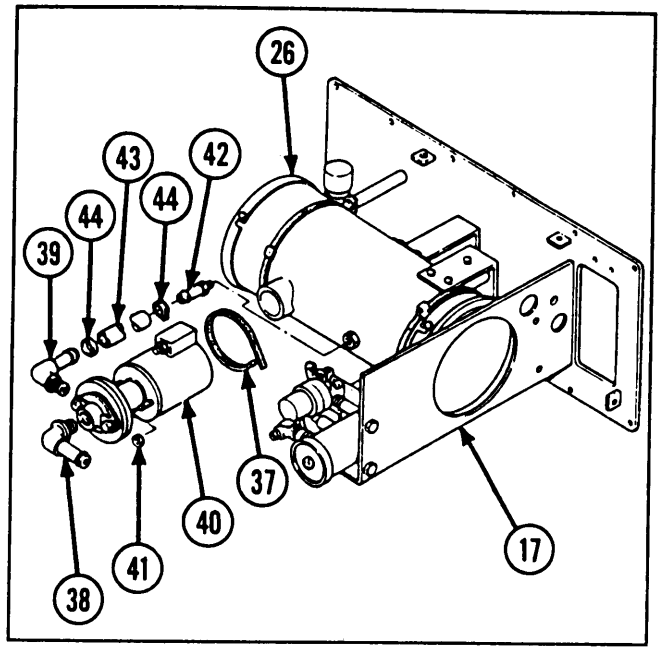
8 Install heater mounting bracket (29) to coolant heater mounting plate (17), and secure with hexagon head capscrew (30), new lockwasher (31), and hexagon plain nut (32).

9 Install heater mounting bracket (33) to coolant heater mounting plate (17), and secure with two new lockwashers (34) and two hexagon head capscrews (35).



10 Install two hose clamps (36) to two heater mounting brackets (29 and 33). Install coolant heater assembly (26), securing with two hose clamps.

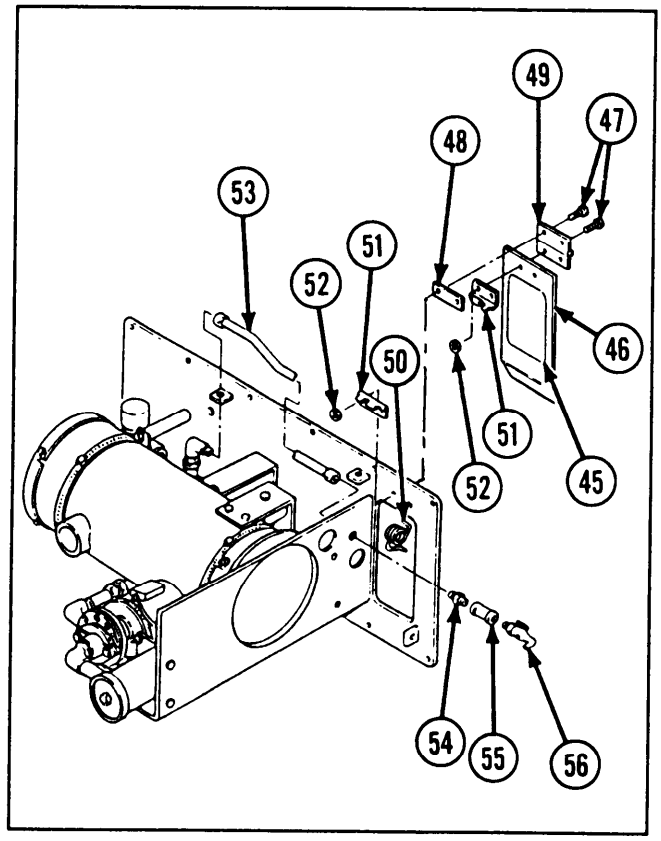
11 Connect fuel filter to regulator nonmetallic hose assembly (28) to fluid filter (8).



12 Install hose clamp (37) and two pipe to hose elbows (38 and 39).

13 Install centrifugal pump unit (40) to coolant heater mounting plate (17), and secure with two nuts (41).

14 Install pipe to tube straight adapter (42) to coolant heater assembly (26). Install rubber hose (43) and two hose clamps (44) to pipe to hose elbow (39) and coolant heater assembly.



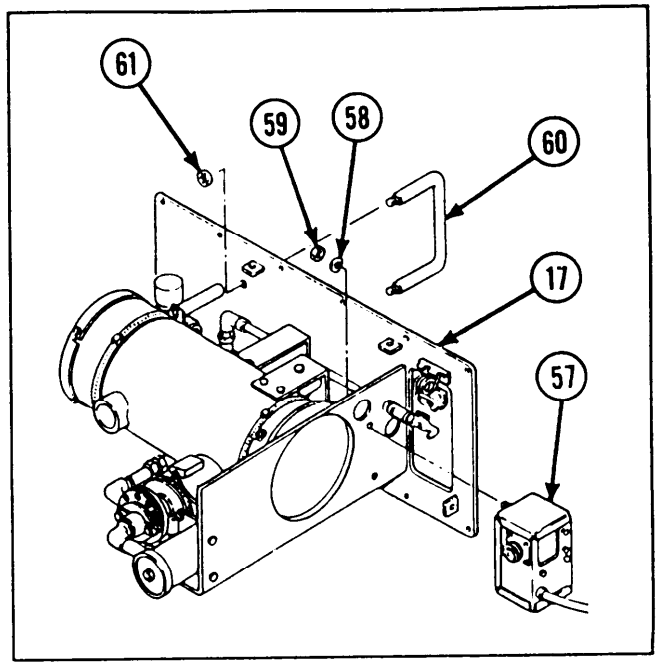
15 If removed, install coolant heater instruction plate (45) to access cover (46) with adhesive.

16 Install access cover (46), and secure with four machine screws (47). Install heater control box cover hinge plate (48), coolant heater control box cover butt hinge (49), torsion heater control box cover helical spring (50), two heater control box cover spring retainers (51), and four new self-locking nuts (52).

17 Install metal tube assembly (53), pipe straight adapter (54), pipe coupling (55), and drain cock (56).

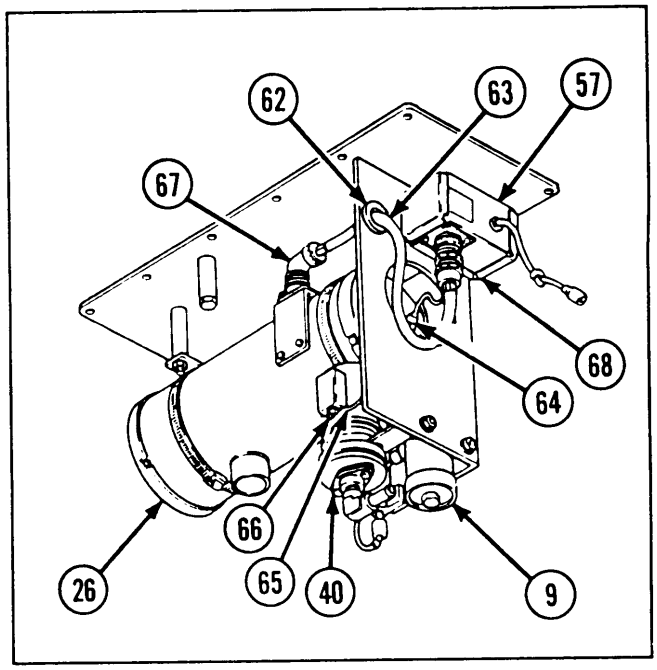
2-186. MAINTENANCE OF ENGINE COOLANT HEATER AND COOLANT HEATER ASSEMBLY BRANCHED WIRING HARNESS (HEATER INSTALLATION KIT) (CONT).

REASSEMBLY (CONT)



18 Install heater electrical control box (57), and secure with two new lockwashers (58) and two hexagon plain nuts (59).

19 Install two service repair coolant heater assembly bow handles (60) to coolant heater mounting plate (17), and secure with four new self-locking nuts (61).



20 Install nonmetallic grommet (62) and coolant heater assembly branched wiring harness (63).

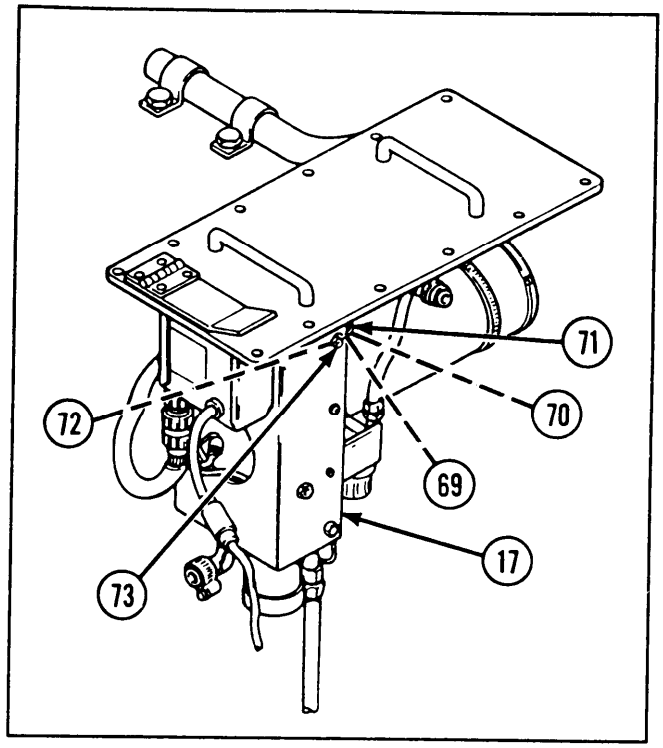
21 Connect coolant heater assembly branched wiring harness shell connector (64) to electrical fuel pump (9).

22 Connect lead (65) to centrifugal pump unit (40), and secure with nut (66).

23 Connect electrical plug connector (67) to coolant heater assembly (26).

24 Connect electrical plug connector (68) to heater electrical control box (57).

25 Install hexagon head capscrew (69), new lockwasher (70), electrical lead (71), new lockwasher (72), and hexagon plain nut (73) on coolant heater mounting plate (17).



INSTALLATION

1 Connect hose (1) to pipe to hose elbow (2), and tighten hose clamp (3).

2 Connect hose (4) to centrifugal pump unit (5), and tighten hose clamp (6).

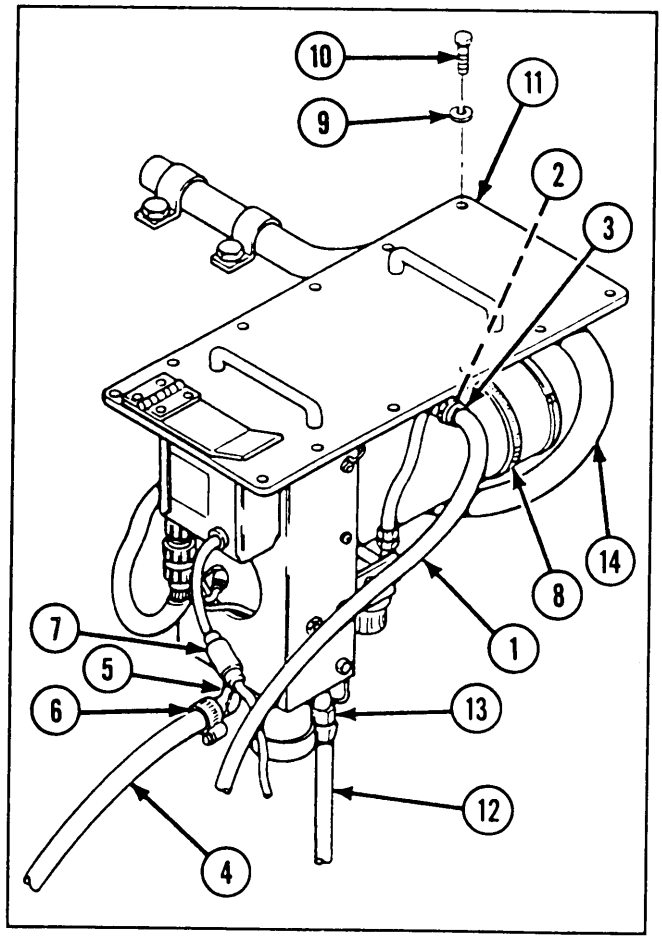
3 Connect heater electrical control box electrical connector (7).

4 Lower coolant heater assembly (8) into hull.

5 Install 12 washers (9) and 12 screws (10) to coolant heater mounting plate (11).

6 Connect nonmetallic hose assembly (12) to electrical fuel pump pipe to hose elbow (13).

7 Connect exhaust tube (14) to coolant heater assembly (8).



2-187. MAINTENANCE OF VEHICULAR HEATER (DRIVER'S COMPARTMENT) (HEATER INSTALLATION KIT).

This task covers:	a. *Removal*	b. *Inspection/Repair*	*c. Installation*

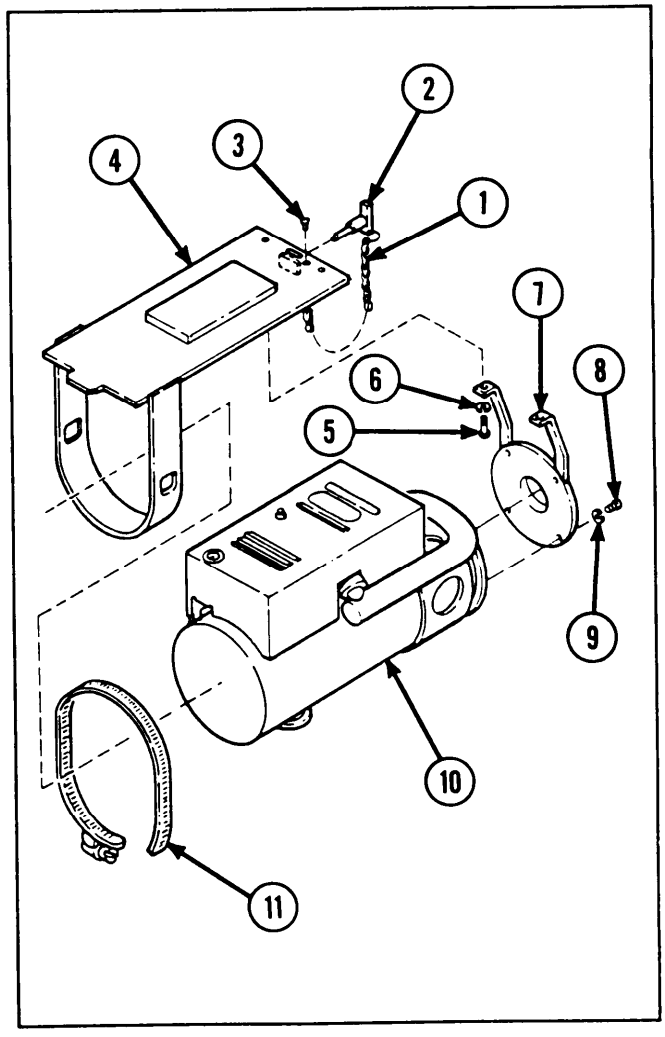
INITIAL SETUP

Materials/Parts
Lockwasher (2)
Lockwasher (3)
Heater mount chain (figure D-6, appx D

References
TM 9-2350-238-24P-1

Equipment Conditions
2-1000 Vehicular heater removed

REMOVAL



1 If damaged, remove heater mount chain (1) from quick release pin (2).

2 If damaged, remove solid rivet (3) and quick release pin (2) from mounting bracket (4).

3 Remove two hexagon head capscrews (5), two lockwashers (6), and nonrotating eye bracket (7) from mounting bracket (4).

4 Remove three machine screws (8), three lockwashers (9), and nonrotating eye bracket (7) from vehicular heater (10).

5 Remove hose clamp (11) and vehicular heater (10) from mounting bracket (4).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Heater mount chain is a manufactured item, refer to appendix D.

3 Vehicular heater is a repairable assembly. Notify direct support maintenance.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

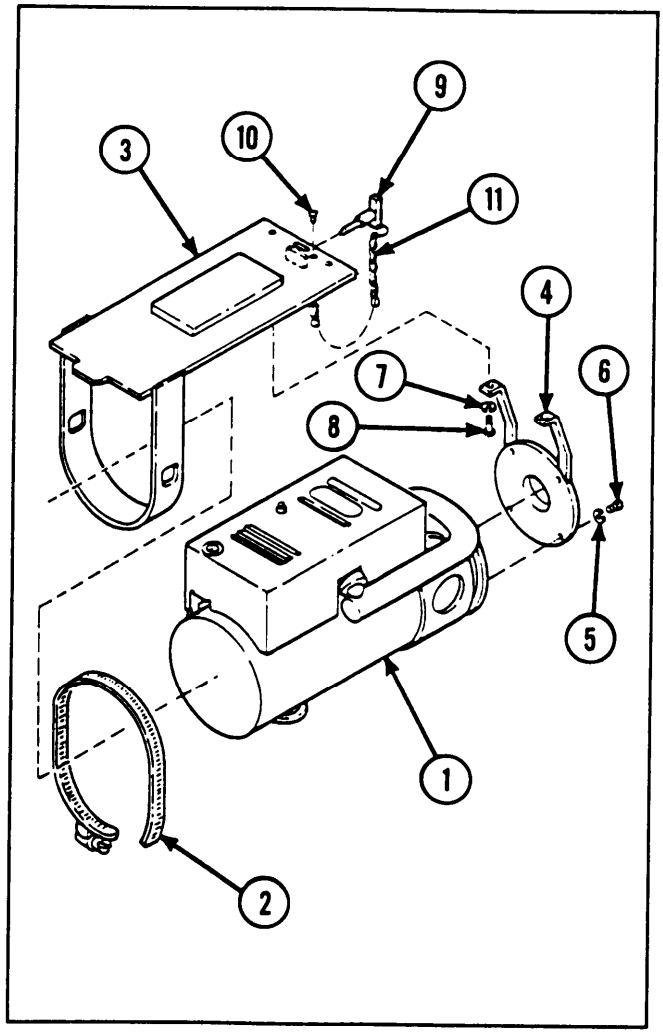
1 Install vehicular heater (1) and hose clamp (2) to mounting bracket (3).

2 Install nonrotating eye bracket (4), three new lockwashers (5), and three machine screws (6) on vehicular heater (1).

3 Install two new lockwashers (7), two hexagon head capscrews (8), and nonrotating eye bracket (4) on mounting bracket (3).

4 If removed, install quick release pin (9) and new solid rivet (10) to mounting bracket (3).

5 If removed, install new heater mount chain (11) on quick release pin (9).



2-188. MAINTENANCE OF DRIVER'S WINDSHIELD ENCLOSURE KIT—ELECTRICAL WIRING.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Materials/Parts
Electrical wire (figure D-2, appx D
Insulation sleeving (figure D-1 , appx D)
Insulation sleeving (figure D-19, appx D)
Lockwasher (3)
Self-locking nut (2)

References
TM 9-2350-238-24P-1

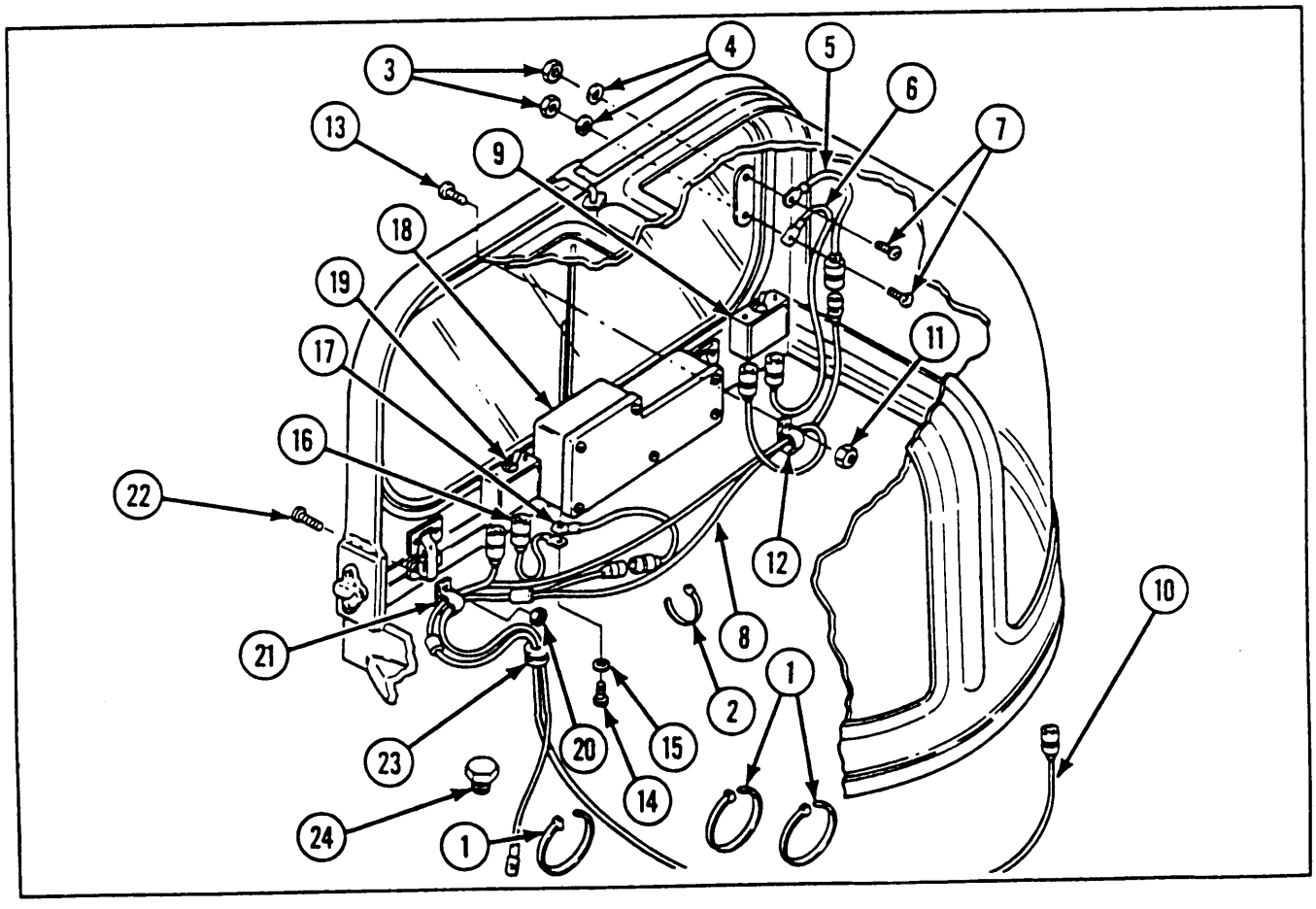
Euipment Conditions
Master power switch OFF
2-840 Batteries disconnected

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Remove three marker bands (1) and electrical tiedown strap (2).

2 Remove two hexagon plain nuts (3), two Iockwashers (4), defroster to switch and ground lead disconnect electrical lead (5), disconnect defroster to switch and ground lead disconnects electrical lead (6), and two machine screws (7) from windshield.

3 Disconnect defroster to switch and ground lead disconnect electrical lead (5) from wiper motor and defroster lead disconnects electrical lead assembly (8).

4 Disconnect disconnect defroster to switch and ground lead disconnects electrical lead (6) from toggle switch (9).

5 Disconnect circuit breaker to wiper motor and defroster switch electrical lead assembly (10) from toggle switch (9) and circuit breaker behind driver's seat.

6 Remove self-locking nut (11), loop clamp (12), and machine screw (13).

7 Remove machine screw (14), IockwaSher (1 5), wiper motor to switch electrical lead (16), and wiper motor to ground lead disconnect (17) from windshield wiper motor assembly (18).

Disconnect wiper motor to ground lead disconnect (17) from wiper motor and defroster lead disconnects electrical lead assembly (8).

9 Disconnect wiper motor to switch electrical lead (16) from toggle switch (19).

10 Disconnect circuit breaker to wiper motor and defroster switch electrical lead assembly (10) from toggle switch (19).

11 Remove self-locking nut (20), loop clamp (21), and machine screw (22).

12 Remove wiper motor and defroster lead disconnects electrical lead assembly (8), circuit breaker to wiper motor and defroster switch electrical lead assembly (10), and rubber grommet (23) from driver's cupola, and install electrical end seal plug (24) in hole.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of shell connectors and cable terminals, refer to general maintenance, page 2-371.

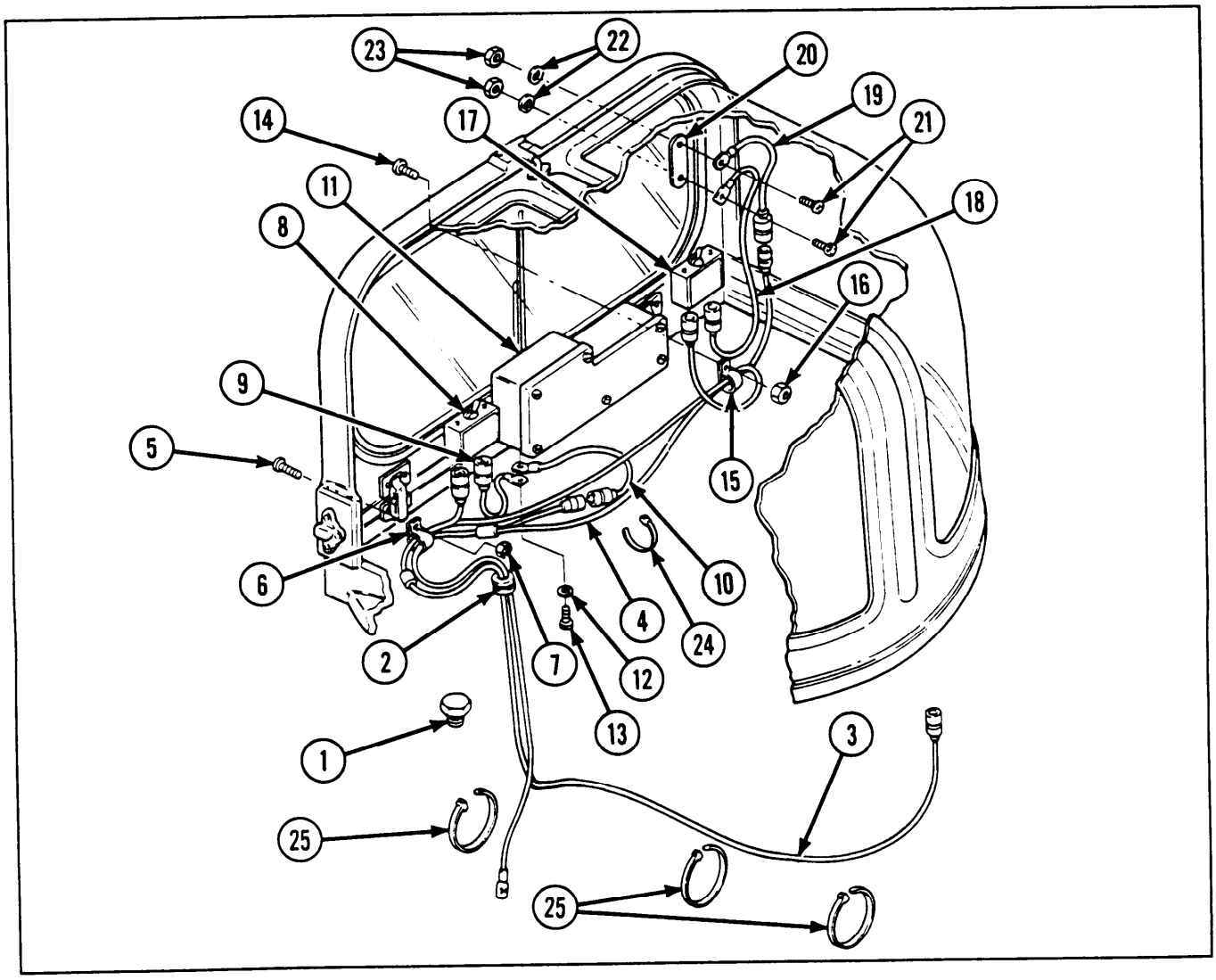
2-188. MAINTENANCE OF DRIVER'S WINDSHIELD ENCLOSURE KIT—ELECTRICAL WIRING (CONT).

INSPECTION/REPAIR (CONT)

4 Electrical wires and insulation sleeving are manufactured items, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



1 Remove electrical end seal plug (1) from hole, and install rubber grommet (2), circuit breaker to wiper motor and defroster switch electrical lead assembly (3), and wiper motor and defroster lead disconnects electrical lead assembly (4).

2 Install machine screw (5), loop clamp (6), and new self-locking nut (7).

3 Connect circuit breaker to wiper motor and defroster switch electrical lead assembly (3) to toggle switch (8).

4 Connect wiper motor to switch electrical lead (9) to toggle switch (8).

5 Connect defroster ground lead disconnects electrical lead (10) to wiper motor and defroster lead disconnects electrical lead assembly (4).

6 Position defroster ground lead disconnects electrical lead (10) and wiper motor to switch electrical lead (9) on windshield wiper motor assembly (11), and secure with new lockwasher (12) and machine screw (13).

7 Install machine screw (14), loop clamp (15), and new self-locking nut (16).

8 Connect circuit breaker to wiper motor and defroster switch electrical lead assembly (3) to toggle switch (17) and circuit breaker behind driver's seat.

9 Connect disconnect defroster to switch and ground lead disconnect electrical lead (18) to toggle switch (17).

10 Connect defroster to switch and ground lead disconnect electrical lead (19) to wiper motor and defroster lead disconnects electrical lead assembly (4).

11 Position disconnect defroster to switch and ground lead disconnect electrical lead (18) and defroster to switch and ground lead disconnect electrical lead (19) on defroster (20), and secure with two machine screws (21), two new lockwashers (22), and two hexagon plain nuts (23).

12 Install tiedown strap (24) and three marker bands (25).

2-189. MAINTENANCE OF DRIVER'S WINDSHIELD ENCLOSURE KIT—DRIVER'S BASE ASSEMBLY AND RELATED PARTS AND ENCLOSURE.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Materials/Parts
Cotter pin (2)
LockWasher
LockWasher (2)
LockWasher (4)
LockWasher (6)
Self-locking nut (4)

References
TM 9-2350-238-24P-1

Equipment Conditions
MASTER power switch OFF
2-640 Batteries disconnected

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

2-189. MAINTENANCE OF DRIVER'S WINDSHIELD ENCLOSURE KIT—DRIVER'S BASE ASSEMBLY AND RELATED PARTS AND ENCLOSURE (CONT).

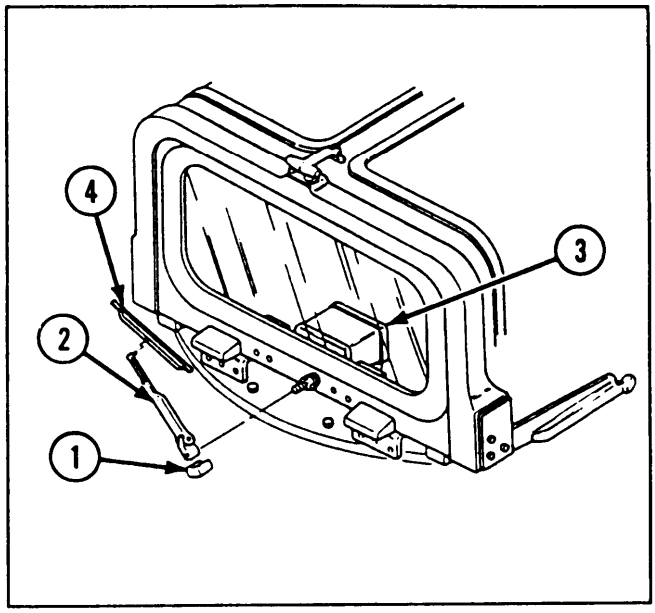
REMOVAL

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Tag and disconnect all electrical leads. Refer to page 2-371.

2 Remove wiper blade clip (1) and windshield wiper arm (2) from windshield wiper motor assembly (3). Remove windshield wiper blade (4) from windshield wiper arm.



NOTE

Nut lockwasher, cup washer, and rubber washer are supplied with windshield wiper motor assembly. Use care not to lose or damage these components.

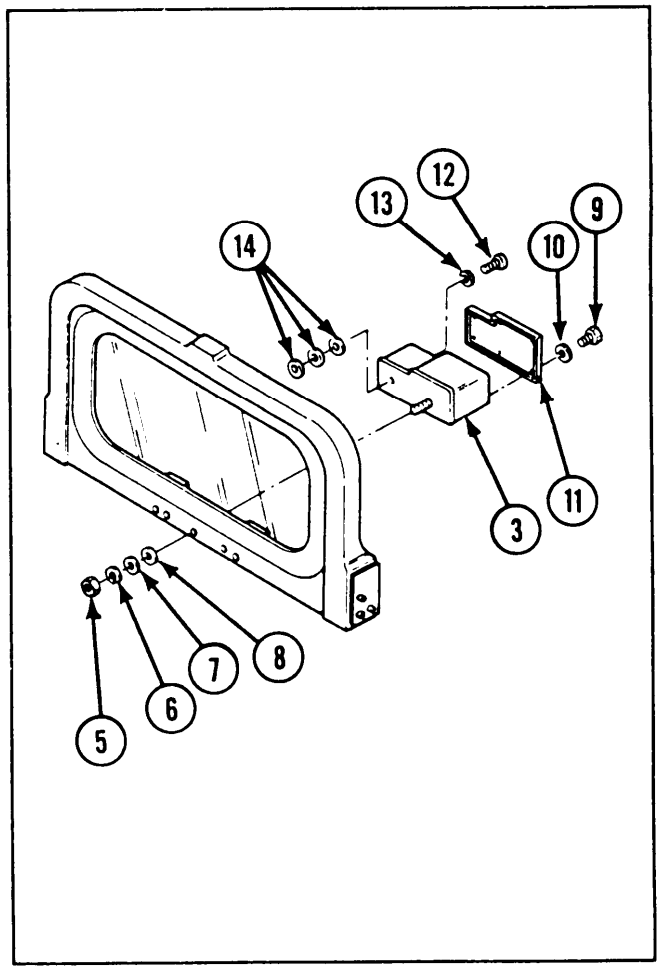
3 Remove nut (5), lockwasher (6), cup washer (7), and rubber washer (8) from windshield wiper motor assembly (3).

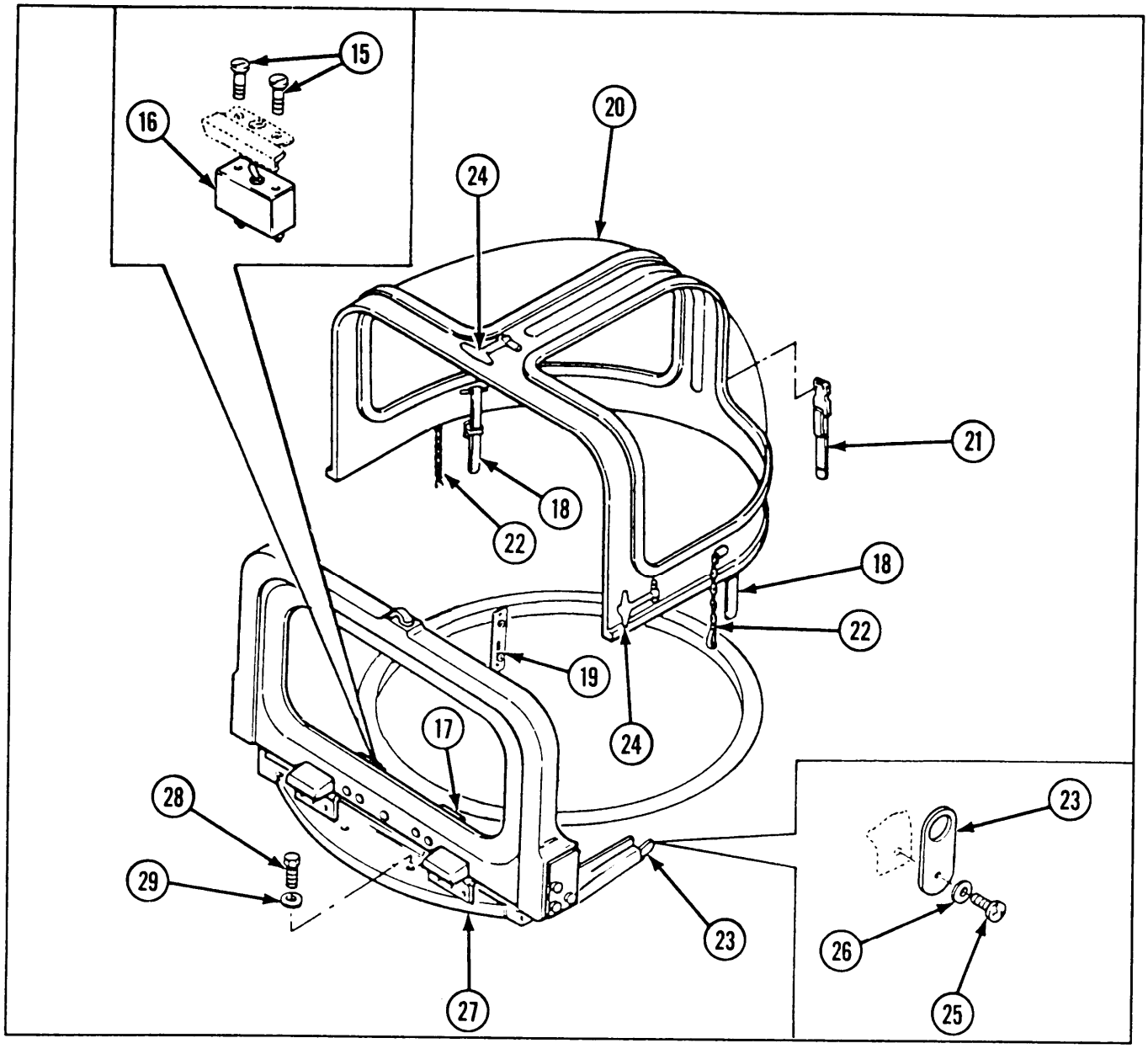
NOTE

The cover on the windshield wiper motor assembly must be removed to gain access to some of the windshield wiper motor assembly attaching hardware.

4 Remove six machine screws (9), six lockwashers (10), and cover (11) from windshield wiper motor assembly (3).

5 Remove machine screw (12), flat washer (13), windshield wiper motor assembly (3), and three flat washers (14).





6 Remove four machine screws (15) and two toggle switches (16 and 17).

7 Disconnect vehicle safety belt (18) from machine screw (19) on each side of vehicular window (20).

8 Remove webbing strap (21). Disconnect driver's cupola chain (22) from chain plate link (23) on both sides of vehicular window (20). Unlatch three fasteners (24), and remove vehicular window.

NOTE

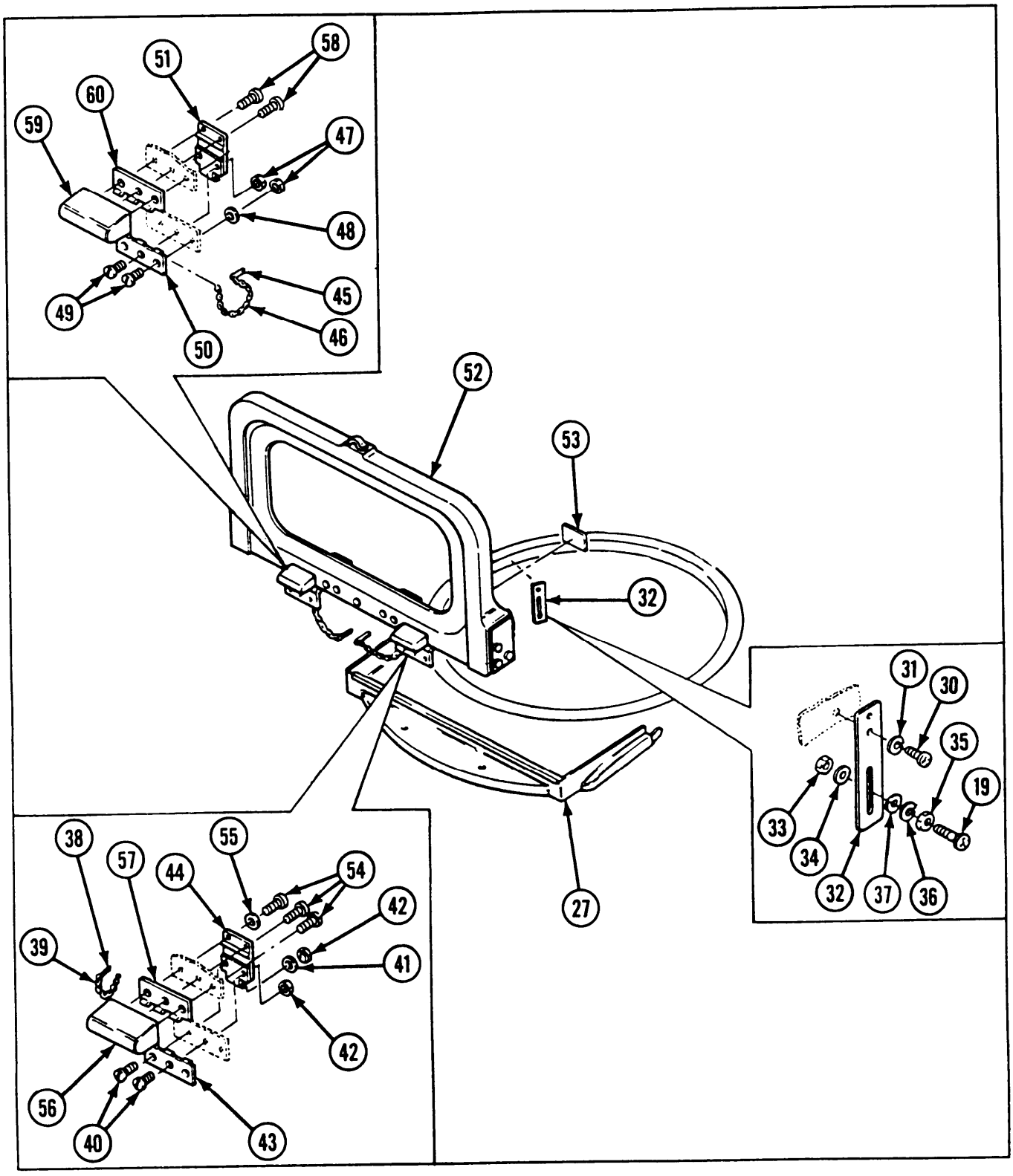
Step 9 is written for removal of one chain plate link, but applies to both chain plate links.

9 Remove machine screw (25), flat washer (26), and chain plate link (23) from driver's base assembly (27).

10 Remove two machine screws (28), two flat washers (29), and driver's base assembly (27).

2-189. MAINTENANCE OF DRIVER'S WINDSHIELD ENCLOSURE KIT—DRIVER'S BASE ASSEMBLY AND RELATED PARTS AND ENCLOSURE (CONT).

REMOVAL (CONT)



NOTE

Steps 11 and 12 are written for one window strap plate, but apply to both window strap plates.

11 Remove two machine screws (30), two lockwashers (31), and window strap plate (32).

12 Remove hexagon plain nut (33), flat washer (34), machine screw (19), hexagon plain nut (35), lockwasher (36), and flat washer (37).

13 Remove cotter pin (38), chain assembly (39), two machine screws (40), flat washer (41), two self-locking nuts (42), and lower half of butt hinge (43) from lower half of windshield pivot retaining spring (44).

14 Remove cotter pin (45), chain assembly (46), two self-locking nuts (47), flat washer (48), two machine screws (49), and lower half of butt hinge (50) from lower half of windshield pivot retaining spring (51).

15 Remove vehicular window (52) from driver's base assembly (27).

16 If damaged, remove identification marker (53) from vehicular window (52).

17 Remove three machine screws (54), flat washer (55), windshield pivot retaining spring (44), windshield support (56), and upper half of butt hinge (57) from vehicular window (52).

18 Remove two machine screws (58), windshield pivot retaining spring (51), windshield support (59), and upper half of butt hinge (60) from vehicular window (52).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Vehicular window is a repairable assembly. Refer to page 2-1084.

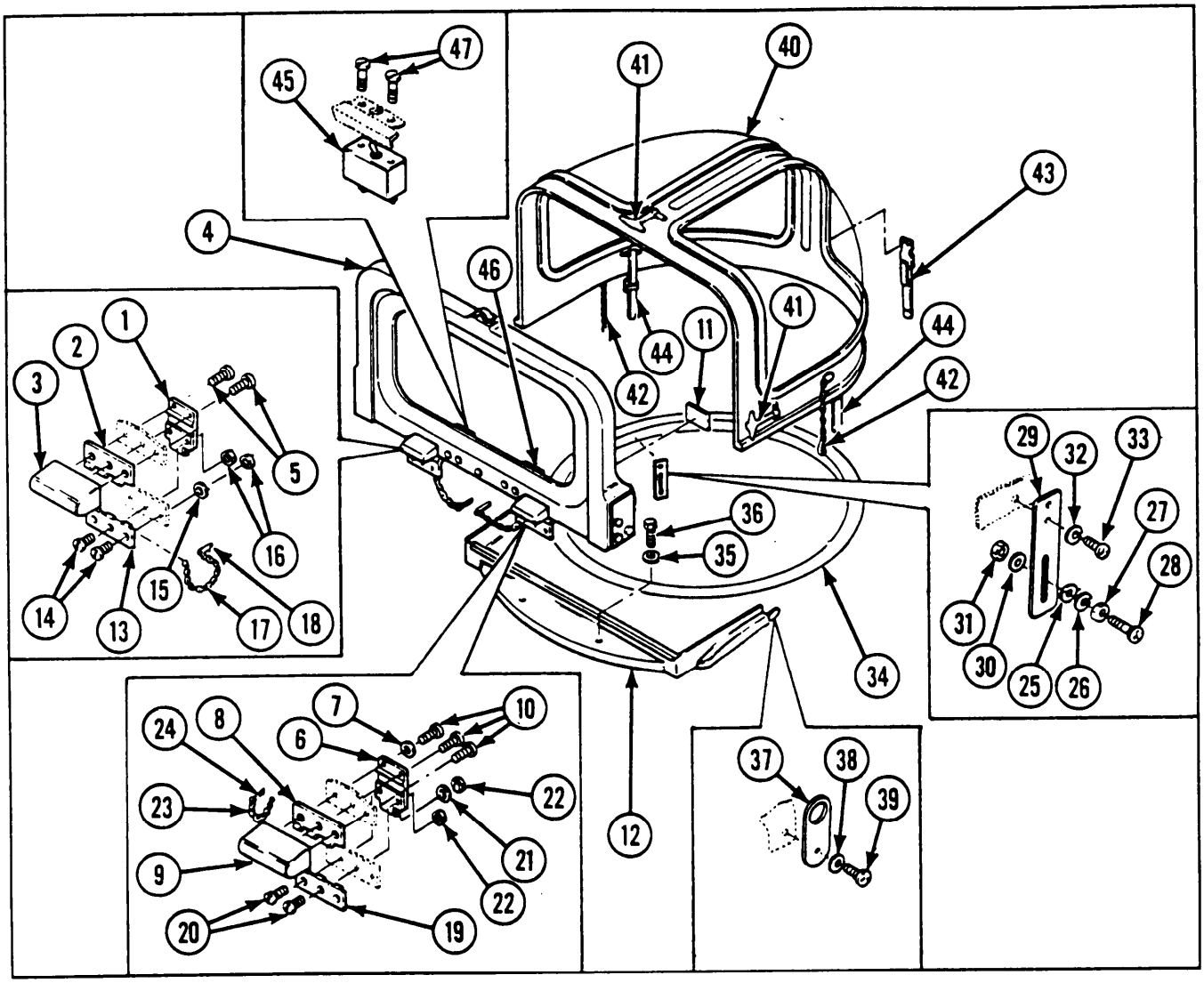
3 Driver's and crane operator's vehicular windows are repairable assemblies. Refer to page 2-1081.

4 Windshield wiper motor assembly is a repairable assembly. Notify direct support maintenance.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-189. MAINTENANCE OF DRIVER'S WINDSHIELD ENCLOSURE KIT—DRIVER'S BASE ASSEMBLY AND RELATED PARTS AND ENCLOSURE (CONT).

INSTALLATION



1 Position windshield pivot retaining spring (1), upper half of butt hinge (2), and windshield support (3) on vehicular window (4). Aline holes, and install two machine screws (5).

2 Position windshield pivot retaining spring (6), flat washer (7), upper half of butt hinge (8), and windshield support (9) on vehicular window (4). Aline holes, and install three machine screws (10).

3 If removed, attach new identification marker (11) to vehicular window (4).

4 Install vehicular window (4) on driver's base assembly (12).

5 Position lower half of butt hinge (13) and windshield pivot retaining spring (1) on driver's base assembly (12), aline holes, and secure with two machine screws (14), flat washer (15), and two new self-locking nuts (16).

6 Align holes in upper (2) and lower (13) halves of butt hinge, and secure by installing chain assembly (17) and new cotter pin (18).

7 Position lower half of butt hinge (19) and windshield pivot retaining spring (6) on driver's base assembly (12), align holes, and secure with two machine screws (20), flat washer (21), and two new self-locking nuts (22).

8 Align holes in upper (8) and lower (19) halves of butt hinge, and secure by installing chain assembly (23) and new cotter pin (24).

NOTE

Steps 9 and 10 are written for one window strap plate, but apply to both window strap plates.

9 Install flat washer (25), new lockwasher (26), hexagon plain nut (27), and machine screw (28) through window strap plate (29), and secure with flat washer (30) and hexagon plain nut (31).

10 Install window strap plate (29), two new lockwashers (32), and two machine screws (33).

11 Position top edge of driver's base assembly (12) on top edge of driver's cupola opening (34), and secure with two flat washers (35) and two machine screws (36). Grind or trim pads to position drive base assembly on driver's cupola opening.

NOTE

Step 12 is written for installation of one chain plate link, but applies to both chain plate links.

12 Install chain plate link (37), flat washer (38), and machine screw (39) on driver's base assembly (12).

13 Position vehicular window (40) on driver's base assembly (12). Latch three fasteners (41), and connect driver's cupola chain (42) to chain plate link (37) on both sides of vehicular window.

14 Install webbing strap (43) on rear of vehicular window (40).

15 Connect vehicular safety belt (44) to machine screw (28) on each side of vehicular window (40). If necessary, adjust distance between vehicular safety belt (44) and machine screw (28) as follows:

a. Loosen hexagon plain nut (27).

b. Adjust machine screw (28) in or out until snap on vehicular safety belt (44) fastens over head of machine screw.

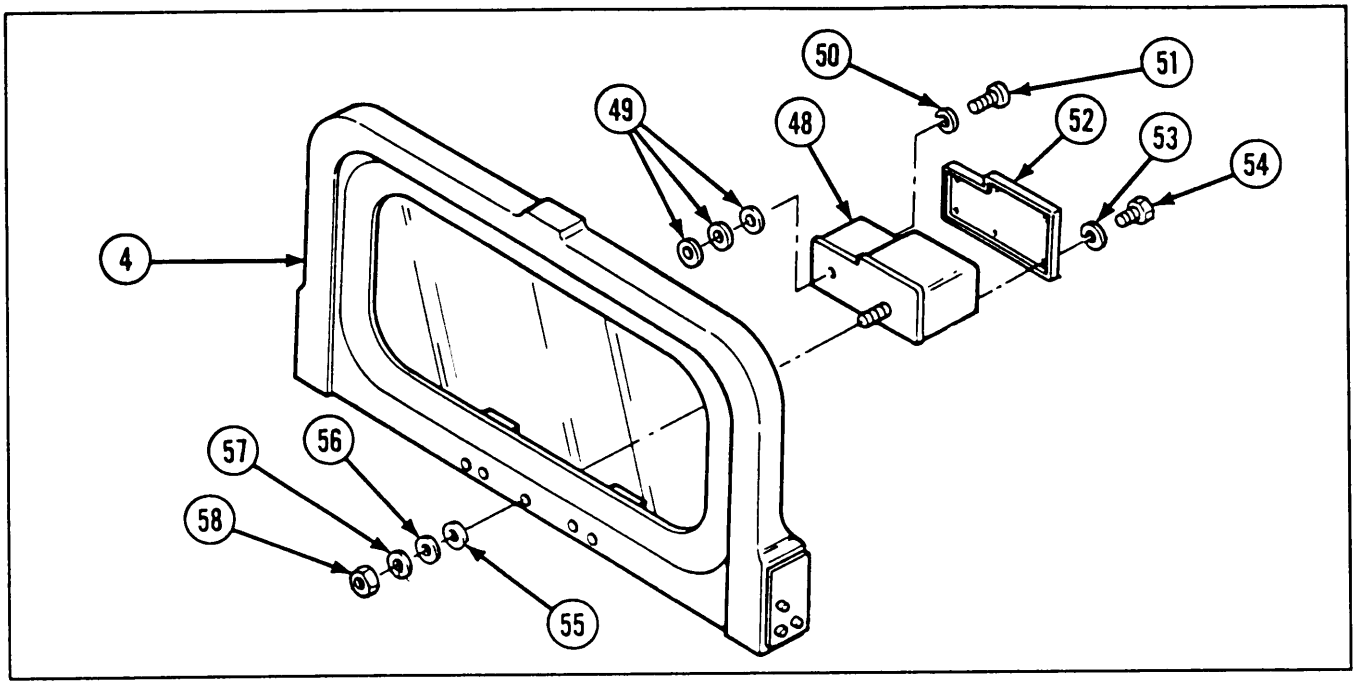
c. Adjust position of machine screw (28) in slot of chain plate link (29) to secure vehicular window (40) to driver's cupola opening (34).

d. Tighten hexagon plain nut (27).

16 Install two toggle switches (45 and 46) and four machine screws (47).

2-189. MAINTENANCE OF DRIVER'S WINDSHIELD ENCLOSURE KIT—DRIVER'S BASE ASSEMBLY AND RELATED PARTS AND ENCLOSURE (CONT).

INSTALLATION (CONT)

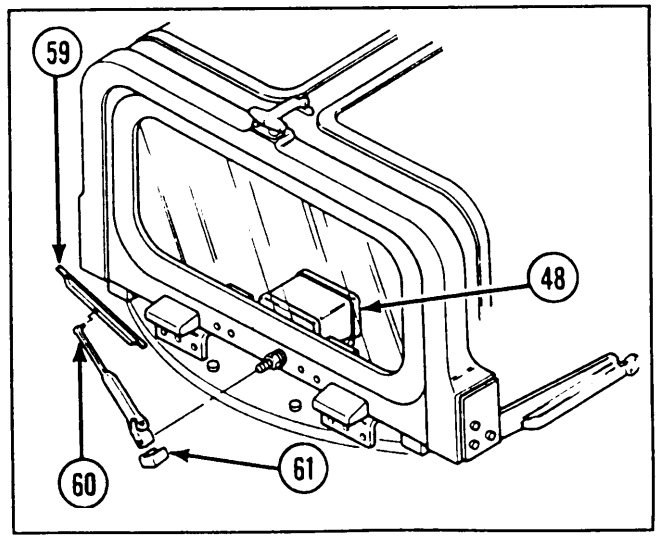


17 Insert windshield wiper motor assembly (48) through vehicuiar window (4).

18 Install three flat washers (49) as spacers between vehicular window (4) and windshield wiper motor assembly (48), and secure with flat washer (50) and machine screw (51).

19 Install cover (52), six new lockwashers (53), and six machine screws (54) on windshield wiper motor assembly (48).

20 Install rubber washer (55), cup washer (56), new lockwasher (57), and nut (58).



21 Install windshield wiper blade (59) on windshield wiper arm (60). Install windshield wiper arm and wiper blade clip (61) on windshield wiper motor assembly (48).

22 Untag and connect all electrical leads. Refer to page 2-371.

2-190. MAINTENANCE OF DRIVER'S AND CRANE OPERATOR'S VEHICULAR WINDOWS (DRIVER'S WINDSHIELD ENCLOSURE KIT).

This task covers: a. *Disassernb/y* b. *Inspeotbn/Repair* *c. Reassembly*

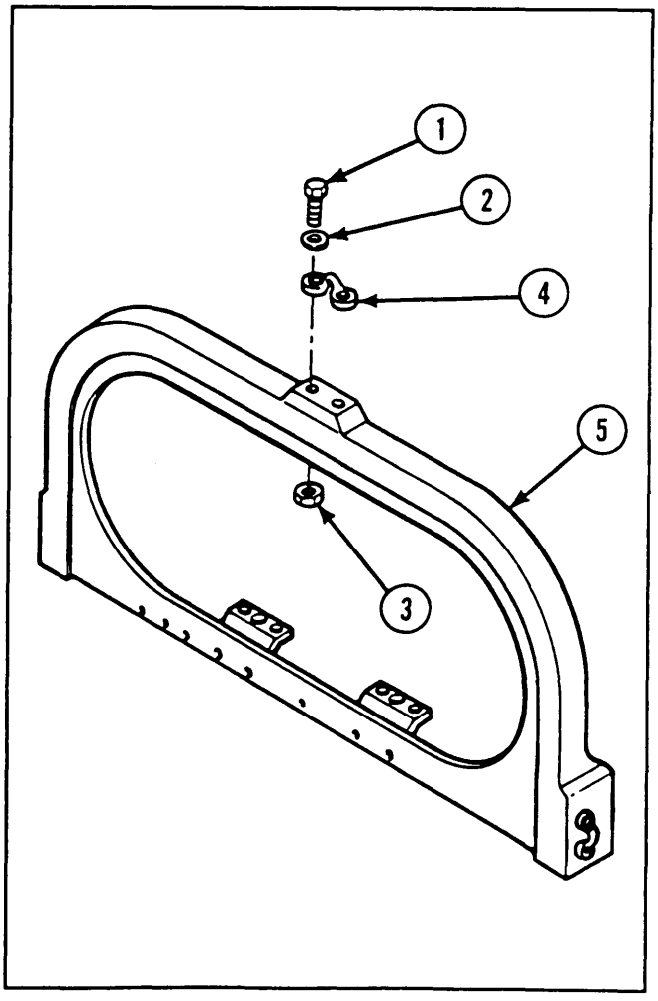
INITIAL SETUP

Materials/Parts
LockWasher (6)
Self-locking nut (6)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-1073 Vehicular window removed

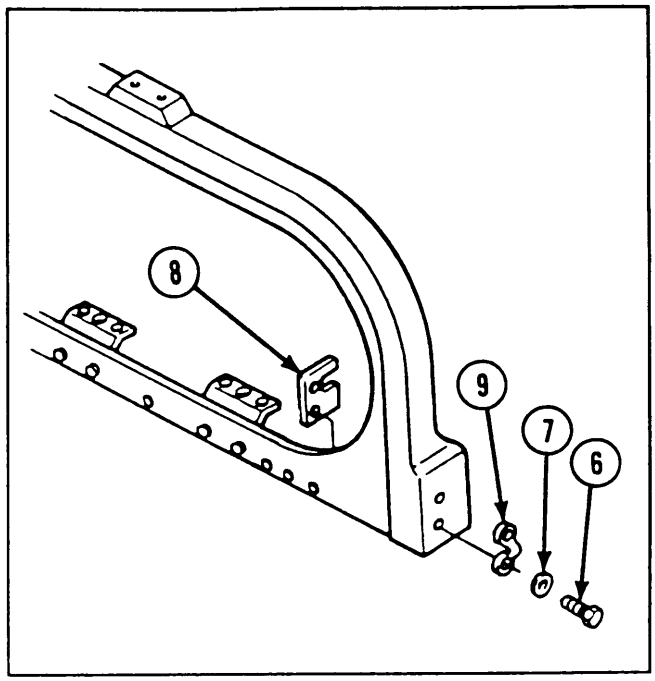
DISASSEMBLY



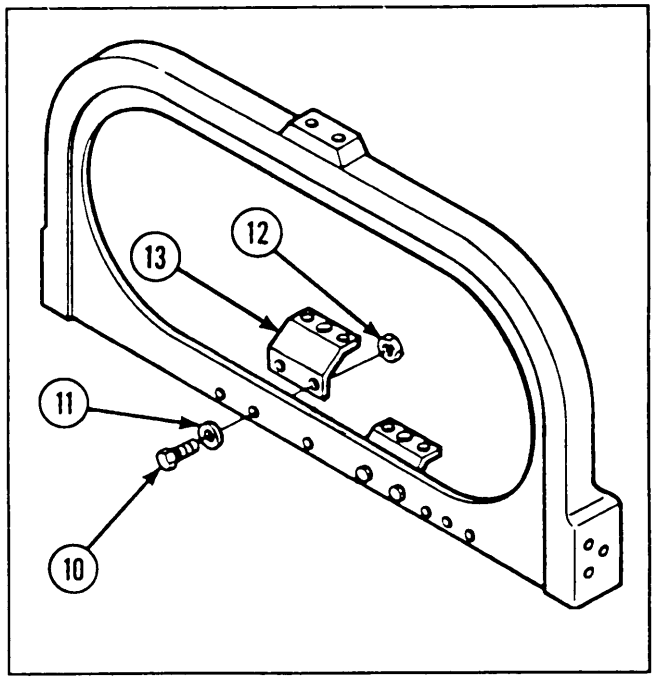
1 Remove two machine screws (1), two flat washers (2), two self-locking nuts (3), and top hood catch bracket (4) from windshield frame (5).

2-190. MAINTENANCE OF DRIVER'S AND CRANE OPERATOR'S VEHICULAR WINDOWS (DRIVER'S WINDSHIELD ENCLOSURE KIT) (CONT).

DISASSEMBLY (CONT)



2 Remove six machine screws (6), six lockwashers (7), two locking plates (8), and two side latch hood catch brackets (9).



3 Remove four machine screws (10), four flat washers (11), four self-locking nuts (12), and two electrical switch support brackets (13).

INSPECTION/REPAIR

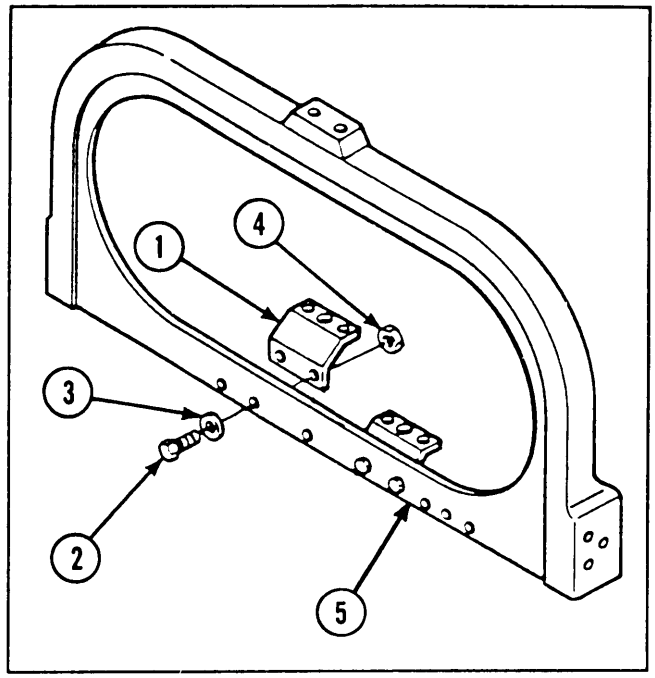
1 Inspect for broken, damaged, or missing parts.

2 For further repair of vehicular window, notify direct support maintenance.

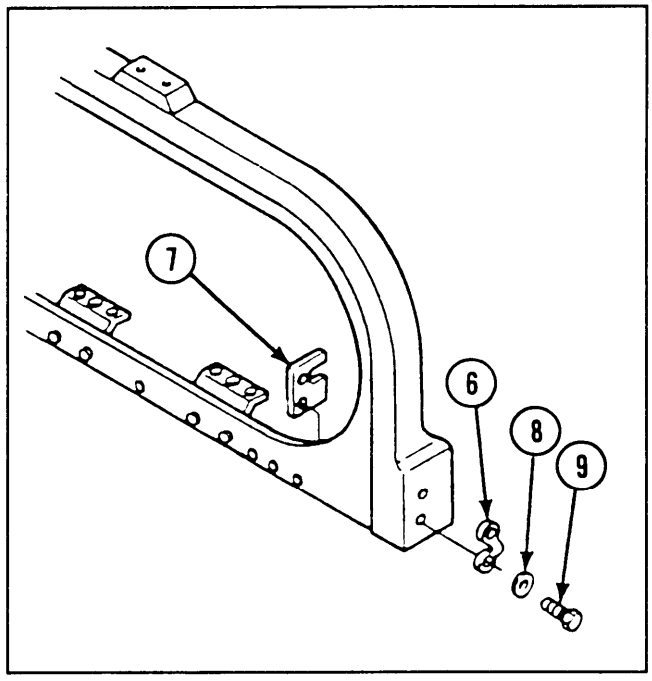
3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

1 Install two electrical switch support brackets (1), four machine screws (2), four flat washers (3), and four new self-locking nuts (4) on windshield frame (5).



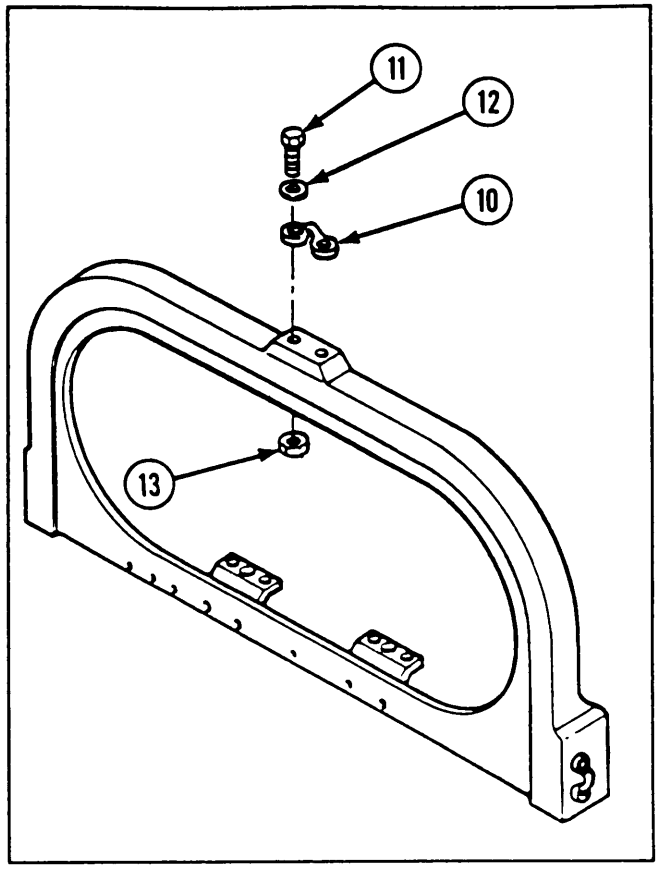
2 Install two side latch hood catch brackets (6), two locking plates (7), six new lockwashers (8), and six machine screws (9).



2-190. MAINTENANCE OF DRIVER'S AND CRANE OPERATOR'S VEHICULAR WINDOWS (DRIVER'S WINDSHIELD ENCLOSURE KIT) (CONT).

REASSEMBLY (CONT)

3 Install top catch bracket (10), two machine screws (11), two flat washers (12), and two new self-locking nuts (13).



2-191. MAINTENANCE OF VEHICULAR WINDOW (DRIVER'S WINDSHIELD ENCLOSURE KIT).

This task covers: a. *Disassembly* b. *Inspection/Repair* *c. Reassembly*

INITIAL SETUP

Materials/Parts
LockWasher(12)
Nonmetallic window assembly seal
Self-locking nut (2)
Self-locking nut (6)
Self-locking nut (7)

References
TM 9-2350-238-24 P-1

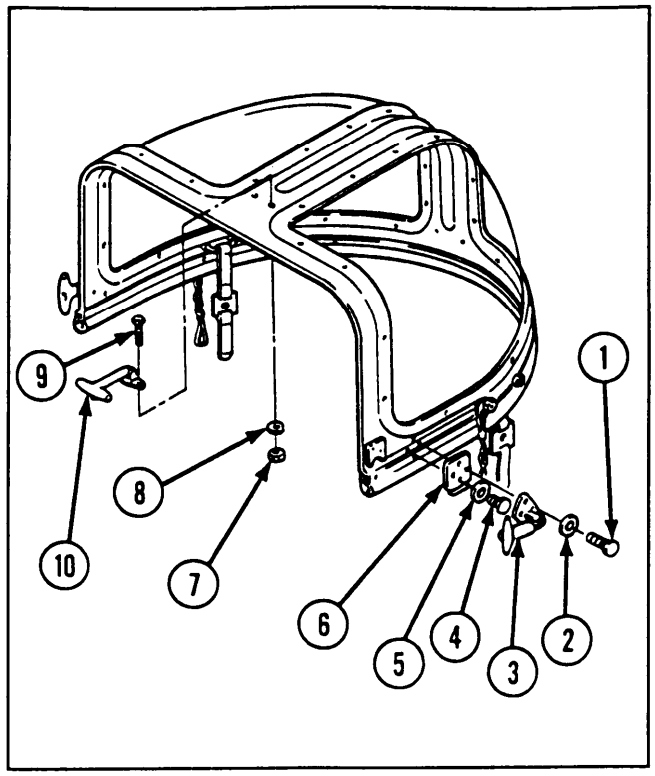
Equipment Conditions
2-1073 Vehicular window removed from driver's cupola

DISASSEMBLY

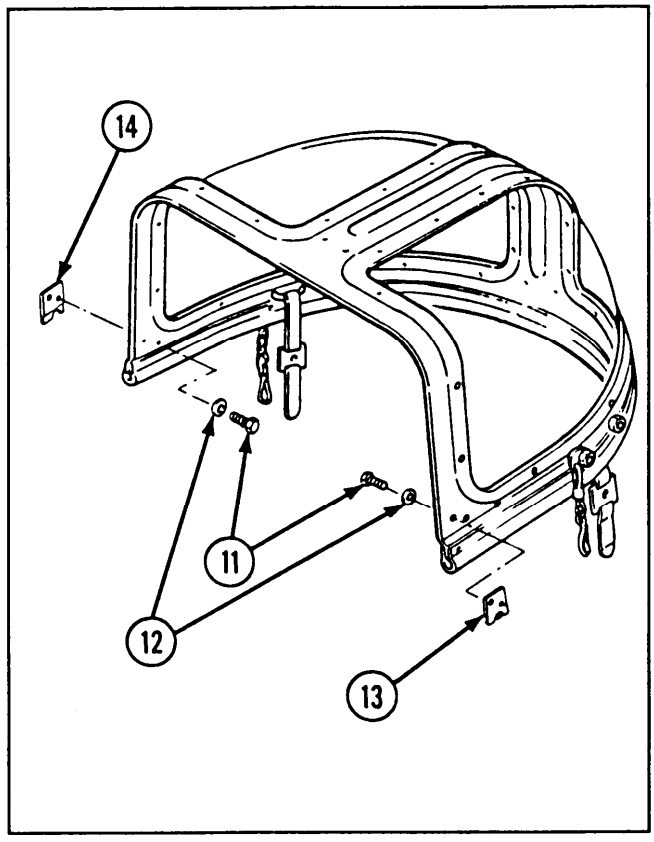
1 Remove four machine screws (1), four lockwashers (2), and two window assembly to windshield assembly cylinder fasteners (3).

2 Remove four machine screws (4), four lockwashers (5), and two window catch pads (6).

3 Remove two self-locking nuts (7), two flat washers (8), two machine screws (9), and window assembly to windshield assembly cylinder fastener (10).

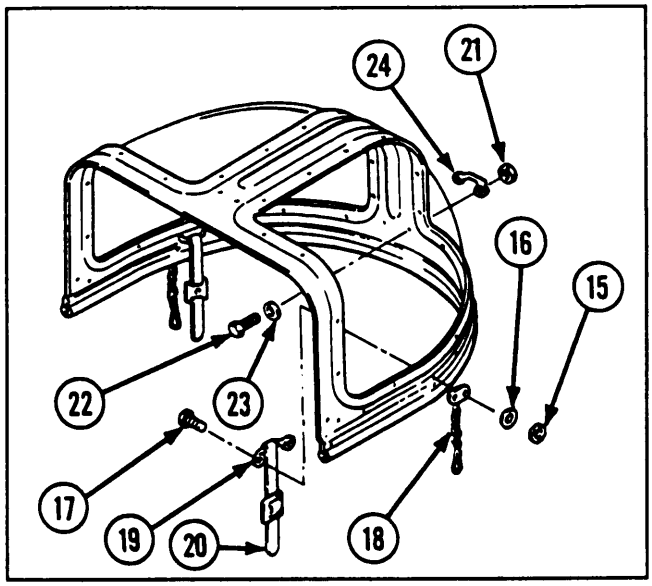


4 Remove four machine screws (11), four lockwashers (12), locking assembly plate (13), and locking assembly plate (14).



2-191. MAINTENANCE OF VEHICULAR WINDOW (DRIVER'S WINDSHIELD ENCLOSURE KIT) (CONT).

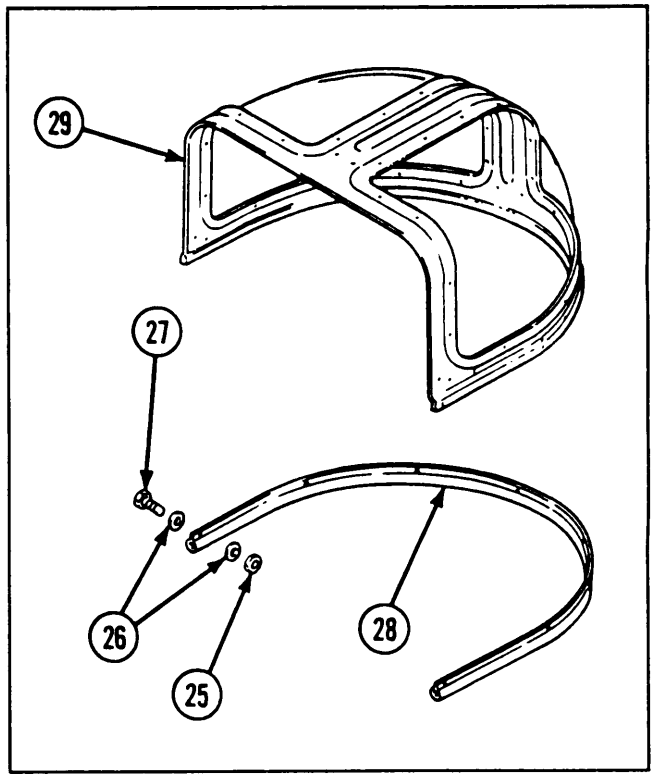
DISASSEMBLY (CONT)



5 Remove four self-locking nuts (15), four flat washers (16), four machine screws (17), *two* window assembly to driver's cupola chains (18), and two strap fastener loops (19).

6 Remove two window assembly to driver's cupola holddown vehicular safety belts (20) from strap fastener loops (19).

7 Remove two self-locking nuts (21), two machine screws (22), two flat washers (23), and strap fastener loop (24).



8 Remove 7 self-locking nuts (25), 14 flat washers (26), and 7 machine screws (27).

9 Remove nonmetallic window assembly seal (28) from driver's cupola cover window frame (29).

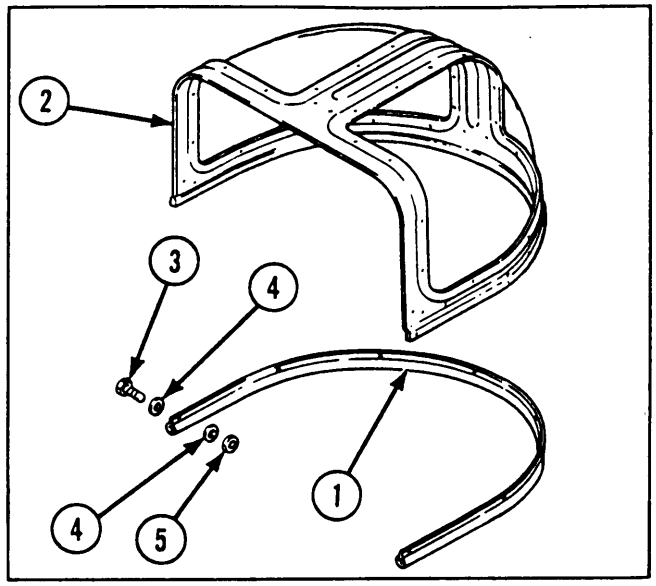
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 For further repair of vehicular window, notify direct support maintenance.

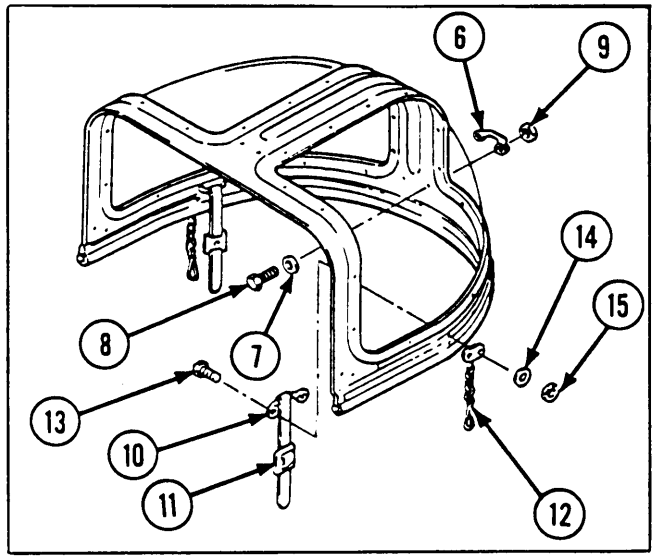
3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY



1 Install new nonmetallic window assembly seal (1) to driver's cupola cover window frame (2).

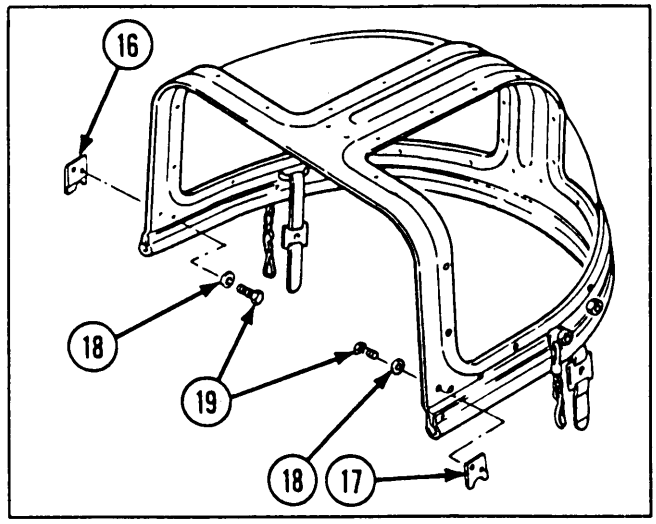
2 Install 7 machine screws (3), 14 flat washers (4), and 7 new self-locking nuts (5).



3 Install strap fastener loop (6), two flat washers (7), two machine screws (8), and two new self-locking nuts (9).

4 Install strap fastener loops (10) to two window assembly to driver's cupola holddown vehicular safety belts (11).

5 Install two strap fastener loops (10), two window assembly to driver's cupola chains (12), four machine screws (13), four flat washers (14), and four new self-locking nuts (15).



6 Install locking assembly plate (16), locking assembly plate (17), four new lockwashers (18), and four machine screws (19).

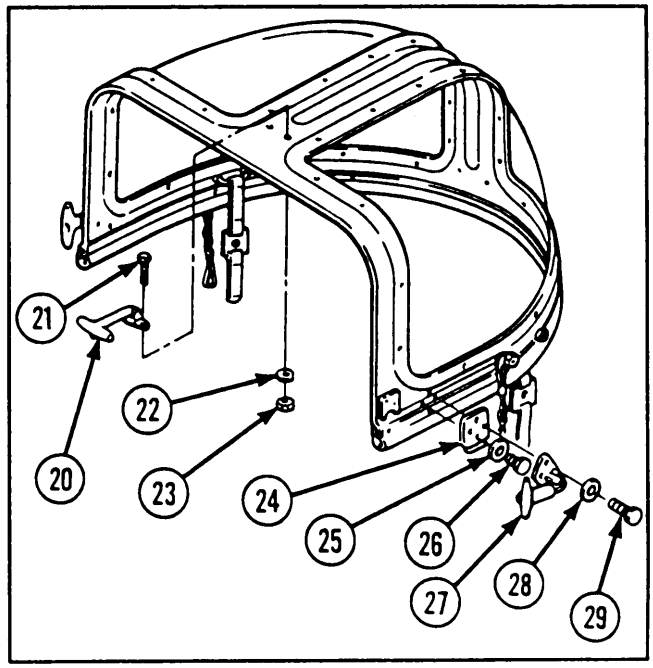
2-191. MAINTENANCE OF VEHICULAR WINDOW (DRIVER'S WINDSHIELD ENCLOSURE KIT) (CONT).

REASSEMBLY (CONT)

7 Install window assembly to windshield assembly cylinder fastener (20), two machine screws (21), two flat washers (22), and two new self-locking nuts (23).

8 Install two window catch pads (24), four new lockwashers (25), and four machine screws (26).

9 Install two window assembly to windshield assembly cylinder fasteners (27), four new lockwashers (28), and four machine screws (29).



2-192. MAINTENANCE OF OIL RESERVOIR HEATER KIT AND ELECTRICAL WIRING.

This task covers:
a. *Removal*
b. *Disassembly*
c. Inspection/Repair
d. *Reassembly*
e. Installation

INITIAL SETUP

Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
- Electrical connector repair tool kit
- Hand wire stripper
- Soldering gun

Materials/Parts
Electrical wire (figure D-2, appx D)
Heater assembly gasket
LockWasher (4)
LockWasher (4)
Solder (item 43, appx C)

References
TB SIG-222
TM 9-2350-238-24P-1

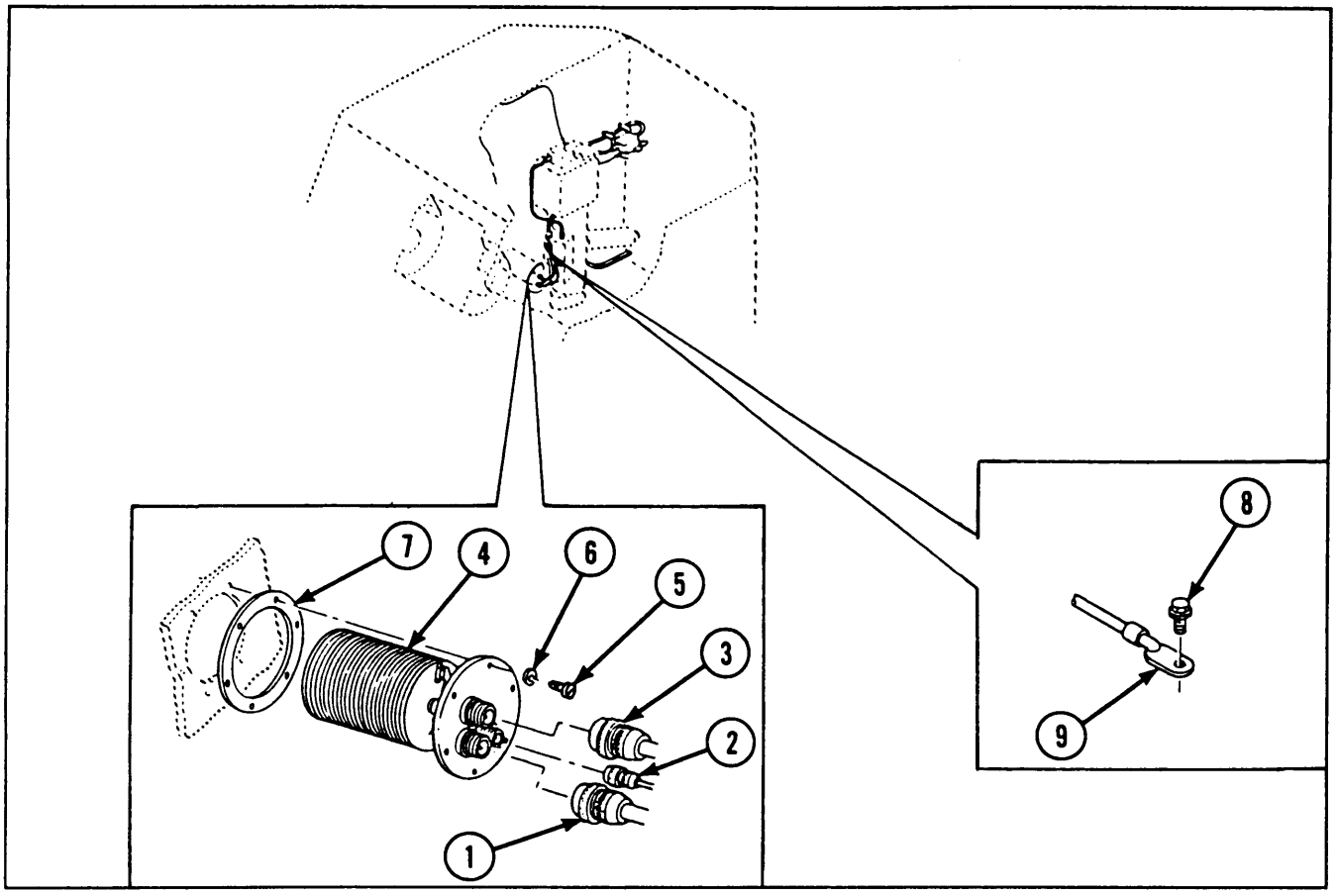
Equipment Conditions
2-384 Hydraulic oil resevoir drained

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. Remove only the hardware which secures the wiring harness or lead being removed.

2 Tag and disconnect plug connectors of relay to heating element electrical lead (1), overheat thermostat to relay branched wiring harness (2), and heating element to slave electrical lead (3) from oil reservoir heater assembly (4).

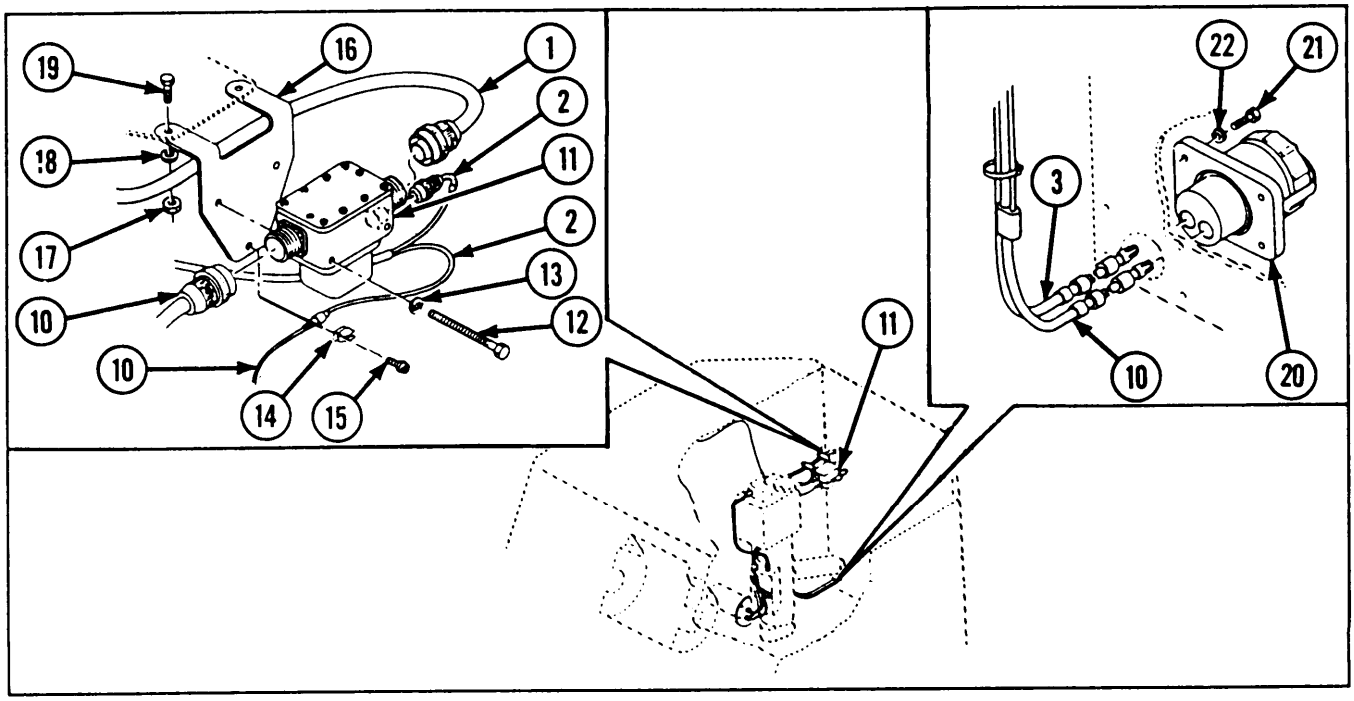
3 Remove six screws (5) and six packings with retainers (6) from oil reservoir heater assembly (4).

4 Pull oil resewoir heater assembly (4) from hydraulic oil reservoir. Remove heater assembly gasket (7).

5 Remove assembled washer screw (8), and disconnect cable terminal (9) of heating element to slave electrical lead (3) from personnel vehicular heater.

2-192. MAINTENANCE OF OIL RESERVOIR HEATER KIT AND ELECTRICAL WIRING (CONT).

REMOVAL (CONT)



6 Tag and disconnect plug connectors of relay and disconnect to slave receptacle special cable assembly (10), relay to heating element electrical lead (1), and overheat thermostat to relay branched wiring harness (2) from immersion heater relay and housing (11). Remove relay to heating element electrical lead.

7 Tag and disconnect shell connector of overheat thermostat to relay branched wiring harness (2) from relay and disconnect to slave receptacle special cable assembly (10). Remove overheat thermostat to relay branched wiring harness.

8 Remove hexagon head capscrews (12), two lockwashers (13), and immersion heater relay and housing (11).

9 Remove shell connector of relay and disconnect to slave receptacle special cable assembly (10) from spring tension clip (14).

10 Remove assembled washer screw (15) and spring tension clip (14) from angle bracket (16).

11 Remove two hexagon plain nuts (17), two lockwashers (18), two machine bolts (19), and angle bracket (16).

12 Unsolder heating element to slave electrical lead (3) from slave receptacle connector (20). Remove heating element to slave electrical lead.

13 Unsolder relay and disconnect to slave receptacle special cable assembly (10) from slave receptacle connector (20). Remove relay and disconnect to slave receptacle special cable assembly.

14 Remove four machine bolts (21), four lockwashers (22), and slave receptacle connector (23) from outside of cab.

DISASSEMBLY

For disassembly of wiring harness plug connectors, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 For repair of cable terminal, refer to general maintenance, page 2-371.

4 Electrical wire is a manufactured item, refer to appendix D.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

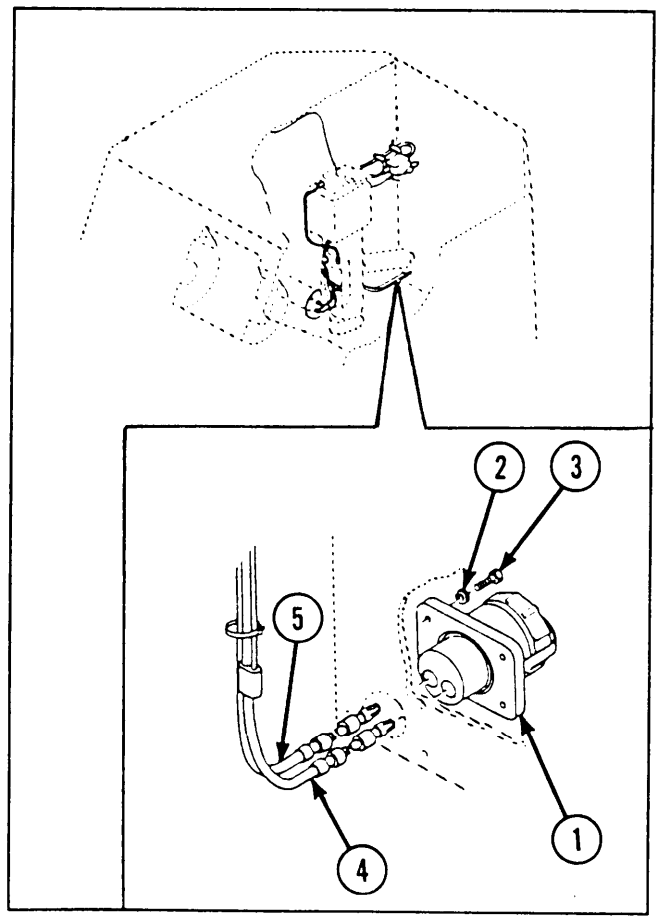
For reassembly of wiring harness plug connectors, refer to general maintenance, page 2-371.

INSTALLATION

1 Install slave receptacle connector (1) with four new lockwashers (2) and four machine bolts (3).

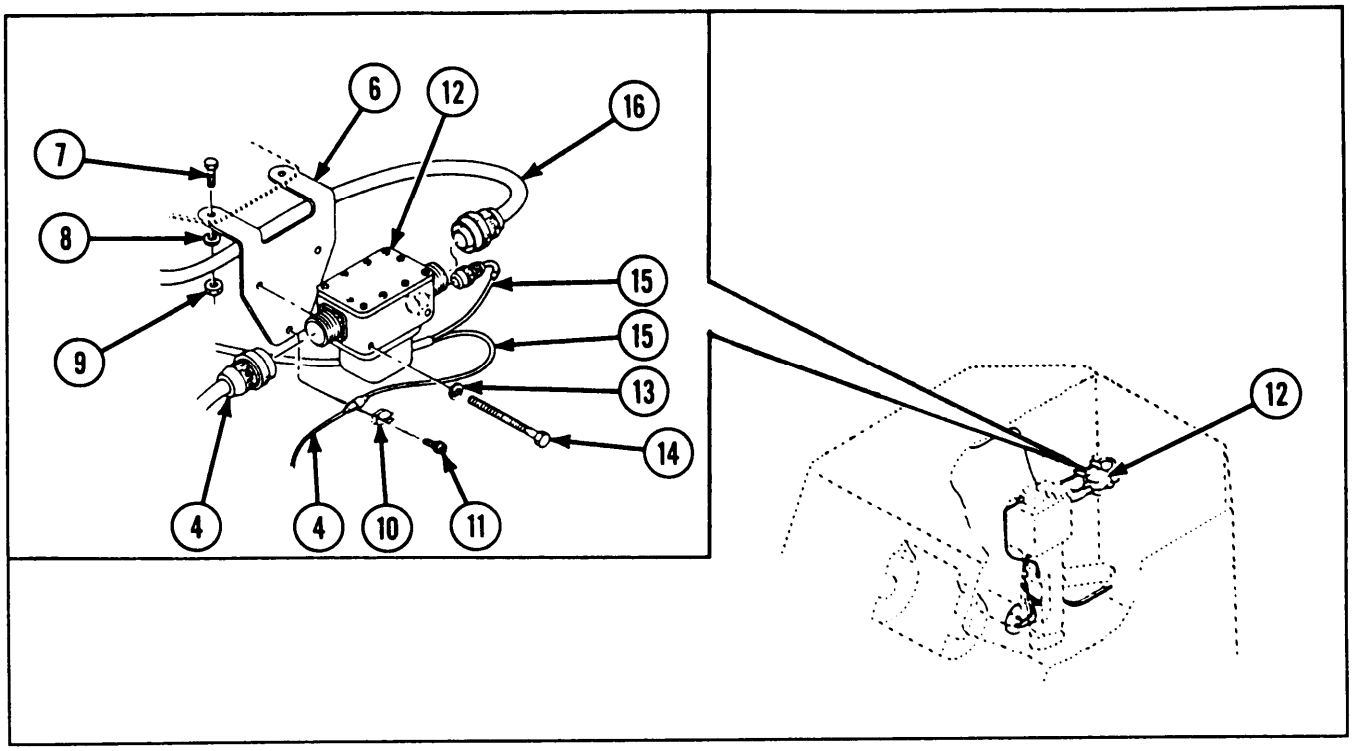
2 Install relay and disconnect to slave receptacle special cable assembly (4) to slave receptacle connector (1). Solder lead to connector per TB SIG-222.

3 Install heating element to slave electrical lead (5) to slave receptacle connector (1). Solder lead to connector per TB SIG-222.



2-192. MAINTENANCE OF OIL RESERVOIR HEATER KIT AND ELECTRICAL WIRING (CONT).

INSTALLATION (CONT)



4 Install angle bracket (6), two machine bolts (7), two new lockwashers (8), and two hexagon plain nuts (9).

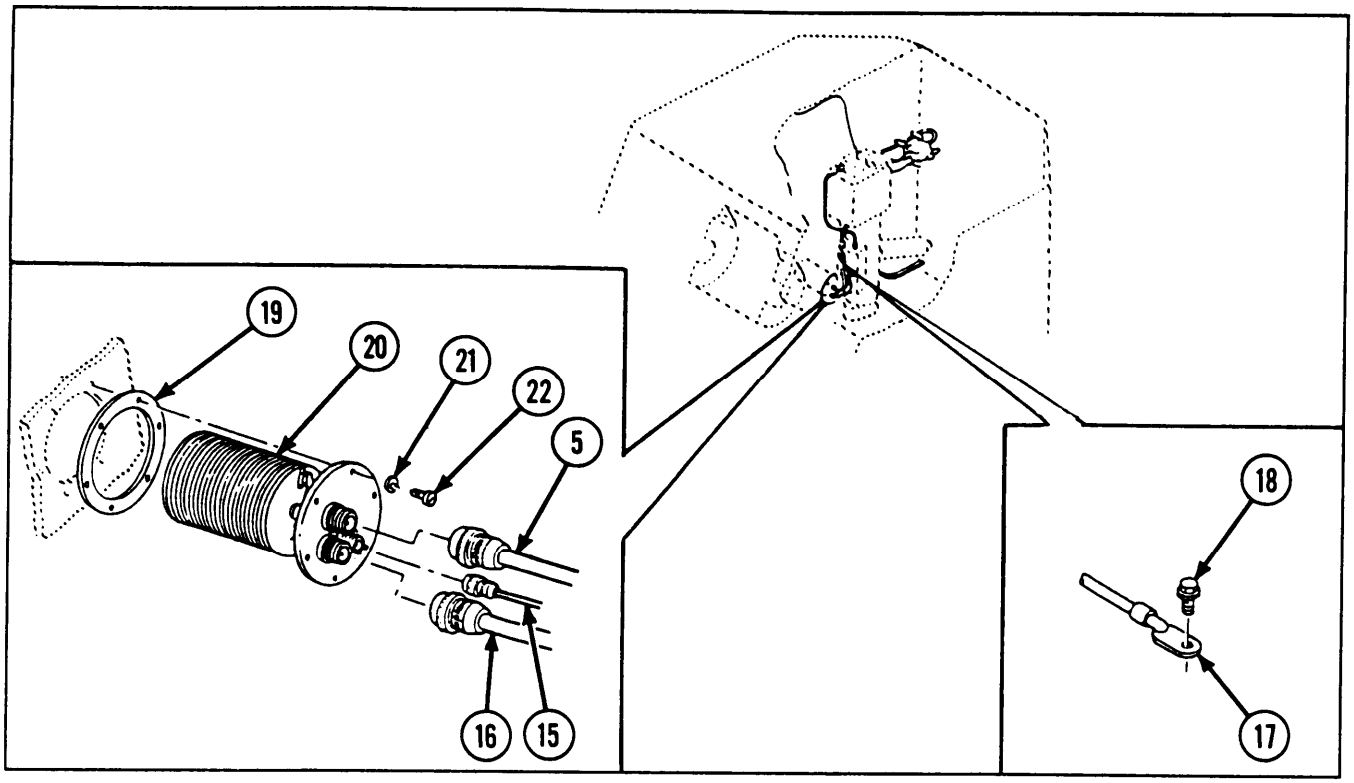
5 Install spring tension clip (10) and assembled washer screw (11) on angle bracket (6).

6 Install shell connector of relay and disconnect to slave receptacle special cable assembly (4) in spring tension clip (10).

7 Install immersion heater relay and housing (12), two new lockwashers (13), and two hexagon head capscrews (14).

8 Install overheat thermostat to relay branched wiring harness (15). Untag and connect shell connector to relay and disconnect to slave receptacle special cable assembly (4) at line connection.

9 Install relay to heating element electrical lead (16). Untag and connect plug connectors of overheat thermostat to relay branched wiring harness (15), relay to heating element electrical lead, and relay and disconnect to slave receptacle special cable assembly (4) to immersion heater relay and housing (12).



10 Connect cable terminal (17) of heating element to slave electrical lead (5) to personnel vehicular heater with assembled washer screw (18).

11 Install new heater assembly gasket (19).

12 Install oil reservoir heater assembly (20) in hydraulic oil reservoir.

13 Install six packings with retainers (21) and six screws (22).

14 Untag and connect plug connectors of heating element to slave electrical lead (5), overheat thermostat to relay branched wiring harness (15), and relay to heating element electrical lead (16) to oil reservoir heater assembly (20).

15 Wiring harnesses and leads are secured to the hull and components with loop clamps, straps, clips, ground screws, etc. During installation, make sure the wiring harness or lead is secure and all hardware is tight.

2-193. MAINTENANCE OF VEHICULAR PARTS KIT—BOOTS, PLUGS, TRAYS, AND RELATED PARTS.

This task covers:	a. *Removal*	b. *Inspection/Repair*	*c. Installation*

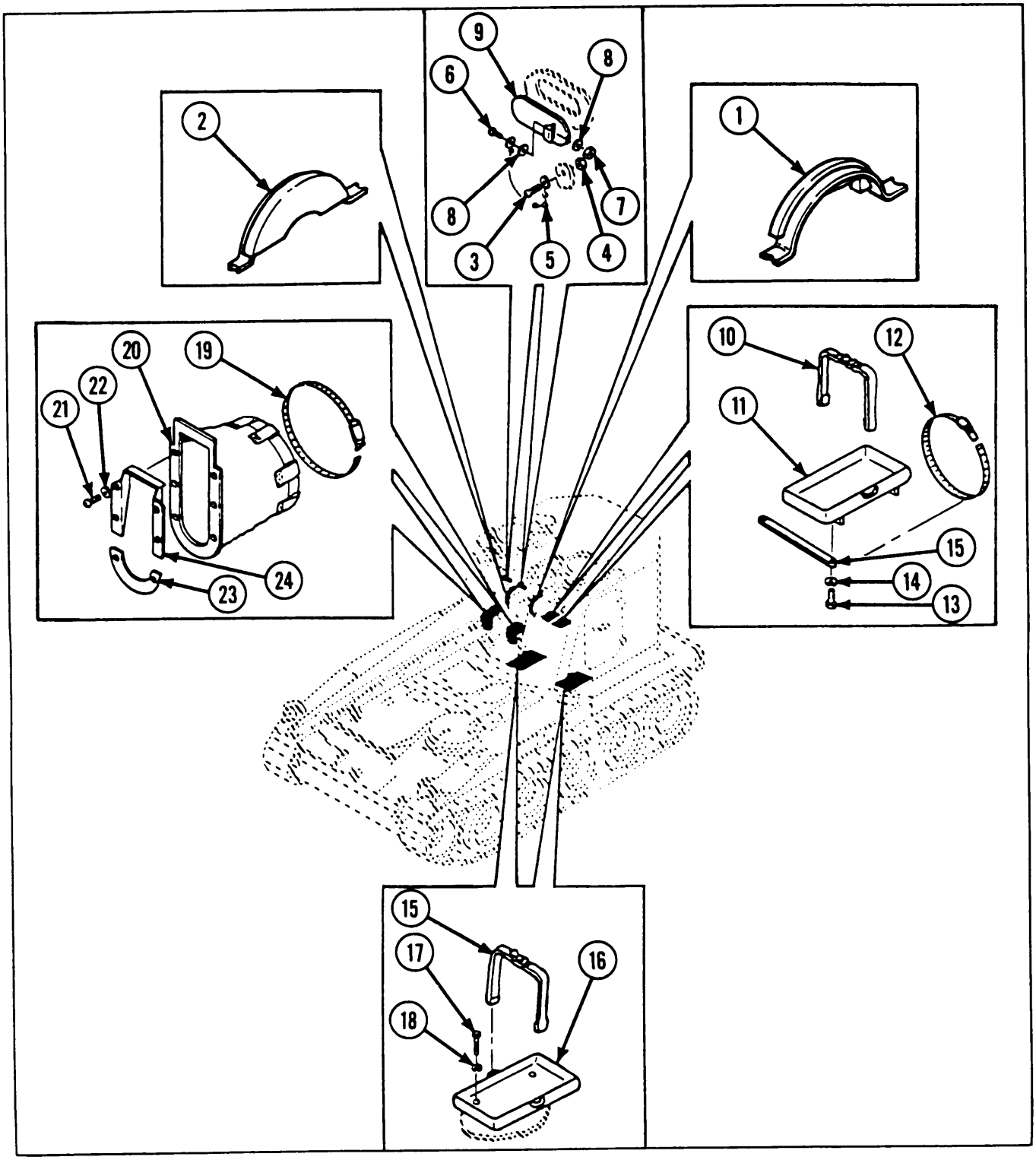
INITIAL SETUP

Materials/Parts
LockWasher (10)
Self-locking nut (2)

References
TM 9-2350-238-24P-1

2-193. MAINTENANCE OF VEHICULAR PARTS KIT—BOOTS, PLUGS, TRAYS, AND RELATED PARTS (CONT).

REMOVAL



1 Remove two seal assemblies (1 and 2) from between winch and curved portion of cab front.

2 Remove machine screw *(3)* and hexagon plain nut (4) to disconnect two single chain assemblies (5).

3 Remove two machine screws (6), two self-locking nuts (7), four flat washers (8), and two single chain assemblies (5) from two boom winch cover protective plugs (9). Remove two boom winch cover protective plugs.

4 Remove two ammunition box tray webbing straps (10) from two boom cylinder ammunition box tray assemblies (11).

5 Remove eight hose clamps (12), and two boom cylinder ammunition box tray assemblies (11), Remove two hexagon head capscrews (13), two lockwashers (14), and ammunition box tray boom cylinder bar (15), and two boom cylinder ammunition box tray assemblies (11).

6 Remove two ammunition box tray webbing straps (15) from two cab ammunition box tray assemblies (16).

7 Remove eight hexagon head capscrews (17), eight lockwashers (18), and two cab ammunition box tray assemblies (16).

8 Remove four hose clamps (19) from two boom cylinder dust and moisture boots (20). Remove twelve machine screws (21), twelve flat washers (22), two lower retainers (23), two upper retainers (24), and two boom cylinder dust and moisture boots (20).

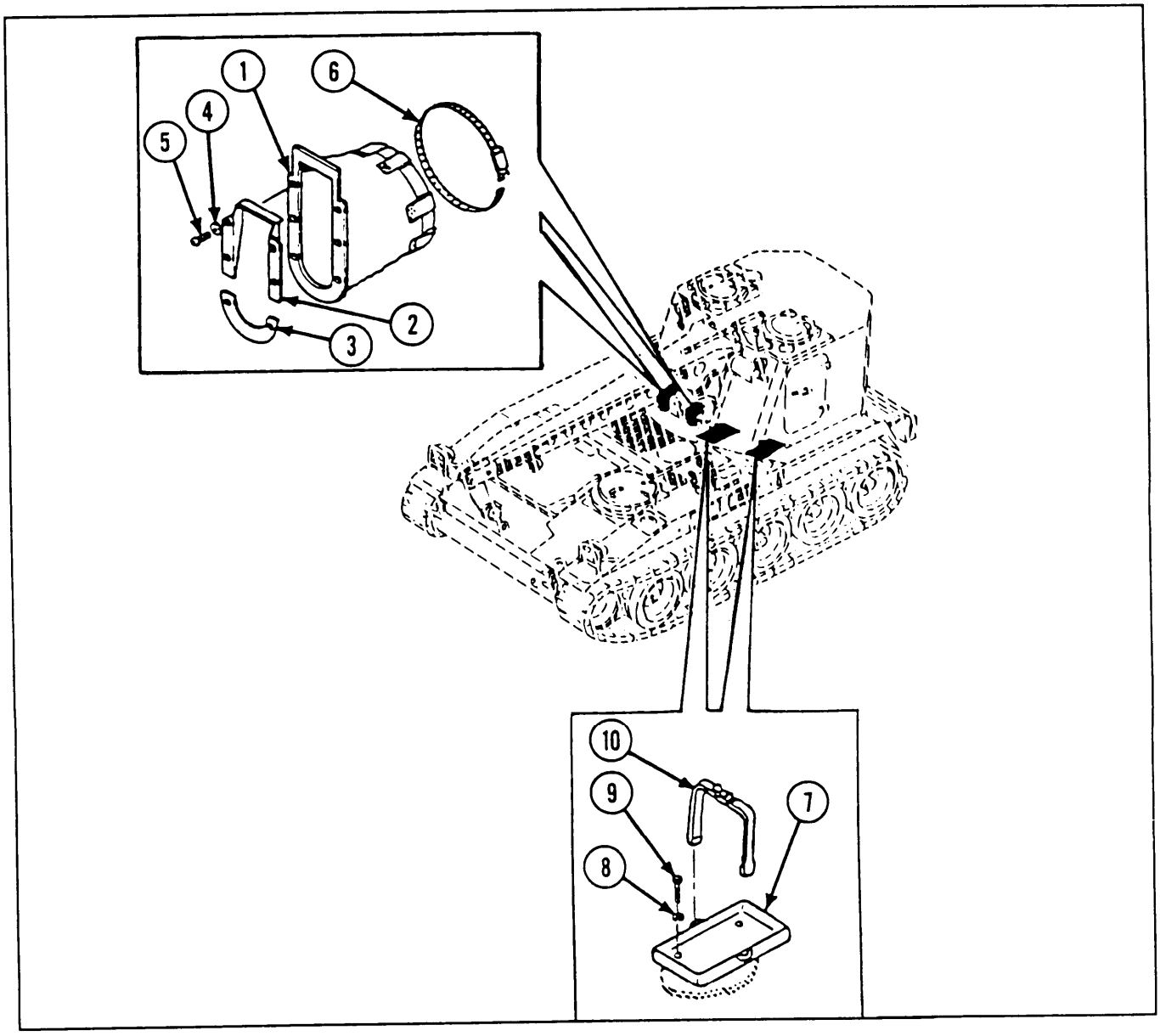
INSPECTIONIREPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-193. MAINTENANCE OF VEHICULAR PARTS KIT—BOOTS, PLUGS, TRAYS, AND RELATED PARTS (CONT).

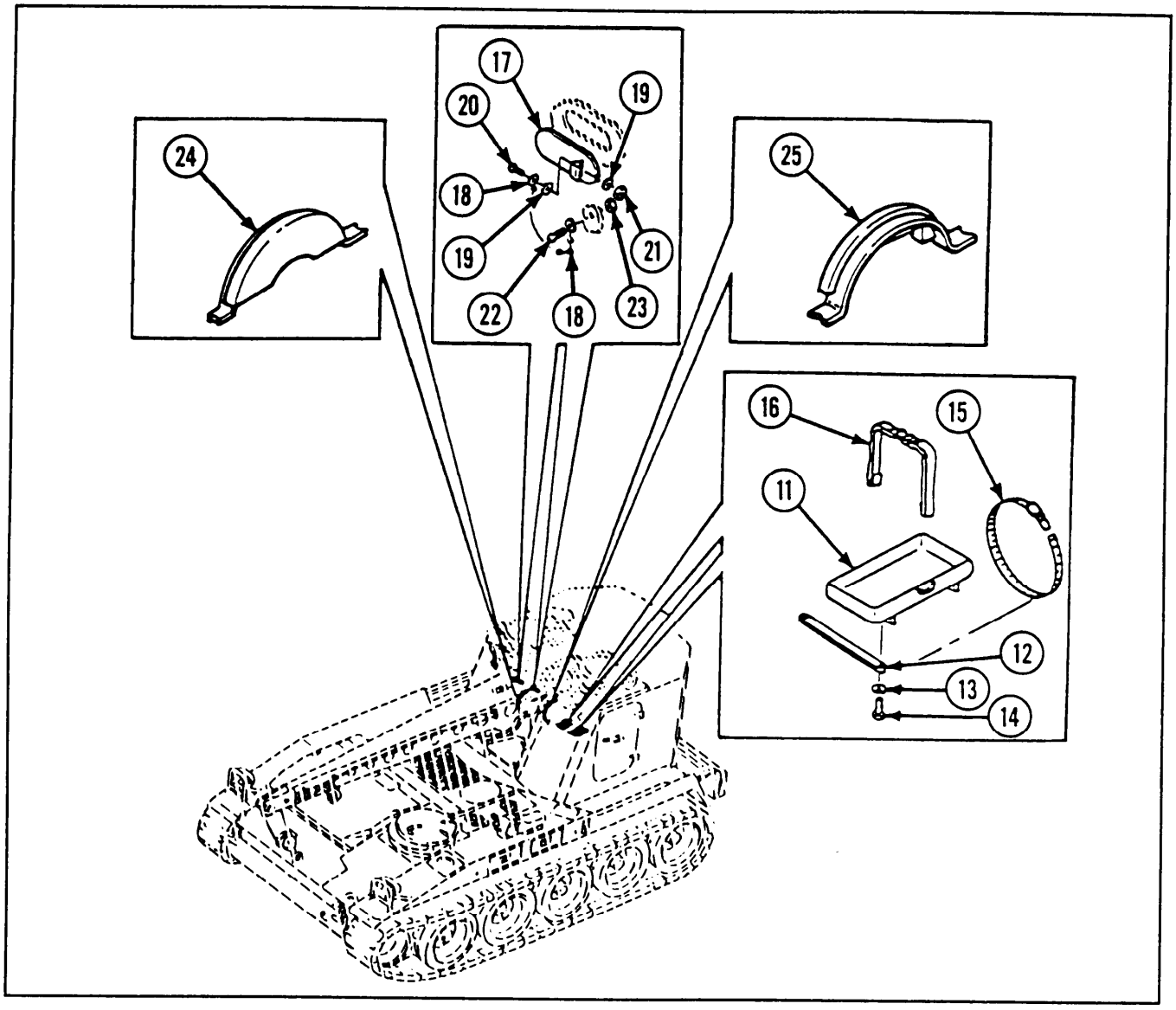
INSTALLATION



1 Install two boom cylinder dust and moisture boots (1), two upper retainers (2), two lower retainers (3), twelve flat washers (4), twelve machine screws (5), and four hose clamps (6).

2 Install two cab ammunition box tray assemblies (7), eight lockwashers (8), and eight hexagon head capscrews (9).

3 Install two ammunition box tray (7).



4 Install two boom cylinder ammunition box tray assemblies (11), boom cylinder bar (12), two lockwashers (13), two hexagon head capscrews (14), and eight hose clamps (15).

5 Install two ammunition box tray webbing straps (16) on two boom cylinder ammunition box tray assemblies (11).

6 Install two boom winch cover protective plugs (17). Install two single chain assemblies (18) on two boom winch cover protective plugs and secure with four flat washers (19), two machine screws (20), and two new self-locking nuts (21).

7 Install machine screw (22) and plain hexagon nut (23) to connect two single chain assemblies (18) to hull.

8 Install two seal assemblies (24 and 25) between winch and curved portion of cab front.

2-194. MAINTENANCE OF VEHICULAR PARTS KIT (HEATER AND RELATED PARTS) AND CIRCUIT BREAKER TO HEATER CONTROL BOX BRANCHED WIRING HARNESS.

This task covers:
a. *Removal*
b. *Disassembly*
c. Inspection/Repair
d. *Reassembly*
e. Installation

INITIAL SETUP

Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 2 (less power) (item 81, appx B)
• Torque wrench

Materials/Parts
Exhaust tube gasket
LockWasher (10)
LockWasher (5)
LockWasher

References
TM 9-2350-238-24P-1

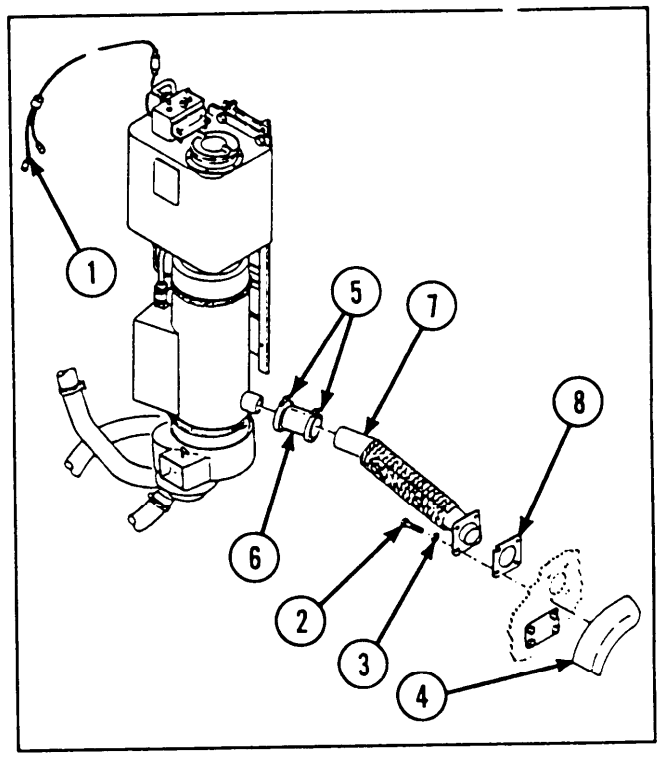
General Safety Instructions

LFailure to remove or disconnect the batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL

WARNING

Failure to remove or disconnect the batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.



1 Disconnect branched wiring harness (1) from circuit breaker and remove from heater control box.

2 Remove four hexagon head capscrews (2), four lockwashers (3), and heater tube exhaust connector (4).

3 Loosen two bolts (5) on tube coupling (6).

4 Remove metallic bent tube (7), tube coupling (6), and exhaust tube gasket (8).

5 Loosen hose clamp (9) attaching air ventilator (10) to slipring ducting hose (11).

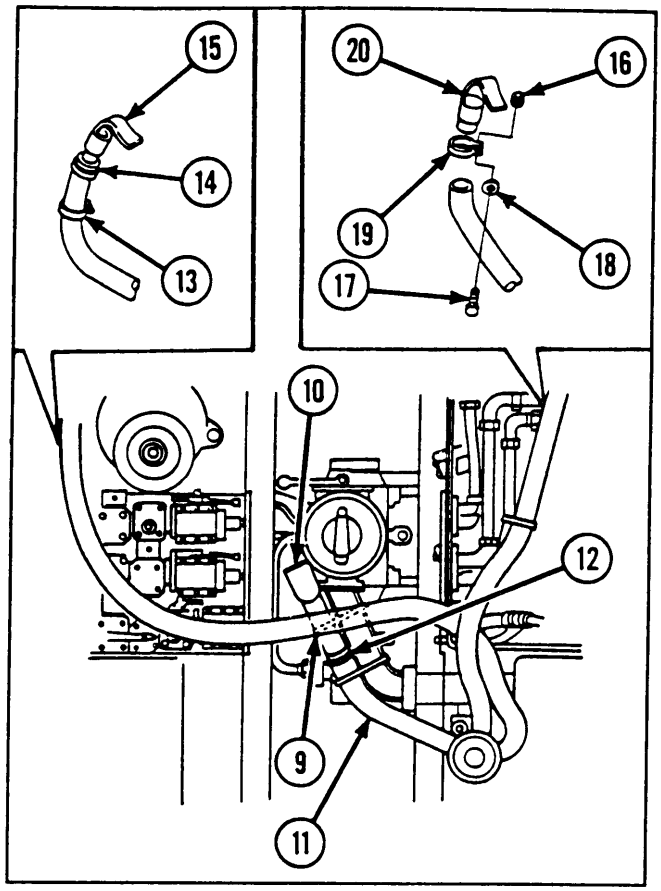
6 Loosen hose clamp (12) and remove air ventilator (10).

7 If damaged, remove six marker bands (13).

8 Loosen hose clamp (14) and remove air ventilator (15) from rigger/gunner cupola.

9 Remove plain hexagon nut (16), machine screw (17), lockwasher (18), and loop clamp (19).

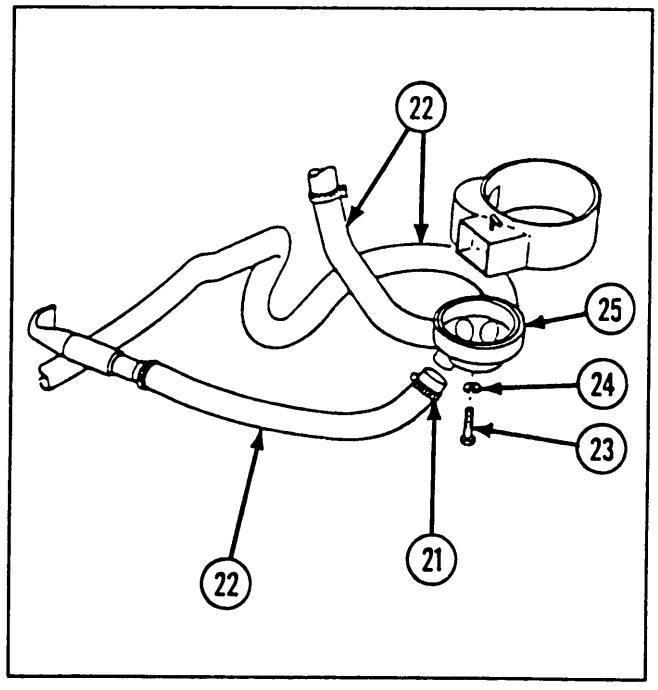
10 Remove airflow deflector (20) from crane operator's cupola.



11 Loosen three hose clamps (21).

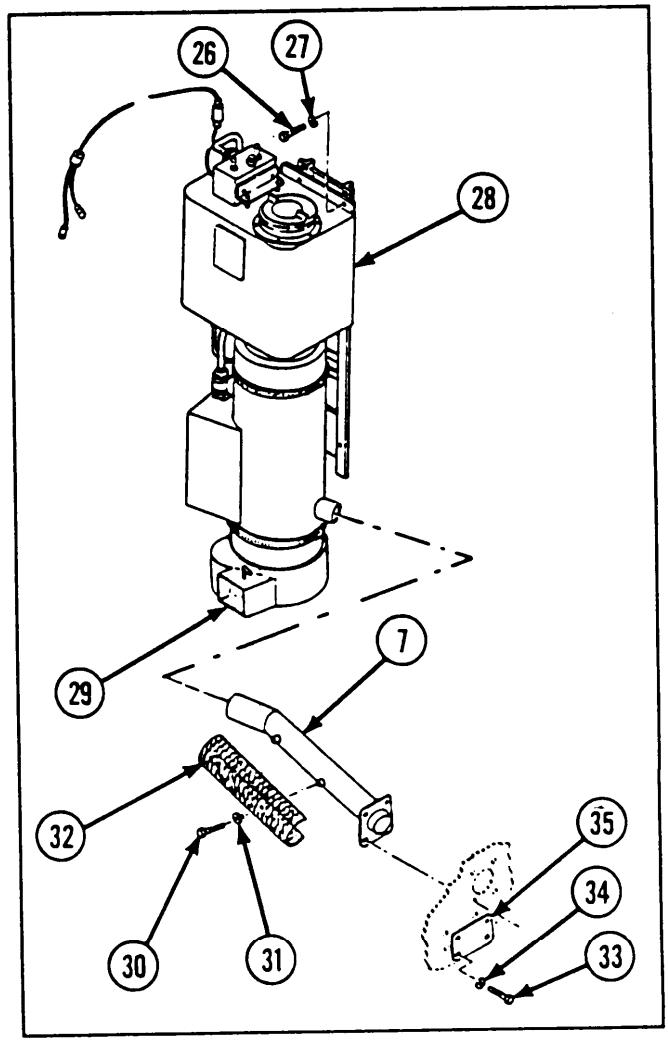
12 Remove three ducting hoses (22).

13 Remove hexagon head capscrew (23), lockwasher (24), and air deflector heater tube adapter (25).



2-194. MAINTENANCE OF VEHICULAR PARTS KIT (HEATER AND RELATED PARTS) AND CIRCUIT BREAKER TO HEATER CONTROL BOX BRANCHED WIRING HARNESS (CONT).

REMOVAL (CONT)



14 Remove six hexagon capscrews (26), six lockwashers (27), and heater assembly (28).

15 Remove air deflector assembly (29) from deck.

16 Remove two hexagon head capscrews (30), two flat washers (31), and heater exhaust shield (32) from metallic tube assembly (7).

17 If damaged, remove four machine bolts (33), four lockwashers (34), and exhaust extension heater plate (35).

DISASSEMBLY

For disassembly of wiring harness connectors, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace marker bands. Etch or stamp lead number on new band.

3 Heater assembly is a repairable assembly. Refer to page 2-1103.

4 Air deflector assembly is a repairable assembly. Notify direct support maintenance.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet the inspection criteria.

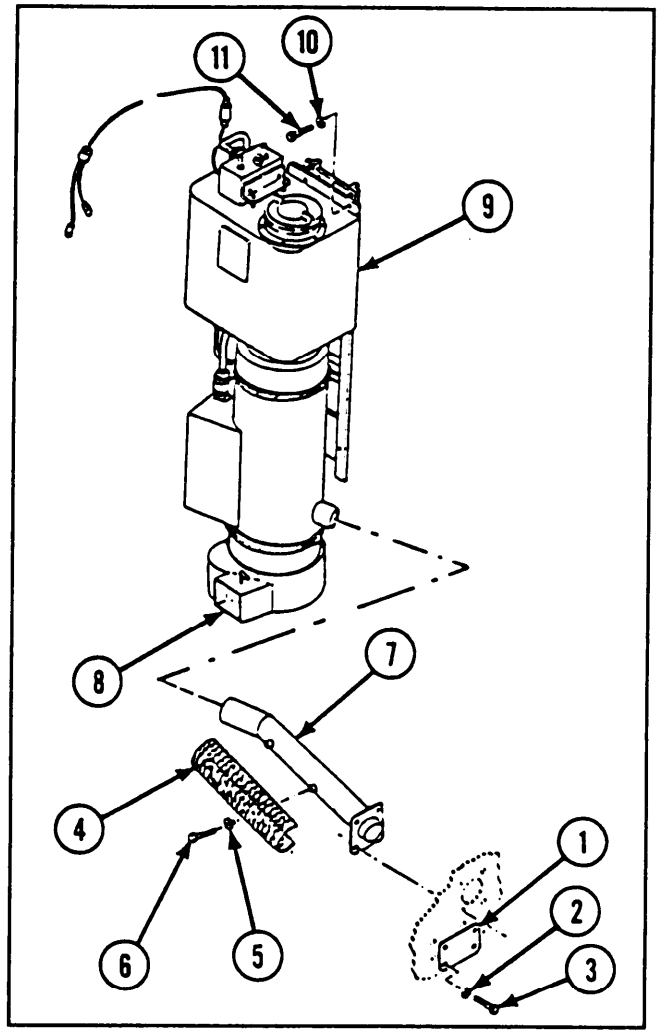
REASSEMBLY

For reassembly of the wiring harness connectors, refer to general maintenance, page 2-371.

INSTALLATION

WARNING

Failure to remove or disconnect the batteries before removing or installing any electrical harness or lead may result in injury or damaged equipment.



1 If removed, install exhaust extension heater plate (1), four lockwashers (2), and four machine bolts (3).

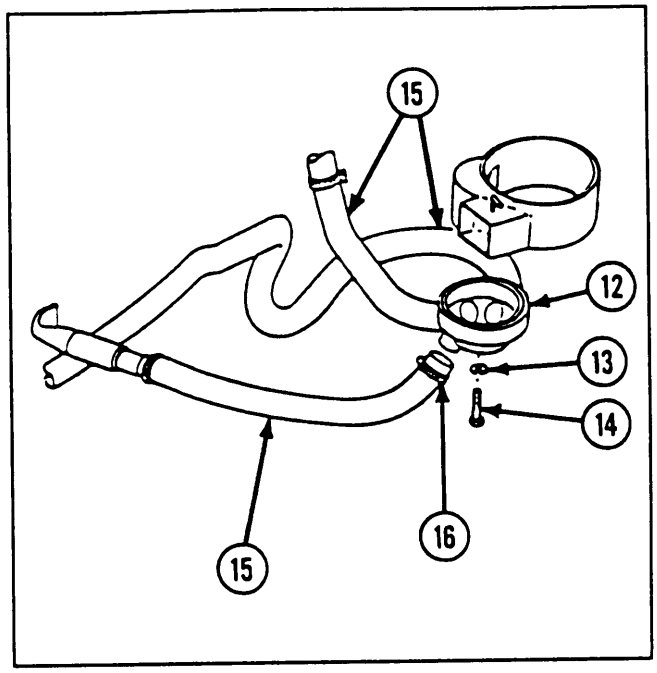
2 Install heater exhaust shield (4), two flat washers (5), and two hexagon head capscrews (6) to metallic tube assembly (7).

3 Install air deflector assembly (8) on deck.

4 Install heater assembly (9), six new lockwashers (10), and six hexagon head capscrews (11).

2-194. MAINTENANCE OF VEHICULAR PARTS KIT (HEATER AND RELATED PARTS) AND CIRCUIT BREAKER TO HEATER CONTROL BOX BRANCHED WIRING HARNESS (CONT).

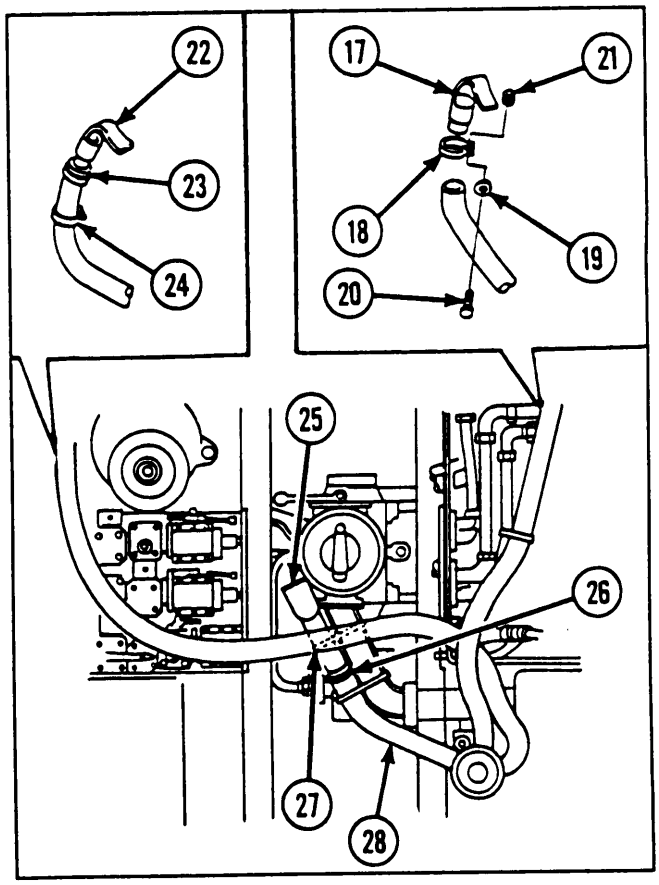
INSTALLATION (CONT)



5 Install air deflector heater tube adapter (12), new lockwasher (13), and hexagon head capscrew (14).

6 Install three ducting hoses (15).

7 Tighten three hose clamps (16).



8 Install airflow deflector (17) to crane operator's cupola.

9 Install loop clamp (18), new lockwasher (19), machine screw (20), and plain hexagon nut (21).

10 Install air ventilator (22) to rigger/gunner cupola and tighten hose clamp (23).

11 If removed, install six marker bands (24).

12 Install air ventilator (25) and tighten hose clamp (26).

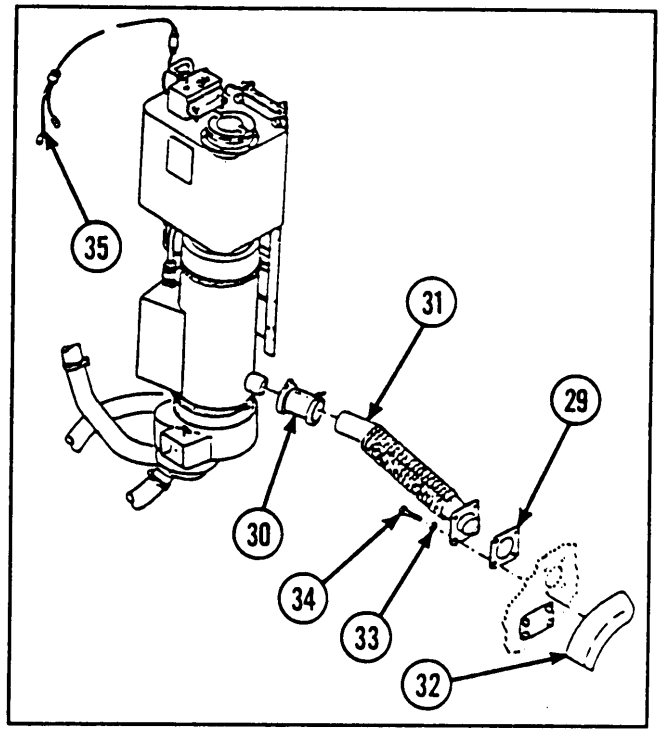
13 Tighten hose clamp (27), attaching air ventilator (25) to slipring ducting hose (28).

14 Install new exhaust tube gasket (29), tube coupling (30), and metallic bent tube (31).

15 Tighten two bolts on tube coupling (30). Torque bolts to 70.00 in.-lb (7.91 N-m).

16 Install heater tube exhaust connector (32), four new lockwashers (33), four hexagon head capscrews (34).

17 Connect branched wiring harness (35) to circuit breaker and heater control box.



2-195. MAINTENANCE OF PERSONNEL VEHICULAR HEATER ASSEMBLY, PERSONNEL VEHICULAR HEATER ASSEMBLY (TANK ASSEMBLY, FILTER, AND PUMP), AND CONTROL BOX ASSEMBLY TO HEATER ASSEMBLY WIRING HARNESS (WINTERIZATION KIT).

This task covers:	a. *Disassembly*	b. *Inspection/Repair*	*c. Reassembly*

INITIAL SETUP

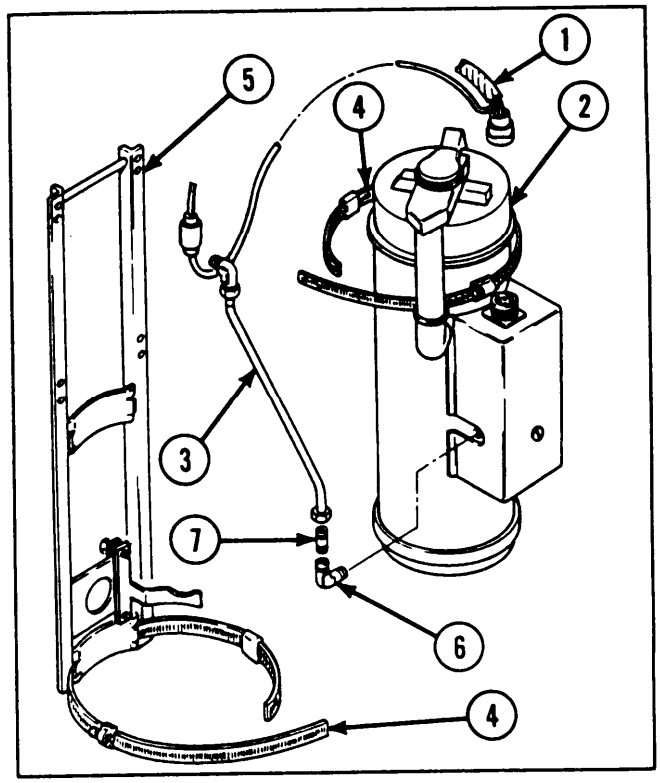
Materials/Parts
- Electrical wire (figure D-2, appx D)
- Fuel tank ring gasket
- Gasket
- Instruction plate
- LockWasher (2)
- LockWasher (12)
- Screen
- Self-locking nut (8)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-1098 Personnel vehicular heater assembly removed

2-195. MAINTENANCE OF PERSONNEL VEHICULAR HEATER ASSEMBLY, PERSONNEL VEHICULAR HEATER ASSEMBLY (TANK ASSEMBLY, FILTER, AND PUMP), AND CONTROL BOX ASSEMBLY TO HEATER ASSEMBLY WIRING HARNESS (WINTERIZATION KIT) (CONT).

DISASSEMBLY

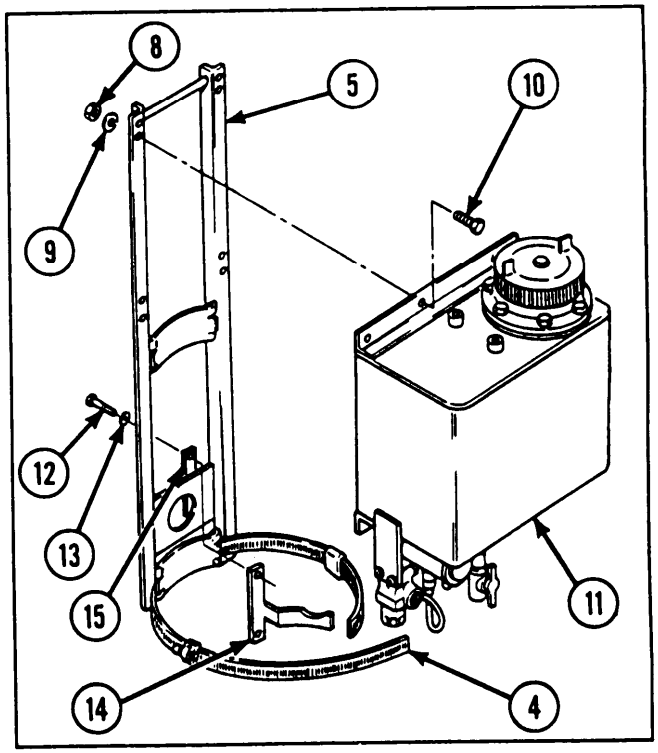


1 Disconnect control box assembly to heater assembly wiring harness (1) from cab hot air vehicular compartment heater (2).

2 Disconnect nonmetallic hose assembly (3) from cab hot air vehicular compartment heater (2).

3 Disconnect two hose clamps (4), and remove cab hot air vehicular compartment heater (2) from personnel heater mounting plate (5).

4 Remove pipe to tube elbow (6) and pipe nipple (7) from cab hot air vehicular compartment heater (2).



5 Remove four hexagon plain nuts (8), four lockwashers (9), four hexagon head capscrews (10), and personnel heater tank assembly (11) from personnel heater mounting plate (5).

6 Remove two hose clamps (4) from personnel heater mounting plate (5).

7 Remove two hexagon head capscrews (12), two lockwashers (13), angle bracket (14), and rigid connecting link (15) from personnel heater mounting plate (5).

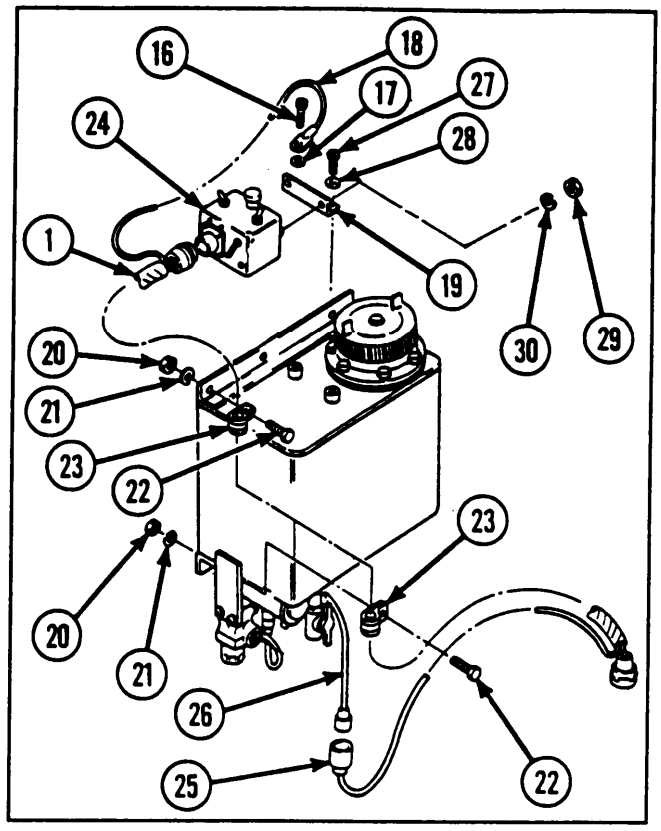
8 Remove hexagon head capscrew (16), lockwasher (17), and ground terminal (18) from heater bracket (19).

9 Remove two hexagon plain nuts (20), two lockwashers (21), two hexagon head capscrews (22), and two loop clamps (23) from control box assembly to heater assembly wiring harness (1).

10 Disconnect control box assembly to heater assembly wiring harness (1) from electrical control box (24). Unplug shell connector (25) from electrical fuel pump lead (26) and remove wiring harness.

11 Remove hexagon head capscrew (27), lockwasher (28), electrical control box (24) and heater bracket (19).

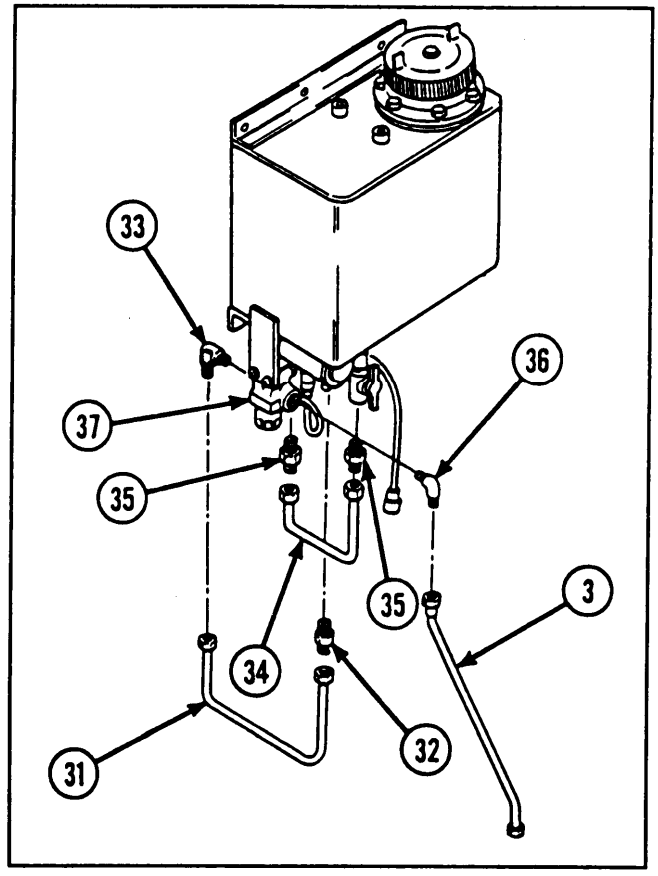
12 Remove two hexagon plain nuts (29), two lockwashers (30), and heater bracket(19) from electrical control box (24).



13 Remove preformed metal tube assembly (31), pipe straight adapter (32), and pipe to tube elbow (33).

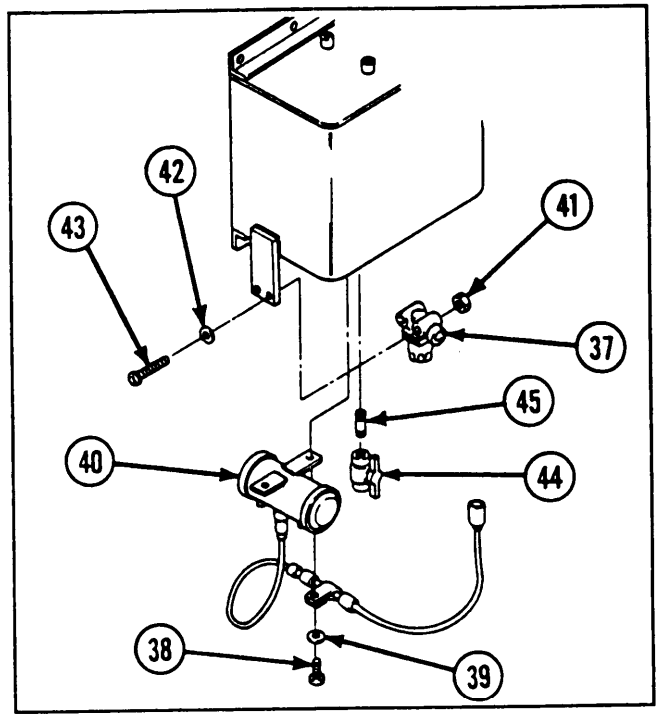
14 Remove metal tube assembly (34) and two pipe straight adapters (35).

15 Remove nonmetallic hose assembly (3) and pipe to tube elbow (36) from fluid filter (37).



2-195. MAINTENANCE OF PERSONNEL VEHICULAR HEATER ASSEMBLY, PERSONNEL VEHICULAR HEATER ASSEMBLY (TANK ASSEMBLY, FILTER, AND PUMP), AND CONTROL BOX ASSEMBLY TO HEATER ASSEMBLY WIRING HARNESS (WINTERIZATION KIT) (CONT).

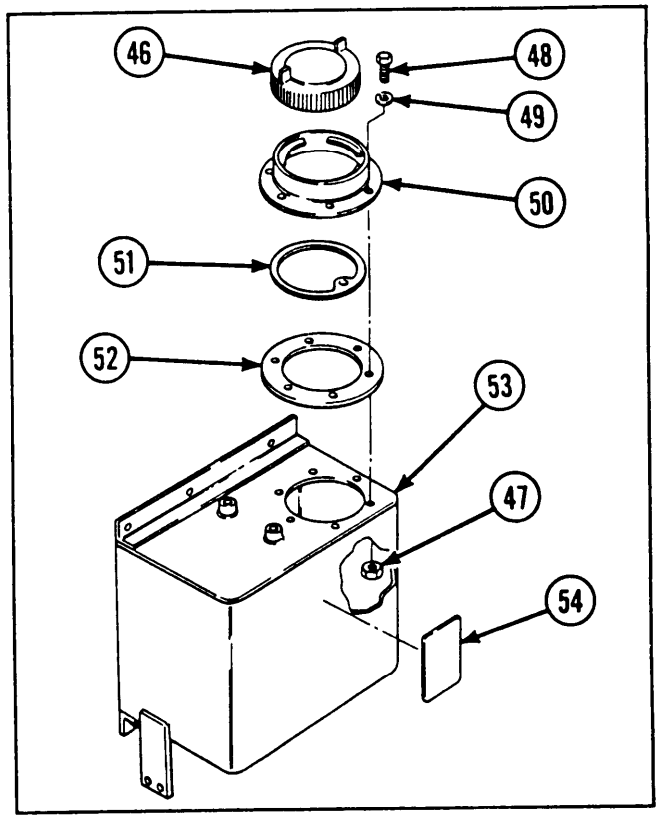
DISASSEMBLY (CONT)



16 Remove two hexagon head capscrews (38), two lockwashers (39), and electrical fuel pump (40).

17 Remove two self-locking nuts (41), two flat washers (42), two machine screws (43), and fluid filter (37).

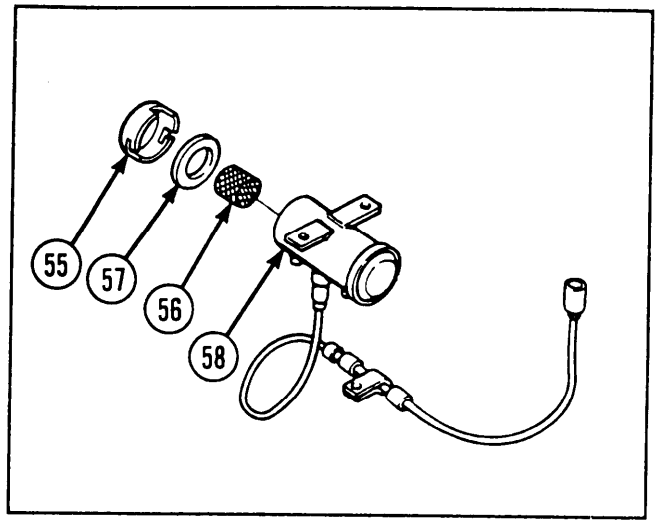
18 Remove screw shutoff cock (44) and pipe nipple (45).



19 Remove filler opening cap (46).

20 Remove six self-locking nuts (47), six machine screws (48), six flat washers (49), fuel tank fill ring (50), fuel cap chain retaining ring (51), and fuel tank ring gasket (52) from fuel tank (53).

21 Remove instruction plate (54) only if damaged.



22 Remove fuel pump cover (55), screen (56), and gasket (57) from fuel pump housing (58).

23 For disassembly of wiring harness plug connectors, refer to general maintenance, page 2-371.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 If damaged or missing, replace wiring harness marker bands. Etch or stamp lead number on new marker bands.

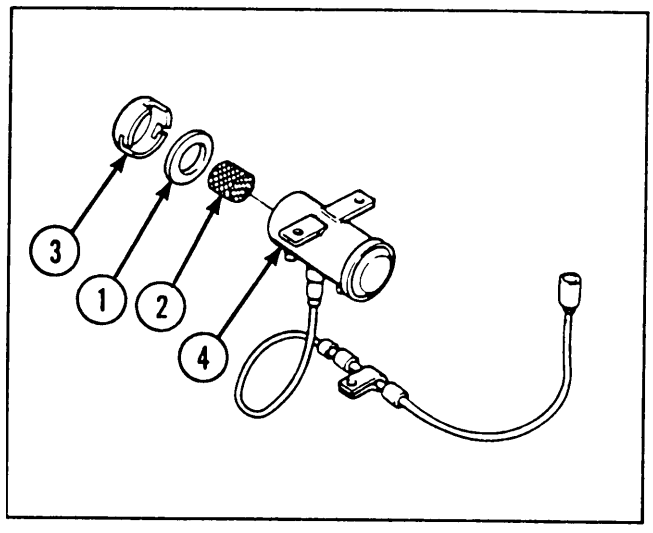
3 For repair of wiring harness shell connectors and cable terminals, refer to general maintenance, page 2-371.

4 Cab hot air vehicular compartment heater and electrical control box are repairable assemblies. Notify direct support maintenance.

5 If fuel pump cover or fuel pump housing is broken or damaged, repair is by replacement of next higher assembly.

6 Electrical wire is a manufactured item. Refer to appendix D.

7 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

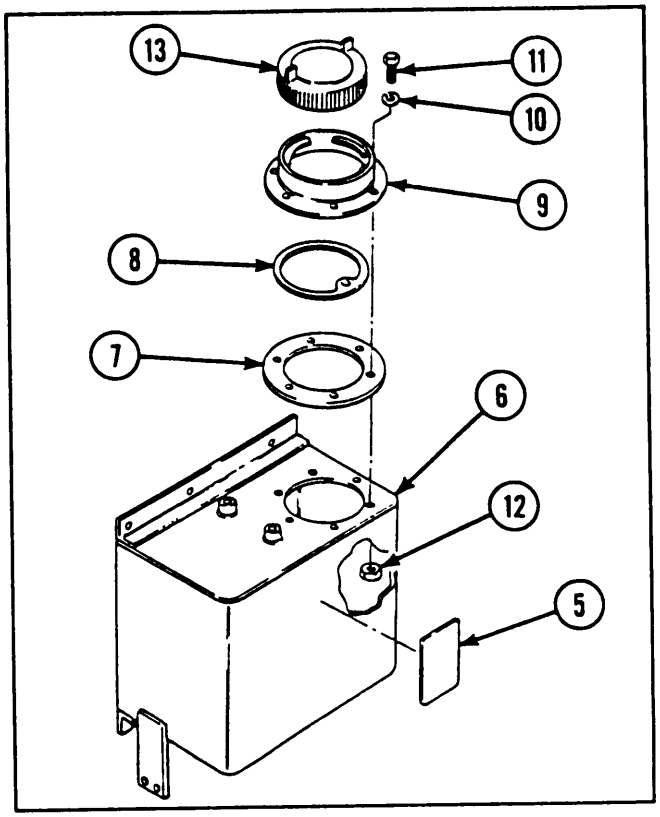


1 For reassembly of wiring harness plug connectors, refer to general maintenance, page 2-371.

2 Install new gasket (1), new screen (2), and fuel pump cover (3) in fuel pump housing (4).

2-195. MAINTENANCE OF PERSONNEL VEHICULAR HEATER ASSEMBLY, PERSONNEL VEHICULAR HEATER ASSEMBLY (TANK ASSEMBLY, FILTER, AND PUMP), AND CONTROL BOX ASSEMBLY TO HEATER ASSEMBLY WIRING HARNESS (WINTERIZATION KIT) (CONT).

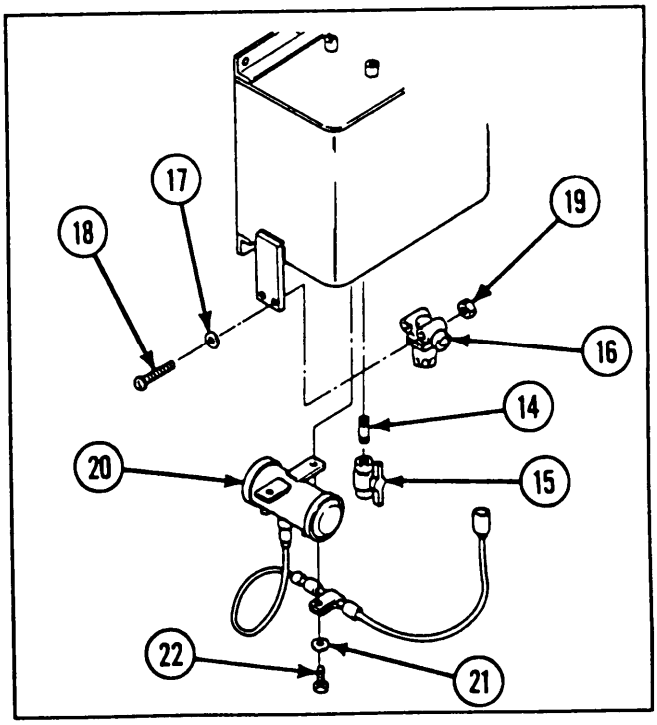
REASSEMBLY (CONT)



3 If removed, install new instruction plate (5) on fuel tank (6).

4 Install new fuel tank ring gasket (7), fuel cap chain retaining ring (8), fuel tank fill ring (9), six flat washers (10), six machine screws (11), and six new self-locking nuts (12).

5 Install filler opening cap (13).



6 Install pipe nipple (14) and screw shutoff cock (1 5).

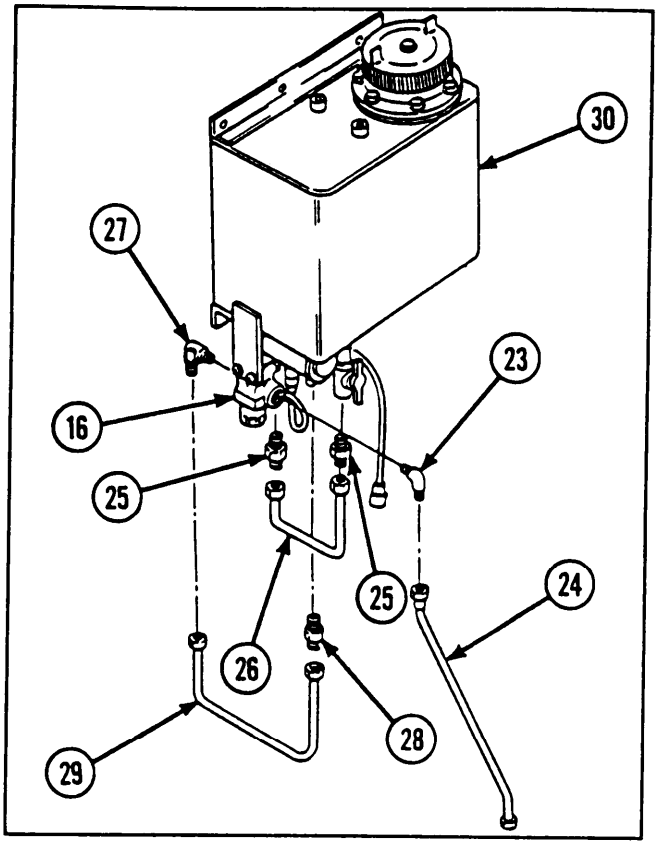
7 Install fluid filter (16), two flat washers (17), two machine screws (18), and two new self-locking nuts (19).

8 Install assembled electrical fuel pump (20), two new lockwashers (21), and two hexagon head capscrews (22).

9 Install pipe to tube elbow (23) and nonmetallic hose assembly (24) on fluid filter (16).

10 Install two pipe straight adapters (25) and metal tube assembly (26).

11 Install pipe to tube elbow (27), pipe straight adapter (28), and preformed metal tube assembly (29) on personnel heater tank assembly (30).



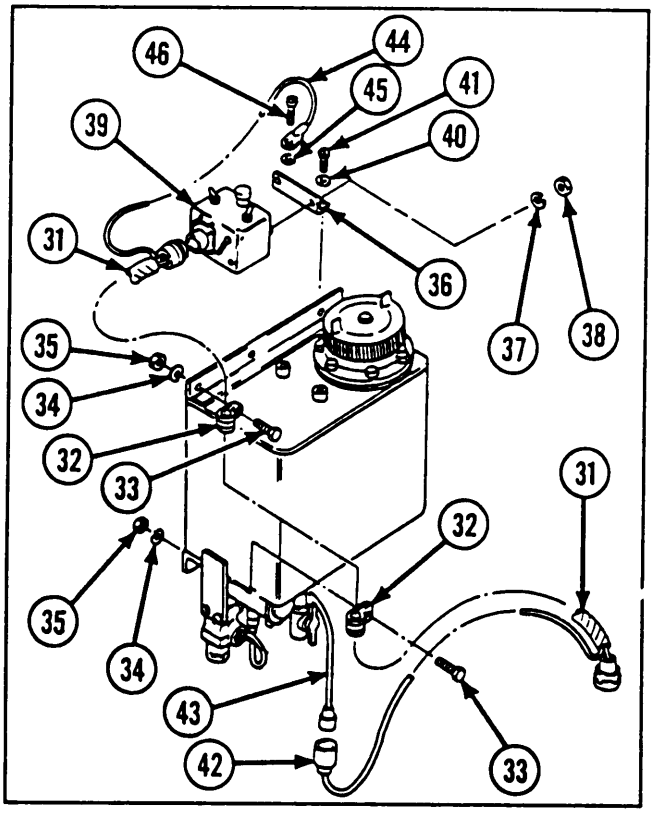
12 Install control box assembly to heater assembly wiring harness (31), two loop clamps (32), two hexagon head capscrews (33), two new lockwashers (34), and two hexagon plain nuts (35).

13 Install heater bracket (36), two new lockwashers (37), and two hexagon plain nuts (38) on electrical control box (39).

14 Install electrical control box (39) with heater bracket (36), new lockwasher (40), and hexagon head capscrew (41) on personnel heater tank assembly (30).

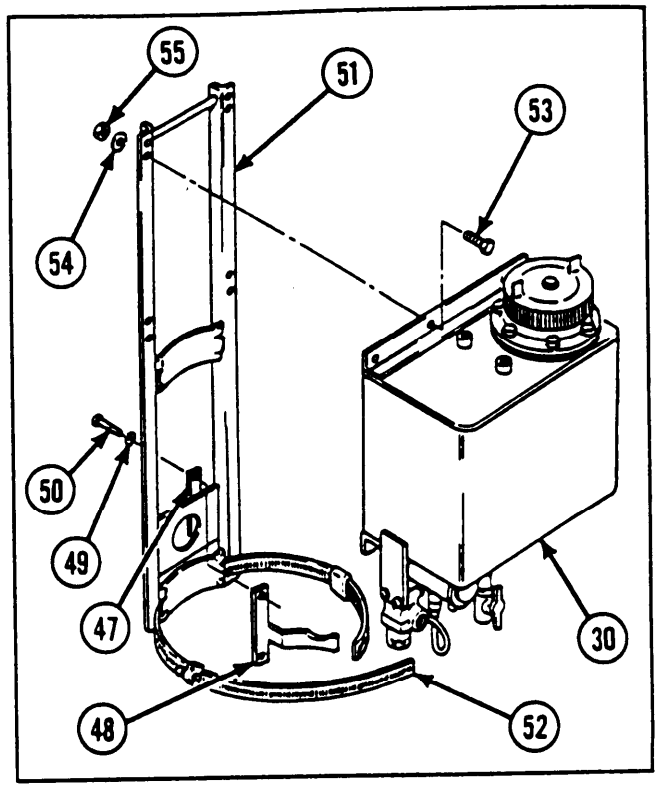
15 Connect control box assembly to heater assembly wiring harness (31) to electrical control box (39). Connect shell connector (42) to electric fuel pump lead (43).

16 Connect ground terminal (44) with new lockwasher (45) and hexagon head capscrew (46) to heater bracket (36).



2-195. MAINTENANCE OF PERSONNEL VEHICULAR HEATER ASSEMBLY, PERSONNEL VEHICULAR HEATER ASSEMBLY (TANK ASSEMBLY, FILTER, AND PUMP), AND CONTROL BOX ASSEMBLY TO HEATER ASSEMBLY WIRING HARNESS (WINTERIZATION KIT) (CONT).

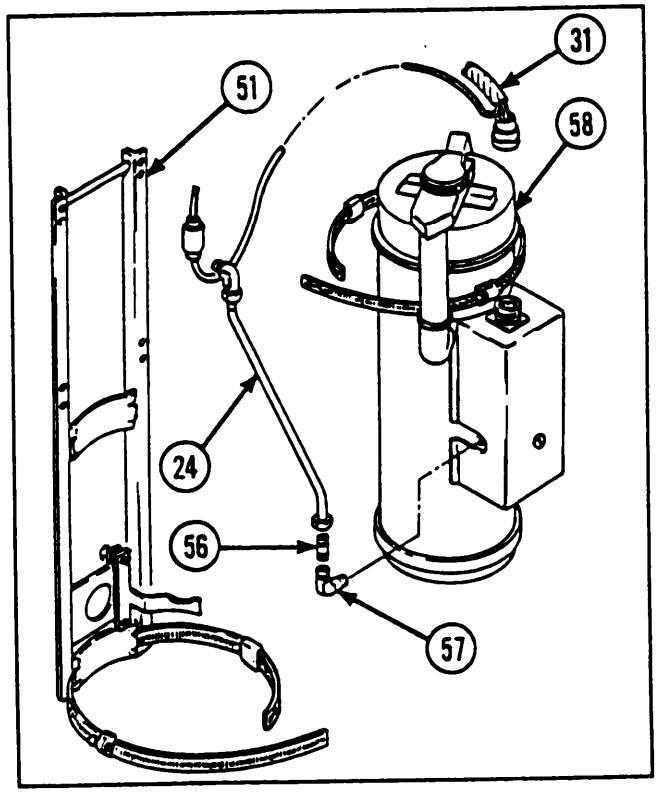
REASSEMBLY(CONT)



17 Install rigid connecting link (47), angle bracket (48), two new lockwashers (49), and two-hexagon head capscrews (50) on personnel heater mounting plate (51).

18 Install two hose clamps (52) on personnel heater mounting plate (51).

19 Install personnel heater tank assembly (30), four hexagon head capscrews (53), four new lockwashers (54), and four hexagon plain nuts (55) on personnel heater mounting plate (51).



20 Install pipe nipple (56) and pipe to tube elbow (57) on cab hot air vehicular compartment heater (58).

21 Install cab hot air vehicular compartment heater (58) on personnel heater mounting plate (51).

22 Connect nonmetallic hose assembly (24) to cab hot air vehicular compartment heater (58).

23 Connect control box assembly to heater assembly wiring harness (31) to cab hot air vehicular compartment heater (58).

2-196. MAINTENANCE OF CRANE OPERATOR'S ENCLOSURE KIT.

This task covers:	a. *Installation* b. *Inspection/Repair*	*c. Testing* d. *Removal*

INITIAL SETUP

Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 2 (less power) (item 81, appx B)
- Drill
- Drill bits
- Tap
- Torque wrench (0 to 200 in.-lb)

Materials/Parts
Adhesive (item 5, appx C)
Antiseize compound (item 6, appx C)
Cutting fluid (item 15, appx C)
Dry cleaning solvent (item 16, appx C)
Liquid soap (item 42, appx C)
Sealant (item 36, appx C)

References
TM 9-2350-238-24P-I

General Safety Instructions

WARNING

- Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.
- Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in a well-ventilated area.

INSTALLATION

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

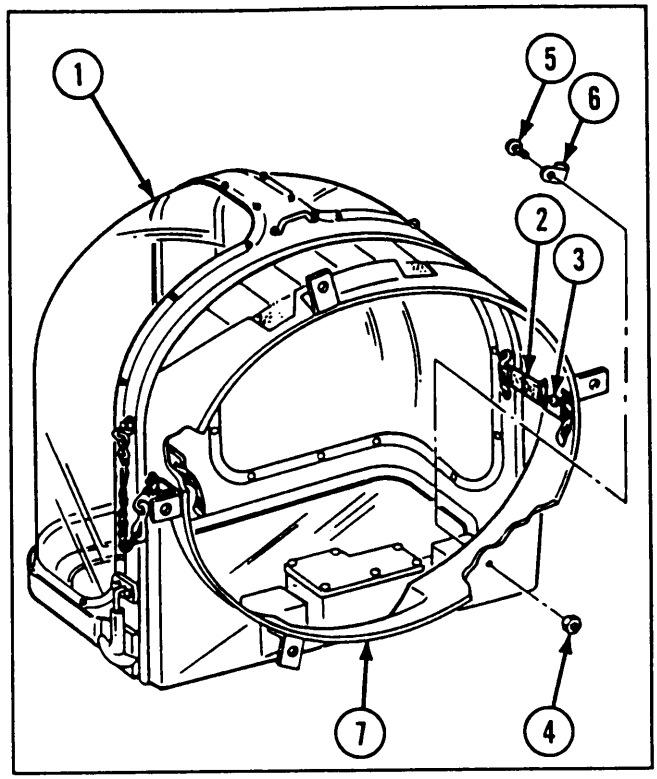
NOTE

The crane operator's enclosure kit must be disassembled before it is installed for the first time.

1 Check to ensure that all kit parts are present and free of damage.

2-196. MAINTENANCE OF CRANE OPERATOR'S ENCLOSURE KIT (CONT).

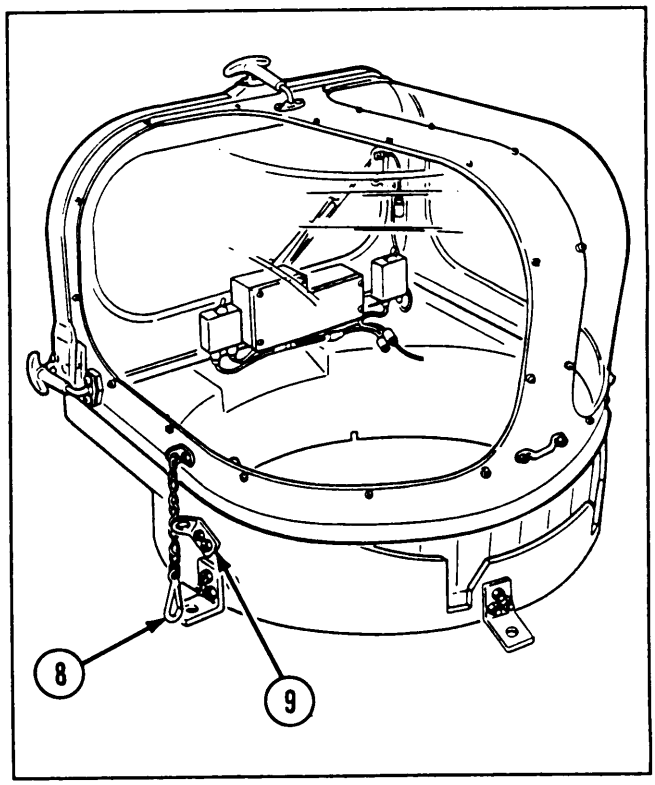
INSTALLATION (CONT)



2 Tip the crane operator's enclosure kit (1) onto the windshield.

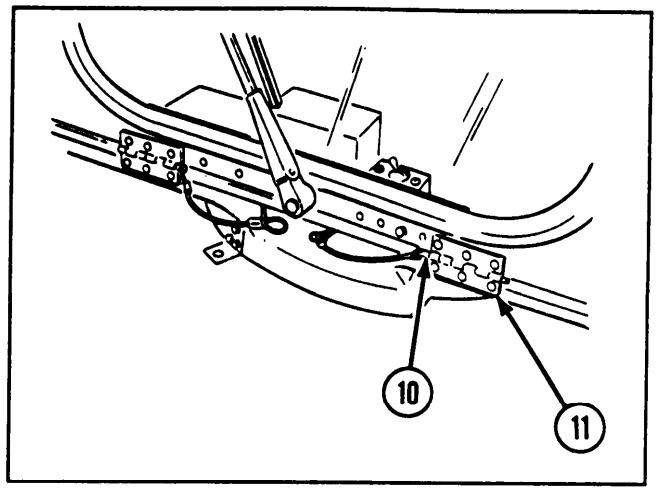
3 Unhook two base straps (2) from two machine screws (3).

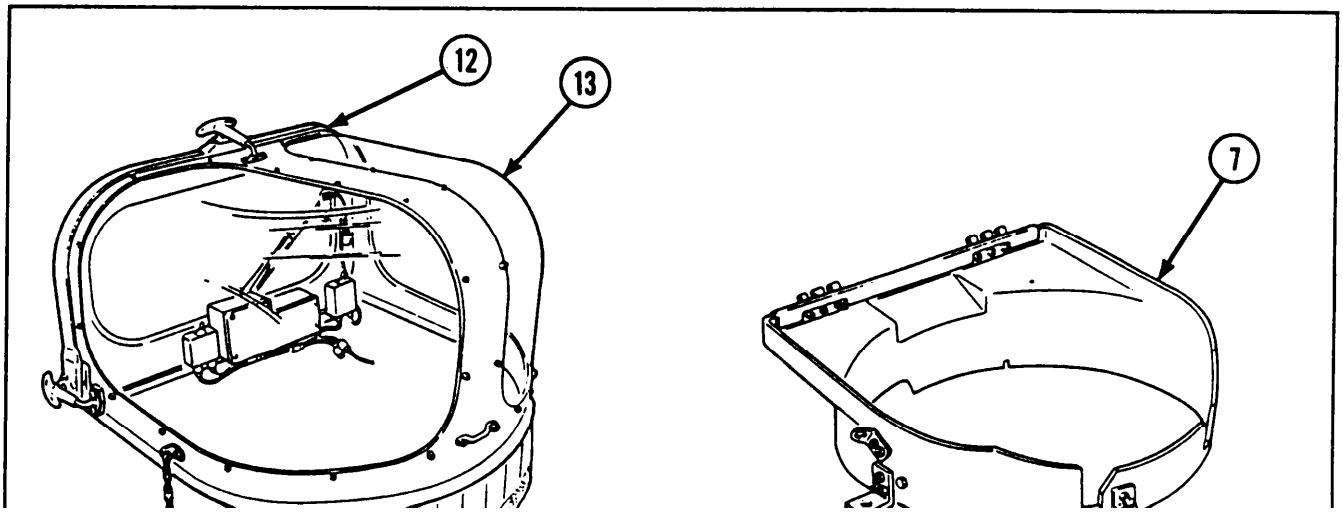
4 Remove self-locking nut (4), machine screw (5), and loop clamp (6) from crane operator's base assembly (7).



5 Remove two window assembly chains (8) from two base links (9).

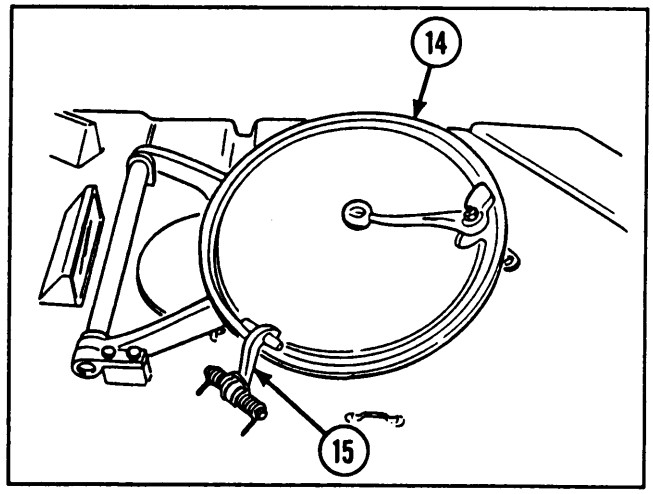
6 Remove two hinge to base pin assemblies (10) from two windshield to base butt hinges (11).





7 Remove vehicular window (12) and crane window assebly (13) from crane operator's base assembly (7).

8 Open and secure hatch cover (14) with latch (15).



2-196. MAINTENANCE OF CRANE OPERATOR'S ENCLOSURE KIT (CONT).

INSTALLATION (CONT)

9 Position crane operator's base assembly (7) on cupola (16) with notched section towards rear.

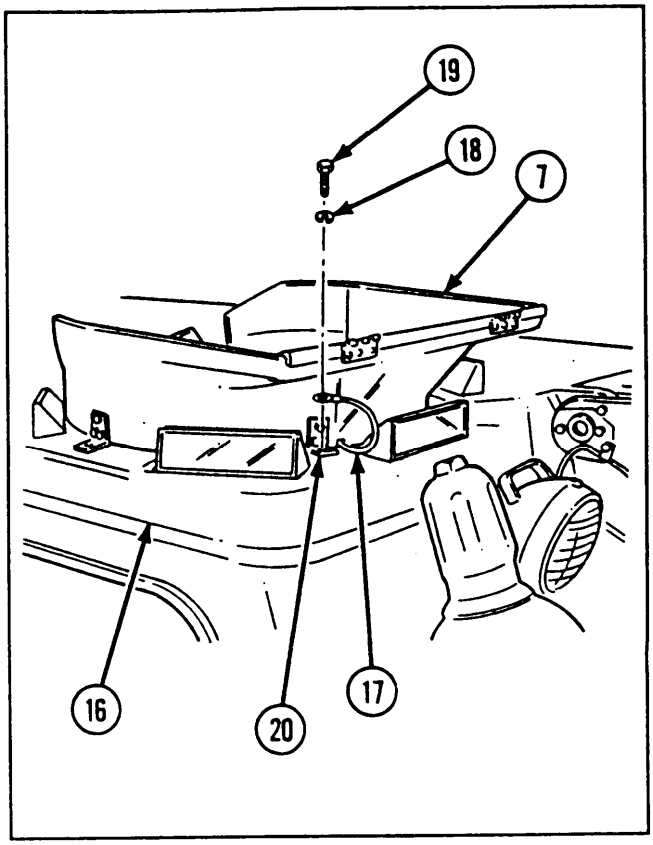
NOTE

Use hull brackets as a template for locating and drilling holes for four crane operator's base assembly mounting screws.

10 Using drill cutting fluid, drill four 7/32-in. (5.56-mm) holes through cupola (16). Tap holes to 0.250-28 UNF-2B.

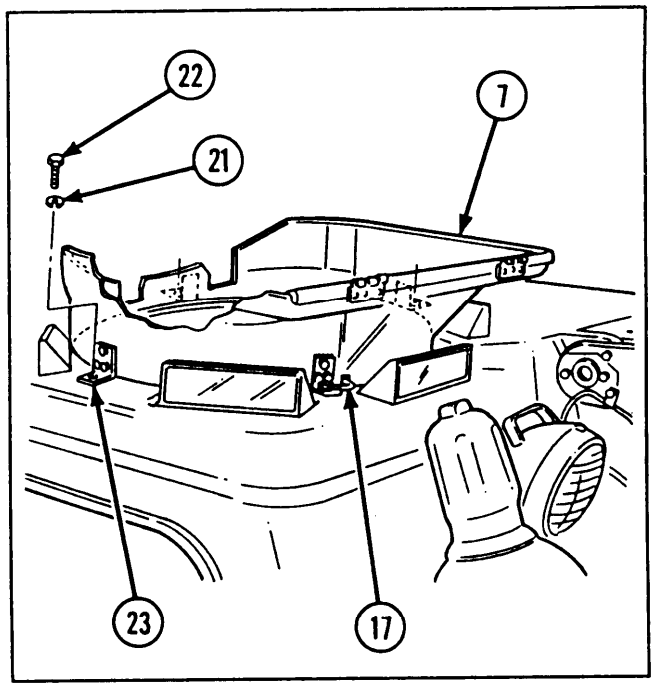
11 Insert wiper motor and defroster lead disconnect branched wiring harness (17) through notch in crane operator's base assembly (7), and lower crane operator's base assembly onto cupola (16).

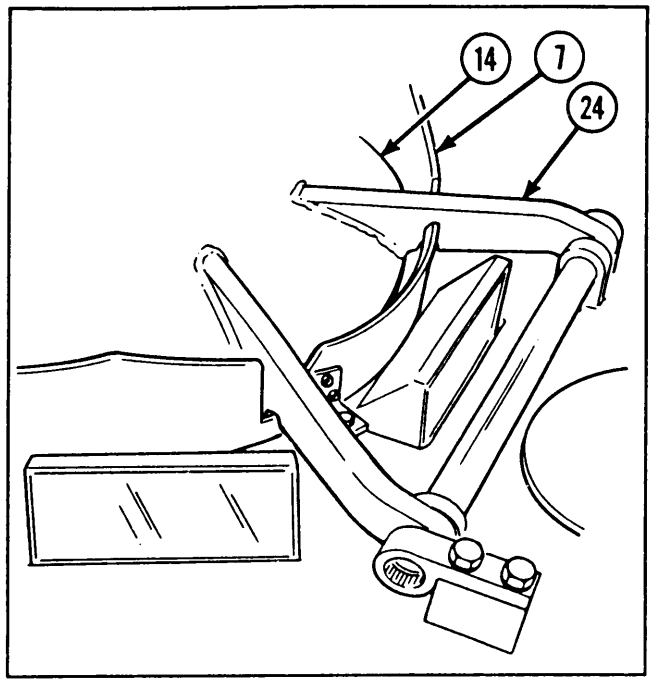
12 Install wiper motor and defroster lead disconnect branched wiring harness (17), lockwasher (18), and hexagon head capscrew (19) on hull bracket (20).



13 Install three lockwashers (21), and three hexagon head capscrews (22), in three hull brackets (23). Torque four hexagon head capscrews to 90.00 ± 5.00 in.-lb (10.17 ± 0.56 N-m).

14 Apply sealant (item 35, appx C) to seal area between wiper motor and defroster lead disconnect branched wiring harness (17) and notch in crane operator's base assembly (7).



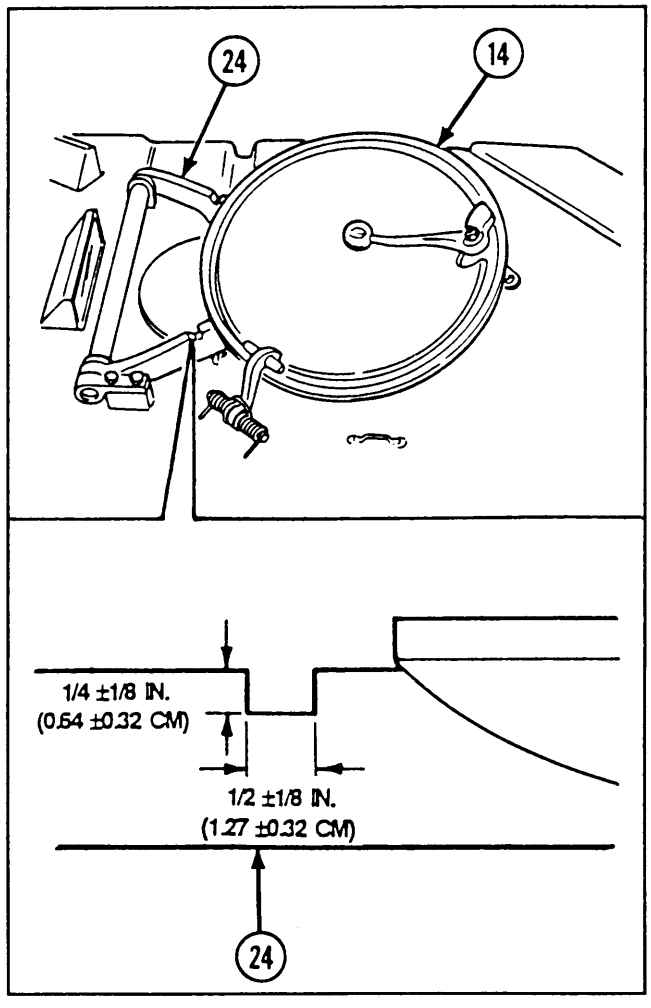


CAUTION

When crane operator's enclosure kit is removed, retain four hexagon head capscrews and four lockwashers to plug threaded holes and prevent entry of moisture.

15 Carefully return hatch cover (14) to the closed position.

16 If hatch cover (14) doesn't close properly, check for interference between crane operator's base assembly (7) and hatch cover arms (24).

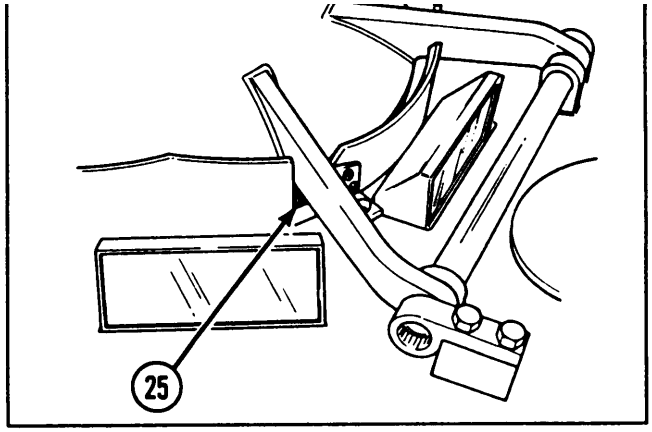


17 If necessary, mark area on hatch cover arms (24) to be removed. Grind hatch cover arms accordingly so hatch cover (14) will close properly.

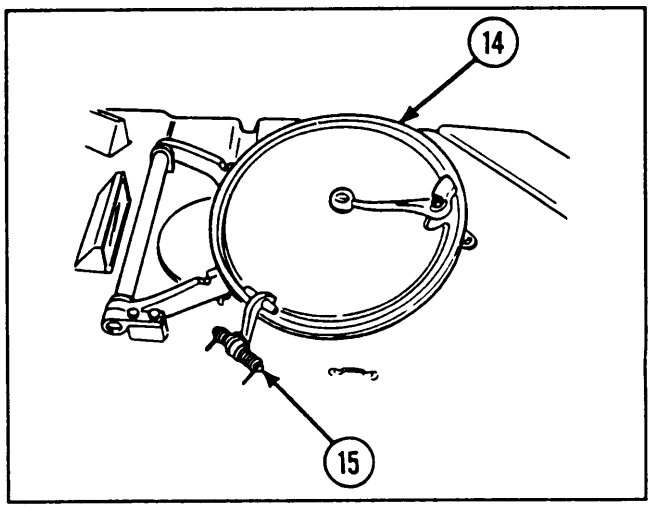
2-196. MAINTENANCE OF CRANE OPERATO'RS ENCLOSURE KIT (CON'T).

INSTALLATION (CONT)

18 If necessary, trim tape strip (25).

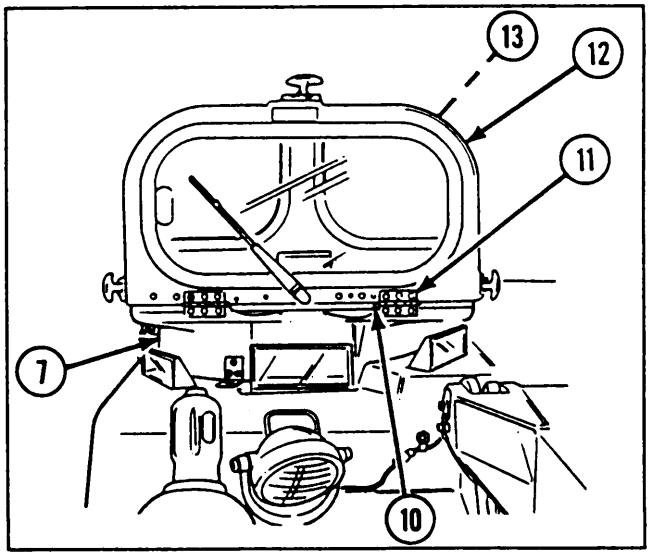


19 Open hatch cover (14) and secure with latch (15).



20 Position vehicular window (12) and crane window assembly (13) on crane operator's base assembly (7).

21 Install two hinge to base pin assemblies (10) in two windshield to base butt hinges (11).



22 Install two window assembly chains (8) on two base links (9).

23 Open vehicular window (12).

24 Peel back a portion of operator's cupola ring cushioning pad (26) and drill a 1/2-in. (12.70-mm) hole through its underside.

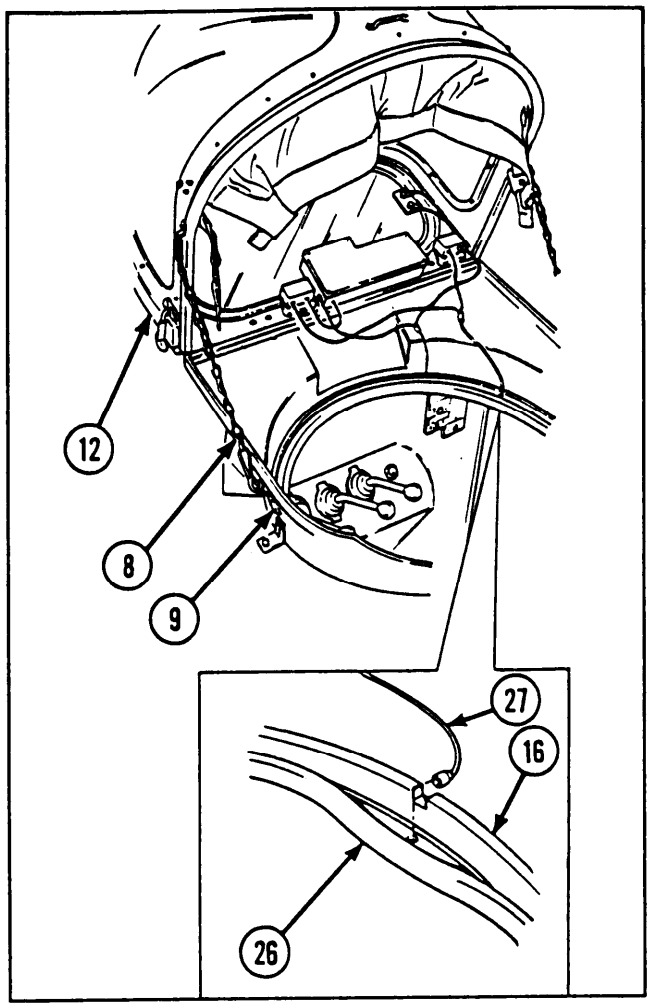
WARNING

Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated area.

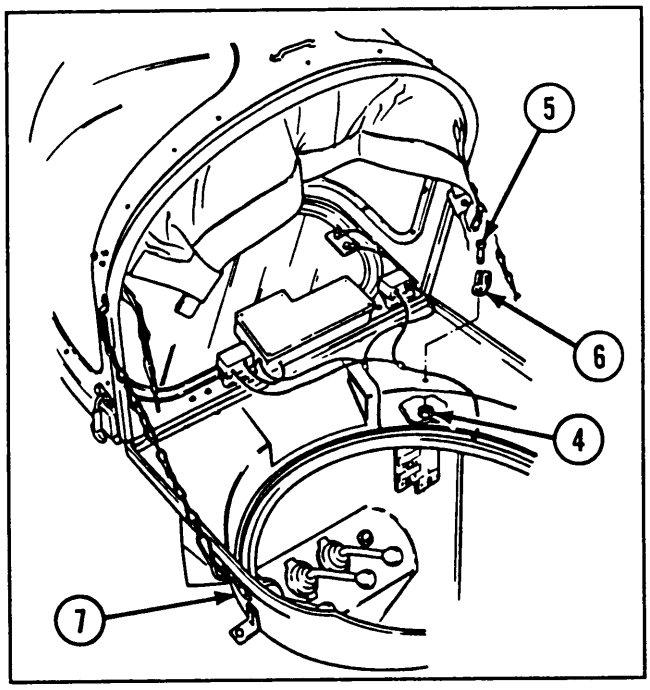
25 Using dry cleaning solvent, remove adhesive residue from underside of operator's cupola (16).

26 Clean operator's cupola ring cushioning pad (26) with liquid soap and water.

27 Insert circuit breaker to wiper motor and defroster switch electrical lead assembly (27) through the 1/2-in. (12.70-mm) hole and into the notch in the cupola (16).

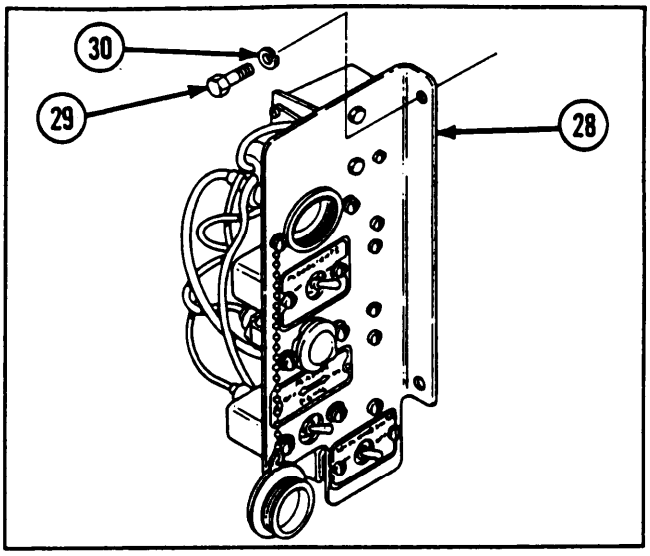


28 Install loop clamp (6), machine screw (5), and self-locking nut (4) on crane operator's base assembly (7).



2-196. MAINTENANCE OF CRANE OPERATOR'S ENCLOSURE KIT (CONT).

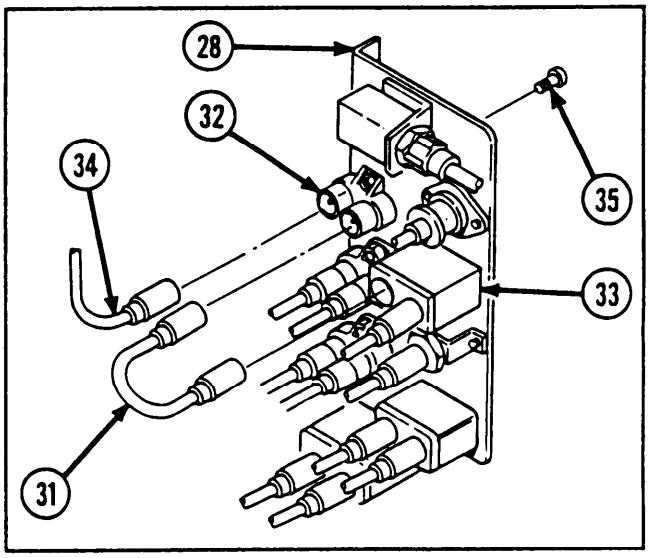
INSTALLATION (CONT)



29 Support angle bracket (28) and remove two hexagon head capscrews (29), two lockwashers (30), and angle bracket from bulkhead.

NOTE

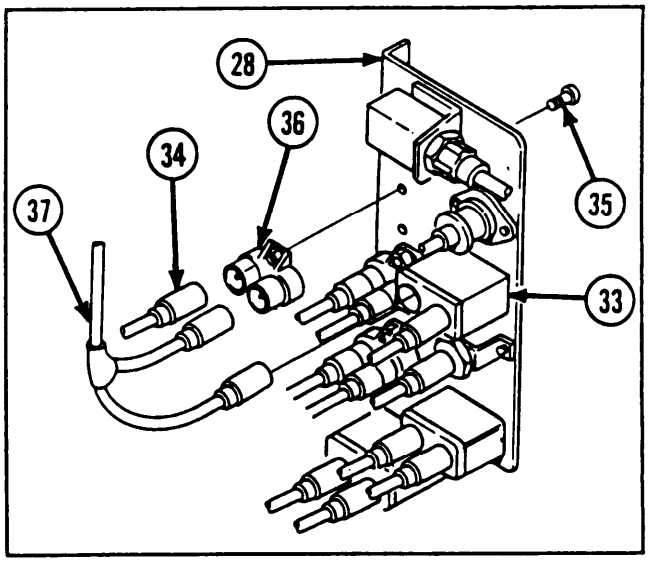
Retain the circuit breaker to floodlight switch electrical lead and 15-amp circuit breaker for installation when the crane operator's enclosure kit is removed.



30 Disconnect circuit breaker to floodlight switch electrical lead (31) from 15-amp circuit breaker (32) and 24-volt toggle switch (33).

31 Disconnect slipring to circuit breakers and radio power disconnect branched wiring harness (34) from 15-amp circuit breaker (32).

32 Remove two machine screws (35) and 15-amp circuit breaker (32) from angle bracket (28).

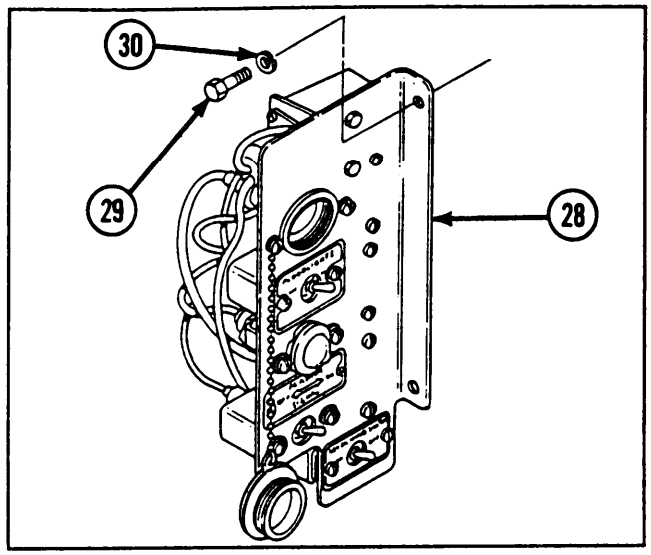


33 Install 30-amp circuit breaker (36) and two machine screws (35) on angle bracket (28).

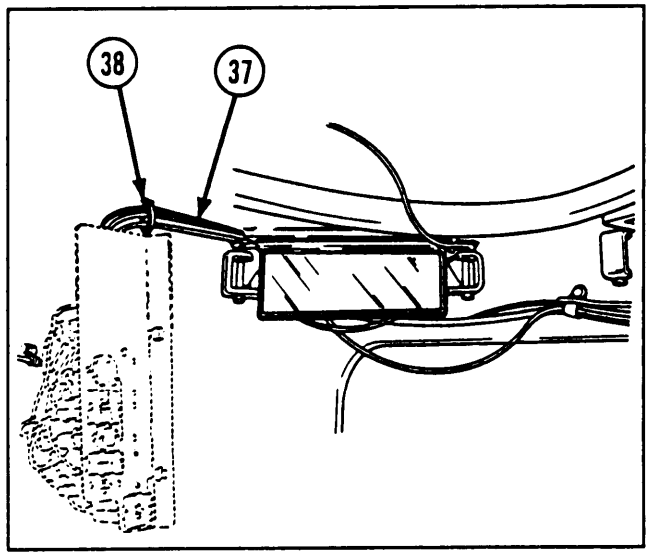
34 Connect circuit breaker to wiper motor and defroster electrical lead assembly (37) to 30-amp circuit breaker (36) and 24-volt toggle switch (33).

35 Connect slipring to circuit breakers and radio power disconnect branched wiring harness (34) to 30-amp circuit breaker (36).

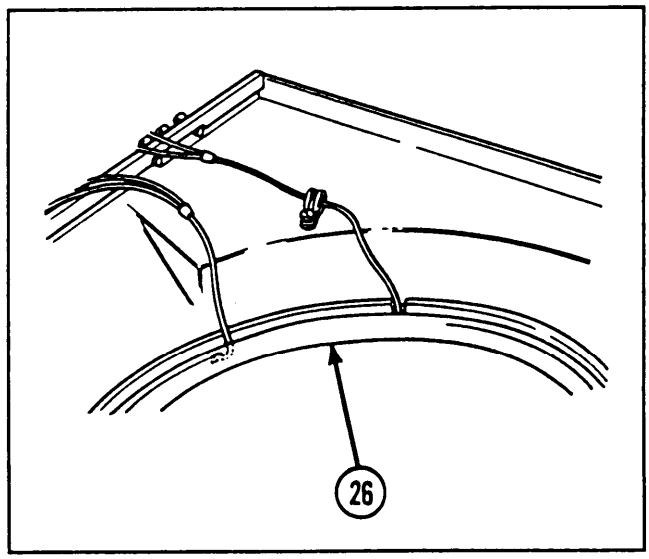
36 Install angle bracket (28), two lockwashers (30), and two hexagon head capscrews (29) on bulkhead.



37 Secure circuit breaker to wiper motor and defroster electrical lead assembly (37) to cab with strap (38).

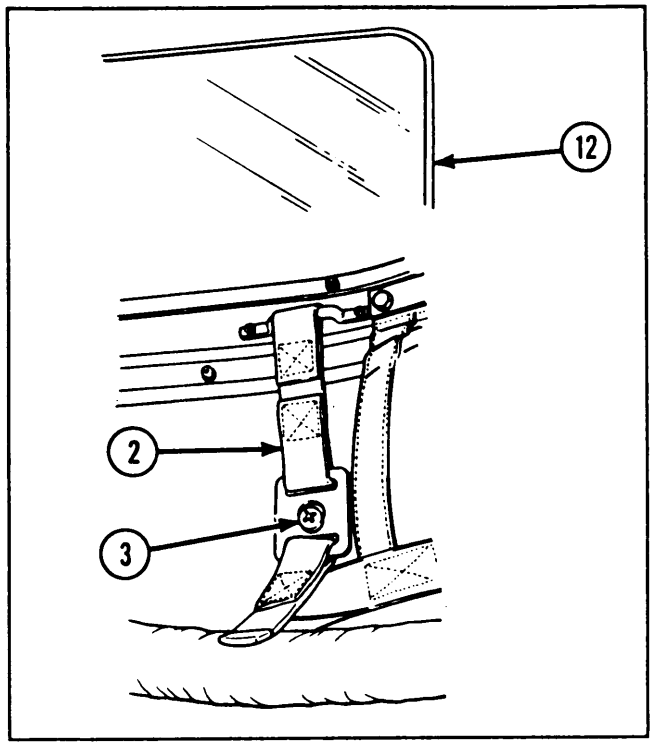


38 Using adhesive, reseal operator's cupola ring cushioning pad (26).



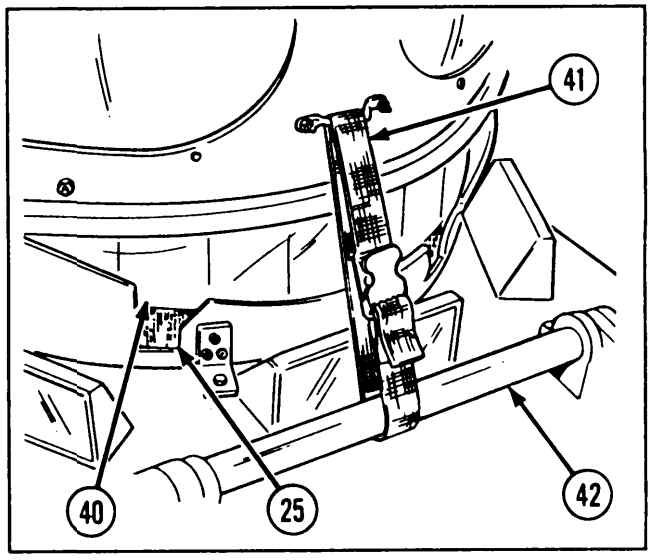
2-196. MAINTENANCE OF CRANE OPERATOR'S ENCLOSURE KIT (CONT).

INSTALLATION (CONT)



39 Close vehicular window (12).

40 Pull down and hook two base straps (2) on two screws (3).



41 Pull down and press the crane operator's window assembly cover assembly (40) against the matching tape strip (25).

42 Install and tighten the webbing strap (41) on the hatch torsion bar (42).

INSPECTION/REPAIR

1 For repair of the crane operator's enclosure electrical wiring, refer to page 2-1126.

2 For repair of the crane operator's enclosure, refer to page 2-1129.

3 For repair of the crane window assembly, refer to page 2-1138.

4 For repair of the crane operator's base assembly, refer to page 2-1142.

TESTING

1 Turn the MASTER switch, instrument panel switch, and the wiper motor switch to ON,

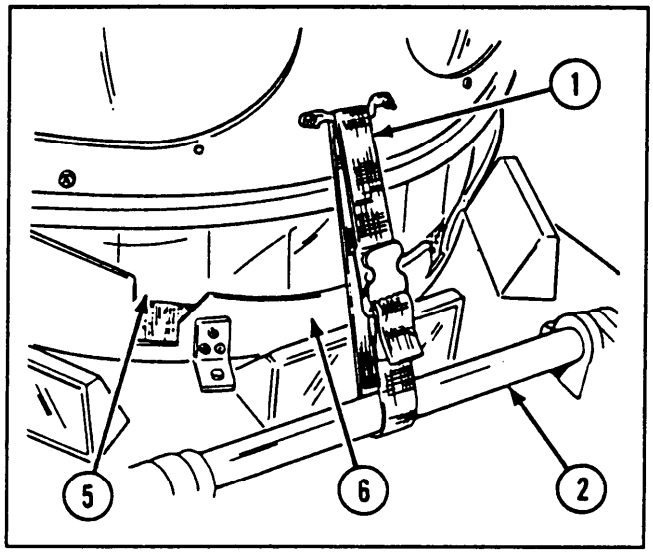
2 If the wiper motor doesn't operate, re-check the electrical connections and leads.

REMOVAL

WARNING

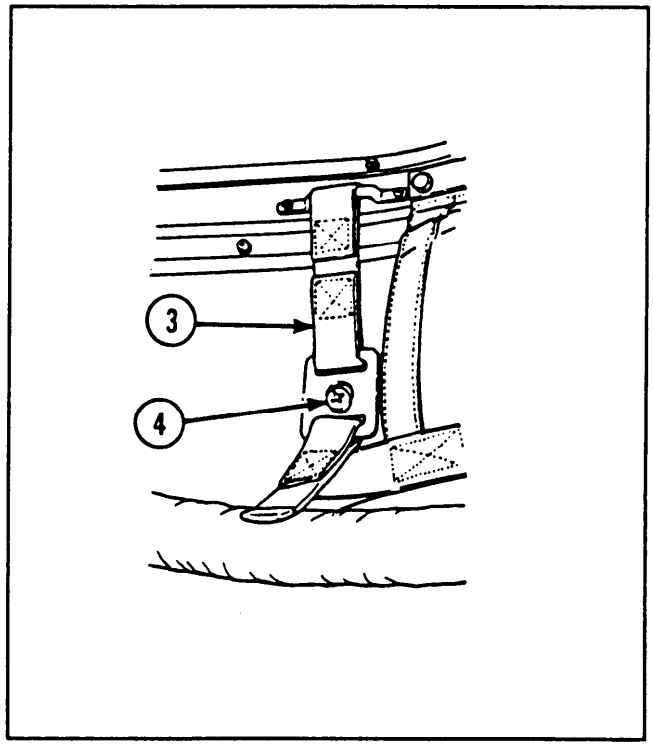
Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Loosen and remove webbing strap (1) on hatch torsion bar (2).



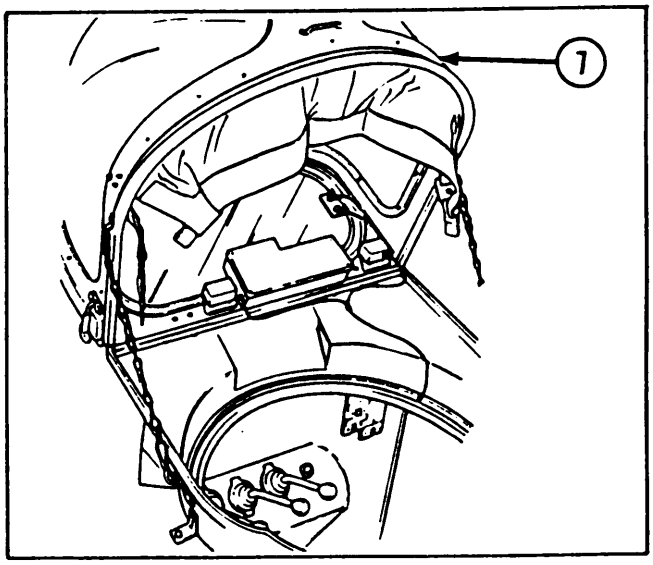
2 Pull down and unhook two base straps (3) from two screws (4).

3 Detach the crane operator's window assembly rear seal (5) from matching tape strip (6).

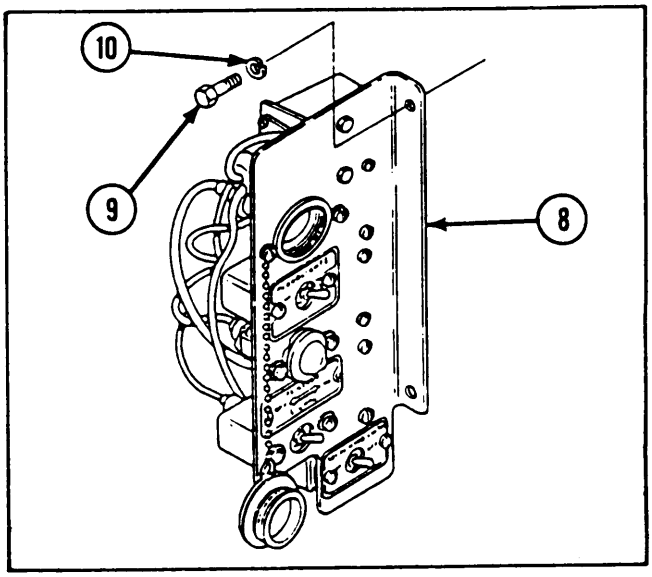


2-196. MAINTENANCE OF CRANE OPERATOR'S ENCLOSURE KIT (CONT).

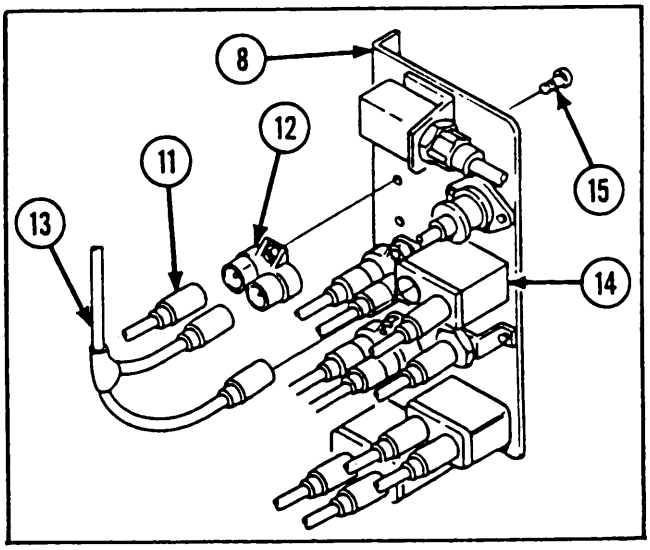
REMOVAL (CONT)



4 Open the vehicular window (7).



5 Support angle bracket (8) and remove two hexagon head capscrews (9), two lockwashers (10), and angle bracket (8) from bulkhead.



6 Disconnect slipring to circuit breakers and radio power disconnect branched wiring harness (11) from 30-amp circuit breaker (12).

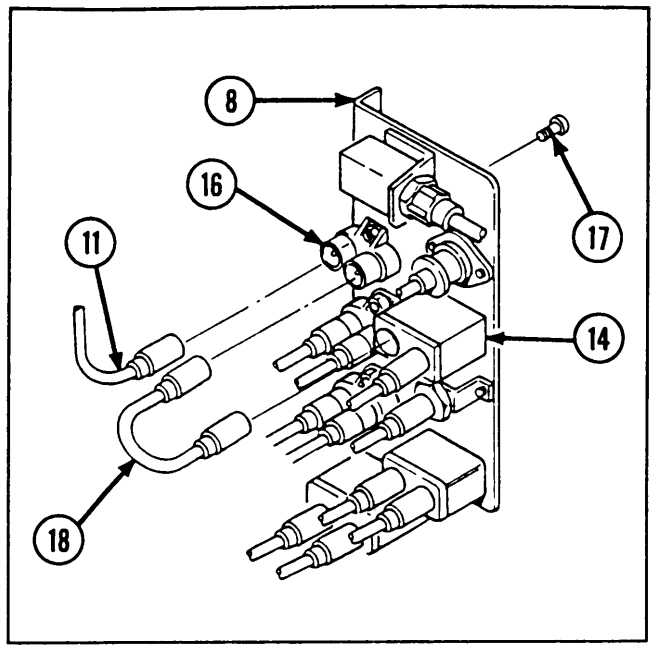
7 Disconnect circuit breaker to wiper motor and defroster electrical lead assembly (13) from 30-amp circuit breaker (12) and 24-volt toggle switch (14).

8 Remove two machine screws (15) and 30-amp circuit breaker (12) from angle bracket (8).

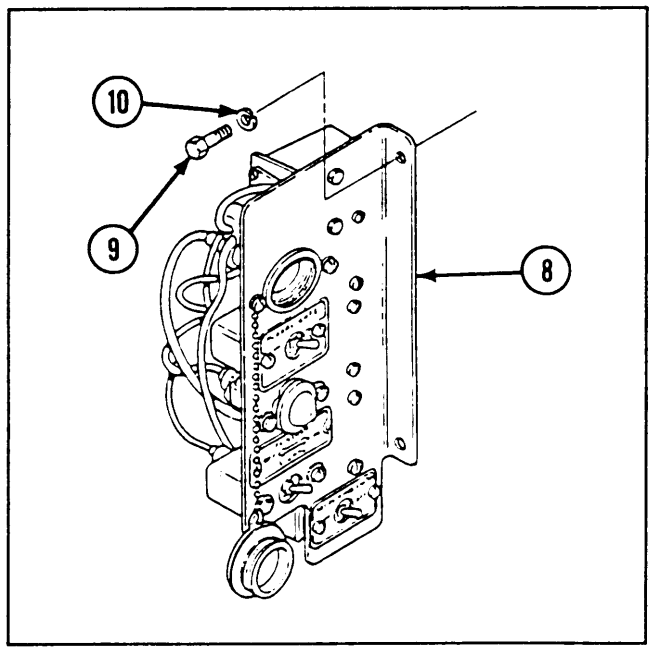
9 Install 15-amp circuit breaker (16) and two machine screws (17) on angle bracket (8).

10 Connect slipring to circuit breakers and radio power disconnect branched wiring harness (11) to 15-amp circuit breaker (16).

11 Connect circuit breaker to floodlight switch electrical lead (18) to 15-amp circuit breaker (16) and 24-volt toggle switch (14).



12 Support angle bracket (8) and install two lockwashers (10), two hexagon head capscrews (9), and angle bracket on bulkhead.



2-196. MAINTENANCE OF CRANE OPERATOR'S ENCLOSURE KIT (CONT).

REMOVAL (CONT)

13 Peel back a portion of the operator's cupola ring cushioning pad (19) and withdraw circuit breaker to wiper motor and defroster electrical lead assembly (13) through the 1/2-in. (12.70-mm) in the operator's cupola ring cushioning pad (19).

14 Using sealant, fill the 1/2-in. (12.70-mm) hole to prevent entry of moisture into the cab.

WARNING

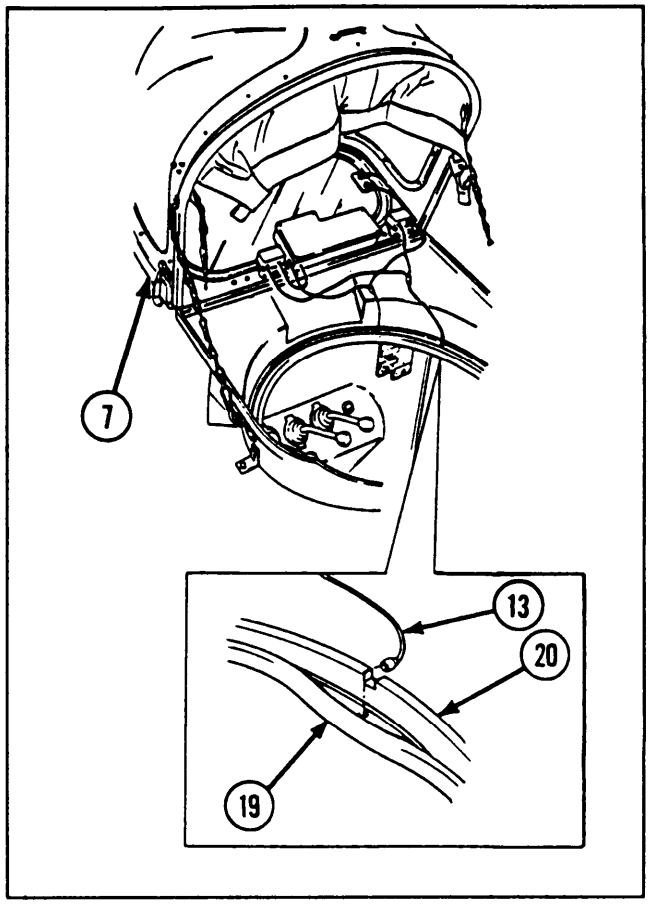
Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well-ventilated area.

15 Using dry cleaning solvent, remove adhesive residue from cupola *(20).*

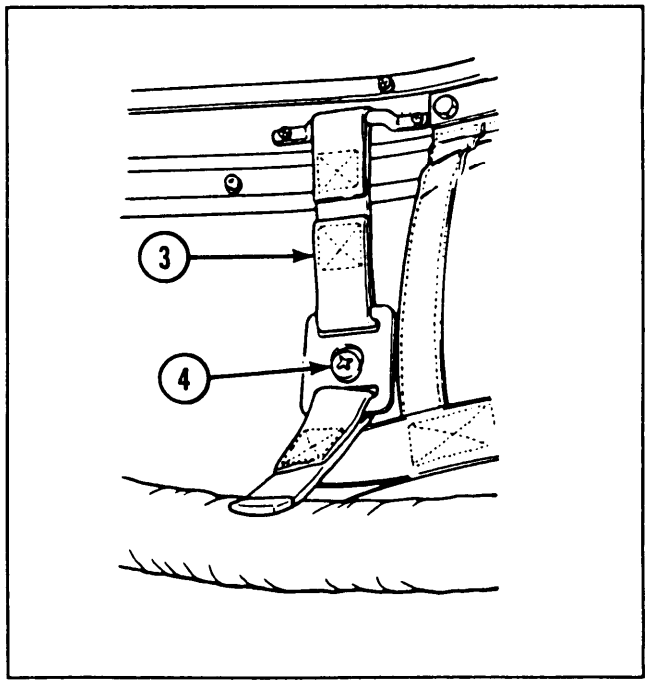
16 Using liquid soap and water, clean operator's cupola ring cushioning pad (19).

17 Using adhesive, reseal operator's cupola ring cushioning pad (19).

18 Close vehicular window (7).



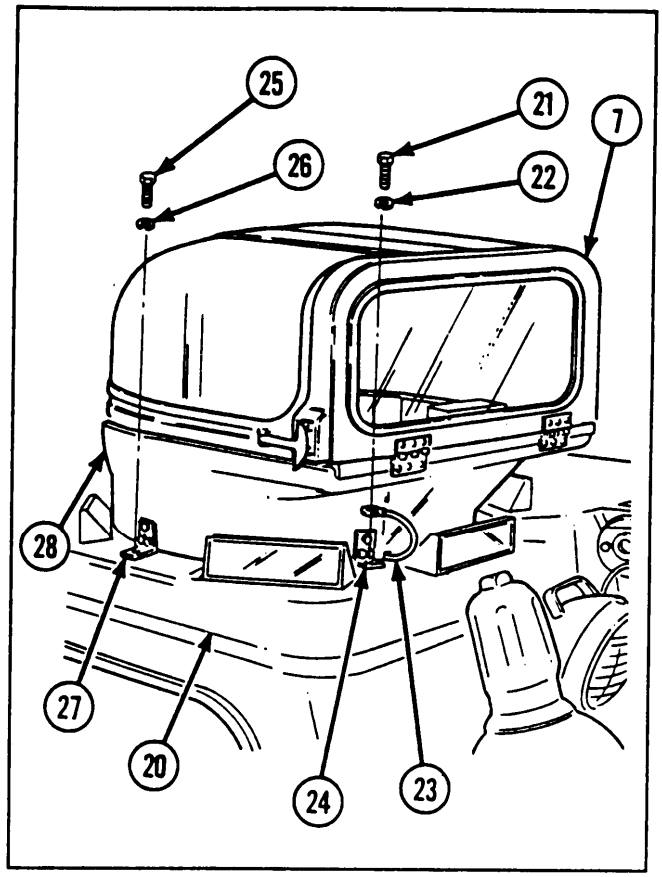
19 Pull down and hook base straps (3) on two screws (4).



20 Remove hexagon head capscrew (21), lockwasher (22), and electrical ground lead (23) from hull bracket (24).

21 Remove three hexagon head capscrews (25) and three lockwashers (26) from three hull brackets (27).

22 Remove vehicular window (7) and crane operator's base assembly (28) from cupola (20).



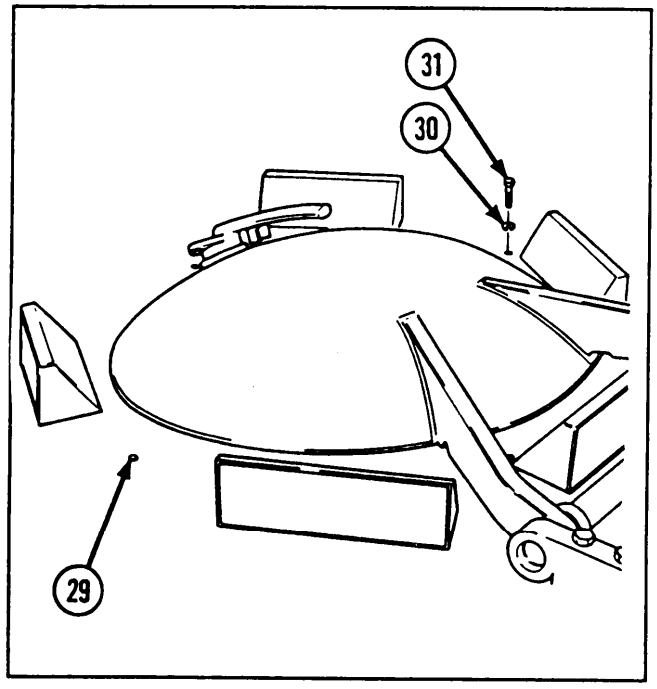
23 Apply antiseize compound to the threads of four hexagon head capscrews.

24 Apply sealant around four screw holes in cupola.

25 Install four lockwashers (30) and four hexagon head capscrews (31) to plug threaded holes to prevent entry of moisture.

26 Torque four hexagon head capscrews (31) to 90.00 ± 5.00 in.-lb (10.17 ± 0.56 N-m).

27 Clean and inspect all kit components. Replace broken, damaged, and missing parts (TM 9-2350-238-24P-1).



2-197. MAINTENANCE OF CRANE OPERATOR'S ENCLOSURE KIT—ELECTRICAL WIRING.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Materials/Parts
Lockwasher (4)
Self-locking nut (2)

References
TM 9-2350-238-24P-1

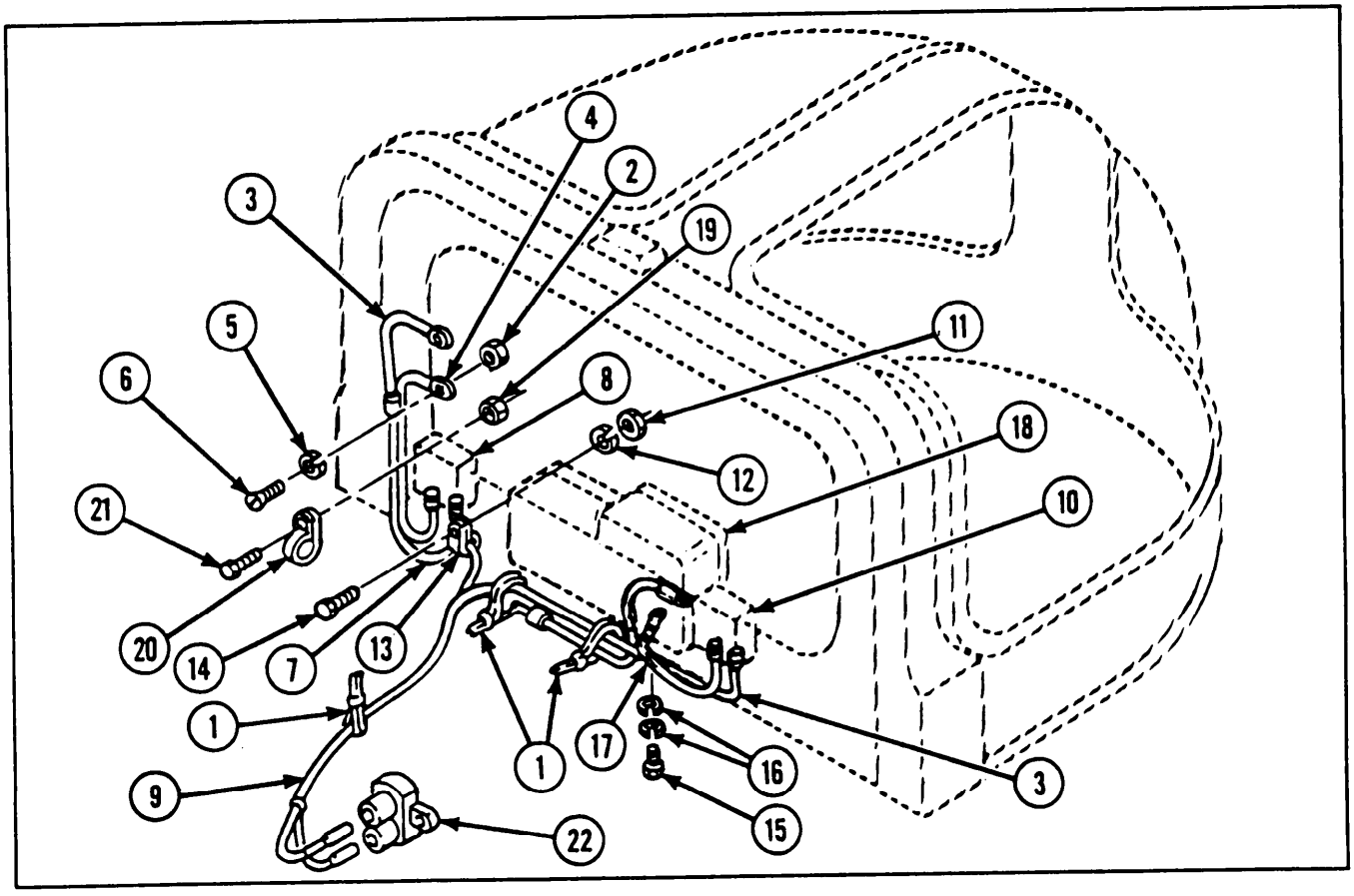
Equipment Conditions
Master power switch OFF
2-640 Batteries disconnected

General Safety Instructions

WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL



WARNING

Failure to remove or disconnect batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Remove three electrical tiedown straps (1).

2 Remove two hexagon plain nuts (2), wiper motor to ground lead disconnect electrical lead (3), defroster switch to defroster lead disconnect electrical lead (4), two lockwashers (5), and two machine screws (6) from windshield.

3 Disconnect wiper motor to ground lead disconnect electrical lead (3) from wiper motor and defroster lead disconnects branched wiring harness (7).

4 Disconnect defroster switch to defroster lead disconnect electrical lead (4) from toggle switch (8).

5 Disconnect circuit breaker to wiper motor and defroster electrical lead assembly (9) from toggle switch (8).

6 Remove self-locking nut (11), lockwasher (12), loop clamp (13), and machine screw (14).

7 Remove machine screw (15), two lockwashers (16), wiper motor switch electrical lead (17), and defroster switch to defroster lead disconnect electrical lead (4) from windshield wiper motor (18).

8 Disconnect wiper motor switch electrical lead (17) from wiper motor and defroster lead disconnects branched wiring harness (7).

9 Disconnect wiper motor to switch electrical lead (17) from toggle switch (10).

10 Disconnect circuit breaker to wiper motor and defroster switch electrical lead assembly (9) from toggle switch (10).

11 Remove self-locking nut (19), loop clamp (20), and machine screw (21).

12 Remove wiper motor and defroster lead disconnects branched wiring harness (7), and circuit breaker to wiper motor and defroster switch electrical lead assembly (9) from circuit breaker (22).

INSPECTION/REPAIR

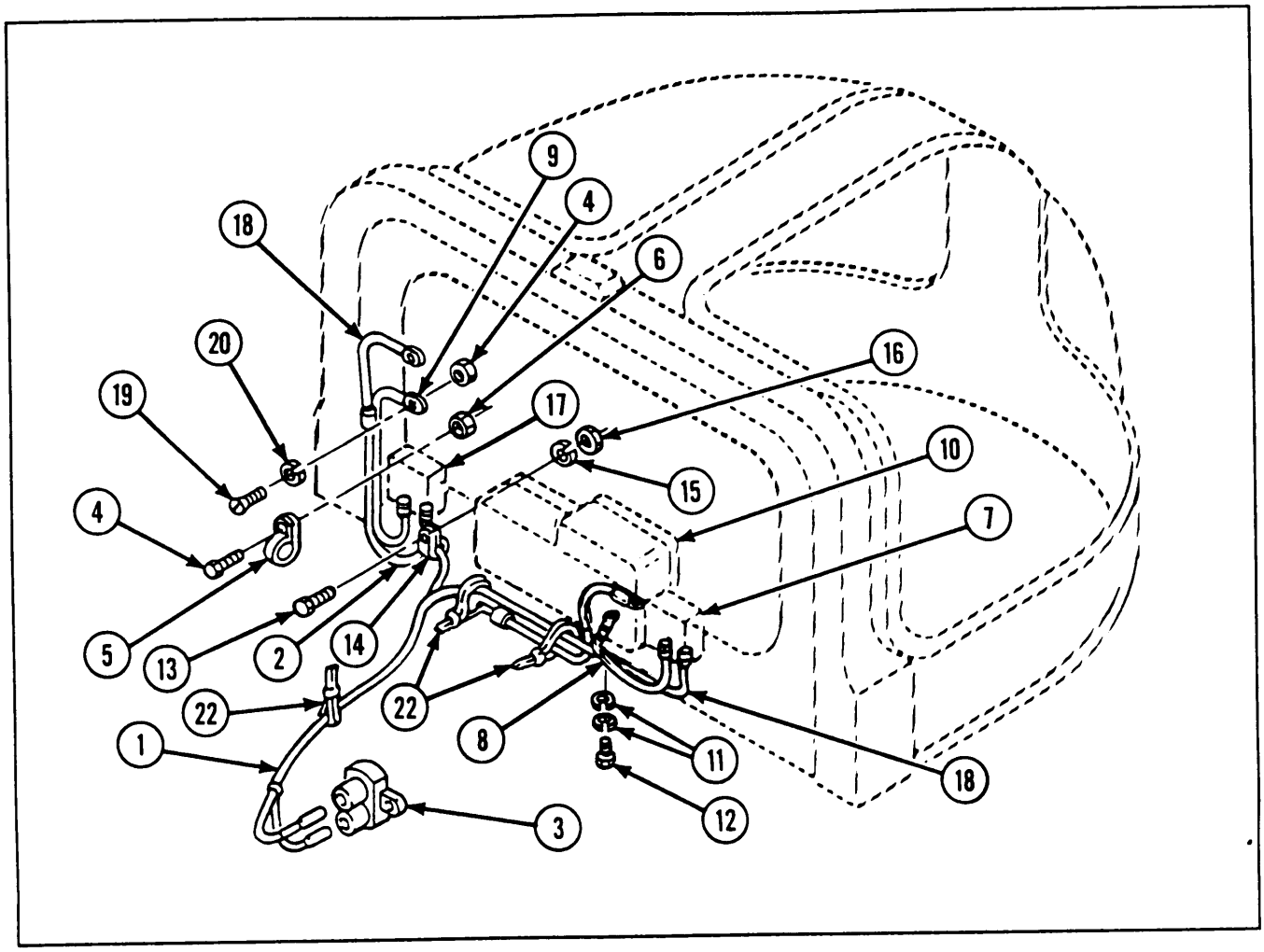
1 Inspect for broken, damaged, or missing parts.

2 For repair of branched wiring harness and electrical leads, refer to general maintenance, page 2-371.

3 Repair is by replacement of authorized parts (TM 9-2350-238-20-1) which do not meet the inspection criteria.

2-197. MAINTENANCE OF CRANE OPERATOR'S ENCLOSURE KIT—ELECTRICAL WIRING (CONT).

INSTALLATION



1 Install circuit breaker to wiper motor and defroster switch electrical lead assembly (1) and wiper motor and defroster lead disconnects branched wiring harness (2) to circuit breaker (3).

2 Install machine screw (4), loop clamp (5), and new self-locking nut (6).

3 Connect circuit breaker to wiper motor and defroster switch electrical lead assembly (1) to toggle switch (7).

4 Connect wiper motor to switch electrical lead (8) to toggle switch (7).

5 Connect wiper motor switch electrical lead (8) to wiper motor and defroster lead disconnects branched wiring harness (2).

6 Position defroster switch to defroster lead disconnect electrical lead (9) and wiper motor to switch electrical lead (8) on windshield wiper motor (10), and secure with two new lockwashers (11) and machine screw (12).

7 Install machine screw (13), loop clamp (14), new lockwasher (15), and new self-locking nut (16).

8 Connect circuit breaker to wiper motor and defroster electrical lead assembly (1) to toggle switch (17).

9 Connect defroster switch to defroster lead disconnect electrical lead (9) to toggle switch (17).

10 Connect wiper motor to ground lead disconnect electrical lead (18) to wiper motor and defroster lead disconnects branched wiring harness (2).

11 Position defroster switch to defroster lead disconnect electrical lead (9) and wiper motor to ground lead disconnect electrical lead (18) on windshield, and secure with two machine screws (20), two new lockwashers (20), and two hexagon plain nuts (21).

12 Install three electrical tiedown straps (22).

2-198. MAINTENANCE OF CRANE OPERATOR'S ENCLOSURE KIT—ENCLOSURE.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

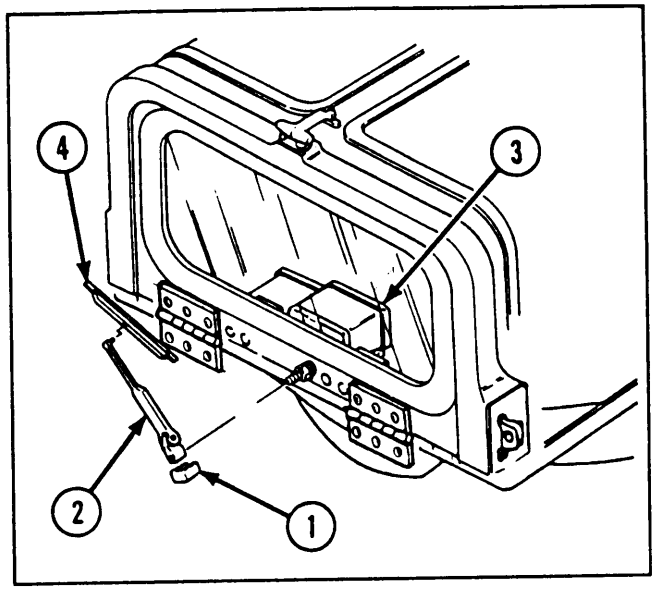
Materials/Parts
Cotter pin (2)
Lockwasher (4)
Self-locking nut (11)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-1126 Crane operator's enclosure kit electrical wiring removed

2-198. MAINTENANCE OF CRANE OPERATOR'S ENCLOSURE KIT—ENCLOSURE (CONT).

REMOVAL



1 Remove wiper blade clip (1) and windshield wiper arm (2) from windshield wiper motor (3). Remove windshield wiper blade (4) from windshield wiper arm.

NOTE

Nut, lockwasher, and washer are supplied with the windshield wiper motor. Use care not to lose or damage these components.

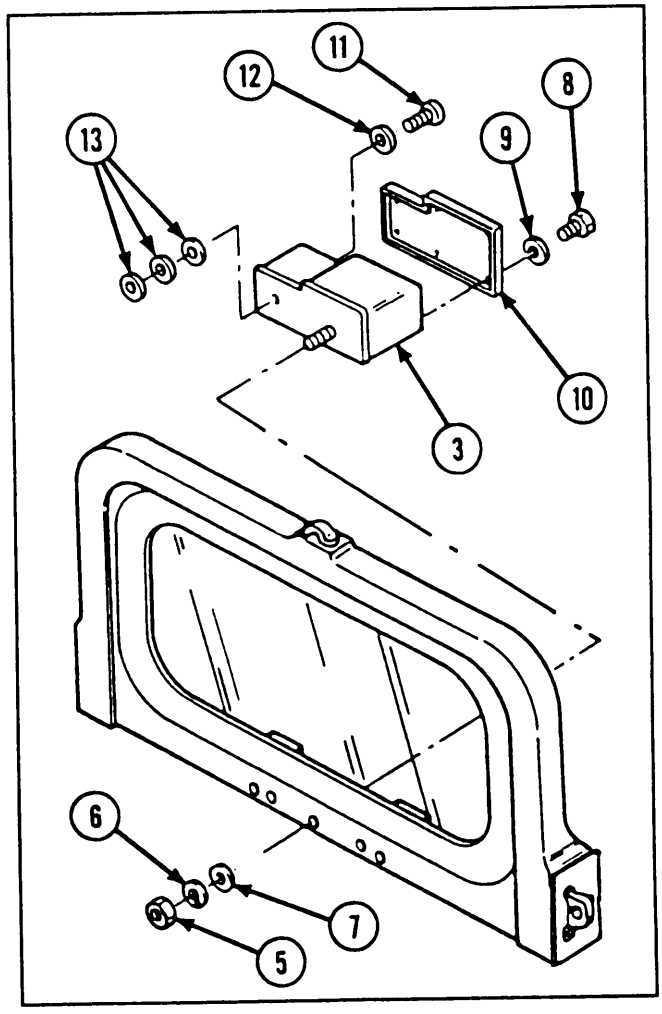
2 Remove nut (5), lockwasher (6), and washer (7) from windshield wiper motor (3).

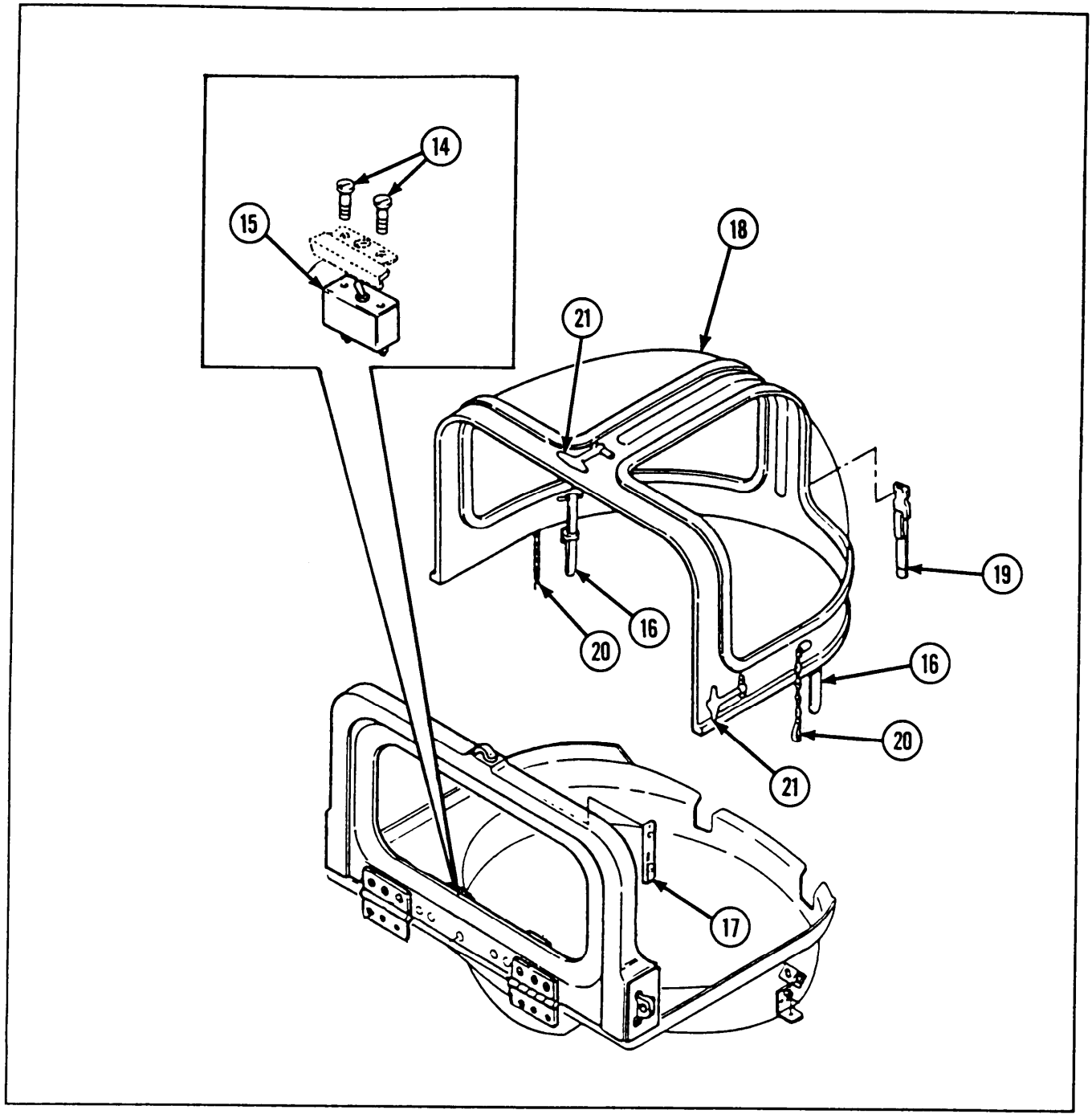
NOTE

The cover on the windshield wiper motor must be removed to gain access to some of the windshield wiper motor attaching hardware.

3 Remove six machine screws (8), six lockwashers (9), and cover (10) from windshield wiper motor (3).

4 Remove machine screw (11), flat washer (12), windshield wiper motor (3), and three flat washers (13).





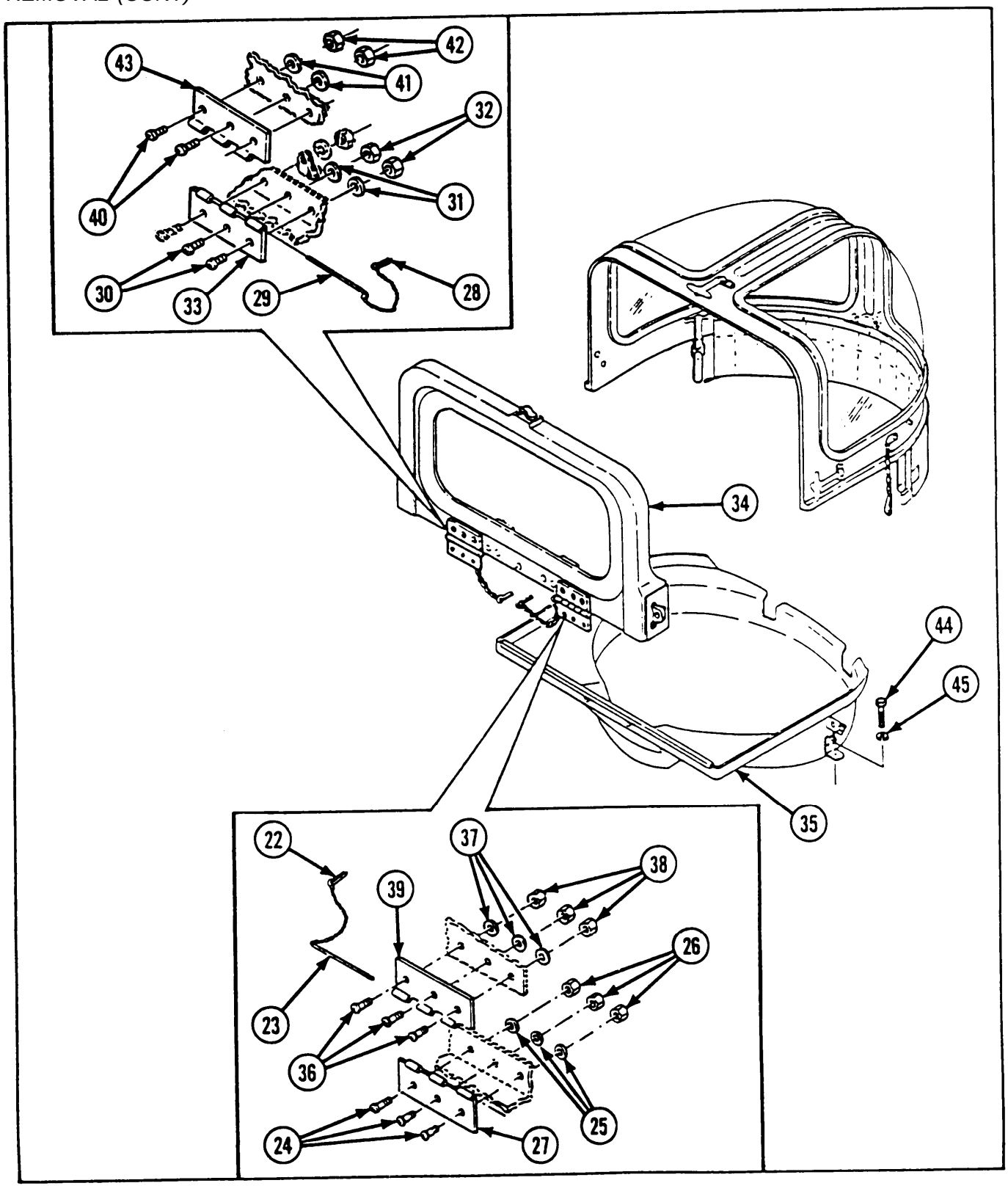
5 Remove four machine screws (14) and two toggle switches (15).

6 Disconnect base straps (16) from machine screw (17) on each side of crane window assembly (18).

7 Remove webbing strap (19). Disconnect window assembly chain (20) on both sides of crane window assembly (18). Unlatch three window assembly to windshield assembly cylinder fasteners (21), and remove crane window assembly.

2-198. MAINTENANCE OF CRANE OPERATOR'S ENCLOSURE KIT-ENCLOSURE (CONT).

REMOVAL (CONT)



8 Remove cotter pin (22), hinge to base pin assembly (23), three machine screws (24), three flat washers (25), three self-locking nuts (26), and lower half of windshield to base butt hinge (27).

9 Remove cotter pin (28), hinge to base pin assembly (29), two machine screws (30), two flat washers (31), two self-locking nuts (32), and lower half of windshield to base butt hinge (33).

10 Remove vehicular window (34) from base assembly (35).

11 Remove three machine screws (36), three flat washers (37), three self-locking nuts (38), and upper half of windshield to base butt hinge (39).

12 Remove two machine screws (40), two flat washers (41), two self-locking nuts (42), and upper half of windshield to base butt hinge (43).

13 Remove four hexagon head capscrews (44), four lockwashers (45), and base assembly (35).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Crane window assembly is a repairable assembly. Refer to page 2-1138.

3 Windshield wiper motor is a repairable assembly. Notify direct support maintenance.

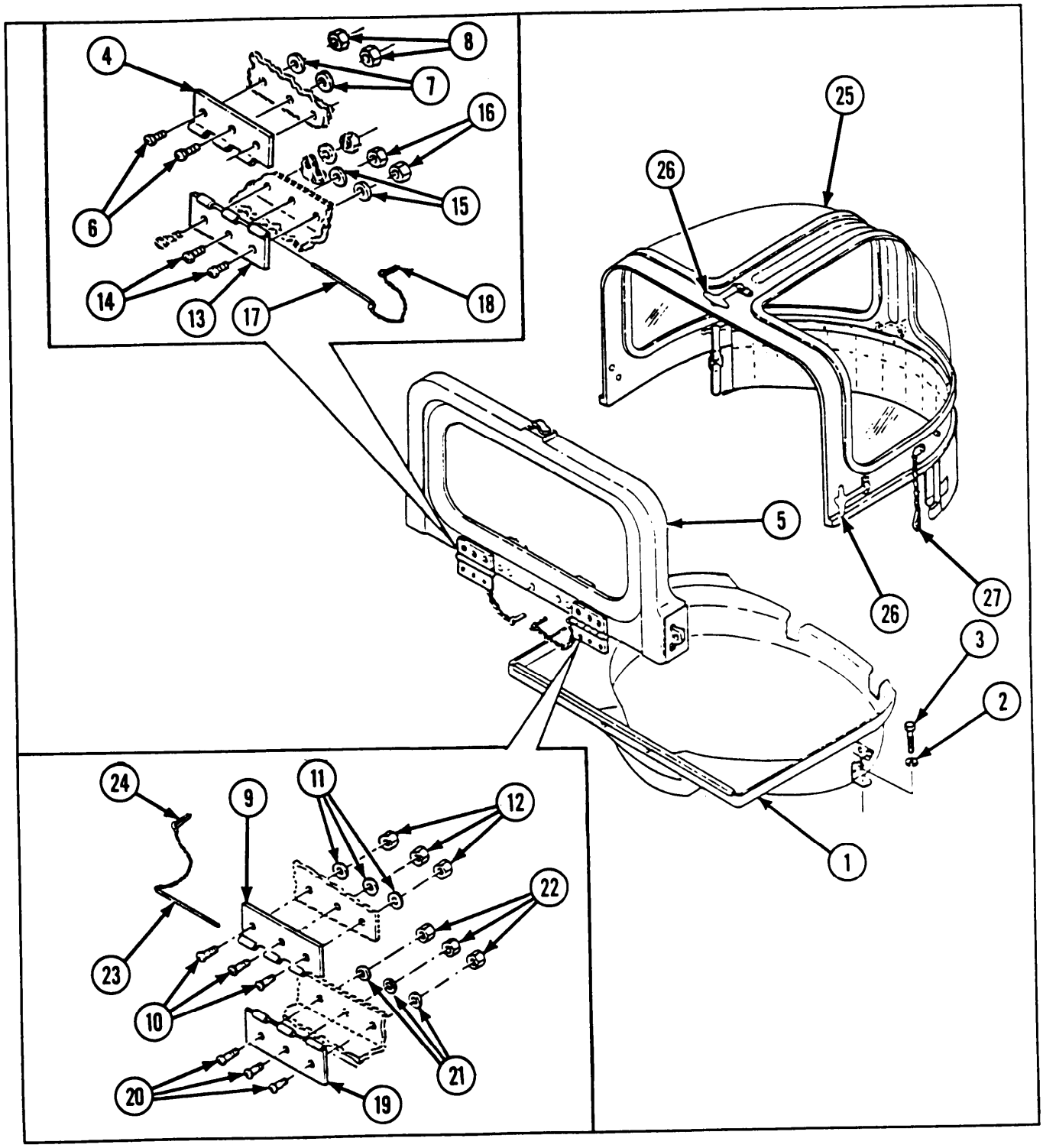
4 Vehicular window is a repairable assembly. Refer to page 2-1081.

5 Base assembly is a repairable assembly. Refer to page 2-1142.

6 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

2-198. MAINTENANCE OF CRANE OPERATOR'S ENCLOSURE KIT-ENCLOSURE (CONT).

INSTALLATION



1 Align base assembly (1) with four screw holes and install four new lockwashers (2) and four hexagon head capscrews (3).

2 Position upper half of windshield to base butt hinge (4) on vehicular window (5). Align holes, and install two machine screws (6), two flat washers (7), and two new self-locking nuts (8).

3 Position upper half of windshield to base butt hinge (9) on vehicular window (5). Align holes, and install three machine screws (10), three flat washers (11), and three new self-locking nuts (12).

4 Install vehicular window (5) on base assembly (1).

5 Position lower half of windshield to base butt hinge (13) on base assembly (1), align holes, and install two machine screws (14), two flat washers (15), and two new self-locking nuts (16).

6 Align holes in upper (4) and lower (13) halves of windshield to base butt hinge, and secure by installing hinge to base pin assembly (17) and new cotter pin (18).

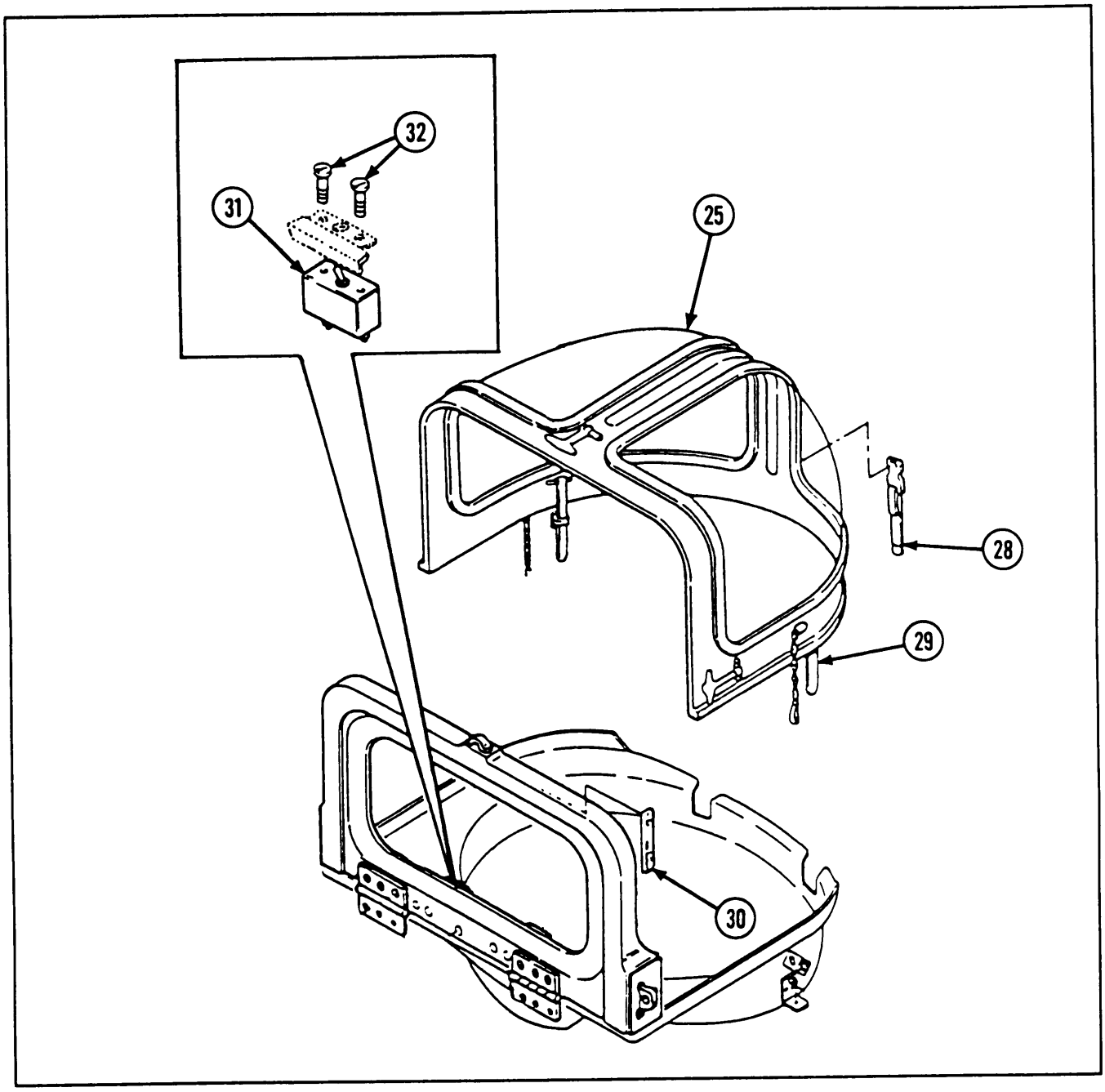
7 Position lower half of windshield to base butt hinge (19) on base assembly (1), align holes, and install three machine screws (20), three flat washers (21), and three new self-locking nuts (22).

8 Align holes in upper (9) and lower (19) halves of windshield to base butt hinge, and secure by installing hinge to base pin assembly (23) and new cotter pin (24).

9 Position window assembly (25) on base assembly (1). Latch three window assembly to windshield assembly cylinder fasteners (26), and connect window assembly chains (27) on both sides of window assembly.

2-198. MAINTENANCE OF CRANE OPERATOR'S ENCLOSURE KIT—ENCLOSURE (CONT).

INSTALLATION (CONT)



10 Install webbing strap (28) on rear of window assembly (25).

11 Connect base strap (29) to machine screw (30) on each side of window assembly (25).

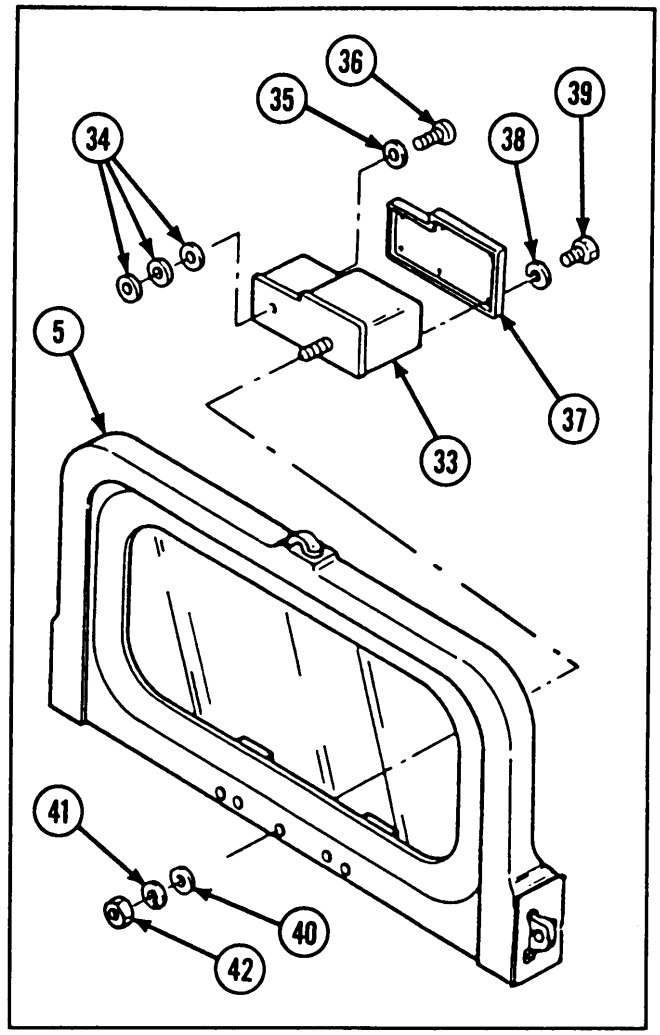
12 Install two toggle switches (31) and four machine screws (32).

13 Install windshield wiper motor (33) through vehicular window (5).

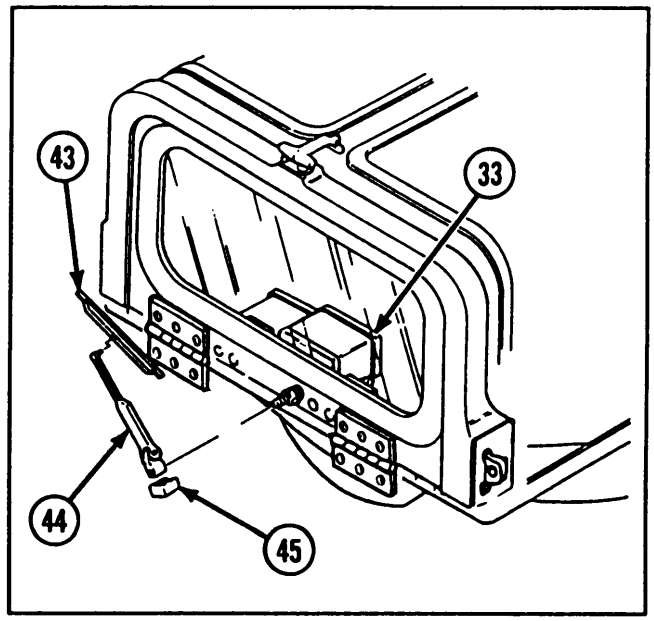
14 Install three flat washers (34) as spacers between vehicular window (5) and windshield wiper motor (33), and secure with flat washer (35) and machine screw (36).

15 Install cover (37), six new lock-washers (38), and six machine screws (39) on windshield wiper motor (33).

16 Install washer (40), new lockwasher (41), and nut (42).



17 Install windshield wiper blade (43) on windshield wiper arm (44). Install windshield wiper arm (44) and wiper blade clip (45) on windshield wiper motor (33).



2-199. MAINTENANCE OF CRANE WINDOW ASSEMBLY.

This task covers: a. *Disassembly* b. *Inspection/Repair* c. *Reassembly*

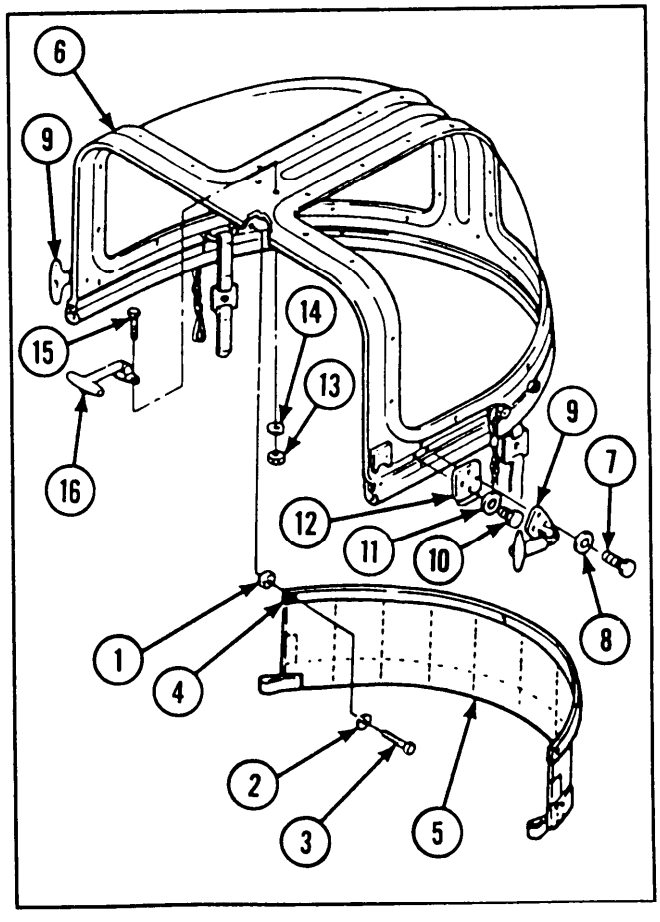
INITIAL SETUP

Materials/Parts
Lockwasher (5)
Lockwasher (12)
Self-locking nut (2)
Self-locking nut (6)
Self-locking nut (7)

References
TM 9-2350-238-24P-1

Equipment Conditions
2-1111 Crane window assembly removed

DISASSEMBLY

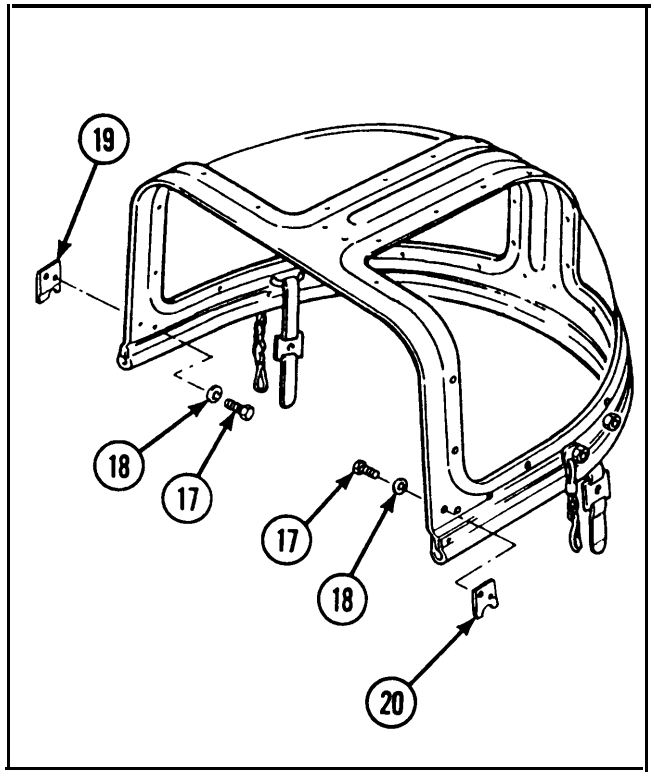


1 Remove five hexagon plain nuts (1), five lockwashers (2), five hexagon head capscrews (3), window assembly retaining strip (4), and cover assembly (5) from frame (6).

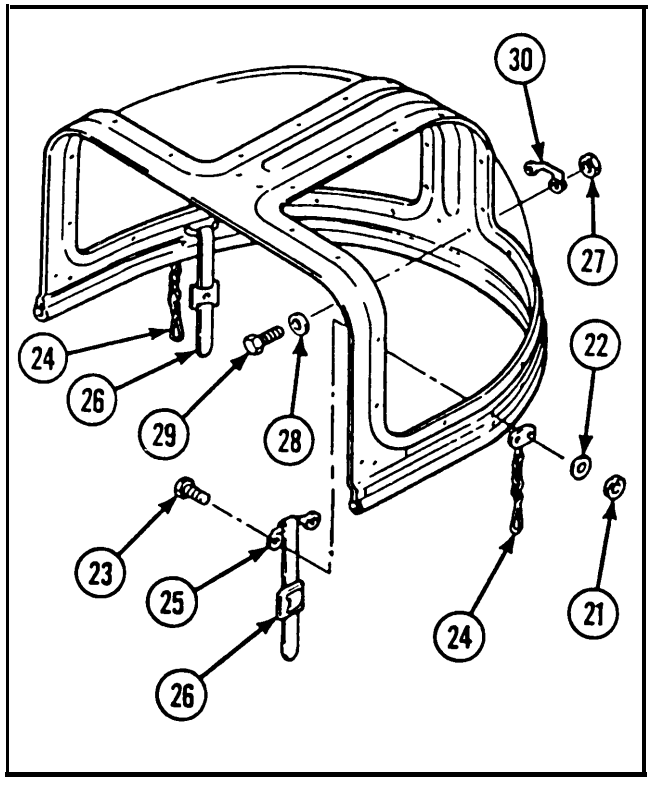
2 Remove four machine screws (7), four lockwashers (8), and two window assembly to windshield assembly cylinder fasteners (9).

3 Remove four machine screws (10), four lockwashers (11), and two window catch pads (12).

4 Remove two self-locking nuts (13), two flat washers (14), two machine screws (15), and window assembly to windshield assembly cylinder fastener (16).



5 Remove four machine screws (17), four lockwashers (18), locking assembly plate (19), and locking assembly plate (20).



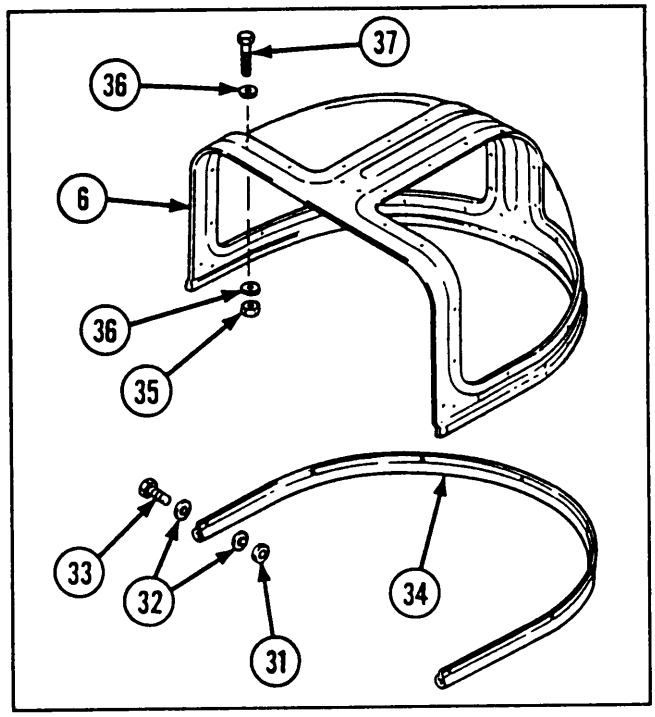
6 Remove four self-locking nuts (21), four flat washers (22), four machine screws (23), two window assembly chains (24), and two strap fastener loops (25).

7 Remove two base straps (26) from two strap fastener loops (25).

8 Remove two self-locking nuts (27), two flat washers (28), two machine screws (29), and strap fastener loop (30).

2-199. MAINTENANCE OF CRANE WINDOW ASSEMBLY (CONT).

DISASSEMBLY (CONT)



9 Remove 7 self-locking nuts (31), 14 flat washers (32), and 7 machine screws (33).

10 Remove nonmetallic window assembly seal (34) from frame (6).

11 If damaged, remove 28 self-locking nuts (35), 56 flat washers (36), and 28 machine screws (37) from frame (6).

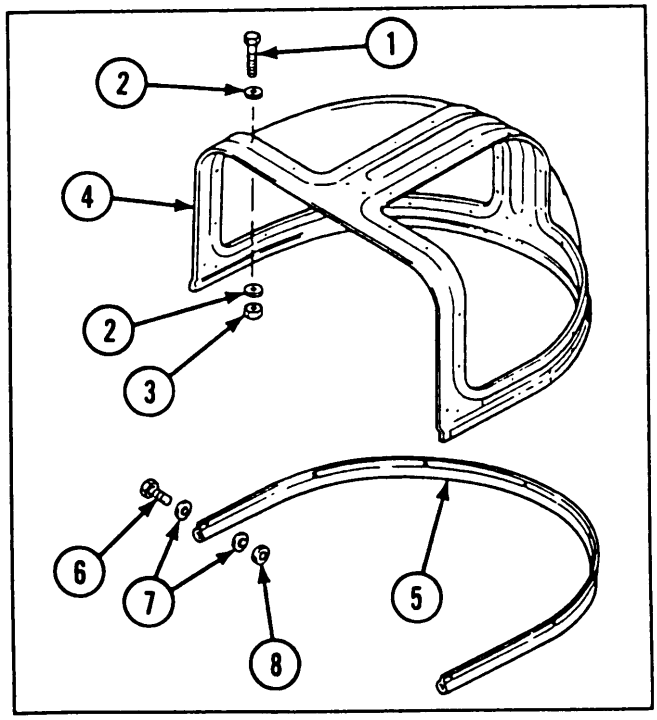
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 For further repair of crane window assembly notify direct support maintenance.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY



1 If removed, install 28 machine screws (1), 56 flat washers (2), and 28 self-locking nuts (3) in frame (4).

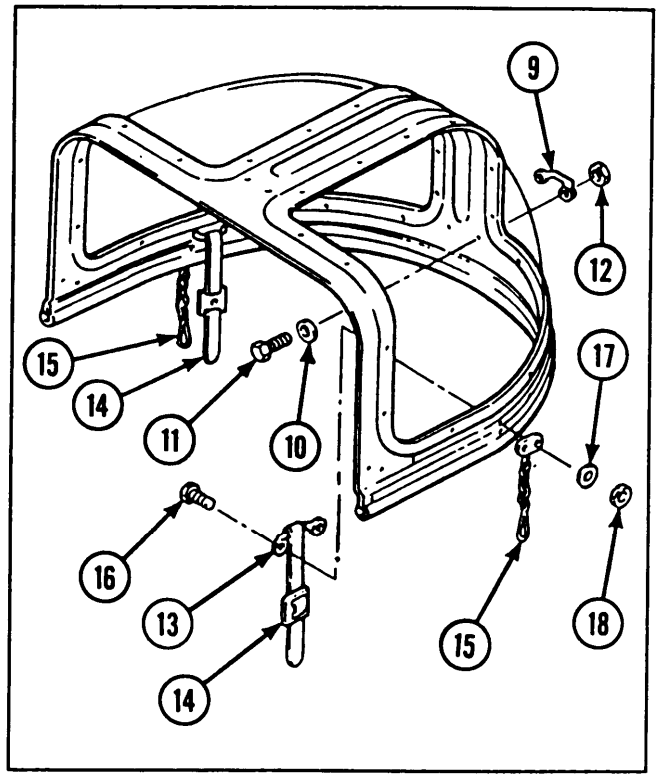
2 Install nonmetallic window assembly seal (5) in frame (4).

3 Install 7 machine screws (6), 14 flat washers (7), and 7 new self-locking nuts (8).

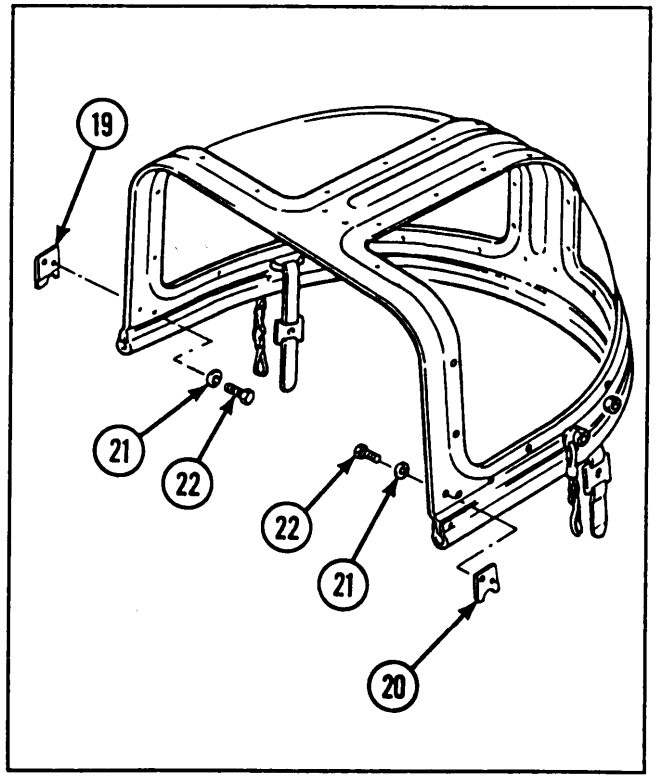
4 Install strap fastener loop (9), two flat washers (10), two machine screws (11), and two new self-locking nuts (12).

5 Install two strap fastener loops (13) on two base straps (14).

6 Install two strap fastener loops (13), two window assembly chains (15), four machine screws (16), four flat washers (17), and four new self-locking nuts (18).

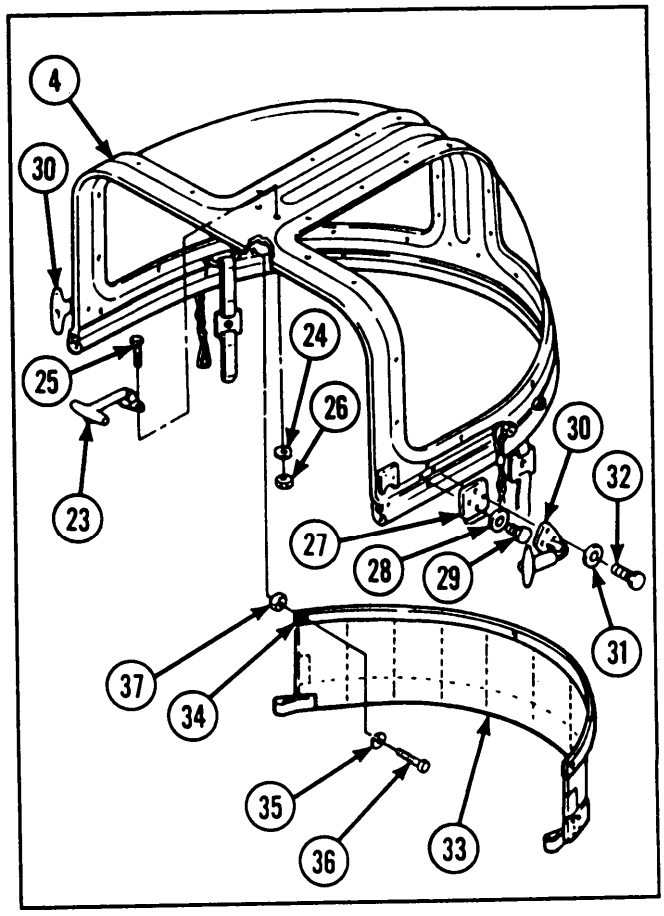


7 Install locking assembly plate (19), locking assembly plate (20), four new lockwashers (21), and four machine screws (22).



2-199. MAINTENANCE OF CRANE WINDOW ASSEMBLY (CONT).

REASSEMBLY (CONT)



8 Install window assembly to windshield assembly fastener (23), two flat washers (24), two machine screws (25), and two new self-locking nuts (26).

9 Install two window catch pads (27), four new lockwashers (28), and four machine screws (29).

10 Install two window assembly to windshield assembly cylinder fasteners (30), four new lockwashers (31), and four machine screws (32).

11 Install cover assembly (33), window assembly retaining strip (34), five new lockwashers (35), five hexagon head capscrews (36), and five hexagon plain nuts (37) on frame (4).

2-200. MAINTENANCE OF CRANE OPERATOR'S BASE ASSEMBLY.

This task covers: a. *Disassembly* b. *Inspection/Repair* c. *Reassembly*

INITIAL SETUP

Materials/Parts
Adhesive (item 5, appx C)
Dry cleaning solvent (item 16, appx C)
Flint abrasive paper (item 2, appx C)
Nonmetallic channel (figure D-11, appx D)
Seal (figure D-14, appx D)
Self-locking nut (16)
Tape strip (figure D-12, appx D)
Tape strip (figure D-13, appx D)

References
TM 9-2350-238-24P-1

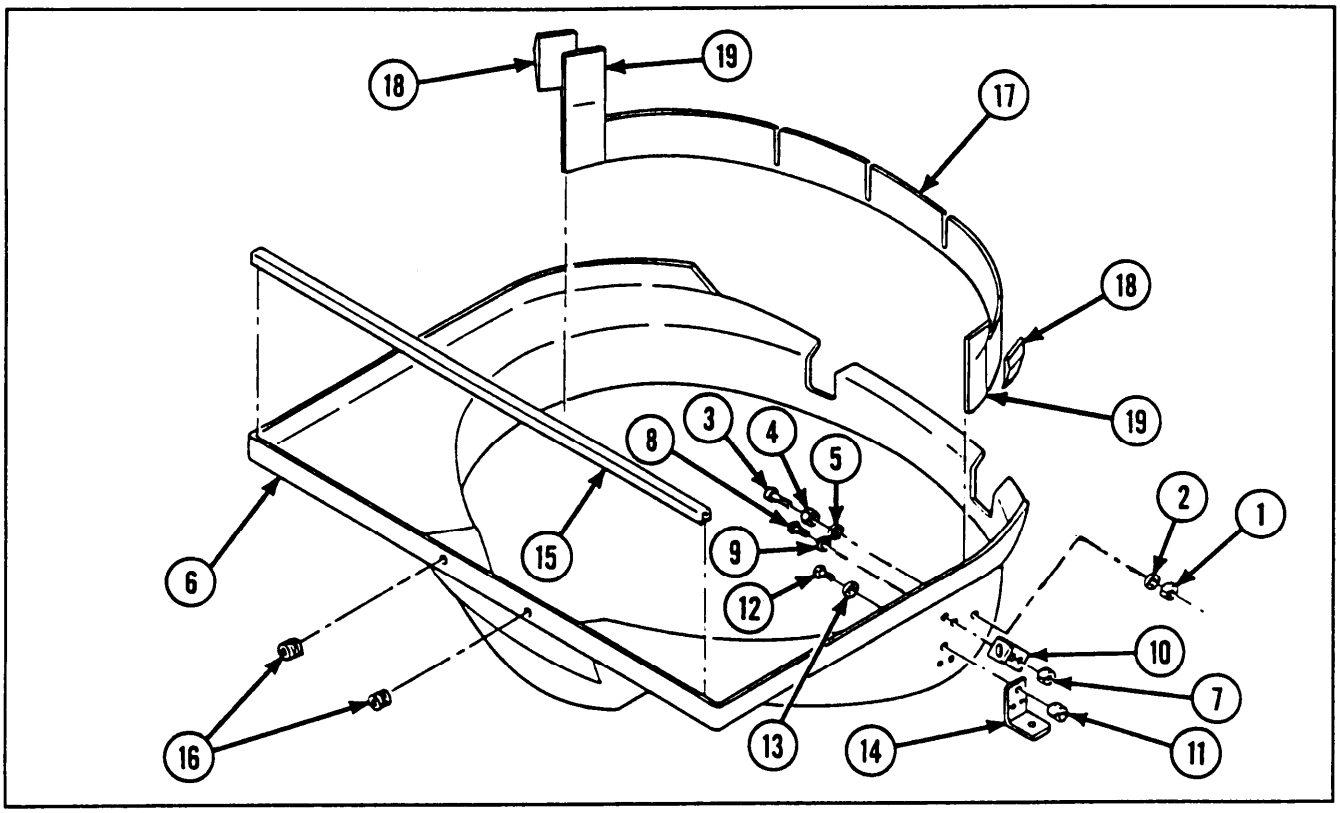
Equipment Conditions
2-1111 Crane operator's base assembly removed

General Safety Instructions

WARNING

Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in a well-ventilated area.

DISASSEMBLY



1 Remove two hexagon plain nuts (1), two flat washers (2), two machine screws (3), two hexagon plain nuts (4), and two flat washers (5) from base (6).

2 Remove four self-locking nuts (7), four machine screws (8), four flat washers (9), and two heater brackets (10) from base (6).

3 Remove 12 self-locking nuts (11), 12 machine screws (12), 12 flat washers (13), and 4 hull brackets (14).

4 Remove nonmetallic channel (15) from base (6).

5 Remove two nonmetallic grommets (16) from base (6).

6 Remove tape strip (17) from base (6).

7 Remove seals (18), and tape strips (19) from tape strip (17).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

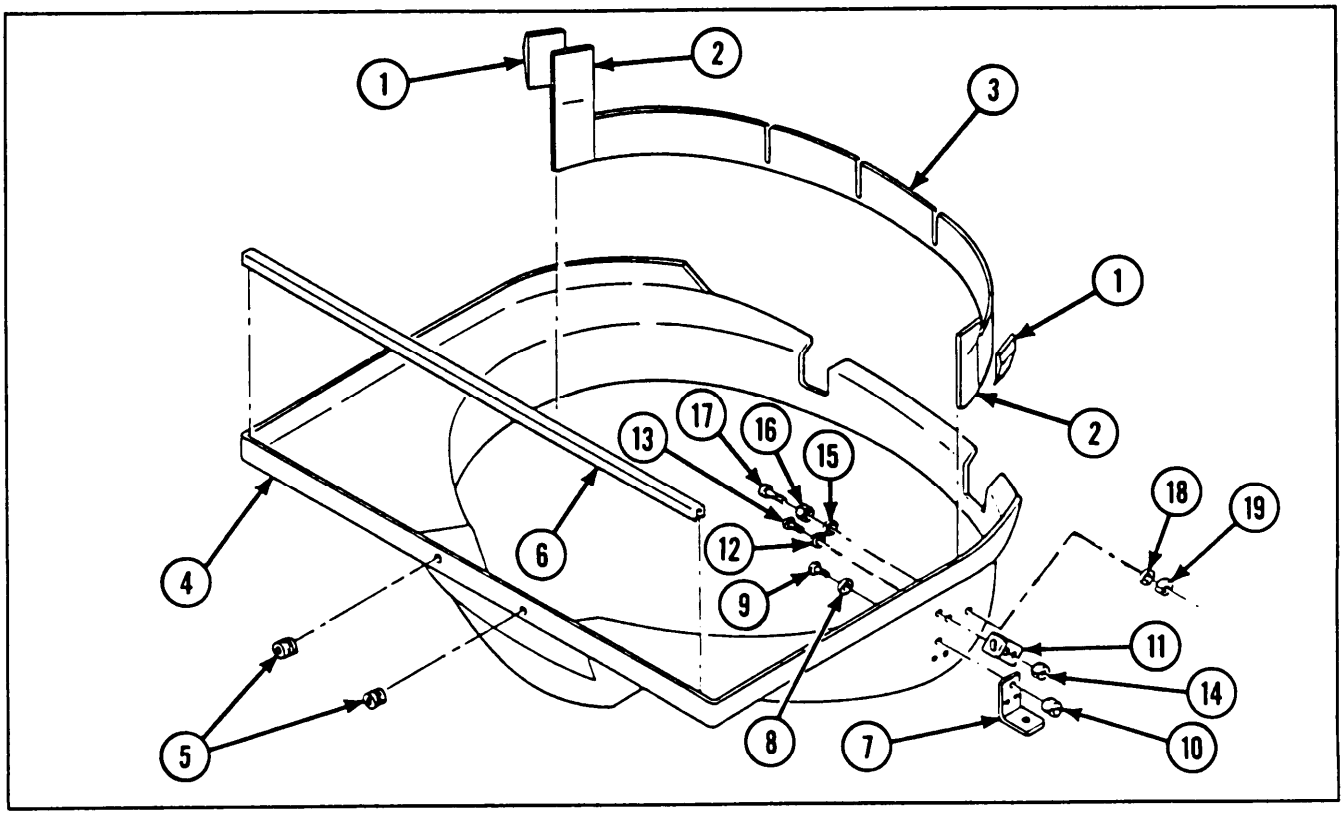
2 Seals and tape strips are manufactured items. Refer to appendix D.

3 If base is damaged, repair is by replacement of next higher assembly.

4 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

2-200. MAINTENANCE OF CRANE OPERATOR'S BASE ASSEMBLY (CONT).

REASSEMBLY



1 Roughen bonding surfaces with flint abrasive paper.

WARNING

Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in a well-ventilated area.

2 Apply dry cleaning solvent to bonding surfaces to remove any grease. Dry surface thoroughly.

3 Apply adhesive to two seals (1) and two tape strips (2). Install seals on tape strips.

4 Apply adhesive to tape strip (3) and install on base (4).

5 Install two nonmetallic grommets (5) in base (4).

6 Cut nonmetallic channel (6) as necessary around grommets. Apply adhesive to nonmetallic channel (6) and install on base (4).

7 Install *4* hull brackets (7), 12 flat washers (8), 12 machine screws (9), and 12 new self-locking nuts (10).

8 Install two base links (11), four flat washers (12), four machine screws (13), and four new self-locking nuts (14) on base. Bend if necessary.

9 Install two flat washers (15), two hexagon plain nuts (16), two machine screws (17), two flat washers (18), and two hexagon plain nuts (19) on base (4).

2-201. MAINTENANCE OF ARCTIC TRACTION KIT.

This task covers:
a. *Removal*
b. *Disassembly*
c. *Inspection/Repair*
d. *Reassembly*
e. *Installation/Adjustment*

INITIAL SETUP

Tools and Special Tools
Automotive maintenance and repair shop equipment: organizational maintenance, common no. 1 (less power) (item 80, appx B)
- Breaker bar (3/4 in. drive)
- Socket (15/16 in., 3/4 in. drive)
- Torque wrench (0 to 600 ft-lb)
- Wire brush

Driftpin (item 4, appx G)
Impact wire adapter (item 1, appx G)
Slide puller (item 18, appx G)
Track connecting fixture (2) (item 6, appx G)

Materials/Parts
Arctic traction parts kit
Corrosion preventive sealant (item 35, appx C)

Personnel Required
Two

References
TM 9-2350-238-10
TM 9-2350-238-24P-1

Equipment Conditions
2-942 Fender extension removed
Jacks applied to track
Track tension decreased (TM 9-2350-238-10)

NOTE
- Install one track before removing the other.
- Normally, the right track has 76 track shoes and the left track has 75 shoes. The number of track shoes may vary due to track wear.

General Safety Instructions

WARNING

Keep personnel away from vehicle. Personnel injury could occur when track falls away from idler wheel.

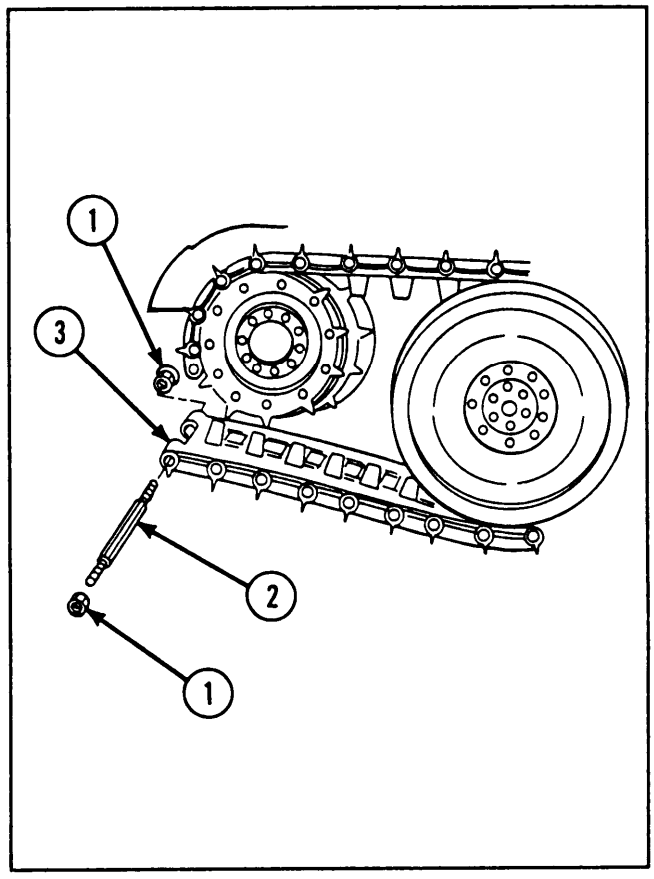
2-201. MAINTENANCE OF ARCTIC TRACTION KIT (CONT).

REMOVAL

NOTE

- It is not necessary to remove track from vehicle to replace arctic track pad.
- Remove one track at a time.
- Select area large enough to allow vehicle to be driven or towed at least 5 vehicle lengths.
- Procedures are written for one track, but apply to both tracks.

1 Remove two self-locking nuts (1).



WARNING

Keep personnel away from vehicle. Personnel injury could result when track falls away from idler wheel.

NOTE

Step 2 applies to the removal of the track shoe link pin from the top of a roadwheel.

2 Install impact wire adapter on track shoe link pin (2). Attach slide puller to impact wire adapter and remove track shoe link pin (2) from track (3).

3 Using driftpin, drive out track shoe link pin (2).

4 Slowly back vehicle until track is completely lying on ground.

5 Back vehicle off track.

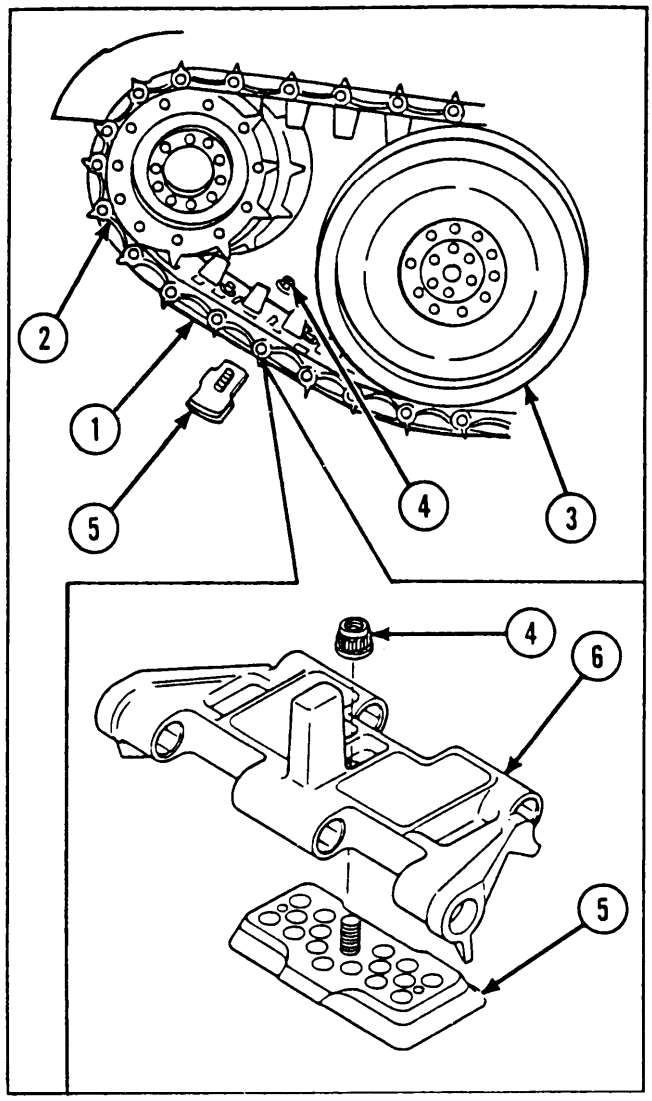
DISASSEMBLY

NOTE

- Procedures are written for one track shoe pad, but apply to all track shoe pads.
- Step 1 applies to the removal of the track shoe pad when the track is installed on the vehicle.

1 Position track shoe (1) between drive hub sprocket (2) and roadwheel (3).

2 If damaged, remove self-locking nut (4) and track shoe pad (5) from shoe assembly (6).



INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Inspect track shoe pads for wear to or below height of grouser lugs.

3 Inspect track shoe pads for chunks of rubber gouged out of contact surfaces.

4 For disassembly of track, refer to page 2-873.

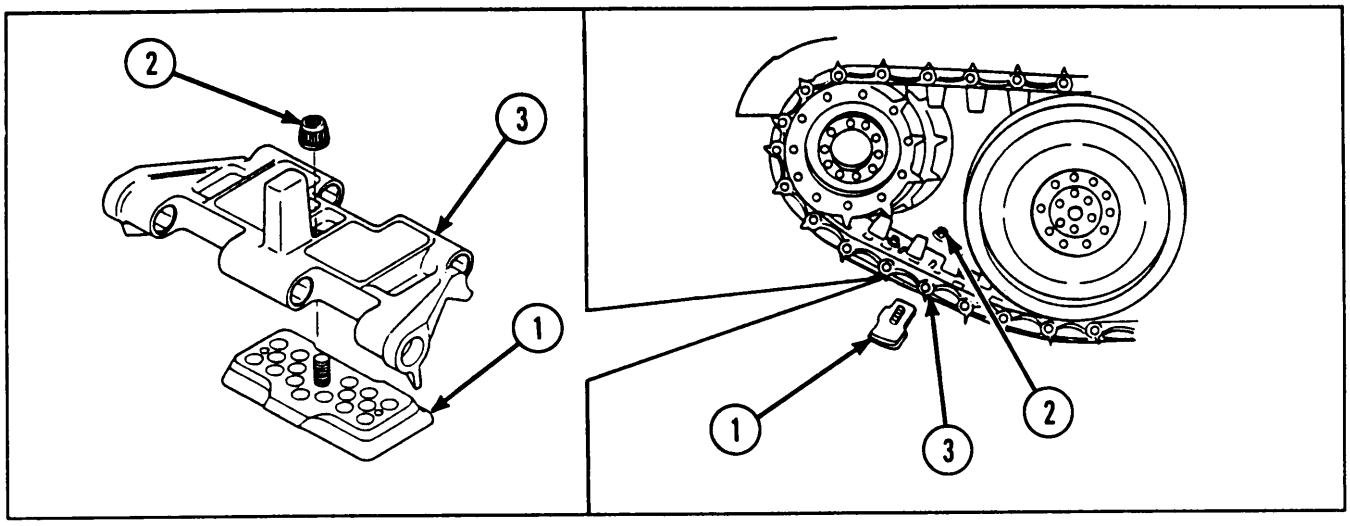
5 If installing arctic traction kit for the first time, store old track shoe pads in a clean, dry place.

6 Using a wire brush, clean and remove old rubber from pad seating area on track shoe.

7 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1) which do not meet inspection criteria.

2-201. MAINTENANCE OF ARCTIC TRACTION KIT (CONT).

REASSEMBLY

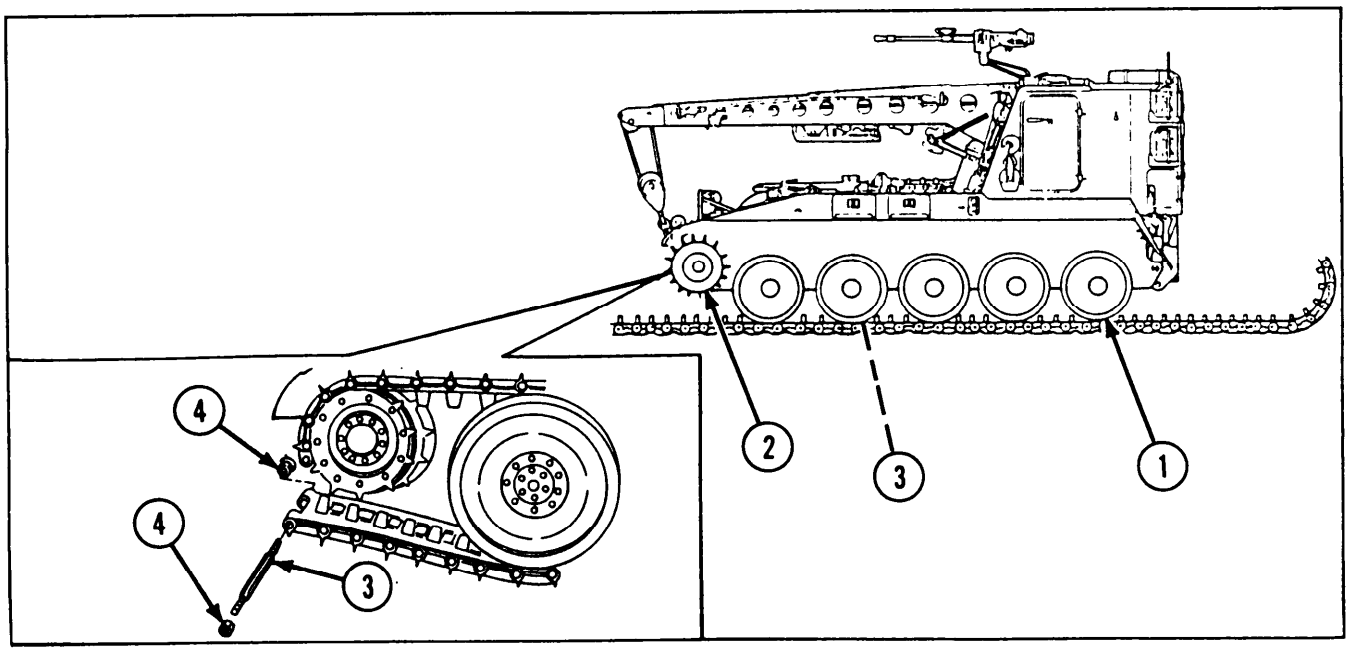


NOTE

Procedures are written for one track shoe pad, but apply to all track shoe pads.

If removed, install track shoe pad (1) and new self-locking nut (2) on shoe assembly (3). Tighten self-locking nut to 180 ft-lb (244 N-m).

INSTALLATION/ADJUSTMENT



NOTE

- Install one track before removing the other.
- Procedures are written for one track, but apply to both tracks.

1 Lay track in straight line in front of vehicle with track shoe grousers forward and track touching first roadwheel.

2 Start engine and slowly drive onto track until 11 track shoes extend past hub of trailing idler wheel (1).

3 Stop engine. Leave parking brake off.

4 Insert driftpin in last track shoe pin hole.

5 Lift end of track over idler wheel (1).

6 Start engine and slowly move vehicle forward. Guide track over roadwheels to prevent end from getting caught between roadwheels. When track reaches drive hub sprocket (2), pry or lift it over sprocket.

7 Using drive hub sprocket, bring ends of track together.

8 Remove driftpin.

9 Install two track connecting fixtures.

10 Apply corrosion preventive sealant to track shoe link pin (3). Install track shoe link pin and two new self-locking nuts (4). Tighten self-locking nuts to 180 to 200 ft-lb (218 to 272 N-m).

2-202. MAINTENANCE OF SPEEDOMETER, TACHOMETER, AND RELATED PARTS.

This task covers:	a. *Removal*	b. *Inspection/Repair*	c. *Installation*

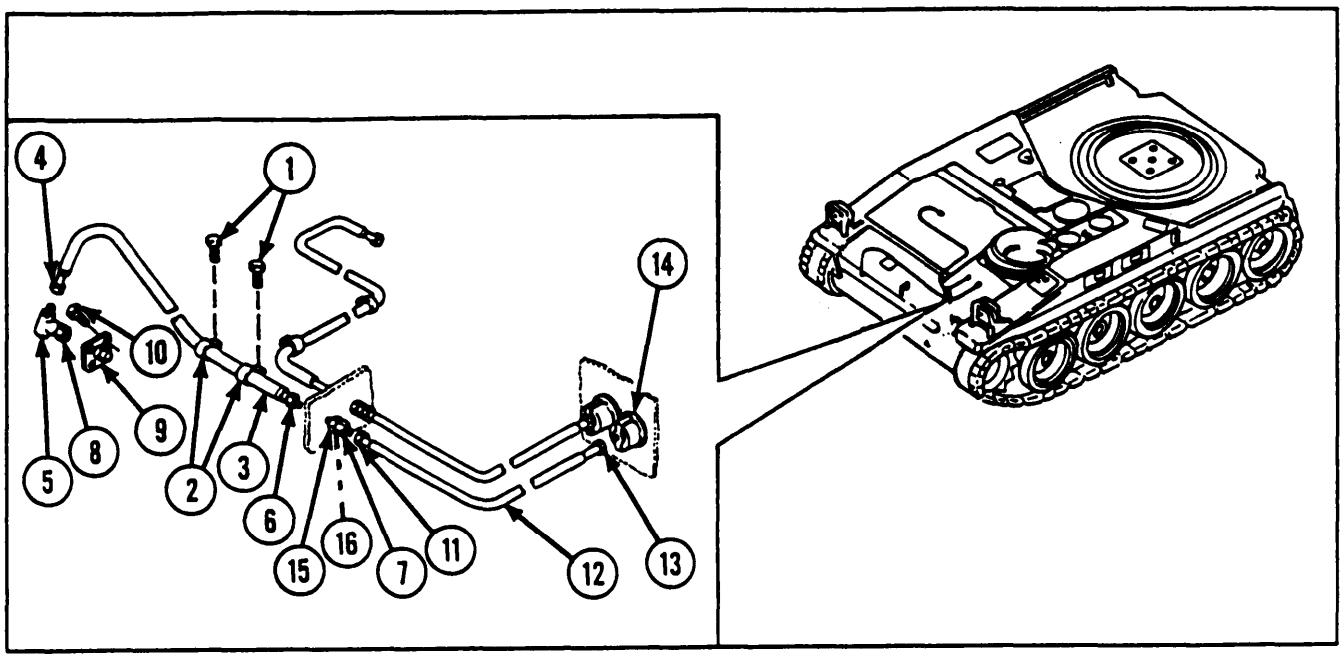
INITIAL SETUP

References
TM 9-2350-238-24P-1

Equipment Conditions
2-935 Hull engine compartment deck assembly lid removed
2-938 Hull transmission compartment deck assembly removed

2-202. MAINTENANCE OF SPEEDOMETER, TACHOMETER, AND RELATED PARTS (CONT).

REMOVAL



1 Remove two screws (1) and two loop clamps (2) from speedometer flexible shaft assembly (3).

2 Disconnect nut (4) on end of speedometer flexible shaft assembly (3) from speedometer adapter (5).

3 Disconnect nut (6) on end of speedometer flexible shaft assembly (3) from speedometer shaft adapter (7), and remove speedometer flexible shaft assembly.

NOTE

Place container under speedometer adapter to catch oil before removing speedometer adapter from engine.

4 Loosen nut (8) and remove speedometer adapter (5) from straight drive speedometer adapter (9).

5 Remove four capscrews (10) and straight drive speedometer adapter (9) from engine.

6 Disconnect nut (11) on end of speedometer flexible shaft assembly (12) from speedometer shaft adapter (7).

7 Disconnect nut (13) on end of speedometer flexible shaft assembly (12) from mechanical speedometer (14). Remove speedometer flexible shaft assembly.

NOTE

Nut and lockwasher removed in step 8 are supplied with speedometer shaft adapter. Take care not to lose nut and lockwasher removed in step 8.

8 Remove nut (15) and lockwasher (16) from speedometer shaft adapter (7). Remove speedometer shaft adapter from wall of driver's compartment.

NOTE

Two nuts, two lockwashers, and mounting clamp removed in step 9 are supplied with mechanical speedometer. Take care not to lose hardware removed in step 9.

9 Remove two nuts (17), two lockwashers (18), and mounting clamp (19) from mechanical speedometer (14). Remove mechanical speedometer from driver's instrument panel.

10 Remove two screws (20) and two loop clamps (21) from tachometer flexible shaft assembly (22).

11 Disconnect nut (23) on end of tachometer flexible shaft assembly (22) from tachometer drive (24).

12 Disconnect nut (25) on end of tachometer flexible shaft assembly (22) from tachometer shaft adapter (26), and remove tachometer flexible shaft assembly.

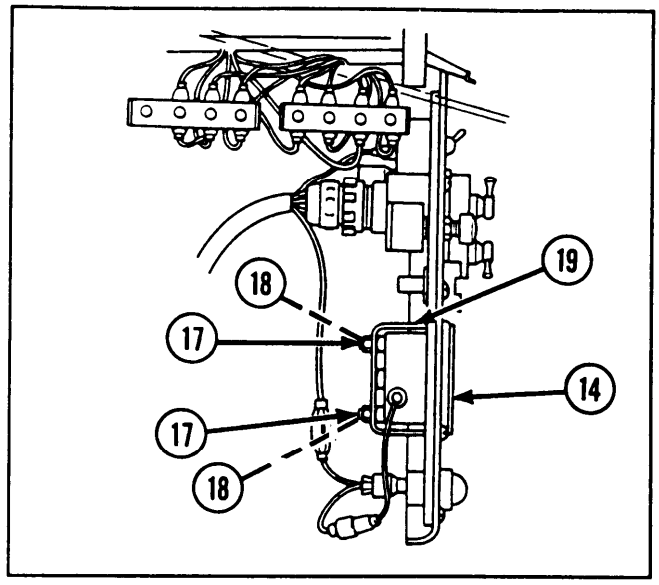
13 Disconnect nut (27) on end of tachometer flexible shaft assembly (28) from tachometer flexible shaft adapter (26).

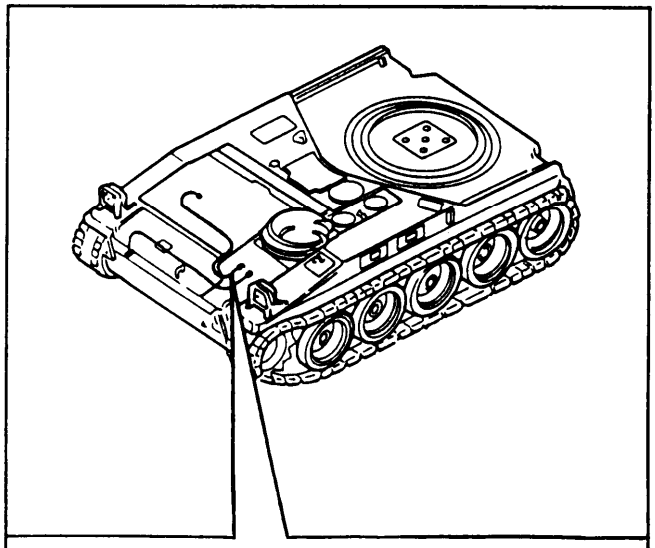
14 Disconnect nut (29) on end of tachometer flexible shaft assembly (28) from mechanical tachometer (30). Remove tachometer flexible shaft assembly.

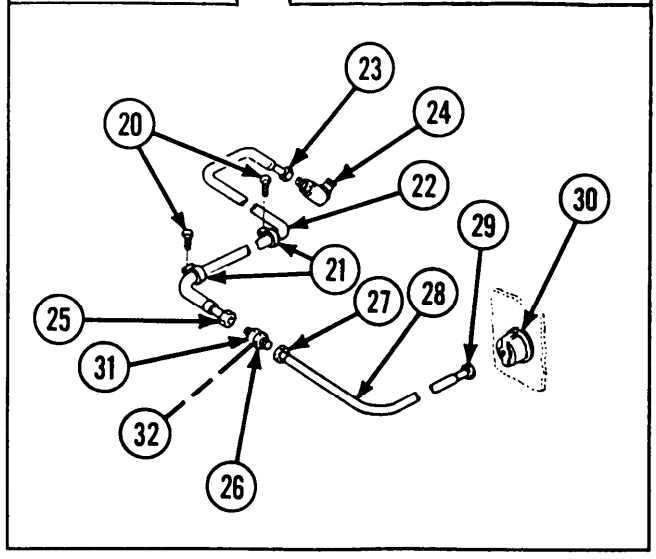
NOTE

Nut and lockwasher removed in step 15 are supplied with tachometer shaft adapter. Take care not to lose nut and lockwasher removed in step 15.

15 Remove nut (31) and lockwasher (32) from tachometer shaft adapter (26). Remove tachometer shaft adapter from wall of driver's compartment.

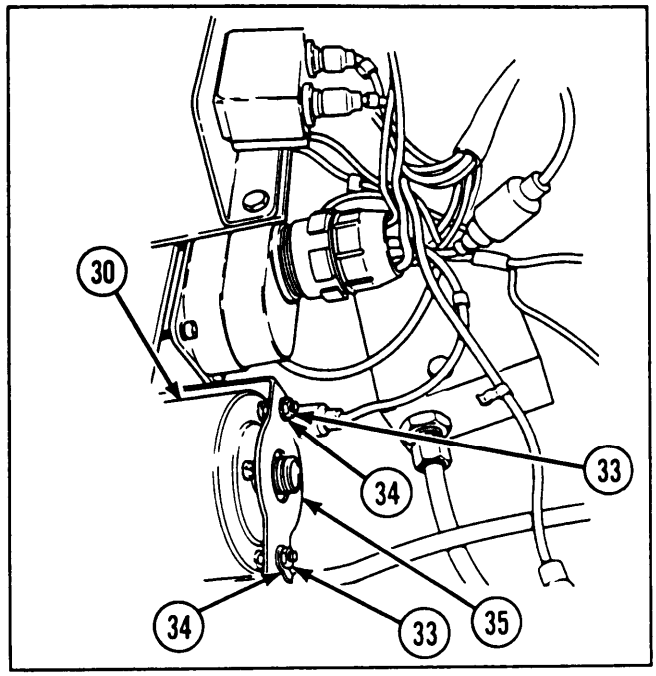






2-202. MAINTENANCE OF SPEEDOMETER, TACHOMETER, AND RELATED PARTS (CONT).

REMOVAL (CONT)



NOTE

Two nuts, two lockwashers, and mounting clamp removed in step 16 are supplied with mechanical tachometer. Take care not to lose hardware removed in step 16.

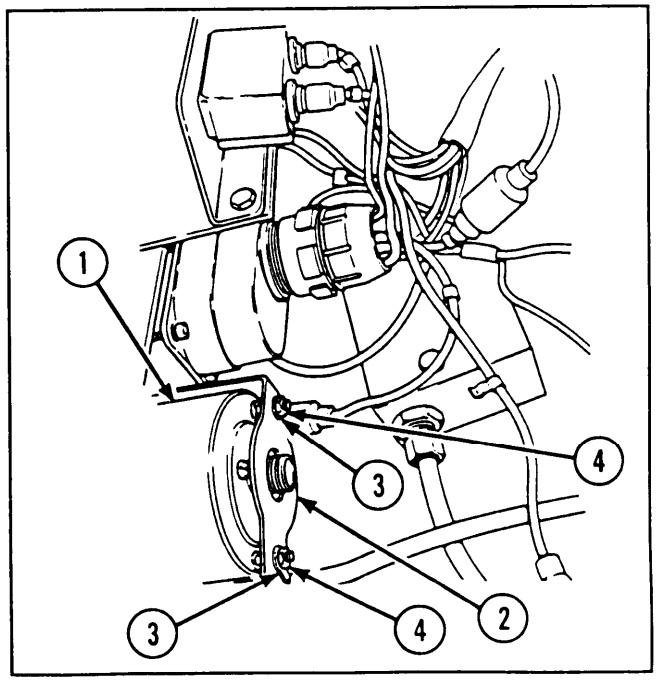
16 Remove two nuts (33), two lockwashers (34), and mounting clamp (35) from mechanical tachometer (30). Remove mechanical tachometer from driver's instrument panel.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



NOTE

If mounting clamp, two lockwashers, or two nuts have been lost or damaged, replace entire mechanical tachometer.

1 Install mechanical tachometer (1) on driver's instrument panel. Install mounting clamp (2) on mechanical tachometer, and secure with two lockwashers (3) and two nuts (4).

NOTE

If lockwasher or nut has been lost or damaged, replace entire tachometer shaft adapter.

2 Install tachometer shaft adapter (5) in wall of driver's compartment, and secure with lockwasher (6) and nut (7).

3 Connect nut (8) on end of tachometer flexible shaft assembly (9) to mechanical tachometer (1).

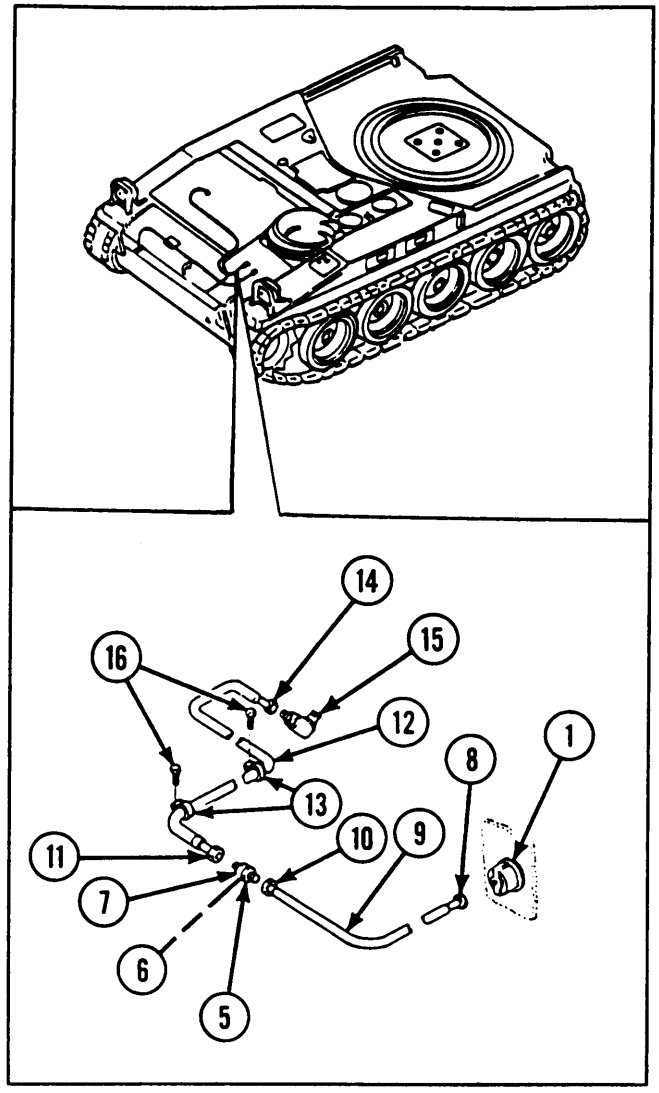
4 Connect nut (10) on end of tachometer flexible shaft assembly (9) to tachometer shaft adapter (5).

5 Connect nut (11) on end of tachometer flexible shaft assembly (12) to tachometer shaft adapter (5).

6 Install two loop clamps (13) on tachometer flexible shaft assembly (12).

7 Connect nut (14) on end of tachometer flexible shaft assembly (12) to tachometer drive (15).

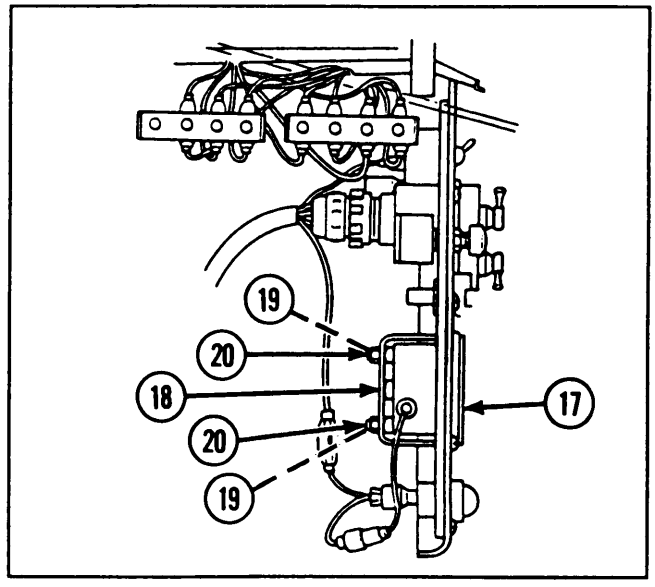
8 Secure two loop clamps (13) with two screws (16).



NOTE

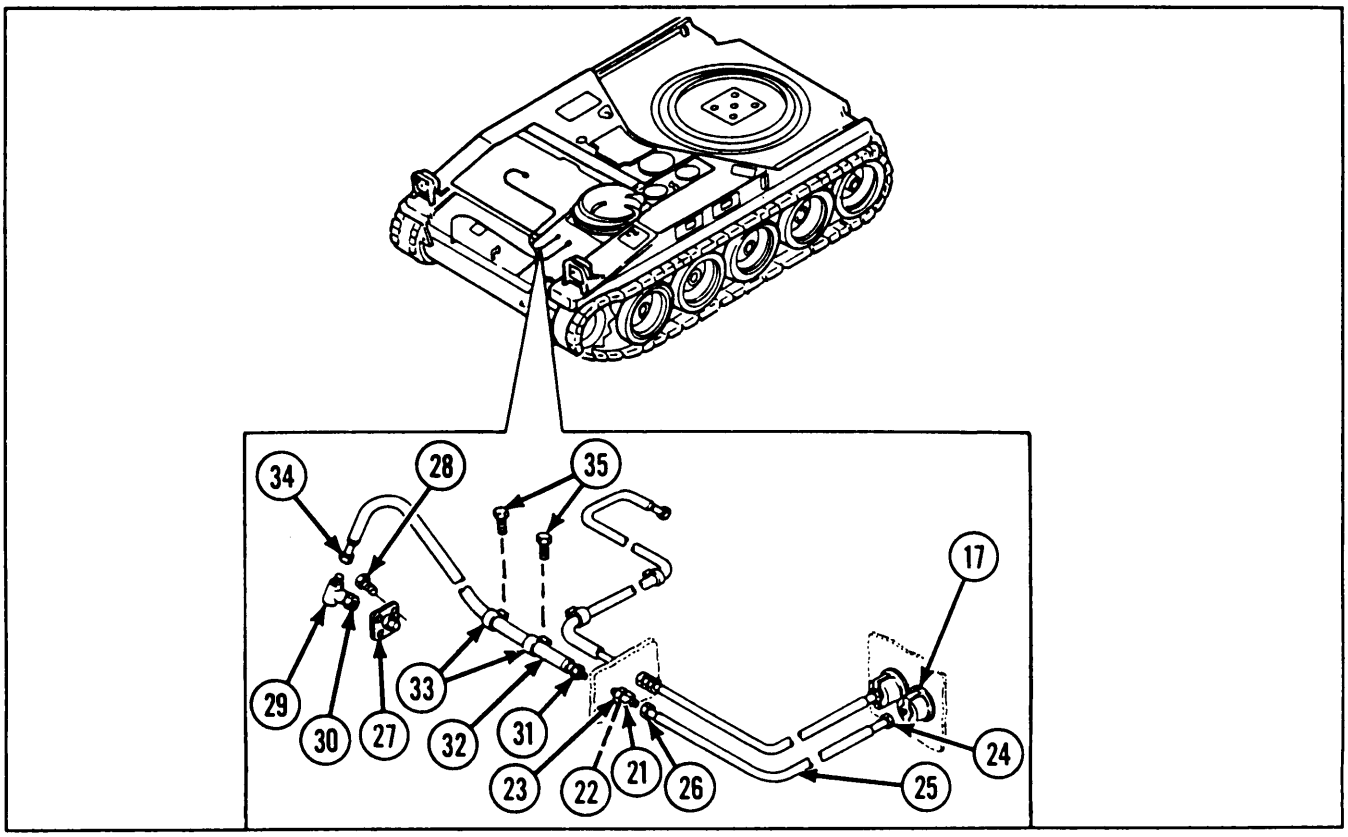
If two lockwashers and two nuts have been lost or damaged, replace entire mechanical speedometer.

9 Install mechanical speedometer (17) on driver's instrument panel. Install mounting clamp (18), two lockwashers (19), and two nuts (20) on mechanical speedometer (17).



2-202. MAINTENANCE OF SPEEDOMETER, TACHOMETER, AND RELATED PARTS (CONT).

INSTALLATION (CONT)



NOTE

If lockwasher or nut has been lost or damaged, replace entire speedometer shaft adapter.

10 Install speedometer shaft adapter (21) in wall of driver's compartment, and secure with lockwasher (22) and nut (23).

11 Connect nut (24) on end of speedometer flexible shaft assembly (25) to mechanical speedometer (17).

12 Connect nut (26) on end of speedometer flexible shaft assembly (25) to speedometer shaft adapter (21).

13 Install straight drive speedometer adapter (27) on engine, and secure with four capscrews (28).

14 Install speedometer adapter (29) on straight drive speedometer adapter (27), and tighten nut (30).

15 Connect nut (31) on end of speedometer flexible shaft assembly (32) to speedometer shaft adapter (21).

16 Install two loop clamps (33) on speedometer flexible shaft assembly (32).

17 Connect nut (34) on end of speedometer flexible shaft assembly (32) to speedometer adapter (29).

18 Secure two loop clamps (33) with two screws (35).

2-203. MAINTENANCE OF FIXED FIRE EXTINGUISHER CONTROL SYSTEM.

This task covers: a. *Removal* b. *Inspection/Repair* c. *Installation*

INITIAL SETUP

Materials/Parts
Lockwasher (4)
Lockwasher
Pull cable control handle antipilferage seal (2)
Self-locking nut (2)

References
TM 9-2350-238-24P-1

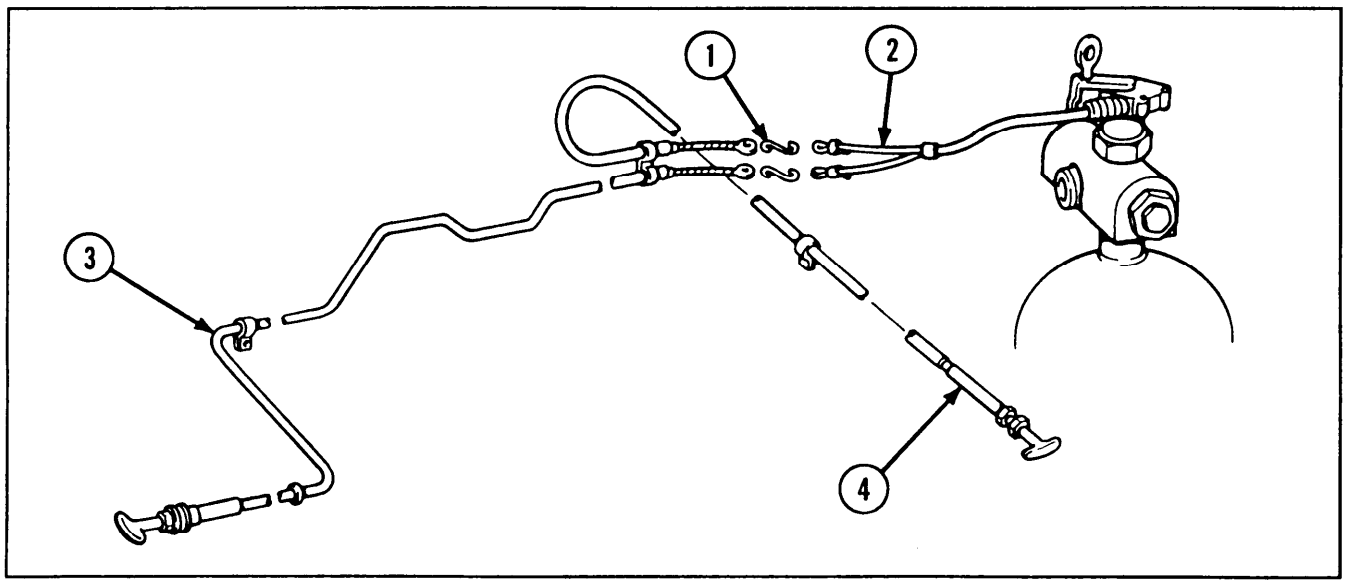
Equipment Conditions
2-928 $C0_2$ cylinder access cover removed
2-640 Batteries and battery support removed
2-952 Seat removed

General Safety Instructions

WARNING

- Handle fire extinguisher cylinders with care-do not drop.
- Never remove main valve head on top of cylinder fire extinguisher. Removal of main valve head can cause serious injury to personnel.

REMOVAL



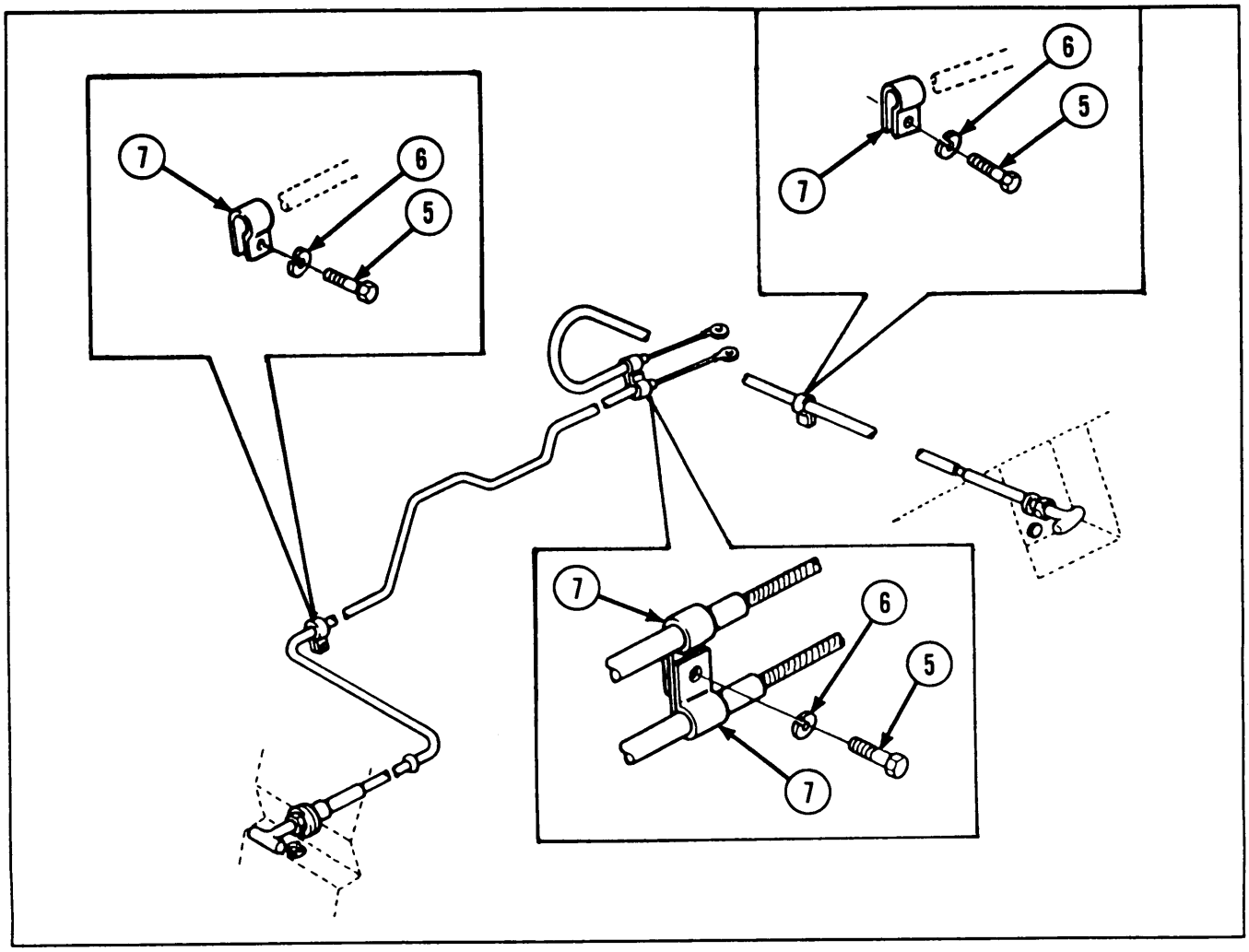
CAUTION

Turning fire extinguisher valve will discharge $C0_2$ cylinders.

1 Remove two chain hooks (1) from cylinder release cable sling wire rope (2), driver's compartment pull cable control assembly (3), and rear left fender pull cable control assembly (4).

2-203. MAINTENANCE OF FIXED FIRE EXTINGUISHER CONTROL SYSTEM (CONT).

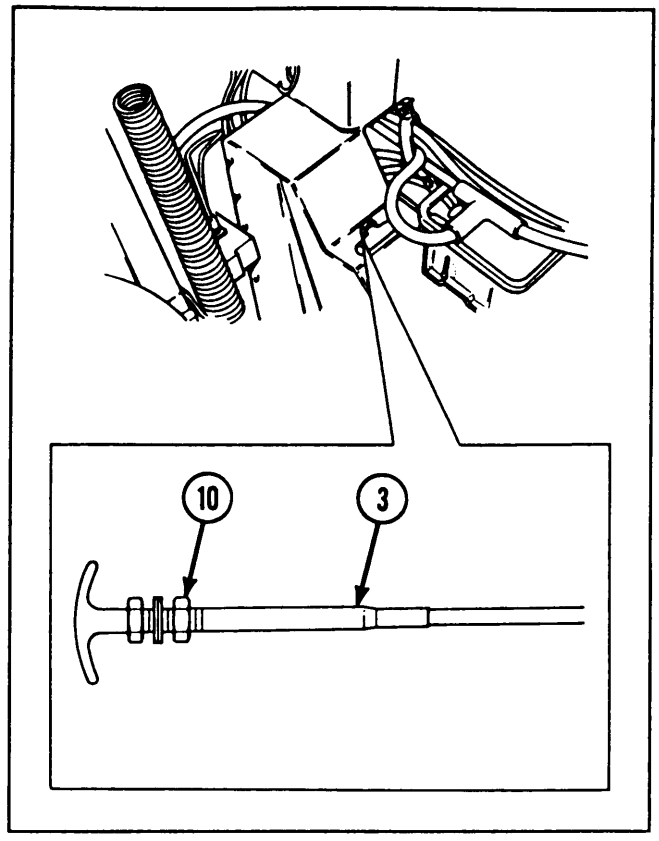
REMOVAL (CONT)



2 Remove three hexagon head capscrews (5), three lockwashers (6), and four loop clamps (7).

3 Cut and remove pull cable control handle antipilferage seal (8) from driver's compartment pull cable control assembly (3) and machine bolt (9).

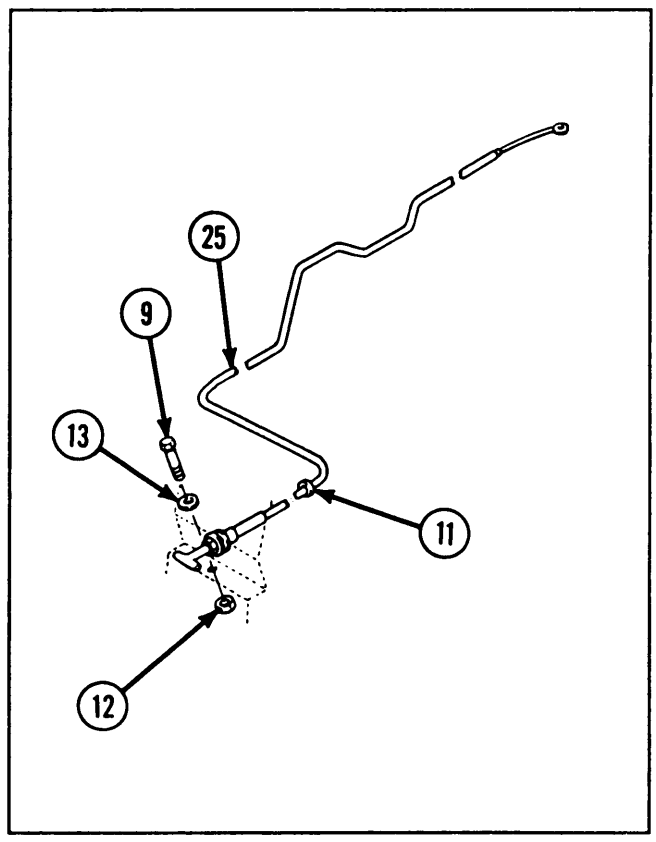
4 From inside driver's compartment aft cowl, loosen jam nut (10).



5 Slide nonmetallic grommet (11) off driver's compartment pull cable control assembly (3).

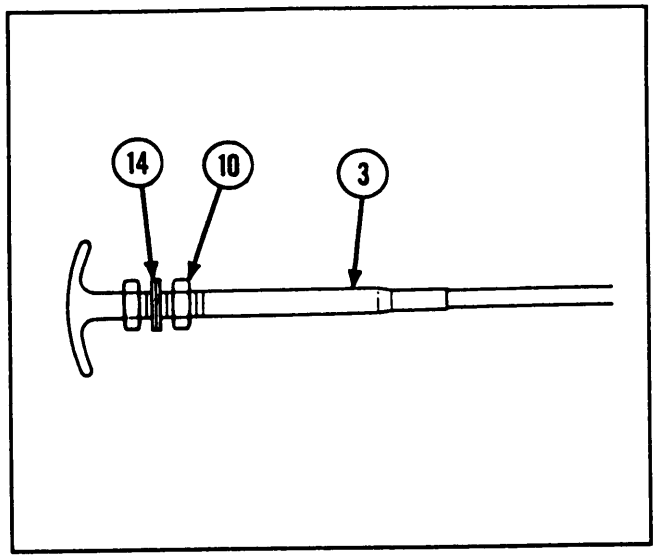
6 Remove hexagon plain nut (12), machine bolt (9), and lockwasher (13) from driver's compartment aft cowl.

7 Remove driver's compartment pull cable control assembly (3) from vehicle.



2-203. MAINTENANCE OF FIXED FIRE EXTINGUISHER CONTROL SYSTEM (CONT).

REMOVAL (CONT)

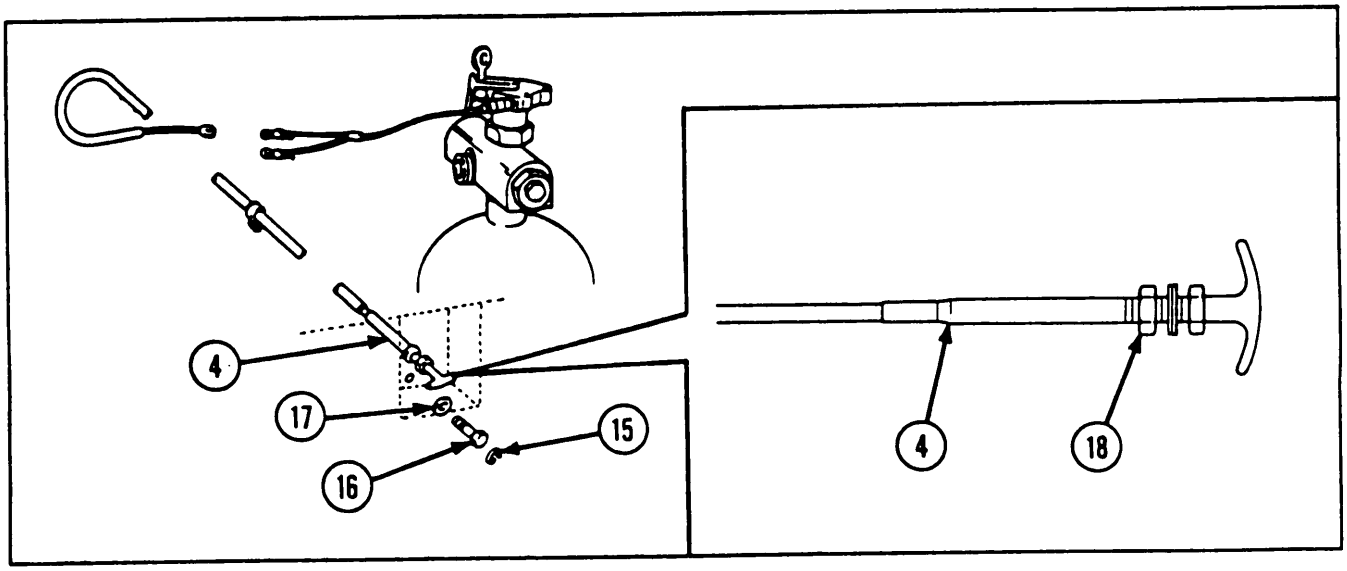


NOTE

Jam nut is supplied with driver's compartment pull cable control assembly. Take care not to lose or damage this part.

8 Remove jam nut (10) from driver's compartment pull cable control assembly (3).

9 Remove two flat washers (14) from driver's compartment pull cable control assembly (3).



10 Cut and remove pull cable control handle antipilferage seal (15) from rear left fender pull cable control assembly (4) and hexagon head capscrew (16).

11 Remove hexagon head capscrew (16) and lockwasher (17) from rear left fender pull cable control assembly (4).

NOTE

Jam nut is supplied with rear left fender pull cable control assembly. Take care not to lose or damage this part.

12 Loosen and remove jam nut (18) from rear left fender pull cable control assembly (4).

13 Remove rear left fender pull cable control assembly (4) from vehicle.

14 Loosen fitting (19) and disconnect left discharge tube (20) from cylinder fire extinguisher (21).

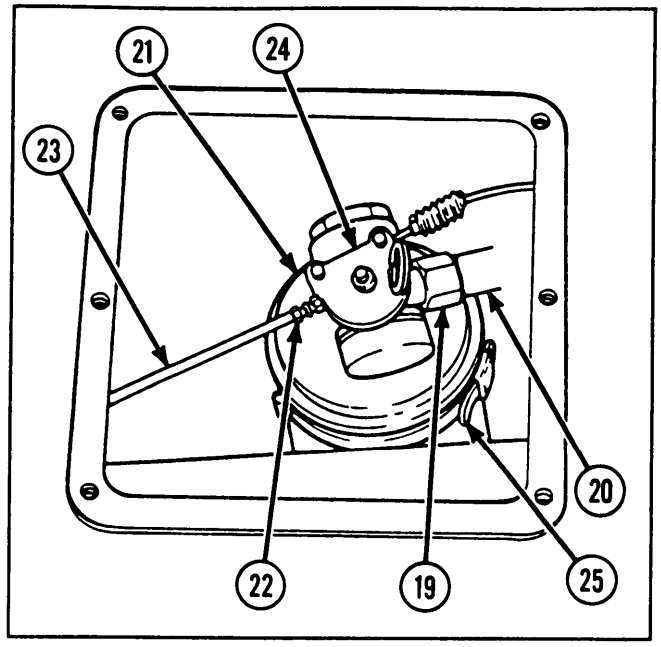
15 Loosen tube coupling nut (22) and disconnect left cylinder to nipple metallic bent tube (23) from fire extinguisher valve (24).

16 Release two cylinder brackets (25).

WARNING

Handle fire extinguisher cylinders with care-do not drop.

17 Remove cylinder fire extinguisher (21) from vehicle.

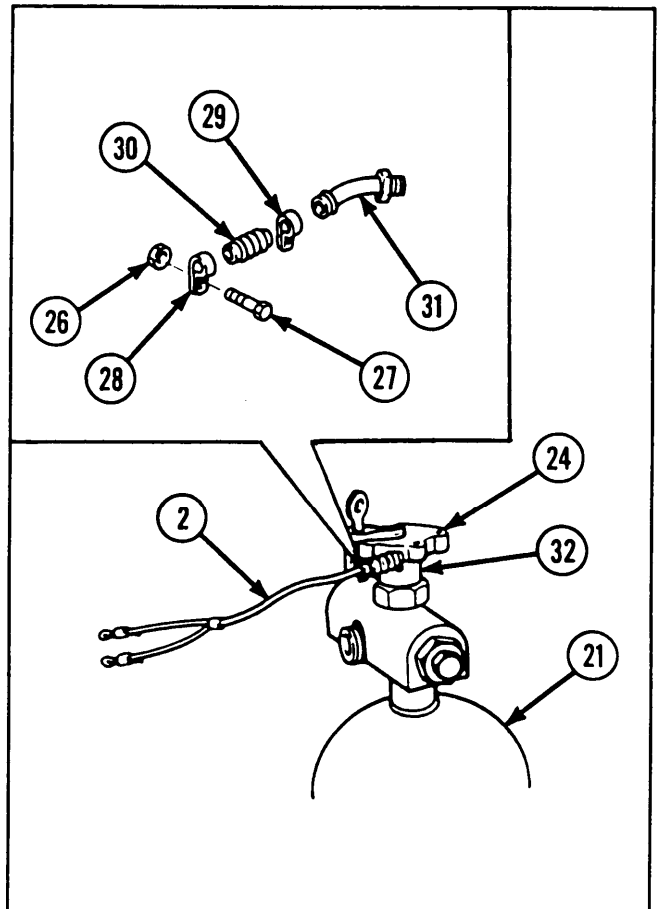


18 Remove two self-locking nuts (26), two machine screws (27), loop clamp (28), loop clamp (29), dust and moisture boot (30), control cable pipe to hose elbow (31), and cylinder release cable sling wire rope (2) from fire extinguisher valve (24).

WARNING

Never remove main valve head on top of cylinder fire extinguisher. Removal of main valve head can cause serious injury to personnel.

19 Remove fire extinguisher valve (24) from main valve head (32) on top of cylinder fire extinguisher (21).



2-203. MAINTENANCE OF FIXED FIRE EXTINGUISHER CONTROL SYSTEM (CONT).

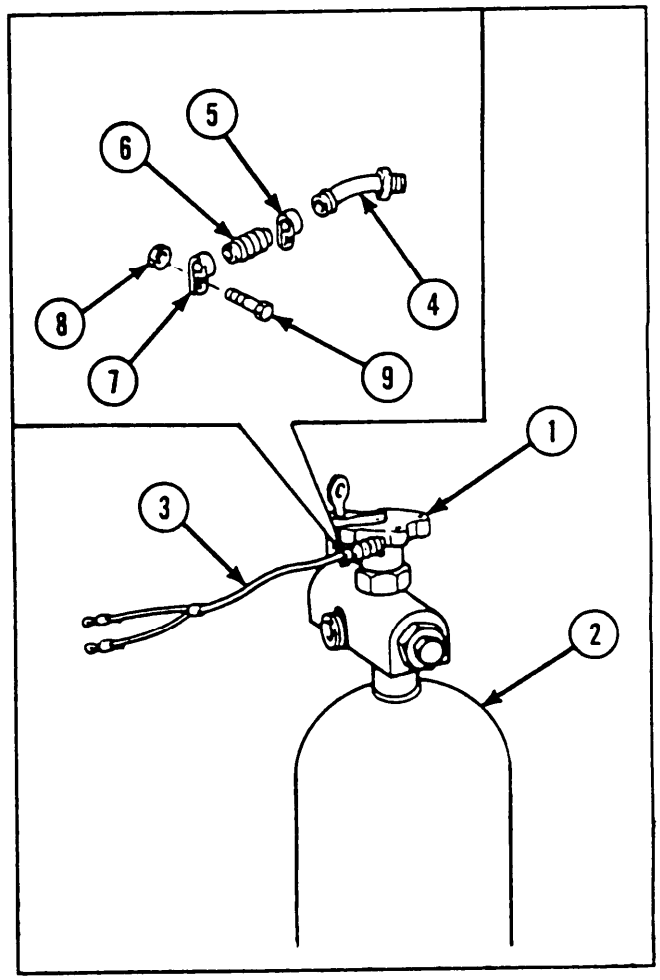
INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Weigh cylinder fire extinguisher for proper weight and charge as necessary. Refer to the PMCS/lubrication table, page 2-13.

3 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



1 Install fire extinguisher valve (1) on cylinder fire extinguisher (2).

2 Install cylinder release cable sling wire rope (3), control cable pipe to hose elbow (4), loop clamp (5), dust and moisture boot (6), and loop clamp (7). Secure with two new self-locking nuts (8) and two machine screws (9).

WARNING

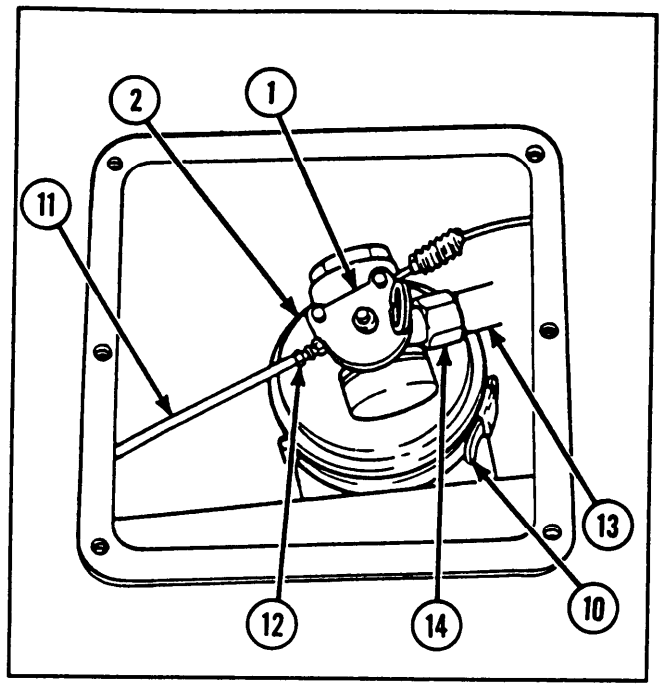
Handle fire extinguisher cylinders with care-do not drop.

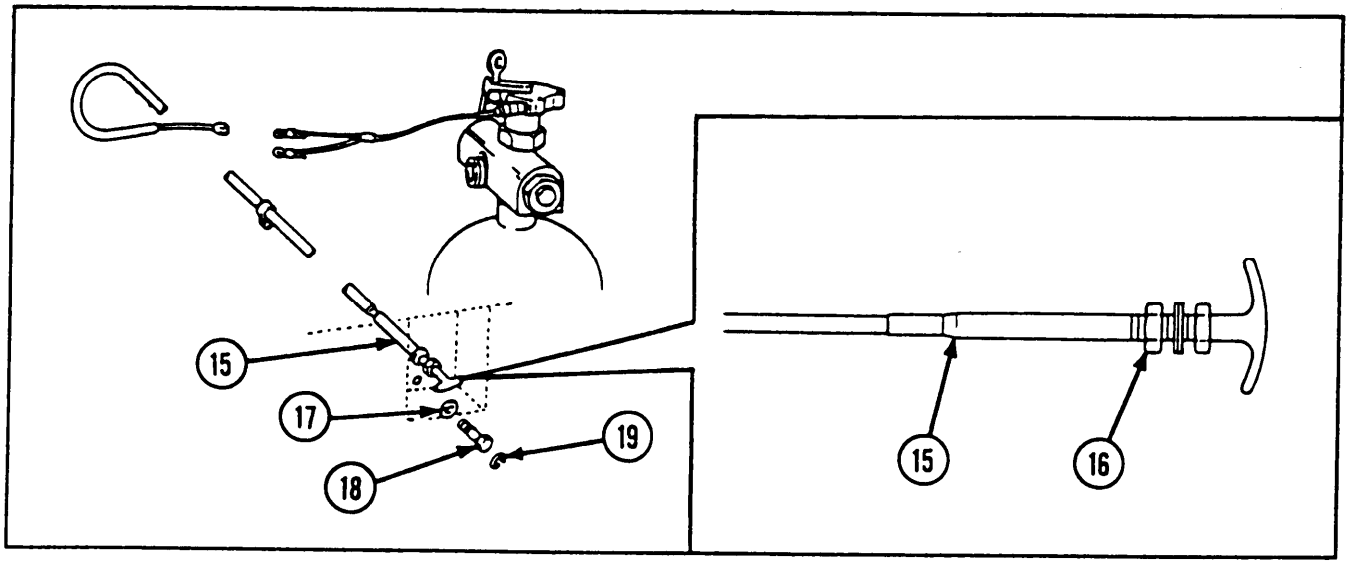
3 Place cylinder fire extinguisher (2) in vehicle.

4 Secure cylinder fire extinguisher (2) with two cylinder brackets (10).

5 Connect left cylinder to nipple metallic bent tube (11) to fire extinguisher valve (1) and tighten tube coupling nut (12).

6 Connect left discharge tube (13) to cylinder fire extinguisher (2) and tighten fitting (14).





NOTE

If jam nut is damaged or missing, replace rear left fender pull cable control assembly.

7 Install rear left fender pull cable control assembly (15) in vehicle. Secure with jam nut (16).

8 Install new lockwasher (17) and hexagon head capscrew (18).

9 Install antipilferage seal (19) on rear left fender pull cable control assembly (15).

2-203. MAINTENANCE OF FIXED FIRE EXTINGUISHER CONTROL SYSTEM (CONT).

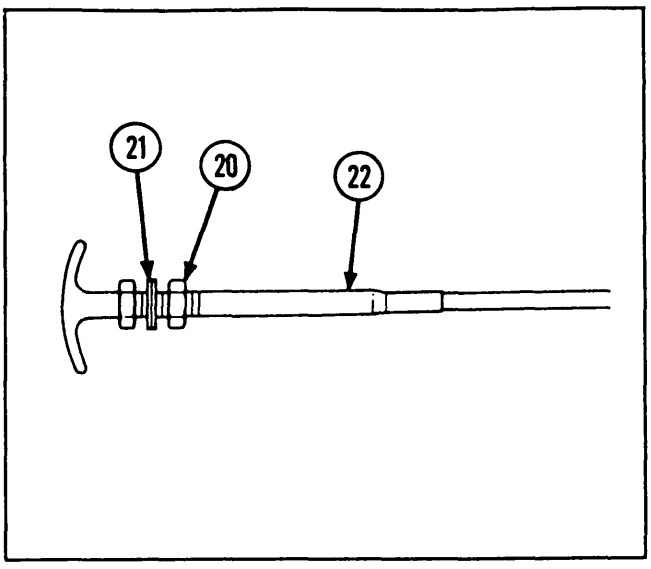
INSTALLATION (CONT)

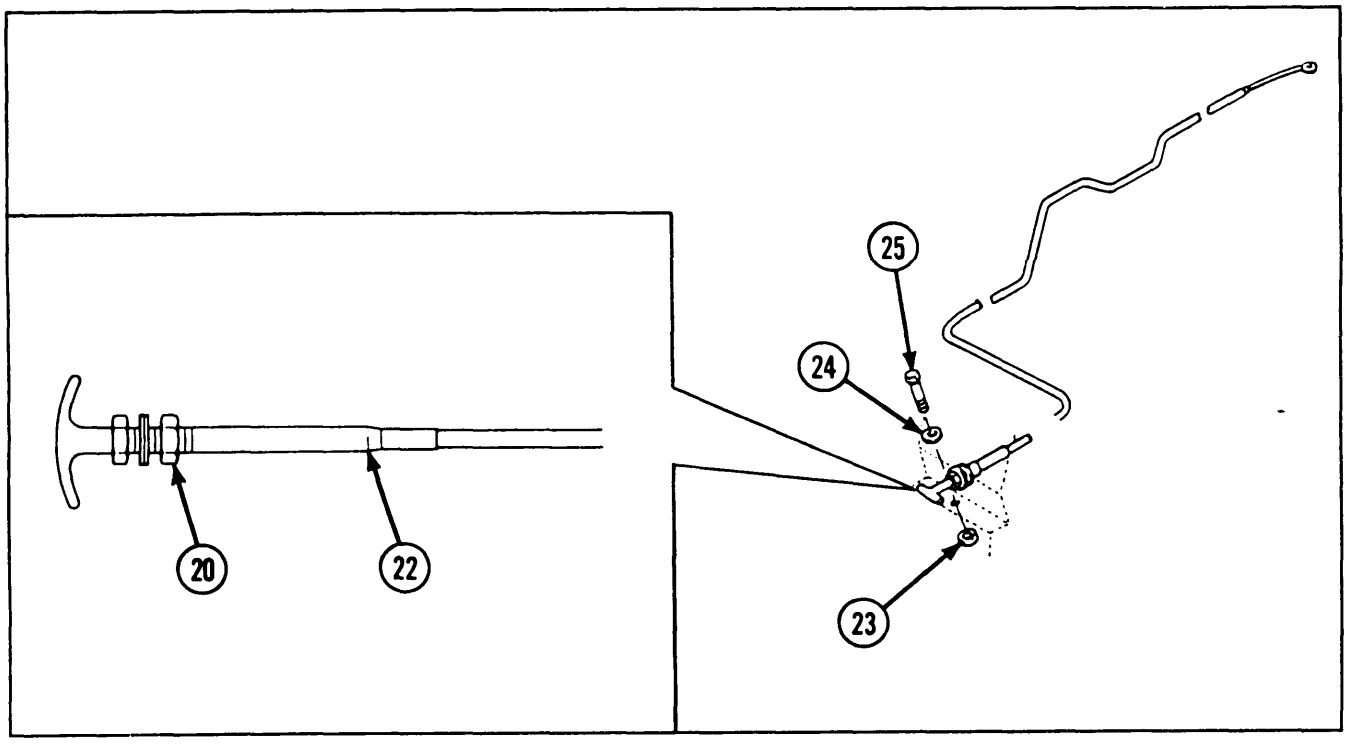
NOTE

If jam nut is damaged or missing, replace driver's compartment pull cable control assembly.

10 Install jam nut (20) and flat washer (21) on driver's compartment pull cable control assembly (22).

11 Install driver's compartment pull cable control assembly (22) in vehicle.

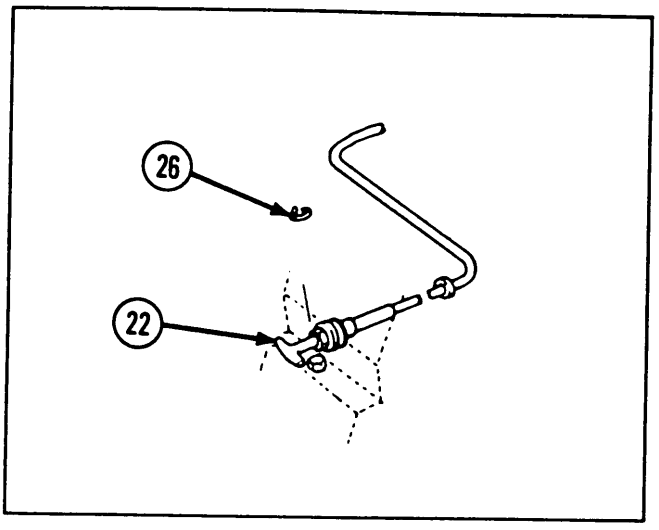


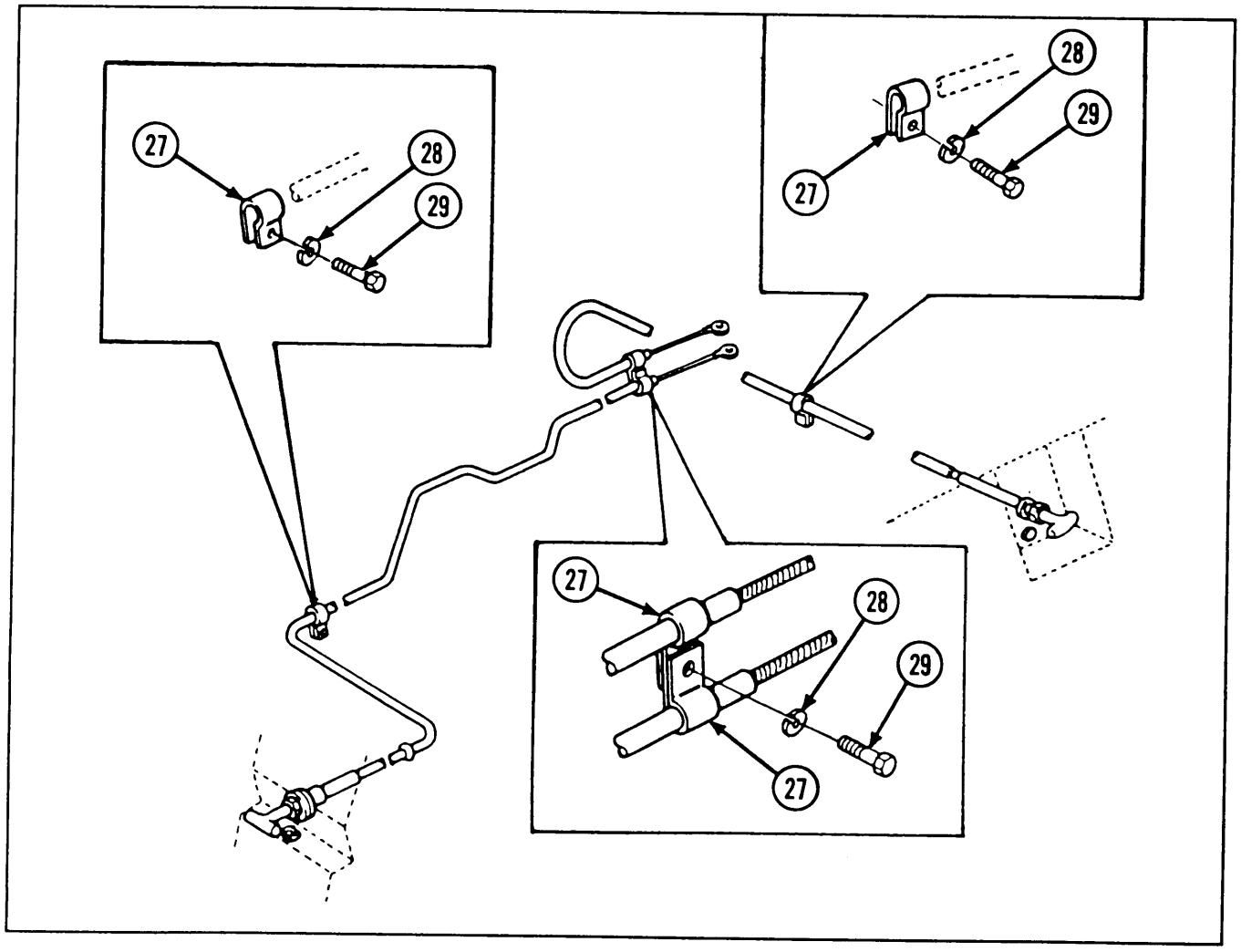


12 Install hexagon plain nut (23), new lockwasher (24), and machine bolt (25) on driver's compartment aft cowl. Tighten hexagon plain nut.

13 Slide driver's compartment pull cable control assembly (22) into slot of driver's compartment aft cowl. Tighten jam nut (20).

14 Secure driver's compartment pull cable control assembly (22) with antipilferage seal (26).

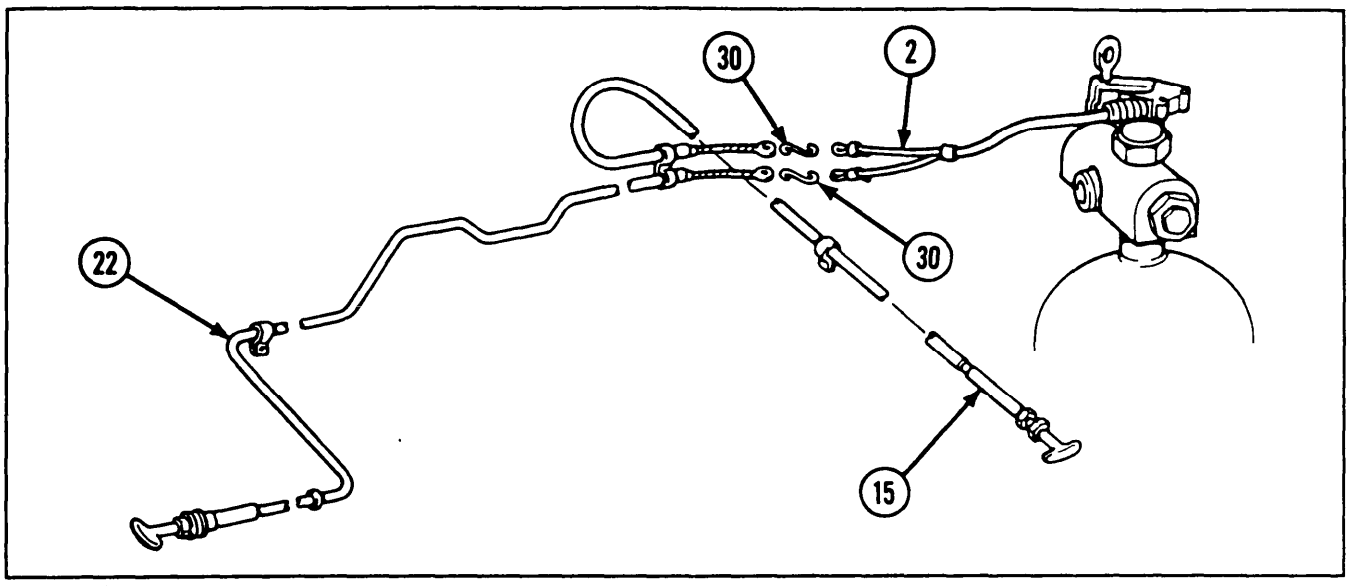




15 Install four loop clamps (27), three new lock-washers (28), and three hexagon head capscrews (29).

2-203. MAINTENANCE OF FIXED FIRE EXTINGUISHER CONTROL SYSTEM (CONT).

INSTALLATION (CONT)



16 Connect cylinder release cable wire rope sling (2), driver's compartment pull cable control assembly (22), and rear left fender control assembly (15) to two chain hooks (30).

2-204. MAINTENANCE OF FIXED FIRE EXTINGUISHER CONNECTING LINES AND FITTINGS.

This task covers:	a. *Removal*	b. *Inspection/Repair*	c. *Installation*

INITIAL SETUP

Materials/Parts
Lockwasher (7)

References
TM 9-2350-238-24P-1

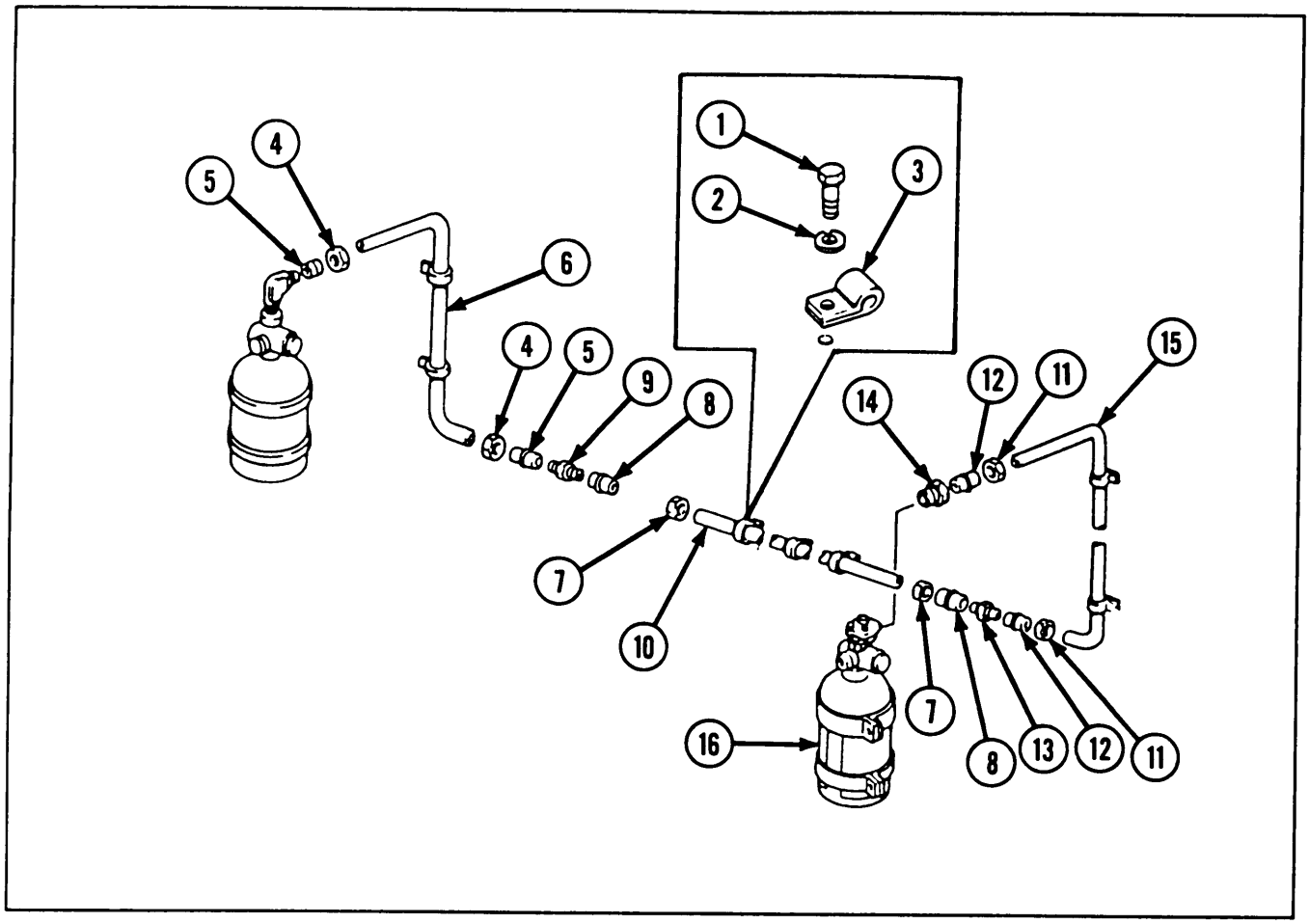
Equipment Conditions
2-923 Access covers removed

General Safety Instructions

WARNING

- Handle fire extinguisher cylinder with care-do not drop.
- Never remove main valve head on top of cylinder fire extinguisher. Removal of main valve head can cause serious injury to personnel.

REMOVAL



1 Remove seven hexagon head capscrews (1), seven lockwashers (2), and seven loop clamps (3) from vehicle as tubes are removed.

2 Remove two tube coupling nuts (4), two tube clinch sleeves (5), and right cylinder to nipple metallic bent tube (6).

3 Remove two tube coupling nuts (7), two tube clinch sleeves (8), boss nipple (9), and nipple to nipple metal tube (10).

4 Remove two tube coupling nuts (11), two tube clinch sleeves (12), boss nipple (13), pipe straight adapter (14), and left cylinder to nipple metallic bent tube (15) from left cylinder fire extinguisher (16).

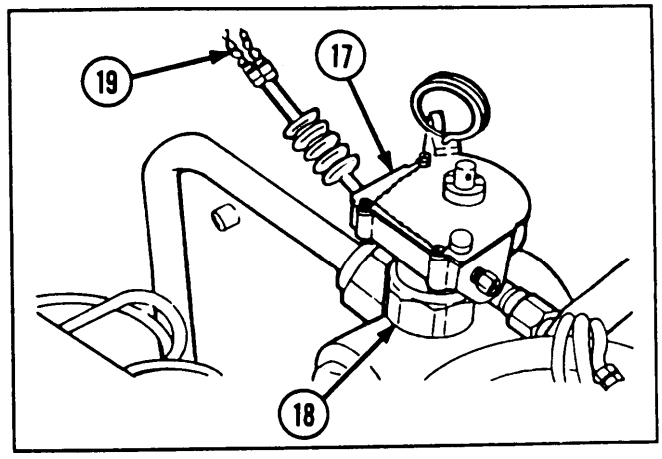
2-204. MAINTENANCE OF FIXED FIRE EXTINGUISHER CONNECTING LINES AND FITTINGS (CONT).

REMOVAL (CONT)

WARNING

Never remove main valve head on top of cylinder fire extinguisher. Removal of main valve head can cause serious injury to personnel.

5 Disconnect fire extinguisher valve (17) at nut (18). Carefully lift valve straight up and remove from left cylinder fire extinguisher. Allow valve to hang from cylinder release cable sling wire rope (19).

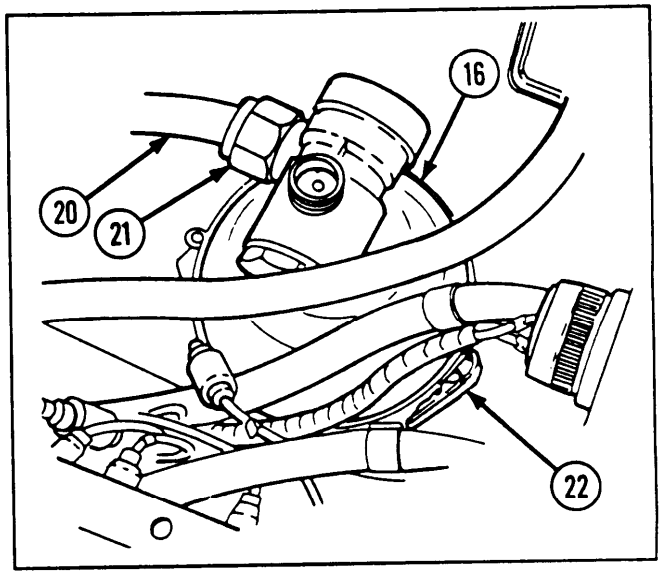


6 Disconnect left discharge tube (20) at nut (21).

WARNING

Handle cylinder fire extinguisher with care-do not drop.

7 Release two retaining straps (22) and remove left cylinder fire extinguisher (16) from vehicle.

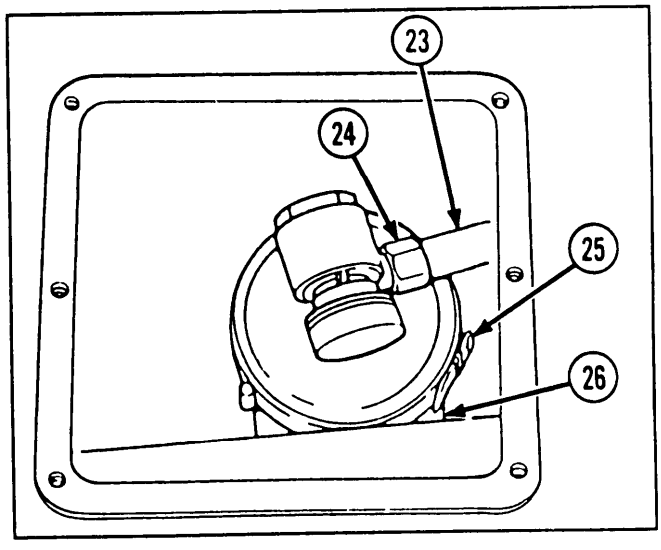


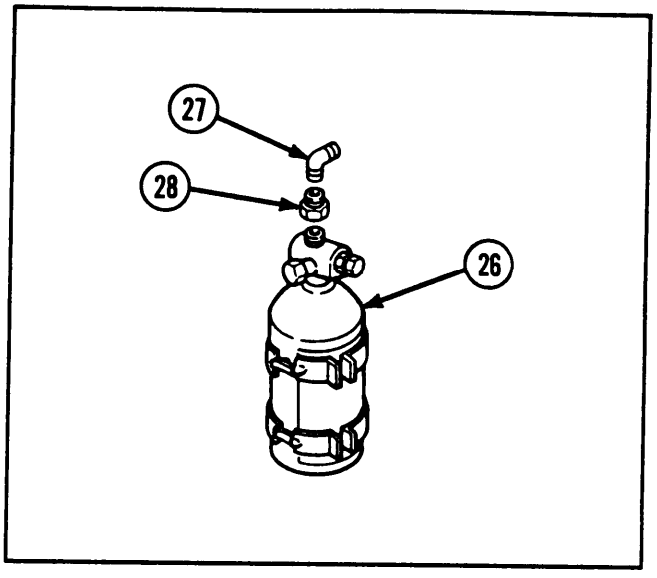
8 Disconnect right discharge tube (23) at nut (24).

WARNING

Handle cylinder fire extinguisher with care-do not drop.

9 Release two retaining straps (25) and remove right cylinder fire extinguisher (26).





10 Remove pipe to tube elbow (27) and right cylinder head (28) from right cylinder fire extinguisher (26).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

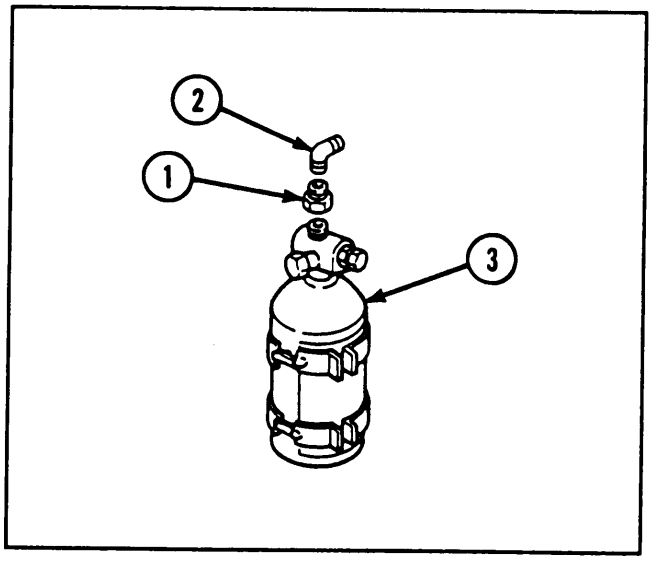
2 Weigh $C0_2$ cylinder for proper weight and charge as necessary. Refer to the PMCS/lubrication table, page 2-13.

3 Retaining straps are repairable assemblies. Refer to page 2-1174.

4 Cylinder fire extinguishers are repairable assemblies. Refer to page 2-1175.

5 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION



1 Install right cylinder head (1) and pipe to tube elbow (2) on right cylinder fire extinguisher (3).

2-204. MAINTENANCE OF FIXED FIRE EXTINGUISHER CONNECTING LINES AND FITTINGS (CONT).

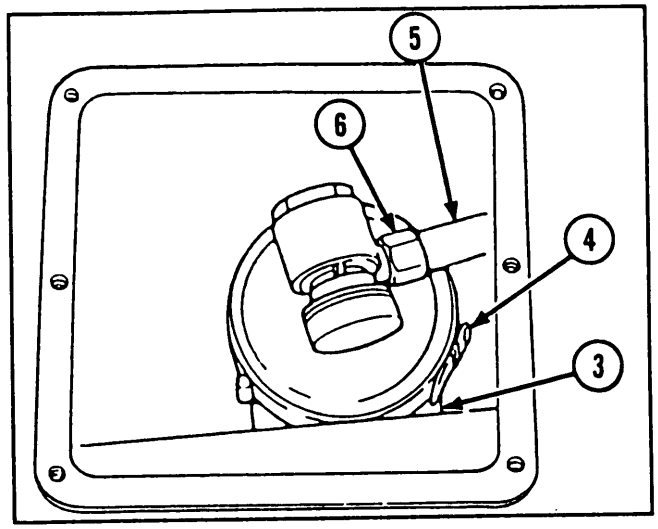
INSTALLATION (CONT)

WARNING

- Handle cylinder fire extinguisher with care-do not drop.
- Never remove main valve head on top of cylinder fire extinguisher. Removal of main valve head can cause serious injury to personnel.

2 Install right cylinder fire extinguisher (3) in vehicle and secure with two retaining straps (4).

3 Connect right discharge tube (5) to right cylinder fire extinguisher (3) and tighten nut (6).

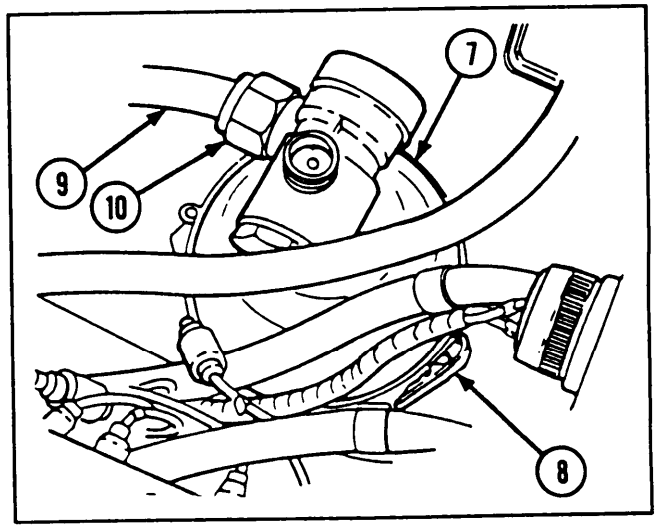


WARNING

Handle cylinder fire extinguisher with care-do not drop.

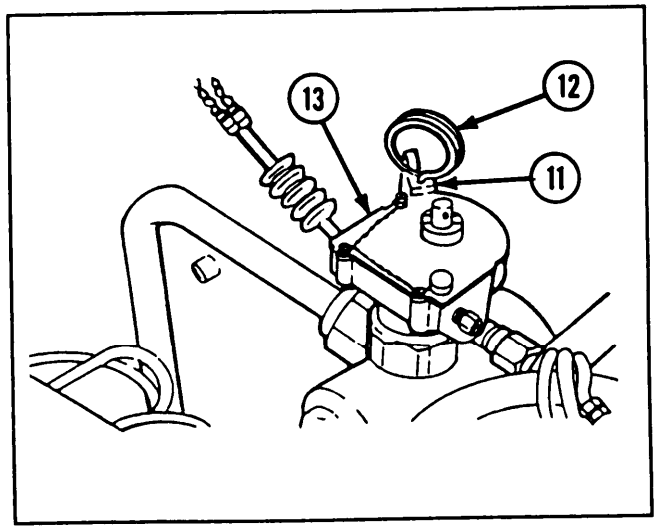
4 Install left cylinder fire extinguisher (7) in vehicle and secure with two retaining straps (8).

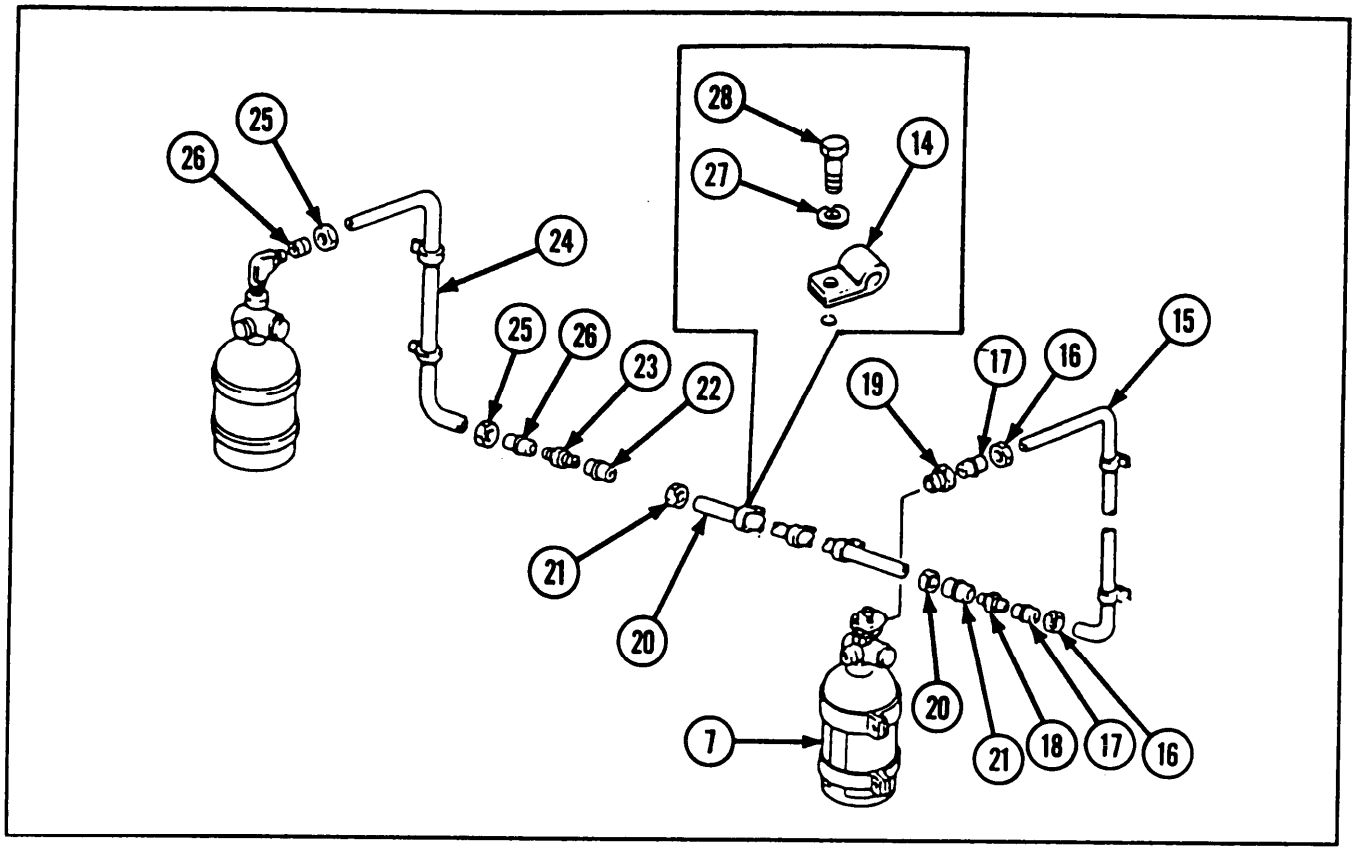
5 Connect left discharge tube (9) to left cylinder fire extinguisher (7) and tighten nut (10).



6 Reset fire extinguisher valve handle (11) and install safety pin (12), if removed.

7 Carefully install fire extinguisher valve (13).





8 Install seven loop clamps (14) as tubes are installed.

9 Install left cylinder to nipple metallic bent tube (15), and secure with two tube coupling nuts (16), two clinch tube sleeves (17), boss nipple (18), and pipe straight adapter (19) on left cylinder fire extinguisher (7).

10 Install nipple to nipple metal tube (20), and secure with two tube coupling nuts (21), two clinch tube sleeves (22), and boss nipple (23).

11 Install right cylinder to nipple metallic bent tube (24), and secure with two tube coupling nuts (25) and two clinch tube sleeves (26).

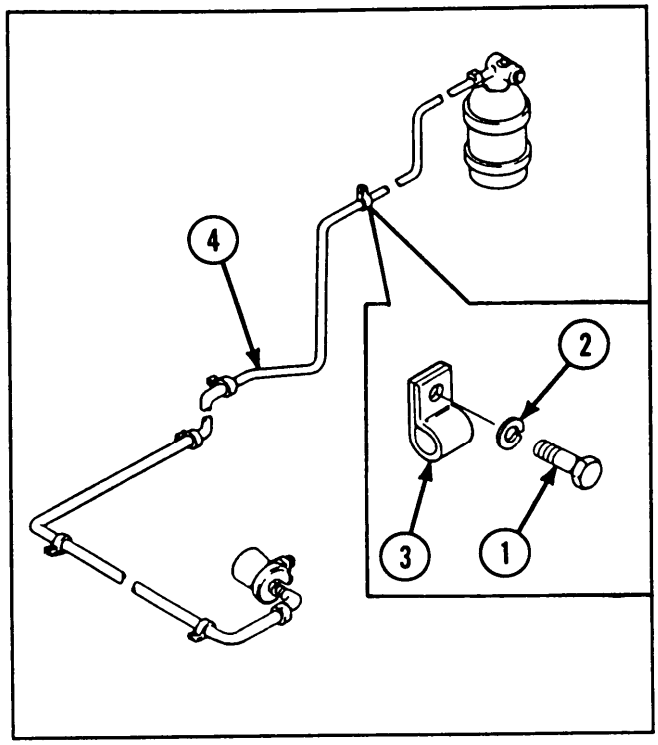
12 Secure seven loop clamps (14) with seven new lockwashers (27) and seven hexagon head capscrews (28).

2-205. MAINTENANCE OF FIXED FIRE EXTINGUISHER FORWARD NOZZLE, LINES AND FITTINGS.

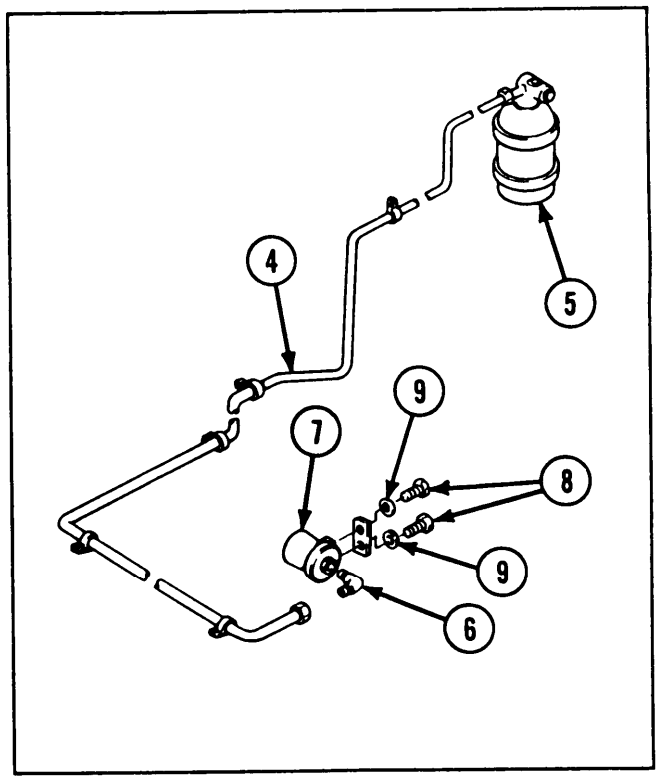
This task covers:	a. *Removal*	b. *Inspection/Repair*	c. *Installation*
INITIAL SETUP			
Materials/Parts Lockwasher (7) Lockwasher (2)		*References* TM 9-2350-238-24P-1	

2-205. MAINTENANCE OF FIXED FIRE EXTINGUISHER FORWARD NOZZLE, LINES AND FITTINGS (CONT).

REMOVAL



1 Remove seven hexagon head capscrews (1), seven lockwashers (2), and seven loop clamps (3) from right cylinder metal hose assembly (4).



2 Disconnect and remove right cylinder metal hose assembly (4) from right cylinder fire extinguisher (5) and pipe to tube elbow (6).

3 Remove pipe to tube elbow (6) from fire hose nozzle (7).

4 Remove two hexagon head capscrews (8), two lockwashers (9), and fire hose nozzle (7) from vehicle.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

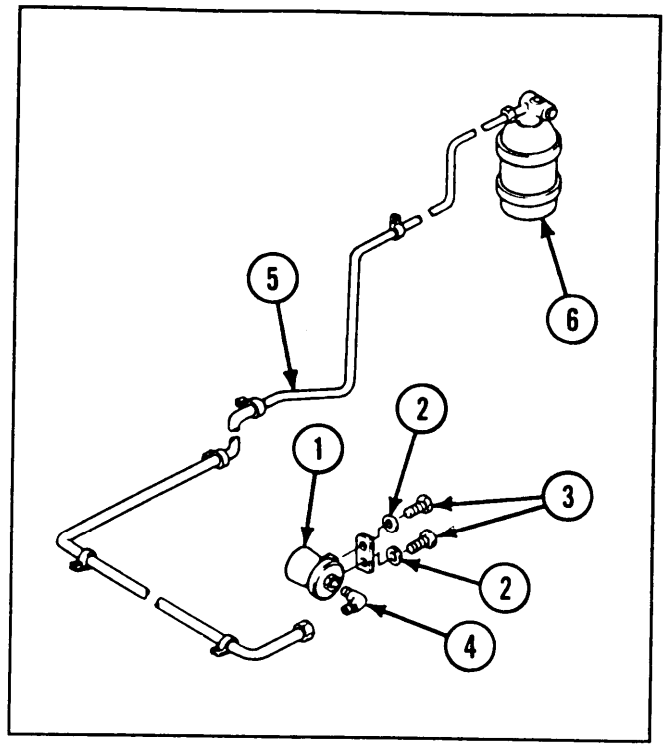
2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

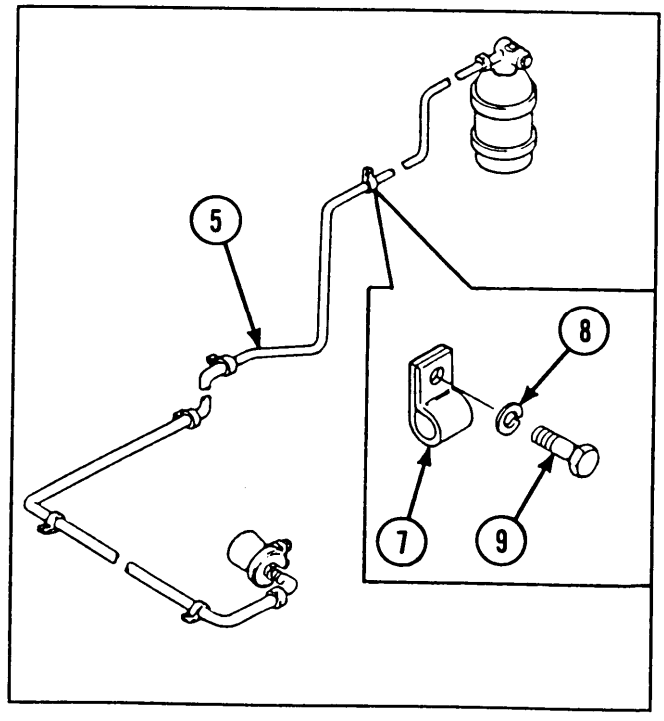
1 Install fire hose nozzle (1) and secure with two new lockwashers (2) and two hexagon head capscrews (3).

2 Install pipe to tube elbow (4) on fire hose nozzle (1).

3 Install right cylinder metal hose assembly (5), and secure to right cylinder fire extinguisher (6) and pipe to tube elbow (4).



4 Secure right cylinder metal hose assembly (5) with seven loop clamps (7), seven new lockwashers (8), and seven hexagon head capscrews (9).



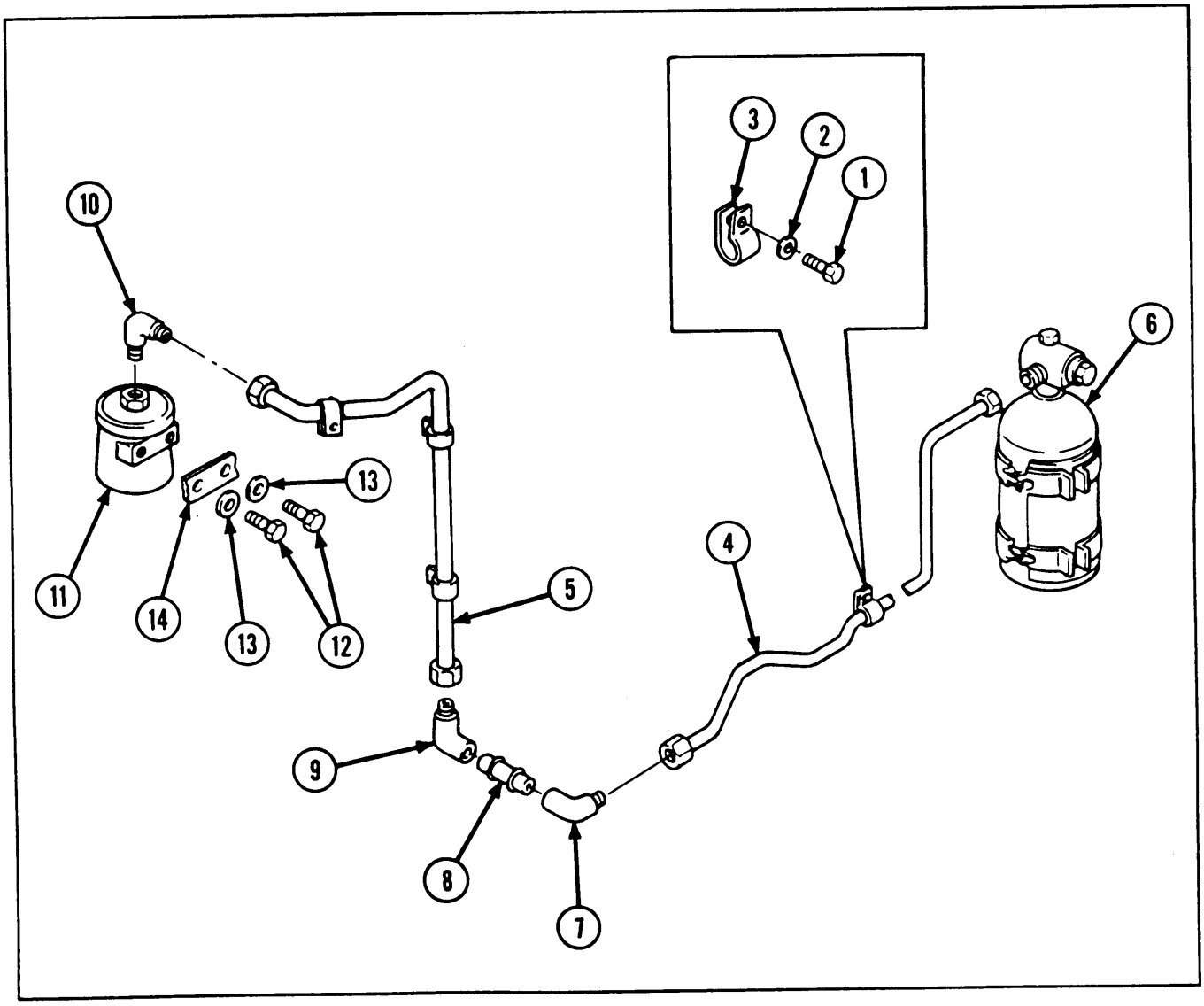
2-206. MAINTENANCE OF FIXED FIRE EXTINGUISHER REAR NOZZLE, LINES AND FITTINGS.

This task covers:	*a. Removal*	b. *Inspection/Repair*	c. *Installation*

INITIAL SETUP

Materials/Parts
Lockwasher (6)
Lockwasher (2)

References
TM 9-2350-238-24P-1



REMOVAL

1 Remove six hexagon head capscrews (1), six lockwashers (2), and six loop clamps (3) from elbow to cylinder metal hose assembly (4) and nozzle to elbow metal hose assembly (5).

2 Disconnect and remove elbow to cylinder metal hose assembly (4) from left cylinder fire extinguisher (6) and pipe to tube elbow (7).

3 Remove pipe to tube elbow (7), nozzle tube to cylinder tube pipe coupling (8), and pipe to tube elbow (9) from nozzle to elbow metal tube assembly (5).

4 Disconnect and remove nozzle to elbow metal hose assembly (5) from pipe to tube elbow (10).

5 Remove pipe to tube elbow (10) from fire hose nozzle (11).

6 Remove two hexagon head capscrews (12), two lockwashers (13), and fire hose nozzle (11) from bracket (14).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

INSTALLATION

1 Install fire hose nozzle (11) to bracket (14), and secure with two new lockwashers (13) and two hexagon head capscrews (12).

2 Install pipe to tube elbow (10) on fire hose nozzle (11).

3 Connect nozzle to elbow metal hose assembly (5) to pipe to tube elbow (10).

4 Install pipe to tube elbow (9), nozzle tube to cylinder tube pipe coupling (8), and pipe to tube elbow (7) on nozzle to elbow metal hose assembly (5).

5 Connect elbow to cylinder metal hose assembly (4) to left cylinder fire extinguisher (6) and pipe to tube elbow (7).

6 Install six loop clamps (3) on nozzle to elbow metal hose assembly (5) and elbow to cylinder metal hose assembly (4), and secure with six new lockwashers (2) and six hexagon head capscrews (1).

2-207. MAINTENANCE OF FIRE EXTINGUISHER RETAINING STRAP.

This task covers:	a. *Disassembly*	b. *Inspection/Repair*	c. *Reassembly*

INITIAL SETUP

Materials/Parts
Self-locking nut (4)

Equipment Conditions
2-923 Access cover removed

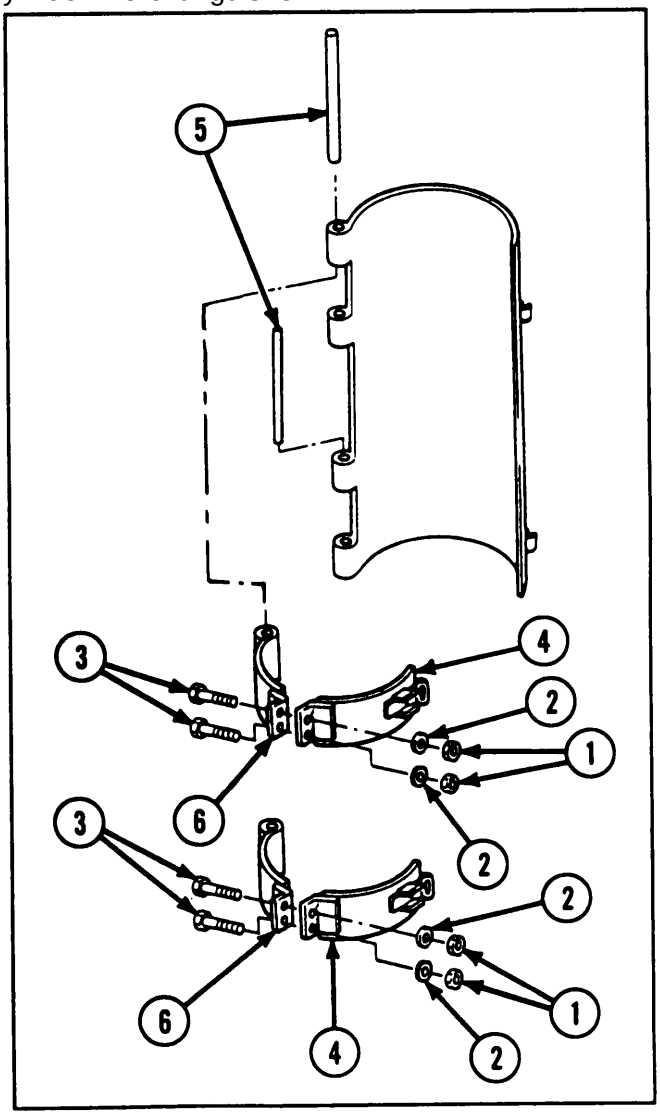
References
TM 9-2350-238-24P-1

DISASSEMBLY

NOTE
Cylinder fire extinguisher is shown removed for clarity. Fire extinguisher retaining straps can be repaired without removing the cylinder fire extinguisher.

1 Remove four self-locking nuts (1), four flat washers (2), four machine bolts (3), and two extinguisher bracket retaining straps (4).

2 Remove two headless straight pins (5) and two extinguisher bracket retaining bands (6).



INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

NOTE
Replace headless straight pins only if damaged.

1 Position two extinguisher bracket retaining bands (6) on vehicle frame, and secure with two headless straight pins (5).

2 Position two extinguisher bracket retaining straps (4) on vehicle frame, and secure with four machine bolts (3), four flat washers (2), and four new self-locking nuts (1).

2-208. MAINTENANCE OF CYLINDER FIRE EXTINGUISHER.

This task covers: a. *Disassembly* b. *Inspection/Repair* c. *Reassembly*

INITIAL SETUP

References
TM 9-2350-238-24P-1

Equipment Conditions
2-1147 Cylinder fire extinguisher removed

DISASSEMBLY

1 Disconnect cap assembly (1) and diffuser cap assembly (2).

2 Remove hose clamp (3), cap assembly (1), and diffuser cap assembly (2).

3 Remove machine threaded plug (4) and machine threaded plug (5) from cylinder assembly (6).

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

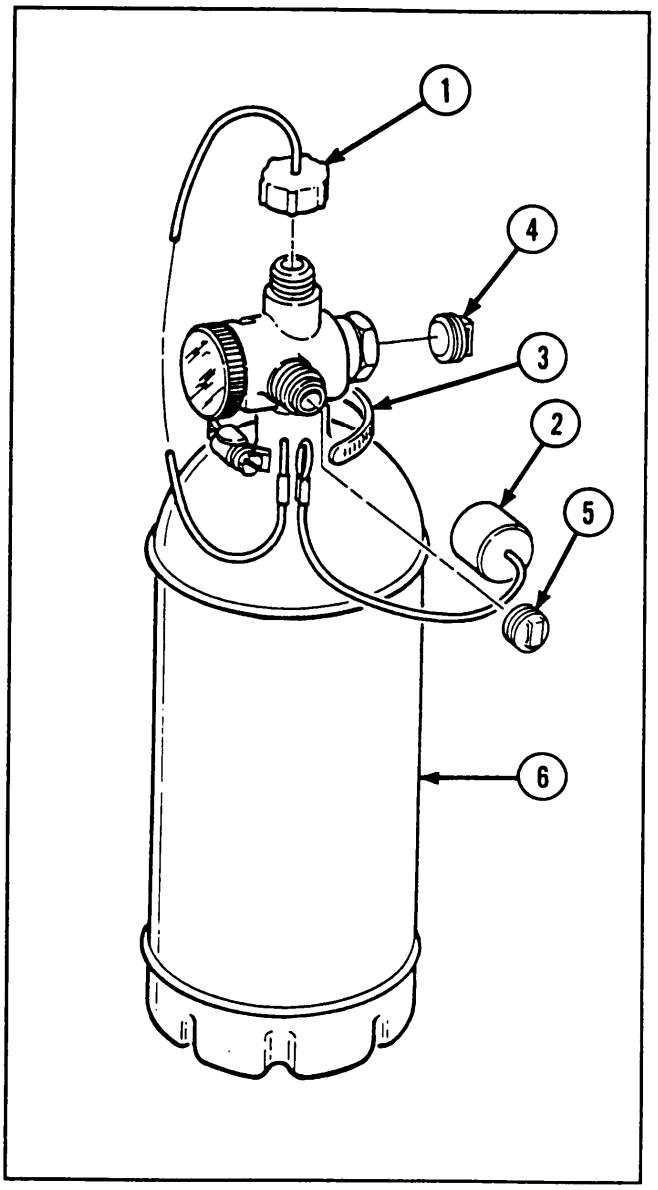
2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

1 Install machine threaded plug (4) and machine threaded plug (5) in cylinder assembly (6).

2 Install end of diffuser cap assembly (2) and cap assembly (1) on hose clamp (3). Install hose clamp on cylinder assembly (6).

3 Connect diffuser cap assembly (2) and cap assembly (1).



2-209. MAINTENANCE OF 12 C.F.M. FOUR-MAN TANK GAS-PARTICULATE FILTER UNIT M8A3.

This task covers:	a. *Removal*	d. *Reassembly*
	b. *Disassembly*	e. *Installation*
	c. *Inspection/Repair*	

INITIAL SETUP

References
TM 9-2350-238-20-2
TM 9-2350-238-24P-1

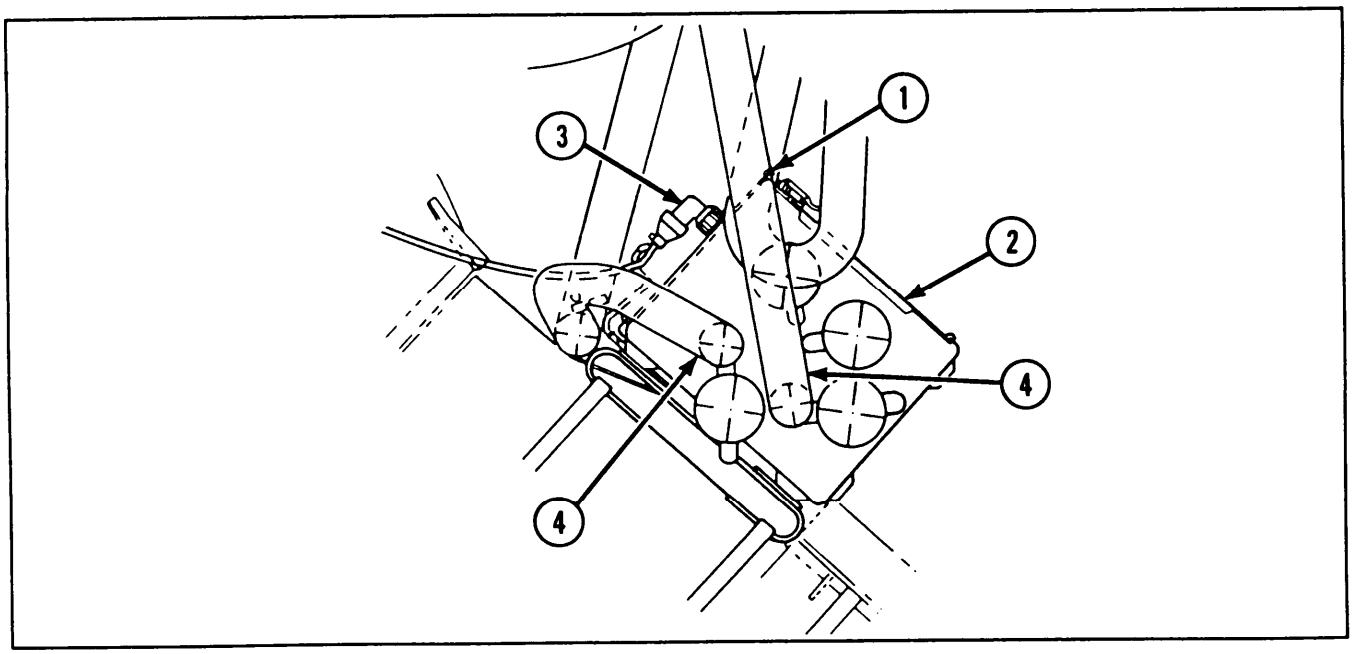
Equipment Conditions
2-840 Batteries disconnected

General Safety Instructions

WARNING

- Make sure MASTER switch is OFF before repairing electrical components. Failure to observe this warning could result in injury or death.
- Failure to remove or disconnect the batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

REMOVAL



WARNING

- Make sure MASTER switch is OFF before repairing electrical components. Failure to observe this warning could result in injury or death.

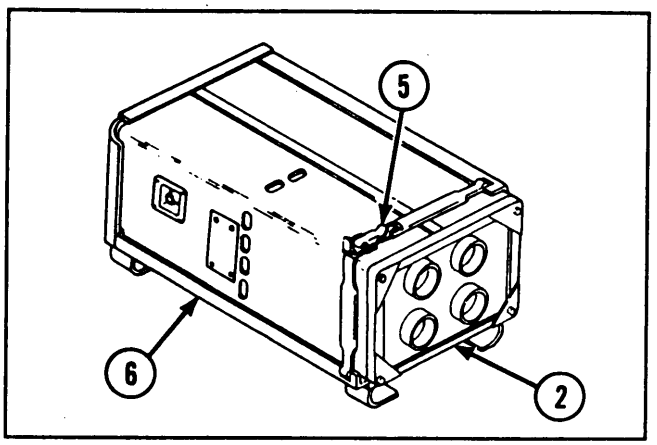
- Failure to remove or disconnect the batteries before removing or installing *any* electrical wiring harness or lead may result in injury or damaged equipment.

1 Disconnect ground cable assembly (1) from gas-particulate filter unit M8A3 (2).

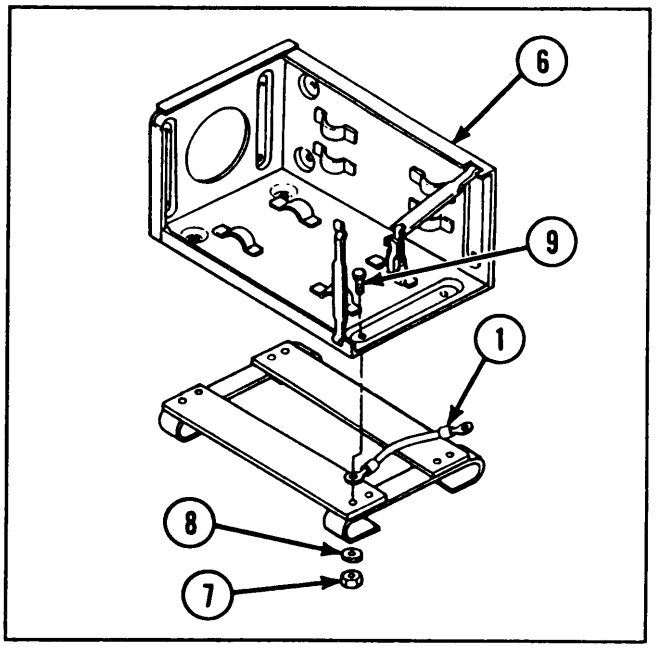
2 Unscrew and disconnect connector (3) from gas-particulate filter unit M8A3 (2).

3 Disconnect hoses (4) from gas-particulate filter unit M8A3 (2).

4 Release hold down latch (5) and remove gas-particulate filter unit M8A3 (2) from frame assembly (6).



5 Remove four nuts (7), four lockwashers (8), four machine screws (9), frame assembly (6), and ground cable assembly (1) from weldment.



2-209. MAINTENANCE OF 12 C.F.M. FOUR-MAN TANK GAS-PARTICULATE FILTER UNIT M8A3 (CONT).

DISASSEMBLY

For disassembly procedures, refer to TM 9-2350-238-20-2.

INSPECTION/REPAIR

1 Inspect for broken, damaged, or missing parts.

2 Repair is by replacement of authorized parts (TM 9-2350-238-24P-1).

REASSEMBLY

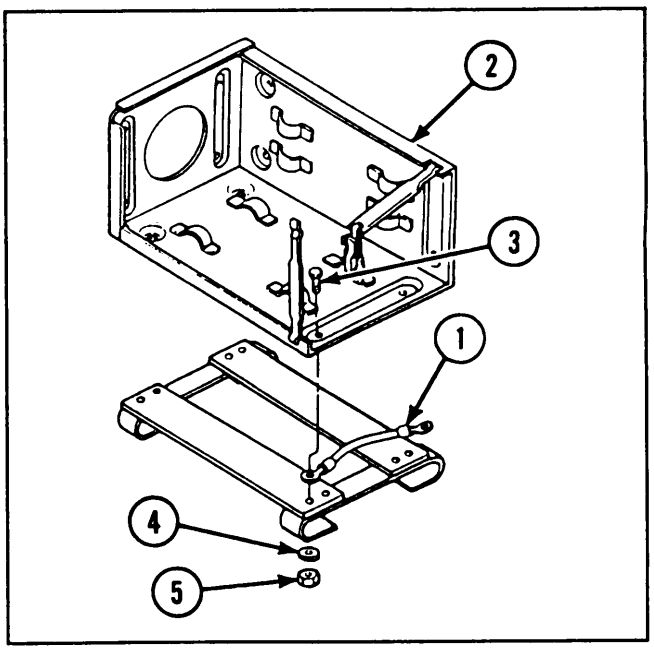
For reassembly procedures, refer to TM 9-2350-238-20-2.

INSTALLATION

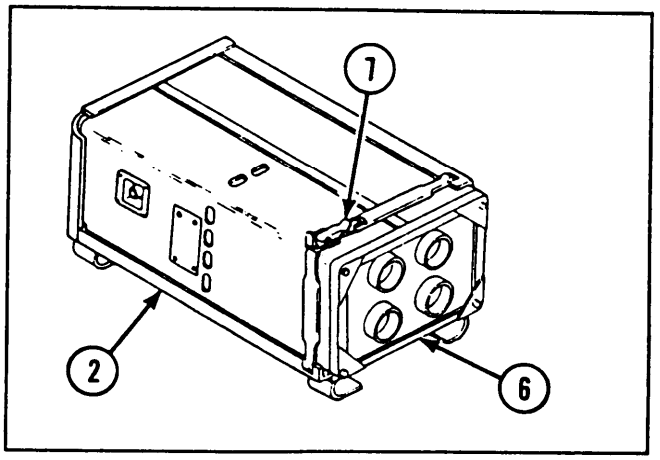
WARNING

- Make sure MASTER switch is OFF before repairing electrical components. Failure to observe this warning could result in injury or death.
- Failure to remove or disconnect the batteries before removing or installing any electrical wiring harness or lead may result in injury or damaged equipment.

1 Install ground cable assembly (1), frame assembly (2), four machine screws (3), four lockwashers (4), and four nuts (5) to weldment.



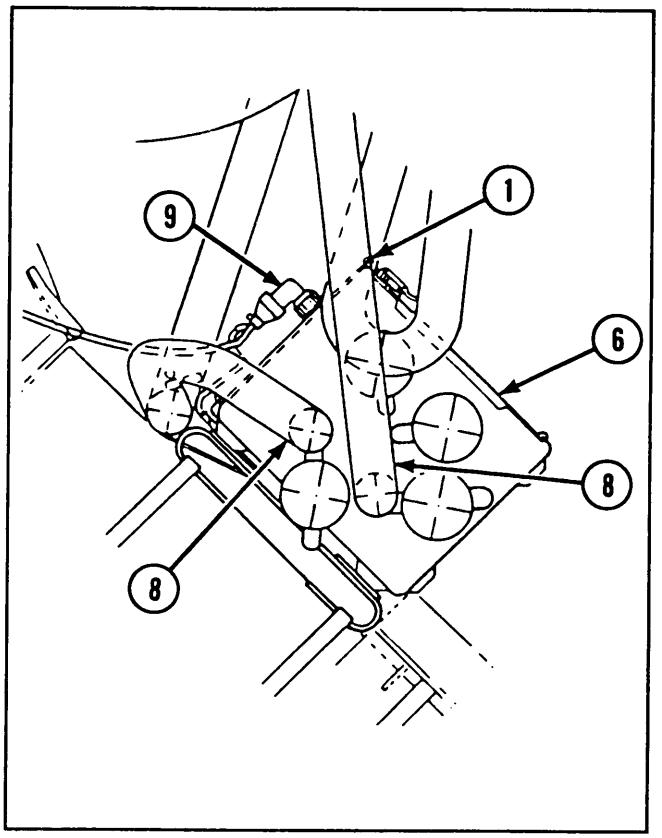
2 Install gas-particulate filter unit M8A3 (6) in frame assembly (2) and secure holddown latch (7).



3 Connect hoses (8) to gas-particulate filter unit M8A3 (6).

4 Install connector (9) to gas-particulate filter unit M8A3 (6).

5 Connect ground cable assembly (1) to gas-particulate filter unit M8A3 (6).



Section VIII. PREPARATION FOR STORAGE OR SHIPMENT

2-210. DEFINITION OF ADMINISTRATIVE STORAGE. The placement of equipment in administrative storage can be for short periods of time when: (1) an organization lacks operating funds, personnel, other resources, or normal usage of its organic materiel, and (2) materiel exceeds the capability of the owning organization to operate or maintain and must be retained by that organization for contingency or other cogent reasons.

Installation or organization commanders may authorize the administrative storage of their materiel within guidance furnished by MACOM commanders and AR 750-1. Recovery vehicles should be ready for use within the time factors as determined by the directing authority.

During the storage period appropriate maintenance records will be kept.

a. *Scope.* The requirements specified herein are necessary to maintain the M578 recovery vehicle in administrative storage in such a way as to achieve the maximum readiness condition.

b. *General.*

(1) Except as indicated in the Maintenance Services and Inspection and Corrections of Shortcomings and Deficiencies paragraphs, equipment that is placed in administrative storage should be capable of being readied to perform its mission within a 24-hour period or as otherwise prescribed by the approving authority. Before equipment is placed in administrative storage, current maintenance services, shortcomings, and deficiencies should be corrected, and all modification work orders (MWOs) should be applied.

(2) Report equipment in administrative storage in Materiel Readiness and Unit Readiness reports as prescribed for all reportable equipment. See AR 220-1.

(3) Perform inspections, maintenance services, and lubrications per TM 9-2350-238 series manuals or applicable technical manuals.

(4) Records and reports to be maintained for equipment in administrative storage are those prescribed by DA PAM 738-750, for equipment in use.

(5) Ten percent variance is acceptable on time running hours, or mileage used to determine maintenance actions required.

c. *Security.* Instructions contained herein do not modify security procedures and requirements for classified or pilferable items. See AR 190-13, DA PAM 738-750, and DA PAM 750-35.

d. *Storage Site.*

(1) Select the best available site for administrative storage. Separate stored equipment from equipment in use. Conspicuously mark the area “Administrative Storage.”

(2) Covered space is preferred. When sufficient covered space for all recovery vehicles to be stored is not available, select an open site.

(3) Open sites should be improved hardstand, if available. Unimproved sites should be firm, well-drained, and kept free of excessive vegetation.

e. *Storage Plan.*

(1) Store equipment so as to provide maximum protection from the elements and to provide access for inspection, maintenance, and exercise. Anticipate removal or deployment problems and take suitable precautions.

(2) Take into account environmental conditions, such as extreme heat or cold; high humidity; blowing sand, dust, or loose debris; soft ground; mud; heavy snows; earthquakes; or combinations thereof and take adequate precautions.

(3) Establish a fire plan and provide for adequate firefighting equipment and personnel.

f. *Maintenance Services and Inspection.* Prior to storage, perform the next scheduled major preventive maintenance service (monthly, quarterly, or semiannually).

g. *Auxiliary Equipment and Basic Issue Items.* Process auxiliary and basic issue items simultaneously with the recovery vehicle to which they are assigned. If possible, store auxiliary and basic issue items with the recovery vehicle. If stored apart from the recovery vehicle, mark auxiliary and basic issue items with tags indicating the recovery vehicle, its registration or serial number and location, and store in protective type closures. In addition, place a tag or list indicating the location of the removed items in a conspicuous place on the recovery vehicle.

h. *Corrections of Shortcomings and Deficiencies.* Correct all shortcomings and deficiencies prior to storage, or obtain a deferment from the approving authority.

i. *Lubrication.* Lubricate equipment per the applicable technical manual. Retract hydraulic systems linkage and coat exposed portion of shafts with grease.

j. *General Cleaning, Painting, and Preservation.*

CAUTION

Do not direct water or steam under pressure against air cleaners, air duct outlets, exhaust outlets, unsealed electrical systems, fire control instruments, upholstery, or any exterior opening which will damage a component.

(1) Clean the equipment of dirt, grease, and other contaminants per this manual.

(2) After cleaning and drying, immediately coat unpainted metal surfaces with an oil or grease as appropriate.

2-210. DEFINITION OF ADMINISTRATIVE STORAGE (CONT).

CAUTION

Place a piece of barrier material between desiccant bags and metal surfaces.

NOTE

Air circulation under draped covers reduces deterioration from moisture and heat.

(3) Sunlight, heat, moisture (humidity), and dirt tend to accelerate deterioration. Install all covers (including vehicle protection closures) authorized for the equipment. Close and secure all openings except those required for venting and draining. Seal openings to prevent the entry of rain, snow, or dust. Insert desiccant when complete seal is required. Place equipment and provide blocking or framing to allow for ventilation and water drainage. Support cover away from recovery vehicle surfaces which may rust, rot, or mildew.

k. *Preparation of Winches.* Refer to TM 9-2350-238-20-2.

2-211. CARE OF EQUIPMENT IN ADMINISTRATIVE STORAGE.

a. *Maintenance Services.* After equipment has been placed in administrative storage, suspend all regularly scheduled preventive maintenance services and inspect and exercise as specified herein. Do not reduce Prescribed Load List. See DA PAM 738-750 and DA PAM 750-35.

b. *Inspection.* Inspection will usually be visual and must consist of at least a walk-around examination of all equipment to observe any deficiencies that may have occurred. Inspect equipment in open storage weekly and that in covered storage monthly. Immediately after any severe storm or environmental change inspect all equipment. The following are examples of things to look for during visual inspection:

(1) Leaks: coolant, fuel, oil, or hydraulic fluid.

(2) Condition of preservatives, seals, and wraps. Seals may develop leaks during storage, during exercise, or shortly thereafter. If leaking continues, refer to maintenance procedures in this manual or notify direct support maintenance.

(3) Corrosion or other deterioration.

(4) Missing or damaged parts.

(5) Water in compartments.

(6) Any other readily recognizable shortcomings or deficiencies.

c. *Exercising.* Exercise equipment before administrative storage if schedule calls for exercising during administrative storage. Limit depreservation to removal of materials that will restrict exercising. Perform the before, during, and after operational checks per TM 9-2350-238-10. Immediately take action to correct shortcomings and deficiencies noted. Note inspection and exercise results on DA Form 2404. Record and report maintenance actions on DA Form 5504. After exercising, restore the preservation to the original condition. Replenish fuel and oil used during exercising.

d. *Rotation.* To assure utilization of all assigned materiel, rotate items per any rotational plan that will keep equipment in an operational condition and reduce maintenance effort.

e. *Removal from Administrative Storage.* Remove preservative materials. Perform the next scheduled preventive maintenance service and prepare equipment for service as outlined in TM 9-2350-238-10.

f. *Servicing.* Resume the maintenance service schedule in effect at the commencement of storage as per DD Form 314. See DA PAM 738-750.

APPENDIX A
REFERENCES

A-1. SCOPE.

This appendix lists all forms, field manuals, technical bulletins, technical manuals, and miscellaneous publications referenced in this manual.

A-2. FORMS.

DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2028-2	Recommended Changes to Equipment Technical Manuals
DA Form 2404	Equipment Maintenance and inspection Worksheet
DA Form 2408-4	Weapon Record Data
DA Form 2408-9	Acceptance and Registration
DA Form 2408-14	Uncorrected Fault Record
DA Form 2408-20	Oil Analysis Log
DA Form 5504	Maintenance Request
DD Form 314	Preventive Maintenance Schedule and Record
DD Form 1397	Processing and Reprocessing Record for Shipment, Storage, and Issue of Vehicles and Spare Engines
SF 364	Report of Discrepancy
SF 368	Product Quality Deficiency Report

A-3. FIELD MANUALS.

FM 21-11	First Aid for Soldiers
FM 21-17	Driver Selection, Training, and Supervision, Tracked Vehicles
FM 21-40	Chemical, Biological, Radiological, and Nuclear Defense

A-4. TECHNICAL BULLETINS.

TB SIG-222	Solder and Soldering
TB 750-651	Antifreeze and Cleaning Compounds in Engines

A-4. TECHNICAL BULLETINS (CONT).

TB 9-1000-234-30	Exercising of Recoil Mechanisms and Equilibrators

A-5. TECHNICAL MANUALS.

TM 9-214	Inspection, Care, and Maintenance of Antifriction Bearings
TM 9-237	Operator's Manual for Welding Theory and Application
TM 9-2350-238-10	Operator's Manual for Recovery Vehicle, Full-Tracked: Light, Armored, M578
TM 9-2350-238-20-2	Unit Maintenance Manual for Crane (Cab) Components, Recovery Vehicle, Full-Tracked: Light, Armored, M578
TM 9-2350-238-24P-1	Unit, Direct Support, and General Support Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Recovery Vehicle, Full-Tracked: Light, Armored, M578
TM 9-2540-205-24&P	Organizational, Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools) for Heaters, Vehicular Compartment (60,000 BTU)
TM 9-2815-202-24P	Unit Maintenance, Direct Support and General Support Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools List)-8V71 T Engines
TM 9-2990-207-23&P	Organizational, Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools) for Heaters, Vehicular Compartment (30,000 BTU)
TM 9-6140-200-14	Storage Batteries, Lead-Acid Type
TM 11-6625-3052-14	Multimeter Digital AN/PSM-45
TM 43-0139	Painting Instructions for Field Use
TM 750-116	General Procedures for Purging and Charging of Fire Control Instruments
TM 750-244-5-1	Destruction of Conventional Ammunition and Improved Conventional Munitions to Prevent Enemy Use
TM 750-244-6	Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use
TM 750-254	Cooling Systems, Tactical Vehicles

A-6. MISCELLANEOUS PUBLICATIONS.

AR 190-13	The Army Physical Security Program
AR 220-1	Unit Status Reporting
AR 700-138	Army Logistics Readiness and Sustainability
AR 750-1	Army Materiel Maintenance Policies
CTA 8-100	Army Medical Department Expendable Durable Items
CTA 50-970	Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items)
DA PAM 25-30	Consolidated Index of Army Publications and Blank Forms
DA PAM 738-750	The Army Maintenance Management Systems (TAMMS)
DA PAM 750-35	Functional User's Guide for Motor Pool Operations
FED-STD-751	Stitches, Seams and Stitching
MIL-STD-190	Identification Marking of Rubber Products
10CFR Part 19	Notices, Instructions, and Reports to Workers; Inspections
10CFR Part 20	Standards for Protection Against Radiation

APPENDIX B
MAINTENANCE ALLOCATION CHART

SECTION I

INTRODUCTION

B-1. GENERAL.

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. The Maintenance Allocation Chart (MAC) in section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels.

c. Section Ill lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS. Maintenance functions will be limited to and defined as follows (except for ammunition MAC'):

a. *Inspect.* To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

b. *Test.* To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. *Service.* Operations required periodically to keep an item in proper operating condition, e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

'Exception is authorized for ammunition MAC to permit the redesignation/redefinition of maintenance function headings to more adequately identify ammunition maintenance functions. The heading designations and definitions will be included in the appropriate technical manual for each category of ammunition.

B-2. MAINTENANCE FUNCTIONS (CONT).

d. *Adjust.* To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. *Align.* To adjust specified variable elements of an item to bring about optimum or desired peformance.

f. *Calibrate.* To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. *Remove/Install.* To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. *Replace.* To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the 3d position code of the SMR code.

i. *Repair.* The application of maintenance services[2] including fault location/troubleshooting[3], removal/installation, and disassemblyassembly[4] procedures, and maintenance actions[5] to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. *Overhaul.* That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. *Rebuild.* Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

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[2]Services-inspect, test, service, adjust, align, calibrate, and/or replace.
[3]Fault location/troubleshooting-The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or unit under test (UUT).
[4]Disassembly/assembly-Encompasses the step-by-step taking apart (or breakdown) of a spare/functional group coded item to the level of its least componency identified as maintenance significant (i.e., assigned an SMR code) for the level of maintenance under consideration.
[5]Actions-Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

a. *Column 1, Group Number.* Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be "00."

b. *Column 2, Component/Assembly.* Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. *Column 3, Maintenance Function.* Column 3 lists the functions to be performed on the item listed in column 2. (For detailed explanation of these functions, see paragraph B-2.)

d. *Column 4, Maintenance Level* Column 4 specifies, by the listing of a work-time figure in the appropriate subcolumn(s), the level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work-time figures are to be shown for each level. The work-time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

C	. . . . .	Operator or crew maintenance
O	. . . . .	Unit maintenance
F	. . . . .	Direct support maintenance
H	. . . . .	General support maintenance
L	. . . . .	Specialized Repair Activity (SRA)[6]
D	. . . . .	Depot maintenance

e. *Column 5, Took and Equipment.* Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

f. *Column 6, Remarks.* This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in section IV.

[6]This maintenance level is not included in section II, column (4) of the MAC. To identify functions to this level of maintenance, enter a work time figure in the "H" column of section II, column (4), and use an associated reference code in the Remarks column (6). Key the code to section IV, Remarks, and explain the SRA complete repair application there. The explanatory remark(s) shall reference the specific Repair Parts and Special Tools List (RPSTL) TM which contains additional SRA criteria and the authorized spare/repair parts.

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III.

a. *Column 1, Reference Code.* The tool and test equipment reference code correlates with a code used in the MAC, section II, column 5.

b. *Column 2, Maintenance Level.* The lowest level of maintenance authorized to use the tool or test equipment.

c. *Column 3, Nomenclature.* Name or identification of the tool or test equipment.

d. *Column 4, National Stock Number.* The National stock number of the tool or test equipment.

e. *Column 5, Tool Number.* The manufacturer's part number.

B-5. EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.

a. *Column 1, Reference Code.* The code recorded in column 6, section Il.

b. *Column 2, Remarks.* This column lists information pertinent to the maintenance function being performed as indicated in the MAC, section Il.

Section II. MAINTENANCE ALLOCATION CHART FOR RECOVERY VEHICLE, FULL TRACKED: LIGHT ARMORED, M578 (2350-00-439-6242) HULL AND RELATED COMPONENTS

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
01	ENGINE								
0100	Engine and Related Parts	Inspect		0.5				1,4,10,	
		Test			0.3			12,14,16,	
		Service	1.0					18,19,20,	
		Adjust			3.0			25,30,41,	
		Replace			8.0			42,43,49,	
		Repair			8.0			55,56,67,	A
		Overhaul				48.0		70,79,81,	
		Rebuild					72.0	83,84,93,	
								94,96,98,	
								99	
0106	External Oil Lines and Fittings and Scavenger Reservoir	Inspect	0.5						
		Service	0.5						
		Replace		2.0	0.5				

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
	Oil Pan	Inspect	0.2						
		Service	0.3						
		Replace		0.5	1.0				A
03	FUEL SYSTEM								
0302	Fuel Pump	Replace		0.5					
		Repair			0.5				A
0304	Engine Air Cleaner System	Inspect	0.3						
		Replace		2.5					
	Air Cleaner Centrifugal Fan 10905010	Inspect	0.2						
		Replace		1.0					
		Repair			1.0				
	Engine Intake Air Ducts	Inspect		0.3				98	
		Replace		1.0					
0305	Turbocharger Air Intake Filter and Related Items (Engine Model 7083-7398)	Inspect		0.1				98	
		Replace		0.5					
	Turbocharger Air Intake Screen and Related Items (Engine Model 7083-7395)	Inspect		0.1				81	
		Replace		0.5					
0306	Fabric Fuel Cell Filler Blocks	Inspect	0.3					79	
		Test			1.0				
		Replace			6.5				
	Fabric Fuel Cell Installation	Inspect	0.3					79	
		Test			1.0				
		Replace			2.0				
		Repair			2.0				
	Fuel Lines and Fittings (Low Pressure)	Inspect	0.5						
		Replace		2.5					
0309	Primary Fuel Filter	Inspect		0.1					
		Replace		0.2					
	Secondary Fuel Filter	Inspect		0.2					
		Replace		0.3					

Section II. MAINTENANCE ALLOCATION CHART FOR RECOVERY VEHICLE, FULL TRACKED: LIGHT ARMORED, M578 (2350-00-439-6242) HULL AND RELATED COMPONENTS (CONT)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
0311	Air Box Heater Installation and Air Box Heater Assembly	Inspect		0.2					
		Replace		1.5					
		Repair		1.5					
	Fuel and Purge-and-Prime Lines and Fittings	Replace		1.0					
		Repair		0.5					
0312	Throttle and Accelerator Controls and Linkage	Service		0.5					
		Replace		1.5					
		Repair		1.0					
04	EXHAUST SYSTEM								
0401	Exhaust System	Inspect		0.3				98	
		Replace		1.0					
		Repair		1.0					
05	COOLING SYSTEM								
0501	Radiator and Related Parts	Inspect	0.3					80	
		Replace		1.0					
		Repair			1.0				B
	Radiator Support Beam and Related Parts	Replace		1.0				80	
		Repair		0.5					
	Surge Tank and Related Parts	Replace		1.0				80	
		Repair		0.5					
0503	Cooling System Hoses, Pipes, and Related Parts	Replace		1.0				26,40	
	Aeration Detector	Replace		1.0					
		Test		0.2					
0505	Cooling System Fan Tensioner and Related Parts	Inspect	0.3					80,82	
		Align		0.5					
		Adjust		0.3					
		Replace		0.5					
		Repair		0.5					

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
	Radiator Cooling Vaneaxial Fan	Replace		0.5				79	
		Repair			0.5				
06	ELECTRICAL SYSTEM								
0601	Generator and Cooling Air Intake System	Inspect	0.3					98	
		Test		0.5					
		Replace		1.0					C
		Repair		1.0	2.5				
0602	Voltage Regulator and Related Parts	Inspect	0.3						
		Replace		0.5					
		Test		0.5					
0603	Starter and Mounting Hardware	Inspect		0.2					
		Replace		1.0					
		Repair			1.0				D
	Starter Relay and Related Items	Replace		0.5					
		Test		0.5					
0606	Neutral Position Switch and Related Parts	Adjust		0.5				80,98	
		Replace		0.5					
0607	Driver's Instrument Panel Installation	Inspect	0.5						
		Replace		1.0					
		Repair		0.5					
	Driver's Instrument Panel 10904806	Inspect	0.3						E
		Replace		1.0					
		Repair		1.5					
	Driver's Instrument Panel 10892415	Inspect	0.3						F
		Replace	0.5	1.0					
		Repair	0.5	1.5	0.5				
0608	Miscellaneous Electrical Components	Replace		2.0					
		Test		0.5					
	Electrical Accessories Power Bus Panel	Replace		1.0					D
		Repair		1.0					
0609	Headlight, Dome Light, Warning Light, and Stoplight-Taillight Installation	Adjust		1.0					
		Replace		0.5					
		Repair		0.5					

Section II. MAINTENANCE ALLOCATION CHART
FOR
RECOVERY VEHICLE, FULL TRACKED: LIGHT ARMORED, M578 (2350-00-439-6242)
HULL AND RELATED COMPONENTS (CONT)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
	Headlight Assembly MS53022-1	Replace Repair	 0.3	1.0 1.5				80	F
	Left Stoplight-Taillight 8378785	Replace Repair	 0.5	1.0 1.2					F
	Right Stoplight-Taillight 8378786	Replace Repair	 0.5	1.0 1.2					F
	Driver's Compartment Dome Light 7064671	Replace Repair	 0.3	0.5 1.5					F
0610	Sending Units, Warning Switches, and Indicator Lights	Adjust Replace	1.0	 2.0					
	Low Engine Coolant Warning Indicator Light 11675565	Replace Repair		0.5 0.5				80	
0611	Audible Warning Horn and Related Parts	Replace		1.0					
0612	Batteries, Electrical Leads, and Related Parts	Inspect Test Service Replace Repair	0.3 0.3 	0.5 0.3 0.3 1.0 	 1.5	 	 	80	 G
0613	Electrical Wiring Installation Attaching Hardware	Replace		2.0					
	Electrical Wiring (Hull Aft)	Replace Repair		5.0 1.0				80	
	Bulkhead Disconnect to Switch Panel Branched Wiring Harness 10881944	Replace Repair		1.0 1.0				80	

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
	Bulkhead Disconnect to Engine Components and Warning Units Branched Wiring Harness 10882032	Replace Repair		1.5 1.0				80	
	Bulkhead Disconnect to Driver's Control Branched Wiring Harness 12289941	Replace Repair		1.5 1.0				80	
	Suspension Lockout System Warning Light Ground and Horn Ground Electrical Lead 10892526	Replace Repair		0.5 0.5				80	
	Line Connection to Right Headlamp Disconnect Branched Wiring Harness 10901827	Replace Repair		1.0 1.5				80	
	Trailer Receptacle Assembly to Disconnect Branched Wiring Harness 10901829	Replace Repair		1.0 1.5				80	
	Battery to Circuit Breaker Electrical Lead 10901835	Replace Repair		0.5 0.5				80	
	Bulkhead Disconnect to Generator Armature Electrical Lead 10901840	Replace Repair		0.5 0.5				80	
	Bulkhead Disconnect to Starter Electrical Lead 10901842	Replace Repair		0.5 0.5				80	
	Bulkhead to Bulkhead Generator Circuit Electrical Lead 10901844	Replace Repair		0.5 0.5				80	

Section II. MAINTENANCE ALLOCATION CHART FOR RECOVERY VEHICLE, FULL TRACKED: LIGHT ARMORED, M578 (2350-00-439-6242) HULL AND RELATED COMPONENTS (CONT)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
	Bulkhead Disconnect to Voltage Regulator Assembly Wiring Harness 10901852	Replace Repair		0.5 1.0				80	
	Floor Disconnect to Bulkhead Disconnect Wiring Harness 10901855	Replace Repair		0.5 0.5				80	
	Bulkhead Disconnect to Magnetic Clutch Branched Wiring Harness 10901856	Replace Repair		0.5 1.0				80	
	Bulkhead Disconnect to Circuit Breaker Branched Wiring Harness 10904973	Replace Repair		1.0 1.0				80	
	Hull Disconnect to Slip Ring Lead and Circuit Breaker 10904974	Replace Repair		0.5 1.0				80	
	Blower to Ground Electrical Lead 10914828	Replace Repair		0.5 0.5				80	
	Intercom Circuit Bulkhead Disconnect to Slip Ring Branched Wiring Harness 10914906	Replace Repair		0.5 1.0				80	
	Horn to Warning Relay Wiring Harness 10919885	Replace Repair		1.0 0.5				80	
	Generator Control Circuits to Bracket Disconnect Branched Wiring Harness 10919889	Replace Repair		1.0 1.5				80	

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
	Disconnect to Instrument Panel Branched Wiring Harness 10934573	Replace Repair		1.0 0.5				80	
	Disconnect to Forward Air Cleaner Blower Motor Electrical Lead 10934867 and Fuel Purge-and-Prime Switch to Solenoid Electrical Lead 12254008 (Engine Model 7083-7395)	Replace Repair		0.5 0.5				80	
	Bulkhead Disconnect to Trailer Receptacle Disconnect, Aft Blower Motor, and Taillights Branched Wiring Harness 10956785	Replace Repair		1.5 1.0				80	
	Lighting Switch to Vehicle Accessories and Disconnect Branched Wiring Harness 11592728	Replace Repair		1.5 1.0				80	
	Battery to Bulkhead Disconnect Cable Assembly 12289960	Replace Repair		0.5 0.5				80	
	Bulkhead to Bulkhead Starter Circuit Branched Wiring Harness 11592731	Replace Repair		0.5 1.0				80	
	Disconnect to Headlamp Wiring Harness 11592755	Replace Repair		1.0 0.5				80	
	Relay to Starter and Neutral Position Switch Branched Wiring Harness 12290396	Replace Repair		1.0 1.5				80	

Section II. MAINTENANCE ALLOCATION CHART
FOR
RECOVERY VEHICLE, FULL TRACKED: LIGHT ARMORED, M578 (2350-00-439-6242)
HULL AND RELATED COMPONENTS (CONT)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
	Fuel Purge-and-Prime Switch to Solenoid Electrical Lead 11675547 (Engine Model 7083-7398)	Replace Repair		0.5 0.5				80	
	Warning Light Low Coolant Detector to Bulkhead Disconnect Branched Wiring Harness 11675566	Replace Repair		1.0 0.5				80	
	Aeration Detector Branched Wiring Harness 11675567	Replace Repair		0.5 0.5				80	
	Low Coolant Warning Light to Bulkhead Disconnect Branched Wiring Harness 11675568	Replace Repair		1.0 0.5				80	
	Master Relay to Bulkhead Disconnect Special Cable Assembly 12289961	Replace Repair		0.5 0.5				80	
	Voltage Regulator to Bulkhead Disconnect, Slave Receptacle, and Accessories Panel Special Cable Assembly 12322791	Replace Repair		1.0 1.0				80	
	Air Cleaner Blower Relay to Bulkhead Disconnect Branched Wiring Harness 12290394	Replace Repair		1.0 1.0				80	

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
	Neutral Position Safety Switch to Engine Disconnect Electrical Lead 12290393	Replace Repair		1.0 1.5				80	
	Slave Receptacle and Ground Electrical Lead 12322792	Replace Repair		0.5 0.5				80	
	Generator to Ground Engine Ignition Lead 10914937	Replace Repair		0.5 0.5				80	
	Starter to Ground Electrical Lead 10901839	Replace Repair		0.3 0.5				80	
0614	Slip Ring Electrical Components	Replace			1.0			79	
	Turret Slip Ring Cover 11593028	Replace Repair			0.3 0.3				
	Slip Ring Electrical Contact Set Assembly 10914699	Replace Repair			0.3 0.3				
	Slip Ring Electrical Brush Connector Assembly 11592936	Replace Repair			0.3 0.5				
	Slip Ring Disconnect to Interior Disconnect Wiring Harness 10914730	Replace Repair			0.3 0.5			79	
	Slip Ring to 24-Volt Feed Electrical Lead 10914731	Replace Repair			0.3 0.5			79	
0615	Hub Cap Radio Static Suppression Spring 7379067	Replace		0.5				80	
07	TRANSMISSION								

Section II. MAINTENANCE ALLOCATION CHART
FOR
RECOVERY VEHICLE, FULL TRACKED: LIGHT ARMORED, M578 (2350-00-439-6242)
HULL AND RELATED COMPONENTS (CONT)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
0710	Transmission Assembly 5703079	Inspect	0.3	0.3				6,7,8,9,	
		Test		2.0				11,13,23,	
		Service	0.5	0.7				31,46,48,	
		Replace			6.0			69,73,79,	
		Repair			9.0			85,88,89,	D
		Overhaul					46.0	95,101,	
		Rebuild					72.0	105,109	
	Transmission Components	Replace		1.0					
0714	Transmission Plugs	Replace		0.5				80,95	
0721	Oil Sampling Drain Cock and Related Parts	Inspect		0.3					
		Service		0.5					
		Replace		0.5					
		Repair		0.5					D
08	TRANSFER AND FINAL DRIVE ASSEMBLIES								
0801	Transfer Assembly	Inspect	0.3	0.5	1.0			44,48,51,	
		Service		0.5				54,58,76,	
		Replace			3.0			79,86	F,H
		Repair			2.0	4.0			
		Overhaul					3.0		
		Rebuild					6.6		
	Final Drive Assemblies	Inspect	0.3	0.5	1.0			44,76,82,	
		Service		0.5				86	
		Replace		3.0					F,H
		Repair			3.0				
		Overhaul					3.0		
		Rebuild					6.6		
	Auxiliary Drive Installation	Replace		2.0				82,98	
	Auxiliary Drive Assembly 11675634	Inspect		0.5				33,36,	
		Service		0.5				62,64,65,	
		Replace		3.0				66,78,79,	
		Repair		1.0	6.5			91,105	
		Overhaul					7.5		
		Rebuild					9.0		

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
	Oil Filler Neck 10934580	Replace		0.5					
		Repair			0.5				
	Oil Drain Tube Assembly 10902501-1	Replace		0.5					
		Repair			0.5				
0803	Shifting Control and Linkage	Inspect	0.3						
		Adjust		0.5					
		Replace		1.0					
		Repair		1.0					
0804	Pump and Slip Ring Assembly 10914685 and Attaching Parts	Replace			3.0			79,82	
		Repair				3.0			
	Slip Ring Assembly 10908809	Replace				1.0			
		Repair				1.0			
	Double Rotary Pump 10867009	Replace				1.0		79	
		Repair				1.0			
	Impact Wrench Regulator Ball Valve 10923477	Replace		0.5					
		Repair		0.1	0.3				
	Fluid Filter	Inspect		0.5				98	
		Replace		1.0					
09	PROPELLER SHAFTS								
0900	Auxiliary Drive Shafts, Universal Joints, and Related Parts	Service	0.5					80,98	
		Replace		1.0					
		Repair		0.5					
	Auxiliary Drive Line Ball Bearing Unit 11642773	Replace		0.5				79,90	
		Repair			1.0				
12	BRAKES								
1201	Parking Brake Control and Linkage	Adjust		0.5					
		Replace		1.0					
	Parking Brake Assembly 12254047	Inspect	0.5					80	
		Service		0.3					
		Adjust		0.5					
		Replace		1.0					
		Repair		0.5					

Section II. MAINTENANCE ALLOCATION CHART
FOR
RECOVERY VEHICLE, FULL TRACKED: LIGHT ARMORED, M578 (2350-00-439-6242)
HULL AND RELATED COMPONENTS (CONT)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
1206	Mechanical Brake Control and Linkage	Inspect	0.5					80,108,	
		Service		0.5				109	
		Adjust		0.5					
		Replace		2.5					
13	WHEELS AND TRACK								
1301	Torsion Bars and Sockets	Inspect		0.5				15,17,47,	
		Replace		2.0				101	
	Roadwheel Arm and Hub Assembly and Attaching Parts	Inspect	0.5					3,35,36,	
		Service		0.5				45,47,76,	
		Replace		1.0				80	
		Overhaul					2.1		
	Roadwheel Pivot Arm Assembly 10891653	Inspect	0.5					29,38,39,	
		Adjust		0.3				68,72,80,	
		Replace		1.0				92	
		Repair		2.0					
	Roadwheel Suspension Hub 11631593	Inspect	0.5					80	
		Replace		1.0					
		Repair		1.0					
1303	Idler Wheel, Roadwheel Wheel, and Left Lubrication Tube	Inspect	0.5					80	
		Replace		1.0					
	Idler Wheel Arm and Hub Assembly and Attaching Parts	Inspect	0.5					3,21,27,	
		Adjust		1.0				29,32,36,	
		Service		0.5				37,45,47,	
		Replace		1.0				71,76,80,	
								97,107	
	Idler Wheel Arm and Hub 10891675	Inspect	0.5					29,38,39,	
		Replace		1.0				80,92	
		Repair		2.0					
	Idler Wheel Vehicular Wheel Hub 10891677	Inspect	0.5					80	
		Replace		1.0					
		Repair		1.0					

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
1304	Drive Hub Sprockets and Related Parts	Inspect Replace	0.3	 1.0				24,80,87	
1305	Vehicular Track Shoe Installation	Inspect Adjust Replace	1.5 0.5	 1.0				2,17,22, 47,80	
	Vehicular Track Shoe 10934639	Inspect Replace Repair	0.3	 0.5 0.5				17	
14	STEERING								
1401	Steering Controls and Linkage and Steering Rod Assembly 12253961	Inspect Adjust Replace Repair		0.5 0.5 2.0 1.0					
15	TOWING ATTACHMENTS								
1503	Towing Pintle Assembly	Service Replace	0.5	 1.0				80	
16	SPRINGS AND SHOCK ABSORBERS								
1604	Lockout Cylinder and Related Parts	Inspect Replace	0.5	 1.0				80,98	
	Hydraulic Suspension Lockout Cylinder Assembly 12254156	Inspect Replace Repair		1.0 1.0		 6.0		5,29,34, 50,59,79, 108	
	Suspension Lockout System Control Valve and Associated Parts	Replace Repair		1.0 2.0					
18	HULL								
1801	Hull Covers and Access Doors	Replace Repair		2.0 1.0					
	Air Cleaner Blower Motor Access Door Assembly 10903996	Replace Repair		0.5	 1.0				
	Battery Access Cover 12355134	Replace Repair		0.5	 1.5				

Section II. MAINTENANCE ALLOCATION CHART
FOR
RECOVERY VEHICLE, FULL TRACKED: LIGHT ARMORED, M578 (2350-00-439-6242)
HULL AND RELATED COMPONENTS (CONT)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
	Air Cleaner Access Door 12355090	Replace Repair		0.5	 1.0				
	Engine Fuel Filter Access Door 11643066	Replace Repair		0.5	 1.0				
	Hull Deck and Miscellaneous Components	Replace Repair		3.0 1.0				98	
	Hull Engine Compartment Deck Assembly Lid 10904150	Replace Repair		0.5 1.0					
	Hull Transmission Compartment Assembly Access Cover 10904116	Replace Repair		0.5 1.0					
1802	Mud Guards, Fender Extensions, and Attaching Parts	Replace		0.5					
1803	Driver's Hatch Cover	Replace Repair		1.5 1.0	 2.0			79	
1804	Hull Drain Plugs, Valves, and Related Parts	Replace		1.5					
1806	Driver's Seat and Associated Parts	Replace		2.0					
	Vehicular Seat 10901351	Inspect Replace Repair	0.2	 0.5 1.0					
1808	Hull Stowage Clamps, Retainers, and Associated Parts	Replace Repair		2.0 1.0					

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
20	POWER TAKEOFF								
2004	Power Takeoff Installation	Inspect			0.3			79	
		Replace			1.0				
	Transmission Power Takeoff 10902000-1	Inspect			0.3			28,52,60,	
		Replace			1.5			63,74,79	
		Repair				1.0			
2005	Spade and Related Parts	Inspect	1.0					80,82,101	
		Service		0.5					
		Replace		8.0					
		Repair		3.0					
	Hydraulic Cylinder Assembly 10904921	Inspect	0.5					34,102,	
		Test			1.0			103,104	
		Replace		2.0					
		Repair			1.0				
	Spade Hydraulic Control Valve, Lines, and Fittings	Inspect	2.0						
		Replace		8.0					
	Direct Linear Valve 10923471	Replace			1.5				
		Repair			0.8				
22	HULL ACCESSORY ITEMS								
2210	Vehicle Data Plates	Replace		1.5					
26	TOOLS AND TEST EQUIPMENT								
2604	Special Tools	Replace		0.5					
33	SPECIAL PURPOSE KITS								
3303	Vehicle Winterization Kit 11643500	Replace			72.0				
		Repair			72.0				
	Heater Installation Kit 11643540	Replace		25.0				98	
		Repair		25.0					
	Battery Positive Terminal to Circuit Breaker Electrical Leads 10934557 and 12355156	Replace		1.0				80	
		Repair		0.5					

Section II. MAINTENANCE ALLOCATION CHART
FOR
RECOVERY VEHICLE, FULL TRACKED: LIGHT ARMORED, M578 (2350-00-439-6242)
HULL AND RELATED COMPONENTS (CONT)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
	Coolant Heater Circuit Breaker to Line Disconnect Special Cable Assembly 11643550	Replace Repair		1.0 0.5				80	
	Heater Control Box to Driver's Heater Wiring Harness 12322871	Replace Repair		1.0 0.5				80	
	Bulkhead Disconnects to Master Relay and Circuit Breaker Special Cable Assembly 11643585	Replace Repair		1.0 0.5				80	
	Bulkhead Disconnect to Circuit Breakers and Electrical Components Branched Wiring Harness 11643591	Replace Repair		2.0 1.0				80	
	Power Plant Compartment Branched Wiring Harness 11643592	Replace Repair		1.5 1.0				80	
	Filter Mounting Fluid Filter 12322867	Inspect Replace Repair		0.3 1.0 0.5					
	Pyrometer Panel Assembly 11643533 and Warning Indicator Light 8729063	Replace Repair		0.5 1.0					
	Engine Blower Assembly 10956647	Replace Repair		1.0	 2.0			79	

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
	Heater Electrical Control Box 11669705	Replace Repair		0.5 0.5	 1.0				
	Engine Coolant Heater 11643561	Replace Repair		1.0	 2.5				I
	Coolant Heater Assembly Branched Wiring Harness 11617762	Replace Repair		1.0 0.5				80	
	Vehicular Heater (Driver's Compartment) 12322854	Replace Repair		1.0 1.0	 2.5				
	Driver's Windshield Enclosure Kit 11643510	Replace Repair		5.0 3.0					
	Vehicular Window 11643497	Replace Repair		1.0 1.0	 0.5				
	Vehicular Window 11643494	Replace Repair		1.0 1.0	1.0 3.0				
	Windshield Wiper Motor Assembly 12355188	Replace Repair		0.5	 1.5				
	Wiper Motor and Defroster Lead Disconnects Electrical Lead Assembly 11643498	Replace Repair		1.0 0.5				80	
	Circuit Breaker to Wiper Motor and Defroster Switch Electrical Lead Assembly 11643499	Replace Repair		1.0 0.5				80	
	Defroster to Switch and Ground Lead Disconnects and Wiper Motor to Ground Lead Disconnect Electrical Leads 11643576-2	Replace Repair		1.0 0.5				80	

Section II. MAINTENANCE ALLOCATION CHART
FOR
RECOVERY VEHICLE, FULL TRACKED: LIGHT ARMORED, M578 (2350-00-439-6242)
HULL AND RELATED COMPONENTS (CONT)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
	Defroster to Switch and Ground Lead Disconnect 12355164 and Wiper Motor to Switch 11643608-1 Electrical Leads	Replace Repair		2.0 1.0				80	
	Oil Reservoir Heater Kit 11643609	Replace Repair		1.8 2.0				80	
	Relay to Heating Element Electrical Lead 10934763	Replace Repair		1.0 0.5				80	
	Overheat Thermostat to Relay Branched Wiring Harness 10934764	Replace Repair		1.0 0.5				80	
	Relay and Disconnect to Slave Receptacle Special Cable Assembly 11592924	Replace Repair		1.0 0.5				80	
	Heating Element to Slave Electrical Lead 11643584	Replace Repair		1.0 0.5				80	
	Vehicular Parts Kit 11643610	Inspect Replace Repair	0.5	 1.0 1.0					
	Circuit Breaker to Heater Control Box Branched Wiring Harness 10934483	Replace Repair		1.0 0.5				80	
	Air Deflector Assembly 11643617	Replace Repair			0.3 0.3				
	Personnel Vehicular Heater Assembly 12290382-2	Replace Repair		1.0 1.0	0.5 0.5			75	J

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
	Control Box Assembly to Heater Assembly Wiring Harness 10934482	Replace Repair		1.0 0.5				80	
	Crane Operator's Enclosure Kit 11643520	Replace Repair		5.0 5.0				80	
	Crane Window Assembly 11643521	Replace Repair		1.0 0.4	1.0 0.3				
	Crane Operator's Base Assembly 11643519	Replace Repair		1.0 0.5					
	Wiper Motor and Defroster Lead Disconnects Branched Wiring Harness 11643522	Replace Repair		1.0 0.5				80	
	Circuit Breaker to Wiper Motor and Defroster Switch Electrical Lead Assembly 11643523	Replace Repair		1.0 0.5				80	
3307	Arctic Traction Kit	Replace		9.0				2,17,22, 47,80	
47	GAGES (NON-ELECTRICAL)								
4701	Speedometer, Tachometer, and Related Parts	Replace		1.0					
76	FIRE FIGHTING EQUIPMENT								
7639	Fixed Fire Extinguisher Control System	Inspect Service Replace		0.5 0.2 1.0					
	Fixed Fire Extinguisher Connecting Lines and Fittings	Replace		1.0					

Section II. MAINTENANCE ALLOCATION CHART
FOR
RECOVERY VEHICLE, FULL TRACKED: LIGHT ARMORED, M578 (2350-00-439-6242)
HULL AND RELATED COMPONENTS (CONT)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
	Fixed Fire Extinguisher Forward Nozzle, Lines and Fittings	Replace		1.0					
	Fixed Fire Extinguisher Rear Nozzle, Lines and Fittings	Replace		1.0					
	Fire Extinguisher Retaining Strap 10946585	Replace Repair		1.0 1.0					
	Cylinder Fire Extinguisher 12257169	Inspect Service Replace Repair		0.3 0.2 1.0	 1.0				
91	CHEMICAL BIOLOGICAL EQUIPMENT								
9111	12 C.F.M. Four-Man Tank Gas-Particulate Filter Unit M8A3	Replace		0.5					

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL NATO STOCK NUMBER	TOOL NUMBER
1	F	Adapter	4910-00-019-5241	10934456
2	O	Adapter, Impact Wire	5130-00-840-4872	11592842
3	O	Adapter, Puller	5120-00-708-2997	7082997
4	F	Adapter, Reducer	2540-00-623-8303	444012
5	H	Adapter, Wrench	N/A	Refer to Section IV, ref code K.
6	H	Aligning Tool, Pinion and Roller	5120-00-733-8904	8351208
7	H	Aligning Tool, Pinion and Roller	5120-00-733-8905	8351209
8	H	Aligning Tool, Pinion and Roller	5120-00-738-1644	8351214
9	H	Bolt Guide	4910-00-722-3917	8351231
10	H	Bracket	4910-00-737-0432	10903999
11	F	Bracket, Transmission Sling Mounting	5340-00-977-5580	8355697
12	H	Clamp Set, Liner	5120-00-219-8390	10881871
13	H	Compressing Tool, Spring	5120-00-996-2119	8355784
14	H	Compressor, Piston Ring	5120-00-308-6785	10881876
15	O	Coupling, Shaft, Rigid	3010-00-733-8961	10904183
16	H	Cradle Assembly	4910-00-795-0198	7950198
17	C	Driftpin	5120-00-708-3639	7083639
18	H	Driver, Cam	4910-00-363-7556	5344997
19	F	Dye	3950-00-823-7664	MILF35093 Type I
20	H	Expander, Oil Seal	5120-00-979-5596	10881890
21	O	Extension, Torque Wrench	N/A	Item 5, appx G.
22	C	Fixture, Track Connecting	5120-00-605-3926	8741739
23	F	Gage, Brake Adjusting	5120-00-733-5005	8351213
24	O	Gage, Sprocket Wear	5210-00-842-3051	11631464
25	F	Gage Assembly	4910-00-870-6283	10899180

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR RECOVERY VEHICLE, FULL TRACKED: LIGHT ARMORED, M578 (2350-00-439-6262) HULL AND RELATED COMPONENTS (CONT)

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL NATO STOCK NUMBER	TOOL NUMBER
26	O	Handle, Driver	5120-00-977-5578	J7079-2
27	O	Handle, Manual Control	5340-00-733-8970	10904204
28	H	Handle, Manual Control	5340-00-316-9182	7950864
29	O	Handle, Remover and Replacer	5120-00-708-3883	7083883
30	H	Holder	2815-00-705-9278	10881910
31	H	Hook, Lifting, Housing	4910-00-757-1961	8351888
32	O	Inserter, Bearing	5120-00-733-8973	10904210
33	F	Inserter, Bearing Cone	5120-00-057-0302	10934814
34	F	Inserter, Oil Seal	5120-00-733-8929	10904174
35	O	Inserter, Seal	5120-00-733-8943	10904176
36	O	Inserter, Seal	5120-00-733-8951	10904181
37	O	Inserter, Seal	5120-00-733-8953	10904182
38	O	Inserter Set, Bearing	5120-00-473-7374	7082834
39	O	Inserter Set, Bearing	5120-00-473-7373	7082876
40	O	Installer, Thermostat Seal	5120-00-977-5579	J8550
41	F	Manometer	6665-00-065-5308	KMJ21478-1
42	F	Mercury	6810-00-290-0017	MILM191 Grade II
43	H	Pan, Drip, Oil	4910-00-545-8839	8708359
44	O	Pin, Shoulder, Headless	4910-00-722-3896	10904172
45	O	Pin, Straight, Threaded	5315-00-722-3888	10904178
46	H	Plate, Spindle, Replacer	4910-00-757-1960	8351492
47	O	Puller, Slide	5120-00-557-3615	5573615
48	H	Puller Attachment, Mechanical	5120-00-473-7352	7082201
49	H	Puller Kit, Mechanical	5120-00-338-6721	8708724

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL NATO STOCK NUMBER	TOOL NUMBER
50	H	Pump Kit, Hydraulic, M3	4933-00-712-2378	7122378
51	H	Remover, Bearing	5120-00-034-0873	8355744
52	H	Remover, Bearing	5120-00-722-4063	10902750
53	F	Remover, Bearing Cup	5120-00-722-4067	10902751
54	O	Remover, Final Drive	5120-00-034-8445	8390335
55	H	Remover, Sleeve Cylinder	5120-00-367-9615	6248510
56	H	Remover and Replacer, Piston Ring	5120-00-494-1846	KMJ8128
57	F	Remover and Replacer, Seal	5120-00-383-3672	8375175
58	H	Replacer	5120-00-034-0872	8351932
59	F	Replacer, Bearing	5120-00-733-8948	10904179
60	F	Replacer, Bearing	5120-00-860-9579	10908787
61	F	Replacer, Bearing Cup	5120-00-722-4071	10902752
62	F	Replacer, Bearing Cup	5120-00-722-4083	10902756
63	H	Replacer, Bearing Cup	5120-00-722-4089	10902757
64	F	Replacer, Bearing Cup	5120-00-722-4093	10902758
65	F	Replacer, Clutch Bearing	5120-01-062-5606	12253880
66	F	Replacer, Gear	5120-00-096-6727	8390373
67	H	Replacer, Gear, Camshaft	5120-00-473-7456	5345096
68	O	Replacer, Hub Spacer	5120-00-733-8964	10904197
69	F	Replacer, Oil Seal	5120-00-893-3745	8351210
70	H	Replacer, Piston Pin Retainers	5120-00-733-8874	10881874
71	O	Replacer, Race and Outer Bearing	5120-00-733-8949	10904180
72	O	Replacer, Seal Guard	5120-00-733-8969	10904297
73	H	Replacer, Spindle	5120-00-733-8906	8351266
74	H	Replacer Assembly, Bearing Cone	5120-00-343-0123	8708070
75	F	Scraper, Carbon	5110-00-735-5872	7355872
76	O	Screw, Cap, Hexagon Head	5305-00-532-9125	8708355

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR RECOVERY VEHICLE, FULL TRACKED: LIGHT ARMORED, M578 (2350-00-439-6262) HULL AND RELATED COMPONENTS (CONT)

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL NATO STOCK NUMBER	TOOL NUMBER
77	O	Screw, Cap, Hexagon Head	5120-00-084-0796	10914934
78	F	Screw, Jacking	4910-00-722-3915	10904195
79	F	Shop Equipment, Automotive Maintenance and Repair: Field Maintenance, Basic, Less Power	4910-00-754-0705	SC 4910-95-CL-A31
80	O	Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No. 1 (Less Power)	4910-00-754-0654	SC 4910-95-CL-A74
81	O	Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No. 2 (Less Power)	4910-00-754-0650	SC 4910-95-CL-A72
82	O	Sling	4933-00-389-0349	REI-91 120 IN
83	O	Sling, Beam Type	3940-01-280-0872	12355173
84	F	Sling, Engine	4910-00-001-3993	11643469
85	H	Sling, Lifting	4910-00-708-3778	7083778
86	O	Sling, Lifting, Final Drive	4910-00-722-3886	10904212
87	O	Sling, Lifting Hub and Sprocket	4910-00-722-3885	10904220
88	H	Sling, Output Carrier	4910-00-575-1959	8351495
89	F	Sling, Transmission	4910-00-473-7556	7081593
90	F	Socket, Face Wrench	5120-00-880-9576	10908791
91	F	Socket, Face Wrench	5120-00-860-9575	10908794
92	O	Socket, Wrench, Face	5120-00-558-4808	8708459
93	H	Stand, Maintenance, Automotive Engine	4910-00-795-0189	7950189
94	F	Street Elbow	4730-00-933-3744	444490

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL NATO STOCK NUMBER	TOOL NUMBER
95	O	Tester, Pressure Gage	6685-00-572-8612	8356176
96	F	Tube, Rubber	4720-00-271-9839	MILS6855B Class 2 Grade 60
97	C	Wedge, Idler Adjustment	2530-00-302-6784	11643492
98	O	Wire Twister, Plier	5120-00-542-4171	GGGW340 SIZE 12
99	O	Wrench	5120-00-891-7866	11617361
100	O	Wrench, Socket	5120-00-708-3642	7083642
101	O	Wrench, Spade Pin Nut	5120-00-084-0788	10909067
102	F	Wrench, Spanner	5120-00-264-3778	426
103	F	Wrench, Spanner	5120-00-293-0245	325291
104	H	Wrench, Spanner	5120-00-950-9566	8355764
105	F	Wrench, Spanner	5120-01-310-1996	10518265
106	O	Wrench, Spanner	5120-00-860-9577	10908797
107	H	Wrench, Spanner, Lockout Cylinder Locknut	5120-00-733-8982	10904219
108	O	Wrench, Splined, Brake Adjustment	5120-00-733-8909	8351386
109	O	Wrench, Splined, Brake Adjustment	5120-00-733-8912	8351387

Section IV. REMARKS

REFERENCE CODE	REMARKS
A	For further repair of diesel engine, refer to TM 9-2815-202-34.
B	For further repair of engine coolant radiator, refer to TM 750-254.
C	For further repair of engine generator and tube axial fan, refer to TM 9-2920-224-34&P.
D	All repair and replacement of parts performed by unit maintenance limited to authorized items listed in TM 9-2350-238-24P-1.
E	All repair and replacement of parts performed by crew maintenance limited to authorized items listed in TM 9-2350-238-24P-1.
F	All repair and replacement of parts performed by crew and unit maintenance limited to authorized items listed in TM 9-2350-238-24P-1.
G	For further repair of storage battery, refer to TM 9-6140-200-14.
H	For further repair of transfer and final drive assemblies, refer to TM 9-2520-234-34P.
I	For further repair of engine coolant heater and driver's compartment vehicular heater, refer to TM 9-2990-207-23&P.
J	For further repair of personnel vehicular heater, refer to TM 9-2540-205-24&P.
K	Wrench adapter is a fabricated tool. For fabrication instructions, refer to TM 9-2350-238-34-1.

APPENDIX C
EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

C-1. SCOPE. This appendix lists expendable/durable supplies and materials you will need to operate and maintain the M578 Recovery Vehicle. This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

C-2. EXPLANATION OF COLUMNS.

a. Column (1) - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "cleaning compound (item 9, appx C)").

b. Column (2) - Level. This column identifies lowest level of maintenance that requires the listed item.

O - Unit Maintenance

c. Column (3) - National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column (4) - Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Contractor and Government Entity Code (CAGEC) in parentheses followed by the part number.

e. Column (5) - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., EA, IN., PR). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	O	5350-00-193-7227	ABRASIVE COMPOUND (58536) A-A-1203	LB
2	O	5350-00-598-5537	ABRASIVE PAPER, FLINT (58536) A-A-1202	SH
3	O	8040-00-849-5195	ADHESIVE: EPOXY RESIN (81349) MMM-A-134	PT
4	O	8040-00-262-9011	ADHESIVE: RECLAIMED RUBBER, liquid, general purpose, type III 4-oz (113-g) tube (80244) MMM-A-1617	OZ
5	O	8040-00-262-9026	ADHESIVE: type II (81348) MMM-A-1617	PT
6	O	8030-00-753-4953	ANTISEIZE COMPOUND l-lb (0.45-kg) can (81349) MIL-A-13881	CN
7	O	6810-00-264-6618	BAKING SODA (sodium bicarbonate) (85050) 0-5-576	LB
8	O	9150-01-053-6888 9150-01-054-6453	CLEANER, LUBRICANT, PRESERVATIVE: CLP 1-gal. (3.78-l) container 1-pt (0.47-ml) container (81349) MIL-L-63460	GL PT
9	O	6850-00-224-6665	CLEANING COMPOUND, SOLVENT: degreasing self emulsifying, 5 gal. (18.93-l) can (81349) MIL-C-11090	GL
10	O	5350-00-221-0872	CLOTH, CROCUS: 9 x 11 sheet (81348) P-C-458	SH

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
11	O	5350-00-584-4654	CLOTH, FINE EMERY (58536) A-A-1049	EA
12	O	8305-00-152-3587	CLOTH, LINT-FREE 45-in. (114.30-cm) wide (81349) MIL-C-40129	SH
13			COOLANT, ANTIFREEZE	
		6850-00-181-7929	1 gal. (3.78-l) can	CN
	O	6850-00-181-7933	5 gal. (18.93-l) can (81349) MILA46153	CN
14	O	4020-00-240-2154	CORD, FIBROUS 500-yd spool (81349) ML-C-5040	YD
15	O	9150-00-912-8784	CUTTING FLUID, type Ill 5gal. (18.93-l) can (81348) W-C-846	CN
16			DRY CLEANING SOLVENT: liquid, white, 140 °F flashpoint (SD2)	
		6850-00-281-3061	4-oz (113-g) can	OZ
	O	6850-00-281-1985	1-gal. (3.78-l) can (81348) P-D-680	GL
17	O	8010-00-079-3752	ENAMEL, black, class A (70785) PSP6	PT
18			ENAMEL, OLIVE DRAB	
		8010-00-297-2104	(81348) TT-E-485	CN
	O	8010-00-297-2105		CN
19	O	9150-00-119-9291	GREASE, AIRCRAFT 2-oz 58-g) tube (81349) MIL-G-4343	TU
20			GREASE, AUTOMOTIVE AND ARTILLERY: (GAA)	
	O	9150-01-197-7693	14-oz (396.8-g) carton	OZ
		9150-01-197-7690	1.75-oz (49.6-g) can	OZ
	O	9150-01-197-7689	6.5-oz (184.2-g) can (81349) MIL-G-10924	OZ

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
21			HYDRAULIC FLUID, PETROLEUM BASE: (OHT)	
	O	9150-00-935-9807	1-qt (0.94-l) can	QT
	O	9150-00-935-9808	1-gal. (3.78-l) can (81349) MIL-G-6083	GL
22	O	8010-00-959-4661	LACQUER, CLEAR Epoxy-polyamide coating 1 qt kit (81349) MIL-C-22750	QT
23	O	9505-00-331-3275	NONELECTRICAL WIRE (98906) MS20995C41	FT
24	O	9505-00-555-8648	NONELECTRICAL WIRE (98908) MS20995C47	FT
25	O	9505-01-236-9343	NONELECTRICAL WIRE (98908) MS20995C91AR	FT
26	O	9505-00-592-4690	NONELECTRICAL WIRE (98908) MS20995F32	FT
27	O	9505-01-684-4843	NONELECTRICAL WIRE (96906) MS20995F41	FT
28	O	9150-00-231-2356	OIL, LUBRICATING: (OE/HDO) (81349) MIL-L-3150	GL
29	O	9150-00-402-2372	OIL, LUBRICATING: (OEA) 5-gal. can (81349) MIL-L-46167	GIL
30	O	6640-00-663-0832	PAPER, LENS (81348) NNN-P-40	EA
31	O	8010-00-899-0931	PRIMER 1-qt (0.946-1) can (81348) TT-P-1757	QT
32	O	8010-00-161-5718	PRIMER COATING (81348) TT-P-636	GL

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
33	0	7920-00-205-1711	RAG, WIPING: cleaned, 50-lb bale (81348) DDR-30	EA
34	0	8030-00-181-7529	RETAINING COMPOUND: type I (80244) MIL-R-46082	...
35	0	8030-00-148-7362	SEALANT, CORROSION PREVENTIVE (81349) MIL-S-8516	KT
36	0	8040-00-845-4304	SEALANT, RTV: type I (80244) MIL-A-46106	PT
37	0	8030-01-069-3046	SEALING COMPOUND: type II, Grade M 50-cc bottle (80249) MIL-S-46163	CC
38	0	8030-00-291-1789	SEALING COMPOUND: type II or III (80244) MIL-S-45180	GL
39			SEALING COMPOUND: BLUE, liquid, C or CV	
	0	8030-00-081-2330	10-cc bottle	CC
	0	8030-00-900-4412	250-cc bottle (80244) MIL-S-22473	CC
40	0	6850-01-304-6632	SILICONE COMPOUND 8-OZ (225.8-g) can (81349) MIL-S-8660	OZ
41	0	8030-00-123-6955	SILICONE COMPOUND: RTV (81349) MIL-S-23586	KT
42	0	8520-00-228-0598	SOAP, LIQUID 6 gal. (22.71 1) (81348) P-S-624	GL
43	0	3439-00-824-9856	SOLDER, TIN ALLOY 1-lb (0.45-kg) spool (81348) QQ-S-571	LB

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST (CONT)

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
44	0	5970-00-184-2003	TAPE, INSULATION (58536) A-A-2094	RO
45	0	7510-00-266-6712	TAPE, MASKING (58536) A-A-883	RO
46	0	5610-00-141-7838	WALKWAY COMPOUND, type II (nonslip paint), color OD 1-gal. (3.79-1) CAN (81348) MIL-W-5044	GL

APPENDIX D
ILLUSTRATED LIST OF MANUFACTURED ITEMS

D-1. INTRODUCTION. This appendix includes complete instructions for making items authorized to be manufactured or fabricated at unit maintenance level.

a. A part number index in alphanumeric order is provided for cross-referencing the part number of the item to be manufactured to the figure which covers fabrication criteria.

b. All bulk materials needed for manufacture of an item are listed by part number or specification number in a tabular list on the illustration.

D-2. MANUFACTURED ITEMS PART NUMBER INDEX.

Part Number	Figure Number
D7444-1 -1R625C	D-1
M13486/1-3AR	D-2
M13486/1-5	D-2
M13486-1-5AR	D-2
M13486/1-7AR	D-2
M13486/1-9	D-2
M13486/1-12AR	D-2
M13486/1-14	D-2
M13486/1-14AR	D-2
M13486/2-2AR	D-3
M1L-H-62028	D-27
MS521301A201R	D-4
MS521301A201024	D-4
MS521301A201052	D-4
MS521301A21903	D-5
MS521301A21904	D-5
NAS1455-00-6CAR	D-6
10904260-2	D-7
10904268-1	D-8
10904268-2	D-8
10946356AR	D-9
11643083AR	D-10
11643508	D-11
11643527	D-12
11643528-1	D-13
11643528-2	D-13
11643529-1	D-14
11643529-2	D-14
11643540N0TE20	D-15
11643553	D-16

D-2. MANUFACTURED ITEMS PART NUMBER INDEX (CONT).

Part Number	Figure Number
11643558-1	D-17
11643558-2	D-17
11643558-5	D-17
11643558-9	D-17
11643558-11	D-17
11643558-12	D-17
11643565-1	D-18
11643608N0TE5	D-19
11675565NOTE3	D-20
12253967-1	D-21
17I1725-96AR	D-22
7064704AR	D-23
8724763	D-24
8724763AR	D-24
8724769AR	D-25
8724783-6	D-26
8724783-10	D-26
8724784AR	D-27

D-3. MANUFACTURED ITEMS ILLUSTRATIONS.

Fabricate insulation sleeving from:

NSN 5970-00-811-0640 PN D7444-1-1R625C
CAGEC 81349

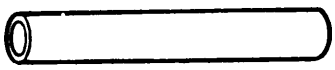
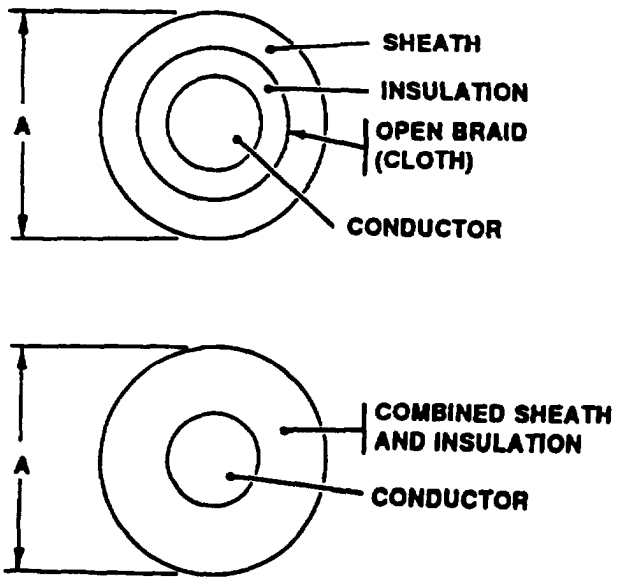


Figure D-1. Insulation Sleeving.

Fabricate electrical wire from:

CAGEC 81349

PART NO.	CONDUCTOR SIZE	DIAMETER%"	NSN
M13486/1-3AR	18	0.135 ± 0.010 IN. (0.343 ± 0.025 CM)	6145-00-161-1609
M13486/1-5	14	0.160 ± 0.010 IN. (0.406 ± 0.025 CM)	6145-00-152-6499
M13486-1-5AR	14	0.160 ± 0.010 IN. (0.406 ± 0.025 CM)	6145-00-152-6499
M13486/1-7AR	12	0.235 ± 0.010 IN. (0.597 ± 0.025 CM)	6145-00-705-6678
M13486/1-9	8	0.360 ± 0.010 IN. (0.914 ± 0.025 CM)	6145-00-165-3735
M13486/1-12AR	2	0.610 ± 0.010 IN. (1.549 ± 0.025 CM)	6145-00-805-3354
M13486/1-14	0	0.672 ± 0.010 IN. (1.707 ± 0.025 CM)	6145-00-705-6674
M13486/1-14AR	0	0.672 ± 0.010 IN. (1.707 ± 0.025 CM)	6145-00-705-6674



OPTIONAL CONSTRUCTION

Figure D-2. Electrical Wire.

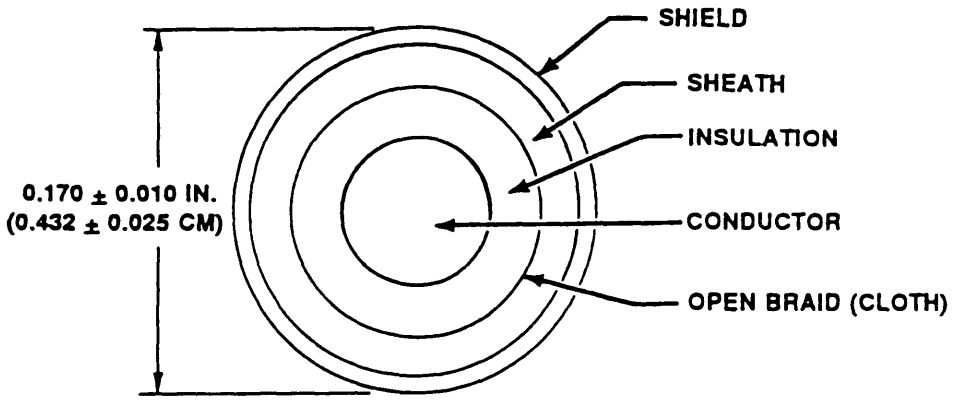
D-3. MANUFACTURED ITEMS ILLUSTRATIONS (CONT).

Fabricate electrical cable from:

NSN 6145-00-567-3255
CAGEC 81349

PN M13486/2-2AR

NOTE:
CONDUCTOR SIZE 16.



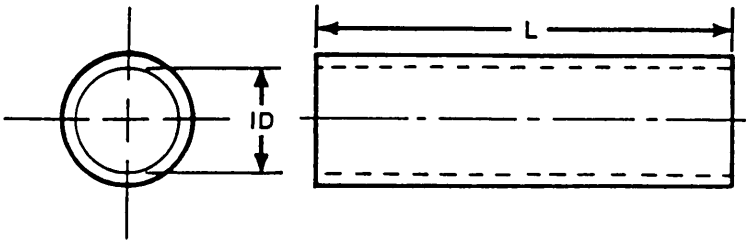
NOTES:
1. SHIELDING MATERIAL: COPPER BRAID
2. BRAID, STRANDS: 0.0063 IN. (0.0160 CM) DIAMETER, TINNED COPPERS
3. BRAID COVERAGE: 90 PERCENT

Figure D-3. Electrical Cable.

Fabricate hose from:

NSN 4720-00-937-1114
CAGEC 96906

PN MS521301A201R
MS521301A201024
MS521301A201052



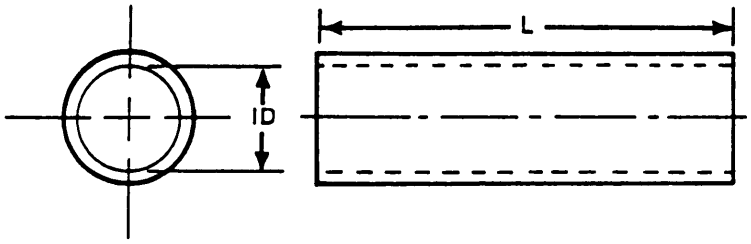
PN	ID	L
MS521301A201R	0.375 IN. (0.953 CM)	Random as specified in ZZ-M-428
MS521301A201024	0.375 IN. (0.953 CM)	2.50 IN. (6.35 CM)
MS521301A201052	0.375 IN. (0.953 CM)	5.25 IN. (13.34 CM)

Figure D-4. Hose.

Fabricate nonmetallic hose from:

NSN 4720-00-200-0370
CAGEC 96906

PN MS521301A21903
MS521301A21904



PN	ID	L
MS521301A21903	2.250 IN. (5.715 CM)	3.00 IN. (7.62 CM)
MS521301A21904	2.250 IN. (5.715 CM)	4.00 IN. (10.16 CM)

Figure D-5. Nonmetallic Hose.

D-3. MANUFACTURED ITEMS ILLUSTRATIONS (CONT).

Fabricate heater mount chain from:

NSN 4010-00-457-1220
CAGEC 80205

PN NAS1455-00-6CAR

Figure D-6. Heater Mount Chain.

Fabricate rubber strip from:

NSN 9320-01-094-0812
CAGEC 19207

PN 10904260-2

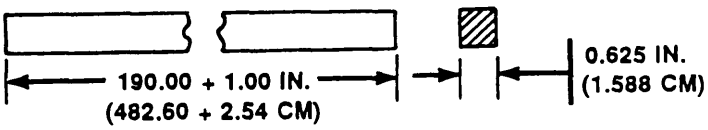
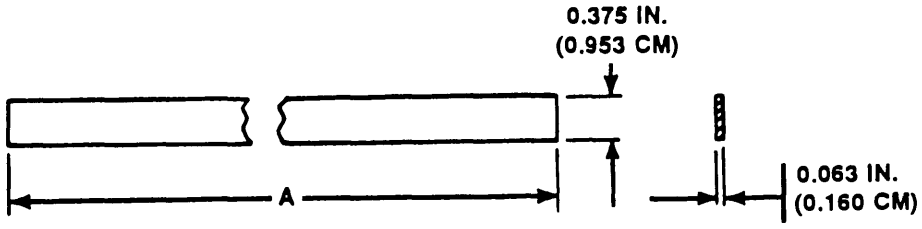


Figure D-7. Rubber Strip.

Fabricate rubber strip from:

NSN 5325-00-164-2087
CAGEC 19207

PART NO.	LENGTH A
10904268-1	31.00 + 1.00 IN. (78.74+ 2.54 CM)
10904268-2	19.00 + 1.00 IN. (48.26+ 2.54 CM)



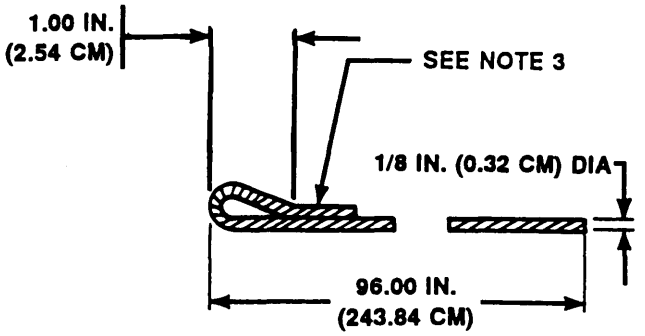
NOTES:

CELLULAR ELASTOMERIC MATERIAL, GRADE SBE7 OR SBE11, SPEC MIL-C-3133

Figure D-8. Rubber Strip.

Fabricate nylon cord from:

NSN 4020-00-915-8161
CAGEC 19207 PN 10946356AR

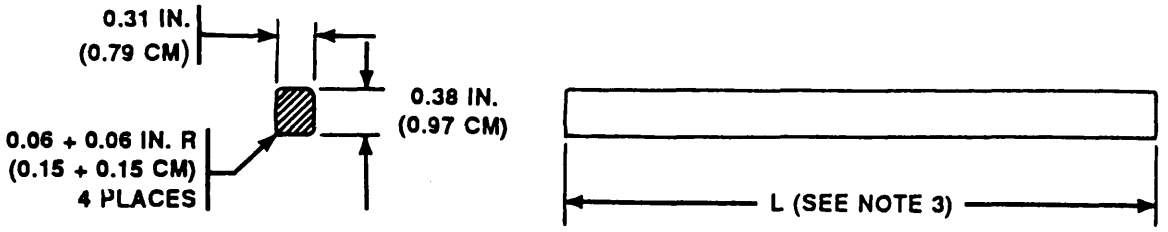


NOTES:
1. CORD, NYLON, TYPE III, COLOR OD, SPEC MIL-C-5040.
2. ENDS SHALL NOT BE FRAYED.
3. STITCH PER SPEC FED-STD-751 .

Figure D-9. Nylon Cord.

Fabricate door seal from:

NSN 9320-01-097-8659 PN 11643083AR
CAGEC 19207



NOTES:
1. CELLULAR ELASTOMERIC MATERIAL, GRADE TE7 TO TE12, K_2, SPEC MIL-C-3133, EXCEPT: MEDIUM DENSITY, 0.020 LB/CU. IN. MAX; SKIN ON FOUR SIDES.
2. APPLY PER MIL-STD-130.
3. LENGTH OF SEAL TO BE AS SPECIFIED ON ASSEMBLY DRAWING OR PARTS LIST.

Figure D-10. Door Seal.

D-3. MANUFACTURED ITEMS ILLUSTRATIONS (CONT).

Fabricate nonmetallic channel from:

NSN 9390-01-139-4878 PN 11843508
CAGEC 19207

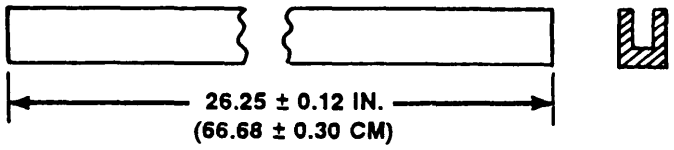


Figure D-11. Nonmetallic Channel.

Fabricate tape strip from:

NSN (...) PN 11843527
CAGEC 19207

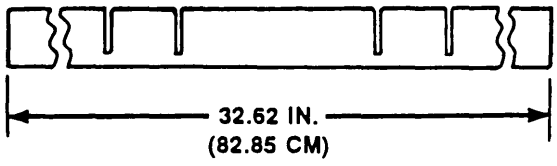


Figure D-12. Tape Strip.

Fabricate tape strip from:

NSN (...) PN 11843528-1
CAGEC 19207 11843528-2

PN	A
11643528-1	3.38 IN. (8.59 CM)
11643528-2	4.75 IN. (12.07 CM)

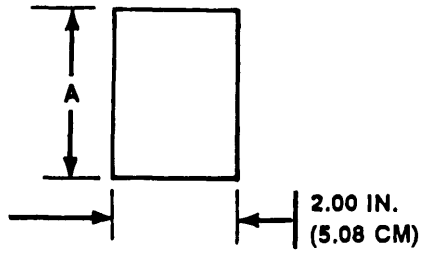


Figure D-13. Tape Strip.

Fabricate seal from:

NSN 5325-00-164-2087 PN 11843529-1
CAGEC 19207 11643529-2

PN	A
11643529-1	1.88 IN. (4.78 CM)
11643529-2	3.00 IN. (7.62 CM)

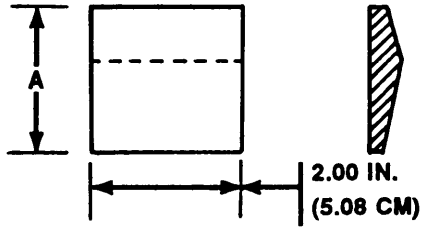


Figure D-14. Seal.

Fabricate exhaust hose from:

NSN 2540-01-027-6073 PN 11843540NOTE20
CAGEC 19207

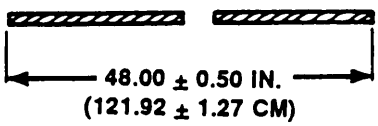
NOTES:

1. **CLASS S, TYPE III, COMPOSITION OPTIONAL.**
2. **SPEC WW-H-1053**
3. **1.50 IN. (3.81 CM) X 138.00 ± 1.50 IN. (350.52 ± 3.81 CM).**

Figure D-15. Exhaust Hose.

Fabricate lacing cord from:

NSN 4020-00-954-1118 PN 11643553
CAGEC 19207



NOTES:

1. **IMPREGNATED TWINE, TYPE P, WAXED, CLASS 1, SPEC MIL-T-713.**
2. **ENDS SHALL NOT BE FRAYED.**

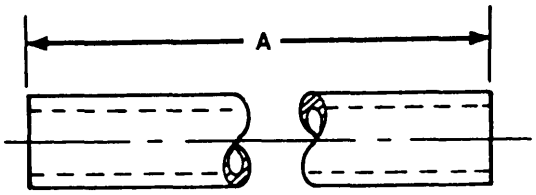
Figure D-16. Lacing Cord.

D-3. MANUFACTURED ITEMS ILLUSTRATIONS (CONT).

Fabricate rubber hose from:

NSN 4720-01-142-1619
CAGEC 19207

PART NO.	A
11643558-1	4.00 IN. (10.16 CM)
11643558-2	13.00 IN. (33.02 CM)
11643558-5	36.00 IN. (91.44 CM)
11643558-9	54.00 IN. (137.16 CM)
11643558-11	72.00 IN. (182.88 CM)
11643558-12	78.00 IN. (198.12 CM)



NOTES:
RUBBER HOSE, TYPE III, SPEC MIL-H-13444, 0.62 IN. (1.57 CM) ID NOMINAL.

Figure D-17. Rubber Hose.

Fabricate nonmetallic hose from:

NSN 4720-01-094-9044 PN 11643565-1
CAGEC 19207

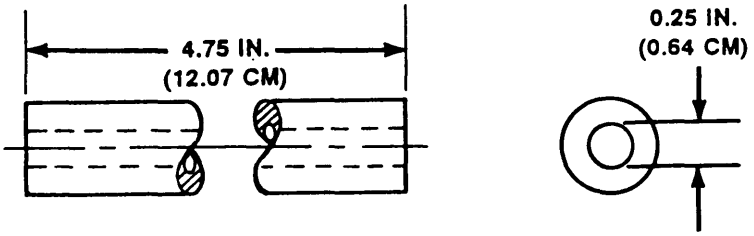
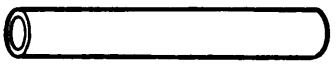


Figure D-18. Nonmetallic Hose.

Fabricate insulation sleeving from:

NSN 5970-00-815-1295 PN 11643608NOTE5
CAGEC 81349



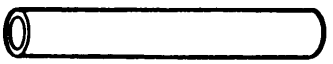
NOTES:

1. **ID MINIMUM (AS SUPPLIED): 0.250 IN. (0.635 CM)**
2. **AFTER UNRESTRICTED SHRINKAGE:**
   ID MAXIMUM: 0.125 IN. (0.318 CM)
   WALL THICKNESS: 0.025 ± 0.003 IN. (0.064 ± 0.008 CM)

Figure D-19. Insulation Sleeving.

Fabricate insulation sleeving from:

NSN 5970-00-954-1622 PN 11675565NOTE3
CAGEC 19207



NOTES:
CLASS I, BLACK, SPEC MIL-I-23053/5, 0.187 IN. (0.475 CM) ID, AS SUPPLIED.

Figure D-20. Insulation Sleeving.

Fabricate rubber hose from:

NSN 4720-00-809-2889 PN 12253967-1
CAGEC 19207

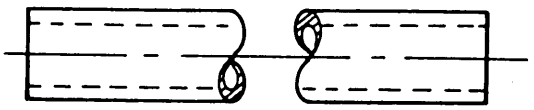


Figure D-21. Rubber Hose.

D-3. MANUFACTURED ITEMS ILLUSTRATIONS (CONT).

Fabricate insulation sleeving from:

NSN 5970-00-705-6634 PN 17I1725-96AR
CAGEC 19207

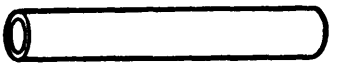
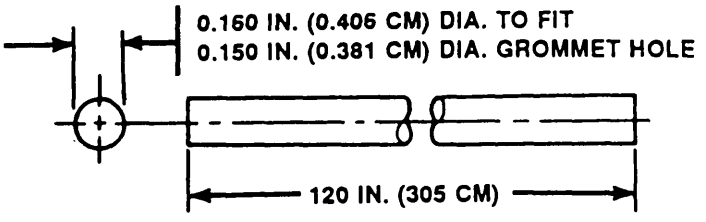


Figure D-22. Insulation Sleeving.

Fabricate rod from:

NSN 2920-00-695-6223 PN 7064704AR
CAGEC 19207

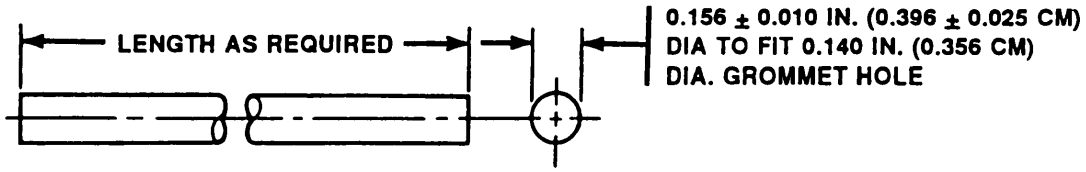


NOTES:
MATERIAL: LAMINATED THERMOSETTING, ROD TYPE I, GRADE XX, SPEC. L-L-31.

Figure D-23. Rod.

Fabricate nonmetallic rod or rod from:

NSN 9390-00-180-7289 PN 8724763
CAGEC 19207 8724763AR



NOTES:

1. **MATERIAL: LAMINATED, THERMOSETTING ROD, TYPE I, GRADE XX, SPEC. L-P-509.**
2. **THIS ROD USED FOR SEALING UNUSED GROMMET HOLES.**

Figure D-24. Nonmetallic Rod or Rod.

Fabricate rod from:

NSN 9390-00-464-4756 PN 8724769AR
CAGEC 19207

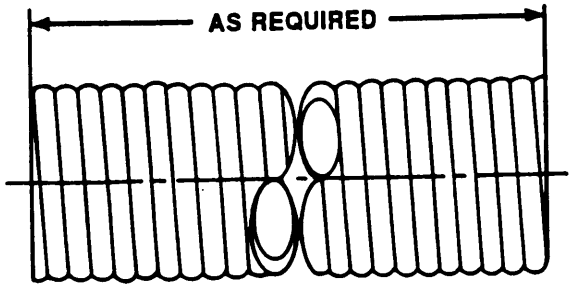
Figure D-25. Rod.

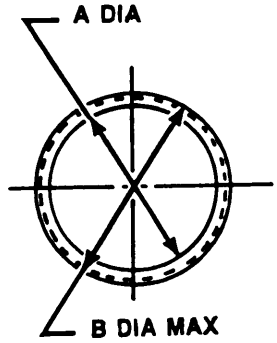
D-3. MANUFACTURED ITEMS ILLUSTRATIONS (CONT).

Fabricate air duct hose from:

NSN 4720-00-882-1669
CAGEC 19207

PN 8724783-6
8724783-10





PN	A	B	ABRASION REQT APPLIES
8724783-6	1.5	1.69	NO
8724783-10	1.5	1.69	NO

NOTES:

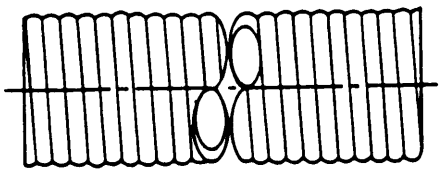
MATERIAL AND CONSTRUCTION TO BE IAW MIL-H-62028, TYPE III, CLASS 3, EXCEPT FOR ABRASION REQUIREMENT AS FOLLOWS: WIRE IN HOSE MUST NOT BE EXPOSED AFTER OUTSIDE OF HOSE IS EXPOSED TO 500 2.50-IN. (6.35-CM) STROKES OF 3/0 EMERY POLISHING CLOTH. STROKES TO BE AT A RATE OF 220 ± 20 STROKES PER MINUTE TRANSVERSE TO LONG AXIS OF THE DUCT. LOAD ON CONTACT AREA TO BE 1.00 ± 0.10 LB (0.45 ± 0.05 KG) PER WIRE.

Figure D-26. Air Duct Hose.

Fabricate air duct hose or ducting hose from:

NSN 4720-01-119-0246
CAGEC 19207

PN MIL-H-62028
8724784AR



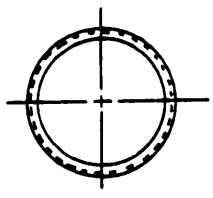


Figure D-27. Air Duct Hose or Ducting Hose.

APPENDIX E
TORQUE VALUES

E-1. GENERAL.

a. Follow torque values given throughout this manual. When no torque value is given, follow the guide to prevent damaging parts.

b. The guide is based on using clean, dry threads.

TORQUE VALUE GUIDE

SCREW DIAMETER	TORQUE NO DASHES (SAE GRADE 2)	TORQUE 3 DASHES (SAE GRADE 5)	TORQUE 6 DASHES (SAE GRADE 8)	SOCKET SIZE
1/4–20 UNC	3–5 ft-lb (4–7 N-m)	6–8 ft-lb (8–11 N-m)	10–12 ft-lb (14–16 N-m)	7/16
1/4–28 UNF	4–6 ft-lb (5–8 N-m)	8–10 ft-lb (11–14 N-m)	9–14 ft-lb (12–19 N-m)	7/16
5/16–18 UNC	7–11 ft-lb (9–15 N-m)	13–17 ft-lb (18–23 N-m)	19–24 ft-lb (26–33 N-m)	1/2
5/16–24 UNF	7–11 ft-lb (9–15 N-m)	14–19 ft-lb (19–26 N-m)	23–28 ft-lb (31–38 N-m)	1/2
3/8–16 UNC	14–18 ft-lb (19–24 N-m)	26–31 ft-lb (35–42 N-m)	39–44 ft-lb (53–60 N-m)	9/16
3/8–24 UNF	15–19 ft-lb (20–26 N-m)	30–35 ft-lb (41–47 N-m)	46–51 ft-lb (62–69 N-m)	9/16
7/16–14 UNC	23–28 ft-lb (31–38 N-m)	44–49 ft-lb (60–66 N-m)	65–70 ft-lb (88–95 N-m)	5/8
7/16–20 UNF	23–28 ft-lb (31–38 N-m)	44–54 ft-lb (60–73 N-m)	69–79 ft-lb (94–107 N-m)	5/8
1/2–13 UNC	32–37 ft-lb (43–50 N-m)	65–75 ft-lb (88–102 N-m)	95–105 ft-lb (129–142 N-m)	3/4
1/2–20 UNF	34–41 ft-lb (46–56 N-m)	73–83 ft-lb (99–113 N-m)	113–123 ft-lb (153–167 N-m)	3/4
9/16–12 UNC	46–56 ft-lb (62–76 N-m)	100–110 ft-lb (136–149 N-m)	145–155 ft-lb (197–210 N-m)	13/16
9/16–18 UNF	47–57 ft-lb (64–77 N-m	107–117 ft-lb (145–159 N-m)	165–175 ft-lb (224–237 N-m)	13/16
5/8–11 UNC	62–72 ft-lb (84–98 N-m)	140–150 ft-lb (190–203 N-m)	200–210 ft-lb (271–285 N-m)	15/16
5/8–18 UNF	67–77 ft-lb (91–104 N-m)	153–163 ft-lb (207–221 N-m)	235–245 ft-lb (319–332 N-m)	15/16
3/4–10 UNC	106–116 ft-lb (144–157 N-m)	260–270 ft-lb (353–366 N-m)	365–375 ft-lb (495–508 N-m)	1-1/4
3/4–16 UNF	115–125 ft-lb (156–169 N-m)	268–278 ft-lb (363–377 N-m)	417 · 427 ft-lb (565–579 N-m)	1-1/4

TORQUE VALUE GUIDE

SCREW DIAMETER	TORQUE NO DASHES (SAE GRADE 2)	TORQUE 3 DASHES (SAE GRADE 5)	TORQUE 6 DASHES (SAE GRADE 8)	SOCKET SIZE
7/8–9UNC	165–175ft-lb (224–237N-m)	385–395ft-lb (522–536N-m)	595–605ft-lb (807–820N-m)	1-5/16
7/8–14UNF	178–188ft-lb (241–255N-m)	424–434ft-lb (575–588N-m)	663–673ft-lb (899–912N-m)	1-5/16
1–8UNC	251–261ft-lb (340–354N-m)	580–590ft-lb (786–800N-m)	900–910ft-lb (1220–1234N-m)	1-1/2
1–14UNF	255–265ft-lb (346–359N-m)	585–634ft-lb (793–860N-m)	943–993ft-lb (1279–1346N-m)	1-1/2
1-1/4–7UNC	451–461ft-lb (611–625N-m)	1070–1120ft-ib (1451–1518N-m)	1767–1817ft-lb (2396–2463N-m)	1-7/8
1-1/4–12UNF	488–498ft-lb (662–675N-m)	1211–1261ft-lb (1642–1710N-m)	1963–2013ft-lb (2661–2729N-m)	1-7/8
l-1/2–6UNC	727–737ft-lb (986–999N-m)	1899–1949ft-lb (2575–2642N-m)	3111–3161ft-lb (4218–4286N-m)	2-1/4
l-1/2–12UNF	816–826ft-lb (1106–1120N-m)	2144–2194ft-lb (2907–2975N-m)	3506–3556ft-lb (4753–4821N-m)	2-1/4

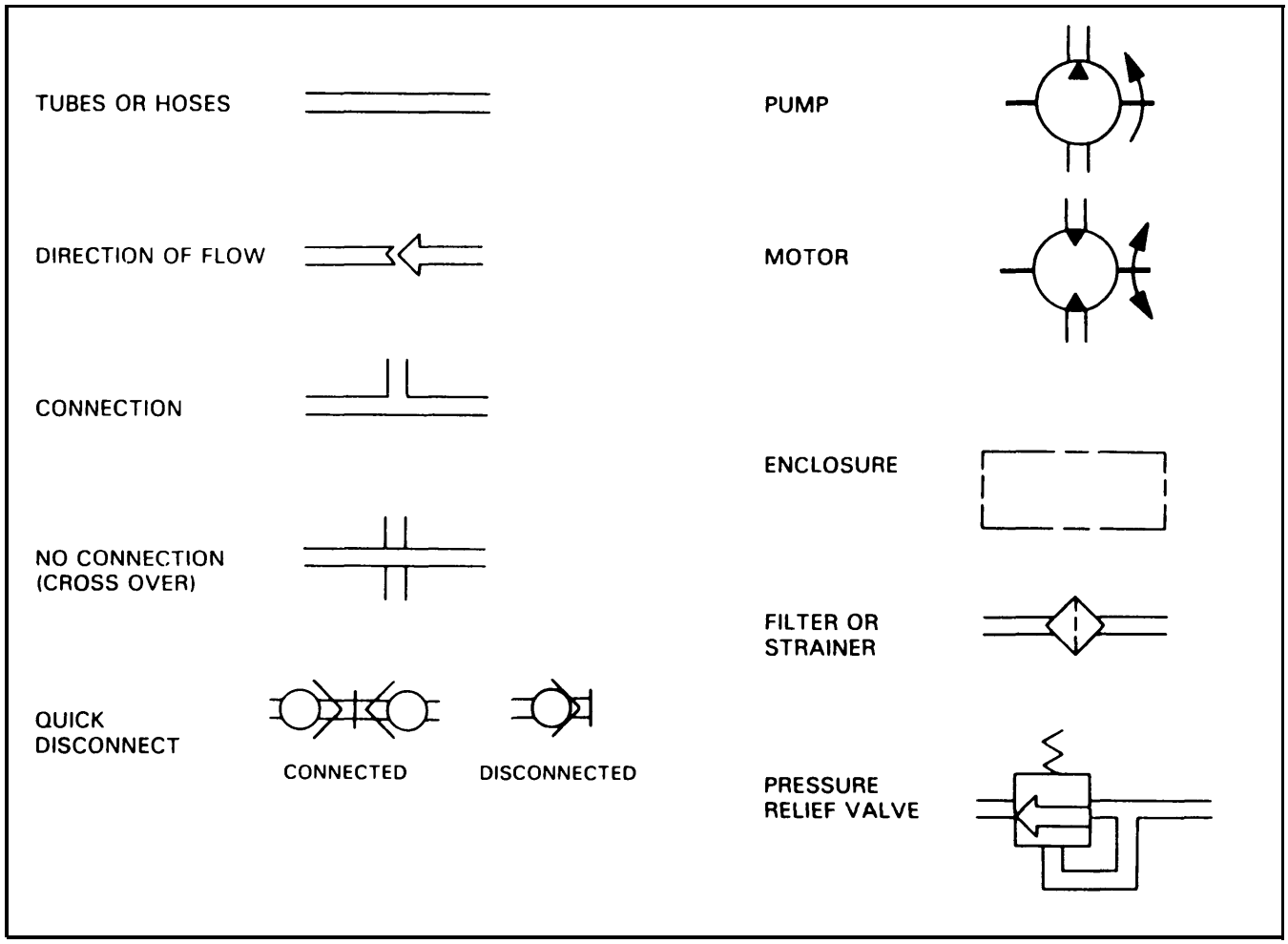
APPENDIX F

HYDRAULIC SYSTEM DESCRIPTION AND SCHEMATIC DIAGRAMS

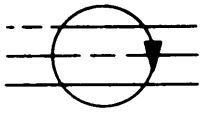
F-1. GENERAL. This appendix contains functional descriptions and schematic diagrams of the hydraulic system. The hydraulic system is divided into eight basic subsystems: hydraulic power, boom winch, traversing, boom cylinder, tow winch, impact wrench, spade, and suspension lockout.

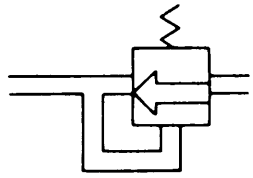
The M578 Recovery Vehicle has an open-center type hydraulic system. This means that the hydraulic fluid continuously circulates through the main hydraulic supply lines. When no hydraulic subsystem is being used, the hydraulic fluid pressure in the main supply lines is near zero. When a subsystem is used, hydraulic fluid from the main supply lines is diverted through the subsystem. Hydraulic fluid pressure builds up within the subsystem to a level high enough for the subsystem to function. Preset pressure relief or pressure reduction valves protect the subsystem from too much pressure.

F-2. HYDRAULIC SYMBOLS.

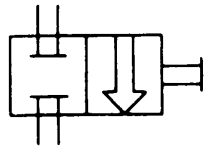


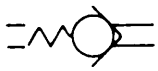
F-2. HYDRAULIC SYMBOLS (CONT).

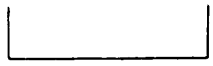
SLIP RING 

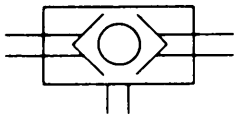
PRESSURE REDUCING VALVE 

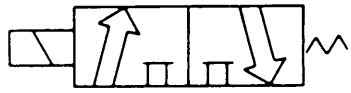
FLOW CONTROL VALVE

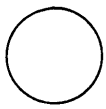
MANUALLY OPERATED SHUTOFF VALVE 

CHECK VALVE OR 

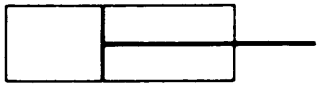
RESERVOIR 

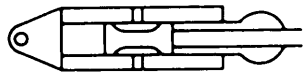
SHUTTLE VALVE 

SOLENOID VALVE 

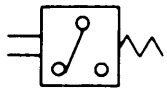
COMPONENT OR 

POWER TAKEOFF (MECHANICAL)

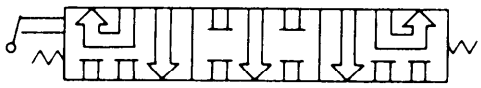
HYDRAULIC CYLINDER 

LOCKOUT CYLINDER 

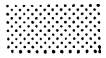
HYDRAULIC PRESSURE SWITCH



DIRECTIONAL CONTROL VALVE (MANUALLY OPERATED SPRING RETURN TO CENTER)



BAR CODE



Supply pressure

Intake or return

Pilot or reduced pressure

Inactive blank

SCHEMATIC DIAGRAM INTERCONNECTIONS

FROM HYDRAULIC POWER SUBSYSTEM		(A)	TO BOOM WINCH SUBSYSTEM
FROM HYDRAULIC POWER SUBSYSTEM		(B)	TO TRAVERSING SUBSYSTEM
FROM TRAVERSING SUBSYSTEM		(C)	TO HYDRAULIC POWER SUBSYSTEM
FROM HYDRAULIC POWER SUBSYSTEM		(D)	TO BOOM CYLINDER SUBSYSTEM
FROM HYDRAULIC POWER SUBSYSTEM		(E)	TO IMPACT WRENCH SUBSYSTEM
FROM HYDRAULIC POWER SUBSYSTEM		(F)	TO BOOM WINCH, TRAVERSING, AND TOW WINCH SUBSYSTEMS
FROM HYDRAULIC POWER SUBSYSTEM		(G)	TO TRAVERSING SUBSYSTEM
FROM SPADE SUBSYSTEM		(H)	TO HYDRAULIC POWER SUBSYSTEM
FROM HYDRAULIC POWER SUBSYSTEM		(I)	TO IMPACT WRENCH SUBSYSTEM
FROM BOOM WINCH, TRAVERSING, BOOM CYLINDER, TOW WINCH, AND SUSPENSION LOCKOUT SUBSYSTEMS		(J)	TO HYDRAULIC POWER SUBSYSTEM
FROM BOOM CYLINDER SUBSYSTEM		(K)	TO TOW WINCH SUBSYSTEM
FROM BOOM WINCH SUBSYSTEM		(L)	TO TOW WINCH SUBSYSTEM
FROM IMPACT WRENCH SUBSYSTEM		(M)	TO SPADE SUBSYSTEM
FROM SPADE SUBSYSTEM		(N)	TO SUSPENSION LOCKOUT SUBSYSTEM

F-3. HYDRAULIC POWER SUBSYSTEM.

Functional Description.

a. Hydraulic reservoir (19) is filled with hydraulic fluid.

b. When engine (13) is running and magnetic clutch (15) is energized, hydraulic fluid from hydraulic reservoir (19) is drawn through filter (21) and slip ring (1) by hydraulic pumps (16, 17, and 18).

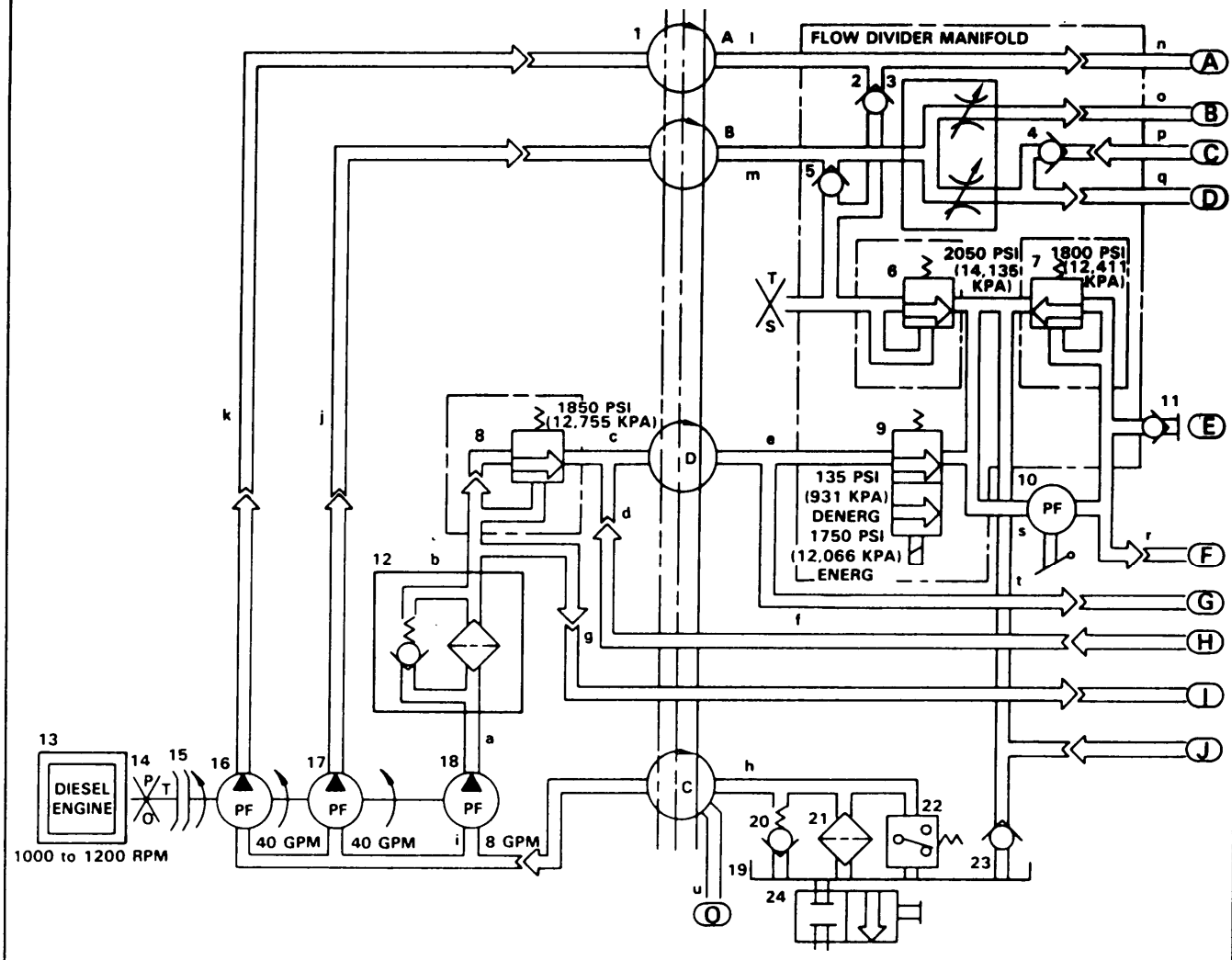
c. The hydraulic pump (16) supplies hydraulic fluid at 40 gallons per minute (152 liters per minute) through the flow divider manifold for distribution to the boom winch subsystem.

d. The hydraulic pump (17) supplies hydraulic fluid at 40 gallons per minute (152 liters per minute) to the flow divider valve (3), which distributes the fluid flow between the traversing subsystem and the boom cylinder subsystem. When the traversing subsystem is not being used, unused fluid is directed back to the flow divider manifold for use by the boom cylinder subsystem as needed.

e. The relief valve (7) has two pressure settings. Only the high pressure setting can be externally adjusted by the pressure adjustment setscrew. The valve is normally in the low pressure setting position, shifting to the high pressure setting when the solenoid is energized by the closing of one of the tow winch level wind switches.

f. The hydraulic pump (18) pumps hydraulic fluid at 8 gallons per minute (30 liters per minute) through the filter (12) and relief valves (8 and 9). The relief valve (8) allows the hydraulic pressure to build up to 1850 psi (12,756 kPa) for operation of the impact wrench, spade, and suspension lockout cylinders. The relief valve (9) is a solenoid operated dual setting type relief valve. Normally, the relief valve is deenergized. When deenergized, the relief valve (9) keeps the pressure in the supply lines to the level wind solenoid valves at 135 psi (931 kPa). During level wind traversing, the relief valve (9) is energized by the tow winch cable sensing switches. When energized, the relief valve (9) increases pressure to 1750 psi (12,066 kPa) to drive the cab traversing hydraulic motor.

g. The handpump (10) provides hydraulic fluid pressure for emergency manual release of the boom winch, tow winch, and traversing motor brakes and for emergency manual raising of the spade.



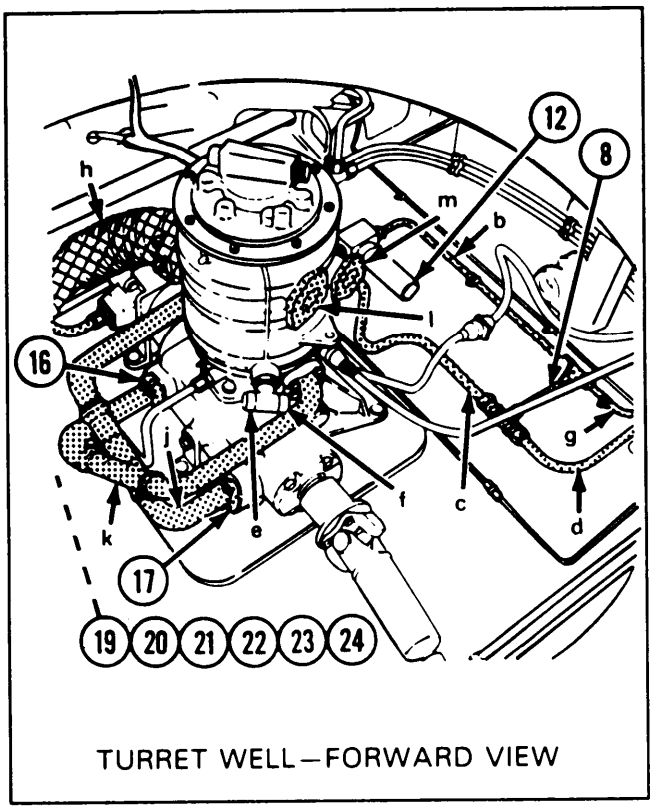
LEGEND

1 Slip ring
2 Check valve
3 Flow divider
4 Check valve
5 Check valve
6 Relief valve
7 Relief valve
8 Relief valve
9 Solenoid dual relief valve
10 Hand pump
11 Quick-disconnect coupling
12 Filter
13 Diesel engine
14 Power takeoff
15 Magnetic clutch
16 Pump
17 Pump
18 Pump
19 Reservoir
20 Filter bypass valve
21 Filter
22 Differential pressure switch
23 Check valve
24 Drain valve

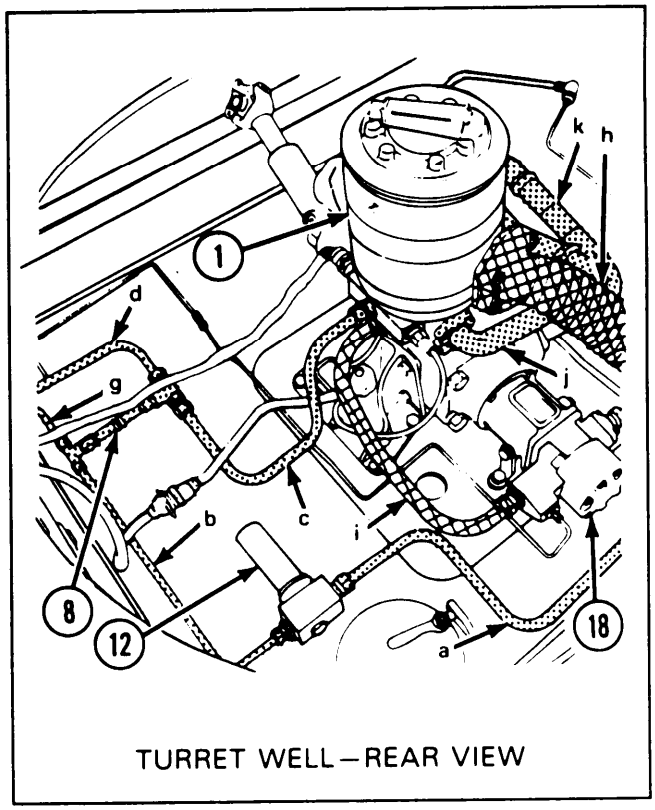
BAR CODE

Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank

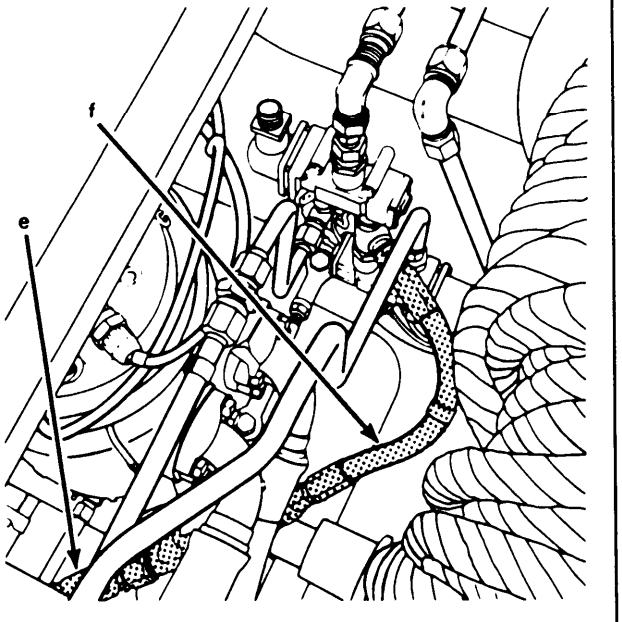
F-3. HYDRAULIC POWER SUBSYSTEM (CONT).



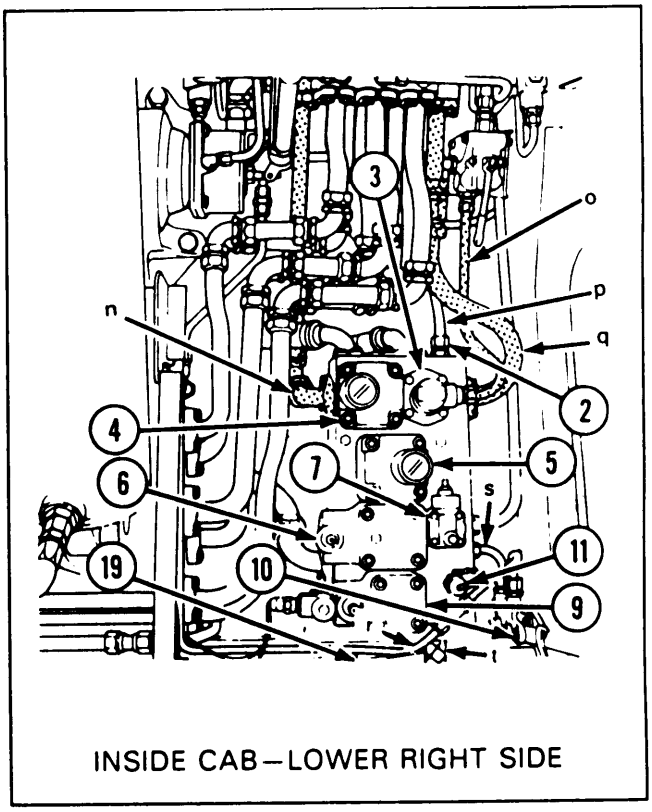
TURRET WELL—FORWARD VIEW



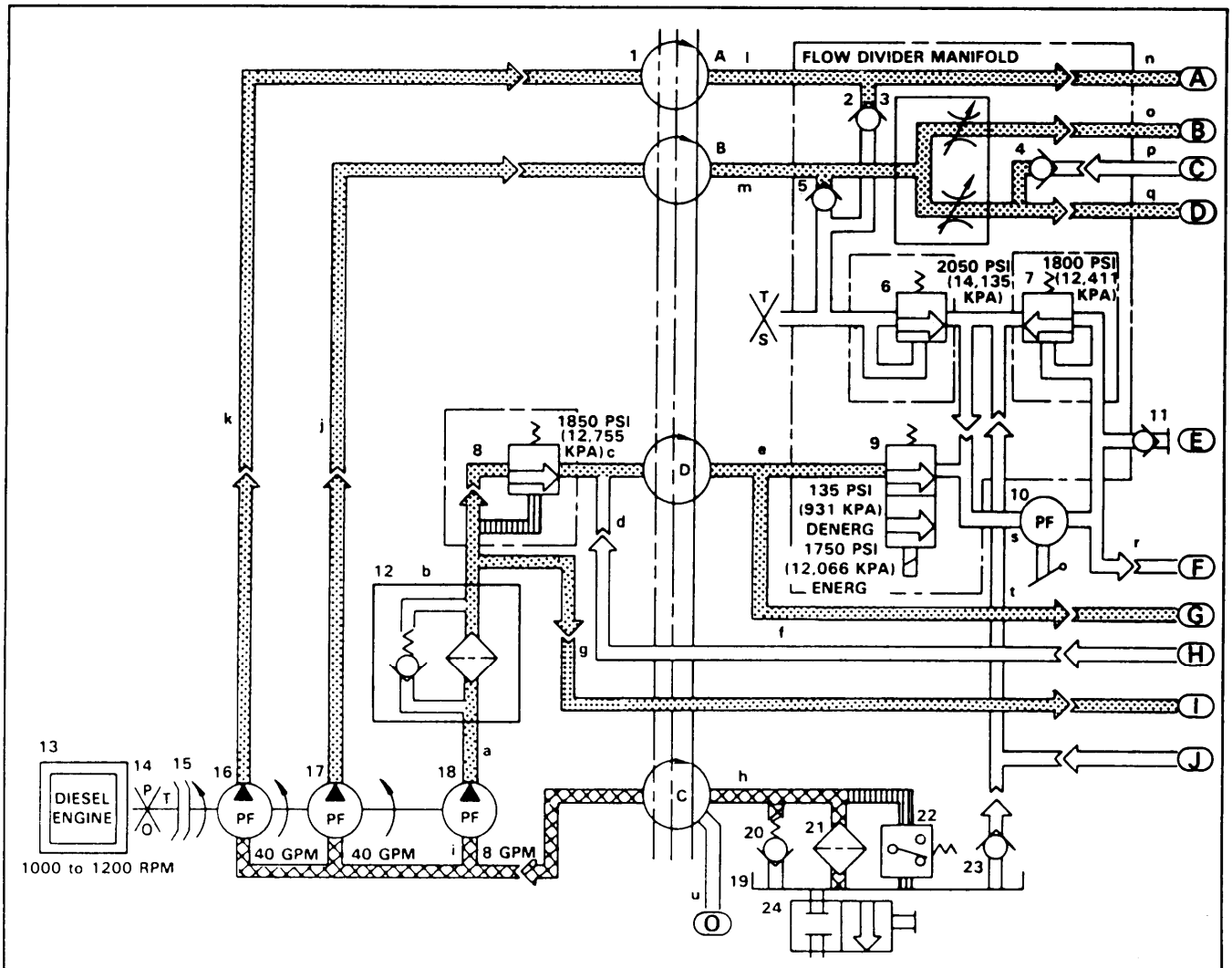
TURRET WELL—REAR VIEW



SLIP RING—FORWARD VIEW



INSIDE CAB—LOWER RIGHT SIDE



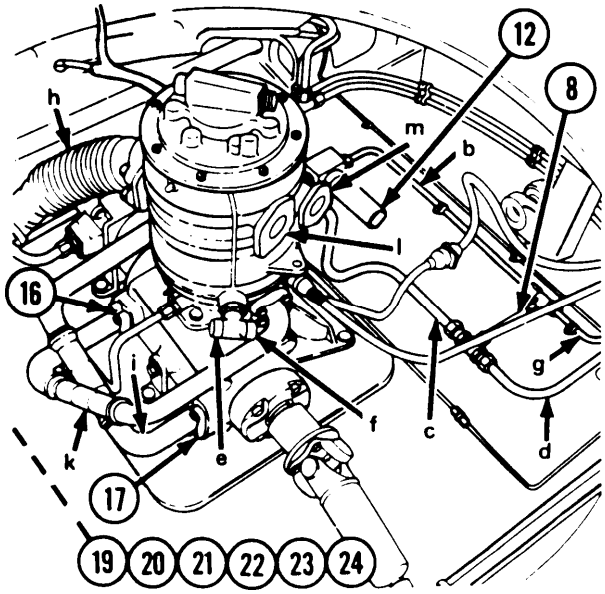
LEGEND

1 Slip ring
2 Check valve
3 Flow divider
4 Check valve
5 Check valve
6 Relief valve
7 Relief valve
8 Relief valve
9 Solenoid dual relief valve
10 Hand pump
11 Quick-disconnect coupling
12 Filter
13 Diesel engine (not shown)
14 Power takeoff (not shown)
15 Magnetic clutch (not shown)
16 Pump (40 GPM)
17 Pump (40 GPM)
18 Pump (8 GPM)
19 Reservoir
20 Filter bypass valve
21 Filter
22 Differential pressure switch
23 Check valve
24 Drain valve

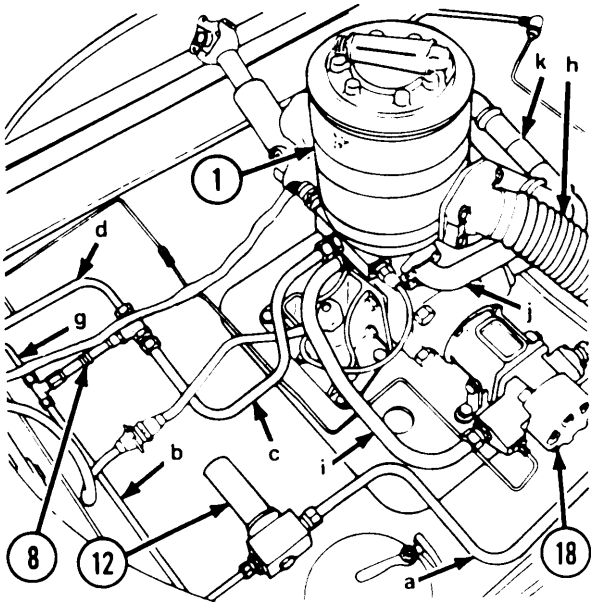
BAR CODE

Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank

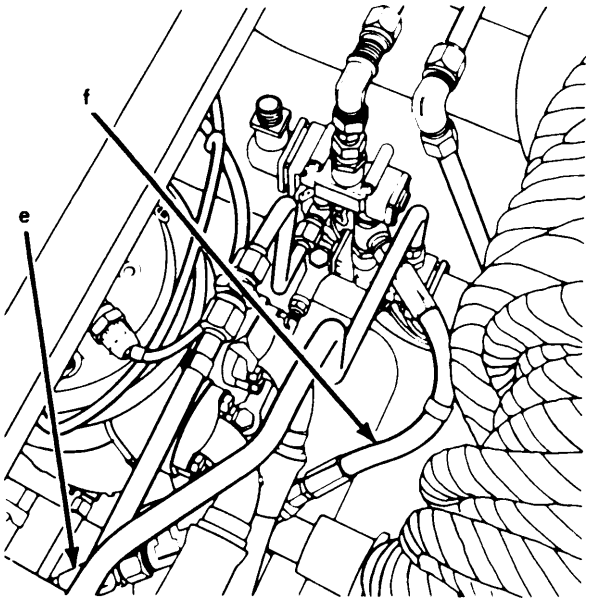
F-4. HYDRAULIC POWER SUBSYSTEM–HAND PUMP OPERATING.



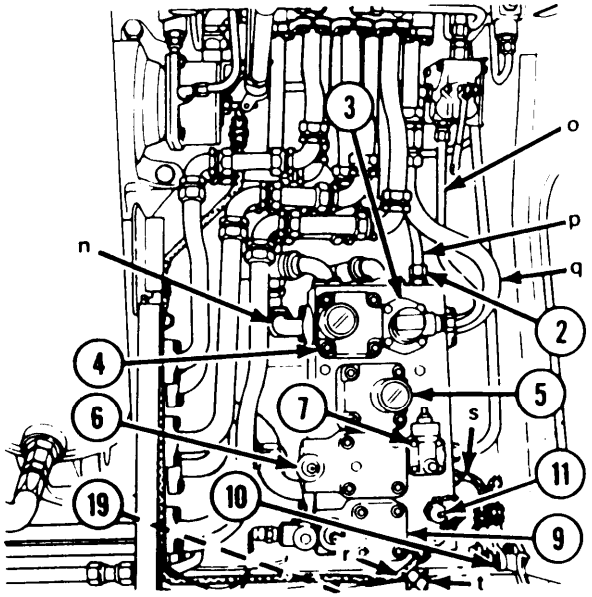
TURRET WELL–FORWARD VIEW



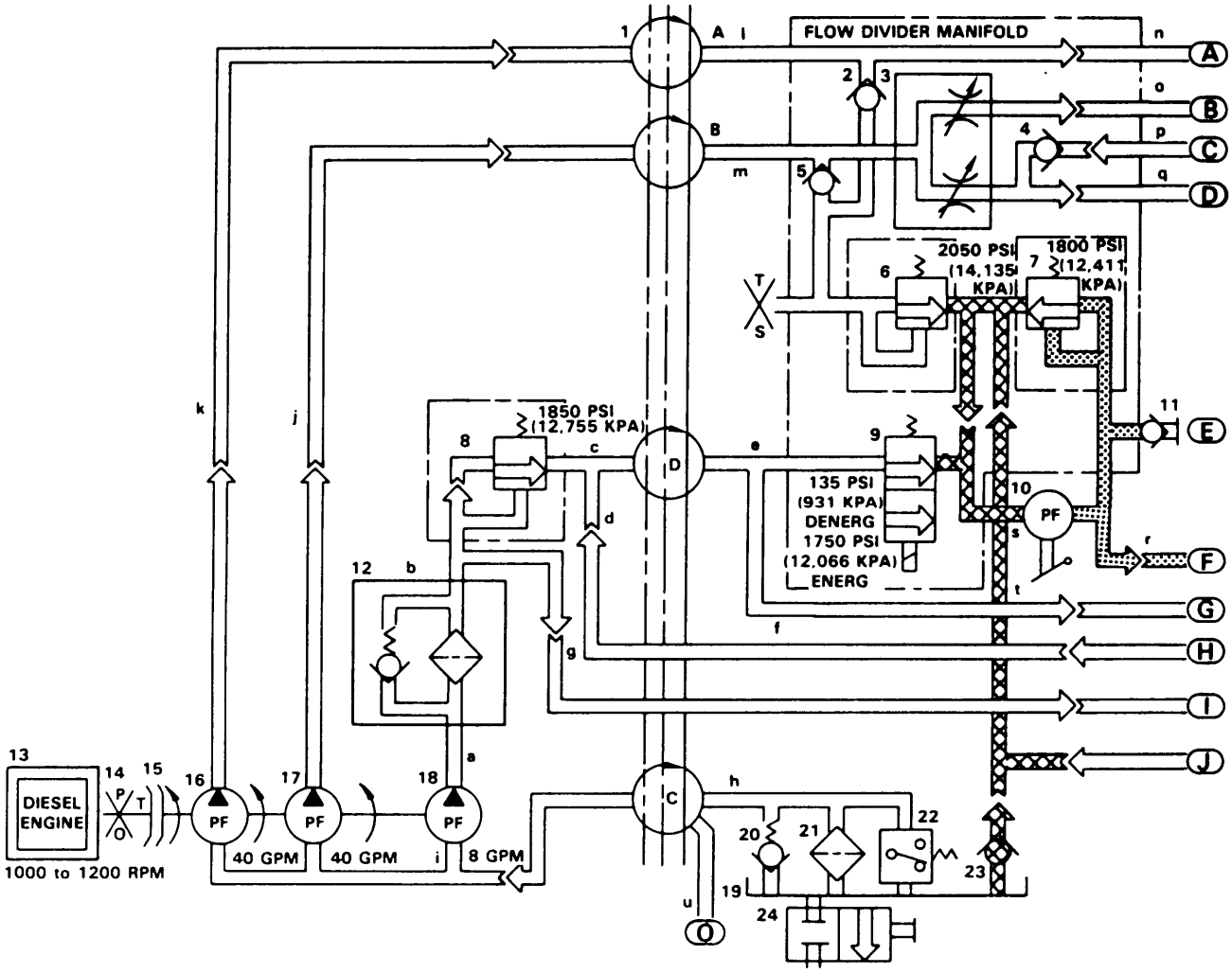
TURRET WELL–REAR VIEW



SLIP RING–FORWARD VIEW



INSIDE CAB–LOWER RIGHT SIDE



LEGEND

1 Slip ring
2 Check valve
3 Flow divider
4 Check valve
5 Check valve
6 Relief valve
7 Relief valve
8 Relief valve
9 Solenoid dual relief valve
10 Hand pump
11 Quick-disconnect coupling
12 Filter
13 Diesel engine (not shown)
14 Power takeoff (not shown)
15 Magnetic clutch (not shown)
16 Pump (40 GPM)
17 Pump (40 GPM)
18 Pump (8 GPM)
19 Reservoir
20 Filter bypass valve
21 Filter
22 Differential pressure switch
23 Check valve
24 Drain valve

BAR CODE

Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank

F-5. BOOM WINCH HYDRAULIC SUBSYSTEM.

Functional Description.

a. The hydraulic fluid power for the operation of the boom winch is supplied by the hydraulic power subsystem.

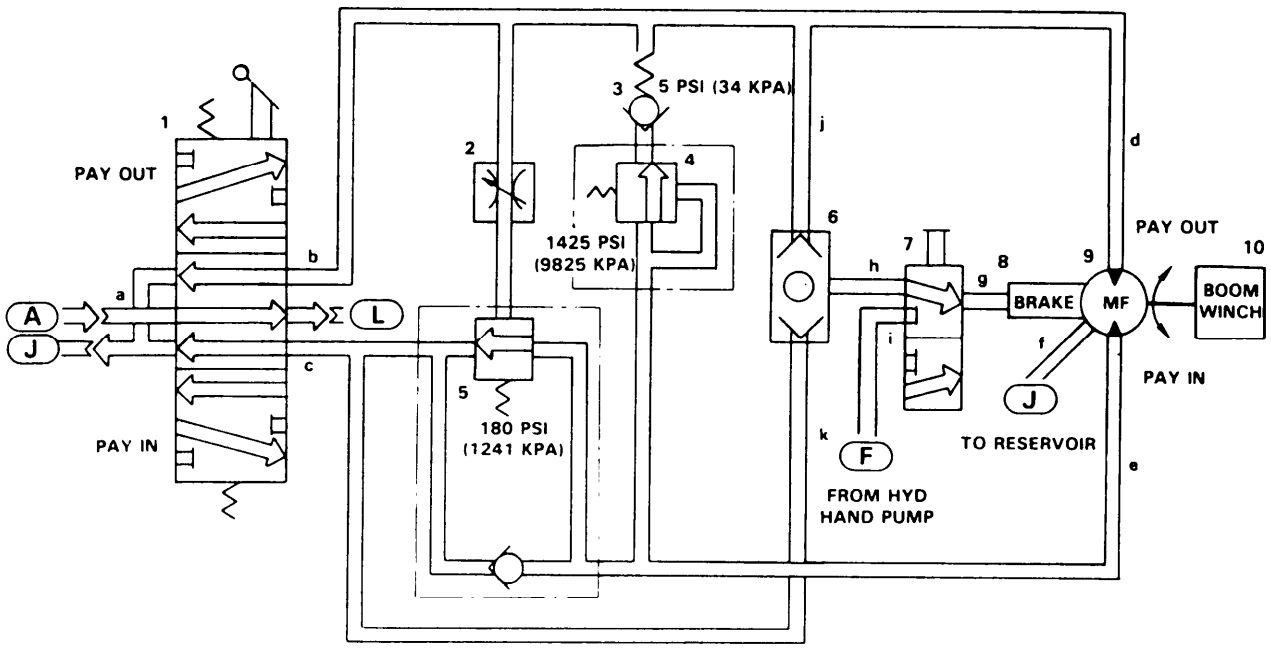
b. The boom winch hydraulic subsystem controls the power for boom winch operation when lifting or lowering a load.

c. Move the handle of the directional control valve (1) in the PAY IN position to direct hydraulic fluid to release brake (7) and operate the hydraulic motor (9) to retrieve the boom winch wire rope. Return fluid from the hydraulic motor (9) flows through the pressure relief valve (5) and the directional control valve (1), then to the reservoir. The relief valve (4) limits hydraulic pressure when paying in to 1425 psi (9825 kPa) to protect the winch com - ponents from overload.

d. Moving the handle of the directional control valve (1) in the PAY OUT position has the same effect as in PAY IN except that the hydraulic fluid is routed in the opposite direction through the hydraulic motor (9). The relief valve (5) controls the rate of flow in the return line and prevents free fall of the load.

e. When the handle of the directional control valve (1) is in the neutral position, hydraulic fluid flows through the open center port to the tow winch directional control valve.

f. When the engine is not operating or during hydraulic power failure, the boom winch brake can be manually released by setting the brake release valve (7) to HAND PUMP PRESSURE and operating the hand pump to lower a load.



LEGEND

1 Directional control valve
2 Flow control valve, P/O valve (5)
3 Check valve
4 Relief valve
5 Relief valve
6 Shuttle valve
7 Brake release valve
8 Brake
9 Hydraulic motor
10 Winch

BAR CODE

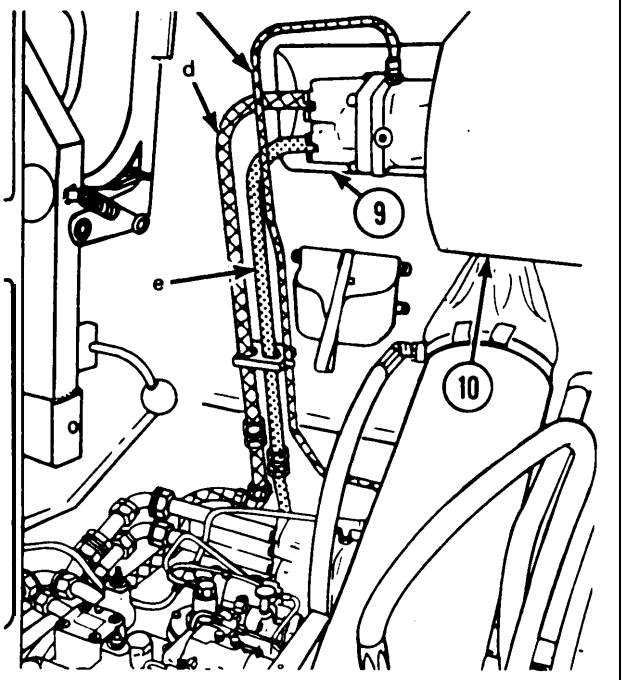
Supply pressure

Intake or return

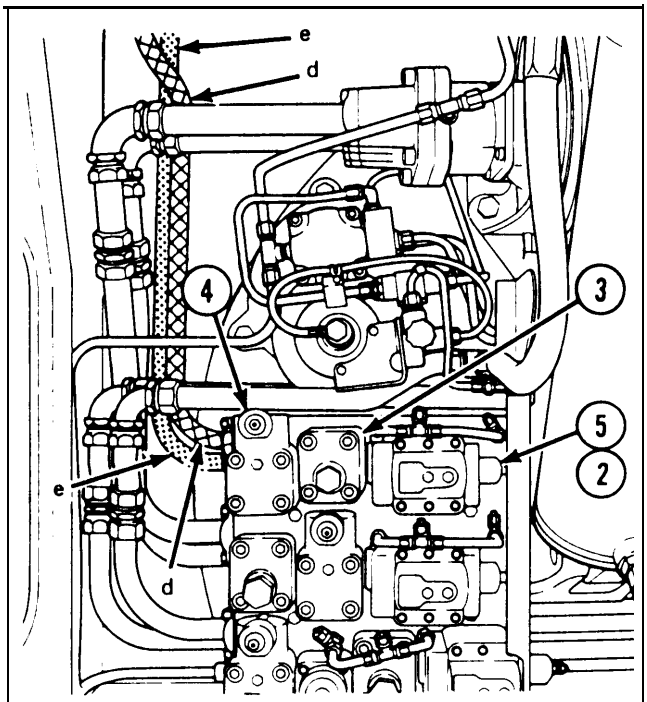
Pilot or reduced pressure

Inactive blank

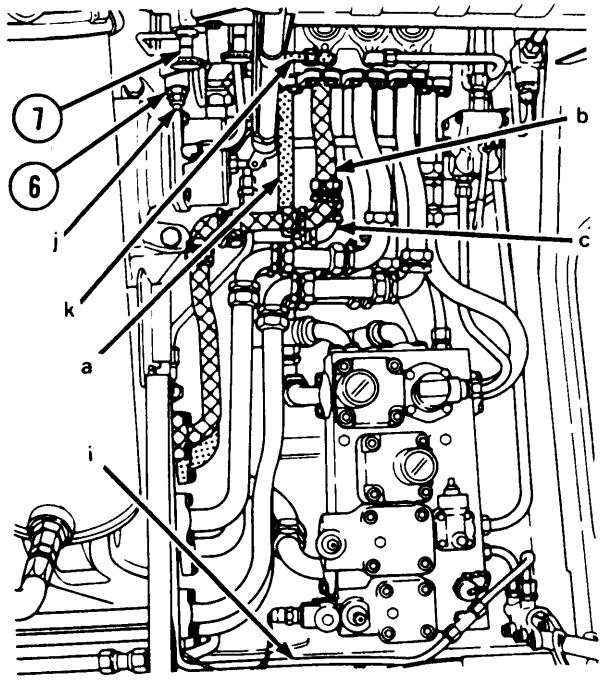
F-6. BOOM WINCH HYDRAULIC SUBSYSTEM–PAY IN.



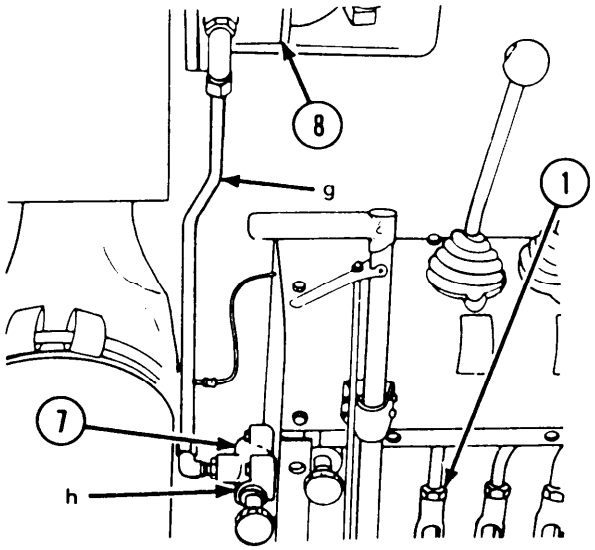
INSIDE CAB–UPPER LEFT SIDE



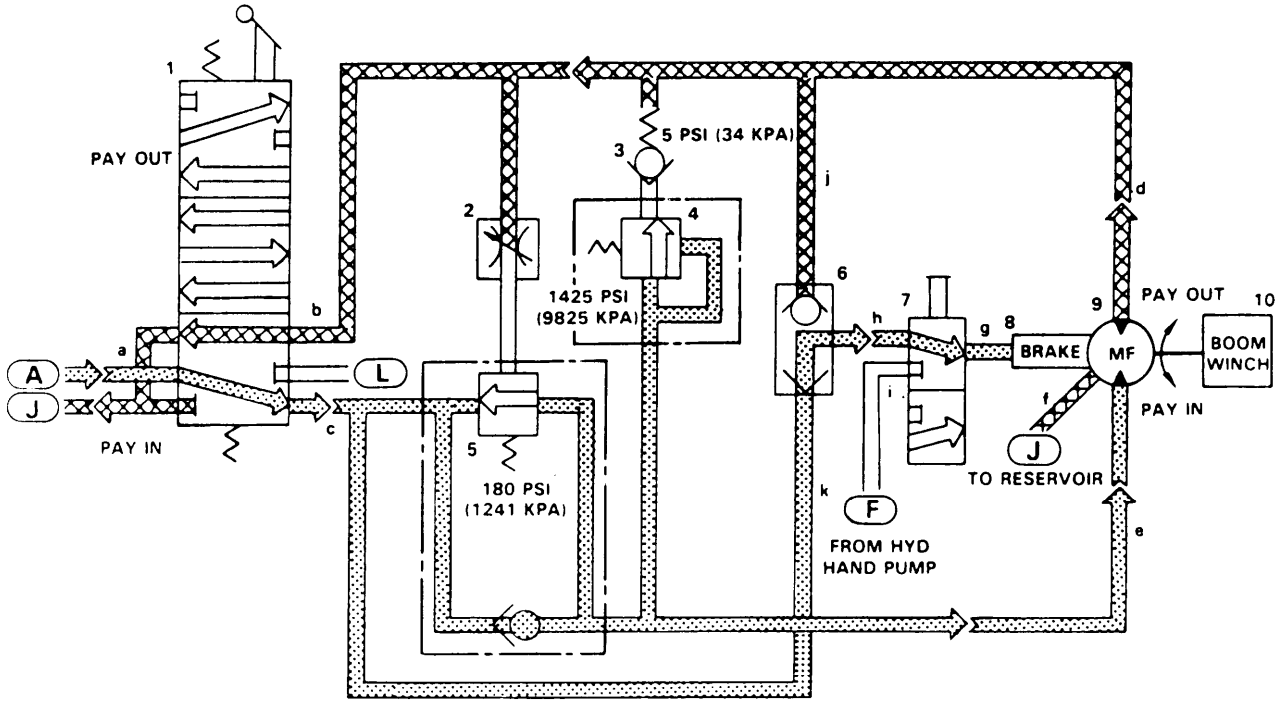
INSIDE CAB–LOWER LEFT SIDE



INSIDE CAB–LOWER RIGHT SIDE



INSIDE CAB–UPPER RIGHT SIDE



LEGEND

1 Directional control valve
2 Flow control valve
3 Check valve
4 Relief valve
5 Relief valve
6 Shuttle valve
7 Brake release valve
8 Brake
9 Hydraulic motor
10 Winch

BAR CODE

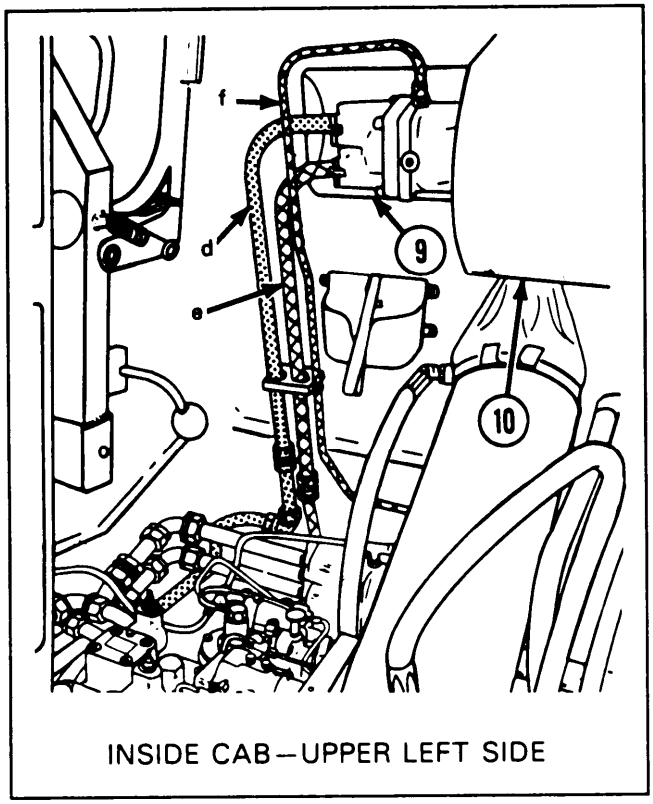
Supply pressure

Intake or return

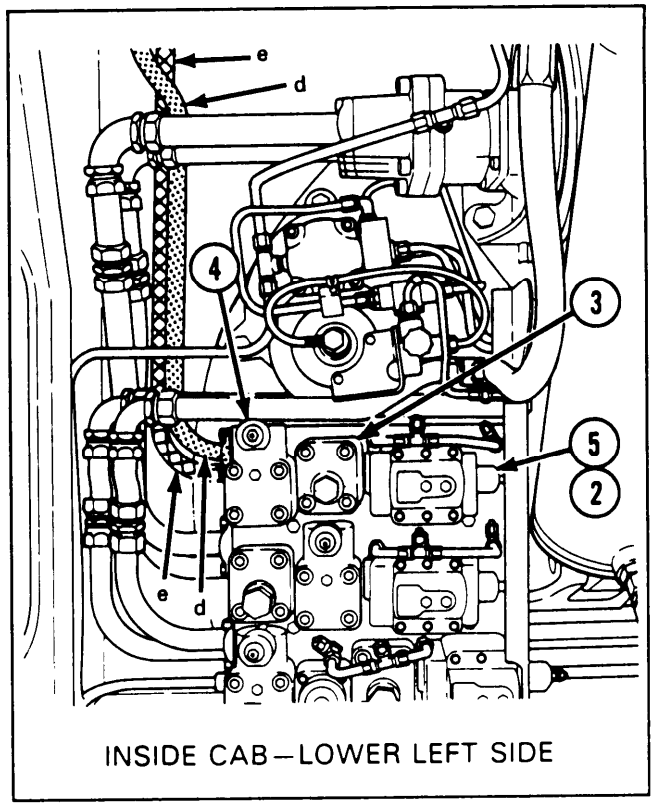
Pilot or reduced pressure

Inactive blank

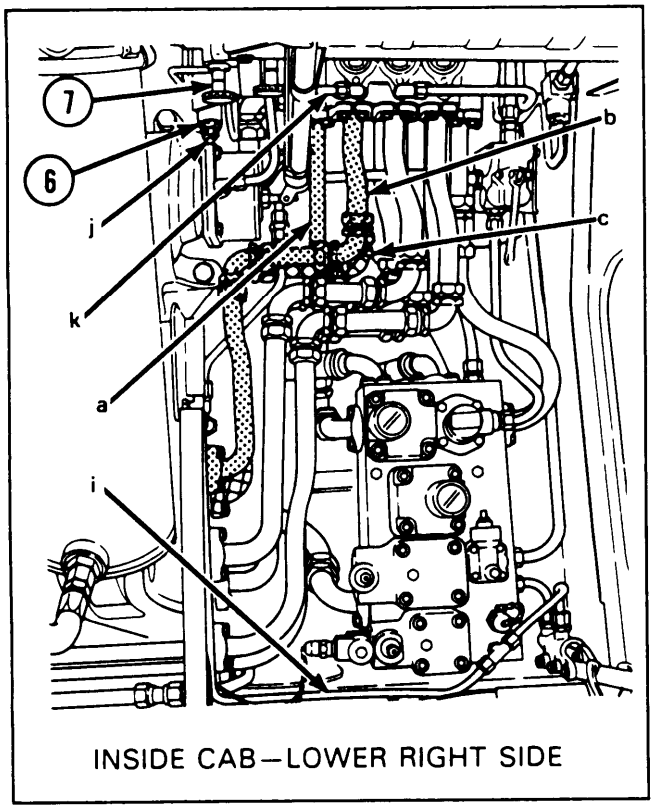
F-7. BOOM WINCH HYDRAULIC SUBSYSTEM—PAY OUT.



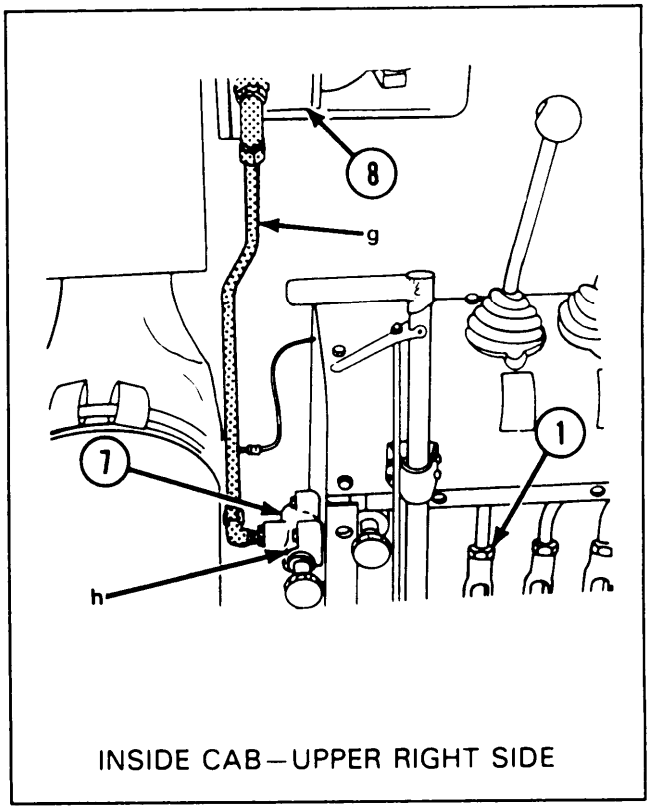
INSIDE CAB—UPPER LEFT SIDE



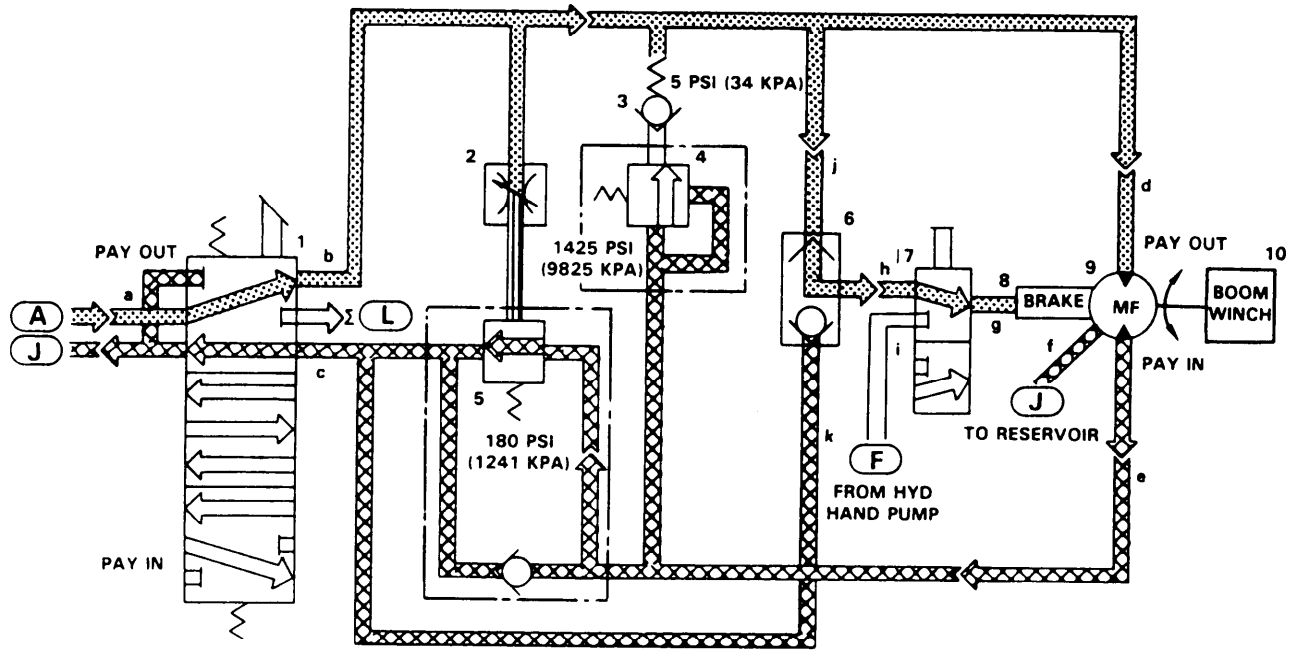
INSIDE CAB—LOWER LEFT SIDE



INSIDE CAB—LOWER RIGHT SIDE



INSIDE CAB—UPPER RIGHT SIDE



LEGEND

1 Directional control valve
2 Flow control valve
3 Check valve
4 Relief valve
5 Relief valve
6 Shuttle valve
7 Brake release valve
8 Brake
9 Hydraulic motor
10 Winch

BAR CODE

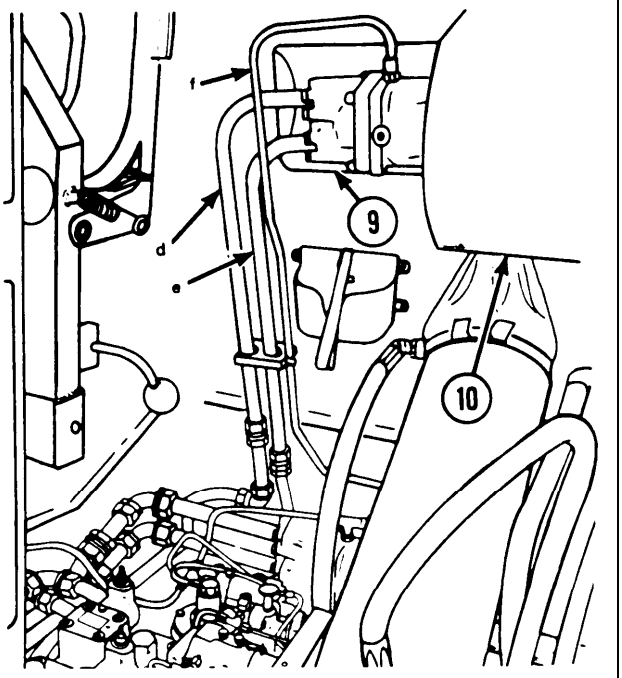
Supply pressure

Intake or return

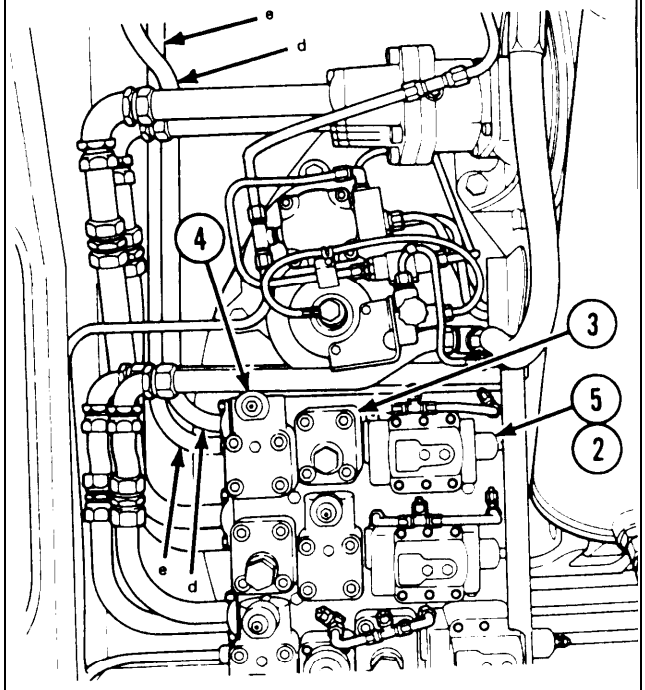
Pilot or reduced pressure

Inactive blank

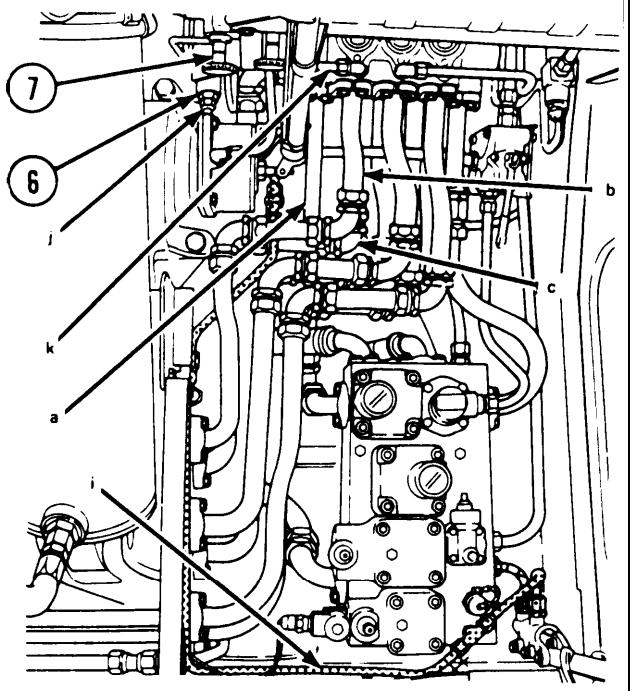
F-8. BOOM WINCH HYDRAULIC SUBSYSTEM –MANUAL RELEASE.



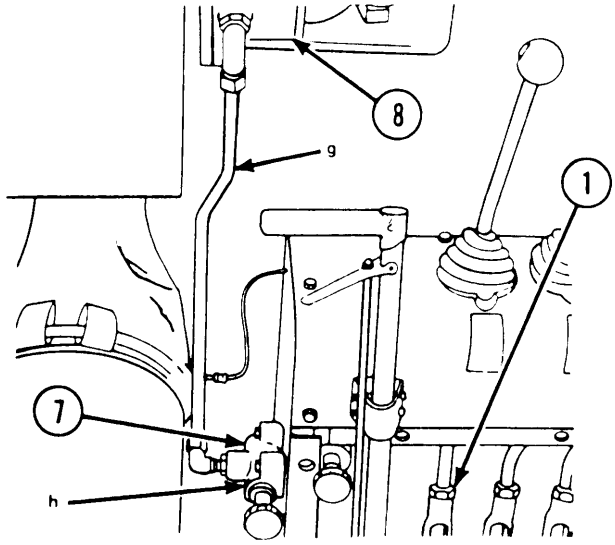
INSIDE CAB–UPPER LEFT SIDE



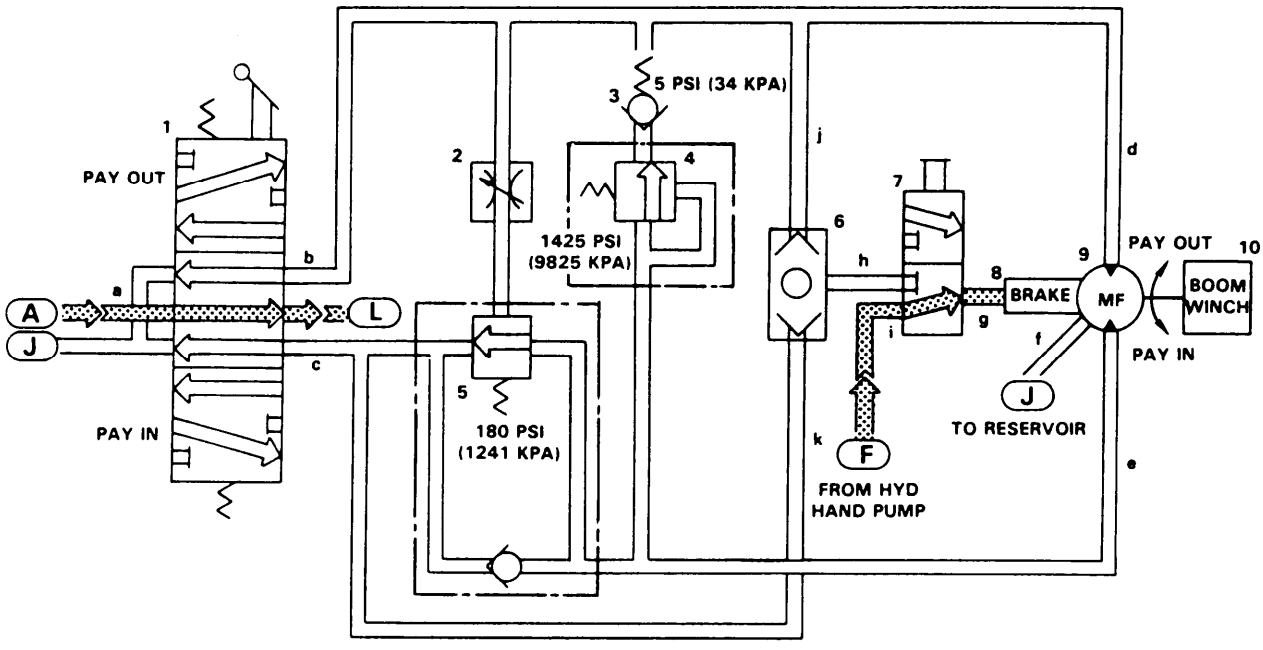
INSIDE CAB–LOWER LEFT SIDE



INSIDE CAB–LOWER RIGHT SIDE



INSIDE CAB–UPPER RIGHT SIDE



LEGEND

1 Directional control valve
2 Flow control valve
3 Check valve
4 Relief valve
5 Relief valve
6 Shuttle valve
7 Brake release valve
8 Brake
9 Hydraulic motor
10 Winch

BAR CODE

Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank

F-9. TRAVERSING HYDRAULIC SUBSYSTEM.

Functional Description.

a. The hydraulic fluid power for the operation of the traversing subsystem is supplied by the hydraulic power subsystem.

b. The traversing hydraulic subsystem controls the power for rotational movement of the cab.

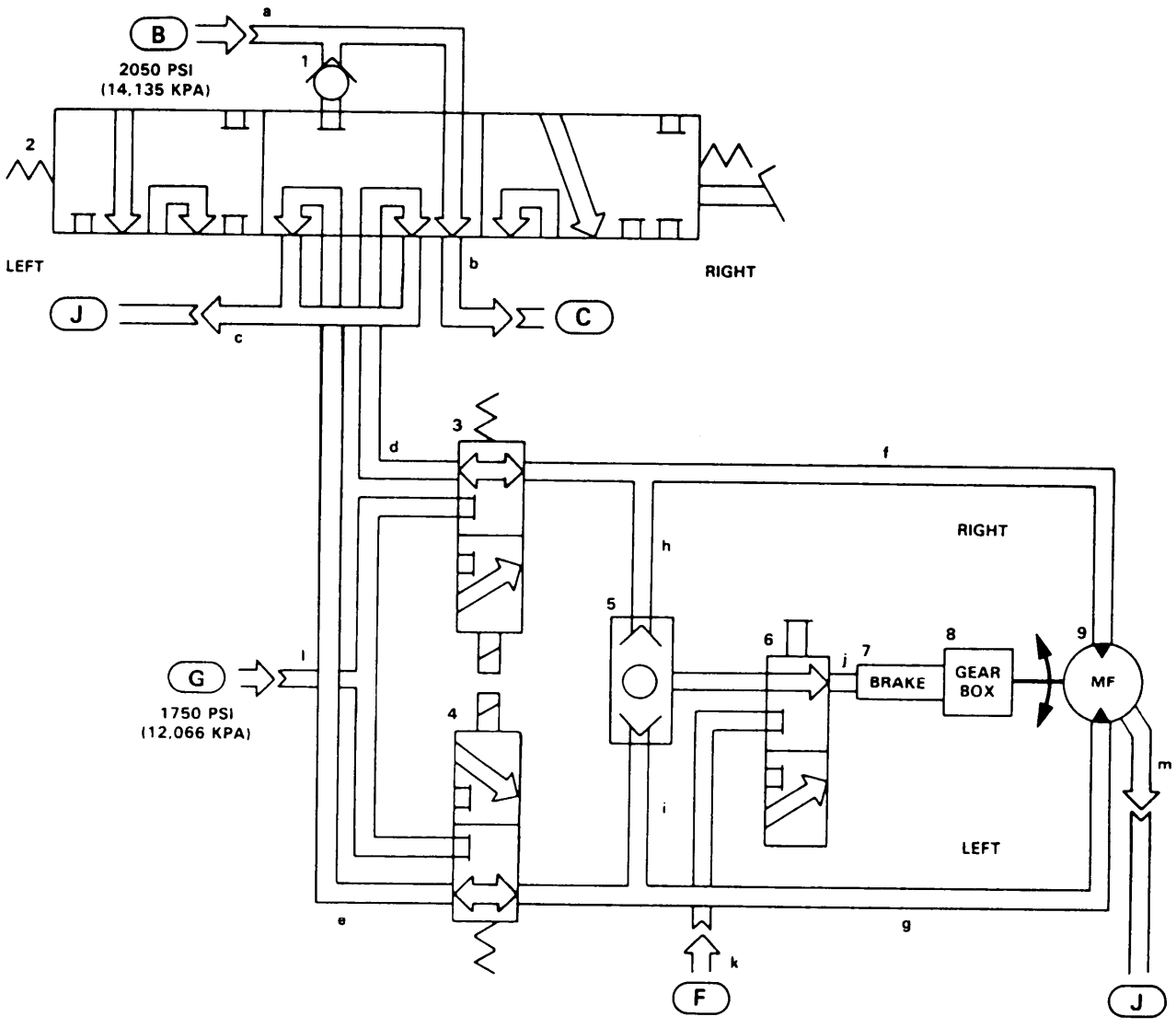
c. Depressing the forward portion of the foot pedal of the directional control valve (2), directs hydraulic fluid at 2050 psi (14,135 kpa) through the solenoid valve (4) to the brake release valve (6), releasing the brake (7), and to the hydraulic motor (9), which traverses the cab to the left. The return flow from the hydraulic motor (9) passes through the solenoid valve (3) and the directional control valve (2) and back to the reservoir.

d. Depressing the rear portion of the foot pedal of the directional control valve (2) has the same effect as when traversing left, described above, except that the hydraulic fluid is routed in the opposite direction through the hydraulic motor (9), which traverses the cab to the right.

e. When directional control valve (2) is in neutral position, hydraulic fluid flows through the open center port to the flow divider manifold in the hydraulic power subsystem.

f. When the engine is not operating or during hydraulic power failure, the traversing brake (7) can be manually released by setting the brake release valve (6) to HAND PUMP PRESSURE and operating the hand pump, so that the cab can be rotated.

9. During tow winch operation, cab traversing is controlled automatically by an electrical sensing system. The sensing system energizes either the solenoid valve (3) for right traversing, or the solenoid valve (4) for left traversing. Hydraulic pressure at 1750 psi (12,066 kPa) is supplied by the 8 gpm pump in the hydraulic power subsystem.



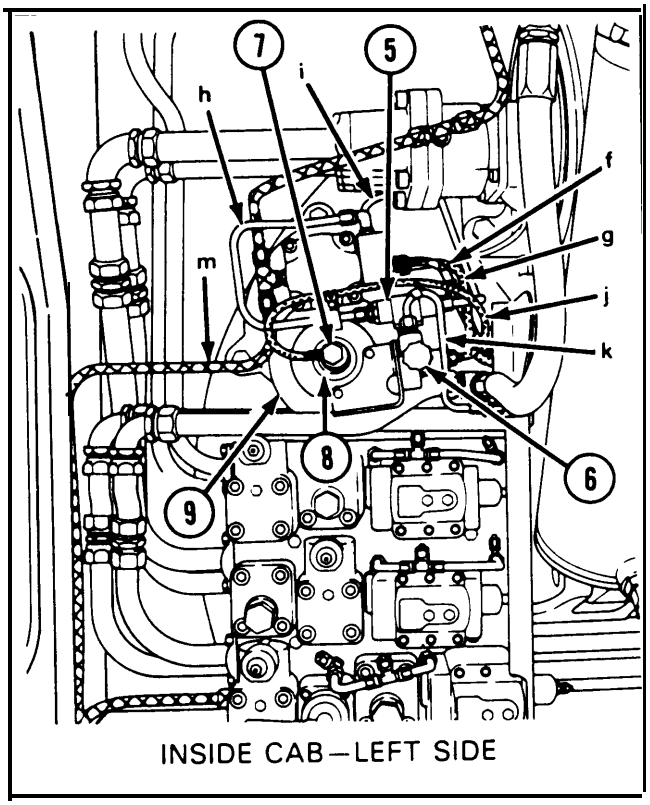
LEGEND

1 Check valve, P/O valve (2)
2 Directional control valve
3 Solenoid valve
4 Solenoid valve
5 Shuttle valve
6 Brake release valve
7 Brake
8 Gearbox
9 Hydraulic motor

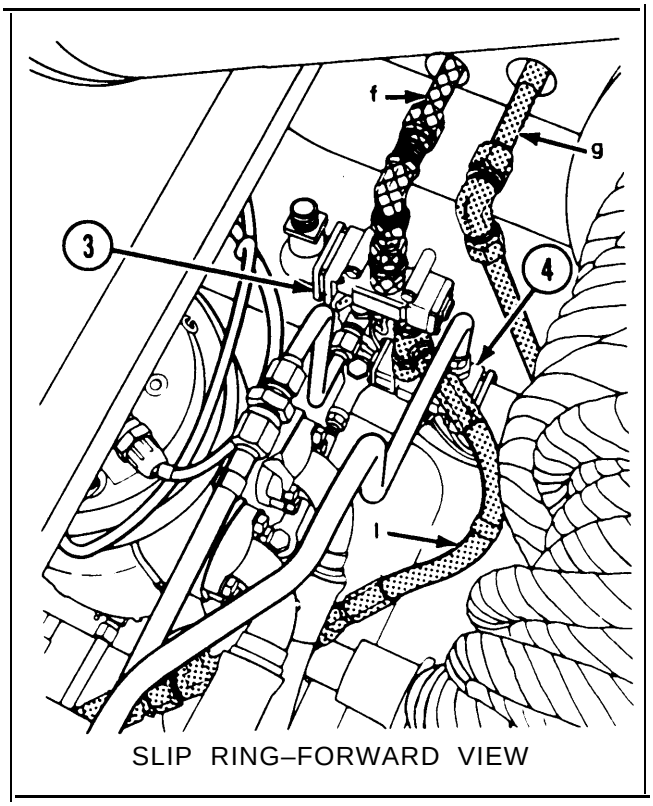
BAR CODE

Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank

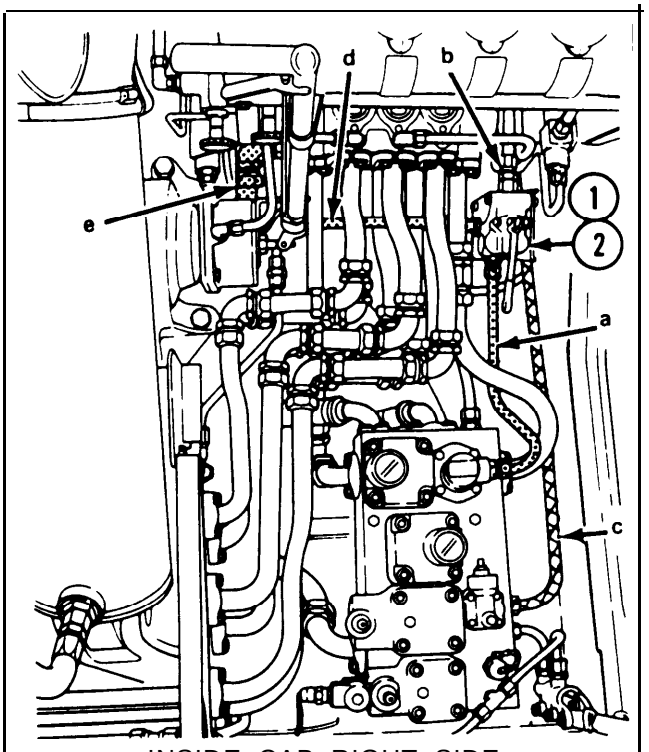
F-10. TRAVERSING HYDRAULIC SUBSYSTEM –TRAVERSING LEFT.



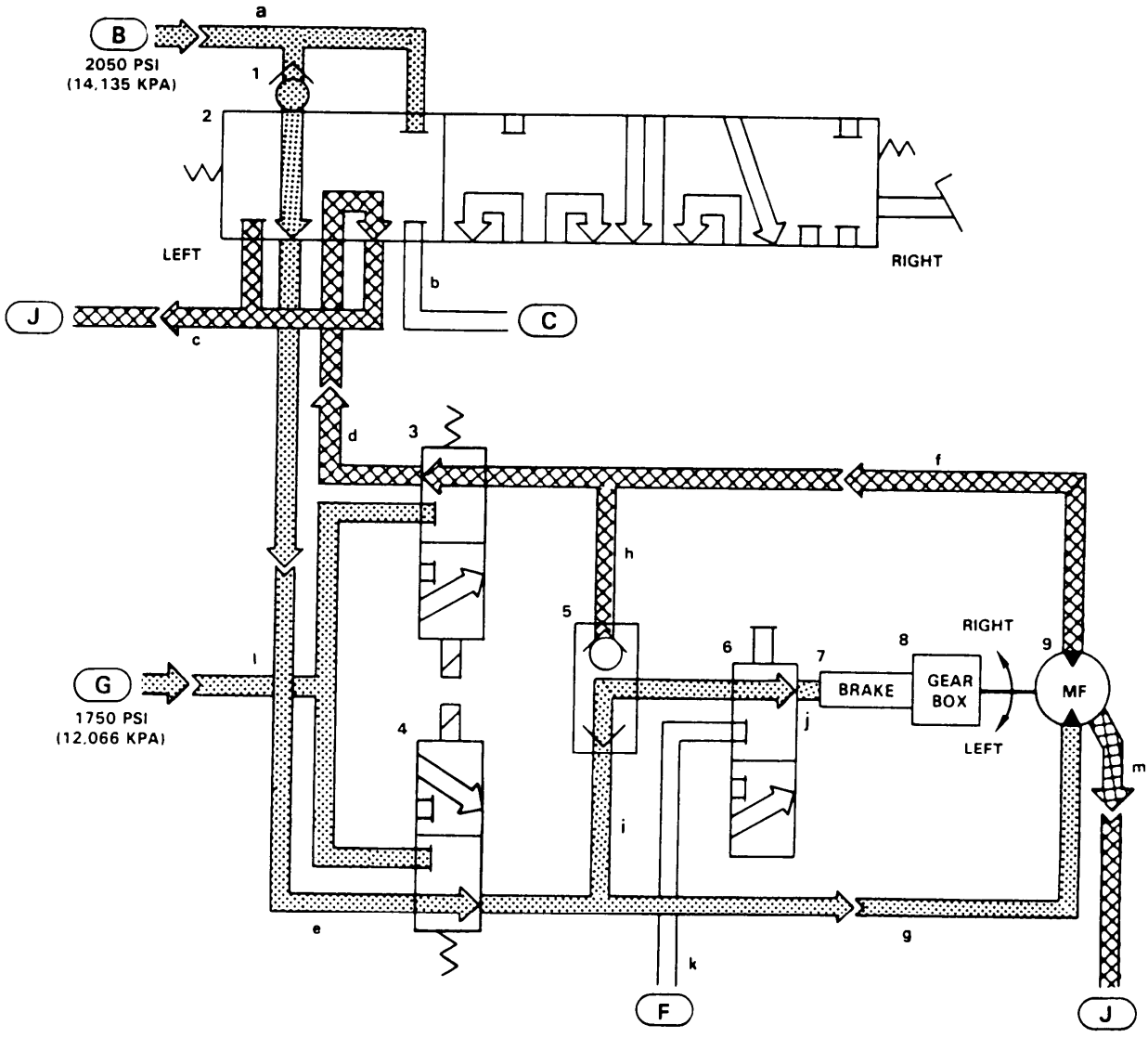
INSIDE CAB—LEFT SIDE



SLIP RING–FORWARD VIEW



INSIDE CAB–RIGHT SIDE

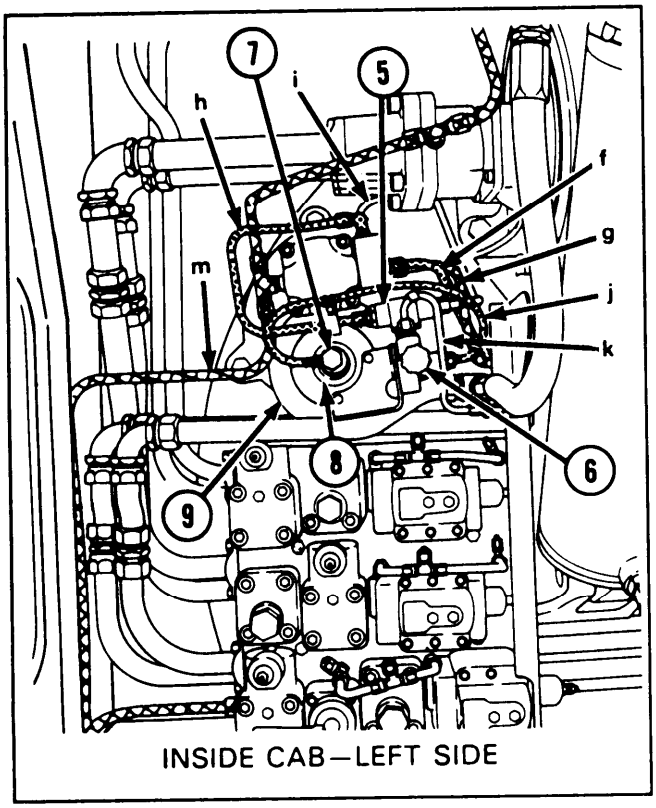


LEGEND

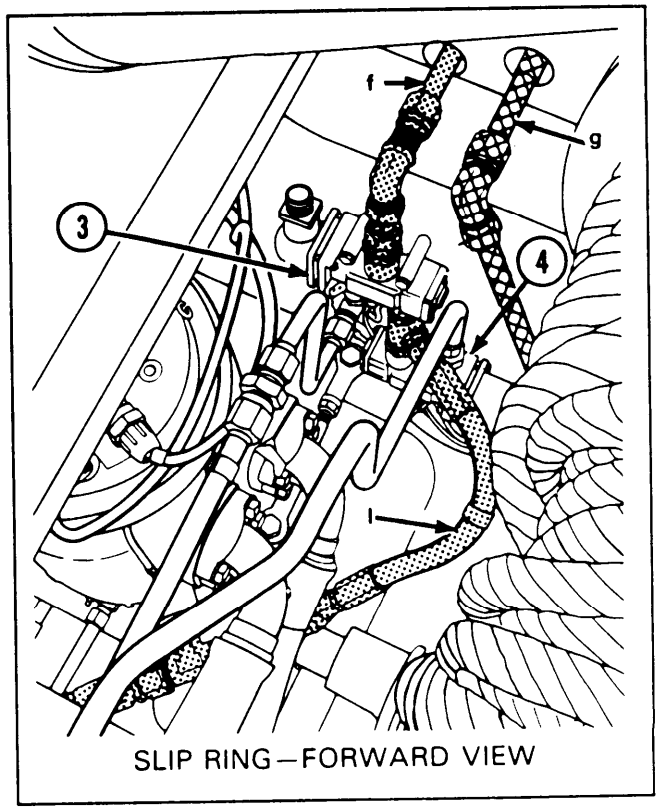
1 Check valve, P/O valve (2)
2 Directional control valve
3 Solenoid valve
4 Solenoid valve
5 Shuttle valve
6 Brake release valve
7 Brake
8 Gearbox
9 Hydraulic motor

BAR CODE

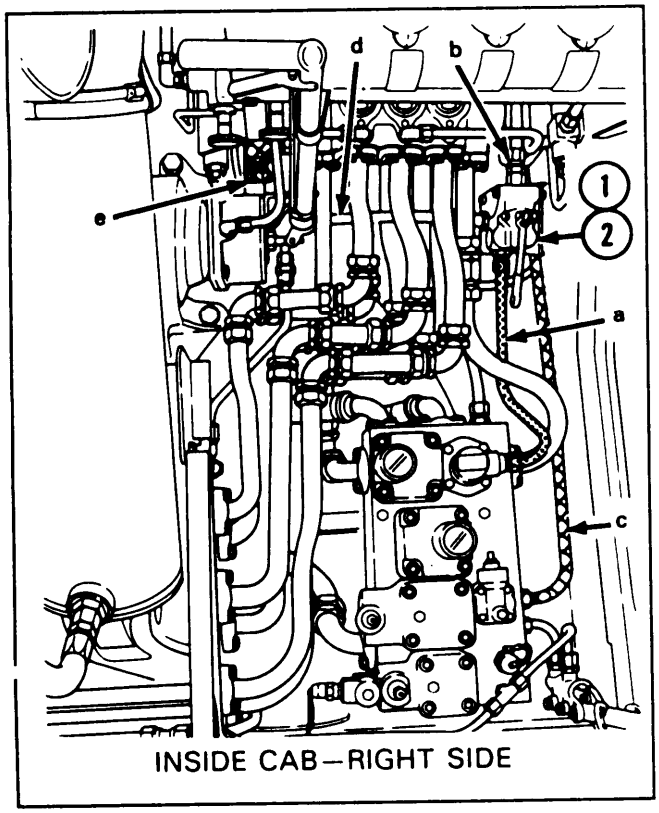
Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank



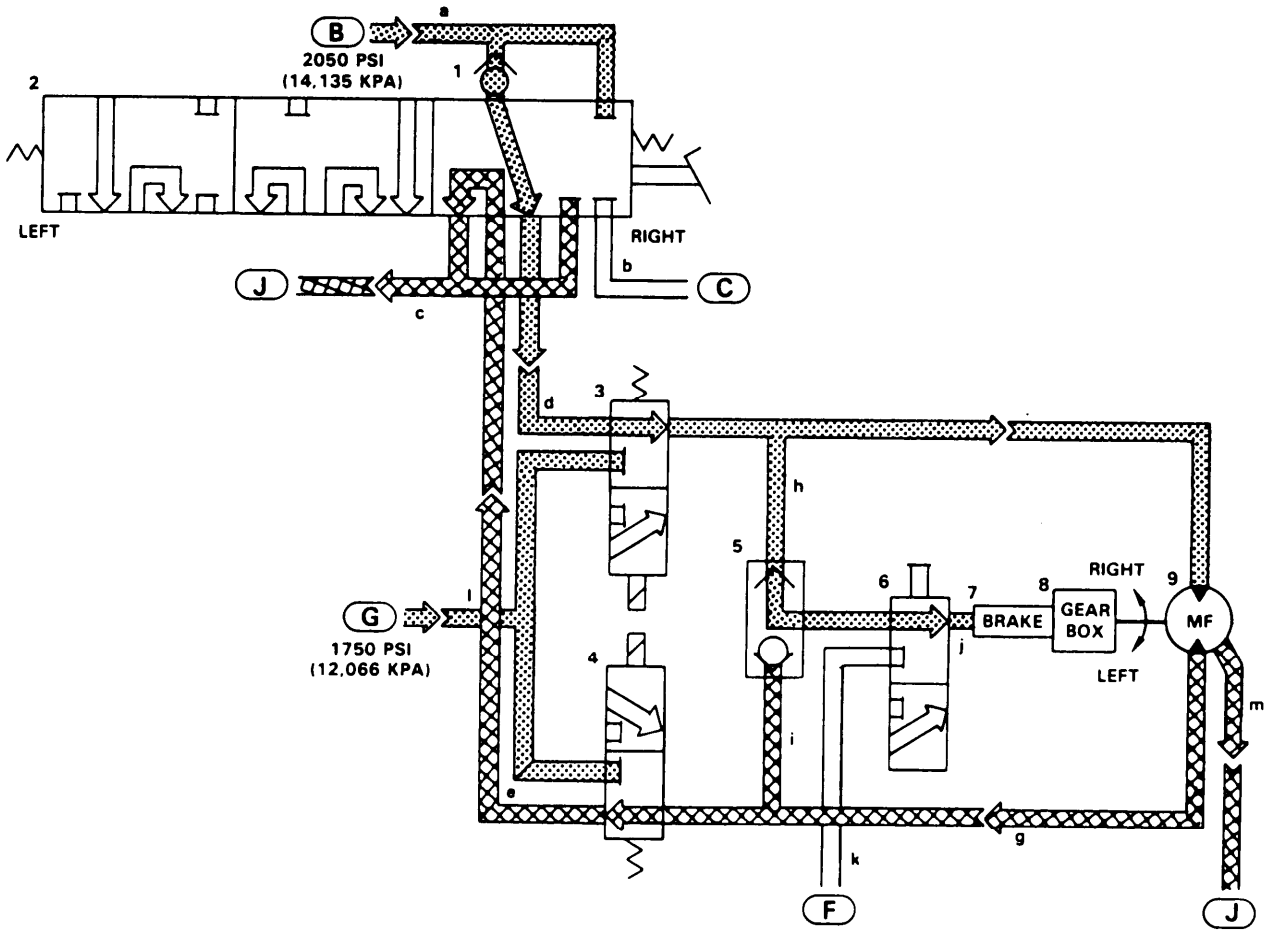
INSIDE CAB—LEFT SIDE



SLIP RING—FORWARD VIEW



INSIDE CAB—RIGHT SIDE



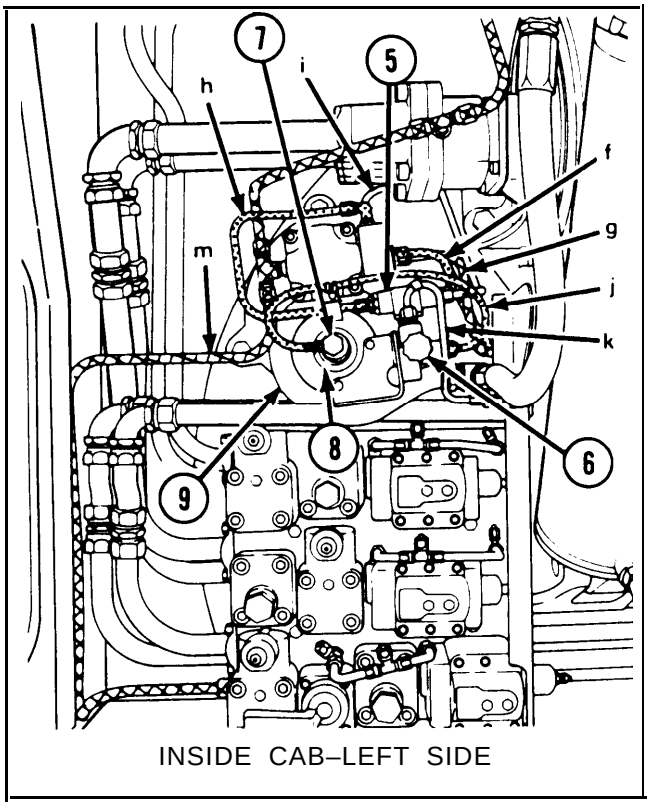
LEGEND

1 Check valve, P/O valve (2)
2 Directional control valve
3 Solenoid valve
4 Solenoid valve
5 Shuttle valve
6 Brake release valve
7 Brake
8 Gearbox
9 Hydraulic motor

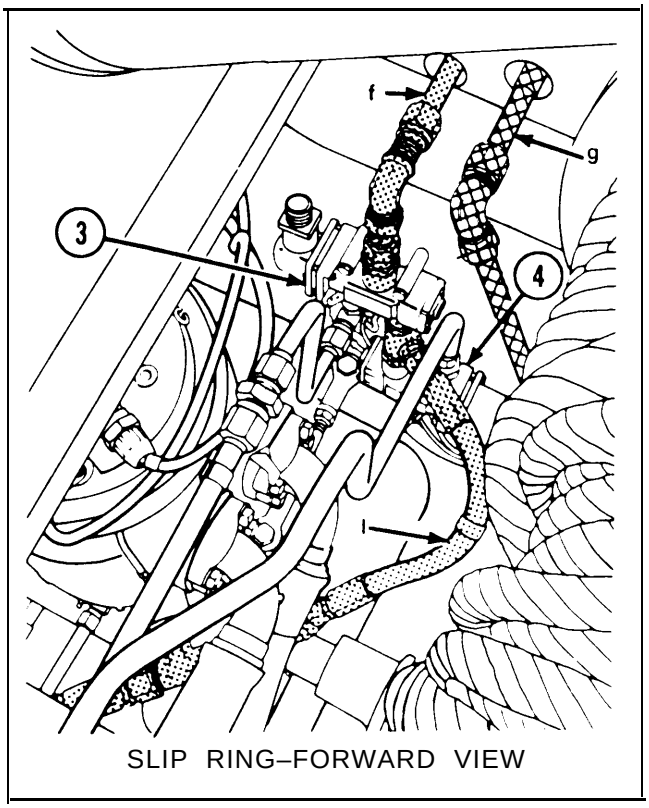
BAR CODE

Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank

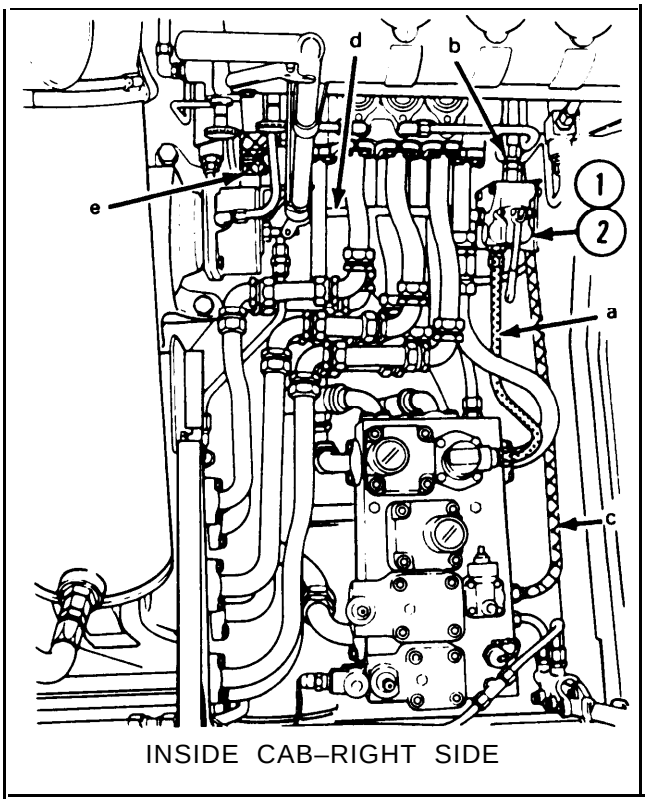
F-12. TRAVERSING HYDRAULIC SUBSYSTEM–LEVEL WIND TRAVERSING RIGHT.



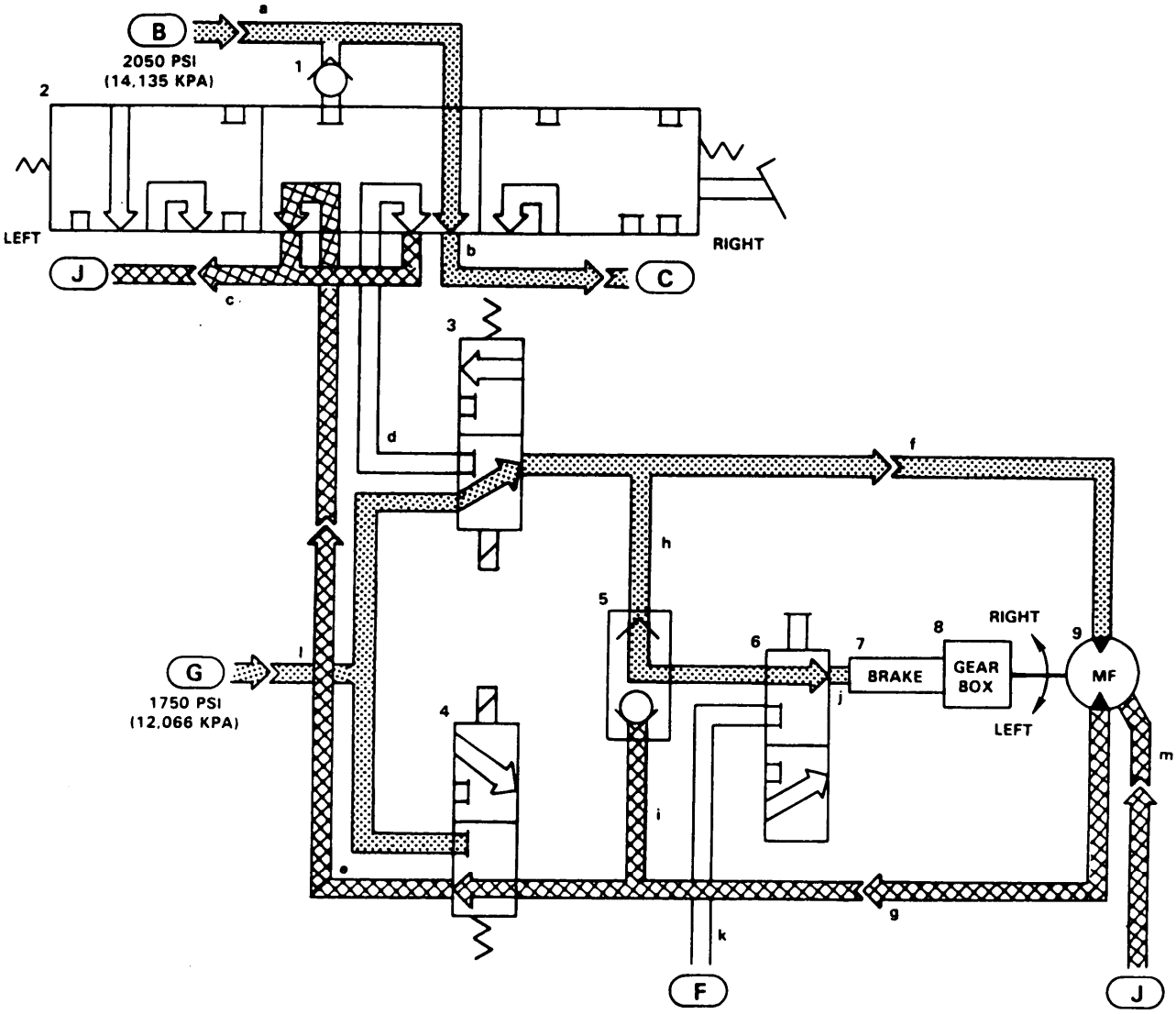
INSIDE CAB–LEFT SIDE



SLIP RING–FORWARD VIEW



INSIDE CAB–RIGHT SIDE



LEGEND

1 Check valve, P/O valve (2)
2 Directional control valve
3 Solenoid valve
4 Solenoid valve
5 Shuttle valve
6 Brake release valve
7 Brake
8 Gearbox
9 Hydraulic motor

BAR CODE

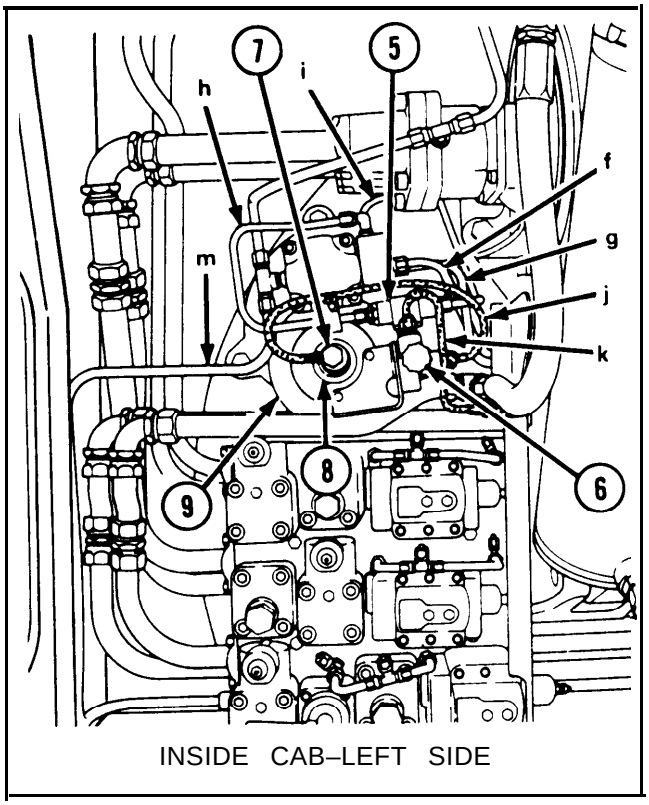
Supply pressure

Intake or return

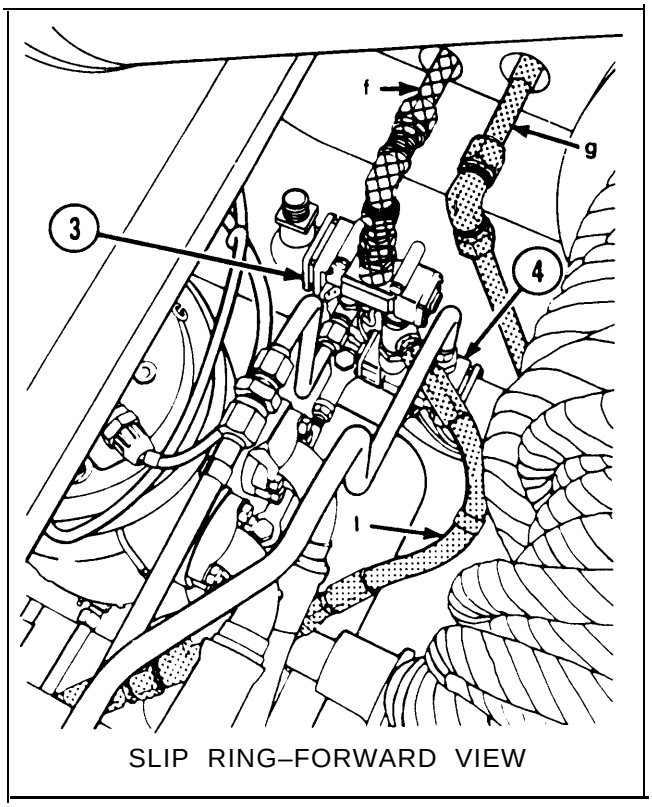
Pilot or reduced pressure

Inactive blank

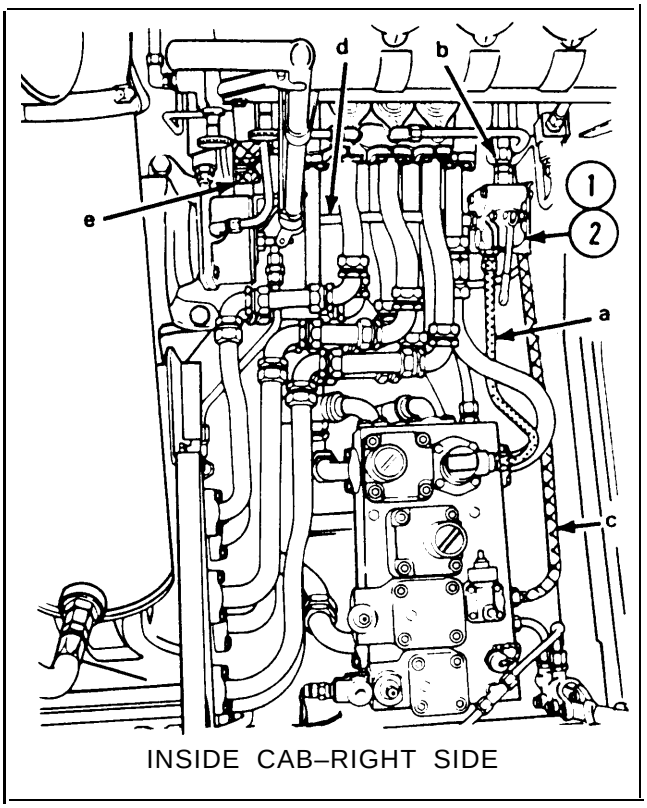
F-13. TRAVERSING HYDRAULIC SUBSYSTEM–LEVEL WIND TRAVERSING LEFT.



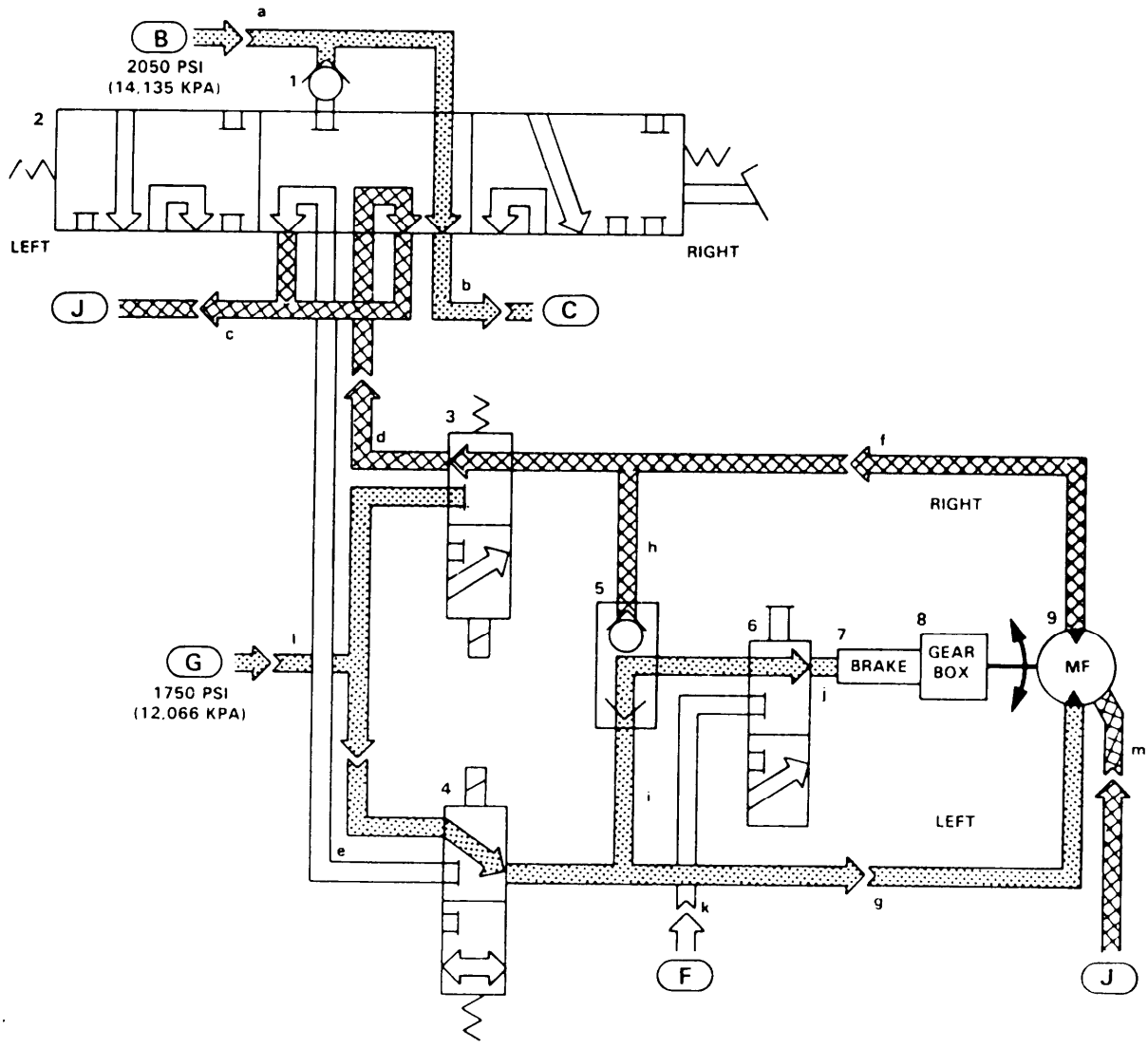
INSIDE CAB–LEFT SIDE



SLIP RING–FORWARD VIEW



INSIDE CAB–RIGHT SIDE



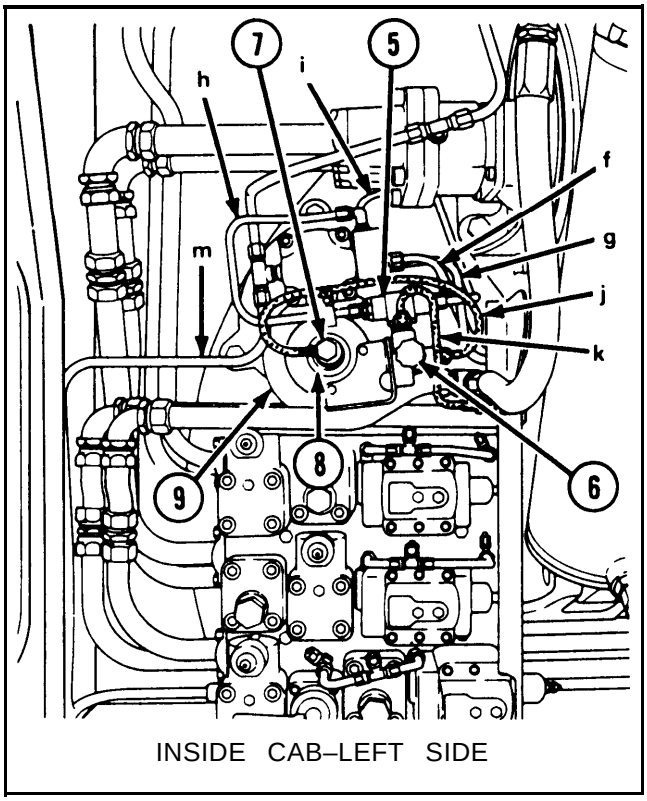
LEGEND

1 Check valve, P/O valve (2)
2 Directional control valve
3 Solenoid valve
4 Solenoid valve
5 Shuttle valve
6 Brake release valve
7 Brake
8 Gearbox
9 Hydraulic motor

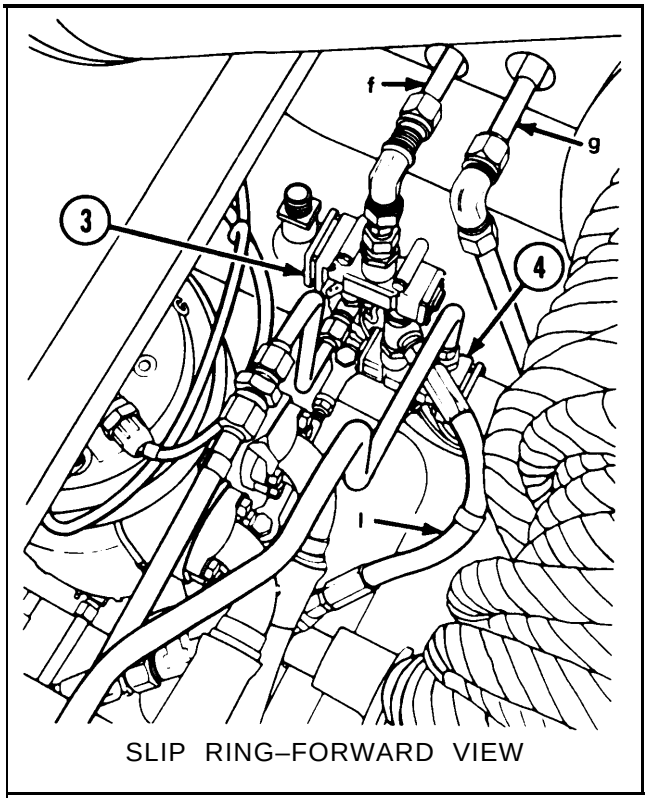
BAR CODE

Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank

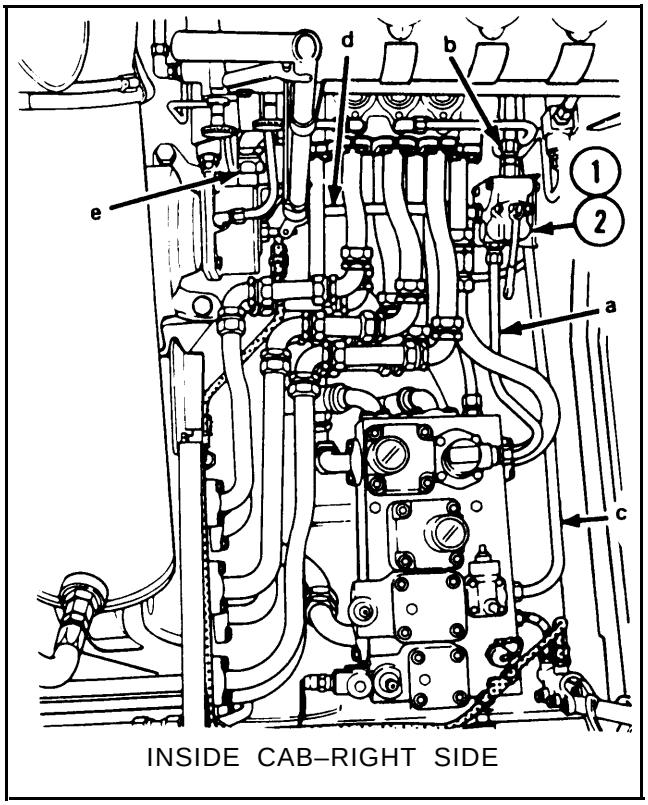
F-14. TRAVERSING HYDRAULIC SUBSYSTEM –MANUAL RELEASE.



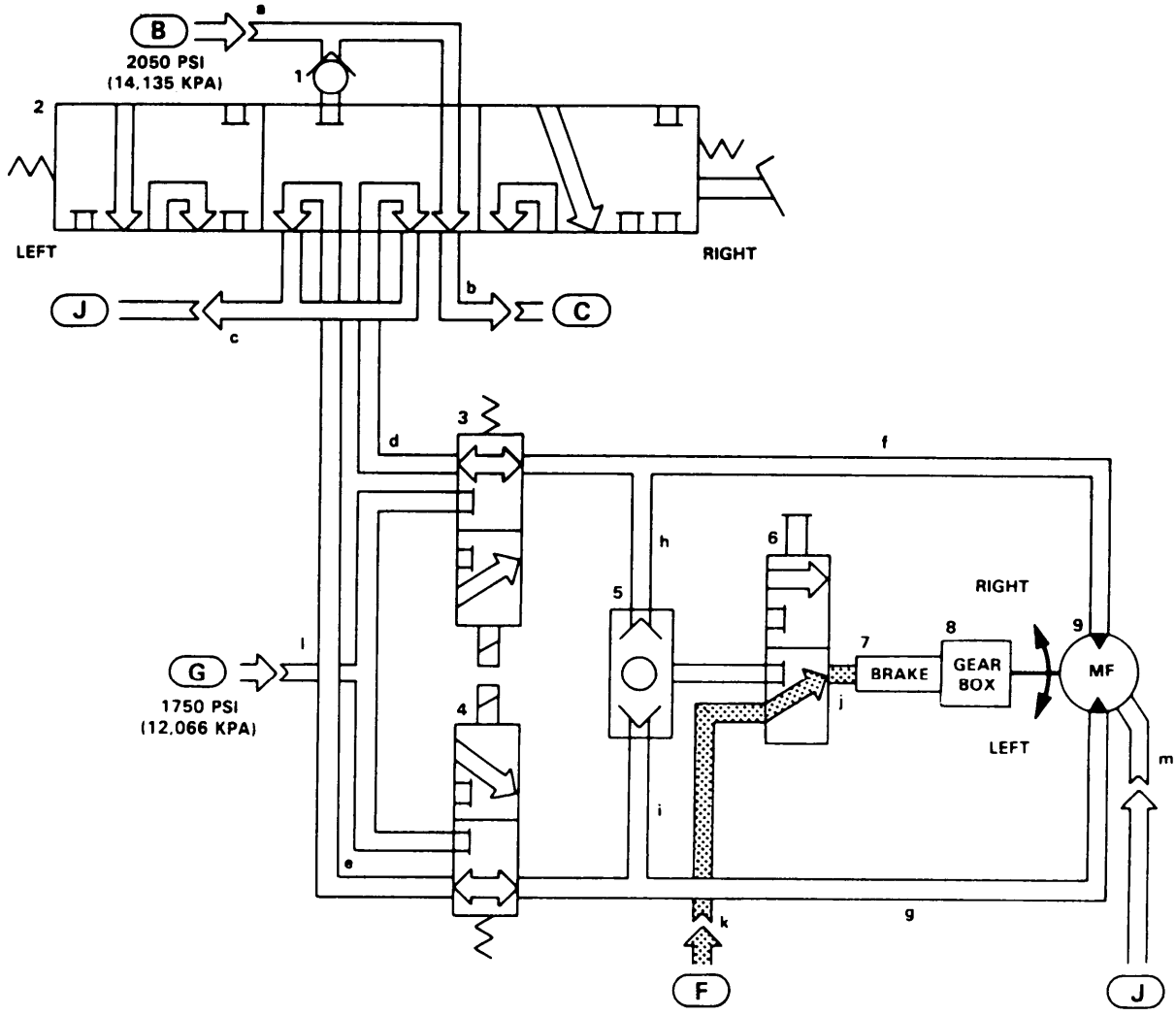
INSIDE CAB–LEFT SIDE



SLIP RING–FORWARD VIEW



INSIDE CAB–RIGHT SIDE



LEGEND

1 Check valve, P/O valve (2)
2 Directional control valve
3 Solenoid valve
4 Solenoid valve
5 Shuttle valve
6 Brake release valve
7 Brake
8 Gearbox
9 Hydraulic motor

BAR CODE

Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank

F-15. BOOM CYLINDER HYDRAULIC SUBSYSTEM.

functional Description.

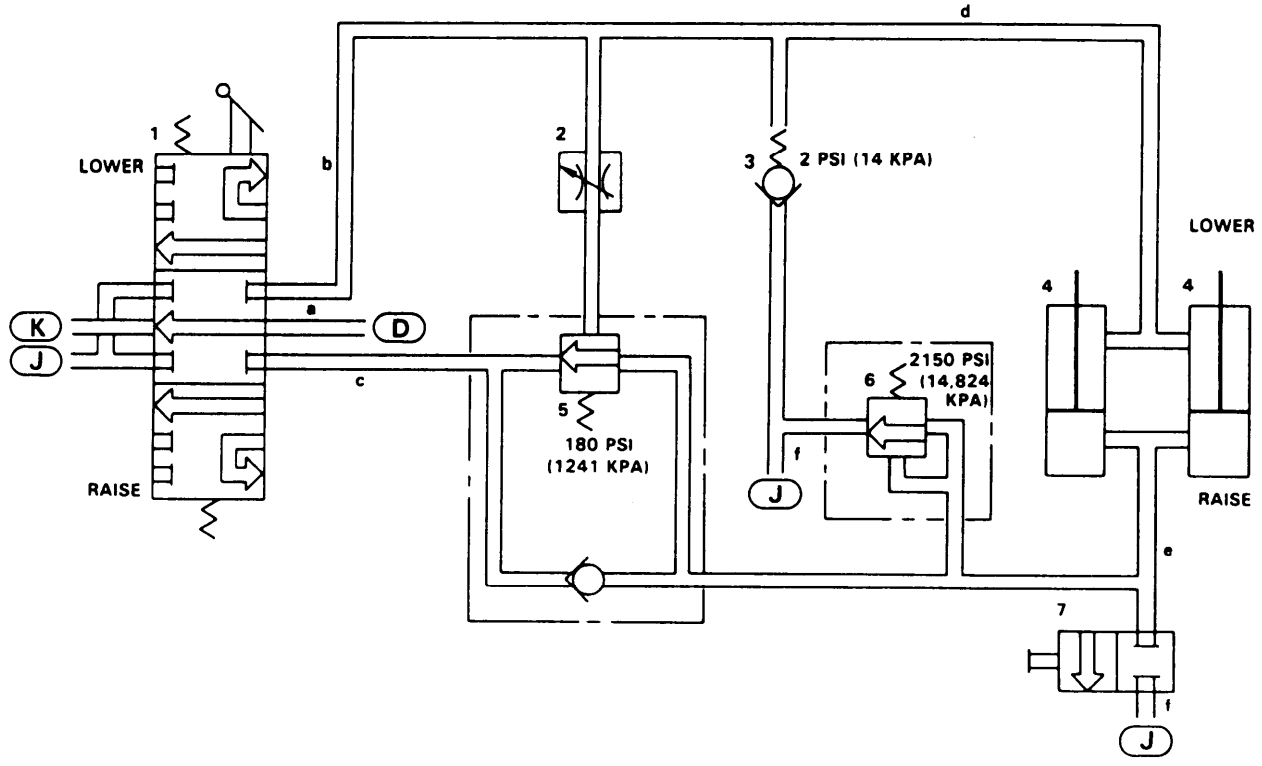
a. The hydraulic fluid power for the operation of the boom cylinders is supplied by the hydraulic power subsystem.

b. The boom cylinder hydraulic subsystem controls the power to raise and lower the boom.

c. Moving the handle of the directional control valve (1) in the RAISE position directs hydraulic fluid through the bypass check valve of the relief valve (5) to the extend ports of the boom cylinders (4), which raises the boom. The relief valve (6) releases excess hydraulic fluid pressure over 2150 psi (14,824 kPa) to return to the reservoir.

d. Moving the handle of the directional control valve (1) in the LOWER position directs hydraulic fluid to the retract ports of the boom cylinders (4), which lowers the boom. The relief valve (6) protects the subsystem from overpressure. Hydraulic pressure passing through the flow control valve (2) causes the relief valve (5) to open and allow return flow to the reservoir.

e. When the handle of the directional control valve (1) is in the neutral position, hydraulic fluid is blocked, hydraulically locking the boom cylinders in a fixed position. The emergency release valve (7) can be opened to lower the boom.



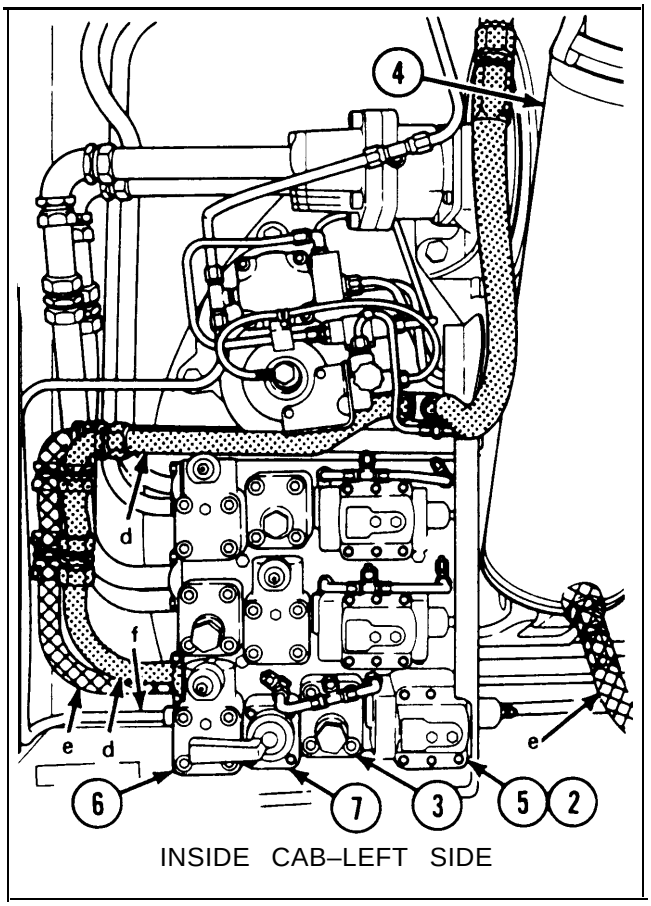
LEGEND

1 Directional control valve
2 Flow control valve, P/O valve (5)
3 Check valve
4 Hydraulic cylinder
5 Relief valve
6 Relief valve
7 Emergency release valve

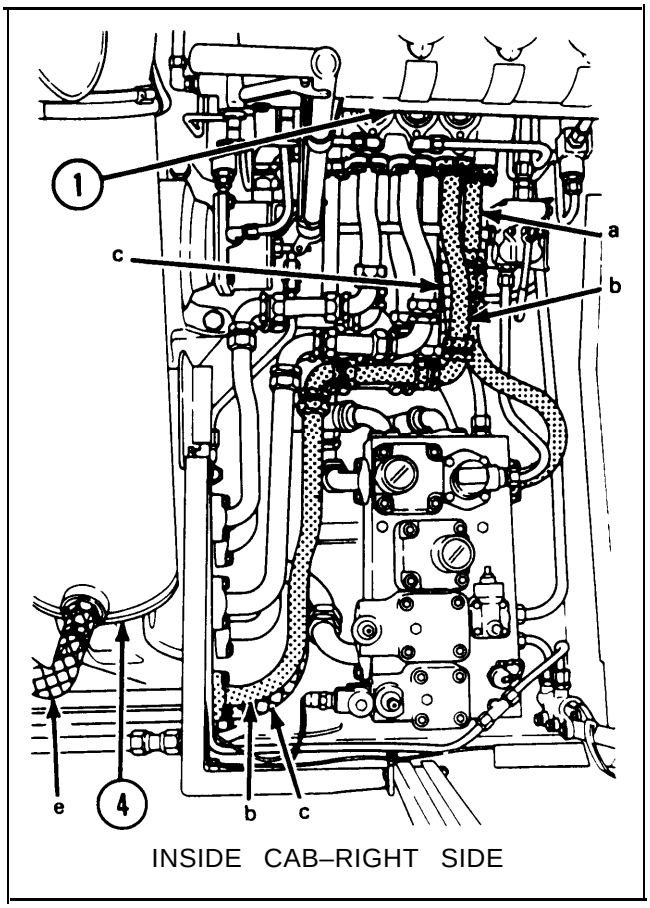
BAR CODE

Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank

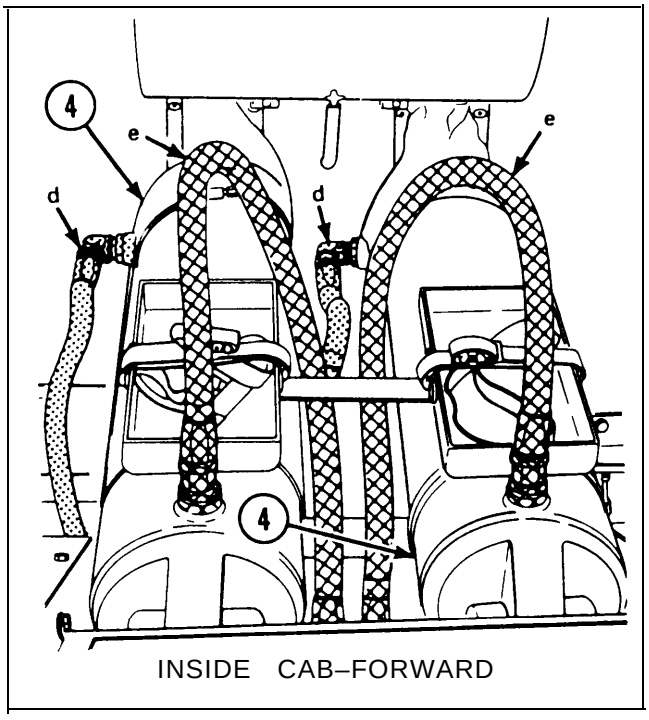
F-16. BOOM CYLINDER HYDRAULIC SUBSYSTEM–LOWERING BOOM.



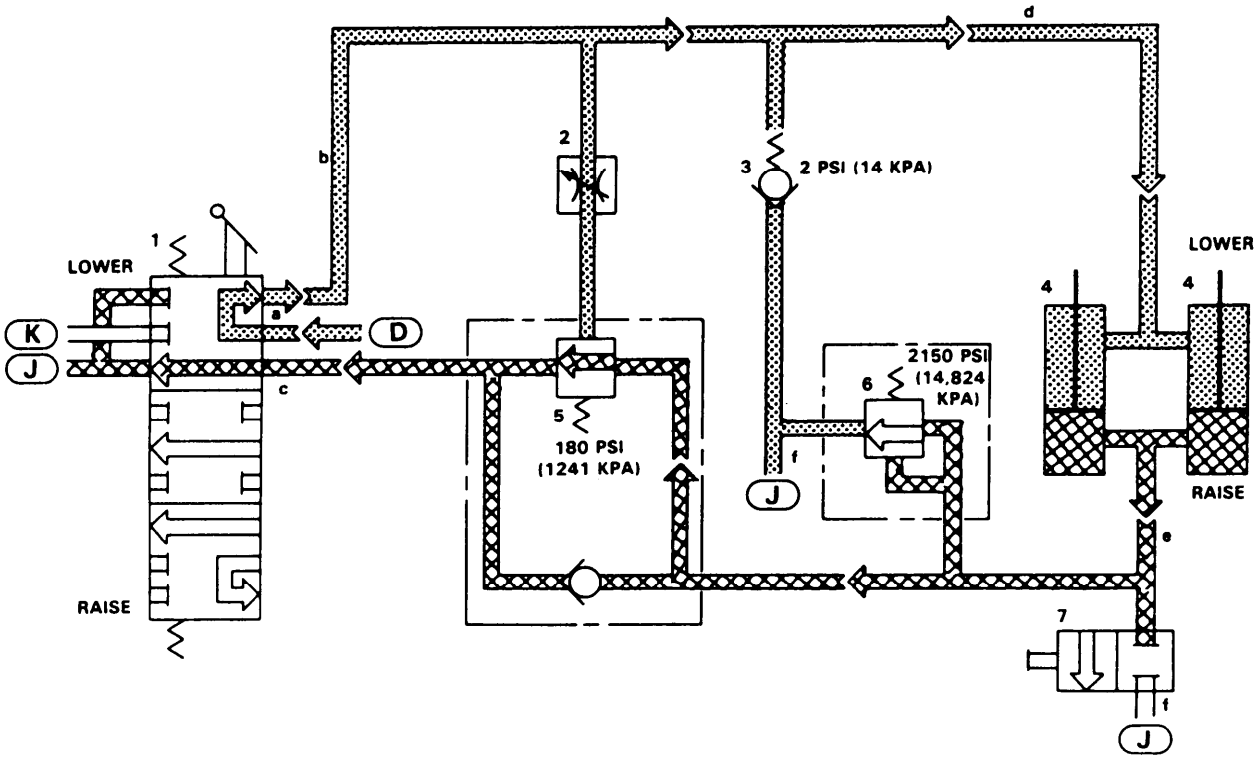
INSIDE CAB–LEFT SIDE



INSIDE CAB–RIGHT SIDE



INSIDE CAB–FORWARD



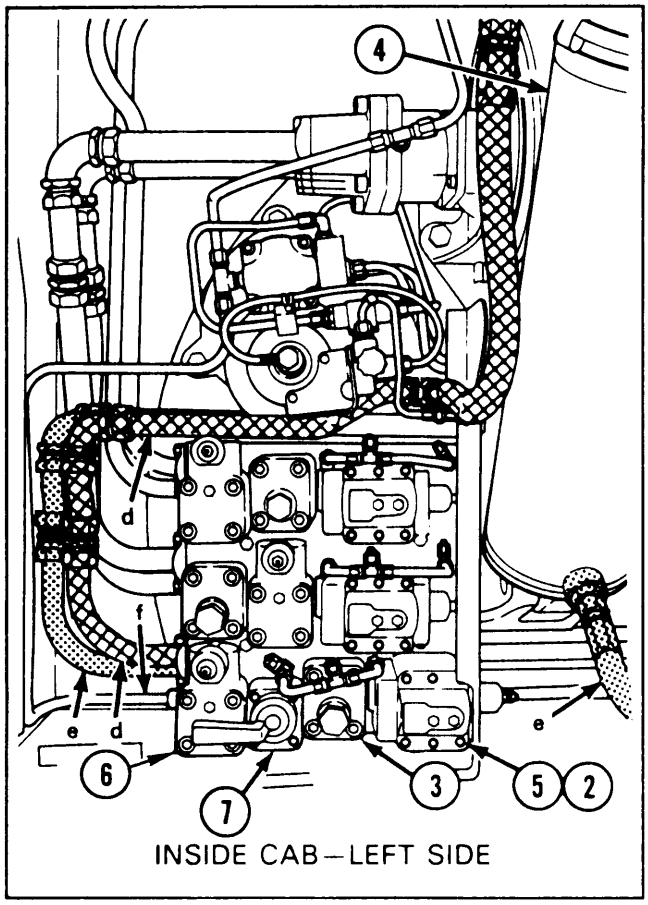
LEGEND

1 Directional control valve
2 Flow control valve, P/O valve (5)
3 Check valve
4 Hydraulic cylinder
5 Relief valve
6 Relief valve
7 Emergency release valve

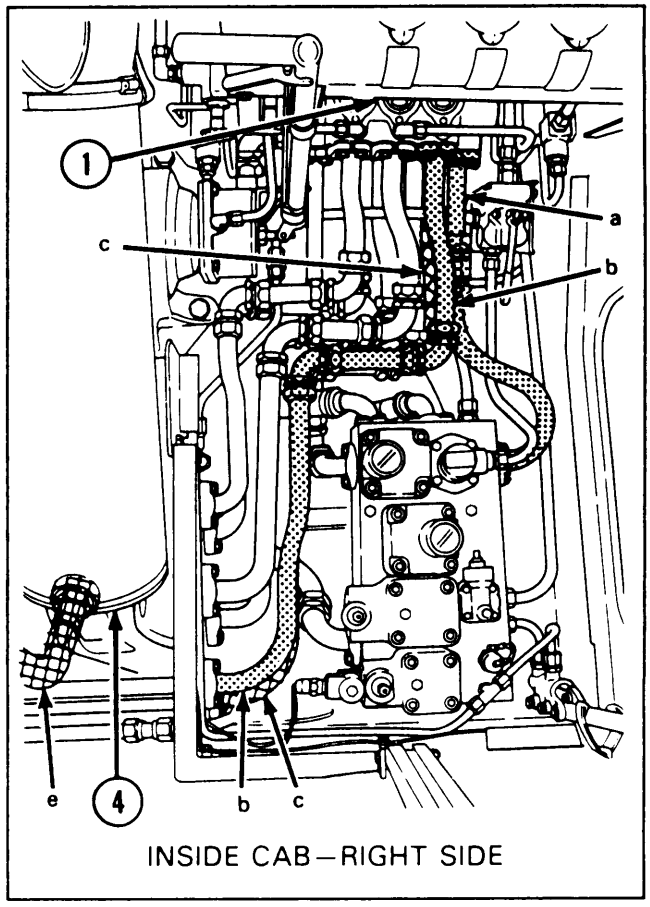
BAR CODE

Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank

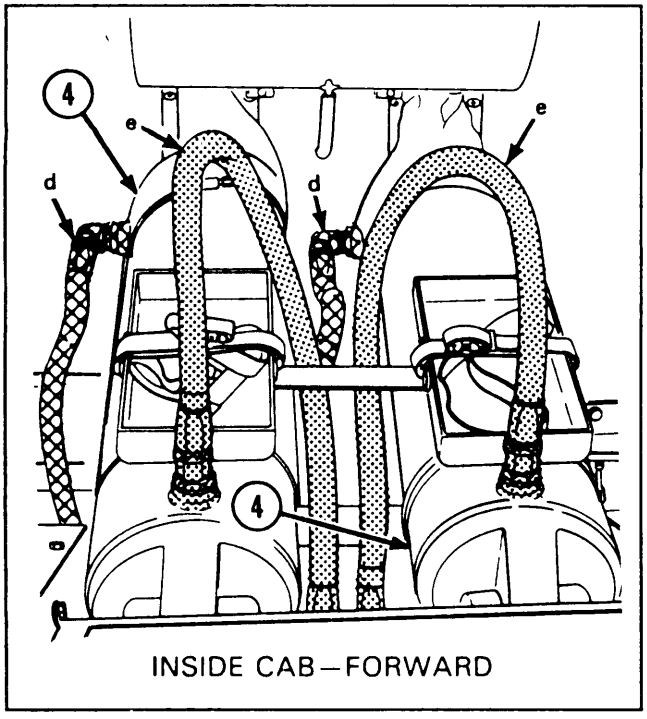
F-17. BOOM CYLINDER HYDRAULIC SUBSYSTEM–RAISING BOOM.



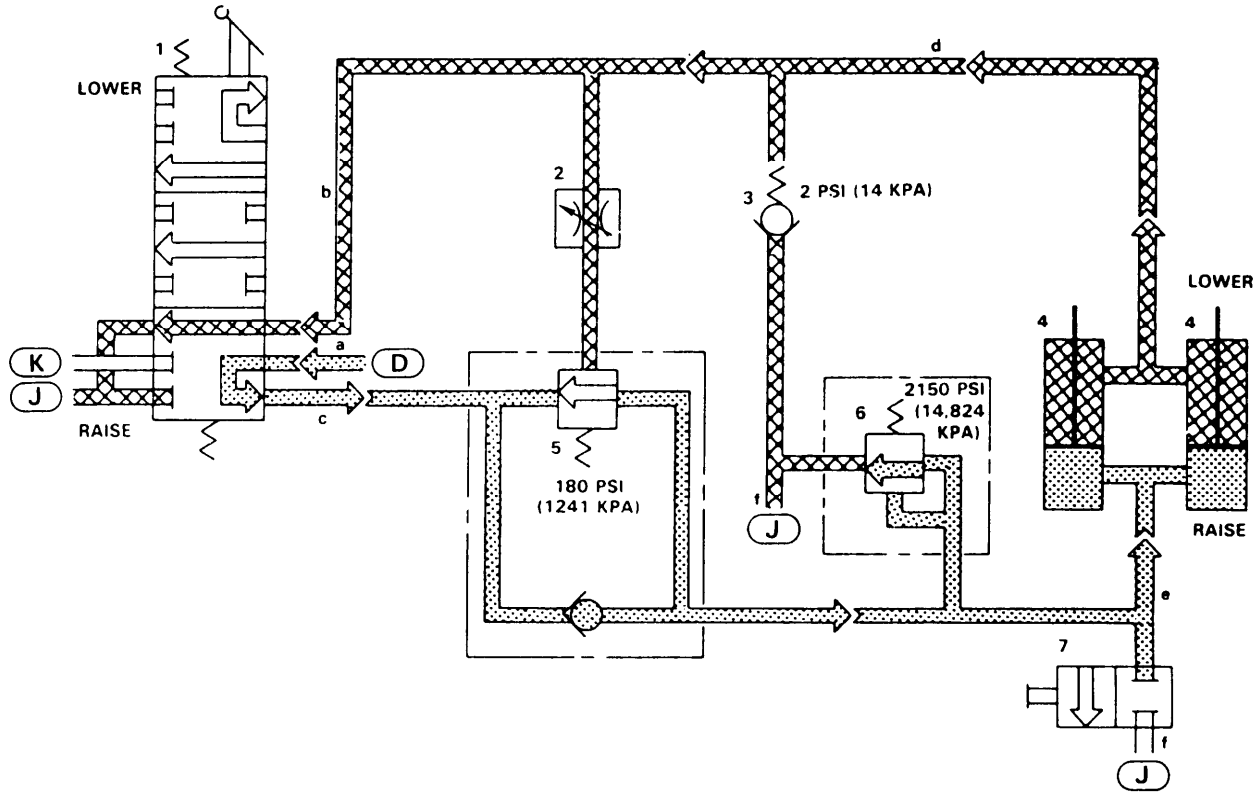
INSIDE CAB–LEFT SIDE



INSIDE CAB–RIGHT SIDE



INSIDE CAB–FORWARD



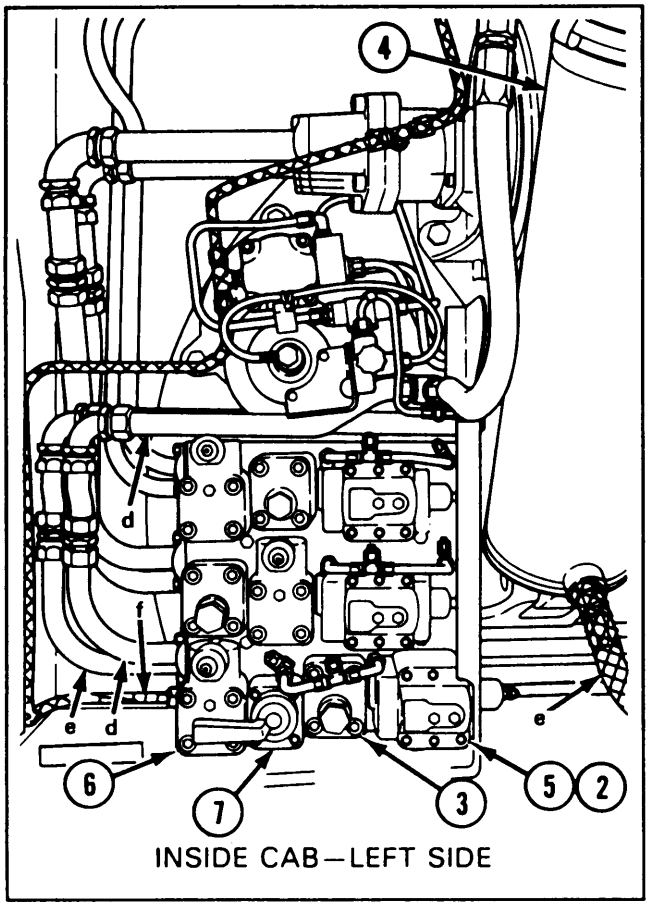
LEGEND

1 Directional control valve
2 Flow control valve, P/O valve (5)
3 Check valve
4 Hydraulic cylinder
5 Relief valve
6 Relief valve
7 Emergency release valve

BAR CODE

Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank

F-18. BOOM CYLINDER HYDRAULIC SUBSYSTEM–MANUAL LOWERING.



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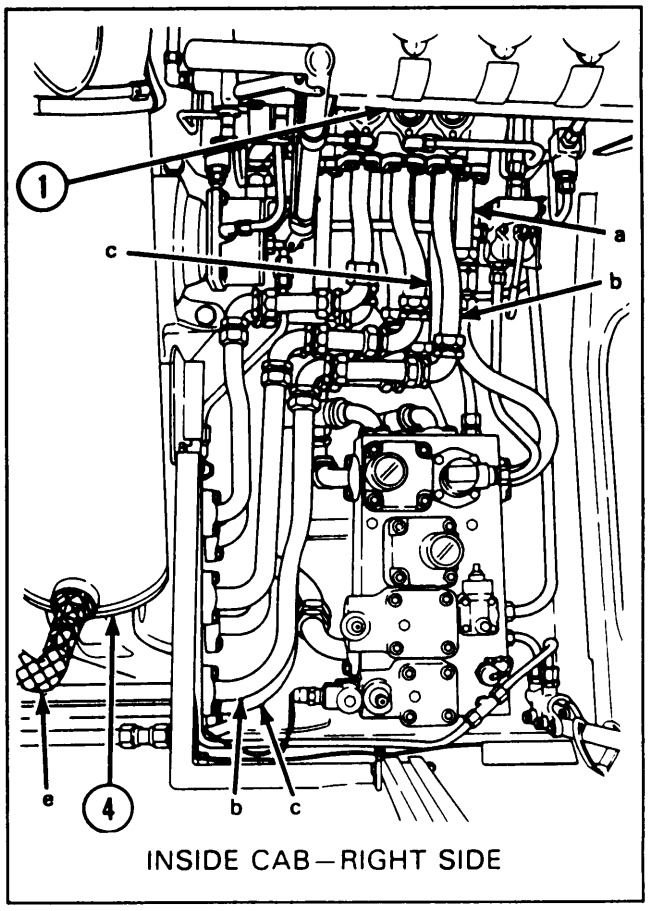
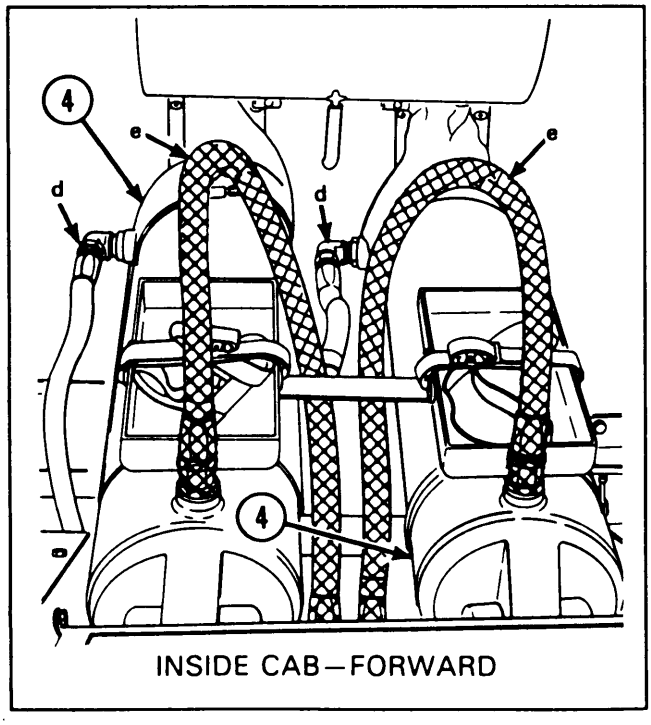
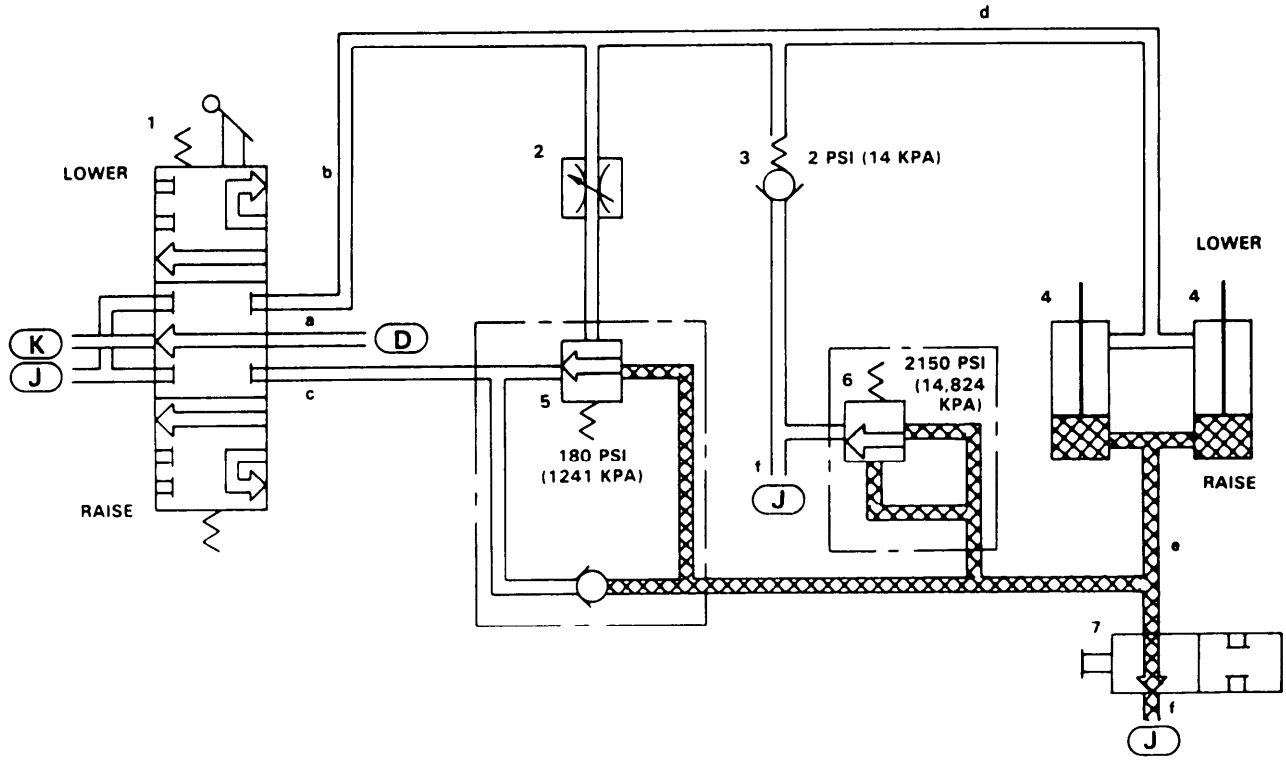


INSIDE CAB—RIGHT SIDE



INSIDE CAB—FORWARD



LEGEND

1 Directional control valve
2 Flow control valve, P/O valve (5)
3 Check valve
4 Hydraulic cylinder
5 Relief valve
6 Relief valve
7 Emergency release valve

BAR CODE

Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank

F-19. TOW WINCH HYDRAULIC SUBSYSTEM.

Functional Description.

a. The hydraulic fluid power for the operation of the tow winch is supplied by the hydraulic power subsystem.

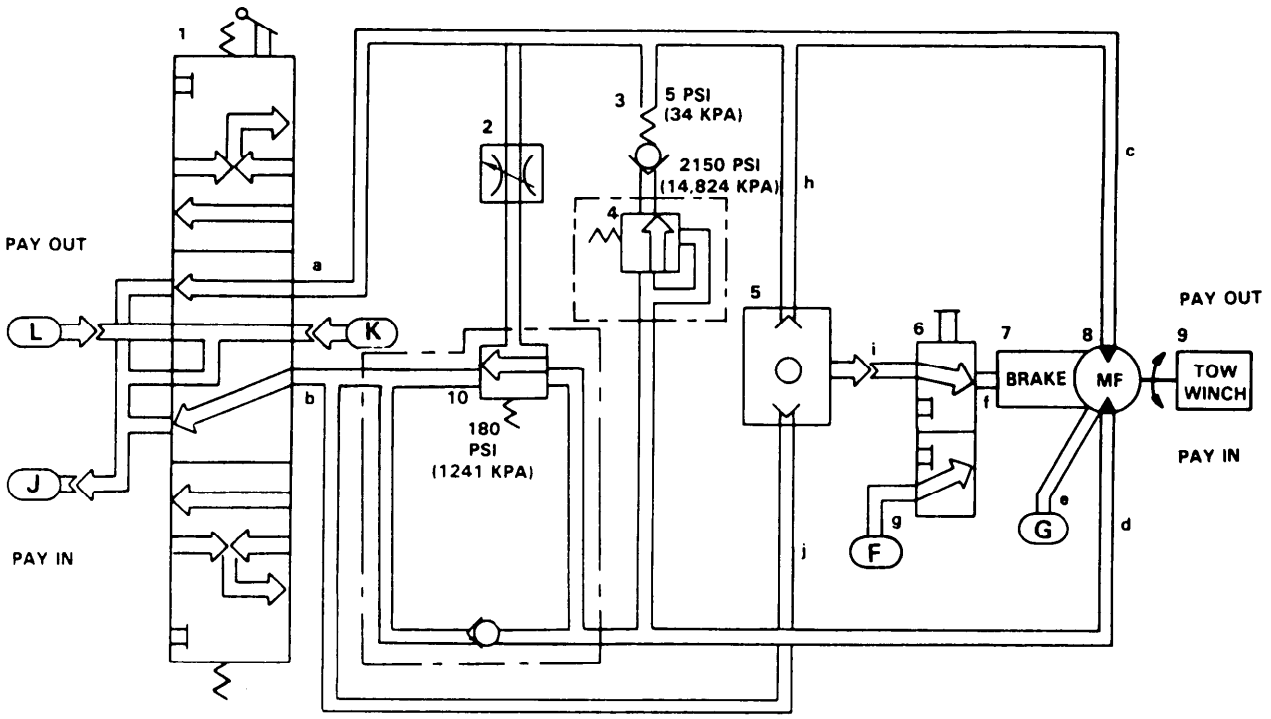
b. The tow winch hydraulic subsystem controls the power for tow winch operation when pulling or releasing a load.

c. Moving the handle of the directional control valve (1) in the PAY IN position directs hydraulic fluid to release brake (7) and operate the hydraulic motor (8) to retrieve the tow winch wire rope. Return fluid from the hydraulic motor (8) flows through the pressure relief valve (10) and the directional control valve (1), then to the reservoir. The relief valve (4) limits hydraulic pressure when paying in to 2150 psi (1 4,824 kPa) to protect winch components from overload.

d. Moving the handle of the directional control valve (1) in PAY OUT position has the same effect as in PAY IN except that the hydraulic fluid is routed in the opposite direction through the hydraulic motor (8). The relief valve (10) controls the rate of flow in the return line.

e. When the handle of the directional control valve (1) is in the neutral position, hydraulic fluid from both 40 gpm hydraulic pumps flows through the open center port to the reservoir.

f. If the boom winch is used at the same time that the tow winch is being used, the tow winch operation will be slowed down in proportion to boom winch use.



LEGEND

1 Directional control valve
2 Flow control valve, P/O valve (10)
3 Check valve
4 Relief valve
5 Shuttle valve
6 Brake release valve
7 Brake
8 Hydraulic motor
9 Winch
10 Relief valve

BAR CODE

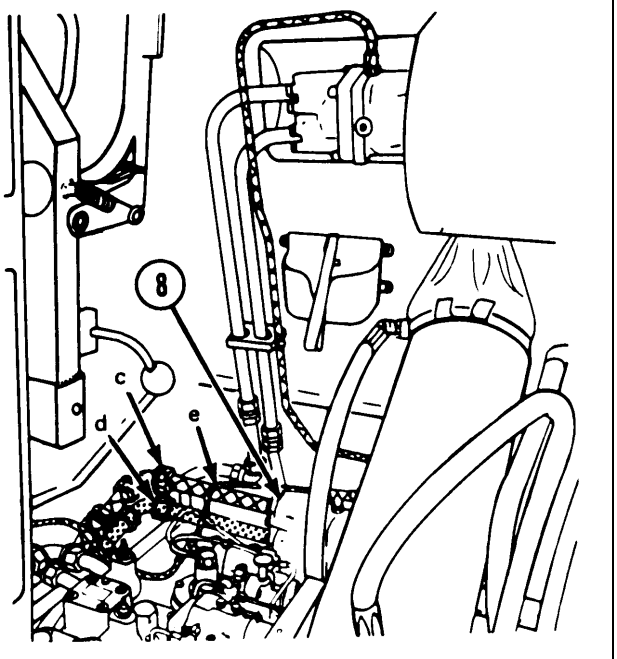
Supply pressure

Intake or return

Pilot or reduced pressure

Inactive blank

F-20. TOW WINCH HYDRAULIC SUBSYSTEM–PAYING IN.



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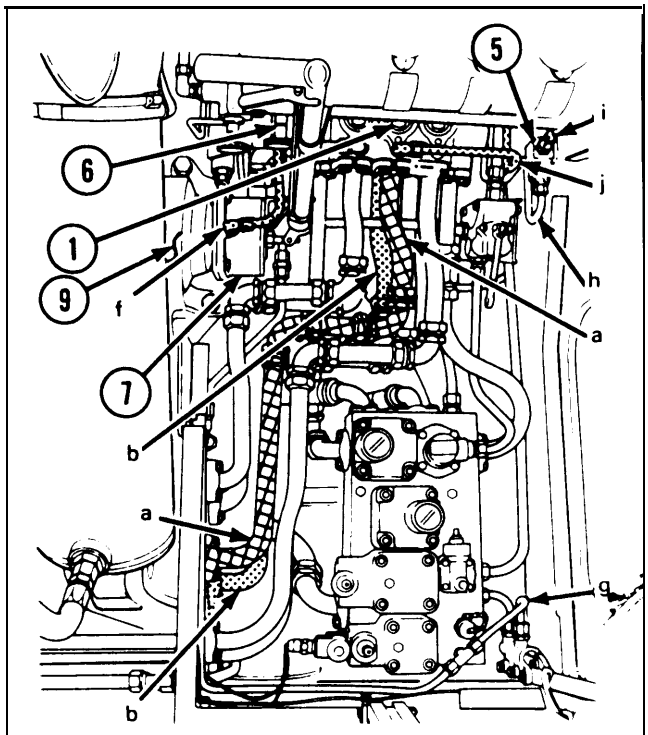
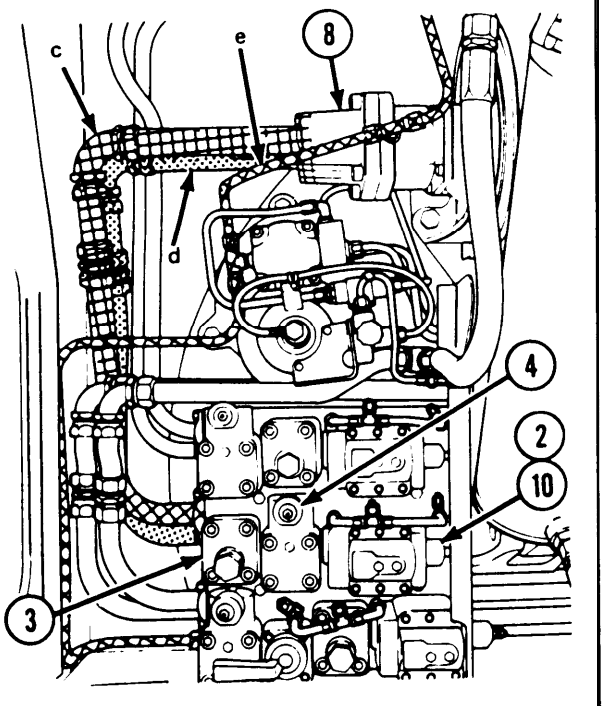
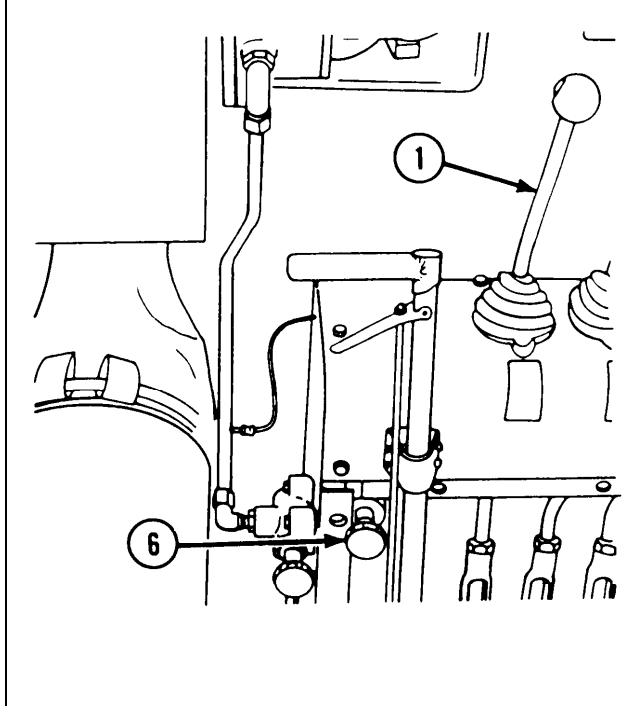


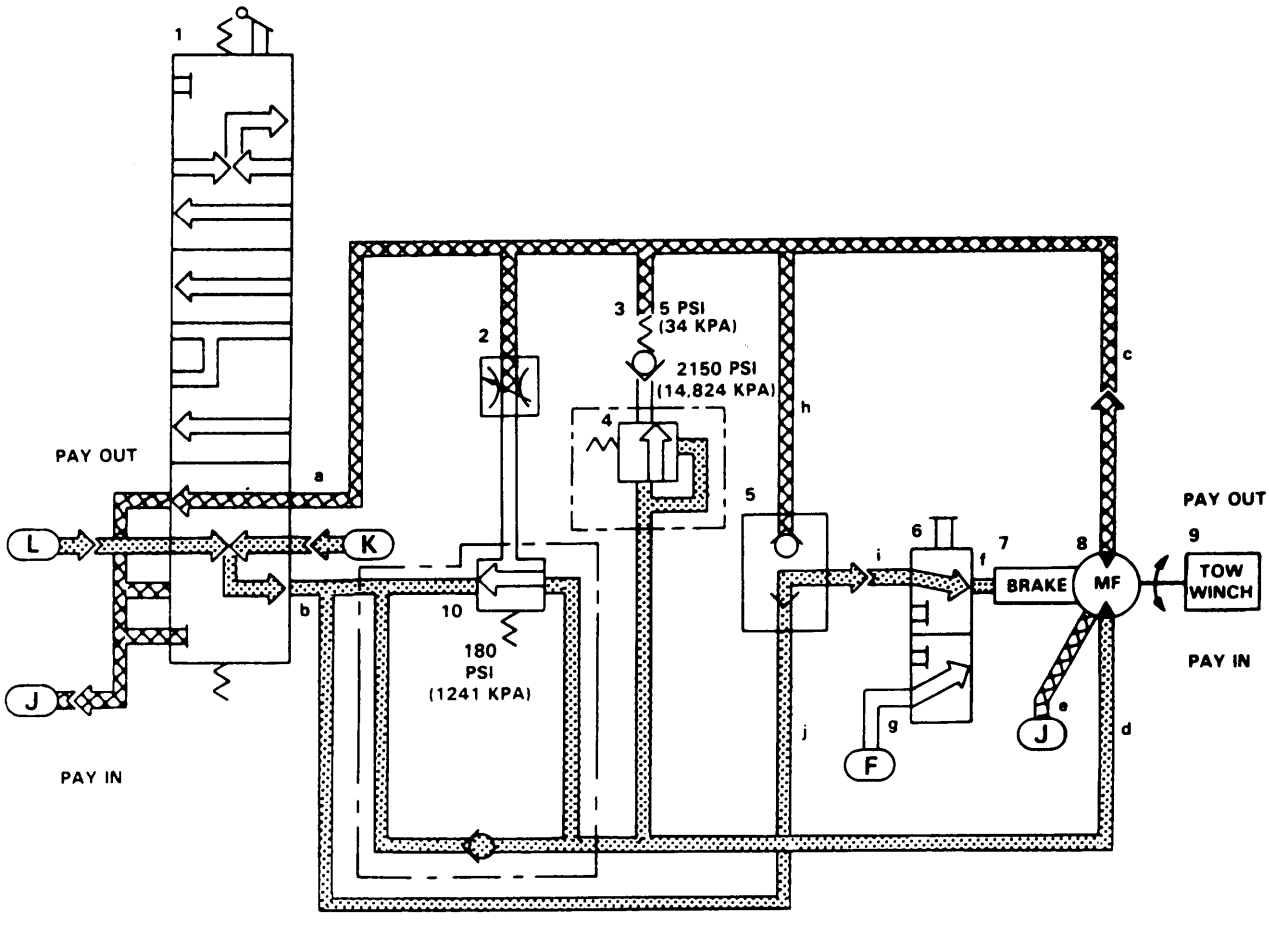
INSIDE CAB–LOWER RIGHT SIDE



INSIDE CAB–LOWER LEFT SIDE



INSIDE CAB–UPPER RIGHT SIDE



LEGEND

1 Directional control valve
2 Flow control valve, P/O valve (10)
3 Check valve
4 Relief valve
5 Shuttle valve
6 Brake release valve
7 Brake
8 Hydraulic motor
9 Winch
10 Relief valve

BAR CODE

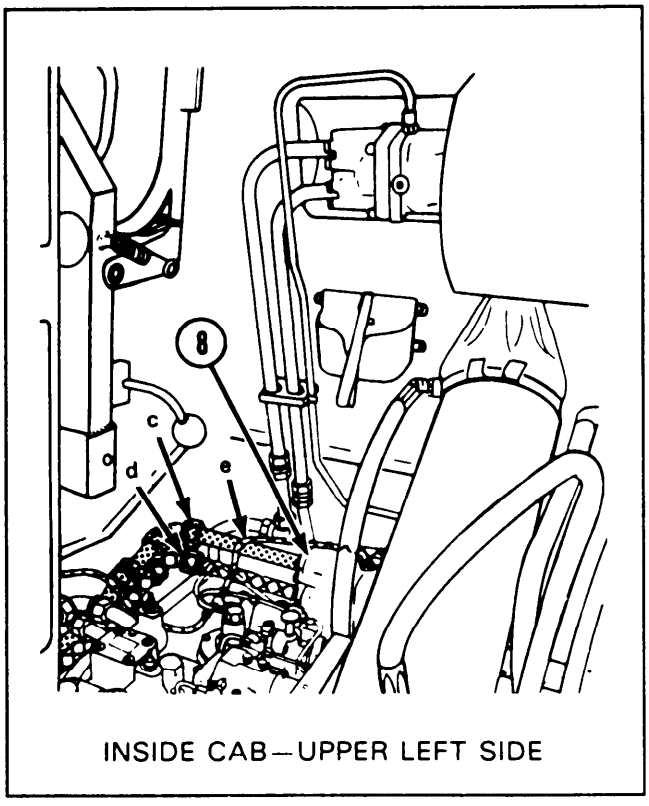
Supply pressure

Intake or return

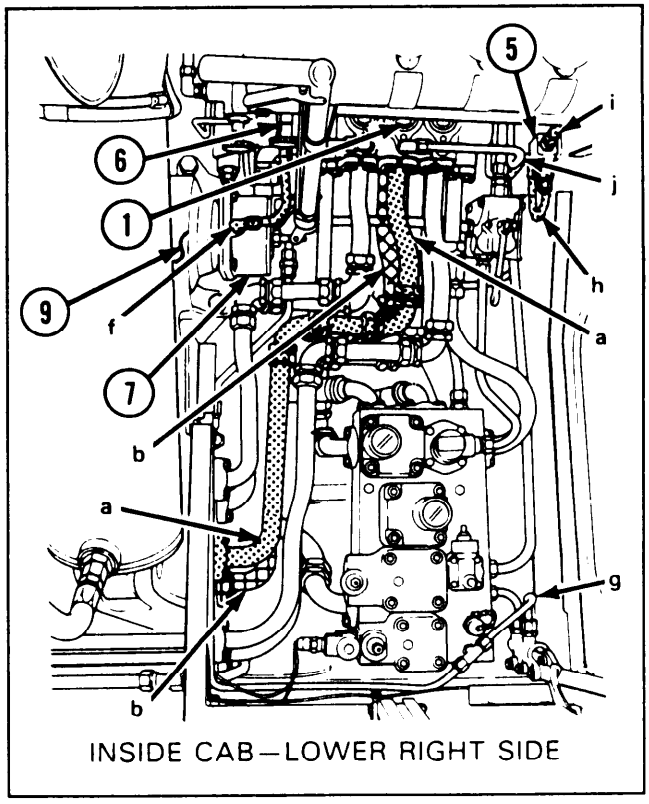
Pilot or reduced pressure

Inactive blank

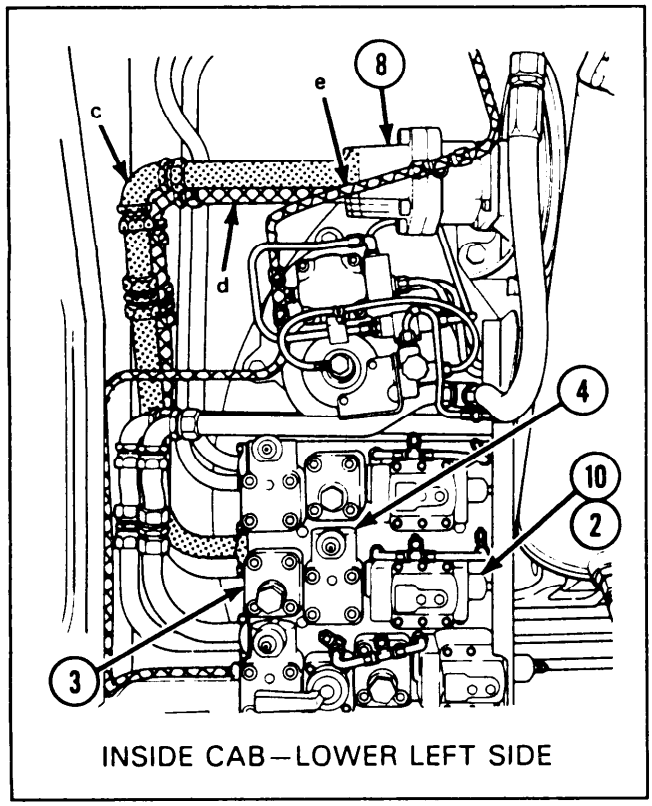
F-21. TOW WINCH HYDRAULIC SUBSYSTEM–PAYING OUT.



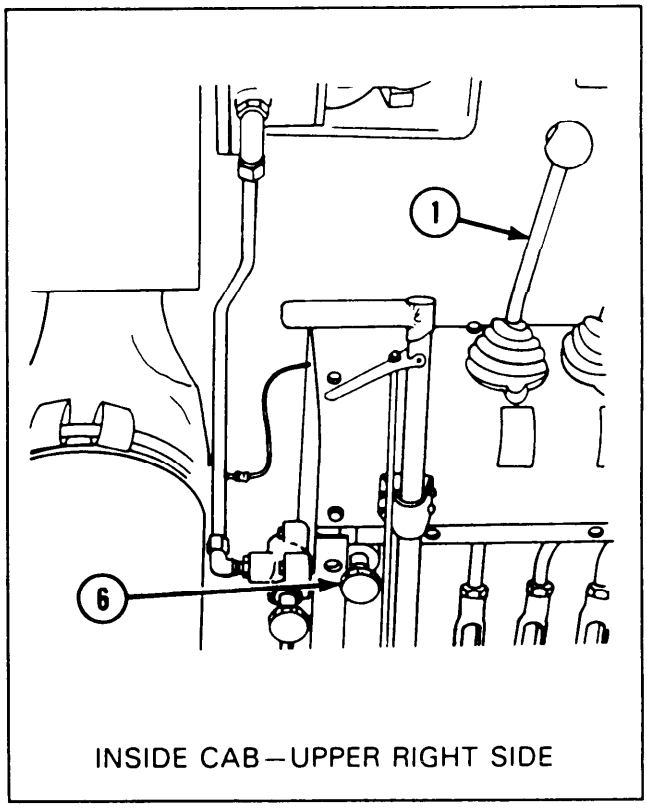
INSIDE CAB—UPPER LEFT SIDE



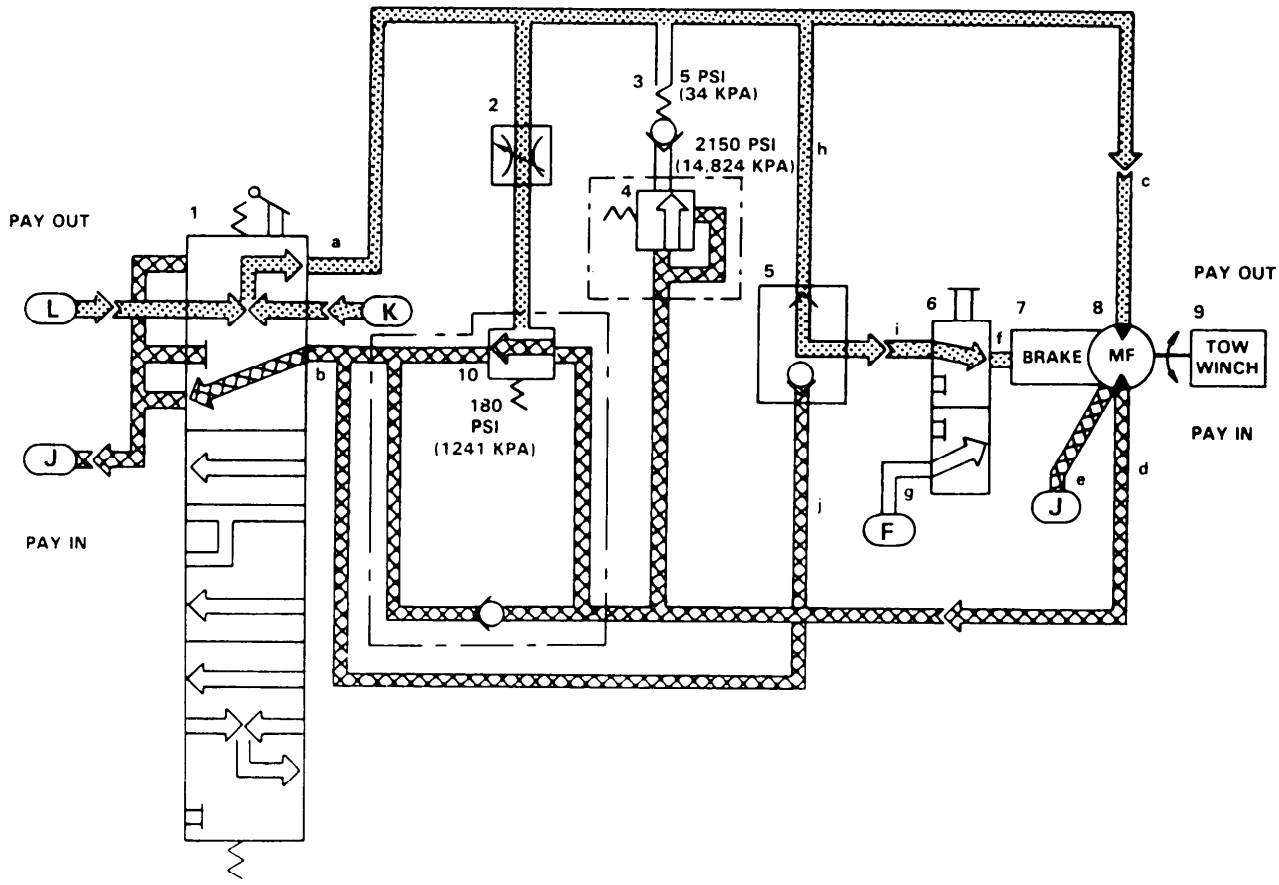
INSIDE CAB—LOWER RIGHT SIDE



INSIDE CAB—LOWER LEFT SIDE



INSIDE CAB—UPPER RIGHT SIDE



LEGEND

1 Directional control valve
2 Flow control valve, P/O valve (10)
3 Check valve
4 Relief valve
5 Shuttle valve
6 Brake release valve
7 Brake
8 Hydraulic motor
9 Winch
10 Relief valve

BAR CODE

Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank

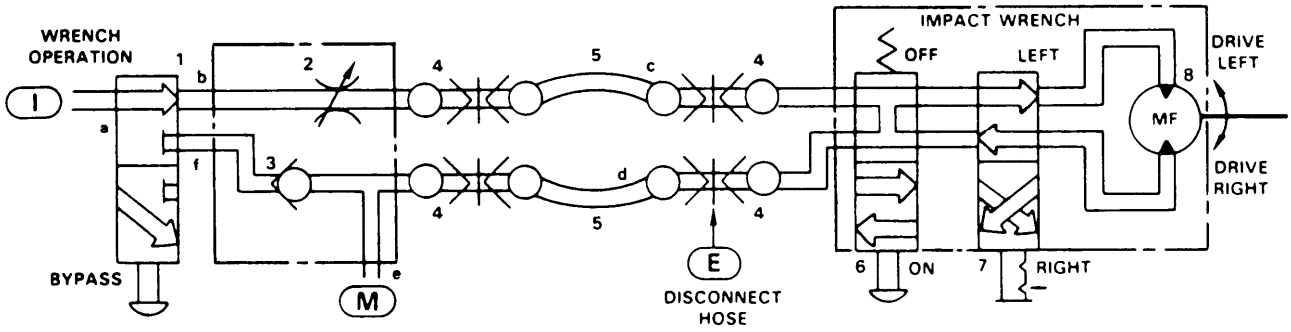
F-22. IMPACT WRENCH HYDRAULIC SUBSYSTEM.

Functional Description.

a. Hydraulic fluid power for the operation of the impact wrench is supplied by the 8 gpm pump of the hydraulic power subsystem.

b. The impact wrench hydraulic subsystem is a continuous flow system, which allows return fluid from the impact wrench to continue on to the spade hydraulic subsystem, During impact wrench operation, the impact wrench is connected to the flow control manifold by means of flexible hoses and quick-disconnect couplings.

c. Pulling out the two-way valve (1) allows hydraulic fluid to flow through the flow control valve (2), through quick-disconnects (4) and the extension hose (5), and on to the impact wrench. Then by pressing the control trigger of the selector valve (6), hydraulic fluid passes through the directional control valve (7) to the hydraulic motor (8). The hydraulic motor (8) rotates in either a clockwise or counterclockwise direction, depending upon the setting of the directional control valve (7). The speed of the hydraulic motor (8) is controlled by adjusting the flow control valve (2).



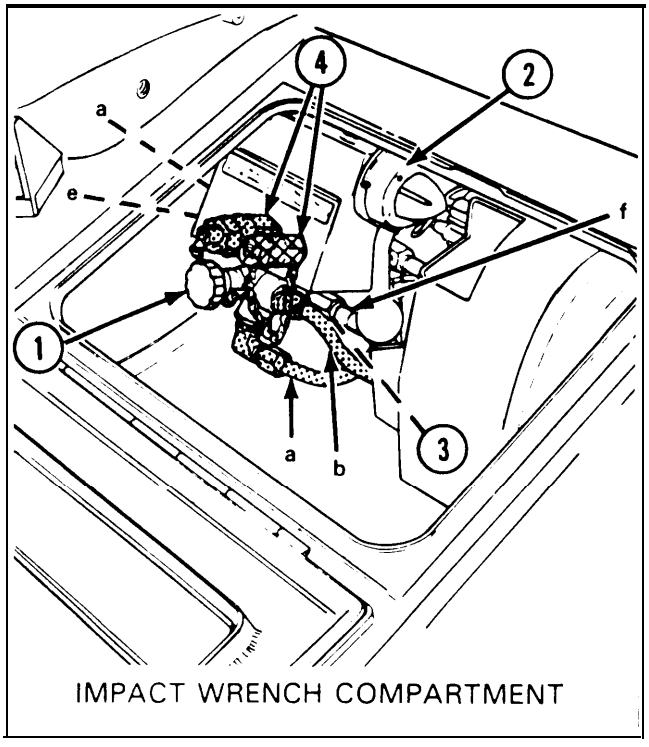
LEGEND

1 Two-way valve
2 Flow control valve
3 Check valve
4 Quick-disconnect coupling
5 Extension hose
6 Selector valve
7 Directional control valve
8 Hydraulic motor

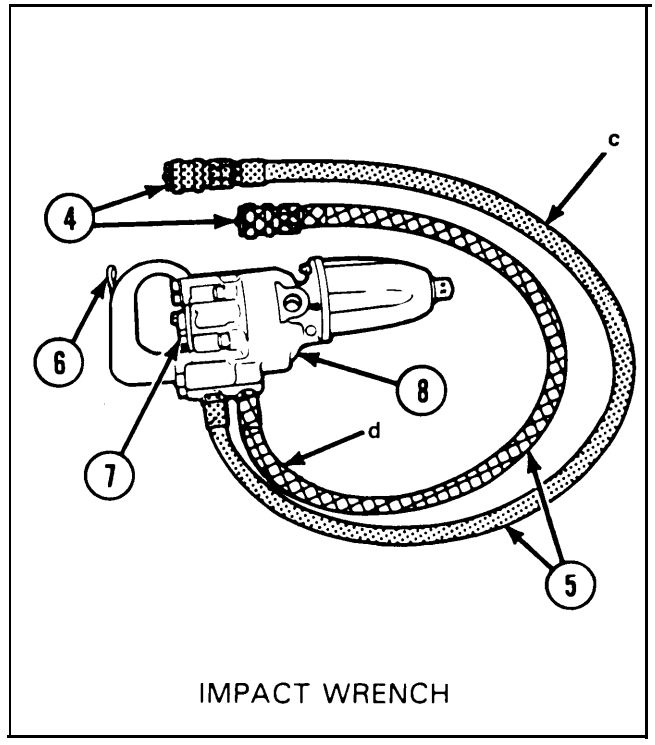
BAR CODE

Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank

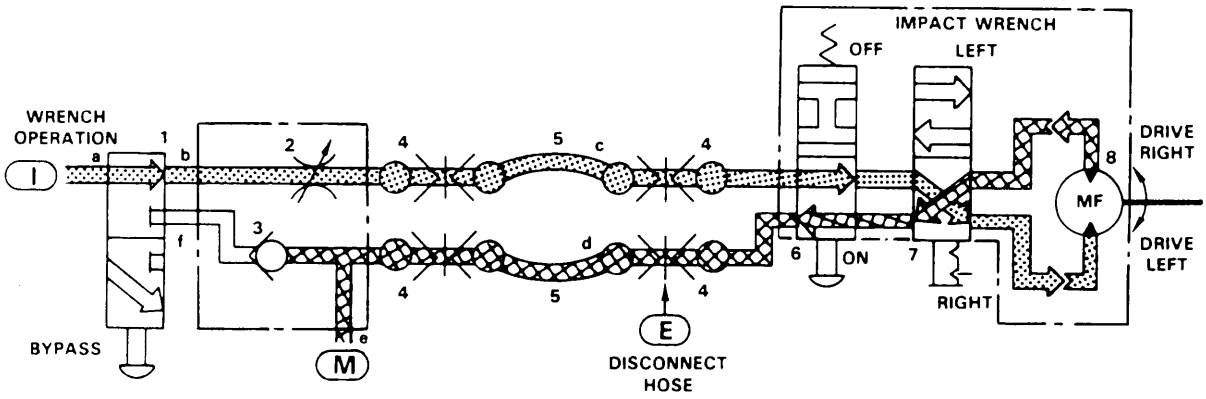
F-23. IMPACT WRENCH HYDRAULIC SUBSYSTEM–DRIVING RIGHT.



IMPACT WRENCH COMPARTMENT



IMPACT WRENCH



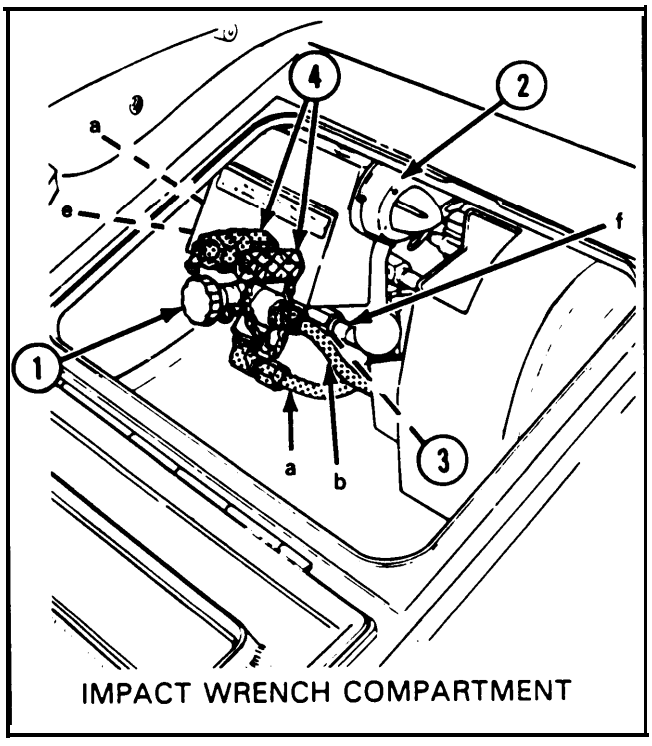
LEGEND

1 Two-way valve
2 Flow control valve
3 Check valve
4 Quick-disconnect coupling
5 Extension hose
6 Selector valve
7 Directional control valve
8 Hydraulic motor

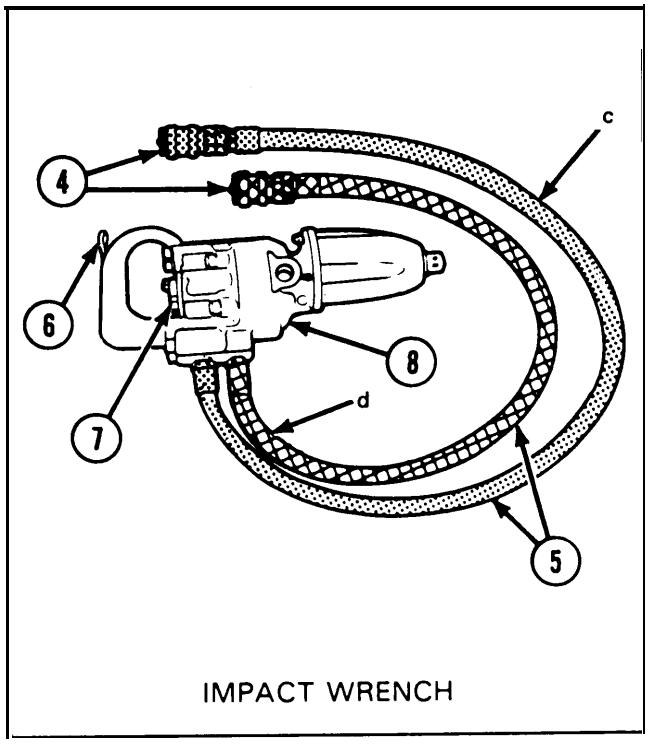
BAR CODE

Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank

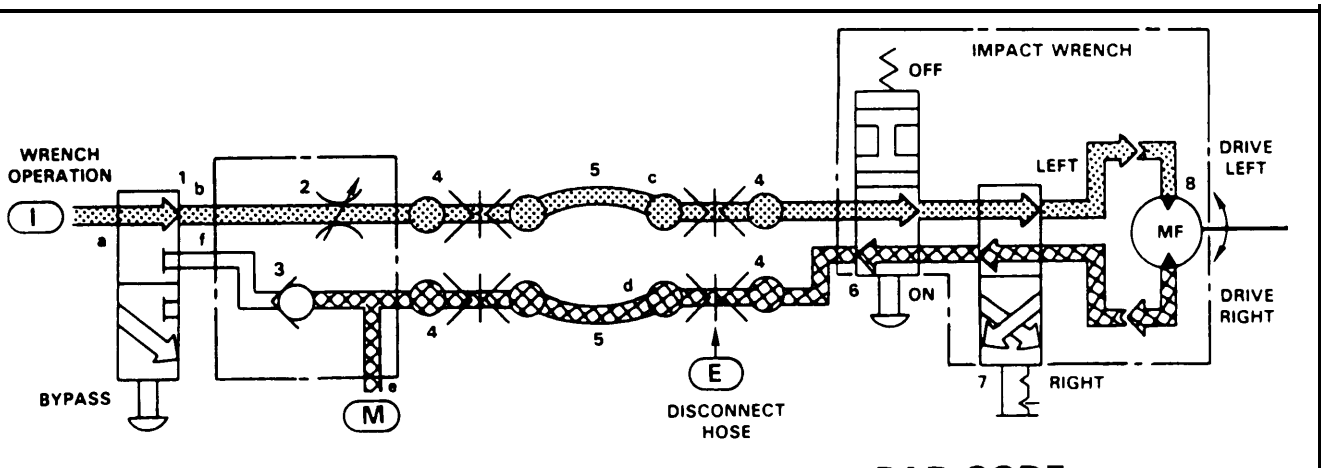
F-24. IMPACT WRENCH HYDRAULIC SUBSYSTEM–DRIVING LEFT.



IMPACT WRENCH COMPARTMENT



IMPACT WRENCH



LEGEND

1 Two-way valve
2 Flow control valve
3 Check valve
4 Quick-disconnect coupling
5 Extension hose
6 Selector valve
7 Directional control valve
8 Hydraulic motor

BAR CODE

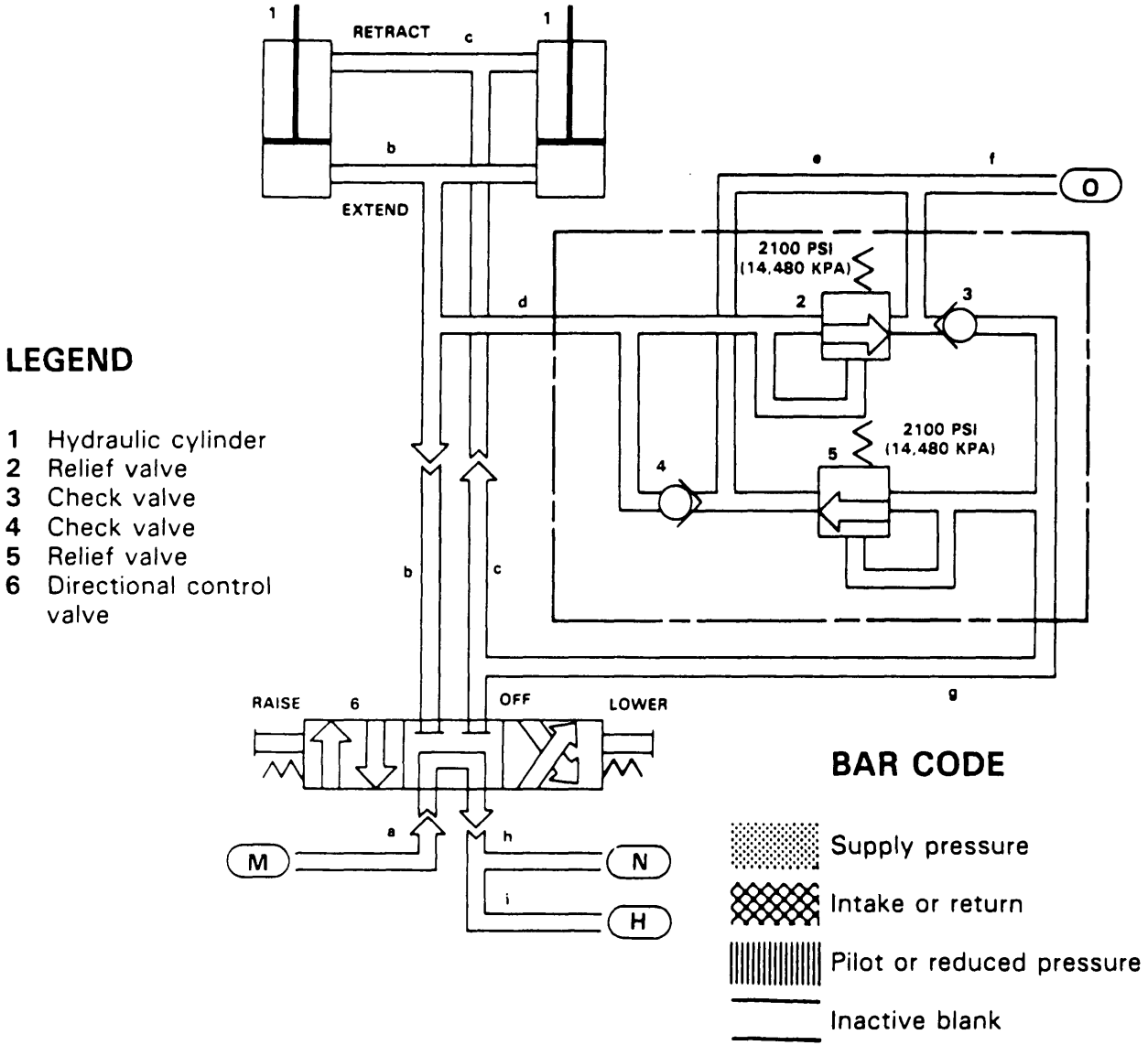
Supply pressure
Intake or return
Pilot or reduced pressure
Inactive blank

F-25. SPADE HYDRAULIC SUBSYSTEM.

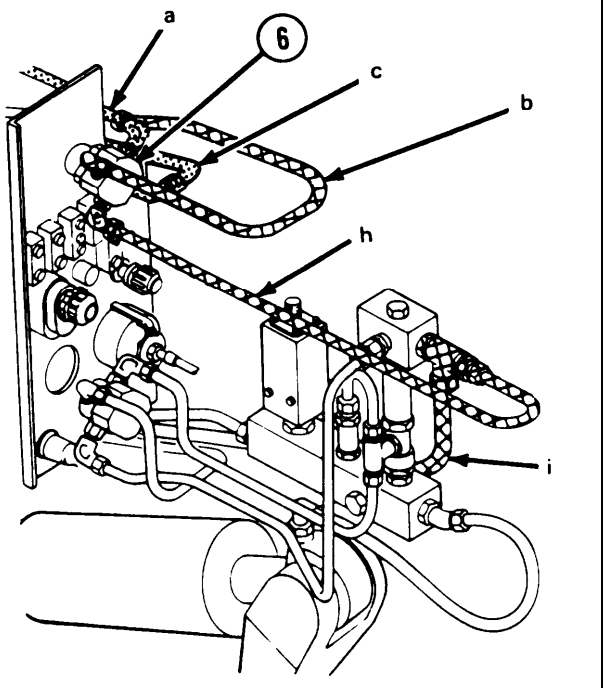
Functional Description.

a. The hydraulic fluid power for the operation of the spade (spade cylinders) is supplied by the 8 gpm pump of the hydraulic power subsystem. The spade hydraulic subsystem controls the power for raising or lowering the spade.

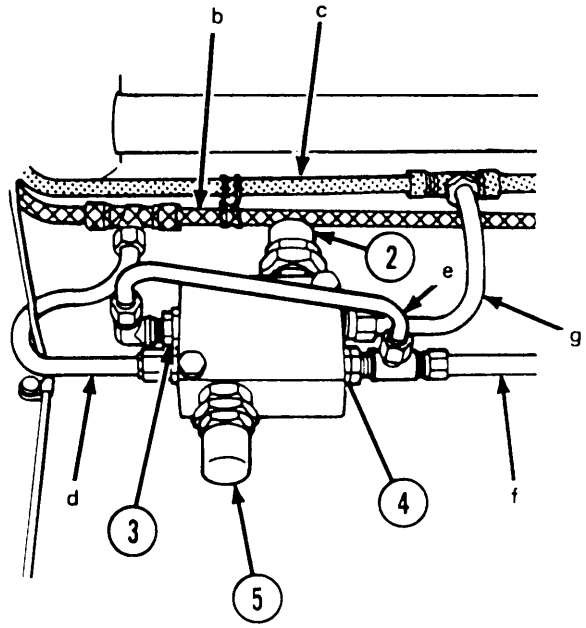
b. Moving the handle of the directional control valve (6) in the LOWER position directs hydraulic fluid to retract hydraulic cylinders (1). The relief valves (2 and 5) protect the subsystem when external forces on the spade create excessive pressure, Pressure over 2100 psi (14,480 kPa) is relieved to the other side of the hydraulic cylinders (1). Moving the handle of the directional control valve (6) in the RAISE position has the same effect as in the LOWER position except that the hydraulic fluid is routed to extend the hydraulic cylinder (1), raising the spade.



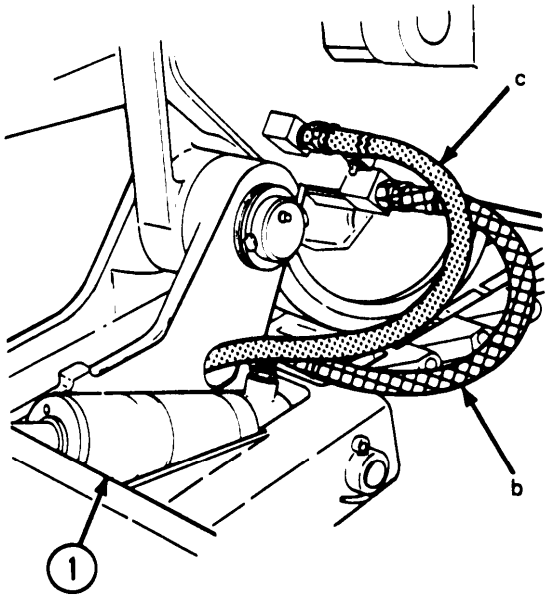
F-26. SPADE HYDRAULIC SUBSYSTEM–RETRACTING SPADE CYLINDERS.



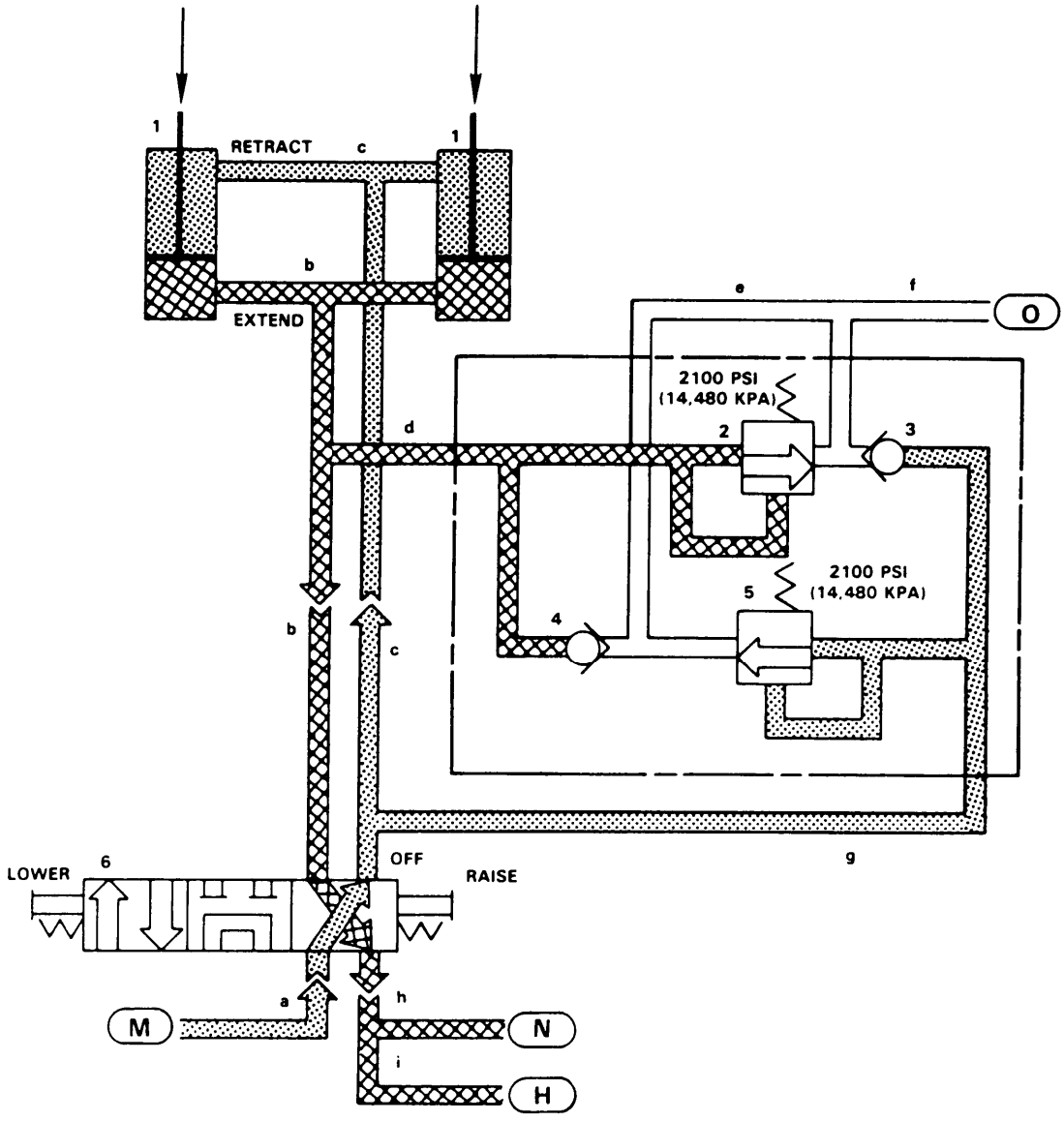
BEHIND DRIVER'S SWITCH PANEL



TURRET WELL—RIGHT REAR



REAR OF VEHICLE



LEGEND

1 Hydraulic cylinder
2 Relief valve
3 Check valve
4 Check valve
5 Relief valve
6 Directional control valve

BAR CODE

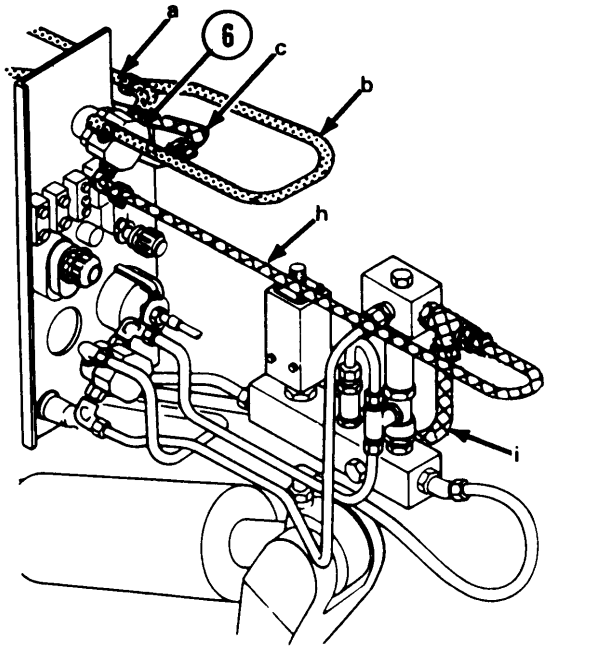
Supply pressure

Intake or return

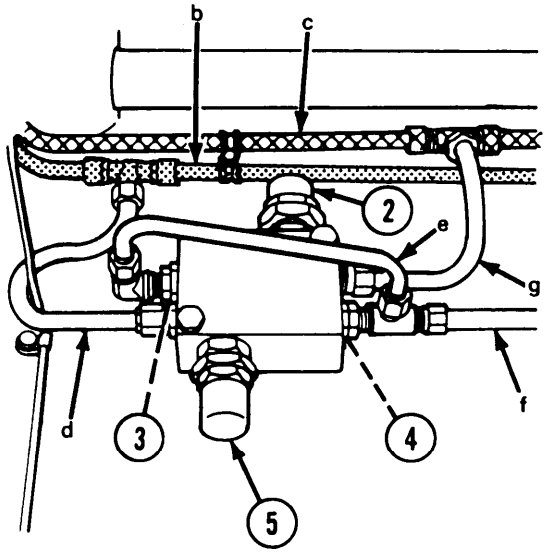
Pilot or reduced pressure

Inactive blank

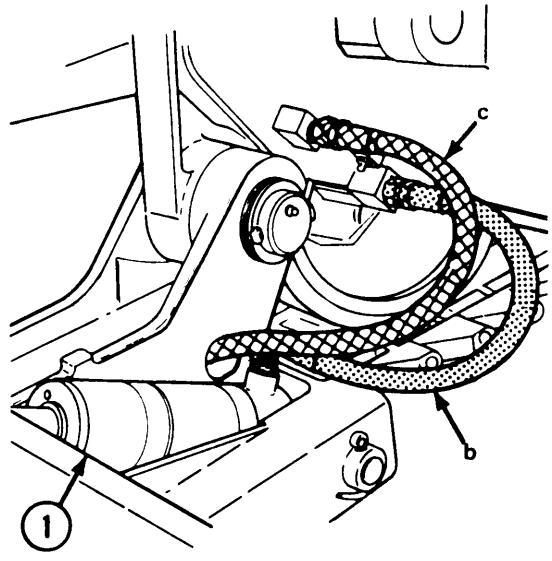
F-27. SPADE HYDRAULIC SUBSYSTEM–EXTENDING SPADE CYLINDERS.



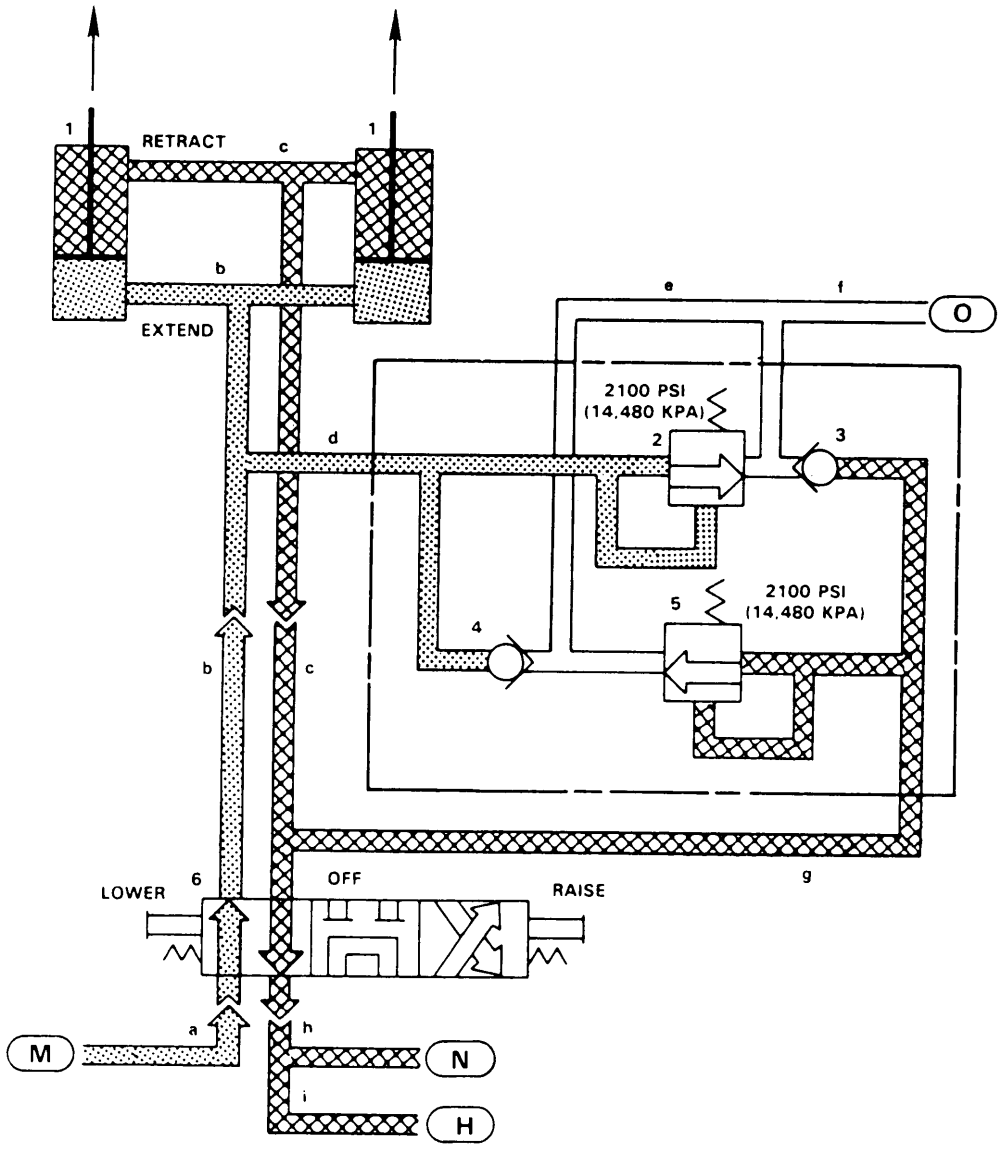
BEHIND DRIVER'S SWITCH PANEL



TURRET WELL–RIGHT REAR



REAR OF VEHICLE



LEGEND

1 Hydraulic cylinder
2 Relief valve
3 Check valve
4 Check valve
5 Relief valve
6 Directional control valve

BAR CODE

Supply pressure

Intake or return

Pilot or reduced pressure

Inactive blank

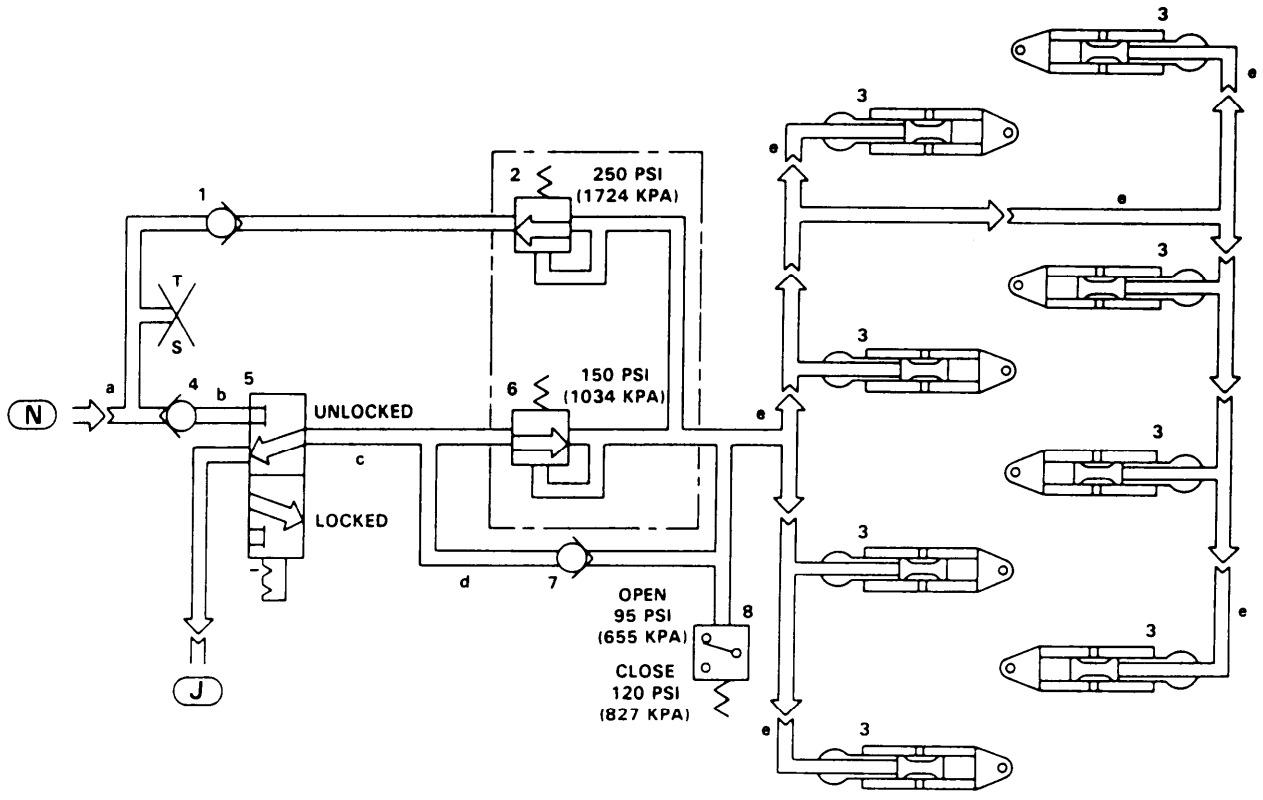
F-28. SUSPENSION LOCKOUT HYDRAULIC SUBSYSTEM.

Functions/Description.

a. The suspension lockout hydraulic subsystem forms a hydrostatic lock within each lockout cylinder (3). This stops up and down movement of the road wheels and provides a solid hoisting platform.

b. Lockout cylinders (3) are locked by setting the selector control valve (5) to LOCKED. Hydraulic fluid at 1600 to 2400 psi (11,032 to 16,548 kPa) flows through the valve (5) to the valve (6). The valve (6) reduces the fluid pressure to 150 psi (1034 kPa). As the fluid pressure builds up in the lockout cylinders (3), the lockout pistons are forced into the lockout position. This prevents hydraulic fluid from passing from one side of the cylinder piston to the other. The pressure switch (8) is closed when pressure in the lockout cylinder is over 120 psi (827 kPa), lighting the SUSPENSION LOCKED indicator lights. When the hydraulic pressure drops below 95 psi (655 kPa), the pressure switch (8) opens, putting out the SUSPENSION LOCKED indicator lights.

c. The subsystem is protected from overpressure by the relief valve (2), which bypasses fluid over 240 psi (1 655 kpa) back to the reservoir. The cylinders (3) are unlocked by setting the valve (5) to UNLOCKED. This allows the hydraulic fluid to flow back to the reservoir.



LEGEND

1 Check valve
2 Relief valve
3 Lockout cylinder
4 Check valve
5 Selector valve
6 Reducing valve, P/O valve (2)
7 Check valve
8 Pressure switch

BAR CODE

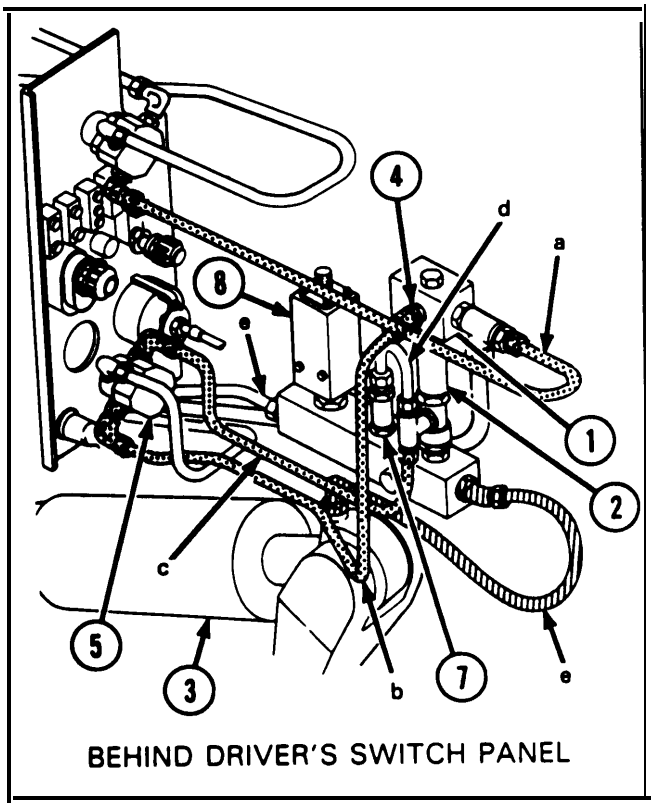
Supply pressure

Intake or return

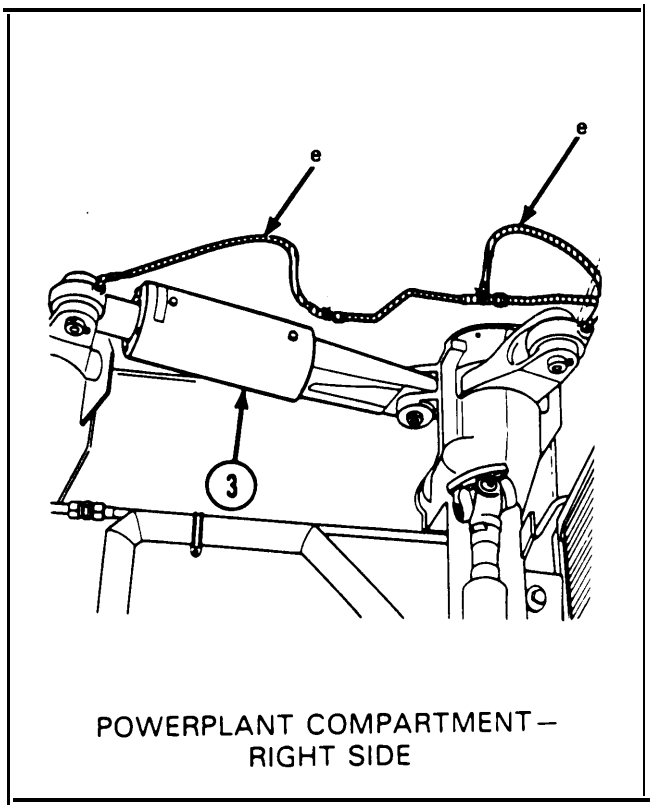
Pilot or reduced pressure

Inactive blank

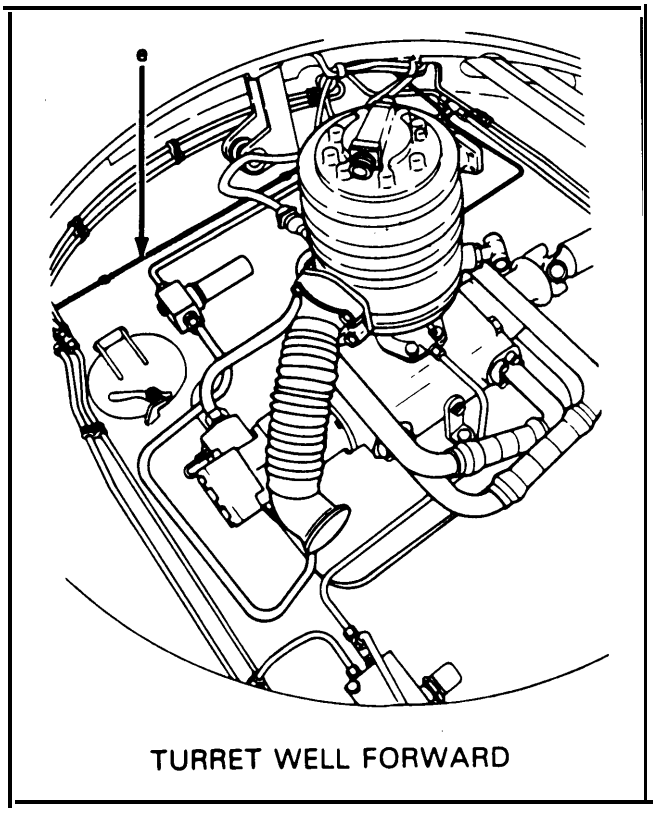
F-29. SUSPENSION LOCKOUT HYDRAULIC SUBSYSTEM –CYLINDERS LOCKED.



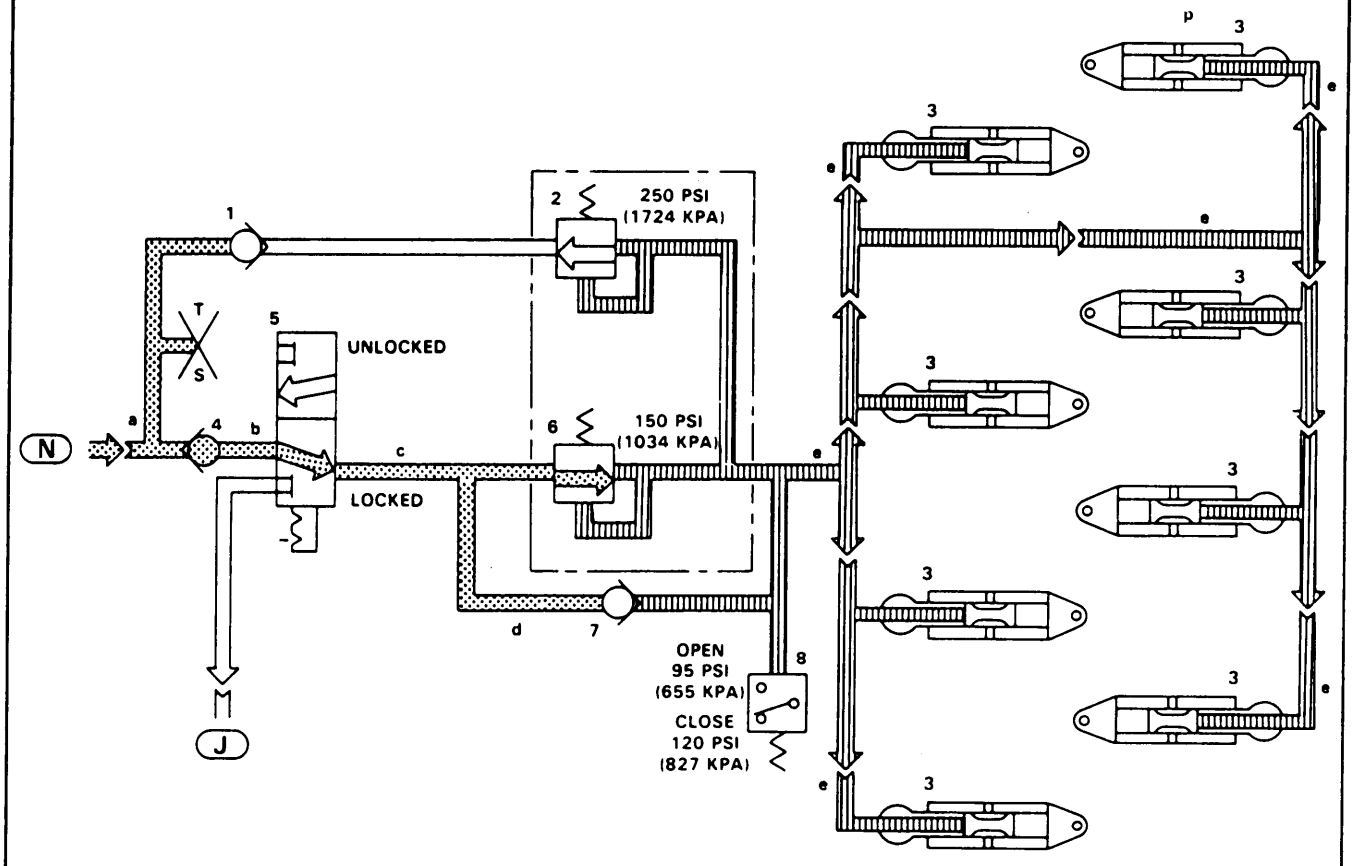
BEHIND DRIVER'S SWITCH PANEL



POWERPLANT COMPARTMENT–
RIGHT SIDE



TURRET WELL FORWARD



LEGEND

1 Check valve
2 Relief valve
3 Lockout cylinder
4 Check valve
5 Selector valve
6 Reducing valve
7 Check valve
8 Pressure switch

BAR CODE

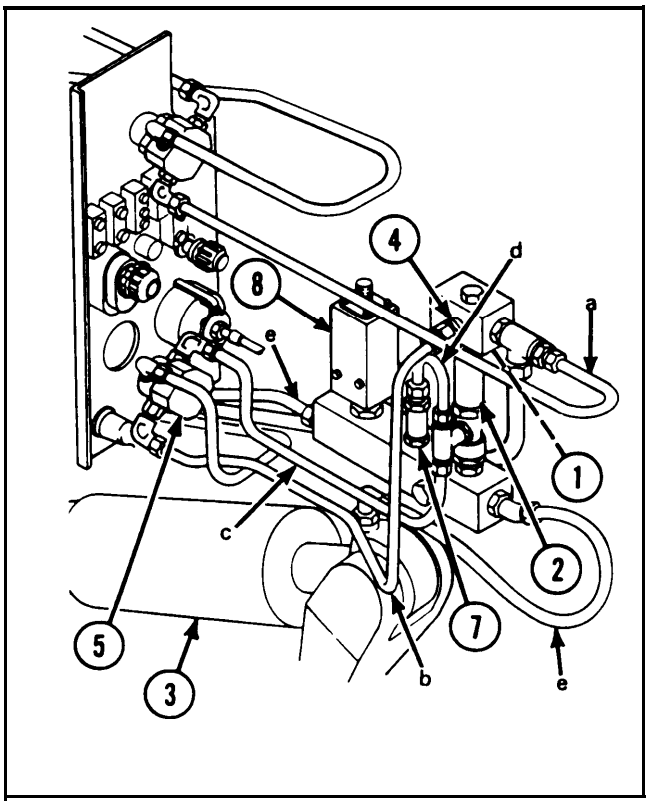
Supply pressure

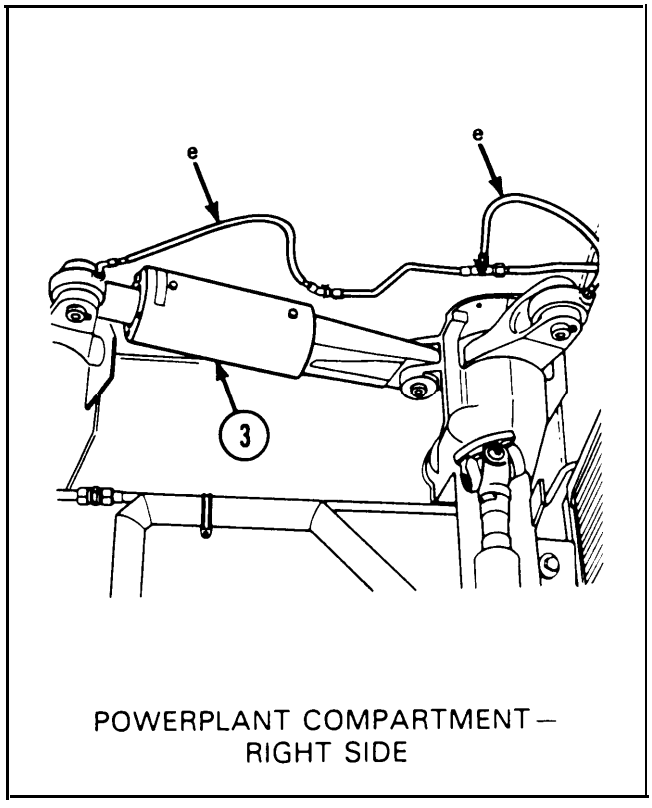
Intake or return

Pilot or reduced pressure

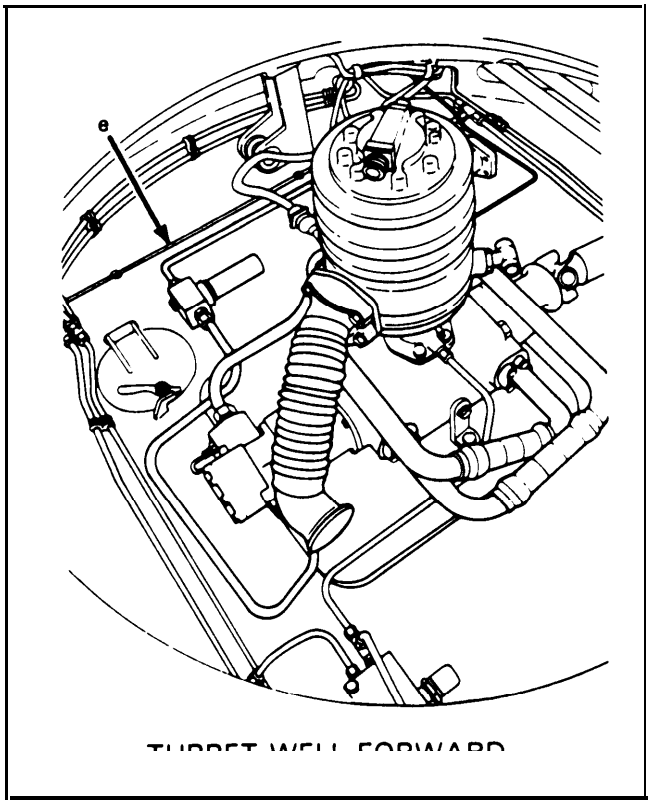
Inactive blank

F-30. SUSPENSION LOCKOUT HYDRAULIC SUBSYSTEM–CYLINDERS UNLOCKED.

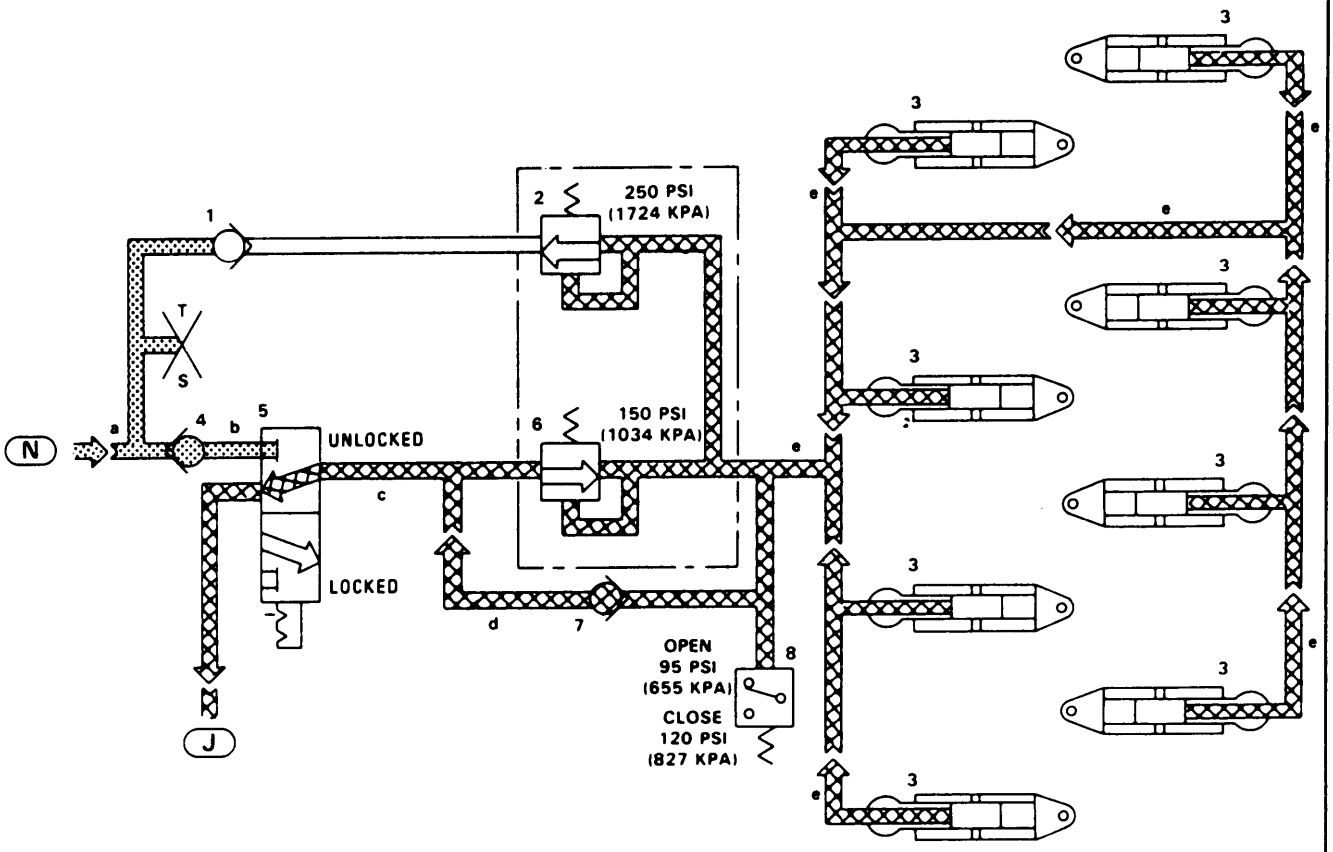




POWERPLANT COMPARTMENT – RIGHT SIDE



TURRET WELL FORWARD



LEGEND

1 Check valve
2 Relief valve
3 Lockout cylinder
4 Check valve
5 Selector valve
6 Reducing valve
7 Check valve
8 Pressure switch

BAR CODE

Supply pressure

Intake or return

Pilot or reduced pressure

Inactive blank

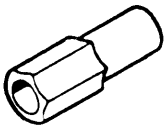
APPENDIX G
SPECIAL TOOLS AND EQUIPMENT

G-1. GENERAL. Repair parts, special tools, and support equipment are issued for maintaining the vehicle. Tools and equipment should not be used for purposes other than those prescribed. When not in use, they should be properly stowed.

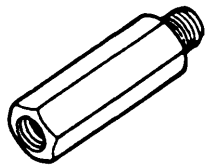
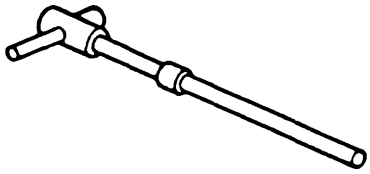
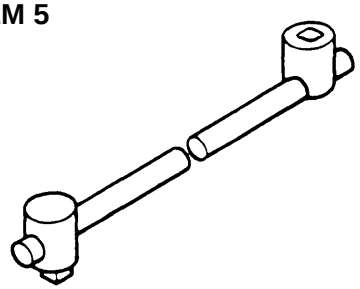
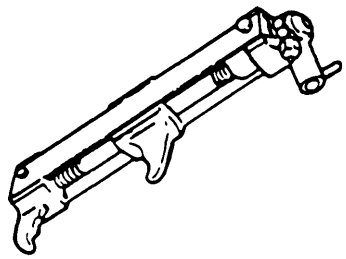
G-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT. Special tools and equipment necessary to perform the maintenance described in this manual are listed for your information. Special tools and support equipment are listed in TM 9-2350-238-24P-1, which is the authority for requisitioning replacements.

G-3. REPAIR PARTS. Repair parts are issued for the replacement of parts that have become worn, broken, or otherwise unserviceable. Repair parts are listed in TM 9-2350-238-24P-1, which is the authority for requisitioning replacements.

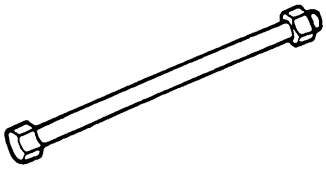
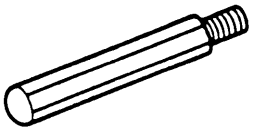
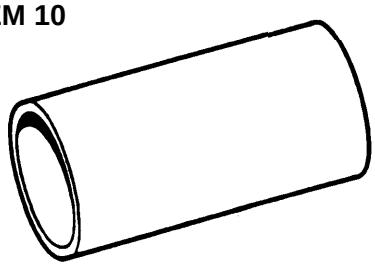
SPECIAL TOOLS AND EQUIPMENT

ITEM	NATIONAL STOCK NUMBER (PART NUMBER)	USE
ITEM 1  ADAPTER, IMPACT WIRE	5130-00-840-4872 (11592842)	Used with slide puller to remove track pin (para 2-151 and para 2-201).
ITEM 2 ADAPTER, PULLER	5120-00-708-2997 (7082997)	Used with slide puller to remove roadwheel arm (para 2-145) and idler wheel arm (para 2-148).

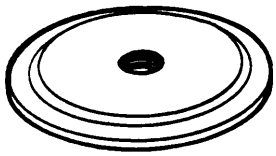
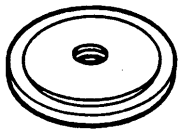
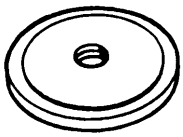
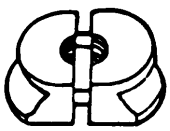
SPECIAL TOOLS AND EQUIPMENT (CONT)

ITEM	NATIONAL STOCK NUMBER (PART NUMBER)	USE
ITEM 3  **COUPLING, SHAFT, RIGID**	3010-00-733-8961 (109041 83)	Used with slide puller to remove torsion bar (para 2-143).
ITEM 4  **DRIFT PIN**	5120-00-708-3639 (7083639)	Used to remove broken torsion bar (para 2-143); used to remove track pin and connect track (para 2-151 and para 2-201).
ITEM 5  **EXTENSION, TORQUE WRENCH**	No NSN (No PN)	For fabrication instructions, notify direct support maintenance. Used to torque trailing idler eccentric bolts (para 2-148).
ITEM 6  **FIXTURE, TRACK CONNECTING**	5120-00-605-3926 (8741 739)	Used with socket wrench adapter and power wrench to connect track (para 2-151 and para 2-201).

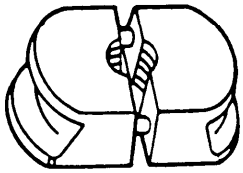
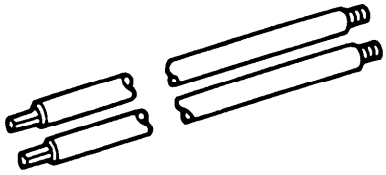
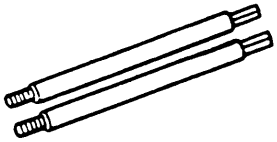
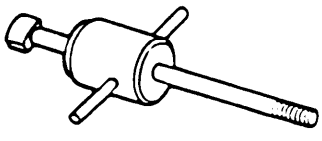
SPECIAL TOOLS AND EQUIPMENT (CONT)

ITEM	NATIONAL STOCK NUMBER (PART NUMBER)	USE
ITEM 7 **GAGE, SPROCKET WEAR**	5210-00-842-3051 (11631464)	Used to check sprocket wear (para 2-150).
ITEM 8  **HANDLE, MANUAL CONTROL**	5340-00-733-8970 (10904204)	Used with seal inserter to replace idler wheel upper spindle oil seal and bearing (para 2-148).
ITEM 9  **HANDLE, REMOVER AND REPLACER**	5340-00-708-3883 (7083883)	Used with seal inserters and bearing inserter sets to replace seals in suspension system (para 2-145, 2-146, 2-148, and 2-149).
ITEM 10  **INSERTER, BEARING**	5120-00-733-8973 (10904210)	Used to replace idler wheel arm inner bearing ring (para 2-148).

SPECIAL TOOLS AND EQUIPMENT (CONT)

ITEM	NATIONAL STOCK NUMBER (PART NUMBER)	USE
ITEM 11  INSERTER, SEAL	5120-00-733-8943 (109041 76)	Used with remover and replacer handle to replace roadwheel arm upper spindle oil seal in retainer (para 2-145).
ITEM 12  INSERTER, SEAL	5120-00-733-8951 (10904181)	Used with manual control handle to replace roadwheel upper spindle inner oil seal and inner bearing (para 2-145) and idler wheel upper spindle inner oil seal and inner bearing (para 2-148).
ITEM 13  INSERTER, SEAL	5120-00-733-8953 (10904182)	Used with remover and replacer handle to install seal in roadwheel flange (para 2-148).
ITEM 14  INSERTER SET, BEARING	5120-00-473-7374 (7082834)	Used with remover and replacer handle to remove and replace roadwheel hub bearing cup (para 2-146) and trailing idler wheel hub outer bearing cup (para 2-149).

SPECIAL TOOLS AND EQUIPMENT (CONT)

ITEM	NATIONAL STOCK NUMBER (PART NUMBER)	USE
ITEM 15  INSERTER SET, BEARING	5120-00-473-7373 (7082876)	Used with remover and replacer handle to remove and replace roadwheel hub inner bearing cup (para 2-146) and compensating idler wheelhub inner bearing cup (para 2-149).
ITEM 16  PIN, SHOULDER, HEADLESS	5315-00-722-3896 (10904172)	Guide final drive to hull (para 2-139).
ITEM 17  PIN, STRAIGHT, THREADED	5315-00-722-3888 (10904178)	Guide roadwheel arm to hull (para 2-145); guide idler wheel arm to hull (para 2-148).
ITEM 18  PULLER, SLIDE	5120-00-557-3615 (5573615)	Used with coupling or adapter to remove torsion bar (para 2-143), roadwheel arm (para 2-145), idler wheel arm (para 2-148), and track shoe link pin (para 2-151 and para 2-201).

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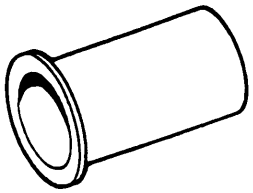
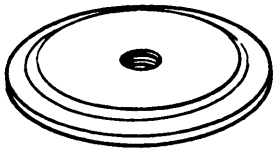
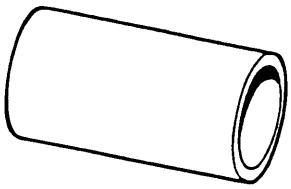
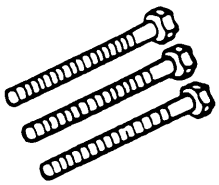
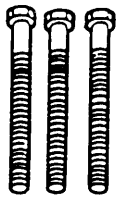
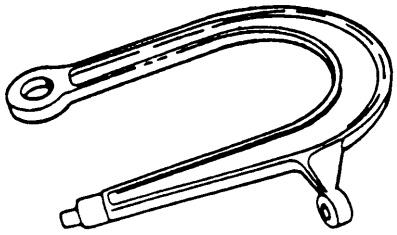
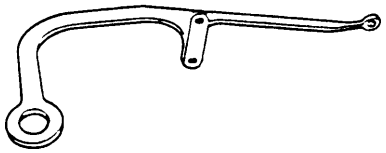
ITEM	NATIONAL STOCK NUMBER (PART NUMBER)	USE
ITEM 19  **REPLACER, HUB SPACER**	5120-00-733-8964 (10904197)	Replace roadwheel hub spacer (para 2-145).
ITEM 20  **REPLACER, RACE AND OUTER BEARING**	5120-00-733-8949 (109041 80)	Used with remover and replacer handle to install oil seal in idler arm housing (para 2-148).
ITEM 21  **REPLACER, SEAL GUARD**	5120-00-733-8969 (10904207)	Replace roadwheel arm seal guard (para 2-145).
ITEM 22  **SCREW, CAP, HEXAGON HEAD**	5305-00-084-0796 (10914934)	Remove final drive (para 2-139).

SPECIAL TOOLS AND EQUIPMENT (CONT)

ITEM	NATIONAL STOCK NUMBER (PART NUMBER)	USE
ITEM 23  **SCREW, CAP, HEXAGON HEAD**	5305-00-532-9125 (8708355)	Remove roadwheel arm (para 2-145) and idler wheel arm (para 2-148).
ITEM 24  **SLING, LIFTING, FINAL DRIVE**	3940-00-722-3886 (10904212)	Lift final drive (para 2-139).
ITEM 25  **SLING, LIFTING, HUB AND SPROCKET**	4910-00-722-3885 (10904220)	Lift hub and sprocket (para 2-150).

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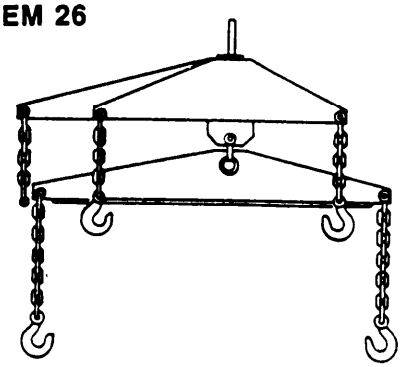
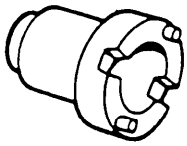
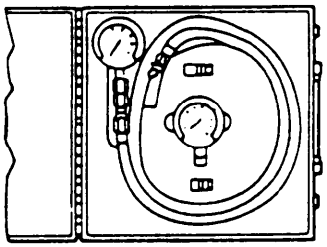
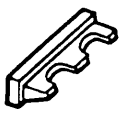
ITEM	NATIONAL STOCK NUMBER (PART NUMBER)	USE
ITEM 26  SLING, BEAM TYPE	3940-01-280-0872 (12355173)	Lift powerplant (para 2-35).
ITEM 27  SOCKET, WRENCH, FACE	5120-00-588-4808 (8708459)	Turn roadwheel bearing adjusting nut (para 2-146) and trailing idler wheel bearing adjusting nut (para 2-149).
ITEM 28  TESTER, PRESSURE GAGE	6685-00-572-8612 (8356176)	Check transmission oil pressure (para 2-127).
ITEM 29  WEDGE, IDLER ADJUSTMENT	2530-00-302-6784 (11643492)	Used to remove, install, and adjust idler wheel arm (para 2-148).

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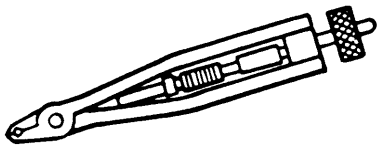
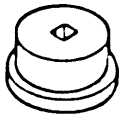
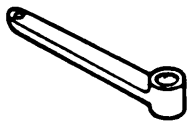
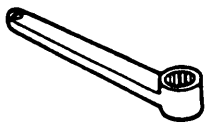
ITEM	NATIONAL STOCK NUMBER (PART NUMBER)	USE
ITEM 30  **WIRE TWISTER, PLIER**	5120-00-542-4171 (GGGW340SIZE12)	Used to remove and install lockwire.
ITEM 31 **WRENCH, SOCKET**	5120-00-708-3642 (7083642)	Used to remove and install machine thread plug in arm and hub assembly (para 2-143).
ITEM 32  **WRENCH, SPADE PIN NUT**	5120-00-084-0788 (10909067)	Hold spade pin nut (para 2-170).
ITEM 33 **WRENCH, SPANNER**	5120-00-860-9577 (10908797)	Turn idler wheel upper spindle sleeve (para 2-148).

SPECIAL TOOLS AND EQUIPMENT (CONT)

ITEM	NATIONAL STOCK NUMBER (PART NUMBER)	USE
ITEM 34  **WRENCH, SPLINED, BRAKE ADJUSTMENT**	3040-00-733-8909 (8351386)	Used to adjust brakes (para 2-142).
ITEM 35  **WRENCH, SPLINED, BRAKE ADJUSTMENT**	3040-00-733-8912 (8351387)	Used to adjust brakes (para 2-142).

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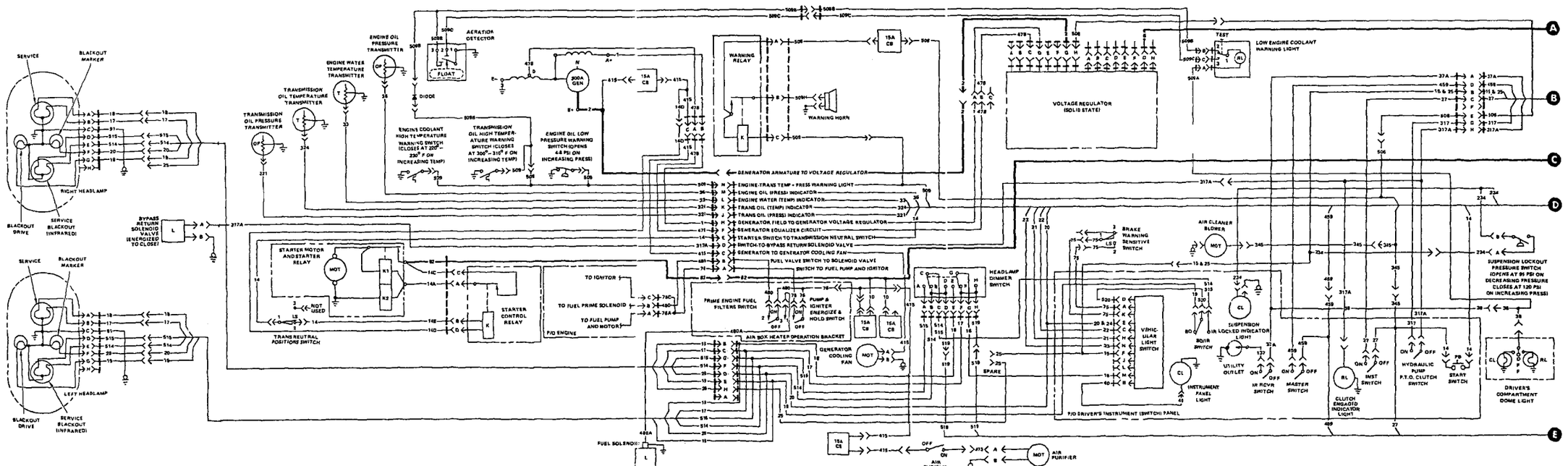
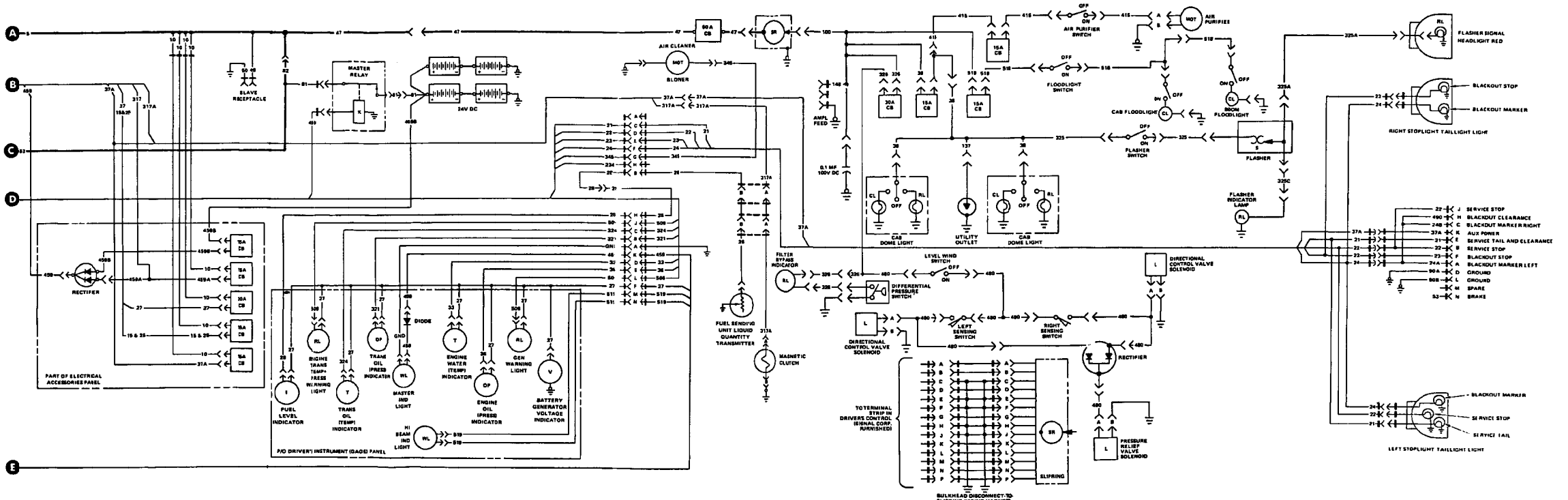


FO-1. Vehicle electrical system schematic diagram (sheet 1 of 2).



FO-2. Vehicle electrical system schematic diagram (sheet 2 of 2).

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GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:

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TM 9-2350-238-20-1	15 May 1994	Unit Maintenance Manual for M578 Recovery Vehicle (Hull)

BE EXACT PINPOINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE

DA FORM 1 JUL 79 **2028-2**

PREVIOUS EDITIONS ARE OBSOLETE.
AMSMC OP-103-85

PS.. IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

REVERSE OF DA FORM 2028-2

TEAR ALONG PERFORATED LINE

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

Commander
US Army Tank-Automotive Command
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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meter = 0.3937 Inch
1 Decimeter = 10 Centimeters = 3.94 Inches
1 Meter = 10 Decimeters = 100 Centiimeters
= 1000 Millimeters = 39.37 Inches
1 Dekameter = 10 Meters = 32.8 Feet
1 Hectometer = 10 Dekameters = 328.08 Feet
1 Kilometer = 10 Hectometers = 1000 Meters
= 0.621 Mile = 3,280.8 Feet
Millimeters = Inches times 25.4
Inches = Millimeters divided by 25.4

WEIGHTS

1 Centigram = 10 Milligrams = 0.154 Grain
1 Decigram = 10 Centigrams = 1.543 Grains
1 Gram = 0.001 Kilogram = 10 Decigrams
= 1000 Milligrams = 0.035 Ounce
1 Dekagram = 10 Grams = 0.353 Ounce
1 Hectogram = 10 Dekagrams = 3.527 Ounces
1 Kilogram = 10 Hectograms = 1000 Grams = 2.205 Pounds
1 Quintal = 100 Kilograms = 220.46 Pounds
1 Metric Ton = 10 Quintals = 1000 Kilograms = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liter = 0.034 Fluid Ounce
1 Centiliter = 10 Milliliters = 0.34 Fluid Ounce
1 Deciliter = 10 Centiliters = 3.38 Fluid Ounces
1 Liter = 10 Deciliters = 1000 Millileters = 33.82 Fluid Ounces
1 Dekaliter = 10 Liters = 2.64 Gallons
1 Hectoliter = 10 Dekaliters = 26.42 Gallons
1 Kiloliter = 10 Hectoliters = 264.18 Gallons

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inch
1 Sq Decimeter = 100 Sq Centimeters = 15.5 Sq Inches
1 Sq Meter (Centare) = 10 Sq Decimeters
= 10,000 Sq Centimeters = 10.764 Sq Feet
1 Sq Dekameter (Are) = 100 Sq Meters = 1,076.4 Sq Feet
1 Sq Hectometer (Hectare) = 100 Sq Dekameters = 2.471 Acres
1 Sq Kilometer = 100 Sq Hectometers = 1,000,000 Sq Meters
= 0.386 Sq Mile

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.061 Cu Inch
1 Cu Decimeter = 1000 Cu Centimeters = 61.02 Cu Inches
1 Cu Meter = 1000 Cu Decimeters = 1,000,000 Cu Centimeters
= 35.31 Cu Feet

TEMPERATURE

5/9 (°F – 32°) = °C
9/5 (°C+ 32°) = °F
–35° Fahrenheit is equivalent to –37° Celsius
0° Fahrenheit is equivalent to –18° Celsius
32° Fahrenheit is equivalent to 0° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
100° Fahrenheit is equivalent to 38° Celsius
212° Fahrenheit is equivalent to 100° Celsius

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound–Feet	Newton–Meters	1.356
Pounds–Inches	Newton–Meters	0.11375
Pounds per Square Inch	Kilopascals	6.895
Ounce–Inches	Newton–Meters	0.007062
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609
Centimeters	Inches	0.394

TO CHANGE	TO	MULTIPLY BY
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton–Meters	Pound–Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621
°Fahrenheit	°Celsius	°C = (°F–32)x5/9
°Celsius	°Fahrenheit	°F = (9/5x°C)+32

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