

TECHNICAL MANUAL

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL FOR

CARRIER, PERSONNEL, FULL TRACKED, ARMORED, M113A2
NSN 2350-01-068-4077

CARRIER, COMMAND POST, LIGHT TRACKED, M577A2
NSN 2350-01-068-4089

CARRIER, MORTAR, 120-MM, M121; SELF-PROPELLED, M1064
NSN 2350-01-338-3116

CARRIER, STANDARDIZED INTEGRATED COMMAND POST SYSTEM,
M1068
NSN 2350-01-354-5657

CARRIER, SMOKE GENERATOR, FULL TRACKED, M1059
NSN 2350-01-203-0188

COMBAT VEHICLE, ANTI-TANK, IMPROVED TOW VEHICLE, M901A1
NSN 2350-01-103-5641

SUPERSEDURE NOTICE — This manual supersedes TM 9-2350-261-34 dated 10 August 1990, including all changes.

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

HEADQUARTERS, DEPARTMENT OF THE ARMY
AUGUST 2005

WARNING SUMMARY

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



HIGH VOLTAGE is used in the operation of this equipment.

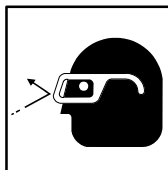
DEATH ON CONTACT may result if personnel fail to observe safety precautions.

NEVER work on equipment unless at least one other person familiar with the operation and hazards of the equipment is nearby. That person should also be familiar with giving first aid. When an operator helps a mechanic, that operator must be warned about dangerous areas.

SHUT OFF POWER supply to equipment before beginning work. Make sure all external power is off/disconnected.

BE CAREFUL not to contact high-voltage connections when installing or operating this equipment.

WARNING



Air pressure in excess of 30 psi (207 kPa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

WARNING



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

WARNING SUMMARY (cont)

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 1 hazardous waste disposal site.

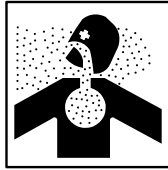
WARNING



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.

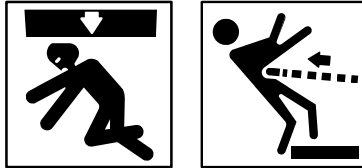
WARNING SUMMARY (cont)

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.

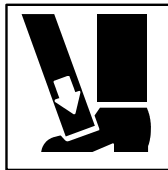
WARNING



Damaged slings can fail when loaded. Breaking slings can strike and injure personnel. Suspended load can fall and crush personnel.

Inspect all slings before use. Do not use damaged slings. Clearly mark all damaged slings as DAMAGED - DO NOT USE.

WARNING



You could get hurt if power plant is not blocked to prevent sudden movement of a component. Block power plant as shown before you attempt any disassembly.

WARNING



Hanging loads could kill or injure you. Keep away from hanging loads and overhead equipment. Keep hands out of engine compartment while power unit is being removed or installed.

WARNING SUMMARY (cont)

WARNING



Hanging loads can kill or injure you. Keep away from hanging loads and overhead equipment. Keep hands away from pinch points. Transmission is heavy. Have helper (H) assist. Use a lifting device.

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.

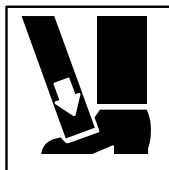
Always use in well ventilated areas, away from heat, sparks, and flames. Do not breathe fumes. Do not allow into contact with skin and eyes. Use goggles or face shield and protective gloves.

WARNING



Engine is heavy. Use a lifting device. Have helper (H) assist.

WARNING



200 amp generator weighs approximately 80 pounds. Have helper assist when removing 200 amp generator.

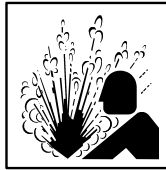
WARNING SUMMARY (cont)

WARNING



Fumes from welding cadmium plated fuel filter bracket are toxic and can poison you. Wear a respirator and use in a well ventilated area to protect you against fume poisoning.

WARNING



Radiator can burst if over pressurized. Do not exceed 25 psi (172 kPa) air pressure. Ensure radiator is submerged before applying air pressure. Always wear safety goggles.

WARNING



High voltage in the M19 periscope can cause serious injury or death. Voltage could exceed 16,000 volts. To avoid accidents, observe the following: Always connect power cable to periscope before turning MASTER SWITCH and infrared (I.R.) POWER switch to ON. Before disconnecting power cable from M19 periscope, always wait at least two minutes after turning infrared (I.R.) POWER switch and MASTER SWITCH OFF. Do not disconnect power cable until image disappears from periscope screen. Never touch end of power cable, or allow it to contact metal surfaces.

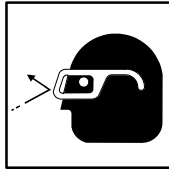
WARNING



To prevent injury to personnel, verify that all grenades have been removed from smoke grenade discharger before removing components.

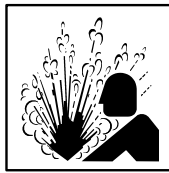
WARNING SUMMARY (cont)

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 TC 9-237. Protective clothing and goggles must be worn; adequate protective equipment used, a suitable fire extinguisher kept nearby; and requirements of TC 9-237 strictly followed.

WARNING



Door could fall and injure you. Make sure door is held by a lifting device before removing hinge screws.

WARNING



Sparks from static electricity could cause a fire or explosion. Make sure to ground the coolant heater before you open fuel supply valve.

WARNING SUMMARY (cont)

WARNING



Mechanical damage, evidence of welding, or corrosion constitute a potential personnel hazard. Use extreme caution when handling fire extinguishers in this condition. Replace if necessary.

WARNING



A cartridge can be punctured if the lever does not work freely. Do not install the cartridge before you make sure the puncture lever works freely.

WARNING



Do not install cartridge without hose in place behind puncture lever. Cartridge will discharge if lever is pushed.

WARNING



Incorrect polarity can harm personnel and damage equipment when power is applied to the power control enclosure. Make sure polarity is correct when installing plug on cable.

FIRST AID

For first aid information, see FM 4-25.11.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

Note: This manual supersedes TM 9-2350-261-34 dated 10 August 1990.

Date of issue for revision is:

Original 0 (26 August 2005)

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 48 AND TOTAL NUMBER OF WORK PACKAGES IS 106 CONSISTING OF THE FOLLOWING:

Page/WP No.	*Change No.	Page/WP No.	*Change No.	Page/WP No.	*Change No.
Cover	0	Chapter 19 Index	0		
a – g/h blank	0	WP 0097 00	0		
A/B blank	0	Chapter 20 Index	0		
i – x	0	WP 0098 00	0		
Chapter 1 Index	0	Chapter 21 Index	0		
WP 0001 00 – 0004 00	0	WP 0099 00 – 0100 00	0		
Chapter 2 Index	0	Chapter 22 Index	0		
WP 0005 00 – 0012 00	0	WP 0101 00 – 0102 00	0		
Chapter 3 Index	0	Chapter 23 Index	0		
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Chapter 4 Index	0	Index 1 – Index 13/14 blank	0		
WP 0015 00 – 0022 00	0	DA 2028 Sample/Reverse	0		
Chapter 5 Index	0	DA 2028/Reverse (3)	0		
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NSN 2350-01-103-5641****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 Equipment Publications), 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 email your letter or DA Form 2028 direct to: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-LC-CIP-WT (Tech Pubs Control Point), Rock Island, IL 61229-7630. The email address is TACOM-TECH-PUBS@ria.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

CURRENT AS OF 5 JANUARY 2004

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HOW TO USE THIS MANUAL

HOW TO USE THIS MANUAL

This manual tells you how to perform direct and general support maintenance for the M113A2, M577A2, M1064, M1068, M1059, and M901A1 Carriers.

Before starting a task or procedure, read HOW TO USE THIS MANUAL and CHAPTER 3, GENERAL MAINTENANCE PROCEDURES.

WHAT'S IN THE MANUAL — FRONT TO BACK

This TM is divided into front and rear matter and Work Packages (WPs) for ease of use.

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.

CHAPTER 1 covers general introductory information with theory of operation. The Equipment Description WP gives a brief description of major parts and features of the carriers. The Theory of Operation WP provides information that will help you understand how the carrier components work.

CHAPTER 2 covers troubleshooting procedures authorized at the DS/GS maintenance level.

CHAPTER 3 includes general maintenance procedures for service upon receipt, PMCS, and general maintenance instructions.

CHAPTER 4 contains maintenance WPs for the engine system.

CHAPTER 5 contains maintenance WPs for the fuel system.

CHAPTER 6 contains maintenance WPs for the cooling system.

CHAPTER 7 contains maintenance WPs for the electrical system.

CHAPTER 8 contains maintenance WPs for the suspension system.

CHAPTER 9 contains maintenance WPs for the hull components.

CHAPTER 10 contains maintenance WPs for ramp system.

CHAPTER 11 contains maintenance WPs for the personnel heater kit.

CHAPTER 12 contains maintenance WPs for the auxiliary engine cover.

CHAPTER 13 contains maintenance WPs for the electronic equipment heater kit.

CHAPTER 14 contains maintenance WPs for the engine coolant heater kit.

CHAPTER 15 contains maintenance WPs for the tent.

CHAPTER 16 contains maintenance WPs for the capstan and anchor kits.

CHAPTER 17 contains maintenance WPs for machine gun armor shield kit.

CHAPTER 18 contains maintenance WPs for electrical/communications equipment (M1068 only).

CHAPTER 19 contains maintenance WPs for fire extinguisher system.

CHAPTER 20 contains maintenance WPs for chemical agent automatic alarm mounting kit.

CHAPTER 21 contains maintenance WPs for the shipping closure and frame.

CHAPTER 22 contains general support maintenance WPs.

CHAPTER 23 provides supporting information for the TM. It includes the following WPs:

The REFERENCES WP lists references to be used by personnel in operating and maintaining the carrier.

The COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES WP lists the tools used in the initial setup.

The EXPENDABLE/DURABLE SUPPLIES AND MATERIALS WP lists the expendable supplies and materials used to maintain or repair the carrier.

The FABRICATED TOOLS WP lists instructions for making tools authorized to be fabricated at DS or GS maintenance levels.

HOW TO USE THIS MANUAL (cont)

The INDEX is an alphabetical listing of all the tasks in the WPs of this TM. 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. A sample is provided to show you how to fill out the DA Form 2028.

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

How to find the WP you need

Pick a key word from the carrier part or system to be used during the WP. Look in the INDEX for this key word or the name of the action you will perform. The INDEX lists each WP under one or more headings. Turn to the page indicated.

How to read the WP

Be sure to read all **WARNINGS**, **CAUTIONS** and **NOTES**. These are in all types of WPs. They help you avoid harm to yourself, other personnel and equipment. They also tell you things you should know about the WP.

Before starting, get all tools, supplies, and personnel, listed on the setup page needed to do the WP. Be sure to read the WP before performing the maintenance. If any other WPs are referenced, you must go to the setup page for each of those WPs to find out what tools, parts, and materials will be needed.

Start with Step 1 and do each step in given order.

Look at the drawings. These show you what to look for when reading a maintenance WP.

Maintenance Instructions WPs

Doing maintenance WPs will keep the carrier in shape to operate. Maintenance WPs are used to present maintenance instructions. Each maintenance WP details steps which you need to perform. If the carrier and parts need maintenance that is not included in any WP in the manual, report this to your supervisor.

Read the INITIAL SETUP section carefully before you start a WP. Get the tools and supplies listed and the personnel needed to perform the WP. Be sure that the equipment is in the condition required.

DEFINITION OF WP TERMS

WARNINGS, CAUTIONS, AND NOTES

Be sure to read all warnings and cautions in 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 WP easier. Warnings, cautions, and notes always appear just above the WP 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.
CAUTIONS	Call attention to actions or materials that could damage equipment.
NOTES	Contain important facts to make the procedure easier.

HELPER

Helpers are needed for WPs that require more than one person such as lifting heavy objects or acting as an observer.

If a helper is needed to perform a procedure, the INITIAL SETUP will list "Helper" under the PERSONNEL REQUIRED heading.

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

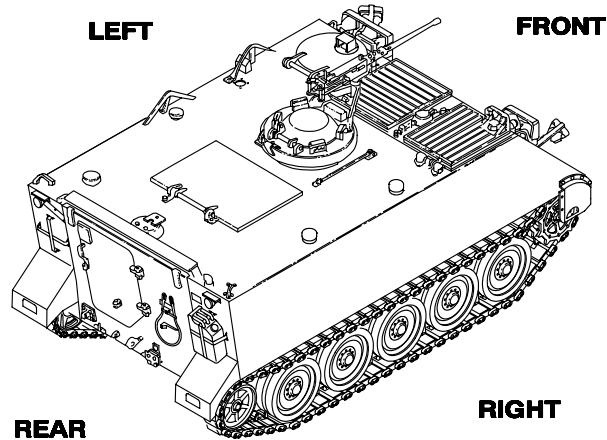
If a helper performs the action alone, the step will start with "HELPER."

HOW TO USE THIS MANUAL (cont)

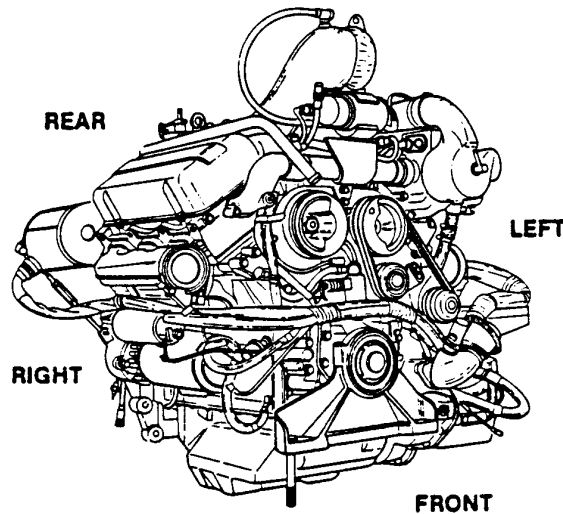
LOCATIONAL TERMS

The terms “front,” “rear,” “left,” and “right” are used to indicate where items are located. THE POINT OF REFERENCE FOR THESE TERMS IS DIFFERENT FOR CARRIER ITEMS AND POWER UNIT ITEMS. (Carrier items are items which are not on the power unit. Power unit items are items on the engine or transmission.)

If you are working with carrier items, use this point of reference. Think of the location as if you were sitting in the driver’s seat looking out the hatch.



If you are working with power unit items, use this point of reference. 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 carrier.



REFERENCES

References within a WP refer to a different manual or to another WP in the same manual. A step in one WP may be a complete WP someplace else. Below is an example of a reference step from the WP INSTALL ENGINE COOLANT HEATER KIT.

Example: Lower power plant grille (see your -20).

The tools needed to do the task will be listed in that task.

MATERIALS/PARTS

For all WPs, the following comments apply:

Parts which are listed under INITIAL SETUP will be referred to as “new” in the WP steps when installed.

Examples are: “locknuts,” “lockwashers,” “cotter pins,” and some “gaskets.”

HOW TO USE THIS MANUAL (cont)

These and other new parts are listed under Materials/Parts in the INITIAL SETUP.

GENERAL MAINTENANCE

Cleaning, inspecting, checking for leaks, and similar procedures which apply to most WPs are found in CHAPTER 3, GENERAL MAINTENANCE PROCEDURES. Use these steps to clean and inspect any part being removed, repaired, or installed. Special cleaning will be covered in the WP steps.

HOW TO USE THE REPAIR PARTS AND SPECIAL TOOLS LISTS (RPSTL) WITH THIS MANUAL

The RPSTL TM 9-2350-261-24P gives the National Stock Number (NSN) required to order parts used in the maintenance WPs. To use the RPSTL to identify and order a part, do the following:

In this manual, turn to the first page of the WP to be performed.

Find Materials/Parts under INITIAL SETUP, and read the part(s) that need replacement. If required, find the illustrated part in the WP steps.

Go to the RPSTL and find the same illustrated part. That part will have an item number assigned to it. Look this item number up in the listing for that figure. The NSN can be found in the National Stock Number and Part Number Index in the back of the RPSTL.

If you inspect an item and find that it is damaged, go to the RPSTL and find the SMR code for the item. If the SMR code does not authorize you to repair the item, reassemble it and send it to the authorized level of maintenance.

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**

Type of Manual: Direct and General Support Maintenance

Equipment Model Number, Name, and Purpose

M113A2 – Carrier, Personnel, Full Tracked, Armored

Purpose: Transportation and positioning combat troops and supplies.

M577A2 – Carrier, Command Post, Light Tracked

Purpose: Provides protection and mobility for field commanders in a tactical environment.

M1059 – Carrier, Smoke Generator, Full Tracked

Purpose: Designed to generate a smoke screen in the battlefield environment.

Other Applicable Manuals: See TM 3-1040-283-20&P for Operator's instructions, Unit maintenance, and repair parts for Smoke Generator Set M157A2.

M901A1 – Combat Vehicle, Anti-Tank Improved TOW Vehicle

Purpose: Provides mobility for heavy anti-tank weapon designed and built to attack and defeat armored vehicles and other targets such as field fortifications.

Other Applicable Manuals: See TM 9-2350-259-34 and TM 9-2350-259-24P for DS and GS maintenance, and repair parts for the turret and related parts.

M1064 – Carrier, Mortar, 120-mm, Self-propelled

Purpose: Provides mobility for the 4.7-inch (120-mm) Mortar M121 or M120. The M121 can be fired from a turntable mounted in the carrier. The M120 can be fired from a portable mount off the carrier.

Other Applicable Manuals: See TM 9-1015-250-23&P for Unit and DS maintenance and repair parts for the 4.7-inch (120-mm) Mortar M121 or M120.

M1068 – Carrier, Standardized Integrated Command Post System

Purpose: Designed as a command post and field office to support the various configurations and installation layouts of the Army Tactical Command and Control System (ATCCS) and provide protection for field commanders in a tactical environment.

Other Applicable Manuals: See TM 11-7010-256-12&P for Operator's instructions, Unit maintenance, and repair parts for SICPS Equipment.

See TM 10-5410-229-13&P for Operator's instructions, Unit and DS maintenance, and repair parts for the Modular Command Post System (MCPS) tent and related parts.

MAINTENANCE FORMS, RECORDS, AND REPORTS

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

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your carrier needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at: Commander, US Army Tank-Automotive Command, ATTN: AMSTA-QRT, Warren, MI 48397-5000. A reply will be sent to you.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

See the following technical manuals for information on destruction of Army materiel:

TM 750-244-2 Procedures for Destruction of Electronics Materiel to Prevent Enemy Use.

TM 750-244-6 Procedures for Destruction of Tank Automotive Equipment to Prevent Enemy Use.

TM 750-244-7 Procedures for Destruction of Equipment in Federal Supply Classifications 1000, 1005, 1010, 1015, 1020, 1025, 1030, 1055, 1090, and 1095 to Prevent Enemy Use.

PREPARATION FOR STORAGE OR SHIPMENT

For information about administrative storage or shipment, see the following documents:

Preparation for Storage or Shipment

Specification	Applicable Carriers
MIL-DTL-45360H	M113A2, M1064, M1059
ATPD 2227	M577A2 and M1068
ATPD 2230	M901A1 TOW Vehicle (Less TOW Weapon)

NOMENCLATURE CROSS-REFERENCE

This listing includes nomenclature cross-references used in this manual.

COMMON NAME

Heat exchanger	Battery plate
Locknut	Self-locking nut
Lockscrew	Self-locking bolt
Lockwasher	Self-locking washer
Pressnut	Splined self-locking nut

METRIC EQUIVALENTS

Metric equivalents are used throughout this manual. Metric symbols and units are:

Metric Equivalents

SYMBOL	UNIT
C	Celsius
cc	Cubic centimeter
cm	Centimeter
j	Joule
kg	Kilogram
kg/min	Kilogram per minute
km	Kilometer
km/h	Kilometer per hour
kPa	Kilopascal
kW	Kilowatt
l	Liter
m	Meter
mm	Millimeter
N·m	Newton-meters

SAFETY, CARE, AND HANDLING

See Warning Summary in front of manual.

EQUIPMENT DESCRIPTION AND DATA

0002 00

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

For equipment characteristics, capabilities, and features, see your -10.

LOCATION AND DESCRIPTIONS OF MAJOR COMPONENTS

ENGINE

A diesel engine is located in the power plant compartment.

TRANSFER GEARCASE

The transfer gearcase is connected to the engine and transmission. It provides power through pulleys to the fan and generator.

TRANSMISSION

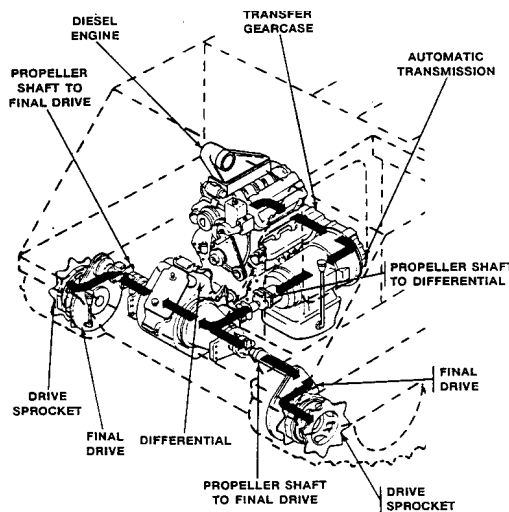
An automotive transmission connects to the transfer gearcase and powers the differential.

DIFFERENTIAL

The differential has three propeller shafts, one inputting power from the transmission, and two propeller shafts attached to final drives. The differential is the steering and braking for the power train.

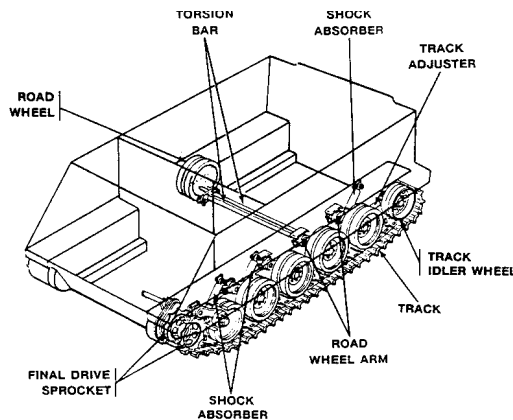
FINAL DRIVES

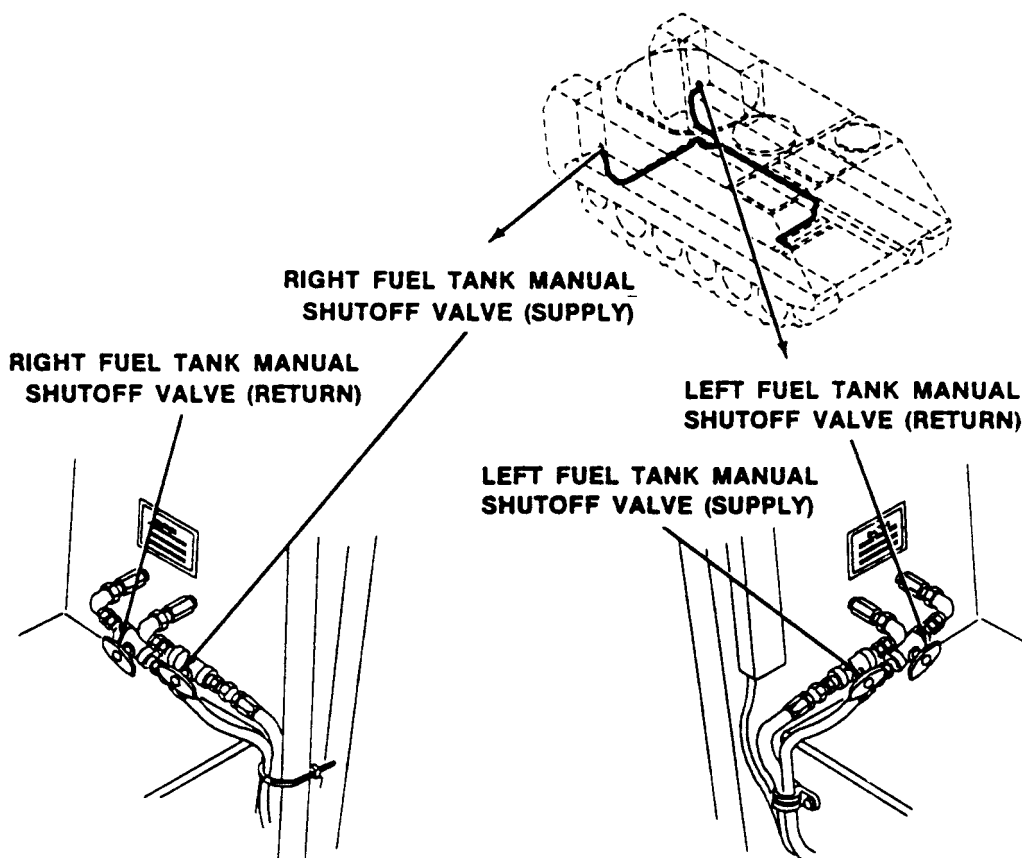
Final drives attach to the differential by propeller shafts. They deliver power to drive sprockets at the front of the carrier.



TRACKS AND SUSPENSION

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



FUEL TANK MANUAL SHUTOFF VALVES (M1064 ONLY)

LEFT FUEL TANK MANUAL SHUTOFF VALVE (SUPPLY)	Starts and stops fuel flow from left fuel tank to engine.
LEFT FUEL TANK MANUAL SHUTOFF VALVE (RETURN)	Starts and stops fuel flow from engine to left fuel tank.
RIGHT FUEL TANK MANUAL SHUTOFF VALVE (SUPPLY)	Starts and stops fuel flow from right fuel tank to engine.
RIGHT FUEL TANK MANUAL SHUTOFF VALVE (RETURN)	Starts and stops fuel flow from engine to right fuel tank.

MATERIAL USED WITH CARRIERS

Various kits can be applied to your carrier to prepare it for particular missions or operating conditions. Each kit is described and illustrated in TM 9-2350-261-10. These kits include:

- Personnel Heater Kit — All Carriers
- Engine Coolant Heater Kit — All Carriers
- Electronic Equipment Heater Kit — M577A2 Only
- Hospital Litter Kit — M113A2 Only
- Windshield Kit — All Carriers
- NBC Systems M8A3, M13, and M14 (NBC Kit) — All Carriers Except M1064
- Capstan and Anchor Kits — M113A2 and M1059
- Smoke Grenade Launcher Kit — M113A2 and M1059

EQUIPMENT DATA

For equipment data, see your -10.

THEORY OF OPERATION

0003 00**GENERAL INFORMATION: M113A2 FOV**

The M113A2 FOV carrier is powered by a liquid cooled 6V53, 210 horsepower diesel engine. The engine power is converted to mechanical power and transferred to the carrier tracks and other components through a transfer gearcase, transmission, differential, and final drives.

The engine, transmission, and steering/braking system are driver controlled. Engine startup and shutdown are controlled by electrical signals and mechanical linkages connected to the accelerator pedal, the fuel shutoff cable, and the hand throttle cable. Steering/braking are controlled through linkages connected to the differential.

ENGINE AND DRIVE TRAIN

The engine converts air and diesel fuel into energy. The engine delivers this power to the transmission. A drive train transfers power from the engine to the carrier tracks. The drive train consists of the engine, transfer gearcase, transmission, differential, drive lines, final drive assemblies, and drive sprockets.

COOLING SYSTEM

The engine and transmission generate heat during normal operation. The cooling system transfers some of the heat to the outside to maintain a safe operating temperature. The vent fan draws air in through the radiator, circulates it around the power plant, and expels it through the exhaust grille above the vent fan. The vent fan is belt-driven from the engine crankshaft. A mixture of antifreeze and water is pumped through the cooling system to cool the engine and transmission. The engine cooling system has a capacity of 9.5 gallons (35.96 liters). The cooling system should be checked regularly. The auxiliary radiator tank, located on the transverse beam, provides space for the separation of air and liquid coolant. Stop engine if temperature goes above 200°F (93.3°C). Refer to Check/Fill Cooling System (TM 9-2350-261-10).

COLD START SYSTEM

The engine is equipped with a cold start system (air box heater). The air box heater heats the air entering the cylinders to assist in ignition of fuel at low ambient temperatures (below 40°F (4.4°C)). A fuel and air mixture is sprayed into the air box and a spark ignites a flame. The flame heats the engine air, which is fed directly into the cylinders to make starting easier.

DIFFERENTIAL STEERING LEVERS

The differential steering levers are used to steer as well as stop the carrier. Pulling on one or both of the differential steering levers applies the brakes in the differential steering unit. To turn left, gradually pull on the left steering lever. To turn right, gradually pull on the right steering lever. To slow or stop the carrier, gradually pull both steering levers. To lock the steering levers in place, push down on the brake lock buttons, located on top of the steering levers. To release the steering levers brake-lock buttons, pull back on the steering levers and the buttons will pop up.

PIVOT STEER LEVERS

The pivot steer levers are used to steer the carrier while in water and to turn a stopped carrier into a tight turn. To pivot steer the carrier, bring the carrier to a stop and pull on the pivot steer lever. Pulling the pivot lever applies the disc brake, which will lock up the one track and allow all of the differential power to be applied to the other back.

FUEL CUTOFF CONTROL

To start fuel flowing to the engine, push the fuel cutoff control all the way in. To stop fuel flow to the engine, pull the fuel cutoff control all the way out. This will shut down the engine when it is running.

HAND THROTTLE CONTROL

The hand throttle control is used to set the engine speed for various reasons. To set the engine speed, while pushing down the accelerator pedal, pull hand throttle control out until desired RPM is indicated by tachometer. Turn the hand throttle control clockwise to lock the control and counterclockwise to release the control. Once the hand throttle control is set, the engine will maintain the set speed without holding down the accelerator pedal.

MAIN LIGHT SWITCH

The main light switch is used to control all of the exterior lights and the instrument panel lights. To select lights, push up and hold the UNLOCK lever before moving desired lever to the position wanted. Refer to Operate Carrier Lights (TM 9-2350-261-10).

AIR CLEANER INDICATOR

The air cleaner indicator indicates if the air cleaner is operating properly or is plugged. When the air cleaner indicator is red, the air cleaner is plugged and needs cleaning. Press rubber dome to reset air cleaner indicator after air cleaner has been replaced or cleaned.

FIXED FIRE EXTINGUISHER

Refer to TM 9-2350-261-10 for operation of the fixed fire extinguisher.

BATTERY GENERATOR GAUGE

The battery generator gauge has the color red repeated. The first (left to right) red position indicates the batteries are dead (no power). The second red position indicates the batteries are being overcharged and could possibly blow up. During normal operation, the gauge should be in the green position. Refer to TM 9-2350-261-10 for other colors.

TACHOMETER GAUGE

The tachometer indicates engine speed and hours of operation. To read engine speed (RPM), multiply the large numbers on the gauge by 100, or add two zeros to number.

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) for your unit. Common tools and equipment needed for the maintenance procedures in the manual are listed in WP 0104 00.

SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Special tools, TMDE, and support equipment needed for the maintenance procedures in this manual are listed in Appendix B. Special tools are also cataloged in the Repair Parts and Special Tools List (RPSTL) TM 9-2350-261-24P. Additional TMDE and special tools are listed in your -20.

NOTE

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

FABRICATED TOOLS

Some tools needed for specialized maintenance procedures are not available in the supply system. These tools are normally fabricated locally by the unit doing the maintenance. Fabrication instructions for these tools are given in WP 0106 00.

REPAIR PARTS

Repair parts are listed and illustrated in the Repair Parts and Special Tools List (RPSTL) TM 9-2350-261-24P. Maintenance and supply personnel can order them.

CHAPTER 2

DIRECT SUPPORT TROUBLESHOOTING PROCEDURES

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
INTRODUCTION HOW TO USE TROUBLESHOOTING.....	0005 00
FAULT SYMPTOM INDEX	0006 00
VEHICLE BATTERIES DISCHARGE WITH EXTERNAL AC POWER APPLIED (M1068 ONLY).....	0007 00
PATCH PANEL BOX A10 INOPERATIVE (M1068 ONLY).....	0008 00
PATCH PANEL BOX A10 (M1068 ONLY).....	0009 00
EXTERNAL COMMUNICATION BOX A11 INOPERATIVE (M1068 ONLY).....	0010 00
VEHICLE WILL NOT ACCEPT EXTERNAL AC POWER (M1068 ONLY).....	0011 00
NO DC OUTPUT FROM DC POWER SUPPLY (M1068 ONLY).....	0012 00

INTRODUCTION HOW TO USE TROUBLESHOOTING

0005 00**PURPOSE**

The purpose of direct and general support maintenance level troubleshooting is to diagnose carrier problems which are reported to direct and general support maintenance. Troubleshooting tasks in this manual are common to all M113A2 FOV carriers except where indicated. You should not begin direct and general support maintenance troubleshooting until all operator and unit troubleshooting has been completed. You will perform four actions in direct and general support maintenance troubleshooting:

- (1) Before starting a troubleshooting task, verify that reported problem is present in carrier.
- (2) After verifying the symptom, find the part that is causing problem.
- (3) Replace or adjust that part.
- (4) Check to make sure problem no longer exists, and that there are no other problems.

DEFINITIONS AND DESCRIPTIONS OF TROUBLESHOOTING PARTS

Troubleshooting tasks always have a beginning and an end. You will use task steps, test procedures, indexes, maintenance tasks, and other technical manuals to troubleshoot. Troubleshooting uses the following terms that are not used in other kinds of tasks:

- | | |
|----------------------------------|--|
| 1. FAULT: | The part that is not operating correctly and is causing the problem. |
| 2. SYMPTOM: | The problem reported by unit maintenance. |
| 3. VERIFY NO FAULTS FOUND | After you have completed the corrective action, you must verify that no faults exist. If the fault condition still exists, then the fault is not fixed or there is another fault. If this happens, start at the beginning of the troubleshooting procedure until you find and correct all faults. Always operate the system and/or carrier to make sure that you have corrected the reported problem. If troubleshooting does not identify a faulty part, the carrier is defective beyond the level of direct and general support maintenance. |

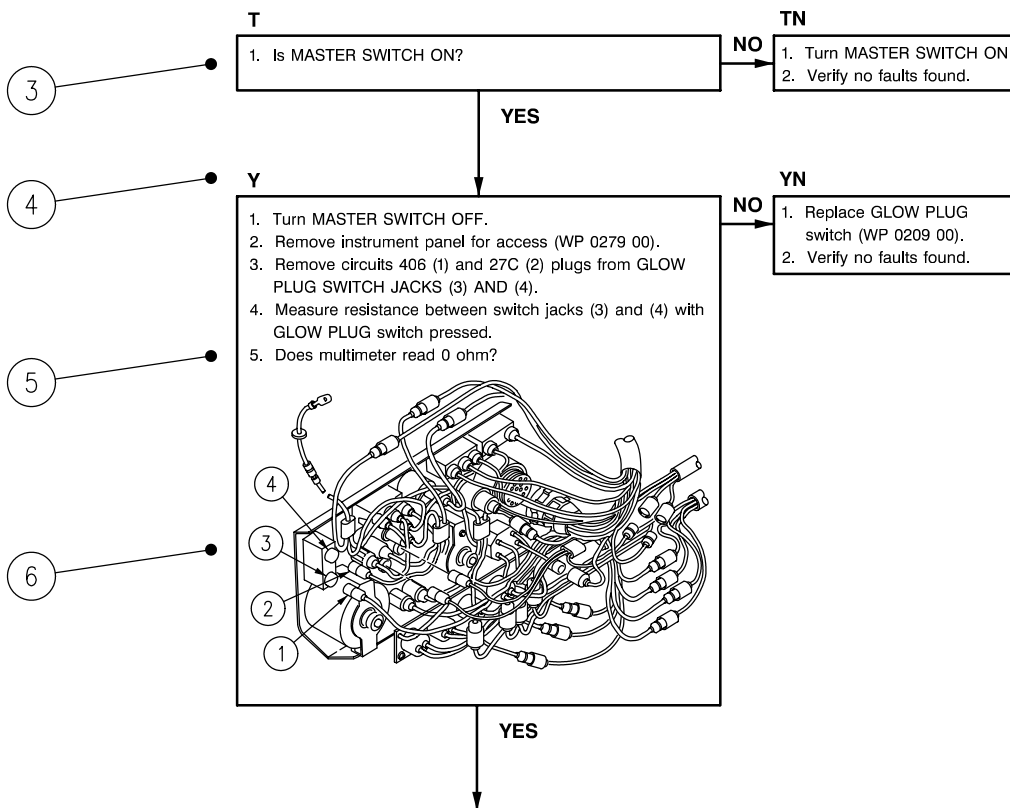
TROUBLESHOOTING BASICS

Troubleshooting Procedure

A troubleshooting procedure serves as a starting point for your troubleshooting work. You will branch in and out of procedures as you work to find a fault. Also, you will correct the fault, and check that the fault has been corrected. The parts of a troubleshooting procedure are given below.

TM 9-2350-261-34

1	WAIT INDICATOR LIGHT DOESN'T LIGHT	0019 00
2	INITIAL SETUP:	
	<u>Maintenance Level</u>	<u>References</u>
	Unit	See your -10
	<u>Tools and Special Tools</u>	
	General mechanics tool kit: automotive (WP 0926 00 Item 65) Multimeter (WP 0926 00 Item 30)	
	<u>Personnel Required</u>	<u>Equipment Condition</u>
	Unit Mech 63T10 Helper (H)	Engine stopped (see your -10) Vehicle blocked (see your -10)



Legend to Sample

1 TITLE	This is the name of the procedure.
2 INITIAL SETUP	This tells you the tools, materials/parts, personnel, references, and equipment conditions needed to do the procedure.
3 TASK STEPS	These boxes give you step-by-step instructions.
4 REFERENCE LETTER	This will send you to the correct block to continue with the troubleshooting procedure.
5 QUESTIONS	This is the last step in YES blocks. The answer to this question will direct you to the next block.
6 ILLUSTRATIONS	These help you locate and identify parts.

Locating the Correct Troubleshooting Procedure

- (1) Component/carrier arrives at shop.
- (2) Read DA Form 2404.
- (3) Verify that the problem on DA Form 2404 exists.
- (4) Look up carrier symptom in Fault Symptom Index and go to that task.

Perform the Troubleshooting Procedure

- (1) Make sure you have all items in INITIAL SETUP.
- (2) Perform required action(s) in Equipment Condition.
- (3) Complete first block of task steps.
- (4) Refer to system schematic or diagram for system components, detail, and clarification.
- (5) Answer question at the bottom of the first block.
- (6) Follow YES or NO arrows to next block.
- (7) Move from block to block. Answer questions and follow instructions. You may be directed to: do further checks and tests on parts; go to another manual and do tasks; or go to another task.

NOTE

After completing the actions called for on another page or manual, return to the point in the troubleshooting procedure where you left off.

- (8) Locate fault and perform corrective action.
- (9) Check to make sure the fault is corrected, and there are no new faults.
- (10) Button up by installing items listed in Equipment Conditions after finishing the troubleshooting task.

TROUBLESHOOTING SAMPLE

The following sample takes you through a typical troubleshooting procedure.

Finding the Right Troubleshooting Procedure

A component/carrier arrives at the shop. The DA Form 2404 shows that the Patch Panel Box A10 is not working. You look up *Patch Panel Box A10 Inoperative* in the Fault Symptom Index (WP 0006 00).

TM 9-2350-261-34

MALFUNCTION/SYMPATOM INDEX WP

0006 00

DIRECT SUPPORT TROUBLESHOOTING

HOW TO USE TROUBLESHOOTING	WP 0005 00
FAULT SYMPTOM INDEX	WP 0006 00
VEHICLE BATTERIES DISCHARGE WITH EXTERNAL AC POWER APPLIED	WP 0007 00
PATCH PANEL BOX A10 INOPERATIVE	WP 0008 00
PATCH PANEL BOX A10 WIRING DIAGRAM	WP 0009 00
EXTERNAL COMMUNICATION BOX A11 INOPERATIVE	WP 0010 00
VEHICLE WILL NOT ACCEPT EXTERNAL AC POWER	WP 0011 00
NO DC OUTPUT FROM DC POWER SUPPLY	WP 0012 00

This is the procedure you want.

Check title to make sure you are troubleshooting the correct system or component for the problem. Next, read the INITIAL SETUP carefully. Make sure you have all the items listed in INITIAL SETUP. Some access steps in Equipment Conditions may not need to be performed depending on fault location. It's up to you to decide which are necessary for your particular problem.

Now you're ready to begin troubleshooting. Look at the first block. Read Step 1. If the answer to the question "Is there output from EXTERNAL BINDING POSTS sockets?" is YES, follow the YES arrow to the next box. Read Step 1 in that box. If the answer to the question "Is there output from TENT INTERFACE PANEL sockets?" is YES, follow the YES arrow to the next box. Follow the same procedure for each box. If you reach the second to last box on the page and the answer to the question "Is there output from RF jacks J119, J120, J121, and/or J122?" is NO, follow the NO arrow to reference GY. Then go to the page indicated.

TM 9-2350-261-34

PATCH PANEL BOX A10 INOPERATIVE

0008 00

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

Electrical Tool Kit (WP 01200 00, Item 60)
Digital Multimeter (WP 0120 00, Item 38)

Personnel Required

Radio Repairer 29E10
Helper (H)

References

See your -10
See your -20
See M1068 wiring diagram (see your -20)

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -20)

WARNING



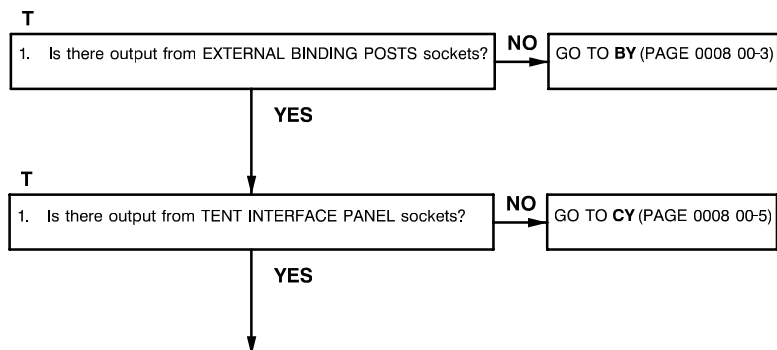
HIGH VOLTAGE is used in the operation of this equipment.

DEATH ON CONTACT may result if personnel fail to observe safety precautions.

NEVER work on equipment unless at least one other person familiar with the operation and hazards of the equipment is nearby. That person should also be familiar with giving first aid. When an operator helps a mechanic, that operator must be warned about dangerous areas.

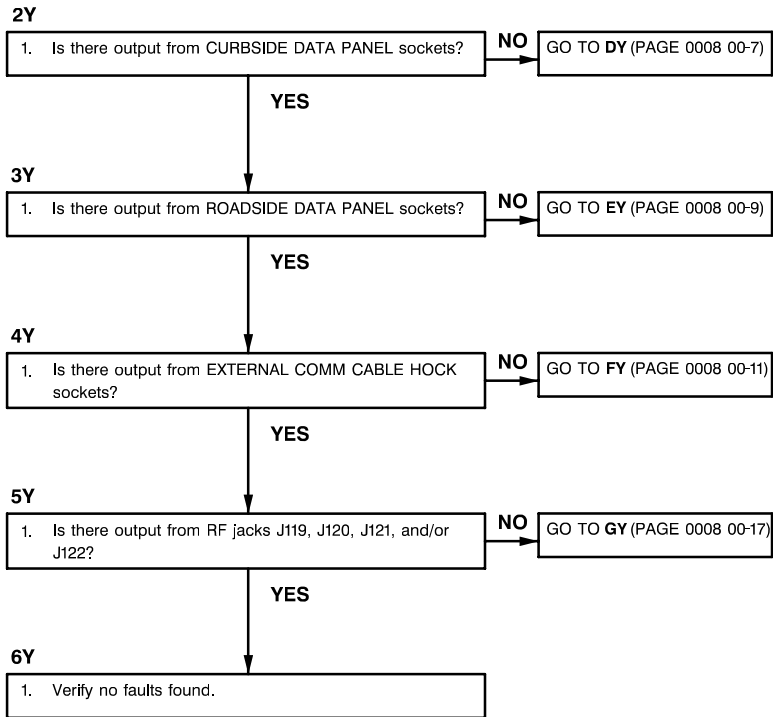
SHUT OFF POWER supply to equipment before beginning work. Make sure all external power is off/disconnected.

BE CAREFUL not to contact high voltage connections when installing or operating this equipment.



TM 9-2350-261-34

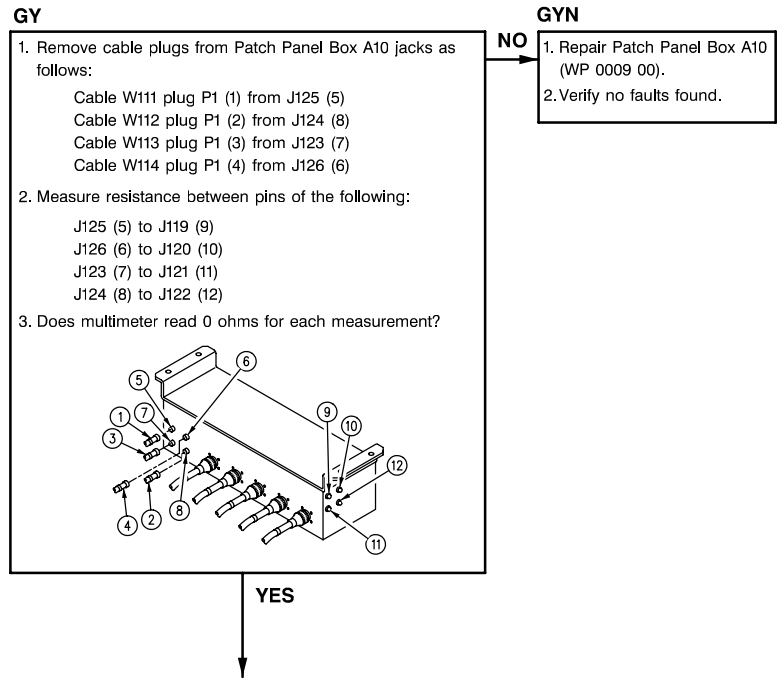
PATCH PANEL BOX A10 INOPERATIVE-Continued 0008 00



This is how GY appears in WP 0008 00. Do Steps 1 thru 3. If the answer to Step 3 is NO, follow the NO arrow to the box at the right.

PATCH PANEL BOX A10 INOPERATIVE-Continued

0008 00



The NO box tells you that the Patch Panel Box A10 is not serviceable and must be repaired. Step 1 tells you to go to the corresponding "REPAIR" task in this manual. Go to the page shown and perform the task. Return to this box when you have completed the repair task.

Step 2 in this box is "Verify no faults found." Check to make sure you have correctly fixed the fault. After no faults found has been verified, return component/carrier to using unit.

This is the end of the troubleshooting sample.

FAULT SYMPTOM INDEX

0006 00

DIRECT SUPPORT TROUBLESHOOTING

HOW TO USE TROUBLESHOOTING.....WP 0005 00

VEHICLE BATTERIES DISCHARGE WITH EXTERNAL AC POWER

 APPLIED (M1068 ONLY).....WP 0007 00

PATCH PANEL A10 INOPERATIVE (M1068 ONLY).....WP 0008 00

PATCH PANEL A10 WIRING DIAGRAM (M1068 ONLY).....WP 0009 00

EXTERNAL COMMUNICATION BOX A11 INOPERATIVE (M1068

 ONLY).....WP 0010 00

VEHICLE WILL NOT ACCEPT EXTERNAL AC POWER (M1068 ONLY).....WP 0011 00

NO DC OUTPUT FROM DC POWER SUPPLY (M1068 ONLY).....WP 0012 00

**VEHICLE BATTERIES DISCHARGE WITH EXTERNAL AC
POWER APPLIED (M1068 ONLY)**

0007 00

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

Digital Multimeter (WP 0104 00, Item 28)
 General Mechanic's Tool Kit (WP 0104 00, Item 19)
 Special Purpose Power Cable (WP 0106 00, Item 2)

Personnel Required

Power-Generation Equipment Repairer 52D10
 Helper (H)

Equipment Condition

Power control enclosure removed (see your -20)
 Power control enclosure power supply cover removed
 (see your -20)
 Unit level troubleshooting completed (see your -20)

WARNING



HIGH VOLTAGE is used in the operation of this equipment.

DEATH ON CONTACT may result if personnel fail to observe safety precautions.

NEVER work on equipment unless at least one other person familiar with the operation and hazards of the equipment is nearby. That person should also be familiar with giving first aid. When an operator helps a mechanic, that operator must be warned about dangerous areas.

SHUT OFF POWER supply to equipment before beginning work. Make sure all external power is off/disconnected.

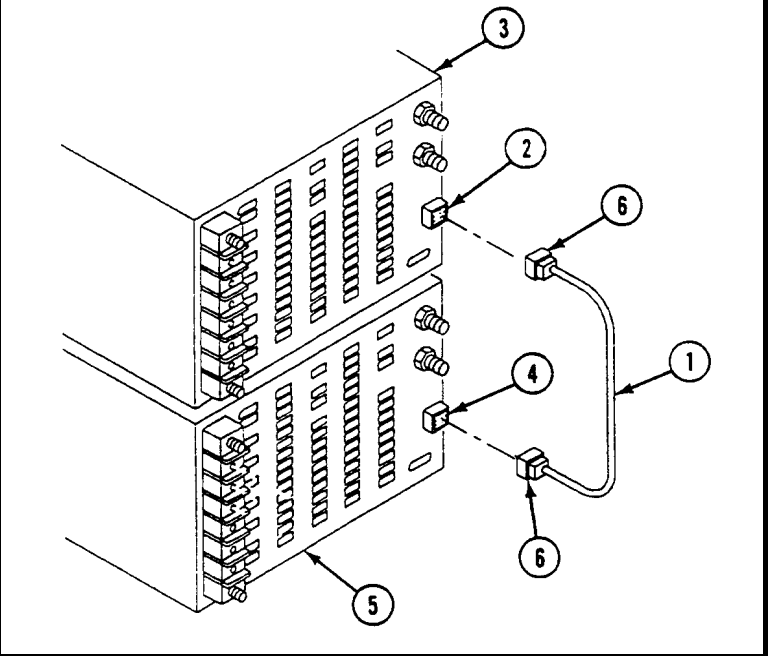
BE CAREFUL not to contact high-voltage connections when installing or operating this equipment.

VEHICLE BATTERIES DISCHARGE WITH EXTERNAL AC POWER APPLIED
(M1068 ONLY) — Continued

0007 00

T

1. Remove jumper cable (1) from terminal J1 (2) on power supply PS1 (3) and terminal J1 (4) on power supply PS2 (5).
2. Measure resistance between terminals (6) of jumper cable (1).
3. Does multimeter read 0 ohms?



NO

TN

1. Replace jumper cable (WP 0086 00).
2. Verify no faults found.

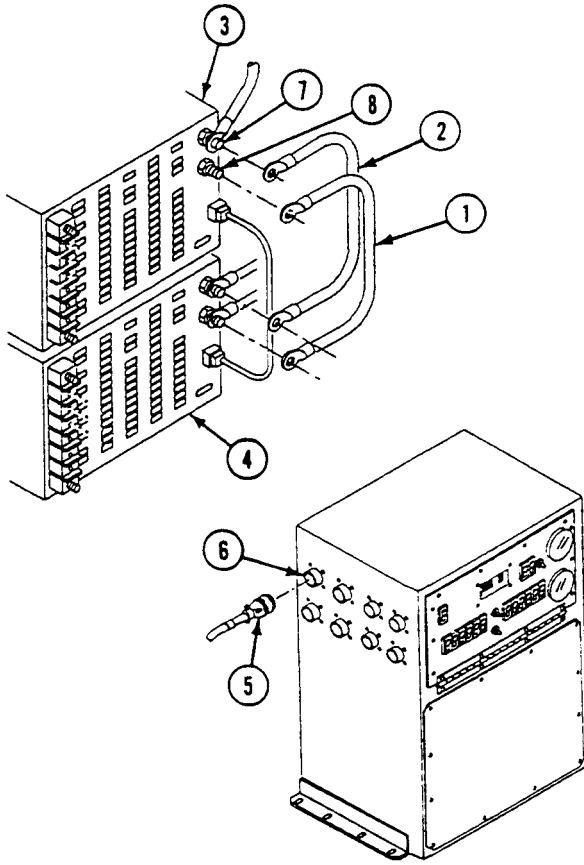
YES

**VEHICLE BATTERIES DISCHARGE WITH EXTERNAL AC POWER APPLIED
(M1068 ONLY) — Continued**

0007 00

Y

1. Remove circuit 32D (1) and circuit 31D (2) from power supply PS1 (3) and power supply PS2 (4).
2. Connect special purpose power cable (5) to external AC power and to J24 (6) on power control enclosure.
3. Set AC MAIN switch and DC POWER SUPPLY switches to ON. See TM 11-7010-256-12&P.
4. Measure voltage between OUTPUT (+) terminal (7) and OUTPUT (-) terminal (8) on power supply PS1 (3).
5. Does multimeter read 26 volts DC or more?



YES

NO

YN

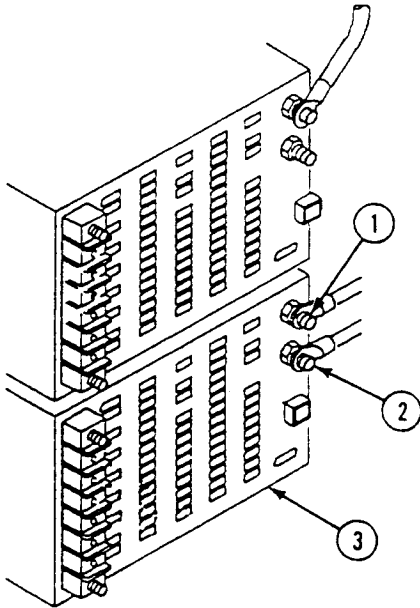
1. Replace power supply PS1 (WP 0086 00).
2. Verify no faults found.

**VEHICLE BATTERIES DISCHARGE WITH EXTERNAL AC POWER APPLIED
(M1068 ONLY) — Continued**

0007 00

2Y

1. Measure voltage between OUTPUT (+) terminal (1) and OUTPUT (-) terminal (2) on power supply PS2 (3).
2. Does multimeter read 26 volts DC or more?



NO

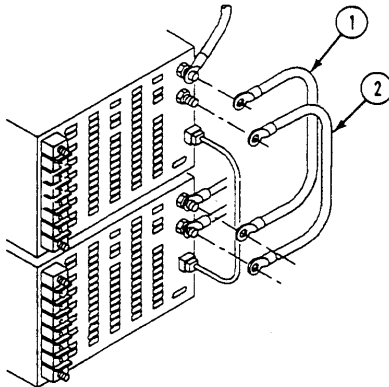
2YN

1. Replace power supply PS2 (WP 0083 00).
2. Verify no faults found.

YES

3Y

1. Measure resistance between terminal ends of circuit 31D (1). Repeat check for circuit 32D (2).
2. Does multimeter read 0 ohms for each measurement?



NO

3YN

1. Replace circuit 31D and/or circuit 32D (WP 0086 00).
2. Verify no faults found.

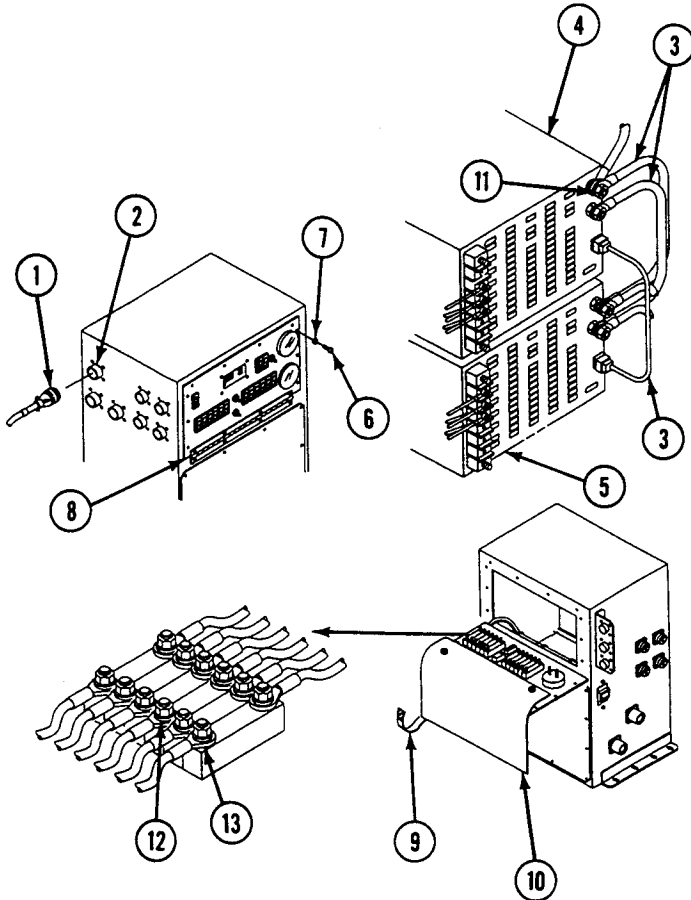
YES

**VEHICLE BATTERIES DISCHARGE WITH EXTERNAL AC POWER APPLIED
(M1068 ONLY) — Continued**

0007 00

4Y

1. Disconnect special purpose power cable (1) from external AC power and from J24 (2) on power control enclosure.
2. Install all circuits (3) on power supplies PS1 (4) and PS2 (5).
3. Remove 10 screws (6) and lockwashers (7) and lower faceplate (8) of power control enclosure. Discard lockwashers.
4. Undo velcro strap (9) securing safety cover (10) over the inside of the faceplate (8). Open safety cover (10).
5. Measure resistance between PS1 (+) OUTPUT terminal (11) and DC bus at terminal 1 (12) of circuit breaker CB15 (13).
6. Does multimeter read 0 ohms?



NO

4YN

1. Replace circuit 31E (WP 0086 00 and see your -20).
2. Verify no faults found.

YES

**VEHICLE BATTERIES DISCHARGE WITH EXTERNAL AC POWER APPLIED
(M1068 ONLY) — Continued**

0007 00

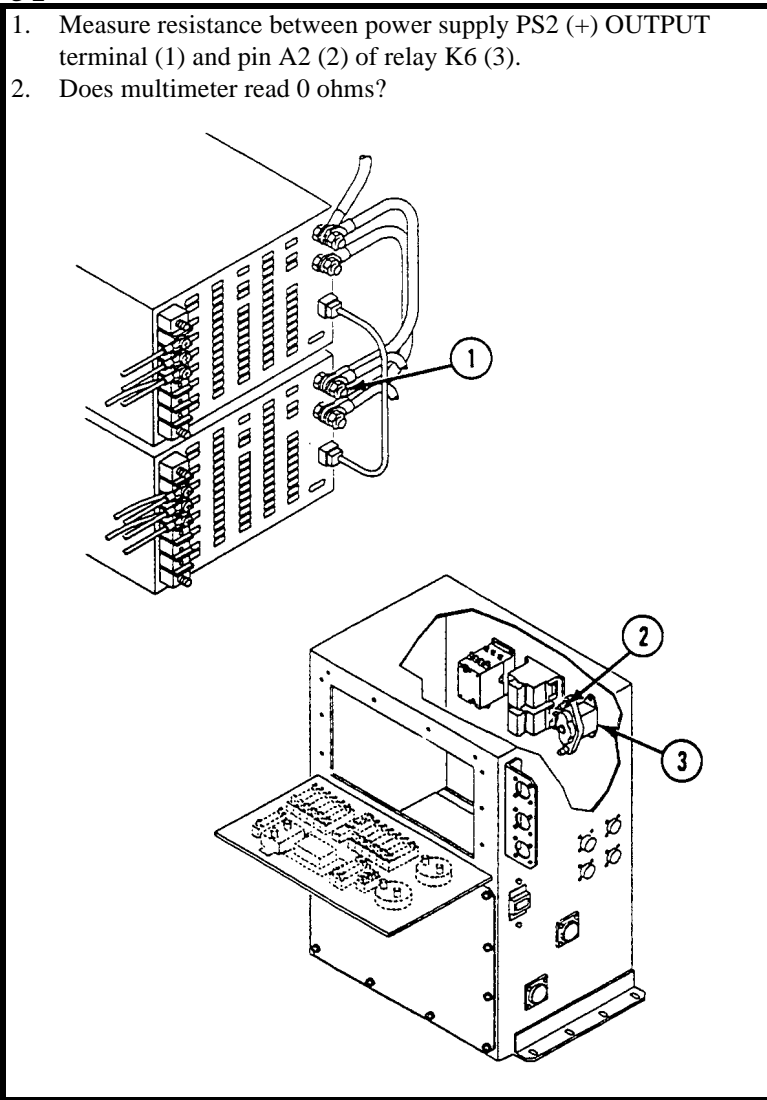
5Y

1. Measure resistance between power supply PS2 (+) OUTPUT terminal (1) and pin A2 (2) of relay K6 (3).
2. Does multimeter read 0 ohms?

NO

5YN

1. Replace circuit 31C (WP 0086 00).
2. Verify no faults found.



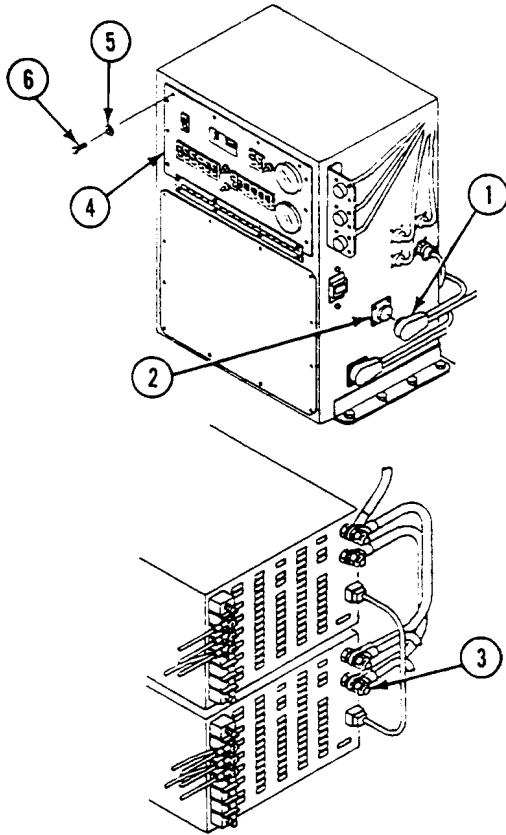
YES

VEHICLE BATTERIES DISCHARGE WITH EXTERNAL AC POWER APPLIED
(M1068 ONLY) — Continued

0007 00

6Y

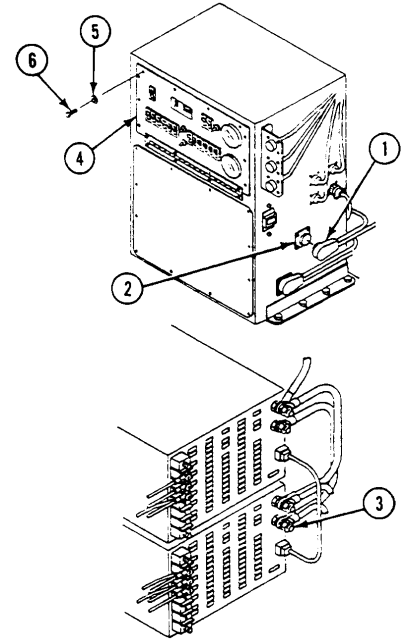
1. Remove cable W4 plug P1 (1) from power control enclosure jack J25 (2).
2. Measure resistance between power supply PS2 (-) OUTPUT terminal (3) and jack J25 (2) outer sleeve.
3. Does multimeter read 0 ohms?



YES

6YN

1. Replace circuit 32E (WP 0086 00).
2. Install cable W4 plug P1 (1) on power control enclosure jack J25 (2).
3. Raise faceplate (4) and secure to power control enclosure with ten new lockwashers (5) and screws (6).
4. Verify no faults found.

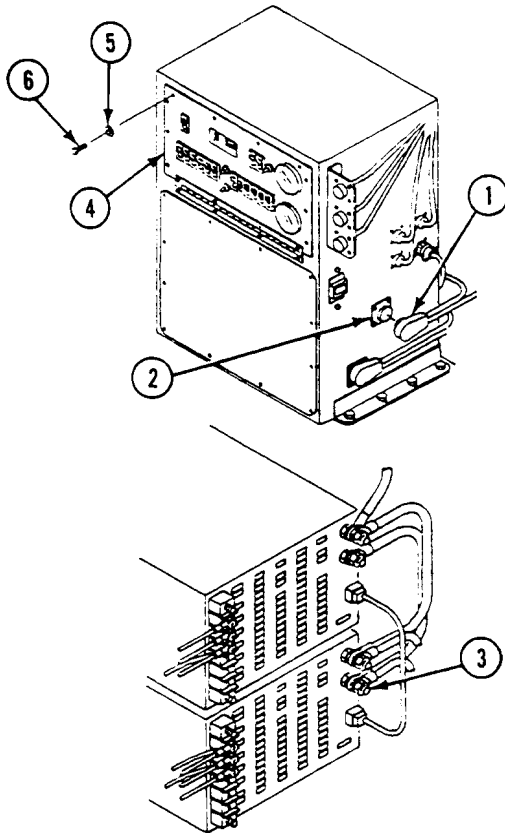


**VEHICLE BATTERIES DISCHARGE WITH EXTERNAL AC POWER APPLIED
(M1068 ONLY) — Continued**

0007 00

7Y

1. Install cable W4 plug P1 (1) on power control enclosure jack J25 (2).
2. Raise faceplate (4) and secure to power control enclosure with ten new lockwashers (5) and screws (6).
3. Verify no faults found.



PATCH PANEL BOX A10 INOPERATIVE (M1068 ONLY)

0008 00

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Radio Repairer 29E10

Helper (H)

Tools and Special Tools

Digital Multimeter (WP 0104 00, Item 28)

Electrical Tool Kit (WP 0104 00, Item 16)

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

WARNING



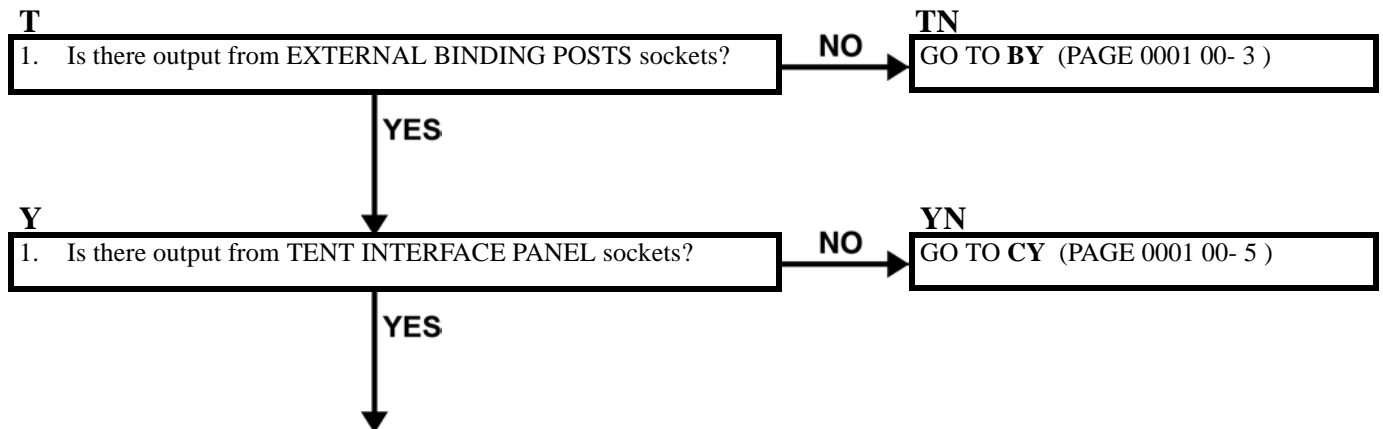
HIGH VOLTAGE is used in the operation of this equipment.

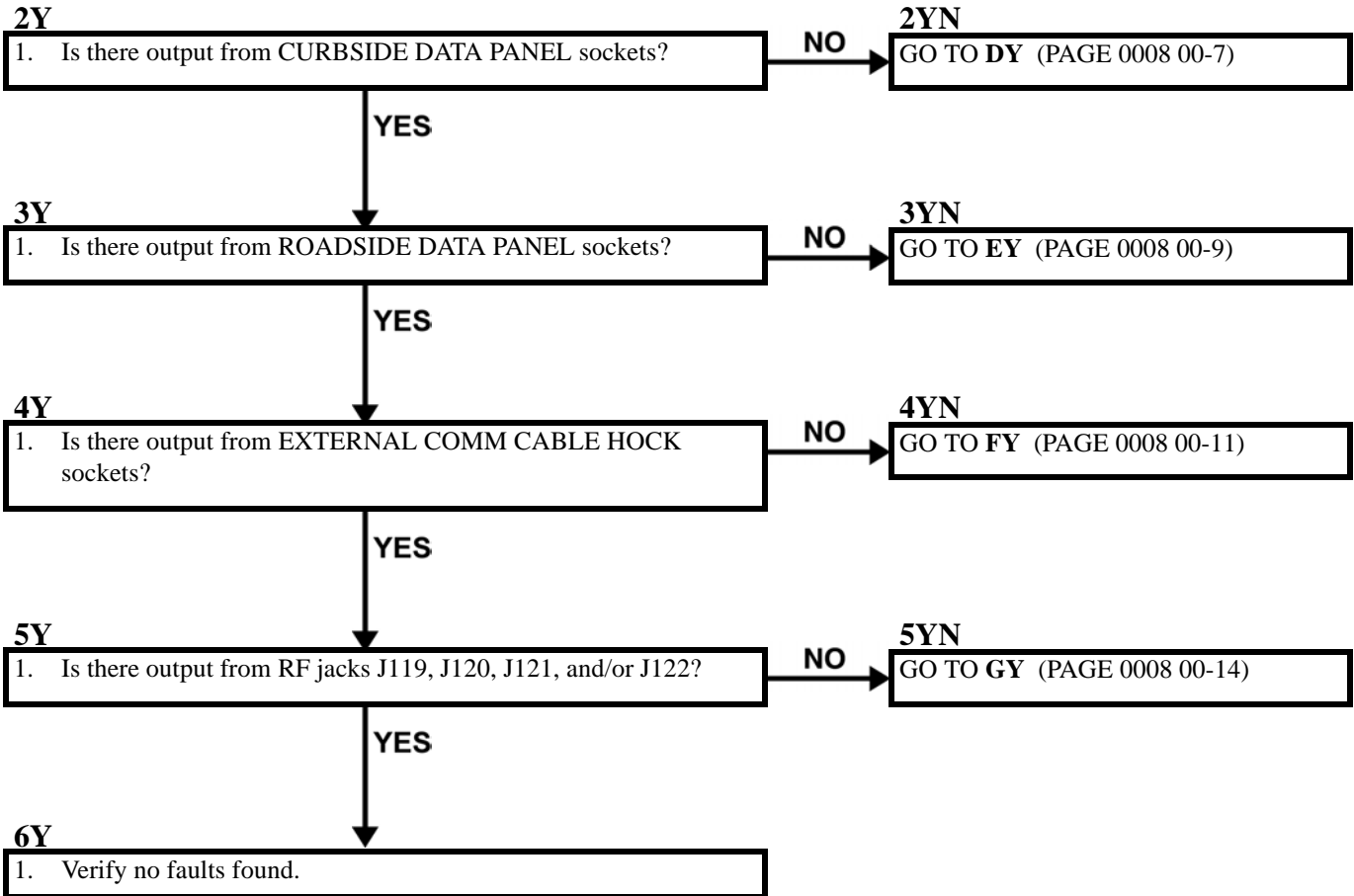
DEATH ON CONTACT may result if personnel fail to observe safety precautions.

NEVER work on equipment unless at least one other person familiar with the operation and hazards of the equipment is nearby. That person should also be familiar with giving first aid. When an operator helps a mechanic, that operator must be warned about dangerous areas.

SHUT OFF POWER supply to equipment before beginning work. Make sure all external power is off/disconnected.

BE CAREFUL not to contact high voltage connections when installing or operating this equipment.





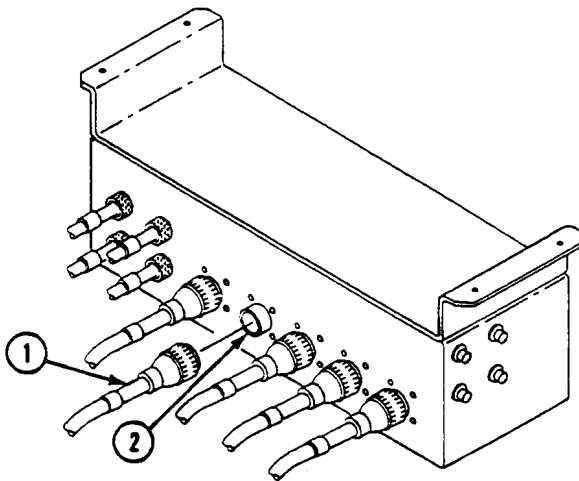
BY

1. Remove cable W115 plug P106 (1) from patch panel box A10 jack J136 (2).

NOTE

Use patch cable with multimeter. See WP 0009 00 for instructions.

2. Measure resistance between 8 pairs of telephone jacks marked EXTERNAL COMM BINDING POSTS and sockets on jack J136 (2) as follows:
 - Jack 1 (Bot) to socket A
 - Jack 1 (Top) to socket B
 - Jack 2 (Bot) to socket C
 - Jack 2 (Top) to socket D
 - Jack 3 (Bot) to socket E
 - Jack 3 (Top) to socket F
 - Jack 4 (Bot) to socket G
 - Jack 4 (Top) to socket H
 - Jack 5 (Bot) to socket J
 - Jack 5 (Top) to socket K
 - Jack 6 (Bot) to socket L
 - Jack 6 (Top) to socket M
 - Jack 7 (Bot) to socket N
 - Jack 7 (Top) to socket P
 - Jack 8 (Bot) to socket R
 - Jack 8 (Top) to socket S
3. Does multimeter read 0 ohms for each measurement?



YES

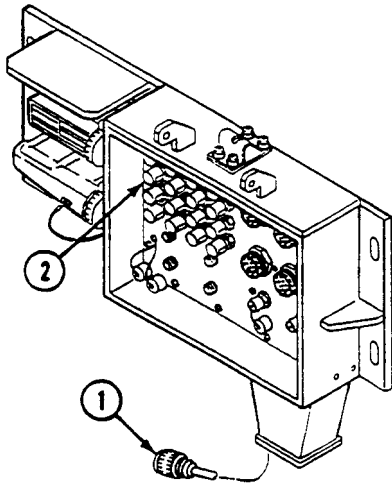
BYN

1. Repair patch panel box A10 (WP 0087 00).
2. Verify no faults found.

NO

B2Y

1. Measure resistance between pins on cable W115 plug P106 (1) and posts on external communication box A11 (2) front panel as follows:
 - Post 1 (Blk) to pin A
 - Post 1 (Red) to pin B
 - Post 2 (Blk) to pin C
 - Post 2 (Red) to pin D
 - Post 3 (Blk) to pin E
 - Post 3 (Red) to pin F
 - Post 4 (Blk) to pin G
 - Post 4 (Red) to pin H
 - Post 5 (Blk) to pin J
 - Post 5 (Red) to pin K
 - Post 6 (Blk) to pin L
 - Post 6 (Red) to pin M
 - Post 7 (Blk) to pin N
 - Post 7 (Red) to pin P
 - Post 8 (Blk) to pin R
 - Post 8 (Red) to pin S
2. Does multimeter read 0 ohms for each measurement?



NO

B2YN

1. Replace cable W115 (WP 0094 00).
2. Verify no faults found.

YES

B3Y

1. Verify no faults found.

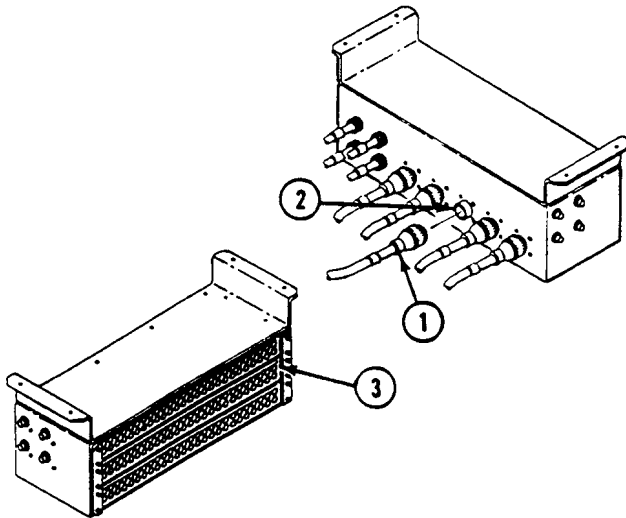
CY

NOTE

Use patch cable with multimeter. See WP 0009 00 for instructions and wiring diagram.

1. Remove cable W32 plug P107 (1) from patch panel box A10 jack J138 (2).
2. Measure resistance between 12 pairs of telephone jacks (3) marked TENT INTERFACE PANEL and sockets on jack J138 (2) as follows:

Jack 1 (Bot) to socket A	Jack 7 (Bot) to socket N
Jack 1 (Top) to socket B	Jack 7 (Top) to socket P
Jack 2 (Bot) to socket C	Jack 8 (Bot) to socket R
Jack 2 (Top) to socket D	Jack 8 (Top) to socket S
Jack 3 (Bot) to socket E	Jack 9 (Bot) to socket T
Jack 3 (Top) to socket F	Jack 9 (Top) to socket U
Jack 4 (Bot) to socket G	Jack 10 (Bot) to socket V
Jack 4 (Top) to socket H	Jack 10 (Top) to socket W
Jack 5 (Bot) to socket J	Jack 11 (Bot) to socket X
Jack 5 (Top) to socket K	Jack 11 (Top) to socket Y
Jack 6 (Bot) to socket L	Jack 12 (Bot) to socket Z
Jack 6 (Top) to socket M	Jack 12 (Top) to socket a
3. Does multimeter read 0 ohms for each measurement?



YES



NO

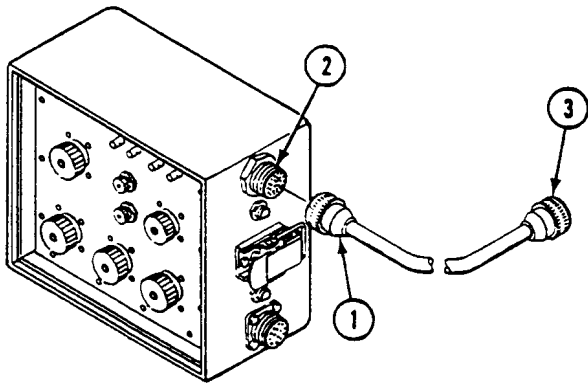
CYN

1. Repair patch panel box A10 (WP 0087 00).
2. Verify no faults found.

C2Y

1. Remove cable W32 plug P7 (1) from tent interface panel jack J8 (2).
2. Measure resistance between sockets on plug P7 (1) and pins on plug P107 (3) of cable W32 as follows:

Socket A to pin A	Socket N to pin N
Socket B to pin B	Socket P to pin P
Socket C to pin C	Socket R to pin R
Socket D to pin D	Socket S to pin S
Socket E to pin E	Socket T to pin T
Socket F to pin F	Socket U to pin U
Socket G to pin G	Socket V to pin V
Socket H to pin H	Socket W to pin W
Socket J to pin J	Socket X to pin X
Socket K to pin K	Socket Y to pin Y
Socket L to pin L	Socket Z to pin Z
Socket M to pin M	Socket a to pin a
3. Does multimeter read 0 ohms for each measurement?



NO

C2YN

1. Replace cable W32 (see your -20).
2. Verify no faults found.

YES

C3Y

1. Verify no faults found.

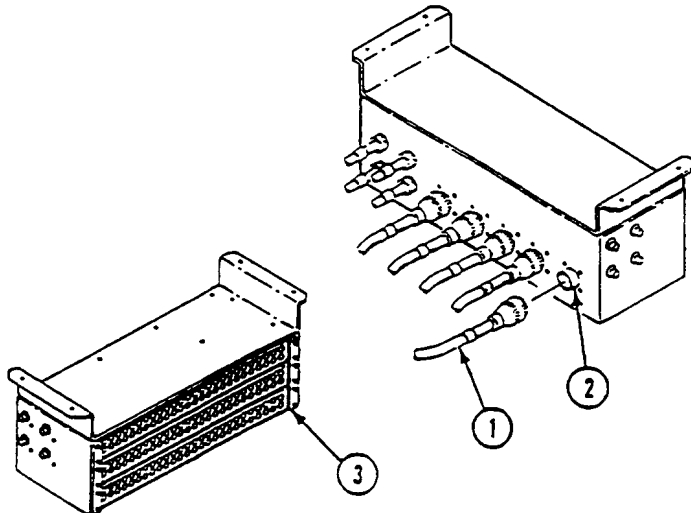
DY

NOTE

Use patch cable with multimeter. See WP 0009 00 for instructions and wiring diagram.

1. Remove cable W124 plug P109 (1) from patch panel box A10 jack J140 (2).
2. Measure resistance between 12 pairs of telephone jacks (3) marked CURBSIDE DATA PANEL and sockets on jack J140 (2) as follows:

Jack 1 (Bot) to socket A	Jack 7 (Bot) to socket N
Jack 1 (Top) to socket B	Jack 7 (Top) to socket P
Jack 2 (Bot) to socket C	Jack 8 (Bot) to socket R
Jack 2 (Top) to socket D	Jack 8 (Top) to socket S
Jack 3 (Bot) to socket E	Jack 9 (Bot) to socket T
Jack 3 (Top) to socket F	Jack 9 (Top) to socket U
Jack 4 (Bot) to socket G	Jack 10 (Bot) to socket V
Jack 4 (Top) to socket H	Jack 10 (Top) to socket W
Jack 5 (Bot) to socket J	Jack 11 (Bot) to socket X
Jack 5 (Top) to socket K	Jack 11 (Top) to socket Y
Jack 6 (Bot) to socket L	Jack 12 (Bot) to socket Z
Jack 6 (Top) to socket M	Jack 12 (Top) to socket a
3. Does multimeter read 0 ohms for each measurement?



YES



NO

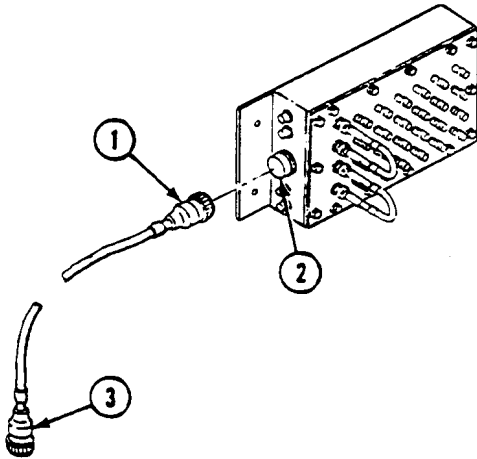
DYN

1. Repair patch panel box A10 (WP 0087 00).
2. Verify no faults found.

D2Y

1. Remove cable W124 plug P1 (1) from curbside data panel jack J3 (2).
2. Measure resistance between sockets on plug P1 (1) and pins on plug P109 (3) of cable W124 as follows:

Socket A to pin A	Socket N to pin N
Socket B to pin B	Socket P to pin P
Socket C to pin C	Socket R to pin R
Socket D to pin D	Socket S to pin S
Socket E to pin E	Socket T to pin T
Socket F to pin F	Socket U to pin U
Socket G to pin G	Socket V to pin V
Socket H to pin H	Socket W to pin W
Socket J to pin J	Socket X to pin X
Socket K to pin K	Socket Y to pin Y
Socket L to pin L	Socket Z to pin Z
Socket M to pin M	Socket a to pin a
3. Does multimeter read 0 ohms for each measurement?



NO →

D2YN

1. Replace cable W124 (see your -20).
2. Verify no faults found.

YES ↓

D3Y

1. Verify no faults found.

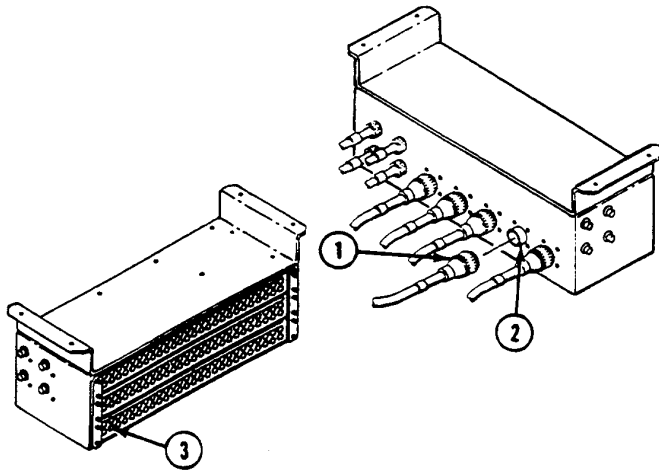
EY

NOTE

Use patch cable with multimeter. See WP 0009 00 for instructions and wiring diagram.

1. Remove cable W126 plug P108 (1) from patch panel box A10 jack J139 (2).
2. Measure resistance between 12 pairs of telephone jacks (3) marked ROADSIDE DATA PANEL and sockets on jack J139 (2) as follows:

Jack 1 (Bot) to socket A	Jack 7 (Bot) to socket N
Jack 1 (Top) to socket B	Jack 7 (Top) to socket P
Jack 2 (Bot) to socket C	Jack 8 (Bot) to socket R
Jack 2 (Top) to socket D	Jack 8 (Top) to socket S
Jack 3 (Bot) to socket E	Jack 9 (Bot) to socket T
Jack 3 (Top) to socket F	Jack 9 (Top) to socket U
Jack 4 (Bot) to socket G	Jack 10 (Bot) to socket V
Jack 4 (Top) to socket H	Jack 10 (Top) to socket W
Jack 5 (Bot) to socket J	Jack 11 (Bot) to socket X
Jack 5 (Top) to socket K	Jack 11 (Top) to socket Y
Jack 6 (Bot) to socket L	Jack 12 (Bot) to socket Z
Jack 6 (Top) to socket M	Jack 12 (Top) to socket a
3. Does multimeter read 0 ohms for each measurement?



YES

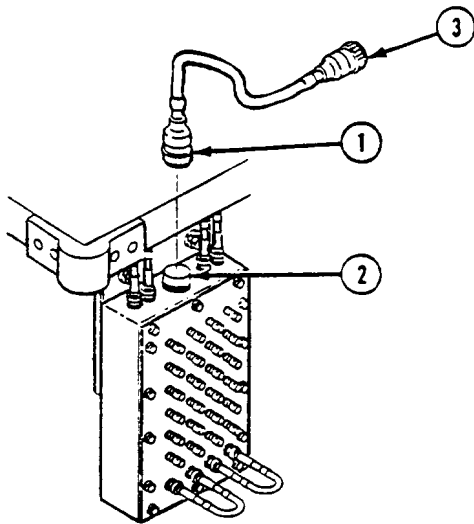
EYN

1. Repair patch panel box A10 (WP 0087 00).
2. Verify no faults found.

E2Y

1. Remove cable W126 plug P1 (1) from roadside data panel jack J3 (2).
2. Measure resistance between sockets on P1 (1) and pins on P108 (3) of cable W126 as follows:

Socket A to pin A	Socket N to pin N
Socket B to pin B	Socket P to pin P
Socket C to pin C	Socket R to pin R
Socket D to pin D	Socket S to pin S
Socket E to pin E	Socket T to pin T
Socket F to pin F	Socket U to pin U
Socket G to pin G	Socket V to pin V
Socket H to pin H	Socket W to pin W
Socket J to pin J	Socket X to pin X
Socket K to pin K	Socket Y to pin Y
Socket L to pin L	Socket Z to pin Z
Socket M to pin M	Socket a to pin a
3. Does multimeter read 0 ohms for each measurement?



NO

E2YN

1. Replace cable W126 (see your -20).
2. Verify no faults found.

YES

E3Y

1. Verify no faults found.

FY

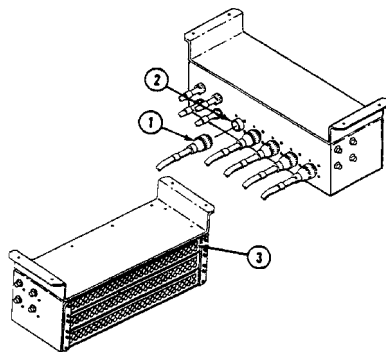
NOTE

Use patch cable with multimeter. See WP 0009 00 for instructions and wiring diagram.

1. Remove cable W118 plug P105 (1) from patch panel box A10 jack J135 (2).
2. Measure resistance between 26 pairs of telephone jacks (3) marked EXTERNAL COMM CABLE HOCK and sockets of jack J135 (2) as follows:

Jack 1 (Bot) to socket 1	Jack 14 (Bot) to socket 27
Jack 1 (Top) to socket 2	Jack 14 (Top) to socket 28
Jack 2 (Bot) to socket 3	Jack 15 (Bot) to socket 29
Jack 2 (Top) to socket 4	Jack 15 (Top) to socket 30
Jack 3 (Bot) to socket 5	Jack 16 (Bot) to socket 31
Jack 3 (Top) to socket 6	Jack 16 (Top) to socket 32
Jack 4 (Bot) to socket 7	Jack 17 (Bot) to socket 33
Jack 4 (Top) to socket 8	Jack 17 (Top) to socket 34
Jack 5 (Bot) to socket 9	Jack 18 (Bot) to socket 35
Jack 5 (Top) to socket 10	Jack 18 (Top) to socket 36
Jack 6 (Bot) to socket 11	Jack 19 (Bot) to socket 37
Jack 6 (Top) to socket 12	Jack 19 (Top) to socket 38
Jack 7 (Bot) to socket 13	Jack 20 (Bot) to socket 39
Jack 7 (Top) to socket 14	Jack 20 (Top) to socket 40
Jack 8 (Bot) to socket 15	Jack 21 (Bot) to socket 41
Jack 8 (Top) to socket 16	Jack 21 (Top) to socket 42
Jack 9 (Bot) to socket 17	Jack 22 (Bot) to socket 43
Jack 9 (Top) to socket 18	Jack 22 (Top) to socket 44
Jack 10 (Bot) to socket 19	Jack 23 (Bot) to socket 45
Jack 10 (Top) to socket 20	Jack 23 (Top) to socket 46
Jack 11 (Bot) to socket 21	Jack 24 (Bot) to socket 47
Jack 11 (Top) to socket 22	Jack 24 (Top) to socket 48
Jack 12 (Bot) to socket 23	Jack 25 (Bot) to socket 49
Jack 12 (Top) to socket 24	Jack 25 (Top) to socket 50
Jack 13 (Bot) to socket 25	Jack 26 (Bot) to socket 51
Jack 13 (Top) to socket 26	Jack 26 (Top) to socket 52

3. Does multimeter read 0 ohms for each measurement?



YES

FYN

1. Repair patch panel box A10 (WP 0087 00).
2. Verify no faults found.

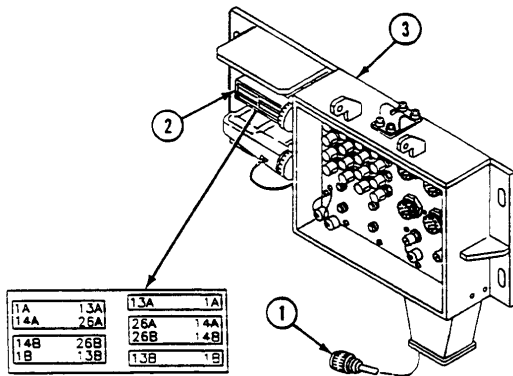
NO

F2Y

1. Measure resistance between pins on plug P105 (1) of cable W118 and pins on connector J101 (2) of external communication box A11 (3) front panel as follows:

- | | |
|-------------------|-------------------|
| Pin 1 to pin 1A | Pin 27 to pin 14A |
| Pin 2 to pin 1B | Pin 28 to pin 14B |
| Pin 3 to pin 2A | Pin 29 to pin 15A |
| Pin 4 to pin 2B | Pin 30 to pin 15B |
| Pin 5 to pin 3A | Pin 31 to pin 16A |
| Pin 6 to pin 3B | Pin 32 to pin 16B |
| Pin 7 to pin 4A | Pin 33 to pin 17A |
| Pin 8 to pin 4B | Pin 34 to pin 17B |
| Pin 9 to pin 5A | Pin 35 to pin 18A |
| Pin 10 to pin 5B | Pin 36 to pin 18B |
| Pin 11 to pin 6A | Pin 37 to pin 19A |
| Pin 12 to pin 6B | Pin 38 to pin 19B |
| Pin 13 to pin 7A | Pin 39 to pin 20A |
| Pin 14 to pin 7B | Pin 40 to pin 20B |
| Pin 15 to pin 8A | Pin 41 to pin 21A |
| Pin 16 to pin 8B | Pin 42 to pin 21B |
| Pin 17 to pin 9A | Pin 43 to pin 22A |
| Pin 18 to pin 9B | Pin 44 to pin 22B |
| Pin 19 to pin 10A | Pin 45 to pin 23A |
| Pin 20 to pin 10B | Pin 46 to pin 23B |
| Pin 21 to pin 11A | Pin 47 to pin 24A |
| Pin 22 to pin 11B | Pin 48 to pin 24B |
| Pin 23 to pin 12A | Pin 49 to pin 25A |
| Pin 24 to pin 12B | Pin 50 to pin 25B |
| Pin 25 to pin 13A | Pin 51 to pin 26A |
| Pin 26 to pin 13B | Pin 52 to pin 26B |

2. Does multimeter read 0 ohms for each measurement?



NO →

F2YN

1. Replace cable W118 (WP 0095 00).
2. Verify no faults found.

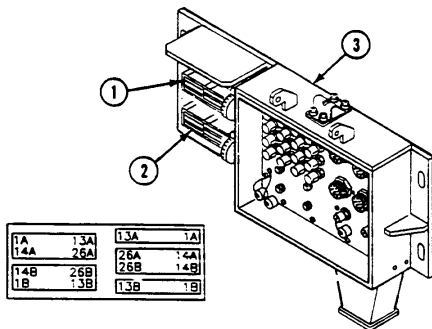
YES ↓

F3Y

1. Measure resistance between pins on connector J101 (1) and connector J102 (2) of external communication box A11 (3) front panel as follows:

- | | |
|--------------------|--------------------|
| Pin 1A to pin 1A | Pin 14A to pin 14A |
| Pin 1B to pin 1B | Pin 14B to pin 14B |
| Pin 2A to pin 2A | Pin 15A to pin 15A |
| Pin 2B to pin 2B | Pin 15B to pin 15B |
| Pin 3A to pin 3A | Pin 16A to pin 16A |
| Pin 3B to pin 3B | Pin 16B to pin 16B |
| Pin 4A to pin 4A | Pin 17A to pin 17A |
| Pin 4B to pin 4B | Pin 17B to pin 17B |
| Pin 5A to pin 5A | Pin 18A to pin 18A |
| Pin 5B to pin 5B | Pin 18B to pin 18B |
| Pin 6A to pin 6A | Pin 19A to pin 19A |
| Pin 6B to pin 6B | Pin 19B to pin 19B |
| Pin 7A to pin 7A | Pin 20A to pin 20A |
| Pin 7B to pin 7B | Pin 20B to pin 20B |
| Pin 8A to pin 8A | Pin 21A to pin 21A |
| Pin 8B to pin 8B | Pin 21B to pin 21B |
| Pin 9A to pin 9A | Pin 22A to pin 22A |
| Pin 9B to pin 9B | Pin 22B to pin 22B |
| Pin 10A to pin 10A | Pin 23A to pin 23A |
| Pin 10B to pin 10B | Pin 23B to pin 23B |
| Pin 11A to pin 11A | Pin 24A to pin 24A |
| Pin 11B to pin 11B | Pin 24B to pin 24B |
| Pin 12A to pin 12A | Pin 25A to pin 25A |
| Pin 12B to pin 12B | Pin 25B to pin 25B |
| Pin 13A to pin 13A | Pin 26A to pin 26A |
| Pin 13B to pin 13B | Pin 26B to pin 26B |

2. Does multimeter read 0 ohms for each measurement?



YES

F4Y

1. Verify no faults found.

F3YN

1. Replace cable W117 (WP 0095 00).
2. Verify no faults found.

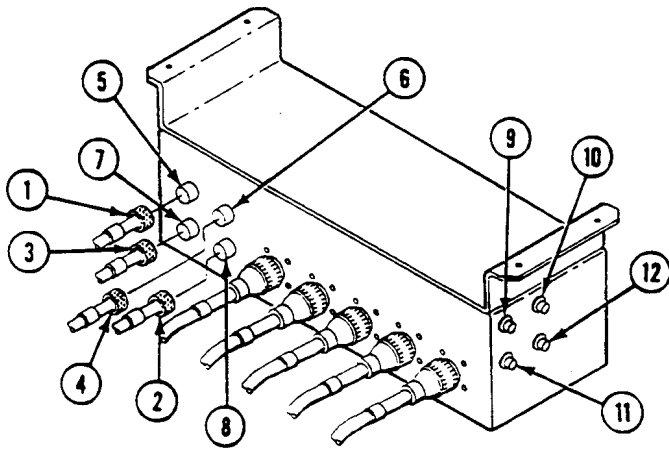
GY

1. Remove cable plugs from the patch panel box A10 jacks as follows:
 - Cable W111 plug P1 (1) from J125 (5)
 - Cable W112 plug P1 (2) from J124 (8)
 - Cable W113 plug P1 (3) from J123 (7)
 - Cable W114 plug P1 (4) from J126 (6)
2. Measure resistance between pins of the following:
 - J125 (5) to J119 (9)
 - J126 (6) to J120 (10)
 - J123 (7) to J121 (11)
 - J124 (8) to J122 (12)
3. Does multimeter read 0 ohms for each measurement?

NO

GYN

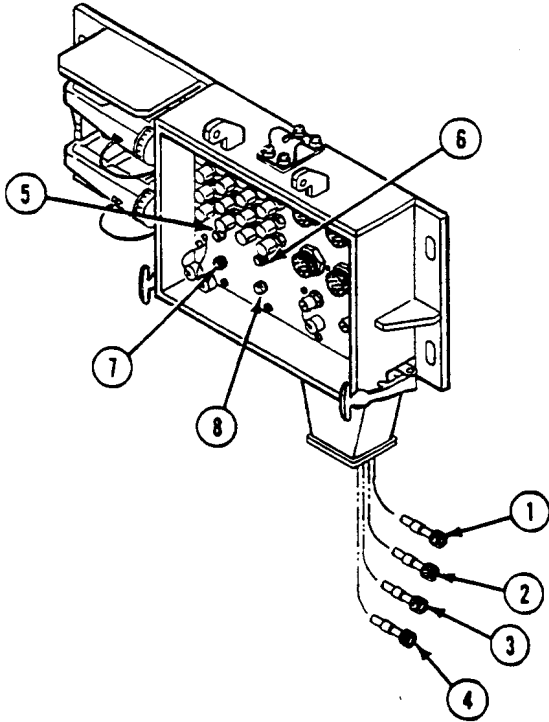
1. Repair patch panel box A10 (WP 0087 00).
2. Verify no faults found.



YES

G2Y

1. Measure resistance between cable plugs and pins on jacks of external communication box A11 as follows:
 - W111 plug P1 (1) and pin of jack J115 (5)
 - W112 plug P1 (2) and pin of jack J116 (6)
 - W113 plug P1 (3) and pin of jack J117 (7)
 - W114 plug P1 (4) and pin of jack J118 (8)
2. Does multimeter read 0 ohms for each measurement?



NO

G2YN

1. Replace cables W111, W112, W113, and/or W114 (WP 0093 00).
2. Verify no faults found.

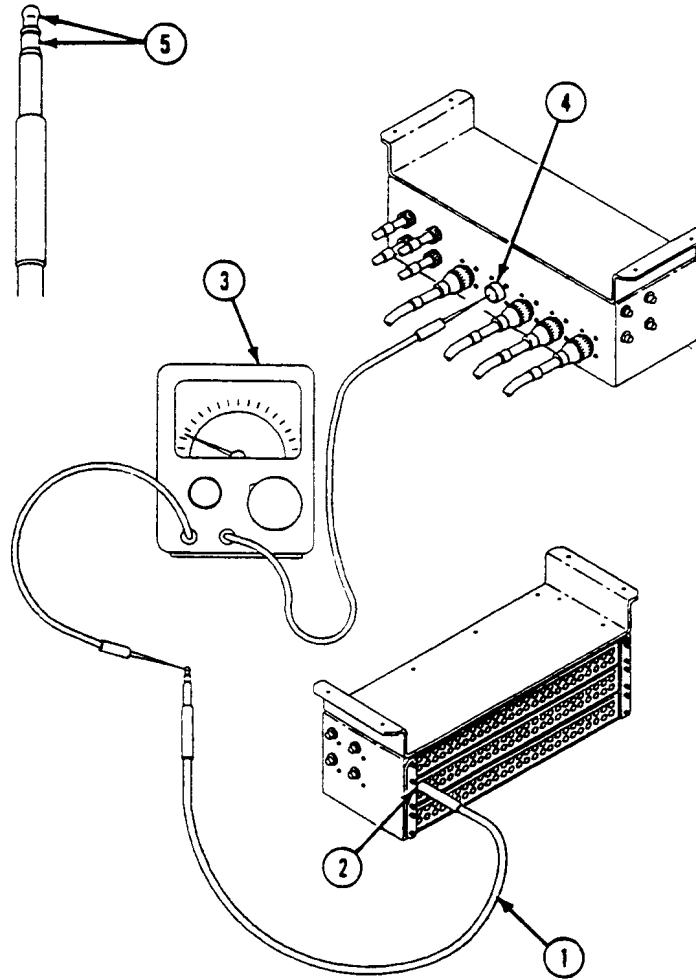
YES

G3Y

1. Verify no faults found.

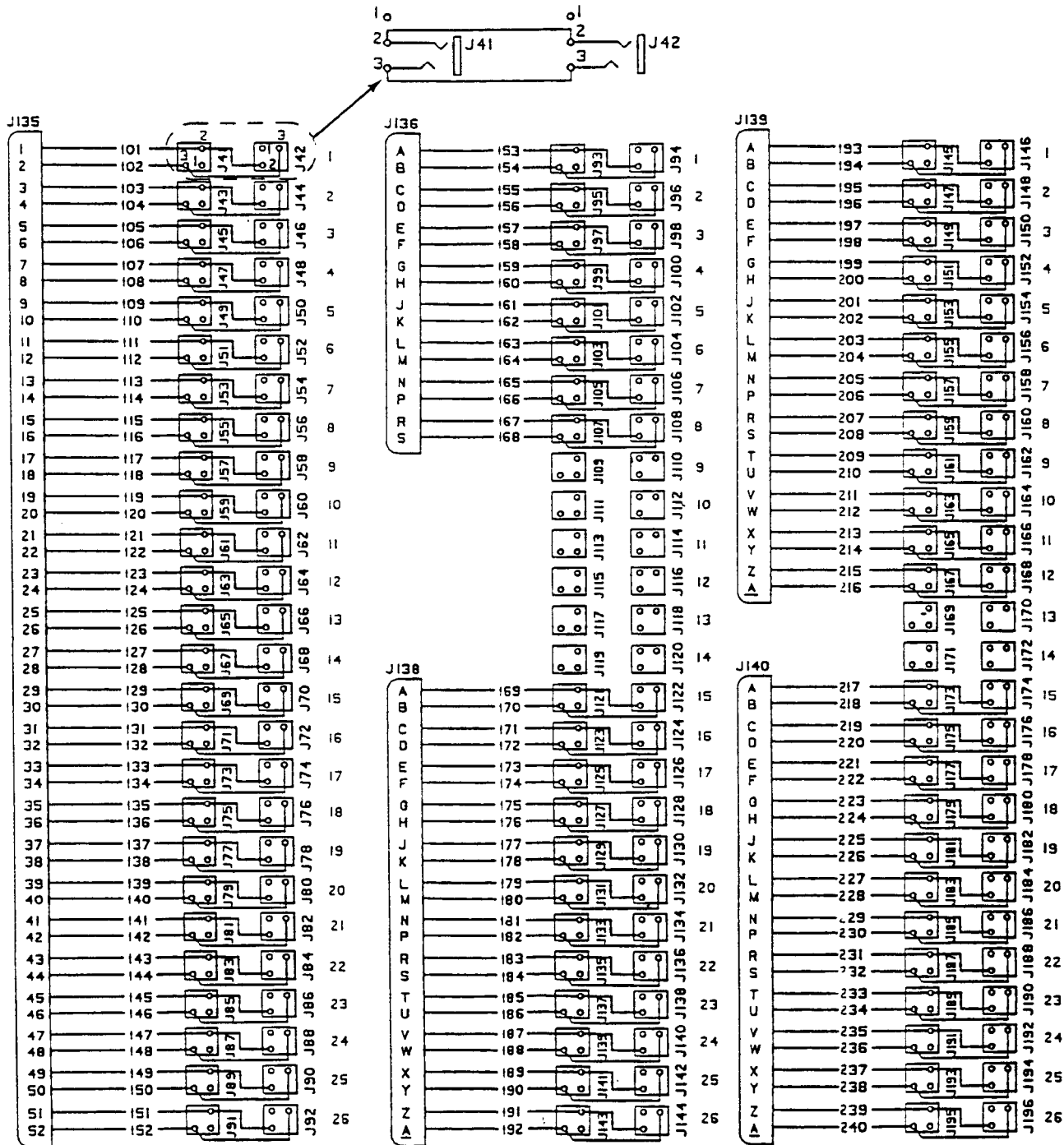
PATCH PANEL BOX A10 (M1068 ONLY)**0009 00****INSTRUCTIONS FOR TESTING PATCH PANEL BOX A10**

Insert patch cable (1) into telephone jack (2) to be checked on patch panel box A10. Use a multimeter (3) to check resistance from listed jack socket (4) to other end of patch cable. Use plug test points (5) in accordance with wiring diagram.



PATCH PANEL BOX A10 WIRING DIAGRAM

Use the wiring diagram below as an aid in performing troubleshooting procedures on the patch panel box A10.



EXTERNAL COMMUNICATION BOX A11 INOPERATIVE (M1068 ONLY)

0010 00

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Radio Repairer 29E10

Helper (H)

Tools and Special Tools

Digital Multimeter (WP 0104 00, Item 28)

Electrical Tool Kit (WP 0104 00, Item 16)

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

WARNING



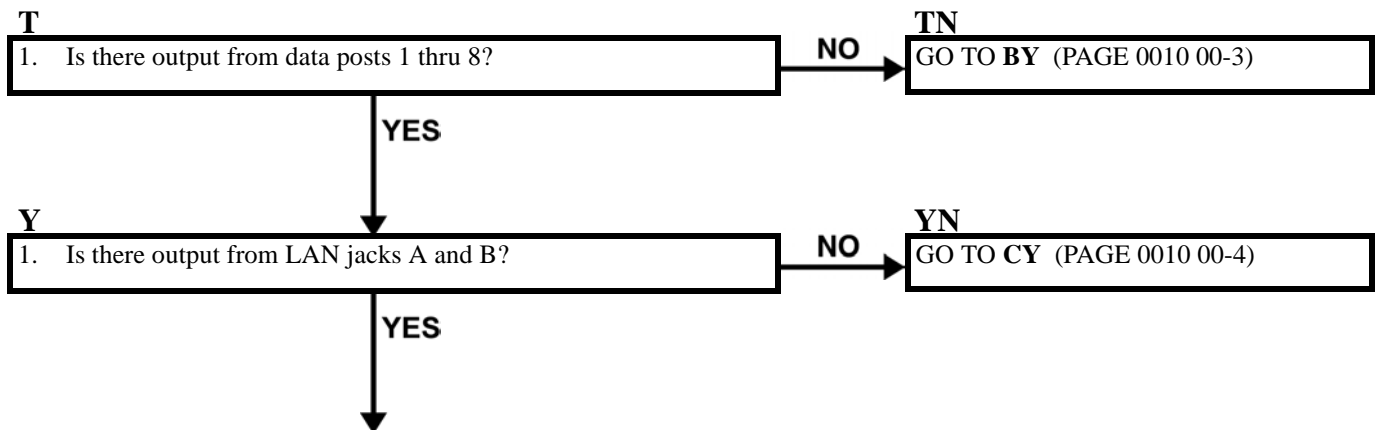
HIGH VOLTAGE is used in the operation of this equipment.

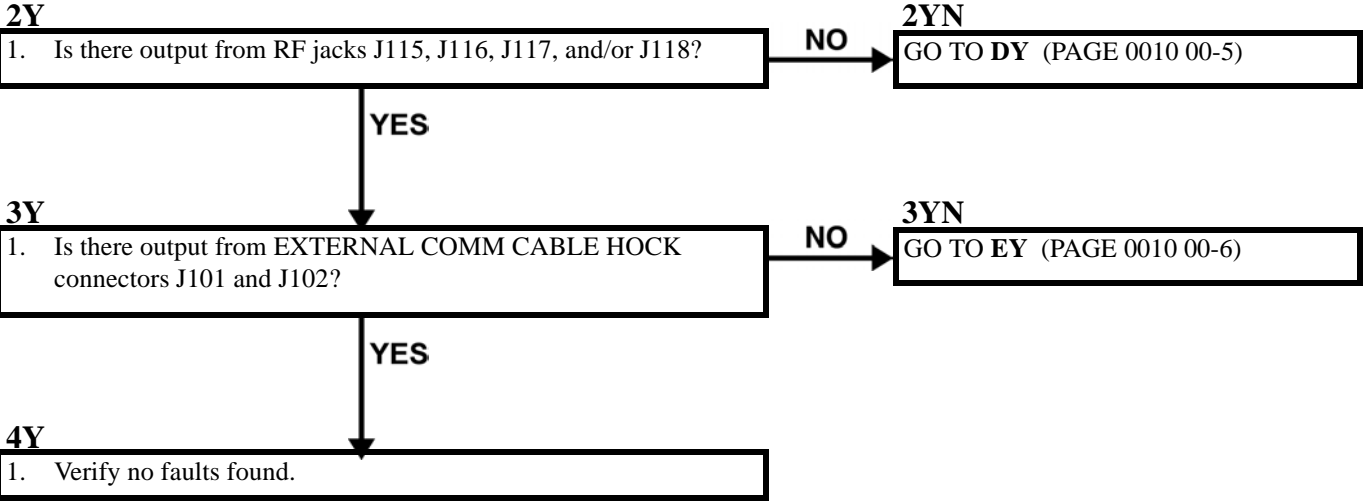
DEATH ON CONTACT may result if personnel fail to observe safety precautions.

NEVER work on equipment unless at least one other person familiar with the operation and hazards of the equipment is nearby. That person should also be familiar with giving first aid. When an operator helps a mechanic, that operator must be warned about dangerous areas.

SHUT OFF POWER supply to equipment before beginning work. Make sure all external power is off/disconnected.

BE CAREFUL not to contact high-voltage connections when installing or operating this equipment.

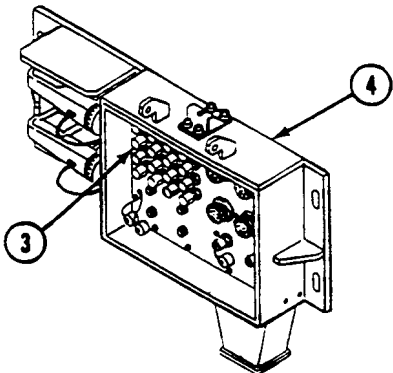
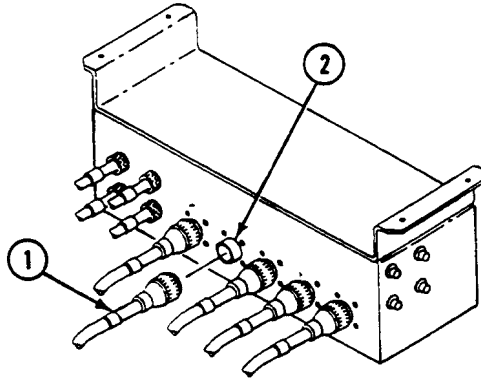




BY

1. Remove cable W115 plug P106 (1) from patch panel box A10 jack J136 (2).
2. Measure resistance between pins of cable W115 plug P106 (1) and posts on front panel (3) of external communication box A11 (4) as follows:

Post 1 (Bot) to pin A	Post 5 (Bot) to pin J
Post 1 (Top) to pin B	Post 5 (Top) to pin K
Post 2 (Bot) to pin C	Post 6 (Bot) to pin L
Post 2 (Top) to pin D	Post 6 (Top) to pin M
Post 3 (Bot) to pin E	Post 7 (Bot) to pin N
Post 3 (Top) to pin F	Post 7 (Top) to pin P
Post 4 (Bot) to pin G	Post 8 (Bot) to pin R
Post 4 (Top) to pin H	Post 8 (Top) to pin S
3. Does multimeter read 0 ohms for each measurement?



NO

BYN

1. Replace cable W115 (WP 0094 00).
2. Verify no faults found.

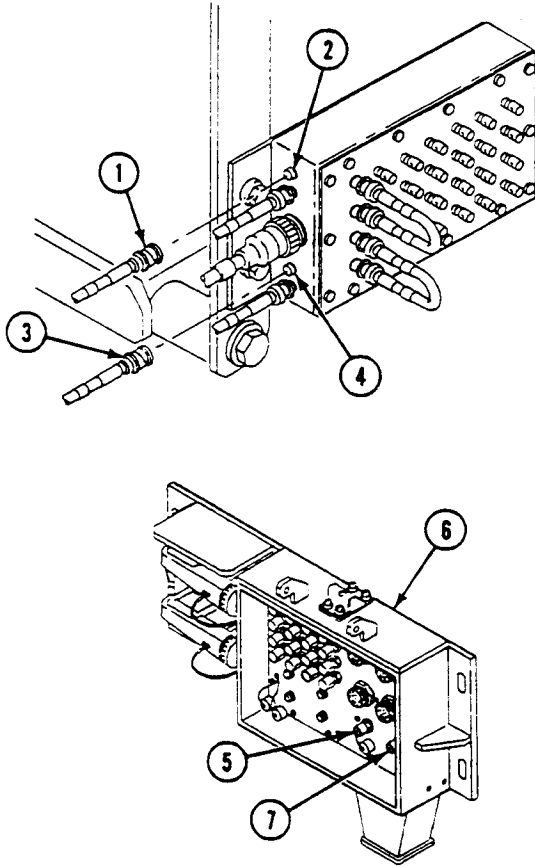
YES

B2Y

1. Verify no faults found.

CY

1. Remove cable W101 plug P1 (1) from jack J1 (2), and cable W102 plug P1 (3) from jack J4 (4) of curbside data panel A12.
2. Measure resistance between pin on cable W101 plug P1 (1) and J103 LAN jack A (5) on external communication box A11 (6) front panel. Repeat check for cable W102 plug P1 (3) and LAN jack B (7).
3. Does multimeter read 0 ohms for each measurement?



NO

CYN

1. Replace cable W101 and/or cable W102 (WP 0092 00).
2. Verify no faults found.

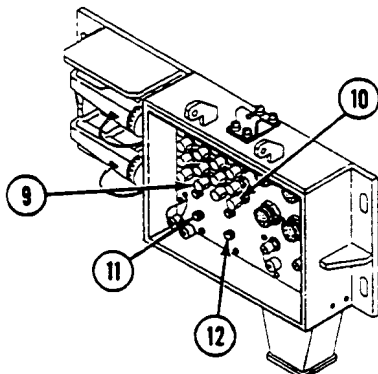
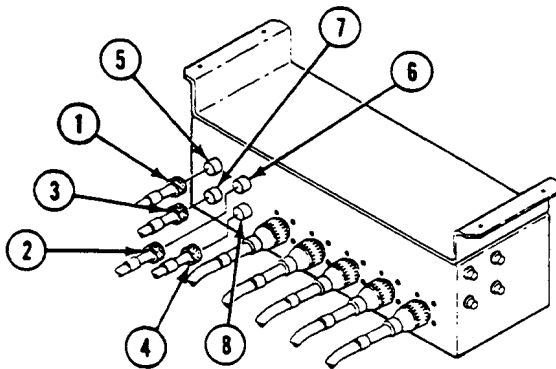
YES

C2Y

1. Verify no faults found.

DY

1. Remove cables from patch panel box A10 as follows:
 - Cable W111 plug P1 (1) from J125 (5)
 - Cable W112 plug P1 (2) from J126 (6)
 - Cable W113 plug P1 (3) from J123 (7)
 - Cable W114 plug P1 (4) from J124 (8)
2. Measure resistance between pins of cables and RF jacks on external communication box A11 front panel as follows:
 - Cable W111 (1) to RF1 (9)
 - Cable W112 (2) to RF2 (10)
 - Cable W113 (3) to RF3 (11)
 - Cable W114 (4) to RF4 (12)
3. Does multimeter read 0 ohms for each measurement?



NO

DYN

1. Replace cables W111, W112, W113, and/or W114 (WP 0093 00).
2. Verify no faults found.

YES

D2Y

1. Verify no faults found.

EY

1. Remove cable W118 plug P105 (1) from patch panel box A10 jack J135 (2).

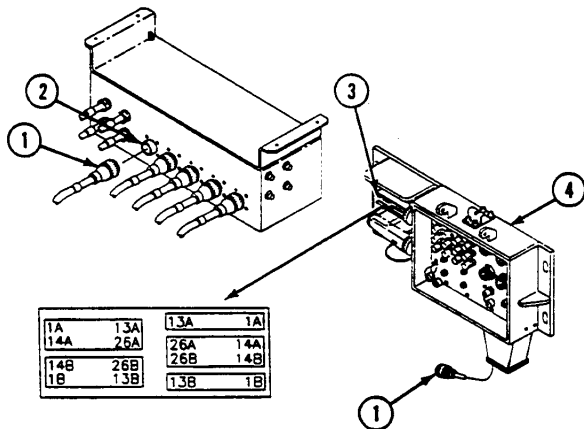
NOTE

Use connector diagram below.

2. Measure resistance between pins on cable W118 plug P105 (1) and pins on connector J101 (3) of external communication box A11 (4) as follows:

- | | |
|-------------------|-------------------|
| Pin 1 to pin 1A | Pin 27 to pin 14A |
| Pin 2 to pin 1B | Pin 28 to pin 14B |
| Pin 3 to pin 2A | Pin 29 to pin 15A |
| Pin 4 to pin 2B | Pin 30 to pin 15B |
| Pin 5 to pin 3A | Pin 31 to pin 16A |
| Pin 5 to pin 3A | Pin 32 to pin 16B |
| Pin 7 to pin 4A | Pin 33 to pin 17A |
| Pin 8 to pin 4B | Pin 34 to pin 17B |
| Pin 9 to pin 5A | Pin 35 to pin 18A |
| Pin 10 to pin 5B | Pin 36 to pin 18B |
| Pin 11 to pin 6A | Pin 37 to pin 19A |
| Pin 12 to pin 6B | Pin 38 to pin 19B |
| Pin 13 to pin 7A | Pin 39 to pin 20A |
| Pin 14 to pin 7B | Pin 40 to pin 20B |
| Pin 15 to pin 8A | Pin 41 to pin 21A |
| Pin 16 to pin 8B | Pin 42 to pin 21B |
| Pin 17 to pin 9A | Pin 43 to pin 22A |
| Pin 18 to pin 9B | Pin 44 to pin 22B |
| Pin 19 to pin 10A | Pin 45 to pin 23A |
| Pin 20 to pin 10B | Pin 46 to pin 23B |
| Pin 21 to pin 11A | Pin 47 to pin 24A |
| Pin 22 to pin 11B | Pin 48 to pin 24B |
| Pin 23 to pin 12A | Pin 49 to pin 25A |
| Pin 24 to pin 12B | Pin 50 to pin 25B |
| Pin 25 to pin 13A | Pin 51 to pin 26A |
| Pin 26 to pin 13B | Pin 52 to pin 26B |

3. Does multimeter read 0 ohms for each measurement?



NO

EYN

1. Replace cable W118 (WP 0095 00).
2. Verify no faults found.

YES

E2Y

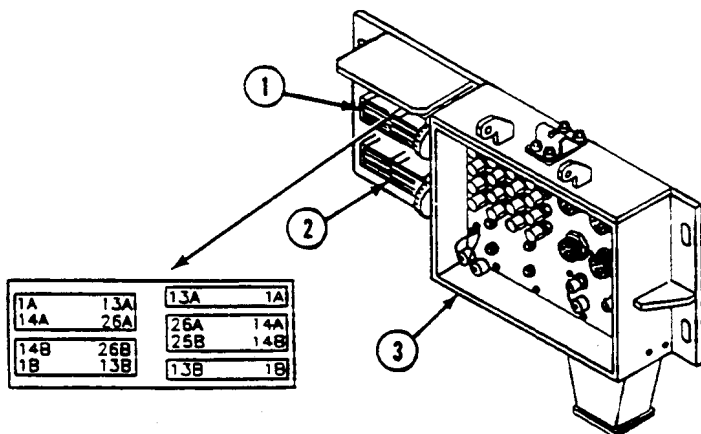
NOTE

Both connectors are identical. Use connector diagram below.

1. Measure resistance between pins on connector J101 (1) and pins on connector J102 (2) of external communication box A11 (3) front panel as follows:

- | | |
|--------------------|--------------------|
| Pin 1A to pin 1A | Pin 14A to pin 14A |
| Pin 1B to pin 1B | Pin 14B to pin 14B |
| Pin 2A to pin 2A | Pin 15A to pin 15A |
| Pin 2B to pin 2B | Pin 15B to pin 15B |
| Pin 3A to pin 3A | Pin 16A to pin 16A |
| Pin 3B to pin 3B | Pin 16B to pin 16B |
| Pin 4A to pin 4A | Pin 17A to pin 17A |
| Pin 4B to pin 4B | Pin 17B to pin 17B |
| Pin 5A to pin 5A | Pin 18A to pin 18A |
| Pin 5B to pin 5B | Pin 18B to pin 18B |
| Pin 6A to pin 6A | Pin 19A to pin 19A |
| Pin 6B to pin 6B | Pin 19B to pin 19B |
| Pin 7A to pin 7A | Pin 20A to pin 20A |
| Pin 7B to pin 7B | Pin 20B to pin 20B |
| Pin 8A to pin 8A | Pin 21A to pin 21A |
| Pin 8B to pin 8B | Pin 21B to pin 21B |
| Pin 9A to pin 9A | Pin 22A to pin 22A |
| Pin 9B to pin 9B | Pin 22B to pin 22B |
| Pin 10A to pin 10A | Pin 23A to pin 23A |
| Pin 10B to pin 10B | Pin 23B to pin 23B |
| Pin 11A to pin 11A | Pin 24A to pin 24A |
| Pin 11B to pin 11B | Pin 24B to pin 24B |
| Pin 12A to pin 12A | Pin 25A to pin 25A |
| Pin 12B to pin 12B | Pin 25B to pin 25B |
| Pin 13A to pin 13A | Pin 26A to pin 26A |
| Pin 13B to pin 13B | Pin 26B to pin 26B |

2. Does multimeter read 0 ohms for each measurement?



NO

E2YN

1. Replace cable W117 (WP 0095 00).
2. Verify no faults found.

YES

E3Y

1. Verify no faults found.

VEHICLE WILL NOT ACCEPT EXTERNAL AC POWER (M1068 ONLY)

0011 00

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Power-Generation Equipment Repairer 52D10
Helper (H)

Tools and Special Tools

Digital Multimeter (WP 0104 00, Item 28)
General Mechanic's Tool Kit (WP 0104 00, Item 19)

Equipment Condition

Power control enclosure removed (see your -20)
Unit level troubleshooting completed (see your -20)

WARNING



HIGH VOLTAGE is used in the operation of this equipment.

DEATH ON CONTACT may result if personnel fail to observe safety precautions.

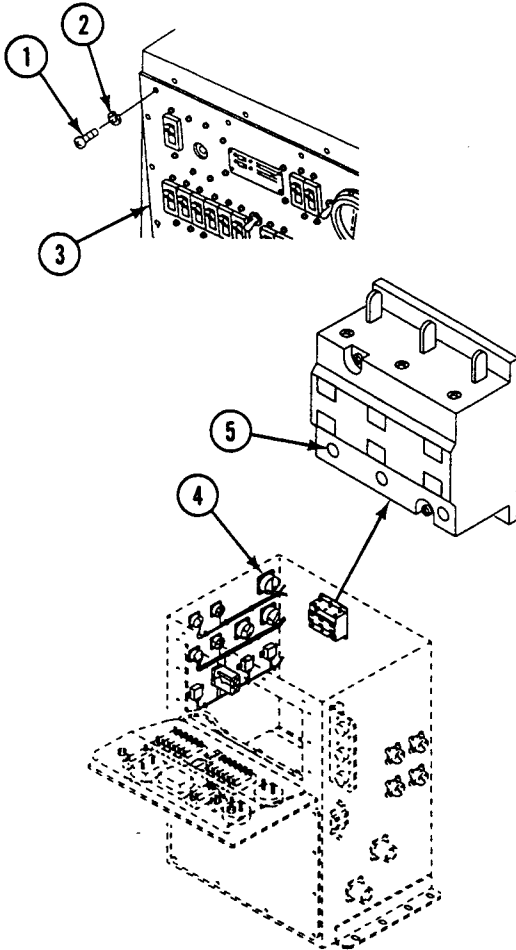
NEVER work on equipment unless at least one other person familiar with the operation and hazards of the equipment is nearby. That person should also be familiar with giving first aid. When an operator helps a mechanic, that operator must be warned about dangerous areas.

SHUT OFF POWER supply to equipment before beginning work. Make sure all external power is off/disconnected.

BE CAREFUL not to contact high-voltage connections when installing or operating this equipment.

T

1. Remove ten screws (1) and lockwashers (2) and lower the faceplate (3). Discard lockwashers.
2. Measure resistance between power enclosure jack J24 pin A (4) and K1 relay terminal T1 (5).
3. Does multimeter read 0 ohms?



NO

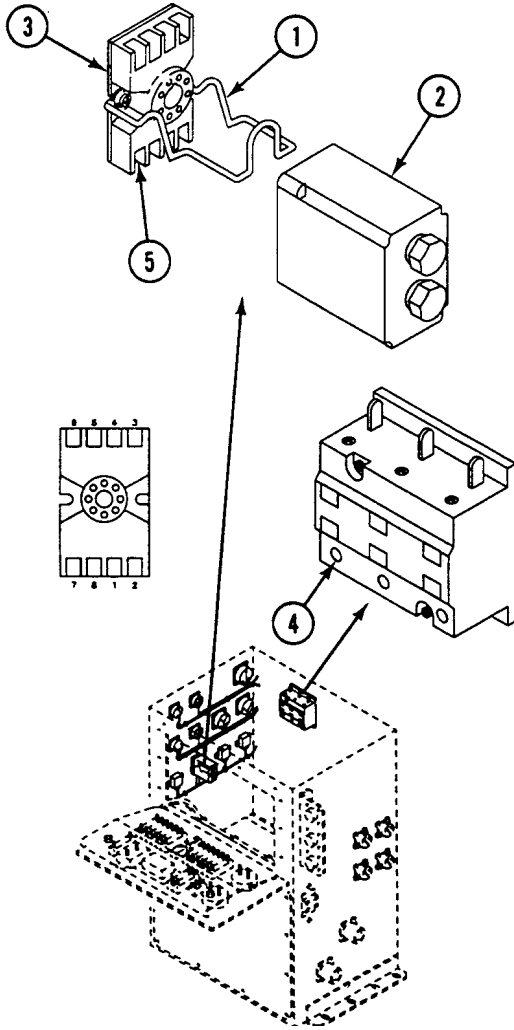
TN

1. Replace lead 1C (WP 0084 00 and WP 0085 00).
2. Verify no faults found.

YES

Y

1. Lift relay bail (1) and remove XK2 relay (2) from relay socket (3).
2. Measure resistance between K1 relay terminal T1 (4) and relay socket terminal 7 (5).
3. Does multimeter read 0 ohms?



NO

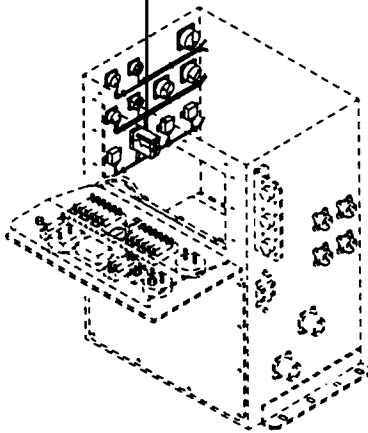
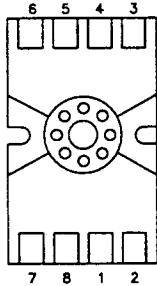
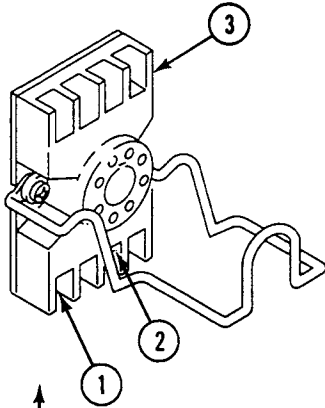
YN

1. Replace lead 1D (WP 0084 00 and WP 0085 00).
2. Verify no faults found.

YES

2Y

1. Measure resistance between terminal 7 (1) and terminal 1 (2) on XK2 relay socket (3).
2. Does multimeter read 0 ohms?



NO

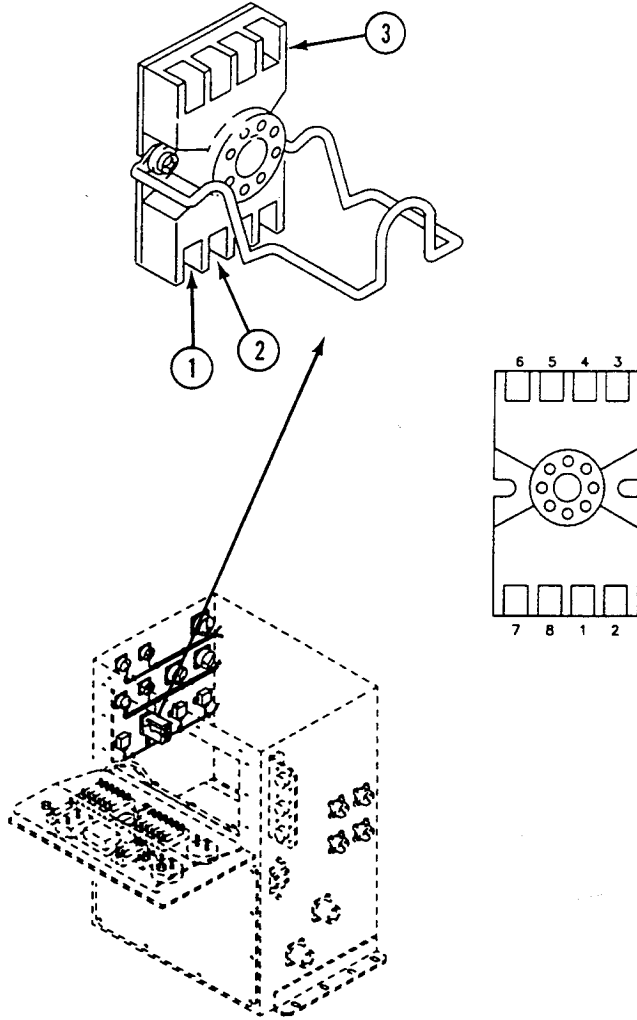
2YN

1. Replace lead 1E (WP 0084 00).
2. Verify no faults found.

YES

3Y

1. Measure resistance between terminal 7 (1) and terminal 8 (2) on XK2 relay socket (3).
2. Does multimeter read 0 ohms?



NO

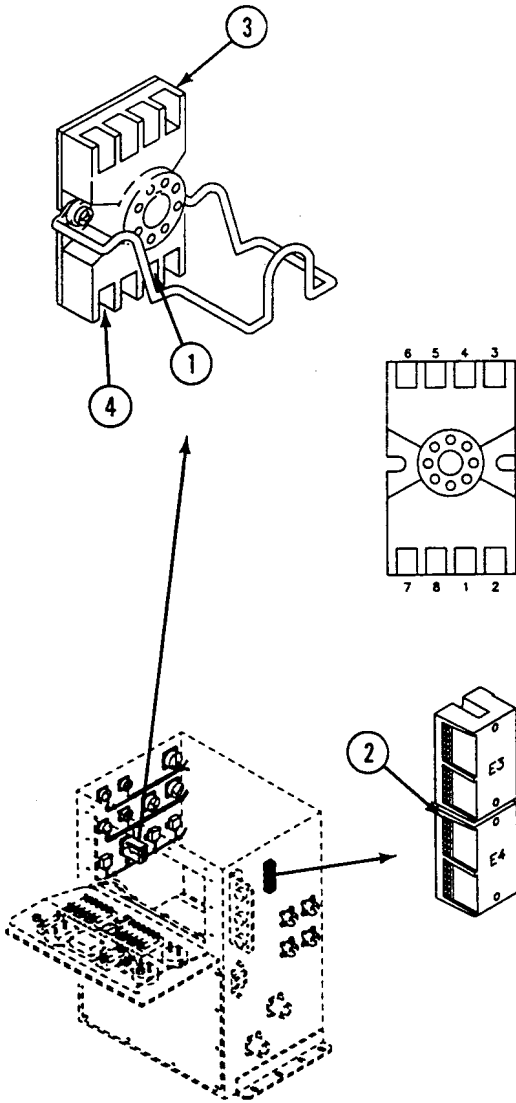
3YN

1. Replace lead 2E (WP 0084 00).
2. Verify no faults found.

YES

4Y

1. Apply external source of AC power to SICPS carrier. See TM 11-7010-256-12&P.
2. Measure voltage between XK2 relay socket terminal 1 (1) and terminal block E4 post 1 (2). Repeat check for terminals 3 (3) and 7 (4) of XK2 relay socket.
3. Does multimeter read 110 volts AC for each measurement?



NO

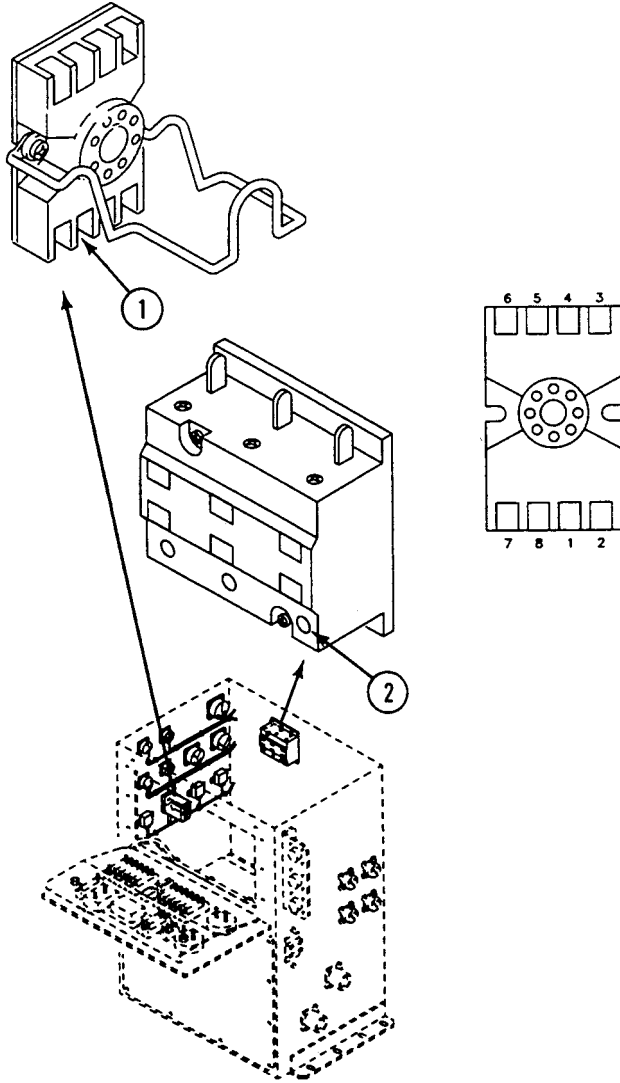
4YN

1. Replace XK2 relay (WP 0084 00).
2. Verify no faults found.

YES

5Y

1. Set external source of AC power to OFF. See TM 11-7010-256-12&P.
2. Measure resistance between XK2 relay socket terminal 8 (1) and K1 relay terminal T2 (2).
3. Does multimeter read 0 ohms?



NO

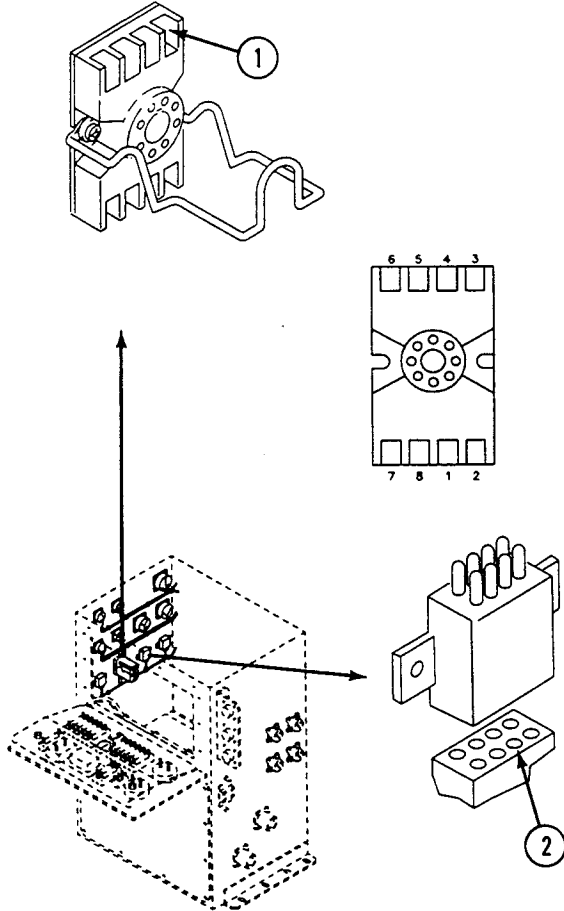
5YN

1. Replace lead 2D (WP 0084 00 and WP 0085 00).
2. Verify no faults found.

YES

6Y

1. Measure resistance between XK2 relay socket terminal 3 (1) and K3 relay terminal A2 (2).
2. Does multimeter read 0 ohms?



NO

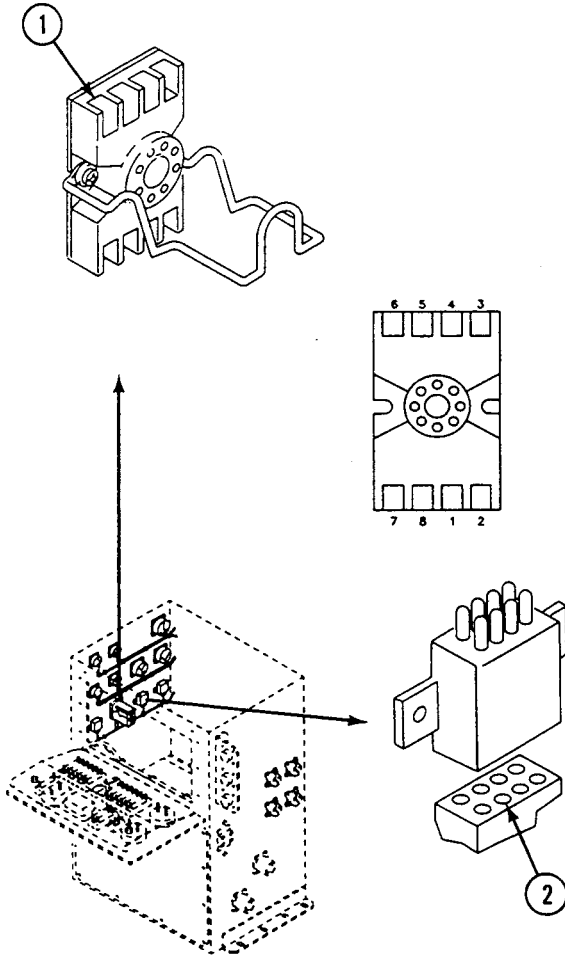
6YN

1. Replace lead 4A (WP 0084 00).
2. Verify no faults found.

YES

7Y

1. Measure resistance between XK2 relay socket terminal 6 (1) and K3 relay terminal X1 (2).
2. Does multimeter read 0 ohms?



NO

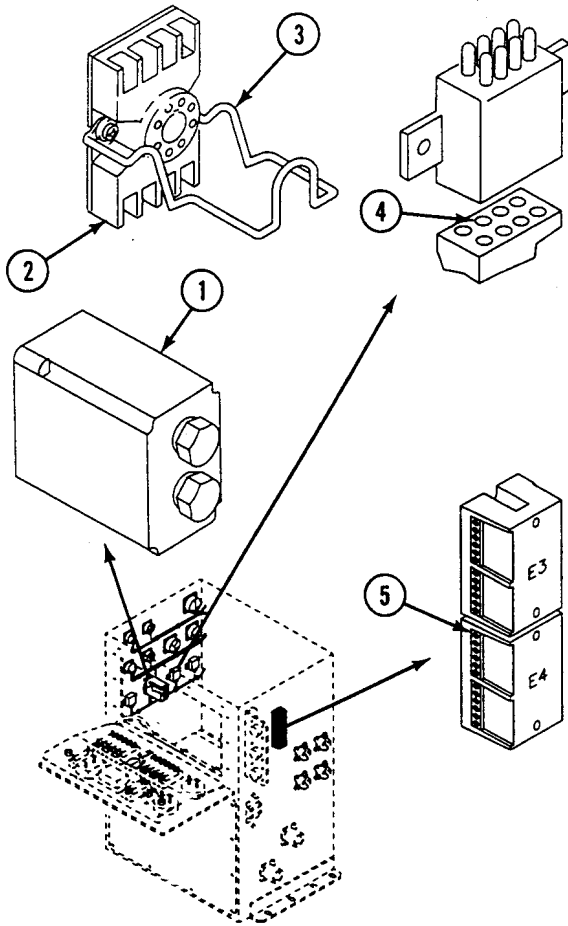
7YN

1. Replace lead 6A (WP 0084 00).
2. Verify no faults found.

YES

8Y

1. Install XK2 relay (1) in relay socket (2) and secure with relay bail (3).
2. Apply external source of AC power to SICPS carrier. See TM 11-7010-256-12&P.
3. Measure voltage between K3 relay terminal A2 (4) and terminal block E4 post 1 (5).
4. Does multimeter read 110 volts AC for each measurement?



NO

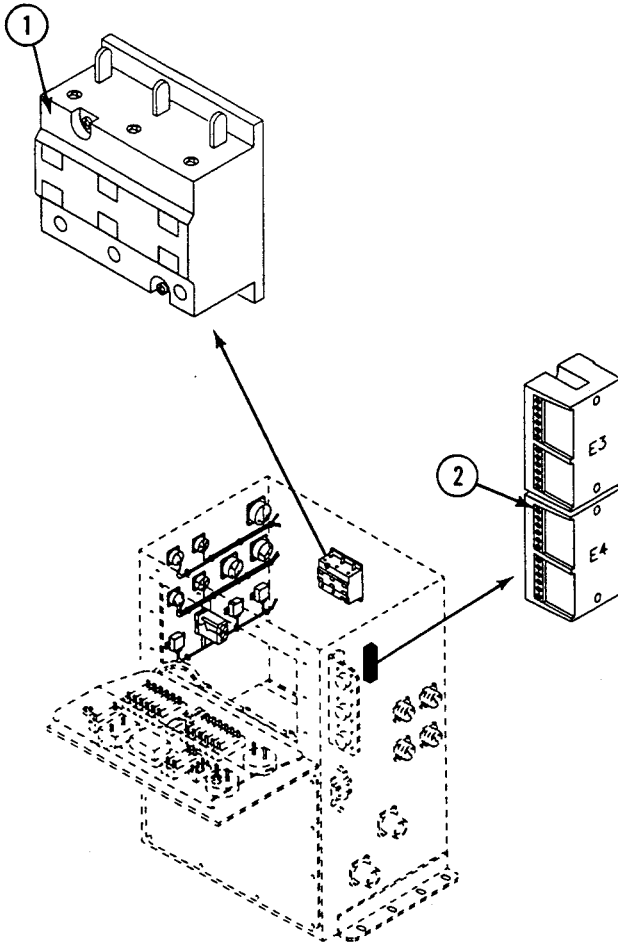
8YN

1. Replace K3 relay (WP 0084 00).
2. Verify no faults found.

YES

9Y

1. Measure voltage between K1 relay terminal L1 (1) to anywhere on E4 terminal block (2).
2. Does multimeter read 110 volts AC or more for both measurements?



YES



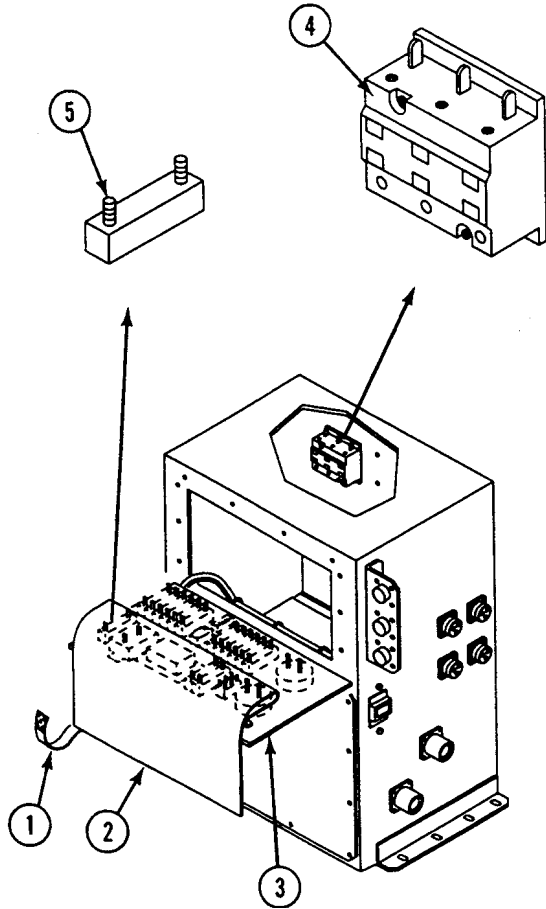
NO

9YN

1. Replace K1 relay (WP 0085 00).
2. Verify no faults found.

10Y

1. Set external source of AC power to OFF. See TM 11-7010-256-12&P.
2. Undo the velcro strap (1) securing the safety cover (2) to the inside of the faceplate (3). Pull the safety cover (2) open to access the circuit breakers.
3. Measure resistance between K1 relay terminal L1 (4) and circuit breaker CB1 terminal 1 (5).
4. Does multimeter read 0 ohms?



NO

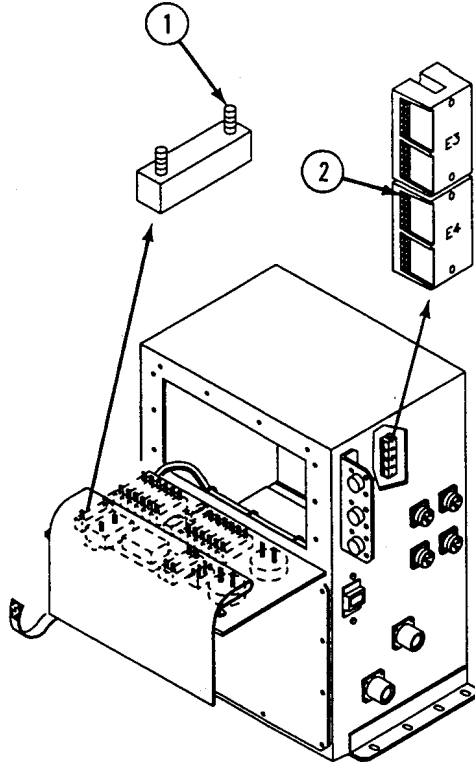
10YN

1. Replace lead 7A (WP 0085 00 and see your -20).
2. Verify no faults found.

YES

11Y

1. Set external source of AC power to ON. See TM 11-7010-256-12&P.
2. Set AC MAIN circuit breaker CB1 to ON. See TM 11-7010-256-12&P.
3. Measure voltage between CB1 post 2 (1) and terminal block E4 post 1 (2).
4. Does multimeter read 110 volts AC or more?



YES

NO

11YN

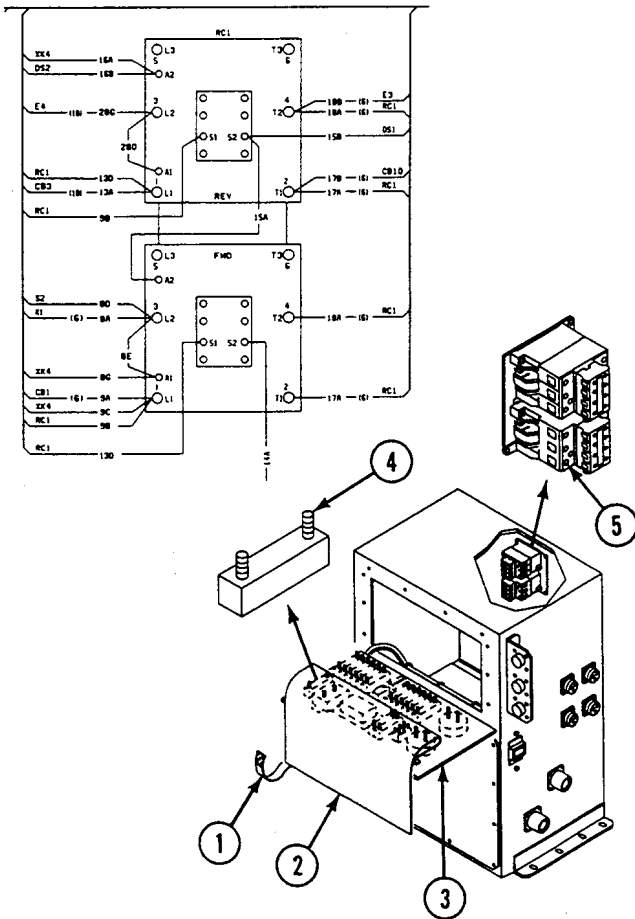
1. Replace circuit breaker CB1 (see your -20).
2. Verify no faults found.

12Y

NOTE

Use wiring diagram below.

1. Set external source of AC power to OFF. See TM 11-7010-256-12&P.
2. Undo velcro strap (1) and lift the safety cover (2) over the top of the faceplate (3).
3. Measure resistance between circuit breaker CB1 terminal 2 (4) and lead 9A to reversing contactor RC1-FWD terminal L1 (5).
4. Lift safety cover (2) over inside of faceplate (3).
5. Does multimeter read 0 ohms?



NO

12YN

1. Replace lead 9A (and see your -20).
2. Verify no faults found.

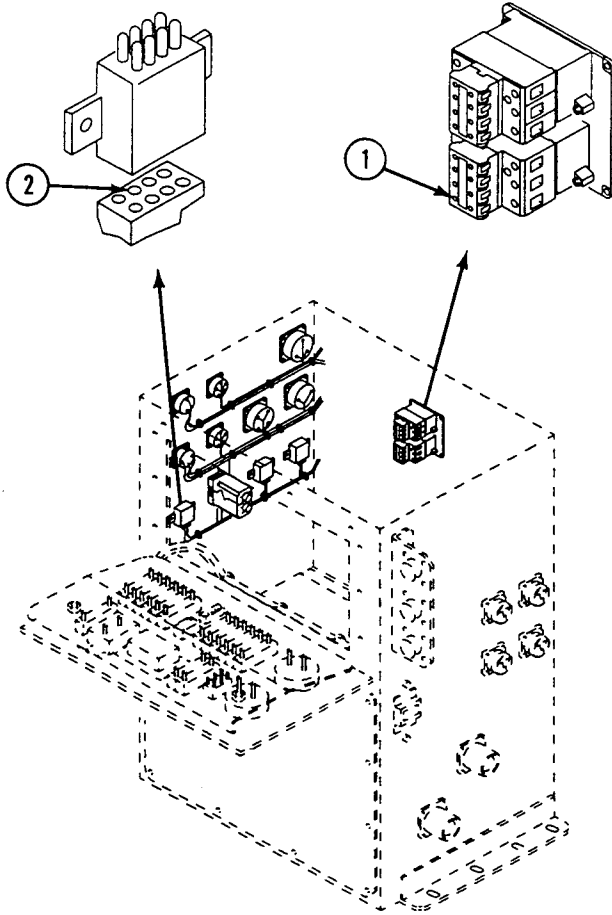
YES

13Y

NOTE

Use wiring diagram (see your -20).

1. Measure resistance between lead 9C to reversing contactor RC1-FWD terminal L1 (1) and K4 relay terminal X2 (2).
2. Does multimeter read 0 ohms?



NO

13YN

1. Replace lead 9C (WP 0084 00 and WP 0085 00).
2. Verify no faults found.

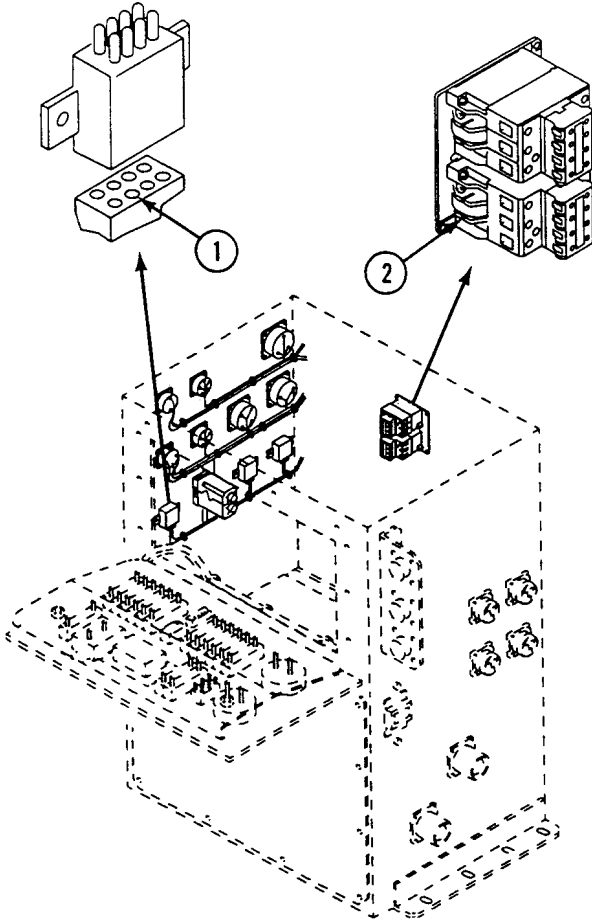
YES

14Y

NOTE

Use wiring diagram (see your -20).

1. Measure resistance between K4 relay terminal X1 (1) and lead 8G to reversing contactor RC1-FWD terminal A1 (2).
2. Does multimeter read 0 ohms?



NO

14YN

1. Replace lead 8G (WP 0084 00 and WP 0085 00).
2. Verify no faults found.

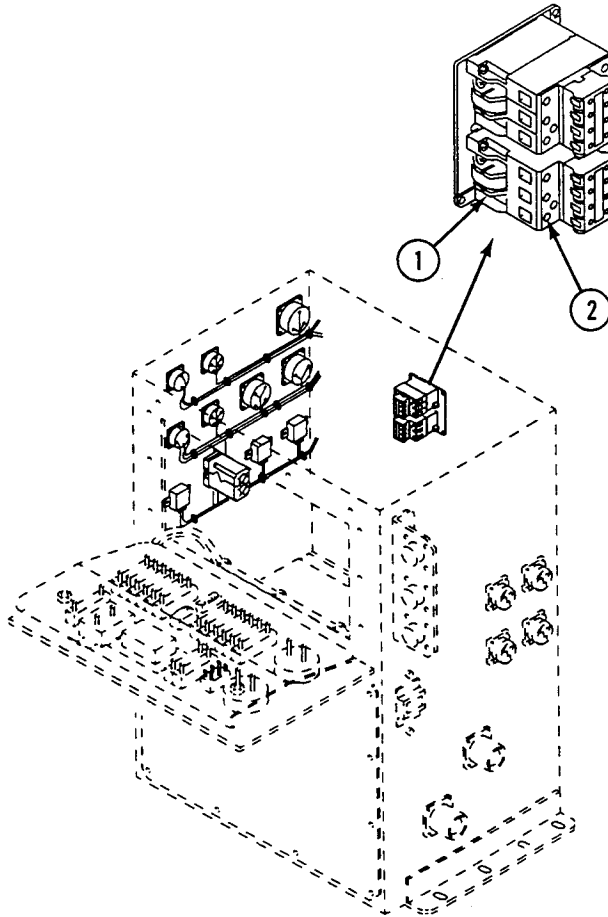
YES

15Y

NOTE

Use wiring diagram (see your -20).

1. Measure resistance between jumper lead 8E to reversing contactor RC1-FWD terminal A1 (1) and terminal L2 (2).
2. Does multimeter read 0 ohms?



NO

15YN

1. Replace jumper lead 8E (WP 0085 00).
2. Verify no faults found.

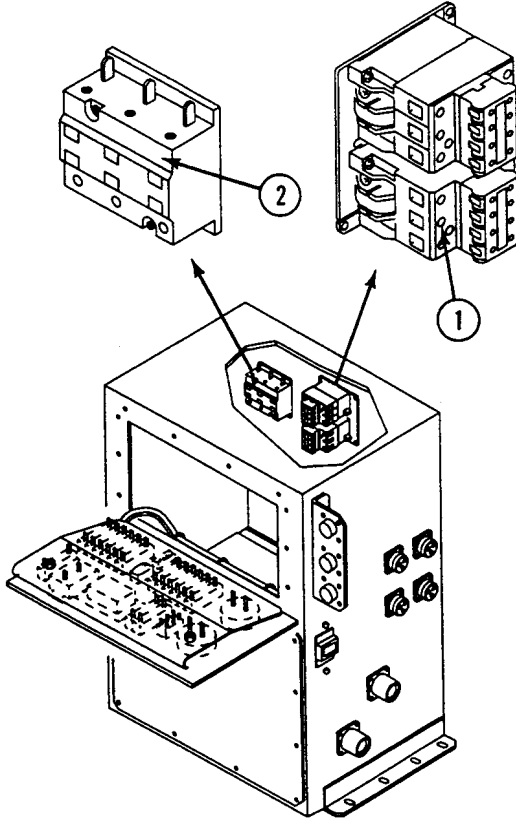
YES

16Y

NOTE

Use wiring diagram (see your -20).

1. Measure resistance between lead 8A to reversing contactor RC1-FWD terminal L2 (1) to K1 relay terminal L2 (2).
2. Does multimeter read 0 ohms?



NO

16YN

1. Replace lead 8A (WP 0085 00).
2. Verify no faults found.

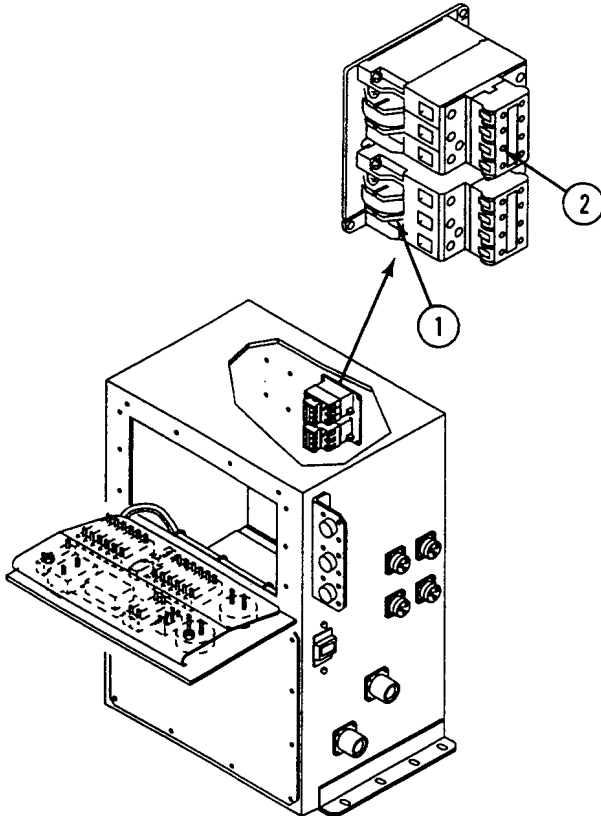
YES

17Y

NOTE

Use wiring diagram (see your -20).

1. Measure resistance between reversing contactor RC1-FWD terminal A1 (1) and lead 9B RC1-REV terminal 51 (2).
2. Does multimeter read 0 ohms?



NO

17YN

1. Replace K4 relay (WP 0084 00).
2. Verify no faults found.

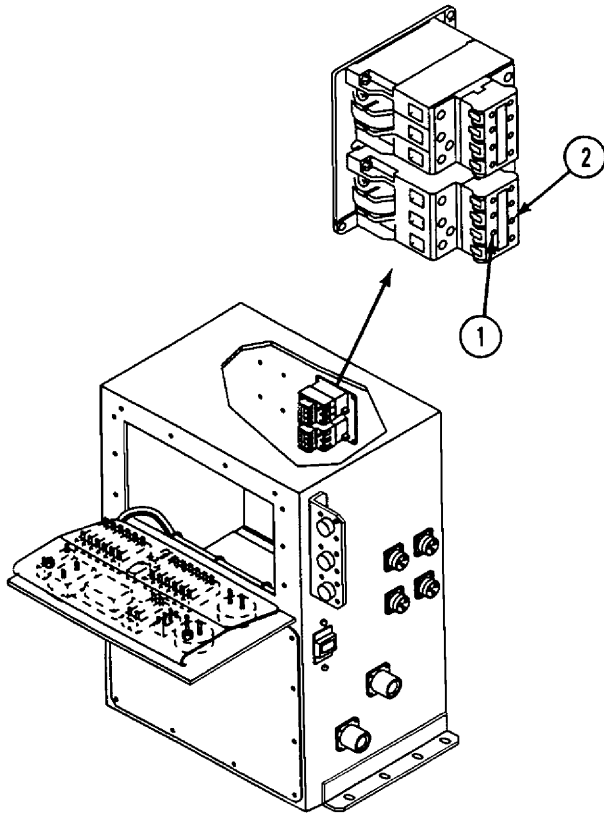
YES

18Y

NOTE

Use wiring diagram (see your -20).

1. Measure resistance between reversing contactor RC1-FWD terminal 51 (1) and terminal 52 (2).
2. Does multimeter read 0 ohms?

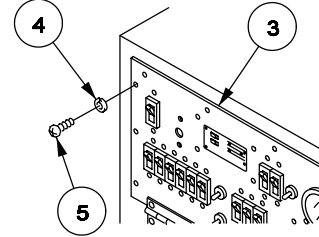


YES

NO

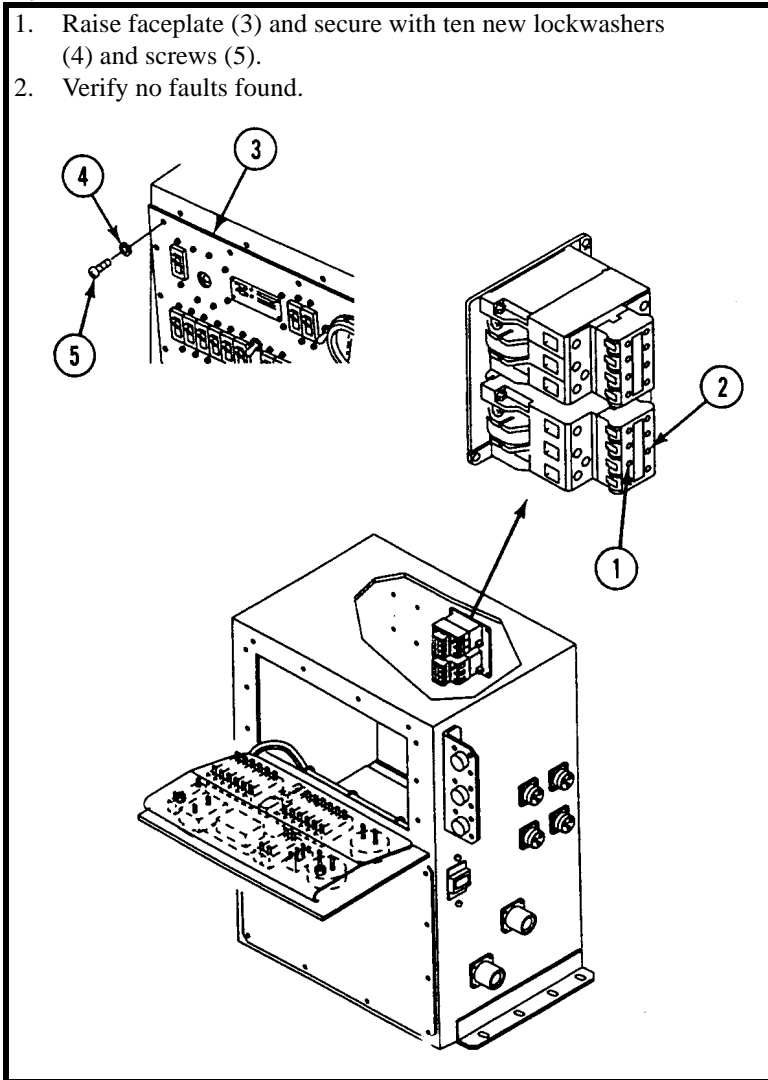
18YN

1. Replace reversing contactor RC1 (WP 0085 00).
2. Raise faceplate (3) and secure with ten new lockwashers (4) and screws (5).
3. Verify no faults found.



19Y

1. Raise faceplate (3) and secure with ten new lockwashers (4) and screws (5).
2. Verify no faults found.



NO DC OUTPUT FROM DC POWER SUPPLY (M1068 ONLY)

0012 00

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Power-Generation Equipment Repairer 52D10
Helper (H)

Tools and Special Tools

Digital Multimeter (WP 0104 00, Item 28)
General Mechanic's Tool Kit (WP 0104 00, Item 19)
Special Purpose Power Cable (WP 0106 00, Item 2)

Equipment Condition

Power control enclosure removed (see your -20)
Power control enclosure faceplate lowered and power supply cover removed (see your -20)
Unit level troubleshooting completed (see your -20)

WARNING



HIGH VOLTAGE is used in operation of this equipment.

DEATH ON CONTACT may result if personnel fail to observe safety precautions.

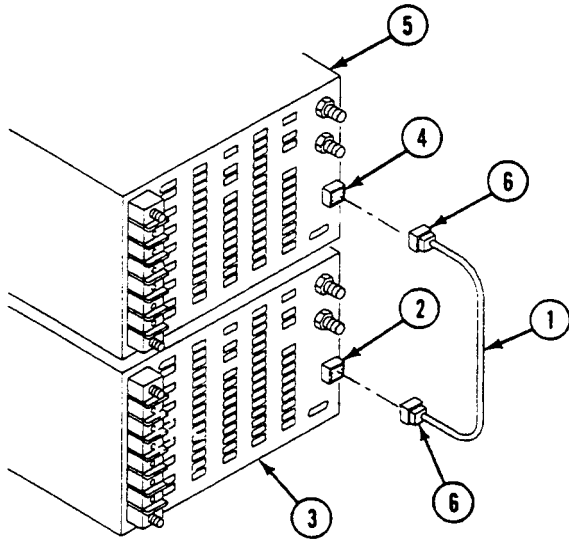
NEVER work on equipment unless at least one other person familiar with operation and hazards of equipment is nearby. That person should also be familiar with giving first aid. When an operator helps a mechanic, that operator must be warned about dangerous areas.

SHUT OFF POWER supply to equipment before beginning work. Make sure all external power is **OFF/disconnected**.

BE CAREFUL not to touch high-voltage connections when installing or operating this equipment.

T

1. Remove jumper cable (1) from terminal J1 (2) on power supply PS2 (3) and terminal J1 (4) on power supply PS1 (5).
2. Measure resistance between pins 9 (6) of jumper cable (1).
3. Does multimeter read 0 ohms?



NO

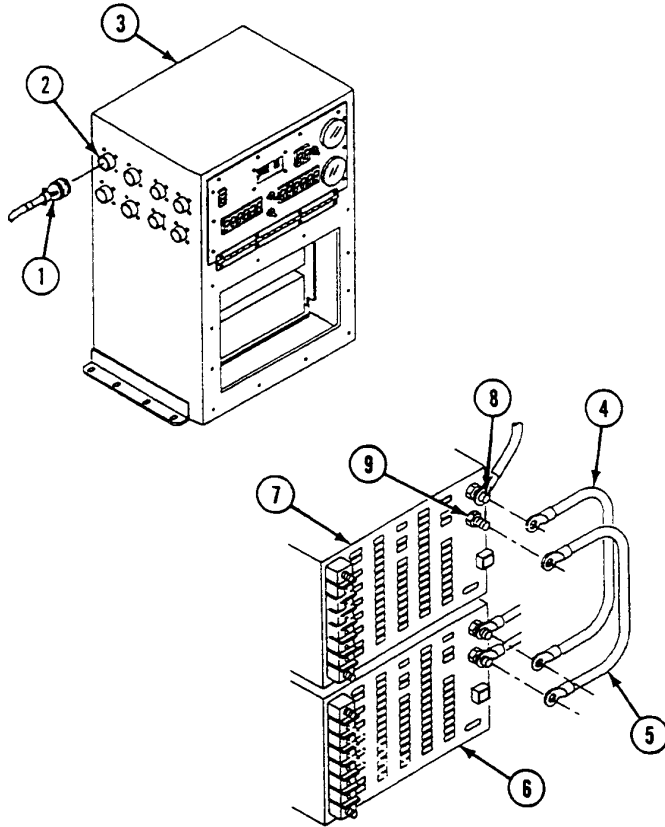
TN

1. Replace jumper cable (WP 0086 00).
2. Verify no faults found.

YES

Y

1. Connect special purpose power cable (1) to external AC power and to J24 (2) on power control enclosure (3).
2. Remove circuit 31D (4) and circuit 32D (5) from power supply PS2 (6) and power supply PS1 (7).
3. Apply external AC power and set AC MAIN and DC POWER SUPPLY switches to ON. See TM 11-7010-256-12&P.
4. Measure voltage between OUTPUT (+) terminal (8) and OUTPUT (-) terminal (9) on power supply PS1 (7).
5. Does multimeter read 26.4 volts DC or more?



YES

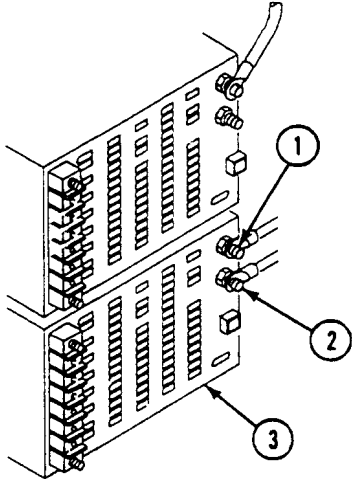
NO

YN

1. Replace power supply PS1 (WP 0086 00).
2. Verify no faults found.

2Y

1. Measure voltage between OUTPUT (+) terminal (1) and OUTPUT (-) terminal (2) on power supply PS2 (3).
2. Does multimeter read 26.4 volts DC or more?



NO

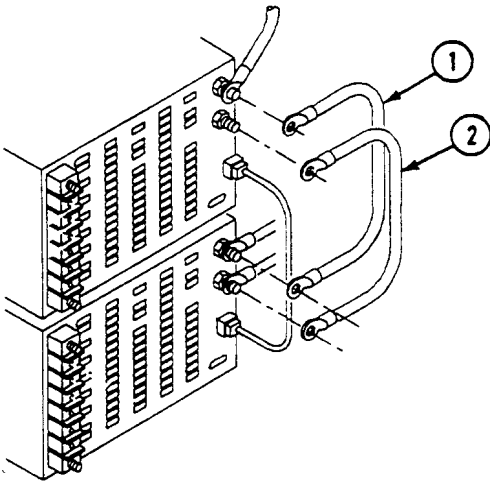
2YN

1. Replace power supply PS2 (WP 0086 00).
2. Verify no faults found.

YES

3Y

1. Measure resistance between terminal ends of circuit 31D (1) and circuit 32D (2).
2. Does multimeter read 0 ohms for each measurement?



NO

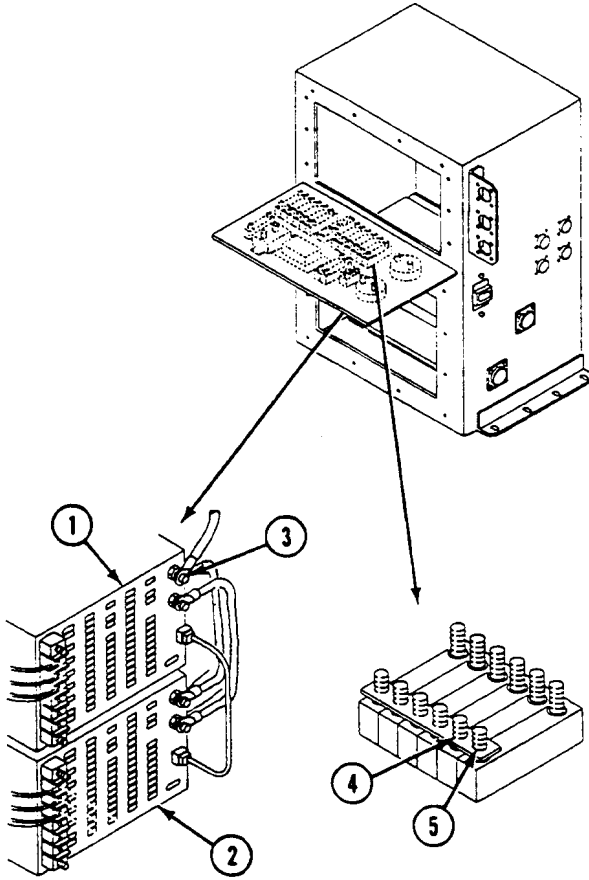
3YN

1. Replace circuit 31D and/or circuit 32D (WP 0086 00).
2. Verify no faults found.

YES

4Y

1. Remove all power from SICPS system (see your -10 and TM 11-7010-256-12&P).
2. Install all circuits on power supplies PS1 (1) and PS2 (2).
3. Measure resistance between PS1 (+) OUTPUT terminal (3) and DC bus bar at terminal 1 (4) of circuit breaker CB15 (5).
4. Does multimeter read 0 ohms?



YES

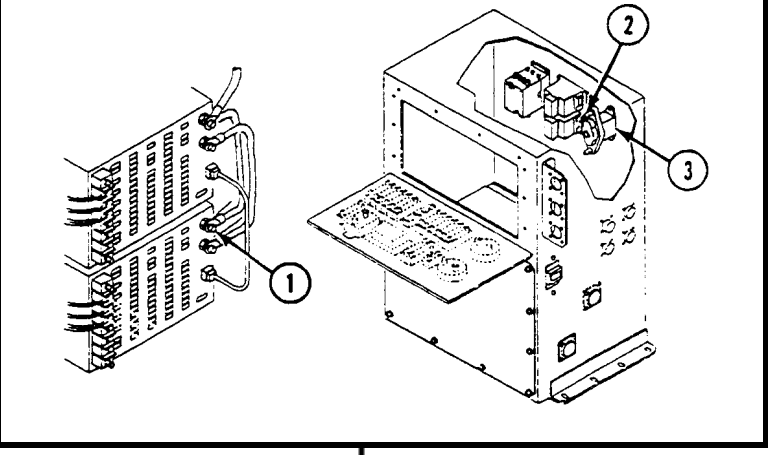
NO

4YN

1. Replace lead 31E (WP 0086 00 and see your -10).
2. Verify no faults found.

5Y

1. Measure resistance between power supply PS2 (+) OUTPUT terminal (1) and pin A2 (2) of relay K6 (3).
2. Does multimeter read 0 ohms?



NO

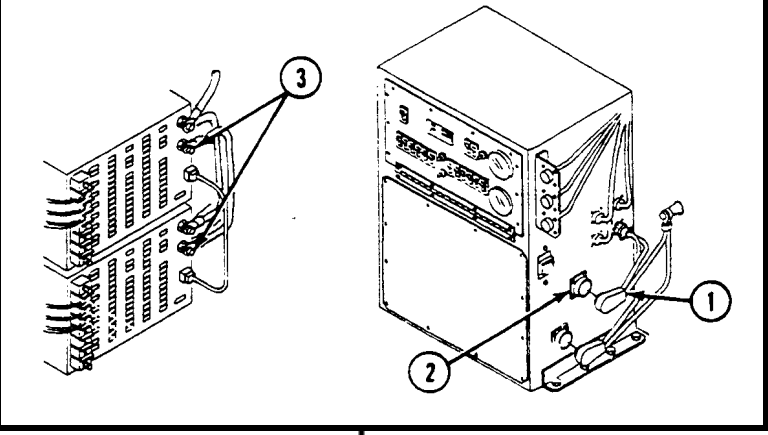
5YN

1. Replace lead 31C (WP 0086 00).
2. Verify no faults found.

YES

6Y

1. Remove cable W4 plug P1 (1) from power control enclosure jack J25 (2).
2. Measure resistance between power supply PS2 (-) OUTPUT terminal (3) and jack J25 (2) outer sleeve.
3. Does multimeter read 0 ohms?



NO

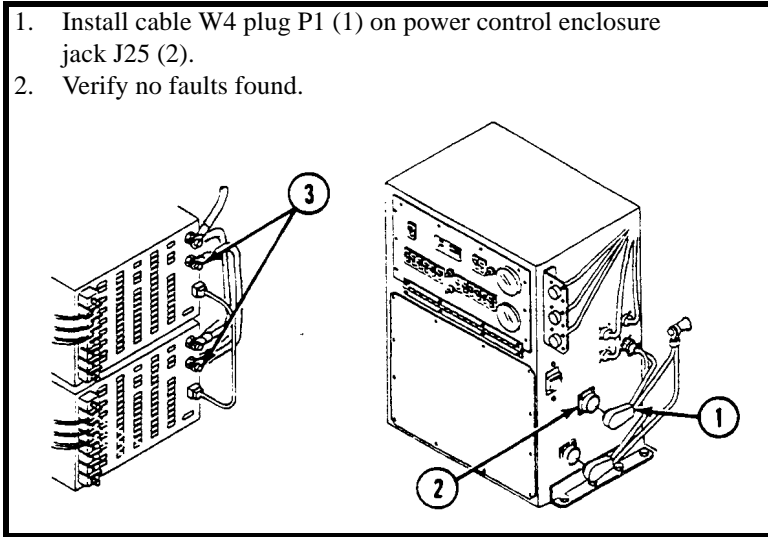
6YN

1. Replace lead 32E (WP 0086 00 and WP 0085 00).
2. Install cable W4 plug P1 on power control enclosure jack J25.
3. Verify no faults found.

YES

7Y

1. Install cable W4 plug P1 (1) on power control enclosure jack J25 (2).
2. Verify no faults found.



CHAPTER 3

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR GENERAL MAINTENANCE PROCEDURES

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
SERVICE UPON RECEIPT.....	0013 00
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS.....	0014 00

SERVICE UPON RECEIPT

0013 00

THIS WORK PACKAGE COVERS:

Service Upon Receipt of Materiel (page 0013 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Personnel Required

Track Vehicle Repairer 63H10

References

See your -10

See your -20

TM 9-6140-200-14

Equipment Condition

Engine stopped (see your -10)

SERVICE UPON RECEIPT OF MATERIEL

Checking Unpacked Equipment

This section provides information on how to check and service your carrier when it is received. *Level B* and *A* deprocessing procedures are given in the following table. *Level B* deprocessing is performed when the carrier has been in storage for less than 90 days. *Level A* deprocessing is performed, in addition to *Level B* deprocessing, when the carrier has been in storage for more than 90 days.

SERVICE UPON RECEIPT			
LOCATION	ITEM	ACTION	REMARKS
LEVEL B			
Hull	Driver's hatch	Remove welded nut/bolt from driver's hatch to gain carrier entry.	
Engine	Engine air intake	(1) Remove air restrictor plug from air duct at air filter. (2) Connect filter hose to air filter. (3) Remove warning tag.	
Engine	Fuel lines	(1) Connect fuel lines at quick disconnect. (2) Connect fuel supply tubing.	
Engine	Crankcase	Remove shipping tape from crankcase breather.	
Engine	Oil level gauge	Remove shipping tape from oil level gauge rod opening.	
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 outside.	
Engine	Power plant access panels	Install power plant access panels.	
Hull	Carrier batteries	(1) Remove shipping tape from filler caps. (2) Add electrolyte and charge batteries. See TM 9-6140-200-14.	
Hull	Battery cables	Install cables on battery. See your -20.	

SERVICE UPON RECEIPT — Continued

0013 00

Hull	Personnel heater/feed line	(1) Remove shipping tape from heater external exhaust and intake elbows. (2) Remove shipping tape from end of disconnected fuel feed line. (3) Connect feed line to heater.	
Hull	Fuel system	Full fuel tank.	
Hull	Squad seats and backrests	Remove shipping paper and tape.	
Hull	Commander's seat and post	Install commander's seat and post on carrier. See your -20.	
Hull	Periscopes	(1) Remove plugs from periscope openings. (2) Remove periscopes from packages and install. See your -20.	
Hull	Fire extinguishers	Check for intact seals on handles.	
Hull	Drain plugs	Close hull drain plugs.	
Hull	Closure kit	Remove and store closure kit.	
Hull	Engine air inlet grille	Remove shipping tape and intake and exhaust grille cover from intake and exhaust grille.	
Hull	Armor mounting inserts and screw holes	Check for loose or missing plugs in inserts and setscrews in hull screw holes.	
LEVEL A			
For level A deprocessing, perform the following procedures in addition to all the procedures for Level B deprocessing.			
Power Plant Compartment	Engine	Change engine oil. See engine crankcase tag on filler neck and your PMCS.	
Power Plant Compartment	Transmission	Service transmission with operational lubricant. See transmission tag on filler neck and your PMCS.	
Hull	Final drives	Service final drives with operational lubricant. See your PMCS.	

Checking Equipment

1. Perform all operator and unit PMCS. See your -10 and -20. M901A1 Turret PMCS is included in TM 9-2350-259-10 and TM 9-2350-259-20.
2. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on Form SF 368 (Quality Deficiency Report).

END OF TASK

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

0014 00

THIS WORK PACKAGE COVERS:

- General Maintenance Instructions (page 0014 00-1).
 - Preventive Maintenance Checks and Services Including Lubrication Instructions (page 0014 00-14).
-

INITIAL SETUP:

<u>Maintenance Level</u>	<u>References</u>
Direct Support	See your -10 See your -20
<u>Materials/Parts</u>	TM 9-214
Crocus cloth (WP 0105 00, Item 9)	TM 9-2350-261-24P
Detergent (WP 0105 00, Item 12)	TC 9-237
Solvent, cleaning compound (WP 0105 00, Item 10)	TM 43-0139
Wiping rag (WP 0105 00, Item 28)	

GENERAL MAINTENANCE INSTRUCTIONS

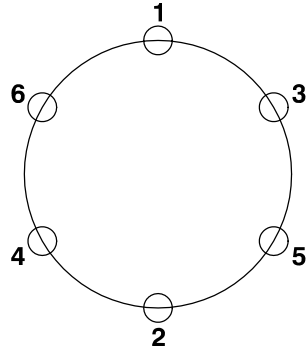
Scope

This section contains safety warnings, guidelines, and general maintenance instructions. They should be followed when doing maintenance procedures authorized for direct and general support maintenance levels.

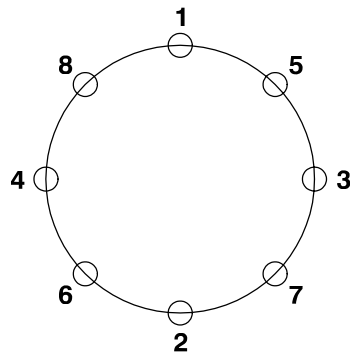
Preparation for Maintenance

1. **PERSONNEL SAFETY.** Practice all shop safety procedures and read all warnings in this manual.
2. **PROPER EQUIPMENT.** Get tools and equipment before starting a maintenance task. See TM 9-2350-261-24P and the maintenance tasks for tools, equipment, parts, and materials.
3. **WHAT TO DISCARD.** Parts to discard, such as lockwashers, locknuts, and gaskets 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 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.

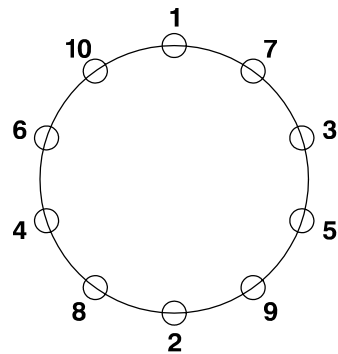
6. **TORQUING.** Where needed, torque values are listed in the maintenance task. When torquing, use one of the star pattern sequences below unless otherwise stated in the maintenance task.



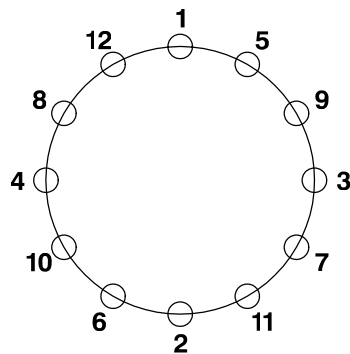
6-HOLE PATTERN



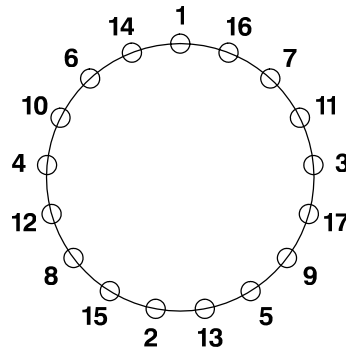
8-HOLE PATTERN



10-HOLE PATTERN



12-HOLE PATTERN



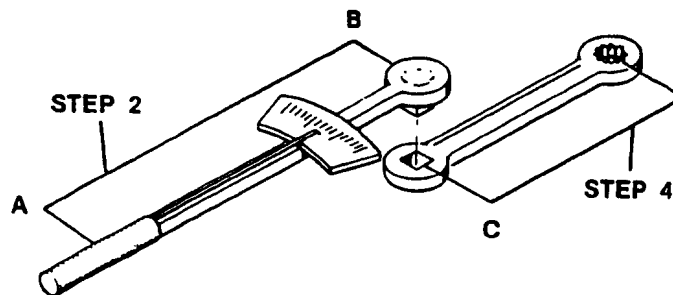
17-HOLE PATTERN

7. TORQUE WRENCH ADAPTERS AND CONVERSION FORMULA.

- a. Torque wrench adapters (extensions) are used to tighten screws and nuts to specific values that cannot be reached with a regular socket on the end of a torque wrench. This makes the dial or scale reading less than the actual torque applied to the screw or nut. When using an adapter, determine the dial or scale reading as follows:
 - 1) Check your manual for specific torque value to which the screw or nut should be tightened.
 - 2) Measure the length of your torque wrench, from the center of the handle (point A) to the center of the socket (point B). Record this measurement.
 - 3) Multiply the above measurement by the desired torque. Record this sum.
 - 4) Measure length of adapter from socket end (point C) to screw or nut end (point D). Record this measurement.
 - 5) Add length of adapter, Item (4), to the length of the torque wrench, Item (2). Record this sum.
 - 6) Divide the sum found in Item (3) by the sum found in Item (5).
 - 7) The sum found in Item (6) is your torque wrench setting. Set your dial.

NOTE

Example: Metric equivalents omitted for clarity.



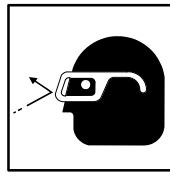
- (1) 40 lb-ft required.
- (2) 12 inches.
- (3) $12 \times 40 = 480$.
- (4) 4 inches.
- (5) $12 + 4 = 16$ inches.
- (6) $480/16 = 30$ lb-ft.
- (7) Torque wrench dial setting = 30.

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

0014 00

8. **GENERAL CLEANING.** 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 the following steps. Special cleaning procedures are covered in the task relating to the specific part. Clean after repair and before assembly.
- CLEAN EVERY PART.** Clean every part well after disassembly and before assembly or installation. Clean parts such as housings, covers, and dipsticks before disassembly. Avoid getting dirt and foreign matter in a system. Inspect and cap all air and fluid openings, lines, and hoses.
 - HANDLE WITH CARE.** Use care when handling parts during cleaning and maintenance. Nicks, scratches, dents, and burrs can prevent proper assembly or cause malfunctions after assembly. Keep hands free of grease. Grease collects dirt. Cover or wrap parts to protect from dirt.
 - AVOID ABRASIVES.** Except where specially 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.
 - REMOVAL AGENTS.** Remove gum or old grease deposits by soaking parts in solvent, cleaning compound. Scrub with a brush. Use crocus cloth to remove minor surface defects.

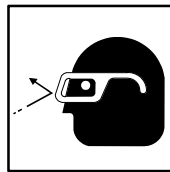
WARNING



Air pressure in excess of 30 psi (207 kPa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

- STEAM CLEANING.** If steam cleaning is used, dry clean parts at once with compressed air. Apply a thin film of clean oil to surfaces that are not painted to prevent rusting. Never use lye or caustic mixtures that will corrode or etch metal surfaces.
- LUBRICATION OF NEW BEARINGS.** See TM 9-214 for cleaning and lubrication procedures. Bearings that have been in service should also be lubricated.

WARNING



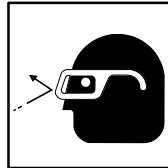
Air pressure in excess of 30 psi (207 kPa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

- CASTINGS.**
 - Clean inner and outer surfaces of casting with solvent, cleaning compound. Dry casting with compressed air.
 - Remove sludge and gum deposits with a brush.
 - Blow out all tapped holes and armor mounting inserts with compressed air.
- BALL BEARINGS.** Bearings require special cleaning techniques. See TM 9-214 for cleaning and maintenance procedures for ball bearings.

i. **OIL PASSAGES.**

- 1) Make sure all oil passages are not clogged.
- 2) Clean oil passages and break up any sludge or gum deposits.

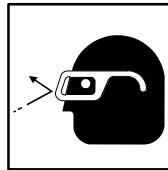
WARNING



Air pressure in excess of 30 psi (207 kPa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

- 3) Flush oil passages with solvent, cleaning compound. Dry parts with compressed air.
- j. **OIL SEALS, ELECTRICAL CABLES, AND FLEXIBLE HOSES.** Clean seals, cables, and flexible hoses with detergent and water. Dry parts with wiping rag.

WARNING



Air pressure in excess of 30 psi (207 kPa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

- k. **INSERTS.** Blow out insert holes with compressed air.
 - l. **GASKETS.** If gasket is being removed, scrape old gasket material and sealant off mating surface. Clean mating surface with solvent, cleaning compound. Dry with wiping rag.
9. **INSPECTION.** All parts must be inspected with care. Replace parts if damage or wear exceeds allowable limits.
- a. **GENERAL.** Procedures for inspection will be the same for most parts. General inspection procedures are given in the following steps. Special inspection procedures are covered in the task as needed.
 - b. **CASTINGS.**
 - 1) Use magnetic particle inspection equipment to check ferrous castings for cracks. Use a magnifying glass and strong light to check nonmetal castings for cracks. Check areas next to studs, threaded inserts, sharp corners, and fillets.
 - 2) Inspect all castings and forgings for breaks, cracks, and wear or scoring that would impair function.
 - 3) Inspect machined surfaces for nicks, burrs, and raised metal. Mark damaged areas for repair.
 - 4) Use straightedge to check all mounting flanges on housings and supports for bends. Inspect mating flanges for stains which would indicate oil leakage.
 - 5) Inspect all threaded parts for damaged or stripped threads.
 - c. **ROLLER AND BALL BEARINGS.** Inspect bearing races for wear and color changes due to heat. See TM 9-214 for inspection procedures for ball bearings.

- d. **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 procedures.
- e. **STUDS.** Inspect all studs for stripped or damaged threads, bent or loose condition, and signs of stretching.
- f. **GEARS.**
 - 1) Use magnetic particle inspection equipment to check all gears for cracks.
 - 2) Inspect gears for burrs, wear, cracked or broken teeth, and pitting at tooth contact areas.
- g. **BUSHINGS AND BUSHING TYPE BEARINGS.**
 - 1) Check all bushings and bushing type bearings for secure fit in casting. Check for color changes which could mean overheating. Inspect for size, scoring, out of roundness, burrs, sharp edges, and signs of seizing.
 - 2) Check for dirt in oil holes and in bushing type bearings. Oil holes and grooves must be clean and not damaged.
- h. **OIL SEALS.**
 - 1) Inspect feather edge of oil seals for tears, fraying, hardening, and cracking.
 - 2) Replace metal covered oil seals when there are signs of damage or oil leakage.
- i. **CORE HOLE PLUGS.** Inspect core holes for signs of leakage. Replace damaged core hole plugs.
- j. **INSERTS.**
 - 1) Inspect inserts for cracks and stripped or damaged threads.
 - 2) Check inserts for loose fit.
 - 3) Inspect armor mounting inserts and hull screw holes for loose or missing plugs and setscrews, as required.
- k. **GREASE SEALS, PREFORMED PACKINGS, AND GASKETS.**
 - 1) Inspect seals that are composition type, rings, and preformed packings for wear, brittleness, cracks, cuts, and damage.
 - 2) Inspect lip seals for cracks, wear, cuts, and brittleness. Inspect springs and seal shells for damage.
 - 3) 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.
- l. **SPLINED PARTS.** Inspect splined parts for burrs, wear, and twisted, cracked or broken splines.
- m. **THREADED PARTS.** Inspect all threaded parts for burrs and stripped or damaged threads.
- n. **RETAINING RINGS.** Inspect retaining rings for nicks, burrs, defects, loss of tension, or wear.
- o. **SPRINGS.** Inspect springs for wear, defects, breaks, and loss of tension or compression. Inspect springs using a spring tester.
- p. **SHAFTS AND SPINDLES.** Inspect shafts and spindles for excessive wear, binding, scores, cracks, burrs, and obstructed oil passages.
- q. **ELECTRICAL PARTS.**
 - 1) Inspect electrical parts before you install them. Look for mildew and corroded or burned parts.
 - 2) Inspect electrical parts for pinched or loose wires and for cracked or broken wires, circuit cards, relays, and connectors.
 - 3) Inspect insulation and heat shrink tubing for cracks, tears, burns, or missing material.

Repair

1. **GENERAL REPAIR.** General repair procedures are given in the following steps. Special repairs are covered in the task. After repair, clean all parts well.
 - a. **CASTINGS.**
 - 1) Replace all cracked or broken castings.
 - 2) Repair minor damage to machined surfaces of castings with crocus cloth. Replace any part with defects that cannot be corrected or which will impair function.
 - 3) Repair minor surface bends by working bent surface of casting across sheet of crocus cloth on surface plate. Replace bent castings which would impair assembly or function.
 - 4) Repair damaged pipe or screw threads with correct tap or die.
 - b. **BALL BEARINGS.** See TM 9-214 for inspection and maintenance of ball bearings.
 - c. **NEEDLE ROLLER BEARINGS.** See TM 9-214 for inspection and maintenance of needle roller bearings.
 - d. **STUDS.**
 - 1) Replace all bent or loose studs or studs which show signs of stretching.
 - 2) Repair minor thread damage with standard thread chaser.
 - 3) To remove studs, back out studs slowly with stud extractor to avoid heating and possible seizure. If studs are broken 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.
 - 4) To replace studs, lightly apply antiseize compound to stud before you install it. 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.
 - e. **GEARS.**
 - 1) Replace gears that have worn, pitted, or gouged teeth.
 - 2) Remove sharp burrs from gear teeth with crocus cloth dipped in solvent, cleaning compound.

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.

- f. **BUSHINGS AND BUSHING TYPE BEARINGS.**
 - 1) 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.
 - 2) 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.
 - 3) 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.

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

0014 00

- g. **OIL SEALS.** Oil seals must be replaced when thin feather edge is damaged or when seal material is brittle.
 - 1) Press damaged oil seal from casting. Be careful not to damage bore.
 - 2) When oil seal bore is damaged so an oil tight seal is impossible, replace casting or adapter. Remove slight nicks, burrs, and scratches with crocus cloth dipped in solvent, cleaning compound.
 - 3) Install new oil seal in casting bore or adapter using suitable oil seal replacement tool.
- h. **INSERTS.** Replace insert when threads are stripped or when insert is cracked or loose.
 - 1) Drill and remove damaged insert from casting.
 - 2) Install new insert in casting using suitable replacement tool.
 - 3) Install plugs in armor mounting inserts, as required.
 - 4) Install setscrews in hull armor mounting screw holes, as required.
- i. **GREASE SEALS, PREFORMED PACKINGS, GROMMETS, AND GASKETS.** Seals, preformed packings, grommets, and gaskets should be replaced when removed unless otherwise stated in the maintenance task. They should not be reused.
- j. **SPLINED PARTS.**
 - 1) Remove burrs from splined parts with a soft honing stone.
 - 2) 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 oversize, while a new die may cut undersize.

- k. **THREADED PARTS.** Repair all parts that have stripped or damaged threads by chasing threads with a used tap or die. Replace parts that cannot be repaired.
- l. **RETAINING RINGS.**
 - 1) Retaining rings should be replaced when removed unless otherwise stated in the maintenance task. They should not be reused.
 - 2) Some retaining rings are beveled on one side. When installing this type of ring, the beveled side must face the part to be retained.
- m. **SPRINGS.** Discard springs that have defects. Load and height inspection data, where needed, are given in maintenance procedures.
- n. **SHAFTS AND SPINDLES.**
 - 1) Replace shafts and spindles that show signs of wear, binding, scores, cracks, burrs, or clogged oil passages.
 - 2) Remove obstructions with compressed air or by probing with soft wire.
 - 3) Remove burrs and minor surface defects with a crocus cloth.
- o. **ELECTRICAL PARTS.**
 - 1) Replace corroded or burned parts and parts which show signs of mildew.
 - 2) Tighten loose connections.
 - 3) Replace cracked or broken wires, circuit cards, relays, and connectors.
 - 4) Replace cracked, torn, or burned insulation and heat shrink tubing.

2. **WELDING INSTRUCTIONS.** Welding safety precautions and welding procedures are given in the following steps. Special instructions are covered in the task.
- a. **SAFETY PRECAUTIONS.**
- 1) Wear clothing such as 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 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.
- b. **GENERAL WELDING PROCEDURES.**
- 1) **BASIC WELDING REPAIRS.** Repairs are made on 5083 aluminum alloy using the MIG (Metal-Inert-Gas) welding method.
 - 2) **CONTRACTION AND EXPANSION.** Aluminum welds contract about 6 percent in volume when they become solid. Welding at 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.
 - 3) **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.
 - 4) **CLEANING OF WELDED SURFACES.** Remove oxides, grease, oil films, paint, and all foreign matter from joint before welding. Wipe edges of joint with a clean cloth dipped in cleaning compound and let dry before welding. Sand with disk sander or brush surface with clean stainless steel wire brush to remove oxide. Clean up weld area and touch up paint all bare metal. See TM 43-0139.
 - 5) **FIT-UP AND TACKING.** Good joint fit-up makes welding easier, saves filler wire and gas, and helps 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.
 - 6) **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 weld pool edges fuse right.
 - 7) **MULTI-PASS 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.

CAUTION

Heat distortion during welding will damage aluminum castings. Do not attempt to repair aluminum castings by welding.

c. ALUMINUM CASTINGS

- 1) **FINAL DRIVE CASTING.** Welding in final drive aluminum casting is not authorized. Do not attempt to weld on final drive housing assembly.

d. MAGNESIUM CASTINGS

WARNING



Magnesium may catch on fire if welded 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



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 1 hazardous waste disposal site.

- 1) **FAN CASTINGS.** Welding on fan magnesium castings is not authorized. Do not attempt to weld on these parts.
- 2) **FILING OR GRINDING MAGNESIUM.** You must observe the following safety precautions when filing or grinding on magnesium:
 - a) Use grinding equipment marked: **FOR MAGNESIUM GRINDING ONLY.**
 - b) Use a suitable coolant when grinding magnesium to keep temperatures below ignition point.
 - c) Keep tools used on magnesium sharp.
 - d) Keep a Class D fire extinguisher nearby for use on magnesium fires.
 - e) Wear outer clothing of fire retardant cloth or leather. Brush clothing often to remove magnesium particles.
 - f) Clean work area often. Do not let magnesium particles build up.
 - g) Dispose of magnesium chips and filings according to regulations.

WARNING

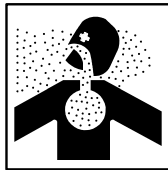


Fuel fumes can explode and burn you. Before welding: Drain all fuel. Disconnect and cap all fuel and vent lines. Purge fuel residue and fumes by steam cleaning. Purge air from fuel tank with CO2.

e. FUEL TANKS

- 1) You must observe all safety precautions when working with fuel or fuel lines.

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.

f. PLASTIC MOLDING MATERIAL PARTS. The following is a list of plastic molding material parts and their location on the carrier:

- 1) Driver's power plant compartment access panel.
- 2) Power plant rear compartment access panel.
- 3) Driver's seat upholstered backrest.
- 4) Trim vane rear pod.
- 5) Trim vane front pod.
- 6) All armor.

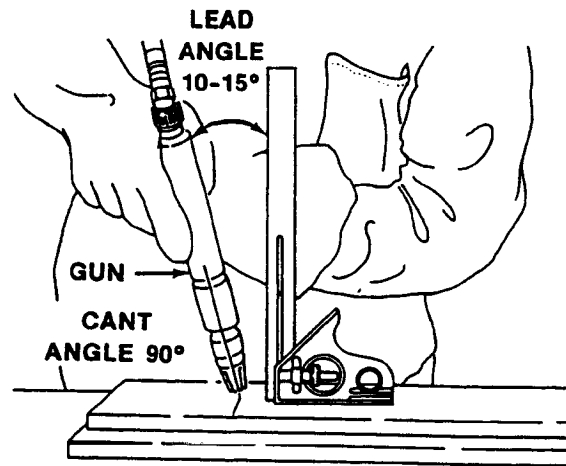
g. MIG WELDING METHOD.

- 1) MIG (Metal-Inert-Gas) 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 welding zone. No flux is needed.

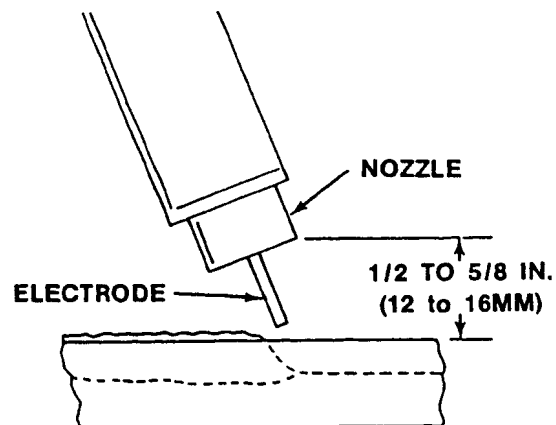
**PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING
LUBRICATION INSTRUCTIONS — Continued**

0014 00

- 2) Lead angle and cant angle. Place gun at a lead angle of 10 deg to 15 deg 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 deg. to parent metal so filler wire and arc are directed towards apex of groove. This will give equal fusion on both sides of material, even weld buildup, good gas coverage, and equal penetration.



- 3) 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:



- a) Oxide deposits in the weld bead.
 - b) Force gas bubbles into the weld.
 - c) Prevent cleaning action on the material in front of the weld pool.
- 4) Arc length. You will hear a smooth hissing or buzzing sound when the right arc length is struck.
 - 5) For further welding instructions, see TC 9-237.

3. FLUID LEAKS AND CHECKING FOR LEAKS.**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. Report Class III or fuel leaks to your supervisor, or notify unit maintenance for corrective action right away.

- a. **GENERAL.** Fluid leaks in hoses and fluid lines affect the carrier parts operation. The types and classes of leaks follow:
 - 1) **CLASS I.** Fluid seepage is not great enough to form drops, but is shown by wetness or color changes.
 - 2) **CLASS II.** Fluid leakage is great enough to form drops. Drops do not drip from the item being checked or inspected.
 - 3) **CLASS III.** Fluid leakage is great enough to form drops that fall from the item being checked or inspected.
- b. **CHECKING FOR LEAKS AFTER A 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:
 - 1) Do visual inspections to find the source of the leak.
 - a) Check for cracks on housing or cover.
 - b) Check that screws and any connections are not loose or overtight.
 - 2) If you cannot see the source of the leak, check the following items:
 - a) Check that preformed gasket is not bent or pinched.
 - b) Check machined surfaces for fit and cleanliness.
 - 3) If leak persists, notify supervisor.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

There are no preventive maintenance checks and services (PMCS) or lubrication procedures required for the M113A2 FOV Carriers at the direct support maintenance level. For crew level PMCS and lubrication procedures, see your -10. For unit level PMCS and lubrication procedures, see your -20.

CHAPTER 4

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR POWER PLANT

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
BLOCK POWER PLANT.....	0015 00
REMOVE/INSTALL TRANSMISSION.....	0016 00
REPLACE TRANSMISSION.....	0017 00
REPLACE TRANSFER GEARCASE PULLEY (M577A2 WITH 200 AMP GENERATOR ONLY).....	0018 00
REMOVE/INSTALL TRANSFER GEARCASE.....	0019 00
REPLACE TRANSFER GEARCASE.....	0020 00
REPLACE ENGINE.....	0021 00
REPAIR 100 AMP GENERATOR FUEL FILTER MOUNTING BRACKET.....	0022 00

BLOCK POWER PLANT

0015 00

THIS WORK PACKAGE COVERS:

Block Power Plant (page 0015 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

Lifting Sling (WP 0104 00, Item 40)
Lifting Device 2,500 lb (1,135 kg) Capacity

Materials/Parts

All blocks are made from surface dimensioned lumber.
Dimensions are in inches with metric equivalents.
Lumber 4 x 6 x 18 (10 x 15 x 46 cm) (5)
Lumber 4 x 6 x 10 (10 x 15 x 25 cm)
Lumber 2 x 4 x 18 (5 x 15 x 46 cm)
Lumber 2 x 4 x 10 (5 x 10 x 25 cm)
Lumber 1 x 4 x 10 (3 x 10 x 25 cm)
Wiping rag (WP 0105 00, Item 28)

Personnel Required

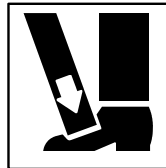
Track Vehicle Repairer 63H10
Helper (H)

Equipment Condition

Power plant removed from carrier (see your -20)

BLOCK POWER PLANT

WARNING

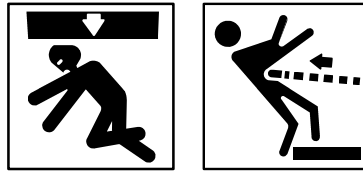


You could get hurt if power plant is not blocked to prevent sudden movement of a component. Block power plant as shown before you attempt any disassembly.

WARNING



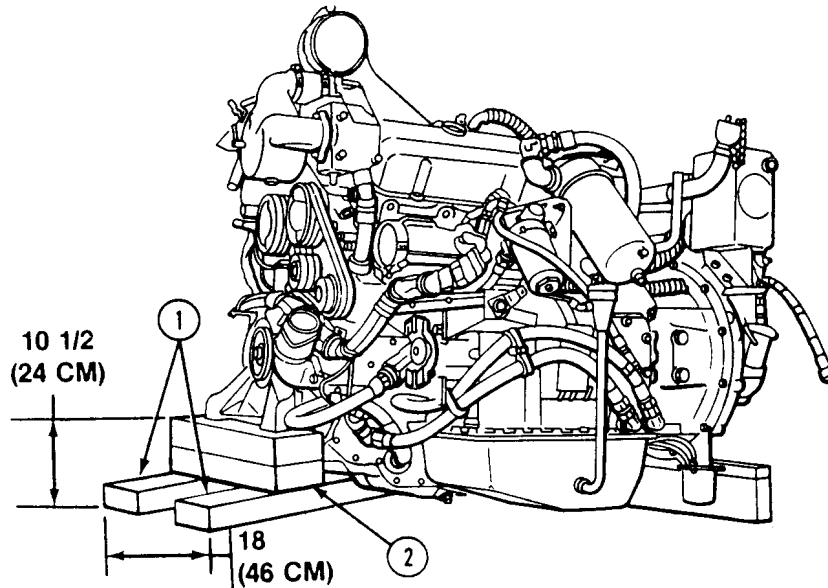
Hanging loads could kill or injure you. Keep away from hanging loads and overhead equipment. Keep hands out of engine compartment while power unit is being removed or installed.

WARNING

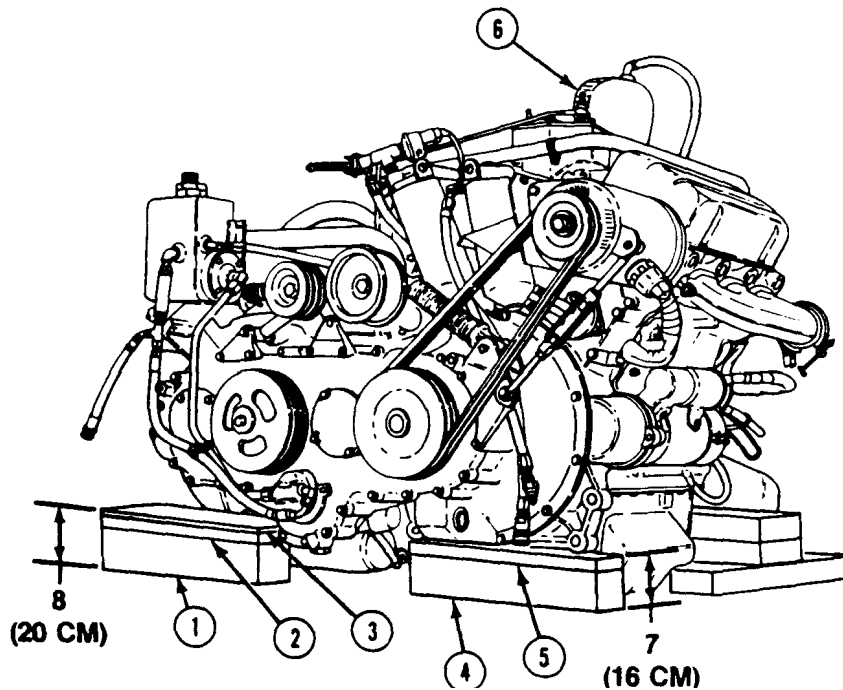
Damaged slings can fail when loaded. Breaking slings can strike and injure personnel. Suspended load can fall and crush personnel.

Inspect all slings before use. Do not use damaged slings. Clearly mark all damaged slings as DAMAGED - DO NOT USE.

1. Use a lifting device of at least 2,500 lb (1,135 kg) capacity and sling to lift power plant. Have helper (H) assist.
2. On level ground, place two 4 x 6 x 18 inch (10 x 15 x 46 cm) blocks (1) under front of engine. Place blocks parallel to each other with 6 inch side down. Blocks should be about 18 inches (46 cm) apart from outside edges.
3. Stack two 4 x 6 x 18 inch (10 x 15 x 46 cm) blocks (2) on top of each other. Place blocks (2) on top of blocks (1) at a 90 degree angle. Blocks will be about 10 1/2 inches (24 cm) high.



4. Stack a 4 x 6 x 10 inch (10 x 15 x 25 cm) block (1), a 2 x 4 x 10 inch (5 x 10 x 25 cm) block (2), and a 1 x 4 x 10 inch (3 x 10 x 25 cm) block (3) under transmission side of transfer gearcase. Blocks should be 8 inches (20 cm) high.
5. Stack a 4 x 6 x 18 inch (10 x 15 x 46 cm) block (4) and a 2 x 4 x 18 inch (5 x 10 x 46 cm) block (5) under rear of engine. Blocks should be about 7 inches (16 cm) high.
6. Lower power plant slowly down onto blocks. Check that power plant is firmly supported by the blocks.
7. Cover air inlet housing (6). Use wiping rag.



FOLLOW-THROUGH STEPS

1. Install power plant in carrier (see your -20).

END OF TASK

REMOVE/INSTALL TRANSMISSION

0016 00

THIS WORK PACKAGE COVERS:

Removal (page 0016 00-1).
 Installation (page 0016 00-9).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10
 Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)
 Torque Wrench (WP 0104 00, Item 55)
 Torque Wrench (WP 0104 00, Item 58)
 Transmission Hoisting Adapter (WP 0104 00, Item 1)
 Lifting Device 400 lb (182 kg) Capacity

References

See your -10

Equipment Condition

Power plant removed from carrier (see your -20)
 Power plant blocked (WP 0015 00)

Materials/Parts

Antiseize compound (WP 0105 00, Item 5)
 Sealing compound (WP 0105 00, Item 17)
 Sealing compound primer (WP 0105 00, Item 21)
 Container, 1 quart (1 liter)
 Key washer (5)
 Locknut (2)
 Locknut (8)
 Locknut

REMOVAL

NOTE

If you need to replace the engine, transmission, or transfer gearcase, drain the oil from each BEFORE power plant is removed from carrier.

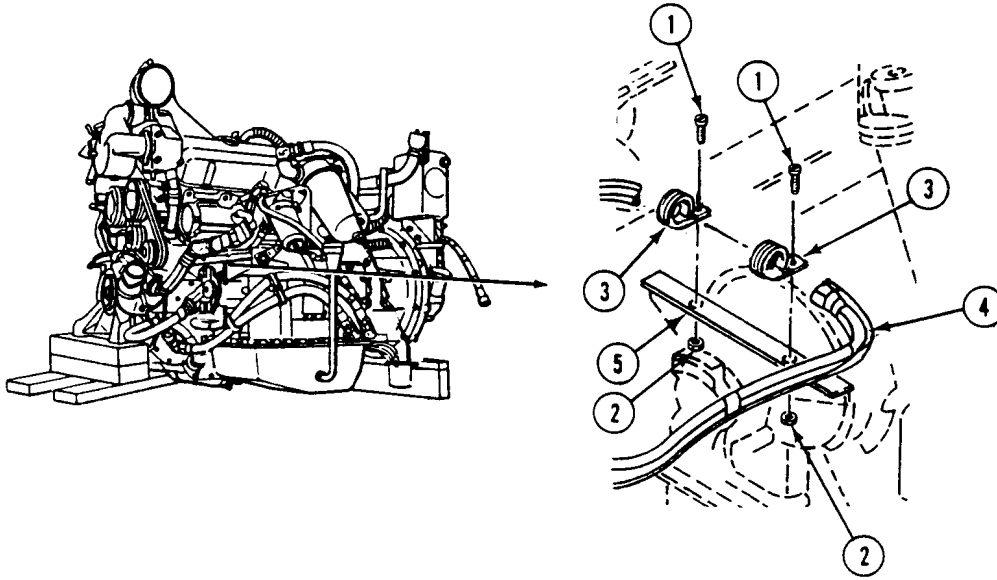
NOTE

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

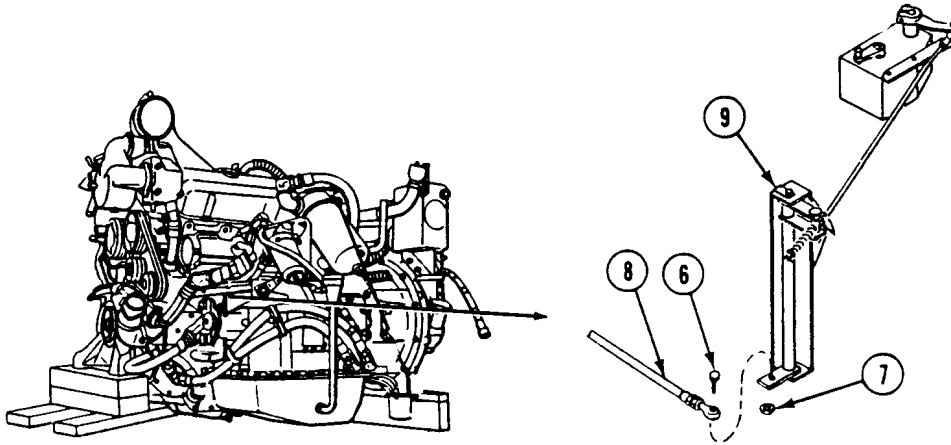
REMOVE/INSTALL TRANSMISSION — Continued

0016 00

1. Remove two screws (1), locknuts (2), clamps (3), and power plant wiring harness (4) from cross-shaft bracket (5). Discard locknuts.



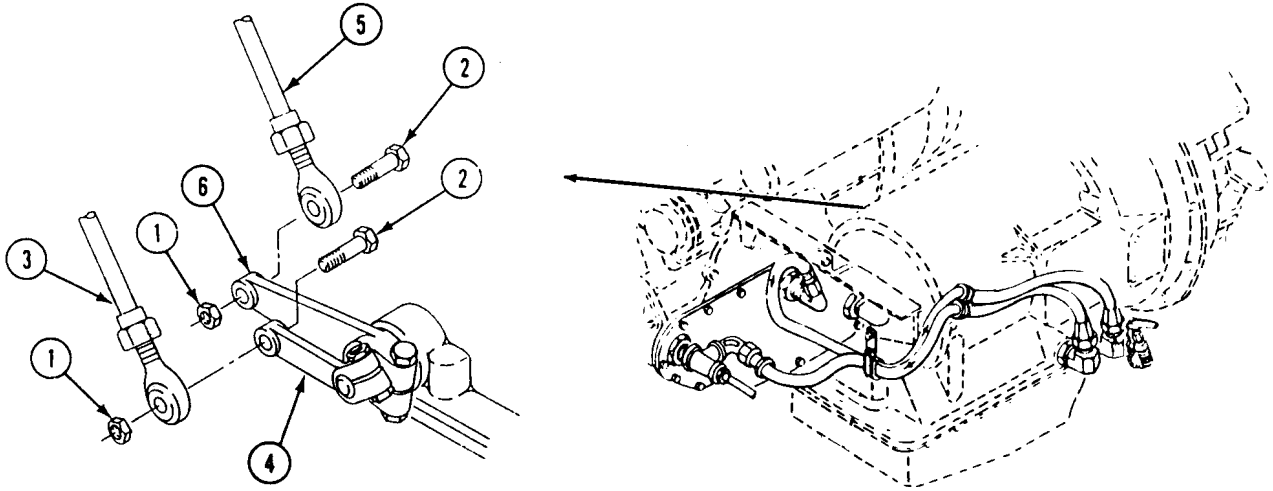
2. Remove screw (6), locknut (7) and governor lever (8) from bracket (9). Discard locknut.



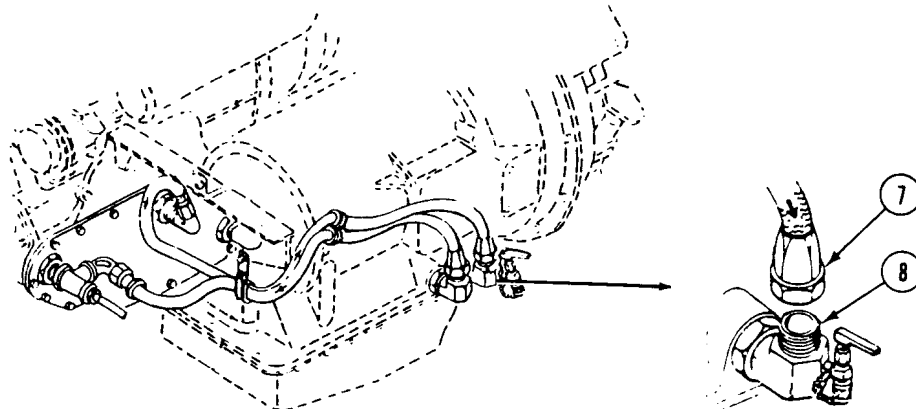
REMOVE/INSTALL TRANSMISSION — Continued

0016 00

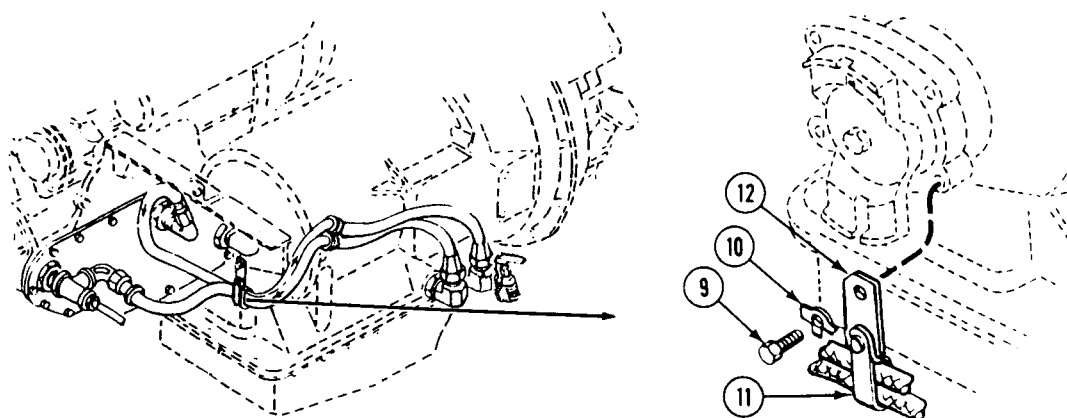
3. Remove two locknuts (1) and screws (2). Remove throttle valve link (3) from throttle valve arm (4). Remove range selector control link (5) from range selector control arm (6). Discard locknuts.



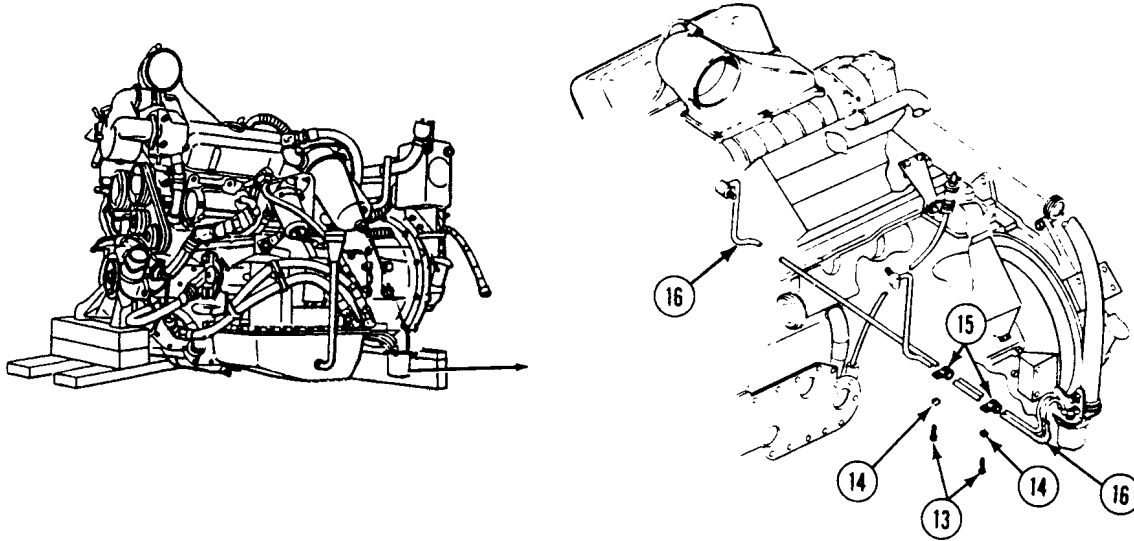
4. Remove two oil cooler hoses (7) from two elbows (8).



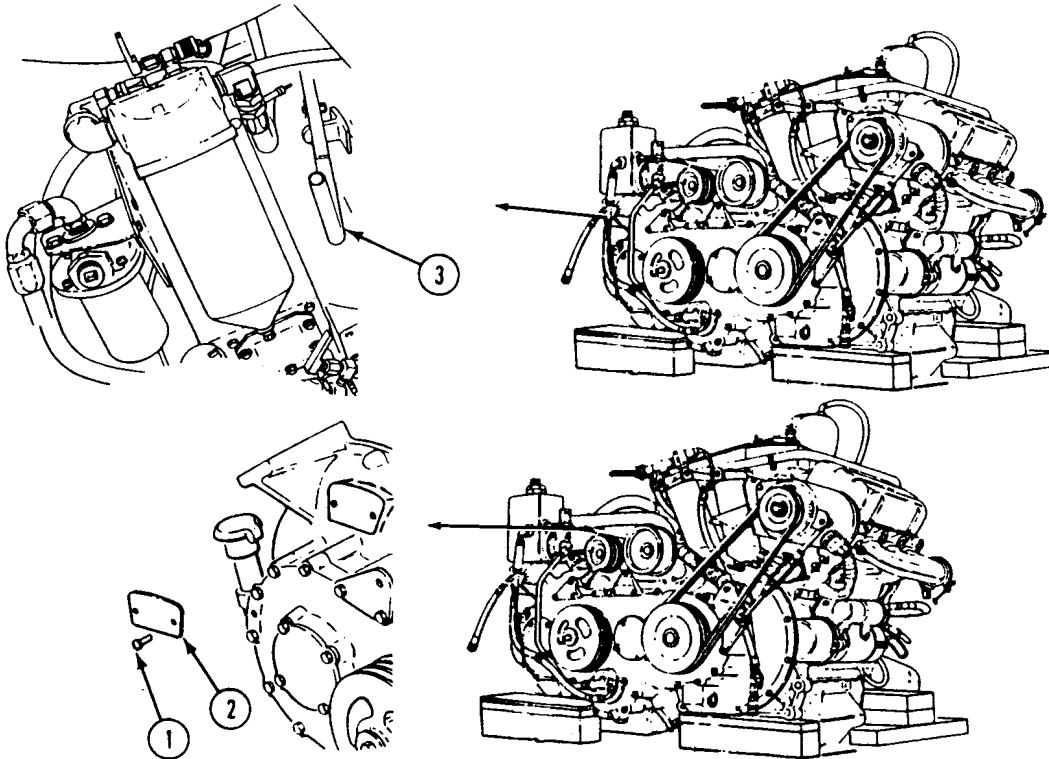
5. Remove screw (9), key washer (10), clamp (11) and bracket (12) from transmission. Discard key washer.



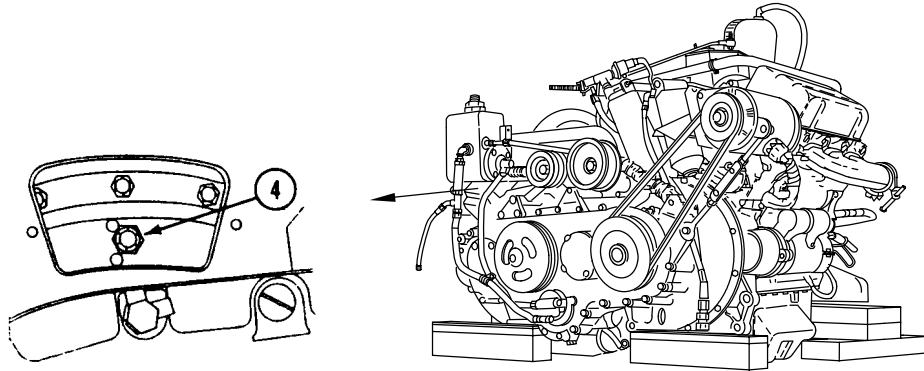
6. Remove two screws (13), two washers (14), and two clamps (15) that secure two air box drain hoses (16) to transmission.



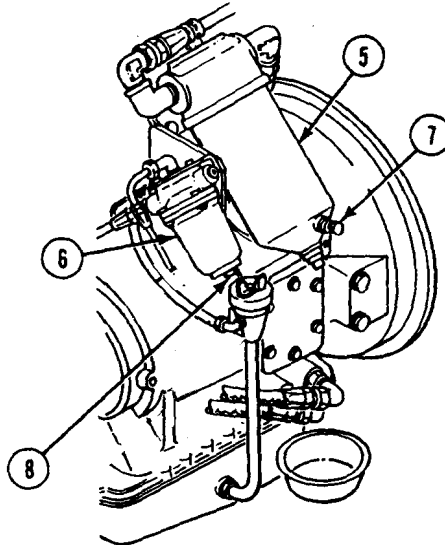
7. Remove two screws (1) and access cover (2) from transfer gearcase. Release engine disconnect lever (3).



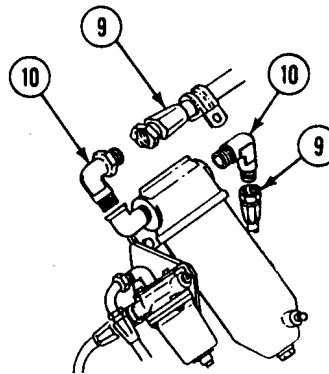
8. Turn transmission drive shaft and remove six locknuts (4) as they appear in the access opening. Discard locknuts.



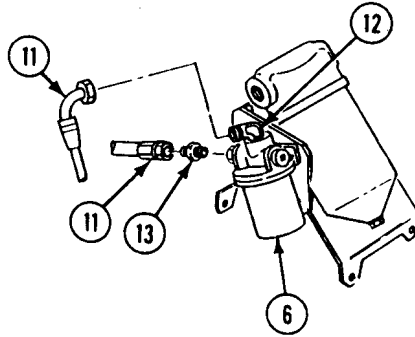
9. Place a 1 quart (1 liter) container under filter assemblies (5) and (6).
10. Remove drain plugs (7) and (8) from filter assemblies (5) and (6). Allow oil to drain.



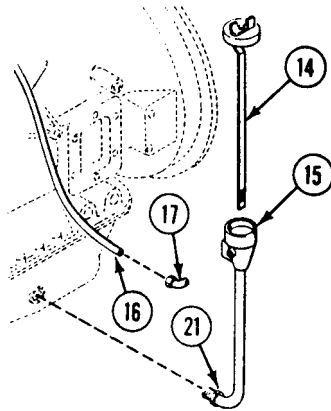
11. Disconnect two engine oil hoses (9) from two pipe-to-tube elbows (10) on engine oil filter (5).



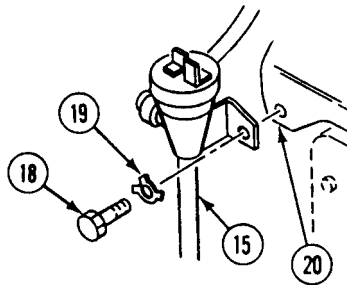
12. Disconnect two differential oil hoses (11) from two pipe-to-tube elbows (12) and adapter (13) on differential oil filter (6).



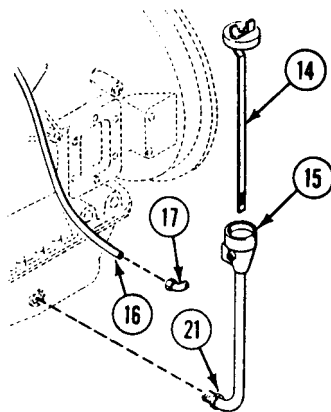
13. Remove dipstick (14) from filler tube (15).
 14. Disconnect vent tube (16) from elbow (17).



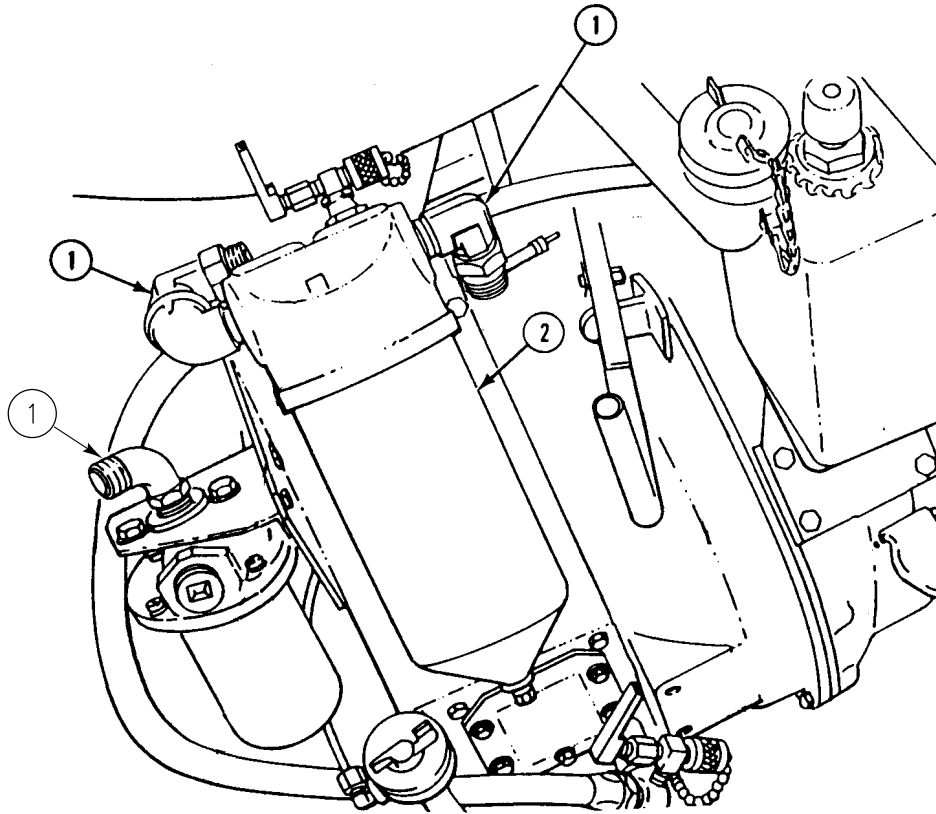
15. Remove screw (18), key washer (19), and filler tube (15) from filter bracket (20). Discard key washer.



16. Loosen filler neck tube nut (21). Remove filler tube (15) from transmission.



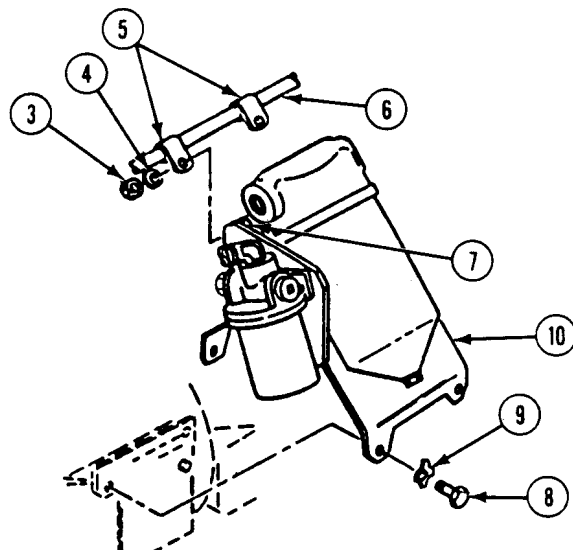
17. Remove three elbows (1) from engine oil filter (2).



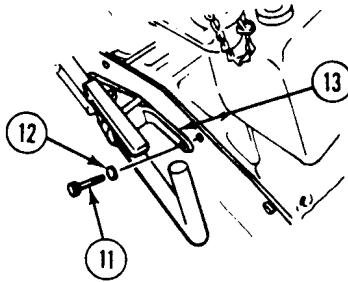
NOTE

Be careful not to damage or lose washers. You will need them for assembly.

18. Remove two nuts (3), washers (4), clamps (5) and engine oil hose (6) from two filter mounting screws (7). Replace nuts and washers back on mounting screws.
19. Remove three screws (8), key washers (9) and filter bracket (10) with filters from transmission. Discard key washers.



20. Remove two screws (11), washers (12), and engine disconnect handle bracket (13) from transmission.



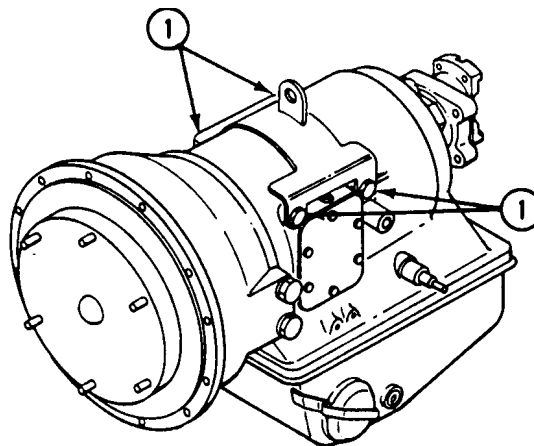
21. Use four filter bracket mounting screws (1) to secure transmission hoisting adapter to transmission.

WARNING



Hanging loads can kill or injure you. Keep away from hanging loads and overhead equipment. Keep hands away from pinch points. Transmission is heavy. Have helper (H) assist. Use a lifting device.

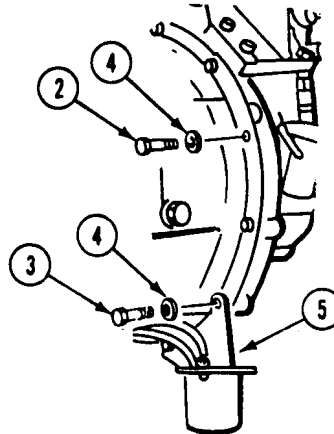
22. Attach a lifting device of at least 400 lb (182 kg) capacity to transmission hoisting adapter. Have helper (H) assist.



NOTE

Screws are different sizes. Tag or mark screws for different sizes when removing. Each screw has to be installed in the same place as it was removed.

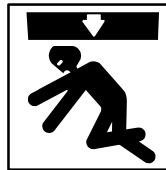
23. Remove ten short screws (2), two long screws (3), and washers (4). Detach transmission and air box drain can bracket (5) from transfer gearcase. Have helper assist.



INSTALLATION

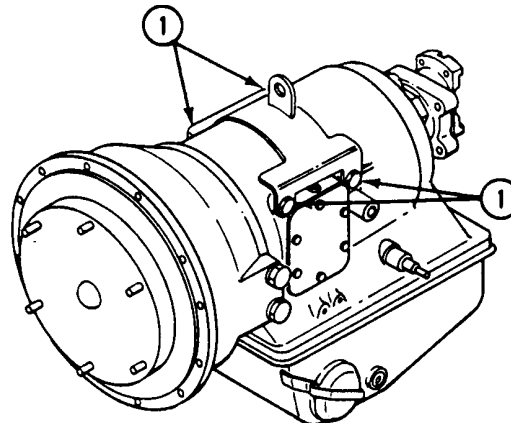
1. Use four filter bracket mounting screws (1) to secure transmission hoisting adapter to transmission.

WARNING



Hanging loads can kill or injure you. Keep away from hanging loads and overhead equipment. Keep hands away from pinch points. Transmission is heavy. Have helper (H) assist. Use a lifting device.

2. Attach a lifting device of at least 400 lb (182 kg) capacity to transmission hoisting adapter. Have helper assist.

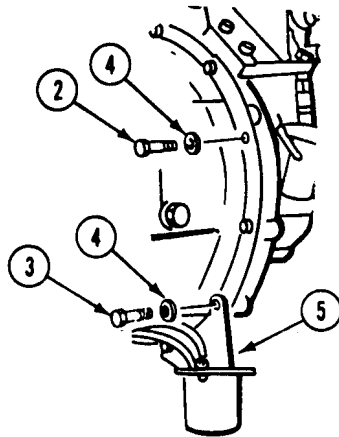


3. Position transmission on transfer gearcase. Turn transmission drive-shaft until transmission torque converter studs align with transfer gearcase drive plate holes. Have helper assist.
4. Apply a thin coat of antiseize compound to cleaned threads of 12 screws (2) and (3).

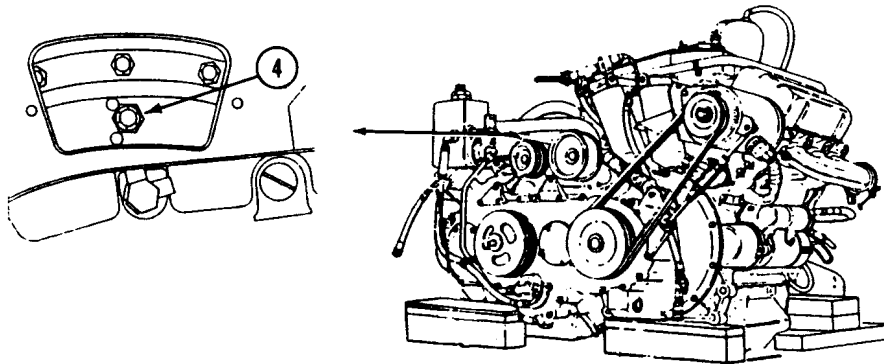
NOTE

Screws are different sizes. Each screw must be installed in the same place as it was removed.

5. Align transmission and air box drain can bracket (5) with transfer gearcase. Secure with ten short screws (2), two long screws (3), and washers (4). Have helper (H) assist. **TIGHTEN EACH SCREW TO 252-300 LB-IN (28-34 N·M) TORQUE.** Use torque wrench. **LOOSEN AND RETIGHTEN TO 252-300 LB-IN (28-34 N·M) TORQUE.** Use torque wrench.



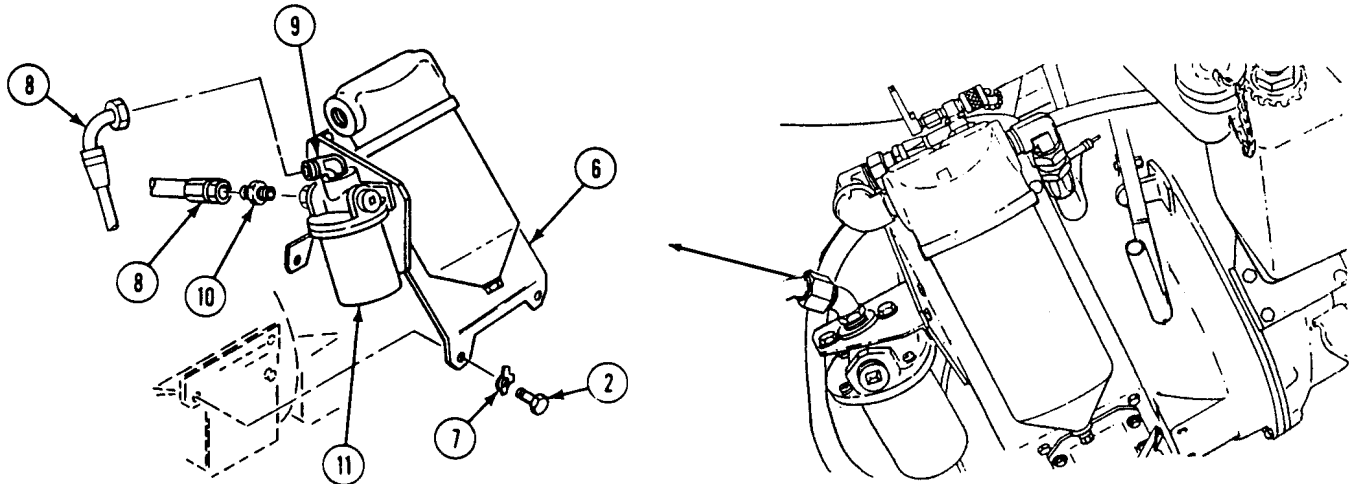
6. Secure converter studs to drive plate with six new locknuts (4). **TIGHTEN NUTS TO 37-40 LB-FT (50-54 N·M) TORQUE.** Use torque wrench.



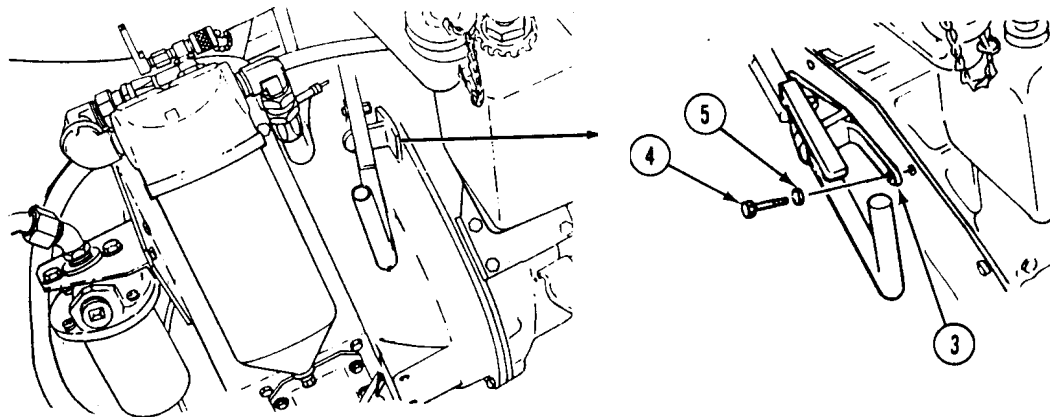
REMOVE/INSTALL TRANSMISSION — Continued

0016 00

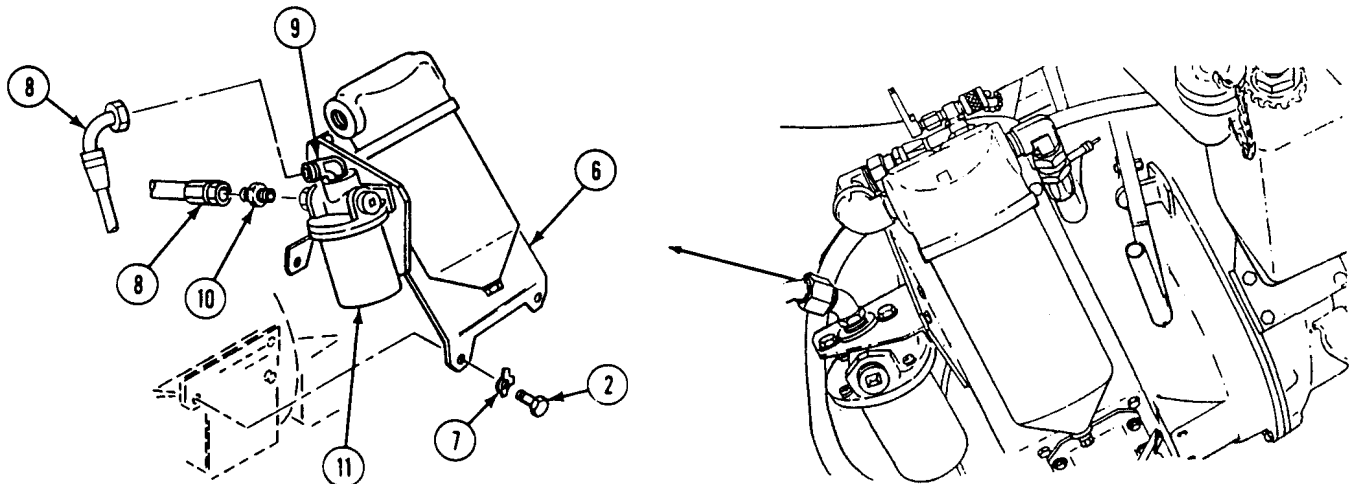
7. Remove four filter bracket mounting screws (2) and transmission hoisting adapter from transmission.



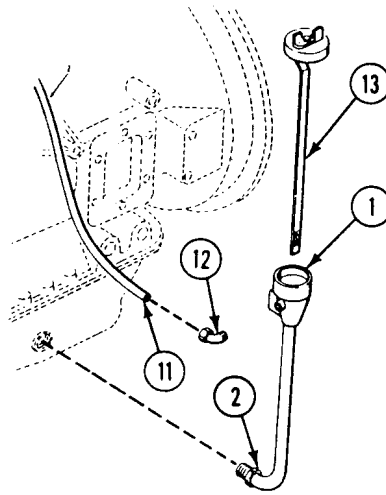
8. Install engine quick disconnect handle bracket (3) on transmission. Secure with two screws (4) and washers (5).



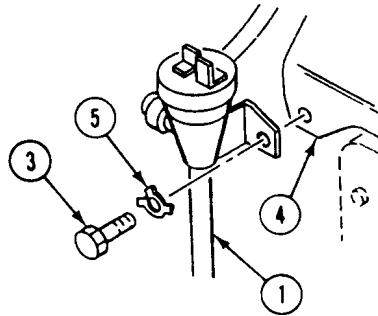
9. Apply a thin coat of antiseize compound to cleaned threads of three screws (2).
 10. Install filter bracket (6) with filters on transmission. Secure with three new key washers (7) and screws (2).
 11. Connect two differential oil hoses (8) to pipe-to-tube elbow (9) and adapter (10) on differential oil filter (11).



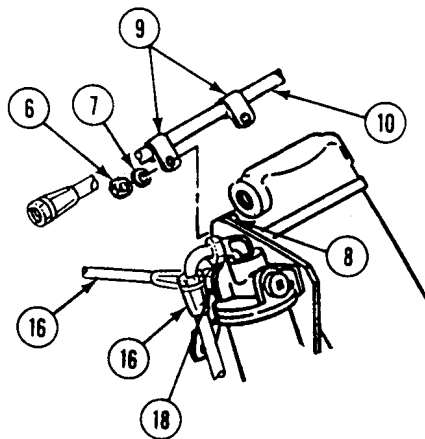
12. Install filler tube (1) in transmission. Secure with nut (2).



13. Apply a thin coat of antiseize compound to cleaned threads of screw (3).
 14. Secure filler tube (1) to filter bracket (4) with screw (3) and new key washer (5).

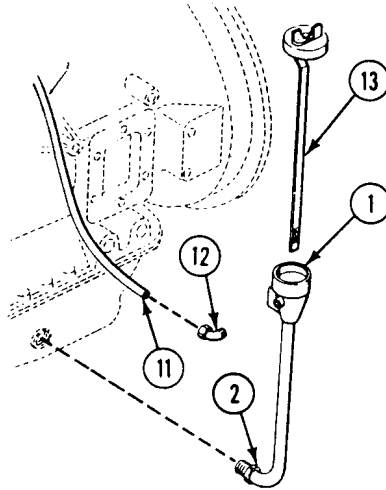


15. Before installation, remove nuts (6) and washers (7) that were left on filter bracket mounting screws (8).
 16. Install two clamps (9) and engine oil hose (10) on filter bracket mounting screws (8). Secure with two washers (7) and nuts (6).

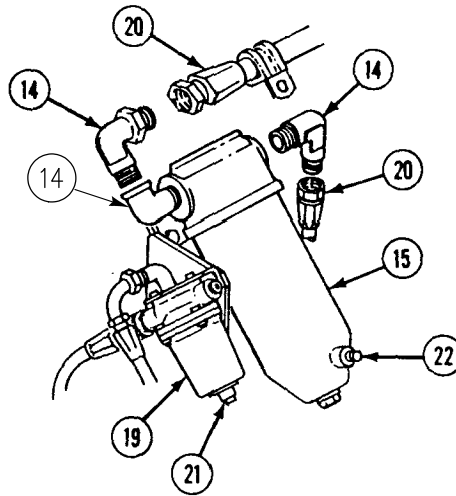


17. Connect vent tube (11) to elbow (12) on filler tube (1).

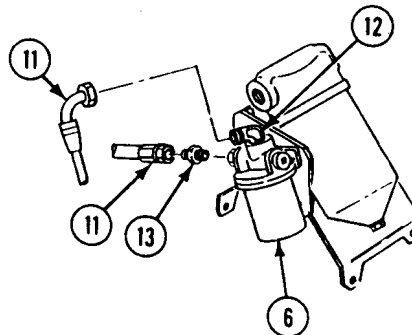
18. Install dipstick (13) in filler tube (1).



19. Install three elbows (14) on engine oil filter (15).

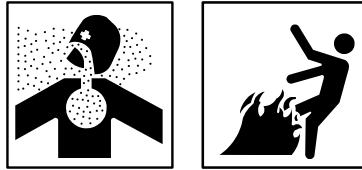


20. Connect two differential hoses (11) to elbows (12) and adapter (13) on differential oil filter (6).



21. Connect two engine oil hoses (20) on elbows (14) on engine oil filter (15).

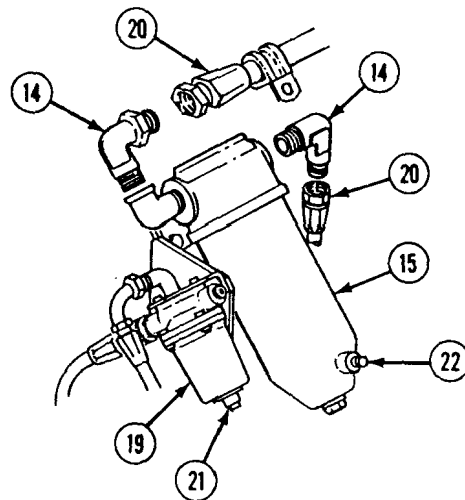
WARNING



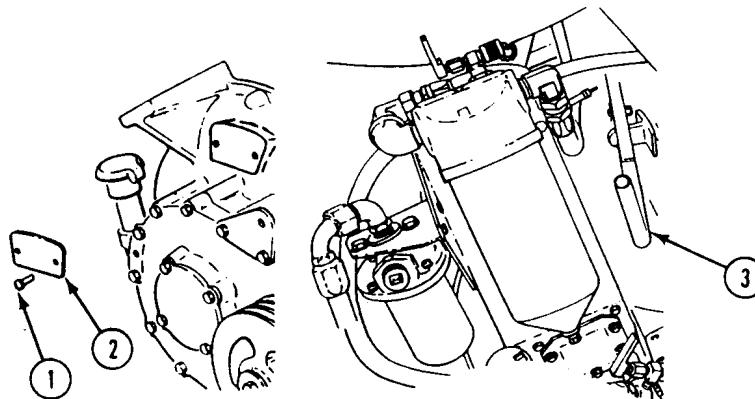
Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

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.

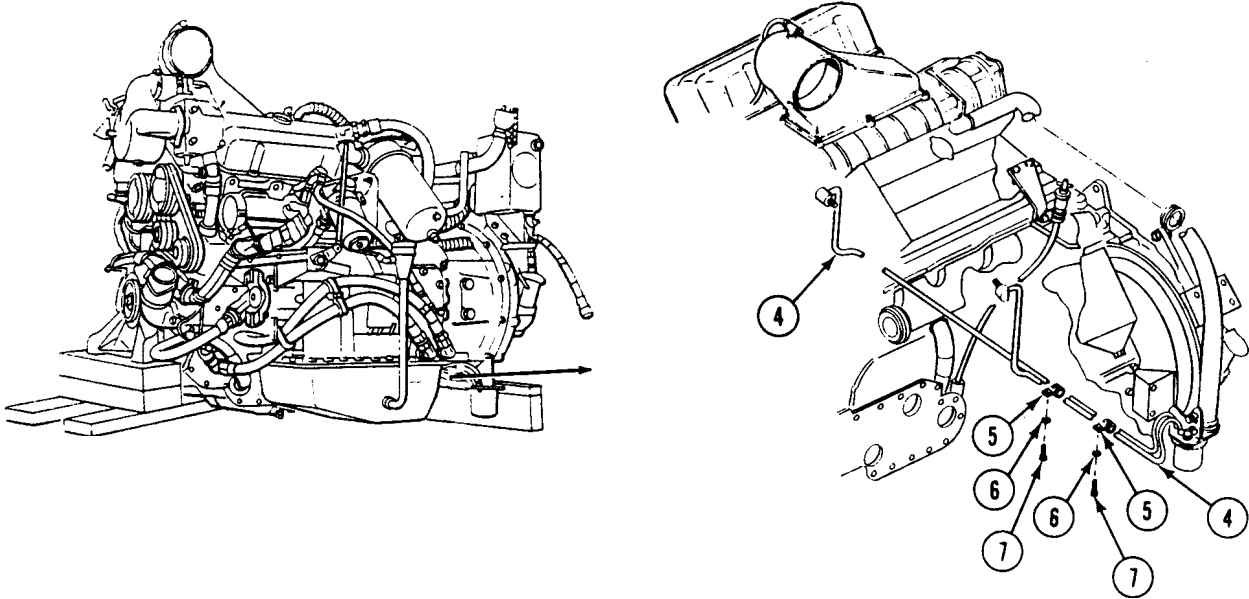
22. Apply a thin, even coat of primer and then sealing compound to cleaned external threads of drain plugs (21) and (22). Do not apply primer or sealing compound beyond small end of threads.
23. Install drain plugs (21) and (22) in filter assemblies (15) and (19).



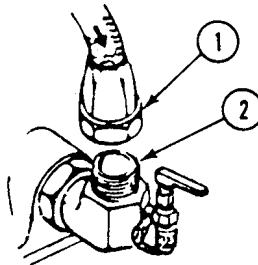
24. Secure access cover (2) to transfer gearcase with two screws (1). Engage engine quick disconnect lever (3).



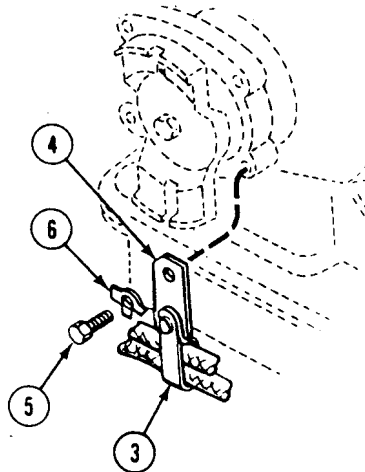
25. Install two air box drain hoses (4) on transmission. Secure with two clamps (5), two washers (6), and two screws (7).
TIGHTEN SCREWS TO 180-216 LB-IN (20-24 N·M) TORQUE. Use torque wrench.



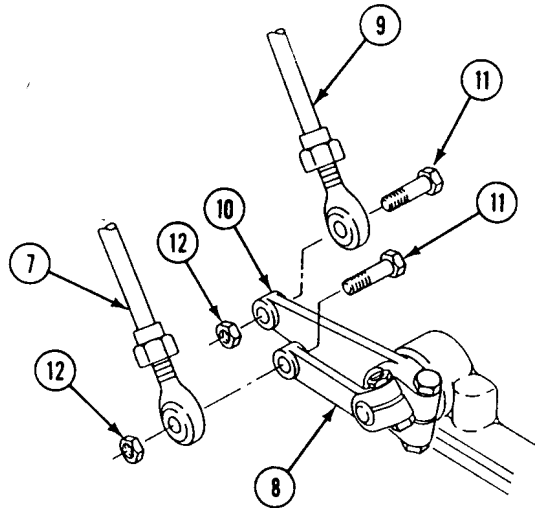
26. Connect two oil cooler hoses (1) to two elbows (2).



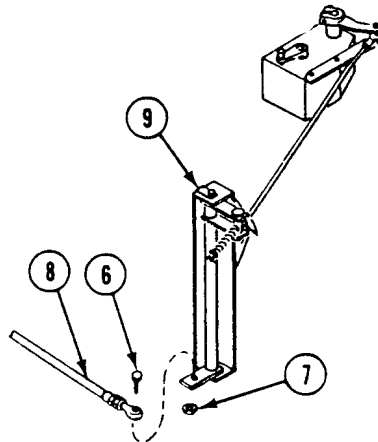
27. Install clamp (3) and bracket (4) on transmission. Secure with screw (5) and new key washer (6).



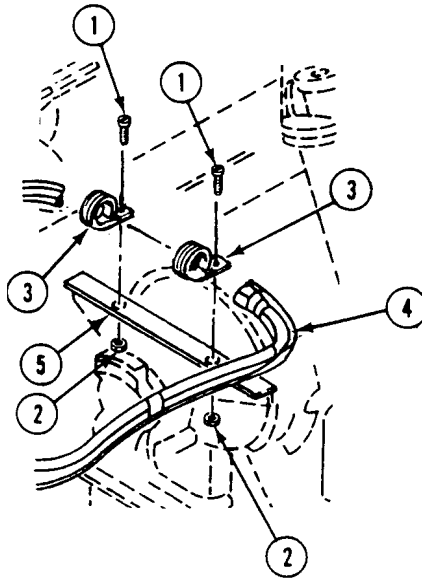
28. Install throttle valve link (7) on throttle valve arm (8). Install range selector control link (9) on range selector control arm (10). Secure with two screws (11) and new locknuts (12).



29. Secure governor lever (8) to bracket (9) with screw (6) and new locknut (7).



30. Install power plant wiring harness (4) in clamps (3) on cross-shaft bracket (5). Secure with two screws (1) and new locknuts (2).



31. Fill transmission (see your -10).
32. Check engine oil level (see your -10).

FOLLOW-THROUGH STEPS

1. Install power plant in carrier (see your -20).
2. Adjust engine power disconnect (see your -20).

END OF TASK

REPLACE TRANSMISSION

0017 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0017 00-1).
 Assembly (page 0017 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)
 Transmission Hoisting Adapter (WP 0104 00, Item 1)

Equipment Condition

Transmission oil drained (see your -20)
 Power plant removed (see your -20)
 Power plant blocked (WP 0015 00)
 Transmission removed from transfer gearcase
 (WP 0016 00)

Materials/Parts

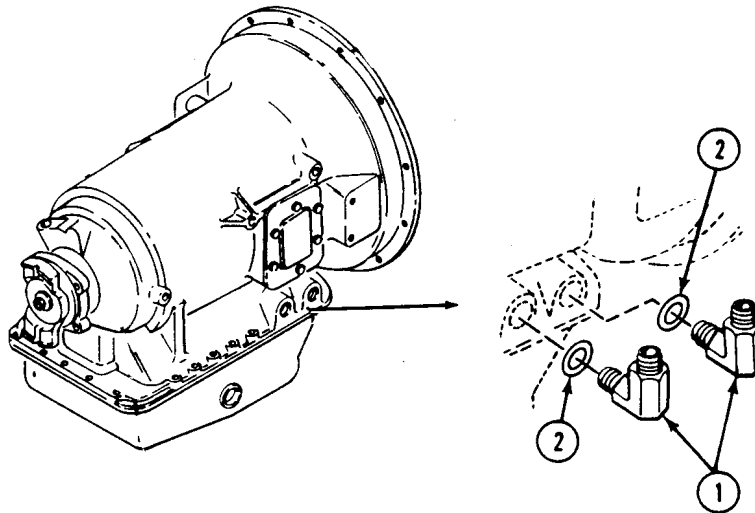
Antiseize compound (WP 0105 00, Item 5)
 Sealing compound (WP 0105 00, Item 17)
 Sealing compound primer (WP 0105 00, Item 21)
 Key washer (2)
 Locknut
 Packing (2)

DISASSEMBLY

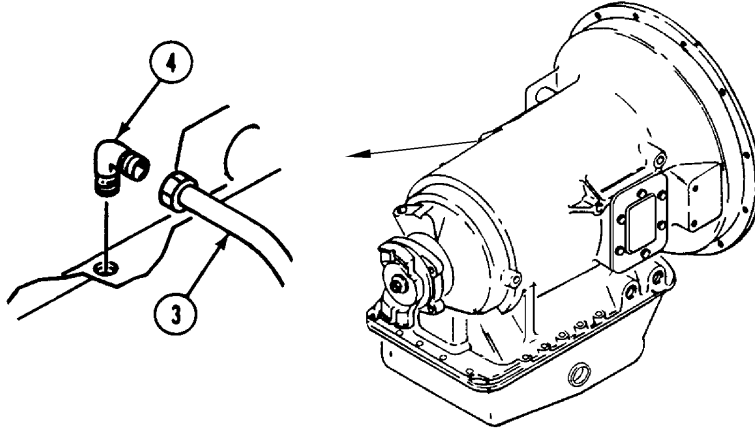
CAUTION

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

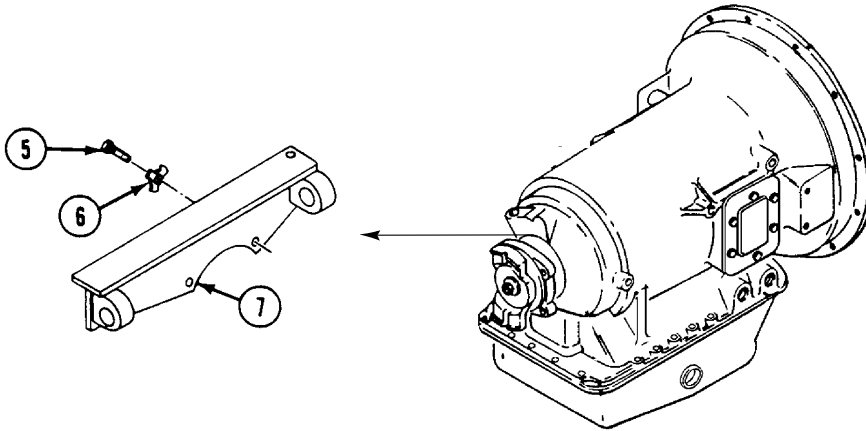
1. Remove two elbows (1) and packings (2) from transmission. Discard packings.



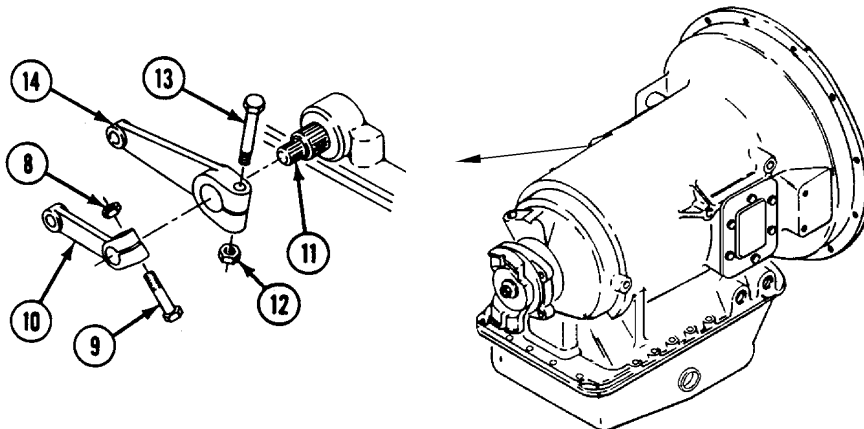
2. Disconnect vent tube (3) from vent tube elbow (4).
3. Remove vent tube elbow (4) from transmission.



4. Remove two screws (5), key washers (6), and cross-shaft bracket (7) from transmission. Discard key washers.

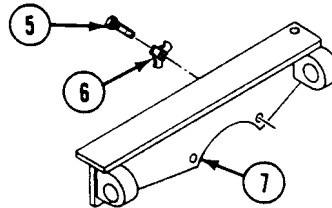
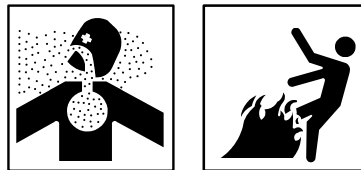


5. Remove locknut (8), screw (9), and throttle valve arm (10) from transmission shaft (11). Discard locknut.
6. Remove nut (12), screw (13), and range selector arm (14) from transmission shaft (11).



ASSEMBLY

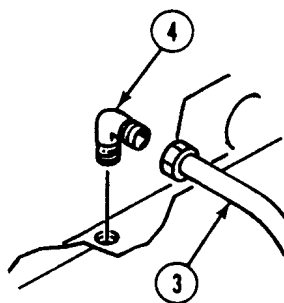
1. Apply a thin coat of antiseize compound to cleaned threads of two screws (5).
2. Install cross-shaft bracket (7) on transmission. Secure with two screws (5) and new key washers (6).

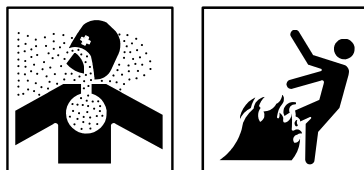
**WARNING**

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.

3. Apply a thin, even coat of primer and then sealing compound to cleaned external threads of vent tube elbow (4). Do not apply primer or sealing compound beyond small end of threads.
4. Install vent tube elbow (4) in transmission.
5. Connect vent tube (3) to vent tube elbow (4).

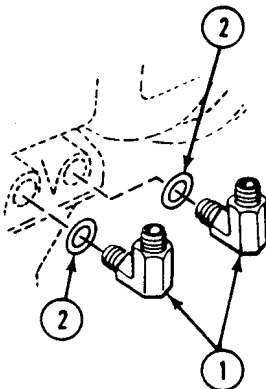


WARNING

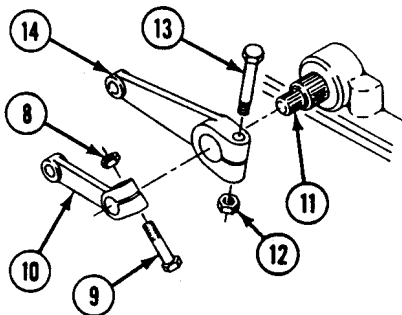
Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

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.

6. Apply a thin, even coat of primer and then sealing compound to cleaned external threads of elbows (1). Do not apply primer or sealing compound beyond small end of threads.
7. Install two new packings (2) and elbows (1) in transmission.



8. Position range selector arm (14) on transmission shaft (11) with offset side of arm toward transmission and clamping screw hole aligned with flat on shaft. Secure with screw (13) and nut (12).
9. Position throttle valve arm (10) on transmission shaft (11) with offset side of arm away from transmission and clamping screw hole aligned with flat on shaft. Secure with screw (9) and new locknut (8).

**FOLLOW-THROUGH STEPS**

1. Install transmission on transfer gearcase (WP 0016 00).
2. Install power plant in carrier (see your -20).
3. Fill transmission (see your -10).

END OF TASK

REPLACE TRANSFER GEARCASE PULLEY (M577A2 WITH 200 AMP GENERATOR ONLY)

0018 00

THIS WORK PACKAGE COVERS:

- Removal (page 0018 00-1).
- Installation (page 0018 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0104 00, Item 19)
- Retaining Ring Pliers (WP 0104 00, Item 29)
- Snap Ring Pliers (WP 0104 00, Item 30)
- Torque Wrench (WP 0104 00, Item 58)

Materials/Parts

- Key washer (4)
- Preformed packing
- Seal

Personnel Required

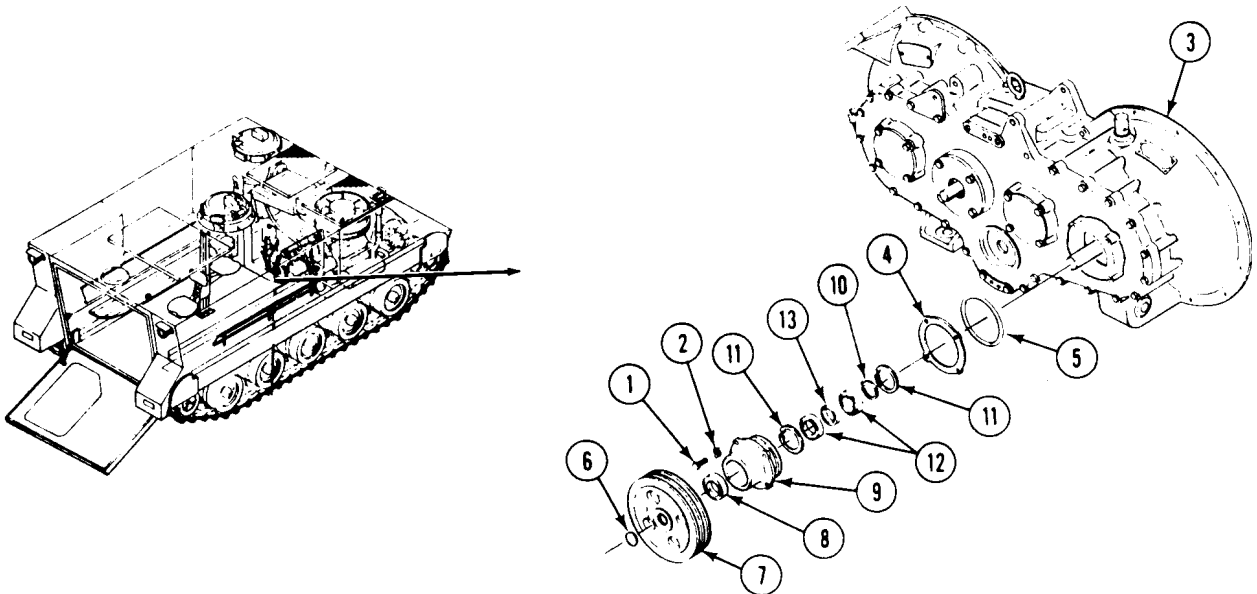
Track Vehicle Repairer 63H10

Equipment Condition

Generator drive belt removed (see your -20)

REMOVAL

1. Remove four cap screws (1) and key washers (2) from drive pulley assembly and transfer gearcase (3). Separate drive pulley assembly from transfer gearcase. Discard key washers.
2. Remove shim (4) and preformed packing (5) from transfer gearcase (3). Discard preformed packing packing.
3. Remove plug (6), drive pulley (7), and seal (8) from drive bearing plate (9). Discard seal.
4. Remove snap ring (10), two retaining rings (11), bearings (12), and spacer (13) from drive bearing plate (9).



REPLACE TRANSFER GEARCASE PULLEY (M577A2 WITH 200 AMP GENERATOR ONLY) — Continued

0018 00

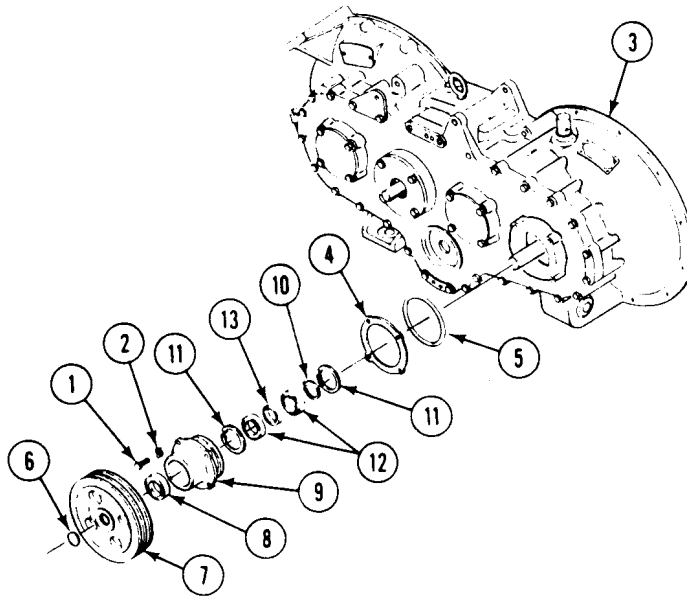
INSTALLATION

1. Install new seal (8) on drive bearing plate (9).
2. Install snap ring (10), two retaining rings (11), two bearings (12), and spacer (13) on drive bearing plate (9). Use retaining ring pliers and snap ring pliers.
3. Install plug (6) and drive pulley (7) on drive bearing plate (9).

CAUTION

Align oil hole in housing with oil hole in case.

4. Install new preformed packing (5) and shim (4) in transfer gearcase (3).
5. Align drive pulley assembly on transfer gearcase (3). Secure with four new key washers (2) and cap screws (1). **TIGHTEN SCREWS TO 252-300 LB-IN (28-33 N·M) TORQUE.** Use torque wrench.

**FOLLOW-THROUGH STEPS**

1. Install generator drive belt (see your -20).

END OF TASK

REMOVE/INSTALL TRANSFER GEARCASE

0019 00

THIS WORK PACKAGE COVERS:

Removal (page 0019 00-1).
Installation (page 0019 00-6).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10
Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)
Torque Wrench (WP 0104 00, Item 58)
Lifting Device 200 lb (91 kg) Capacity

References

See your -20

Materials/Parts

Antiseize compound (WP 0105 00, Item 5)
Cotter pin
Key washer (5)
Packing (3)

Equipment Condition

Power plant removed (see your -20)
Power plant blocked (WP 0015 00)
Transmission removed from transfer gearcase (WP 0016 00)

REMOVAL

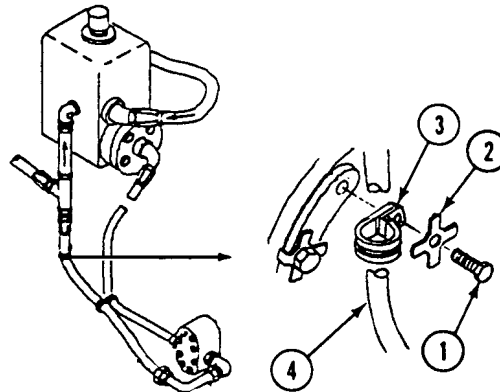
CAUTION

Cap or cover openings where fuel oil, coolant, or hydraulic lines or fittings have been removed.

NOTE

If you need to replace the engine, transmission, or transfer gearcase, drain the oil from each BEFORE power plant is removed from carrier.

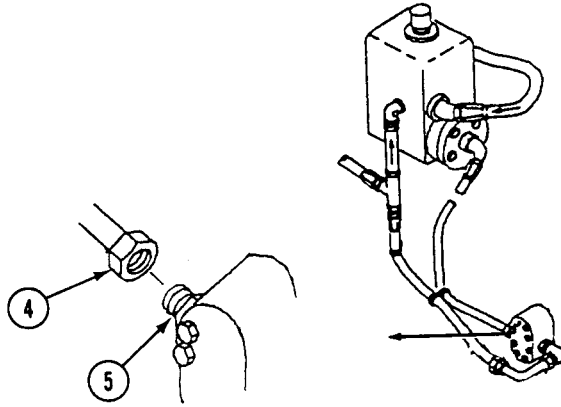
1. Drain hydraulic system (see your -20).
2. Remove screw (1), key washer (2), and clamp (3) that secure hydraulic hose (4) to transfer gearcase. Discard key washer.



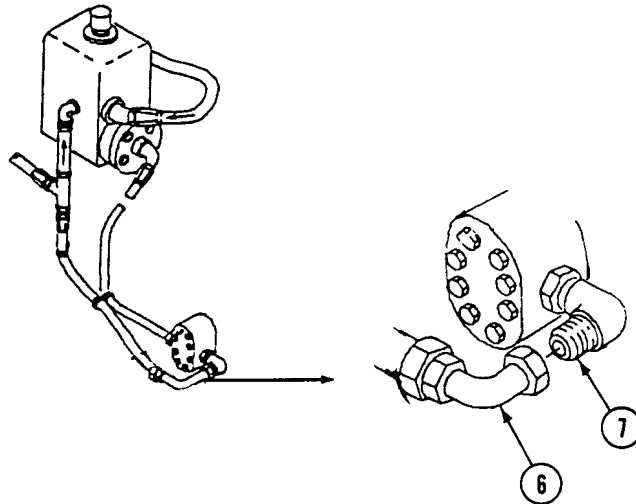
REMOVE/INSTALL TRANSFER GEARCASE — Continued

0019 00

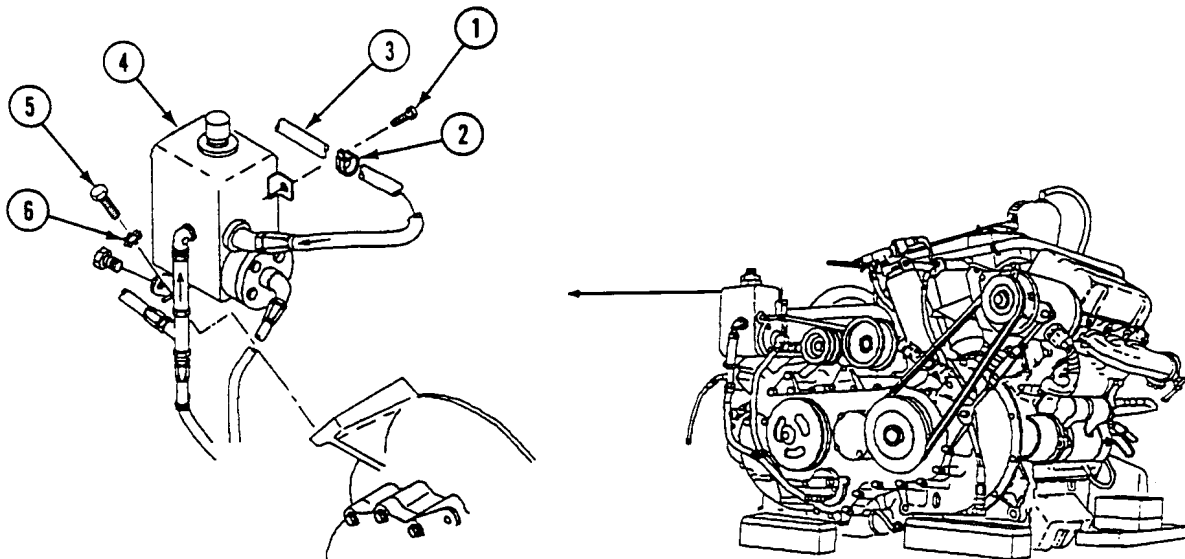
3. Disconnect hydraulic hose (4) from pump adapter (5).



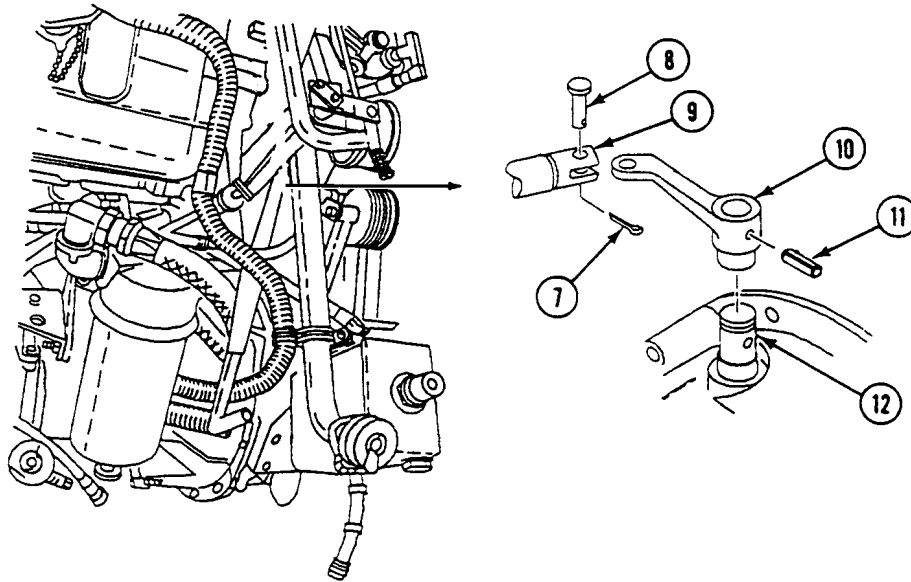
4. Disconnect hydraulic hose (6) from pump elbow (7).



5. Remove screw (1) that secures clamp (2) and oil filler tube (3) to hydraulic tank (4).
6. Remove four screws (5), key washers (6), and hydraulic tank (4) from transfer gearcase. Discard key washers.



7. Remove cotter pin (7) and headed pin (8) that secure engine quick disconnect/connect handle (9) to disconnect arm (10). Discard cotter pin.
8. Remove headless pin (11) securing disconnect arm (10) to shaft (12) on transfer gearcase. Remove arm.

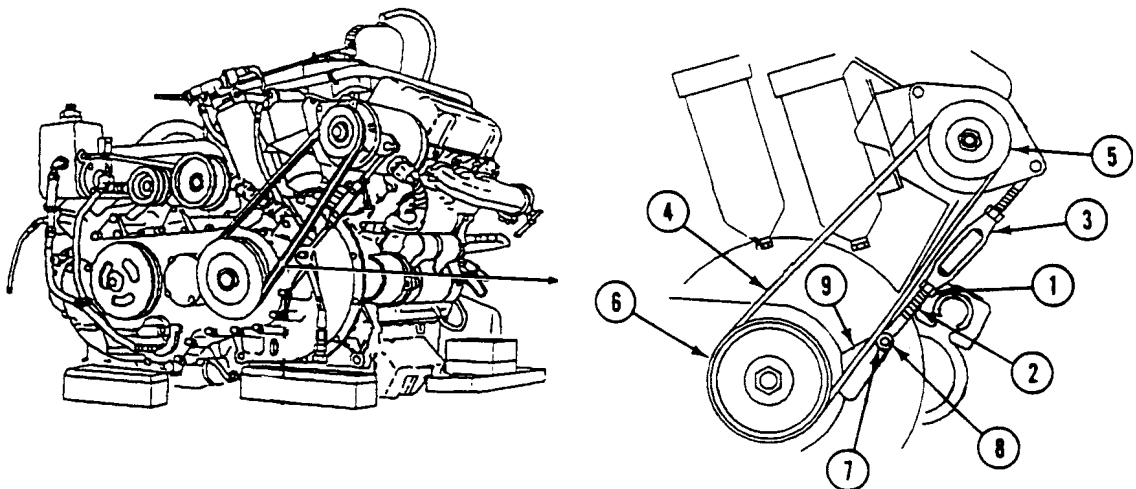


9. Loosen locknut (1) on rod end (2).
10. Turn turnbuckle (3) to the left to loosen two generator drive belts (4).

NOTE

There can be different generator components on transfer gearcase. Refer to TM 9-2350-261-20 for 200 amp generator maintenance components.

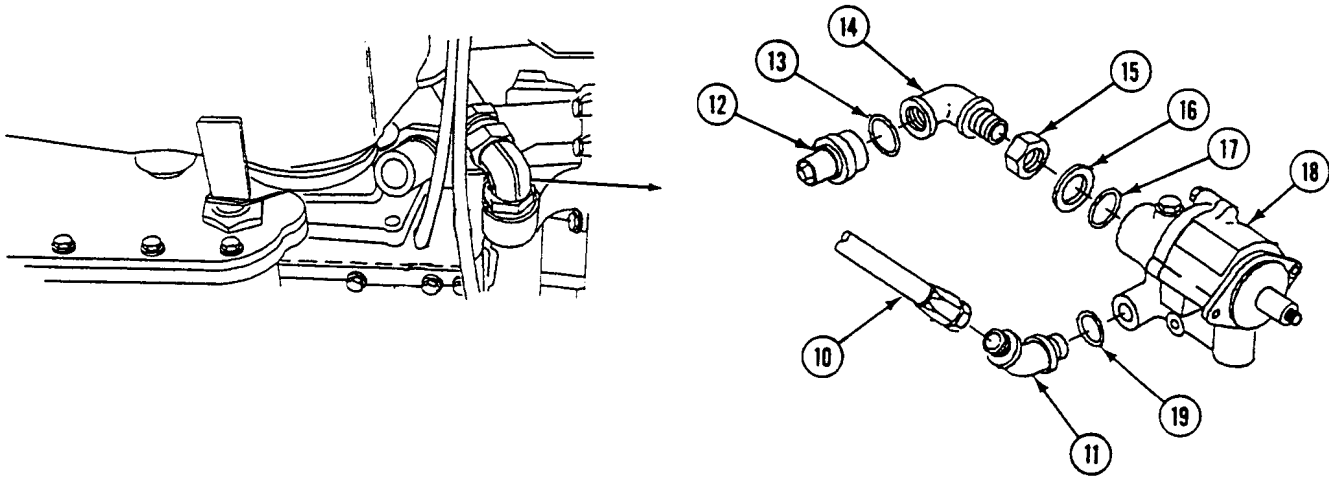
11. Remove two generator drive belts (4) from generator pulley (5) and transfer gearcase pulley (6).
12. Remove nut (7), screw (8), and turnbuckle (3) from idler arm bracket (9).



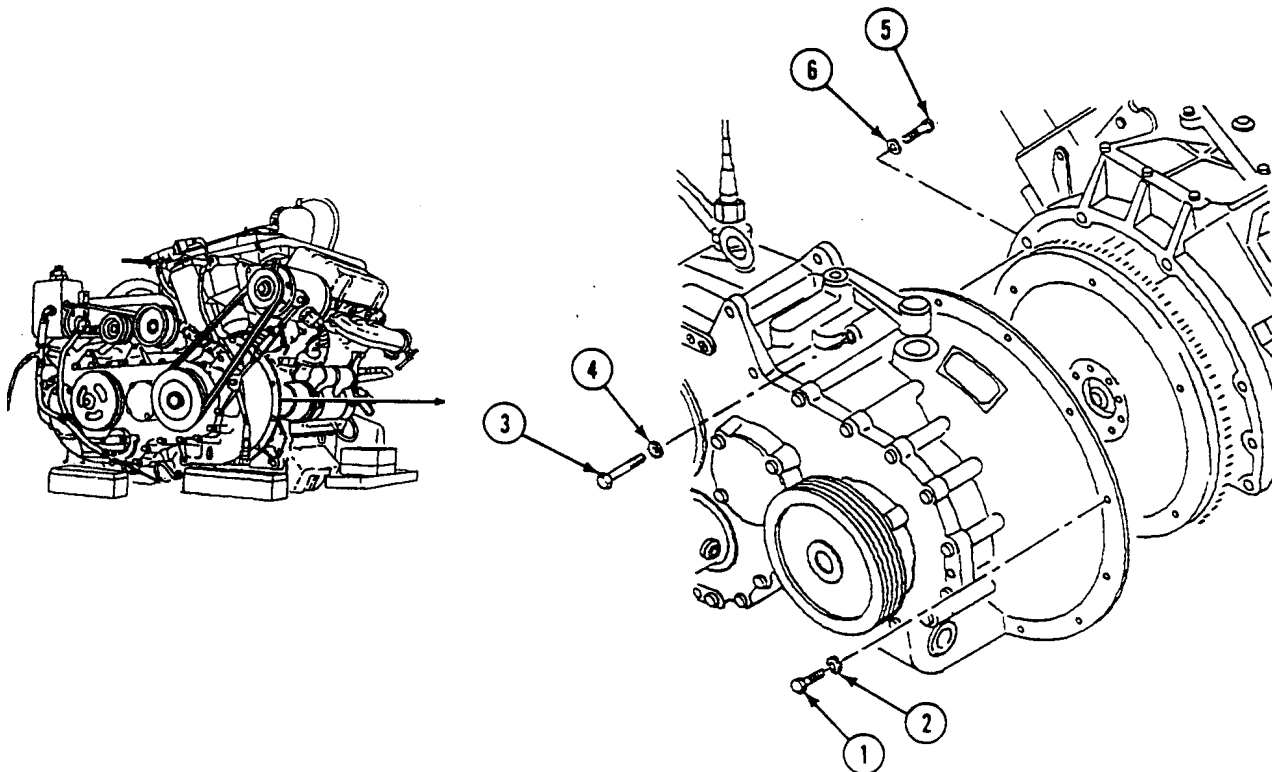
NOTE

If pump is to be replaced, follow Steps 13 - 16.

13. Drain transfer gearcase (see your -20).
14. Disconnect differential oil hose (10) from elbow (11).
15. Remove quick disconnect half (12) and packing (13) from elbow (14). Discard packing.
16. Remove nut (15), elbow (14), retainer (16), and packing (17) from differential oil pump (18). Discard packing.
17. Remove elbow (11) and packing (19) from differential oil pump (18). Discard packing.



18. Remove nine screws (1) and washers (2) from engine and transfer gearcase.
19. Remove one long screw (3) and washer (4).



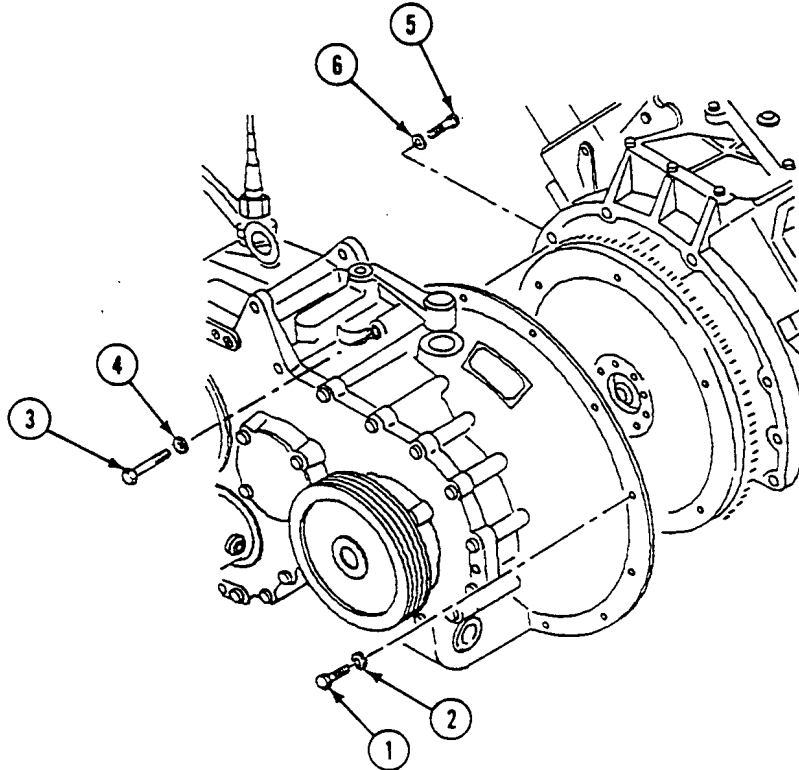
WARNING

Hanging loads could kill or injure you. Keep away from hanging loads and overhead equipment. Keep hands out of engine compartment while power unit is being removed or installed.

NOTE

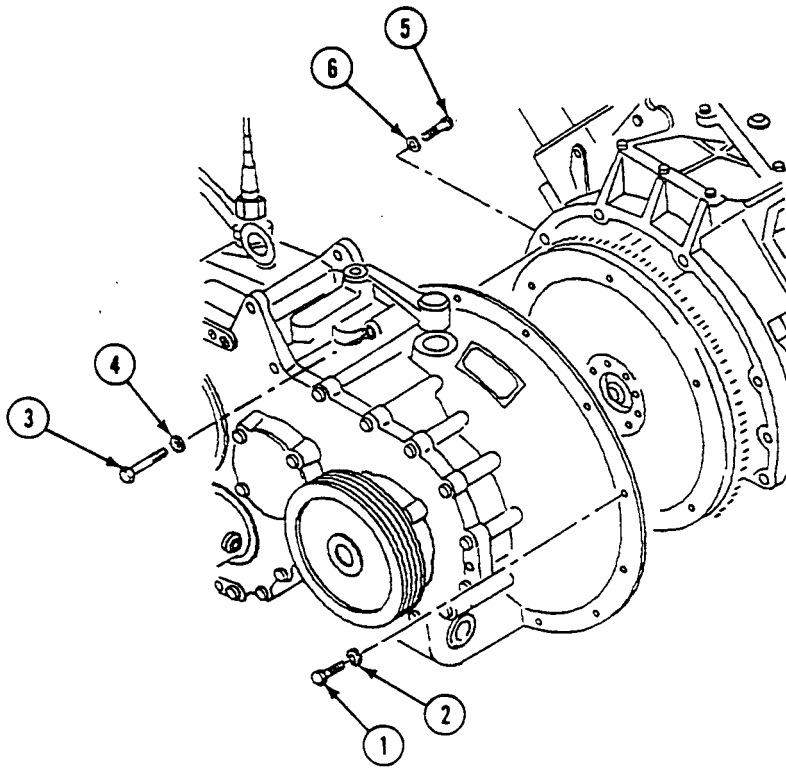
One screw and washer is trapped in engine bell housing.

20. Attach a lifting device of at least 200 lb (91 kg) capacity to the transfer gearcase. Have helper assist.
21. Remove two screws (5) and washers (6). Detach transfer gearcase from engine. Have helper assist.



INSTALLATION

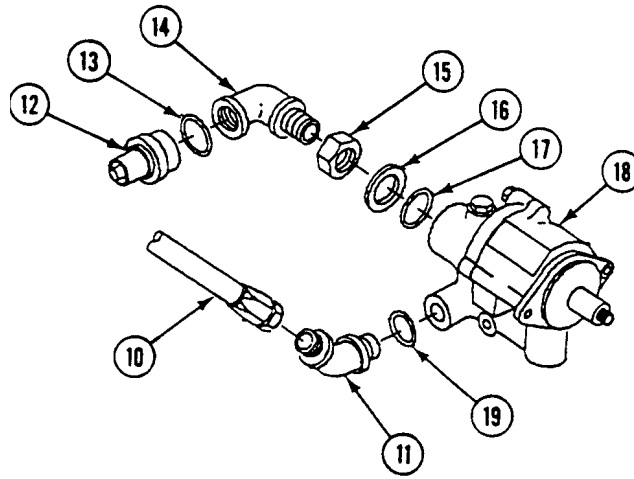
1. Apply a thin coat of antiseize compound to cleaned threads of 12 screws (1), (3), and (5) removed.
2. Attach a lifting device of at least 200 lb (91 kg) capacity to transfer gearcase. Have helper assist.
3. Align transfer gearcase with engine. Have helper assist.
4. Install two screws (5) and washers (6).
5. Install one long screw (3) and washer (4).
6. Secure transfer gearcase to engine with nine screws (1) and washers (2). **TIGHTEN ALL 12 SCREWS TO 252-300 LB-IN (28-34 N·M) TORQUE. Use torque wrench. LOOSEN AND RETIGHTEN TO 252-300 LB-IN (28-34 N·M) TORQUE. Use torque wrench.**

**NOTE**

If pump has been replaced, follow Steps 7 - 9.

7. Install new packing (19) and elbow (11) in differential oil pump (18).
8. Install nut (15) on elbow (14).
9. Install new packing (17), retainer (16), and elbow (14) in differential oil pump (18).
10. Install new packing (13) and quick disconnect half (12) on elbow (14).

11. Connect differential oil hose (10) to elbow (11).



12. Install turnbuckle (3) on idler arm bracket (9). Secure with screw (8) and nut (7).

NOTE

When replacing generator drive belts, replace in matched sets only.

NOTE

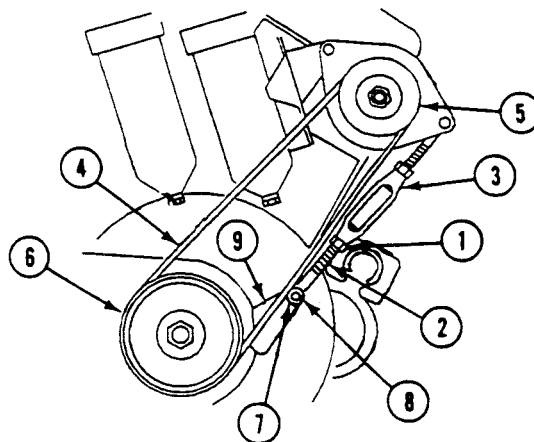
There can be different generator components on transfer gearcase. Refer to TM 9-2350-261-20 for 200 amp generator maintenance components.

13. Install two generator drive belts (4) on generator pulley (5) and transfer gearcase pulley (6).

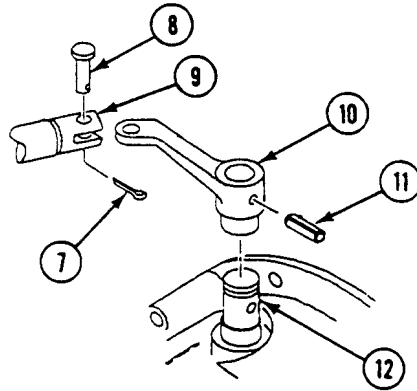
NOTE

Check alignment of generator pulley with transfer gearcase drive pulley. If necessary, position generator bracket until pulleys are aligned within 1/8 inch (3 mm).

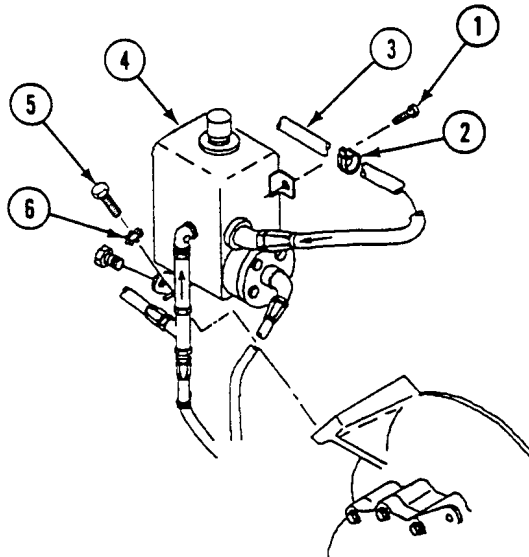
14. Turn turnbuckle (3) to the right until belt deflection at midspan is 1/2 to 5/8 inch (13 to 16 mm) when measured with machinist rule.
 15. Tighten locknut (1) on rod end (2).



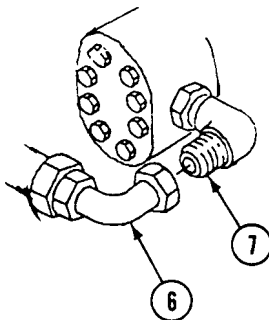
16. Install disconnect arm (10) to shaft (12) on transfer gearcase. Secure with headless pin (11).
17. Install engine quick disconnect/connect handle (9) on disconnect arm (10). Secure with headed pin (8) and new cotter pin (7).



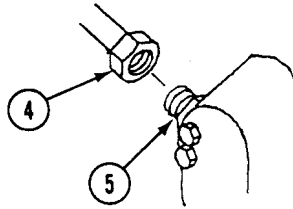
18. Apply a thin coat of antiseize compound to cleaned threads of four screws (5).
19. Install hydraulic tank (4) on transfer gearcase. Secure with four screws (5) and new key washers (6).
20. Secure clamp (2) and oil filler tube (3) to hydraulic tank (4) with screw (1).



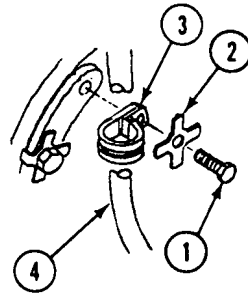
21. Connect hydraulic hose (6) to pump elbow (7).



22. Connect hydraulic hose (4) to pump adapter (5).



23. Install clamp (3) and hydraulic hose (4) on transfer gearcase. Secure with screw (1) and new key washer (2). **TIGHTEN SCREW TO 144-192 LB-IN (16-22 N·M) TORQUE. Use torque wrench.**



24. Fill hydraulic system (see your -20).
25. Fill transfer gearcase (see your -20).

FOLLOW-THROUGH STEPS

1. Install transmission on transfer gearcase (WP 0016 00).
2. Install power plant in carrier (see your -20).

END OF TASK

REPLACE TRANSFER GEARCASE

0020 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0020 00-1).
 Assembly (page 0020 00-4).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10
 Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)
 Torque Wrench (WP 0104 00, Item 58)

References

TM 9-2520-238-34
 TM 9-2520-238-34P

Materials/Parts

Antiseize compound (WP 0105 00, Item 5)
 Cotter pin (3)
 Gasket (2)
 Key washer (6)
 Lockwasher
 Preformed packing
 Spring pin

Equipment Condition

Power plant removed (see your -20)
 Power plant blocked (WP 0015 00)
 Transmission removed from transfer gearcase
 (WP 0016 00)
 Transfer gearcase removed from engine (WP 0019 00)

DISASSEMBLY

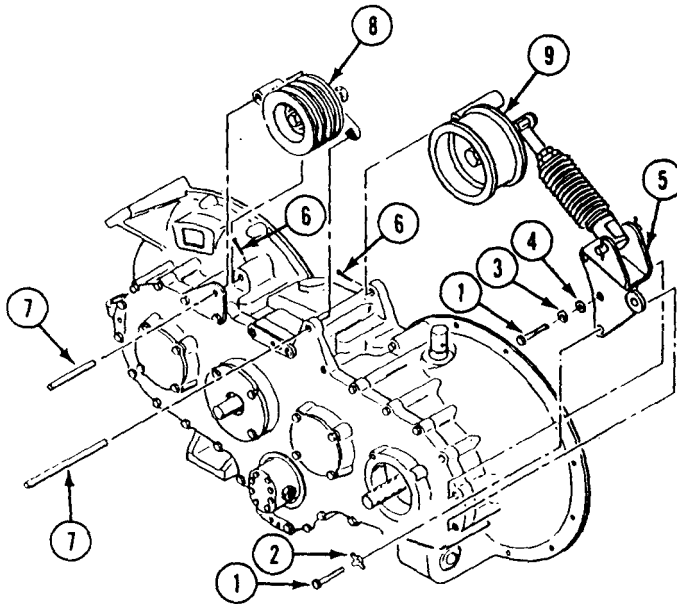
CAUTION

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

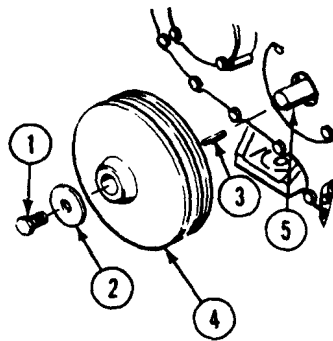
NOTE

Carriers with a 200 amp generator have a different generator drive pulley than carriers with a 100 amp generator. Check that the new transfer gearcase has the proper generator drive pulley for your carrier. If not, remove generator drive pulley assembly from unserviceable transfer gearcase. Inspect drive assembly. If serviceable, install drive assembly in new transfer gearcase. If unserviceable, install new drive assembly in transfer gearcase. Install improper or unserviceable drive assembly in unserviceable transfer gearcase. See TM 9-2520-238-34 and TM 9-2520-238-34P.

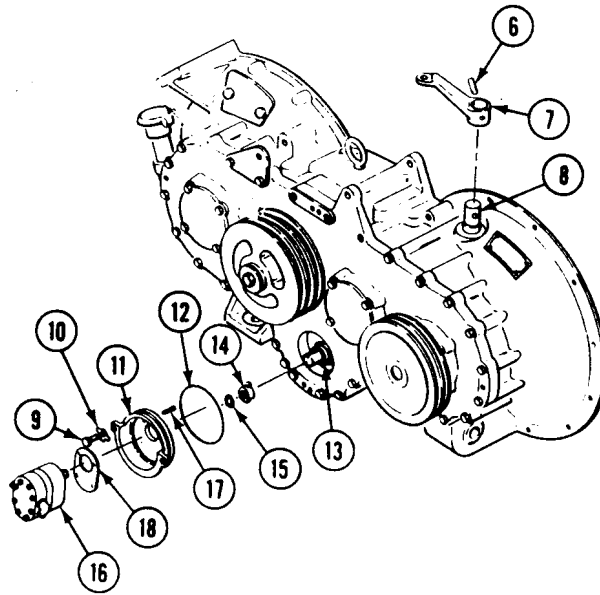
1. Remove three screws (1), two key washers (2), one lockwasher (3), one flat washer (4), and idler arm bracket (5) from transfer gearcase. Discard key washers and lockwasher.
2. Remove two cotter pins (6), straight pins (7), and two fan idler assemblies (8) and (9) with idler arm bracket (5) from transfer gearcase. Discard cotter pins.



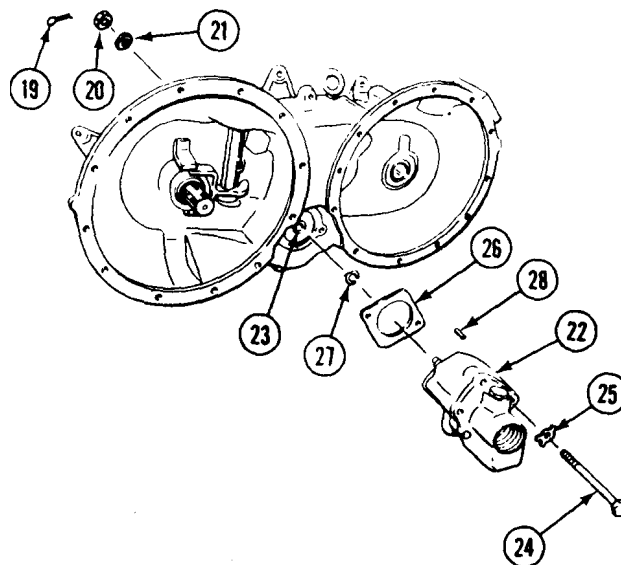
3. Remove screw (1), washer (2), key (3), and fan drive pulley (4) from secondary intermediate gear (5).



4. Remove spring pin (6) and lever (7) from actuator (8). Discard spring pin.
5. Remove two screws (9), key washers (10), flange (11), and packing (12) from secondary pump drive gear (13). Discard key washers and packing.
6. Remove coupling (14) and retaining ring (15) from ramp pump (16).
7. Remove four screws (17), ramp pump (16), and gasket (18) from flange (11). Discard gasket.

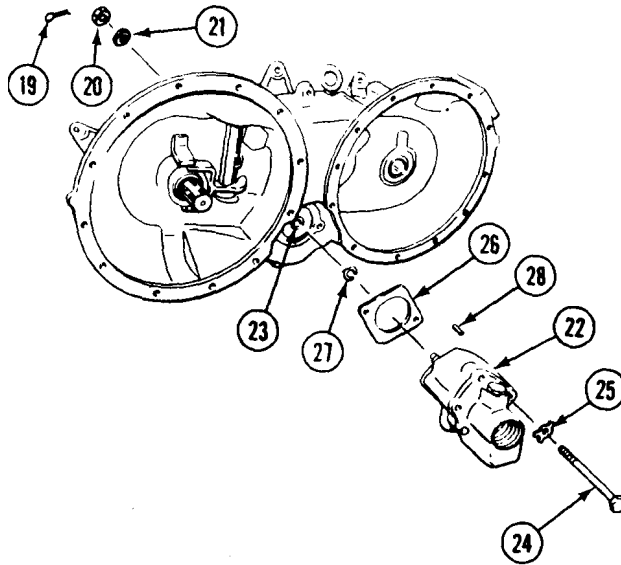


8. Remove cotter pin (19), nut (20), and washer (21) that secure differential oil pump (22) to secondary pump drive gear (23). Discard cotter pin.
9. Remove two screws (24) and key washers (25) that secure differential pump (22) and gasket (26) to transfer gearcase. Discard gasket and key washers.
10. Remove differential oil pump (22), retaining ring (27), and key (28) from drive gear (23).



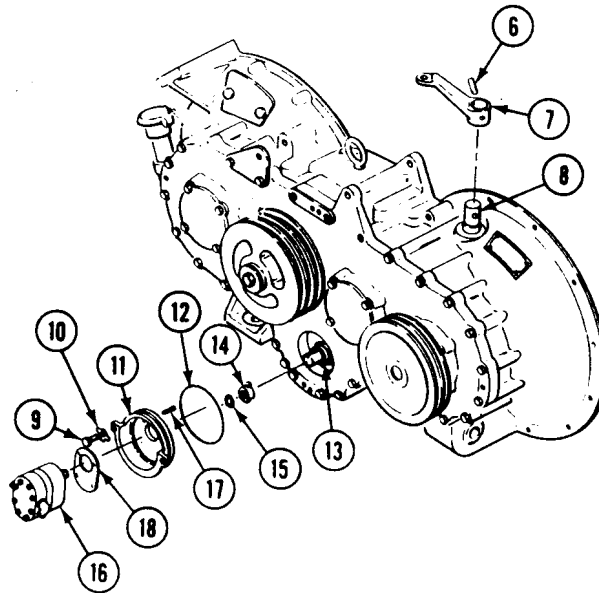
ASSEMBLY

1. Place new gasket (26) on differential oil pump (22).
2. Install differential pump (22) with key (28) and retaining ring (27) in secondary pump drive gear (23).
3. Apply a thin coat of antiseize compound to cleaned threads of two screws (24).
4. Install differential oil pump (22) on transfer gearcase. Secure with two screws (24) and new key washers (25). TIGHTEN SCREWS TO 420-480 LB-IN (47-54 N·M) TORQUE. Use torque wrench.
5. Install differential pump (22) on drive gear (23). Secure with washer (21), nut (20), and new cotter pin (19).



6. Install ramp pump (16) and new gasket (18) in flange (11). Secure with four screws (17) and retaining ring (15).
7. Install coupling (14) on secondary pump drive gear (13).
8. Place new packing (12) on flange (11).
9. Install ramp pump (16) shaft in coupling (14).
10. Install flange (11) on transfer gearcase. Secure with two screws (9) and new key washers (10). TIGHTEN SCREWS TO 144-180 LB-IN (16-20 N·M) TORQUE. Use torque wrench.

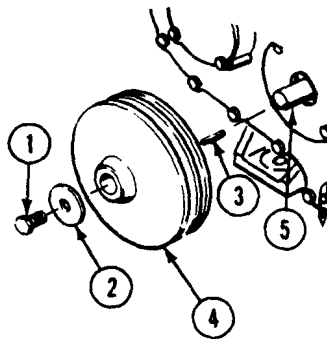
11. Secure lever (7) on actuator (8) with new spring pin (6).



NOTE

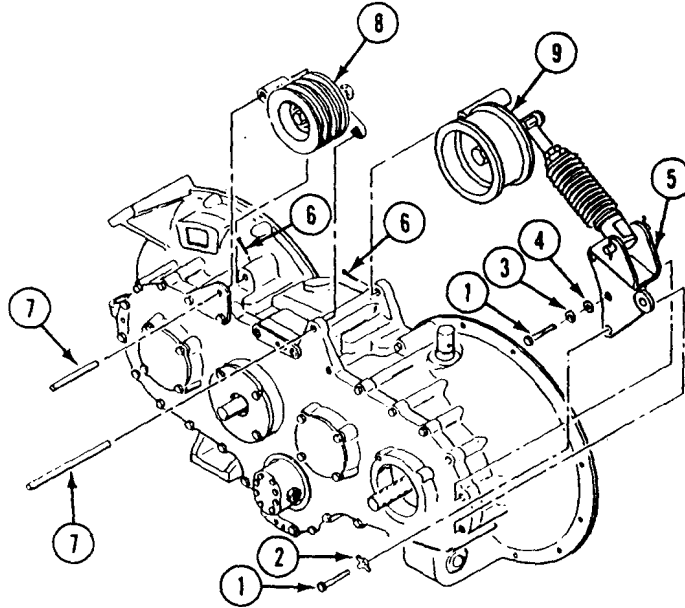
Carriers with a 200 amp generator have a different generator drive pulley than carriers with a 100 amp generator. Check that the new transfer gearcase has the proper generator drive pulley for your carrier. If not, remove generator drive pulley assembly from unserviceable transfer gearcase. Inspect drive assembly. If serviceable, install drive assembly in new transfer gearcase. If unserviceable, install new drive assembly in transfer gearcase. Install improper or unserviceable drive assembly in unserviceable transfer gearcase. See TM 9-2520-238-34 and TM 9-2520-238-34P.

12. Install fan drive pulley (4) on secondary intermediate gear (5). Secure with screw (1), washer (2), and key (3).



REPLACE TRANSFER GEARCASE — Continued**0020 00**

13. Install two fan idler assemblies (8) and (9) on transfer gearcase. Secure with two straight pins (7) and two new cotter pins (6).
14. Apply a thin coat of antiseize compound to cleaned threads of three screws (1).
15. Install idler arm bracket (5) and idler arm assemblies (8) and (9) on transfer gearcase. Secure with three screws (1), two new key washers (2), one new lockwasher (3), and one flat washer (4).

**FOLLOW-THROUGH STEPS**

1. Install transfer gearcase on engine (WP 0019 00).
2. Install transmission on transfer gearcase (WP 0016 00).
3. Install power plant in carrier (see your -20).

END OF TASK

REPLACE ENGINE

0021 00

THIS WORK PACKAGE COVERS:

Removal (page 0021 00-1).
 Installation (page 0021 00-18).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10
 Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)
 Lifting Sling (WP 0104 00, Item 40)
 Torque Wrench (WP 0104 00, Item 56)
 Torque Wrench (WP 0104 00, Item 58)
 Wrench, Open End, Fixed (WP 0104 00, Item 54)
 Lifting Device 2000 lb (908 kg) Capacity

References

See your -20
 WP 0015 00

Equipment Condition

Engine oil drained (see your -20)
 Power plant removed from carrier (see your -20)
 Power plant blocked (WP 0015 00)
 Transmission removed from transfer gearcase
 (WP 0016 00)
 Transfer gearcase removed from engine (WP 0019 00)

Materials/Parts

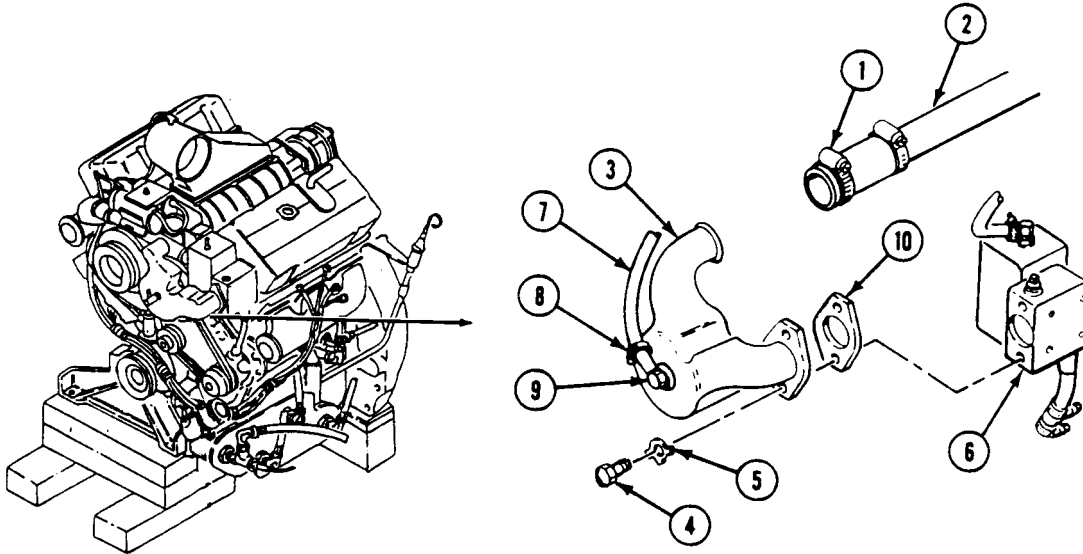
Antiseize compound (WP 0105 00, Item 5)
 Sealing compound (WP 0105 00, Item 17)
 Sealing compound (WP 0105 00, Item 18)
 Sealing compound primer (WP 0105 00, Item 21)
 Container, 1 gallon (4 liters)
 Fuel filter
 Gasket (4)
 Key washer (9)
 Locknut (7)
 Lockwasher (10)
 Oil filter
 Tie strap

REMOVAL

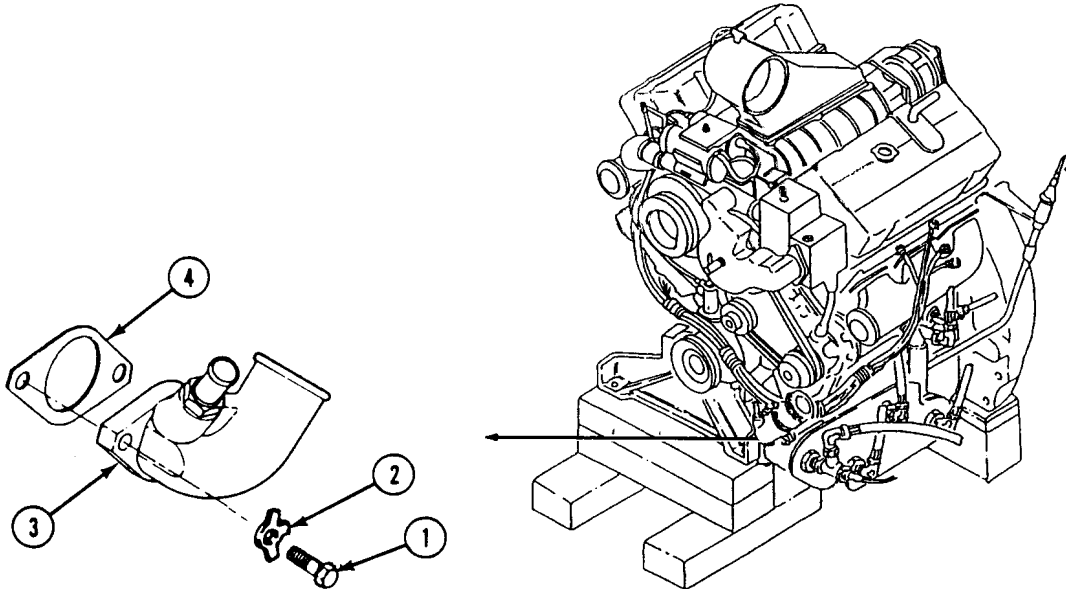
CAUTION

Cap or cover openings where fuel, oil, coolant, or hydraulic lines or fittings have been removed.

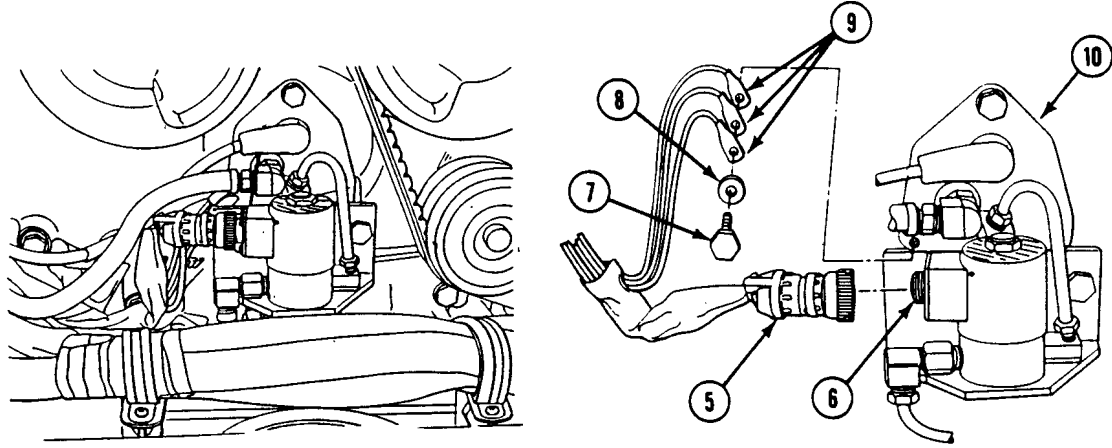
1. Disconnect clamp (1) and coolant tube (2) from deaeration elbow (3). Remove from engine.
2. Remove two screws (4) and key washers (5) from thermostat housing cover (6). Remove deaeration elbow (3) with hose (7), clamp (8), elbow (9), and gasket (10) from cover (6). Discard key washers and gasket.



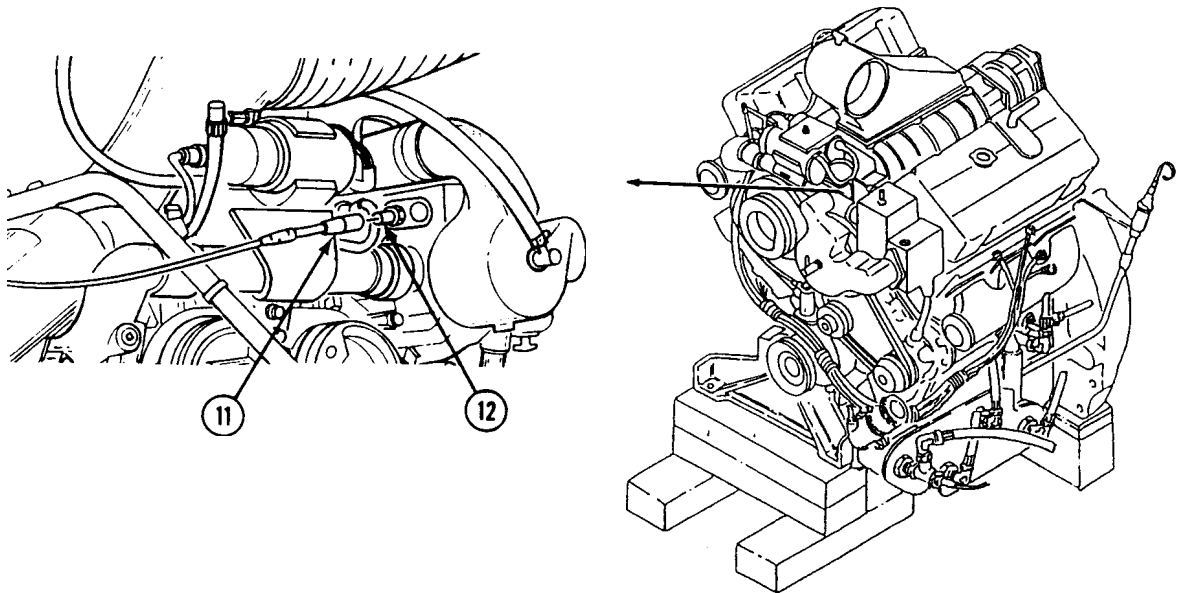
3. Remove two screws (1), key washers (2), oil cooler elbow (3), and gasket (4) from engine. Discard gasket and key washers.



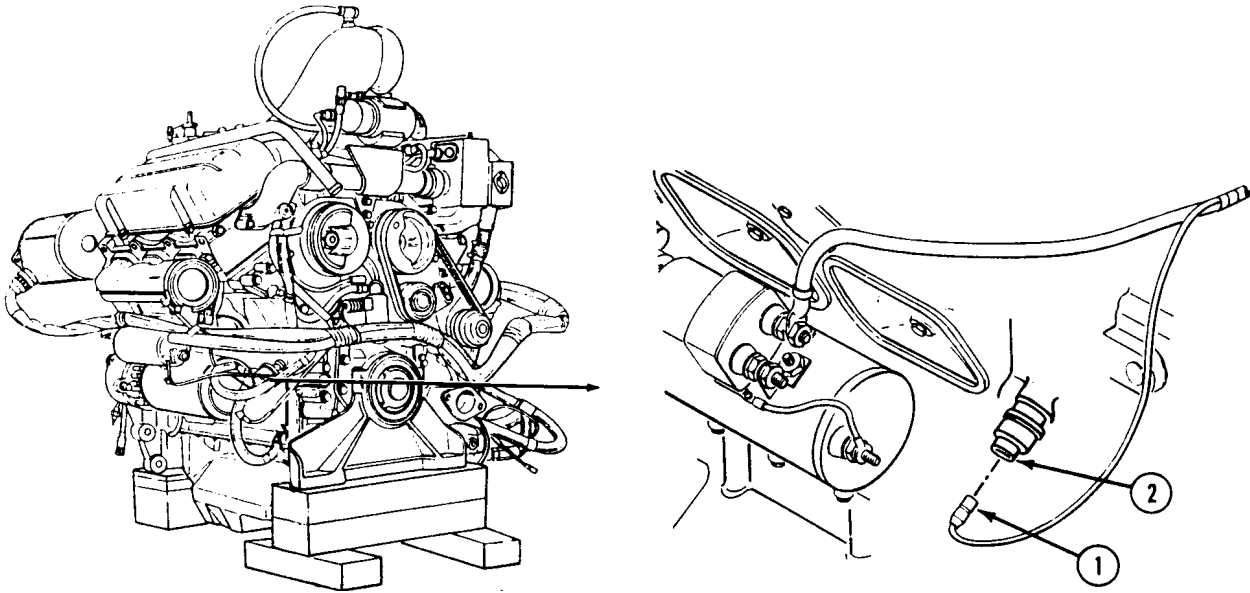
4. Disconnect power plant wiring harness circuit 406 lead (5) from air box heater wiring harness connector (6).
5. Remove screw (7), lockwasher (8), and three ground leads (9) from air box heater bracket (10). Discard lockwasher.



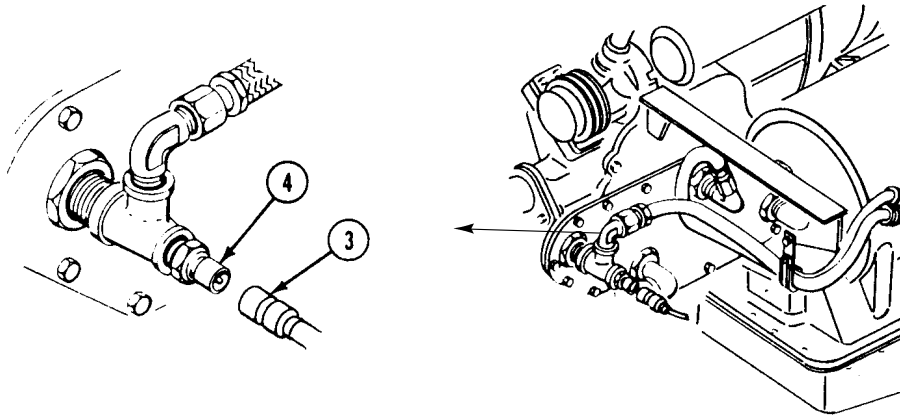
6. Disconnect power plant wiring harness circuit 33 lead (11) from coolant temperature sending unit (12).



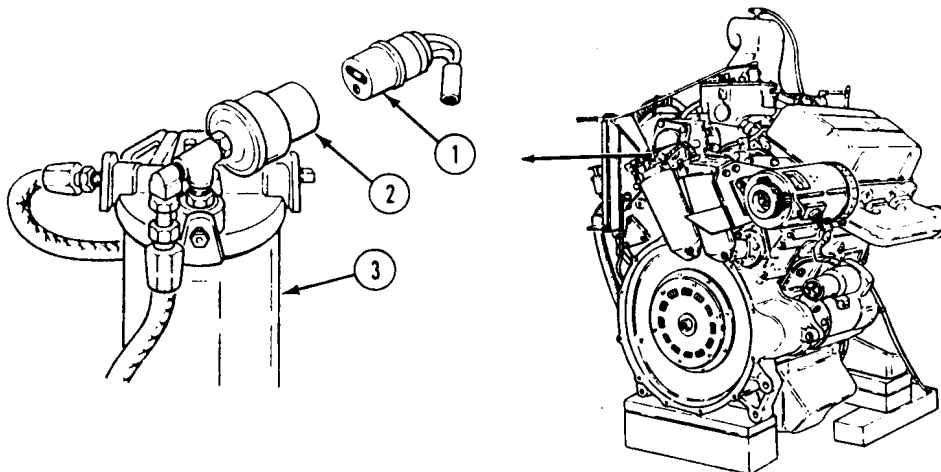
7. Disconnect power plant wiring harness circuit 34 lead (1) from engine low oil pressure switch (2).



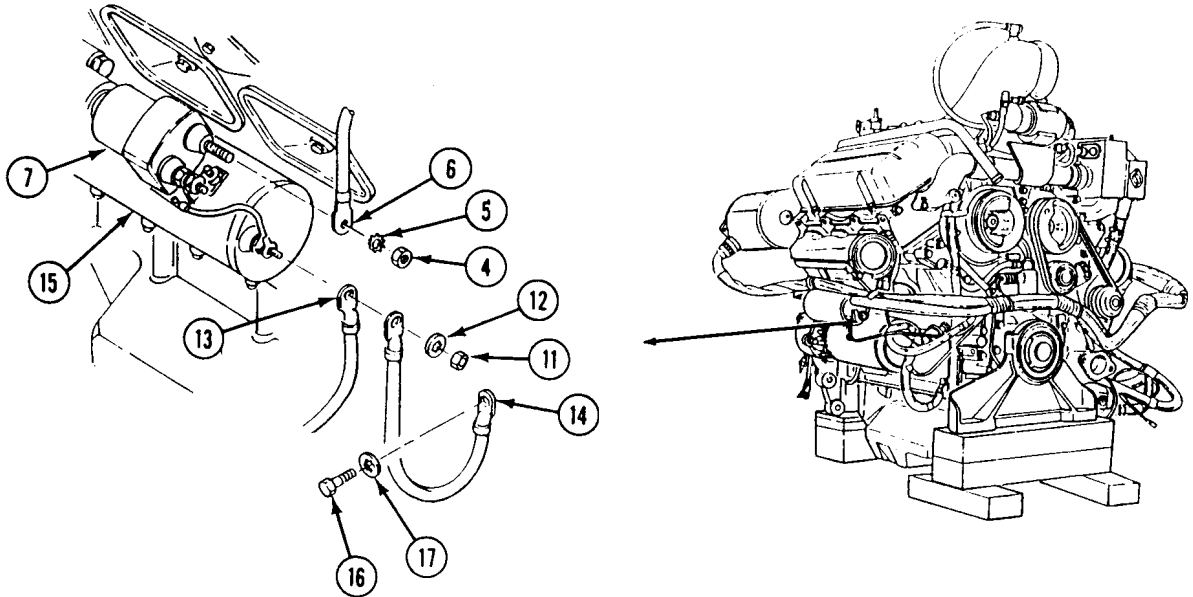
8. Disconnect power plant wiring harness circuit 327 lead (3) from transmission oil temperature sending unit (4).



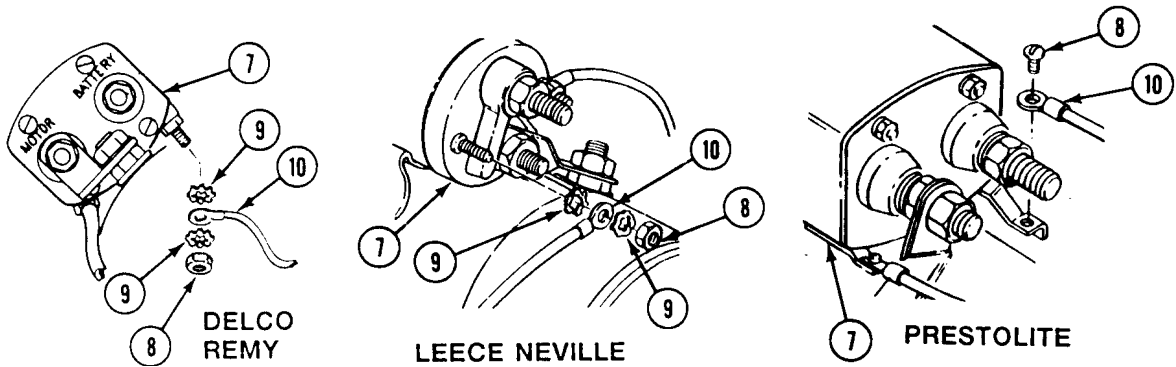
9. Disconnect power plant wiring harness circuits 1A and 1B lead (1) from field switch (2) at secondary fuel filter (3).



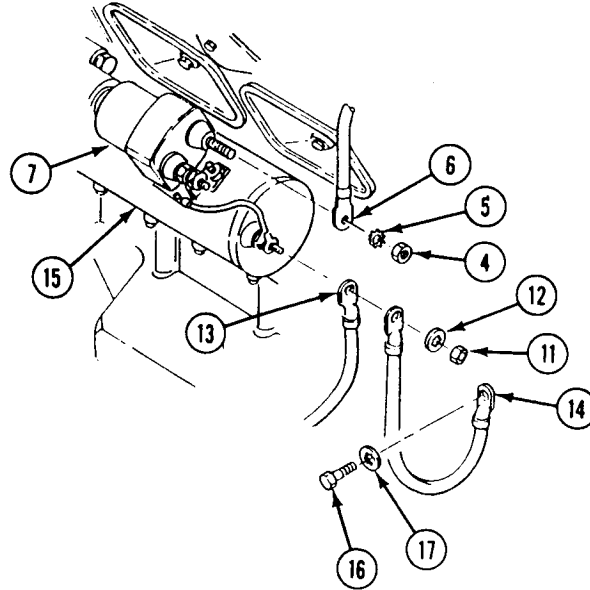
10. Remove nut (4), lockwasher (5), and circuit 6 lead (6) from terminal on starter solenoid (7). Discard lockwasher.



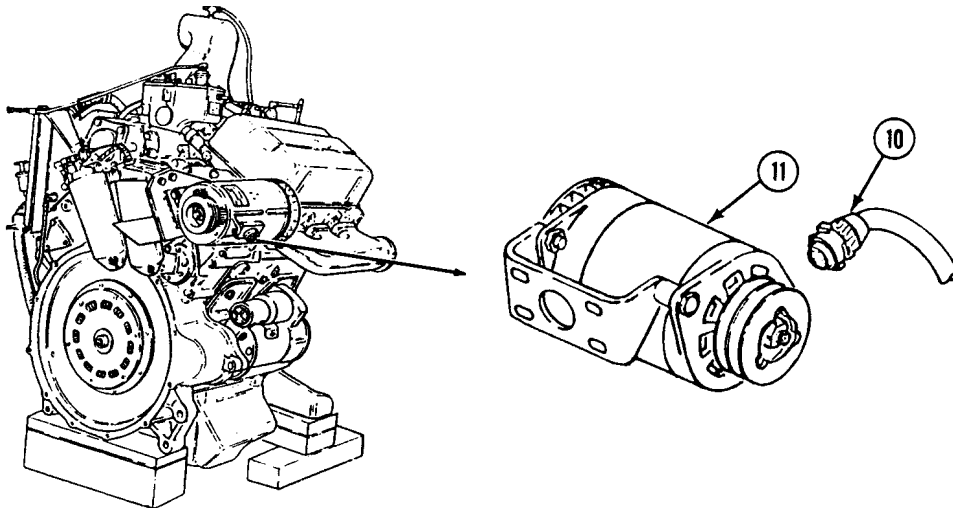
11. Remove nut (8) (screw on Prestolite), two lockwashers (9) (Delco and Leece Neville only), and circuit 74A lead (10) from terminal on starter solenoid (7). Discard lockwashers.



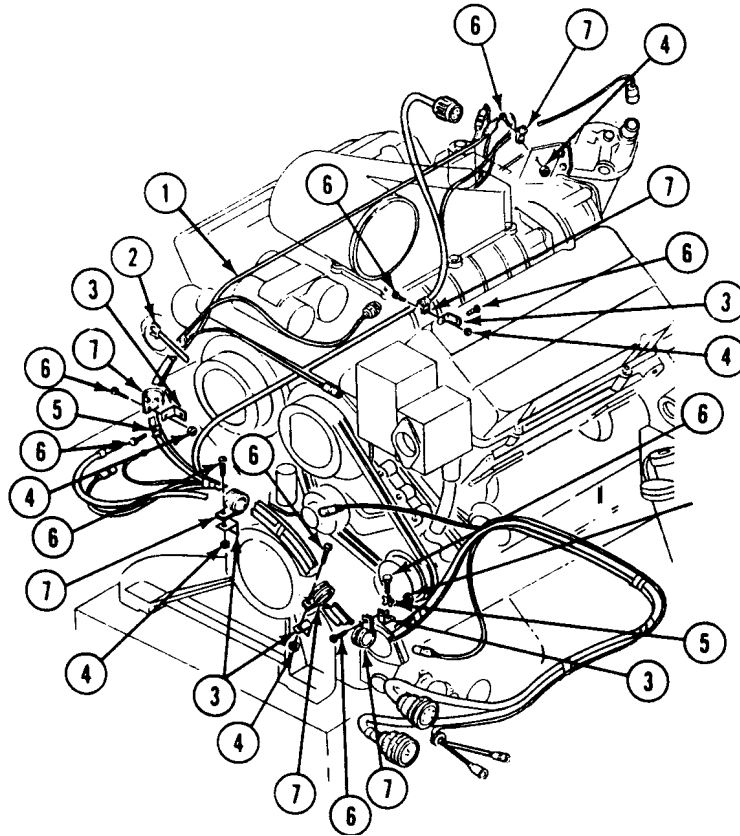
12. Remove nut (11), lockwasher (12), and two ground leads (13) and (14) from starter (15). Discard lockwasher.
13. Remove screw (16), lockwasher (17), and ground lead (14) from engine block. Discard lockwasher.



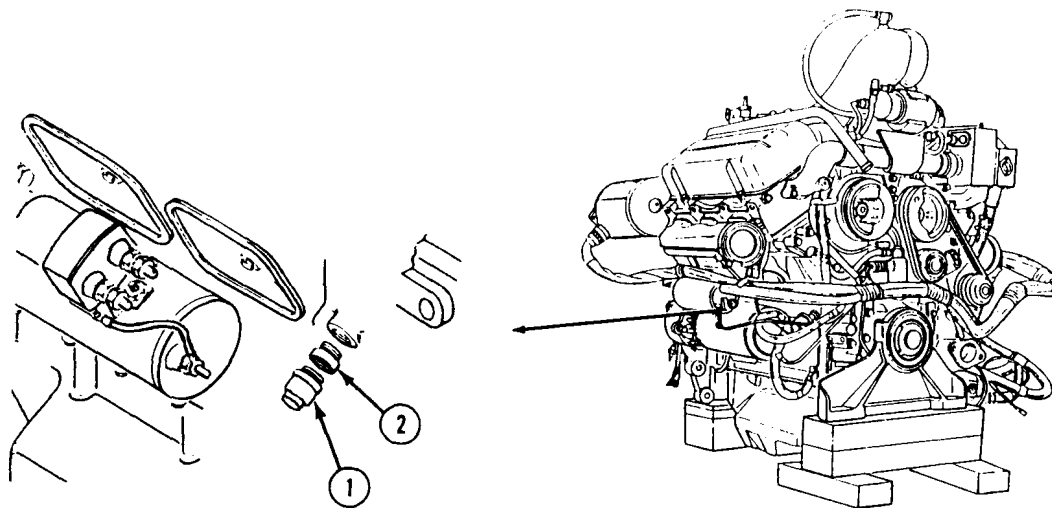
14. Disconnect cable (10) from generator (11).



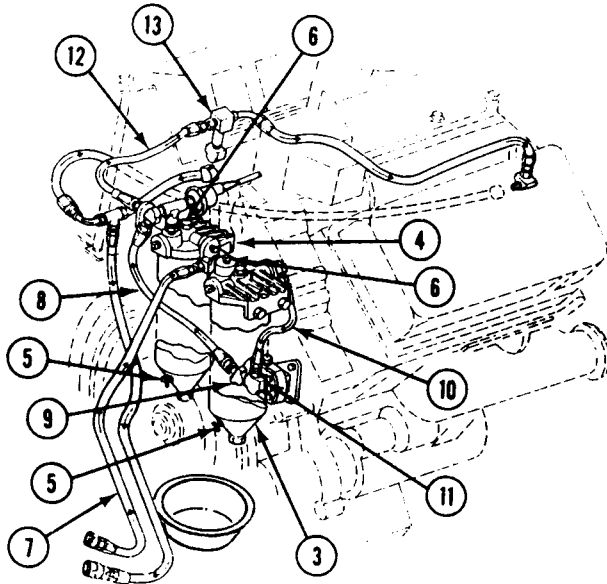
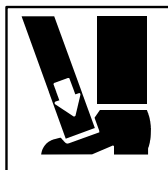
15. Remove nine screws (6), two washers (5), six nuts (4), five brackets (3), six clamps (7), strap (2), and power plant wiring harness (1) from power plant.



16. Remove engine low oil pressure switch (1) and bushing (2) from engine block.

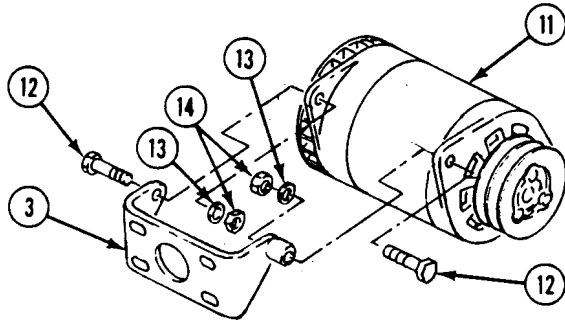


17. Place a 1 gallon (4 liter) can under two filters (3) and (4). Open two drain valves (5). Remove bleed plugs (6) from filter to drain.
18. Disconnect fuel supply hose (7) from primary fuel filter (3).
19. Disconnect fuel supply hose (8) from pump inlet elbow (9) and secondary fuel filter (4).
20. Disconnect fuel supply hose (10) from fuel pump outlet elbow (11) and primary fuel filter (3).
21. Disconnect and remove fuel supply hose (12) from tee (13) and secondary fuel filter (4).

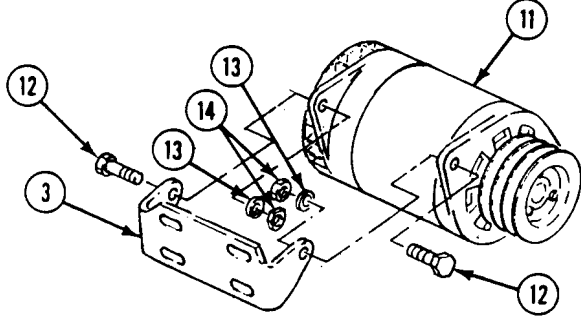
**WARNING**

200 amp generator weighs approximately 80 pounds. Have helper assist when removing 200 amp generator.

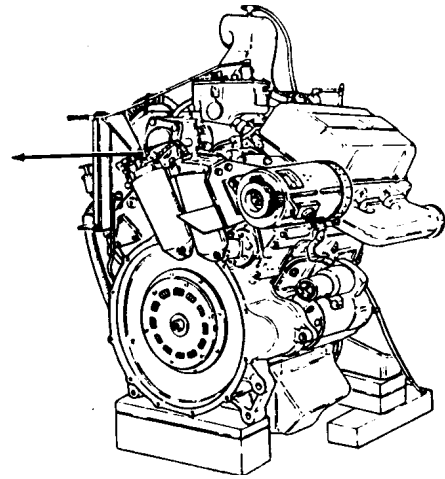
22. Remove two screws (12), washers (13), locknuts (14), and generator (11) from generator mount bracket (3). Discard locknuts. Have helper assist.



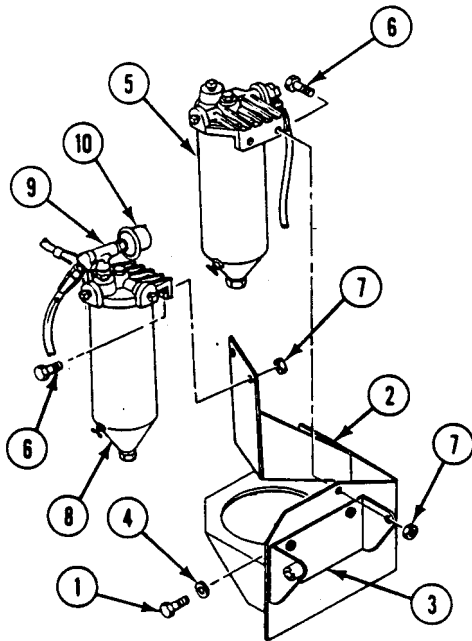
**MOUNTING BRACKET FOR
100 AMP GENERATOR**



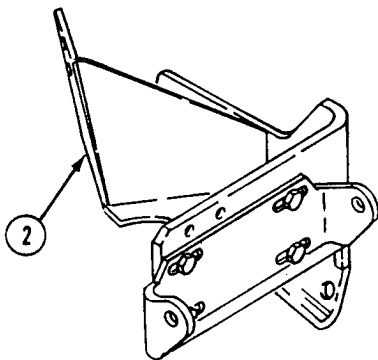
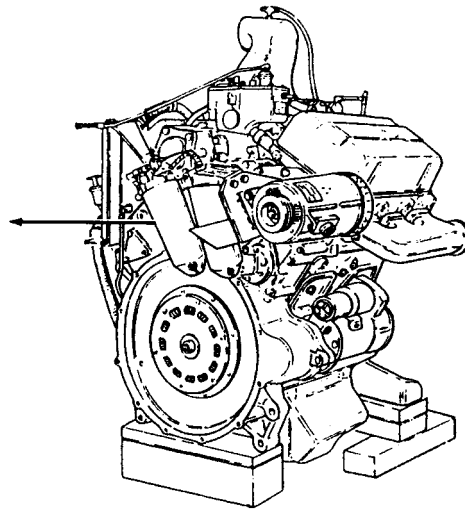
**MOUNTING BRACKET FOR
200 AMP GENERATOR**



23. Remove four screws (6) and locknuts (7) from fuel filter mounting bracket (2). Remove two filters (5) and (8) with tee (9) and neutral start switch (10) from bracket (2). Discard locknuts.
24. Remove four screws (1), washers (4), and bracket (2) with generator mount bracket (3) from engine.

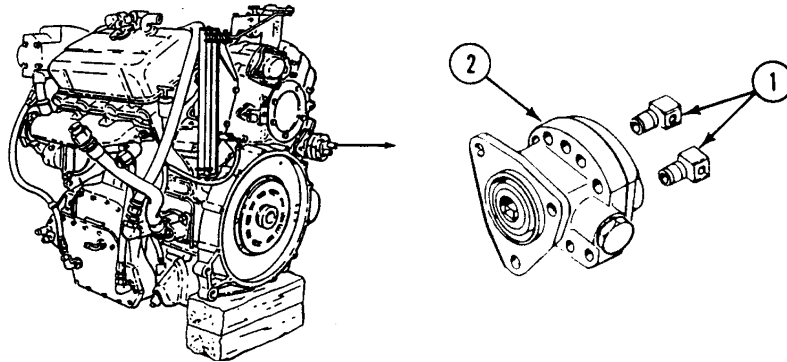


**FUEL FILTER BRACKET
FOR 100 AMP GENERATOR**

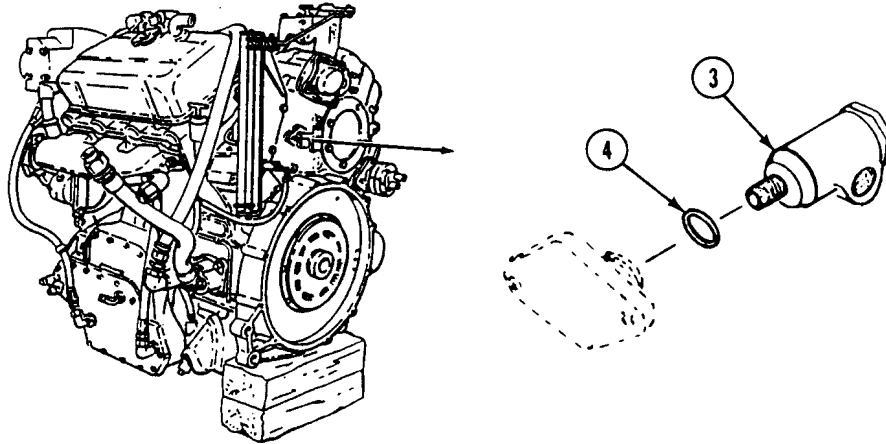


**FUEL FILTER BRACKET
FOR 200 AMP GENERATOR**

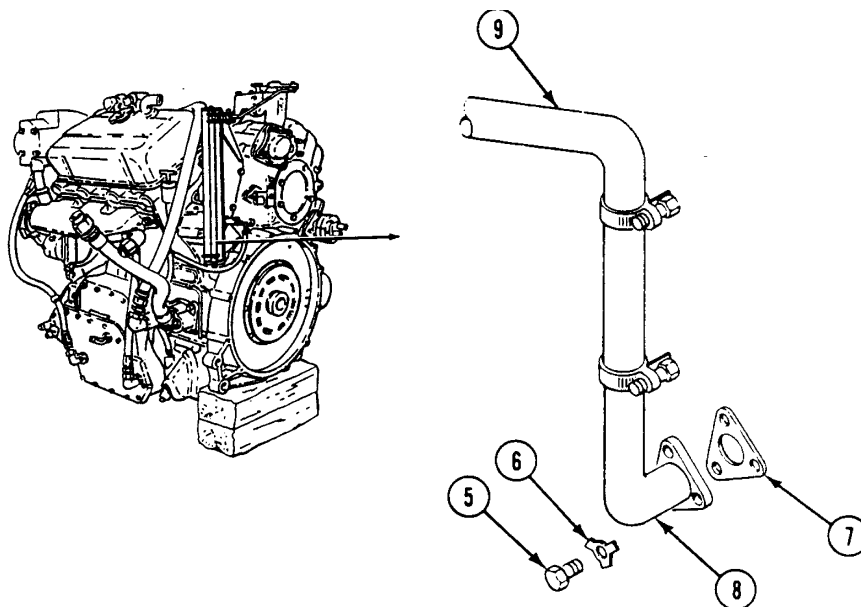
25. Remove two elbows (1) from fuel pump (2).



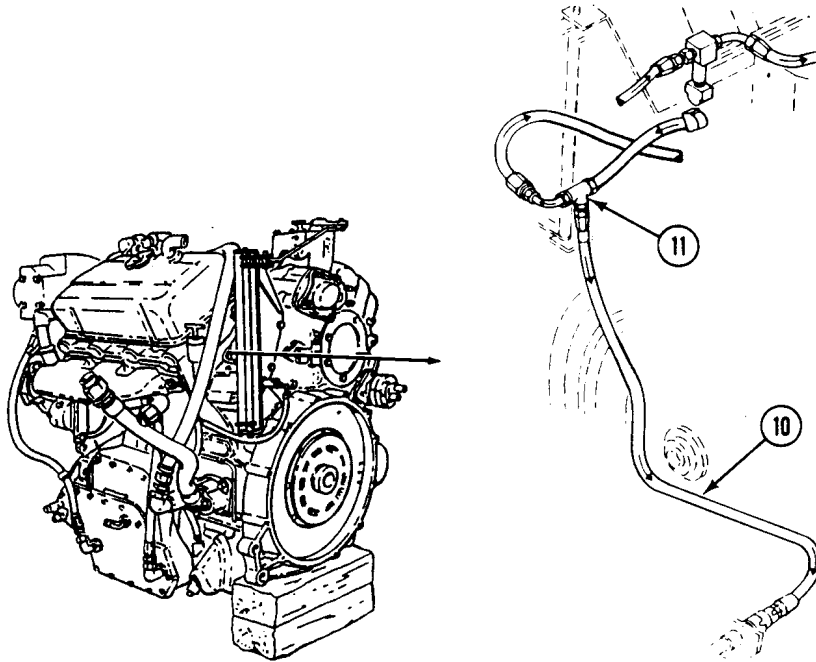
26. Remove tachometer drive adapter (3) and gasket (4) from engine. Discard gasket.



27. Remove three screws (5), key washers (6), gasket (7), oil filler elbow (8), and hose (9) from engine. Discard gasket and key washers.

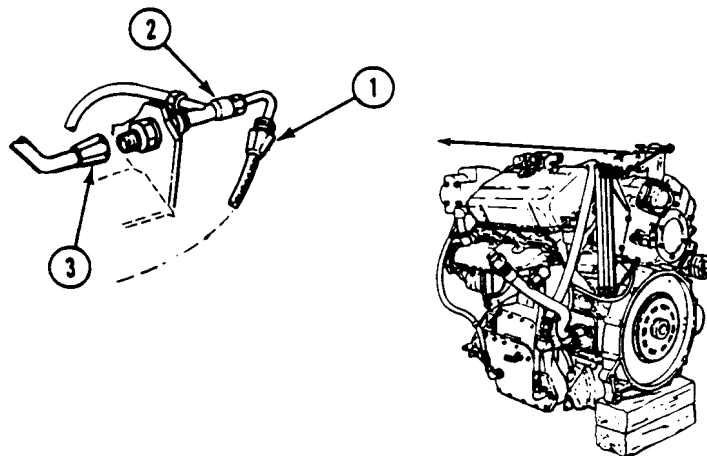


28. Disconnect and remove fuel return hose (10) from tee (11). Use open end wrench.

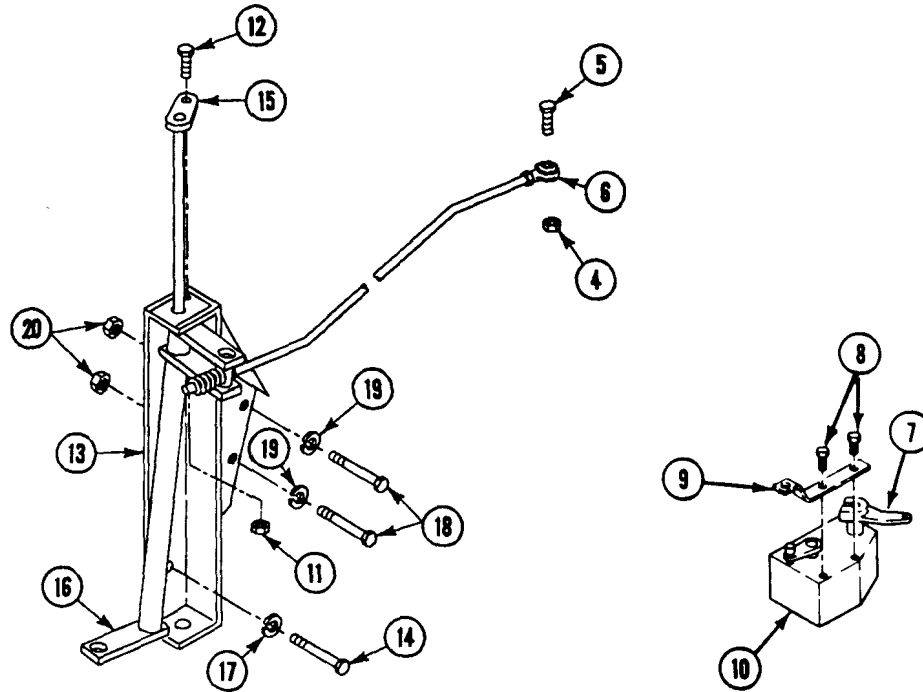


29. Disconnect air box heater fuel hose (1) from tee (2).

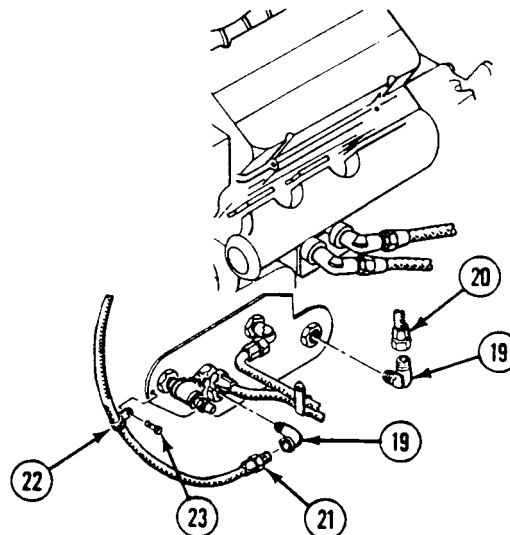
30. Disconnect elbow (3) from tee (2).



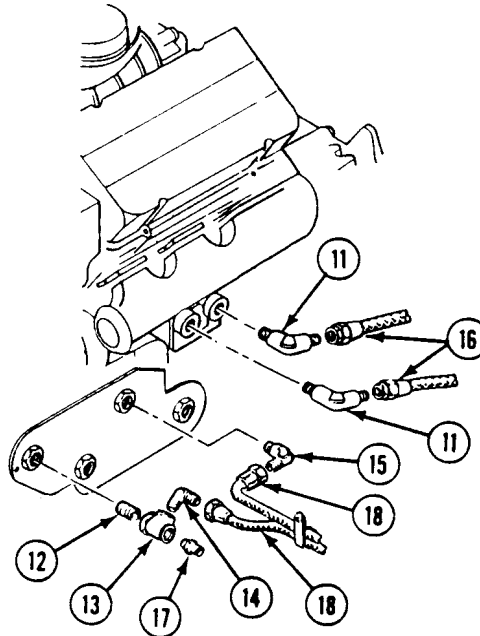
31. Remove nut (4), screw (5), and governor control link (6) from throttle arm (7).
32. Remove two screws (8) and gauge (9) from governor (10).
33. Remove locknut (11) and screw (12) from bracket assembly (13). Use cross-tip screwdriver. Discard locknut.
34. Before removing screw (14), raise inner transfer shaft (15) high enough to tilt the outer transfer shaft (16).
35. Remove screw (14) and lockwasher (17) from bracket assembly (13). Discard lockwasher.
36. Remove two screws (18), lockwashers (19), nuts (20), and bracket assembly (13) from power plant. Discard lockwashers.



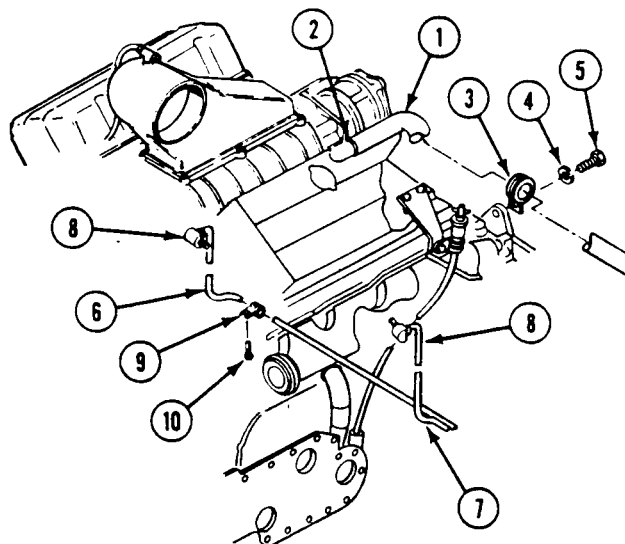
37. Remove screw (23) and clamp (22) from differential oil hose (21).
38. Disconnect and remove two differential oil hoses (21) and (20) from elbows (19).
39. Remove two elbows (19) from engine oil cooler housing.



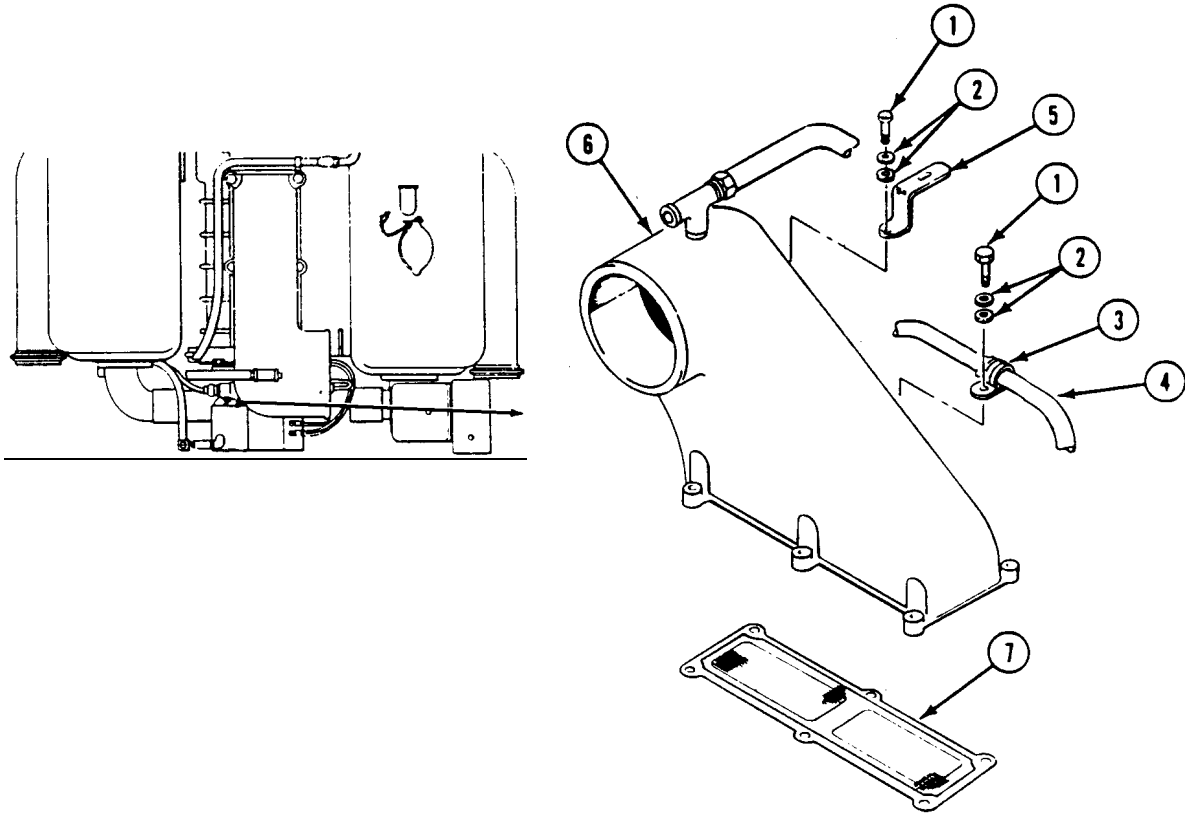
40. Disconnect and remove two transmission oil hoses (18) from two elbows (14) and (15).
41. Remove elbow (15) from engine oil cooler housing.
42. Remove transmission oil temperature sending unit (17) from tee (13).
43. Remove tee (13) with elbow (14) from oil cooler nipple (12).
44. Remove oil cooler nipple (12) from engine oil cooler housing.
45. Disconnect and remove two engine oil filter hoses (16) from two elbows (11).
46. Remove two elbows (11) from engine block.



47. Disconnect two hoses (6) and (7) from air box drain tubes (8). Remove screw (10) and clamp (9) with hose (6) from engine oil pan.
48. Remove spring clamp (2) and engine breather tube (1) from engine rocker arm cover. Remove screw (5), lockwasher (4), and clamp (3) from engine. Discard lockwasher.



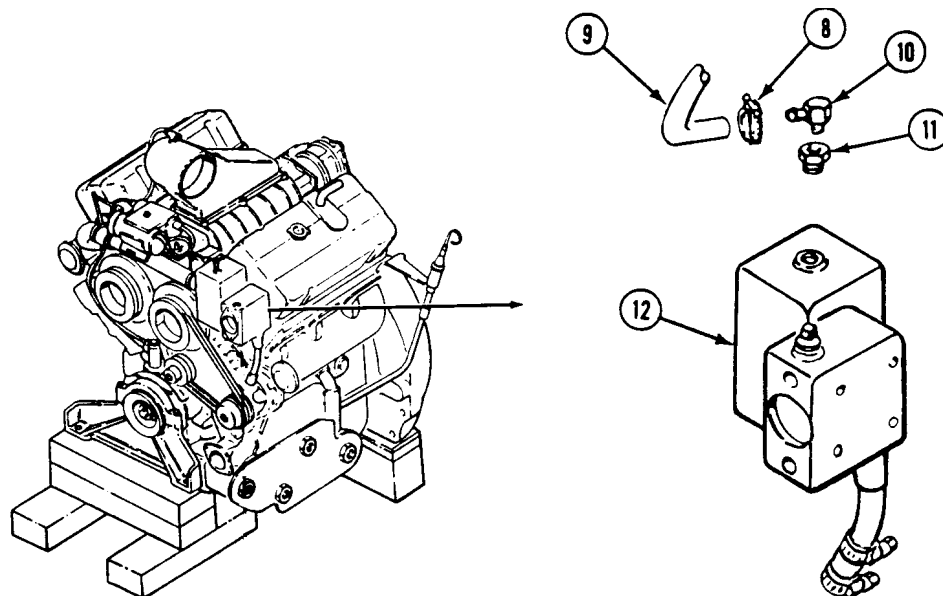
49. Remove six screws (1), 12 washers (2), clamp (3), hose (4), bracket (5), air horn (6), and screen (7) from engine. Leave clamp (3) on hose (4).



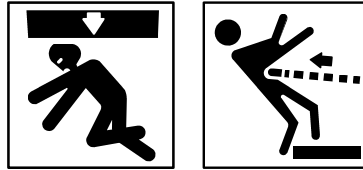
50. Remove clamp (8) and hose (9) from thermostat housing elbow (10).

51. Remove thermostat elbow (10) from thermostat housing bushing (11).

52. Remove thermostat bushing (11) from thermostat housing (12).



WARNING



Damaged slings can fail when loaded. Breaking slings can strike and injure personnel. Suspended load can fall and crush personnel.

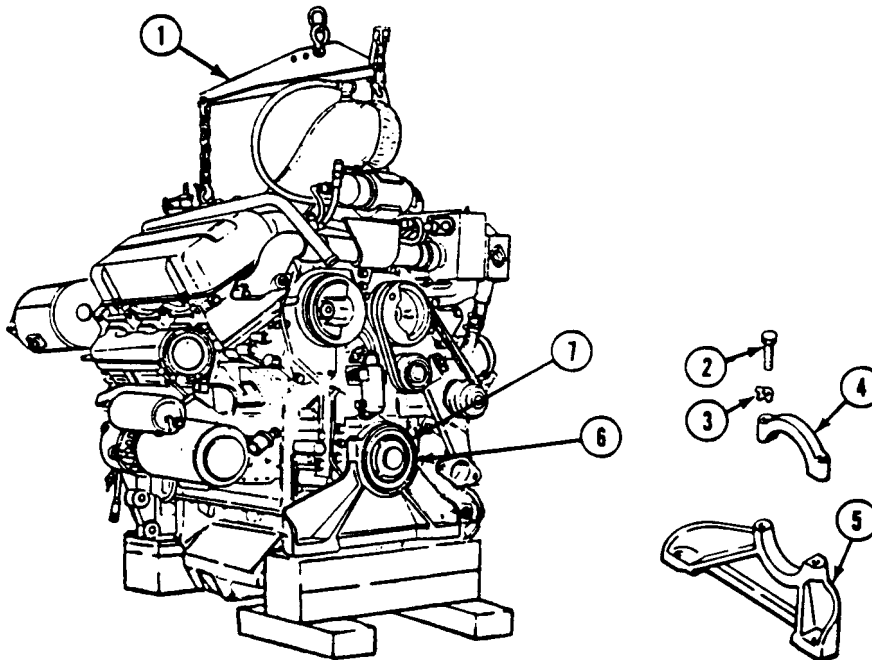
Inspect all slings before use. Do not use damaged slings. Clearly mark all damaged slings as DAMAGED - DO NOT USE.

WARNING



Hanging loads could kill or injure you. Keep away from hanging loads and overhead equipment. Keep hands out of engine compartment while power unit is being removed or installed.

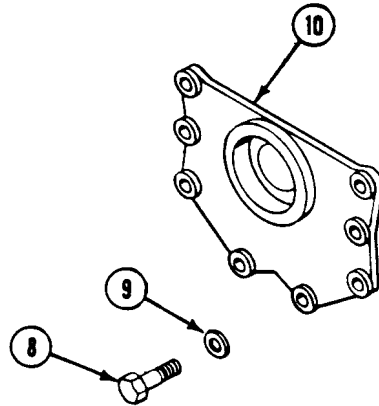
53. Use a lifting device of at least 2000 lb (908 kg) capacity and sling (1) to lift engine.
54. Remove two screws (2), key washers (3), cap (4), base (5), and rubber engine mount (6) from support (7). Discard key washers.



NOTE

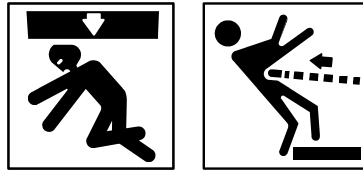
Remove and retain trunnion mounts for M1064 carrier engine only.

55. Remove eight screws (8), washers (9), and trunnion mount (10) from engine.



INSTALLATION

WARNING



Damaged slings can fail when loaded. Breaking slings can strike and injure personnel. Suspended load can fall and crush personnel.

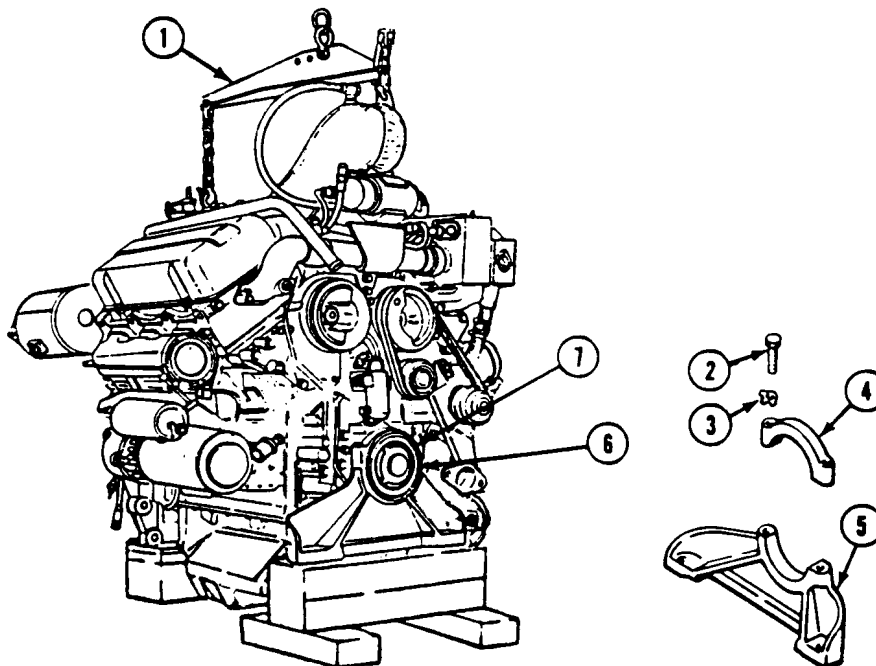
Inspect all slings before use. Do not use damaged slings. Clearly mark all damaged slings as DAMAGED - DO NOT USE.

WARNING



Hanging loads could kill or injure you. Keep away from hanging loads and overhead equipment. Keep hands out of engine compartment while power unit is being removed or installed.

1. Use a lifting device of at least 2000 lb (908 kg) capacity and sling (1) to lift new engine from shipping container. Block rear end of engine on level ground (WP 0015 00).
2. Apply a thin coat of antiseize compound to cleaned threads of two screws (2).



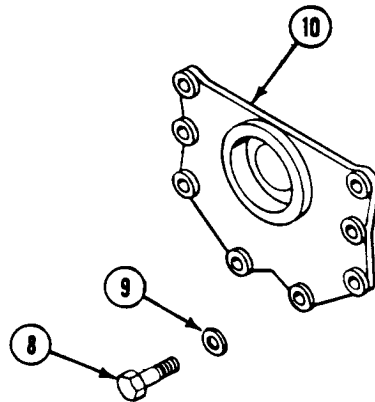
CAUTION

Parts installed in Steps 3 - 67 are not supplied with new engine. These parts must be retained from the old engine.

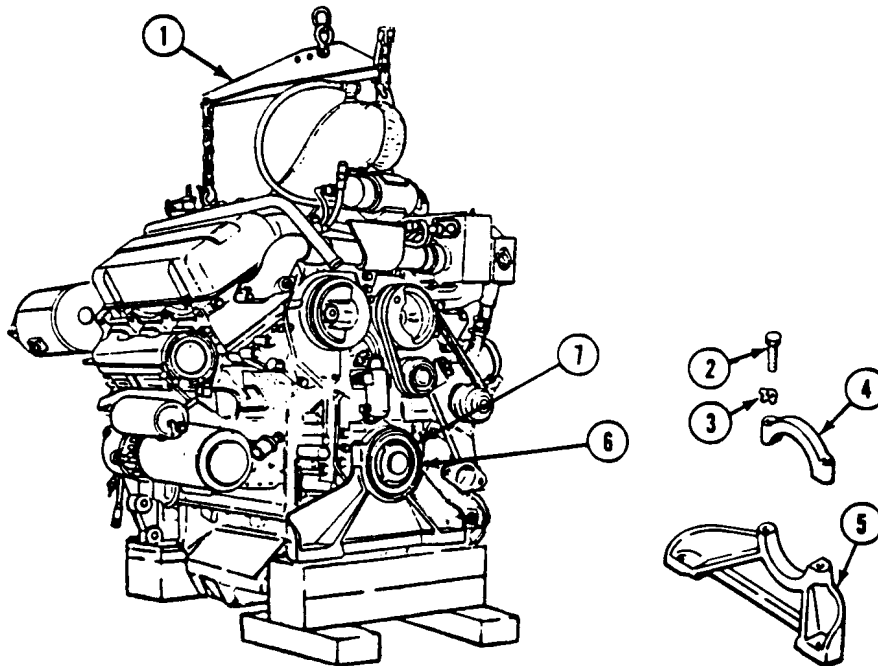
NOTE

Install retained trunnion mounts for M1064 carrier engine only.

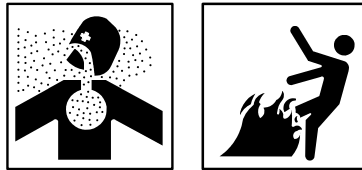
3. Install trunnion mount (10) on engine. Secure with eight screws (8) and washers (9). TIGHTEN SCREWS TO 55-60 LB-FT (75-81 N·M) TORQUE. Use torque wrench.



4. Install base (5), rubber engine mount (6), and cap (4) on support (7). Secure with two screws (2) and new key washers (3). TIGHTEN SCREWS TO 360-420 LB-IN (41-47 N·M) TORQUE. Use torque wrench.



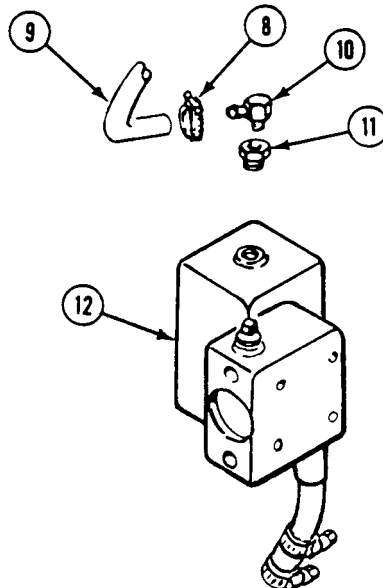
5. Block front of engine mount with wood blocks (WP 0015 00).

WARNING

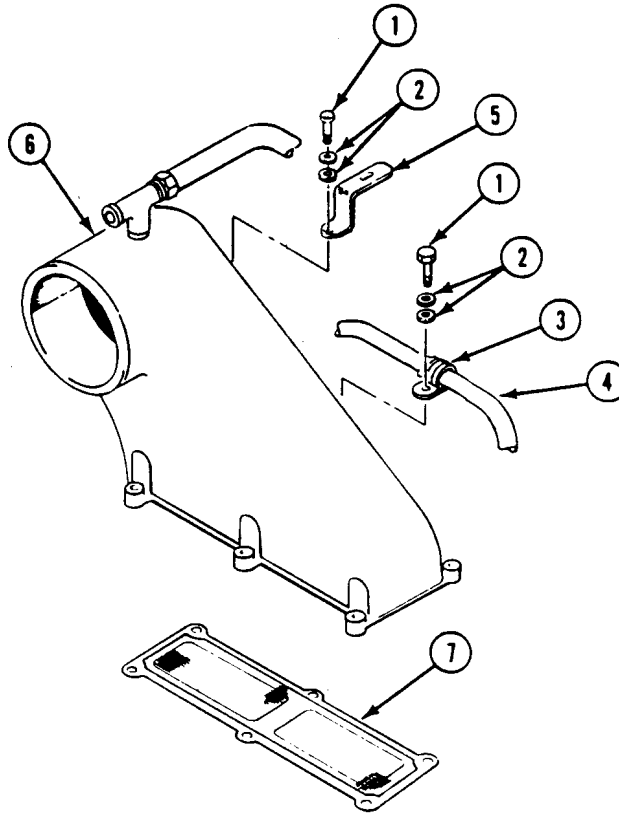
Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

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.

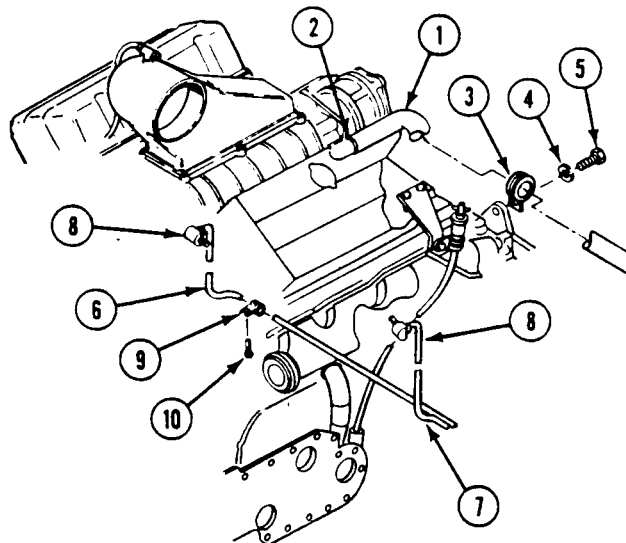
6. Apply a thin, even coat of primer and then sealing compound to cleaned external pipe threads of bushing (11) and elbow (10). Do not apply primer or sealant beyond small end of threads.
7. Install thermostat housing bushing (11) in thermostat housing (12).
8. Install thermostat housing elbow (10) in bushing (11).
9. Connect hose (9) with clamp (8) to thermostat elbow (10).



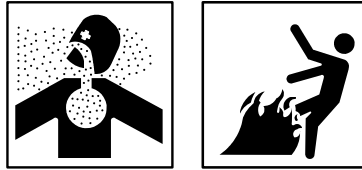
10. Install screen (7), air horn (6), bracket (5), and hose (4) with clamp (3) on engine. Secure with six screws (1) and 12 washers (2). TIGHTEN SCREWS TO 25-30 LB-FT (34-41 N·M) TORQUE. Use torque wrench.



11. Secure engine breather tube (1) with spring clamp (2) to engine rocker arm cover. Install clamp (3) with new lockwasher (4) and screw (5) on engine.
12. Connect two hoses (6) and (7) to air box drain tubes (8). Secure hose (6) with clamp (9) and screw (10) to engine.



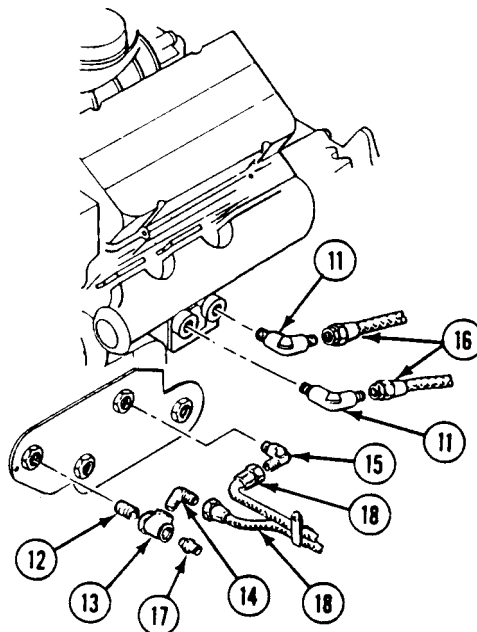
WARNING

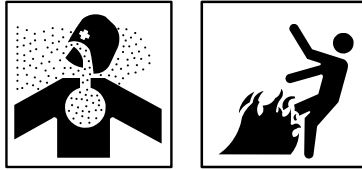


Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

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.

13. Apply a thin, even coat of primer and then sealing compound to cleaned external pipe threads of elbows (11), nipple (12), tee (13), elbow (14), and elbow (15). Do not apply primer or sealant beyond small end of threads.
14. Install two elbows (11) in engine block.
15. Connect two engine oil filter hoses (16) to two elbows (11).
16. Install oil cooler nipple (12) in engine oil cooler housing.
17. Connect tee (13) with elbow (14) to oil cooler housing nipple (12).
18. Install transmission oil temperature sending unit (17) to tee (13). **TIGHTEN OIL TEMPERATURE SENDING UNIT TO 240-300 LB-IN (27-34 N·M) TORQUE.** Use torque wrench.
19. Install elbow (15) in engine oil cooler housing.
20. Connect two transmission oil hoses (18) to two elbows (15) and (14).

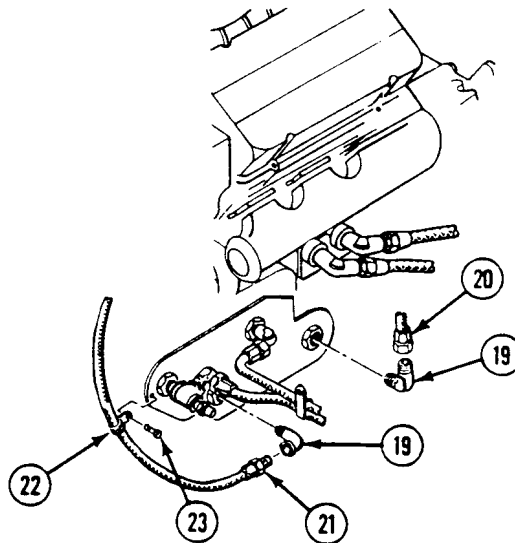


WARNING

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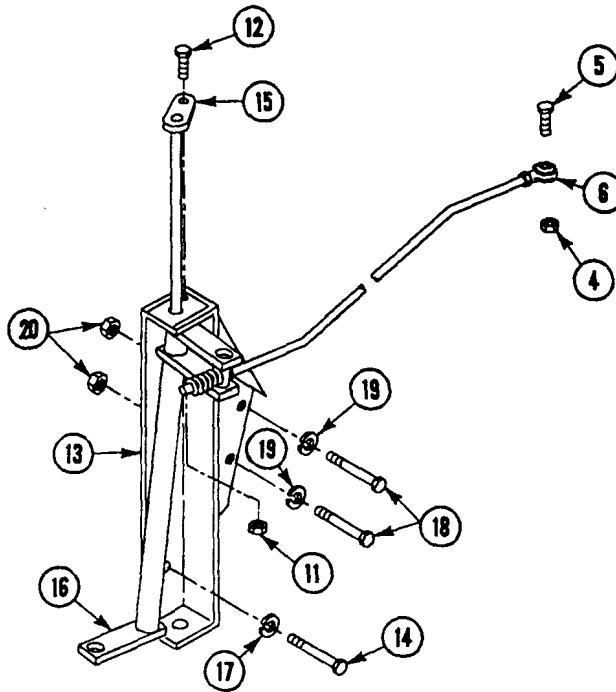
21. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external pipe threads of elbows (19). Do not apply primer or sealant beyond small end of threads.
22. Install two elbows (19) in engine cooler housing.
23. Connect two differential oil hoses (20) and (21) to two elbows (19). Secure hose (21) with clamp (22) and screw (23) to oil cooler housing.



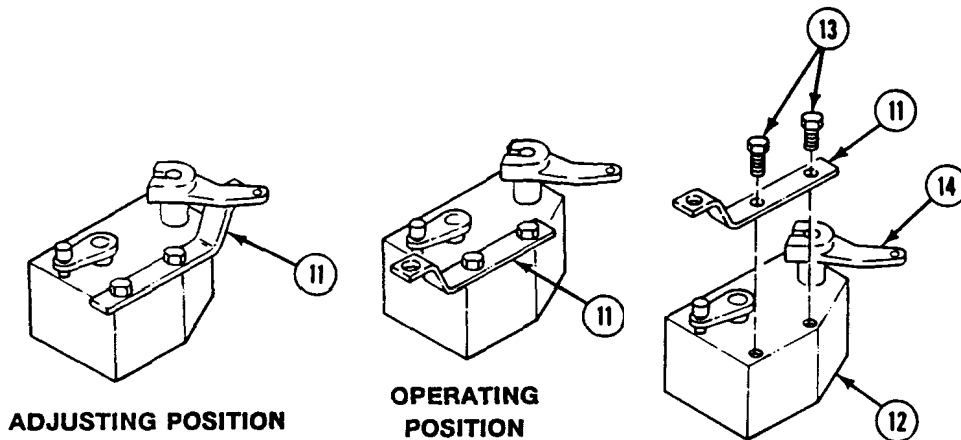
NOTE

Lubricate rod end bearings before assembling. Use GAA grease (see your -20).

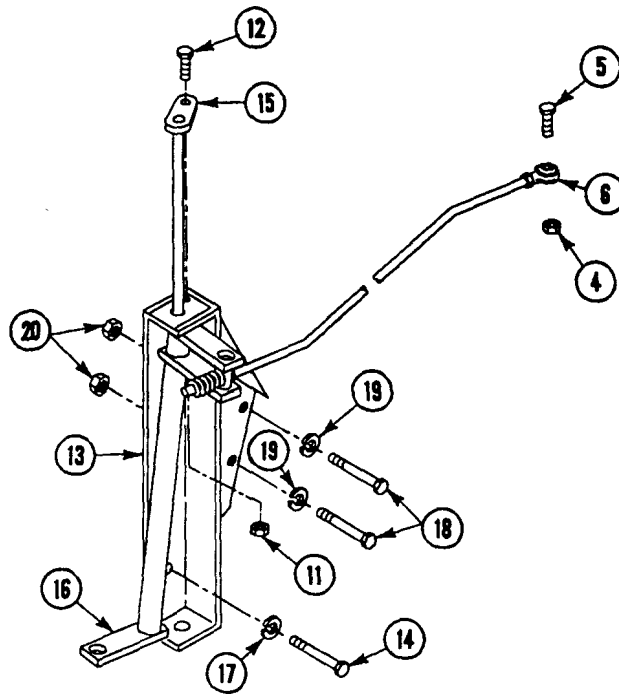
24. Apply thin coat of antiseize compound to clean threads of three screws (18) and (14).
25. Install bracket assembly (13) on power plant. Secure with two screws (18), new lockwashers (19), and nuts (20). TIGHTEN SCREWS TO 300-324 LB-IN (34-37 N·M) TORQUE. Use torque wrench and socket wrench set.
26. Install screw (14) and new lockwasher (17) in bottom hole of bracket assembly (13). TIGHTEN SCREW TO 264-288 LB-IN (30-33 N·M) TORQUE. Use torque wrench and socket wrench set.
27. Position inner transfer shaft (15) and outer transfer shaft (16) in bracket assembly (13). Secure with screw (12) and new locknut (11). Use cross-tip screwdriver.



28. Attach gauge (11) to governor (12) in adjusting position. Secure with two screws (13). Align hole in throttle arm (14) with hole in gauge. Secure throttle arm.
29. Remove two screws (13) and gauge (11) from governor (12). Install gauge in operating position on governor. Secure with two screws.

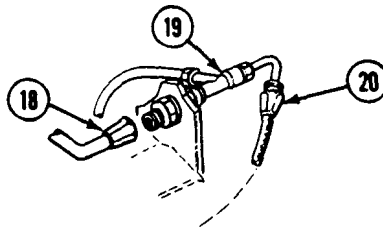


30. Install governor control link (6) on throttle arm with screw (5) and nut (4).

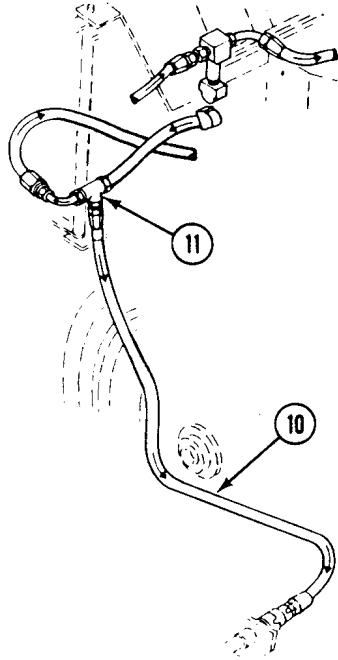


31. Connect elbow (18) to tee (19).

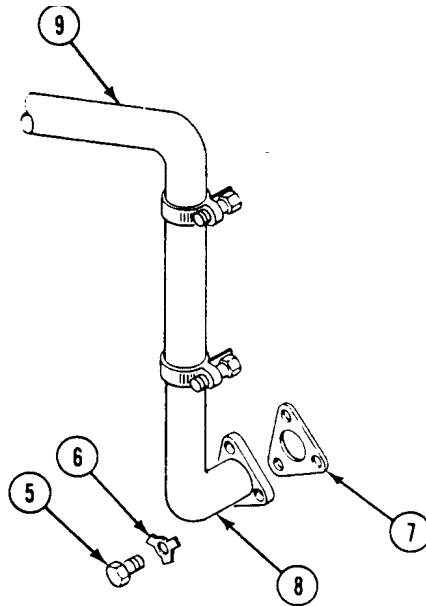
32. Connect air box heater fuel supply hose (20) to tee (19).



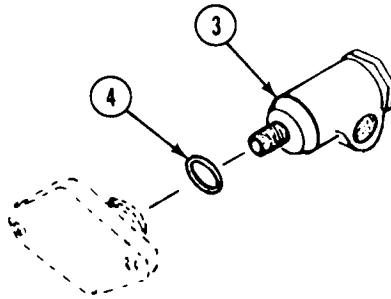
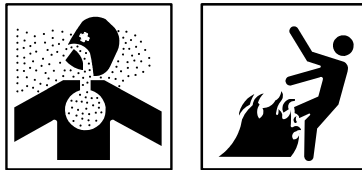
33. Connect fuel return hose (10) to tee (11). Use open end wrench.



34. Install oil filler elbow (8), hose (9), and new gasket (7) on engine. Secure with three new key washers (6) and screws (5).



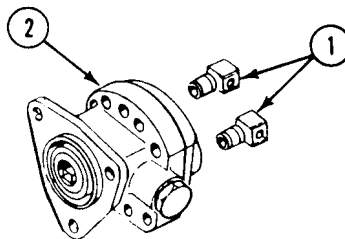
35. Install tachometer drive adapter (3) and new gasket (4) on engine.

**WARNING**

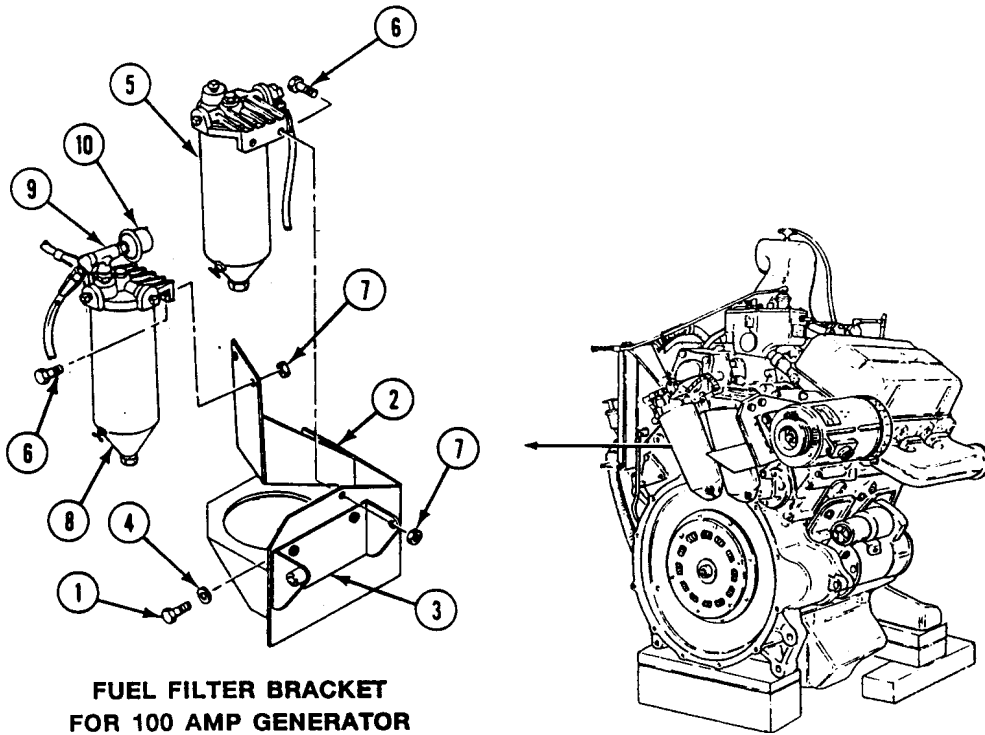
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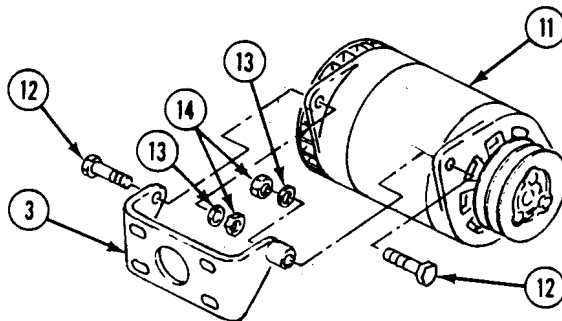
36. Apply a thin, even coat of primer and then sealing compound to cleaned external pipe threads of elbows (1). Do not apply primer or sealant beyond small end of threads.
37. Install two elbows (1) in fuel pump (2).



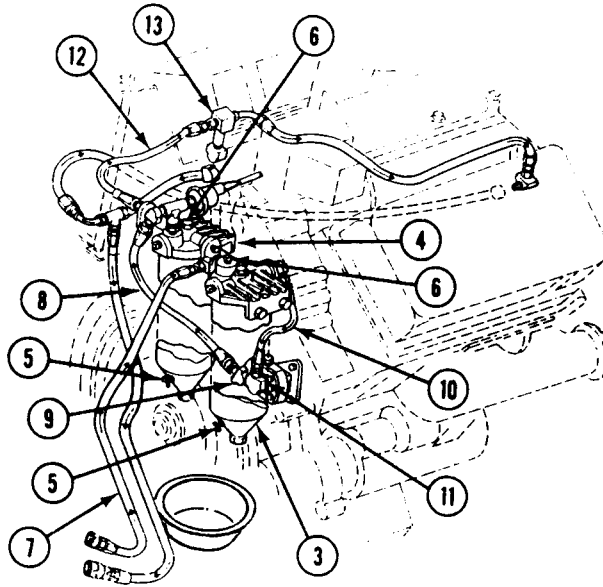
38. Apply a thin coat of antiseize compound to cleaned threads of four screws (1).
39. Install fuel filter mounting bracket (2) with generator mount (3) on engine. Secure with four screws (1) and washers (4). TIGHTEN SCREWS TO 50-55 LB-FT (68-75 N·M) TORQUE. Use torque wrench.
40. Install primary fuel filter (5) on bracket (2) at right side. Secure with two screws (6) and new locknuts (7).
41. Install secondary fuel filter (8) with tee (9) and neutral start switch assembly (10) on bracket (2) at left side. Secure with two screws (6) and new locknuts (7).

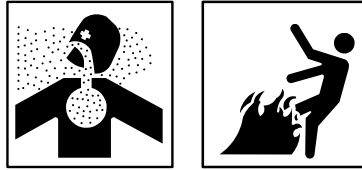


42. Install generator (11) on generator mount (3). Secure with two screws (12), washers (13), and new locknuts (14).



43. Connect fuel supply hose (12) to tee (13) and secondary fuel filter (4).
44. Connect fuel supply hose (10) to fuel pump outlet elbow (11) and primary fuel filter (3).
45. Connect fuel supply hose (8) to fuel pump inlet elbow (9) and secondary fuel filter (4).
46. Connect fuel supply hose (7) to primary fuel filter (3).
47. Service both fuel filters (see your -20).

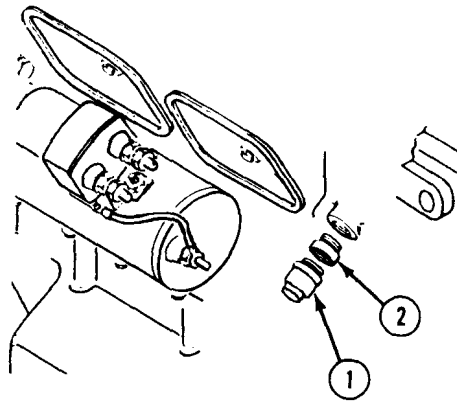


WARNING

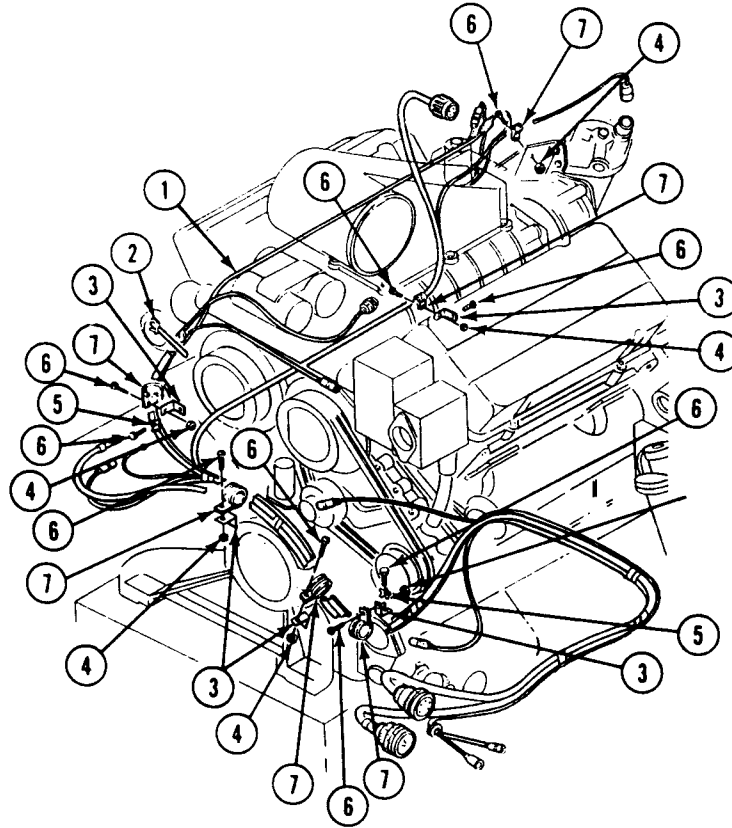
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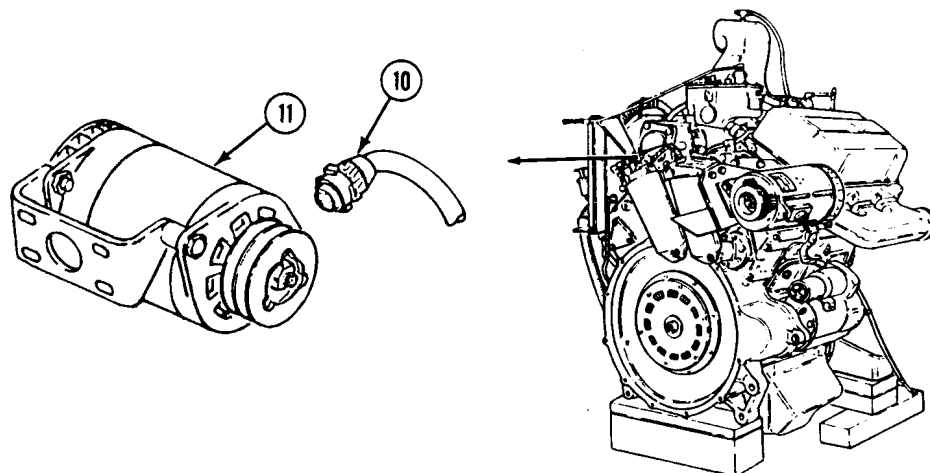
48. Apply a thin, even coat of primer and then sealing compound to cleaned external pipe threads of bushing (2). Do not apply primer or sealant beyond small end of threads.
49. Install engine low oil pressure switch bushing (2) and switch (1) on engine block.



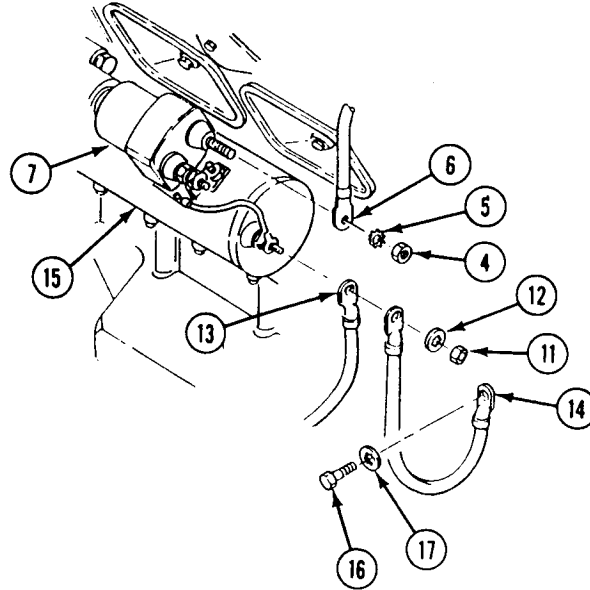
50. Install power plant wiring harness (1) on engine. Secure with new tie strap (2), five brackets (3), six nuts (4), two washers (5), nine screws (6), and six clamps (7).



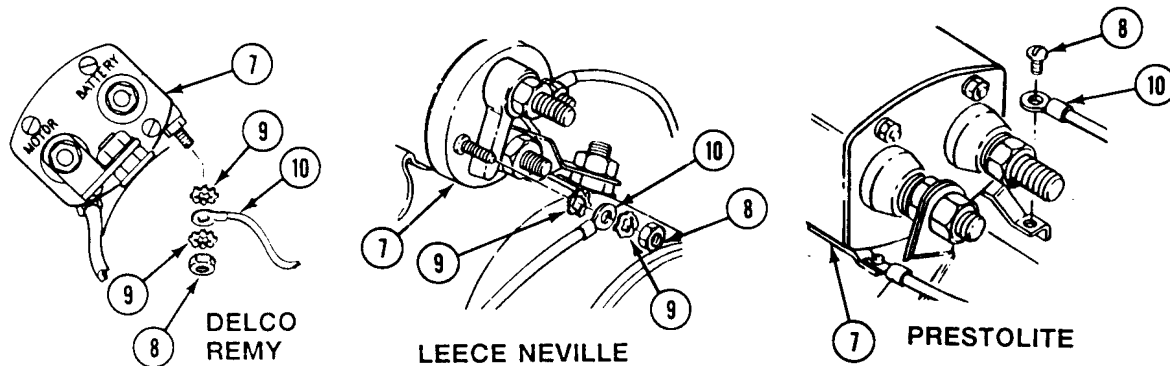
51. Connect cable (10) to generator (11).



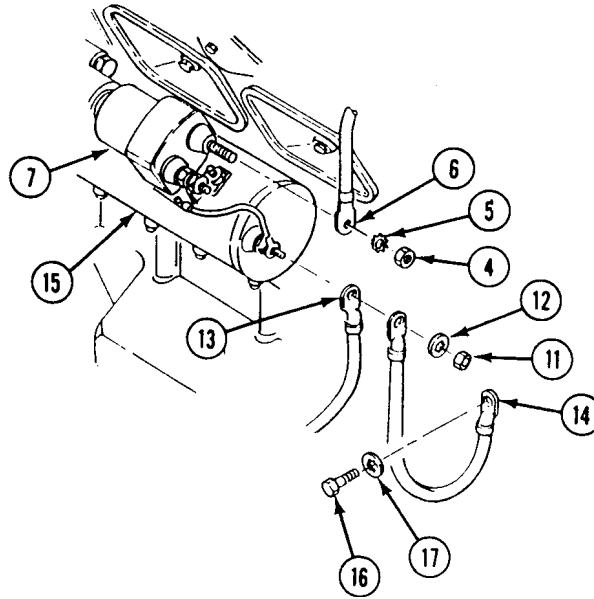
52. Install ground lead (14) on engine block. Secure with new lockwasher (17) and screw (16).
53. Install two ground leads (14) and (13) on starter (15). Secure with new lockwasher (12) and nut (11).



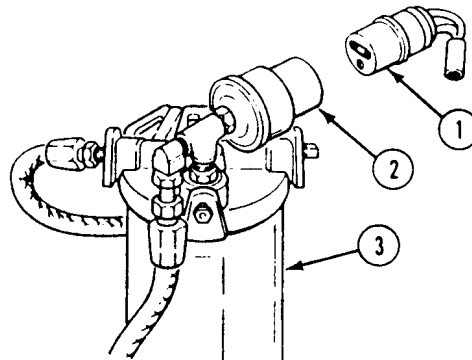
54. Install two new lockwashers (9) (Delco and Leece Neville only) and circuit 74A lead (10) on terminal of starter solenoid (7). Secure with nut (8) (screw on Prestolite).



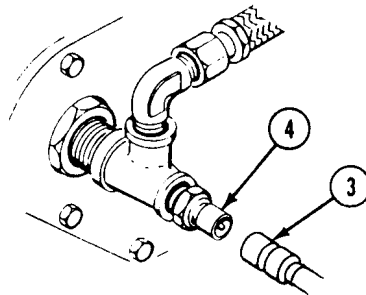
55. Install circuit 6 lead (6) on terminal of starter solenoid (7). Secure with new lockwasher (5) and nut (4).



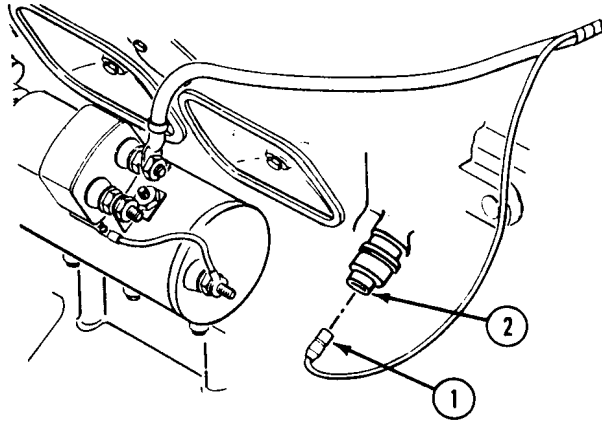
56. Connect power plant wiring harness circuits 1A and 1B lead (1) to field switch (2) at secondary fuel filter (3).



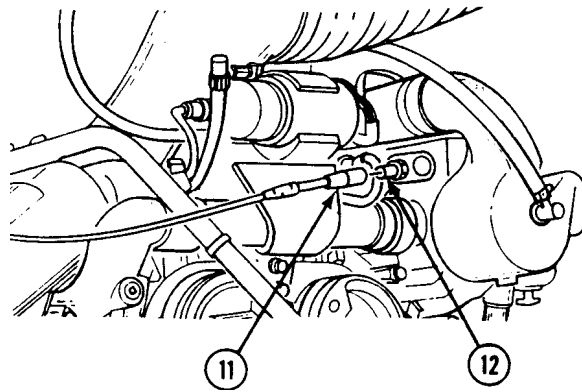
57. Connect power plant wiring harness circuit 327 lead (3) to transmission oil temperature sending unit (4).



58. Connect power plant wiring harness circuit 34 lead (1) to engine low oil pressure switch (2).

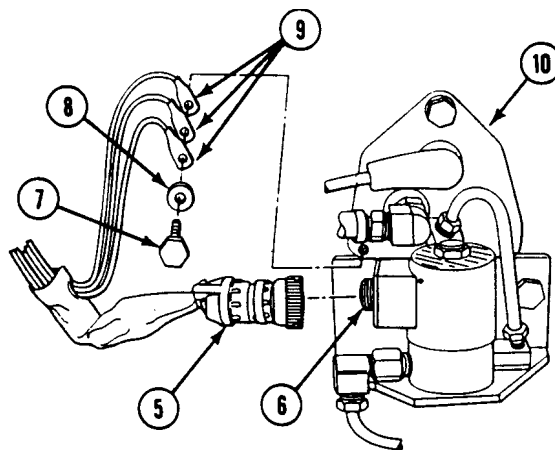


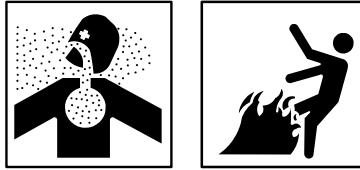
59. Connect power plant wiring harness circuit 33 lead (11) to coolant temperature sending unit (12).



60. Connect three ground leads (9) to air box heater bracket (10). Secure with screw (7) and new lockwasher (8).

61. Connect power plant wiring harness circuit 406 lead (5) to air box heater wiring harness connector (6).

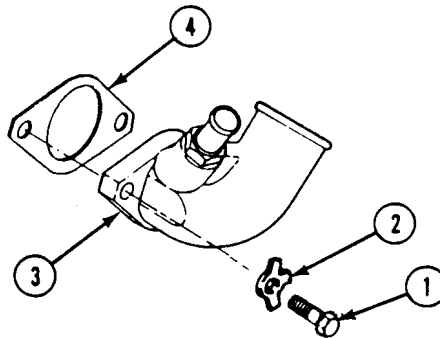


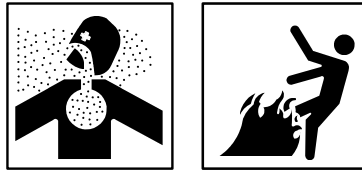
WARNING

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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.

62. Apply a thin coat of sealant to both sides of gasket (4) before assembly.
63. Apply a thin coat of antiseize compound to cleaned threads of screws (1).
64. Install new gasket (4) and oil cooler elbow (3) on engine. Secure with two screws (1) and new key washers (2).

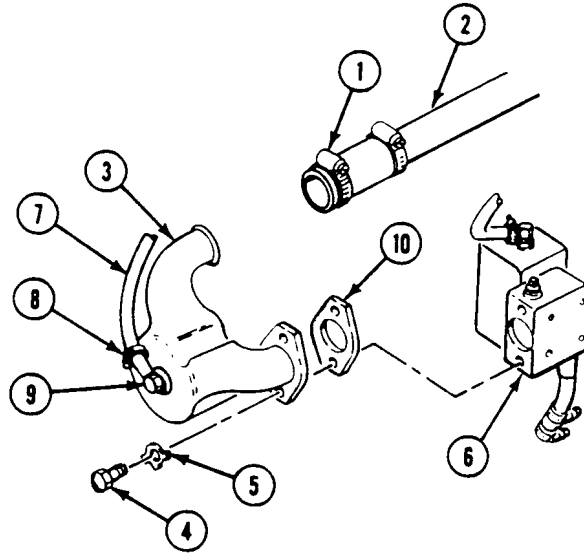


WARNING

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65. Apply a thin coat of sealant to both sides of gasket (10) before assembly.
66. Install deaeration elbow (3) with hose (7), clamp (8), elbow (9), and new gasket (10) on thermostat housing cover (6). Secure with two screws (4) and new key washers (5).
67. Connect coolant tube (2) to deaeration elbow (3). Secure with clamp (1).

**FOLLOW-THROUGH STEPS**

1. Install transfer gearcase on engine (WP 0019 00).
2. Install transmission on transfer gearcase (WP 0016 00).
3. Install power plant in carrier (see your -20).
4. Change engine oil and filter (see your -20).
5. Change fuel filters (see your -20).
6. Check belt tension (see your -20).
7. Adjust engine power disconnect (see your -20).
8. Adjust governor linkage (see your -20).

END OF TASK

REPAIR 100 AMP GENERATOR FUEL FILTER MOUNTING BRACKET

0022 00

THIS WORK PACKAGE COVERS:

Repair (page 0022 00- 1).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Metal Worker 44B10

Tools and Special Tools

Body and Fender Repair Tool Kit (WP 0104 00, Item 27)
 Welding Shop, Trailer-Mounted (WP 0104 00, Item 49)

References

TC 9-237
 TM 43-0139
 TB 43-0242

Materials/Parts

Anodic coating (WP 0105 00, Item 4)
 Solvent, cleaning compound (WP 0105 00, Item 10)
 Wiping rag (WP 0105 00, Item 28)
 Steel sheet or plate, 3" x 1" x 3/16"

Equipment Condition

Fuel filter bracket removed (see your -20)

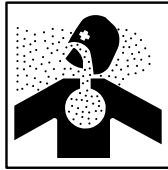
REPAIR

NOTE

This procedure is to be performed on cracked brackets only.

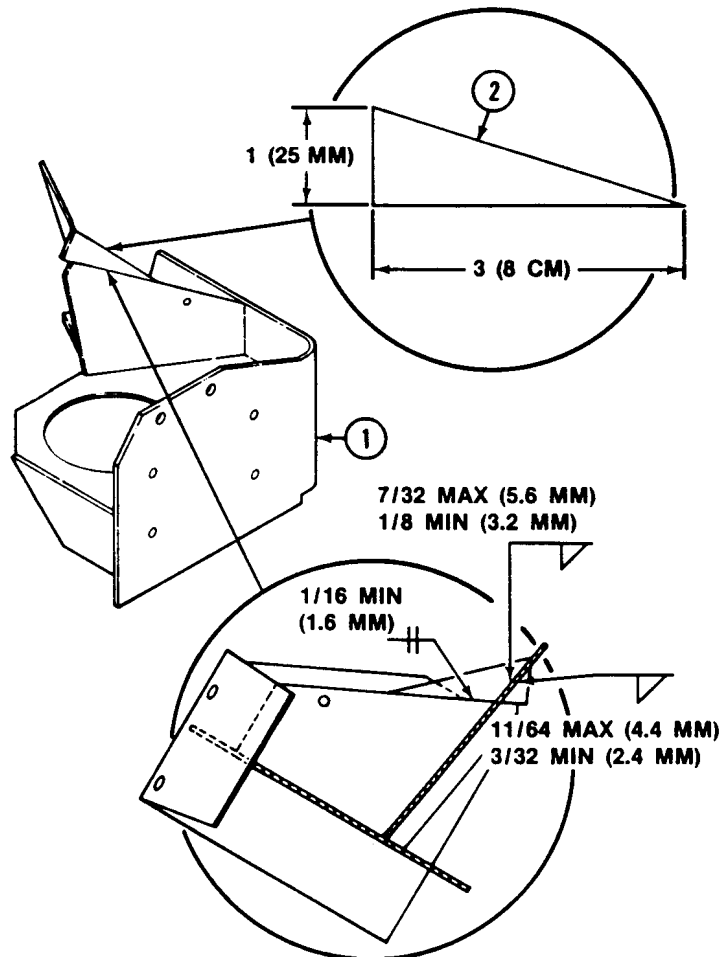
1. Clean fuel filter bracket (1) using solvent, cleaning compound and wiping rag.
2. Fabricate reinforcement plate (2) for welding.
3. Clamp reinforcement plate (2) to bracket (1) in position as shown.

WARNING



Fumes from welding cadmium plated fuel filter bracket are toxic and can poison you. Wear a respirator and use in a well ventilated area to protect you against fume poisoning.

4. Weld plate (2) to bracket (1) in accordance with TC 9-237. Welding of crack(s) are not necessary.



5. Apply paint to repaired area. See TM 43-0139/TB 43-0242.

FOLLOW-THROUGH STEPS

1. Install fuel filter bracket (see your -20).

END OF TASK

CHAPTER 5

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR FUEL SYSTEM

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
REPAIR AIR CLEANER HOUSING.....	0023 00
REPAIR FUEL TANK (M577A2 AND M1068 ONLY).....	0024 00

REPAIR AIR CLEANER HOUSING

0023 00

THIS WORK PACKAGE COVERS:

- Disassembly (page 0023 00-1).
 - Inspect and Repair (page 0023 00-1).
 - Assembly (page 0023 00-2).
-

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Equipment Condition

Air cleaner housing removed (see your -20)

Materials/Parts

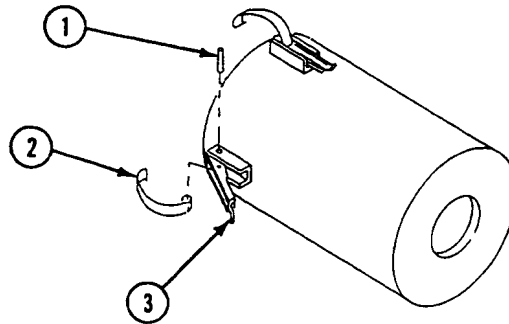
Rivet

DISASSEMBLY

NOTE

You will have one of two air cleaner configurations. Body and elements are not interchangeable except as sets.

1. Remove rivet (1) and spring clip (2) from latching lever (3). Discard rivet.



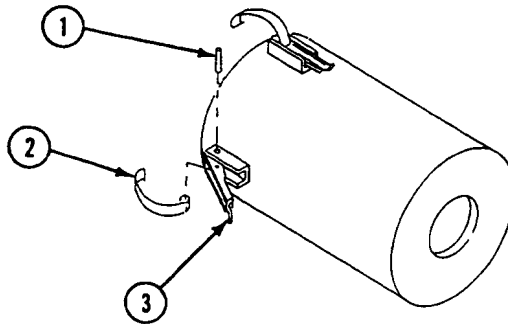
INSPECT AND REPAIR

1. Inspect parts for corrosion, distortion, cracks, breaks, and loose or missing parts. Repair or replace damaged or missing parts.

ASSEMBLY**NOTE**

You will have one of two air cleaner configurations. Body and elements are not interchangeable except as sets.

1. Install spring clip (2) in latching lever (3). Secure with new rivet (1).

**FOLLOW-THROUGH STEPS**

1. Install air cleaner housing (see your -20).

END OF TASK

REPAIR FUEL TANK (M577A2 AND M1068 ONLY)

0024 00

THIS WORK PACKAGE COVERS:

Cleaning (page 0024 00-1).
 Repair (page 0024 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

References

See your -20
 TC 9-237

Tools and Special Tools

Body and Fender Repair Tool Kit (WP 0104 00, Item 27)
 Trailer-Mounted Welding Shop (WP 0104 00, Item 49)

Equipment Condition

Fuel tank removed (see your -20)
 Fuel tank access cover removed (see your -20)
 Fuel quantity sending unit removed (see your -20)

Materials/Parts

Sealing compound (WP 0105 00, Item 20)
 Wiping rag (WP 0105 00, Item 28)

Personnel Required

Metal Worker 44B10

CLEANING

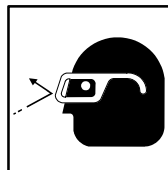
WARNING



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.

1. Use a wire brush to remove paint and dirt from outer surface area to be welded.

WARNING

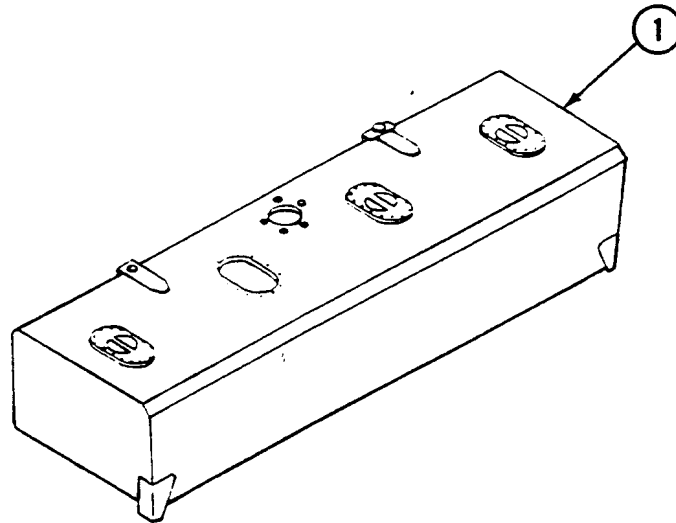


Air pressure in excess of 30 psi (207 kPa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

CAUTION

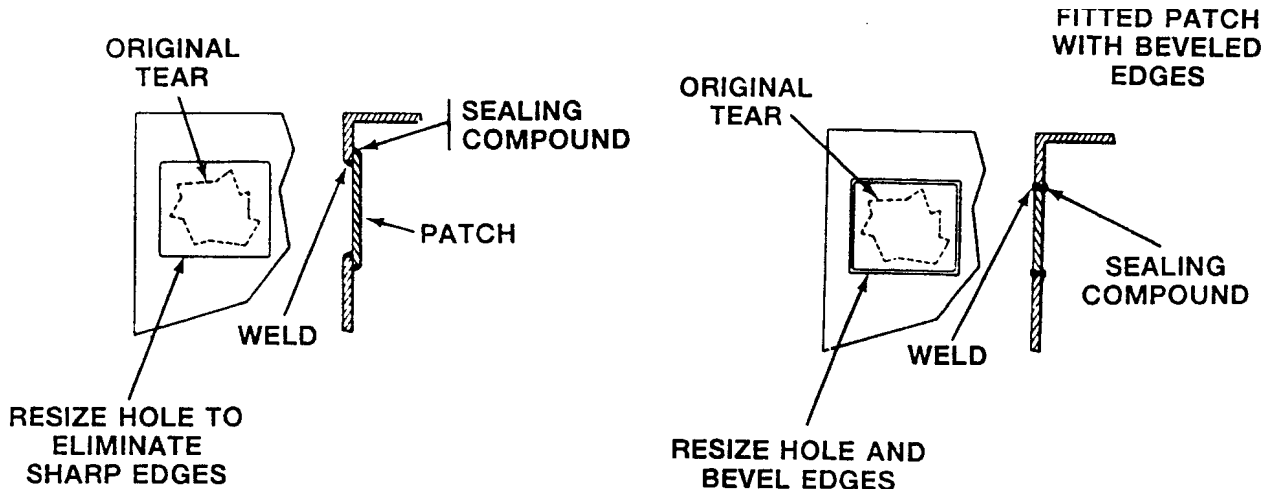
Do not expose seal areas to steam for more than 15 minutes, as existing seal will begin to deteriorate.

2. Steam clean inside of fuel tank (1). Use clean rags and 30 psi (207 kPa) compressed air to dry.
3. Direct carbon dioxide or argon gas into fuel tank (1) at 30-60 cubic feet (0.84-1.68 cubic meters) per hour until gas escapes from access cover openings.

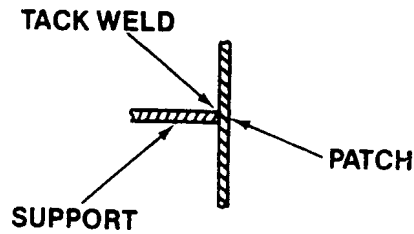


REPAIR

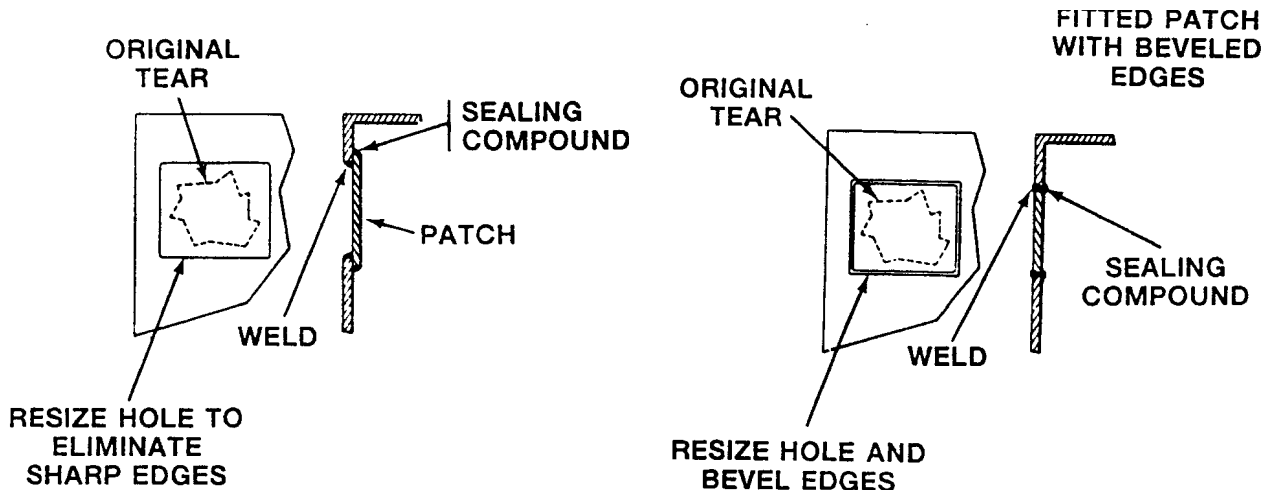
1. Plan to weld on outside of fuel tank, if possible.
2. Determine type of repair, overlapping or fitted patch.
3. Resize hole in fuel tank, to remove sharp edges or cracks, for type of patch selected.
4. Prepare a piece of aluminum of the same alloy and thickness as the fuel tank.
5. Size patch to cover hole in fuel tank.



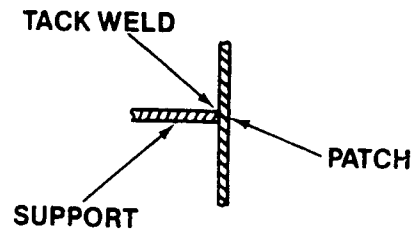
6. Tack weld a small piece of aluminum upright to center of patch to hold patch for welding.



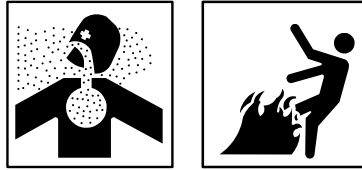
7. Weld patch to fuel tank. See TC 9-237 and your -20.



8. Break support away from patch. Discard support.



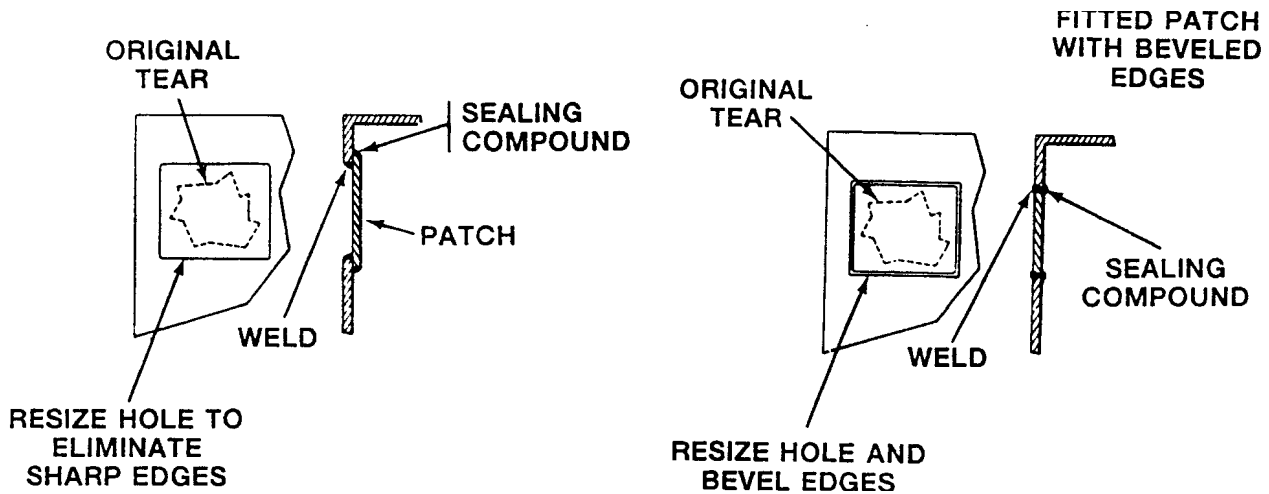
WARNING



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9. Seal weld patch with sealing compound.



FOLLOW-THROUGH STEPS

1. Install fuel quantity sending unit (see your -20).
2. Install fuel tank access cover (see your -20).
3. Install fuel tank (see your -20).

END OF TASK

CHAPTER 6

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR COOLING SYSTEM

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
REPAIR RADIATOR.....	0025 00
REPAIR RADIATOR AUXILIARY TANK.....	0026 00
REPAIR FAN.....	0027 00

REPAIR RADIATOR

0025 00

THIS WORK PACKAGE COVERS:

- Clean and Inspect (page 0025 00-1).
- Test Radiator for Leaks (page 0025 00-2).
- Flush Radiator (page 0025 00-2).
- Test Radiator for Flow (page 0025 00-3).
- Repair (page 0025 00-4).
- Rodding (page 0025 00-4).

INITIAL SETUP:

Maintenance Level

Direct Support

Materials/Parts

- Solder (WP 0105 00, Item 26)
- Soldering flux (WP 0105 00, Item 23)

Tools and Special Tools

- Body and Fender Repair Tool Kit (WP 0104 00, Item 27)
- Industrial Goggles (WP 0104 00, Item 21)
- Radiator Flow Test Machine (WP 0104 00, Item 18)
- Radiator Test Plug Set (WP 0104 00, Item 33)
- Radiator Test Stand (WP 0104 00, Item 43)
- Scratch Wire Brush (WP 0104 00, Item 5)
- Utility Apron (WP 0104 00, Item 3)

Personnel Required

Metal Worker 44B10

References

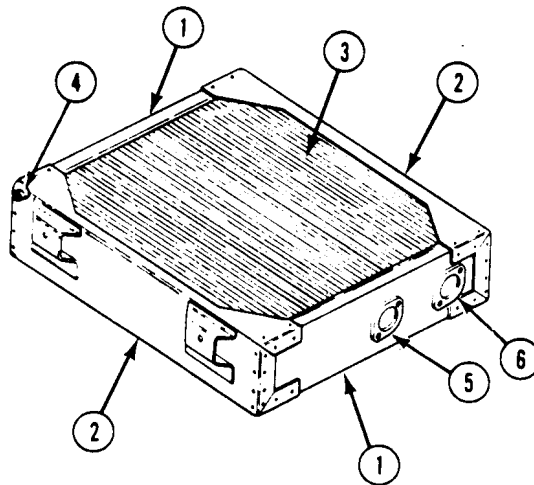
TM 750-254

Equipment Condition

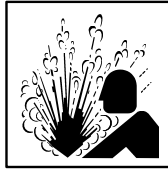
Radiator removed from carrier (see your -20)

CLEAN AND INSPECT

1. Clean radiator. See TM 750-254. Use safety goggles, rubber gloves, and rubber apron.
2. Inspect radiator. Check upper and lower tanks (1), side brackets (2), and tubes and fins (3). If damage is minor, pressure test radiator. If damage is major, see repair instructions to determine if radiator can be repaired.

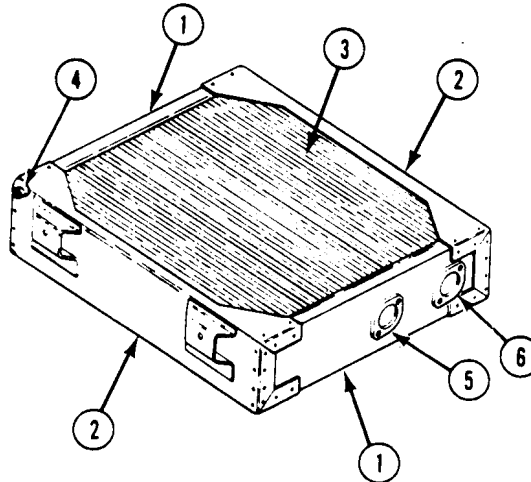


TEST RADIATOR FOR LEAKS

WARNING

Radiator can burst if over pressurized. Do not exceed 25 psi (172 kPa) air pressure. Ensure radiator is submerged before applying air pressure. Always wear safety goggles.

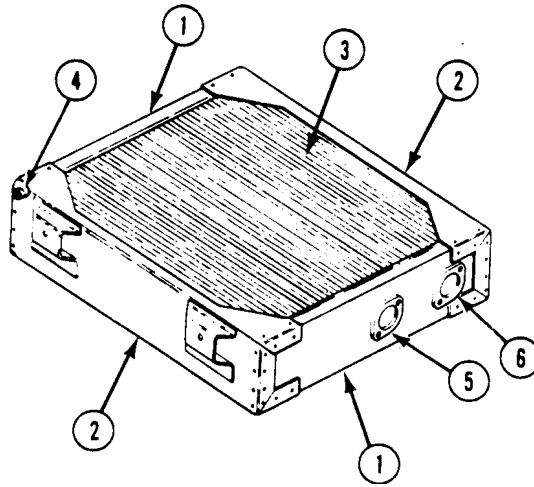
1. Plug auxiliary tank connector opening (4). Use radiator test plug set.
2. Plug radiator outlet opening (5). Use radiator test plug set.
3. Connect regulated air supply from radiator test stand to inlet opening (6).
4. Submerge radiator in radiator test stand. Apply 20-25 psi (137-172 kPa) air pressure to radiator.
5. If air bubbles appear, repair radiator. See REPAIR, Steps 1 - 6.



FLUSH RADIATOR

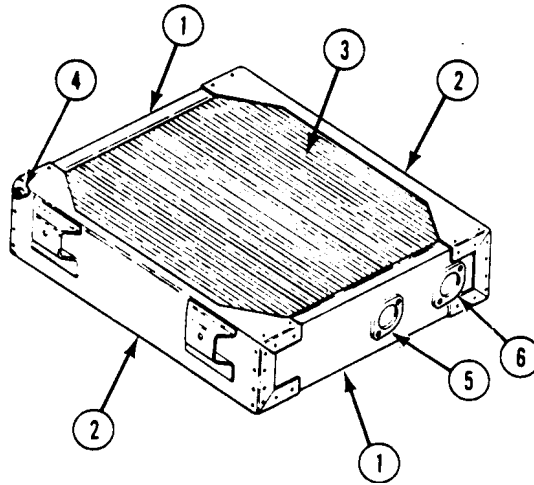
1. Plug auxiliary tank connection opening (4). Use radiator test plug set.
2. Connect water supply to radiator outlet opening (5). Use radiator test stand.

3. Flush radiator until water from radiator inlet opening (6) runs clear.



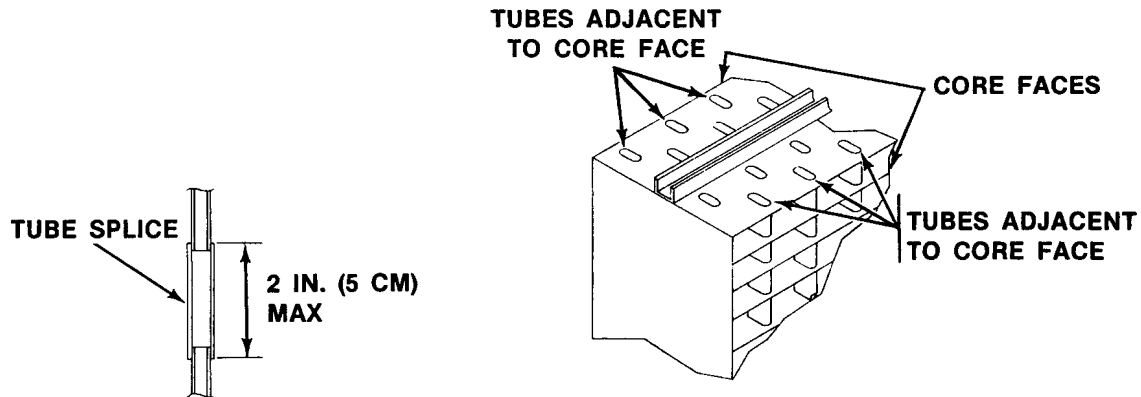
TEST RADIATOR FOR FLOW

1. Plug auxiliary tank connection opening (4). Use radiator test plug set.
2. Using radiator flow test machine, connect supply hose to radiator inlet (6).
3. Connect return hose of test machine to radiator outlet (5).
4. Flow test radiator at 70-80 gallons (276-292 liters) per minute. See TM 750-254.
5. If pressure drop is more than 4 psi (28 kPa), disassemble radiator and rod out radiator core. See RODDING, Steps 1 - 9.



REPAIR

1. Re-solder cracked solder joints and splice damaged tubes. If necessary to repair tube damage near end tanks, disassemble radiator. See RODDING, Steps 1 - 2.
2. Tube splicing shall be limited to no more than two tubes adjacent to the core face on either side.



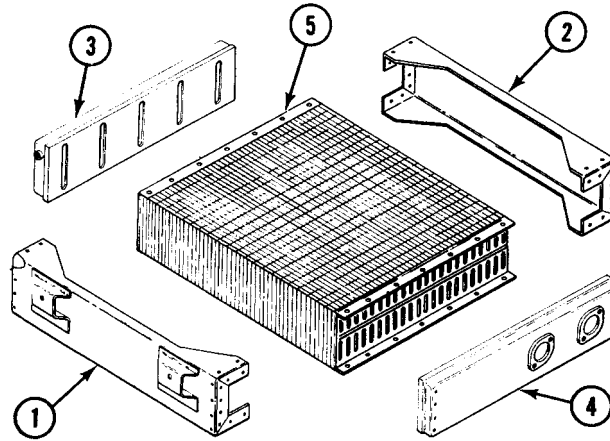
3. Removed areas of fin shall not exceed 6-1/2 square inches (42 sq cm) per side, per any tube repair. Length of tube splice shall not exceed 2 inches (5 cm). Tube blockage is not allowed.



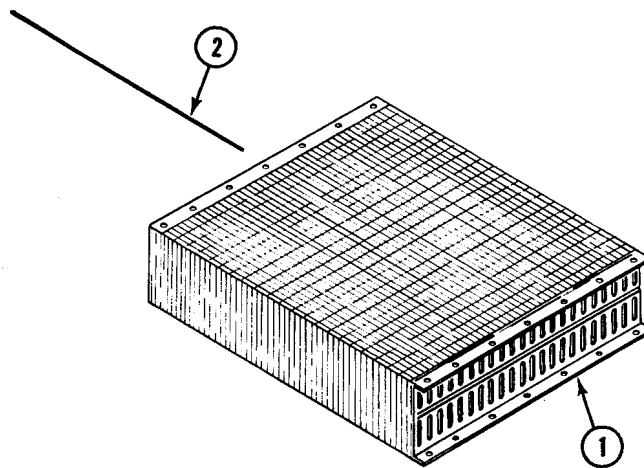
4. Heat solder repair of the upper and lower tanks, side brackets, and inlet and outlet openings is allowed.
5. Heat soldering of a core shall not exceed a linear length of 8 inches (20 cm) for any one core assembly.
6. Fin straightening is allowed.

RODDING

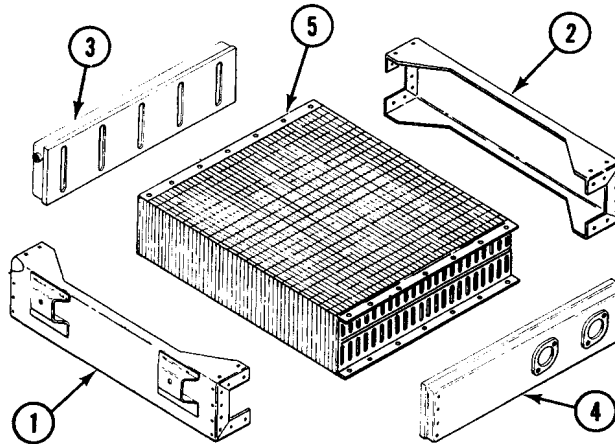
1. Heat melt and wire brush off the solder that secures two side brackets (1) and (2) to two end tanks (3) and (4).
2. Heat melt and wire brush off the solder that secures two end tanks (3) and (4) to core (5).



3. Wire brush rust, scale, and sediment from core tube openings (1).
4. Locate plugged tubes (1) by directing water into tubes. Check for flow at opposite end.
5. Insert a metal rod (2) long enough and slightly smaller in diameter than tubes (1) through tubes to remove blockage.
6. Clear tubes (1) until water flows through freely.



7. Install end tanks (3) and (4) on core (5). Secure with acid core solder.
8. Install two side brackets (2) and (1) on two end tanks (4) and (3). Secure with acid core solder.



9. Pressure test radiator (page 0025 00-2).

FOLLOW-THROUGH STEPS

1. Install radiator in carrier (see your -20).

END OF TASK

REPAIR RADIATOR AUXILIARY TANK

0026 00

THIS WORK PACKAGE COVERS:

Repair (page 0026 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

Body and Fender Repair Kit (WP 0104 00, Item 27)

Degreaser (WP 0104 00, Item 9)

Radiator Test Plug Set (WP 0104 00, Item 33)

Radiator Test Stand (WP 0104 00, Item 43)

References

TM 43-0139

TC 9-237

MIL-C-5541E

Equipment Condition

Radiator auxiliary tank removed from carrier
(see your -20)

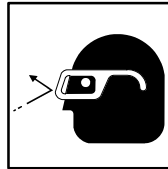
Personnel Required

Metal Worker 44B10

REPAIR

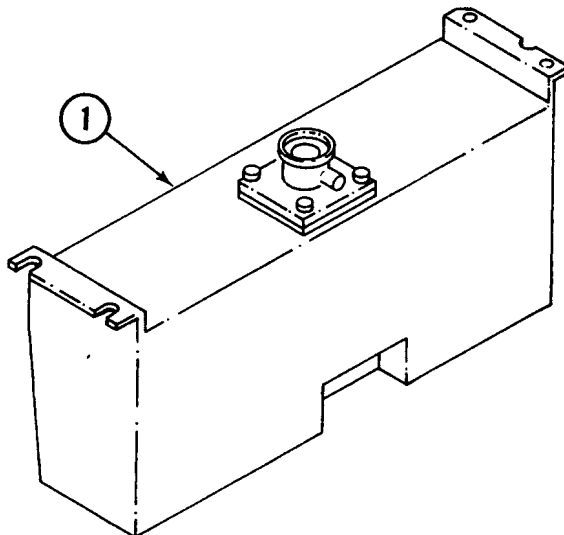
1. Degrease tank (1).

WARNING



Air pressure in excess of 30 psi (207 kPa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

2. Attach tank (1) to radiator test stand.



NOTE

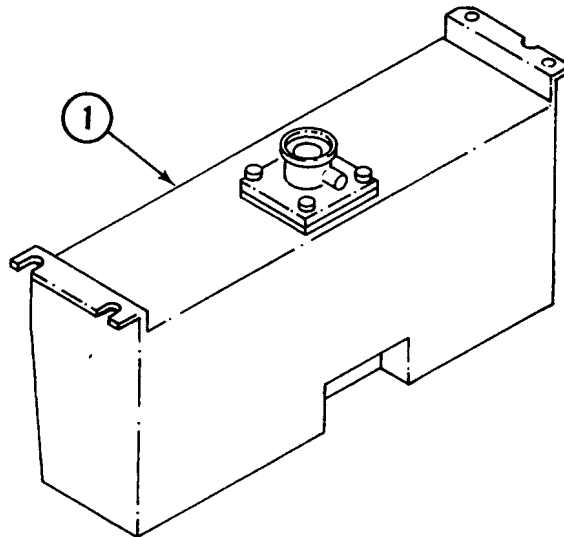
There are two ways to pressure test tank. If using water pressure, do Step 3, then go to Step 5. If using air pressure, go to Step 4.

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 TC 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-5541E, see TM 43-0139.

**FOLLOW-THROUGH STEPS**

1. Install radiator auxiliary tank (see your -20).

END OF TASK

REPAIR FAN

0027 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0027 00-1).
 Assembly (page 0027 00-4).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)
 Mechanical Puller Kit (WP 0104 00, Item 26)
 Retaining Ring Pliers (WP 0104 00, Item 29)
 Torque Wrench (WP 0104 00, Item 55)
 Torque Wrench (WP 0104 00, Item 58)

Materials/Parts

Sealing compound (WP 0105 00, Item 18)
 Flat washer
 Key washer (3)
 Locknut (8)
 Lockwasher (4)
 Preformed packing

Personnel Required

Track Vehicle Repairer 63H10

References

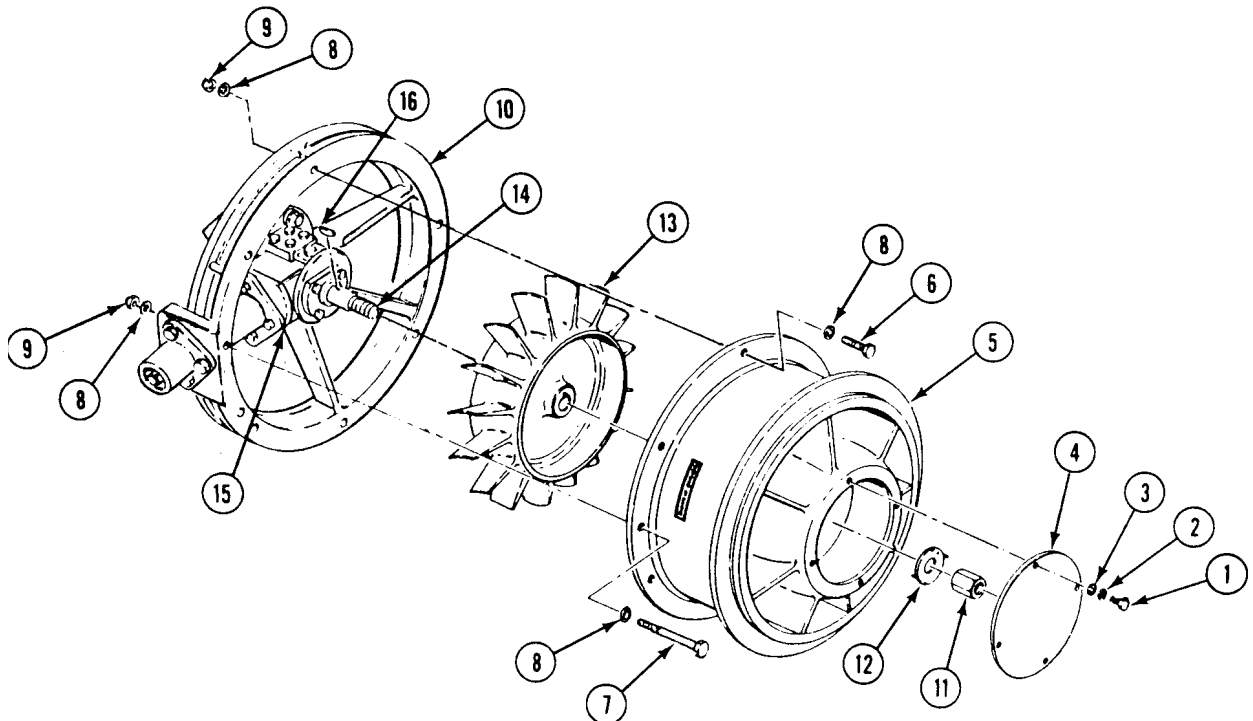
TM 9-214
 TM 9-2520-238-34

Equipment Condition

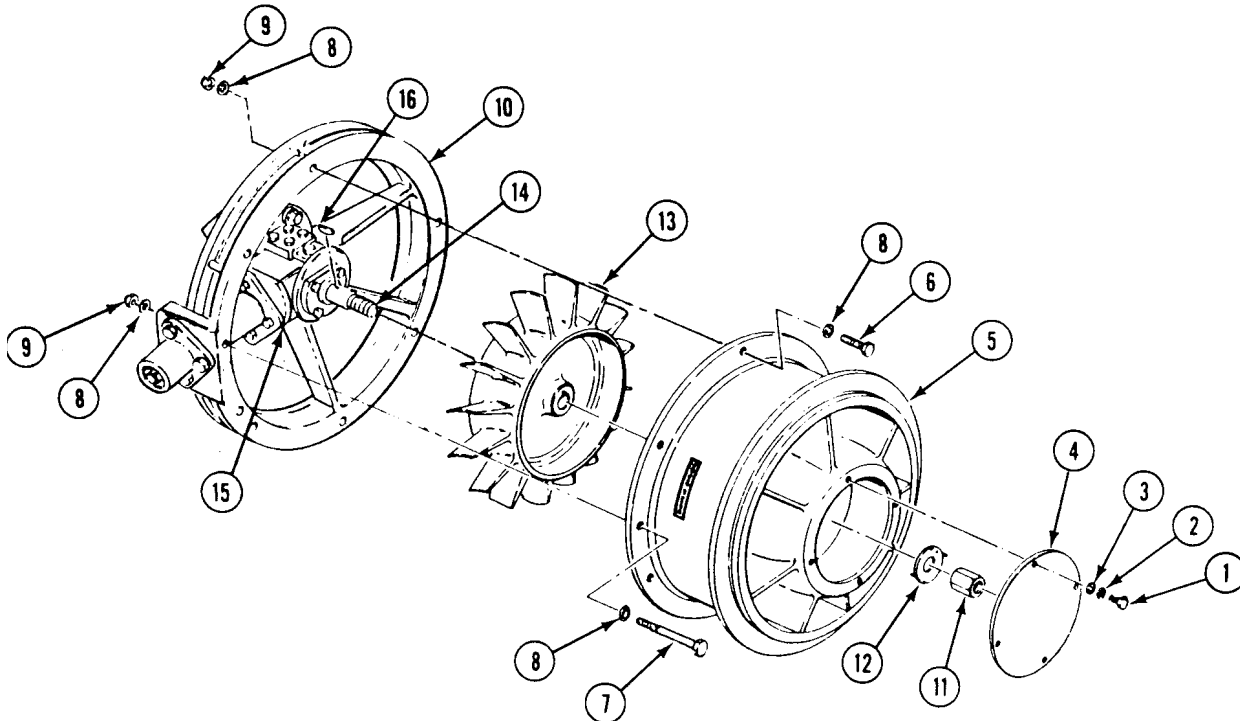
Fan assembly removed from carrier (see your -20)

DISASSEMBLY

1. Remove four screws (1), lockwashers (2), flat washers (3), and cover (4) from fan housing (5). Discard lockwashers.
2. Remove six screws (6), two screws (7), 16 flat washers (8), eight locknuts (9), and fan housing (5) from support (10). Discard locknuts.



3. Remove nut (11) and washer (12) that secure fan (13) to shaft (14) on gear box (15). Discard washer.
4. Use puller to remove fan (13) from gearbox (15).
5. Remove key (16) from shaft (14).



6. Remove three screws (1) and key washers (2) that secure housing (3) to support (4). Discard key washers.

NOTE

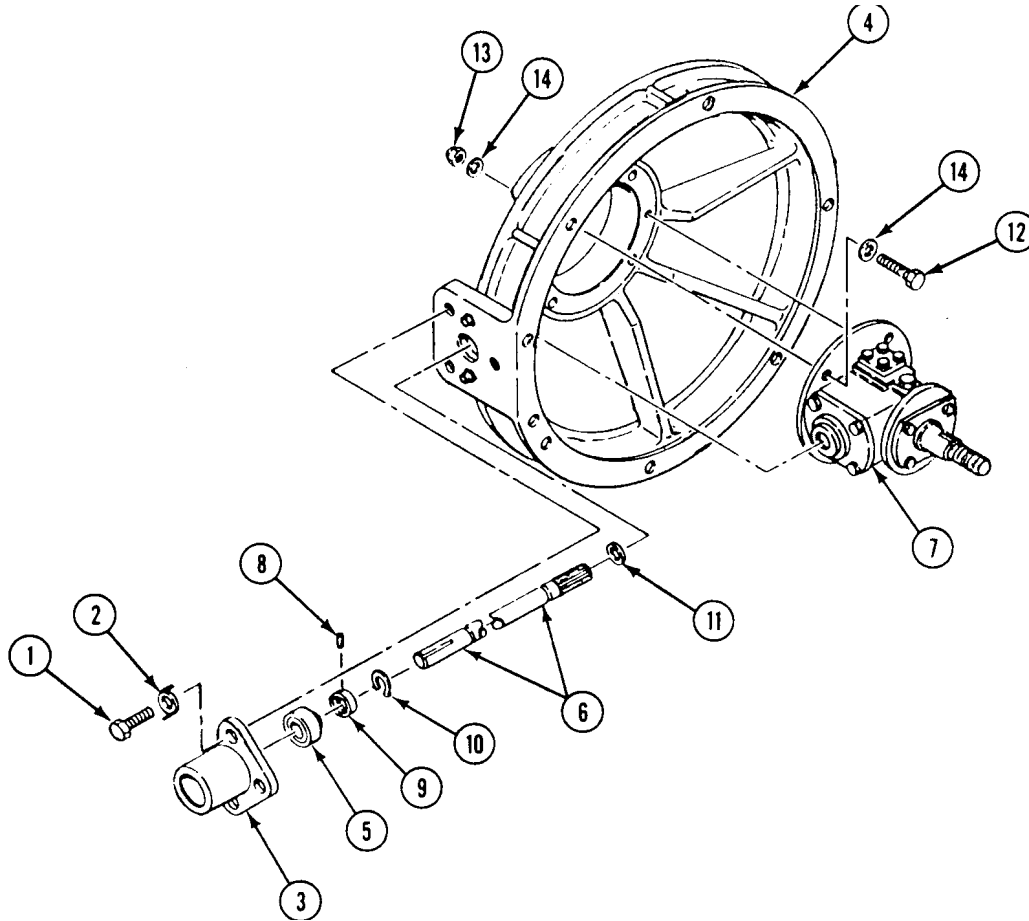
Refer to TM 9-214 for bearing maintenance.

7. Remove housing (3), bearing (5), and drive shaft (6) from gearbox (7) and support (4).
8. Loosen setscrew (8). Remove collar (9) and drive shaft (6) from housing (3).
9. Remove bearing (5) from housing (3).
10. Remove lock ring (10) and packing (11) from drive shaft (6). Use retaining ring pliers. Discard packing.

NOTE

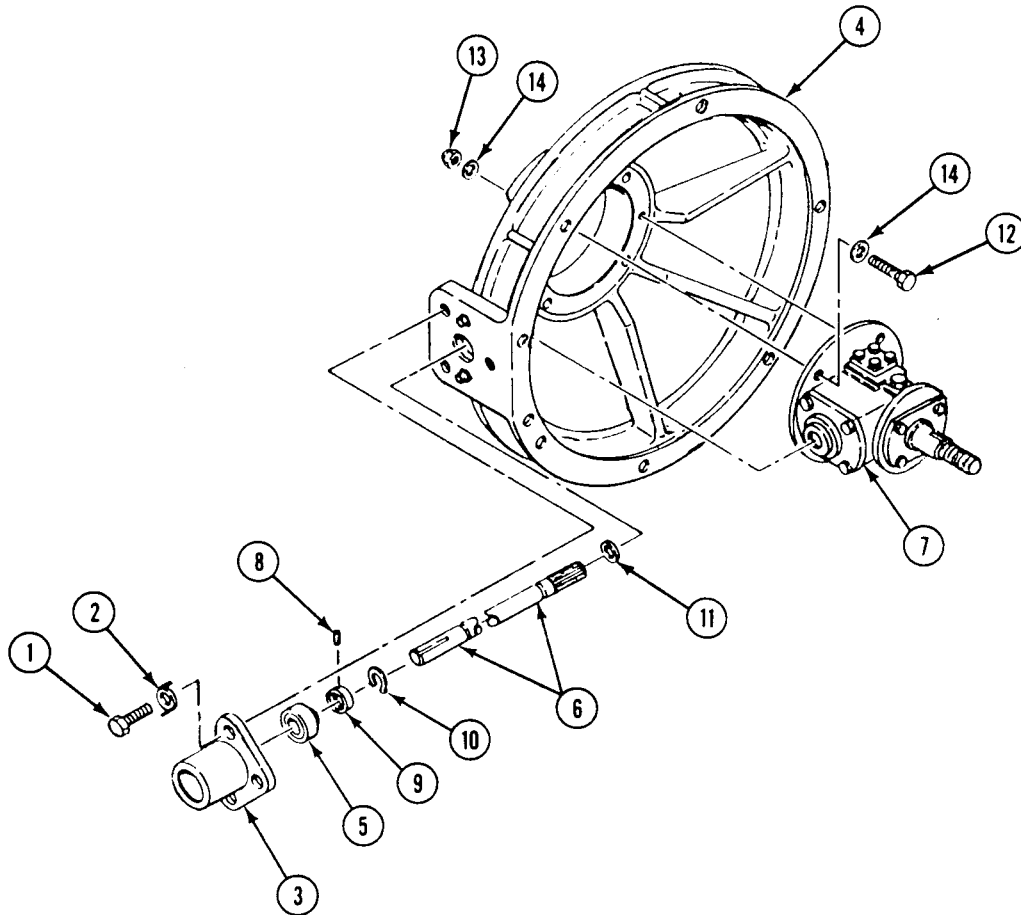
Refer to TM 9-2520-238-34 for disassembly of gearbox.

11. Remove four screws (12), nuts (13), eight washers (14), and gearbox (7) from support (4).



ASSEMBLY

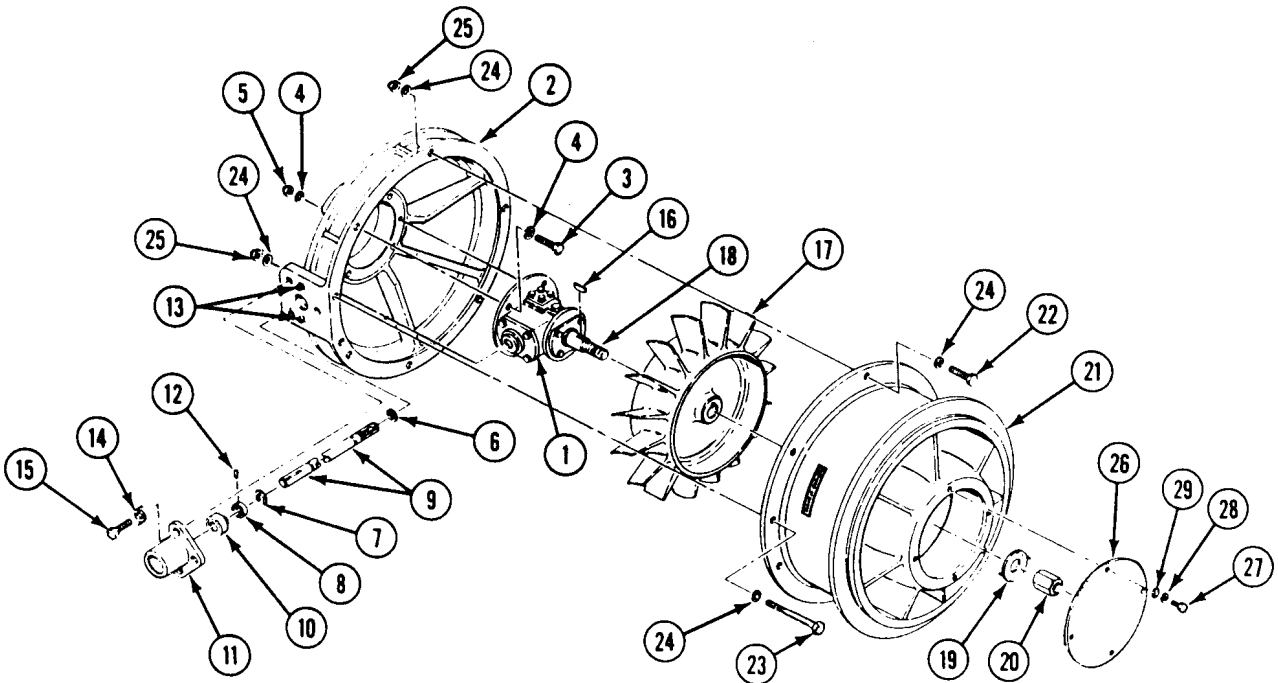
1. Install gearbox (7) on support (4). Secure with four screws (12), eight washers (14), and four nuts (13).
2. Install new packing (11), lock ring (10), and collar (9) on drive shaft (6). Use retaining ring pliers.
3. Install bearing (5) in housing (3).
4. Install housing (3) and bearing (5) on drive shaft (6) and collar (9) on bearing.
5. Position housing (3), bearing (5), and collar (9) against lock ring (10). Tighten setscrew (8).

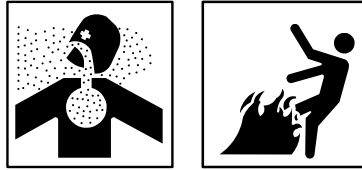


NOTE

Make sure two pins (13) are installed in support (2) before doing Step 6.

6. Install housing (11) and shaft (9) in gearbox (1).
7. Secure housing (11) to support (2) with three new key washers (14) and screws (15).
8. **TIGHTEN THREE SCREWS (15) TO 252-300 LB-IN (28-34 N·M) TORQUE.** Use torque wrench.
9. Install key (16) and fan (17) on shaft (18) of gearbox (1). Secure with new washer (19) and nut (20).
10. **TO SET ROTOR AND SEAL, TIGHTEN NUT (20) TO 70-75 LB-FT (95-102 N·M) TORQUE.** Then loosen nut. Use torque wrench.

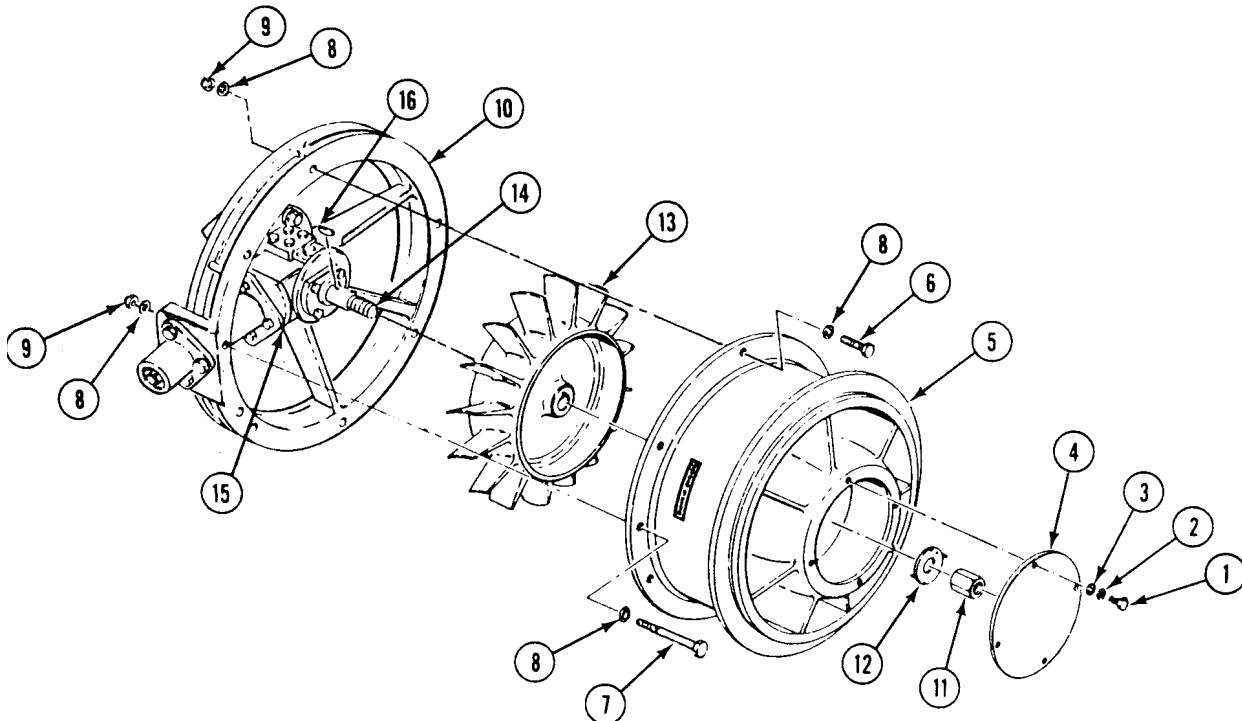


WARNING

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.

11. Apply sealing compound to both sides of washer (12).
12. TIGHTEN NUT (11) TO 324-384 LB-IN (37-43 N·M) TORQUE. Use torque wrench.
13. Bend one edge of washer (12) against nut (11) and on edge against fan (13).
14. Install fan housing (5) on support (10). Secure with six screws (6), two screws (7), 16 flat washers (8), and eight new locknuts (9).
15. Install cover (4) on fan housing (5). Secure with four screws (1), new lockwashers (2), and flat washers (3).

**FOLLOW-THROUGH STEPS**

1. Install fan assembly in carrier (see your -20).

END OF TASK

CHAPTER 7

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR ELECTRICAL SYSTEM

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
REPLACE INSTRUMENT PANEL GAUGES AND SWITCHES WIRING HARNESS.....	0028 00
REPLACE INSTRUMENT PANEL BATTERY AND GENERATOR GAUGES WIRING HARNESS.....	0029 00
REPLACE INFRARED POWER SUPPLY CABLE ASSEMBLY.....	0030 00
REPLACE POWER PLANT WIRING HARNESS.....	0031 00
REPLACE FRONT MAIN WIRING HARNESS.....	0032 00
REPLACE CHASSIS TURRET WIRING HARNESS (M901A1 ONLY).....	0033 00
REPAIR MULTIPIN CONNECTORS.....	0034 00

REPLACE INSTRUMENT PANEL GAUGES AND SWITCHES WIRING HARNESS

0028 00

THIS WORK PACKAGE COVERS:

- Removal (page 0028 00-1).
- Installation (page 0028 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Materials/Parts

- Locknut (2)
- Lockwasher (2)

Personnel Required

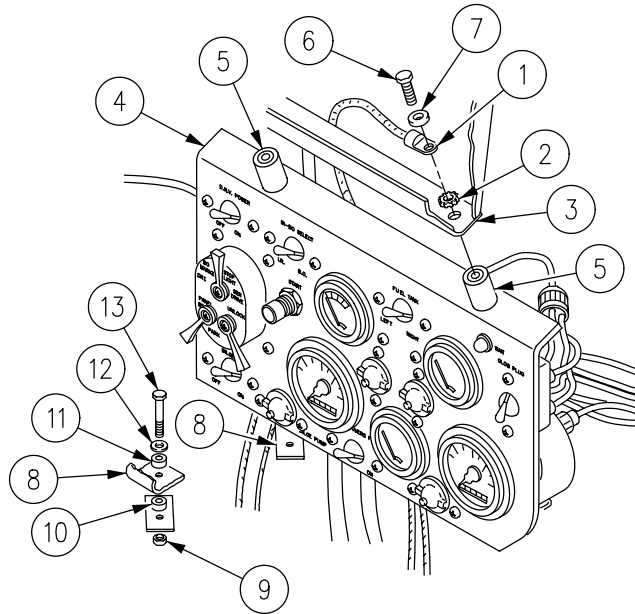
Track Vehicle Repairer 63H10

Equipment Condition

- Engine stopped/shutdown (see your -10)
- Carrier blocked (see your -10)
- Master switch turned OFF (see your -10)
- Battery ground lead disconnected (see your -20)
- Tachometer and speedometer disconnected from instrument panel gauges (see your -20)

REMOVAL

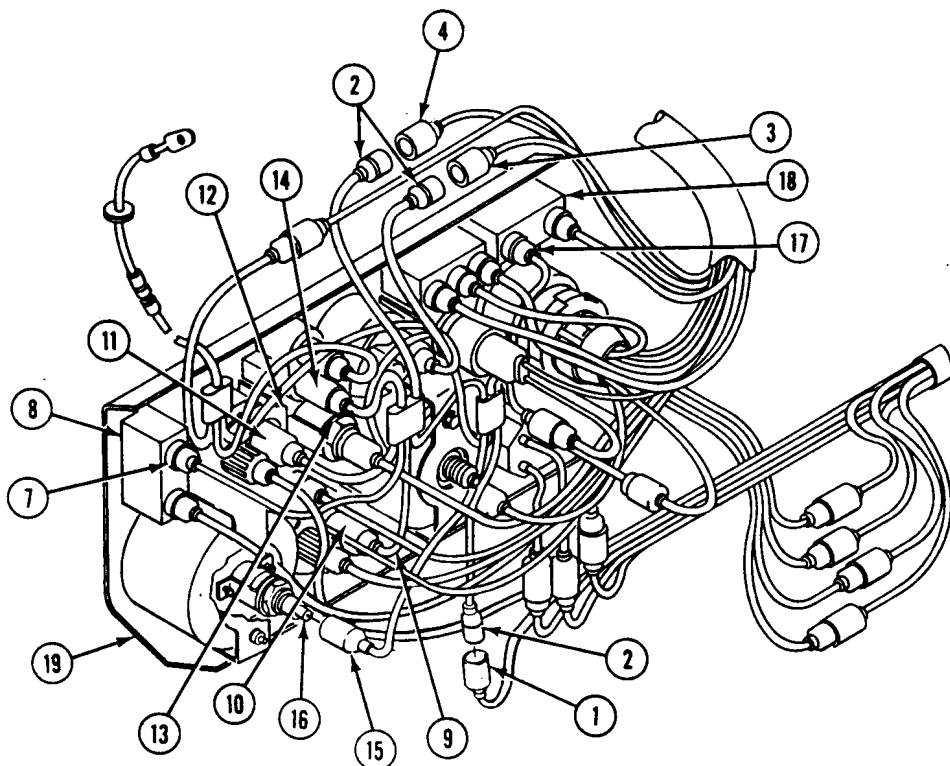
1. Remove two locknuts (9), mounts (10) and (11), flat washers (12), and screws (13) that secure instrument panel (4) to two struts (8). Discard locknuts.
2. Support panel (4). Remove two screws (6), flat washers (7), lockwashers (2), and ground lead (1) from two mounts (5) and upper support (3). Discard lockwashers.
3. Support panel (4) on two struts (8) to gain access to rear of panel.



REPLACE INSTRUMENT PANEL GAUGES AND SWITCHES WIRING HARNESS — Continued

0028 00

4. Disconnect circuit 38 lead (1) from instrument panel wiring harness (2).
5. Disconnect circuit 25A lead (3) from panel wiring harness (2).
6. Disconnect circuit 27F lead (4) from panel wiring harness (2).
7. Disconnect circuit 27C lead (7) from air box heater switch (8).
8. Disconnect circuit 27B lead (9) from engine coolant temperature gauge (10).
9. Disconnect circuit 27A lead (11) from fuel quantity gauge (12).
10. Disconnect circuit 27 lead (13) from instrument panel circuit breaker (14).
11. Disconnect circuit 459 lead (15) from master switch ON indicator light (16).
12. Disconnect circuit 516 lead (17) from infrared (I-R) power selector switch (18).
13. Remove panel wiring harness (2) from instrument panel (19).

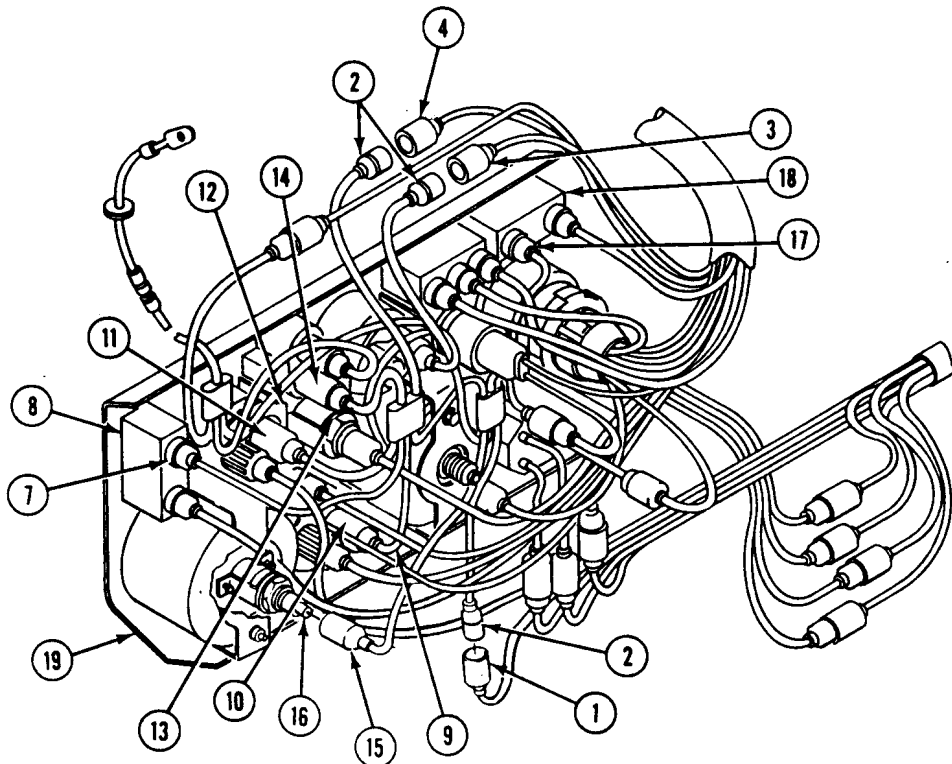


**REPLACE INSTRUMENT PANEL GAUGES AND SWITCHES WIRING
HARNESS — Continued**

0028 00

INSTALLATION

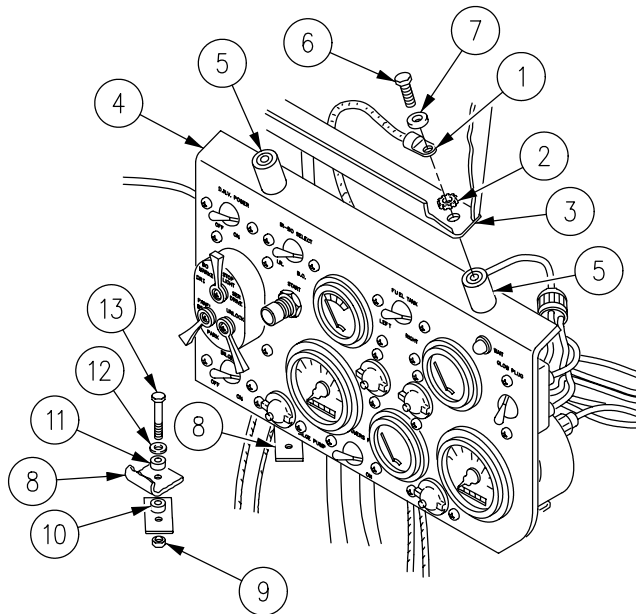
1. Install instrument panel wiring harness (2) on instrument panel (19).
2. Connect circuit 516 lead (17) to infrared (I-R) power selector switch (18).
3. Connect circuit 459 lead (15) to master switch ON indicator light (16).
4. Connect circuit 27 lead (13) to instrument panel circuit breaker (14).
5. Connect circuit 27A lead (11) to fuel quantity gauge (12).
6. Connect circuit 27B lead (9) to engine coolant temperature gauge (10).
7. Connect circuit 27C lead (7) to air box heater switch (8).
8. Connect circuit 27F lead (4) to panel wiring harness (2).
9. Connect circuit 25A lead (3) to instrument panel wiring harness (2).
10. Connect circuit 38 lead (1) to panel wiring harness (2).



**REPLACE INSTRUMENT PANEL GAUGES AND SWITCHES WIRING
HARNES — Continued**

0028 00

11. Install ground lead (1) and new lockwashers (2) on upper support (3).
12. Install instrument panel (4) with two mounts (5) on support (3). Secure with two screws (6) and flat washers (7).
13. Install panel (4) on two struts (8). Secure with two new locknuts (9), mounts (10) and (11), flat washers (12), and screws (13).

**FOLLOW-THROUGH STEPS**

1. Connect speedometer and tachometer cables to instrument panel gauges (see your -20).
2. Connect battery negative lead (see your -20).
3. Turn master switch ON (see your -20).
4. Drive carrier to check that panel gauges and lights operate properly (see your -10).
5. Stop/shutdown engine (see your -10).

END OF TASK

**REPLACE INSTRUMENT PANEL BATTERY AND GENERATOR
GAUGES WIRING HARNESS**

0029 00

THIS WORK PACKAGE COVERS:

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

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Materials/Parts

- Locknut (8)
- Locknut (2)
- Lockwasher (2)

Personnel Required

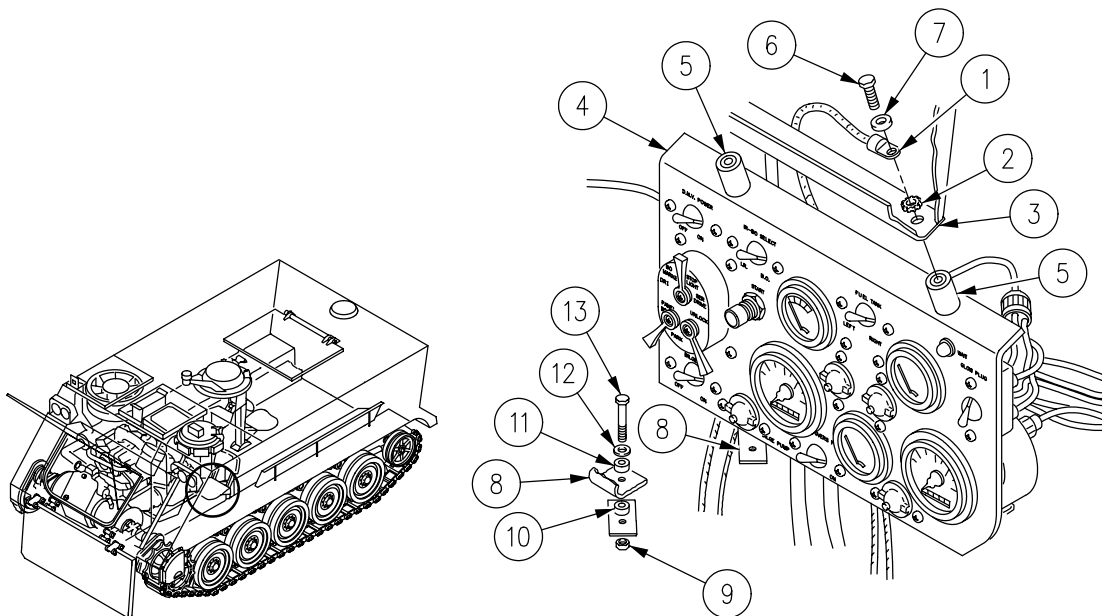
Track Vehicle Repairer 63H10

Equipment Condition

- Engine stopped (see your -10)
- Carrier blocked (see your -10)
- Master switch turned OFF (see your -10)
- Battery ground strap disconnected (see your -10)
- Tachometer and speedometer disconnected from instrument panel gauges (see your -20)

REMOVAL

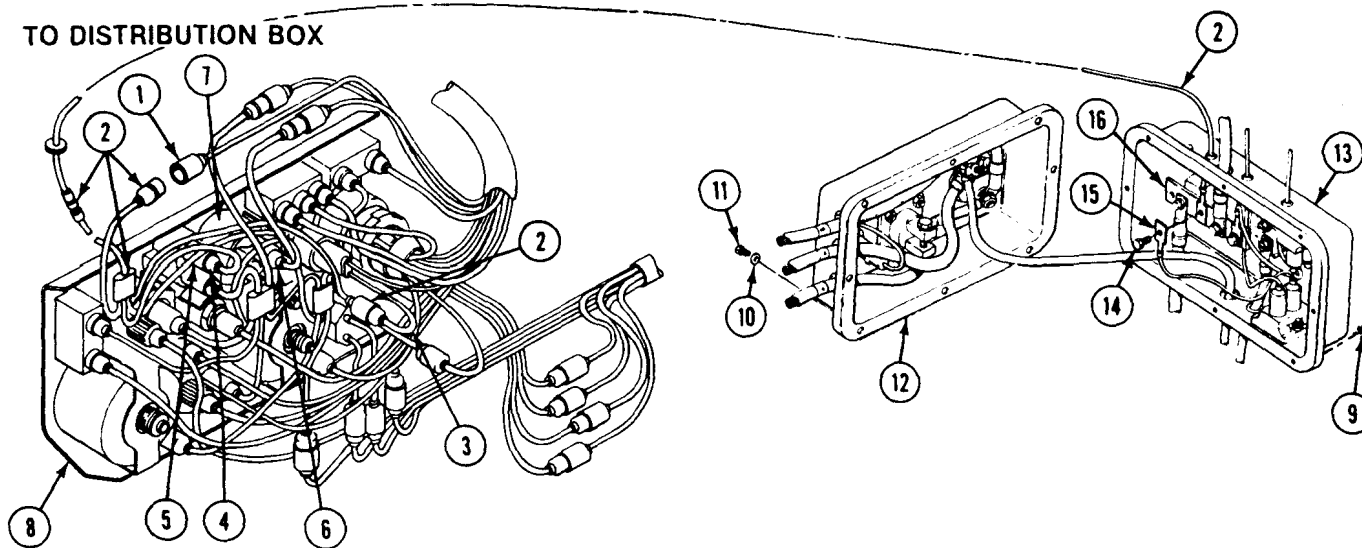
1. Remove two locknuts (9), mounts (10) and (11), washers (12), and screws (13) that secure instrument panel (4) to two struts (8). Discard locknuts.
2. Support panel (4). Remove two screws (6), washers (7), lockwashers (2), and ground strap (1) from two mounts (5) and upper support (3). Discard lockwashers.
3. Support panel (4) on two struts (8) to gain access to rear of panel.



**REPLACE INSTRUMENT PANEL BATTERY AND GENERATOR GAUGES
WIRING HARNESS — Continued**

0029 00

4. Disconnect circuit 15 lead (1) from instrument panel wiring harness (2).
5. Disconnect circuit 14 lead (3) from panel wiring harness (2).
6. Disconnect circuit 10 lead (4) from panel circuit breaker (5).
7. Disconnect circuit 27E lead (6) from battery generator gauge (7).
8. Remove panel wiring harness (2) from instrument panel (8).
9. Remove eight locknuts (9), washers (10), and screws (11). Separate master switch panel (12) from distribution box (13). Discard locknuts.
10. Remove screw (14), circuit 450A lead (15), and harness lead (2) from bus bar (16).
11. Remove panel wiring harness lead (2) from distribution box (13).

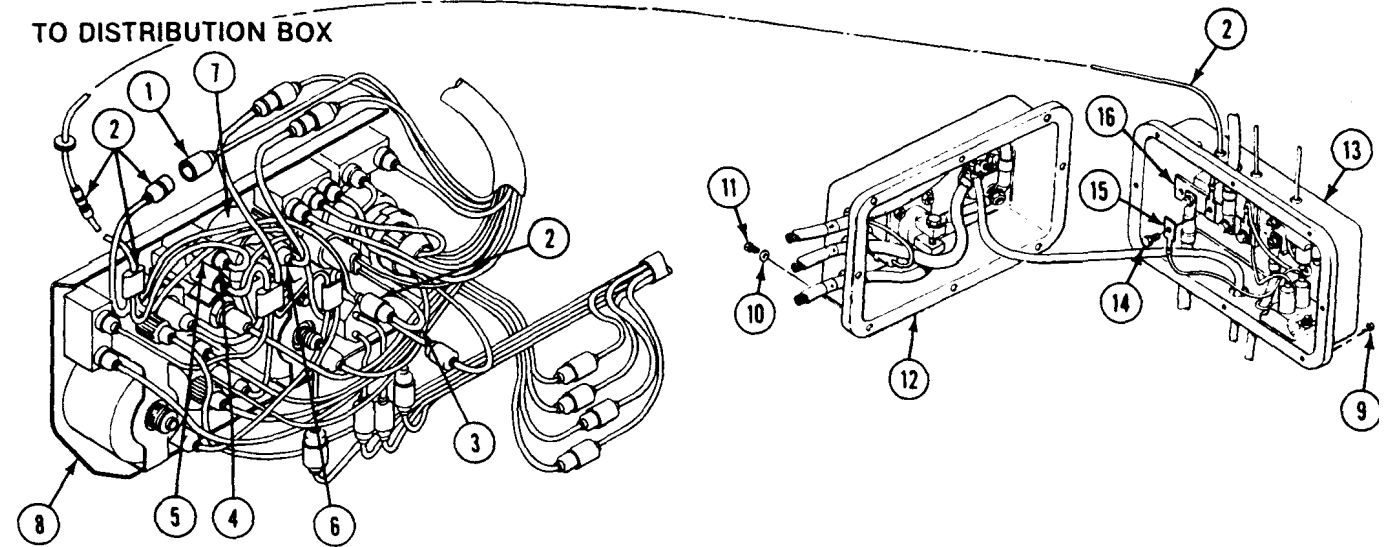
TO DISTRIBUTION BOX

INSTALLATION

1. Install harness lead (2) through hole in top of distribution box (13). Secure harness lead and circuit 450A lead (15) to bus bar (16) with screw (14).
2. Install master switch panel (12) on distribution box (13). Secure with eight screws (11), washers (10), and new locknuts (9).
3. Connect circuit 27E lead (6) to battery generator gauge (7).
4. Connect circuit 10 lead (4) to instrument panel circuit breaker (5).
5. Connect circuit 14 lead (3) to instrument panel wiring harness (2).

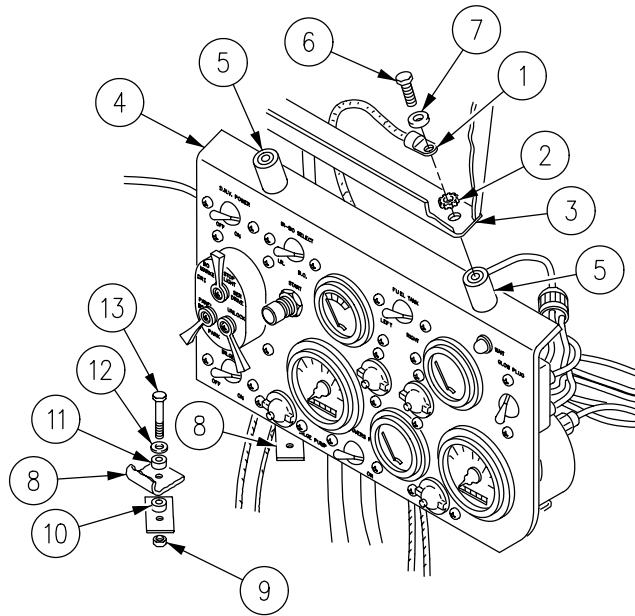
**REPLACE INSTRUMENT PANEL BATTERY AND GENERATOR GAUGES
WIRING HARNESS — Continued**

0029 00

6. Connect circuit 15 lead (1) to panel wiring harness (2).



7. Install ground lead (1) and new lockwashers (2) on upper support (3).
8. Install instrument panel (4) with two mounts (5) on support (3). Secure with two screws (6) and washers (7).
9. Install instrument panel (4) on two struts (8). Secure with two new locknuts (9), mounts (10) and (11), washers (12), and screws (13).



**REPLACE INSTRUMENT PANEL BATTERY AND GENERATOR GAUGES
WIRING HARNESS — Continued**

0029 00

FOLLOW-THROUGH STEPS

1. Connect tachometer and speedometer to instrument panel gauges (see your -20).
2. Connect battery ground strap (see your -20).
3. Master switch turned ON (see your -10).
4. Drive carrier to check that panel gauges and lights operate properly (see your -10).
5. Stop/shutdown engine (see your -10).

END OF TASK

REPLACE INFRARED POWER SUPPLY CABLE ASSEMBLY

0030 00

THIS WORK PACKAGE COVERS:

Removal (page 0030 00-1).
 Installation (page 0030 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Equipment Condition

Engine stopped/shutdown (see your -10)
 Carrier blocked (see your -10)
 Battery ground lead disconnected (see your -20)

REMOVAL

WARNING

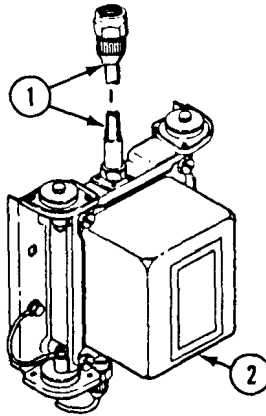
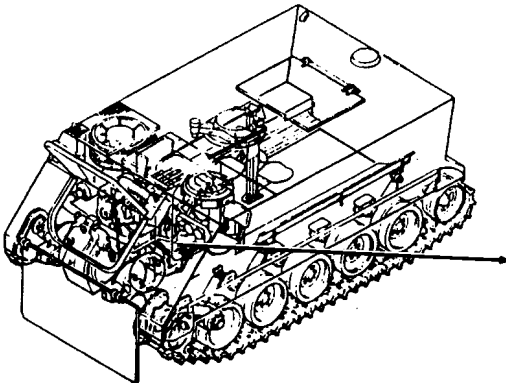


High voltage in the M19 periscope can cause serious injury or death. Voltage could exceed 16,000 volts. To avoid accidents, observe the following: Always connect power cable to periscope before turning MASTER SWITCH and infrared (I.R.) POWER switch to ON. Before disconnecting power cable from M19 periscope, always wait at least two minutes after turning infrared (I.R.) POWER switch and MASTER SWITCH OFF. Do not disconnect power cable until image disappears from periscope screen. Never touch end of power cable, or allow it to contact metal surfaces.

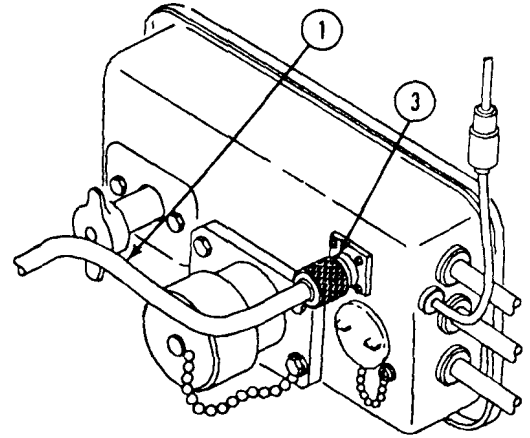
REPLACE INFRARED POWER SUPPLY CABLE ASSEMBLY — Continued

0030 00

1. If circuit 517 lead (1) is in stowed position, disconnect it from the top of power supply assembly (2) and master switch panel dummy connector (3).

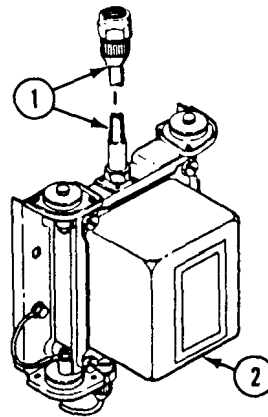
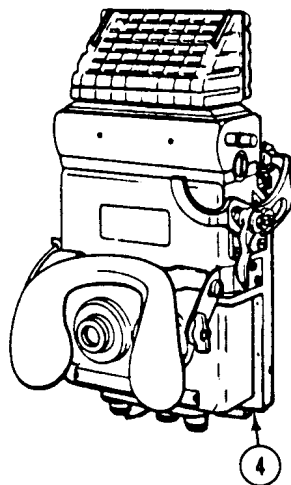


INFRARED POWER SUPPLY
CABLE ASSEMBLY
OPERATING POSITION



INFRARED POWER SUPPLY
CABLE ASSEMBLY
STOWED POSITION

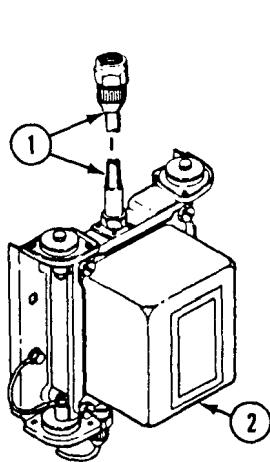
2. If circuit 517 lead (1) is in operating position, disconnect it from the top of power supply assembly (2) and bottom of periscope (4).



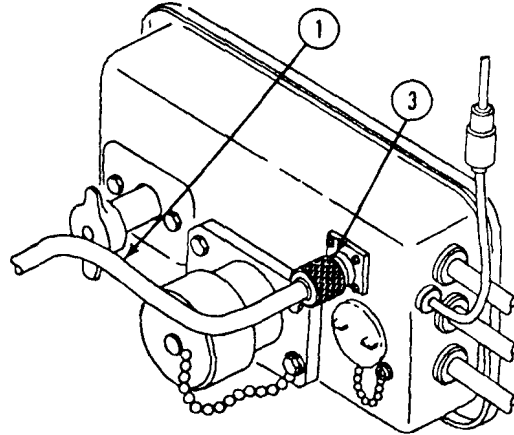
INFRARED POWER SUPPLY
CABLE ASSEMBLY
OPERATING POSITION

INSTALLATION

1. For stowed position, connect circuit 517 lead (1) to the top of power supply assembly (2) and master switch panel dummy connector (3).

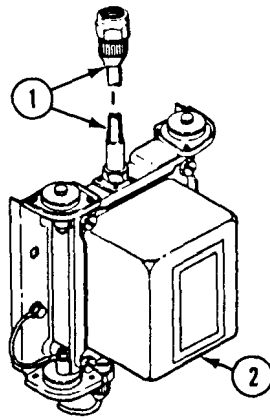


**INFRARED POWER SUPPLY
CABLE ASSEMBLY
OPERATING POSITION**

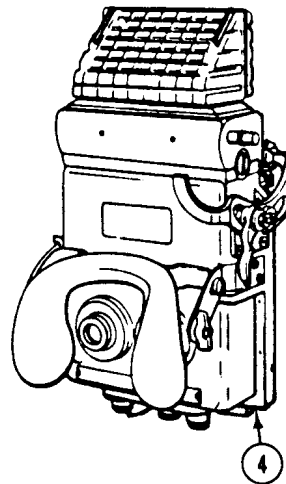


**INFRARED POWER SUPPLY
CABLE ASSEMBLY
STOWED POSITION**

2. For operating position, connect circuit 517 lead (1) to top of power supply assembly (2) and bottom of periscope (4).



**INFRARED POWER SUPPLY
CABLE ASSEMBLY
OPERATING POSITION**



FOLLOW-THROUGH STEPS

1. Connect battery ground lead (see your -20).

END OF TASK

REPLACE POWER PLANT WIRING HARNESS

0031 00

THIS WORK PACKAGE COVERS:

Removal (page 0031 00-1).
 Installation (page 0031 00-5).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Materials/Parts

Lockwasher (4)

Personnel Required

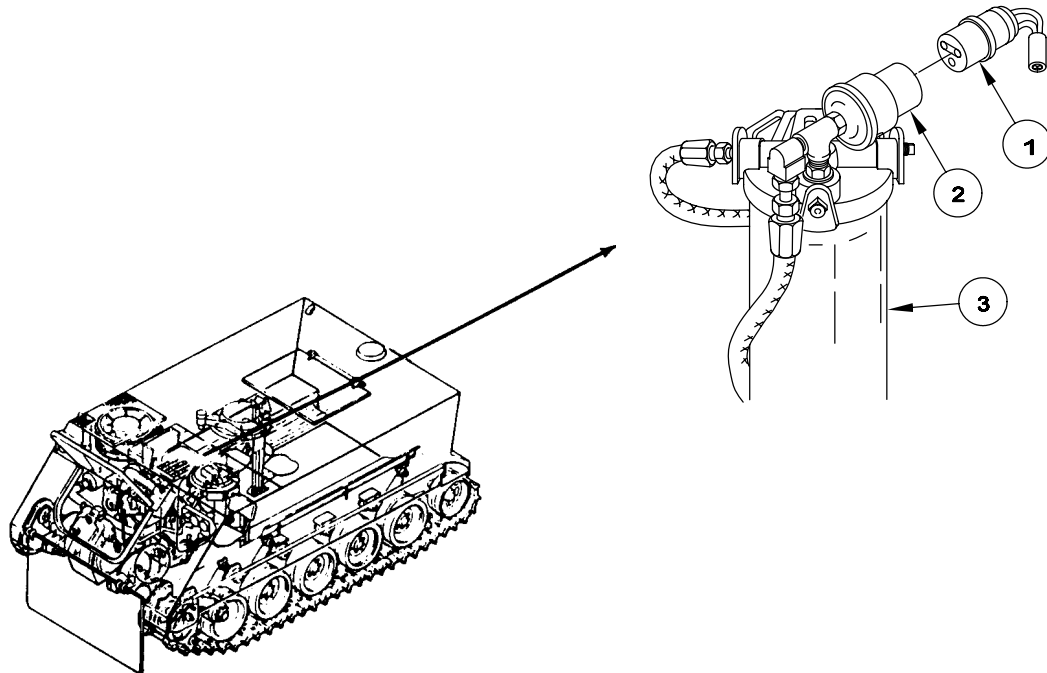
Track Vehicle Repairer 63H10

Equipment Condition

Ramp lowered (see your -10)
 Engine stopped/shutdown (see your -10)
 Carrier blocked (see your -10)
 Battery ground lead disconnected (see your -20)
 Power plant rear access panel removed (see your -20)
 Hull bottom access cover removed (see your -20)
 Trim vane lowered and power plant front access door opened (see your -10)

REMOVAL

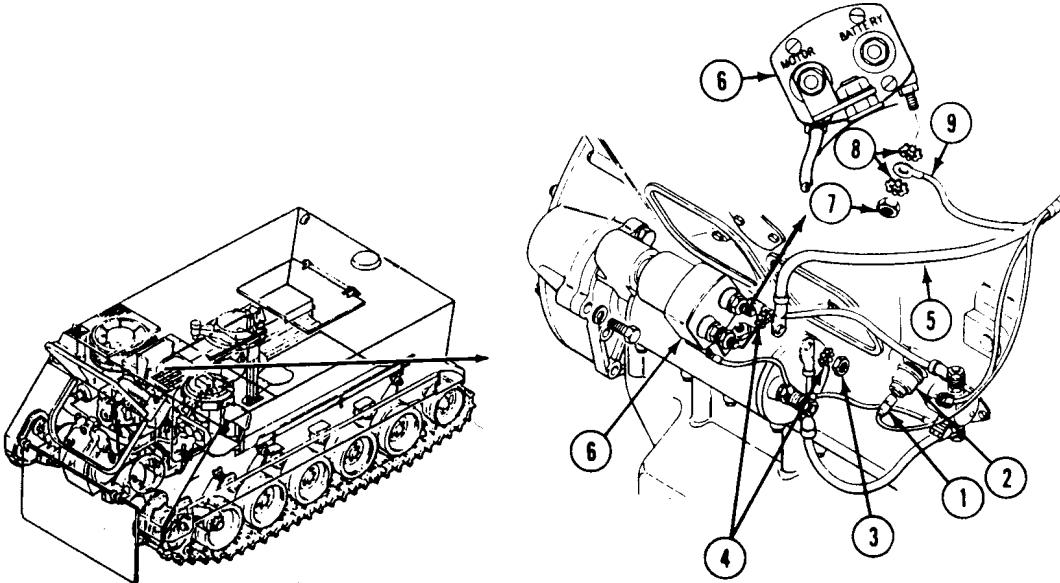
1. Disconnect circuit 1B lead (1) from generator field switch (2) on secondary fuel filter (3).



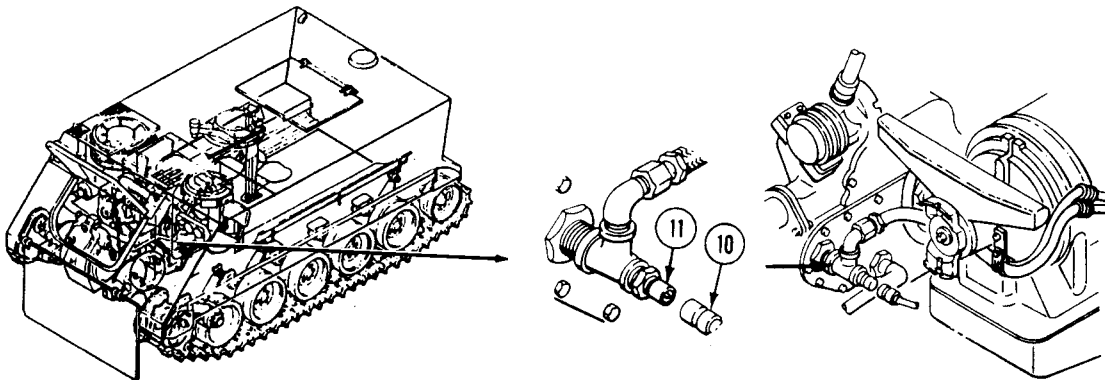
REPLACE POWER PLANT WIRING HARNESS — Continued

0031 00

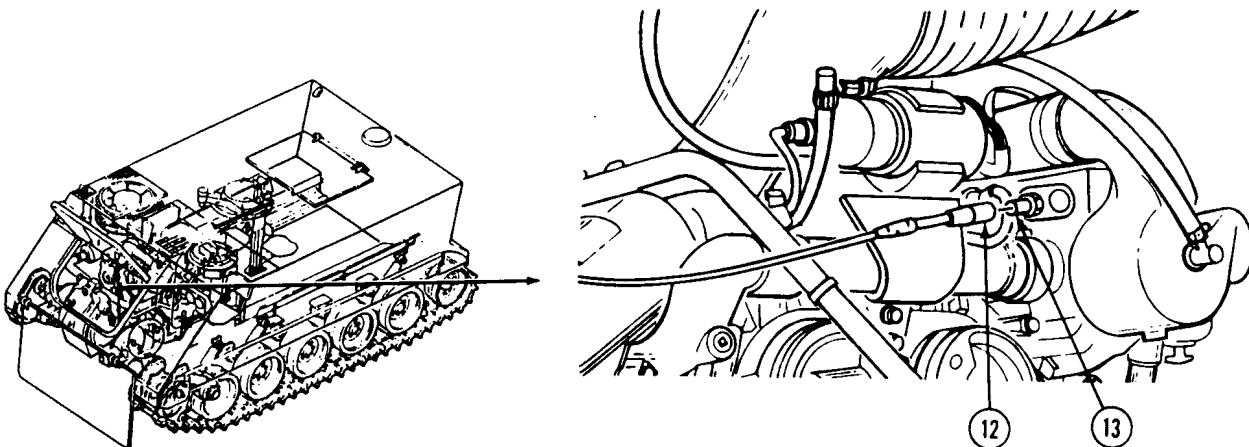
2. Disconnect circuit 34 lead (1) from engine low oil pressure switch (2).
3. Remove nut (3), two lockwashers (4), and circuit 6 lead (5) from starter solenoid (6). Discard lockwashers.
4. Remove nut (7), two lockwashers (8), and circuit 74A lead (9) from solenoid (6). Discard lockwashers.



5. Disconnect circuit 327 lead (10) from engine high oil temperature switch (11).



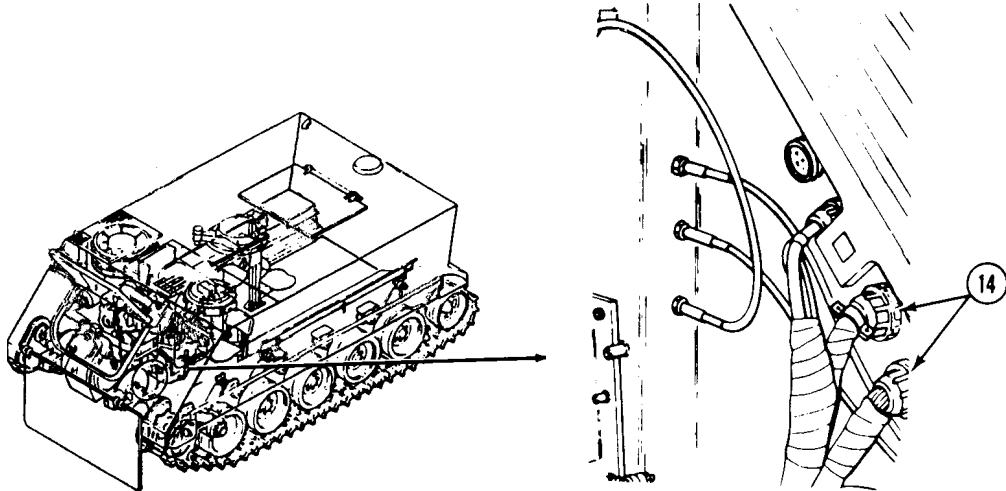
6. Disconnect circuit 33 lead (12) from engine coolant temperature switch (13).



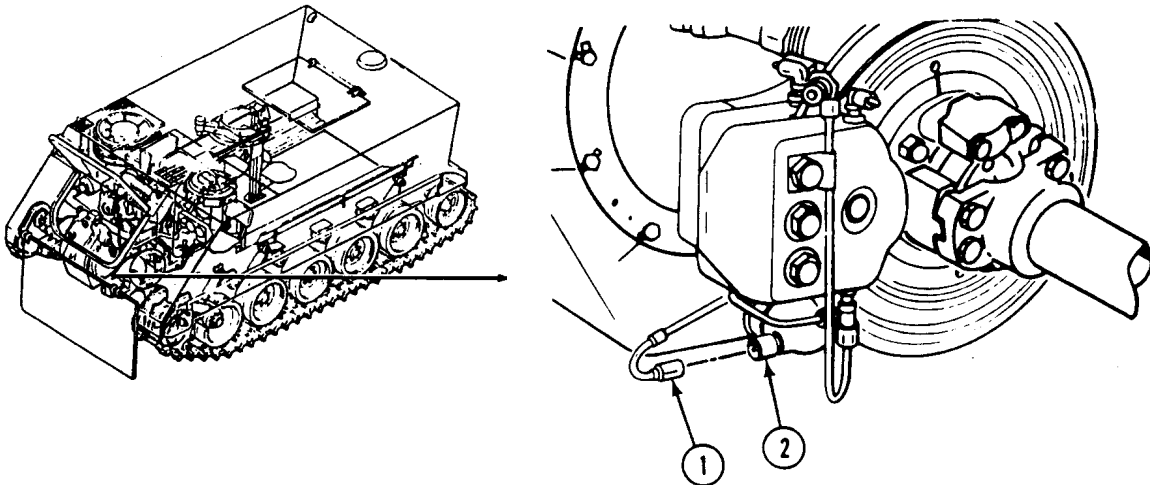
REPLACE POWER PLANT WIRING HARNESS — Continued

0031 00

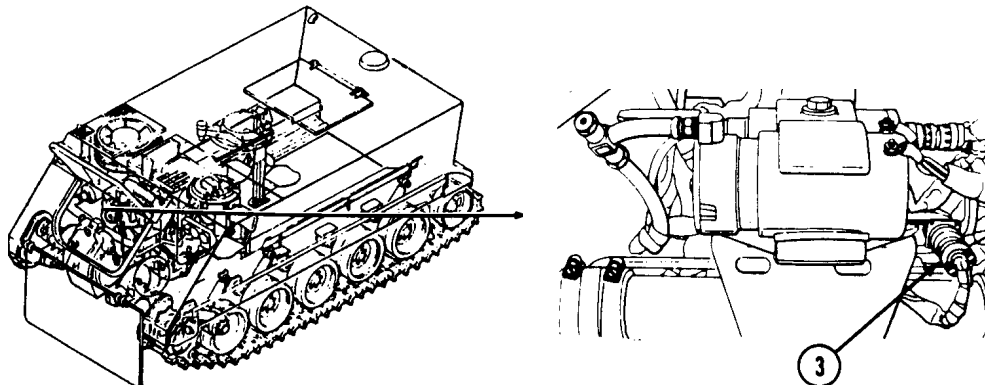
7. Disconnect three power plant wiring harness connectors (14) from main wiring harness at driver's compartment bulkhead.



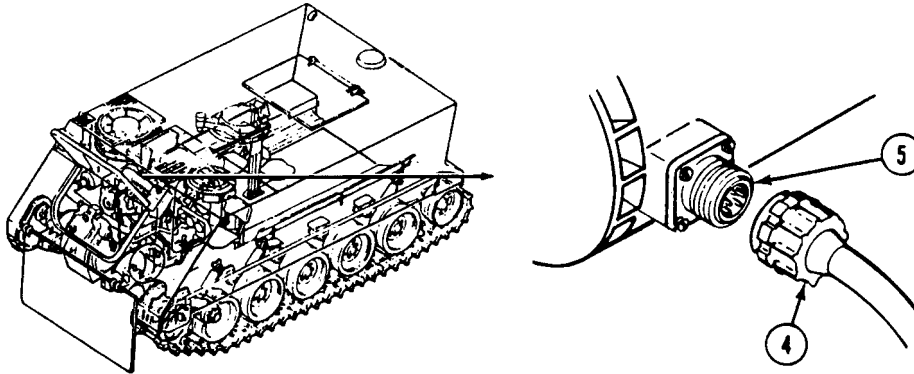
8. Disconnect circuit 328 lead (1) from differential high oil temperature switch (2).



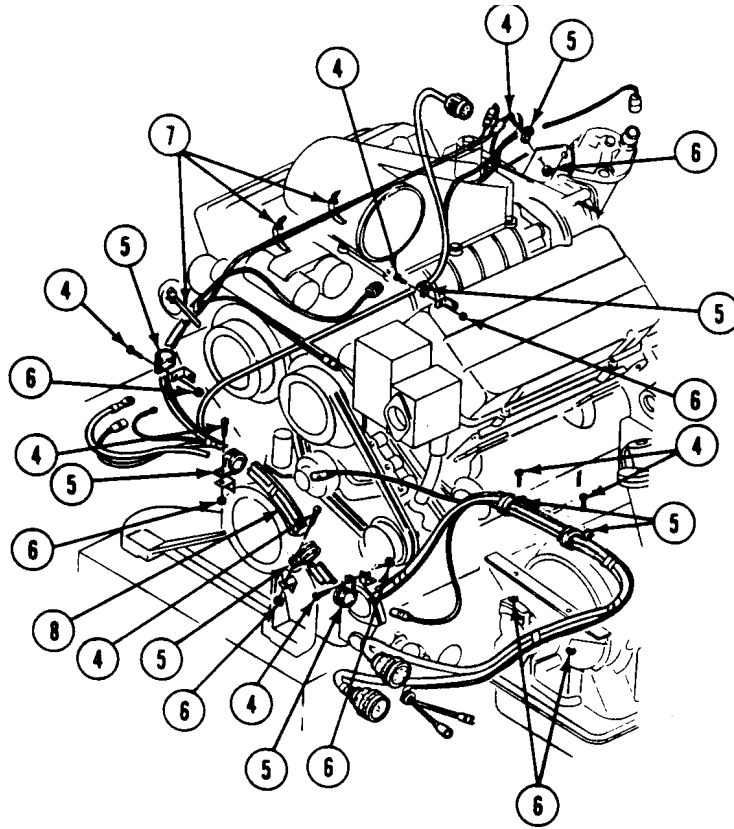
9. Disconnect circuit 406-406A lead (3) from air box heater wiring harness.



10. Disconnect circuit 1, 2, 3, and 3A lead (4) from generator (5).

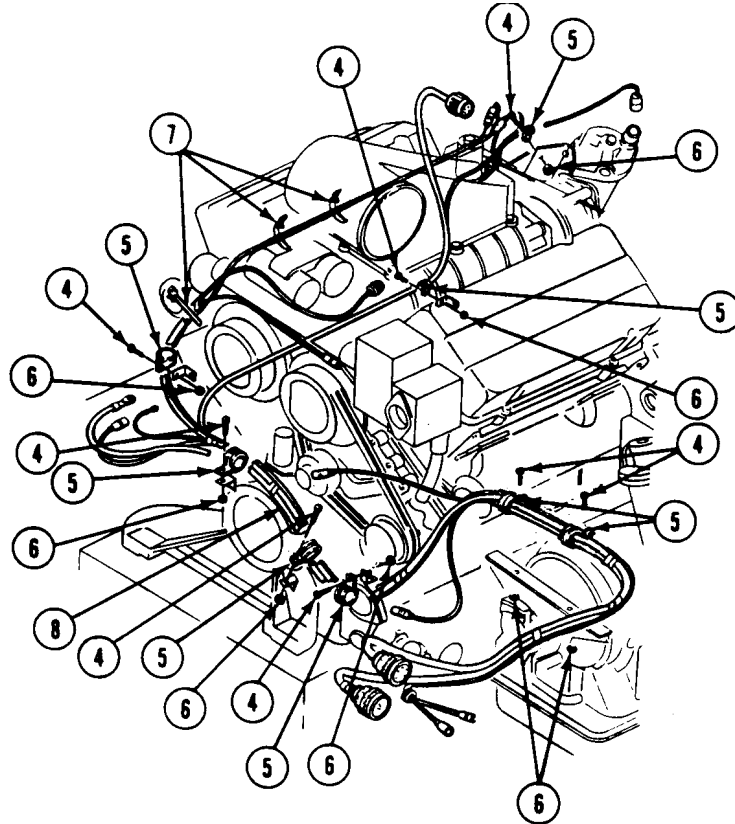


11. Remove 11 screws (4), eight clamps (5), eight nuts (6) three tie straps (7), and power plant wiring harness (8) from power plant. Discard tie straps.

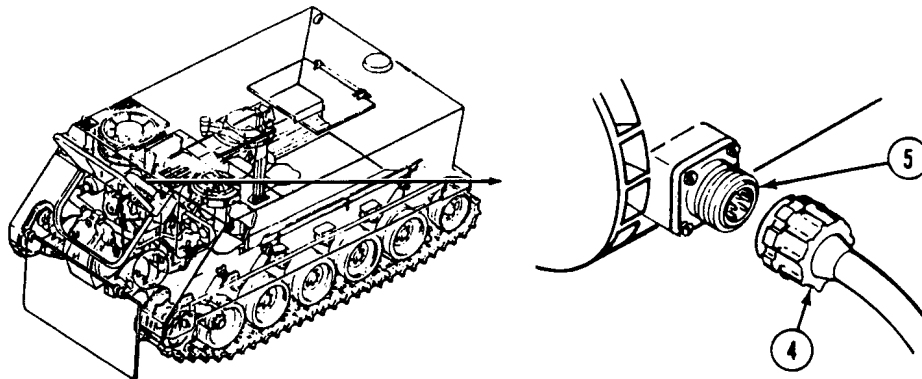


INSTALLATION

1. Install power plant wiring harness (8) on power plant. Secure with three new tie straps (7), eight nuts (6), eight clamps (5), and 11 screws (4).



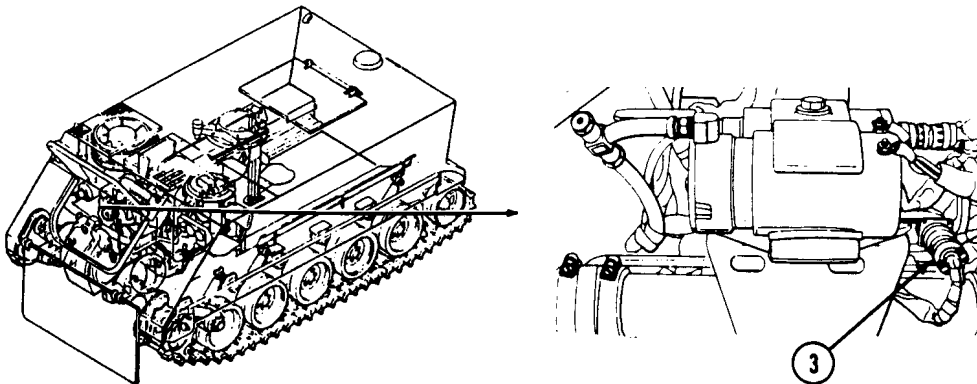
2. Connect circuit 1, 2, 3, and 3A lead (4) to generator (5).



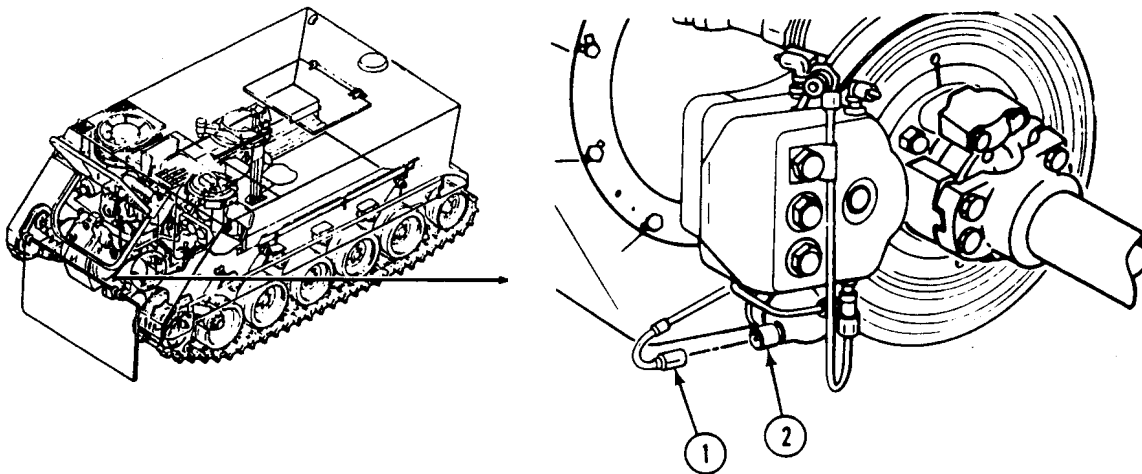
REPLACE POWER PLANT WIRING HARNESS — Continued

0031 00

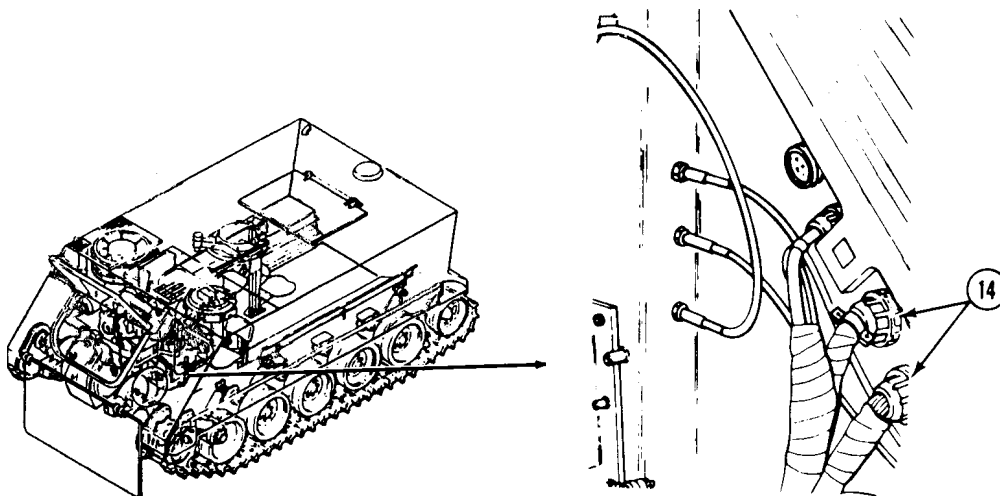
3. Connect circuit 406-406A lead (3) to air box heater.



4. Connect circuit 328 lead (1) to differential high oil temperature switch (2).



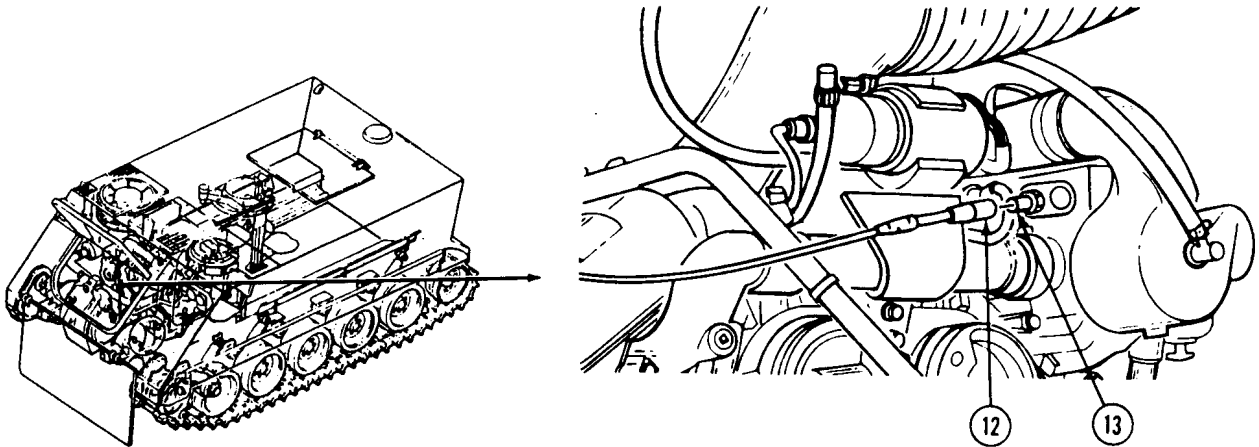
5. Connect three power plant wiring harness connectors (14) to main wiring harness at driver's compartment bulkhead.



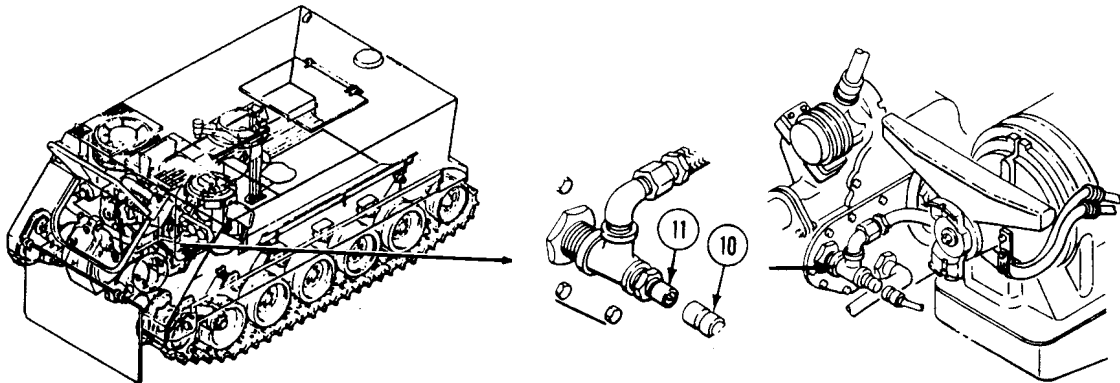
REPLACE POWER PLANT WIRING HARNESS — Continued

0031 00

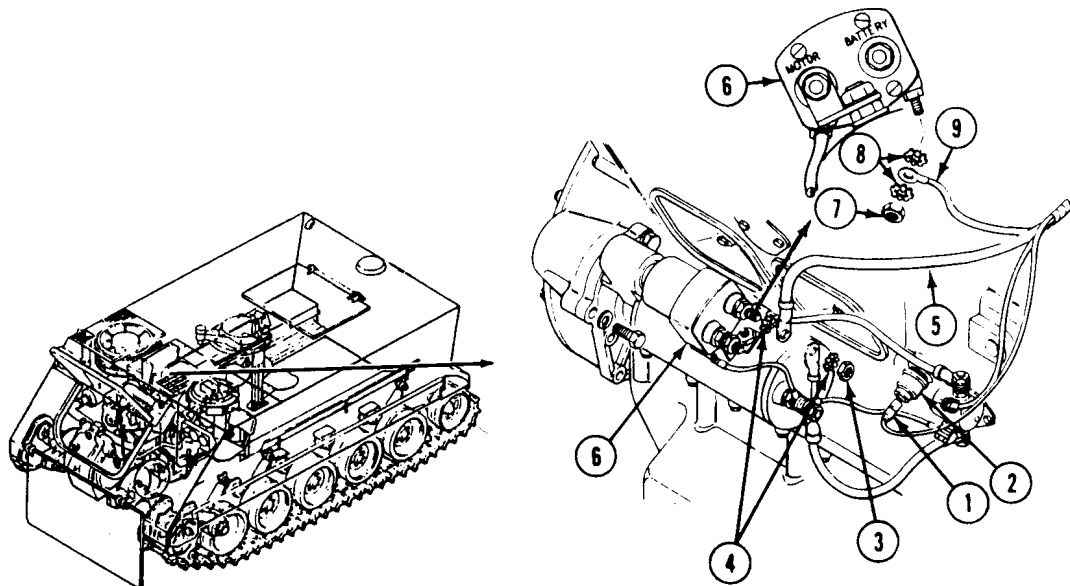
6. Connect circuit 33 lead (12) to engine coolant temperature switch (13).



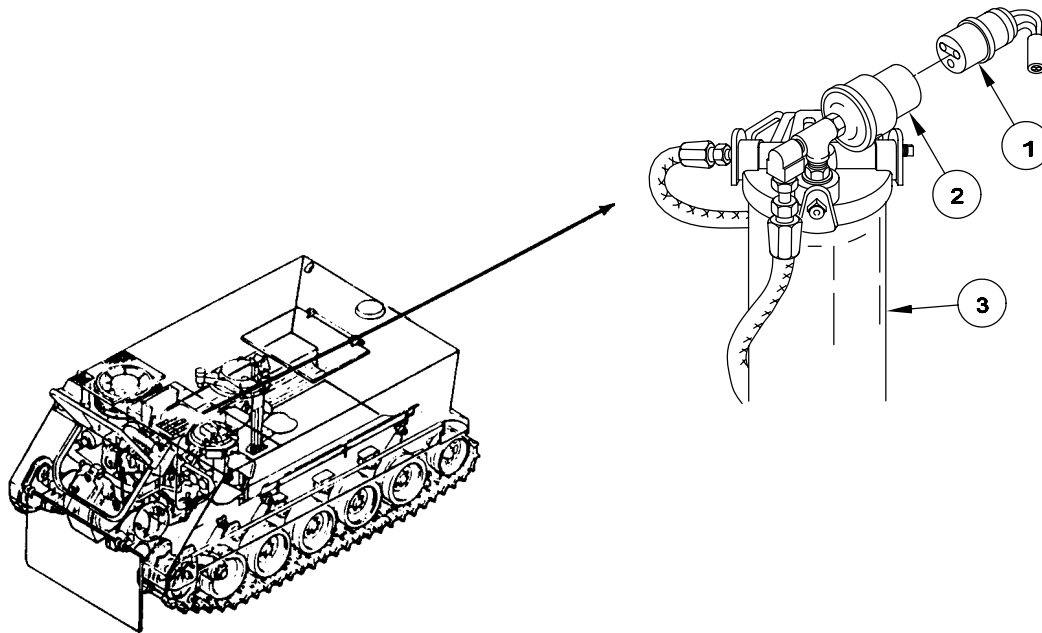
7. Connect circuit 327 lead (10) to transmission high oil temperature switch (11).



8. Install circuit 74A lead (9) and two new lockwashers (8) on starter solenoid (6). Secure with nut (7).
9. Install circuit 6 lead (5) and two new lockwashers (4) on solenoid (6). Secure with nut (3).
10. Connect circuit 34 lead (1) to engine low oil pressure switch (2).



11. Connect circuit 1B lead (1) to generator field switch (2) on secondary fuel filter (3).



FOLLOW-THROUGH STEPS

1. Connect battery ground lead (see your -20).
2. Install power plant rear access panel (see your -20).
3. Start engine (see your -10). Check that power plant wiring harness works correctly.
4. Raise and lock ramp (see your -10).
5. Stop/shutdown engine (see your -10).
6. Close power plant front access door and raise trim vane (see your -10).
7. Install hull bottom access cover (see your -20).

END OF TASK

REPLACE FRONT MAIN WIRING HARNESS

0032 00

THIS WORK PACKAGE COVERS:

Removal (page 0032 00-1).
 Installation (page 0032 00-12).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10
 Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

References

See your -20

Materials/Parts

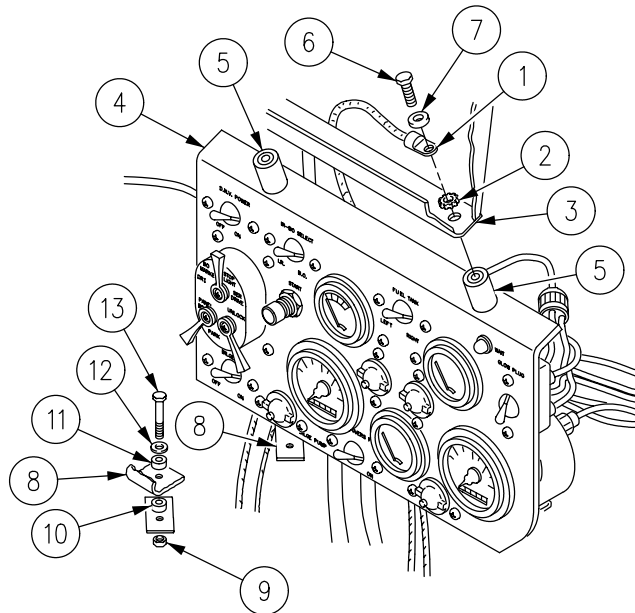
Grommet (3)
 Locknut (2)
 Lockwasher
 Lockwasher
 Lockwasher (8)
 Lockwasher (4)
 Lockwasher (2)
 Terminal (6)

Equipment Condition

Engine stopped/shutdown (see your -10)
 Carrier blocked (see your -10)
 Battery ground lead disconnected (see your -20)
 Driver's power plant access cover removed (see your -20)
 Trim vane lowered and power plant front access door opened (see your -10)

REMOVAL

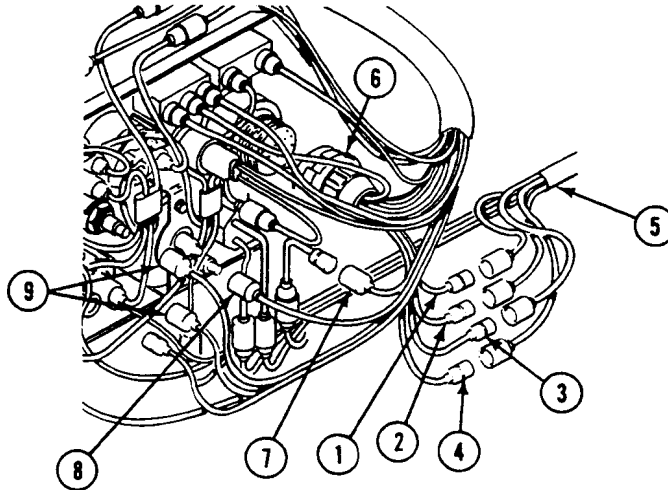
1. Remove two locknuts (9), mounts (10) and (11), flat washers (12), and screws (13) that secure panel (4) to two struts (8). Discard locknuts.
2. Support panel (4). Remove two screws (6), flat washers (7), one lockwasher (2), and ground lead (1) from two mounts (5) and upper support (3). Discard lockwasher.
3. Support instrument panel (4) on two struts (8) to gain access to rear of panel.



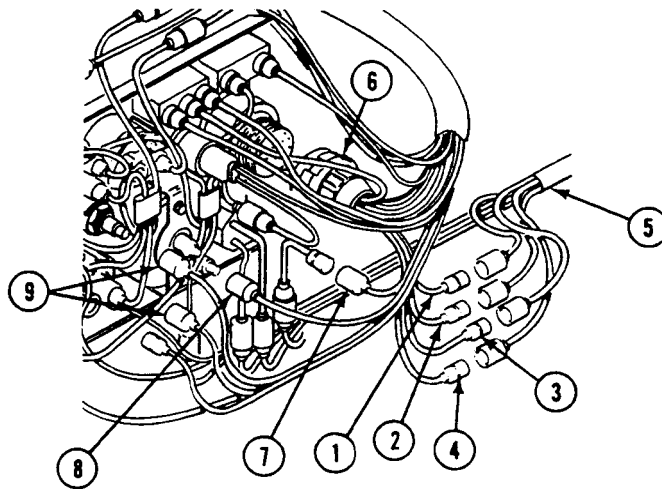
REPLACE FRONT MAIN WIRING HARNESS — Continued

0032 00

4. Disconnect circuit 24, 23, 22, and 21 leads (1), (2), (3), and (4) from rear main wiring harness (5).
5. Remove connector (6) from light selector switch.



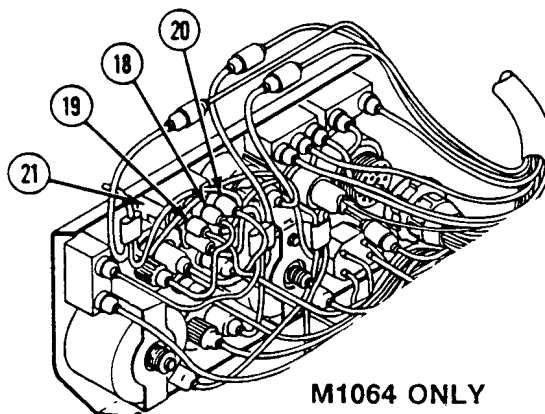
6. Disconnect circuit 452A lead (7) from bilge pump switch.
7. Disconnect circuit 452B lead (8) from bilge pump ON light.
8. Disconnect two circuit 40 leads (9) from instrument panel lights.



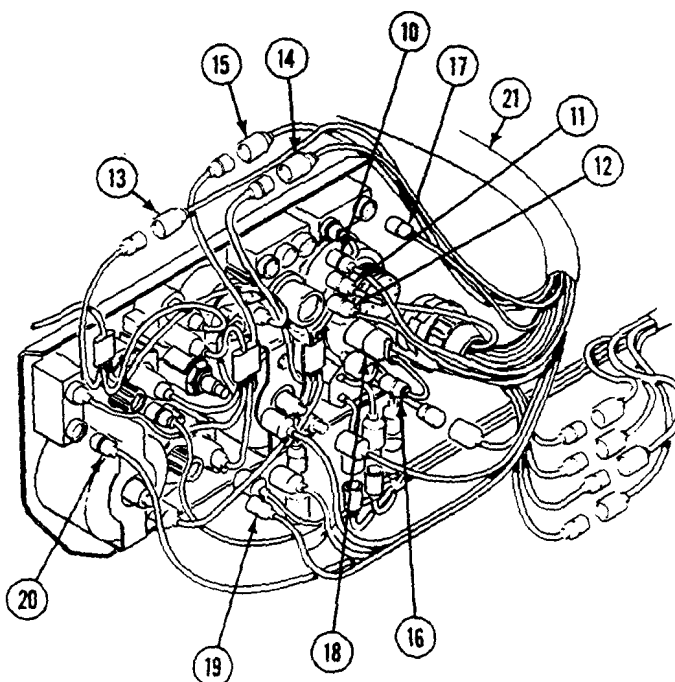
NOTE

Step 9 applies to the M1064 only.

9. Disconnect circuit 28 (18), circuit 30 (19), and circuit 31 (20) from fuel tank switch (21).



10. Disconnect circuit 19 (10), circuit 520 (11), and circuit 514-515 (12) leads from infrared blackout (I.R. - B.O.) selector switch.
11. Disconnect circuit 15 (13), circuit 25A (14), circuit 27F (15), and circuit 14 (16) leads from instrument panel wiring harness.
12. Disconnect circuit 516A lead (17) from infrared (I.R.) power selector switch.
13. Disconnect circuit 74 and 14 plug (18) from starter switch.
14. Disconnect circuit 33 lead (19) from engine coolant temperature gauge.
15. Disconnect circuit 406 lead (20) from air box heater switch.
16. Remove front wiring harness (21) from instrument panel.

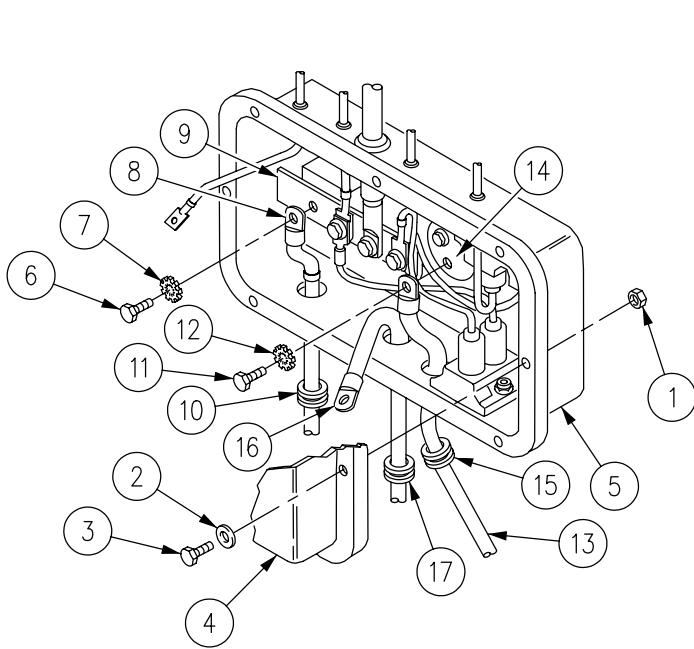


17. Remove eight nuts (1), washers (2), and screws (3). Separate master switch panel assembly (4) from distribution box (5).
18. Remove circuit 2A lead (13) or (19) and circuit 2 lead (16) or (18) from master switch panel assembly (see your -20).

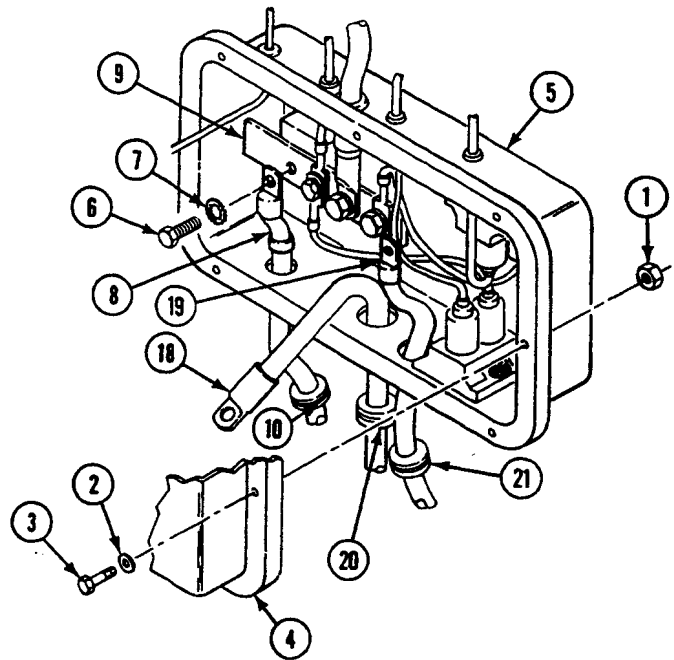
NOTE

The distribution boxes shown below are M113A2 configuration. Your distribution box may have leads not shown here. Remove and install those leads as needed to do Steps 19 - 22 below.

19. Remove screw (6), lockwasher (7), and circuit 6 lead (8) from bus bar (9). Remove circuit 6 lead and grommet (10) from distribution box (5). Discard grommet and lockwasher.
20. On 100 amp generator system, remove screw (11), lockwasher (12), and circuit 3 lead (13) from circuit breaker (14). Remove circuit 3 lead and grommet (15) from distribution box (5). Discard grommet and lockwasher.
21. On 100 amp generator system, remove circuit 2 lead (16) from master switch panel assembly (see your -20). Remove circuit 2 lead and grommet (17) from distribution box (5). Discard grommet.
22. On 200 amp generator system, remove circuit 2 lead (18) and circuit 2A lead (19) from master switch panel assembly (see your -20). Remove circuit 2 lead, circuit 2A lead, and two grommets (20) and (21) from distribution box (5). Discard grommets.



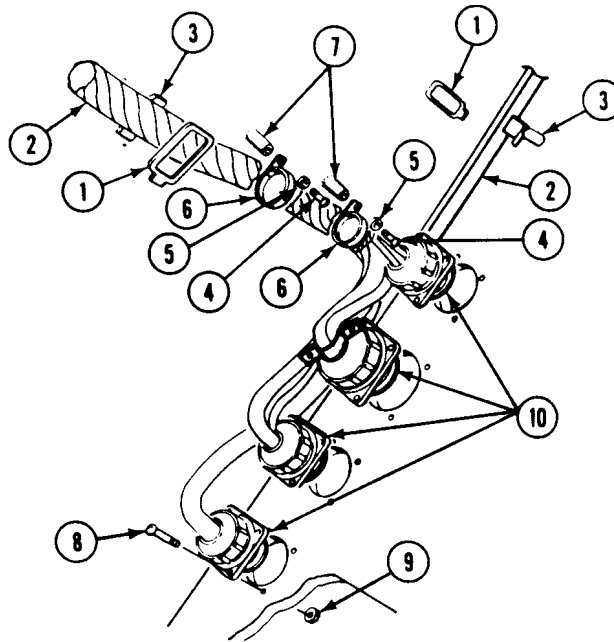
FOR 100 AMP GENERATOR SYSTEM



FOR 200 AMP GENERATOR SYSTEM

REPLACE FRONT MAIN WIRING HARNESS — Continued**0032 00**

23. Remove three cradle clips (1) and front main wiring harness (2) from three cradles (3).
24. Remove three screws (4), washers (5), clamps (6), and harness (2) from three weldnuts (7).
25. Remove 16 screws (8), nuts (9), and four connectors (10) from driver's bulkhead.

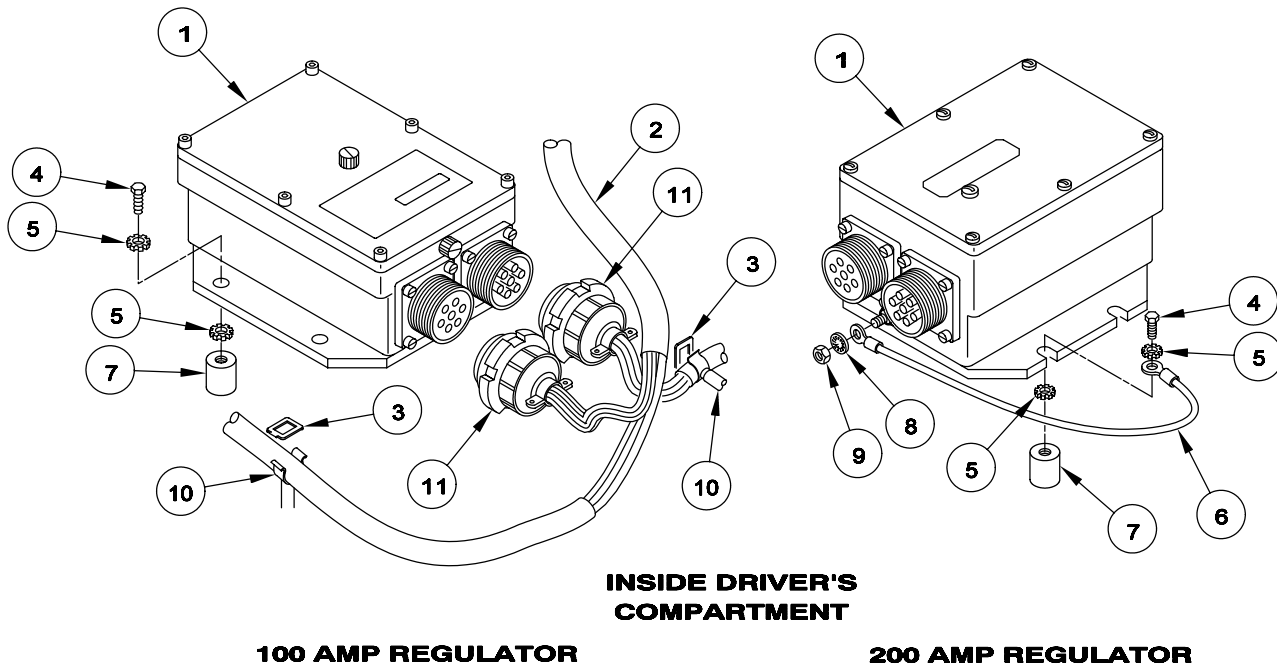
**INSIDE DRIVER'S
COMPARTMENT**

26. Disconnect two connectors (11) from voltage regulator (1).

NOTE

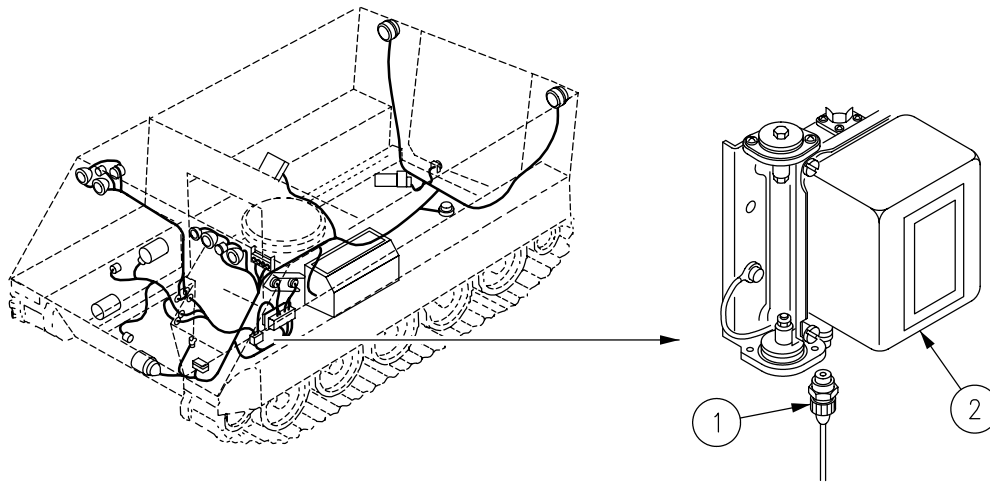
If you need to remove voltage regulator, do Steps 27 - 28. Otherwise, go to Step 29.

27. For 200 amp regulator remove nut (9), lockwasher (8), and ground strap (6) from regulator (1). Discard lockwasher.
28. Remove four screws (4), eight lockwashers (5), and regulator (1) from four weldnuts (7). Discard lockwashers.
29. Remove two clips (3) and harness (2) from two cradles (10) inside driver's compartment.

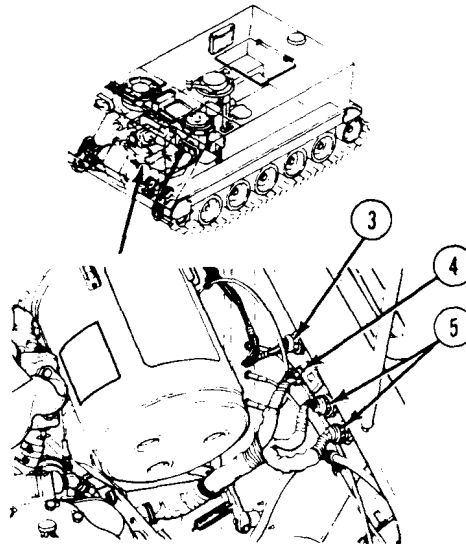


REPLACE FRONT MAIN WIRING HARNESS — Continued**0032 00**

30. Inside driver's compartment, disconnect circuit 516A lead (1) from infrared power pack (2).



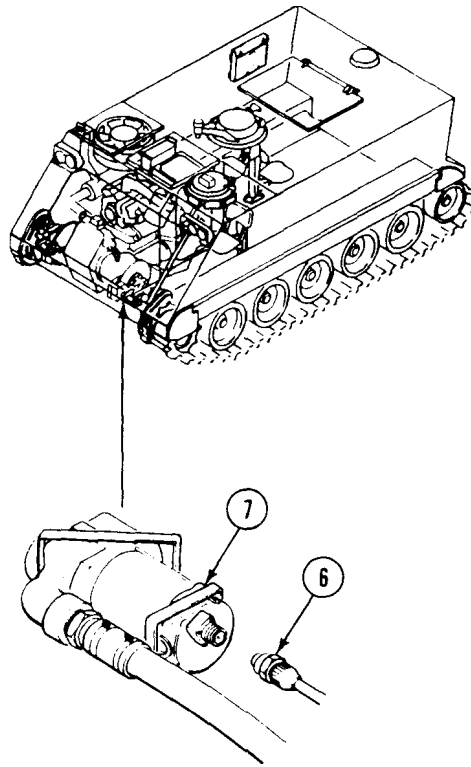
31. From inside power plant compartment, disconnect right headlight wiring harness (3), voltage regulator lead (4), and two power plant harness leads (5) from driver's compartment bulkhead.



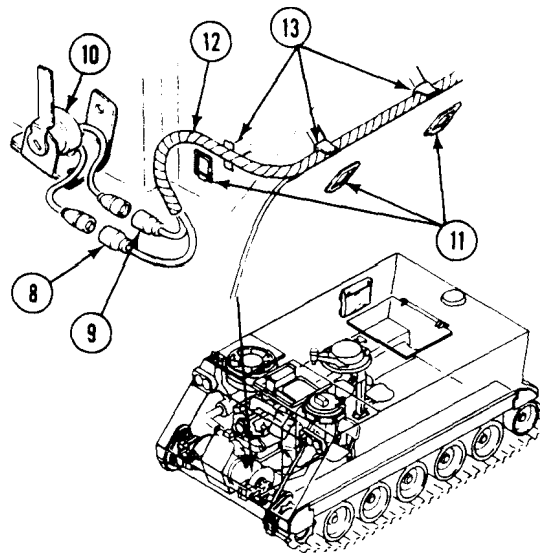
REPLACE FRONT MAIN WIRING HARNESS — Continued

0032 00

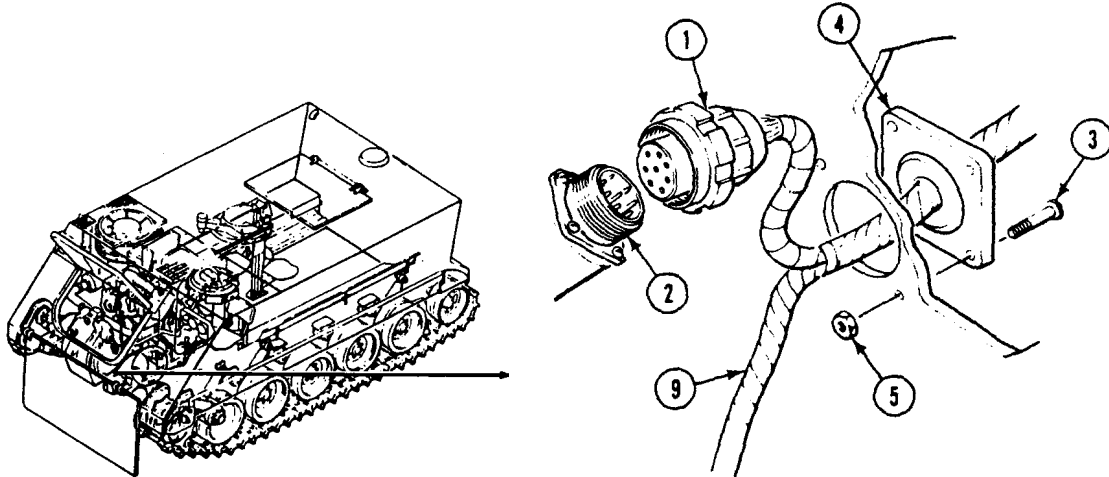
32. Disconnect circuit 452 lead (6) from front bilge pump (7).



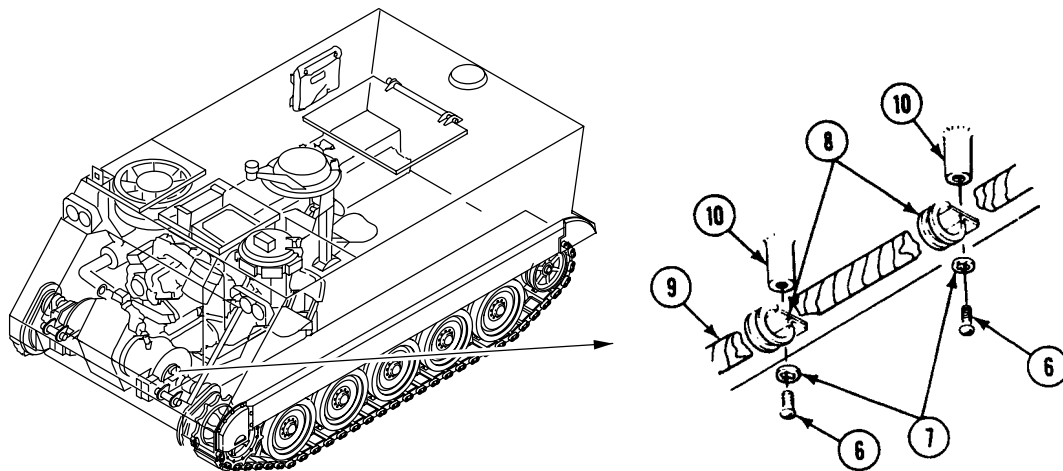
33. Disconnect circuit leads 75A (8) and 75B (9) from stop light switch (10) inside power plant compartment.
34. Remove three cradle clips (11) and front main wiring harness (12) from three cradles (13).



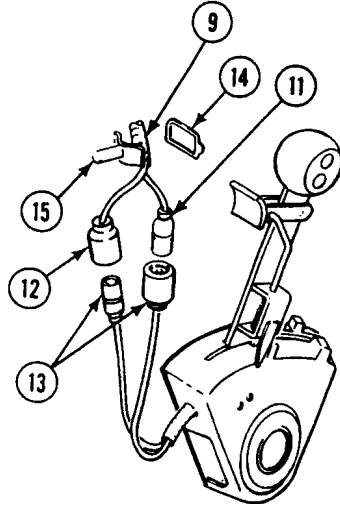
35. Disconnect connector (1) from dimmer switch (2).
36. Remove four screws (3) and cover (4) from four pressnuts (5) in driver's compartment bulkhead.



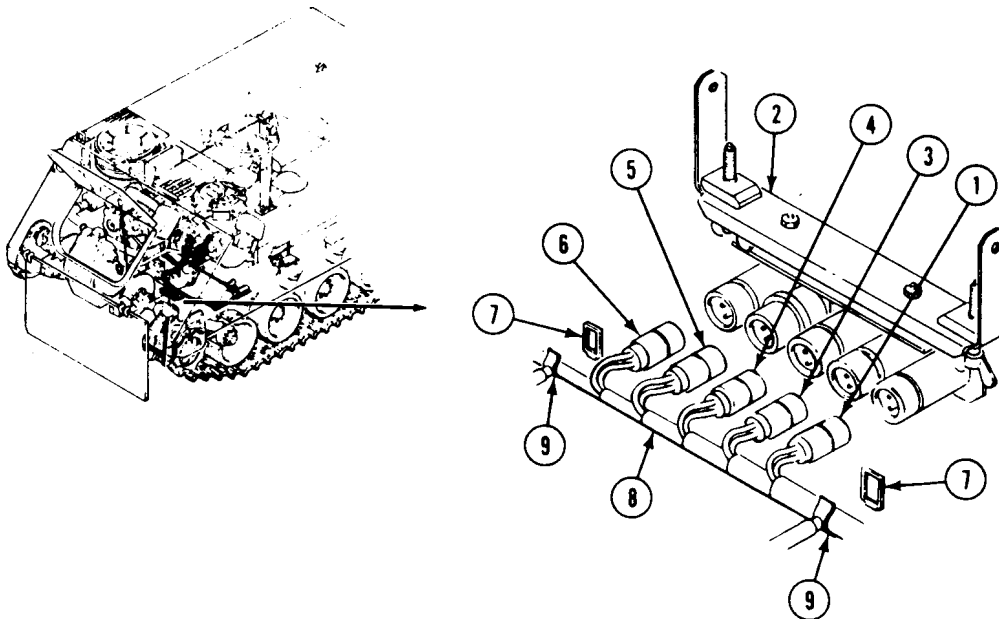
37. Remove two screws (6), lockwashers (7), and clamps (8) that secure harness (9) to two weldnuts (10). Discard lockwashers.
38. Pull harness (9) through bulkhead into driver's compartment.



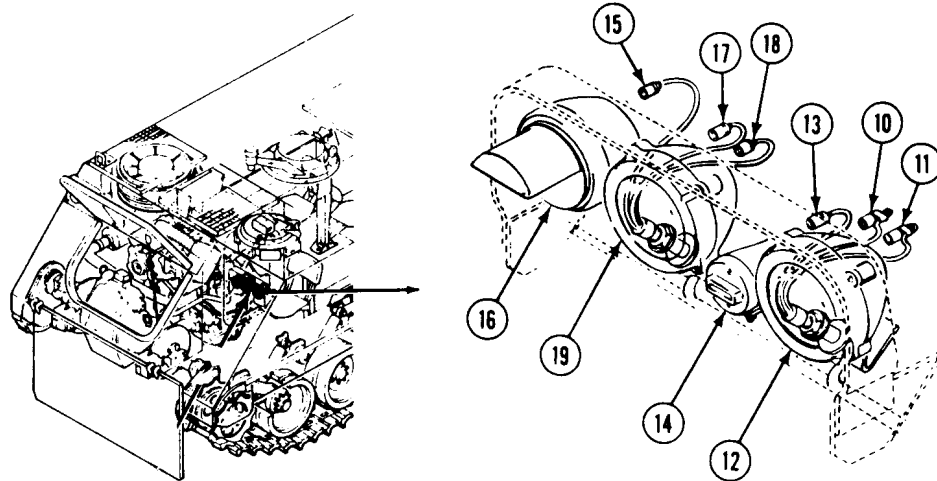
39. Disconnect circuit 74 lead (11) and circuit 74A lead (12) from range selector leads (13).
40. Remove cradle clip (14) and harness (9) from cradle (15).



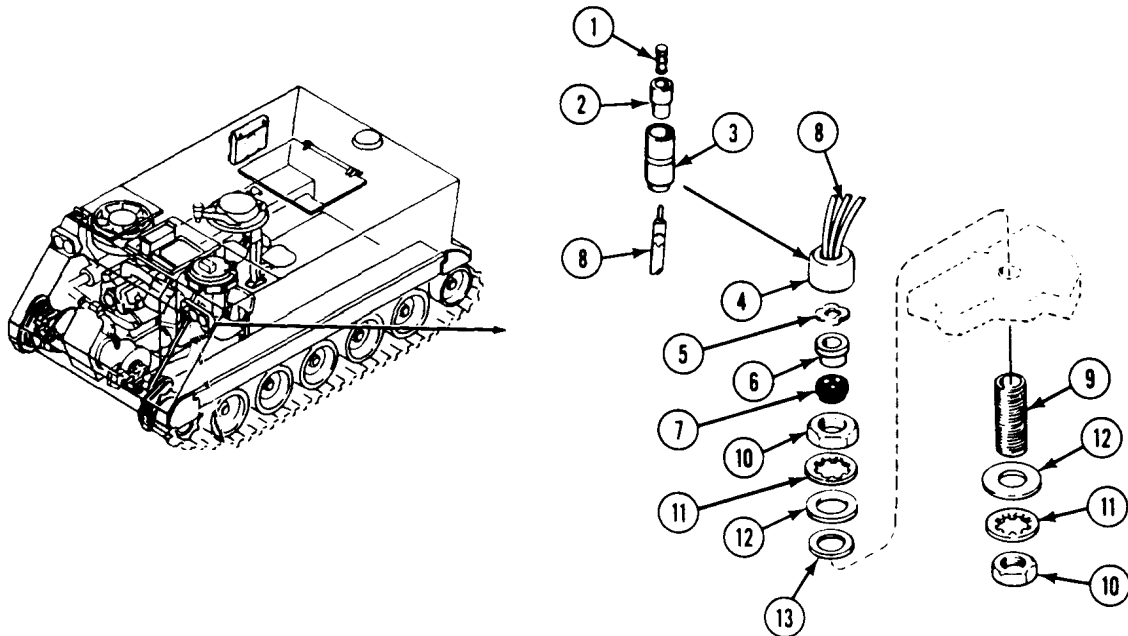
41. Disconnect circuit 27K and 328 plug (1) from differential high oil temperature warning light on panel (2).
42. Disconnect circuit 27G and 327 plug (3) from transmission high oil temperature warning light on panel (2).
43. Disconnect circuit 27J and 34 plug (4) from engine low oil pressure warning light on panel (2).
44. Disconnect circuit 25 and 25A plug (5) from horn switch on panel (2).
45. Disconnect circuit 519 and 519A plug (6) from high beam indicator light on panel (2).
46. Remove two cradle clips (7) and front main wiring harness (8) from cradles (9).



47. Disconnect circuit 17 (10) and 18 (11) leads from left service headlight (12).
48. Disconnect circuit 20 lead (13) from left blackout marker light (14).
49. Disconnect circuit 19 lead (15) from blackout headlight (16).
50. Disconnect circuit 514 and 515 leads (17) and (18) from left infrared service headlight (19).



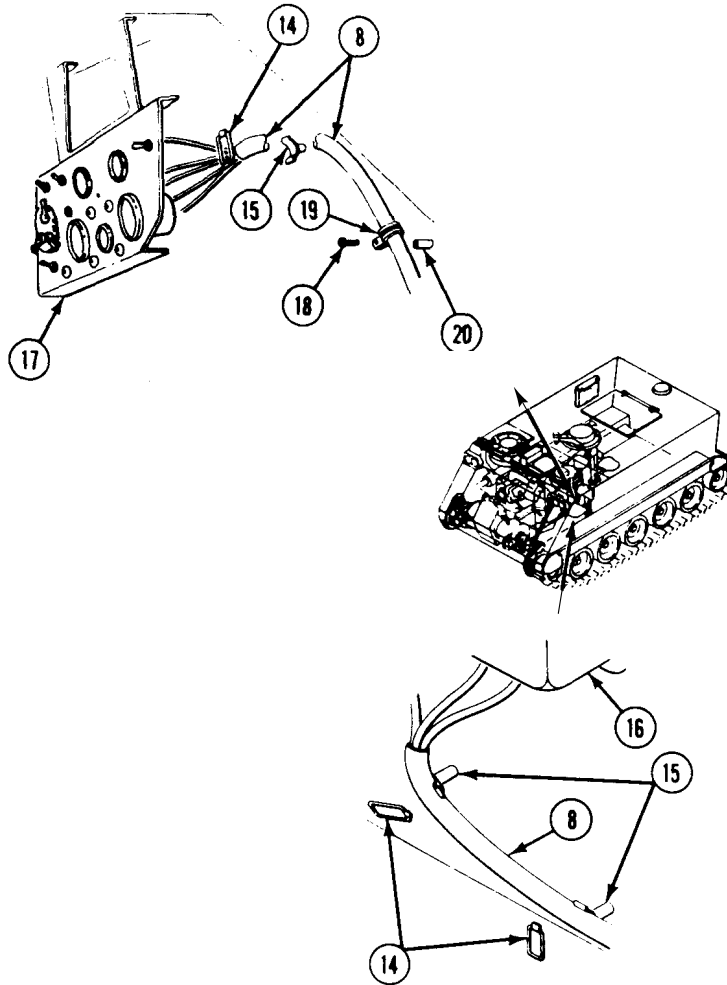
51. Remove six terminals (1), insulators (2), and connectors (3) from leads that were disconnected in Steps 47 - 50. Discard terminals.
52. Remove two nuts (4), spring washers (5), retainers (6), and bushings (7) from six leads removed in Steps 47 - 50.
53. Pull these six leads on harness (8) through two bushings (9).
54. Remove four nuts (10), lockwashers (11), flat washers (12), two flat washers (13), and bushings (9) from front of hull. Discard lockwashers.



REPLACE FRONT MAIN WIRING HARNESS — Continued

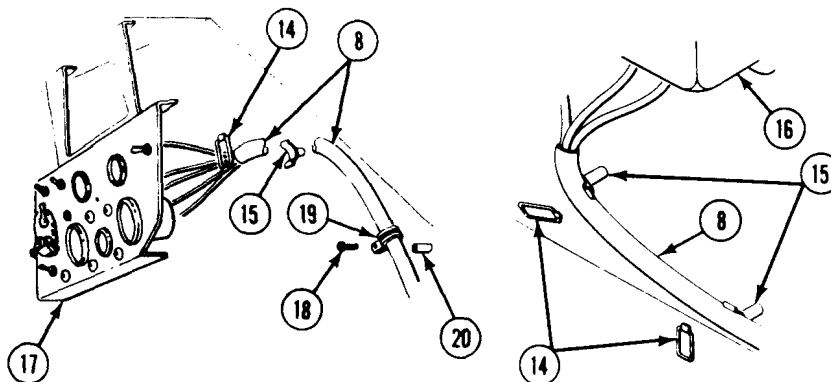
0032 00

55. Remove three cradle clips (14) from three cradles (15) between distribution box (16) and instrument panel (17).
56. Remove screw (18), clamp (19), and harness (8) from weldnut (20) near panel.
57. Remove harness (8) from carrier.

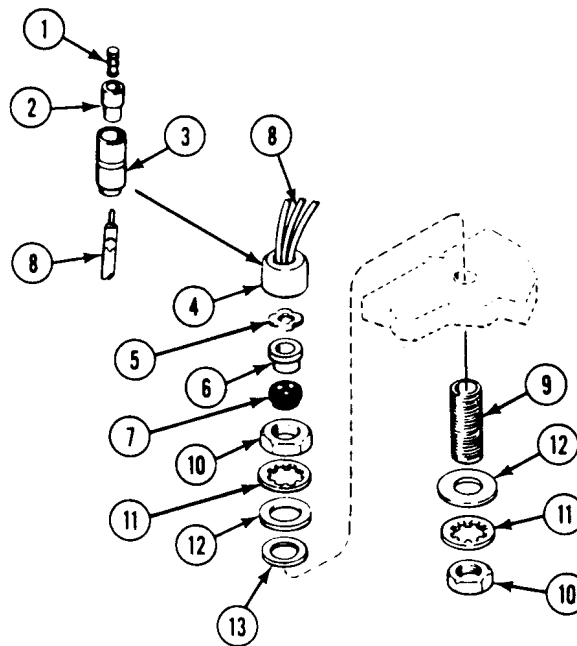


INSTALLATION

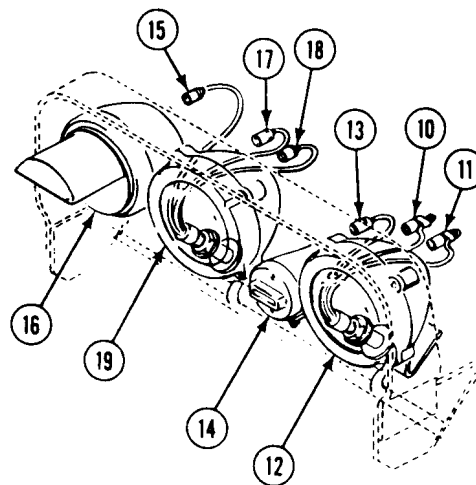
1. Install harness (8) on weldnut (20) near instrument panel (17). Secure with clamp (19) and screw (18).
2. Install harness (8) on three cradles (15) between distribution box (16) and panel (17). Secure with three clips (14).



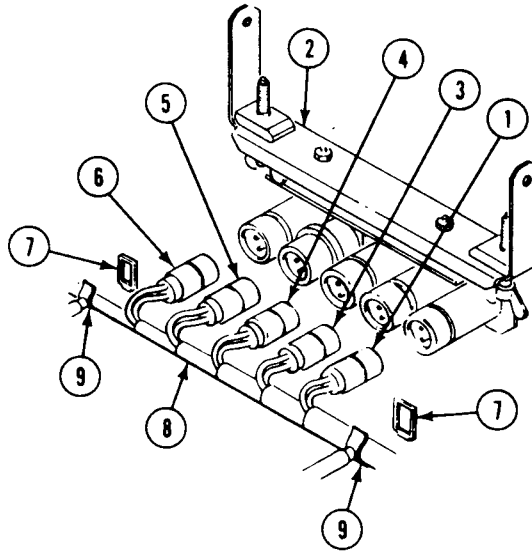
3. Install two bushings (9) on front of hull. Secure with two flat washers (13), four flat washers (12), new lockwashers (11), and nuts (10).
4. Install six leads on front main wiring harness (8) through two bushings (9) and bushings (7).
5. Install harness (8) on two bushings (7) and bushings (9). Secure with two retainers (6), spring washers (5), and nuts (4).
6. Install six new terminals (1), insulators (2), and connectors (3) on the ends of six leads (8).



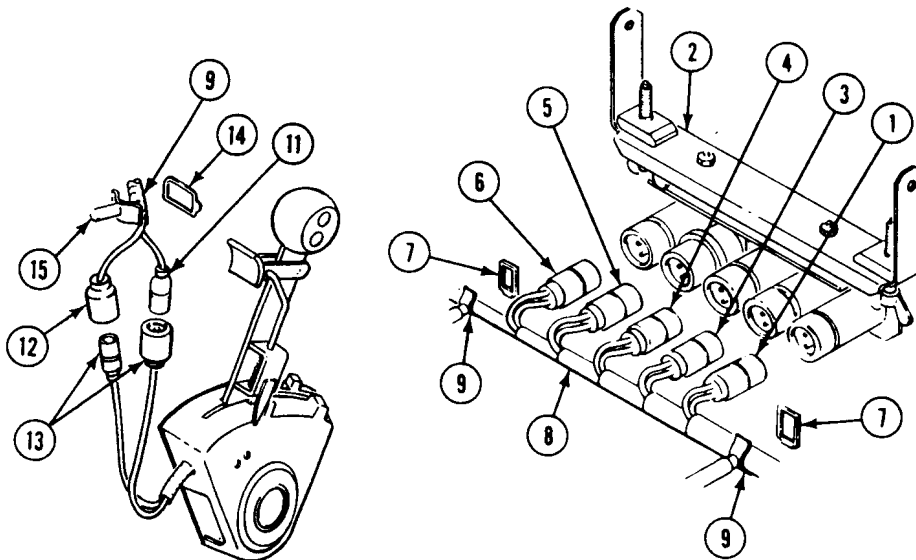
7. Connect circuit 514 lead (17) and circuit 515 lead (18) to left infrared service headlight (19).
8. Connect circuit 19 lead (15) to blackout headlight (16).
9. Connect circuit 20 lead (13) to left blackout marker light (14).
10. Connect circuit 17 lead (10) and circuit 18 lead (11) to left service headlight (12).



11. Connect circuit 27K and 328 plug (1) to differential high oil temperature warning light on panel (2).
12. Connect circuit 27G and 327 plug (3) to transmission high oil temperature warning light on panel (2).
13. Connect circuit 27J and 34 plug (4) to engine low oil pressure warning light on panel (2).
14. Connect circuit 25 and 25A plug (5) to horn switch on panel (2).
15. Connect circuit 519 and 519A plug (6) to high beam indicator light on panel (2).

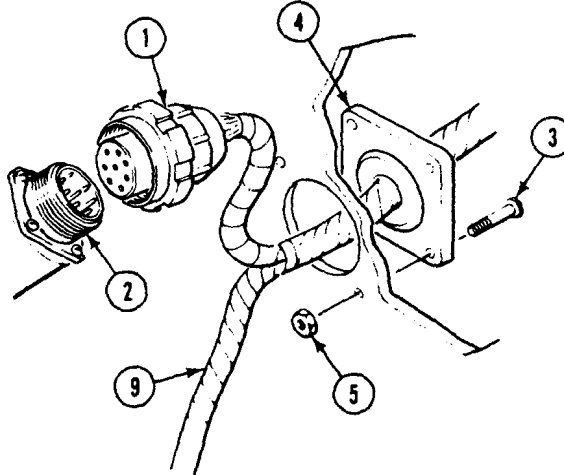


16. Connect circuit 74 lead (11) and circuit 74A lead (12) to range selector leads (13).
17. Install harness (9) on cradle (15) above range selector. Secure with clip (14). Install harness on two cradles (9) behind warning light panel (2). Secure with clips (7).

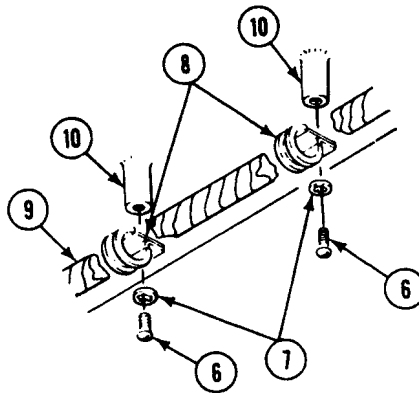


18. Install harness (9) through driver's compartment bulkhead opening. Connect connector (1) to dimmer switch (2).

19. Secure cover (4) to bulkhead pressnuts (5) with four screws (3).

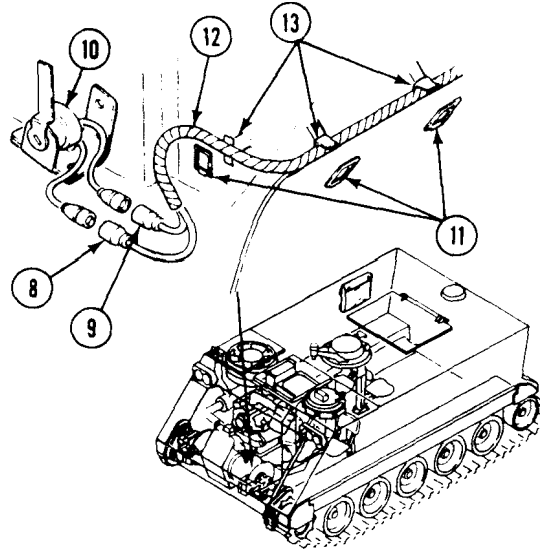


20. Install harness (9) on two weldnuts (10). Secure with two clamps (8), new lockwashers (7), and screws (6).

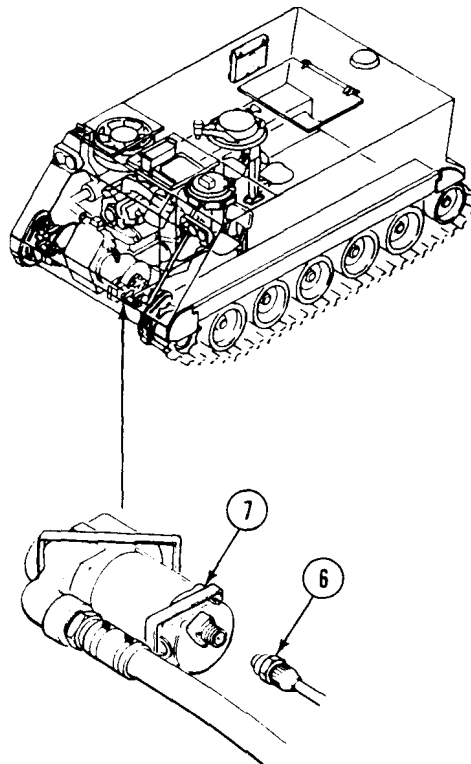


REPLACE FRONT MAIN WIRING HARNESS — Continued**0032 00**

21. Install harness (12) on three cradles (13). Secure with three cradle clips (11).
22. Connect circuit 75A lead (8) and circuit 75B lead (9) to stop light switch (10) inside power plant compartment.



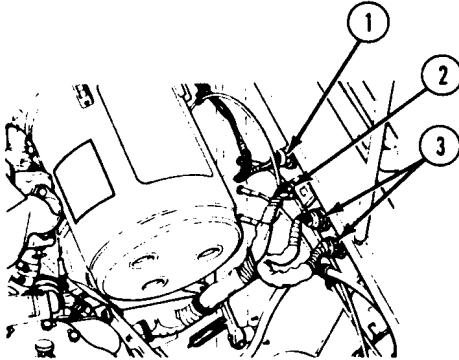
23. Connect circuit 452 lead (6) to front bilge pump (7).



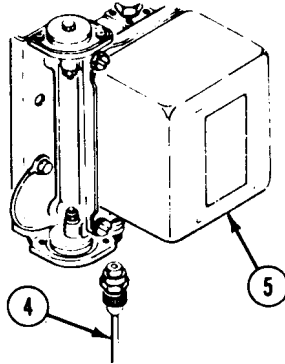
REPLACE FRONT MAIN WIRING HARNESS — Continued

0032 00

24. From inside power plant compartment, connect right headlight wiring harness (1), voltage regulator lead (2), and two power plant harness leads (3) to driver's compartment bulkhead.



25. Inside driver's compartment, connect circuit 516A lead (4) to infrared power pack (5).



26. Inside driver's compartment, install front main wiring harness (2) on two cradles (10). Secure with two cradle clips (3).

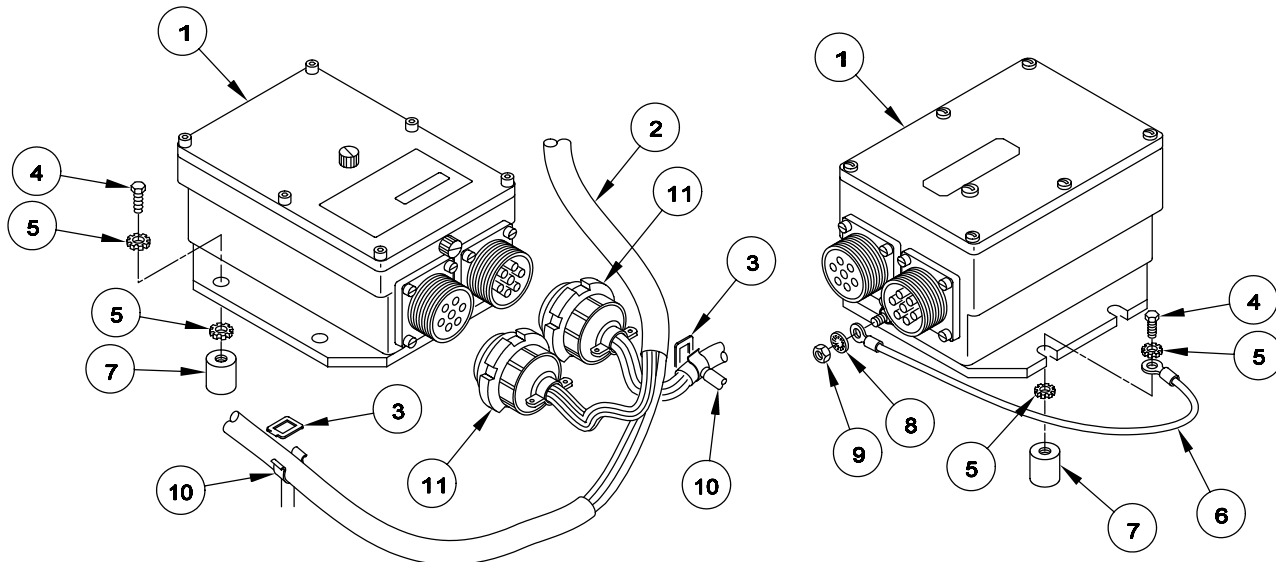
CAUTION

Equipment may be damaged if ground strap is not connected to the 200 AMP regulator.

NOTE

If voltage regulator was removed in REMOVAL Step 28, do INSTALLATION Steps 27 - 28. Otherwise, go to INSTALLATION Step 29.

- 27. 200 amp regulator only. Install ground strap (6) on regulator. Secure with lockwasher (8) and nut (9).
- 28. Install voltage regulator (1) on four weldnuts (7). Secure with eight new lockwashers (5) and four screws (4).
- 29. Connect two connectors (11) to regulator (1).



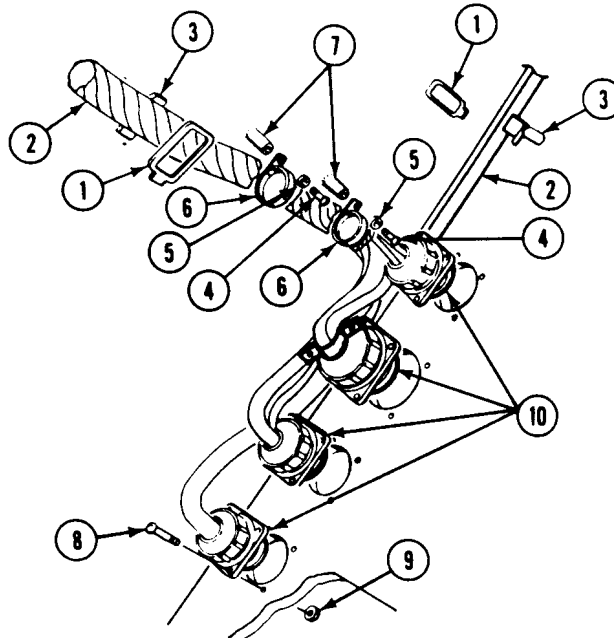
INSIDE DRIVER'S COMPARTMENT

100 AMP REGULATOR

200 AMP REGULATOR

REPLACE FRONT MAIN WIRING HARNESS — Continued**0032 00**

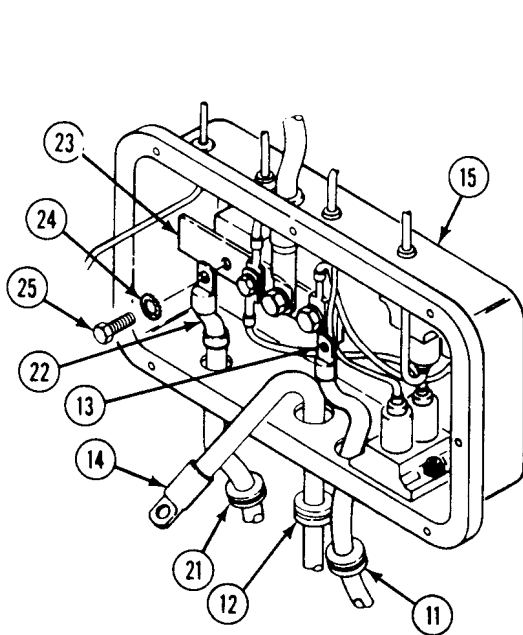
30. Install harness (2) on wall of driver's compartment. Secure to three weldnuts (7) and cradles (3) with three clamps (6), washers (5), screws (4), and clip (1).
31. Install four connectors (10) on driver's bulkhead. Secure with 16 nuts (9) and screws (8). Have helper assist.

**INSIDE DRIVER'S
COMPARTMENT**

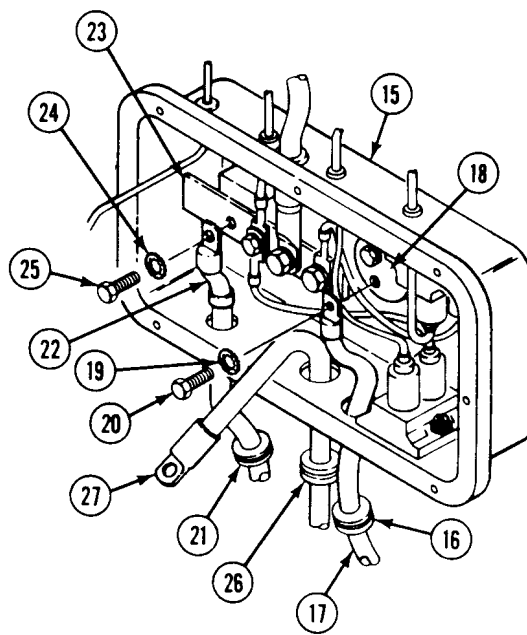
REPLACE FRONT MAIN WIRING HARNESS — Continued

0032 00

32. On 200 amp generator system, install two new grommets (11) and (12), circuit 2A lead (13), and circuit 2 lead (14) in distribution box (15).
33. On 100 amp generator system, install new grommet (16) and circuit 3 lead (17) in distribution box (15). Install circuit 3 lead on circuit breaker (18) and secure with new lockwasher (19) and screw (20).
34. Install new grommet (21) and circuit 6 lead (22) in distribution box (15). Install circuit 6 lead on bus bar (23). Secure with new lockwasher (24) and screw (25).
35. On 100 amp generator system, install new grommet (26) and circuit 2 lead (27) in distribution box (15). Install circuit 2 lead in master switch panel assembly (see your -20).
36. On 200 amp generator system, install circuit 2A lead (13) and circuit 2 lead (14) in master switch panel assembly (see your -20).

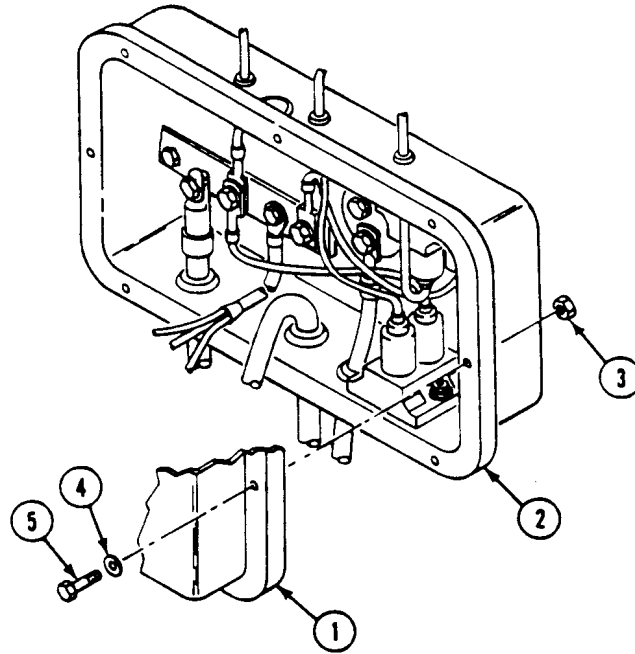


FOR 200 AMP GENERATOR SYSTEM

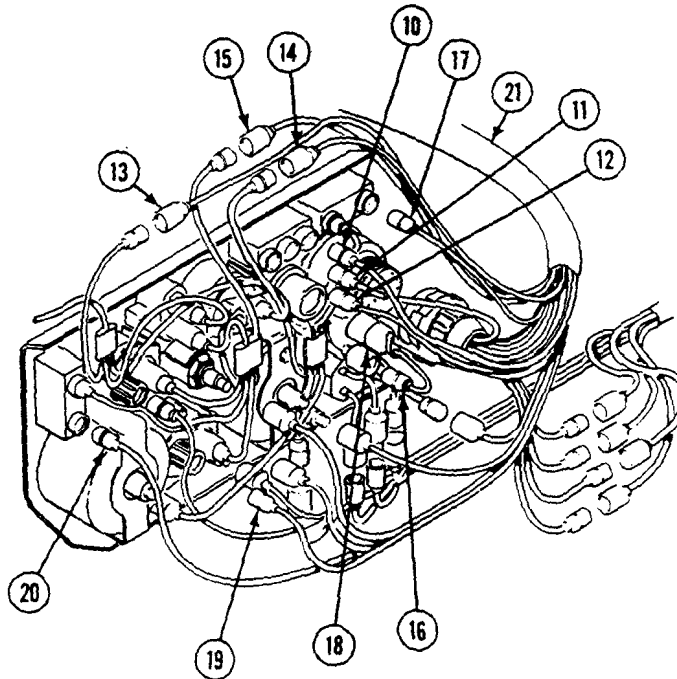


FOR 100 AMP GENERATOR SYSTEM

37. Install master switch panel assembly (1) on distribution panel (2). Secure with eight nuts (3), washers (4), and screws (5).



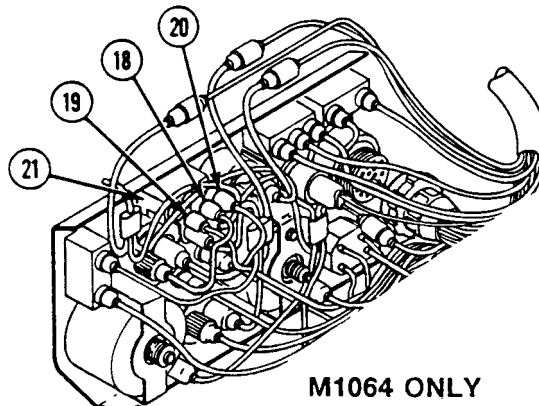
38. Route front main wiring harness (21) up behind instrument panel. Follow Steps 39 - 49 to attach leads to panel.
39. Connect circuit 406 lead (20) to air box heater switch.
40. Connect circuit 33 lead (19) to engine coolant temperature gauge.
41. Connect circuit 74 and 14 plug (18) to starter switch.
42. Connect circuit 516A lead (17) to infrared (I.R.) power selector switch.
43. Connect circuit 15 lead (13), circuit 25A lead (14), circuit 27F lead (15), and circuit 14 lead (16) to instrument panel wiring harness.
44. Connect circuit 19 lead (10), circuit 520 lead (11), and circuit 514-515 lead (12) to infrared blackout (I.R. - B.O.) switch.



NOTE

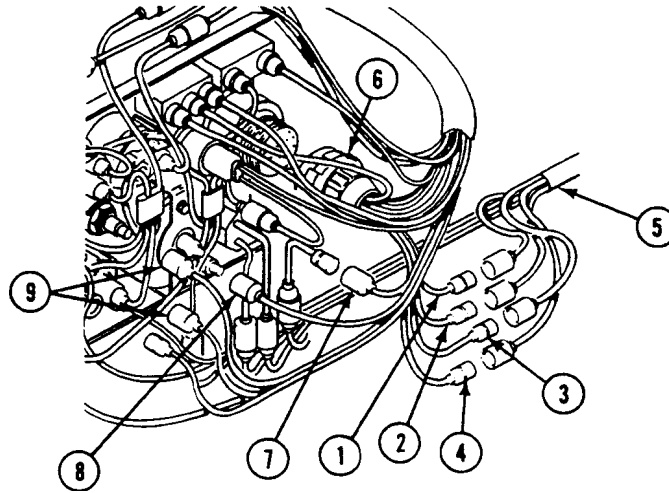
Step 44 applies to M1064 only.

45. Install circuit 28 lead (18), circuit 30 lead (19), and circuit 31 lead (20) on fuel tank switch (21).

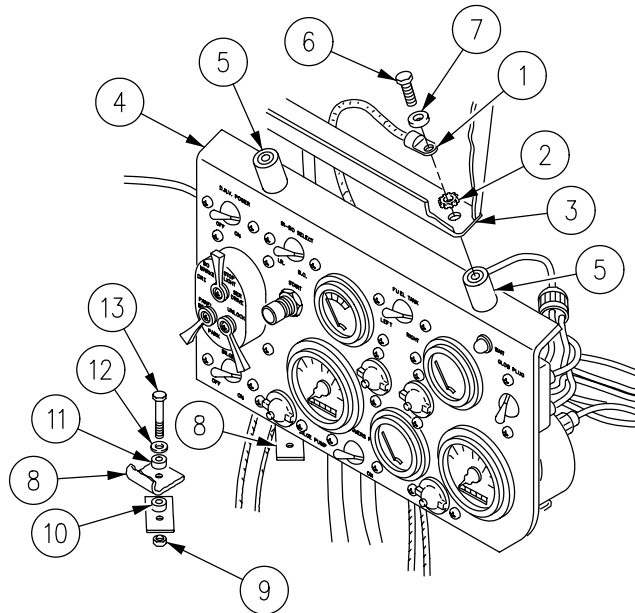


M1064 ONLY

46. Connect two circuit 40 leads (9) to instrument panel lights.
47. Connect circuit 452B lead (8) to bilge pump ON light.
48. Connect circuit 452A lead (7) to bilge pump switch.
49. Connect connector (6) to light selector switch.
50. Connect circuit 24 lead (1), circuit 23 lead (2), circuit 22 lead (4), and circuit 21 lead (3) to rear main wiring harness (5).



51. Support instrument panel (4) on two struts (8).
52. Install ground lead (1), two screws (6), flat washer (7), and lockwasher (2) on upper support (3).
53. Install panel (4) with two mounts (5) on upper support (3). Secure with two screws (6).
54. Install panel (4) on two struts (8). Secure with two new locknuts (9), mounts (10) and (11), flat washers (12), and screws (13).



FOLLOW-THROUGH STEPS

1. Install driver's power plant access cover (see your -20).
2. Close power plant front access door and raise trim vane (see your -10).
3. Connect battery ground lead (see your -20).
4. Start engine (see your -10). Check that master switch panel, instrument panel, and distribution box operate properly.
5. Check that lights operate properly (see your -10).
6. Stop/shutdown engine (see your -10).

END OF TASK

REPLACE CHASSIS TURRET WIRING HARNESS (M901A1 ONLY)

0033 00

THIS WORK PACKAGE COVERS:

- Removal (page 0033 00-1).
- Installation (page 0033 00-6).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Materials/Parts

- Locknut (4)
- Locknut (5)
- Lockwasher (4)
- Lockwasher (4)
- Lockwasher (8)
- Lockwasher (8)
- Lockwasher (8)
- Lockwasher (8)
- Lockwasher (11)
- Safety wire (as required)

Personnel Required

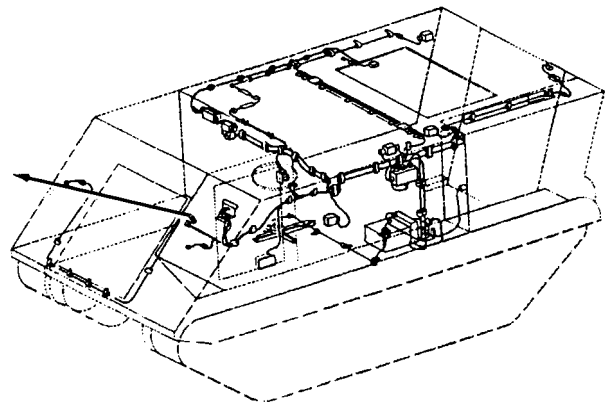
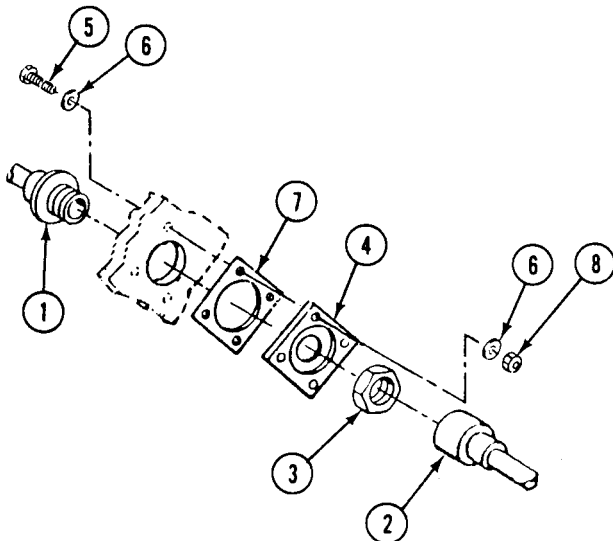
- Track Vehicle Repairer 63H10
- Helper (H)

Equipment Condition

- Engine shutdown (see your -10)
- Carrier blocked (see your -10)
- Master switch panel removed (see your -20)
- Turret removed. See TM 9-2350-259-34
- Power plant access door opened (see your -10)
- Driver's level indicator removed (see your -20)

REMOVAL

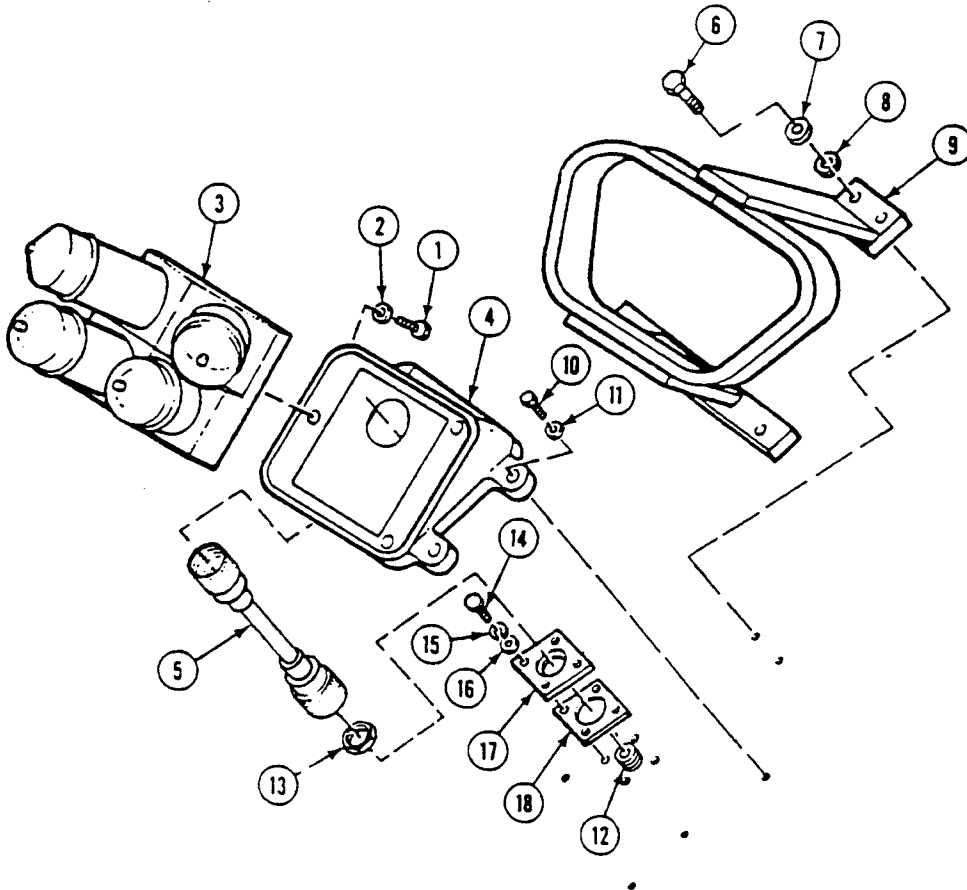
1. Disconnect right smoke grenade wiring harness connector (1) from connector (2).
2. Remove jamnut (3) from connector (1). Remove connector from plate (4). Have helper assist.
3. Remove four screws (5), eight washers (6), gasket (7), plate (4), and four locknuts (8). Discard locknuts. Have helper assist.



WARNING

To prevent injury to personnel, verify that all grenades have been removed from smoke grenade discharger before removing components.

4. Remove three screws (1) and washers (2) securing smoke grenade discharger (3) to mounting base (4). Pull away discharger and disconnect wiring harness (5). Remove discharger.
5. Remove four screws (6), lockwashers (7), and washers (8) securing brush guard (9) to hull. Remove brush guard. Discard lockwashers.
6. Remove three screws (10), washers (11), and mounting base (4) from hull.
7. Disconnect wiring harness (5) from hull connector (12). Remove wiring harness.
8. Remove jamnut (13) from connector (12) in hull. Let connector fall inside driver's compartment.
9. Remove four screws (14), lockwashers (15), washers (16), mounting plate (17), and gasket (18). Discard lockwashers.

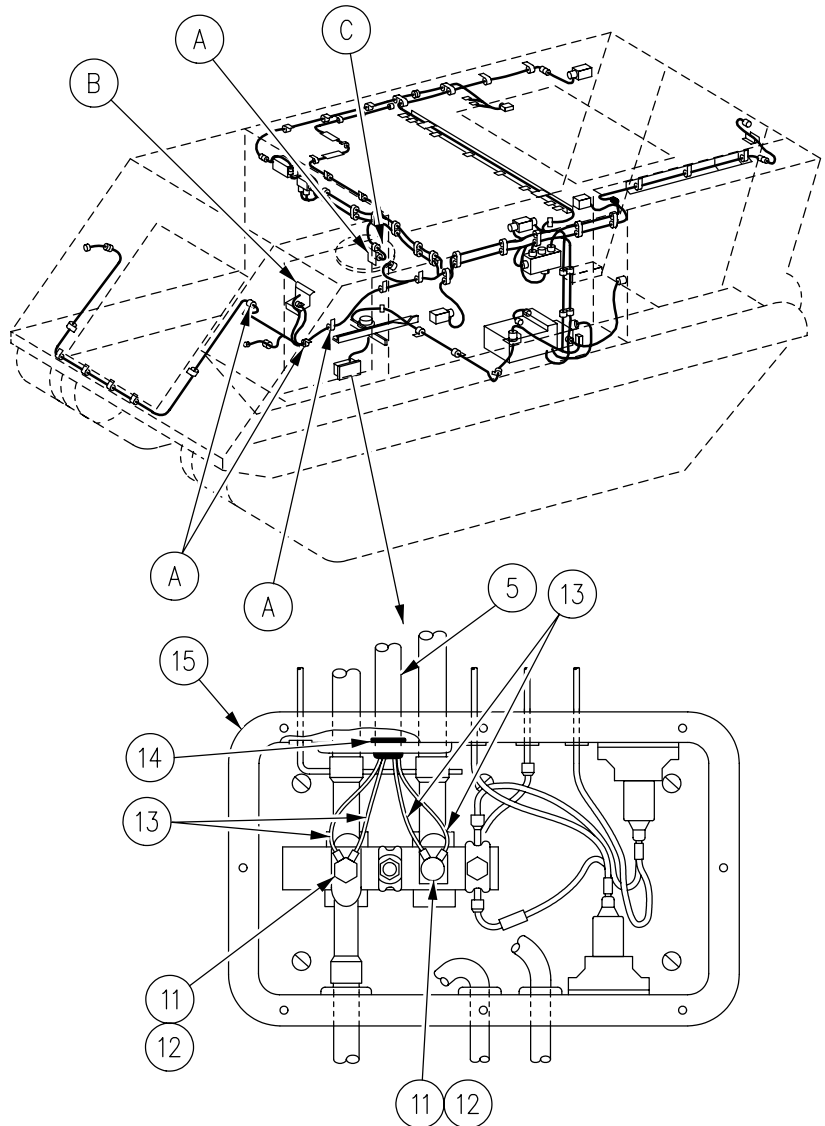
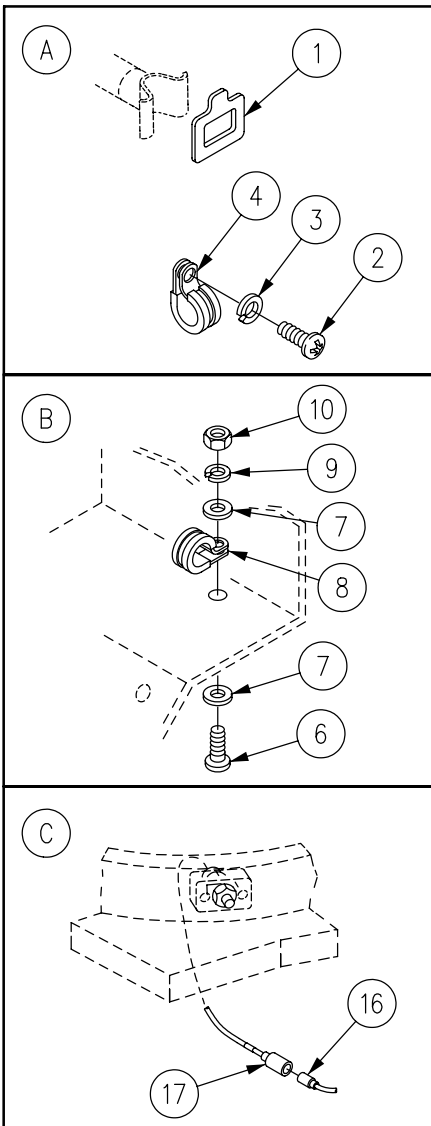


10. Remove clip (1), three screws (2), lockwashers (3), and clamps (4) from wiring harness. Discard lockwashers.
11. Remove screw (6), two washers (7), clamp (8), lockwasher (9), and nut (10). Discard lockwasher.

NOTE

Tag leads before removing.

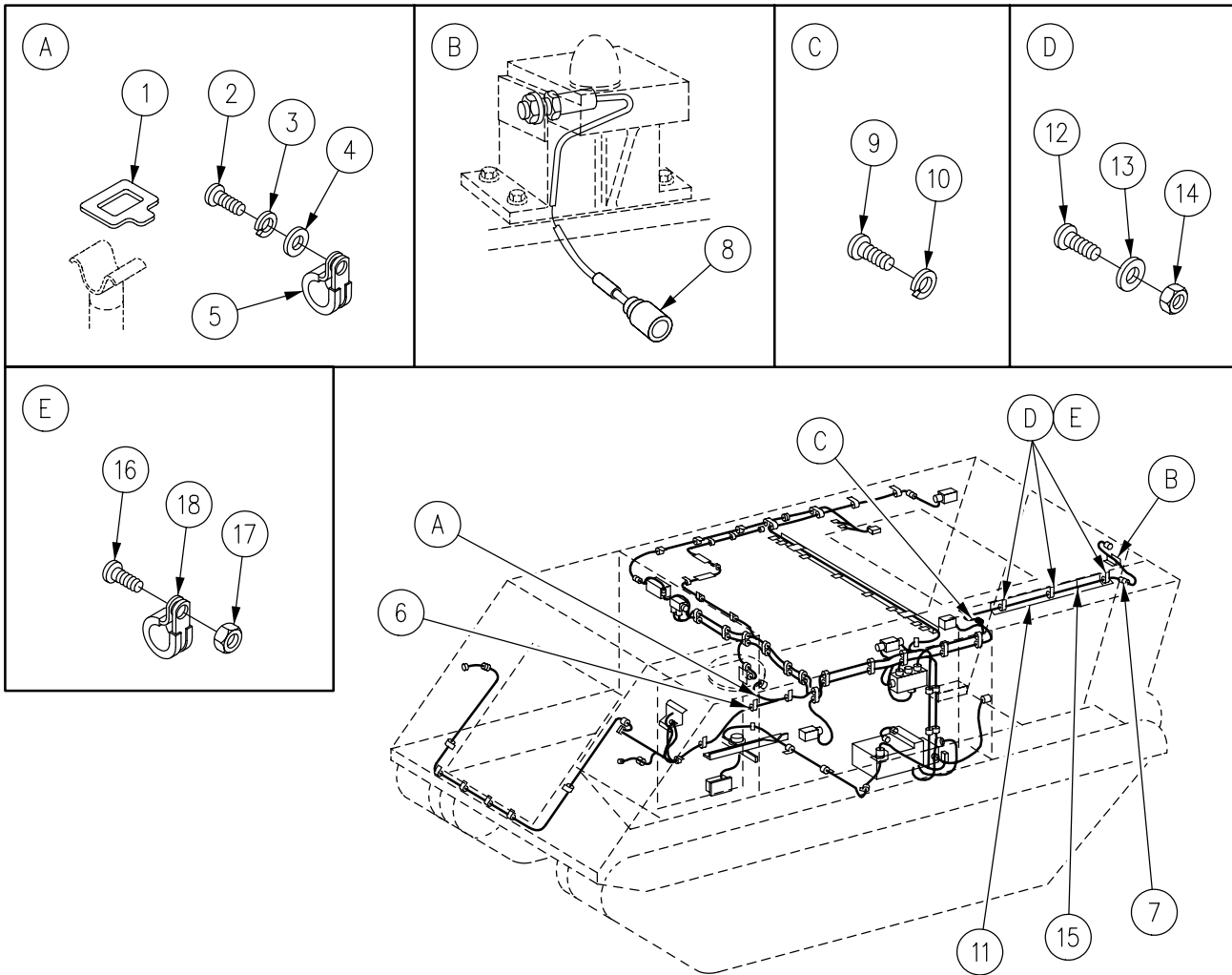
12. Remove two screws (11), lockwashers (12), four leads (13), grommet (14), and wiring harness (5) from distribution box (15). Discard lockwashers.
13. Disconnect wiring harness lead W8 P4 (16) from driver's hatch proximity switch plug A5S2 J1 (17).



REPLACE CHASSIS TURRET WIRING HARNESS (M901A1 ONLY) — Continued

0033 00

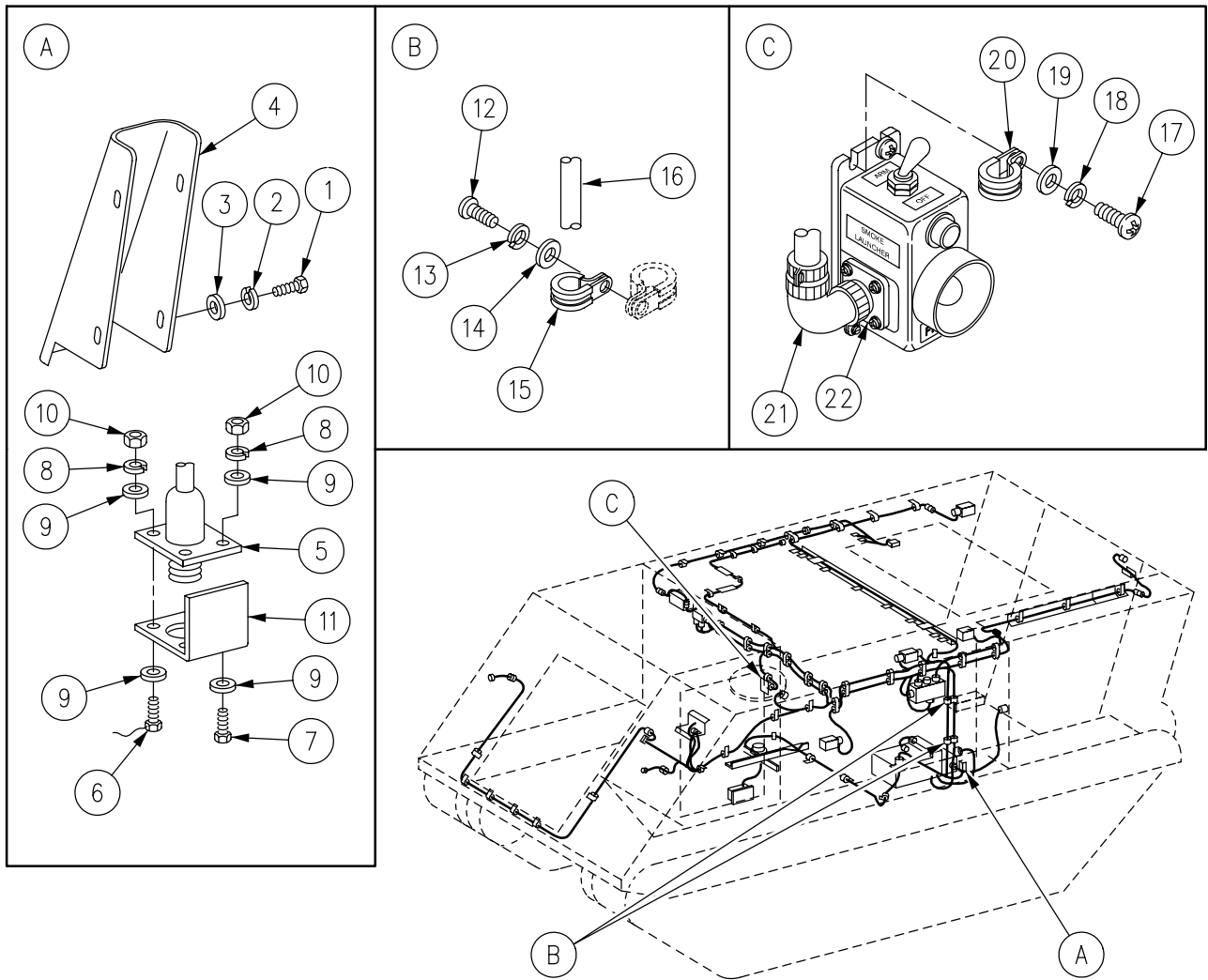
14. Remove three clips (1), screw (2), lockwasher (3), washer (4), clamp (5), and wiring harness (6) from left side of driver's compartment. Discard lockwasher.
15. Disconnect wiring harness lead W8 P3 (7) from cargo hatch full open proximity switch plug A5S4 J1 (8).
16. Remove two screws (9), lockwashers (10), and guard (11) from fuel tank weldnuts. Discard lockwashers.
17. Remove two screws (12), washers (13), locknuts (14), and guard (15) from guard (11). Discard locknuts.
18. Remove three screws (16), locknuts (17), and clamps (18) from guard (11) and wiring harness (6).
19. Remove seven clips (1) and wiring harness (6) from front of fuel tank and left side of carrier.



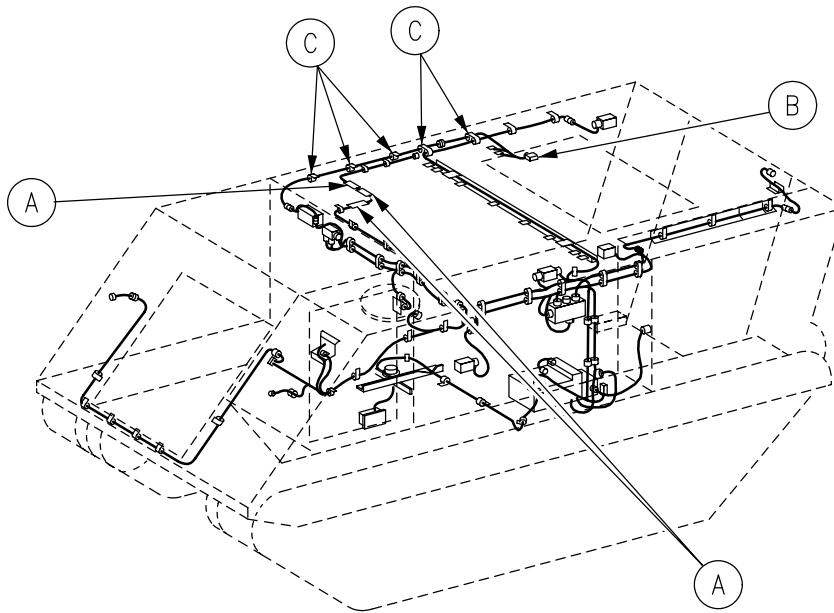
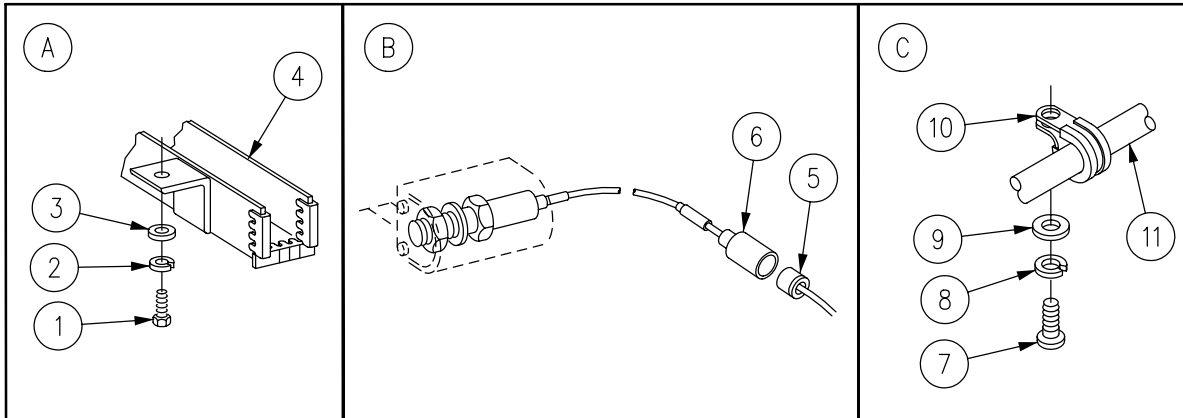
REPLACE CHASSIS TURRET WIRING HARNESS (M901A1 ONLY) — Continued

0033 00

20. Remove four screws (1), lockwashers (2), washers (3), and cable guard (4) securing connector W8 J1 (5) to floor near bulkhead. Disconnect connector W8 J1 (5) from turret slip ring wiring harness. Discard lockwashers.
21. Cut safety wire securing connector W8 J1 (5) to screw (6). Remove screw (6), three screws (7), four lockwashers (8), eight washers (9), four nuts (10), and connector W8 J1 (5) from bracket (11). Discard lockwashers.
22. Remove two screws (12), lockwashers (13), washers (14), clamps (15), and wiring harness (16) from left bulkhead. Discard lockwashers.
23. Remove screw (17), lockwasher (18), washer (19), and clamp (20) securing smoke grenade arming/firing unit lead W8 P1 (21) to rear engine compartment bulkhead. Discard lockwasher.
24. Disconnect wiring harness lead W8 P1 (21) from smoke grenade arming/firing unit connector (22).



25. Remove eight screws (1), lockwashers (2), washers (3), and four protectors (4) from overhead. Discard lockwashers.
26. Disconnect wiring harness lead W8 P5 (5) from cargo hatch closed proximity switch connector A5S3 J1 (6).
27. Remove eleven screws (7), lockwashers (8), washers (9), and clamps (10) from weldnuts overhead. Discard lockwashers.
28. Remove wiring harness (11) from carrier.



INSTALLATION

NOTE

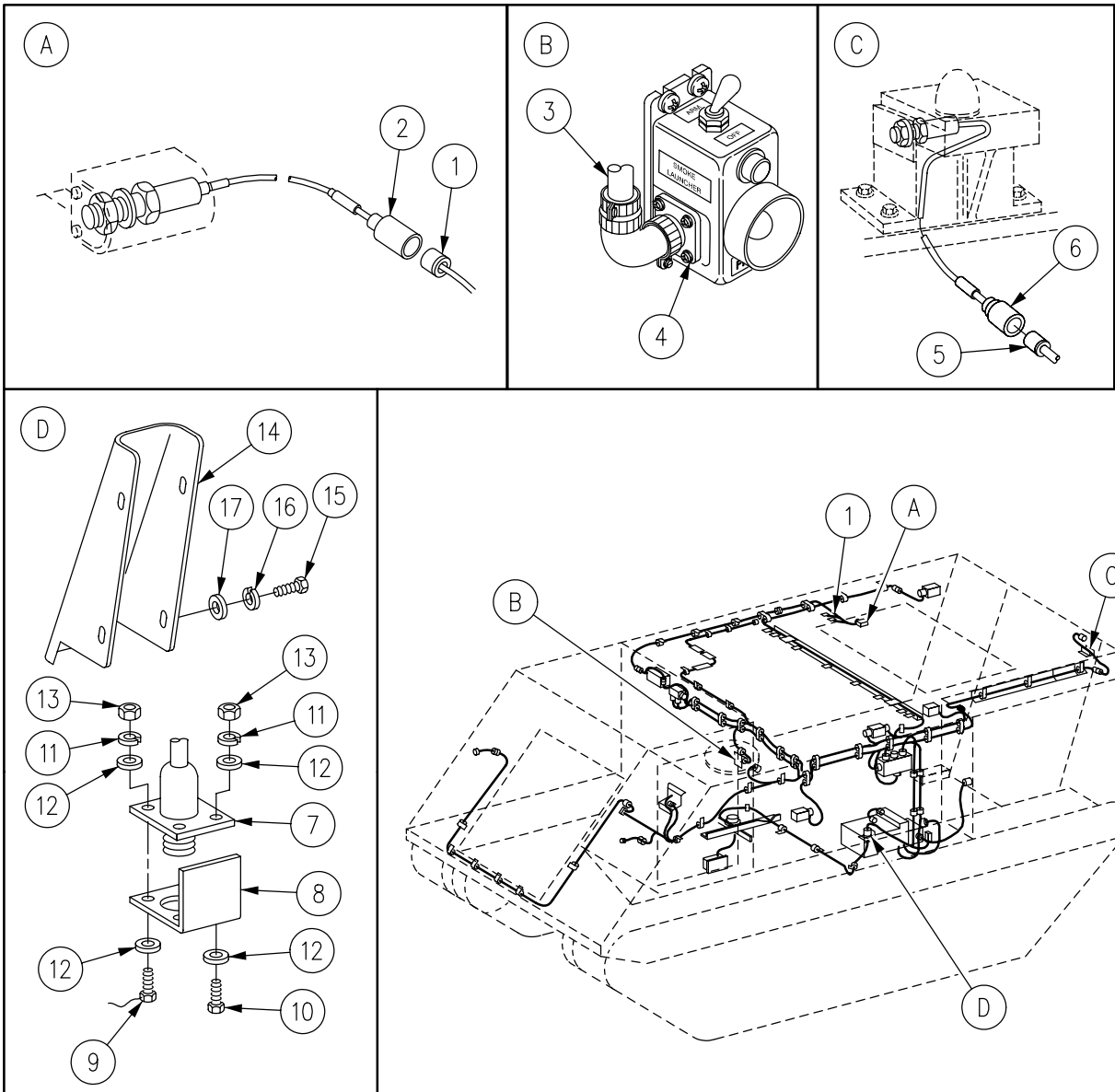
Lay out wiring harness inside carrier.

1. Connect wiring harness lead W8 P5 (1) to cargo hatch closed proximity switch A5S3 J1 (2).
2. Connect wiring harness lead W8 P1 (3) to arming/firing unit connector A5A1 J1 (4).
3. Connect wiring harness lead W8 P3 (5) to cargo hatch full open proximity switch A5S4 J1 (6).

REPLACE CHASSIS TURRET WIRING HARNESS (M901A1 ONLY) — Continued

0033 00

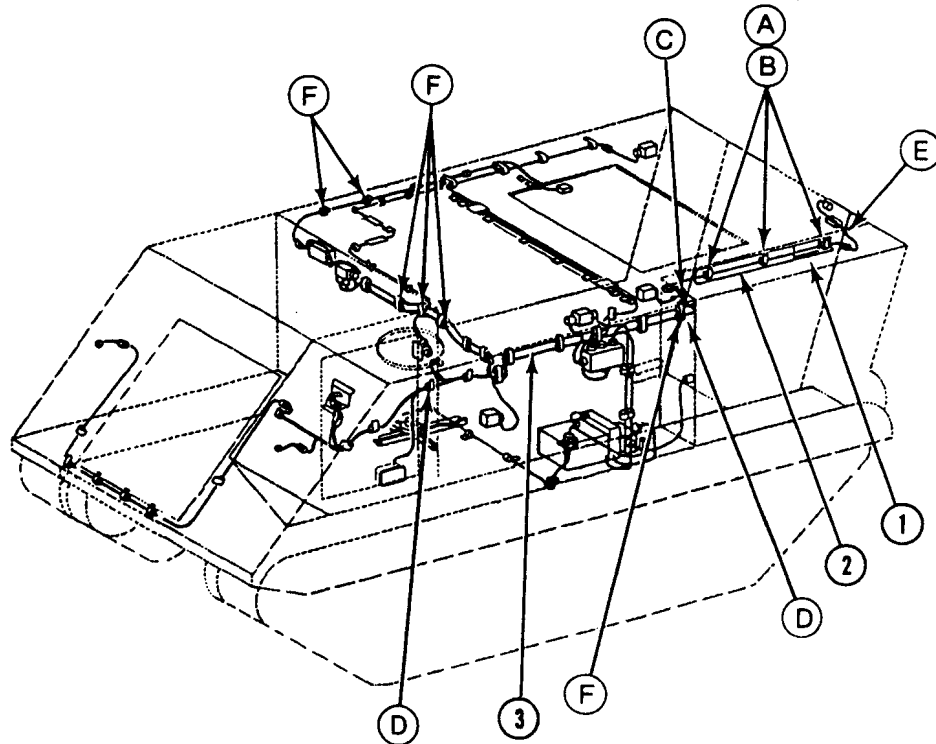
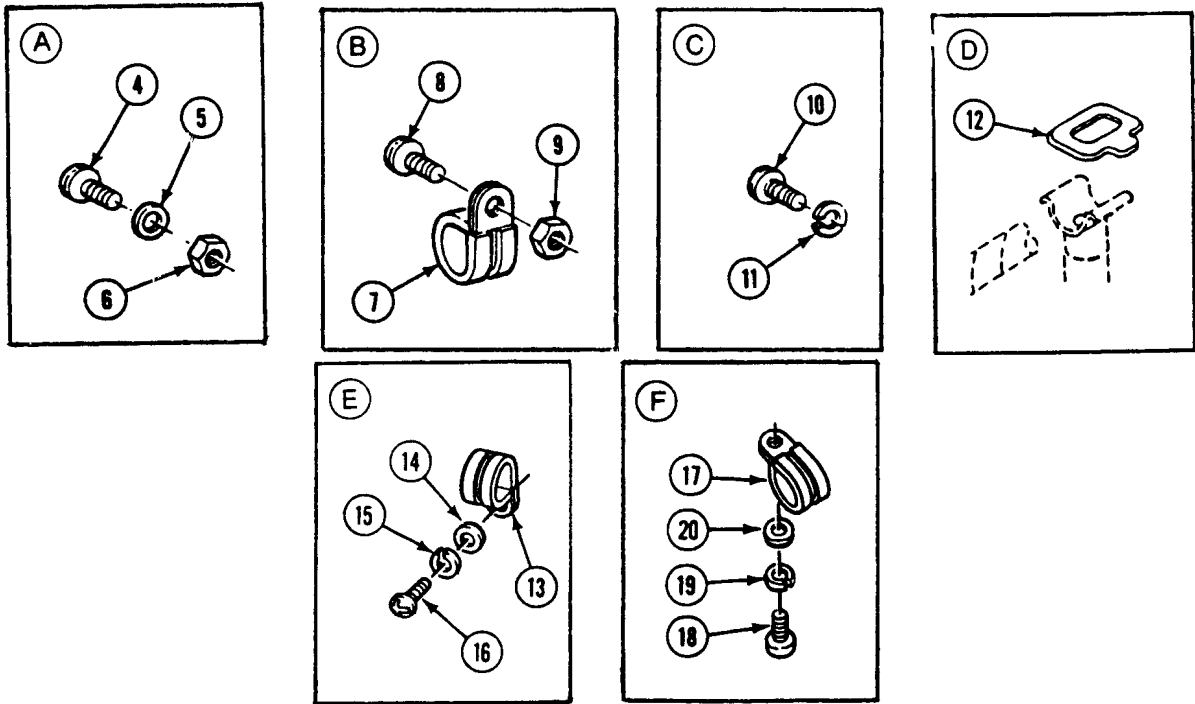
4. Position connector W8 J1 (7) on bracket (8). Secure with screw (9), three screws (10), four new lockwashers (11), eight washers (12), and four nuts (13).
5. Safety wire connector W8 J1 (7) to screw (9).
6. Connect turret slip ring wiring harness connector to connector W8 J1 (7).
7. Install guard (14) with four screws (15), new lockwashers (16), and washers (17).



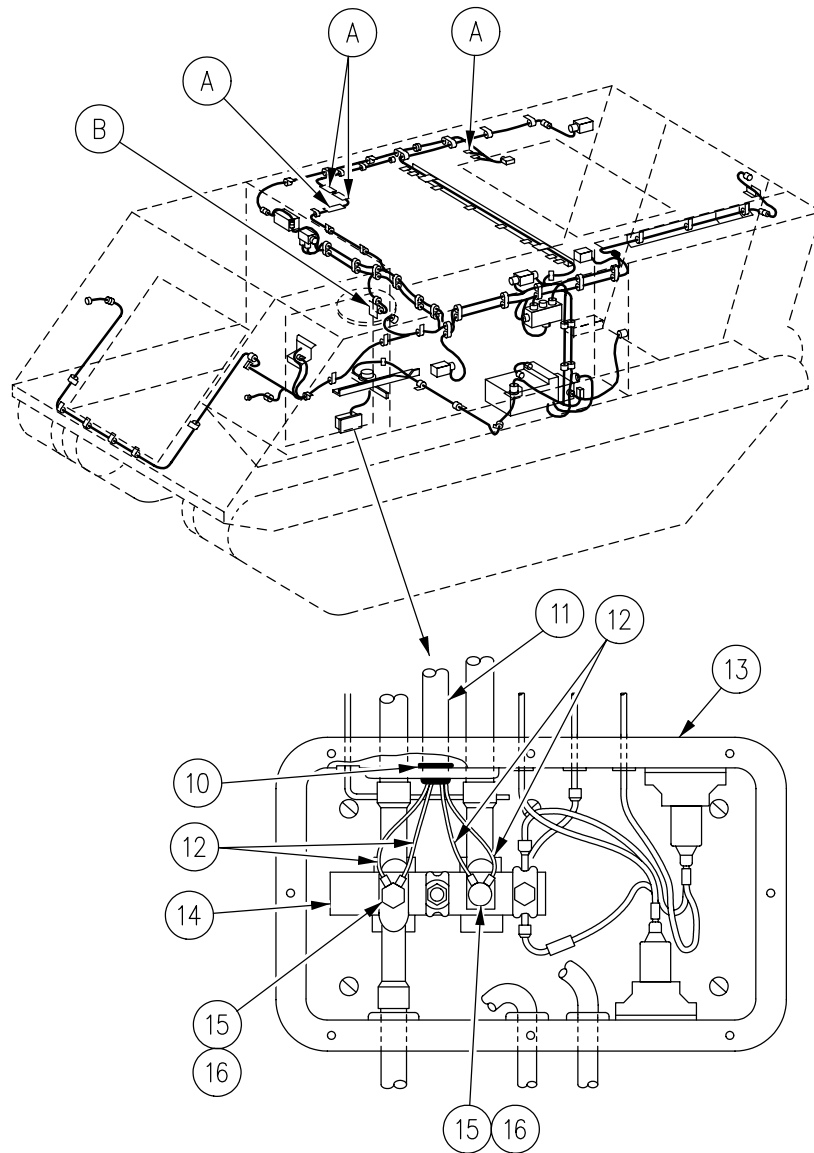
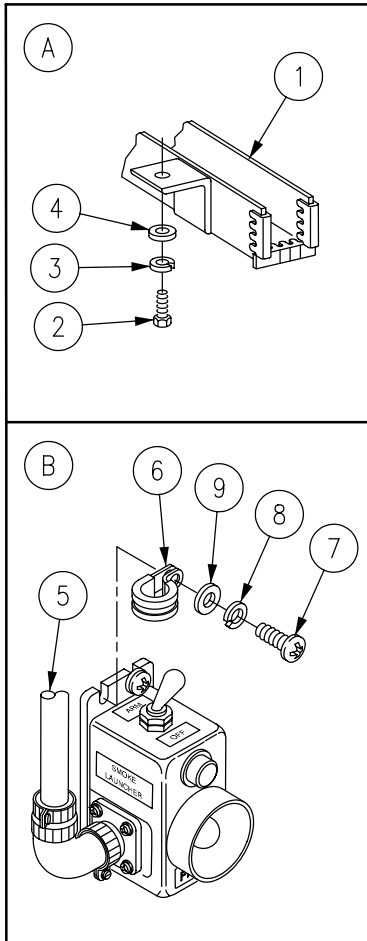
NOTE

Make sure to secure all wiring harness clamps loosened during removal procedure.

8. Position guards (1) and (2) over rear section of wiring harness (3) near fuel tank. Secure guards with two screws (4), washers (5), and new locknuts (6).
9. Take proper amount of slack out of wiring harness (3) and secure to guard (2) with three clamps (7), screws (8), and new locknuts (9).
10. Attach guard (2) to fuel tank and weldnuts with two screws (10) and new lockwashers (11).
11. Attach wiring harness (3) to front of fuel tank and left bulkhead using seven clips (12).
12. Attach wiring harness (3) to bulkhead using two clamps (13), washers (14), new lockwashers (15), and screws (16).
13. Secure wiring harness (3) to overhead with eleven clamps (17), screws (18), new lockwashers (19), and washers (20).



14. Install four protectors (1) with eight screws (2), new lockwashers (3), and washers (4) to overhead.
15. Secure smoke grenade arming/firing unit lead (5) to rear engine compartment bulkhead with clamp (6), screw (7), new lockwasher (8), and washer (9).
16. Place grommet (10) on wiring harness (11). Feed wiring harness leads (12) into distribution box (13) and attach four leads (12) to bus bar (14). Secure leads with two screws (15) and new lockwashers (16) after positioning grommet in distribution box.



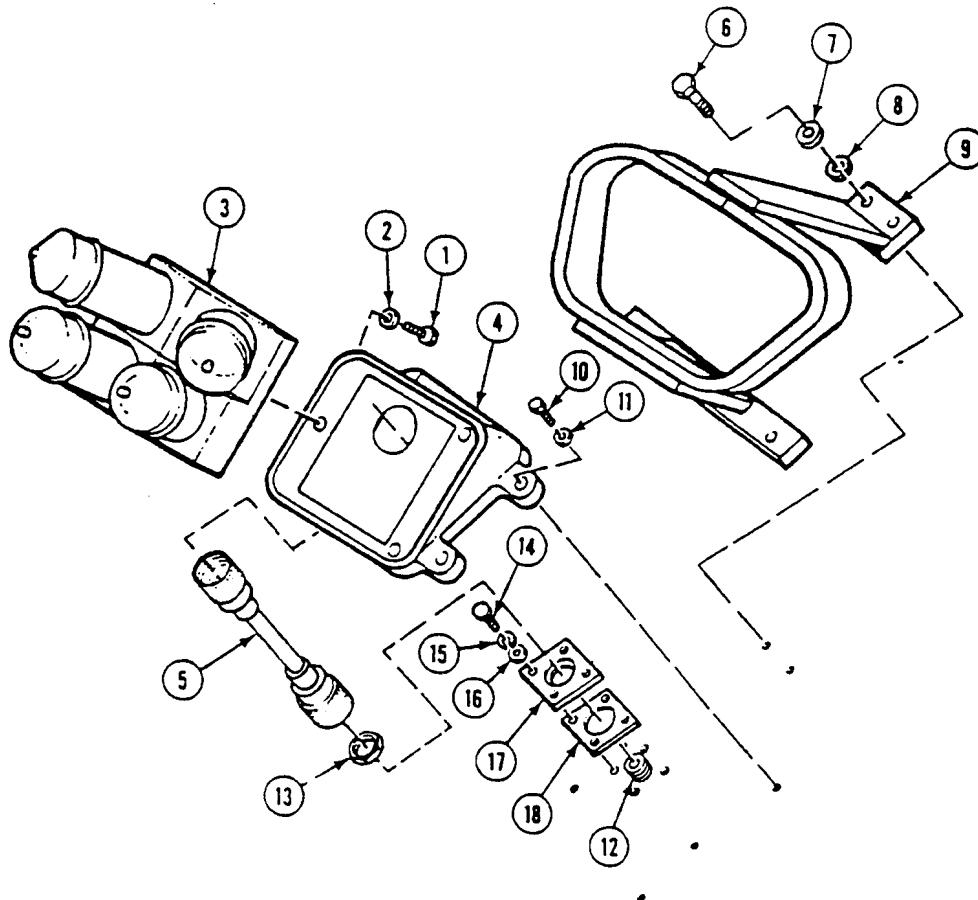
17. Position plate (17) and gasket (18) on hole on outside of hull. Secure with four screws (14), new lockwashers (15), and washers (16).

WARNING



To prevent injury to personnel, verify that all grenades have been removed from smoke grenade discharger before removing components.

18. Hold left smoke grenade wiring harness connector (5) up to plate (17) and secure with jamnut (13). Have helper assist.
19. Connect wiring harness (5) to hull connector (12).
20. Install mounting base (4) on hull. Pass the loose end of the wiring harness (5) through the opening in the base (4). Secure with three screws (10) and washers (11).
21. Install brush guard (9) on hull. Secure with four screws (6), new lockwashers (7), and washers (8).
22. Position smoke grenade discharger (3) and connect wiring harness (5) to connector on discharger.
23. Install discharger (3) on mounting base (4) and secure with three washers (2) and screws (1).

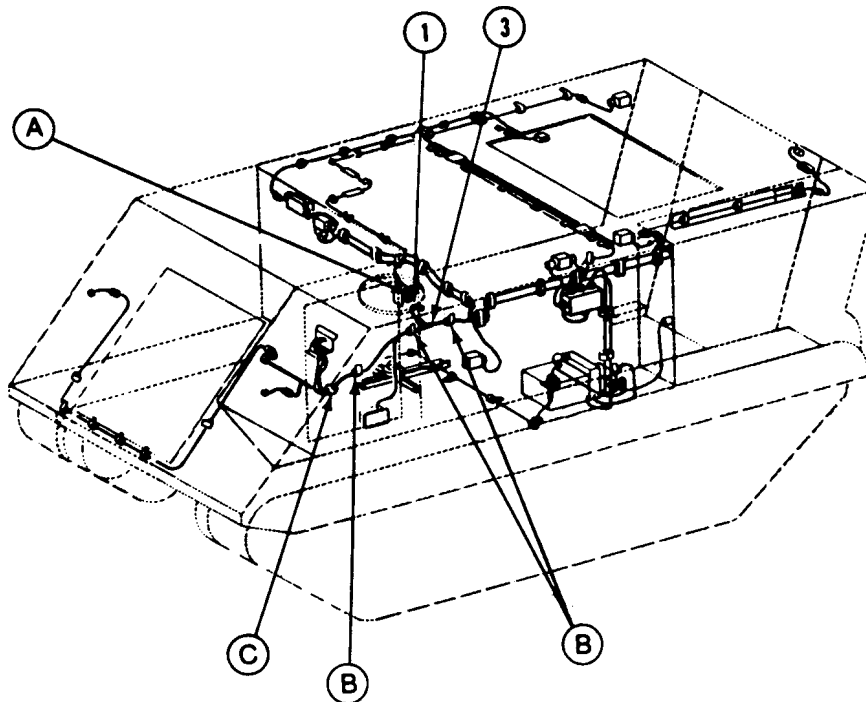
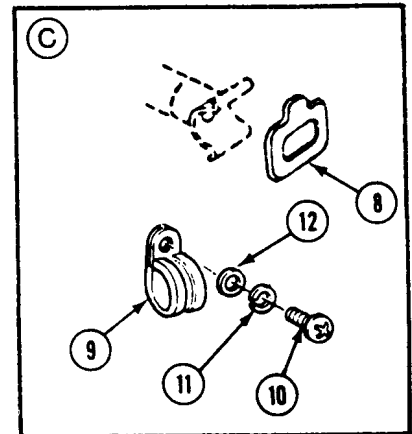
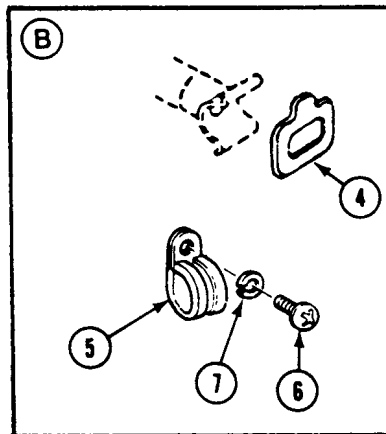
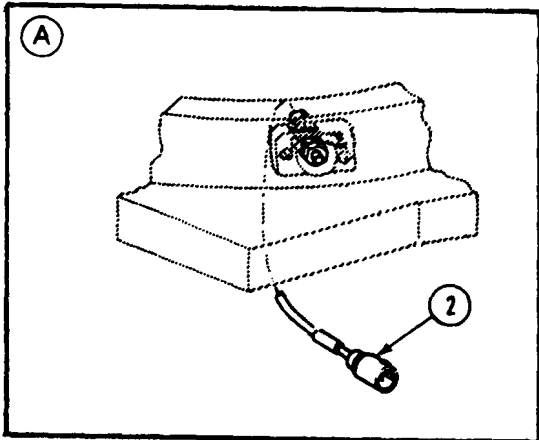


24. Connect wiring harness lead W8 P4 (1) to driver's hatch proximity switch plug A5S2 J1 (2).

NOTE

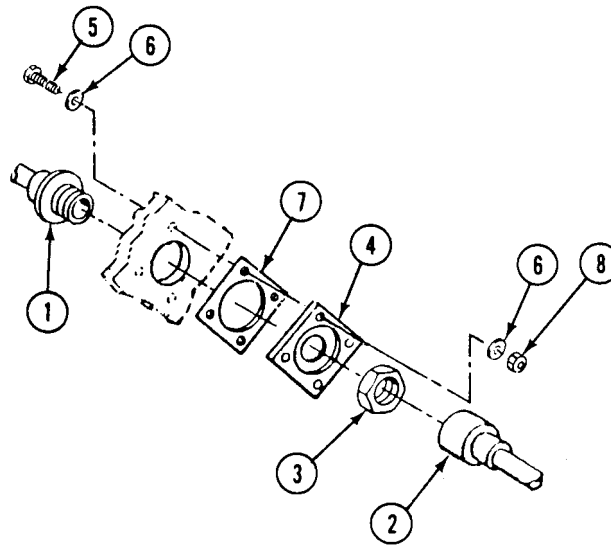
Make sure to secure all wiring harness clamps that were loosened or butterflied to the turret wiring harness.

25. Secure wiring harness (3) with clip (4), three clamps (5), screws (6), and new lockwashers (7).
26. Secure wiring harness (3) with three clips (8), clamp (9), screw (10), new lockwasher (11), and washer (12) to left side of driver's compartment.



REPLACE CHASSIS TURRET WIRING HARNESS (M901A1 ONLY) — Continued**0033 00**

27. Install gasket (7) and plate (4) on driver's bulkhead. Secure with four screws (5), eight washers (6), and four new locknuts (8). Have helper assist.
28. Install connector (1) on plate (4) with jamnut (3).
29. Connect right smoke grenade wiring harness connector (2) to connector (1).

**FOLLOW-THROUGH STEPS**

1. Install driver's level indicator (see your -20).
2. Install master switch panel (see your -20).
3. Install turret. See TM 9-2350-259-34.
4. Close power plant access door (see your -10).

END OF TASK

REPAIR MULTIPIN CONNECTORS

0034 00

THIS WORK PACKAGE COVERS:

- Remove Receptacle (page 0034 00-1).
 - Install Receptacle (page 0034 00-2).
 - Remove Cable Connector (page 0034 00-2).
 - Install Cable Connector (page 0034 00-3).
-

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

- Automotive Fuel and Electrical System Repair Tool Kit (WP 0104 00, Item 4)
- Digital Multimeter (WP 0104 00, Item 28)
- Electrical Tool Kit (WP 0104 00, Item 16)
- Soldering Gun (WP 0104 00, Item 22)

Materials/Parts

- Insulation tape (WP 0105 00, Item 15)
- Tin alloy solder (WP 0105 00, Item 26)
- Contacts (as required)

Personnel Required

Fuel and Elec Sys Rep 63G10

Equipment Condition

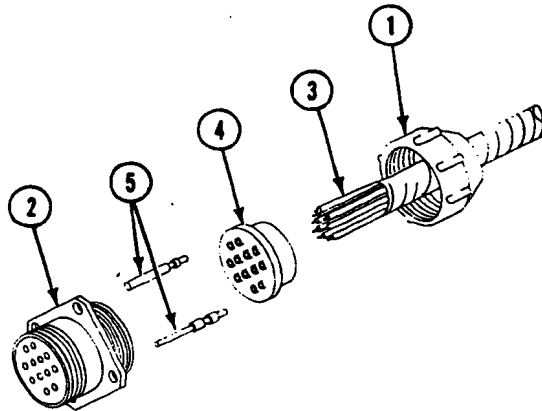
Repairable parts on workbench

REMOVE 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 de-solder leads from contacts. Discard contacts.
4. Remove grommet (4) and nut (1) from leads (3).



INSTALL RECEPTACLE**NOTE**

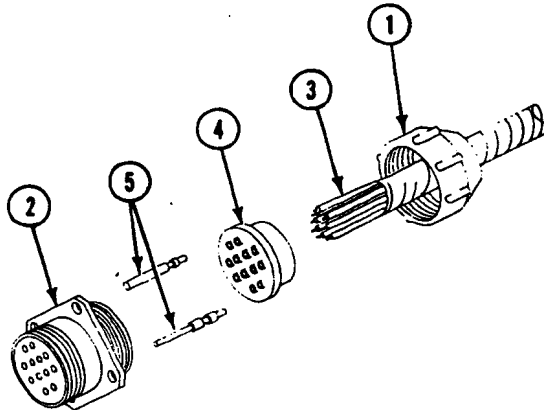
If replacing lead, cut new wire from bulk supply. Measure original length, gauge, and type of wire.

1. Strip insulation from leads (3) to uncover just enough wire to fill well in contact (5).
2. Slide nut (1) over leads (3).

NOTE

Make sure leads pass through proper lettered hole in grommet.

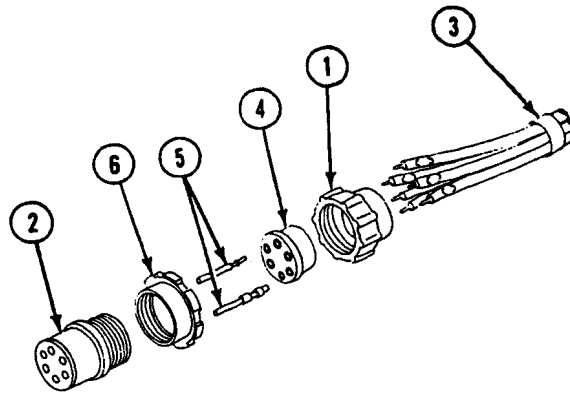
3. Push leads (3) through grommet (4) and insert in new contacts (5).
4. Solder leads (3) in contacts (5) and press contacts into grommet (4). Check leads for continuity.
5. Align and install grommet (4) in receptacle (2). Secure with nut (1).

**REMOVE 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 de-solder leads from contacts. Discard contacts.

- Remove grommet (4) and retaining nut (1) from cable (3).



INSTALL CABLE CONNECTOR

NOTE

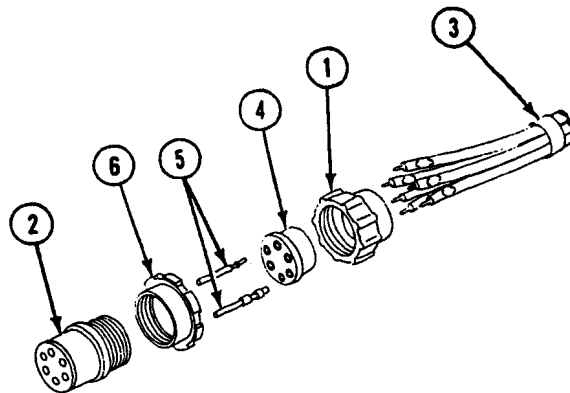
If replacing lead, cut new wire from bulk supply. Measure original length, gauge, and type of wire.

- Strip insulation from leads of cable (3) to uncover just enough wire to fill well in contact (5).
- Slide retaining nut (1) and coupling nut (6) on cable (3).

NOTE

Make sure leads pass through proper lettered hole in grommet.

- Push leads of cable (3) through grommet (4) and insert in new contacts (5).
- Solder leads in contacts (5) and press contacts into grommet (4). Check leads for resistance.
- Align and install grommet (4) in plug (2). Secure with retaining nut (1).



END OF TASK

CHAPTER 8

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR SUSPENSION SYSTEM

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
REPAIR TRACK IDLER ARM.....	0035 00
IDLER ARM, ROAD WHEEL ARM, AND HUBS WEAR LIMITS.....	0036 00
REPAIR TRACK TENSION ADJUSTER.....	0037 00
REPAIR SHOCK ABSORBER.....	0038 00

REPAIR TRACK IDLER ARM

0035 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0035 00- 1).
 Assembly (page 0035 00- 2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Equipment Condition

Track idler arm assembly removed (see your -20)
 Hub assembly removed (see your -20)

Materials/Parts

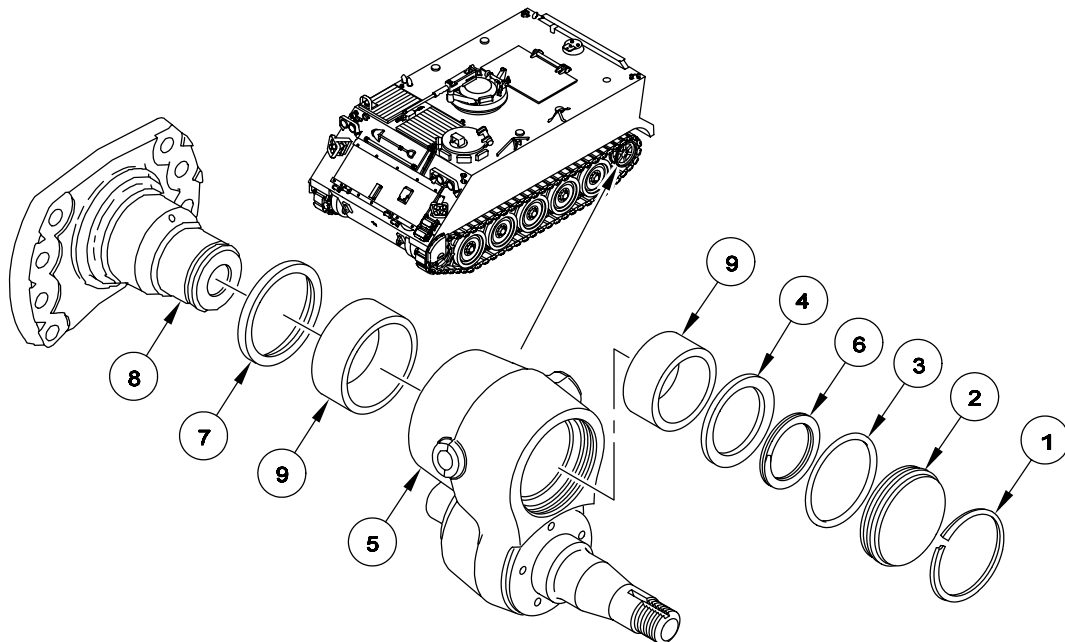
Non-metallic seal
 Packing (2)

DISASSEMBLY

NOTE

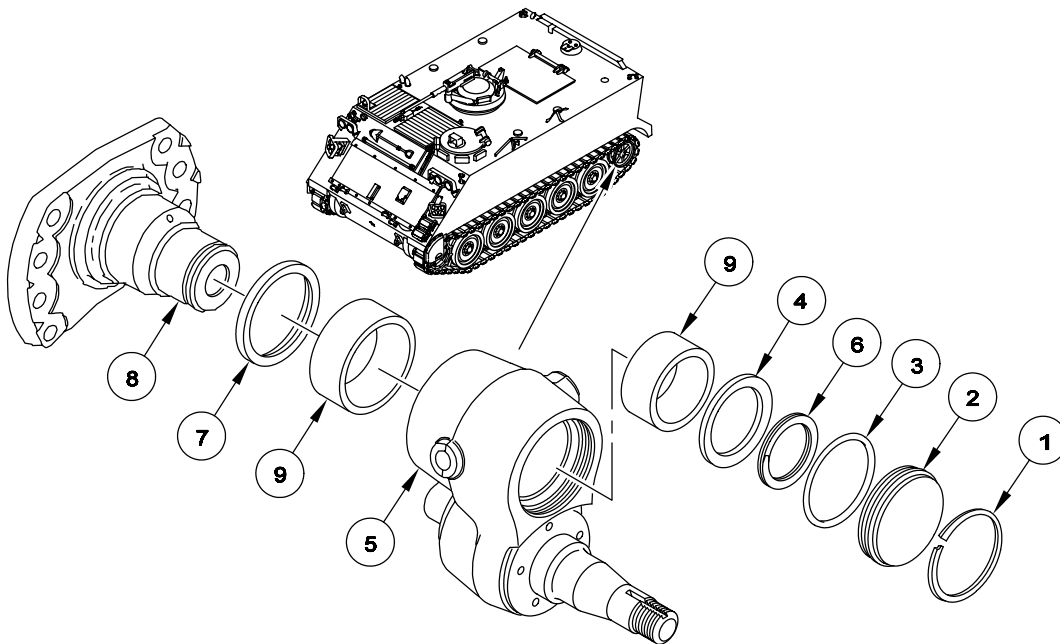
To remove retaining ring, pry open with a screwdriver tip in slot of ring. Retaining ring pliers are not required.

1. Remove retaining ring (1), cover (2), and packing (3) from arm (5). Discard packing.
2. Remove retaining ring (6), spacer (4), arm (5), and non-metallic seal (7) from spindle (8). Discard seal.
3. Remove two bearings (9) from arm (5).



ASSEMBLY

1. Install two bearings (9) in arm (5).
2. Install new non-metallic seal (7) and arm (5) on spindle (8). Secure with spacer (4) and retaining ring (6).
3. Install new packing (3) in arm (5).
4. Secure cover (2) in arm (5) with retaining ring (1).

**FOLLOW-THROUGH STEPS**

1. Install track idler arm assembly (see your -20).
2. Install hub assembly (see your -20).
3. Lube track idler arm (see your -20).

END OF TASK

IDLER ARM, ROAD WHEEL ARM, AND HUBS WEAR LIMITS

0036 00**THIS WORK PACKAGE COVERS:**

Clean, Inspect, and Repair (page 0036 00-1).

INITIAL SETUP:Maintenance Level

Direct Support

Equipment Condition

Track idler arm assembly removed from carrier (see your -20)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Hub assembly removed (see your -20)

Road wheel support arm disassembled (see your -20)

Personnel Required

Track Vehicle Repairer 63H10

References

TM 9-214

CLEAN, INSPECT, AND REPAIR

1. See TM 9-214 to check bearings.
2. Check parts shown in figures that have reference letters.
3. Check the parts' dimensions with chart below to determine replacement.

Table 1. HUBS

Reference Letter	Point of Measurement	Idler Hubs	Wear Limits	All Road Wheels	Wear Limits
A	Inside diameter of inner hub bearing	2.0625 to 2.0630	*	2.000 to 2.005	2.0010
B	Inside diameter of outer hub bearing	1.5625 to 1.5630	*		
C	Outside diameter of outer bearing cup	3.1562 to 3.1572	*		
D	Inside diameter of outer bearing hub surface	3.1527 to 3.1537	*	2.9965 to 2.9975	*
C-D	Fit of cup in hub	0.0025T to 0.0045T			
E	Outside diameter of inner bearing cup	3.6250 to 3.6260	*	3.5000 to 3.5005	*
F	Inside diameter of inner bearing hub surface	3.621 to 3.622		3.4960 to 3.4970	*
E-F	Fit of cup in hub	0.003T to 0.005T			

*Must be within new parts dimensions.

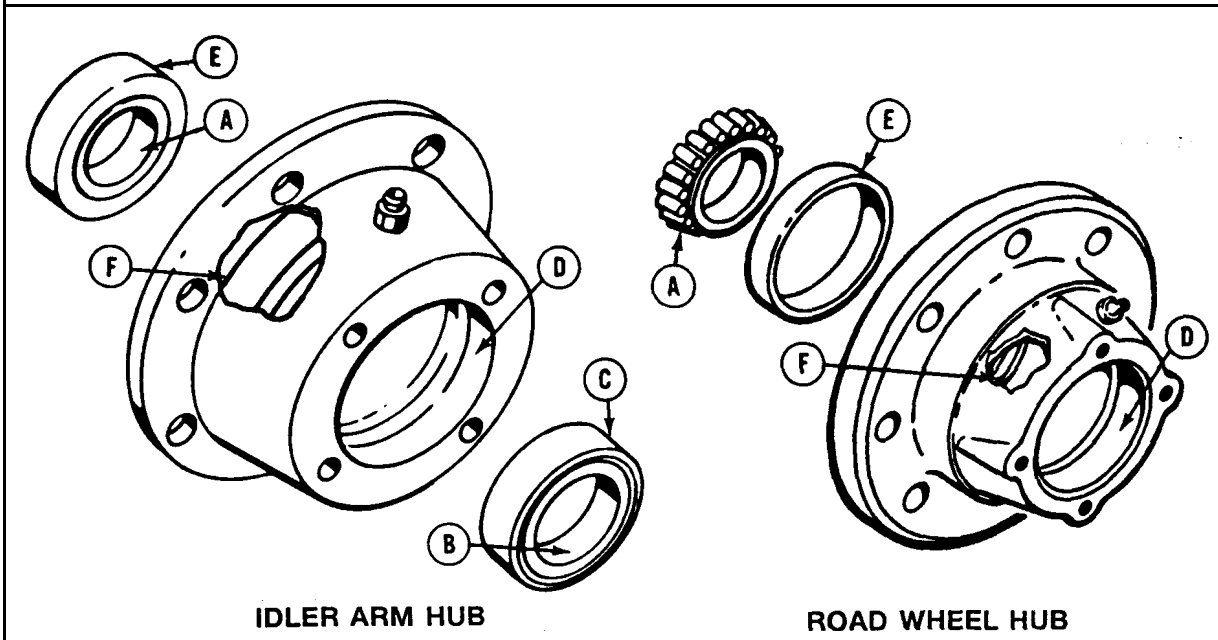


Table 2. IDLER ARMS

Reference Letter	Point of Measurement	Idler Arms	Wear Limits	All Road Wheels	Wear Limits
A	Inside diameter of arm bore	3.185 to 3.188	*		
B	Outside diameter of bearing	3.1885 to 3.1925	*		
C	Outside diameter of bearing	3.8135 to 3.8175	*		
D	Inside diameter of arm bore-inner	3.809 to 3.812	*		
A-B	Fit of bearing in arm bore	0.0005 to 0.0075			
C-D	Fit of bearing in arm bore	0.0015T to 0.0085T			
E	Inside diameter of outer bearing	2.7605 to 2.7765			2.778**
F	Outside diameter of outer spindle	2.750 to 2.752			See note
G	Inside diameter of bearing	3.3855 to 3.4015			3.403**
H	Outside diameter of inner spindle surface	3.375 to 3.377			See note
G-F	Fit of bearing on spindle	0.001L to 0.026L			
G-H	Fit of bearing on spindle	0.000 to 0.025L			
I	Outside diameter of outer hub spindle	1.5618 to 1.5623	1.561		
J	Outside diameter of inner hub spindle	2.0618 to 2.0623	2.061		
K	Outside diameter at track adjuster sleeve	1.495 to 1.500			1.4850
*Must be within new parts dimensions.		**Measured in assembly.			

NOTE

A used idler spindle shall not be put back into service if the nickel plating (0.001 to 0.002 thick) is worn through. A used spindle can be switched to the opposite side of the carrier, which places the load on an unused plated surface.

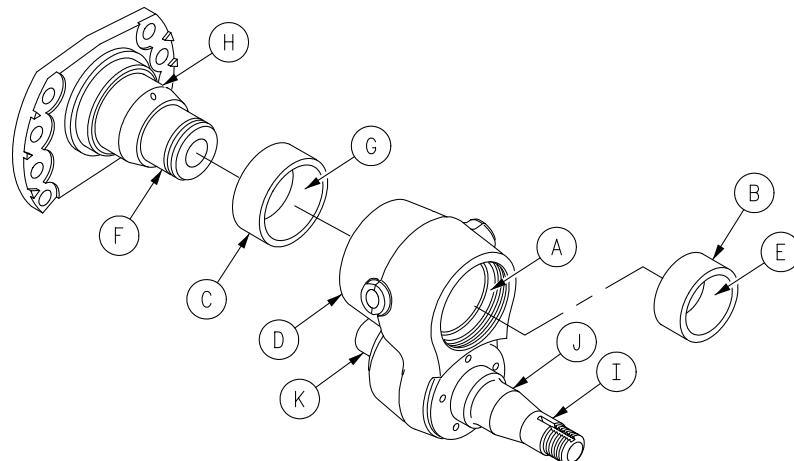
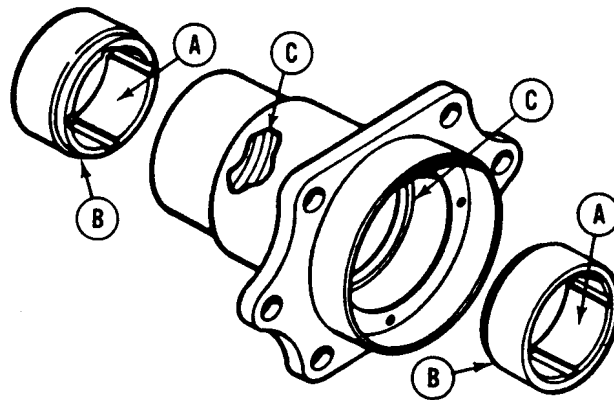


Table 3. ROAD WHEEL SUPPORT

Reference Letter	Point of Measurement	Idler Hubs	Wear Limits	All Road Wheels	Wear Limits
A	Inside diameter of support bearing			3.010 to 3.015	3.020**
B	Outside diameter of support bearing			3.753 to 3.758	*
C	Inside bore diameter of support			3.748 to 3.750	3.758

*Must be within new parts dimensions.

** Measured in assembly.



ROAD WHEEL SUPPORT

FOLLOW-THROUGH STEPS

1. Assemble road wheel support arm (see your -20).
2. Install hub assembly (see your -20).
3. Install track idler arm assembly on carrier (see your -20).
4. Lube idler arm, road wheel support, and hubs (see your -20).

END OF TASK

REPAIR TRACK TENSION ADJUSTER

0037 00

THIS WORK PACKAGE COVERS:

- Disassembly (page 0037 00-1).
- Clean, Inspect, and Repair (page 0037 00-2).
- Assembly (page 0037 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

- Arbor Press (WP 0104 00, Item 32)
- General Mechanic's Tool Kit (WP 0104 00, Item 19)
- Inside Caliper, Micrometer Set (WP 0104 00, Item 6)
- Outside Caliper, Micrometer Set (WP 0104 00, Item 7)
- Screw Threading Set (WP 0104 00, Item 37)

Materials/Parts

- Grease (WP 0105 00, Item 13)
- Engine oil (WP 0105 00, Item 11)
- Wiping rag (WP 0105 00, Item 28)
- Packing (6)
- Retaining ring (2)
- Sleeve bushing (2)
- Wiper ring

Personnel Required

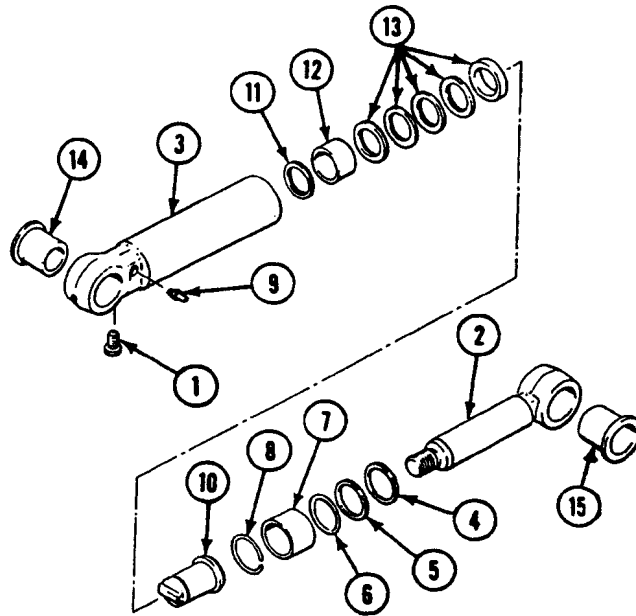
Track Vehicle Repairer 63H10

Equipment Condition

Track tension adjuster removed from carrier
(see your -20)

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 until plunger rotates freely.

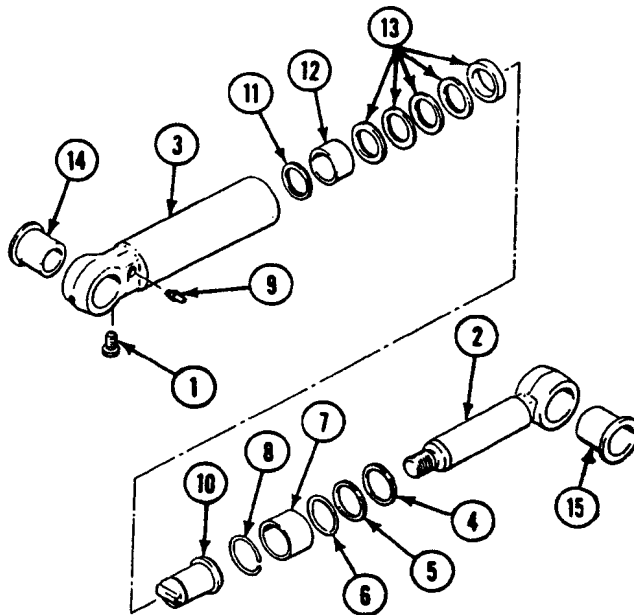


3. Pull plunger rod (2) from cylinder (3).
4. Remove retaining ring (4), wiper ring (5), and packing (6) from cylinder (3). Discard retaining ring, wiper ring, and packing.
5. Press bearing (7) about 1 inch (3 cm) in cylinder (3) to force retaining ring (8) from groove in cylinder.
6. Pull bearing (7) from cylinder (3). Discard bearing.
7. Turn retaining ring (8) 90 degrees in cylinder (3). Remove ring from cylinder. Discard retaining ring.
8. Close bleeder valve (1). Force grease through lubrication fitting (9) until piston assembly (10) is forced from cylinder (3).
9. Use clean cloth to remove excess grease from piston assembly (10) and cylinder (3).

NOTE

Packing set may be a five or seven piece design.

10. Remove retaining ring (11), bearing (12), and five packings (13) from piston assembly (10). Discard packings, bearing, and retaining ring.
11. Remove bleeder valve (1) and lubrication fitting (9) from cylinder (3).
12. If damaged or worn, press sleeve bushing (14) from cylinder (3). Discard sleeve bushing.
13. If damaged or worn, press sleeve bushing (15) from plunger rod (2). Discard sleeve bushing.

**CLEAN, INSPECT, AND REPAIR**

1. Check threads of plunger (2) and cylinder (3). Chase damaged threads with a die. Replace parts as a matched set if the threads of either part are stripped or worn.
2. Check parts shown in Table 1, page 0037 00-4, that have reference letters.
3. Check the parts' dimensions with Table 1, page 0037 00-4, to determine replacement.

ASSEMBLY

1. If removed, press new sleeve bushing (14) in cylinder (3) from side opposite lubrication fitting (9). Use arbor press.
2. If removed, press new sleeve bushing (15) into plunger (2). Use arbor press.

NOTE

Install new packings (13) with sealing lips facing away from flange on piston (10). Lips face inside of cylinder.

3. Install five new 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 cylinder (3).
5. Install piston assembly (10) in cylinder (3).
6. Install new retaining ring (8) in cylinder (3). Make sure it seats in groove.
7. Install new bearing (7) in cylinder (3).

NOTE

Install new wiper ring (5) with grooved edge facing out of cylinder toward retaining ring.

8. Install new packing (6), new wiper ring (5), and new retaining ring (4) in cylinder (3).
9. Apply a light coat of lubricating oil to plunger (2).
10. Install plunger (2) in cylinder (3). Maintain inward pressure on plunger and rotate clockwise until secure.
11. Install bleeder valve (1) and lubrication fitting (9) in cylinder (3).

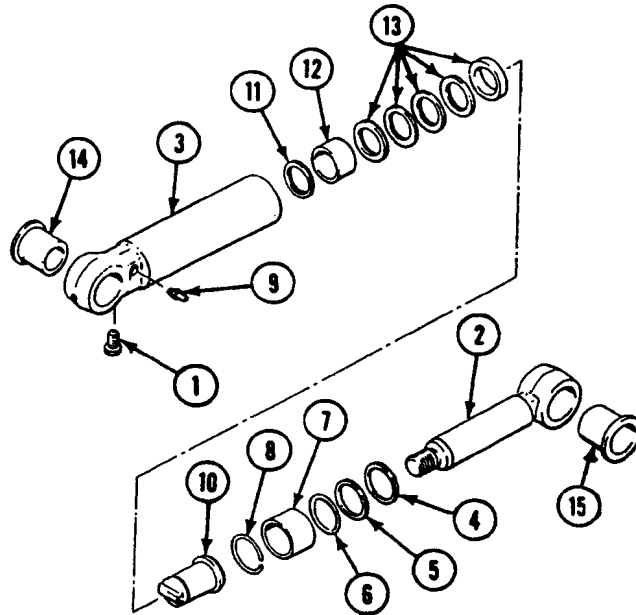
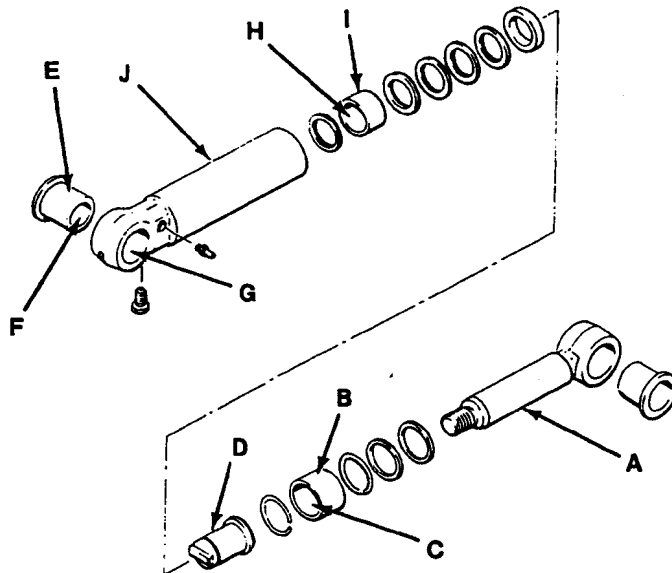


Table 1. TRACK TENSION ADJUSTER

Reference Letter	Point of Measurement	Sizes and Fits of New Parts	Wear Limits
A	Outside diameter of plunger	1.7580 to 1.76000	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	1.4990 to 1.5010	1.4980
E	Outside diameter of sleeve	1.8780 to 1.8830	*
F	Inside diameter of sleeve	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 bearing	1.5030 to 1.5060	1.5160
I	Outside diameter of piston bearing	1.9940 to 1.9970	1.9930
J	Inside diameter of cylinder	1.9990 to 2.0010	2.0020

* Must be within new parts dimensions.



FOLLOW-THROUGH STEPS

1. Install track tension adjuster (see your -20).
2. Adjust track tension (see your -10).

END OF TASK

REPAIR SHOCK ABSORBER

0038 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0038 00-1).
 Assembly (page 0038 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Materials/Parts

Bearing (2)

Tools and Special Tools

Arbor Press (WP 0104 00, Item 32)
 Bearing Positioner (WP 0104 00, Item 31)
 Bearing Staker (WP 0104 00, Item 42)
 General Mechanic's Tool Kit (WP 0104 00, Item 19)

Personnel Required

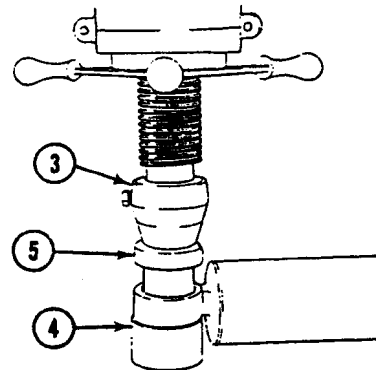
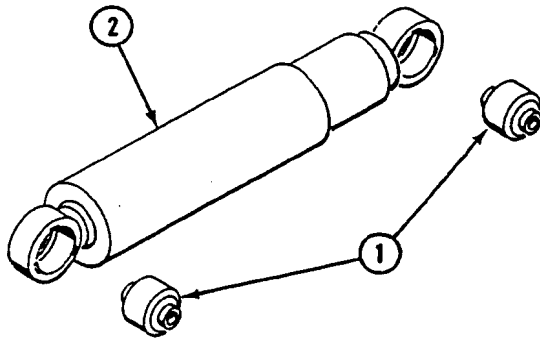
Track Vehicle Repairer 63H10

Equipment Condition

Shock absorber removed (see your -20)

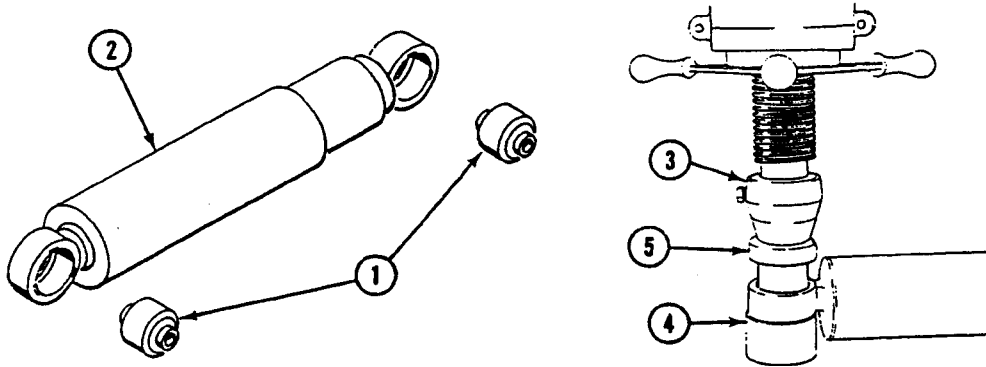
DISASSEMBLY

1. Remove two self-aligning bearings (1) from shock absorber (2). Use a press (3), support (4), and positioner (5).

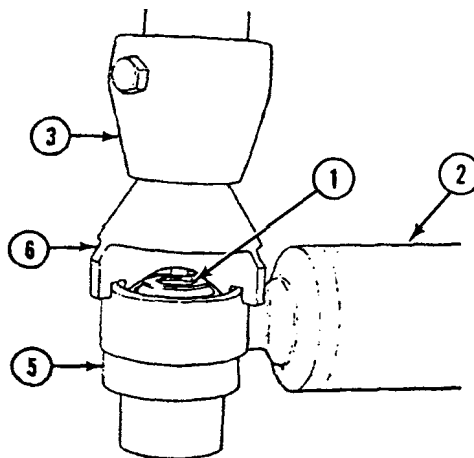


ASSEMBLY

1. Install two 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 a positioner (5).



FOLLOW-THROUGH STEPS

1. Install shock absorber on carrier (see your -20).

END OF TASK

CHAPTER 9

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR HULL COMPONENTS

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
REPLACE COMMANDER'S CUPOLA (M113A2, M1064, AND M1059 ONLY).....	0039 00
REPAIR COMMANDER'S CUPOLA (M113A2, M1059, AND M1064 ONLY).....	0040 00
REPAIR DRIVER'S HATCH COVER HINGES.....	0041 00
REPAIR DRIVER'S HATCH COVER HULL HINGES.....	0042 00
REPLACE/REPAIR DRIVER'S LEVEL INDICATOR (M901A1 ONLY).....	0043 00
REPAIR CARGO HATCH HINGE (M113A2, M1059, AND M901A1 ONLY).....	0044 00
REPAIR COMMANDER'S CUPOLA COVER HINGES (M113A2, M1064, AND M1059 ONLY).....	0045 00
REPAIR COMMANDER'S CUPOLA HINGES (M113A2, M1064, AND M1059 ONLY).....	0046 00
REPAIR COMMANDER'S HATCH COVER HINGES (M577A2 AND M1068 ONLY).....	0047 00
REPAIR COMMANDER'S HATCH COVER HULL HINGES (M577A2 AND M1068 ONLY).....	0048 00
REPLACE KEY LOCKED SCREW INSERTS.....	0049 00
REPLACE SERRATED LOCK RING SCREW INSERTS.....	0050 00
REPLACE FRONT SPLASH GUARDS OR REAR FENDERS.....	0051 00
REPAIR/REPLACE ACCELERATOR STOP SUPPORT ASSEMBLY.....	0052 00

REPLACE COMMANDER'S CUPOLA (M113A2, M1064, AND M1059 ONLY)

0039 00

THIS WORK PACKAGE COVERS:

Removal (page 0039 00-1).
 Installation (page 0039 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10
 Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)
 Sling (WP 0104 00, Item 39)
 Torque Wrench (WP 0104 00, Item 56)
 Lifting Device 300 lb (136 kg) Capacity

Equipment Condition

Engine stopped (see your -10)
 Carrier blocked (see your -10)
 Ramp lowered (see your -10)

REMOVAL

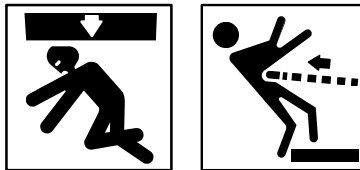
WARNING



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.

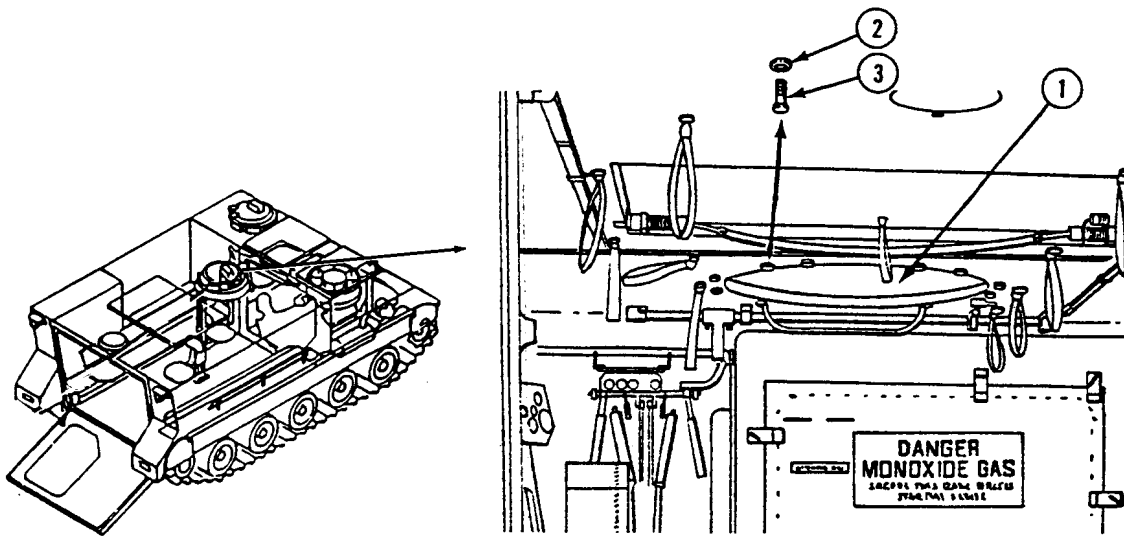
WARNING



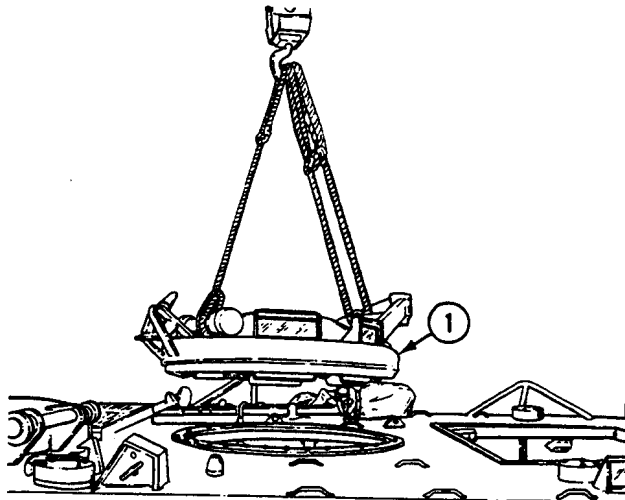
Damaged slings can fail when loaded. Breaking slings can strike and injure personnel. Suspended load can fall and crush personnel.

Inspect all slings before use. Do not use damaged slings. Clearly mark all damaged slings as DAMAGED - DO NOT USE.

1. Remove 12 screws (3) and washers (2) that hold commander's cupola (1) to carrier top deck.



2. Attach lifting device of at least 300 lb (136 kg) capacity to cupola (1). Lift cupola from carrier.



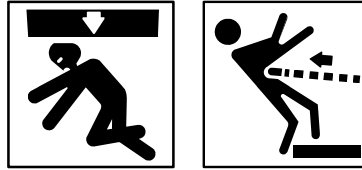
INSTALLATION

WARNING



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

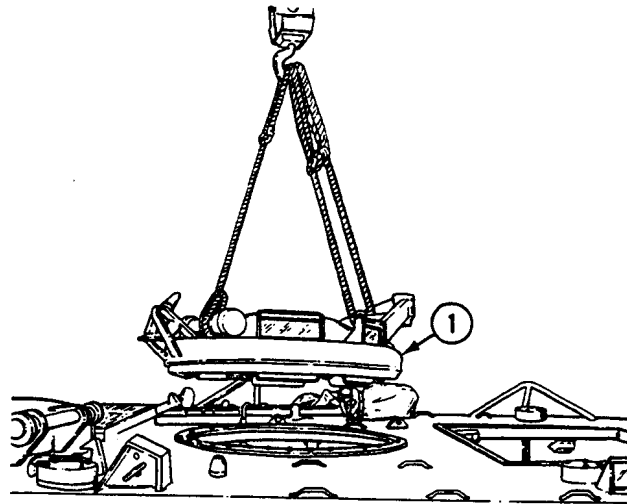
Stay clear of hanging loads, heavy parts, and overhead equipment. Use correct lifting devices. Always have helper guide heavy parts and equipment.

WARNING

Damaged slings can fail when loaded. Breaking slings can strike and injure personnel. Suspended load can fall and crush personnel.

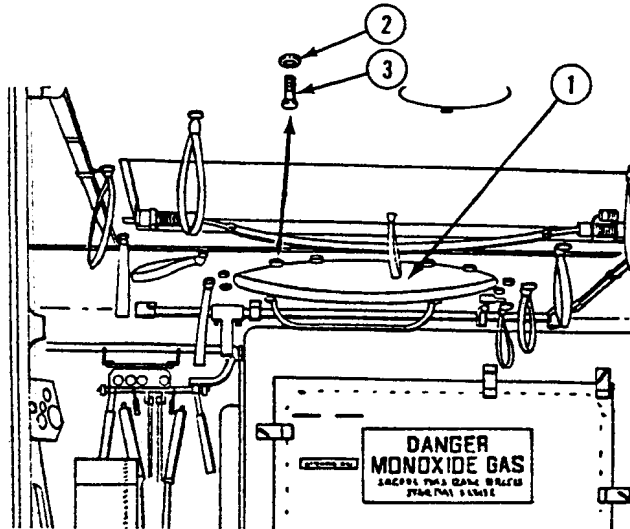
Inspect all slings before use. Do not use damaged slings. Clearly mark all damaged slings as DAMAGED - DO NOT USE.

1. Align traverse lock pin with groove in cupola (1). Install commander's cupola (1) on carrier top deck ring.

**NOTE**

Rotation of cupola after installation should require no more than 150 lb-ft (204 N·m) torque.

- Secure cupola (1) to deck with 12 washers (2) and screws (3). TIGHTEN SCREWS TO 120-130 LB-FT (162-176 N·M) TORQUE. Use torque wrench.



END OF TASK

REPAIR COMMANDER'S CUPOLA (M113A2, M1059, AND M1064 ONLY)

0040 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0040 00-1).
 Assembly (page 0040 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10
 Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)
 Torque Wrench (WP 0104 00, Item 56)

Equipment Condition

Commander's cupola removed (WP 0039 00)

Materials/Parts

Lockwasher (18)

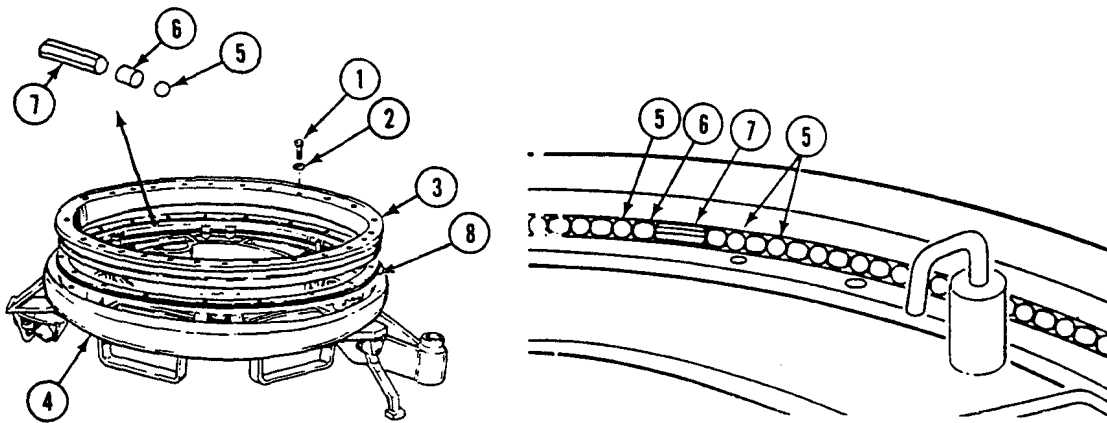
DISASSEMBLY

1. Turn cupola over. Remove 18 socket head screws (1), lockwashers (2), and outer race (3) from hatch (4). Discard lockwashers. Have helper assist.

NOTE

Separators are like bearings except for size and color. Ball bearings are slightly larger than separators and are white or cream color. Separators may be any dark color.

2. Remove 140 ball bearings (5), 146 separators (6), and six bearing blocks (7) from inner race (8). Remove inner race from hatch (4).



ASSEMBLY**NOTE**

If one ball bearing or separator needs to be replaced, all ball bearings and separators must be replaced.

1. Install inner race (8) on hatch (4).

CAUTION

Improper installation will cause binding, resulting in bearing failure. Bearing block (7) radius surface must face toward cupola center.

Do not use talcum or other powder to reduce friction. When talcum is exposed to moisture, a chalky substance will form, causing binding.

NOTE

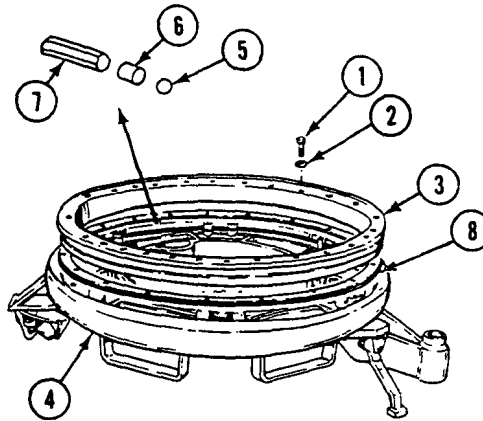
Alternately, install 24 separators (6) and 23 ball bearings (5) between bearing blocks (7). One separator (6) is to be installed on each side of each bearing block (7). A maximum number of sets (one ball and one spacer per set) is needed between any two blocks. The number of sets in each space between blocks must not differ by more than one set.

2. Install 140 ball bearings (5), 146 separators (6), and six bearing blocks (7) in groove of inner race (8).

NOTE

The outer race and inner race must be aligned correctly so that the traverse lock pin will fit.

3. Install outer race (3) on hatch (4). Place large unthreaded hole in outer race (3) directly above largest unthreaded hole in inner race (8).
4. Secure outer race (3) to inner race (8) with 18 new lockwashers (2) and socket head screws (1). TIGHTEN SCREWS TO 25-34 LB-FT (34-46 N·M) TORQUE. Use torque wrench.

**FOLLOW-THROUGH STEPS**

1. Install commander's cupola (WP 0039 00).

END OF TASK

REPAIR DRIVER'S HATCH COVER HINGES

0041 00

THIS WORK PACKAGE COVERS:

Dissassembly (page 0041 00-1).
 Assembly (page 0041 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Metal Worker 44B10

Tools and Special Tools

Body and Fender Repair Tool Kit (WP 0104 00, Item 27)
 Electric Disc Sander (WP 0104 00, Item 35)
 Industrial Goggles (WP 0104 00, Item 21)
 Sander Spindle Adapter (WP 0104 00, Item 2)
 Trailer Mounted Welding Shop (WP 0104 00, Item 49)
 Welder's Gloves (WP 0104 00, Item 20)
 Welder's Helmet (WP 0104 00, Item 25)

References

TM 43-0139
 TC 9-237

Equipment Condition

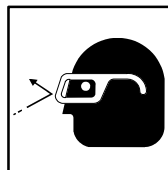
Driver's hatch cover removed (see your -20)
 Battery ground disconnected (see your -20)

Materials/Parts

Welding electrode (WP 0105 00, Item 27)

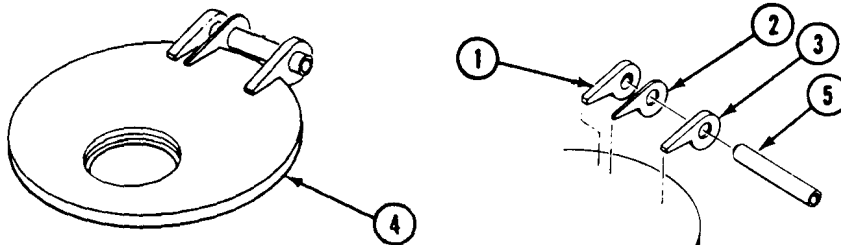
DISASSEMBLY

WARNING



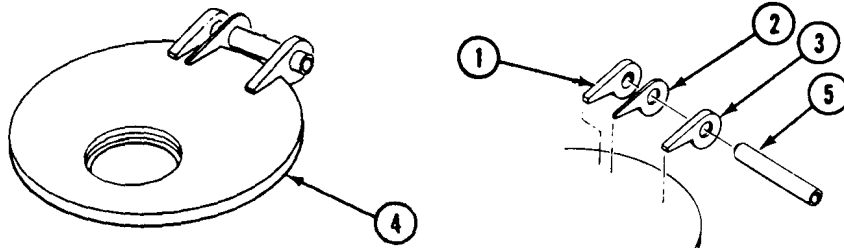
Metal chips and grinding dust can cause eye injury. Wear goggles and gloves.

1. Remove and discard broken hinge part (1), (2), or (3) from hatch cover (4).
2. Use a machinist's hammer and a cold chisel to chip off remaining part of bad hinge (1), (2), or (3) from hatch cover (4).
3. Use a disc sander to sand chipped area smooth and remove any hard coating from weld area.

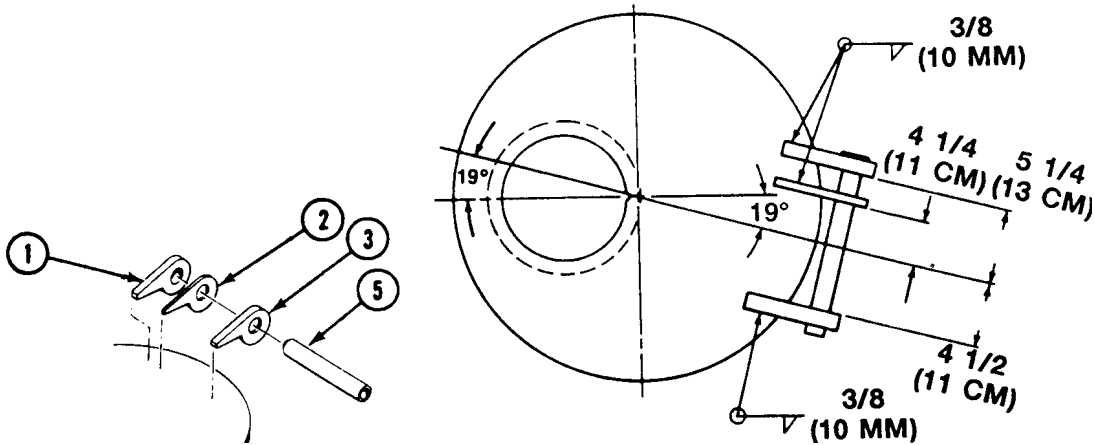


ASSEMBLY

1. Clamp or tack weld new hinge (1), (2), or (3) on hatch cover (4). Check alignment of cover hinges with hinges on hull.
2. Insert spring shield (5) through hinges (3) or (2). Seat shield in hinge (1).



3. Make sure hinges are aligned and spaced as shown.
4. Weld hinge (1), (2), or (3) to hatch cover (4). See TC 9-237. Use electrode type 5356.
5. Clean the weld area and apply touch-up paint to repaired area. See TM 43-0139.



FOLLOW-THROUGH STEPS

1. Install driver's hatch cover (see your -20).
2. Reconnect battery ground (see your -20).

END OF TASK

REPAIR DRIVER'S HATCH COVER HULL HINGES

0042 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0042 00-2).
 Assembly (page 0042 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Metal Worker 44B10

Tools and Special Tools

Body and Fender Repair Tool Kit (WP 0104 00, Item 27)
 Electric Disc Sander (WP 0104 00, Item 35)
 Industrial Goggles (WP 0104 00, Item 21)
 Sander Spindle Adapter (WP 0104 00, Item 2)
 Trailer Mounted Welding Shop (WP 0104 00, Item 49)
 Welder's Gloves (WP 0104 00, Item 20)
 Welder's Helmet (WP 0104 00, Item 25)

References

TM 43-0139
 TC 9-237

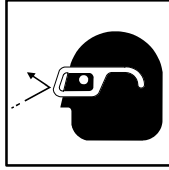
Equipment Condition

Driver's hatch cover removed (see your -20)
 Battery ground disconnected (see your -20)

Materials/Parts

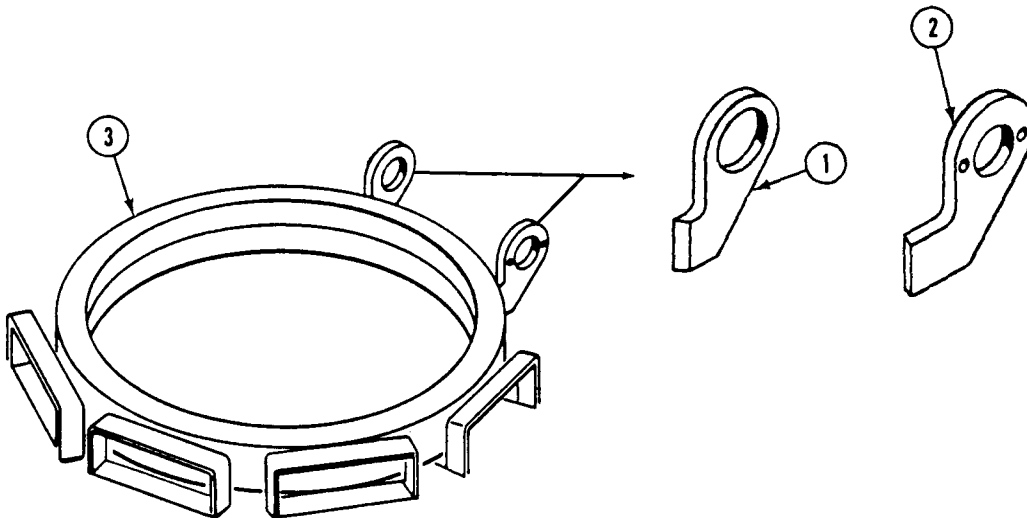
Welding electrode (WP 0105 00, Item 27)

DISASSEMBLY

WARNING

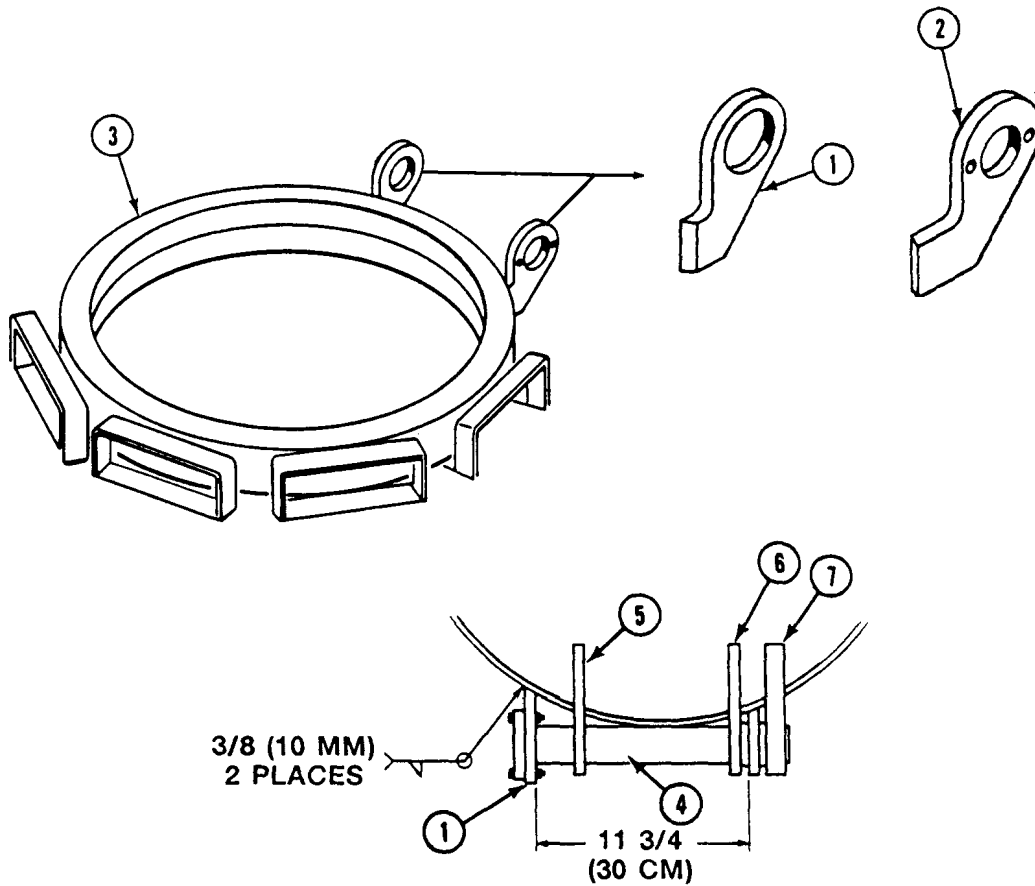
Metal chips and grinding dust can cause eye injury. Wear goggles and gloves.

1. Remove and discard broken hinge part (1) or (2) from hatch mounting ring (3) on hull.
2. Use a machinist's hammer and a cold chisel to chip off remaining part of bad hinge (1) or (2) from hatch mounting ring (3) on hull.
3. Use a disc sander to sand chipped area smooth and remove any hard coating from weld area.



ASSEMBLY

1. Clamp or tack weld new hinge (1) or (2) on mounting ring (3). Set cover on mounting ring. Check alignment of cover hinges with hinges of ring (3).
2. Insert spring shield (4) through hinges (1) or (2) and cover hinges (5), (6), and (7). Seat shield in cover hinge (7).
3. Make sure hinges (1) or (2) are aligned and spaced as shown.
4. Weld hinge (1) or (2) to mounting ring (3) and hull. See TC 9-237. Use electrode type 5356.
5. Clean the weld area and apply touch-up paint to repaired area. See TM 43-0139.



FOLLOW-THROUGH STEPS

1. Install driver's hatch cover (see your -20).
2. Reconnect battery ground (see your -20).

END OF TASK

REPLACE/REPAIR DRIVER'S LEVEL INDICATOR (M901A1 ONLY)

0043 00

THIS WORK PACKAGE COVERS:

- Removal (page 0043 00-1).
- Installation (page 0043 00-2).
- Adjustment (page 0043 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

- Clinometer (WP 0104 00, Item 8)
- Drill, Portable Electric (WP 0104 00, Item 10)
- Drill set, twist (WP 0104 00, Item 14)
- General Mechanic's Tool Kit (WP 0104 00, Item 19)
- Soldering and De-Soldering Set (WP 0104 00, Item 41)

Materials/Parts

- Soldering flux (WP 0105 00, Item 23)
- Lockwasher (6)
- Lockwasher
- Lockwasher
- Plate nut (2)
- Rivet, solid (4)

Personnel Required

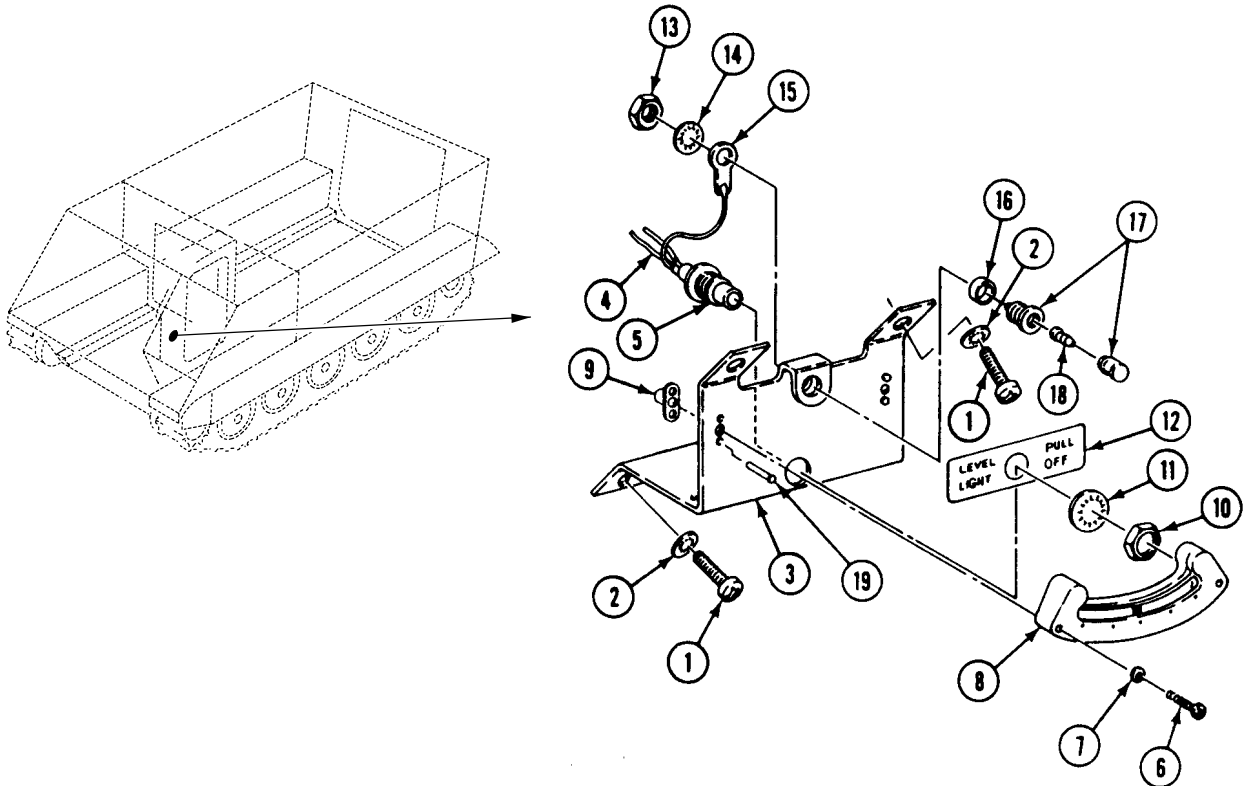
Track Vehicle Repairer 63H10

Equipment Condition

- Engine shut down (see your -10)
- Carrier blocked (see your -10)

REMOVAL

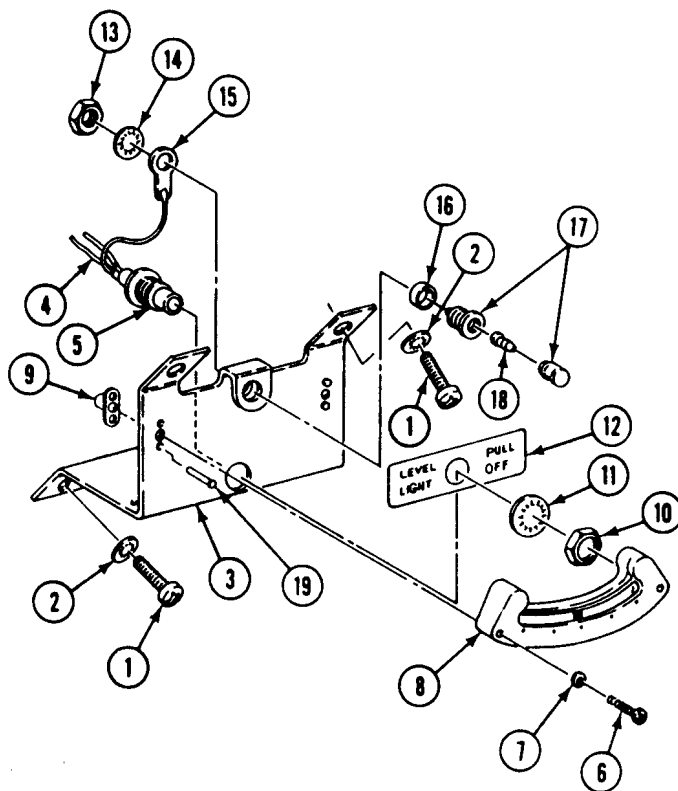
1. Remove four screws (1), lockwashers (2), and driver's level indicator bracket assembly (3) from bulkhead. Discard lockwashers.



NOTE

Make sure all leads are tagged before removing.

2. Unsolder three electrical leads (4) from indicator switch (5) on indicator bracket (3).
3. Remove two screws (6), lockwashers (7), and level indicator (8) from plate nuts (9) on indicator bracket (3). Discard lockwashers.
4. Remove nut (10), lockwasher (11), marker (12), and switch (5) from bracket (3). Discard lockwasher.
5. Remove nut (13), lockwasher (14), terminal lug (15), ring spacer (16), lamp retainer (17), and lamp (18) from bracket (3). Discard lockwasher.
6. Drill out four rivets (19) and remove two plate nuts (9) from indicator bracket (3). Discard plate nuts and rivets.

**INSTALLATION****NOTE**

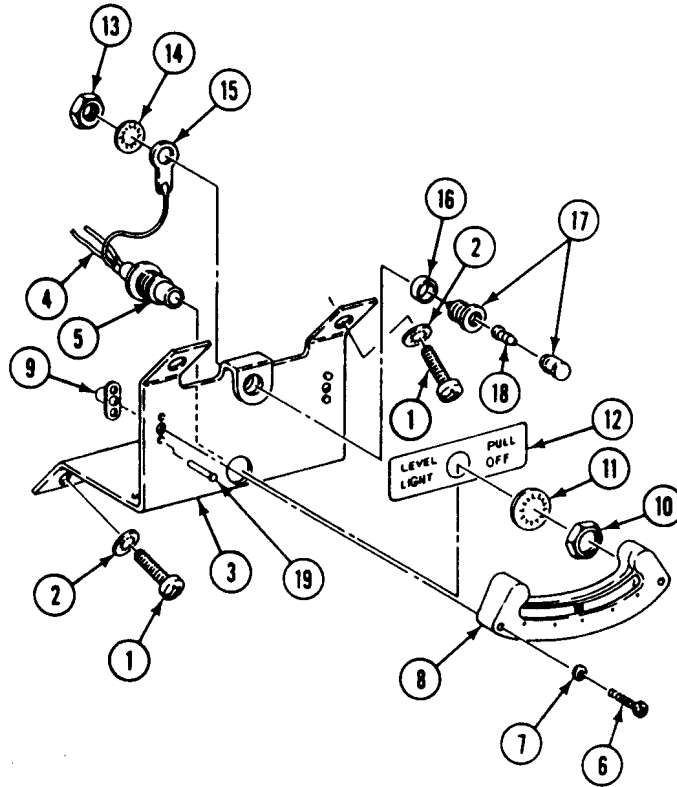
Make sure carrier is on level ground. When installing driver's level indicator, make sure cable is not pinched against housing.

1. Install new plate nuts (9) with four new rivets (19) on indicator bracket (3).
2. Install nut (13), new lockwasher (14), terminal lug (15), ring spacer (16), lamp retainer (17), and lamp (18) on indicator bracket (3).
3. Install nut (10), new lockwasher (11), marker (12), and indicator switch (5) on bracket (3).
4. Install two screws (6), new lockwashers (7), and level indicator (8) in plate nuts (9) on indicator bracket (3).

NOTE

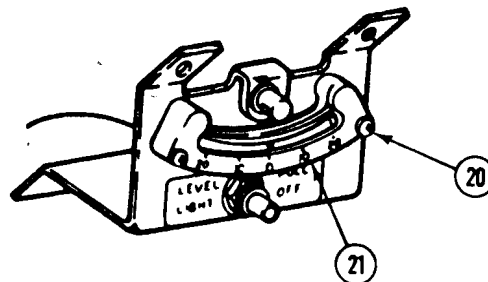
Make sure tags are removed from leads before installing.

5. Solder three tagged electrical leads (4) on indicator switch (5) on indicator bracket (3)
6. Install driver's level indicator bracket assembly (3) on bulkhead with four new lockwashers (2) and screws (1).



ADJUSTMENT

1. Set up clinometer on top deck to the right of turret, and adjust to read side-to-side tilt.
2. Note the reading on the clinometer.
3. Loosen two adjustment screws (20) on driver's level indicator (21). Adjust level indicator to read the same as the clinometer.
4. Tighten adjustment screws (20) then recheck driver's level indicator (21) with clinometer.



END OF TASK

REPAIR CARGO HATCH HINGE (M113A2, M1059, AND M901A1 ONLY)

0044 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0044 00-1).
 Assembly (page 0044 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Metal Worker 44B10

Tools and Special Tools

Body and Fender Repair Tool Kit (WP 0104 00, Item 27)
 Electric Disc Sander (WP 0104 00, Item 35)
 Industrial Goggles (WP 0104 00, Item 21)
 Sander Spindle Adapter (WP 0104 00, Item 2)
 Trailer Mounted Welding Shop (WP 0104 00, Item 49)
 Welder's Gloves (WP 0104 00, Item 20)
 Welder's Helmet (WP 0104 00, Item 25)

References

TM 43-0139
 TC 9-237

Equipment Condition

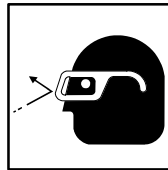
Cargo hatch removed from carrier (see your -20)
 Battery ground disconnected (see your -20)

Materials/Parts

Welding electrode (WP 0105 00, Item 27)

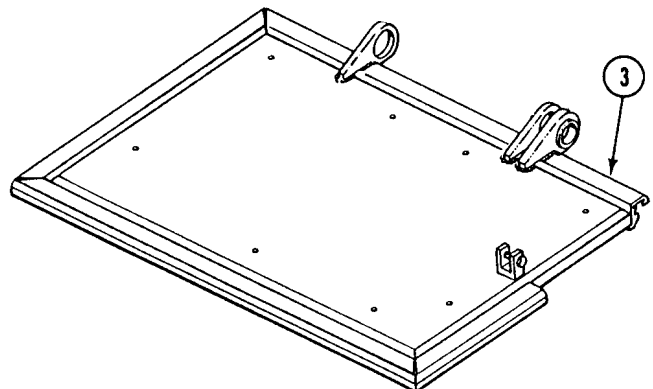
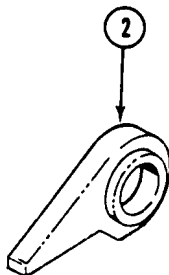
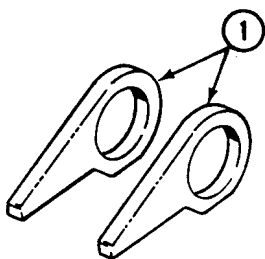
DISASSEMBLY

WARNING

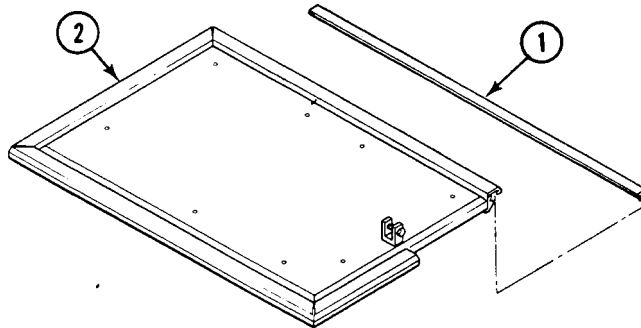


Metal chips and grinding dust can cause injury. Wear goggles and gloves.

1. Remove and discard broken hinge (1) or (2) from hatch (3).
2. Use a machinist's hammer and a cold chisel to chip off remaining part of bad hinge (1) or (2) from cargo hatch (3).
3. Use a disc sander to sand chipped area smooth and remove any hard coating from weld area.



- Remove rubber seal (1) from hinge edge of hatch (2).

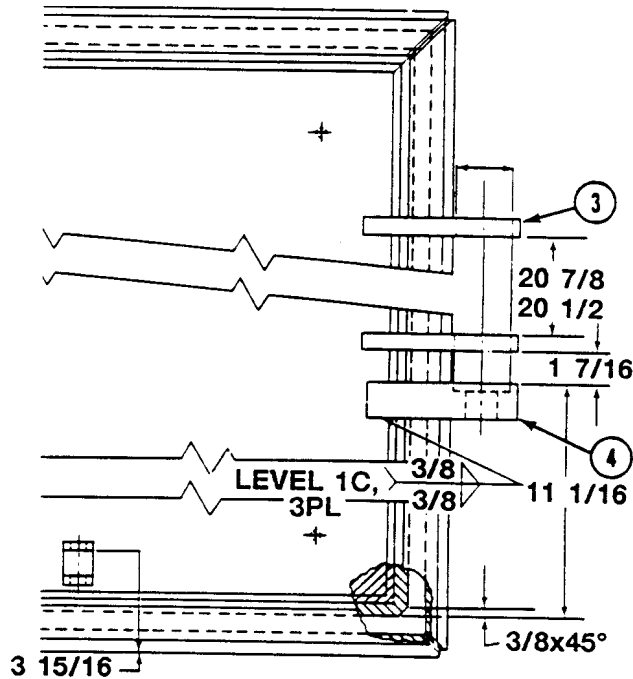


ASSEMBLY

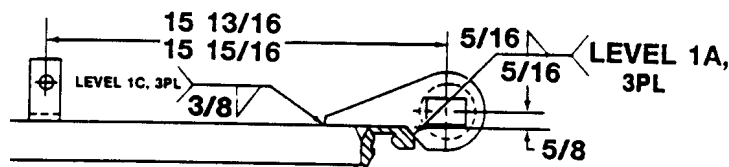
NOTE

All weld joints should be metal to metal fit. In no case should weld gap exceed 3/32 inch or one half the thickness of thinner member, whichever is less.

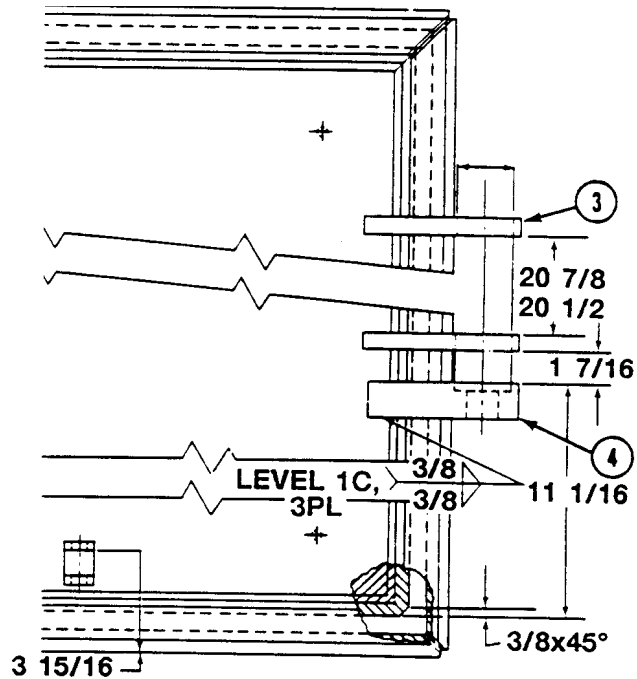
- Clamp or tack weld new hinge (3) or (4) on hatch (2).



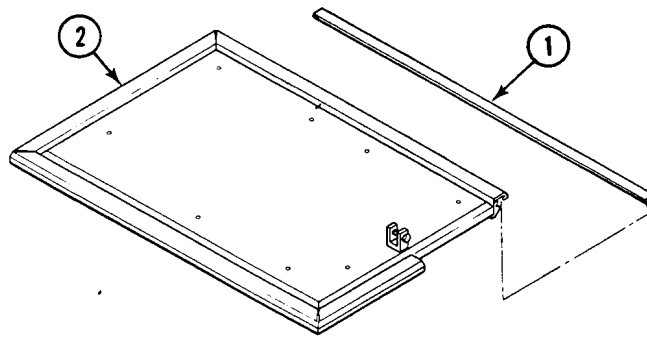
- Make sure hinges are aligned and spaced as shown.



- Weld hinge (3) or (4) to hatch. See TC 9-237. Use electrode type 5356.



- Clean weld area and apply touch-up paint to repaired area. See TM 43-0139. Install rubber seal (1) along hinge edge of hatch (2).



FOLLOW-THROUGH STEPS

- Install cargo hatch on carrier (see your -20).
- Reconnect battery ground (see your -20).

END OF TASK

REPAIR COMMANDER'S CUPOLA COVER HINGES (M113A2, M1064, AND M1059 ONLY)

0045 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0045 00-1).
 Assembly (page 0045 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Materials/Parts

Welding electrode (WP 0105 00, Item 27)

Tools and Special Tools

Body and Fender Repair Tool Kit (WP 0104 00, Item 27)
 Electric Disc Sander (WP 0104 00, Item 35)
 Industrial Goggles (WP 0104 00, Item 21)
 Sander Spindle Adapter (WP 0104 00, Item 2)
 Trailer Mounted Welding Shop (WP 0104 00, Item 49)
 Welder's Gloves (WP 0104 00, Item 20)
 Welder's Helmet (WP 0104 00, Item 25)

Personnel Required

Metal Worker 44B10

References

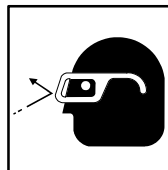
TM 43-0139
 TC 9-237

Equipment Condition

Commander's cupola cover removed (see your -20)

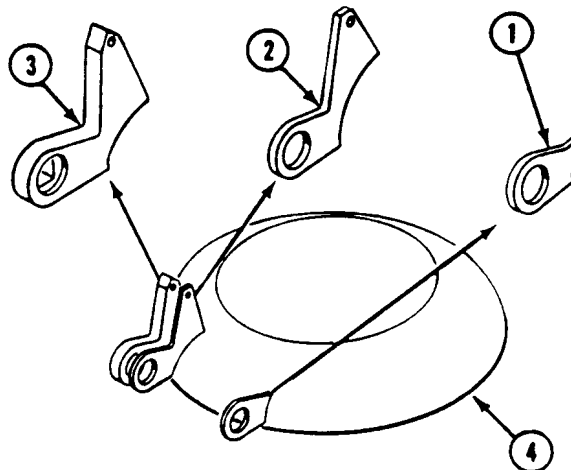
DISASSEMBLY

WARNING



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

1. Remove and discard broken hinge part (1), (2), or (3) from cover (4).
2. Use a machinist's hammer and a cold chisel to chip off remaining part of bad hinge from cover.
3. Use a disc sander to sand chipped area smooth and remove any hard coating from weld area.

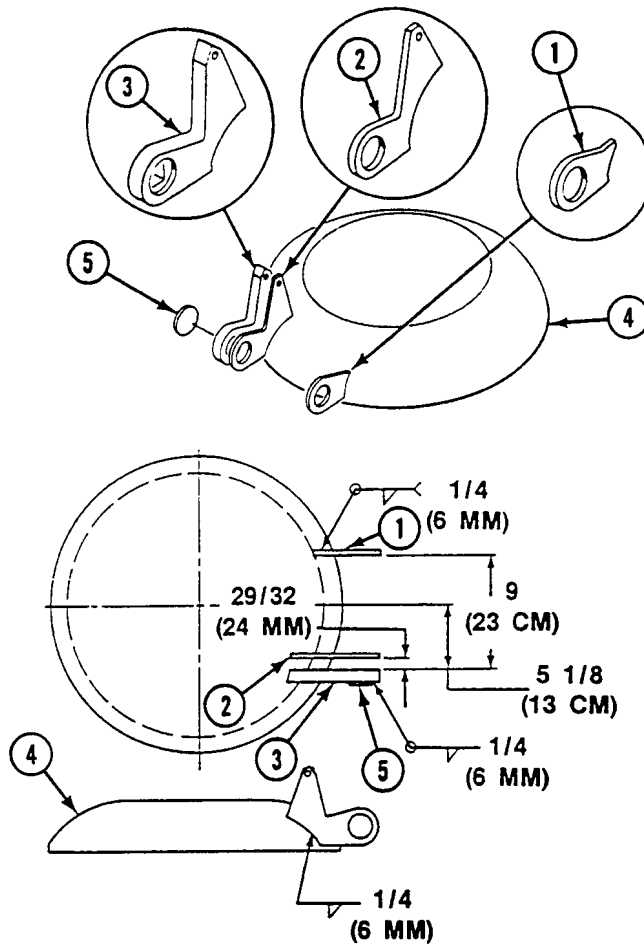


REPAIR COMMANDER'S CUPOLA COVER HINGES (M113A2, M1064, AND M1059 ONLY) — Continued

0045 00

ASSEMBLY

1. Clamp or tack weld new hinge(s) (1), (2), or (3) on cover (4). Set cover on commander's cupola. Check alignment of cover hinges with hinges on cupola.
2. Make sure hinges are aligned and spaced as shown.
3. Weld hinges to cover. See TC 9-237. Use electrode type 5356.
4. If hinge (3) has been replaced, weld in a new torsion bar cover (5).
5. Clean the weld area and apply touch-up paint to repaired area. See TM 43-0139.



FOLLOW-THROUGH STEPS

1. Install commander's cupola cover (see your -20).

END OF TASK

**REPAIR COMMANDER'S CUPOLA HINGES (M113A2, M1064,
AND M1059 ONLY)**

0046 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0046 00-1).
Assembly (page 0046 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Materials/Parts

Welding electrode (WP 0105 00, Item 27)

Tools and Special Tools

Body and Fender Repair Tool Kit (WP 0104 00, Item 27)
Electric Disc Sander (WP 0104 00, Item 35)
Industrial Goggles (WP 0104 00, Item 21)
Sander Spindle Adapter (WP 0104 00, Item 2)
Trailer Mounted Welding Shop (WP 0104 00, Item 49)
Welder's Gloves (WP 0104 00, Item 20)
Welder's Helmet (WP 0104 00, Item 25)

Personnel Required

Metal Worker 44B10

References

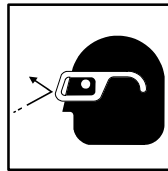
TM 43-0139
TC 9-237

Equipment Condition

Commander's cupola cover removed (see your -20)

DISASSEMBLY

WARNING

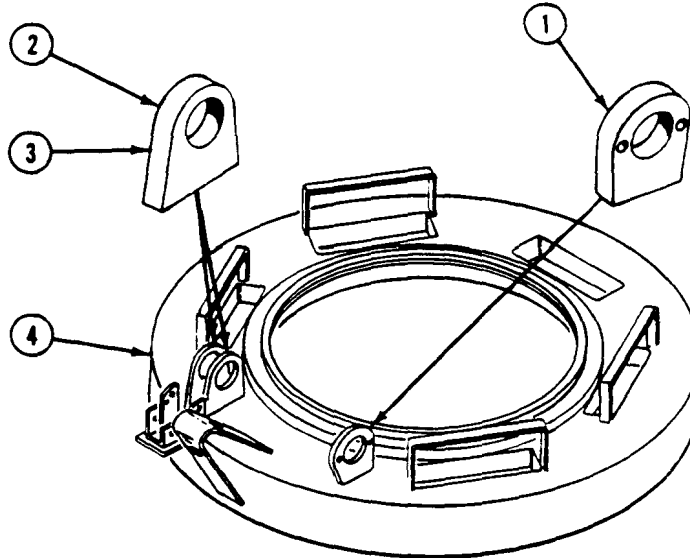


Metal chips and grinding dust can cause eye injury. Wear goggles and gloves.

REPAIR COMMANDER'S CUPOLA HINGES (M113A2, M1064, AND M1059 ONLY) — Continued

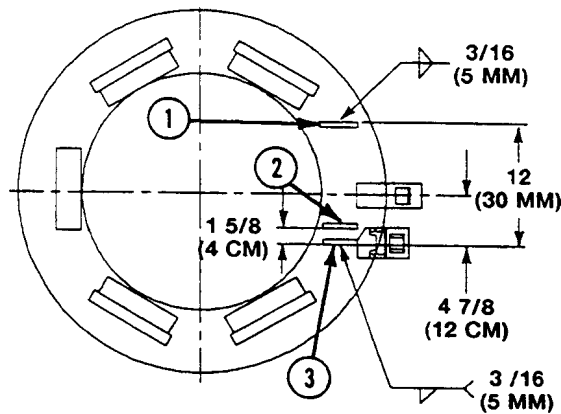
0046 00

1. Remove and discard broken hinge part (1), (2), or (3) from commander's cupola (4).
2. Use a machinist's hammer and a cold chisel to chip off remaining part of bad hinge from cupola.
3. Use a disc sander to sand chipped area smooth and remove any hard coating from weld area.



ASSEMBLY

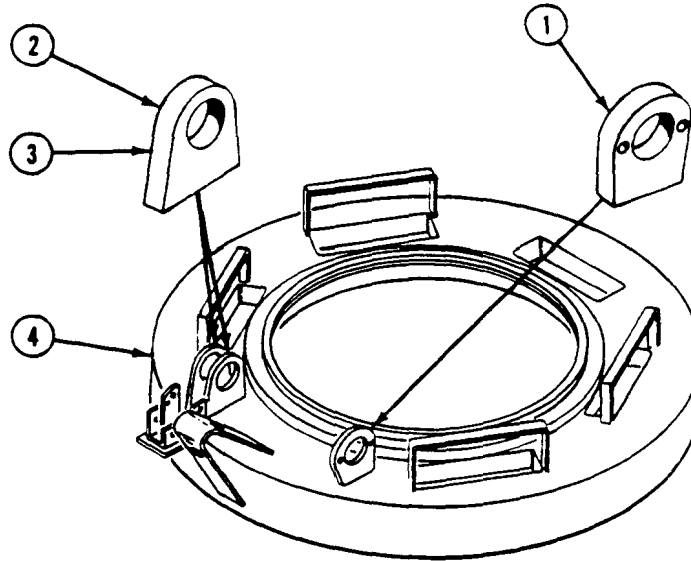
1. Clamp or tack weld new hinge(s) (1), (2), or (3) on commander's cupola (4). Set cover on commander's cupola. Check alignment of cover hinges with hinges on hull.
2. Make sure hinges (1), (2), or (3) are aligned and spaced as shown.



REPAIR COMMANDER'S CUPOLA HINGES (M113A2, M1064, AND M1059 ONLY) — Continued

0046 00

3. Weld hinges (1), (2), or (3) to commander's cupola (4). See TC 9-237. Use electrode type 5356.



4. Clean the weld area and apply touch-up paint to all bare metal. See TM 43-0139.

FOLLOW-THROUGH STEPS

1. Install commander's cupola cover on carrier (see your -20).

END OF TASK

REPAIR COMMANDER'S HATCH COVER HINGES (M577A2 AND M1068 ONLY)

0047 00

THIS WORK PACKAGE COVERS:

- Disassembly (page 0047 00-1).
- Assembly (page 0047 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Metal Worker 44B10

Tools and Special Tools

- Body and Fender Repair Tool Kit (WP 0104 00, Item 27)
- Electrical Disc Sander (WP 0104 00, Item 35)
- Industrial Goggles (WP 0104 00, Item 21)
- Sander Spindle Adapter (WP 0104 00, Item 2)
- Trailer Mounted Welding Shop (WP 0104 00, Item 49)
- Welder's Gloves (WP 0104 00, Item 20)
- Welder's Helmet (WP 0104 00, Item 25)

References

- See your -20
- TM 43-0139
- TC 9-237

Equipment Condition

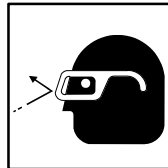
- Commander's hatch cover removed from carrier (see your -20)
- Battery ground strap disconnected (see your -20)
- Personnel heater wiring harness disconnected (see your -20)

Materials/Parts

- Welding electrode (WP 0105 00, Item 27)

DISASSEMBLY

WARNING

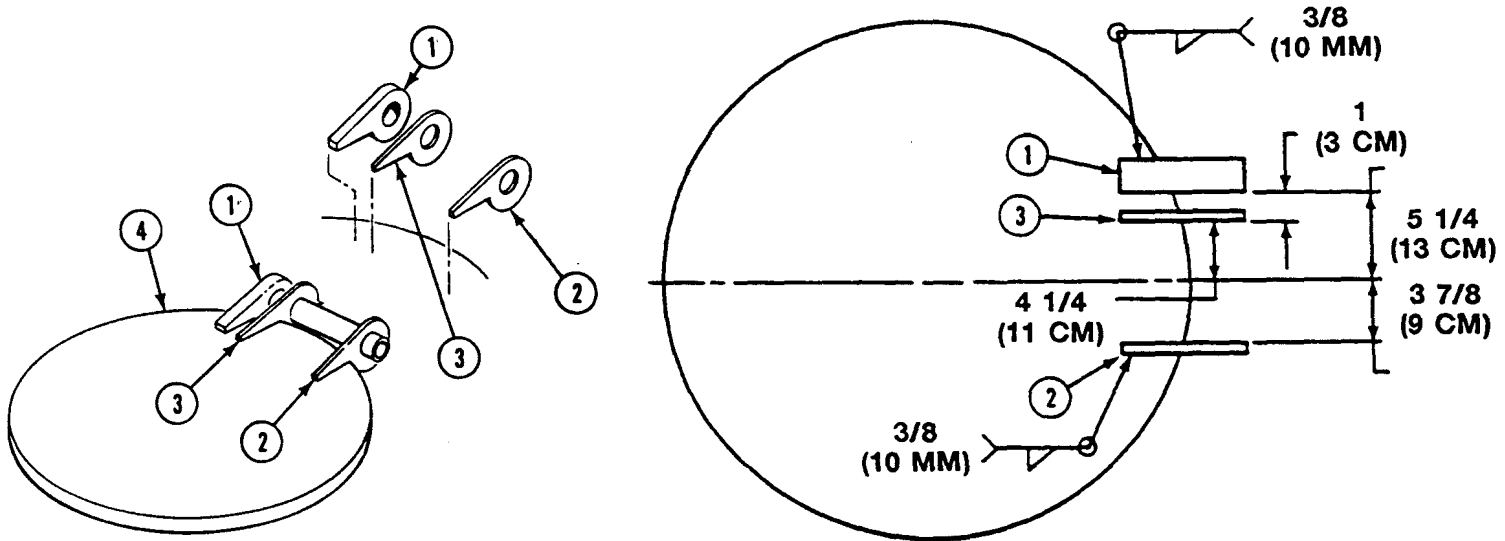


Metal chips and grinding dust can cause injury. Wear goggles and gloves.

REPAIR COMMANDER'S HATCH COVER HINGES (M577A2 AND M1068 ONLY) — Continued

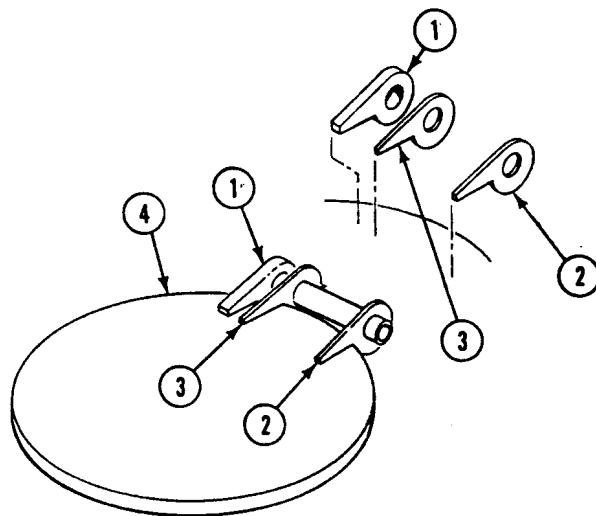
0047 00

1. Remove and discard broken hinge part (1), (2), or (3) from hatch cover (4).
2. Use a machinist's hammer and a cold chisel to chip off remaining part of bad hinge from hatch (4).
3. Use a disc sander to sand chipped area smooth and remove any hard coating from weld area.



ASSEMBLY

1. Clamp or tack weld new hinge part (1), (2), or (3) on cover (4).
2. Install cover (4) on hatch (see your -20).
3. Check alignment of hinges (1), (2), or (3) on cover (4) with torsion bar shields and hinges on hull.
4. Remove cover. Weld hinges (1), (2), or (3) to cover (4). See TC 9-237. Use electrode type 5356.



REPAIR COMMANDER'S HATCH COVER HINGES (M577A2 AND M1068 ONLY) — Continued

0047 00

5. Clean weld area and apply touch-up paint to repaired area. See TM 43-0139.

FOLLOW-THROUGH STEPS

1. Install commander's hatch cover on carrier (see your -20).
2. Connect battery ground strap (see your -20).
3. Connect personnel heater wiring harness (see your -20).

END OF TASK

**REPAIR COMMANDER'S HATCH COVER HULL HINGES
(M577A2 AND M1068 ONLY)**

0048 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0048 00-1).
Assembly (page 0048 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

Body and Fender Repair Tool Kit (WP 0104 00, Item 27)
Electrical Disc Sander (WP 0104 00, Item 35)
Industrial Goggles (WP 0104 00, Item 21)
Sander Spindle Adapter (WP 0104 00, Item 2)
Welder's Gloves (WP 0104 00, Item 20)
Welder's Helmet (WP 0104 00, Item 25)

Materials/Parts

Welding electrode (WP 0105 00, Item 27)

Personnel Required

Metal Worker 44B10

References

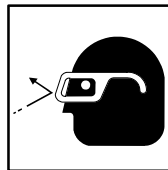
See your -20
TM 43-0139
TC 9-237

Equipment Condition

Commander's hatch cover removed from carrier (see your -20)
Battery ground strap disconnected (see your -20)
Personnel heater wiring harness disconnected (see your -20)

DISASSEMBLY

WARNING

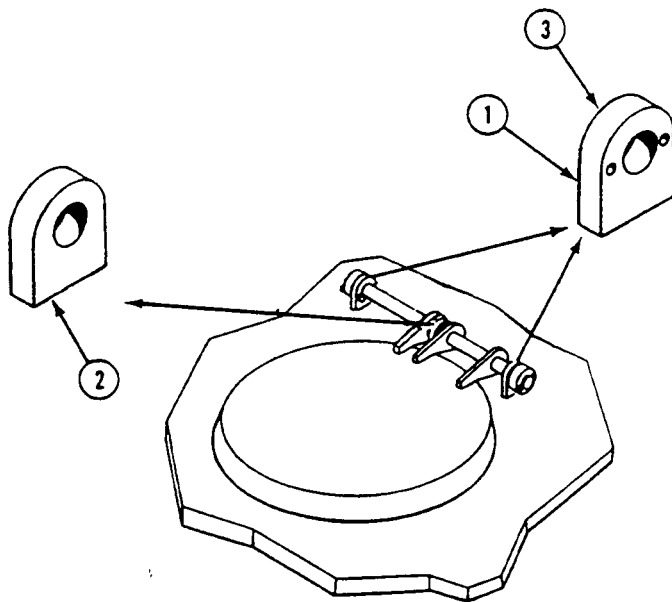


Metal chips and grinding dust can cause injury. Wear goggles and gloves.

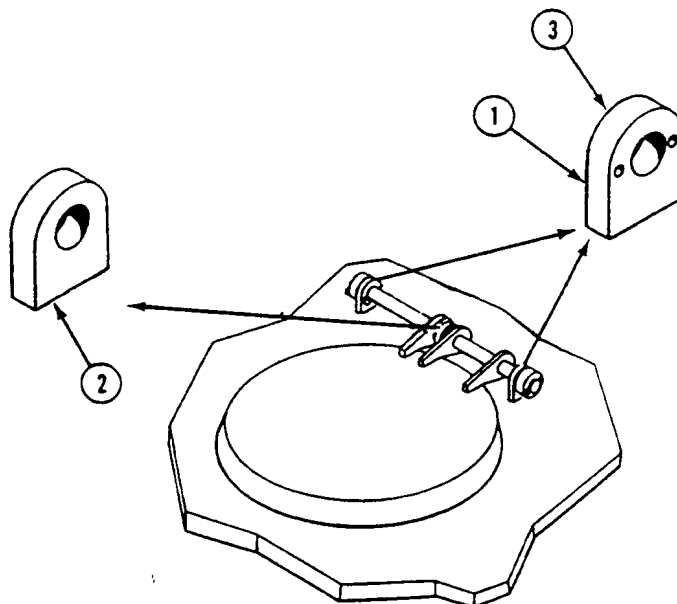
REPAIR COMMANDER'S HATCH COVER HULL HINGES (M577A2 AND M1068 ONLY) — Continued

0048 00

1. Remove and discard broken hinge part (1), (2), or (3) from hull.
2. Use a machinist's hammer and a cold chisel to chip off remaining part of bad hinge (1), (2), or (3) from hull.
3. Use a disc sander to sand chipped area smooth and remove any hard coating from weld area.

**ASSEMBLY**

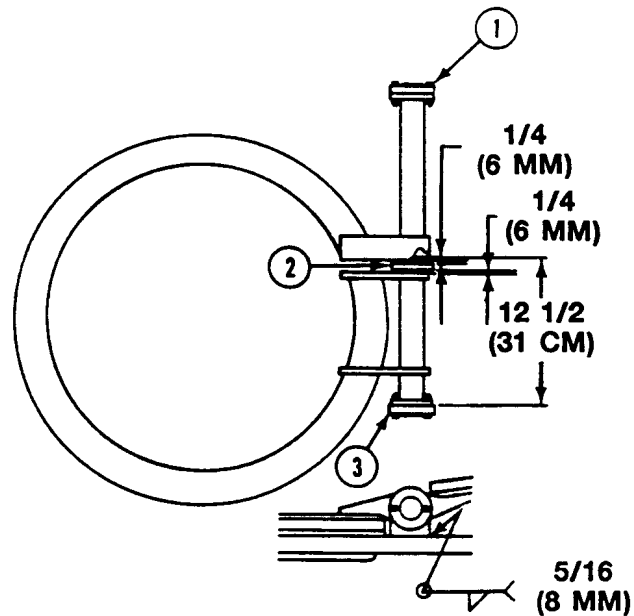
1. Clamp or tack weld new hinge part (1), (2), or (3) on hull.
2. Install cover on hatch (see your -20).



REPAIR COMMANDER'S HATCH COVER HULL HINGES (M577A2 AND M1068 ONLY) — Continued

0048 00

3. Check alignment of hinges (1), (2), or (3) on cover with torsion bar shields and hinges on hull.



4. Remove cover. Weld hinges to hull. See TC 9-237. Use electrode type 5356.
 5. Clean weld area and apply touch-up paint to repaired area. See TM 43-0139.

FOLLOW-THROUGH STEPS

1. Install commander's hatch cover on carrier (see your -20).
2. Connect battery ground strap (see your -20).
3. Connect personnel heater wiring harness (see your -20).

END OF TASK

REPLACE KEY LOCKED SCREW INSERTS

0049 00

THIS WORK PACKAGE COVERS:

Removal (page 0049 00-1).
 Installation (page 0049 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

Drill Set (WP 0104 00, Item 50)
 General Mechanic's Tool Kit (WP 0104 00, Item 19)
 Portable Electric Drill (WP 0104 00, Item 10)
 Screw Extractor Set (WP 0104 00, Item 17)

Equipment Condition

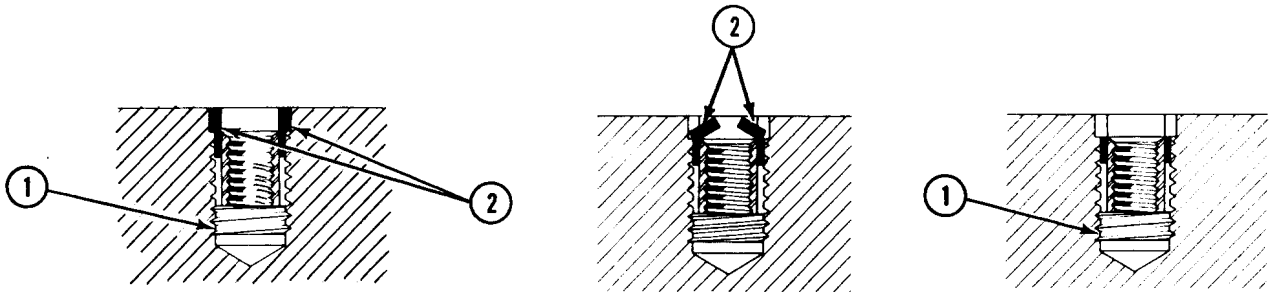
Carrier blocked (see your -10)
 Engine stopped (see your -10)

Materials/Parts

Screw insert

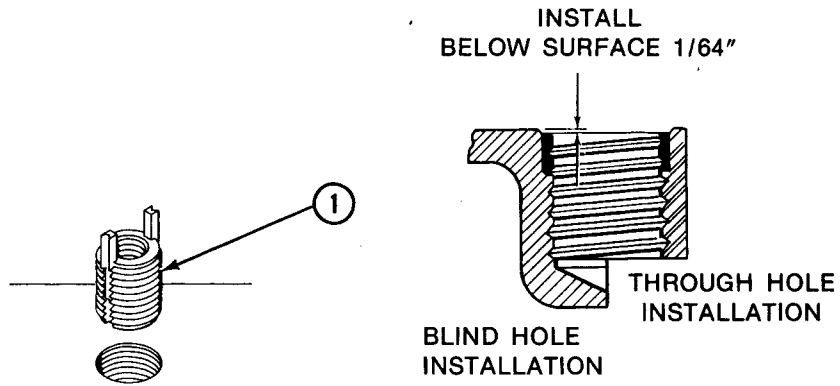
REMOVAL

1. Drill out insert (1) to depth of keys (2). Use drill the same diameter as distance between keys.
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.

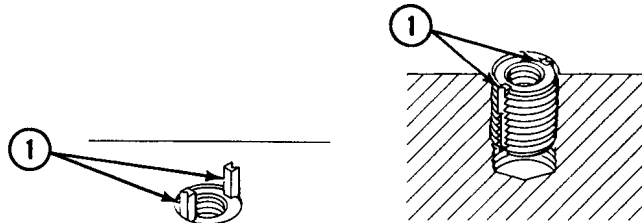


Table 1. KEY-LOCKED SCREW INSERT DATA

Internal Thread Size	Part Number	National Stock Number	External Thread Size	Application
3/4-16UNF-2B	7771298-3 (19207)	5340-00-111-7360	1 1/8-12 UNF-2A	SUSPENSION SYSTEM Torsion bar anchor mounting (M1064) Idler spindle mounting POWER PLANT COVER Lifting eye mounting pad
5/8-18UNF-2B	7771298-2 (19207)	5340-00-016-0025	1-14UNS-2A	SUSPENSION SYSTEM Road wheel arm mounting Shock absorber bracket mounting Track tension adjuster bracket mounting POWER PLANT Power plant grille
1/2-20UNF-2B	771298-1 (19207)	5340-00-115-9420	3/4-10UNC-2A	POWER PLANT Access covers Auxiliary power unit (M577A2) POWER TRAIN Differential steering bracket Final drive mounting PERSONNEL COMPARTMENT Commander's platform seat and post (M577A2 and M1064) Floor plate mounting
3/8-16UNC-3B	7771298-6 (19207)	5340-00-931-7253	9/16-12UNC-2A	HULL Covered extension (M577A2)
1/4-20UNF-3B	MS51830-202L	5340-00-079-2066	3/8-16UNC-2A	DRIVER'S HATCHES AND PERISCOPES Driver's hatch support assembly (M901A1) HULL Direct vision housing assembly, rear panel (M901A1)
5/16-24UNJF-3B	MS51830-203L	5340-00-009-6878	7/16-24UNC-2A	HULL Driver's hatch (M901A1) Stowage bracket (M901A1) Gunner's hatch (M901A1)
1/2-20UNJF-3B	MS51830-206L	5340-00-403-6393	9/16-11UNC-2A	HULL FLOORS AND SUB-FLOORS Interior floor (M901A1) Stowage bracket (M901A1)
6/32UNC-3B	MS51830-103L	5340-00-178-8116	12-28UNF-2A	HULL Proximity switch housing (M901A1)

END OF TASK

REPLACE SERRATED LOCK RING SCREW INSERTS

0050 00

THIS WORK PACKAGE COVERS:

- Removal (page 0050 00-1).
- Installation (page 0050 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Materials/Parts

Screw insert

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0104 00, Item 19)
- Inserter (see Table 1, page 0050 00- 3)
- Lock Ring Drive Tool (see Table 1, page 0050 00- 3)
- Portable Electric Drill (WP 0104 00, Item 10) or
(WP 0104 00, Item 11)
- Screw Extractor Set (WP 0104 00, Item 17)
- Twist Drill (see Table 1, page 0050 00- 3)

Personnel Required

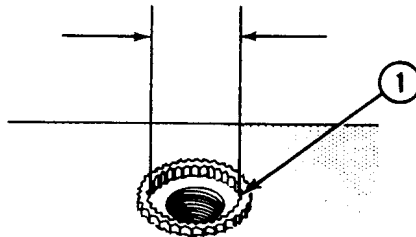
Track Vehicle Repairer 63H10

Equipment Condition

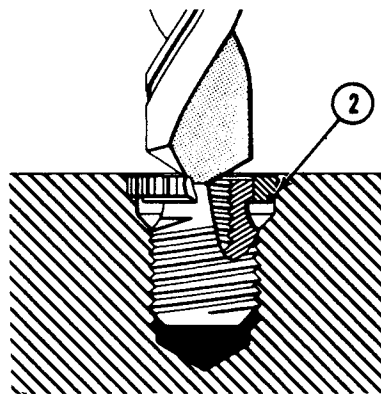
- Engine stopped (see your -10)
- Carrier blocked (see your -10)

REMOVAL

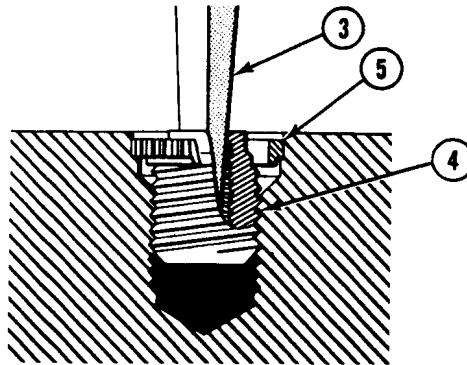
1. Drill out inside serrations of lock ring (1). Use drill same diameter as inside serrations. See Table 1, page 0050 00-3.



2. Drill to depth of counterbore (2).

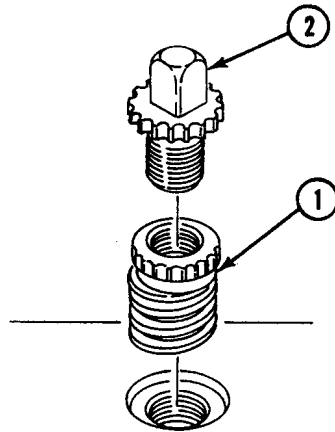


3. Drive in extractor tool (3) to screw out insert (4). As insert comes out, it will push out lock ring (5).
4. If lock ring (5) does not come out with insert (4), hit ring with a punch and hammer to collapse ring. Remove ring.



INSTALLATION

1. Install insert (1) in threaded hole. Use inserter (2). See Table 1, page 0050 00-3.



NOTE

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

2. Using lock ring drive tool (Table 1, page 0050 00-3), drive lock ring (3) into surface until drive tool (4) touches surface. Lock ring will be set at proper depth.

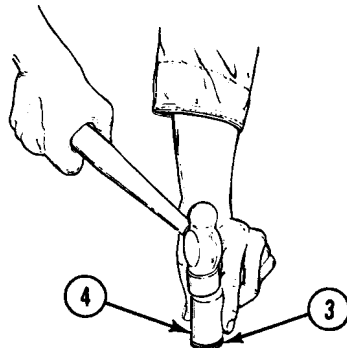


Table 1. SERRATED LOCK RING SCREW INSERT DATA

Internal Thread Size	Part Number/ National Stock Number	Removal Drill Diameter/Twist Drill Set	Inserter/ Wrench	Application
3/4-16UNF-3B	CR313SB18L 5340-00-999-5627	1 1/32 (WP 0104 00, Item 12)	CR13W R213D	SUSPENSION SYSTEM Torsion bar anchor mounting (M1064) Idler spindle mounting POWER PLANT COVER Lifting eye mounting pad
5/8-18UNF-3B	CR312SB16L 5340-00-921-6094	57/64 (WP 0104 00, Item 13)	CR12W R212D	SUSPENSION SYSTEM Road wheel arm mounting Shock absorber bracket mounting Track tension adjuster bracket mounting POWER PLANT Power plant grille
1/2-20UNF-3B	CR210SB12L 5340-00-930-1618	11/16 (WP 0104 00, Item 51)	CR10W R210D	POWER PLANT Access covers Auxiliary power unit POWER TRAIN Differential steering bracket Final drive mounting PERSONNEL COMPARTMENT Commander's platform seat and post (M577A2 and M1064) Floor plate mounting
3/8-16UNC-3B	CR108SB10L	29/64 (WP 0104 00, Item 50)	CR08W R108D	HULL Covered extension (M577A2)
1/2-20UNF-3B	CR2410SB17	11/16 (WP 0104 00, Item 51)	CR10W R210D	Fuel tank cover (M1064)

END OF TASK

REPLACE FRONT SPLASH GUARDS OR REAR FENDERS

0051 00

THIS WORK PACKAGE COVERS:

Removal (page 0051 00-1).
 Installation (page 0051 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Metal Worker 44B10

Tools and Special Tools

Arc Welding Machine (WP 0104 00, Item 52)
 Body and Fender Repair Tool Kit (WP 0104 00, Item 27)
 Electric Disc Sander (WP 0104 00, Item 35)
 Industrial Goggles (WP 0104 00, Item 21)
 Sander Spindle Adapter (WP 0104 00, Item 2)
 Trailer Mounted Welding Shop (WP 0104 00, Item 49)
 Welder's Gloves (WP 0104 00, Item 20)
 Welder's Helmet (WP 0104 00, Item 25)

References

See your -20
 TC 9-237
 TM 43-0139

Equipment Condition

Engine stopped (see your -10)
 Track shroud and covers on damaged side removed (see your -20)
 Track disconnected (see your -20)
 Battery ground disconnected (see your -20)

Materials/Parts

Welding electrode (WP 0105 00, Item 27)

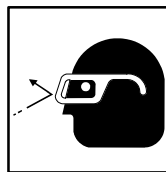
REMOVAL

NOTE

If replacing front splash guard, remove drive sprocket from carrier (see your -20). If replacing rear fender, remove idler wheel (see your -20).

1. Remove and discard damaged splash guard or damaged fender from carrier.

WARNING



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

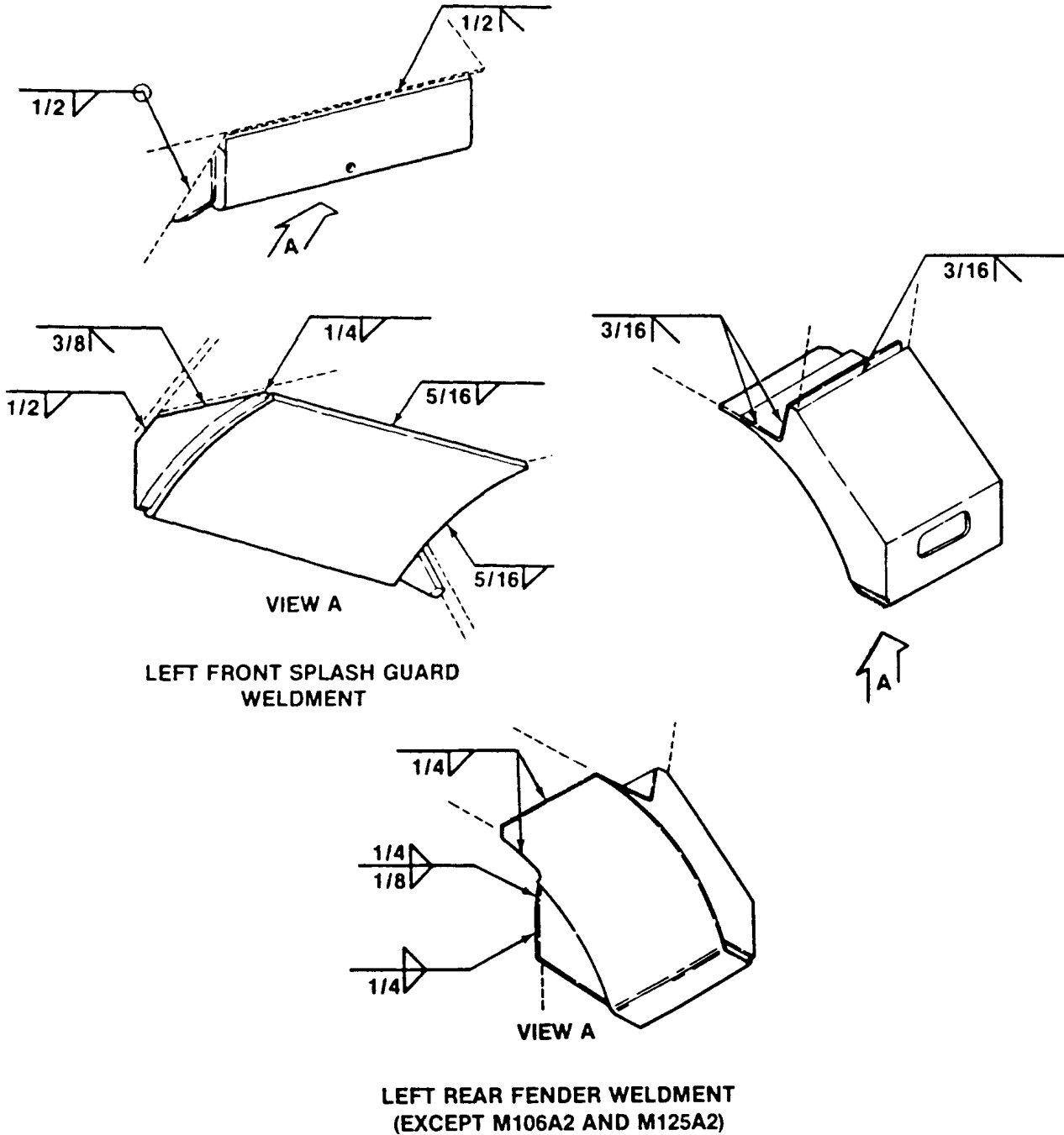
2. Use a hand grinder to grind area smooth.

INSTALLATION

NOTE

Weld left front splash guard as shown. Right side is the opposite and is welded accordingly.

1. Weld new splash guard or new fender as shown in illustrations and in accordance with TC 9-237.



2. Clean all bare metal and paint per TM 43-0139.

FOLLOW-THROUGH STEPS

NOTE

If front splash guard was replaced, install drive sprocket on carrier (see your -20). If rear fender was replaced, install idler wheel (see your -20).

1. Connect track and adjust tension (see your -10).
2. Install track shroud and covers on carrier (see your -20).
3. Reconnect battery ground (see your -20).

END OF TASK

REPAIR/REPLACE ACCELERATOR STOP SUPPORT ASSEMBLY

0052 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0052 00-2).
Assembly (page 0052 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

Arc Welding Machine (WP 0104 00, Item 52)
Body and Fender Repair Tool Kit (WP 0104 00, Item 27)
Electric Disc Sander (WP 0104 00, Item 34)
Industrial Goggles (WP 0104 00, Item 21)
Sander Spindle Adapter (WP 0104 00, Item 2)
Trailer Mounted Welding Shop (WP 0104 00, Item 49)
Welder's Gloves (WP 0104 00, Item 20)
Welder's Helmet (WP 0104 00, Item 25)

Materials/Parts

Welding electrode (WP 0105 00, Item 27)

Personnel Required

Metal Worker 44B10

References

TC 9-237
TM 43-0139

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Ramp lowered (see your -10)
Battery ground strap disconnected (see your -20)
Driver's seat removed (see your -20)
Upper accelerator pedal removed (see your -20)
Lower accelerator pedal removed (see your -20)
Upper and lower service brake pedals removed (see your -20)

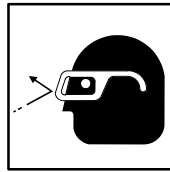
DISASSEMBLY

1. Remove screw (2) and nut (3) from support assembly (4).

NOTE

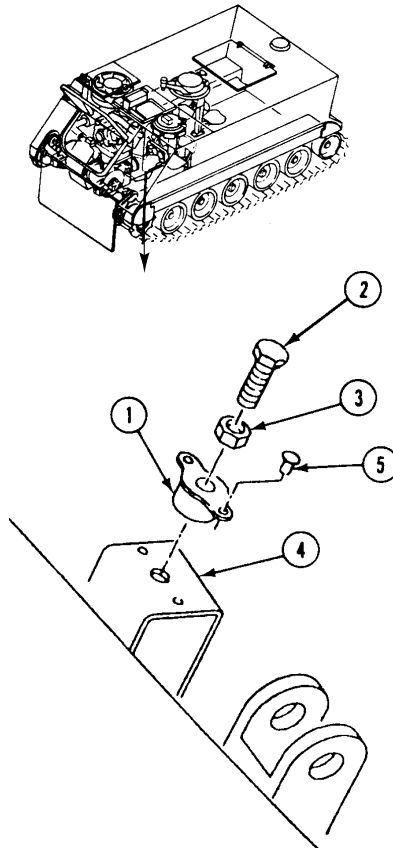
To replace nut (1) only, go directly to Step 5.

2. Remove broken support assembly (4) 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 (5) securing nut (1) to support. Remove nut.



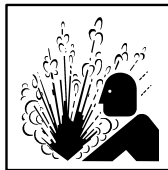
ASSEMBLY

NOTE

To install nut (2) only, go directly to Step 4.

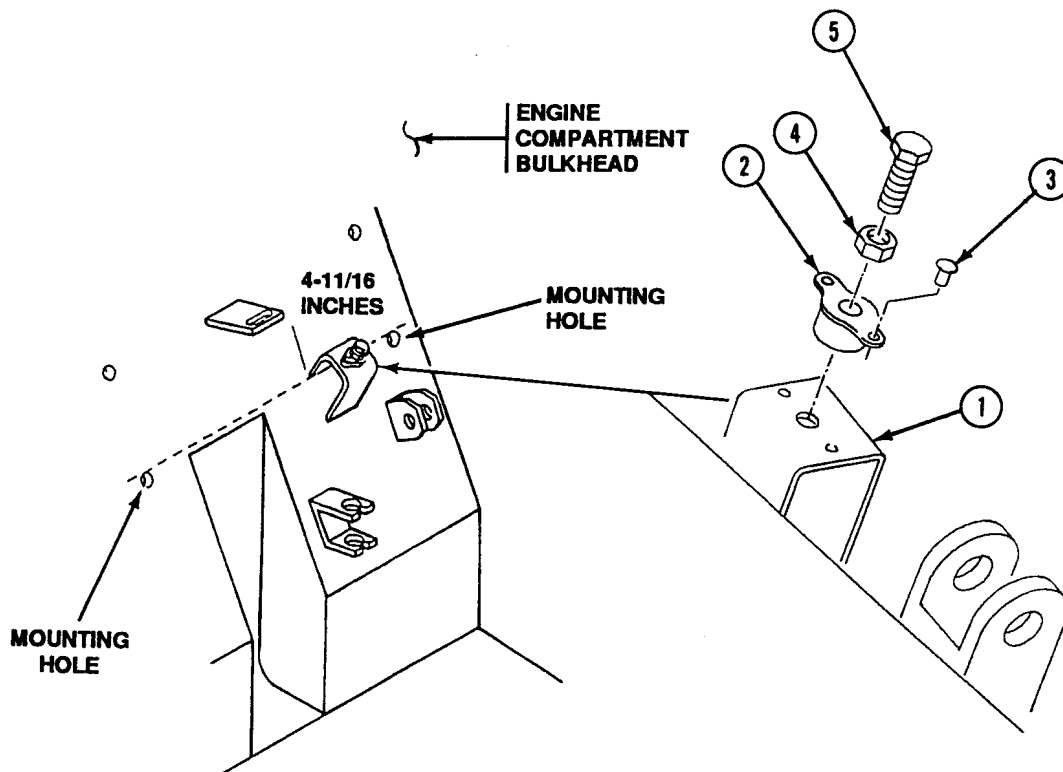
1. Position support assembly (1) on front bulkhead 4-11/16 inches (11.9 cm) from left edge of support to engine compartment bulkhead. Use straight edge to locate and scribe a line between mounting holes.

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 TC 9-237. Protective clothing and goggles must be worn; adequate protective equipment used, a suitable fire extinguisher kept nearby; and requirements of TC 9-237 strictly followed.

2. Weld support assembly (1) to floor plate, using dimensions shown, in accordance with TC 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).



FOLLOW-THROUGH STEPS

1. Install upper and lower service brake pedals (see your -20).
2. Install lower accelerator pedal (see your -20).
3. Install upper accelerator pedal (see your -20).
4. Install driver's seat (see your -20).
5. Connect battery ground strap (see your -20).
6. Start engine (see your -10). Check that accelerator pedal works right.
7. Raise and lock ramp (see your -10).
8. Stop engine (see your -10).

END OF TASK

CHAPTER 10

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR RAMP SYSTEM

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
REPAIR RAMP ACCESS DOOR.....	0053 00
REPLACE RAMP HYDRAULIC CYLINDER ANCHOR (M1064 ONLY).....	0054 00

REPAIR RAMP ACCESS DOOR

0053 00

THIS WORK PACKAGE COVERS:

Removal (page 0053 00-1).
 Installation (page 0053 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10
 Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)
 Lifting Device 200 lbs (91 kg) Capacity

Equipment Condition

Ramp raised and locked (see your -10)
 Engine stopped/shutdown (see your -10)
 Carrier blocked (see your -10)

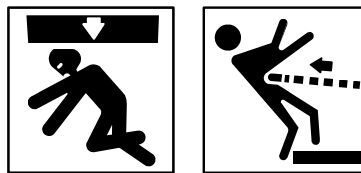
REMOVAL

WARNING



Door could fall and injure you. Make sure door is held by a lifting device before removing hinge screws.

WARNING



Damaged slings can fail when loaded. Breaking slings can strike and injure personnel. Suspended load can fall and crush personnel.

Inspect all slings before use. Do not use damaged slings. Clearly mark all damaged slings as DAMAGED - DO NOT USE.

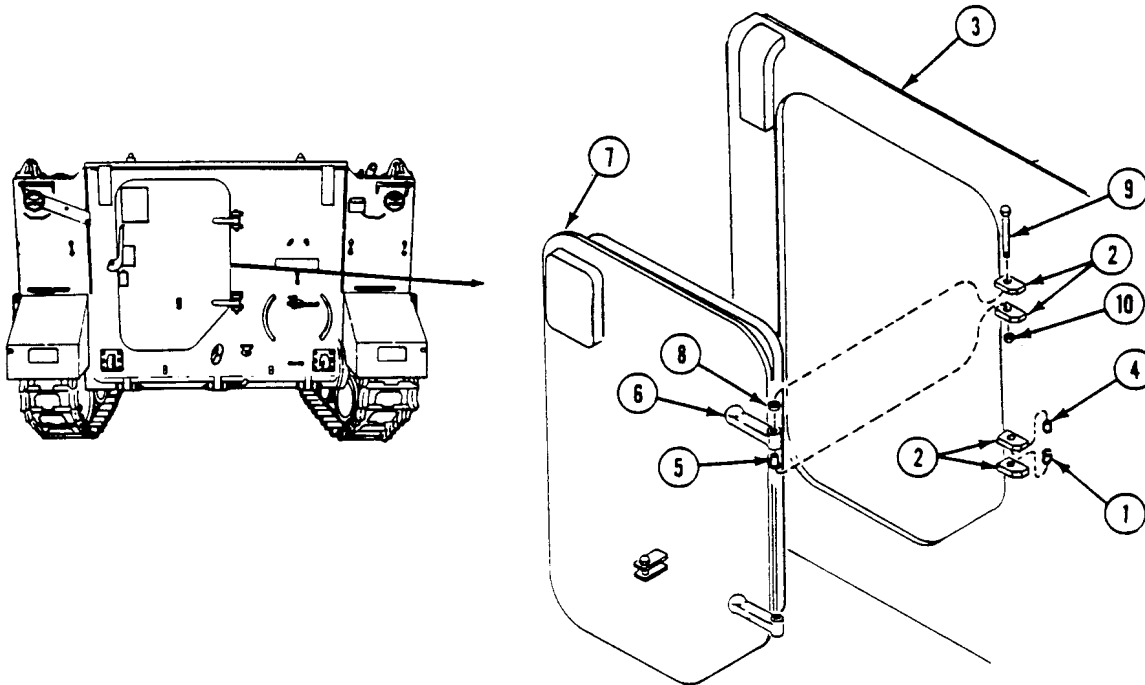
1. Attach door to lifting device.

- Remove two nuts (10), screws (9), and spacers (8) that secure ramp door (7) to four hinge parts (2) on ramp (3). Remove door from ramp. Have helper assist.

NOTE

**Shoulder bushings (1) and (5) provide clearance between spacer and upper ramp hinge part.
Replace bushings that do not provide 1/16 inch (2 mm) clearance.**

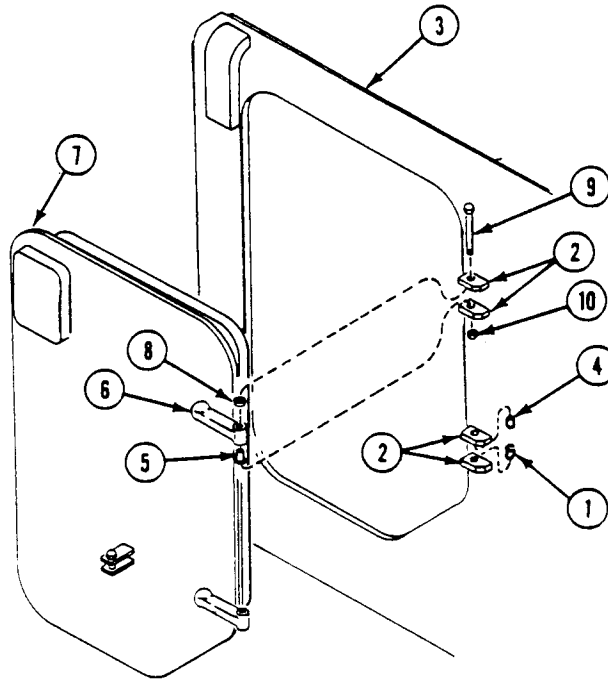
- Remove two shoulder bushings (5) from two hinges (6) on ramp door (7).
- Remove two bushings (4) from two upper hinge parts (2) on ramp (3). Remove two shoulder bushings (1) from two lower hinge parts (2).

**INSTALLATION****NOTE**

**Shoulder bushings (1) and (5) provide clearance between spacer and upper ramp hinge part.
Replace bushings that do not provide 1/16 inch (2 mm) clearance.**

- Install two shoulder bushings (1) in two lower hinge parts (2) on ramp (3).
- Install two bushings (4) in two upper hinge parts (2) on ramp (3).
- Install two shoulder bushings (5) in two hinges (6) on ramp door (7).

- Place door (7) in ramp (3). Secure with two spacers (8), screws (9), and nuts (10).

**FOLLOW-THROUGH STEPS**

- Adjust handle (see your -20).

END OF TASK

REPLACE RAMP HYDRAULIC CYLINDER ANCHOR (M1064 ONLY)

0054 00

THIS WORK PACKAGE COVERS:

- Removal (page 0054 00-1).
- Modify (page 0054 00-3).
- Installation (page 0054 00-4).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

- Electrical Disc Sander (WP 0104 00, Item 34)
- General Mechanic's Tool Kit (WP 0104 00, Item 19)
- Pneumatic Hammer (WP 0104 00, Item 24)
- Portable Electric Drill (WP 0104 00, Item 10)
- Torque Wrench (WP 0104 00, Item 55)
- Twist Drill Set (WP 0104 00, Item 14)

References

TM 43-0139

Equipment Condition

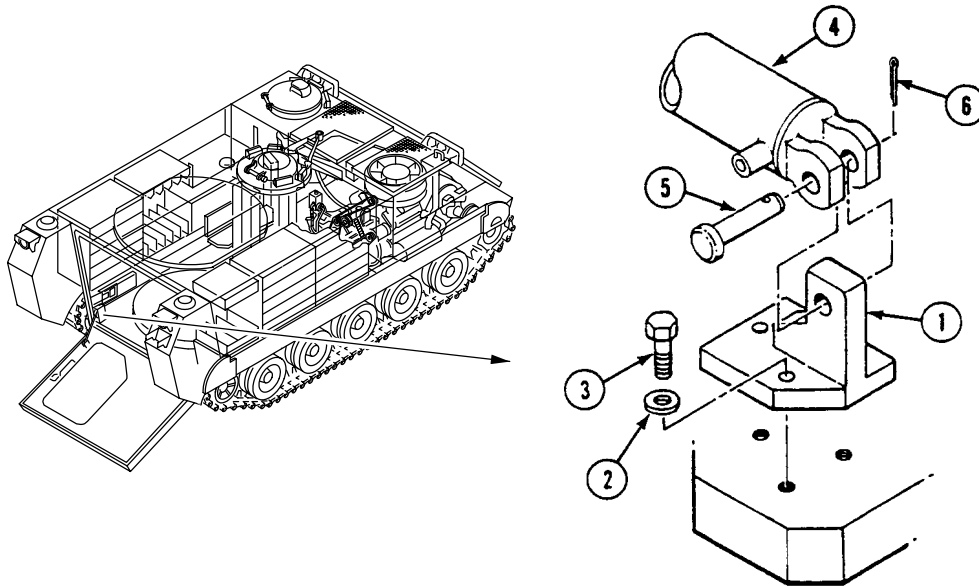
- Engine stopped (see your -10)
- Carrier blocked (see your -10)
- Ramp lowered (see your -10)
- Mortar removed (TM 9-1015-250-10)
- Mortar turntable and ring gear removed (TM 9-1015-232-35)

Materials/Parts

- Sealing compound primer (WP 0105 00, Item 21)
- Cotter pin
- Screw (3)
- Washer (3)

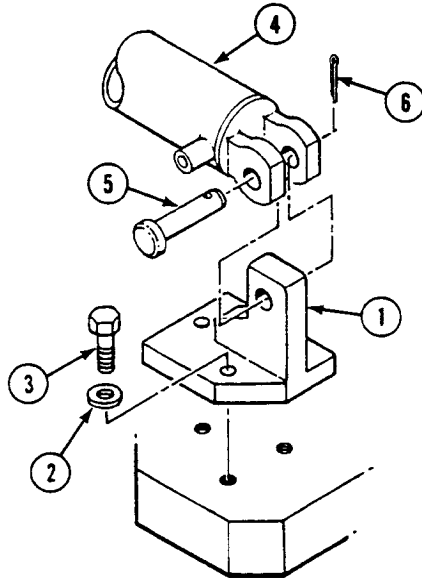
REMOVAL

1. Remove cotter pin (6). Discard pin.



REPLACE RAMP HYDRAULIC CYLINDER ANCHOR (M1064 ONLY) — Continued**0054 00**

2. Remove headed pin (5). Retain pin.
3. Remove cylinder (4) from anchor (1).
4. Remove three screws (3), washers (2), anchor (1), and all weld material from hull bottom plate. Discard anchor, washers, and screws.



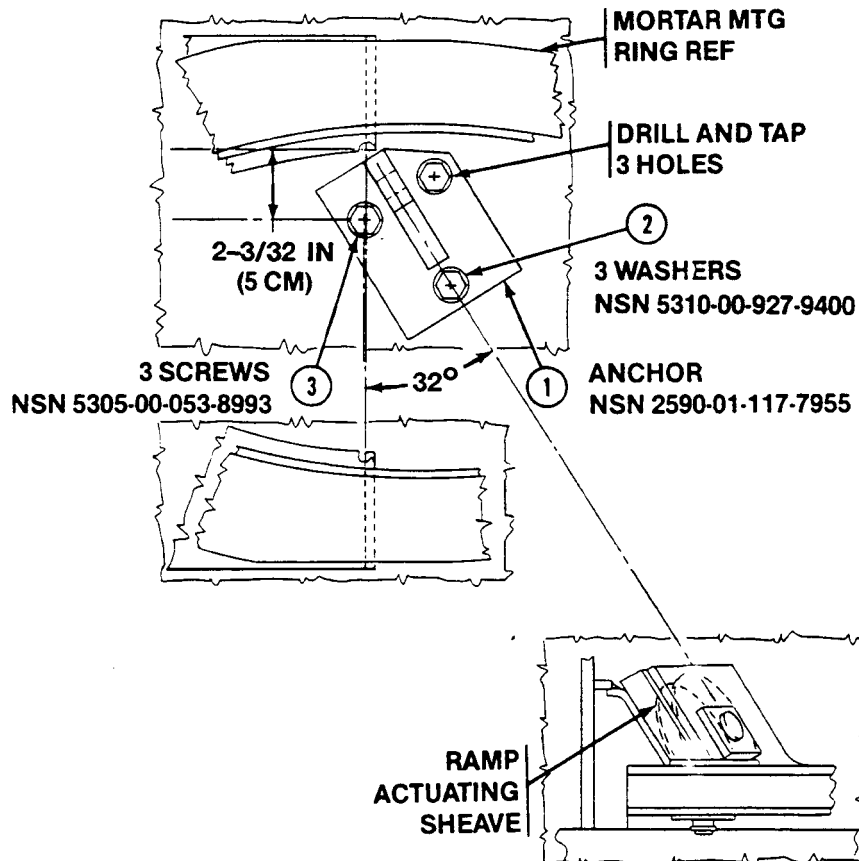
MODIFY

1. Grind weld area level and smooth.
2. Locate center of first hole as shown.

NOTE

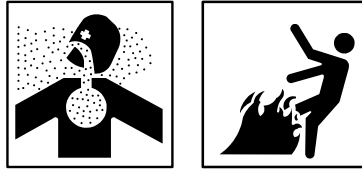
Drill all holes straight and at right angles to hull bottom plate.

3. Drill first hole with 7/16 inch (11 mm) diameter drill. Bottom plate is 1-1/8 inches (3 cm) thick. Do not break through.
4. Tap first hole with a 1/2-13UNC tap to a minimum thread depth of 7/8 inch (22 mm).
5. Position new anchor (1) 32 degrees from reference line as shown, with centerline of anchor and bottom centerline of ramp pulley in alignment.
6. Secure anchor (1) with one new washer (2) and one new screw (3).
7. Use new anchor (1) as template. Locate center of remaining two holes. Remove anchor. Drill and tap holes same way as first hole in Steps 3 - 4.
8. Clean surface with wire brush.
9. Paint any exposed metal surfaces. See TM 43-0139.



INSTALLATION

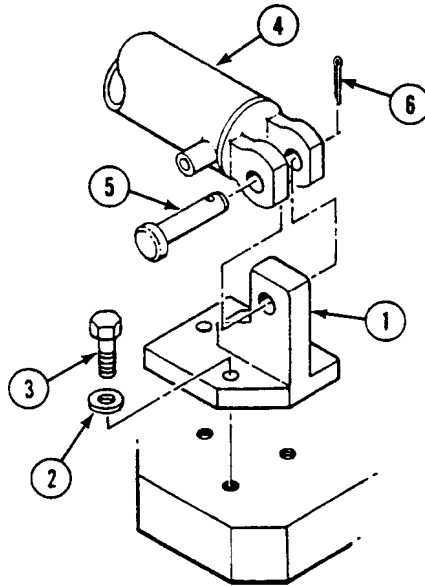
1. Install new anchor (1) with three new washers (2) and new screws (3).

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.

2. **TIGHTEN SCREWS (3) TO 54-59 LB-FT (73-80 N·M) TORQUE.** Use torque wrench. Use adhesive primer as lubricant on threads and under screw heads.
3. Install cylinder (4) on anchor (1) with headed pin (5). Secure with new cotter pin (6).

**FOLLOW-THROUGH STEPS**

1. Install mortar turntable and ring gear. See TM 9-1015-232-23&P.
2. Install mortar in carrier. See TM 9-1015-250-10.
3. Raise and lock ramp (see your -10).
4. Stop engine (see your -10).

END OF TASK

CHAPTER 11

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR PERSONNEL HEATER KIT

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
INSTALL PERSONNEL HEATER KIT (M113A2 AND M1059 ONLY).....	0055 00
INSTALL PERSONNEL HEATER KIT (M1064 ONLY).....	0056 00

INSTALL PERSONNEL HEATER KIT (M113A2 AND M1059 ONLY)

0055 00

THIS WORK PACKAGE COVERS:

Installation (page 0055 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

References

See your -20

Tools and Special Tools

- Frame Hacksaw (WP 0104 00, Item 23)
- General Mechanic's Tool Kit (WP 0104 00, Item 19)

Equipment Condition

- Ramp lowered (see your -10)
- Engine stopped (see your -10)
- Carrier blocked (see your -10)
- Battery ground lead disconnected (see your -20)
- Power plant rear access panel removed (see your -20)
- Floor plates removed (see your -20)
- Fuel compartment drained (see your -20)

Materials/Parts

- Hacksaw blade (WP 0105 00, Item 6)
- Sealing compound (WP 0105 00, Item 17)
- Sealing compound primer (WP 0105 00, Item 21)
- Solvent, cleaning compound (WP 0105 00, Item 10)
- Kit P/N 12269140 (19207)

Personnel Required

Track Vehicle Repairer 63H10

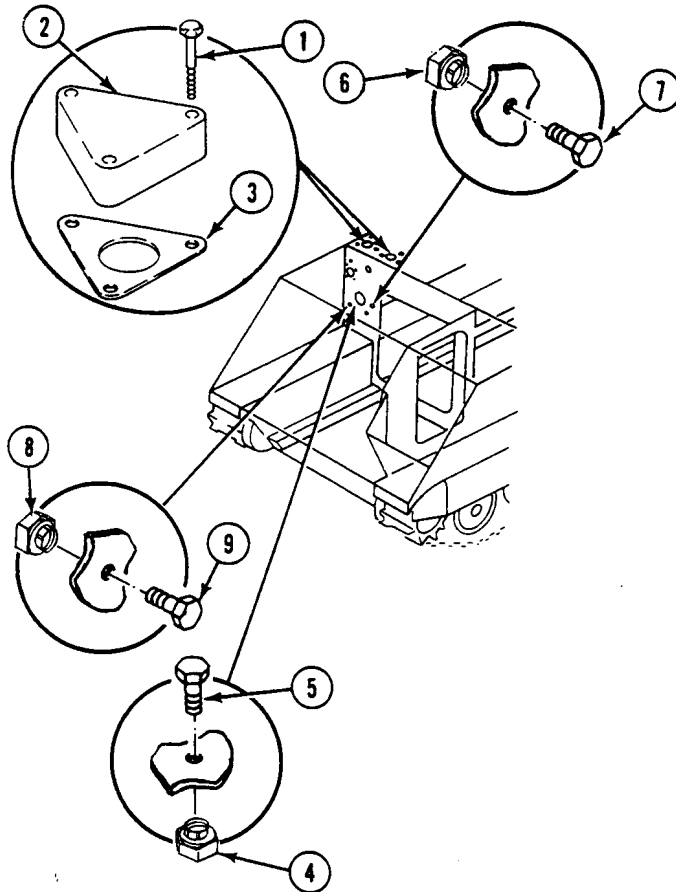
INSTALLATION

NOTE

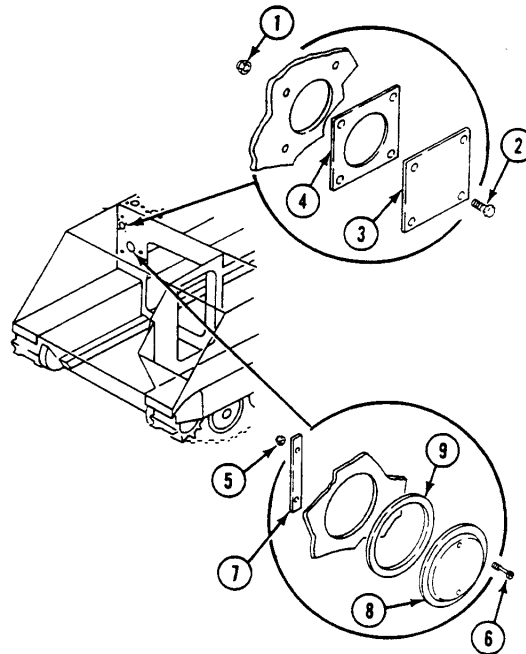
Fuel hoses used on the personnel heater installation are the flareless type. If it is necessary to replace hose, the connection fittings must also be replaced.

INSTALL PERSONNEL HEATER KIT (M113A2 AND M1059 ONLY) — Continued**0055 00**

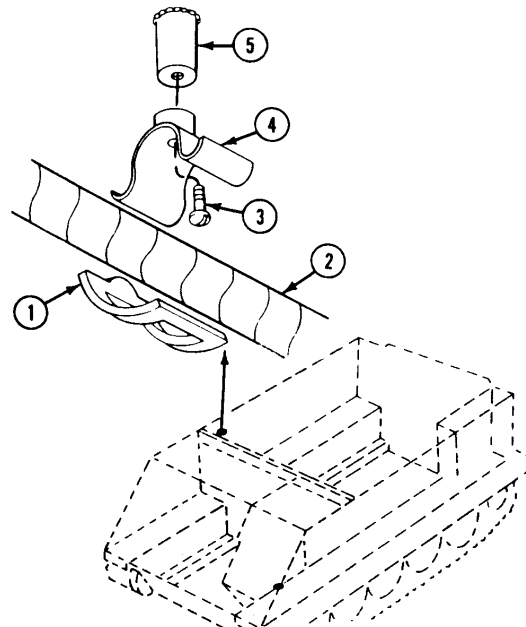
1. Remove six screws (1), two cover plates (2), and two gaskets (3) from top of carrier. Discard cover plates and gaskets.
2. Remove nut (4) and screw (5) from transverse beam. Discard nut and screw.
3. Remove nut (6) and screw (7) from engine compartment bulkhead. Discard nut and screw.
4. Remove four nuts (8) and screws (9) from engine compartment bulkhead. Retain four nuts and screws.



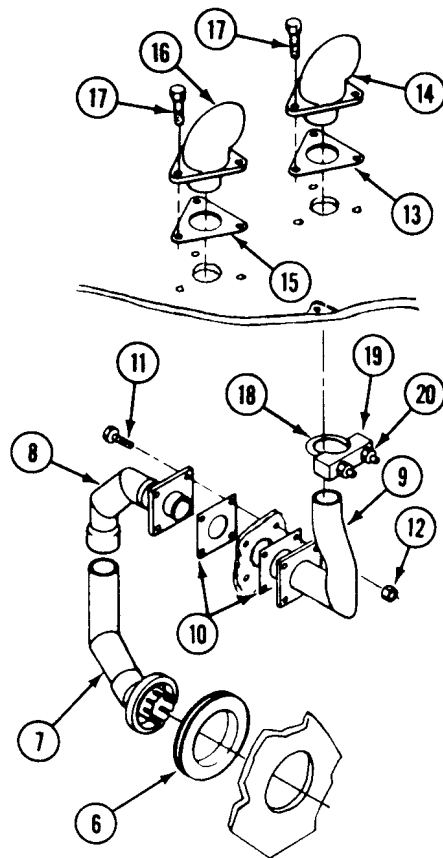
5. Remove four nuts (1), screws (2), cover (3) and gasket (4) from engine compartment bulkhead. Retain four nuts. Discard screws, cover, and gasket.
6. Remove two nuts (5), screws (6), retainer (7), cover (8), and gasket (9) from engine compartment bulkhead. Discard nuts, screws, retainer, cover, and gasket.



7. Remove and discard cradle clip (1), move battery lead (2) aside.
8. Remove screw (3) and cradle (4) from weldnut (5). Discard screw and cradle.



9. Install grommet (6) in power plant bulkhead.
10. Install exhaust pipe (7) in grommet (6).
11. Install exhaust pipe (8) on exhaust pipe (7).
12. Secure two exhaust pipes (8) and (9) and two gaskets (10) to power plant bulkhead with four screws (11) and retained nuts (12).
13. Install gasket (13) on exhaust elbow (14) and insert elbow through top deck into exhaust pipe (9).
14. Install gasket (15) on intake elbow (16) and position elbow through top deck opening.
15. Secure exhaust and intake elbows (14) and (16) to top deck with six screws (17).
16. Secure exhaust pipe (9) to elbow (14) with U-bolt (18), clamp (19), and two nuts (20).

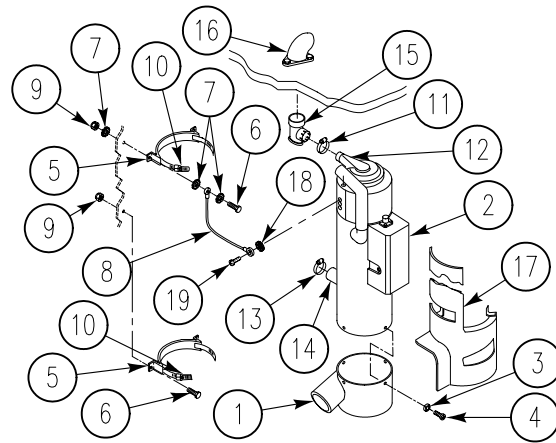
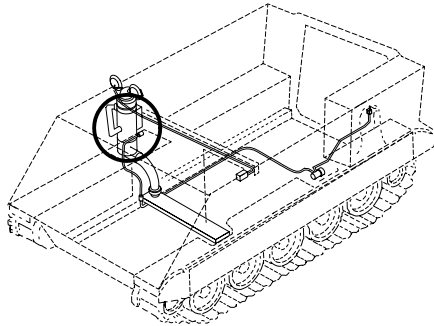


17. Secure plenum (1) to heater (2) with four lockwashers (3) and screws (4).

NOTE

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

18. Secure two saddles (5) to power plant bulkhead with four retained screws (6), three lockwashers (7), ground strap (8) and four retained nuts (9).
19. Install two clamps (10) in two saddles (5).
20. Position clamp (11) on heater intake pipe (12) and place clamp (13) on heater exhaust pipe (14). Do not tighten.

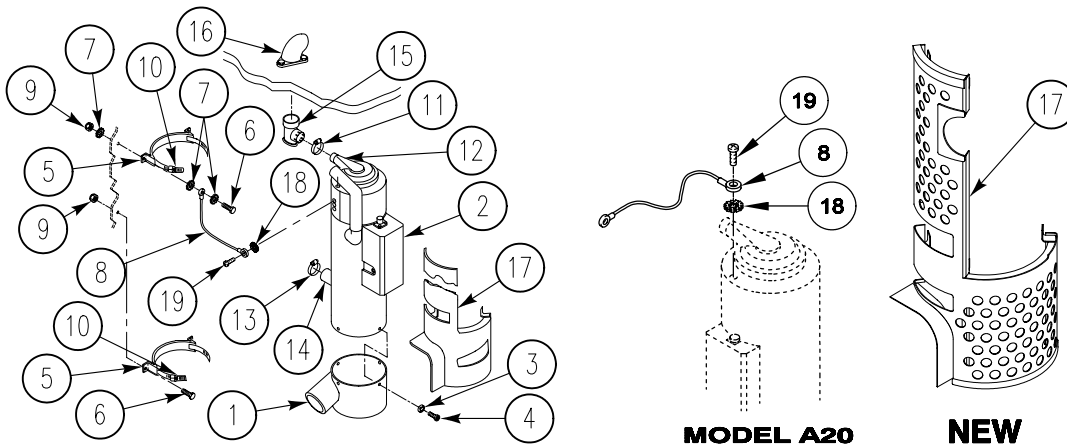


21. Install elbow (15) in heater intake pipe (12) and intake elbow (16).
22. Align inlet elbow (15) with intake elbow (16), and align exhaust pipe (14) with exhaust pipe in carrier. Place heater (2) and shield (17) against saddles (5).
23. While still supporting heater, double check for proper mating of heater exhaust port (14) and exhaust pipe in carrier. Tighten two saddle clamps (10).

NOTE

Heater Model A-20 has ground strap attached to top of heater.

24. Position ground strap (8) on heater (2) and secure with one lockwasher (18) and screw (19). Discard existing screw and use kit screw.
25. Tighten clamp (13) on heater exhaust pipe (14) and exhaust pipe in carrier.
26. Tighten clamp (11) on heater intake pipe (12).



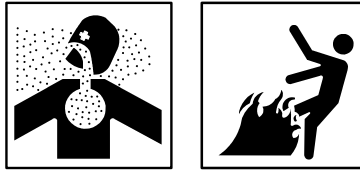
27. Secure fuel pump (1) to threaded bracket (2) with four lockwashers (3), two flat washers (4), and screw (5).

CAUTION

Shielded lead can damage pump. Shielded lead must not contact pump body or other surfaces.

28. Secure shielded lead (6) to weldnut (7) with washer (8), two lockwashers (9), and screw (10).
 29. Clean external pipe threads of fittings with solvent, cleaning compound.

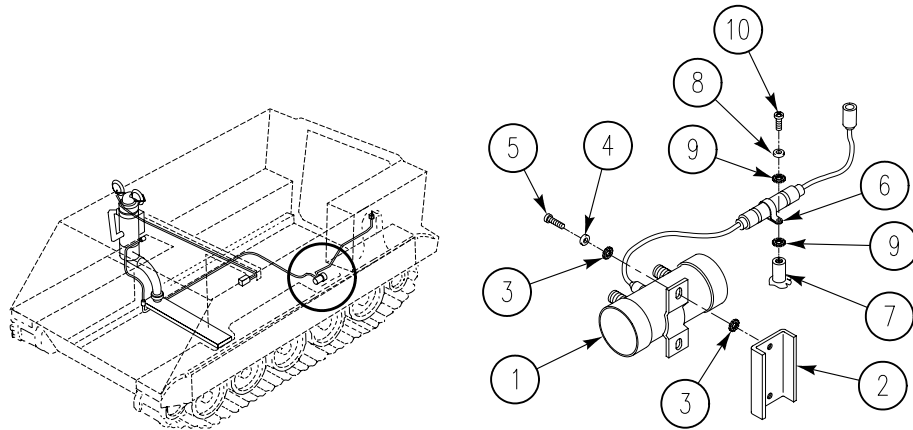
WARNING



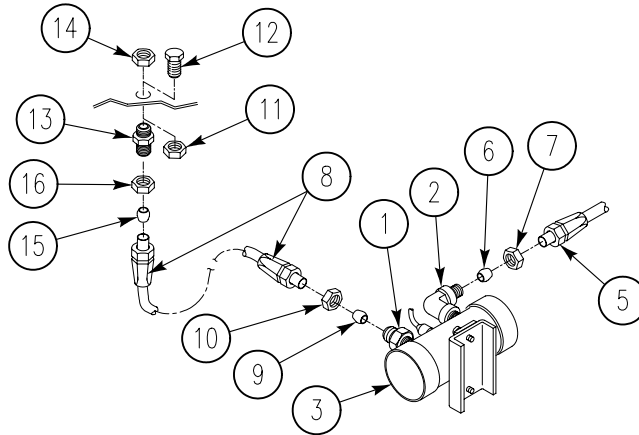
Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

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.

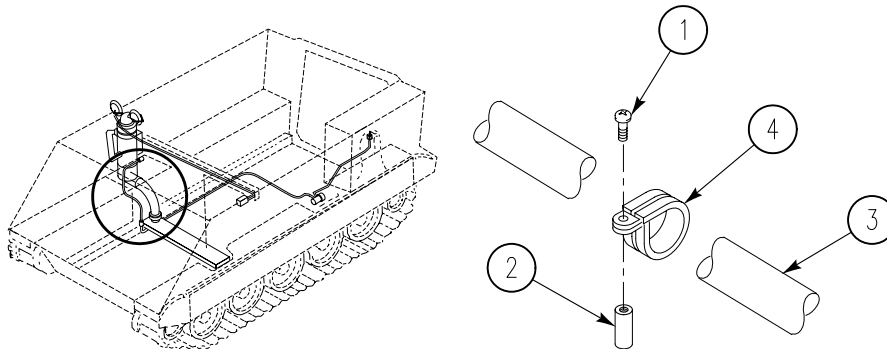
30. Apply a thin, even coat of primer and then sealing compound to cleaned external pipe threads of fittings. Do not apply primer or sealing compound beyond small end of threads.



31. Install adapter (1) and elbow (2) on fuel pump (3).
32. Secure personnel heater fuel hose (5) to elbow (2) with sleeve (6) and nut (7).
33. Secure personnel heater fuel hose (8) to adapter (1) with sleeve (9) and nut (10).
34. Remove nut (11) and screw (12) from crossmember. Discard screw and nut.
35. Secure adapter body (13) to crossmember with nut (14).
36. Secure personnel heater fuel hose (8) to adapter body (13) with sleeve (15) and nut (16).

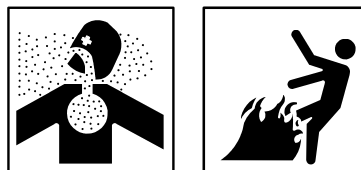


37. Remove five screws (1) from weldnuts (2).
38. Secure personnel heater fuel hose (3) to eight weldnuts (2) with five screws, three kit screws (1), and eight clamps (4).



39. Clean external threads of fittings with solvent, cleaning compound.

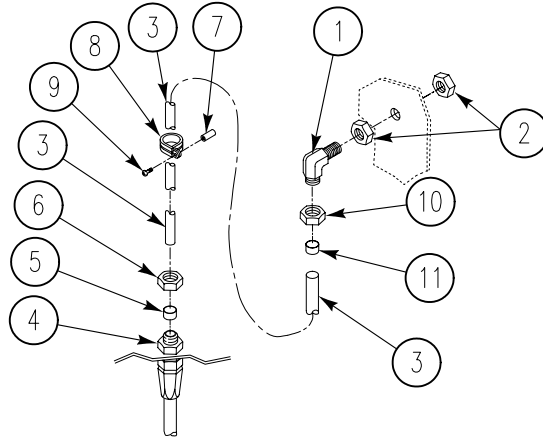
WARNING



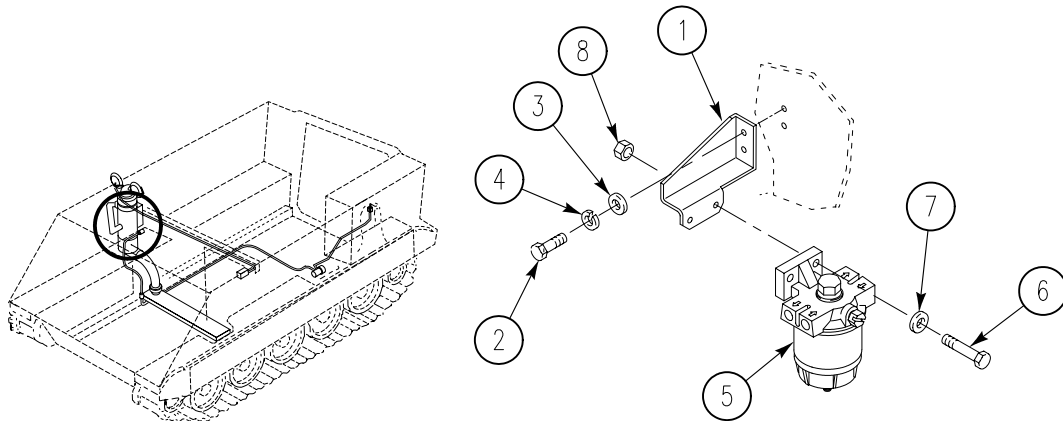
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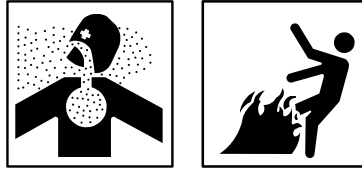
40. Apply a thin, even coat of primer and then sealing compound to cleaned external pipe threads of fittings. Do not apply primer or sealing compound beyond small end of threads.
41. Secure elbow (1) to power plant bulkhead with two locknuts (2).
42. Install nut (10) and sleeve (11) onto tube (3).
43. Secure tube (3) to adapter body (4) with sleeve (5) and nut (6).
44. Secure tube (3) to weldnut (7) with clamp (8) and screw (9).



45. Drill two holes in bulkhead to mount bracket (1).
46. Install fuel filter bracket (1) in hull. Secure with two screws (2), washers (3), and lockwashers (4).
47. Install fuel filter (5) in bracket (1), with port 4 facing hull. Secure with two screws (6), washers (7), and new locknuts (8).



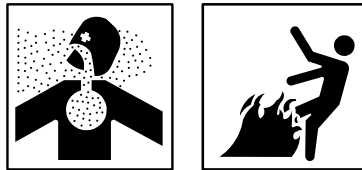
48. Install valve (2) on adapter (3) with valve knob on top.

WARNING

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49. Apply sealant to clean external tapered threads of elbow (1). Install elbow (1) in valve (2), adapter (3), and new packing (4) in port 1 of fuel filter (5).
50. Install elbow (6) on elbow (7) on engine compartment bulkhead.
51. Connect inlet fuel hose (8) to elbow (1) and elbow (6).
52. Install two plugs (9) and new packings (10) in ports 2 and 3 of fuel filter (5).
53. Install elbow (11) and new packing (12) in port 4 of fuel filter (5).

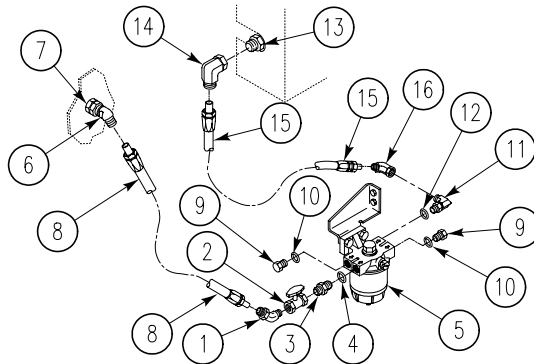
WARNING

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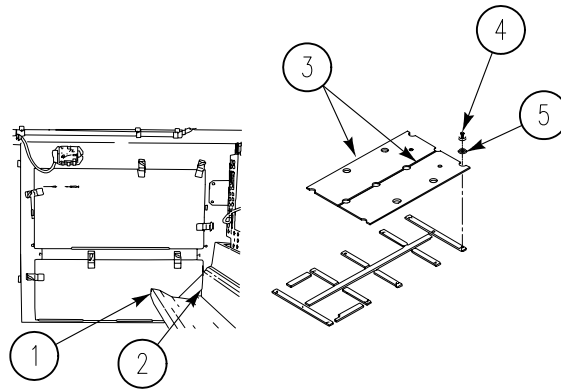
54. Apply sealant to clean external threads of fittings. Install nipple (13) in personnel heater and install elbow (14) on nipple with elbow facing down.

55. Connect heater inlet fuel line (15) to elbow (14) and elbow (16). Connect elbow (16) to elbow (11).



56. If required, use a hacksaw to trim ends of personnel seat (1) and seat back (2), so heater hose may be installed.

57. Secure left and right floor plates (3) to hull crossmembers with seven screws (4) and washers (5).

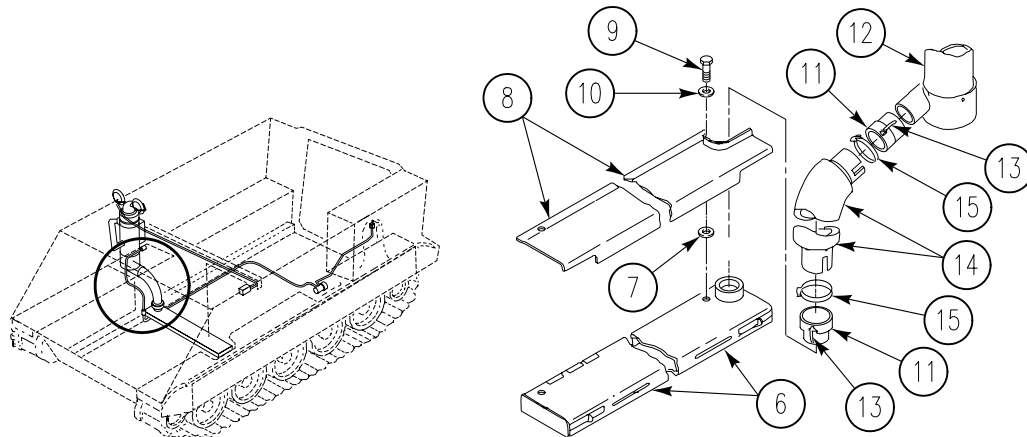


58. Align heater duct (6), washer (7), and shield (8) with front three holes in floor plates. Secure with three new screws (9) and washers (10) from kit.

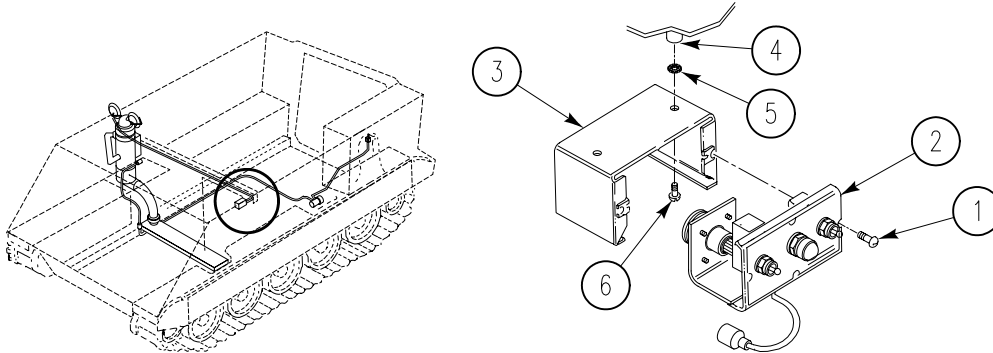
59. Secure one nipple (11) to plenum (12) with latch (13).

60. Secure one nipple (11) to duct (6) with latch (13).

61. Secure hose (14) to two nipples (11) with two clamps (15).

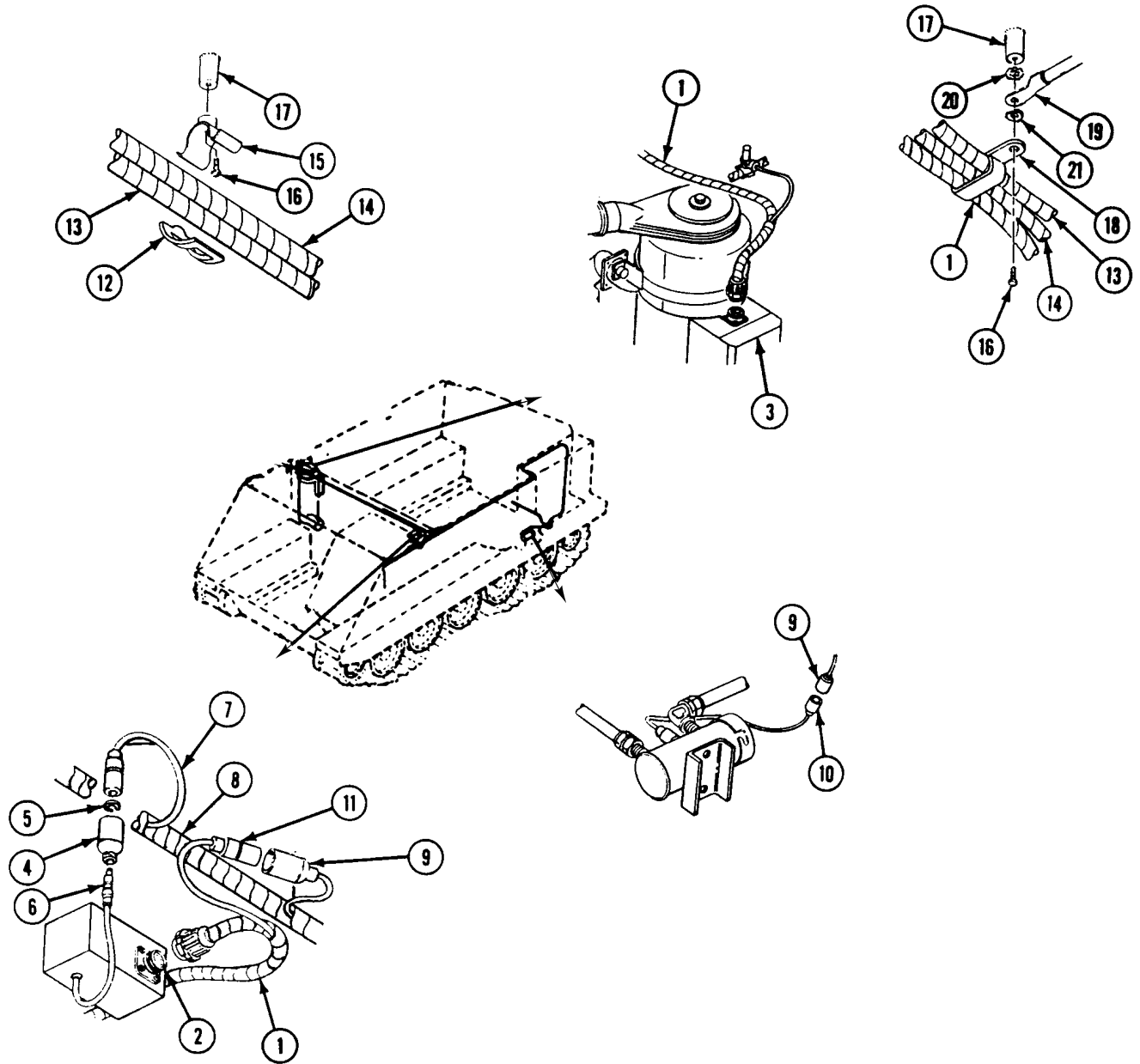


62. Remove two screws (1) and control box (2) from control box case (3).
63. Remove two screws, nuts, and washers supplied with control box case (3). Discard screws, nuts, and washers.
64. Secure control box case (3) to two weldnuts (4) with two lockwashers (5) and screws (6).
65. Secure control box (2) to control box case (3) with two screws (1).
66. Clean small area on hull support next to control box (2) and apply warning decal (see your -20).



67. Thread personnel heater wiring harness (1) through transverse beam from driver's compartment into personnel compartment.
68. Connect personnel heater wiring harness (1) to control box (2).
69. Connect personnel heater wiring harness (1) to personnel heater (3).
70. Install shell (4) and washer (5) on control box lead (6).
71. Connect circuit 400 lead (7) of rear main wiring harness (8) to control box lead (6).
72. Connect circuit 402 lead (9) of rear main wiring harness (8) to fuel pump lead (10) and to connector (11) of personnel heater wiring harness (1).
73. Remove clip (12) securing battery cable (13) and radio cable (14) to cradle (15). Discard clip.
74. Remove screw (16) and cradle (15) from weldnut (17). Discard cradle.
75. Install clamp (18) on battery cable (13), radio cable (14), and personnel heater wiring harness (1).

76. Secure personnel heater wiring harness ground lead (19) and clamp (18) to weldnut (17) with retained screw (16), lockwasher (20), and flat washer (21).



FOLLOW-THROUGH STEPS

1. Fill fuel compartment (see your -10).
2. Open fuel shutoff cock and check for leaks (see your -10).
3. Bleed air from heater fuel lines (see your -20).
4. Connect battery negative lead (see your -20).
5. Start personnel heater, and check personnel heater installation for proper operation and leaks (see your -10).
6. Turn personnel heater OFF (see your -10).
7. Install power plant rear access panel (see your -20).
8. Install rear floor plate (see your -20).
9. Raise and lock ramp (see your -10).
10. Stop engine (see your -10).

END OF TASK

INSTALL PERSONNEL HEATER KIT (M1064 ONLY)

0056 00

THIS WORK PACKAGE COVERS:

Installation (page 0056 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

References

See your -20

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Equipment Condition

Ramp lowered (see your -10)

Engine stopped/shutdown (see your -10)

Carrier blocked (see your -10)

Battery ground lead disconnected (see your -20)

Rear access panel removed (see your -20)

Floor plates removed (see your -20)

Materials/Parts

Sealing compound (WP 0105 00, Item 17)

Sealing compound primer (WP 0105 00, Item 21)

Solvent, cleaning compound (WP 0105 00, Item 10)

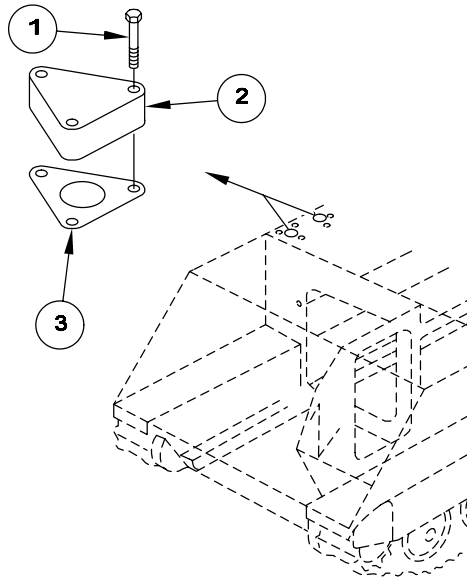
Kit P/N 12268857 (19207)

Personnel Required

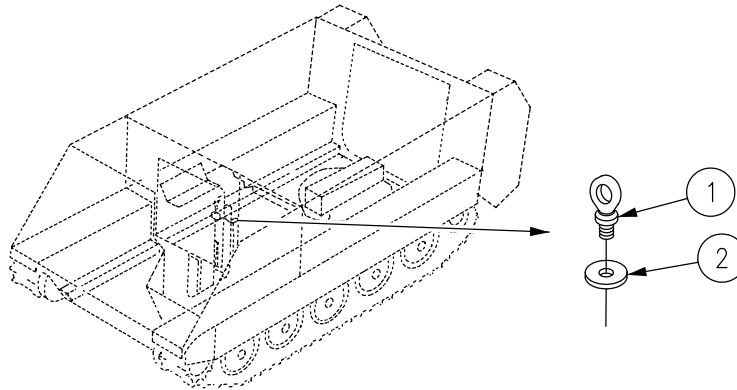
Track Vehicle Repairer 63H10

INSTALLATION

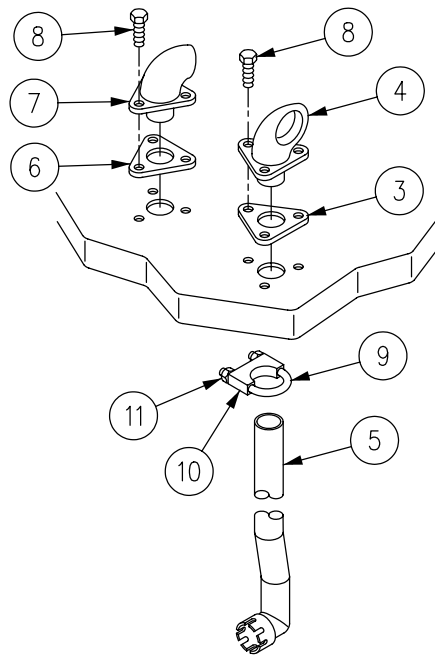
1. Remove six screws (1), two plates (2), and gaskets (3) from top of carrier. Discard screws, plates, and gaskets.



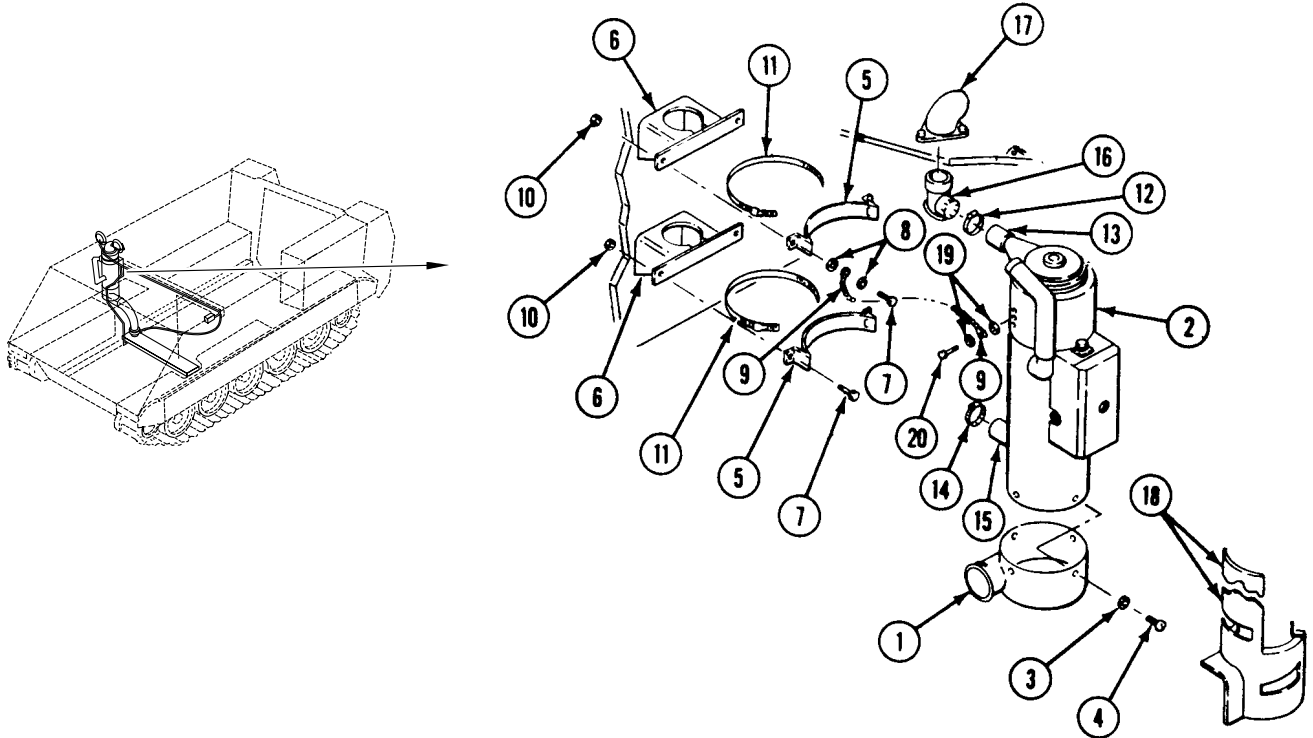
2. Discard front three screws (1) and washers (2) removed with floor plates.



3. Install gasket (3) on exhaust elbow (4) and insert elbow through top deck into exhaust pipe (5).
4. Install gasket (6) on intake elbow (7) and position elbow through top deck opening.
5. Secure exhaust and intake elbows (4) and (7) to top deck with six screws (8).
6. Secure exhaust pipe (5) to elbow (4) with U-bolt (9), clamp (10), and two nuts (11).



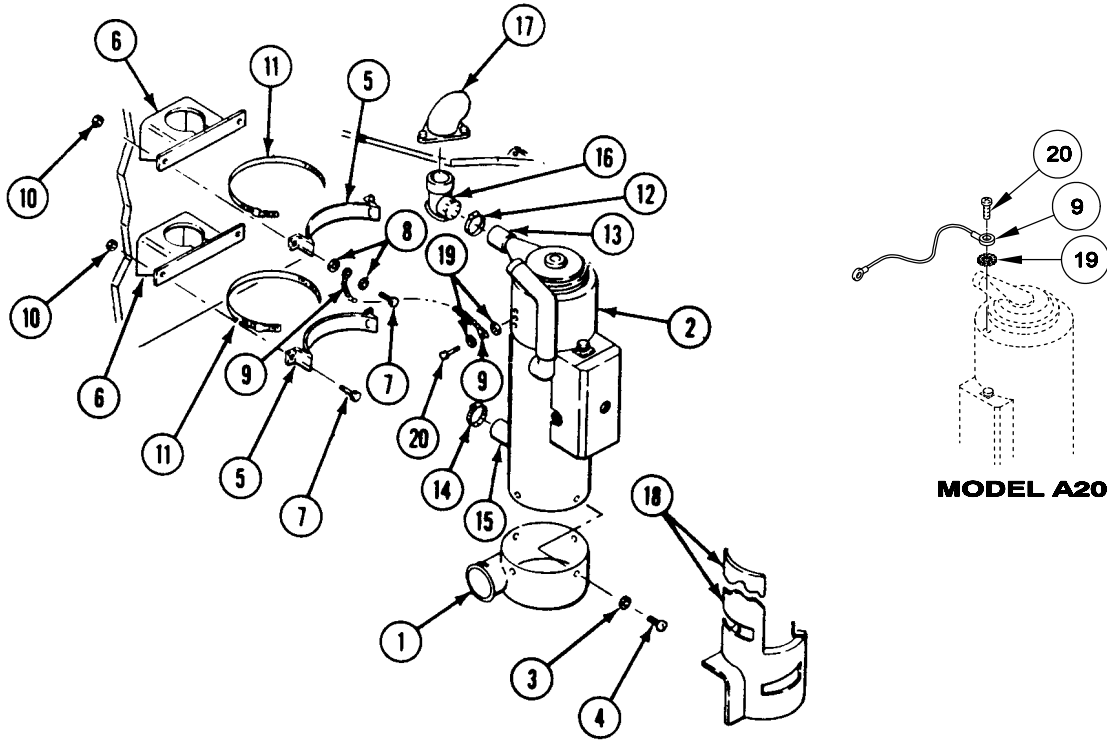
7. Secure plenum (1) to personnel heater (2) with four lockwashers (3) and screws (4).
8. Secure two saddles (5) to two brackets (6) with four screws (7), three washers (8), ground strap (9), and four nuts (10).
9. Install two clamps (11) on two saddles (5).
10. Position clamp (12) on heater intake pipe (13) and clamp (14) on heater exhaust pipe (15).
11. Install elbow (16) on heater intake pipe (13) and intake elbow (17).
12. Position heater (2) and shield (18) on two mounts (5), and secure with two clamps (11).



NOTE

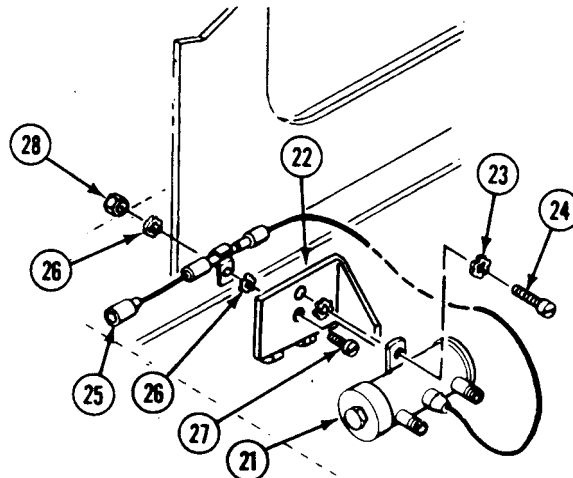
Heater Model A-20 has ground strap attached to the top of heater.

13. Secure ground strap (9) to heater with two lockwashers (19) and existing screw (20).
14. Tighten clamp (14) on heater exhaust pipe (15) and exhaust pipe in carrier.
15. Tighten clamp (12) on heater intake pipe (13).

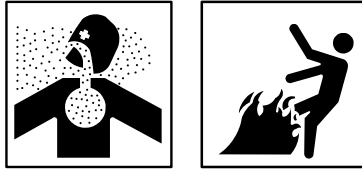


MODEL A20

16. Secure pump lead (25) to hull bracket (22) with two lockwashers (26), screw (27), and locknut (28).
17. Secure fuel pump (21) to hull bracket (22) with four lockwashers (23) and two screws (24).



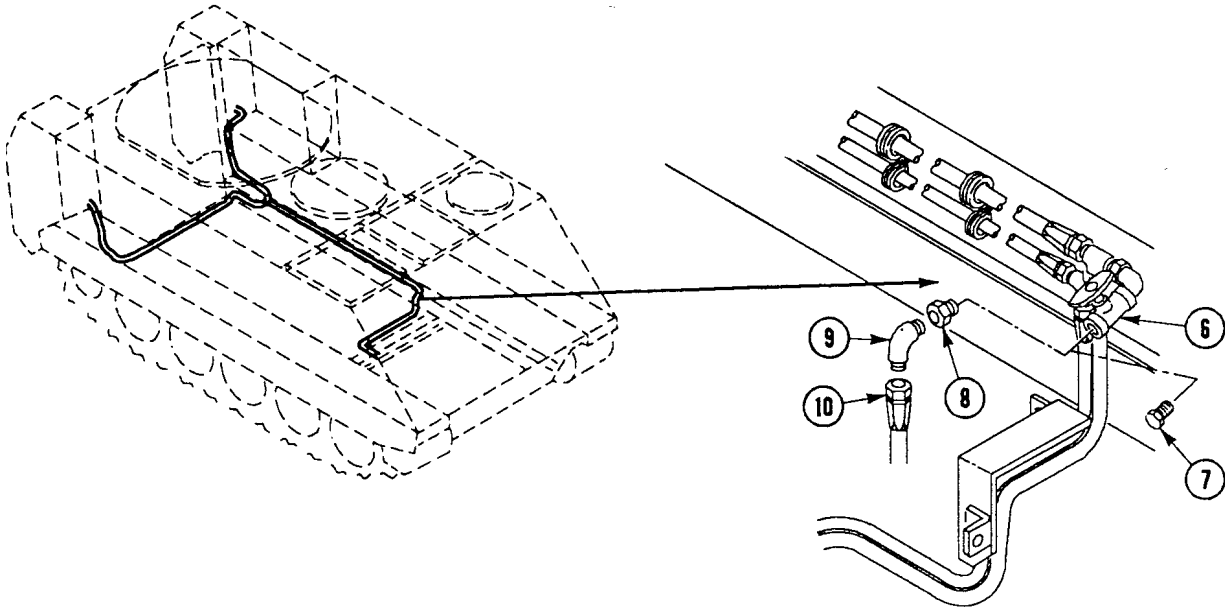
- Clean external pipe threads of fittings with solvent, cleaning compound.

WARNING

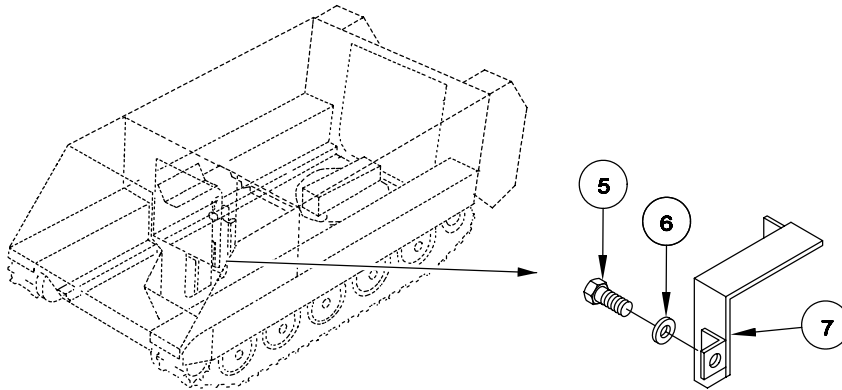
Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

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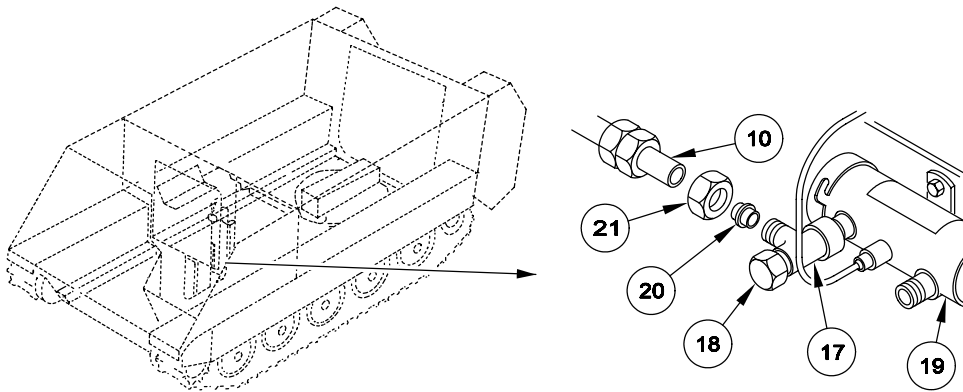
- Apply a light coat of sealing compound to clean external pipe threads of fittings.
- Close heater fuel shutoff valve (6).
- Remove plug (7) from shutoff valve (6). Discard plug.
- Install adapter (8) on shutoff valve (6).
- Install elbow (9) on adapter (8).
- Install personnel heater fuel hose (10) on elbow (9).



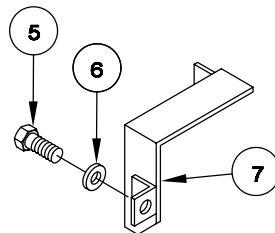
25. Remove two screws (5), washers (6), and guard (7) from hull crossmember.



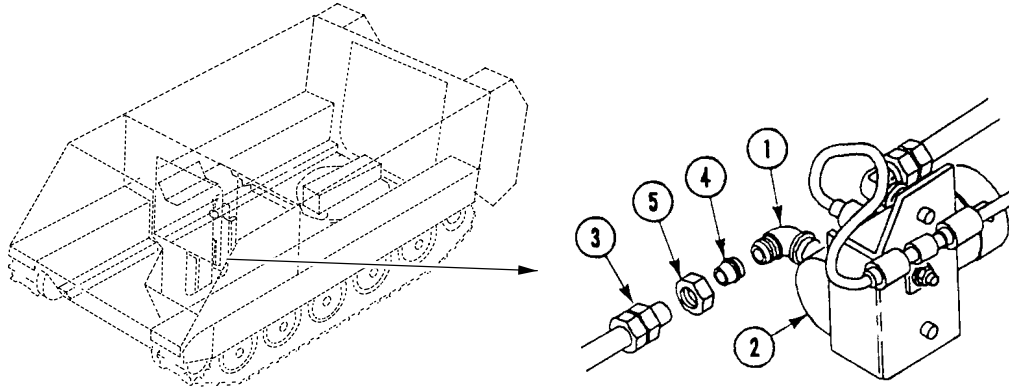
26. Install tee (17) and cap (18) on fuel pump (19).
 27. Secure heater fuel hose (10) to elbow (17) with sleeve (20) and nut (21).



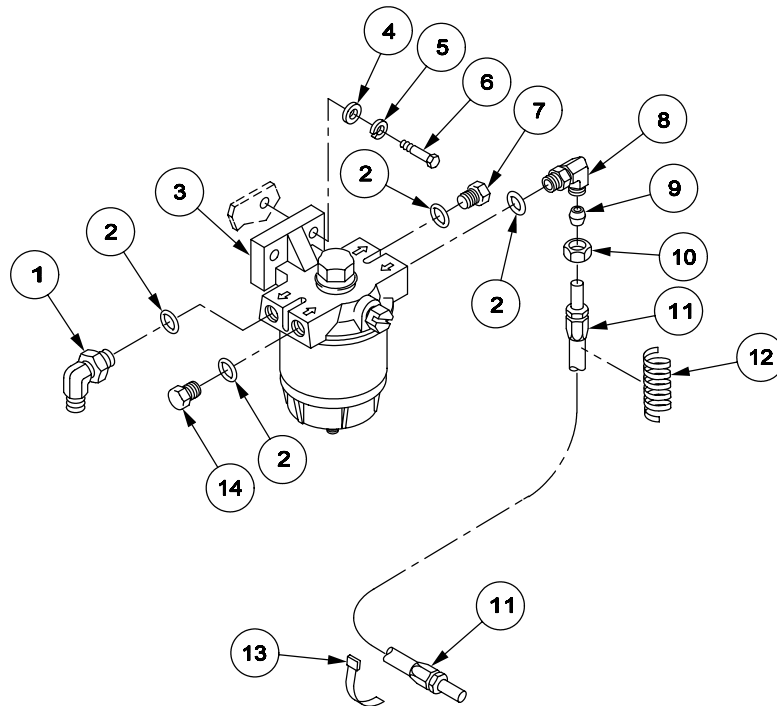
28. Secure guard (7) to hull crossmember with two screws (5) and washers (6).

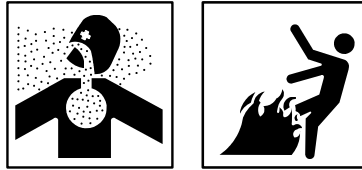


29. Install elbow body (1) on fuel pump (2).
30. Secure heater fuel hose (3) to elbow body (1) with sleeve (4) and nut (5).



31. Wrap protective tubing (12) on fuel hose (11).
32. Secure personnel heater fuel filter (3) to side of sponson with two washers (4), lockwashers (5), and screws (6).
33. Install two packings (2) and plugs (7) and (14) in fuel filter (3).
34. Install two packings (2) and elbows (8) and (1).
35. Secure fuel hose (11) to elbow (8) with sleeve (9) and nut (10).
36. Secure fuel hose (11) with strap(s) (13) to engine fuel hoses.

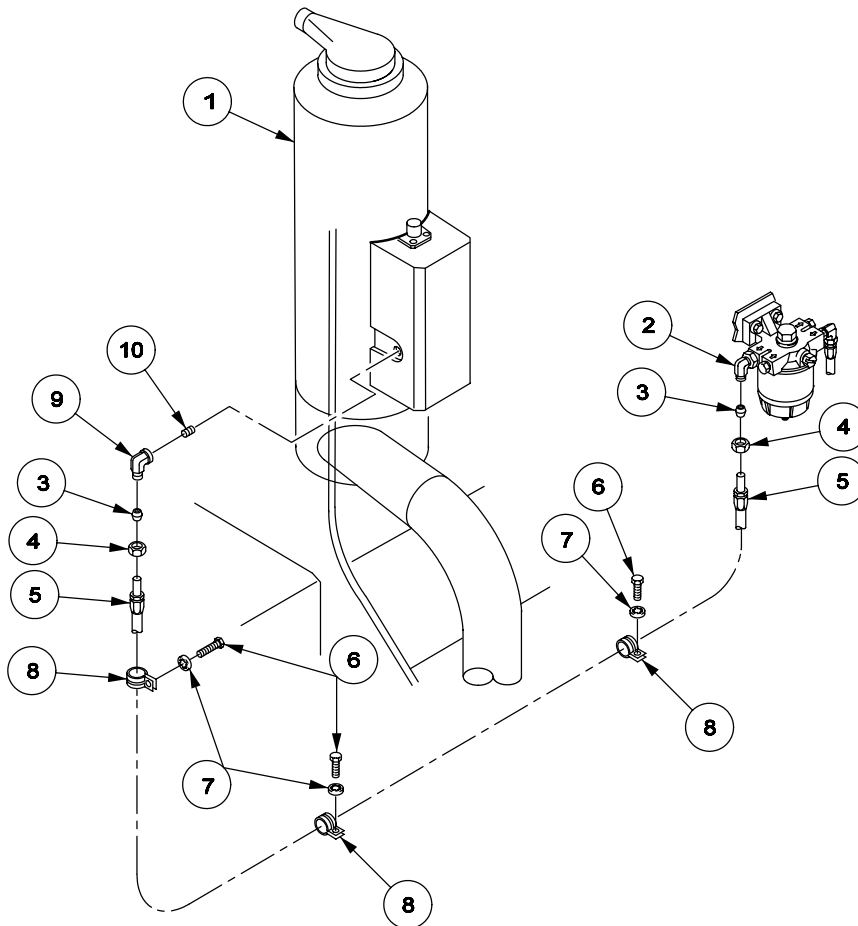


WARNING

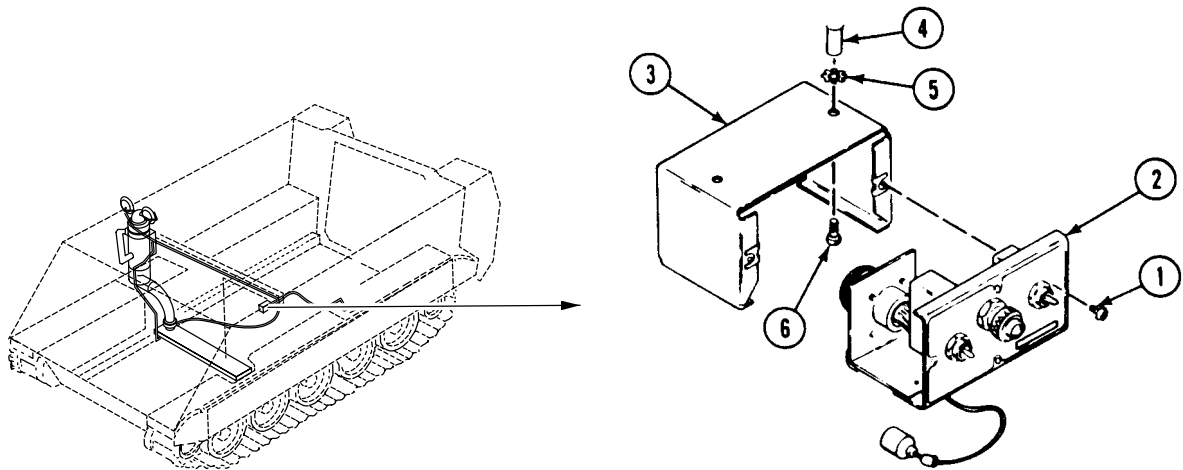
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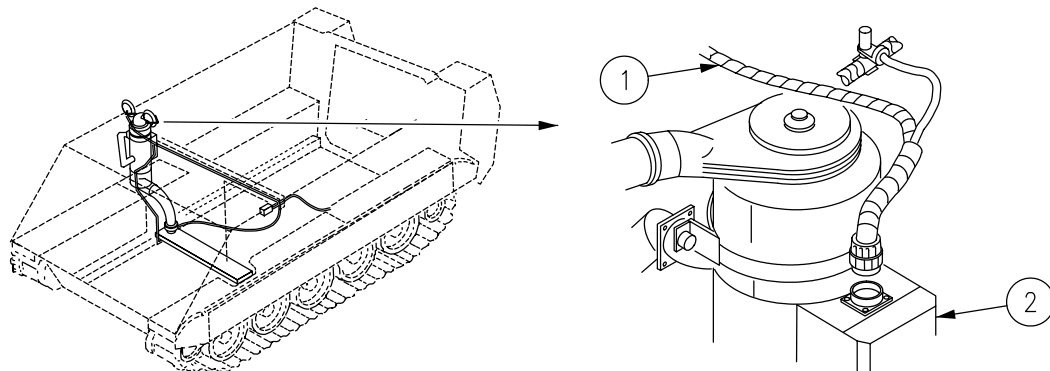
37. Apply sealing compound to external threads of nipple (10).
38. Install nipple (10) in personnel heater (1).
39. Install elbow (9) on nipple (10).
40. Install fuel hose (5) to elbows (2) and (9). Secure with sleeves (3) and nuts (4).
41. Secure fuel hose (5) with three clamps (8), lockwashers (7), and screws (6).



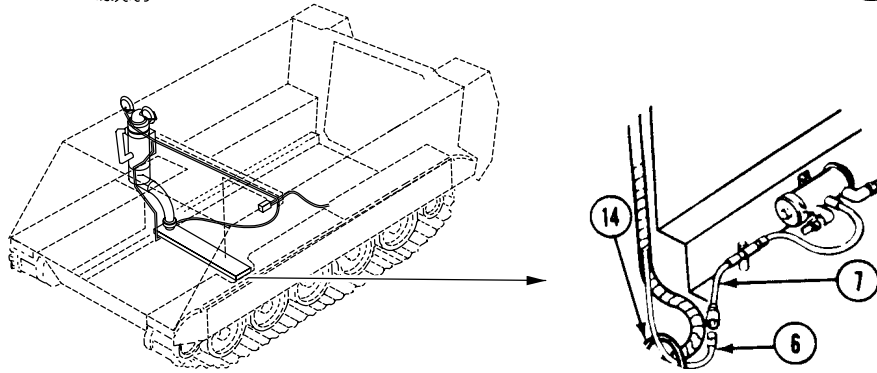
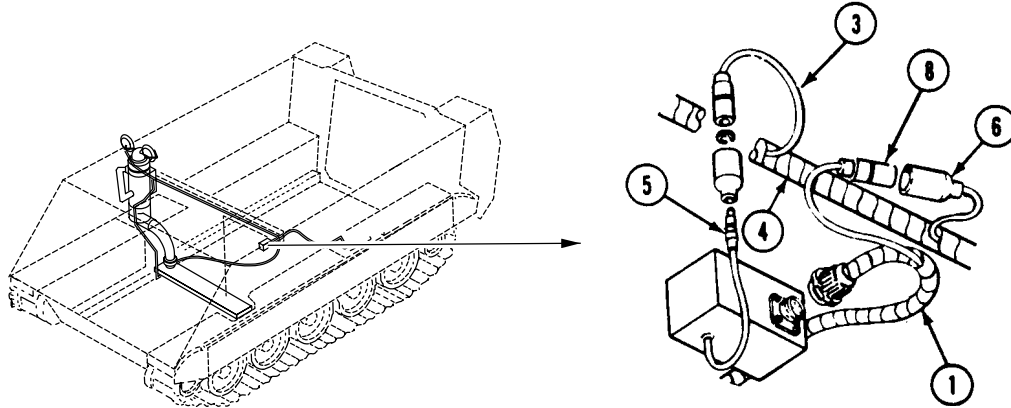
42. Remove two screws (1) and control box (2) from control box case (3).
43. Remove two screws, nuts, and washers supplied with control box case (3). Discard screws, nuts, and washers.
44. Secure control box case (3) to two weldnuts (4) with two lockwashers (5) and screws (6).
45. Secure control box (2) to control box case (3) with two screws (1).
46. Clean small area on transverse beam next to control box (2) and apply warning decal (see your -20).



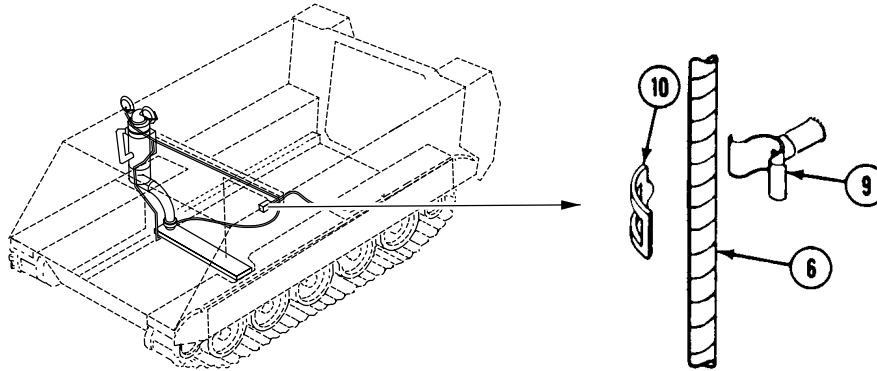
47. Thread personnel heater wiring harness (1) through transverse beam from driver's compartment into personnel compartment.
48. Connect wiring harness (1) to personnel heater (2).



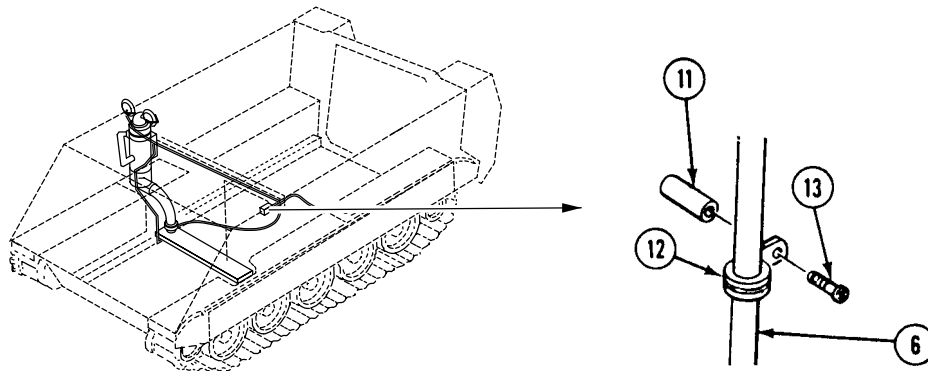
49. Connect circuit 400 lead (3) of rear main wiring harness (4) to control box lead (5).
50. Connect circuit 402 lead (6) to fuel pump lead (7) and to connector (8) of heater wiring harness (1).



51. Secure circuit 402 lead (6) to cradle (9) with cradle clip (10).

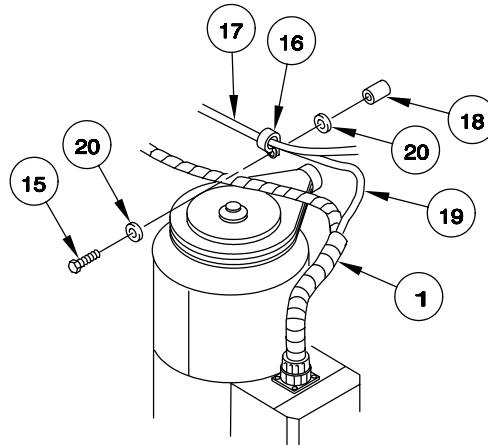


52. Secure circuit 402 lead (6) to four weldnuts (11) with four clamps (12) and screws (13).



53. Remove screw (15) and two washers (20) securing clamp (16) and dome light lead (17) from weldnut (18).

54. Secure heater wiring harness (1), ground lead (19), clamp (16), and dome light lead (17) to weldnut (18) with screw (15) and two washers (20).



FOLLOW-THROUGH STEPS

1. Open fuel shutoff cock (see your -10) and check for leaks.
2. Connect battery ground lead (see your -20).
3. Start personnel heater (see your -10) and check personnel heater installations for proper operation and leaks.
4. Turn personnel heater OFF (see your -10).
5. Install floor plates (see your -20).
6. Raise and lock ramp (see your -10).
7. Stop engine (see your -10).

END OF TASK

CHAPTER 12

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR AUXILIARY ENGINE COVER

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
REPAIR AUXILIARY POWER UNIT COVER (4.2 KW GENERATOR SET ONLY) (M577A2 ONLY).....	0057 00

REPAIR AUXILIARY POWER UNIT COVER (4.2 KW GENERATOR SET ONLY) (M577A2 ONLY)

0057 00

THIS WORK PACKAGE COVERS:

Inspection of Installed Items (page 0057 00-1).
 Repair or Replacement (page 0057 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 43M10

Tools and Special Tools

Industrial Sewing Machine (WP 0104 00, Item 38)

References

FM 10-16

Materials/Parts

Adhesive sealant (WP 0105 00, Item 2)

Vinyl coated nylon cloth (WP 0105 00, Item 7)

Equipment Condition

Cover removed from carrier (see your -10)

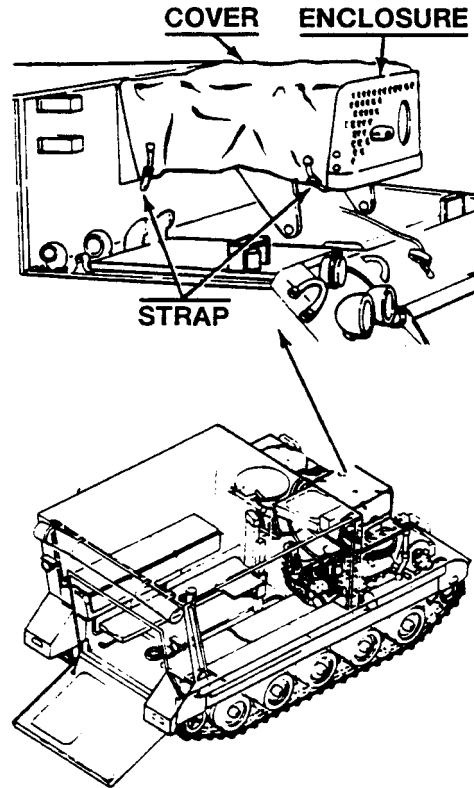
INSPECTION OF INSTALLED ITEMS

1. Check fabric. Weak or torn areas may be repaired by a cement patch or machined patch. All material used to repair the cover must be the same as the original material.
2. Check tensile strength of fabric. Grasp a small fold of fabric between thumb and forefinger of each hand, gripping it closely so tips of forefingers touch. Tug material several times. If it does not rip, it is repairable. If it tears on first tug, test several areas for extent of damage. Weak sections must be replaced.
3. Check for spots and stains. Non-wear spots and stains are all right if fabric has been brushed clean. Repair fabric where fabric strength has been weakened by mildew, sap, or dirt stains.
4. Check fabric. Repair opened seams, runoff stitching, and broken threads. Re-stitch worn stitching.
5. Check webbing straps. Repair or replace worn, frayed, or torn straps.
6. Check buckles. Replace buckles that are bent, broken, or missing.
7. Check for slide fasteners (zippers). Replace zippers that are rusted or do not work correctly.

REPAIR AUXILIARY POWER UNIT COVER (4.2 KW GENERATOR SET ONLY) (M577A2 ONLY) — Continued

0057 00

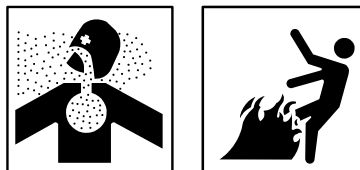
8. Check eyelets, washers, and studs. Replace parts that are bent, broken, or missing.


REPAIR OR REPLACEMENT
NOTE

The materials used to make a cement patch are adhesive, round patch of vinyl coated nylon cloth, roller, board, wire brush, and soft bristle brush.

1. Select patch that overlaps damaged area with a margin of at least 3/4 inch (19 mm) on all sides.
2. Place board under damaged area for a flat working surface.
3. Buff patch and damaged area of fabric with wire brush.

WARNING



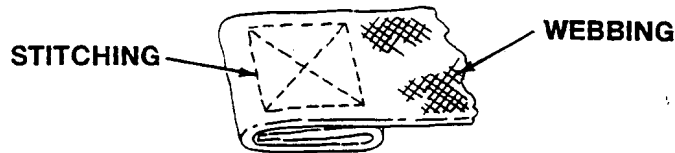
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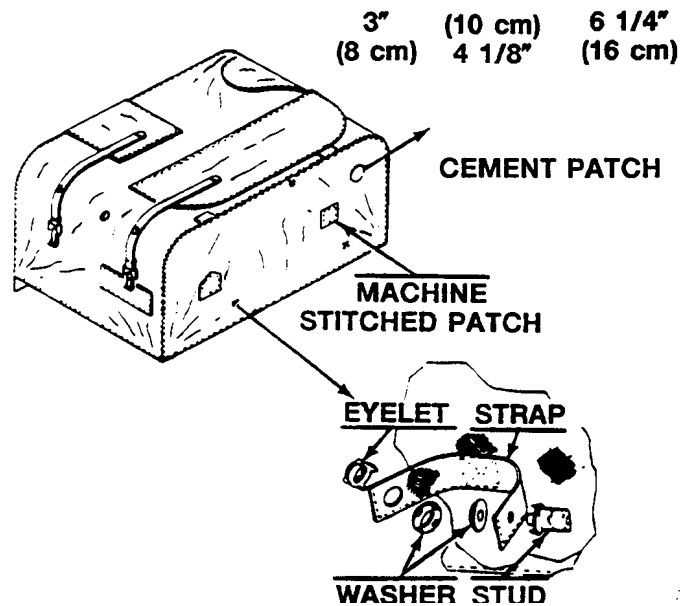
REPAIR AUXILIARY POWER UNIT COVER (4.2 KW GENERATOR SET ONLY) (M577A2 ONLY) — Continued

0057 00

4. Center patch over damaged area. Apply adhesive to patch and patch edge, making a circle on fabric with soft bristle brush.
5. Lift patch. Apply adhesive to area of fabric inside adhesive circle.
6. Allow adhesive to dry until tacky (about 10 minutes).
7. Press cement surfaces together firmly with roller while tacky.
8. Seal by wiping edge of patch with soft bristle brush.
9. Install or repair webbing using machine stitching in a square pattern with diagonal stitches from corner to corner.



10. Repair hardware as shown in the following figure. See FM 10-16 for installation of eyelets and studs with washers.



NOTE

Use lock stitching when you install patches, flaps, and straps or repair open seams. Use polyester thread and smallest needle you can to make weatherproof seams. Allow 5 to 7 stitches per inch (3 cm). Backstitch all thread breaks at least 1 inch (3 cm). Backstitch all ends at least 1 inch (3 cm), except where ends are turned under in a hem or seam or held down by other stitching. Maintain thread tension so stitching is tight and lock is fixed firmly in center of material. Trim all ends. Take care when re-stitching to make a new stitch line.

11. Repair extensive damage between seams. See Steps 12 - 22.
12. Open seam 2 inches (5 cm) beyond damaged area on both sides.
13. Square off damaged area from seam to seam.
14. Cut patch 2 inches (5 cm) wider than squared-off section. Allow for 3/4 inch (19 mm) turn under on sides.
15. Center patch over cutaway section. Turn sides under, and reform double-felled seams at top and bottom.

REPAIR AUXILIARY POWER UNIT COVER (4.2 KW GENERATOR SET ONLY) (M577A2 ONLY) — Continued

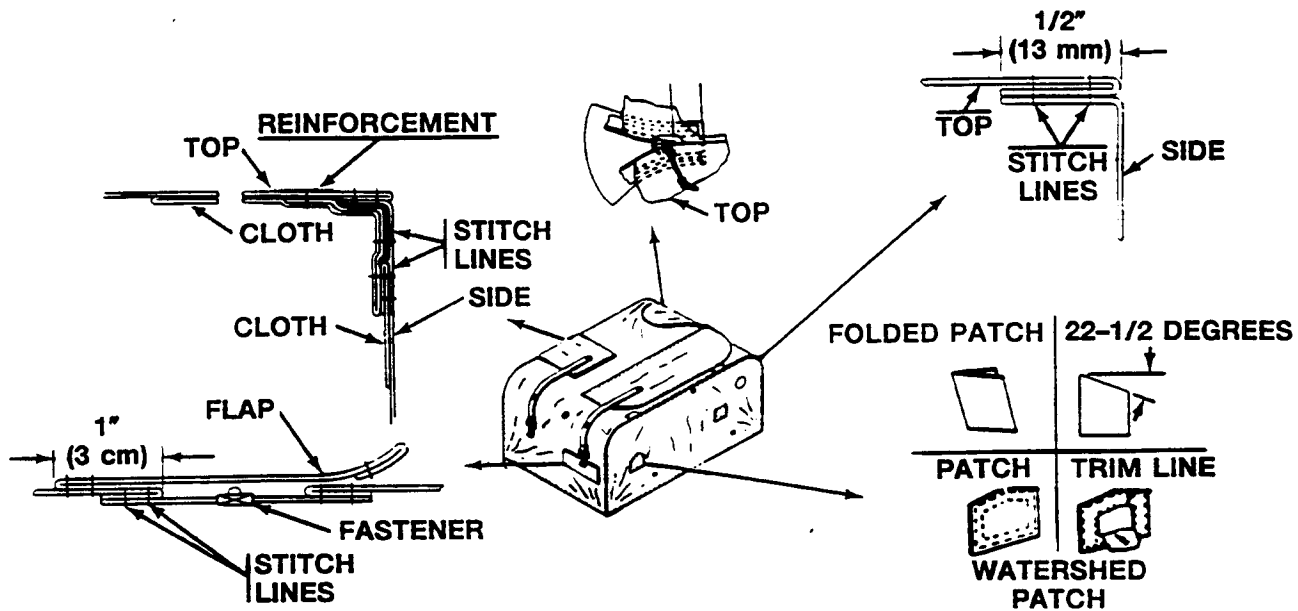
0057 00

16. Finish by stitching patch into place. Secure patch to cover with a second row of stitching. Place second row 3/8-1/2 inch (10-13 mm) from first.

NOTE

The watershed patch is a patch with the top edge angled off to give a roof effect. Because the roof type patch sheds water, the patch lasts longer than a square patch.

17. Use watershed patches, as needed.
18. Cut patch large enough to overlap 2 inches (5 cm) on all sides of area to be repaired. Allow for 3/4 inch (19 mm) turn under of edge.
19. Fold patch in half lengthwise. Cut from open edges to folded edge at 22 1/2 degree angle as shown in illustration.
20. Center patch over damaged area. Turn under patch edges and stitch in place with a row of stitching no more than 1/8 inch (3 mm) from edge.
21. Secure patch to cover with a second row of stitching. Place second row 3/8-1/2 inch (10-13 mm) from first.
22. Turn material over. Cut away damaged area, notch corners, and turn edges in. Stitch turned-in edges to patch with a row of stitching no more than 1/8 inch (3 mm) from edge.



FOLLOW-THROUGH STEPS

1. Stow or install cover on carrier (see your -10).

END OF TASK

CHAPTER 13

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR ELECTRONIC EQUIPMENT HEATER KIT

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
INSTALL ELECTRONIC EQUIPMENT HEATER KIT (M577A2 ONLY).....	0058 00

INSTALL ELECTRONIC EQUIPMENT HEATER KIT (M577A2 ONLY)

0058 00

THIS WORK PACKAGE COVERS:

Installation (page 0058 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

Ramp lowered (see your -10)

Battery ground lead disconnected (see your -20)

Floor plates removed (see your -20)

Carrier fuel shutoff valve closed (see your -10)

Materials/Parts

Adhesive silicone sealant (WP 0105 00, Item 3)

Sealing compound (WP 0105 00, Item 17)

Sealing compound primer (WP 0105 00, Item 21)

Silicone compound (WP 0105 00, Item 22)

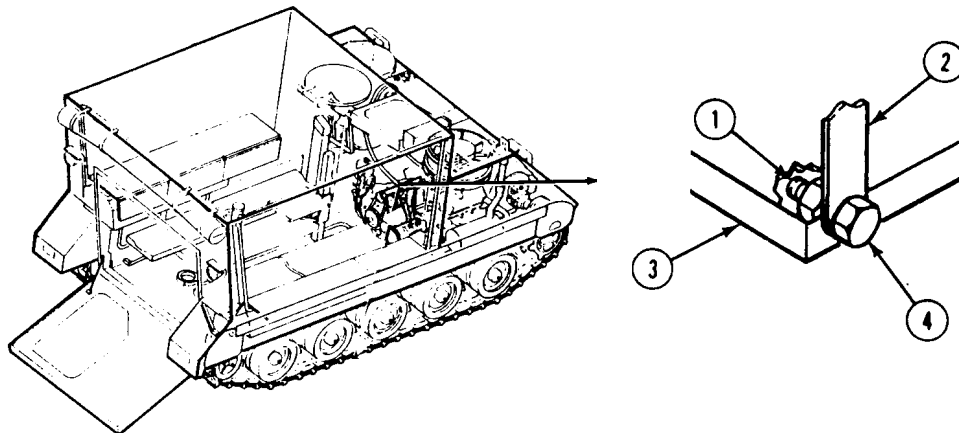
Solvent, cleaning compound (WP 0105 00, Item 10)

INSTALLATION

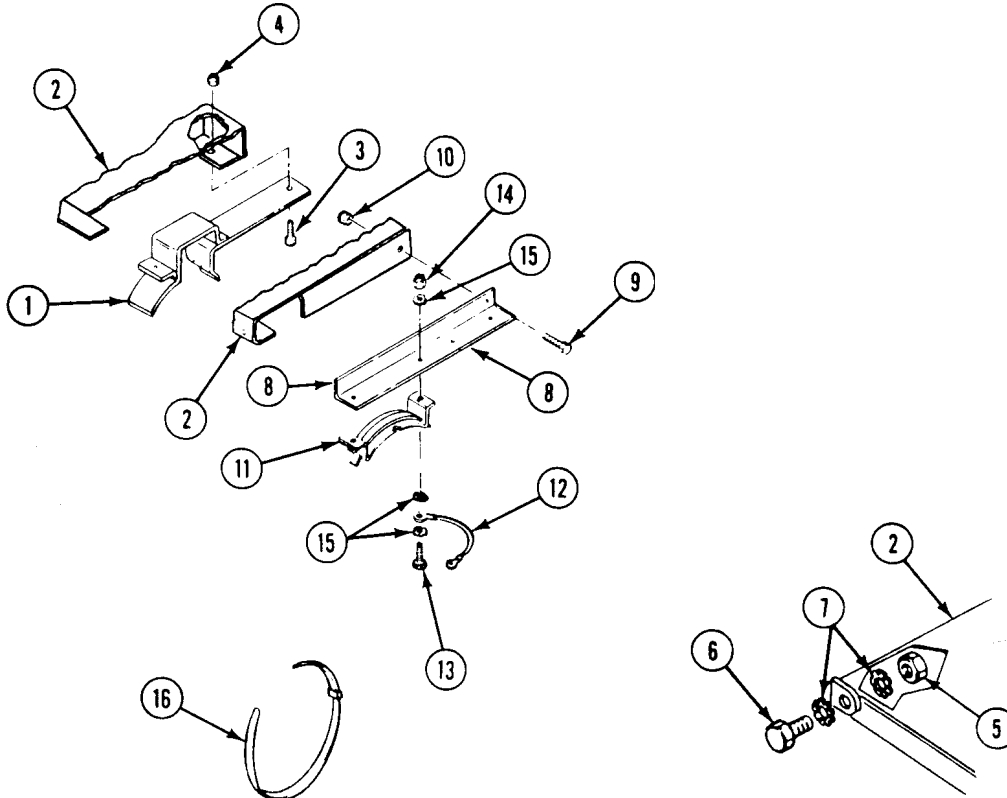
NOTE

This kit can not be installed if the 5.0 KW APU is installed.

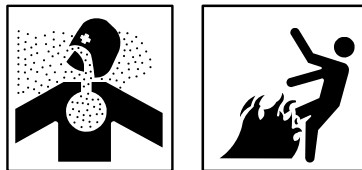
1. Nut (1) is located on longest support link (2). If nut is on inside of radio mount platform (3), remove nut and screw (4). Install screw from inside of platform and nut on outside of link.



2. Place bracket (1) under platform (2). Secure with two screws (3) and nuts (4).
3. Remove nut (5), screw (6), and two washers (7) from platform (2).
4. Place bracket (8) on the end of platform (2). Secure with screw (6), nut (5), and two washers (7) that were removed in Step 3 above. Secure other end of bracket with screw (9) and nut (10).
5. Place saddle (11) and ground lead (12) under bracket (8). Secure with screw (13), nut (14), and three washers (15). Secure other end of saddle (11) with screw (13) and nut (14).
6. Install one clamp (16) in saddle (11) and one clamp (16) in bracket (1).



WARNING

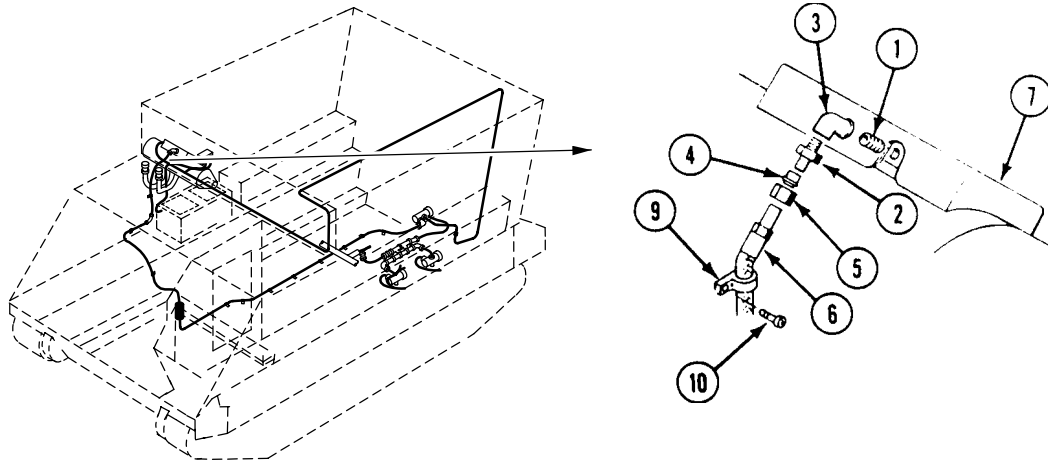


Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

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.

7. Apply a thin, even coat of primer and then sealing compound to external tapered pipe threads of heater fuel inlet nipple (1) and adapter (2). Do not apply primer or sealing compound beyond small end of threads.

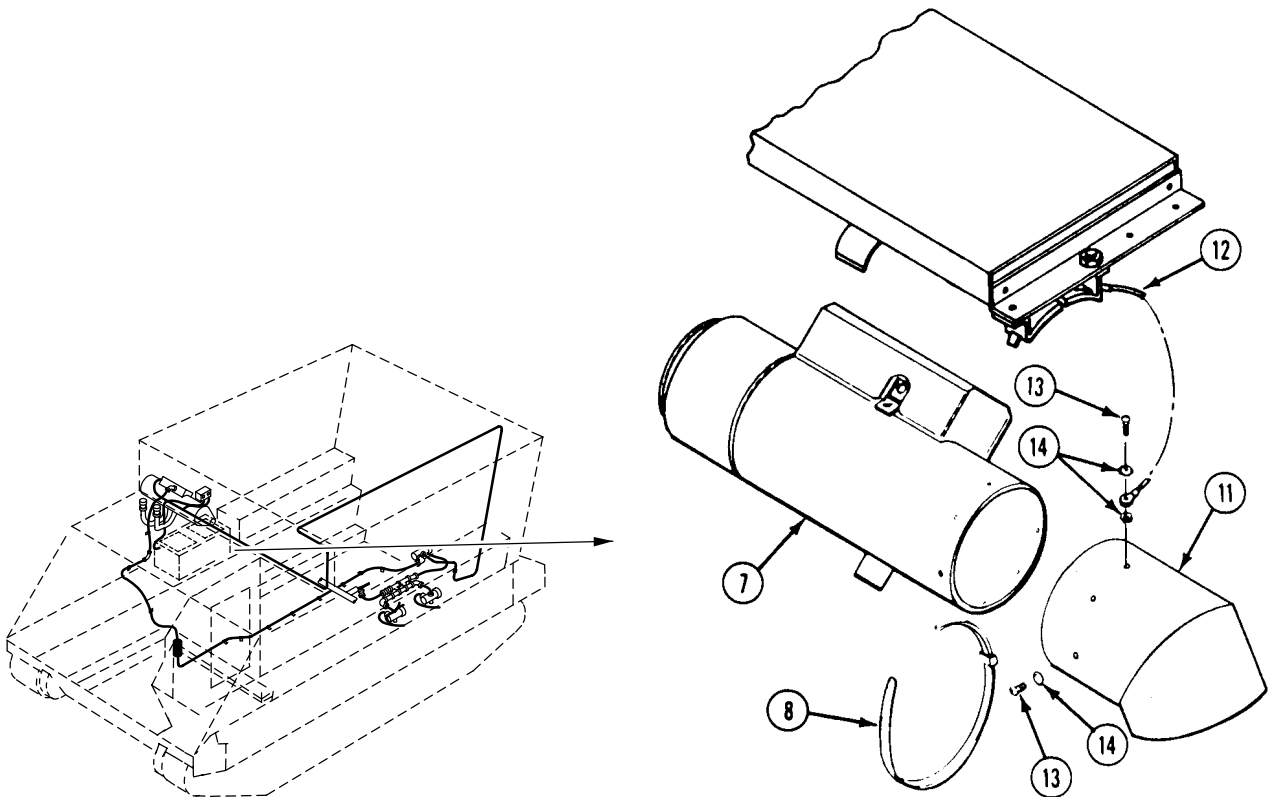
8. Install inlet nipple (1), elbow (3), and adapter (2) in heater assembly.
9. Install sleeve (4) and nut (5) on heater fuel inlet hose (6).
10. Connect fuel inlet hose (6) to adapter (2) on heater assembly (7).



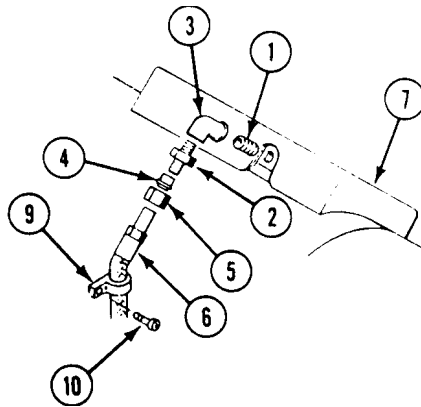
NOTE

Before you secure heater assembly clamps, make sure there is at least 1 inch (3 cm) clearance between hull side wall and rear of heater assembly.

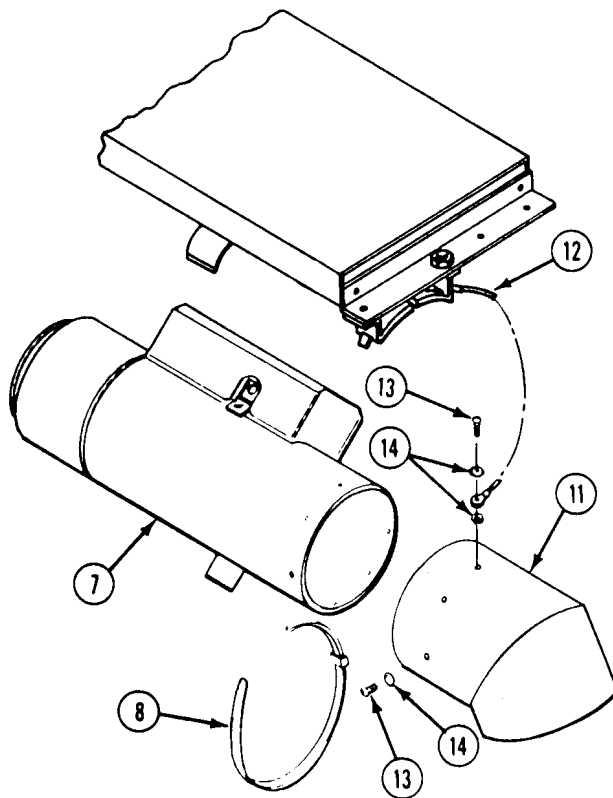
11. Place heater assembly (7) in clamps (8). Tighten clamps (8).



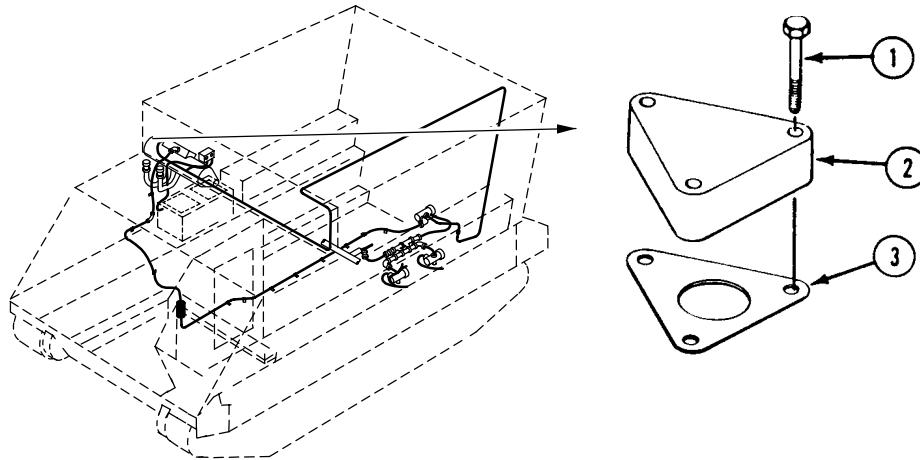
12. Install two clamps (9) on fuel inlet hose (6). Secure to hull with two screws (10).



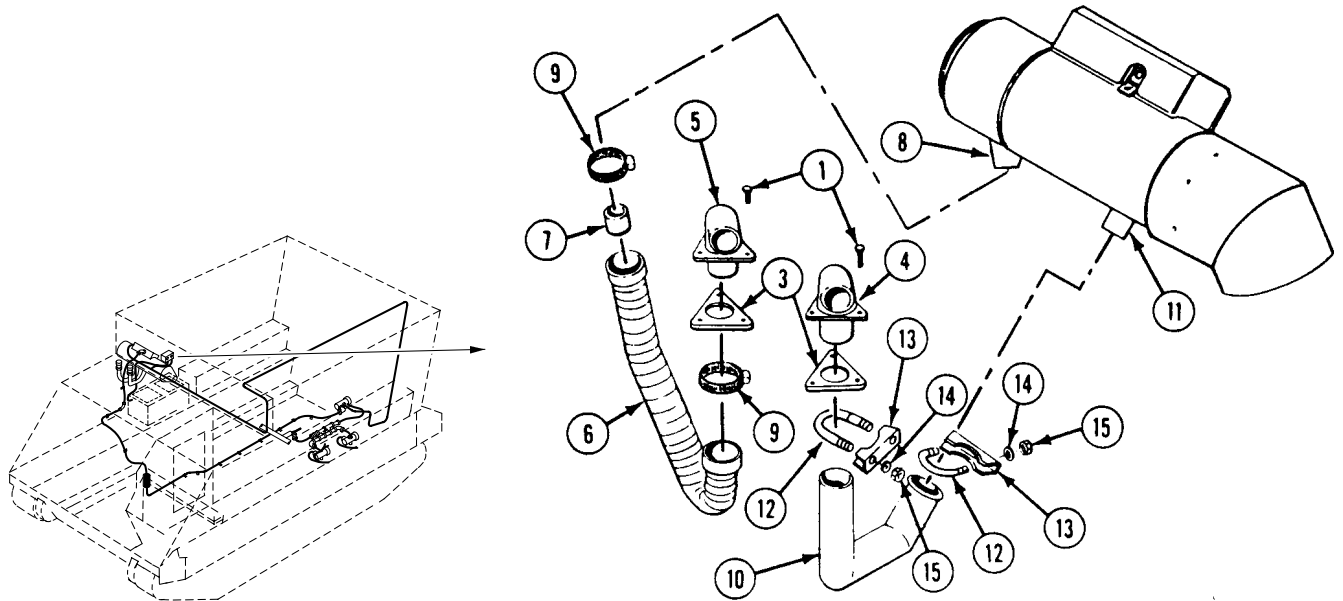
13. Place heater elbow (11) and ground lead (12) on heater assembly (7). Secure with screw (13) and two washers (14). Install three other screws (13) and washers (14).



14. Remove and discard six screws (1), two cover plates (2), and plate gaskets (3) from top of carrier.

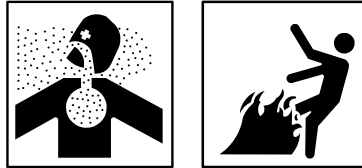


15. Place two new gaskets (3), exhaust elbow (4), and intake elbow (5) on top of carrier. Secure with six new screws (1).



16. Clean inside surface of intake hose (6) at one end only. Use solvent, cleaning compound.

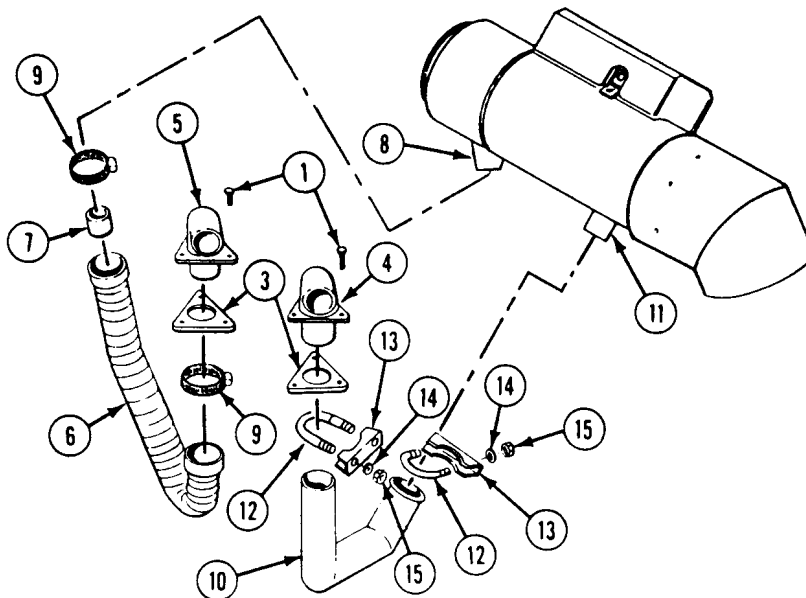
WARNING



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.

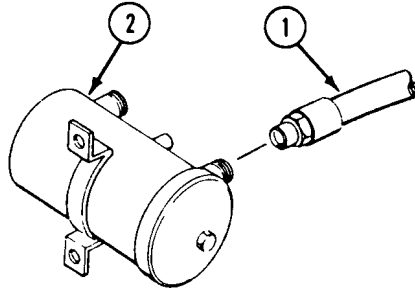
17. Apply silicone adhesive sealant to cleaned inside surface of intake hose (6).
18. Insert a 1 inch (3 cm) silicone rubber hose (7) into intake hose (6) until end of hose (7) is flush with end of intake hose (6).
19. Place a 30 inch (76 cm) intake hose (6) with large end on intake elbow (5) and reduced end on heater intake duct (8). Secure both ends with two clamps (9).
20. Place exhaust duct (10) on exhaust elbow (4) and heater assembly exhaust outlet (11).
21. Install duct (10) in elbow (4) and exhaust outlet (11). Secure with two U-bolts (12), saddles (13), four washers (14), and four nuts (15).

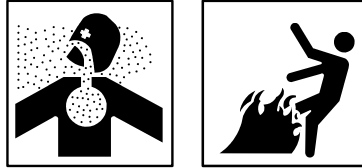


NOTE

If fuel supply adapter kit is not installed, follow Steps 22 - 36. If fuel supply adapter kit is installed, go to Step 37.

22. Disconnect personnel heater-to-fuel shutoff cock flexible hose (1) from personnel heater fuel pump (2).

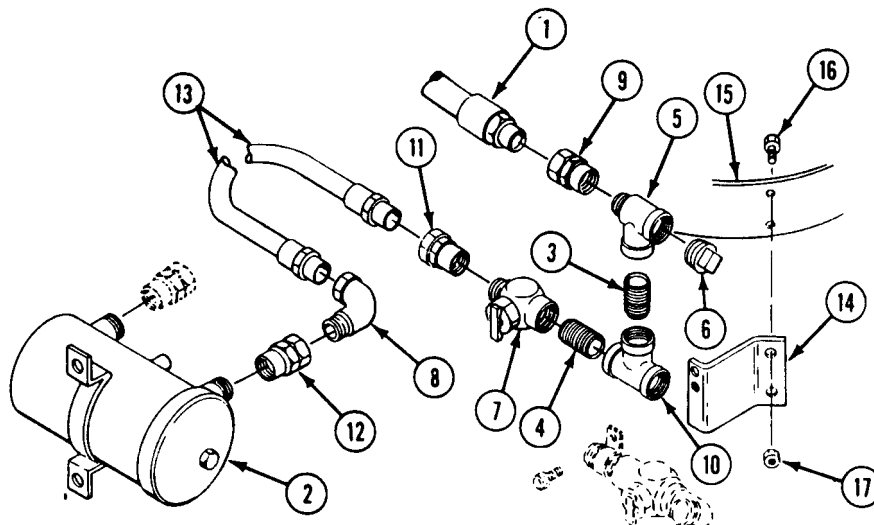


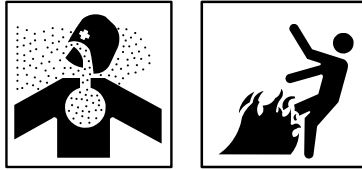
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23. Apply a thin, even coat of primer and then sealing compound to external pipe threads of nipples (3) and (4), tee (5), plug (6), shutoff cock (7), and elbow (8). Do not apply primer or sealing compound beyond small end of threads.
24. Remove tube adapter (9) from fuel pump (2). Install adapter on fuel tube tee (5).
25. Connect flexible hose (1) to adapter (9).
26. Install plug (6) and nipple (3) in tee (5).
27. Install nipple (4) in tee (10) and cock (7).
28. Install tee (10) on nipple (3).
29. Install adapter (11) on cock (7).
30. Install coupler (12) in fuel pump (2).
31. Install elbow (8) in coupler (12).
32. Connect hose (13) between elbow (8) and adapter (11).
33. Install bracket (14) on hull bracket (15). Secure with two screws (16) and nuts (17).

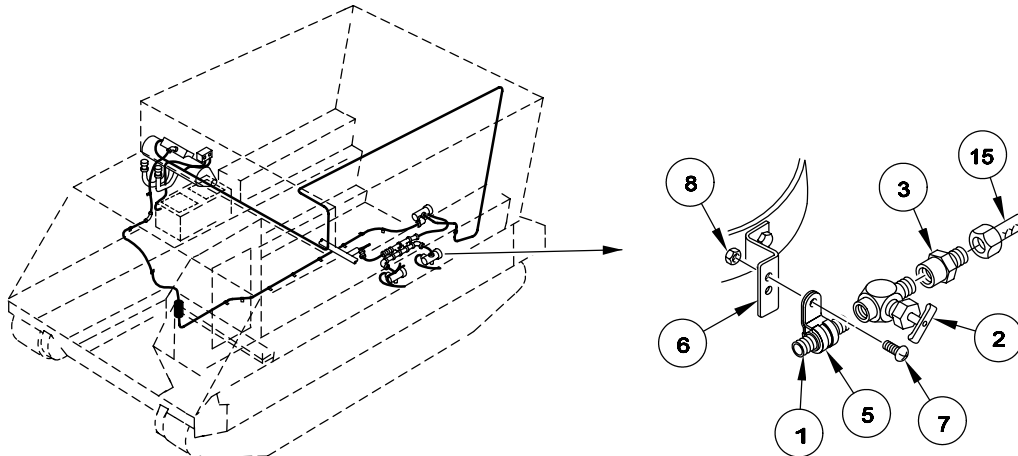


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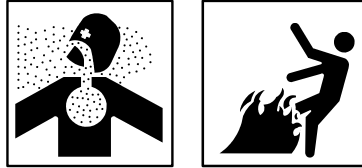
Always use in well ventilated areas, away from heat, sparks, and flames. Do not breathe fumes. Do not allow into contact with skin and eyes. Use goggles or face shield and protective gloves.

34. Apply a thin, even coat of primer and then sealing compound to external tapered threads of nipple (1) and shutoff cock (2). Do not apply primer or sealing compound beyond small end of threads.
35. Install nipple (1) and fuel pump inlet hose adapter (3) on fuel shutoff cock (2).
36. Install clamp (5) on nipple (1). Secure clamp (5) to bracket (6) with screw (7) and nut (8).



37. Place electronic equipment heater fuel pump (9) on center floor support beam near rear of carrier. Secure with four washers (10), two screws (11), and two nuts (12).

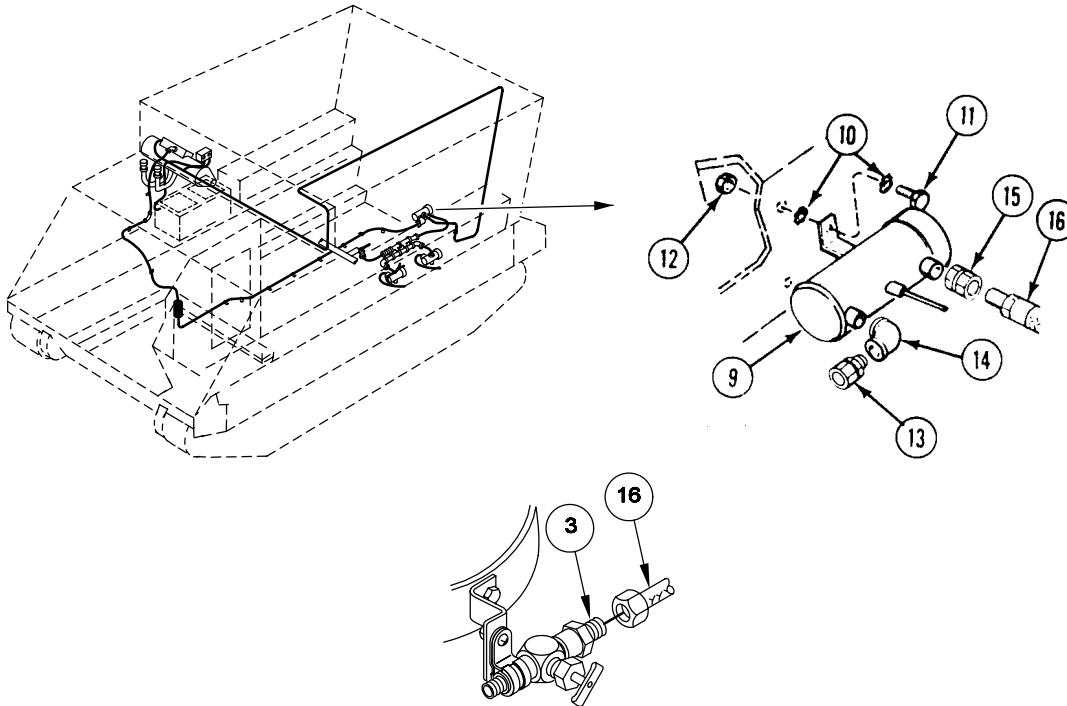
WARNING



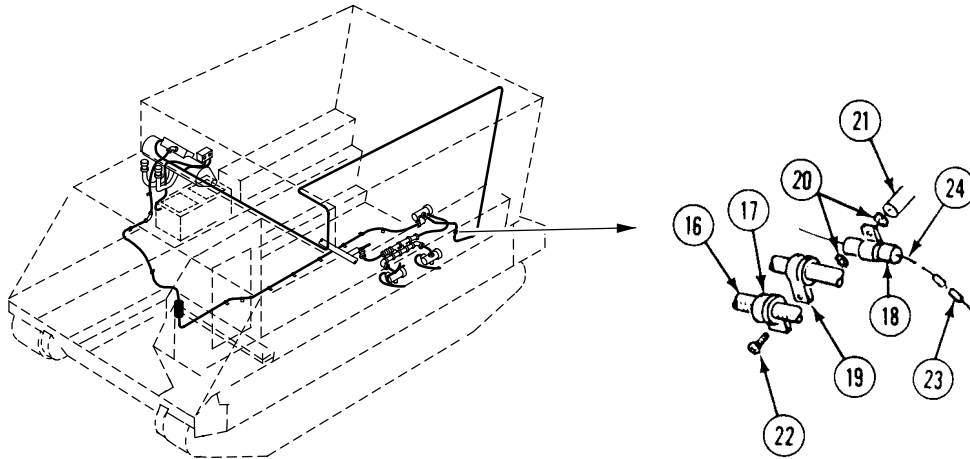
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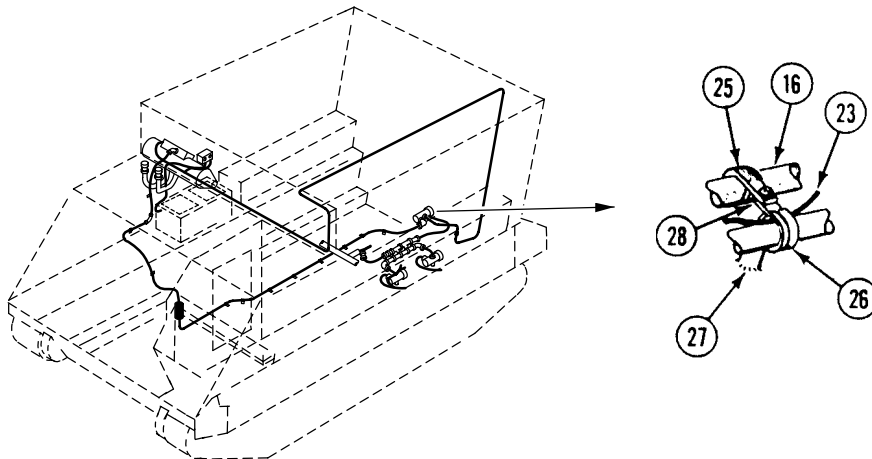
38. Apply a thin, even coat of primer and then sealing compound to external pipe threads of adapter (13). Do not apply primer or sealing compound beyond small end of threads.
39. Install outlet elbow (14) and outlet adapter (13) on fuel pump (9).
40. Install fuel pump inlet adapter (15) on fuel pump (9).
41. Connect inlet hose (16) to inlet hose adapter (3) and inlet adapter (15).

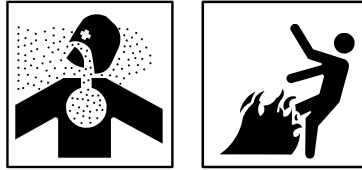


42. Install clamp (17) on inlet hose (16).
43. Place fuel pump capacitor (18), fuel hose clamp (17), wiring harness clamp (19), and two washers (20) on hull weldnut (21). Secure with new screw (22).
44. Lubricate rubber to rubber mating surfaces with silicone compound.
45. Connect circuit 402A lead (23) to capacitor lead (24).



46. Install clamp (25) on inlet hose (16).
47. Place fuel hose clamp (25) and wiring harness clamp (26) on hull weldnut (27). Secure with screw (28).

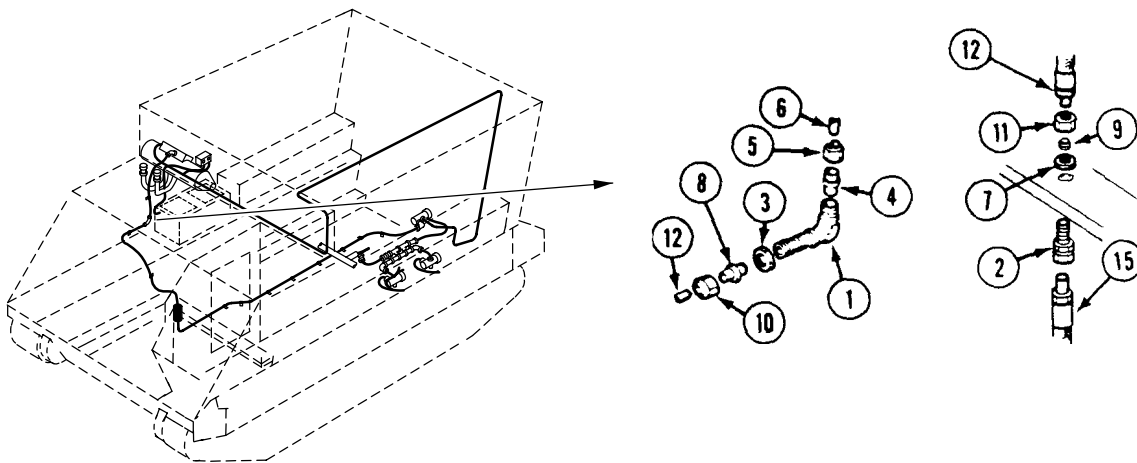


WARNING

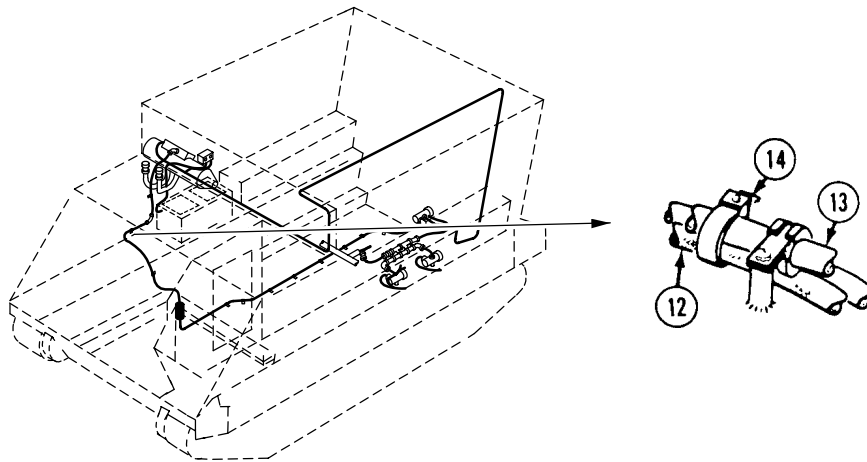
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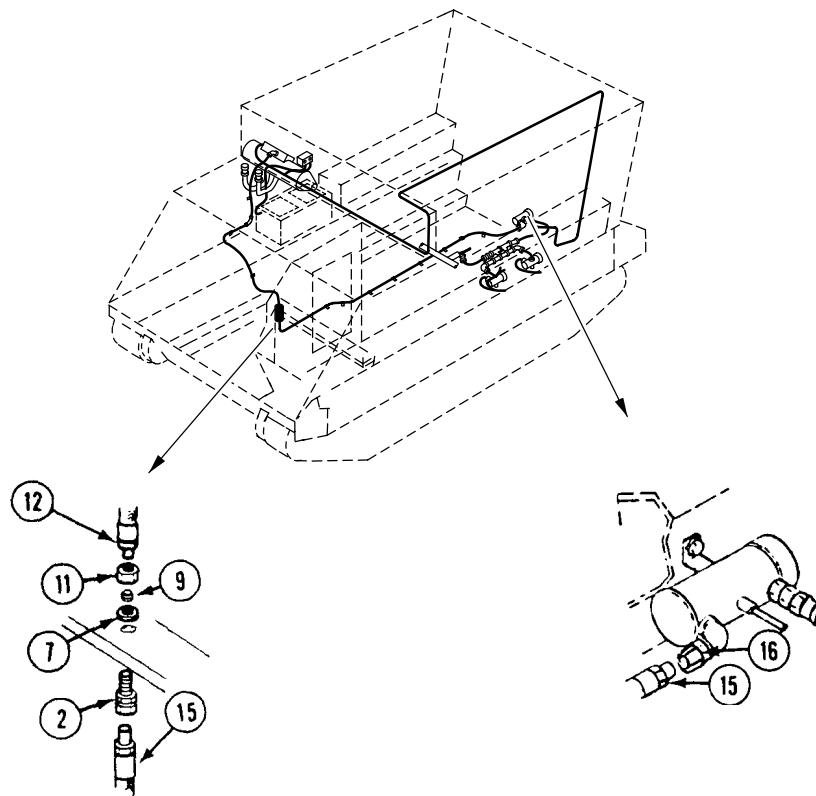
48. Apply a thin, even coat of primer and then sealing compound to external pipe threads of engine bulkhead elbow (1) and transverse beam nipple (2). Do not apply primer or sealing compound beyond small end of threads.
49. Secure elbow (1) to power plant bulkhead with nut (3).
50. Install sleeve (4) and nut (5) on heater fuel inlet hose (6).
51. Connect fuel inlet hose (6) to elbow (1).
52. Disassemble bulkhead side of beam nipple (2). Install nipple in transverse engine compartment beam with nut (7).
53. Install sleeves (8) and (9) and nuts (10) and (11) on fuel hose (12).
54. Connect fuel hose (12) to elbow (1) and beam nipple (2).



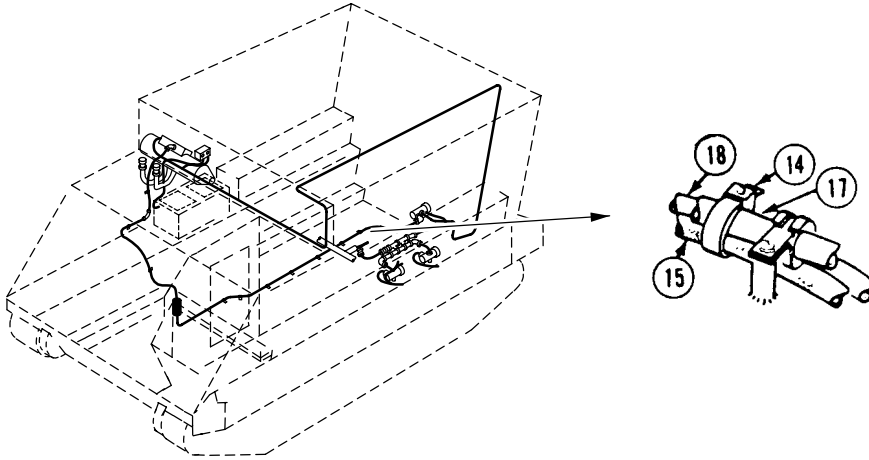
55. Install fuel hose (12) on personnel compartment heater fuel line (13). Secure with two strap assemblies (14).



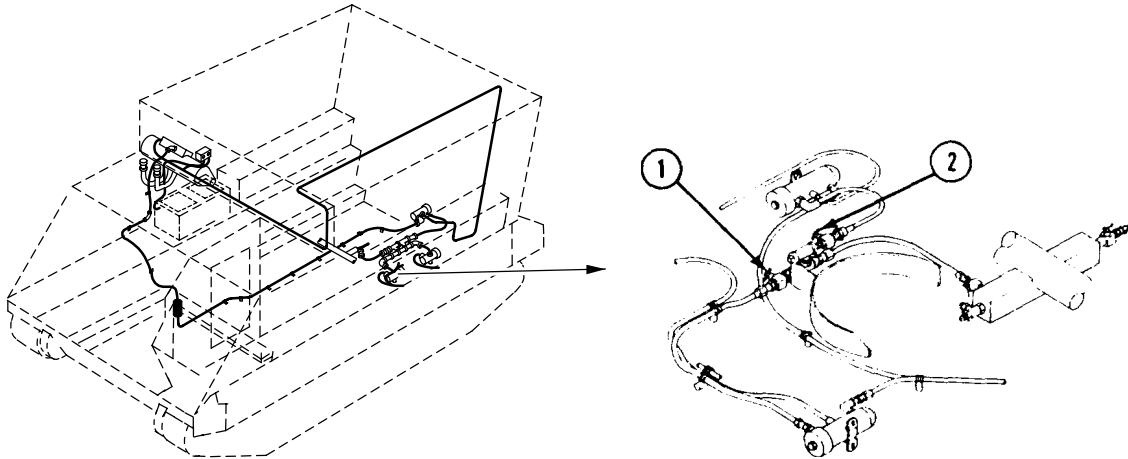
56. Connect fuel line (15) to beam nipple (2) and fuel pump adapter (16).



57. Install fuel line (15) on personnel compartment heater fuel line (17) and engine coolant heater fuel line (18), if installed. Secure with nine strap assemblies (14).

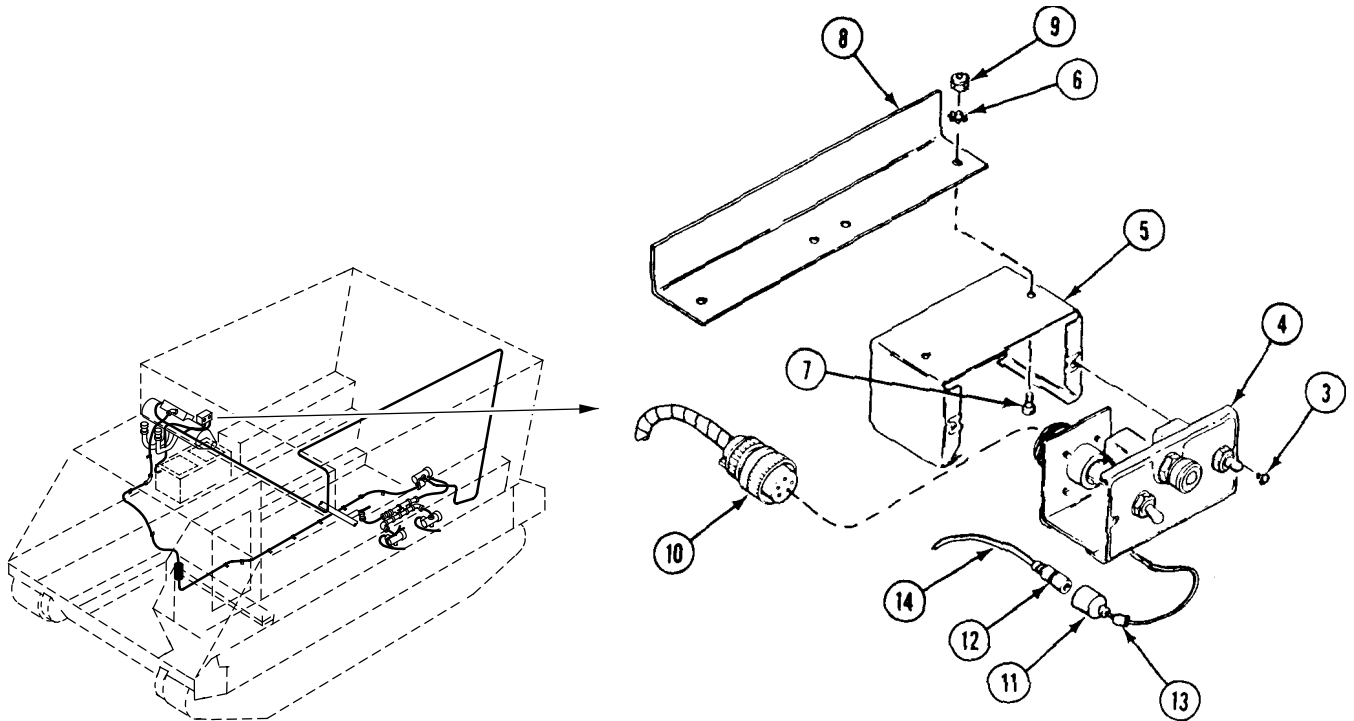


58. Open fuel shutoff valves (1) and (2). Check for fuel leaks.

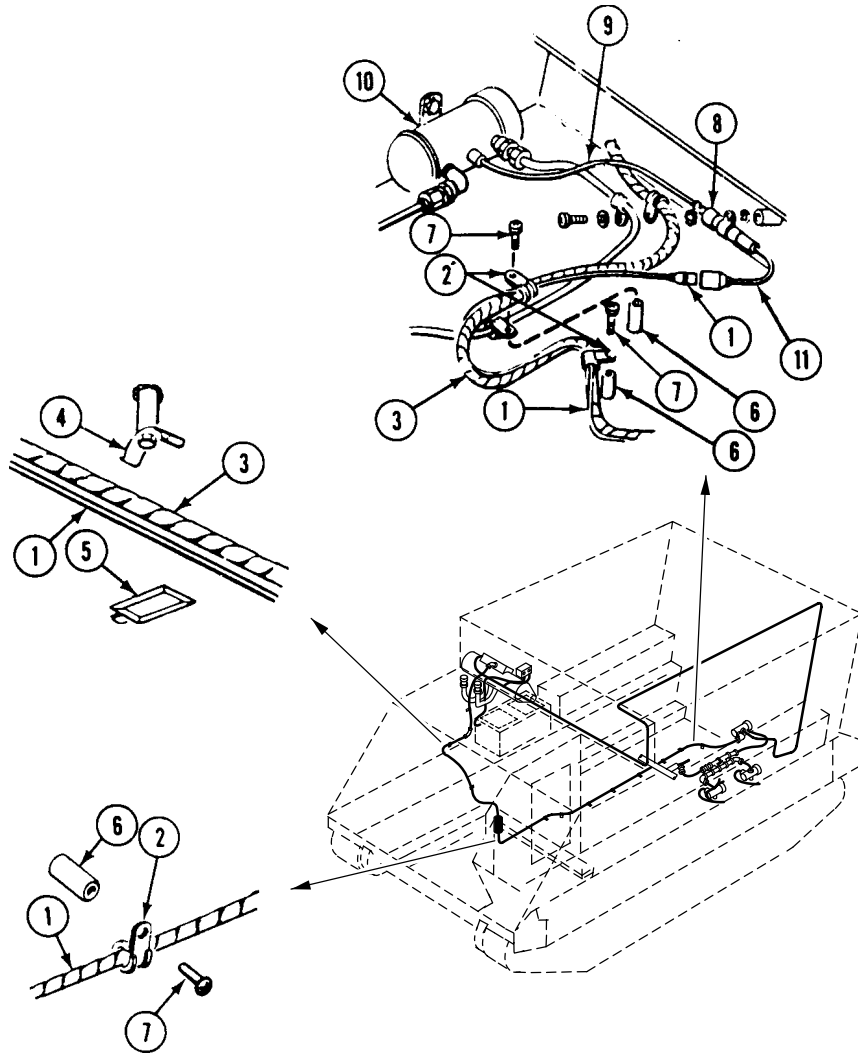


INSTALL ELECTRONIC EQUIPMENT HEATER KIT (M577A2 ONLY) — Continued

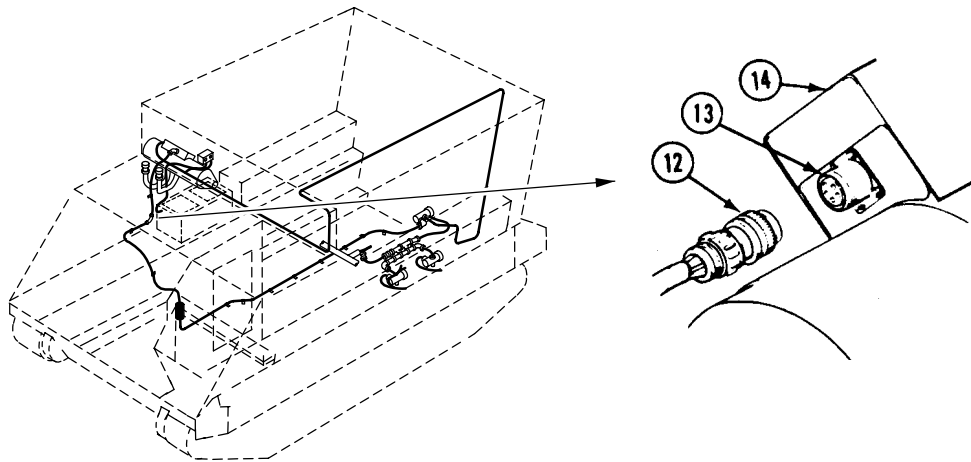
59. Remove two screws (3). Remove panel (4) from heater control box case (5).
60. Remove and discard two nuts furnished with control box case (5). Retain two lockwashers (6) and screws (7).
61. Place control box case (5) on bracket (8). Secure with retained screws (7), retained washers (6), and new nuts (9).
62. Place panel (4) in case (5). Secure with two screws (3).
63. Connect wiring harness (10) to connector on control box panel (4).
64. Install shell (11) and washer (12) on pin contact of heater control box lead (13).
65. Connect circuit 400A lead (14) to control box lead (13).



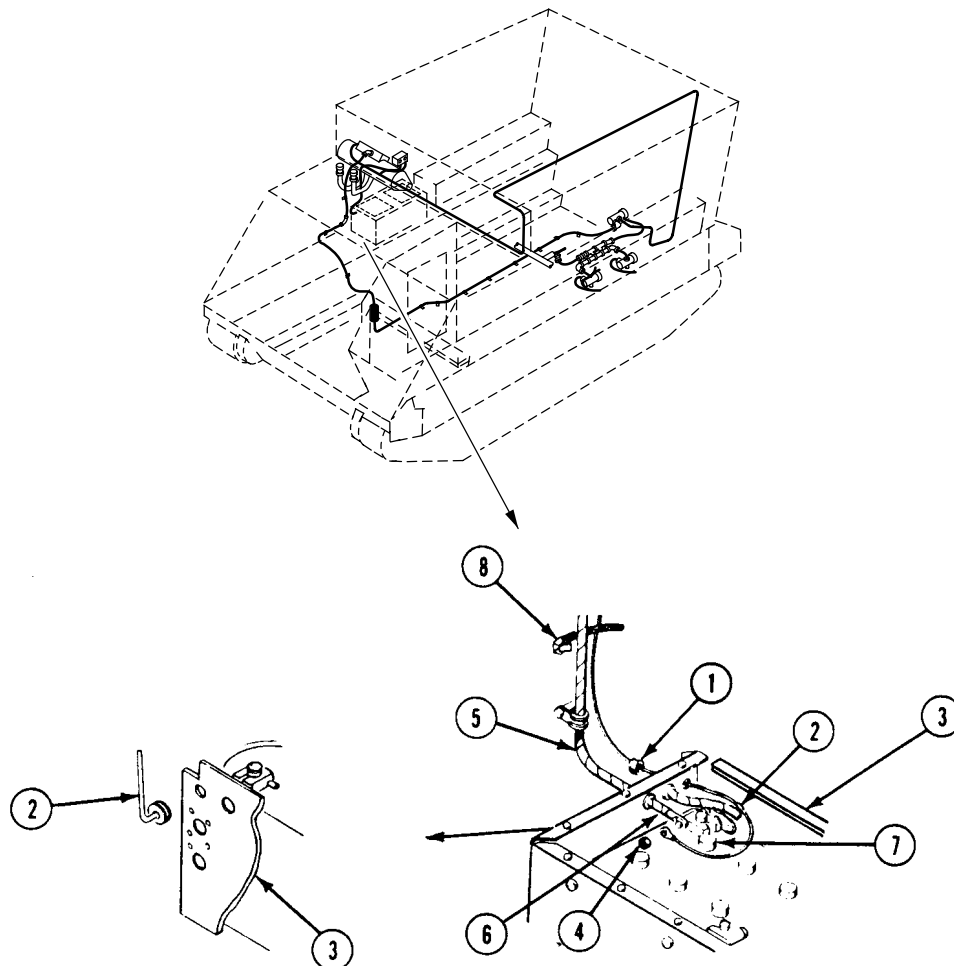
66. Apply a light coat of silicone compound to mating surfaces of rear main wiring harness circuit 402A lead (1).
67. Place circuit 402A lead (1) on rear main wiring harness clamps (2).
68. Install circuit 402A lead (1) along rear main wiring harness (3) up to forward hull grommet. Secure with nine cradles (4) and cradle clips (5).
69. Install six clamps (2) on circuit 402A lead (1). Secure clamps to power plant compartment bulkhead weldnuts (6) with six screws (7).
70. Connect capacitor (8) lead (11) to circuit 402A lead (1).



71. Connect electrical equipment heater wiring harness (12) to connector (13) on heater assembly (14).



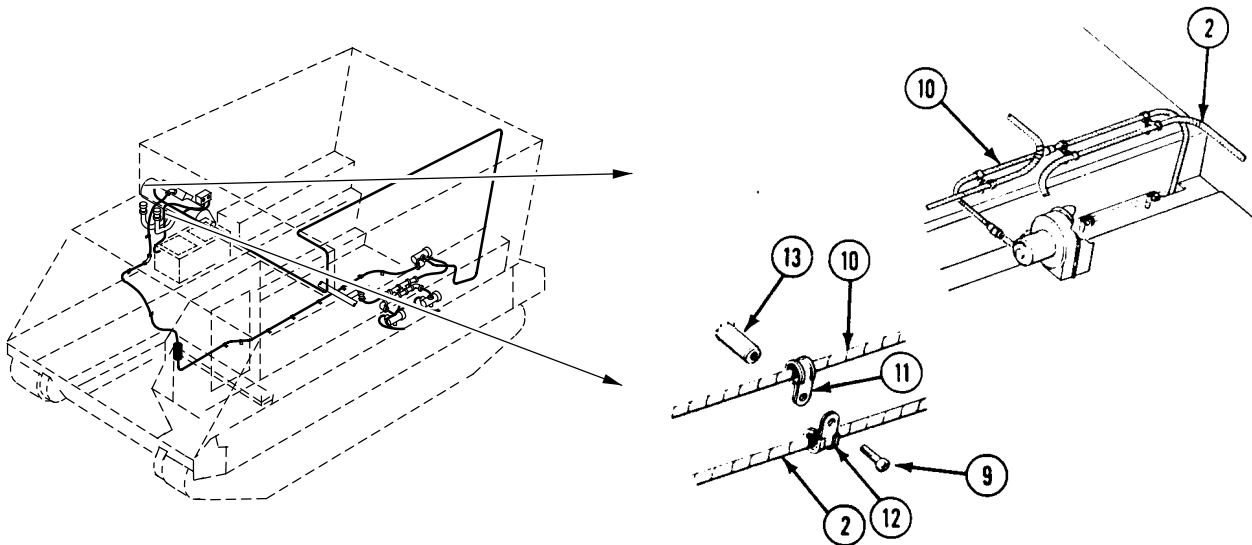
72. Install grommet (1) on circuit 400A lead (2). Feed lead into battery box (3). Install grommet in battery box hole.
 73. Remove nut (4) that holds circuit 6 lead (5) to battery positive terminal (6).
 74. Place circuit 400A lead (2) on battery terminal bolt (7). Secure with nut (4).
 75. Place circuit 6 lead (5) and circuit 400A lead (2) on two strap assemblies (8). Secure strap assemblies.



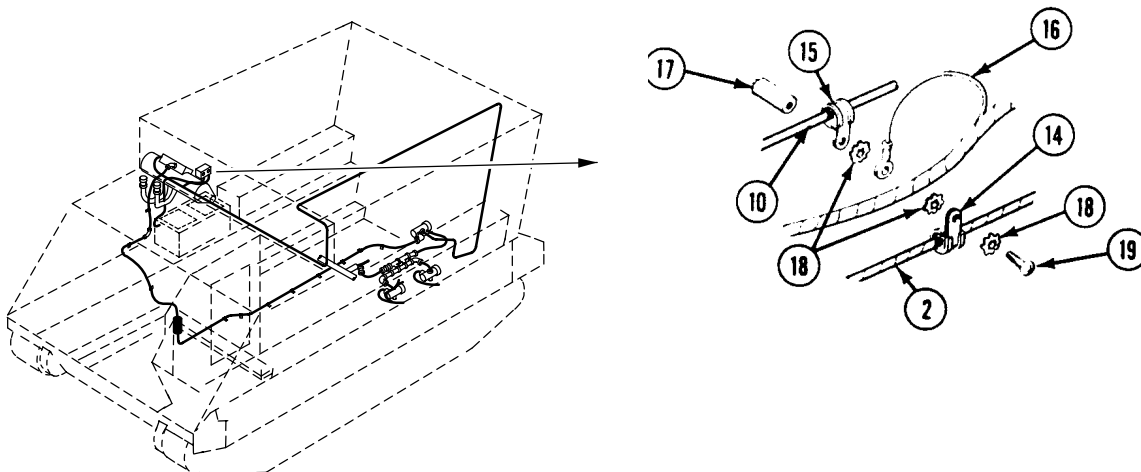
INSTALL ELECTRONIC EQUIPMENT HEATER KIT (M577A2 ONLY) — Continued

0058 00

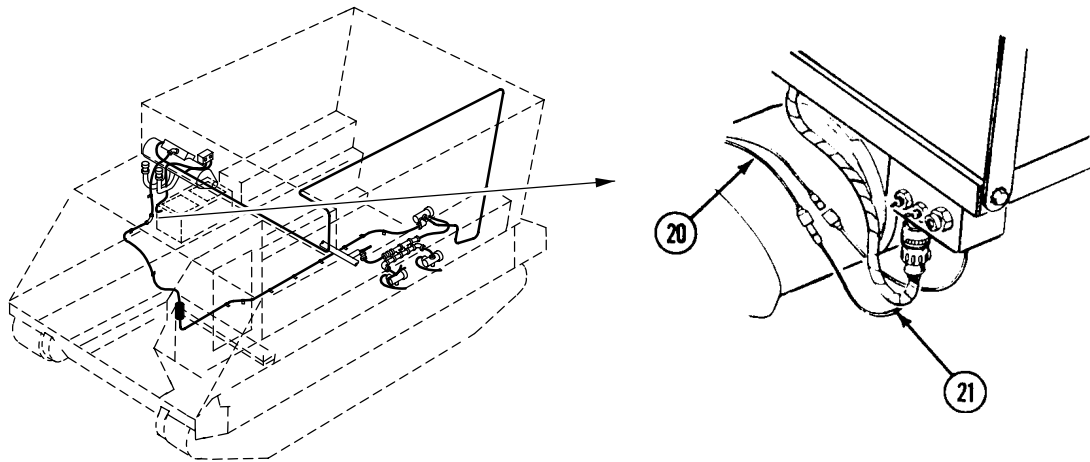
76. Remove two screws (9), circuit 59 lead (10), and two clamps (11) from hull to relocate.
77. Install two clamps (12) on circuit 400A lead (2).
78. Install two clamps (11), circuit 59 lead (10), two clamps (12), and circuit 400A lead (2) on two weldnuts (13). Secure with two screws (9).



79. Install clamp (14) on circuit 400A lead (2).
80. Place circuit 59 lead clamp (15), wiring harness ground lead (16), and circuit 400A lead clamp (14) on weldnut (17). Secure with two washers (18) and screw (19).



81. Connect circuit 402A leads (20) and (21).

**FOLLOW-THROUGH STEPS**

1. Connect battery ground negative lead (see your -20).
2. Open heater fuel shutoff valve (see your -10).
3. Start heater. Check that it is properly installed. Turn heater to OFF (see your -10).
4. Install floor plates (see your -20).
5. Raise and lock ramp (see your -10).
6. Stop engine (see your -10).

END OF TASK

CHAPTER 14

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR ENGINE COOLANT HEATER KIT

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY).....	0059 00
INSTALL ENGINE COOLANT HEATER KIT (M577A2 AND M1068 ONLY).....	0060 00
INSTALL ENGINE COOLANT HEATER KIT (M1064 ONLY).....	0061 00
REPLACE FUEL CONTROL VALVE.....	0062 00
REPLACE RESTRICTION THERMOSTAT.....	0063 00
REPLACE OVERHEAT THERMOSTAT.....	0064 00
REPLACE FIXED RESISTOR.....	0065 00
REPLACE BURNER PACKING AND GASKET.....	0066 00
REPLACE DIODE AND MOTOR RESISTOR.....	0067 00
REPLACE BLOWER MOTOR.....	0068 00
ENGINE COOLANT HEATER DATA.....	0069 00
FINAL TEST - COOLANT HEATER.....	0070 00

**INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1,
AND M1059 ONLY)**

0059 00

THIS WORK PACKAGE COVERS:

Installation (page 0059 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Materials/Parts

- Sealing compound (WP 0105 00, Item 17)
- Sealing compound (WP 0105 00, Item 18)
- Sealing compound primer (WP 0105 00, Item 21)
- Solvent, cleaning compound (WP 0105 00, Item 10)
- Tape, glass, insulation (WP 0105 00, Item 24)
- Kit P/N 12349820 (19207)
- Lockwasher
- Lockwasher (4)
- Lockwasher (8)

Personnel Required

Track Vehicle Repairer 63H10

References

See your -20
TM 9-6140-200-14

Equipment Condition

- Engine stopped/shutdown (see your -10)
 - Carrier blocked (see your -10)
 - Ramp lowered (see your -10)
 - Battery ground lead disconnected (see your -20)
 - Driver's power plant access panel removed (see your -20)
 - Power plant rear access panel removed (see your -20)
 - Trim vane lowered and power plant front access door opened (see your -10)
 - Rear and right front floor plates removed (see your -20)
 - Power plant grille raised (see your -20)
 - Carrier cooling system drained (see your -20)
 - Personnel heater kit installed (WP 0055 00)
 - Personnel heater removed (see your -20)
-

INSTALLATION

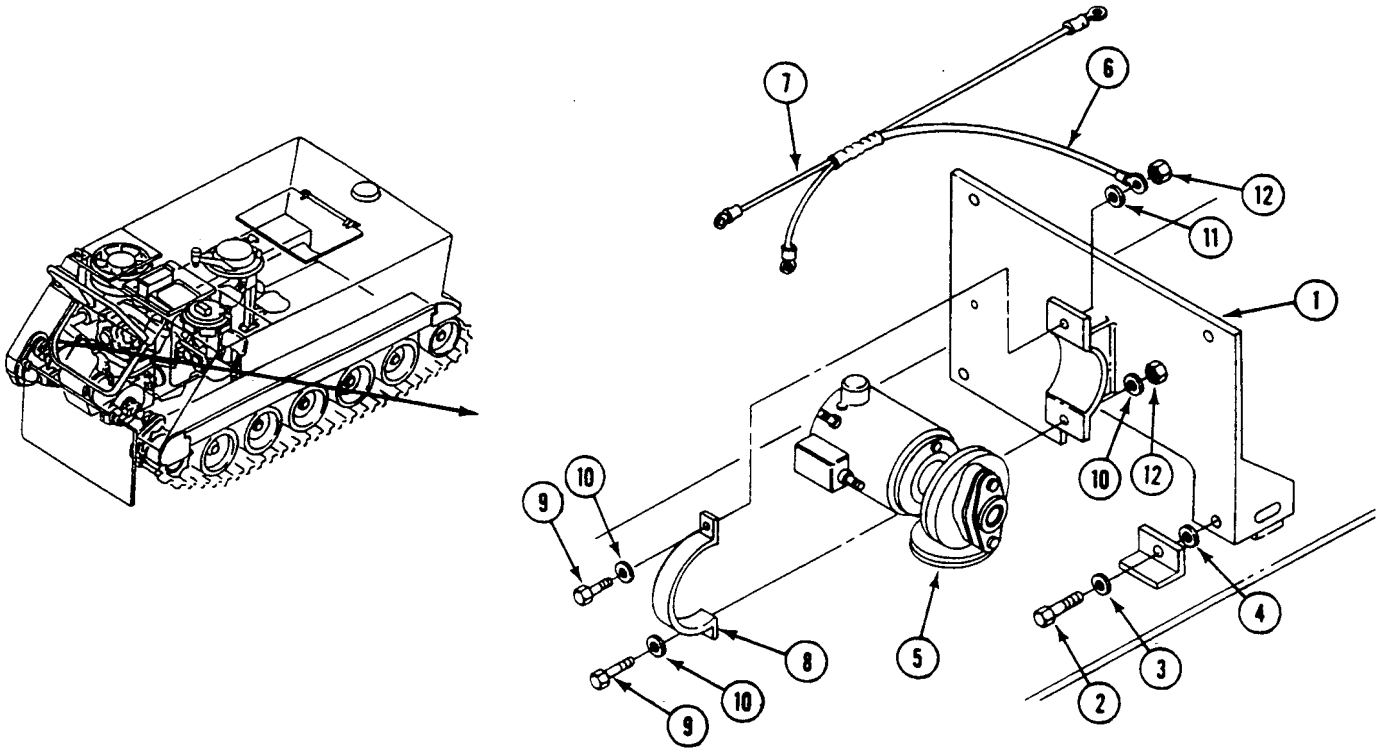
NOTE

Fuel hoses used on the engine coolant heater installation are the flareless type. If it is necessary to replace hose, the connection fittings must also be replaced.

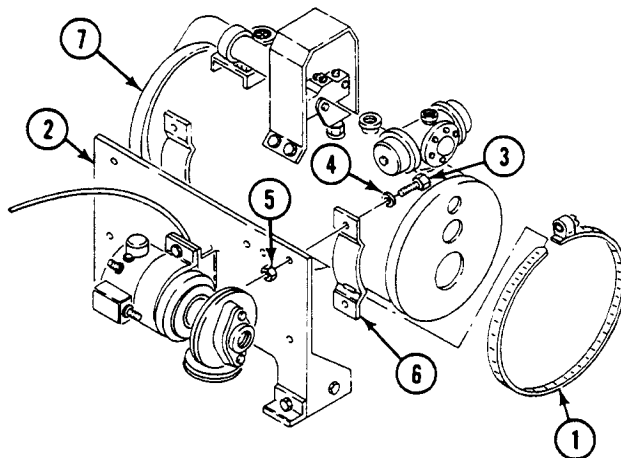
INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

1. Install mounting bracket (1) on right front sponson. Secure with four screws (2), washers (3), and lockwashers (4).
2. Install coolant pump (5) and ground lead (6) for wiring harness (7) on mounting bracket (1). Secure with clamp (8), two screws (9), three washers (10), one lockwasher (11), and two nuts (12).



3. Install two mounting saddles (6) on mounting bracket (2). Secure with four screws (3), washers (4), and nuts (5).
4. Install two clamps (1) on two mounting saddles (6).
5. Install coolant heater (7) on two mounting saddles (6). Secure with two clamps (1).



INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

6. Clean external tapered pipe threads of tee (8), two shutoff cocks (9) and (10), three bushings (11), (12), and (13), and four elbows (14), (15), (16), and (17) with solvent, cleaning compound.

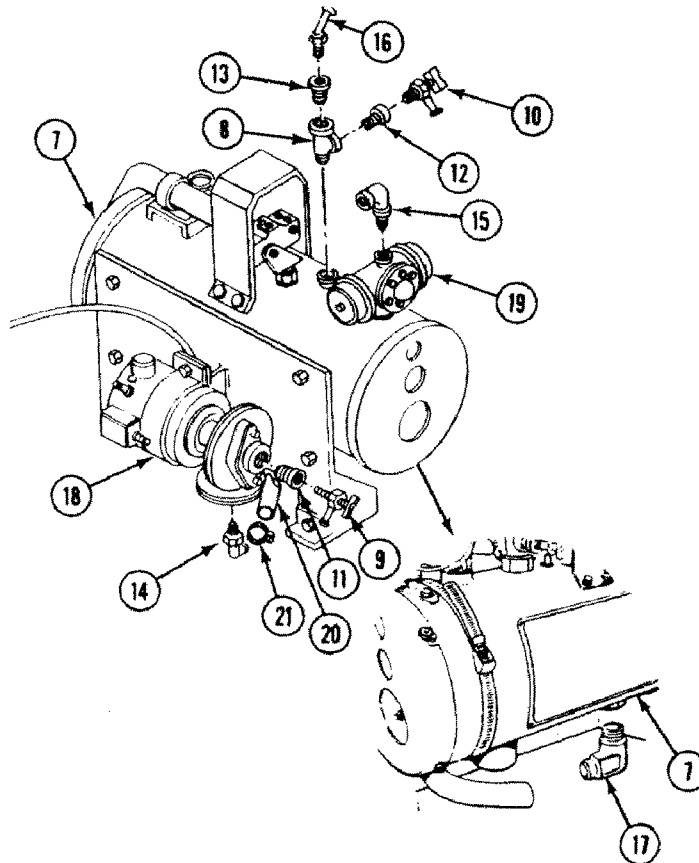
WARNING



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.

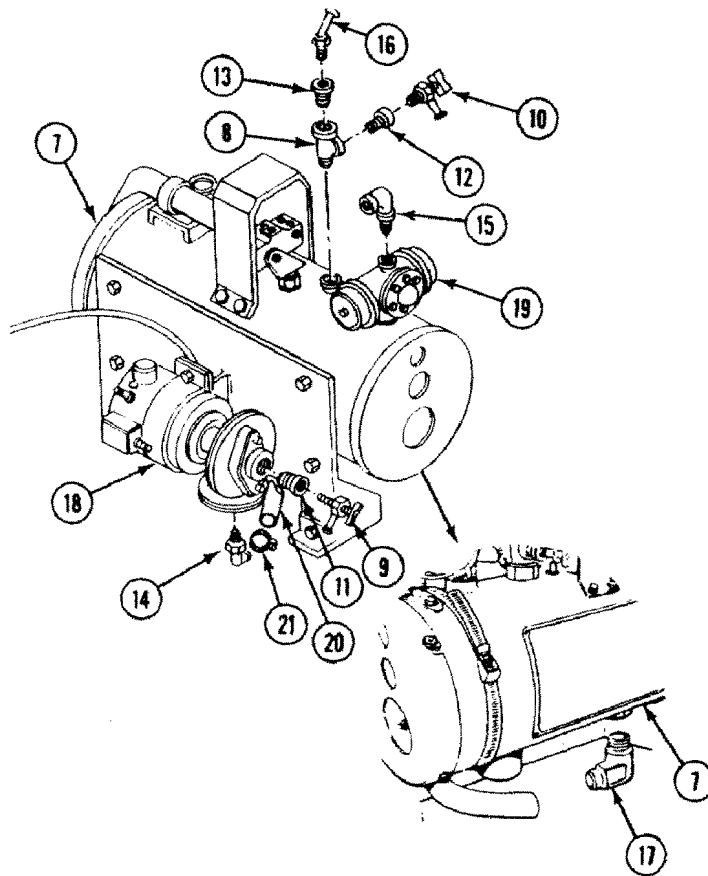
7. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external tapered pipe threads of tee (8), two shutoff cocks (9) and (10), three bushings (11), (12), and (13), and four elbows (14), (15), (16), and (17). Do not apply primer or sealing compound beyond small end of tapered threads.



INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

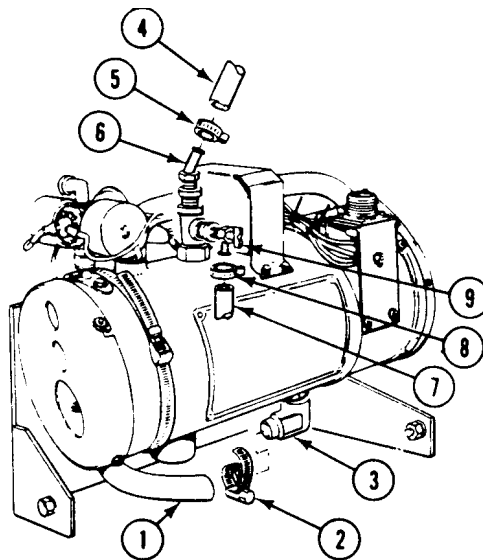
8. Install bushing (11), shutoff cock (9), and elbow (14) in coolant pump (18).
9. Install elbow (15) on control valve (19).
10. Install tee (8) in coolant heater (7).
11. Install bushing (12) in tee (8).
12. Install shutoff cock (10) in bushing (12).
13. Install bushing (13) in tee (8).
14. Install elbow (16) in bushing (13).
15. Install hose (20) and clamp (21) on elbow (14).
16. Install elbow (17) in coolant heater (7).



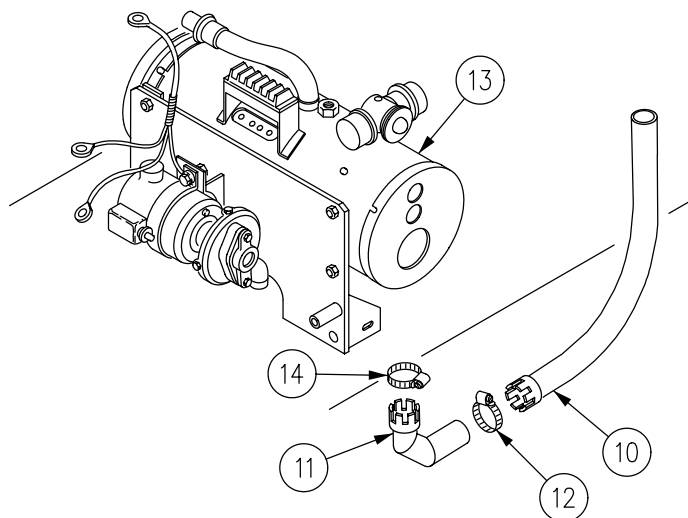
INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

17. Install hose (1) and clamp (2) on elbow (3). Tighten clamp.
18. Install hose (4) and clamp (5) on elbow (6). Tighten clamp.
19. Install hose (7) and clamp (8) on shutoff cock (9). Tighten clamp.



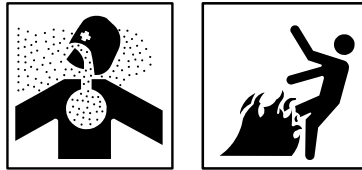
20. Install exhaust pipe (10) on lower tube (11). Secure with clamp (12). Do not tighten clamp.
21. Install lower tube (11) in coolant heater (13). Secure with clamp (14). Do not tighten clamp.
22. Tighten two clamps (12) and (14).



**INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND
M1059 ONLY) — Continued**

0059 00

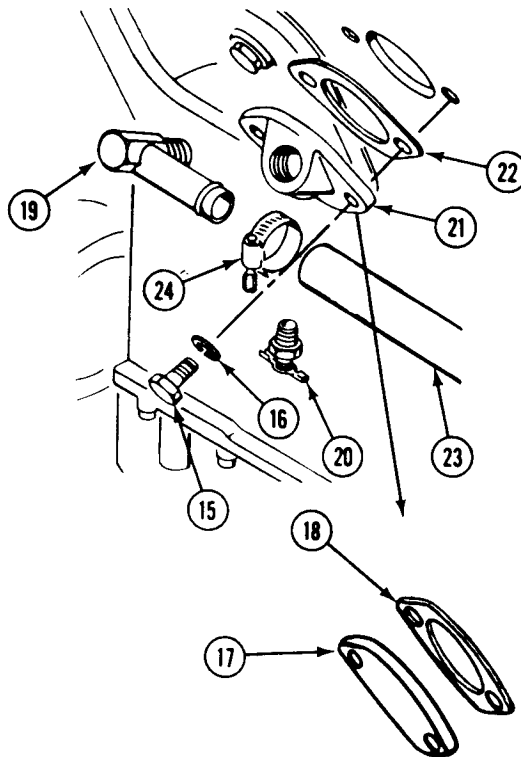
23. Remove two screws (15), two washers (16), plate (17), and gasket (18) from engine right side. Discard plate and gasket.
24. Install elbow (19) and drain cock (20) in mount (21).

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.

25. Apply a thin coat of sealing compound (WP 0105 00, Item 18) to both sides of gasket (22) before assembly.
26. Install mount (21) and gasket (22) on engine right side opening. Secure with two screws (15) and washers (16).
27. Install hose (23) on elbow (19). Secure with clamp (24).

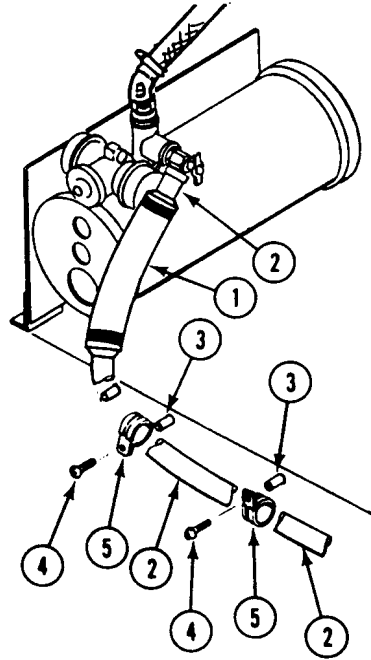


INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

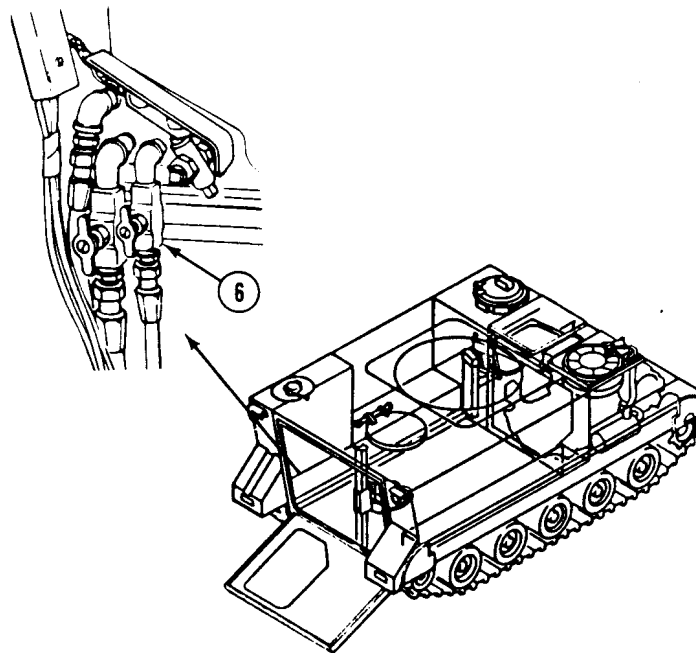
0059 00

28. Install insulation tube (1) on hose (2). Secure with tape.
29. Install hose (2) on two weldnuts (3). Secure with two screws (4) and clamps (5).

COOLANT HEATER



30. Make sure heater fuel valve (6) is closed.

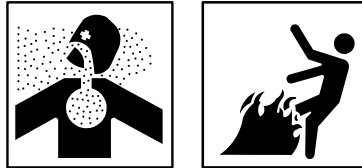


INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

31. Install coolant heater fuel pump (7) on bracket (8). Secure with two screws (9), four lockwashers (10), two washers (11), and two nuts (12).

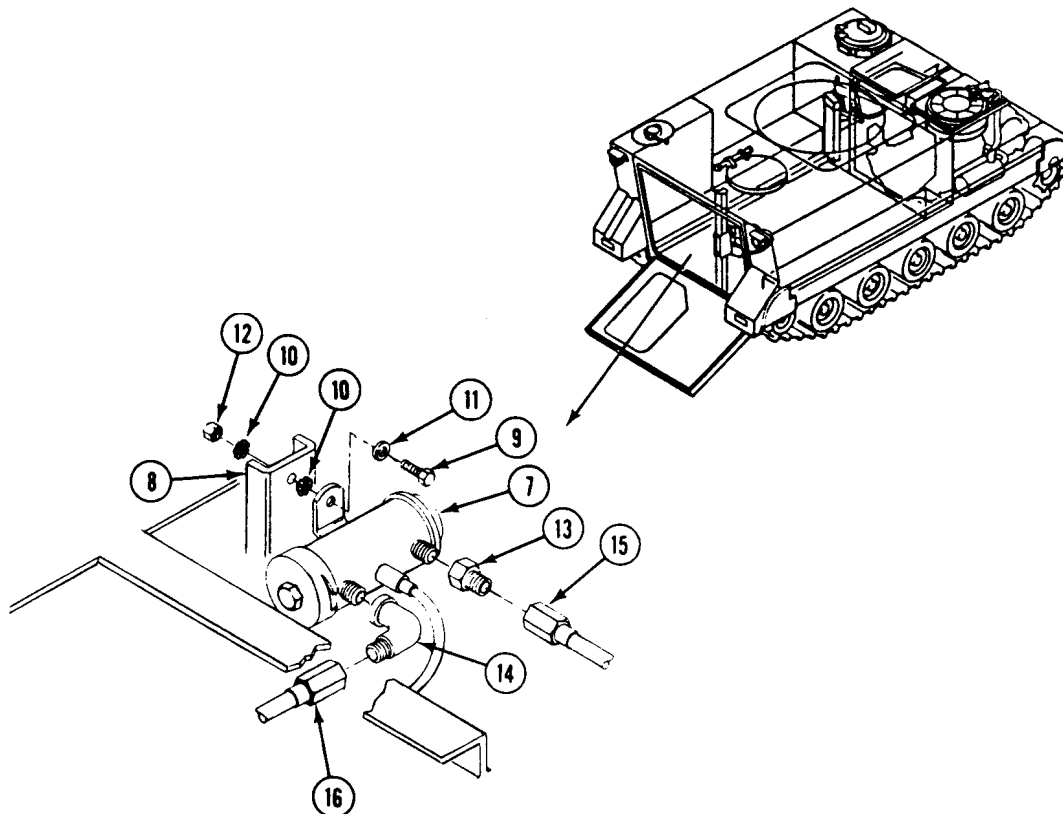
WARNING



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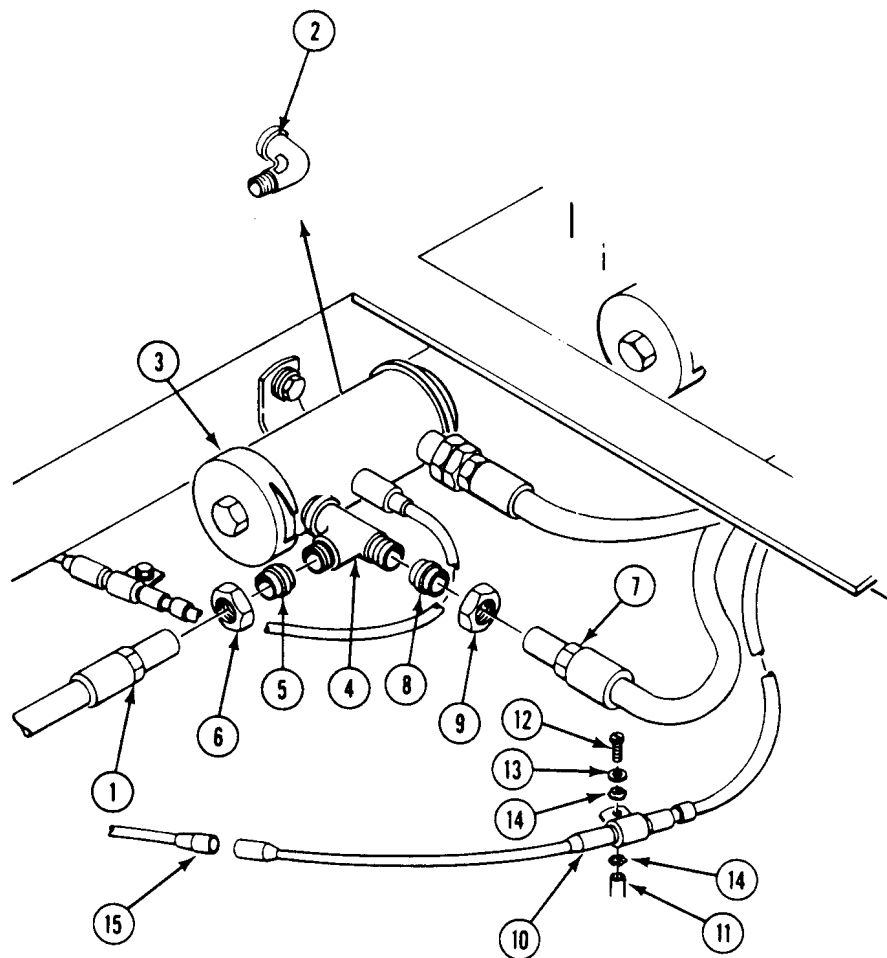
32. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external tapered pipe threads of adapter (13) and elbow (14). Do not apply primer or sealing compound beyond small end of tapered threads.
33. Install adapter (13) on coolant heater fuel pump (7).
34. Install fuel hose (15) on adapter (13).
35. Install elbow (14) on coolant heater fuel pump (7).
36. Install fuel hose (16) on elbow (14).



INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

37. Disconnect fuel hose (1) from existing elbow (2) on personnel heater fuel pump (3).
38. Remove and discard elbow (2) from personnel heater fuel pump (3).
39. Install tee (4) on personnel heater fuel pump (3).
40. Secure fuel hose (1) on tee (4). Secure with sleeve (5) and nut (6).
41. Install fuel hose (7) on tee (4). Secure with sleeve (8) and nut (9).
42. Install coolant heater fuel pump lead (10) on weldnut (11). Secure with screw (12), flat washer (13), and two lockwashers (14).
43. Connect circuit 402A lead (15) to coolant heater fuel pump lead (10).

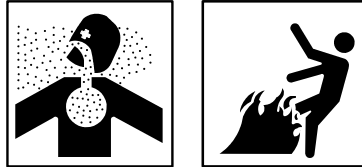


INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

44. Clean external pipe threads of two elbows (1) and (2) with solvent, cleaning compound.

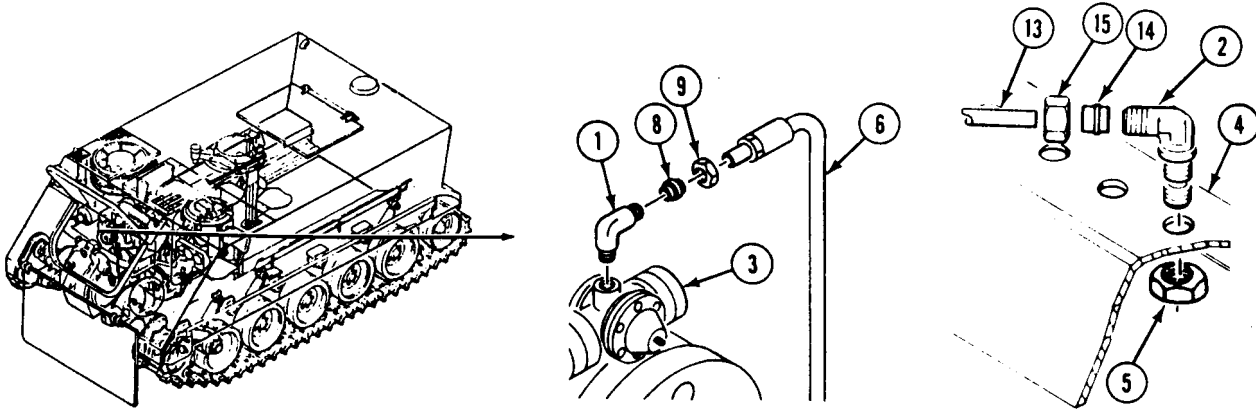
WARNING



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.

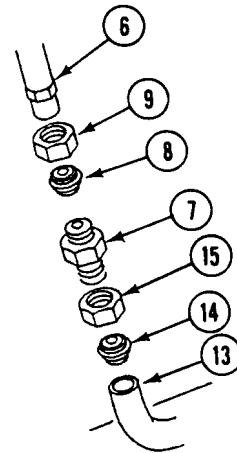
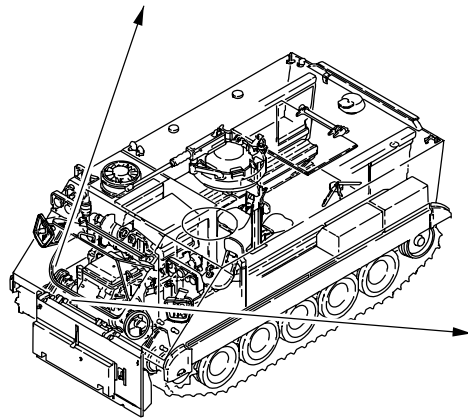
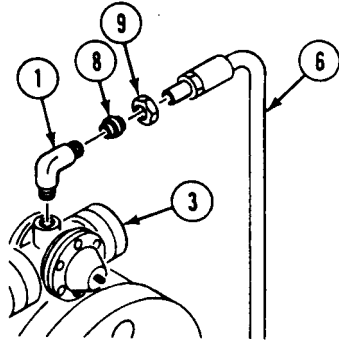
45. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external pipe threads of mounting ends on two elbows (1) and (2). Do not apply primer or sealing compound beyond small end of threads.
46. Install elbow (1) in control valve (3).
47. Install elbow (2) in transverse beam (4) and secure with nut (5).



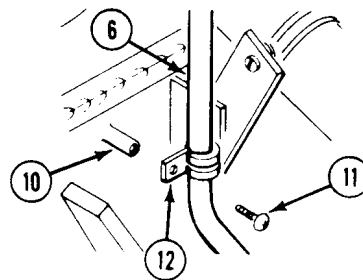
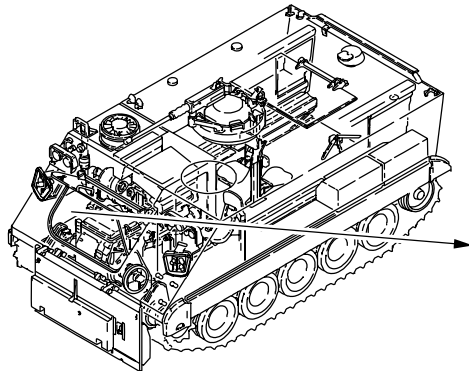
INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

48. Install fuel hose (6) in elbow (1) and adapter body (7). Secure with two sleeves (8) and nuts (9).



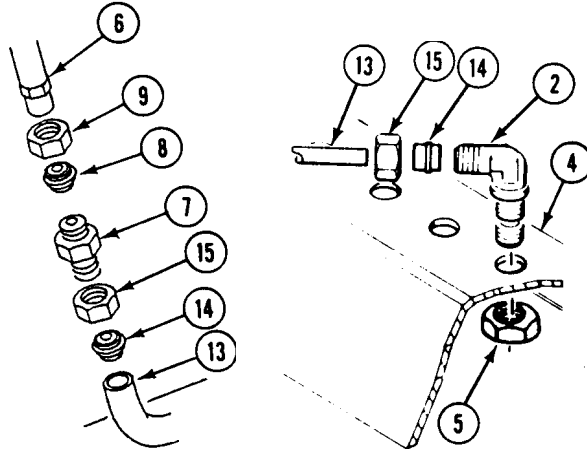
49. Secure fuel hose (6) to weldnut (10) with screw (11) and clamp (12).



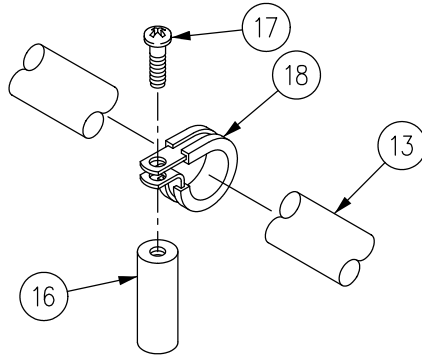
INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

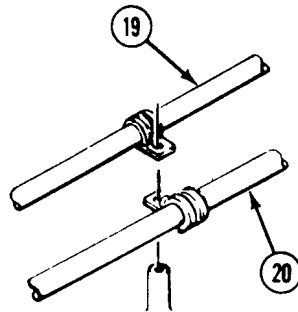
50. Install fuel hose (13) in elbow (2) and adapter body (7). Secure with two sleeves (14) and nuts (15).



51. Install fuel hose (13) on three weldnuts (16). Secure with three screws (17) and clamps (18).



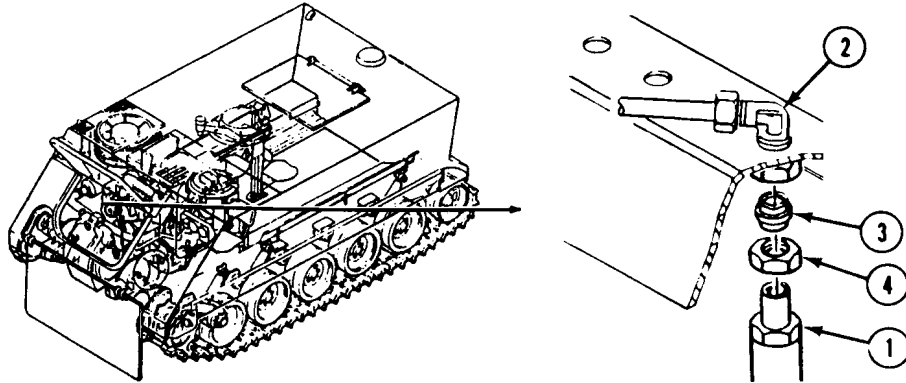
52. Place coolant heater fuel hose (19) next to personnel heater fuel hose (20).



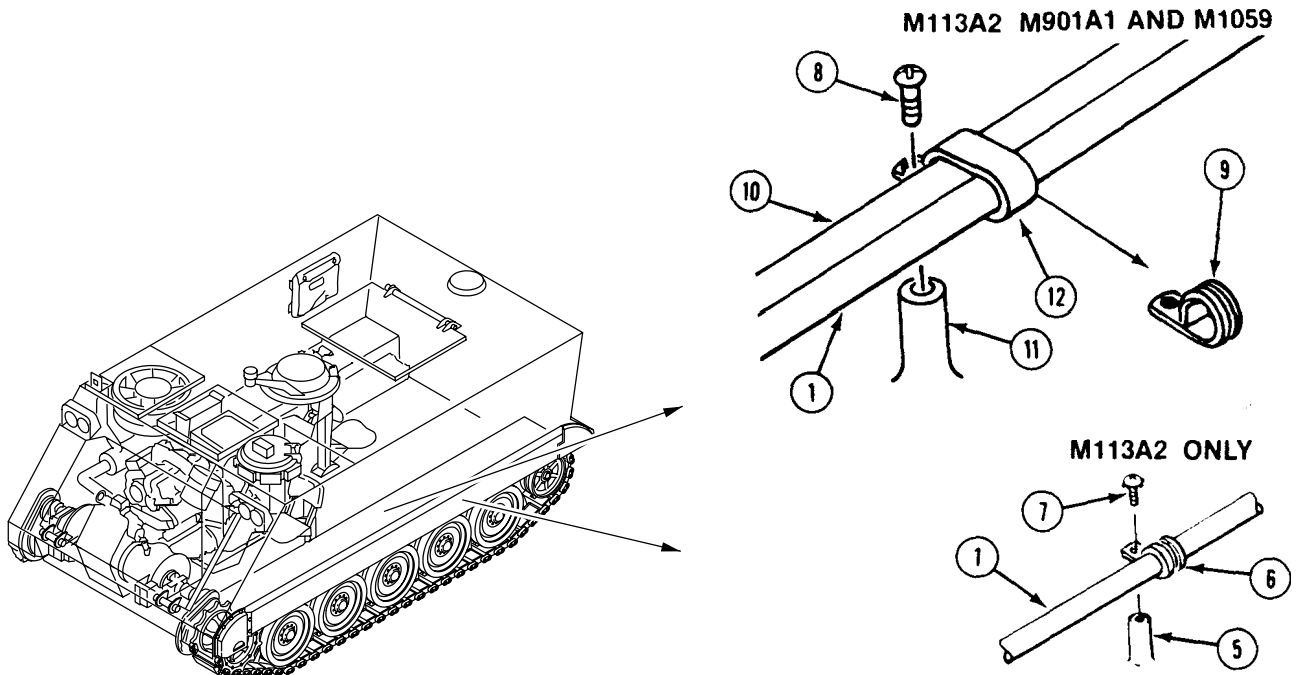
INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

53. Install coolant heater fuel hose (1) on elbow (2). Secure with sleeve (3) and nut (4).



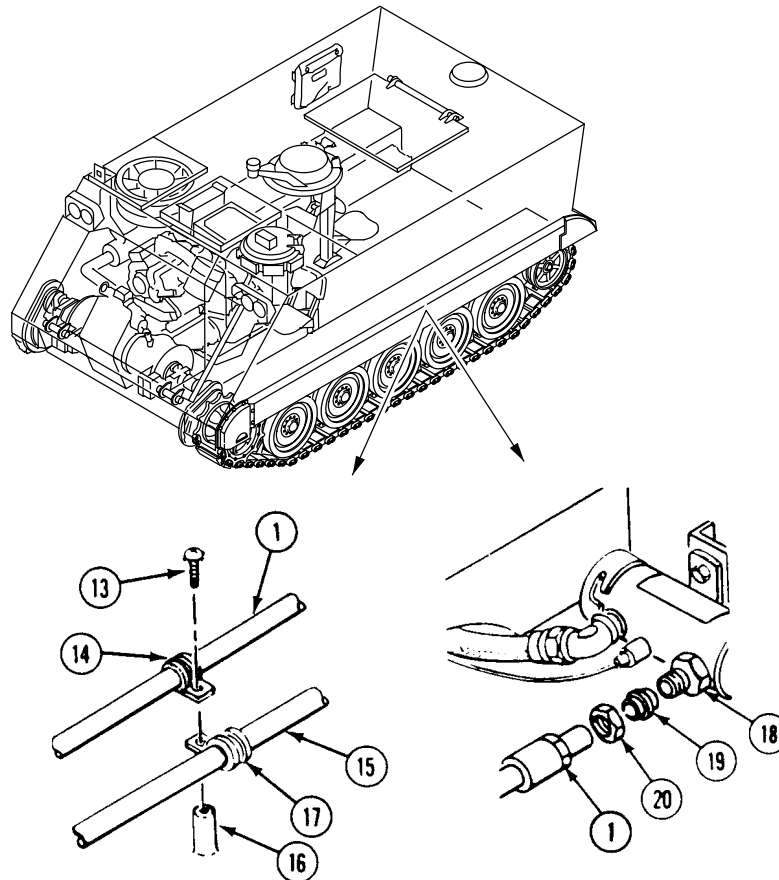
54. On M113A2 only, install coolant heater fuel hose (1) on five weldnuts (5). Secure with five clamps (6) and screws (7).
55. On M113A2 only, remove three screws (8) and clamps (9) that secure hydraulic line (10) to three weldnuts (11). Discard clamps.
56. On M113A2 only, install coolant heater fuel hose (1) and hydraulic line (10) on three weldnuts (11). Secure with three clamps (12) and screws (8).



**INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND
M1059 ONLY) — Continued**

0059 00

57. Remove four screws (13), clamps (14), and personnel heater fuel hose (15) from four weldnuts (16).
58. Install personnel heater fuel hose (15) and coolant heater fuel hose (1) on four weldnuts (16). Secure with four clamps (14), one clamp (17), and four screws (13).
59. Secure coolant heater fuel hose (1) to adapter body (18) with sleeve (19) and nut (20).

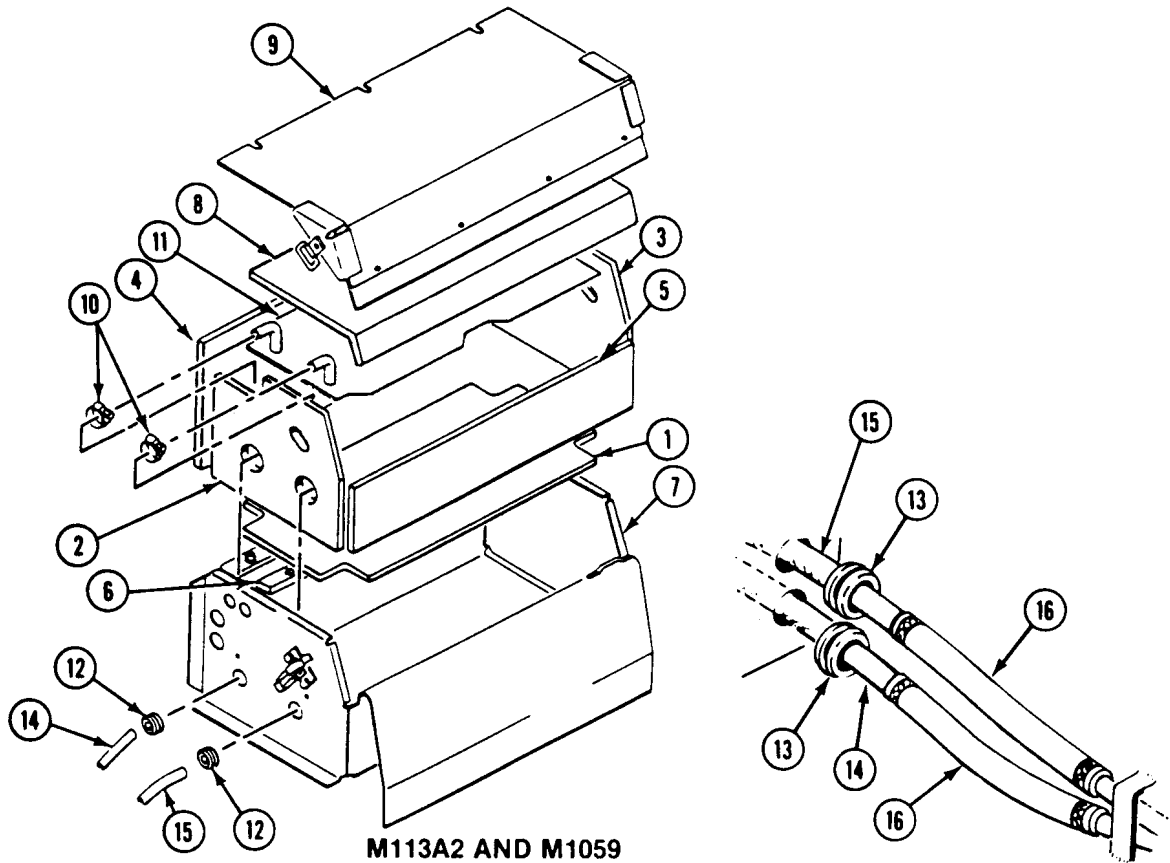


60. Remove batteries and retainers from battery box (see your -20). Clean battery box and battery box cover. See TM 9-6140-200-14.
61. Clean battery box with solvent, cleaning compound.
62. Renew adhesive backing on insulation sheets with solvent, cleaning compound. Wait 10 to 20 seconds until adhesive becomes tacky.
63. Install insulation sheets (1), (2), (3), (4), and (5) and strip (6) in battery box (7).
64. Install insulation sheet (8) on battery box cover (9).
65. Install two clamps (10) on heat exchanger (11).
66. Install two grommets (12) and heat exchanger (11) in battery box (7).
67. Remove two blank grommets from power plant compartment. Discard grommets.
68. Install two grommets (13) in power plant compartment bulkhead.

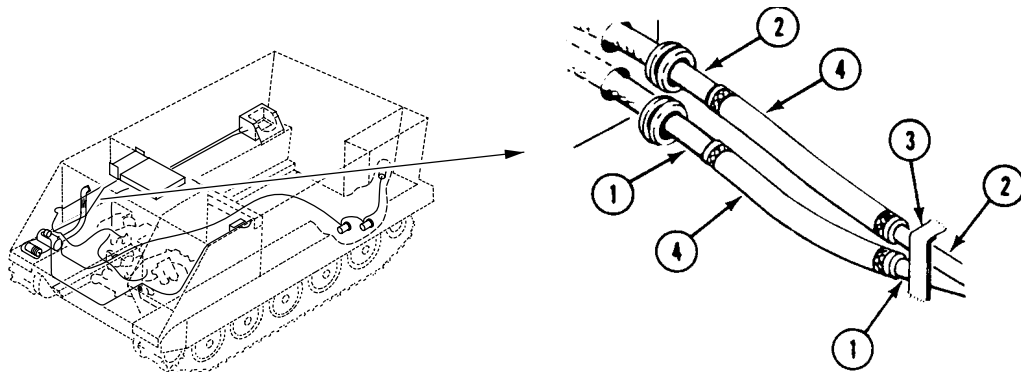
INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

- 69. Connect coolant pump hose (14) and engine hose (15) to heat exchanger (11). Hoses must go through grommets (13).
- 70. Pull two hoses (14) and (15) through two grommets (13) in personnel compartment until hoses reach battery box (7).
- 71. Install two insulation tubes (16) on two hoses (14) and (15) at rear of power plant compartment.



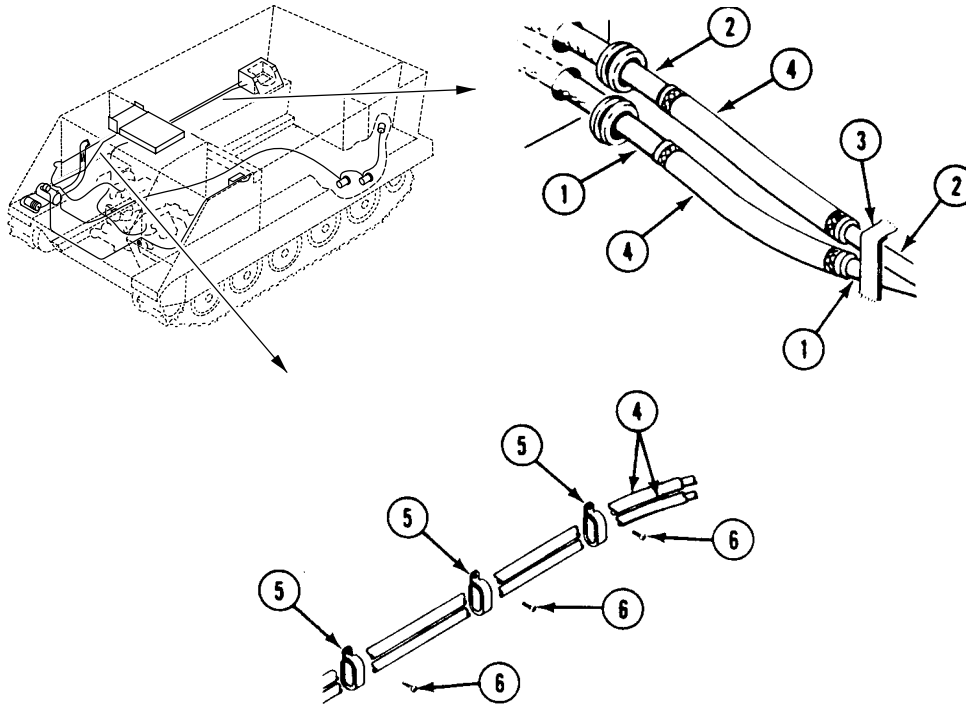
- 72. On M113A2 only, install two hoses (1) and (2) through four brackets (3) on right sponson.



INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

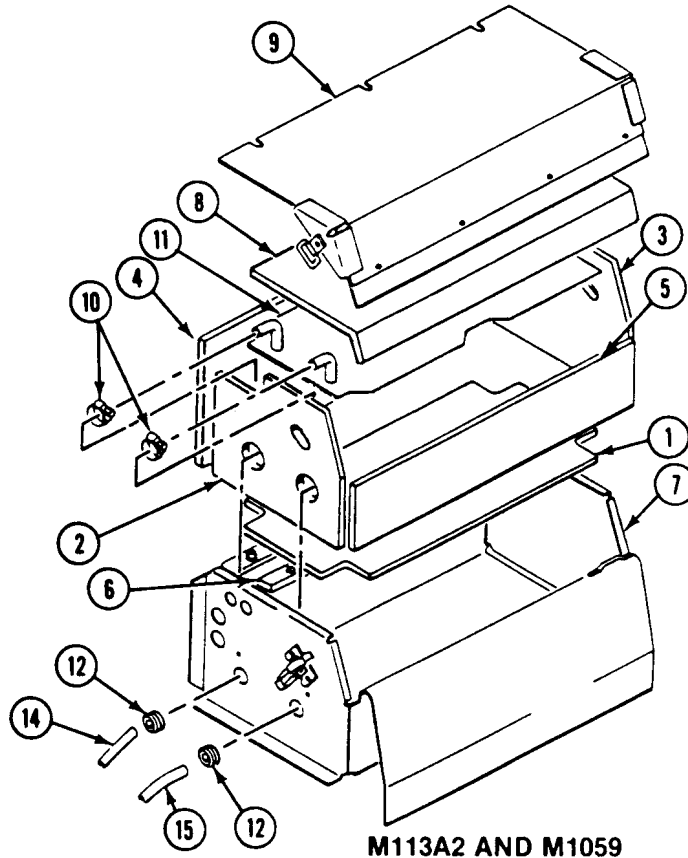
73. Install two insulation tubes (4) on two hoses (1) and (2) on forward side of power plant compartment rear bulkhead.
74. Install two insulation tubes (4) and two hoses (1) and (2) on power plant compartment. Secure with three clamps (5) and screws (6).
75. Secure ends of all insulation tubes (4) to two hoses (1) and (2) with tape.



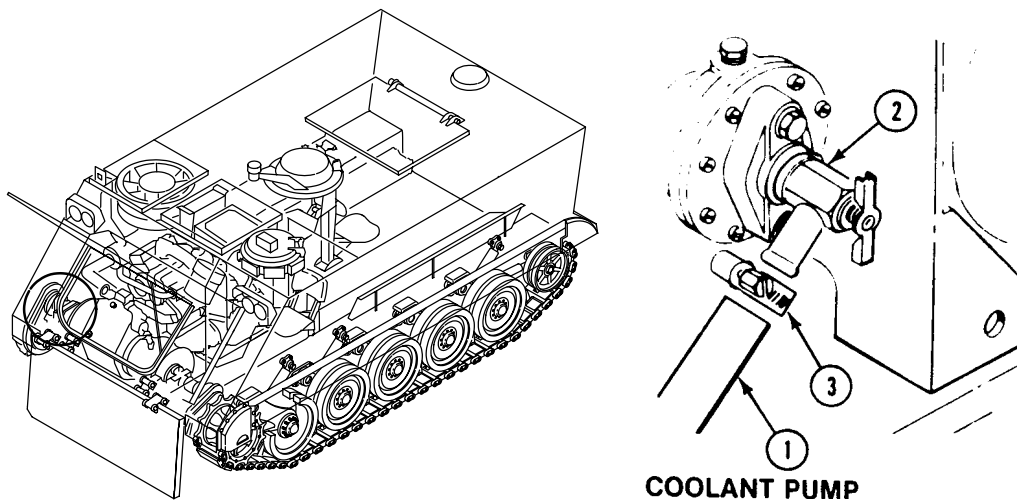
INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

- 76. Secure two hoses (14) and (15) to heat exchanger (11) with two clamps (10).
- 77. Install batteries in battery box (see your -20). Install battery box cover (9) on battery box (7).



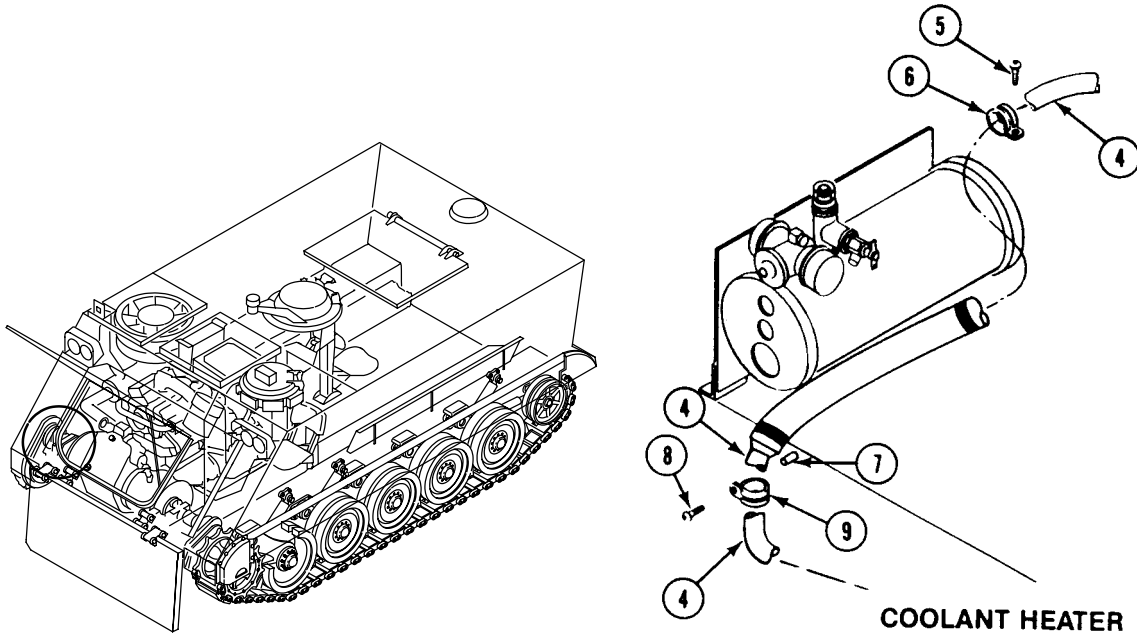
- 78. Install hose (1) on shutoff cock (2). Secure with clamp (3).



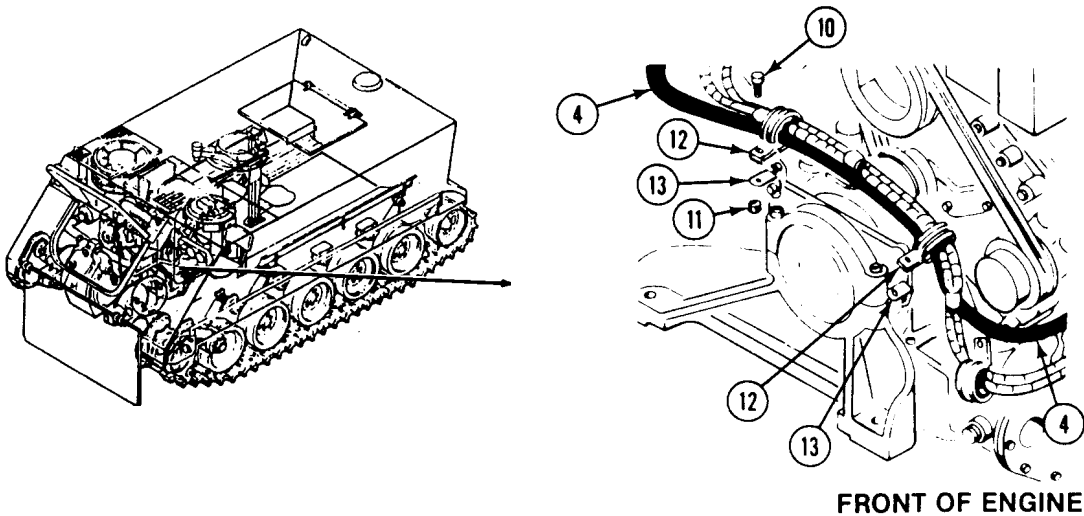
INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

79. Install hose (4) on sponson. Secure with screw (5) and clamp (6).
80. Install hose (4) on weldnut (7). Secure with screw (8) and clamp (9).



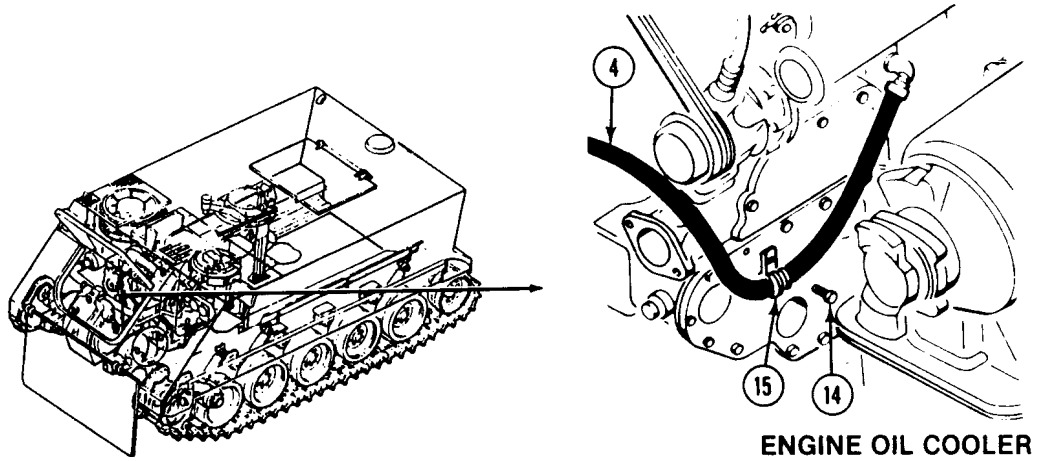
81. Remove two screws (10), nuts (11), and clamps (12) that secure power plant wiring harness to two brackets (13). Discard clamps.
82. Install hose (4) and power plant wiring harness on two brackets (13). Secure with two screws (10), nuts (11), and clamps (12).



**INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND
M1059 ONLY) — Continued**

0059 00

83. Remove screw (14) from oil cooler housing.
84. Install hose (4) on oil cooler housing. Secure with screw (14) and clamp (15).

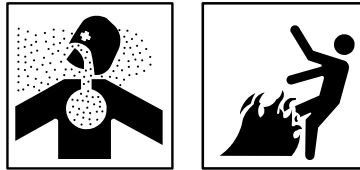


INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

85. Remove plug (1) from oil cooler elbow (2). Discard plug.
86. Clean external pipe threads of elbow (3) and adapter (4) with solvent, cleaning compound.

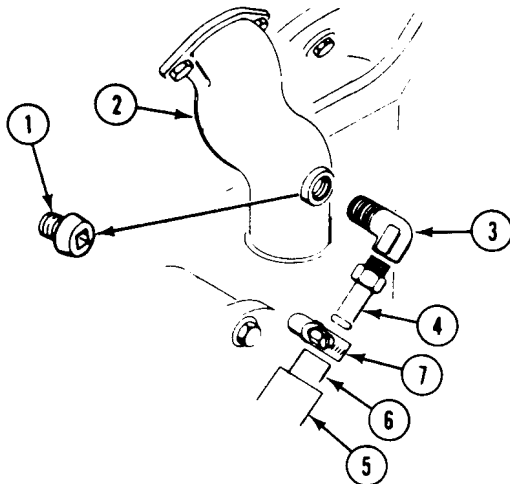
WARNING



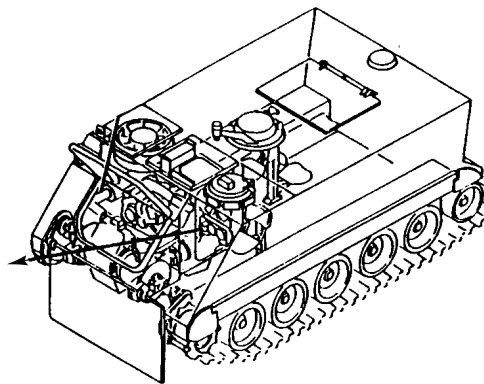
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87. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external pipe threads of elbow (3) and adapter (4). Do not apply primer or sealing compound beyond small end of threads.
88. Install elbow (3) in elbow (2).
89. Install adapter (4) in elbow (3).
90. Install insulation tube (5) on hose (6) and secure with tape.
91. Install hose (6) on adapter (4). Secure with clamp (7).



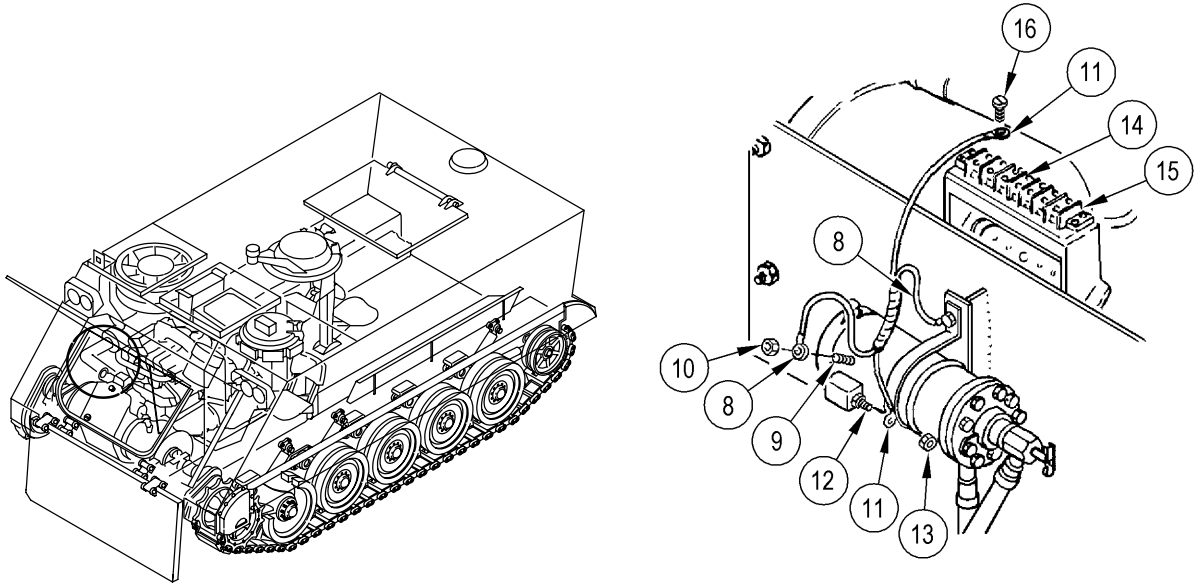
ENGINE BLOCK (LEFT SIDE)



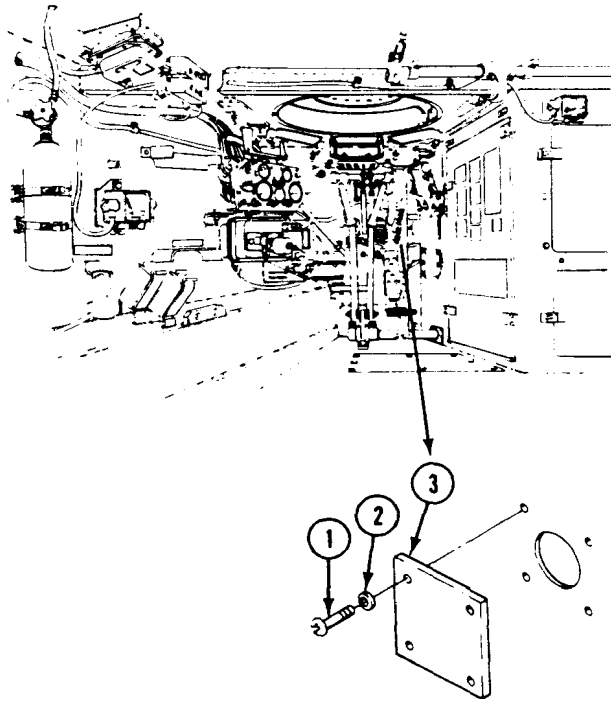
INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

92. Secure ground leads (8) to coolant pump terminal (9) with nut (10).
93. Secure circuit 402B lead (11) to coolant pump terminal (12) with nut (13).
94. Secure circuit 402B lead (11) to terminal 4 (14) of terminal strip (15) with screw (16).



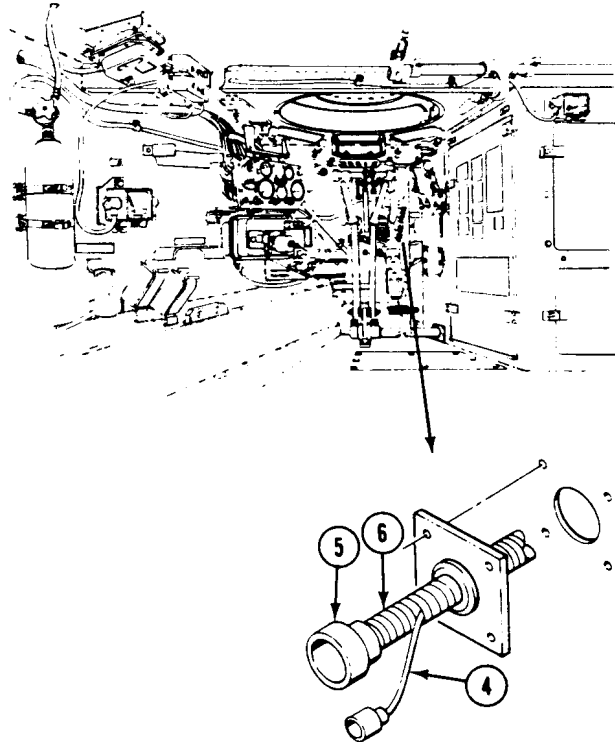
95. Remove four screws (1), washers (2), and plate (3) from driver's compartment bulkhead. Discard plate.



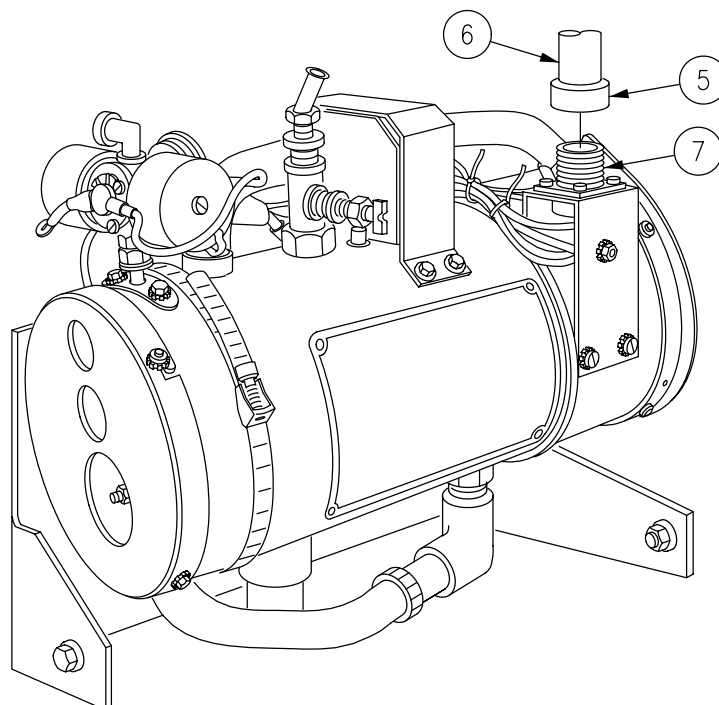
INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

96. Thread terminal ground lead (4) and coolant heater connector (5) of wiring harness (6) through driver's compartment bulkhead opening.



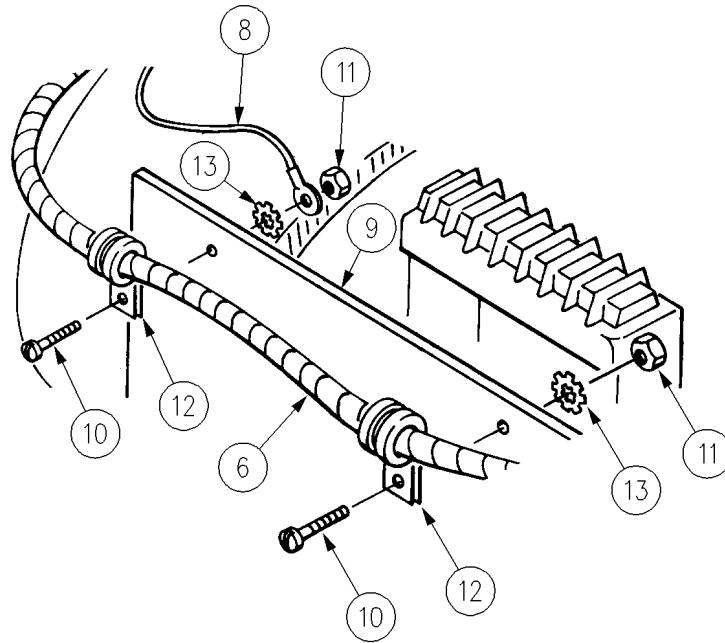
97. Connect coolant heater connector (5) of wiring harness (6) to coolant heater receptacle (7).



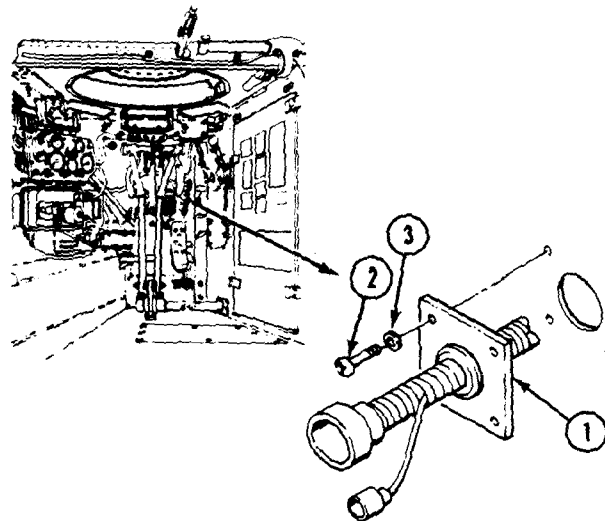
INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

98. Install wiring harness (6) and terminal ground lead (8) to mounting bracket (9). Secure with two screws (10), nuts (11), clamps (12), and lockwashers (13).



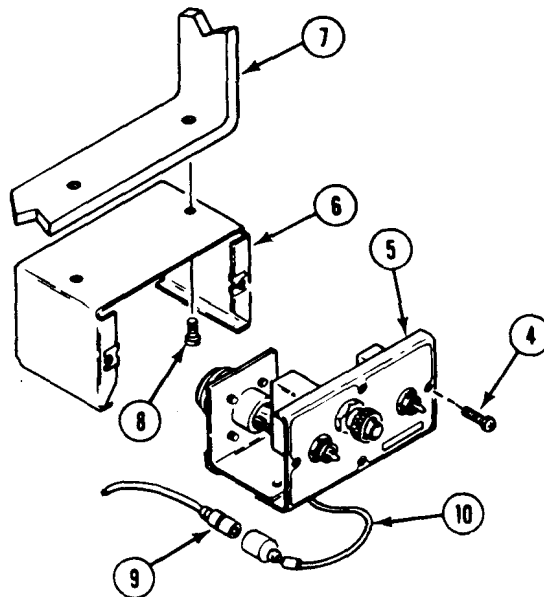
99. Install wiring harness plate (1) to driver's compartment bulkhead. Secure with four screws (2) and washers (3).



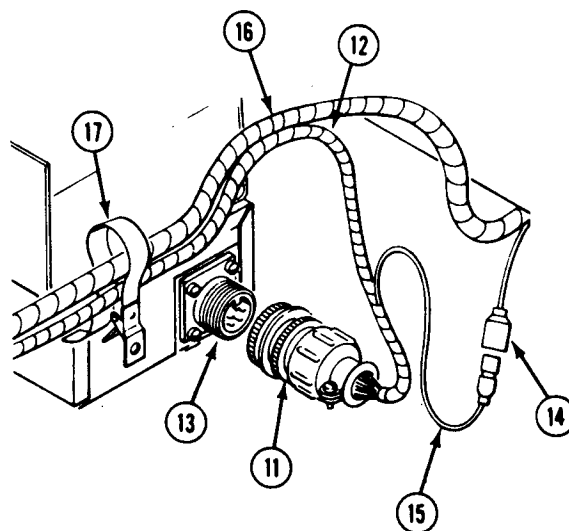
**INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND
M1059 ONLY) — Continued**

0059 00

100. Remove two screws (4) and control panel (5) from control box case (6).
101. Remove and discard two screws, nuts, and washers supplied with control box case (6).
102. Install control box case (6) on hull bracket (7). Secure with two screws (8).
103. Install control panel (5) to control box case (6). Secure with two screws (4).
104. Connect circuit 400A lead (9) to control box lead (10).



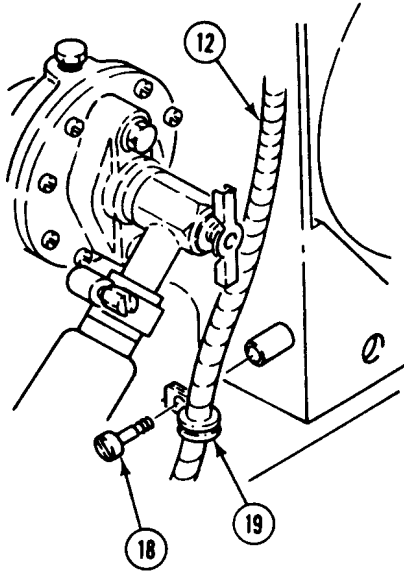
105. Connect control box connector (11) of wiring harness (12) to control box receptacle (13).
106. Connect main wiring harness 402A lead (14) to coolant heater wiring harness lead (15). Secure wiring harness (12) to front main wiring harness (16) with eight straps (17).



**INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND
M1059 ONLY) — Continued**

0059 00

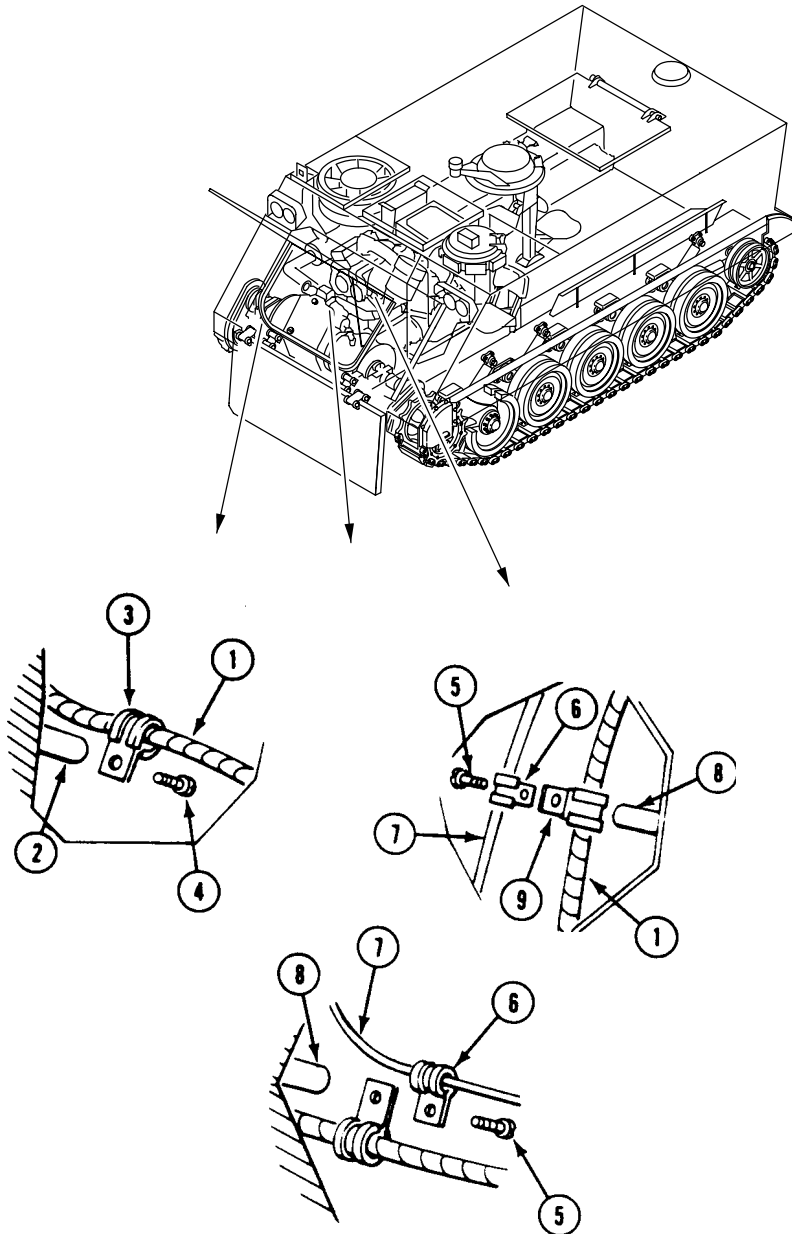
107. Install wiring harness (12) on mounting bracket. Secure with screw (18) and clamp (19).



**INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND
M1059 ONLY) — Continued**

0059 00

108. Install wiring harness (1) on two weldnuts (2). Secure with two clamps (3) and screws (4).
109. Remove three screws (5) and clamps (6) that secure fuel control cable (7) to three weldnuts (8).
110. Install wiring harness (1) and fuel control cable (7) on three weldnuts (8). Secure with three screws (5), clamps (6), and clamps (9).

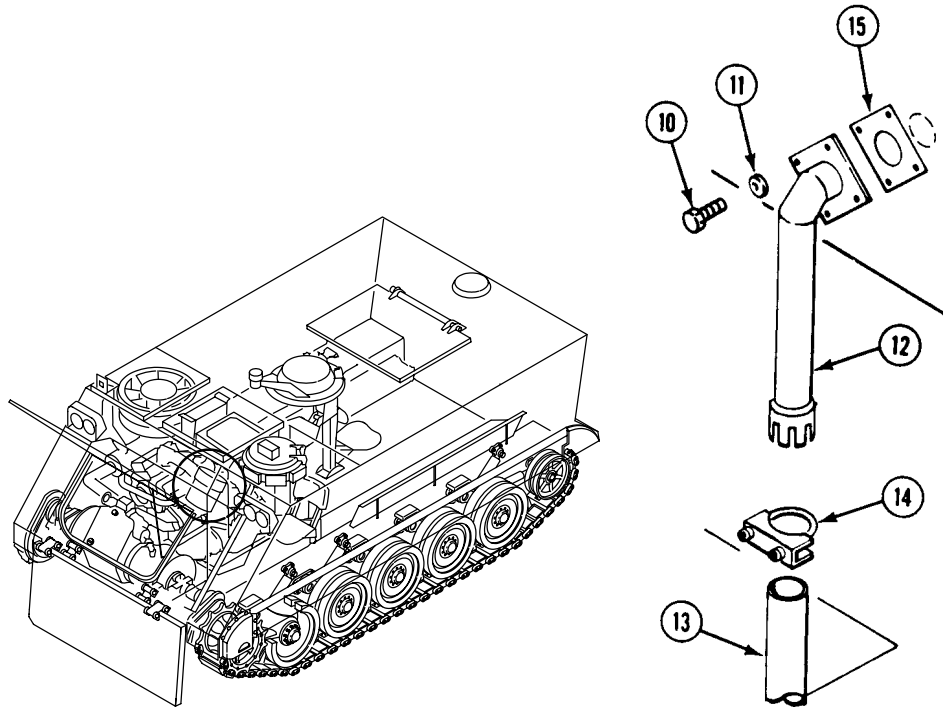


111. Lower power plant grille assembly (see your -20).
112. Remove four screws (10), washers (11), and plate from grille. Discard plate.
113. Install upper tube (12) on exhaust pipe (13). Secure with clamp (14). Do not tighten.
114. Position upper tube (12) and gasket (15) on grille.
115. Secure upper tube (12) to grille with four screws (10) and washers (11).

INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

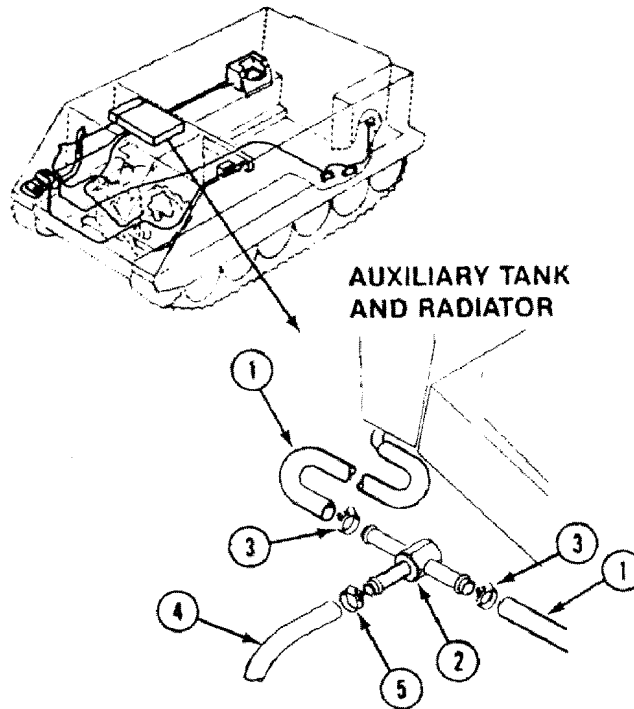
0059 00

116. Tighten clamp (14).



117. Cut auxiliary tank hose (1) and secure to tee (2) with two clamps (3).

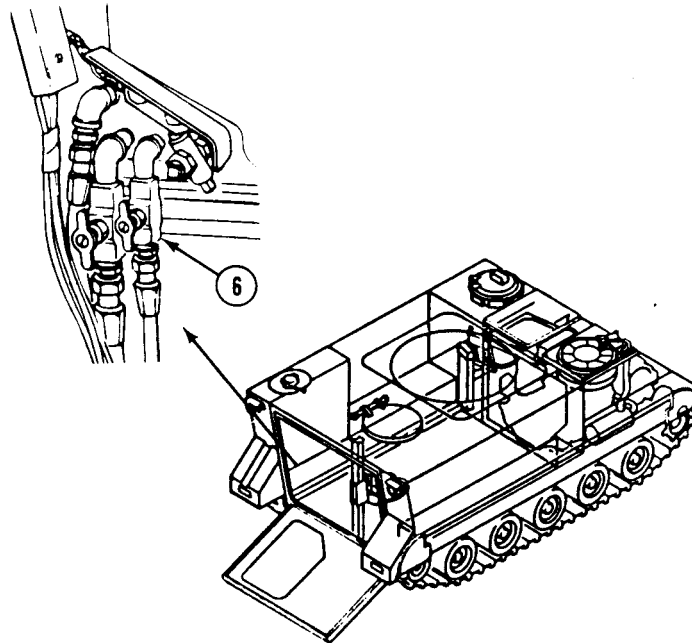
118. Secure hose (4) to tee (2) with clamp (5).



INSTALL ENGINE COOLANT HEATER KIT (M113A2, M901A1, AND M1059 ONLY) — Continued

0059 00

119. Replace standard generator belts with kit belts (see your -20).
120. Replace standard fan drive belts with kit belts (see your -20).
121. Open fuel tank shutoff valve (6).

**FOLLOW-THROUGH STEPS**

1. Install personnel heater (see your -20).
2. Fill carrier cooling system (see your -20).
3. Connect battery ground lead (see your -20).
4. Bleed coolant heater fuel line (see your -20).
5. Start coolant heater (see your -10). Check that heater operates properly and does not leak. Turn coolant heater off.
6. Install rear and right front floor plates (see your -20).
7. Install driver's power plant access panel (see your -20).
8. Install power plant rear access panel (see your -20).
9. Close power plant front access panel (see your -20).
10. Raise trim vane (see your -10).
11. Raise and lock ramp (see your -10).
12. Stop/shutdown engine (see your -10).

END OF TASK

INSTALL ENGINE COOLANT HEATER KIT (M577A2 AND M1068 ONLY)

0060 00

THIS WORK PACKAGE COVERS:

Installation (page 0060 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Materials/Parts

- Sealing compound (WP 0105 00, Item 17)
- Sealing compound (WP 0105 00, Item 18)
- Sealing compound primer (WP 0105 00, Item 21)
- Solvent, cleaning compound (WP 0105 00, Item 10)
- Tape, glass, insulation (WP 0105 00, Item 24)
- Kit P/N 12269197 (19207)
- Lockwasher (2)
- Lockwasher (5)
- Lockwasher (8)

Personnel Required

Track Vehicle Repairer 63H10

References

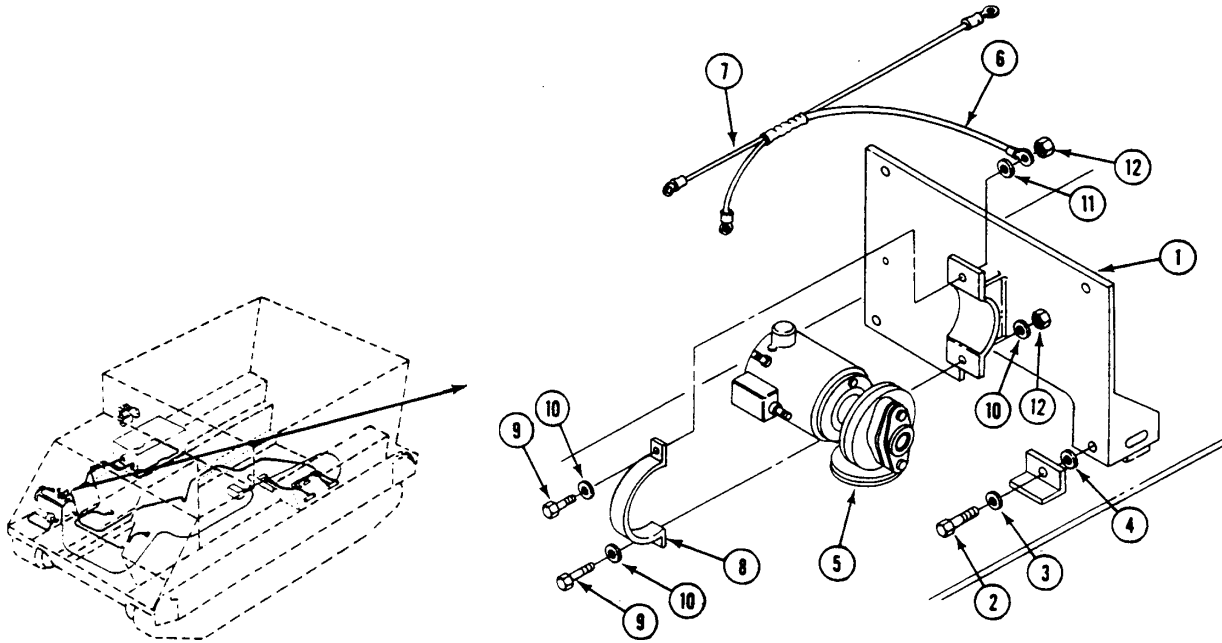
- See your -20
- TM 9-6140-200-14

Equipment Condition

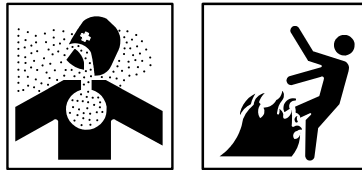
- Engine stopped/shutdown (see your -10)
 - Carrier blocked (see your -10)
 - Ramp lowered (see your -10)
 - Battery ground lead disconnected (see your -20)
 - Driver's power plant access panel removed (see your -20)
 - Power plant rear access panel removed (see your -20)
 - Trim vane lowered and power plant front access door opened (see your -10)
 - Rear and right front floor plates removed (see your -20)
 - Power plant grille raised (see your -20)
 - Carrier cooling system drained (see your -20)
 - Generator set removed (see your -10)
 - Personnel heater removed (see your -20)
-

INSTALLATION

1. Install mounting bracket (1) on right front sponson. Secure with four screws (2), washers (3), and lockwashers (4).
2. Install coolant pump (5) and ground lead (6) for wiring harness (7) on mounting bracket (1). Secure with clamp (8), two screws (9), three washers (10), one lockwasher (11), and two nuts (12).



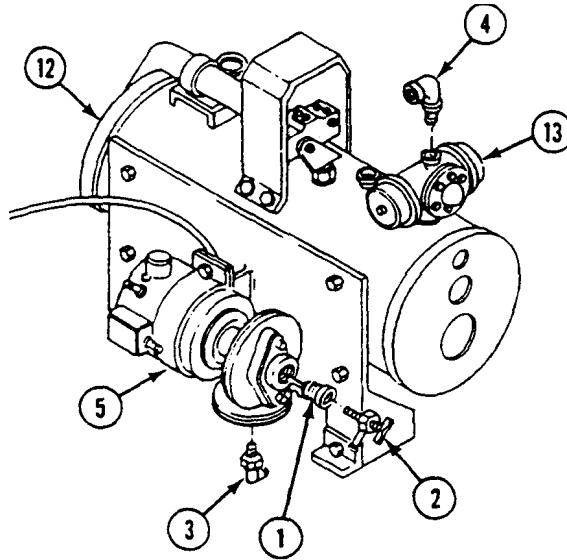
3. Clean external tapered pipe threads of bushing (1), shutoff cock (2), elbow (3), and elbow (4) with solvent, cleaning compound.

WARNING

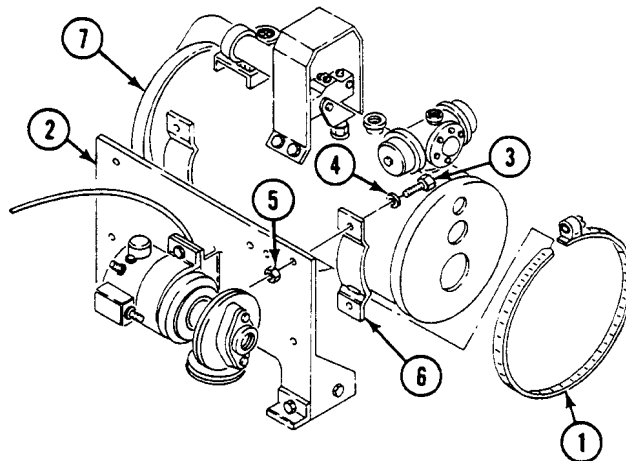
Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

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.

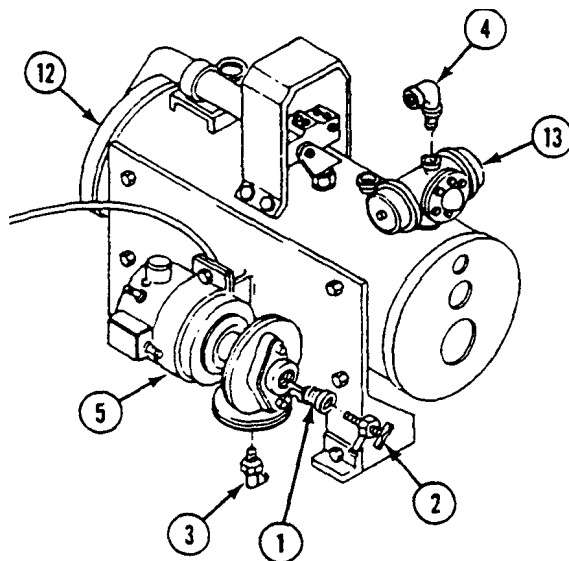
4. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external tapered pipe threads of bushing (1), shutoff cock (2), elbow (3), and elbow (4). Do not apply primer or sealing compound beyond small end of threads.
5. Install bushing (1), shutoff cock (2), and elbow (3) in coolant pump (5).



6. Install two mounting saddles (6) on mounting bracket (2). Secure with four screws (3), washers (4), and nuts (5).
7. Install two clamps (1) on two mounting saddles (6).
8. Install coolant heater (7) on two mounting saddles (6). Secure with two clamps (1).

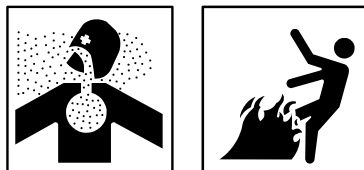


9. Install elbow (4) on control valve (13).



10. Clean external tapered pipe threads of tee (1), bushing (2), shutoff cock (3), bushing (4), elbow (5), and elbow (6) with solvent, cleaning compound.

WARNING

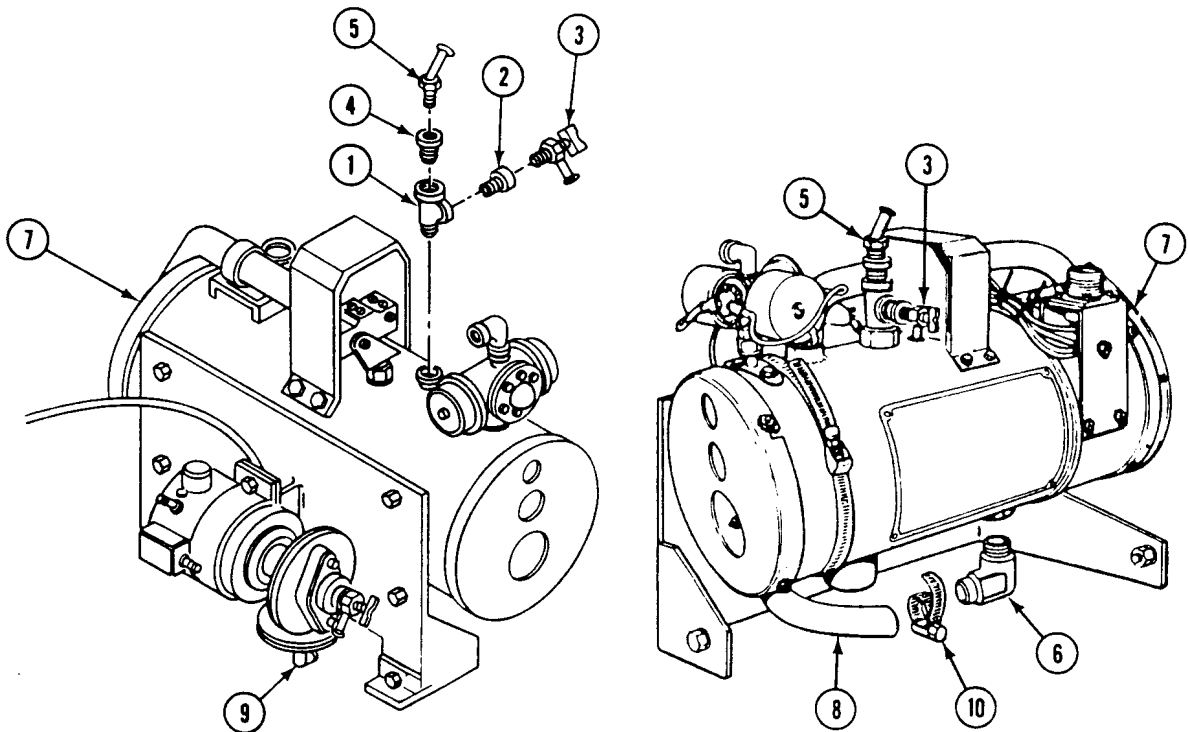


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11. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external tapered pipe threads of tee (1), bushing (2), shutoff cock (3), bushing (4), elbow (5), and elbow (6). Do not apply primer or sealing compound beyond small end of threads.
12. Install tee (1) in coolant heater (7).
13. Install bushing (2) in tee (1).
14. Install shutoff cock (3) in bushing (2).
15. Install bushing (4) in tee (1).
16. Install elbow (5) in bushing (4).
17. Install elbow (6) in coolant heater (7).

18. Install hose (8) on elbow (9) and elbow (6). Secure with two clamps (10).



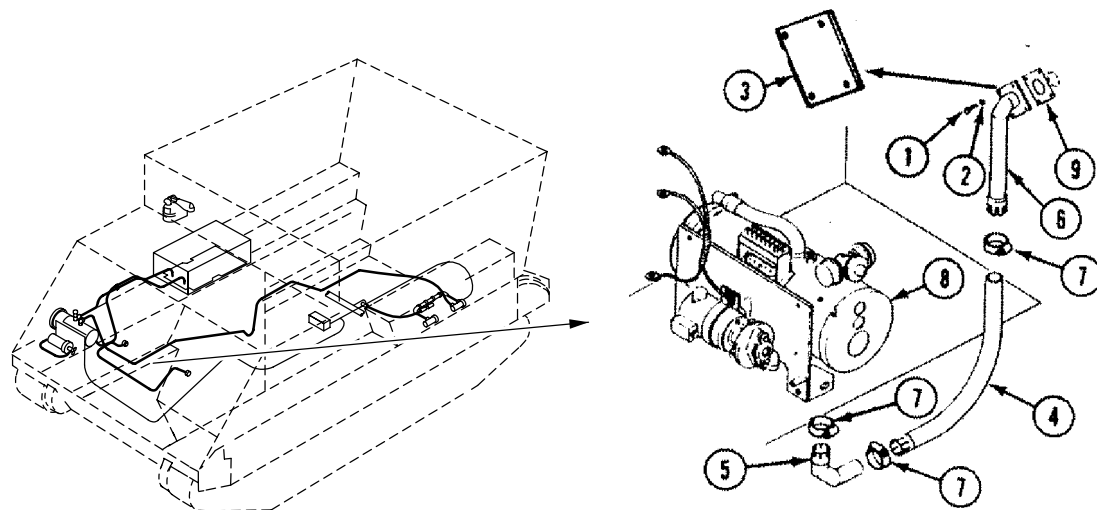
19. Remove four screws (1), washers (2), and plate (3) from power plant compartment wall. Discard plate.

20. Install exhaust pipe (4) on lower elbow (5) and upper elbow (6). Secure with two clamps (7). Do not tighten clamps.

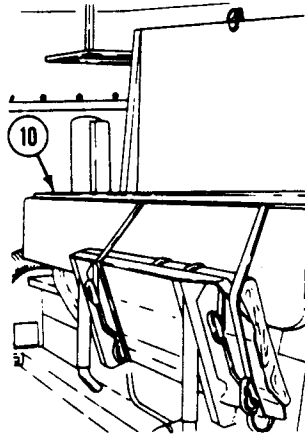
21. Install lower elbow (5) in coolant heater (8). Secure with clamp (7). Do not tighten clamp.

22. Install upper elbow (6) and gasket (9) on power plant compartment wall. Secure with four screws (1) and washers (2).

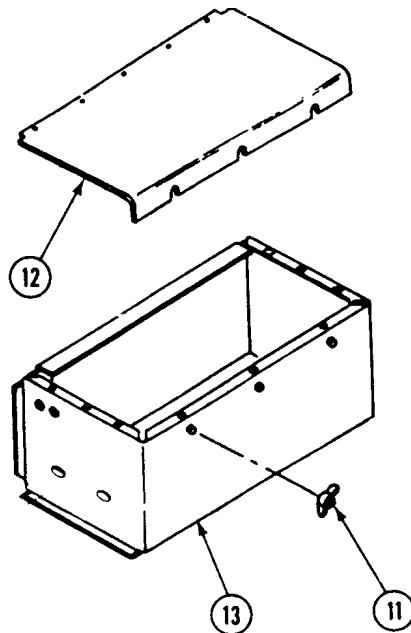
23. Tighten three clamps (7).



24. Raise and secure map table (10).

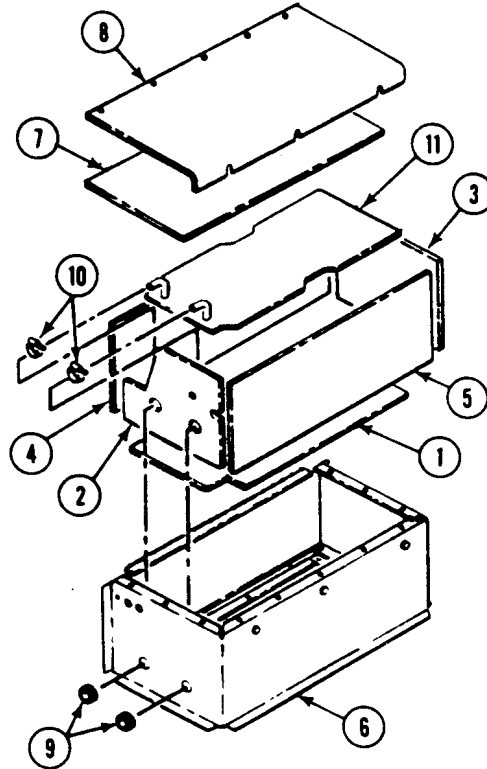


25. Remove three wing nuts (11) and battery box cover (12) from battery box (13).
26. Remove batteries from battery box (13) (see your -20). Clean battery box and battery box cover (12). See TM 9-6140-200-14.
27. Clean battery box (13) and battery box cover (12) with solvent, cleaning compound.

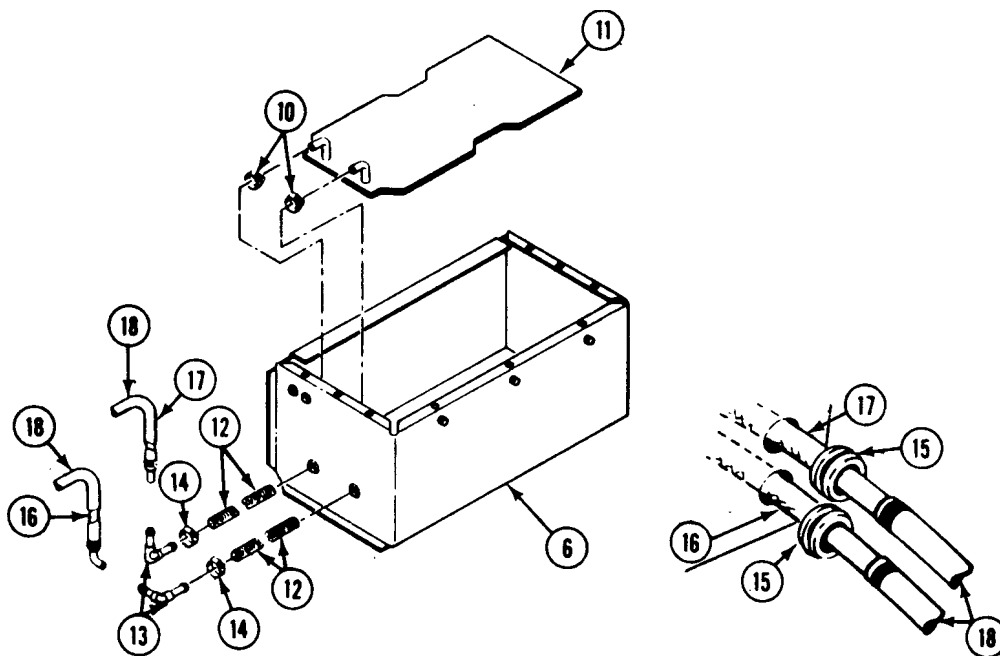


INSTALL ENGINE COOLANT HEATER KIT (M577A2 AND M1068 ONLY) — Continued**0060 00**

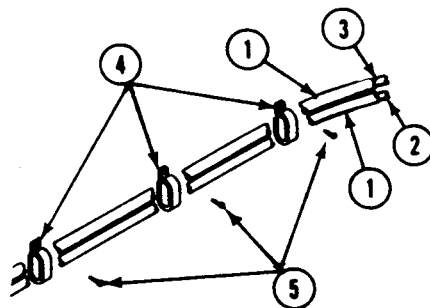
28. Renew adhesive backing on all insulation sheets with solvent, cleaning compound. Wait 10 to 20 seconds until adhesive becomes tacky.
29. Install bottom insulation sheet (1), left insulation sheet (2), right insulation sheet (3), rear insulation sheet (4), and front insulation sheet (5) in battery box (6).
30. Install insulation sheet (7) on battery box cover (8).
31. Install two grommets (9) in battery box (6).



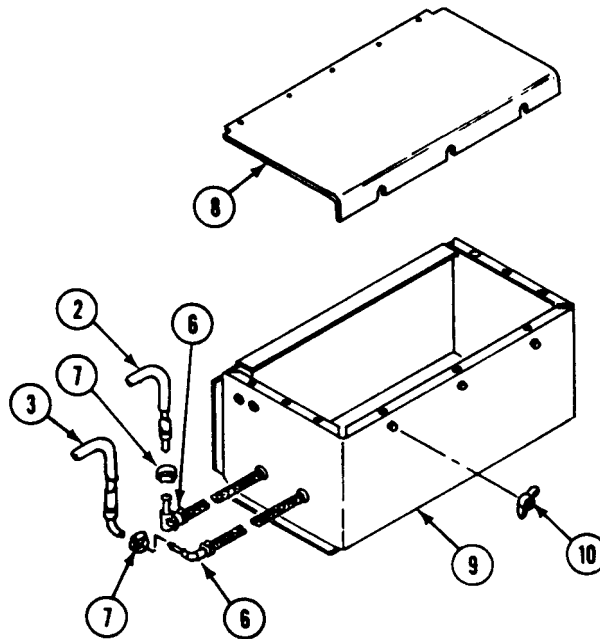
32. Place two clamps (10) on heat exchanger (11).
33. Install heat exchanger (11) in battery box (6).
34. Install two short hoses (12) on heat exchanger (11). Secure with two clamps (10).
35. Install two elbows (13) in two short hoses (12). Secure with two clamps (14).
36. Remove and discard two blank grommets from power plant bulkhead.
37. Install two grommets (15) in power plant compartment bulkhead.
38. Thread hose (16) and hose (17) through two grommets (15) in power plant compartment.
39. Pull two hoses (16) and (17) through two grommets (15) into personnel compartment to battery box (6).
40. Install two insulation tubes (18) on two hoses (16) and (17) at rear of power plant compartment. Secure with tape.



41. Install two insulation tubes (1) on two hoses (2) and (3) on forward side of power plant compartment rear bulkhead.
42. Install two insulation tubes (1) and two hoses (2) and (3) in power plant compartment. Secure with three clamps (4) and screws (5).
43. Install ends of insulation tubes (1) on two hoses (2) and (3). Secure with tape.

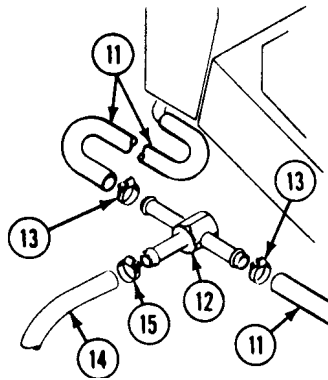


44. Install hoses (2) and (3) on two elbows (6). Secure with two clamps (7).
45. Install batteries (see your -20) and battery box cover (8) in battery box (9). Secure cover to battery box with three wing nuts (10).

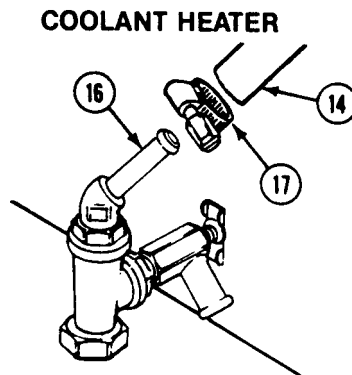


46. Cut auxiliary tank hose (11). Secure to tee (12) with two clamps (13).
47. Secure hose (14) to tee (12) with clamp (15).

AUXILIARY TANK AND RADIATOR

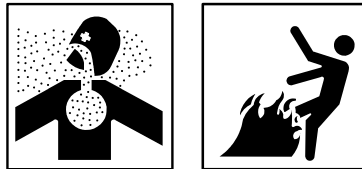


48. Install hose (14) on elbow (16). Secure with clamp (17).



49. Clean external pipe threads of elbow (19) and drain cock (20) with solvent, cleaning compound.

WARNING

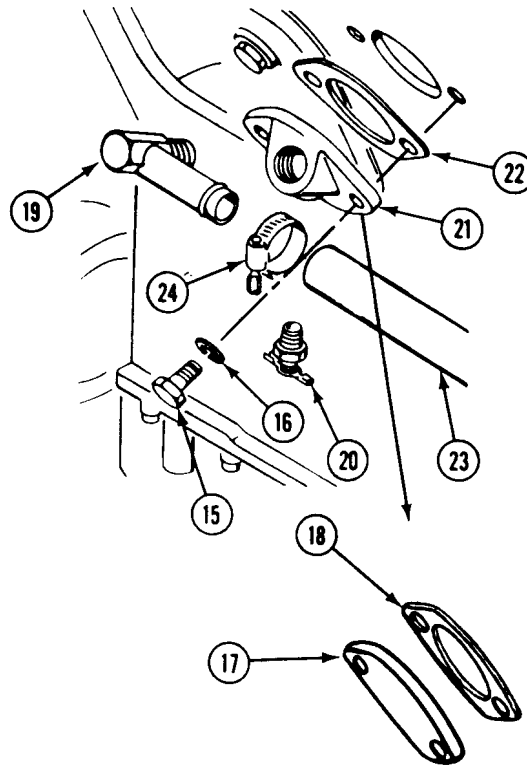


Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

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.

50. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external pipe threads of elbow (19) and drain cock (20). Do not apply primer or sealing compound beyond small end of threads.
51. Remove two screws (15), washers (16), plate (17), and gasket (18) from engine right side. Discard plate and gasket. Retain screws and washers.
52. Install elbow (19) and drain cock (20) in mount (21).
53. Apply a thin coat of sealing compound (WP 0105 00, Item 18) to both sides of gasket (22) before assembly.
54. Install mount (21) and gasket (22) over engine right side opening. Secure with two screws (15) and washers (16).

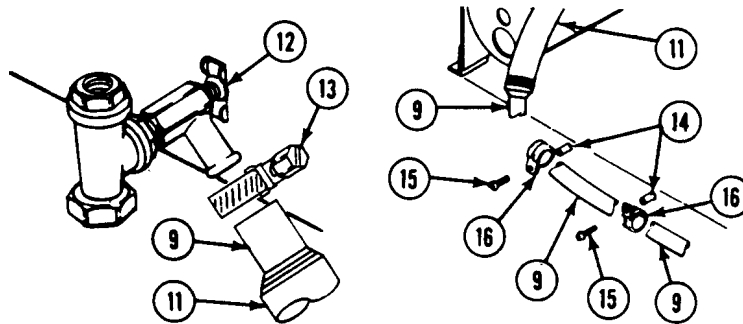
55. Install hose (23) on elbow (19). Secure with clamp (24).



56. Install insulation tube (11) on hose (9). Secure with tape.

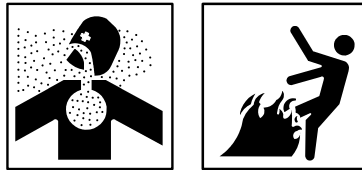
57. Install hose (9) on shutoff cock (12). Secure with clamp (13).

58. Install hose (9) on two weldnuts (14). Secure with two screws (15) and clamps (16).



59. Remove plug (1) from oil cooler elbow (2). Discard plug.
60. Clean external pipe threads of elbow (3) and adapter (4) with solvent, cleaning compound.

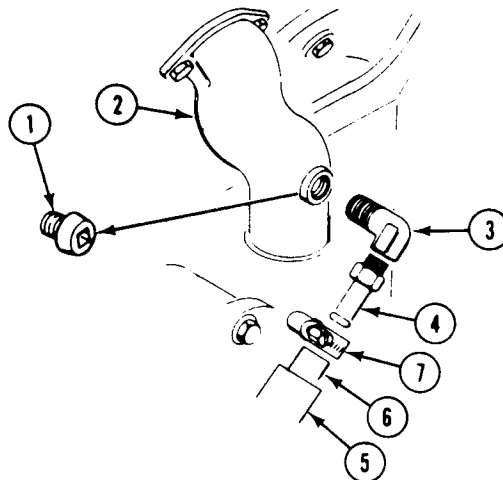
WARNING



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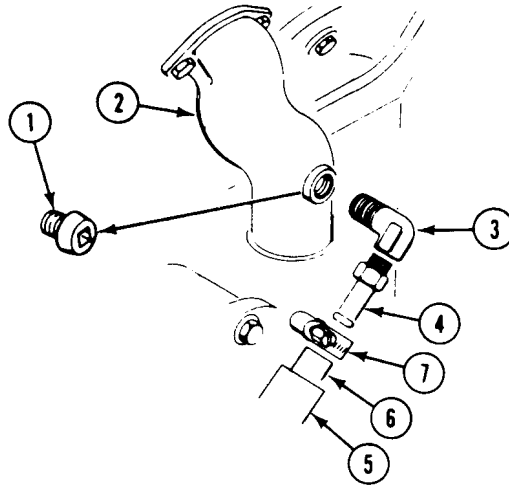
61. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external pipe threads of elbow (3) and adapter (4). Do not apply primer or sealing compound beyond small end of threads.



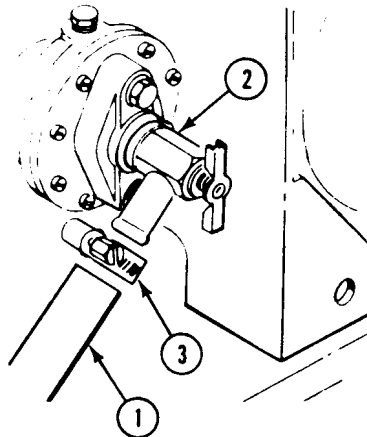
ENGINE BLOCK (LEFT SIDE)

INSTALL ENGINE COOLANT HEATER KIT (M577A2 AND M1068 ONLY) — Continued**0060 00**

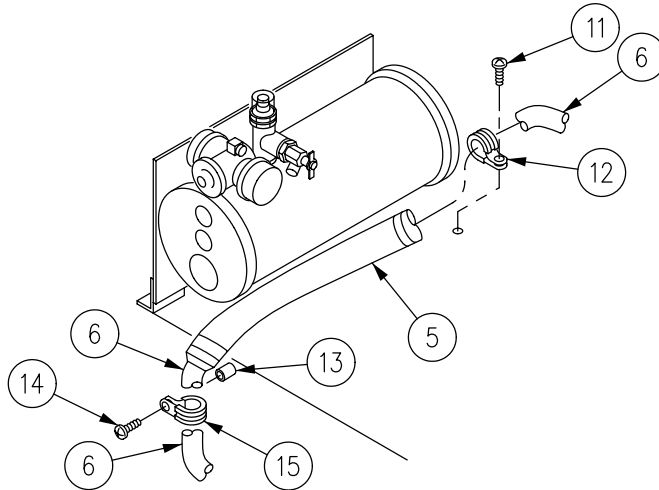
62. Install elbow (3) in elbow (2).
63. Install adapter (4) in elbow (3).
64. Install insulation tube (5) on hose (6). Secure with tape.
65. Install hose (6) on adapter (4). Secure with clamp (7).

**ENGINE BLOCK (LEFT SIDE)**

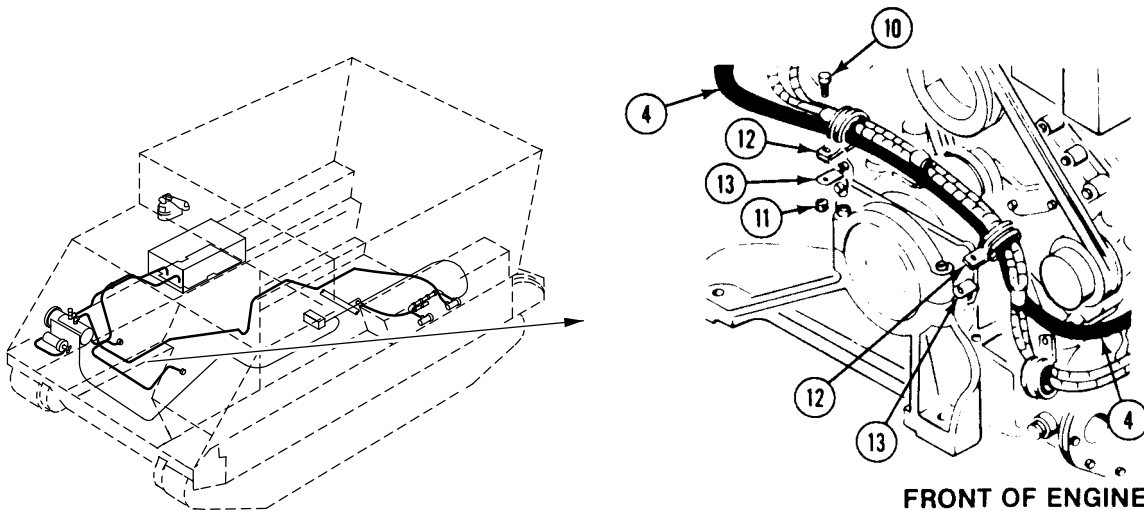
66. Install hose (1) on shutoff cock (2). Secure with clamp (3).

**COOLANT PUMP**

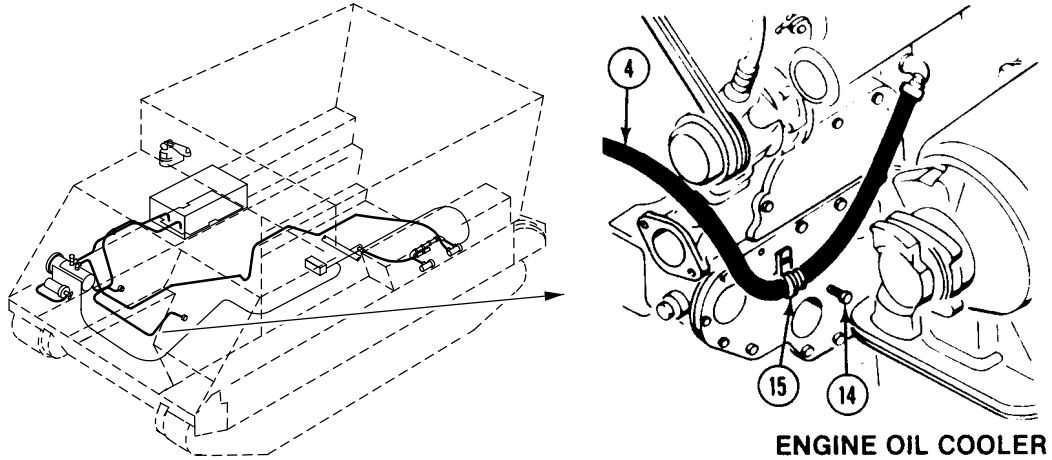
- 67. Install hose (6) on sponson. Secure with screw (11) and clamp (12).
- 68. Install hose (6) on weldnut (13). Secure with screw (14) and clamp (15).



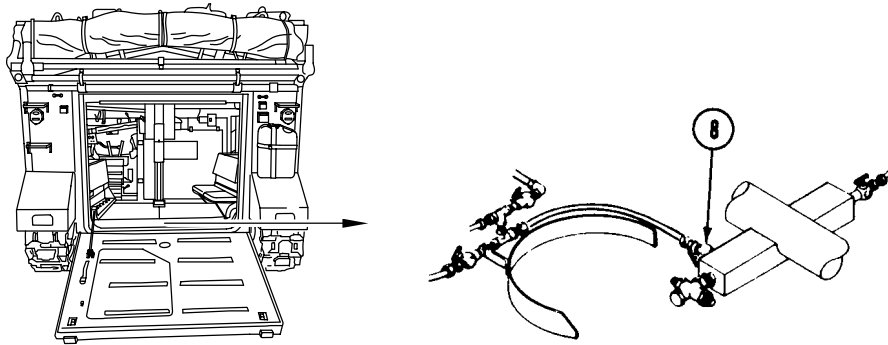
- 69. Remove two screws (10), nuts (11), and clamps (12) that secure power plant wiring harness to two brackets (13). Discard clamps.
- 70. Install hose (4) and power plant wiring harness on two brackets (13). Secure with two screws (10), nuts (11), and two clamps (12).



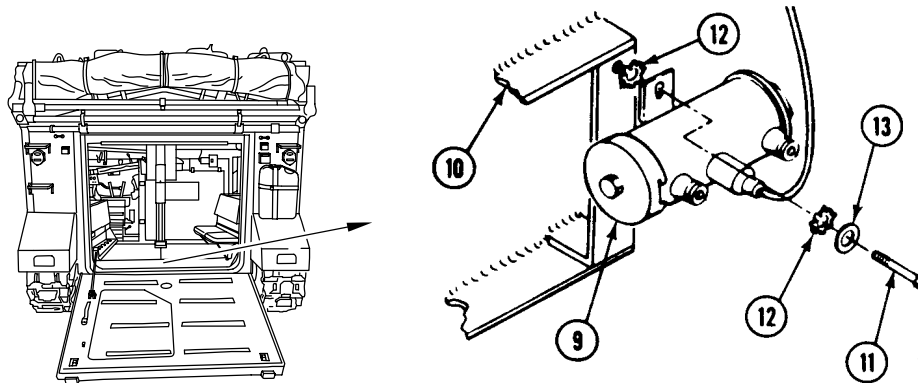
71. Remove screw (14) from oil cooler housing.
72. Install hose (4) on oil cooler housing. Secure with screw (14) and clamp (15).



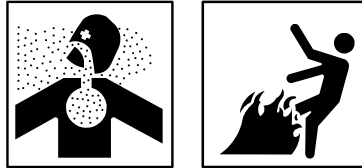
73. Make sure heater fuel valve (8) is closed.



74. Install coolant heater fuel pump (9) on bracket (10). Secure with two screws (11), four lockwashers (12), and two flat washers (13).



75. Clean external pipe threads of all fittings with solvent, cleaning compound.

WARNING

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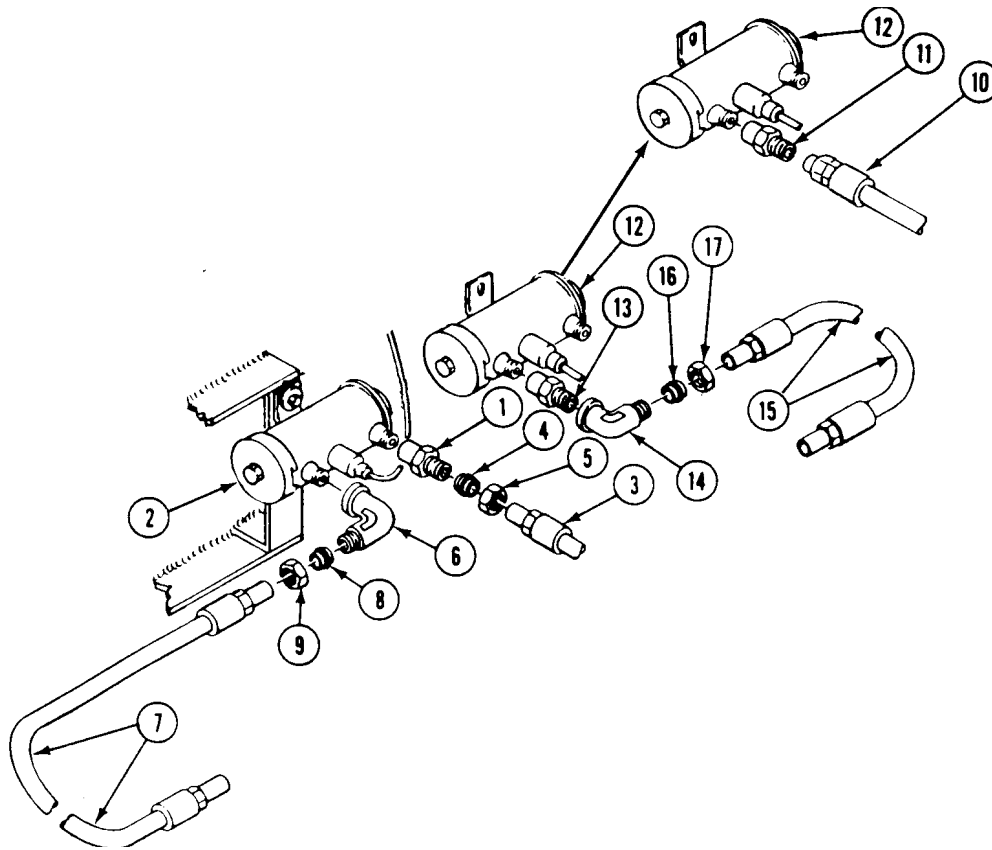
76. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external pipe threads of all fittings. Do not apply primer or sealing compound beyond small end of threads.
77. Install adapter body (1) on coolant heater fuel pump (2).
78. Install fuel hose (3) in adapter body (1). Secure with sleeve (4) and nut (5).
79. Install elbow (6) on coolant heater fuel pump (2).
80. Install fuel hose (7) in elbow (6). Secure with sleeve (8) and nut (9).

NOTE

Parts (10) through (17) are already installed if the electronic equipment heater has been installed.

81. Disconnect fuel hose (10) from adapter body (11) on personnel heater fuel pump (12).
82. Remove and retain adapter body (11) from personnel heater fuel pump (12).
83. Install adapter body (13) on personnel heater fuel pump (12).
84. Secure elbow (14) to adapter (13).

85. Install fuel hose (15) in elbow (14). Secure with sleeve (16) and nut (17).

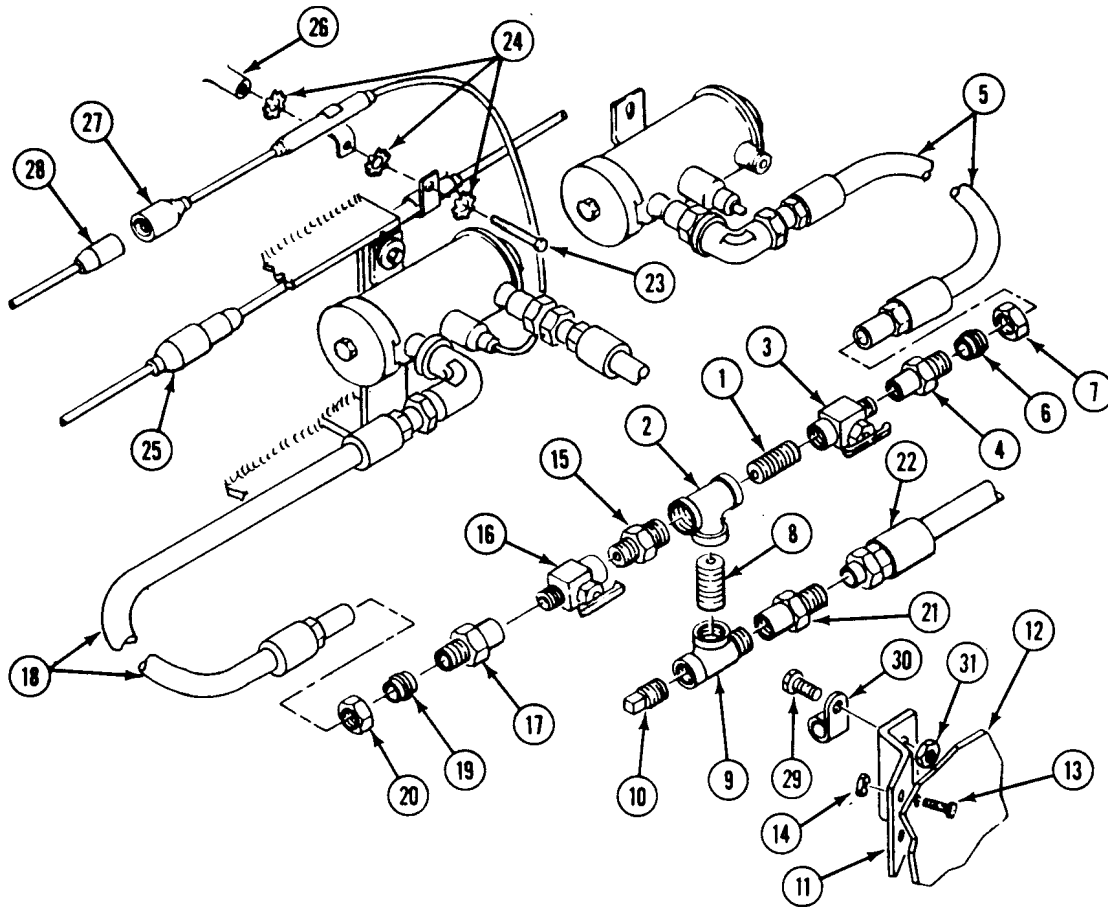


NOTE

Parts (1) through (15) and (29) through (31) are already installed if the electronic equipment heater has been installed.

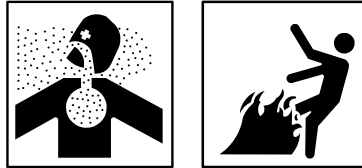
86. Install nipple (1) in tee (2).
87. Install shutoff cock (3) on nipple (1).
88. Install adapter (4) in shutoff cock (3).
89. Install fuel hose (5) in adapter body (4). Secure with sleeve (6) and nut (7).
90. Install nipple (8) in tee (2).
91. Install tee (9) on nipple (8).
92. Install plug (10) in tee (9).
93. Install bracket (11) on fuel hose guard (12). Secure with two screws (13) and nuts (14).
94. Install adapter (15) in tee (2).
95. Install coolant heater fuel shutoff cock (16) on adapter (15).
96. Install adapter body (17) on coolant heater fuel shutoff cock (16).
97. Install fuel hose (18) in adapter body (17). Secure with sleeve (19) and nut (20).
98. Install adapter body (21) in tee (9).
99. Connect fuel hose (22) to adapter body (21).
100. Remove screw (23), lockwasher (24), and personnel heater fuel pump lead (25) from weldnut (26).
101. Install coolant heater fuel pump lead (27) and personnel heater fuel pump lead (25) on weldnut (26). Secure with screw (23) and three lockwashers (24).
102. Connect circuit 400C lead (28) to coolant heater fuel pump lead (27).

103. Install adapter (15) on bracket (11). Secure with screw (29), clamp (30), and nut (31).



104. Clean external pipe threads of elbow (1) with solvent, cleaning compound.

WARNING

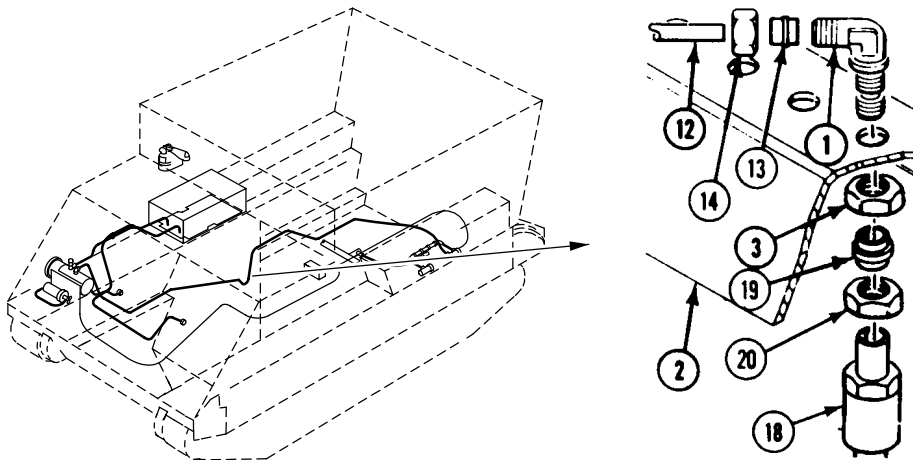


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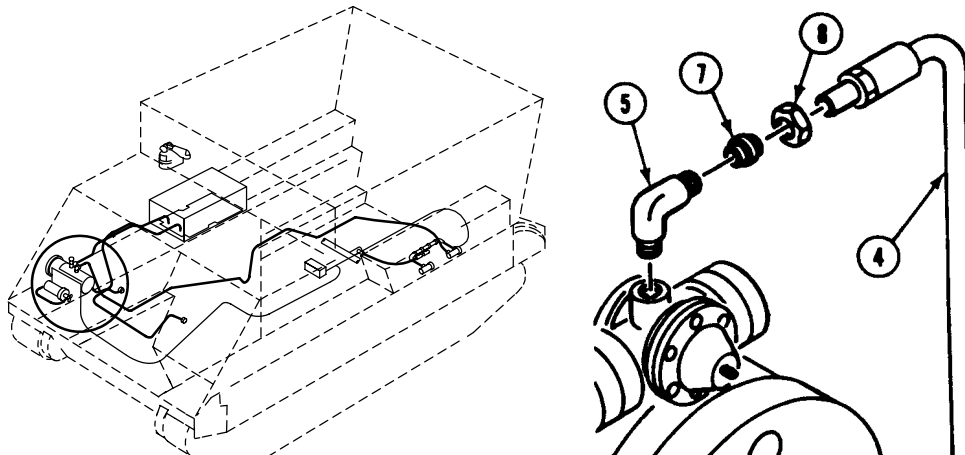
Always use in well ventilated areas, away from heat, sparks, and flames. Do not breathe fumes. Do not allow into contact with skin and eyes. Use goggles or face shield and protective gloves.

105. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external pipe threads of elbow (1). Do not apply primer or sealing compound beyond small end of threads.

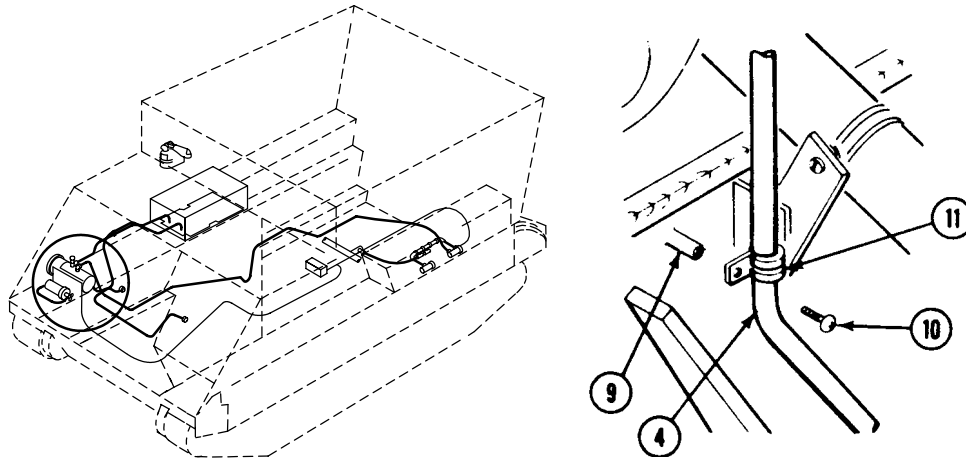
106. Install elbow (1) in transverse beam (2). Secure with nut (3).



107. Install fuel hose (4) in control valve elbow (5). Secure with sleeve (7) and nut (8).

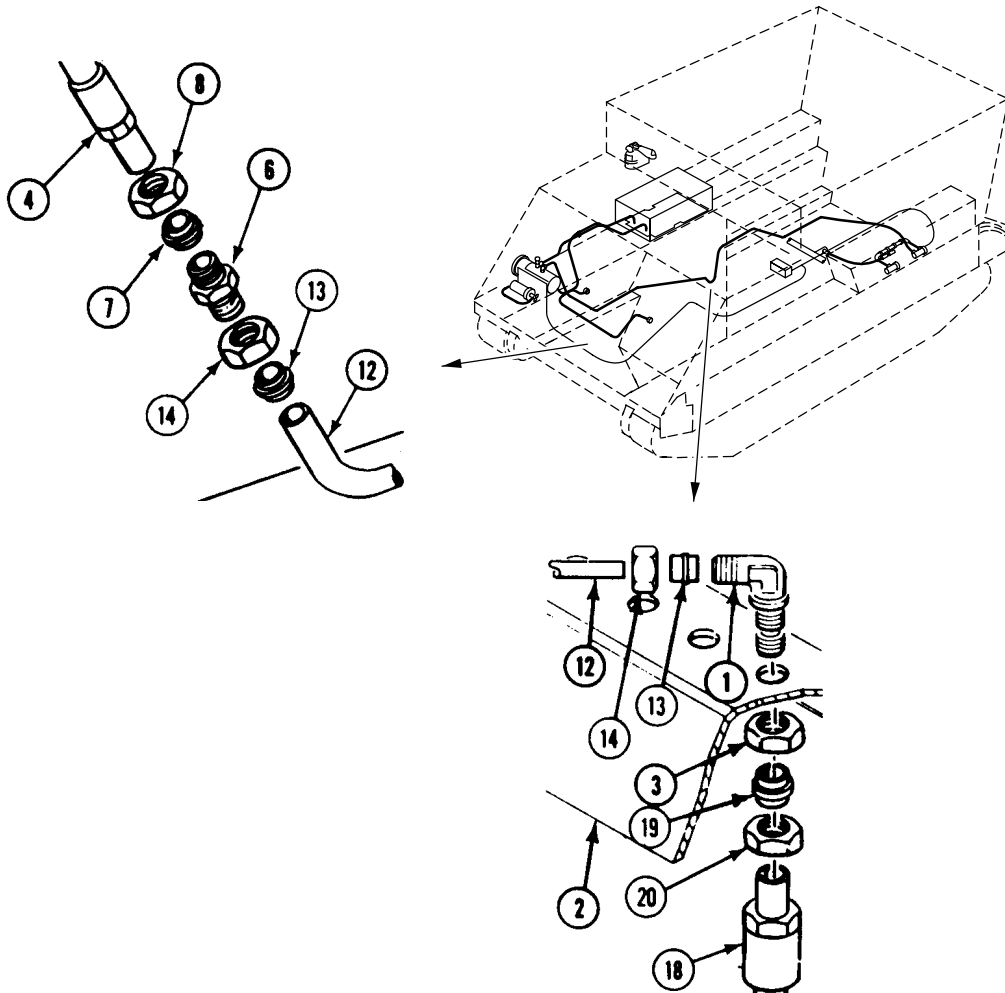


108. Install fuel hose (4) on weldnut (9). Secure with screw (10) and clamp (11).

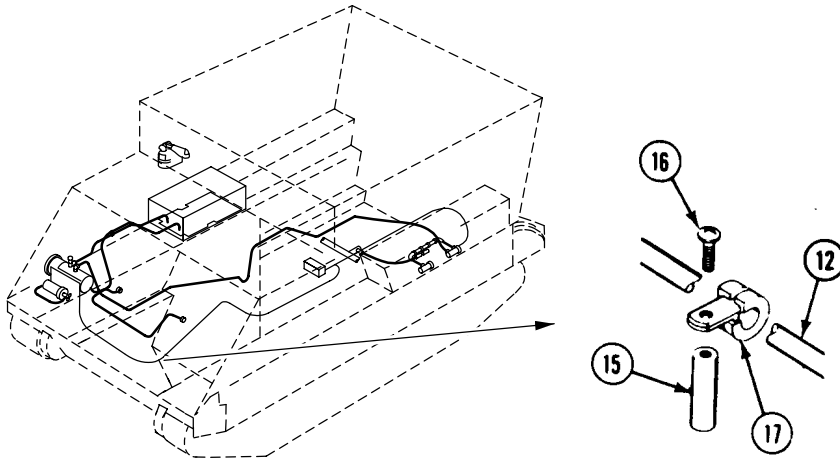


109. Install fuel tube (12) in elbow (1) and nipple (6). Secure with two sleeves (13) and nuts (14).

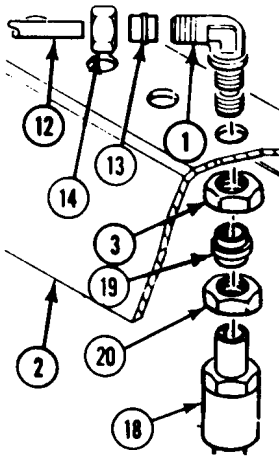
110. Install fuel hose (4) in nipple (6). Secure with sleeve (7) and nut (8).



111. Install fuel tube (12) on three weldnuts (15). Secure with three screws (16) and clamps (17).

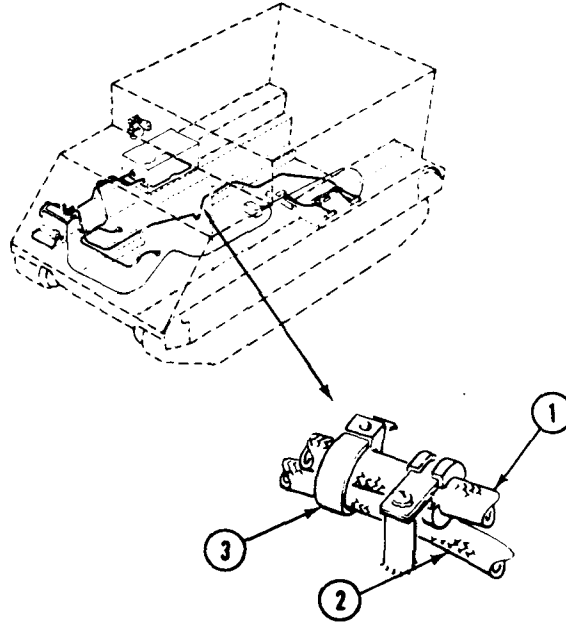


112. Install fuel hose (18) in elbow (1). Secure with sleeve (19) and nut (20).



113. Place fuel hose (1) next to personnel heater fuel hose (2).

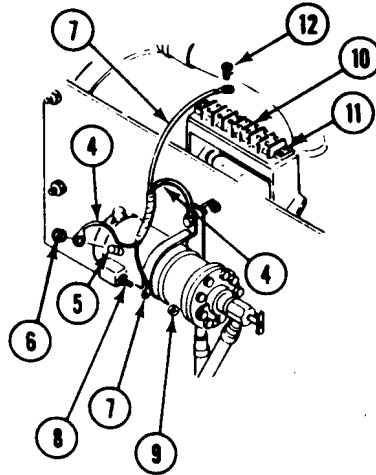
114. Install fuel hose (1) on personnel heater fuel hose (2). Secure with ten straps (3).



115. Install ground leads (4) on coolant pump terminal (5). Secure with nut (6).

116. Install circuit 402B lead (7) on coolant pump terminal (8). Secure with nut (9).

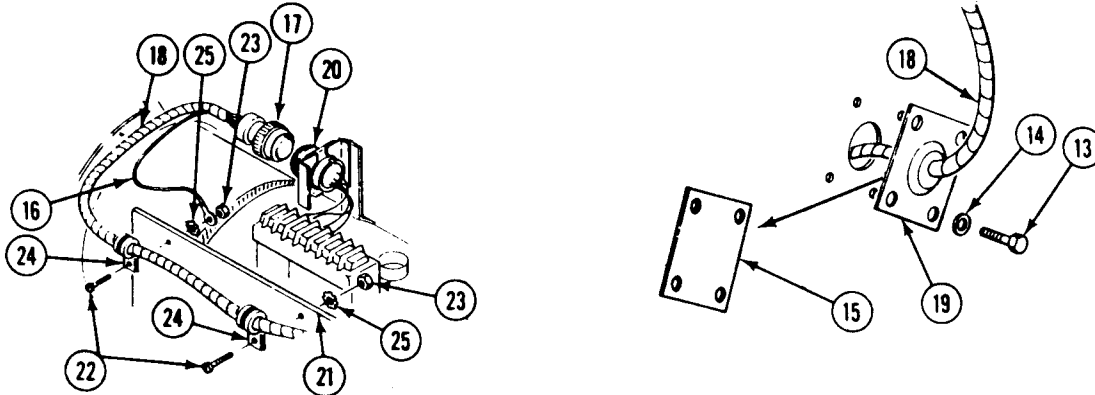
117. Secure circuit 402B lead (7) to terminal 4 (10) on terminal strip (11) with screw (12).



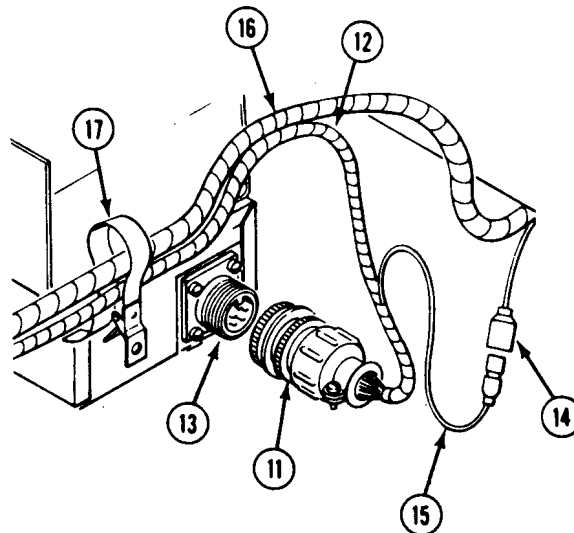
INSTALL ENGINE COOLANT HEATER KIT (M577A2 AND M1068 ONLY) — Continued

0060 00

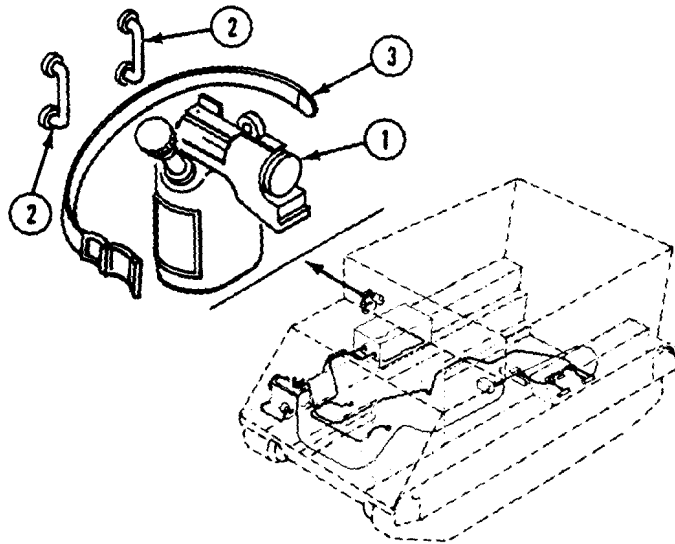
118. Remove four screws (13), washers (14), and plate (15) from driver's compartment bulkhead. Discard plate.
119. Thread terminal ground lead (16), coolant heater connector (17), and wiring harness (18) through new wiring harness plate (19) and driver's compartment bulkhead opening.
120. Install wiring harness plate (19) on driver's compartment bulkhead. Secure with four screws (13) and washers (14).
121. Connect coolant heater connector (17) of wiring harness (18) to coolant heater receptacle (20).
122. Install wiring harness (18) and terminal ground lead (16) on mounting bracket (21). Secure with two screws (22), nuts (23), clamps (24), and lockwashers (25).



123. Connect control box connector (11) of wiring harness (12) to control box receptacle (13).
124. Connect main wiring harness circuit 400C lead (14) to coolant heater wiring harness lead (15).
125. Install wiring harness (12) on front main wiring harness (16). Secure with eight straps (17).



126. Install blowtorch (1) on two brackets (2). Secure with strap (3).



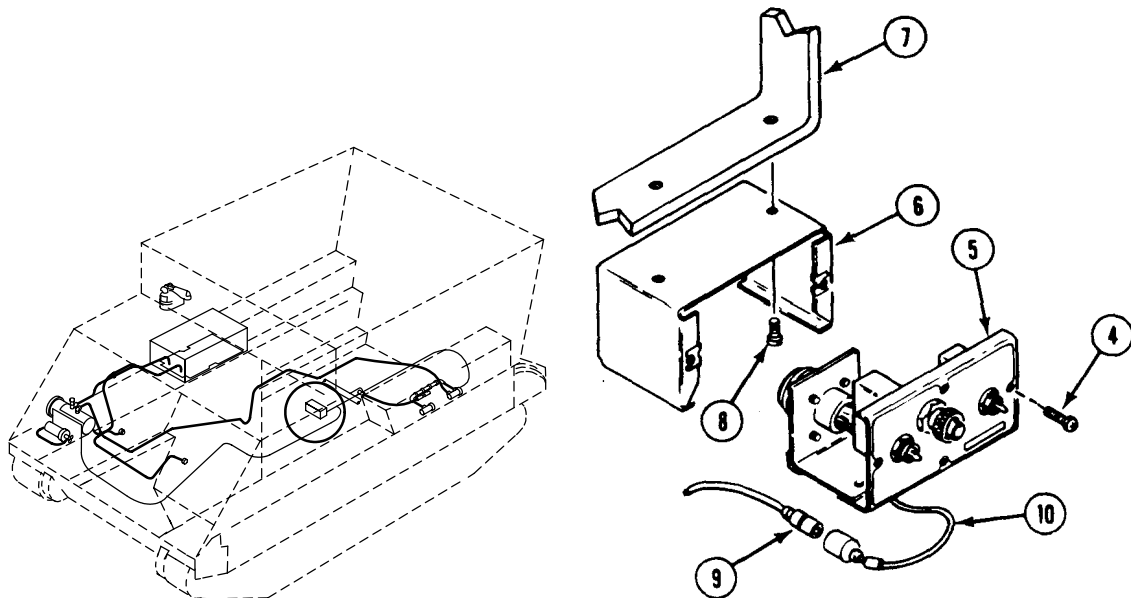
127. Remove two screws (4) and control panel (5) from control box case (6).

128. Remove and discard two screws, nuts, and washers supplied with control box case (6).

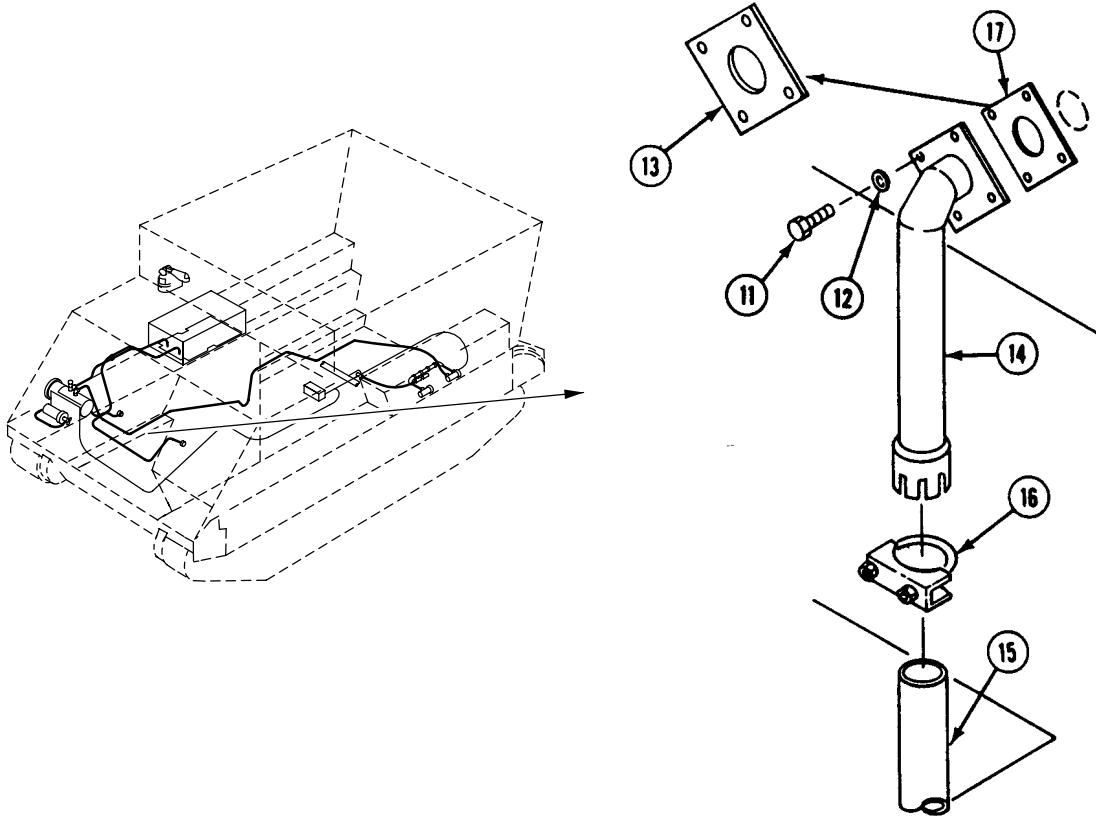
129. Install control box case (6) on hull bracket (7). Secure with two screws (8).

130. Install control panel (5) in control box case (6). Secure with two screws (4).

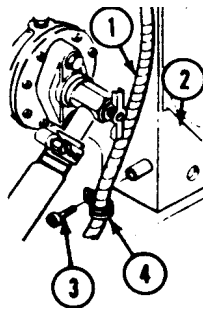
131. Connect circuit 400C lead (9) to control box lead (10).



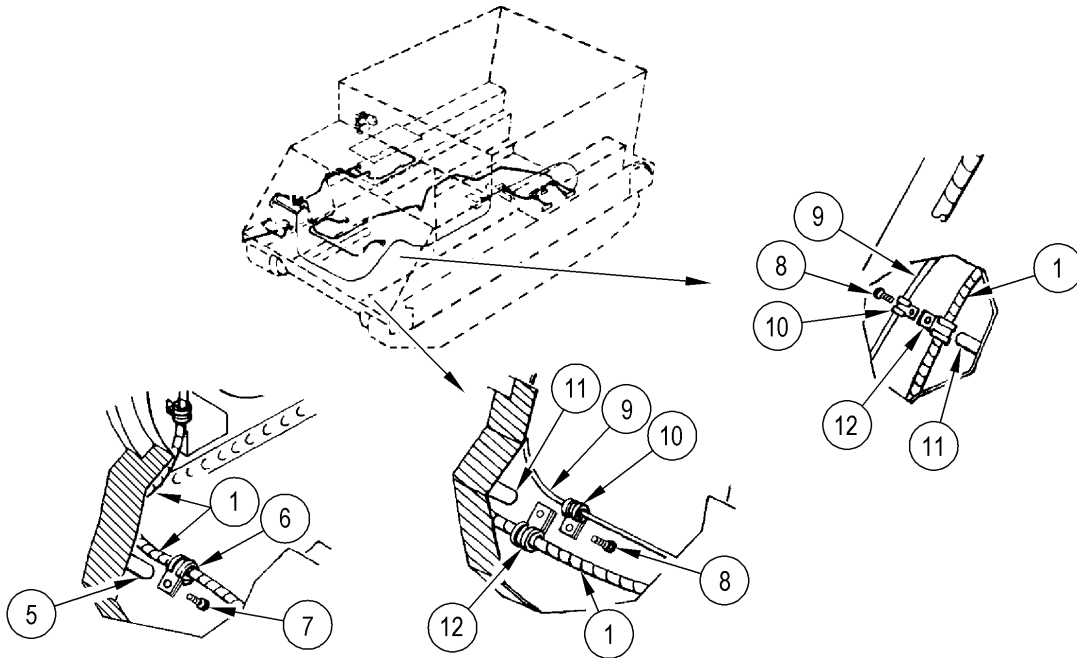
132. Lower power plant grille assembly (see your -20).
133. Remove four screws (11), washers (12), and plate (13) from grille. Discard plate.
134. Install upper tube (14) on exhaust pipe (15). Secure with clamp (16). Do not tighten.
135. Position upper tube (14) and gasket (17) on grille.
136. Secure with four screws (11) and washers (12).
137. Tighten clamp (16).



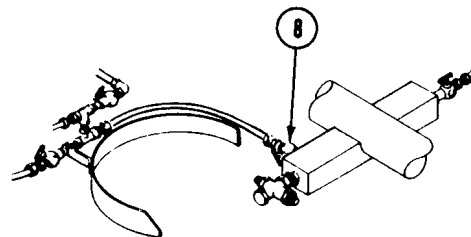
138. Install wiring harness (1) on mounting bracket (2) left side. Secure with screw (3) and clamp (4).



139. Install wiring harness (1) on two weldnuts (5). Secure with two clamps (6) and screws (7).
140. Remove three screws (8) that secure fuel control cable (9) and three clamps (10) to three weldnuts (11).
141. Install wiring harness (1) and fuel control cable (9) to three weldnuts (11). Secure with three screws (8), clamps (10), and clamps (12).



142. Replace standard generator belts with kit belts (see your -20).
143. Replace standard fan drive belts with kit belts (see your -20).
144. Open coolant heater fuel valve (8).



FOLLOW-THROUGH STEPS

1. Install personnel heater (see your -20).
2. Lower power plant grille (see your -20).
3. Fill carrier cooling system (see your -20).
4. Fill coolant heater cooling system (see your -20).
5. Connect battery ground lead (see your -20).
6. Bleed coolant heater fuel line (see your -20).
7. Start coolant heater (see your -10). Check for leaks and that heater operates properly. Turn heater off.
8. Install rear and right front floor plates (see your -20).
9. Install driver's power plant access panel (see your -20).
10. Install power plant rear access panel (see your -20).
11. Close power plant front access door and raise trim vane (see your -10).
12. Raise and lock ramp (see your -10).
13. Stop engine (see your -10).
14. Install generator set (see your -10) or 5.0 KW APU (see your -20).

END OF TASK

INSTALL ENGINE COOLANT HEATER KIT (M1064 ONLY)

0061 00

THIS WORK PACKAGE COVERS:

Installation (page 0061 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Materials/Parts

- Sealing compound (WP 0105 00, Item 17)
- Sealing compound (WP 0105 00, Item 18)
- Sealing compound primer (WP 0105 00, Item 21)
- Solvent, cleaning compound (WP 0105 00, Item 10)
- Tape, glass, insulation (WP 0105 00, Item 24)
- Kit P/N 12269225 (19207)
- Lockwasher
- Lockwasher (4)
- Lockwasher (5)

Personnel Required

Track Vehicle Repairer 63H10

References

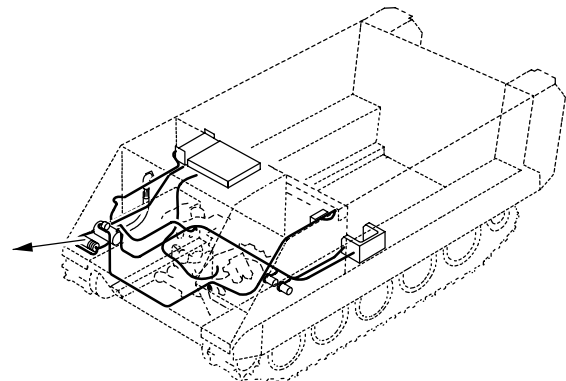
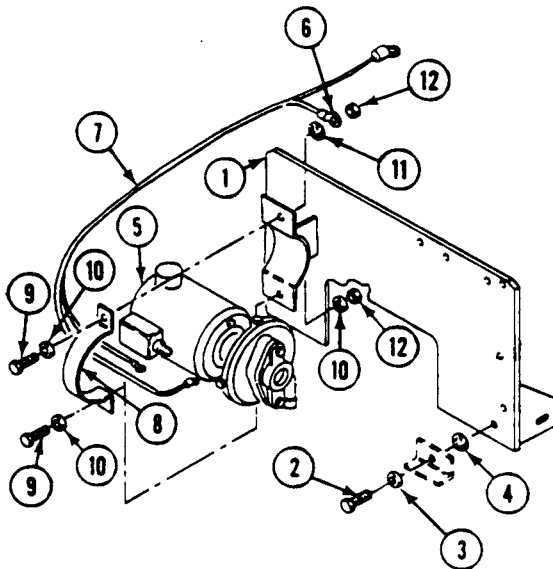
- See your -20
- TM 9-6140-200-14

Equipment Condition

- Engine stopped (see your -10)
- Carrier blocked (see your -10)
- Ramp lowered (see your -10)
- Battery ground lead disconnected (see your -20)
- Driver's power plant access panel removed (see your -20)
- Power plant rear access panel removed (see your -20)
- Trim vane lowered and power plant front access door open (see your -10)
- Front floor plates removed (see your -20)
- Power plant grille raised (see your -20)
- Carrier cooling system drained (see your -20)
- Personnel heater kit installed (WP 0056 00)
- Personnel heater removed (see your -20)

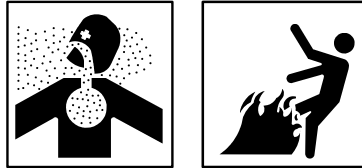
INSTALLATION

1. Install mounting bracket (1) on right front sponson. Secure with four screws (2), flat washers (3), and lockwashers (4).
2. Install coolant pump (5) and ground lead (6) for wiring harness (7) to mounting bracket (1). Secure with clamp (8), two screws (9), three flat washers (10), one lockwasher (11), and two nuts (12).



3. Clean external pipe threads of bushing (1), shutoff cock (2), elbow (3), and elbow (4) with solvent, cleaning compound.

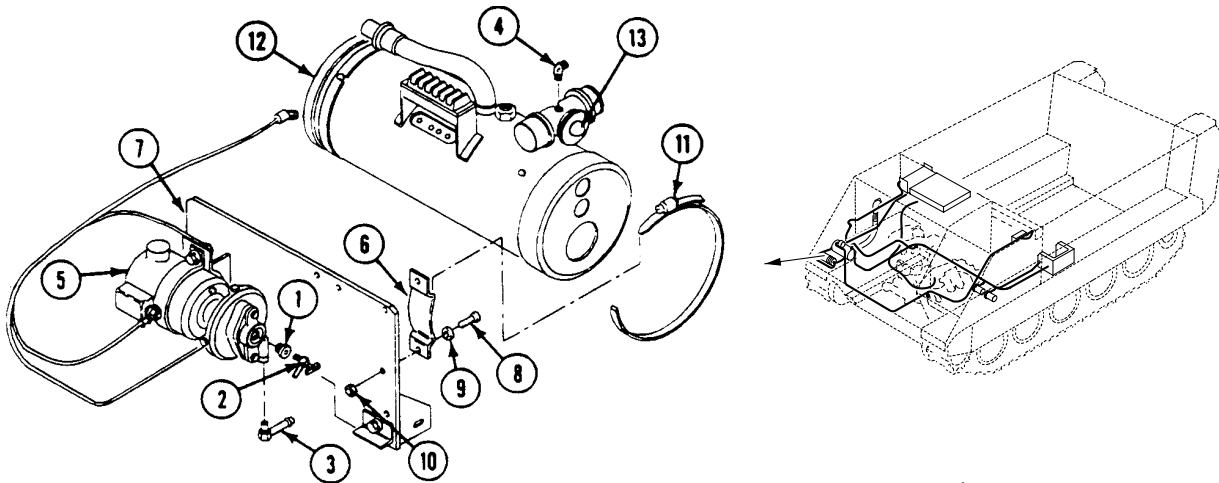
WARNING



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.

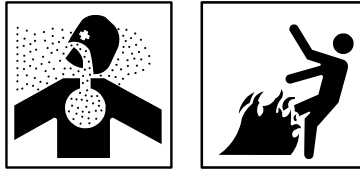
Always use in well ventilated areas, away from heat, sparks, and flames. Do not breathe fumes. Do not allow into contact with skin and eyes. Use goggles or face shield and protective gloves.

4. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external pipe threads of bushing (1), shutoff cock (2), elbow (3), and elbow (4). Do not apply primer or sealing compound beyond small end of threads.
5. Install bushing (1), shutoff cock (2), and elbow (3) in coolant pump (5).
6. Install two mounting saddles (6) on mounting bracket (7). Secure with four screws (8), washers (9), and nuts (10).
7. Install two clamps (11) in two mounting saddles (6).
8. Install coolant heater (12) to two mounting saddles (6). Secure with two clamps (11).
9. Install elbow (4) in control valve (13).



10. Clean external pipe threads of tee (1), bushing (2), shutoff cock (3), bushing (4), elbow (5), and elbow (6) with solvent, cleaning compound.

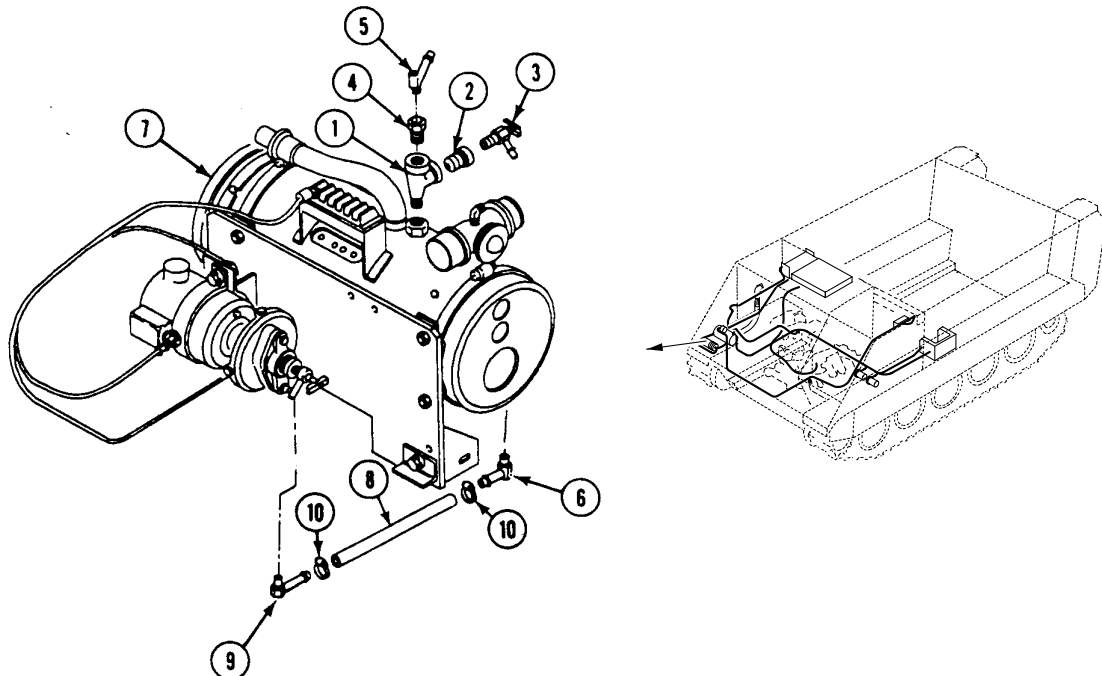
WARNING



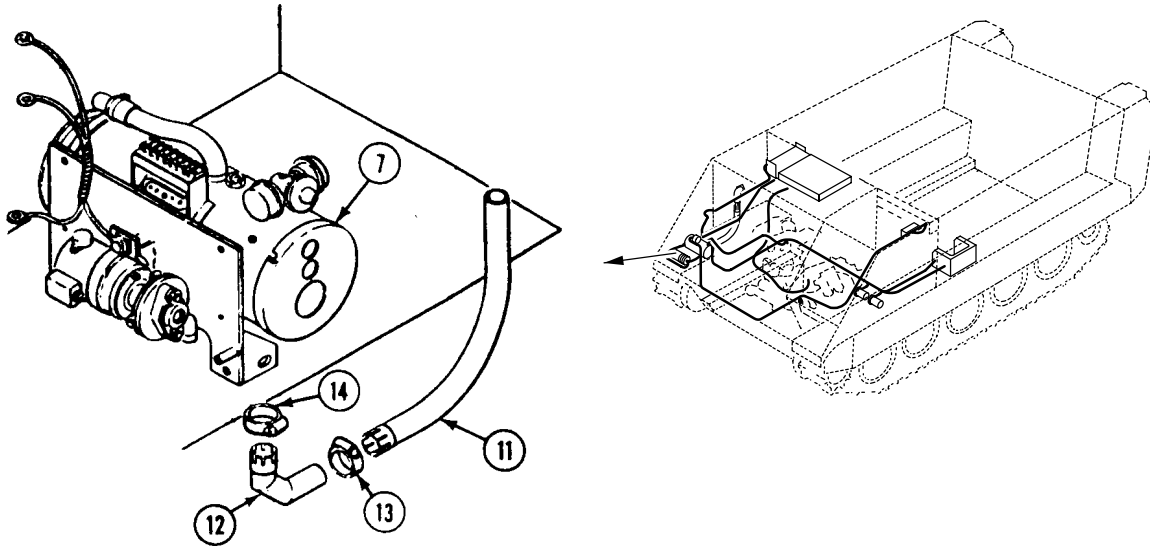
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11. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external pipe threads of tee (1), bushing (2), shutoff cock (3), bushing (4), and two elbows (5) and (6). Do not apply primer or sealing compound beyond small end of threads.
12. Install tee (1) in coolant heater (7).
13. Install bushing (2) in tee (1).
14. Install shutoff cock (3) in bushing (2).
15. Install bushing (4) in tee (1).
16. Install elbow (5) in bushing (4).
17. Install elbow (6) in coolant heater (7).
18. Install hose (8) on elbow (9) and elbow (6) with two clamps (10).



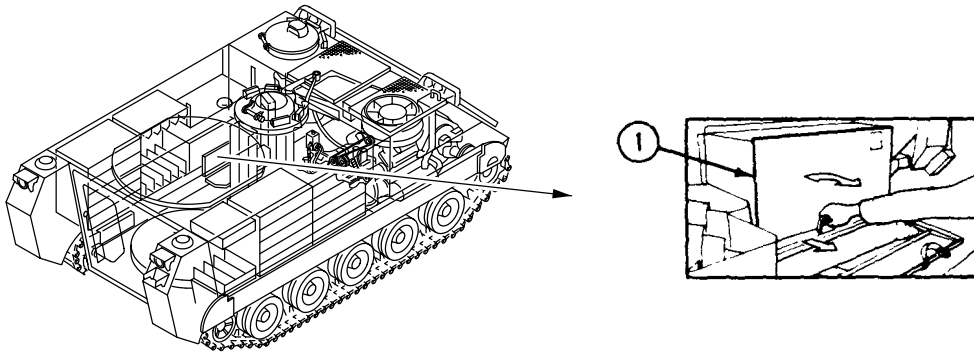
19. Install exhaust pipe (11) on lower tube (12). Secure with clamp (13). Do not tighten clamp.
20. Install lower tube (12) in coolant heater (7). Secure with clamp (14). Do not tighten clamp.
21. Tighten two clamps (13) and (14).



NOTE

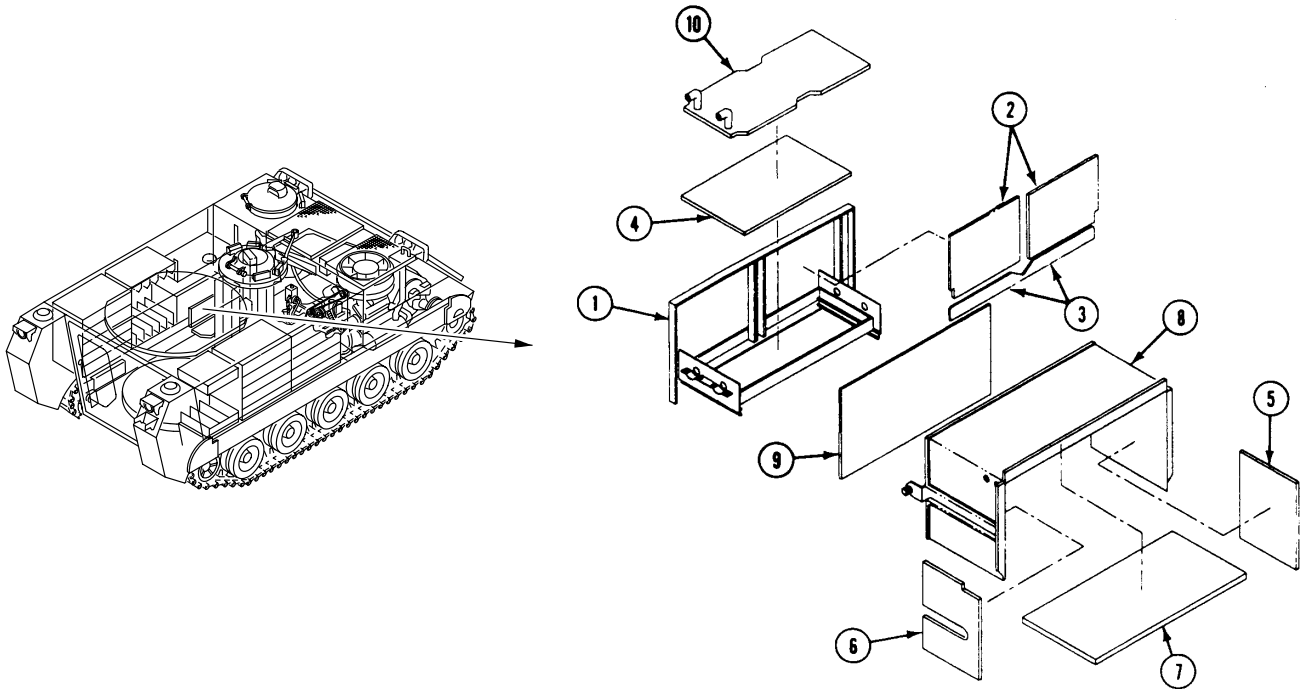
Lower the left crew seat backrest before you open the battery drawer.

22. Open battery drawer (1) and remove batteries (see your -20). Clean battery drawer. See TM 9-6140-200-14. Clean batteries with solvent, cleaning compound.

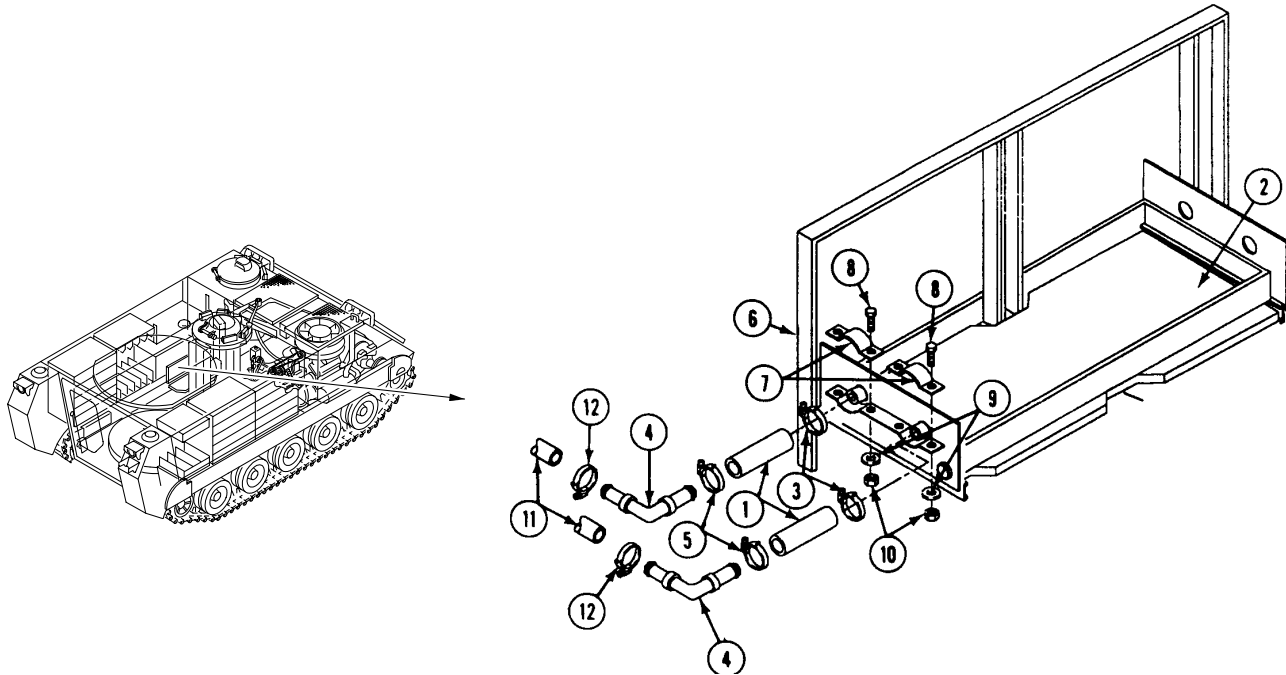


INSTALL ENGINE COOLANT HEATER KIT (M1064 ONLY) — Continued**0061 00**

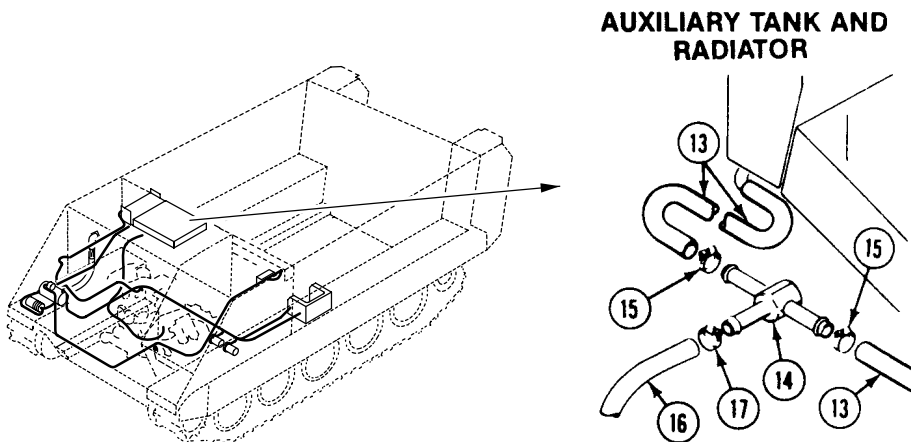
23. Renew adhesive backing on insulation sheets (2) with solvent, cleaning compound. Wait 10 to 20 seconds until adhesive becomes tacky.
24. Install two insulation sheets (2) and two strips (3) on battery drawer (1) front. Install bottom insulation sheet (4) in battery drawer (1).
25. Install left insulation sheet (5), right insulation sheet (6), and top insulation sheet (7) in battery drawer shield (8). Install rear insulation sheet (9) in rear of battery drawer compartment.
26. Place heat exchanger (10) in battery drawer (1).



27. Install two short hoses (1) in heat exchanger (2). Secure with two clamps (3).
28. Install two elbows (4) on two short hoses (1). Secure with two clamps (5).
29. Install two hoses (1) in battery drawer (6). Secure with two brackets (7), four screws (8), washers (9), and nuts (10).
30. Install two hoses (11) to two elbows (4). Secure with two clamps (12).
31. Install batteries. Close and latch battery drawer (6).

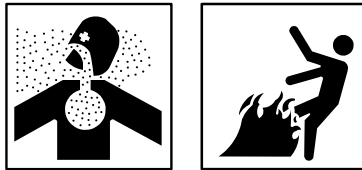


32. Cut auxiliary tank hose (13). Install tee (14) and secure with two clamps (15).
33. Install hose (16) on tee (14). Secure with clamp (17).



34. Clean external pipe threads of tee (1), bushing (2), elbow (3), bushing (4), shutoff cock (5), elbow (6), and draincock (7) with solvent, cleaning compound.

WARNING

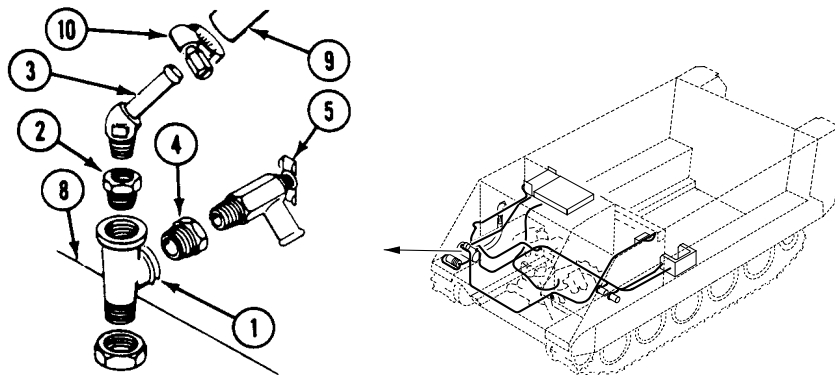


Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

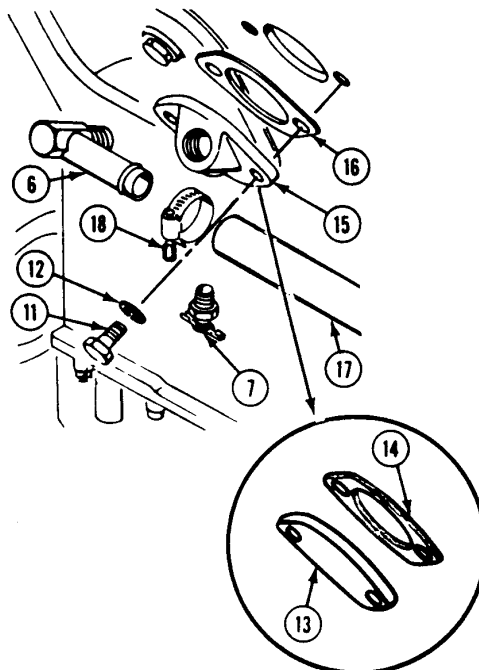
Always use in well ventilated areas, away from heat, sparks, and flames. Do not breathe fumes. Do not allow into contact with skin and eyes. Use goggles or face shield and protective gloves.

35. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external pipe threads of tee (1), bushing (2), elbow (3), bushing (4), shutoff cock (5), elbow (6), and draincock (7). Do not apply primer or sealing compound beyond small end of threads.

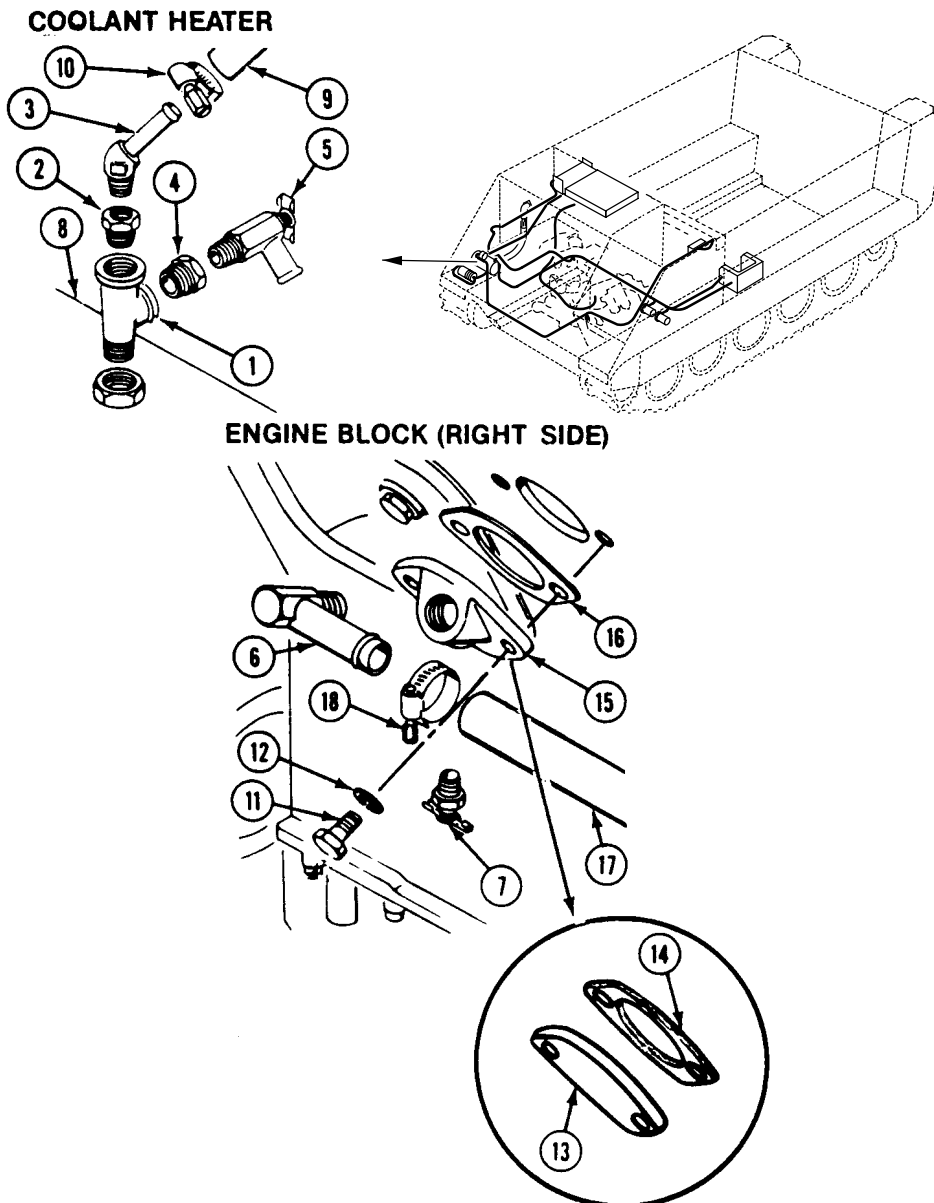
COOLANT HEATER



ENGINE BLOCK (RIGHT SIDE)



36. Install tee (1) in coolant heater (8).
37. Install bushing (2) in tee (1).
38. Install elbow (3) in bushing (2).
39. Install bushing (4) in tee (1).
40. Install shutoff cock (5) in bushing (4).
41. Install hose (9) on elbow (3). Secure with clamp (10).
42. Remove two screws (11), washers (12), plate (13), and gasket (14) from engine block right side. Discard plate and gasket.
43. Install elbow (6) and draincock (7) in mount (15).
44. Apply a thin coat of sealing compound (WP 0105 00, Item 18) to both sides of gasket (16) before assembly.
45. Install mount (15) and gasket (16) on engine block opening. Secure with two screws (11) and washers (12).
46. Install hose (17) on elbow (6). Secure with clamp (18).

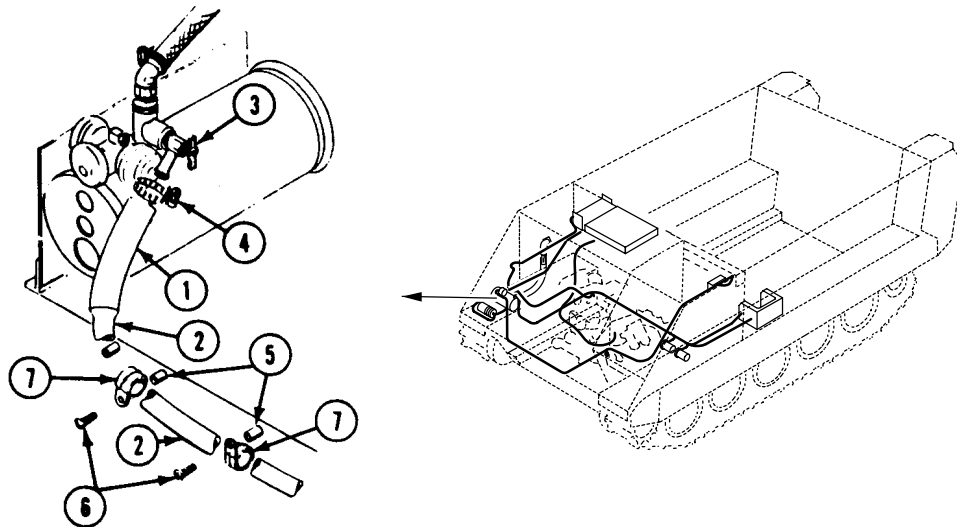


INSTALL ENGINE COOLANT HEATER KIT (M1064 ONLY) — Continued

0061 00

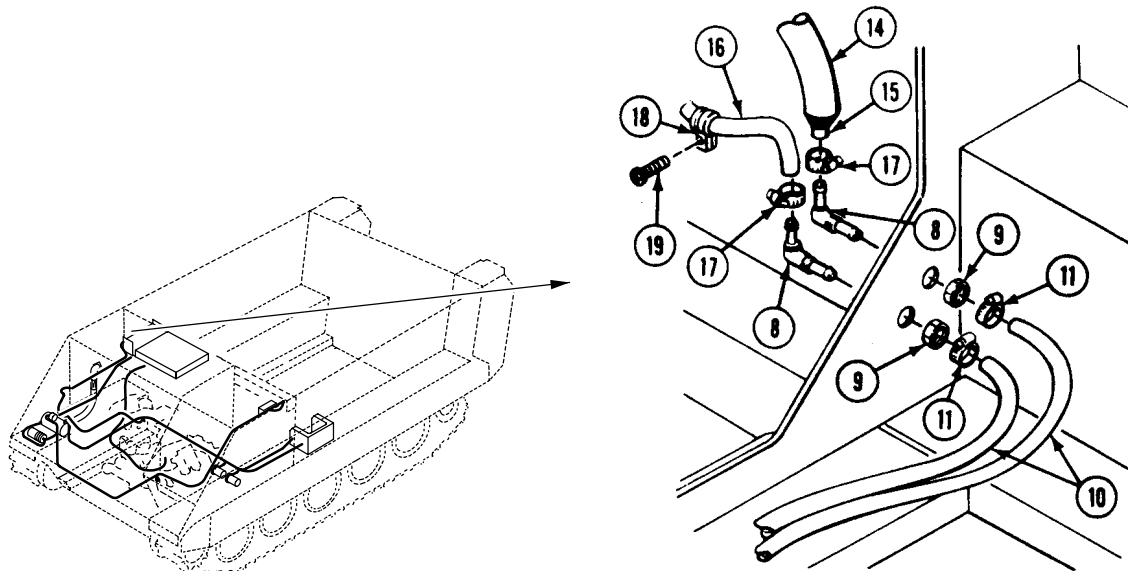
47. Install insulation tube (1) on hose (2) and secure with tape.
48. Install hose (2) on shutoff cock (3). Secure with clamp (4).
49. Install hose (2) on two weldnuts (5). Secure with two screws (6) and clamps (7).

COOLANT HEATER

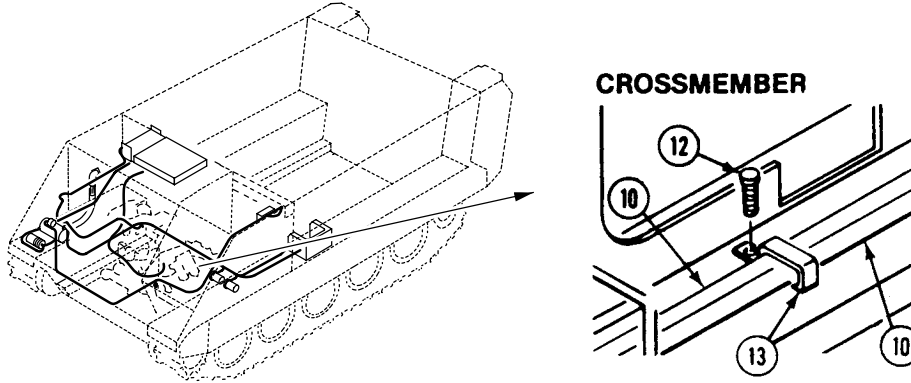


50. Install two elbows (8) to power plant compartment bulkhead. Secure with two nuts (9).
51. Install two hoses (10) on two elbows (8). Secure with two clamps (11).

POWER PLANT BULKHEAD

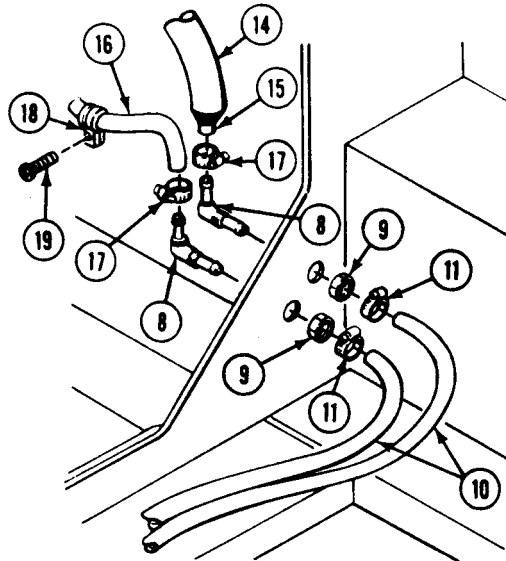


52. Remove two screws (12) that secure personnel heater duct to floor plate.
53. Install two hoses (10), clamps (13), and heater duct on floor plate. Secure with two screws (12).

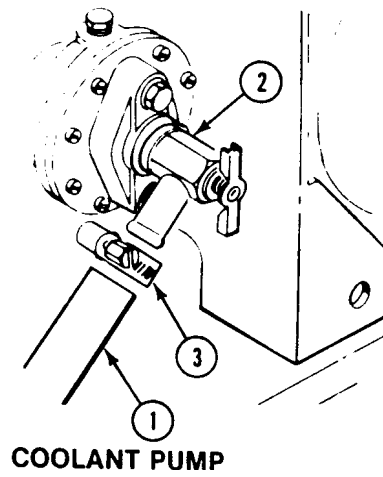


54. Install insulation tubing (14) on hose (15). Secure with insulation tape.
55. Install two hoses (15) and (16) on two elbows (8). Secure with two clamps (17).
56. Install hose (16) on side of sponson. Secure with three clamps (18) and screws (19).

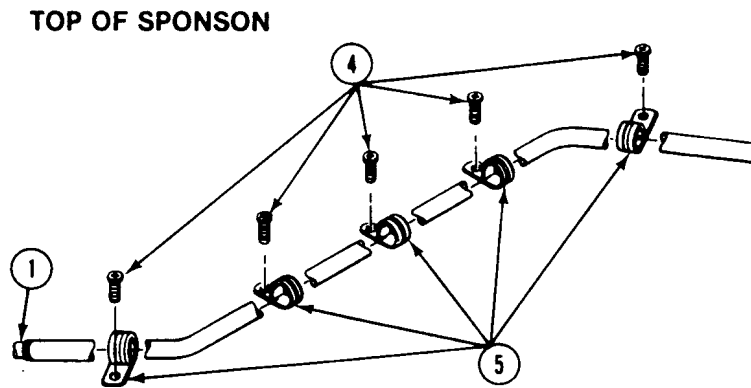
POWER PLANT BULKHEAD



57. Install hose (1) on shutoff cock (2). Secure with clamp (3).

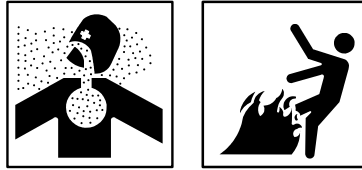


58. Install hose (1) on top of sponson. Secure with five screws (4) and clamps (5).



59. Clean external pipe threads of elbow (3) and adapter (4) with solvent, cleaning compound.

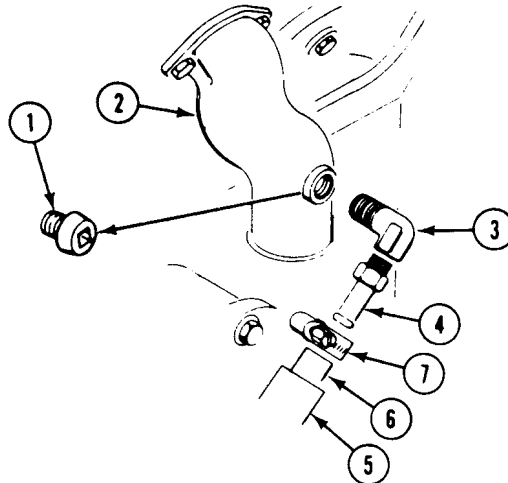
WARNING



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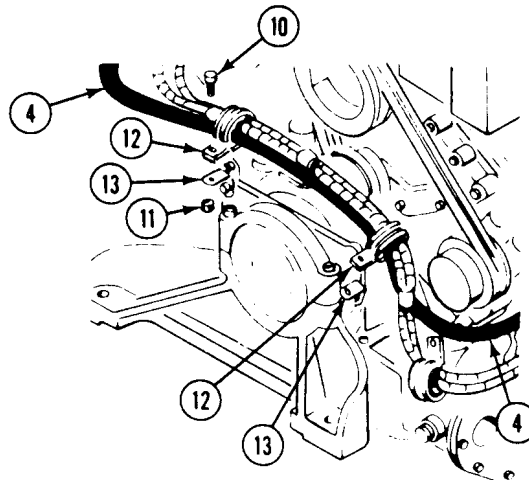
60. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external pipe threads of elbow (3) and adapter (4). Do not apply primer or sealing compound beyond small end of threads.
61. Remove existing plug (1) from oil cooler elbow (2). Discard plug.
62. Install elbow (3) in elbow (2).
63. Install adapter (4) in elbow (3).
64. Install hose (6) on adapter (4). Secure with clamp (7).



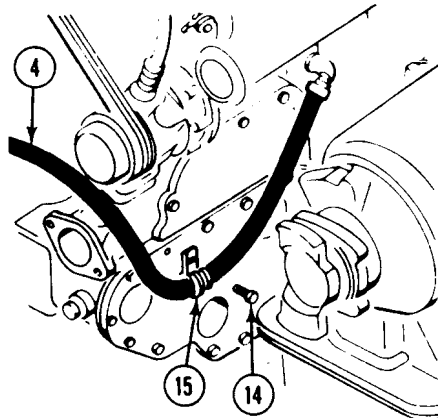
ENGINE BLOCK (LEFT SIDE)

INSTALL ENGINE COOLANT HEATER KIT (M1064 ONLY) — Continued**0061 00**

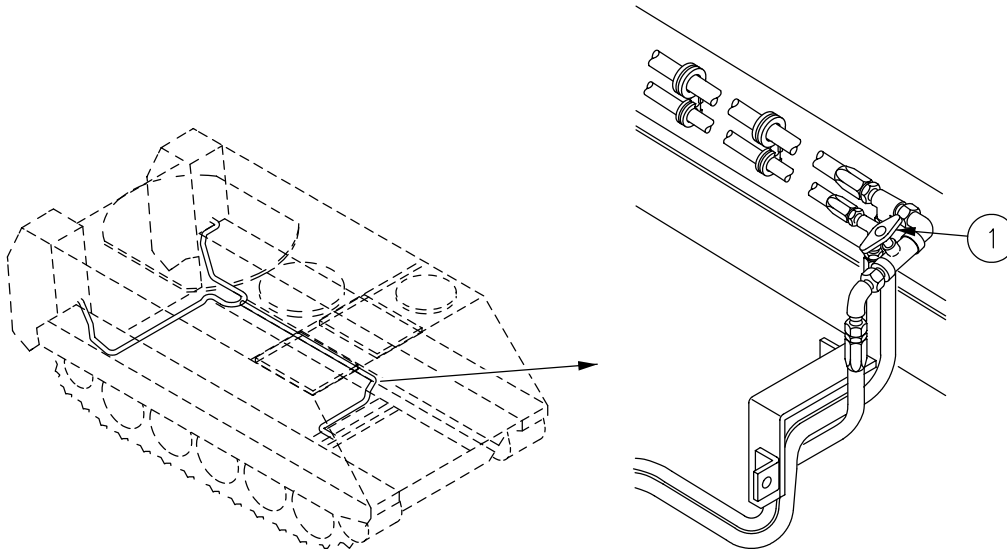
65. Remove two screws (10), nuts (11), and clamps (12) that secure power plant wiring harness to two brackets (13). Discard clamps.
66. Install hose (4) and power plant wiring harness on two brackets (13). Secure with two screws (10), nuts (11), and new clamps (12).

**FRONT OF ENGINE**

67. Remove screw (14) from oil cooler housing.
68. Install hose (4) on oil cooler housing. Secure with screw (14) and clamp (15).

**ENGINE OIL COOLER**

69. Make sure heater fuel valve (1) is closed.

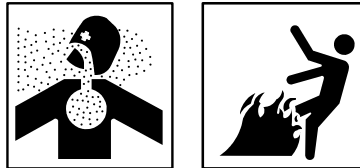


70. Install coolant heater fuel pump lead (1) on hull mount. Secure with two lockwashers (2), screw (3), and nut (4).

71. Install coolant heater fuel pump (5) on hull bracket. Secure with four lockwashers (6) and two screws (7).

72. Clean external pipe threads of fuel pump (5) with solvent, cleaning compound.

WARNING



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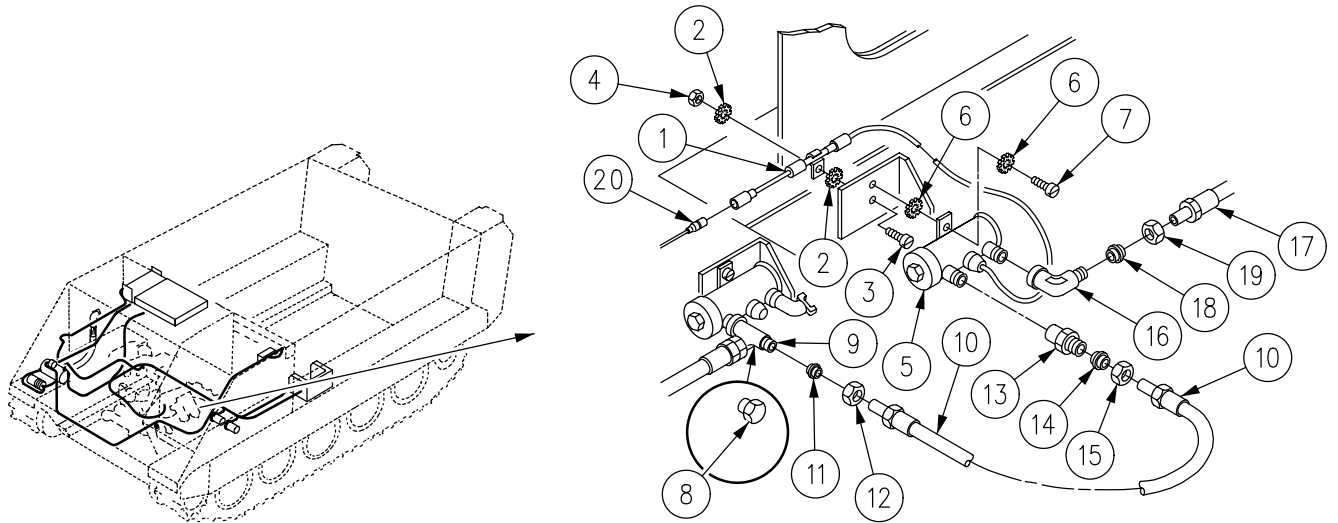
Always use in well ventilated areas, away from heat, sparks, and flames. Do not breathe fumes. Do not allow into contact with skin and eyes. Use goggles or face shield and protective gloves.

73. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external pipe threads of fuel pump (5). Do not apply primer or sealing compound beyond small end of threads.

INSTALL ENGINE COOLANT HEATER KIT (M1064 ONLY) — Continued

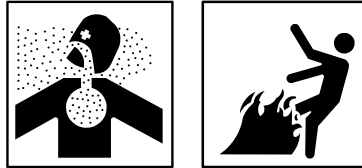
0061 00

74. Remove cap (8) from tee (9). Discard cap.
75. Install fuel hose (10) on tee (9). Secure with sleeve (11) and nut (12).
76. Install adapter body (13) on coolant heater fuel pump (5).
77. Secure fuel hose (10) to adapter body (13) with sleeve (14) and nut (15).
78. Install elbow body (16) on coolant heater fuel pump (5).
79. Install fuel hose (17) on elbow body (16). Secure with sleeve (18) and nut (19).
80. Connect circuit 402A lead (20) to coolant heater fuel pump lead (1).



81. Clean external pipe threads of two elbows (1) and (2) with solvent, cleaning compound.

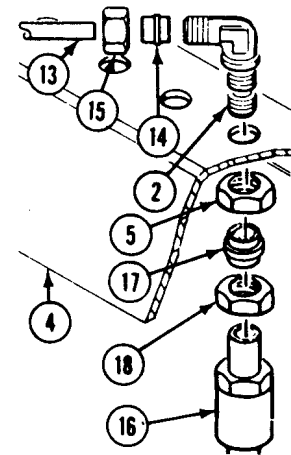
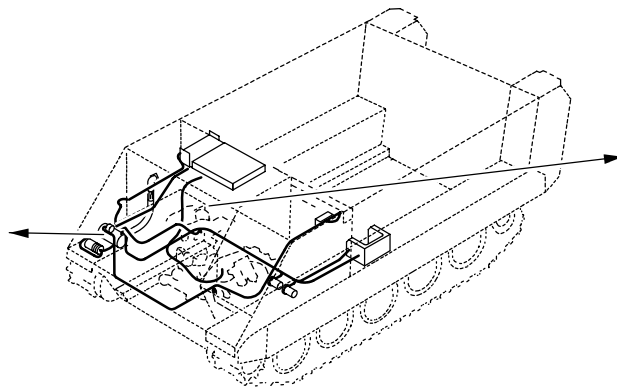
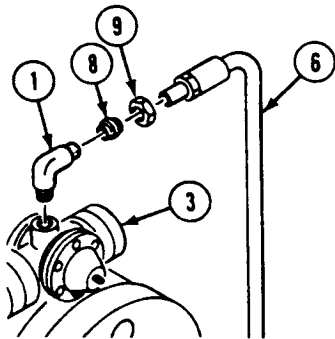
WARNING



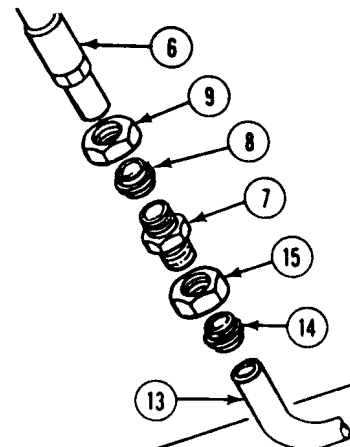
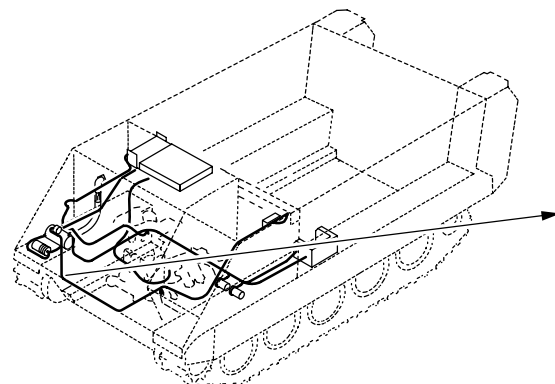
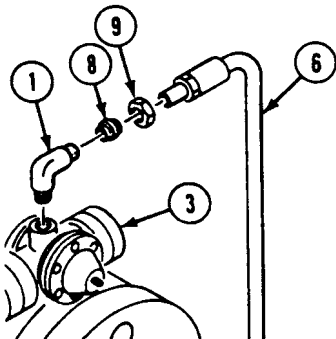
Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

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.

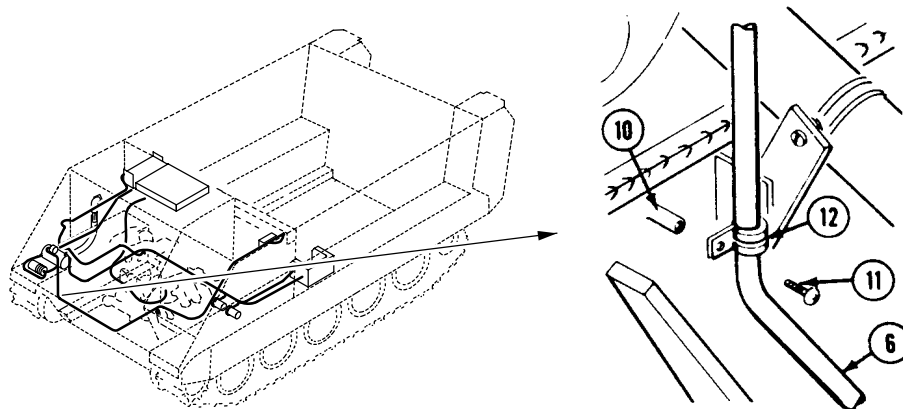
82. Apply a thin, even coat of primer and then sealing compound (WP 0105 00, Item 17) to cleaned external pipe threads of elbows (1) and (2). Do not apply primer or sealing compound beyond small end of threads.
83. Install elbow (1) in control valve (3).
84. Install elbow (2) in transverse beam (4). Secure with nut (5).



85. Install fuel hose (6) on control valve elbow (1) and adapter body (7). Secure with two sleeves (8) and nuts (9).

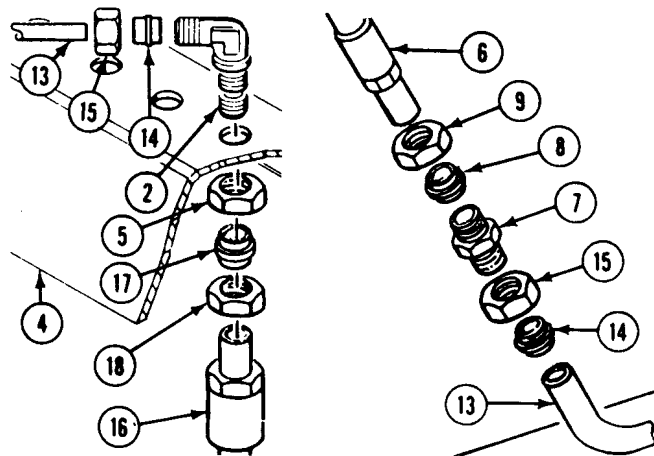


86. Install fuel hose (6) on weldnut (10). Secure with screw (11) and clamp (12).



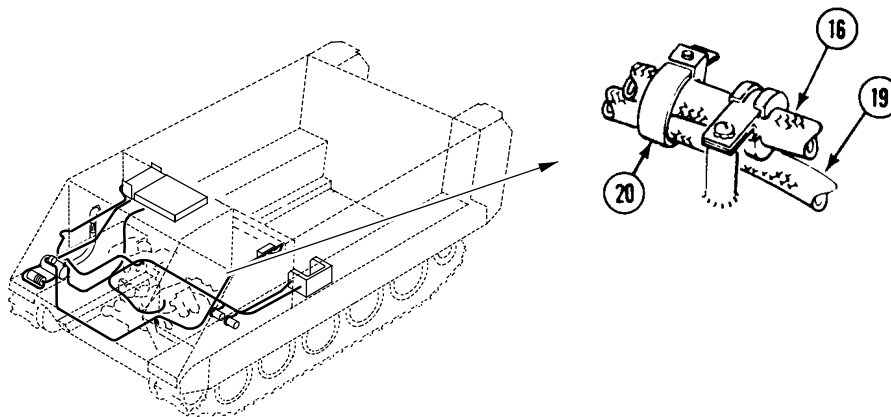
87. Install fuel tube (13) on elbow (2) and adapter (7). Secure with two sleeves (14) and nuts (15).

88. Install fuel hose (16) on elbow (2). Secure with sleeve (17) and nut (18).

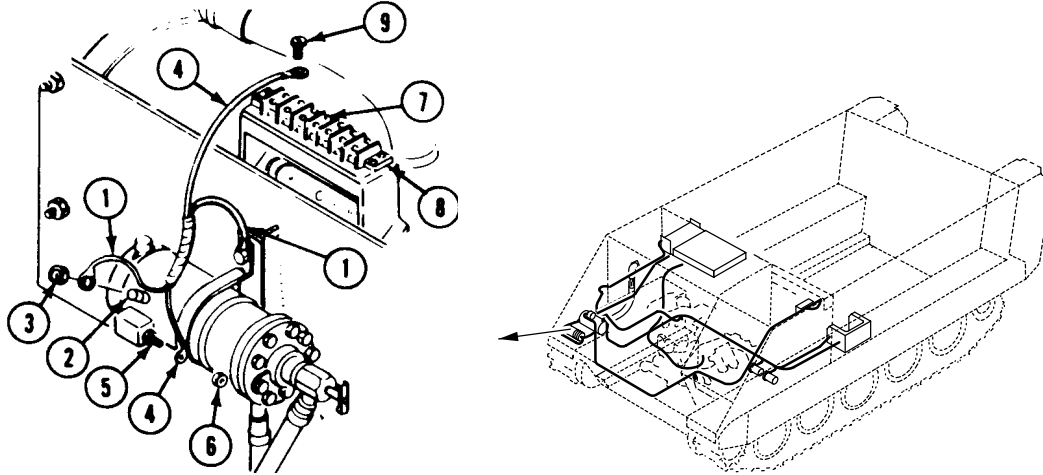


89. Position fuel hose (16) next to personnel heater fuel hose (19).

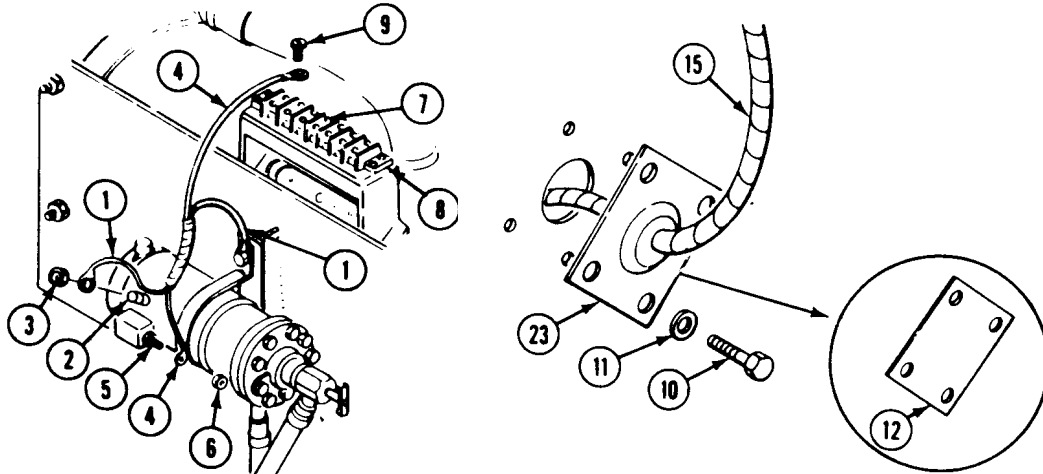
90. Install fuel hose (16) to personnel heater fuel hose (19) with ten straps (20).



91. Install ground lead (1) on coolant pump terminal (2). Secure with nut (3).
92. Install circuit 402B lead (4) on coolant pump terminal (5). Secure with nut (6).
93. Install circuit 402B (4) on terminal 4 (7) on terminal strip (8) with screw (9).



94. Remove four screws (10), washers (11), and plate (12) from driver's compartment bulkhead. Discard plate.

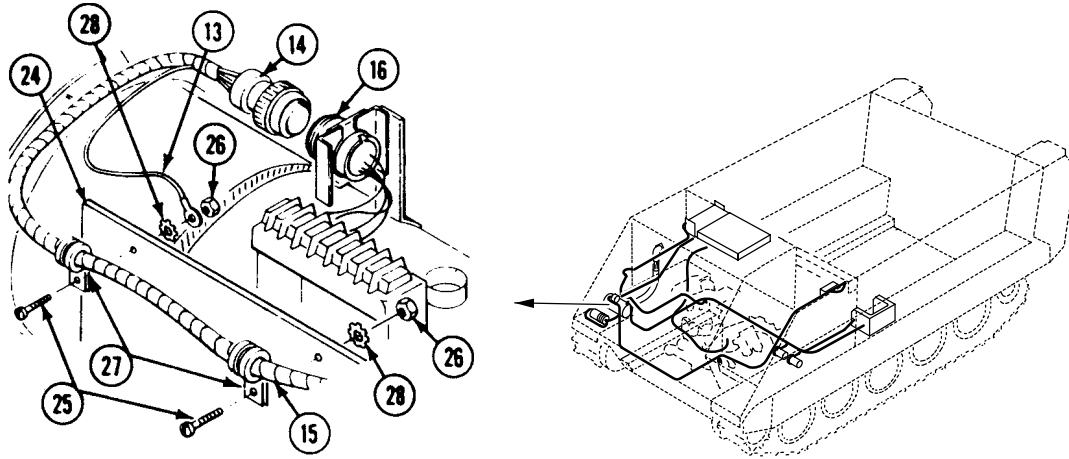


INSTALL ENGINE COOLANT HEATER KIT (M1064 ONLY) — Continued

0061 00

95. Thread terminal ground lead (13) and coolant heater connector (14) through driver's compartment bulkhead opening.

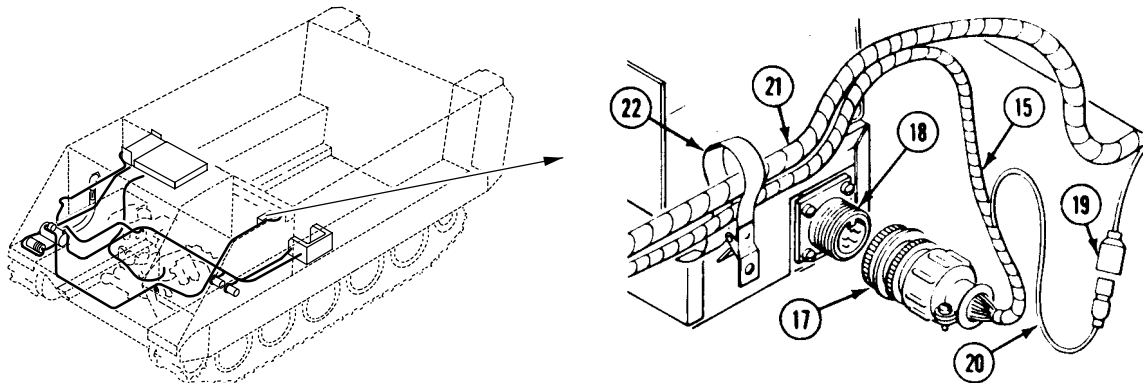
96. Connect coolant heater connector (14) of wiring harness (15) to coolant heater receptacle (16).



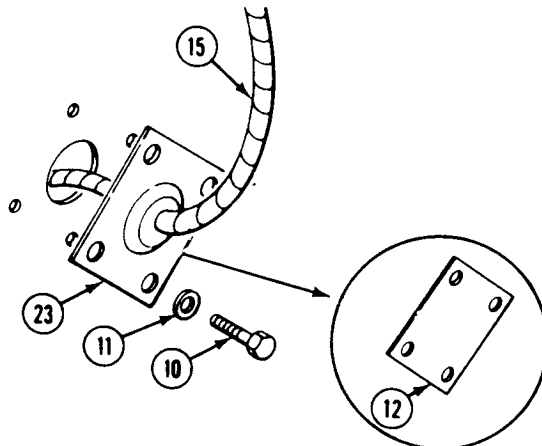
97. Connect control box connector (17) of wiring harness (15) to control box receptacle (18).

98. Connect main wiring harness 402A lead (19) to coolant heater wiring harness lead (20).

99. Install wiring harness (15) on front main wiring harness (21). Secure with eight straps (22).



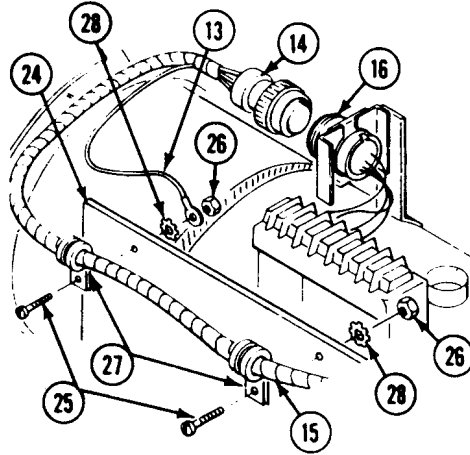
100. Install wiring harness plate (23) on driver's compartment bulkhead. Secure with four screws (10) and washers (11).



INSTALL ENGINE COOLANT HEATER KIT (M1064 ONLY) — Continued

0061 00

101. Install wiring harness (15) and terminal ground lead (13) on mounting bracket (24). Secure with two screws (25), nuts (26), clamps (27), and lockwashers (28).



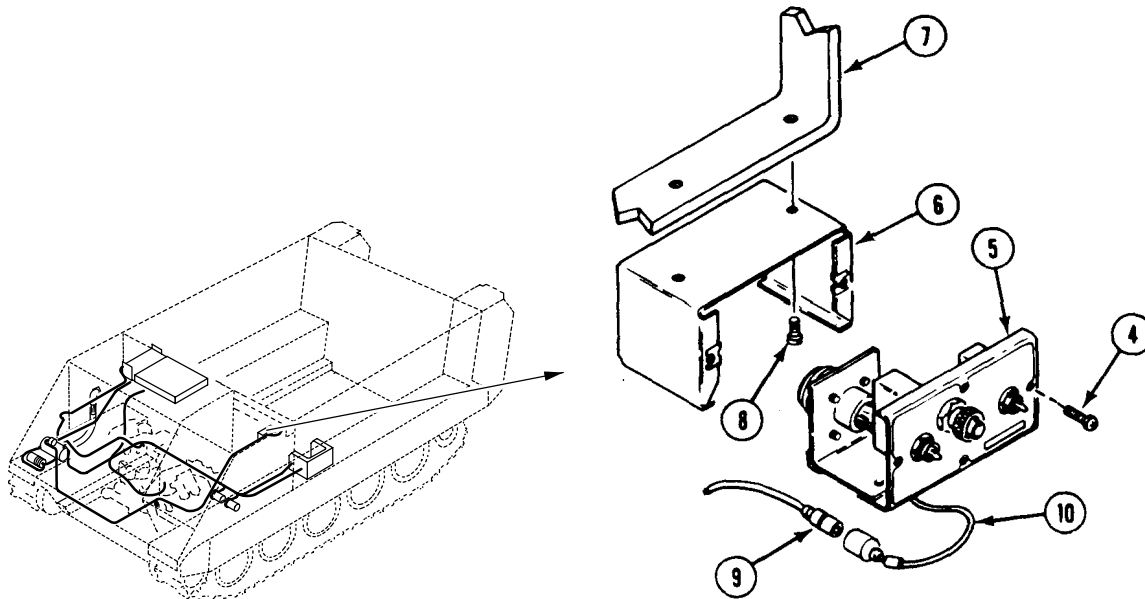
102. Remove two screws (4) and control panel (5) from control box case (6).

103. Remove and discard two screws, nuts, and washers supplied with control box case (6).

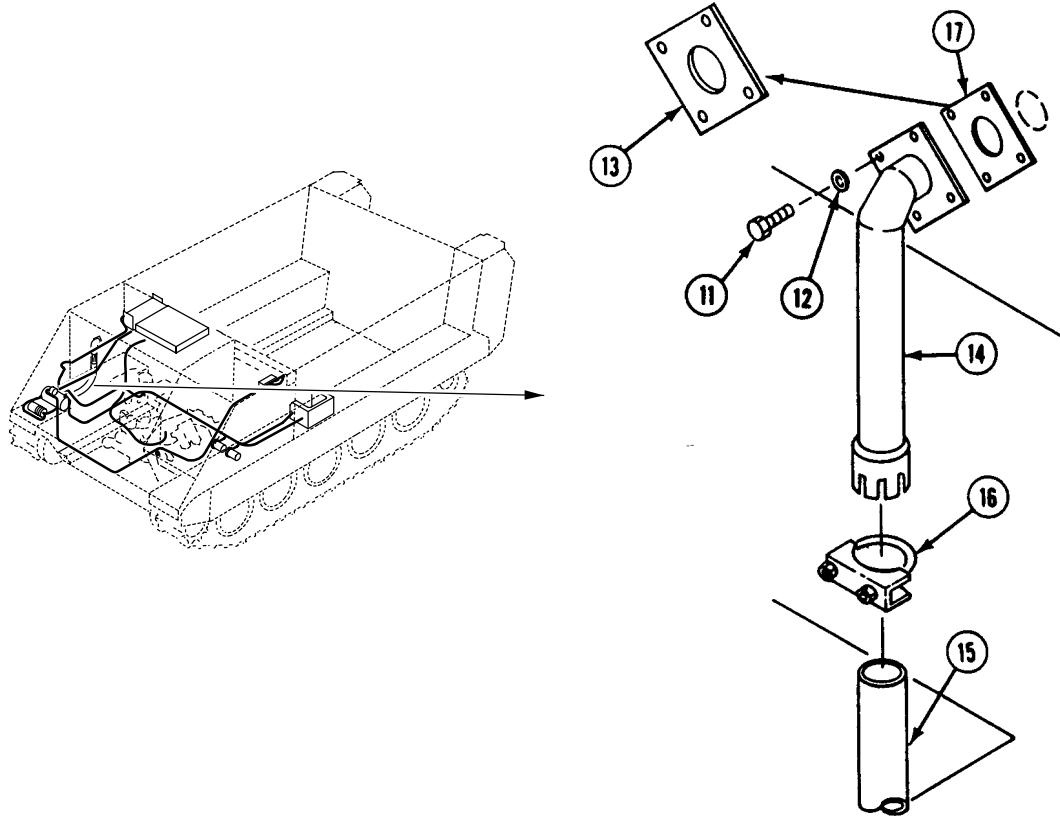
104. Install control box case (6) on hull bracket (7). Secure with two new screws (8).

105. Install control panel (5) in control box case (6). Secure with two screws (4).

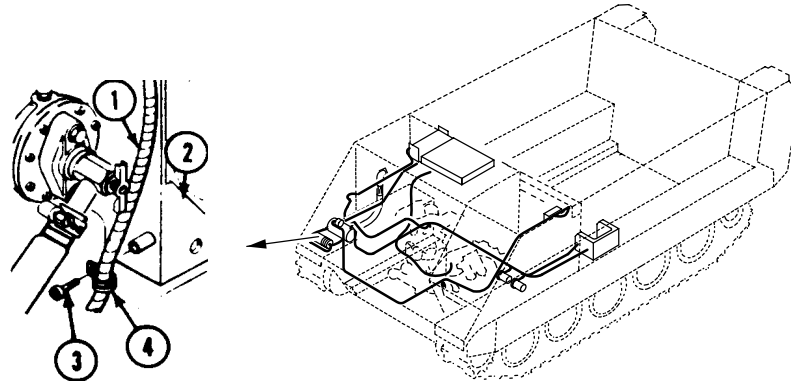
106. Connect circuit 402A lead (9) to control box lead (10).



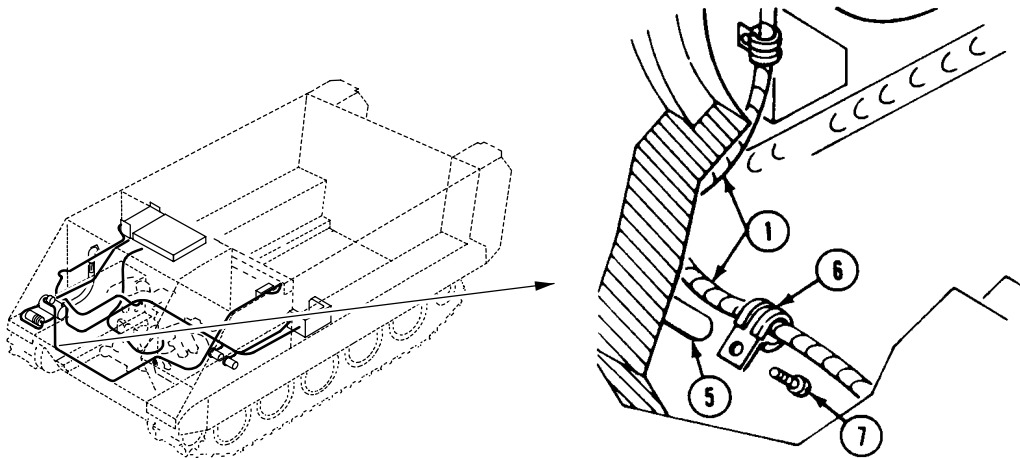
107. Lower power plant grille assembly (see your -20).
108. Remove four screws (11), washers (12), and plate (13) from grille. Discard plate.
109. Install upper tube (14) on exhaust pipe (15). Secure with clamp (16). Do not tighten.
110. Position upper tube (14) and gasket (17) on grille.
111. Secure with four screws (11) and washers (12).
112. Tighten clamp (16).



113. Secure wiring harness (1) to mounting bracket (2) with screw (3) and clamp (4).

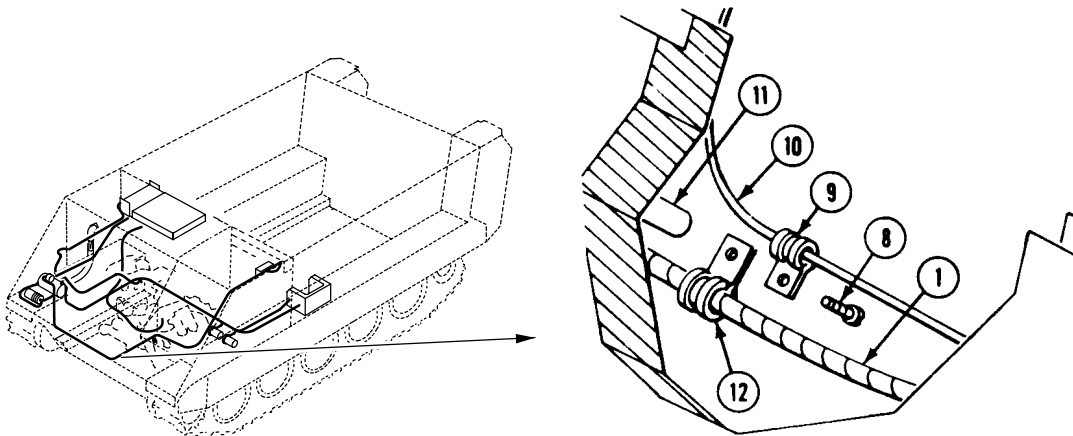


114. Secure wiring harness (1) to two weldnuts (5) with two clamps (6) and screws (7).

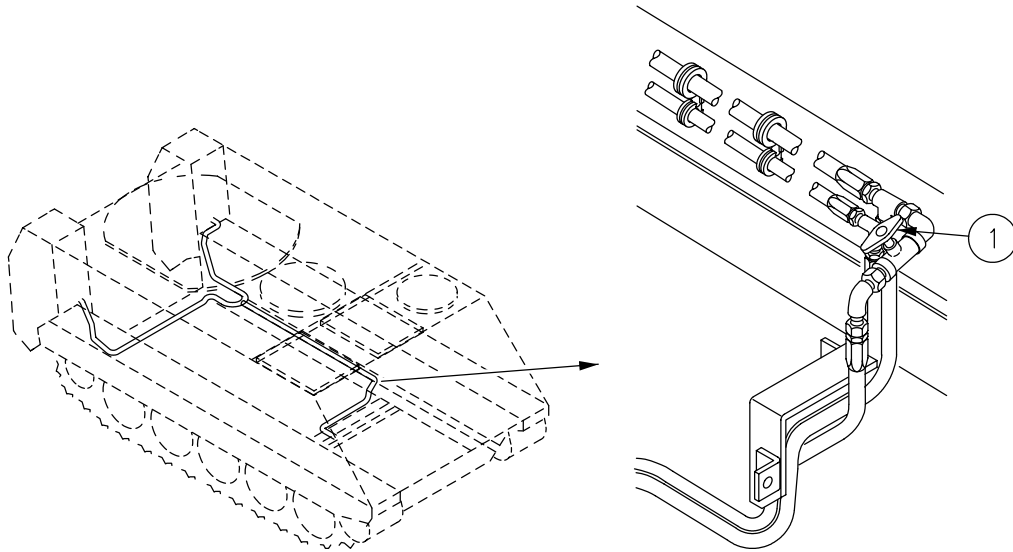


115. Remove three screws (8) and three clamps (9) that secure fuel control cable (10) to three weldnuts (11).

116. Install wiring harness (1) and fuel control cable (10) on three weldnuts (11). Secure with three screws (8), three clamps (9), and three clamps (12).



117. Replace standard generator belts with kit belts (see your -20).
118. Replace standard fan drive belts with kit belts (see your -20).
119. Adjust belts (see your -20).
120. Open heater fuel valve (1).



FOLLOW-THROUGH STEPS

1. Install personnel heater (see your -20).
2. Lower power plant grille (see your -20).
3. Fill carrier cooling system (see your -20).
4. Connect battery ground lead (see your -20).
5. Bleed coolant heater fuel line (see your -20).
6. Start coolant heater (see your -10). Check for leaks and proper operation. Turn coolant heater off.
7. Install front floor plates (see your -20).
8. Install driver's power plant access panel (see your -20).
9. Install power plant rear access panel (see your -20).
10. Close power plant front access door and raise trim vane (see your -10).
11. Raise and lock ramp (see your -10).
12. Stop engine (see your -10).

END OF TASK

REPLACE FUEL CONTROL VALVE**0062 00****THIS WORK PACKAGE COVERS:**

Removal (page 0062 00-1).
 Fuel Flow Test (page 0062 00-3).
 Leak Test (page 0062 00-5).
 Installation (page 0062 00-6).

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 0104 00, Item 4)
 Calibrated Cubic Centimeter Container
 Overflow Receptacle
 Watch
 24V Power Supply (Assembled Batteries)

References

WP 0059 00
 WP 0060 00
 WP 0061 00

Equipment Condition

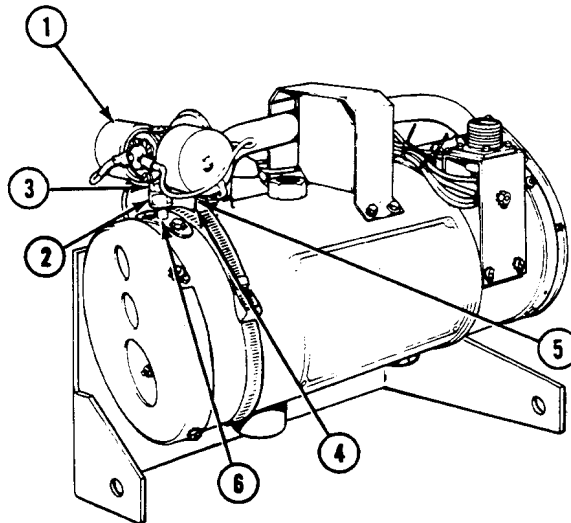
Engine coolant heater removed from carrier
 (see your -20)

Materials/Parts

Insulating varnish (WP 0105 00, Item 14)

REMOVAL

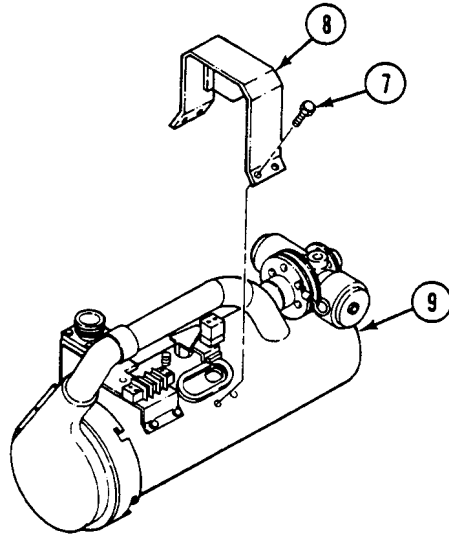
1. Remove nut (3) from union (2) beneath fuel control valve (1).
2. Remove two screws (4) and fuel control valve (1) from bracket (5) and fuel tube (6).



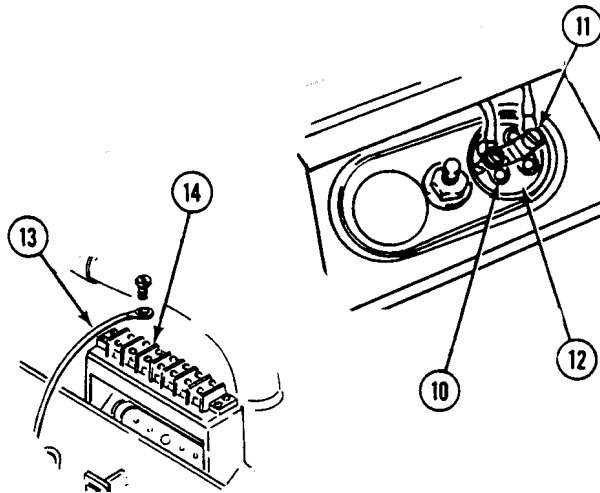
REPLACE FUEL CONTROL VALVE — Continued

0062 00

3. Remove four screws (7) and guard (8) from coolant heater (9).

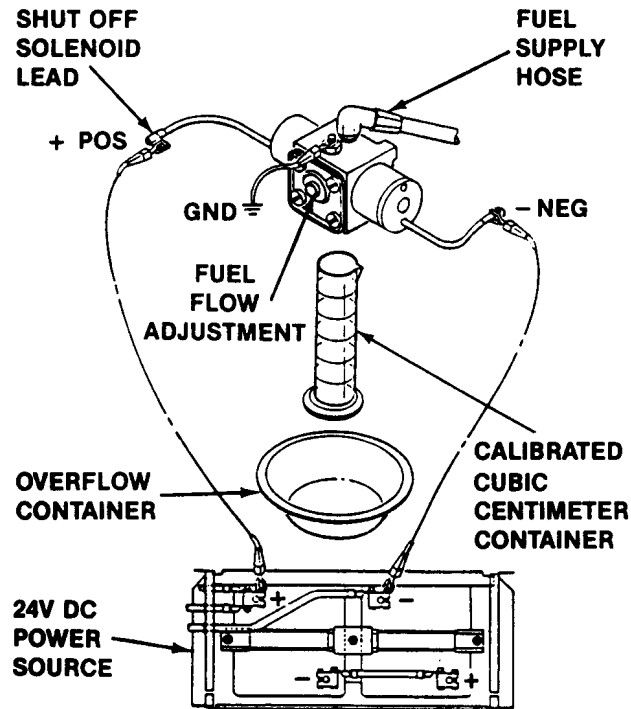


4. Disconnect two fuel control valve leads (10) and (11) from overhear thermostat (12).
5. Disconnect fuel control valve lead (13) from terminal strap (14).



FUEL FLOW TEST

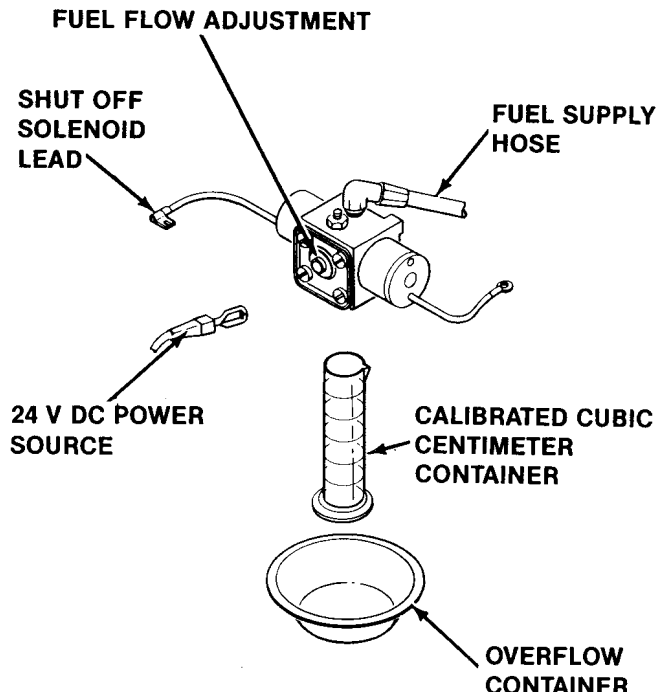
1. Connect fuel control valve to coolant heater fuel hose. Fuel pressure must be 3 to 15 psi (21 to 103 kPa) when fuel valve is open.
2. Place fuel control valve outlet over calibrated and overflow containers.
3. Make sure the body of fuel valve is grounded.
4. Energize fuel valve solenoids. Connect two solenoid leads to a 24 V dc power source. Solenoids are now open for high heat fuel flow.



WARNING

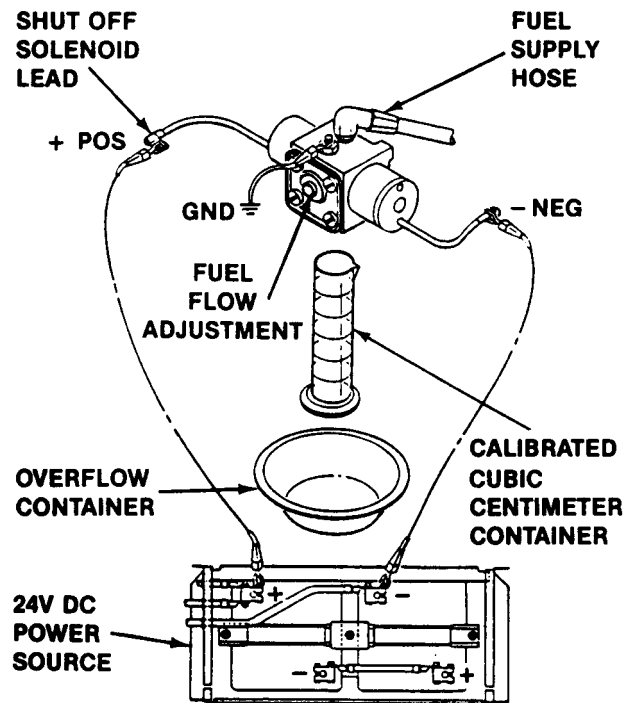
Sparks from static electricity could cause a fire or explosion. Make sure to ground the coolant heater before you open fuel supply valve.

5. Open coolant heater fuel supply valve (WP 0059 00, WP 0060 00, or WP 0061 00). Bleed fuel hose in a suitable container.
6. After fuel flow is stable, place calibrated cubic centimeter container under fuel control valve.
7. Allow fuel to flow for exactly 1 minute then close coolant heater fuel supply valve. Container should contain 14 ± 2 cubic centimeters of fuel.



8. Repeat Steps 1 - 7 with shutoff solenoid side only of fuel control valve energized with 24 V dc.
9. Calibrated cubic centimeter glass container should now contain 8.5 ± 2 cubic centimeters of fuel.
10. If fuel flow rates are not within limits, adjust flow. Turn adjusting screw to right to increase and to left to decrease. Adjust high heat flow first, then low heat flow.
11. After fuel flow is adjusted within limits, seal adjusting screw with insulating varnish.

12. If fuel flow cannot be adjusted within limits, replace fuel control valve.

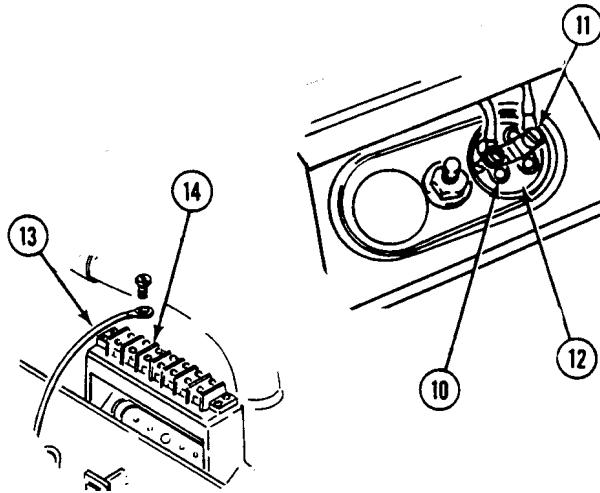


LEAK TEST

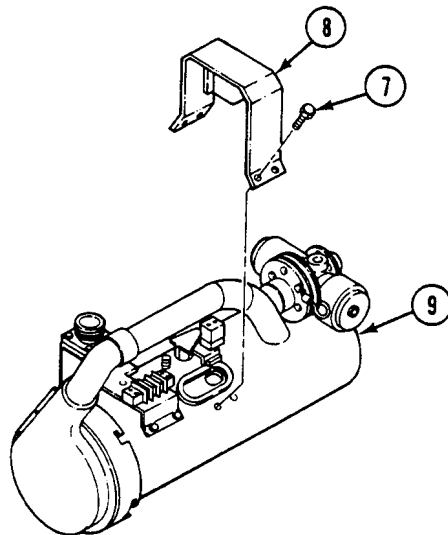
1. Repeat high heat fuel flow test. Disconnect both solenoid leads from 24 V dc power source.
2. One or two drops of fuel may form after solenoid leads are disconnected from power source. Further leakage is not acceptable.
3. Replace fuel control valve that leaks.

INSTALLATION

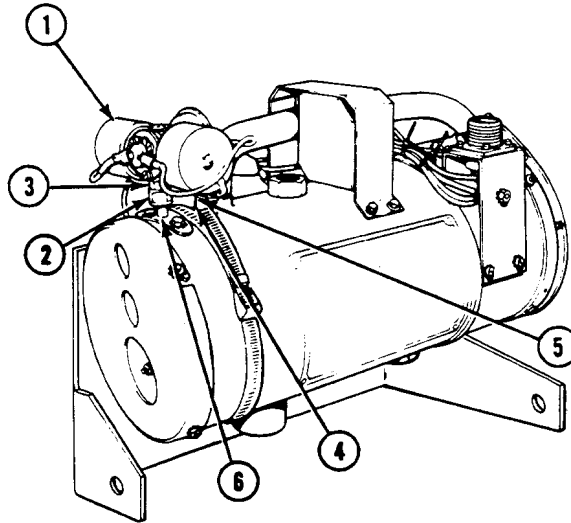
1. Connect fuel control valve lead (13) to terminal strap (14).
2. Connect two fuel control valve leads (10) and (11) to overheat thermostat (12).



3. Install guard (8) on coolant heater (9). Secure with four screws (7).



4. Install fuel control valve (1) on bracket (5). Secure with two screws (4).
5. Install fuel control valve (1) on fuel tube (6). Tighten nut (3) on union (2) beneath fuel control valve.

**FOLLOW-THROUGH STEPS**

1. Install engine coolant heater in carrier (see your -20).

END OF TASK

REPLACE RESTRICTION THERMOSTAT

0063 00

THIS WORK PACKAGE COVERS:

Removal (page 0063 00-1).
 Installation (page 0063 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G10

Tools and Special Tools

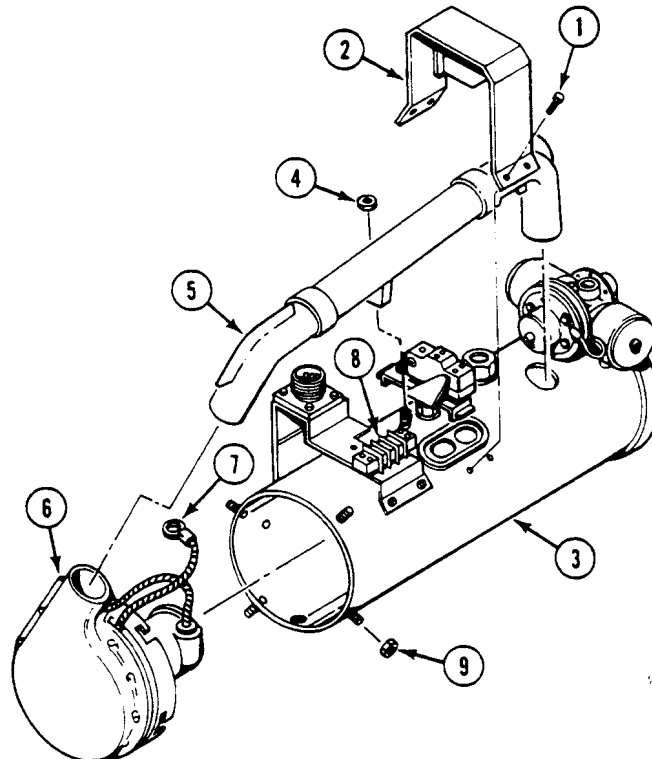
Automotive Fuel and Electrical System Repair Tool Kit
 (WP 0104 00, Item 4)
 Metric Wrench Kit (WP 0104 00, Item 53)

Equipment Condition

Engine coolant heater removed from carrier
 (see your -20)

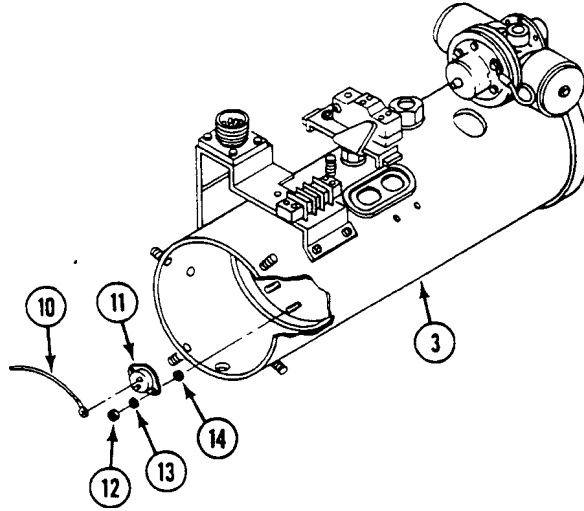
REMOVAL

1. Remove four screws (1) and guard (2) from coolant heater (3).
2. Remove nut (4) and combustion tube assembly (5) from coolant heater (3) and blower assembly (6).
3. Disconnect blower assembly lead (7) from terminal number 6 of terminal strap (8).
4. Loosen four nuts (9) and turn blower assembly (6) counterclockwise to remove blower assembly from coolant heater (3).

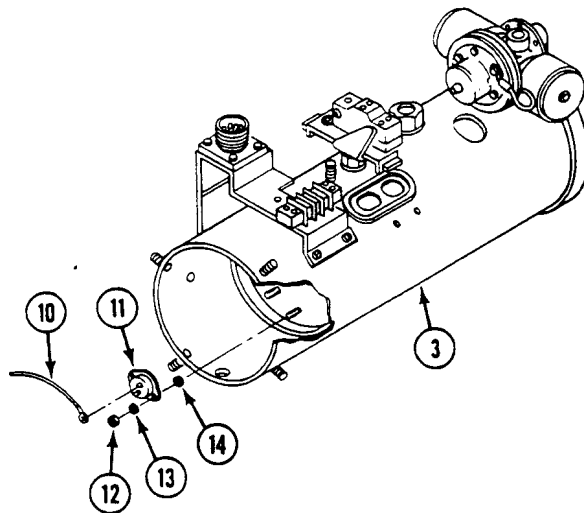


REPLACE RESTRICTION THERMOSTAT — Continued**0063 00**

5. Disconnect two leads (10) from restriction thermostat (11).
6. Remove two nuts (12), washers (13), restriction thermostat (11), and two spacers (14) from heater (3).

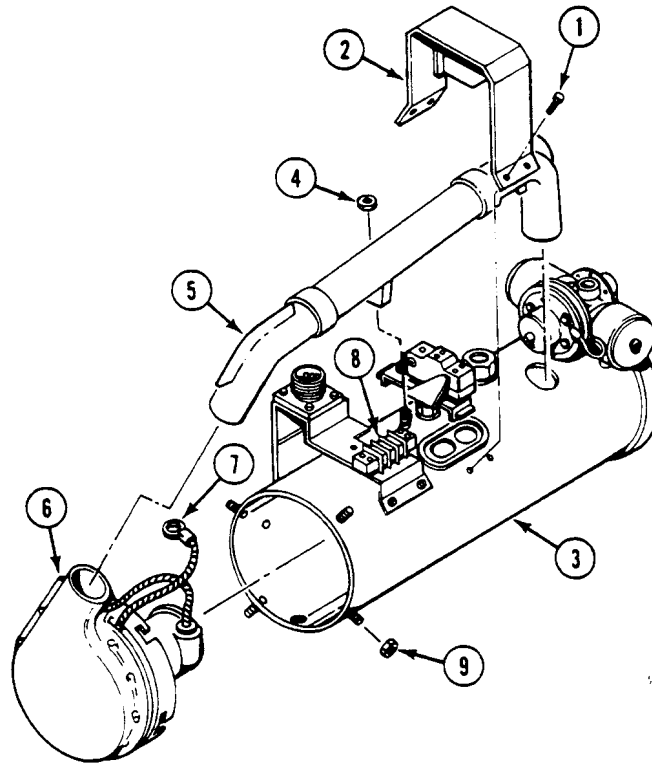
**INSTALLATION**

1. Place two spacers (14) and new restriction thermostat (11) on studs of heater (3). Secure with two washers (13) and nuts (12).
2. Connect two leads (10) to restriction thermostat (11).



REPLACE RESTRICTION THERMOSTAT — Continued**0063 00**

3. Install blower assembly (6) on heater (3) and turn clockwise. Secure with four nuts (9).
4. Connect blower lead (7) to terminal number 6 of terminal strap (8).
5. Place combustion tube assembly (5) on coolant heater (3) and blower assembly (6). Secure with nut (4).
6. Install guard (2) on coolant heater (3). Secure with four screws (1).

**FOLLOW-THROUGH STEPS**

1. Install engine coolant heater in carrier (see your -20).

END OF TASK

REPLACE OVERHEAT THERMOSTAT

0064 00**THIS WORK PACKAGE COVERS:**

Removal (page 0064 00-1).
Installation (page 0064 00-3).

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 0104 00, Item 4)
Digital Multimeter (WP 0104 00, Item 28)

Equipment Condition

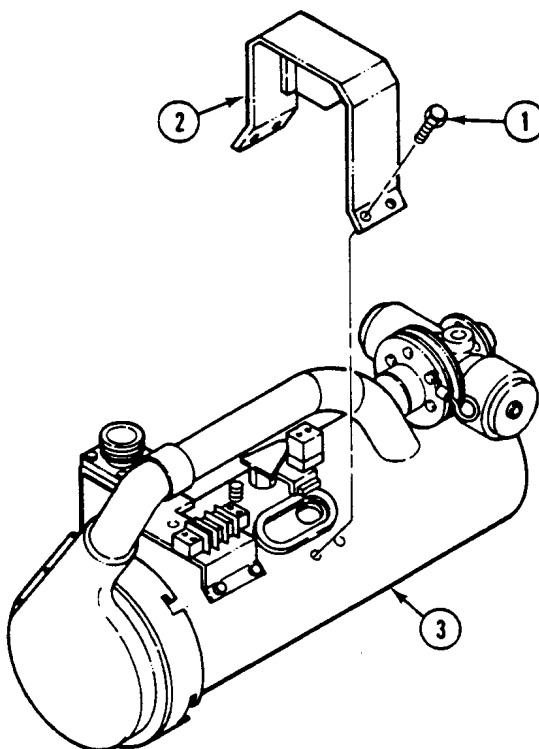
Engine coolant heater removed from carrier
(see your -20)

Materials/Parts

Lockwasher
Packing

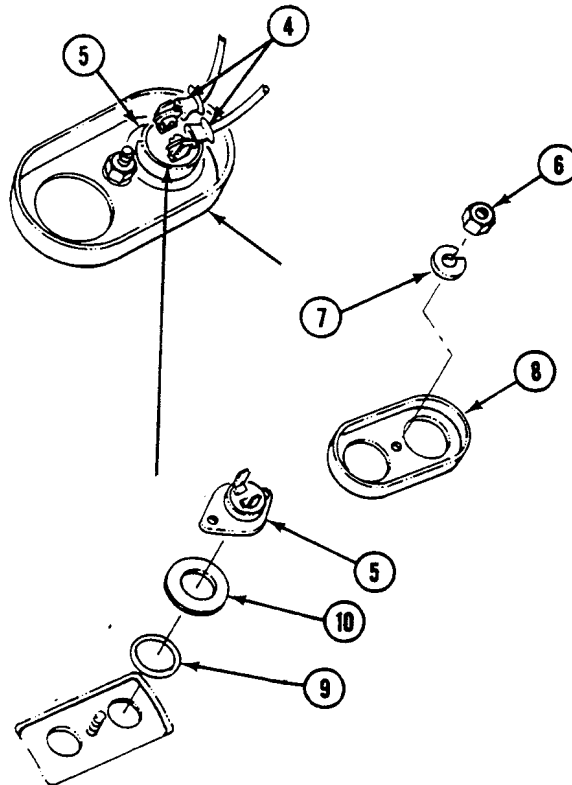
REMOVAL

1. Remove four screws (1) and guard (2) from coolant heater (3).



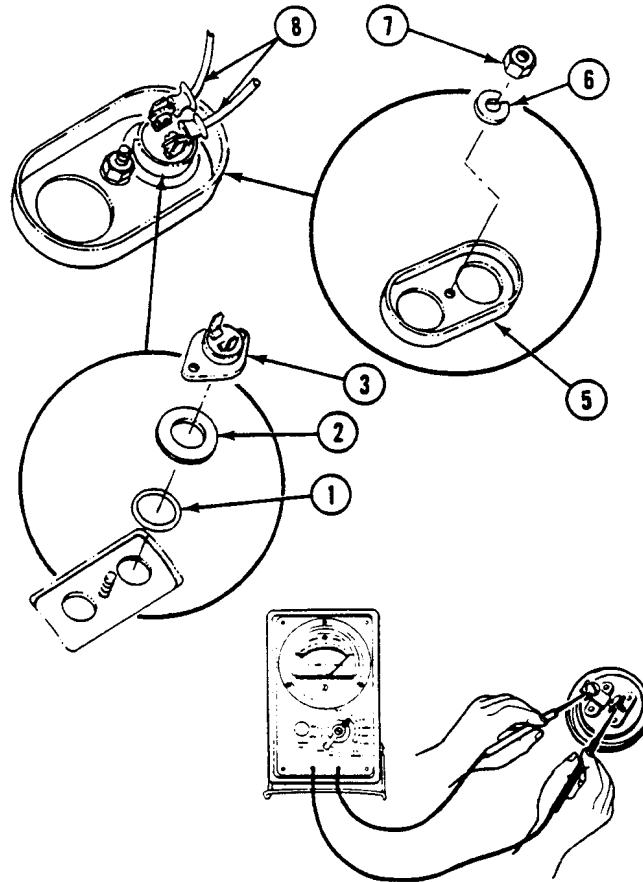
REPLACE OVERHEAT THERMOSTAT — Continued**0064 00**

2. Disconnect two leads (4) from overheating thermostat (5).
3. Remove nut (6), lockwasher (7), and retainer (8) from heater. Discard lockwasher.
4. Remove overheating thermostat (5), packing (9), and washer (10) from heater. Discard packing.
5. Use multimeter to check resistance through overheating thermostat.
6. Multimeter should read 0 ohms. If reading is infinity, replace overheating thermostat.

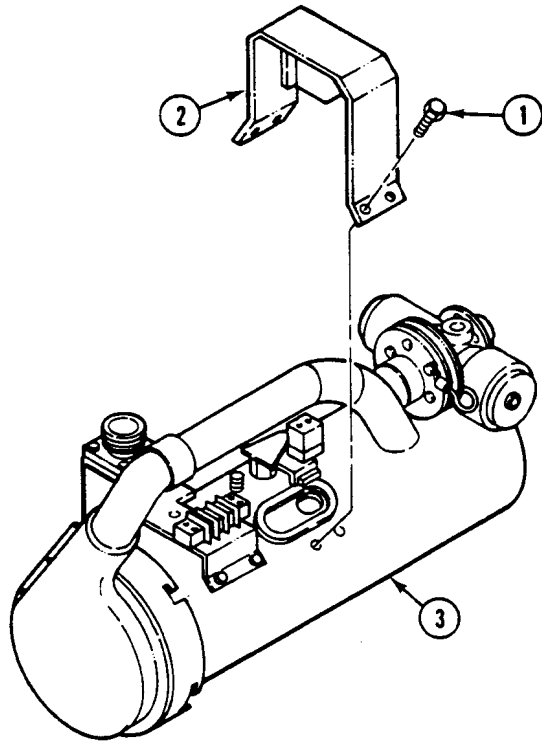


INSTALLATION

1. Install new packing (1), washer (2), and overheat thermostat (3) in coolant heater. Secure with retainer (5), new lockwasher (6), and nut (7).
2. Connect two leads (8) to overheat thermostat (3).



3. Install guard (2) on heater (3). Secure with four screws (1).

**FOLLOW-THROUGH STEPS**

1. Install engine coolant heater in carrier (see your -20).

END OF TASK

REPLACE FIXED RESISTOR

0065 00

THIS WORK PACKAGE COVERS:

Removal (page 0065 00-1).
 Installation (page 0065 00-2).

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 0104 00, Item 4)
 Digital Multimeter (WP 0104 00, Item 28)
 Metric Wrench Kit (WP 0104 00, Item 53)

Equipment Condition

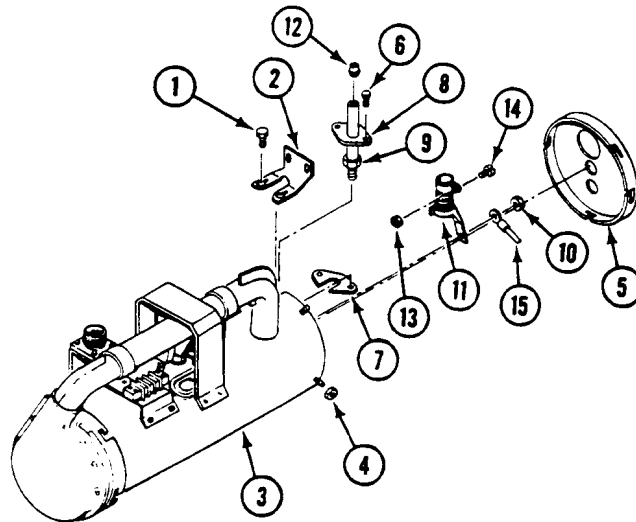
Engine coolant heater removed from carrier
 (see your -20)
 Fuel control valve removed from coolant heater
 (WP 0062 00)

Materials/Parts

Sleeve

REMOVAL

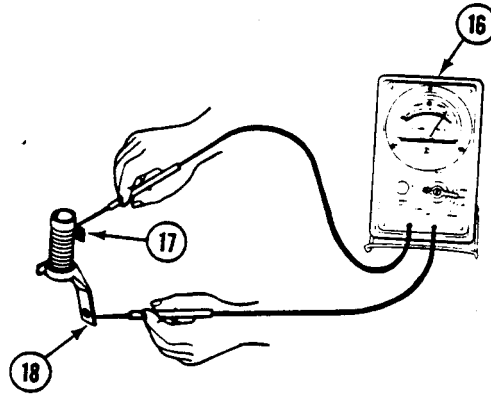
1. Remove two screws (1) and fuel control valve bracket (2) from coolant heater (3).
2. Loosen four nuts (4) and remove end cover (5) from heater (3).
3. Remove two screws (6) that secure tapping plate (7), flange (8), and fuel tube (9) to heater (3).
4. Remove nut (10), fixed resistor (11), flange (8), fuel tube (9), and sleeve (12) from heater (3).
5. Remove nut (13), screw (14), and electrical lead (15) from fixed resistor (11).



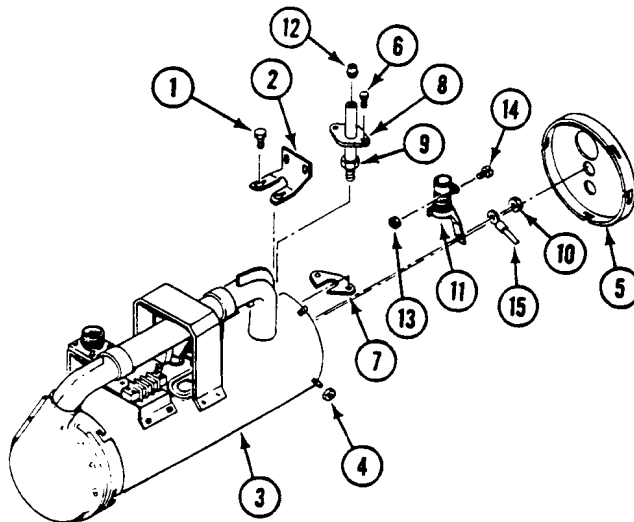
REPLACE FIXED RESISTOR — Continued

0065 00

6. Use multimeter (16). Check resistance from circuit 7 terminal end (17) to strap end (18) of fixed resistor.
7. Multimeter should read 1.6 to 1.7 ohms. If reading is not in range, replace fixed resistor.

**INSTALLATION**

1. If fixed resistor (11) is to be replaced, grind or cut sleeve (12) off of fuel tube (9). Discard sleeve.
2. Install fixed resistor (11) and new sleeve (12) on fuel tube (9).
3. Secure electrical lead (15) to fixed resistor (11) with screw (14) and nut (13).
4. Secure fixed resistor (11) to heater (3) with nut (10).
5. Secure fuel tube (9), flange (8), and tapping plate (7) to heater (3) with two screws (6).
6. Install end cover (5) on heater (3). Tighten four nuts (4).
7. Secure fuel control valve bracket (2) to heater (3) with two screws (1).

**FOLLOW-THROUGH STEPS**

1. Install fuel control valve on coolant heater (WP 0062 00).
2. Install engine coolant heater in carrier (see your -20).

END OF TASK

REPLACE BURNER PACKING AND GASKET

0066 00

THIS WORK PACKAGE COVERS:

Removal (page 0066 00-1).
 Installation (page 0066 00-2).

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 0104 00, Item 4)
 Metric Wrench Kit (WP 0104 00, Item 53)

Equipment Condition

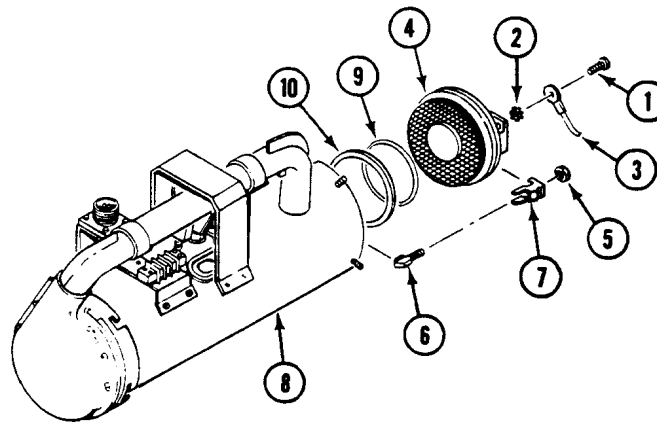
Engine coolant heater removed from carrier
 (see your -20)
 Fixed resistor removed (WP 0065 00)
 Fuel control valve removed (WP 0062 00)

Materials/Parts

Gasket
 Preformed packing

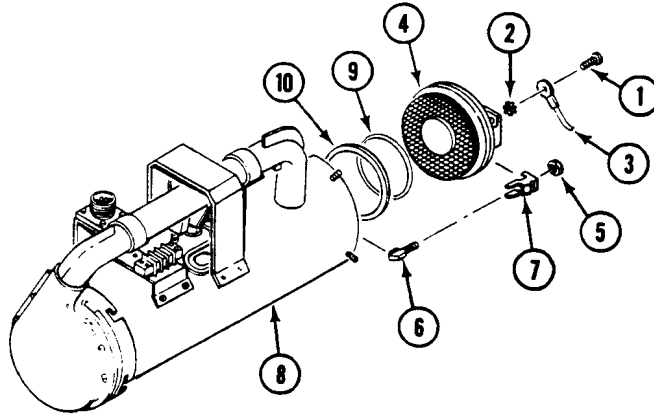
REMOVAL

1. Remove screw (1), washer (2), and ground strap (3) from burner assembly (4).
2. Remove four nuts (5), bolts (6), clamps (7), and burner (4) from heater (8).
3. Remove preformed packing (9) and gasket (10) from burner (4). Discard preformed packing and gasket.



INSTALLATION

1. Install new preformed packing (9) and new gasket (10) in groove of burner (4).
2. Place burner (4) in heater (8). Secure with four nuts (5), bolts (6), and clamps (7).
3. Install ground strap (3) on burner (4). Secure with screw (1) and washer (2).

**FOLLOW-THROUGH STEPS**

1. Install fixed resistor (WP 0065 00).
2. Install fuel control valve (WP 0062 00).
3. Install engine coolant heater in carrier (see your -20).

END OF TASK

REPLACE DIODE AND MOTOR RESISTOR

0067 00

THIS WORK PACKAGE COVERS:

Removal (page 0067 00-1).
 Installation (page 0067 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G10

Tools and Special Tools

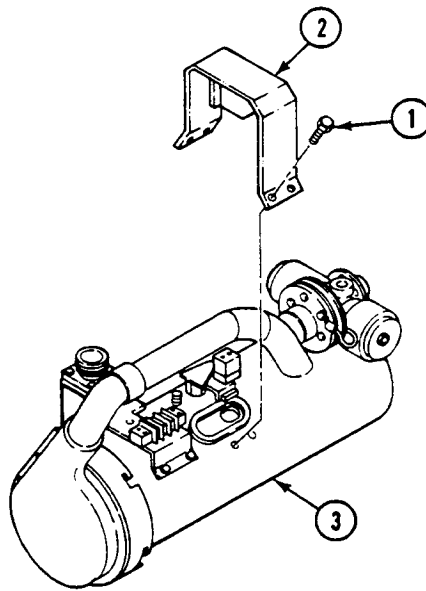
Automotive Fuel and Electrical System Repair Tool Kit
 (WP 0104 00, Item 4)
 Digital Multimeter (WP 0104 00, Item 28)
 Metric Wrench Kit (WP 0104 00, Item 53)

Equipment Condition

Engine coolant heater removed from carrier
 (see your -20)

REMOVAL

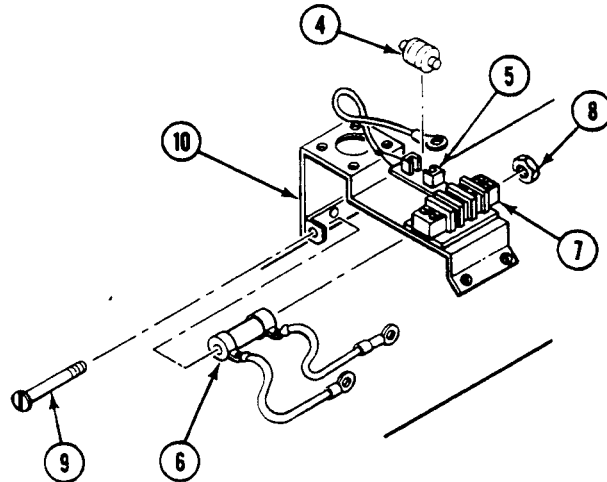
1. Remove four screws (1) and guard (2) from heater (3).



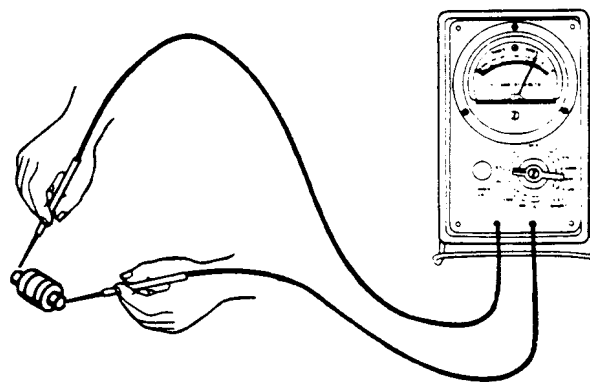
NOTE

Note direction of arrow on diode so it can be installed later.

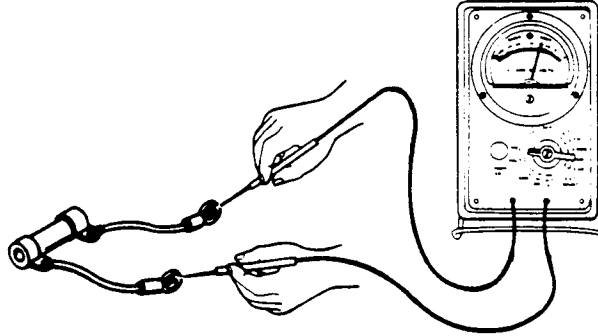
2. Remove diode (4) from holder (5).
3. Remove motor resistor (6) leads from terminals 4 and 6 on terminal board (7).
4. Remove nut (8), screw (9), and motor resistor (6) from bracket (10).



5. Use multimeter to check diode. Set meter to above 200 mV scale. Place probes on each end of diode and note reading. Switch probes and note reading. One reading must indicate continuity and other reading must indicate high resistance. If they do not, replace diode.

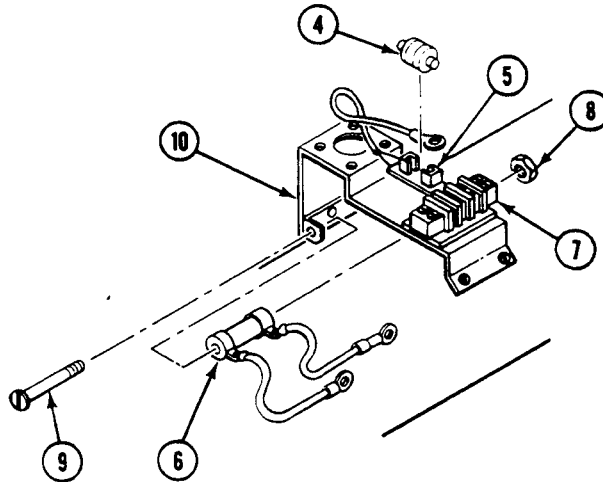


6. Use multimeter to check motor resistor. Place probes on resistor leads. Multimeter should read 0 ohms resistance. Replace resistor if reading is infinity.

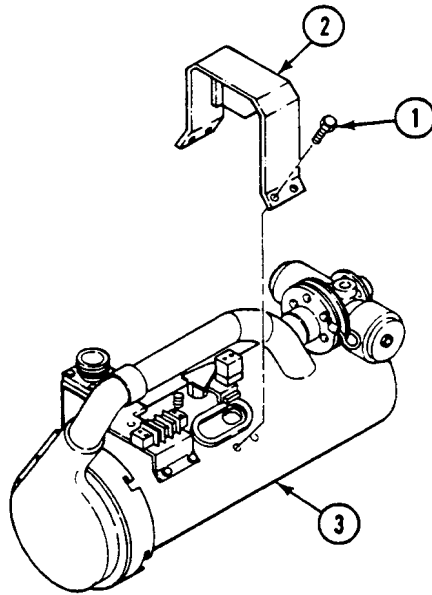


INSTALLATION

1. Install motor resistor (6) on bracket (10) with screw (9) and nut (8).
2. Secure motor resistor (6) leads to terminals 4 and 6 of terminal board (7).
3. Install diode (4) in holder (5).



4. Install guard (2) on heater (3). Secure with four screws (1).

**FOLLOW-THROUGH STEPS**

1. Install engine coolant heater in carrier (see your -20).

END OF TASK

REPLACE BLOWER MOTOR

0068 00**THIS WORK PACKAGE COVERS:**

Removal (page 0068 00-1).
Installation (page 0068 00-2).

INITIAL SETUP:Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G10

Tools and Special Tools

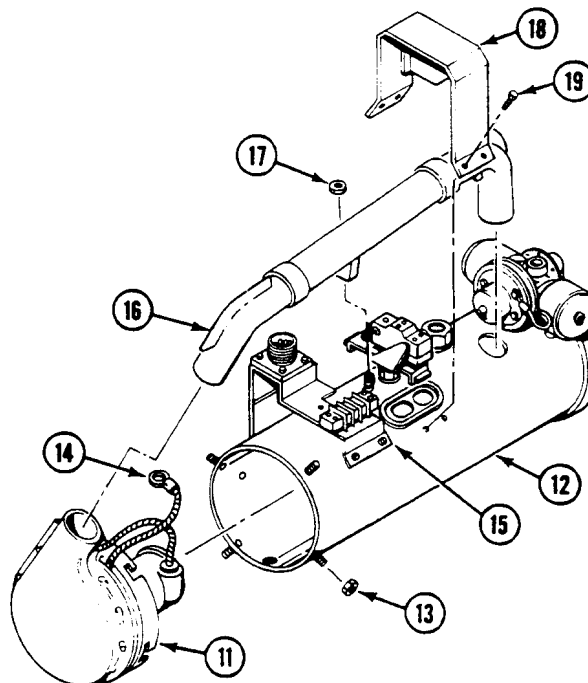
Automotive Fuel and Electrical System Repair Tool Kit
(WP 0104 00, Item 4)
Metric Wrench Kit (WP 0104 00, Item 53)

Equipment Condition

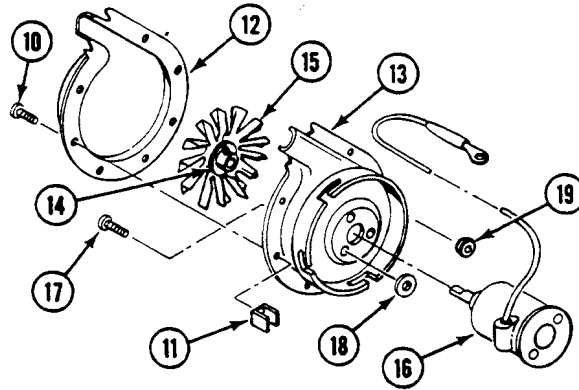
Engine coolant heater removed from carrier
(see your -20)

REMOVAL

1. Remove four screws (19) and guard (18) from coolant heater (12).
2. Remove nut (17) and combustion tube assembly (16) from coolant heater (12) and blower assembly (11).
3. Disconnect blower assembly lead (14) from terminal strap (15) on terminal 6.
4. Scribe a line on blower assembly (11) and on coolant heater (12) for proper alignment.
5. Loosen four nuts (13) and turn blower assembly (11) counterclockwise and remove blower assembly from coolant heater (12).

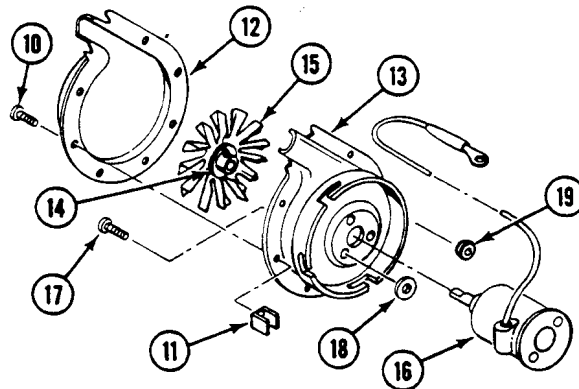


6. Remove seven screws (10), speed nuts (11), and cover (12) from blower plate (13).
7. Loosen set screw (14) and remove fan vane (15) from motor (16).
8. Remove three screws (17), spacers (18), and grommets (19), and motor (16) from blower plate (13).



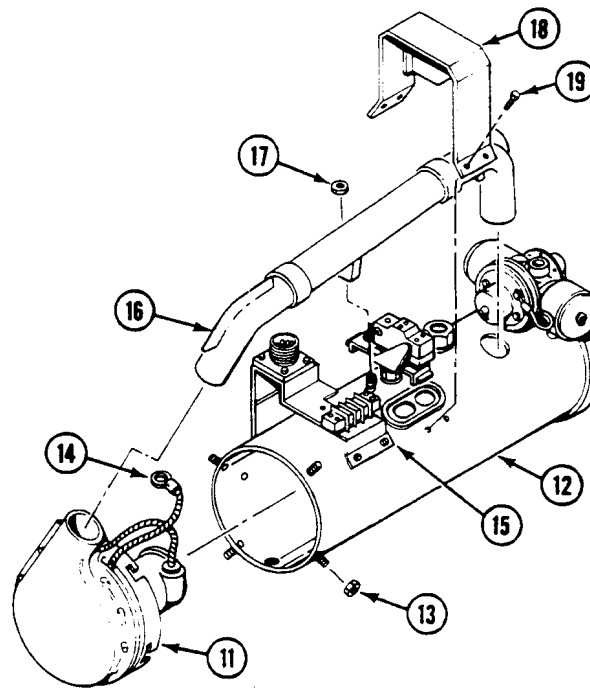
INSTALLATION

1. Install motor (16) in blower plate (13). Secure with three screws (17), spacers (18), and grommets (19).
2. Place fan vane (15) flush with end of motor shaft. Secure with set screw (14).
3. Install cover (12) on blower plate (13). Secure with seven screws (10) and speed nuts (11). Turn fan vane (15) through combustion tube opening to make sure fan vane is clear.



REPLACE BLOWER MOTOR — Continued**0068 00**

4. Place blower assembly (11) on heater (12) and turn clockwise. Secure with four nuts (13).
5. Connect blower assembly lead (14) to terminal strap (15) on terminal 6.
6. Place combustion tube assembly (16) on coolant heater (12) and blower assembly (11). Secure with nut (17).
7. Install guard (18) on coolant heater (12). Secure with four screws (19).

**FOLLOW-THROUGH STEPS**

1. Install coolant heater in carrier (see your -20).

END OF TASK

ENGINE COOLANT HEATER DATA

0069 00

THIS WORK PACKAGE COVERS:

The engine coolant heater specifications are listed in the following table.

INITIAL SETUP:

Maintenance Level

Direct Support

EQUIPMENT DATA

Description	Characteristics	Metric Equivalents
Manufacturer	Stewart Warner	
Model	939-J24	
Part number	11601698	
Heat output:		
Coolant:		
High heat	15,000 Btu/hr	4.4 kW
Low heat	8,000 Btu/hr	2.3 kW
Operating temperature range		
(surrounding)	-65° to +100°F	-54° to +38°C
Electrical requirements:		
Operating voltage range	20 to 28.5 V	
Amperes draw (maximum above)	70°F	22°C
Start	12.0 amp	
Run	1.5 amp	
Amperes draw (maximum below)	70°F	22°C
Start	15.0 amp	
Run	3.5 amp	
Performance:		
Fuel	grades DF-1, DF-2, DFA,	
Fuel consumption:	CIE, and JP-8	
High heat (normal)	0.026 ± 0.005 lb/min	0.013 ± 0.003 kg/min
Low heat (normal)	0.011 ± 0.003 lb/min	0.006 ± 0.002 kg/min
Fuel pressure (at fuel valve inlet)	3 to 15 psi	21 to 103 kPa
Fuel pump output pressure	3 to 6 psi	21 to 41 kPa
Temperature settings:		
Overheat thermostat (opens)	245°F	118°C
Restriction thermostat setting	160°F	71°C
Dimensions and weight:		
Height	10 in.	25.40 cm
Length	15-5/16 in.	38.89 cm
Width	6-3/16 in.	15.71 cm
Weight	15 lb	6.81 kg
Coolant pump:		
Manufacturer	MP Pumps, Inc.	
Model	12245	
Part number	10946835	
Electrical requirements:		
Operating voltage range	20 to 28.5 V	
Ampere draw	2.0 amp	
Output	12 to 16 gpm	45 to 61 liters/min
Weight (maximum)	10 lb	5 kg

END OF TASK

FINAL TEST - COOLANT HEATER

0070 00

THIS WORK PACKAGE COVERS:

- Test Setup (page 0070 00-1).
 - Coolant System (page 0070 00-3).
 - Electrical Wiring (page 0070 00-4).
 - Exhaust Collector (page 0070 00-5).
 - Testing (page 0070 00-5).
 - Burn Test (page 0070 00-6).
 - Testing Restriction Thermostat and Thermostatic Switch (page 0070 00-7).
-

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 0104 00, Item 4)
- Digital Multimeter (WP 0104 00, Item 28)

References

WP 0062 00

Equipment Condition

Coolant heater removed from carrier (see your -20)

Materials/Parts

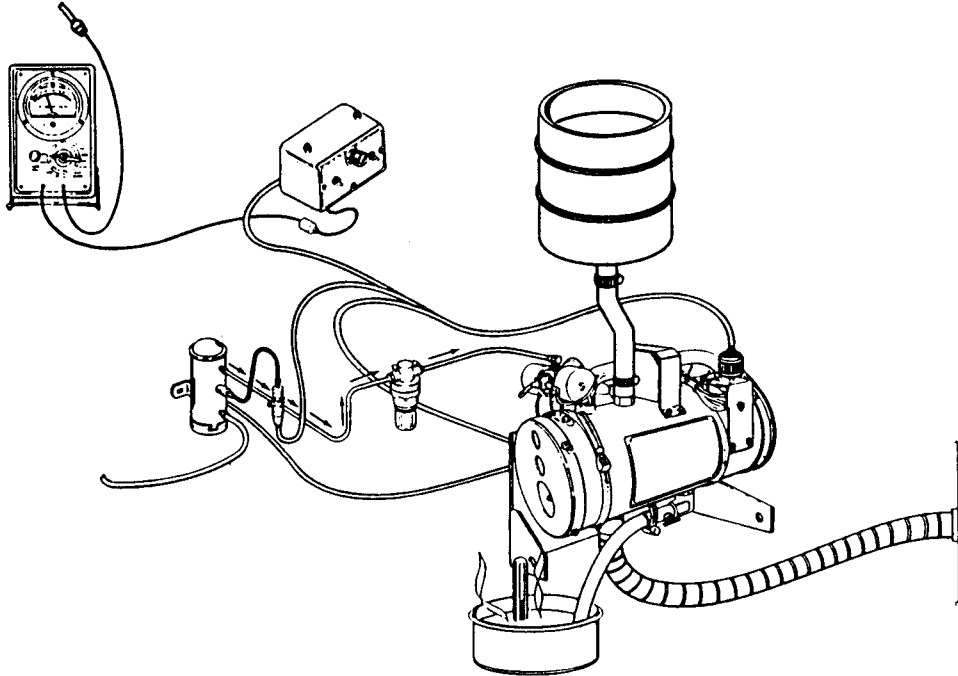
- Control box
 - Fuel filter
 - Fuel pump
 - Fuel source
 - Stopwatch
 - Suitable coolant container (5 gallon minimum)
 - Suitable exhaust hose (10 foot maximum)
 - Suitable rack or cradle
 - Thermometer
 - 24 V dc power source
-

TEST SETUP

CAUTION

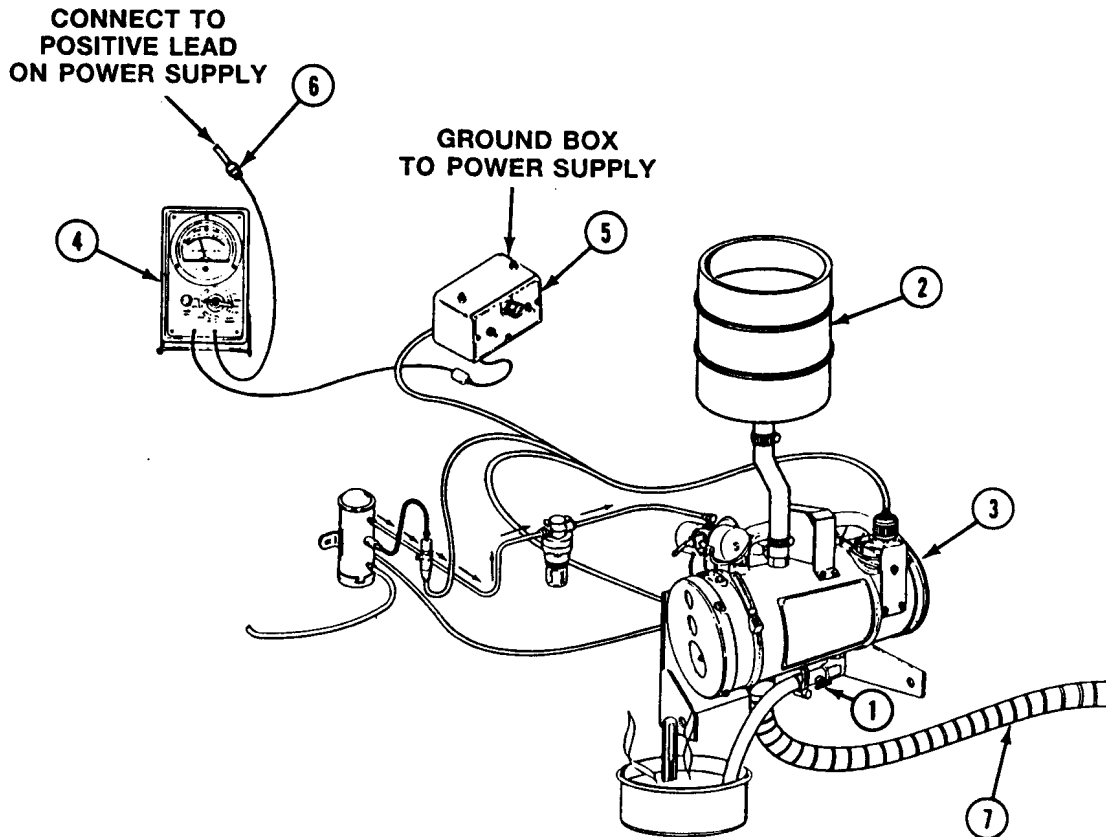
Test setup must be wired for negative ground.

1. After overhaul of coolant heater, conduct a final test before installation, to make sure heater will work right. The suggested typical test setup is shown.



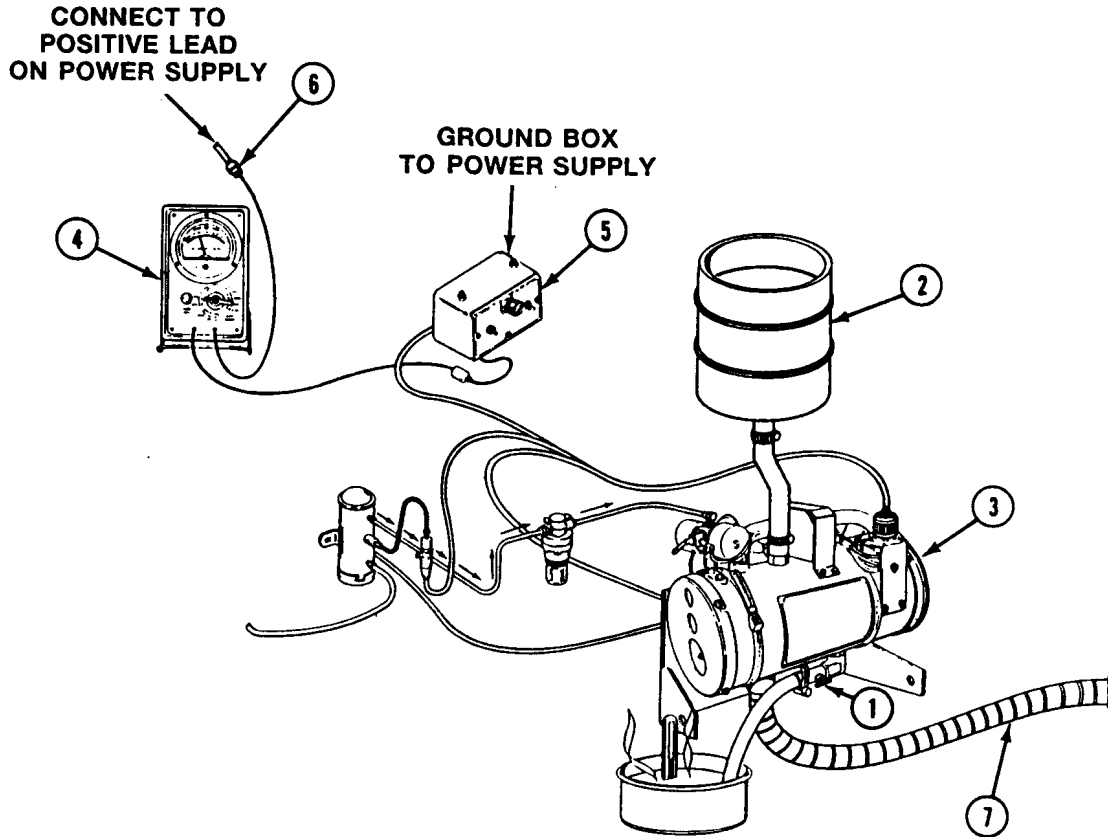
COOLANT SYSTEM

1. Do not use more than 5 gallons of coolant. Use same coolant as in carrier. Do not use water.
2. Change coolant quickly. Allow coolant to cool between tests. The coolant system should have a shutoff valve (1).
3. Vent the coolant container (2) for air. The coolant container may remain open or closed. Use of a thermo-syphon type flow is allowed. No pump is required.



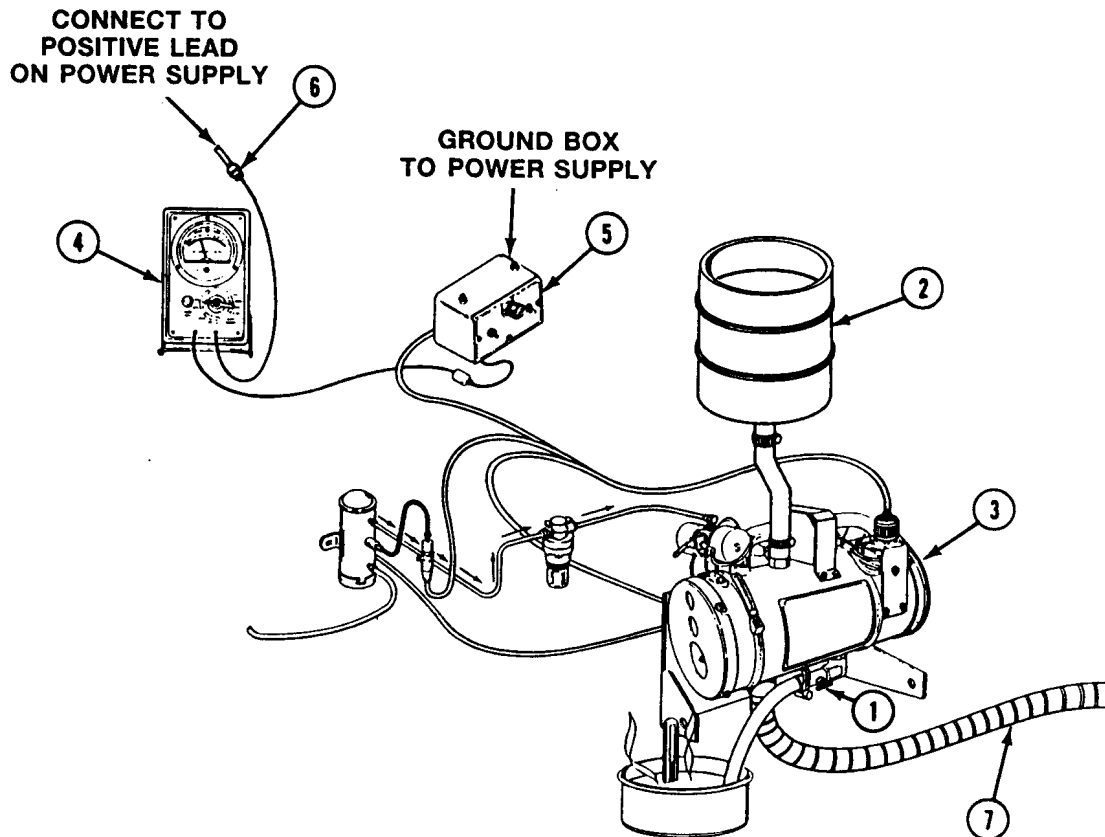
ELECTRICAL WIRING

1. Wire the heater (3), using the regular wiring harness. See wiring diagram, page 0070 00-8. Connect a multimeter (4) across the circuit between the hot lead of the control box (5) and the power source (6).
2. Use a fully charged battery for the power source.



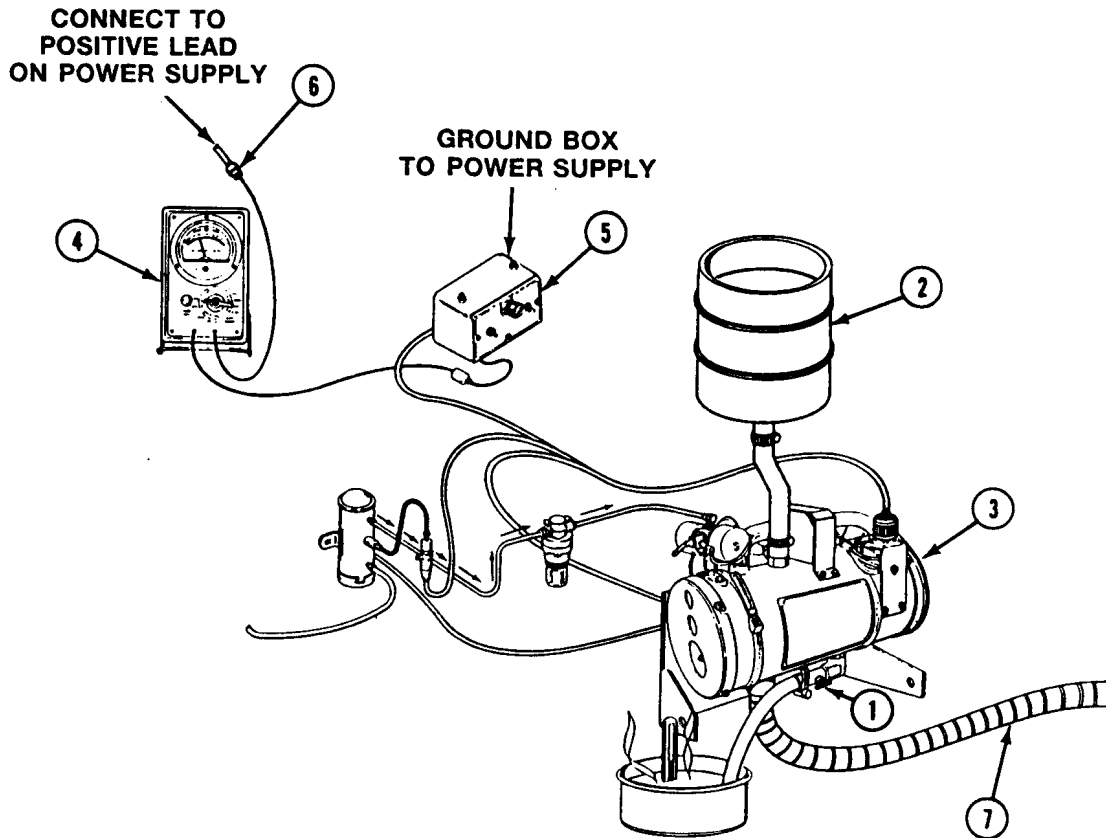
EXHAUST COLLECTOR

1. Conduct the heater exhaust away from the test area. Use an exhaust extension made of flexible hose (7) not more than 10 feet long.

**TESTING**

1. A complete test of the coolant heater consists of the following:
 - a. Fuel flow test (WP 0062 00).
 - b. Burn test.
 - c. Restriction thermostat test.
 - d. Thermostatic switch test.
 - e. Combustion air blower test.
2. Obtaining equipment for the combustion air blower test may be difficult. Do not do this test if the heater burns properly and the igniter cavity does not show undue carbon deposits.

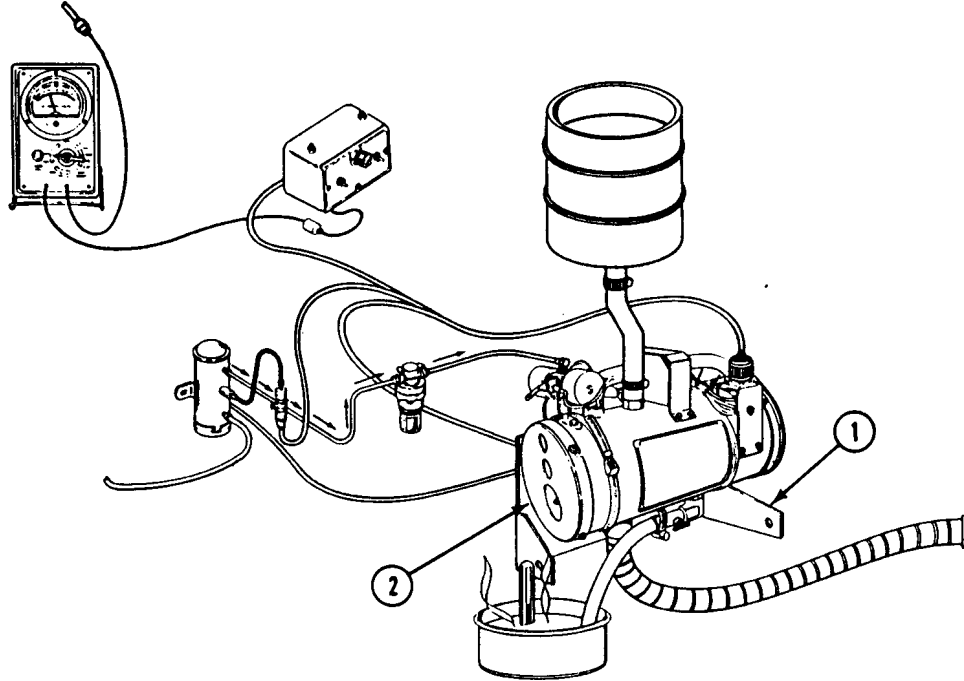
- Replace the blower if the heater goes out during test or smokes a lot and has heavy carbon deposits in the igniter cavity (WP 0068 00). Moderate carbon deposits are normal and do not indicate a bad blower.



BURN TEST

- Secure coolant heater to test stand (1) and coolant, fuel, electrical, and exhaust connections. Do not start the heater unless there is an ample supply of coolant.
- Remove heater end cover (2) and check inside for coolant leakage before starting burn test. Replace heater if coolant has leaked.
- Place heater control switch in START position and start timing heater immediately.
- Note multimeter reading. Amperage draw must not exceed 12.8 amps (15.3 amps below 70°F (21°C)).
- Heater should ignite within 40 seconds from time heater control switch is turned on.
- The flame detector switch must transfer within 200 seconds. Transfer will be indicated by the pilot lamp and a drop in amperage draw. Move the heater control switch to RUN. Amperage draw must not exceed 1.5 amps (4 amps below 70°F (21°C)). While burner is igniting, and prior to flame switch transfer, check burner seal for signs of fuel leakage. If leakage is present, replace packing gasket (WP 0066 00).
- If the heater fails to ignite or is slow to set flame, clean the igniter cavity and install a new igniter (see your -20).
- If the flame detector switch does not transfer within the required time limits, the burner is bad. Replace heater if burner is bad.
- Allow the heater to burn one minute on HI heat, then move heater control HI-LO switch to LO. Burning and blower speed should continue, but slow down. If the heater goes out, replace the fuel control valve (WP 0062 00) and heater end cover.

10. Turn the heater control switch to OFF. Fuel flow and burning should stop in about 30 seconds. Blower should continue to run from 1 to 3 minutes and then stop. If blower does not work within limits, readjust the flame detector switch (see your -20). If the blower still fails to work within limits, replace the flame detector switch (see your -20).



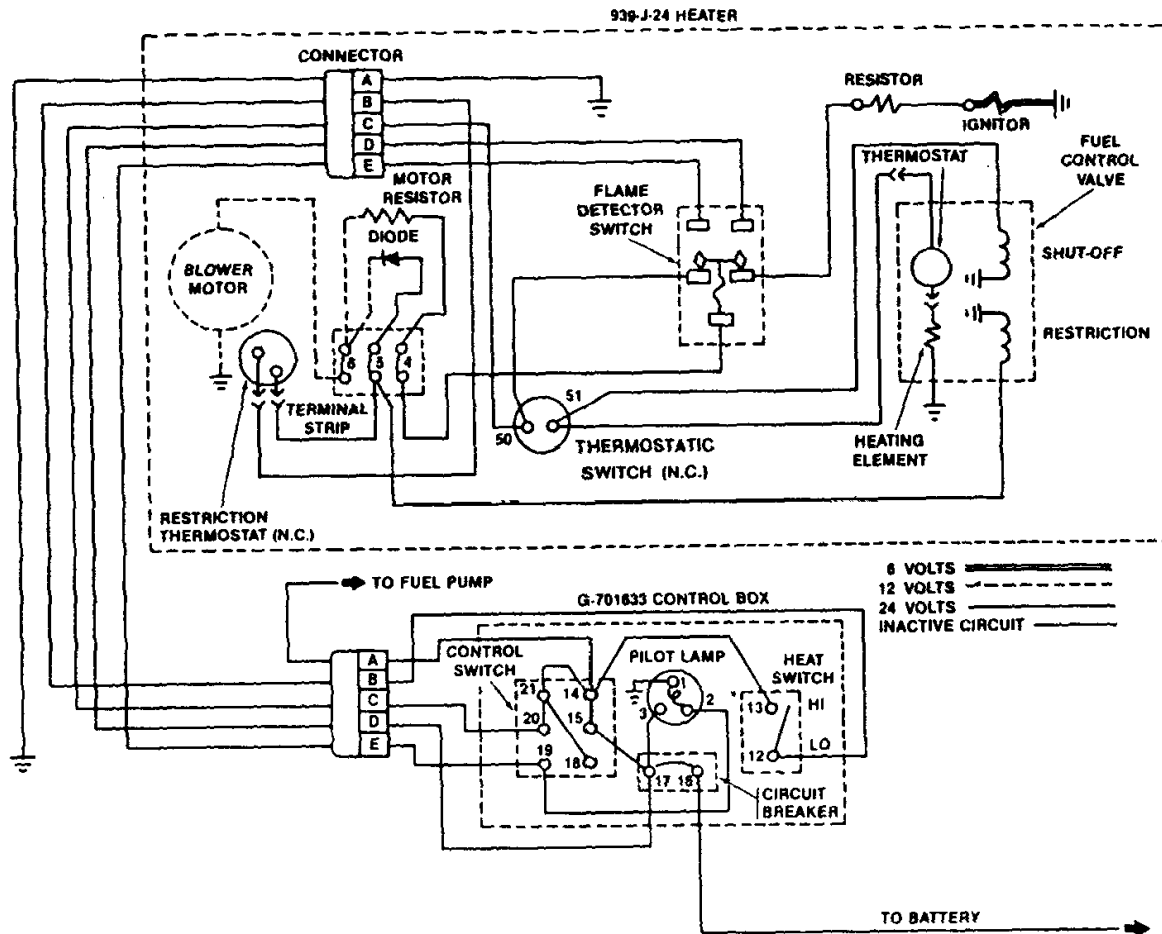
TESTING RESTRICTION THERMOSTAT AND THERMOSTATIC SWITCH

NOTE

**Thermostat shown in fuel control valve is set to open at 70°F (21°C) and to close at 30°F (-1°C).
If temperature is below 70°F (21°C), the heating element in fuel control valve can be energized during any operational cycle.**

1. Turn the heater on and run it until the coolant is hot enough to make the heater cycle from high to low heat. Leave the heater alone, then take the temperature of the coolant. The temperature should be between 140°F (60°C) and 170°F (76°C). If coolant temperature is not within limits, replace restriction thermostat (WP 0063 00).

- After testing the restriction thermostat, close circuit across terminal board terminals 4 and 5 to make the heater stay on high heat. Heat the coolant until the heater burning stops. Check the temperature of the coolant, it should be not less than 220°F (104°C) or more than 250°F (121°C). If the coolant temperature is not within these limits, replace the thermostatic switch (WP 0064 00).



FOLLOW-THROUGH STEPS

- Install coolant heater in carrier (see your -20).

END OF TASK

CHAPTER 15

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR TENT

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
REPAIR TENT (M577A2 AND M1068 ONLY).....	0071 00

REPAIR TENT (M577A2 AND M1068 ONLY)

0071 00

THIS WORK PACKAGE COVERS:

- Inspection of Installed Items (page 0071 00-1).
 - Repair or Replacement (page 0071 00-2).
-

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fabric Repairman 43M20

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0104 00, Item 19)
- Industrial Sewing Machine (WP 0104 00, Item 38)

References

- See your -10
- FM 10-16
- TM 10-5410-229-13&P

Materials/Parts

- Adhesive sealant (WP 0105 00, Item 2)
- Canvas preservative coating (WP 0105 00, Item 16)
- Cotton duck cloth (WP 0105 00, Item 8)
- Polyester thread (WP 0105 00, Item 25)
- Solvent, cleaning compound (WP 0105 00, Item 10)

Equipment Condition

Tent removed from carrier (see your -10)

NOTE

For M1068 tent repair, see TM 10-5410-229-13&P.

INSPECTION OF INSTALLED ITEMS

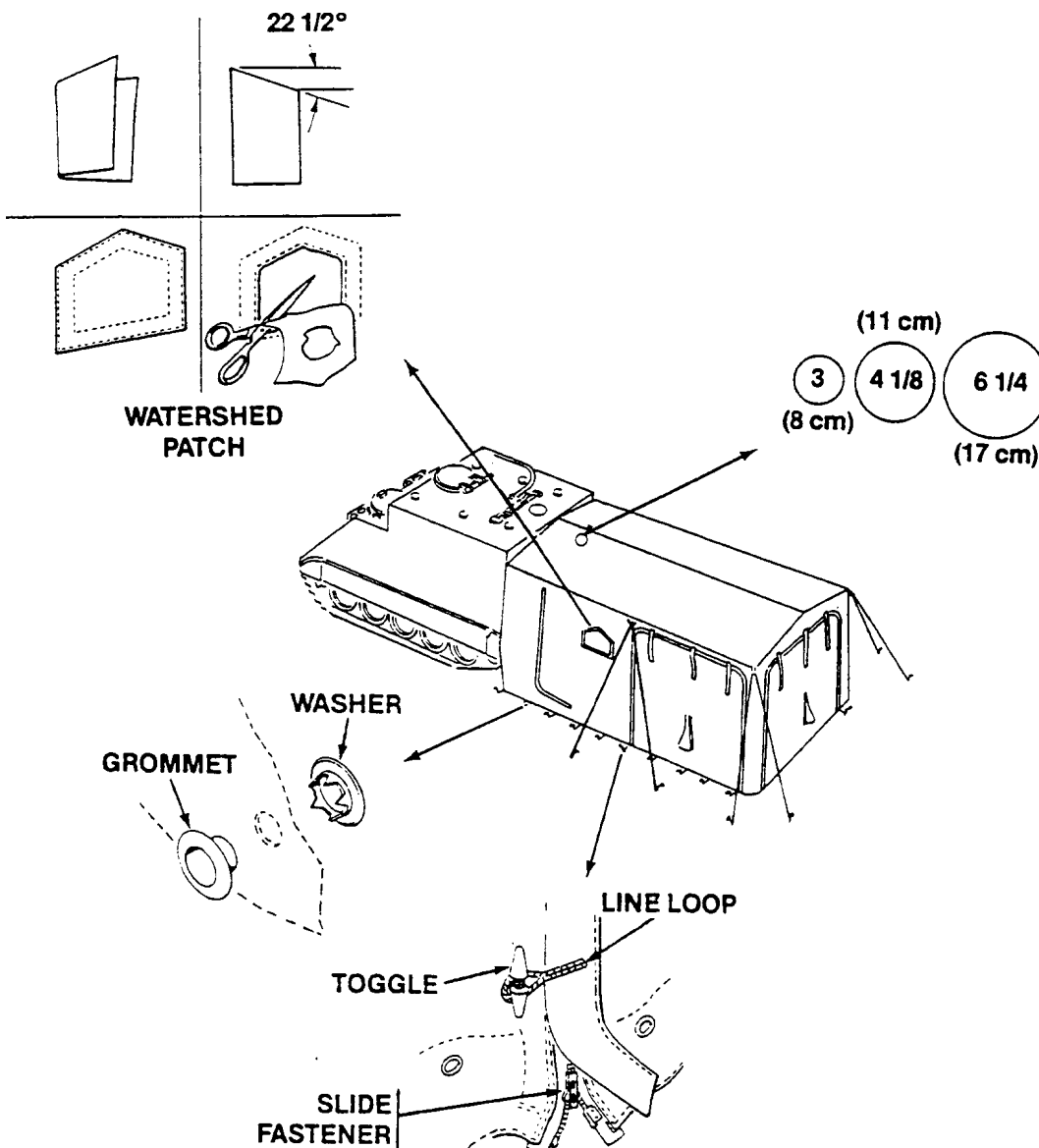
1. Check tent. Mark defects to be repaired.
2. Check framework, support leg, ridge, eave and bow poles, joints, adjusting pins, and chains. Remove burrs. Straighten bends and dents. Weld broken joints. Replace badly damaged parts.
3. Check tensile strength of fabric. Grasp a small fold of fabric between thumb and forefinger of each hand, gripping it closely so tips of forefingers touch. Test material against threads that run the length of material. The weaker cross threads should not be used for testing tensile strength. Tug material several times. If it does not rip, it is repairable. If it tears on first tug, test several areas for extent of damage. Weak sections must be replaced.
4. Check fabric. Repair sections that have been weakened by stains or that cannot be brushed clean. Repair or replace sections that are worn or torn or have a large number of patches.
5. Check stitching. Repair runoffs and broken threads. Restitch weak stitching and open seams.
6. Check webbing. Repair or replace tie tapes, guy lines, corner straps, and web reinforcements that are frayed, worn, or torn.
7. Check leather. Replace leather reinforcements that are cracked, worn, or weak.
8. Check hardware. Replace parts that are broken, bent, corroded, or missing.
9. Check toggles. Replace split, broken, or missing toggles.
10. Check loops, guy lines, foot stops, and mounting lines. Replace parts that have frayed or broken strands or raveled ends.
11. Check netting. Replace torn netting.

REPAIR OR REPLACEMENT

NOTE

To repair fabric, use 12-19/64 ounce (363 ml) per square cotton sateen or cotton duck and size FF polyester thread. The cloth and thread must be fire, water, weather, and mildew resistant.

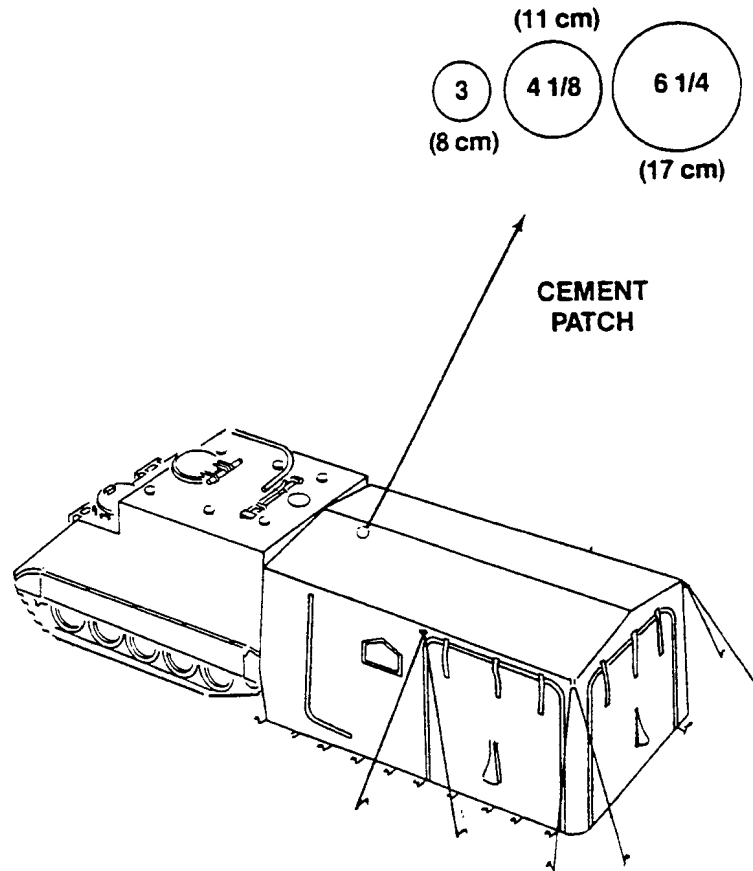
1. Use lockstitching to install all patches, straps, flaps, and side fasteners and to repair open seams. Use smallest needle size you can to make weatherproof seams. Allow 5 to 7 stitches per 1 inch (3 cm). Backstitch all thread breaks at least 1 inch (3 cm). Backstitch all ends at least 1 inch (3 cm), except where ends are turned under in a hem or seam or held down by other stitching. Maintain thread tension so stitching is tight and lock is firmly fixed in center of material. Trim all ends. Take care, when restitching, to make a new stitch line. All hardware, leather, webbing, lines and netting used for repair must be the same as the original material.



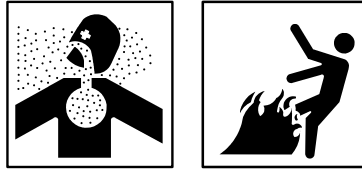
NOTE

A hole or tear in the tent more than 4-3/4 inches (12 cm) in diameter or length may be repaired by a cement patch. The tear must not occur on seams, edges, or areas that support hardware. The materials used to make a cement patch are adhesive, round patches, roller, board, wire brush, and soft bristled brush. For cement patch repair, do Steps 2 - 9.

2. Select one of three sizes of patches that will overlap damaged area with a margin of at least 3/4 inch (19 cm) on all sides.



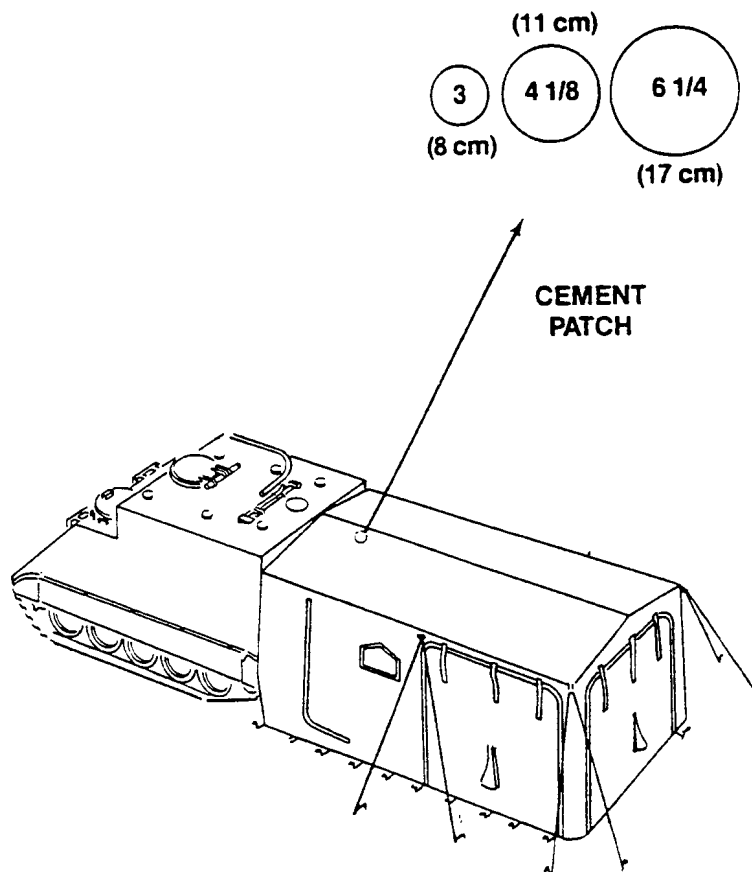
3. Place board under damaged area for a flat working surface.
4. Buff patch and damaged area of tent with a wire brush.

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.

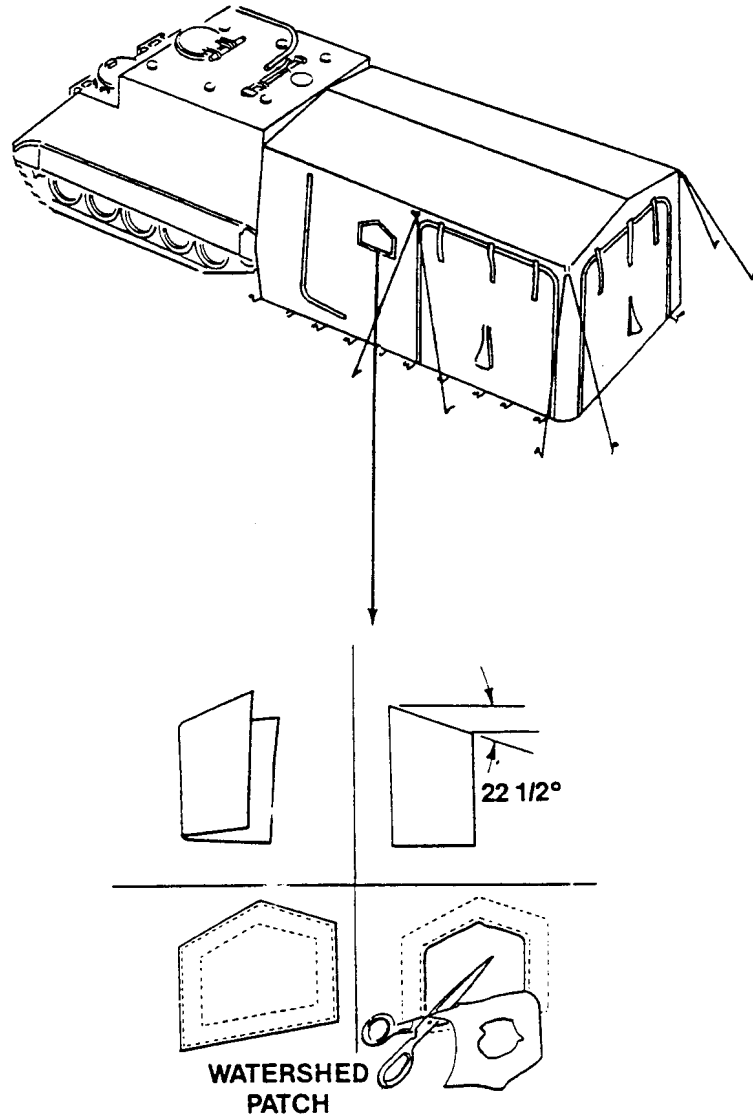
5. Center patch over damaged area. Apply adhesive to patch and patch edge with a soft bristle brush, making a circle on tent.
6. Lift patch. Apply adhesive to area of tent inside adhesive circle.
7. Allow adhesive to dry until tacky.
8. Press cement surfaces together firmly with roller while tacky.
9. Seal by wiping edge of patch with soft bristle brush.



NOTE

The watershed patch has the top edge angled to give a roof effect. Because the roof-type top edge sheds water, the patch lasts longer than a rectangular patch. For watershed patch repair, do Steps 10 - 14.

10. Cut patch large enough to overlap 2 inches (5 cm) on all sides of area to be repaired. Allow for 3/4 inch (19 mm) turn-under of edge.



11. Fold patch in half lengthwise. Cut from open edges to folded edge at 22-1/2 degree angle.
12. Center patch over damaged area on outside of tent. Turn under patch edges. Stitch in place with a row of stitching no more than 1/8 inch (3 mm) from the edge.
13. Secure patch to tent with a second row of stitching. Place second row 3/8-1/2 inch (10-13 mm) from first row.
14. Turn material over. Cut away damaged area, notch corners, and turn edges in. Stitch turned edges to patch with a row of stitching no more than 1/8 inch (3 mm) from the edge.

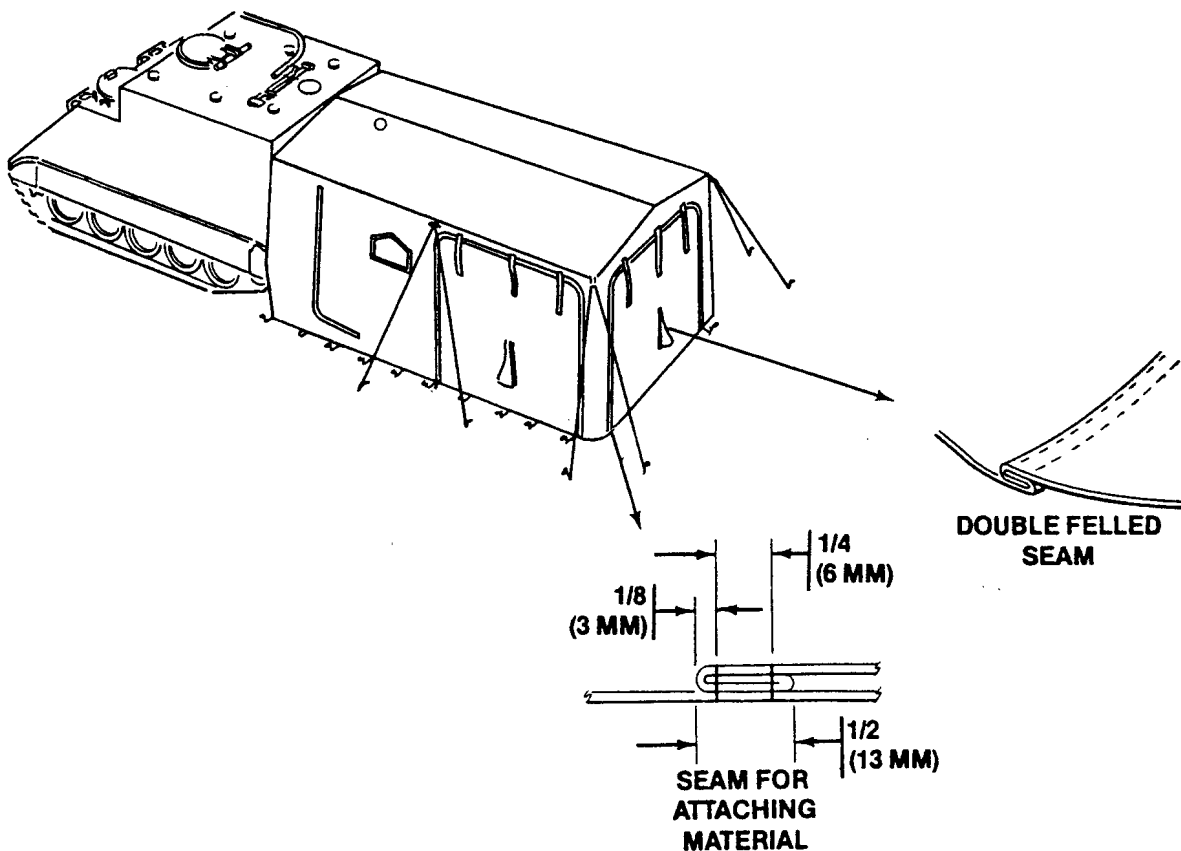
NOTE

Extensive damage between seams is repaired with a seam-to-seam patch. For seam-to-seam patch repair, do Steps 15 - 19.

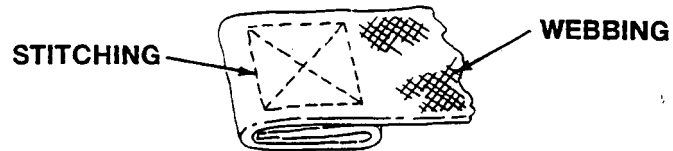
15. Open seam 2 inches (5 cm) beyond damaged area on both sides.
16. Square off damaged area from seam to seam.
17. Cut patch 2 inches (5 cm) wider than squared-off section. Allow for 3/4 inch (19 mm) turn-under on sides.
18. Center patch over cutaway section. Turn sides under and reform double-felled seams at top and bottom.
19. Finish by stitching patch into place.

NOTE

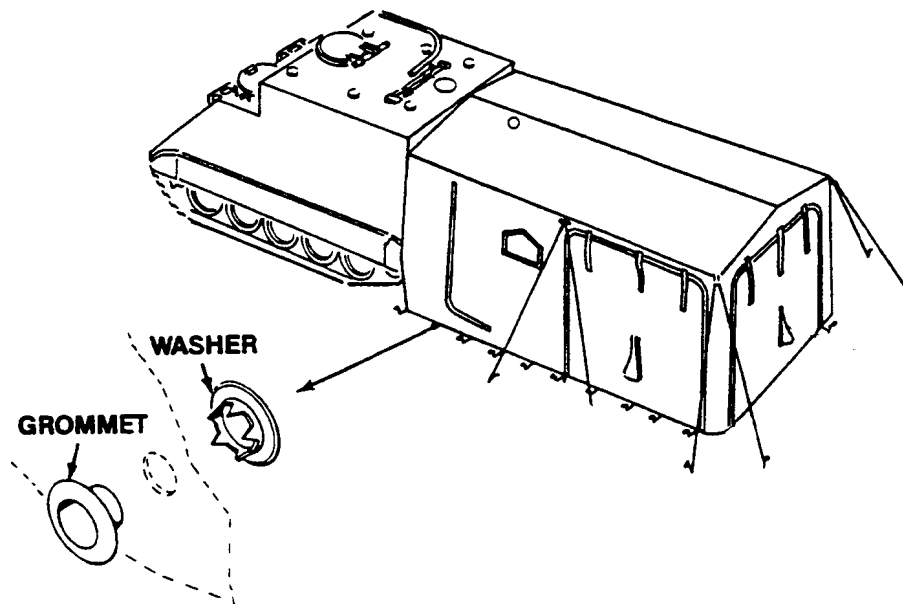
For webbing and reinforcement repair, do Steps 20 - 21.



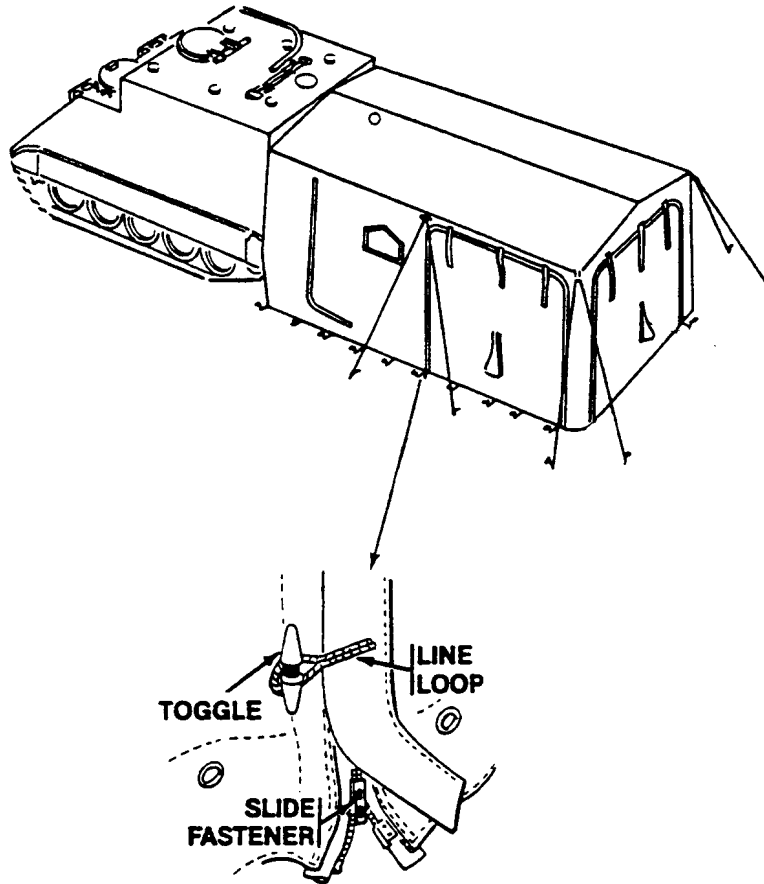
20. Install webbing and reinforcements. Machine stitch a rectangular pattern 1/8 inch (3 cm) in from the edges, a set of stitches 1/8 inch (3 mm) in from end stitchings, and diagonal stitches from corner to corner.
21. Attach all leather reinforcements. Use the same stitching method used for webbing.



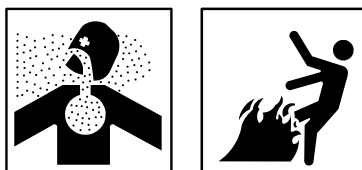
22. Install end clips. Insert strap into ball-type end clip. Flatten clip with hammer.
23. Install grommets per FM 10-16. Holes punched in the material to receive grommets shall be smaller than outside diameter of grommet barrel. Clinch grommets firmly without cutting material.



24. Install line loops in fastener flaps. Use hand-sewn, overcast stitch. See FM 10-16 for overcast stitch and information on hand sewing.



25. Install netting. Use machine stitching.

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.

NOTE

The tent should be treated, as needed. Use sealing compound that is textile, paste form and fire, water, weather and mildew resistant. To use sealing compound, do Steps 26 - 31.

26. Make sure tent is dry. Remove dirt, oil, and grease stains.
27. Erect tent (see your -10).
28. Reduce paste to spray consistency by mixing with solvent, cleaning compound.
29. Apply compound by spray gun. Operator should wear respirator.
30. Apply compound to patches and newly repaired areas.
31. Allow at least 24 hours for tent to dry.

FOLLOW-THROUGH STEPS

1. Stow or install tent on carrier (see your -10).

END OF TASK

CHAPTER 16

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR CAPSTAN AND ANCHOR KITS

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
INSTALL CAPSTAN KIT (M113A2 AND M1059 ONLY).....	0072 00
INSTALL ANCHOR KIT (M113A2 AND M1059 ONLY).....	0073 00

INSTALL CAPSTAN KIT (M113A2 AND M1059 ONLY)

0072 00

THIS WORK PACKAGE COVERS:

Installation (page 0072 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Metalbody Repairer 44B

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Hacksaw Frame (WP 0104 00, Item 23)

Measuring Tape (WP 0104 00, Item 44)

Torque Wrench (WP 0104 00, Item 55)

Trailer Mounted Welding Shop (WP 0104 00, Item 49)

References

TC 9-237

TM 43-0139

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

Carrier on level surface with tracks removed from sprockets (see your -20)

Materials/Parts

Hacksaw blade (WP 0105 00, Item 6)

Welding electrode (WP 0105 00, Item 27)

Kit P/N 5703657

INSTALLATION

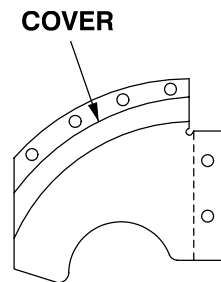
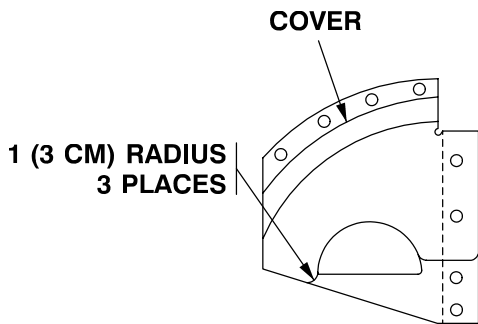
NOTE

There are two configurations of the shroud cover installation. They are shown below. Before cutting, select the one that your carrier has.

1. Mark cutting lines as shown in the upper view of the correct illustration for your carrier's shroud cover (left side).
2. Use hacksaw and cut the front shroud cover as needed, along the cutting lines. The final cut should look like the lower view of the correct illustration of your carrier's shroud cover (left side).
3. Repeat Steps 1 - 2 on the right side of your carrier.
4. Smooth out any sharp edges that may remain on the shroud cover with a round file.

MARKING FOR CUTTING LINES

AFTER CUTTING

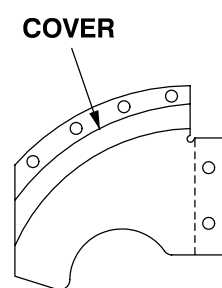
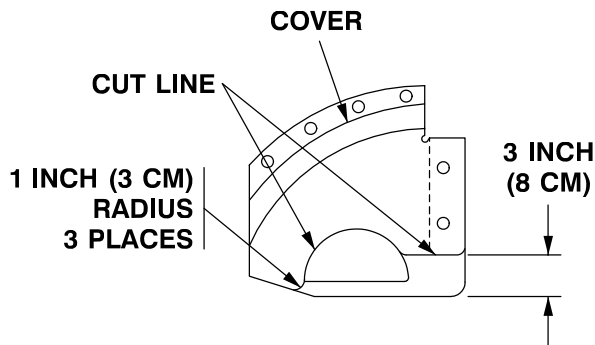


**17 1/2 INCH (44 CM) SHROUD COVER
(WITH STEP)**

**17 1/2 INCH (44 CM) SHROUD COVER
(WITH STEP)**

MARKING FOR CUTTING LINES

AFTER CUTTING



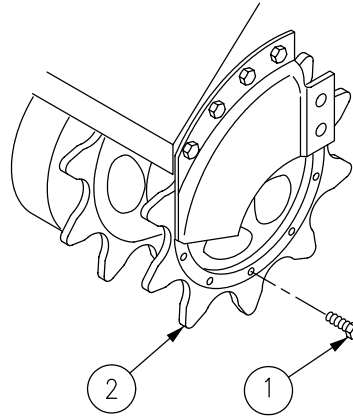
**12 INCH (30 CM) SHROUD COVER
(WITH STEP)**

**12 INCH (30 CM) SHROUD COVER
(WITH STEP)**

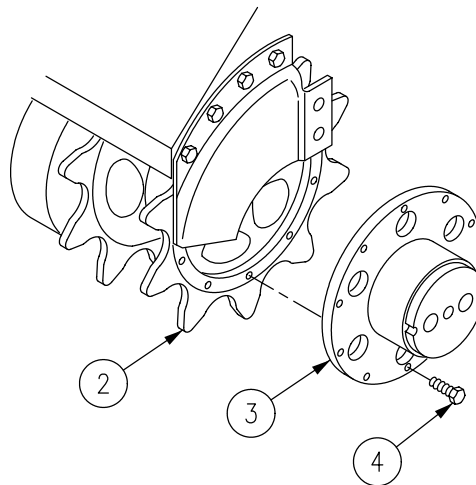
NOTE

Two types of screws are provided in capstan kit. One type of screw is for counterbore holes in sprocket. The other type of screw is for holes without counterbore construction. Twenty of each type of screw is provided. Use as applicable.

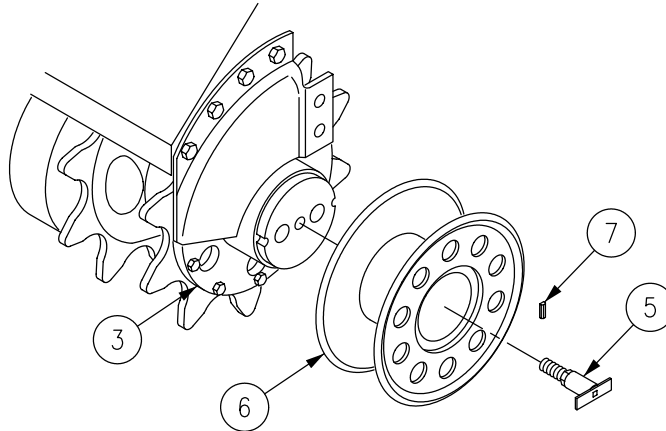
5. Remove ten screws (1) from left sprocket (2) and ten screws from right sprocket.



6. Place two adapters (3) on two sprockets (2).
7. Secure adapters (3) to sprockets (2) with 20 screws (4). **TIGHTEN SCREWS TO 110-115 LB-FT (149-156 N·M) TORQUE.** Use torque wrench.



8. Make sure retainer (5) is installed in drum (6) with pin (7).
9. Install drum (6) on adapter (3). Secure with retainer (5).

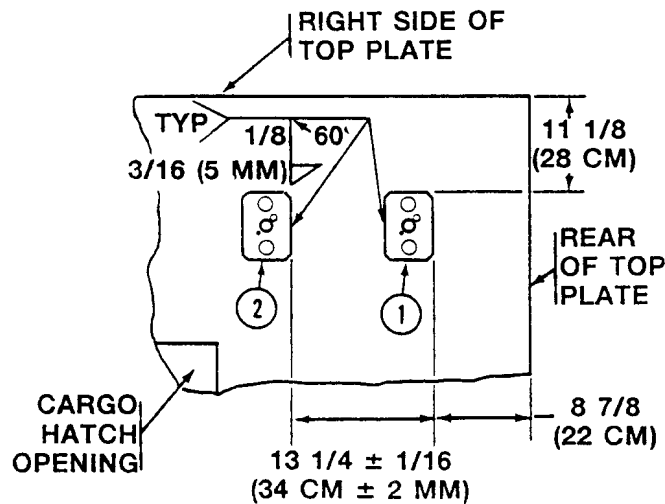


10. Measure and mark the correct positions for the smaller stowage support (1) and for the larger support (2) on top of carrier.

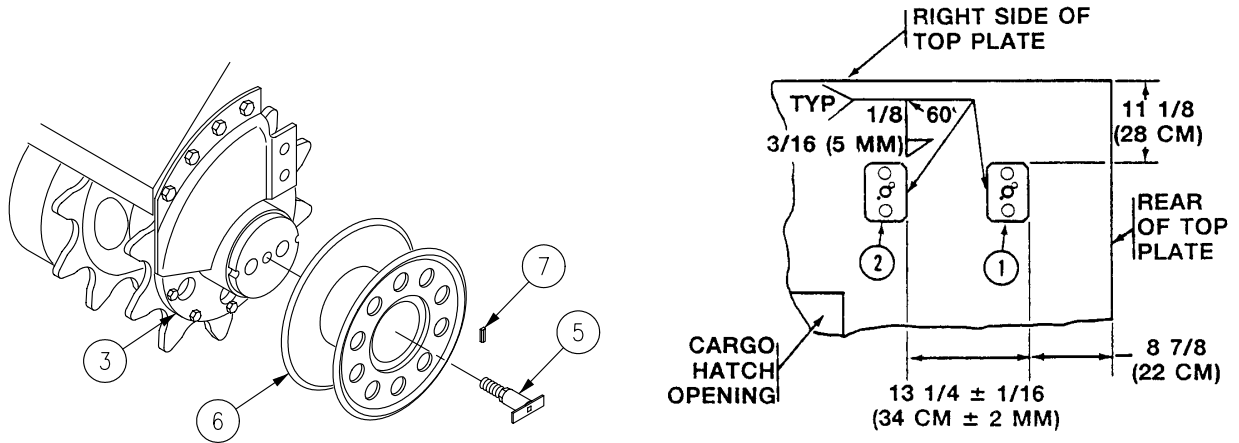
NOTE

All weld sizes are minimum. Do not exceed 1/16 inch (2 mm) over specified sizes.

11. Remove all paint, alodine, and debris from surfaces under stowage supports to be welded.
12. Weld stowage supports (1) and (2) to top plate of carrier as marked in Step 10 in accordance with TC 9-237. Use electrode type 5356.



13. Clean weld area and apply touch-up paint to repaired area. See TM 43-0139.
14. Unscrew two retainers (5) to remove two drums (6) from two adapters (3).
15. Place one drum (6) over stowage support (1). Place the other drum (6) over stowage support (2). Secure with two retainers (5).



FOLLOW-THROUGH STEPS

1. Install tracks on carrier (see your -20).

END OF TASK

INSTALL ANCHOR KIT (M113A2 AND M1059 ONLY)

0073 00

THIS WORK PACKAGE COVERS:

Installation (page 0073 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Materials/Parts

Kit P/N 5703656

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Measuring Tape (WP 0104 00, Item 44)

Portable Electric Drill (WP 0104 00, Item 10)

Screw Threading Set (WP 0104 00, Item 37)

Twist Drill Set (WP 0104 00, Item 50)

Personnel Required

Track Vehicle Repairer 63H10

Equipment Condition

Engine stopped (see your -10)

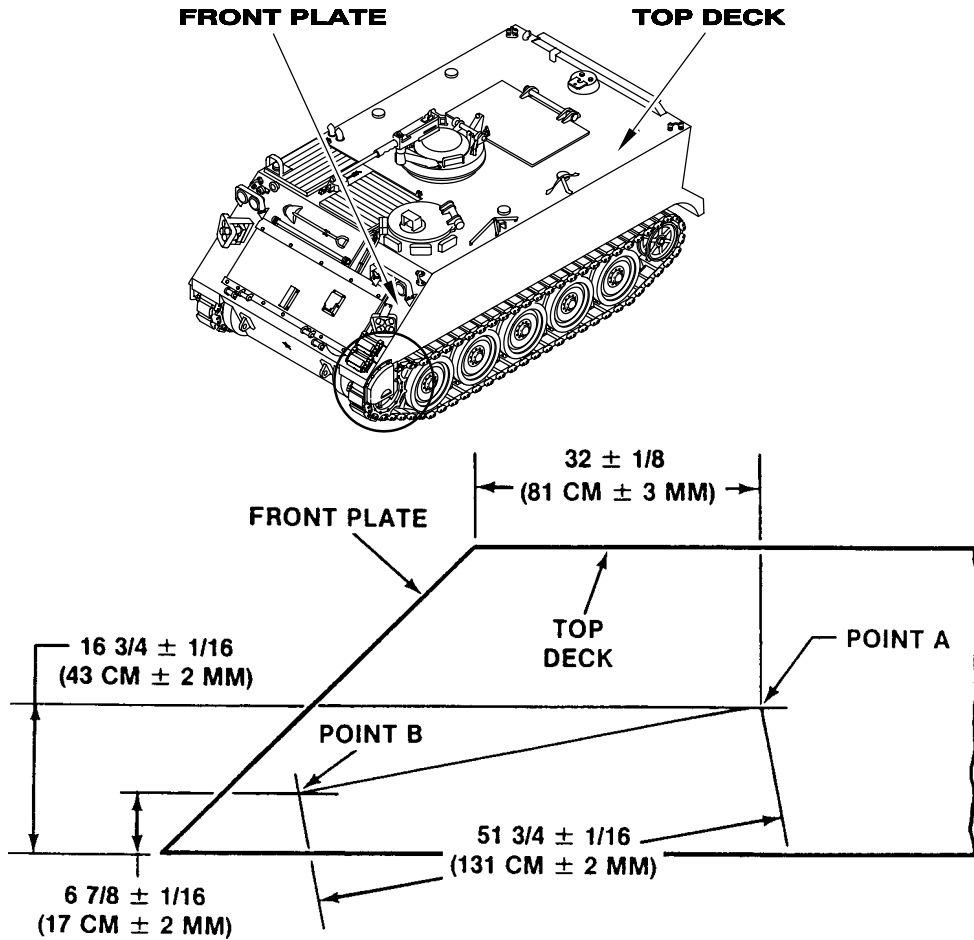
Carrier blocked (see your -10)

INSTALLATION

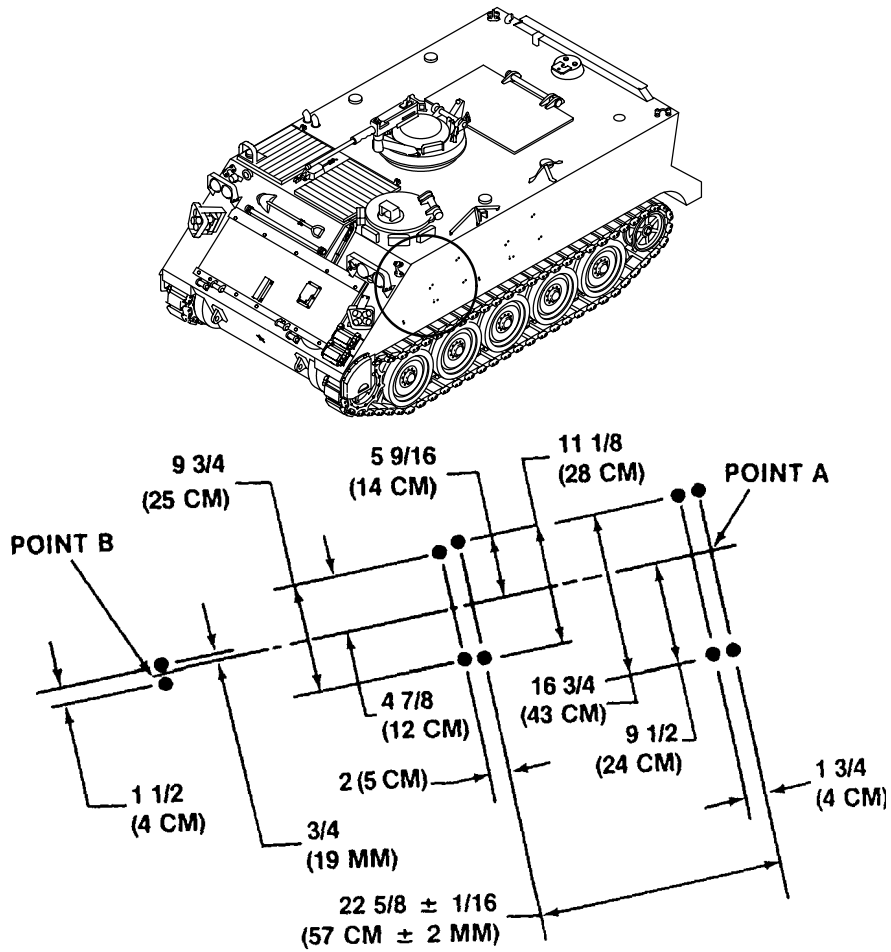
NOTE

The positions of ten screws, out of the 20 screws furnished in the kit, are measured from the line connecting POINT A and POINT B.

1. Locate and mark POINT A and POINT B on the left side of carrier, using dimensions given below.
2. Mark a line between POINT A and POINT B.



3. Measure and mark the center points for holes, using the dimensions given below.

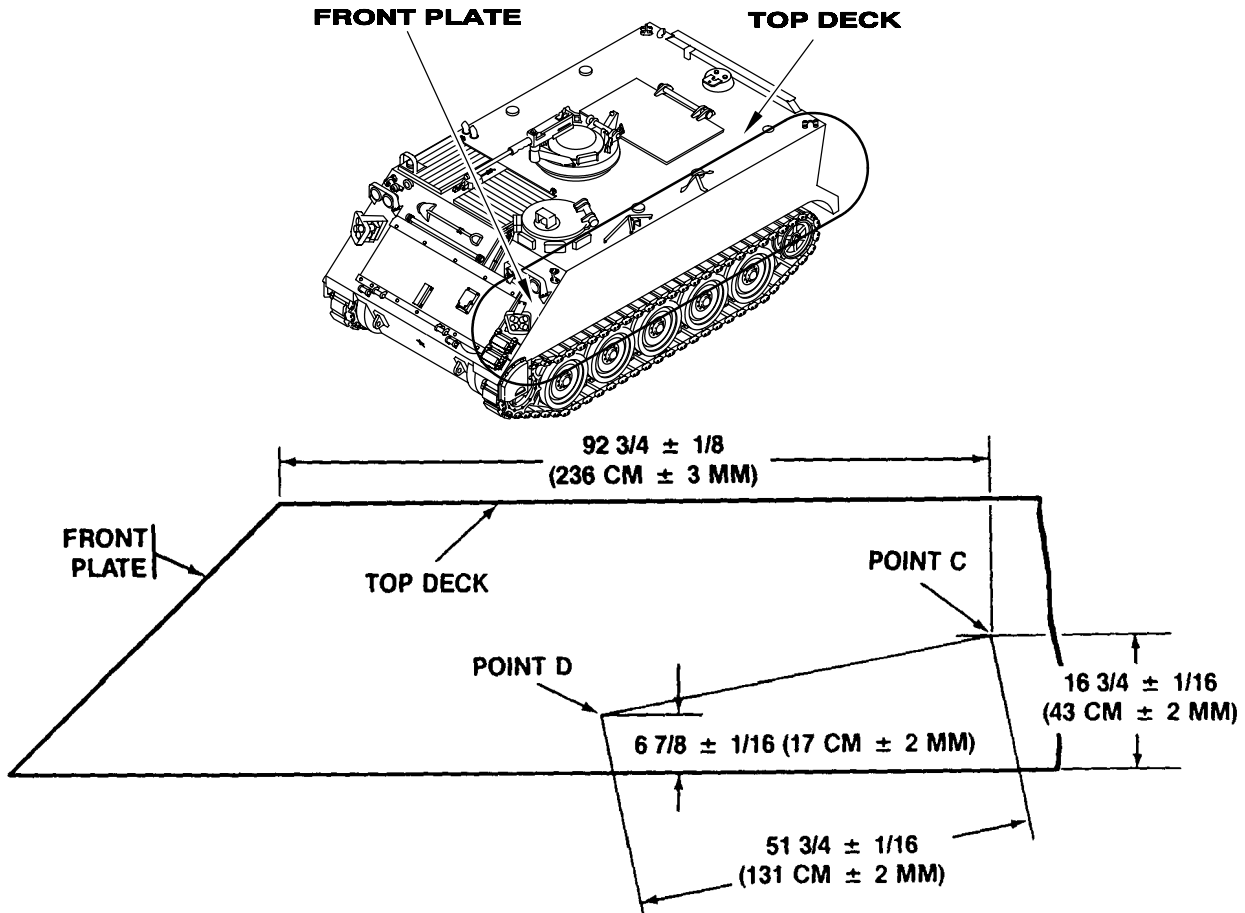


4. Drill and tap the ten holes marked in Step 3. Tap holes to 1/2-13 UNC-2B, 1 inch (3 cm) minimum full thread depth.

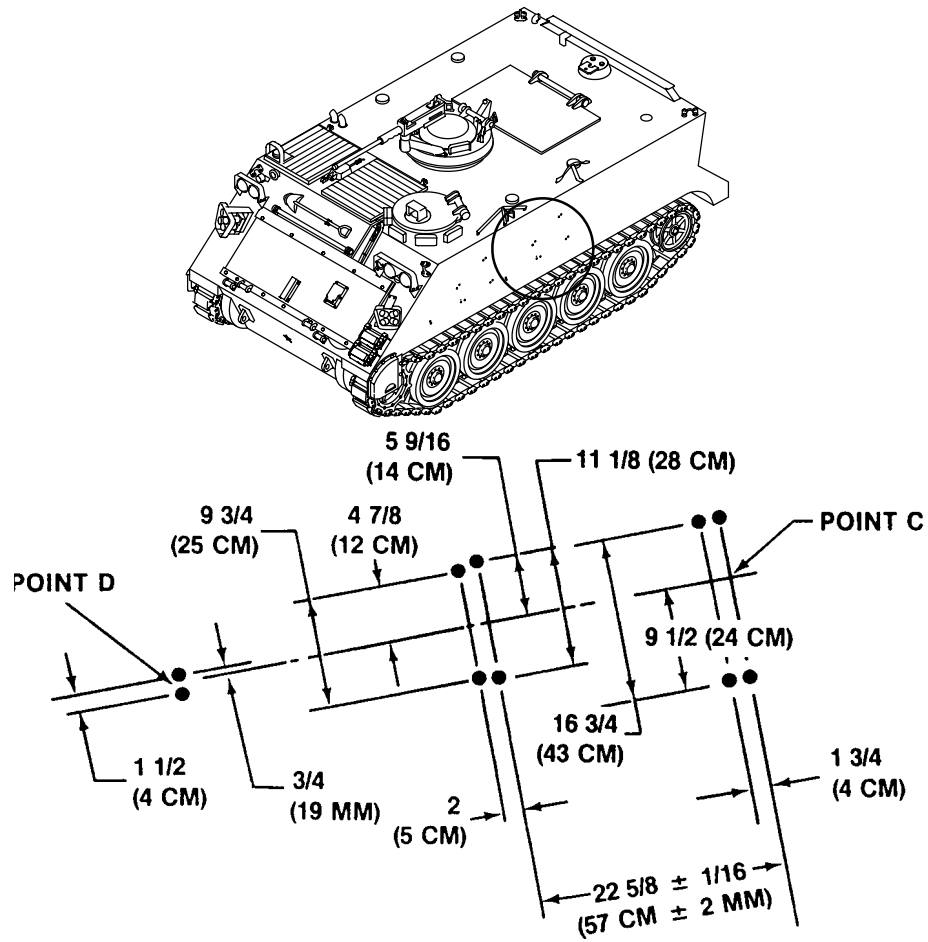
NOTE

The positions of the remaining ten screws are measured from the line connecting POINT C and POINT D.

5. Locate and mark POINT C and POINT D on the left side of carrier, using dimensions given below.
6. Mark a line between POINT C and POINT D.



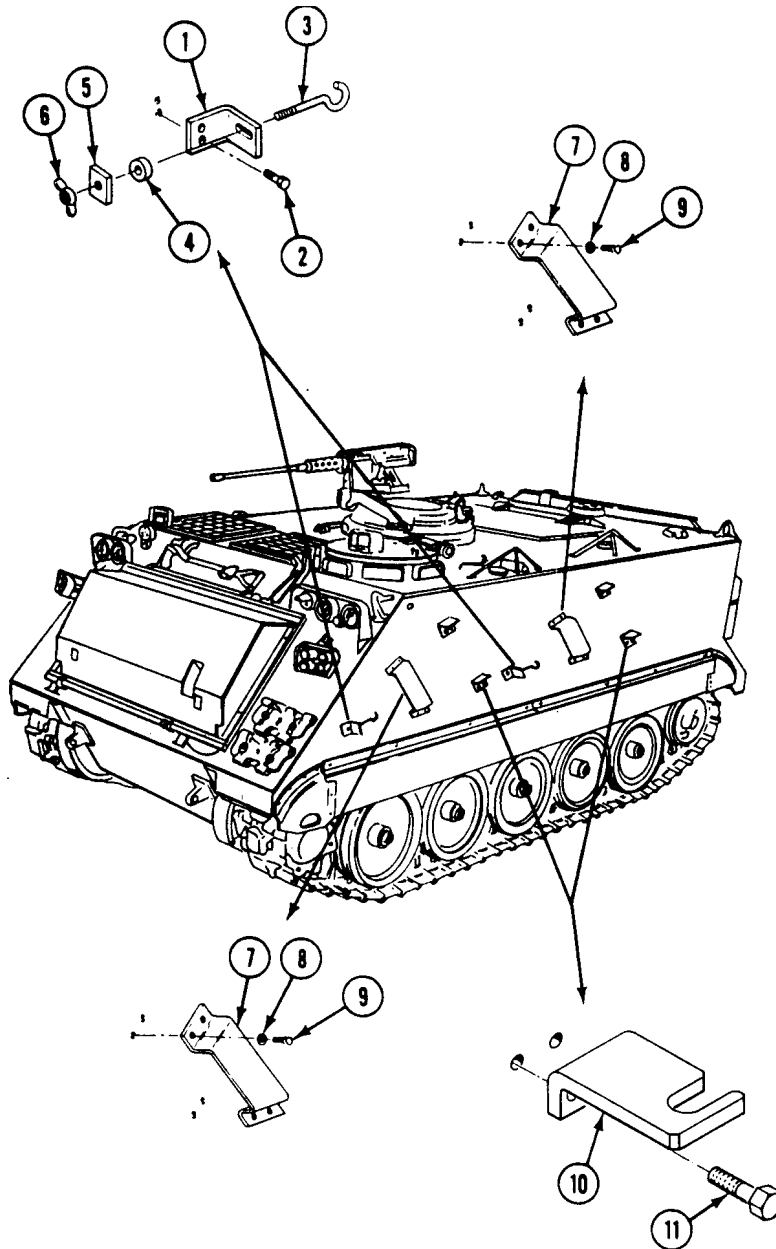
7. Measure and mark the center points for ten holes, using the dimensions given below.



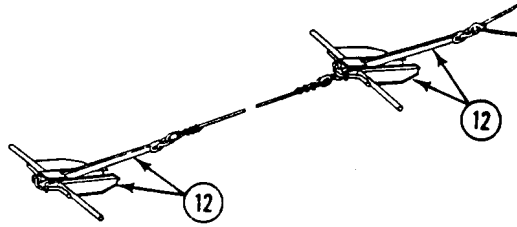
INSTALL ANCHOR KIT (M113A2 AND M1059 ONLY) — Continued

0073 00

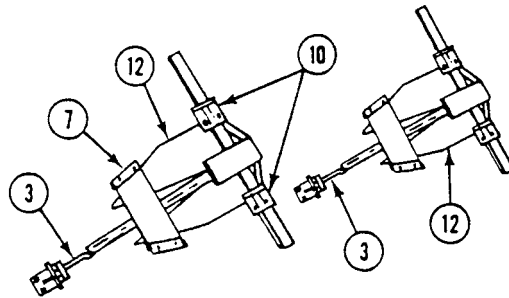
8. Drill and tap ten holes as marked in Step 7. Tap holes to 1/2-13 UNC-2B, 1 inch (3 cm) minimum to 1 9/16 inch (4 cm) maximum full thread depth.
9. Install two hook brackets (1) on carrier. Secure with four screws (2).
10. Install two hooks (3) on brackets (1). Secure with two spacers (4), square nuts (5), and wingnuts (6). Stake last two threads of hook to retain wingnuts.
11. Install two supports (7) on carrier. Secure with eight flat washers (8) and screws (9).
12. Install four angle brackets (10) on carrier. Secure with eight screws (11).



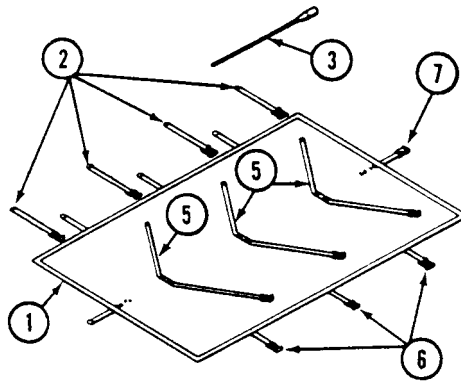
13. Remove two anchors (12) from the cables and towlines of anchor kit.



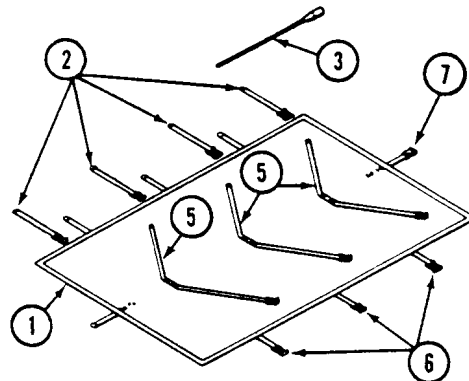
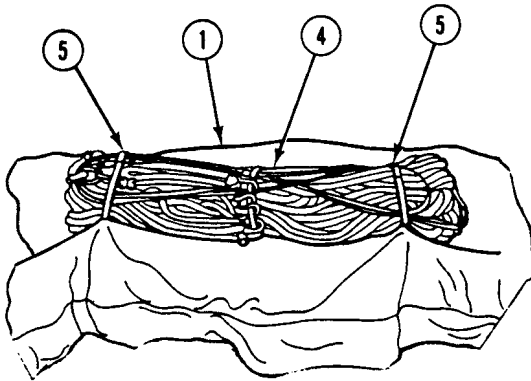
14. Slide two anchors (12) into supports (7) and brackets (10) on left side of carrier.
15. Fasten two hooks (3) to anchors (12) and tighten wingnuts.



16. Place tarpaulin (1), four straps (2), and fid (3) on flat surface.
17. Place two cable assemblies, six towlines, six shackles, and fid on tarpaulin (1).



18. Fasten anchor kit items (4) on tarpaulin (1) with three straps (5) that are part of tarpaulin.
19. Wrap tarpaulin (1) over anchor kit items (4). Fasten tarpaulin together with three straps (6) and webbing (7) that are parts of tarpaulin. Use fid (rounded pin) to tuck towlines into tarpaulin.
20. Stow anchor kit on carrier as directed by local authority. Use four straps (2) to secure kit in place.



END OF TASK

CHAPTER 17

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR MACHINE GUN ARMOR SHIELD KIT

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
INSTALL COMMANDER'S CUPOLA ARMOR SHIELDS (M113A2, M1059, AND M1064 ONLY).....	0074 00
INSTALL CARGO HATCH ARMOR SHIELDS (M113A2 ONLY).....	0075 00
REPAIR MACHINE GUN SHIELD MOUNTING ARM (M113A2 AND M1059 ONLY).....	0076 00

INSTALL COMMANDER'S CUPOLA ARMOR SHIELDS (M113A2, M1059, AND M1064 ONLY)

0074 00

THIS WORK PACKAGE COVERS:

Installation (page 0074 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0104 00, Item 19)
- Portable Electric Drill (WP 0104 00, Item 10)
- Screw Threading Set (WP 0104 00, Item 37)
- Trailer Mounted Welding Shop (WP 0104 00, Item 49)
- Twist Drill Set (WP 0104 00, Item 50)

Materials/Parts

- Machine gun shield kit P/N 11660854
- Spacer, 1/16 to 1/8 inch thick (2)
- Wood blocks of equal height (2)

Personnel Required

- Track Vehicle Repairer 63H10
- Helper (H)

References

- TM 43-0139
- TC 9-237

Equipment Condition

- Engine stopped (see your -10)
 - Carrier blocked (see your -10)
-

INSTALL COMMANDER'S CUPOLA ARMOR SHIELDS (M113A2, M1059, AND M1064 ONLY) — Continued

0074 00

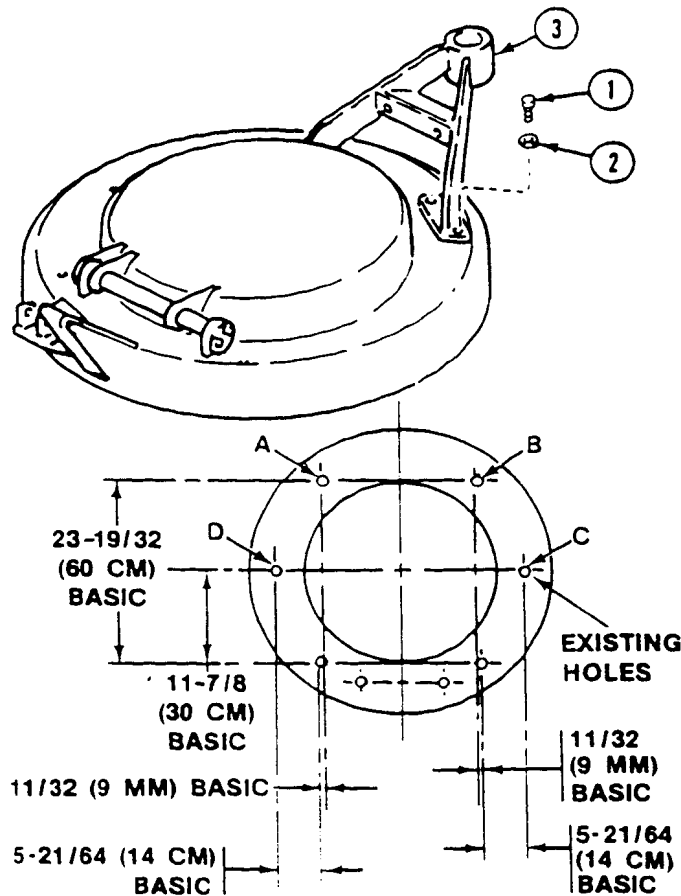
INSTALLATION

1. If four shield mounting holes are already drilled in cupola hatch, remove and discard four 1/2-13 screws and flat washers from hatch. If mounting holes are NOT drilled, follow Steps 3 - 5.
2. Remove two 5/8-18 screws (1) and washers (2) from outboard support legs of machine gun pintle (3). Discard screws. Keep flat washers.
3. Remove machine gun mount and support from cupola. Close cupola (see your -10).

NOTE

All dimensions are in inches with metric equivalents.

4. Measure and mark four points (A, B, C, and D) on cupola. Measure point positions from four existing screw holes that secure machine gun support to cupola.
5. Drill four holes using 27/64 (11 mm) drill. Drill to a maximum depth of 1-1/4 (3 cm). Tap with a 1/2-13 UNC tap to a minimum depth of 7/8 (22 mm).



**INSTALL COMMANDER'S CUPOLA ARMOR SHIELDS (M113A2, M1059,
AND M1064 ONLY) — Continued**

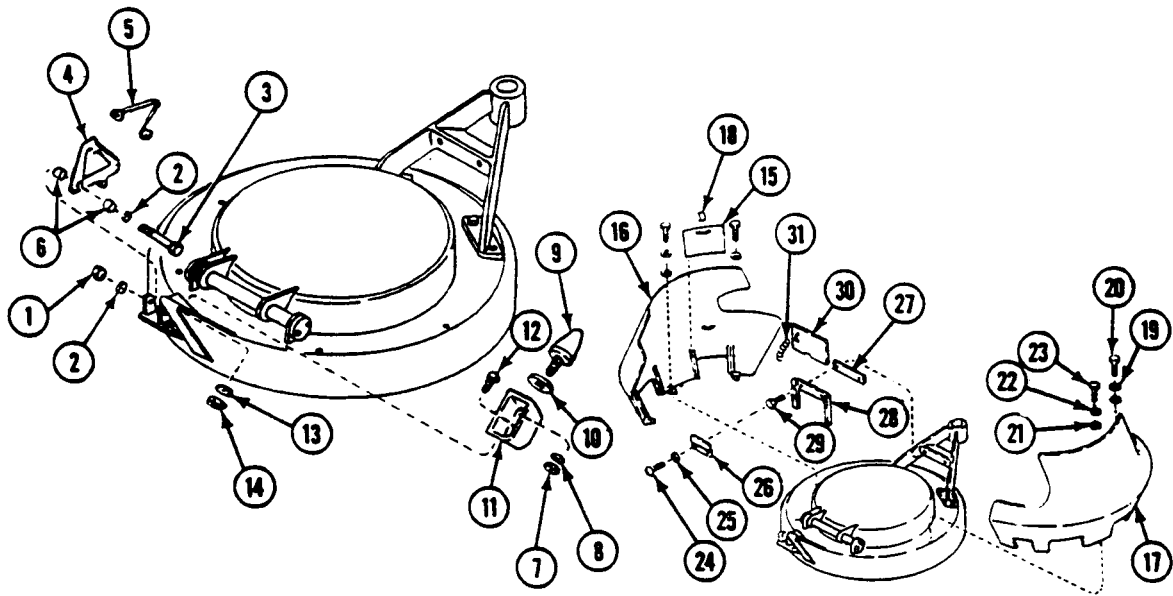
0074 00

6. Remove locknut (1), two flat washers (2), and cap screw (3) that secure hook (4), spring (5), and two spacers (6) on cupola hatch. Discard hook. Keep all other parts.
7. Place new hook (4), spring (5), and two spacers (6) on cupola hatch. Secure with two flat washers (2), cap screw (3), and locknut (1).
8. Remove locknut (7) and flat washer (8) that secure bumper (9) and flat washers (10) to cupola hatch. Remove bumper and washers. Keep washers. Discard locknut.
9. Place new bumper extension bracket (11) on cupola hatch with welded end up. Secure with new cap screw (12), flat washer (13), and locknut (14).
10. Use flat washers (10), as needed, to compress bumper 1/4 inch (6 mm) when cover is open and latched. Place flat washers (10) and bumper (9) on bracket (11). Secure with flat washer (8) and new locknut (7).

NOTE

Gun shields are large and bulky. Get an assistant to help you.

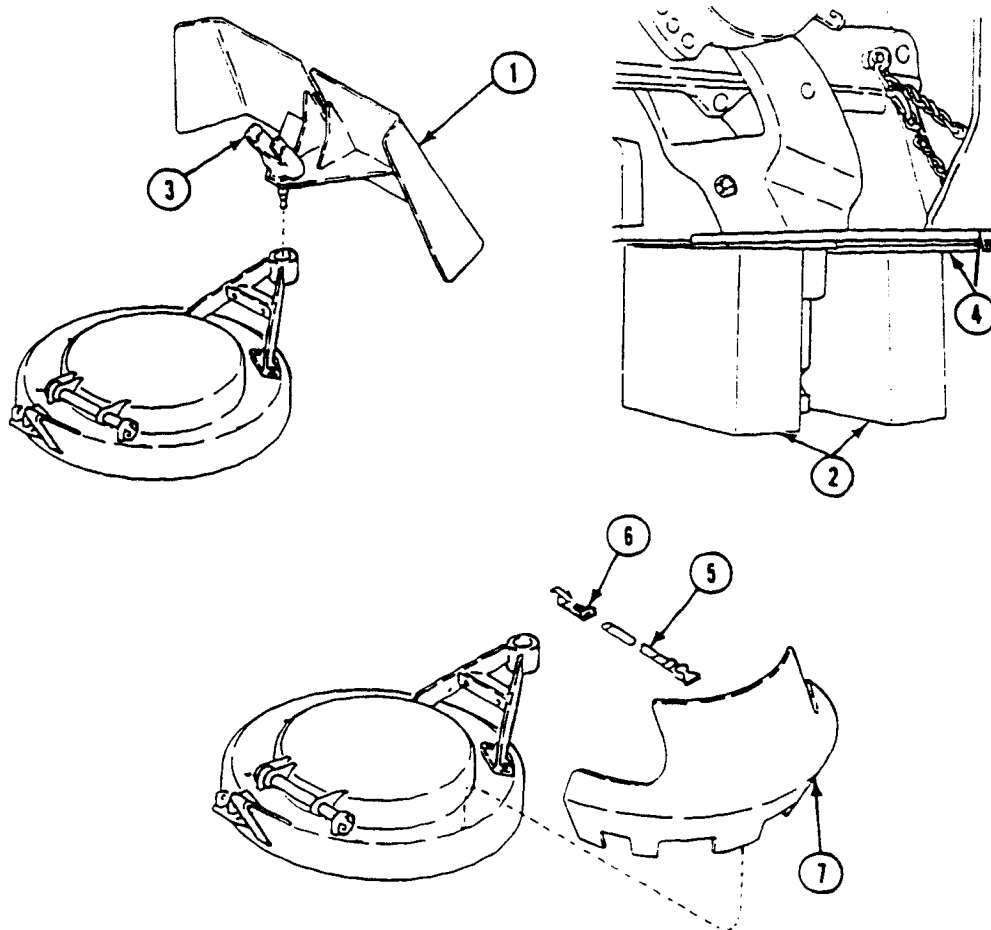
11. Install curved doors (15) in guide channels of shields (16) and (17). There are two doors in each shield. Install four clips (18) to secure doors open. Bend clips to turn freely around loop on doors.
12. Place left and right shields (16) and (17) on cupola. Secure with two retained flat washers (19), two cap screws (20), four flat washers (21), four lockwashers (22), and four cap screws (23).
13. Remove two cap screws (24) and lockwashers (25) that secure plastic covered stop (26) on machine gun support. Remove stop. Discard stop, screws, and lockwashers.
14. Place spacer (27) and bracket (28) on machine gun support. Secure with two machine screws (29).
15. Install flat door (30) in slots in bracket (28). Install four hooks (31). Close hooks to form a chain from loop on door to loop on bracket.



**INSTALL COMMANDER'S CUPOLA ARMOR SHIELDS (M113A2, M1059,
AND M1064 ONLY) — Continued**

0074 00

16. Place front armor shield (1) on a level surface with shield plate supported on two blocks (2) of equal height. Place blocks about 2 1/2 inches (6 cm) apart with hole in plate centered between blocks. Blocks must support pintle flange of machine gun mount.
17. Place machine gun mount (3) on shield plate (1). Install machine gun in mount. Center machine gun in shield slot.
18. Place two 1/16 to 1/8 inch (2 to 3 mm) thick spacers (4) between blocks and shield plate so pintle flange is 1/16 to 1/8 inch (2 to 3 mm) below shield plate.
19. Using a level, check to see that pintle flange (3) and shield plate (1) are level. Make sure machine gun is still centered in slot. Remove machine gun.
20. Use a welding machine and tack weld pintle flange to shield plate (1) in four places. Then weld pintle to upper surface on plate with not less than 3/16 inch (4 mm) fillet weld all around pintle flange. Weld in accordance with TC 9-237.
21. Raise and lower machine gun mount. Check for interference between ammunition tray and shield plate. Use a hand grinder and grind off plate, as needed.
22. Touch up any damaged areas with enamel paint. See TM 43-0139.
23. Install front shield (1) with machine gun pintle on cupola support. Install travel strap (5) and clamp (6) on right armor shield (7).



END OF TASK

INSTALL CARGO HATCH ARMOR SHIELDS (M113A2 ONLY)

0075 00

THIS WORK PACKAGE COVERS:

Installation (page 0075 00-1)

INITIAL SETUP:

Maintenance Level

Direct Support

Materials/Parts

Machine gun shield kit 11660854 (19207)

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0104 00, Item 19)
- Measuring Tape (WP 0104 00, Item 44)
- Portable Electric Drill (WP 0104 00, Item 10)
- Portable Electric Drill (WP 0104 00, Item 11)
- Screw Threading Set (WP 0104 00, Item 37)
- Twist Drill Set (WP 0104 00, Item 50)
- Twist Drill Set (WP 0104 00, Item 51)

Personnel Required

Track Vehicle Repairer 63H10

References

See your -10

Equipment Condition

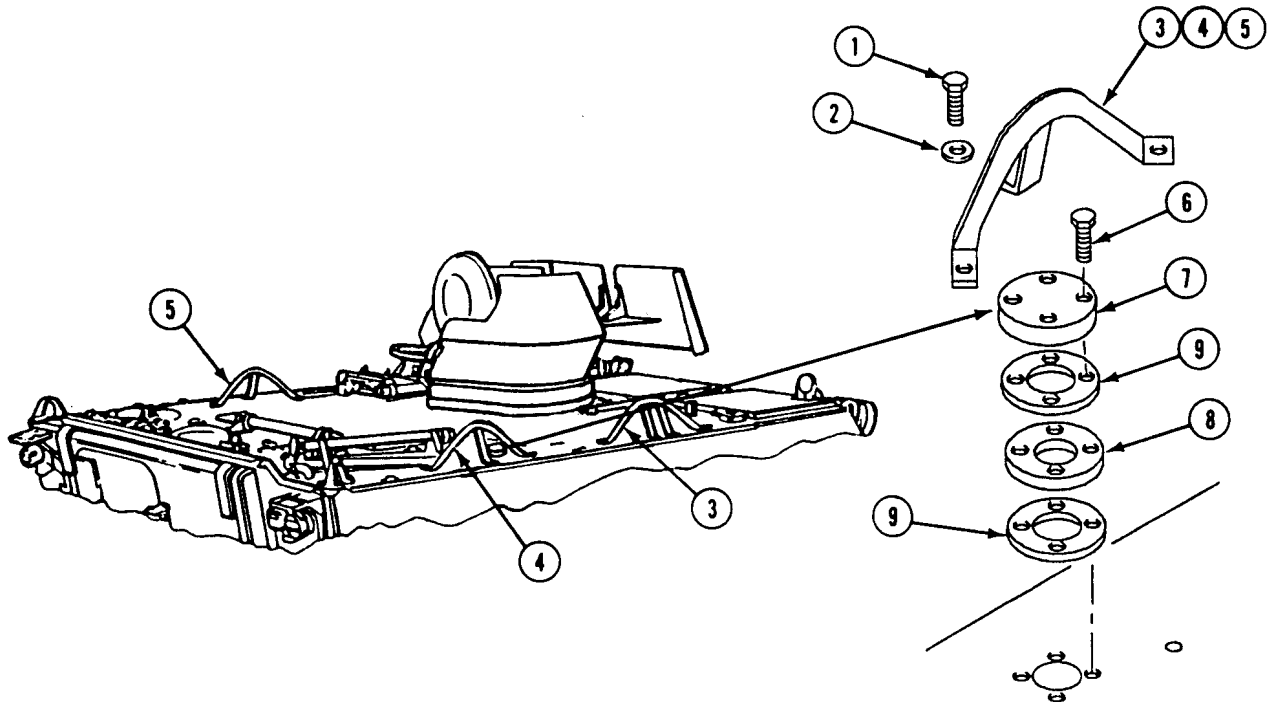
- Engine stopped (see your -10)
- Carrier blocked (see your -10)

INSTALLATION

NOTE

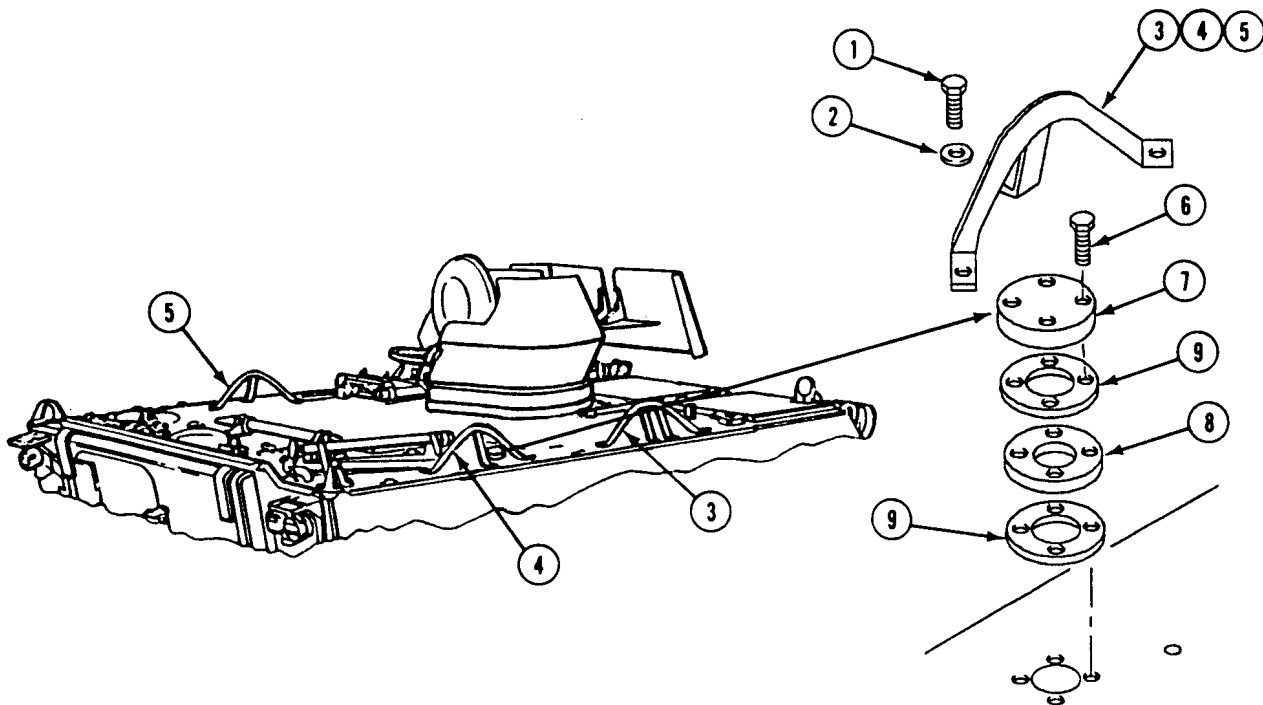
If carrier is equipped with antenna guards on the right side, the forward guard may be a three or four screw type.

1. Remove nine or ten screws (1) and flat washers (2) that secure right front antenna guard (3), right rear antenna guard (4), and left rear antenna guard (5) on hull top deck. Remove guards. Discard antenna guards and screws. Keep washers.
2. Plug antenna guard mounting holes with two flat washers under each screw.



INSTALL CARGO HATCH ARMOR SHIELDS (M113A2 ONLY) — Continued**0075 00**

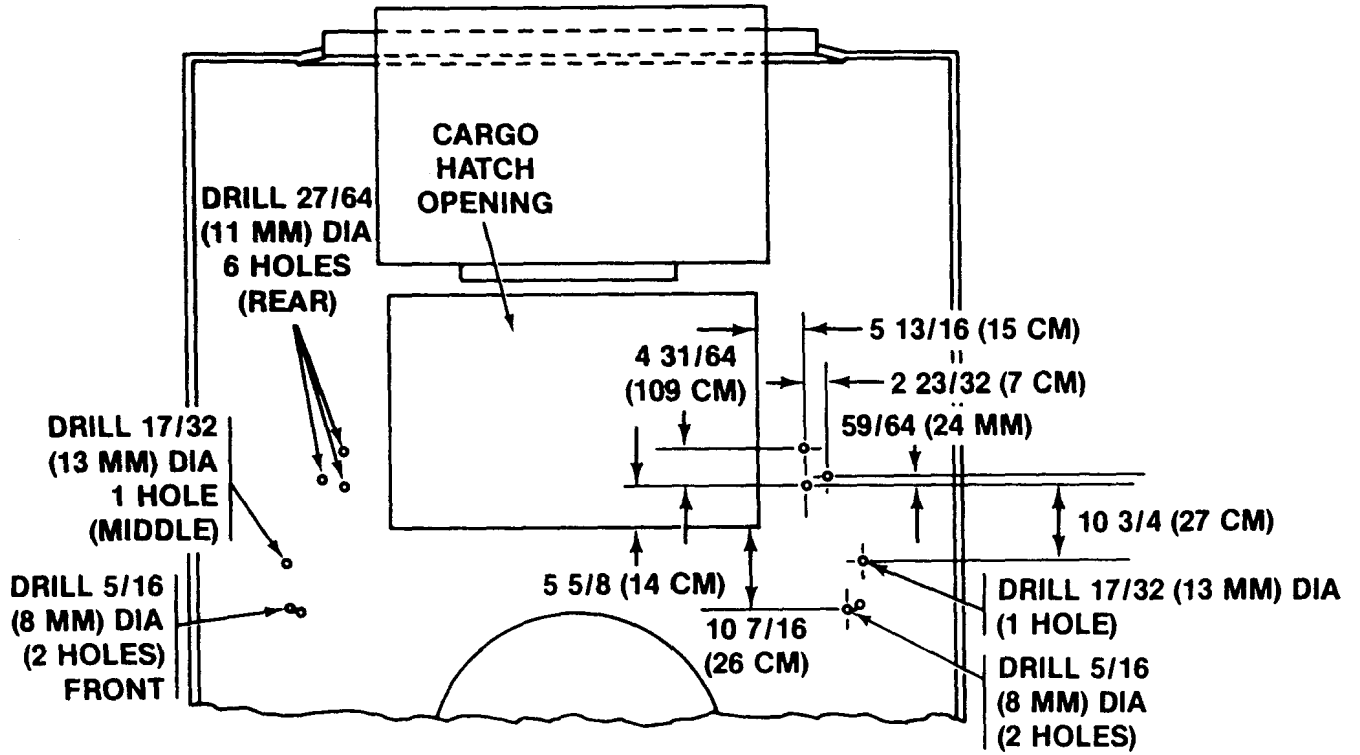
3. Remove eight screws (6) that secure left and right rear antenna access covers (7) on hull top deck. Remove covers, adapters (8), and gaskets (9). Discard two covers, two adapters, and eight screws. Keep gaskets.
4. Place two gaskets (9) and two new covers (7) on hull top deck. Secure with eight new screws (6).
5. If armor gun shield mounting holes are not drilled and tapped in hull top deck, go to Step 6. If these holes have been drilled and tapped, go to Step 9.



NOTE

All dimensions are in inches with metric equivalents.

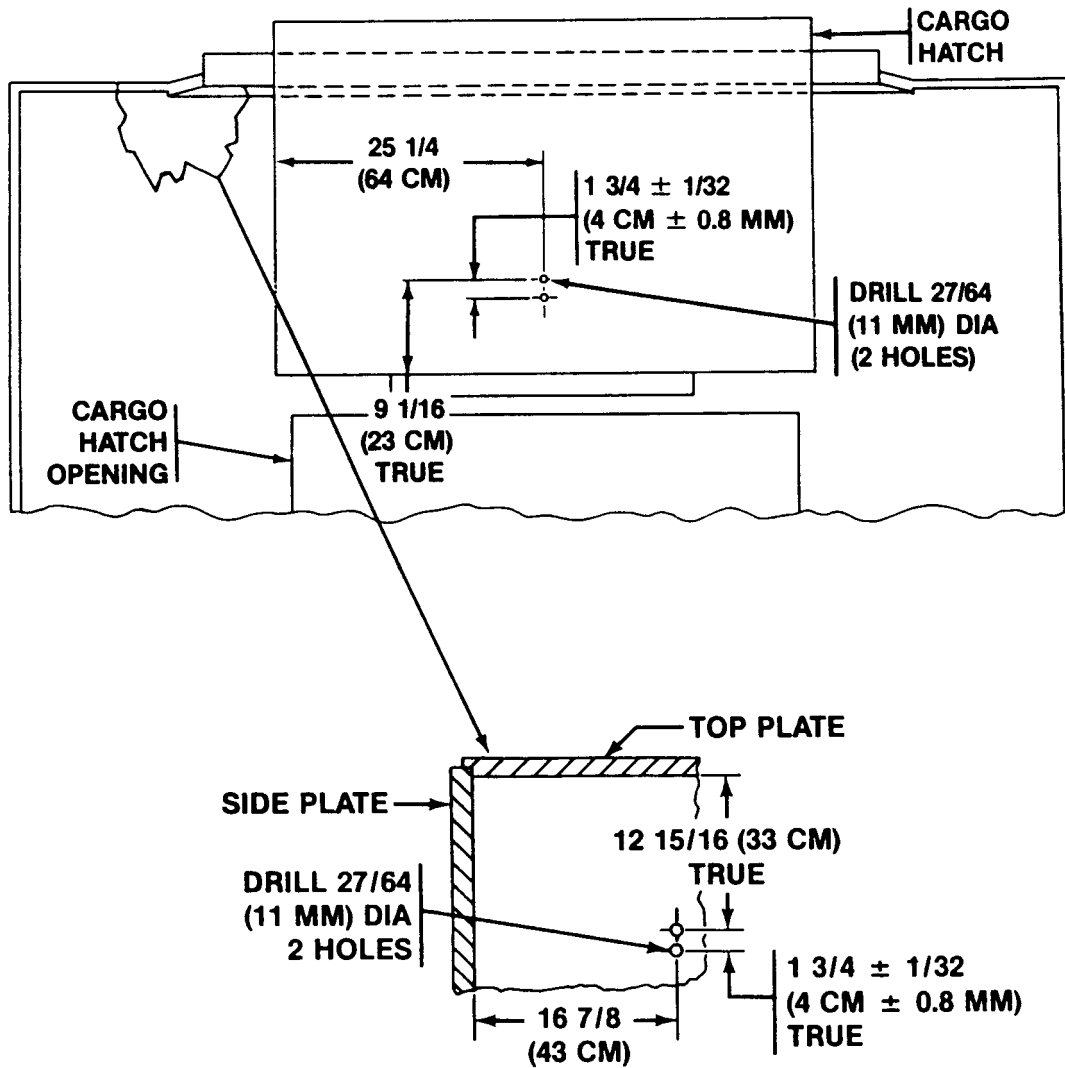
6. Measure center points for 12 holes as shown below, six holes on each side of top deck.
7. Drill holes to a maximum depth of 1-1/4 inch (3 cm) using drill sizes as shown below.
8. Tap six holes (rear) to 1/2-13 UNC-2B, two holes (middle) to 5/8-11 UNC-2B, and four holes (front) to 3/8-16 UNC-2B. Tap all holes to 7/8 inch (22 mm) minimum depth.



INSTALL CARGO HATCH ARMOR SHIELDS (M113A2 ONLY) — Continued

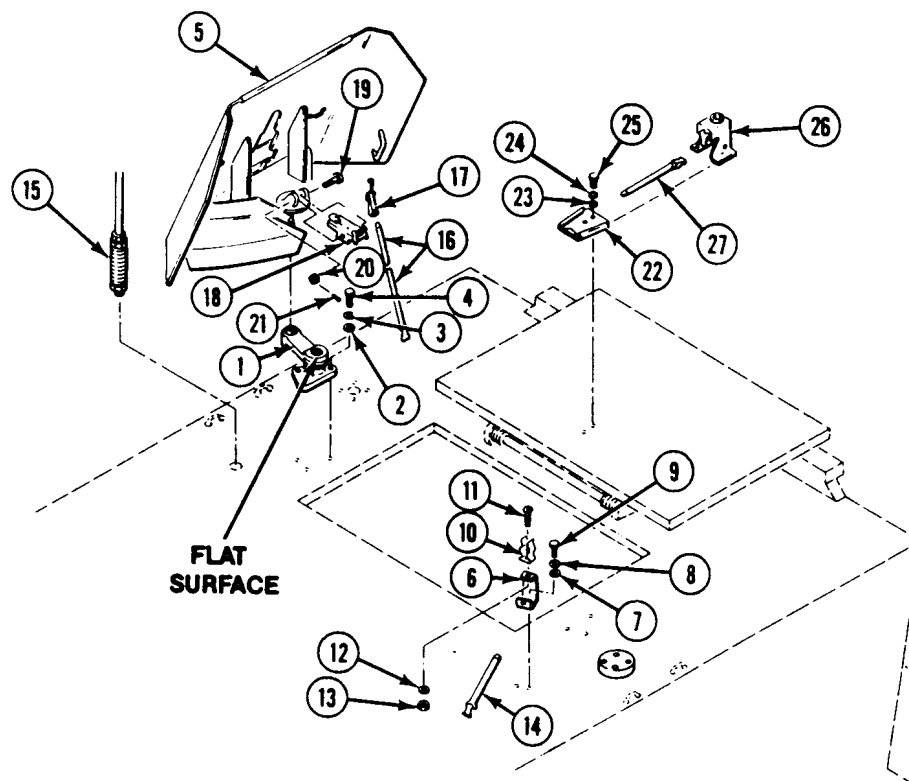
0075 00

9. If holes are already in carrier, remove and discard six 1/2 inch (13 mm) screws and washers, two 5/8 inch (16 mm) screws and washers, and four 3/8 inch (10 mm) screws and washers.
10. If pintle socket plate mounting holes are not drilled and tapped in cargo cover and on inside rear hull plate, go to Step 11. If these holes have been drilled and tapped, go to Step 13.
11. Measure center point for four holes as shown below. Two holes are on cargo cover. Two holes are on inside rear hull plate.



INSTALL CARGO HATCH ARMOR SHIELDS (M113A2 ONLY) — Continued**0075 00**

12. Drill all holes to 1-1/4 inch (3 cm) maximum depth. Tap all holes to 7/8 inch (22 mm) minimum depth.
13. Remove two 1/2 inch (13 mm) screws and four washers from cargo cover. Remove two screws and four washers from inside rear hull plate. Discard washers. Keep screws.
14. Place two mounting arms (1) on top deck with flat surface of mount parallel to side of hull. Loosen mounting screw and rotate mount, as needed. Secure with six flat washers (2), lockwashers (3), and cap screws (4).
15. Place armor shield (5) in left and right mounting arm (1).
16. Place two brackets (6) on top deck. Secure with four flat washers (7), lockwashers (8), and cap screws (9).
17. Place clips (10) on left and right brackets (6). Secure with four machine screws (11), flat washers (12), and locknuts (13).
18. Install straps (14) on left and right brackets (6).
19. Install two restrictors (15) on top deck.
20. Insert four shield retaining straps (16) through loops under each side of both shields (5). Install clamps (17) on each strap (16). Connect clamps to loops on shields. Tighten straps to secure shields.
21. Place 7.62 mm platforms or caliber .50 adapters (18) on left and right shields (5). Secure with two bolts (19), nuts (20), and cotter pins (21). Stow unused platforms or adapters (18) in carrier tool bag (see your -10 for stowage).
22. Place plates (22) on cargo cover and on inside rear hull plate. Secure with four flat washers (23), four new lockwashers (24), and four screws (25).
23. Place pintle socket (26) on one of the two plates (22). Secure with strap (27). Lace strap through loop on plate and around the round bar of the pintle socket. Secure strap.

**END OF TASK**

REPAIR MACHINE GUN SHIELD MOUNTING ARM (M113A2 AND M1059 ONLY)

0076 00

THIS WORK PACKAGE COVERS:

- Disassembly (page 0076 00-1).
- Assembly (page 0076 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0104 00, Item 19)
- Hand Arbor Press (WP 0104 00, Item 32)

Materials/Parts

- Bearing
- Bushing
- Lockwasher (2)

Personnel Required

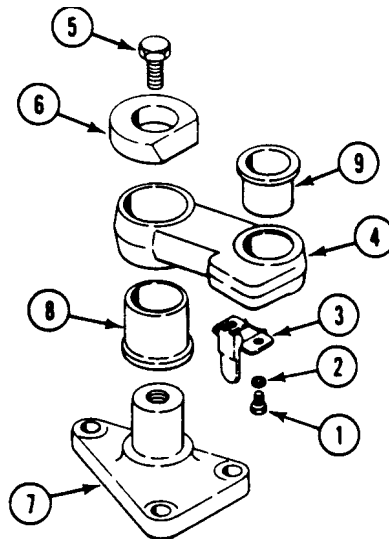
Track Vehicle Repairer 63H10

Equipment Condition

Rear armor shield mounting arm removed (see your -20)

DISASSEMBLY

1. Remove two cap screws (1) and lockwashers (2) that secure lock (3) to arm (4). Remove lock. Discard lockwashers.
2. Remove cap screw (5) that secures mount (6) and bracket (7) to arm (4). Remove mount and bracket.
3. Press bracket bearing (8) and bushing (9) from arm (4). Discard bearing and bushing.

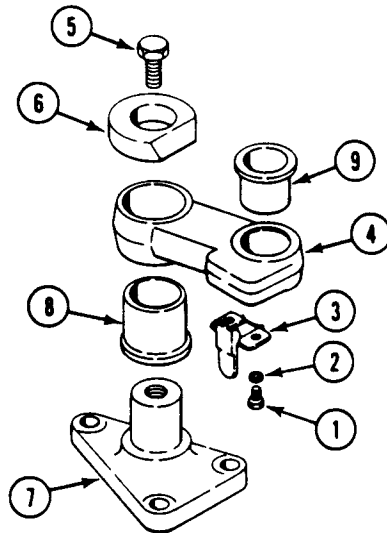


REPAIR MACHINE GUN SHIELD MOUNTING ARM (M113A2 AND M1059 ONLY) — Continued

0076 00

ASSEMBLY

1. Press new bushing (9) and bracket bearing (8) in arm (4).
2. Install bracket (7), arm (4), and mount (6). Secure with cap screw (5).
3. Secure lock (3) to arm (4) with two new lockwashers (2) and cap screws (1).

**FOLLOW-THROUGH STEPS**

1. Install rear armor shield mounting arm (see your -20).

END OF TASK

CHAPTER 18

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR ELECTRICAL/COMMUNICATIONS EQUIPMENT (M1068 ONLY)

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
REPAIR POWER ENTRY BOX ASSEMBLY A4 (M1068 ONLY).....	0077 00
REPAIR EXTERNAL COMMUNICATION BOX A11 (M1068 ONLY).....	0078 00
REPLACE/REPAIR INVERTER AND INVERTER HOUSING ASSEMBLY A2 (M1068 ONLY).....	0079 00
REPAIR AC POWER EXTENSION BOXES A6 AND A7 (M1068 ONLY).....	0080 00
REPAIR ROADSIDE DC POWER EXTENSION BOX A9 (M1068 ONLY).....	0081 00
REPAIR ROADSIDE AND CURBSIDE DATA PANEL ASSEMBLIES A12 AND A13 (M1068 ONLY).....	0082 00
REPAIR POWER CONTROL ENCLOSURE, RIGHT PANEL (M1068 ONLY).....	0083 00
REPAIR POWER CONTROL ENCLOSURE, LEFT PANEL (M1068 ONLY).....	0084 00
REPAIR POWER CONTROL ENCLOSURE, REAR PANEL (M1068 ONLY).....	0085 00
REPLACE POWER CONTROL ENCLOSURE POWER SUPPLIES (M1068 ONLY).....	0086 00
REPAIR SIGNAL PATCH PANEL BOX A10 (M1068 ONLY).....	0087 00
REPAIR PHONE EXTENSION BOX A14 (M1068 ONLY).....	0088 00
REPAIR TENT INTERFACE PANEL BOX ASSEMBLY A5 (M1068 ONLY).....	0089 00
REPAIR ROADSIDE AC POWER EXTENSION BOX A18 (M1068 ONLY).....	0090 00
REPAIR CURBSIDE AC POWER EXTENSION BOX A19 (M1068 ONLY).....	0091 00
REPLACE LAN A CABLE W101 AND/OR LAN B CABLE W102 (M1068 ONLY).....	0092 00
REPLACE RF 1, 2, 3, 4 CABLE ASSEMBLIES W111, W112, W113, AND W114 (M1068 ONLY).....	0093 00
REPLACE CABLE ASSEMBLY W115 (M1068 ONLY).....	0094 00
REPLACE CABLE ASSEMBLIES W117 AND W118 (M1068 ONLY).....	0095 00
REPAIR CURBSIDE DC POWER EXTENSION BOX A8 (M1068 ONLY).....	0096 00

REPAIR POWER ENTRY BOX ASSEMBLY A4 (M1068 ONLY)

0077 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0077 00-1).
 Assembly (page 0077 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Power-Generation Equipment Repairer 52D10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Equipment Condition

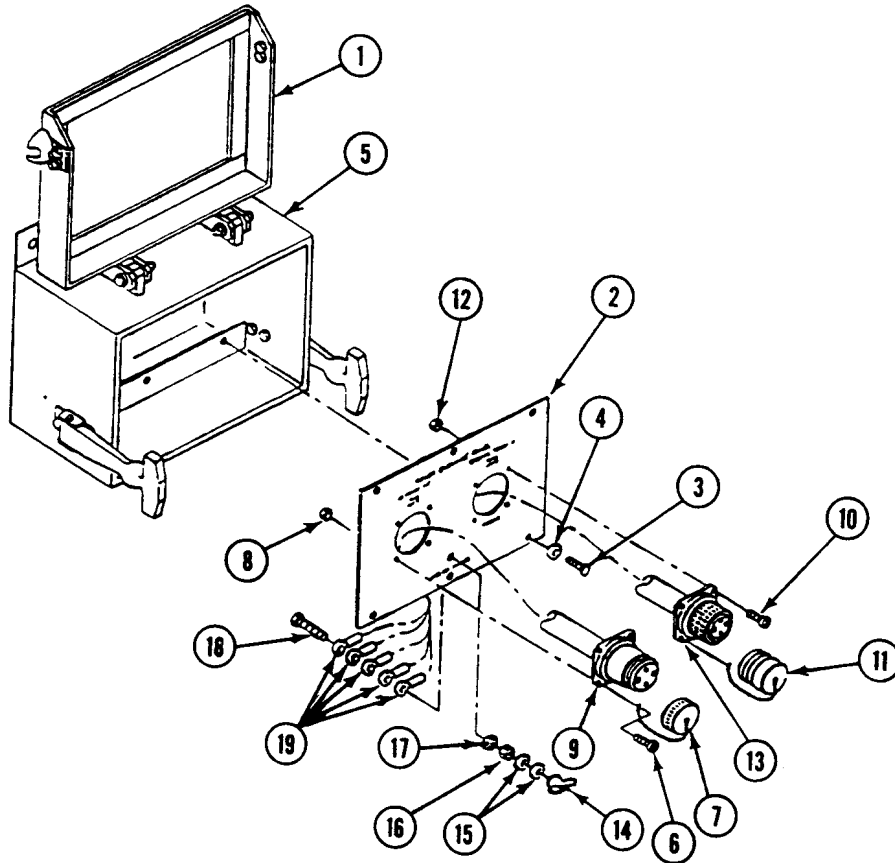
Power entry box removed (see your -20)

Materials/Parts

Locknut (8)
 Lockwasher

DISASSEMBLY

1. Open lid (1) to access faceplate (2).
2. Remove six screws (3), washers (4), and faceplate (2) from power entry box (5).

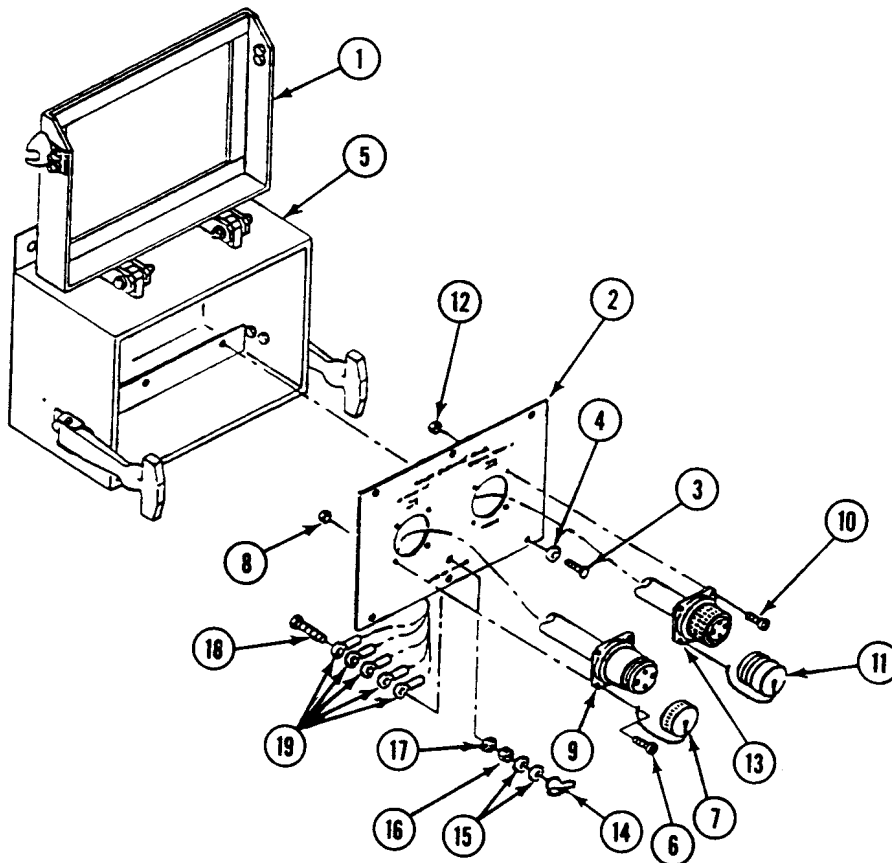


3. Remove four screws (6), cap and chain (7), locknuts (8), and cable W14 (9) from AC POWER OUT hole on faceplate (2). Discard locknuts.
4. Remove four screws (10), cap and chain (11), locknuts (12), and cable W13 (13) from EXTERNAL POWER IN hole on faceplate (2). Discard locknuts.

NOTE

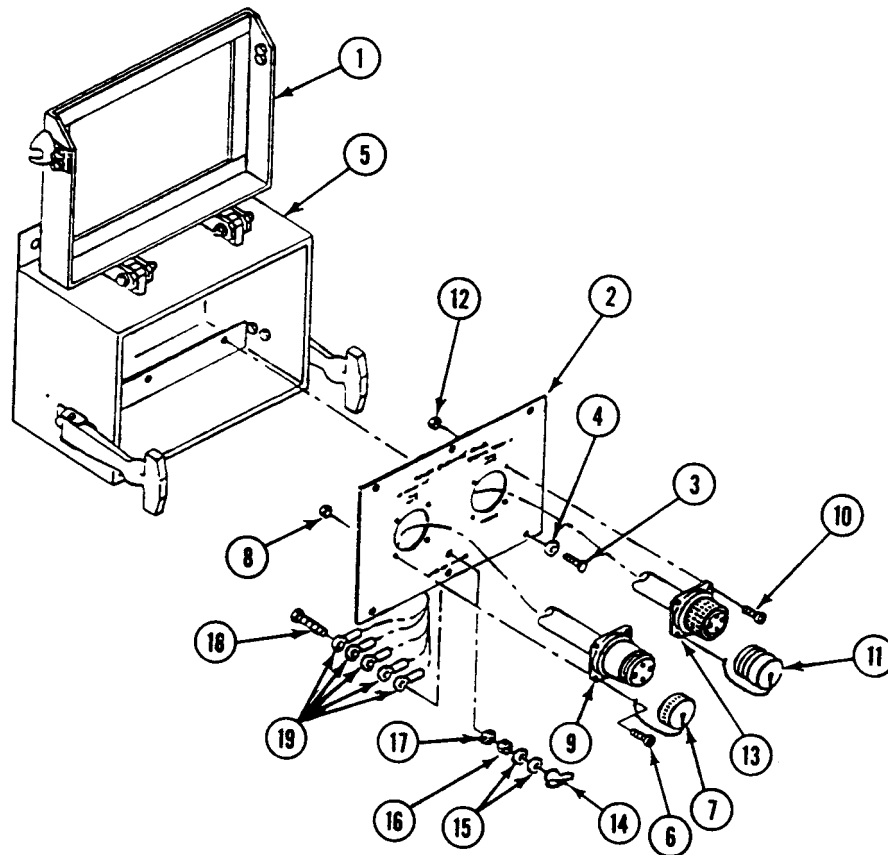
Tag all leads before removing from terminals.

5. Remove wingnut (14), two washers (15), nut (16), lockwasher (17), screw (18), and five leads (19) from faceplate (2). Discard lockwasher.



ASSEMBLY

1. Install five leads (19), screw (18), new lockwasher (17), nut (16), two washers (15), and wingnut (14) on faceplate (2).
2. Install cable W13 (13) in EXTERNAL POWER IN hole on faceplate (2) with cap and chain (11) and secure with four screws (10) and new locknuts (12).
3. Install cable W14 (9) in AC POWER OUT hole on faceplate (2) with cap and chain (7) and secure with four screws (6) and new locknuts (8).
4. Install faceplate (2) on power entry box (5) and secure with six screws (3) and washers (4).
5. Close and secure lid (1) on power entry box (5).

**FOLLOW-THROUGH STEPS**

1. Install power entry box (see your -20).

END OF TASK

REPAIR EXTERNAL COMMUNICATION BOX A11 (M1068 ONLY)

0078 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0078 00-2).
Assembly (page 0078 00-4).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Radio Repairer 29E10

Tools and Special Tools

Electronic Equipment Tool Kit TK-105/G
(WP 0104 00, Item 46)

References

See your -20

Materials/Parts

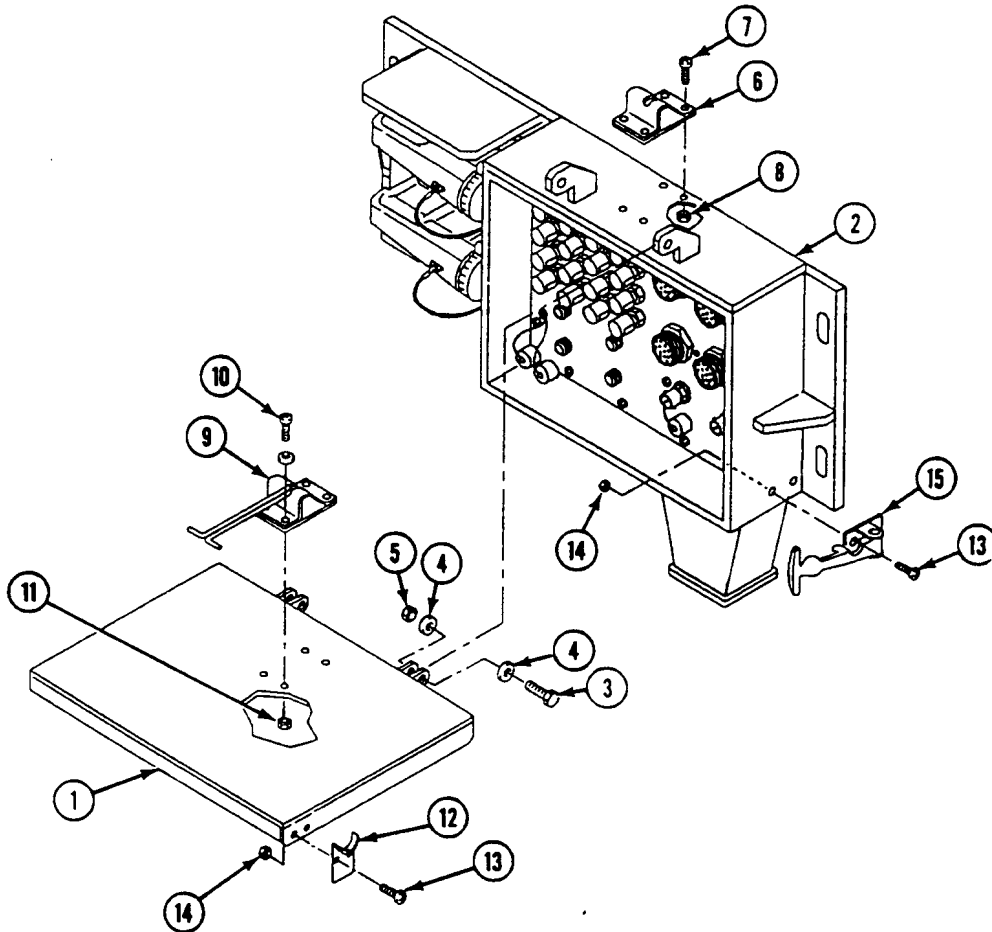
Locknut (8)
Locknut (8)
Locknut (4)
Locknut (2)
Lockwasher (36)

Equipment Condition

External communication box removed (see your -20).

DISASSEMBLY

1. Remove four screws (13), locknuts (14), and two latches (15) from communication box (2). Discard locknuts.
2. Remove four screws (13), locknuts (14), and two catches (12) from communication box lid (1). Discard locknuts.
3. Remove four screws (10), locknuts (11), and latch half (9) from lid (1). Discard locknuts.
4. Remove four screws (7), locknuts (8), and latch half (6) from communication box (2). Discard locknuts.
5. Remove two screws (3), four washers (4), two locknuts (5), and lid (1) from communication box (2). Discard locknuts.

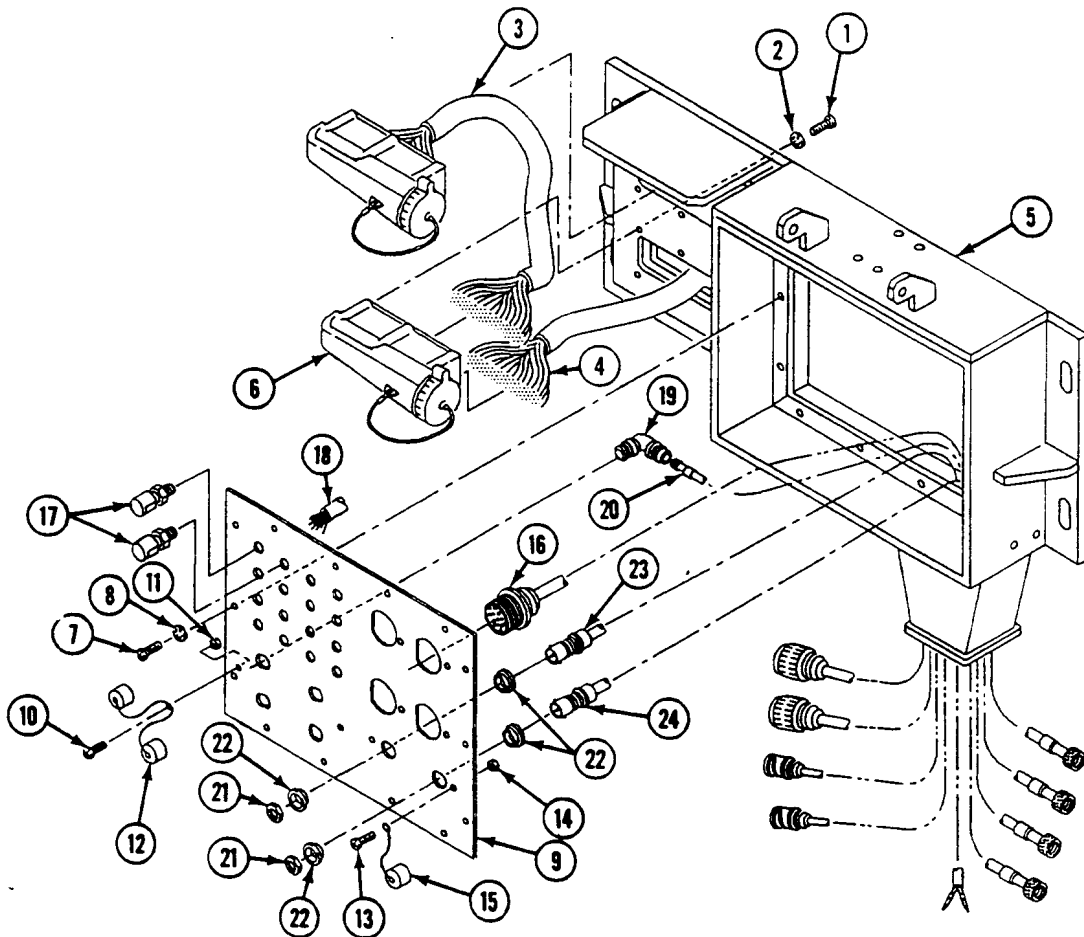
**NOTE**

See wiring diagram (page 0078 00-6) for assembly/disassembly of wires to connectors.
 Tag leads/cables before removing/disconnecting. Replace pads only if damaged.

NOTE

If cable W118 is being replaced, remove connector (6) before discarding.

6. Remove twelve screws (1), lockwashers (2), cable W117 (3), and cable W118 (4) from communication box (5). Discard lockwashers.
7. Remove fourteen screws (7), lockwashers (8), and faceplate (9) from communication box (5). Discard lockwashers.
8. Remove two screws (10), locknuts (11), and four caps (12) from faceplate (9). Discard locknuts.
9. Remove two screws (13), locknuts (14), and caps (15) from faceplate (9). Discard locknuts.
10. Remove four cables (16) from faceplate (9).
11. Loosen 16 binding posts (17) and remove cable W115 (18).
12. Remove four connectors (19) and four cables (20) from faceplate (9).
13. Remove two nuts (21), four bushings (22), cable W101 (23), and cable W102 (24) from faceplate (9).

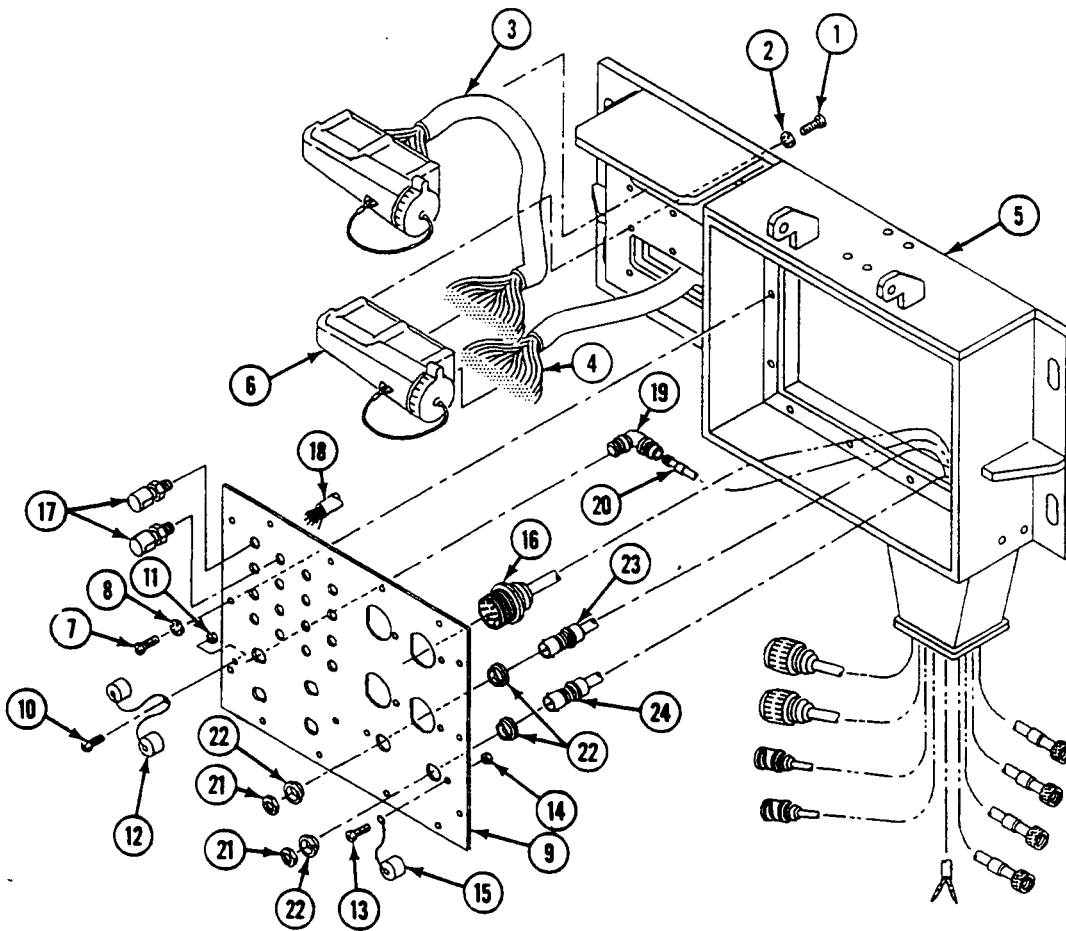


ASSEMBLY

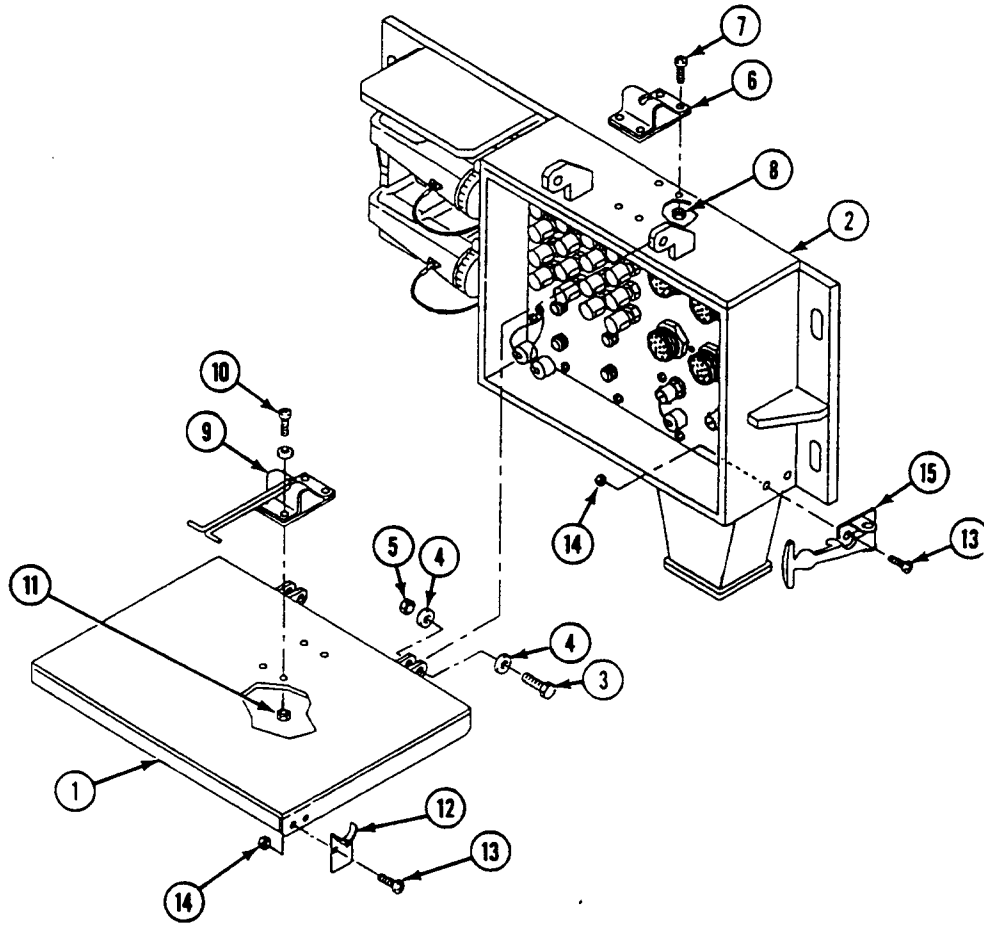
NOTE

See wiring diagram (page 0078 00-6) for assembly/disassembly of wires to connectors.

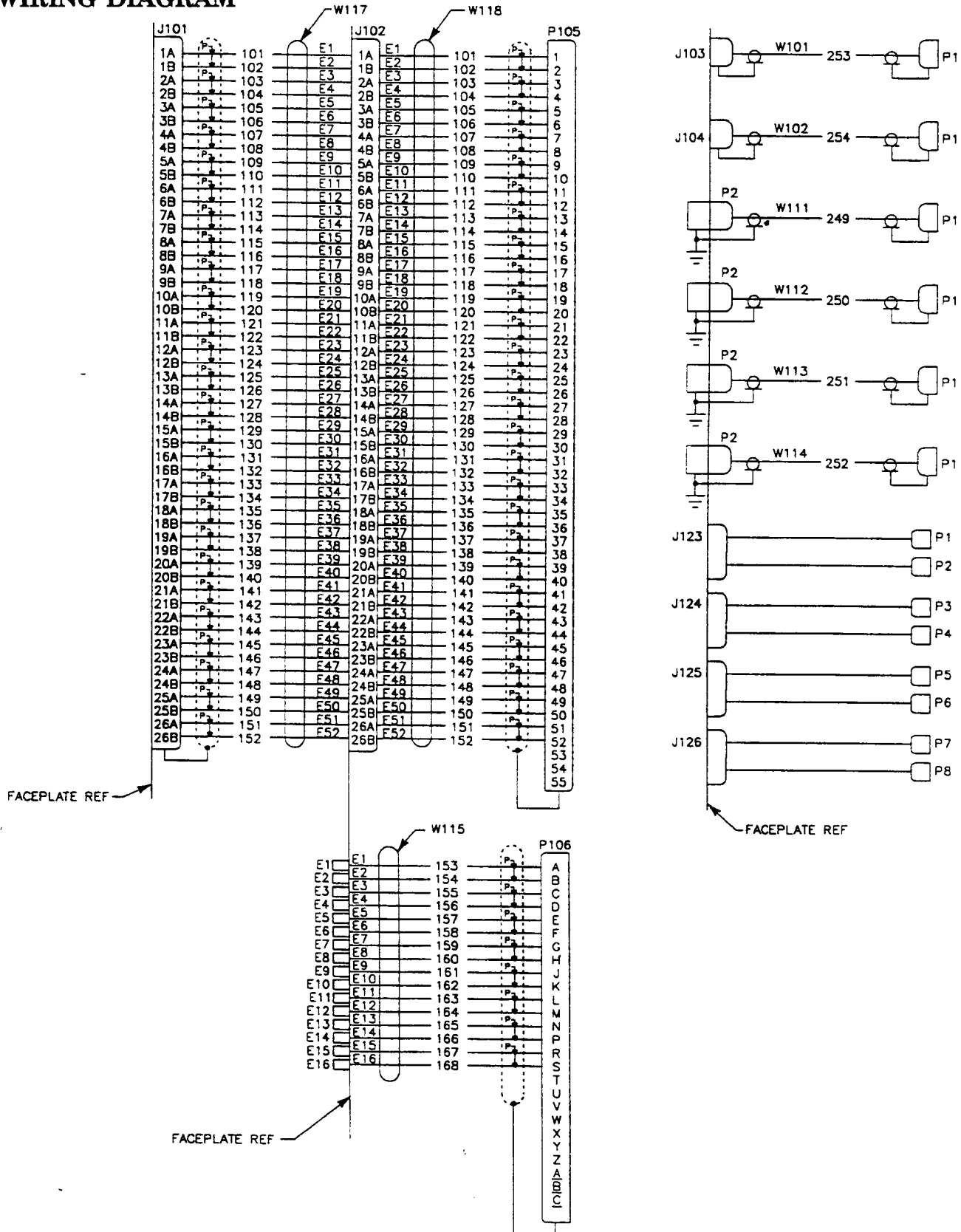
1. Install cable W101 (23) and cable W102 (24) on faceplate (9) and secure with four bushings (22) and two nuts (21).
2. Install four cables (20) and connectors (19) on faceplate (9).
3. Connect cable W115 (18) to 16 binding posts (17).
4. Install four cables (16) on faceplate (9).
5. Install two caps (15) on faceplate (9) and secure with two screws (13) and new locknuts (14).
6. Install four caps (12) on faceplate (9) and secure with two screws (10) and new locknuts (11).
7. Install faceplate (9) on communication box (5) and secure with fourteen screws (7) and new lockwashers (8).
8. Install cable W117 (3) and cable W118 (4) on communication box (5) and secure with twelve screws (1) and new lockwashers (2).



9. Install lid (1) on communication box (2) and secure with two screws (3), four washers (4), and two new locknuts (5).
10. Install latch half (6) on communication box (2) and secure with four screws (7) and new locknuts (8).
11. Install latch (9) on lid (1) and secure with four screws (10) and new locknuts (11).
12. Install two catches (12) on lid (1) and secure with four screws (13) and new locknuts (14).
13. Install two latches (15) on communication box (2) and secure with four screws (13) and new locknuts (14).



WIRING DIAGRAM



FOLLOW-THROUGH STEPS

1. Install external communication box (see your -20).

END OF TASK

**REPLACE/REPAIR INVERTER AND INVERTER HOUSING
ASSEMBLY A2 (M1068 ONLY)**

0079 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0079 00-1).
Assembly (page 0079 00-4).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Power-Generation Equipment Repairer 52D10
Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
All external power disconnected
(TM 11-7010-256-12&P)
Battery ground lead disconnected (see your -20)
Power control enclosure removed (see your -20)

Materials/Parts

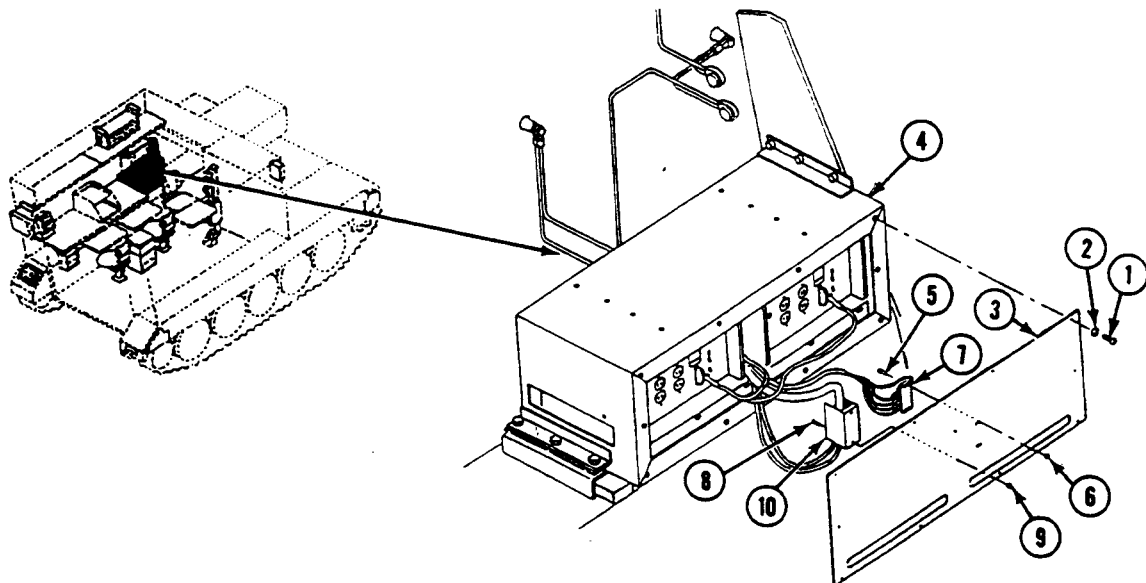
Locknut (16)
Locknut (8)
Locknut (4)
Locknut (4)
Locknut (3)
Locknut (2)
Lockwasher (12)
Lockwasher (3)
Lockwasher (4)

DISASSEMBLY

NOTE

It is not necessary to remove the housing to remove one or both inverters.

1. Remove ten screws (1), lockwashers (2), and cover (3) from inverter housing (4). Discard lockwashers.
2. Remove four screws (5), locknuts (6), and terminal block TB2 (7) from cover (3). Discard locknuts.
3. Remove two screws (8), locknuts (9), and terminal block TB1 (10) from cover (3). Discard locknuts.



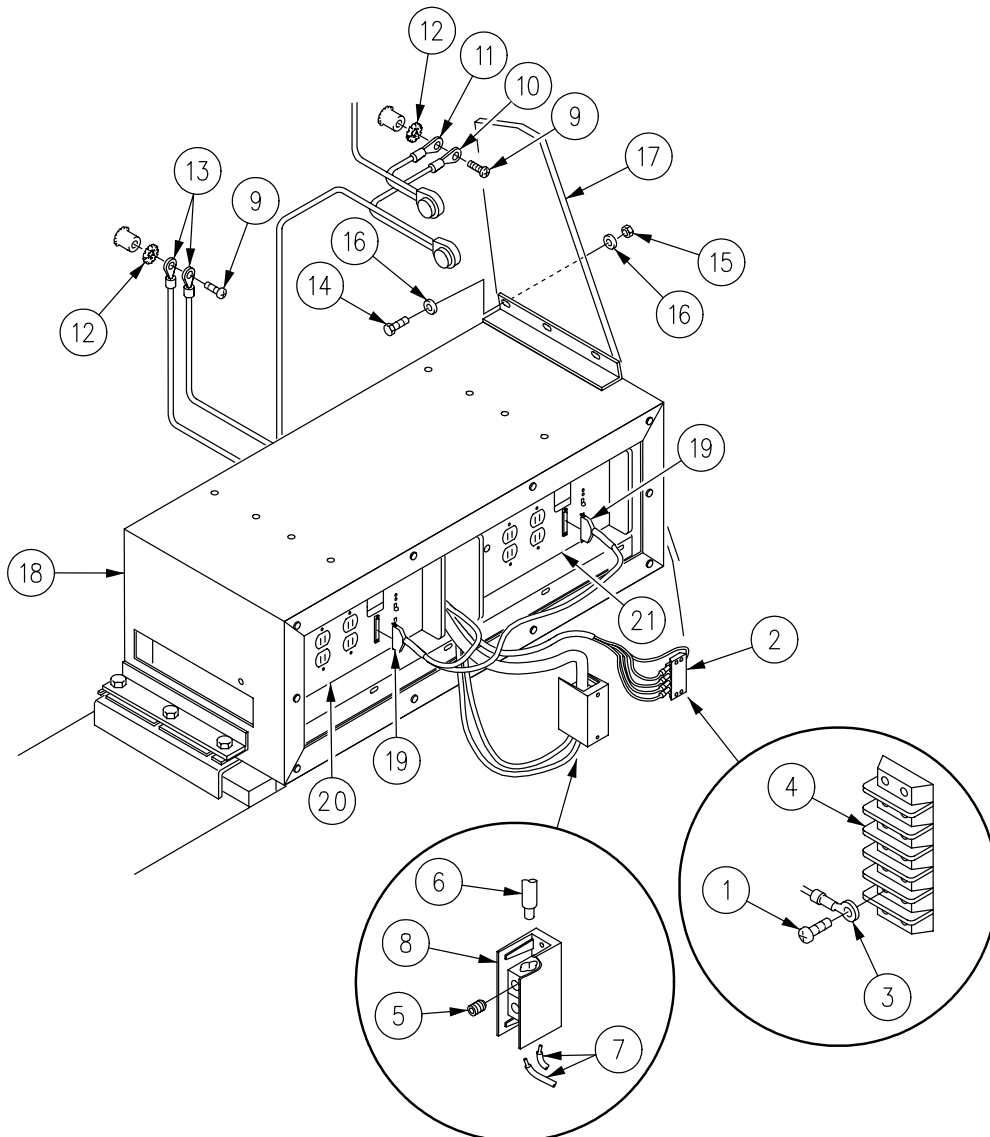
**REPLACE/REPAIR INVERTER AND INVERTER HOUSING ASSEMBLY
A2 (M1068 ONLY) — Continued**

0079 00

NOTE

Tag leads/cables before removing/disconnecting.

4. Remove ten screws (1), cable W5 (2), and six leads (3) from terminal block TB2 (4).
5. Remove two set screws (5), cable W6 (6), and two leads E4 (7) from terminal block TB1 (8).
6. Remove screw (9), ground lead W632 (10), ground lead W432 (11), and lockwasher (12) from carrier wall. Discard lockwasher.
7. Remove screw (9), two ground leads E5 (13), and lockwasher (12) from carrier wall. Discard lockwasher.
8. Remove three screws (14), locknuts (15), and six washers (16) from blackout curtain (17) and inverter housing (18). Discard locknuts.
9. Disconnect two cable W15 connectors (19) from inverter IN1 (20) and inverter IN2 (21).



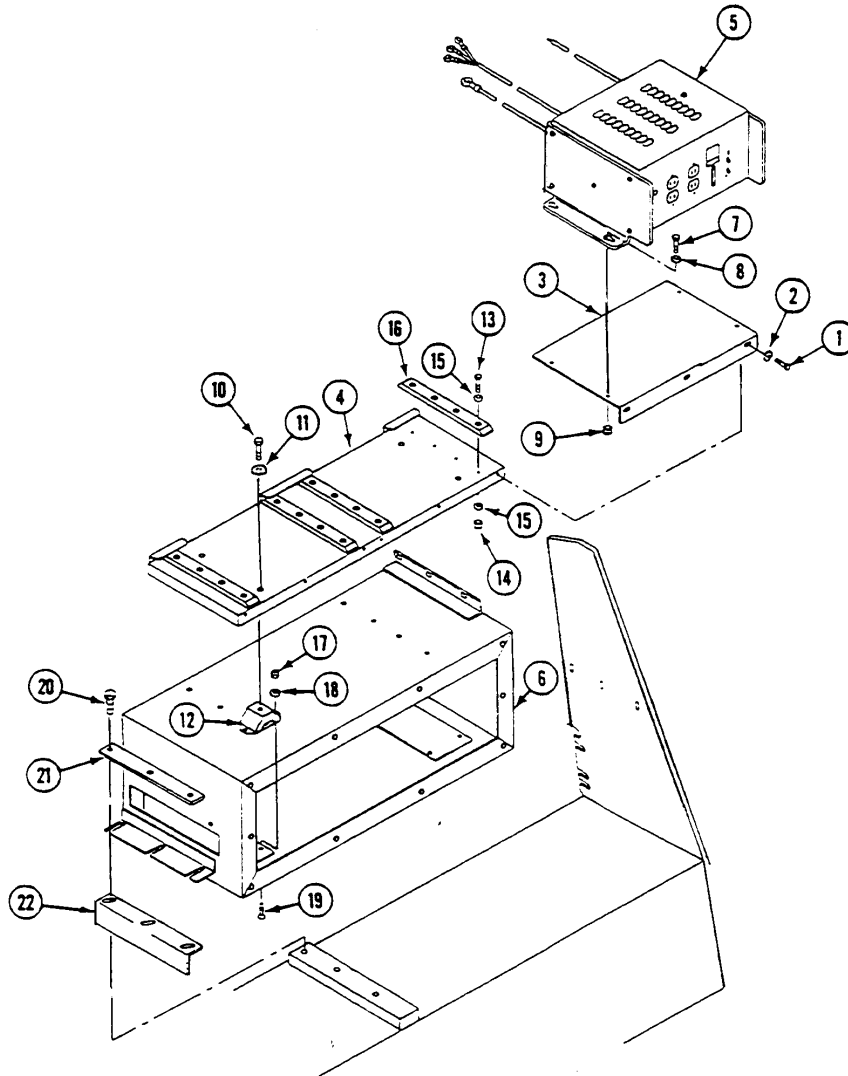
**REPLACE/REPAIR INVERTER AND INVERTER HOUSING ASSEMBLY
A2 (M1068 ONLY) — Continued**

0079 00

NOTE

Both inverters are removed the same way.

10. Remove three screws (1) and lockwashers (2) from mount (3) and tray (4). Discard lockwashers.
11. Remove mount (3) and inverter (5) from housing (6). Have Helper assist.
12. Remove four screws (7), washers (8), locknuts (9), and mount (3) from inverter (5). Discard locknuts.
13. Remove four screws (10), lockwashers (11), and tray (4) from four resilient mounts (12). Discard lockwashers.
14. Remove 16 screws (13), locknuts (14), 32 washers (15), and four straps (16) from tray (4). Discard locknuts.
15. Remove eight locknuts (17), washers (18), screws (19), and four resilient mounts (12) from housing (6). Discard locknuts.
16. Remove three screws (20), mounting strip (21), inverter housing (6), and retaining strip (22) from sponson.



**REPLACE/REPAIR INVERTER AND INVERTER HOUSING ASSEMBLY
A2 (M1068 ONLY) — Continued**

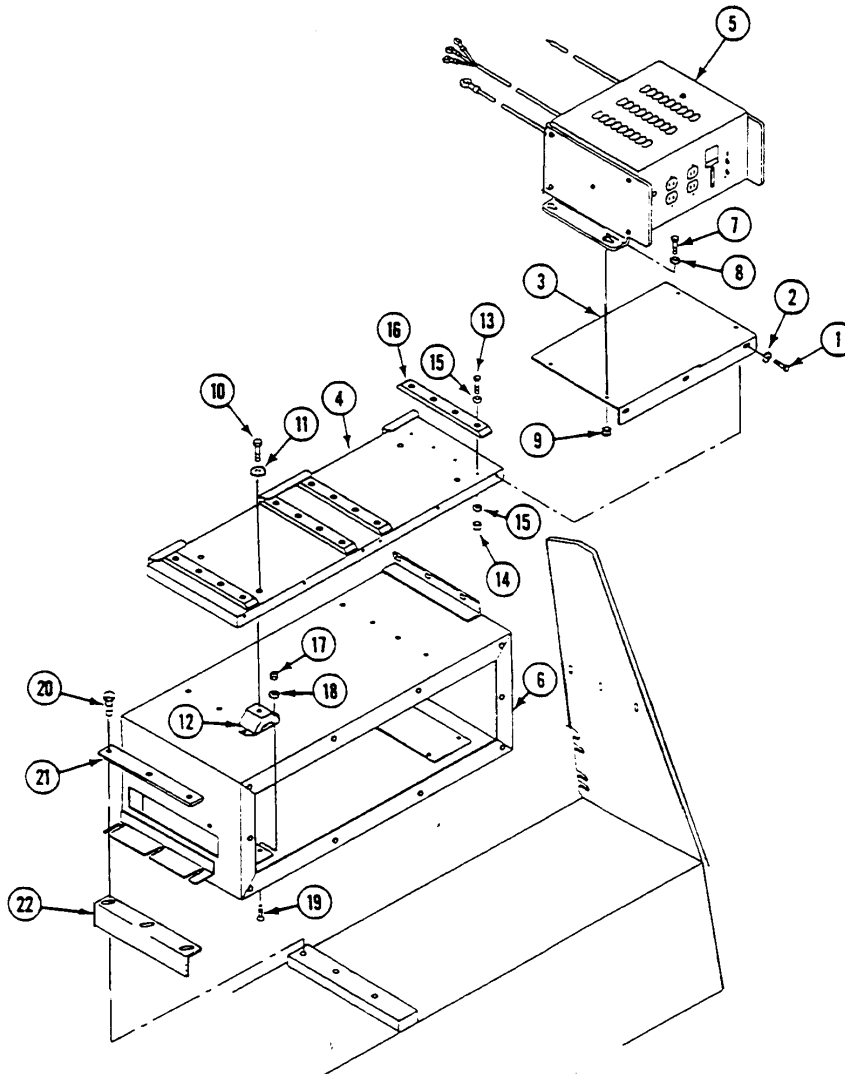
0079 00

ASSEMBLY

NOTE

Both inverters are installed the same way.

1. Install retaining strip (22), inverter housing (6), and mounting strip (21) on sponson and secure with three screws (20).
2. Install four resilient mounts (12) on inverter housing (6) and secure with eight screws (19), washers (18), and new locknuts (17).
3. Install four straps (16) on tray (4) and secure with 16 screws (13), 32 washers (15), and 16 new locknuts (14).
4. Install tray (4) on four resilient mounts (12) and secure with four screws (10) and new lockwashers (11).
5. Install mount (3) on inverter (5) and secure with four screws (7), washers (8), and new locknuts (9).
6. Install mount (3) and inverter (5) in housing (6) and secure on tray (4) with three screws (1) and new lockwashers (2). Have helper assist.



**REPLACE/REPAIR INVERTER AND INVERTER HOUSING ASSEMBLY
A2 (M1068 ONLY) — Continued**

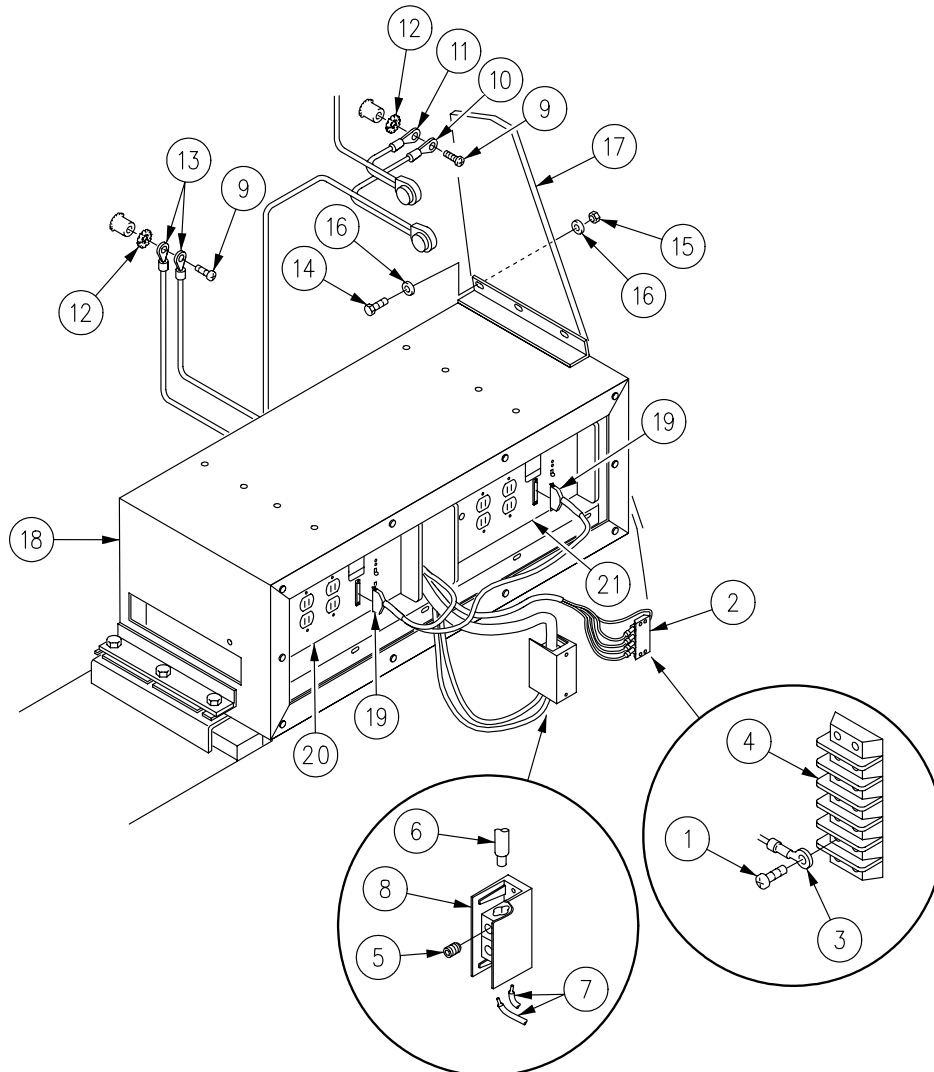
0079 00

NOTE

Before installation of inverters IN1 and IN2, shut POWER switches OFF. The cascade remote harness W15 will control inverters.

Installation for inverters IN1 and IN2 are different. Follow schematic for proper wiring connections.

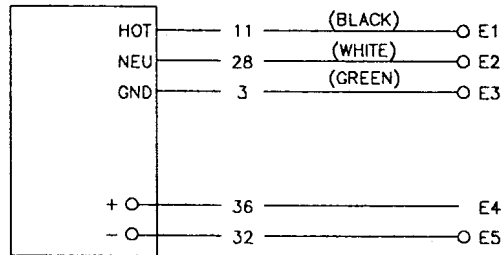
7. Connect two cable W15 connectors (19) to inverter IN1 (20) and inverter IN2 (21).
8. Install blackout curtain (17) on inverter housing (18) and secure with six washers (16), three screws (14), and new locknuts (15).
9. Install two ground leads E5 (13) on carrier wall and secure with new lockwasher (12) and screw (9).
10. Install ground lead W432 (11) and ground lead W632 (10) on carrier wall and secure with new lockwasher (12) and screw (9).
11. Connect cable W6 (6) and two leads E4 (7) on terminal block TB1 (8) and secure with two set screws (5).
12. Connect cable W5 (3) and six leads (2) on terminal block TB2 (4) and secure with ten screws (1).



**REPLACE/REPAIR INVERTER AND INVERTER HOUSING ASSEMBLY
A2 (M1068 ONLY) — Continued**

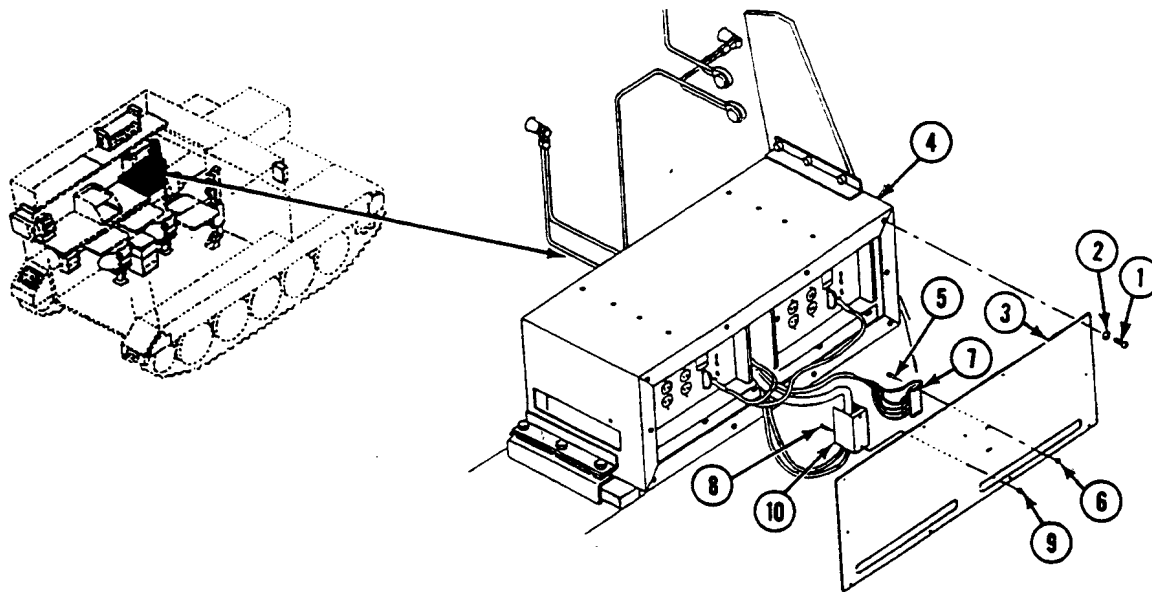
0079 00

WIRING DIAGRAM



PART NUMBER	"A" (5)	"B" (5)
12383902-1 (IN1)	IN1 E1(A2TB2-1)	IN1 E2(A2TB2-2)
12383902-2 (IN2)	IN2 E1(A2TB2-3)	IN2 E2(A2TB2-4)

13. Install terminal block TB1 (10) on cover (3) and secure with two screws (8) and new locknuts (9).
14. Install terminal block TB2 (7) on cover (3) and secure with four screws (5) and new locknuts (6).
15. Install cover (3) on inverter housing (4) and secure with ten screws (1) and new lockwashers (2).



FOLLOW-THROUGH STEPS

1. Install power control enclosure (see your -20).
2. Connect battery ground lead (see your -20).

END OF TASK

REPAIR AC POWER EXTENSION BOXES A6 AND A7 (M1068 ONLY)

0080 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0080 00-1).
 Assembly (page 0080 00-2).

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 0104 00, Item 4)

Equipment Condition

AC power extension box A6 removed (see your -20)
 AC power extension box A7 removed (see your -20)

Materials/Parts

Locknut (40)

DISASSEMBLY

NOTE

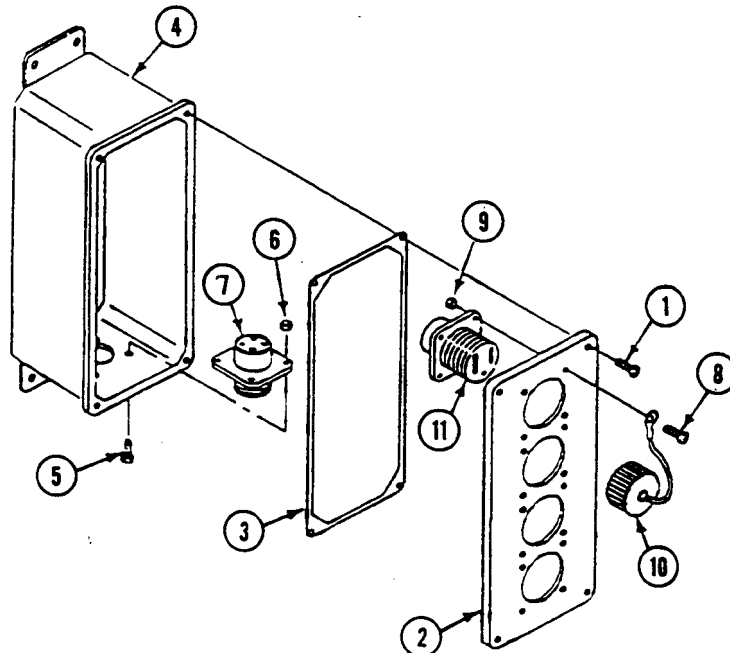
Mechanical Disassembly/Assembly are the same for A6 and A7. Electrical reference designators are different. Use wiring diagram (page 0080 00-3) for reassembly.

1. Remove four screws (1), cover (2), and gasket (3) from extension box (4).

NOTE

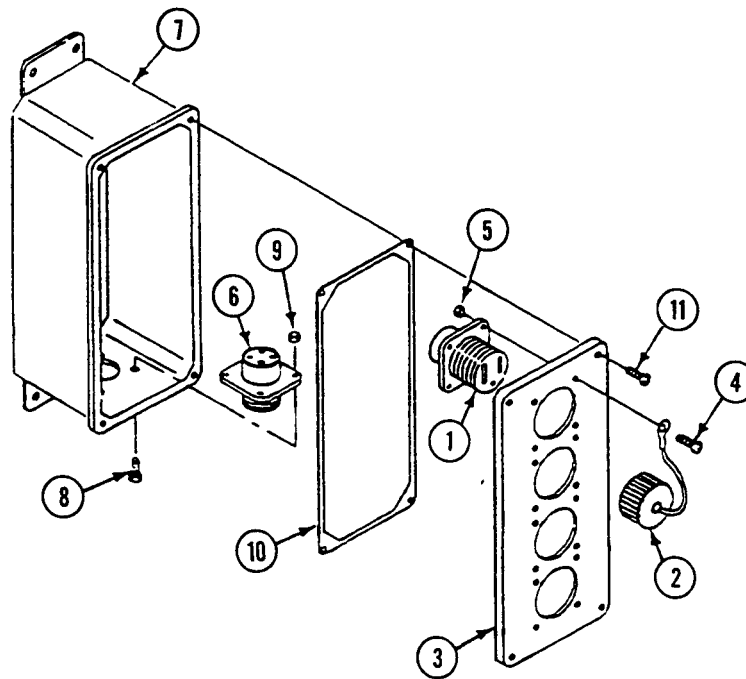
Tag all leads before disconnecting for proper assembly later.

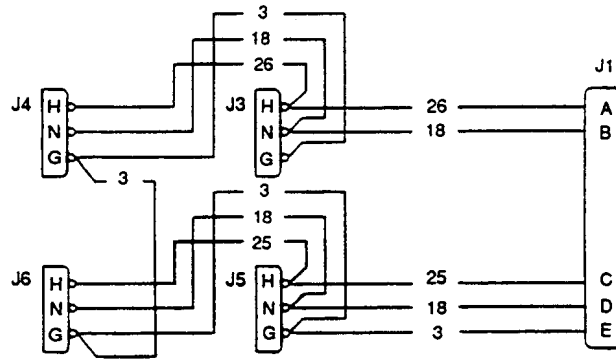
2. Remove four screws (5), locknuts (6), and connector J1 (7) from extension box (4). Discard locknuts.
3. Disconnect leads from connectors if necessary.
4. Remove 16 screws (8), locknuts (9), four dust caps (10), and connectors (11) from cover (2). Discard locknuts.



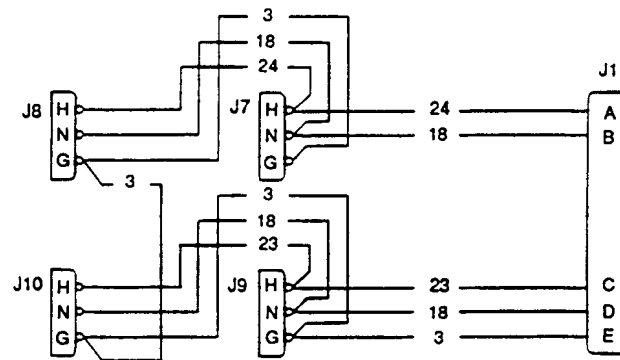
ASSEMBLY

1. Install four connectors (1) and dust caps (2) on cover (3) and secure with 16 screws (4) and new locknuts (5).
2. Install connector J1 (6) on extension box (7) and secure with four screws (8) and new locknuts (9).
3. Connect leads to connectors if necessary.
4. Install gasket (10) and cover (3) on extension box (7) and secure with four screws (11).

NOTE**Color Designation for Terminals:****H (HOT) = YELLOW****N (NEUTRAL) = WHITE****G (GROUND) = GREEN**



12383854-1 (A6) WIRING DIAGRAM



12383854-2 (A7) WIRING DIAGRAM

FOLLOW-THROUGH STEPS

1. Install AC power extension A6 box (see your -20).
2. Install AC power extension A7 box (see your -20).

END OF TASK

REPAIR ROADSIDE DC POWER EXTENSION BOX A9 (M1068 ONLY)

0081 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0081 00-1).
 Assembly (page 0081 00-3).

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 0104 00, Item 4)

Equipment Condition

Roadside DC power extension box removed
 (see your -20)

Materials/Parts

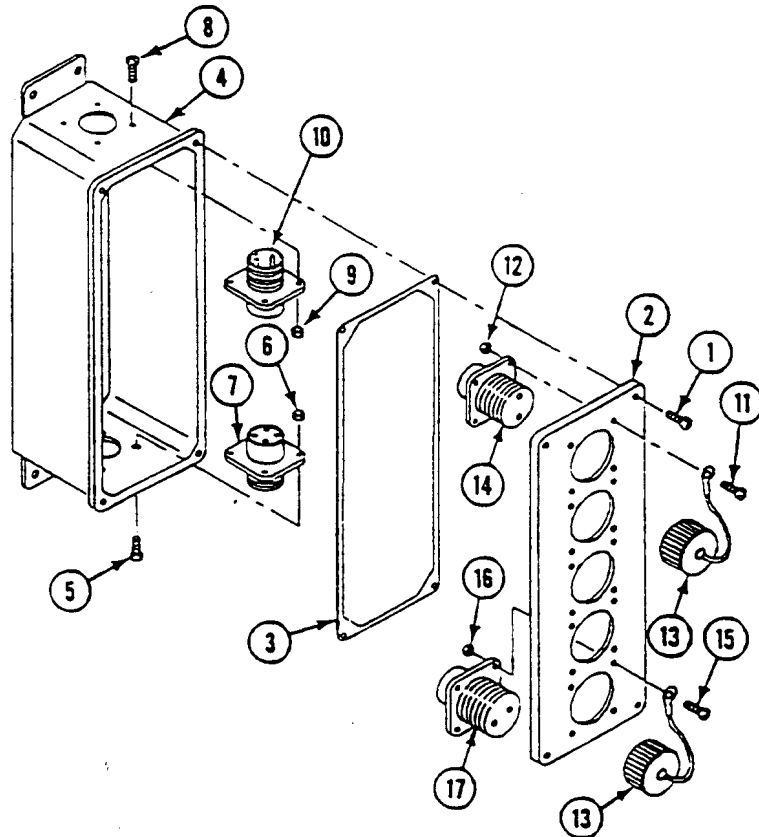
Locknut (28)

DISASSEMBLY

NOTE

See wiring diagram (page 0081 00-4) for assembly/disassembly of wires to connectors.

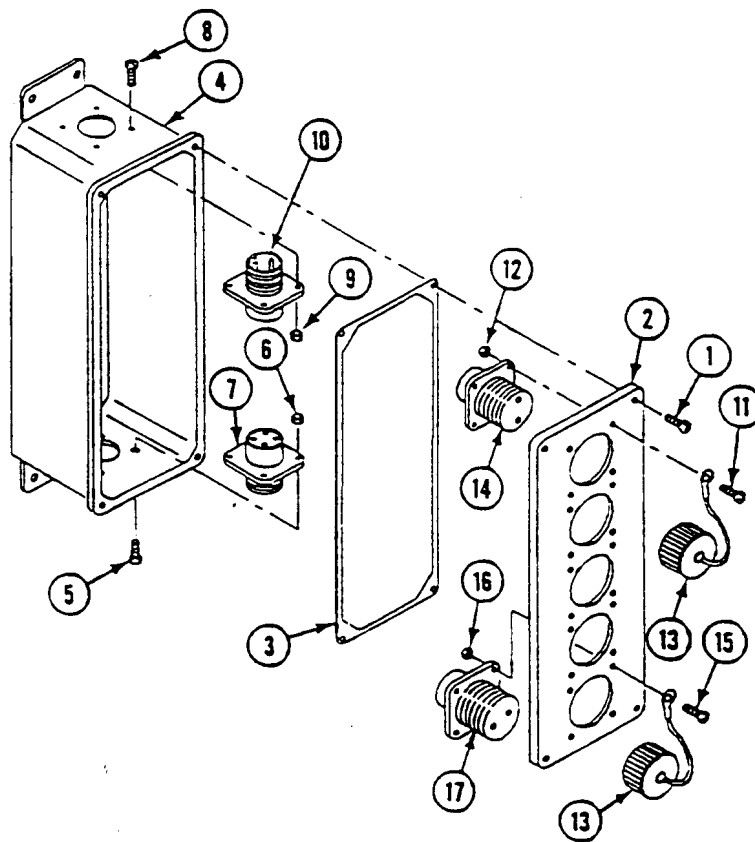
1. Remove four screws (1), cover (2), and gasket (3) from extension box (4).



NOTE

Tag all leads before disconnecting for proper assembly later.

2. Remove four screws (5), locknuts (6), and connector J1 (7) from extension box (4). Discard locknuts.
3. Remove four screws (8), locknuts (9), and connector J2 (10) from extension box (4). Discard locknuts.
4. Remove 16 screws (11), locknuts (12), four dust caps (13), and four connectors J18-J21 (14) from cover (2). Discard locknuts.
5. Remove four screws (15), locknuts (16), dust cap (13), and connector J23 (17) from cover (2). Discard locknuts.
6. Disconnect leads from connectors if necessary.

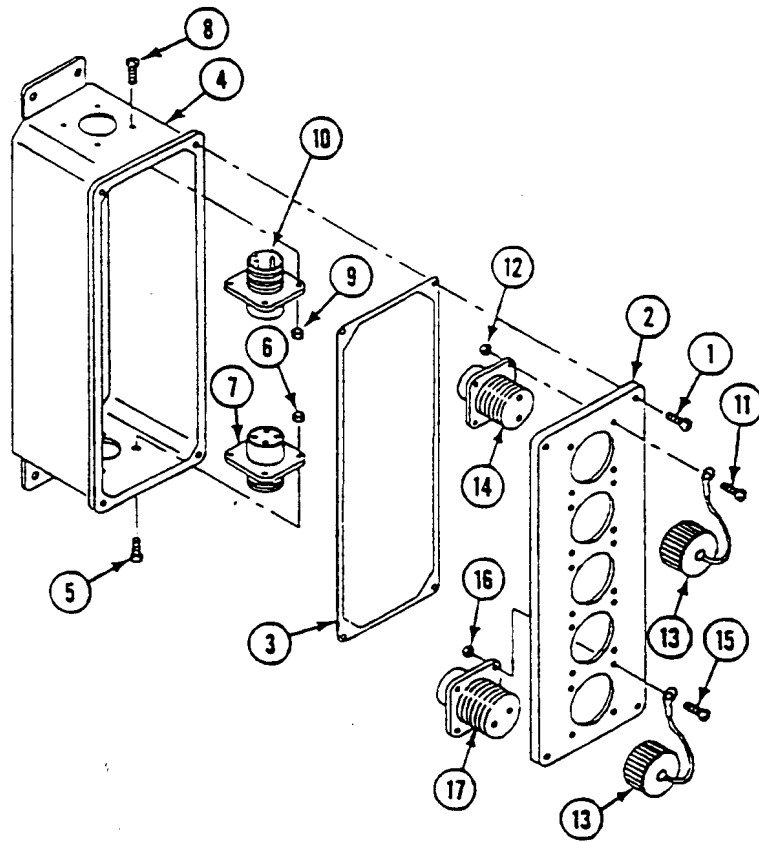


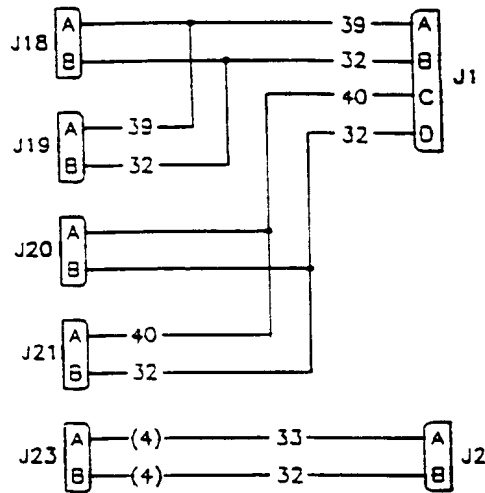
ASSEMBLY

NOTE

See wiring diagram (page 0081 00-4) for assembly/disassembly of wires to connectors.

1. Install connector J23 (17) on cover (2) with dustcap (13) and secure with four screws (15) and new locknuts (16).
2. Install four connectors J18-J21 (14) on cover (2) with dust caps (13) and secure with 16 screws (11) and new locknuts (12).
3. Install connector J2 (10) on extension box (4) and secure with four screws (8) and new locknuts (9).
4. Install connector J1 (7) on extension box (4) and secure with four screws (5) and new locknuts (6).
5. Connect leads to connectors if necessary.
6. Install cover (2) on extension box (4) with gasket (3) and secure with four screws (1).





(A9) WIRING DIAGRAM

FOLLOW-THROUGH STEPS

1. Install roadside DC power extension box (see your -20).

END OF TASK

**REPAIR ROADSIDE AND CURBSIDE DATA PANEL ASSEMBLIES
A12 AND A13 (M1068 ONLY)**

0082 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0082 00-1).
Assembly (page 0082 00-4).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Radio Repairer 29E10

Tools and Special Tools

Radio Equipment Tool Kit (WP 0104 00, Item 47)

Equipment Condition

Data box removed (see your -20)

Materials/Parts

Locknut (4)
Lockwasher (14)

DISASSEMBLY

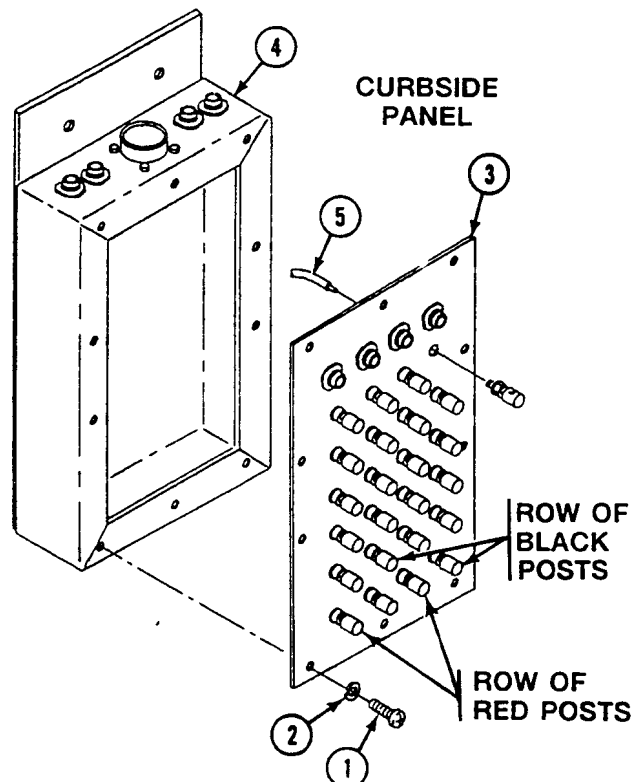
NOTE

Tag all leads before removal for proper installation later.

Follow illustration for removal/installation of red/black binding posts.

See wiring diagrams (page 0082 00-6) for disassembly/assembly of wires to connectors/binding posts.

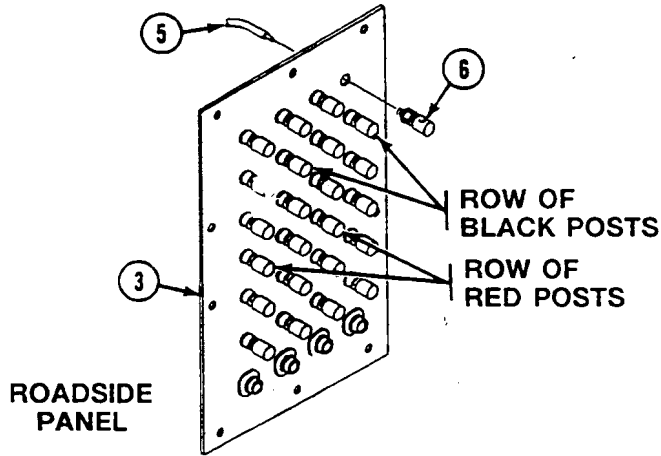
1. Remove 14 screws (1), lockwashers (2), and faceplate (3) from box (4). Discard lockwashers.



REPAIR ROADSIDE AND CURBSIDE DATA PANEL ASSEMBLIES A12 AND A13 (M1068 ONLY) — Continued

0082 00

- Disconnect leads (5) from 24 binding posts (6).



NOTE

Tag all leads before removal for proper installation later.

Follow illustration for removal/installation of red/black binding posts.

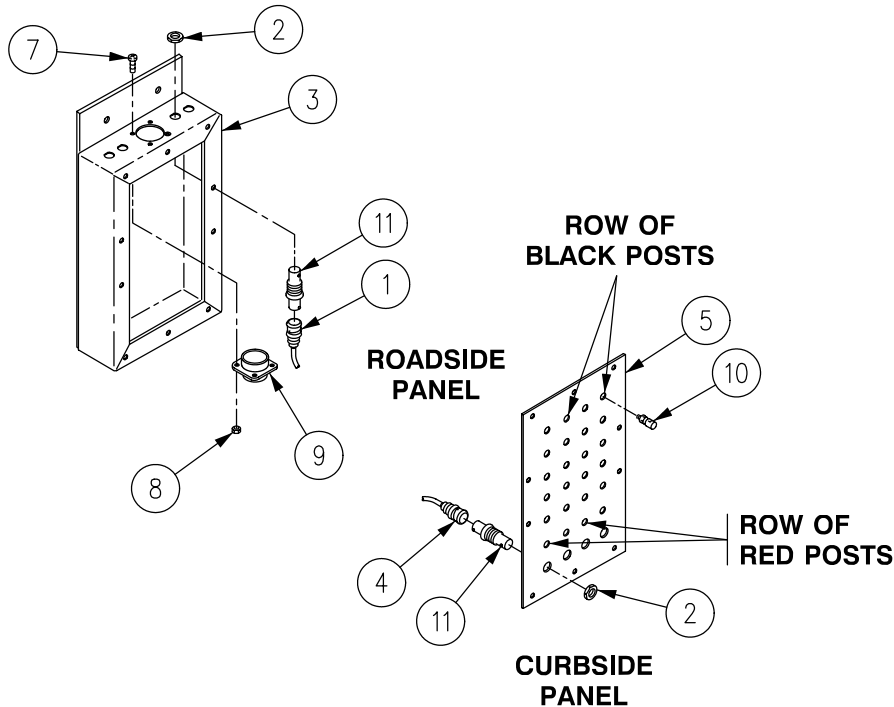
See wiring diagrams (page 0082 00-6) for disassembly/assembly of wires to connectors/binding posts.

- Remove four connectors J1, J2, J4, J5 (1), jamnuts (2), and adapters (11) from box (3).

NOTE

Do Step 4 for curbside data panel only. Do Step 5 for roadside data panel only.

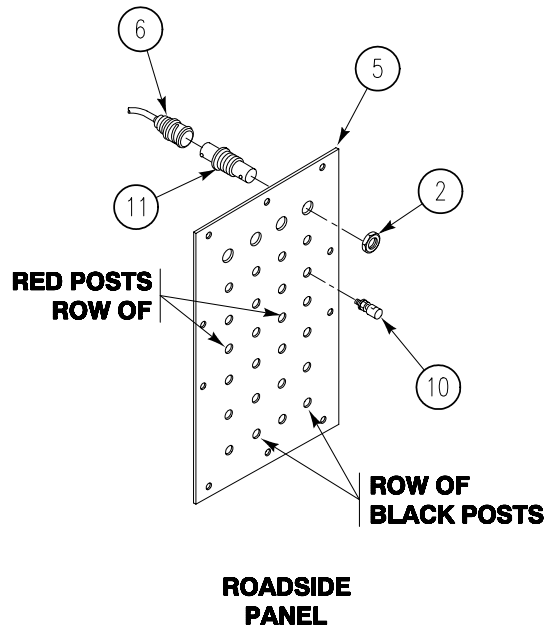
- Remove four connectors J105 thru J108 (4), jamnuts (2), and adapters (11) from faceplate (5).



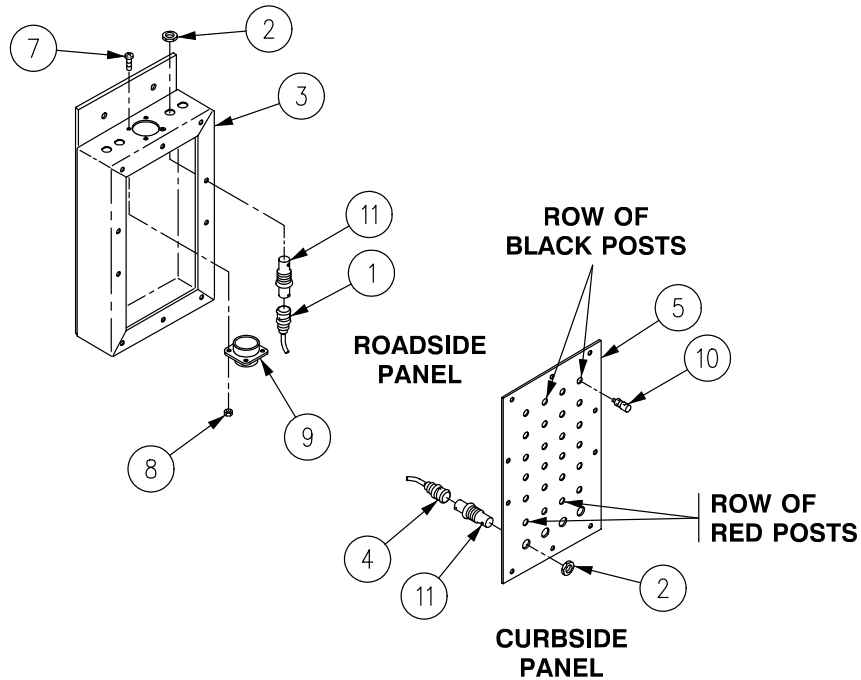
REPAIR ROADSIDE AND CURBSIDE DATA PANEL ASSEMBLIES A12 AND A13 (M1068 ONLY) — Continued

0082 00

- Remove four connectors J109 thru J112 (6), jamnuts (2), and adapters (11) from faceplate (5).



- Remove four screws (7), locknuts (8), and connector J1 (9) from box (3). Discard locknuts.
- Remove 24 binding posts (10) from faceplate (5).



ASSEMBLY

NOTE

See wiring diagrams (page 0082 00-6) for assembly/disassembly of wires to connectors/binding posts.

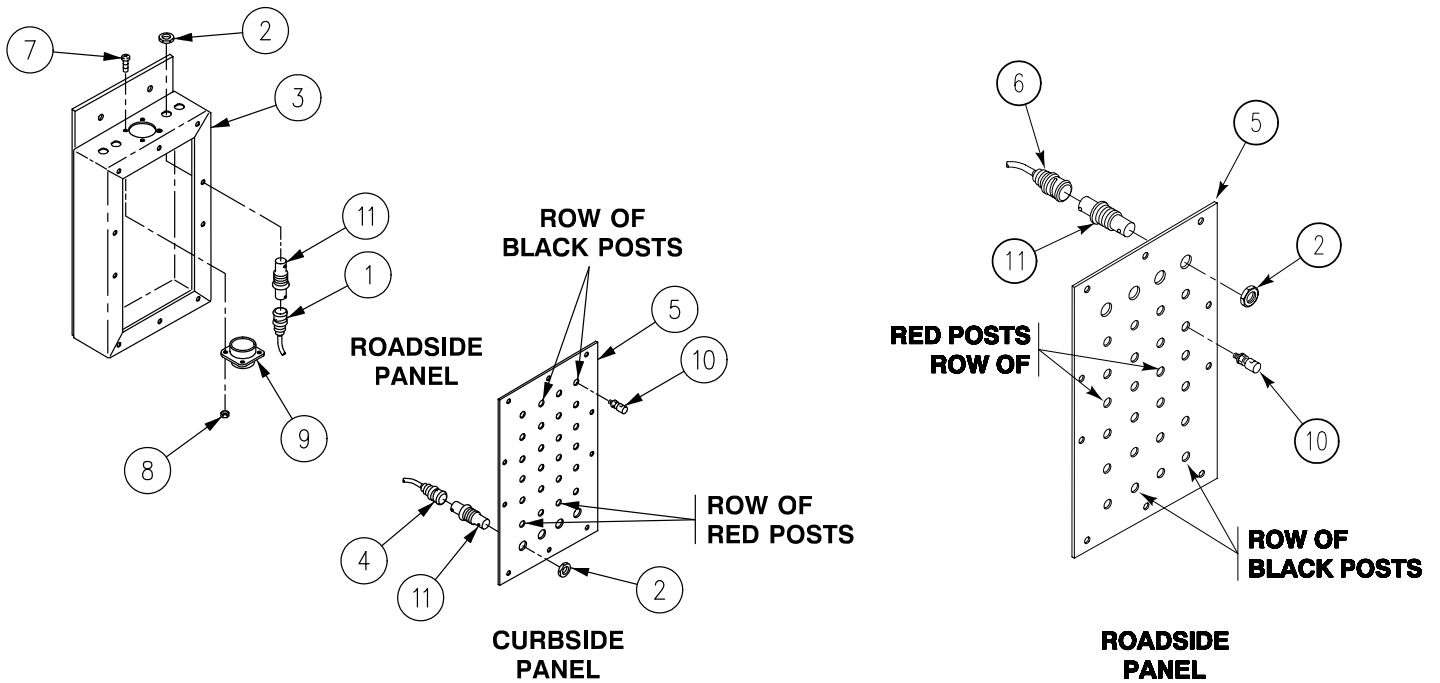
Follow illustration for assembly/disassembly of red/black binding posts.

1. Install 24 binding posts (10) on faceplate (5).
2. Install connector J1 (9) on box (3) and secure with four screws (7) and new locknuts (8).

NOTE

Do Step 3 for roadside data panel only. Do Step 4 for curbside data panel only.

3. Install four adapters (11) and connectors J109 thru J112 (6) on faceplate (5) and secure with jamnuts (2).
4. Install four adapters (11) and connectors J105 thru J108 (4) on faceplate (5) and secure with jamnuts (2).
5. Install four adapters (11) and connectors J1, J2, J4, J5 (1) on box (3) and secure with jamnuts (2).

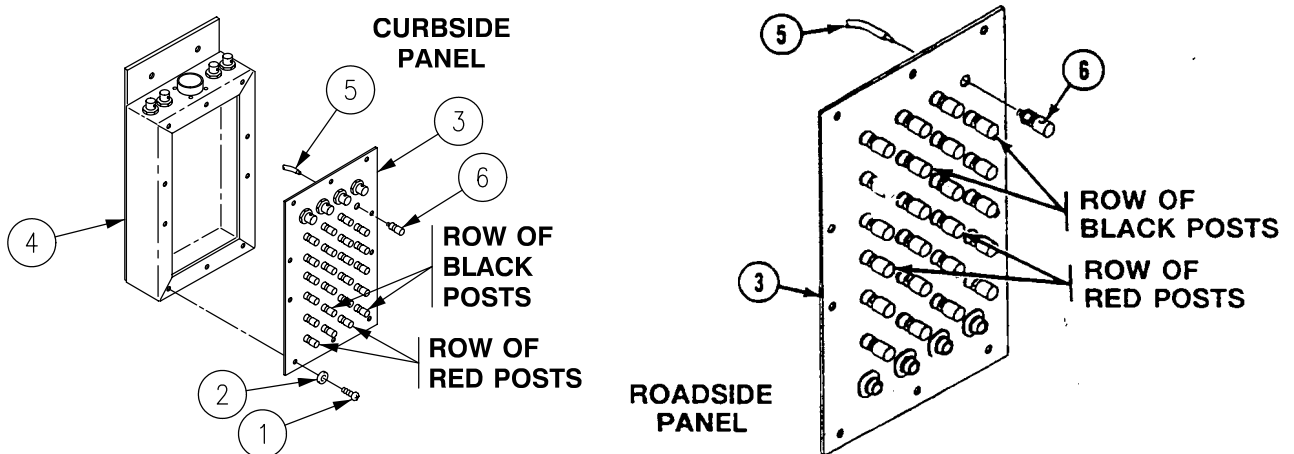


NOTE

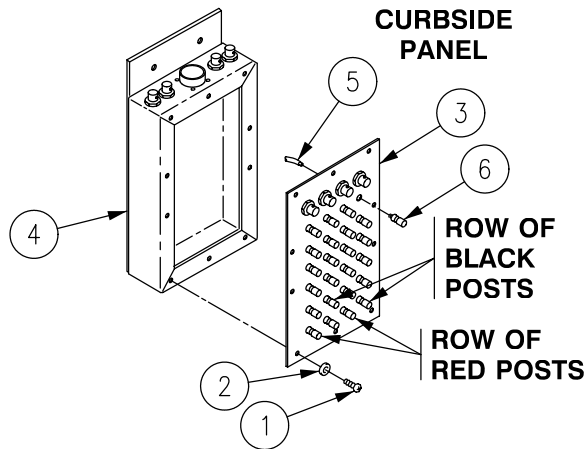
See wiring diagrams (page 0082 00-6) for assembly/disassembly of wires to connectors/binding posts.

Follow illustration for assembly/disassembly of red/black binding posts.

6. Connect leads (5) to 24 binding posts (6).

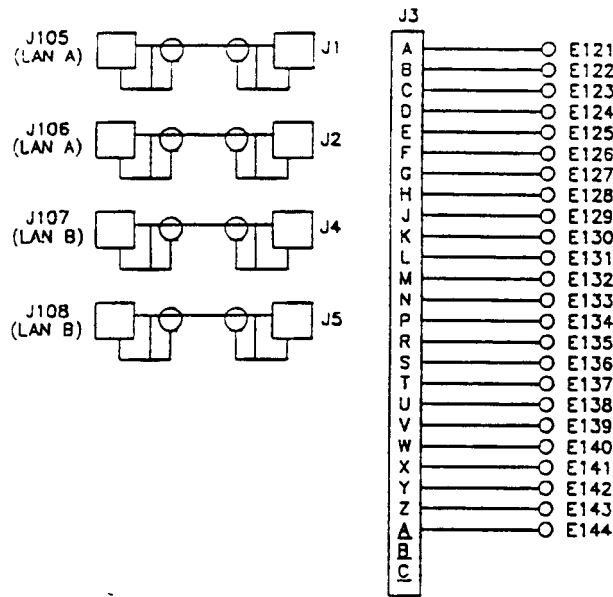


7. Install faceplate (3) on box (4) and secure with 14 screws (1) and new lockwashers (2).

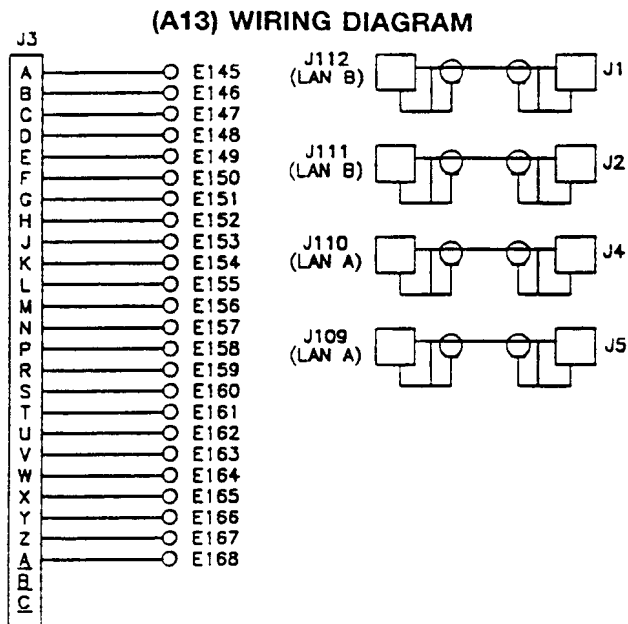


REPAIR ROADSIDE AND CURBSIDE DATA PANEL ASSEMBLIES A12 AND A13 (M1068 ONLY) — Continued

0082 00



(A12) WIRING DIAGRAM



(A13) WIRING DIAGRAM

FOLLOW-THROUGH STEPS

1. Install data box (see your -20).

END OF TASK

REPAIR POWER CONTROL ENCLOSURE, RIGHT PANEL (M1068 ONLY)

0083 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0083 00-1).

Assembly (page 0083 00-5).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Power-Generation Equipment Repairer 52D10

Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Equipment Condition

Power control enclosure assembly removed
(see your -20)

Materials/Parts

Locknut (16)

Locknut (8)

Locknut (4)

Lockwasher (12)

Lockwasher (10)

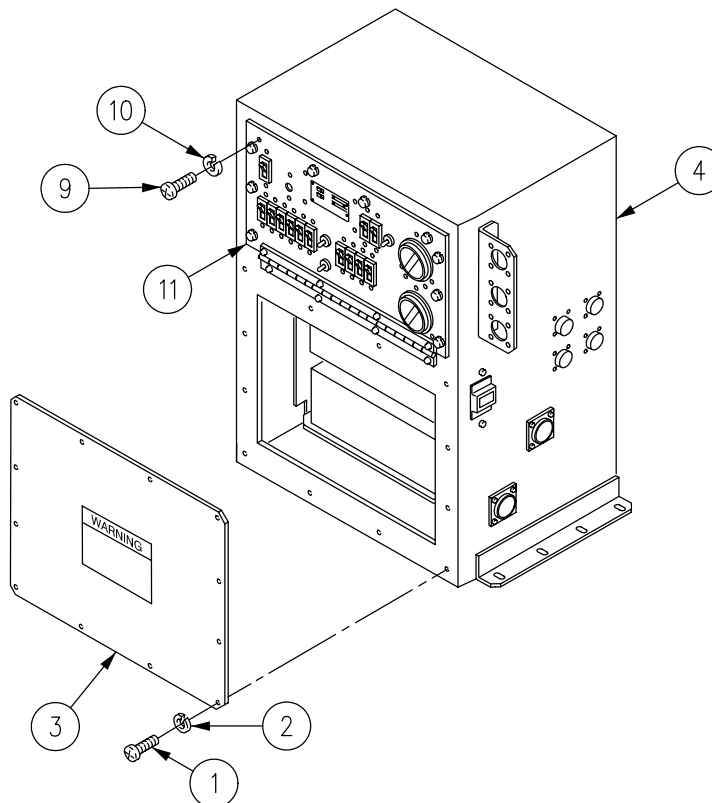
Lockwasher (8)

Lockwasher (2)

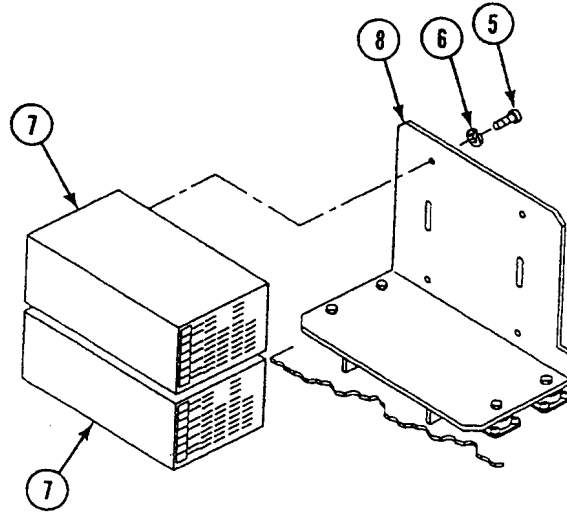
Lockwasher (4)

DISASSEMBLY

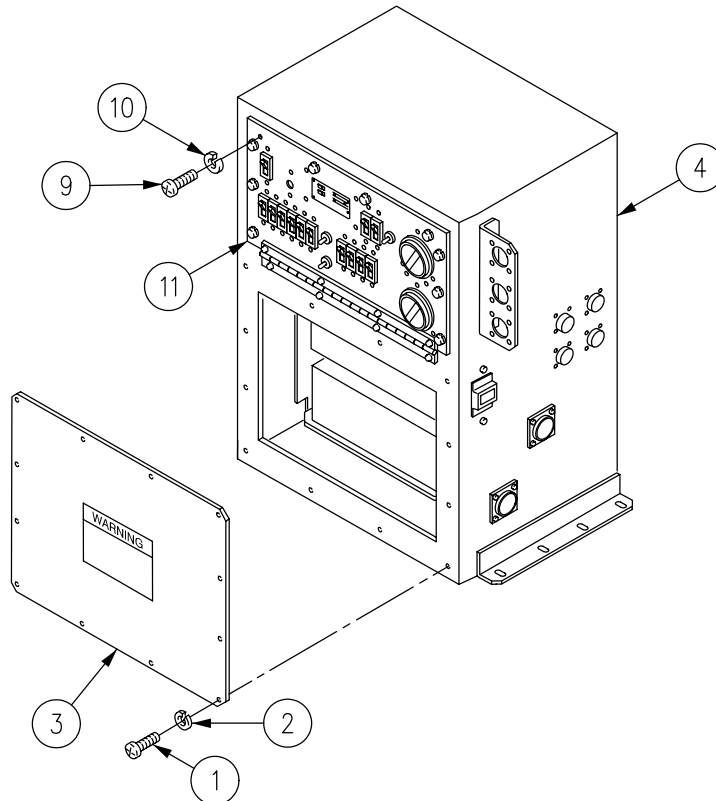
1. Remove 12 screws (1), lockwashers (2), and cover (3) from enclosure (4). Discard lockwashers.



2. Remove eight screws (5) and lockwashers (6) connecting power supplies (7) to bracket (8) and shift (move or slide) power supplies (7) to the left. Discard lockwashers. Have helper assist.



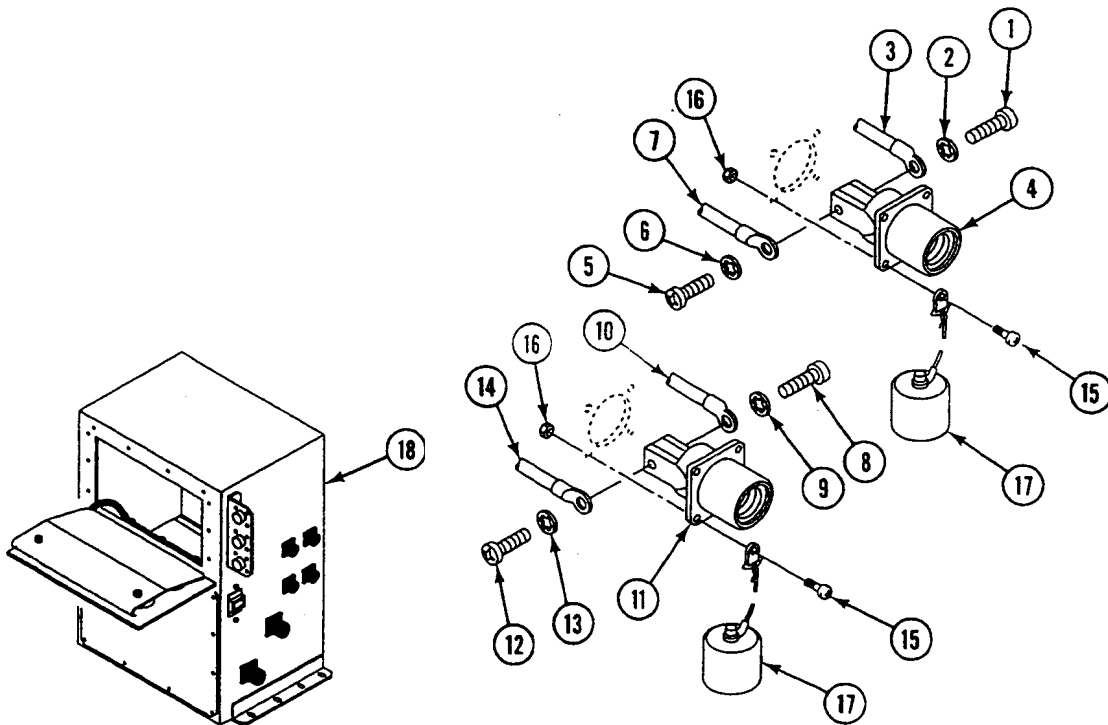
3. Remove ten screws (9) and lockwashers (10) from faceplate (11). Lower faceplate. Discard lockwashers.



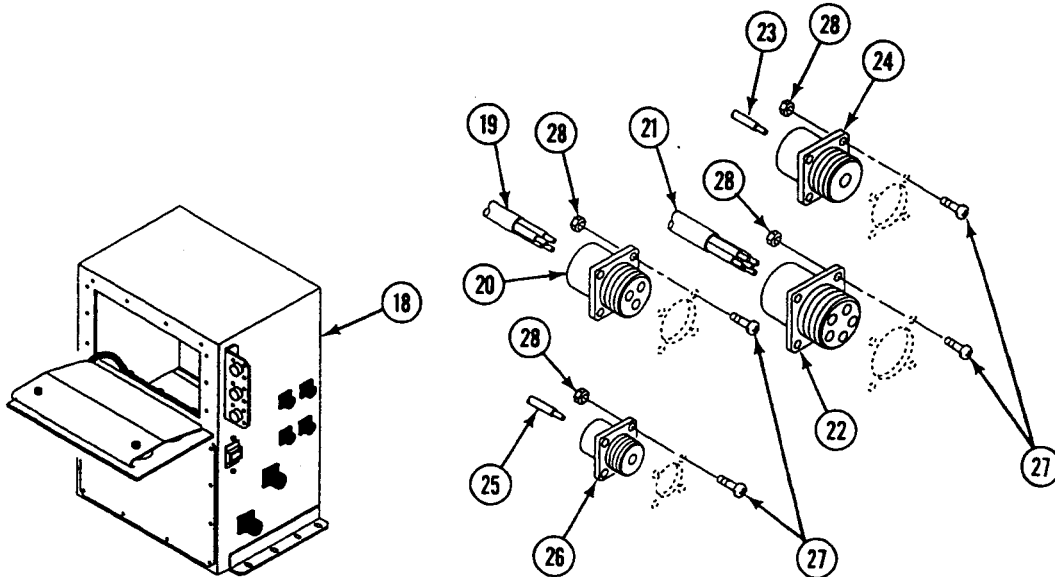
NOTE

Tag all leads and cables before removal.

4. Remove screw (1), lockwasher (2), and circuit 31A lead (3) from positive terminal of connector J25 (4).
5. Remove screw (5), lockwasher (6), and circuit 32E lead (7) from negative terminal of connector J25 (4).
6. Remove screw (8), lockwasher (9), and circuit 36C lead (10) from positive terminal of connector J26 (11).
7. Remove screw (12), lockwasher (13), and circuit 32C lead (14) from negative terminal of connector J26 (11).
8. Remove eight screws (15), locknuts (16), two dust caps (17), connector J25 (4), and connector J26 (11) from enclosure (18). Discard locknuts.



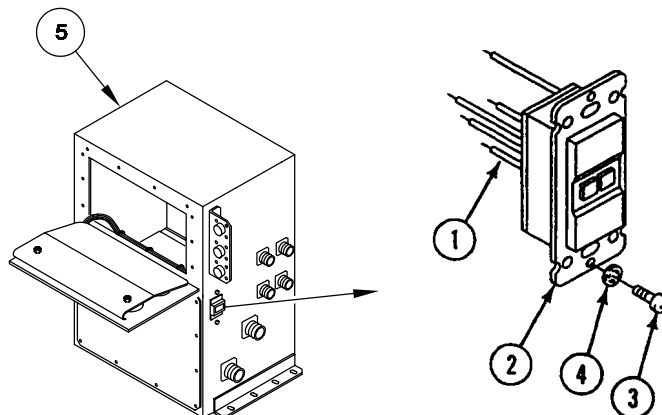
9. Remove circuit leads 20B, 18D, and 3AC (19) from connector J37 (20).
10. Remove circuit leads 11A, 28A, 12A, 28B, and 3W (21) from J27 (22).
11. Remove circuit lead 44A (23) from J28 (24).
12. Remove circuit 34A (25) from J29 (26).
13. Remove 16 screws (27), locknuts (28), and connectors J37 (20), J27 (22), J28 (24), and J29 (26) from enclosure (18). Discard locknuts.



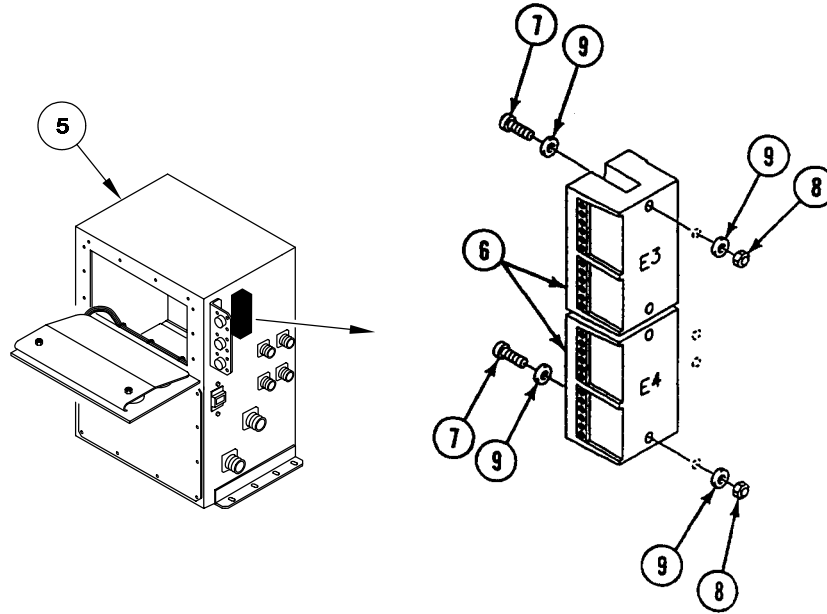
14. Remove circuit leads 22A, 21A, 3AA, 18C, and 27A (1) from ground fault interrupter (2). Remove two screws (3), lockwashers (4), and ground fault interrupter (2) from enclosure (5). Discard lockwashers.

NOTE

See wiring diagram (page 0083 00-9) to disconnect wires from terminal blocks. There are set screws securing each wire.

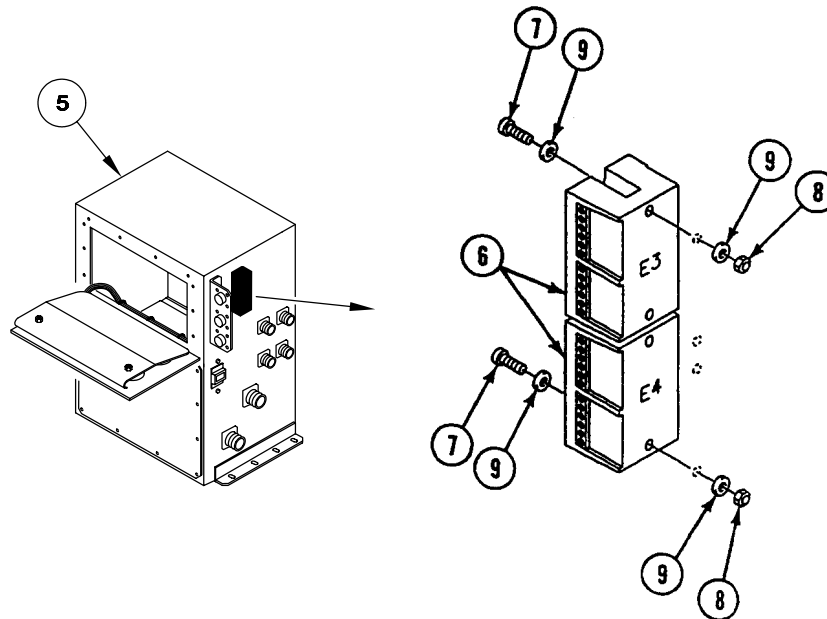


- Remove all wiring from terminal blocks (6) by loosening all set screws. Remove four screws (7), locknuts (8), eight washers (9), and two terminal blocks (6) from enclosure (5). Discard locknuts.

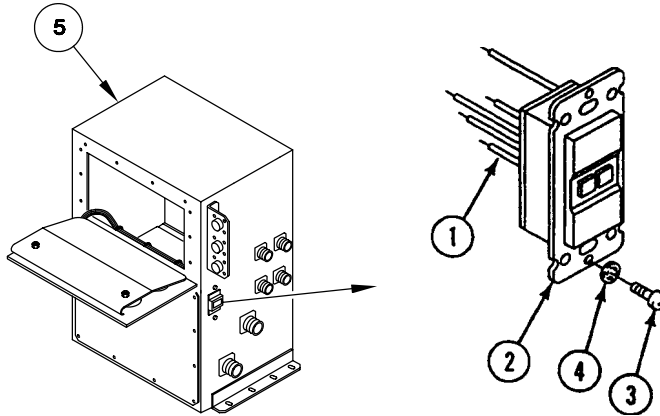


ASSEMBLY

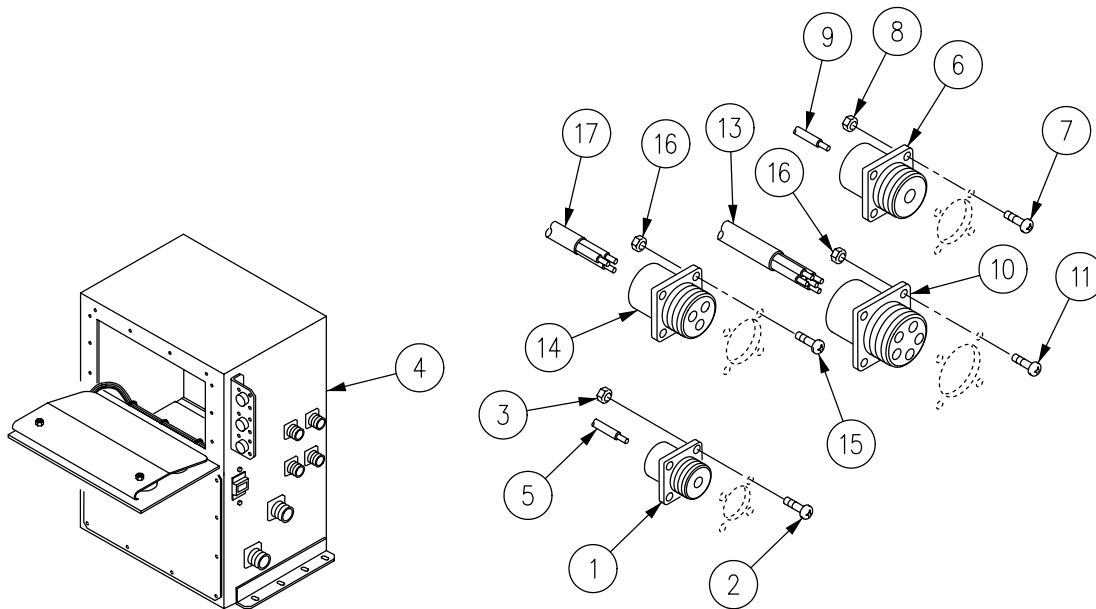
- Install two terminal blocks (6), four screws (7), new locknuts (8), and eight washers (9) on enclosure (5). Use wiring diagram (page 0083 00-9). Install all wiring to terminal blocks and secure all set screws.



2. Install ground fault interrupter (2) on enclosure (5) with two new lockwashers (4) and screws (3). Install circuit leads 22A, 21A, 3AA, 18C, and 27A (1) on ground fault interrupter (2).

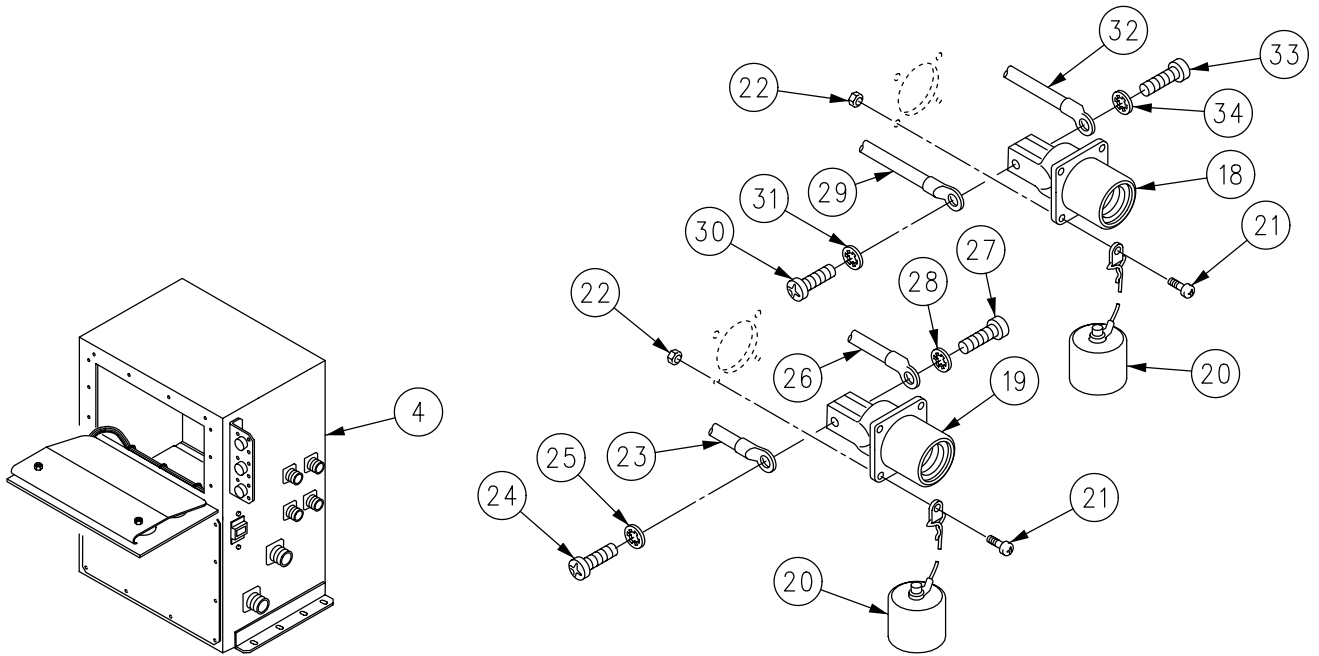


3. Install connector J29 (1), four screws (2), and new locknuts (3) on enclosure (4). Install circuit lead 34A (5) on J29 (1).
4. Install connector J28 (6), four screws (7), and new locknuts (8) on enclosure (4). Install circuit lead 44A (9) on J28 (6).
5. Install connector J27 (10), four screws (11), and new locknuts (16) on enclosure (4). Install circuit leads 11A, 28A, 12A, 28B, and 3W (13) on J27 (10).
6. Install connector J37 (14), four screws (15), and new locknuts (16) on enclosure (4). Install circuit leads 20B, 18D, and 3AC (17) on J37 (14).



7. Install connector J25 (18), connector J26 (19), two dust caps (20) with retainers, eight screws (21), and new locknuts (22) on enclosure (4).
8. Install circuit 32C lead (23), screw (24), and lockwasher (25) on negative terminal of connector J26 (19).
9. Install circuit 36C lead (26), screw (27), and lockwasher (28) on positive terminal of connector J26 (19).
10. Install circuit 32E lead (29), screw (30), and lockwasher (31) on negative terminal of connector J25 (18).

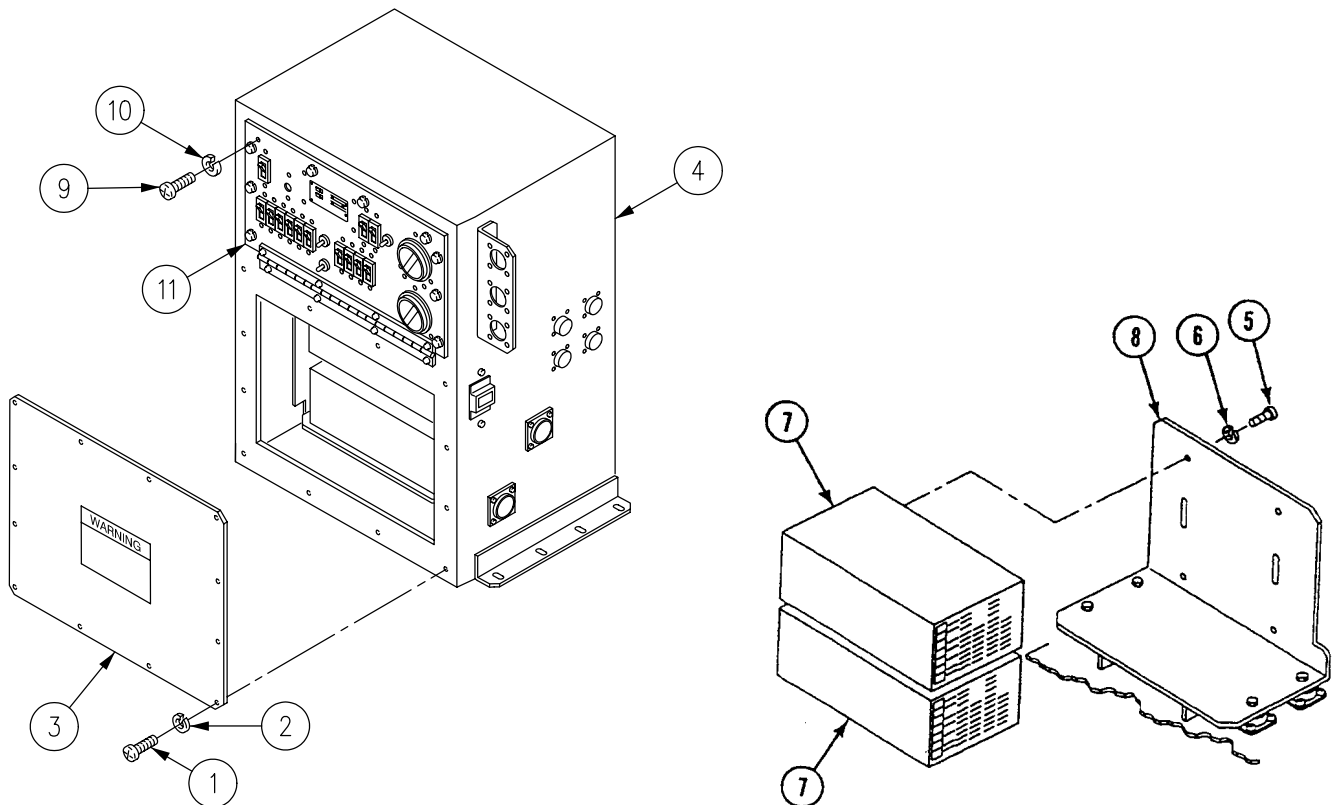
11. Install circuit 31A lead (32), screw (33), and lockwasher (34) on positive terminal of connector J25 (18).



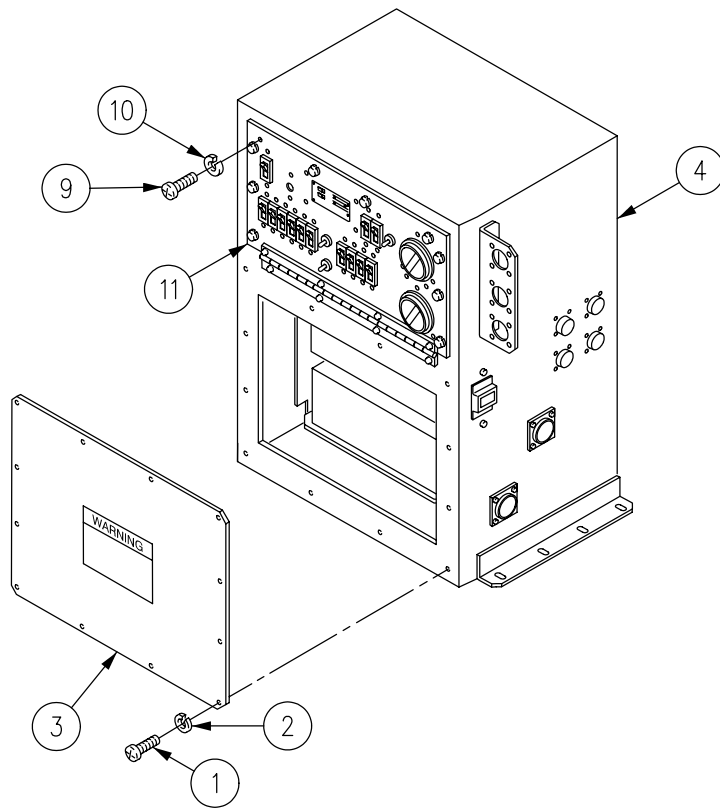
12. Close faceplate (11) and install ten screws (9) and new lockwashers (10).

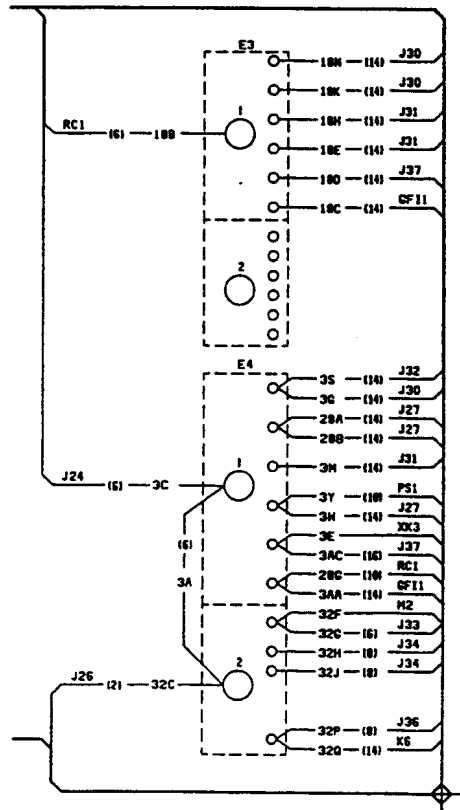
13. Move power supplies (7) into the proper position inside power enclosure (4). Have helper assist.

14. Install eight screws (5) and new lockwashers (6) and secure power supplies (7) to bracket (8) inside enclosure (4).



15. Install cover (3), 12 new lockwashers (2), and screws (1) on power enclosure (4).





WIRING DIAGRAM

FOLLOW-THROUGH STEPS

1. Install power control enclosure assembly (see your -20).

END OF TASK

REPAIR POWER CONTROL ENCLOSURE, LEFT PANEL (M1068 ONLY)

0084 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0084 00-2).
Assembly (page 0084 00-5).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Power-Generation Equipment Repairer 52D10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Equipment Condition

Power control enclosure assembly removed
(see your -20).

Materials/Parts

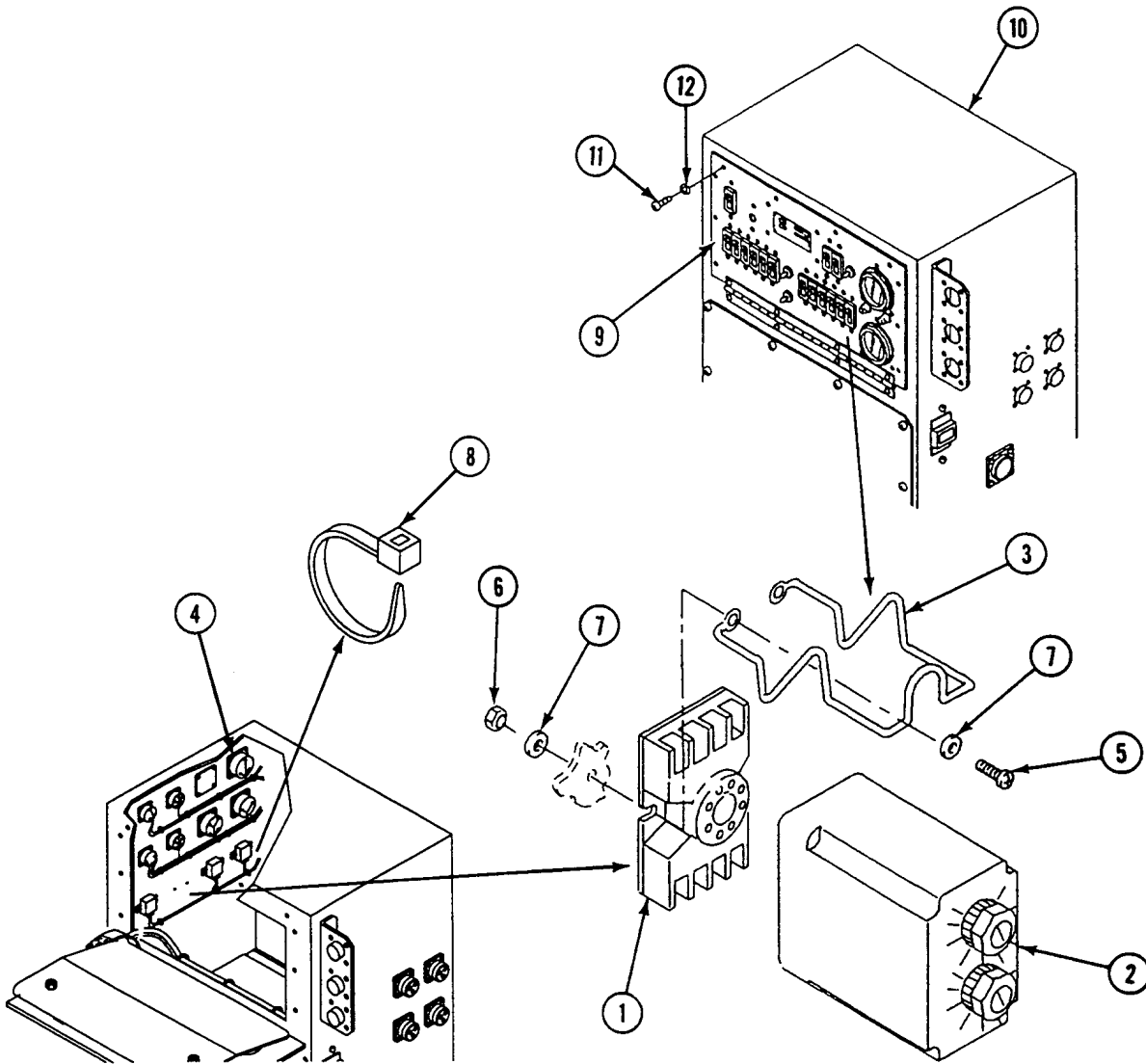
Locknut (40)

Lockwasher (10)

Strap

DISASSEMBLY

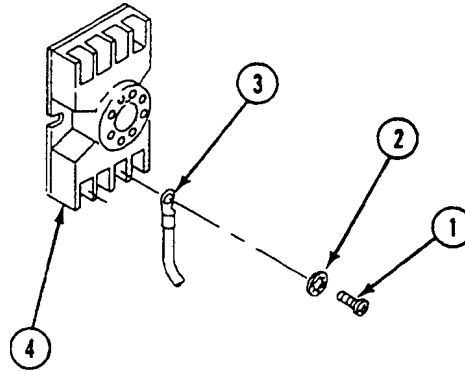
1. Remove ten screws (11), lockwashers (12), and lower faceplate (9) from enclosure (10). Discard lockwashers.
2. Remove two screws (5), locknuts (6), four washers (7), relay bail (3), relay XK2 (2), and relay socket (1) from left panel (4). Discard locknuts.
3. Unplug relay socket (1) from relay XK2 (2).
4. Remove tie straps (8) from wires as required. Discard tie straps.



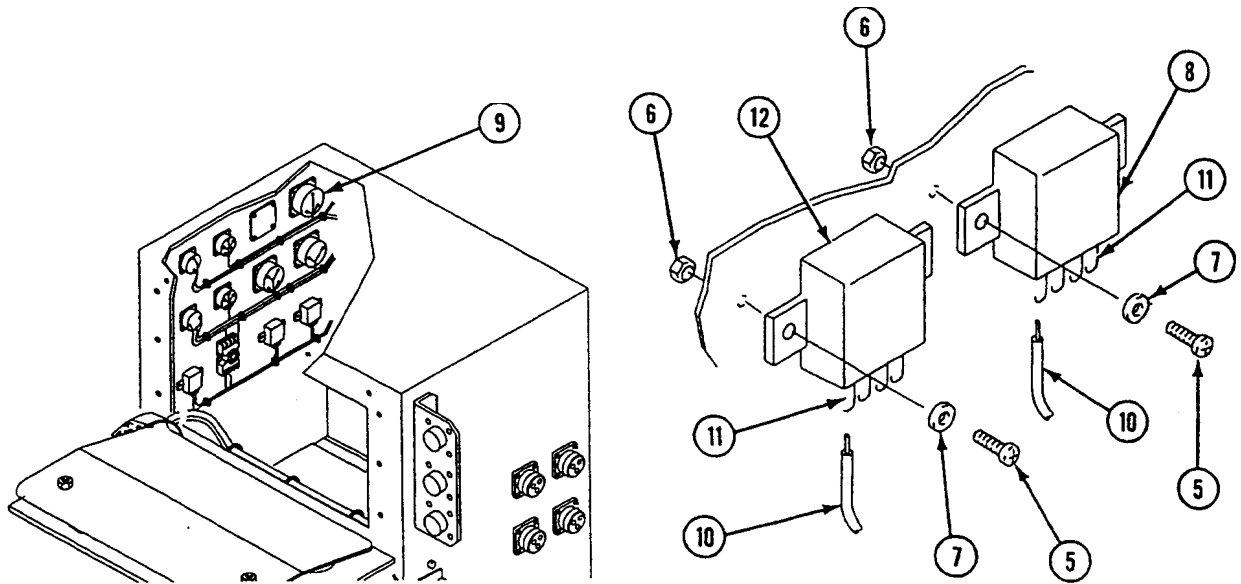
NOTE

Tag all leads/wires before removal for proper installation later. See wiring diagram (page 0084 00-8) for disassembly/assembly of wires/leads.

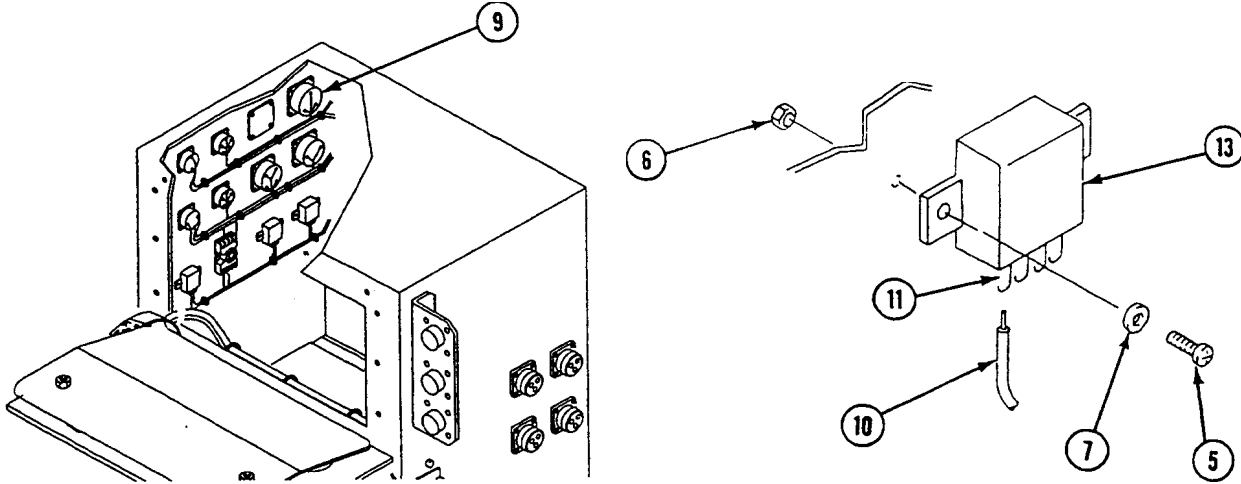
5. Remove six screws (1), lockwashers (2), and eight circuit leads (3) from terminals of relay XK2 socket (4).



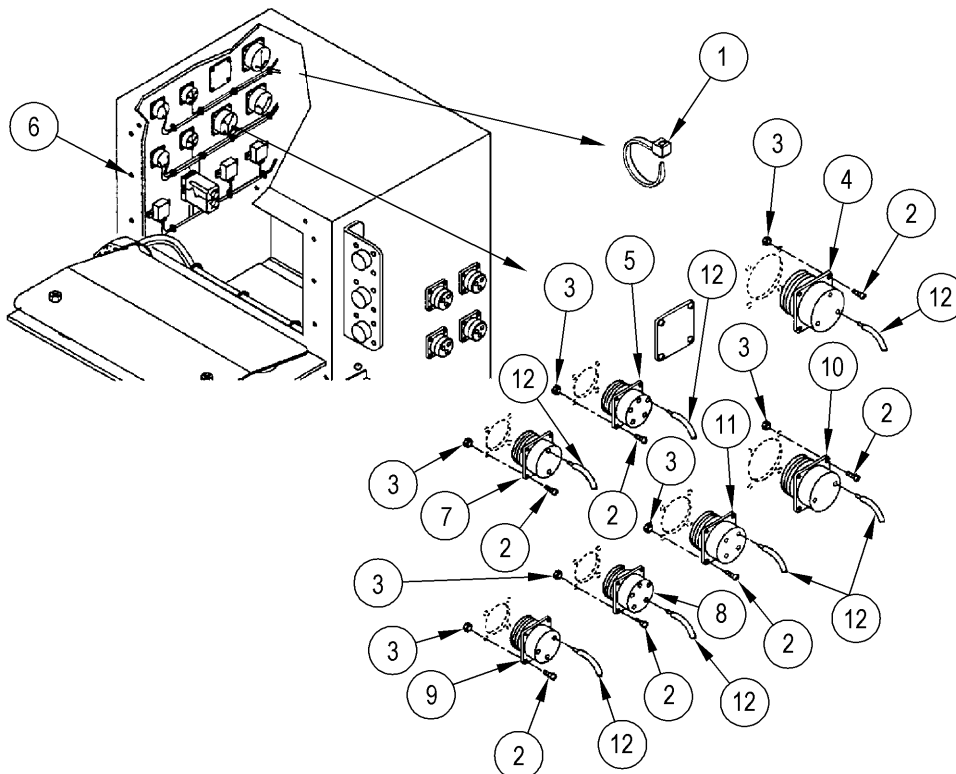
6. Remove two screws (5), locknuts (6), washers (7), and relay XK5 (8) from left panel (9). Discard locknuts.
7. De-solder/remove four wires (10) from terminals (11) of relay XK5 (8).
8. Remove two screws (5), locknuts (6), washers (7), and relay XK3 (12) from left panel (9). Discard locknuts.
9. De-solder/remove five wires (10) from terminals (11) of relay XK3 (12).



10. Remove two screws (5), locknuts (6), washers (7), and relay XK4 (13) from left panel (9). Discard locknuts.
11. De-solder/remove four wires (10) from terminals (11) of relay XK4 (13).



12. Remove tie straps (1) from wires as required. Discard tie straps.
13. Remove 12 screws (2), locknuts (3), three connectors J24 (4), J31 (5), and J36 (7) from left panel (6). Discard locknuts.
14. Remove 16 screws (2), locknuts (3), and four connectors J30 (8), J32 (9), J33 (10), and J34 (11) from left panel (6). Discard locknuts.
15. Remove/de-solder 28 wires (12) from terminals of connectors. See wiring diagram, page 0084 00-8.

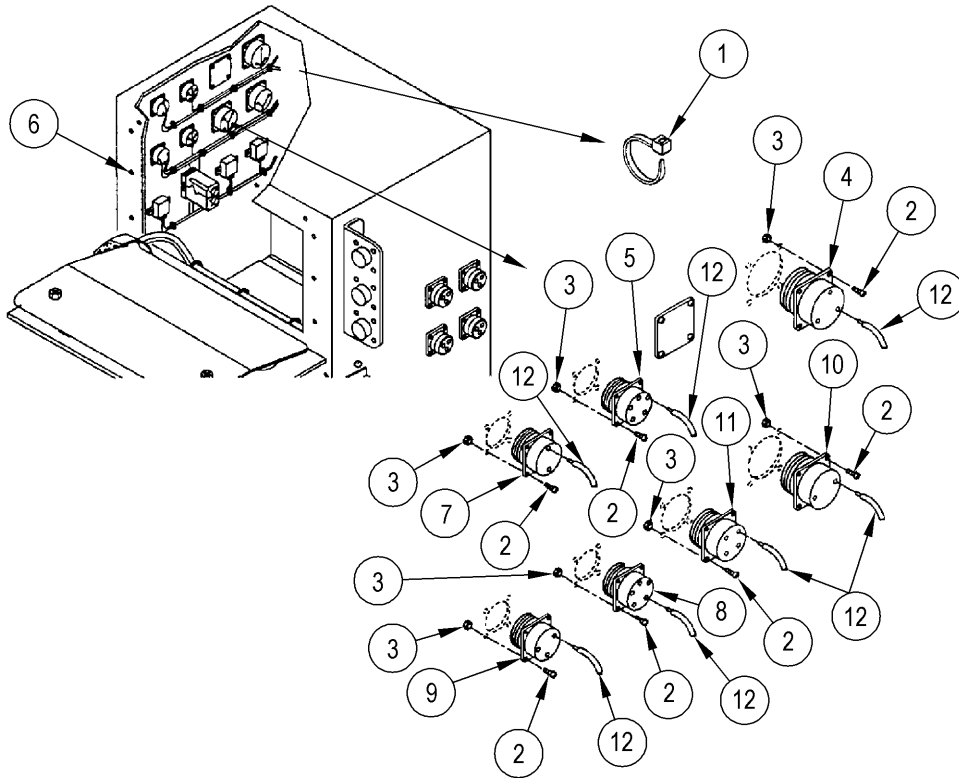


ASSEMBLY

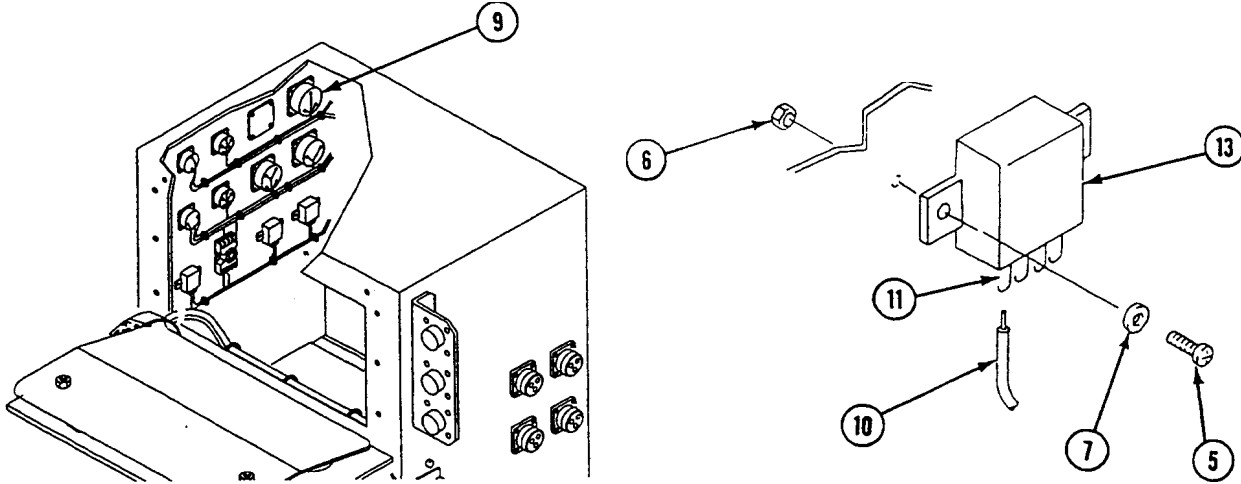
NOTE

See wiring diagram (page 0084 00-8) for assembly of wires/leads.

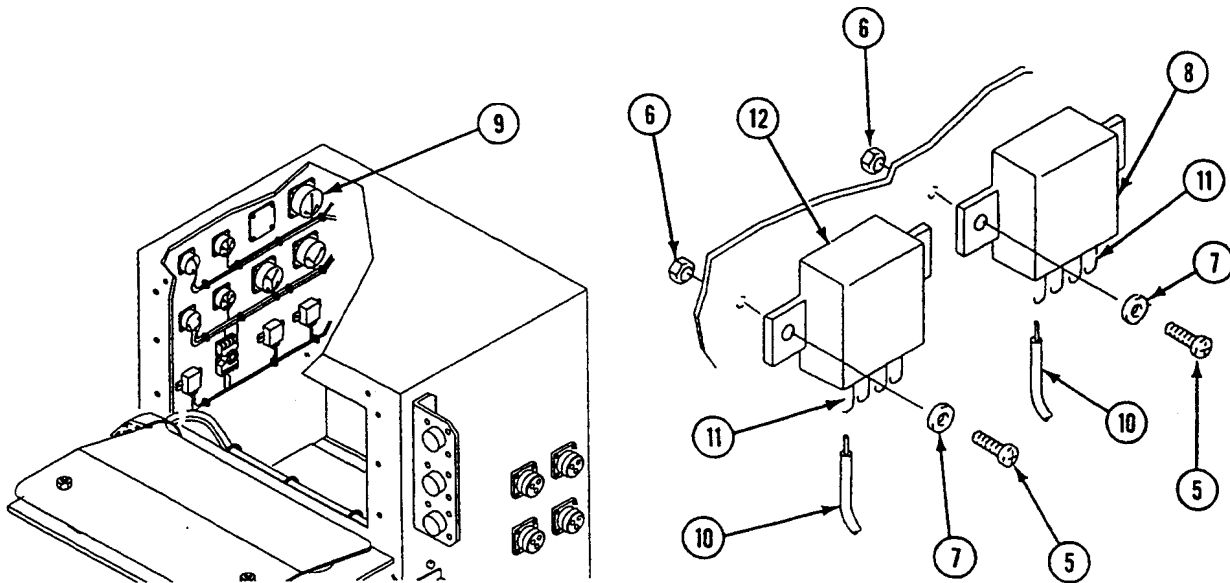
1. Solder/install 28 wires (12) on terminals of connectors.
2. Install four connectors J30 (8), J32 (9), J33 (10), and J34 (11) on left panel (6) and secure with 16 screws (2) and new locknuts (3).
3. Install three connectors J24 (4), J31 (5), and J36 (7) on left panel (6) and secure with 12 screws (2) and new locknuts (3).
4. Install new tie straps (1) on wires as required.



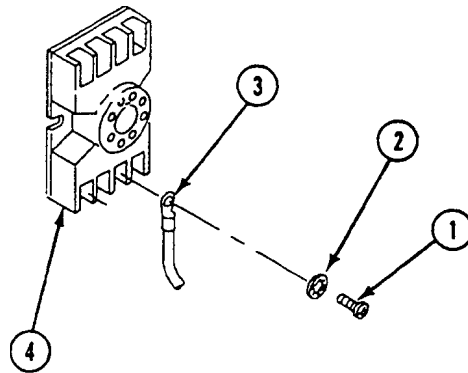
5. Solder/install four wires (10) on terminals (11) of relay XK4 (13).
6. Install relay XK4 (13) on left panel (9) and secure with two screws (5), new locknuts (6), and washers (7).



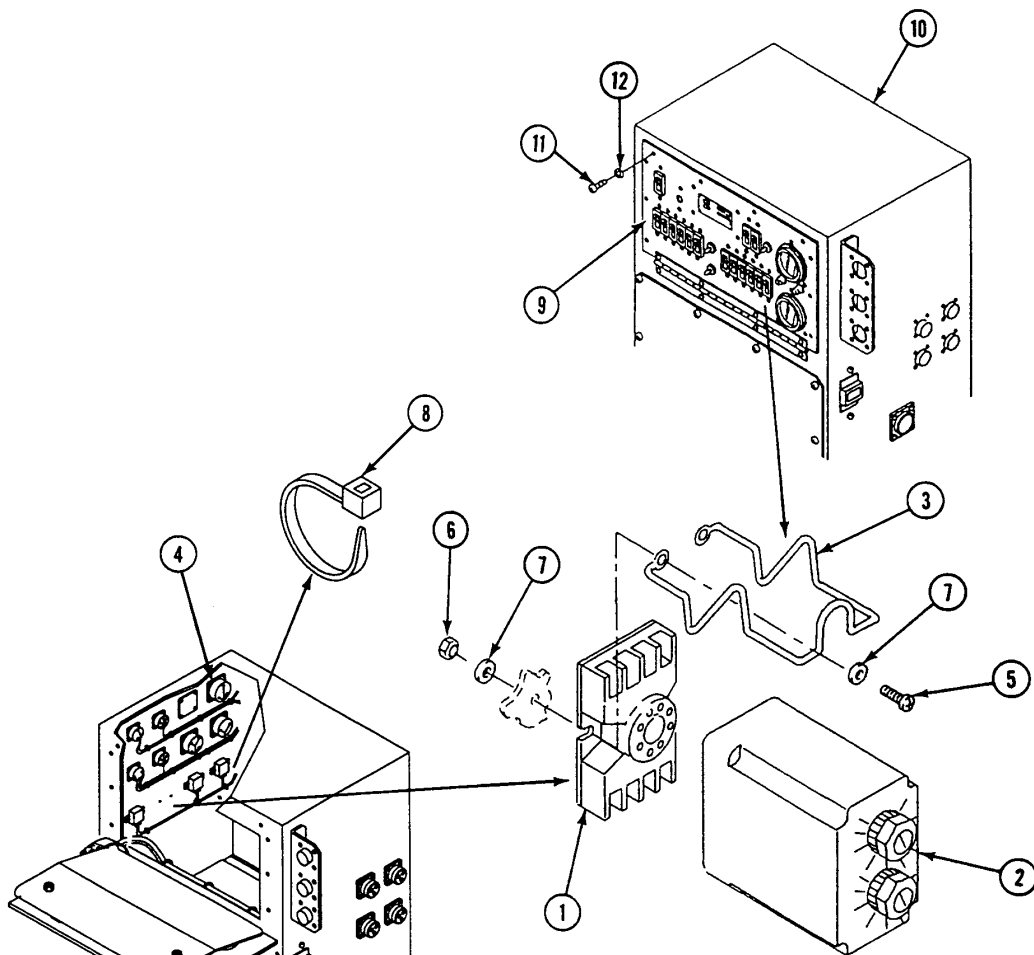
7. Solder/install five wires (10) on terminals (11) of relay XK3 (12).
8. Install relay XK3 (12) on left panel (9) and secure with two screws (5), new locknuts (6), and washers (7).
9. Solder/install four wires (10) on terminals (11) of relay XK5 (8).
10. Install relay XK5 (8) on left panel (9) and secure with two screws (5), new locknuts (6), and washers (7).

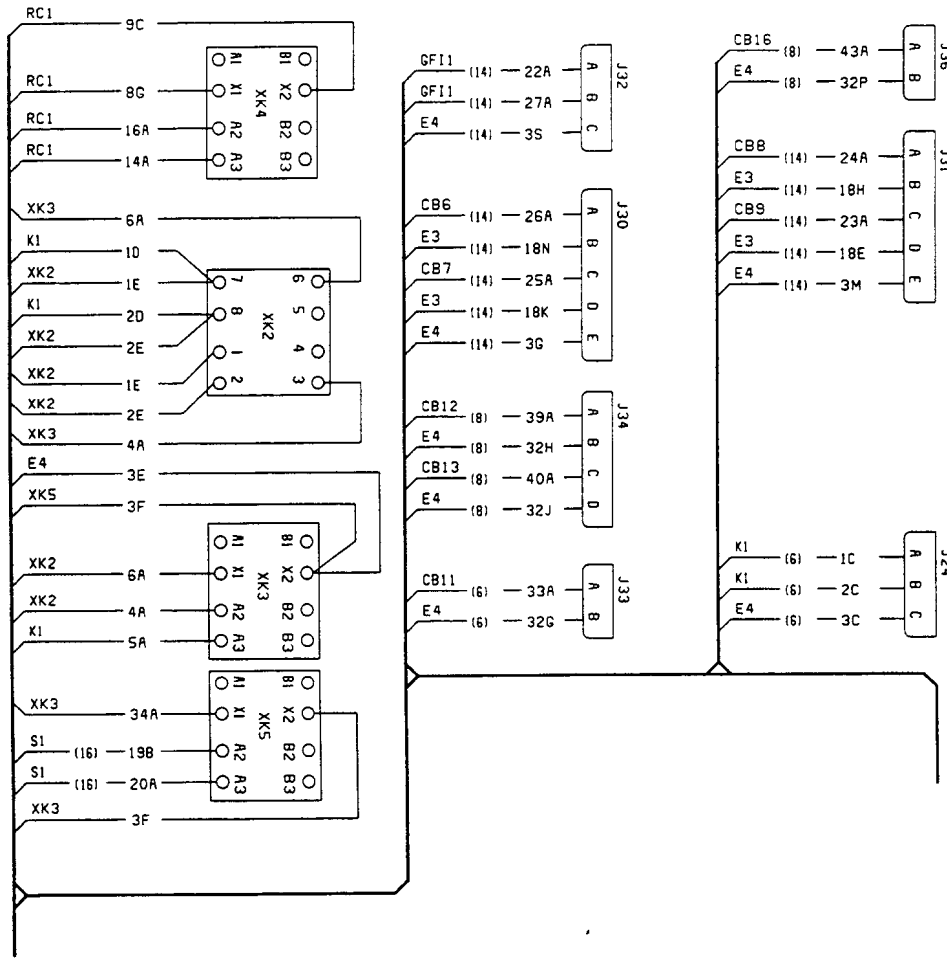


11. Install eight circuit leads (3) on terminals of relay socket (4) and secure with six screws (1) and lockwashers (2).



12. Plug relay socket (1) in relay XK2 (2).
13. Install relay bail (3) over relay XK2 (2) and relay socket (1) on left panel (4) and secure with two screws (5), new locknuts (6), and four washers (7).
14. Install new tie straps (8) on wires as required.
15. Close/install faceplate (9) on enclosure (10) and secure with ten screws (11) and new lockwashers (12).





WIRING DIAGRAM

FOLLOW-THROUGH STEPS

1. Install power control enclosure assembly (see your -20).

END OF TASK

REPAIR POWER CONTROL ENCLOSURE, REAR PANEL (M1068 ONLY)

0085 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0085 00-1).
 Assembly (page 0085 00-5).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Power-Generation Equipment Repairer 52D10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Equipment Condition

Power control enclosure assembly removed
 (see your -20)

Materials/Parts

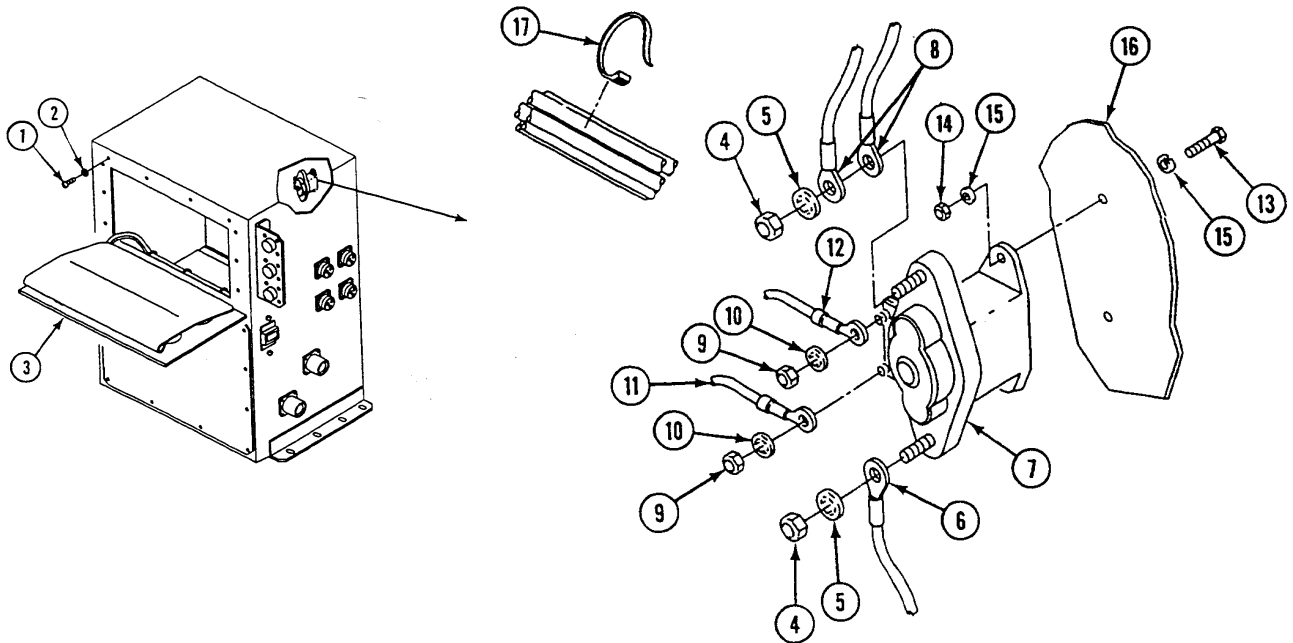
Locknut (9)
 Lockwasher (10)
 Tie strap (AR)

DISASSEMBLY

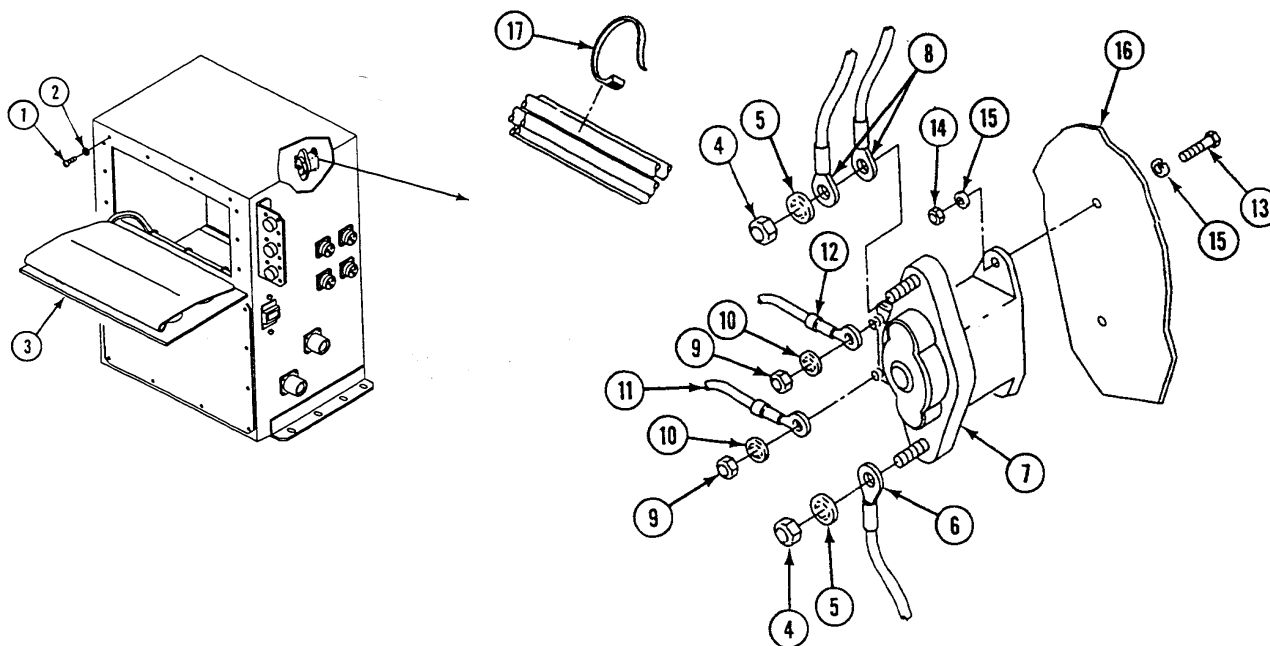
NOTE

Tag all wires before disconnecting them.

1. Remove ten screws (1) and lockwashers (2), and lower the faceplate (3). Discard lockwashers.
2. Remove nut (4), lockwasher (5), and lead 31A (6) from terminal A1 of relay K6 (7).

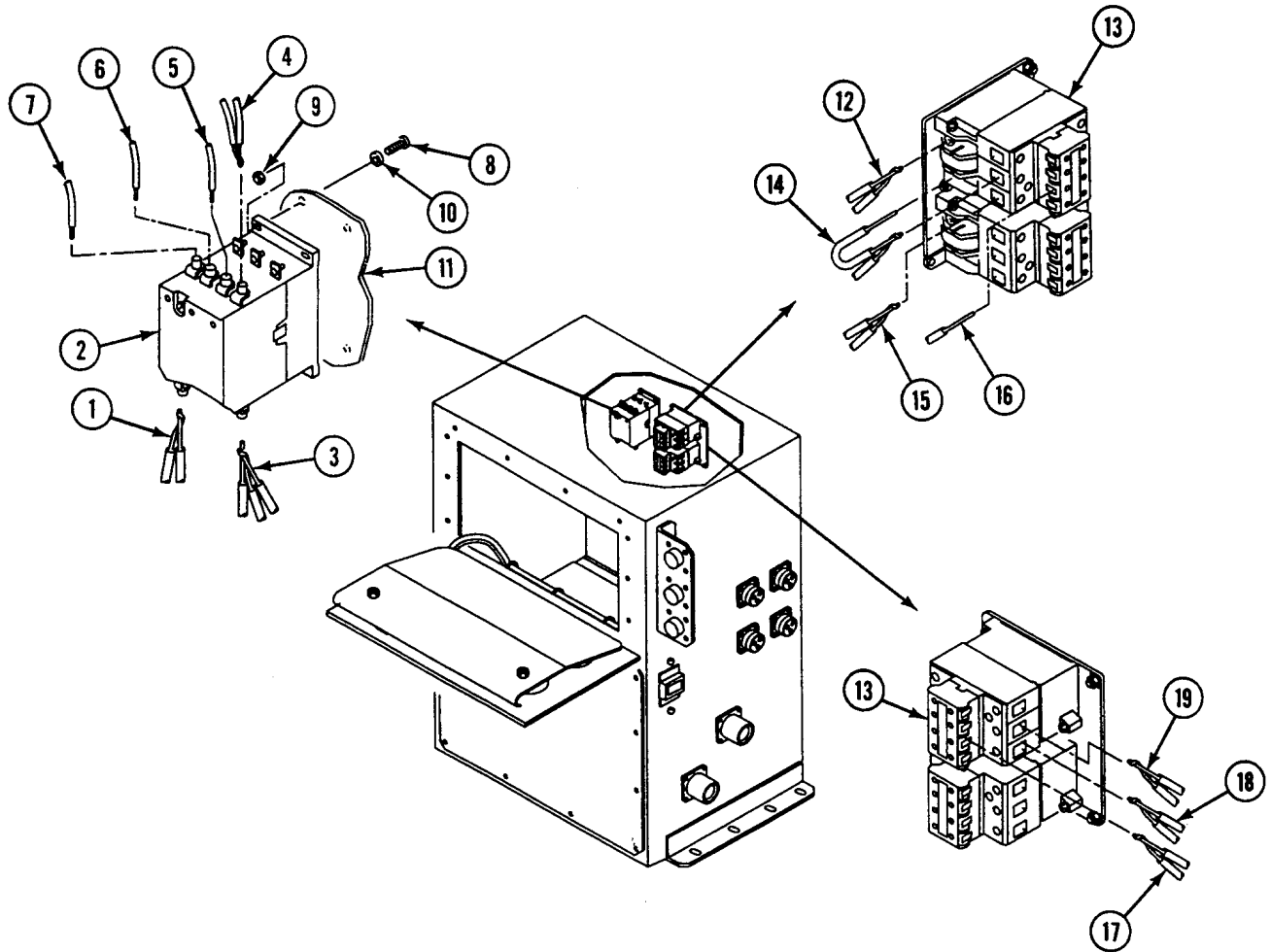


3. Remove nut (4), lockwasher (5), and leads 31B and 31C (8) from terminal A2 of relay K6 (7).
4. Remove nut (9), lockwasher (10), and lead 44A (11) from terminal X1 of relay K6 (7).
5. Remove nut (9), lockwasher (10), and lead 32Q (12) from terminal X2 of relay K6 (7).
6. Remove two screws (13), locknuts (14), four washers (15), and relay K6 (7) from rear panel (16). Discard locknuts.
7. Remove tie straps (17) from leads as required. Discard tie straps.

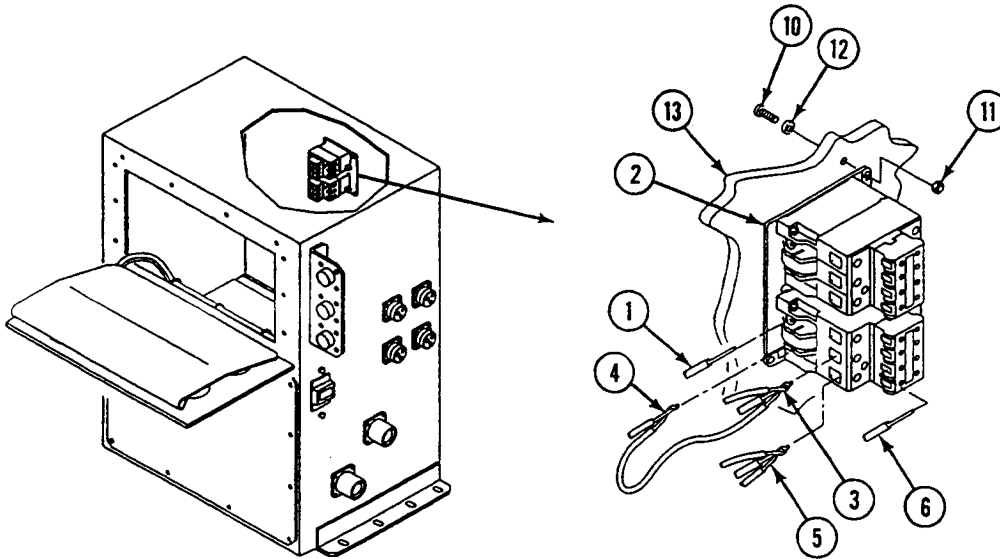


8. Remove leads 1C and 1D (1) from terminal T1 of contactor relay K1 (2).
9. Remove leads 2C, 2D, and 2F (3) from terminal T2 of contactor relay K1 (2).
10. Remove leads 8A and 8B (4) from terminal L2 of contactor relay K1 (2).
11. Remove lead 2F (5) from terminal A2 of contactor relay K1 (2).
12. Remove lead 5A (6) from terminal A1 of contactor relay K1 (2).
13. Remove lead 7A (7) from terminal L1 of contactor relay K1 (2).
14. Remove four screws (8), locknuts (9), washers (10), and contactor relay K1 (2) from rear panel (11). Discard locknuts.
15. Disconnect leads 16A and 16B (12) from terminal A2 of reversing contactor RC1 (13).
16. Disconnect leads 28G and 28D (14) from terminal L2 of reversing contactor RC1 (13).
17. Disconnect lead 28D (14) from terminal A1 of reversing contactor RC1 (13).
18. Disconnect leads 13A and 13D (15) from terminal L1 of reversing contactor RC1 (13).

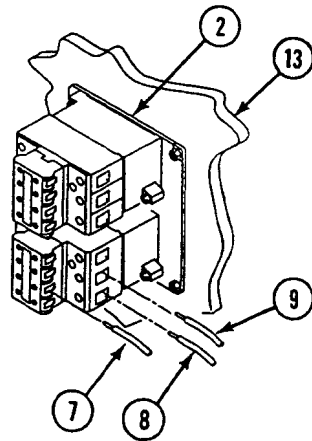
19. Disconnect lead 9B (16) from terminal 51 of reversing contactor RC1 (13).
20. Disconnect leads 15A and 15B (17) from terminal 52 of reversing contactor RC1 (13).
21. Disconnect leads 17A and 17B (18) from terminal T1 of reversing contactor RC1 (13).
22. Disconnect leads 18A and 18B (19) from terminal T2 of reversing contactor RC1 (13).



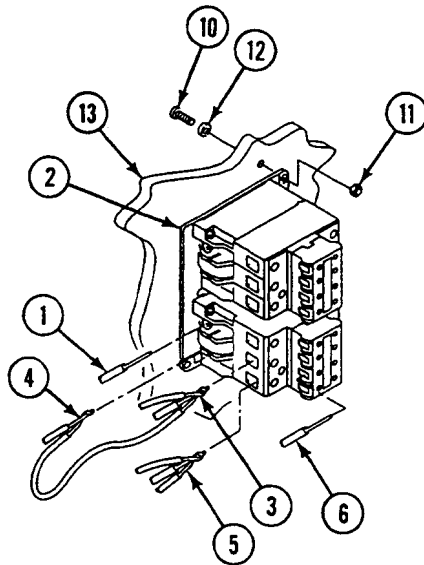
23. Disconnect lead 15A (1) from terminal A2 of contactor RC1 (2).
24. Disconnect leads 8A, 8D, and 8E (3) from terminal L2 of contactor RC1 (2).
25. Disconnect leads 8G and 8E (4) from terminal A1 of contactor RC1 (2).
26. Disconnect leads 9A, 9B, and 9C (5) from terminal L1 of contactor RC1 (2).
27. Disconnect lead 13D (6) from terminal 51 of contactor RC1 (2).



28. Disconnect lead 14A (7) from terminal 52 of contactor RC1 (2).
29. Disconnect lead 17A (8) from terminal T1 of contactor RC1 (2).
30. Disconnect lead 18A (9) from terminal T2 of contactor RC1 (2).

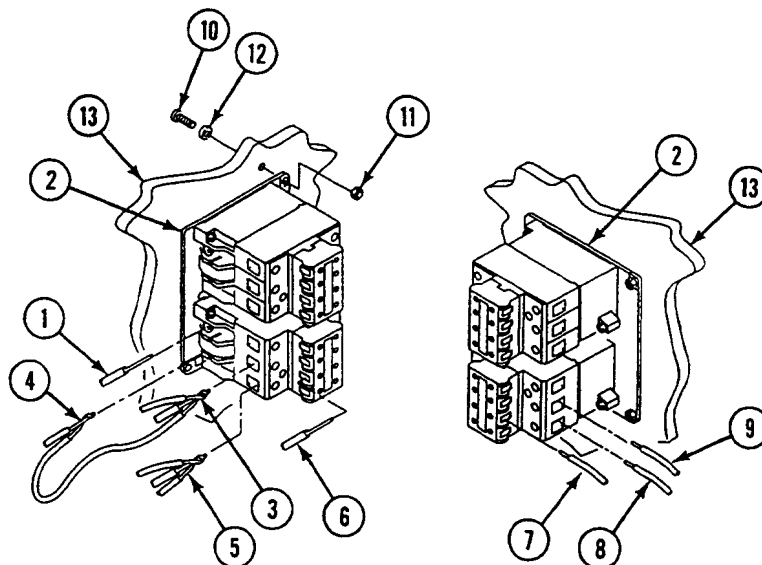


31. Remove three screws (10), locknuts (11), washers (12), and contactor RC1 (2) from rear panel (13). Discard locknuts.

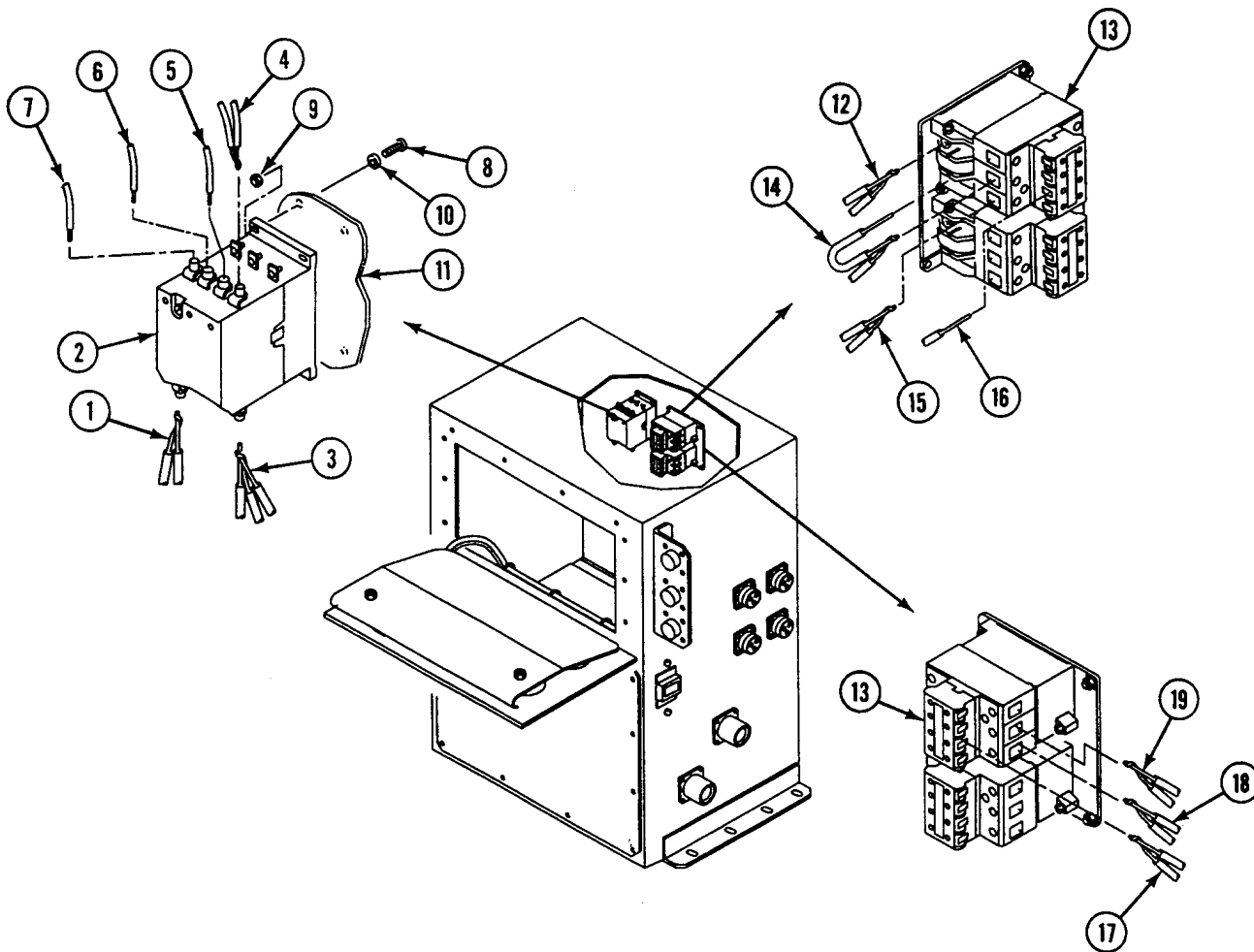


ASSEMBLY

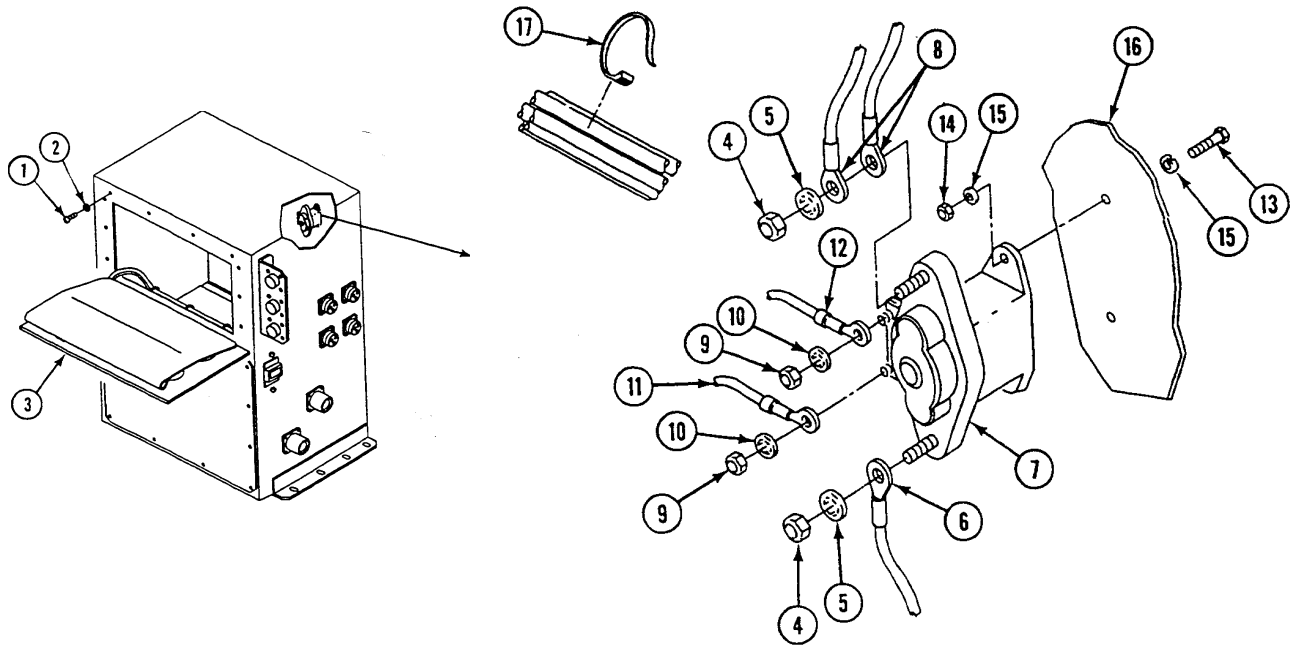
1. Install contactor RC1 (2), three screws (10), washers (12), and new locknuts (11) in rear panel (13).
2. Install lead 18A (9) in terminal T2 of contactor RC1 (2).
3. Install lead 17A (8) in terminal T1 of contactor RC1 (2).
4. Install lead 14A (7) in terminal 52 of contactor RC1 (2).
5. Install lead 13D (6) in terminal 51 of contactor RC1 (2).
6. Install leads 9A, 9B, and 9C (5) in terminal L1 of contactor RC1 (2).
7. Install leads 8G and 8E (4) in A1 of contactor RC1 (2).
8. Install leads 8A, 8D, and 8E (3) in terminal L2 of contactor RC1 (2).
9. Install lead 15A (1) in terminal A2 of contactor RC1 (2).



10. Install leads 18A and 18B (19) in terminal T2 of reversing contactor RC1 (13).
11. Install leads 17A and 17B (18) in terminal T1 of reversing contactor RC1 (13).
12. Install leads 15A and 15B (17) in terminal 52 of reversing contactor RC1 (13).
13. Install lead 9B (16) in terminal 51 of reversing contactor RC1 (13).
14. Install leads 13A and 13D (15) in terminal L1 of reversing contactor RC1 (13).
15. Install lead 28D (14) in terminal A1 of reversing contactor RC1 (13).
16. Install leads 28G and 28D (14) in terminal L2 of reversing contactor RC1 (13).
17. Install leads 16A and 16B (12) in terminal A2 of reversing contactor RC1 (13).
18. Install contactor relay K1 (2), four screws (8), washers (10), and new locknuts (9) on rear panel (11).
19. Install lead 7A (7) in terminal L1 of contactor relay K1 (2).
20. Install lead 5A (6) in terminal A1 of contactor relay K1 (2).
21. Install lead 2F (5) in terminal A2 of contactor relay K1 (2).
22. Install leads 8A and 8B (4) in terminal L2 of contactor relay K1 (2).
23. Install leads 2C, 2D, and 2F (3) in terminal T2 of contactor relay K1 (2).
24. Install leads 1C and 1D (1) in terminal T1 of contactor relay K1 (2).



25. Secure leads with new tie straps (17) as required.
26. Install relay K6 (7), two screws (13), new locknuts (14), and four washers (15) on rear panel (16).
27. Install lead 32Q (12), lockwasher (10), and nut (9) on terminal X2 of relay K6 (7).
28. Install lead 44A (11), lockwasher (10), and nut (9) on terminal X1 of relay K6 (7).
29. Install leads 31B and 31C (8), lockwasher (5), and nut (4) on terminal A2 of relay K6 (7).
30. Install lead 31A (6), lockwasher (5), and nut (4) on terminal A1 of relay K6 (7).
31. Close faceplate (3) and install ten screws (1) and new lockwashers (2).



FOLLOW THROUGH STEPS

1. Install power control enclosure assembly (see your -20).

END OF TASK

REPLACE POWER CONTROL ENCLOSURE POWER SUPPLIES (M1068 ONLY)

0086 00

THIS WORK PACKAGE COVERS:

Removal (page 0086 00-1).
 Installation (page 0086 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Power-Generation Equipment Repairer 52D10
 Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Equipment Condition

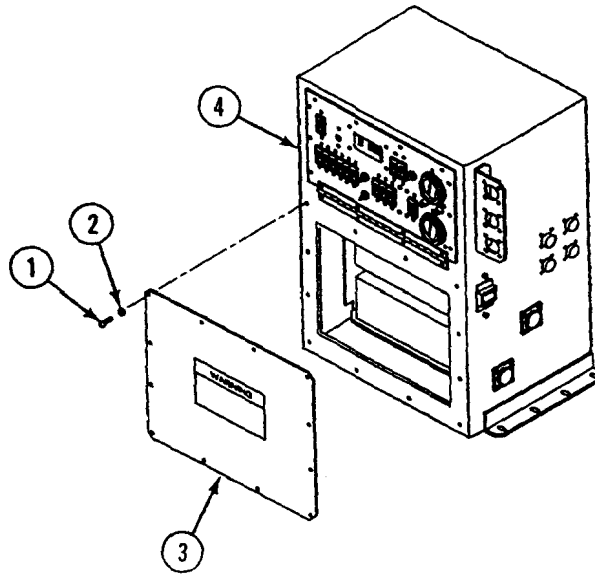
Power control enclosure assembly removed
 (see your -20)

Materials/Parts

Locknut (16)
 Lockwasher (4)
 Lockwasher (8)
 Lockwasher (12)
 Tie strap (AR)

REMOVAL

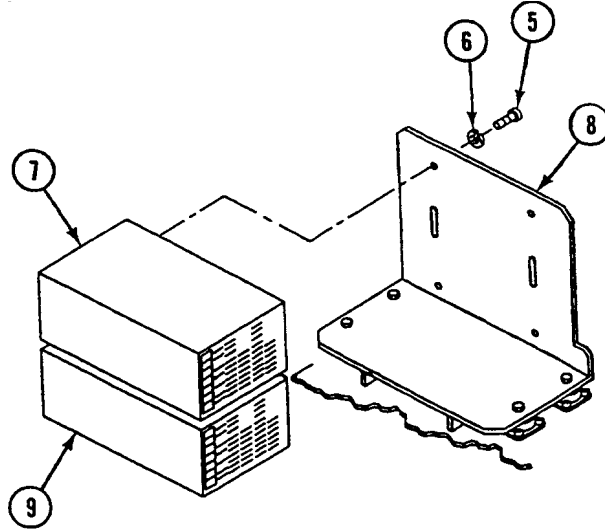
1. Remove 12 screws (1), lockwashers (2), and cover (3) from enclosure (4). Discard lockwashers.



REPLACE POWER CONTROL ENCLOSURE POWER SUPPLIES (M1068 ONLY) — Continued

0086 00

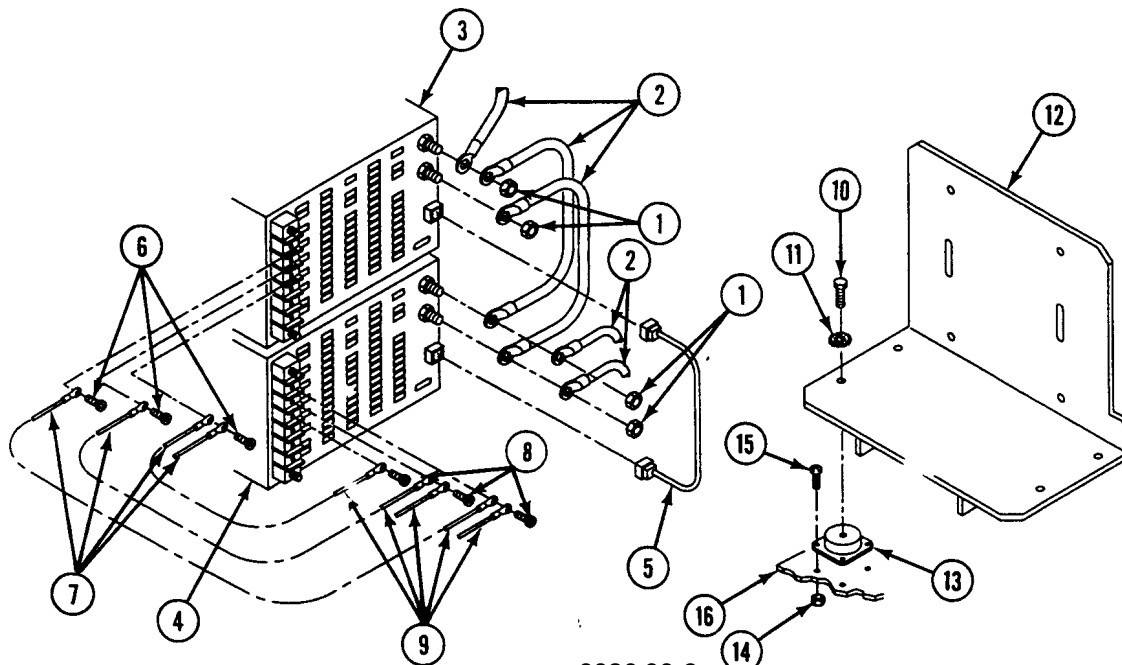
2. Remove four screws (5) and lockwashers (6) connecting power supply (7) to bracket (8). Discard lockwashers.
3. Remove four screws (5) and lockwashers (6) connecting power supply (9) to bracket (8). Discard lockwashers.



NOTE

Tag all leads before disconnecting from terminals.

4. Remove four nuts (1) and five leads (2) from two power supplies (3) and (4).
5. Disconnect jumper cable (5) from two power supplies (3) and (4).
6. Remove three screws (6) and four leads (7) from power supply (3). Lift power supply (3) from enclosure. Have helper assist.
7. Remove three screws (8) and five leads (9) from power supply (4). Lift power supply from enclosure. Have helper assist.
8. Remove four screws (10), lockwashers (11), and bracket (12) from four isolators (13). Discard lockwashers.
9. Remove 16 locknuts (14), screws (15), and four isolators (13) from enclosure (16). Discard locknuts.

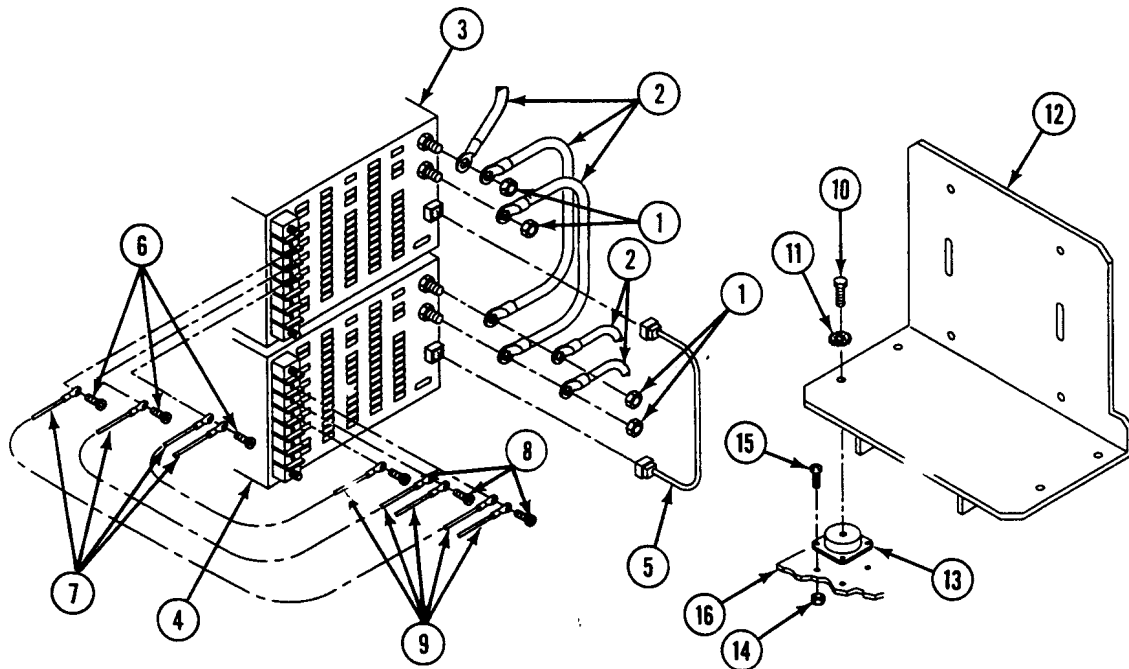


REPLACE POWER CONTROL ENCLOSURE POWER SUPPLIES (M1068 ONLY) — Continued

0086 00

INSTALLATION

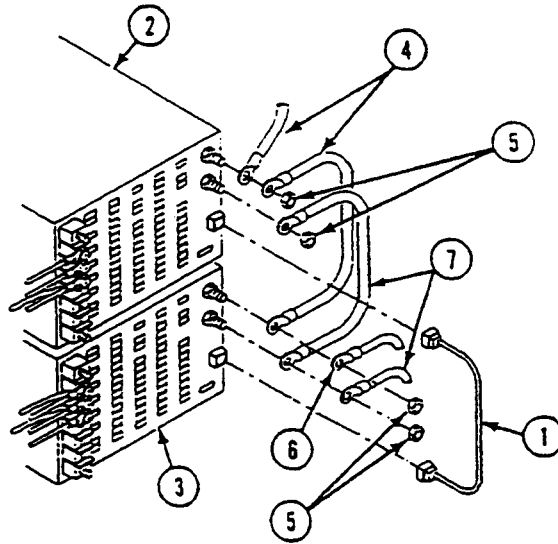
1. Install four isolators (13), 16 screws (15), and new locknuts (14) in enclosure (16).
2. Install bracket (12), four new lockwashers (11), and screws (10) on four isolators (13).
3. Lift power supply (4) into enclosure. Have helper assist. Install circuits 10A and 10B leads with screw (8) on AC HIGH terminal of power supply (4).
4. Install circuits 8B and 8C leads with screw (8) on AC LOW terminal of power supply (4).
5. Install circuit 3Z lead with screw (8) on GND terminal of power supply (4).
6. Lift power supply (3) into enclosure. Have helper assist. Install circuit 10B lead with screw (6) on AC HIGH terminal of power supply (3).
7. Install circuit 8C lead with screw (6) on AC LOW terminal of power supply (3).
8. Install circuits 3Z and 3Y leads with screw (6) on GND terminal of power supply (3).



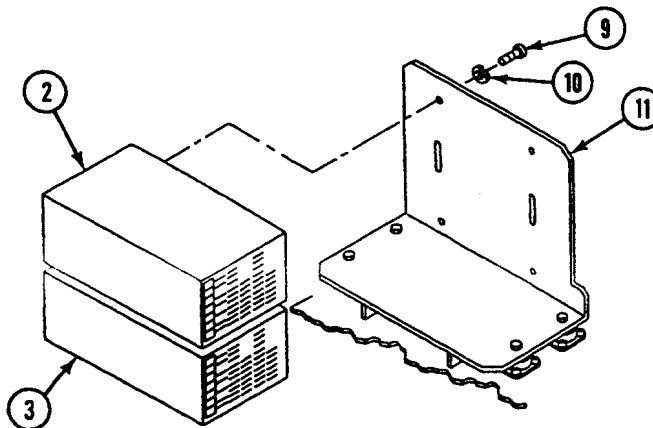
REPLACE POWER CONTROL ENCLOSURE POWER SUPPLIES (M1068 ONLY) — Continued

0086 00

9. Connect jumper cable (1) to J1 on power supply (2) and J1 on power supply (3).
10. Connect circuits 31E and 31D leads (4) with nut (5) to positive terminal of power supply (2).
11. Connect circuits 31C (6) and 31D leads (4) with nut (5) to positive terminal of power supply (3).
12. Connect circuits 32D and 32E leads (7) with nut (5) to negative terminal on power supply (3).
13. Connect circuit 32D lead (7) with nut (5) to negative terminal of power supply (2).



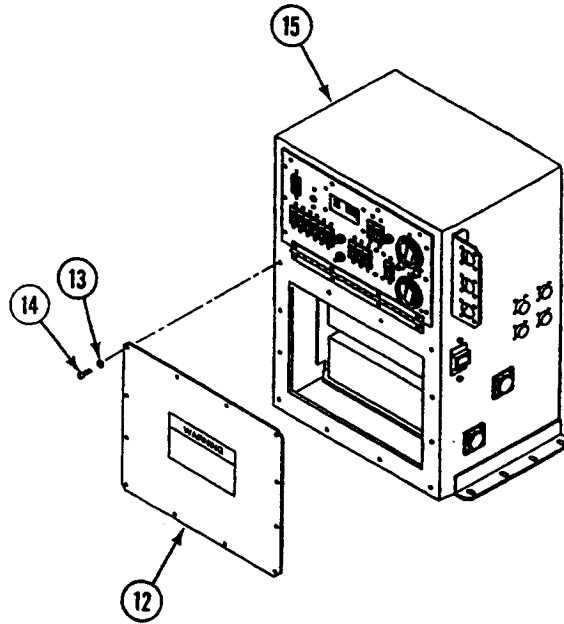
14. Secure power supply (2) with four screws (9) and new lockwashers (10) on bracket (11).
15. Secure power supply (3) with four screws (9) and new lockwashers (10) on bracket (11).



REPLACE POWER CONTROL ENCLOSURE POWER SUPPLIES (M1068 ONLY) — Continued

0086 00

16. Install cover (12) on enclosure (15). Secure with 12 new lockwashers (13) and screws (14).

**FOLLOW-THROUGH STEPS**

1. Install power control enclosure assembly (see your -20).

END OF TASK

REPAIR SIGNAL PATCH PANEL BOX A10 (M1068 ONLY)

0087 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0087 00-2).
Assembly (page 0087 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Radio Repairer 29E10

Tools and Special Tools

Electronic Equipment Tool Kit (WP 0104 00, Item 46)

Equipment Condition

Signal patch panel box removed (see your -20)

Materials/Parts

Sealing compound (WP 0105 00, Item 19)
Sealing compound primer (WP 0105 00, Item 21)
Locknut (20)
Lockwasher (AR)
Rivet (AR)

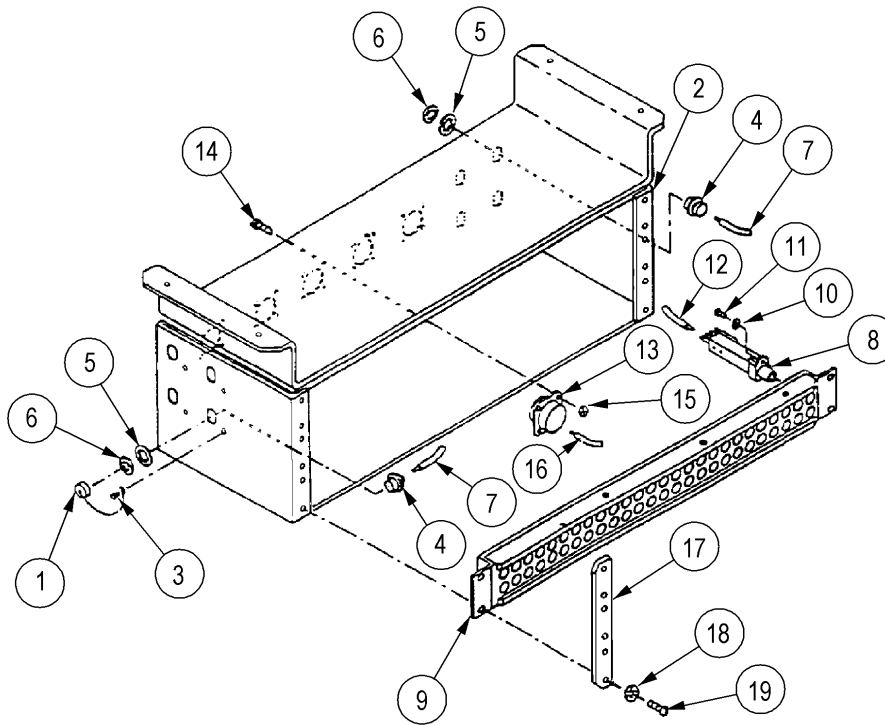
DISASSEMBLY

1. Remove 12 screws (19), lockwashers (18), two strips (17), and three jackfields (9) from signal patch panel box (2).

NOTE

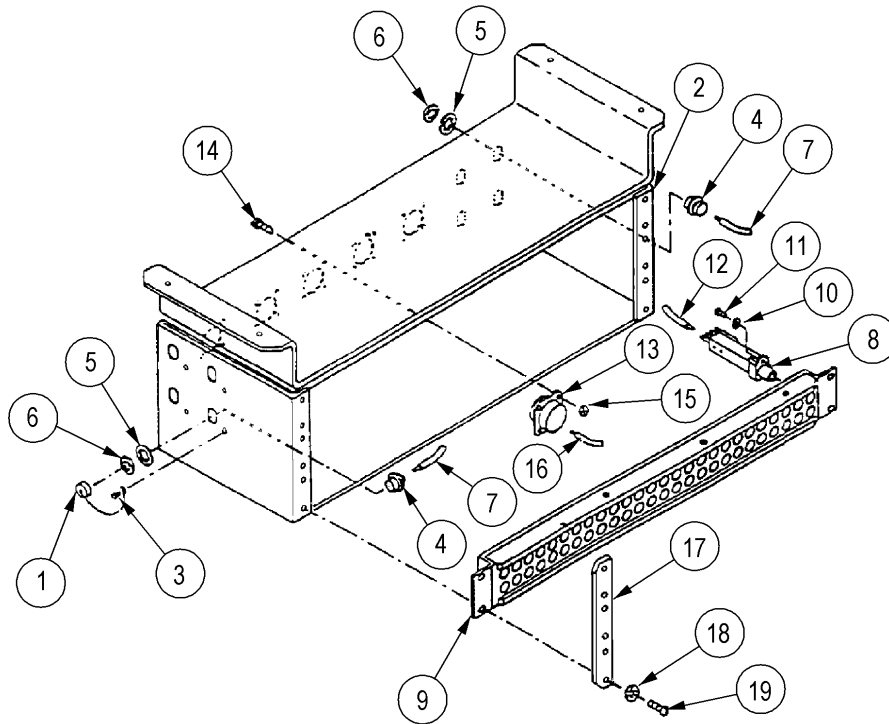
Tag all wires/leads before removal, use wiring diagram (page 0087 00-6).

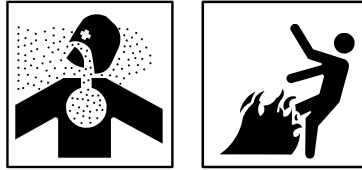
2. Remove 20 locknuts (15), screws (14), and five connectors J135, J136, J138, J139, and J140 (13) from signal patch panel box (2). Discard locknuts.
3. Disconnect wires (16) from five connectors J135, J136, J138, J139, and J140 (13).
4. Remove screws (11), lockwashers (10), and 156 jacks (8) from three jackfields (9). Discard lockwashers.
5. Remove two leads (12) from each jack (8).
6. Remove jamnuts (6), lockwashers (5), and eight connectors (4) from signal patch panel box (2).
7. Remove wires (7) from eight connectors (4).
8. If dust caps (1) are damaged, remove rivets (3) and dust caps from signal patch panel box (2).



ASSEMBLY

1. If dust caps (1) were removed, install dust caps on signal patch panel box (2) and secure with new rivets (3).
2. Install eight connectors (4) on signal patch panel box (2) and secure with lockwashers (5) and jamnuts (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.

NOTE

Install wires (7) on eight connectors (4) using wiring diagram (page 0087 00-6).

Apply primer and sealant to threads of screws (11).

3. Install 156 jacks (8) on three jackfields (9) and secure with new lockwashers (10) and screws (11).

NOTE

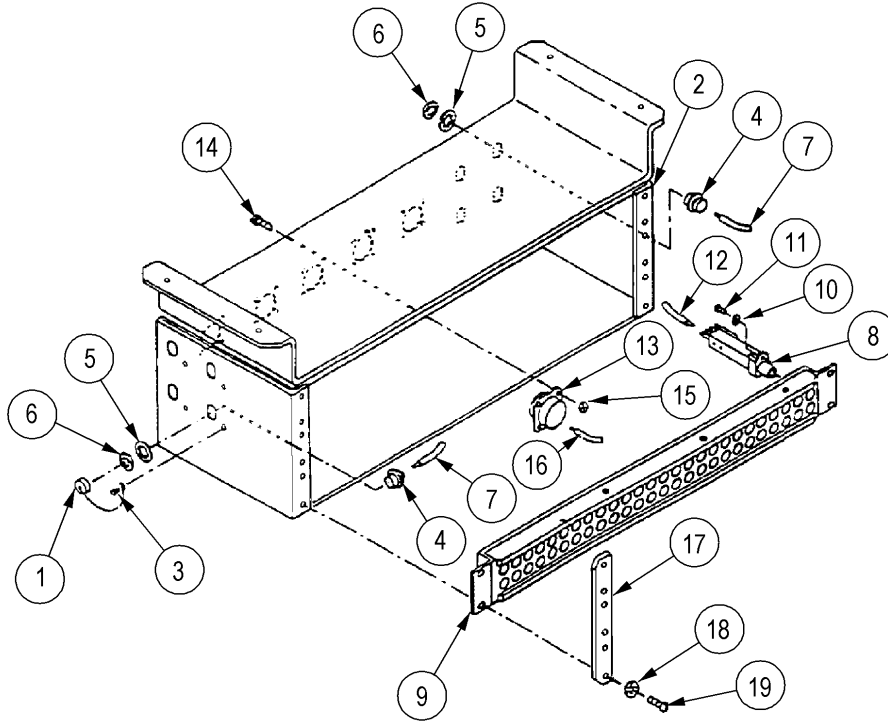
Install two leads (12) on each jack (8) using wiring diagram (page 0087 00-6).

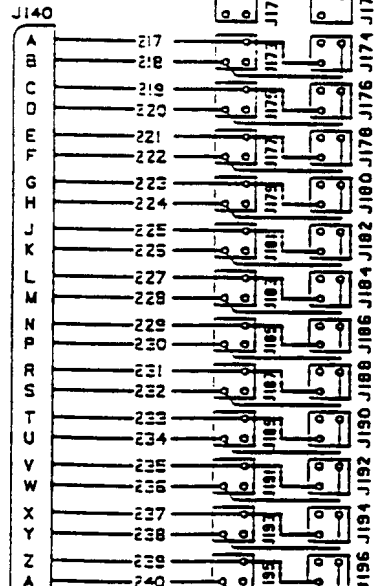
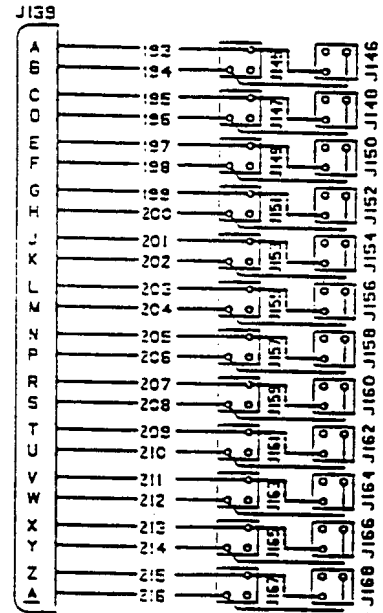
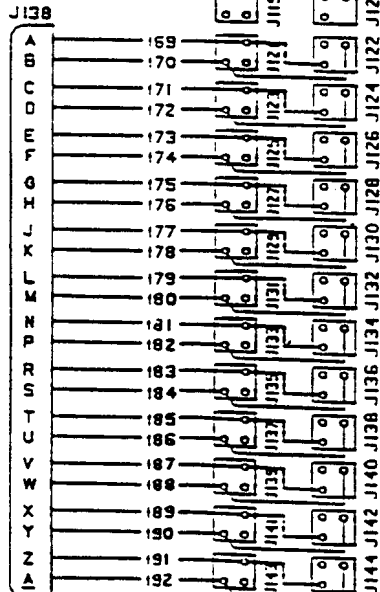
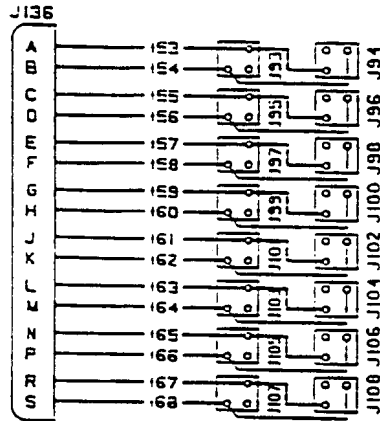
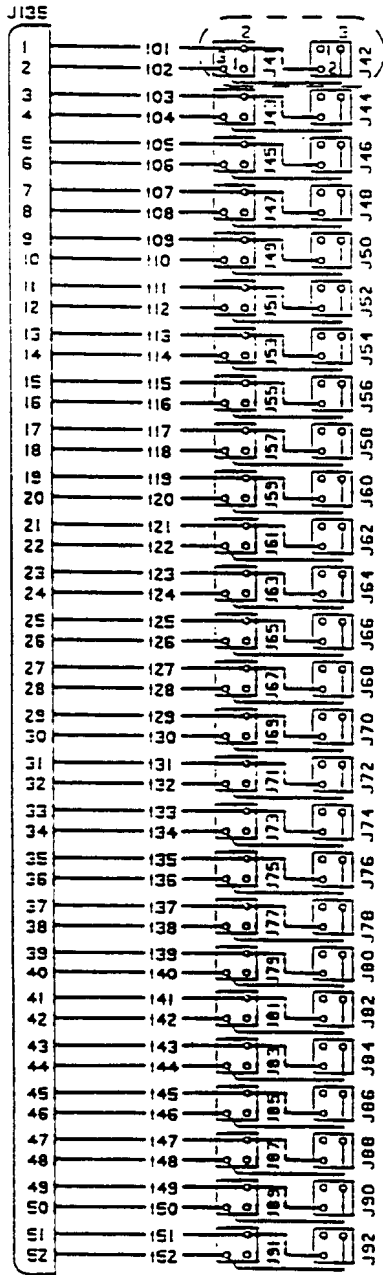
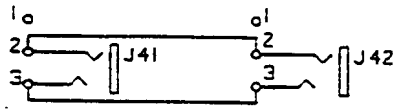
4. Install five connectors J135, J136, J138, J139, and J140 (13) on signal patch panel box (2) and secure with 20 screws (14) and new locknuts (15).

NOTE

Install wires (16) on five connectors J135, J136, J138, J139, and J140 (13), using wiring diagram (page 0087 00-6).

5. Install three jackfields (9) on signal patch panel box (2) and secure with two strips (17), 12 new lockwashers (18), and screws (19).





SIGNAL PATCH PANEL BOX A10 WIRING DIAGRAM

FOLLOW-THROUGH STEPS

1. Install signal patch panel box (see your -20).

END OF TASK

REPAIR PHONE EXTENSION BOX A14 (M1068 ONLY)

0088 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0088 00-2).
Assembly (page 0088 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Radio Repairer 29E10

Tools and Special Tools

Electronic Equipment Tool Kit (WP 0104 00, Item 46)

Equipment Condition

Phone extension box removed from stowage box
(see your -20)

Materials/Parts

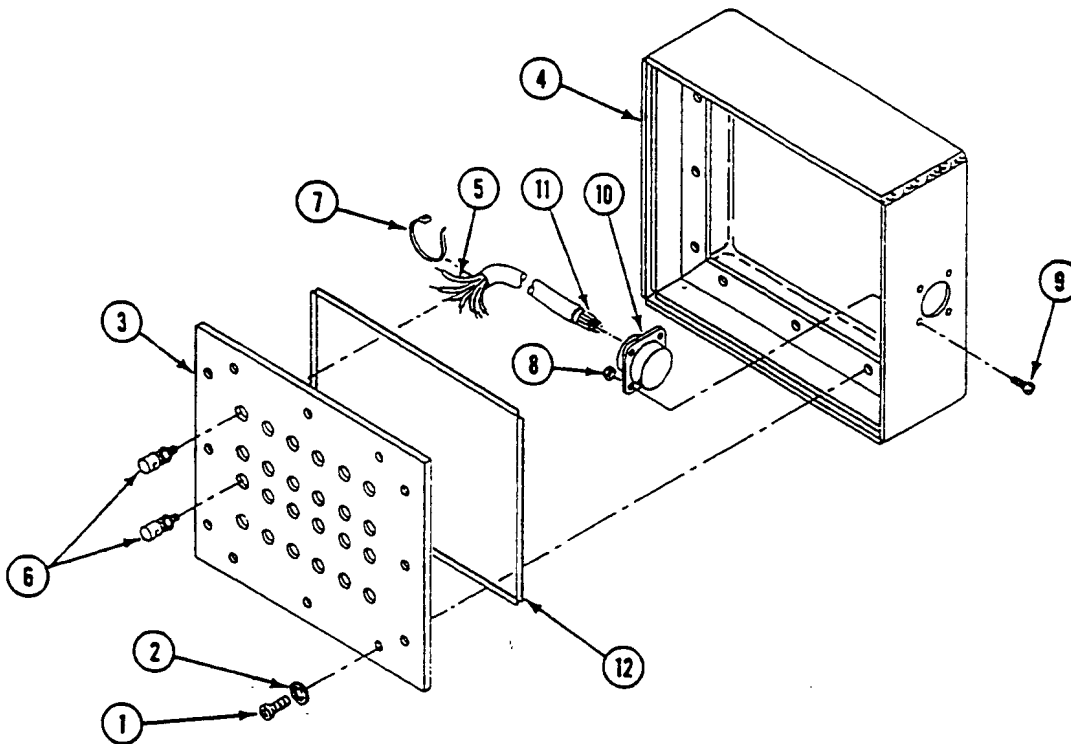
Adhesive (WP 0105 00, Item 1)
Locknut (4)
Lockwasher (12)
Tie strap (AR)

DISASSEMBLY

NOTE

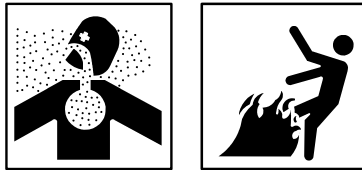
Tag all leads before removal.

1. Remove 12 screws (1), lockwashers (2), and faceplate (3) from phone extension box (4). Discard lockwashers.
2. Disconnect all leads (5) from 24 binding posts (6).
3. Remove 24 binding posts (6) from faceplate (3).
4. Remove and discard tie straps (7), as required.
5. Remove four locknuts (8), screws (9), and connector J1 (10) from phone extension box (4). Discard locknuts.
6. Remove leads (11) from connector J1 (10).
7. Remove and discard any damaged gaskets (12).



ASSEMBLY

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.

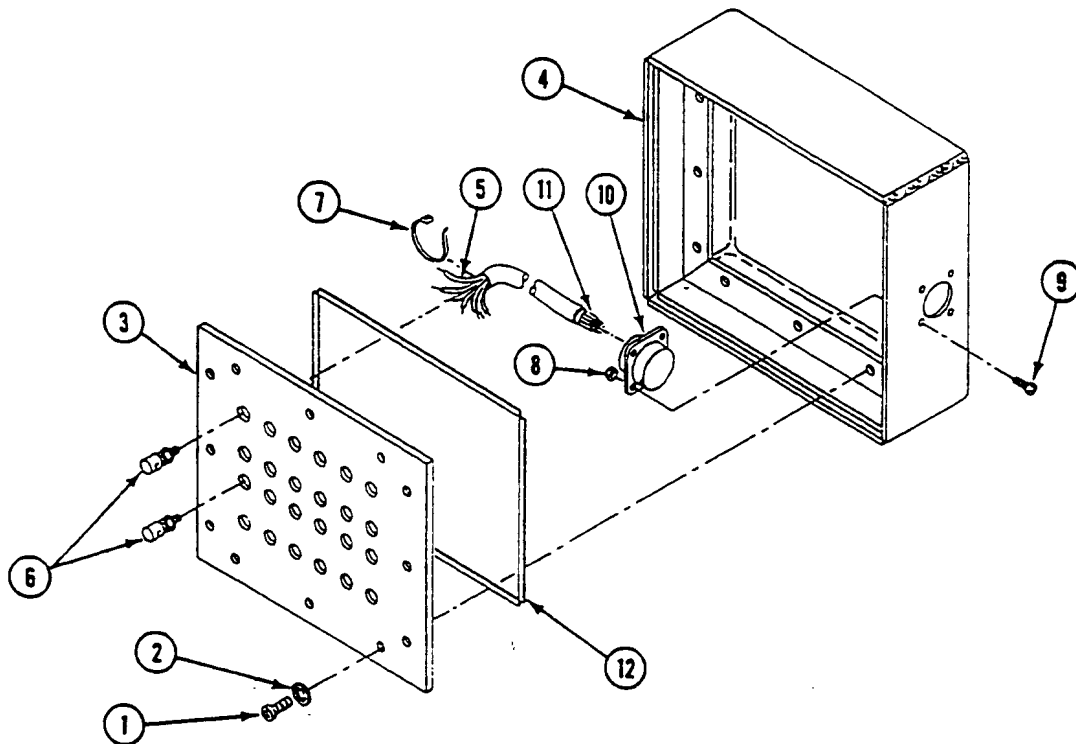
Always use in well ventilated areas, away from heat, sparks, and flames. Do not breathe fumes. Do not allow into contact with skin and eyes. Use goggles or face shield and protective gloves.

1. If removed, install new gaskets (12) by applying a thin coat of adhesive to phone extension box surface and to gasket surface. Allow 10 to 20 minutes to dry (tacky to the touch). Position gasket on phone extension box and press firmly into place.

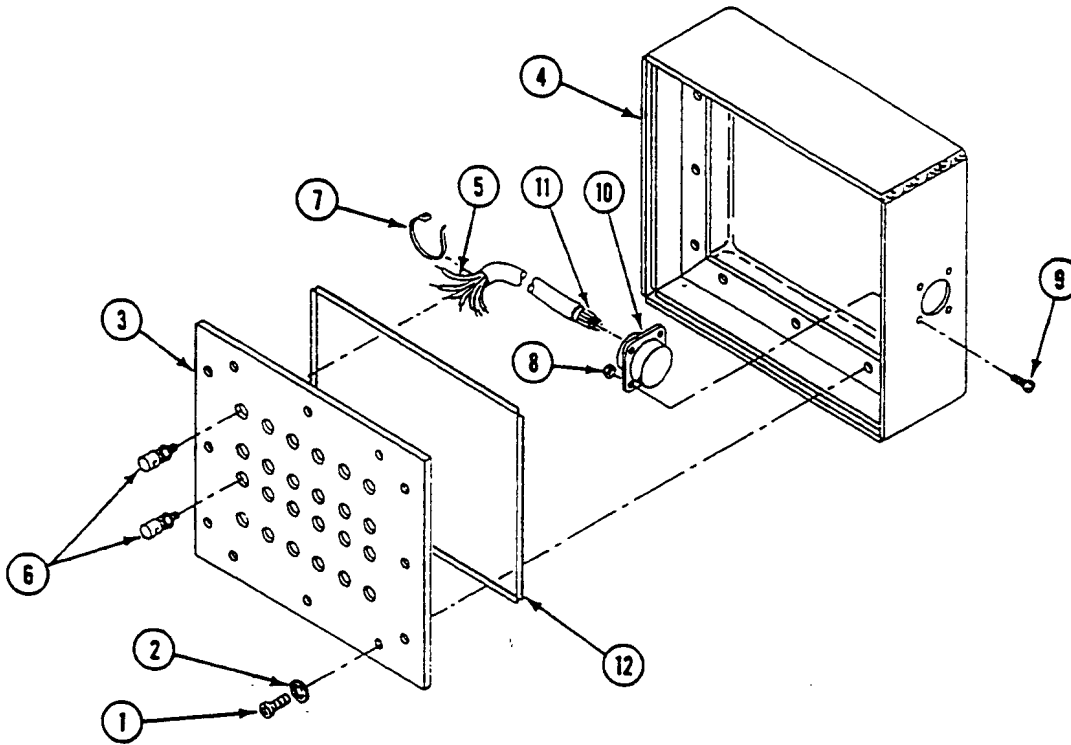
NOTE

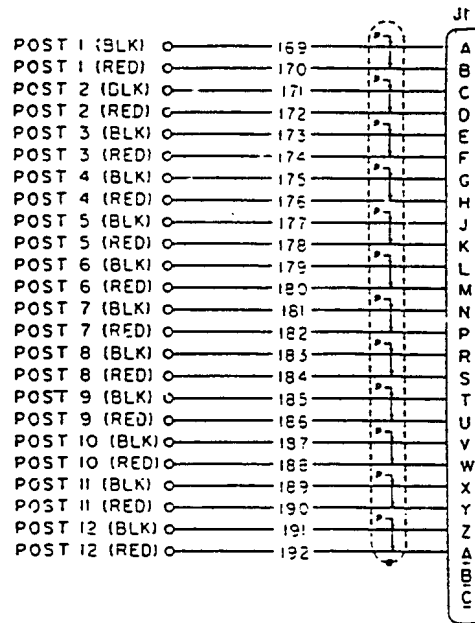
Use wiring diagram (page 0088 00-5) to identify location of post by color and for rewiring connector J1 and binding posts.

2. Install leads (11) in connector J1 (10).



3. Install connector J1 (10) on phone extension box (4). Secure with four screws (9) and new locknuts (8).
4. Install 24 binding posts (6) on faceplate (3).
5. Connect all leads (5) to 24 binding posts (6).
6. Install new tie straps (7), as required.
7. Install faceplate (3) on phone extension box (4). Secure with 12 new lockwashers (2) and screws (1).





PHONE EXTENSION BOX A14 WIRING DIAGRAM

FOLLOW-THROUGH STEPS

1. Stow phone extension box in stowage box (see your -20).

END OF TASK

REPAIR TENT INTERFACE PANEL BOX ASSEMBLY A5 (M1068 ONLY)

0089 00

THIS WORK PACKAGE COVERS:

- Disassembly (page 0089 00-1).
- Assembly (page 0089 00-4).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

- Power-Generation Equipment Repairer 52D10
- Radio Repairer 29E10

Tools and Special Tools

- Electronic Equipment Tool Kit (WP 0104 00, Item 46)
- General Mechanic's Tool Kit (WP 0104 00, Item 19)

Equipment Condition

Tent interface panel box assembly removed
(see your -20)

Materials/Parts

- Adhesive (WP 0105 00, Item 1)
- Gasket (3)
- Gasket (2)
- Gasket
- Gasket
- Locknut (30)
- Lockwasher (14)

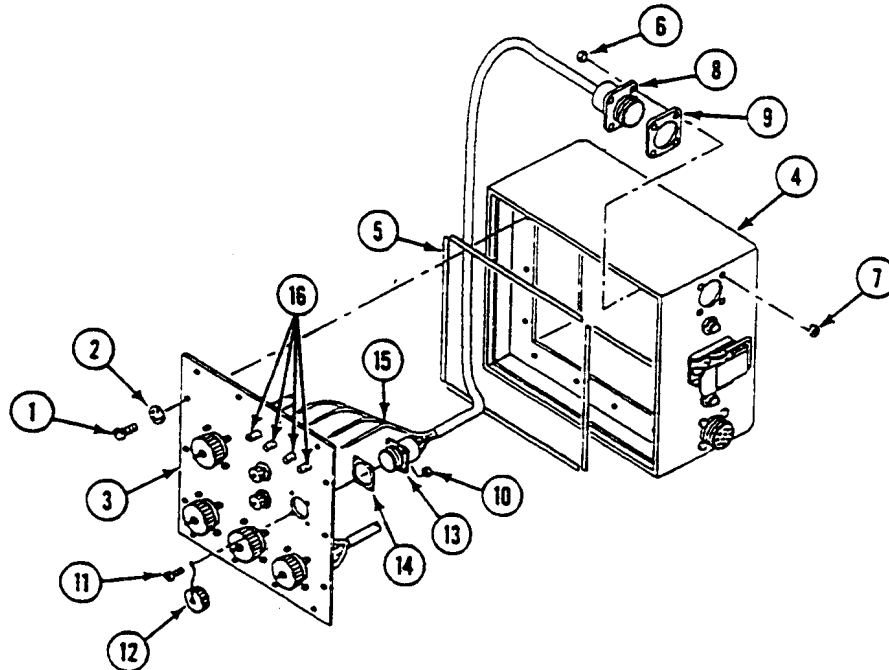
DISASSEMBLY

1. Remove 14 screws (1), lockwashers (2), and faceplate (3) from box (4). Discard lockwashers.

NOTE

Do not remove gasket unless gasket is damaged.

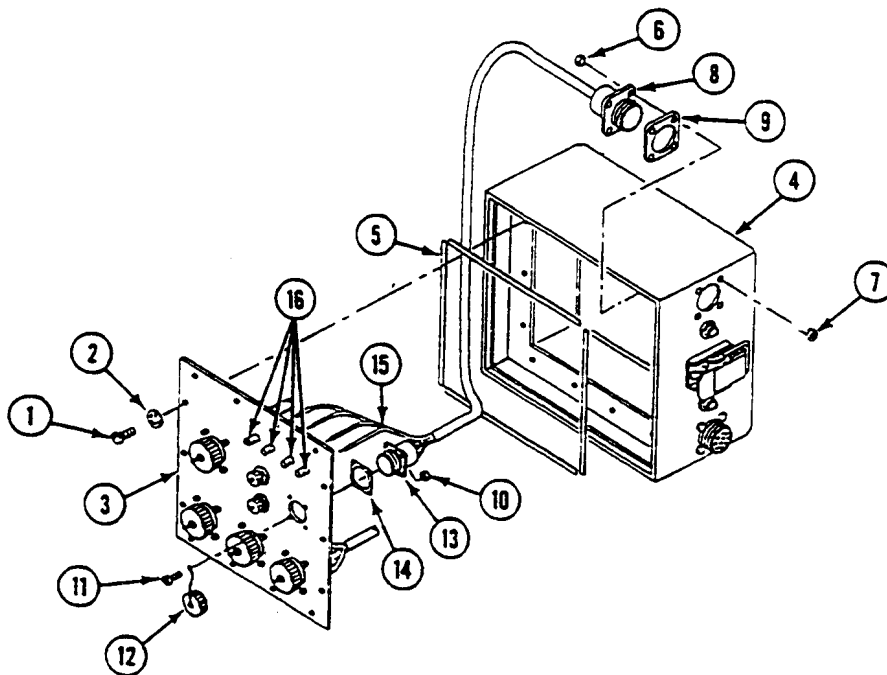
2. If any of four gaskets (5) are damaged, remove only the damaged gaskets from box (4) and discard.



NOTE

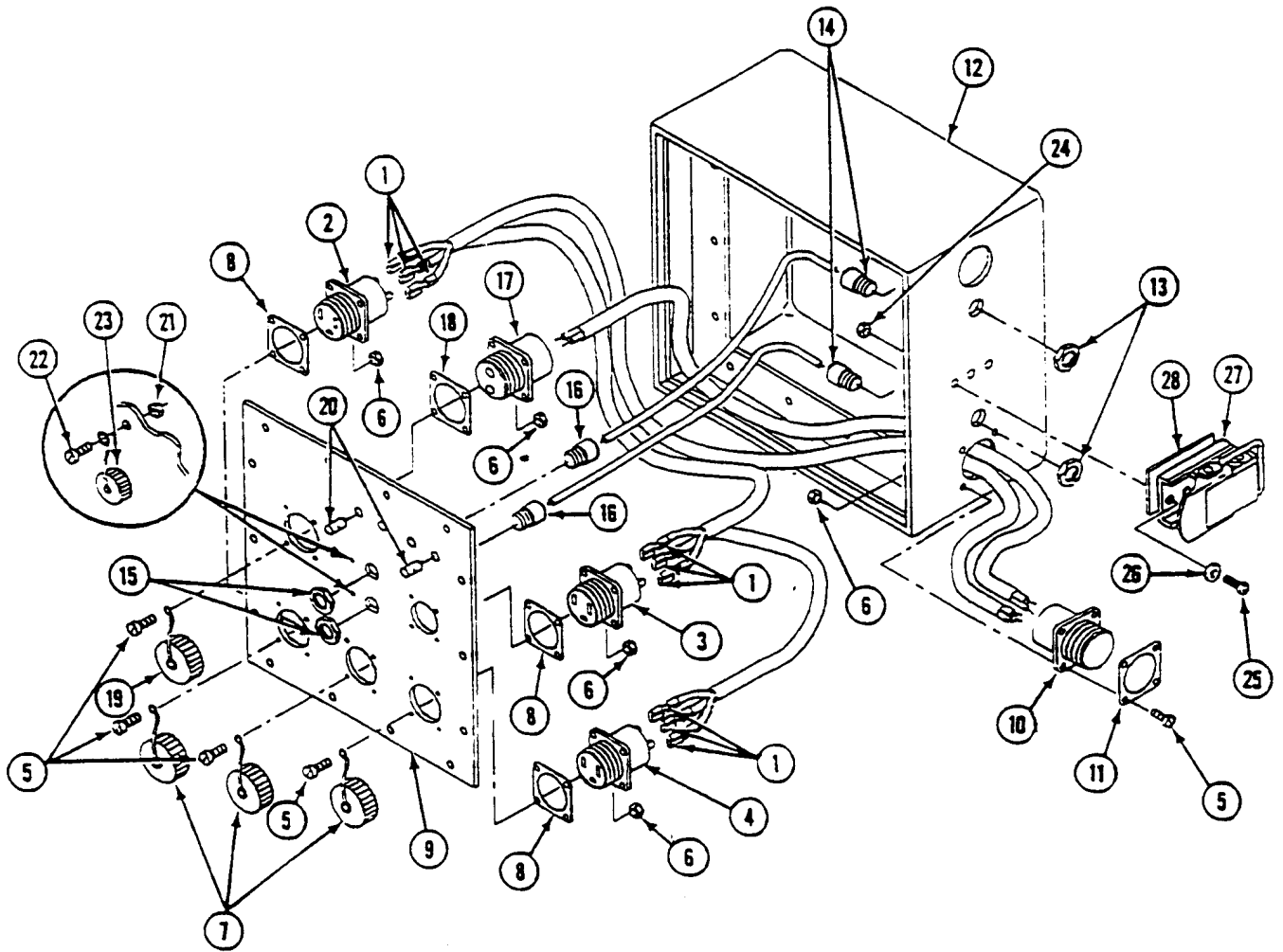
Tag all leads before disconnecting from connectors. Use wiring diagram (page 0089 00-6).

3. Remove four locknuts (6), screws (7), connector (8), and gasket (9) from box (4). Discard locknuts and gasket.
4. Remove four locknuts (10), screws (11), dust cap (12), connector J137 (13), and gasket (14) from faceplate (3). Discard locknuts and gasket.
5. Disconnect four leads (15) from four binding posts (16).



6. Disconnect three lead terminals (1) from connector J11 (2).
7. Disconnect three terminals (1) from connector J12 (3).
8. Disconnect three lead terminals (1) from connector J13 (4).
9. Remove 12 screws (5), locknuts (6), three dust caps (7), connectors (2), (3), and (4), and gaskets (8) from faceplate (9). Discard locknuts and gaskets.
10. Remove four screws (5), locknuts (6), J7 connector (10), and gasket (11) from box (12). Discard locknuts and gasket.
11. Remove two jamnuts (13) and connectors J9 and J10 (14) from box (12).
12. Remove two jamnuts (15) and connectors J113 and J114 (16) from faceplate (9).
13. Remove four screws (5), locknuts (6), connector J22 (17), gasket (18), and dust cap (19) from faceplate (9). Discard locknuts and gasket.
14. Remove four binding posts (20) from faceplate (9).
15. Remove two locknuts (21), screws (22), and caps (23) from faceplate (9). Discard locknuts.

16. Remove six nuts (24), screws (25), washers (26), and two catch assemblies (27) from box (12).



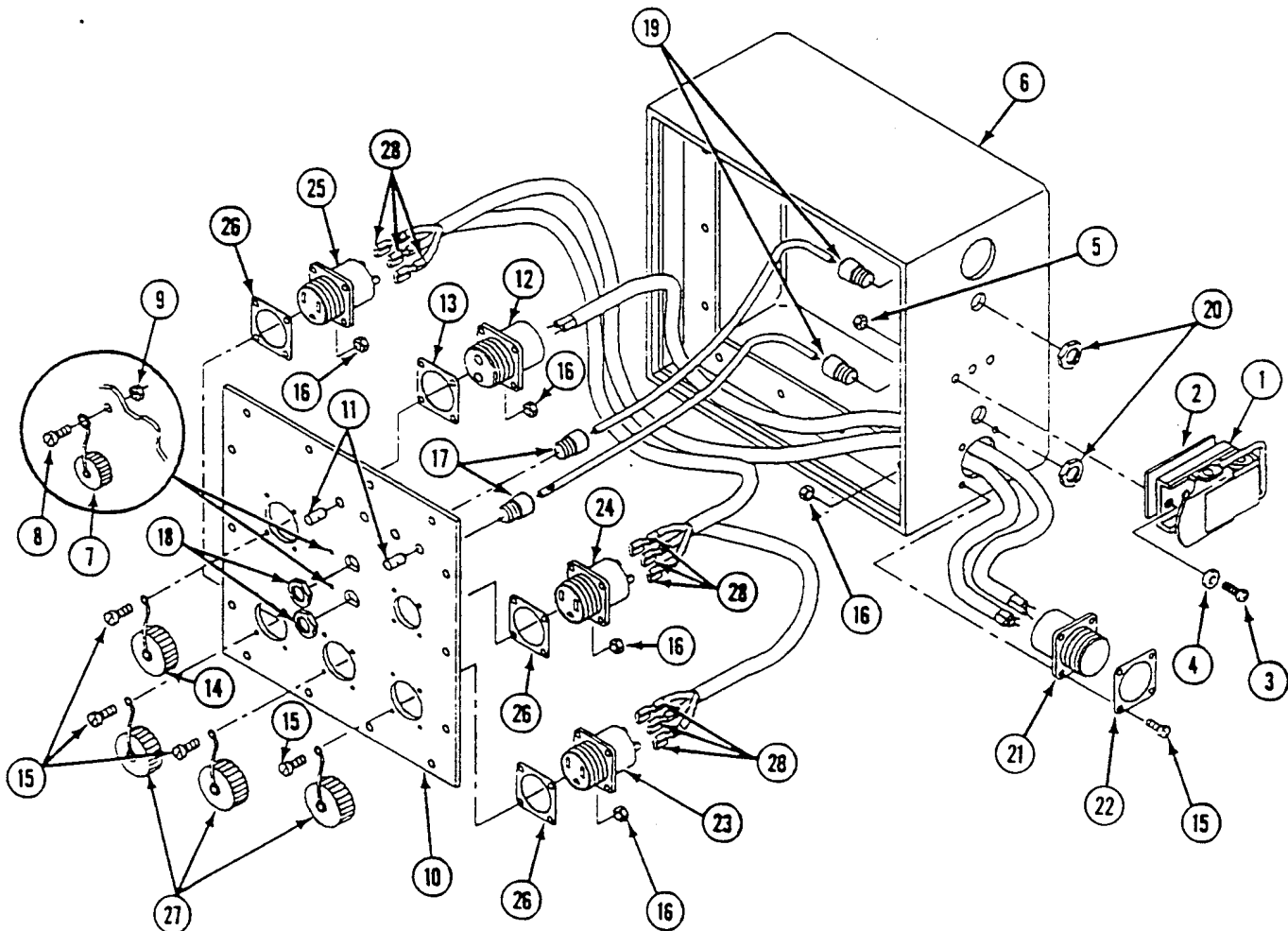
ASSEMBLY

1. Install two catch assemblies (1), six screws (3), washers (4), and nuts (5) on box (6).
2. Install two caps (7), screws (8), and new locknuts (9) on faceplate (10).
3. Install four binding posts (11) on faceplate (10).
4. Install connector J22 (12), new gasket (13), dust cap (14), four screws (15), and new locknuts (16) on faceplate (10).
5. Install two connectors J113 and J114 (17) and jamnuts (18) on faceplate (10).
6. Install two connectors J9 and J10 (19) and jamnuts (20) on box (6).
7. Install connector J7 (21), new gasket (22), four screws (15), and new locknuts (16) on box (6).
8. Install three connectors (23), (24), and (25), new gaskets (26), dust caps (27), 12 screws (15), and new locknuts (16) on faceplate (10).

NOTE

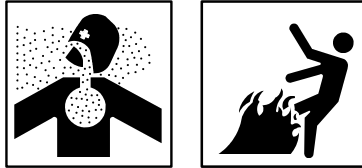
Use wiring diagram (page 0089 00-6).

9. Connect three lead terminals (28) on connector J13 (23).
10. Connect three lead terminals (28) on connector J12 (24).
11. Connect three lead terminals (28) on connector J11 (25).



12. Install four leads (1) on four binding posts (2).
13. Install connector J137 (3), new gasket (4), dust cap (5), four screws (6), and new locknuts (7) on faceplate (8).
14. Install connector J8 (9), new gasket (10), four screws (11), and new locknuts (12) on box (13).

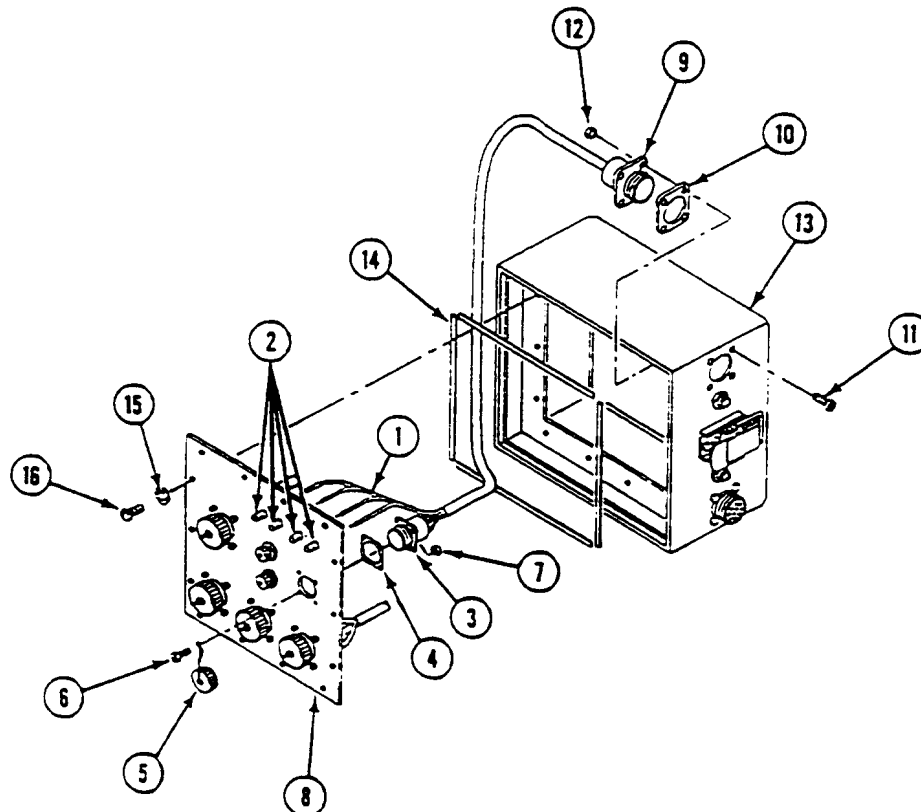
WARNING

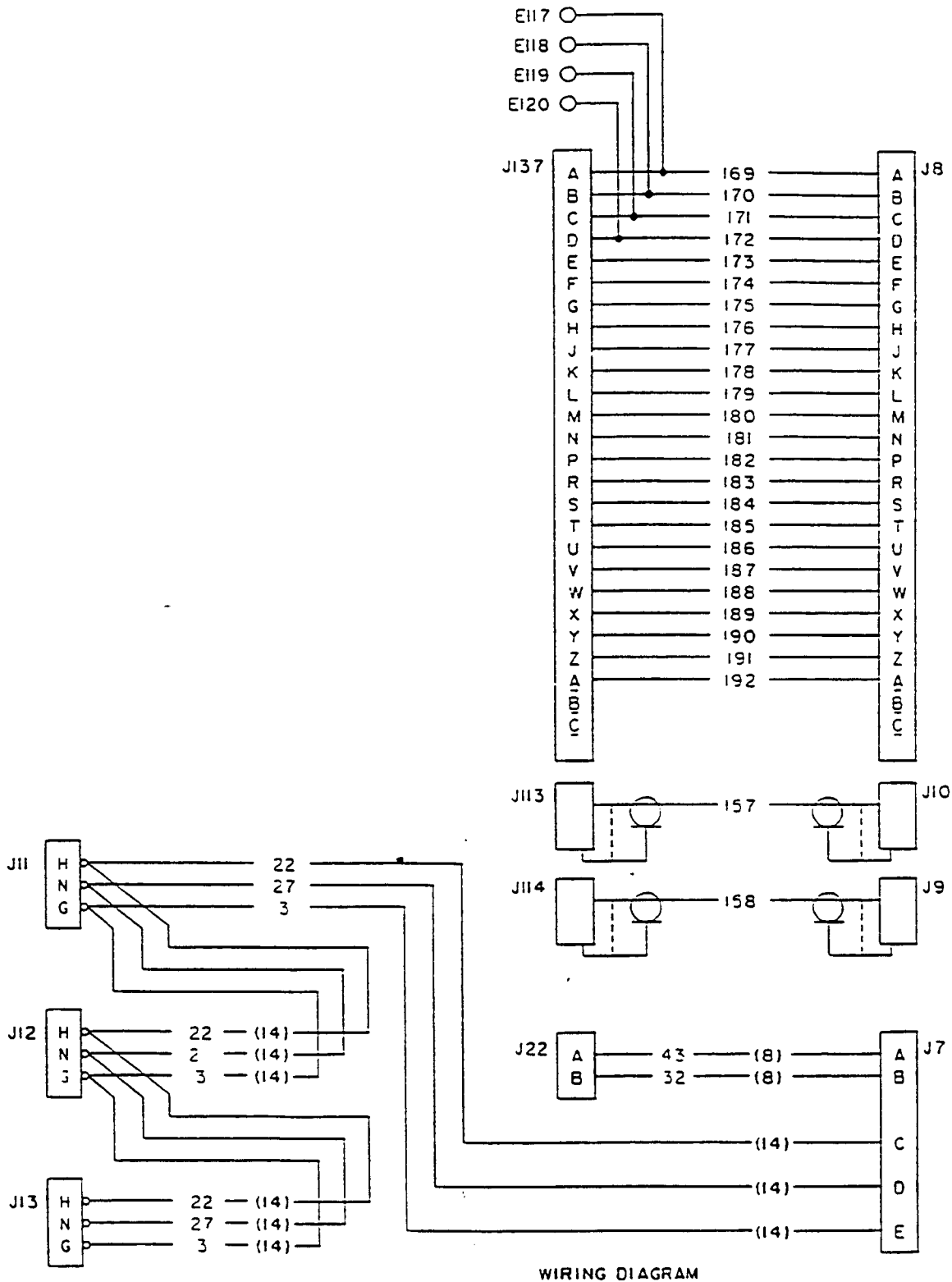


Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

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.

15. Install new gaskets (14) by applying a thin coat of adhesive to box surface and to gasket surface. Allow 10 to 20 minutes to dry (tacky to the touch). Position gasket on box (13) and press firmly into place.
16. Install faceplate (8), 14 new lockwashers (15), and screws (16) on box (13).





WIRING DIAGRAM

TENT INTERFACE PANEL BOX A5 WIRING DIAGRAM

FOLLOW-THROUGH STEPS

1. Install tent interface panel box assembly (see your -20).

END OF TASK

REPAIR ROADSIDE AC POWER EXTENSION BOX A18 (M1068 ONLY)

0090 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0090 00-1).
 Assembly (page 0090 00-2).

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 0104 00, Item 4)

Equipment Condition

Roadside AC power extension box A18 removed
 (see your -20)

Materials/Parts

Locknut (24)

DISASSEMBLY

NOTE

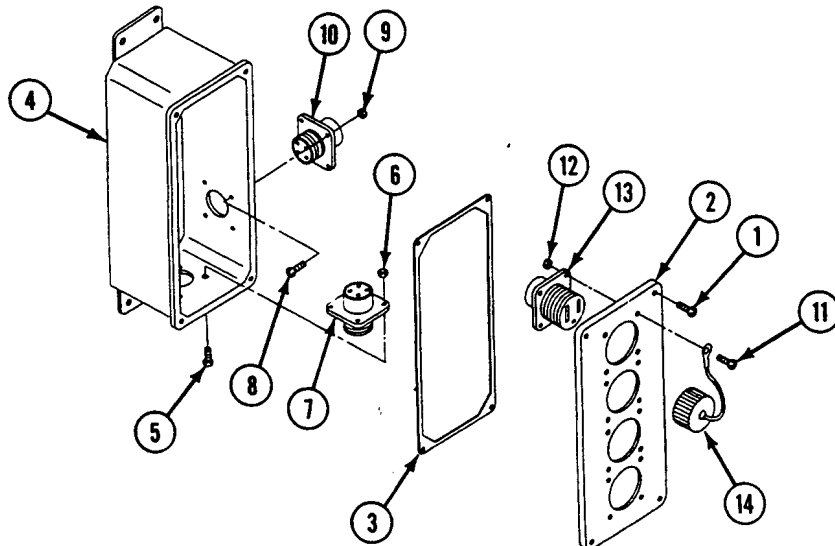
See wiring diagram (page 0090 00-3) for assembly/disassembly of wires to connectors.

1. Remove four screws (1), cover (2), and gasket (3) from extension box (4).

NOTE

Tag all leads before disconnecting for proper assembly later.

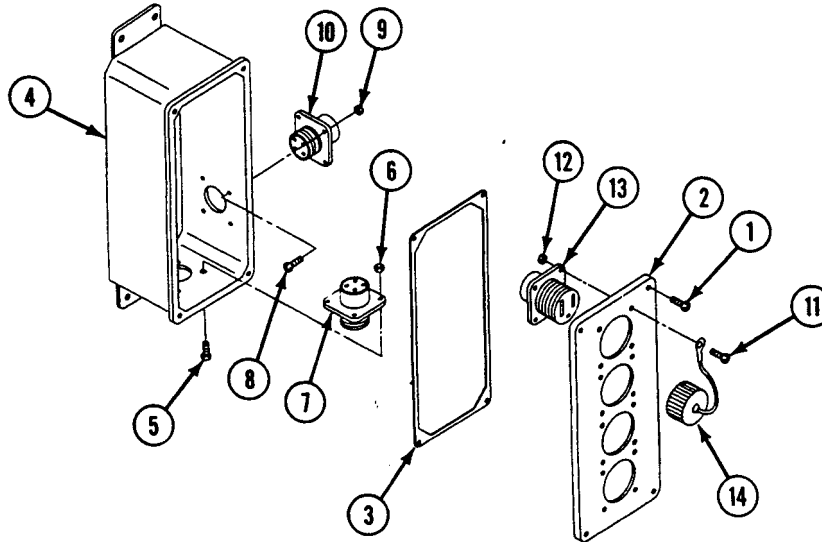
2. Remove four screws (5), locknuts (6), and connector J6 (7) from extension box (4). Discard locknuts.



NOTE

The four screws that secure connector J1 are shorter. Do not mix with other connectors.

3. Remove four screws (8), locknuts (9), and connector J1 (10) from extension box (4). Discard locknuts.
4. Disconnect leads from connectors if necessary.
5. Remove 16 screws (11), locknuts (12), four connectors (13), and dust caps (14) from cover (2). Discard locknuts.



ASSEMBLY

1. Install four connectors (13) on cover (2) with dust caps (14) and secure with 16 screws (11) and new locknuts (12).

NOTE

The four screws that secure connector J1 are shorter. Do not mix with other connectors.

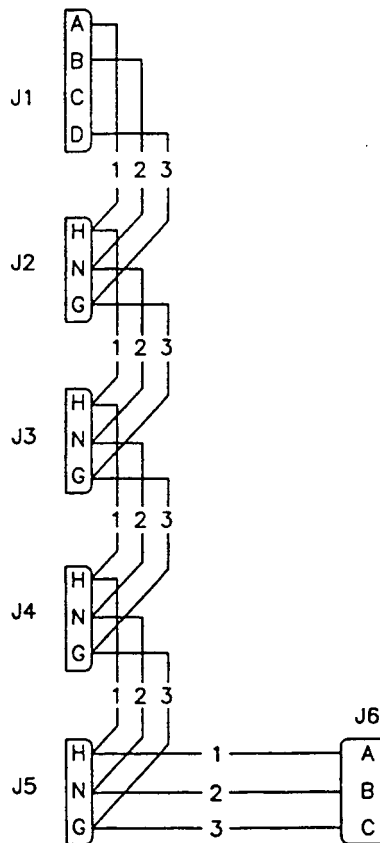
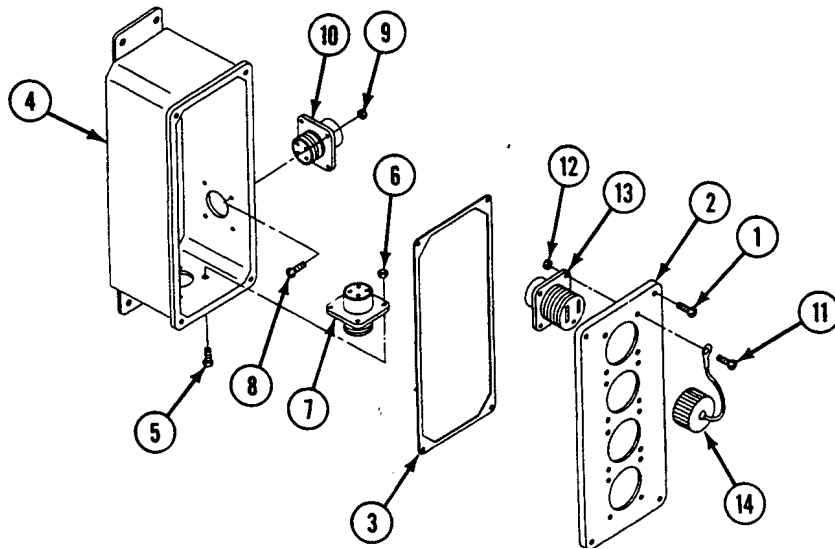
2. Install connector J1 (10) on extension box (4) and secure with four screws (8) and new locknuts (9).
3. Install connector J6 (7) on extension box (4) and secure with four screws (5) and new locknuts (6).

NOTE

See wiring diagram (page 0090 00-3) for assembly/disassembly of wires to connectors.

4. Connect leads to connectors if necessary.

5. Install gasket (3) on extension box (4) with cover (2) and secure with four screws (1).



(A18) WIRING DIAGRAM

ROADSIDE POWER EXTENSION BOX A18 WIRING DIAGRAM

FOLLOW-THROUGH STEPS

1. Install roadside AC power extension box A18 (see your -20).

END OF TASK

REPAIR CURBSIDE AC POWER EXTENSION BOX A19 (M1068 ONLY)

0091 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0091 00-1).
 Assembly (page 0091 00-3).

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 0104 00, Item 4)

Equipment Condition

Curbside AC power extension box A19 removed
 (see your -20)

Materials/Parts

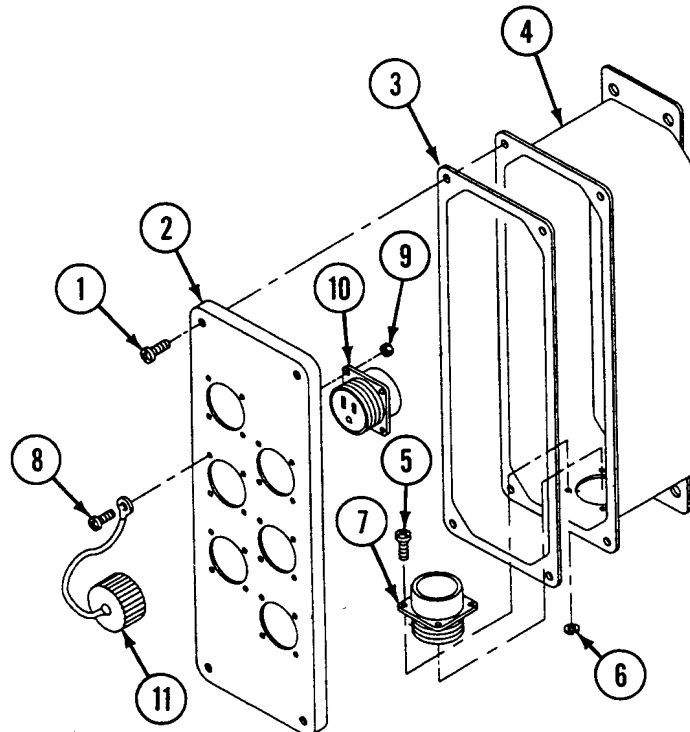
Locknut (28)

DISASSEMBLY

NOTE

See wiring diagram (page 0091 00-4) for assembly/disassembly of wires to connectors.

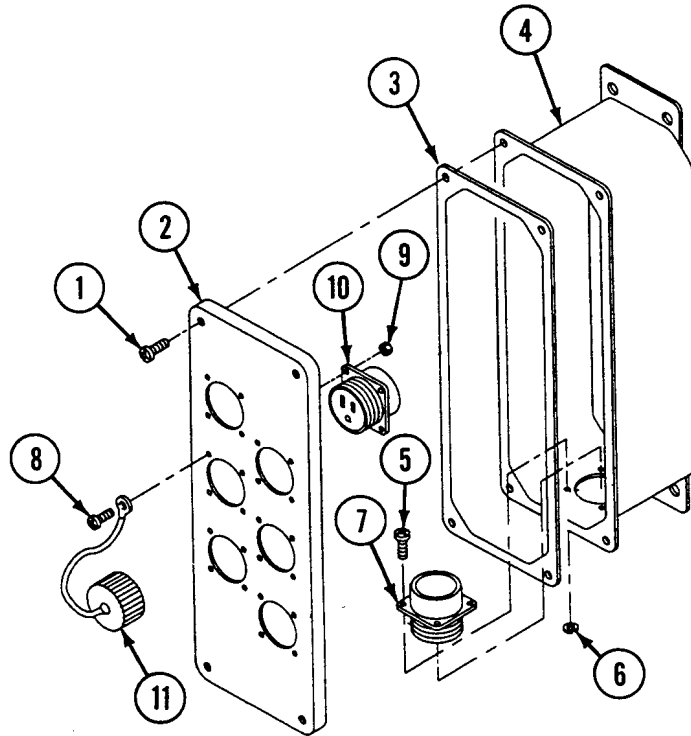
1. Remove four screws (1), cover (2), and gasket (3) from extension box (4).



NOTE

Tag all leads before disconnecting for proper assembly later.

2. Remove four screws (5), locknuts (6), and connector J15 (7) from extension box (4). Discard locknuts.
3. Remove 24 screws (8), locknuts (9), six connectors (10), and dust caps (11) from cover (2). Discard locknuts.



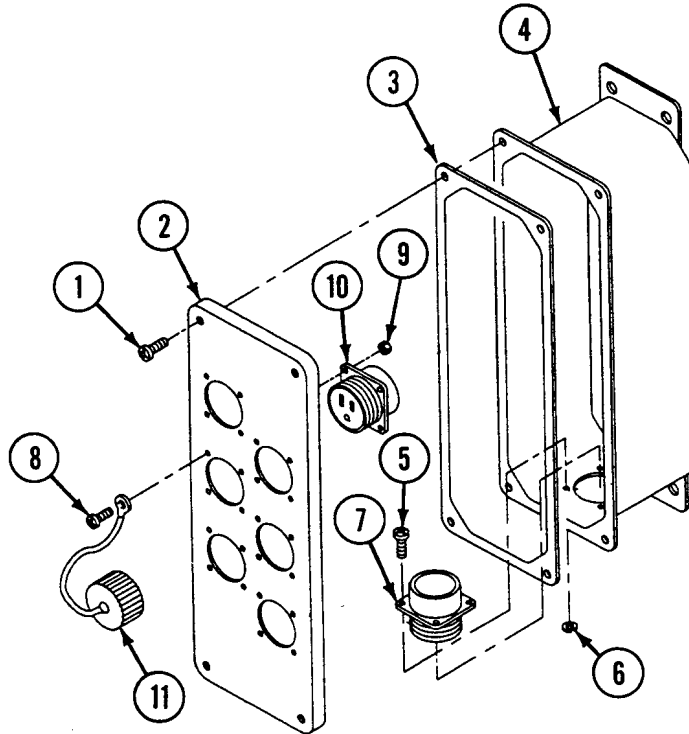
ASSEMBLY

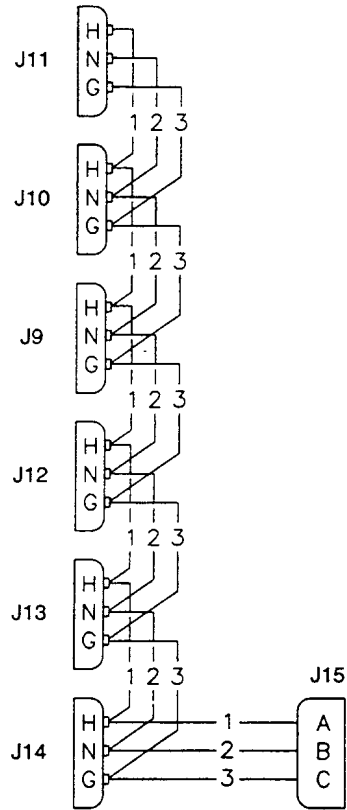
1. Install six connectors (10) on cover (2) with dust caps (11) and secure with 24 screws (8) and new locknuts (9).
2. Install connector J15 (7) on extension box (4) and secure with four screws (5) and new locknuts (6).

NOTE

See wiring diagram (page 0091 00-4) for assembly/disassembly of wires to connectors.

3. Connect leads to connectors if necessary.
4. Install gasket (3) on extension box (4) with cover (2) and secure with four screws (1).





(A19) WIRING DIAGRAM

CURBSIDE AC POWER EXTENSION BOX A19 WIRING DIAGRAM

FOLLOW-THROUGH STEPS

1. Install curbside AC power extension box A19 (see your -20).

END OF TASK

REPLACE LAN A CABLE W101 AND/OR LAN B CABLE W102 (M1068 ONLY)

0092 00

THIS WORK PACKAGE COVERS:

Removal (page 0092 00-1).
 Installation (page 0092 00-4).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Radio Repairer 29E10
 Helper (H)

Tools and Special Tools

Electronic Equipment Tool Kit (WP 0104 00, Item 46)

Equipment Condition

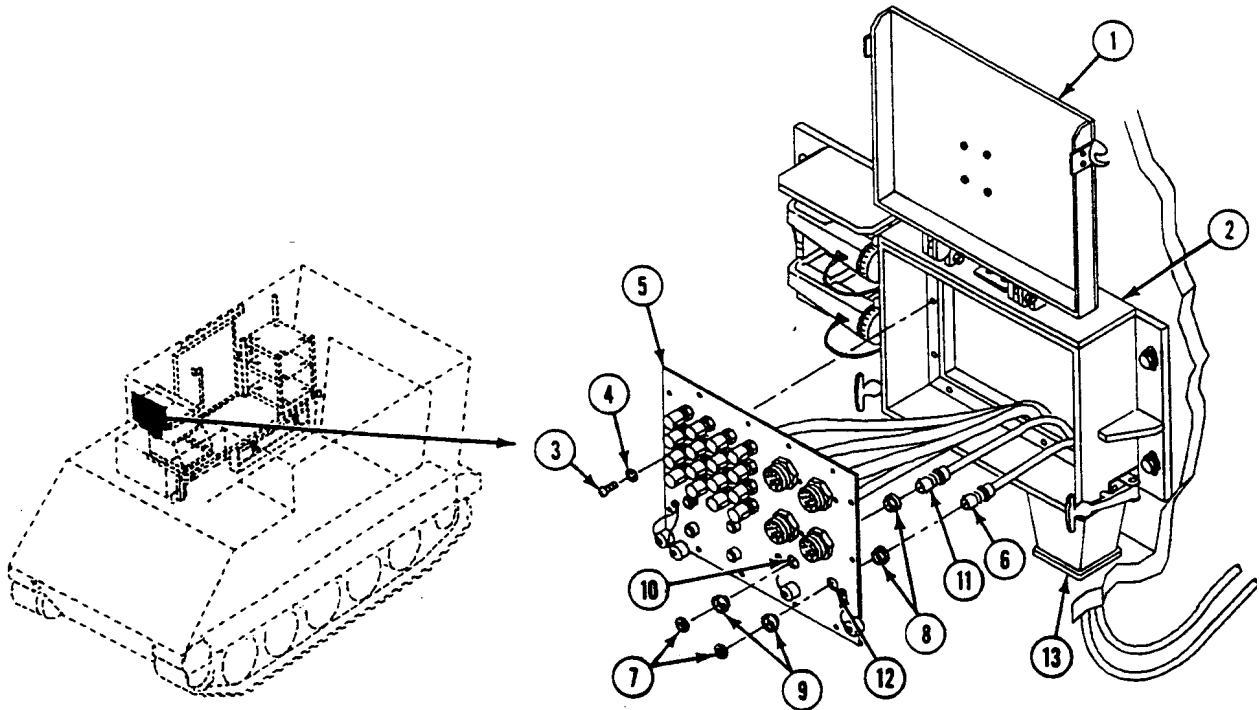
Engine stopped (see your -10)
 Carrier blocked (see your -10)
 All external power disconnected
 (TM 11-7010-256-12&P)
 Battery ground strap disconnected (see your -20)

Materials/Parts

Locknut (2)
 Lockwasher (14)
 Tie strap (AR)

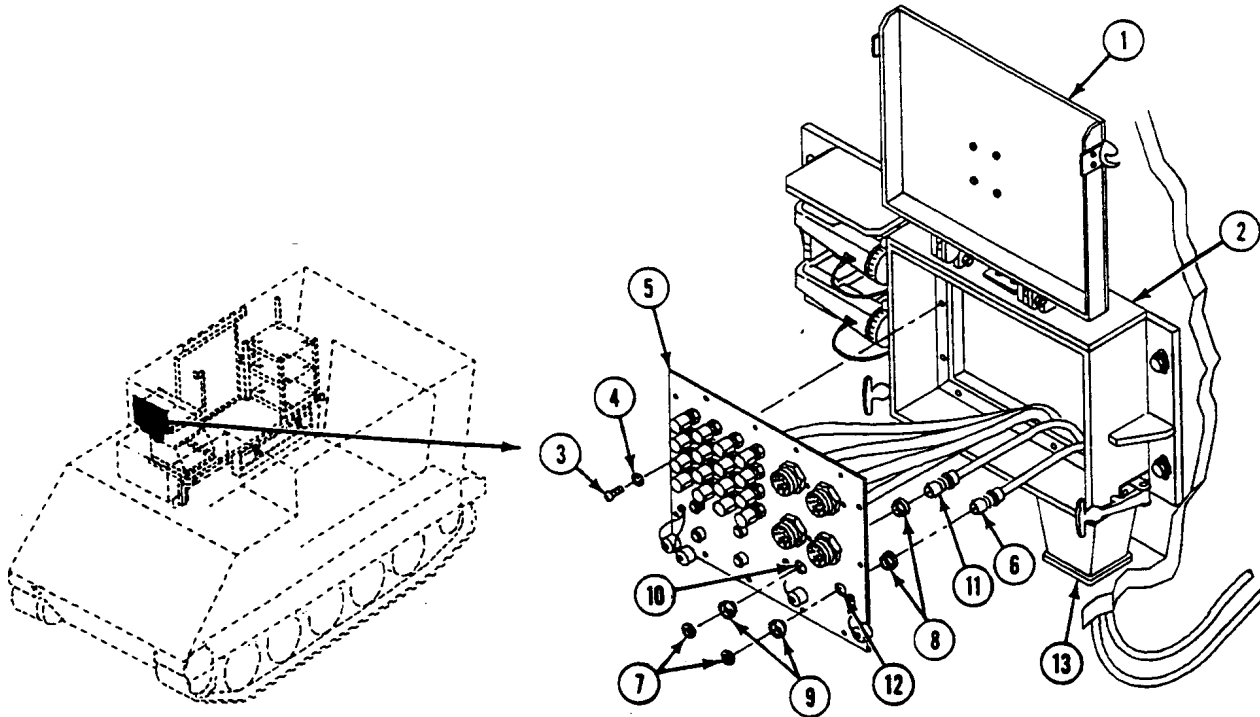
REMOVAL

1. Lift and secure cover (1) of external communications box A11 (2).
2. Remove 14 screws (3), lockwashers (4), and faceplate (5) from external communications box A11 (2). Discard lockwashers.

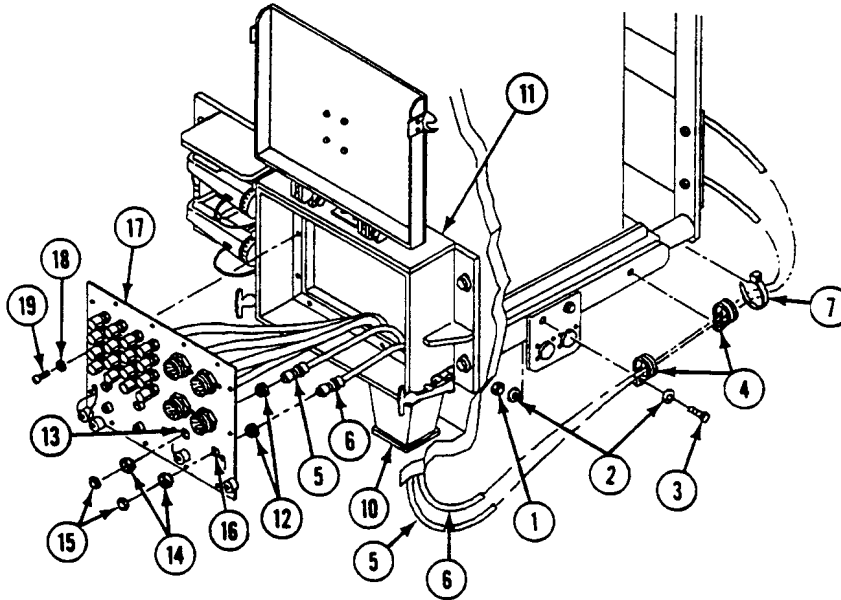


NOTE**Tag cables before disconnecting them.**

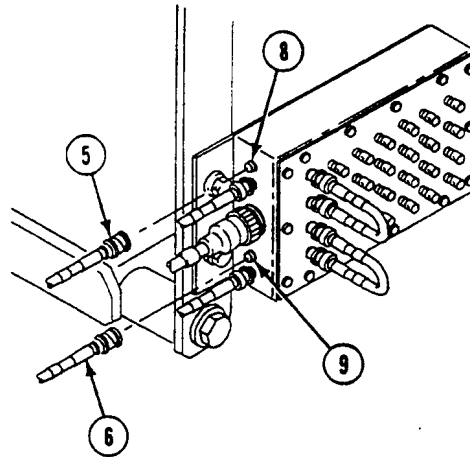
3. Disconnect cable W101 jack J103 (6), jamnut (7), inside bushing (8), and outside bushing (9) from faceplate LAN A (12) on external communications box A11 (2).
4. Disconnect cable W102 jack J104 (11) jamnut (7), inside bushing (8), and outside bushing (9) from faceplate LAN B (10) on external communications box A11 (2).
5. Remove and push cable(s) W101 (6) and/or W102 (11) down into hull, pull through opening in bottom (13) of external communications box A11 (2). Have helper assist.



6. Remove two locknuts (1), four washers (2), two screws (3), and clamps (4) from cables W101 (5) and W102 (6). Discard locknuts.
7. Remove and discard tie straps (7), as required.

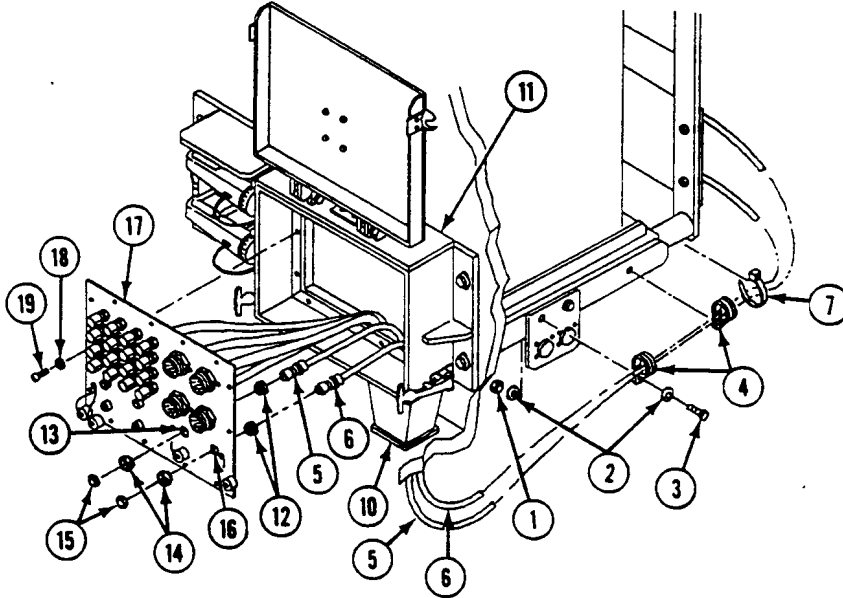


8. Disconnect cable W101 (5) from data panel assembly A12 jack J1 (8) and remove from carrier.
9. Disconnect cable W102 (6) from data panel assembly A12 jack J4 (9) and remove from carrier.

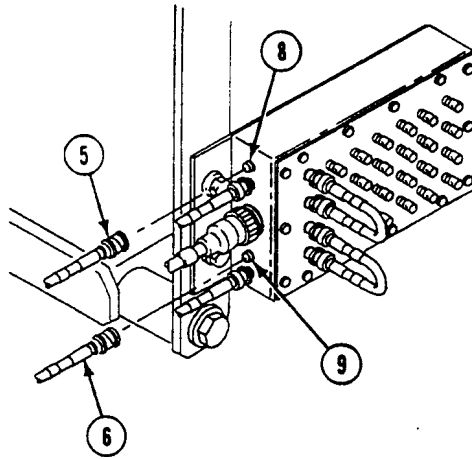


INSTALLATION

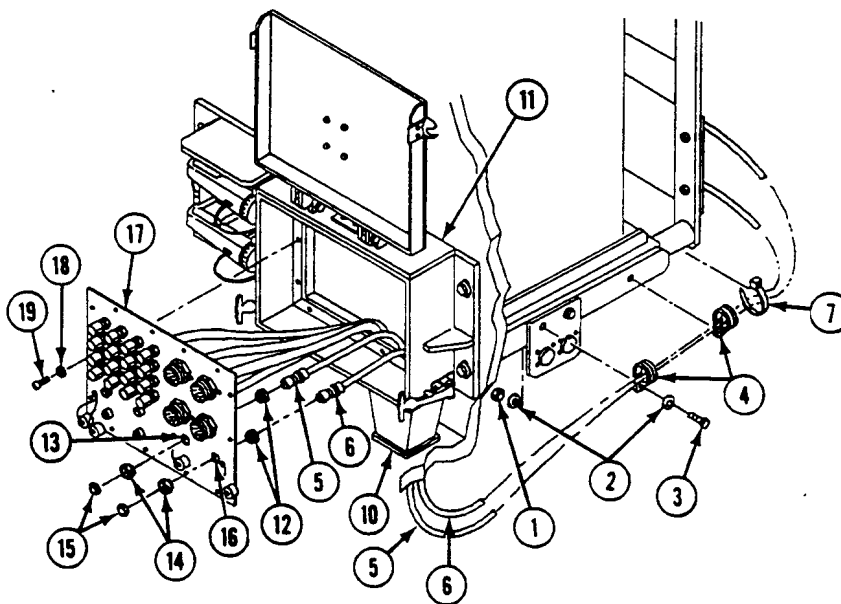
1. Install cable W101 jack J103 (5) and/or W102 jack J104 (6) in carrier and route through hole in hull top plate (10) up into base of external communications box A11 (11). Have helper assist.



2. Connect cable W101 (5) on data panel assembly A12 jack J1 (8).
3. Connect cable W102 (6) on data panel assembly A12 jack J4 (9).



4. Connect cable W101 jack J103 (5) with inside bushing (12) on faceplate LAN A (13) secure with outside bushing (14) and jamnut (15).
5. Connect cable W102 jack J104 (6) with inside bushing (12) on faceplate LAN B (16) secure with outside bushing (14) and jamnut (15).
6. Secure cable W101 (5) and/or W102 (6) to hull with two clamps (4), screws (3), four washers (2), and two new locknuts (1).
7. Secure slack in cable with new tie straps (7), as required.
8. Install faceplate (17) on external communications box A11 (11) and secure with 14 new lockwashers (18) and screws (19).



FOLLOW-THROUGH STEPS

1. Connect battery ground strap (see your -20).
2. Turn MASTER SWITCH to ON (see your -10). Check that electrical system works properly.
3. Turn MASTER SWITCH to OFF (see your -10).

END OF TASK

REPLACE RF 1, 2, 3, 4 CABLE ASSEMBLIES W111, W112, W113, AND W114 (M1068 ONLY)

0093 00

THIS WORK PACKAGE COVERS:

- Removal (page 0093 00-1).
- Installation (page 0093 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Radio Repairer 29E10
 Helper (H)

Tools and Special Tools

Electronic Equipment Tool Kit (WP 0104 00, Item 46)

Equipment Condition

External communication box removed (see your -20)

Materials/Parts

Lockwasher (14)
 Tie strap (AR)

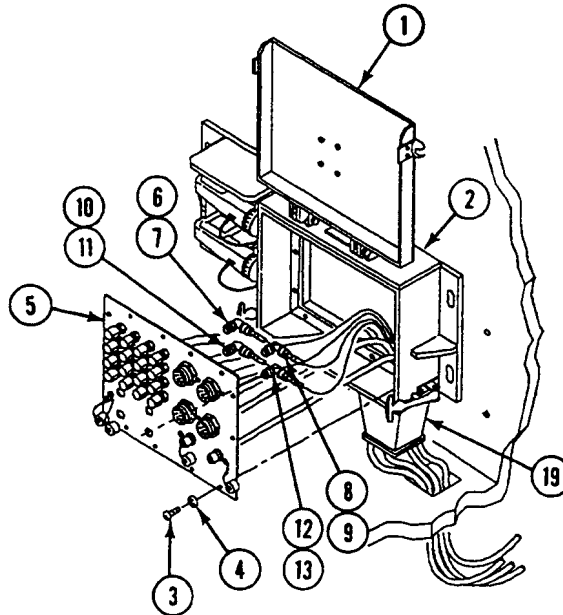
REMOVAL

1. Lift and secure cover (1) of external communications box (2).
2. Remove 14 screws (3), lockwashers (4), and faceplate (5) from external communications box (2). Discard lockwashers.

NOTE

Tag all cables before disconnecting them.

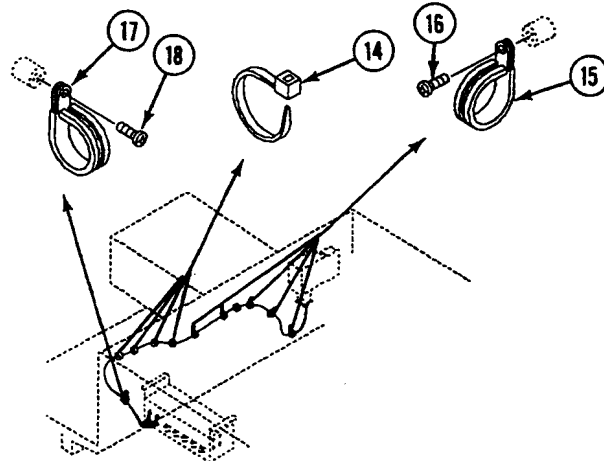
3. Disconnect W111 plug P2 (6) from jack J115 (7) on faceplate (5).
4. Disconnect W112 plug P2 (8) from jack J116 (9) on faceplate (5).
5. Disconnect W113 plug P2 (10) from jack J117 (11) on faceplate (5).
6. Disconnect W114 plug P2 (12) from jack J118 (13) on faceplate (5).



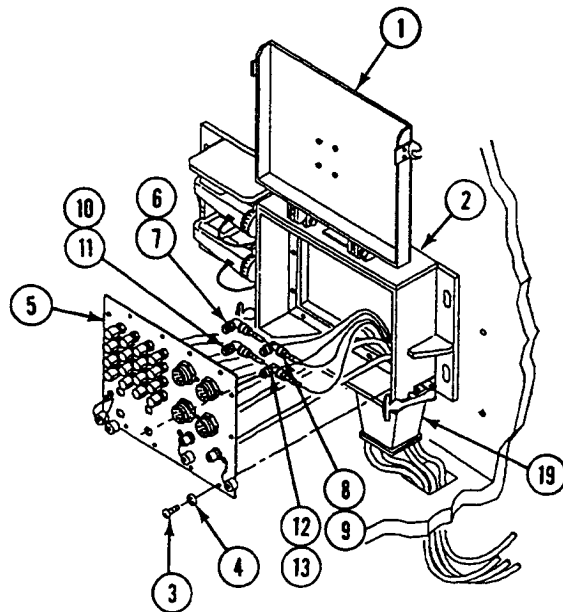
REPLACE RF 1, 2, 3, 4 CABLE ASSEMBLIES W111, W112, W113, AND W114 (M1068 ONLY) — Continued

0093 00

7. Remove and discard tie straps (14), as required.
8. Remove five clamps (15) and screws (16).
9. Remove clamp (17) and screw (18).



10. Pull harness through base (19) of communications box (2). Have helper assist.



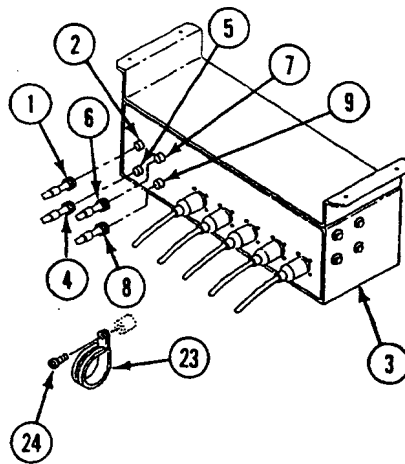
REPLACE RF 1, 2, 3, 4 CABLE ASSEMBLIES W111, W112, W113, AND W114 (M1068 ONLY) — Continued

0093 00

NOTE

Tag all cables before disconnecting them.

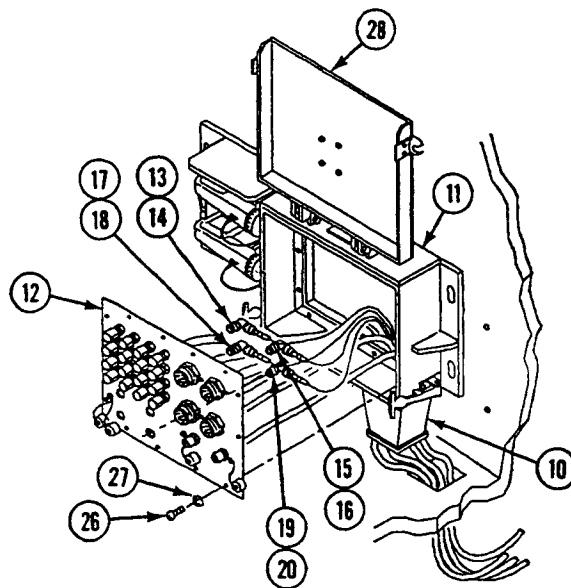
11. Disconnect W111 plug P1 (1) from jack J115 (2) on signal patch panel box (3).
12. Disconnect W112 plug P1 (4) from jack J116 (5) on signal patch panel box (3).
13. Disconnect W113 plug P1 (6) from jack J117 (7) on signal patch panel box (3).
14. Disconnect W114 plug P1 (8) from jack J118 (9) on signal patch panel box (3).



15. Remove cable assemblies from carrier. Have helper assist.

INSTALLATION

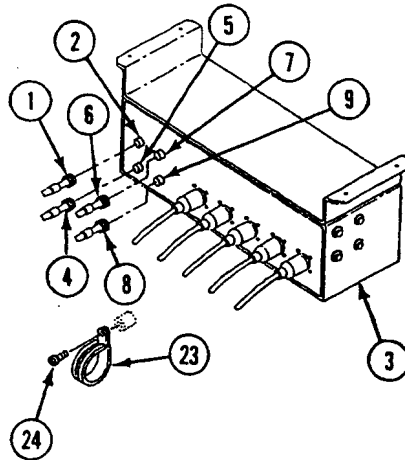
1. Install cable assemblies in carrier. Have helper assist.
2. Push harness into base (10) of external communications box (11). Have helper assist.



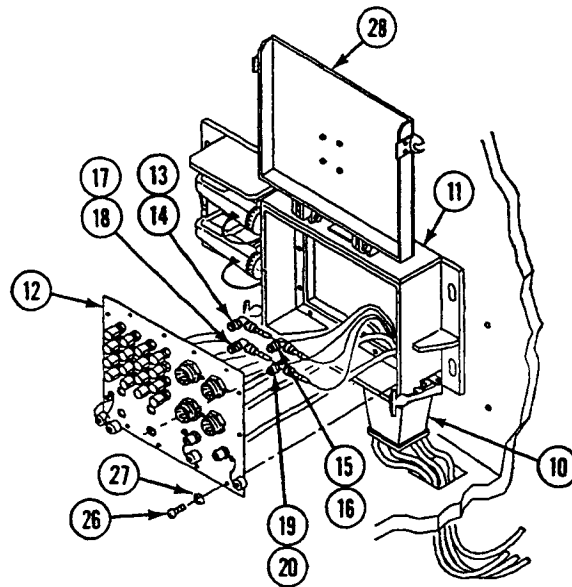
REPLACE RF 1, 2, 3, 4 CABLE ASSEMBLIES W111, W112, W113, AND W114 (M1068 ONLY) — Continued

0093 00

3. Connect W111 plug P1 (1) to jack J115 (2) on signal patch panel box (3).
4. Connect W112 plug P1 (4) to jack J116 (5) on signal patch panel box (3).
5. Connect W113 plug P1 (6) to jack J117 (7) on signal patch panel box (3).
6. Connect W114 plug P1 (8) to jack J118 (9) on signal patch panel box (3).



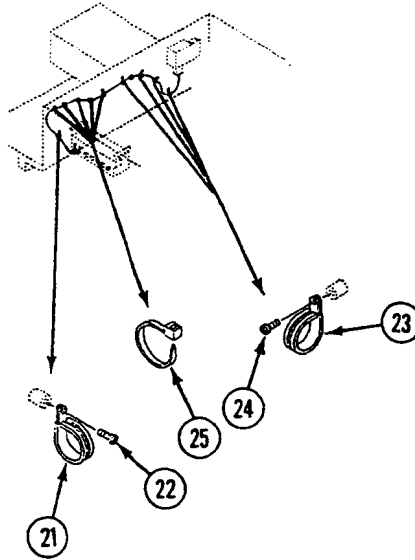
7. Connect harness to inside of faceplate (12) of external communications box (11).
8. Connect W111 plug P2 (13) to jack J115 (14) on faceplate (12).
9. Connect W112 plug P2 (15) to jack J116 (16) on faceplate (12).
10. Connect W113 plug P2 (17) to jack J117 (18) on faceplate (12).
11. Connect W114 plug P2 (19) to jack J118 (20) on faceplate (12).



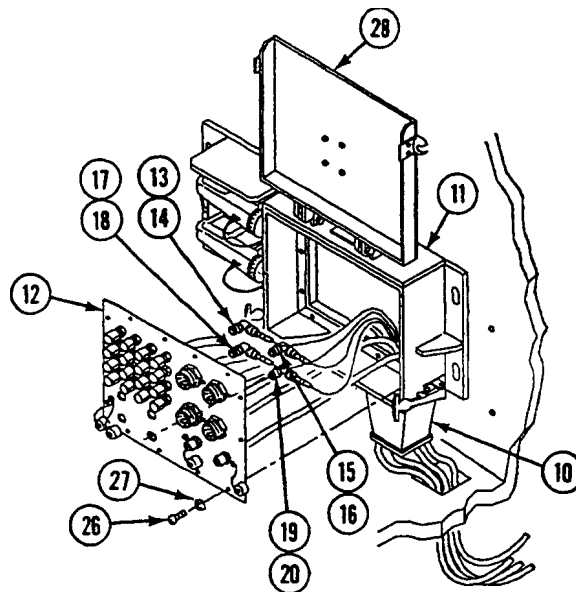
REPLACE RF 1, 2, 3, 4 CABLE ASSEMBLIES W111, W112, W113, AND W114 (M1068 ONLY) — Continued

0093 00

12. Install clamp (21) and screw (22).
13. Install five clamps (23) and screws (24).
14. Install new tie straps (25), as required.



15. Install faceplate (12) on external communications box (11) and secure with 14 screws (26) and new lockwashers (27).
16. Lower and secure cover (28) of external communications box (11).



FOLLOW-THROUGH STEPS

1. Install external communication box (see your -20).

END OF TASK

REPLACE CABLE ASSEMBLY W115 (M1068 ONLY)

0094 00

THIS WORK PACKAGE COVERS:

Removal (page 0094 00-1).
 Installation (page 0094 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Radio Repairer 29E10
 Helper (H)

Tools and Special Tools

Electronic Equipment Tool Kit (WP 0104 00, Item 46)

Equipment Condition

External communication box removed (see your -20)

Materials/Parts

Lockwasher (14)
 Tie strap (AR)

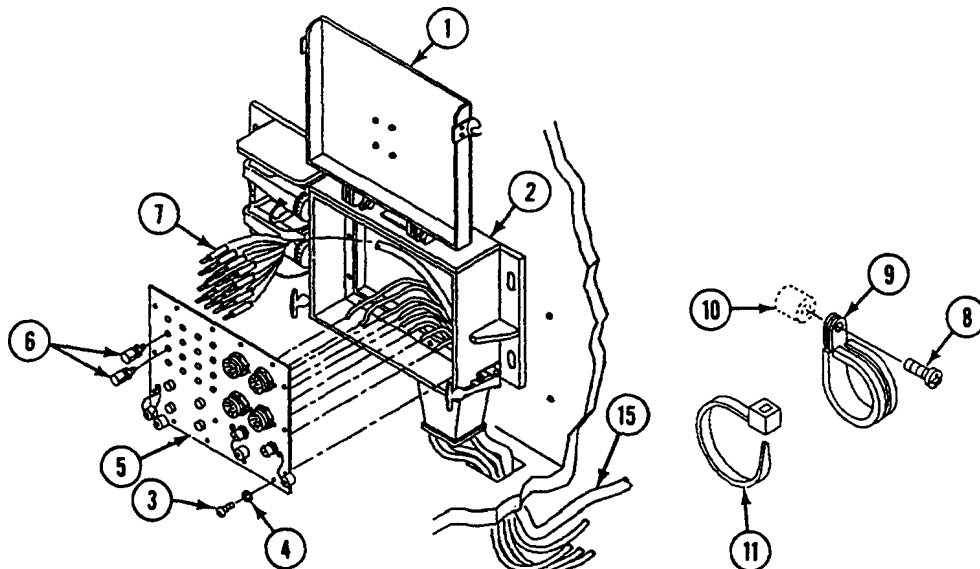
REMOVAL

1. Open and secure lid (1) on external communication box (2).
2. Remove 14 screws (3), lockwashers (4), and faceplate (5) from external communication box (2). Discard lockwashers.

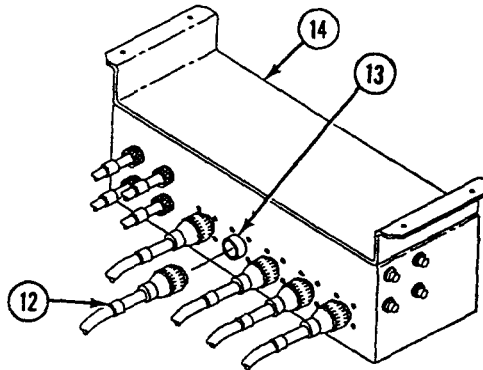
NOTE

Tag leads before disconnecting from binding posts.

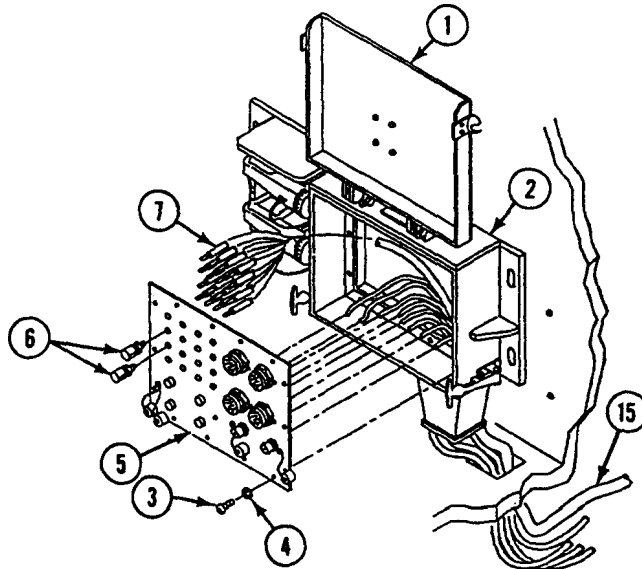
3. Remove binding posts (6) and 16 leads (7) from external communication box (2).
4. Remove screws (8) and clamps (9) from weldnuts (10), as required.
5. Remove and discard tie straps (11), as required.



6. Disconnect cable assembly W115 plug P106 (12) from jack J136 (13) on signal patch panel box (14).

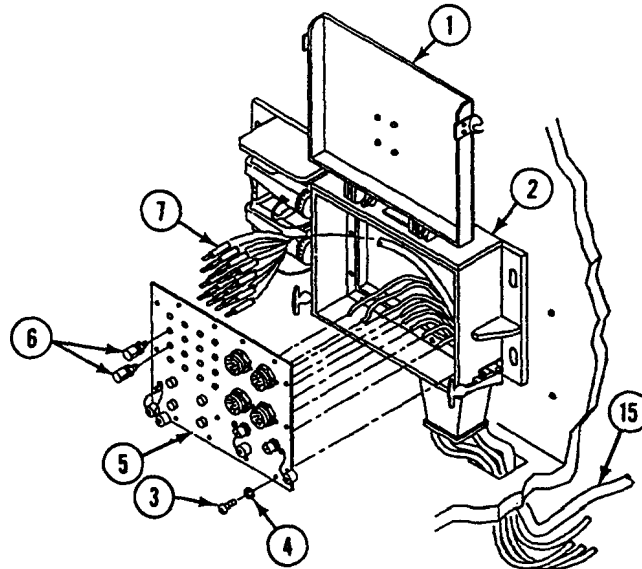


7. Pull cable assembly W115 down through base (15) out of external communications box (2). Remove cable assembly W115 from carrier. Have helper assist.

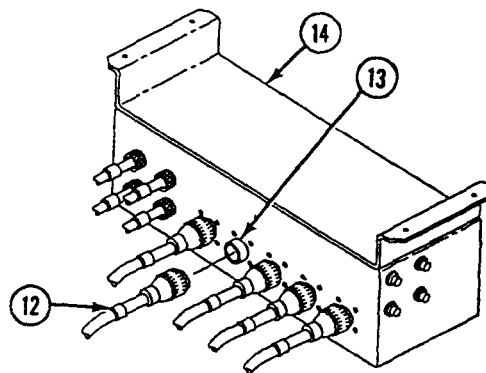


INSTALLATION

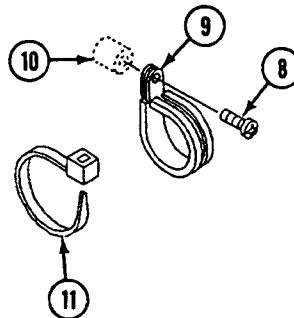
1. Install cable assembly W115 into carrier, and route cable up through base (15) into external communications box (2). Have helper assist.



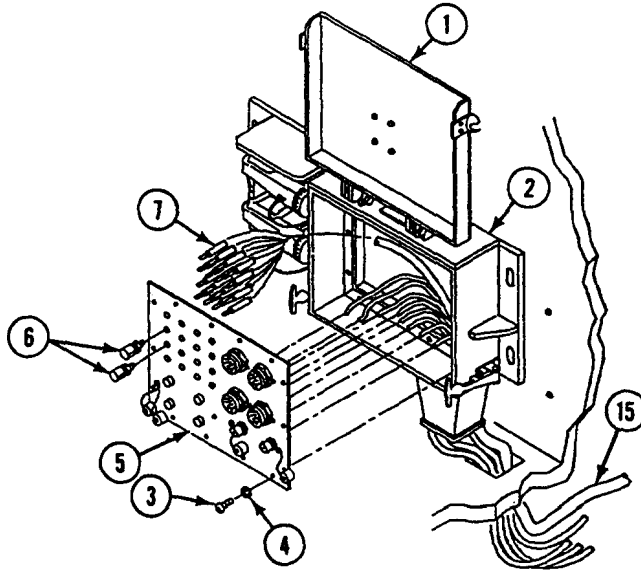
2. Connect cable assembly W115 plug P106 (12) to jack J136 (13) on signal patch panel box (14).



3. Install clamps (9) on cable assembly and secure to weldnuts (10) with screws (8), as required.
4. Install new tie straps (11) to secure cable W115, as required.



5. Connect 16 leads (7) to binding posts (6) on faceplate (5).
6. Install faceplate (5) on external communication box (2) and secure with 14 new lockwashers (4) and screws (3).
7. Close and secure lid (1) on external communication box (2).



FOLLOW-THROUGH STEPS

1. Install external communication box (see your -20).

END OF TASK

REPLACE CABLE ASSEMBLIES W117 AND W118 (M1068 ONLY)

0095 00

THIS WORK PACKAGE COVERS:

Removal (page 0095 00-1).
 Installation (page 0095 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Radio Repairer 29E10
 Helper (H)

Tools and Special Tools

Electronic Equipment Tool Kit (WP 0104 00, Item 46)

Equipment Condition

External communication box removed (see your -20)

Materials/Parts

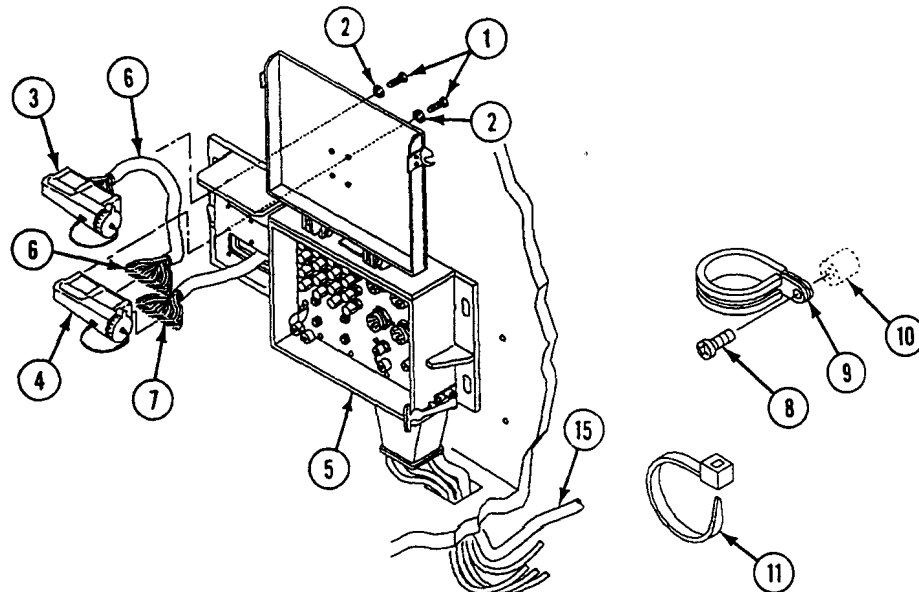
Lockwasher (12)
 Tie strap (AR)

REMOVAL

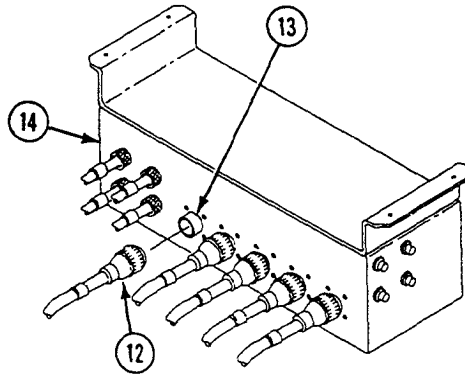
NOTE

Tag all cables before disconnecting them.

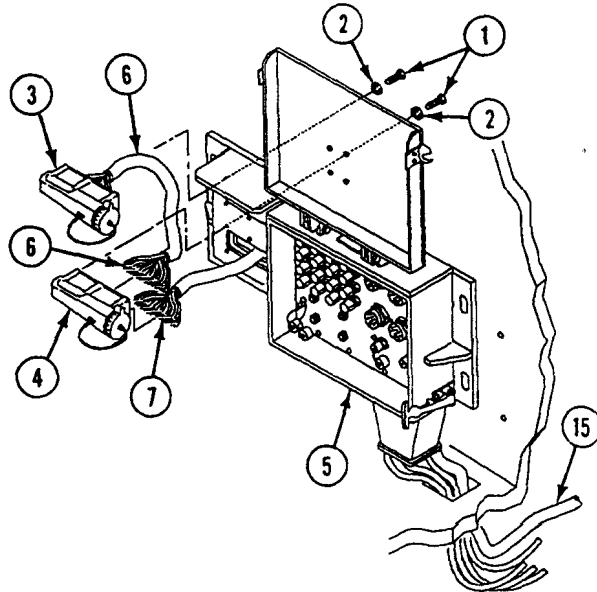
1. Remove 12 screws (1), lockwashers (2), and connectors J101 (3) and J102 (4) from the external communication box (5). Discard lockwashers.
2. Remove cable assembly W117 (6) from connector J101 (3).
3. Remove cable assemblies W117 (6) and W118 (7) from connector J102 (4) of external communication box (5).
4. Remove screws (8) and clamps (9) from weldnuts (10), as required.
5. Remove and discard tie straps (11), as required.



6. Disconnect cable assembly W118 plug P105 (12) from jack J135 (13) on signal patch panel box (14).

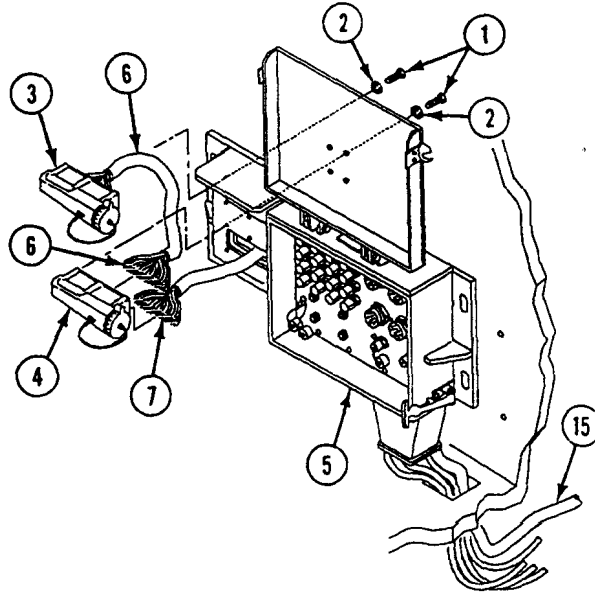


7. Pull cable assembly W118 down through base (15) out of external communications box (5). Remove cable assembly W118 from carrier. Have helper assist.

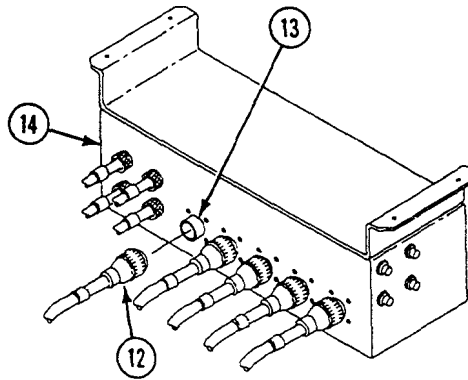


INSTALLATION

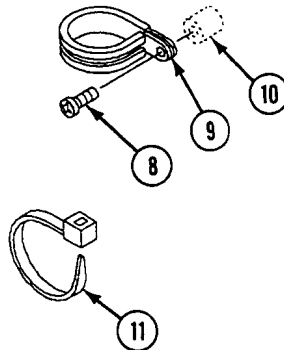
1. Install cable assembly W118 into carrier, and route cable up through base (15) into external communications box (5). Have helper assist.



2. Connect cable assembly W118 plug P105 (12) to jack J135 (13) on signal patch panel box (14).

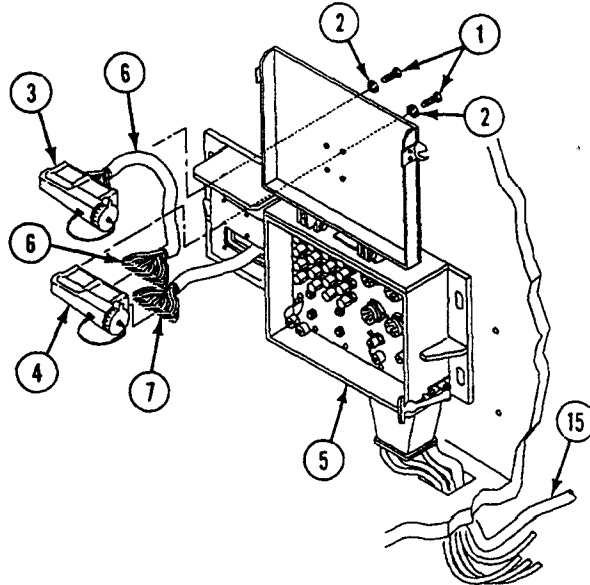


3. Install clamps (9) on cable assembly and secure to weldnuts (10) with screws (8), as required.
4. Install new tie straps (11) to secure cable assembly, as required.



REPLACE CABLE ASSEMBLIES W117 AND W118 (M1068 ONLY) — Continued**0095 00**

5. Install cable assemblies W117 (6) and W118 (7) on connector J102 (4) of external communication box (5).
6. Install cable assembly W117 (6) on connector J101 (3).
7. Install connectors J101 (3) and J102 (4) on the external communication box (5) and secure with 12 screws (1) and new lockwashers (2).

**FOLLOW-THROUGH STEPS**

1. Install external communication box (see your -20).

END OF TASK

REPAIR CURBSIDE DC POWER EXTENSION BOX A8 (M1068 ONLY)

0096 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0096 00-1).
 Assembly (page 0096 00-2).

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 0104 00, Item 4)

Equipment Condition

Curbside DC power extension box removed
 (see your -20)

Materials/Parts

Locknut (20)

DISASSEMBLY

NOTE

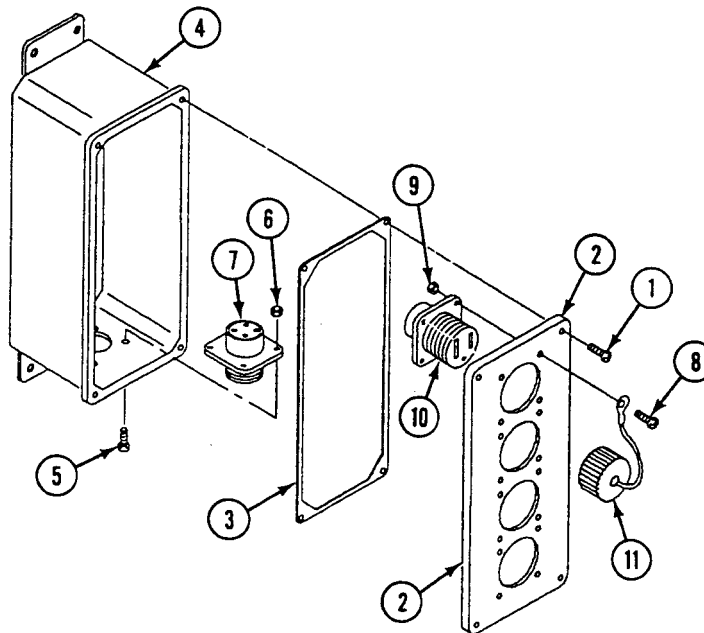
See wiring diagram (page 0096 00-2) for assembly/disassembly of wires to connectors.

1. Remove four screws (1), cover (2), and gasket (3) from extension box (4).

NOTE

Tag all leads before disconnecting for proper assembly later.

2. Remove four screws (5), locknuts (6), and connector J1 (7) from extension box (4). Discard locknuts.
3. Disconnect leads from connectors if necessary.
4. Remove 16 screws (8), locknuts (9), four connectors (10), and dust caps (11) from cover (2). Discard locknuts.



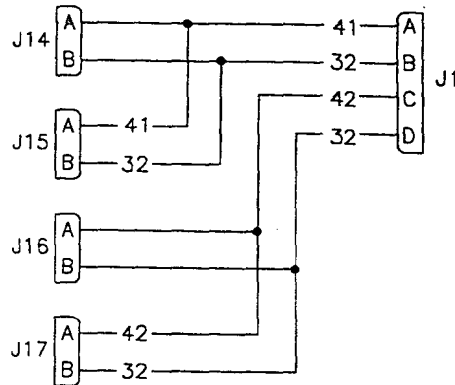
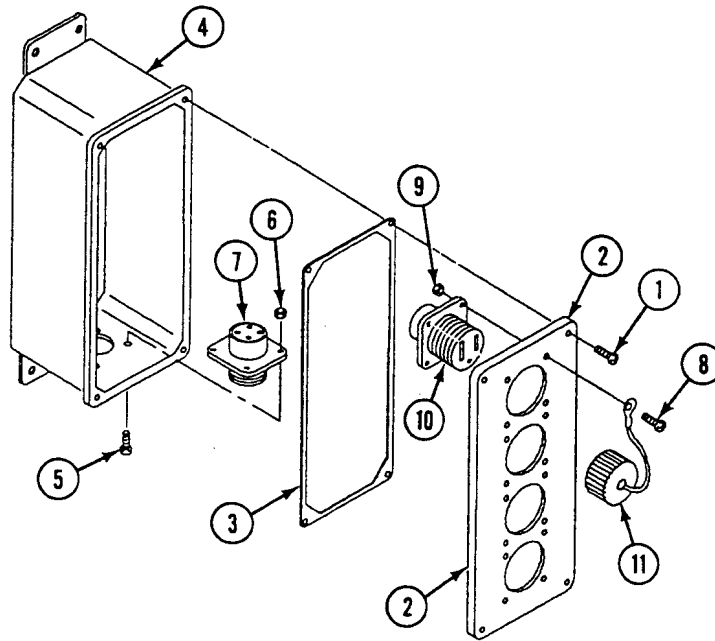
ASSEMBLY

1. Install four connectors (10) on cover (2) with dust caps (11) and secure with 16 screws (8) and new locknuts (9).
2. Install connector J1 (7) on extension box (4) and secure with four screws (5) and new locknuts (6).

NOTE

See wiring diagram (page 0096 00-2) for assembly/disassembly of wires to connectors.

3. Connect leads to connectors if necessary.
4. Install cover (2) and gasket (3) on extension box (4) and secure with four screws (1).



(A8) WIRING DIAGRAM

(A8) WIRING DIAGRAM

FOLLOW-THROUGH STEPS

1. Install curbside DC power extension box (see your -20).

END OF TASK

CHAPTER 19

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR FIRE EXTINGUISHER SYSTEM

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
SERVICE CHEMICAL FIRE EXTINGUISHER (M1059 ONLY).....	0097 00

SERVICE CHEMICAL FIRE EXTINGUISHER (M1059 ONLY)

0097 00

THIS WORK PACKAGE COVERS:

Inspection and Maintenance (page 0097 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)
 Mail and Parcel Post Scale (WP 0104 00, Item 36)

Equipment Condition

Fire extinguisher removed from carrier (see your -20)

Materials/Parts

Preformed packing

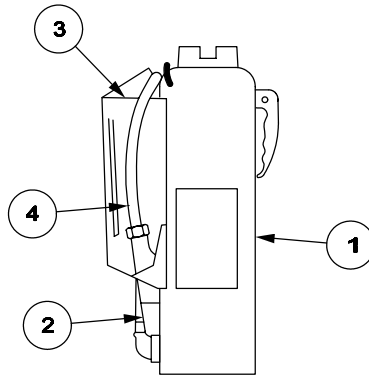
INSPECTION AND MAINTENANCE

WARNING

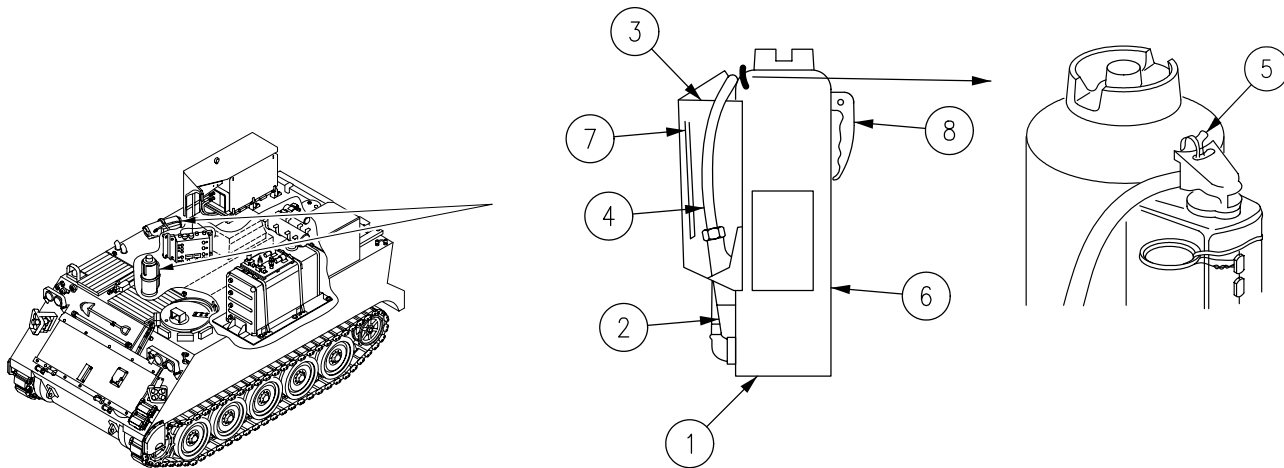


Mechanical damage, evidence of welding, or corrosion constitute a potential personnel hazard. Use extreme caution when handling fire extinguishers in this condition. Replace if necessary.

1. Invert extinguisher (1) and open nozzle (2) to release any remaining pressure or dust from cartridge receiver (3) and hose (4).



2. Return extinguisher (1) to upright position.
3. Inspect visual inspection seal wire (5) for security.
4. Examine outer components for cleanliness and corrosion or damage.
5. Check exterior shell (6), cartridge guard (7), cartridge receiver (3), hose (4), nozzle (2), and handle assembly (8) for wear or other disorders.



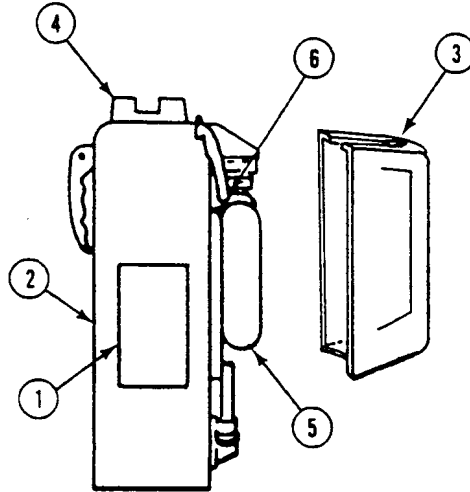
6. Check nameplates (1) for legibility and security. If nameplate is loose, remove and examine mounting area on shell (2) for corrosion.
7. Pull cartridge guard (3) from extinguisher (4). Inspect the inside components for working order and cleanliness.
8. Unscrew cartridge (5) left hand thread (counterclockwise). Check seal (6) for punctures.

WARNING

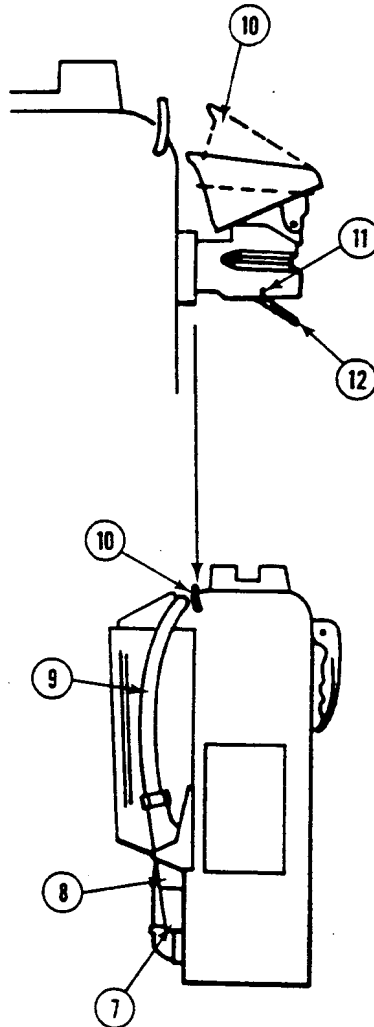


A cartridge can be punctured if the lever does not work freely. Do not install the cartridge before you make sure the puncture lever works freely.

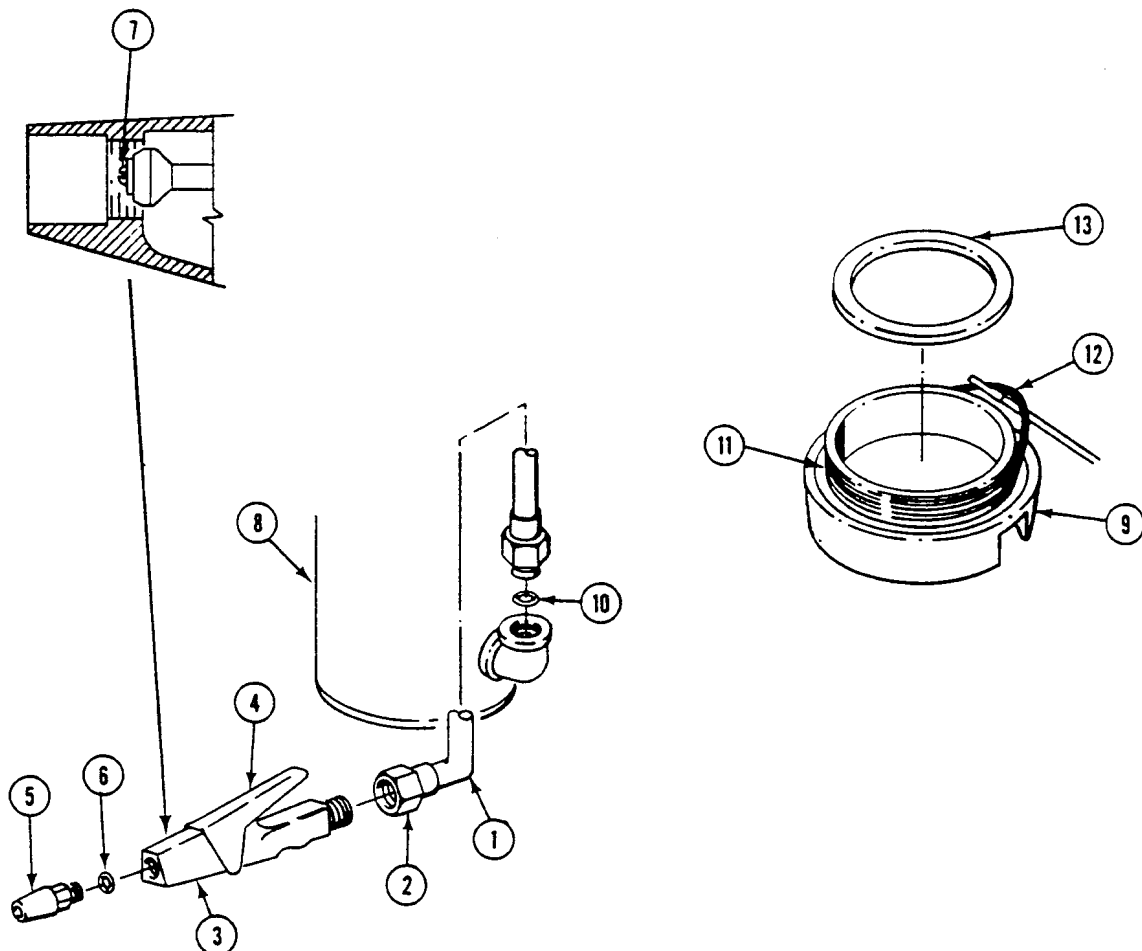
9. Weigh cartridge (5). If weight is less than 1/2 oz. of weight stamped on cartridge, the cartridge must be replaced. Use 5-pound mail and parcel post scale.



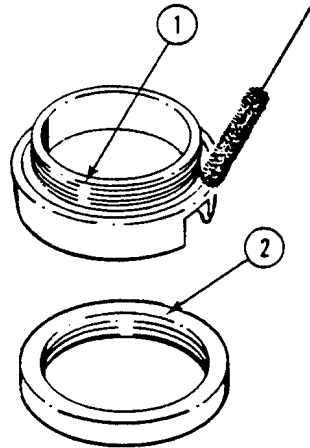
10. Remove nozzle (7) from holder (8) and lift hose (9) from behind puncture lever (10).
11. Operate puncture lever (10) to check for proper working order.
12. Check the pressure relief vent (11) for obstructions.
13. Remove cartridge receiver gasket (12) and check for cuts or wear. If damaged, replace.



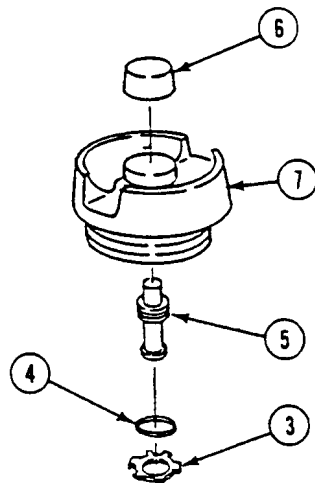
14. Examine hose (1) and hose couplings (2) for cuts or cracks.
15. Check nozzle (3) for proper operation.
 - a. Check handle (4) for binding.
 - b. Unscrew nozzle tip (5) and inspect for obstructions or damaged gasket (6).
 - c. Inspect plunger tip (7) for cuts or brittleness.
16. Check hose (1) for blockage.
 - a. Place extinguisher (8) horizontally on solid surface with discharge outlet UP.
 - b. Loosen filler cap (9) three and one half turns.
 - c. Wipe nozzle (3) clean and blow into extinguisher (8), observing gas escape from filler cap (9).
 - d. Unscrew hose (1) from extinguisher (8) and check preformed packing (10) for damage. If damaged, replace.
17. Return extinguisher (8) to upright position and remove filler cap (9). Remove any remaining dust.
18. Inspect filler cap (9) threads for nicks, cross threading, corrosion, and wear.
19. Check pressure relief vent (11) for obstructions.
20. Remove quad ring (12) and flat gasket (13) from filler cap (9).



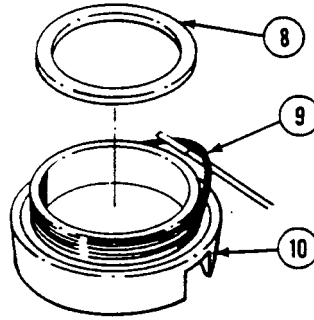
21. Thoroughly clean threads and gasket surface with stiff brush. Ensure pressure relief vent (1) grooves are unobstructed.
22. Thoroughly clean threads of top collar (2) with stiff brush. Wipe clean with a rag.



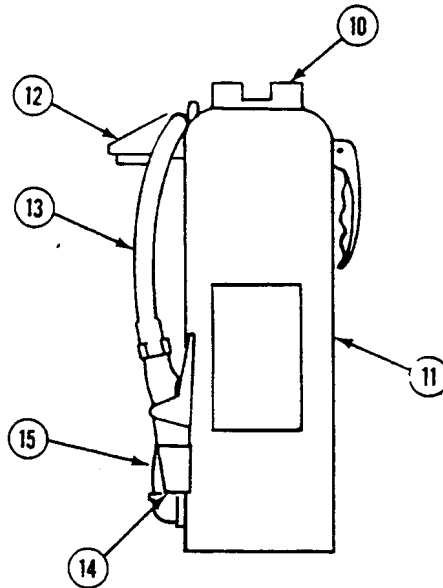
23. Remove retainer (3) and preformed packing (4) which secure stem indicator (5). Discard preformed packing.
24. Clean or replace parts as required. Cap (6) should be replaced only if damaged.
25. Install stem indicator (5), new preformed packing (4), and retainer (3) in cap indicator (7). Reset indicator by pulling it in.



26. Clean gasket (8) and quad ring (9) with dry wiping rag. Inspect for cuts, breaks, wear, and elasticity.
27. Apply a thin coat of grease to gasket (8) surfaces.
28. Install gasket (8) and quad ring (9) on filler cap (10).



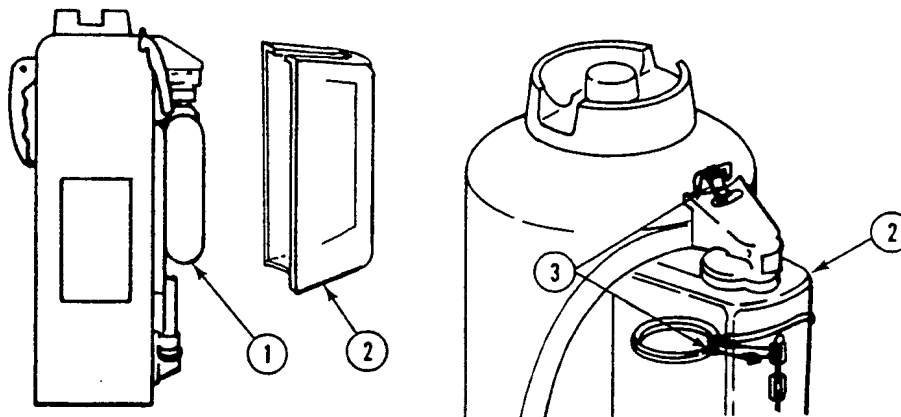
29. Ensure inside of shell (11) is clean and dry. Fill extinguisher with agent as required.
30. Install filler cap (10).
31. Lift puncture lever (12) and place hose (13) behind lever securing nozzle (14) in holder (15).



WARNING

Do not install cartridge without hose in place behind puncture lever. Cartridge will discharge if lever is pushed.

32. Install cartridge (1).
33. Install cartridge guard (2).
34. Install visual inspection seal wire (3).

**FOLLOW-THROUGH STEPS**

1. Install fire extinguisher in carrier (see your -20).

END OF TASK

CHAPTER 20

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR CHEMICAL AGENT AUTOMATIC ALARM MOUNTING KIT

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
INSTALL CHEMICAL AGENT AUTOMATIC ALARM MOUNTING KIT (M113A2 ONLY).....	0098 00

INSTALL CHEMICAL AGENT AUTOMATIC ALARM MOUNTING KIT (M113A2 ONLY)

0098 00

THIS WORK PACKAGE COVERS:

- Prepare Carrier (page 0098 00-1).
- Installation (page 0098 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0104 00, Item 19)
- Torque Wrench (WP 0104 00, Item 57)
- Torque Wrench (WP 0104 00, Item 58)

References

See your -20

Equipment Condition

- Ramp lowered (see your -10)
- Engine stopped (see your -10)
- Carrier blocked (see your -10)

Materials/Parts

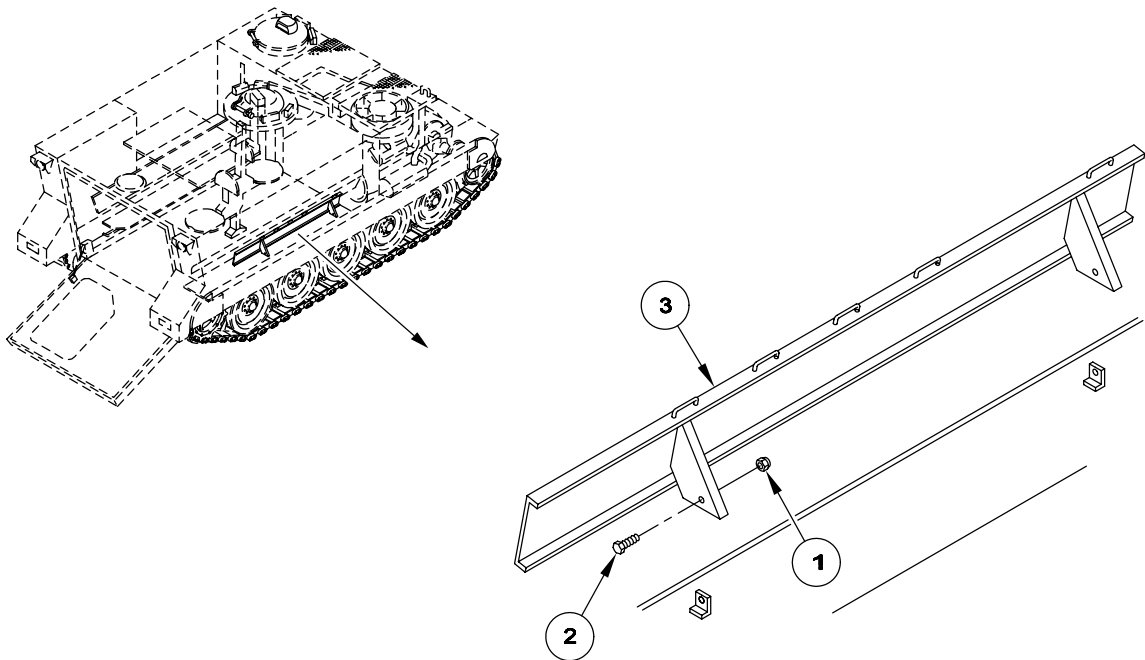
- Kit P/N 12313244 (19207)
- Locknut (2)

PREPARE CARRIER

NOTE

Check alarm kit before starting installation. Be sure alarm kit is complete. Install kit in right rear and left side center of troop compartment.

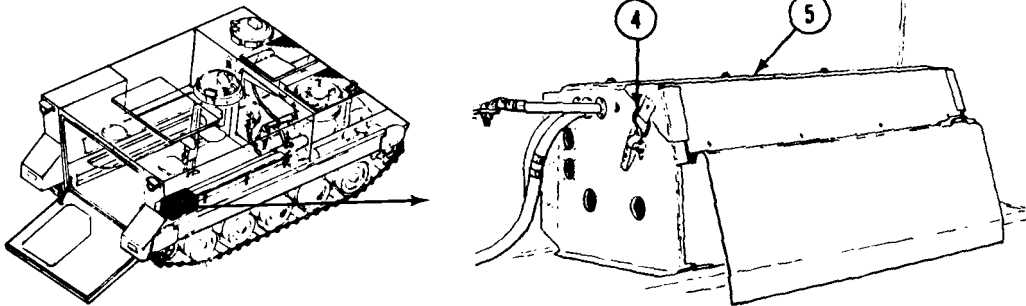
1. Remove two locknuts (1), screws (2), and right front personnel seat back rest (3) from sponson brackets. Remove back rest from carrier. Retain back rest and attaching parts. Discard locknuts.



**INSTALL CHEMICAL AGENT AUTOMATIC ALARM MOUNTING KIT
(M113A2 ONLY) — Continued**

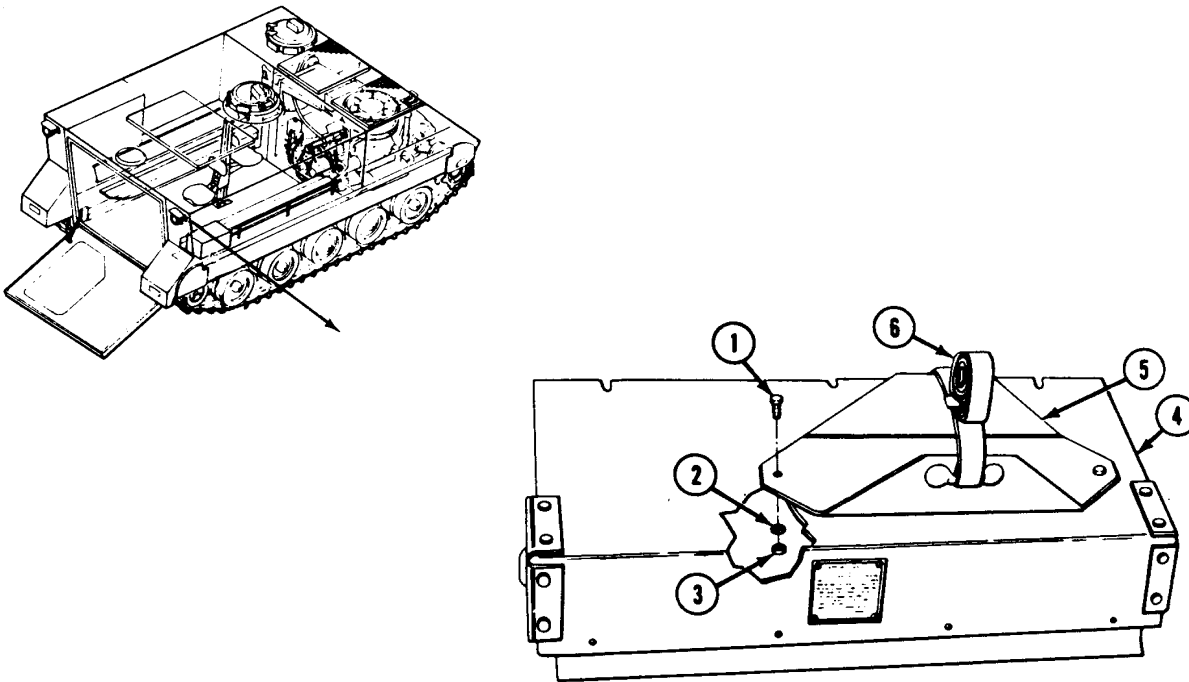
0098 00

2. Release latch (4) on each side of battery box. Lift and slide cover (5) from box. Retain cover.



INSTALLATION

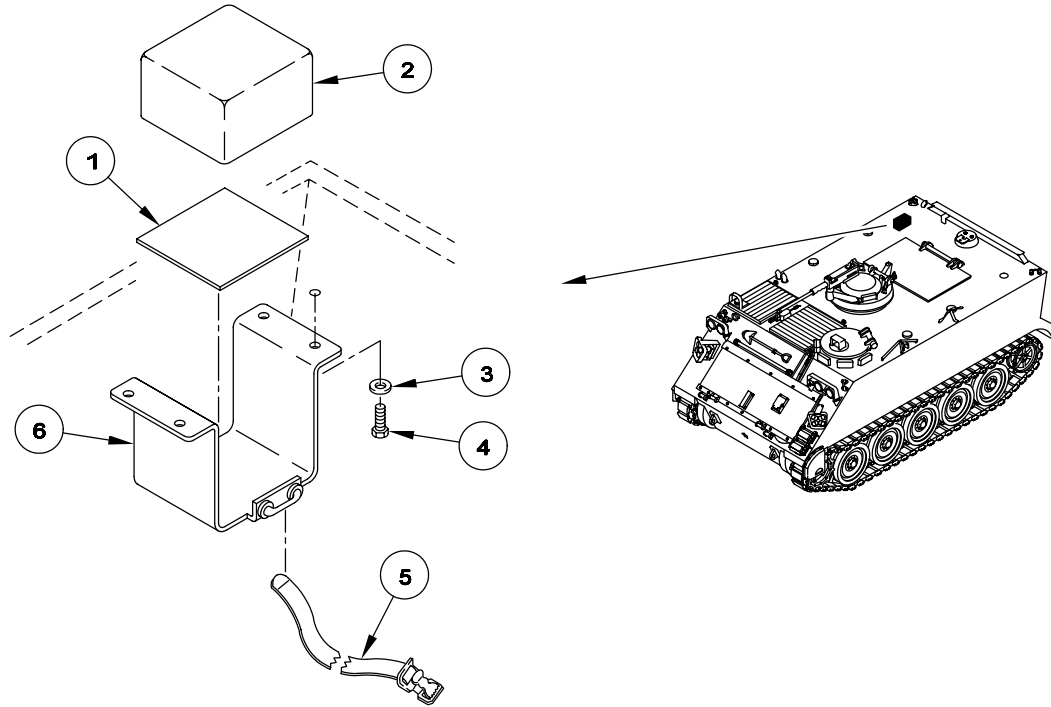
1. Remove two screws (1), washers (2), and locknuts (3) from battery box cover (4). Discard locknuts.
2. Place refill kit mounting bracket (5) on battery box cover (4). Secure with two screws (1), washers (2), and locknuts (3).
3. Install strap assembly (6) on bracket (5).



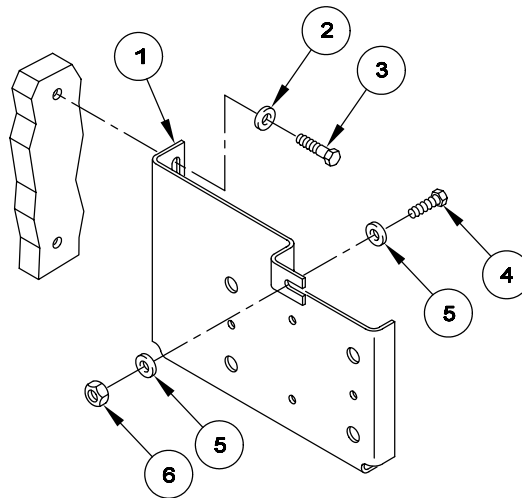
**INSTALL CHEMICAL AGENT AUTOMATIC ALARM MOUNTING KIT
(M113A2 ONLY) — Continued**

0098 00

4. Remove four screws (4) and washers (3) from overhead.
5. Place alarm spare battery bracket (6) on overhead. Secure with four washers (3) and screws (4). **TIGHTEN SCREWS TO 264-288 LB-IN (30-33 N·M) TORQUE.** Use torque wrench (WP 0104 00, Item 58).
6. Install strap (5) on alarm spare battery bracket (6).



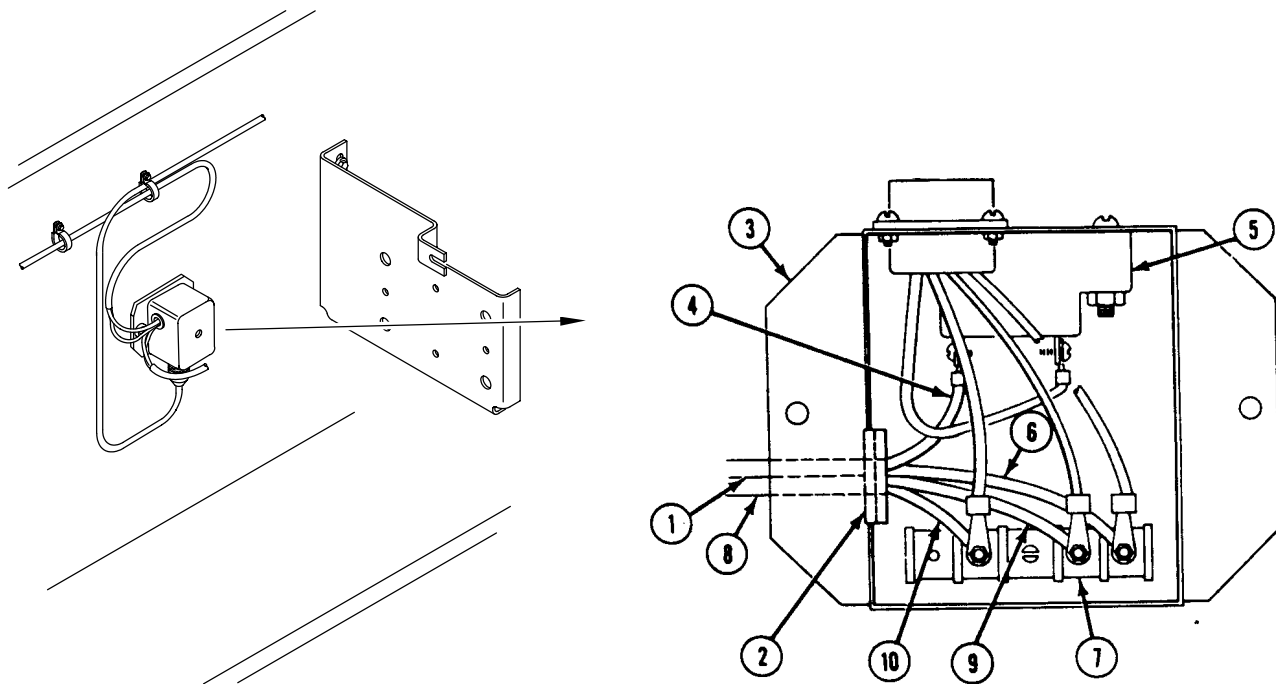
7. Remove two screws (3) and washers (2) from left hull plate.
8. Install bracket (1) with two screws (3) and washers (2) to hull.
9. Install screw (4), two washers (5), and locknut (6) to bracket (1).



**INSTALL CHEMICAL AGENT AUTOMATIC ALARM MOUNTING KIT
(M113A2 ONLY) — Continued**

0098 00

10. Thread battery cable (1) through rear grommet (2) of junction box (3).
11. Connect circuit 6B POS lead (4) to rear terminal of circuit breaker (5).
12. Connect circuit 7B NEG lead (6) to terminal strip (7).
13. Thread alarm unit cable (8) through rear grommet (2) of junction box (3).
14. Connect 509B lead (9) to terminal strip (7).
15. Connect 509C lead (10) to terminal strip (7).

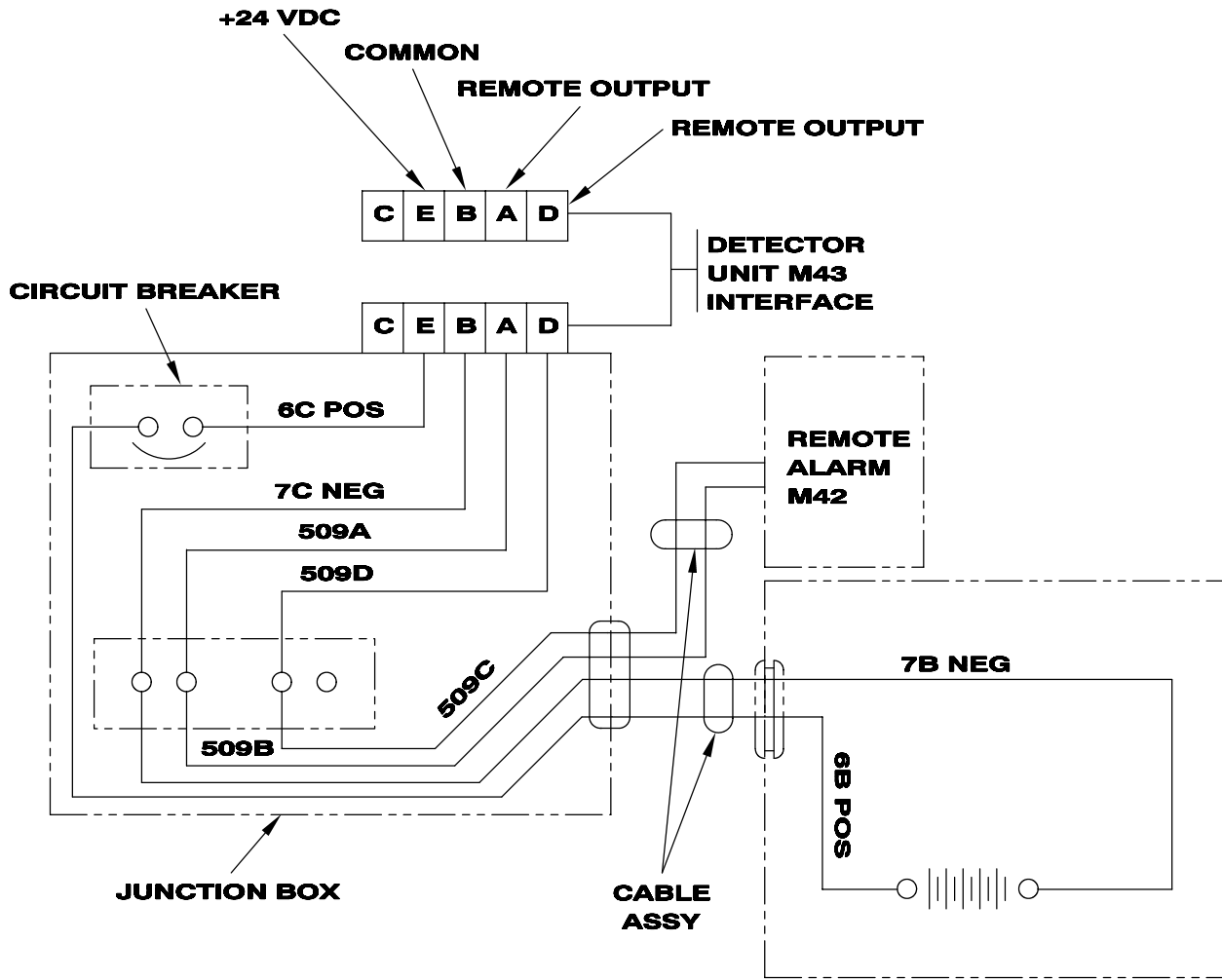


**INSTALL CHEMICAL AGENT AUTOMATIC ALARM MOUNTING KIT
(M113A2 ONLY) — Continued**

0098 00

NOTE

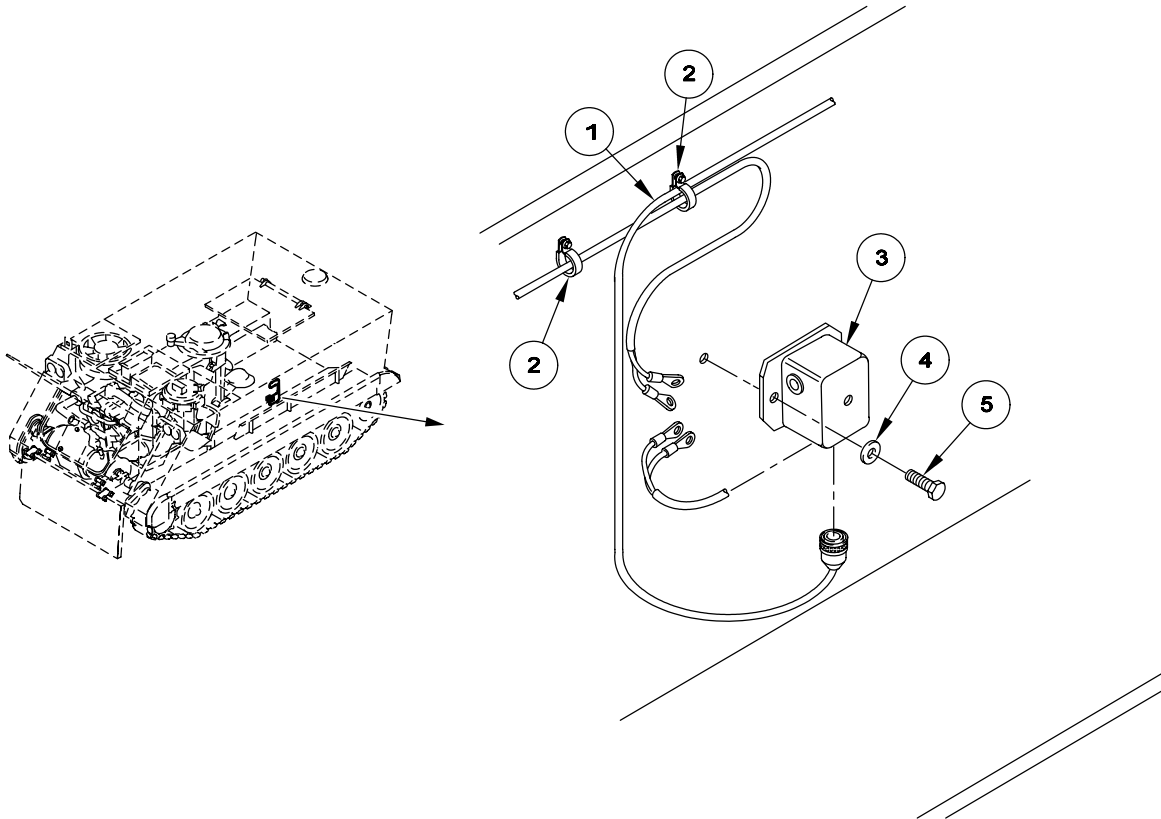
Check wiring connections with wiring diagram before attaching junction box.



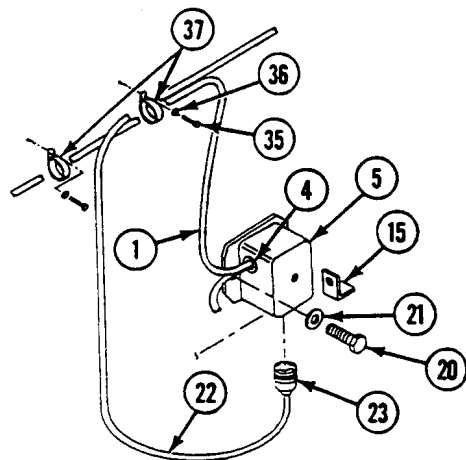
**INSTALL CHEMICAL AGENT AUTOMATIC ALARM MOUNTING KIT
(M113A2 ONLY) — Continued**

0098 00

16. Remove two screws (5) and washers (4) from hull.
17. Place junction box (3) on hull. Secure with two washers (4) and screws (5). **TIGHTEN SCREWS TO 72-78 LB-IN (8-9 N·M) TORQUE.** Use torque wrench (WP 0104 00, Item 57).
18. Route alarm unit cable (1) over cradle (2) and along main wiring harness.



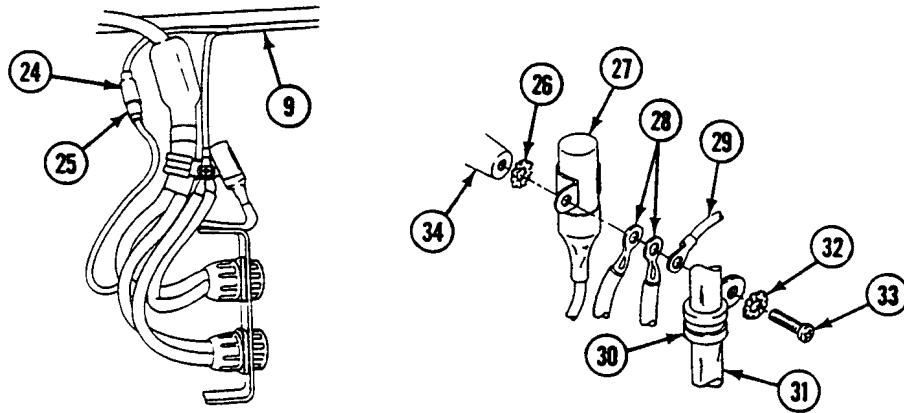
19. Connect wiring harness (22) plug (23) to jack on bottom of junction box (5).



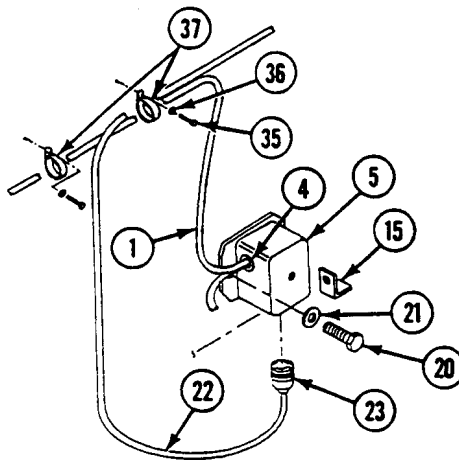
**INSTALL CHEMICAL AGENT AUTOMATIC ALARM MOUNTING KIT
(M113A2 ONLY) — Continued**

0098 00

20. Connect power cable (9) plug 6B POS (24) to socket (25).
21. Install new lockwasher (26), capacitor bracket (27), two ground leads (28), power cable (9), ground lead (29), clamp (30) with cable (31), new lockwasher (32), and screw (33) on weldnut (34).



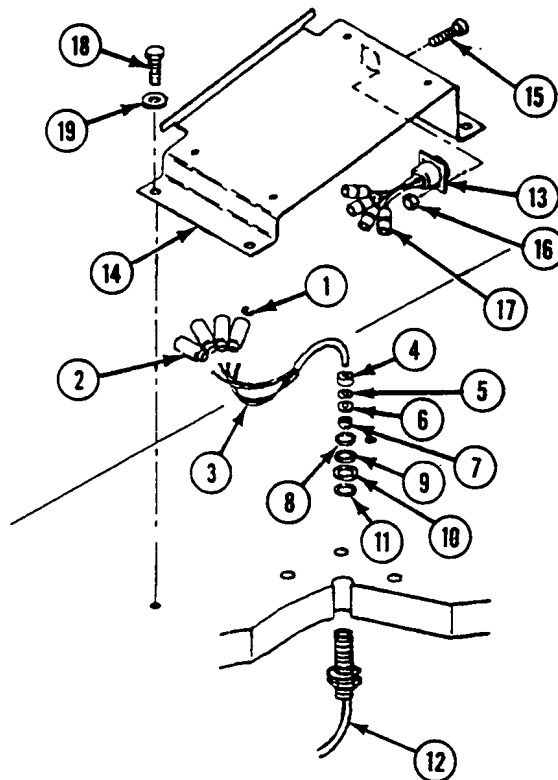
22. Install two screws (35), washers (36), and clamps (37) with cable (1) and wiring harness (22) on hull.



**INSTALL CHEMICAL AGENT AUTOMATIC ALARM MOUNTING KIT
(M113A2 ONLY) — Continued**

0098 00

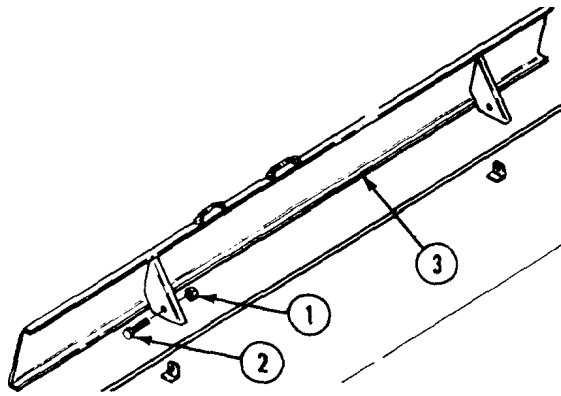
23. Remove four C-clip retainers (1) and backshells (2) from four leads (3).
24. Remove coupling nut (4), spring tension washer (5), retainer (6), bushing (7), nut (8), lockwasher (9), flat washer (10), and insulator washer (11) from harness (12).
25. Insert harness (12) through hole in carrier top plate. Have helper assist.
26. Install insulator washer (11), flat washer (10), lockwasher (9), nut (8), bushing (7), retainer (6), spring tension washer (5), and coupling nut (4) on harness (12).
27. Install four backshells (2) and C-clip retainers (1) on leads (3).
28. Attach wiring harness (13) to bracket (14) with four screws (15) and new locknuts (16).
29. Attach four leads (3) to leads (17) as follows:
 - 509E to 509G
 - 509F to 509H
 - 6D POS to 6E POS
 - 7D NEG to 7E NEG
30. Install bracket (14) on carrier with four screws (18) and washers (19).



**INSTALL CHEMICAL AGENT AUTOMATIC ALARM MOUNTING KIT
(M113A2 ONLY) — Continued**

0098 00

31. Install battery box cover (see your -20).
32. Install front personnel seat back rest (3) to sponson brackets with two screws (2) and new locknuts (1).



33. Test electrical continuity of chemical alarm kit circuits (see your -20).

FOLLOW-THROUGH STEPS

1. Raise and lock ramp (see your -10).
2. Stop engine (see your -10).

END OF TASK

CHAPTER 21

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR SHIPPING CLOSURE AND FRAME

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
REMOVE SHIPPING CLOSURE AND FRAME (ALL EXCEPT M577A2 AND M1068).....	0099 00
REMOVE SHIPPING CLOSURE AND FRAME (M577A2 AND M1068 ONLY).....	0100 00

REMOVE SHIPPING CLOSURE AND FRAME (ALL EXCEPT M577A2 AND M1068)

0099 00

THIS WORK PACKAGE COVERS:

Removal (page 0099 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Equipment Condition

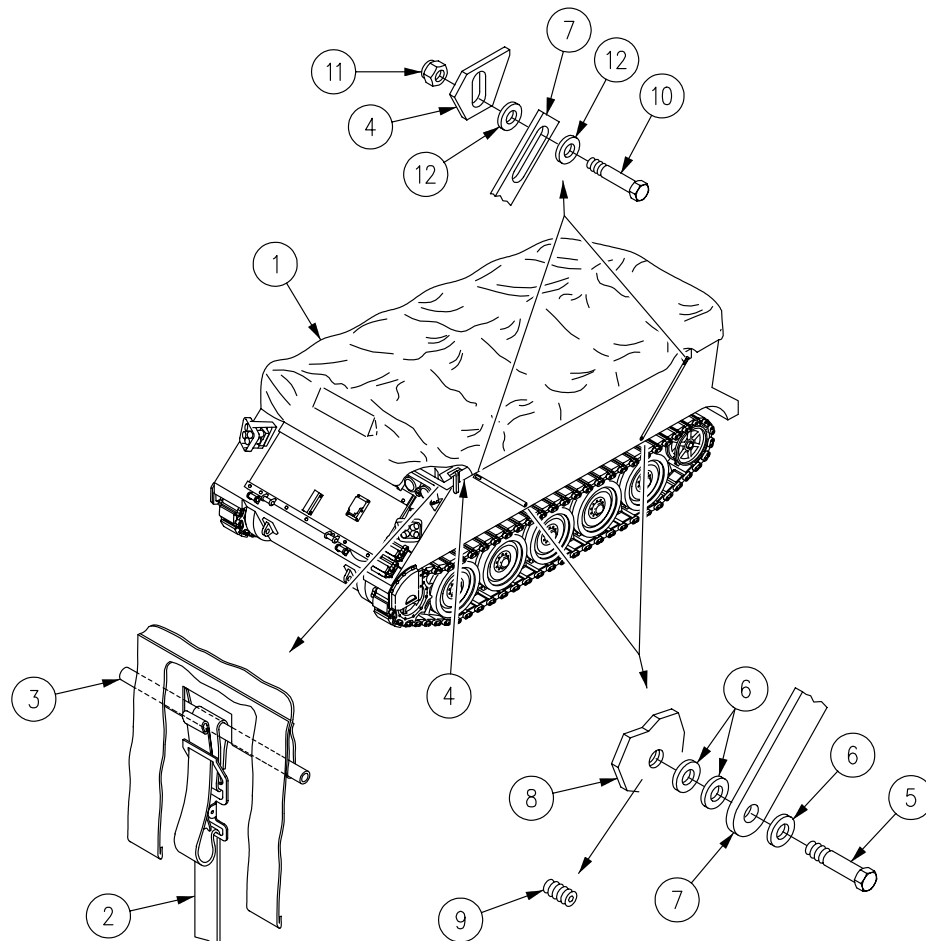
Carrier delivered to using troops

REMOVAL

NOTE

Do not damage or destroy the closure cover or frame. They can be used again. Turn them in to supply personnel.

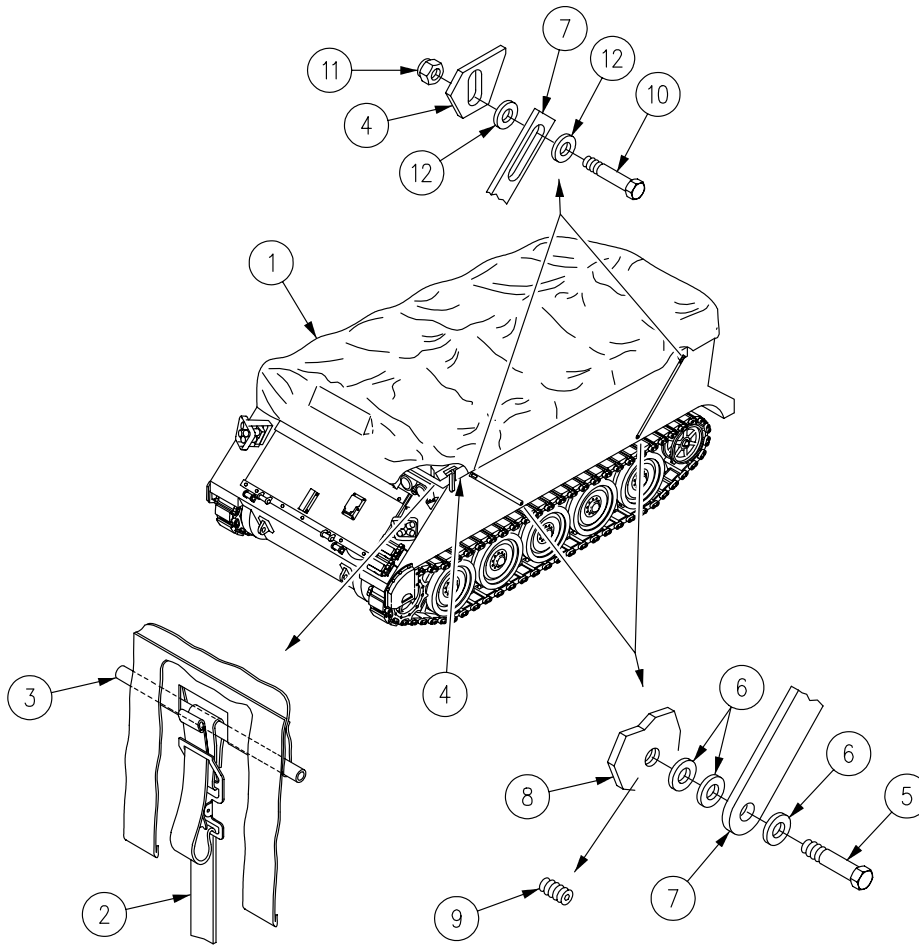
1. Fold up cover (1). Release 16 straps (2).
2. Remove eight rods (3) from cover (1).
3. Remove cover (1) from frame (4).



REMOVE SHIPPING CLOSURE AND FRAME (ALL EXCEPT M577A2 AND M1068) — Continued

0099 00

4. Remove four screws (5), 12 washers (6), and four tiedown supports (7) from four track shroud holes (8).
5. Install setscrew (9) in track shroud hole (8).
6. Remove four screws (10), nuts (11), eight washers (12), and four supports (7) from frame (4).
7. Remove frame (4) from carrier.



END OF TASK

REMOVE SHIPPING CLOSURE AND FRAME (M577A2 AND M1068 ONLY)

0100 00

THIS WORK PACKAGE COVERS:

Removal (page 0100 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H10

Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0104 00, Item 19)

Equipment Condition

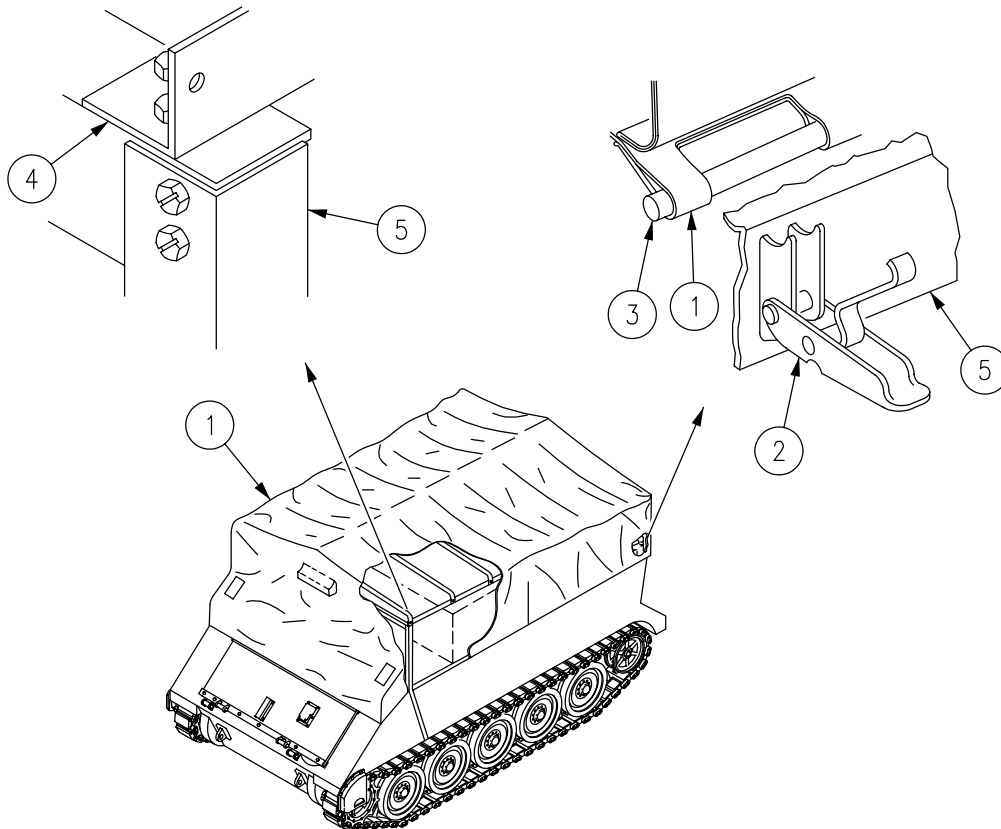
Carrier delivered to using troops

REMOVAL

NOTE

Do not damage or destroy the closure cover or frames. They can be used again. Turn them in to supply personnel.

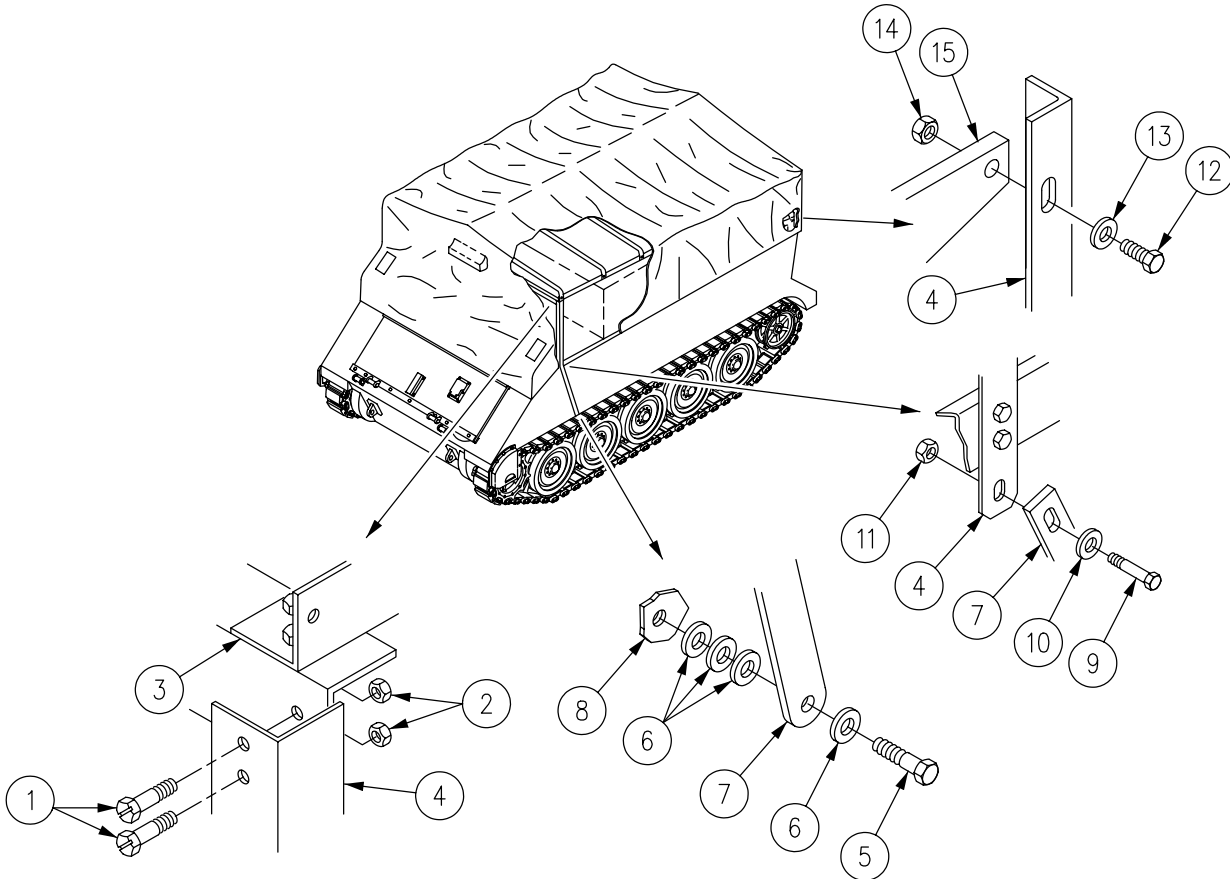
1. Fold up cover (1). Release 20 rod clamps (2). Have helper assist.
2. Remove ten rods (3) from cover (1).
3. Remove cover (1) from upper frame (4) and lower frame (5). Have helper assist.



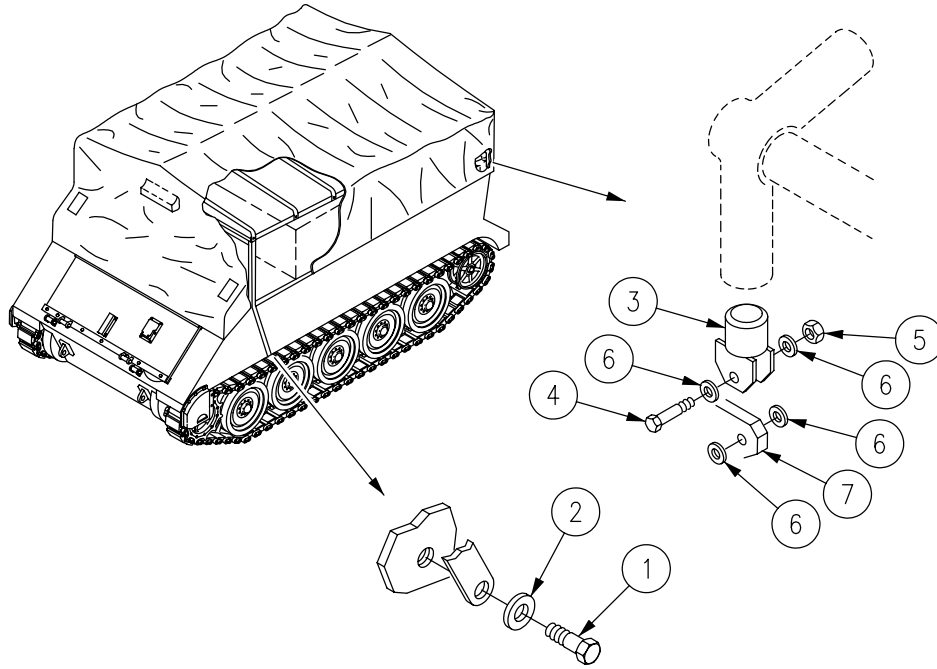
REMOVE SHIPPING CLOSURE AND FRAME (M577A2 AND M1068 ONLY) — Continued

0100 00

4. Remove eight screws (1), nuts (2), and upper frame (3) from lower frame (4). Have helper assist.
5. Remove two screws (5), eight washers (6), and two frame supports (7) from two track shroud hole (8).
6. Remove two screws (9), washers (10), nuts (11), and frame supports (7) from lower frame (4).
7. Remove two screws (12), washers (13), nuts (14), and lower frame (4) from two extension brackets (15).
8. Remove lower frame (4) from carrier. Have helper assist.



9. Remove bolts (1) and washers (2) from driver's compartment.
10. Remove two end fittings (3), screws (4), nuts (5), and eight washers (6) from driver's compartment.
11. Install two end fittings (3) on two extension brackets (7). Secure with two screws (4), nuts (5), and eight washers (6).



END OF TASK

CHAPTER 22

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR GENERAL SUPPORT MAINTENANCE

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
REPLACE OVERSIZE SCREW INSERTS WITH LOCKRING.....	0101 00
REPLACE LOCKED-IN STUDS (M577A2 AND M1068 ONLY).....	0102 00

REPLACE OVERSIZE SCREW INSERTS WITH LOCKRING

0101 00

THIS WORK PACKAGE COVERS:

Installation (page 0101 00-1).

INITIAL SETUP:

Maintenance Level

General Support

Personnel Required

Track Vehicle Repairer 63H10

Tools and Special Tools

- Drill Set (WP 0104 00, Item 50)
- General Mechanic's Tool Kit (WP 0104 00, Item 19)
- Oversize Rosan Insert Tool Kit (WP 0104 00, Item 48)
- Portable Electric Drill (WP 0104 00, Item 10)
- Screw Threading Set (WP 0104 00, Item 37)
- Thread Inserter Holder Kit (WP 0104 00, Item 45)

Equipment Condition

- Engine stopped (see your -10)
 - Carrier blocked (see your -10)
 - Road wheel support arm removed (see your -20)
-

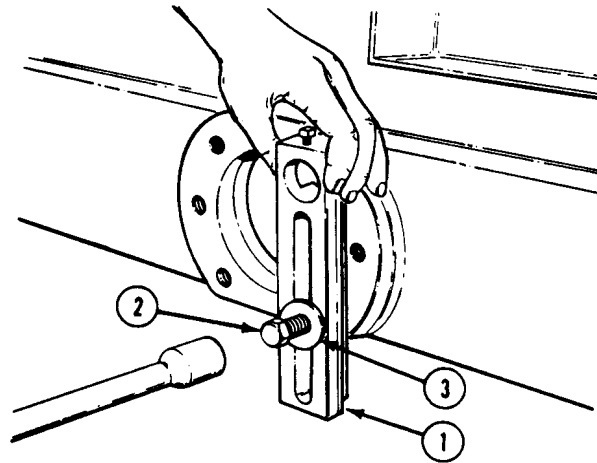
INSTALLATION

1. Align bushing hole of body (1) with existing insert hole in hull.

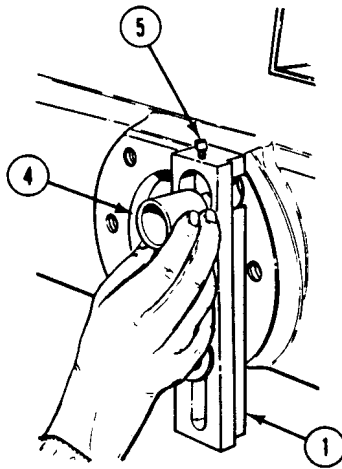
NOTE

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

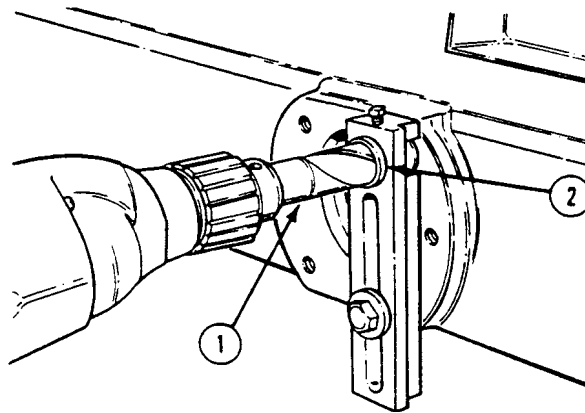
2. Install body (1) on hull. Secure with cap screw (2) and flat washer (3). Screw cap screw into a serviceable thread insert or tapped hole.



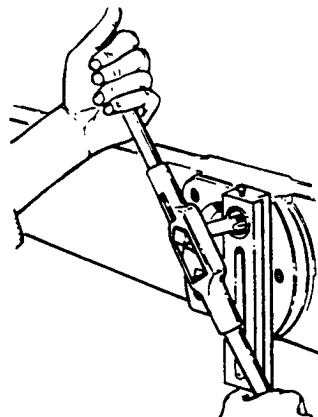
3. Install correct size bushing (4) in body (1). Secure with set screw (5).



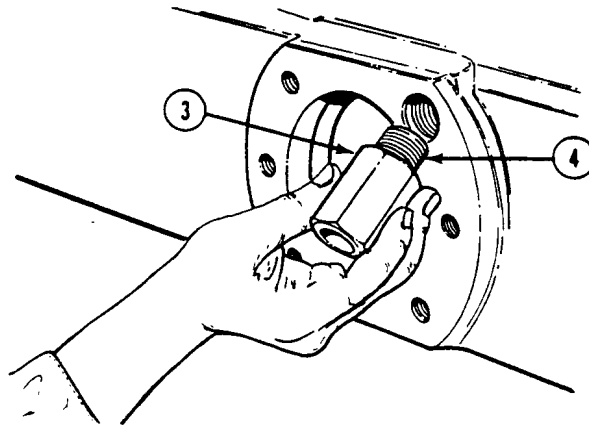
4. Use a hand drill and correct size counterbore drill (1) to drill through bushing (2) into hull to the depth of insert to be installed.
5. Counterbore to depth of lockring thickness plus 0.010 to 0.020 inch (0.254 to 0.508 mm).



6. Hand tap correct size threads.



7. Use wrench (3) to install oversize insert (4) in threaded hole.



8. Install oversize locking (5) flush with hull surface. Use drive tool (6).

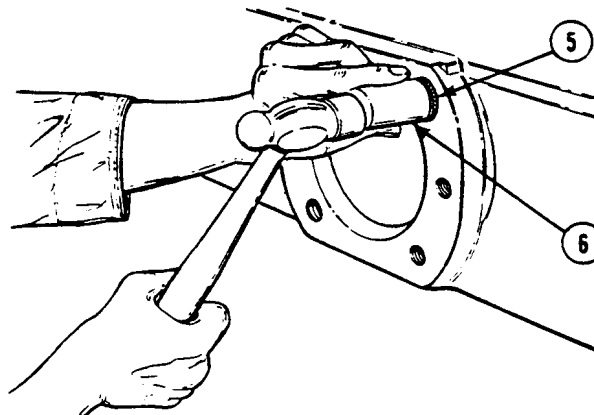


Table 1. OVERSIZE INSERT TECHNICAL DATA

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
3/8-16UNC	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

FOLLOW-THROUGH STEPS

1. Install road wheel support arm (see your -20).

END OF TASK

REPLACE LOCKED-IN STUDS (M577A2 AND M1068 ONLY)

0102 00

THIS WORK PACKAGE COVERS:

Removal (page 0102 00-1).
 Installation (page 0102 00-2).

INITIAL SETUP:

Maintenance Level

General Support

Materials/Parts

Stud

Tools and Special Tools

Drill Set (WP 0104 00, Item 50)
 Extractor Screw Set (WP 0104 00, Item 17)
 General Mechanic's Tool Kit (WP 0104 00, Item 19)
 Hacksaw (WP 0104 00, Item 23)
 Lockring Drive Tool (WP 0104 00, Item 15)
 Portable Electric Drill (WP 0104 00, Item 10)
 Screw Threading Set (WP 0104 00, Item 37)

Personnel Required

Track Vehicle Repairer 63H10

References

WP 0106 00

Equipment Condition

Engine stopped (see your -10)
 Carrier blocked (see your -10)

REMOVAL

1. Use a hacksaw to cut off broken stud as close to mounting surface as you can.
2. If a locked stud with serrated lockring is being removed, punch center of remaining stud. Drill a pilot hole.

NOTE

Key-locked studs have pre-drilled pilot holes.

3. Use an extractor to remove stud. Discard stud.

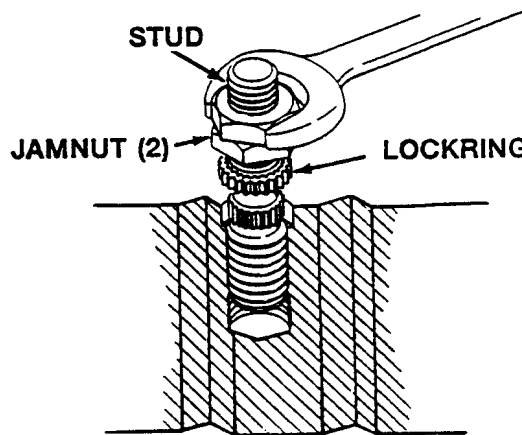
INSTALLATION

1. Use correct size tap drill (Table 1, page 0102 00-3) to drill hole for stud.
2. Tap threads. See Table 1, page 0102 00-3, for correct thread size.
3. Install new stud in threaded hole.
4. If stud cannot be turned by hand, lock two jamnuts on nut end of stud. Then turn with a wrench.

NOTE

See Table 1, page 0102 00-3, for correct nut thread size.

5. Remove jamnuts.
6. If stud with serrated lockring is to be installed, place lockring on stud.



**A. INSTALL STUD
USING TWO JAMNUTS**

7. Cut off a piece of heavy walled pipe or tubing to fit over stud as shown in Step 9. See WP 0106 00 for fabrication instructions.

NOTE

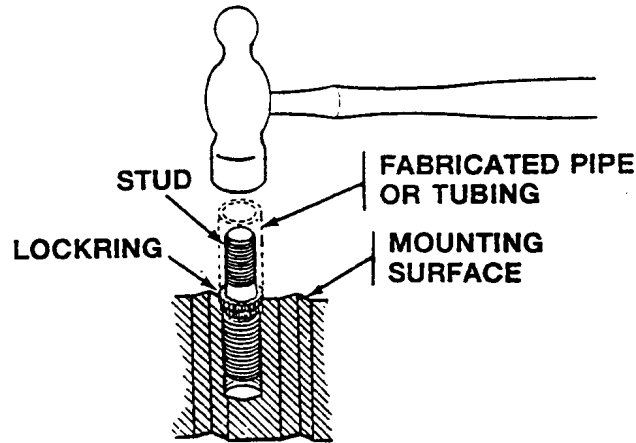
Installation of key-locked stud is similar to installation of stud with serrated lockring. Make sure fabricated pipe or tubing bears on keys. Drive straight down. Avoid breaking keys.

NOTE

Do not drive upper edge of lockring below upper edge of serrated part of stud. Drive straight down.

8. Use a hammer to drive keys or lockring down to secure stud.

9. Drive keys flush with mount surface.



B. PLACE TUBE ON LOCKRING AND DRIVE FLUSH WITH MOUNTING SURFACE

Table 1. LOCKED-IN STUDS

Nut and Thread Size	NSN or Part Number	Stud End	Application
3/8-24NF-3A	Stud - *5307-00-965-5686 10932377 (19207) Lockring - 5365-00-735-0196 7350196 (19207)	7/16-14UNC-2A (33/64 (13 mm) counterbore)	Covered extension (M577A2)
* Screw thread stud with serrated lockring.			

END OF TASK

CHAPTER 23

SUPPORTING INFORMATION

WORK PACKAGE INDEX

<u>Title</u>	<u>Sequence No.</u>
REFERENCES.....	0103 00
COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES LIST.....	0104 00
EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST.....	0105 00
FABRICATED TOOLS.....	0106 00

REFERENCES

0103 00

SCOPE

This appendix lists all forms, field manuals, technical manuals, and miscellaneous publications referenced to be used by personnel in operating and maintaining the carriers. The DA PAM 25-30 series Department of the Army Pamphlets should be consulted often for the latest changes or revisions to references given in this appendix and for new publications relating to the material covered in this technical manual.

FORMS

- Equipment Inspection and Maintenance Worksheet.....DA Form 2404
- Quality Deficiency Report.....SF 368
- Recommended Changes to Publications and Blank Forms.....DA Form 2028

FIELD MANUALS

- First Aid.....FM 4-25.11
- Fabric Repair.....FM 10-16

TECHNICAL MANUALS

- Cooling Systems: Tactical Vehicles.....TM 750-254
- Direct Support and General Support Maintenance Manual for Combat Vehicle, Anti-Tank, Improved TOW Vehicle M901A1TM 9-2350-259-34
- Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools List) for Right Angle Drive, Cooling Fan; Gearcase Transfer; Service Gearcase, Drive Assembly; Differential, Steering Control; Brake, Single Disk; Cylinder Assembly, Hydraulic Brake.....TM 9-2520-238-34P
- Direct Support and General Support Maintenance Manual: Angle Drive Cooling Fan; Gearcase Transfer; Differential, Steering Control: DS-200, Drive Assembly Output; Final Drive, Vehicular; Brake Assembly, Pivot Steer; Cylinder Assembly, Hydraulic Brake Master.....TM 9-2520-238-34
- Inspection, Care, and Maintenance of Antifriction Bearings.....TM 9-214
- Operator’s and Unit Maintenance Manual (Including Repair Parts and Special Tools List) for Tactical Command Systems used in M1068 Standardized Integrated Command Post System.....TM 11-7010-256-12&P
- Operator’s Manual: Carrier, Personnel, Full Tracked, Armored M113A2; Carrier, Command Post, Light, Tracked M577A2; Carrier, Smoke Generator, Full Tracked, M1059; Carrier, Mortar, 120 MM, Self-Propelled M1064; and Carrier, Standardized Integrated Command Post System, M1068; Combat Vehicle, Anti-Vehicle, Improved TOW Vehicle, M901A1.....TM 9-2350-261-10
- Operator’s Manual for Combat Vehicle, Anti-Tank, Improved TOW Vehicle, M901A1.....TM 9-2350-259-10
- Operator’s Manual for Mortar, 120MM Towed M120 and Mortar, 120MM Carrier Mounted M121.....TM 9-1015-250-10
- Operator’s, Unit, and Direct Support Maintenance Manual (Including Repair Parts and Special Tools List) for Modular Command Post System (MCPS).....TM 10-5410-229-13&P
- Operator’s, Unit, Direct Support and General Support Maintenance Manual for Lead-Acid Storage Batteries.....TM 9-6140-200-14
- Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tools List for Combat Vehicle, Anti-Tank Improved TOW Vehicle, M901A1TM 9-2350-259-24P

REFERENCES — Continued

0103 00

Organizational Maintenance Manual: Carrier, Personnel, Full Tracked, Armored, M113A2; Carrier, Command Post, Light Tracked, M577A2; Carrier, Mortar, 120 MM, Self Propelled, M1064; Carrier, Smoke Generator, Full Tracked, Armored, M1059; Combat Vehicle, Anti-Tank, Improved TOW Vehicle, M901A1; Carrier, Standardized Integrated Command Post System, M1068.....TM 9-2350-261-20

Painting Instructions for Army Material.....TM 43-0139

Procedures for Destruction of Electronics Material to Prevent Enemy Use (Electronics Command).....TM 750-244-2

Procedures for Destruction of Equipment in Federal Supply Classifications 1000, 1005, 1010, 1015, 1020, 1025, 1030, 1055, 1090 and 1095 To Prevent Enemy Use.....TM 750-244-7

Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use (US Army Tank-Automotive Command).....TM 750-244-6

Unit and Direct Support Maintenance (Including Repair Parts and Special Tools List) (Including Depot Repair Parts) for Mortar, 120MM: Towed M120 Mortar, 120MM Carrier-Mounted M121 Trailer Mortar, 120MM: M1100TM 9-1015-250-23&P

Unit and Intermediate Direct Support Maintenance Manual (Including Repair Parts and Special Tools List) for 107-MM Mortar Turntable and Mount, 81-MM Mortar Turntable and Mount, and 81-MM Mortar Bipod AssemblyTM 9-1015-232-23&P

Unit Maintenance, Direct Support and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools List) for Carrier, Personnel, Full Tracked, Armored, M113A2; Carrier, Command Post, Light Tracked, M577A2; Carrier, Smoke Generator, Full Tracked, M1059; Combat Vehicle, Anti-Tank, Improved TOW Vehicle, M901A1; Carrier, Mortar, 120 MM, M121, Self-Propelled, M1064; Carrier, Standardized Integrated Command Post System, M1068.....TM 9-2350-261-24P

Unit Maintenance Manual for Combat Vehicle, Anti-Tank, Improved Vehicle, M901A1.....TM 9-2350-259-20

Unit Maintenance Manual (Including Repair Parts and Speical Tool List) for Generator Set, Smoke, Mechanical: Pulse Jet, M157A2, w/120 Gallon Fog Oil TankTM 3-1040-283-20&P

MISCELLANEOUS PUBLICATIONS

CARC Spot Painting.....TB 43-0242

Carriers, Personnel, Full-Tracked: Armored, M113A2 and M113A3; Mortars, Self-Propelled, 107MM, M106, M106A2, and 81MM, M125A1 and M125A2, and 120MM, M1064; and Smoke Generator, M1059; Processing for Storage and Shipment of.....MIL-DTL-45360H

Chemical Conversion Coatings on Aluminum and Aluminum Alloys.....MIL-C-5541E

Operator’s Manual: Welding Theory and Application.....TC 9-237

The Army Maintenance Management System (TAMMS).....DA PAM 738-750

COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES LIST

0104 00

INTRODUCTION

Scope

This appendix lists all common tools, supplements and special tools/fixtures needed to maintain the M113A2, M577A2, M1064, M1059, M1068, and M901A1 carriers.

Explanation of Columns

Column (1) — Item Number. This number is assigned to the entry in the listing and is referenced in the Initial Setup to identify the item (e.g., “Torque Wrench (WP 0104 00, Item 55)”).

Column (2) — Name. This column lists the item by noun nomenclature and other descriptive features (e.g., “Sander, disk, electrical”).

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 appendix.

Table 1. Tool Identification List

(1) ITEM NO.	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
1	ADAPTER, HOISTING, TRANSMISSION	4910-00-572-8614	8356184	TM 9-2350-261-24P
2	ADAPTER, SPINDLE, PORTABLE SANDER	5130-00-293-2330	CP-50	SC 4940-95-CL-A31
3	APRON, UTILITY	8415-00-082-6108	MIL-A-41829	SC 4910-95-CL-A01
4	AUTOMOTIVE FUEL AND ELECTRICAL SYSTEM REPAIR TOOL KIT	5180-00-754-0655	SC4910-95-CL-A50	SC 5180-95-CL-B08
5	BRUSH, WIRE, SCRATCH	7920-00-291-5815	HB178	SC 4940-95-CL-B04
6	CALIPERS, MICROMETER, INSIDE 0-6 INCH	5120-00-229-3058	184	SC 3470-95-CL-A15
7	CALIPERS, MICROMETER, OUTSIDE 0-3 INCH	5120-00-554-7135	GGG-C-105	SC 4910-95-CL-A63
8	CLINOMETER	6675-00-777-4529	TB107A	TM 9-2350-261-24P
9	DEGREASER	4940-00-078-9192	2A	SC 4910-95-CL-A76
10	DRILL, PORTABLE ELECTRIC, 1/2 INCH	5130-00-293-1849	WD-661-TY3CLA	SC 3470-95-CL-A74
11	DRILL, PORTABLE ELECTRIC, 3/4 MORSE TAPER	5130-00-473-6228	ES212W5TAND	SC 4910-95-CL-A31

COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES
LIST — Continued

0104 00

(1) ITEM NO.	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
12	DRILL SET, TWIST: MORSE, 1-1/32 TO 1-1/4 INCH	5133-00-542-4001	GGG-D-751	TM 9-2350-261-24P
13	DRILL SET, TWIST: MORSE, 5/64 #2	5133-00-277-6942	74357	TM 9-2350-261-24P
14	DRILL SET, TWIST	5133-00-449-6775	GGG-D-751	SC 4910-95-CL-A01
15	DRIVE TOOL, LOCKRING, CIRCUIT CARD	5120-01-165-0488	R112D	TM 9-2350-261-24P
16	ELECTRICAL TOOL KIT	5180-00-876-9336	7550526	SC 4910-95-CL-A31
17	EXTRACTOR SCREW SET	5120-00-610-1888	A-A-28	SC 4910-95-CL-A31
18	FLOW TEST MACHINE, RADIATOR	4910-00-075-2395	35A	SC 4910-95-CL-A76
19	GENERAL MECHANIC'S TOOL KIT	5180-00-177-7033	SC5180-90-CL-N26	SC 5180-90-CL-N26
20	GLOVES, WELDER'S, LEATHER	8415-00-268-7859	A-A-50022	SC 5910-95-CL-A31
21	GOGGLES, INDUSTRIAL	4240-00-269-7912	A-A-1814	SC 3431-95-CL-A31
22	GUN, SOLDERING	3439-00-542-0396	8200G3	SC 4910-95-CL-A31
23	HACKSAW, FRAME	5110-00-289-9657	163-20	SC 4910-95-CL-A31
24	HAMMER, PNEUMATIC, PORTABLE	5130-00-889-8984	A-A-2350	GSA SUPPLY CATALOG
25	HELMET, WELDER'S	4240-00-540-0623	A-A-1994	SC 4940-95-CL-B04
26	MECHANICAL PULLER KIT	5180-00-423-1596	PE12	SC 4910-95-CL-A31
27	BODY AND FENDER REPAIR TOOL KIT	5180-00-754-0643	SC5180-90-CL-N34	SC 5180-90-CL-N34
28	MULTIMETER, DIGITAL	6625-01-265-6000	27/FMW/ACCE	SC 4910-95-CL-A31
29	PLIERS, RETAINING RING, INTERNAL, 4 INCH TO 6.5 INCH	5120-00-293-0186	7082060	SC 4910-95-CL-A31
30	PLIERS, SNAP RING	5120-00-595-9551	APS10254	SC 4910-95-CL-A31
31	POSITIONER, BEARING	4910-01-128-0093	12313101	TM 9-2350-261-24P
32	PRESS, ARBOR, HAND OPERATED, 60 TON	3444-00-449-7295	26A49	SC 4910-95-CL-A31
33	RADIATOR TEST PLUG SET	4910-00-273-3660	2005-S-S	SC 4910-95-CL-A76
34	SANDER, DISK, ELECTRICAL	5130-00-857-8526	00S90	SC 4940-95-CL-A31
35	SANDER, DISK, ELECTRICAL	5130-00-596-9728	00-S-90	SC 3431-95-CL-A01
36	SCALE, MAIL AND PARCEL POST (5 LBS)	6670-01-021-4860	1509	SC 4910-95-CL-A31
37	SCREW THREADING SET	5180-00-448-2362	GGG-T-330	SC 4910-95-CL-A31

**COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES
LIST — Continued**

0104 00

(1) ITEM NO.	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
38	SEWING MACHINE, INDUSTRIAL	3530-01-182-8560	206RB1 (110/ 220VAC60/1)	TM 9-2350-261-24P
39	SLING, ENDLESS	3940-00-675-5003	PD101-96	TM 9-2350-261-24P
40	SLING ASSEMBLY, ENGINE AND DIFFERENTIAL	3940-00-646-6893	10942647	TM 9-2350-261-24P
41	SOLDERING AND DESOLDERING SET	3439-00-460-7198	W-TCP-K	SC 3431-95-CL-A01
42	STAKER, BEARING	5120-01-128-0094	12313102	TM 9-2350-261-24P
43	STAND, RADIATOR, TEST	4910-00-078-9190	MILS4534	SC 4910-95-CL-A76
44	TAPE, MEASURING	5210-00-234-6745	GGG-T-106	SC 4910-95-CL-A31
45	THREAD INSERTER HOLDER KIT	5180-00-966-5958	10932383	TM 9-2350-261-24P
46	TOOL KIT, ELECTRONIC EQUIPMENT	5180-00-610-8177	TK-105	SC 5180-91-CL-R07
47	TOOL KIT, RADIO EQUIPMENT	5180-00-064-5178	TK-101/G	SC 5180-91-CL-R13
48	TOOL SET, OVERSIZE ROSAN INSERT	5180-00-966-5961	10932474	TM 9-2350-261-24P
49	TRAILER MOUNTED WELDING SHOP	3431-00-935-7821	MILW52629	SC 3431-97-CL-E03
50	TWIST DRILL SET, 1/16 TO 1/2 INCH	5133-00-293-0983	DB129B	SC 4910-95-CL-A31
51	TWIST DRILL SET, 33/64 TO 3/4 INCH	5133-00-596-8088	GGG-D-751	SC 3470-95-CL-A02
52	WELDING MACHINE, ARC	3431-01-032-6289	7550000	SC 3431-95-CL-A01
53	WRENCH KIT, 5MM TO 12MM, OPEN END	5120-01-070-8954	E5860MDFSS	SC 4910-95-CL-A31
54	WRENCH, OPEN END FIXED 1-1/8 X 1-5/16	5120-00-184-8438	1037A	SC 4910-95-CL-A01
55	WRENCH, TORQUE, 1/2 INCH DRIVE, 0-170 FT-LB	5120-00-640-6364	A-A-2411	SC 4910-95-CL-A31
56	WRENCH, TORQUE, 1/2 INCH DRIVE, 0-150 FT-LB	5120-00-247-2540	F150	SC 4910-95-CL-A31
57	WRENCH, TORQUE, 3/8 INCH DRIVE, 0-150 IN-LB	5120-00-230-6380	TE12A	SC 4910-95-CL-A31
58	WRENCH, TORQUE, 3/8 INCH DRIVE, 0-600 IN-LB	5120-00-542-5681	B58	SC 5180-95-CL-A12

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST**0105 00****INTRODUCTION****Scope**

This appendix lists expendable supplies and materials you will need to maintain the M113A2, M577A2, M1064, M1059, M1068, and M901A1 carriers. These items are authorized to you by CTA 50-570, Expendable 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 Materials/Parts section of the task to identify the item (e.g., “Solvent, cleaning compound (WP 0105 00, Item 10)”).

Column (2) — Level. This column identifies the lowest level of maintenance that requires the listed item.

O — Unit Maintenance

F — Direct Support Maintenance

H — General Support Maintenance

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. The last line for each item indicates the Commercial and Government Entity Codes (CAGEC) in parentheses followed by the part number.

Column (5) — Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., EA, IN, PR). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Table 1. Expendable and Durable Items List

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC, PART NUMBER	(5) U/M
1	O	8040-01-068-2423	ADHESIVE SEALANT (94960) 2141PT	PT
2	O	8040-00-839-4919	ADHESIVE SEALANT (04963) EC1099	QT
3	O	8040-00-728-3088	ADHESIVE SEALANT (78500) 1199-T-3842	OZ
4	F	8030-01-124-5034	ANODIC COATING (81349) MIL-A-8625	PT
5	O	8030-00-251-3980	ANTISEIZE COMPOUND (81349) MIL-A-907	LB
6	O	5110-00-277-4588	BLADES, HACKSAW (54940) 31-51024	EA
7	O	8305-00-616-0022	CLOTH, VINYL COATED NYLON (81349) MIL-C-20696	YD
8	O	8305-00-170-3903	COTTON DUCK CLOTH (81348) CCCC 428	YD
9	F	5350-00-221-0872	CLOTH ABRASIVE (CROCUS) (58536) A-A-1206	EA

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST — Continued

0105 00

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC, PART NUMBER	(5) U/M
10	O	6850-01-277-0595	CLEANING COMPOUND SOLVENT (59557) 134 HI-SOLV	GL
11	O	9150-01-152-4119	ENGINE LUBRICATING OIL (81349) MIL-L-2104GRADE15W40	GL
12	O	7930-00-282-9699	GENERAL DETERGENT (81349) MIL-D-16791	GL
13	O	9150-01-197-7690	GREASE, AUTOMOTIVE, 1.75 LB CAN (81349) MIL-G-10924	CN
	O	9150-01-197-7689	GREASE, AUTOMATIC, 6.50 LB CAN (81349) MIL-G-10924	CN
	O	9150-00-190-0906	GREASE, AUTOMATIC, 25 LB CAN (81349) MIL-G-10924	CN
14	O	5970-00-161-7422	INSULATING VARNISH (24446) 1201	GL
15	O	5970-00-816-6056	INSULATION TAPE (81348) HH-I-595-B-108-0	FT
16	F	8030-00-664-4944	PRESERVATIVE COATING, CANVAS (81348) TT-P-595	GL
17	O	8030-01-166-0675	SEALING COMPOUND (05972) 567-47	EA
18	O	8030-00-252-3391	SEALING COMPOUND (81349) MIL-S-45180TY2	OZ
19	F	8030-00-924-1878	SEALING COMPOUND (81349) MIL-S-22473	PT
20	O	8030-00-723-5344	SEALING COMPOUND, FUEL TANK (83574) PR-1440A-2	QT
21	O	8030-00-980-3975	SEALING COMPOUND PRIMER (05972) 764-56	OZ
22	O	6850-00-880-7616	SILICONE COMPOUND (81349) MIL-S-8660	OZ
23	F	3439-01-219-7884	SOLDERING FLUX (85150) DAYFLO STD	GL
24	O	5970-00-841-1172	TAPE, INSULATION (81349) MIL-I-22444	EA
25		8310-00-988-1301	THREAD, POLYESTER (70167) 23B28030-3	TU
26	O	3439-00-453-5472	TIN ALLOY SOLDER (81348) SN60WRMAP2 0.036 1LB	LB

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST — Continued

0105 00

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC, PART NUMBER	(5) U/M
27	F	3439-00-803-9498	WELDING ELECTRODE (31505) AWSA5.10-69ER53560.0471/2LB	OZ
28	O	7920-00-205-1711	WIPING RAG (58536) A-A-2522	LB

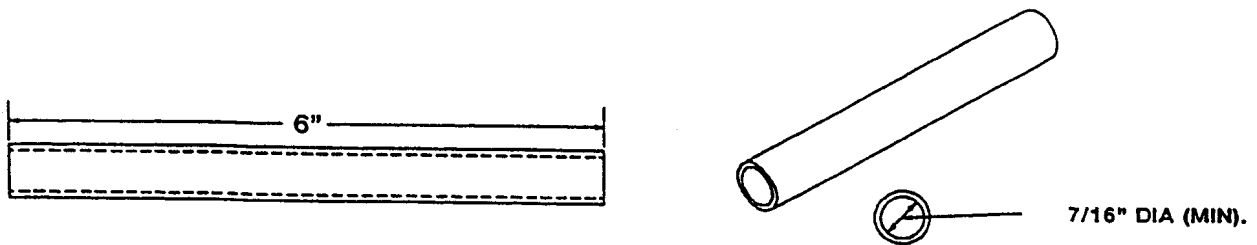
FABRICATED TOOLS

0106 00**SCOPE**

This work package includes instructions for making tools authorized to be fabricated at DS or GS maintenance levels. 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 task.

FABRICATION INSTRUCTIONS

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.



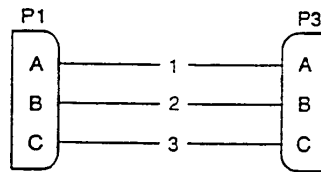
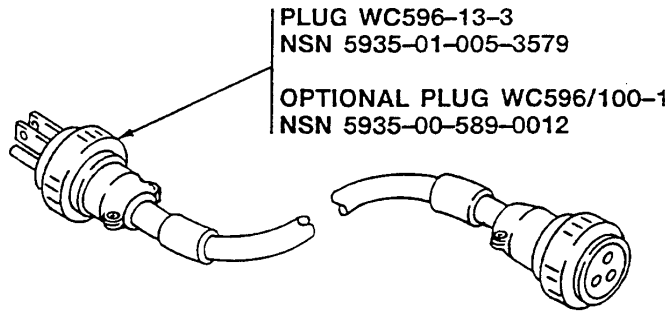
Lockring Drive Tool for Stud Insert

MATERIALS/PARTS 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.



WIRING DIAGRAM

1 = HOT
2 = NEUTRAL
3 = GROUND

Special Purpose Power Cable for Power Control Enclosure (M1068 Only)

MATERIALS/PARTS REQUIRED

W3 Cable P/N 12383899

Plug WC596-13-3 or WC596/100-1

NOTES

1. Remove connector labeled W3 P1 (A3 J1) from W3 cable.
2. Cut cable to required length (for connecting power control enclosure to AC outlet).

WARNING



Incorrect polarity can harm personnel and damage equipment when power is applied to the power control enclosure. Make sure polarity is correct when installing plug on cable.

3. Install new plug WC596-13-3 or WC596/100-1 on W3 cable. Connect per wiring diagram.
4. Purpose of cable is to connect the power control enclosure to shop AC power.

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PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER TM 9-2350-261-34	DATE 26 AUGUST 2005	TITLE Unit Maintenance Manual for M113A2, M577A2, M1064, M1068, M1059 and M901A1
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ITEM	PAGE	PARA	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON
0052 00-4						Inspection Step 1 WP reference should be (WP 0003 00) <div style="text-align: center; font-size: 4em; opacity: 0.5;"> SAMPLE </div>

**Reference to line numbers within the paragraph or subparagraph.*

TYPED, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION
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PART III – REMARKS *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed).*

SAMPLE

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By Order of the Secretary of the Army:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

Official:


SANDRA R. RILEY
Administrative Assistant to the
Secretary of the Army
0520004

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
 1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
 1 Kilogram = 1000 Grams = 2.2 Lb.
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
 1 Sq. Kilometer = 1,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

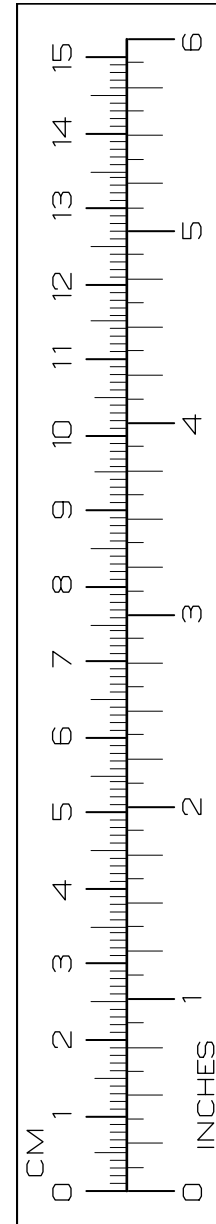
1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $(9/5 \times ^{\circ}\text{C}) + 32 = ^{\circ}\text{F}$

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	Millimeters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



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