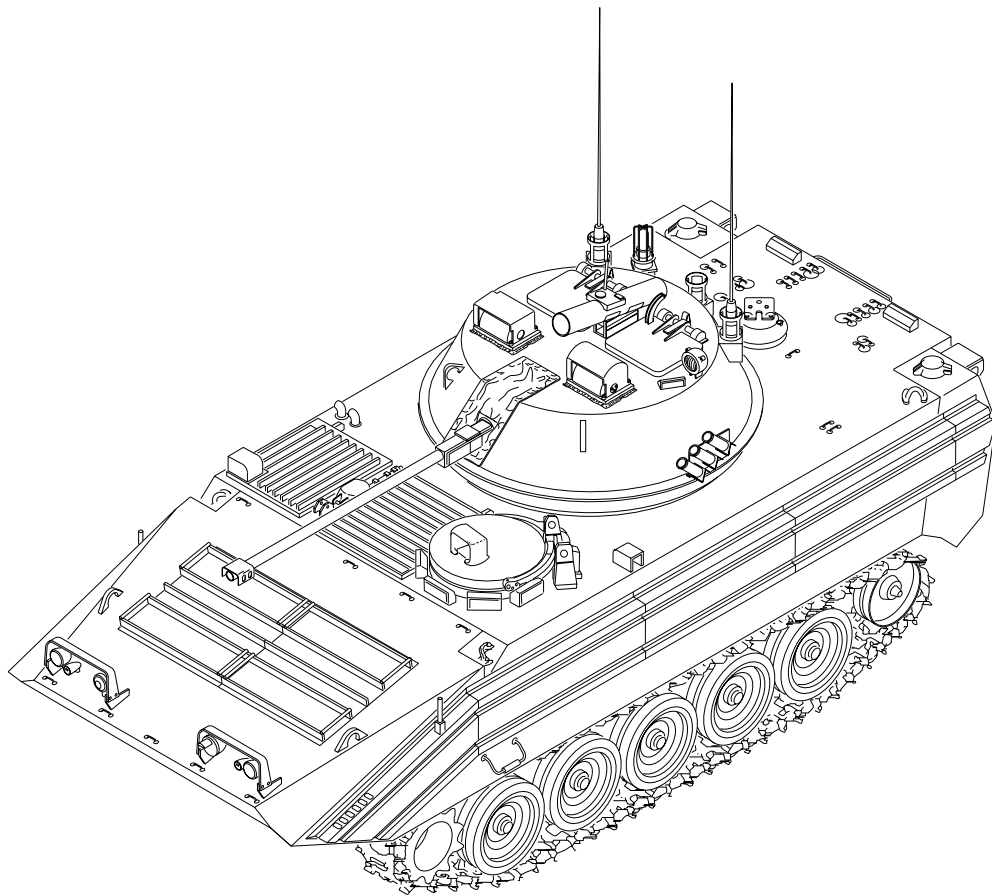


TM 9-2350-366-34-1

TECHNICAL MANUAL

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

FOR
OPPOSING FORCES SURROGATE VEHICLE (OSV)
M113A3/BMP-2
6920-01-420-4716 (EIC AUK)
HULL



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

HEADQUARTERS, DEPARTMENT OF THE ARMY

26 JULY 2001

WARNING SUMMARY

WARNING SUMMARY

This section provides a summary of all critical safety information in this TM. It includes general WARNINGS not found in the Work Package (WP) procedures, hazardous materials WARNINGS, and a list of critical WARNINGS extracted from the WPs.

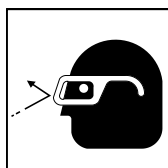
Prior to starting any WP procedure, the WARNINGS included in the text for that WP must be reviewed and understood.

Also review the materials list in the INITIAL SETUP of the WP for hazardous materials used during maintenance of the equipment. Then refer to the detailed WARNINGS for hazardous materials listed separately in this WARNING SUMMARY under the heading HAZARDOUS MATERIALS WARNINGS.

GENERAL WARNINGS NOT FOUND IN WP PROCEDURES

The following WARNINGS are general safety statements. They are not unique to any specific procedures and, therefore, do not appear elsewhere in this TM. All personnel operating this equipment or working near this equipment must understand and continually observe the precautions in these WARNINGS.

WARNING



Compressed air can injure you or others.

Do not aim compressed air at yourself or other personnel. Always wear goggles when working with compressed air. Do not use more pressure than 30 psi (207kPa) with air nozzles.

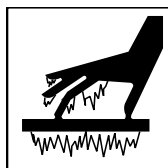
WARNING



Hot parts can burn you.

Allow parts to cool before working on or near them. If necessary, use heat protective gloves to work on hot parts.

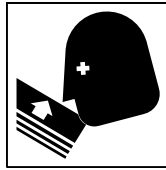
WARNING



Contact with cold metal can cause frostbite. Wear gloves in cold conditions. Do not touch cold metal with bare skin.

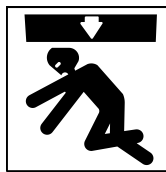
WARNING SUMMARY (cont)

WARNING



Power plant door may spring open. Soldiers can be injured. When opening, stay out of door path.

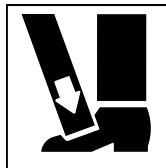
WARNING



Hanging loads, heavy parts, and overhead equipment can fall unexpectedly and kill or injure you.

Stay clear of hanging loads, heavy parts, and overhead equipment. Use correct lifting devices. Always have helper guide heavy parts and equipment.

WARNING



Improperly supported engine can fall and kill or seriously injure you.

Test engine stability before removing engine sling.

WARNING SUMMARY (cont)

HAZARDOUS MATERIALS WARNINGS

The following are detailed warnings for hazardous materials used during maintenance of the equipment. When these materials are used in a procedure, a general warning will be provided with a reference to the detailed information in this section. All personnel maintaining this equipment must be familiar with the safety precautions related to these materials.

WARNING



Fire Resistant Hydraulic fluid (FRH) is toxic if absorbed through skin or ingested.

Do not service hydraulic system when FRH is hot or pressurized.

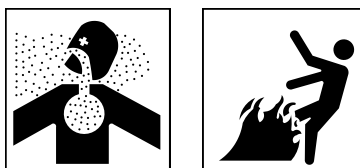
Wear gloves and avoid contact with skin.

If FRH contacts skin, wash immediately with soap.

If FRH gets into eyes, wash with lots of water for 15 minutes and get medical attention.

If FRH is swallowed, get medical attention.

WARNING



Applying CARC paint exposes personnel to toxic fumes and flammable materials. Grinding or welding on CARC painted surfaces exposes personnel to dusts and fumes containing toxic materials that can be inhaled.

Follow these guidelines when working with CARC paint and CARC painted surfaces:

Do not breathe vapors, spray mist, or sanding dust.

Use in well ventilated area.

Wear dust mask when grinding.

Wear ANSI approved chemical work goggles, face shield, and solvent impermeable gloves and clothing.

Wash solid clothing before reuse.

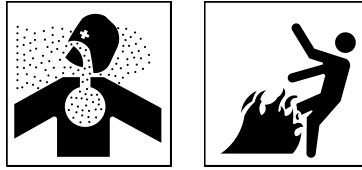
Wash hands before eating or smoking.

If you have difficulty breathing, leave area to obtain fresh air. If material contacts eyes, wash from eyes for 15 minutes with water. Wash from skin with soap and water after use. Seek medical help if breathing difficulty or irritation persists.

Store and apply CARC paint away from heat, electrical equipment, sparks, or flame. Extinguish with CO₂, dry chemical, foam, or other NFPA approved method for treating class B fires.

WARNING SUMMARY (cont)

WARNING

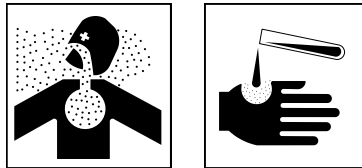


CARC paint is toxic and flammable.

Always use in well ventilated area away from heat, sparks, and flames. Do not breathe fumes or allow to contact eyes or skin. Wear chemical protective gloves, clothing, chemical safety goggles, and respirator when working with CARC paint. Always seek medical attention when exposed to carc paint or fumes.

Read CARC paint warning in front of this manual.

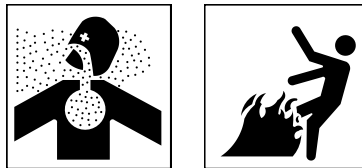
WARNING



Chemical products, tools, and equipment can be hazardous if not handled safely. Unsafe use of chemical products, tools, and equipment can kill or seriously injure personnel.

Read and follow warnings and instructions on labels of all chemical products. Follow all general shop safety procedures. See unit commander for further instructions on safety.

WARNING



Cleaning solvent is mildly toxic. Solvent evaporates and both the fumes and liquid are flammable. Continued contact with solvent can cause skin problems.

Ensure there is good air flow when using solvent and work area is away from heat and flames.

Keep fire extinguisher nearby.

Do not breathe solvent fumes.

Avoid skin contact. Use gloves or a brush if necessary.

Wash hands after using solvent.

Wear eye protection if solvent could splash into eyes.

If solvent gets in eyes, flush with fresh water for at least 15 minutes and get medical assistance.

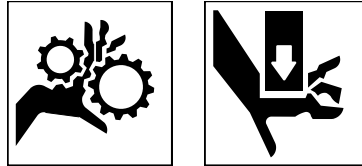
Do not use P-D-680 solvent, dry cleaning solvent, benzene (benzol), paint thinner, gasoline, or diesel fuel oil as solvent replacements. These materials are all more flammable, more toxic, and can damage materials that approved solvent does not.

WARNING SUMMARY (cont)

LIST OF WARNINGS IN WP PROCEDURES

This list includes all the critical WARNINGS in the WP procedures. Study these WARNINGS carefully. They can save your life and the lives of soldiers with whom you work.

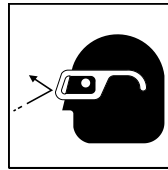
WARNING



Moving parts of power unit can seriously injure you.

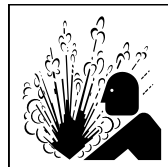
Clear personnel away from power unit before startup. Stay clear of moving parts when power unit is running.

WARNING



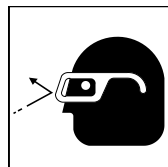
Metal chips and grinding dust can cause eye injury. Wear goggles and gloves.

WARNING



Unsafe welding practices can cause serious injury from fire, explosions, or harmful agents. Allow only authorized personnel to weld or cut metals, and follow safety precautions in TM 9-237. Protective clothing and goggles must be worn; adequate protective equipment used, a suitable fire extinguisher kept nearby; and requirements of TM 9-237 strictly followed.

WARNING

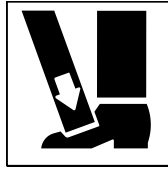


Compressed air can injure you or others.

Do not aim compressed air at yourself or other personnel. Always wear goggles when working with compressed air. Do not use more pressure than 30 psi (207kPa) with air nozzles.

WARNING SUMMARY (cont)

WARNING



Improperly supported engine can fall and kill or seriously injure you.

Test engine stability before removing engine sling.

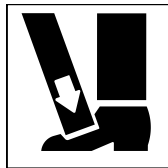
WARNING



Hanging loads, heavy parts, and overhead equipment can fall unexpectedly and kill or injure you.

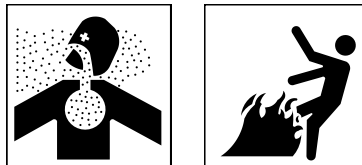
Stay clear of hanging loads, heavy parts, and overhead equipment. Use correct lifting devices. Always have helper guide heavy parts and equipment.

WARNING



Engine support could fall and injure you. Make sure to secure engine support to main frame before towing, lifting or transporting engine stand.

WARNING



Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

Always use in well ventilated areas, away from heat, sparks, and flames. Do not breathe fumes. Do not allow into contact with skin and eyes. Use goggles or face shield and protective gloves.

WARNING SUMMARY (cont)

WARNING



Accidental discharge of fire bottles can seriously injure you.

Deactivate fire suppression system and insert anti-recoil plugs and safety pins before you work near fire bottles.

WARNING



Accidental discharge of fire bottles can seriously injure your eyes or skin.

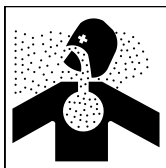
Wear face shield, ear plugs, protective clothing, and gloves during fire bottle maintenance.

WARNING



You can be injured if cylinder discharges when it is out of its mounting brackets or is dropped. Discharge cylinder completely before removing from its mount. Handle with great care.

WARNING



Solvent fumes and fluid are poisonous and can cause skin irritation.

Solvent may be harmful if swallowed. Avoid skin contact and breathing of fumes. Read solvent warning at the front of this manual.

WARNING SUMMARY (cont)

WARNING



Solvent evaporates rapidly and makes fumes that are flammable.

Do not smoke or allow open flames near solvent fumes.

Read solvent warning at the front of this manual.

WARNING



Magnesium may catch fire if welded on or exposed to high temperatures. Do not weld on magnesium castings or expose them to high temperatures.

WARNING



Fine particles of magnesium can catch fire and burn you. Be very careful when filing or grinding on magnesium. Use grinding equipment marked "FOR MAGNESIUM GRINDING ONLY." Keep a Class D fire extinguisher close by.

WARNING



Water and foam-type fire extinguishers will cause magnesium fires to flare up. Use a Class D fire extinguisher or a sodium chloride base dry powder to fight magnesium fires.

WARNING SUMMARY (cont)

WARNING



Improper disposal of magnesium can cause a fire or explosion. Do not expose magnesium to high temperatures. Let magnesium dry before placing in sealed metal containers. Label containers and ship to a Class I hazardous waste disposal site.

WARNING



Fuel fumes can explode and burn you. Before welding:

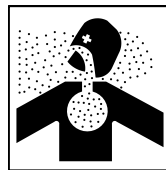
Drain all fuel.

Disconnect and cap all fuel and vent lines.

Purge fuel residue and fumes by steam cleaning.

Purge air from fuel tank with CO₂.

WARNING



Do not weld on plastic molding material parts. Welding on plastic molding material parts creates toxic fumes. Fumes are hazardous to your health and can result in death.

FIRST AID

For first aid information, see FM 21-11.

INSERT LATEST UPDATED PAGES / WORK PACKAGES. DESTROY SUPERSEDED DATA.

LIST OF EFFECTIVE PAGES / WORK PACKAGES

NOTE: Updates to all portions of this TM are indicated by a vertical bar in the outer margin of the page.

Dates of issue for original and updated pages / work packages are:

Original 0 (26 July 2001)

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 33 AND TOTAL NUMBER OF WORK PACKAGES IS 49 CONSISTING OF THE FOLLOWING:

| Page / WP No. | * Change No. | Page / WP No. | * Change No. | Page / WP No. | * Change No. |
|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|
| Title | 0 | | | | |
| A/B | 0 | | | | |
| a – i/j blank | 0 | | | | |
| i – vii/viii blank | 0 | | | | |
| WP 0001 00 – 0049 00 | 0 | | | | |
| 1 – 7/8 blank | 0 | | | | |
| DA 2028 (3 copies) | 0 | | | | |
| Authentication | 0 | | | | |
| Metric Chart | 0 | | | | |
| Back Cover | 0 | | | | |

* Zero in this column indicates an original page or work package.

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 26 JULY 2001

TECHNICAL MANUAL
DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL
OPPOSING FORCES SURROGATE VEHICLE (OSV) M113A3/BMP-2
NSN 6920-01-420-4716
(EIC AUK)
HULL

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028 (Recommended Changes to Publications and Blank Forms), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is <http://aeprs.ria.army.mil>. If you need a password, scroll down and click on "ACCESS REQUEST FORM". The DA Form 2028 is located in the ONLINE FORMS PROCESSING section of the AEPS. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, fax, or E-mail your letter or DA Form 2028 directly to: AMSTA-LC-CI/TECH PUBS, TACOM-RI, 1 Rock Island Arsenal, Rock Island, IL 61299-7630. The E-mail address is TACOM-TECH-PUBS@ria.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0762.

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

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| THEORY OF OPERATION..... | 0003 00 |
| REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT..... | 0004 00 |

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HOW TO USE THIS MANUAL

HOW TO USE THIS MANUAL

The safest, easiest, and best way to maintain the OSV hull is to use this manual. Learning to use this manual is as easy as reading it. Knowing what is in this manual and how to use it will save you time. Becoming familiar with the work, procedures, and cautions will help you in your job and reduce your exposure to unnecessary hazards.

WHERE DO YOU START

This TM is divided into chapters and front and rear matter. The chapters are further divided into Work Packages (WPs) for ease of use. Go to the area within the manual that covers what you are to do and follow the instructions. Be sure to read and follow the Warnings, Cautions, and Notes.

HOW THIS MANUAL IS ORGANIZED

The WARNING SUMMARY section provides safety and first aid information. This section includes general warnings not found in the TM text and a list of the most important detailed warnings extracted from the WPs. All of these warnings cover hazards that could kill or injure personnel.

The TABLE OF CONTENTS lists the WPs in each chapter.

CHAPTER 1 covers General Information, Equipment Description and Data, and Theory of Operation. The Equipment Description WP gives a brief description of major parts and features of the OSV hull. The Theory of Operation WP provides information that will help you understand how the hull components work.

CHAPTERS 2 through 16 include all Direct Support Maintenance WPs for the OSV hull. [At this time, there are no General Support Maintenance WPs in this document.]

CHAPTER 17 contains supporting information, such as lists of references, tools, expendable/durable items, etc.

The INDEX is an alphabetical listing of all the WPs in this manual. Each entry is cross-referenced to the WP number and page number.

DA FORM 2028 is used to report errors and to recommend improvements for procedures in this manual. Three blank DA Forms 2028 are in the back of this manual.

The back cover includes a METRIC CONVERSION CHART that can be used to convert U.S. customary measurements to their metric equivalents. Measurements in this manual are given in U.S. customary unit with metric units in parentheses.

HOW TO USE THE WORK PACKAGES

Pick a key word from the hull part or system to be repaired. Look in the INDEX for this key word or the name of the action you will perform. Turn to the WP and page indicated.

How to read the WP

WPs provide either descriptive/supporting information or detailed procedures for maintaining/repairing the equipment.

Pay attention to all **warnings**, **cautions** and **notes**. These can appear in all types of procedures. They help you avoid harm to yourself, other personnel, and equipment. They also tell you things you should know about the procedure.

Before you start a procedure, get all the tools, supplies, and personnel you need to do the procedure. These items will be listed in the INITIAL SETUP of the WP.

Start with step 1 and do each step in the order given. Numbered primary steps tell you WHAT to do. Alpha substeps tell you HOW to do it.

Look at the illustrations. Locators show you where the parts are located on the hull or assembly. Close-up illustrations show the details you need to do the procedure.

The words END OF TASK will tell you when you have finished the procedure.

HOW TO USE THIS MANUAL (cont)

DEFINITION OF WP TERMS

Warnings, Cautions, And Notes

Pay attention to all warnings and cautions within the WP. Ignoring a warning could cause death or injury to yourself or other personnel. Ignoring a caution could cause damage to equipment. Notes contain facts to make the procedure easier. Warnings, cautions, and notes always appear just above the step to which they apply.

| | |
|-----------------|---|
| WARNINGS | Call attention to things that could kill or injure personnel. Warnings are also listed in the Warning Summary section (page a). |
| CAUTIONS | Call attention to actions or materials that could damage equipment. |
| NOTES | Contain important facts to make the procedure easier. |

Helper

Helpers are needed in procedures that require more than one person. A helper may be needed to help lift objects or act as an outside observer.

If a helper is needed to perform a procedure, the INITIAL SETUP will list “Helper (H)” under the PERSONNEL REQUIRED heading.

If a helper assists with a step, the step will include: “Have helper assist”.

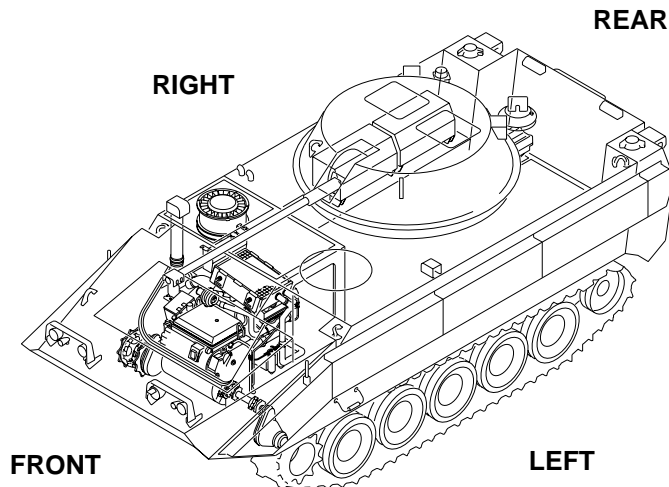
If a helper performs the action alone, the step will start with “(H):”.

Location Terms

The terms “front”, “rear”, “left”, and “right” are used to indicate where items are located on the vehicle, turret, and power unit.

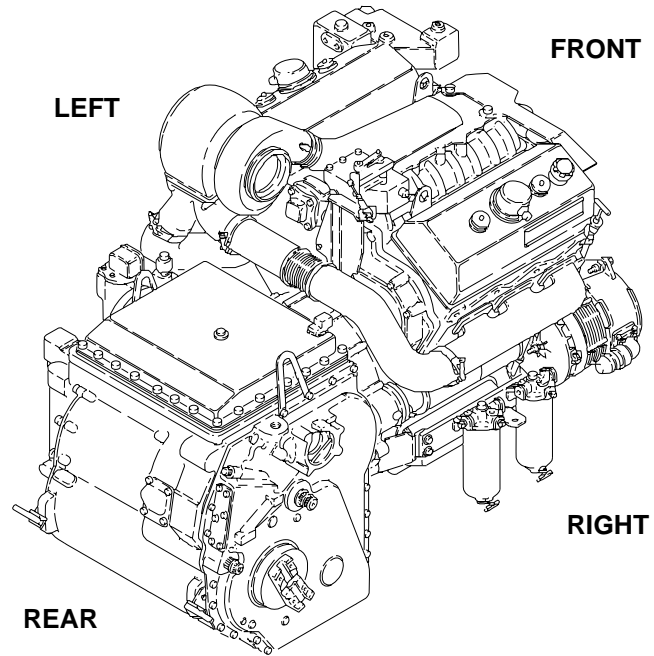
THE POINT OF REFERENCE IS DIFFERENT FOR VEHICLE ITEMS AND POWER UNIT ITEMS. Vehicle items are items not on the power unit. Power unit items are items on the engine or transmission.

If you are working with vehicle items, think of the locations as if you were standing on the ramp facing the inside of the vehicle or sitting in the turret facing the 30mm gun.



HOW TO USE THIS MANUAL (cont)

If you are working with power unit items, think of the locations as if you were standing at the transmission end of the power unit and facing the flywheel. This rule applies whether the power unit is IN or OUT of the vehicle.



CHAPTER 1

INTRODUCTORY INFORMATION WITH THEORY OF OPERATION

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|---|---------------------|
| GENERAL INFORMATION..... | 0001 00 |
| EQUIPMENT DESCRIPTION AND DATA..... | 0002 00 |
| THEORY OF OPERATION..... | 0003 00 |
| REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT..... | 0004 00 |

GENERAL INFORMATION

0001 00

SCOPE

This manual tells you how to perform Direct Support and General Support Maintenance on the automotive/hull parts of the OSV M113A3/BMP-2. It contains information you need to know in order to maintain and repair the hull and hull systems. It tells you what to do and what not to do, and how to protect the safety of yourself and others. TM 9-2350-366-34-2 tells how to maintain/repair the turret parts of the M113A3/BMP-2.

Type of Manual: Direct Support and General Support

Equipment Name: Opposing Forces Surrogate Vehicle M113A3/BMP-2 — Hull

Purpose of Equipment: Visually and tactically represent the Soviet BMP-2 Infantry Fighting Vehicle

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).

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your M113A3/BMP-2 needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to us: Director, U.S. Army Armament Research, Development, and Engineering Center, ATTN: AMSTA-AR-QAW-A (R), Rock Island, IL 61299-7300. We will send you a reply.

CORROSION PREVENTION AND CONTROL (CPC)

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 future items.

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.

If a corrosion problem is identified, it can be reported using Standard Form 368 (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. The form should be submitted to: Commander, US Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E, Warren, MI 48397-5000.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

The following manuals tell you how and when to destroy Army materiel to prevent enemy use:

TM 43-0002-33

TM 750-244-2

TM 750-244-6

TM 750-244-7

PREPARATION FOR STORAGE OR SHIPMENT

See DA PAM 738-750 for information about administrative storage of the IFV, CFV, and components. See TM 55-2350-252-14 for information about transportability of the vehicles.

NOMENCLATURE CROSS-REFERENCE

The following list provides nomenclature cross-references for common terms used in this manual.

| <u>Common Name</u> | <u>Official Nomenclature</u> |
|---------------------------------|--------------------------------|
| Bilge pump | Rotary pump unit |
| Cleaning solvent | Cleaning compound solvent |
| Dipstick with tube | Rod gauge with tube |
| Dust cap | Connector plug |
| Fan control box | Vent van controller |
| Hydroelectric power unit | Ramp power unit |
| Jack | Receptacle |
| Lead | Terminal |
| Lock screw | Self-locking bolt |
| Lock wire | Nonelectrical wire |
| Locknut | Self-locking nut |
| O-ring | Preformed packing |
| Personnel heater | Compartment vehicle heater |
| Plastic face hammer | Inserted hammer face |
| Plug | Connector |
| Prussian blue dye | Prussian blue paste |
| Pulsation damper | Inertia damper |
| Push rod cover | Push tube cover |
| Snap ring pliers | External retaining ring pliers |
| Sealing washer | Packing with retainer |
| Transmission coupling | Vibration damper |

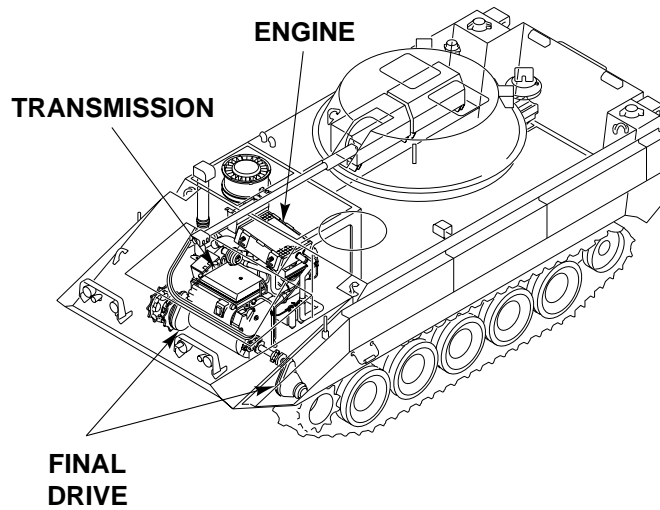
SAFETY, CARE, AND HANDLING

Read warnings in Warning Summary (page a) and within the WPs.

EQUIPMENT DESCRIPTION AND DATA

0002 00**EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES**

For equipment characteristics, capabilities, and features, see TM 9-2350-366-10-1.

LOCATION AND DESCRIPTIONS OF MAJOR COMPONENTS**ENGINE, MECHANICAL:**

The turbocharged diesel engine is the primary power source for the vehicle. It is located in the power plant compartment.

TRANSMISSION:

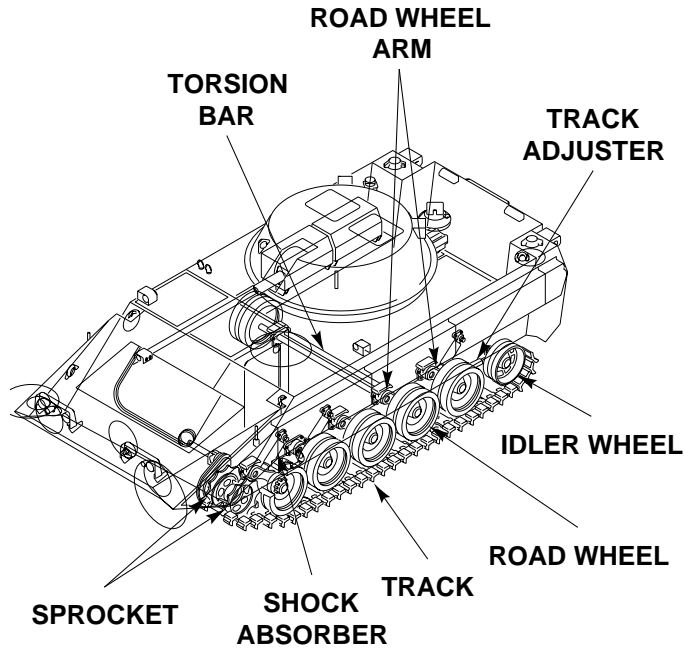
An automotive transmission connects to the engine and powers the final drive.

FINAL DRIVE:

Final drives attach to the transmission by propeller shafts. They deliver power to drive sprockets at the front of the vehicle.

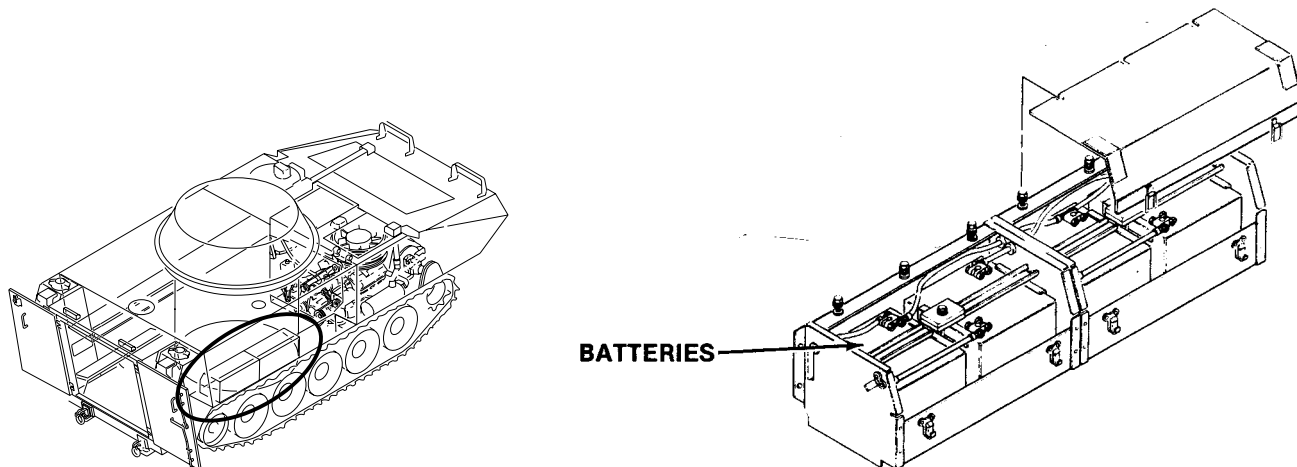
TRACK AND SUSPENSION:

Drive sprockets at the front of the vehicle drive track. Torsion bars and shock absorbers attach to road wheels and provide suspension.



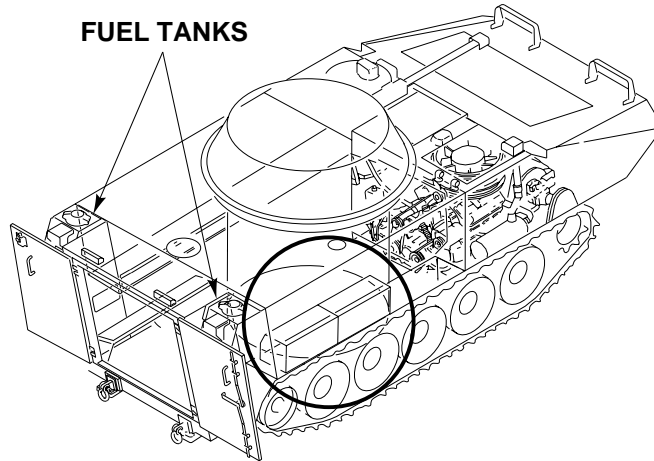
ELECTRICAL:

Four batteries, connected in a parallel series arrangement, supply electricity through the distribution box to the vehicle. On the OSV, the four batteries are located on the right sponson.



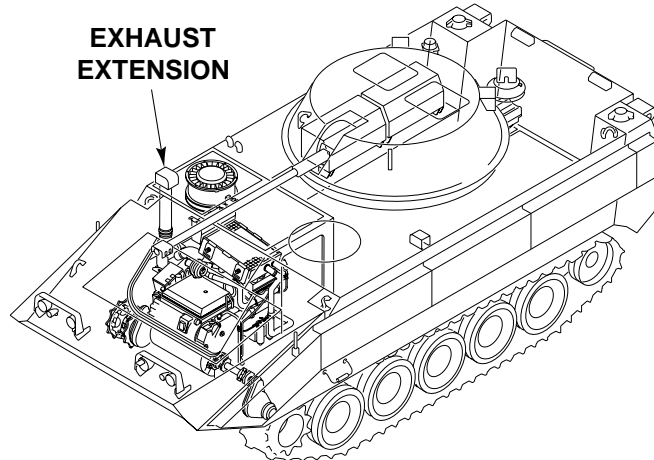
FUEL SYSTEM:

The OSV vehicles have two external fuel tanks located at the rear of the vehicle on each side of the ramp. Total capacity is 95 gallons.



EXHAUST SYSTEM:

The exhaust system drives the turbocharger and carries exhaust gases through manifolds and the muffler.



EQUIPMENT DATA

For equipment data, see TM 9-2350-366-10-1.

THEORY OF OPERATION

0003 00**SCOPE**

This section describes the functions of the M113A3/BMP-2 hull systems, including the power unit, auxiliary automotive systems, suspension system, and electrical system.

POWER PLANT

The OSV power unit includes the engine, transmission, DC generator, exhaust system, cooling system, and air intake system.

Engine, Diesel:

The diesel engine is the primary power source for the vehicle. The engine changes air and diesel fuel into energy and delivers this power to the transmission. The diesel engine consists of three major systems: fuel, oil, and starting.

In the fuel system, diesel fuel is stored in the fuel tanks. The fuel is drawn through one filter and pumped through the other filter to the engine. The injectors force fuel into combustion cylinders where it is mixed with air and changed into energy.

The oil system provides lubrication for the engine. Oil is cycled throughout the engine by a pump. The pump is located at the lower front of the engine. An oil filter cleans the oil, and an oil cooler reduces oil temperature.

The engine is equipped with a heavy-duty starter. The starter, with built-in solenoid, is used to crank the engine for starting.

Transmission:

The vehicle uses a hydromechanical transmission with hydrostatic steering. The transmission has its own oil system with filter and separately mounted oil cooler. This transmission oil system is separate from the engine oil system.

The transmission delivers power from the engine to the left and right final drives. The left and right final drives are driven by propeller shafts. The final drives deliver power to drive sprockets in the suspension system.

DC Generator:

The DC generator is part of the vehicle electrical system. It is driven directly by engine power. The generator charges the batteries in the vehicle when the engine is running. A regulator mounted near the driver keeps the voltages at the correct level.

Exhaust System:

Major exhaust system parts are the turbocharger, exhaust manifolds, and muffler.

The turbocharger is driven by exhaust gases from the engine. The turbocharger helps the engine develop more power and operate more efficiently. The exhaust manifolds carry the exhaust gases to the turbocharger from the engine. The muffler cuts down engine noise and allows exhaust to escape outside the vehicle.

Cooling System:

The cooling system cools the engine and transmission. It consists of a fan, fan drive, fan speed control assembly, radiator, coolant pump, auxiliary tank, transmission oil cooler, and thermostats. The cooling system contains approximately 53 quarts of liquid coolant. The liquid coolant is cycled through the engine and transmission oil cooler by the coolant pump. This process keeps the engine and transmission temperature in a safe operation range.

As coolant flows through the engine, it absorbs heat from the engine and transmission oil coolers. The heated coolant then flows to the radiator to remove coolant heat. The coolant fan pulls outside air in and through the radiator to remove heat. The fan is powered by the engine through a fan drive.

The variable-speed fan drive system is designed to modulate the cooling fan speed to maintain relatively constant coolant temperatures despite vehicle load or ambient temperature. The cooling fan speed is controlled by the fan drive assembly. The fan drive assembly is driven by the engine crankshaft through a splined coupling. The fan drive assembly contains a multiplate clutch pack that regulates the fan drive output speed. The thermostatic control valve senses engine coolant

temperature and regulates the hydraulic pressure to the fan drive assembly clutch pack. The higher the coolant temperature, the higher the hydraulic pressure, which results in less clutch slip and higher fan speed.

The surge tank acts as an overflow tank to keep the cooling system from overpressuring. It also removes air from the engine coolant. There is a low coolant level transmitter to signal the operator if more coolant is needed.

Air Intake System:

The engine air intake system allows air to enter the engine. The air cleaner cleans air that enters the engine. Dust is drawn out through a scavenge outlet. Air is filtered through a reusable filter element before delivery to the engine. An air filter indicator shows when the element is clogged and needs cleaning or replacing. After being filtered, the air moves through the turbocharger and into the engine cylinders.

AUXILIARY AUTOMOTIVE SYSTEMS

The auxiliary automotive systems includes driver controls, fuel tanks, personnel heater, bilge pumps, and fire extinguisher system.

Driver Controls:

The driver controls regulate the engine, transmission, steering, and braking systems of the vehicle.

The fuel shut-off control is used to stop the supply of fuel to the fuel pump. To start the engine, the driver must open the valve. The throttle linkages are used to control the engine speed. The gear selector allows the driver to choose the proper gear for the vehicle. The steering system controls the vehicle direction. The steering control consists of a steering yoke and linkage connected to the transmission.

The brake system allows the driver to stop a moving vehicle and hold the vehicle in position. The braking system consists of the service brake and the parking brake. The service brakes are hydraulic and are applied by pedal. The parking brake mechanically locks the transmission to prevent vehicle movement. Also, the system has levers, rods, shafts, and linkages connecting to the transmission's brake shaft.

Fuel Tanks:

Diesel fuel is stored in two separate fuel tanks. They are located on the back of the vehicle hull. The fuel is drawn from the fuel tanks through the primary fuel filter by the fuel pump. The fuel then flows through the secondary fuel filter to the injectors. The injectors regulate the amount of fuel which enters the engine.

Personnel Heater:

The personnel heater system provides heat inside the vehicle. Major parts are the combination combustion chamber/heat exchanger, blowers, a fuel pump, and an electric control and safety system. The heater is operated by diesel fuel drawn from the fuel tanks. Fuel is delivered to the combustion chamber from the fuel pump. Outside air is drawn into the combustion chamber by one of the blowers. A blower draws air from the crew compartment into the combustion chamber. The air is warmed by heat from the combustion process and then returned to the crew compartment.

Bilge Pumps:

One electrically driven bilge pump removes water and other liquids from the hull. Water enters the pump through a screened inlet. The pump forces water out of the vehicle through an outlet tube. The bilge pump is controlled by a switch on the driver's instrument panel.

Fire Extinguisher System:

The fire extinguisher system will detect and put out fires in the vehicle. It consists of two Carbon Dioxide (CO₂) cylinders. CO₂ can put out fires quickly and effectively. The cylinders are operated manually by pulling cables located in the hull.

There is a fire extinguisher located in the driver's compartment that is manually discharged into the engine compartment. Another extinguisher is located in the personnel compartment.

SUSPENSION SYSTEM

The suspension system supports the vehicle and delivers engine power to the road. It allows the vehicle to maneuver and be stable. Suspension system parts are the drive sprockets, tracks, idler wheels, track adjuster, road wheels, and road wheel support arms. Also, there are torsion bars and shock absorbers.

The drive sprockets drive the tracks. They are powered by left and right final drives from the transmission. The tracks consist of two flexible chains of track shoes. The tracks ride on the drive sprockets and are guided by idler wheels. The idler wheels can be adjusted to maintain correct track tension.

There are five pairs of road wheels per side. Track guides fit between each pair of road wheels. All road wheels are connected to road wheel support arms.

ELECTRICAL SYSTEM

The electrical system provides power for the vehicle. The system operates on wet cell batteries and includes charging, regulating, and monitoring equipment. The batteries provide a normal operating 24 volts with an amperage capability of 200 amps per hour.

The batteries supply the vehicle with electricity when the engine is off. All electrical power is delivered through the distribution box, except for the engine coolant heater and personnel heater, which are directly powered from the batteries. Electrical power flows from the batteries through the distribution box, cables, and wiring assemblies to the hull. The hull is a ground for the electrical system.

The DC generator recharges the batteries and supplies electricity while the engine is running. The DC generator has 200 amps per hour capability.

There are several electrical subsystems within the hull. Each subsystem contains at least one wiring assembly. Major electrical subsystems and assemblies include the interior and exterior lights, fuel supply, starting and charging systems, ventilation, heating, and bilge pump.

REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

0004 00**COMMON TOOLS AND EQUIPMENT**

For authorized common tools and equipment, see the Modified Table of Organization and Equipment (MTOE), 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*, as applicable to your unit. Some common tools and equipment are part of the general mechanic's tool kit: automotive. Other tools are listed in the WPs which need them.

SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT**NOTE**

More than one model of multimeter is available to you in the supply system. You may use any model available.

Special tools needed are listed in WP 0046 00 and RPSTL TM 9-2350-366-24P-1. Test, Measurement, and Diagnostic Equipment (TMDE) are listed in TM 9-2350-366-20-1.

Fabricated tools are listed in WP 0047 00, which provides manufacturing instructions for each item.

Always check block three of calibration label on all test/measurement equipment. If date listed is AFTER the date you are using the equipment, continue with task. Otherwise the equipment must be calibrated before use.

REPAIR PARTS

Repair parts are listed and illustrated in RPSTL TM 9-2350-366-24P-1. Maintenance and supply personnel can order them.

CHAPTER 2

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR VEHICLE HULL — GENERAL

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|---|---------------------|
| SERVICE UPON RECEIPT..... | 0005 00 |
| PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS..... | 0006 00 |

SERVICE UPON RECEIPT

0005 00

THIS WORK PACKAGE COVERS:

Checking Unpacked Equipment (page 0005 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General mechanics tool kit (WP 0046 00, Item 54)

Personnel Required

Track Veh Rep 63H10

References

- TM 9-2350-366-10-1
- TM 9-2350-366-10-2
- TM 9-2350-366-20-1

Equipment Condition

- Engine stopped (TM 9-2350-366-10-1)
- Turret shut down (TM 9-2350-366-10-2)

SERVICE UPON RECEIPT OF MATERIEL

Checking Unpacked Equipment

This work package contains information on how to check the M113A3/BMP-2 when it is received.

Do the following steps to check M113A3/BMP-2 parts upon receipt.

1. Perform all operator and unit PMCS. For PMCS, see TM 9-2350-366-10-1 and TM 9-2350-366-20-1.
2. Inspect the equipment for possible damage incurred during shipment. If the equipment has been damaged, report the damage on SF 364, Report of Discrepancy (ROD).
3. The following table tells you how to check and service the M113A3/BMP-2. These procedures will allow you to drive the vehicle to the motor pool. Procedures are given for Level B and Level A deprocessing. Level B deprocessing is performed when the vehicle has been in storage for less than 90 days. Level A deprocessing is performed in addition to Level B deprocessing when the vehicle has been in storage for more than 90 days. For Level A deprocessing, perform the Level B procedures in addition to the Level A procedures.

Table 1. Service Upon Receipt

| LOCATION | ITEM | ACTION | REMARKS |
|----------------|--------------------|---|---------|
| Level B | | | |
| Hull | Driver's hatch | Remove welded nut/bolt from driver's hatch to gain vehicle entry. | |
| Engine | Engine air intake | a. Remove air restrictor plug from air duct at air filter. b. Connect filter hose to air filter. c. Remove warning tag. | |
| Engine | Fuel lines | a. Connect fuel lines at quick disconnect. b. Connect fuel system tubing. | |
| Engine | Crankcase breather | Remove shipping tape from crankcase breather. | |
| Engine | Oil level gauge | Remove shipping tape from oil level gauge rod opening. | |

SERVICE UPON RECEIPT — Continued

0005 00

| LOCATION | ITEM | ACTION | REMARKS |
|----------------|--|--|---------|
| Engine | Oil filter cap | Remove shipping tape from oil filter cap. | |
| Engine | Caps and plugs | Remove caps and plugs from all openings to engine that vent to outside. | |
| Hull | Power unit access panels | Install power unit access panels. See TM 9-2350-366-10-1. | |
| Hull | Vehicle batteries | a. Remove shipping tape from filter caps. b. Add electrolyte and charge batteries. See TM 9-6140-200-14. | |
| Hull | Battery cables | Install cables on battery. See TM 9-2350-366-20-1. | |
| Hull | Personnel heater/feed line | a. Remove shipping tape from heater external exhaust. b. Remove shipping tape from end of disconnected fuel feed line. c. Connect feed line to heater. | |
| Hull | Fuel system | Fill fuel tank. See TM 9-2350-366-10-1 | |
| Hull | Squad seats and backrests | Remove shipping paper and tape. | |
| Hull | Periscopes | Remove shipping tape and hard board. | |
| Hull | Commander's seat and post | Install commander's seat and post on vehicle. See TM 9-2350-366-20-1. | |
| Hull | Fire extinguishers | Check for intact seals on handles. | |
| Hull | Drain plugs | Close hull drain plugs. | |
| Hull | Engine air inlet grille | Remove shipping tape and intake and exhaust grille cover from exhaust and intake grille. | |
| Hull | Armor mounting inserts and screw holes | Check for loose or missing plugs in inserts and setscrews in hull screw holes. | |
| Level A | | | |
| Engine | Engine | Change engine oil. See PMCS in TM 9-2350-366-10-1 or TM 9-2350-366-20-1. | |
| Hull | Transmission | Service transmission with operational lubricant. See PMCS in TM 9-2350-366-10-1 or TM 9-2350-366-20-1. | |
| Hull | Final drives | Service final drives with operational lubricant. See PMCS in TM 9-2350-366-10-1 or TM 9-2350-366-20-1. | |

END OF TASK

**PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS),
INCLUDING LUBRICATION INSTRUCTIONS**

0006 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level

Direct Support

GENERAL

There are no PMCS requirements at the Direct Support level.

| ITEM NO. | INTERVAL | MAN-HOUR | ITEM TO BE CHECKED OR SERVICED | <u>CREWMEMBER</u> PROCEDURE | EQUIPMENT NOT READY/ AVAILABLE IF: |
|--|----------|----------|--------------------------------|--------------------------------|---------------------------------------|
| NO REQUIREMENTS AT DIRECT SUPPORT LEVEL. | | | | | |

CHAPTER 3

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR ENGINE

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|--|---------------------|
| REPLACE ENGINE..... | 0007 00 |
| REPLACE VARIABLE SPEED DRIVE ASSEMBLY ADAPTER..... | 0008 00 |

REPLACE ENGINE

0007 00

THIS WORK PACKAGE COVERS:

Removal (page 0007 00-2).
 Installation (page 0007 00-20).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10
 Helper (H)

Tools and Special Tools

General mechanic's tool kit: automotive
 (WP 0046 00, Item 54)
 Engine and transmission sling (WP 0046 00, Item 46)
 Torque wrench, 1/2 inch drive, 0-175 ft-lb
 (WP 0046 00, Item 64)
 Lifting device with rated lift capability of at least
 1700 lb (772 kg)

References

TM 9-2350-366-10-1
 TM 9-2350-366-20-1

Materials/Parts

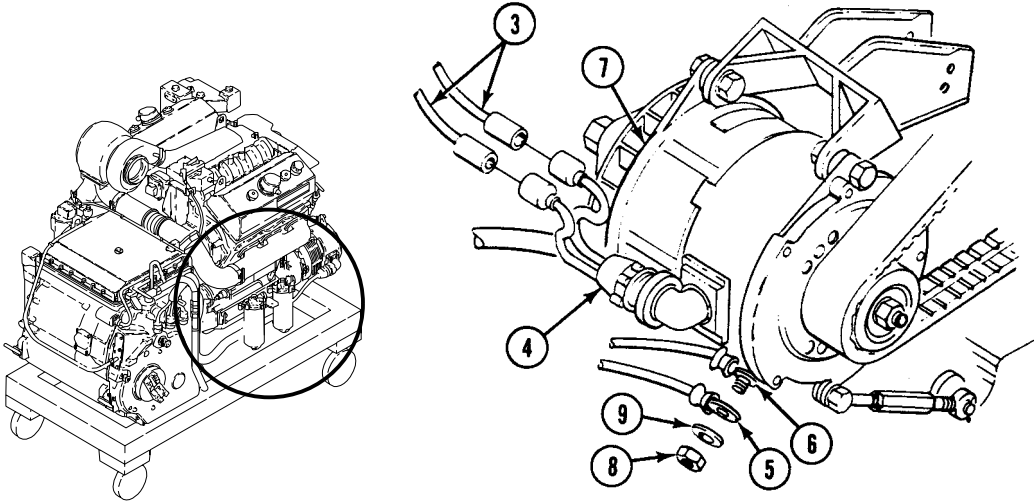
Antifreeze
 Engine and transmission oil
 Hydraulic fluid
 Cotter pin
 Gasket
 Locknut
 Locknut
 Locknut
 Locknut
 Locknut
 Locknut (2)
 Locknut (2)
 Locknut (2)
 Locknut (3)
 Lockwasher
 Lockwasher
 Lockwasher
 Lockwasher (2)
 Lockwasher (3)
 Packing
 Self-locking bolt (10)
 Tie down strap (7)

Equipment Condition

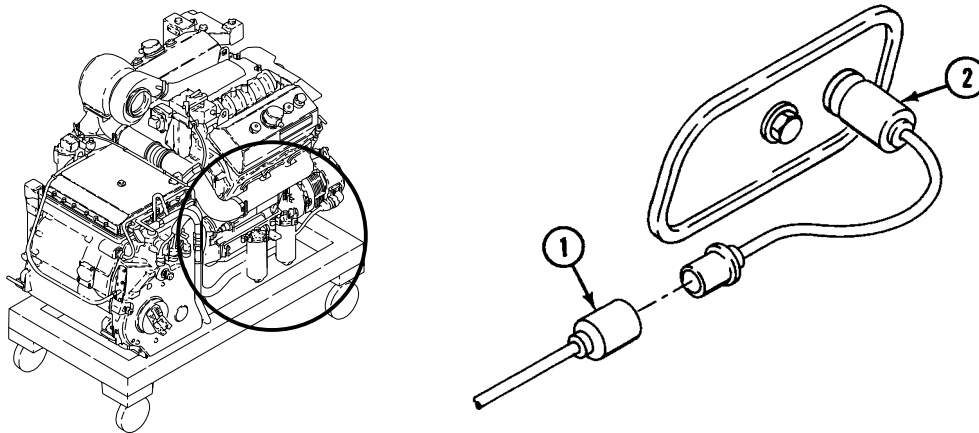
Power plant removed (TM 9-2350-366-20-1)
 Power plant on power plant stand (WP 0037 00)
 Engine oil drained (TM 9-2350-366-20-1)
 Hydraulic fluid drained (TM 9-2350-366-20-1)
 Engine wiring harness removed (TM 9-2350-366-20-1)

REMOVAL

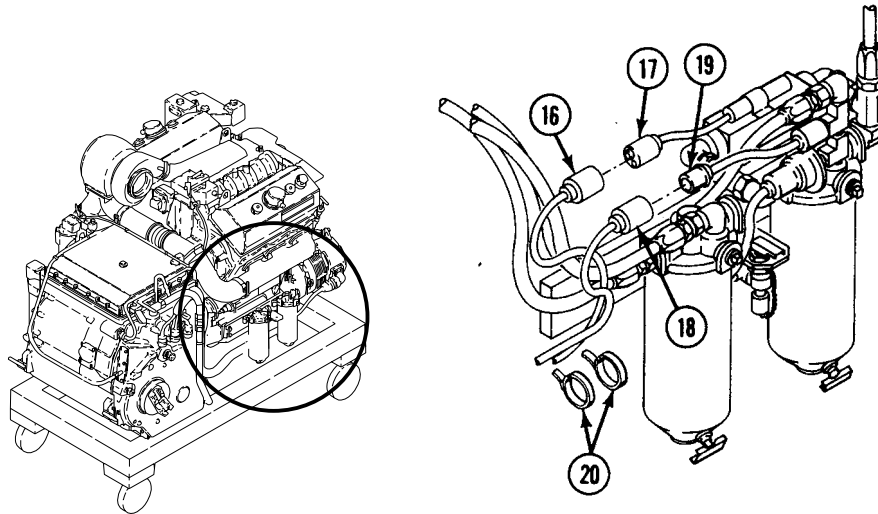
1. REMOVE NUT (8), LOCKWASHER (9), GROUND LEAD (5) AND CIRCUIT LEAD 771 (6) FROM GENERATOR (7). DISCARD LOCKWASHER.
2. DISCONNECT TWO LEADS (3) FROM GENERATOR MAIN CABLE (4).



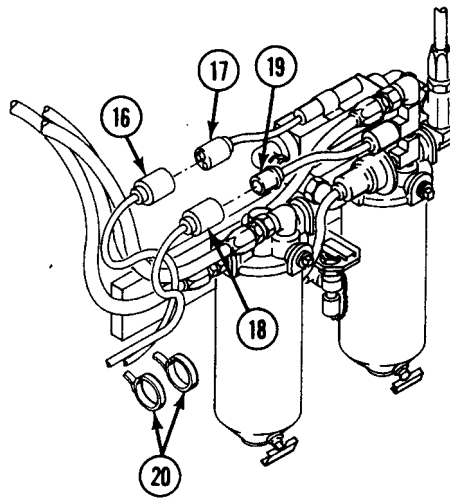
3. DISCONNECT LEAD (1) FROM AIR BOX PRESSURE TRANSDUCER (2).



4. DISCONNECT LEAD (18) FROM FUEL SUPPLY PRESSURE TRANSDUCER (19).

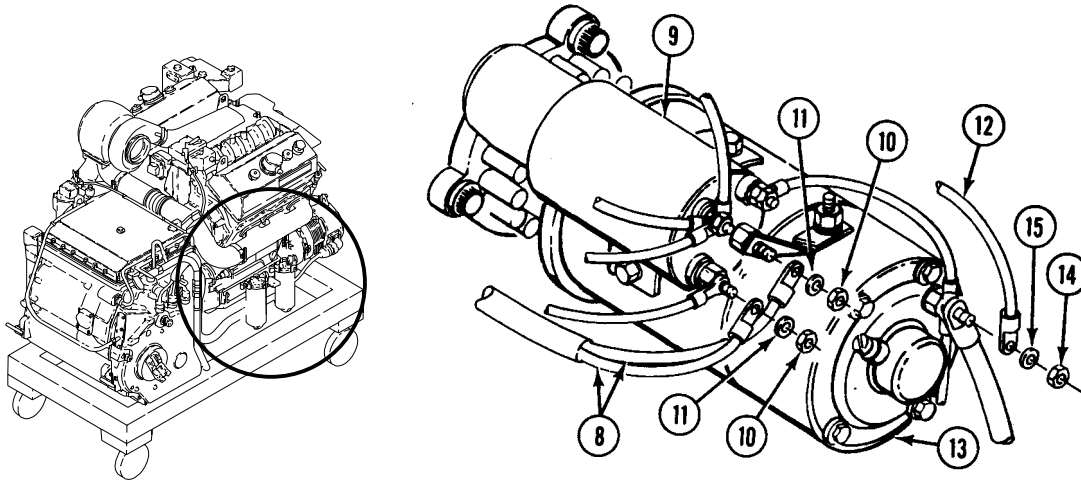


5. DISCONNECT LEAD (16) FROM FUEL FILTER DIFFERENTIAL PRESSURE SWITCH (17).

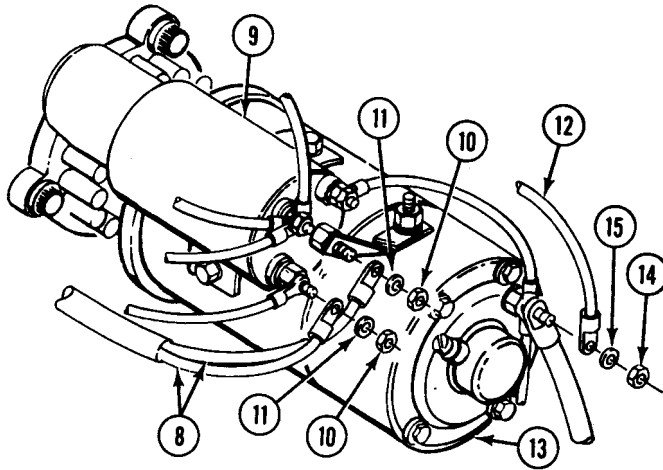


6. REMOVE TWO TIE DOWN STRAPS (20) FROM HARNESS. DISCARD STRAPS.

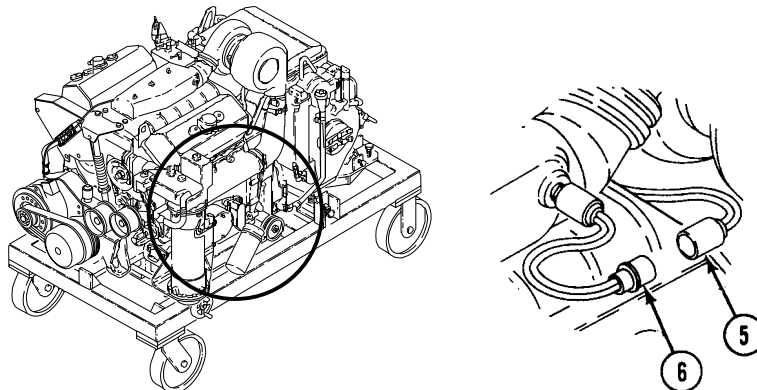
7. REMOVE NUT (14), LOCKWASHER (15), AND LEADS (12) FROM STARTER (13). DISCARD LOCKWASHER.



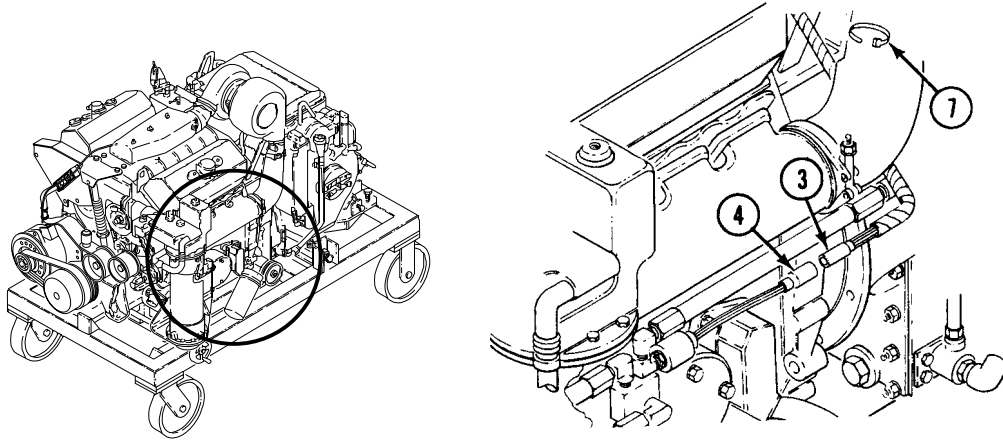
8. REMOVE TWO NUTS (10), LOCKWASHERS (11), AND LEADS (8) FROM STARTER SOLENOID (9) TERMINALS. DISCARD LOCKWASHERS.



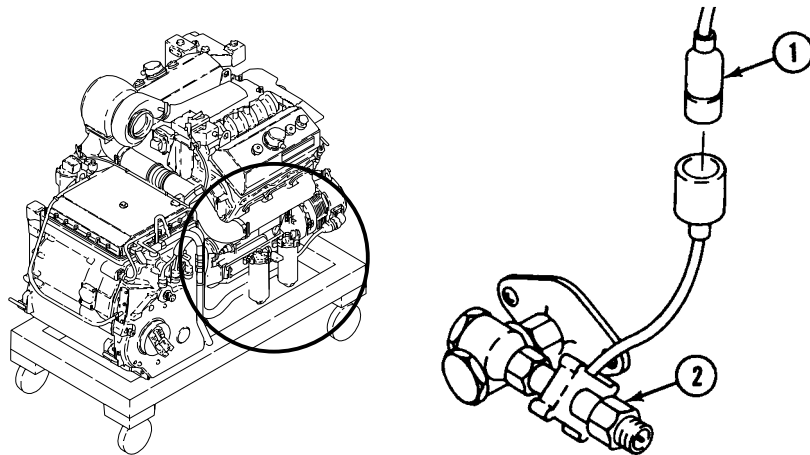
9. DISCONNECT LEAD (5) FROM TURBO OUTLET PRESSURE SWITCH (6).



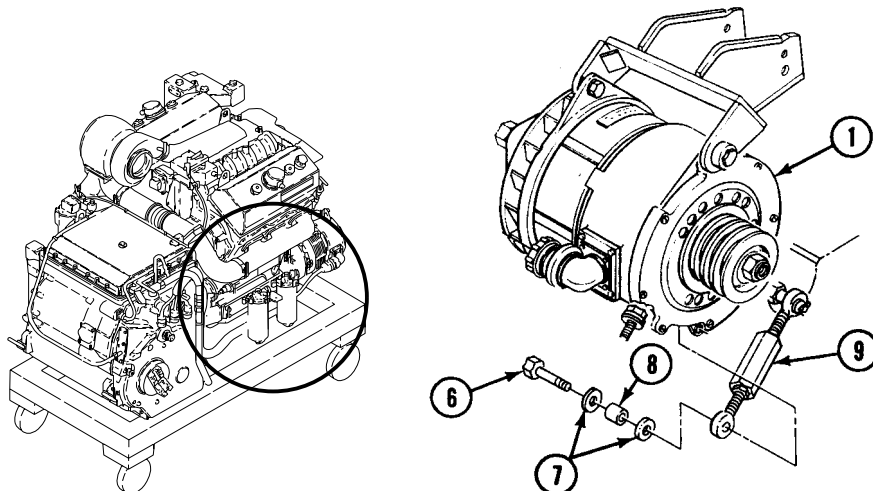
10. DISCONNECT LEAD (3) FROM FUEL RETURN PRESSURE SWITCH (4).
11. REMOVE TIE DOWN STRAP (7) FROM HARNESS. DISCARD STRAP.



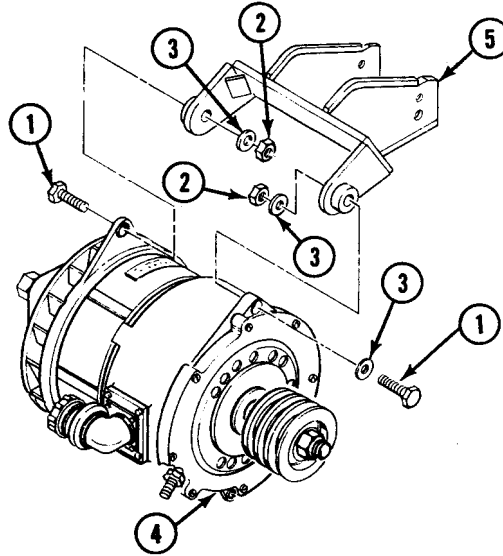
12. DISCONNECT LEAD (1) FROM PULSE TACHOMETER (2). REMOVE HARNESS FROM ENGINE.



13. REMOVE SCREW (6), TWO WASHERS (7), SPACER (8), AND TURNBUCKLE (9) FROM GENERATOR (1).

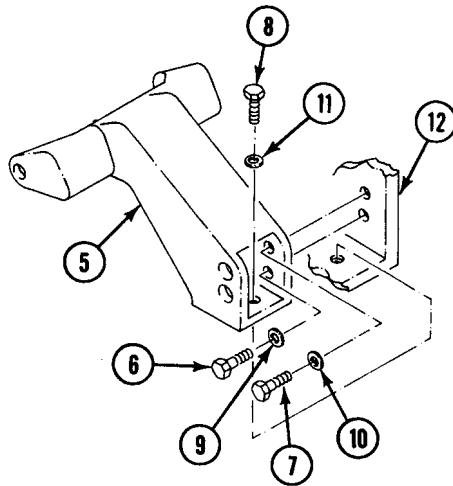


14. REMOVE TWO SCREWS (1), LOCKNUTS (2), THREE WASHERS (3), AND GENERATOR (4) FROM BRACKET (5). HAVE HELPER ASSIST. DISCARD LOCKNUTS.

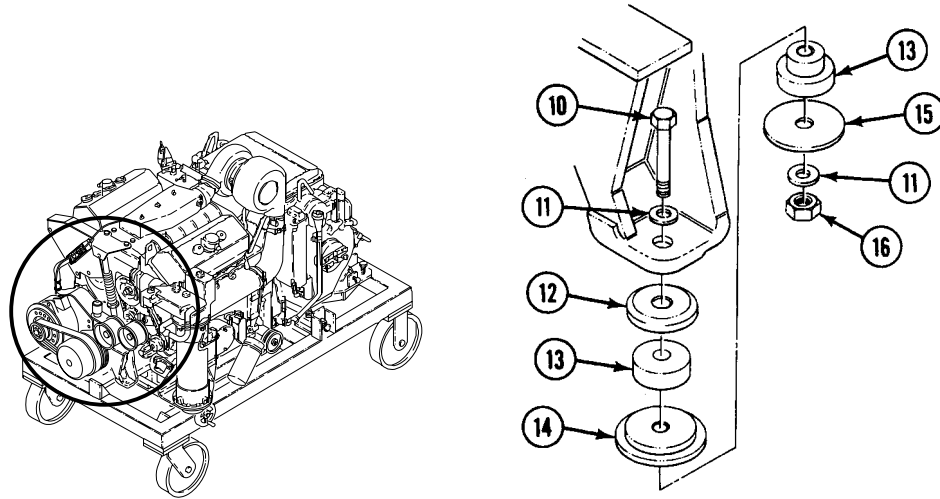


15. REMOVE THREE SCREWS (6), (7), AND (8), AND WASHERS (9), (10), AND (11) FROM GENERATOR MOUNTING BRACKET (5).

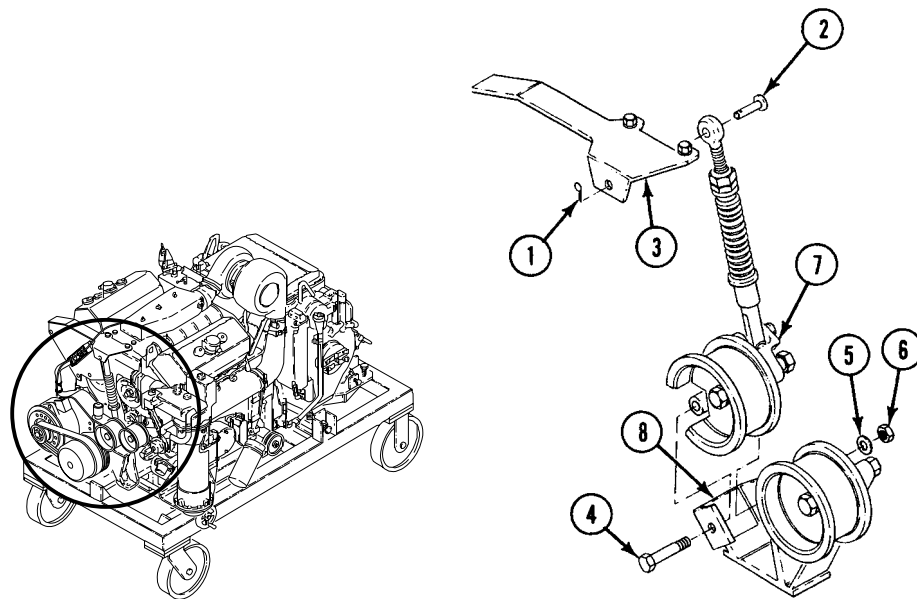
16. REMOVE GENERATOR MOUNTING BRACKET (5) FROM ENGINE BLOCK (12).



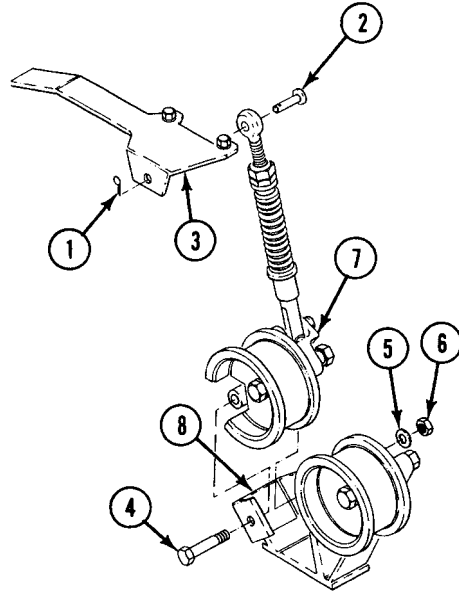
17. REMOVE TWO SCREWS (10), FOUR WASHERS (11), TWO WASHERS (12), FOUR MOUNTS (13), TWO BLOCKS (14), TWO WASHERS (15), AND TWO LOCKNUTS (16) FROM ENGINE. DISCARD LOCKNUTS.



18. REMOVE COTTER PIN (1) AND PIN (2) FROM BRACKET (3). DISCARD COTTER PIN.

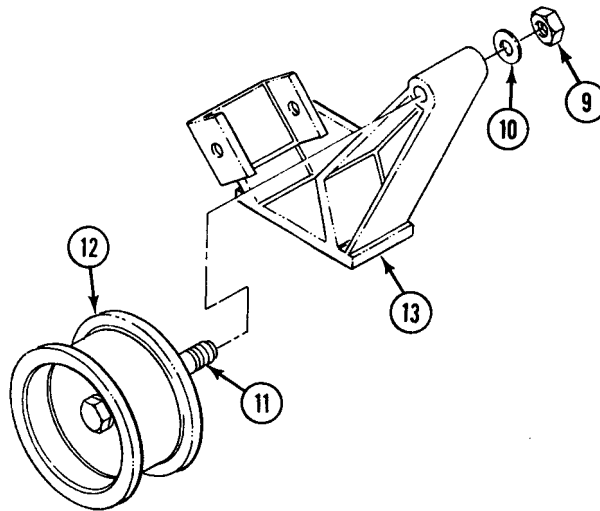


19. REMOVE SCREW (4), WASHER (5), LOCKNUT (6), AND IDLER ARM (7) FROM BRACKET (8). REMOVE IDLER ARM WITH PULLEY AND SPRING TENSIONER ASSEMBLY. DISCARD LOCKNUT.

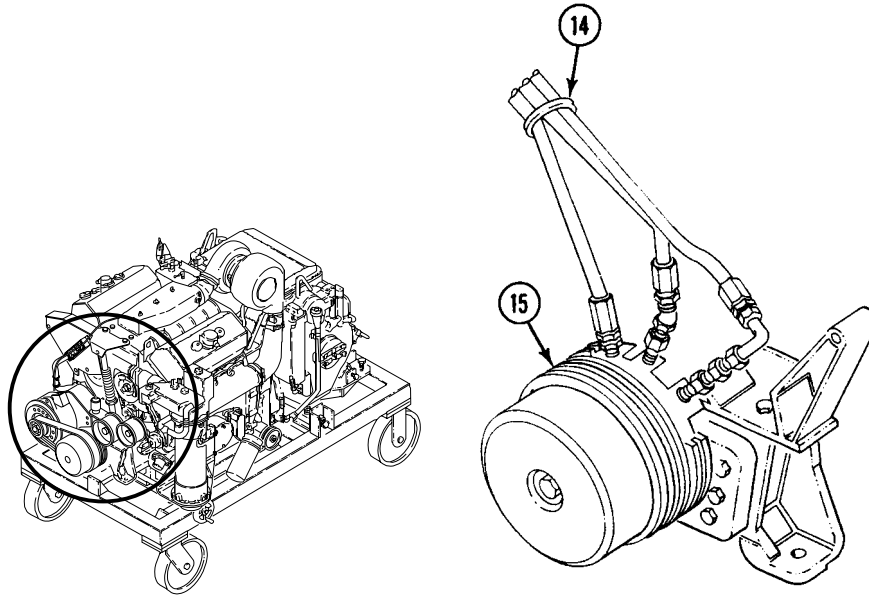


20. REMOVE LOCKNUT (9) AND WASHER (10) FROM BOLT (11). DISCARD LOCKNUT.

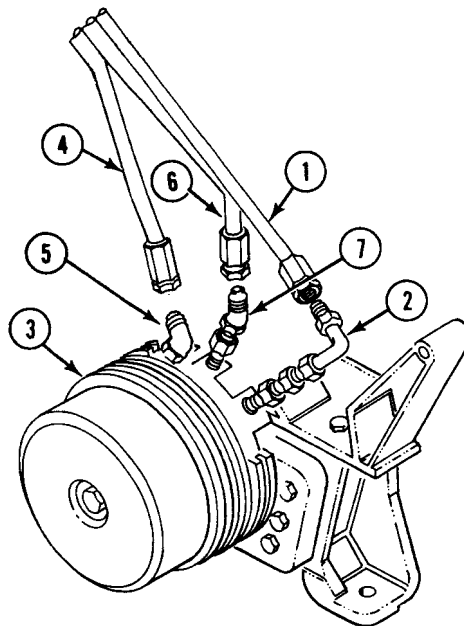
21. REMOVE BOLT (11) AND PULLEY (12) FROM BRACKET (13).



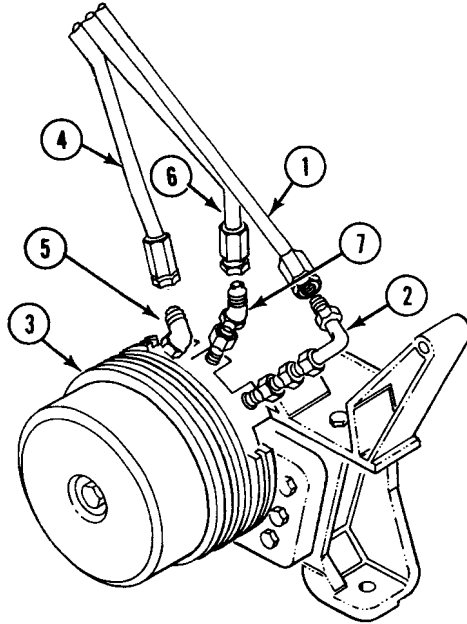
22. REMOVE TIE DOWN STRAP (14) FROM HOSES ON VARIABLE SPEED DRIVE (15).



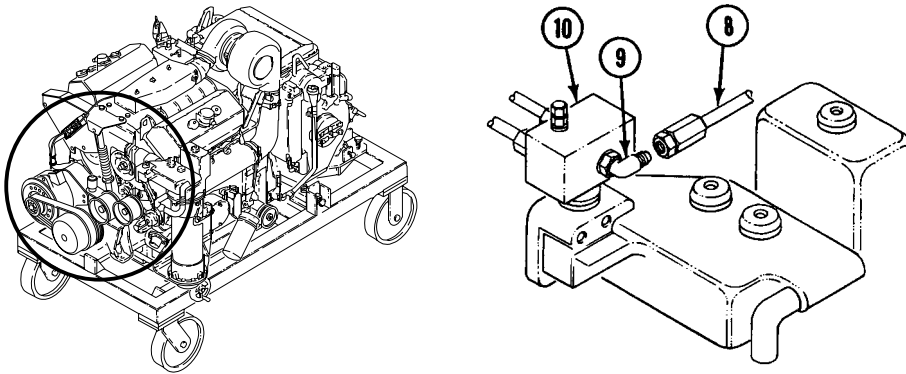
23. REMOVE LUBE PORT HOSE (1) FROM ELBOW (2) ON VARIABLE SPEED DRIVE (3).



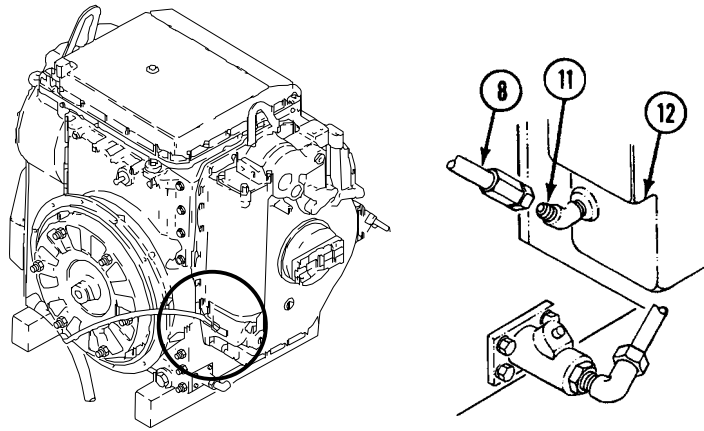
24. REMOVE PRESSURE HOSE (4) FROM ELBOW (5) ON VARIABLE SPEED DRIVE (3).
25. REMOVE RETURN HOSE (6) FROM ELBOW (7) ON VARIABLE SPEED DRIVE (3).



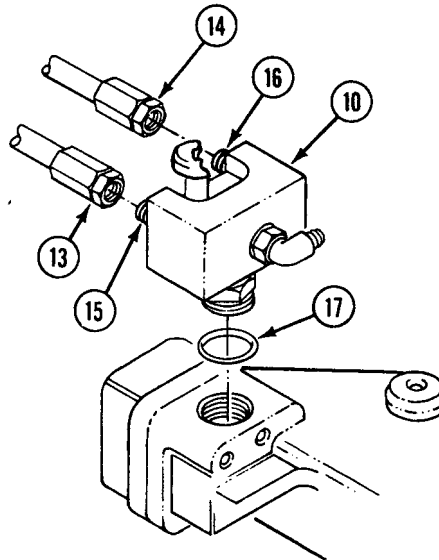
26. REMOVE SUPPLY HOSE (8) FROM ELBOW (9) ON THERMOSTATIC SWITCH (10).



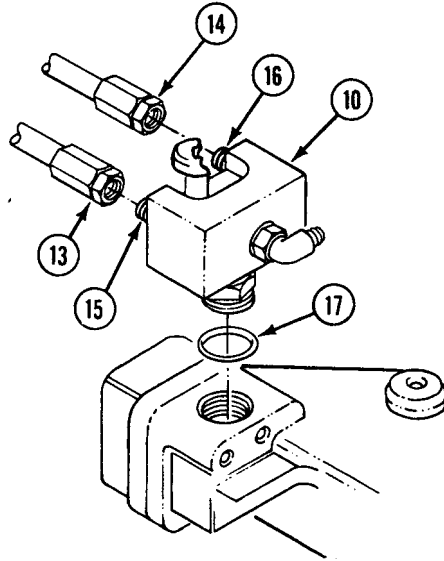
27. REMOVE SUPPLY HOSE (8) FROM ELBOW (11) ON TRANSMISSION (12).



28. REMOVE TWO HOSES (13), AND (14) FROM ADAPTERS (15), AND (16).



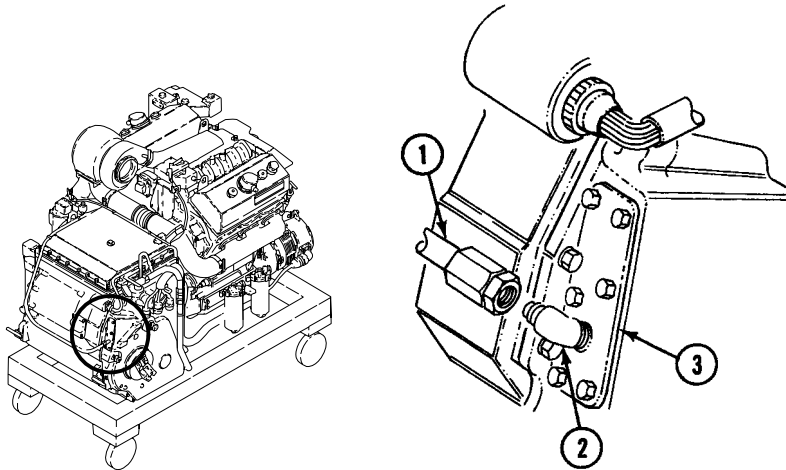
29. REMOVE THERMOSTATIC SWITCH (10) AND PREFORMED PACKING (17) FROM POWER PLANT. DISCARD PACKING.



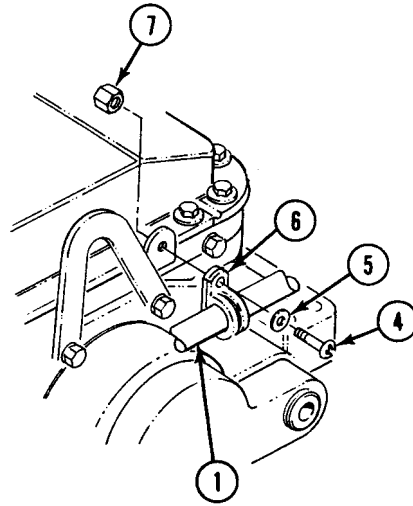
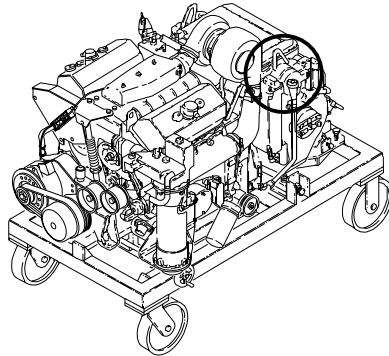
CAUTION

Cap or cover openings where oil lines or fittings have been removed.

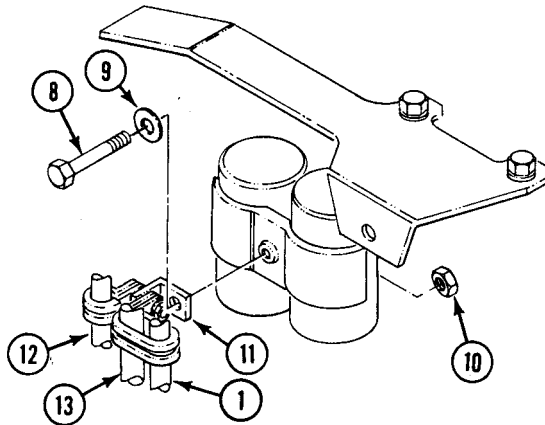
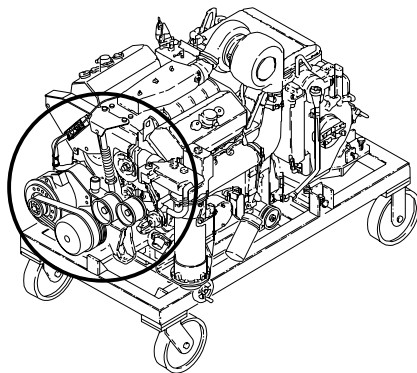
30. REMOVE HOSE (1) FROM ELBOW (2) ON TRANSMISSION END COVER (3).



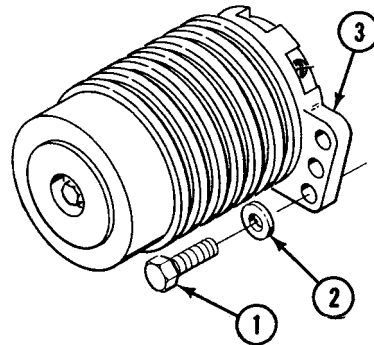
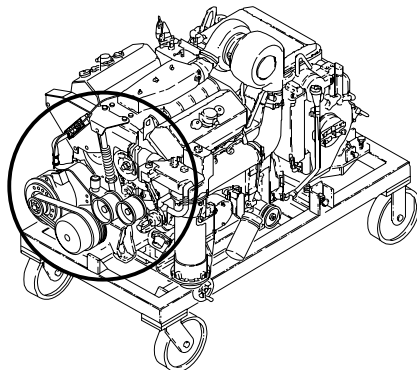
31. REMOVE SCREW (4), WASHER (5), CLAMP (6), AND NUT (7) THAT SECURE HOSE (1) TO TRANSMISSION.



32. REMOVE SCREW (8), WASHER (9), AND NUT (10) FROM BRACKET (11). REMOVE BRACKET WITH HOSES (12), (13) AND (1) FROM ENGINE.

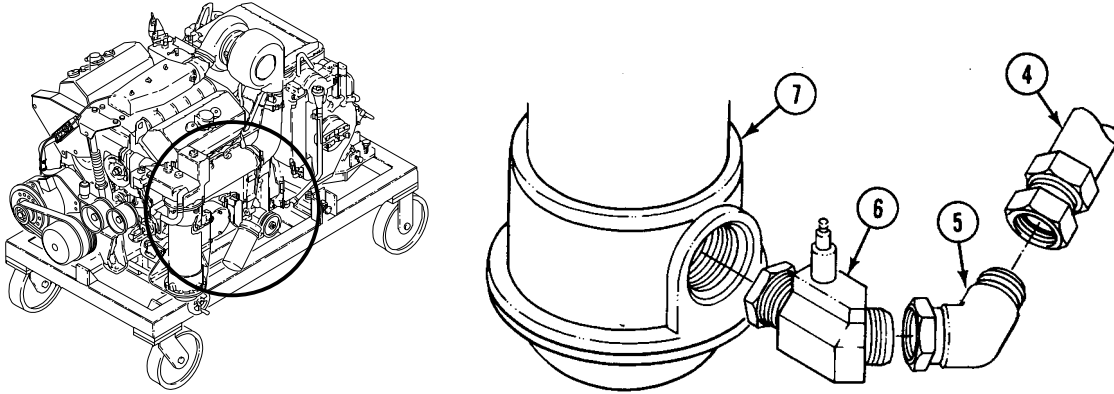


33. REMOVE SIX SCREWS (1), WASHERS (2), AND VARIABLE SPEED DRIVE ASSEMBLY (3) FROM ENGINE. HAVE HELPER ASSIST.

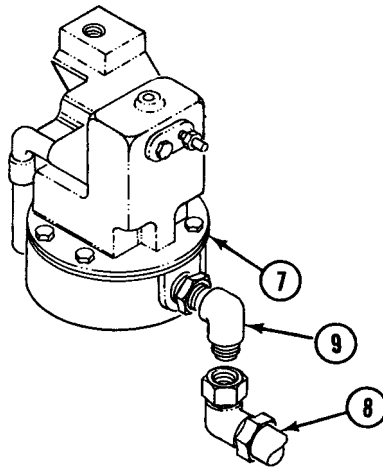


34. REMOVE VARIABLE SPEED DRIVE ASSEMBLY ADAPTER (WP 0008 00).

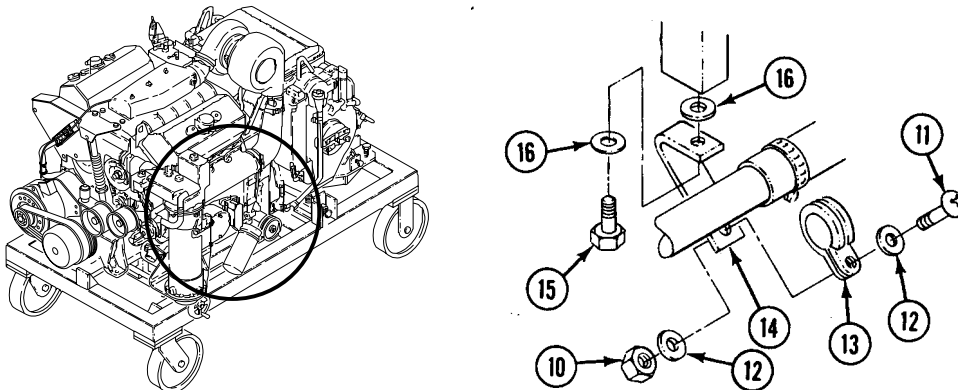
35. REMOVE TRANSMISSION OIL OUTLET HOSE (4) FROM ELBOW (5), AND REMOVE ELBOW FROM TEE (6) ON OIL COOLER (7).
36. REMOVE TEE ASSEMBLY (6) FROM OIL COOLER (7).



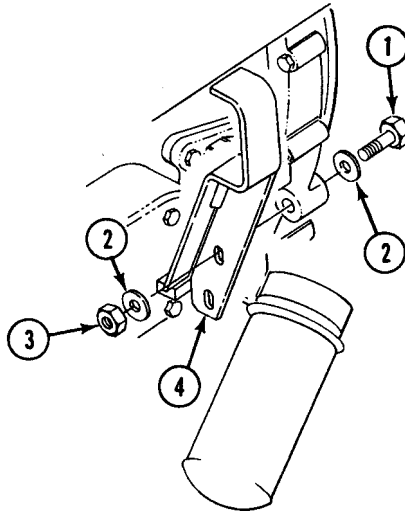
37. REMOVE OIL INLET HOSE (8) FROM UPPER ELBOW (9) ON OIL COOLER (7). REMOVE ELBOW ASSEMBLY FROM OIL COOLER.



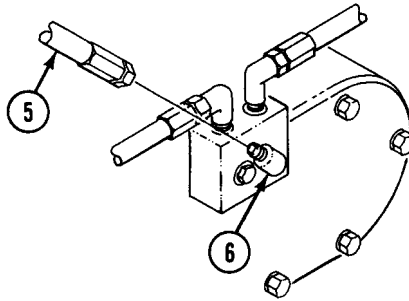
38. REMOVE LOCKNUT (10), SCREW (11), TWO WASHERS (12), AND CLAMP (13) FROM BRACKET (14). DISCARD LOCKNUT.
39. REMOVE SCREW (15), TWO WASHERS (16) AND BRACKET (14) FROM ENGINE.



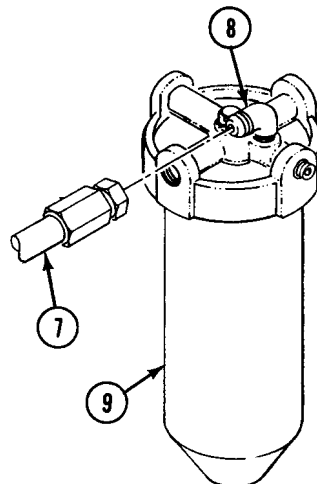
40. REMOVE TWO SCREWS (1), FOUR WASHERS (2), TWO NUTS (3), AND BRACKET (4) FROM ENGINE.



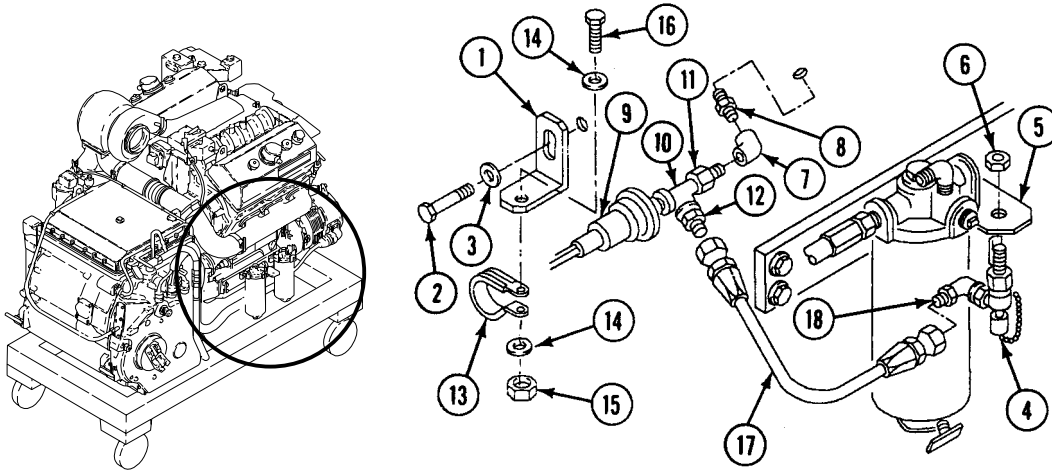
41. DISCONNECT FUEL RETURN HOSE (5) FROM ELBOW (6).



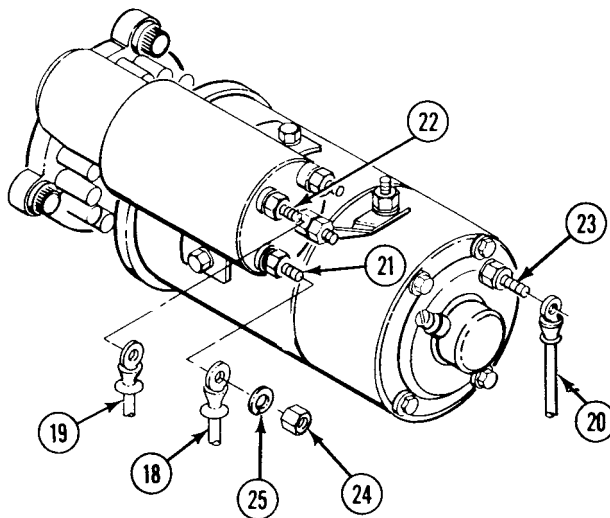
42. DISCONNECT SUPPLY HOSE (7) FROM ELBOW (8) ON PRIMARY FUEL FILTER (9). REMOVE ELBOW.



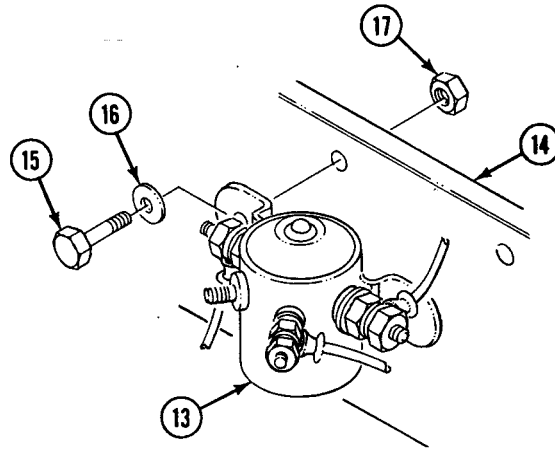
43. DISCONNECT HOSE (17) FROM ADAPTER (18) ON OIL SAMPLE VALVE (4).
44. DISCONNECT HOSE (17) FROM ADAPTER (12) AND REMOVE HOSE.
45. REMOVE SCREW (16), NUT (15), TWO WASHERS (14), AND CLAMP (13) FROM TRANSMITTER (9).
46. REMOVE TRANSMITTER (9), ADAPTER (10), TEE (11), AND ADAPTER (12) FROM ELBOW (7).
47. REMOVE ELBOW (7) AND NIPPLE (8) FROM ENGINE.
48. REMOVE SCREW (2), WASHER (3), AND BRACKET (1) FROM ENGINE.
49. LOOSEN JAMNUT (6) ON VALVE (4) AND REMOVE VALVE FROM BRACKET (5).



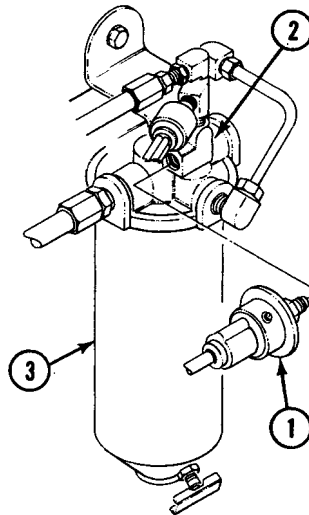
50. REMOVE THREE NUTS (24), LOCKWASHERS (25), AND CIRCUIT LEADS 74A (20), 74C (19), AND 74D (18) FROM SOLENOID BATTERY TERMINALS (21) AND (22), AND STARTER TERMINAL (23). DISCARD LOCKWASHERS.



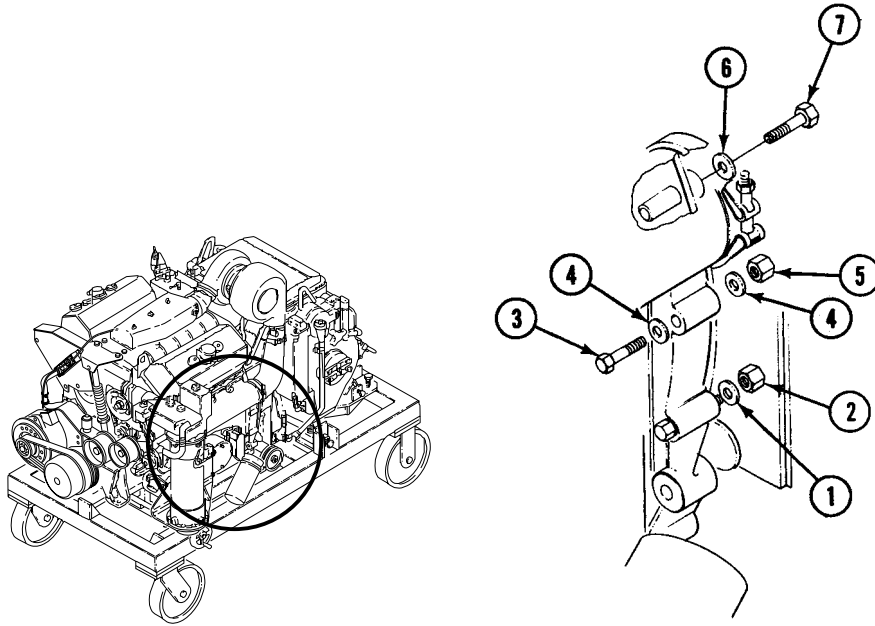
51. REMOVE TWO SCREWS (15), WASHERS (16), LOCKNUTS (17) AND STARTER RELAY SWITCH (13) FROM BRACKET (14). DISCARD LOCKNUTS.



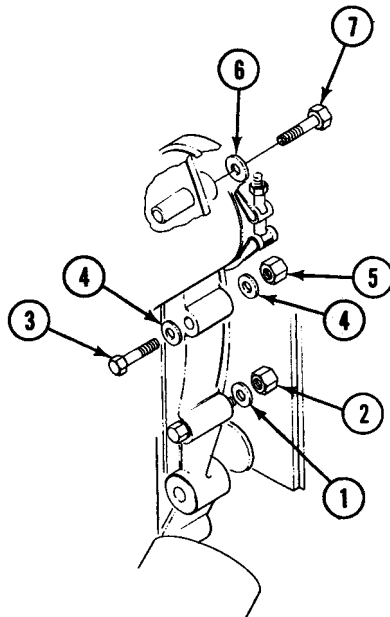
52. REMOVE SWITCH (1) FROM TEE (2) ON SECONDARY FUEL FILTER (3).



53. REMOVE TEN SELF-LOCKING BOLTS (7) AND TEN WASHERS (6) MATING ENGINE TO TRANSMISSION. DISCARD SELF-LOCKING BOLTS.

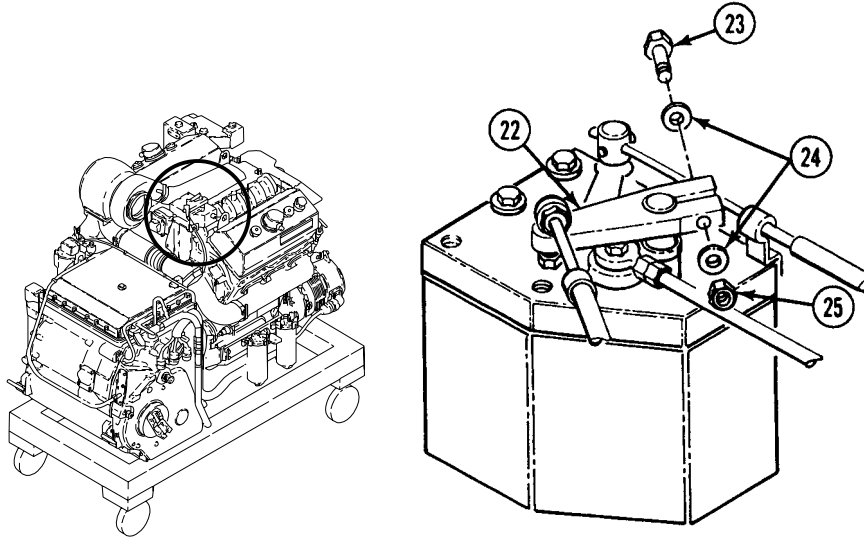


54. REMOVE SCREW (3), TWO WASHERS (4), AND LOCKNUT (5) FROM ENGINE. DISCARD LOCKNUT.
 55. REMOVE LOCKNUT (2) AND WASHER (1) FROM ENGINE. DISCARD LOCKNUT.

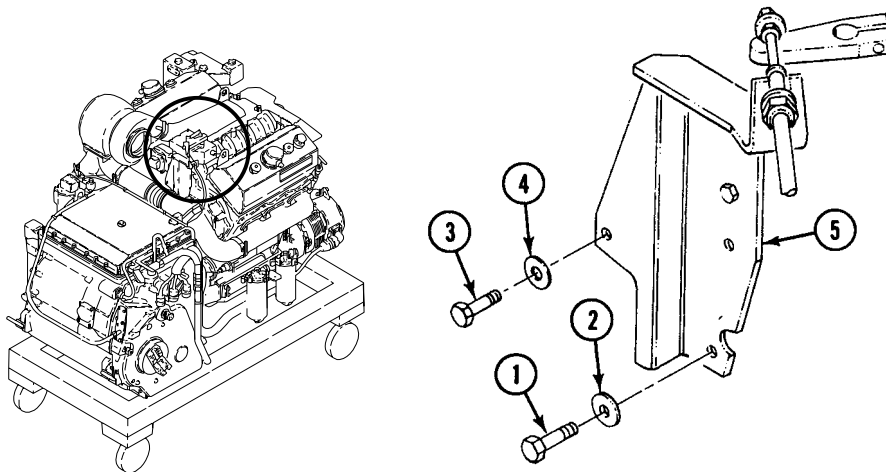


56. SEPARATE ENGINE FROM TRANSMISSION.

57. REMOVE SCREW (23), TWO WASHERS (24), AND NUT (25) THAT SECURE LEVER ASSEMBLY (22) TO ENGINE.



58. REMOVE SCREW (1) AND WASHER (2).
 59. REMOVE SCREW (3), WASHER (4) AND BRACKET (5).



INSTALLATION

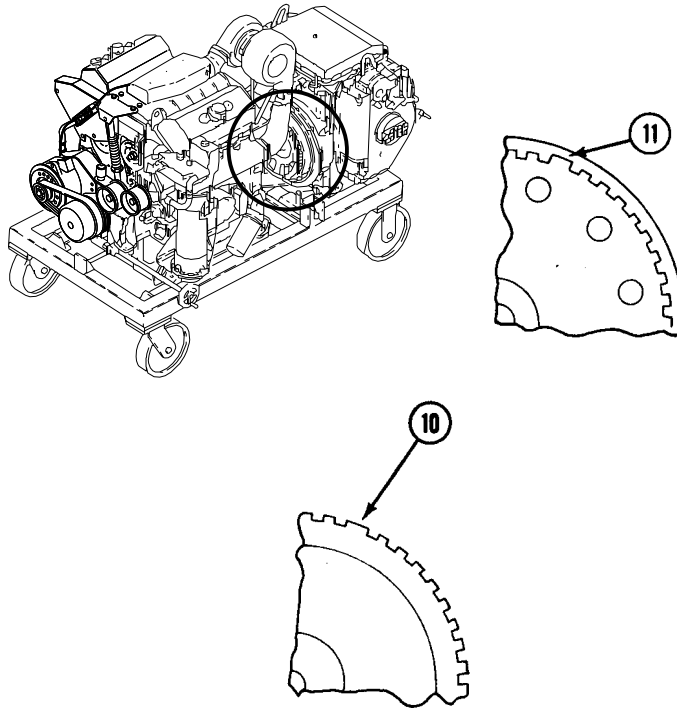
1. REMOVE NEW ENGINE FROM SHIPPING CONTAINER AND PLACE NEW ENGINE ON ENGINE AND TRANSMISSION STAND. USE SLING AND LIFTING DEVICE.
2. PLACE AND SECURE OLD ENGINE IN SHIPPING CONTAINER.

NOTE

There are two sets of index splines located on the engine flywheel and transmission drive coupling, 180 degrees apart.

Transmission drive coupling may be rotated with a screw driver to align index splines for assembly. Do not use fingers.

3. ROTATE TRANSMISSION DRIVE COUPLING (10) TO ALIGN WITH ENGINE FLYWHEEL INDEXING SPLINE (11).

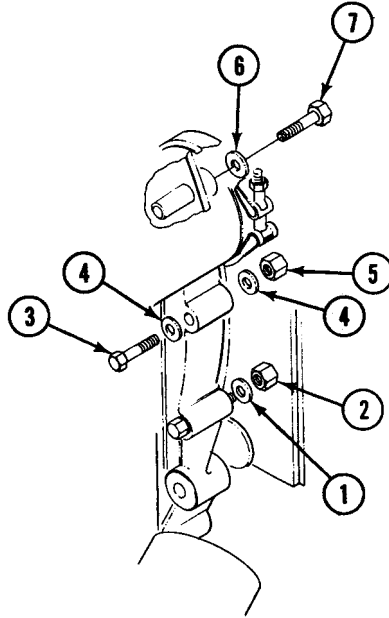


4. USING ENGINE AND TRANSMISSION STAND, ADJUST TRANSMISSION TO ALIGN WITH ENGINE. WITH PROPER ALIGNMENT, MATE ENGINE TO TRANSMISSION.

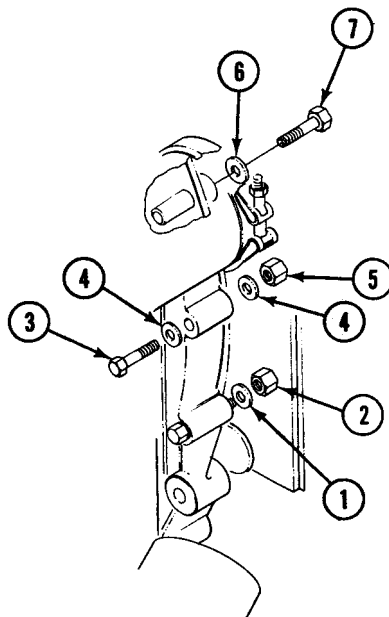
NOTE

Do not torque engine to transmission attaching screws and nuts until all twelve screws have been seated.

5. INSTALL WASHER (1) AND NEW LOCKNUT (2). TIGHTEN LOCKNUT TO 25–27 LB-FT (34–37 N·m TORQUE).



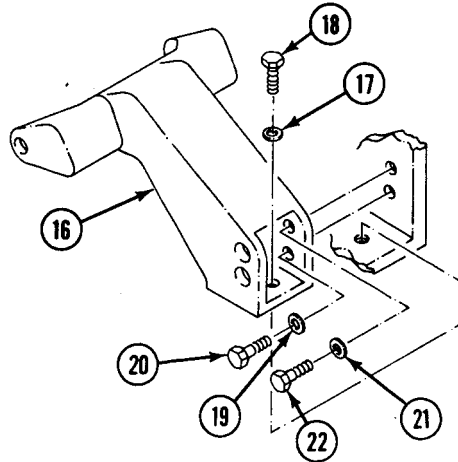
6. INSTALL SCREW (3), TWO WASHERS (4), AND NEW LOCKNUT (5). TIGHTEN LOCKNUT TO 25–27 LB-FT (34–37 N·m TORQUE).
7. INSTALL TEN WASHERS (6) AND NEW SELF-LOCKING BOLTS (7). TIGHTEN BOLTS TO 38–41 LB-FT (52–56 N·m TORQUE).



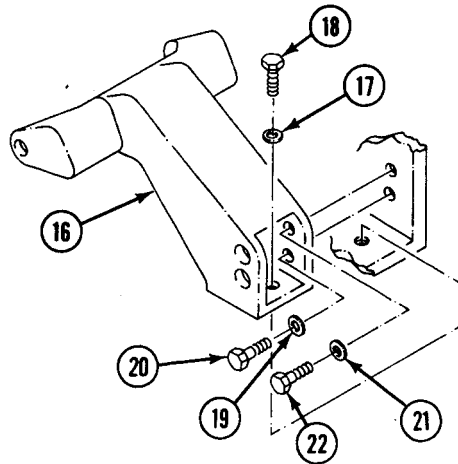
NOTE

Do not tighten generator mounting bracket screws until all the mounting screws have been installed. All three screws require a specific torque.

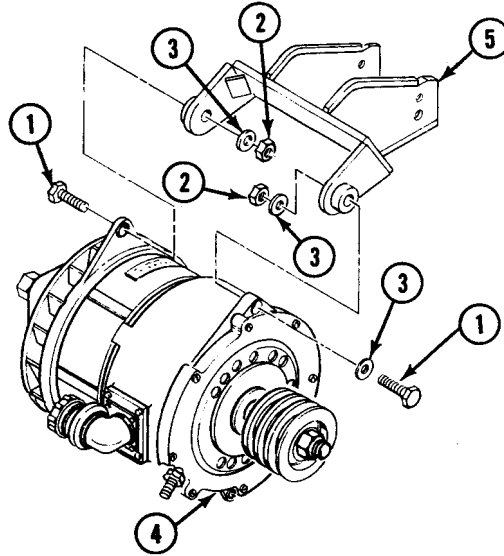
8. POSITION GENERATOR MOUNTING BRACKET (16) AND INSTALL WASHER (17) AND SCREW (18). TIGHTEN SCREW TO 32–34 LB-FT (43–46 N·m TORQUE).



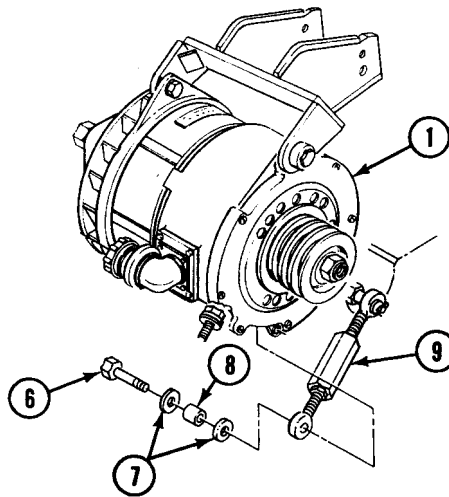
9. ALIGN GENERATOR MOUNTING BRACKET (16) HOLES. INSTALL WASHER (19) AND SCREW (20). TIGHTEN SCREW TO 36–38 LB-FT (49–52 N·m TORQUE).
10. ALIGN GENERATOR MOUNTING BRACKET (16) HOLES. INSTALL WASHER (21) AND SCREW (22). TIGHTEN SCREW TO 32–34 LB-FT (43–46 N·m TORQUE).



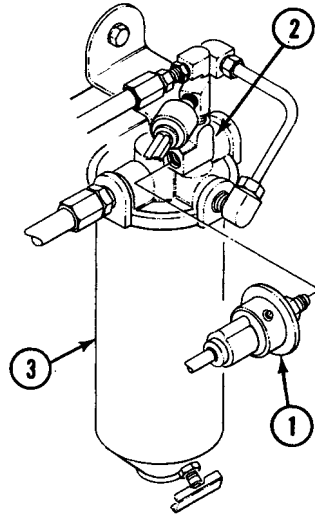
11. INSTALL GENERATOR (4) ON BRACKET (5) WITH TWO SCREWS (1), NEW LOCKNUTS (2), AND THREE WASHERS (3).



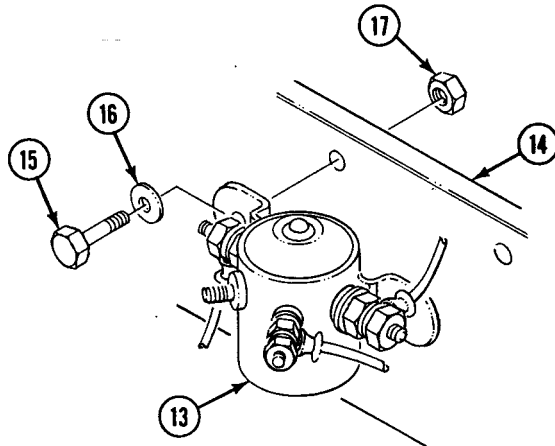
12. INSTALL SCREW (6), TWO WASHERS (7), SPACER (8), AND TURNBUCKLE (9) ON GENERATOR (1).



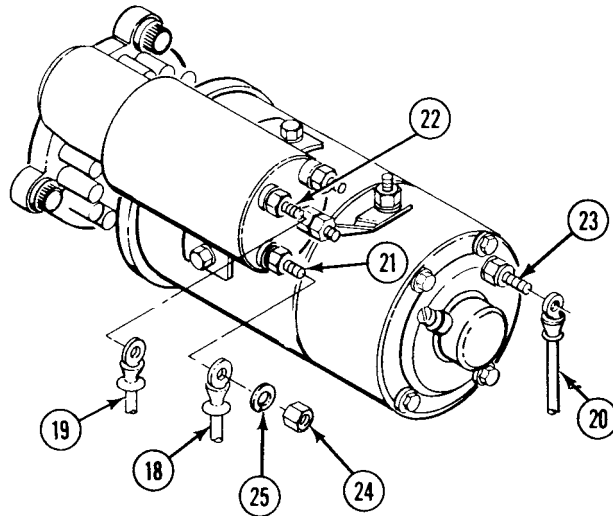
13. INSTALL GENERATOR FIELD SWITCH (1) ON TEE (2) AND SECONDARY FUEL FILTER (3).



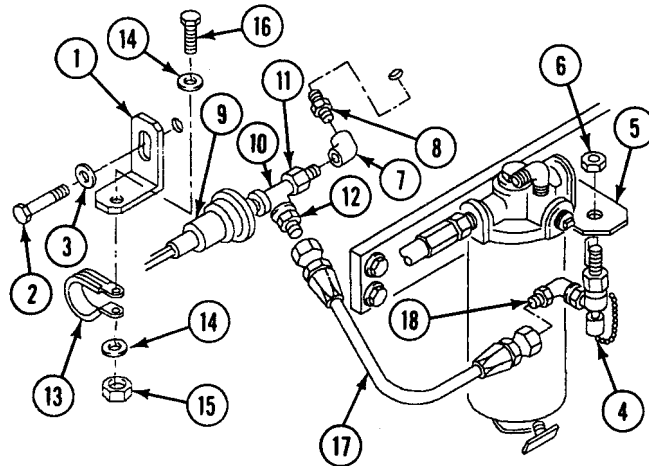
14. INSTALL STARTER RELAY SWITCH (13) ON BRACKET (14) WITH TWO SCREWS (15), WASHERS (16), AND NEW LOCKNUTS (17).



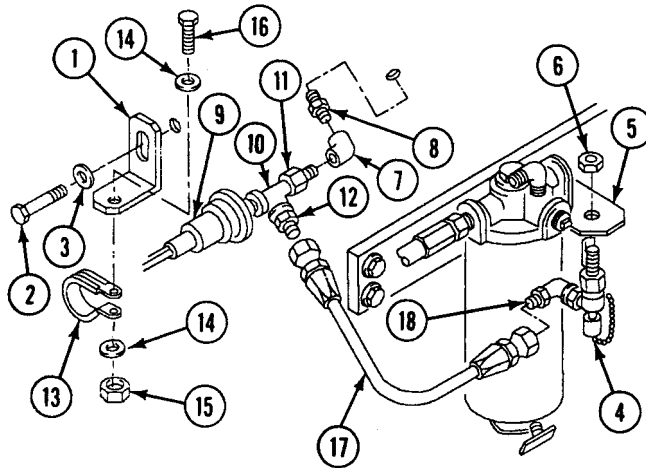
15. INSTALL CIRCUIT LEADS 74D (18), 74C (19), AND 74A (20) TO SOLENOID BATTERY TERMINALS (21) AND (22), AND STARTER TERMINAL (23) WITH THREE NUTS (24) AND NEW LOCKWASHERS (25).



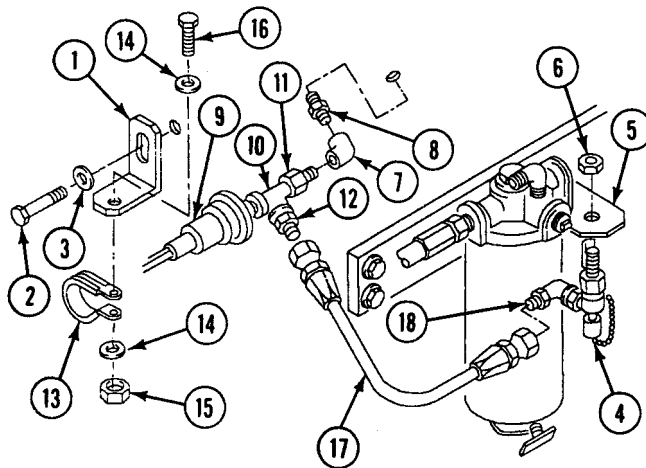
16. INSTALL BRACKET (1) WITH SCREW (2) AND WASHER (3) ON ENGINE. TIGHTEN SCREW TO 30–35 LB-FT (41–48 N·m) TORQUE.
17. POSITION OIL SAMPLE VALVE (4) ON BRACKET (5) AND SECURE WITH JAMNUT (6).



18. INSTALL ELBOW (7) AND NIPPLE (8) ON ENGINE.

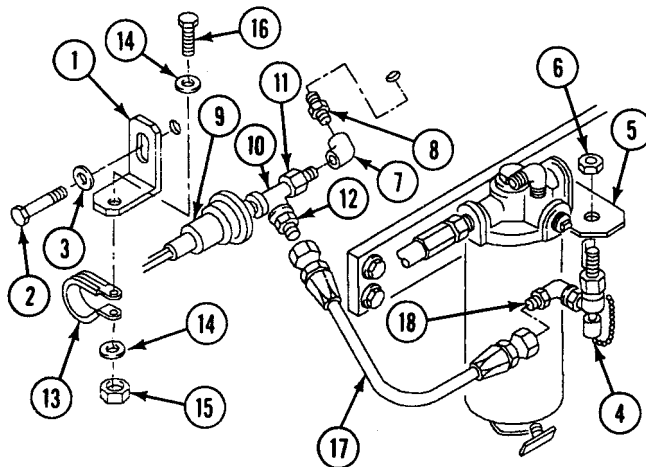


19. INSTALL LOW OIL PRESSURE SWITCH (9), TEE (10), AND TWO ADAPTERS (11)(12) ON ELBOW (7).

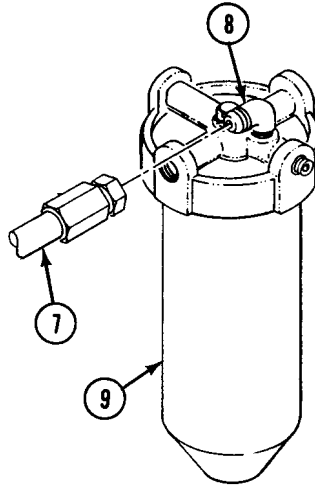


20. INSTALL CLAMP (13) ON LOW OIL PRESSURE SWITCH (9) AND SECURE TO BRACKET (1) WITH TWO WASHERS (14), NUT (15), AND SCREW (16).

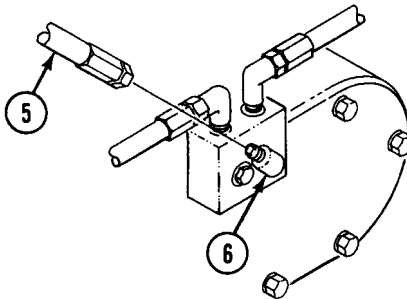
21. CONNECT HOSE (17) TO ADAPTER (18) ON OIL SAMPLE VALVE (4) AND TO ADAPTER (12) ON TEE (10).



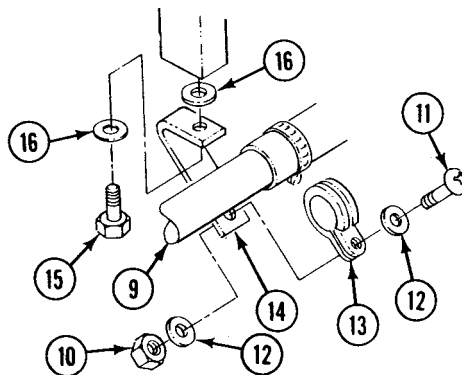
22. INSTALL ELBOW (8) ON PRIMARY FUEL FILTER (9).
23. CONNECT FUEL SUPPLY HOSE (7) TO ELBOW (8).



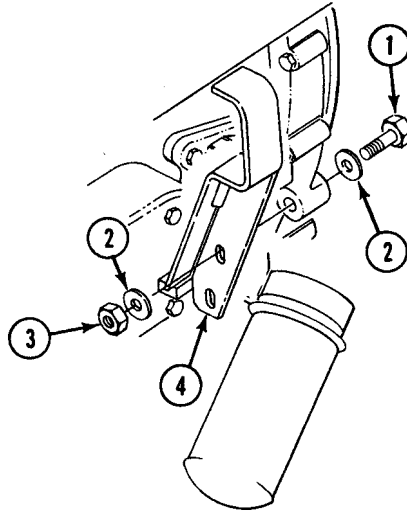
24. CONNECT FUEL RETURN HOSE (5) TO ELBOW (6) ON ENGINE.



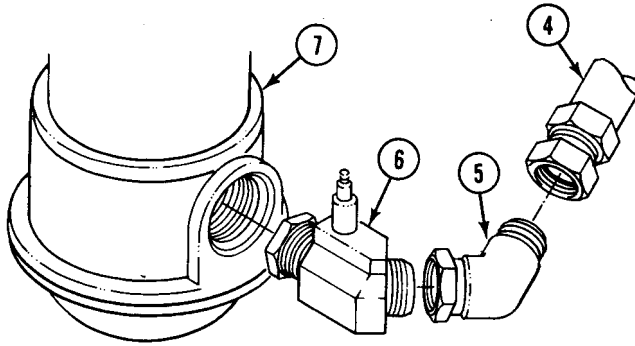
25. INSTALL BRACKET (14) WITH SCREW (15) AND TWO WASHERS (16).
26. SECURE TRANSMISSION OIL DRAIN TUBE (9) ON BRACKET (14) WITH CLAMP (13), SCREW (11), TWO WASHERS (12), AND NEW LOCKNUT (10).



27. INSTALL BRACKET (4), TWO SCREWS (1), FOUR WASHERS (2), AND TWO NUTS (3) ON ENGINE.

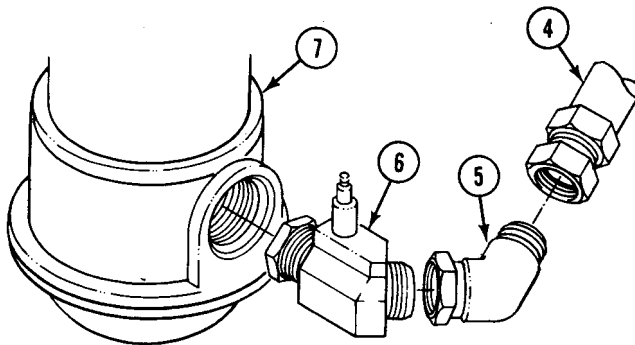


28. INSTALL TEE ASSEMBLY (6) ON OIL COOLER (7).

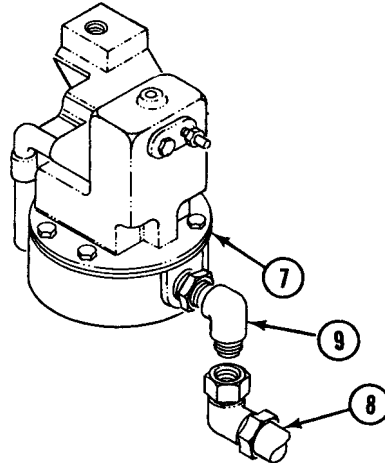


29. INSTALL ELBOW (5) ON TEE ASSEMBLY (6).

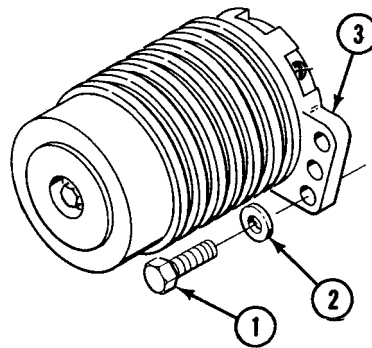
30. INSTALL OIL OUTLET HOSE (4) TO ELBOW (5).



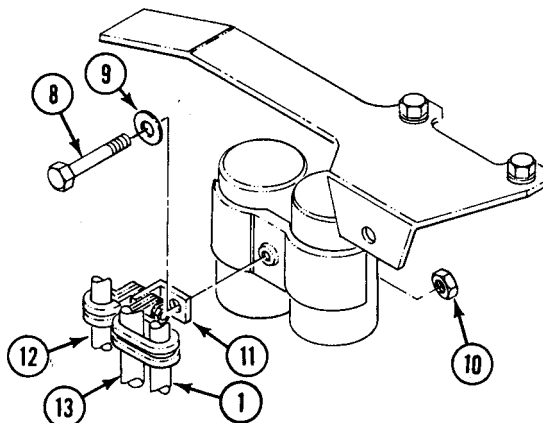
31. INSTALL ELBOW ASSEMBLY (9) ON OIL COOLER (7).
32. INSTALL OIL INLET HOSE (8) ON ELBOW ASSEMBLY (9).



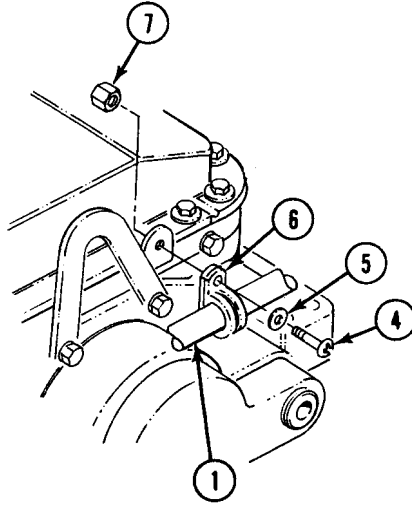
33. INSTALL VARIABLE SPEED DRIVE ADAPTER (WP 0008 00).
34. INSTALL FAN AND VARIABLE SPEED DRIVE ASSEMBLY (3) WITH SIX SCREWS (1) AND WASHERS (2). HAVE HELPER ASSIST.



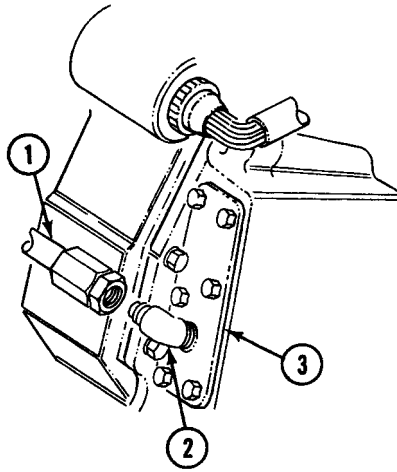
35. INSTALL BRACKET (11) WITH HOSES (1), (13) AND (12) ON TRANSMISSION. USE EXISTING SCREW (8), WASHER (9), AND NUT (10).



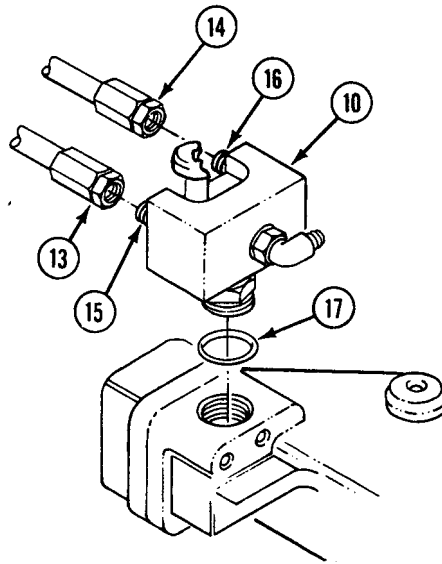
36. INSTALL CLAMP (6) WITH HOSE (1) ON TRANSMISSION. USE EXISTING SCREW (4), WASHER (5), AND NUT (7).



37. CONNECT HOSE (1) TO ELBOW (2) ON TRANSMISSION END COVER (3).

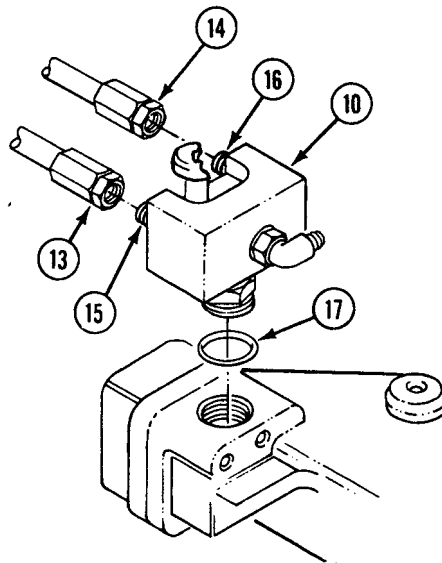


38. INSTALL NEW PREFORMED PACKING (17) AND THERMOSTATIC SWITCH (10) ON POWER PLANT.

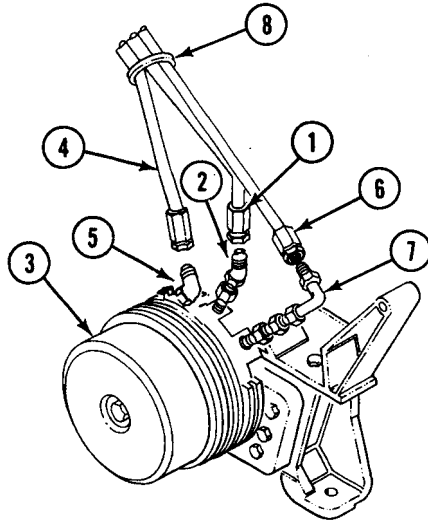


39. CONNECT PRESSURE HOSE (14) TO ADAPTER (16) ON THERMOSTATIC SWITCH (10).

40. CONNECT LUBE PORT HOSE (13) TO ADAPTER (15) ON THERMOSTATIC SWITCH (10).



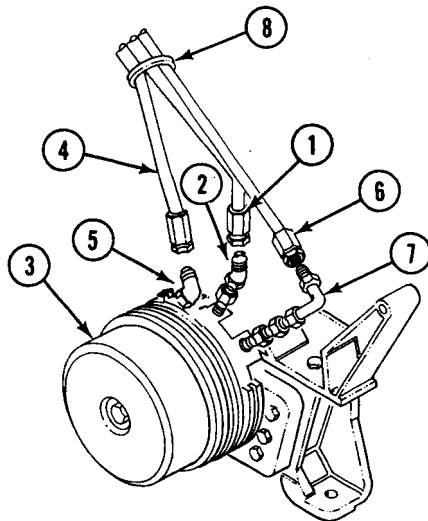
41. CONNECT RETURN HOSE (1) TO ELBOW (2) ON VARIABLE SPEED DRIVE ASSEMBLY (3).



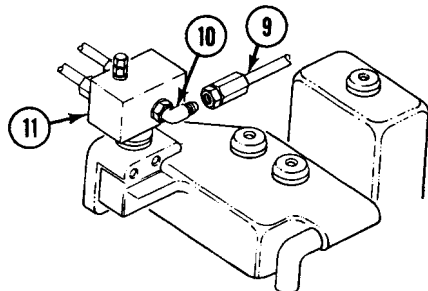
42. CONNECT PRESSURE HOSE (4) TO ELBOW (5) ON VARIABLE SPEED DRIVE ASSEMBLY (3).

43. CONNECT LUBE PORT HOSE (6) TO ELBOW (7) ON VARIABLE SPEED DRIVE ASSEMBLY (3).

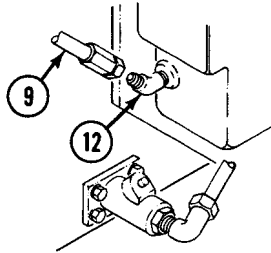
44. INSTALL TIE DOWN STRAP (8) ON HOSES FROM VARIABLE SPEED DRIVE.



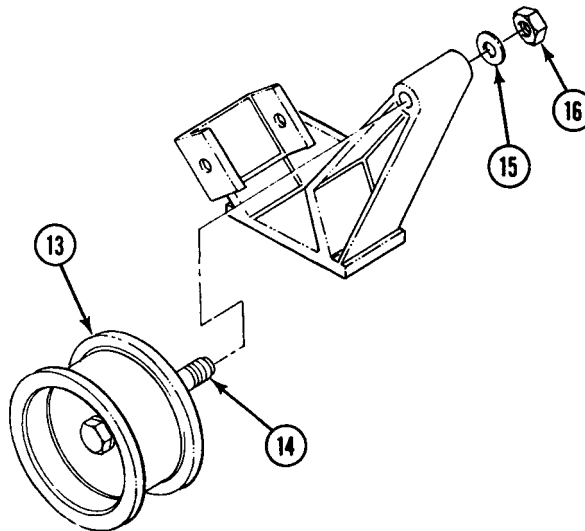
45. CONNECT SUPPLY HOSE (9) TO ELBOW (10) ON THERMOSTATIC SWITCH (11).



46. CONNECT SUPPLY HOSE (8) TO ELBOW (12) ON TRANSMISSION.

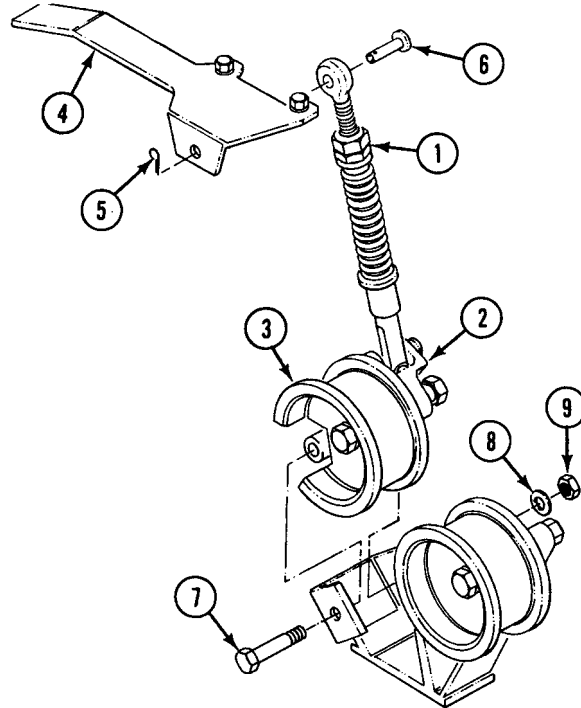


47. INSTALL PULLEY (13) WITH BOLT (14), WASHER (15), AND NEW LOCKNUT (16).

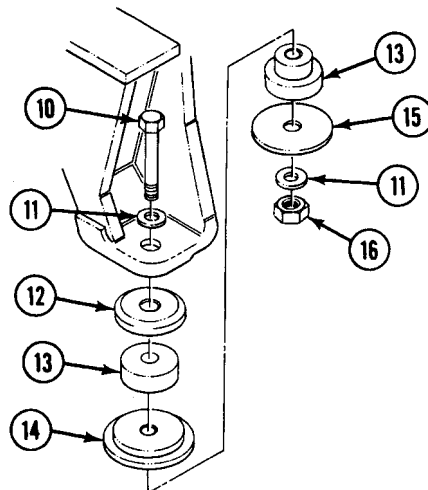


48. POSITION SPRING TENSIONER (1) WITH IDLER ARM (2) AND PULLEY (3) ON BRACKET (4) AND INSTALL COTTER PIN (5) AND PIN (6).

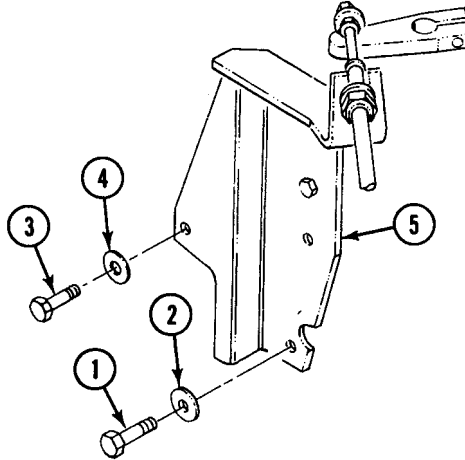
49. POSITION IDLER ARM (2) AND INSTALL SCREW (7), WASHER (8), AND NEW LOCKNUT (9).



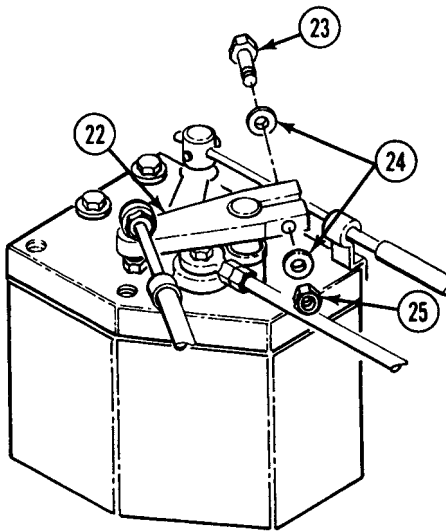
50. INSTALL TWO SCREWS (10), FOUR WASHERS (11), TWO WASHERS (12), FOUR MOUNTS (13), TWO BLOCKS (14), TWO WASHERS (15), AND TWO LOCKNUTS (16) ON ENGINE. TIGHTEN TO 100–120 LB-FT (136–163 N·m) TORQUE.



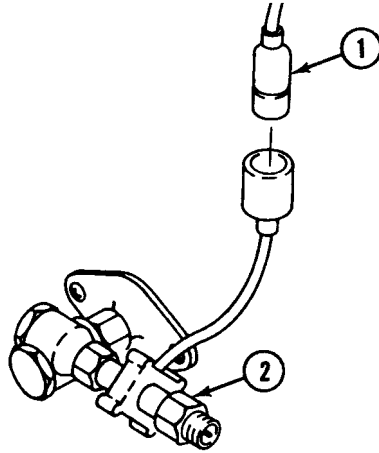
51. INSTALL BRACKET (5) WITH SCREW (3) AND WASHER (4), AND WITH EXISTING SCREW (1) AND WASHER (2).



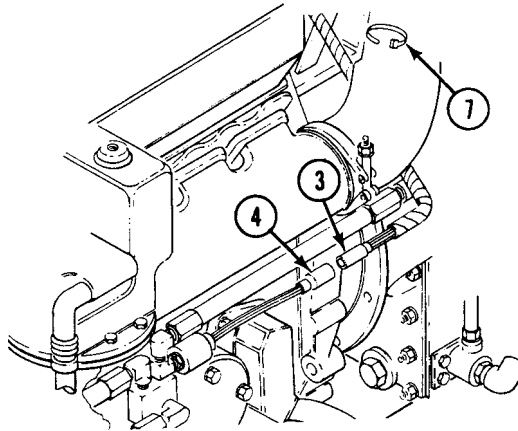
52. POSITION LEVER (22) AND SECURE WITH SCREW (23), TWO WASHERS (24), AND NUT (25).



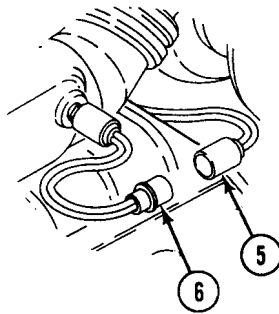
53. CONNECT HARNESS LEAD (1) TO PULSE TACHOMETER (2).



54. CONNECT LEAD (3) TO FUEL RETURN PRESSURE SWITCH (4).



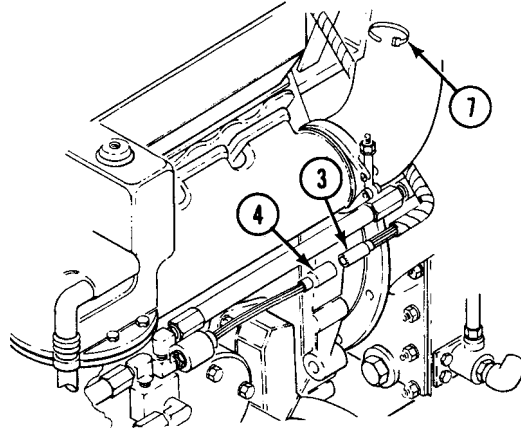
55. CONNECT LEAD (5) TO TURBO OUTLET PRESSURE SWITCH (6).



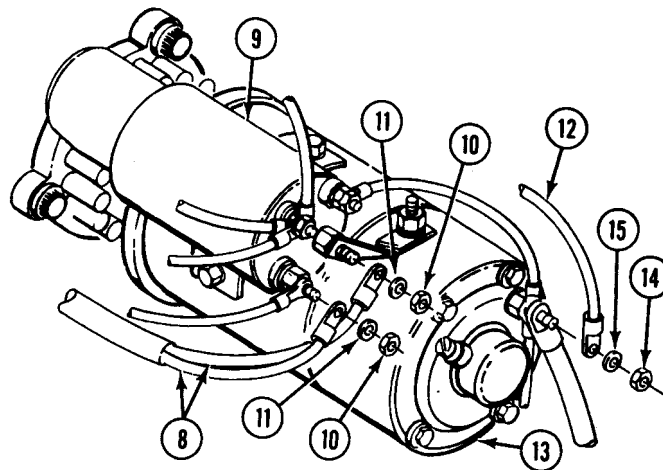
CAUTION

Excess heat can cause the fuel return pressure switch to leak. Leaking fuel can catch fire and cause equipment damage. Make sure electrical lead is secured away from exhaust duct.

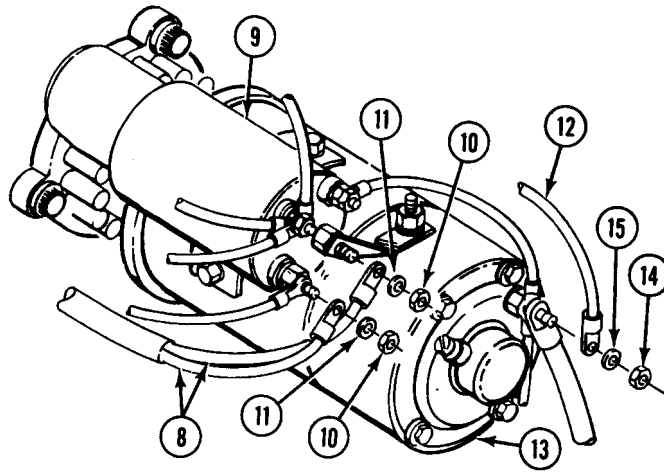
56. SECURE NEW TIE STRAP (7).



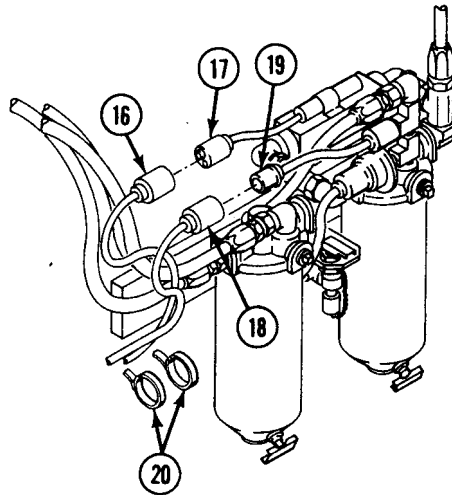
57. INSTALL LEADS (8) ON STARTER SOLENOID (9) TERMINALS WITH TWO NUTS (10) AND NEW LOCKWASHERS (11).



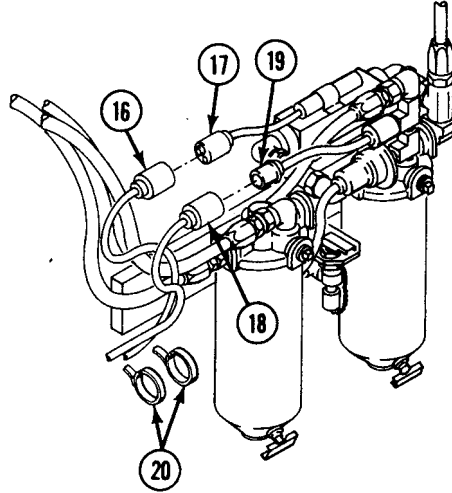
58. INSTALL LEAD (12) ON STARTER (13) TERMINAL WITH NUT (14) AND NEW LOCKWASHER (15).



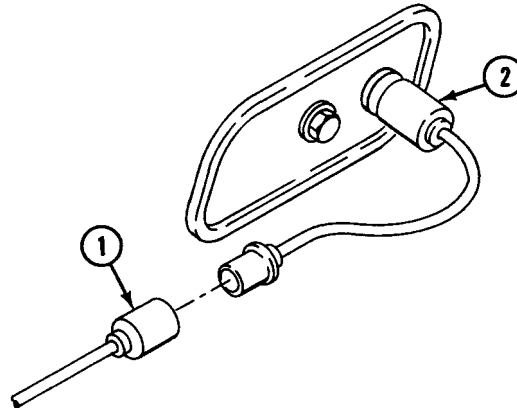
59. CONNECT LEAD (16) TO FUEL FILTER DIFFERENTIAL PRESSURE SWITCH (17).



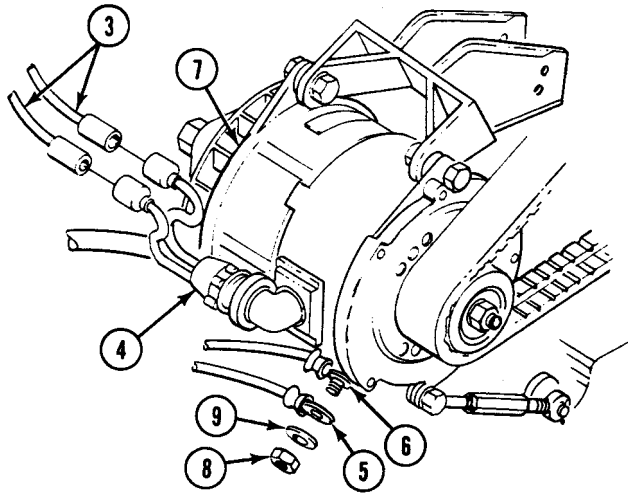
60. CONNECT LEAD (18) TO FUEL SUPPLY PRESSURE TRANSDUCER (19).
61. SECURE HARNESS TO ENGINE WITH TWO NEW TIE STRAPS (20).



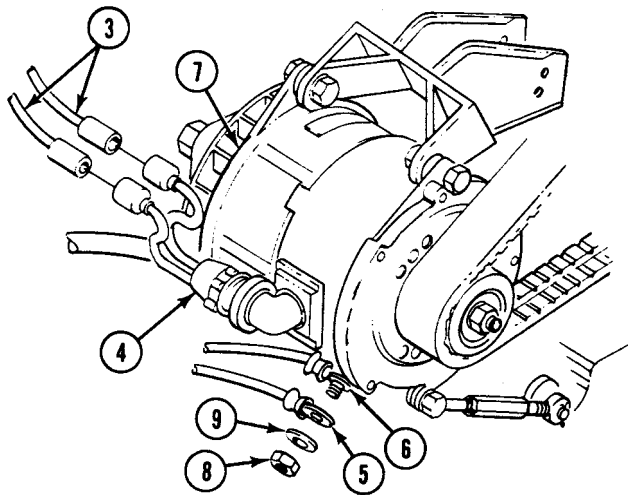
62. CONNECT LEAD (1) TO AIR BOX PRESSURE TRANSDUCER (2).



63. CONNECT LEADS (3) TO GENERATOR MAIN CABLE (4).



64. INSTALL GROUND LEAD (5) AND CIRCUIT LEAD (6) ON GENERATOR (7) WITH NUT (8) AND NEW LOCKWASHER (9).



END OF TASK

REPLACE VARIABLE SPEED DRIVE ASSEMBLY ADAPTER

0008 00

THIS WORK PACKAGE COVERS:

Removal (page 0008 00-1).
 Installation (page 0008 00-5).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10
 Helper (H)

Tools and Special Tools

General mechanic's tool kit: automotive
 (WP 0046 00, Item 54)
 Retaining ring pliers (WP 0046 00, Item 36)
 Puller set (WP 0046 00, Item 42)
 Screws 1/4-28 UNF, cap, hexagon (3)
 (WP 0046 00, Item 44)
 Washer (3) (WP 0046 00, Item 58)
 Torque wrench, 3/4 inch drive, 0-600 lb-ft
 (WP 0046 00, Item 67)
 Socket wrench set, 3/4 inch drive (WP 0046 00, Item 68)

References

TM 9-2350-366-20-1

Equipment Condition

Variable speed drive assembly removed
 (TM 9-2350-366-20-1)

Materials/Parts

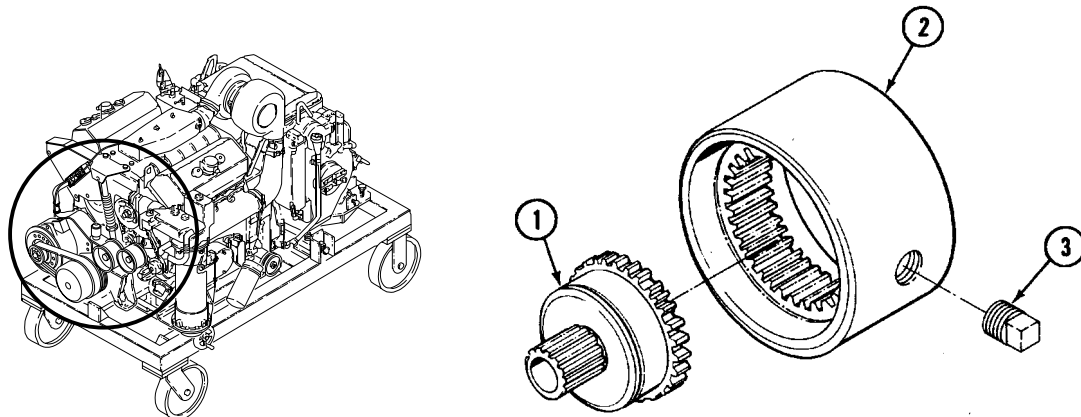
Grease (WP 0048 00, Item 3)
 Sealing compound (WP 0048 00, Item 15)
 Cotter pin
 Preformed packing (2)
 Preformed packing (2)

REMOVAL

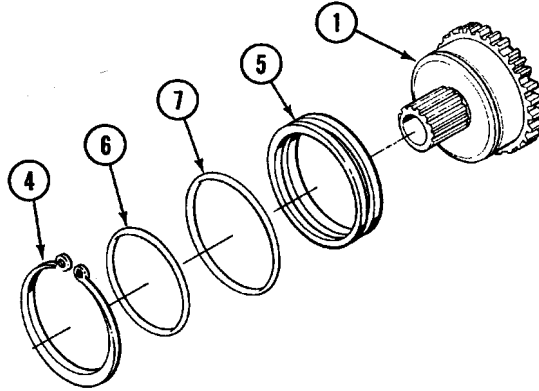
NOTE

Front hub assembly may come out when variable speed drive assembly is removed from engine or it may remain in engine. Go to Step 2 if front hub comes out with variable speed drive assembly.

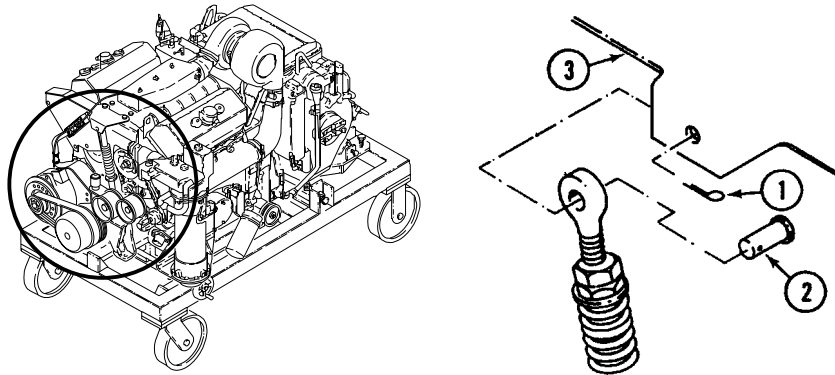
1. REMOVE FRONT HUB (1) FROM SLEEVE (2) IN ENGINE.
2. REMOVE PLUG (3) FROM SLEEVE (2).



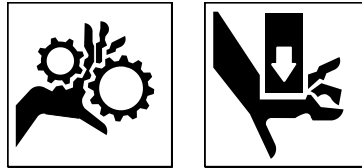
3. REMOVE SNAP RING (4) FROM FRONT HUB (1). REMOVE HOLDER (5) AND DISCARD PREFORMED PACKINGS (6) AND (7).



4. REMOVE COTTER PIN (1) AND PIN (2) FROM BRACKET (3). DISCARD COTTER PIN.



WARNING



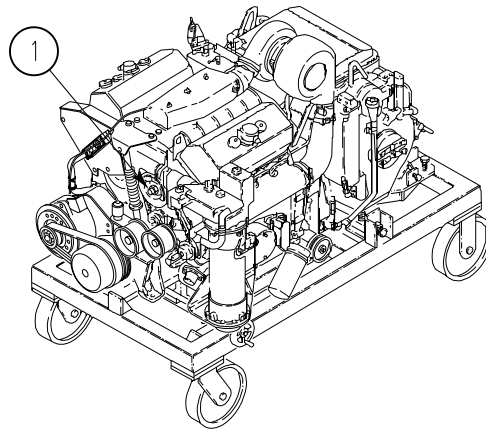
Moving parts of power unit can seriously injure you.

Clear personnel away from power unit before startup. Stay clear of moving parts when power unit is running.

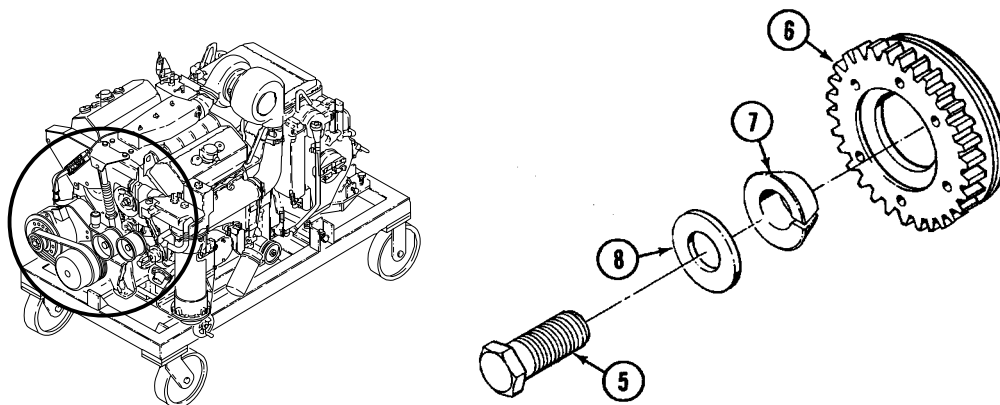
NOTE

Ensure FUEL SHUTOFF HANDLE is in OFF position. Engine could start during performance of Step 6

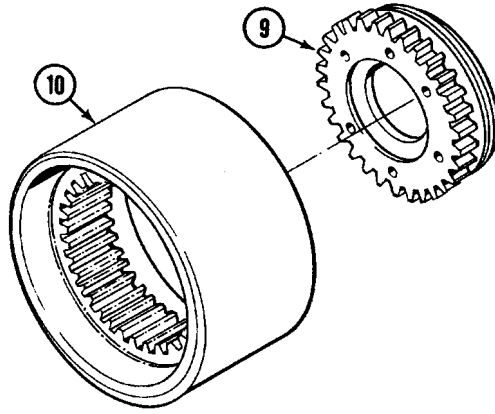
5. (H): USE 1 1/2 INCH SOCKET AND 3/4 INCH DRIVE BREAKER BAR ON CAM NUT (1) TO PREVENT ENGINE FROM TURNING OVER IN NEXT STEP.



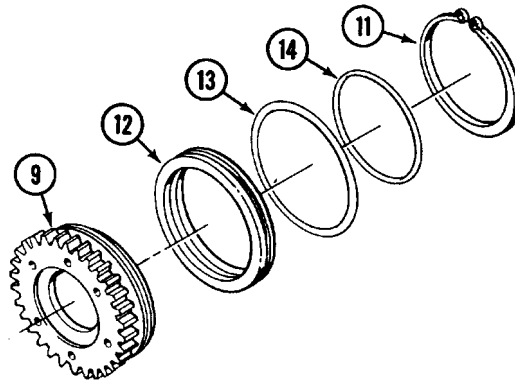
6. LOOSEN RETAINER SCREW (5) FOUR COMPLETE TURNS. USE 3/4 INCH DRIVE BREAKER BAR. INSTALL PULLER AND THREE 1/4-28 UNF SCREWS. INSTALL THREE SCREWS AND WASHERS INTO REAR HUB (6). BREAK LOOSE FRONT CONE (7) FROM SEATED POSITION. REMOVE PULLER AND THREE SCREWS. UNSCREW RETAINER SCREW (5), REMOVE WASHER (8), AND FRONT CONE (7).



7. REMOVE REAR HUB (9) FROM SLEEVE (10).

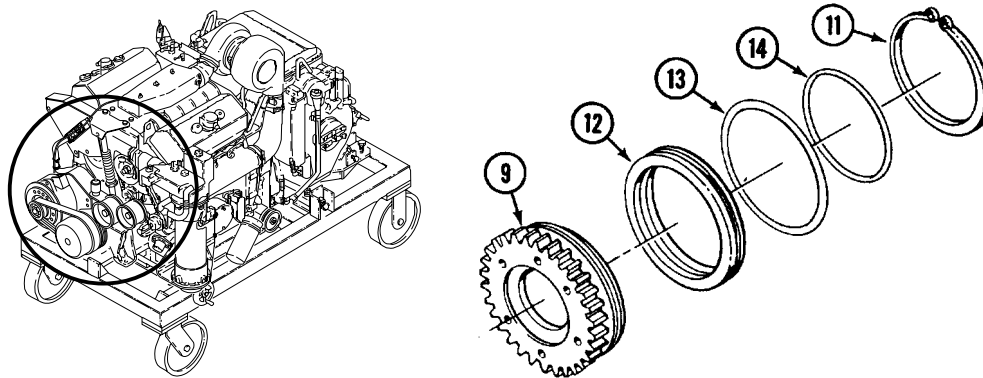


8. REMOVE SNAP RING (11) AND HOLDER (12) FROM REAR HUB (9). REMOVE PREFORMED PACKINGS (13) AND (14). DISCARD PREFORMED PACKINGS.

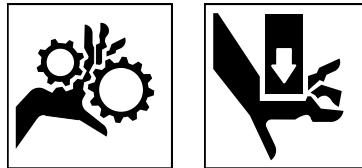


INSTALLATION

1. INSTALL NEW PREFORMED PACKINGS (13) AND (14) ON REAR HOLDER (12).
2. INSTALL HOLDER (12) AND SNAP RING (11) ON REAR HUB (9). LUBRICATE SPLINES.



WARNING



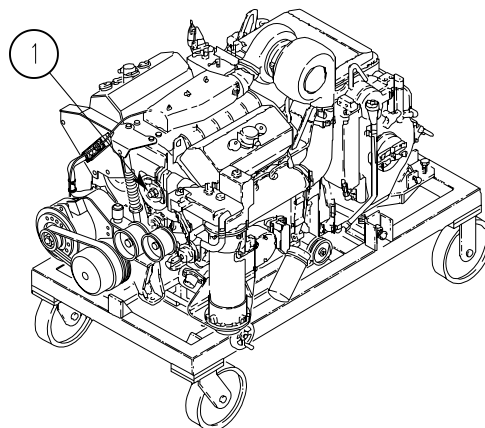
Moving parts of power unit can seriously injure you.

Clear personnel away from power unit before startup. Stay clear of moving parts when power unit is running.

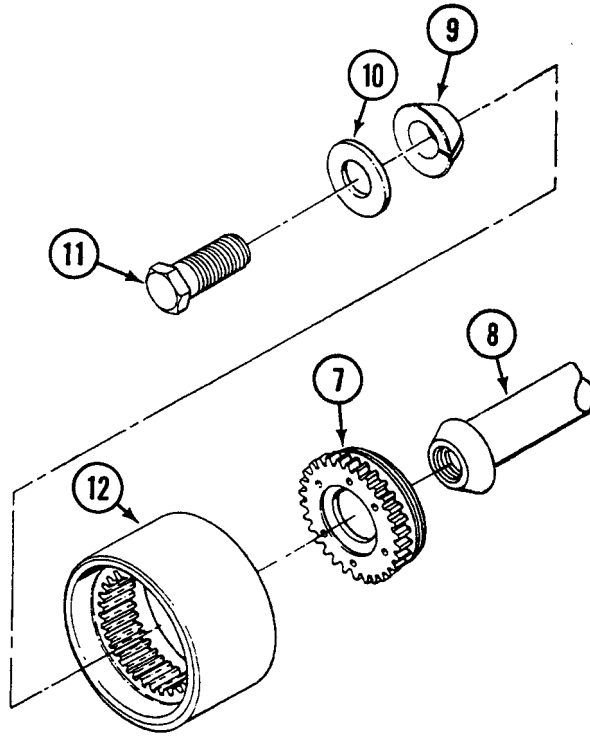
NOTE

Ensure fuel SHUT-OFF HANDLE is in OFF position. Engine could start during performance of Step 5

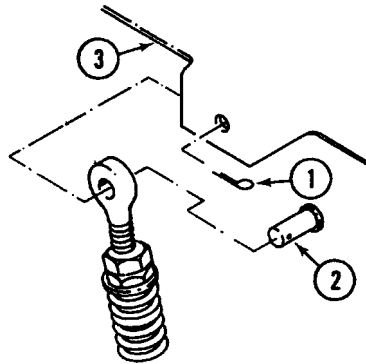
3. (H): USE 1 1/2 INCH SOCKET AND 3/4 INCH DRIVE BREAKER BAR ON CAM NUT (1) TO PREVENT ENGINE FROM TURNING OVER IN Step 5.



4. INSTALL REAR HUB (7) ON ENGINE CRANK SHAFT (8).
5. INSTALL FRONT CONE (9), WASHER (10), AND SCREW (11). TIGHTEN SCREW TO 290–300 LB-FT (33–34 N·m) TORQUE.
6. INSTALL SLEEVE (12) ON REAR HUB (7).



7. INSTALL NEW COTTER PIN (1) AND PIN (2) TO BRACKET (3). HAVE HELPER ASSIST.



CHAPTER 4

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR FUEL SYSTEM

WORK PACKAGE INDEX

Title

Sequence No.

REPAIR/REPLACE ACCELERATOR STOP SUPPORT ASSEMBLY.....0009 00

REPAIR/REPLACE ACCELERATOR STOP SUPPORT ASSEMBLY

0009 00

THIS WORK PACKAGE COVERS:

- Removal (page 0009 00-1).
- Installation (1).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

- Metalworker's tool kit (WP 0046 00, Item 55)
- Trailer-mounted welding shop (WP 0046 00, Item 60)
- Sander spindle adapter (WP 0046 00, Item 1)
- Welder's gloves (WP 0046 00, Item 17)
- Industrial goggles (WP 0046 00, Item 18)
- Welder's helmet (WP 0046 00, Item 19)
- Electric disc sander (WP 0046 00, Item 43)
- Arc welding machine (WP 0046 00, Item 59)

Materials/Parts

- Welding electrode (WP 0048 00, Item 20)

Personnel Required

- Metal Worker 44B10

References

- TM 9-2350-366-10-1
- TM 9-2350-366-20-1
- TM 9-237
- TM 43-0139

Equipment Condition

- Engine stopped (TM 9-2350-366-10-1)
- Vehicle blocked (TM 9-2350-366-10-1)
- Battery ground strap disconnected (TM 9-2350-366-20-1)
- Driver's seat removed (TM 9-2350-366-20-1)
- Upper and lower accelerator pedals removed (TM 9-2350-366-20-1)
- Upper and lower service brake pedals removed (TM 9-2350-366-20-1)

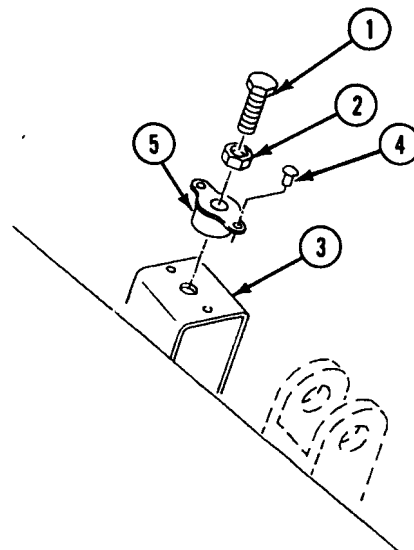
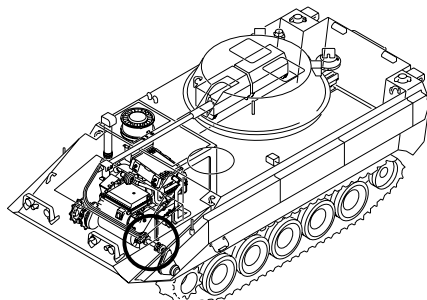
REMOVAL

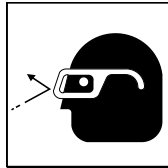
1. REMOVE SCREW (1) AND NUT (2) FROM SUPPORT ASSEMBLY (3).

NOTE

To replace nut only, go directly to Step 5.

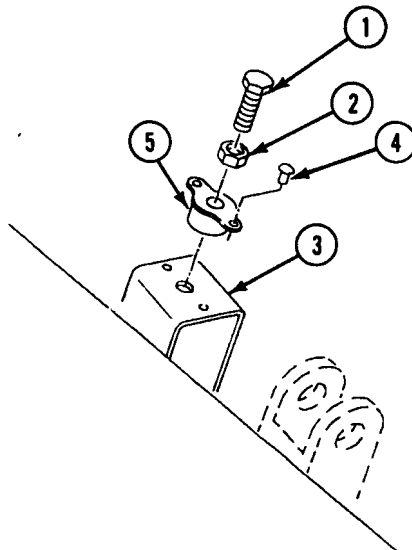
2. REMOVE BROKEN SUPPORT ASSEMBLY (3) FROM FLOOR PLATE. DISCARD BROKEN SUPPORT ASSEMBLY.



WARNING

Metal chips and grinding dust can cause eye injury. Wear goggles and gloves.

3. USE A MACHINIST'S HAMMER AND A COLD CHISEL TO CHIP OFF REMAINING PART OF BAD SUPPORT ASSEMBLY FROM FLOOR PLATE.
4. USE A DISC SANDER TO SAND CHIPPED AREA SMOOTH AND REMOVE HARD COATING FROM WELD AREA.
5. USE A MACHINIST'S HAMMER AND A COLD CHISEL TO REMOVE TWO RIVETS (4) SECURING NUT (5) TO SUPPORT. REMOVE NUT.

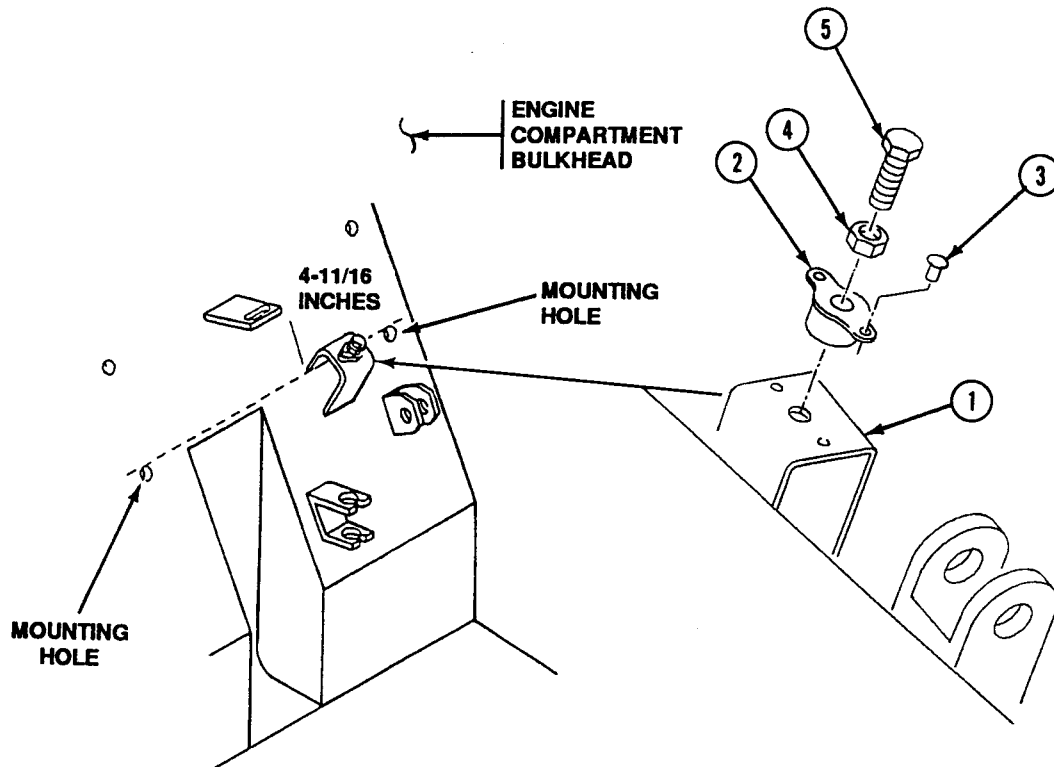


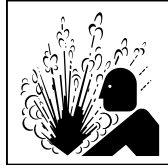
INSTALLATION

NOTE

To install nut only, go directly to Step 4.

1. POSITION SUPPORT ASSEMBLY (1) ON FRONT BULKHEAD 4-11/16 INCHES FROM LEFT EDGE OF SUPPORT TO ENGINE COMPARTMENT BULKHEAD. USE STRAIGHT EDGE TO LOCATE AND SCRIBE A LINE BETWEEN MOUNTING HOLES.



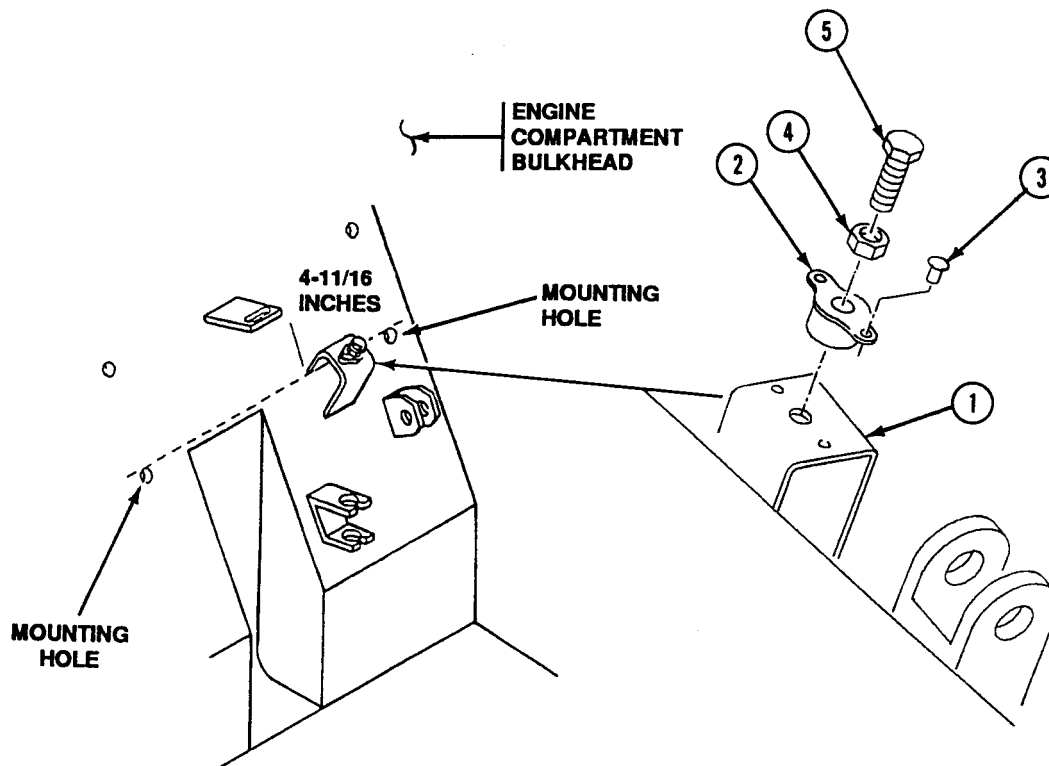
WARNING

Unsafe welding practices can cause serious injury from fire, explosions, or harmful agents. Allow only authorized personnel to weld or cut metals, and follow safety precautions in TM 9-237. Protective clothing and goggles must be worn; adequate protective equipment used, a suitable fire extinguisher kept nearby; and requirements of TM 9-237 strictly followed.

NOTE

Read welding instructions in WP 0049 00 before welding.

2. WELD SUPPORT ASSEMBLY (1) TO FLOOR PLATE, USING DIMENSIONS SHOWN, IN ACCORDANCE WITH TM 9-237. USE ELECTRODE TYPE 5356.
3. PREPARE AND PAINT SURFACE IN ACCORDANCE WITH TM 43-0139.
4. POSITION NUT (2) ON SUPPORT (1). SECURE WITH TWO RIVETS (3).
5. INSTALL NUT (4) AND SCREW (5) INTO NUT (2).



END OF TASK

CHAPTER 5

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR COOLING SYSTEM

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|--|---------------------|
| REPAIR RADIATOR..... | .0010 00 |
| REPAIR RADIATOR AUXILIARY TANK..... | .0011 00 |
| REPAIR FAN AND GENERATOR VARIABLE SPEED DRIVE..... | .0012 00 |
| REPAIR VENTILATING FAN ASSEMBLY..... | .0013 00 |
| REPAIR FAN DRIVE SHAFT AND BEARING HOUSING..... | .0014 00 |

REPAIR RADIATOR

0010 00

THIS WORK PACKAGE COVERS:

- Inspection and Repair (page 0010 00-1).
- Disassembly (page 0010 00-2).
- Cleaning (page 0010 00-2).
- Rodding (page 0010 00-3).
- Assembly (page 0010 00-3).
- Testing Radiator for Flow (page 0010 00-4).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Metal Worker 44B10

Tools and Special Tools

- Metalworker's tool kit (WP 0046 00, Item 55)
- Apron (WP 0046 00, Item 2)
- Scratch wire brush (WP 0046 00, Item 4)
- Radiator flow test machine (WP 0046 00, Item 15)
- Industrial goggles (WP 0046 00, Item 18)
- Radiator test plug set (WP 0046 00, Item 38)
- Radiator test stand (WP 0046 00, Item 50)

References

- TM 9-2350-366-10-1
- TM 9-2350-366-20-1
- TM 750-254

Materials/Parts

- Soldering flux (WP 0048 00, Item 18)
- Tin alloy solder (WP 0048 00, Item 19)

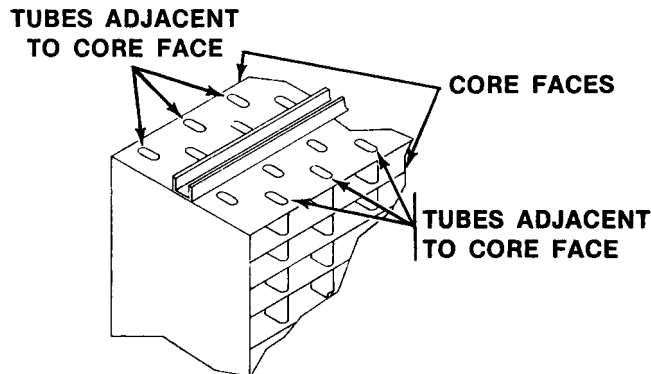
Equipment Condition

Radiator removed (TM 9-2350-366-20-1)

REPAIR OR REPLACEMENT

INSPECTION AND REPAIR

1. CHECK UPPER AND LOWER RADIATOR TANKS, BAFFLES, AND REINFORCEMENTS. REPAIR SOLDER BREAKS.
2. REPAIR SHALL BE LIMITED TO NO MORE THAN TWO TUBES ADJACENT TO THE CORE FACE ON EITHER SIDE.



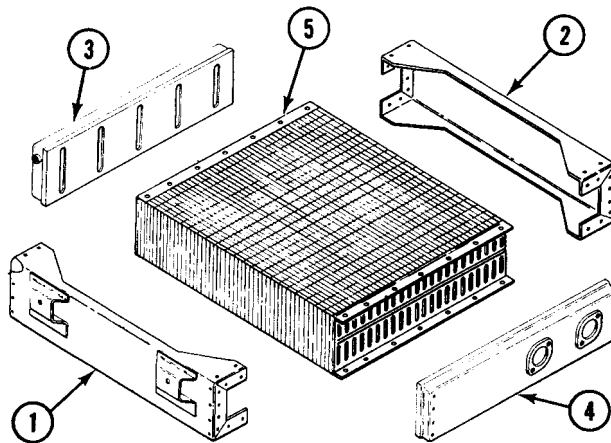
3. REMOVED AREAS OF FIN SHALL NOT EXCEED 6-1/2 SQUARE INCHES (42 SQUARE CENTIMETERS) PER SIDE, PER ANY TUBE REPAIR. LENGTH OF TUBE SPLICE SHALL NOT EXCEED 2 INCHES (5 CM). TUBE BLOCKAGE IS NOT ALLOWED.



4. HEAT SOLDER REPAIR OF THE UPPER AND LOWER TANKS, OVERFLOW TUBE, AND INLET AND OUTLET OPENINGS IS ALLOWED.
5. HEAT SOLDERING OF A CORE SHALL NOT EXCEED A LINEAR LENGTH OF 8 INCHES (20 CM) FOR ANY ONE CORE ASSEMBLY.
6. FIN STRAIGHTENING IS ALLOWED.

DISASSEMBLY

1. HEAT MELT AND WIRE BRUSH OFF THE SOLDER THAT SECURES TWO SIDE BRACKETS (1) AND (2) TO TWO END TANKS (3) AND (4).
2. HEAT MELT AND WIRE BRUSH OFF THE SOLDER THAT SECURES TWO END TANKS (3) AND (4) TO CORE (5).

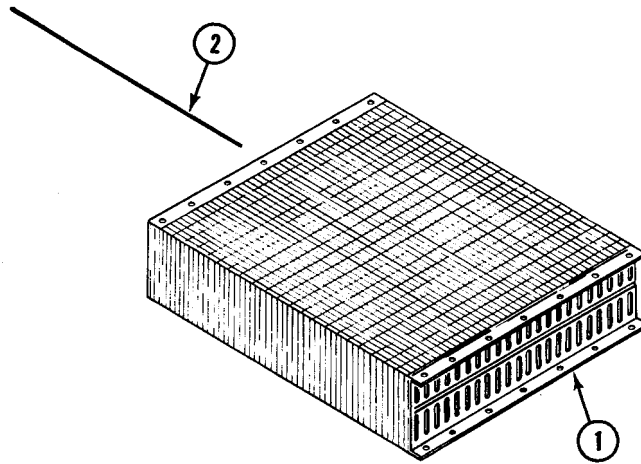


CLEANING

1. CLEAN RADIATOR. SEE TM 750-254. USE SAFETY GOGGLES, RUBBER GLOVES AND RUBBER APRON.
2. THOROUGHLY FLUSH RADIATOR. USE RADIATOR TEST PLUG SET. SEE TM 750-254.
3. TEST RADIATOR FOR FLOW. GO TO TESTING RADIATOR FOR FLOW Step 1.
4. IF WATER DOES NOT FLOW FREELY FROM INLET OPENING AFTER CLEANING, CLEAN BY RODDING.

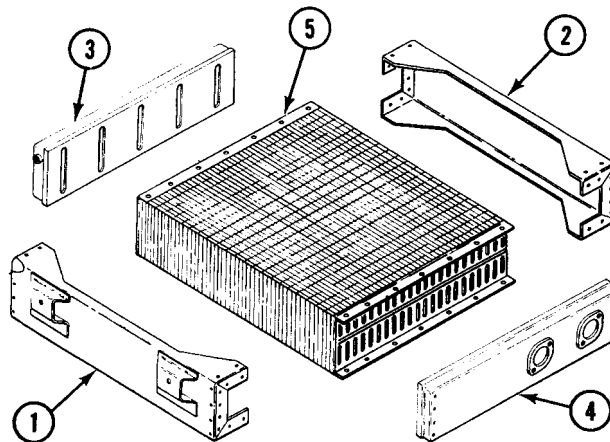
RODDING

1. WIRE BRUSH RUST, SCALE, AND SEDIMENT FROM CORE TUBE OPENINGS.
2. LOCATE PLUGGED TUBES (1) BY DIRECTING WATER INTO TUBES. CHECK FOR FLOW AT OPPOSITE END.
3. INSERT A METAL ROD (2) LONG ENOUGH AND SLIGHTLY SMALLER IN DIAMETER THAN TUBES (1) THROUGH TUBES TO REMOVE BLOCKAGE.
4. CLEAR TUBES (1) UNTIL WATER FLOWS THROUGH FREELY.

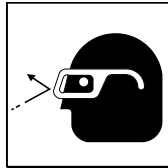


ASSEMBLY

1. INSTALL END TANKS (3) AND (4) ON CORE (5). SECURE WITH ACID CORE SOLDER.
2. INSTALL TWO SIDE BRACKETS (1) AND (2) ON TWO END TANKS (3) AND (4). SECURE WITH ACID CORE SOLDER.
3. TEST RADIATOR. REPLACE LEAKY RADIATOR.



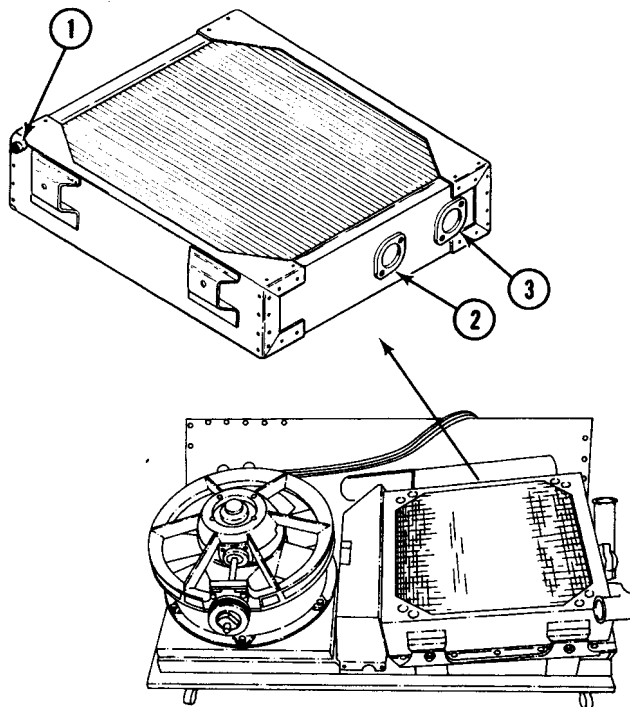
TESTING RADIATOR FOR FLOW

WARNING

Compressed air can injure you or others.

Do not aim compressed air at yourself or other personnel. Always wear goggles when working with compressed air. Do not use more pressure than 30 psi (207kPa) with air nozzles.

1. PLUG AUXILIARY TANK CONNECTOR OPENING (1). USE RADIATOR TEST PLUG SET.
2. PLUG RADIATOR OUTLET OPENING (2). USE RADIATOR TEST PLUG SET.
3. IMMERSE RADIATOR IN WATER. DIRECT AIR AT 25 TO 30 PSI (172 TO 207 KPA) INTO INLET OPENING (3). USE RADIATOR FLOW TEST MACHINE.
4. IF AIR BUBBLES APPEAR, RETURN TO INSPECTION AND REPAIR Step 1 AND REPAIR RADIATOR.



END OF TASK

REPAIR RADIATOR AUXILIARY TANK

0011 00

THIS WORK PACKAGE COVERS:

Repair or Replacement (page 0011 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Metal Worker 44B10

Tools and Special Tools

- Metalworker's tool kit (WP 0046 00, Item 55)
- Degreaser (WP 0046 00, Item 5)
- Industrial goggles (WP 0046 00, Item 18)
- Welder's gloves (WP 0046 00, Item 17)
- Welder's helmet (WP 0046 00, Item 19)
- Radiator test plug set (WP 0046 00, Item 38)
- Radiator test stand (WP 0046 00, Item 50)
- Arc welding machine (WP 0046 00, Item 59)

References

- TM 9-2350-366-20-1
- TM 9-237
- TM 43-0139

Materials/Parts

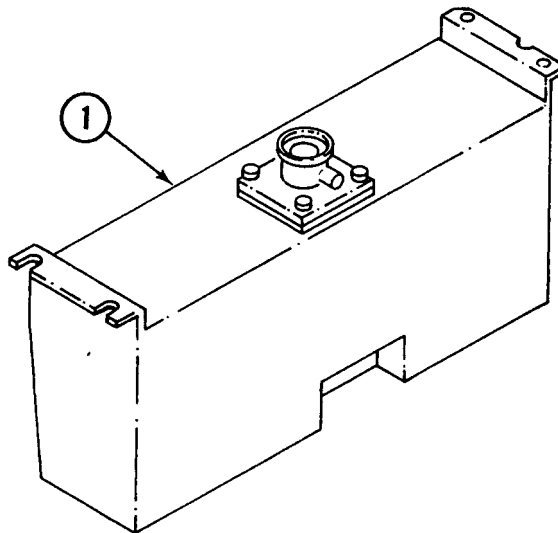
- Welding electrode (WP 0048 00, Item 20)

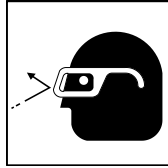
Equipment Condition

Radiator auxiliary tank removed (TM 9-2350-366-20-1)

REPAIR OR REPLACEMENT

1. DEGREASE TANK (1).
2. ATTACH TANK (1) TO RADIATOR TEST STAND.



WARNING

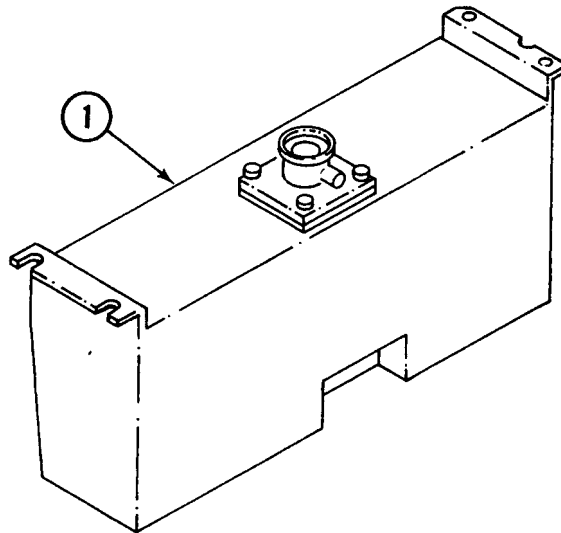
Compressed air can injure you or others.

Do not aim compressed air at yourself or other personnel. Always wear goggles when working with compressed air. Do not use more pressure than 30 psi (207kPa) with air nozzles.

NOTE

There are two ways to pressure test tank. If using water pressure, do Step 3, then Step 5. If using air pressure, go to Step 4.

3. APPLY INTERNAL WATER PRESSURE OF 18–20 PSI FOR MINIMUM OF 3 MINUTES. CHECK FOR WATER LEAKS.
4. SUBMERGE TANK (1) IN WATER AND APPLY PRESSURE OF 18–20 PSI FOR MINIMUM OF 3 MINUTES. CHECK FOR AIR LEAKS.

**NOTE**

Mark areas of leaks and remove all plugs before welding.

5. WELD AREAS OF LEAKS IN ACCORDANCE WITH CLASS A, SPECIFICATION MIL-W-45205. SEE TM 9-237. USE ELECTRODE TYPE 5356. ALL WELD SIZES TO BE MINIMUM REQUIREMENT FOR LEAK REPAIR.
6. REPEAT Step 3 OR Step 4 AFTER WELDING.
7. REFINISH TANK (1). TREAT PER CLASS 1A, SPECIFICATION MIL-C-5541. SEE TM 43-0139.

END OF TASK

REPAIR FAN AND GENERATOR VARIABLE SPEED DRIVE

0012 00**THIS WORK PACKAGE COVERS:**

Disassembly (page 0012 00-2).
 Assembly (page 0012 00-8).

INITIAL SETUP:Maintenance Level

Direct Support

Personnel Required

Track Veh Rpr 63H10
 Helper (H)

Tools and Special Tools

General mechanic's tool kit (WP 0046 00, Item 54)
 Screwdriver bit, 3/16 hex (part of impact wrench set)
 (WP 0046 00, Item 3)
 Internal retaining ring pliers (WP 0046 00, Item 37)
 Arbor press (WP 0046 00, Item 40)
 Puller set (WP 0046 00, Item 42)
 Jacking screw (3) (WP 0046 00, Item 45)
 Torque wrench, 1/2 inch drive, 0-175 lb-ft
 (WP 0046 00, Item 64)
 Torque wrench, 1/2 inch drive, 0-300 lb-in
 (WP 0046 00, Item 65)

References

TM 9-2350-366-20-1

Equipment Condition

Variable speed drive assembly removed
 (TM 9-2350-366-20-1)

Materials/Parts

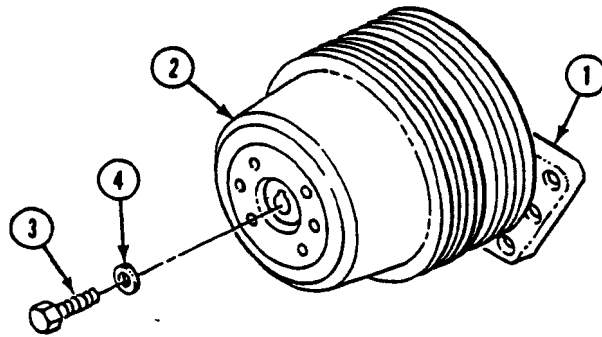
Engine oil (WP 0048 00, Item 6)
 Encased seal (2)
 Encased seal
 Gasket
 Hose clamp, 2-inch (51-mm) diameter (2)
 Preformed packing
 Preformed packing
 Retaining ring (3)
 Seal (3)
 Shim stock, 0.020 in. x 6 in. x 1-1/2 in.
 (0.5 mm x 152 mm x 38 mm)

DISASSEMBLY

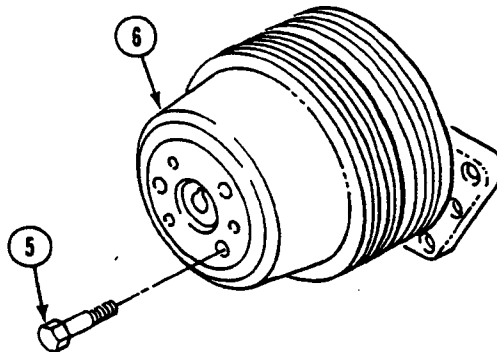
CAUTION

Cast aluminum can be damaged. Do not overtighten or mar in holding fixture.

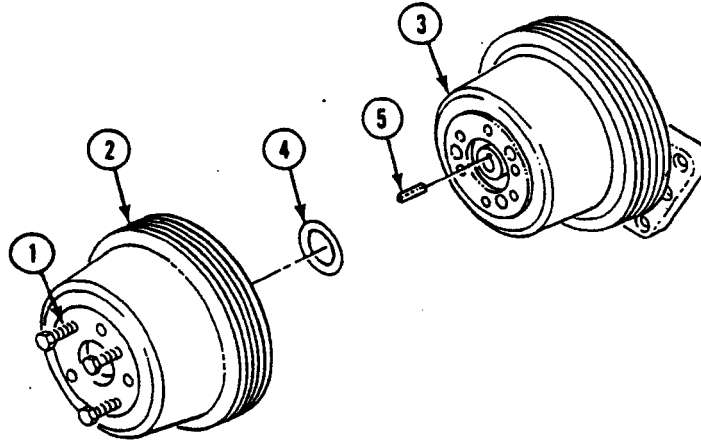
1. PLACE DRIVE ASSEMBLY (1) IN A SUITABLE HOLDING FIXTURE. HAVE HELPER ASSIST.
2. SECURE GENERATOR PULLEY (2), AND REMOVE SCREW (3) AND WASHER (4).



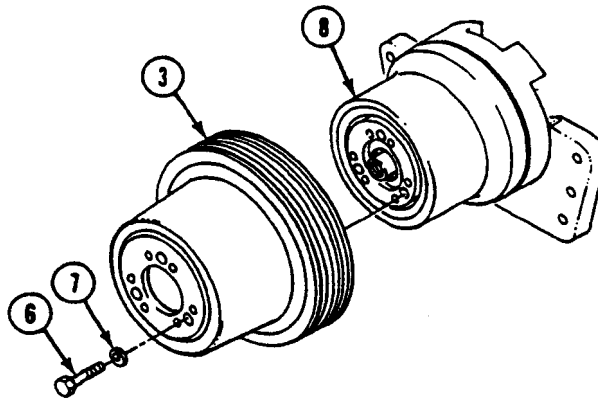
3. INSTALL THREE JACKING SCREWS (5) IN GENERATOR PULLEY (6).



4. USING THREE JACKING SCREWS (1), SEPARATE GENERATOR PULLEY (2) FROM FAN PULLEY (3). REMOVE PREFORMED PACKING (4) AND KEY (5). DISCARD PREFORMED PACKING.



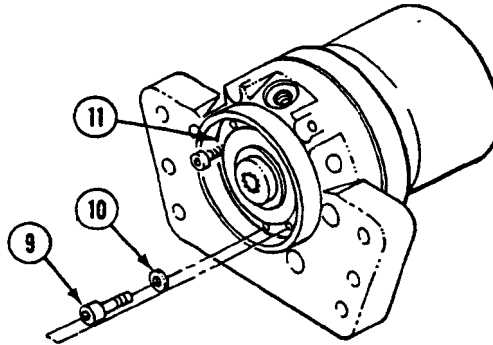
5. SECURE FAN PULLEY (3) IN HOLDING FIXTURE.
6. REMOVE SIX SCREWS (6) AND WASHERS (7) FROM FAN PULLEY (3). SEPARATE FAN PULLEY FROM INNER HOUSING ASSEMBLY (8).
7. REVERSE HOUSING ASSEMBLY (8) IN HOLDING FIXTURE.



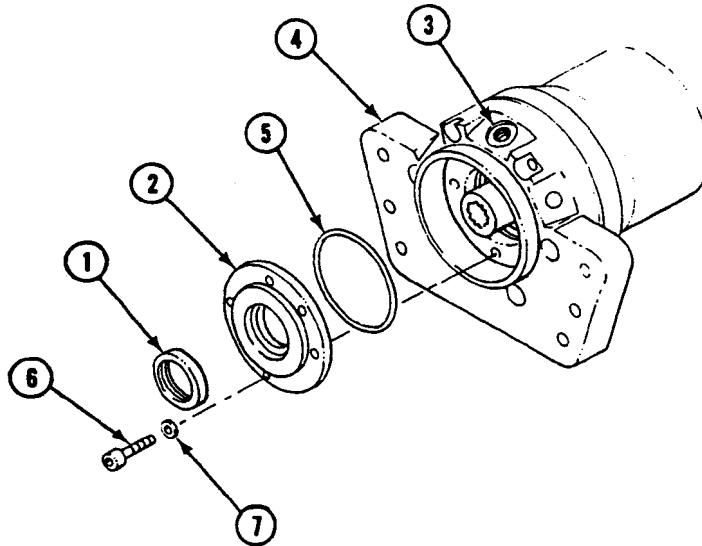
NOTE

Use two of the screws removed in Step 8 as jacking screws to remove cover plate.

8. REMOVE SIX SCREWS (9) AND WASHERS (10) FROM COVER PLATE (11). INSTALL TWO JACKING SCREWS IN THREADED HOLES OF COVER PLATE (11).



9. REMOVE COVER PLATE (2) AND PREFORMED PACKING (5) FROM REAR HOUSING (3). DISCARD PREFORMED PACKING. REMOVE TWO JACKING SCREWS FROM COVER PLATE.
10. PRESS ENCASED OIL SEAL (1) OUT OF COVER PLATE (2). DISCARD OIL SEAL.

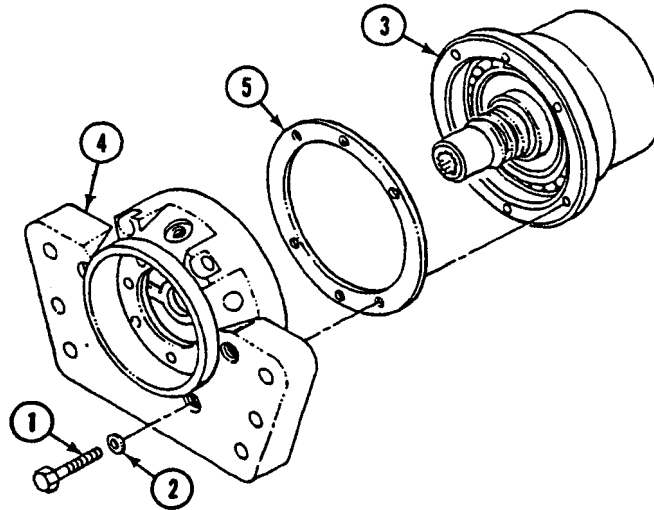


11. REMOVE SIX SCREWS (1) AND WASHERS (2) FROM FRONT HOUSING (3).

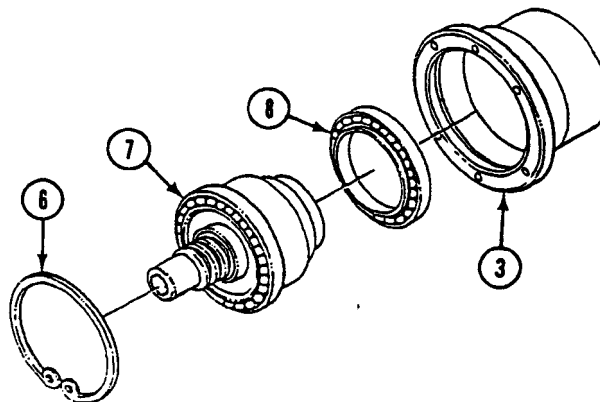
NOTE

When the front housing is separated from the rear housing, the inner housing with shaft and clutch assembly may stay with the front housing.

12. SEPARATE FRONT HOUSING (3) FROM REAR HOUSING (4). TAP OFF AT SHAFT WITH RUBBER HAMMER.
13. REMOVE GASKET (5) FROM REAR HOUSING (4). DISCARD GASKET.



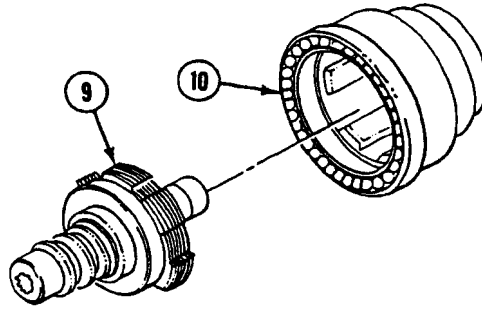
14. REMOVE THE LARGE LOCK RING (6) THAT SECURES THE CLUTCH HOUSING ASSEMBLY (7) TO THE FRONT HOUSING (3).
15. PRESS CLUTCH HOUSING ASSEMBLY (7) (WITH SHAFT AND CLUTCH) OUT OF FRONT HOUSING (3).



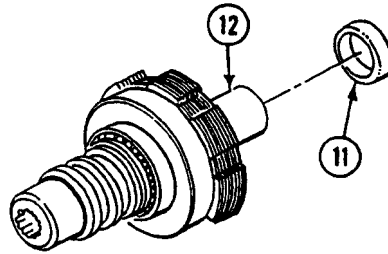
NOTE

If bearing remains inside of front housing, go to Step 29 for bearing removal. If bearing remains on inner housing, go to Step 23. After removal of bearing, return to Step 16.

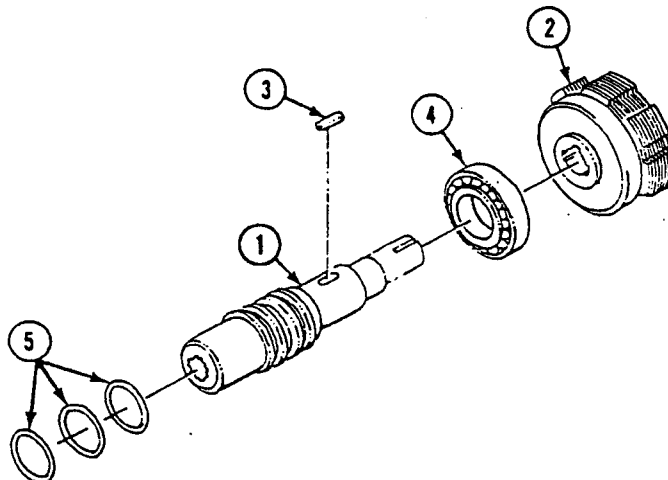
16. PRESS SHAFT AND CLUTCH ASSEMBLY (9) OUT OF INNER HOUSING (10).



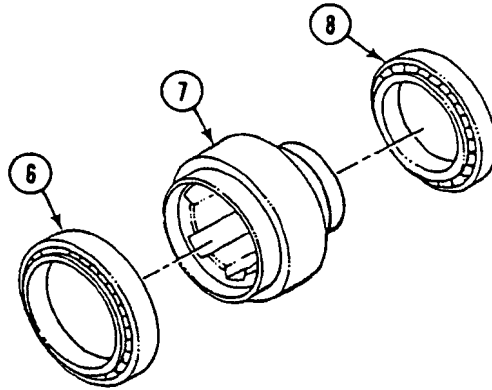
17. REMOVE SPACER (11) FROM SHAFT (12).



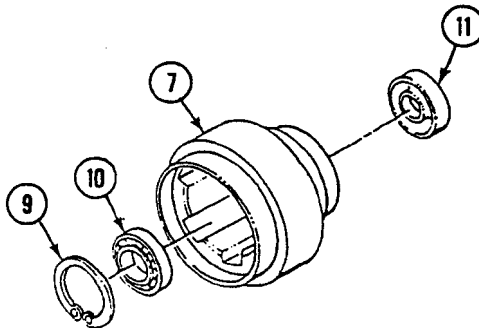
18. PRESS SHAFT (1) OUT OF CLUTCH (2).
 19. REMOVE KEY (3) FROM SHAFT (1).
 20. PRESS BEARING (4) FROM SHAFT (1).
 21. REMOVE THREE RINGS (5) FROM SHAFT (1). DISCARD RINGS.



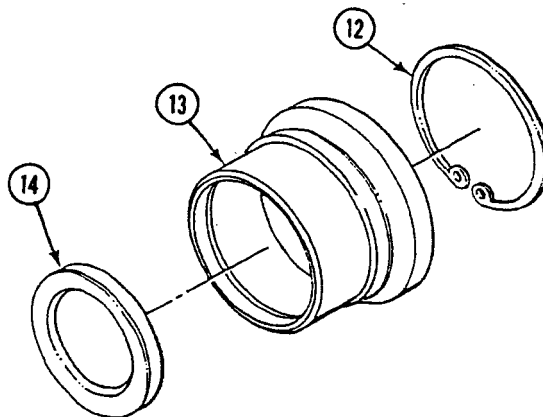
22. PRESS LARGER BEARING (6) FROM THE INNER HOUSING (7).
23. REMOVE BEARING (8) FROM INNER HOUSING (7). USE PULLER.



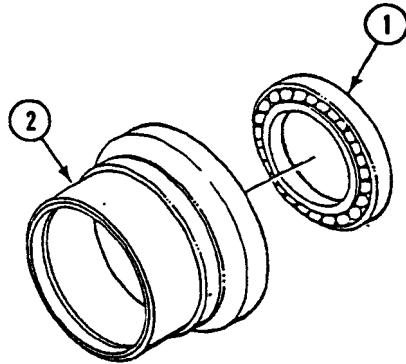
24. REMOVE LOCK RING (9) FROM INNER HOUSING (7).
25. REMOVE BEARING (10) FROM INNER HOUSING (7). USE PULLER.
26. REMOVE OIL SEAL (11) FROM INNER HOUSING (7). DISCARD OIL SEAL.



27. REMOVE LOCK RING (12) FROM FRONT HOUSING (13).
28. REMOVE ENCASED OIL SEAL (14) FROM THE FRONT HOUSING (13). DISCARD OIL SEAL.

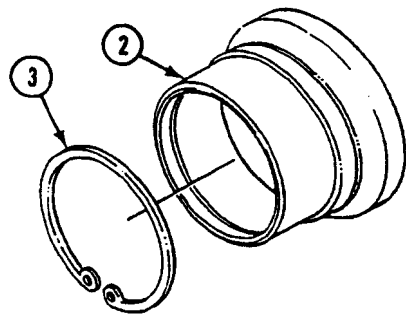


29. PRESS BEARING (1) FROM FRONT HOUSING (2).



ASSEMBLY

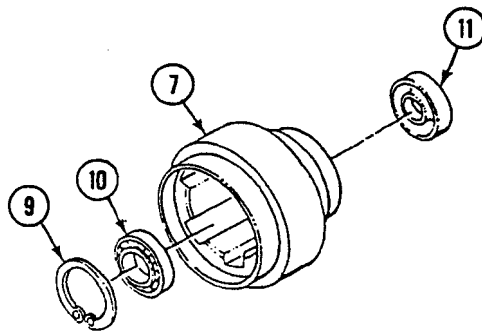
1. INSTALL LOCK RING (3) IN FRONT HOUSING (2).



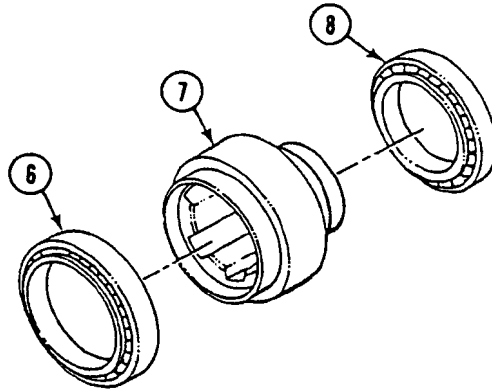
2. INSTALL NEW ENCASED OIL SEAL (11) IN INNER HOUSING (7).

3. PRESS BEARING (10) INTO INNER HOUSING (7).

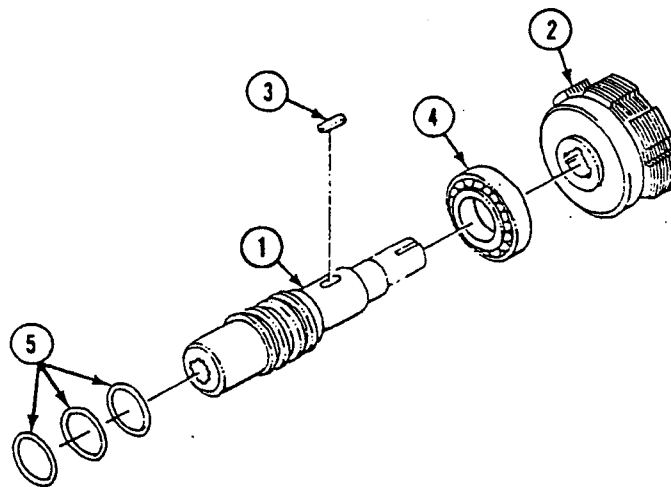
4. INSTALL LOCK RING (9) IN INNER HOUSING (7).



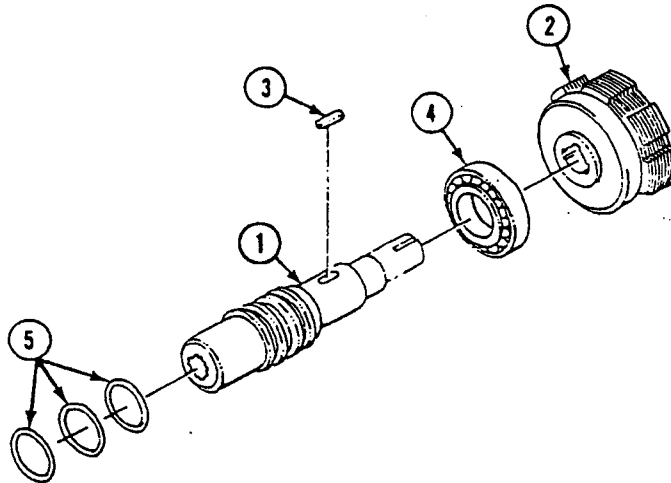
5. PRESS SMALLER BEARING (8) ON INNER HOUSING (7).
6. PRESS BEARING (6) ON INNER HOUSING (7).



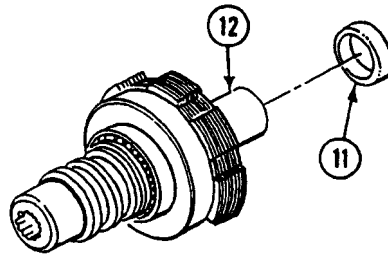
7. COAT THREE NEW RINGS (5) WITH LUBRICATING OIL. INSTALL THREE RINGS ON SHAFT (1).
8. PRESS BEARING (4) ON SHAFT (1).



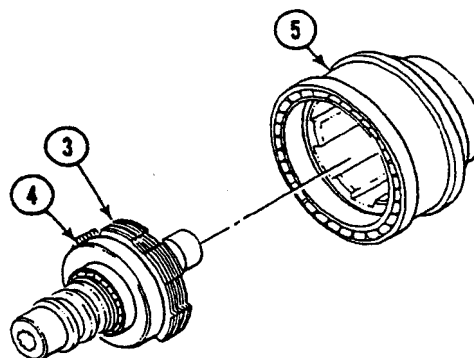
9. INSTALL KEY (3) ON SHAFT (1).
10. LIGHTLY LUBRICATE SHAFT (1) BEFORE INSTALLING CLUTCH (2).
11. PRESS CLUTCH (2) ONTO SHAFT (1).



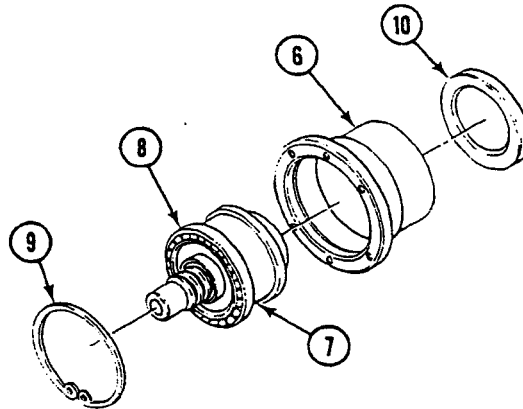
12. INSTALL SPACER (11) ON SHAFT (12).



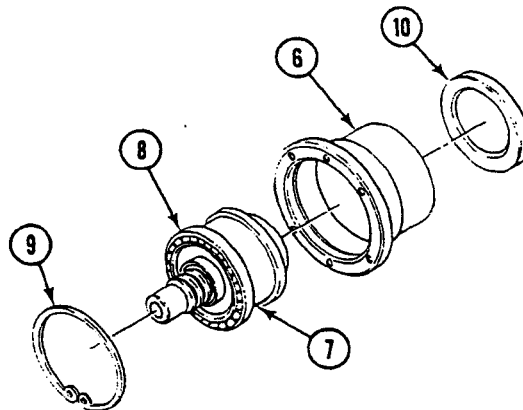
13. ALINE RING TABS (3) ON CLUTCH ASSEMBLY (4) BEFORE INSTALLING SHAFT IN HOUSING (5).
14. PRESS SHAFT AND CLUTCH ASSEMBLY (4) INTO INNER HOUSING (5).
15. LIGHTLY LUBRICATE BOTH OUTER BEARING RACES.



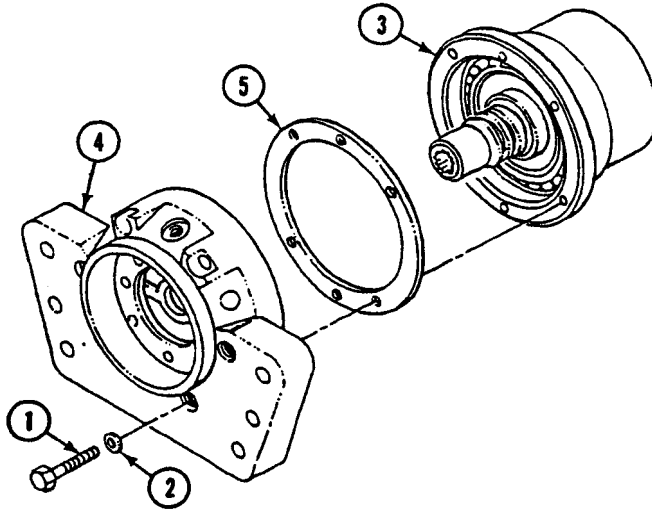
16. SUPPORT FRONT HOUSING (6) ONLY DURING INSTALLATION OF INNER HOUSING (7) ON ARBOR PRESS TO ALLOW INNER HOUSING TO EXTEND DOWN PAST FRONT HOUSING EDGE.



17. PRESS INNER HOUSING (8) (WITH CLUTCH AND SHAFT) INTO THE FRONT HOUSING (6).
18. INSTALL LARGE LOCK RING (9) THAT SECURES THE INNER HOUSING (8) TO THE FRONT HOUSING (6).
19. LUBRICATE NEW ENCASED OIL SEAL (10).
20. INSTALL NEW ENCASED OIL SEAL (10) INTO FRONT HOUSING (6). USE BRASS DRIFT AND HAMMER.

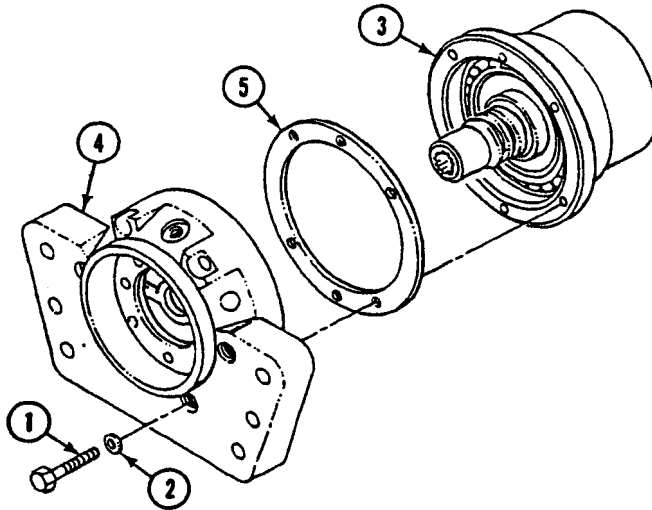


21. INSTALL NEW GASKET (5) ON REAR HOUSING (4).

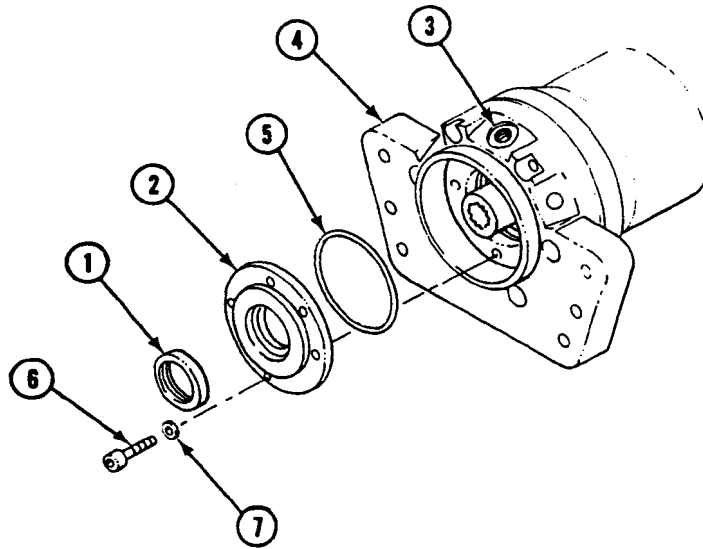


22. INSTALL FRONT HOUSING (3) ON REAR HOUSING (4).

23. INSTALL SIX SCREWS (1) AND WASHERS (2) TO SECURE FRONT HOUSING (3) TO REAR HOUSING (4). TIGHTEN SCREWS TO 210–220 LB-IN (24–25 N·m) TORQUE.



24. INSTALL NEW ENCASED OIL SEAL (1) IN COVER PLATE (2).

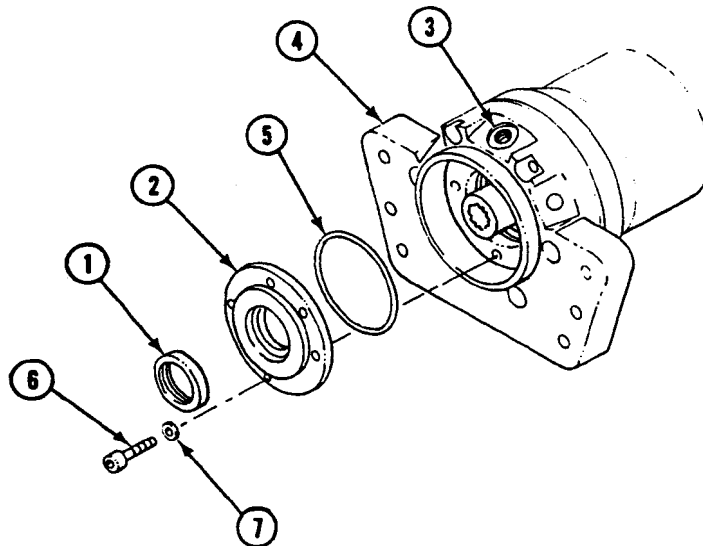


25. PUMP OIL THROUGH LOWER OIL PASSAGE (3) UNTIL REAR HOUSING (4) IS FULL.

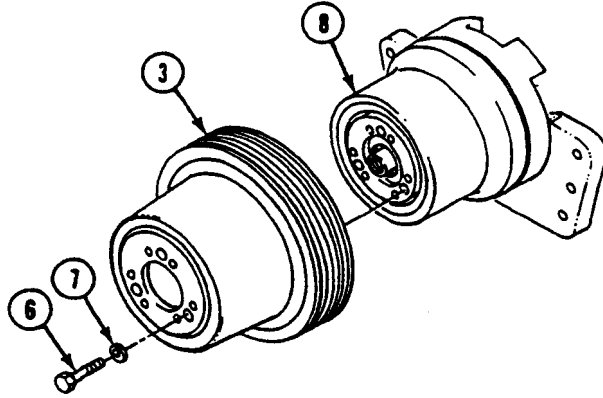
26. LUBRICATE NEW PREFORMED PACKING (5) AND INSTALL ON COVER PLATE (2). INSTALL COVER PLATE (2) ON REAR HOUSING (4).

27. INSTALL SIX SCREWS (6) AND WASHERS (7) TO SECURE COVER PLATE (2). TIGHTEN SCREWS TO 100–105 LB-IN (11–12 N·m) TORQUE.

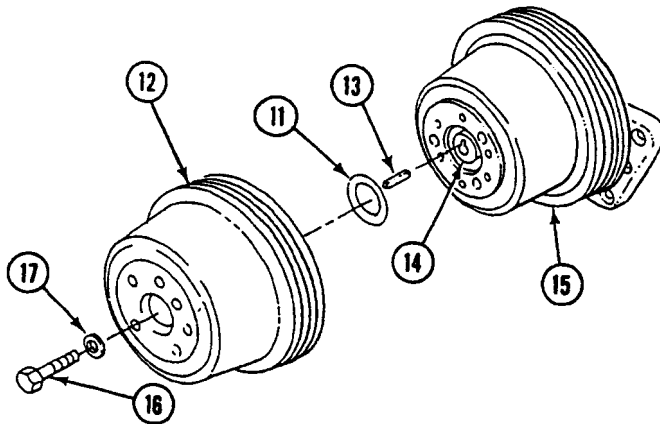
28. INSTALL PROTECTIVE PLUGS IN THREE REAR PORTS.



29. REVERSE HOUSING ASSEMBLY (8).
30. INSTALL FAN PULLEY (3) ON HOUSING ASSEMBLY (8). SECURE PULLEY WITH SIX SCREWS (6) AND WASHERS (7). TIGHTEN SCREWS TO 210–220 LB-IN (24–25 N·m) TORQUE.



31. LUBRICATE NEW PREFORMED PACKING (11) AND INSTALL ON GENERATOR PULLEY (12).
32. INSTALL KEY (13) ON SHAFT (14).
33. INSTALL GENERATOR PULLEY (12) ON FAN PULLEY (15). SECURE WITH SCREW (16) AND WASHER (17). TIGHTEN SCREW TO 76–79 LB-FT (103–108 N·m) TORQUE.



END OF TASK

REPAIR VENTILATING FAN ASSEMBLY

0013 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0013 00-2).
 Assembly (page 0013 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Veh Rpr 63H10

Tools and Special Tools

General mechanic's tool kit (WP 0046 00, Item 54)
 Mechanical puller kit (WP 0046 00, Item 41)
 Adjustable wrench (WP 0046 00, Item 61)
 Torque wrench, 1/2 inch drive, 0-175 lb-ft
 (WP 0046 00, Item 64)

References

TM 9-2350-366-20-1

Materials/Parts

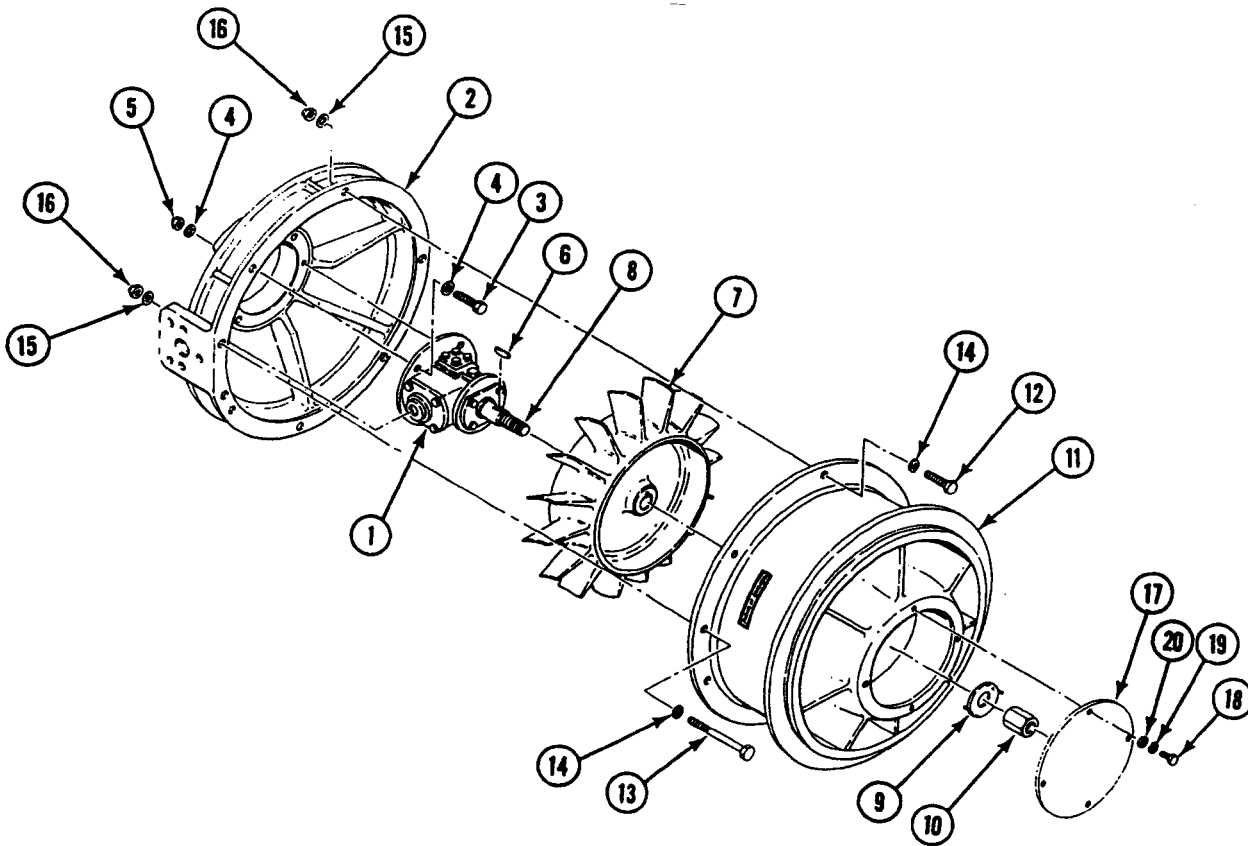
Sealing compound (WP 0048 00, Item 15)
 Packing
 Lockwasher (4)
 Lockwasher (8)
 Washer (3)

Equipment Condition

Fan assembly removed (TM 9-2350-366-20-1)
 Fan drive shaft and bearing housing removed from fan
 assembly (TM 9-2350-366-20-1)

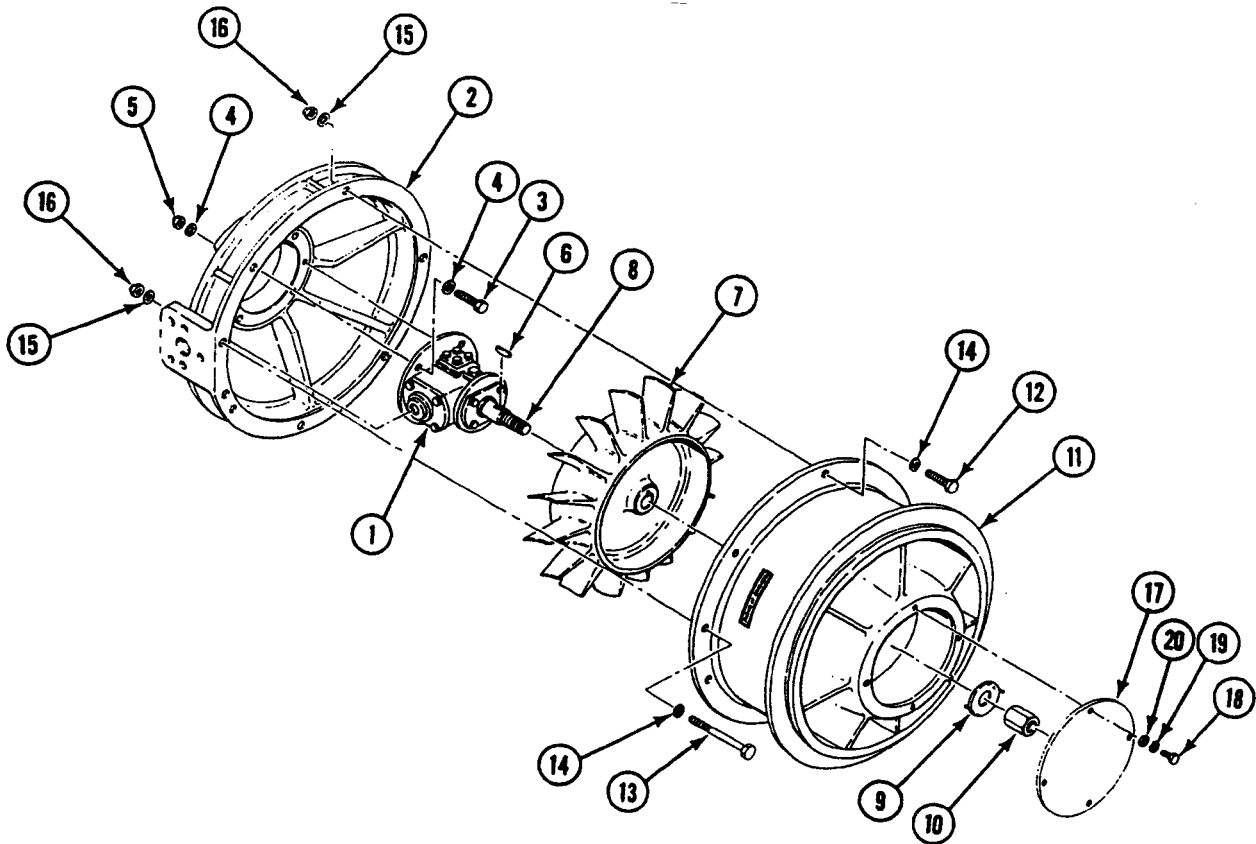
DISASSEMBLY

1. REMOVE FOUR SCREWS (18), LOCKWASHERS (19), WASHERS (20), AND COVER (17) FROM FAN HOUSING (11). DISCARD LOCKWASHERS.
2. REMOVE SIX SCREWS (12), TWO SCREWS (13), EIGHT WASHERS (14), LOCKWASHERS (15), NUTS (16), AND FAN HOUSING (11) FROM SUPPORT (2). DISCARD LOCKWASHERS.
3. REMOVE NUT (10) AND WASHER (9) FROM FAN (7) ON SHAFT (8). DISCARD WASHER.
4. USE PULLER TO REMOVE FAN (7) FROM GEARBOX (1).
5. REMOVE KEY (6) FROM SHAFT (8).
6. REMOVE FOUR SCREWS (3), NUTS (5), EIGHT WASHERS (4), AND GEARBOX (1) FROM SUPPORT (2).
7. REPLACE MARKER IF LETTERS ON MARKER ARE ILLEGIBLE. See TM 9-2350-366-20-1.
8. REPLACE NAME PLATE IF IT IS DAMAGED. See TM 9-2350-366-20-1.



ASSEMBLY

1. INSTALL GEARBOX (1) ON SUPPORT (2). SECURE WITH FOUR SCREWS (3), EIGHT WASHERS (4), AND FOUR NUTS (5).
2. INSTALL KEY (6) AND FAN (7) ON SHAFT (8) OF GEARBOX (1). SECURE WITH NEW WASHER (9) AND NUT (10).
3. TO SEAT ROTOR AND SEAL, TIGHTEN NUT (10) TO 70–75 LB-FT (95–102 N·m) TORQUE. THEN REMOVE NUT (10) AND WASHER (9).
4. APPLY SEALING COMPOUND TO BOTH SIDES OF WASHER (9).
5. INSTALL WASHER (9) AND NUT (10) ON SHAFT (8). TIGHTEN NUT (10) TO 27–32 LB-FT (37–43 N·m) TORQUE.
6. BEND ONE EDGE OF WASHER (9) AGAINST NUT (10) AND ONE EDGE AGAINST FAN (7).
7. INSTALL FAN HOUSING (11) ON SUPPORT (2). SECURE WITH SIX SCREWS (12), TWO SCREWS (13), EIGHT WASHERS (14), NEW LOCKWASHERS (15), AND NUTS (16).
8. INSTALL COVER (17) ON FAN HOUSING (11). SECURE WITH FOUR SCREWS (18), NEW LOCKWASHERS (19), AND WASHERS (20).



END OF TASK

REPAIR FAN DRIVE SHAFT AND BEARING HOUSING

0014 00

THIS WORK PACKAGE COVERS:

Inspection of Installed Items (page 0014 00-1).
 Disassembly (page 0014 00-2).
 Assembly (page 0014 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

References

TM 9-2350-366-20-1

Tools and Special Tools

General mechanics tool kit (WP 0046 00, Item 54)
 Hammer face (WP 0046 00, Item 14)
 Inserted hammer face holder (WP 0046 00, Item 20)
 Arbor press (WP 0046 00, Item 40)

Equipment Condition

Shaft and bearing housing removed from vehicle
 (TM 9-2350-366-20-1)

Personnel Required

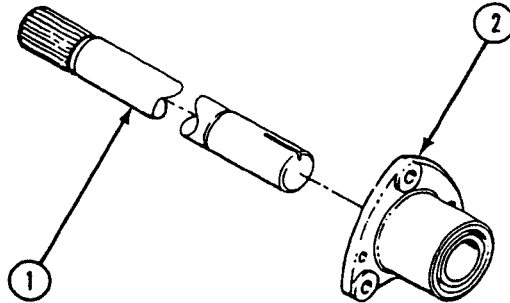
Track Veh Rpr 63H10

INSPECTION OF INSTALLED ITEMS

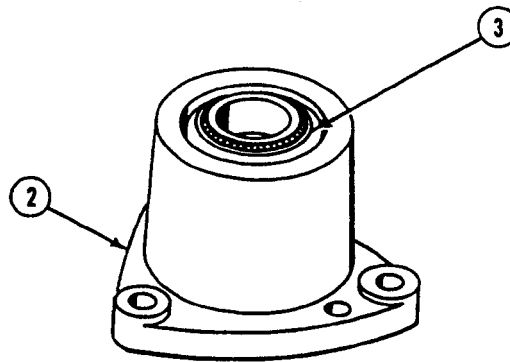
1. INSPECT DRIVE SHAFT AND FAN PULLEY FOR WEAR AND DAMAGE. REPLACE BAD DRIVE SHAFT OR FRONT PULLEY.
2. INSPECT BEARING SUPPORT AND FAN HOUSING FOR WEAR AND DAMAGE. REPLACE IF NECESSARY.

DISASSEMBLY

1. REMOVE DRIVE SHAFT (1) FROM BEARING HOUSING (2) BY PRESSING SHAFT (1) OUT.

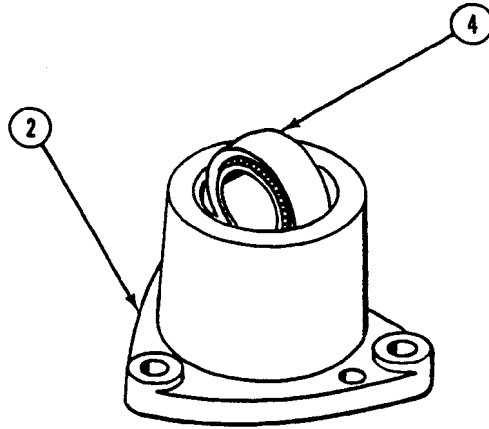


2. PLACE BEARING HOUSING (2) ON FLAT SURFACE. TAP OUTER EDGE OF BEARING (3) UNTIL BEARING TURNS TO VERTICAL POSITION. TAP BEARING EDGE TO REMOVE BEARING FROM HOUSING.

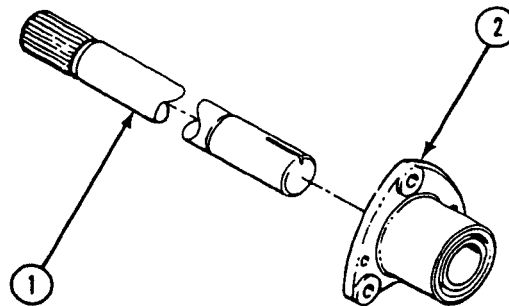


ASSEMBLY

1. PLACE BEARING HOUSING (2) ON FLAT SURFACE WITH BEARING ON TOP. TAP OUTER RACE OF BEARING (4) EVENLY UNTIL BEARING RACE IS SEATED FLUSH WITH EDGE OF HOUSING. TAP EDGE OF BEARING DOWNWARD TO SEAT BEARING IN HOUSING.



2. PRESS DRIVE SHAFT (1) IN BEARING HOUSING (2).



3. INSTALL SHAFT AND BEARING HOUSING IN VEHICLE. See TM 9-2350-366-20-1.

END OF TASK

CHAPTER 6

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR ELECTRICAL SYSTEM

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|---|---------------------|
| REPAIR GENERATOR..... | .0015 00 |
| REPLACE WARNING LIGHT PANEL MOUNTING BRACKET..... | .0016 00 |
| REPAIR BATTERY..... | .0017 00 |
| REPAIR MULTIPIN CONNECTORS..... | .0018 00 |
| REPAIR ENGINE WIRING HARNESS..... | .0019 00 |
| REPAIR TRANSMISSION WIRING HARNESS..... | .0020 00 |
| REPAIR TRANSMISSION CONTROL WIRING HARNESS..... | .0021 00 |
| REPLACE FRONT MAIN WIRING HARNESS..... | .0022 00 |
| REPAIR FRONT MAIN WIRING HARNESS..... | .0023 00 |

REPAIR GENERATOR

0015 00

THIS WORK PACKAGE COVERS:

Repair or Replacement (page 0015 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Equipment Condition

Generator removed (TM 9-2350-366-20-1)

Personnel Required

Track Veh Rpr 63H10

References

TM 9-2920-257-30&P

TM 9-2350-366-20-1

REPAIR OR REPLACEMENT

1. REPAIR GENERATOR. See TM 9-2920-257-30&P.

END OF TASK

REPLACE WARNING LIGHT PANEL MOUNTING BRACKET

0016 00

THIS WORK PACKAGE COVERS:

Removal (page 0016 00-1).
 Installation (page 0016 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Veh Rpr 63H10

Tools and Special Tools

General Mechanics Tool Kit (WP 0046 00, Item 54)

References

TM 9-2350-366-10-1

Materials/Parts

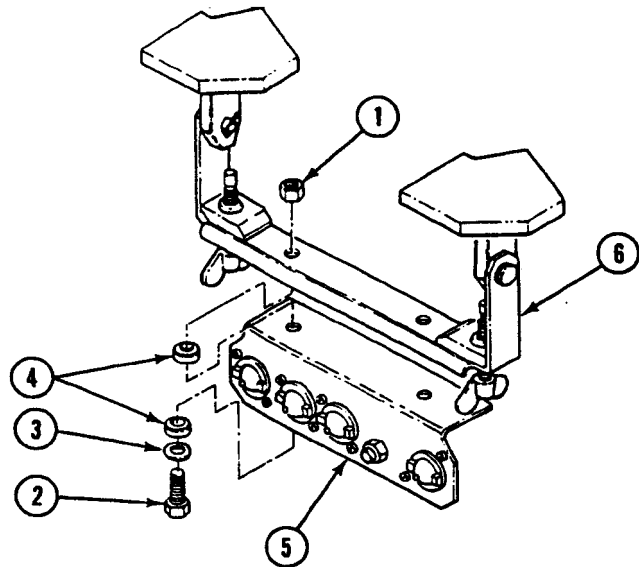
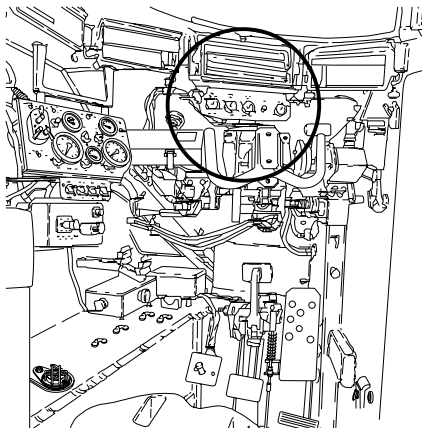
Cotter pin (2)
 Insert (2)
 Locknut (2)
 Thumbscrew (2)

Equipment Condition

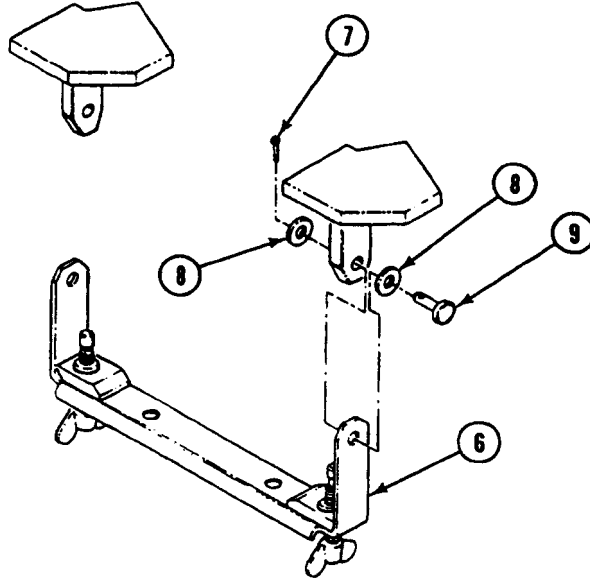
Engine stopped (TM 9-2350-366-10-1)
 Vehicle blocked (TM 9-2350-366-10-1)
 M27 periscope removed (TM 9-2350-366-10-1)

REMOVAL

1. REMOVE TWO LOCKNUTS (1), SCREWS (2), WASHERS (3), MOUNTS (4), AND PANEL (5) FROM BRACKET (6). DISCARD LOCKNUTS. SUPPORT PANEL AFTER REMOVING SCREWS.

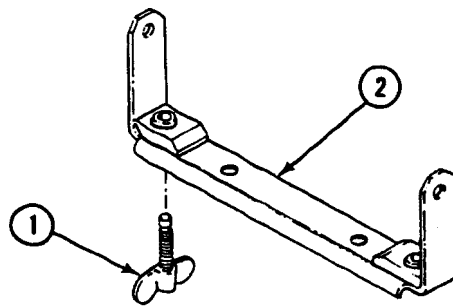


2. REMOVE TWO COTTER PINS (7), FOUR WASHERS (8), TWO HEADED PINS (9), AND BRACKET (6) FROM HULL. DISCARD COTTER PINS.



INSTALLATION

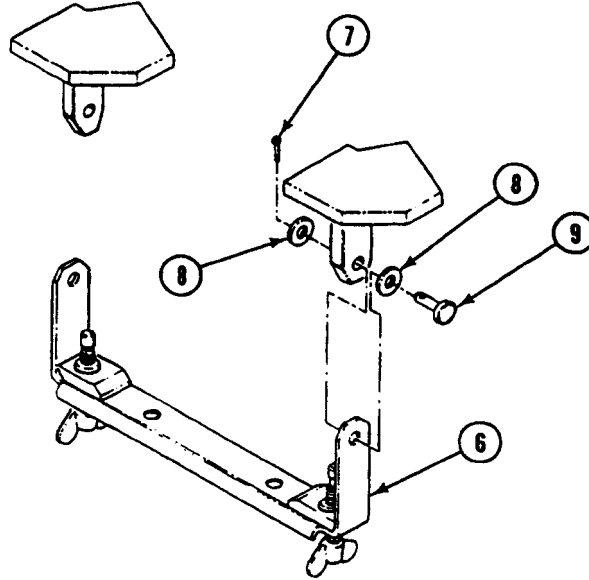
1. INSTALL TWO NEW INSERTS AND LOCK RINGS INTO NEW BRACKET (WP 0030 00).
2. INSTALL TWO NEW THUMBSCREWS (1) INTO NEW BRACKET (2). STAKE FIRST TWO THREADS AT END OF THUMBSCREWS AFTER INSTALLING INTO BRACKET.



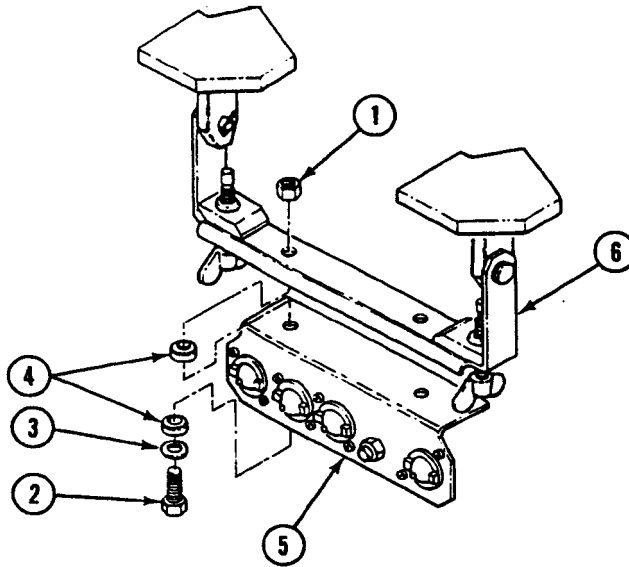
REPLACE WARNING LIGHT PANEL MOUNTING BRACKET — Continued

0016 00

- INSTALL FOUR WASHERS (8), TWO HEADED PINS (9), AND TWO NEW COTTER PINS (7) HOLDING BRACKET (6) TO HULL.



- INSTALL PANEL (5) ON BRACKET (6) WITH TWO SCREWS (2), WASHERS (3), MOUNTS (4), AND NEW LOCKNUTS (1).



END OF TASK

REPAIR BATTERY

0017 00

THIS WORK PACKAGE COVERS:

Repair or Replacement (page 0017 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

References

TM 9-6140-200-14

Tools and Special Tools

Automotive fuel and electrical system repair tool kit
(WP 0046 00, Item 52)

Equipment Condition

Personnel Required

Fuel and Elec Sys Rep 63G10

Battery on workbench

REPAIR OR REPLACEMENT

1. REPAIR BATTERIES. See TM 9-6140-200-14.

END OF TASK

REPAIR MULTIPIN CONNECTORS

0018 00

THIS WORK PACKAGE COVERS:

- Removal of Receptacle (page 0018 00-1).
- Removal of Cable Connector (page 0018 00-2).
- Installation of Receptacle (page 0018 00-3).
- Installation of Cable Connector (page 0018 00-4).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G10

Tools and Special Tools

- Automotive fuel and electrical system repair tool kit (WP 0046 00, Item 52)
- Digital multimeter (WP 0046 00, Item 35)
- Electrical connector tool kit (WP 0046 00, Item 53)
- Soldering gun (WP 0046 00, Item 48)

Equipment Condition

Repairable parts on workbench

Materials/Parts

- Insulating tape (WP 0048 00, Item 12)
- Tin alloy solder (WP 0048 00, Item 19)
- Contacts (AR)

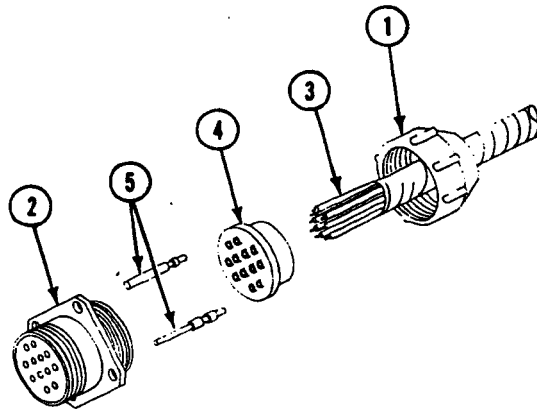
REMOVAL

RECEPTACLE

NOTE

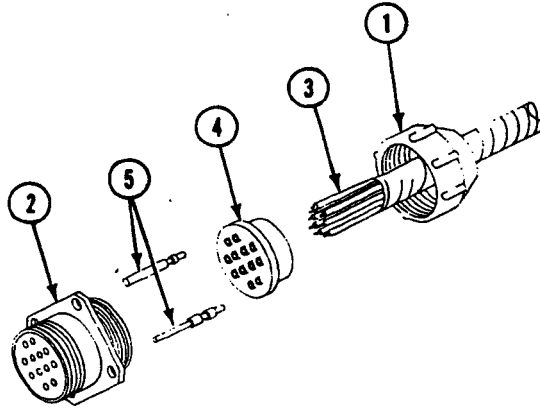
Use same procedure for repairing single or multiple lead, and male or female receptacle.

1. LOOSEN NUT (1) FROM RECEPTACLE (2). SLIDE NUT BACK ON LEADS (3).



2. REMOVE GROMMET (4) WITH CONTACTS (5) FROM REAR OF RECEPTACLE (2).

3. PUSH LEADS (3) INTO GROMMET (4) UNTIL CONTACTS (5) ARE FULLY EXPOSED ON OTHER SIDE OF GROMMET. CLIP OR DESOLDER LEADS FROM CONTACTS. DISCARD CONTACTS.
4. REMOVE GROMMET (4) AND NUT (1) FROM LEADS (3).

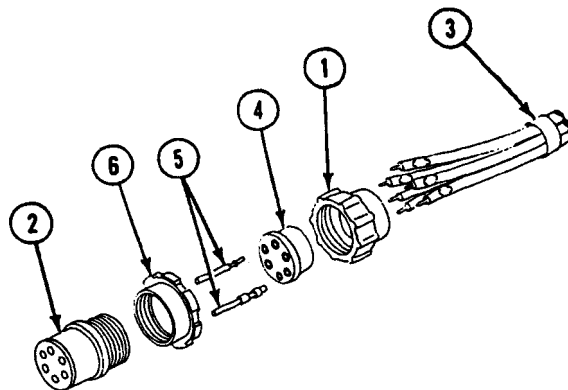


CABLE CONNECTOR

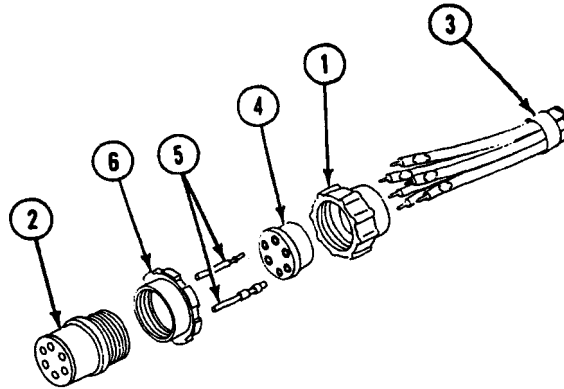
NOTE

Use same procedure for repairing single or multiple lead, and male or female cable connectors.

1. LOOSEN RETAINING NUT (1) FROM PLUG (2). SLIDE NUT BACK ON CABLE (3).
2. PULL GROMMET (4) WITH CONTACTS (5) FROM REAR OF PLUG (2).
3. REMOVE PLUG (2) AND COUPLING NUT (6) FROM CABLE (3).



4. PUSH LEADS OF CABLE (3) INTO GROMMET (4) UNTIL CONTACTS (5) ARE FULLY EXPOSED ON OTHER SIDE OF GROMMET. CLIP OR DESOLDER LEADS FROM CONTACTS. DISCARD CONTACTS.
5. REMOVE GROMMET (4) AND RETAINING NUT (1) FROM CABLE (3).



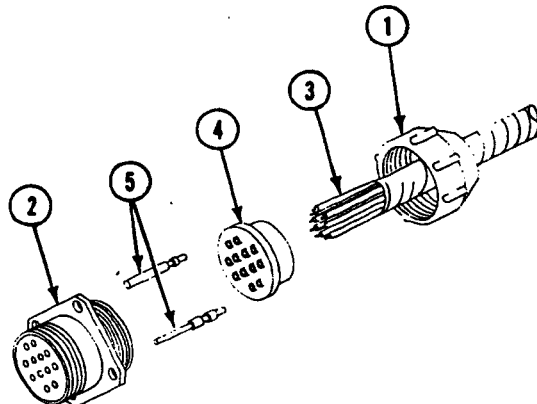
INSTALLATION

RECEPTACLE

NOTE

If replacing lead, cut new wire from bulk supply. Measure original length, gage, and type of wire.

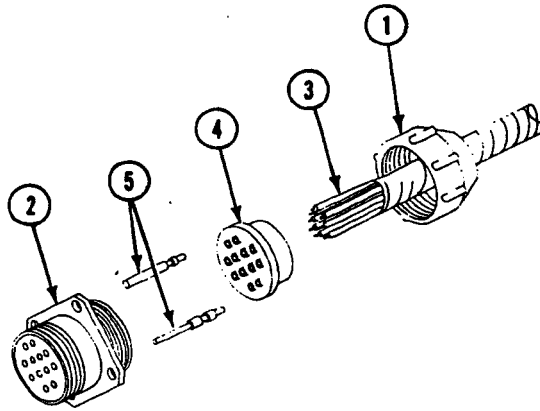
1. STRIP INSULATION FROM LEADS (3) TO UNCOVER JUST ENOUGH WIRE TO FILL WELL IN CONTACTS (5).
2. SLIDE NUT (1) OVER LEADS (3).
3. PUSH LEADS (3) THROUGH GROMMET (4) AND INSERT IN NEW CONTACTS (5).



NOTE

Make sure leads pass through proper lettered hole in grommet.

4. SOLDER LEADS (3) IN CONTACTS (5) AND PRESS CONTACTS INTO GROMMET (4). CHECK LEADS FOR CONTINUITY.
5. ALIGN AND INSTALL GROMMET (4) IN RECEPTACLE (2). SECURE WITH NUT (1).

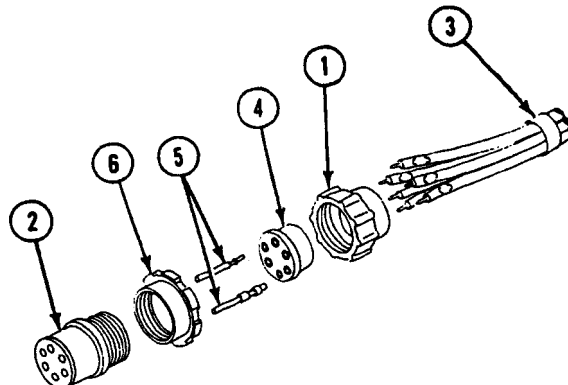


CABLE CONNECTOR

NOTE

If replacing lead, cut new wire from bulk supply. Measure original length, gage, and type of wire.

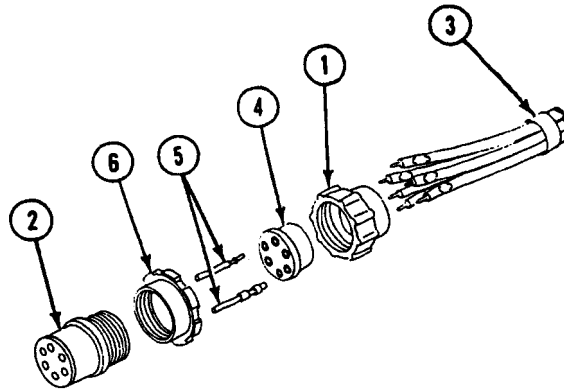
1. STRIP INSULATION FROM LEADS OF CABLE (3) TO UNCOVER JUST ENOUGH WIRE TO FILL WELL IN CONTACTS (5).
2. SLIDE RETAINING NUT (1) AND COUPLING NUT (6) ON CABLE (3).
3. PUSH LEADS OF CABLE (3) THROUGH GROMMET (4) AND INSERT IN NEW CONTACTS (5).



NOTE

Make sure leads pass through proper lettered hole in grommet.

4. SOLDER LEADS IN CONTACTS (5) AND PRESS CONTACTS INTO GROMMET (4). CHECK LEADS FOR CONTINUITY.
5. ALIGN AND INSTALL GROMMET (4) IN PLUG (2). SECURE WITH RETAINING NUT (1).



END OF TASK

REPAIR ENGINE WIRING HARNESS

0019 00

THIS WORK PACKAGE COVERS:

Repair or Replacement (page 0019 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G10

Tools and Special Tools

Automotive fuel and electrical system repair tool kit
(WP 0046 00, Item 52)
Electrical connector tool kit (WP 0046 00, Item 53)
Digital multimeter (WP 0046 00, Item 35)

References

TM 9-2350-366-20-1

Materials/Parts

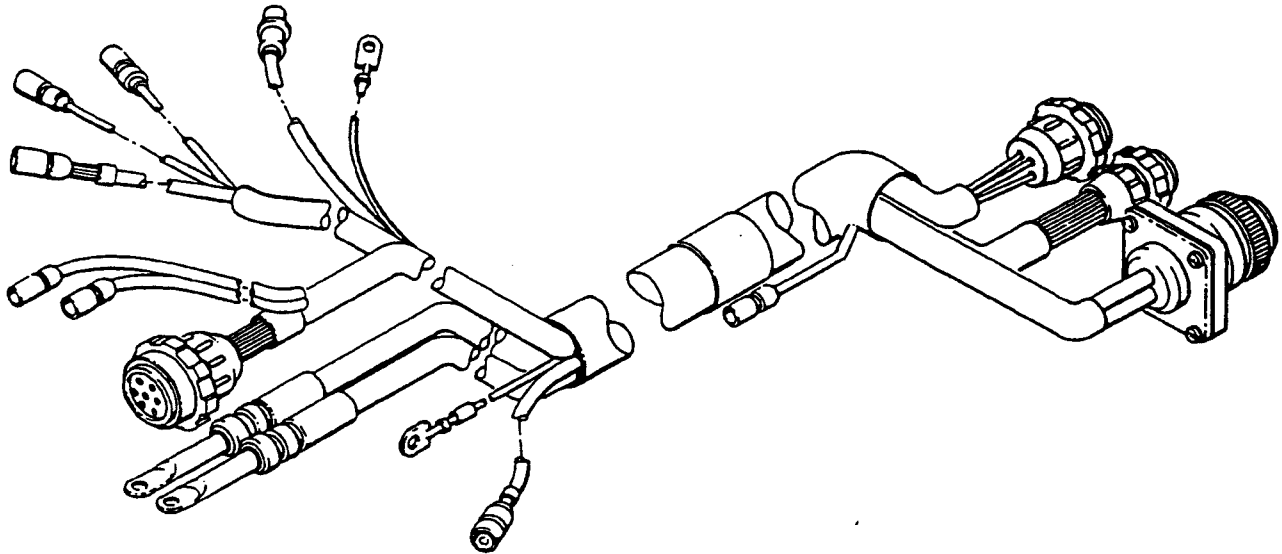
Insulating tape (WP 0048 00, Item 12)

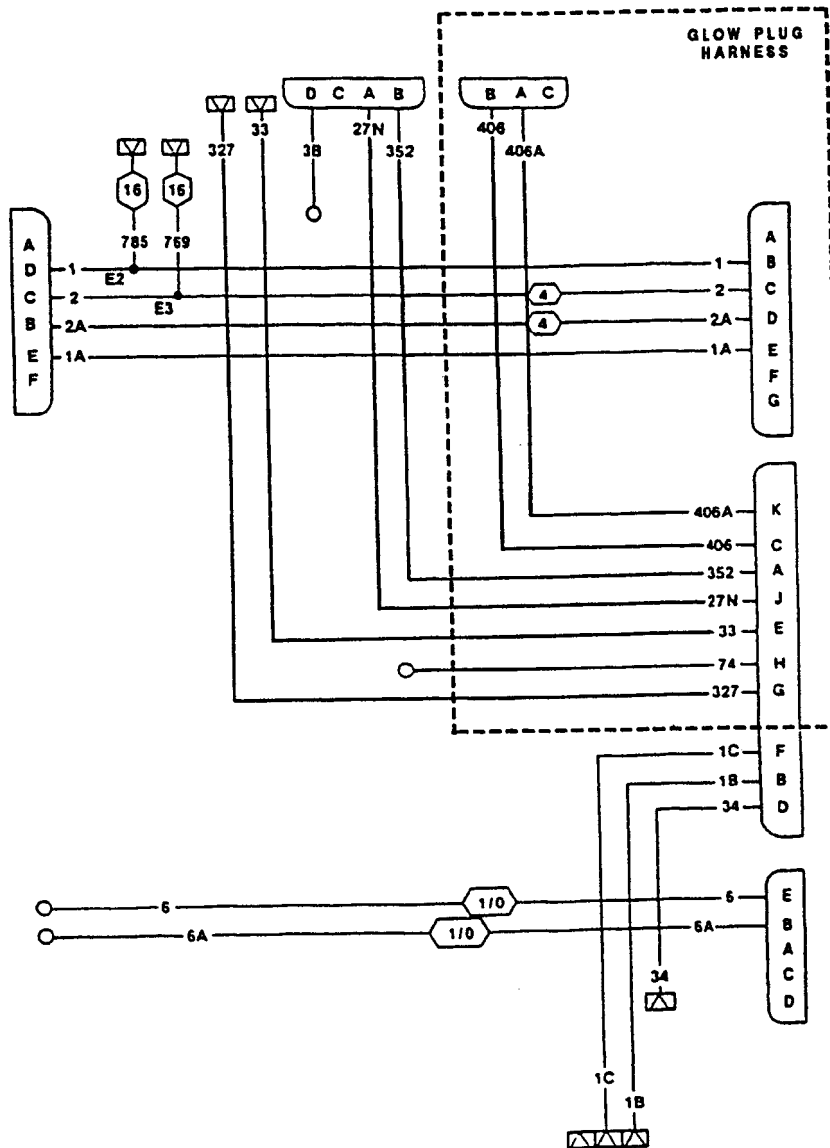
Equipment Condition

Engine wiring harness removed (TM 9-2350-366-20-1)

REPAIR OR REPLACEMENT

1. PERFORM CONTINUITY CHECK ON ENGINE WIRING HARNESS ASSEMBLY TO DETERMINE WHICH PARTS REQUIRE REPAIR OR REPLACEMENT.





2. REPAIR CONNECTORS AS REQUIRED (WP 0018 00).
3. REPAIR LEADS AND/OR SMALL CONNECTORS AS REQUIRED.
4. REPEAT CONTINUITY CHECK ON ENGINE WIRING HARNESS ASSEMBLY TO DETERMINE THAT REPAIRS HAVE BEEN COMPLETED.
5. USE INSULATING TAPE TO BIND WIRING HARNESS.

END OF TASK

REPAIR TRANSMISSION WIRING HARNESS

0020 00

THIS WORK PACKAGE COVERS:

Repair or Replacement (page 0020 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G10

Tools and Special Tools

Automotive fuel and electrical system repair tool kit
(WP 0046 00, Item 52)

Electrical connector tool kit (WP 0046 00, Item 53)

Digital multimeter (WP 0046 00, Item 35)

References

TM 9-2350-366-20-1

Materials/Parts

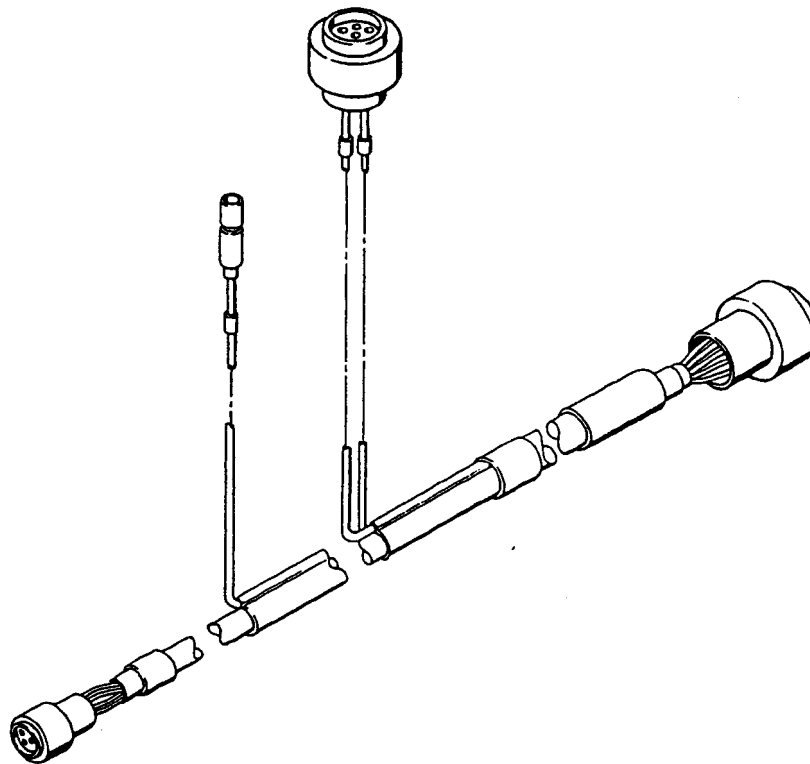
Insulating tape (WP 0048 00, Item 12)

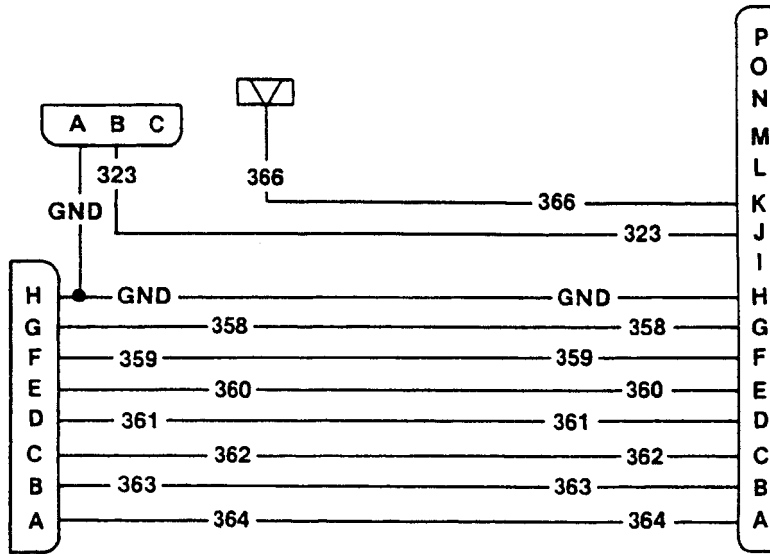
Equipment Condition

Transmission wiring harness removed
(TM 9-2350-366-20-1)

REPAIR OR REPLACEMENT

1. PERFORM CONTINUITY CHECK ON TRANSMISSION WIRING HARNESS ASSEMBLY TO DETERMINE WHICH PARTS REQUIRE REPAIR OR REPLACEMENT.





WIRING DIAGRAM

2. REPAIR CONNECTORS AS REQUIRED (WP 0018 00).
3. REPAIR SMALL CONNECTORS AS REQUIRED.
4. REPEAT CONTINUITY CHECK ON TRANSMISSION WIRING HARNESS ASSEMBLY TO DETERMINE THAT REPAIRS HAVE BEEN COMPLETED.
5. USE INSULATING TAPE TO BIND WIRING HARNESS.

END OF TASK

REPAIR TRANSMISSION CONTROL WIRING HARNESS

0021 00

THIS WORK PACKAGE COVERS:

Repair or Replacement (page 0021 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G10

Tools and Special Tools

Automotive fuel and electrical system repair tool kit
(WP 0046 00, Item 52)

Electrical connector tool kit (WP 0046 00, Item 53)

Digital multimeter (WP 0046 00, Item 35)

References

TM 9-2350-366-20-1

Materials/Parts

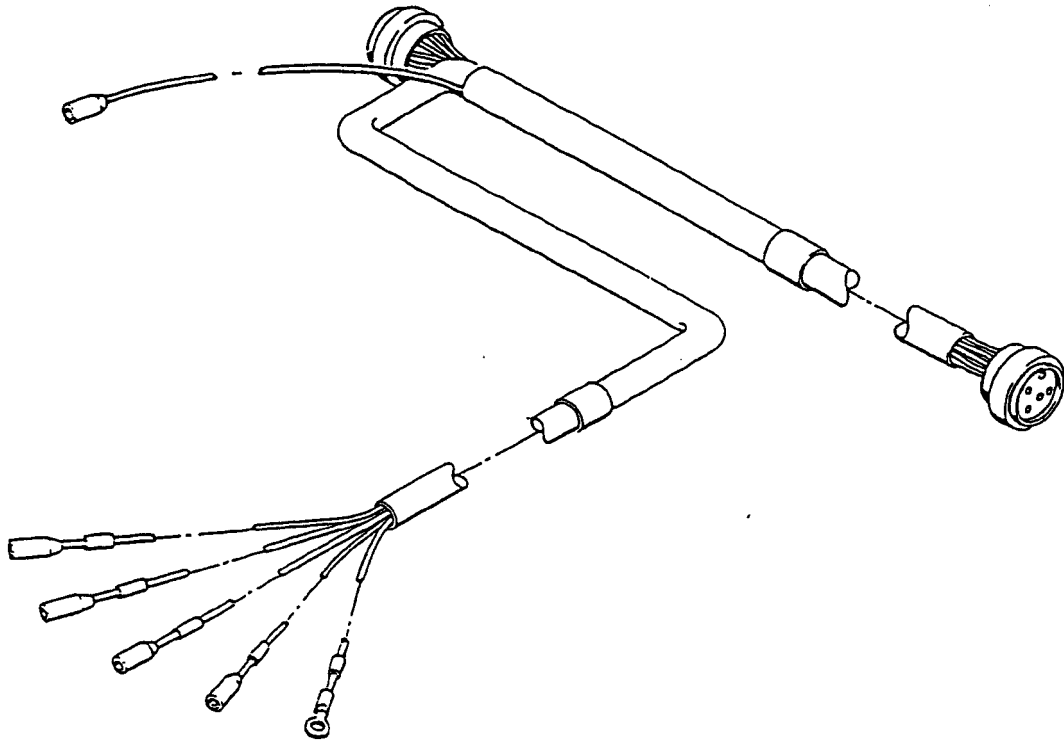
Insulating tape (WP 0048 00, Item 12)

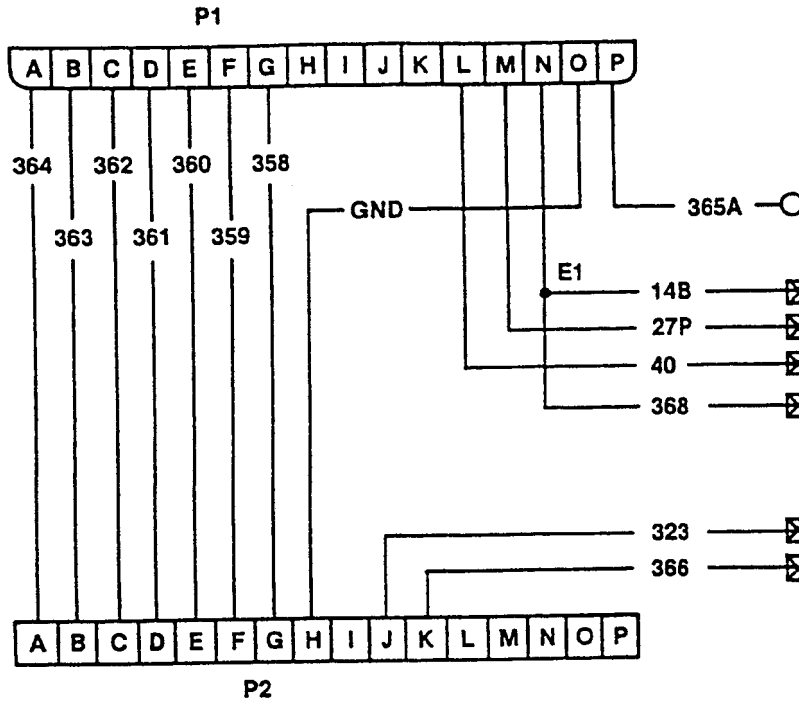
Equipment Condition

Transmission control wiring harness removed
(TM 9-2350-366-20-1)

REPAIR OR REPLACEMENT

1. PERFORM CONTINUITY CHECK ON TRANSMISSION CONTROL WIRING HARNESS ASSEMBLY TO DETERMINE WHICH PARTS REQUIRE REPAIR OR REPLACEMENT.





2. REPAIR CONNECTORS AS REQUIRED (WP 0018 00).
3. REPAIR SMALL TERMINALS AS REQUIRED.
4. REPEAT CONTINUITY CHECK ON TRANSMISSION CONTROL WIRING HARNESS ASSEMBLY TO DETERMINE THAT REPAIRS HAVE BEEN COMPLETED.
5. USE INSULATINGTAPE TO BIND WIRING HARNESS.

END OF TASK

REPLACE FRONT MAIN WIRING HARNESS

0022 00

THIS WORK PACKAGE COVERS:

Removal (page 0022 00-1).
 Installation (page 0022 00-20).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G10

Tools and Special Tools

General mechanic's tool kit: automotive
 (WP 0046 00, Item 54)
 Automotive fuel and electrical system repair tool kit
 (WP 0046 00, Item 52)
 Electrical connector tool kit (WP 0046 00, Item 53)
 Open end wrench, 1-1/8 inch (WP 0046 00, Item 62)

References

TM 9-2350-366-10-1
 TM 9-2350-366-20-1

Materials/Parts

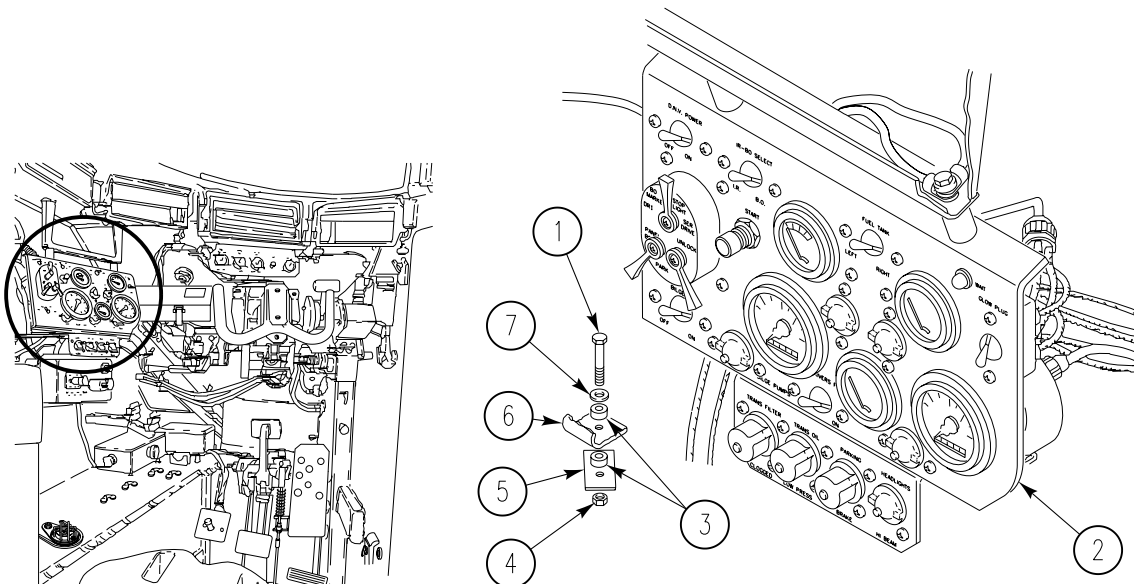
Locknut
 Locknut (13)
 Locknut (16)
 Lockwasher (4)
 Lockwasher (22)
 Tie down strap (3)

Equipment Condition

Engine stopped (TM 9-2350-366-10-1)
 Vehicle blocked (TM 9-2350-366-10-1)
 Power plant access cover removed
 (TM 9-2350-366-10-1)
 Power plant front access panel removed
 (TM 9-2350-366-10-1)
 Battery ground strap disconnected
 (TM 9-2350-366-20-1)

REMOVAL

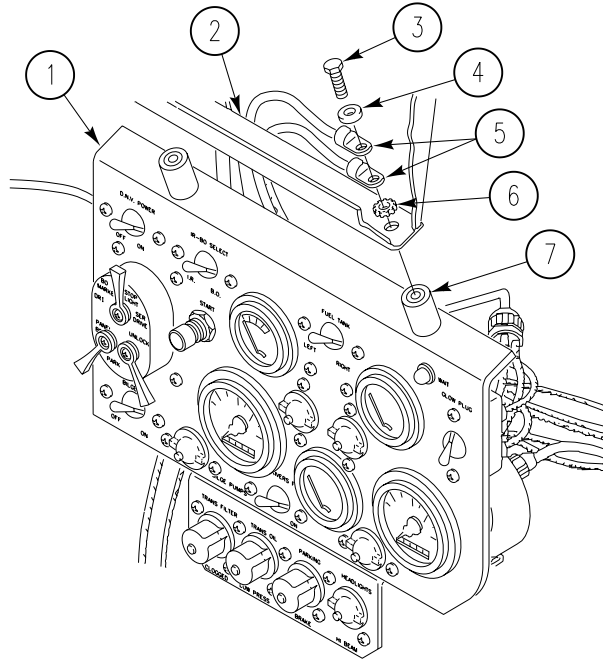
1. REMOVE TWO NUTS (4), MOUNTS (3), WASHERS (7), AND SCREWS (1) THAT SECURE INSTRUMENT PANEL (2) TO TWO STRUTS (5) AND (6).



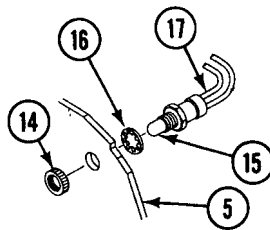
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

2. SUPPORT INSTRUMENT PANEL (1). REMOVE TWO SCREWS (3), WASHERS (4), AND LOCKWASHER (6) THAT SECURE GROUND LEAD (5), WAIT INDICATOR GROUND LEAD (5) (GLOW PLUG SYSTEM ONLY), AND UPPER SUPPORT (2) ON TWO MOUNTS (7). DISCARD LOCKWASHER.
3. SUPPORT INSTRUMENT PANEL (1) ON TWO STRUTS TO GAIN ACCESS TO REAR OF PANEL.



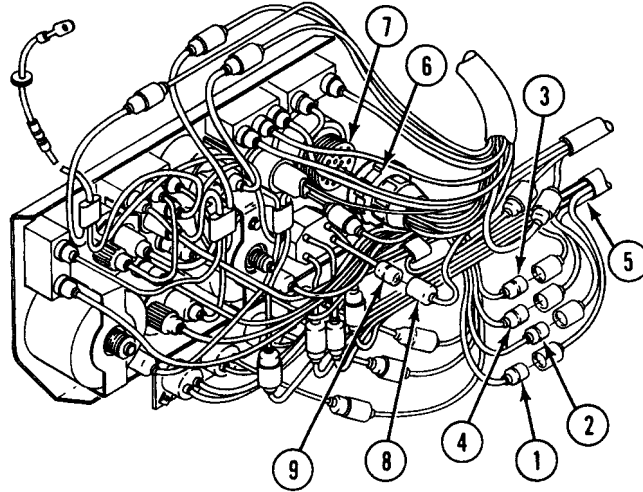
4. REMOVE KNURLED NUT (14) AND WAIT INDICATOR (15) WITH LOCKWASHER (16) FROM INSTRUMENT PANEL (5) (GLOW PLUG SYSTEM ONLY).



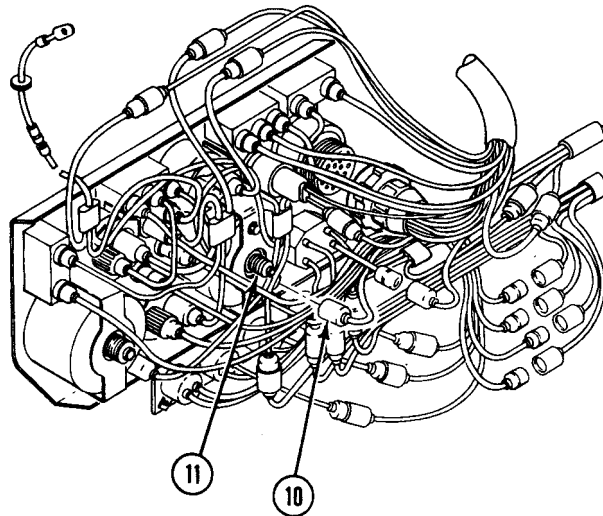
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

5. DISCONNECT CIRCUIT LEADS 24 (1), 23 (2), 22 (3), AND 21 (4) FROM REAR MAIN WIRING HARNESS (5).
6. DISCONNECT CONNECTOR (6) FROM LIGHT SELECTOR SWITCH (7).
7. DISCONNECT CIRCUIT LEAD 452A (8) FROM BILGE PUMP SWITCH CONNECTOR (9).



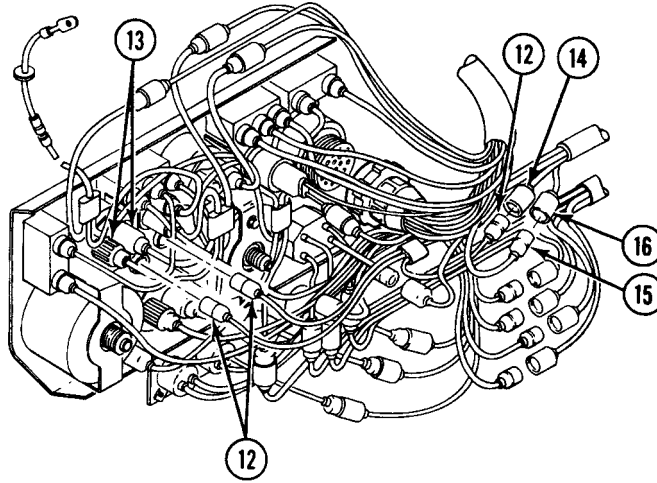
8. DISCONNECT CIRCUIT LEAD 452B (10) FROM BILGE PUMP ON INDICATOR LIGHT (11).



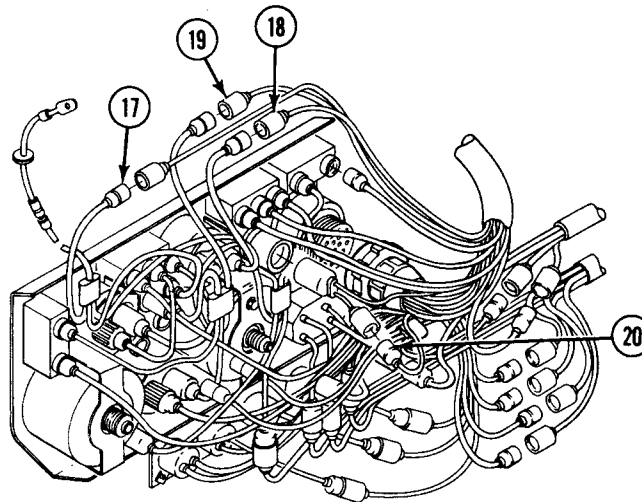
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

9. DISCONNECT THREE CIRCUIT 40 LEADS (12) FROM TWO INSTRUMENT PANEL LIGHTS (13) AND TRANSMISSION CONTROL WIRING HARNESS CONNECTOR (14).
10. DISCONNECT CIRCUIT LEAD 366 (15) FROM CIRCUIT CONNECTOR 366 (16).



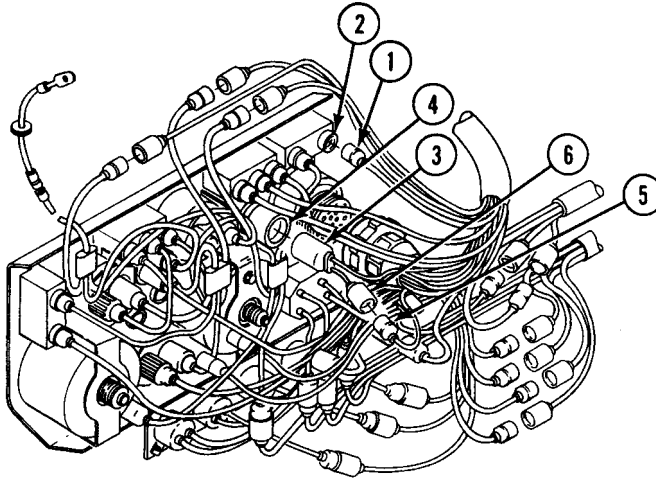
11. DISCONNECT CIRCUIT LEADS 15 (17), 25A (18), 27F (19), AND 14 (20) FROM INSTRUMENT PANEL WIRING HARNESS CONNECTORS.



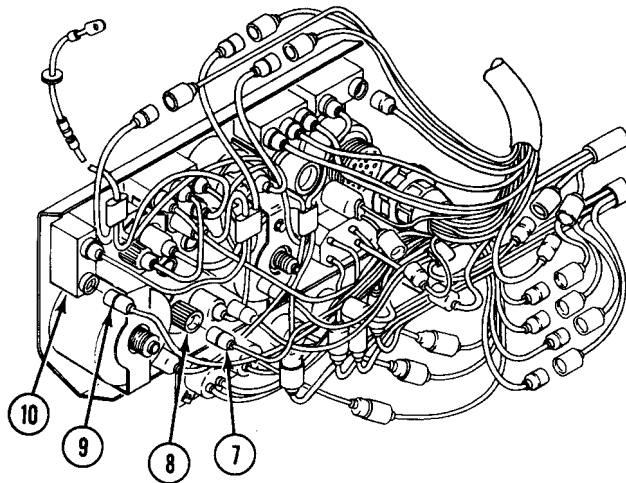
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

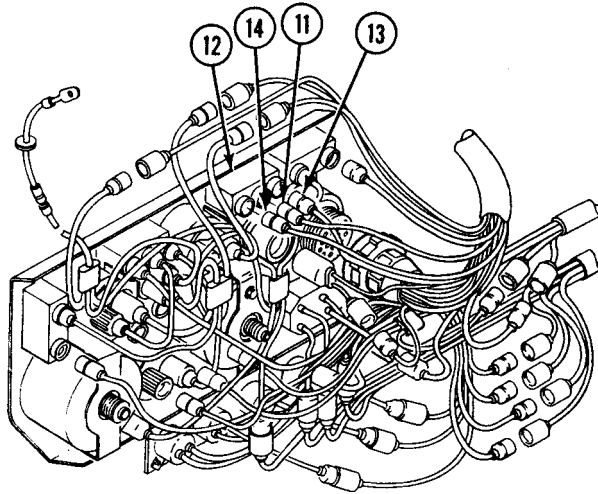
12. DISCONNECT CIRCUIT LEAD 516A (1) FROM INFRARED (IR) POWER PACK SWITCH (2).
13. DISCONNECT CIRCUIT LEAD 74 (3) FROM STARTER SWITCH (4) AND LEAD 14 (5) FROM CONNECTOR 14B (6).



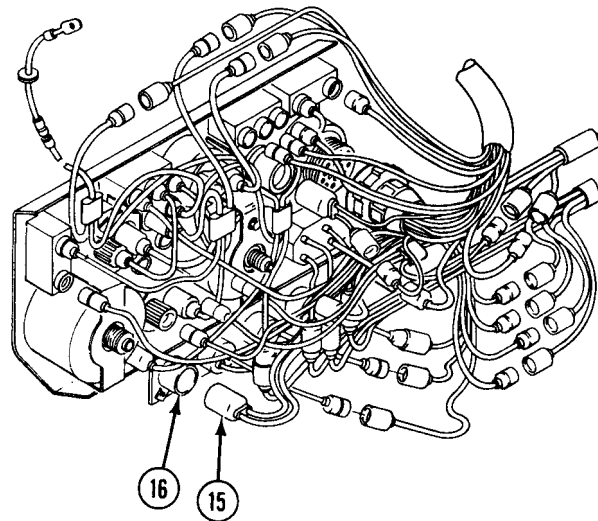
14. DISCONNECT CIRCUIT LEAD 33 (7) FROM ENGINE COOLANT TEMPERATURE GAUGE (8).
15. DISCONNECT CIRCUIT LEAD 406 (9) FROM AIR BOX HEATER SWITCH (10).



16. DISCONNECT CIRCUIT LEAD 520 (11) FROM IR BO SELECTOR SWITCH (12).
17. DISCONNECT CIRCUIT LEAD 19 (13) FROM IR BO SELECTOR SWITCH (12).
18. DISCONNECT CIRCUIT LEADS 514 AND 515 (14) FROM IR BO SELECTOR SWITCH (12).



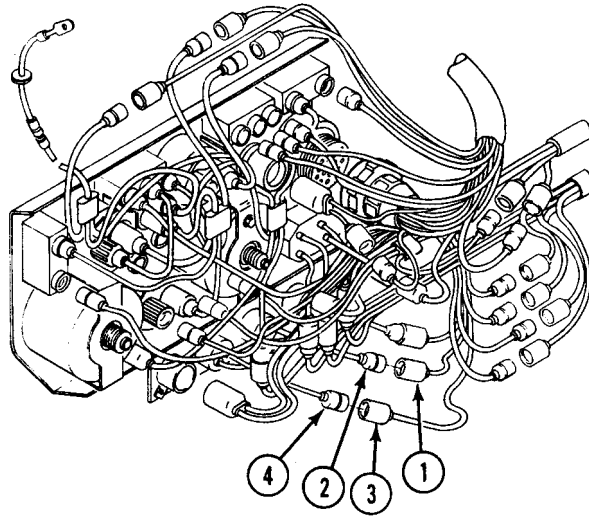
19. DISCONNECT CIRCUIT LEADS 519 AND 519A (15) FROM HEADLIGHTS HIGH BEAM INDICATOR (16).



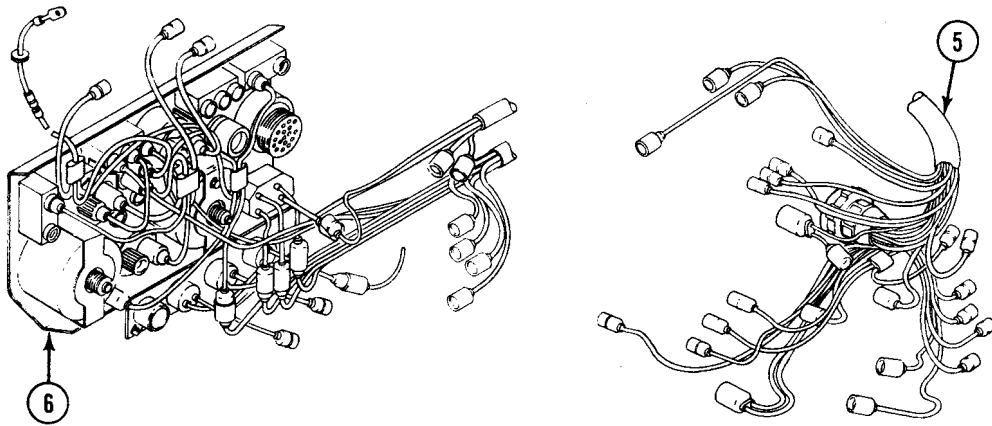
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

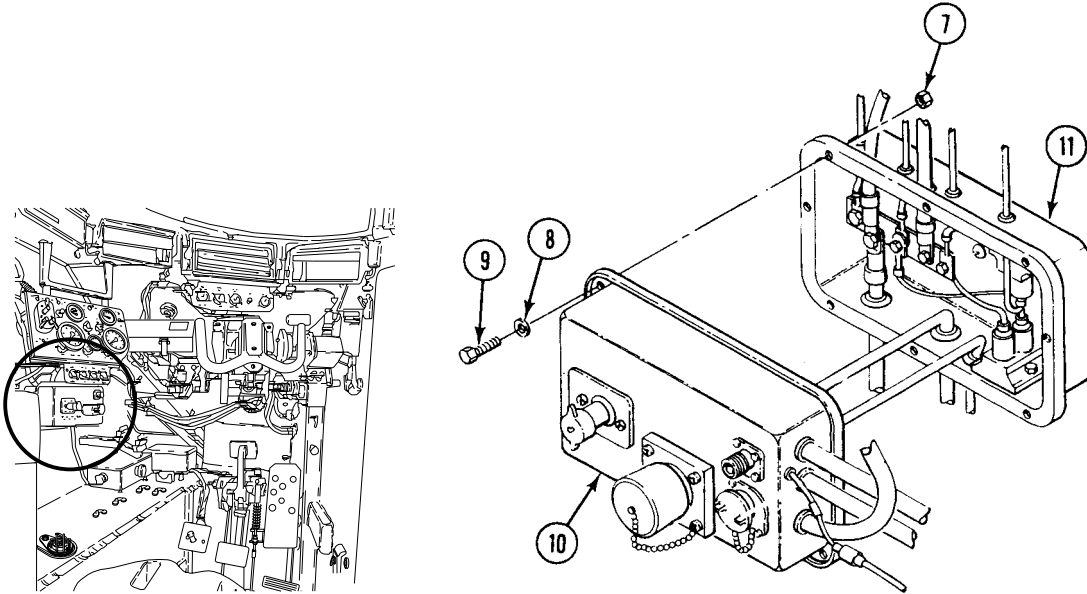
20. DISCONNECT CIRCUIT LEAD 367 (1) FROM TRANSMISSION LOW OIL PRESSURE INDICATOR CONNECTOR (2).
21. DISCONNECT CIRCUIT LEAD 370 (3) FROM CONNECTOR (4).



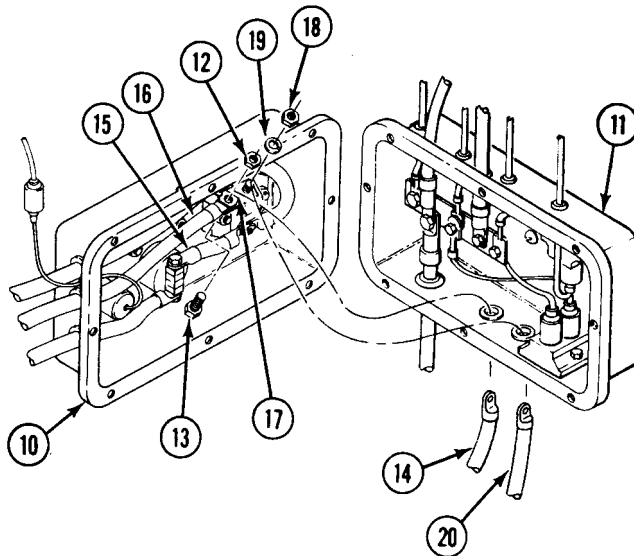
22. REMOVE FRONT MAIN WIRING HARNESS (5) FROM INSTRUMENT PANEL (6).



23. REMOVE EIGHT LOCKNUTS (7), WASHERS (8), AND SCREWS (9) THAT SECURE MASTER SWITCH PANEL (10) ON DISTRIBUTION BOX (11). PULL MASTER SWITCH PANEL AWAY FROM BOX. DISCARD LOCKNUTS.



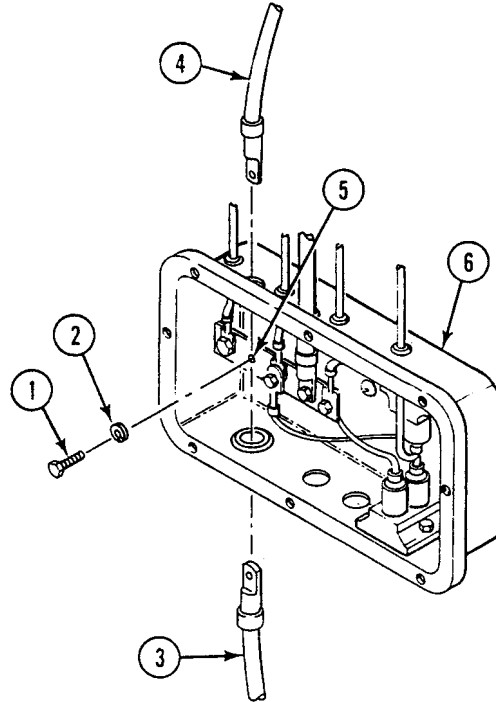
24. REMOVE LOCKNUT (12) AND SCREW (13) THAT SECURES CIRCUIT LEADS 2 (14), 6 (15), AND 400 (16) ON CONDUCTOR BUS (17) OF MASTER SWITCH PANEL (10). REMOVE NUT (18) AND LOCKWASHER (19) THAT SECURE CIRCUIT 2A (20) ON CONDUCTOR BUS. REMOVE CIRCUIT LEADS 2A (20) AND 2 (14) FROM MASTER SWITCH PANEL THROUGH DISTRIBUTION BOX (11). DISCARD LOCKNUT.



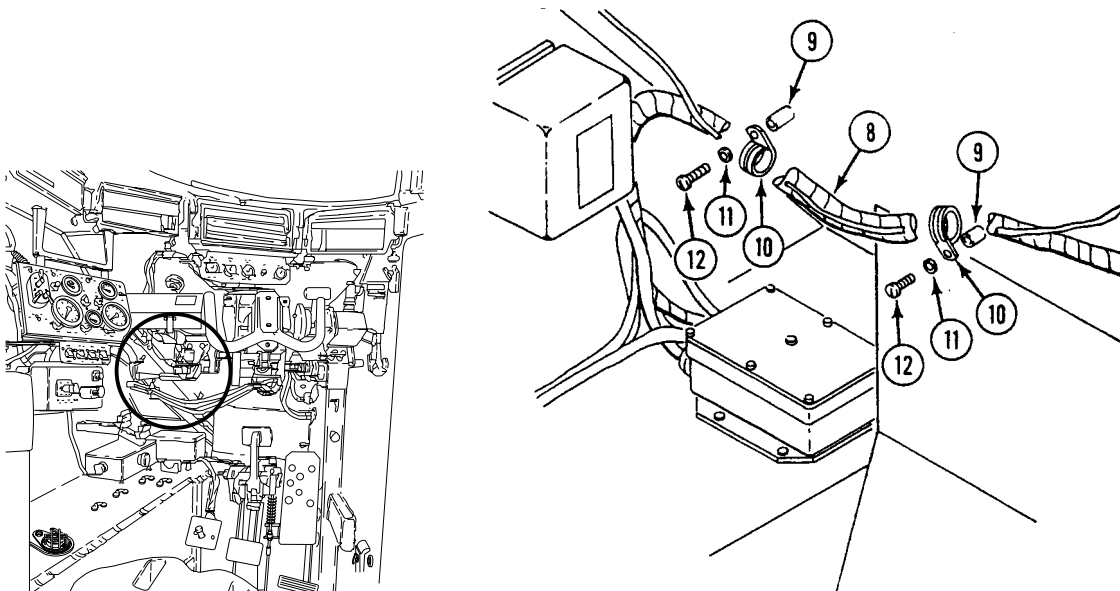
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

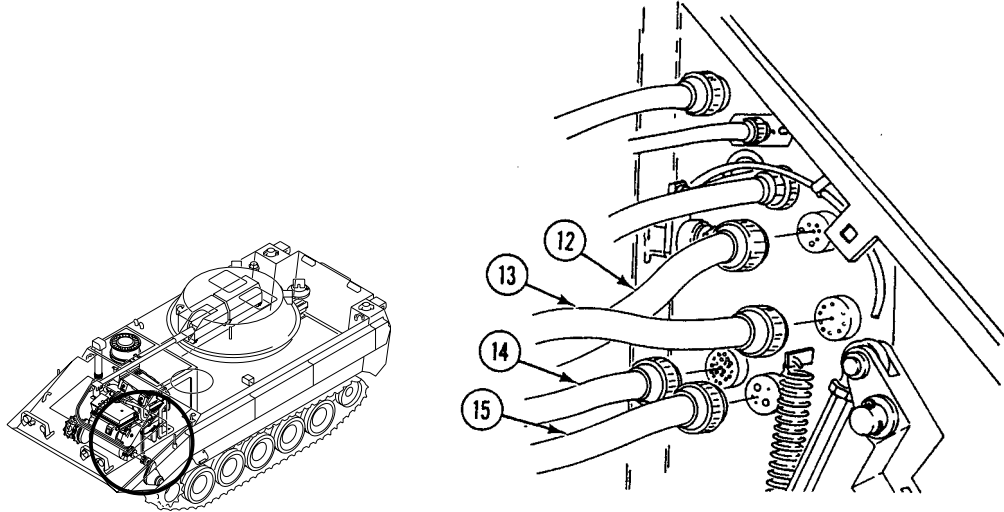
25. REMOVE SCREW (1), LOCKWASHER (2), CIRCUIT LEADS 6 (3) AND 6A (4) FROM BUS BAR (5) AND DISTRIBUTION BOX (6). DISCARD LOCKWASHER.



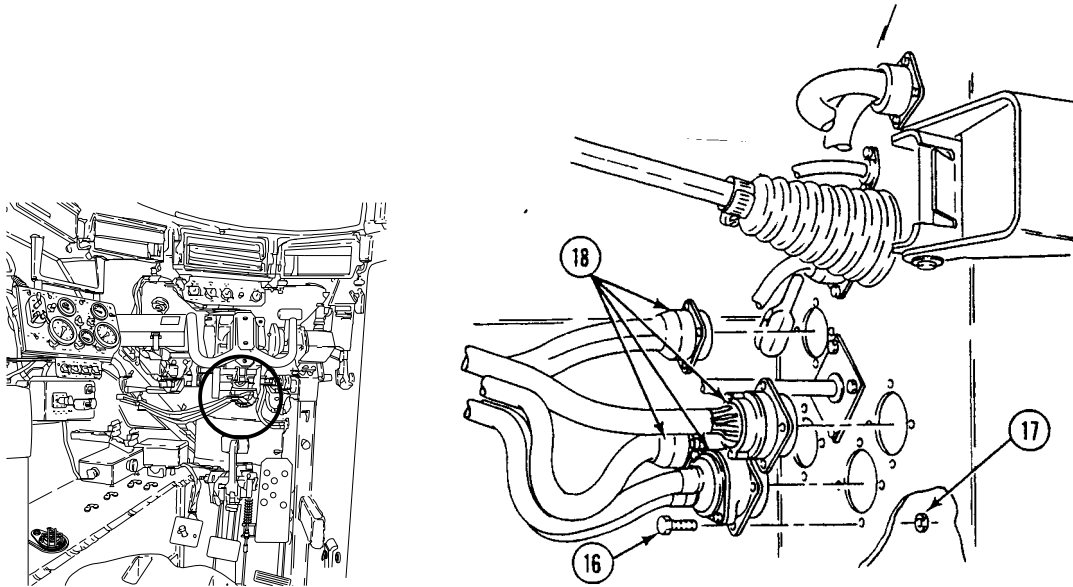
26. REMOVE TWO SCREWS (12), LOCKWASHERS (11) AND TWO CLAMPS (10) FROM FRONT MAIN WIRING HARNESS (8) AND TWO WELD NUTS (9) ON SIDE PLATE OF HULL. DISCARD LOCKWASHERS.



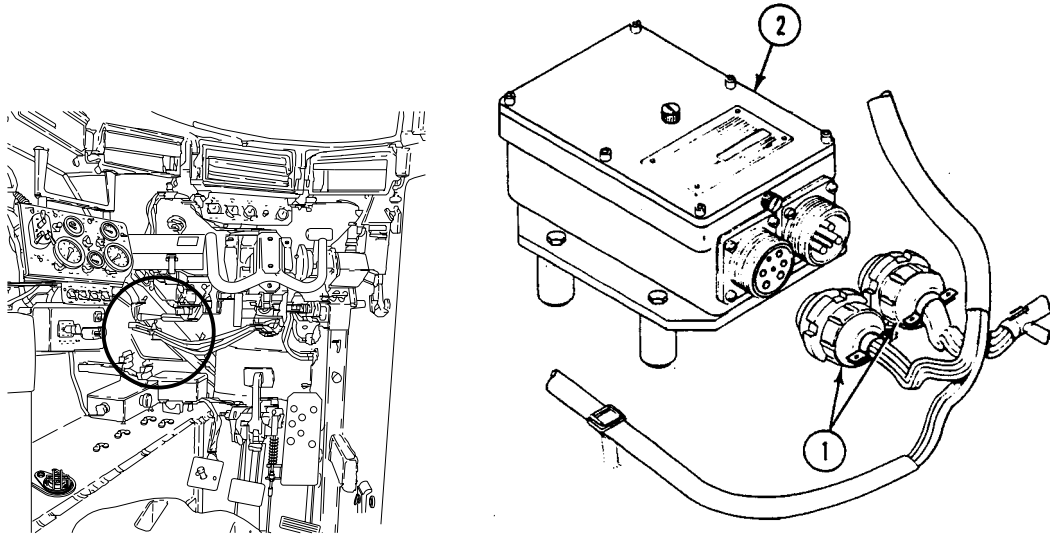
27. FROM INSIDE OF POWER PLANT COMPARTMENT REMOVE FOUR CONNECTORS FROM DRIVER'S BULKHEAD AS FOLLOWS: RIGHT HEADLIGHT WIRING HARNESS (12), GENERATOR REGULATOR LEAD (13), AND TWO POWER PLANT HARNESS LEADS (14) AND (15).



28. REMOVE 16 SCREWS (16), LOCKNUTS (17) AND FOUR CONNECTORS (18) FROM DRIVER'S BULKHEAD. DISCARD LOCKNUTS.

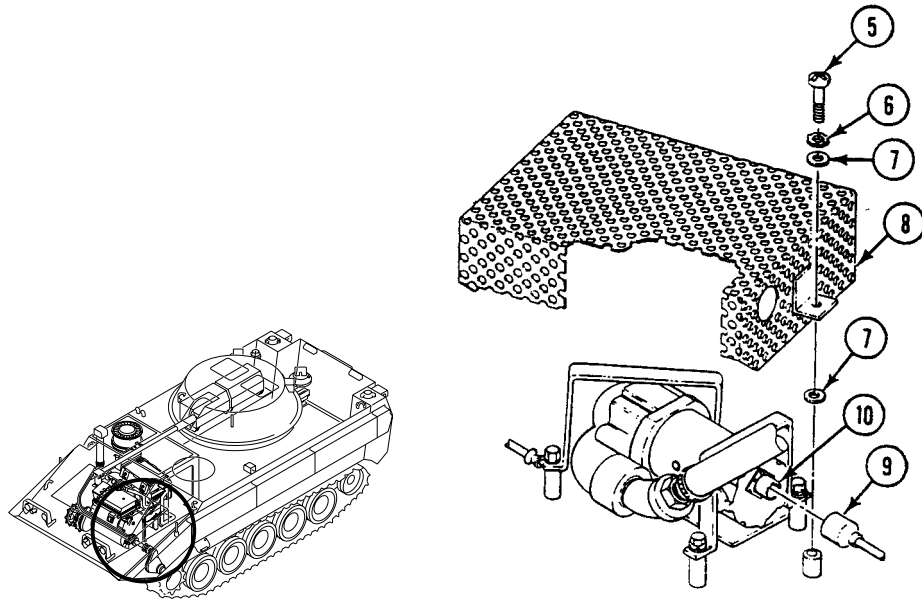


29. DISCONNECT TWO CONNECTORS (1) FROM GENERATOR REGULATOR (2).



30. REMOVE TWO SCREWS (5), LOCKWASHERS (6), FOUR WASHERS (7) AND BILGE PUMP STRAINER (8) FROM WELD NUTS. DISCARD LOCKWASHERS.

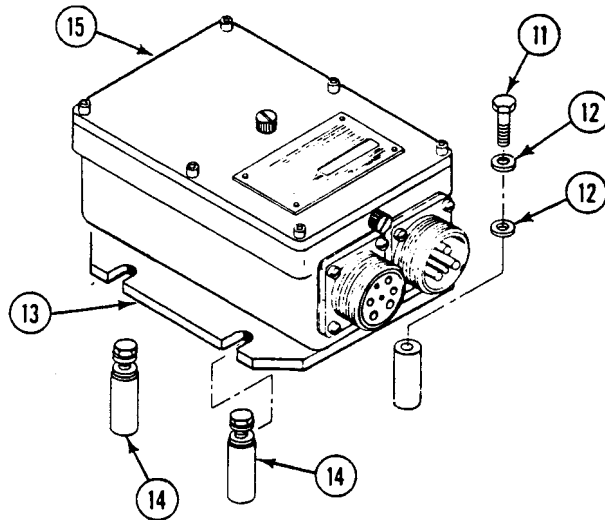
31. DISCONNECT CIRCUIT LEAD 452 (9) FROM FRONT BILGE PUMP (10).



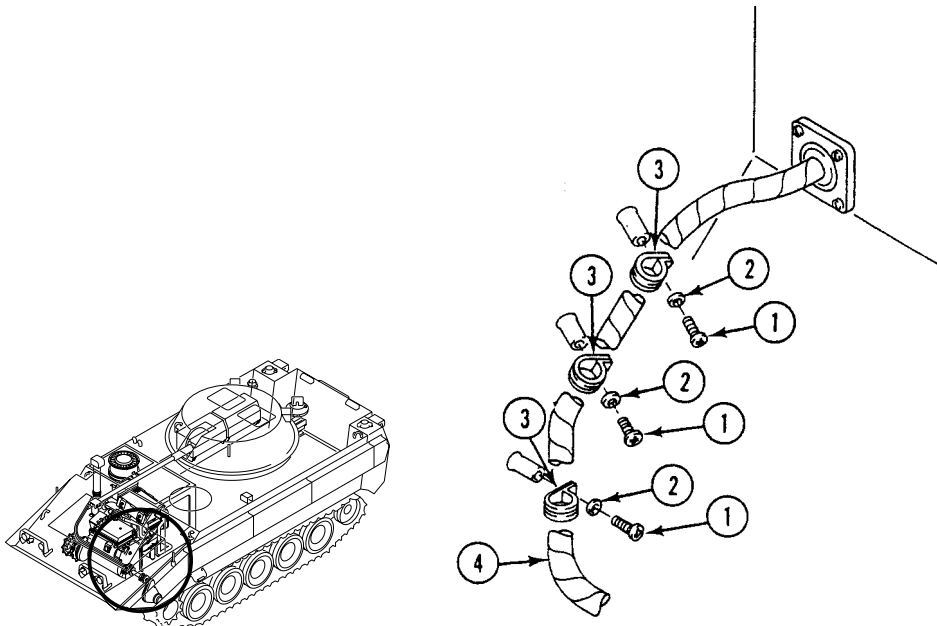
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

32. REMOVE TWO FRONT SCREWS (11) AND FOUR LOCKWASHERS (12) FROM VOLTAGE REGULATOR MOUNTING PLATE (13). DISCARD LOCKWASHERS.
33. LOOSEN TWO REAR SCREWS (14) FROM VOLTAGE REGULATOR MOUNTING PLATE (13). SLIDE VOLTAGE REGULATOR (15) FROM MOUNTS FOR ACCESS.



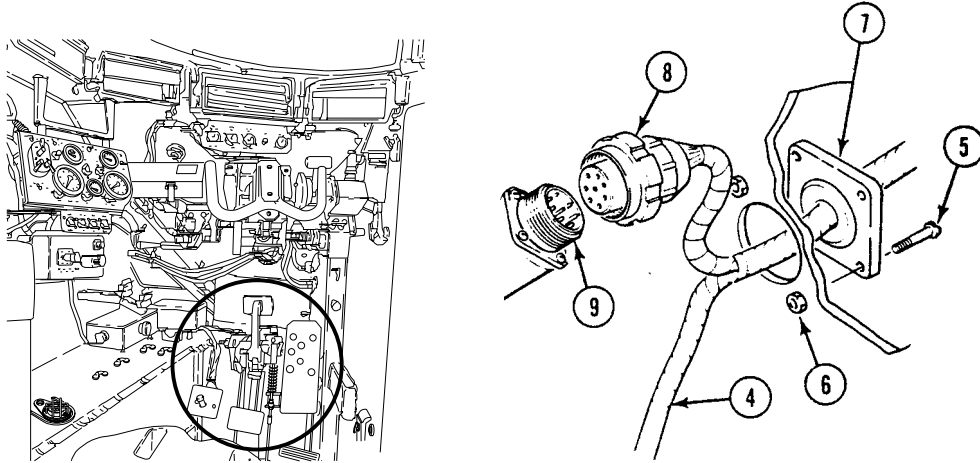
34. FROM INSIDE OF POWER PLANT COMPARTMENT REMOVE THREE SCREWS (1), LOCKWASHERS (2), CLAMPS (3) AND WIRING HARNESS (4) FROM DRIVER'S BULKHEAD. DISCARD LOCKWASHERS.



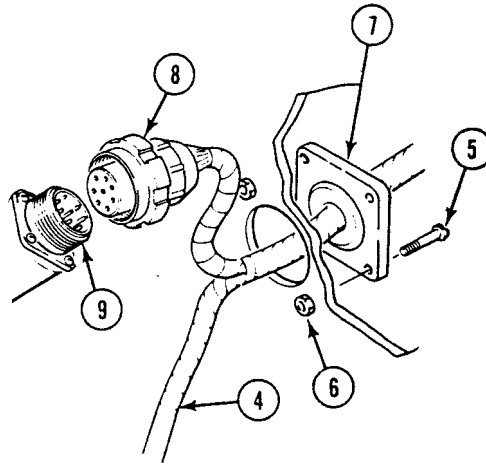
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

35. REMOVE FOUR SCREWS (5), LOCKNUTS (6), COVER (7) AND WIRING HARNESS (4) FROM DRIVER'S COMPARTMENT BULKHEAD. PULL HARNESS THROUGH BULKHEAD INTO DRIVER'S COMPARTMENT. DISCARD LOCKNUTS.



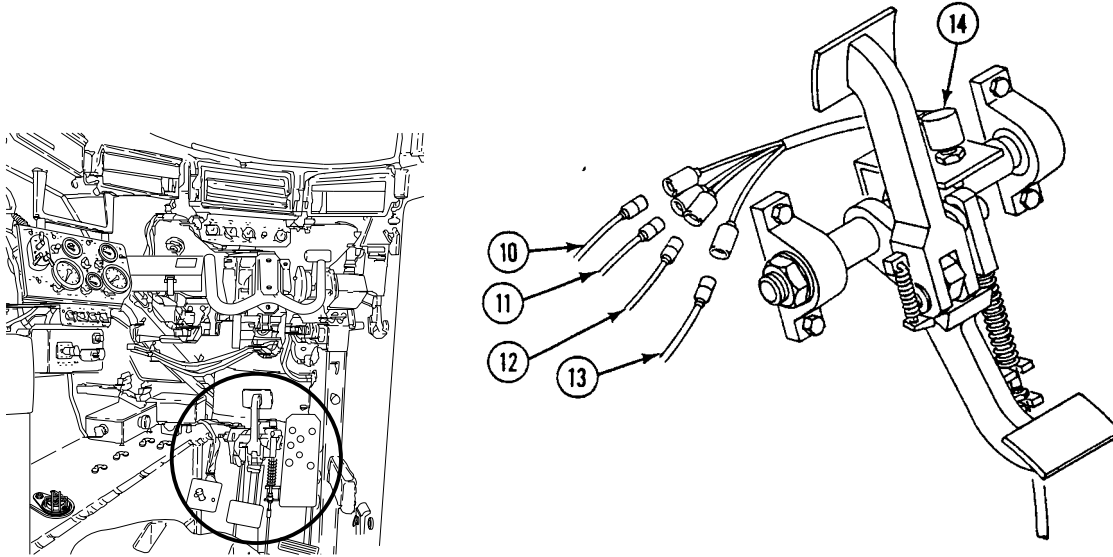
36. DISCONNECT CONNECTOR (8) FROM DIMMER SWITCH (9).



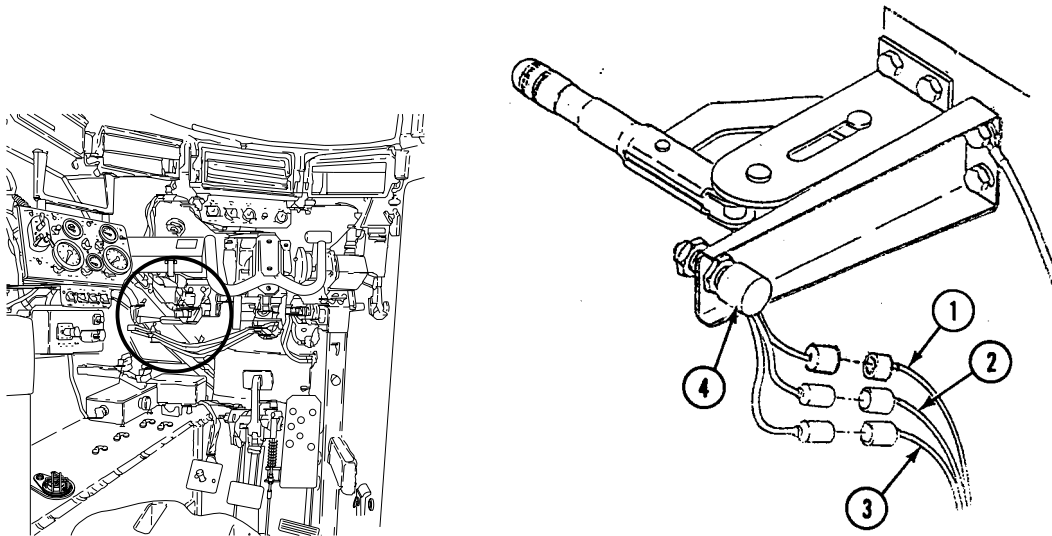
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

37. DISCONNECT CIRCUIT LEADS 75A (10), 75B (11), 366A (12), AND 366 (13) FROM STOP SWITCH (14).



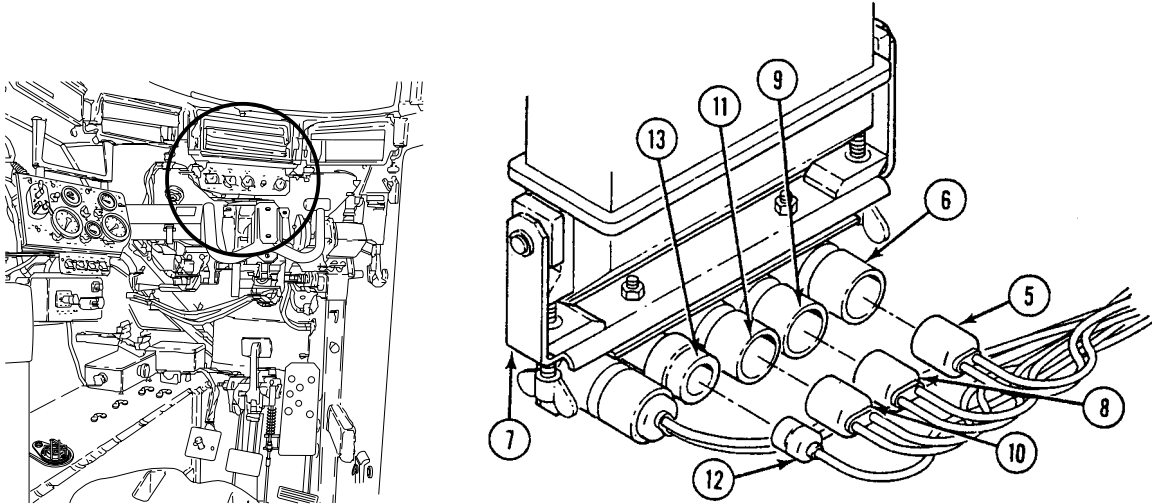
38. DISCONNECT CIRCUIT LEADS 366A (1), 367 (2), AND 370 (3) FROM PARKING BRAKE SWITCH (4).



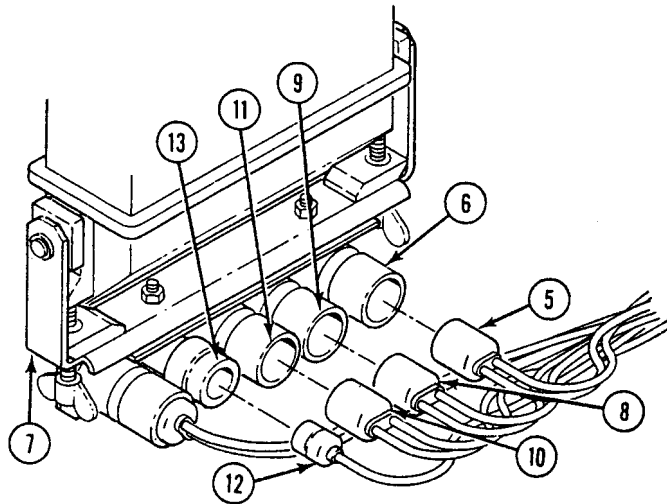
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

39. DISCONNECT CIRCUITS 27K/352 PLUG (5) FROM ENGINE LOW COOLANT LEVEL INDICATOR (6) ON WARNING LIGHT PANEL (7).



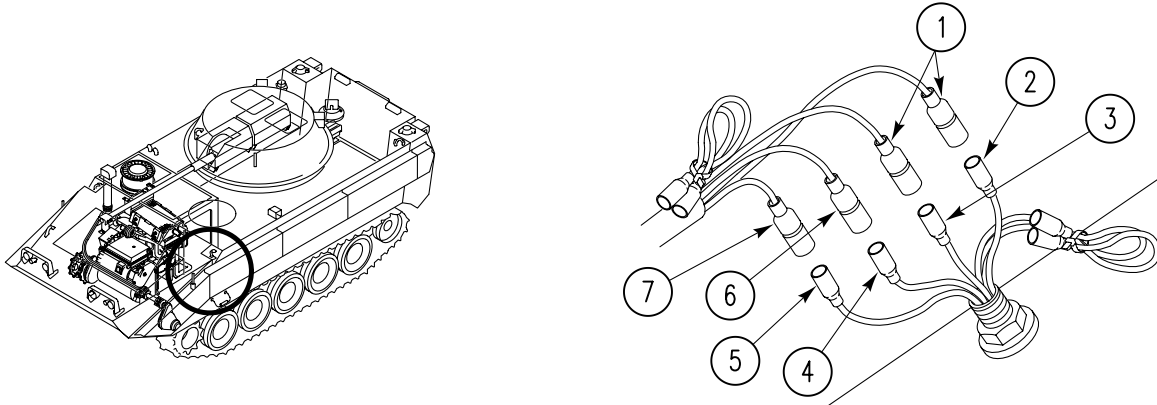
40. DISCONNECT CIRCUITS 27J/34 PLUG (8) FROM ENGINE LOW OIL PRESSURE INDICATOR (9) ON WARNING LIGHT PANEL (7).
41. DISCONNECT CIRCUITS 27G/327 PLUG (10) FROM TRANSMISSION HIGH OIL TEMPERATURE INDICATOR (11) ON WARNING LIGHT PANEL (7).
42. DISCONNECT CIRCUITS 25/25A PLUG (12) FROM HORN SWITCH (13) ON WARNING LIGHT PANEL (7).



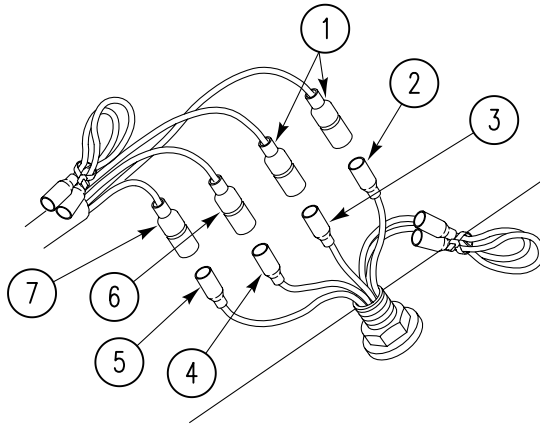
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

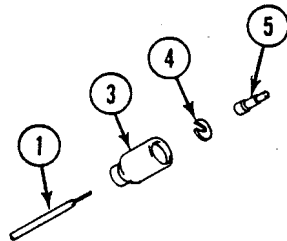
43. DISCONNECT CIRCUIT LEADS 17 (2) AND 18 (3) FROM LEFT SERVICE HEADLIGHT EXTENSION CABLE (1).
44. DISCONNECT CIRCUIT LEAD 20 (4) FROM LEFT BLACKOUT MARKER LIGHT EXTENSION CABLE (6).



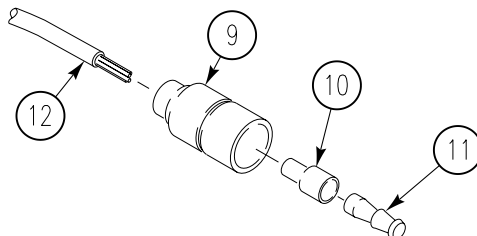
45. DISCONNECT CIRCUIT LEAD 19 (5) FROM BLACKOUT HEADLIGHT EXTENSION CABLE (7).



46. REMOVE ELECTRICAL SHELL (3), WASHER (4), AND TERMINAL (5) FROM CIRCUIT LEAD 19 (1).



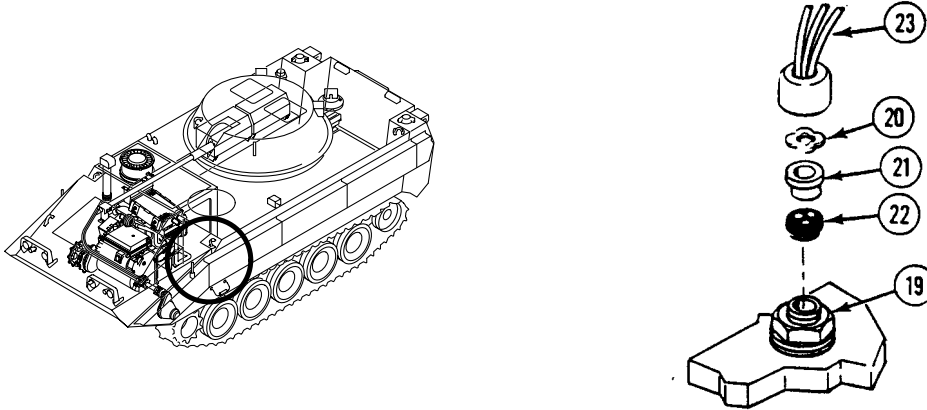
47. REMOVE THREE ELECTRICAL SHELLS (9), SLEEVES (10), AND CONTACTS (11) FROM LEADS (12) DISCONNECTED IN Step 43 AND Step 44. DISCARD CONTACTS.



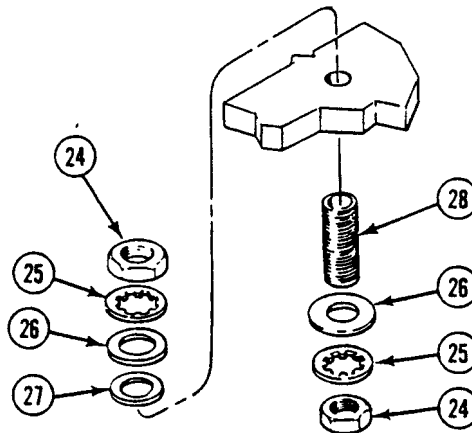
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

48. REMOVE TWO NUTS (19), SPRING WASHERS (20), RETAINERS (21), AND BUSHINGS (22) THAT SECURE WIRING HARNESS (23) ON FRONT UPPER NOSE PLATE. PULL LEADS ON HARNESS THROUGH TWO BUSHINGS.



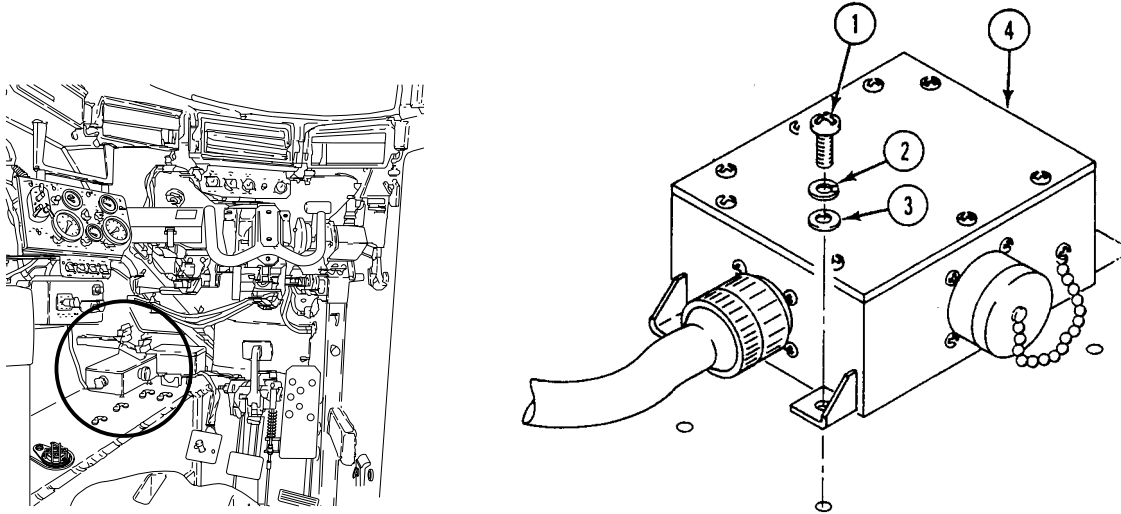
49. REMOVE FOUR NUTS (24), LOCKWASHERS (25), WASHERS (26), WASHERS (27), AND BUSHING (28) FROM FRONT NOSE PLATE OF HULL. DISCARD LOCKWASHERS.



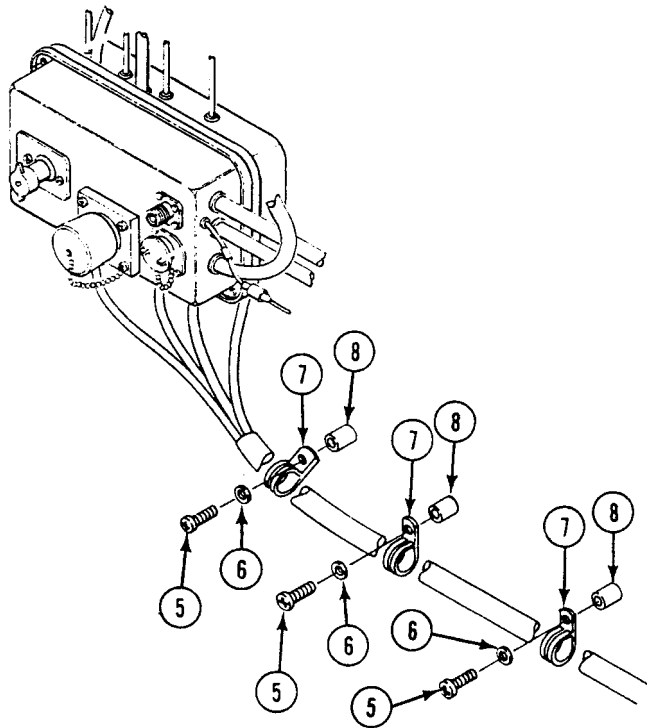
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

50. REMOVE FOUR SCREWS (1), LOCKWASHERS (2), AND WASHERS (3) AND STE/ICE DISTRIBUTION BOX (4). DISCARD LOCKWASHERS.



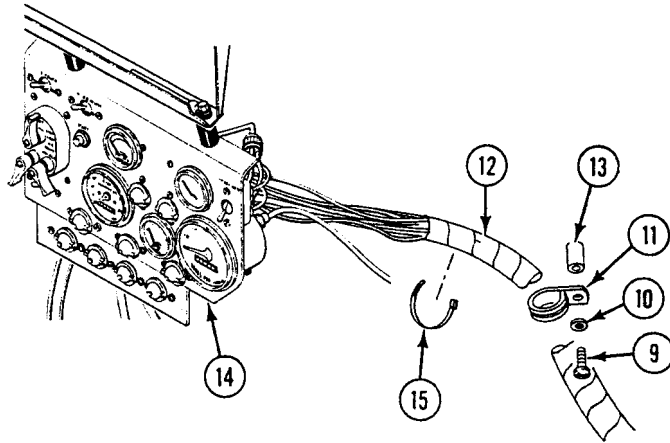
51. REMOVE THREE SCREWS (5), LOCKWASHERS (6), AND CLAMPS (7) FROM WELD NUTS (8) BEHIND STE/ICE DISTRIBUTION BOX. DISCARD LOCKWASHERS.



REPLACE FRONT MAIN WIRING HARNESS — Continued

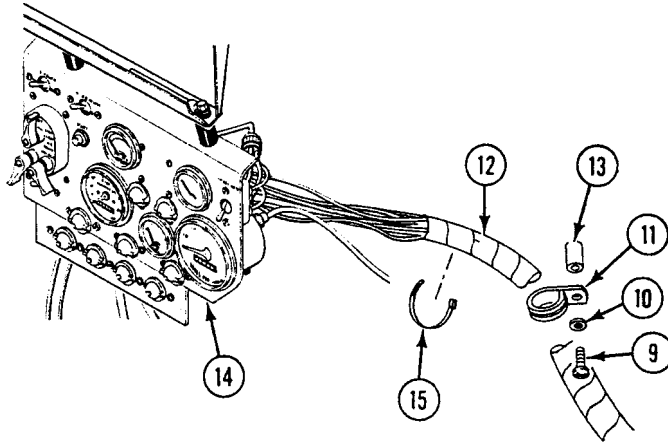
0022 00

52. REMOVE SCREW (9), LOCKWASHER (10), CLAMP (11), AND WIRING HARNESS (12) FROM WELD NUT (13) NEAR INSTRUMENT PANEL (14). DISCARD LOCKWASHER.
53. REMOVE THREE TIE DOWN STRAPS (15) FROM FRONT MAIN WIRING HARNESS (12). REMOVE WIRING HARNESS FROM CARRIER.

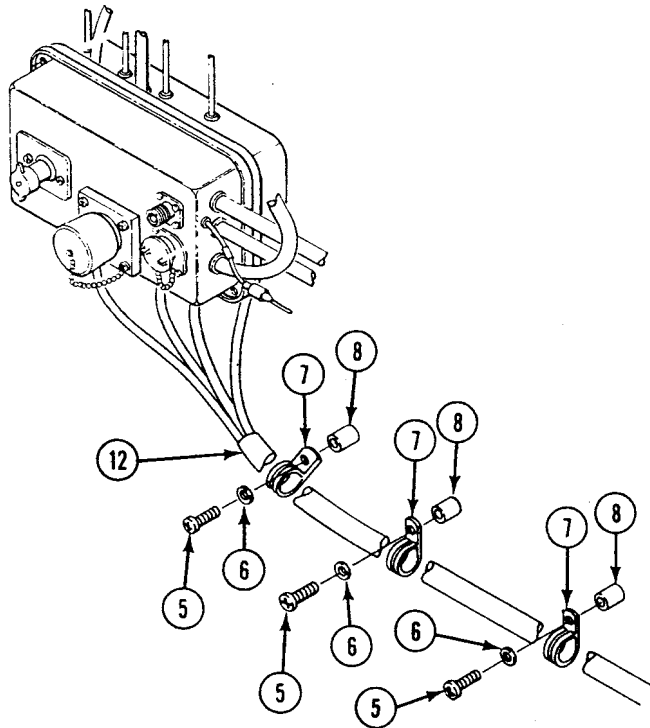


INSTALLATION

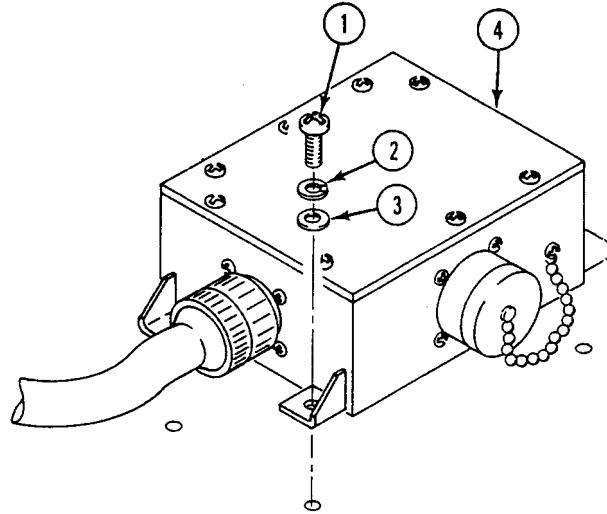
1. INSTALL HARNESS (12) ON WELD NUT (13) NEAR INSTRUMENT PANEL (14) WITH CLAMP (11), NEW LOCKWASHER (10), AND SCREW (9).
2. INSTALL THREE NEW TIE DOWN STRAPS (15) TO HARNESS (12).



3. INSTALL HARNESS (12) ON THREE WELD NUTS (8) BEHIND STE/ICE DISTRIBUTION BOX WITH THREE CLAMPS (7), NEW LOCKWASHERS (6), AND SCREWS (5).



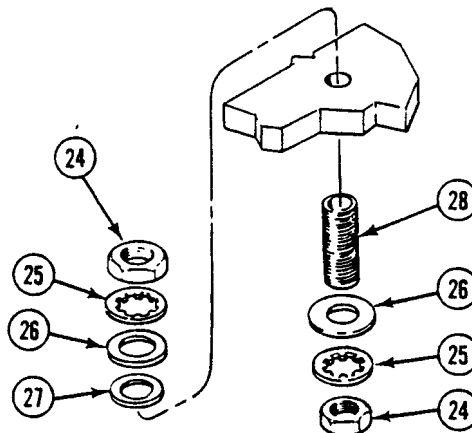
4. INSTALL FOUR SCREWS (1), NEW LOCKWASHERS (2), WASHERS (3), AND STE/ICE DISTRIBUTION BOX (4).



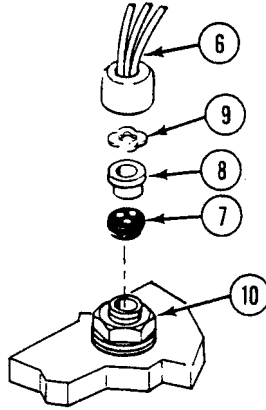
NOTE

Two lead bushings are installed the same way in Step 5 and Step 6.

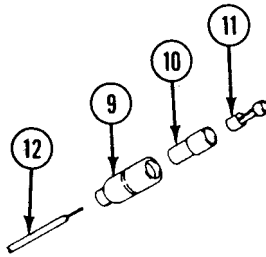
5. INSTALL BUSHING (28) INTO LEFT BUSHING HOLE ON FRONT UPPER NOSE PLATE OF HULL. SECURE WITH WASHER (26), NEW LOCKWASHER (25), AND NUT (24) (FROM INSIDE OF HULL), TWO WASHERS (27) AND (26), NEW LOCKWASHER (25), AND NUT (24) (FROM OUTSIDE OF HULL).



6. ROUTE CIRCUIT LEADS 17, 18, AND 20 (6) OUT THROUGH BUSHING. INSTALL RUBBER BUSHING (7), RETAINER PACK (8), AND SPRING WASHER (9) ON BUSHING. SECURE WITH COUPLING NUT (10).



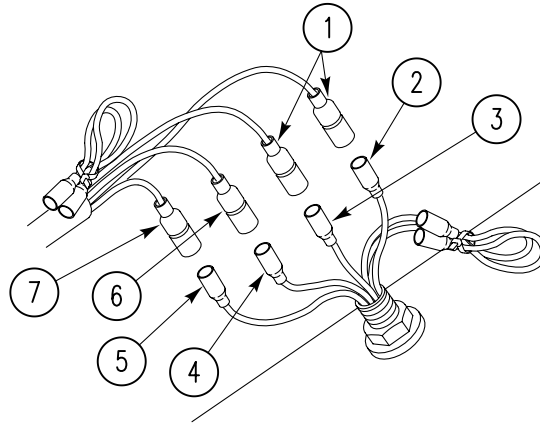
7. INSTALL THREE ELECTRICAL SHELLS (9), SLEEVES (10), AND CONTACTS (11) ON CIRCUIT LEADS 17, 18, AND 20 (12).



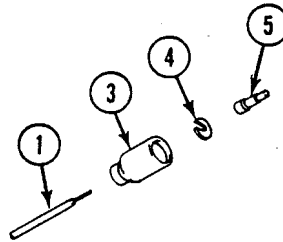
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

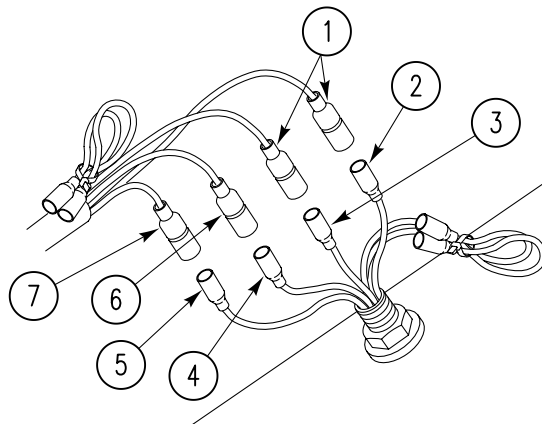
8. CONNECT CIRCUIT LEADS 17 (2) AND 18 (3) TO LEFT SERVICE HEADLIGHT EXTENSION CABLE (1).
9. CONNECT CIRCUIT LEAD 20 (4) TO LEFT BLACKOUT MARKER LIGHT EXTENSION CABLE (6).



10. INSTALL ELECTRICAL SHELL (3), WASHER (4), AND TERMINAL (5) ON CIRCUIT LEAD 19 (1).



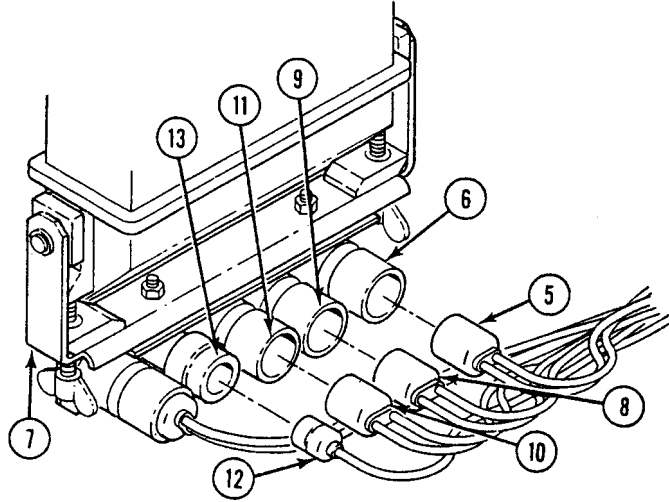
11. CONNECT CIRCUIT LEAD 19 (5) TO LEFT BLACKOUT LIGHT EXTENSION CABLE (7).



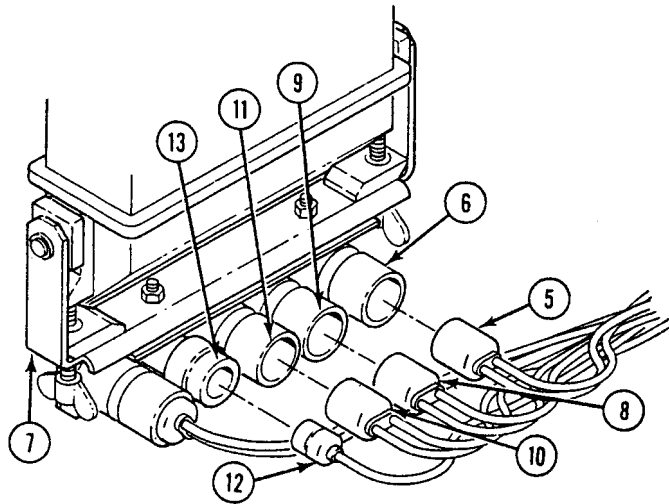
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

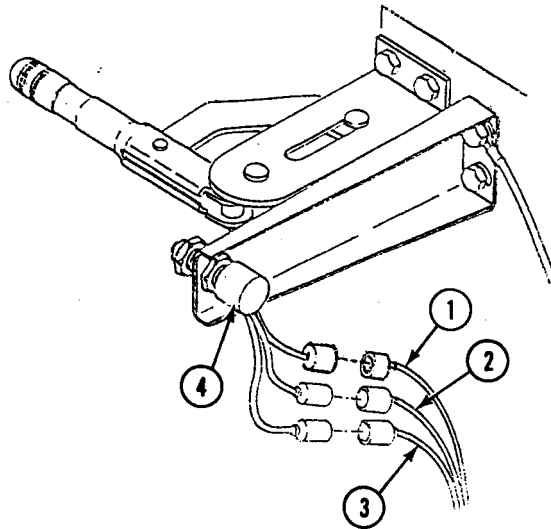
12. CONNECT CIRCUIT 25/25A PLUG (12) TO HORN SWITCH (13) ON WARNING LIGHT PANEL (7).
13. CONNECT CIRCUIT 27G/327 PLUG (10) TO TRANSMISSION HIGH OIL TEMPERATURE INDICATOR (11) ON WARNING LIGHT PANEL (7).



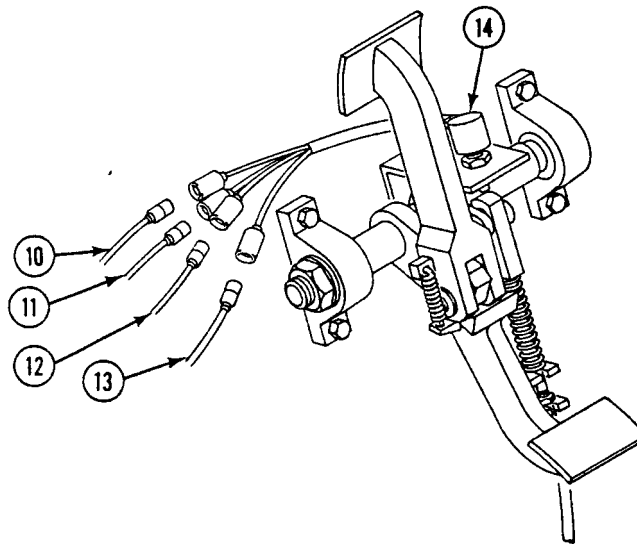
14. CONNECT CIRCUIT 27J/34 PLUG (8) TO ENGINE LOW OIL PRESSURE INDICATOR (9) ON WARNING LIGHT PANEL (7).
15. CONNECT CIRCUITS 27K/352 PLUG (5) TO ENGINE LOW COOLANT LEVEL INDICATOR (6) ON WARNING LIGHT PANEL (7).



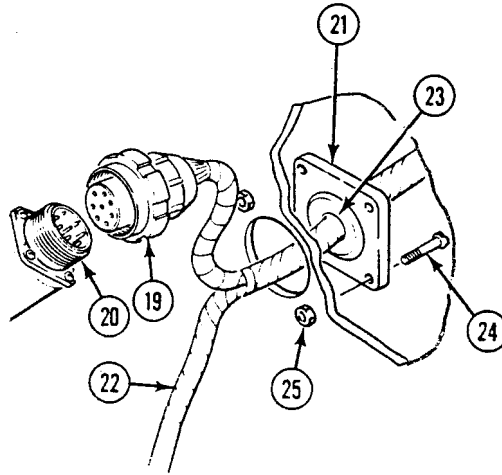
16. CONNECT CIRCUIT LEADS 366A (1), 367 (2), AND 370 (3) TO PARKING BRAKE SWITCH (4).



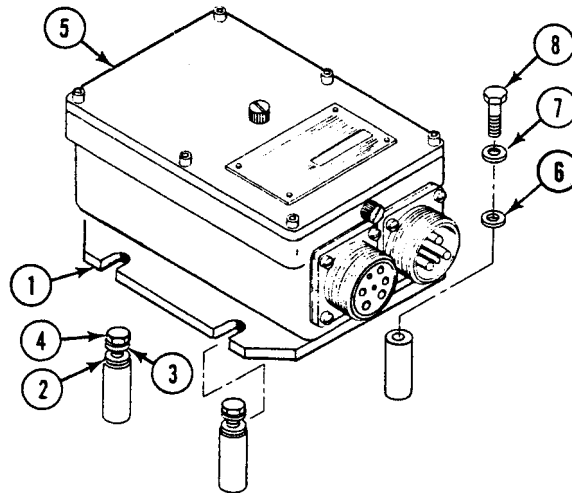
17. CONNECT CIRCUIT LEADS 75A (10), 75B (11), 366 (12), 366A (13) TO STOP SWITCH (14).



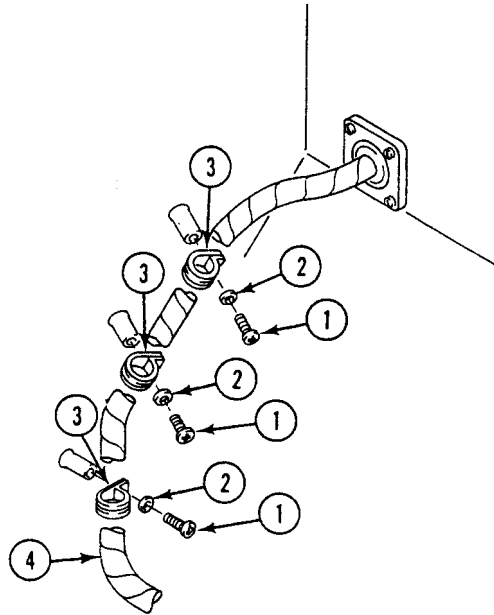
18. CONNECT CONNECTOR (19) TO DIMMER SWITCH (20).
19. INSTALL COVER (21) ON HARNESS (22). ROUTE HARNESS THROUGH COVER OPENING (23) INTO POWER PLANT COMPARTMENT. SECURE COVER ON DRIVER'S COMPARTMENT BULKHEAD WITH FOUR SCREWS (24) AND NEW LOCKNUTS (25).



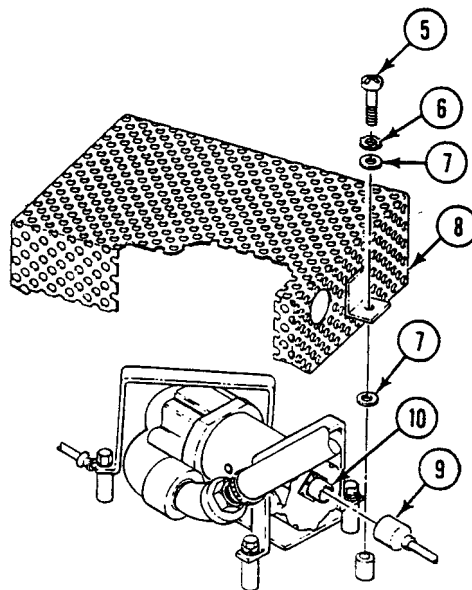
20. SLIDE MOUNT PLATE (1) OF VOLTAGE REGULATOR (5) BETWEEN TWO LOWER LOCKWASHERS (2), TWO UPPER LOCKWASHERS (3), AND SCREWS (4).
21. SLIDE TWO NEW LOCKWASHERS (6), UNDER FRONT MOUNT PLATE (1) ON HULL WELD NUTS. PLACE TWO NEW LOCKWASHERS (7) ON MOUNT PLATE (1) OVER HOLES AND INSTALL TWO SCREWS (8).
22. TIGHTEN TWO REAR SCREWS (4).



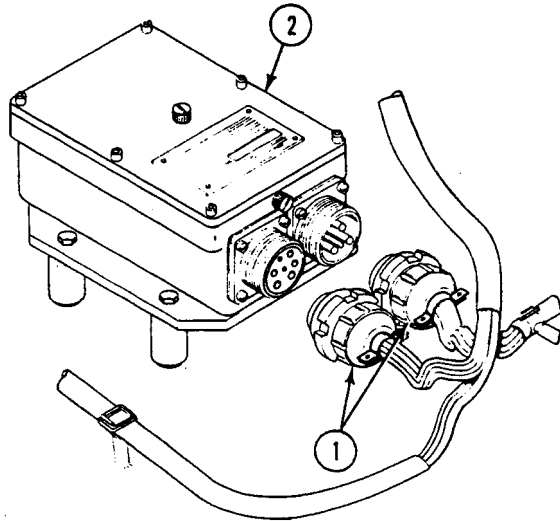
23. FROM INSIDE OF POWER PLANT COMPARTMENT INSTALL HARNESS (4) ON DRIVER'S BULKHEAD WITH THREE CLAMPS (3), NEW LOCKWASHERS (2), AND SCREWS (1).



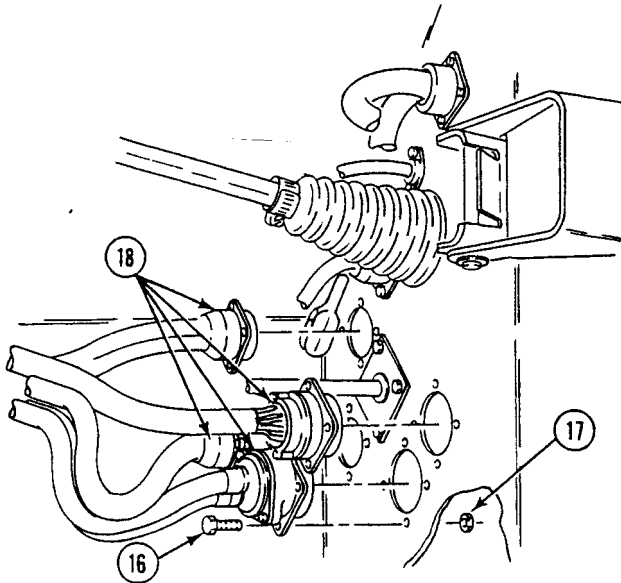
24. CONNECT CIRCUIT LEAD 452 (9) TO FRONT BILGE PUMP (10).
25. INSTALL TWO SCREWS (5), NEW LOCKWASHERS (6), AND FOUR WASHERS (7), SECURING BILGE PUMP STRAINER (8) TO WELD NUTS.



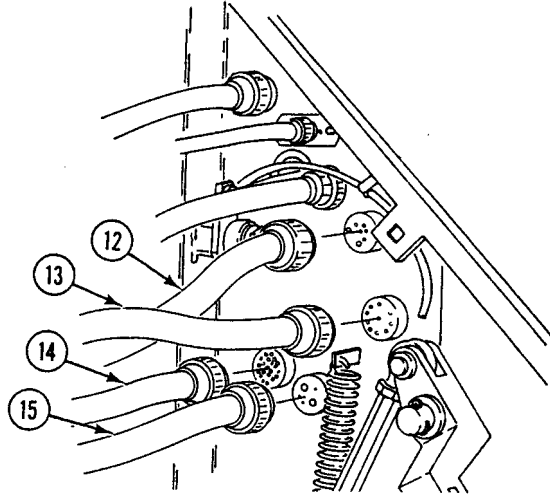
26. CONNECT TWO CONNECTORS (1) TO GENERATOR REGULATOR (2).



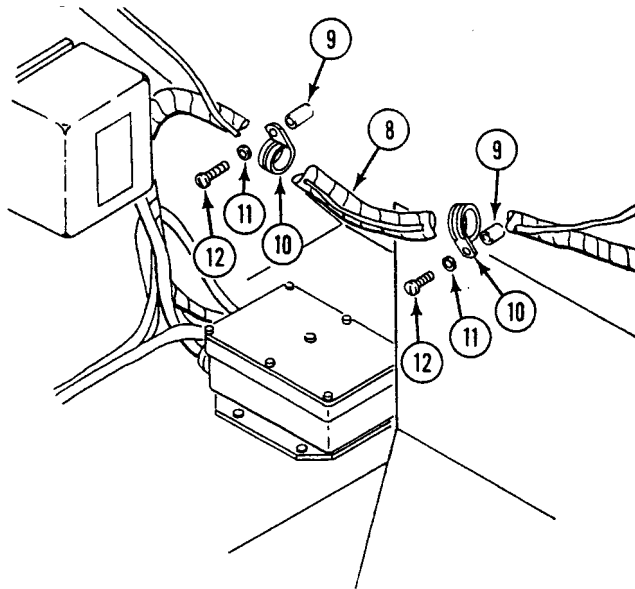
27. INSTALL FOUR CONNECTORS (18) ON DRIVER'S BULKHEAD WITH 16 NEW LOCKNUTS (17) AND SCREWS (16).



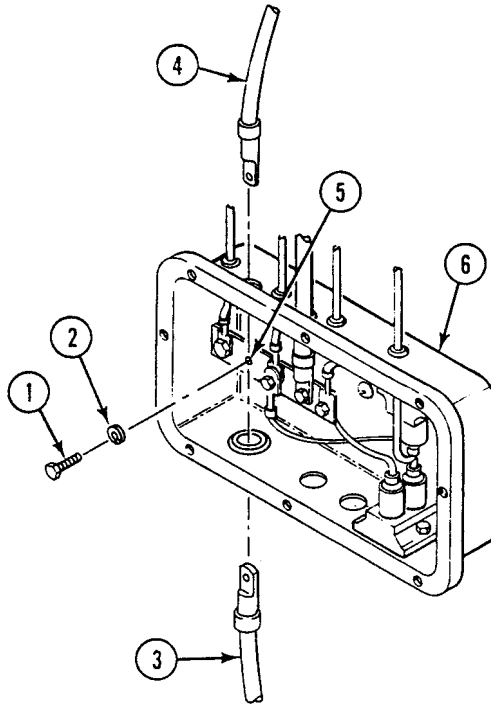
28. FROM POWER PLANT COMPARTMENT, CONNECT FOUR CONNECTORS TO DRIVER'S BULKHEAD AS FOLLOWS: RIGHT HEADLIGHT WIRING HARNESS (12), GENERATOR REGULATOR LEAD (13), AND TWO POWER PLANT HARNESS LEADS (14) AND (15).



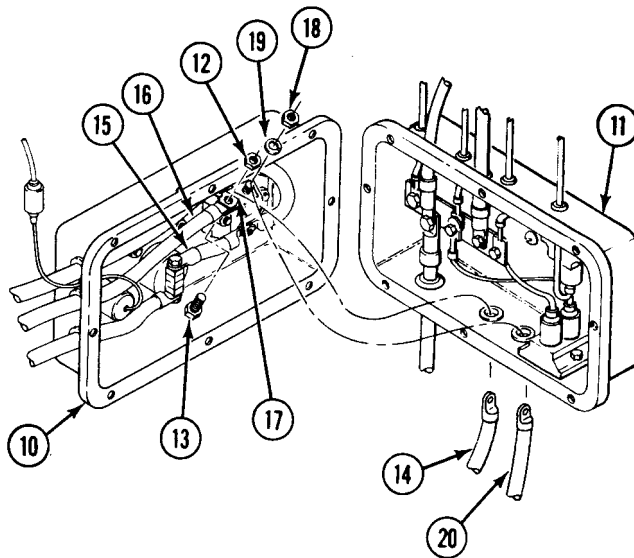
29. PLACE HARNESS (8) ON TWO WELD NUTS (9). SECURE WITH TWO CLAMPS (10), NEW LOCKWASHERS (11), AND THREE SCREWS (12) ON SIDE PLATE OF HULL.



30. INSTALL CIRCUIT LEADS 6 (3) AND 6A (4) INTO DISTRIBUTION BOX (6) ON BUS BAR (5) WITH NEW LOCKWASHER (2) AND SCREW (1).



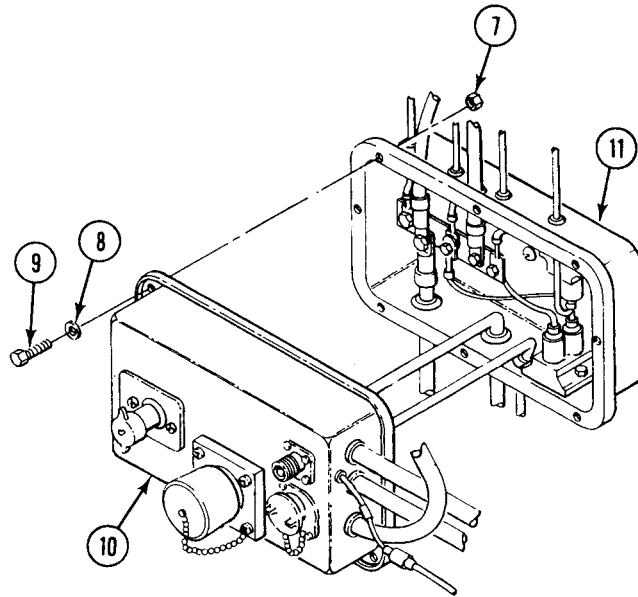
31. INSTALL CIRCUIT LEADS 2 (14), AND 2A (20) INTO MASTER SWITCH PANEL (10) THROUGH DISTRIBUTION BOX (11). SECURE CIRCUIT LEADS 6 (15), 2 (14) AND 400 (16) ON CONDUCTOR BUS (17) WITH NEW LOCKNUT (12), AND SCREW (13). SECURE CIRCUIT LEAD 2A (20) ON CONDUCTOR BUS (17) WITH LOCKWASHER (19) AND NUT (18).



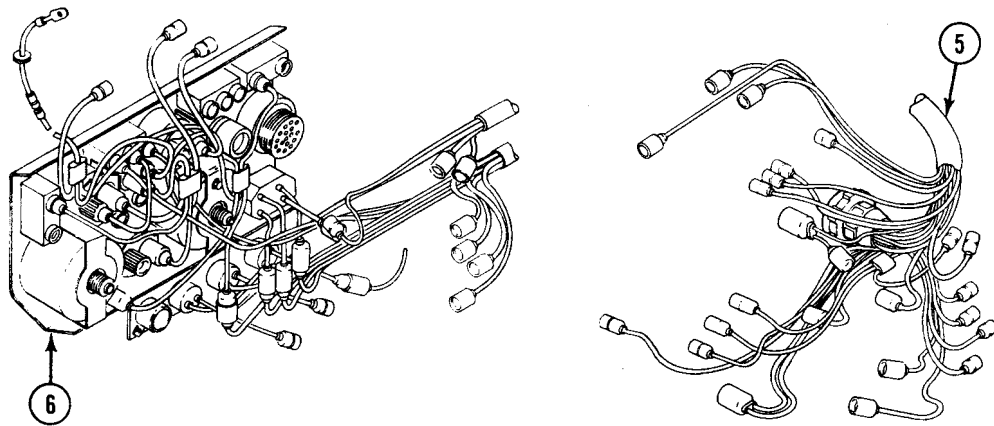
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

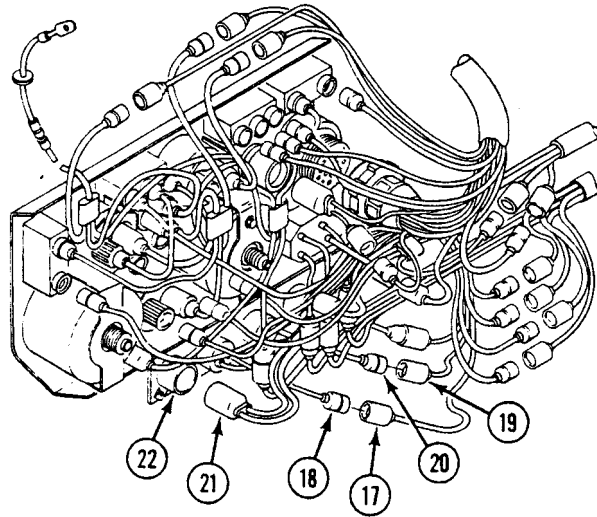
32. INSTALL MASTER SWITCH PANEL (10) ON DISTRIBUTION BOX (11) WITH EIGHT SCREWS (9), WASHERS (8), AND NEW LOCKNUTS (7).



33. PLACE HARNESS (5) INTO INSTRUMENT PANEL (6).

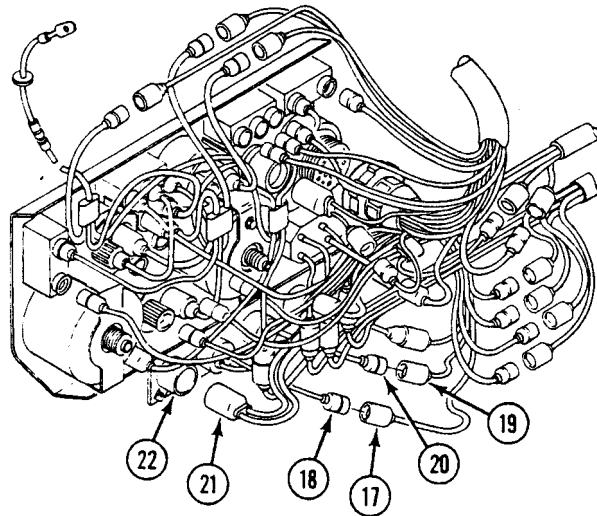


34. CONNECT CIRCUIT LEAD 370 (17) TO CONNECTOR (18).

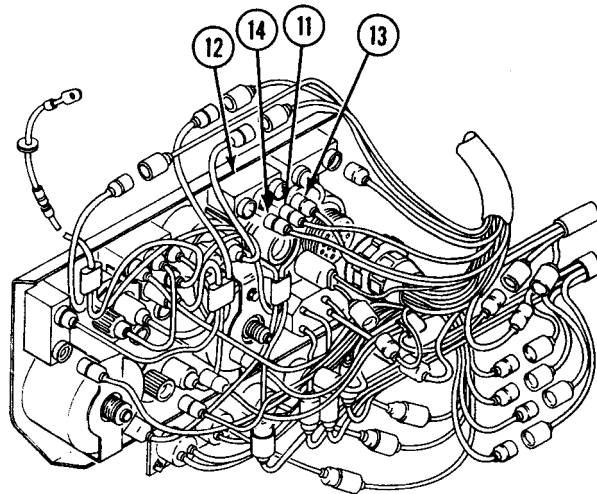


35. CONNECT CIRCUIT LEAD 367 (19) TO TRANSMISSION LOW OIL PRESSURE INDICATOR CONNECTOR (20).

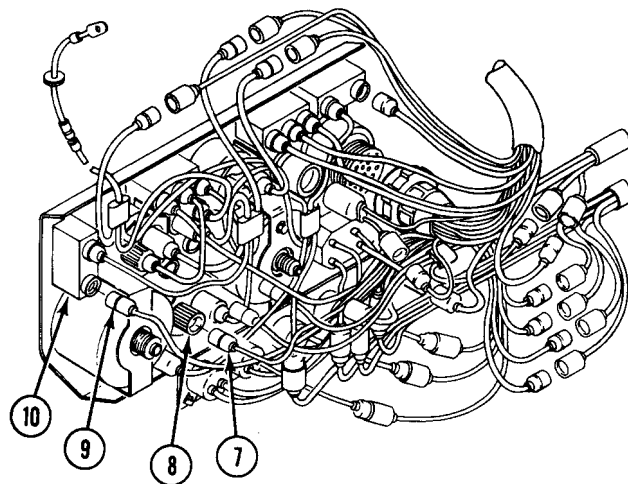
36. CONNECT CIRCUIT LEADS 519 AND 519A (21) TO HEADLIGHTS HIGH BEAM INDICATOR (22).



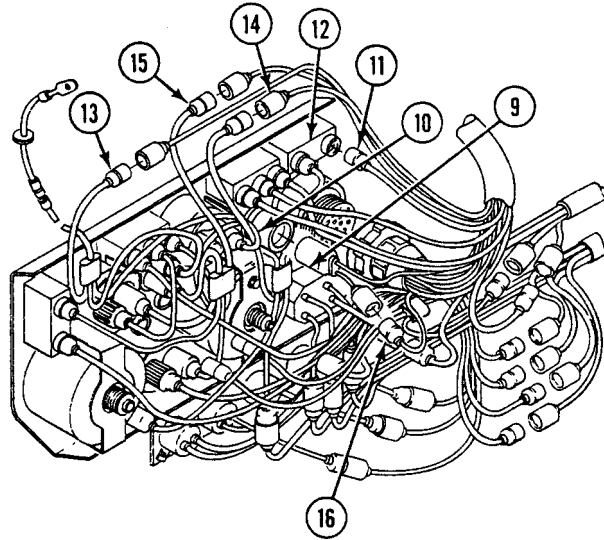
37. CONNECT CIRCUIT LEADS 514 AND 515 (14) TO IR BO SELECTOR SWITCH (12).
38. CONNECT CIRCUIT LEAD 19 (11) TO IR BO SELECTOR SWITCH (12).
39. CONNECT CIRCUIT LEAD 520 (13) TO IR BO SELECTOR SWITCH (12).



40. CONNECT CIRCUIT LEAD 406 (9) TO AIR BOX HEATER SWITCH (10).
41. CONNECT CIRCUIT LEAD 33 (7) TO ENGINE COOLANT TEMPERATURE GAUGE (8).

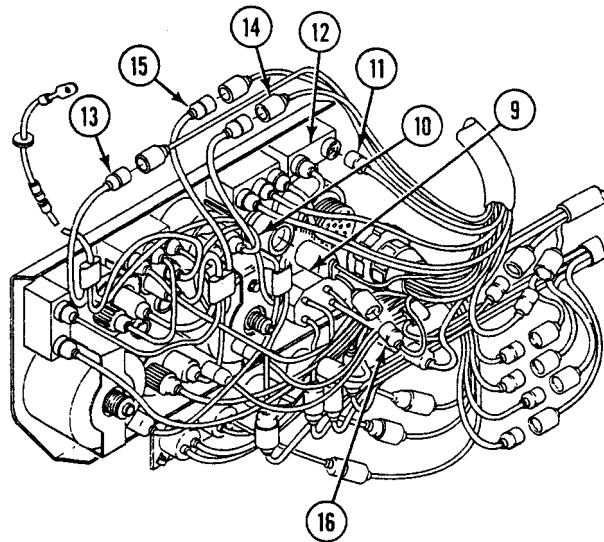


42. CONNECT CIRCUIT LEADS 74/14 (9) TO STARTER SWITCH (10).



43. CONNECT CIRCUIT LEAD 516A (11) TO IR POWER PACK SWITCH (12).

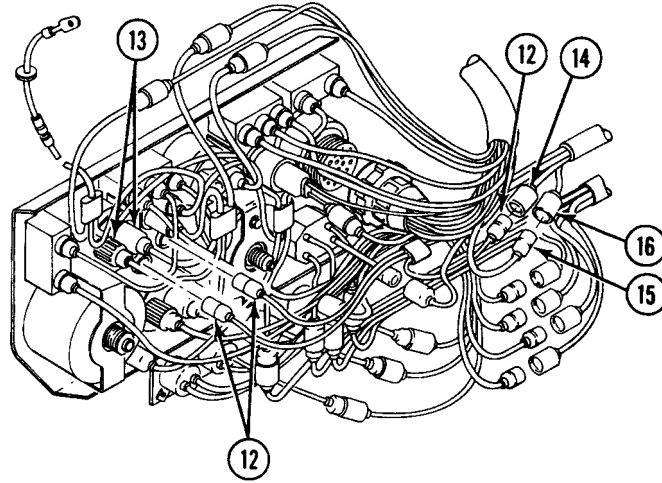
44. CONNECT CIRCUIT LEADS 15 (13), 25A (14), 27F (15) AND 14 (16) TO INSTRUMENT PANEL WIRING HARNESS CONNECTORS.



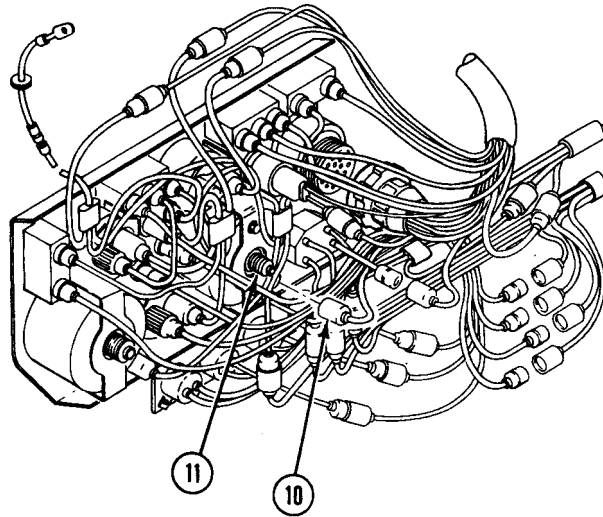
REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

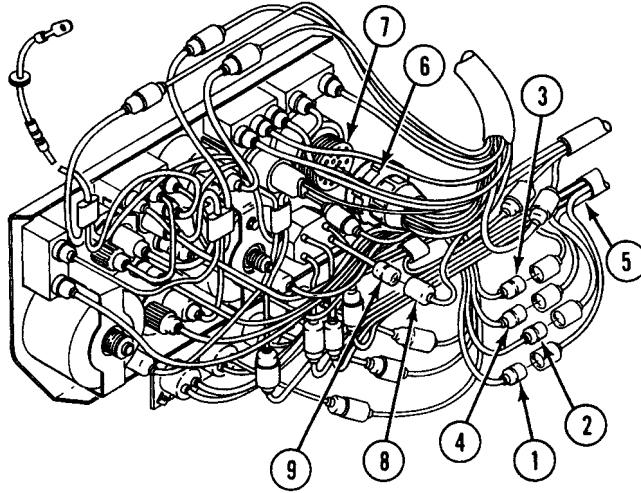
45. CONNECT THREE CIRCUIT LEADS 40 (12) TO TWO INSTRUMENT PANEL LIGHTS (13) AND TRANSMISSION CONTROL WIRING HARNESS CONNECTOR (14).
46. CONNECT CIRCUIT 366 (15) TO CIRCUIT 366 (16).



47. CONNECT CIRCUIT LEAD 452B (10) TO BILGE PUMP ON INDICATOR LIGHT (11).

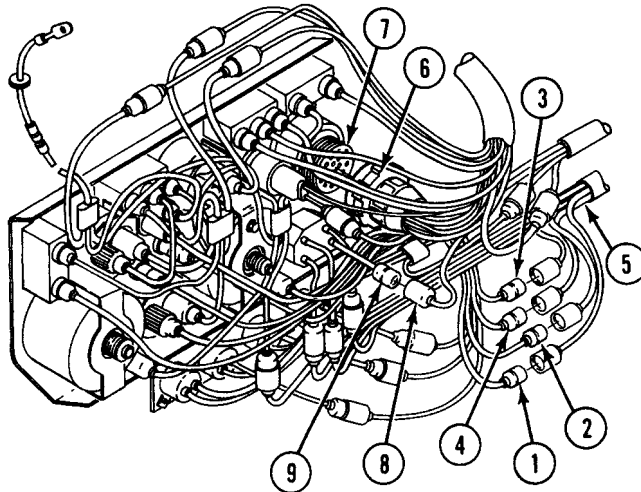


48. CONNECT CIRCUIT LEAD 452A (8) TO BILGE PUMP SWITCH (9).

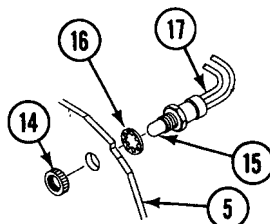


49. CONNECT CONNECTOR (6) TO LIGHT SELECTOR SWITCH (7).

50. CONNECT CIRCUIT LEADS 24 (1), 23 (2), 22 (3), AND 21 (4) TO REAR MAIN WIRING HARNESS (5).



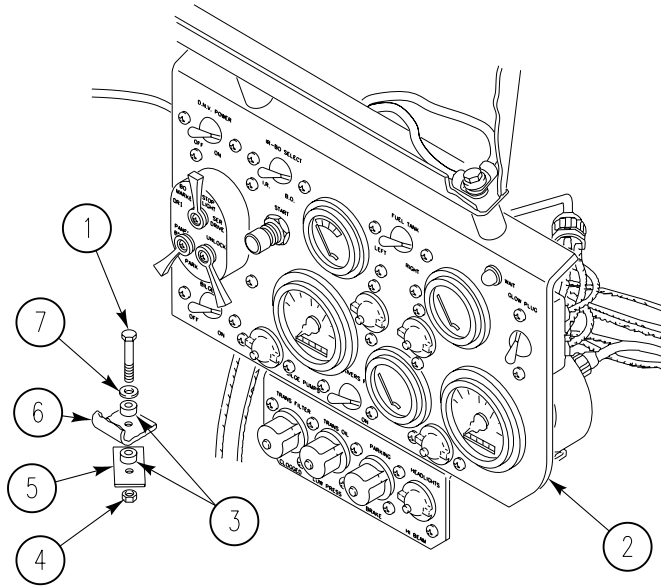
51. INSTALL WAIT INDICATOR (15) WITH LOCKWASHER (16) IN INSTRUMENT PANEL (5) AND SECURE WITH KNURLED NUT (14) (GLOW PLUG SYSTEM ONLY).



REPLACE FRONT MAIN WIRING HARNESS — Continued

0022 00

55. INSTALL PANEL (2) ON TWO STRUTS (5) AND (6) WITH TWO NUTS (4), MOUNTS (3), WASHERS (7), AND SCREWS (1).



END OF TASK

REPAIR FRONT MAIN WIRING HARNESS

0023 00

THIS WORK PACKAGE COVERS:

Repair or Replacement (page 0023 00-1)

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G10

Tools and Special Tools

Automotive fuel and electrical system repair tool kit
(WP 0046 00, Item 52)
Electrical connector tool kit (WP 0046 00, Item 53)
Digital multimeter (WP 0046 00, Item 35)

References

TM 9-2350-366-20-1

Materials/Parts

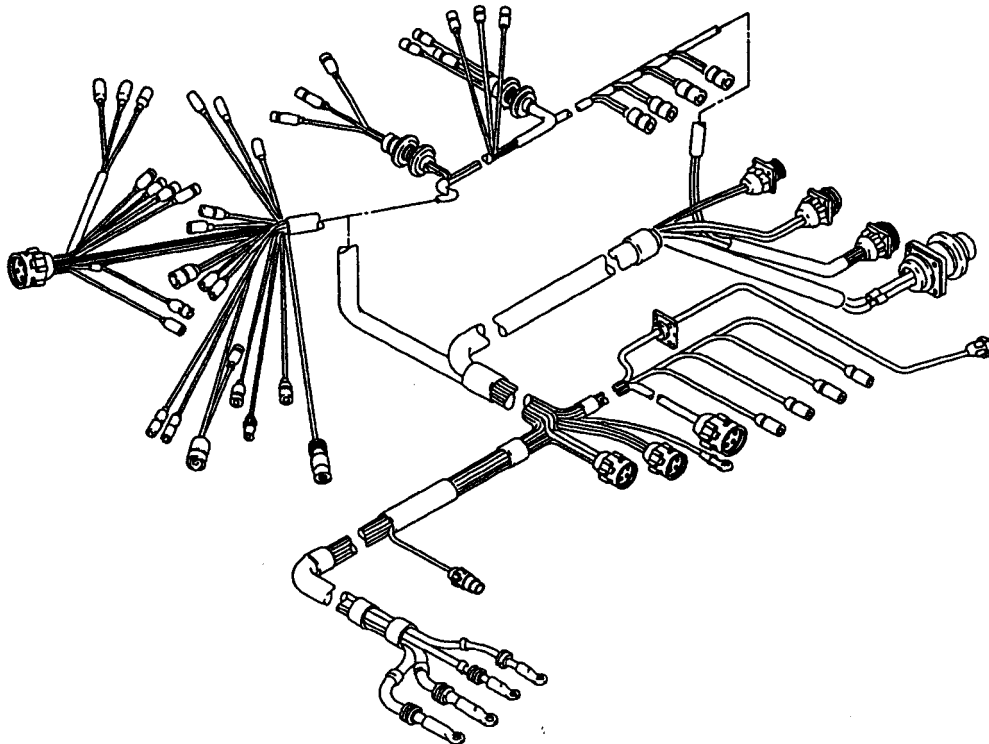
Insulating tape (WP 0048 00, Item 12)

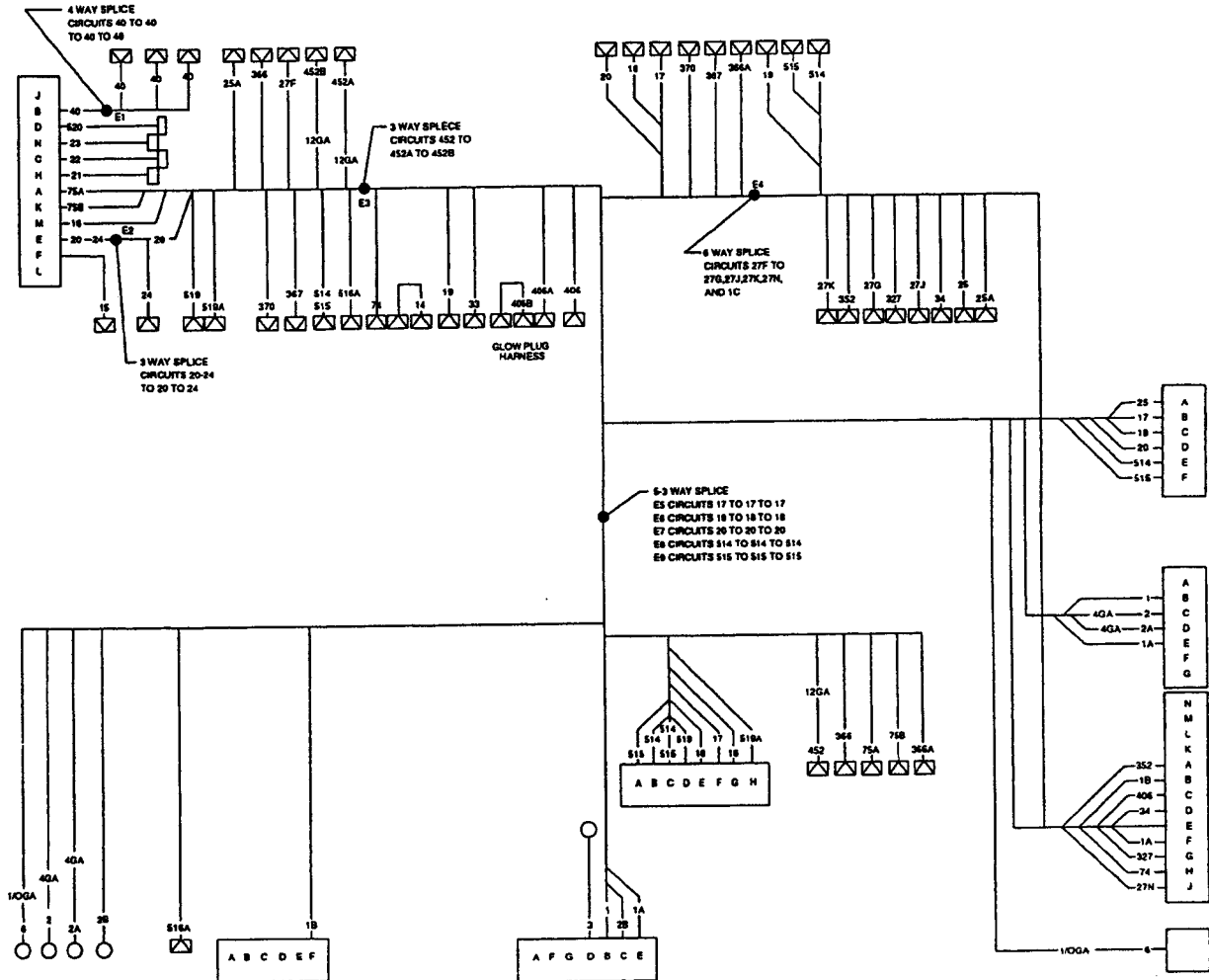
Equipment Condition

Front main wiring harness removed
(TM 9-2350-366-20-1)

REPAIR OR REPLACEMENT

1. PERFORM CONTINUITY CHECK ON FRONT MAIN WIRING HARNESS ASSEMBLY TO DETERMINE WHICH PARTS REQUIRE REPAIR OR REPLACEMENT.





2. REPAIR CONNECTORS AS REQUIRED (WP 0018 00).
3. REPAIR TERMINALS AS REQUIRED.
4. REPEAT CONTINUITY CHECK ON FRONT MAIN WIRING HARNESS ASSEMBLY TO DETERMINE THAT REPAIRS HAVE BEEN COMPLETED.
5. USE INSULATING TAPE TO BIND WIRING HARNESS.

END OF TASK

CHAPTER 7

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR TRANSMISSION

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|---------------------------|---------------------|
| REPLACE TRANSMISSION..... | 0024 00 |

REPLACE TRANSMISSION

0024 00

THIS WORK PACKAGE COVERS:

Removal (page 0024 00-1).
 Installation (page 0024 00-13).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

General mechanic's tool kit: automotive
 (WP 0046 00, Item 54)
 Adjustable wrench (WP 0046 00, Item 61)
 Engine and transmission sling (WP 0046 00, Item 46)
 Torque wrench, 1/2 inch drive, 0-175 ft-lb
 (WP 0046 00, Item 64)
 Torque wrench, 1/2 inch drive, 0-300 in-lb
 (WP 0046 00, Item 65)
 Torque wrench, 1/2 inch drive, 0-150 ft-lb
 (WP 0046 00, Item 66)
 Lifting device with rated lift capability of at least
 1,700 lb (772 kg)

References

TM 9-2350-366-20-1
 TM 9-2520-272-34&P

Equipment Condition

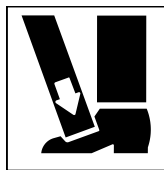
Power plant removed (TM 9-2350-366-20-1)
 Power plant on maintenance stand (WP 0037 00)
 Transmission oil drained (TM 9-2350-366-20-1)
 Dipstick and filler tube removed (TM 9-2350-366-20-1)
 Transmission oil sampling valve removed
 (TM 9-2350-366-20-1)
 Ramp hydraulic pump removed (TM 9-2350-366-20-1)

Materials/Parts

Sealing compound (WP 0048 00, Item 14)
 Block (2)
 Gasket
 Locknut
 Locknut (2)
 Locknut (2)
 Lock screw
 Preformed packing
 Self-locking bolt (11)
 Tie down strap (2)

REMOVAL

WARNING



Improperly supported engine can fall and kill or seriously injure you.

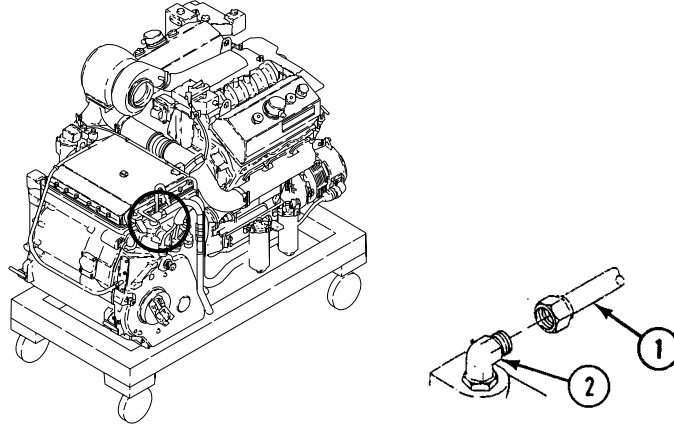
Test engine stability before removing engine sling.

CAUTION

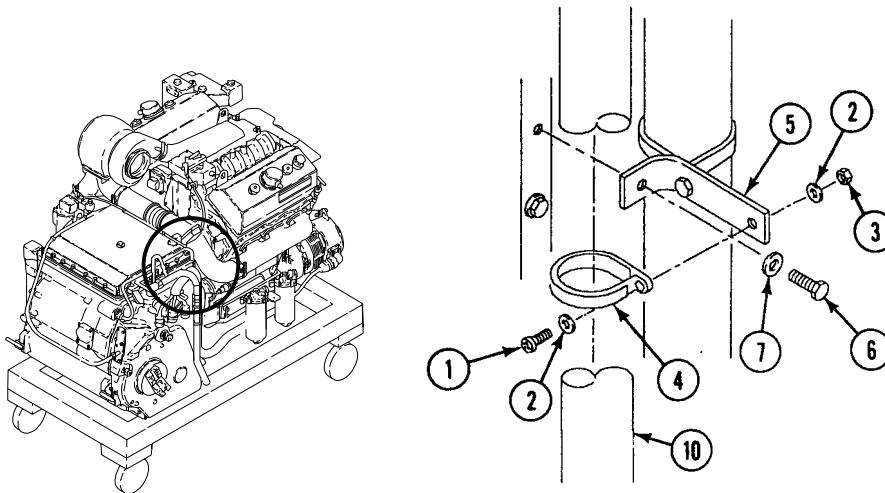
Engine jack screw could be damaged if the two screws and nuts attaching the jack screw to main frame are not removed. Remove the screws and nuts before towing, lifting or transporting an empty engine stand.

Contamination of fuel, oil, and coolant lines or fittings can damage equipment. Make sure to cap or cover fuel, oil, and coolant lines or fittings to be removed.

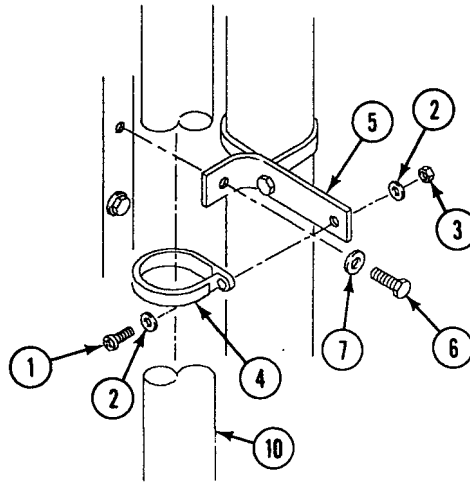
1. DISCONNECT TRANSMISSION INLET HOSE (1) FROM ELBOW (2).



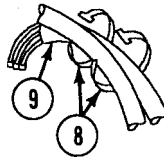
2. REMOVE SCREW (1), TWO WASHERS (2), LOCKNUT (3), AND INLET HOSE CLAMP (4) FROM TRANSMISSION MOUNT BRACKET (5). DISCARD LOCKNUT.



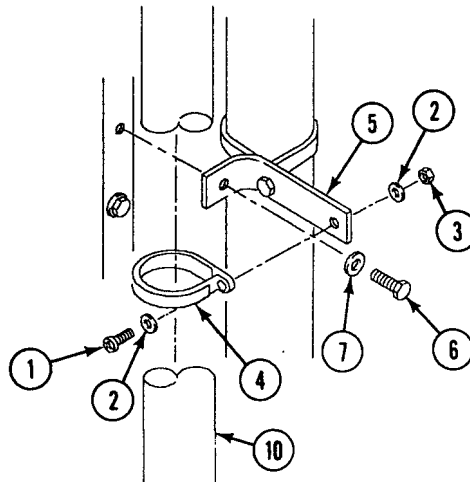
- REMOVE SCREW (6), WASHER (7), AND BRACKET (5) FROM TRANSMISSION.



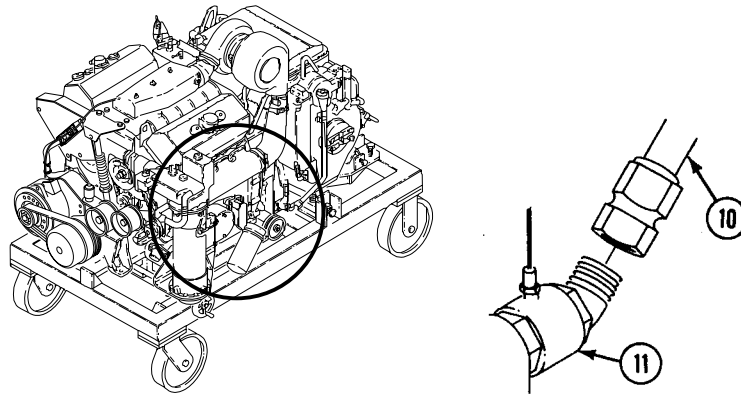
- REMOVE TWO TIE DOWN STRAPS (8) FROM ENGINE WIRING HARNESS (9). DISCARD TIE DOWN STRAPS.



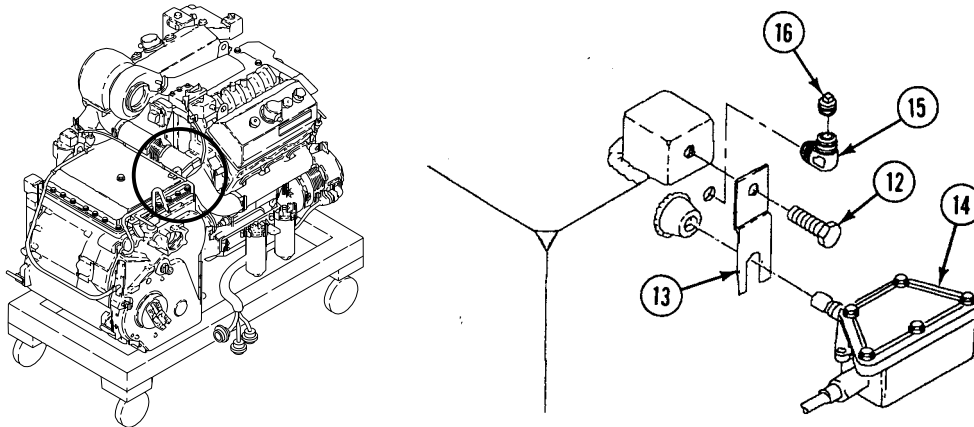
- PULL INLET HOSE (10) FROM UNDER POWER PLANT TO OIL COOLER HOUSING SIDE.



6. REMOVE TRANSMISSION OIL INLET HOSE (10) FROM OIL COOLER OUTLET ELBOW (11).

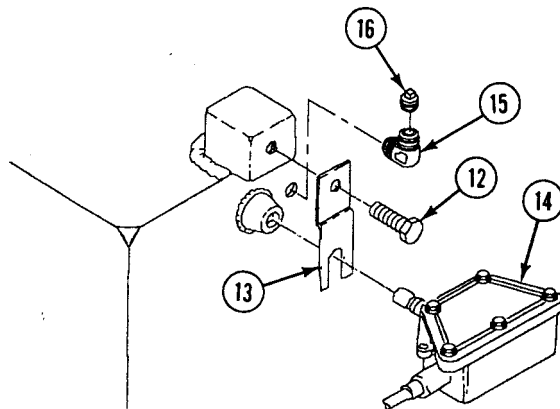


7. REMOVE LOCK BOLT (12), MOUNTING CLAMP (13), AND TV MODULATOR (14) FROM TRANSMISSION. DISCARD LOCK BOLT.

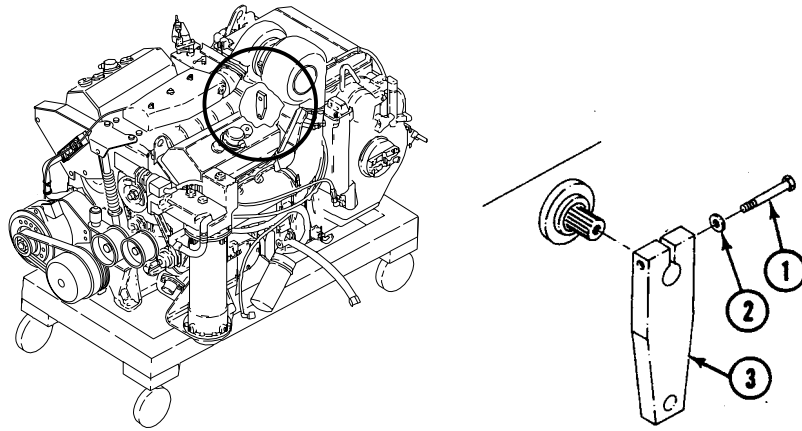


8. REMOVE ELBOW (15) AND PIPE PLUG (16) FROM TRANSMISSION.

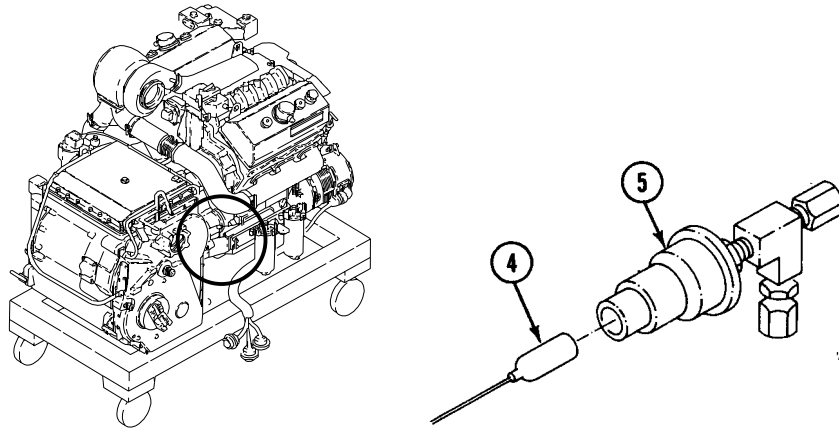
9. REMOVE PIPE PLUG (16) FROM ELBOW (15), AND INSTALL PLUG INTO THROTTLE VALVE MODULATOR PRESSURE PORT.



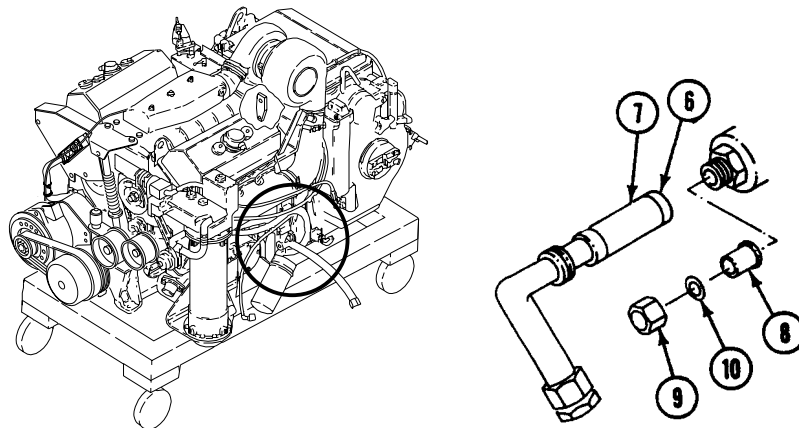
10. REMOVE SCREW (1), WASHER (2), AND STEERING LEVER (3) FROM TRANSMISSION.



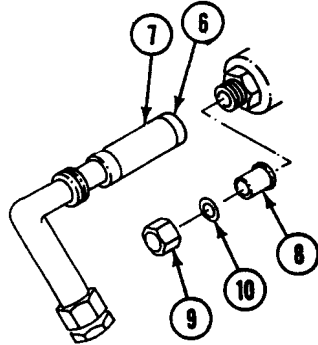
11. DISCONNECT CIRCUIT LEAD 34 (4) FROM ENGINE OIL LOW PRESSURE SWITCH (5).



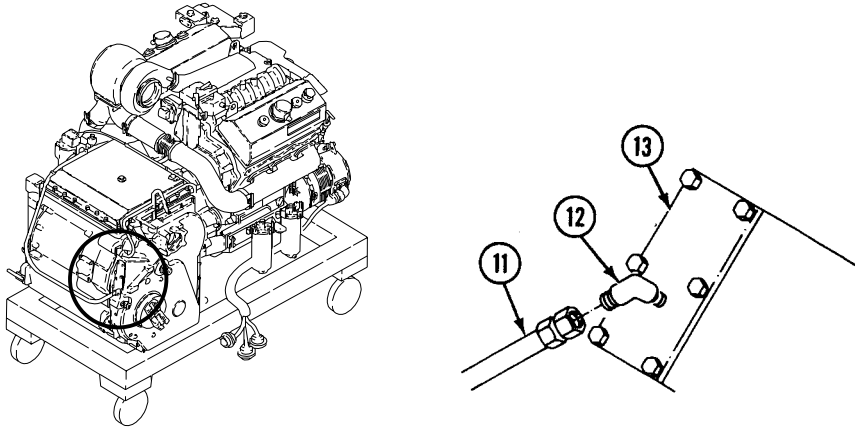
12. LOOSEN TRANSMISSION DRAIN TUBE MOUNT CLAMP (6). DISCONNECT DRAIN TUBE (7) FROM TRANSMISSION ADAPTER (8) AND SLIDE DRAIN TUBE FORWARD.



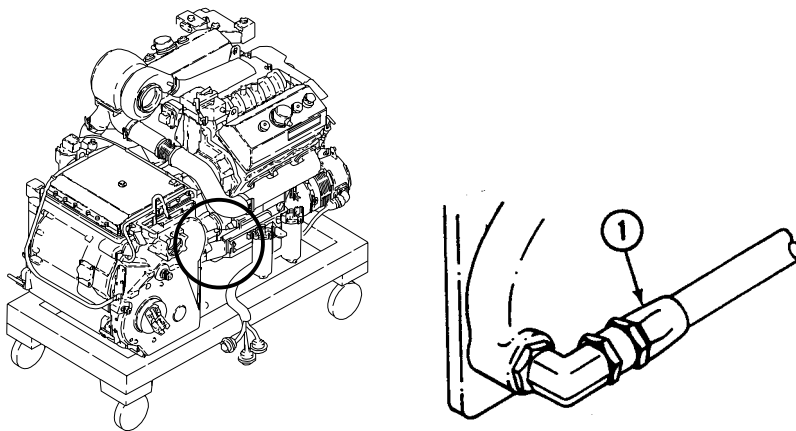
13. REMOVE NUT (9), TRANSMISSION DRAIN ADAPTER (8), AND PREFORMED PACKING (10) FROM TRANSMISSION. DISCARD PREFORMED PACKING.



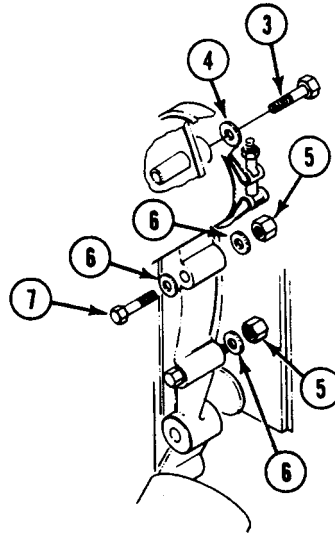
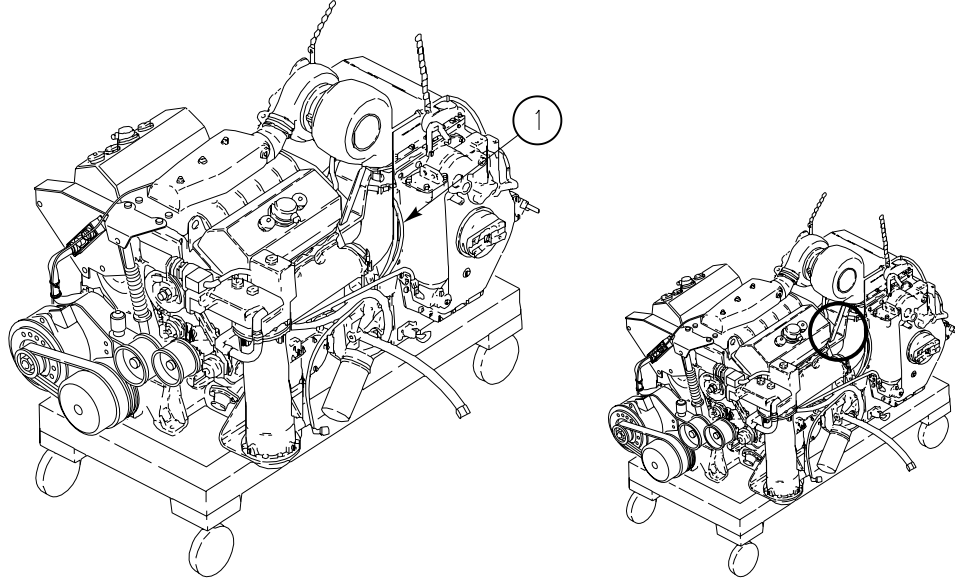
14. DISCONNECT VARIABLE SPEED DRIVE CLUTCH RETURN HOSE (11) FROM ELBOW (12) ON TRANSMISSION END COVER (13).



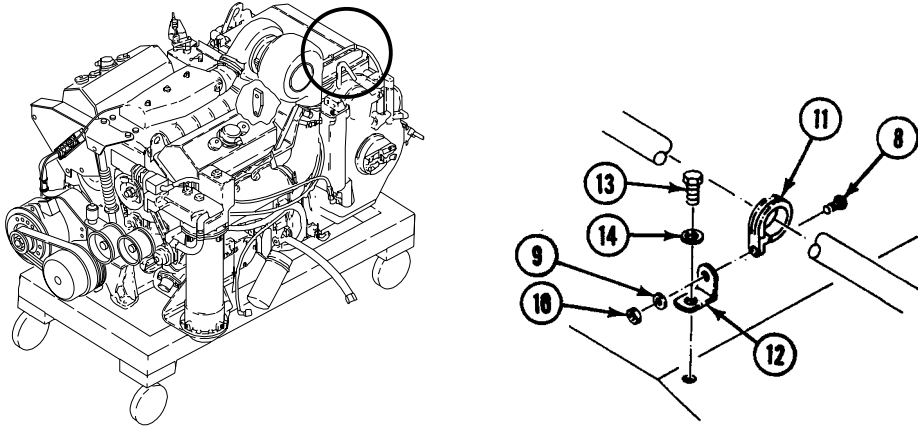
15. LOOSEN LOCKNUT ON ELBOW AND TRANSMISSION OIL OUTLET HOSE (1) ENOUGH TO LOOSEN HOSES ON OTHER SIDE OF POWER UNIT.



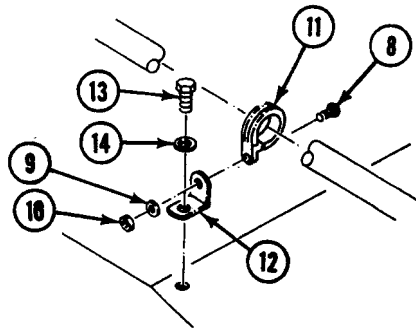
16. LOOSEN HOSES (1) TO ACCESS LOCK BOLTS. REMOVE 10 LOCK BOLTS (3), 10 WASHERS (4), TWO LOCKNUTS (5), THREE WASHERS (6), AND SCREW (7) THAT SECURE TRANSMISSION TO ENGINE. DISCARD LOCK BOLTS AND LOCKNUTS.



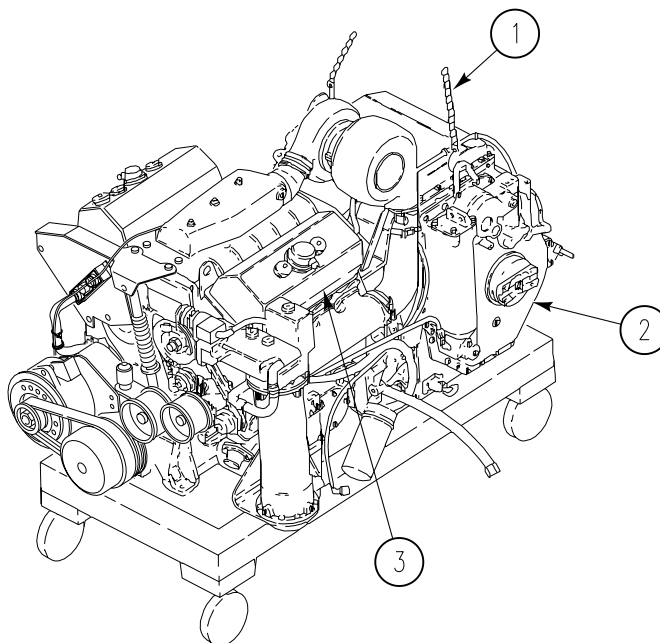
17. REMOVE TWO SCREWS (8), WASHERS (9), LOCKNUTS (10), AND VARIABLE SPEED CLUTCH RETURN HOSE CLAMPS (11) FROM BRACKETS (12). DISCARD LOCKNUTS.



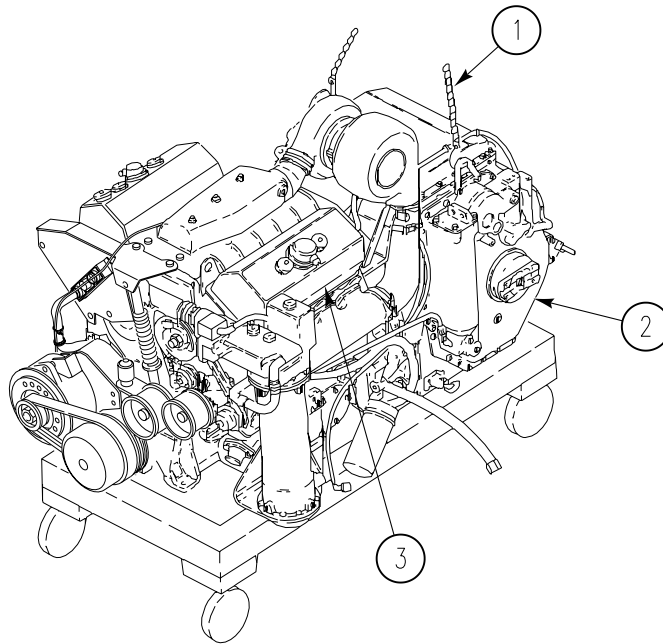
18. REMOVE TWO SCREWS (13), WASHERS (14), AND BRACKETS (12) FROM TRANSMISSION.



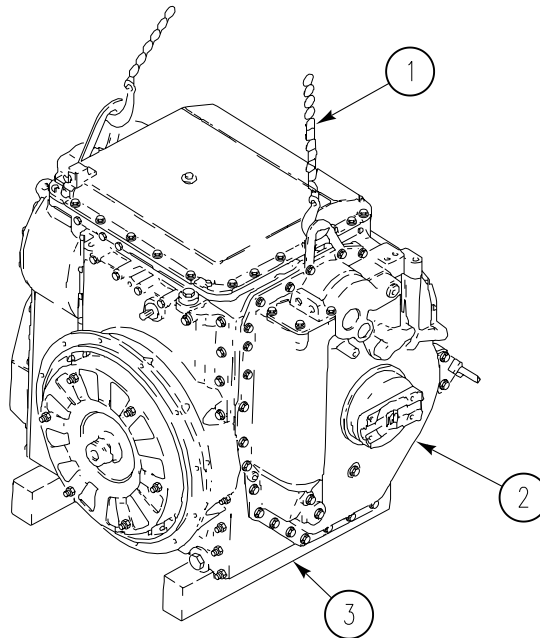
19. SEPARATE TRANSMISSION (2) FROM ENGINE (3).



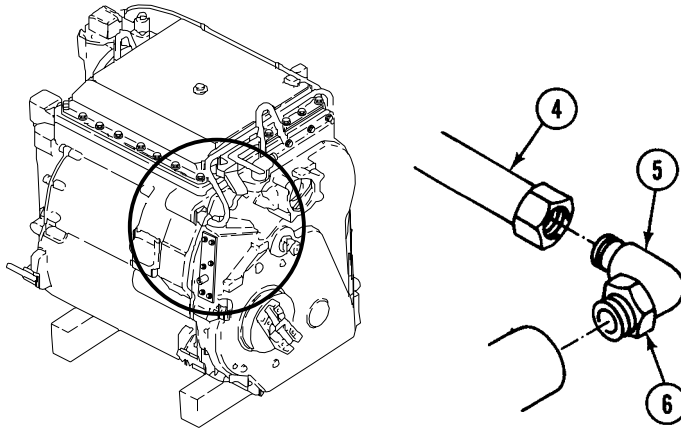
20. ATTACH SLING (1) TO TRANSMISSION (2).



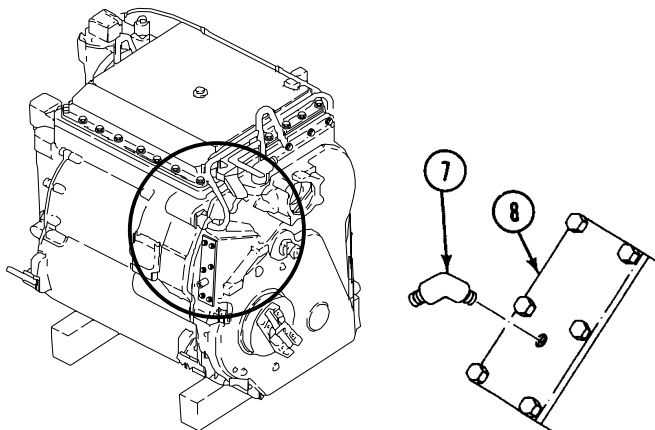
21. REMOVE TRANSMISSION (2) FROM POWER PLANT STAND AND SET ON TWO BLOCKS (3). REMOVE SLING (1).



22. DISCONNECT TRANSMISSION OIL OUTLET HOSE (4) FROM ELBOW (5). LOOSEN JAMNUT (6) AND REMOVE ELBOW (5) FROM TRANSMISSION.

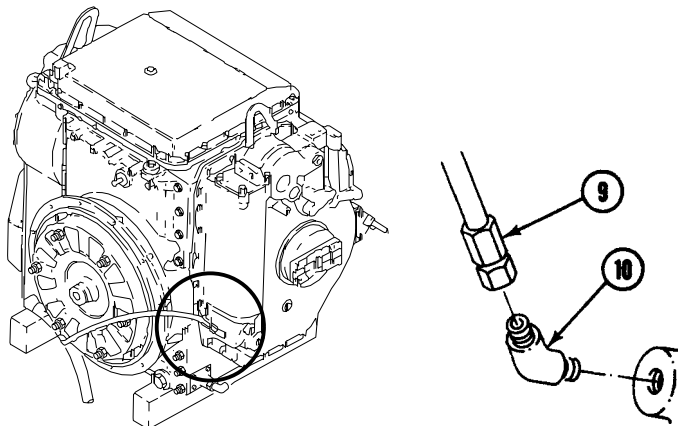


23. REMOVE VARIABLE SPEED CLUTCH HOSE RETURN ELBOW (7) FROM TRANSMISSION END COVER (8).

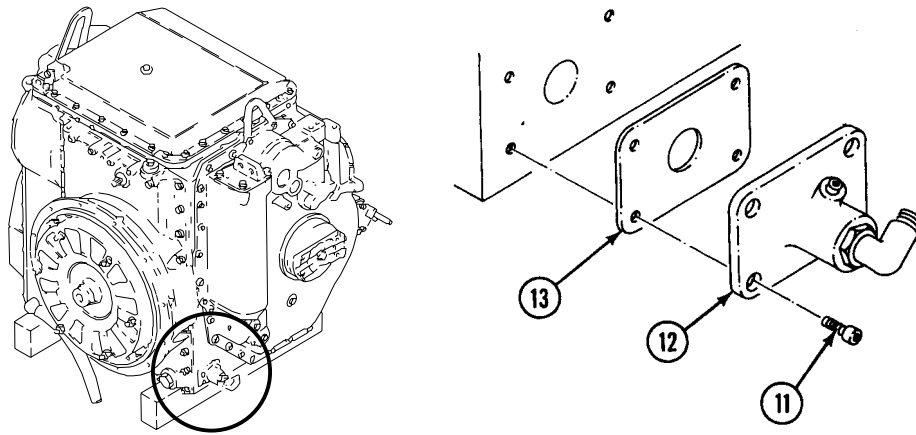


24. DISCONNECT VARIABLE SPEED DRIVE CLUTCH SUPPLY HOSE (9) FROM ELBOW (10) ON TRANSMISSION FILTER CASE.

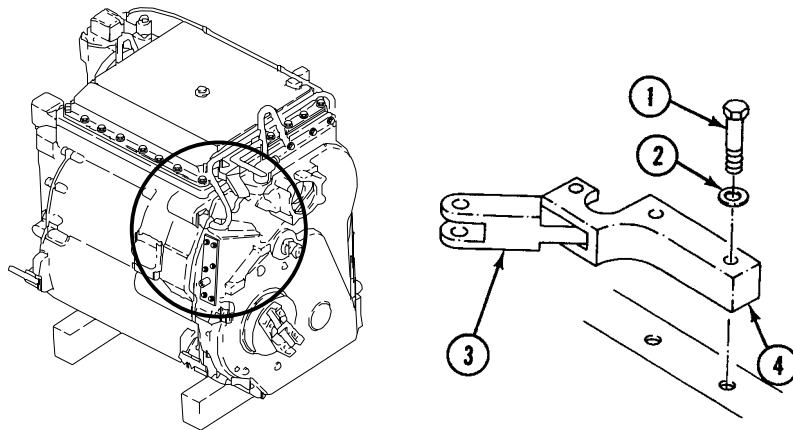
25. REMOVE ELBOW (10) FROM TRANSMISSION.



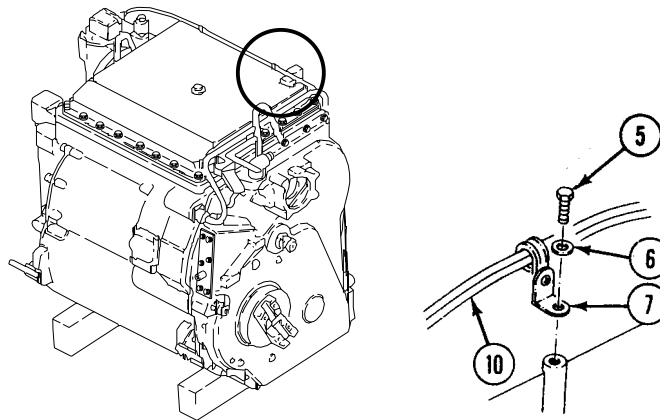
26. REMOVE FOUR SCREWS (11), DIPSTICK TUBE ADAPTER (12), AND GASKET (13) FROM TRANSMISSION. DISCARD GASKET.



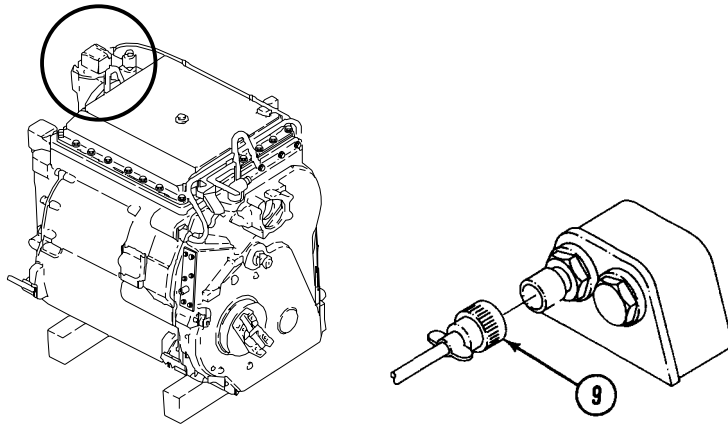
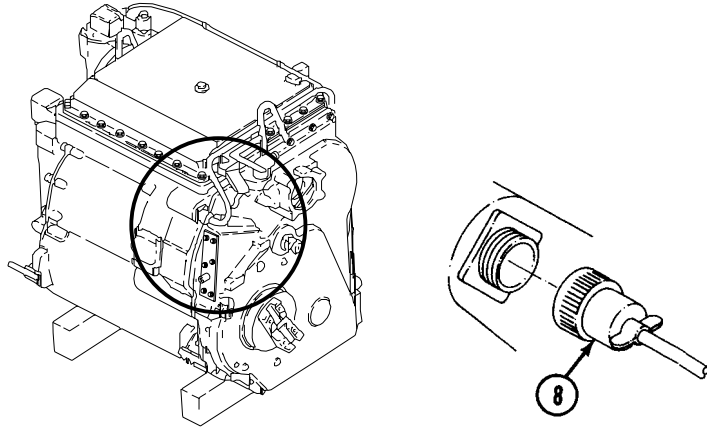
27. REMOVE TWO SCREWS (1), WASHERS (2), TOW START CONTROL LEVER (3), AND MOUNTING BRACKET (4) FROM TRANSMISSION.



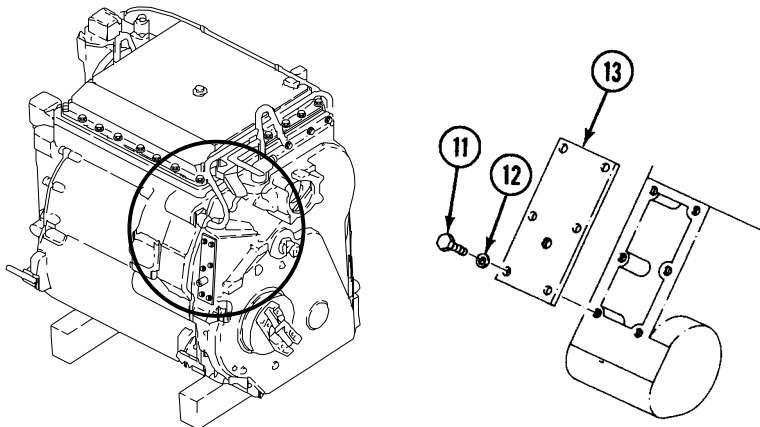
28. REMOVE FOUR SCREWS (5), WASHERS (6), AND WIRING HARNESS BRACKETS (7) FROM TRANSMISSION.



29. DISCONNECT FRONT CONNECTOR (8) AND REAR CONNECTOR (9) FROM TRANSMISSION AND REMOVE TRANSMISSION WIRING HARNESS.

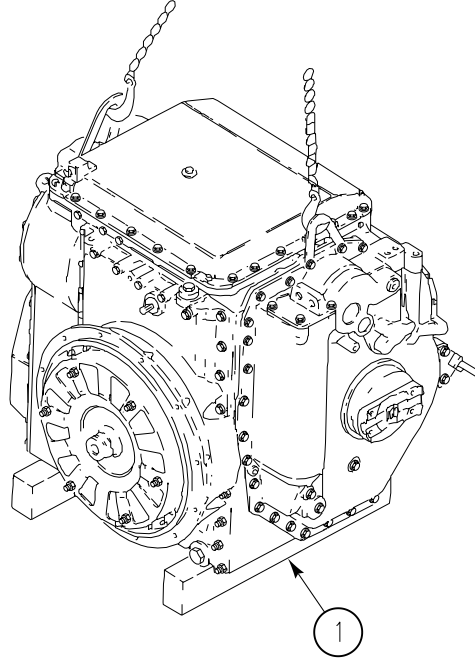


30. REMOVE SIX SCREWS (11), WASHERS (12), AND END COVER (13) FROM RIGHT REAR OF TRANSMISSION.

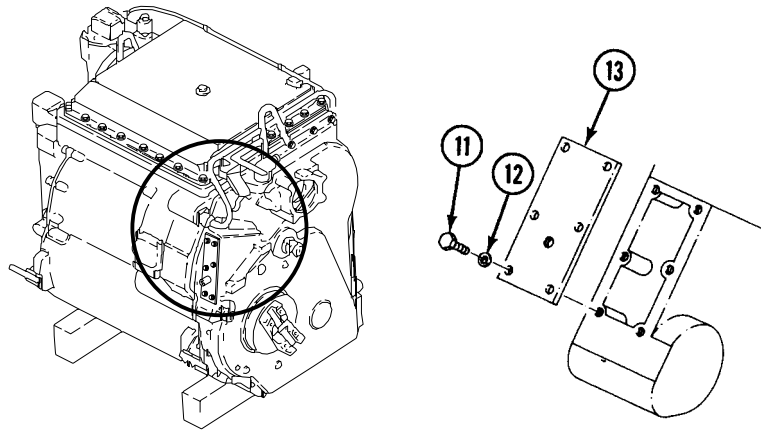


INSTALLATION

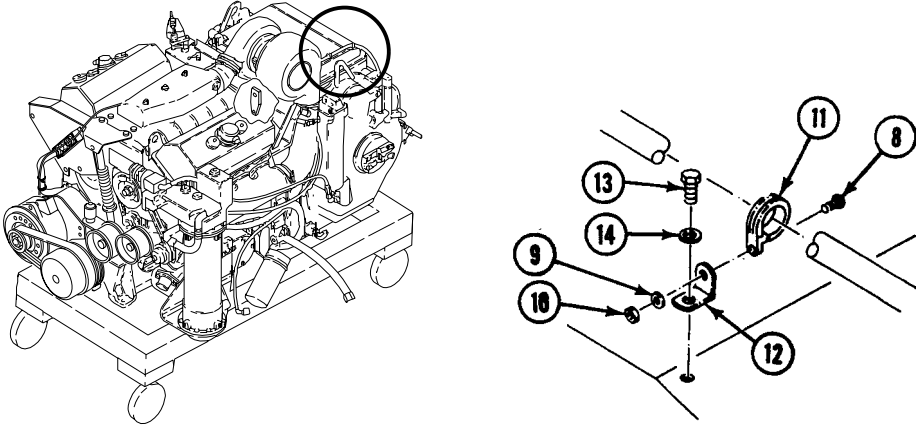
1. REMOVE TRANSMISSION FROM SHIPPING CONTAINER. SEE TM 9-2520-272-34&P. SET TRANSMISSION ON TWO BLOCKS (1).



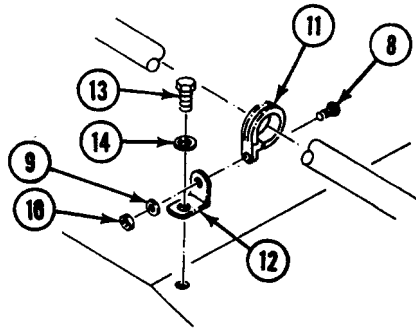
2. INSTALL END COVER (13) ON TRANSMISSION WITH SIX SCREWS (11) AND WASHERS (12). TIGHTEN SIX SCREWS TO 156–180 LB-IN (18–20 N·m) TORQUE.



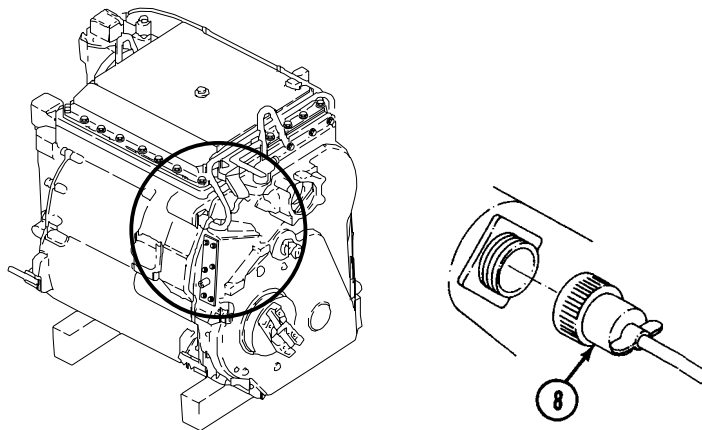
3. INSTALL TWO VARIABLE SPEED CLUTCH HOSE CLAMP BRACKETS (12) ON TRANSMISSION WITH TWO SCREWS (13) AND WASHERS (14).

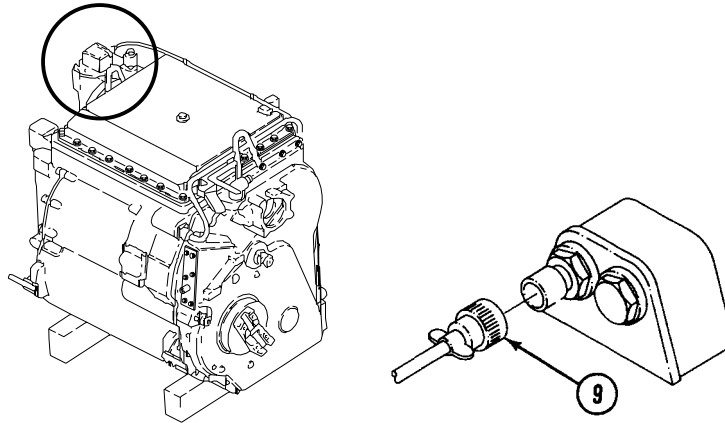


4. MOUNT TWO VARIABLE SPEED HOSE CLAMPS (11) ON BRACKETS (12) WITH TWO SCREWS (8), WASHERS (9), AND NEW LOCKNUTS (10).

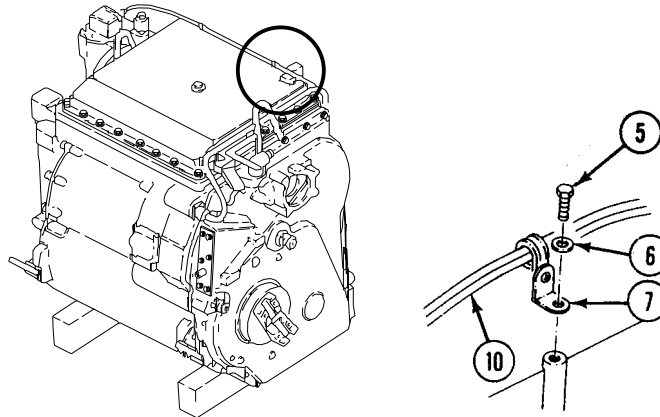


5. POSITION WIRING HARNESS ON TRANSMISSION AND CONNECT REAR CONNECTOR (9) AND FRONT CONNECTOR (8).

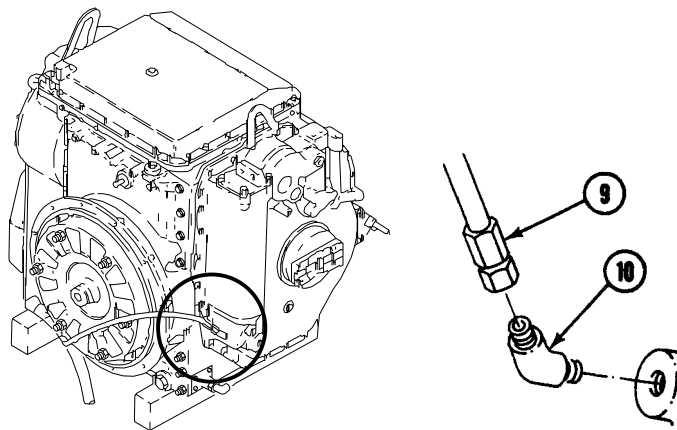




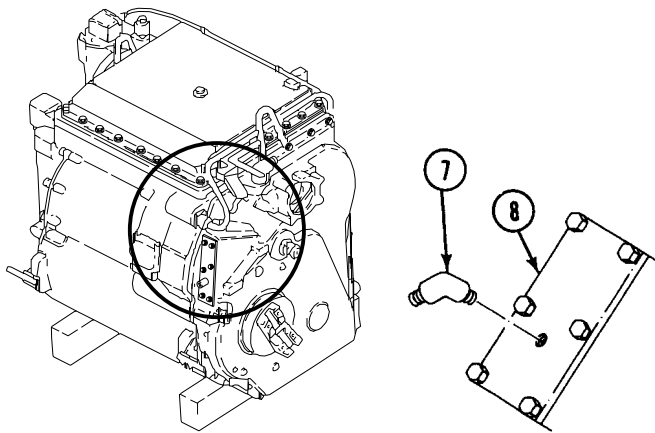
6. INSTALL FOUR WIRING HARNESS BRACKETS (7) ON TRANSMISSION WITH FOUR SCREWS (5) AND WASHERS (6). TIGHTEN SCREWS TO 13–15 LB-FT (18–20 N·m) TORQUE.



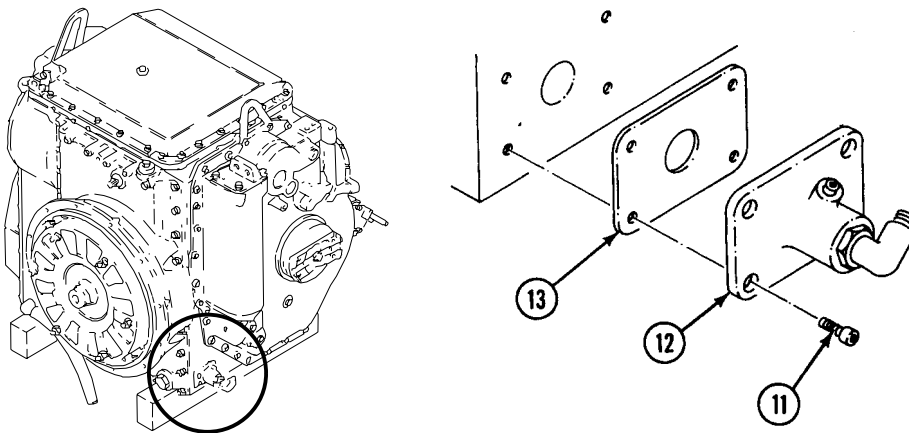
7. INSTALL VARIABLE SPEED CLUTCH SUPPLY HOSE ELBOW (10) ON TRANSMISSION FILTER CASE.



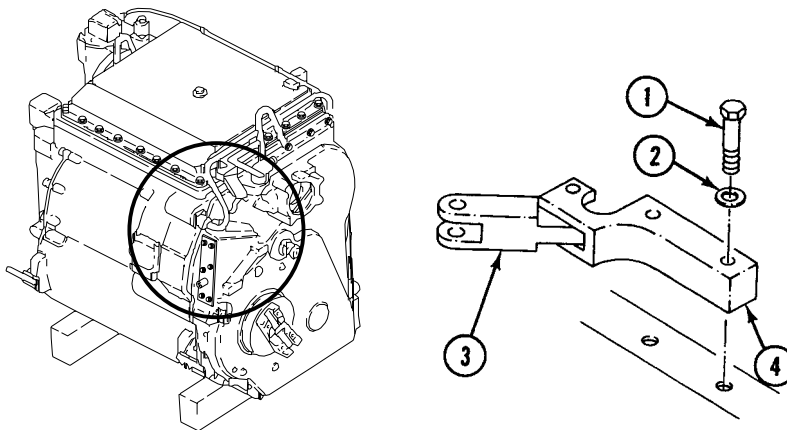
8. INSTALL VARIABLE SPEED CLUTCH RETURN HOSE ELBOW (7) ON TRANSMISSION END COVER (8).



9. INSTALL ADAPTER (12) AND NEW GASKET (13) ON TRANSMISSION WITH FOUR SCREWS (11). TIGHTEN FOUR SCREWS TO 27–32 LB-FT (36–44 N·m) TORQUE.

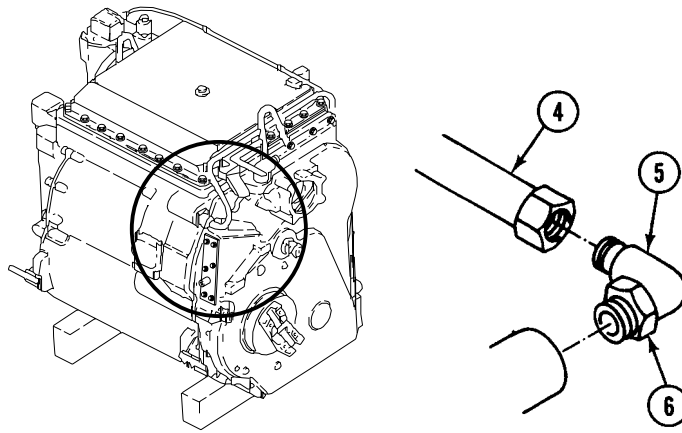


10. INSTALL TOW START CONTROL LEVER (3) AND BRACKET (4) ON TRANSMISSION WITH TWO SCREWS (1) AND WASHERS (2).

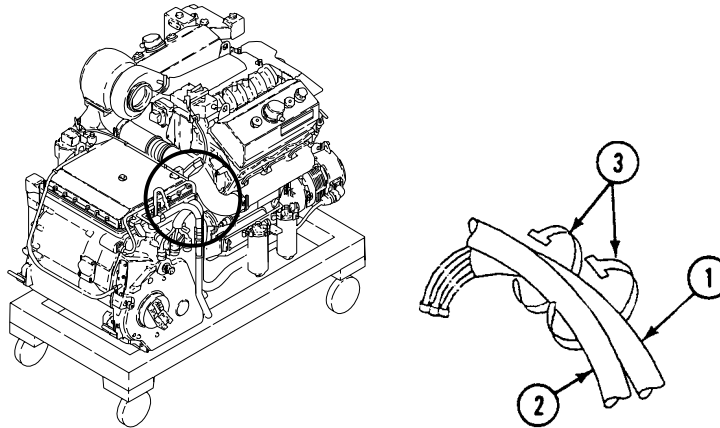


11. INSTALL ELBOW (5) ON TRANSMISSION. TIGHTEN JAMNUT (6).

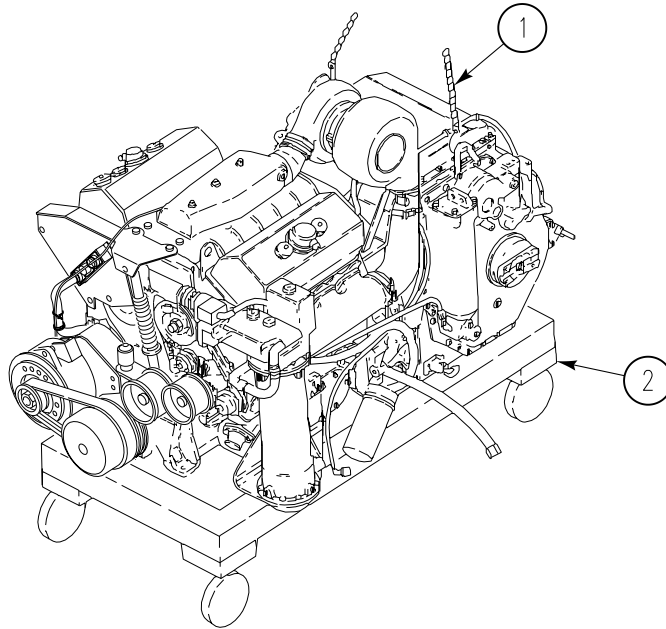
12. INSTALL OIL OUTLET HOSE (4) ON ELBOW (5). DO NOT TIGHTEN.



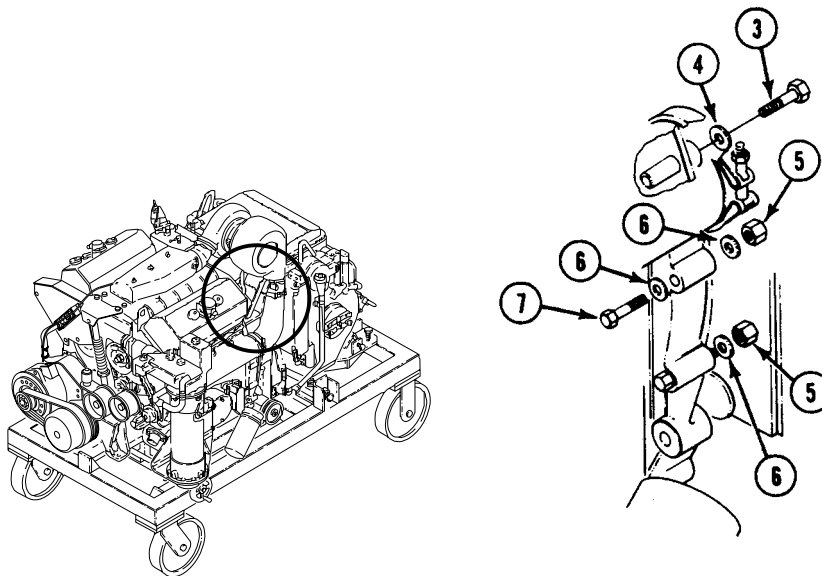
13. SECURE ENGINE WIRING HARNESS (1) TO OIL INLET HOSE (2) WITH TWO NEW TIE DOWN STRAPS (3).



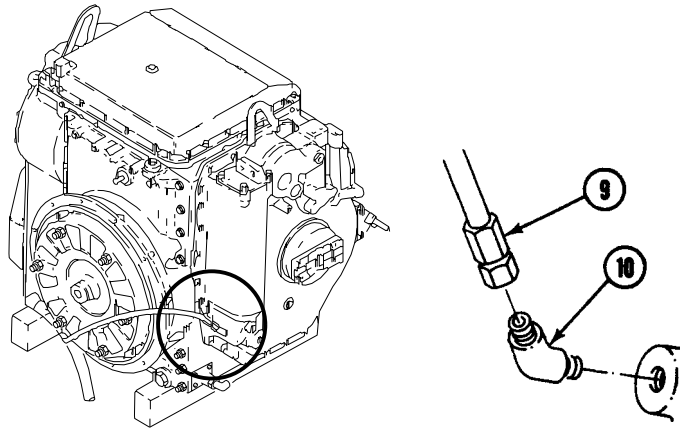
14. LIFT TRANSMISSION FROM BLOCKS AND PLACE ON POWER PLANT STAND (2). 1 TO 2 INCHES FROM ENGINE. USE SLING (1) AND SUITABLE LIFTING DEVICE.



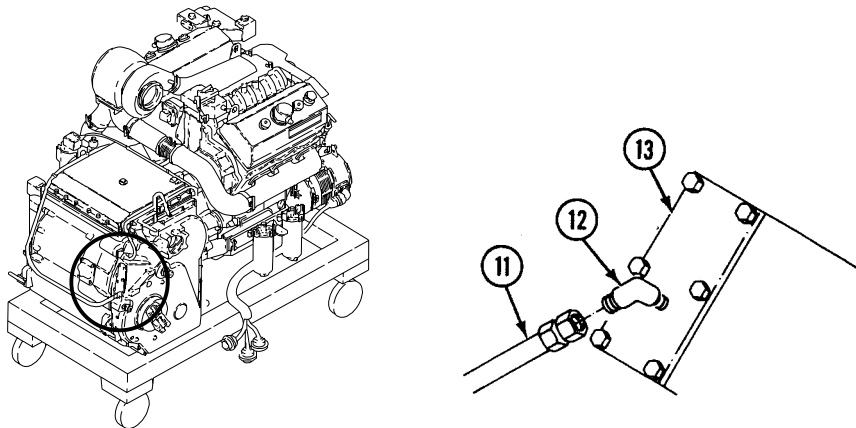
15. USING SCREWDRIVER, ROTATE FLYWHEEL SO THAT FLYWHEEL GROOVES LINE UP WITH SPLINED COUPLING GROOVES. SLIDE ENGINE AND TRANSMISSION TOGETHER AND SECURE WITH 10 NEW LOCK BOLTS (3), 10 WASHERS (4), SCREW (7), THREE WASHERS (6), AND TWO NEW LOCKNUTS (5). TIGHTEN SCREW WITH LOCKNUT TO 38–41 LB-FT (52–56 N·m) TORQUE. TIGHTEN OIL OUTLET HOSE. USE ADJUSTABLE WRENCH.



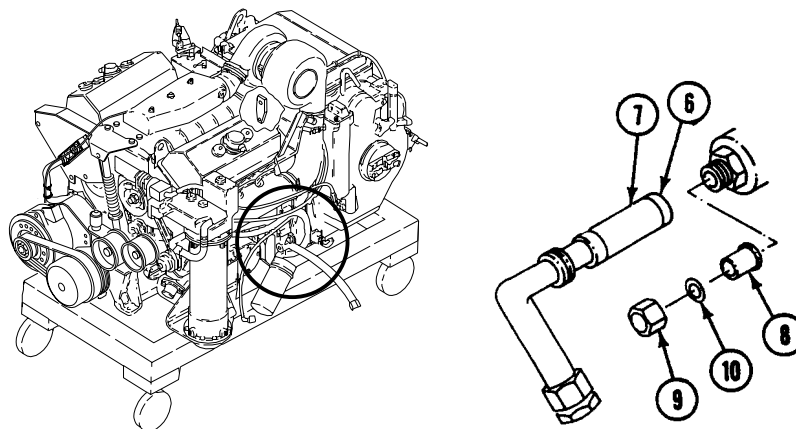
16. CONNECT VARIABLE SPEED CLUTCH SUPPLY HOSE (9) TO ELBOW (10) ON TRANSMISSION FILTER CASE.



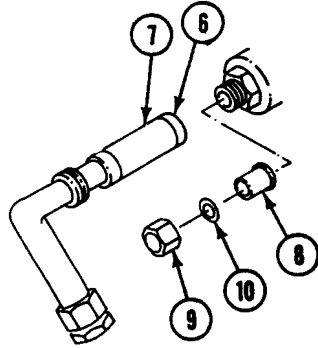
17. CONNECT VARIABLE SPEED DRIVE CLUTCH RETURN HOSE (11) TO ELBOW (12) ON END COVER (13) AT REAR OF TRANSMISSION.



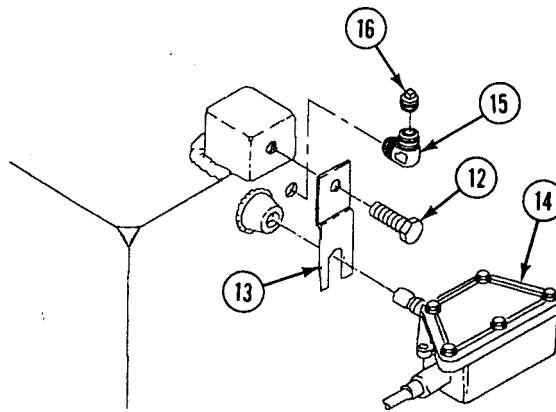
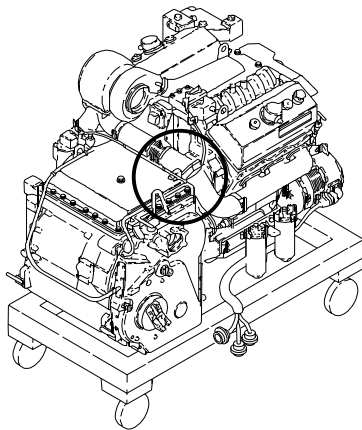
18. INSTALL NEW PREFORMED PACKING (10), TRANSMISSION DRAIN ADAPTER (8), AND NUT (9) ON TRANSMISSION.



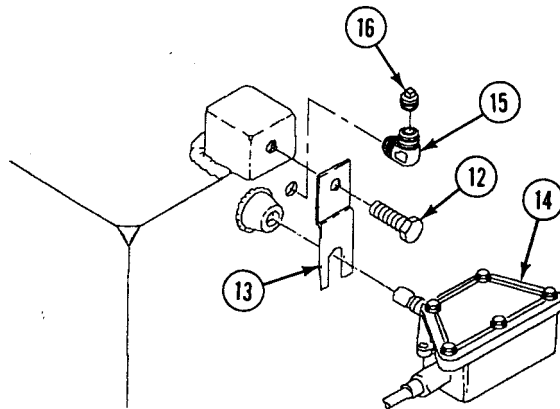
19. SLIDE DRAIN TUBE (7) AND SECURE TO TRANSMISSION ADAPTER (8). TIGHTEN DRAIN TUBE MOUNT CLAMP (6).



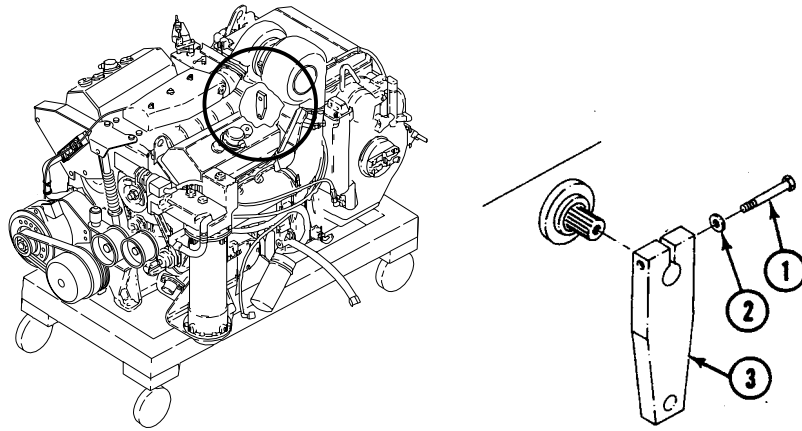
20. REMOVE PIPE PLUG (16) FROM TV MODULATOR PRESSURE PORT. APPLY SEALING COMPOUND TO ALL MALE THREADS BEFORE INSTALLATION. INSTALL PIPE PLUG IN ELBOW (15). INSTALL ELBOW IN TRANSMISSION IN THE 1:00 TO 2:00 O'CLOCK POSITION.



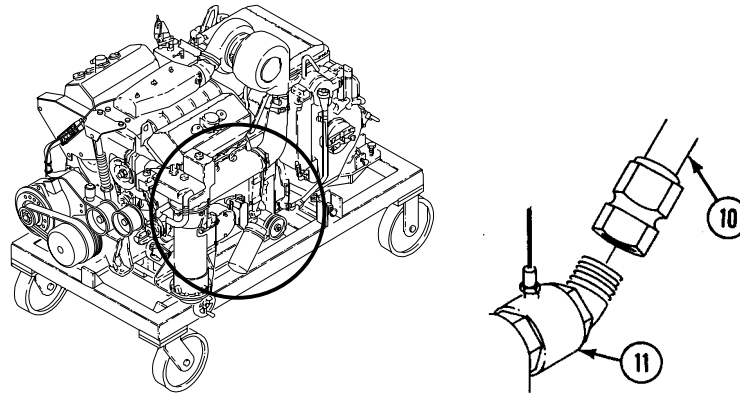
21. INSTALL TV MODULATOR (14) ON TRANSMISSION WITH MOUNTING CLAMP (13) AND NEW LOCK BOLT (12).



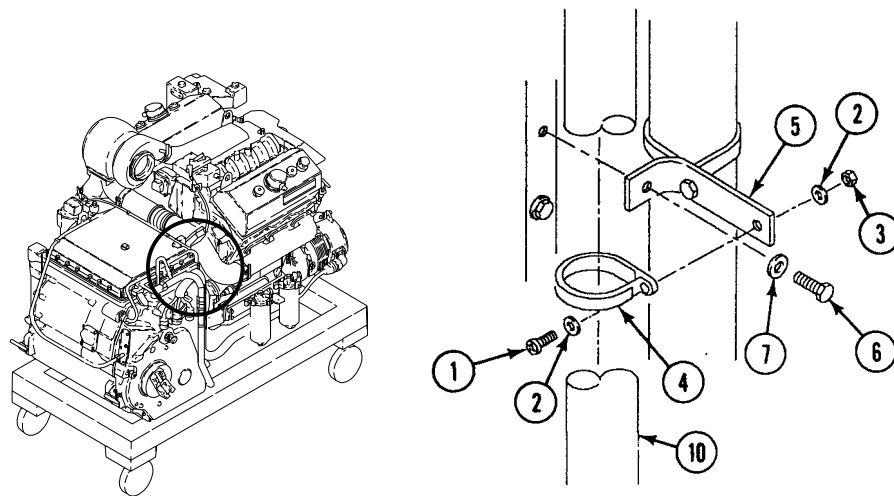
22. INSTALL SCREW (1), WASHER (2), AND STEERING LEVER (3) ON TRANSMISSION.



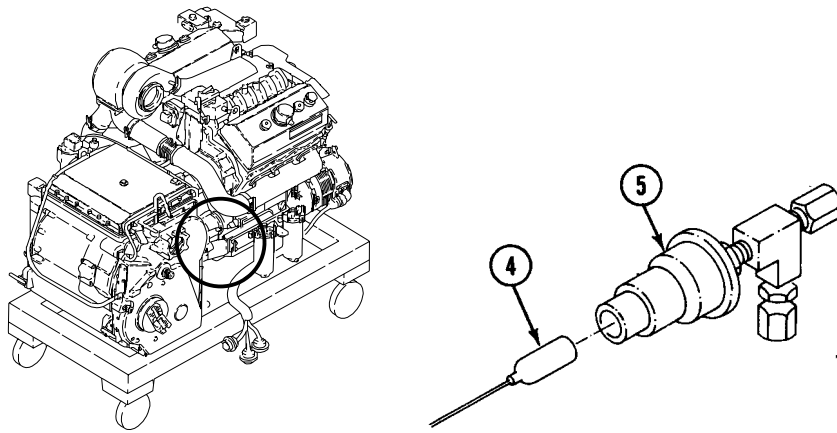
23. INSTALL TRANSMISSION OIL INLET HOSE (10) ON OIL COOLER OUTLET ELBOW (11).



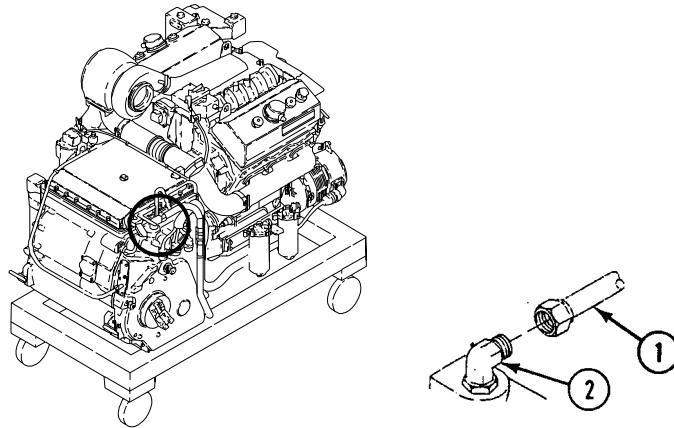
24. MOUNT INLET HOSE CLAMP BRACKET (5) ON TRANSMISSION WITH SCREW (6) AND WASHER (7).



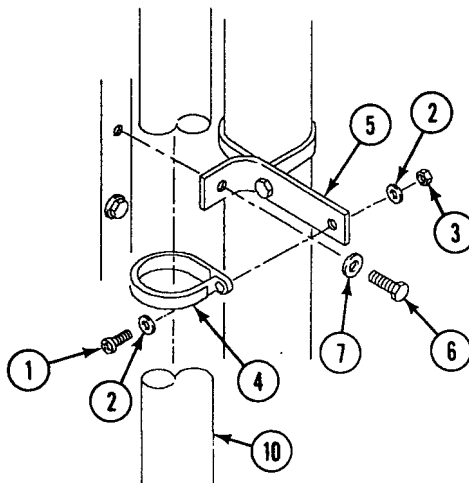
25. CONNECT CIRCUIT LEAD 34 (4) TO ENGINE OIL LOW PRESSURE SWITCH (5).



26. CONNECT TRANSMISSION INLET HOSE (1) TO ELBOW (2).



27. INSTALL INLET HOSE (10) TO BRACKET (5) WITH CLAMP (4), SCREW (1), TWO WASHERS (2), AND NEW LOCKNUT (3). TIGHTEN SCREW TO 27–32 LB-FT (36–44 N·m) TORQUE.



END OF TASK

CHAPTER 8

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR FINAL DRIVE ASSEMBLIES

WORK PACKAGE INDEX

Title

Sequence No.

REPAIR/OVERHAUL FINAL DRIVE ASSEMBLY.....0025 00

REPAIR/OVERHAUL FINAL DRIVE ASSEMBLY

0025 00

THIS WORK PACKAGE COVERS:

Repair or Replacement (page 0025 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Equipment Condition

Final drive assembly removed (TM 9-2350-366-20-1)

Personnel Required

Track Vehicle Repairer 63H10

References

TM 9-2520-238-34
TM 9-2350-366-20-1

REPAIR OR REPLACEMENT

1. REPAIR/OVERHAUL FINAL DRIVE ASSEMBLY. See TM 9-2520-238-34.

END OF TASK

CHAPTER 9

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR WHEELS AND TRACKS

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|------------------------------------|---------------------|
| REPAIR TRACK IDLER ARM..... | 0026 00 |
| REPAIR TRACK TENSION ADJUSTER..... | 0027 00 |

REPAIR TRACK IDLER ARM

0026 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0026 00-1).
 Assembly (page 0026 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

References

TM 9-2350-366-20-1

Tools and Special Tools

General mechanic's tool kit: automotive
 (WP 0046 00, Item 54)

Equipment Condition

Track idler arm assembly removed
 (TM 9-2350-366-20-1)

Materials/Parts

Packing (2)

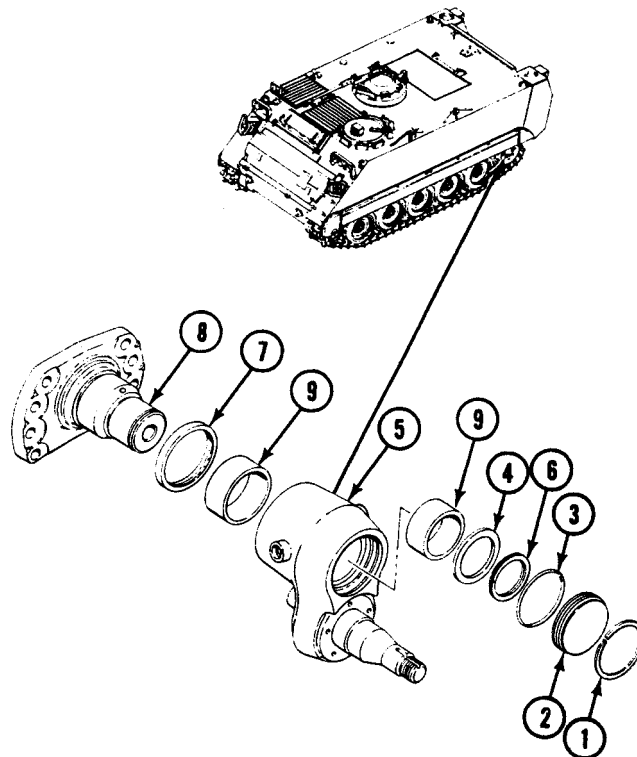
Personnel Required

Track Vehicle Repairer 63H10

Hub assembly removed (TM 9-2350-366-20-1)

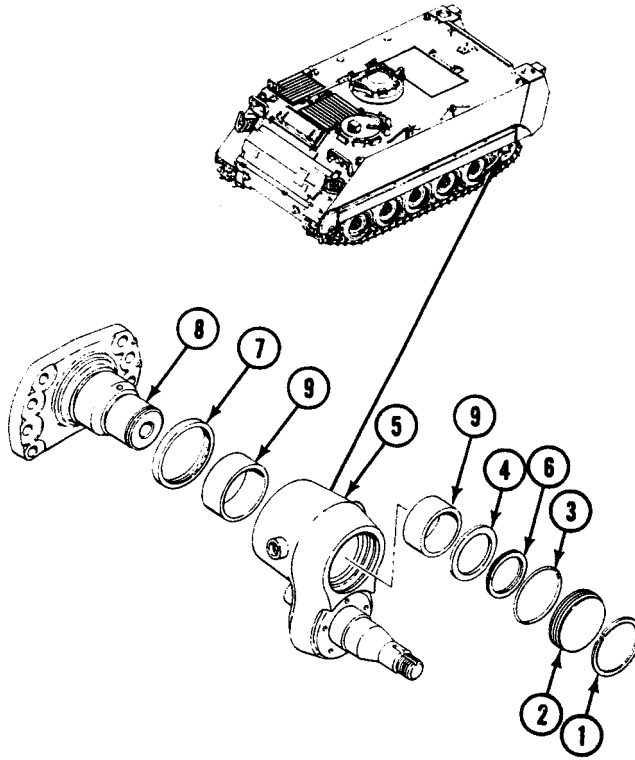
DISASSEMBLY

1. REMOVE RETAINING RING (1), COVER (2), PACKING (3), AND WASHER (4) FROM ARM (5). DISCARD PACKING.
2. REMOVE RETAINING RING (6), ARM (5), AND PACKING (7) FROM SPINDLE (8). DISCARD PACKING.
3. REMOVE TWO BEARINGS (9) FROM ARM (5).



ASSEMBLY

1. INSTALL TWO BEARINGS (9) IN ARM (5).
2. INSTALL NEW PACKING (7) AND ARM (5) ON SPINDLE (8). SECURE WITH RETAINING RING (6).
3. INSTALL WASHER (4) AND NEW PACKING (3) IN ARM (5).
4. SECURE COVER (2) IN ARM (5) WITH RETAINING RING (1).

**END OF TASK**

REPAIR TRACK TENSION ADJUSTER

0027 00

THIS WORK PACKAGE COVERS:

- Disassembly (page 0027 00-1).
- Inspection–Acceptance and Rejection Criteria (page 0027 00-3).
- Assembly (page 0027 00-4).

INITIAL SETUP:

Maintenance Level
Direct Support

Personnel Required
Track Vehicle Repairer 63H10

Tools and Special Tools
General mechanic’s tool kit: automotive
(WP 0046 00, Item 54)
Arbor press (WP 0046 00, Item 40)

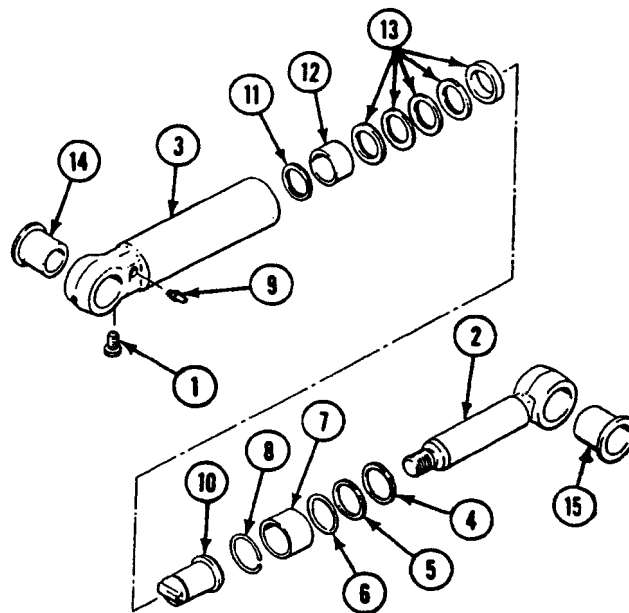
References
TM 9-2350-366-20-1

Materials/Parts
Engine oil (WP 0048 00, Item 6)
Repair kit P/N 5703829
Sleeve bearing (2)

Equipment Condition
Track tension adjuster removed (TM 9-2350-366-20-1)

DISASSEMBLY

1. LOOSEN BLEEDER VALVE (1). PUSH PLUNGER (2) IN AS FAR AS IT WILL GO.
2. MAINTAIN INWARD PRESSURE ON PLUNGER (2) AND ROTATE COUNTERCLOCKWISE (TO THE LEFT) UNTIL PLUNGER ROTATES FREELY.
3. PULL PLUNGER (2) FROM PISTON (3).
4. REMOVE RETAINING RING (4), WIPER RING (5), AND PACKING (6) FROM PISTON (3). DISCARD RETAINING RING, WIPER RING, AND PACKING.

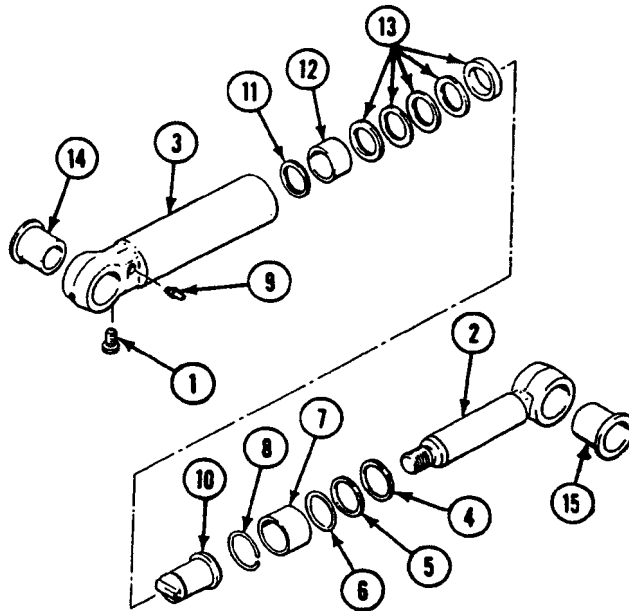


5. PRESS BEARING (7) ABOUT 1 INCH (3 CM) IN PISTON (3) TO FORCE RETAINING RING (8) FROM GROOVE IN PISTON.
6. PULL BEARING (7) FROM PISTON (3). DISCARD BEARING.
7. TURN RETAINING RING (8) 90 DEGREES IN PISTON (3). REMOVE RING FROM PISTON. DISCARD RING.
8. CLOSE BLEEDER VALVE (1). FORCE GREASE THROUGH LUBRICATION FITTING (9) UNTIL PISTON ASSEMBLY (10) IS FORCED FROM PISTON (3).
9. USE A CLEAN CLOTH TO REMOVE EXCESS GREASE FROM PISTON ASSEMBLY (10) AND PISTON (3).

NOTE

Preformed packing set may be a five- or seven-piece design.

10. REMOVE RETAINING RING (11), BEARING (12), AND FIVE PREFORMED PACKINGS (13) FROM PISTON ASSEMBLY (10). DISCARD PREFORMED PACKINGS, BEARING, AND RETAINING RING.
11. REMOVE BLEEDER VALVE (1) AND LUBRICATION FITTING (9) FROM PISTON (3).
12. PRESS SLEEVE BEARING (14) FROM PISTON (3). DISCARD SLEEVE BEARING.
13. PRESS SLEEVE BEARING (15) FROM PLUNGER (2). DISCARD SLEEVE BEARING.



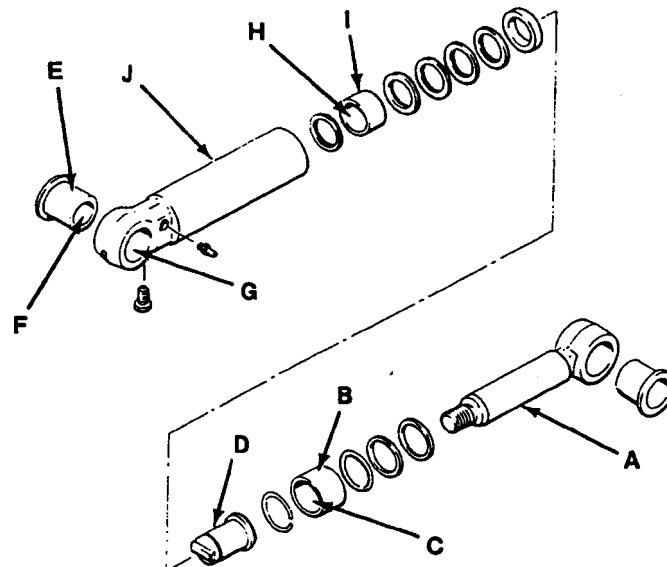
INSPECTION-ACCEPTANCE AND REJECTION CRITERIA

1. CHECK THREADS OF PLUNGER (A) AND PISTON ASSEMBLY (D). CHASE DAMAGED THREADS WITH A DIE. REPLACE PARTS AS A MATCHED SET IF THE THREADS OF EITHER PART ARE STRIPPED OR WORN.
2. CHECK MACHINED SURFACES OF PISTON (J) AND PLUNGER (A). REMOVE GROOVES AND SCRATCHES. REPLACE PARTS THAT HAVE DEEP GROOVES AND SCRATCHES OR ARE WORN.
3. CHECK PARTS SHOWN IN FIGURE BELOW THAT HAVE REFERENCE LETTERS.
4. CHECK PARTS DIMENSIONS IN FOLLOWING TABLE TO DETERMINE REPLACEMENT.

TRACK TENSION ADJUSTER

| Reference Letter | Point of Measurement | New Part Size/Fit | Wear Limit |
|------------------|---|-------------------|------------|
| A | Outside diameter of plunger | 1.7580 to 1.7600 | 1.7560 |
| B | Outside diameter of piston bearing | 1.9940 to 1.9970 | 1.9930 |
| C | Inside diameter of piston bearing | 1.7620 to 1.7650 | 1.7670 |
| D | Outside diameter of piston assembly | 1.4990 to 1.5010 | 1.4980 |
| E | Outside diameter of sleeve bearing | 1.8780 to 1.8830 | * |
| F | Inside diameter of sleeve bearing | 1.5200 to 1.5300 | 1.5450 |
| G | Inside diameter of piston or plunger bearing bore | 1.8740 to 1.8760 | * |
| H | Inside diameter of piston assembly bearing | 1.5030 to 1.5060 | 1.5160 |
| I | Outside diameter of piston assembly bearing | 1.9940 to 1.9970 | 1.9930 |
| J | Inside diameter of piston | 1.9990 to 2.0010 | 2.0020 |

* Must be within new part dimensions.



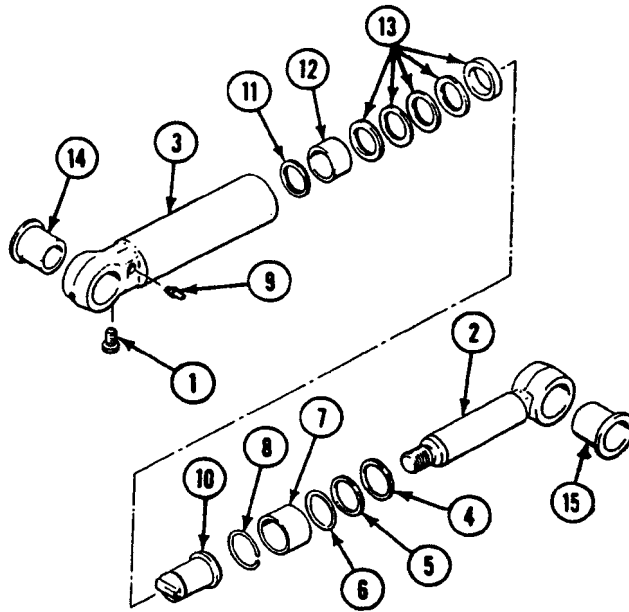
ASSEMBLY

1. PRESS NEW SLEEVE BEARING (14) IN PISTON (3) FROM SIDE OPPOSITE LUBRICATION FITTING (9). USE ARBOR PRESS.
2. PRESS NEW SLEEVE BEARING (15) IN PLUNGER (2). USE ARBOR PRESS.

NOTE

Preformed packings, bearings, and retaining rings are part of repair kit p/n 5703829.

3. INSTALL FIVE NEW PREFORMED PACKINGS (13), NEW BEARING (12), AND NEW RETAINING RING (11) ON PISTON ASSEMBLY (10).
4. APPLY A LIGHT COAT OF ENGINE OIL TO PISTON ASSEMBLY (10) AND TO INSIDE OF PISTON (3).
5. INSTALL PISTON ASSEMBLY (10) IN PISTON (3).
6. INSTALL NEW RETAINING RING (8) IN PISTON (3). MAKE SURE IT SEATS IN GROOVE.
7. INSTALL NEW BEARING (7) IN PISTON (3).
8. INSTALL NEW PACKING (6), NEW WIPER RING (5), AND NEW RETAINING RING (4) IN PISTON (3).
9. INSTALL PLUNGER (2) IN PISTON (3). MAINTAIN INWARD PRESSURE ON PLUNGER AND ROTATE CLOCKWISE (TO THE RIGHT) UNTIL SECURE.
10. INSTALL BLEEDER VALVE (1) AND LUBRICATION FITTING (9) IN PISTON (3).



END OF TASK

CHAPTER 10

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR STEERING

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|---|---------------------|
| REPAIR STEERING BRACKET AND SHAFT HOUSING BEARINGS..... | 0028 00 |

REPAIR STEERING BRACKET AND SHAFT HOUSING BEARINGS

0028 00

THIS WORK PACKAGE COVERS:

Removal (page 0028 00-1).
 Installation (page 0028 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

General mechanic's tool kit: automotive
 (WP 0046 00, Item 54)
 Arbor press (WP 0046 00, Item 40)

References

TM 9-2350-366-20-1

Materials/Parts

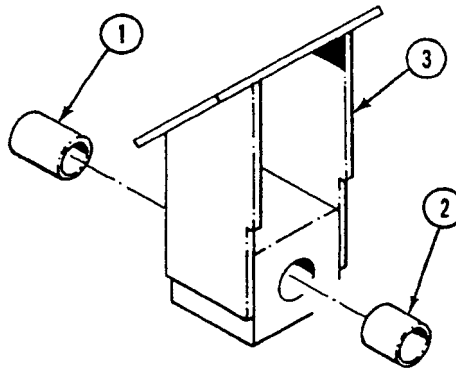
Bearing
 Bearing
 Bearing (2)
 Bearing

Equipment Condition

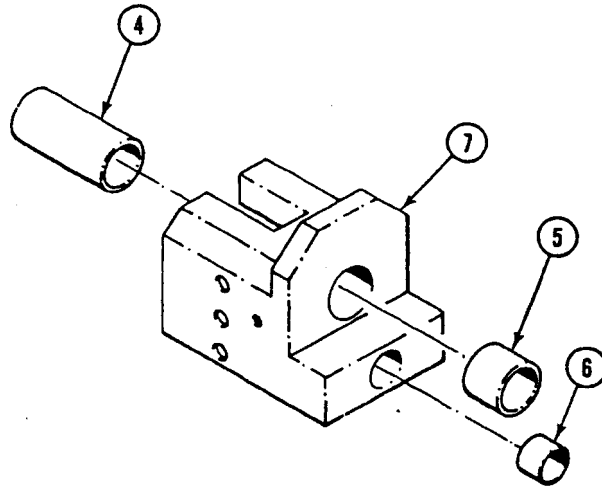
Steering brackets removed (TM 9-2350-366-20-1)

REMOVAL

1. PRESS TWO BEARINGS (1) AND (2) FROM BRACKET (3). DISCARD BEARINGS.

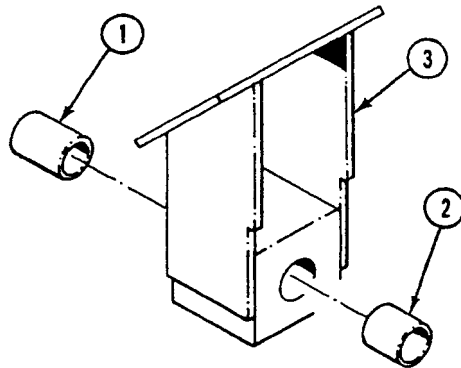


2. PRESS THREE BEARINGS (4), (5), AND (6) FROM HOUSING (7). DISCARD BEARINGS.

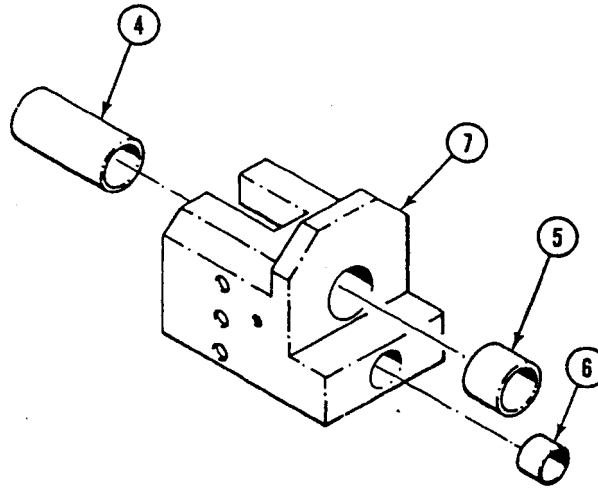


INSTALLATION

1. PLACE TWO NEW BEARINGS (1) AND (2) ON BRACKET (3) AND PRESS INTO PLACE.



2. PLACE THREE NEW BEARINGS (4), (5), AND (6) ON HOUSING (7) AND PRESS INTO PLACE.



3. INSTALL STEERING BRACKETS. See TM 9-2350-366-20-1.

END OF TASK

CHAPTER 11

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR SHOCK ABSORBERS

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|----------------------------|---------------------|
| REPAIR SHOCK ABSORBER..... | 0029 00 |

REPAIR SHOCK ABSORBER

0029 00

THIS WORK PACKAGE COVERS:

- Removal (page 0029 00-1).
- Installation (page 0029 00-2).

INITIAL SETUP:

Maintenance Level
Direct Support

Personnel Required
Track Vehicle Repairer 63H10

Tools and Special Tools
General mechanic's tool kit: automotive
(WP 0046 00, Item 54)
Positioner (WP 0046 00, Item 39)
Arbor press (WP 0046 00, Item 40)
Staker (WP 0046 00, Item 49)

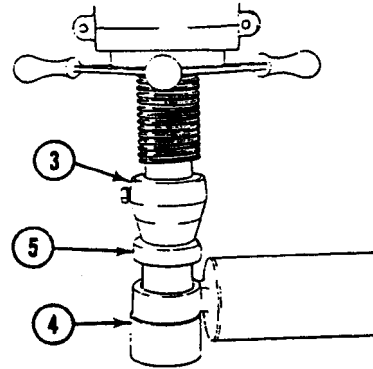
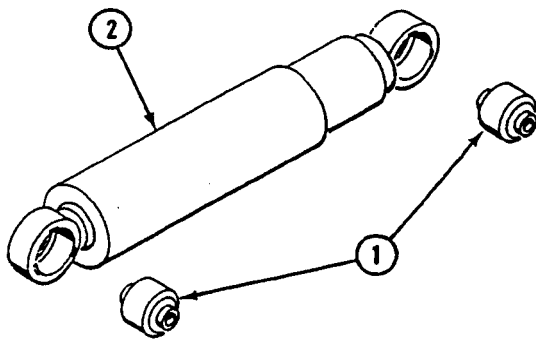
References
TM 9-2350-366-20-1

Materials/Parts
Bearing (2)

Equipment Condition
Shock absorber removed (TM 9-2350-366-20-1)

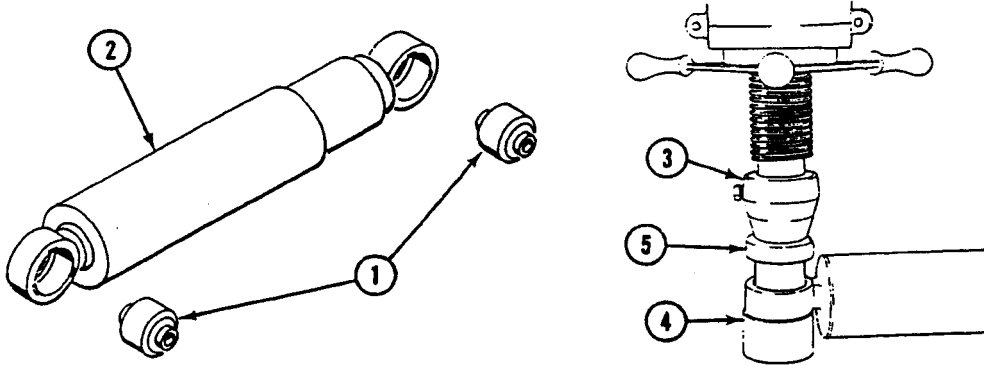
REMOVAL

1. REMOVE TWO SELF-ALIGNING BEARINGS (1) FROM SHOCK ABSORBER (2). USE PRESS (3), SUPPORT (4), AND POSITIONER (5). DISCARD BEARINGS.

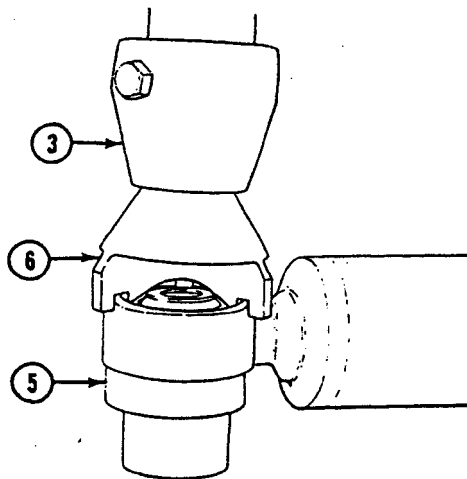


INSTALLATION

1. INSTALL TWO NEW SELF-ALIGNING BEARINGS (1) IN SHOCK ABSORBER (2). USE PRESS (3) AND TWO POSITIONERS (5).



2. STAKE TWO SELF-ALIGNING BEARINGS (1) INTO SHOCK ABSORBER (2). USE STAKER (6) AND POSITIONER (5).



END OF TASK

CHAPTER 12

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR HULL

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|---|---------------------|
| REPLACE SERRATED LOCK RING SCREW INSERTS..... | 0030 00 |
| REPLACE SERRATED LOCK RING SCREW INSERT WITH PACKING..... | 0031 00 |
| REPLACE OVERSIZE SCREW INSERTS WITH LOCK RING..... | 0032 00 |
| REPLACE KEY-LOCKED SCREW INSERTS..... | 0033 00 |
| REPLACE PRESSNUT..... | 0034 00 |

REPLACE SERRATED LOCK RING SCREW INSERTS

0030 00

THIS WORK PACKAGE COVERS:

- Removal (page 0030 00-1).
- Installation (page 0030 00-2).

INITIAL SETUP:

Maintenance Level
Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

- General mechanic's tool kit: automotive (WP 0046 00, Item 54)
- Portable electric drill (WP 0046 00, Item 7)
- Screw extractor set (WP 0046 00, Item 13)
- Twist drill (see table below)
- Inserter (see table below)
- Lock ring drive tool (see table below)

References

TM 9-2350-366-10-1

Equipment Condition

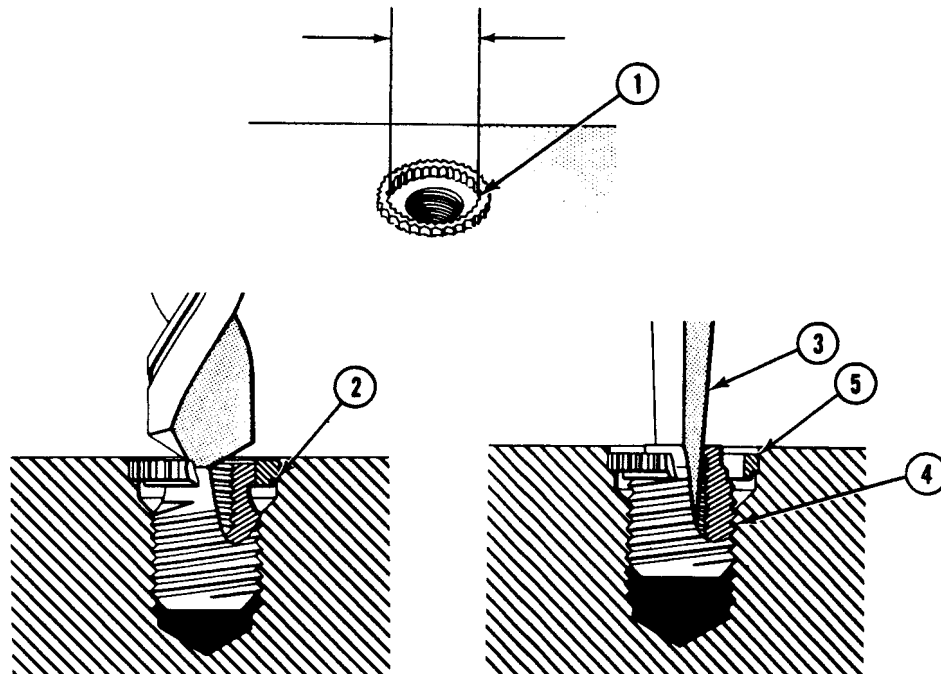
- Engine stopped (TM 9-2350-366-10-1)
- Vehicle blocked (TM 9-2350-366-10-1)

Materials/Parts

Screw insert

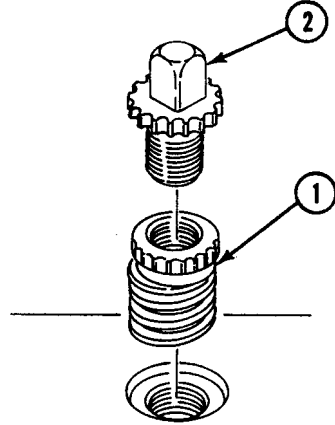
REMOVAL

1. DRILL OUT INSIDE SERRATIONS OF LOCK RING (1). USE DRILL SAME DIAMETER AS INSIDE SERRATIONS. SEE TABLE BELOW.
2. DRILL TO DEPTH OF COUNTERBORE (2).
3. DRIVE IN EXTRACTOR TOOL (3) TO SCREW OUT INSERT (4). AS INSERT COMES OUT, IT WILL PUSH OUT LOCK RING (5).
4. IF LOCK RING (5) DOES NOT COME OUT WITH INSERT (4), HIT RING WITH A PUNCH AND HAMMER TO COLLAPSE RING. REMOVE RING.



INSTALLATION

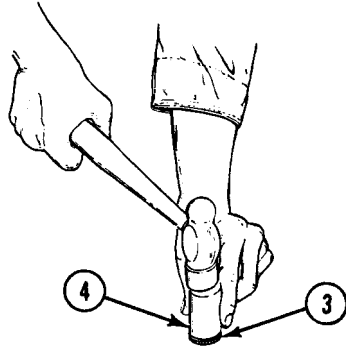
1. INSTALL INSERT (1) IN THREADED HOLE. USE INSERTER (2). SEE TABLE BELOW.



NOTE

Do not attempt to drive lock ring beyond the top surface of insert serrations.

2. USING LOCK RING DRIVE TOOL (SEE TABLE BELOW), DRIVE LOCK RING (3) INTO SURFACE UNTIL DRIVE TOOL (4) TOUCHES SURFACE. LOCK RING WILL BE SET AT PROPER DEPTH.



SERRATED LOCK RING SCREW INSERT DATA

| Internal Thread Size | Part Number/NSN | Removal Drill Diameter/ WP 0046 00 Item | Inserter Part No/ WP 0046 00 Item | Lock Ring Drive Tool Part No/ WP 0046 00 Item | Application |
|----------------------|---------------------------------|---|-----------------------------------|---|--|
| 1/4-28UNF | CR206SB8L 5340-01-066-2840 | 5/16 Item 9 | CR06W Item 28 | R206D Item 24 | Steering Installation |
| 3/8-16 UNC | CR108SB10 5340-00-930-1615 | 29/64 Item 9 | CR08W Item 29 | R108D Item 23 | Warning Lights Panel |
| 3/8-16 UNC | CR108SB10L 5340-00-930-1619 | 29/64 Item 9 | CR08W Item 29 | R108D Item 23 | Ramp Assembly Steering Instl Mtg Provisions Hull Subassembly |
| 1/2-20 UNF | CR210SB12L 5340-00-930-1618 | 11/16 Item 10 | CR10W Item 30 | R210D Item 25 | Power Train Mtg Provisions Seats & Platform Installation |
| 1/2-20 UNF | CR2410SB17 5340-01-074-5975 | 11/16 Item 10 | CR10W Item 30 | R210D Item 25 | Fuel Tank Cover |
| 5/8-11 UNC | CR912SB16FL 5340-01-106-7977 | 57/64 Item 8 | CR12W Item 31 | R112D Item 12 | Ramp Assembly |
| 5/8-18 UNF | CR312SB16L 5340-00-921-6094 | 57/64 Item 8 | CR12W Item 31 | R212D Item 26 | Suspension Installation |
| 3/4-16 UNF | CR313SB18L 5340-00-999-5627 | 1-1/32 Item 11 | CR13W Item 32 | R213D Item 27 | Suspension Installation |

END OF TASK

REPLACE SERRATED LOCK RING SCREW INSERT WITH PACKING

0031 00

THIS WORK PACKAGE COVERS:

Removal (page 0031 00-1).
 Installation (page 0031 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

General mechanic's tool kit: automotive
 (WP 0046 00, Item 54)
 Portable electric drill, Morse #2 (WP 0046 00, Item 7)
 Twist drill set, 33/64 to 3/4 inch, Morse #2
 (WP 0046 00, Item 10)
 Screw extractor set (WP 0046 00, Item 13)
 Bearing inserter (WP 0046 00, Item 25)

References

TM 9-2350-366-10-1

Equipment Condition

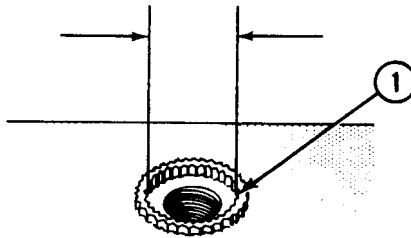
Engine stopped (TM 9-2350-366-10-1)
 Access cover removed (TM 9-2350-366-10-1)
 Vehicle blocked (TM 9-2350-366-10-1)

Materials/Parts

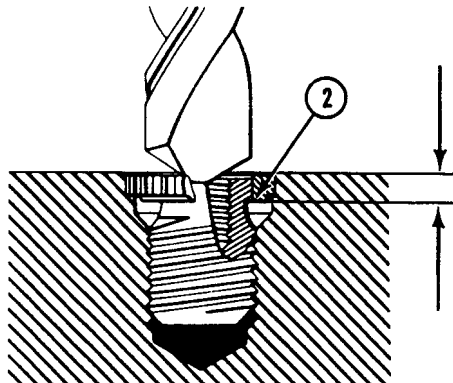
Sealing compound (WP 0048 00, Item 14)
 Preformed packing
 Screw insert

REMOVAL

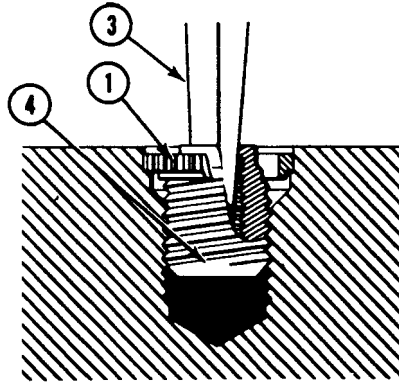
1. DRILL OUT INSIDE SERRATIONS OF LOCK RING (1). USE 11/16 INCH DRILL.



2. DRILL TO DEPTH OF COUNTERBORE (2). MAXIMUM DRILL DEPTH IS 5/32.

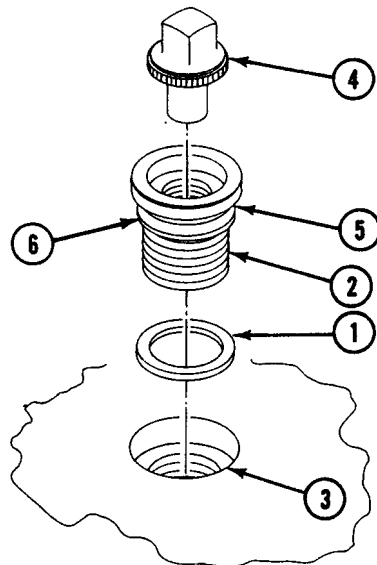


3. DRIVE IN EXTRACTOR TOOL (3) TO SCREW OUT INSERT (4). AS INSERT COMES OUT, IT WILL PUSH OUT LOCK RING (1).
4. IF LOCK RING (1) DOES NOT COME OUT WITH INSERT (4), HIT RING WITH A PUNCH AND HAMMER TO COLLAPSE RING. REMOVE RING. DISCARD INSERT.



INSTALLATION

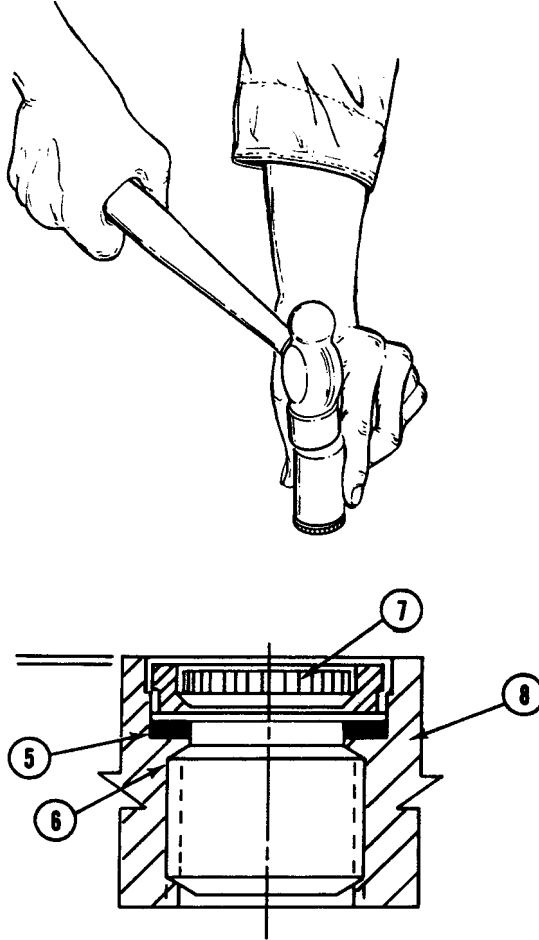
1. LUBRICATE NEW PREFORMED PACKING (1) USING FUEL OIL AND INSTALL ON NEW INSERT (2).
2. COAT MALE THREADS OF INSERT (2) WITH SEALING COMPOUND.
3. WRENCH NEW INSERT (2) INTO THREADED HOLE (3) BY HAND USING WRENCH (4) UNTIL PREFORMED PACKING (1) TOUCHES BOTTOM OF COUNTERBORE (5) AND BOTTOM OF INSERT FLANGE (6). THEN WRENCH INSERT 1/4 TO 3/8 OF A TURN FURTHER TO COMPRESS PREFORMED PACKING (1).



NOTE

Do not attempt to drive lock ring beyond the top surface of insert serrations.

4. DRIVE LOCK RING (7) INTO PARENT MATERIAL (8) UNTIL DRIVE TOOL TOUCHES THE SURFACE. THIS WILL SET LOCK RING (7) TO DEPTH.



END OF TASK

REPLACE OVERSIZE SCREW INSERTS WITH LOCK RING

0032 00

THIS WORK PACKAGE COVERS:

Installation (page 0032 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

References

TM 9-2350-366-10-1
 TM 9-2350-366-20-1

Tools and Special Tools

General mechanic's tool kit: automotive
 (WP 0046 00, Item 54)
 Oversize rosan insert tool kit (WP 0046 00, Item 56)
 Portable electric drill, 1/2 inch (WP 0046 00, Item 6)
 Twist drill set, 1/16 to 1/2 inch, round shank
 (WP 0046 00, Item 9)
 Thread inserter holder kit (WP 0046 00, Item 21)
 Screw threading set (WP 0046 00, Item 51)

Equipment Condition

Engine stopped (TM 9-2350-366-10-1)
 Vehicle blocked (TM 9-2350-366-10-1)
 Road wheel support arm removed
 (TM 9-2350-366-20-1)

Personnel Required

Track Vehicle Repairer 63H10

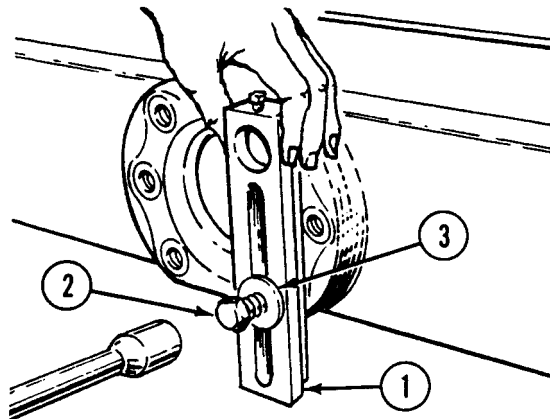
INSTALLATION

1. ALIGN BUSHING HOLE OF BODY (1) WITH EXISTING INSERT HOLE IN HULL.

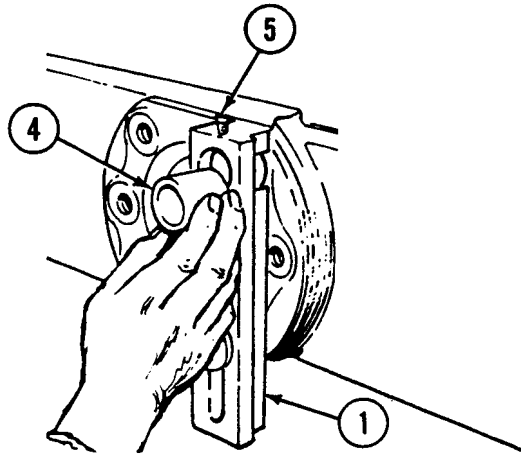
NOTE

Cap screw thread size must be the same size as inside thread of hull insert.

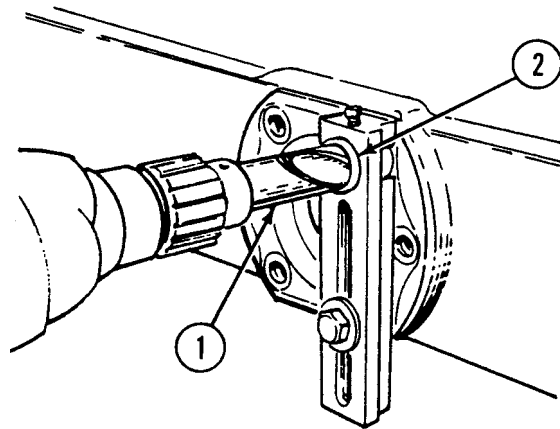
2. INSTALL BODY (1) ON HULL WITH CAP SCREW (2) AND WASHER (3). SCREW CAP SCREW INTO A SERVICEABLE THREAD INSERT OR TAPPED HOLE.



3. INSTALL CORRECT SIZE BUSHING (4) IN BODY (1). SECURE WITH SET SCREW (5).

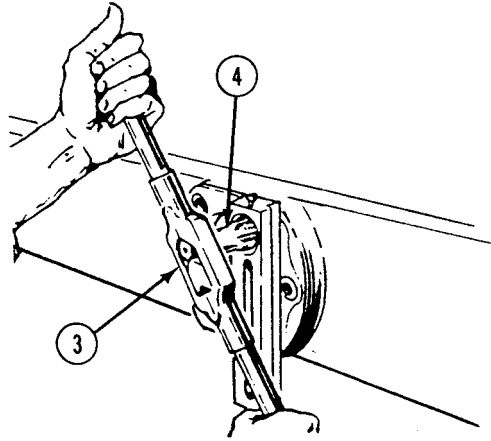


4. USE A HAND DRILL AND CORRECT SIZE COUNTERBORE DRILL (1) TO DRILL THROUGH BUSHING (2) INTO HULL TO THE DEPTH OF INSERT TO BE INSTALLED.
5. COUNTERBORE TO DEPTH OF LOCKRING THICKNESS PLUS 0.010 TO 0.020 INCH (0.254 TO 0.508 MM).

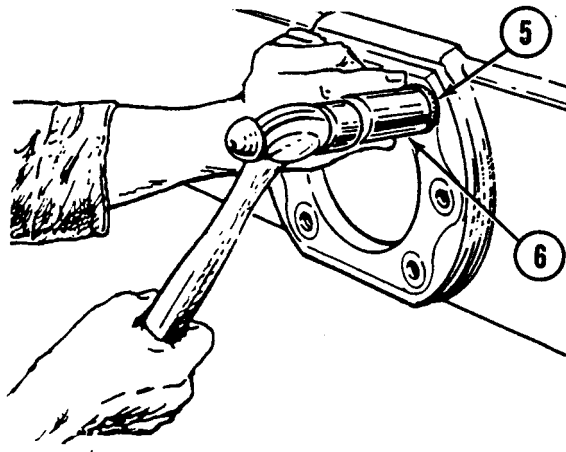


6. HAND TAP CORRECT SIZE THREADS.

7. USE WRENCH (3) TO INSTALL OVERSIZE INSERT (4) IN THREADED HOLE.



8. INSTALL OVERSIZE LOCK RING (5) FLUSH WITH HULL SURFACE. USE DRIVE TOOL (6).



OVERSIZE INSERT TECHNICAL DATA

| Internal Thread Size | Oversize Insert Part Number/NSN | Lock Ring Part Number/NSN |
|----------------------|---------------------------------|------------------------------|
| 1/4-28 UNF | R231SB9L 5340-00-701-7231 | RL31SB9 5365-00-281-3146 |
| 3/8-16 UNC | R133SB11L 5340-00-701-7266 | RL47SB10 5365-00-281-9221 |
| 1/2-20 UNF | R235SB16L 5340-00-701-7294 | RL64SB11 5365-00-282-4566 |
| 5/8-18 UNF | R337SB18L | RL82SB12 5365-00-595-9726 |
| 3/4-16 UNF | R338SB-20L 5340-00-701-7329 | RL90SB12 5365-00-200-7742 |

END OF TASK

REPLACE KEY-LOCKED SCREW INSERTS

0033 00

THIS WORK PACKAGE COVERS:

- Removal (page 0033 00-1).
- Installation (page 0033 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

- General mechanic's tool kit: automotive (WP 0046 00, Item 54)
- Portable electric drill, 1/2 inch (WP 0046 00, Item 6)
- Twist drill set, 1/16 to 1/2 inch, round shank (WP 0046 00, Item 9)
- Screw extractor set (WP 0046 00, Item 13)

References

TM 9-2350-366-10-1

Equipment Condition

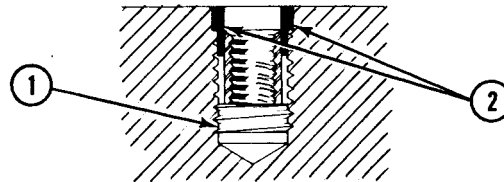
- Vehicle blocked (TM 9-2350-366-10-1)
- Engine stopped (TM 9-2350-366-10-1)

Materials/Parts

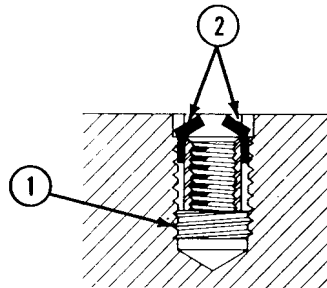
Screw insert

REMOVAL

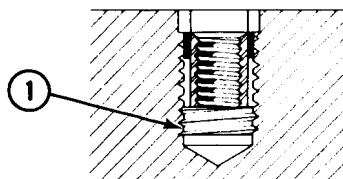
1. DRILL OUT INSERT (1) TO DEPTH OF KEYS (2). SEE TABLE BELOW FOR CORRECT DRILL SIZE AND DEPTH.



2. BEND KEYS (2) IN TO UNLOCK INSERT (1). BREAK OFF BENT PORTIONS OF KEYS.

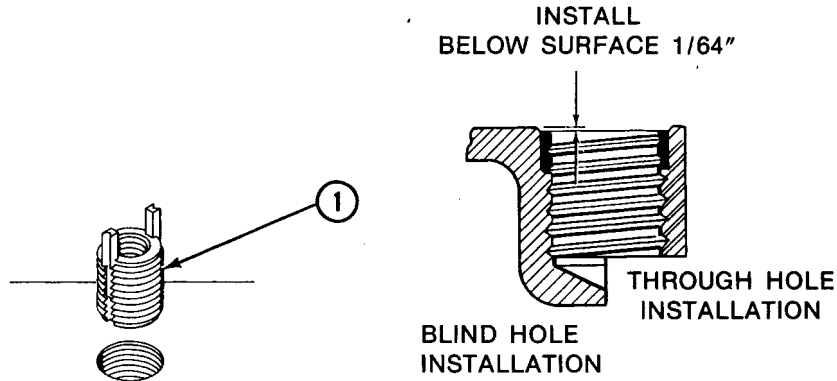


3. WITH ALL KEYS BROKEN OFF, REMOVE INSERT (1). DISCARD INSERT.



INSTALLATION

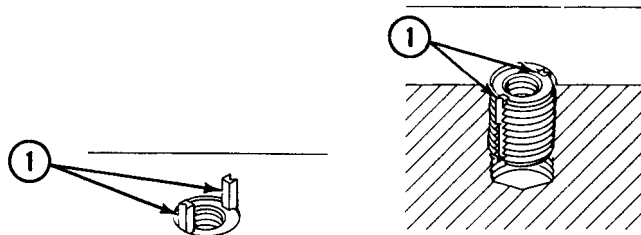
1. INSTALL NEW INSERT (1) TO DIMENSION SHOWN.



CAUTION

Take care not to break keys.

2. DRIVE KEYS (1) FLUSH WITH SURROUNDING SURFACE.



KEY-LOCKED SCREW INSERT DATA

| Internal Thread Size | Part Number/NSN | Removal Drill | | Application |
|----------------------|---------------------------------------|---------------|-------------|--|
| | | Diameter | Depth | |
| 3/8-16UNJC-3B | MS51813-104 5340-01-066-2840 | .469 (15/32) | .187 (3/16) | Air Cleaner Mtg Provisions |
| 5/8-18UNF-3B | 7771298-2 (19207) 5340-00-016-0025 | .781 (25/32) | .188 (3/16) | Suspension Installation Hull Bolted Subassy |
| 3/4-16UNF-3B | 7771298-3 (19207) 5340-00-111-7360 | .969 (31/32) | .313 (5/16) | Suspension Installation Hull Bolted Subassy |

END OF TASK

REPLACE PRESSNUT

0034 00

THIS WORK PACKAGE COVERS:

Removal (page 0034 00-1).
 Installation (page 0034 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10
 Metal Worker 44B10

Tools and Special Tools

General mechanic's tool kit: automotive
 (WP 0046 00, Item 54)
 Trailer mounted welding shop (WP 0046 00, Item 60)
 Portable electric drill, 1/2 inch (WP 0046 00, Item 6)
 Twist drill set, 1/16 to 1/2 inch, round shank
 (WP 0046 00, Item 9)

References

TM 9-2350-366-10-1
 TM 9-237

Materials/Parts

Pressnut

Equipment Condition

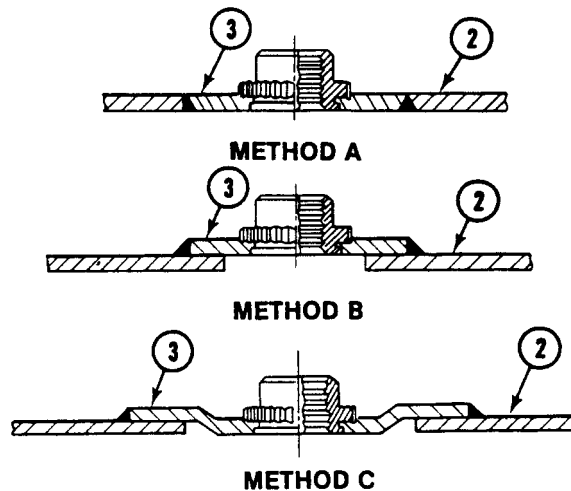
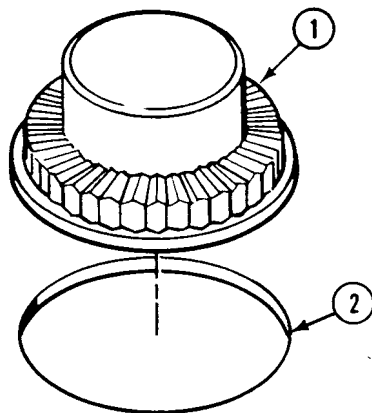
Engine stopped (TM 9-2350-366-10-1)
 Vehicle blocked (TM 9-2350-366-10-1)

REMOVAL

NOTE

Pressnuts which are loose or have unrepairable damaged threads shall be replaced using the procedure below.

1. REMOVE PRESSNUT (1) BY PRESSING OUT.
2. ENLARGE THE HOLE IN THE PARENT MATERIAL (2) TO ACCOMMODATE METHOD A, B, OR C REPAIR OPTIONS.

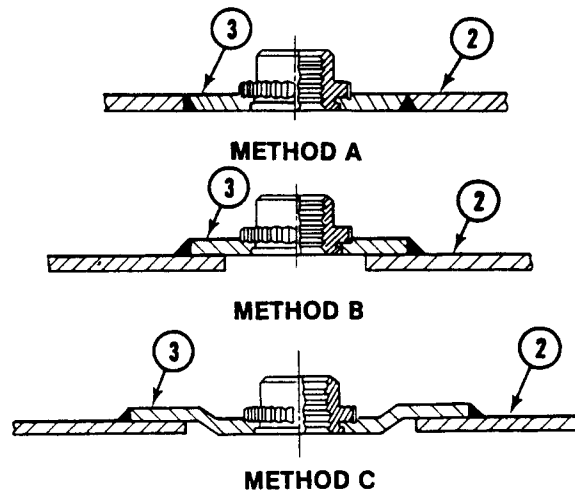


3. IF REQUIRED: FORM A PIECE OF MATERIAL (3) TO FILL OR COVER THE HOLE IN PARENT MATERIAL (2) (SAME THICKNESS AND MATERIAL AS PARENT MATERIAL).

NOTE

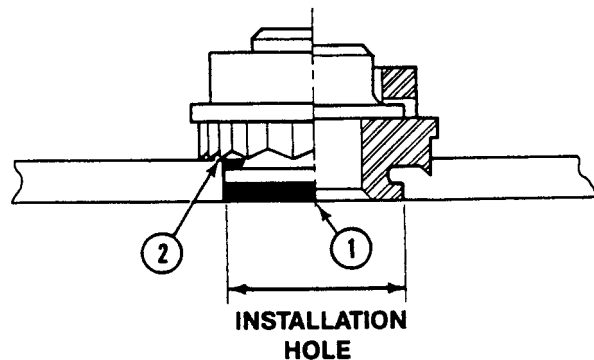
If replacing pressnuts in the driver's floor plate, install pressnut into formed material, then weld formed material to floor plate in accordance with method C. Use floor plate cover for template.

4. IF REQUIRED: WELD FORMED PIECE OF MATERIAL (3) IN PLACE IN ACCORDANCE WITH TM 9-237.



INSTALLATION

1. IF REQUIRED: DRILL OR PUNCH HOLE (1) OF PROPER SIZE IN NEW REPAIRED MATERIAL. SEE TABLE BELOW.



2. DO NOT CHAMFER, BREAK OR DEBURR EDGES OF HOLE ON ENTERING SIDE (2). INSTALLATION SHOULD ALWAYS BE MADE ON THE EXIT SIDE ON THE PUNCHED HOLES.
3. DRIVE NEW PRESSNUT WITH APPROPRIATE DRIVE TOOL TO PROPERLY SET PRESSNUT IN REPAIRED MATERIAL.

PRESSNUT TECHNICAL DATA

| Part Number/NSN | Hole Diameter | Minimum Material Thickness | Application |
|-----------------------------|----------------------|-----------------------------------|---|
| 7341627 5310-00-982-3356 | 3/8 | 1/16 | Fuel Control Installation |
| 7341628 5310-00-758-1900 | 3/8 | 1/16 | Engine Coolant Heater Instl Heater Compartment |
| 7341632 5310-00-073-0131 | 1/2 | 1/8 | Metal Grill Fan Mounting Engine Coolant Mtg Provisions Driver's Floor Plate |

END OF TASK

CHAPTER 13

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR TOOLS AND TEST EQUIPMENT

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|--|---------------------|
| TEST LOAD POWER PLANT SLING..... | 0035 00 |
| REPAIR POWER PLANT SLING..... | 0036 00 |
| ADJUST ENGINE AND TRANSMISSION STAND..... | 0037 00 |
| SERVICE ENGINE AND TRANSMISSION STAND..... | 0038 00 |
| REPAIR ENGINE AND TRANSMISSION STAND..... | 0039 00 |

TEST LOAD POWER PLANT SLING

0035 00

THIS WORK PACKAGE COVERS:

Test and Inspection (page 0035 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

General mechanic's tool kit: automotive
(WP 0046 00, Item 54)

Lifting device with rated lift capability of at least
6600 lb (2997 kg)

References

TB 43-0142

Materials/Parts

Cotter pin

Suitable weight of 3000 lb (1362 kg)

Suitable weight of 1500 lb (681 kg) (2)

Equipment Condition

Power plant sling repaired and inspected (TB 43-0142)

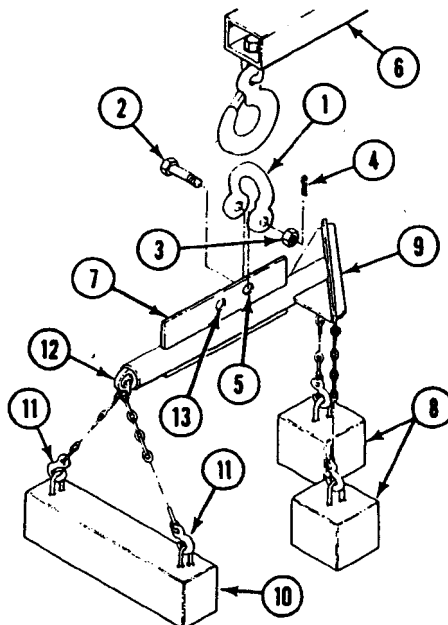
TEST AND INSPECTION

NOTE

All fabricated weights and available items used for load testing must be verified for proper weight by use of a calibrated scale.

Cross beam legs should hold vertical loads and two legs at tip of beam should hold horizontal load at 60 degree angle.

1. INSTALL MAIN LIFTING SHACKLE (1), SCREW (2), NUT (3), AND NEW COTTER PIN (4) IN HOLE (5).
2. ATTACH LIFTING DEVICE (6) TO SHACKLE (1) AND RAISE SLING (7).



3. ATTACH 1,500-POUND WEIGHTS (8) TO EACH CROSSBEAM LEG (9) AND ATTACH 3,000-POUND WEIGHT (10) TO TWO LEGS (11) AT TIP OF BEAM (12).

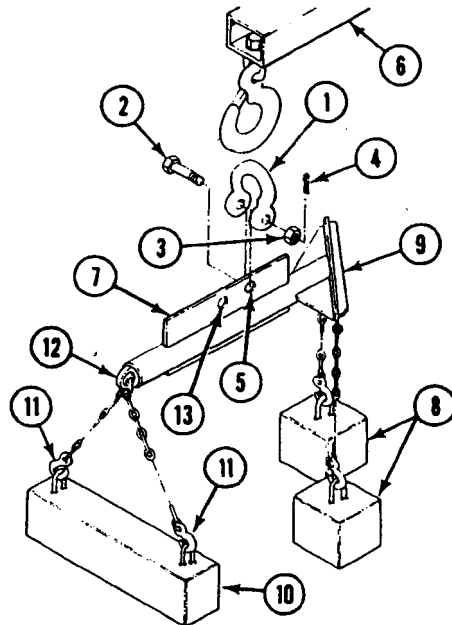
WARNING



Hanging loads, heavy parts, and overhead equipment can fall unexpectedly and kill or injure you.

Stay clear of hanging loads, heavy parts, and overhead equipment. Use correct lifting devices. Always have helper guide heavy parts and equipment.

4. RAISE SLING (7) AND WEIGHTS (8) AND (10) UNTIL WEIGHTS CLEAR 6 TO 12 INCHES FROM SURFACE.
5. ALLOW SLING (7) TO SUPPORT WEIGHTS (8) AND (10) FOR A MINIMUM OF 10 MINUTES.
6. INSPECT SLING FOR DISTORTION. See TB 43-0142.
7. LOWER SLING (7) TO RELIEVE WEIGHTS (8) AND (10). REPEAT INSPECTION OF ANY AREAS OF DISTORTION FOUND IN Step 6. NO PERMANENT DISTORTION IS ALLOWED.
8. REMOVE COTTER PIN (4), NUT (3), SCREW (2), AND SHACKLE (1) FROM HOLE (5). DISCARD COTTER PIN.
9. REPEAT Step 1 FOR SECOND HOLE (13).
10. REPEAT Steps 4 - 7.
11. REMOVE WEIGHTS (8) AND (10) FROM SLING (7).
12. REMOVE SHACKLE (1) FROM LIFTING DEVICE (6).



END OF TASK

REPAIR POWER PLANT SLING

0036 00

THIS WORK PACKAGE COVERS:

- Remove Leg Assembly (page 0036 00-1).
- Install Leg Assembly (page 0036 00-2).
- Repair Chain Links (page 0036 00-2).
- Repair Hooks (page 0036 00-3).
- Replace Data Plate (page 0036 00-3).
- Repair Beam Assembly (page 0036 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10
Metal Worker 44B10

Tools and Special Tools

Metal worker's tool kit (WP 0046 00, Item 55)
Trailer mounted welding shop (WP 0046 00, Item 60)

References

TM 9-237
TB 43-0142

Materials/Parts

Inspection penetrant (WP 0048 00, Item 10)
Sealing compound (WP 0048 00, Item 15)
Data plate
Drive screw (4)

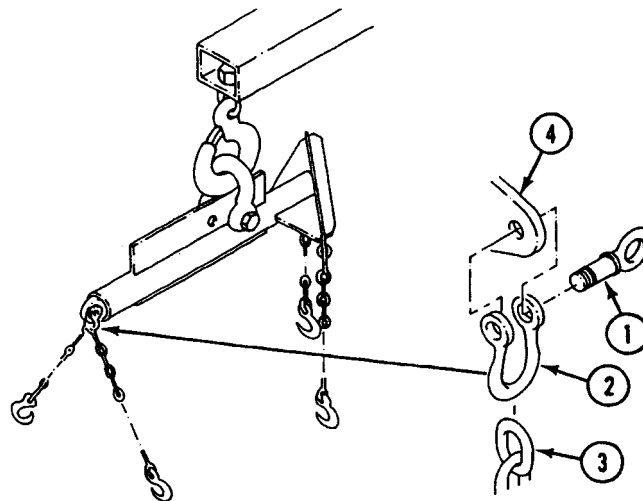
Equipment Condition

Power plant sling inspected - periodic (TB 43-0142)

REPAIR OR REPLACEMENT

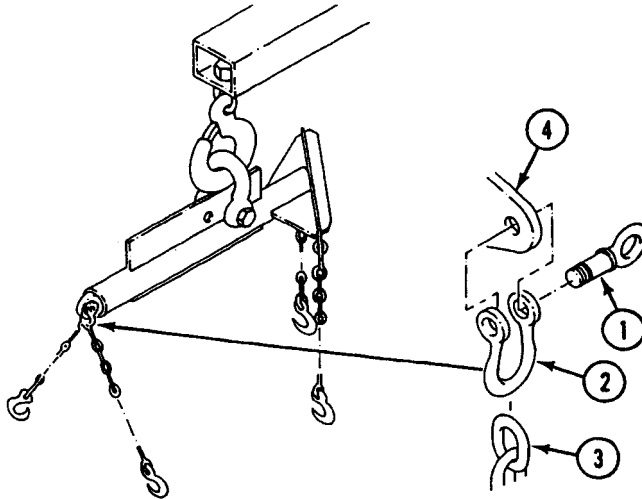
REMOVE LEG ASSEMBLY

1. REMOVE PIN (1) FROM SHACKLE (2).
2. REMOVE CHAIN (3) FROM SHACKLE (2).



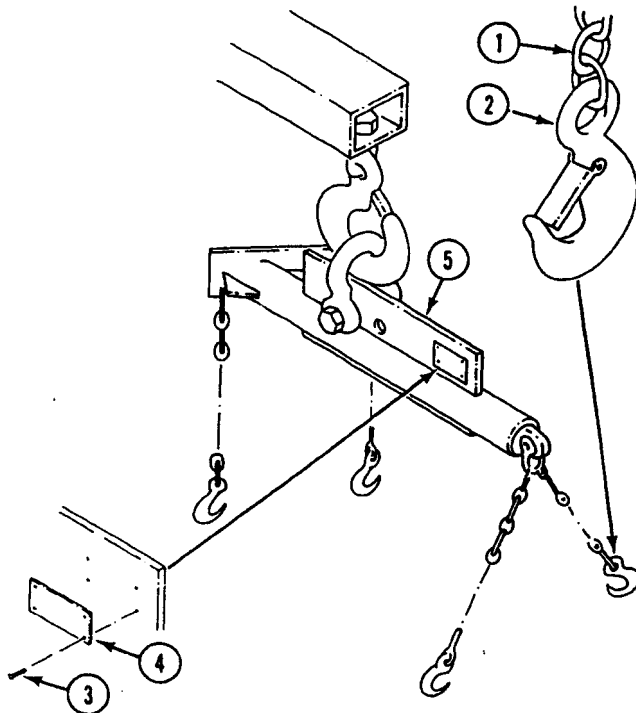
INSTALL LEG ASSEMBLY

1. POSITION CHAIN (3) OVER SHACKLE (2).
2. ADD SEALING COMPOUND TO THREADS ON PIN (1).
3. INSTALL PIN (1) IN SHACKLE (2). HOOK SHOULD POINT AWAY FROM SUPPORT BEAM (4).



REPAIR CHAIN LINKS

1. REPAIR CHAIN LINKS (1) BY DRAW FILING TO BLEND OUT NICKS. DO NOT EXCEED WEAR LIMITS FOR THE SIZE LINK USED: 3/64 INCH (.234 CM) DIAMETER FOR 9/32 INCH CHAIN AND 5/64 INCH (.296 CM) DIAMETER FOR 3/8 INCH CHAIN.



REPAIR HOOKS

1. REPAIR CRACKS, NICKS, AND GOUGES ON HOOKS (2) BY FILING OR GRINDING LONGITUDINALLY, FOLLOWING CONTOUR OF HOOK, PROVIDED NO DIMENSION IS REDUCED MORE THAN 10% OF ITS ORIGINAL VALUE.
2. PERFORM DIE-PENETRANT INSPECTION TO ENSURE REPAIR OF CRACKS HAS BEEN COMPLETED.

REPLACE DATA PLATE

1. REMOVE FOUR DRIVE SCREWS (3) FROM DATA PLATE (4). REMOVE DATA PLATE. DISCARD PLATE AND SCREWS.

NOTE

To order a new data plate, provide Depot with the same information contained on the original data plate: Contract Number, Serial Number, Date of Manufacture, Maximum Work Load, Proof Load, National Stock Number, Part Number, and Commercial and Government Entity Code.

2. LOCATE NEW DATA PLATE (4) IN SAME LOCATION. USE THE DATA PLATE AS A TEMPLATE TO DRILL FOUR MOUNTING HOLES 3/64 TO 1/16 INCH DIAMETER AND 5/32 INCH DEEP MINIMUM.
3. INSTALL FOUR NEW DRIVE SCREWS (3) ON DATA PLATE (4).

REPAIR BEAM ASSEMBLY

1. REPAIR CRACKED OR TORN WELDS BY MACHINING OR GRINDING THE DEFECTIVE BEAM ASSEMBLY (5) TO APPROXIMATELY 1.0 INCH BEYOND THE DEFECT. MINIMUM ROOT DIMENSION SHOULD BE 1/16 INCH RADIUS. THE BASE METAL IS ALUMINUM, CLASS 5083-H32. USE GAS METAL-ARC WELDING PROCESS (GMAW) AND ANSI/AWS A5.10, CLASS 5356 ELECTRODE, WELD SIZE 1/4 INCH MINIMUM IAW MIL-W-45305, CLASS A.
2. INSPECT BEAM ASSEMBLY (5) FOR UNDERCUT, OVERLAP, SURFACE CAVITIES, SURFACE CRACKS IN WELD METAL, OR IN HEAT-AFFECTED ZONE OF BASE METAL, AND LACK OF WELD PENETRATION DEFECTS.

END OF TASK

ADJUST ENGINE AND TRANSMISSION STAND

0037 00

THIS WORK PACKAGE COVERS:

Adjustment (page 0037 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

References

TM 9-2350-366-20-1

Tools and Special Tools

General mechanic's tool kit: automotive
(WP 0046 00, Item 54)
Engine and transmission sling (WP 0046 00, Item 46)
Lifting device with rated lift capability of at least
2,750 lb (1,249 kg)

Equipment Condition

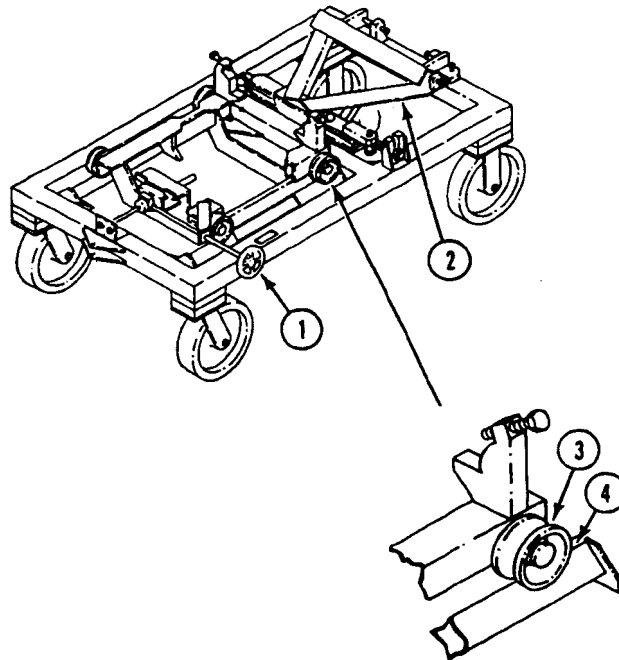
Engine and transmission stand blocked
Power plant removed from vehicle
(TM 9-2350-366-20-1)

Personnel Required

Track Vehicle Repairer 63H10

ADJUSTMENT

1. TURN HAND WHEEL (1) CLOCKWISE (TO THE RIGHT) TOWARD TRANSMISSION SUPPORT (2) UNTIL ENGINE SUPPORT WHEELS (3) ARE AGAINST STOPS (4).

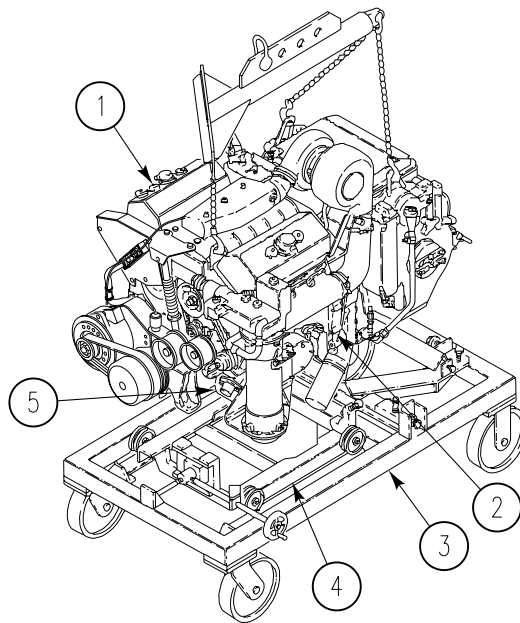


WARNING

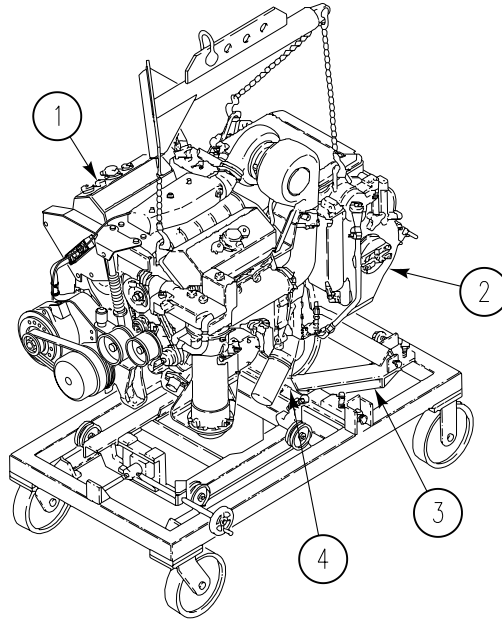
Hanging loads, heavy parts, and overhead equipment can fall unexpectedly and kill or injure you.

Stay clear of hanging loads, heavy parts, and overhead equipment. Use correct lifting devices. Always have helper guide heavy parts and equipment.

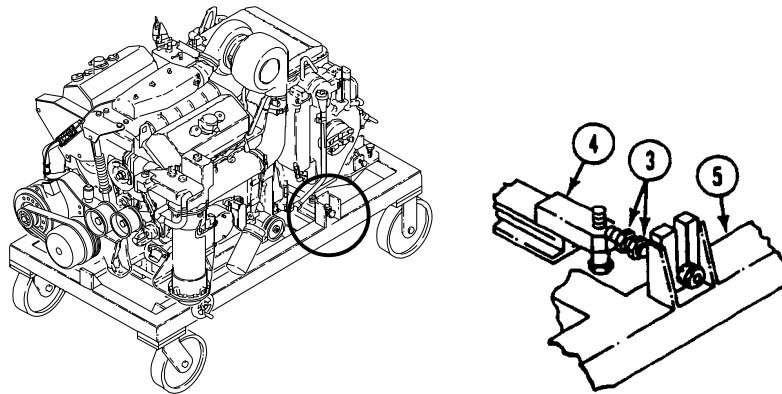
2. SLOWLY LOWER POWER PLANT (1) DOWN ON ENGINE AND TRANSMISSION STAND (3). MAKE SURE THAT HOSES AND HARNESSSES DO NOT GET PINCHED OR CRUSHED AS POWER PLANT IS PLACED ON POWER PLANT STAND.
3. POSITION ENGINE SO EDGE OF ENGINE OIL PAN (5) AND EACH SIDE OF ENGINE FLYWHEEL HOUSING (2) ARE SEATED COMPLETELY ON ENGINE SUPPORT (4).



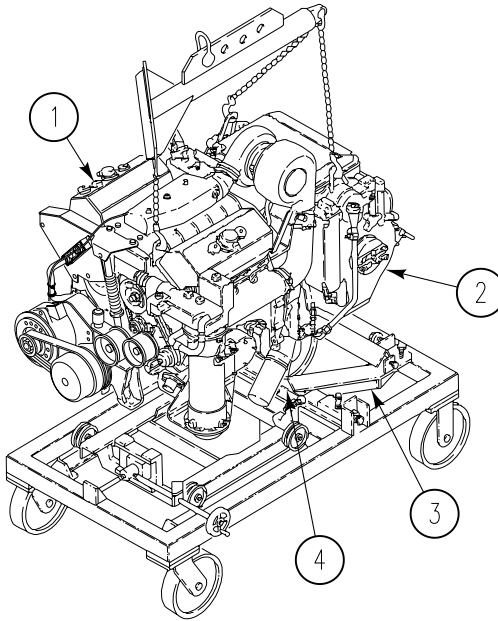
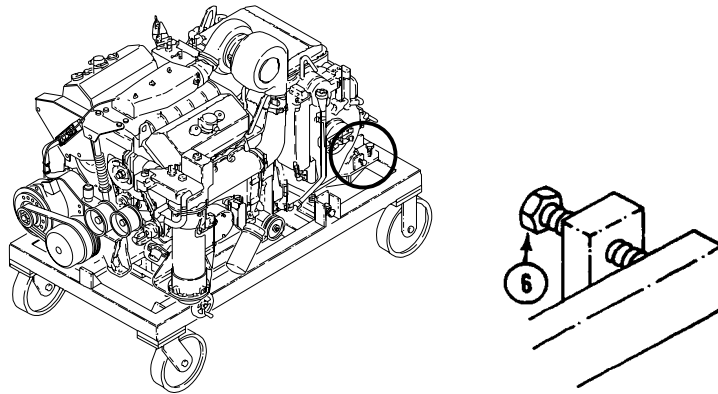
4. THE LOWER REAR SIDE OF THE TRANSMISSION SHOULD BE AGAINST EDGE OF TRANSMISSION SUPPORT STOP (4).
5. RELEASE ALL TENSION ON POWER PLANT SLING. REMOVE POWER PLANT SLING FROM POWER PLANT (1).



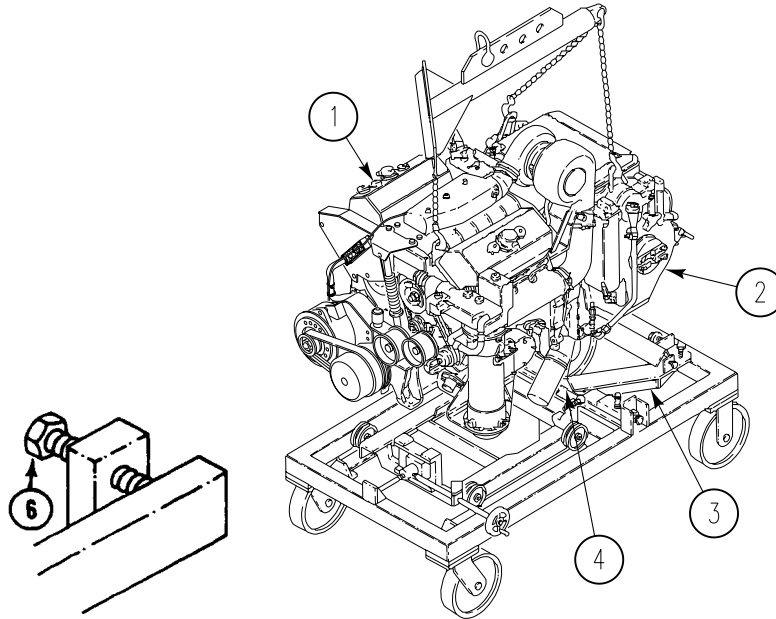
6. LOOSEN TWO JAMNUTS (3) SECURING BEAM ASSEMBLY (4) TO MAIN FRAME (5).



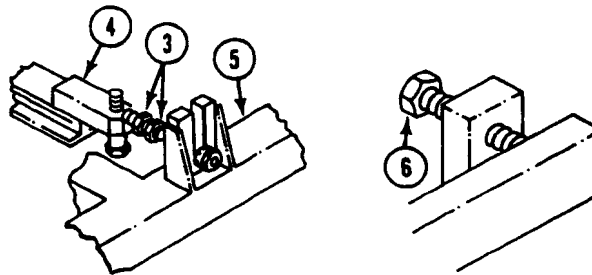
7. LOOSEN TWO SCREWS (6) THAT HOLD TRANSMISSION SUPPORT (3).



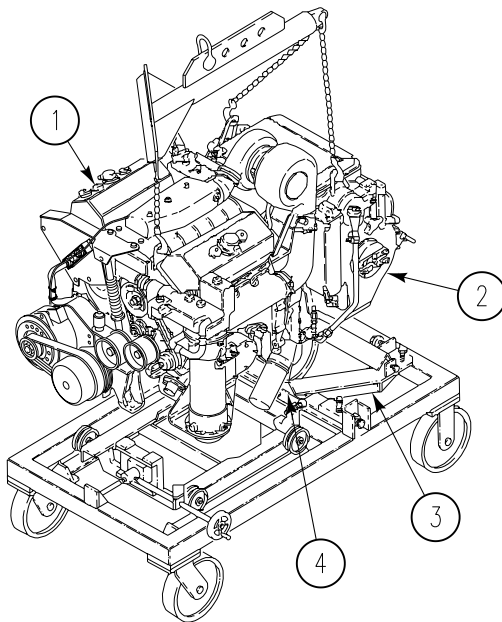
8. TURN EACH LEVELING SCREW (6) UNTIL TRANSMISSION SUPPORT (3) IS SUPPORTING BOTTOM OF TRANSMISSION (2). ALL THREE CONTACT POINTS OF ENGINE SUPPORT SHOULD STILL BE SUPPORTING ENGINE.



9. TIGHTEN TWO JAMNUTS (3) TO SECURE BEAM ASSEMBLY (4). TIGHTEN TWO SCREWS (6) SECURING TRANSMISSION SUPPORT (3) EVENLY.



10. IF TRANSMISSION (2) SHIFTS UP OR DOWN WHEN SEPARATED FROM ENGINE, IT WILL BE NECESSARY TO ADJUST TRANSMISSION SUPPORT (3) TO ALLOW TRANSMISSION SPLINE COUPLING TO MATE WITH ENGINE SPLINED COUPLING. REPEAT Steps 6 - 9.



11. ADJUST TRANSMISSION TO KEEP TRANSMISSION LEVEL WITH ENGINE DURING DISASSEMBLY AND ASSEMBLY.

END OF TASK

SERVICE ENGINE AND TRANSMISSION STAND

0038 00

THIS WORK PACKAGE COVERS:

Servicing (page 0038 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

Lubricating kit (WP 0046 00, Item 34)

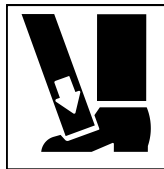
Materials/Parts

Automotive grease (WP 0048 00, Item 3)

Engine oil (WP 0048 00, Item 6)

SERVICING

WARNING

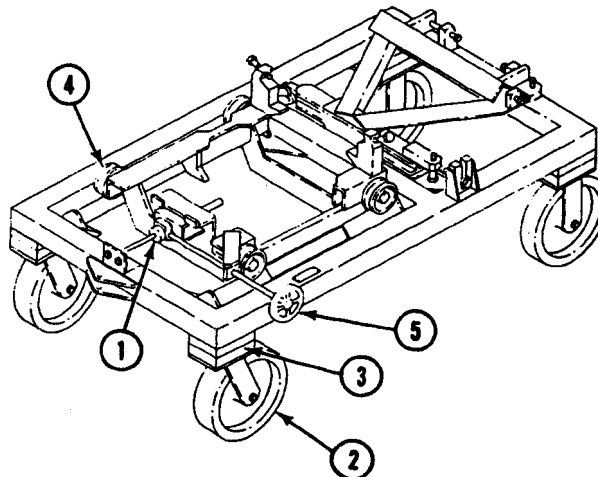


Engine support could fall and injure you. Make sure to secure engine support to main frame before towing, lifting or transporting engine stand.

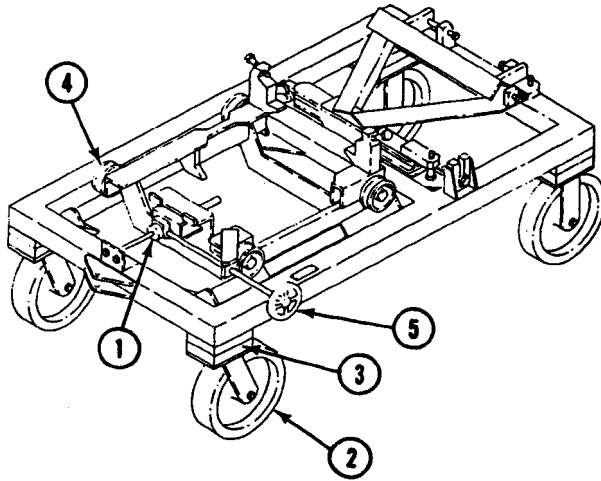
CAUTION

Engine stand jack screw could be damaged if the two screws and nuts attaching jack screw to main frame are not removed. Remove screws and nuts before towing, lifting or transporting an empty engine stand.

1. EXTEND JACK SCREW (1) AND CLEAN EXPOSED THREADS AND ALL LUBRICATION FITTINGS.



2. APPLY GREASE TO LUBRICATION FITTINGS ON CASTER WHEELS (2), CASTERS (3), VEE WHEELS (4), AND JACK SCREW (1). REMOVE EXCESS GREASE.
3. APPLY LUBRICATING OIL TO HANDWHEEL TUBE (5) AT BUSHING POINT.



END OF TASK

REPAIR ENGINE AND TRANSMISSION STAND

0039 00

THIS WORK PACKAGE COVERS:

- Replace Caster Assembly (page 0039 00-2).
- Replace Engine Support Vee Wheels (page 0039 00-3).
- Replace Jack Screw (page 0039 00-5).
- Replace Beam Assembly Bearing (page 0039 00-9).
- Replace Data Plate (page 0039 00-12).
- Repair by Welding (page 0039 00-12).

INITIAL SETUP:

Maintenance Level

Direct Support

Materials/Parts

- Automotive grease (WP 0048 00, Item 3)
- Bearing
- Cotter pin
- Cotter pin (8)
- Drive screw (4)
- Headless pin (2)
- Lockwasher (4)
- Locknut
- Locknut
- Locknut
- Locknut (2)
- Locknut (4)
- Wooden block (2 x 4)

Tools and Special Tools

- General mechanic's tool kit: automotive (WP 0046 00, Item 54)
- Trailer mounted welding shop (WP 0046 00, Item 60)
- Lubricating kit (WP 0046 00, Item 34)
- Retaining ring pliers, internal (WP 0046 00, Item 37)
- Arbor press (WP 0046 00, Item 40)
- Trestle (WP 0046 00, Item 57)
- Open end wrench, 1-5/16 x 1-1/2 (WP 0046 00, Item 63)
- Socket wrench set, 3/4 inch drive (WP 0046 00, Item 68)

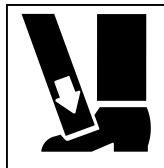
Personnel Required

- Track Vehicle Repairer 63H10
- Welder 44B10

References

TM 9-237

WARNING



Engine support could fall and injure you. Make sure to secure engine support to main frame before towing, lifting or transporting engine stand.

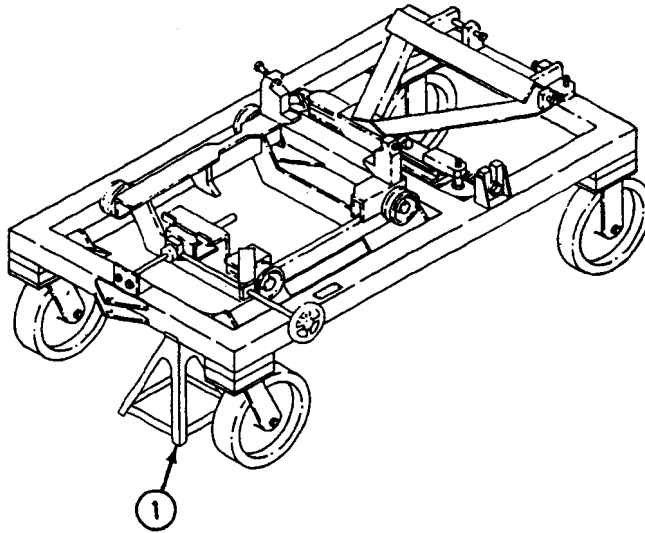
CAUTION

Engine stand jack screw could be damaged if the two screws and nuts attaching jack screw to main frame are not removed. Remove screws and nuts before towing, lifting or transporting an empty engine stand.

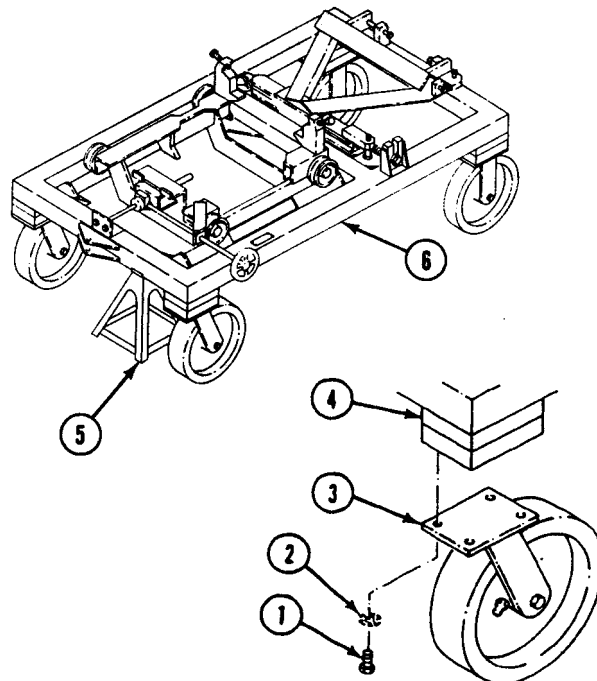
REPAIR OR REPLACEMENT

REPLACE CASTER ASSEMBLY

1. RAISE CORNER OF STAND AND INSTALL A TRESTLE (1).

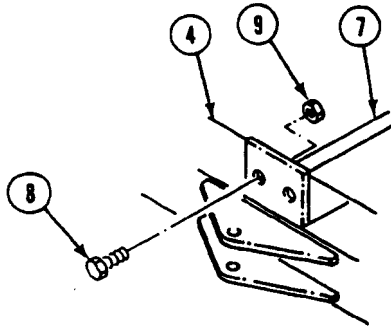


2. REMOVE FOUR SCREWS (1), LOCKWASHERS (2), AND CASTER ASSEMBLY (3) FROM MAIN FRAME (4). DISCARD LOCKWASHERS.
3. PLACE CASTER (3) ON MAIN FRAME (4) AND INSTALL FOUR SCREWS (1) AND NEW LOCKWASHERS (2).
4. LUBRICATE CASTER (3). USE AUTOMOTIVE GREASE.
5. REMOVE TRESTLE (5) AND LOWER STAND (6).

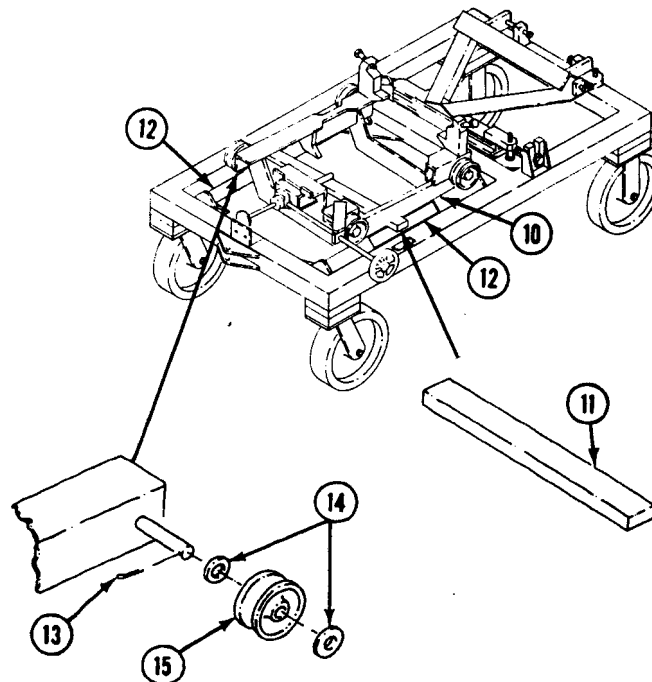


REPLACE ENGINE SUPPORT VEE WHEELS

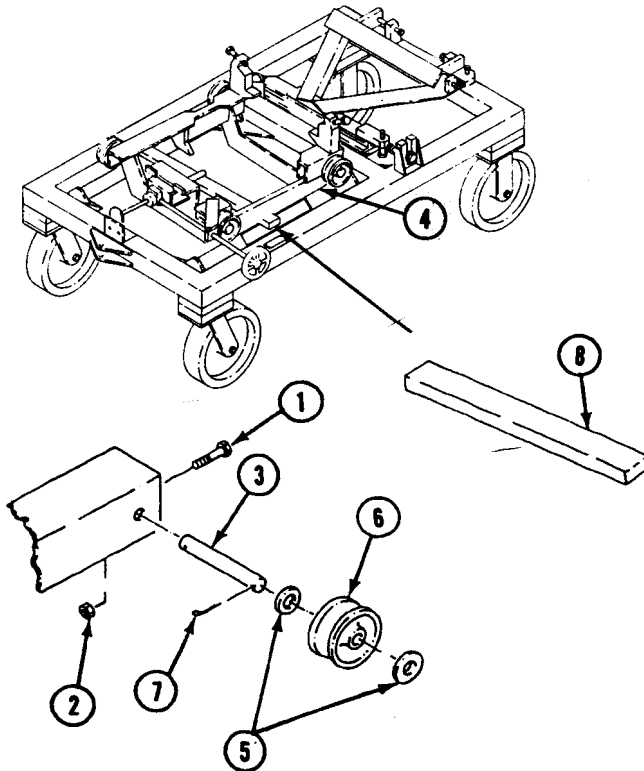
1. RETRACT JACK SCREW (7).
2. REMOVE TWO SCREWS (8) AND LOCKNUTS (9) SECURING JACK SCREW (7) TO MAIN FRAME (4). DISCARD LOCKNUTS.



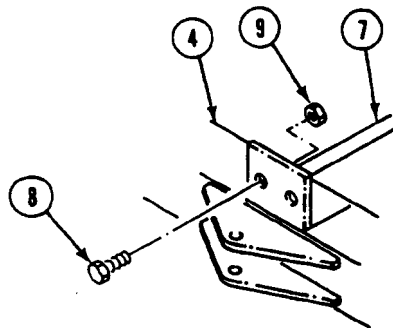
3. RAISE SUPPORT (10) AND INSTALL WOODEN 2 X 4 (11) BETWEEN FRAME RAILS (12). REST SUPPORT ON 2 X 4.
4. REMOVE COTTER PIN (13), WASHER (14), VEE WHEEL (15), AND WASHER (14). DISCARD COTTER PIN.



5. REMOVE SCREW (1), LOCKNUT (2) AND AXLE (3) FROM SUPPORT (4). DISCARD LOCKNUT.
6. INSTALL AXLE (3), SCREW (1), AND NEW LOCKNUT (2).
7. INSTALL WASHER (5), VEE WHEEL (6), WASHER (5), AND NEW COTTER PIN (7).
8. LUBRICATE VEE WHEEL (6). USE AUTOMOTIVE GREASE.
9. RAISE SUPPORT (4), REMOVE 2 X 4 (8), AND LOWER WHEELS (6) ONTO TRACK.

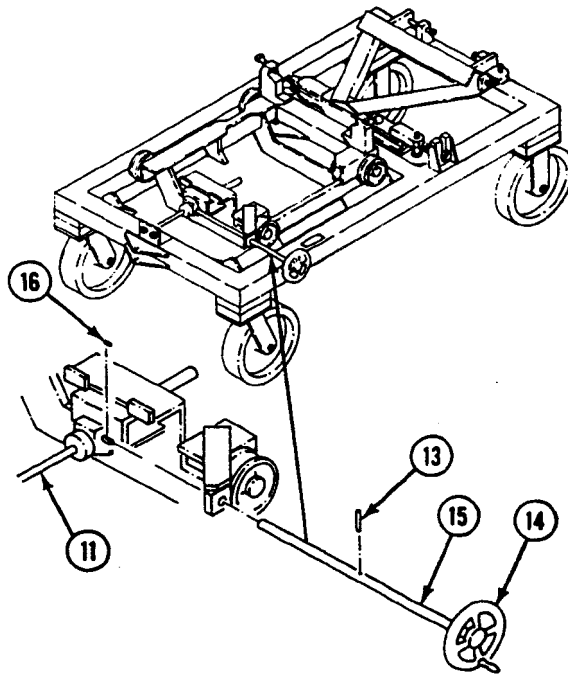


10. INSTALL TWO SCREWS (8) AND NEW LOCKNUTS (9) SECURING JACK SCREW (7) TO MAIN FRAME (4).



REPLACE JACK SCREW

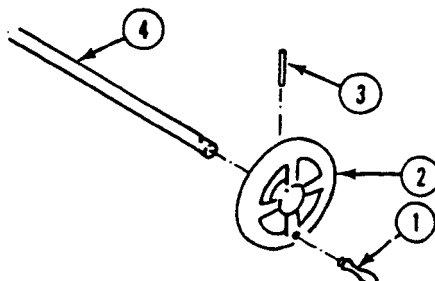
1. RETRACT JACK SCREW (11). DOWEL PIN BEHIND BRACKET BUSHING SHOULD BE HORIZONTAL AND KEYWAY IN END OF HANDWHEEL TUBE POINTING UP.
2. DRIVE OUT PIN (13). DISCARD PIN.
3. REMOVE HANDWHEEL (14) AND TUBE (15). BE CAREFUL NOT TO LOSE KEY (16).



NOTE

If handwheel or tube requires replacement, go to Step 4, if not, go to Step 7.

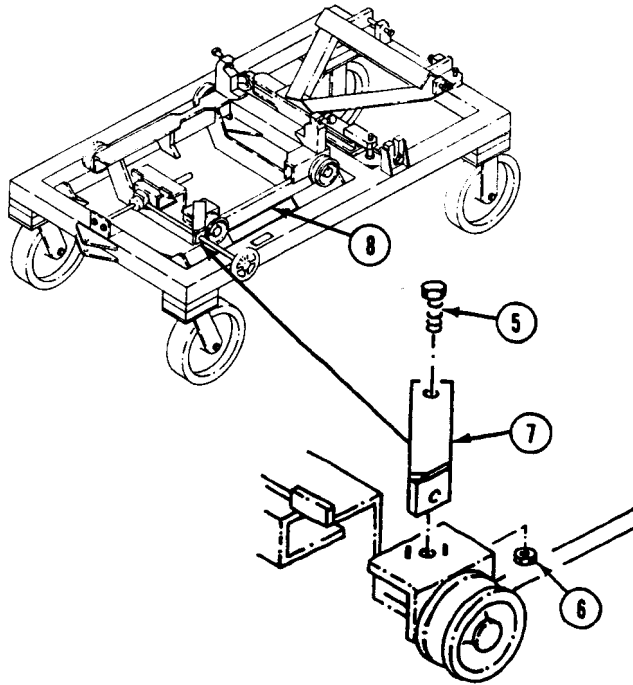
4. REMOVE HANDLE (1) FROM HANDWHEEL (2).
5. DRIVE OUT PIN (3) FROM HANDWHEEL (2). DISCARD PIN.
6. INSTALL HANDWHEEL (2) ON TUBE (4). ALIGN DOWEL HOLES AND INSTALL NEW PIN (3).



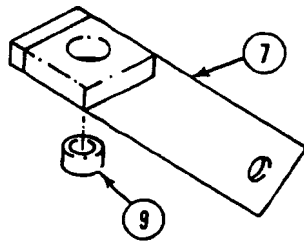
NOTE

If handwheel bushing requires replacement, go to Step 7. If not, go to Step 11.

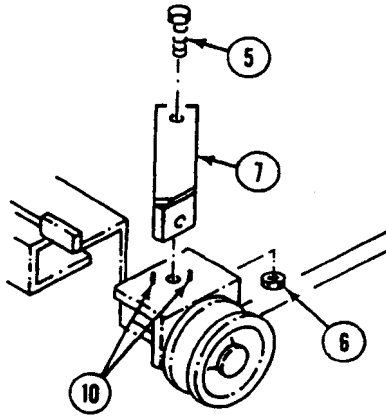
7. REMOVE SCREW (5), LOCKNUT (6), AND BRACKET (7) FROM ENGINE SUPPORT (8). DISCARD LOCKNUT.



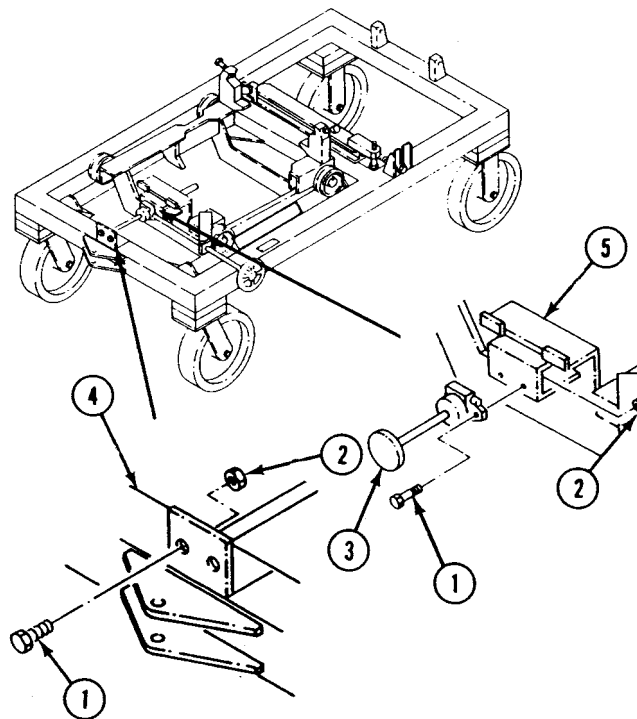
8. PLACE BRACKET (7) IN PRESS AND PUSH OUT BUSHING (9). NOTE WHICH SIDE OF BRACKET BUSHING FLANGE WAS ON.
9. PRESS NEW BUSHING (9) INTO BRACKET (7).



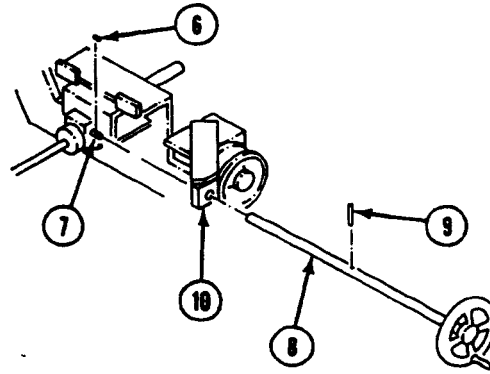
10. PLACE BRACKET (7) OVER DOWELS (10) AND INSTALL SCREW (5) AND NEW LOCKNUT (6).



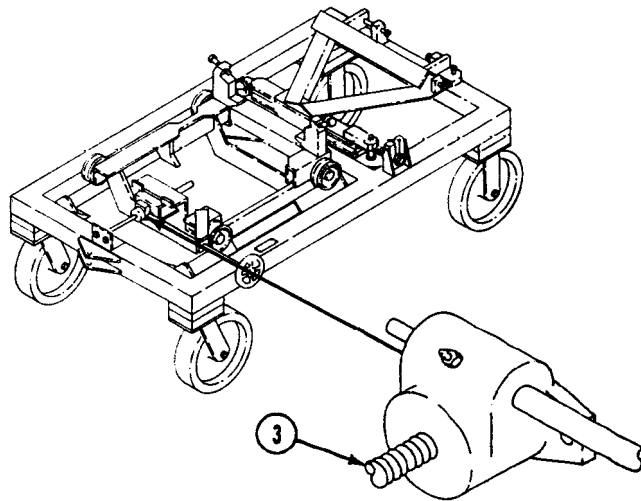
11. REMOVE FOUR SCREWS (1), LOCKNUTS (2), AND JACK SCREW (3) FROM MAIN FRAME (4) AND ENGINE SUPPORT (5). DISCARD LOCKNUTS.
12. PLACE NEW JACK SCREW (3) ON ENGINE SUPPORT (5) AND MAIN FRAME (4). INSTALL FOUR SCREWS (1) AND NEW LOCKNUTS (2).



13. INSTALL KEY (6) INTO JACK SCREW KEYWAY (7).
14. INSTALL HANDWHEEL TUBE (8).
15. INSTALL NEW PIN (9) BEHIND BRACKET BUSHING (10).

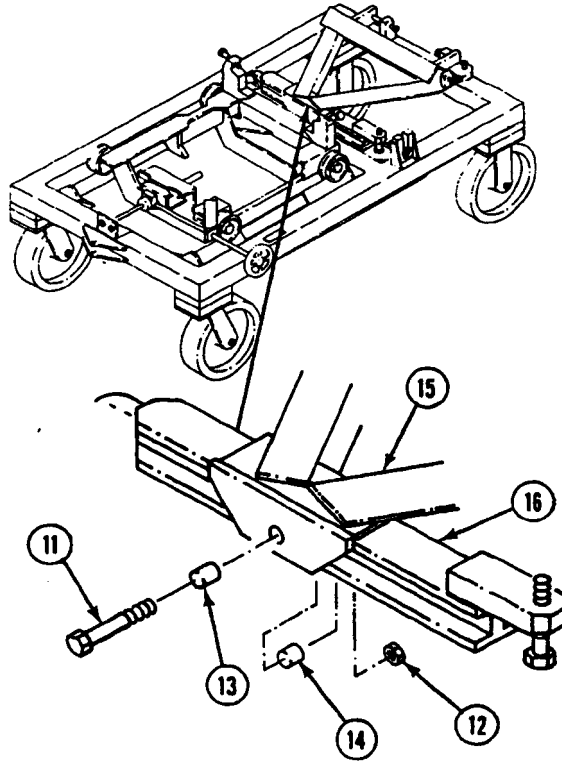


16. LUBRICATE JACK SCREW (3). USE AUTOMOTIVE GREASE.

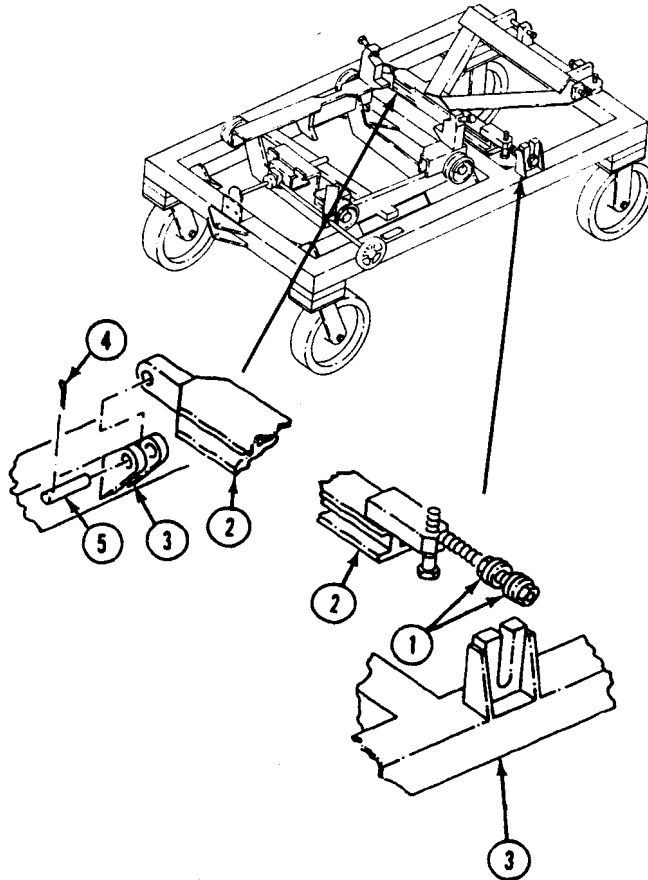


REPLACE BEAM ASSEMBLY BEARING

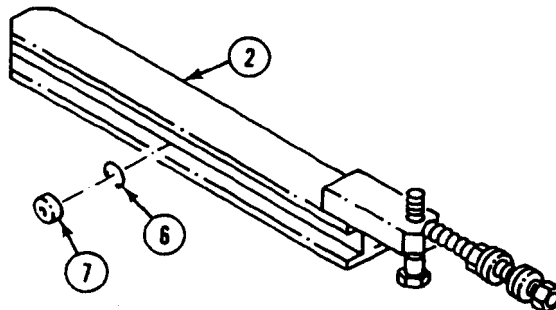
1. REMOVE SCREW (11), LOCKNUT (12), LONG SPACER (13), SHORT SPACER (14) AND TRANSMISSION SUPPORT (15) FROM BEAM ASSEMBLY (16). DISCARD LOCKNUT.



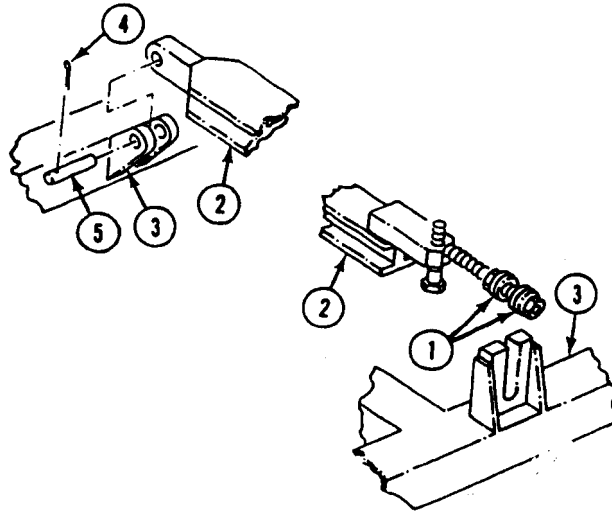
2. LOOSEN TWO JAM NUTS (1) SECURING BEAM ASSEMBLY (2) TO MAIN FRAME (3).
3. REMOVE COTTER PIN (4), HEADLESS PIN (5), AND BEAM ASSEMBLY (2) FROM MAIN FRAME (3). DISCARD COTTER PIN.



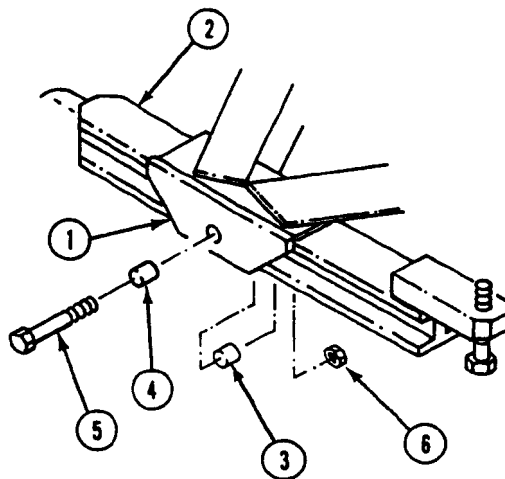
4. PLACE BEAM ASSEMBLY (2) ON WORKBENCH.
5. REMOVE RETAINING RING (6) SECURING BEARING (7).
6. PUSH BEARING (7) OUT OF BEAM ASSEMBLY (2).
7. INSTALL NEW BEARING (7).
8. INSTALL RETAINING RING (6) ON BEAM ASSEMBLY (2).



9. INSTALL BEAM ASSEMBLY (2) ON MAIN FRAME (3) WITH HEADLESS PIN (5) AND NEW COTTER PIN (4).
10. TIGHTEN JAM NUTS (1).

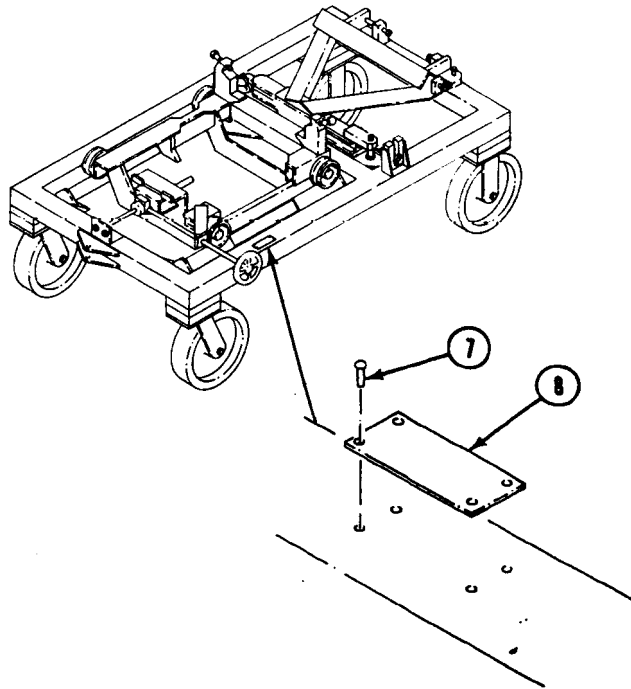


11. POSITION TRANSMISSION SUPPORT (1) ON BEAM ASSEMBLY (2). INSTALL SHORT SPACER (3), BEAM ASSEMBLY, LONG SPACER (4), SCREW (5), AND NEW LOCKNUT (6) ON TRANSMISSION SUPPORT.



REPLACE DATA PLATE

1. REMOVE FOUR DRIVE SCREWS (7).
2. LOCATE NEW DATA PLATE (8) IN SAME AREA. USING PLATE AS A TEMPLATE, DRILL FOUR MOUNTING HOLES $3/64-1/16$ INCH DIAMETER.
3. INSTALL FOUR NEW DRIVE SCREWS (7).

**REPAIR BY WELDING**

1. WELD IN ACCORDANCE WITH TM 9-237 USING GAS TUNGSTEN-ARC WELDING (GTAW) PROCESS, SHIELDED METAL-ARC WELDING (SMAW) PROCESS OR GAS METAL-ARC WELDING (GMAW) PROCESS.
2. MATERIAL: BAR AND PLATE HOT-ROLLED CARBON STEEL AISI 1020; TUBING ASTM-A501, ANGLE ASTM-A36.

END OF TASK

CHAPTER 14

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR SPECIAL PURPOSE KITS

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|---------------------------------------|---------------------|
| INSTALL PERSONNEL HEATER KIT..... | 0040 00 |
| REPAIR PERSONNEL HEATER ASSEMBLY..... | 0041 00 |

INSTALL PERSONNEL HEATER KIT

0040 00

THIS WORK PACKAGE COVERS:

Installation (page 0040 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

Automotive fuel and electrical system repair tool kit
(WP 0046 00, Item 520)
Hacksaw frame (WP 0046 00, Item 16)

Materials/Parts

Adhesive (WP 0048 00, Item 1)
Hacksaw blade (WP 0048 00, Item 8)

Personnel Required

Fuel and Elec Sys Rep 63G10

Equipment Condition

Engine stopped (TM 9-2350-366-10-1)
Vehicle blocked (TM 9-2350-366-10-1)
Battery ground strap disconnected
(TM 9-2350-366-20-1)
Power plant rear access panels removed
(TM 9-2350-366-20-1)
Floor plates removed (TM 9-2350-366-20-1)
Both main fuel tank shut-off valves off
(TM 9-2350-366-10-1)

References

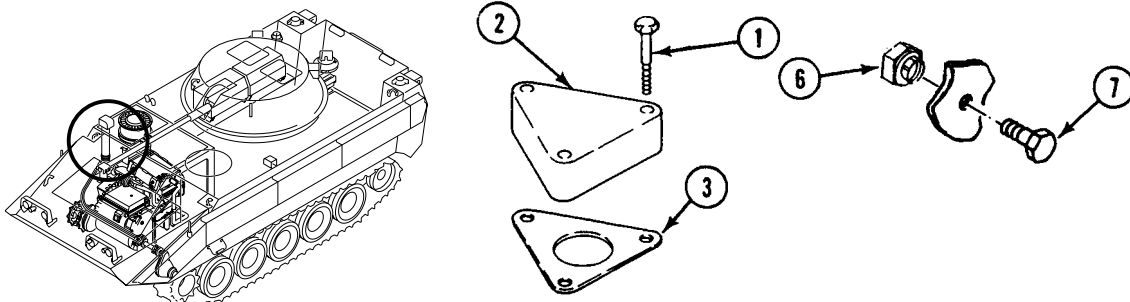
TM 9-2350-366-10-1
TM 9-2350-366-20-1

INSTALLATION

NOTE

Flareless (compression) fittings are used on fuel lines. When these fittings are first installed, a sleeve is crimped on the tube or hose end. Consequently, when tubes or hoses are replaced, new fitting sleeves are required.

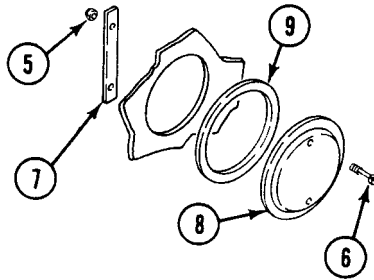
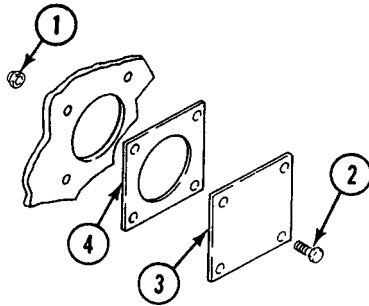
1. REMOVE SIX SCREWS (1), TWO COVER PLATES (2), AND TWO GASKETS (3) FROM TOP OF VEHICLE. DISCARD COVER PLATES AND GASKETS.
2. REMOVE SIX LOCKNUTS (6) AND SCREWS (7) FROM TRANSVERSE BEAM AND ENGINE COMPARTMENT BULKHEAD. RETAIN FOUR LOCKNUTS AND SCREWS.



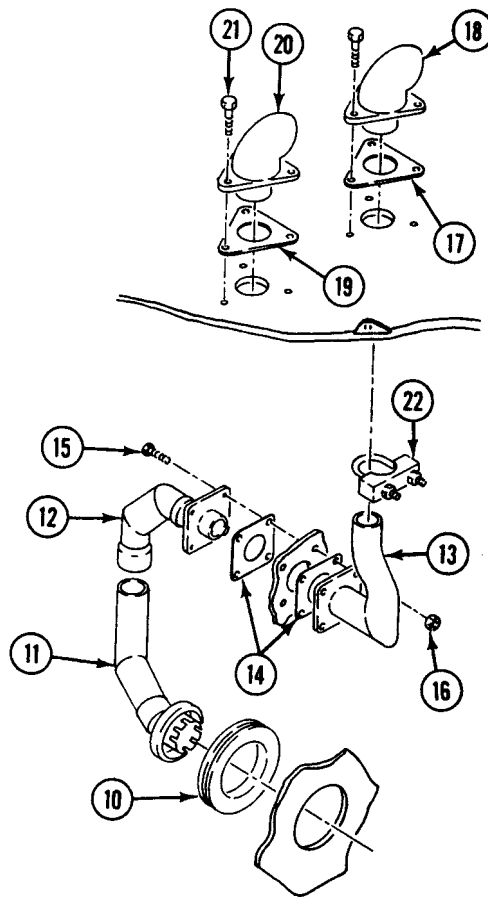
INSTALL PERSONNEL HEATER KIT — Continued

0040 00

3. REMOVE FOUR LOCKNUTS (1), SCREWS (2), COVER (3), AND GASKET (4) FROM ENGINE COMPARTMENT BULKHEAD. RETAIN FOUR LOCKNUTS. DISCARD SCREWS, COVER, AND GASKET.
4. REMOVE TWO LOCKNUTS (5), SCREWS (6), RETAINER (7), COVER (8), AND GASKET (9) FROM ENGINE COMPARTMENT BULKHEAD. DISCARD LOCKNUTS, SCREWS, RETAINER, COVER AND GASKET.



5. INSTALL GROMMET (10) IN POWER PLANT BULKHEAD.
6. INSTALL EXHAUST PIPE (11) IN GROMMET (10).
7. INSTALL EXHAUST PIPE (12) ON EXHAUST PIPE (11).
8. SECURE TWO EXHAUST PIPES (12) AND (13) AND TWO GASKETS (14) TO POWER PLANT BULKHEAD WITH FOUR SCREWS (15) AND RETAINED LOCKNUTS (16).
9. INSTALL GASKET (17) ON EXHAUST ELBOW (18) AND INSERT ELBOW THROUGH TOP DECK INTO EXHAUST PIPE (13).
10. INSTALL GASKET (19) ON INTAKE ELBOW (20) AND POSITION ELBOW THROUGH TOP DECK OPENING.
11. SECURE EXHAUST AND INTAKE ELBOWS (18) AND (20) TO TOP DECK WITH SIX SCREWS (21).
12. SECURE EXHAUST PIPE (13) TO ELBOW (18) WITH LOOP CLAMP (22).

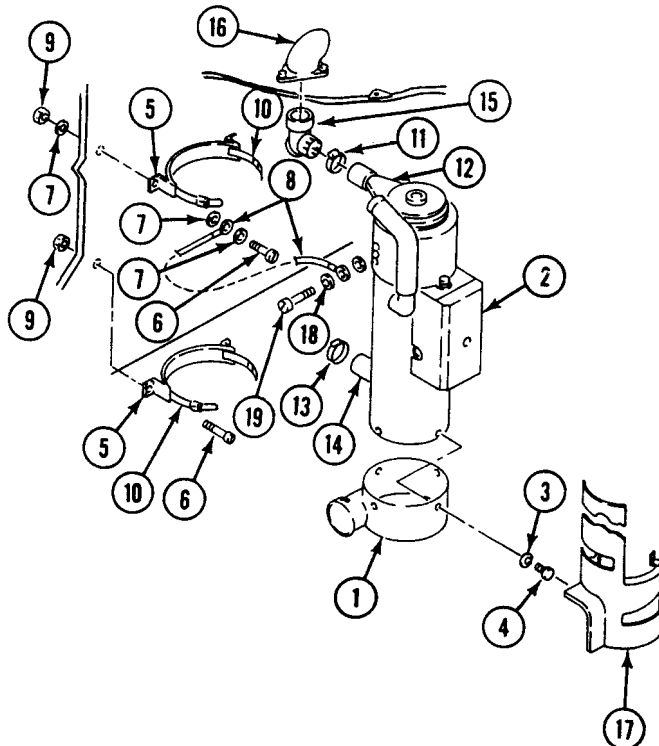


13. SECURE PLENUM (1) TO HEATER (2) WITH FOUR LOCKWASHERS (3) AND SCREWS (4).

NOTE

Four locknuts and screws were previously removed and retained, however, screw that secures ground strap is supplied in the personnel heater kit.

14. SECURE TWO SADDLES (5) TO POWER PLANT BULKHEAD WITH FOUR RETAINED SCREWS (6), THREE LOCKWASHERS (7), GROUND STRAP (8), AND FOUR RETAINED LOCKNUTS (9).
15. INSTALL TWO CLAMPS (10) IN TWO SADDLES (5).
16. POSITION CLAMP (11) ON HEATER INTAKE PORT (12) AND CLAMP (13) ON HEATER EXHAUST PIPE (14). DO NOT TIGHTEN.
17. INSTALL ELBOW (15) IN HEATER INTAKE PIPE (12) AND INTAKE ELBOW (16).
18. ALIGN INLET ELBOW (15) WITH INTAKE ELBOW (16) AND EXHAUST PORT (14) WITH EXHAUST PIPE IN VEHICLE. PLACE HEATER (2) AND SHIELD (17) AGAINST SADDLES (5).
19. WHILE STILL SUPPORTING HEATER, DOUBLE CHECK FOR PROPER MATING OF HEATER EXHAUST PORT (14) AND EXHAUST PIPE IN CARRIER. TIGHTEN SADDLE CLAMPS (10).
20. INSTALL GROUND STRAP (8) ON HEATER (2) WITH LOCKWASHER (18) AND SCREW (19). DISCARD EXISTING SCREW AND USE SCREW PROVIDED IN KIT.
21. TIGHTEN CLAMP (13) ON HEATER EXHAUST PORT (14) AND EXHAUST PIPE IN VEHICLE.
22. TIGHTEN CLAMP (11) ON HEATER INTAKE PIPE (12).

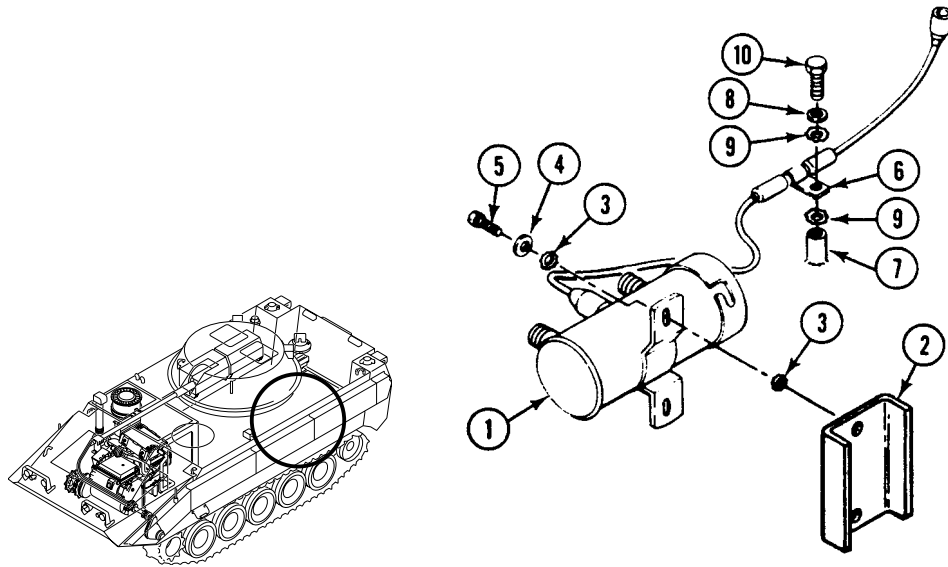


23. SECURE FUEL PUMP (1) TO THREADED BRACKET (2) WITH FOUR LOCKWASHERS (3), TWO WASHERS (4), AND SCREWS (5).

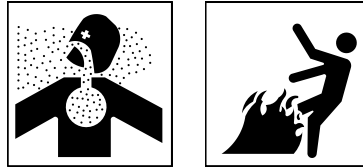
NOTE

Shielded lead must be secured to weld nut to ensure proper grounding and operation of fuel pump.

24. SECURE SHIELDED LEAD (6) TO WELD NUT (7) WITH WASHER (8), TWO LOCKWASHERS (9), AND SCREW (10).



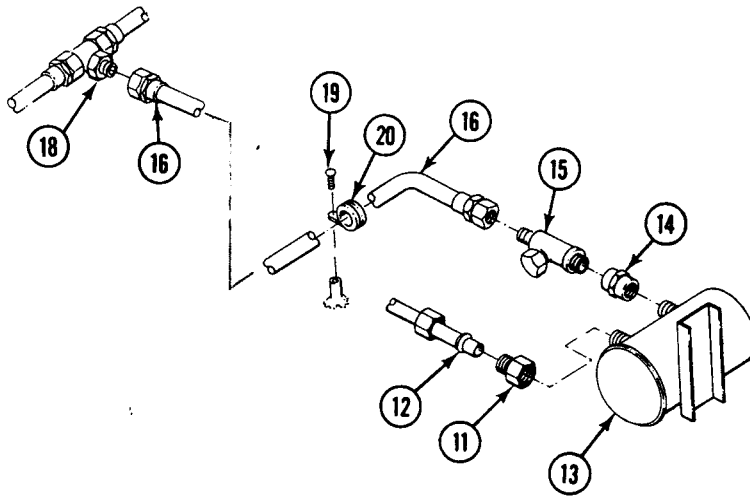
25. INSTALL ADAPTER (11) ON HOSE END (12).
26. INSTALL PERSONNEL HEATER FUEL HOSE (12) ON OUTLET SIDE OF FUEL PUMP (13).

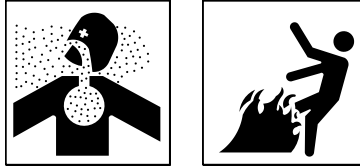
WARNING

Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

Always use in well ventilated areas, away from heat, sparks, and flames. Do not breathe fumes. Do not allow into contact with skin and eyes. Use goggles or face shield and protective gloves.

27. APPLY A THIN COAT OF ADHESIVE TO EXTERNAL TAPERED THREADS OF FITTINGS.
28. INSTALL COUPLING (14) ON INLET SIDE OF FUEL PUMP (13).
29. INSTALL TEE (15) ON COUPLING (14).
30. SECURE PERSONNEL HEATER FUEL HOSE (16) TO TEE (15).

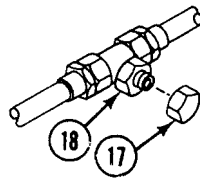


WARNING

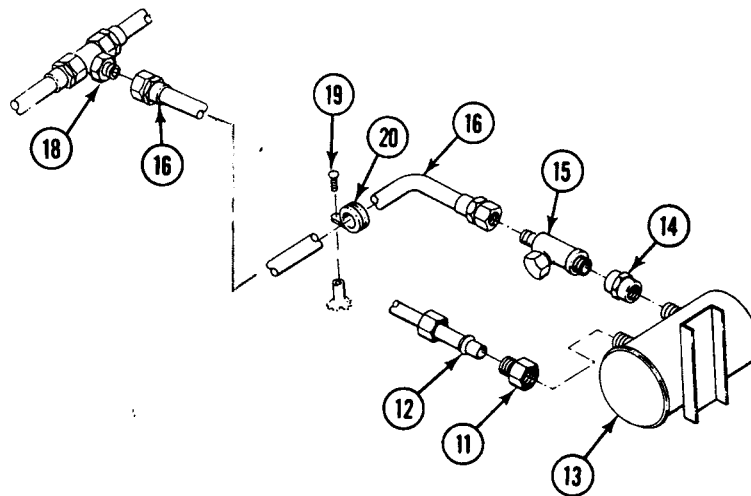
Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

Always use in well ventilated areas, away from heat, sparks, and flames. Do not breathe fumes. Do not allow into contact with skin and eyes. Use goggles or face shield and protective gloves.

31. APPLY A THIN COAT OF ADHESIVE TO CLEAN EXTERNAL TAPERED THREADS OF FITTINGS.
32. REMOVE CAP (17) FROM REDUCER (18).



33. SECURE PERSONNEL HEATER FUEL HOSE (16) TO REDUCER (18).
34. REMOVE SCREW (19) FROM WELD NUT.
35. INSTALL CLAMP (20) ON HOSE (16). SECURE CLAMP (20) TO WELD NUT ON HULL WITH SCREW (19).

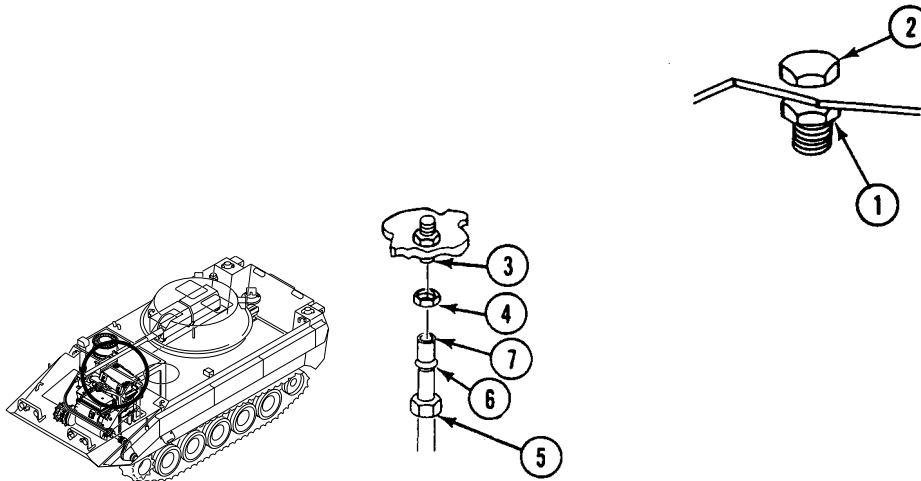


36. REMOVE LOCKNUT (1) AND SCREW (2) FROM CROSS MEMBER. DISCARD LOCKNUT AND SCREW.

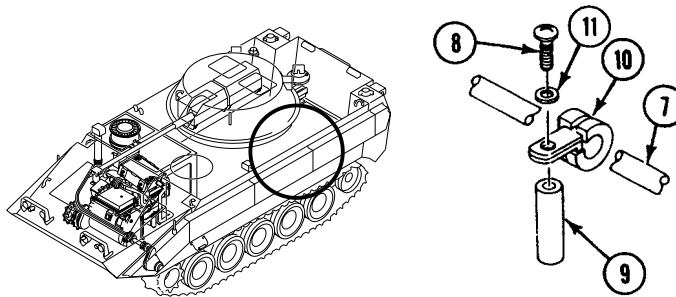
NOTE

Remove both nuts, sleeves, and locknut prior to installing nipple through cross member.

37. INSTALL NIPPLE BODY (3) THROUGH CROSS MEMBER AND SECURE WITH LOCKNUT (4).
 38. INSTALL NUT (5) AND SLEEVE (6) ON HOSE END (7).
 39. SECURE PERSONNEL HEATER FUEL HOSE (7) TO NIPPLE BODY (3).



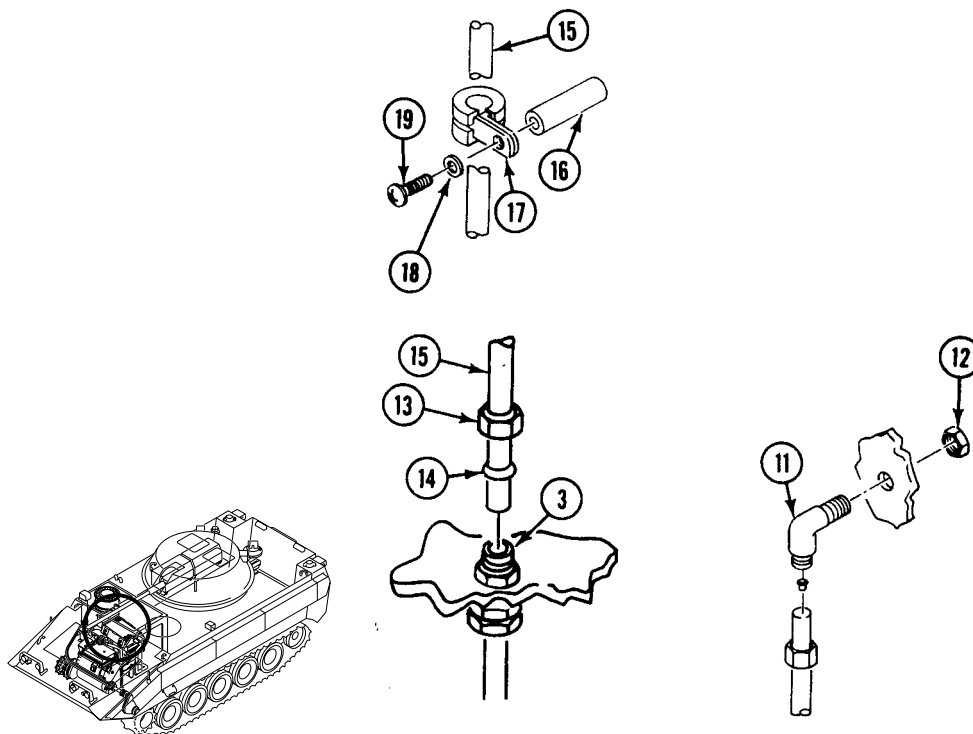
40. REMOVE EIGHT SCREWS (8) FROM EIGHT WELD NUTS (9).
 41. SECURE PERSONNEL HEATER FUEL HOSE (7) TO EIGHT WELD NUTS (9) WITH EIGHT WASHERS (11), SCREWS (8) AND CLAMPS (10).



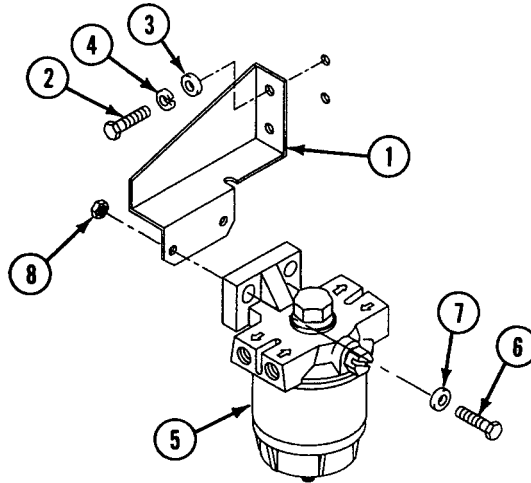
NOTE

Disassemble elbow assembly before installing through bulkhead.

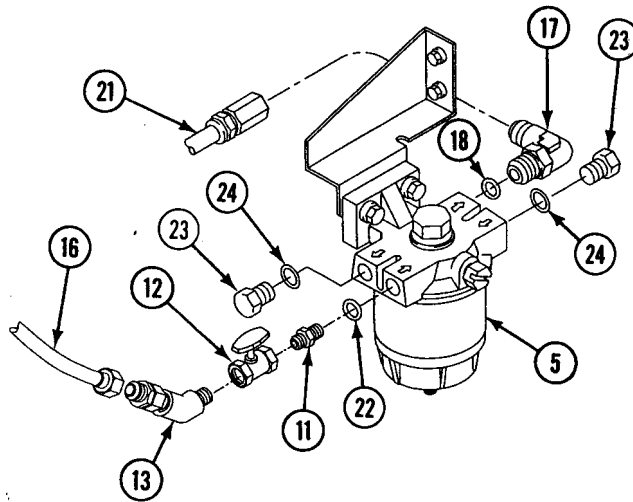
42. APPLY A THIN COAT OF ADHESIVE TO CLEAN EXTERNAL TAPERED THREADS OF FITTINGS.
43. SECURE ELBOW (11) TO POWER PLANT BULKHEAD WITH LOCKNUT (12).
44. INSTALL NUT (13) AND SLEEVE (14) ON TUBE (15).
45. SECURE TUBE (15) TO NIPPLE BODY (3).
46. SECURE TUBE (15) TO ELBOW (11).
47. SECURE TUBE (15) TO WELD NUT (16) WITH CLAMP (17), WASHER (18), AND SCREW (19).



48. INSTALL FUEL FILTER BRACKET (1) IN HULL WITH TWO SCREWS (2), WASHERS (3), AND LOCKWASHERS (4).
49. INSTALL FUEL FILTER (5) IN BRACKET (1), WITH PORT 4 FACING HULL. SECURE WITH TWO SCREWS (6), WASHERS (7), AND NEW LOCKNUTS (8).



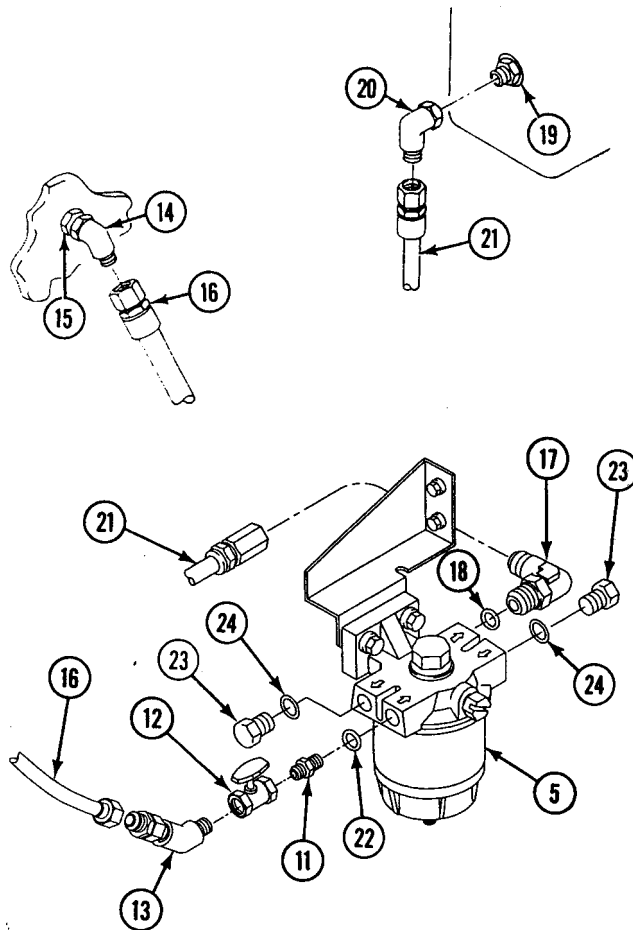
50. INSTALL VALVE (12) ON ADAPTER (11) WITH VALVE KNOB ON TOP.
51. APPLY SEALANT TO CLEAN EXTERNAL TAPERED THREADS OF ELBOW (13). INSTALL ELBOW (13) IN VALVE (12), ADAPTER (11), AND NEW PACKING (22) IN PORT 4 OF FUEL FILTER (5).



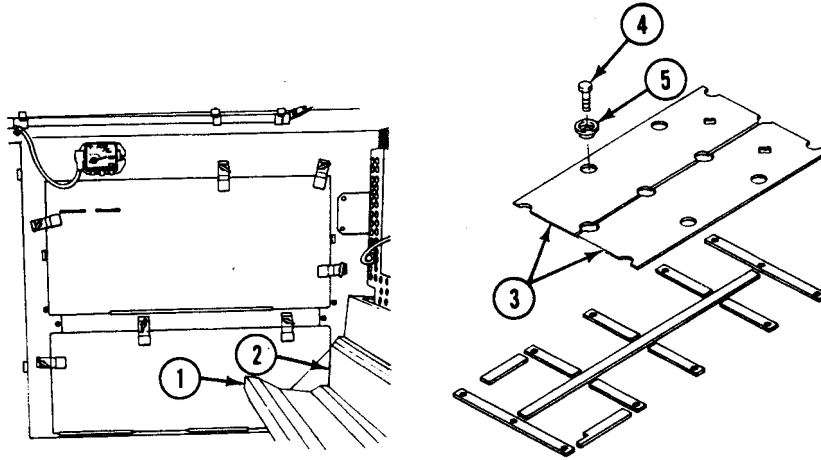
INSTALL PERSONNEL HEATER KIT — Continued

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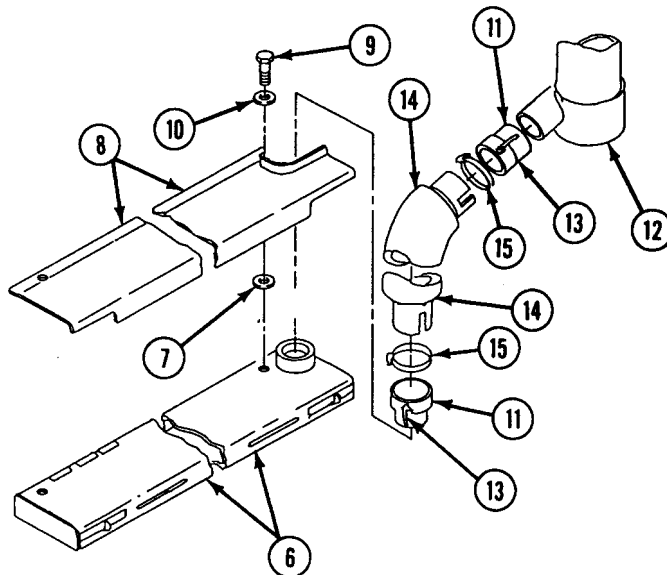
52. INSTALL ELBOW (14) ON ELBOW (15) ON ENGINE COMPARTMENT BULKHEAD.
53. CONNECT INLET FUEL HOSE (16) TO ELBOW (13) AND ELBOW (14).
54. INSTALL TWO PLUGS (23) AND NEW PACKINGS (24) IN PORTS 2 AND 3 OF FUEL FILTER (5).
55. INSTALL ELBOW (17) AND NEW PACKING (18) IN PORT 4 OF FUEL FILTER (5).
56. APPLY SEALANT TO CLEAN EXTERNAL THREADS OF FITTINGS. INSTALL NIPPLE (19) IN PERSONNEL HEATER AND INSTALL ELBOW (20) ON NIPPLE WITH ELBOW FACING DOWN.
57. CONNECT HEATER INLET FUEL LINE (21) TO ELBOW (20) AND ELBOW (17).



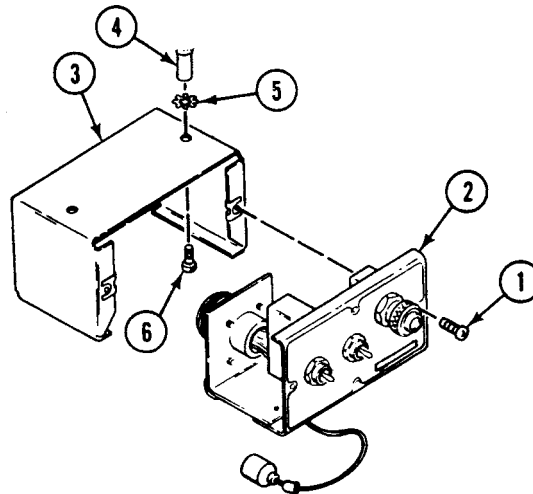
58. IF REQUIRED, USE A HACKSAW TO TRIM ENDS OF PERSONNEL SEAT (1) AND SEAT BACK (2), SO HEATER HOSE MAY BE INSTALLED.
59. SECURE LEFT AND RIGHT FLOOR PLATES (3) TO HULL CROSS MEMBERS WITH SEVEN SCREWS (4) AND WASHERS (5).



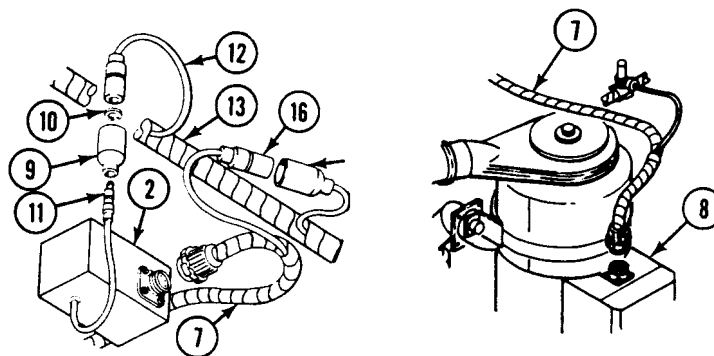
60. ALIGN HEATER DUCT (6), THREE INSULATION WASHERS (7), AND SHIELD (8) WITH FRONT THREE HOLES IN FLOOR PLATES. SECURE WITH THREE NEW SCREWS (9) AND WASHERS (10) FROM KIT.
61. SECURE ONE NIPPLE (11) TO PLENUM (12) WITH LATCH (13).
62. SECURE ONE NIPPLE (11) TO DUCT (6) WITH LATCH (13).
63. SECURE HOSE (14) TO TWO NIPPLES (11) WITH TWO CLAMPS (15).



64. REMOVE TWO SCREWS (1) AND CONTROL BOX (2) FROM CONTROL BOX CASE (3).
65. REMOVE TWO SCREWS, NUTS, AND WASHERS SUPPLIED WITH CONTROL BOX CASE (3). DISCARD SCREWS, NUTS AND WASHERS.
66. SECURE CONTROL BOX CASE (3) TO TWO WELD NUTS (4) WITH TWO LOCKWASHERS (5) AND SCREWS (6).
67. SECURE CONTROL BOX (2) TO CONTROL BOX CASE (3) WITH TWO SCREWS (1).
68. CLEAN SMALL AREA ON HULL SUPPORT NEXT TO CONTROL BOX (2) AND APPLY WARNING DECAL. See TM 9-2350-366-20-1.



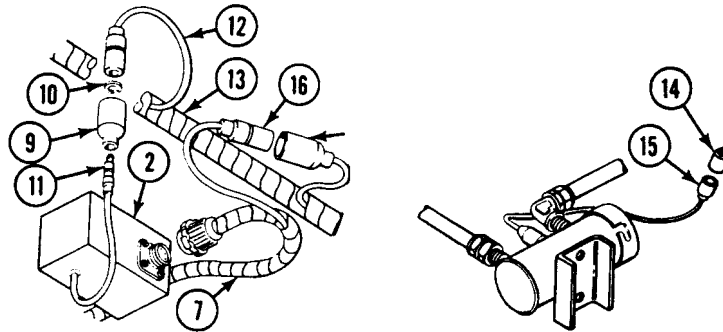
69. ROUTE PERSONNEL HEATER WIRING HARNESS (7) THROUGH TRANSVERSE BEAM FROM DRIVER'S COMPARTMENT INTO PERSONNEL COMPARTMENT.
70. CONNECT PERSONNEL HEATER WIRING HARNESS (7) TO CONTROL BOX (2).
71. CONNECT PERSONNEL HEATER WIRING HARNESS (7) TO PERSONNEL HEATER (8).
72. INSTALL SHELL (9) AND WASHER (10) ON CONTROL BOX LEAD (11).



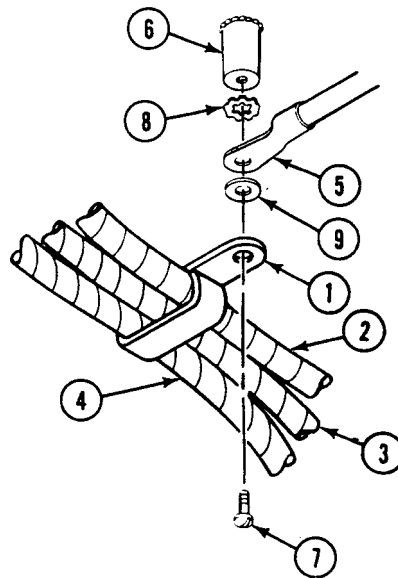
INSTALL PERSONNEL HEATER KIT — Continued

0040 00

73. CONNECT CIRCUIT 400 LEAD (12) OF REAR MAIN WIRING HARNESS (13) TO CONTROL BOX LEAD (11).
74. CONNECT CIRCUIT 402 LEAD (14) OF REAR MAIN WIRING HARNESS (13) TO FUEL PUMP LEAD (15) AND TO CONNECTOR (16) OF PERSONNEL HEATER WIRING HARNESS (7).



75. INSTALL CLAMP (1) ON BATTERY CABLE (2), RADIO CABLE (3), AND PERSONNEL HEATER WIRING HARNESS (4).
76. SECURE CLAMP (1) AND PERSONNEL HEATER WIRING HARNESS GROUND LEAD (5) TO WELD NUT (6) WITH RETAINED SCREW (7), LOCKWASHER (8), AND WASHER (9).



END OF TASK

REPAIR PERSONNEL HEATER ASSEMBLY

0041 00

THIS WORK PACKAGE COVERS:

Repair or Replacement (page 0041 00-1)

INITIAL SETUP:

Maintenance Level

Direct Support

Equipment Condition

Personnel heater assembly removed
(TM 9-2350-366-20-1)

Personnel Required

Fuel and Elec Sys Rep 63G10

References

TM 9-2540-205-24&P
TM 9-2350-366-20-1

REPAIR OR REPLACEMENT

1. REPAIR PERSONNEL HEATER ASSEMBLY. See TM 9-2540-205-24&P.

END OF TASK

CHAPTER 15

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR PRECISION INSTRUMENTS AND SYSTEMS

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|--------------------------------------|---------------------|
| REPAIR STE/ICE DISTRIBUTION BOX..... | 0042 00 |
| REPAIR STE/ICE WIRING HARNESS..... | 0043 00 |

REPAIR STE/ICE DISTRIBUTION BOX

0042 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0042 00-1).
 Assembly (page 0042 00-4).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G10

Tools and Special Tools

Automotive fuel and electrical system repair tool kit
 (WP 0046 00, Item 52)
 General mechanic's tool kit: automotive
 (WP 0046 00, Item 54)

References

TM 9-2350-366-20-1

Materials/Parts

Adhesive (WP 0048 00, Item 1)
 Lockwasher (4)
 Locknut
 Locknut (8)

Equipment Condition

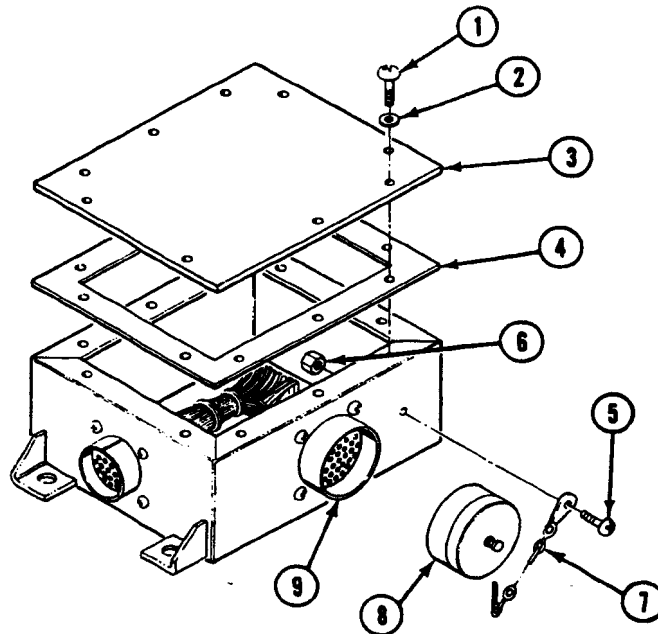
STE/ICE distribution box removed
 (TM 9-2350-366-20-1)

DISASSEMBLY

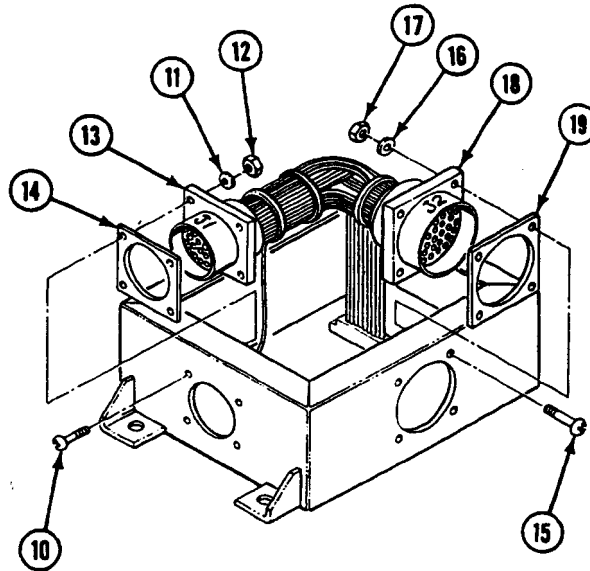
NOTE

Replace gasket if material is torn or cold flawed.

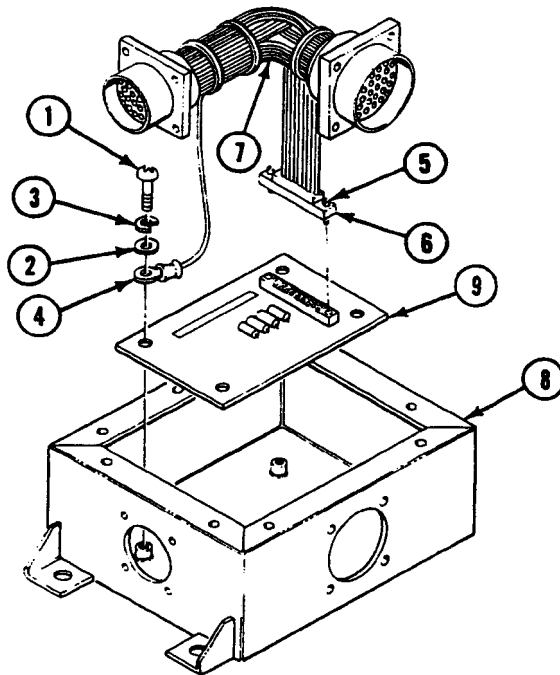
1. REMOVE 10 SCREWS (1), WASHERS (2), AND COVER (3) FROM GASKET (4).
2. REMOVE SCREW (5), LOCKNUT (6), AND CHAIN (7). DISCARD LOCKNUT.
3. UNSCREW CAP (8) FROM CONNECTOR J2 (9).



4. REMOVE FOUR SCREWS (10), WASHERS (11), LOCKNUTS (12), AND CONNECTOR J1 (13). DISCARD LOCKNUTS.
5. REMOVE GASKET (14) AND INSPECT FOR TORN OR COLD FLAWED AREAS. REPLACE IF NECESSARY.
6. REMOVE FOUR SCREWS (15), WASHERS (16), LOCKNUTS (17), AND CONNECTOR J2 (18). DISCARD LOCKNUTS.
7. REMOVE GASKET (19) AND INSPECT FOR TORN OR COLD FLAWED AREAS. REPLACE IF NECESSARY.

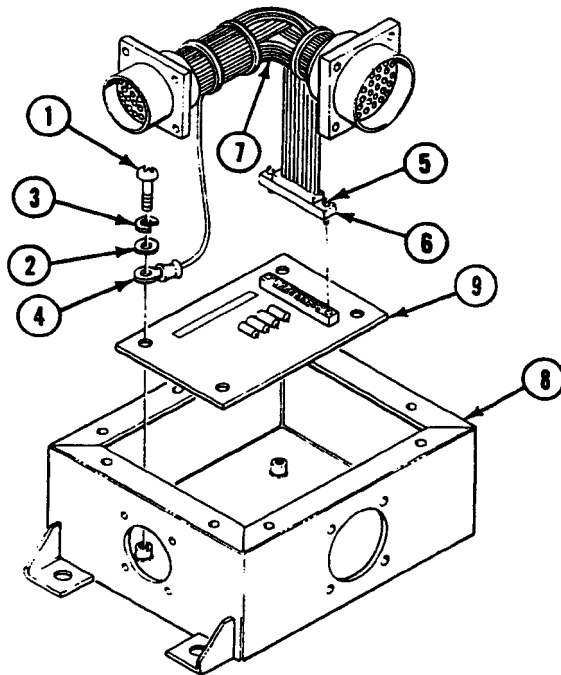


8. REMOVE SCREW (1), WASHER (2), LOCKWASHER (3), AND LEAD (4). DISCARD LOCKWASHER.
9. REMOVE TWO SCREWS (5), UNPLUG CONNECTOR (6), AND REMOVE WIRING HARNESS (7) FROM JUNCTION BOX (8).
10. REMOVE THREE REMAINING SCREWS (1), WASHERS (2), AND LOCKWASHERS (3). DISCARD LOCKWASHERS.
11. REMOVE CIRCUIT CARD ASSEMBLY (9) FROM JUNCTION BOX (8).

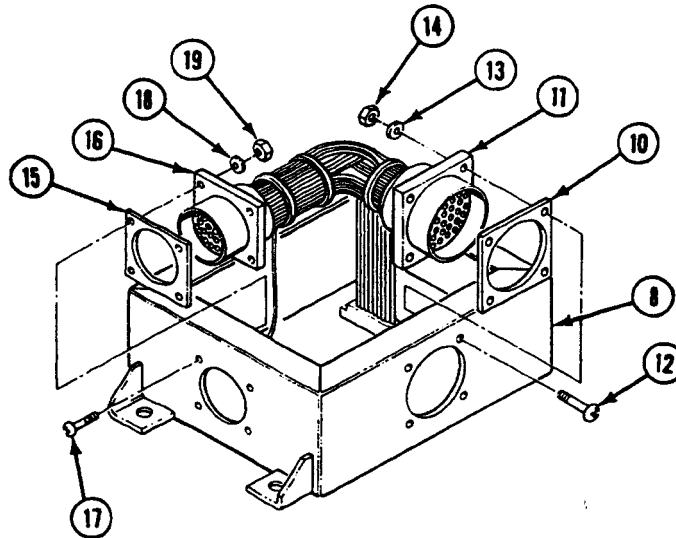


ASSEMBLY

1. POSITION CIRCUIT CARD (9) IN JUNCTION BOX (8).
2. INSTALL THREE WASHERS (2), NEW LOCKWASHERS (3), AND SCREWS (1).
3. POSITION WIRING HARNESS (7) IN JUNCTION BOX (8).
4. INSTALL PLUG (6) TO CIRCUIT CARD (9) WITH TWO SCREWS (5).
5. CONNECT LEAD (4) WITH SCREW (1), WASHER (2), AND NEW LOCKWASHER (3).

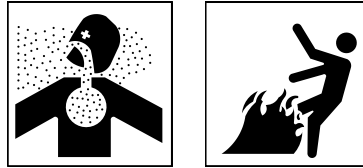


6. INSTALL GASKET (10) BETWEEN CONNECTOR J2 (11) AND JUNCTION BOX (8).
7. SECURE CONNECTOR J2 (11) WITH FOUR SCREWS (12), WASHERS (13), AND NEW LOCKNUTS (14).
8. INSTALL GASKET (15) BETWEEN CONNECTOR J1 (16) AND JUNCTION BOX (8).
9. SECURE CONNECTOR J1 (16) WITH FOUR SCREWS (17), WASHERS (18), AND NEW LOCKNUTS (19).



10. SCREW CAP (8) ON CONNECTOR J2 (9).
11. INSTALL CHAIN (7) WITH SCREW (5) AND NEW LOCKNUT (6).

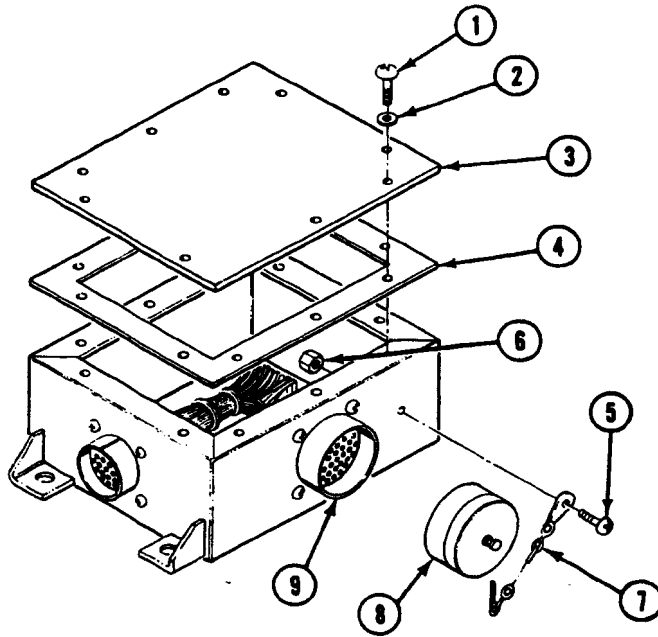
WARNING



Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

Always use in well ventilated areas, away from heat, sparks, and flames. Do not breathe fumes. Do not allow into contact with skin and eyes. Use goggles or face shield and protective gloves.

12. IF REQUIRED, CEMENT GASKET (4) TO JUNCTION BOX. APPLY A THIN EVEN COAT OF ADHESIVE TO BOTH SURFACES. ALLOW TO DRY UNTIL TACKY. PRESS SURFACES TOGETHER FIRMLY.
13. INSTALL COVER (3) ON GASKET (4) WITH 10 WASHERS (2) AND SCREWS (1).



END OF TASK

REPAIR STE/ICE WIRING HARNESS

0043 00

THIS WORK PACKAGE COVERS:

Repair or Replacement (page 0043 00-1)

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G10

Tools and Special Tools

Automotive fuel and electrical system repair tool kit
(WP 0046 00, Item 52)

Electrical connector tool kit (WP 0046 00, Item 53)

Digital multimeter (WP 0046 00, Item 35)

References

TM 9-2350-366-20-1

Materials/Parts

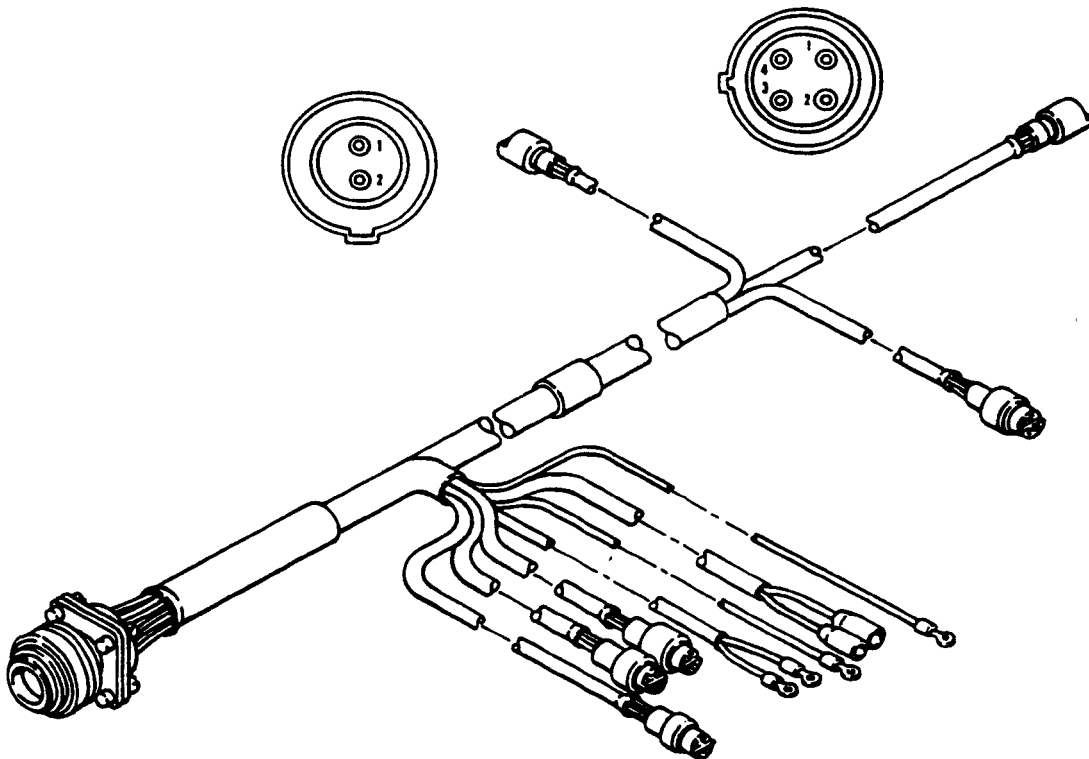
Insulating tape (WP 0048 00, Item 12)

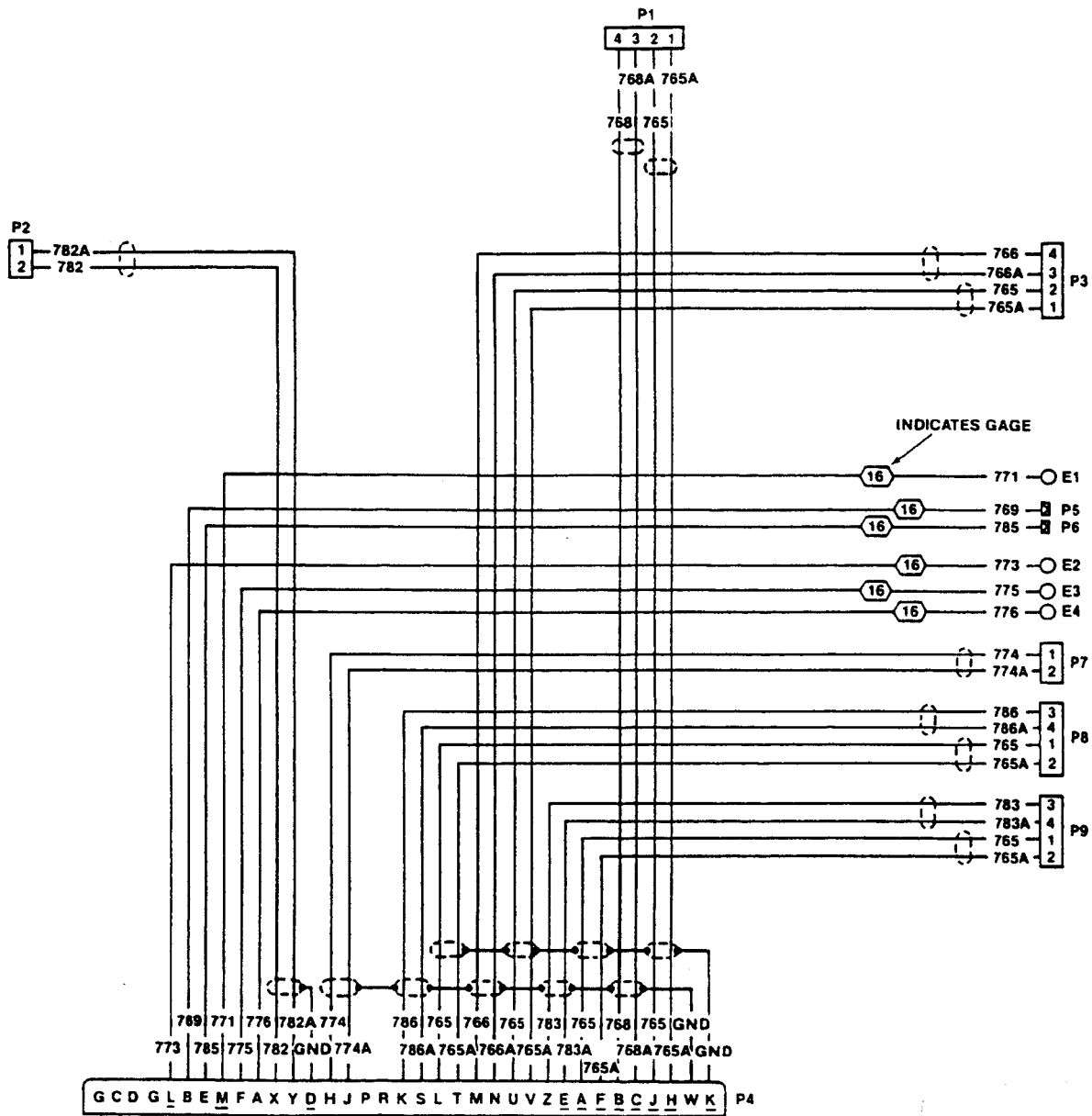
Equipment Condition

STE/ICE wiring harness removed
(TM 9-2350-366-20-1)

REPAIR OR REPLACEMENT

1. PERFORM CONTINUITY CHECK ON STE/ICE WIRING HARNESS TO DETERMINE WHICH PARTS REQUIRE REPAIR OR REPLACEMENT. USE MULTIMETER.





WIRING DIAGRAM (5)

2. REPAIR CONNECTORS AS REQUIRED (WP 0018 00).
3. REPAIR TERMINALS AS REQUIRED. See TM 9-2350-366-20-1.
4. REPEAT CONTINUITY CHECK ON STE/ICE WIRING HARNESS TO VERIFY REPAIRS ARE COMPLETE.
5. USE INSULATING TAPE TO BIND WIRING HARNESS.

END OF TASK

CHAPTER 16

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR FIRE FIGHTING EQUIPMENT

WORK PACKAGE INDEX

Title

Sequence No.

SERVICE FIRE EXTINGUISHER CYLINDER AND SAFETY DISC.....0044 00

SERVICE FIRE EXTINGUISHER CYLINDER AND SAFETY DISC

0044 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0044 00-1).
 Cleaning (page 0044 00-3).
 Assembly (page 0044 00-4).

INITIAL SETUP:

Maintenance Level

Direct Support

References

TM 9-2350-366-10-1
 TM 9-2350-366-20-1

Tools and Special Tools

General mechanic's tool kit (WP 0046 00, Item 54)

Equipment Condition

Engine stopped (TM 9-2350-366-10-1)
 Fire extinguisher cylinder removed from vehicle
 (TM 9-2350-366-20-1)

Materials/Parts

Cleaning solvent (WP 0048 00, Item 5)
 Wiping rag (WP 0048 00, Item 21)
 Gasket

Personnel Required

Track Vehicle Repairer 63H10

DISASSEMBLY

WARNING



Accidental discharge of fire bottles can seriously injure you.

Deactivate fire suppression system and insert anti-recoil plugs and safety pins before you work near fire bottles.

WARNING



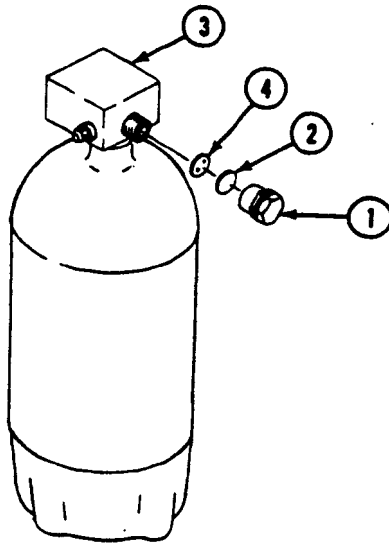
Accidental discharge of fire bottles can seriously injure your eyes or skin.

Wear face shield, ear plugs, protective clothing, and gloves during fire bottle maintenance.

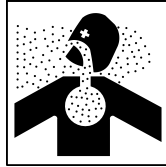
WARNING

**You can be injured if cylinder discharges when it is out of its mounting brackets or is dropped.
Discharge cylinder completely before removing from its mount. Handle with great care.**

1. REMOVE SAFETY DISC NUT (1) AND SAFETY DISC (2) FROM CYLINDER VALVE (3). DISCARD SAFETY DISC.
2. REMOVE GASKET (4) FROM CYLINDER VALVE (3). DISCARD GASKET.



CLEANING

WARNING

Solvent fumes and fluid are poisonous and can cause skin irritation.

Solvent may be harmful if swallowed. Avoid skin contact and breathing of fumes. Read solvent warning at the front of this manual.

WARNING

Solvent evaporates rapidly and makes fumes that are flammable.

Do not smoke or allow open flames near solvent fumes.

Read solvent warning at the front of this manual.

CAUTION

Do not allow cleaning solvent to enter cylinder valve housing. Internal parts may be damaged after assembly.

1. CLEAN SAFETY DISC NUT AND CYLINDER VALVE (WP 0049 00). USE CLEANING SOLVENT AND WIPING RAG. DRY PARTS.
2. CHECK SAFETY DISC NUT AND CYLINDER VALVE FOR CORROSION, CRACKS, DAMAGE, STRIPPED THREADS, AND METAL PARTICLES REMAINING FROM SAFETY DISC AND GASKET. REPAIR OR REPLACE DAMAGED SAFETY DISC NUT OR CYLINDER VALVE.

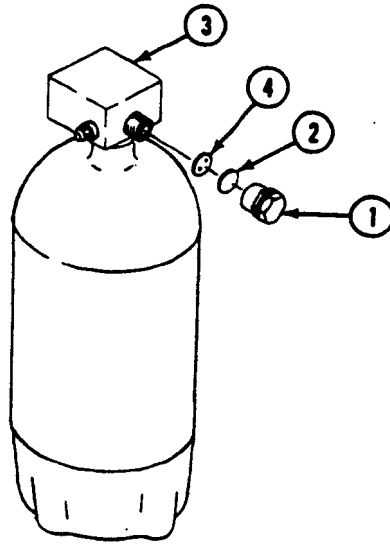
ASSEMBLY

1. INSTALL NEW GASKET (4) IN CYLINDER VALVE (3).

CAUTION

Dull side of safety disc must be against surface of gasket to prevent electrolytic corrosion of parts.

2. INSTALL NEW SAFETY DISC (2) AND SAFETY DISC NUT (1) IN CYLINDER VALVE (3).

**END OF TASK**

CHAPTER 17

SUPPORTING INFORMATION

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|---|---------------------|
| REFERENCES..... | 0045 00 |
| COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES LIST..... | 0046 00 |
| FABRICATED TOOLS..... | 0047 00 |
| EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST..... | 0048 00 |
| GENERAL MAINTENANCE INSTRUCTIONS..... | 0049 00 |

REFERENCES

0045 00

SCOPE

This work package lists all forms, field manuals, technical manuals, and miscellaneous publications referenced in this manual.

FORMS

Processing and Deprocessing Record for Shipment, Storage, and Issue of Vehicles and Spare Engines.....DD Form 1397

Quality Deficiency Report.....SF 368

Recommended Changes to Publications and Blank Forms.....DA Form 2028

LUBRICATION

M113A3/BMP-2 Opposing Forces Surrogate Vehicle (OSV) Hull (6920-01-420-4716).....See TM 9-2350-366-10-1

FIELD MANUALS

First Aid for Soldiers.....FM 21-11

Fundamentals of Machine Tools.....FM 9-24

Metal Body Repair and Related Operations.....FM 43-2

Operation and Maintenance of Ordnance Materiel in Cold Weather (0° to -65° F).....FM 9-207

TECHNICAL MANUALS

Cooling Systems: Tactical Vehicles.....TM 750-254

Direct Support and General Support Maintenance: Right Angle Drive, Cooling Fan; Gear Case, Transfer; Drive Assembly, Final; Differential, Steering Control; Brake, Single Disk; Cylinder Assembly, Hydraulic Brake.....TM 9-2520-238-34

Direct Support and General Support Maintenance for Engine w/Container: Model 5063-5299 (2815-00-124-5390) (2815-01-295-7458); Engine w/Container: Model 5063-5392 (2815-01-246-0903); Engine w/Container: Model 5063-5393 (2815-01-248-7644); Engine w/Container: Model 5063-5395 (2815-01-031-6154); Engine w/Container: Model 5063-5398 (2815-00-909-5949); Engine w/Container: Model 5063-539F (2815-01-316-6617).....TM 9-2815-205-34

Direct Support and General Support Maintenance for Periscope, Tank: M19, Old and New Configuration (6650-00-765-2971) (1240-01-005-6035); Periscope, Tank: M24, Old and New Configuration (6650-00-344-4647) (1240-01-005-6036).....TM 9-1240-216-34

Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts) for Engine w/Container: Model 5063-5299 (2815-00-124-5390) (2815-01-295-7458); Engine w/Container: Model 5063-5392 (2815-01-246-0903); Engine w/Container: Model 5063-5393 (2815-01-248-7644); Engine w/Container: Model 5063-5395 (2815-01-031-6154); Engine w/Container: Model 5063-5398 (2815-00-909-5949); Engine w/Container: Model 5063-539F (2815-01-316-6617); Engine w/Container: Model 5063-539L (2815-01-412-2715).....TM 9-2815-205-34P

Direct Support and General Support Maintenance Repair Parts and Special Tools Manual for Generator, Alternating Current, 200 AMPS (2920-01-147-1575) Leece-Neville Model A0012260.....TM 9-2920-257-30&P

REFERENCES—Continued

0045 00

Direct Support and General Support Maintenance Repair Parts and Special Tools Lists
(Including Depot Maintenance Allowances): Generator, Engine Accessory, Alternating
Current, Prestolite Model AMA-5102UT; Leece-Neville Models 3002AC and 3002AD,
5504AA and 5504AB, 2184AC and 5300GP, and Regulator, Generator, Leece-Neville
Model 3392R12P (FSN 2920-540-9476).....TM 9-2920-257-34P

Inspection, Care, and Maintenance of Antifriction Bearings.....TM 9-214

Intermediate Direct and General Support Maintenance Manual (Including Repair Parts and
Special Tools List); Cross Drive Transmission W/Container Model X200-4
(2520-01201-4784) Allison Transmission Division, GMC.....TM 9-2520-272-34&P

Operator, Organizational, Direct Support and General Support Maintenance Manual:
Lead-Acid Storage Batteries.....TM 9-6140-200-14

Operator, Organizational, Direct Support and General Support Maintenance Manual: Welding
Set, Arc, Inert Gas Shielded; Plastic or Meta-lined Gun: for 3/4 Inch Wire; DC, 115V
(Westinghouse Model SA-135) (FSN 3431-879-9709).....TM 5-3431-200-15

Operator’s Manual: M113A3/BMP-2 Opposing Forces Surrogate Vehicle (OSV) Hull
(6920-01-420-4716).....TM 9-2350-366-10-1

Operator’s Manual: Welding Theory and Application.....TM 9-237

Organizational, DS and GS Maintenance Manual: Standards for Inspection and Classification
of Tracks, Track Components and Solid Rubber Tires.....TM 9-2630-200-14

Painting Instructions for Army Materiel.....TM 43-0139

Preparation and Inspection of Industrial Equipment for Storage or Shipment.....TM 38-260

Preservation, Packaging, and Packing of Military Supplies and Equipment—Preservation and
Packaging (Vol. I).....TM 38-230-1

Preservation, Packaging, and Packing of Military Supplies and Equipment—Packing (Vol. II).....TM 38-230-2

Unit Maintenance: M113A3/BMP-2 Opposing Forces Surrogate Vehicle (OSV) Hull
(6920-01-420-4716).....TM 9-2350-366-20-1

Unit Maintenance: M113A3/BMP-2 Opposing Forces Surrogate Vehicle (OSV) Turret
(6920-01-420-4716).....TM 9-2350-366-20-2

Unit Maintenance, Direct Support and General Support Maintenance Repair Parts and Special
Tools List: M113A3/BMP-2 Opposing Forces Surrogate Vehicle (OSV) Hull
(6920-01-420-4716).....TM 9-2350-366-24P-1

Operator’s Manual: Carrier, Personnel, Armored, M113A3 (2350-01-219-7577); Carrier,
Command Post, M577A3 (2350-01-369-6085); Carrier, Anti-Tank (TOW), M901A3
(2350-01-369-7253); Carrier, Fire Support Personnel, M981A3 (2350-01-369-6079);
Carrier, Smoke Generator, M1059A3 (2350-01-369-6083); Carrier, Mortar, 120-MM
M121, M1064A3 (2350-01-369-6082); Carrier, Standardized Integrated Command Post
System (SICPS), M1068A3 (2350-01-369-6086); Chassis, Mechanized Smoke Obscurant,
M58 (2350-01-418-6654).....TM 9-2350-277-10

REFERENCES—Continued

0045 00

Unit Maintenance:Carrier, Personnel, Armored, M113A3 (2350-01-219-7577); Carrier, Command Post, M577A3 (2350-01-369-6085); Carrier, Anti-Tank, (TOW), M901A3, (2350-01-369-7253); Carrier, Fire Support Personnel, M981A3 (2350-01-369-6079); Carrier, Smoke Generator, M1059A3 (2350-01-369-6083); Carrier, Mortar, 120-MM M121, M1064A3 (2350-01-369-6082); Carrier, Standardized Integrated Command Post System (SICPS), M1068A3 (2350-01-369-6086); Chassis, Mechanized Smoke Obscurant, M58 (2350-01-418-6654).....TM 9-2350-277-20

Unit Maintenance, Direct Support and General Support Maintenance Repair Parts and Special Tools List: Carrier, Personnel, Armored, M113A3 (2350-01-219-7577); Carrier, Command Post, M577A3 (2350-01-369-6085); Carrier, Anti-Tank, (TOW), M901A3, (2350-01-369-7253); Carrier, Fire Support Personnel, M981A3 (2350-01-369-6079); Carrier, Smoke Generator, M1059A3 (2350-01-369-6083); Carrier, Mortar, 120-MM M121, M1064A3 (2350-01-369-6082); Carrier, Standardized Integrated Command Post System (SICPS), M1068A3 (2350-01-369-6086); Chassis, Mechanized Smoke Obscurant, M58 (2350-01-418-6654).....TM 9-2350-277-24P

Intermediate Direct Support and General Support Maintenance: Carrier, Personnel, Full Tracked, Armored M113A3, 2350-01-219-7577; Carrier, Command Post, Light Tracked M577A3, 2350-01-369-6085; Carrier, Anti-Tank (TOW), Full Tracked, Armored M901A3, 2350-01-369-7253; Carrier, Fire Support Personnel, Full tracked, Armored M981A3, 2350-01-369-6079; Carrier, Smoke Generator, Full Tracked M1059A3, 2350-01-369-6083; Carrier Mortar, 120-MM, Self Propelled M1064A3, 2350-01-369-6082; Carrier, Standardized Integrated Command Post System M1068A3, 2350-01-369-6086; Chassis, Mechanized Smoke Obscurant M58, 2350-01-418-6654.....TM 9-2350-277-34

Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) for Angle Drive, Cooling Fan, 2990-00-712-1280, 3010-01-318-5670; Gearcase, Transfer, 2520-01-061-5570, 2520-01-047-8613, 2520-00-572-8605, 2520-01-087-0156, 2520-01-362-8589; Differential Steering Control, 2520-00-714-6135; Drive Assembly, Final, 2520-01-061-5766, 2520-00-895-9164, 2520-01-067-8933, 2520-00-224-7952; Brake, Single Disk, Pivot, 2520-00-088-9866; Cylinder, Hydraulic, Master, 2530-00-679-9169.....TM 9-2520-238-34P

Use and Care of Hand Tools and Measuring Tools.....TM 9-243

MISCELLANEOUS PUBLICATIONS

Color, Marking, and Camouflage Painting of Military Vehicles, Construction Equipment, and Materiels Handling Equipment.....TB 43-0209

Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).....CTA 50-970

Safety Inspection and Testing of Lifting Devices.....TB 43-0142

Solder and Soldering.....TB SIG 222

The Army Maintenance Management System (TAMMS).....DA PAM 738-750

COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES LIST

0046 00

INTRODUCTION

Scope

This work package lists all common tools, supplements, and special tools/fixtures needed to maintain the OSV.

Explanation of Columns

Column (1) — Item Number. This number is assigned to the entry in the listing and is referenced in the Initial Setup section of the WP under Tools to identify the item (e.g., “Torque wrench (WP 0046 00, Item 64)”).

Column (2) — Name. This column lists the item by noun nomenclature and other descriptive features (e.g., “Wrench set, socket, 1/4 drive”).

Column (3) — National Stock Number. This is the National Stock Number (NSN) assigned to the item; use it to requisition the item.

Column (4) — Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

Column (5) — Reference. This column identifies the authorizing Supply Catalog (SC) or Repair Parts and Special Tools List (RPSTL) for items listed in this work package.

TOOL IDENTIFICATION LIST

Table 1. Tool Identification List

| (1) ITEM NO. | (2) ITEM NAME | (3) NATIONAL STOCK NUMBER | (4) PART NUMBER | (5) REFERENCE |
|--------------------|--|---------------------------------|-----------------------|---------------------|
| 1 | ADAPTER, SPINDLE, PORTABLE SANDER | 5130-00-293-2330 | N/A | SC 4910-95-CL-B04 |
| 2 | APRON, IMPERMEABLE | 8415-00-082-6108 | N/A | SC 4910-95-CL-A76 |
| 3 | BIT, SCREWDRIVER, 3/16 HEX (PART OF IMPACT WRENCH SET) | 5130-00-049-7913 | N/A | SC 4910-95-CL-A31 |
| 4 | BRUSH, WIRE, SCRATCH | 7920-00-291-5815 | N/A | SC 4910-95-CL-A76 |
| 5 | DEGREASER | 4940-00-078-9192 | N/A | SC 4910-95-CL-A76 |
| 6 | DRILL, ELECTRIC, PORTABLE, 1/2 INCH | 5130-00-889-9004 | N/A | SC 4910-95-CL-A31 |
| 7 | DRILL, ELECTRIC, PORTABLE, MORSE #2 | 5130-00-473-6228 | N/A | SC 4910-95-CL-A31 |
| 8 | DRILL, TWIST, 5/64, MORSE #2 | 5133-00-277-6942 | 74357 | TM 9-2350-366-24P-1 |
| 9 | DRILL SET, TWIST, 1/16 TO 1/2 INCH, RND SHANK | 5133-00-293-0983 | N/A | SC 4910-95-CL-A31 |

COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES
LIST—Continued

0046 00

| (1) ITEM NO. | (2) ITEM NAME | (3) NATIONAL STOCK NUMBER | (4) PART NUMBER | (5) REFERENCE |
|--------------------|--|---------------------------------|-----------------------|---------------------|
| 10 | DRILL SET, TWIST, 33/64 TO 3/4 INCH, MORSE #2 | 5133-00-596-8088 | N/A | SC 4910-95-CL-A31 |
| 11 | DRILL, TWIST, 1-1/32, MORSE #3 | 5133-00-228-1351 | 25154 | TM 9-2350-366-24P-1 |
| 12 | DRIVE TOOL, LOCKRING | 5120-01-165-0448 | R112D | TM 9-2350-366-24P-1 |
| 13 | EXTRACTOR SET, SCREW | 5120-00-610-1888 | N/A | SC 4910-95-CL-A31 |
| 14 | FACE, HAMMER, INSERTED, MEDIUM PLASTIC | 5120-00-585-8202 | N/A | SC 4910-95-CL-A31 |
| 15 | FLOW TEST MACHINE, RADIATOR | 4910-00-075-2395 | N/A | SC 4910-95-CL-A76 |
| 16 | FRAME, HACKSAW | 5110-00-289-9657 | 163-20 | SC 4910-95-CL-A31 |
| 17 | GLOVES, WELDER'S LEATHER | 8415-00-268-7859 | N/A | SC 4910-95-CL-A31 |
| 18 | GOGGLES, INDUSTRIAL | 4240-00-052-3776 | N/A | SC 4910-95-CL-A76 |
| 19 | HELMET, WELDER'S | 4240-00-540-0623 | N/A | SC 3431-95-CL-A01 |
| 20 | HOLDER, INSERTED HAMMER FACE | 5120-00-903-8553 | N/A | SC 4910-95-CL-A31 |
| 21 | HOLDER KIT, THREAD INSERTER | 5180-00-966-5958 | 10932383 | TM 9-2350-366-24P-1 |
| 22 | INSERTER, BEARING | 5120-01-263-3628 | CRB2112D | TM 9-2350-366-24P-1 |
| 23 | INSERTER, BEARING | 5120-00-708-2641 | R108D | TM 9-2350-366-24P-1 |
| 24 | INSERTER, BEARING | 5120-00-473-7013 | R206D | TM 9-2350-366-24P-1 |
| 25 | INSERTER, BEARING | 5120-00-473-7017 | R210D | TM 9-2350-366-24P-1 |
| 26 | INSERTER, BEARING | 5120-00-378-4276 | R212D | TM 9-2350-366-24P-1 |
| 27 | INSERTER, BEARING | 5120-01-249-6363 | R213D | TM 9-2350-366-24P-1 |
| 28 | INSERTER, SCREW THREAD | 5120-01-163-1425 | CR06W | TM 9-2350-366-24P-1 |
| 29 | INSERTER, SCREW THREAD | 5120-01-153-1860 | CR08W | TM 9-2350-366-24P-1 |
| 30 | INSERTER, SCREW THREAD | 5120-01-163-9922 | CR10W | TM 9-2350-366-24P-1 |
| 31 | INSERTER, SCREW THREAD | 5120-01-159-6487 | CR12W | TM 9-2350-366-24P-1 |
| 32 | INSERTER, SCREW THREAD | 5120-01-254-1497 | CR13W | TM 9-2350-366-24P-1 |
| 33 | INSERTER, SCREW THREAD | 5120-01-250-6420 | CRB2112WIS | TM 9-2350-366-24P-1 |
| 34 | LUBRICATING KIT | 4930-00-357-6301 | N/A | SC 4910-95-CL-A31 |
| 35 | MULTIMETER, DIGITAL | 6625-01-139-2512 | N/A | SC 4910-95-CL-A01 |
| 36 | PLIERS, RETAINING RING, EXTERNAL | 5120-00-595-9552 | N/A | SC 4910-95-CL-A31 |
| 37 | PLIERS, RETAINING RING, INTERNAL | 5120-00-293-0048 | N/A | SC 4910-95-CL-A31 |
| 38 | PLUG SET, RADIATOR TEST | 4910-00-273-3660 | N/A | SC 4910-95-CL-A76 |
| 39 | POSITIONER, BEARING | 4910-01-128-0093 | 12313101 | TM 9-2350-366-24P-1 |

COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES
LIST—Continued

0046 00

| (1) ITEM NO. | (2) ITEM NAME | (3) NATIONAL STOCK NUMBER | (4) PART NUMBER | (5) REFERENCE |
|--------------------|---|---------------------------------|-----------------------|---------------------|
| 40 | PRESS, ARBOR, HAND OPERATED | 3444-00-449-7295 | N/A | SC 4910-95-CL-A31 |
| 41 | PULLER KIT, MECHANICAL | 5120-00-423-1596 | N/A | SC 4910-95-CL-A62 |
| 42 | PULLER SET | 5120-01-140-0950 | 4205A | TM 9-2350-366-24P-1 |
| 43 | SANDER, DISC, ELECTRIC, PORTABLE | 5130-00-857-8526 | 00S90 | SC 4910-95-CL-A31 |
| 44 | SCREW, CAP, HEXAGON | 5305-00-267-8954 | MS90727-10 | IMPROVISED TOOL |
| 45 | SCREW, CAP, SOCKET HEAD (JACKING) | 5305-00-978-9380 | MS16997-61 | IMPROVISED TOOL |
| 46 | SLING, POWER PLANT | 1450-01-240-2206 | 12350306 | TM 9-2350-366-24P-1 |
| 47 | SOCKET, TAPER SHANK, MORSE #3 TO #2 | 3460-00-227-7524 | OO-S-550 | TM 9-2350-366-24P-1 |
| 48 | SOLDERING GUN | 3439-00-542-0396 | 8200G3 | SC 4910-95-CL-A31 |
| 49 | STAKER, BEARING | 5120-01-128-0094 | 12313102 | TM 9-2350-366-24P-1 |
| 50 | STAND, RADIATOR TEST AND REPAIR | 4910-00-078-9190 | N/A | SC 4910-95-CL-A76 |
| 51 | THREADING SET, SCREW | 5180-00-448-2362 | N/A | SC 4910-95-CL-A31 |
| 52 | TOOL KIT, AUTOMOTIVE FUEL AND ELECTRICAL SYSTEM REPAIR | 5180-00-754-0655 | N/A | SC 5180-90-CL-B08 |
| 53 | TOOL KIT, ELECTRICAL | 5180-00-876-9336 | N/A | SC 4910-95-CL-A31 |
| 54 | TOOL KIT, GENERAL MECHANIC'S | 5180-00-177-7033 | N/A | SC 5180-90-CL-N26 |
| 55 | TOOL KIT, BODY AND FENDER REPAIR | 5180-00-754-0643 | N/A | SC 5180-90-CL-N34 |
| 56 | TOOL KIT, OVERSIZE ROSAN INSERT | 5180-00-966-5961 | 10932474 | TM 9-2350-366-24P-1 |
| 57 | TRESTLE, MOTOR VEHICLE MAINTENANCE | 4910-00-251-8013 | N/A | SC 4910-95-CL-A31 |
| 58 | WASHER, FLAT | 5310-00-809-4058 | MS27183-10 | IMPROVISED TOOL |
| 59 | WELDING, MACHINE ARC | 3431-01-032-6289 | N/A | SC 4910-95-CL-A01 |
| 60 | WELDING SHOP, TRAILER MOUNTED | 3431-00-935-7821 | N/A | SC 3431-95-CL-A01 |
| 61 | WRENCH, ADJUSTABLE | 5120-00-423-6728 | N/A | SC 3431-95-CL-A31 |
| 62 | WRENCH, OPEN END, 1 X 1-1/8 | 5120-00-187-7133 | N/A | SC 3431-95-CL-A31 |
| 63 | WRENCH, OPEN END, 1-5/16 X 1-1/2 | 5120-00-277-2323 | N/A | SC 3431-95-CL-A31 |
| 64 | WRENCH, TORQUE, 1/2 INCH DRIVE, 0-175 LB-FT | 5120-00-640-6364 | N/A | SC 3431-95-CL-A31 |
| 65 | WRENCH, TORQUE, 1/2 INCH DRIVE, 0-300 LB-IN | 5120-00-247-2536 | N/A | SC 3431-95-CL-A31 |

**COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES
LIST—Continued**

0046 00

| (1) ITEM NO. | (2) ITEM NAME | (3) NATIONAL STOCK NUMBER | (4) PART NUMBER | (5) REFERENCE |
|--------------------|--|---------------------------------|-----------------------|-------------------|
| 66 | WRENCH, TORQUE, 1/2 INCH DRIVE, 0-150 LB-FT | 5120-00-247-2540 | N/A | SC 3431-95-CL-A31 |
| 67 | WRENCH, TORQUE, 3/4 INCH DRIVE, 0-600 LB-FT | 5120-00-221-7983 | N/A | SC 3431-95-CL-A31 |
| 68 | WRENCH SET, SOCKET, 3/4 INCH DRIVE | 5120-00-204-1999 | N/A | SC 4910-95-CL-A31 |

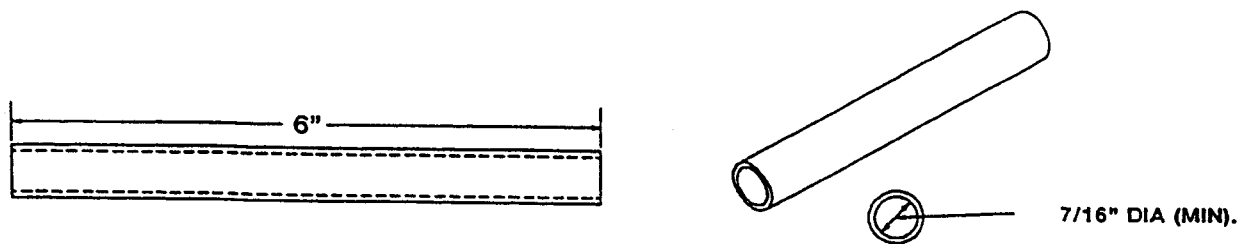
FABRICATED TOOLS

0047 00**INTRODUCTION****Scope**

This work package includes instructions for making tools authorized to be fabricated at DS or GS maintenance level. These tools are needed for special maintenance procedures, but are not available in the supply system. The tools are normally fabricated locally when required by the troubleshooting or maintenance WP.

FABRICATION ILLUSTRATIONS

The following figures provide tool fabrication instructions. All parts and bulk materials needed for manufacturing the tool are listed on each figure. When needed, any special explanatory instructions are included in the notes on the figure.

**MATERIAL REQUIRED:**

Round steel stock 1020 or 1040 or locally procured steel pipe.

NOTES:

1. Remove all burrs.
2. Do not break sharp edges.
3. All dimensions are in inches.

Figure 1. Lock Ring Drive Tool for Stud Insert

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

0048 00

INTRODUCTION

Scope

This work package lists expendable and durable items you will need to maintain the OSV. These items are authorized to you by CTA 50-970, *Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items)*.

Explanation of Columns in the Expendable/Durable Items List

Column (1) — Item Number. This number is assigned to the entry in the listing, and is referenced in the Initial Setup section of the WP under Materials/Parts to identify the item (e.g., “Automotive grease (WP 0048 00, Item 3)”).

Column (2) — Level. This column identifies the lowest level of maintenance that requires the listed item.

O — Unit Maintenance

F — Direct Support

Column (3) — National Stock Number. This is the National Stock Number (NSN) assigned to the item. Use it to request or requisition the item.

Column (4) — Description. Indicates the Federal item name and, if required, a description to identify the item. This column also includes the Commercial and Government Entity Code (CAGEC) and the part number for each item.

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 the requirements.

EXPENDABLE AND DURABLE ITEMS LIST

Table 1. Expendable and Durable Items List

| (1) ITEM NUMBER | (2) LEVEL | (3) NATIONAL STOCK NUMBER | (4) ITEM NAME,DESCRIPTION,CAGE,PART NUMBER | (5) U/M |
|-----------------------|--------------|------------------------------------|--|------------|
| 1 | O | 8040-00-664-4318 | ADHESIVE (04963) EC2141 | PT |
| 2 | O | 6850-00-181-7940 | ANTIFREEZE (81349) MIL-A-46153 | GL |
| 3 | O | 9150-01-197-7692 | AUTOMOTIVE GREASE (81349) MIL-G-10924 | LB |
| 4 | F | 5350-00-221-0872 | CROCUS CLOTH (81348) PC458T1C1 | EA |
| 5 | O | 6850-01-378-0679 | CLEANING COMPOUND, SOLVENT (OK209) BREAKTHROUGH | GL |
| 6 | O | 9150-01-152-4119 | ENGINE LUBE OIL (OE/HDO-10) (81349) MIL-L-2104 GRADE15W40 | GL |
| 7 | O | 7930-00-282-9699 | GENERAL PURPOSE DETERGENT (77902) TRITONX-100 | GL |
| 8 | O | 5110-00-277-4588 | HACKSAW BLADE (54940) 31-51024 | EA |

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST—Continued

0048 00

| (1) ITEM NUMBER | (2) LEVEL | (3) NATIONAL STOCK NUMBER | (4) ITEM NAME,DESCRIPTION,CAGE,PART NUMBER | (5) U/M |
|-----------------------|--------------|------------------------------------|--|------------|
| 9 | O | 9150-01-131-3323 | HYDRAULIC FLUID (FRH) (81349) MIL-H-46170 | QT |
| 10 | F | 6850-00-145-0255 | INSPECTION PENETRANT (81349) MIL-I-25135 | EA |
| 11 | O | 5970-00-161-7422 | INSULATING VARNISH (24446) 1201 | EA |
| 12 | O | 5970-00-816-6056 | INSULATING TAPE (81348) HH-I-595-B-108-0 | FT |
| 13 | O | 9150-00-754-2595 | MOLYBDENUM D GREASE (GMD) (81349) MIL-G-21164 | LB |
| 14 | F | 8030-00-174-2598 | SEALING COMPOUND (03956) P1896694-3 | PT |
| 15 | O | 8030-01-166-0675 | SEALING COMPOUND (05972) 567-47 | EA |
| 16 | F | 8030-00-723-5344 | SEALING COMPOUND (FUEL) (83574) PR1440A-2 | PT |
| 17 | O | 3940-00-675-5003 | SLING (ENDLESS) (81996) PD101-96 | EA |
| 18 | F | 3439-01-219-7884 | SOLDERING FLUX (85150) DAYFLO STD | OZ |
| 19 | O | 3439-00-453-5472 | TIN ALLOY SOLDER (81348) SN60WRMAP2 0.036 | LB |
| 20 | F | 3439-00-803-9498 | WELDING ELECTRODE (34920) 5356 | OZ |
| 21 | O | 7920-00-205-1711 | WIPING RAG (58536) A-A-531 | LB |

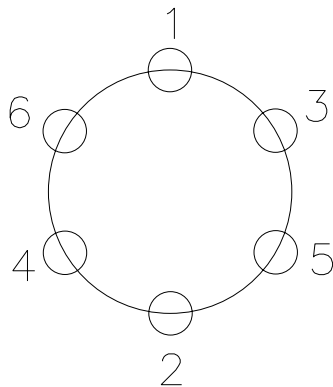
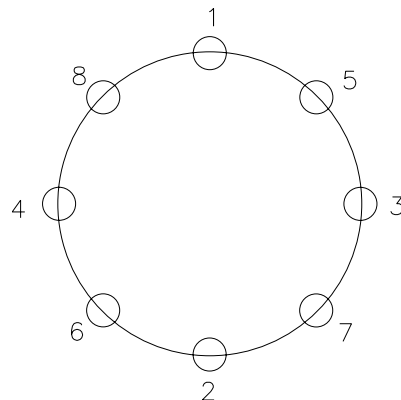
GENERAL MAINTENANCE INSTRUCTIONS

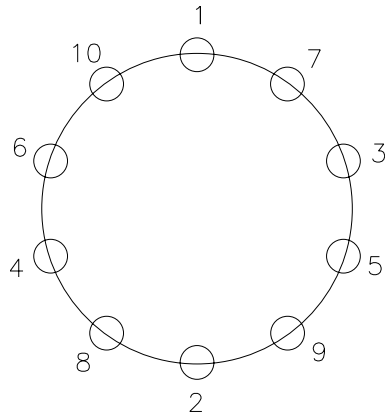
0049 00**SCOPE**

This section contains safety warnings, guidelines, and general maintenance instructions. They should be followed when doing maintenance procedures.

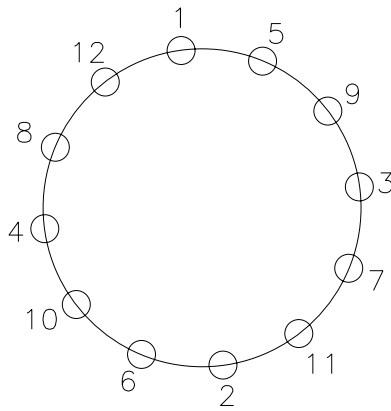
PREPARATION FOR MAINTENANCE

1. *PERSONNEL SAFETY.* Practice all shop safety procedures and read all warnings in this manual.
2. *PROPER EQUIPMENT.* Get tools, equipment, parts, and materials before starting a maintenance task. See TM 9-2350-366-24P-1, and the maintenance task's **INITIAL SETUP** for tools, equipment, parts, and materials.
3. *WHAT TO DISCARD.* Parts to discard, such as lock washers, locknuts, gaskets, and preformed packings, are listed in the maintenance tasks. If the step does not say to discard a part, the part should be saved. It may be used later or be repaired.
4. *HANDLING TECHNIQUES.*
 - a. Avoid damage to parts during disassembly, cleaning, inspection, repair, and reassembly procedures. Nicks, scratches, and dents caused by careless handling could result in equipment failure.
 - b. Dirt can damage parts and cause malfunctions. Make sure all air and fluid openings, lines, and hoses are capped or plugged during maintenance procedures.
5. *IDENTIFICATION.*
 - a. During disassembly, tag parts to ensure proper assembly.
 - b. During disassembly, tag leads on electrical parts to ensure proper assembly. Tag each lead, as it is removed, with numbers from wiring diagrams and terminals.
6. *TORQUING.* When needed, torque values are listed in the maintenance tasks. When torquing, use one of the star pattern sequences below unless otherwise stated in the maintenance task.

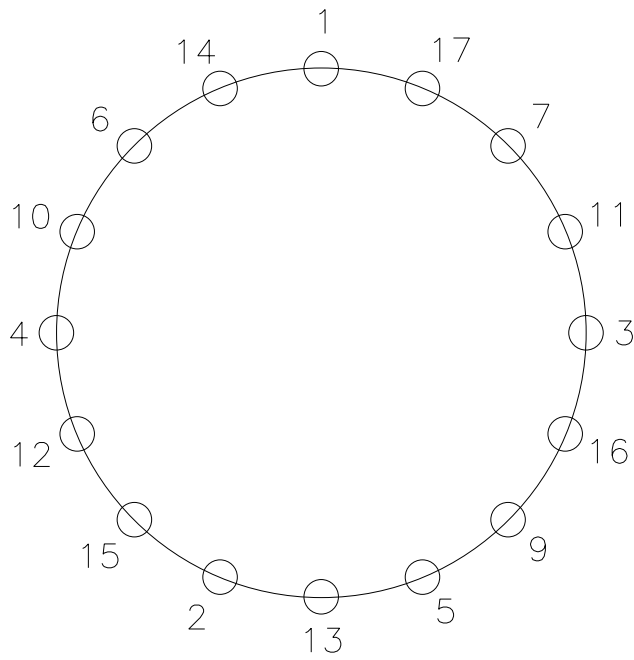
**6-HOLE PATTERN****8-HOLE PATTERN**



10-HOLE PATTERN



12-HOLE PATTERN



17-HOLE PATTERN

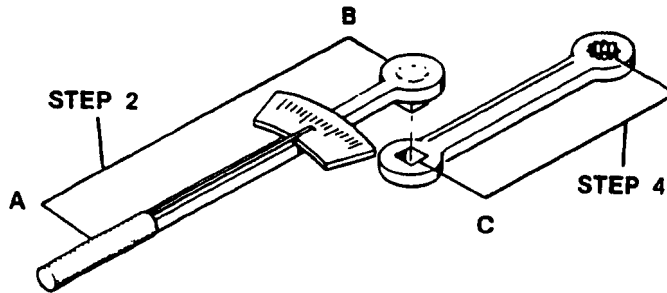
7. USE OF TORQUE WRENCH ADAPTERS AND CONVERSION FORMULA.

- a. The torque values given in the text of this manual are the actual values that must be applied to the nut or screw for proper maintenance.
- b. Some tasks require the use of a torque wrench adapter when the nut or screw cannot be reached with a regular socket on the end of the torque wrench. These adapters add to the overall length of the torque wrench and make the dial or scale reading less than the actual torque applied to the nut or screw. To prevent over torquing and damage to equipment, you must calculate a corrected dial or scale reading

NOTE

The length of the torque wrench is measured from the center of the handle to the center of the drive. The length of the adapter is measured from the center of the drive to the center of the wrench.

- c. To determine the corrected scale or dial reading, use the following formula and refer to the example below.

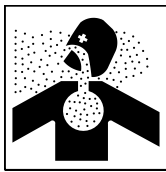


| | | | | |
|-------------------|---|-----------------------|---|--|
| Corrected reading | = | Required torque value | ÷ | $\frac{\text{Length of torque wrench} + \text{length of adapter}}{\text{Length of torque wrench}}$ |
| Corrected reading | = | 19 ft-lb | ÷ | $\frac{22 \text{ inches} + 3 \text{ inches}}{22 \text{ inches}}$ |
| Corrected reading | = | 19 ft-lb | ÷ | $\frac{25 \text{ inches}}{22 \text{ inches}}$ |
| Corrected reading | = | 19 ft-lb | ÷ | 1.14 |
| Corrected reading | = | 17 ft-lb | | |

- d. In the example above, the torque wrench measured 22 inches and the adapter measured 3 inches, and the required torque is 19 ft-lb (3 mkg). The corrected dial or scale reading to use is 17 ft-lb.

CLEANING

1. *GENERAL.* Cleaning is very important. All parts must be cleaned well and kept clean during maintenance. Dirt or foreign matter can cause malfunctions and equipment failure. General cleaning procedures are detailed in Steps 2 - 14. Special cleaning procedures are covered in the task relating to the specific part.
2. *CLEAN EVERY PART.* Clean every part well after disassembly and before assembly or installation. Clean parts such as housings and covers before disassembly. Avoid getting dirt and foreign matter in a system.
3. *HANDLE WITH CARE.* Use care when handling parts during cleaning and maintenance. Nicks, scratches, dents, or burns can prevent proper assembly or cause malfunctions after assembly.
4. *AVOID ABRASIVES.* Except where called for in a task, don't use abrasives, files, wire brushes, or sharp tools. On some surfaces, finish is important to the operation of close-fitting parts.

WARNING

Solvent fumes and fluid are poisonous and can cause skin irritation.

Solvent may be harmful if swallowed. Avoid skin contact and breathing of fumes. Read solvent warning at the front of this manual.

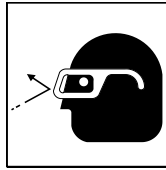
WARNING

Solvent evaporates rapidly and makes fumes that are flammable.

Do not smoke or allow open flames near solvent fumes.

Read solvent warning at the front of this manual.

5. *REMOVAL AGENTS.* Remove gum or old grease deposits by soaking in cleaning solvent (WP 0048 00, Item 5). Scrub with a brush. Use an abrasive cloth (WP 0048 00, Item 4) to remove minor surface defects.

WARNING

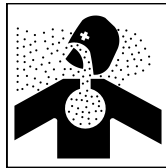
Compressed air can injure you or others.

Do not aim compressed air at yourself or other personnel. Always wear goggles when working with compressed air. Do not use more pressure than 30 psi (207kPa) with air nozzles.

CAUTION

Lye or caustic mixtures will damage metal surfaces. Do not use lye or caustic mixtures to clean metal surfaces.

6. *CLEANING INSTRUCTIONS.* If steam cleaning is used, dry all clean parts with compressed air. Apply a thin film of clean general purpose oil to surfaces that are not painted to prevent rusting. Never use lye or caustic mixtures that will corrode or etch metal surfaces.
7. *LUBRICATION OF NEW BEARINGS.* See TM 9-214 for cleaning and lubrication procedures. Bearings that have been in service should also be lubricated.
8. *CLEANING INSTRUCTIONS.* Care is needed in all cleaning procedures. Dirt can damage parts and cause malfunctions. When you perform any cleaning procedure, do the following:
 - a. Inspect and cap all air and fluid openings, lines, and hoses.

WARNING

Solvent fumes and fluid are poisonous and can cause skin irritation.

Solvent may be harmful if swallowed. Avoid skin contact and breathing of fumes. Read solvent warning at the front of this manual.

WARNING

Solvent evaporates rapidly and makes fumes that are flammable.

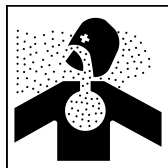
Do not smoke or allow open flames near solvent fumes.

Read solvent warning at the front of this manual.

CAUTION

Lye or caustic mixtures will damage metal surfaces. Do not use lye or caustic mixtures to clean metal surfaces.

- b. Clean all parts before inspection, after repair, and before assembly. Use cleaning solvent (WP 0048 00, Item 5) or approved cleaner. Dry parts with wiping rag (WP 0048 00, Item 21).
- c. Keep hands free of grease; grease collects dirt.
- d. After cleaning, cover or wrap parts to protect from dirt.

WARNING

Solvent fumes and fluid are poisonous and can cause skin irritation.

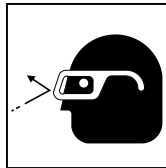
Solvent may be harmful if swallowed. Avoid skin contact and breathing of fumes. Read solvent warning at the front of this manual.

WARNING

Solvent evaporates rapidly and makes fumes that are flammable.

Do not smoke or allow open flames near solvent fumes.

Read solvent warning at the front of this manual.

WARNING

Compressed air can injure you or others.

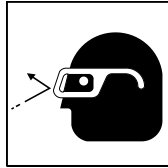
Do not aim compressed air at yourself or other personnel. Always wear goggles when working with compressed air. Do not use more pressure than 30 psi (207kPa) with air nozzles.

9. *CASTINGS*.
 - a. Clean inner and outer surfaces of casting with cleaning solvent (WP 0048 00, Item 5). Dry casting with compressed air.
 - b. Remove sludge and gum deposits with stiff brush.
 - c. Blow out all tapped holes with compressed air.
10. *BALL BEARINGS*. Ball bearings require special cleaning techniques. See TM 9-214 for cleaning and maintenance procedures for ball bearings.

CAUTION

Cleaning solvent causes leather, rubber, and synthetic materials to become brittle. Do not use cleaning solvent to clean seals, cables, and flexible hoses.

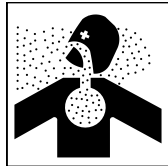
11. *OIL SEALS, ELECTRICAL CABLES, AND FLEXIBLE HOSES*. Clean seals, cables, and flexible hoses with general detergent and water. Dry parts with wiping rag (WP 0048 00, Item 21).

WARNING

Compressed air can injure you or others.

Do not aim compressed air at yourself or other personnel. Always wear goggles when working with compressed air. Do not use more pressure than 30 psi (207kPa) with air nozzles.

12. *INSERTS*. Blow out all insert holes with compressed air.

WARNING

Solvent fumes and fluid are poisonous and can cause skin irritation.

Solvent may be harmful if swallowed. Avoid skin contact and breathing of fumes. Read solvent warning at the front of this manual.

WARNING

Solvent evaporates rapidly and makes fumes that are flammable.

Do not smoke or allow open flames near solvent fumes.

Read solvent warning at the front of this manual.

13. *GASKETS*. If gasket is being removed, scrape old gasket material and sealant off mating surface. Clean mating surface with cleaning solvent (WP 0048 00, Item 5). Dry with wiping rag (WP 0048 00, Item 21).
14. *OPTICS*.
- Clean all optics using isopropyl and lens tissue paper.
 - Clean optics before inspection, after repair, and before assembly.
 - After cleaning, cover or wrap optics to protect from dirt and damage.

INSPECTION

All removed parts must be inspected with care. Replace parts if damage or wear exceeds allowable limits.

1. *GENERAL*. Procedures for inspection will be the same for most parts. General inspection procedures are given in Steps 2 - 16. Special inspection procedures are covered in the task as needed.
2. *CASTINGS*.
 - a. Visually inspect all castings for cracks. Check areas next to studs, threaded inserts, sharp corners, and fillets.
 - b. Inspect all castings and forgings for breaks, cracks, and wear or scoring that would impair function.
 - c. Inspect machined surfaces for nicks, burrs, and raised metal. Mark damaged areas for repair.
 - d. Use straightedge to check all mounting flanges on housings and supports for bends. Inspect mating flanges for stains which would indicate oil leakage.
 - e. Inspect all threaded parts for damaged or stripped threads.
3. *ROLLER AND BALL BEARINGS*. Inspect bearing races for wear and color changes due to heat. See TM 9-214 for inspection procedure for ball bearings.
4. *NEEDLE ROLLER BEARINGS*. Inspect bearings for free and smooth rotation and broken or missing rollers. Also look for tightness of fit in bearing bores. Inspect bearing races for wear and color changes due to heat. See TM 9-214 for inspection procedure.
5. *STUDS*. Inspect all studs for stripped or damaged threads, bent or loose condition, and signs of stretching.
6. *GEARS*.
 - a. Use magnetic particle inspection equipment to check all gears for cracks.
 - b. Inspect gears for burrs, wear, cracked or broken teeth, and pitting at tooth contact areas.
7. *BUSHINGS AND BUSHING-TYPE BEARINGS*.
 - a. Check all bushings and bushing-type bearings for secure fit in casting. Check for color changes due to heat. Inspect for size, scoring, out-of-roundness, burrs, sharp edges, and signs of seizing.
 - b. Check for dirt in oil holes and in bushing-type bearings. Oil holes and grooves must be clean and not damaged.
8. *INSERTS*.
 - a. Inspect inserts for cracks and stripped or damaged threads.
 - b. Check inserts for loose fit.
9. *GREASE SEALS, PREFORMED PACKINGS, AND GASKETS*.
 - a. Inspect composition-type seals, rings, and preformed packings for wear, brittleness, cracks, and damage.
 - b. Inspect lip seals for wear, cuts, and brittleness. Inspect springs and seal shells for damage.
 - c. Gaskets and seals on electrical parts may be reused. Inspect gaskets and seals for wear, nicks, cuts, and torn or missing gasket material. Replace gasket if needed.
10. *SPLINED PARTS*. Inspect splined parts for burrs, wear, and twisted, cracked, or broken splines.
11. *THREADED PARTS*. Inspect all threaded parts for burrs and stripped or damaged threads.
12. *RETAINING RINGS*. Inspect retaining rings for nicks, burrs, defects, loss of tension, and wear.
13. *SPRINGS*. Inspect springs for wear, defects, breaks, and loss of tension or compression.
14. *SHAFTS AND SPINDLES*. Inspect shafts and spindles for wear, binding, scores, cracks, burrs, and clogged oil passages.

15. ELECTRICAL PARTS.

- a. Inspect electrical parts before you install them. Look for mildew and corroded or burned parts.
- b. Inspect electrical parts for pinched or loose wires and for cracked or broken wires, circuit cards, relays, jacks, and plugs.
- c. Inspect insulation and heat-shrink tubing for cracks, tears, burns, or missing material.
- d. Inspect for proper grounding of electrical components. Inspect for metal-to-metal contact. Remove paint, grease, or dirt from metallic surfaces to ensure metal-to-metal contact. Inspect ground straps for security of fasteners.

16. *OPTICS*. Inspect all objects for cracks in lenses and mirrors, or scratches in coating on lenses and mirrors.

REPAIR

1. *GENERAL*. General repair procedures are given in Steps 2 - 15. Special repairs are covered in the maintenance task. After repair, clean all parts well.

2. CASTINGS.

- a. Replace all cracked or broken castings.
- b. Repair minor damage to machined surfaces of castings with abrasive cloth (WP 0048 00, Item 4). Replace any part with defects that cannot be corrected or which will impair function.
- c. Repair minor surface bends by working bent surface of casting across sheet of abrasive cloth (WP 0048 00, Item 4) on surface plate. Replace bent castings which would impair assembly or function.
- d. Repair damaged pipe or screw threads with correct tap or die.

3. *BALL BEARINGS*. See TM 9-214 for inspection and maintenance of ball bearings.

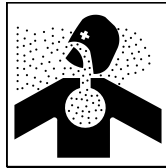
4. *NEEDLE ROLLER BEARINGS*. See TM 9-214 for inspection and maintenance of needle roller bearings.

5. STUDS.

- a. Replace all bent or loose studs or studs which show signs of stretching.
- b. Repair minor thread damage with standard thread chaser.
- c. To remove studs, back out studs slowly with stud extractor to avoid heating and possible seizure. If damaged studs are too short to use extractor, drill and extract studs with suitable remover. A short stud may be removed by welding nut to stud and removing with wrench.
- d. Only standard studs are supplied for repair parts. If threaded hole is damaged beyond repair, drill and tap damaged hole. Install threaded insert in tapped hole.

6. GEARS.

- a. Replace gears that have worn, pitted, or gouged teeth.

WARNING

Solvent fumes and fluid are poisonous and can cause skin irritation.

Solvent may be harmful if swallowed. Avoid skin contact and breathing of fumes. Read solvent warning at the front of this manual.

WARNING

Solvent evaporates rapidly and makes fumes that are flammable.

Do not smoke or allow open flames near solvent fumes.

Read solvent warning at the front of this manual.

- b. Remove sharp burrs from gear teeth with abrasive cloth (WP 0048 00, Item 4) dipped in dry cleaning solvent (WP 0048 00, Item 5).

7. *BUSHINGS, BUSHING-TYPE BEARINGS*

- a. Replace bushings and bushing-type bearings if they are loose, scored, or have color change due to heat. When you replace bushings and bushing-type bearings, check nearby parts for damage or wear.

CAUTION

Damaged housing bore can cause equipment failure. Do not damage housing bore when cutting bushings.

NOTE

Do not remove bushings and bushing-type bearings unless replacement is necessary and authorized. Removal usually damages these parts.

- b. Remove bushings and bushing-type bearings by pressing them out. Use a suitable arbor press or special tools. It may be necessary to remove bushings in blind holes with a saw or by using a narrow cap chisel.
 - c. Install bushings or bushing-type bearings by aligning them in casting or retaining cage. Press bushing or bushing-type bearings into place with suitable arbor press or with special tools.
8. *INSERTS*. Replace insert when threads are stripped or when insert is cracked or loose.
- a. Drill and remove damaged insert from casting.
 - b. Install new insert in casting using suitable replacement tool.

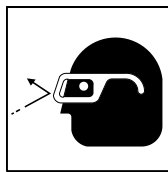
9. *GREASE SEALS, PREFORMED PACKINGS, AND GASKETS.*
- Replace seals which show signs of wear, brittleness, cracks, and damage.
 - Replace defective lip seals, springs, and seal shells.
 - Prefformed packings and gaskets should be replaced when removed unless otherwise stated in the maintenance task. They should not be reused.
10. *SPLINED PARTS.*
- Remove burrs from splined parts with a soft honing stone.
 - Replace parts that are worn or have twisted, cracked, or broken splines.

NOTE

Chase threads with a used tap or die. A new tap may cut oversized, while a new die may cut undersized.

11. *THREADED PARTS.* Replace all parts that have stripped or damaged threads. Replace parts that cannot be repaired by chasing threads with a used tap or die.
12. *RETAINING RINGS.*
- Replace retaining rings that have defects.
 - Some retaining rings are beveled on one side. When installing this type of ring, the beveled side must face the part to be retained.
13. *SPRINGS.* Discard springs that have defects. Where needed, load and height inspection data are given in maintenance procedures.
14. *SHAFTS AND SPINDLES.*
- Replace shafts and spindles that show signs of wear, binding, scores, cracks, burrs, or clogged oil passages.

WARNING



Compressed air can injure you or others.

Do not aim compressed air at yourself or other personnel. Always wear goggles when working with compressed air. Do not use more pressure than 30 psi (207kPa) with air nozzles.

- Remove obstructions with compressed air.
 - Remove burrs and minor surface defects with an abrasive cloth (WP 0048 00, Item 4).
15. *ELECTRICAL PARTS.*
- Replace corroded or burned parts and parts which show signs of mildew.
 - Tighten loose connections.
 - Replace cracked or broken wires, circuit cards, relays, jacks, and plugs.
 - Replace cracked, torn, or burned insulation and heatshrink tubing.

WELDING INSTRUCTIONS**SAFETY PRECAUTIONS**

1. Wear clothing such as heavy leather or heavy denim. Do not wear clothing with loose pockets, trouser cuffs or short or rolled up sleeves.
2. Do not expose bare skin to welding arc.
3. Do not look directly at welding arc unless you are wearing a welding hood.
4. Wear flash goggles or tinted safety glasses (No. 2) in welding area.
5. Disconnect power source before changing parts or making equipment repairs.
6. Do not touch drive mechanism or any part of the electrode.
7. Make sure welding area has plenty of fresh air without being drafty. Remove all toxic and combustible materials.
8. Make sure all electrical and gas connections are tight.
9. Do not touch any metal in welding area with bare hands. Aluminum does not change color when hot.
10. Do not weld in the fuel compartment where sealing compound has been applied.
11. Use a welding screen to protect personnel from arc flash.

12. GENERAL WELDING PROCEDURES

BASIC WELDING REPAIRS. Repairs are made on 5083 aluminum alloy using the MIG (Gas Metal Arc) welding method.

13. CONTRACTION AND EXPANSION. Aluminum welds contract about 6 percent in volume when they become solid. Welding at a slow speed may cause too much heating of the area around the weld. This will cause the metal to expand too much or melt. It will then cause cracking upon cooling.
14. FILLER WIRE. Always use clean wire. Filler wire polluted by grease, oil, dust or shop fumes causes porous welds. After welding, cover wire to prevent pollution. Store covered wire in warm, dry place.
15. CLEANING OF WELDING SURFACES. Remove oxides, grease, oil films, paint, and all foreign matter from joint before welding. Wipe edges of joint with clean cloth dipped in solvent, and let dry before welding. Sand with disc sander or brush surface with clean stainless steel wire brush to remove oxide. Clean up weld area and touch up all bare metal. Use touch-up paint. See TM 43-0139.
16. FIT-UP AND TACKING. Good joint fit-up makes welding easier, saves filler wire and gas, and helps to get higher quality welds. You must tack weld to hold the joint members in place if you don't have jigs. Tack welds should be small, neat, and placed right to keep parts lined up before and during welding.
17. WELDING UNEQUAL SECTIONS. When welding unequal sections, direct arc against heavier piece to fuse the two edges evenly. Watch weld pool edge rather than arc to ensure pool edges fuse right.
18. MULTIPASS WELDING. Make sure edges of weld pool fuse right. Watch weld pool rather than arc. Any oscillating or weaving motion should be slight, smooth, and slow. Brush material with clean stainless steel wire brush after each pass. On small weldments, lower amperage slightly after each pass if welding members become too hot.
19. ALUMINUM CASTINGS

CAUTION

Heat distortion during welding will damage aluminum castings. Do not attempt to repair aluminum castings by welding.

19. FINAL DRIVE CASTING. Welding in final drive aluminum casting is not authorized. Do not attempt to weld on final drive housing assembly.

20. MAGNESIUM CASTINGS

WARNING



Magnesium may catch fire if welded on or exposed to high temperatures. Do not weld on magnesium castings or expose them to high temperatures.

20. FAN CASTINGS. Welding on fan magnesium castings is not authorized. Do not attempt to weld on these parts.

WARNING



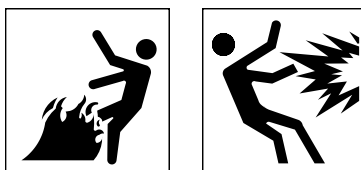
Fine particles of magnesium can catch fire and burn you. Be very careful when filing or grinding on magnesium. Use grinding equipment marked "FOR MAGNESIUM GRINDING ONLY." Keep a Class D fire extinguisher close by.

WARNING



Water and foam-type fire extinguishers will cause magnesium fires to flare up. Use a Class D fire extinguisher or a sodium chloride base dry powder to fight magnesium fires.

WARNING



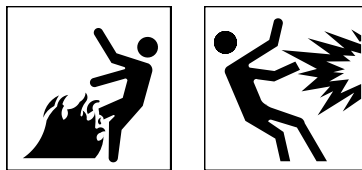
Improper disposal of magnesium can cause a fire or explosion. Do not expose magnesium to high temperatures. Let magnesium dry before placing in sealed metal containers. Label containers and ship to a Class I hazardous waste disposal site.

21. **FILING OR GRINDING MAGNESIUM.** You must observe the following safety precautions when filing or grinding on magnesium:

- Use grinding equipment marked "FOR MAGNESIUM GRINDING ONLY."
- Use a suitable coolant when grinding magnesium to keep temperatures below ignition point.
- Keep tools used on magnesium sharp.
- Keep a Class D fire extinguisher nearby for use on magnesium fires.
- Wear outer clothing of fire retardant cloth or leather. Brush clothing often to remove magnesium particles.
- Clean work area often. Do not let magnesium particles build up.
- Dispose of magnesium chips and filings according to regulations.

22. **FUEL TANKS**

WARNING



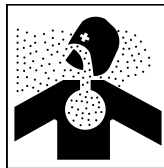
Fuel fumes can explode and burn you. Before welding:

- Drain all fuel.**
- Disconnect and cap all fuel and vent lines.**
- Purge fuel residue and fumes by steam cleaning.**
- Purge air from fuel tank with CO2.**

- a. You must observe the above warning when working with fuel or fuel lines.

23. **PLASTIC MOLDING MATERIAL PARTS**

WARNING



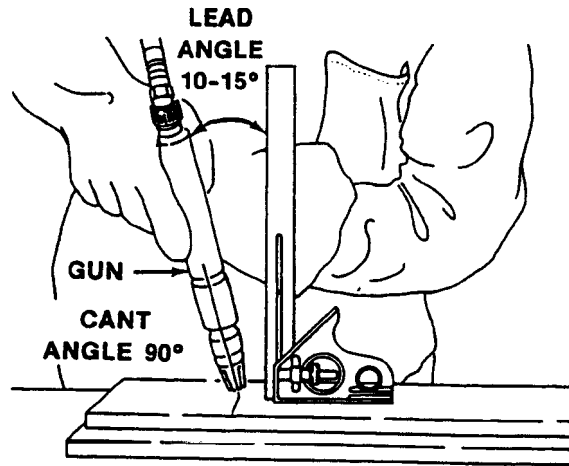
Do not weld on plastic molding material parts. Welding on plastic molding material parts creates toxic fumes. Fumes are hazardous to your health and can result in death.

- a. **PLASTIC MOLDING MATERIAL PARTS WELDING.** The following is a list of plastic molding material parts and their location on the vehicle:
- Driver's power plant compartment access panel
 - Power plant rear compartment access panel
 - Driver's seat upholstered back rest
 - Trim vane rear pod
 - Trim vane front pod
 - All armor.

24. MIG WELDING METHOD

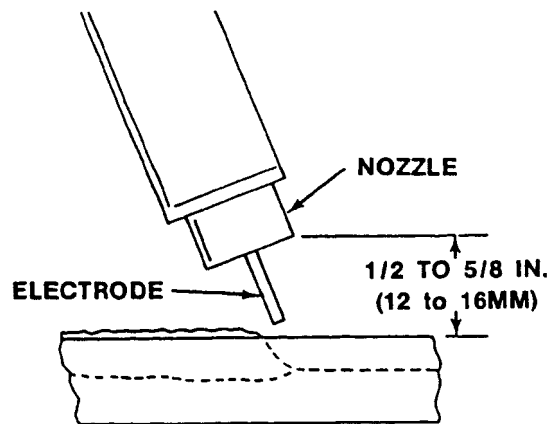
METAL-INERT-GAS (MIG) WELDING. This process uses a DC power source, control panel, and a welding gun. The gun feeds a consumable bare electrode at a given rate into a molten pool beneath a blanket of inert gas. When an arc is struck, a molten pool forms at once. Move the welding gun along the joint line at a rate that shapes the right size bead. The covering inert gas keeps air from polluting the weld zone. No flux is needed.

25. LEAD ANGLE AND CANT ANGLE. Place gun at a lead angle of 10° to 15° off vertical. Point gun in direction of weld travel for good gas coverage, cleaning, and preheating of material. Place gun at a cant angle of 90° to parent metal so filler wire and arc are directed toward apex of groove. This will give equal fusion on both sides of material, even weld build-up, good gas coverage, and equal penetration.



26. NOZZLE CLEARANCE. Keep nozzle clearance of $1/2$ to $5/8$ inch (12 to 16 mm) for good gas coverage. Wrong nozzle clearance will cause the following:

- Oxide deposits in the weld bead
- Force gas bubbles into the weld
- Prevent cleaning action on the material in front of the weld pool.



27. ARC LENGTH. You will hear a smooth hissing or buzzing sound when the right arc length is struck.
28. For further welding instructions, see TM 9-237.

FLUID LEAKS AND CHECKING FOR LEAKS

1. *GENERAL.* Fluid leaks in holes and fluid lines affect the vehicle parts operation. The types and classes of leaks are given below.

CLASS I — Fluid seepage is not great enough to form drops, but it is shown by wetness or changes.

CLASS II — Fluid leakage is great enough to form drops, but drops do not drip from item being checked or inspected.

CLASS III — Fluid leakage is great enough to form drops that fall from the item being checked or inspected.

NOTE

You are allowed to operate equipment with minor leaks (Class I or II). You must consider how much fluid the item or system being checked or inspected can hold. When in doubt, notify your supervisor. When operating equipment with Class I or II leaks, continue to check fluid levels as required in your PMCS. Correct Class III leaks right away.

2. *CHECKING FOR LEAKS AFTER MAINTENANCE TASK.* After doing maintenance on a part which involves hoses or fluid lines, check for leaks. If leaks occur after you have done a replace or repair task, find the source of the leak. Correct the problem. Follow these procedures.
 - a. Do visual inspection to find the source of the leak.
 - 1) Check for cracks on housing or cover.
 - 2) Check that screws and any connections are not loose or overly tight.
 - b. If you cannot see the source of the leak, repeat the maintenance task. Check the items listed below as you repeat the task.
 - 1) Check that performed gasket is not bent, broken, or pinched.
 - 2) Check machined surfaces for fit and cleanliness.
 - 3) Install new replacement parts.
 - c. After you repeat the task and install a new part, the leak could persist. If so, report the problem to your supervisor.

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By Order of the Secretary of the Army:

Official:



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*Administrative Assistant to the
Secretary of the Army*
0107108

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METRIC CONVERSION CHART

APPROXIMATE CONVERSION FACTORS

| TO CHANGE | TO | MULTIPLY BY |
|------------------------|----------------------|-------------|
| Inches | Centimeters | 2.540 |
| Feet | Meters | 0.305 |
| Yards | Meters | 0.914 |
| Miles | Kilometers | 1.609 |
| Square Inches | Square Centimeters | 6.451 |
| Square Feet | Square Meters | 0.093 |
| Square Yards | Square Meters | 0.836 |
| Square Miles | Square Kilometers | 2.590 |
| Acres | Square Hectometers | 0.405 |
| Cubic Feet | Cubic Meters | 0.028 |
| Cubic Yards | Cubic Meters | 0.765 |
| Fluid Ounces | Milliliters | 29.573 |
| Pints | Liters | 0.473 |
| Quarts | Liters | 0.946 |
| Gallons | Liters | 3.785 |
| Ounces | Grams | 28.349 |
| Pounds | Kilograms | 0.454 |
| Short Tons | Metric Tons | 0.907 |
| Pound-Feet | Newton-Meters | 1.356 |
| Pounds per Square Inch | Kilopascals | 6.895 |
| Miles per Gallon | Kilometers per Liter | 0.425 |
| Miles per Hour | Kilometers per Hour | 1.609 |

| TO CHANGE | TO | MULTIPLY BY |
|----------------------|------------------------|-------------|
| Centimeters | Inches | 0.394 |
| Meters | Feet | 3.280 |
| Meters | Yards | 1.094 |
| Kilometers | Miles | 0.621 |
| Square Centimeters | Square Inches | 0.155 |
| Square Meters | Square Feet | 10.764 |
| Square Meters | Square Yards | 1.196 |
| Square Kilometers | Square Miles | 0.386 |
| Square Hectometers | Acres | 2.471 |
| Cubic Centimeters | Cubic Inches | 0.060 |
| 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 |

TEMPERATURE CONVERSIONS

$$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$$

212° Fahrenheit is equivalent to 100° Celsius

90° Fahrenheit is equivalent to 32.2° Celsius

32° Fahrenheit is equivalent to 0° Celsius

$$9/5 \text{ C}^{\circ} + 32 = \text{F}^{\circ}$$

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