
TECHNICAL MANUAL

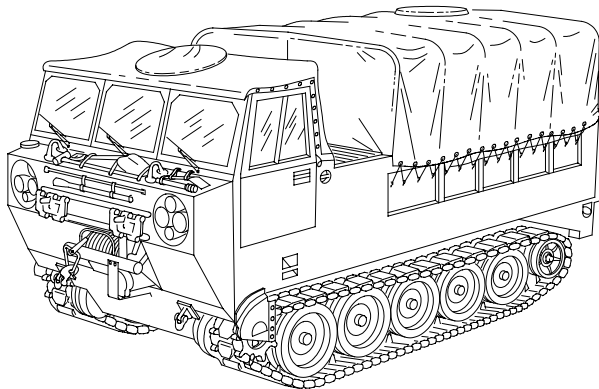
DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

FOR

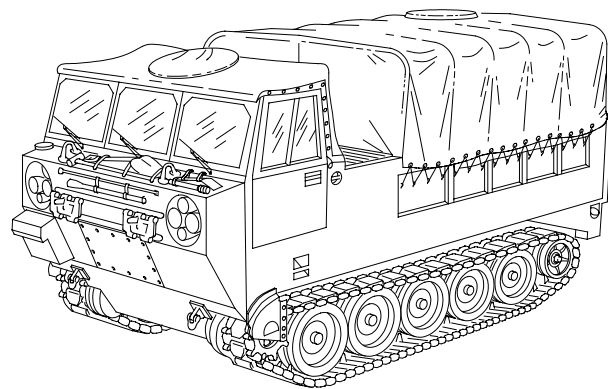
CARRIER, CARGO, TRACKED, 6-TON M548A1 2350-01-096-9356 (EIC: AEU)

M548A3

2350-01-369-6081 (EIC: AE9)



M548A1



M548A3

SUPERSEDURE NOTICE — This manual supersedes TM 9-2350-247-34 dated August 1994, including all changes.

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

HEADQUARTERS, DEPARTMENT OF THE ARMY

30 June 2001

WARNING SUMMARY

WARNING SUMMARY

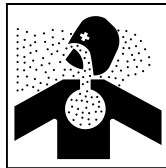
This list summarizes critical WARNINGS in this manual. They are repeated here to let you know how important they are. Study these WARNINGS carefully; they can save your life and the lives of personnel you work with.

WARNING



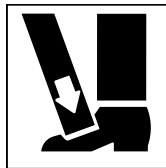
Fuel fumes can explode and burn you. Drain all fuel before welding. Disconnect and cap all fuel and vent lines. Purge fuel residue and fumes by steam cleaning. Purge air from fuel tank with argon or CO2 gas.

WARNING



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

WARNING



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

WARNING



Transmission is heavy. Use a lifting device.

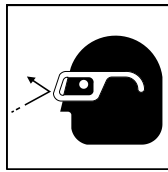
WARNING SUMMARY (cont)

WARNING



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

WARNING



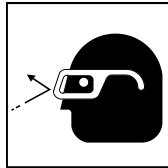
Air pressure in excess of 30 psi (207 kPa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

WARNING



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.

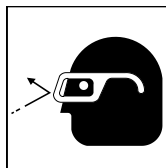
WARNING



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

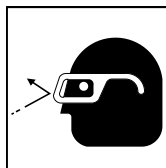
WARNING SUMMARY (cont)

WARNING



Steam can splash back and burn you. Direct steam splash back away from you and others. Always wear full eye protection.

WARNING



Oil can splash back and burn you. Always wear full eye protection.

WARNING



Adhesive is flammable and can injury you. Keep it away from heat, sparks, and open flame. Avoid repeated or prolonged breathing of vapors. Avoid contact with your skin.

WARNING



Canvas preservative is flammable. Keep it away from open flame. Keep preservative off your skin. Wash well after handling. Use solvent spray precautions.

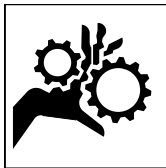
WARNING SUMMARY (cont)

WARNING



Failure to set the parking brake and block the road wheels can allow the carrier to move and could result in injury or death. Always set the parking brake and block road wheels before working on the carrier.

WARNING



Power cable connections should not be attempted until grounding system and signal/data cabling have been completed.

System ground must be completed prior to making any power connections. Failure to do so may result in personal injury and/or damage to the equipment.

Improper or loose connection between the surface wire grounding systems and ground lugs could cause a short in the system, which may cause personal injury.

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 competent in giving first aid. When an operator helps a technician, that operator must be warned about dangerous areas.

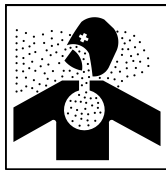
SHUT OFF POWER supply to equipment before beginning work. Make sure all external power is off/disconnected.

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

KEEP one hand away from the equipment to reduce the hazard of current flowing through life-sustaining organs of the body.

WARNING SUMMARY (cont)

WARNING



The following first aid supplies should be supplied, with instructions for use, to personnel working with polyurethane foam:

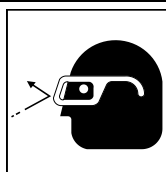
Respirator - to be worn at all times unless forced ventilation is available.

Goggles — TO BE WORN AT ALL TIMES.

Plastic laboratory apron or suitable coveralls and neoprene gloves.

At least 1 gallon of isopropanol (rubbing alcohol) for washing material from skin.

WARNING



Observe the following basic rules for safe handling of polyurethane foam:

Work in well-ventilated area, preferably one which is force-ventilated.

Do not breathe fumes from products. Avoid standing directly over containers and rising masses of foam.

Wear goggles at all times when using these products.

Wash all resins from skin with isopropanol (rubbing alcohol) in plentiful quantities immediately after contact.

In case of contact with eyes, seek immediate medical assistance, but try to get as much material as possible out of eye by washing with water. Do not blink-hold eyelid open by hand.

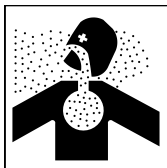
WARNING



Fire resistant hydraulic (FRH) fluid may contain Tricresyl Phosphate which, if taken internally, can produce paralysis. Hydraulic fluid may be absorbed through the skin. Wear long sleeves, gloves, goggles, and face shield. If FRH gets in eyes, wash them immediately and get medical aid immediately. If FRH gets on skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking.

WARNING SUMMARY (cont)

WARNING



Chemical agent resistant coating (CARC) paint contains isocyanate (HDI) which is highly irritating to skin and respiratory system. High concentrations of HDI can produce symptoms of itching and reddening of skin, a burning sensation in throat and nose, and watering of the eyes. In extreme concentrations, HDI can cause cough, shortness of breath, pain during respiration, increased sputum production, and chest tightness. The following precautions must be taken whenever using CARC paint:

ALWAYS use air line respirators when using CARC paint unless air sampling shows exposure to be below standards. Use chemical cartridge respirator if air sampling is below standards.

DO NOT let skin or eyes come in contact with CARC paint. Always wear protective equipment (gloves, ventilation mask, safety goggles, etc.).

DO NOT use CARC paint without adequate ventilation.

NEVER weld or cut CARC-coated materials.

DO NOT grind or sand painted equipment without high-efficiency air purifying respirators in use.

BE AWARE of CARC paint exposure symptoms; symptoms can occur a few days after initial exposure. Seek medical help immediately if symptoms are detected.

WARNING



Mixing of CARC paint must be done in a well-ventilated mixing room or spraying area away from open flame with personnel wearing eye protection. Paint is flammable and can cause injury or death to personnel.

WARNING



Protective equipment (gloves, goggles, ventilation mask) must be worn when using CARC paint. **DO NOT** leave any skin exposed. Contact with CARC paint can cause skin burns.

WARNING SUMMARY (cont)

WARNING



High efficiency air purifying respirators should be used when grinding or sanding CARC-coated equipment. Failure to do so may result in injury or death to personnel.

WARNING



Unsafe use of chemical products can injure you. Read and follow warnings and instructions on labels of all chemical products. Follow all general shop safety procedures. See supervisor for further instructions on safety.

WARNING



Unsafe use of tools and equipment can injure you. Read and follow warnings and instructions on labels of all equipment. Follow all general shop safety procedures. See supervisor for further instructions on safety.

WARNING



Diesel fuel can catch fire and seriously injure or kill soldiers and damage or destroy vehicles. Wipe up fuel spills immediately. Do not smoke near fuel or when working on the fuel system.

FIRST AID

For artificial respiration and first aid, see FM 4-25.11.

CHANGE
NO. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 26 AUGUST 2005

TECHNICAL MANUAL
DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

FOR

CARRIER, CARGO TRACKED, 6-TON
M548A1
2350-01-096-9356 (EIC: AEU)

CARRIER, CARGO TRACKED, 6-TON
M548A3
2350-01-369-6081 (EIC: AE9)

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

TM 9-2350-247-34, 30 June 2001 is updated as follows:

1. File this change sheet in front of the publication for reference purposes.
2. New or updated text is indicated by a vertical bar in the outer margin of the page.
3. Revised illustrations are indicated by a miniature pointing hand adjacent to the updated area.
4. Remove old pages/Work Packages and insert new pages/Work Packages as indicated below.

Remove Pages/Work Packages


g/h blank
A/B blank
i – ii
WP 0001 00
WP 0056 00
WP 0077 00
None
DA 2028 (3)
Metric Chart/Back Cover
Front Cover

Insert Pages/Work Packages

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A/B blank
i – ii
WP 0001 00
WP 0056 00
WP 0077 00
DA 2028 Sample
DA 2028 (3)
Metric Chart/Back Cover
Front Cover

By Order of the Secretary of the Army:

Official:


SANDRA R. RILEY
*Administrative Assistant to the
Secretary of the Army*
0519906

PETER J. SCHOOMAKER
*General, United States Army
Chief of Staff*

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To be distributed in accordance with the initial distribution number (IDN) 370827 requirements for TM 9-2350-247-34.

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

LIST OF EFFECTIVE PAGES/WORK PACKAGES

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

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

Original 0 (30 June 2001)
 Change 1 (26 August 2005)

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 44 AND TOTAL NUMBER OF WORK PACKAGES IS 80 CONSISTING OF THE FOLLOWING:

| Page/WP No. | *Change No. | Page/WP No. | *Change No. | Page/WP No. | *Change No. |
|----------------------------|-------------|------------------------|-------------|-------------|-------------|
| Cover | 1 | WP 0055 00 | 0 | | |
| Transmittal/Authentication | 1 | WP 0056 00 | 1 | | |
| a – f | 0 | WP 0057 00 – 0076 00 | 0 | | |
| g/h blank | 1 | Chapter 16 WP Index | 0 | | |
| A/B blank | 1 | WP 0077 00 | 1 | | |
| i | 1 | WP 0078 00 – 0080 00 | 0 | | |
| ii – viii | 0 | Index 1 – Index 10 | 0 | | |
| Chapter 1 WP Index | 0 | DA 2028 Sample/Reverse | 1 | | |
| WP 0001 00 | 1 | DA 2028/Reverse (3) | 1 | | |
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| Chapter 2 WP Index | 0 | Metric Chart | 1 | | |
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| Chapter 6 WP Index | 0 | | | | |
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| Chapter 15 WP Index | 0 | | | | |

*Zero in this column indicates an original page.

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 30 June 2001

TECHNICAL MANUAL

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

CARRIER, CARGO TRACKED, 6-TON, M548A1
NSN 2350-00-096-9356
(EIC: AEU)

M548A3
NSN 2350-01-369-6081
(EIC: AE9)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028 (Recommended Changes to Equipment Technical Publications), through the Internet, on the Army Electronic Produce Support (AEPS) website. The Internet address is <http://aeps.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: Technical Publication Information Office, TACOM-RI, 1 Rock Island, IL 61299-7630. 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 M548A1 and M548A3 carriers.

Before starting a task or procedure, read HOW TO USE THIS MANUAL and the GENERAL MAINTENANCE PROCEDURES section of the PMCS (WP 0005 00).

WHAT'S IN THE MANUAL — FRONT TO BACK

This TM supplement 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 includes general maintenance procedures for PMCS and general maintenance instructions.

CHAPTER 3 contains maintenance WPs for the engine system.

CHAPTER 4 contains maintenance WPs for the fuel system.

CHAPTER 5 contains maintenance WPs for the cooling system.

CHAPTER 6 contains maintenance WPs for the electrical system.

CHAPTER 7 contains maintenance WPs for the transmission.

CHAPTER 8 contains maintenance WPs for the transfer and final drive assemblies.

CHAPTER 9 contains maintenance WPs for the wheels and tracks.

CHAPTER 10 contains maintenance WPs for the shock absorbers.

CHAPTER 11 contains maintenance WPs for the hull.

CHAPTER 12 contains maintenance WPs for the winch (M548A1).

CHAPTER 13 contains maintenance WPs for the hull accessory items.

CHAPTER 14 contains maintenance WPs for tools and test equipment.

CHAPTER 15 contains maintenance WPs for special purpose kits.

CHAPTER 16 contains supporting information for the TM which includes the following WPs:

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

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

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

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

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 THIS MANUAL (cont)

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. Turn to the page indicated.

The INDEX lists each WP under one or more headings. For example, the WP titled INSTALL ENGINE COOLANT HEATER could be found under the two headings, "Coolant heater", and "Heater".

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 illustrations. 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 (page a). |
| CAUTIONS | Call attention to actions or materials that could damage equipment. |
| NOTES | Contain important facts to make the procedure easier. |

HELPER

Helpers are needed 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".

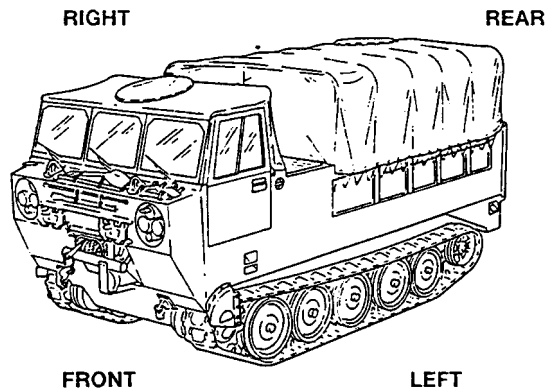
If a helper performs the action alone, the step will start with "HELPER".

Locational Terms

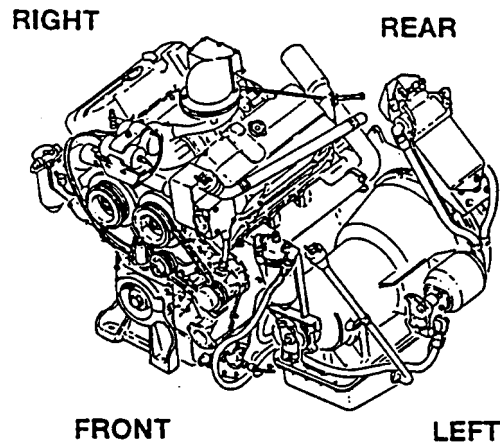
The terms "front", "rear", "left", and "right" are used to indicate where items are located. The POINT OF REFERENCE FOR THESE TERMS IS DIFFERENT FOR CARRIER ITEMS AND POWER UNIT ITEMS. (Carrier items are items which are not on the power unit. Power unit items are items on the engine or transmission).

HOW TO USE THIS MANUAL (cont)

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.



M548A1 SHOWN

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 grill (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 on the setup page will be referred to as "new" in the WP setup when installed.

Examples are: "lock nuts", "lock washers", "cotter pins", and some "gaskets".

These and other new parts are listed under MATERIAL/PARTS in the initial set up.

HOW TO USE THIS MANUAL (cont)

GENERAL MAINTENANCE

Cleaning, inspecting, checking for leaks, and similar procedures which apply to most WPs are found in the GENERAL MAINTENANCE PROCEDURES section of the PMCS (WP 0005 00). Use these steps to clean and inspect any part being removed, repaired, or installed. Special cleaning will be covered in the WP step.

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

The RPSTL TM 9-2350-247-24P gives the National Stock Number (NSN) required to order parts use 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.

OTHER MANUALS

The following maintenance manuals are used in support of carriers.

TM 9-2815-205-34 and TM 9-2815-205-34P are used for engine repair.

TM 9-2520-254-34 and TM 9-2520-254-34P are used for A1 transmission repair.

TM 9-2520-272-34&P is used for A3 transmission repair.

TM 9-2520-238-34 and TM 9-2520-238-34P are used for gearbox repair.

TM 9-2920-225-34 and TM 9-2920-225-34P are used for 100 amp generator repair.

TM 9-2920-257-30&P is used for 200 amp generator repair.

CHAPTER 1

DIRECT SUPPORT 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:

M548A1 – Carrier, Cargo, Tracked, 6-ton

M548A3 – Carrier, Cargo, Tracked, 6-ton

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 and armaments Command, ATTN: AMSTA-TR-QCL, 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 43-0002-33 Destruction of Conventional Ammunition and Improved Conventional Munitions (ICM) 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

See ATPD 2228 for information about administrative storage or shipment of the M548A1 and M548A3 carriers.

NOMENCLATURE CROSS-REFERENCE

This listing includes nomenclature cross references used in this manual.

COMMON NAME

| | |
|-------------------|--------------------|
| Locknut | Self-locking nut |
| Lock screw | Self-locking bolt |
| Lockwire | Nonelectrical wire |

LIST OF ABBREVIATIONS / ACRONYMS

Many abbreviations are used in this manual. They are listed below. Learn what each one means. It will make your job easier.

| | |
|--------------|-----------------------------------|
| A | After |
| B | Before |
| BATT | Battery |
| BO | Blackout |
| BRT | Bright |
| CB | Circuit Breaker or common battery |
| COEIL | Components of end items list |
| CVC | Combat Vehicle Communications |
| D | During |
| ENG | Engine |

| | |
|-----------------|--|
| FOV | Field-of-view |
| GEN | Generator |
| HI TEMP | High Temperature |
| Intercom | Intercommunication |
| IR | Infrared |
| NBC | Nuclear, biological and chemical |
| N2 | Nitrogen gas |
| OVE | On Vehicle Equipment |
| PMCS | Preventive Maintenance Checks and Services |
| PRESS | Pressure |
| TEMP | Temperature |
| TRANS | Transmission |
| Vent | Ventilation |
| W | Weekly |

SAFETY, CARE, AND HANDLING

Read the Warnings in the Warning Summary in the front of the TM.

EQUIPMENT DESCRIPTION AND DATA

0002 00

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

LOCATION AND DESCRIPTIONS OF MAJOR COMPONENTS

For location and description of major components, see your -10.

For differences between models, see your -10.

For equipment data, see your -10.

THEORY OF OPERATION

0003 00

For a brief description of principles of operation and equipment, see your -10.

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 0078 00.

SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Special tools, TMDE, and support equipment needed for the maintenance procedures in this manual are listed in WP 0078 00. Special tools are also cataloged in the Repair Parts and Special Tools List (RPSTL) TM 9-2350-247-24P. Additional TMDE and special tools are listed in your TM 9-2350-247-20.

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 0079 00.

REPAIR PARTS

Repair parts are listed and illustrated in the Repair Parts and Special Tools List (RPSTL) TM 9-2350-247-24P. Maintenance and supply personnel can order them.

CHAPTER 2

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR CARRIER

WORK PACKAGE INDEX

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

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

0005 00

THIS WORK PACKAGE COVERS:

General Maintenance Instructions (page 0005 00-1).
Preventive Maintenance Checks And Services (page 0005 00-11).

INITIAL SETUP:Maintenance LevelDirect Support

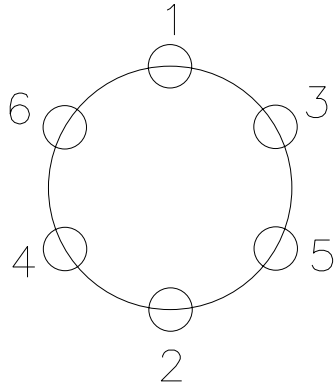
GENERAL MAINTENANCE INSTRUCTIONS**SCOPE**

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.

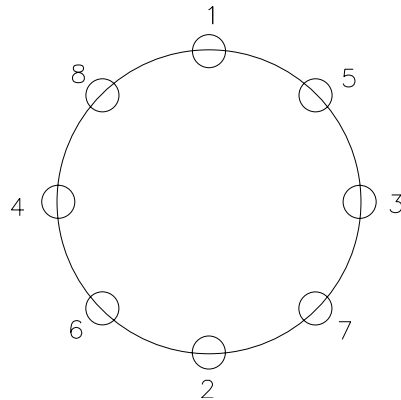
PREPARATION FOR MAINTENANCE

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 9-2350-247-24P, 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.

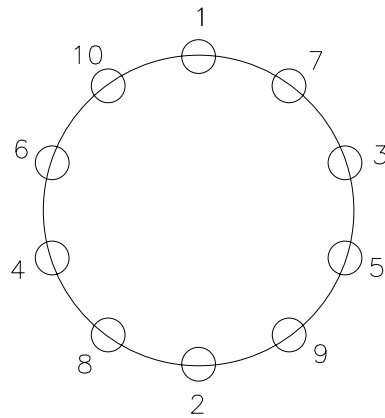
6. **TORQUING.** Where needed, torque values are listed in the maintenance task. When torquing, use one of the star pattern sequences below unless otherwise stated in the maintenance task.



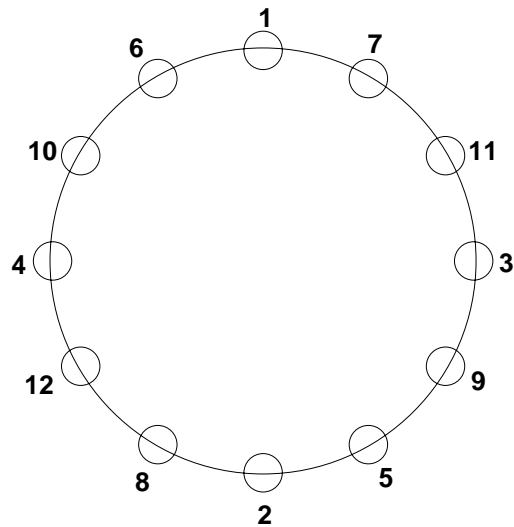
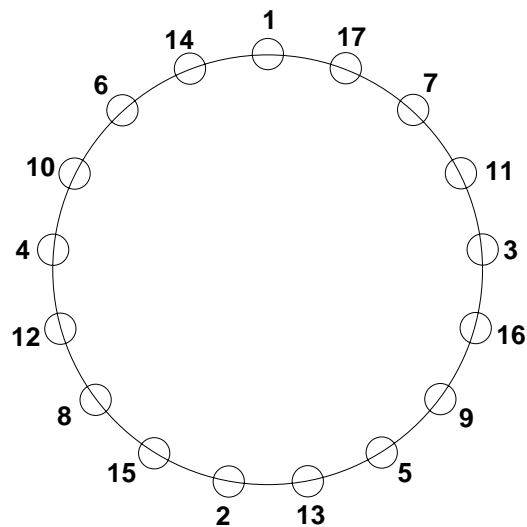
6-HOLE PATTERN



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.

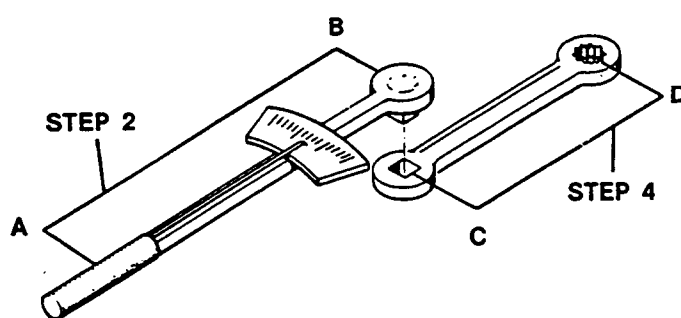
**PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING
LUBRICATION INSTRUCTIONS — Continued**

0005 00

- 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 (Step 7a4) to the length of the torque wrench (Step 7a2). Record this sum.
- 6) Divide the sum found in Step 7a3 by the sum found in Step 7a5.
- 7) The sum found in Step 7a6 is your torque wrench setting. Set your dial.

NOTE

Setting the torque wrench dial at the reading found in Step 7a7 will deliver the required torque at the end of your adapter.



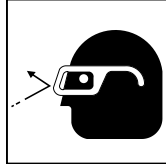
Example: (Metric equivalents omitted for clarity).

- 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.

CLEANING

8. **GENERAL.** Cleaning is very important. All parts must be cleaned well and kept clean during maintenance. Dirt or foreign matter can cause malfunctions and equipment failure. General cleaning procedures are detailed in the following steps. Special cleaning procedures are covered in the task relating to the specific part. Clean after repair and before assembly.
 - a. **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.
 - b. **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.
 - c. **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.
 - d. **REMOVAL AGENTS.** Remove gum or old grease deposits by soaking parts in cleaning compound (WP 0080 00, Item 49). Scrub with a brush. Use crocus cloth (WP 0080 00, Item 1) to remove minor surface defects.

WARNING



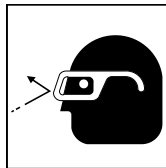
Air pressure in excess of 30 psi (207 kPa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

CAUTION

Lye or caustic substances will damage metal surfaces. Do not use lye or caustic mixtures to clean metal surfaces.

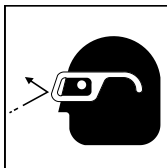
- e. **STEAM CLEANING.** If steam cleaning is used, dry clean parts at once with compressed air. Apply a thin film of clean oil to surfaces that are not painted to prevent rusting. Never use lye or caustic mixtures that will corrode or etch metal surfaces.
- f. **LUBRICATION OF NEW BEARINGS.** See TM 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.

- g. **CASTINGS.**
 - 1) Clean inner and outer surfaces of casting with cleaning compound (WP 0080 00, Item 49). Dry casting with compressed air.
 - 2) Remove sludge and gum deposits with a brush.
 - 3) Blow out all tapped holes and armor mounting inserts with compressed air.
- h. **BALL AND NEEDLE 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

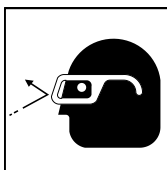
Air pressure in excess of 30 psi (207 kPa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

- 3) Flush oil passages with cleaning compound (WP 0080 00, Item 49). Dry parts with compressed air.

CAUTION

Cleaning solvent causes leather, rubber, and synthetic materials to become brittle. Do not use cleaning solvent to clean seals, cables, and flexible hoses.

- j. **OIL SEALS, ELECTRICAL CABLES, AND FLEXIBLE HOSES.** Clean seals, cables, and flexible hoses with detergent (WP 0080 00, Item 18) and water. Dry parts with wiping rag (WP 0080 00, Item 46).

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 cleaning compound (WP 0080 00, Item 49). Dry with wiping rag (WP 0080 00, Item 46).

INSPECTION

9. All removed 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.

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

0005 00

- 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 PACKING, AND GASKETS.**
 - 1) Inspect seals that are composition type, rings, and preformed packing 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.

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

0005 00

- 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

10. **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 (WP 0080 00, Item 1). 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 (WP 0080 00, Item 1) 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 (WP 0080 00, Item 1) dipped in cleaning compound (WP 0080 00, Item 49).

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.

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

0005 00

- 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.
- 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 (WP 0080 00, Item 1) dipped in cleaning compound (WP 0080 00, Item 49).
 - 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 PACKING, GROMMETS, AND GASKETS.** Seals, preformed packing, 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 (WP 0080 00, Item 1).
- o. **ELECTRICAL PARTS.**

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

0005 00

- 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.

WELDING INSTRUCTIONS

11. 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) See TC 9-237.

12. **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.

a. 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.

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

0005 00

- b. **CHECKING FOR LEAKS AFTER A MAINTENANCE TASK.** After doing maintenance on a part which involves hoses of 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 M548A1 and M548A3 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.

REPAIR MULTIPIN CONNECTORS

0006 00

THIS WORK PACKAGE COVERS:

- Removal (page 0006 00-2).
- Installation (page 0006 00-3).
- Removal (page 0006 00-5).
- Installation (page 0006 00-6).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

- Automotive Fuel and Electrical System Repair Tool Kit
(WP 0078 00, Item 64)
- Electrical Connector Repair Tool Kit
(WP 0078 00, Item 66)
- Multimeter (WP 0078 00, Item 36)
- Soldering Gun (WP 0078 00, Item 56)

Materials/Parts

- Insulation tape (WP 0080 00, Item 24)
- Tin alloy solder (WP 0080 00, Item 43)
- Contacts (AR)

Personnel Required

Fuel and Elec Sys Rep 63G

Equipment Condition

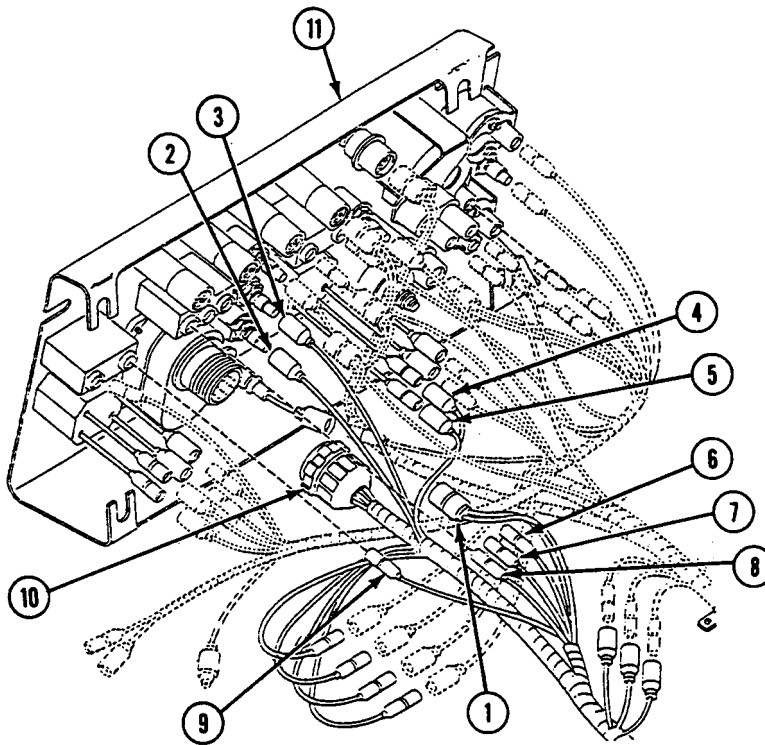
Repairable parts on workbench

REMOVAL

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 nut grommet (4) with contacts (5) from rear of receptacle (2).
3. Push leads (3) into grommet (4) until contacts (5) are fully exposed on other side of grommet. Clip or desolder leads from contacts. Discard contacts.
4. Remove grommet (4) and nut (1) from leads (3).

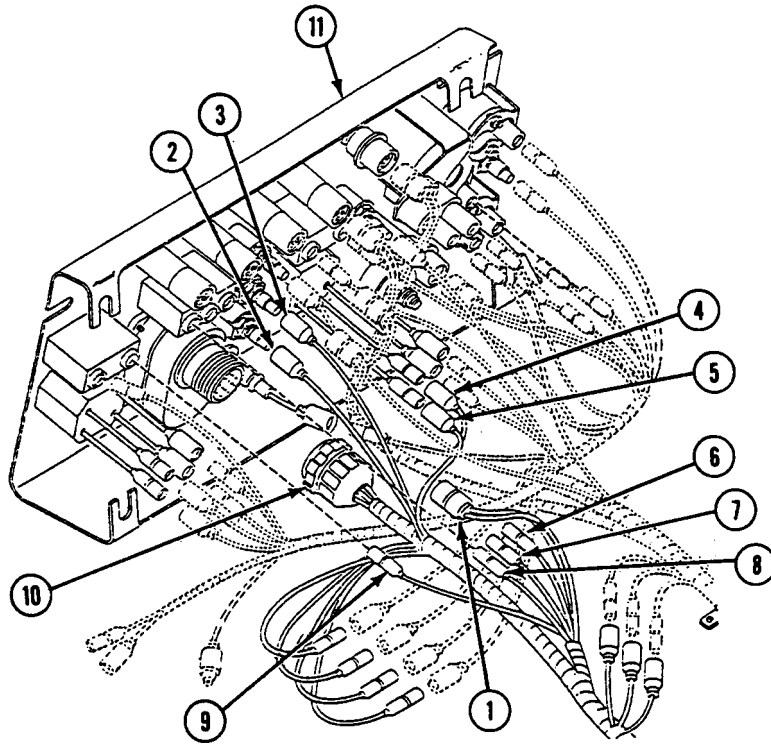


INSTALL RECEPTACLE

NOTE

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

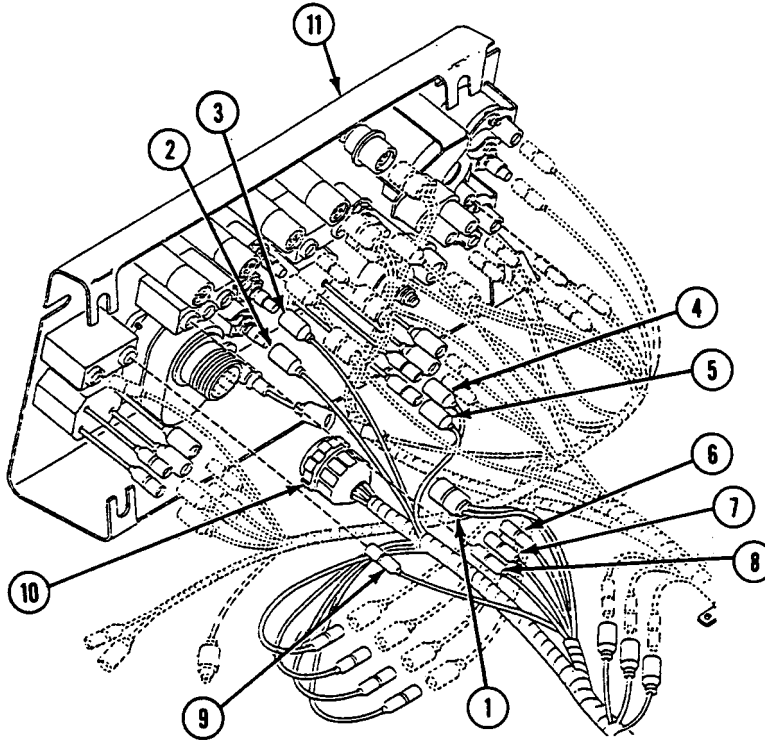
1. Strip insulation from leads (3) to uncover just enough wire to fill well in contact (5).
2. Slide nut (1) over leads (3).
3. Push leads (3) through grommet (4) and insert new contacts (5).



NOTE

Make sure leads pass through proper lettered hole in grommet.

4. Solder leads (3) in contacts (5) and press contacts into grommet (4). Check leads for continuity.
5. Align and install grommet (4) in receptacle (2). Secure with nut (1).

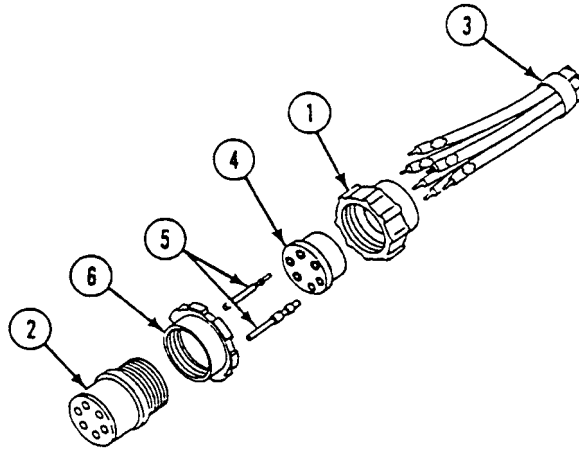


REMOVE CABLE CONNECTOR

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 desolder leads from contacts. Discard contacts.
5. Remove grommet (4) and retaining nut (1) from cable (3).



INSTALL CABLE CONNECTOR**NOTE**

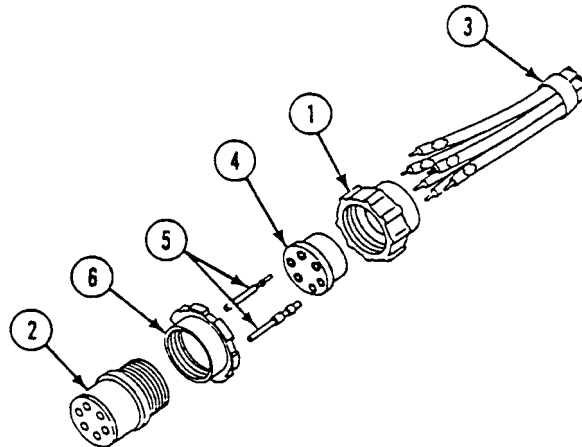
If replacing lead, cut new wire from bulk supply. Measure original length, gauge, and type of wire.

1. Strip insulation from leads of cable (3) to uncover just enough wire to fill well in contact (5).
2. Slide retaining nut (1) and coupling nut (6) on cable (3).
3. Push leads of cable (3) through grommet (4) and insert in new contacts (5).

NOTE

Make sure leads pass through proper lettered hole in grommet.

4. Solder leads in contacts (5) and press contacts into grommet (4). Check leads for resistance.
5. Align and install grommet (4) in plug (2). Secure with retaining nut (1).

**END OF TASK**

CHAPTER 3

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR ENGINE

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|------------------------------|---------------------|
| REPLACE ENGINE (M548A1)..... | 0007 00 |
| REPLACE ENGINE (M548A3)..... | 0008 00 |

REPLACE ENGINE (M548A1)

0007 00

THIS WORK PACKAGE COVERS:

Removal (page 0007 00-2).
 Installation (page 0007 00-21).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Engine and Differential Sling (WP 0078 00, Item 50)
 Open End Wrench (WP 0078 00, Item 77)
 Socket Wrench Set, 3/8 Inch Drive
 (WP 0078 00, Item 79)
 Torque Wrench (WP 0078 00, Item 83)
 Lifting device with rated lift capability of at least 2,000
 lb (908 kg)

Materials/Parts

Antiseize compound (WP 0080 00, Item 6)
 Automotive grease GAA (WP 0080 00, Item 7)
 Sealing compound (WP 0080 00, Item 32)
 Sealing compound (WP 0080 00, Item 35)
 Sealing compound primer (WP 0080 00, Item 37)
 Container, 1 gallon (4 liters)
 Fuel filter

Gasket (4)
 Key washer (8)
 Lock nut (5)
 Lock washer (7)
 Oil filter

Personnel Required

Track Vehicle Repairer 63H
 Helper (H)

References

See your -20

Equipment Condition

Engine oil drained (see your -20)
 Power plant removed from carrier (see your -20)
 Power plant blocked (see your -20)
 Transmission removed from transfer gearcase
 (WP 0027 00)
 Transfer gearcase removed from engine (WP 0030 00)
 Generator and bracket with linkage removed
 (see your -20)

REMOVAL

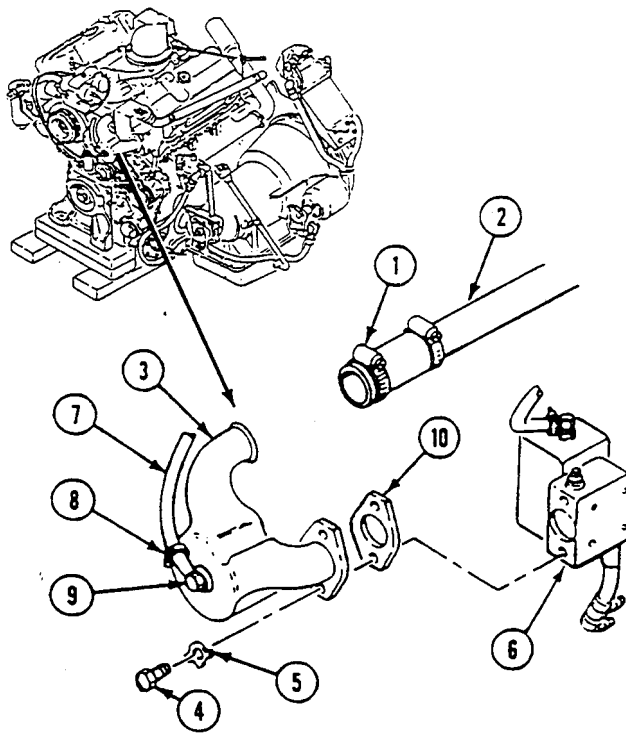
CAUTION

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

NOTE

Installation Steps 2 - 59 will tell what parts must be retained during removal, so they may be reinstalled on the new engine.

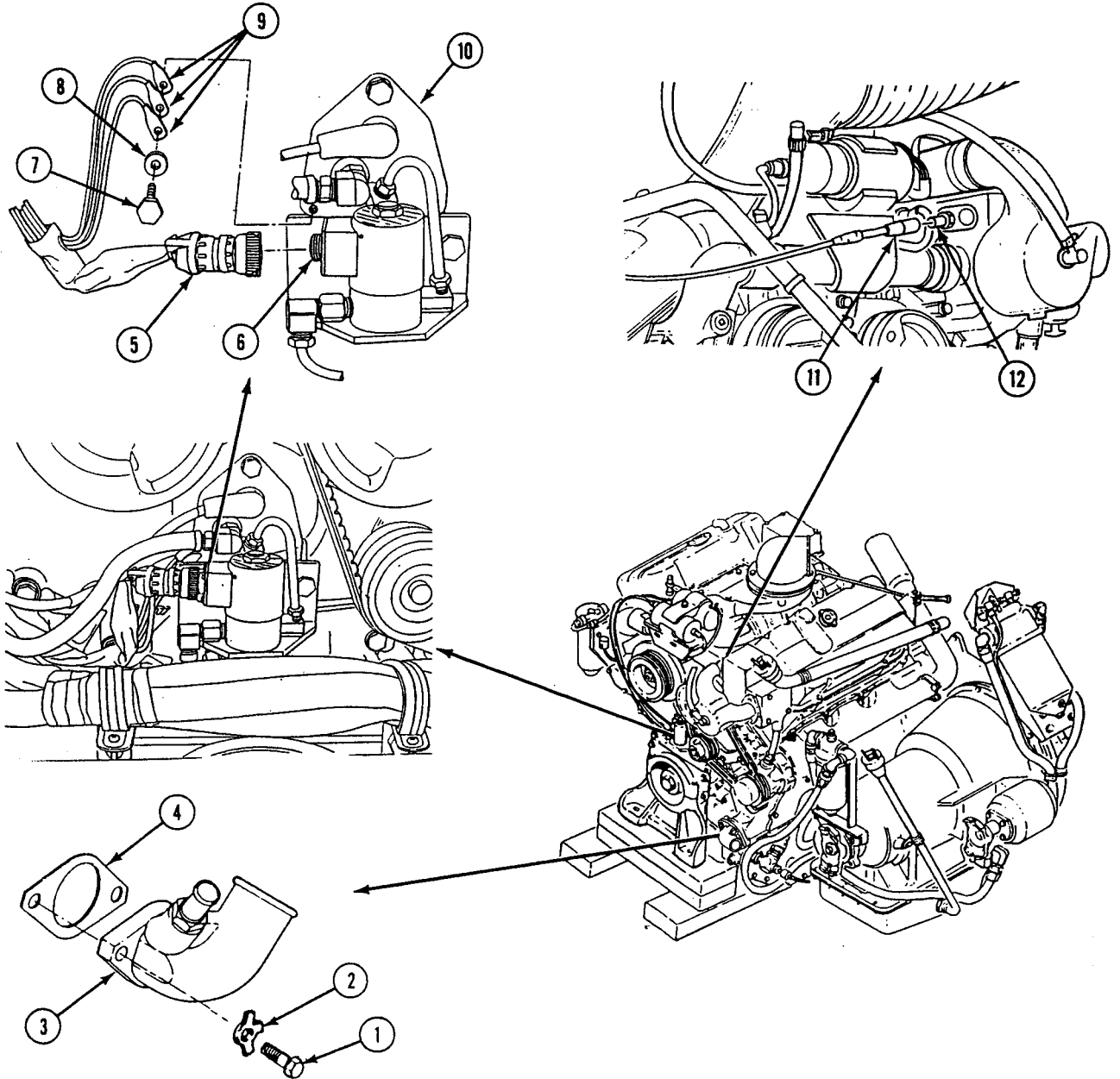
1. Disconnect clamp (1) and coolant tube (2) from deaeration elbow (3). Remove from engine.
2. Remove two screws (4) and key washers (5) from thermostat housing cover (6). Remove deaeration elbow (3) with hose (7), clamp (8), elbow (9), and gasket (10) from cover (6). Discard key washers and gasket.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



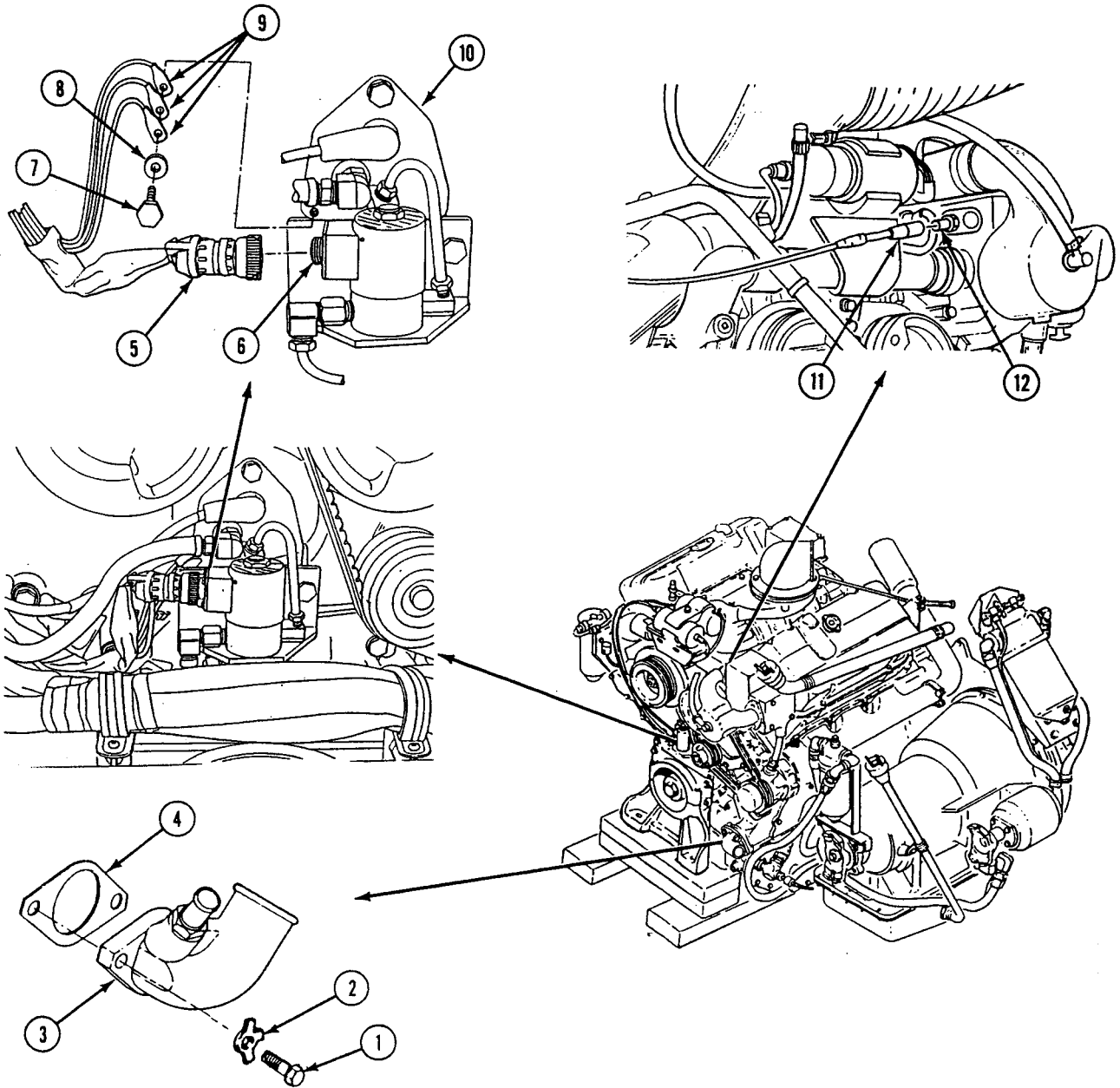
REPLACE ENGINE (M548A1) — Continued

0007 00

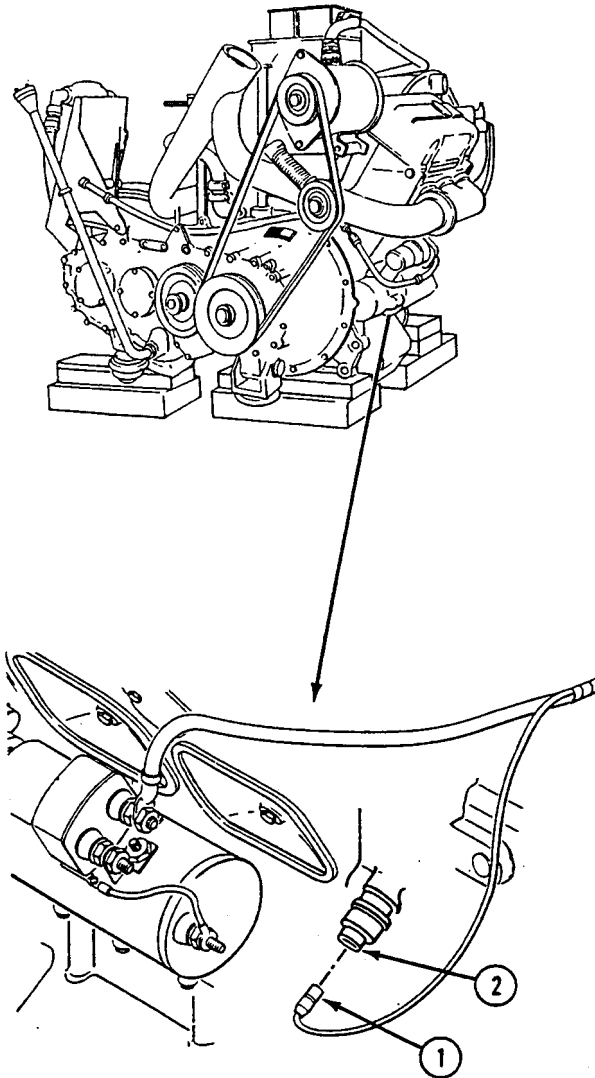
4. Disconnect power plant wiring harness circuit 406 lead (5) from air box heater wiring harness connector (6).
5. Remove screw (7), lock washer (8), and three ground leads (9) from air box heater bracket (10). Discard lock washer.



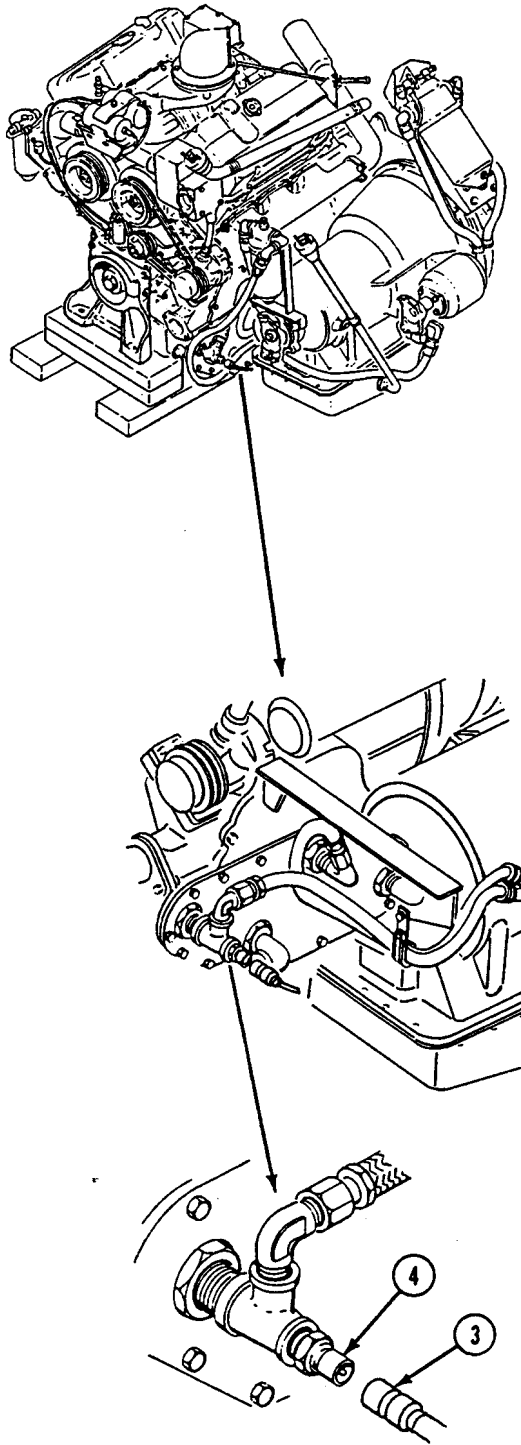
6. Disconnect power plant wiring harness circuit 33 lead (11) from coolant temperature sending unit (12).



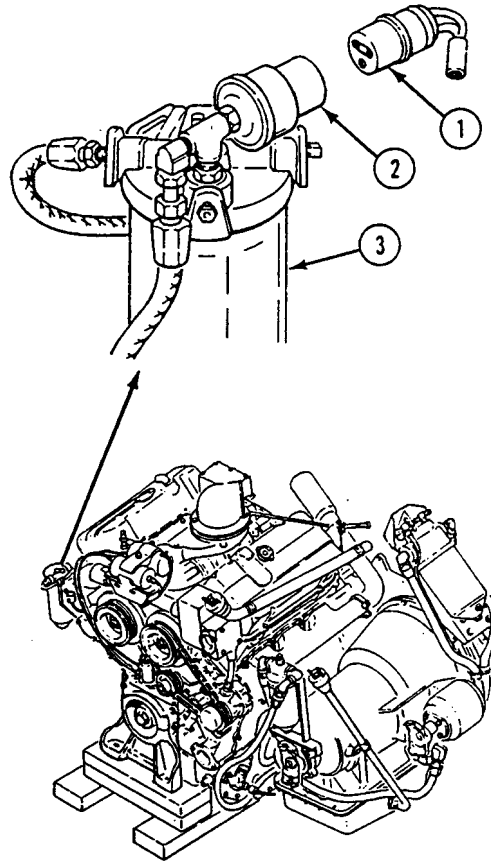
7. Disconnect power plant wiring harness circuit 34 lead (1) from engine low oil pressure switch (2).



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



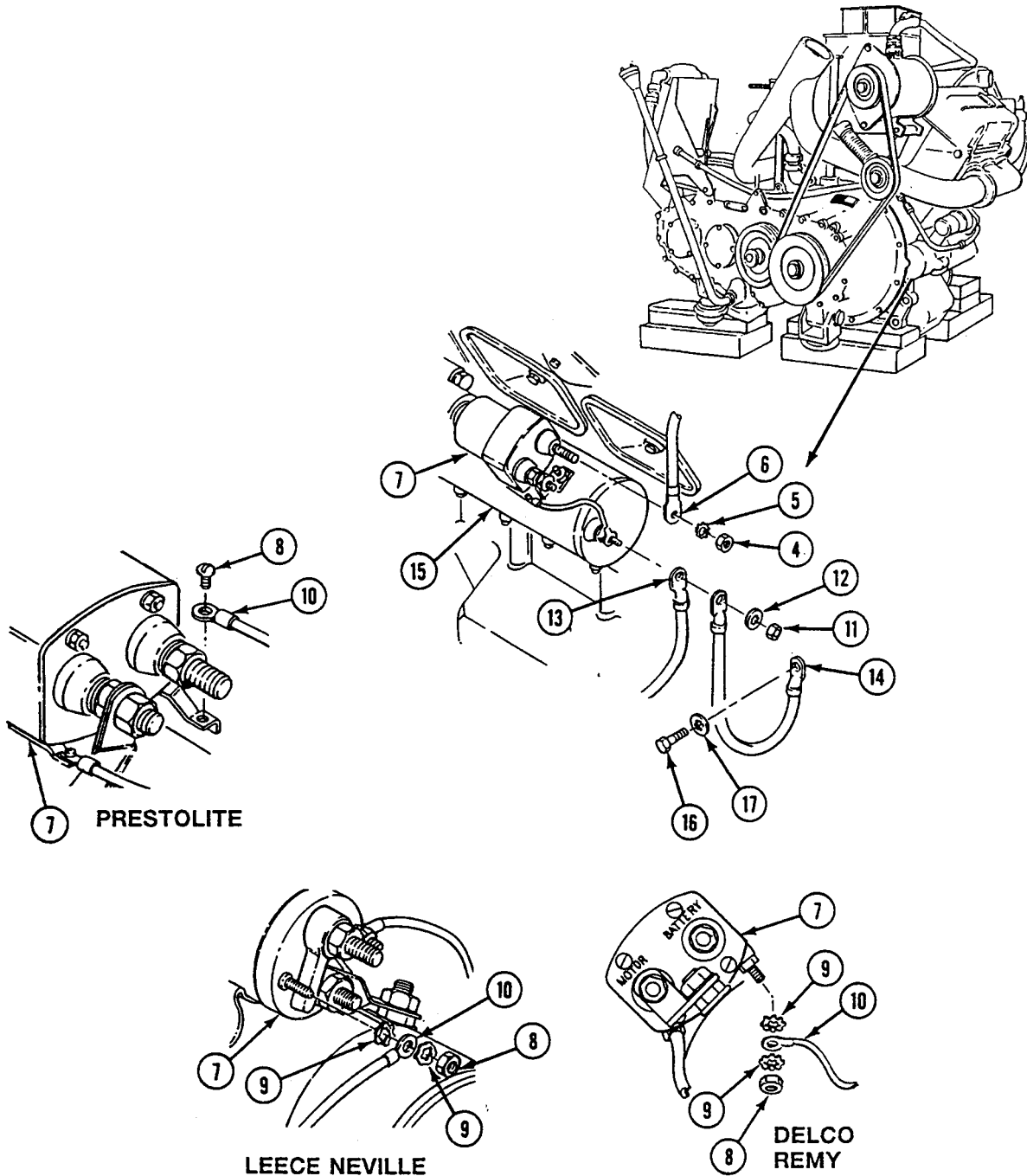
9. Disconnect power plant wiring harness circuits 1A and 1B lead (1) from field switch (2) at secondary fuel filter (3).



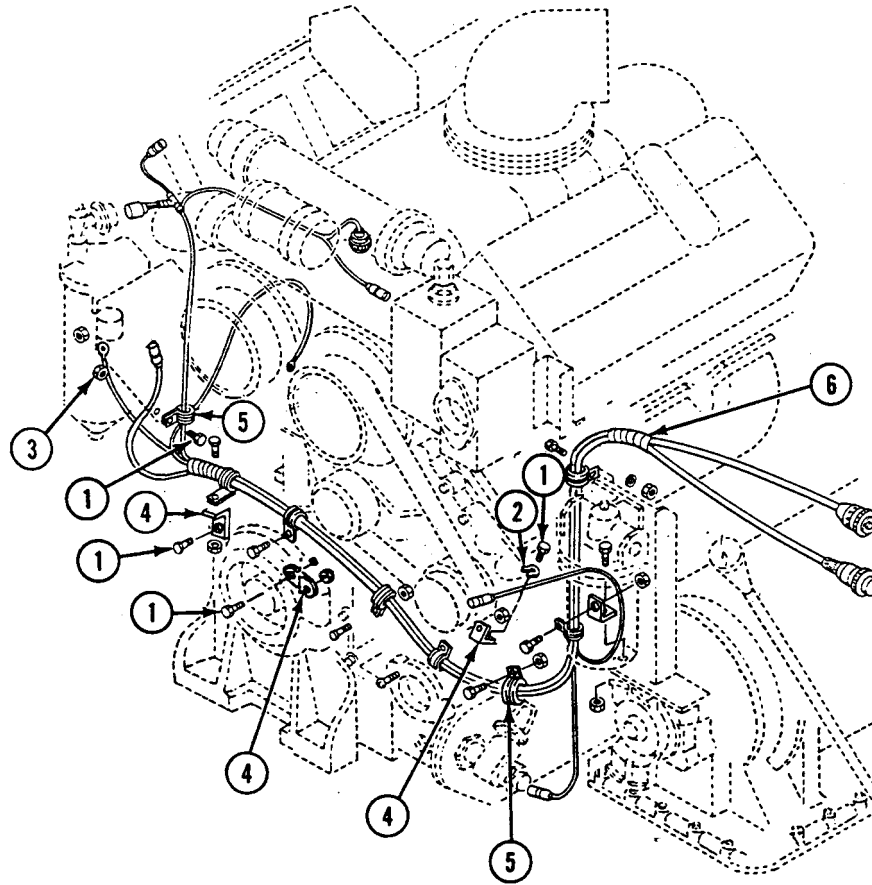
REPLACE ENGINE (M548A1) — Continued

0007 00

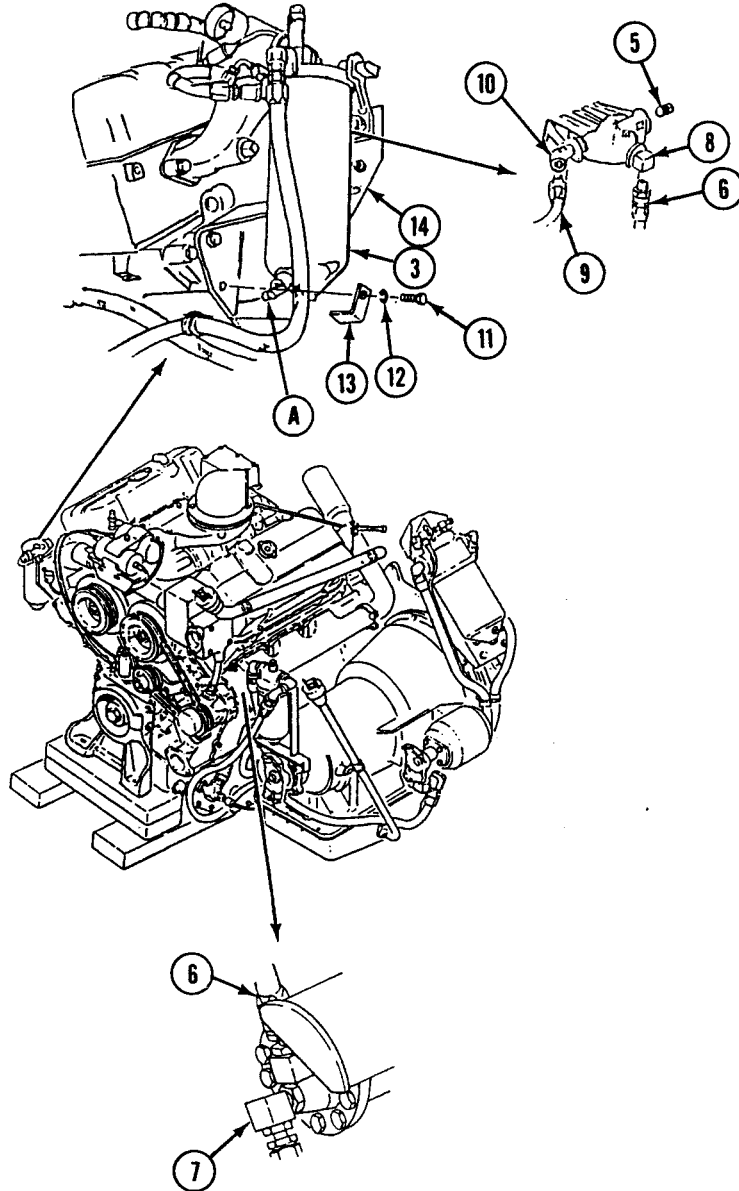
10. Remove nut (4), lock washer (5), and circuit 6 lead (6) from terminal on starter solenoid (7). Discard lock washer.
11. Remove nut (8), (screw on Prestolite), two lock washers (9), (Delco and Leece Neville only) and circuit 74A lead (10) from terminal on starter solenoid (7). Discard lock washers.
12. Remove nut (11), lock washer (12), ground lead (13), and ground lead (14) from starter (15). Discard lock washer.
13. Remove screw (16), lock washer (17), and ground lead (14) from engine block. Discard lock washer.



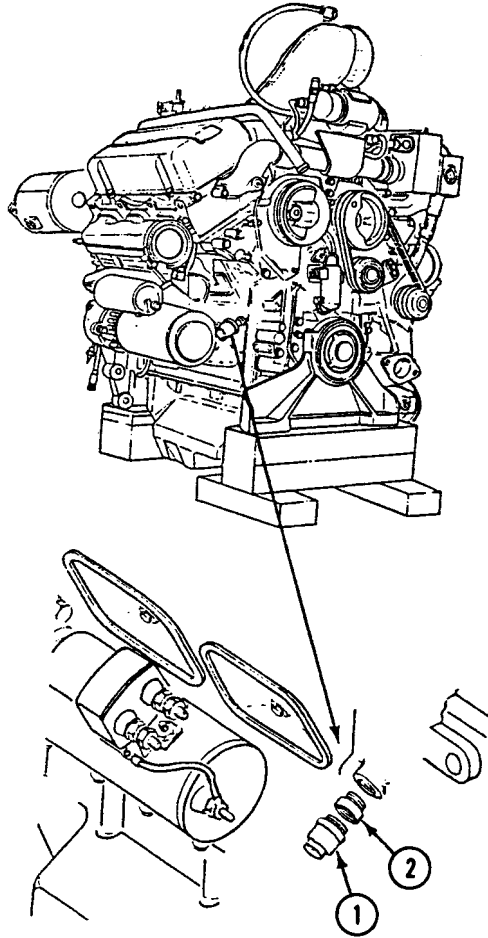
14. Remove four screws (1), key washers (2), lock nut (3), three brackets (4), four clamps (5), and power plant wiring harness (6) from power plant. Discard lock nut and key washer.



15. Remove engine low oil pressure switch (1) and bushing (2) from engine block.
16. Place a 1-gallon (4-liter) can under secondary filter (3). Open drain valve (4). Remove bleed plug (5) from filter to drain.



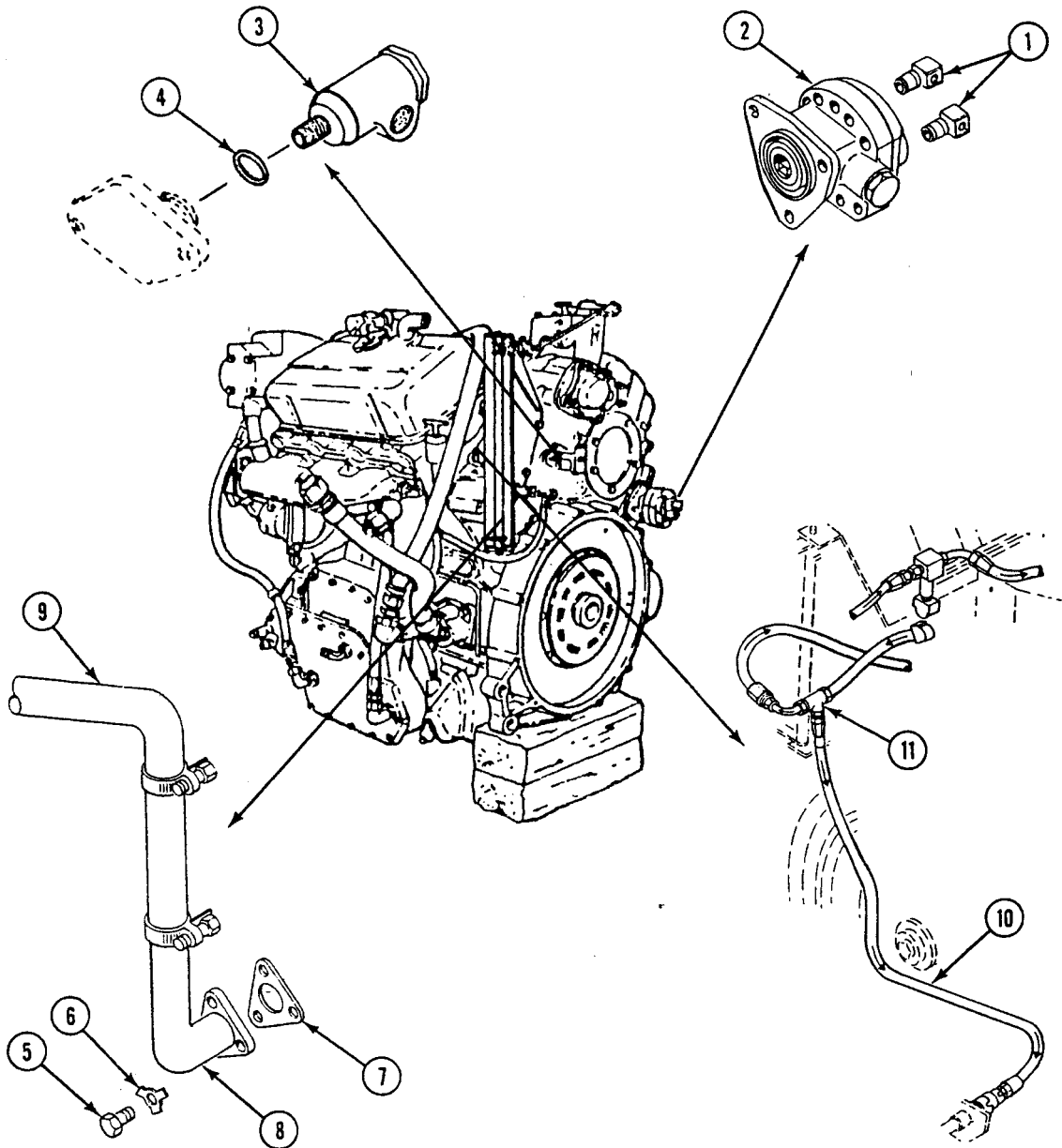
17. Disconnect fuel supply hose (6) from pump inlet elbow (7) and secondary fuel filter elbow (8).
18. Disconnect and remove fuel supply hose (9) from secondary fuel filter elbow (10).
19. Remove two screws (11), lock washers (12), bracket (13), and secondary fuel filter bracket (14) from engine. Discard lock washers.



REPLACE ENGINE (M548A1) — Continued

0007 00

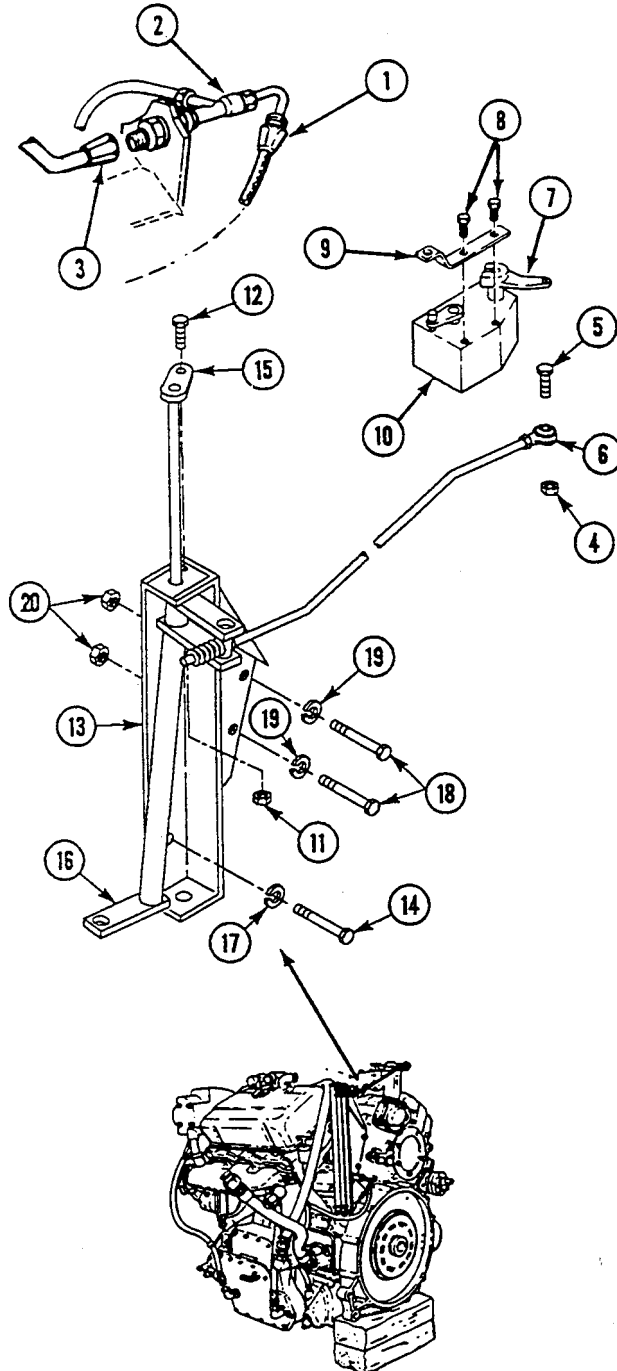
20. Remove two elbows (1) from fuel pump (2).
21. Remove tachometer drive adapter (3) and gasket (4) from engine. Discard gasket.
22. Remove three screws (5), key washers (6), gasket (7), oil filler elbow (8), and hose (9) from engine. Discard key washers and gasket.
23. Disconnect and remove fuel return hose (10) from tee (11).



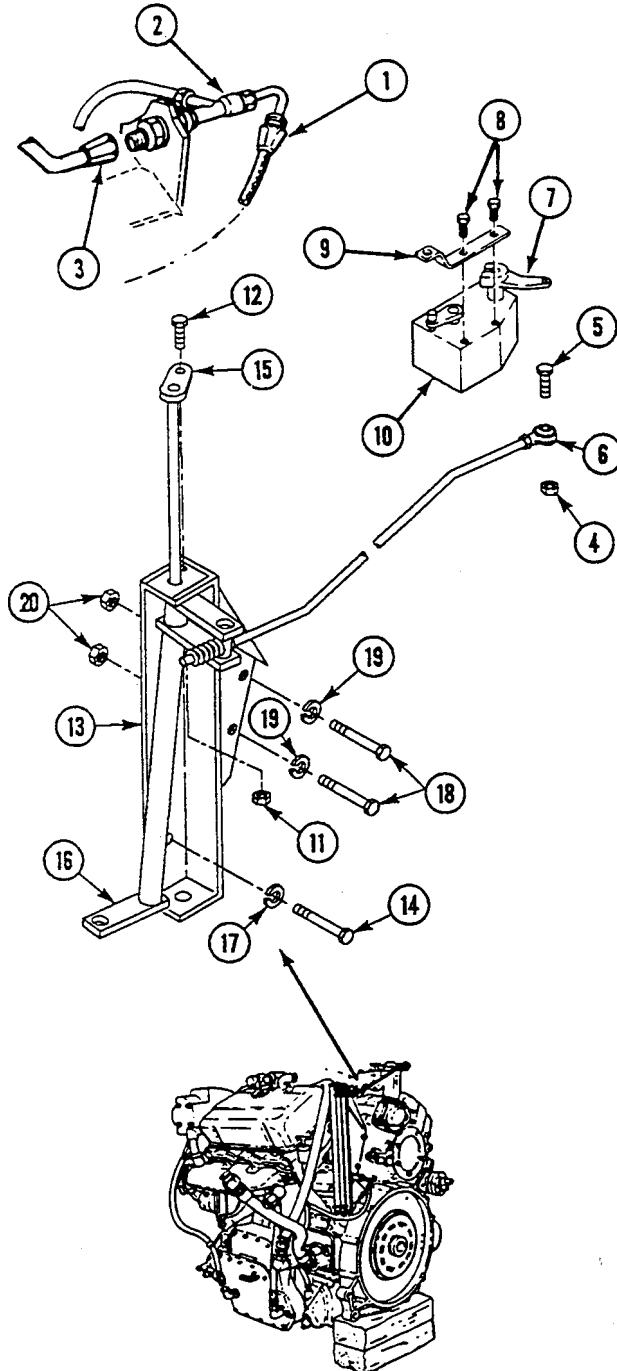
REPLACE ENGINE (M548A1) — Continued

0007 00

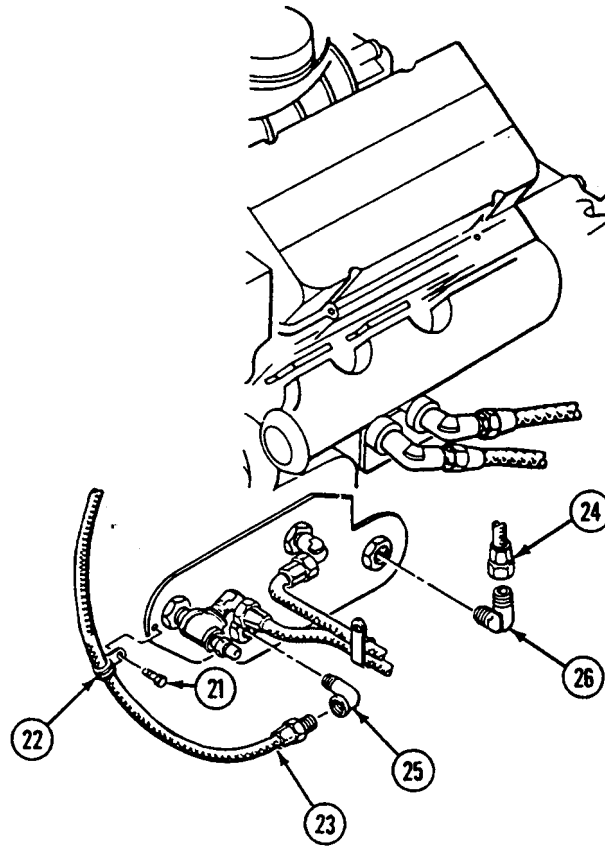
24. Disconnect air box heater fuel hose (1) from tee (2).
25. Disconnect elbow (3) from tee (2).
26. Remove nut (4), screw (5), and governor control link (6) from throttle arm (7).
27. Remove two screws (8) and gauge (9) from governor (10).



28. Remove lock nut (11) and screw (12) from bracket assembly (13). Discard lock nut.
29. Before removing screw (14), raise inner transfer shaft (15) high enough to tilt the outer transfer shaft (16).
30. Remove screw (14) and lock washer (17) from bracket assembly (13). Discard lock washer.
31. Remove two screws (18), lock washers (19), nuts (20), and bracket assembly (13) from power plant. Discard lock washers.

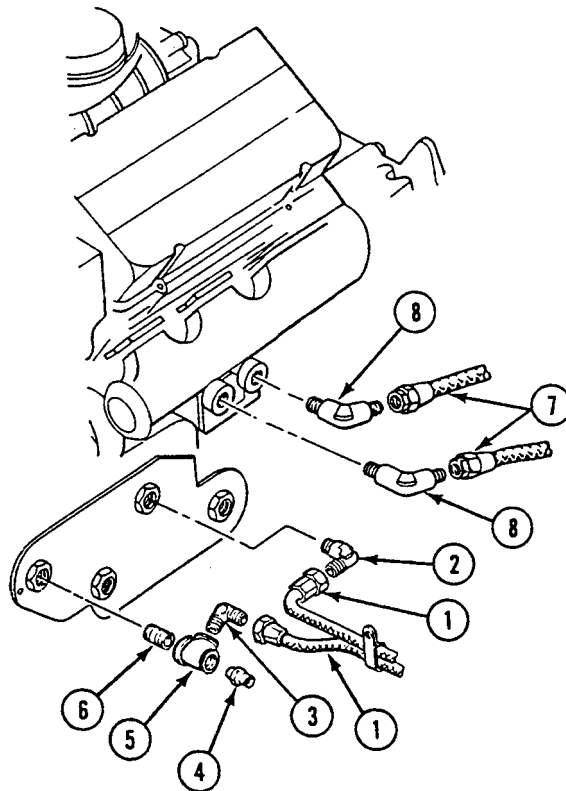


32. Remove screw (21) and clamp (22) from differential oil hose (23).
33. Disconnect and remove differential oil hose (23) and differential oil hose (24) from elbow (25) and elbow (26).
34. Remove elbow (25) and elbow (26) from engine oil cooler housing.



REPLACE ENGINE (M548A1) — Continued**0007 00**

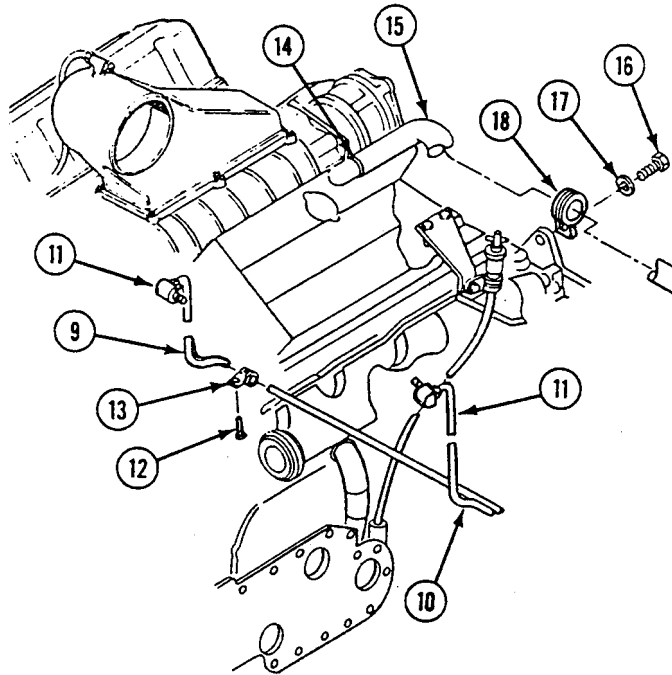
35. Disconnect and remove two transmission oil hoses (1) from elbow (2) and elbow (3).
36. Remove elbow (2) from engine oil cooler housing.
37. Remove transmission oil temperature sending unit (4) from tee (5).
38. Remove tee (5) with elbow (3) from oil cooler nipple (6).
39. Remove oil cooler nipple (6) from engine oil cooler housing.
40. Disconnect and remove two engine oil filter hoses (7) from two elbows (8).
41. Remove two elbows (8) from engine block.



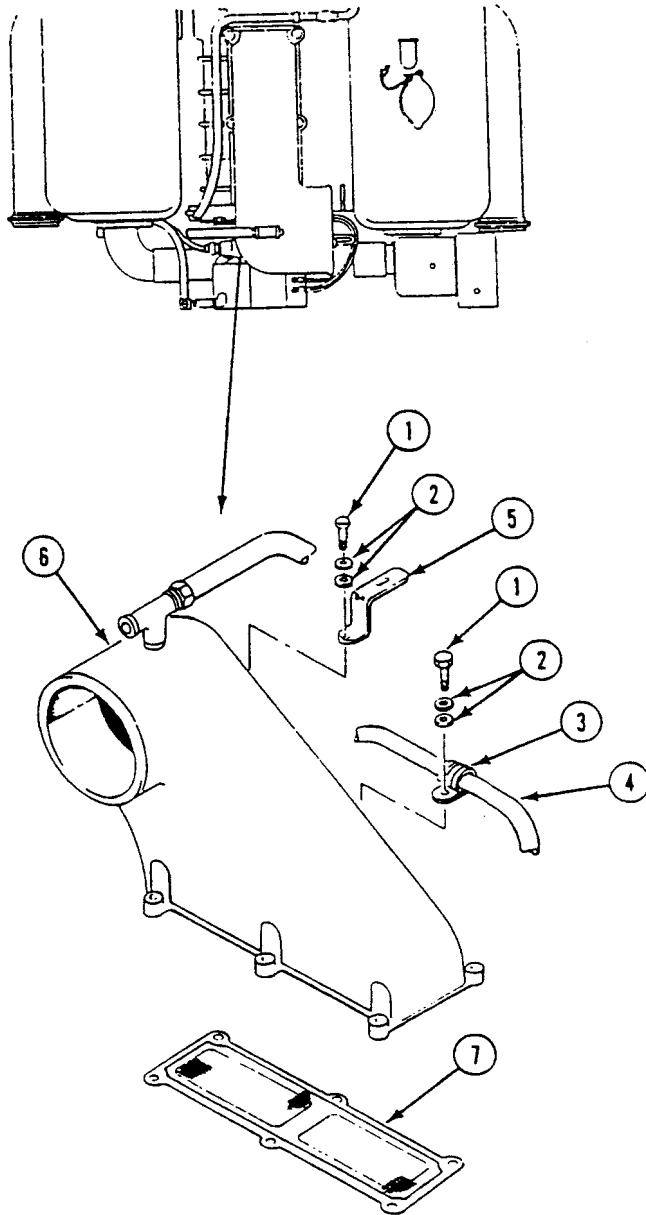
REPLACE ENGINE (M548A1) — Continued

0007 00

42. Disconnect hose (9) and hose (10) from air box drain tubes (11). Remove screw (12) and clamp (13) with hose (9) from engine oil pan.
43. Remove spring clamp (14) and engine breather tube (15) from engine rocker arm cover. Remove screw (16), lock washer (17), and clamp (18) from engine. Discard lock washer.



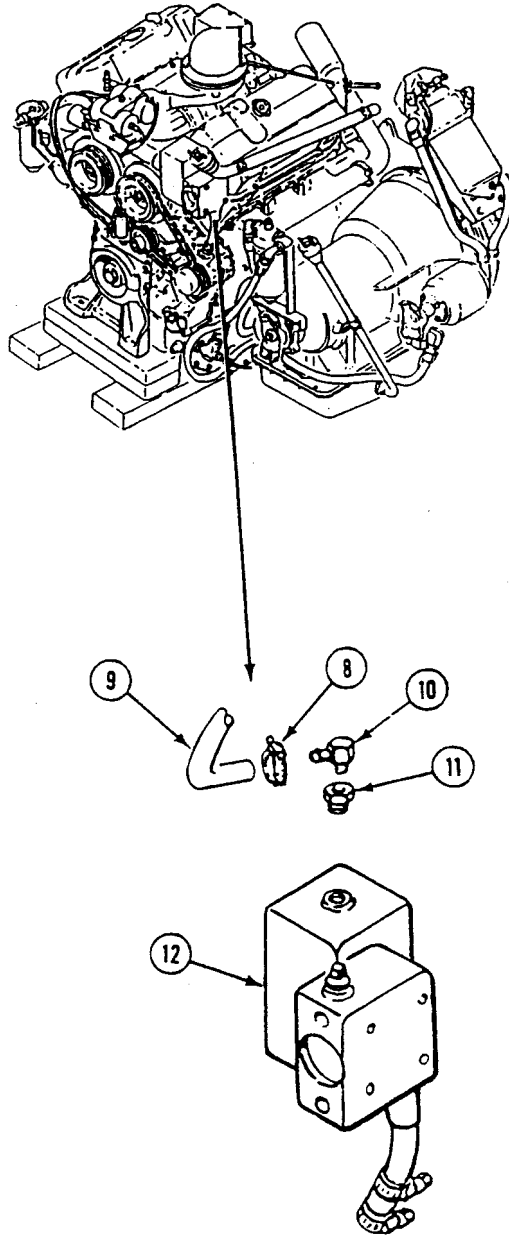
44. Remove 6 screws (1), 12 washers (2), clamp (3), hose (4), bracket (5), air horn (6), and screen (7) from engine. Leave clamp (3) on hose (4).



REPLACE ENGINE (M548A1) — Continued

0007 00

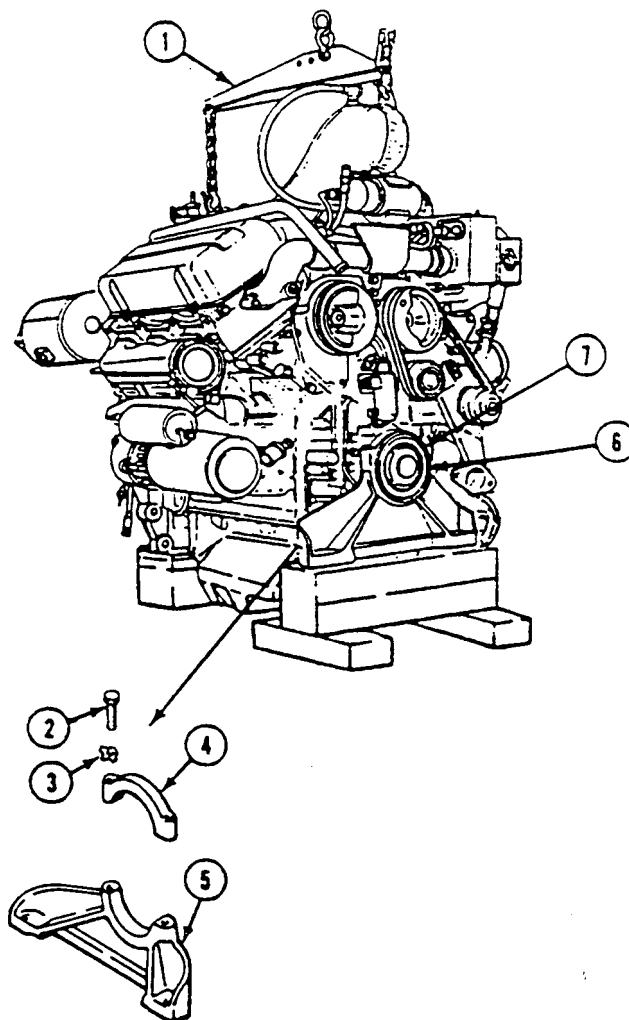
45. Remove clamp (8) and hose (9) from thermostat housing elbow (10).
46. Remove thermostat elbow (10) from thermostat housing bushing (11).
47. Remove thermostat bushing (11) from thermostat housing (12).



WARNING

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

48. Use a lifting device of at least 2,000 lb (908 kg) capacity and sling (1) to lift engine.
49. Remove two screws (2), key washers (3), cap (4), base (5), and rubber engine mount (6) from support (7). Discard key washers.



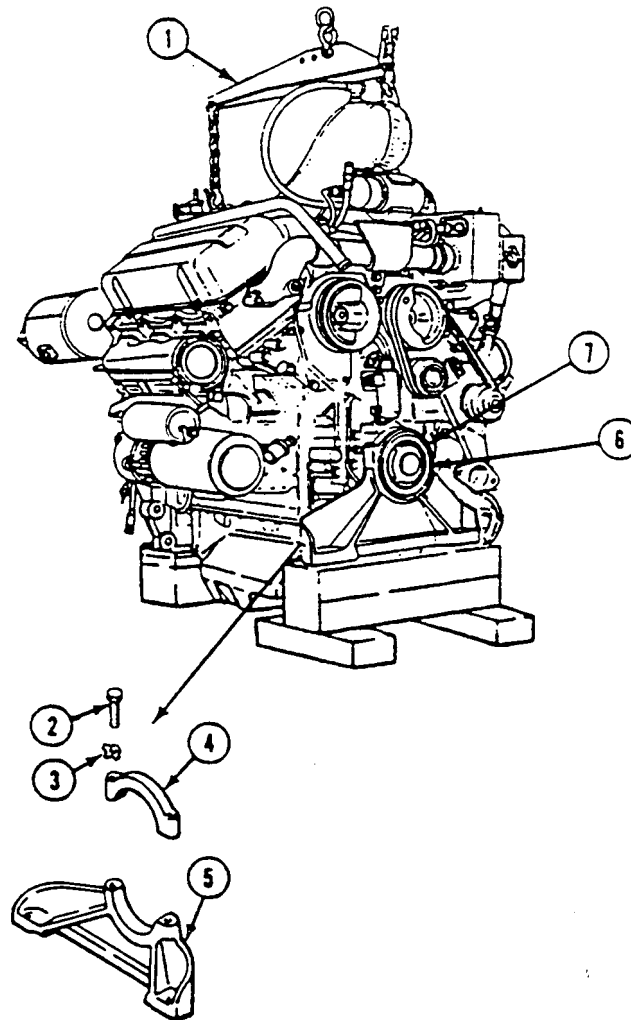
INSTALLATION

1. Use a lifting device of at least 2,000 lb (908 kg) capacity and sling (1) to lift new engine from shipping container. Block rear end of engine on level ground (see your -20).

CAUTION

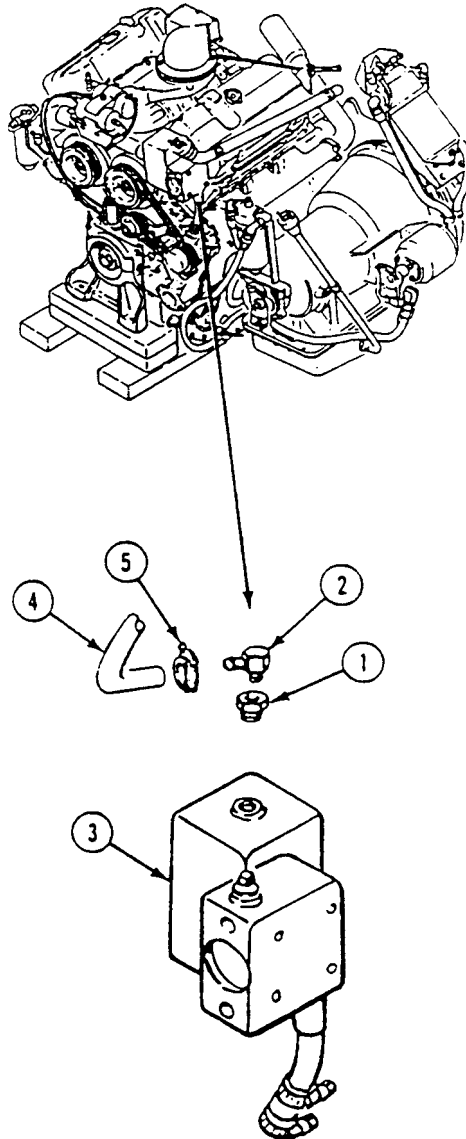
Parts installed in Steps 2 - 59 are not supplied with new engine. These parts must be retained from the old engine.

2. Apply a thin coat of antiseize compound to cleaned threads of two screws (2).
3. 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.
4. Block front of engine mount (see your -20) with wood blocks.



REPLACE ENGINE (M548A1) — Continued**0007 00**

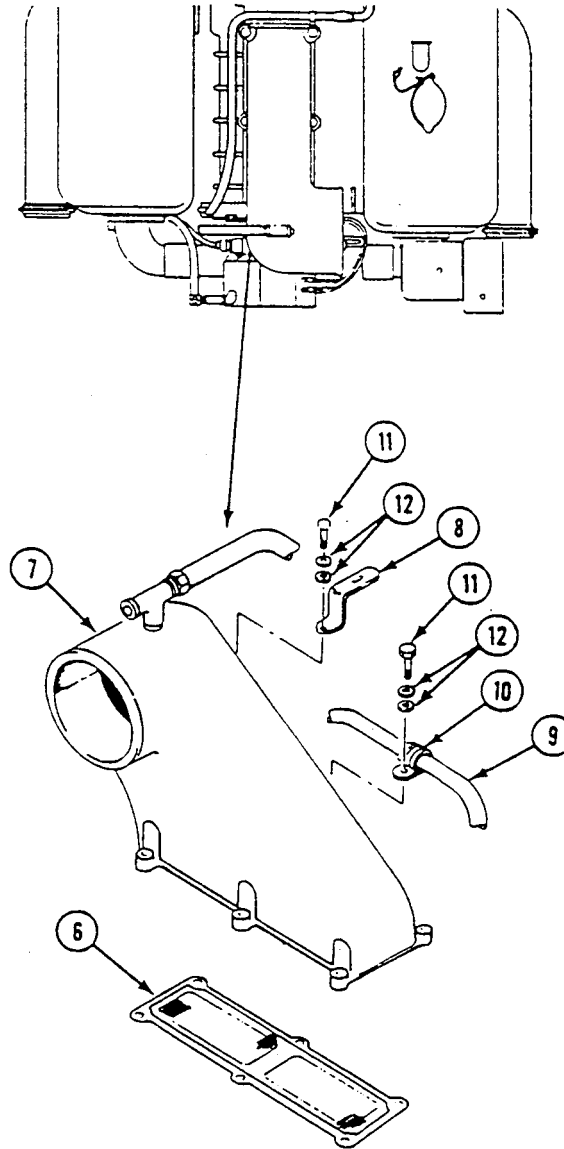
5. Apply a thin, even coat of primer and then sealing compound (WP 0080 00, Item 35) to cleaned external pipe threads of bushing (1) and elbow (2). Do not apply primer or sealant beyond small end of threads.
6. Install thermostat housing bushing (1) in thermostat housing (3).
7. Install thermostat housing elbow (2) in bushing (1).
8. Connect hose (4) with clamp (5) to thermostat elbow (2).



REPLACE ENGINE (M548A1) — Continued

0007 00

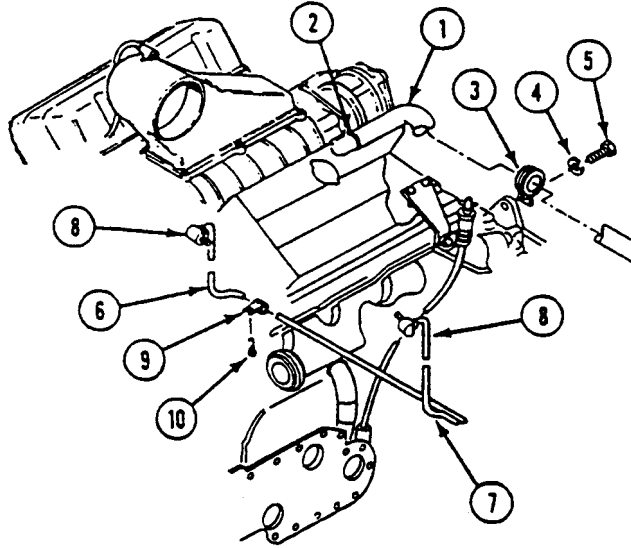
9. Install screen (6), air horn (7), bracket (8), and hose (9) with clamp (10) on engine. Secure with 6 screws (11) and 12 washers (12). Tighten screws to 300-360 lb-in (34-41 N•m) torque.



REPLACE ENGINE (M548A1) — Continued

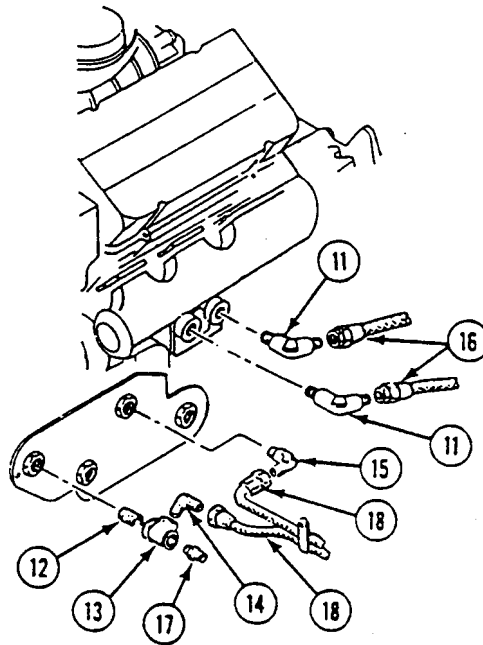
0007 00

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



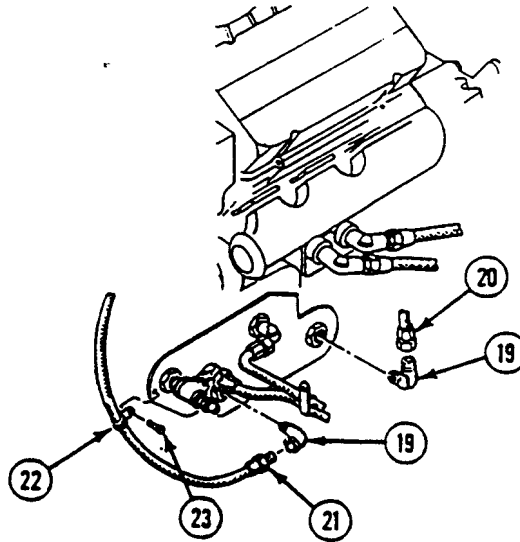
REPLACE ENGINE (M548A1) — Continued**0007 00**

12. Apply a thin, even coat of primer and then sealing compound (WP 0080 00, Item 35) 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.
13. Install two elbows (11) in engine block.
14. Connect two engine oil filter hoses (16) to two elbows (11).
15. Install oil cooler nipple (12) in engine oil cooler housing.
16. Connect tee (13) with elbow (14) to oil cooler housing nipple (12).
17. 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.
18. Install elbow (15) in engine oil cooler housing.
19. Connect two transmission oil hoses (18) to elbow (15) and elbow (14).



REPLACE ENGINE (M548A1) — Continued**0007 00**

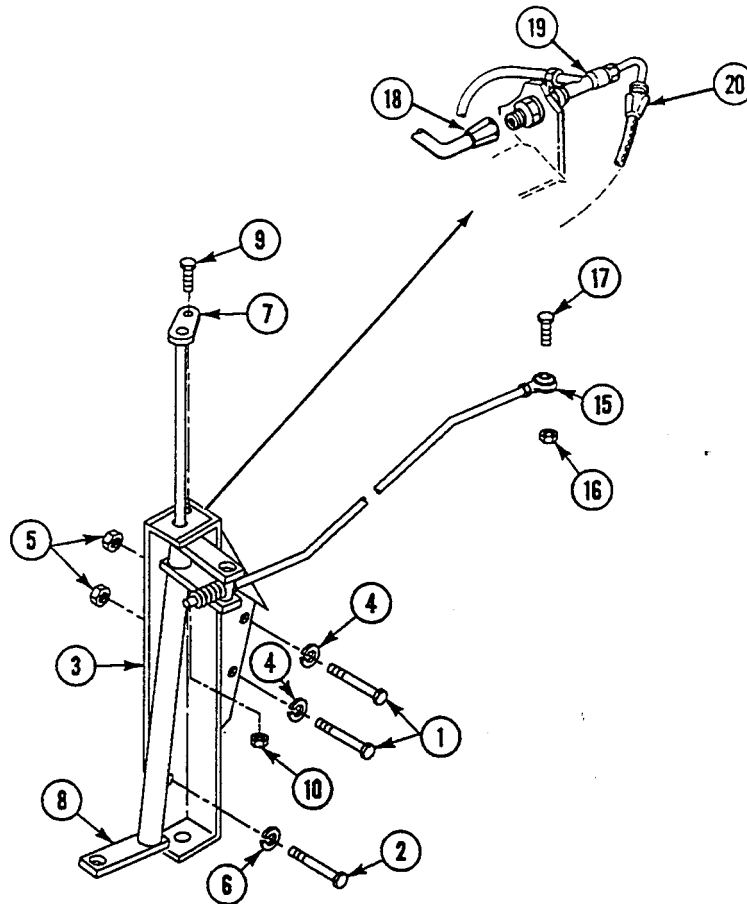
20. Apply a thin, even coat of primer and then sealing compound (WP 0080 00, Item 35) to cleaned external pipe threads of elbows (19). Do not apply primer or sealant beyond small end of threads.
21. Install two elbows (19) in engine cooler housing.
22. Connect two differential oil hose (20) and differential oil hose (21) to two elbows (19). Secure hose (21) with clamp (22) and screw (23) to oil cooler housing.



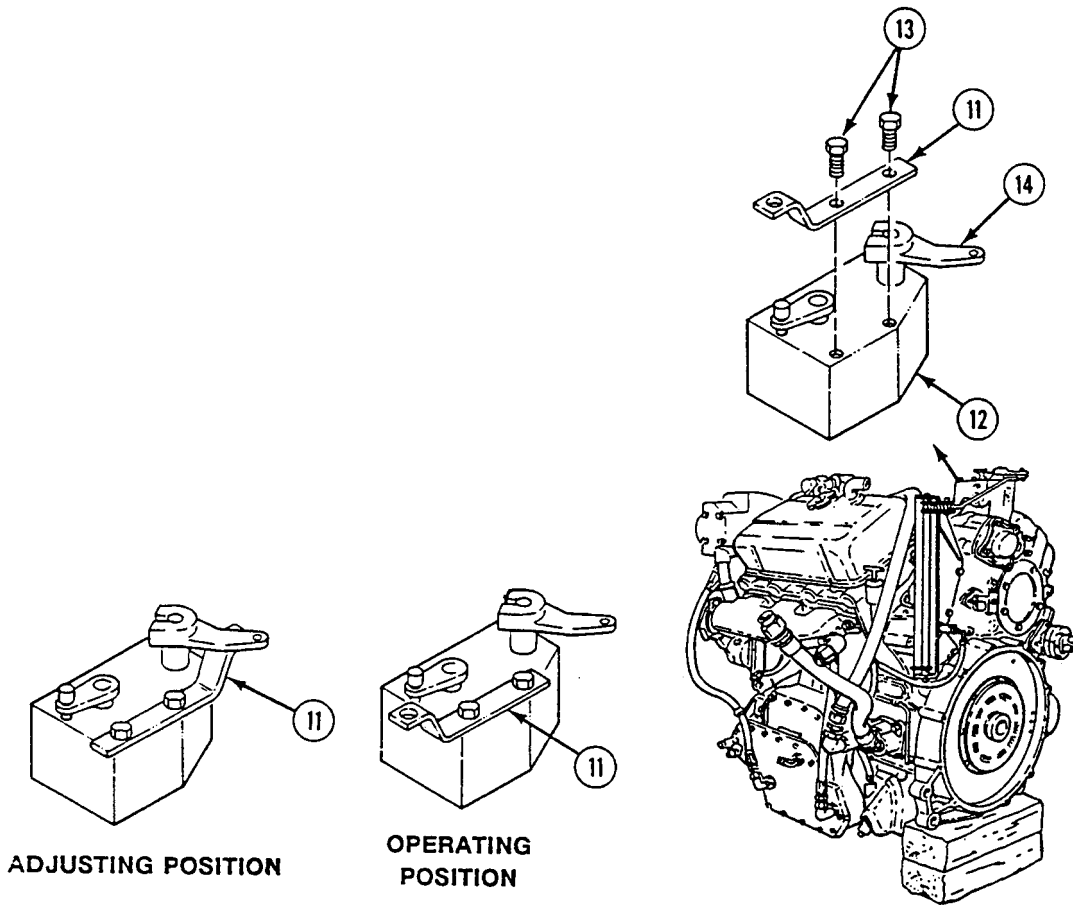
NOTE

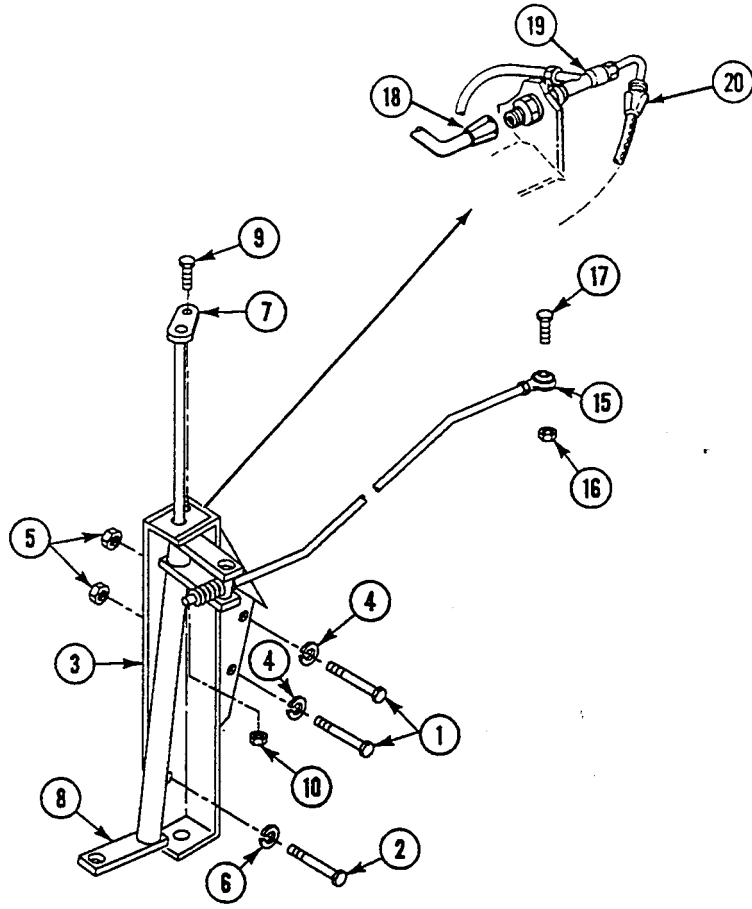
Lubricate rod end bearings before assembling. Use GAA grease (see your -20).

23. Apply thin coat of antiseize compound to clean threads of screw (1) and two screws (2).
24. Install bracket assembly (3) on power plant. Secure with two screws (1), new lock washers (4), and nuts (5). Tighten screws to 300-324 lb-in (34-37 N•m) torque.
25. Install screw (2) and new lock washer (6) in bottom hole of bracket assembly (3). Tighten screw to 264-288 lb-in (30-33 N•m) torque.
26. Position inner transfer shaft (7) and outer transfer shaft (8) in bracket assembly (3). Secure with screw (9) and new lock nut (10).

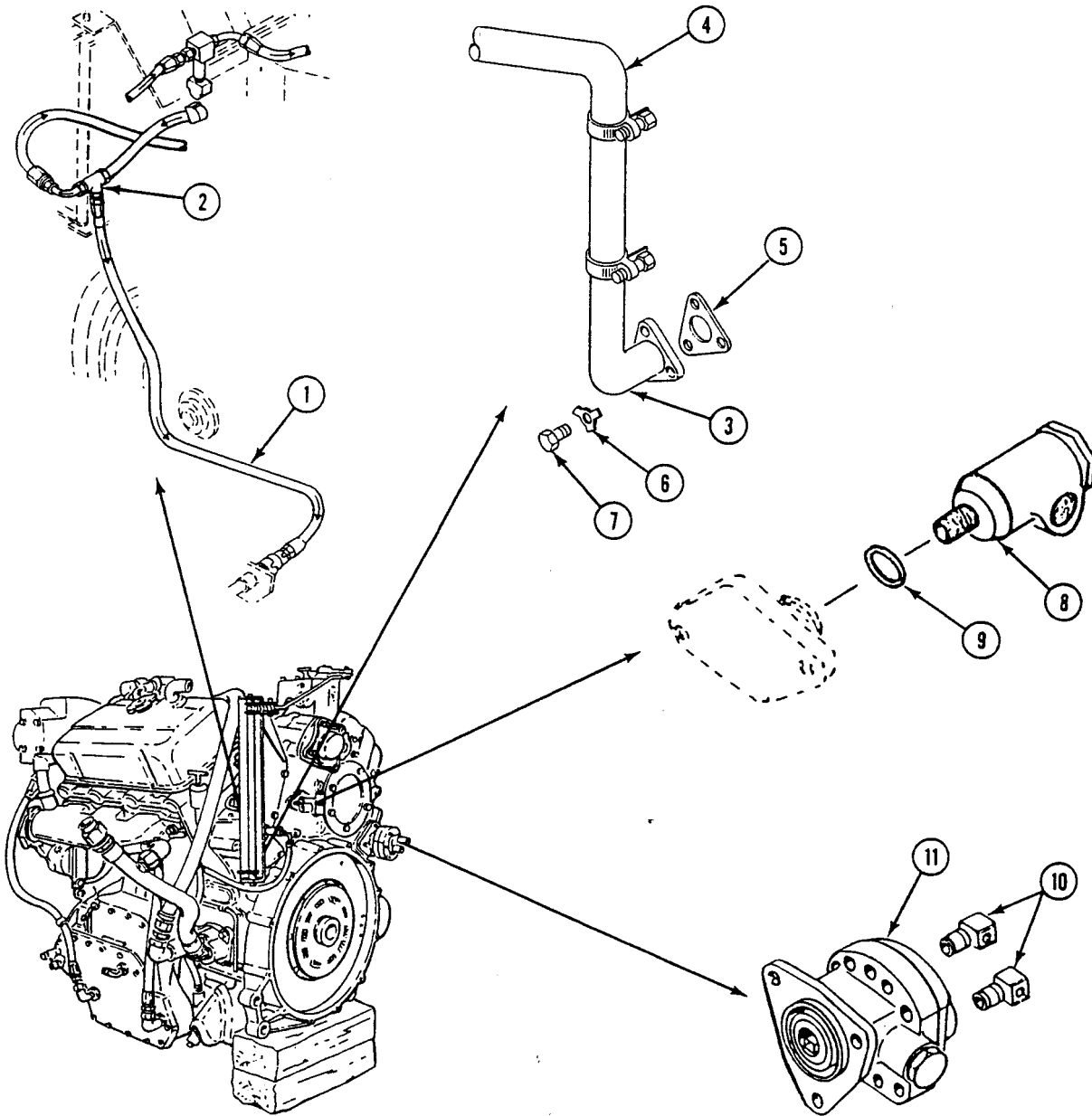


27. Attach gauge (11) to governor (12) in adjusting position. Secure with two screws (13). Align hole in throttle arm (14) with hole in gauge. Secure throttle arm.
28. Remove two screws (13) and gauge (11) from governor (12). Install gauge in operating position on governor. Secure with two screws.
29. Install governor control link (15) on throttle arm (14) with screw (16) and nut (17).
30. Connect elbow (18) to tee (19).
31. Connect air box heater fuel supply hose (20) to tee (19).

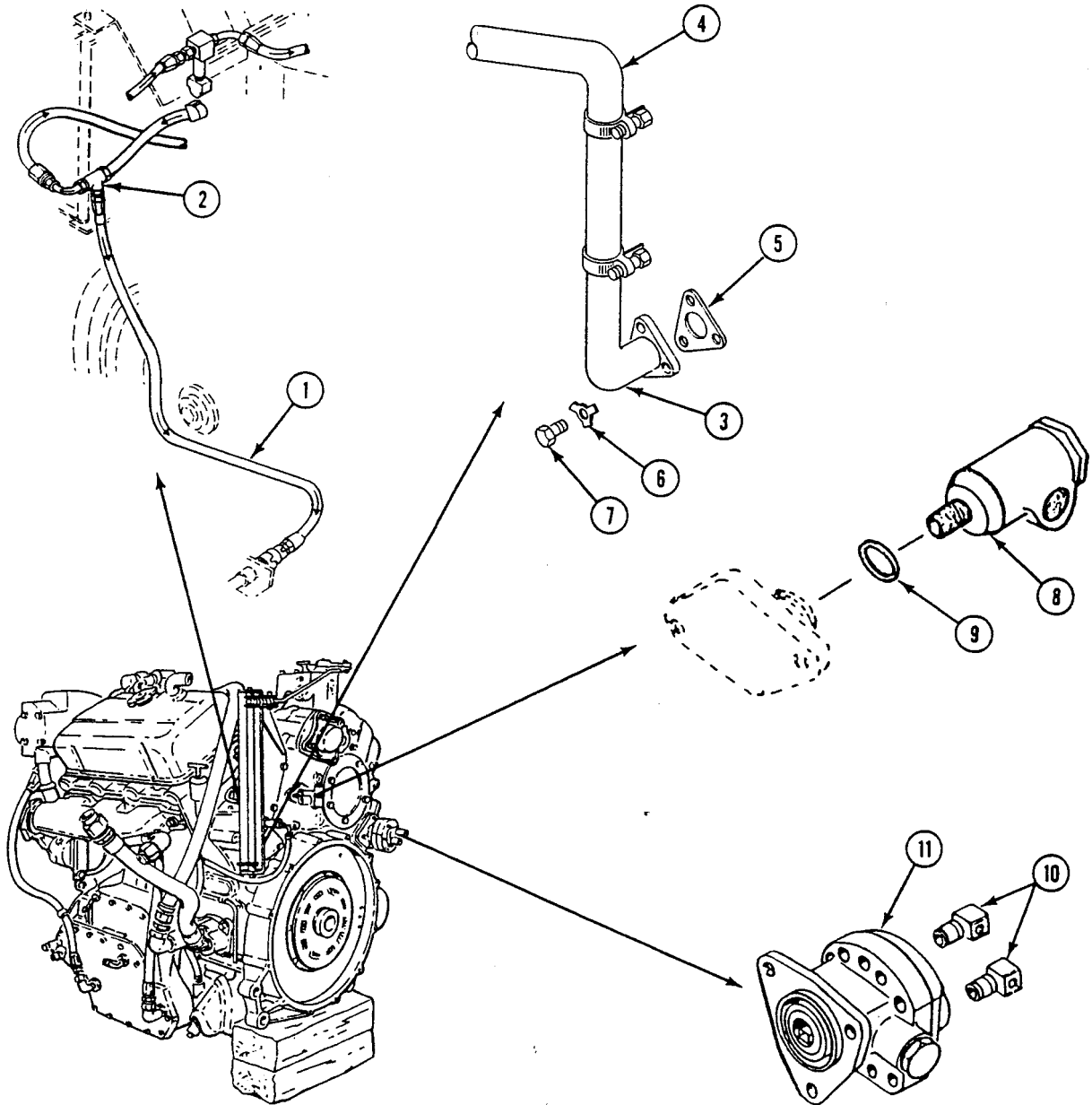




32. Connect fuel return hose (1) to tee (2).
33. Install oil filler elbow (3), hose (4), and new gasket (5) on engine. Secure with three new key washers (6) and screws (7).
34. Install tachometer drive adapter (8) and new gasket (9) on engine.

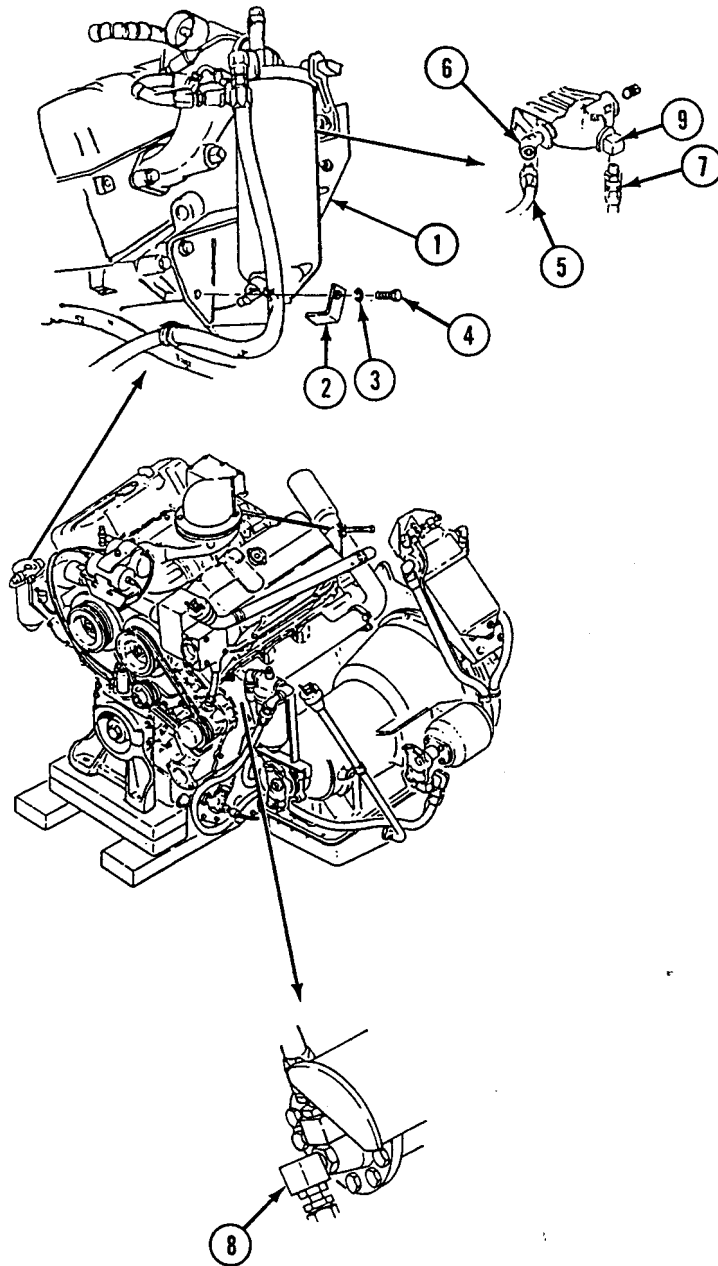


35. Apply a thin, even coat of primer and then sealing compound (WP 0080 00, Item 35) to cleaned external pipe threads of elbows (10). Do not apply primer and sealant beyond small end of threads.
36. Install two elbows (10) in fuel pump (11).

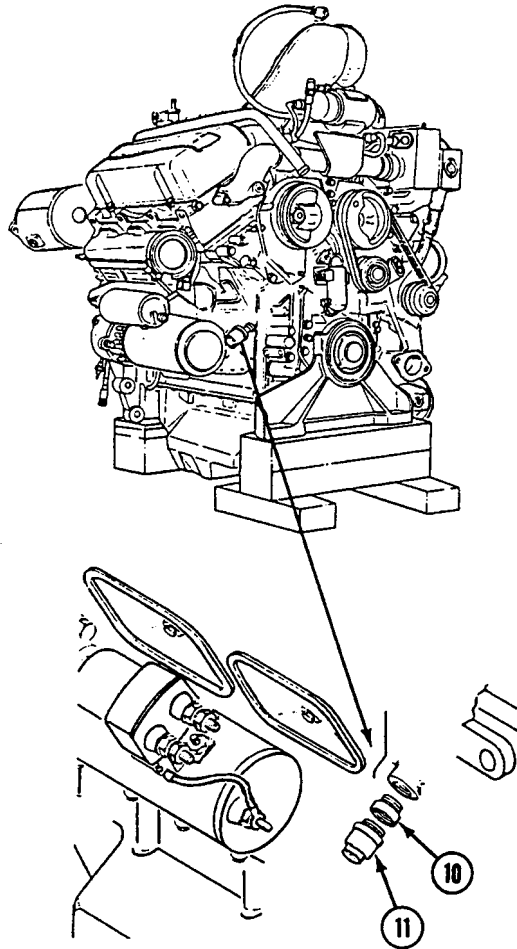


REPLACE ENGINE (M548A1) — Continued**0007 00**

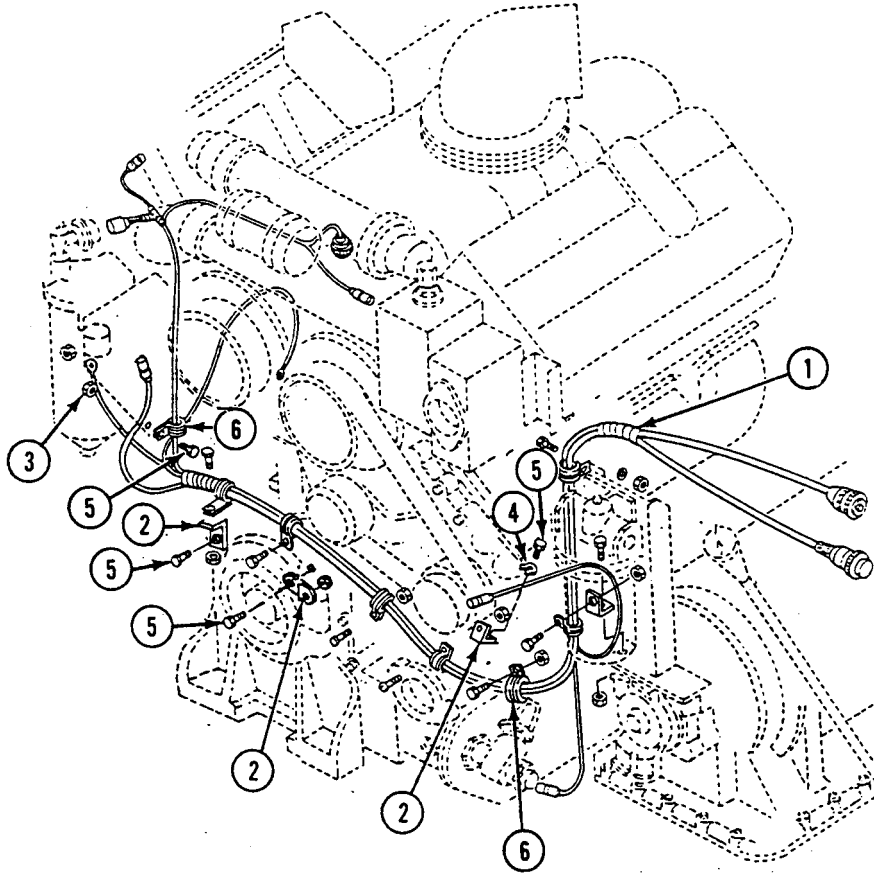
37. Install secondary fuel filter bracket (1), bracket (2), two new lock washers (3), and screws (4) on engine.
38. Connect fuel supply hose (5) to secondary fuel filter elbow (6).
39. Connect fuel supply hose (7) to fuel pump inlet elbow (8) and secondary fuel filter elbow (9).



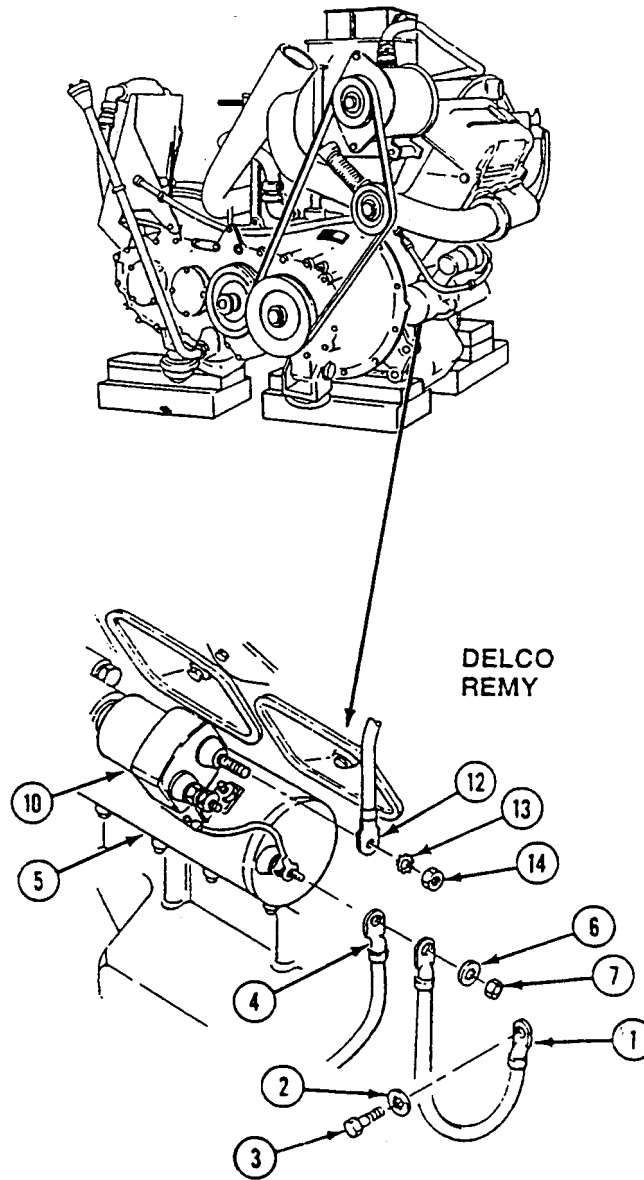
40. Service secondary fuel filter (see your -20).
41. Apply a thin, even coat of primer and then sealing compound (WP 0080 00, Item 35) to cleaned external pipe threads of bushing (10). Do not apply primer or sealant beyond small end of threads.
42. Install engine low oil pressure switch bushing (10) and switch (11) on engine block.

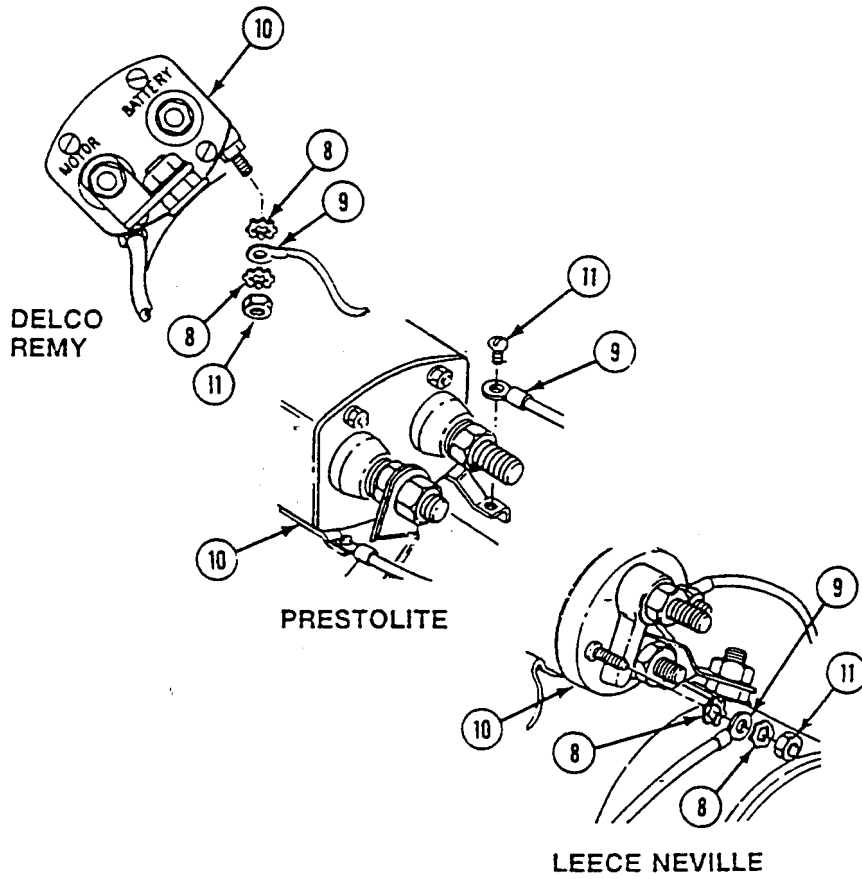


43. Install power plant wiring harness (1) on engine. Secure with three brackets (2), new lock nut (3), new key washer (4), four screws (5), and four clamps (6).

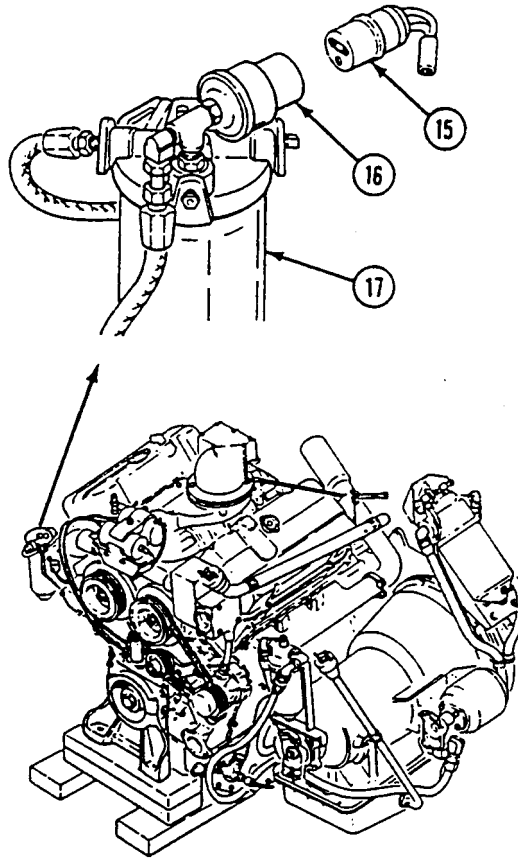


44. Install ground lead (1) on engine block. Secure with new lock washer (2) and screw (3).
45. Install ground lead (1) and ground lead (4) on starter (5). Secure with new lock washer (6) and nut (7).
46. Install two new lock washers (8) (Delco and Leece Neville only) and circuit 74A lead (9) on terminal of starter solenoid (10). Secure with nut (11) (screw on Prestolite).
47. Install circuit 6 lead (12) on terminal of starter solenoid (10). Secure with new lock washer (13) and nut (14).

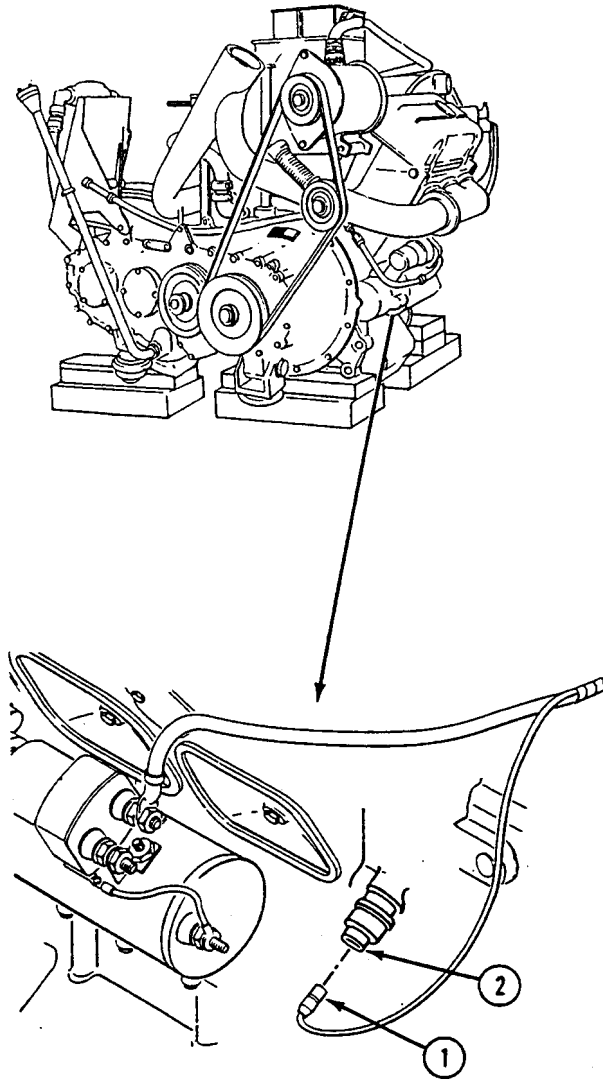




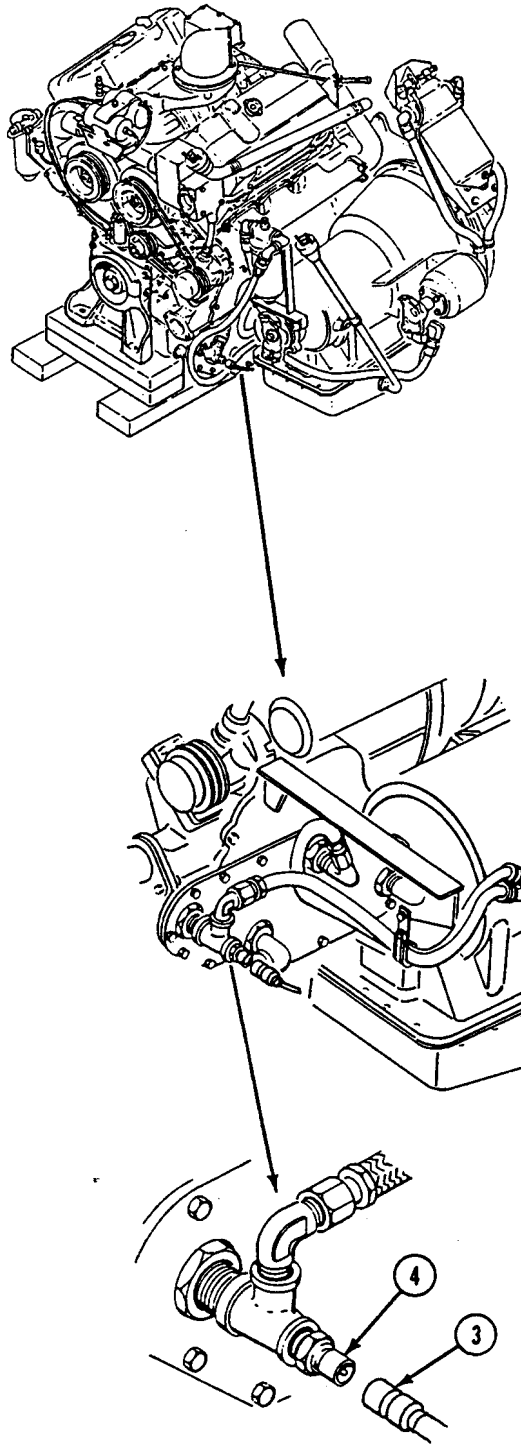
48. Connect power plant wiring harness circuits 1A and 1B lead (15) to field switch (16) at secondary fuel filter (17).



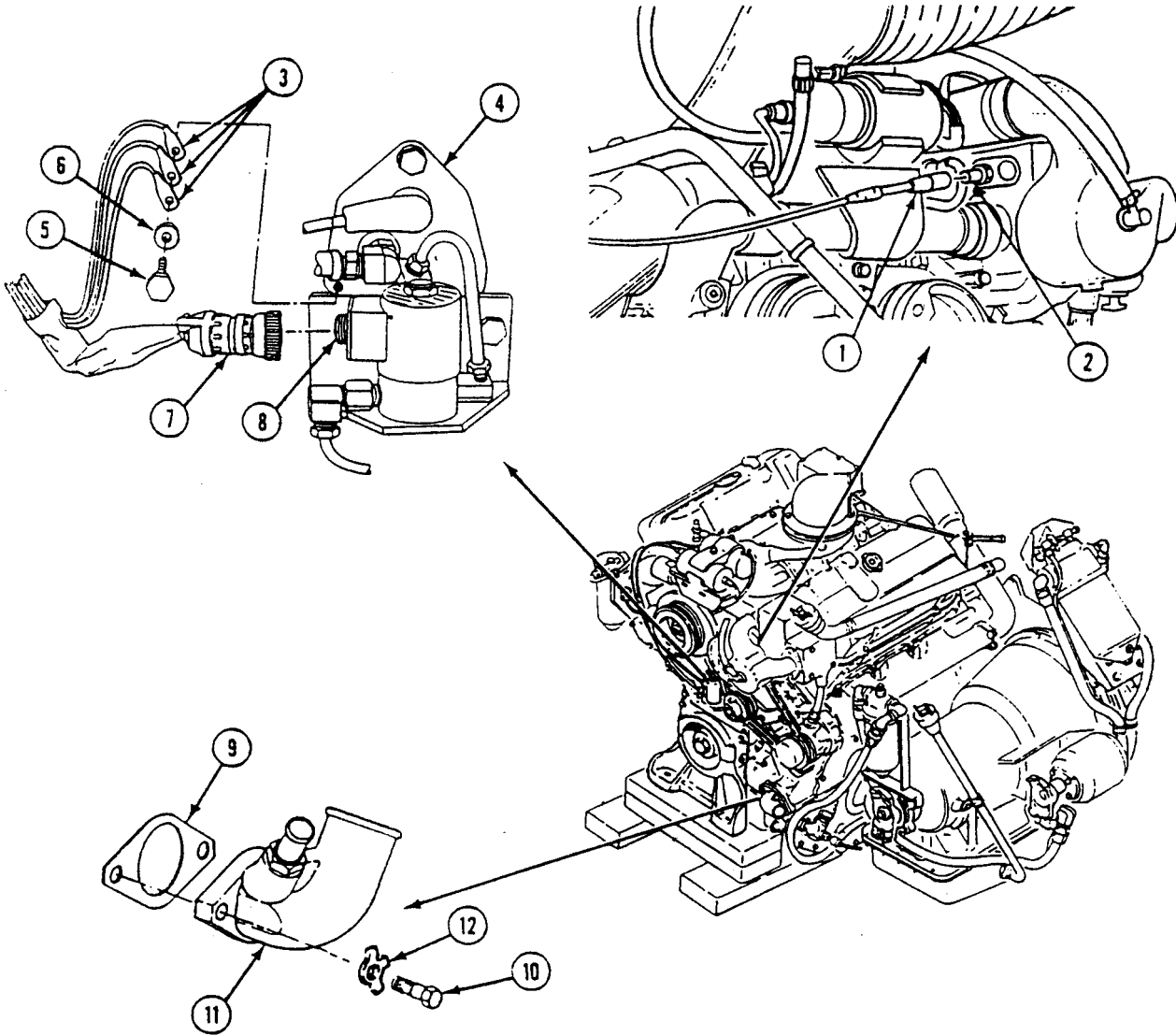
49. Connect power plant wiring harness circuit 327 lead (1) to transmission oil temperature sending unit (2).



50. Connect power plant wiring harness circuit 34 lead (3) to engine low oil pressure switch (4).



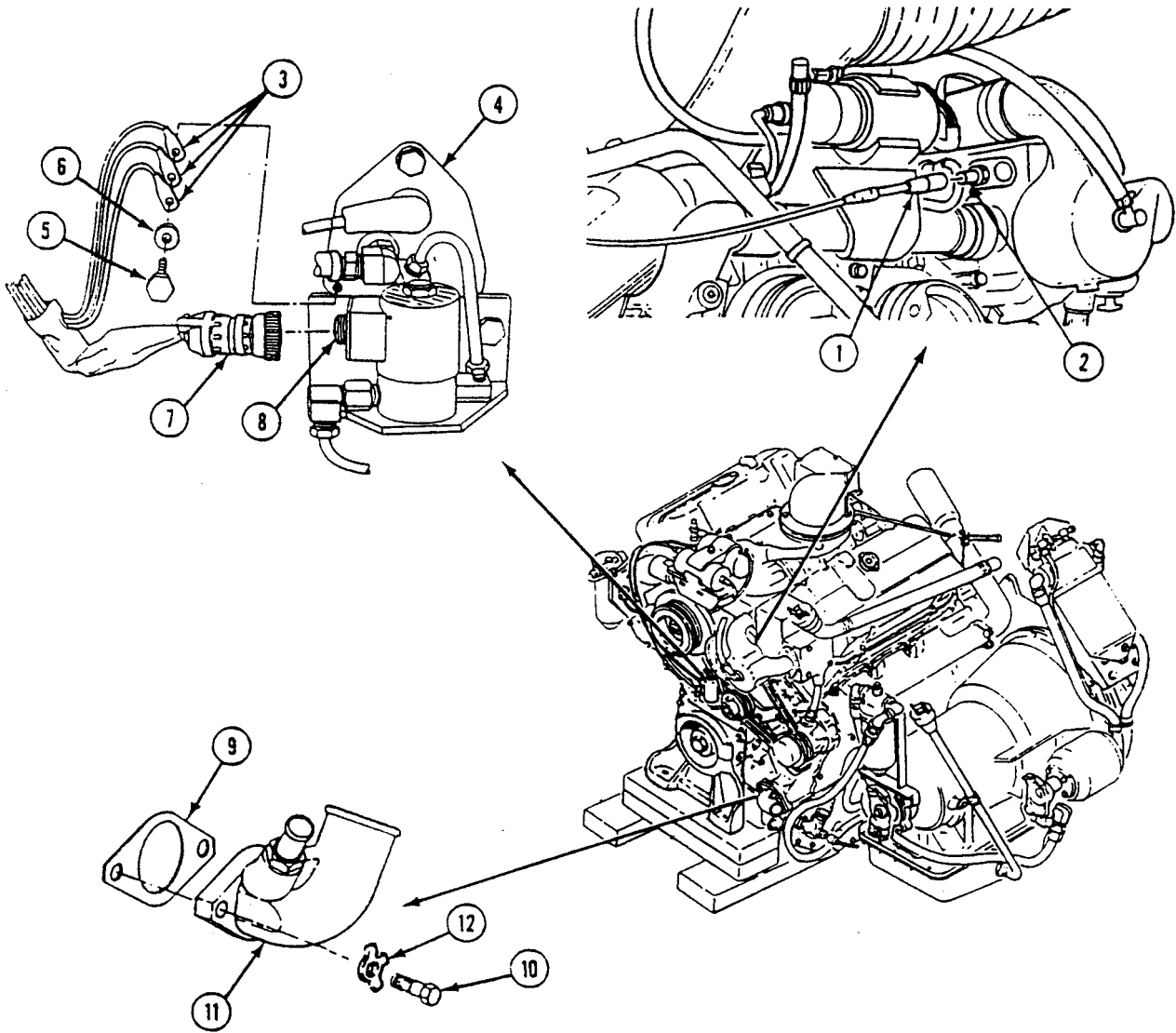
51. Connect power plant wiring harness circuit 33 lead (1) to coolant temperature sending unit (2).
52. Connect three ground leads (3) to air box heater bracket (4). Secure with screw (5) and new lock washer (6).
53. Connect power plant wiring harness circuit 406 lead (7) to air box heater wiring harness connector (8).



REPLACE ENGINE (M548A1) — Continued

0007 00

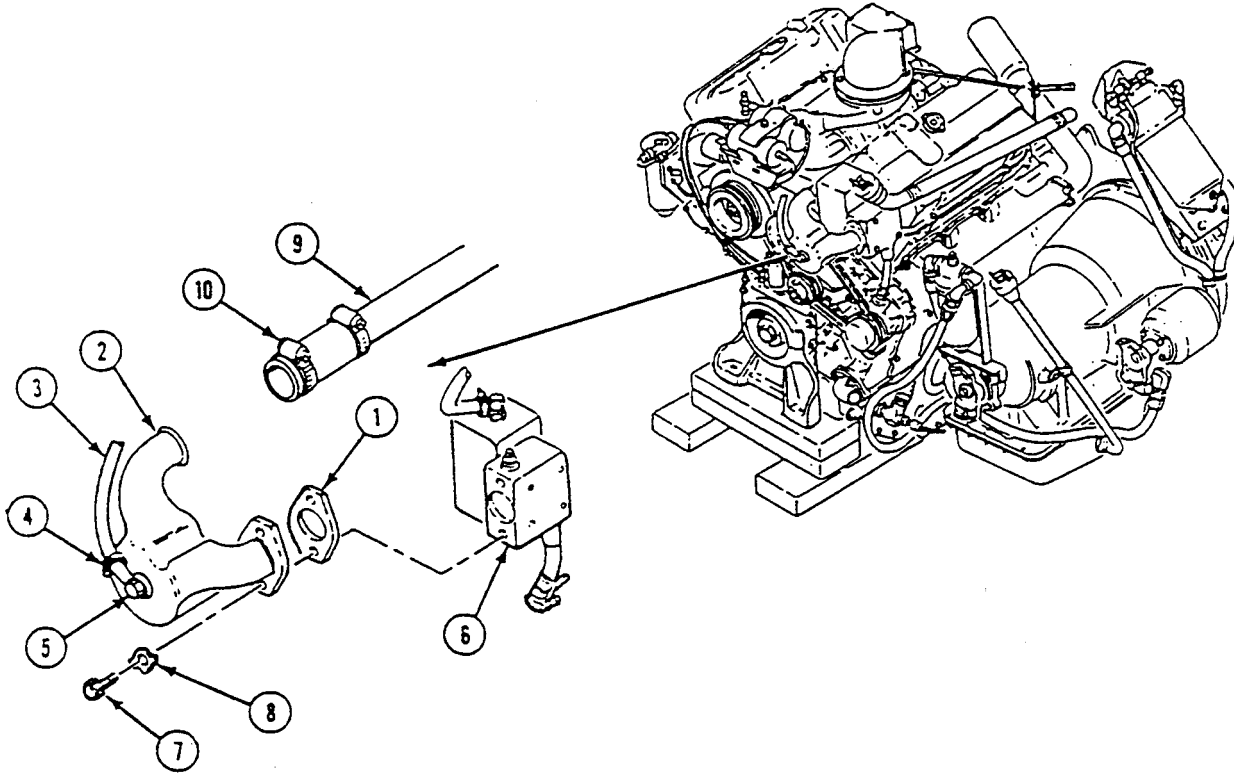
54. Apply a thin coat of sealing compound (WP 0080 00, Item 32) to both sides of gasket (9) before assembly.
55. Apply a thin coat of antiseize compound to cleaned threads of screws (10).
56. Install new gasket (9) and oil cooler elbow (11) on engine. Secure with two screws (10) and new lock washers (12).



REPLACE ENGINE (M548A1) — Continued

0007 00

57. Apply a thin coat of sealing compound (WP 0080 00, Item 32) to both sides of gasket (1) before assembly.
58. Install deaeration elbow (2) with hose (3), clamp (4), elbow (5), and new gasket (1) on thermostat housing cover (6). Secure with two screws (7) and new key washers (8).
59. Connect coolant tube (9) to deaeration elbow (2). Secure with clamp (10).



FOLLOW-THROUGH STEPS

1. Install transfer gearcase on engine (WP 0030 00).
2. Install transmission on transfer gearcase (WP 0027 00).
3. Install generator and bracket with linkage (see your -20).
4. Install power plant in carrier (see your -20).
5. Change engine oil and filter (see your -20).
6. Change fuel filters (see your -20).
7. Check belt tension (see your -20).
8. Adjust engine power disconnect (see your -20).
9. Adjust governor linkage (see your -20).

END OF TASK

REPLACE ENGINE (M548A3)

0008 00

THIS WORK PACKAGE COVERS:

Removal (page 0008 00-2).
 Installation (page 0008 00-11).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Engine and Transmission Sling (WP 0078 00, Item 51)
 V-Belt Tensiometer (WP 0078 00, Item 60)
 Socket Wrench Set, 3/8 Inch Drive
 (WP 0078 00, Item 79)
 Torque Wrench (WP 0078 00, Item 83)
 Torque Wrench (WP 0078 00, Item 85)
 Yardstick (WP 0080 00, Item 47)
 Yardstick (WP 0080 00, Item 48)
 Lifting device with rated capacity of 1700 lbs (772 kg)
 Magnetic base dial indicator (WP 0080 00, Item 86)

Materials/Parts

Antiseize compound (WP 0080 00, Item 6)
 Sealing compound (WP 0080 00, Item 33)
 Jack screw (3) (MS90725-60 or B1821BH038C100N)
 Cotter pin
 Lock nut (2)
 Lock nut (3)
 Lock nut
 Lock nut

Lock nut (2)

Lock nut (2)

Lock nut

Lock screw (6)

Lock washer

Lock washer

Lock washer

Lock washer (2)

Lock washer (2)

Personnel Required

Track Vehicle Repairer 63H
 Helper (H)

References

See your -20

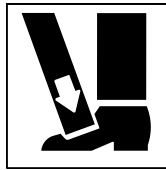
Equipment Condition

Power plant on the power plant stand (WP 0052 00)

Engine oil drained (see your -20)

Power plant wiring harness removed (see your -20)

REMOVAL

WARNING

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

CAUTION

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

CAUTION

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

NOTE

Wiring harnesses and hoses connected to both engine and transmission are removed from engine in this procedure and stay attached to transmission.

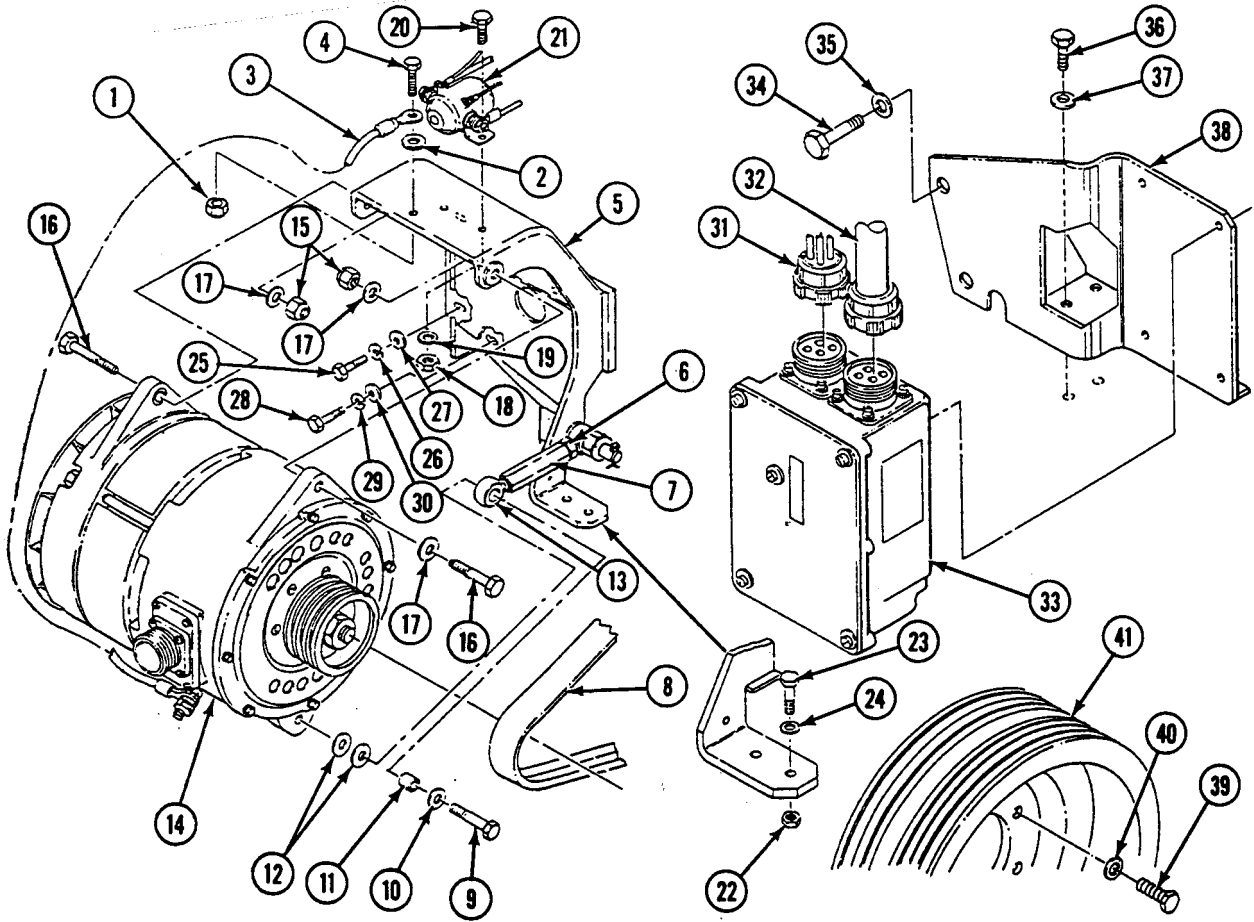
The following components must be removed from the old engine and reinstalled on the replacement engine.

1. Remove nut (1), lock washer (2), ground lead (3) and screw (4) from generator mount (5). Discard lock washer.

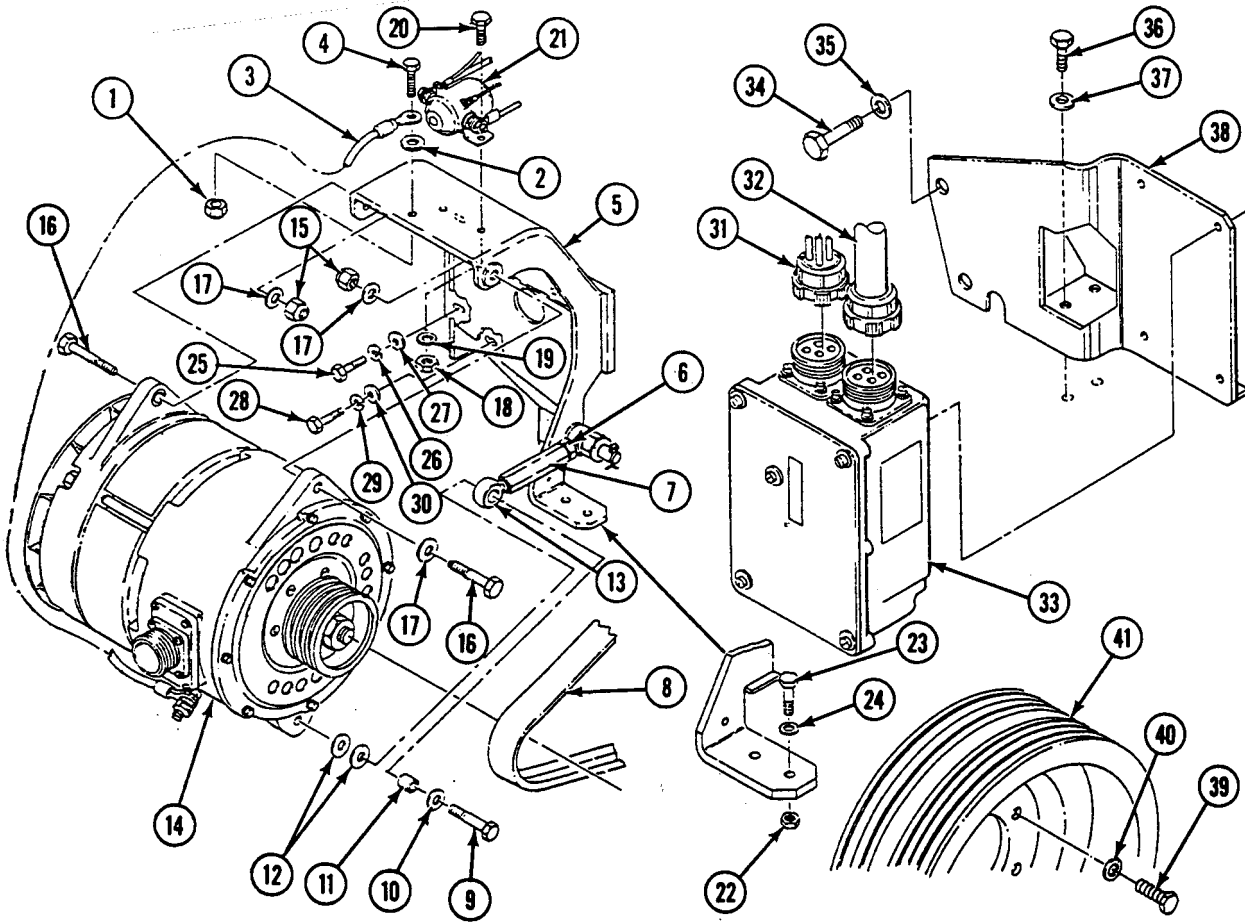
REPLACE ENGINE (M548A3) — Continued

0008 00

2. Loosen screw (6) and turnbuckle adjusting nut (7). Rotate clockwise to relieve tension on drive belt (8). Remove drive belt.



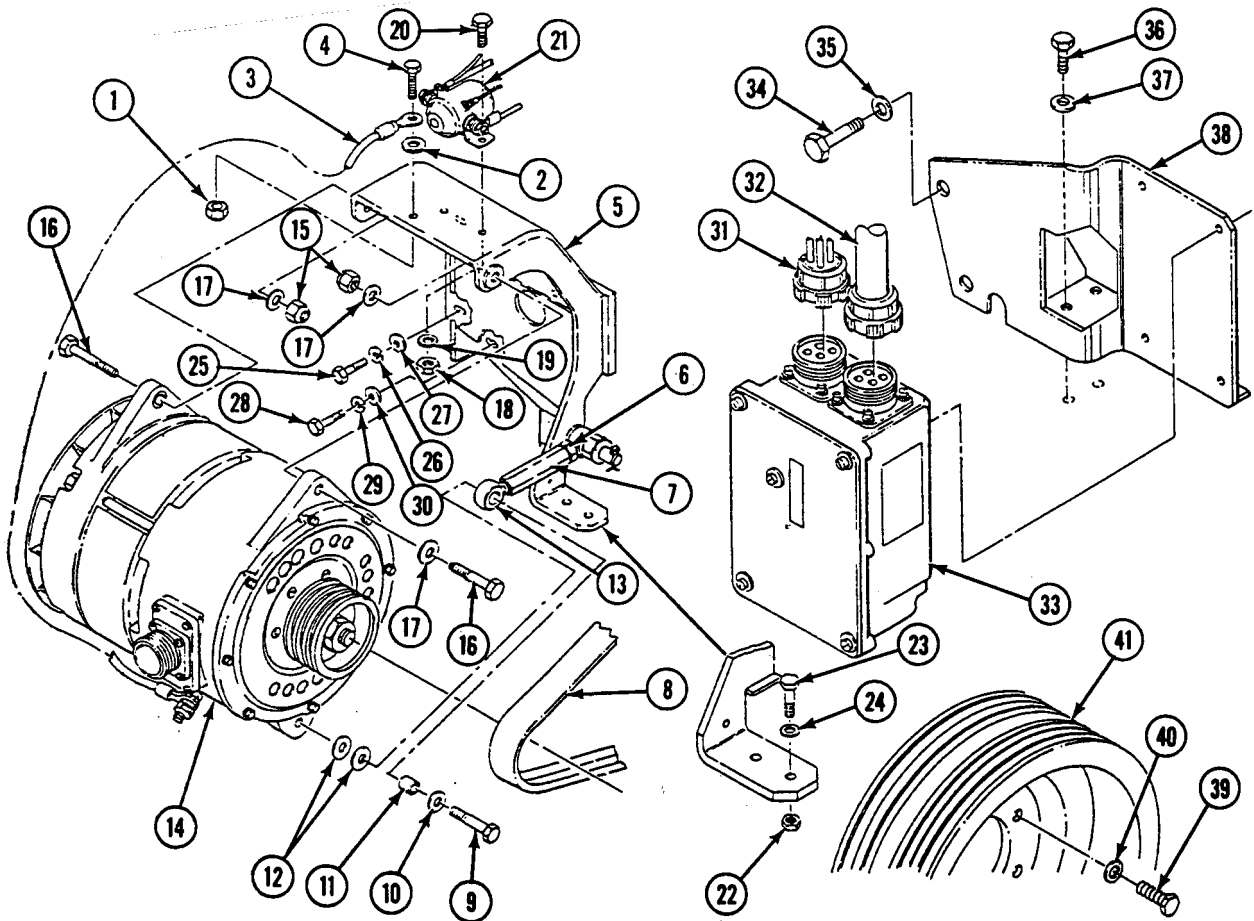
3. Remove screw (9), washer (10), spacer (11), two washers (12) and turnbuckle (13) from generator (14).
4. Remove two lock nuts (15), screws (16), three washers (17) and generator (14) from mount (5). Have helper assist. Discard lock nuts.
5. Remove two lock nuts (18), washers (19), screws (20) and starter relay switch (21) from generator mount (5). Discard lock nuts.
6. Remove two nuts (22), screws (23) and washers (24) from coolant pipe bracket.
7. Remove two screws (25), lock washers (26), washers (27), two screws (28), lock washers (29), washers (30) and generator mount (5) from engine. Discard lock washers.



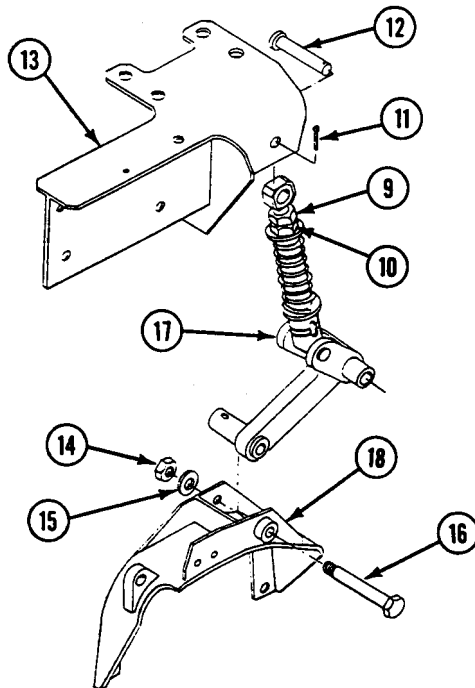
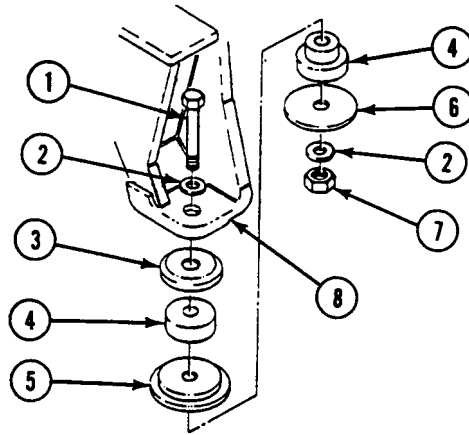
REPLACE ENGINE (M548A3) — Continued

0008 00

8. Disconnect power cable (31) and regulator cable (32) from regulator (33).
9. Remove two screws (34), washers (35), two screws (36), washers (37) and bracket (38) with regulator from engine.
10. Remove six lock screws (39) and washers (40) from pulley (41). Discard lock screws.
11. Install three jack screws (3/8-16 X 1 inch – MS90725-60) in threaded holes in pulley (41). Progressively tighten screws and remove pulley.



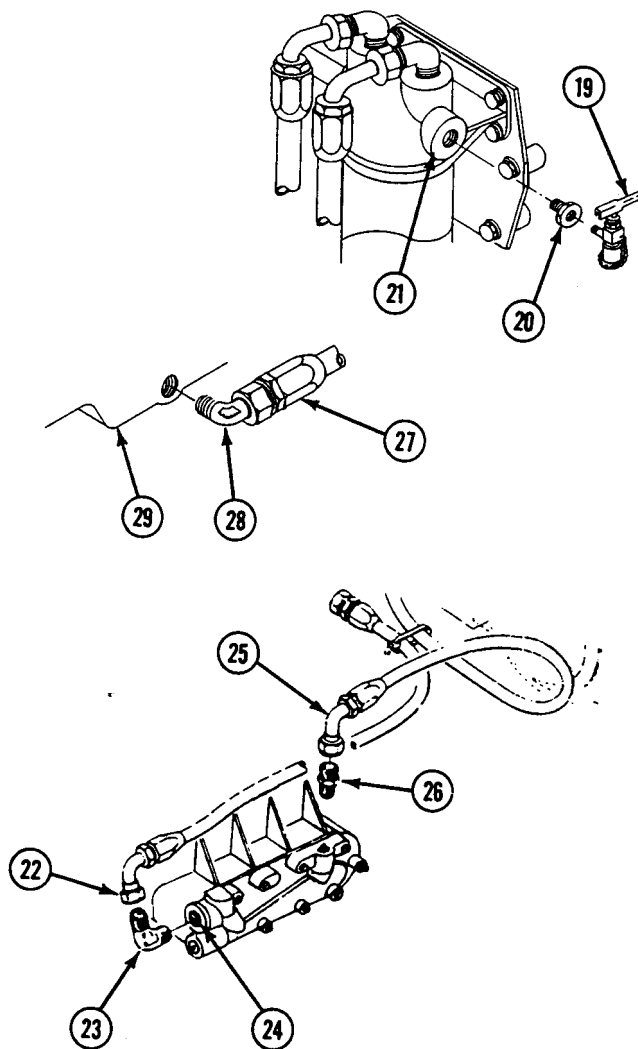
12. Remove two screws (1), four washers (2), two washers (3), four mounts (4), two blocks (5), two washers (6) and two lock nuts (7) from engine mount (8). Discard lock nuts.
13. Loosen lock nut (9) and rotate adjusting nut (10) to loosen fan drive belt. Remove belt.
14. Remove cotter pin (11) from pin (12). Discard cotter pin.
15. Remove pin (12) and adjustment screw assembly from bracket (13).
16. Remove lock nut (14), washer (15), screw (16) and idler arm (17) with adjustment screw assembly from bracket (18). Discard lock nut.



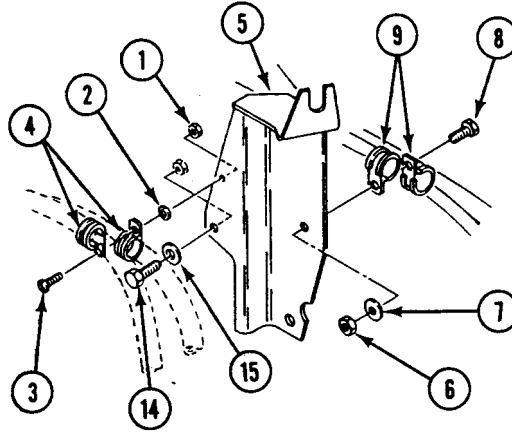
REPLACE ENGINE (M548A3) — Continued

0008 00

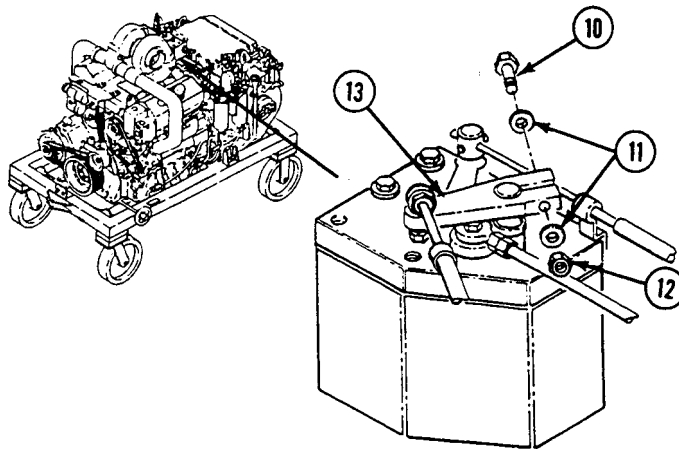
17. Remove oil sample valve (19) from bushing (20) in oil filter housing (21).
18. Remove bushing (20) from oil filter housing (21).
19. Remove transmission-to-oil cooler hose (22) and elbow (23) from transmission oil cooler (24).
20. Remove oil cooler-to-transmission hose (25) and adapter (26) from transmission oil cooler (24).
21. Remove hose (27) from elbow (28) in engine oil pan (29).
22. Remove elbow (28) from engine oil pan (29).



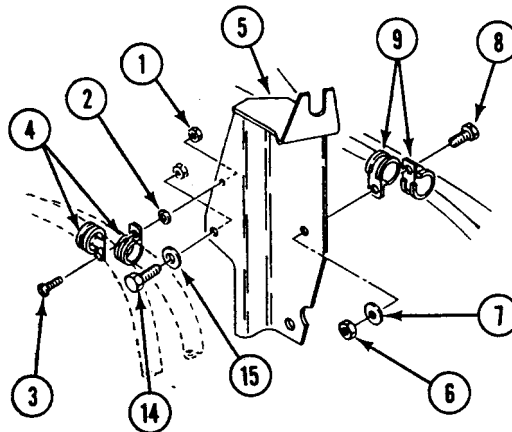
23. Remove lock nut (1), washer (2), screw (3) and two hose clamps (4) from bracket (5). Discard lock nut.
24. Remove lock nut (6), washer (7), screw (8) and two hose clamps (9) from bracket (5). Discard lock nut.



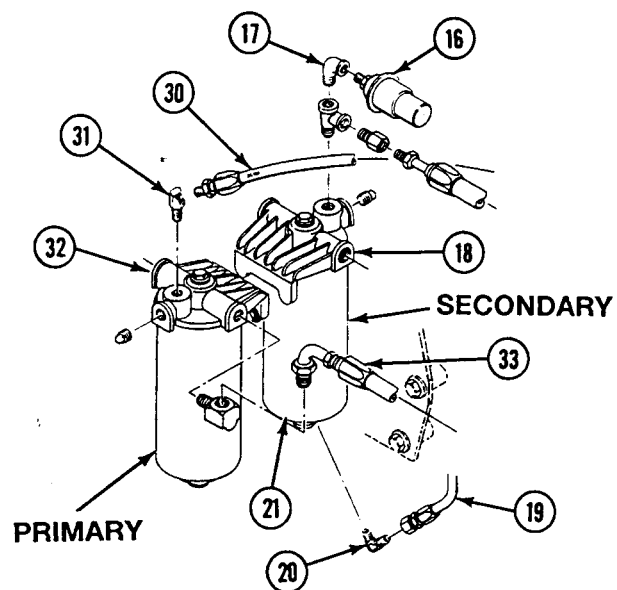
25. Remove screw (10), two washers (11), and nut (12) that secure lever assembly (13) to engine.



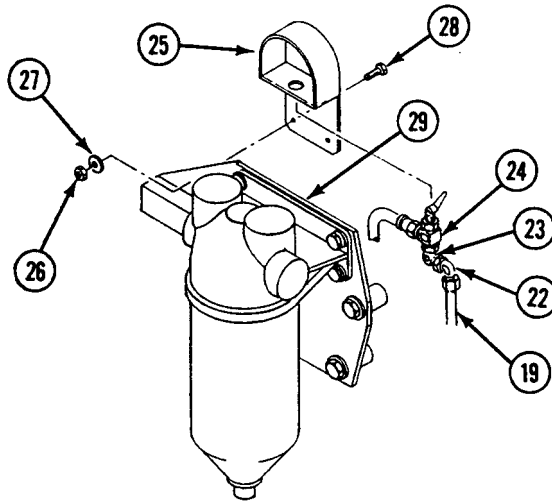
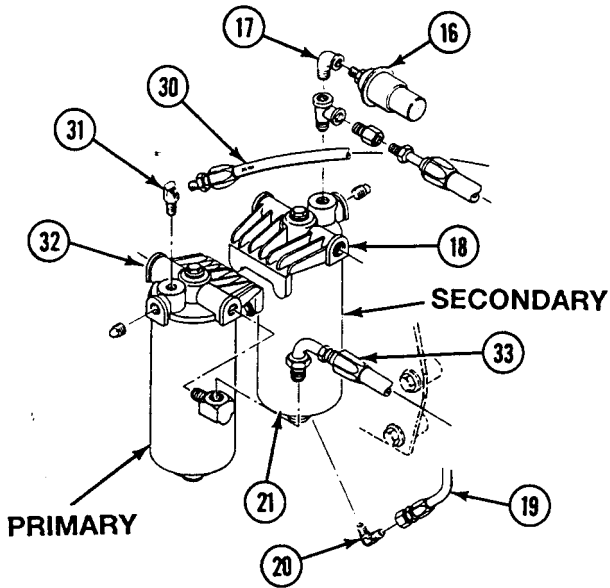
26. Remove screw (14), washer (15) and bracket (5) from engine.



27. Remove pressure switch (16) from elbow (17) on secondary fuel filter (18).
28. Remove elbow (17) from secondary fuel filter (18).
29. Remove drain hose (19) from elbow (20) on secondary fuel filter cannister (21).
30. Remove elbow (20) from secondary fuel filter cannister (21).

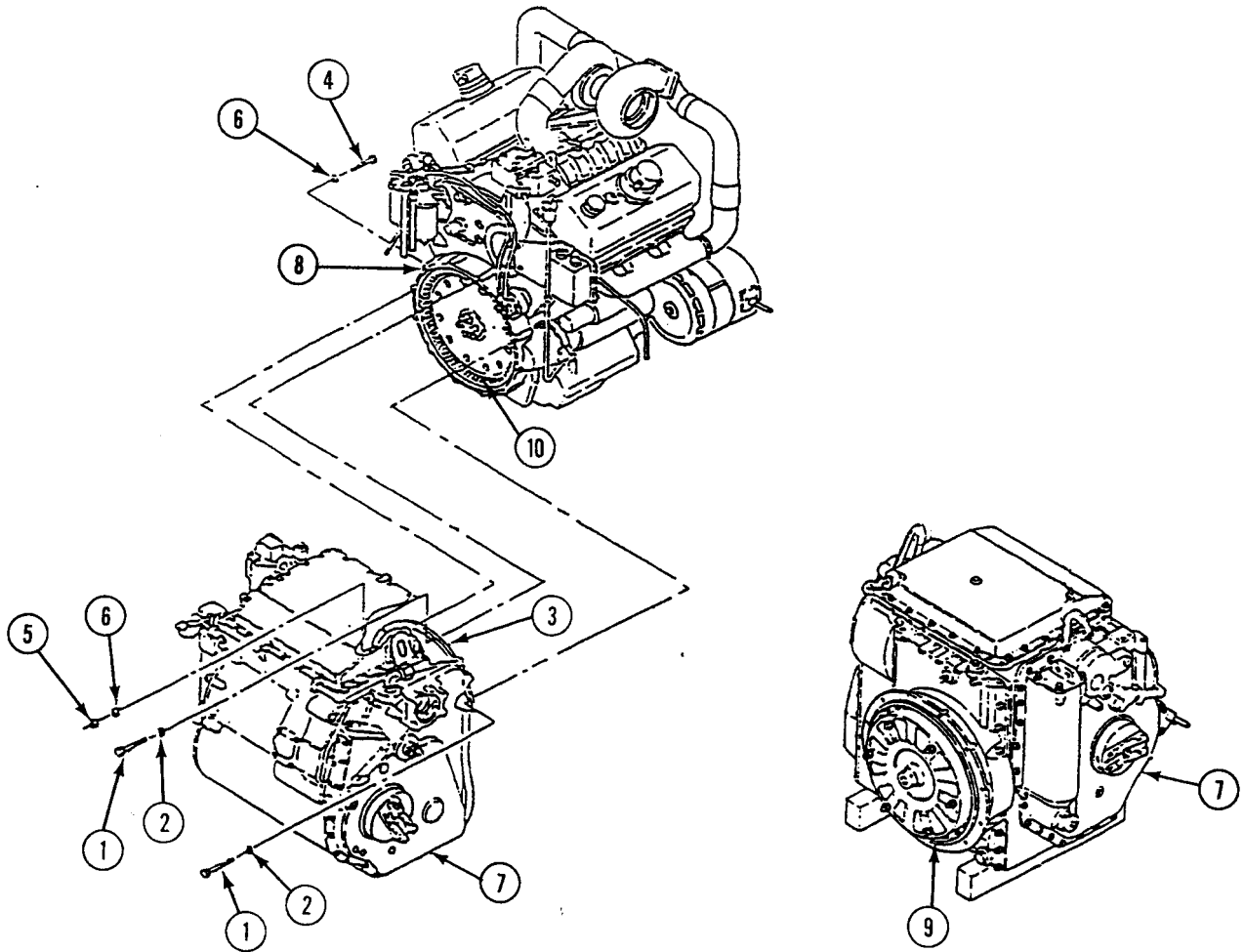


31. Remove drain hose (19) from elbow (22).
32. Remove elbow (22) from elbow (23).
33. Remove elbow (23) and drain valve (24) with hose and adapter from support (25).
34. Remove two lock nuts (26), washers (27), screws (28) and support (25) from mount (29). Discard lock nuts.
35. Remove inlet hose (30) from elbow (31) on primary fuel filter housing (32).
36. Remove elbow (31) from primary fuel filter housing (32).
37. Remove return hose (33) from primary fuel filter housing (32).



REPLACE ENGINE (M548A3) — Continued**0008 00**

38. Remove ten lock screws (1) and washers (2) from transmission input housing (3). Discard lock screws.
39. Remove two screws (4), lock nuts (5), and washers (6) from transmission (7) and engine flywheel housing (8). Discard lock nuts.
40. Move engine away from transmission (7) until splined coupling separates.



41. Attach lifting device and sling to engine. Have helper assist.
42. Remove engine from power plant stand. Use sling and lifting device. Have helper assist.

INSTALLATION

1. Remove new engine from shipping container and place on power plant stand. Use sling and lifting device. Have helper assist.

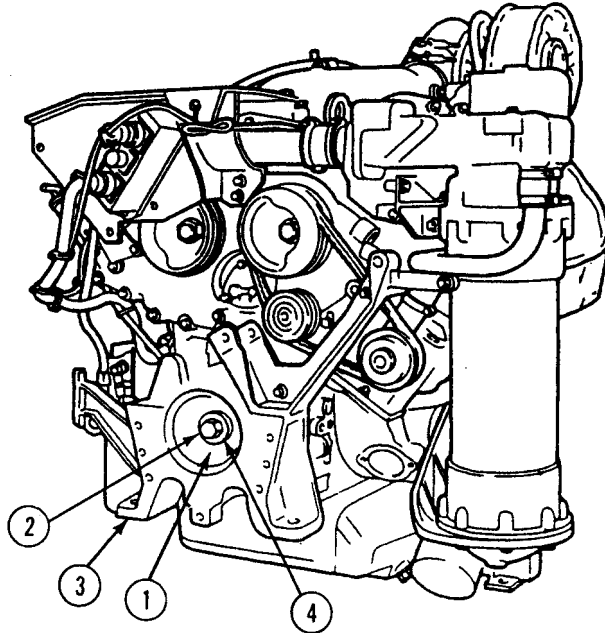
CAUTION

Damage to engine will result if crankshaft endplay is not complied with. Engines require a crankshaft endplay of not less than 0.004 inch nor more than 0.016 inch with new parts of 0.018 inch with used parts.

NOTE

The crankshaft endplay inspection must be completed without the transmission or front crankshaft pulley installed.

2. Hit the front of the crankshaft (1) two to three times with a large plastic mallet, driving the crankshaft (1) towards the rear of the engine or flywheel-housing end. Striking the crankshaft (1) will reduce the oil film on the thrust washers (4) and provide a more accurate reading.
3. Apply constant pressure on the crankshaft (1) towards the rear mount and position a magnetic base dial indicator or equivalent to the front bracket (3) – 8928723 on model 5063–539L engines. Then zero the dial indicator with dial indicator plunger on the crankshaft screw (2).
4. Position a small pry bar (less than 12 inches) between the front crankshaft washer (4) and the bracket (3). With the pry bar pull the crankshaft (1) towards the front of the engines. Keeping a constant pressure, record the crankshaft endplay. Engines require a crankshaft endplay of not less than 0.004 inch nor more than 0.0016 inches with new parts or 0.018 inch with used parts.

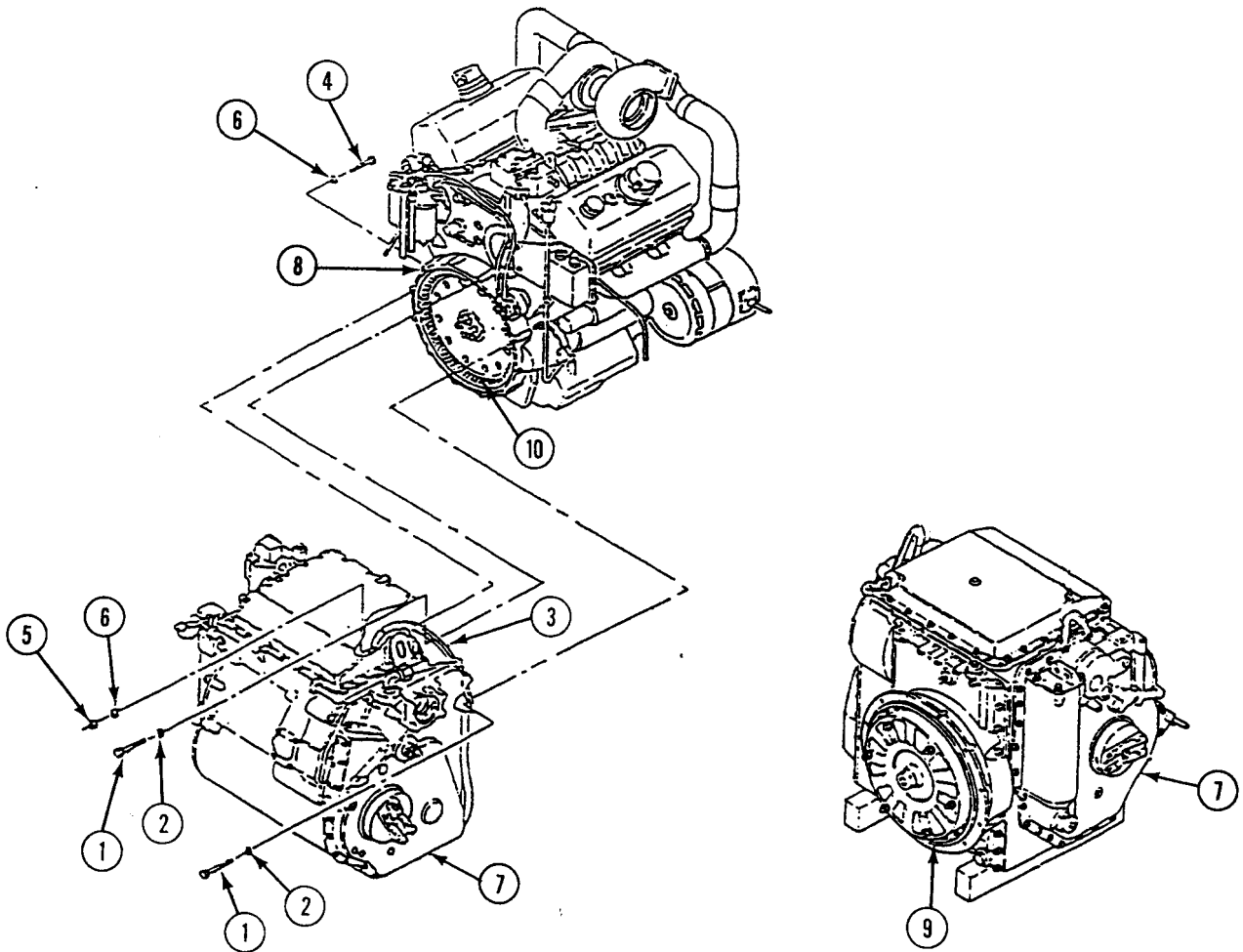


5. After the transmission has been mounted to the engine, repeat Steps 2 - 4 and record the crankshaft endplay reading.
6. Compare the crankshaft endplay readings, before and after transmission has been mounted to the engine. The recorded crankshaft endplay readings should not be different.
7. If the reading has changed, or reduced, then a binding or misalignment had occurred. The transmission mounting bolts should then be removed and the transmission (7) pulled away from the engine. The transmission (7) should then be remounted in alignment with the crankshaft and flywheel housing (8). After the second mounting, recheck the crankshaft endplay.

REPLACE ENGINE (M548A3) — Continued

0008 00

8. Clean transmission-drive coupling (9) and engine-flywheel spline (10). Apply antiseize compound.
9. Move transmission (7) onto engine splined coupling (10). Install two screw (4), new lock nuts (5), and four washers (6) holding transmission (7) to engine flywheel housing (8). Tighten screws to 25-27 lb-ft (34-37 N•m) torque. Have helper assist.
10. Install ten washers (2) and new lock screws (1) holding transmission to input housing (3). Tighten screws to 38-41 lb-ft (52-55N•m) torque.

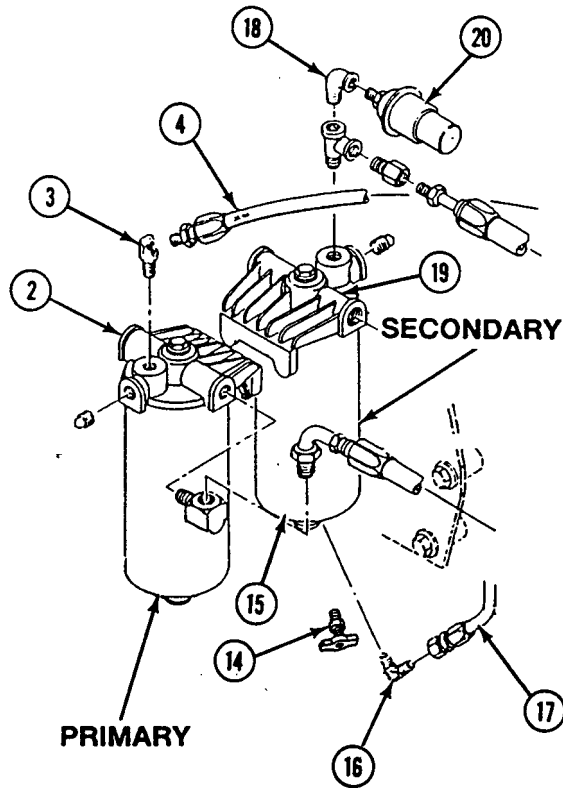


NOTE

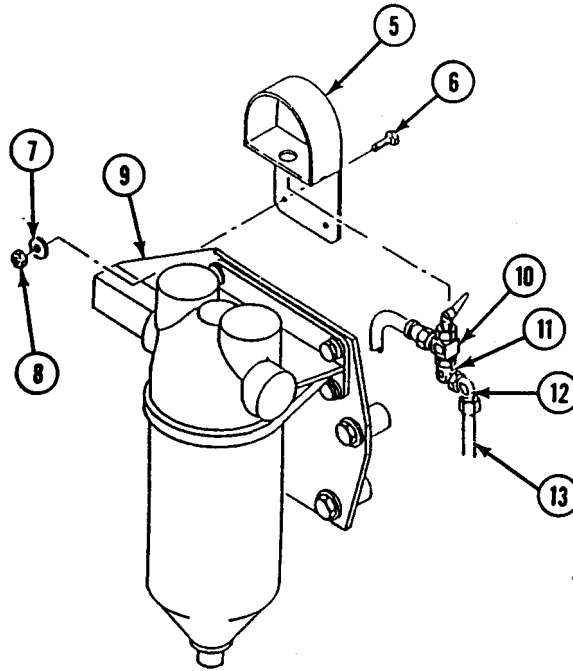
All plugs removed from replacement engine should be reinstalled in return engine.

Clean external threads of screws and straight pipe fittings and apply light coat of antiseize compound. Apply a light coat of sealing compound to tapered pipe fittings.

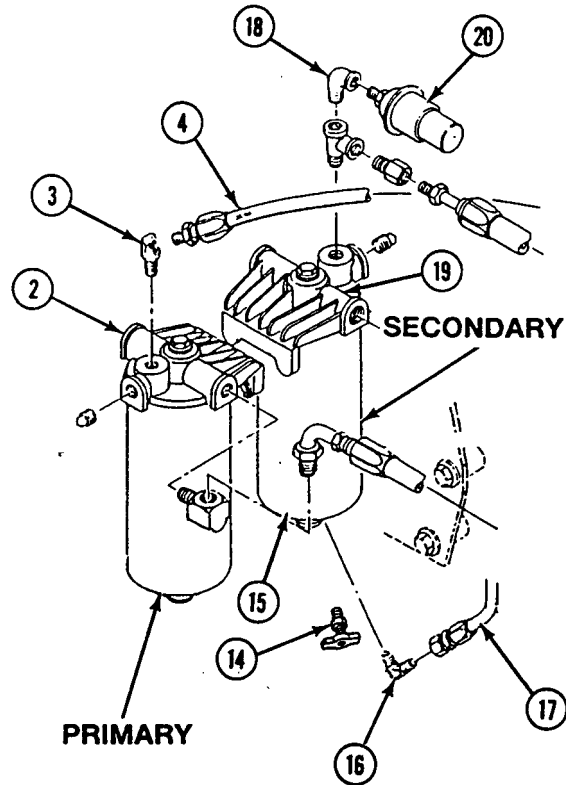
11. Install fuel return hose (1) on primary fuel filter housing (2).
12. Install elbow (3) on primary fuel filter housing (2).
13. Install inlet fuel hose (4) on elbow (3).



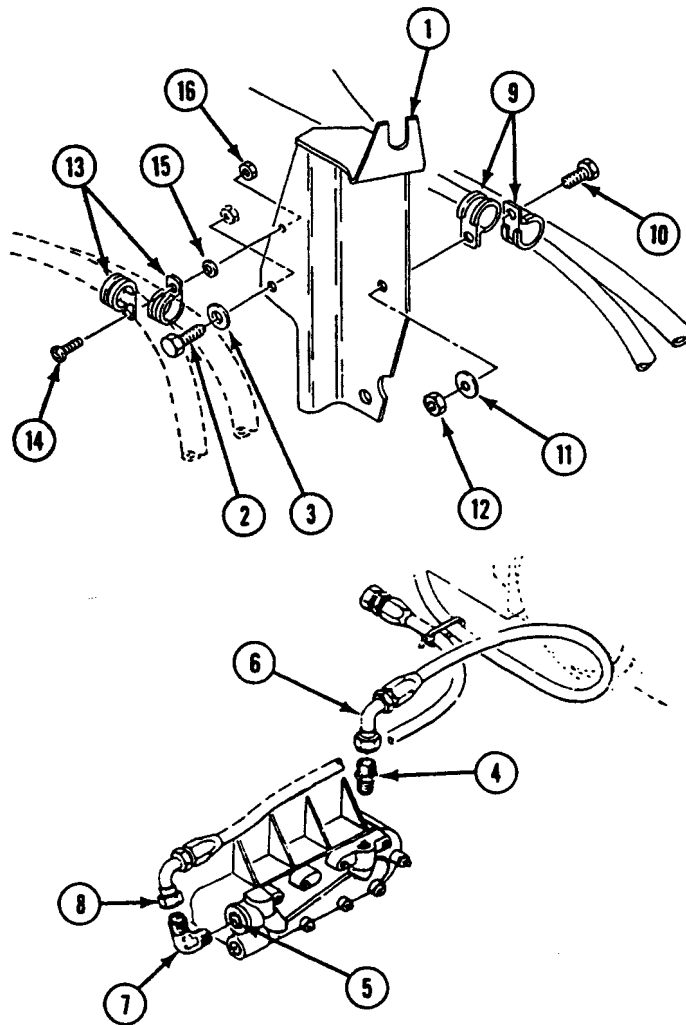
14. Install drain valve support (5), two screws (6), washers (7) and new lock nuts (8) on mount (9).
15. Install drain valve (10) with hose in support (5). Secure with elbow (11).
16. Install elbow (12) on elbow (11).
17. Install drain hose (13) on elbow (12).



18. Remove drain cock (14) from secondary fuel filter cannister (15). Install elbow (16).
19. Install drain hose (17) on elbow (16).
20. Install elbow (18) on secondary fuel filter housing (19).
21. Install pressure switch (20) on elbow (18).

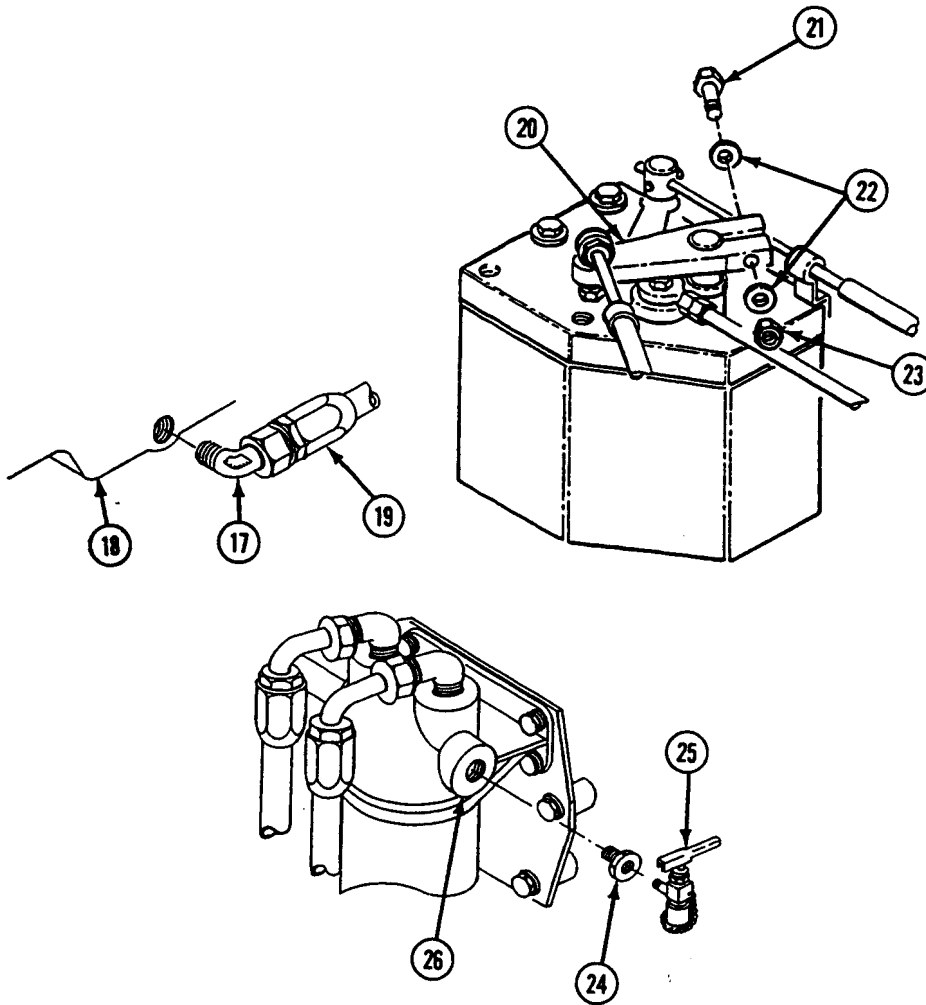


22. Install bracket (1), two screws (2) and washers (3) on engine.
23. Apply light coat of sealing compound to tapered threads. Do not apply beyond small end of taper. Install adapter (4) in transmission oil cooler (5).
24. Install oil cooler-to-transmission hose (6) on adapter (4).
25. Apply light coat of sealing compound to tapered threads. Do not apply beyond small end of taper. Install elbow (7) on transmission oil cooler (5).
26. Install transmission-to-oil cooler hose (8) on elbow (7).
27. Install two hose clamps (9), screw (10), washer (11) and new lock nut (12) on bracket (1).
28. Install two hose clamps (13), screw (14), washer (15) and new lock nut (16) on bracket (1).

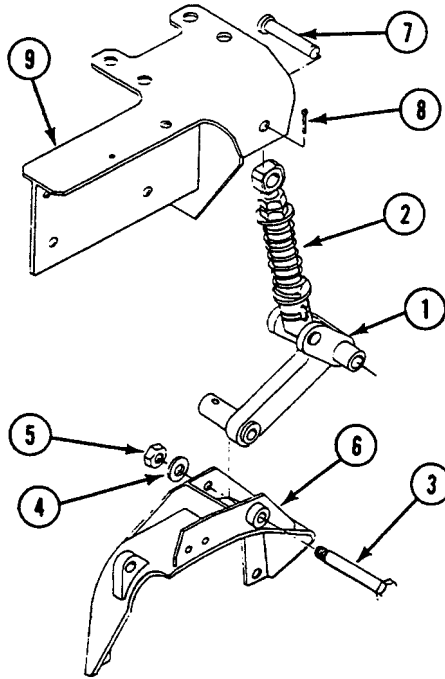


REPLACE ENGINE (M548A3) — Continued**0008 00**

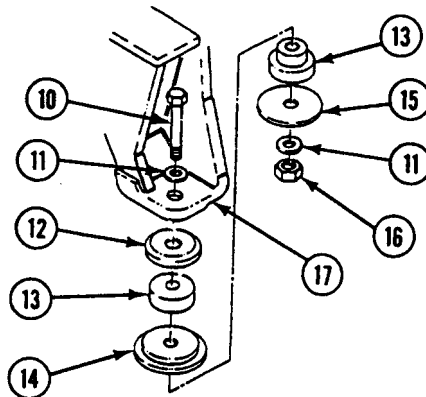
29. Install elbow (17) in oil pan (18).
30. Install hose (19) on elbow (17).
31. Position lever (20) on governor shaft and secure with screw (21), two washers (22), and nut (23).
32. Install bushing (24) in oil filter housing (25).
33. Install oil sample valve (26) in bushing (24).



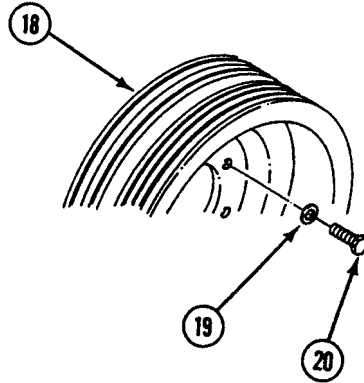
34. Install idler arm (1) with adjustment screw assembly (2), screw (3), washer (4), and new lock nut (5) on bracket (6).
35. Install pin (7), adjustment screw assembly (2) and new cotter pin (8) on bracket (9).



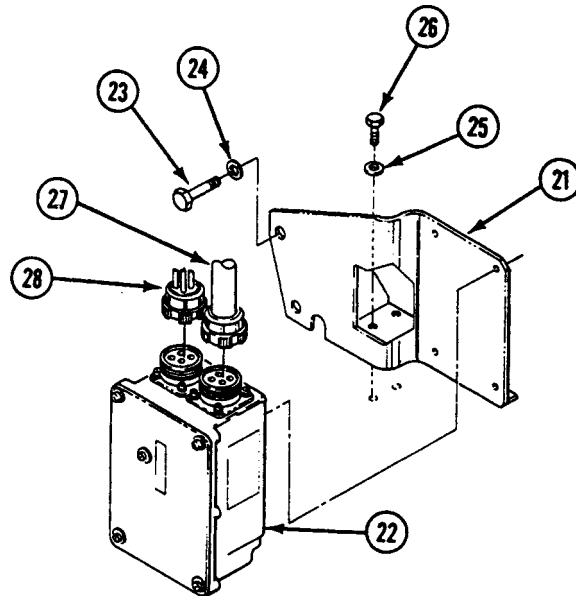
36. Install two screws (10), four washers (11), two washers (12), four mounts (13), two blocks (14), two washers (15) and two new lock nuts (16) on engine mount (17). Torque screws to 100-120 lb-ft (136-163 N•m) torque.



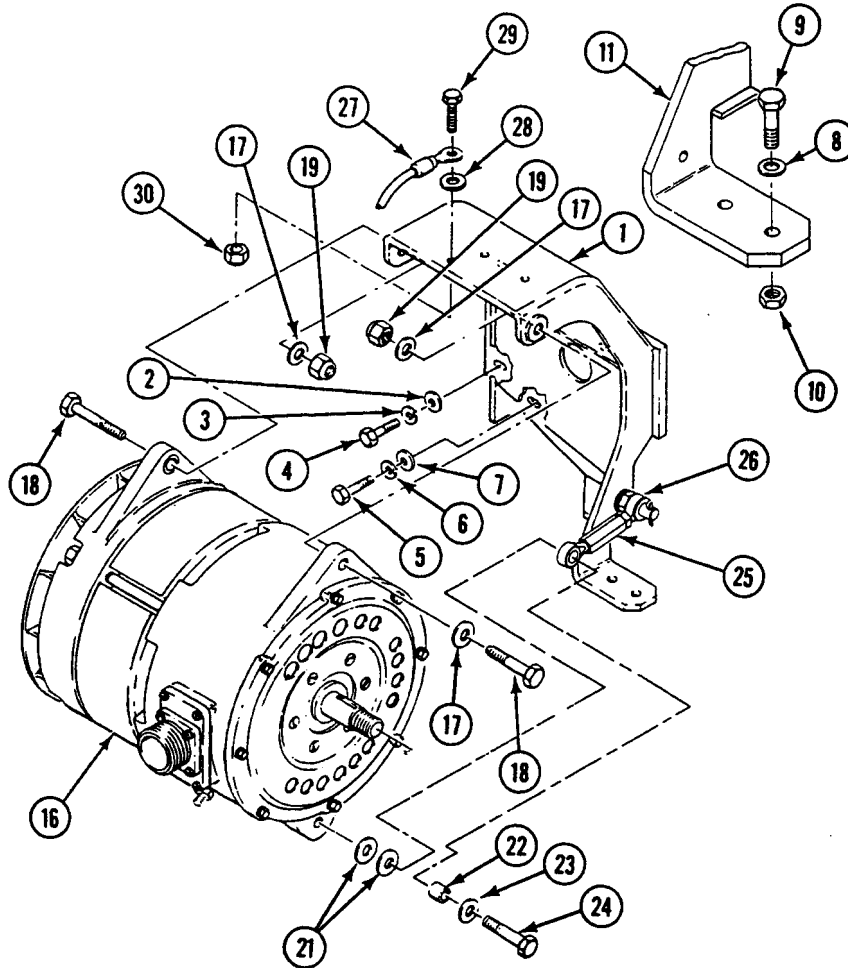
37. Install pulley (18), six washers (19), new lock screws (20) on engine. Torque bolts to 52-56 lb-ft (71-76 N•m) torque.
38. Install and adjust fan drive belt (see your -20).



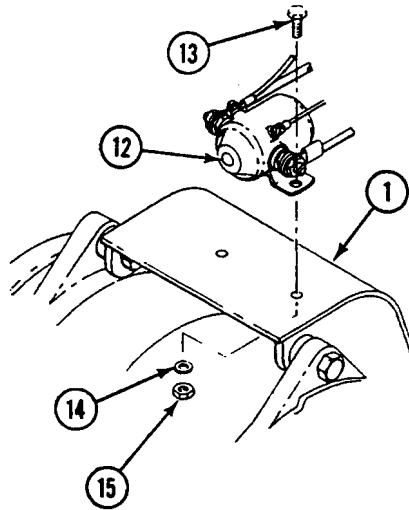
39. Install bracket (21) with regulator (22), two washers (23) and screws (24) on engine. Torque screws to 372-396 lb-in (42-45 N•m) torque.
40. Install two washers (25) and screws (26) in bracket (21). Torque screws to 264-288 lb-in (30-33 N•m) torque.
41. Connect regulator cable (27) and power cable (28) to regulator (22).



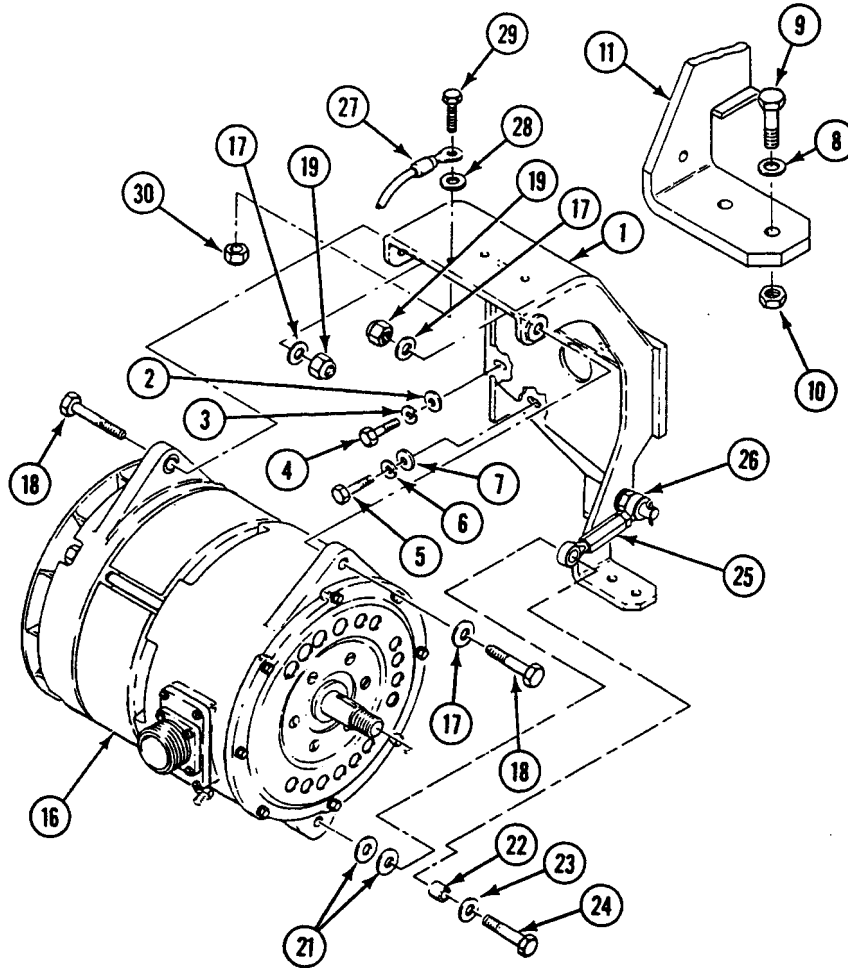
42. Install generator mount (1), two washers (2), new lock washers (3) and screws (4) on engine. Install two washers (5), new lock washers (6) and screws (7) in mount. Torque screws (4) to 144-180 lb-in (16-20 N•m) torque. Torque screws (7) to 264-288 lb-in (30-33 N•m) torque.
43. Install two washers (8), two screws (9) and two new lock nuts (10) in coolant pipe bracket (11).



44. Install starter relay switch (12), two screws (13), washers (14) and new lock nuts (15) on generator mount (1).



45. Install generator (16), three washers (17), two screws (18) and new lock nuts (19) on mount (1). Have helper assist. Do not tighten nuts.
46. Install turnbuckle (20), two washers (21), spacer (22), washer (23) and screw (24) on generator (16).
47. Install drive belt (see your -20).
48. Rotate turnbuckle adjusting screw (25) until belt deflection is 0.19 to 0.25 inches (4.8 to 6.4 mm) with a force of 15 to 17 lbs (6.8 to 7.7 kg). Use v-belt tensiometer and yardstick. Tighten lock nut (26).
49. Tighten two lock nuts (19) to 36-38 lb-ft (49-52 N•m) torque.
50. Install ground lead (27), new lock washer (28), screw (29) and nut (30) on generator mount (1).



FOLLOW-THROUGH STEPS

1. Install power plant wiring harness (see your -20).
2. Fill engine and transmission (see your -20).

END OF TASK

CHAPTER 4

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR FUEL SYSTEM

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|--|---------------------|
| REPAIR AIR CLEANER HOUSING (M548A1)..... | 0009 00 |
| REPAIR FUEL TANK..... | 0010 00 |
| REPAIR AIR SEPARATOR TANK..... | 0011 00 |

REPAIR AIR CLEANER HOUSING (M548A1)

0009 00

THIS WORK PACKAGE COVERS:

Removal (page 0009 00-1).
 Installation (page 0009 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Hand Blind Riveter (WP 0078 00, Item 47)

References

See your -10

Materials/Parts

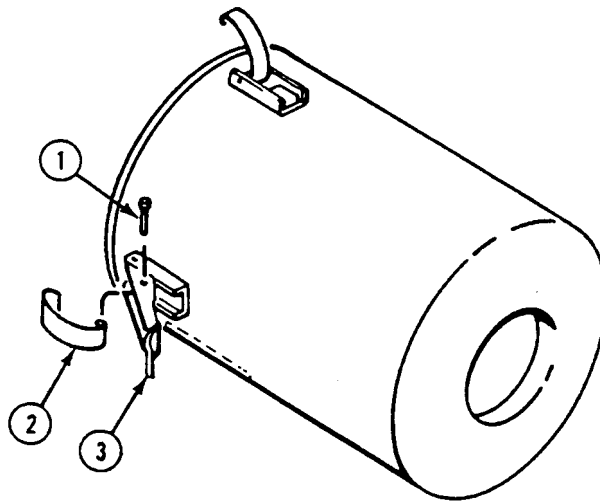
Rivet

Equipment Condition

Air cleaner container removed (see your -10)

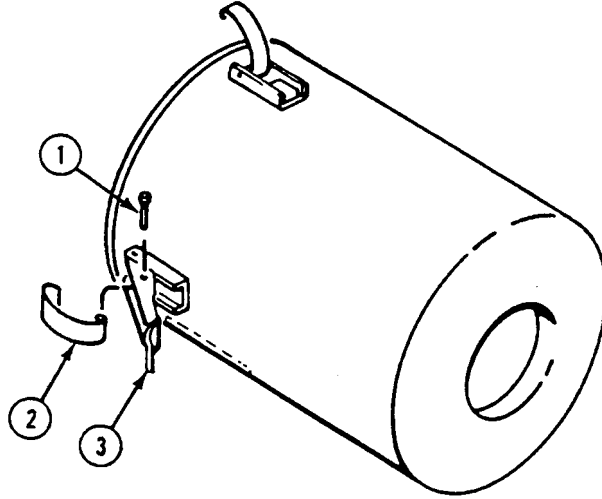
REMOVAL

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



INSTALLATION

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

**FOLLOW-THROUGH STEPS**

1. Install air cleaner container (see your -10).

END OF TASK

REPAIR FUEL TANK

0010 00

THIS WORK PACKAGE COVERS:

- Cleaning (page 0010 00-1).
 - Repair or Replacement (page 0010 00-3).
-

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Metal Worker 44B

Tools and Special Tools

- Metal Worker's Tool Kit (WP 0078 00, Item 69)
- Trailer Mounted Welding Shop (WP 0078 00, Item 74)

References

- See your -10
- See your -20
- TC 9-237

Materials/Parts

- Carbon dioxide gas (WP 0080 00, Item 10)
- Technical argon (WP 0080 00, Item 40)
- Metal plate (WP 0080 00, Item 26)
- Sealing compound (WP 0080 00, Item 36)
- Wiping rag (WP 0080 00, Item 46)

Equipment Condition

- Fuel compartment drained (see your -20)
 - Fuel tank access cover removed (see your -20)
-

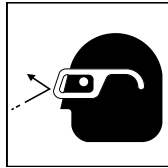
CLEANING

WARNING

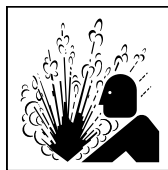


Fuel fumes can explode and burn you. Before welding: Drain all fuel. Disconnect and cap all fuel and vent lines. Purge fuel residue and fumes by steam cleaning. Purge air from fuel tank with carbon dioxide or argon gas.

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.

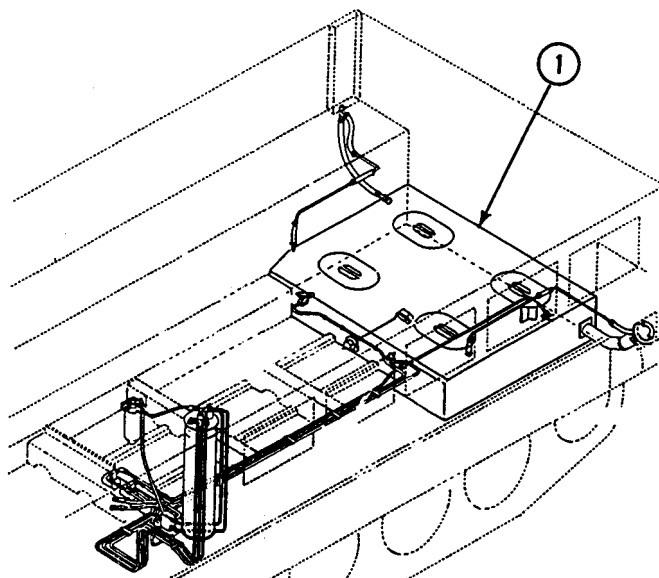
WARNING

Steam can splash back and burn you. Direct steam splash back away from you and others. Always wear full eye protection.

CAUTION

Do not expose sealed 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 wiping rags and 30 psi (207 kPa) compressed air to dry.
3. Direct carbon dioxide or argon gas into fuel tank (1) at 30 to 60 cubic feet (0.8 to 1.7 cubic meters) per hour until gas escapes from access cover openings.

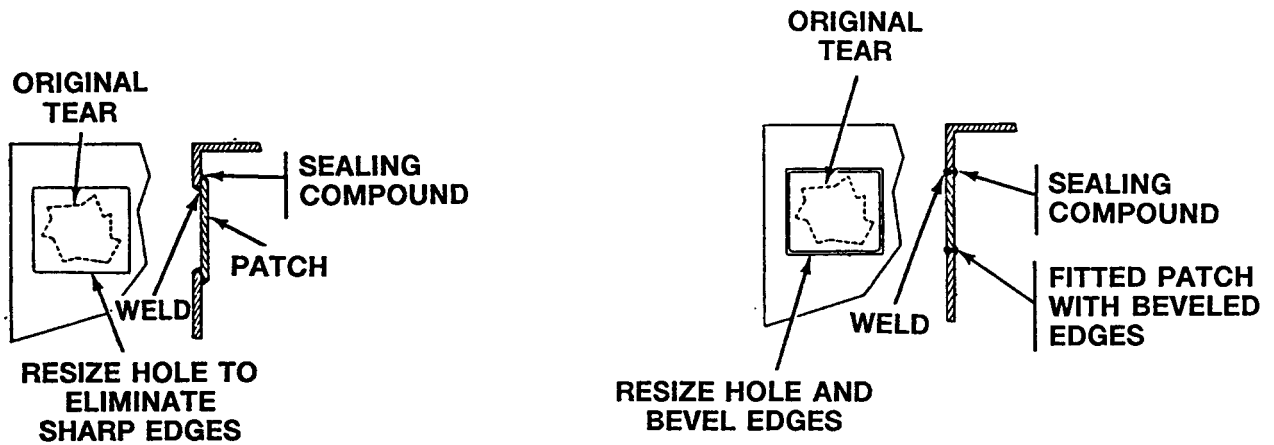


REPAIR OR REPLACEMENT

NOTE

Plan to weld on outside of fuel tank, if possible.

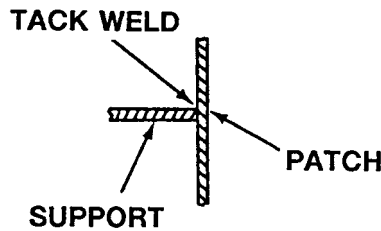
1. Determine type of repair, overlapping or fitted patch.
2. Resize hole in fuel tank, to remove sharp edges or cracks, for type of patch selected.
3. Prepare a piece of aluminum of the same alloy and thickness as the fuel tank.
4. Size patch to cover hole in fuel tank.
5. Tack weld a small piece of aluminum upright to center of patch to hold patch for welding.



A. OVERLAPPING PATCH REPAIR

B. FITTED PATCH REPAIR

6. Weld patch to fuel tank. See TC 9-237 and your -20.
7. Break support away from patch. Discard support.
8. Seal weld patch with sealing compound.



FOLLOW-THROUGH STEPS

1. Install fuel tank access cover (see your -20).
2. Check tank for leaks with air pressure. Main fuel tank shall not leak when charged with $20 \pm 1/2$ psi (138 ± 3 kPa).
3. Fuel carrier (see your -10).

END OF TASK

REPAIR AIR SEPARATOR TANK

0011 00

THIS WORK PACKAGE COVERS:

- Cleaning (page 0011 00-1).
 - Repair or Replacement (page 0011 00-4).
-

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Metal Worker 44B

Tools and Special Tools

- Metal Worker's Tool Kit (WP 0078 00, Item 69)
- Trailer Mounted Welding Shop (WP 0078 00, Item 74)

References

See your -20
TC 9-237

Materials/Parts

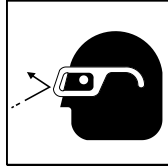
- Carbon dioxide gas (WP 0080 00, Item 10)
- Technical argon (WP 0080 00, Item 40)
- Metal sheet (WP 0080 00, Item 28)
- Sealing compound (WP 0080 00, Item 36)
- Wiping rag (WP 0080 00, Item 46)

Equipment Condition

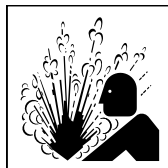
Air separator tank removed from carrier (see your -20)

CLEANING

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.

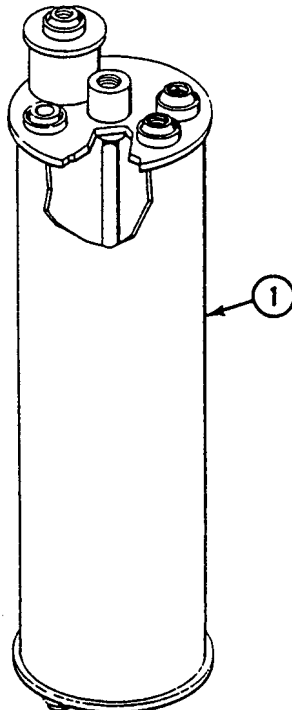
WARNING

Steam can splash back and burn you. Direct steam splash back away from you and others. Always wear full eye protection.

CAUTION

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

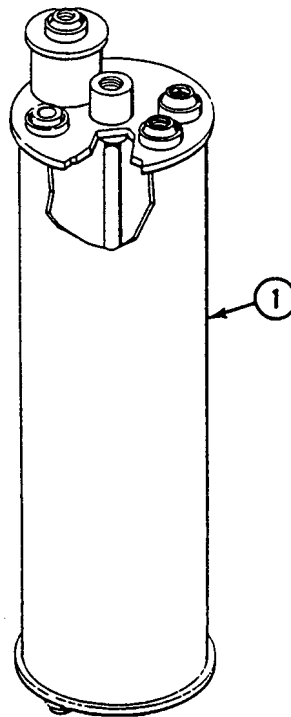
2. Steam clean inside of separator tank (1). Use clean rags and 30 psi (207 kPa) compressed air to dry.



WARNING

Fuel fumes can explode and burn you. Before welding: Drain all fuel. Purge fuel residue and fumes by steam cleaning. Purge air from separator tank with carbon dioxide or argon gas.

3. Direct carbon dioxide or argon gas into separator tank (1) at 30 to 60 cubic feet (0.8 to 1.7 cubic meters) per hour until gas escapes from flange openings.

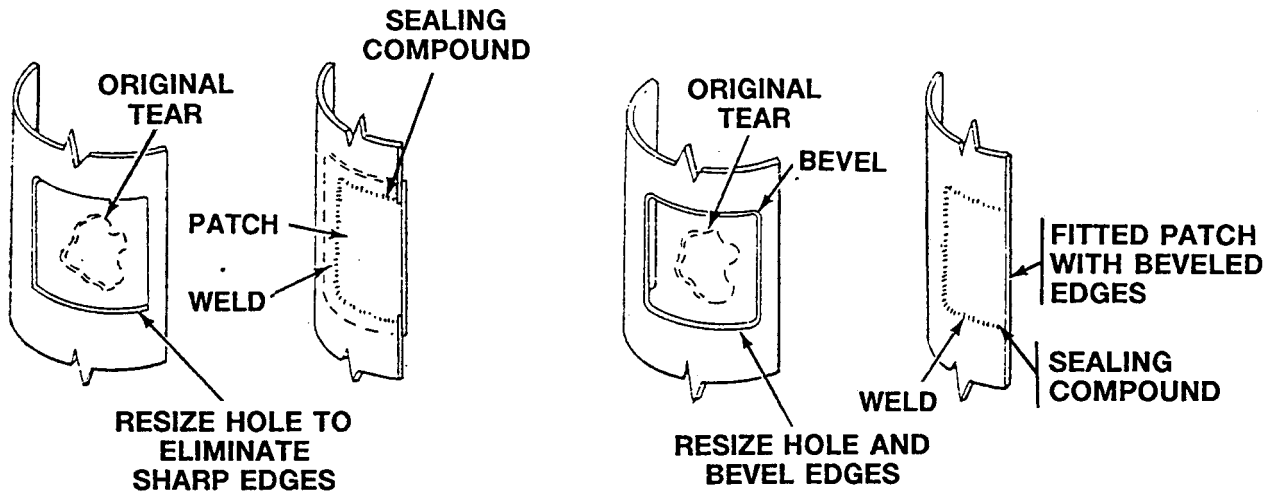


REPAIR OR REPLACEMENT

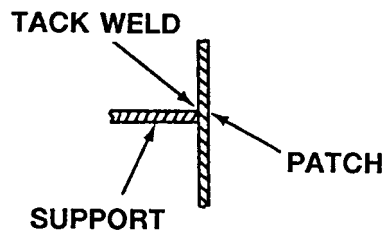
NOTE

Plan to weld on outside of separator tank, if possible.

1. Determine type of repair, overlapping or fitted patch.
2. Resize hole in separator tank, to remove sharp edges or cracks, for type of patch selected.
3. Prepare a piece of aluminum of the same alloy and thickness as the separator tank.
4. Size patch to cover hole in separator tank.
5. Tack weld a small piece of aluminum upright to center of patch to hold patch for welding.



6. Weld patch to separator tank. See TC 9-237 and your -20.
7. Break support away from patch. Discard support.
8. Seal weld with sealing compound.



FOLLOW-THROUGH STEPS

1. Install air separator tank (see your -20).

END OF TASK

CHAPTER 5

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR COOLING SYSTEM

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|--|---------------------|
| REPAIR RADIATOR..... | 0012 00 |
| REPLACE ENGINE THERMOSTAT (M548A3)..... | 0013 00 |
| REPAIR FAN ASSEMBLY (M548A1)..... | 0014 00 |
| REPAIR FAN ASSEMBLY (M548A3)..... | 0015 00 |
| REPAIR FAN DRIVE (M548A1)..... | 0016 00 |
| REPAIR FAN DRIVE SHAFT AND BEARING HOUSING (M548A3)..... | 0017 00 |

REPAIR RADIATOR

0012 00

THIS WORK PACKAGE COVERS:

- Cleaning (page 0012 00-1).
- Inspection-Acceptance and Rejection Criteria (page 0012 00-2).
- Test Radiator For Leaks(page 0012 00-3).
- Flush Radiator (page 0012 00-4).
- Test Radiator For Flow (page 0012 00-4).
- Repair or Replacement (page 0012 00-5).
- Rodding (page 0012 00-6).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Metal Worker 44B

Tools and Special Tools

- Metal Worker's Tool Kit (WP 0078 00, Item 69)
- Utility Apron (WP 0078 00, Item 4)
- Radiator Flow Test Machine (WP 0078 00, Item 20)
- Chemical Protective Gloves (WP 0078 00, Item 22)
- Radiator Test Plug Set (WP 0078 00, Item 40)
- Radiator Test Stand (WP 0078 00, Item 58)

References

- See your -20
- TM 750-254
- TC 9-237
- TB SIG 222

Materials/Parts

- Lead alloy solder (WP 0080 00, Item 25)
- Soldering flux (WP 0080 00, Item 39)

Equipment Condition

Radiator removed from carrier (see your -20)

CLEANING

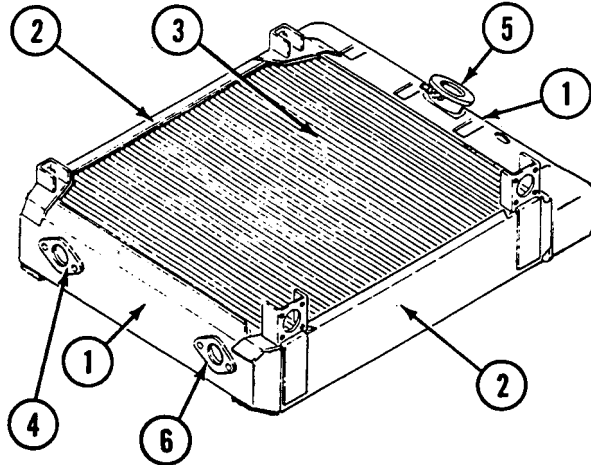
NOTE

Repair of M548A1 radiator and M548A3 is the same. Configurations may differ slightly. M548A1 is shown.

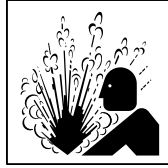
1. Clean radiator. See TM 750-254. Use safety goggles, rubber gloves, and rubber apron.

INSPECTION-ACCEPTANCE AND REJECTION CRITERIA

1. Inspect radiator. Check upper and lower tanks (1), side brackets (2), tubes and fins (3). If damage is minor, pressure test radiator Steps 1 - 4. If damage is major, see repair instructions Steps 1 - 6 to determine if radiator can be repaired.

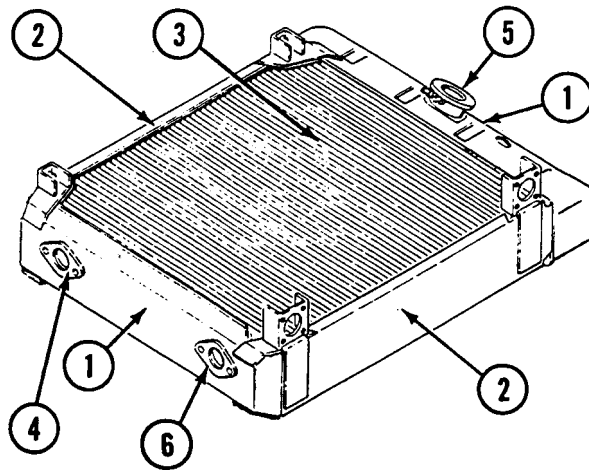


TEST RADIATOR FOR LEAKS

WARNING

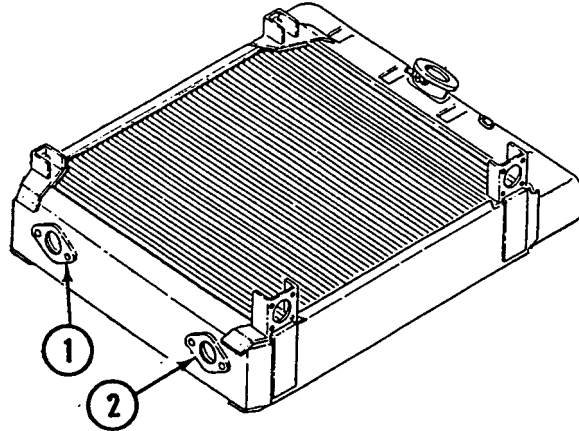
Radiator can burst if over pressurized. Do not exceed 25 psi (172 kPa) air pressure. Ensure radiator is submerged before applying air pressure. Always wear safety goggles.

1. Plug radiator outlet opening (4), filler opening (5), and vent openings. Use radiator test plug set.
2. Connect regulated air supply from radiator test stand to inlet opening (6).
3. Submerge radiator in radiator test stand. Apply 20-25 psi (138-172 kPa) air pressure to radiator.
4. If air bubbles appear, repair radiator Steps 1 - 6 .

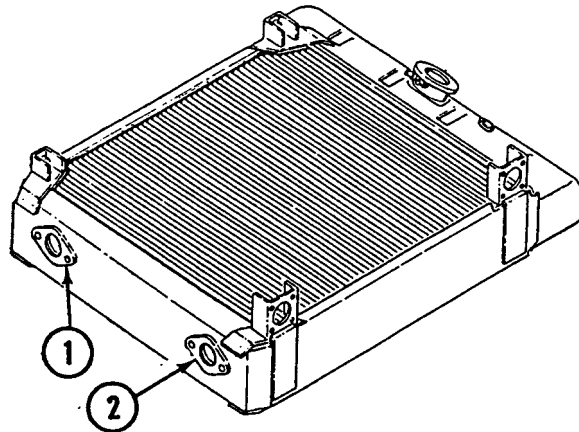


FLUSH RADIATOR

1. Connect water supply to radiator outlet opening (1). Use radiator test stand.
2. Flush radiator until water from radiator inlet opening (2) runs clear.

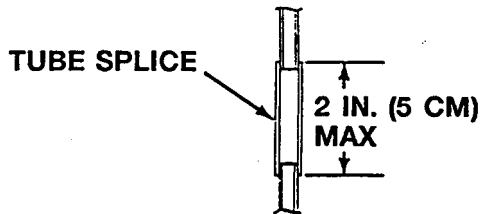
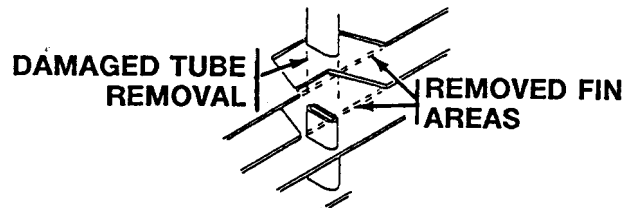
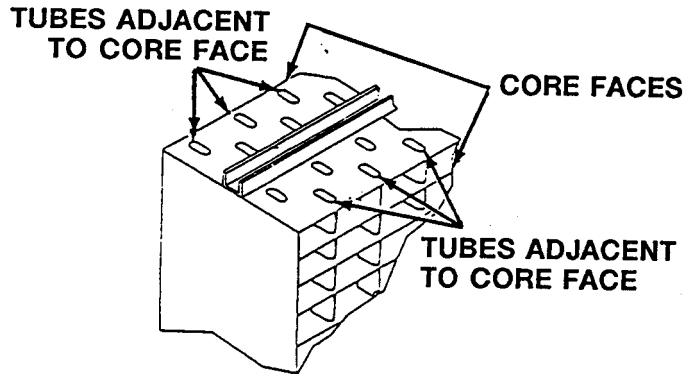
**TEST RADIATOR FOR FLOW**

1. Using radiator flow test machine, connect supply hose to radiator inlet (2).
2. Connect return hose of test machine to radiator outlet (1).
3. Flow test radiator at 70-80 gallons (265-303 liters) per minute. See TM 750-254.
4. If pressure drop is more than 4 psi (28 kPa), disassemble radiator and rod out radiator core Rodding Procedure Steps 1 - 9.



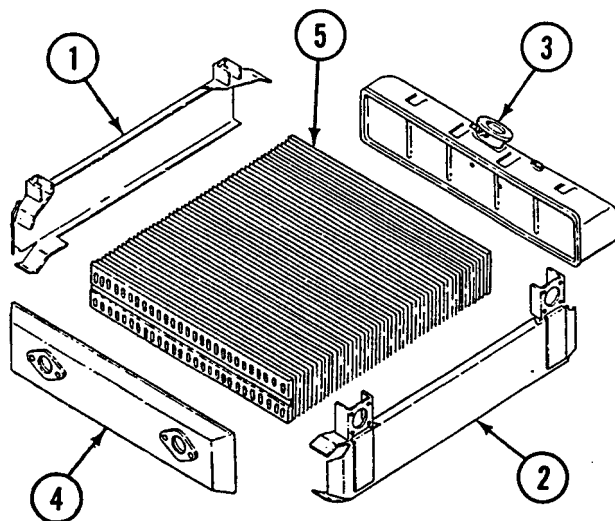
REPAIR OR REPLACEMENT

1. Resolder cracked solder joints. Splice damaged tubes. If necessary to repair tube damage near end tanks, disassemble radiator Step 1 and Step 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, 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.

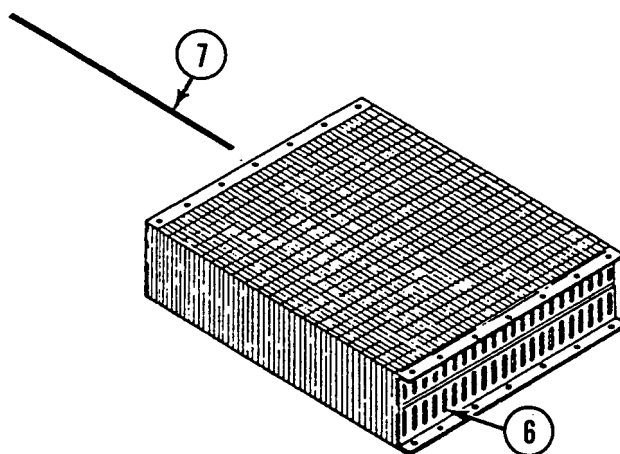


RODDING

1. Heat melt and wire brush off the solder that secures side bracket (1) and side bracket (2) to end tank (3) and end tank (4).
2. Heat melt and wire brush off the solder that secures end tank (3) and end tank (4) to core (5).
3. Wire brush rust, scale, and sediment from core tube openings.
4. Locate plugged tubes (6) by directing water into tubes. Check for flow at opposite end.



5. Insert a metal rod (7) long enough and slightly smaller in diameter than tubes (6) through tubes to remove blockage.
6. Clear tubes (6) until water flows through freely.
7. Install end tank (4) and end tank (3) on core (5). Secure with lead alloy solder.
8. Install side bracket (2) and side bracket (1) on end tank (4) and end tank (3). Secure with lead alloy solder.
9. Pressure test radiator Steps 1 - 4 .

**FOLLOW-THROUGH STEPS**

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

END OF TASK

REPLACE ENGINE THERMOSTAT (M548A3)

0013 00

THIS WORK PACKAGE COVERS:

- Removal (page 0013 00-1).
- Cleaning (page 0013 00-2).
- Installation (page 0013 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0078 00, Item 68)
- Socket Wrench Set (WP 0078 00, Item 79)
- Torque Wrench (WP 0078 00, Item 83)

References

- See your -10
- See your -20

Materials/Parts

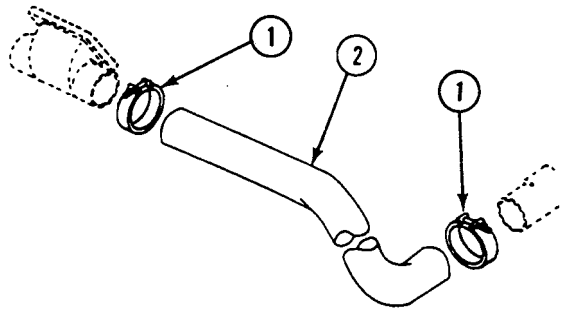
- Cleaning compound (WP 0080 00, Item 49)
- Sealing compound (WP 0080 00, Item 32)
- Gasket
- Lock washer (4)
- Seal

Equipment Condition

- Engine stopped (see your -10)
 - Carrier blocked (see your -10)
 - Top access cover removed (see your -10)
 - Hull bottom access cover removed (see your -10)
 - Thermostat housing drained (see your -20)
-

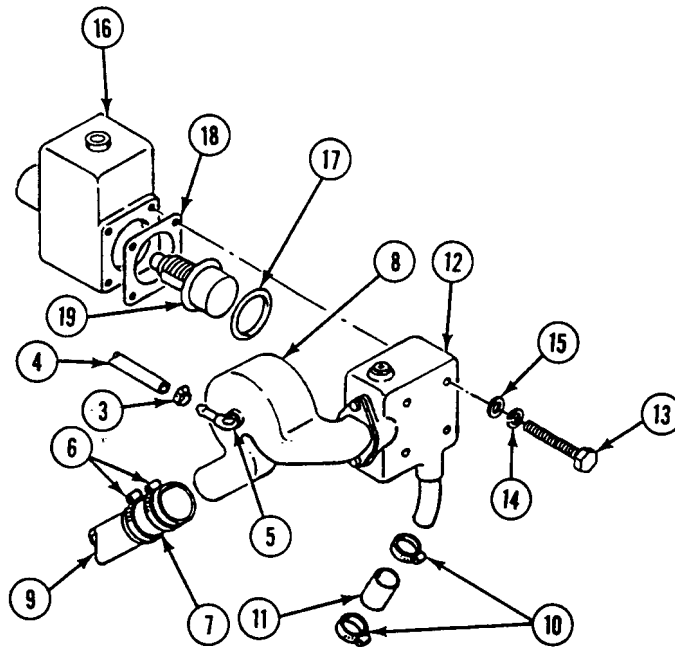
REMOVAL

1. Loosen two clamps (1) and remove right engine exhaust pipe (2).



REPLACE ENGINE THERMOSTAT (M548A3) — Continued**0013 00**

- Loosen clamp (3) that secures thermostat vent hose (4) to elbow (5). Separate hose and clamp from elbow.
- Loosen two clamps (6) that secure hose (7) to deaeration elbow (8) and tube (9). Slide hose and clamps off deaeration tube.
- Loosen two clamps (10) that secure hose (11) to right thermostat housing (12). Separate hose from thermostat housing.
- Remove four screws (13), lock washers (14), and flat washers (15) that secure right thermostat housing (12) and left thermostat housing (16). Discard lock washers.
- Remove seal (17), gasket (18), and thermostat (19) from left thermostat housing (16). Discard seal and gasket.

**CLEANING**

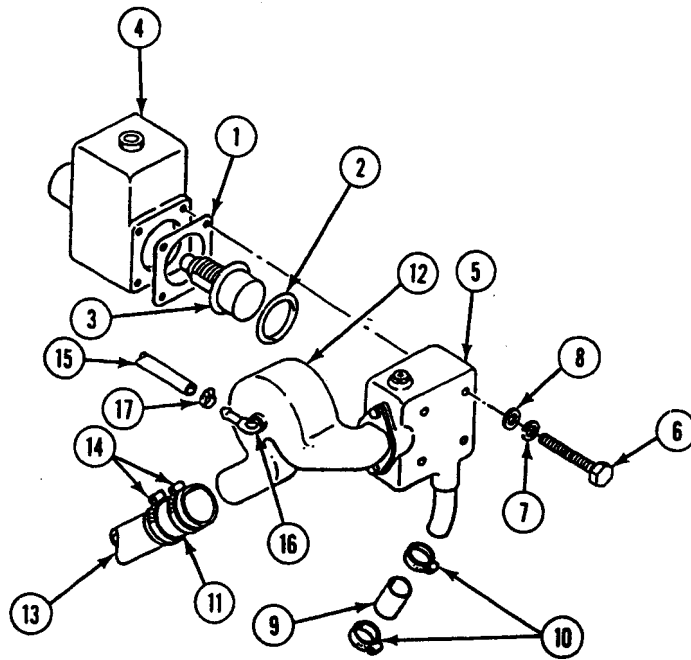
- Clean thermostat housing with cleaning compound.

INSTALLATION

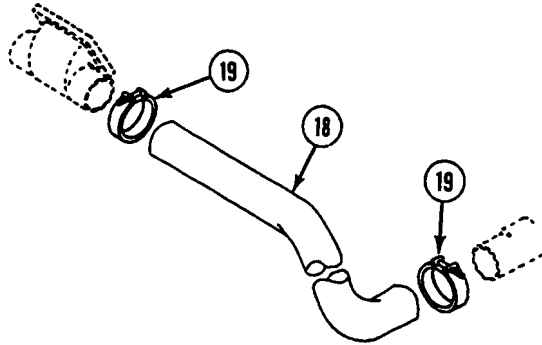
NOTE

Install thermostat in housing in position shown.

1. Put a thin coat of sealing compound on both sides of new gasket (1).
2. Install new seal (2), gasket (1), and thermostat (3) in left thermostat housing (4).
3. Secure left thermostat housing (4) and right thermostat housing (5) with four screws (6), new lock washers (7), and flat washers (8). Torque screws to 180-240 lb-in (20-27 N•m).
4. Install hose (9) on right thermostat housing (5). Secure with two clamps (10).
5. Install hose (11) on deaeration elbow (12). Secure hose on deaeration tube (13) and elbow (12) with two clamps (14).
6. Install hose (15) on elbow (16). Secure with clamp (17).



7. Install right engine exhaust pipe (18). Secure with two clamps (19). Tighten clamp nuts to 100-110 lb-in (11-12 N•m) torque.

**FOLLOW-THROUGH STEPS**

1. Close thermostat housing drain valve (see your -20).
2. Install hull bottom access cover (see your -10).
3. Fill cooling system (see your -20).
4. Start engine (see your -10) and run until operating temperature of 160°-230°F (71°-110°C) is reached. Check for leaks.
5. Stop engine (see your -10). Check coolant level.
6. Add coolant as needed to bring level to bottom of filler neck (see your -20).
7. Install top access cover (see your -10).

END OF TASK

REPAIR FAN ASSEMBLY (M548A1)

0014 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0014 00-1).
 Assembly (page 0014 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Retaining Ring Pliers (WP 0078 00, Item 39)
 Universal Puller Kit (WP 0078 00, Item 43)
 Torque Wrench (WP 0078 00, Item 85)

References

See your -20

Materials/Parts

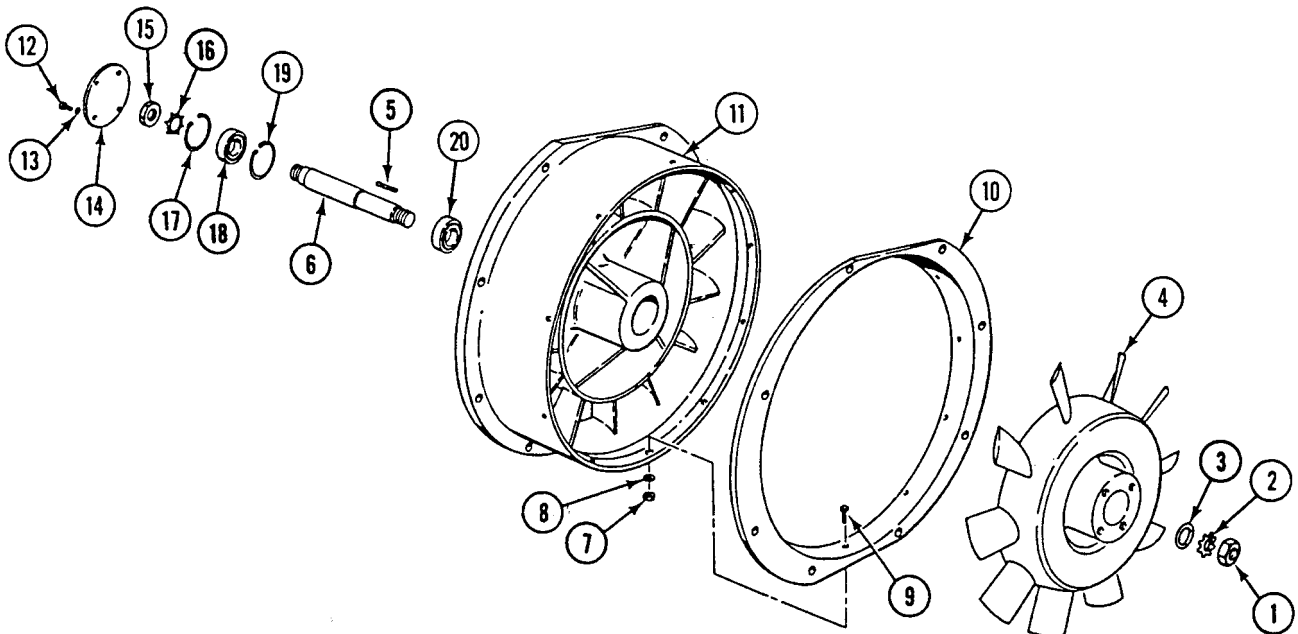
Antiseize compound (WP 0080 00, Item 6)
 Lock nut (10)
 Lock washer (2)
 Lock washer (4)

Equipment Condition

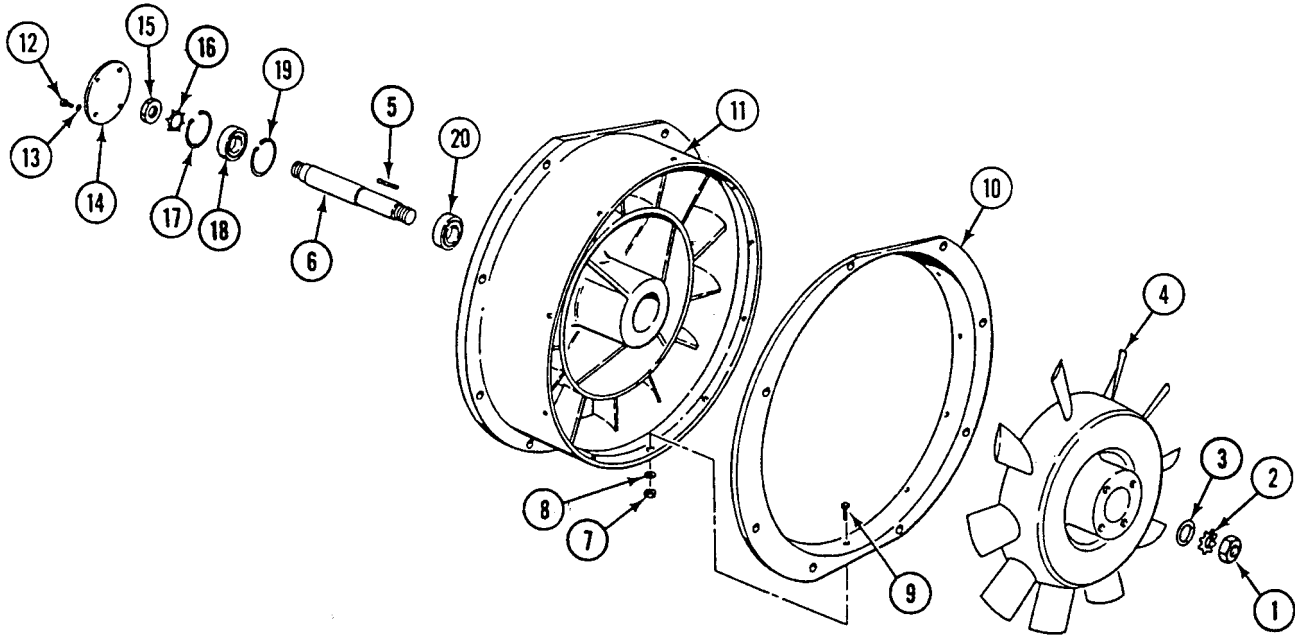
Fan assembly removed from carrier (see your -20)

DISASSEMBLY

1. Remove rotor retaining nut (1), lock washer (2), washer (3), fan (4), and rotor shaft key (5) from rotor shaft (6). Use puller to remove fan from shaft. Discard lock washer.
2. Remove 10 lock nuts (7), washers (8), screws (9), and bellring (10) from fan housing (11). Discard lock nuts.
3. Remove four screws (12), lock washers (13), and cover plate (14) from fan housing (11). Discard lock washers.

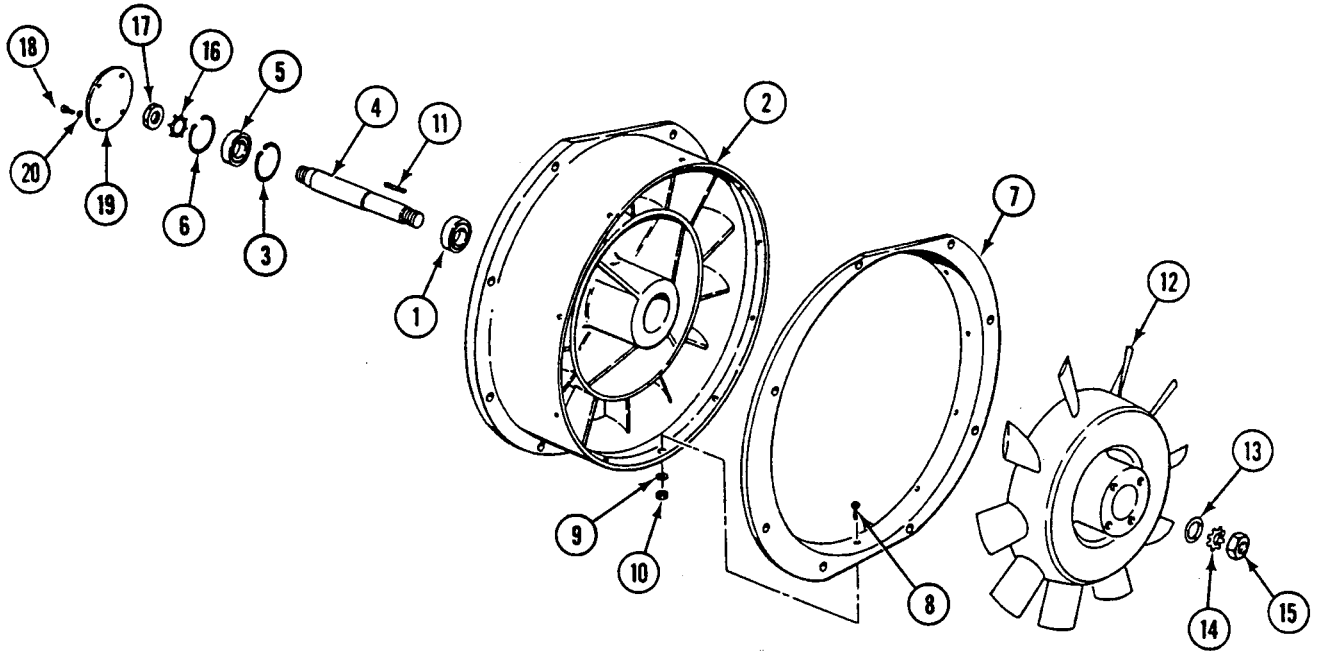


4. Remove bearing retaining nut (15), lock washer (16), and rear retaining ring (17) from fan housing (11). Discard lock washer.
5. Gently tap rotor shaft (6) toward rear bearing side of fan housing (11) until rear bearing (18) clears housing. Remove rear bearing from rotor shaft. Continue tapping rotor shaft until removed from fan housing.
6. Remove front retaining ring (19) from fan housing (11).
7. Remove front bearing (20) from fan housing (11). Use puller.



ASSEMBLY

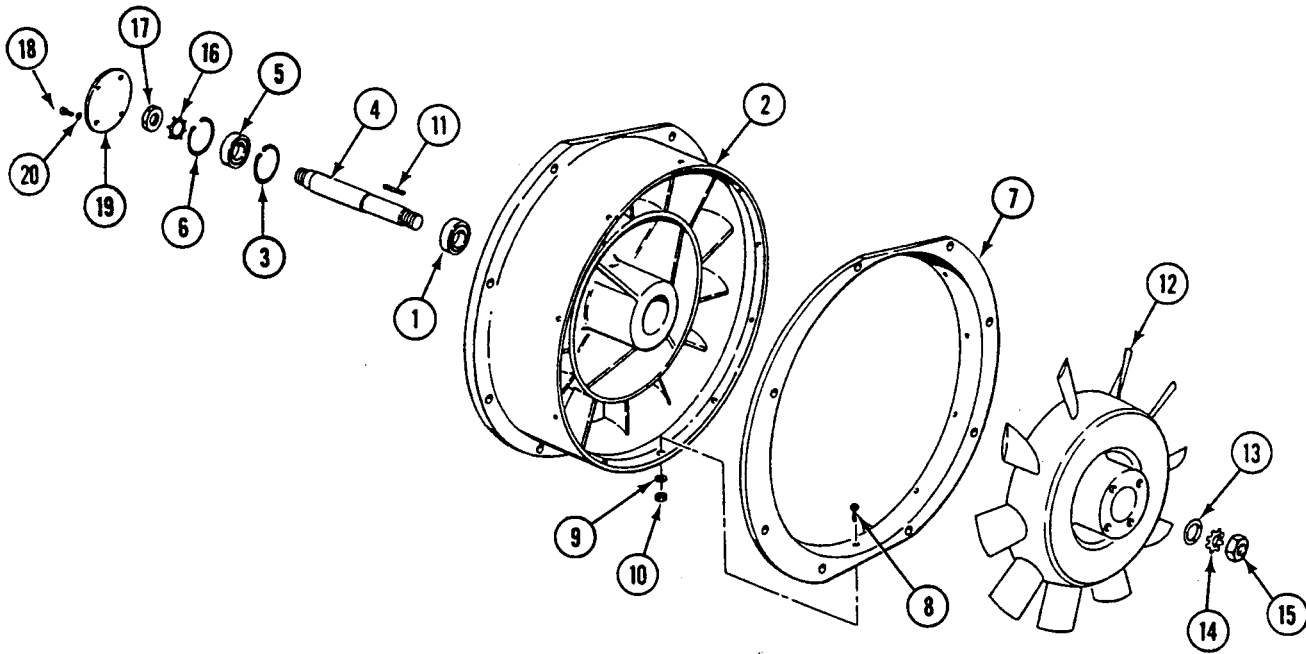
1. Install front bearing (1) in fan housing (2).
2. Install retaining ring (3) in front ring groove of fan housing.
3. Position rotor shaft (4) through bore of front bearing (1) in fan housing. Gently tap end of shaft to seat against bearing.
4. Install rear bearing (5) on end of rotor shaft (4) in fan housing. Gently tap bearing to seat against front retaining ring.
5. Install retaining ring (6) in rear ring groove of fan housing.



REPAIR FAN ASSEMBLY (M548A1) — Continued

0014 00

6. Install bellring (7), 10 screws (8), washers (9) and new lock nuts (10) on fan housing.
7. Insert rotor shaft key (11) in rotor shaft (4) and install fan (12) on rotor shaft. Gently tap fan in place to clear threaded end of rotor shaft.
8. Install washer (13), new lock washer (14) and nut (15) on rotor shaft (4). Torque nut to 150-170 lb-ft (204-232 N•m).
9. Install new lock washer (16) and nut (17) on rotor shaft (4). Torque nut to 150-170 lb-ft (204-232 N•m).
10. Apply a light coat of antiseize compound to clean threads of four screws (18).
11. Install cover plate (19), four new lock washers (20) and screws (18) to fan housing.

**FOLLOW-THROUGH STEPS**

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

END OF TASK

REPAIR FAN ASSEMBLY (M548A3)

0015 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0015 00-1).
 Assembly (page 0015 00-3).

INITIAL SETUP:

Maintenance Level
 Direct Support

Personnel Required
 Track Vehicle Repairer 63H

Tools and Special Tools
 General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Universal Puller Kit (WP 0078 00, Item 43)
 Adjustable Wrench (WP 0078 00, Item 75)
 Torque Wrench (WP 0078 00, Item 85)

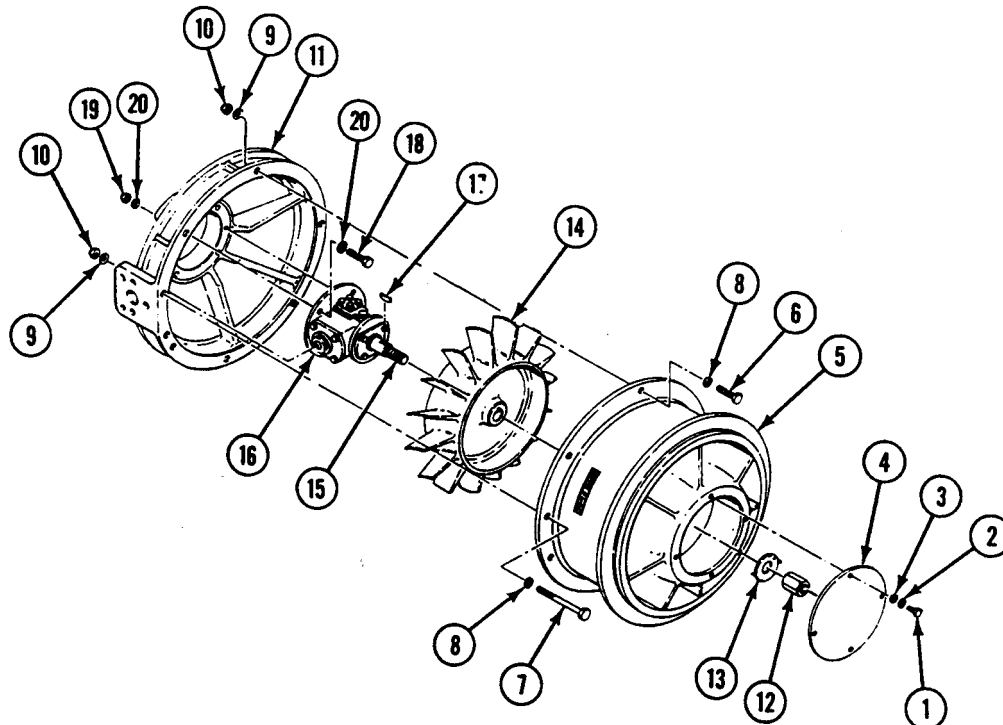
References
 See your -20

Materials/Parts
 Sealing compound (WP 0080 00, Item 32)
 Lock washer (4)
 Lock washer (8)
 Washer

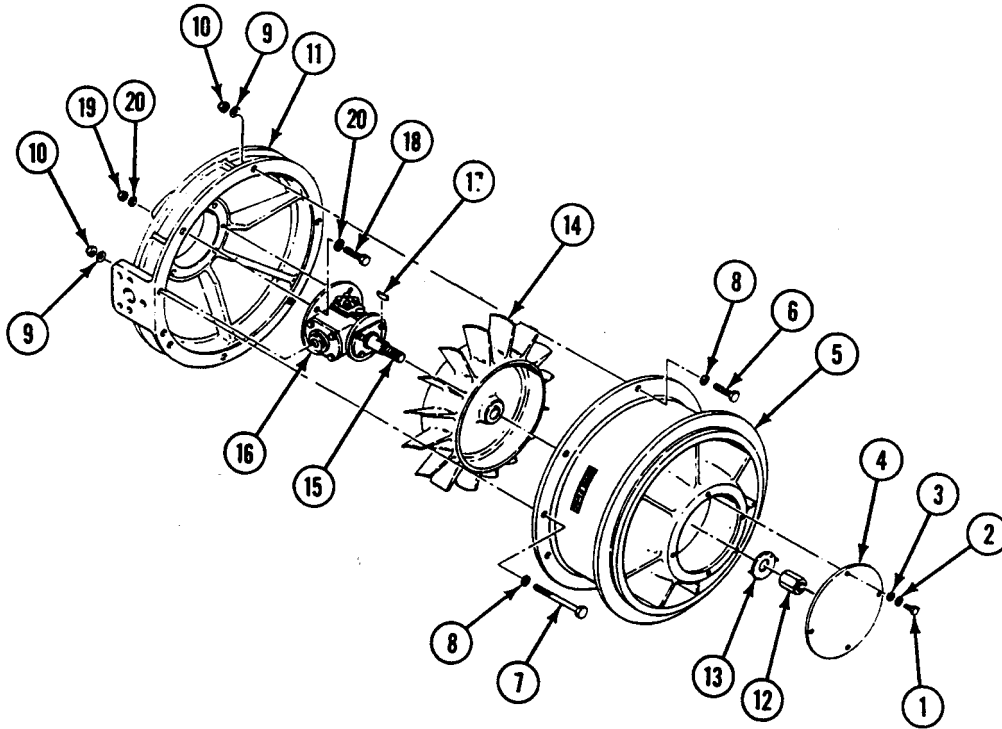
Equipment Condition
 Fan assembly removed from carrier (see your -20)
 Fan drive housing and shaft removed from fan assembly (see your -20)

DISASSEMBLY

1. Remove four screws (1), lock washers (2), washers (3), and cover (4) from fan housing (5). Discard lock washers.
2. Remove six screws (6), two screws (7), eight washers (8), lock washers (9), nuts (10), and fan housing (5) from support (11). Discard lock washers.
3. Remove nut (12) and washer (13) that secure fan (14) to shaft (15) on gearbox (16). Discard washer.

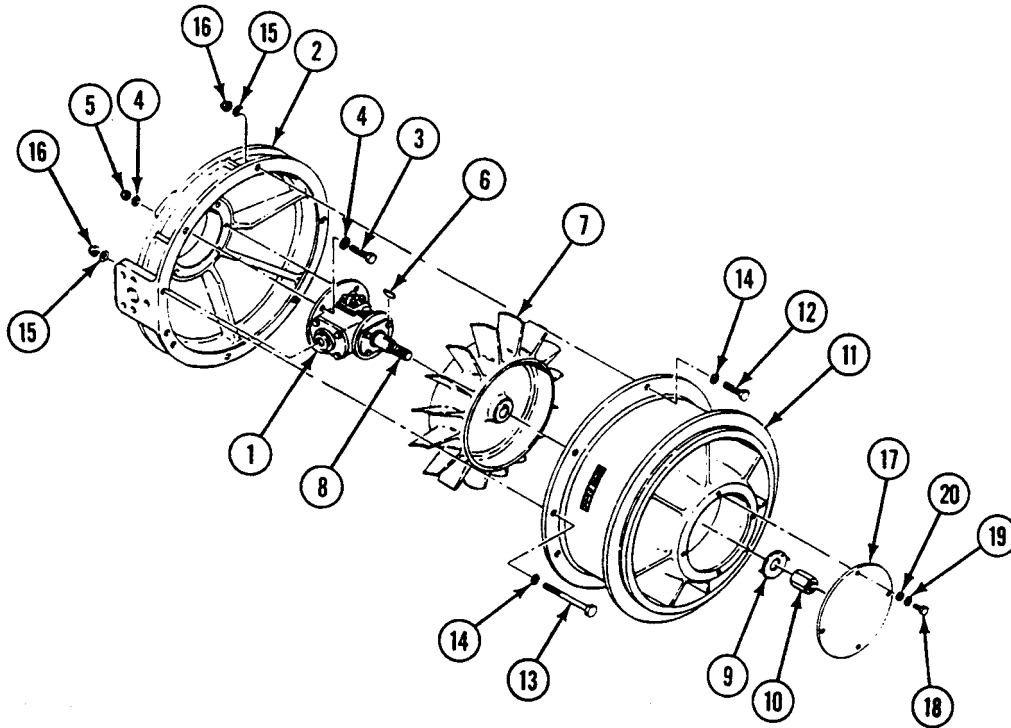


4. Use puller to remove fan (14) from shaft (15) on gearbox (16).
5. Remove key (17) from shaft (15).
6. Remove four screws (18), nuts (19), eight washers (20), and gearbox (16) from support (11).
7. If letters on marker are illegible, replace marker (see your -20).
8. If name plate is damaged, replace it (see your -20).

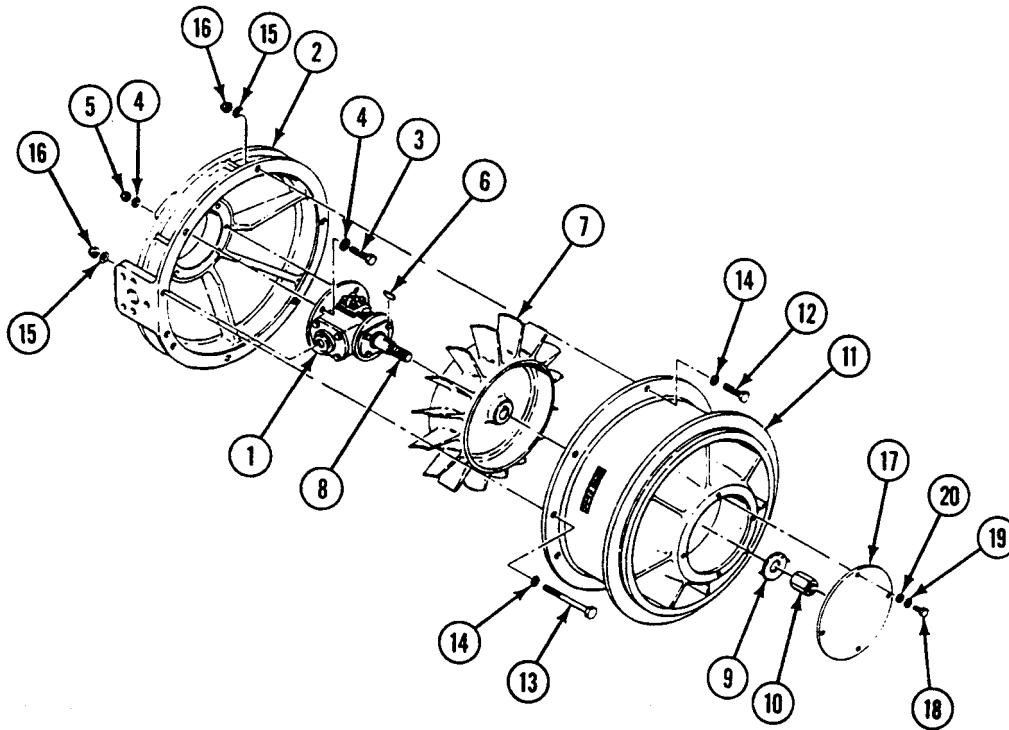


ASSEMBLY

1. Install gearbox (1) on support (2). Secure with four screws (3), eight washers (4), and four nuts (5).
2. Install key (6) and fan (7) on shaft (8) on gearbox (1). Secure with new washer (9) and nut (10).
3. To seat fan on gearbox, tighten nut (10) to 70-75 lb-ft (95-102 N•m) torque. Then remove nut (10) and washer (9).
4. Apply sealing compound to both sides of washer (9).



5. Install washer (9) and nut (10) on shaft (8). Tighten nut (10) to 27-32 lb-ft (37-43 N•m) torque.
6. Bend one edge of washer (9) against nut (10) and one edge against fan (7).
7. Install fan housing (11) on support (2). Secure with six screws (12), two screws (13), eight washers (14), new lock washers (15), and nuts (16).
8. Install cover (17) on fan housing (11). Secure with four screws (18), new lock washers (19), and washers (20).



FOLLOW-THROUGH STEPS

1. Install fan drive housing and shaft in fan assembly (see your -20).
2. Install fan assembly in carrier (see your -20).

END OF TASK

REPAIR FAN DRIVE (M548A1)

0016 00

THIS WORK PACKAGE COVERS:

Removal (page 0016 00-1).
 Installation (page 0016 00-4).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H
 Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)

References

See your -10
 See your -20

Materials/Parts

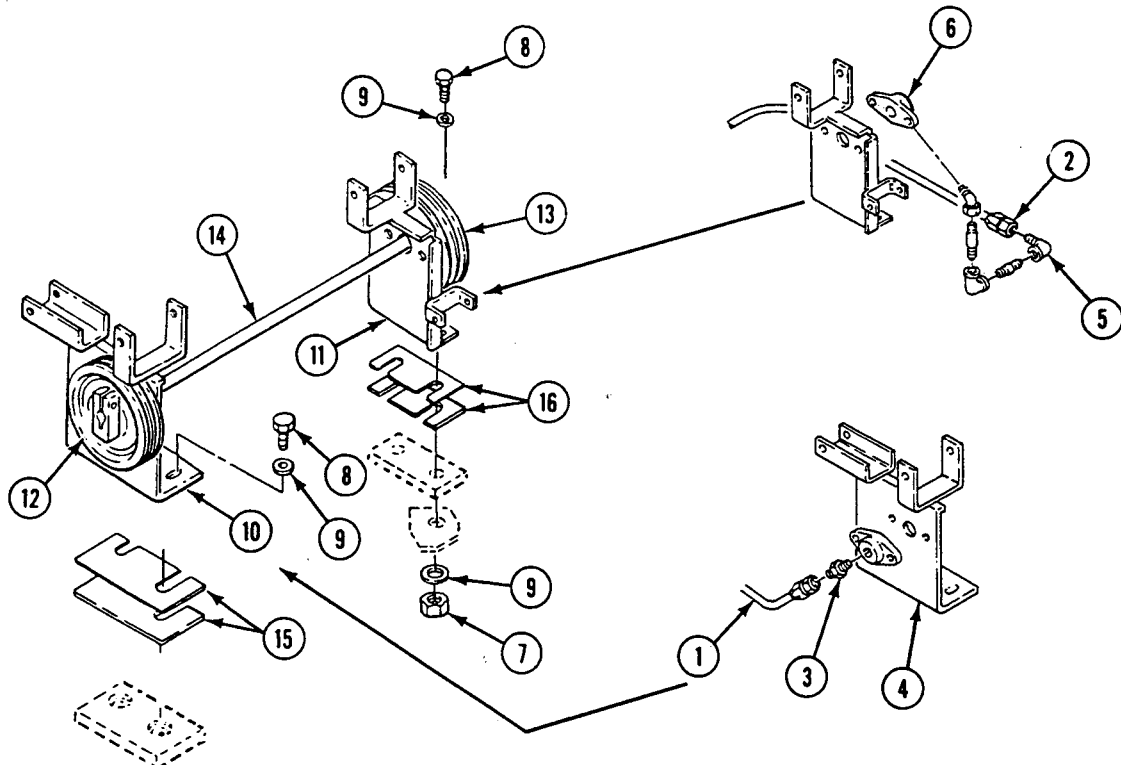
Automotive grease GAA (WP 0080 00, Item 7)
 Lock nut (2)
 Lock nut (4)
 Shim (as needed)

Equipment Condition

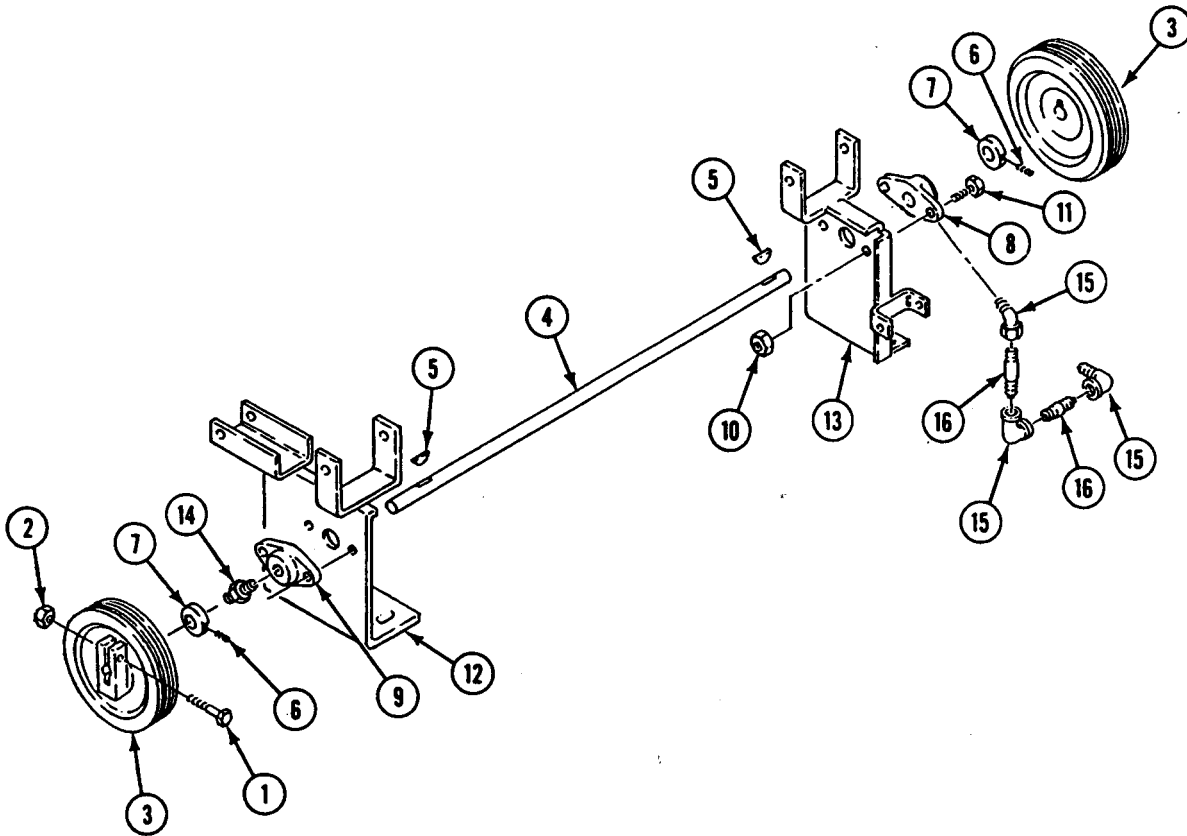
Power plant removed from carrier (see your -20)
 Fan drive belts removed (see your -20)
 Fan drive adjusting linkage removed (see your -20)

REMOVAL

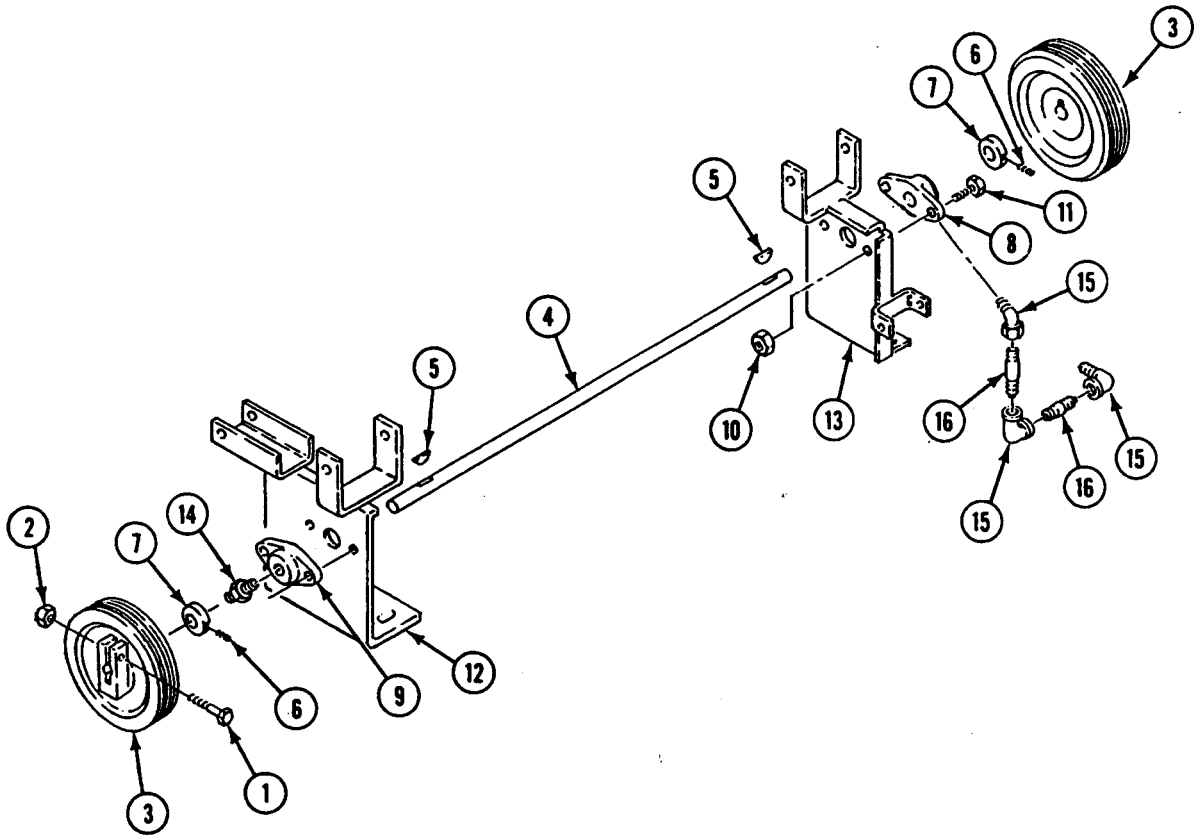
1. Remove hose (1) and hose (2) from fitting (3) on front bearing (4), and elbow (5) on rear bearing (6).
2. Remove two lock nuts (7), four screws (8), and six washers (9) securing bracket (10) and bracket (11) to carrier. Discard lock nuts.
3. Remove bracket (10), bracket (11), drive shaft pulley (12), drive shaft pulley (13), fan drive shaft (14), shim (15), and shim (16) from carrier.



4. Loosen two retaining screws (1) and nuts (2) securing two pulleys (3) on drive shaft (4), and remove pulleys and two drive shaft keys (5).
5. Loosen two setscrews (6) securing two collars (7) to drive shaft (4), bearing (8), and bearing (9).
6. Turn two collars (7) counterclockwise to disengage collars from bearing (8) and bearing (9), and remove from drive shaft (4).

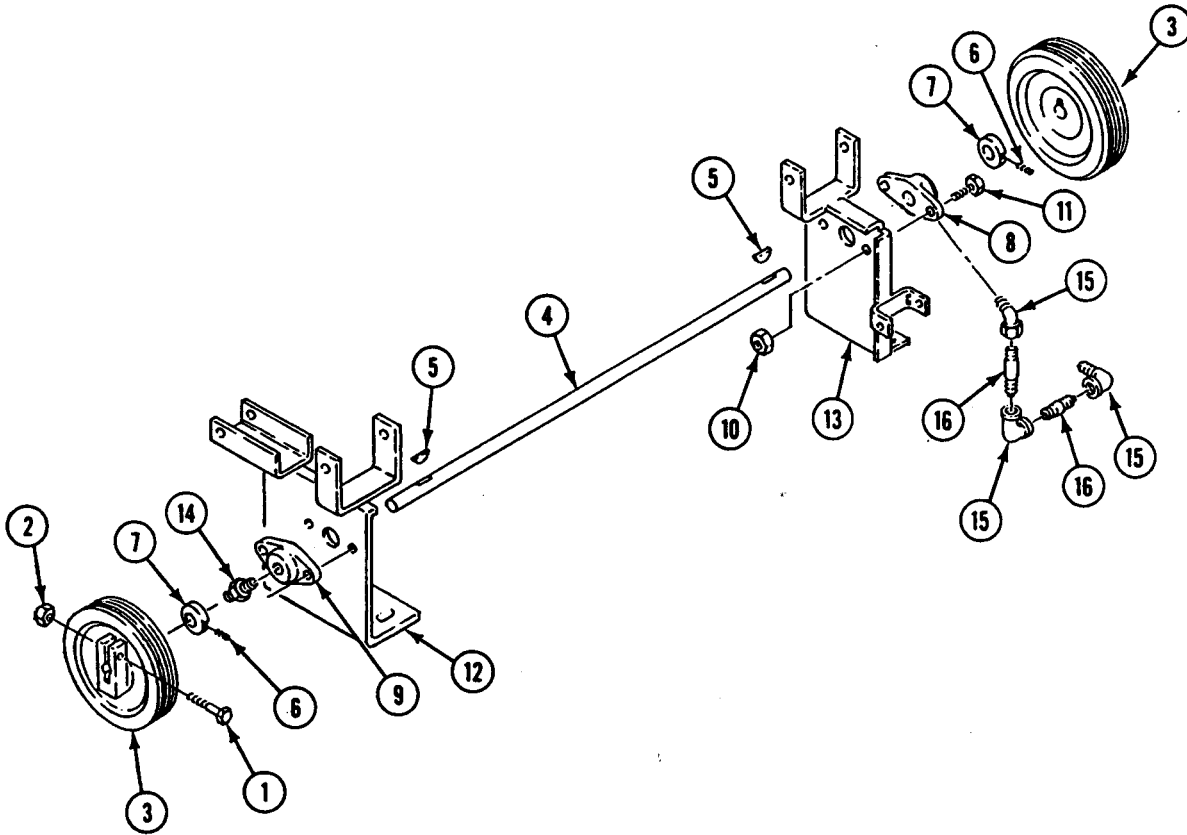


7. Remove drive shaft (4) from bearing (8) and bearing (9).
8. Remove four lock nuts (10), screws (11), and bearing (8) and bearing (9) from bracket (12) and bracket (13). Discard lock nuts.
9. Remove fitting (14) from bearing (9).
10. Remove three elbows (15) and two nipples (16) from bearing (8).

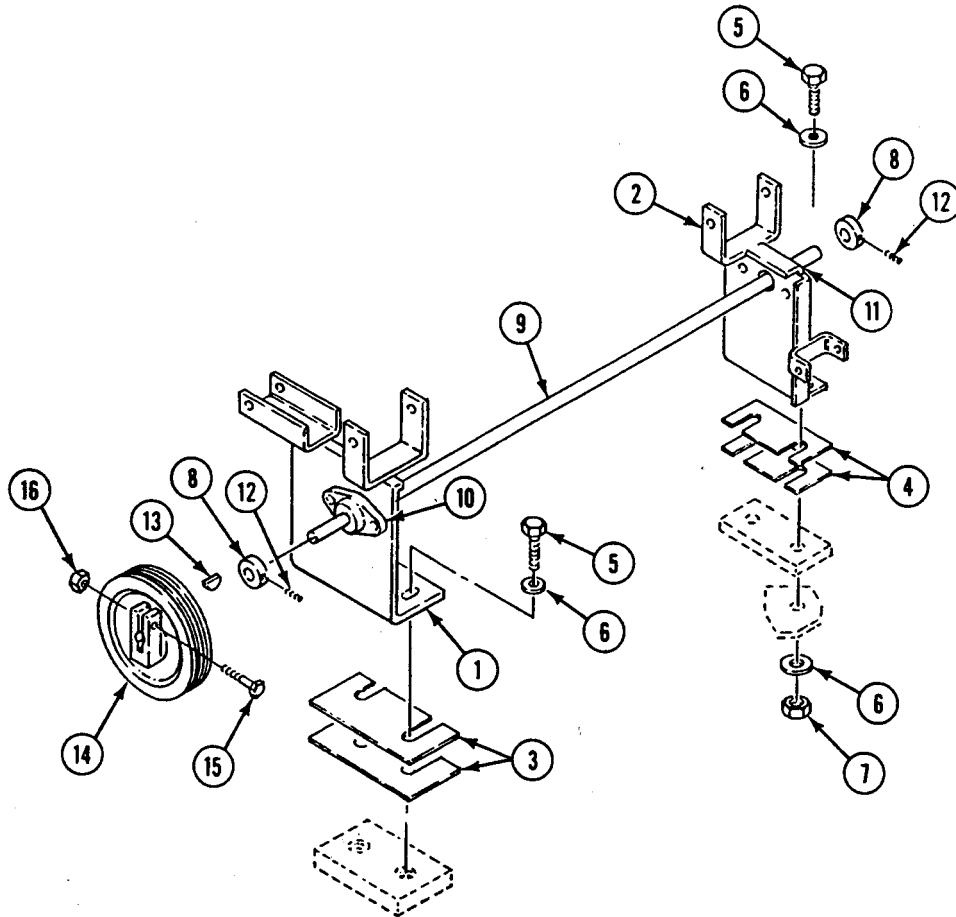


INSTALLATION

1. Install three elbows (15) and two nipples (16) to bearing (8).
2. Install fitting (14) to bearing (9).
3. Install bearing (8) and bearing (9), four screws (11), and new lock nuts (10) on bracket (12) and bracket (13).
4. Insert drive shaft (4) through bearing (8) and bearing (9) with the double key slot end through the rear bearing (8).



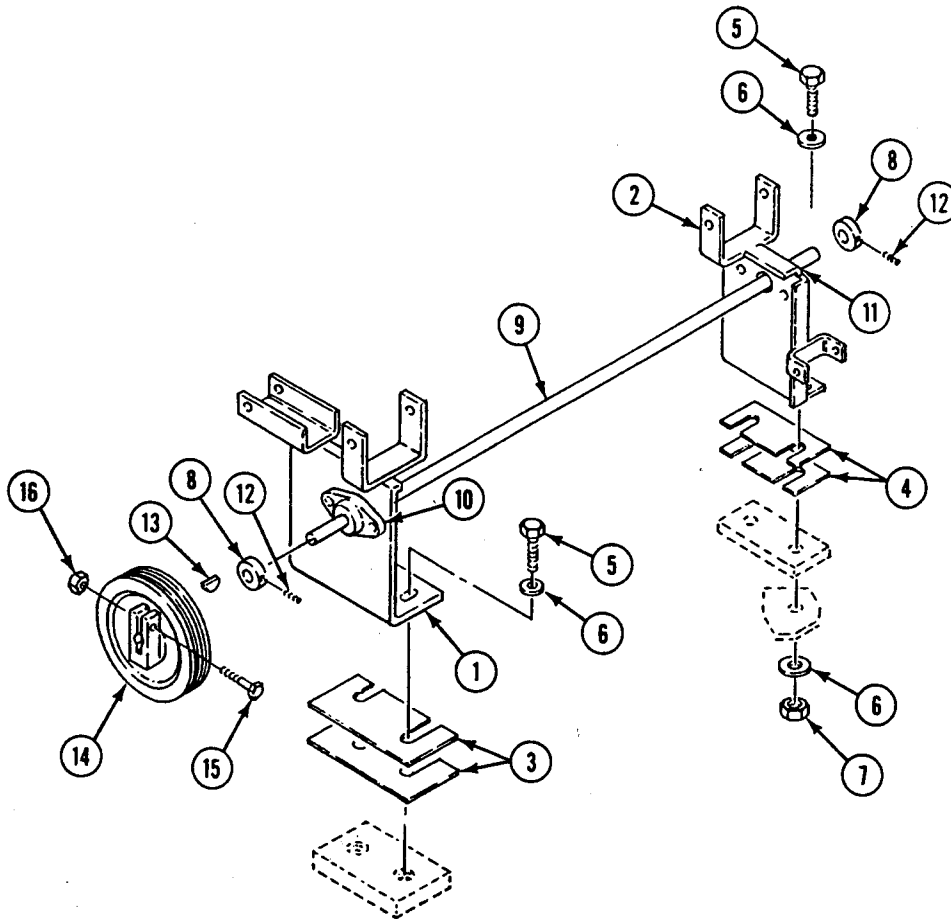
5. Position bracket (1) and bracket (2) with drive shaft, bearings, and shim (3) shim (4) in power plant compartment.
6. Install two bracket (1), bracket (2), four screws (5), six washers (6), and two new lock nuts (7) to carrier. Do not tighten.
7. Align drive shaft so the front pulley key slot and rear pulley key slot (second from the end) extend an equal distance through two bearings.



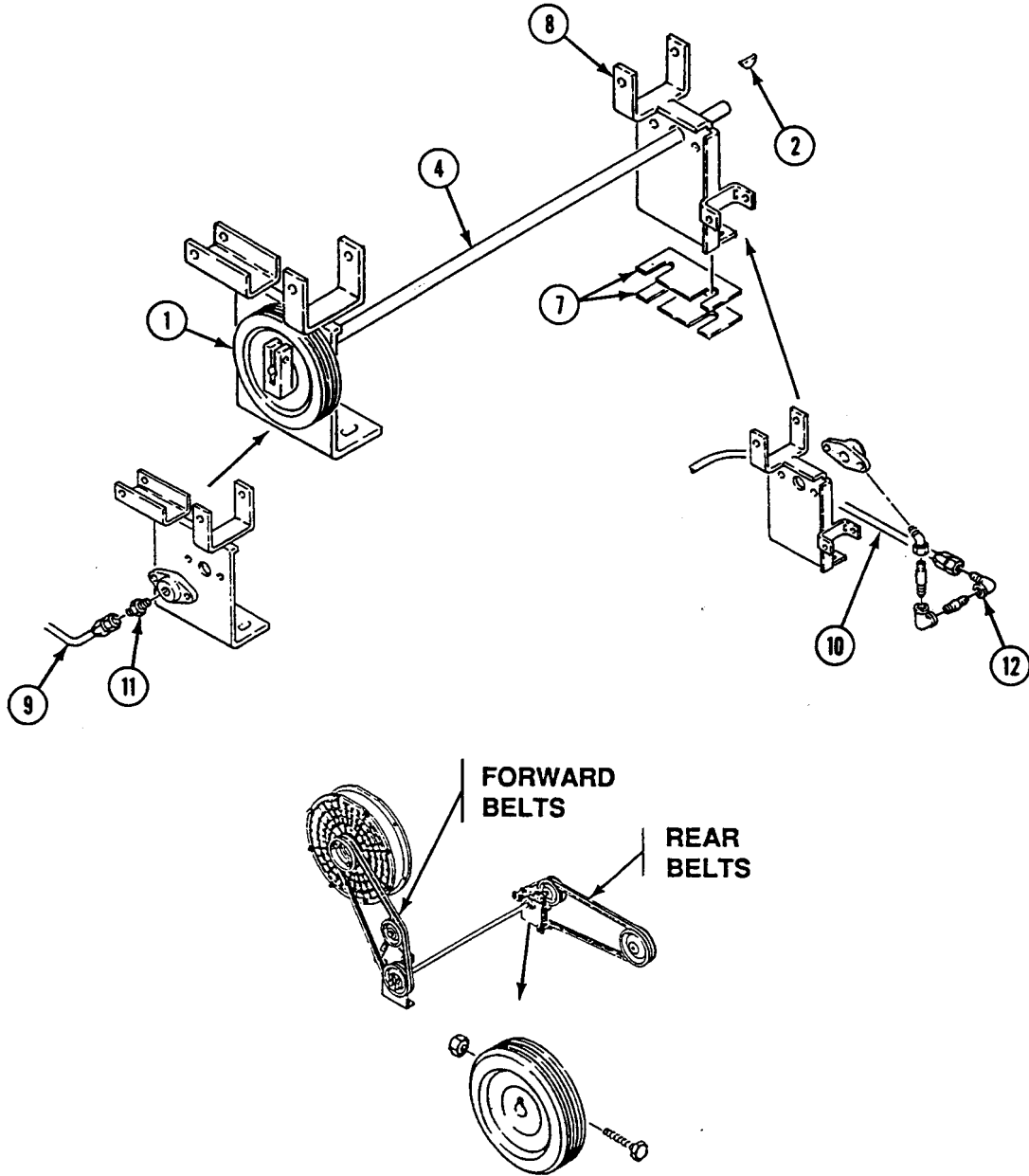
CAUTION

Use auxiliary holes in bearing collars to turn collars. Using socket head screw key in setscrew to rotate collars will damage setscrew.

8. Install two collars (8) on drive shaft (9) and position collars on bearing (10) and bearing (11). Rotate two collars clockwise on bearing until eccentric cams on collars jam tightly against shaft.
9. Tighten two setscrews (12) on collars (8).
10. Install drive shaft key (13) and pulley (14) on front end of drive shaft (9) flush with end of shaft, and tighten retaining screw (15) and nut (16).



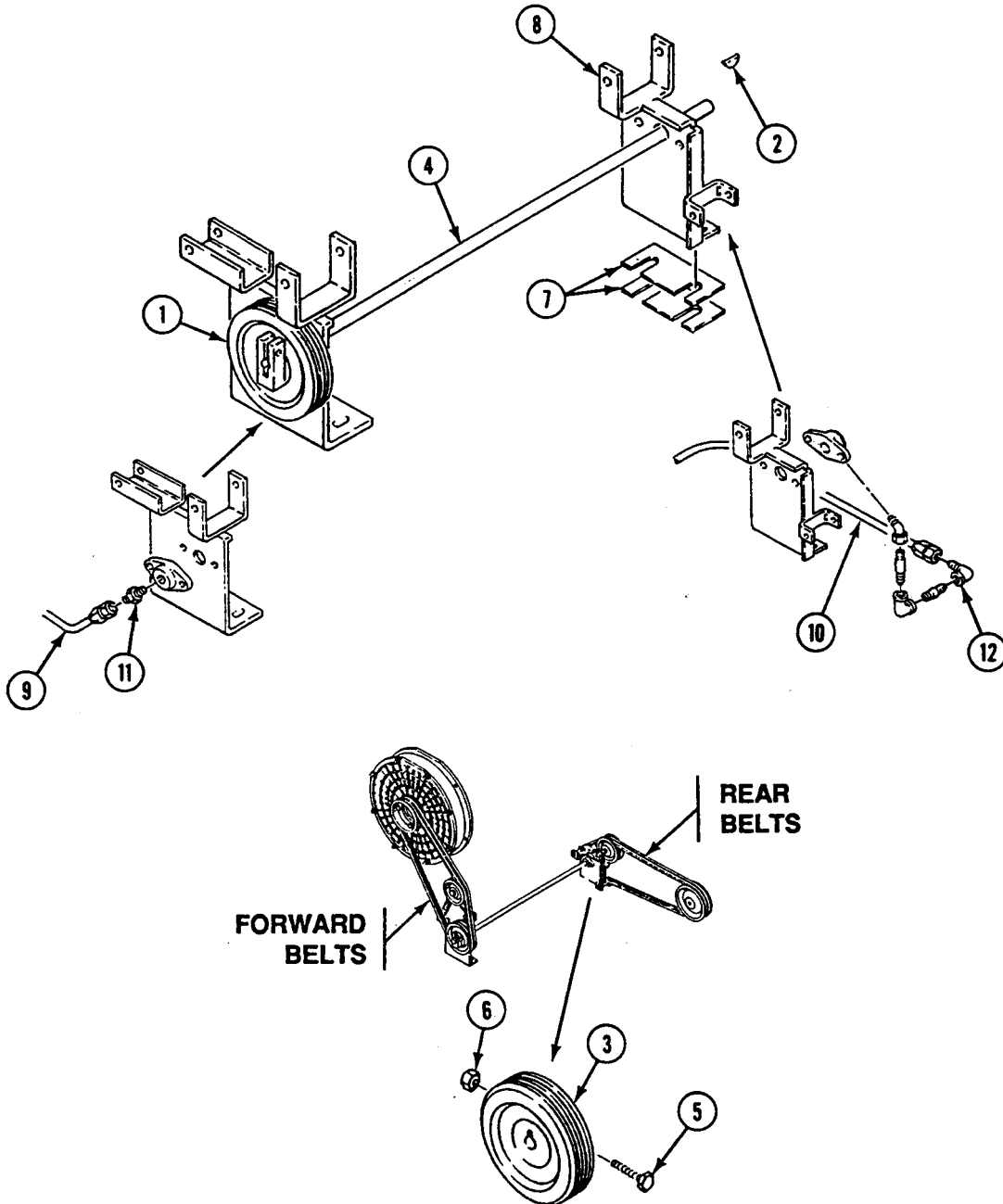
11. Install forward and rear fan drive belt adjusting linkage and adjust rod ends to show 2-3/8 inches (6.0 cm) of exposed threads (see your -20).
12. Install forward fan drive belts (see your -20).
13. Add shims (3) under bracket (1) as required to get proper belt tension (tensioner in operating range).
14. Use straightedge to align front pulley (1) with pulley on fan within 1/8 inch (3.2 mm), and tighten two screws (5).
15. Install power plant (see your -20).



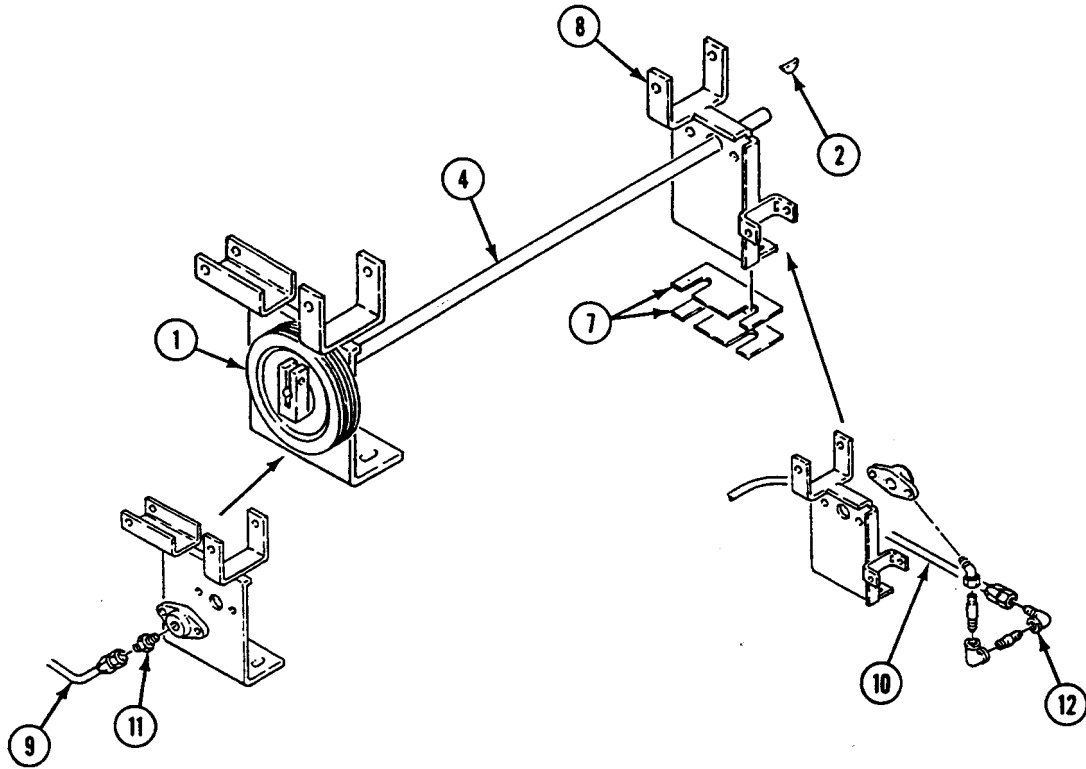
NOTE

Use either of the key slots on the double keyed end of the drive shaft. Keys must not extend more than 3/8 inch (10 mm) beyond either side of pulley.

16. Install drive shaft key (2) and pulley (3) on end of drive shaft (4) flush end of shaft. Use straightedge to align pulley (3) with pulley on transfer gearbox and tighten retaining screw (5) and nut (6).
17. Install rear fan drive belts (see your -20).



18. Add shims (7) under bracket (8) as required to get proper belt tension (tensioner in operating range).
19. Install hoses (9) and hose (10) on fitting (11) and elbow (12).
20. Lubricate bearings (see your -20).

**FOLLOW-THROUGH STEPS**

1. Start engine (see your -10).
2. Check fan drive for proper operation.
3. Stop engine (see your -10).

END OF TASK

REPAIR FAN DRIVE SHAFT AND BEARING HOUSING (M548A3)

0017 00

THIS WORK PACKAGE COVERS:

- Disassembly (page 0017 00-1).
 - Inspection-Acceptance and Rejection Criteria (page 0017 00-1).
 - Assembly (page 0017 00-2).
-

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0078 00, Item 68)
- Hammer Face (WP 0078 00, Item 19)
- Inserted Hammer Face Holder (WP 0078 00, Item 27)
- Arbor Press (WP 0078 00, Item 42)

References

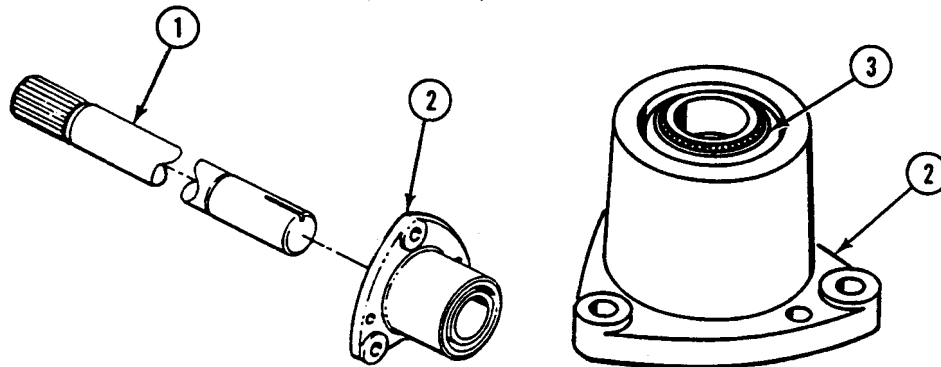
See your -20

Equipment Condition

Fan drive housing and shaft removed from carrier
(see your -20)

DISASSEMBLY

1. Remove drive shaft (1) from bearing housing (2) by pressing shaft (1) out.
2. Place bearing housing (2) on flat surface. Tap outer edge of bearing (3) until bearing turns to vertical position. Tap bearing edge to remove bearing from housing.

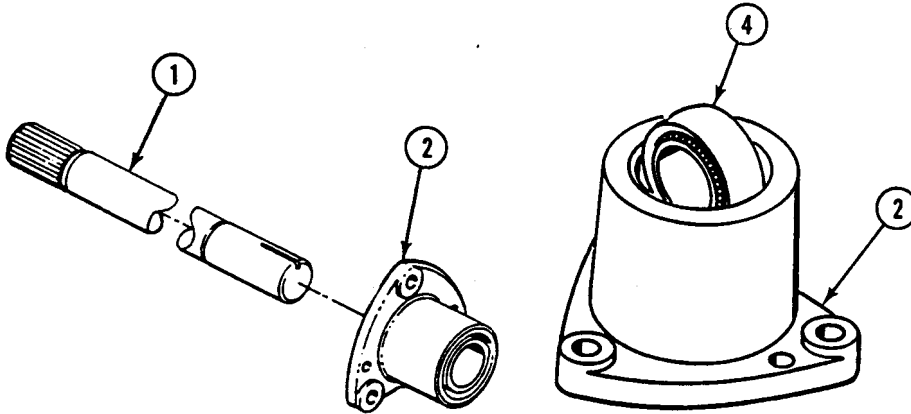


INSPECTION-ACCEPTANCE AND REJECTION CRITERIA

1. Inspect drive shaft and fan pulley for wear and damage. Replace bad drive shaft or front pulley.
2. Inspect bearing support and fan housing for wear and damage. Replace if necessary.

ASSEMBLY

1. Place bearing housing (2) on flat surface with bearing on top. Tap outer race of bearing (4) evenly until bearing race is seated flush with edge of housing. Tap edge of bearing downward to seat bearing in housing.
2. Press drive shaft (1) in bearing housing (2).

**FOLLOW-THROUGH STEPS**

1. Install fan drive housing and shaft in carrier (see your -20).

END OF TASK

CHAPTER 6

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR ELECTRICAL SYSTEM

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|---|---------------------|
| REPLACE INSTRUMENT PANEL (M548A1)..... | 0018 00 |
| REPLACE INSTRUMENT PANEL (M548A3)..... | 0019 00 |
| REPLACE POWER WIRING HARNESS (M548A1)..... | 0020 00 |
| REPLACE INSTRUMENT PANEL WIRING HARNESS (M548A3)..... | 0021 00 |
| REPLACE TRANSMISSION SHIFT TOWER WIRING HARNESS (M548A3)..... | 0022 00 |
| REPLACE FUEL PUMP WIRING HARNESS (M548A1)..... | 0023 00 |
| REPLACE RADIO RECEPTACLE/HEATER WIRING HARNESS..... | 0024 00 |
| REPLACE MAIN WIRING HARNESS..... | 0025 00 |
| REPLACE POWER PLANT WIRING HARNESS (M548A1)..... | 0026 00 |

REPLACE INSTRUMENT PANEL (M548A1)

0018 00

THIS WORK PACKAGE COVERS:

- Removal (page 0018 00-1).
- Disconnect Power Wiring Harness (page 0018 00-3).
- Disconnect Main Wiring Harness (page 0018 00-7).
- Connect Main Wiring Harness (page 0018 00-9).
- Connect Power Wiring Harness (page 0018 00-11).
- Installation (page 0018 00-15).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

Automotive Fuel and Electrical System Repair Tool Kit
(WP 0078 00, Item 64)

Personnel Required

Fuel and Elec Sys Rep 63G

References

- See your -10
- See your -20
- See M548A1 wiring diagram (see your -20, FO-1)

Equipment Condition

- Engine stopped (see your -10)
- Carrier blocked (see your -10)
- Master switch off
- Battery negative lead disconnected (see your -20)

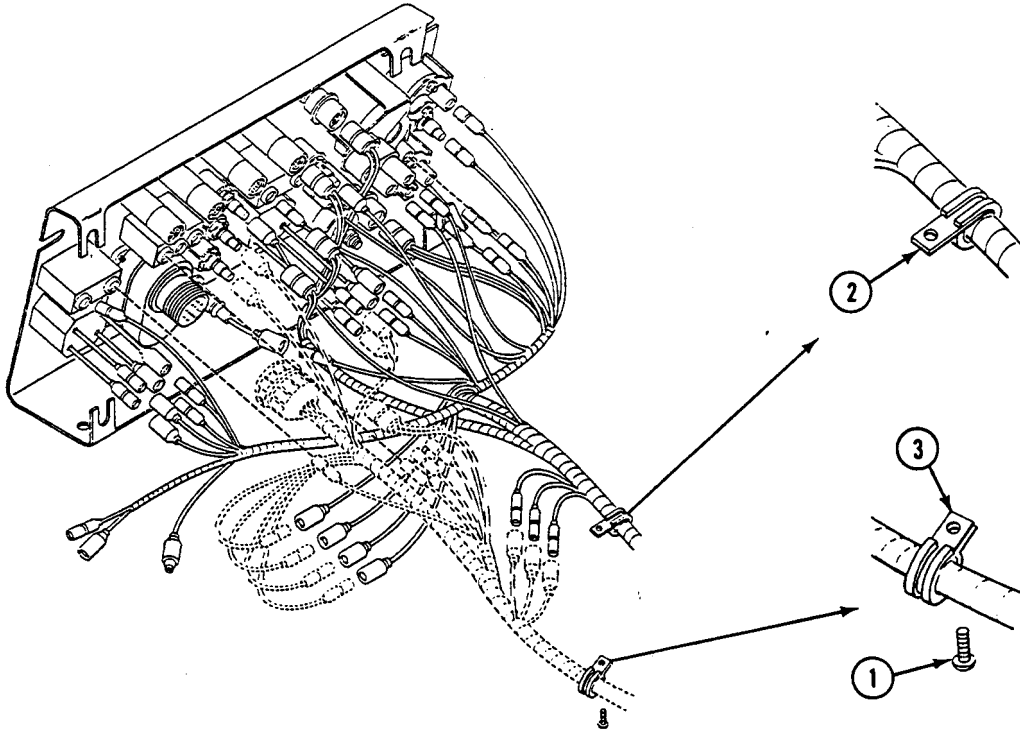
REMOVAL

1. Partially remove instrument panel (see your -20).
2. Rest instrument panel on mounts and do Steps 3 - 8.

NOTE

For proper grounding of electrical components, the back side of instrument panel should not be painted.

3. Remove harness clamp screw (1) securing power wiring harness clamp (2) and main wiring harness clamp (3) to hull.

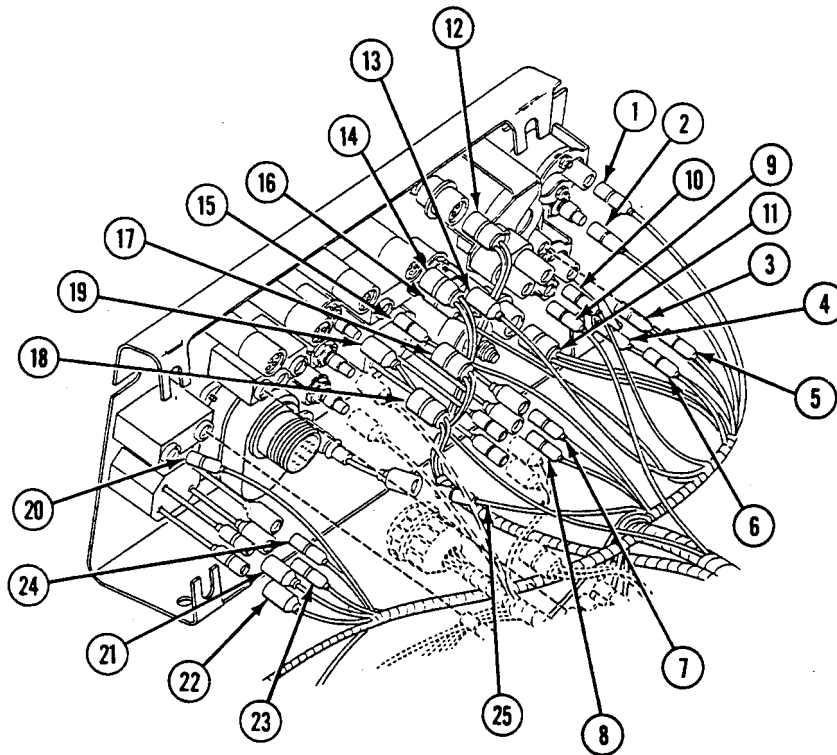


DISCONNECT POWER WIRING HARNESS

NOTE

For proper installation, tag all electrical leads when removed.

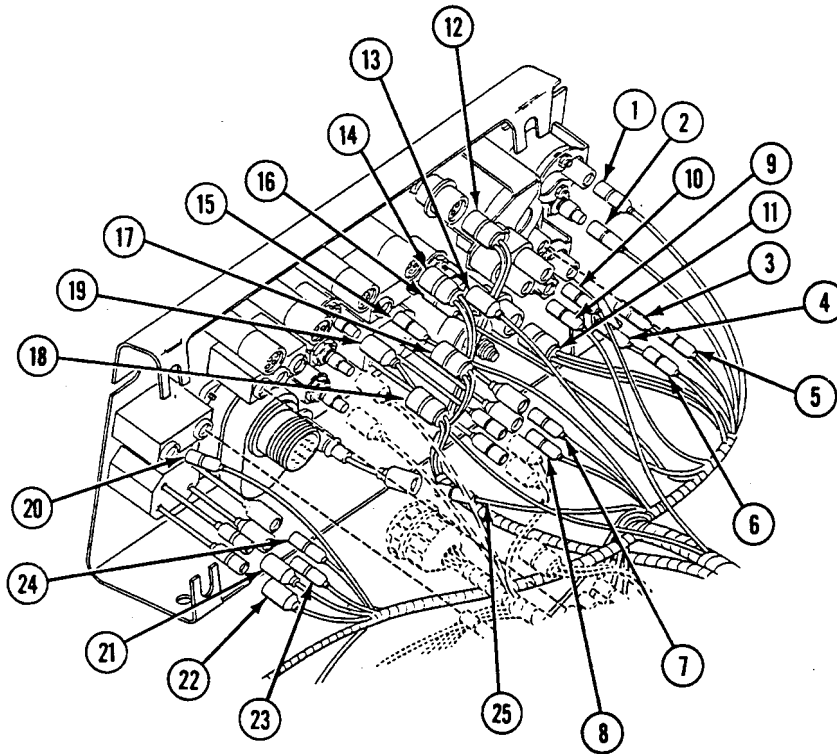
1. Disconnect circuit 27E lead (1) from battery generator regulator.
2. Disconnect circuit 40 lead (2) from left instrument panel light.
3. Disconnect circuit 27B lead (3) and circuit 33 lead (4) from coolant temperature indicator.
4. Disconnect circuit 27A lead (5) and circuit 28 lead (6) from fuel quantity indicator.
5. Disconnect 450 lead (7) and circuit 450B lead (8) from bilge pump switch.



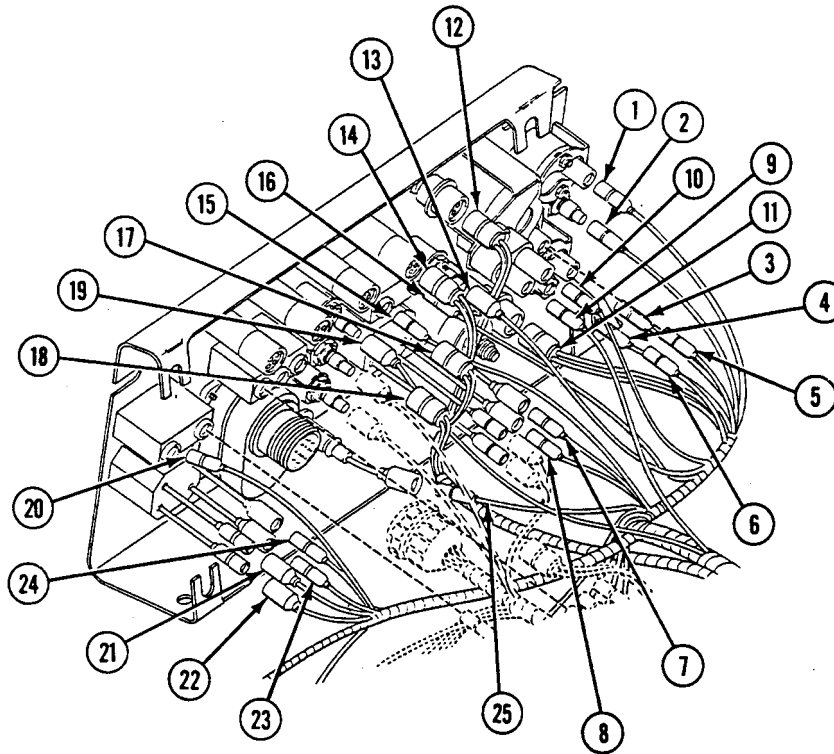
REPLACE INSTRUMENT PANEL (M548A1) — Continued

0018 00

6. Disconnect circuit 10 lead (9) and circuit 14-27 lead (10) from instrument panel circuit breaker on tachometer.
7. Disconnect circuit 25 and 25A double connector (11) from horn switch.
8. Disconnect circuit 14-27 and 14A double connector (12) from starter switch.
9. Disconnect circuit 40 lead (13) from center instrument panel light.
10. Disconnect circuit 34 and 27J double connector (14) from engine oil low pressure warning light.



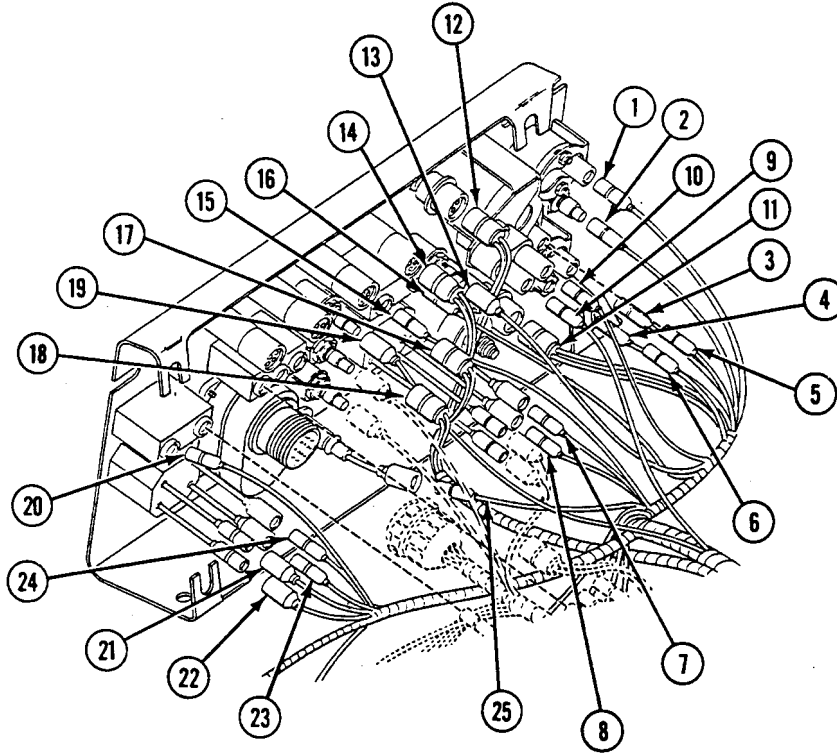
11. Disconnect circuit 406 lead (15) and circuit 400B lead (16) from air box heater switch.
12. Disconnect circuit 327 and 27G double connector (17) from transmission oil temperature warning light.
13. Disconnect circuit 328 and 27K double (18) connector from differential oil high temperature indicator light.
14. Disconnect circuit 27D lead (19) from master switch ON indicator light.
15. Disconnect circuit 27-71A lead (20) from windshield wiper switch.



REPLACE INSTRUMENT PANEL (M548A1) — Continued

0018 00

16. Disconnect circuit 74 lead (21), circuit 77-78 lead (22), circuit 76 lead (23), and circuit 14A lead (24) from fuel pump switch.
17. Disconnect circuit 37 lead (25) from utility outlet receptacle.



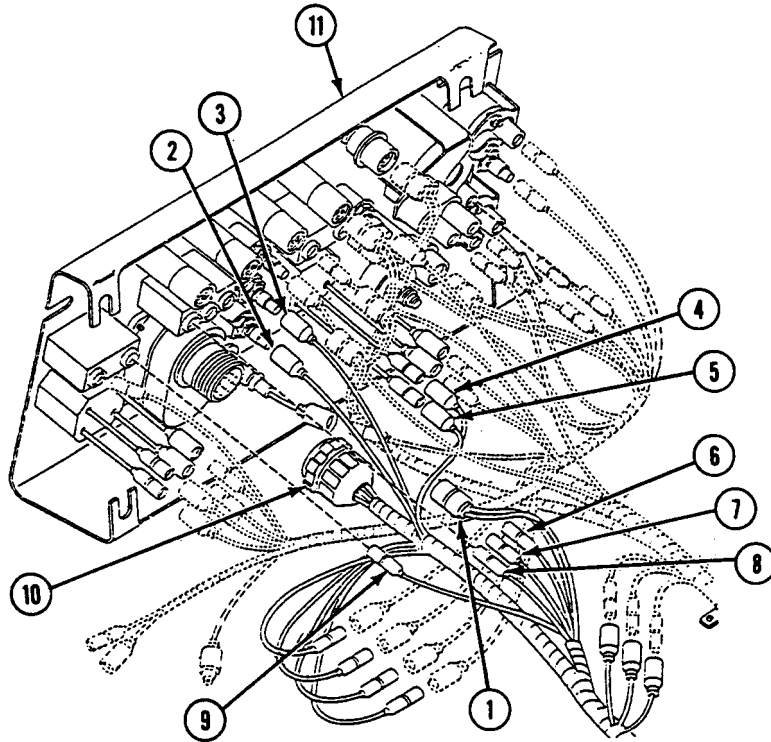
DISCONNECT MAIN WIRING HARNESS

1. Disconnect circuit 519 and 519A double connector (1) from headlight high beam indicator light.

NOTE

Although circuit 451 lead is in wiring harness, there is no rear bilge pump in M548A1 Carriers.

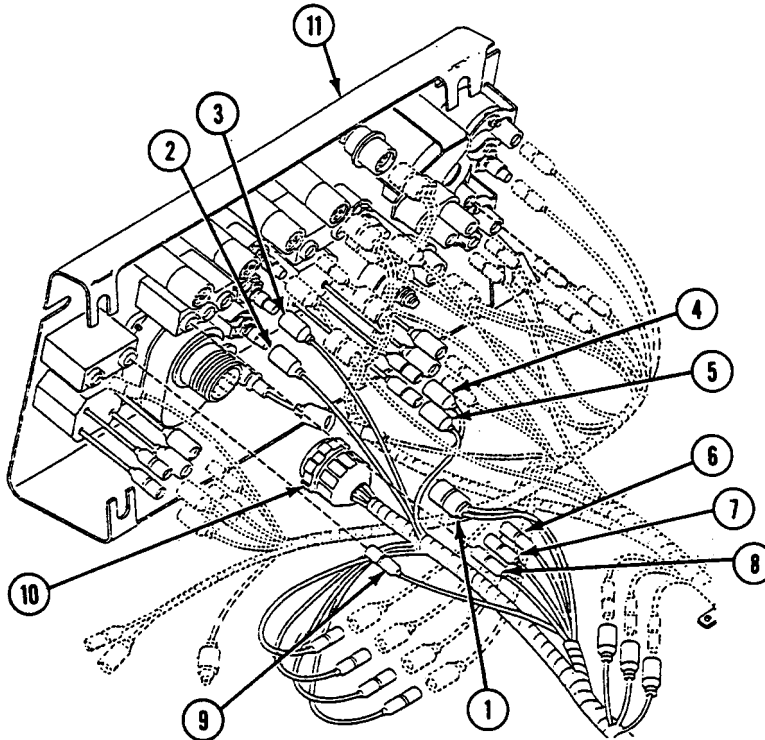
2. Disconnect circuit 451 lead (2) from rear bilge pump ON indicator light.
3. Disconnect circuit 452 lead (3) from front bilge pump ON indicator light.
4. Disconnect circuit 451 lead (4) and circuit 452 lead (5) from bilge pump switch.



REPLACE INSTRUMENT PANEL (M548A1) — Continued

0018 00

5. Disconnect circuit 19 lead (6), circuit 520 lead (7), and circuit 514-515 lead (8) from infrared-blackout selector switch.
6. Disconnect circuit 71 lead (9) from windshield wiper switch.
7. Disconnect main light switch connector (10) from main light switch.
8. Remove instrument panel (11) from mounts.



CONNECT MAIN WIRING HARNESS

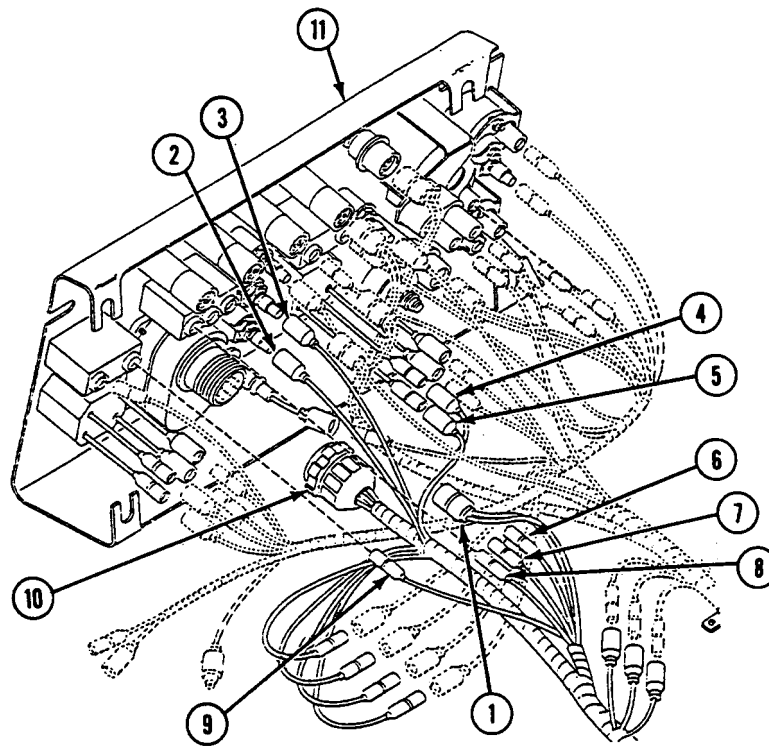
1. Position new instrument panel (11) on mounts.

NOTE

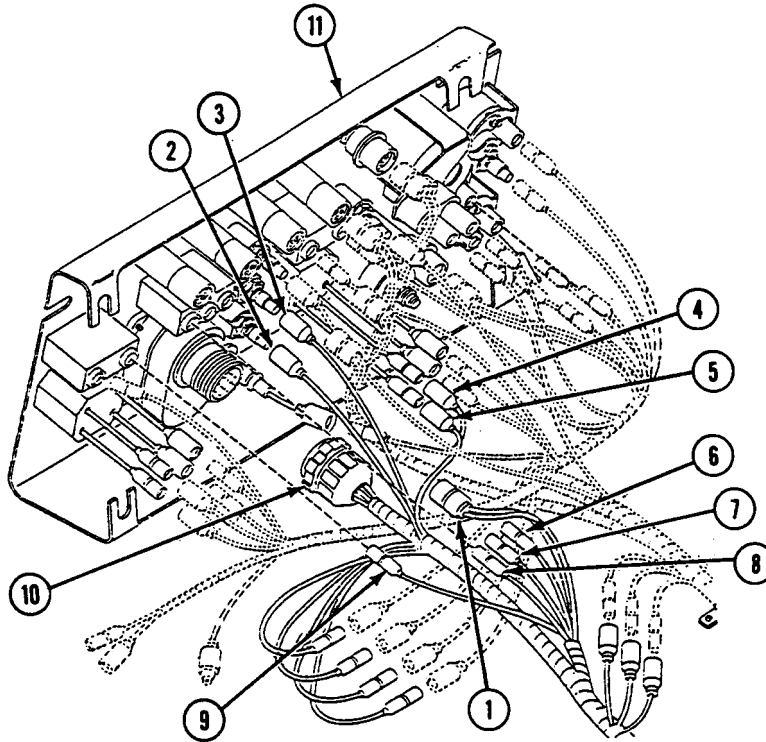
For proper grounding of electrical components, the back side of instrument panel should not be painted.

Use tags to ensure correct connections.

2. Connect main light switch connector (10) to main light switch.
3. Connect circuit 71 lead (9) to windshield wiper switch.
4. Connect circuit 19 lead (6), circuit 520 lead (7), and circuit 514-515 lead (8) to infrared-blackout selector switch.

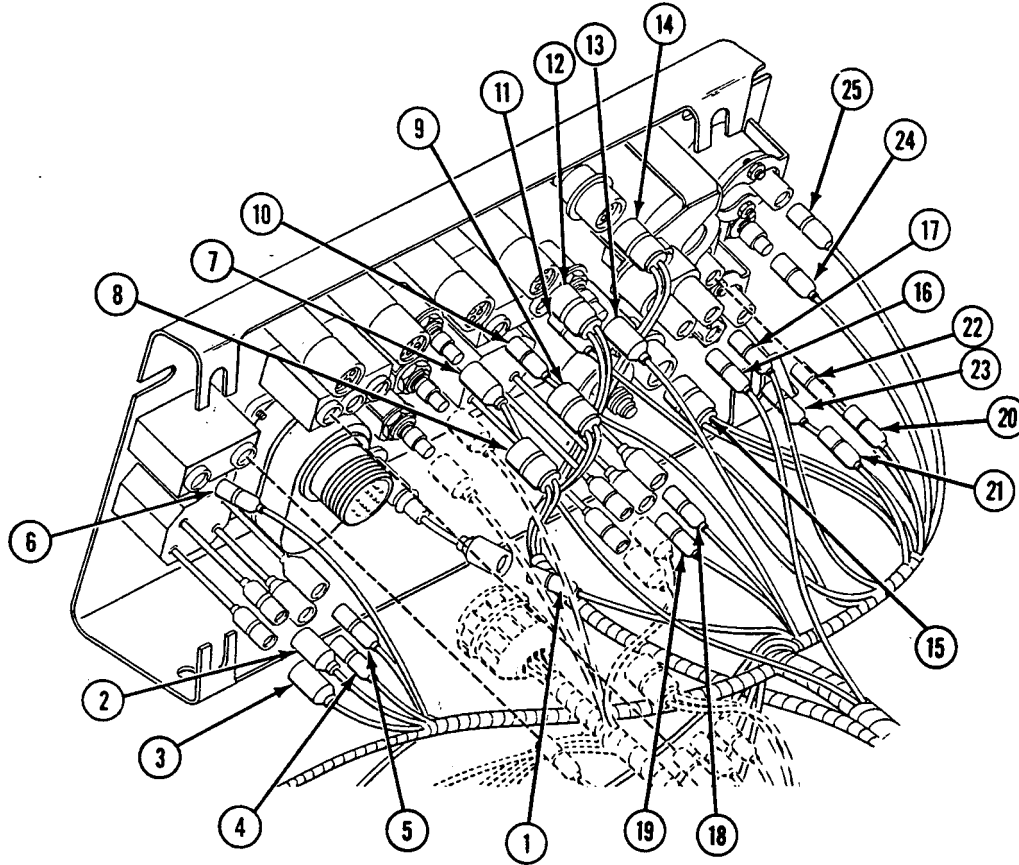


5. Connect circuit 452 lead (5) and circuit 451 lead (4) to bilge pump switch.
6. Connect circuit 452 lead (3) to front bilge pump ON indicator light.
7. Connect circuit 451 lead (2) to rear bilge pump ON light.
8. Connect circuit 519 and 519A double connector (1) to headlight high beam indicator light.

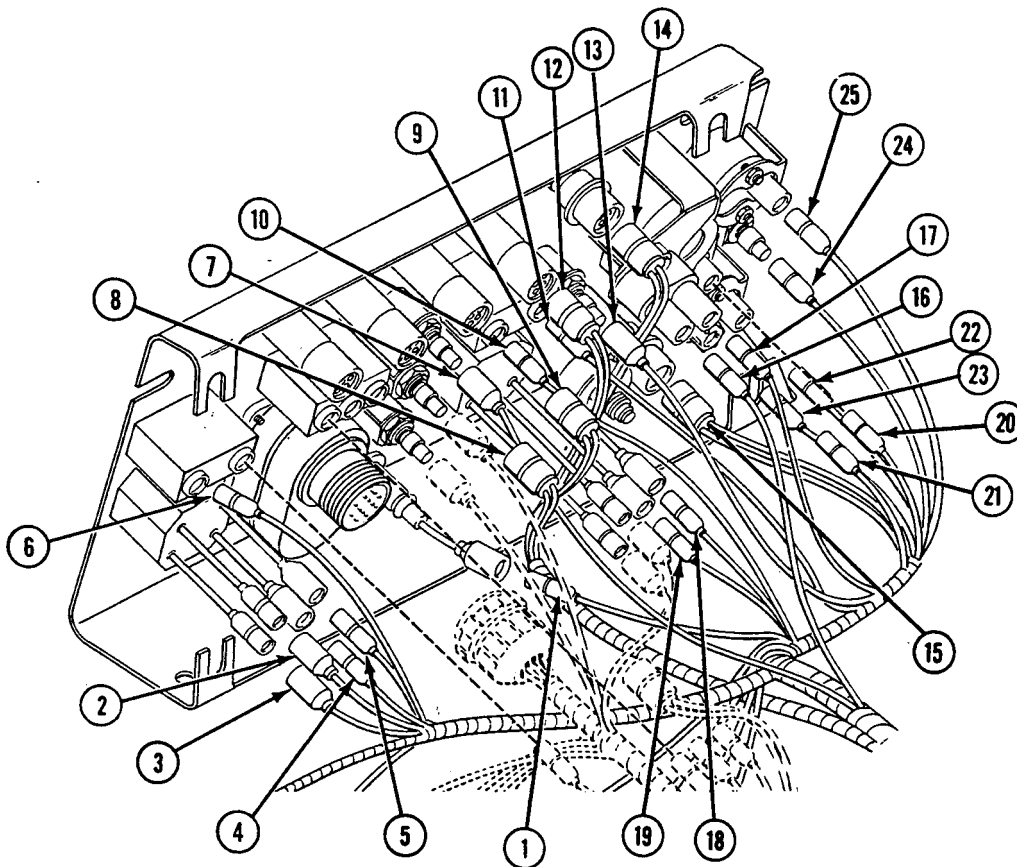


CONNECT POWER WIRING HARNESS

1. Connect circuit 37 lead (1) to utility outlet receptacle.
2. Connect circuit 74 lead (2), circuit 77-78 lead (3), circuit 76 lead (4), and circuit 14A lead (5) to fuel pump switch.
3. Connect circuit 27-71A lead (6) to windshield wiper switch.
4. Connect circuit 27D lead (7) to master switch ON indicator light.
5. Connect circuit 328 and 27K double (8) connector to differential oil high temperature indicator light.



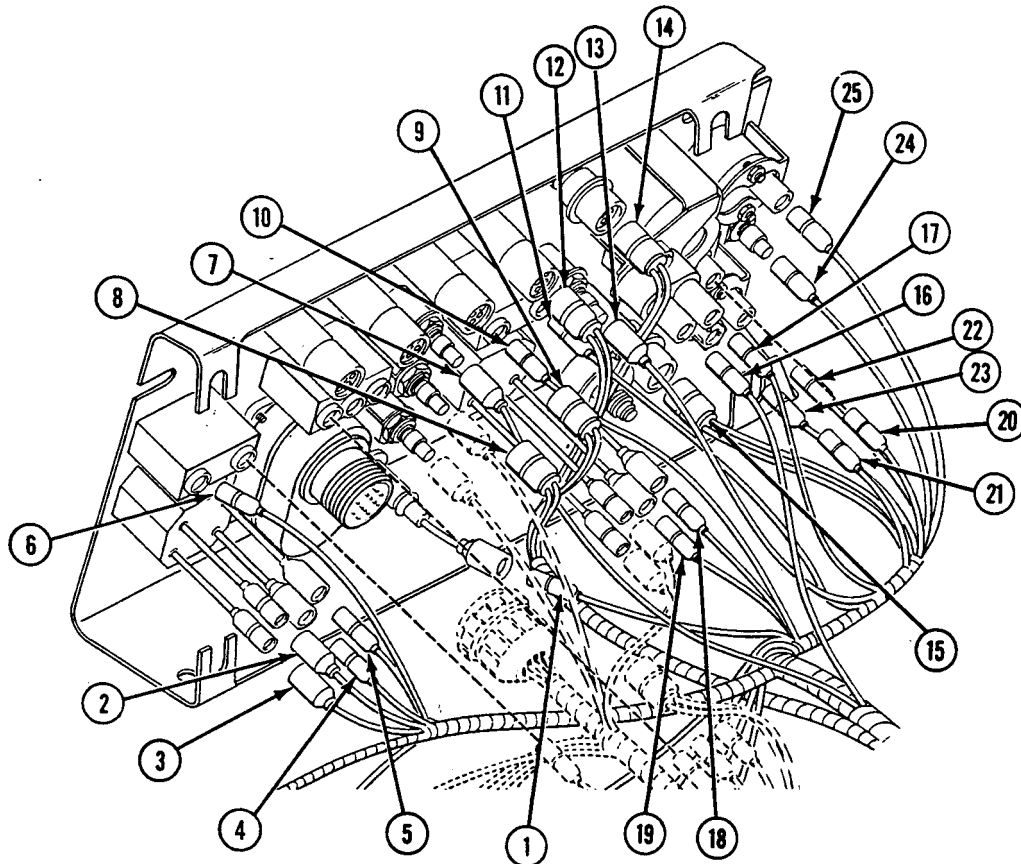
6. Connect circuit 327 and 27G double connector (9) to transmission oil temperature warning light.
7. Connect circuit 406 lead (10) and circuit 400B lead (11) to air box heater switch.
8. Connect circuit 34 and 27J double connector (12) to engine oil low pressure warning light.
9. Connect circuit 40 lead (13) to center instrument panel light.
10. Connect circuit 14-27 and 14A double connector (14) to starter switch.



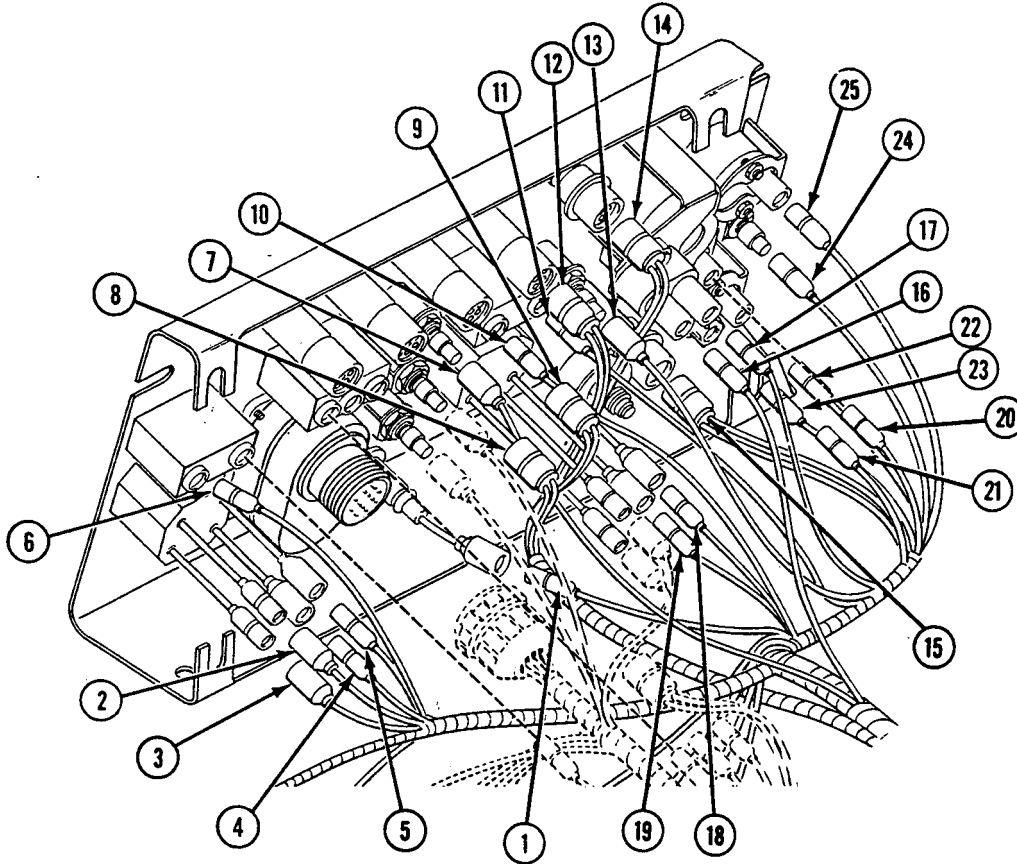
REPLACE INSTRUMENT PANEL (M548A1) — Continued

0018 00

11. Connect circuit 25 and 25A double connector (15) to horn switch.
12. Connect circuit 10 lead (16) and circuit 14-27 lead (17) to instrument panel circuit breaker on tachometer.
13. Connect 450 lead (18) and circuit 450B lead (19) to bilge pump switch.
14. Connect circuit 27A lead (20) and circuit 28 lead (21) to fuel quantity indicator.
15. Connect circuit 27B lead (22) and circuit 33 lead (23) to coolant temperature indicator.

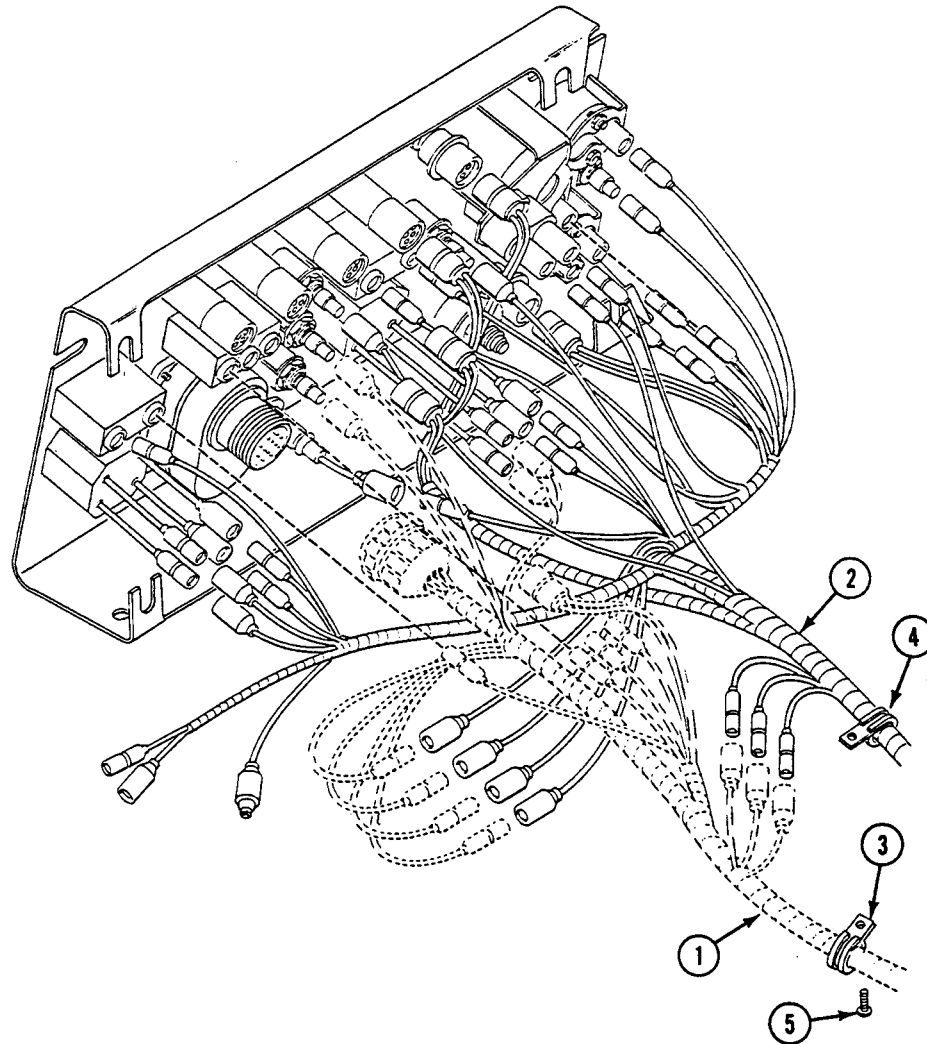


16. Connect circuit 40 lead (24) to left instrument panel light.
17. Connect circuit 27E lead (25) to battery generator regulator.



INSTALLATION

1. Position main wiring harness (1) and power wiring harness (2) on hull. Secure with main wiring harness clamp (3), power wiring harness clamp (4) and harness clamp screw (5).
2. Complete instrument panel installation (see your -20).

**FOLLOW-THROUGH STEPS**

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

END OF TASK

REPLACE INSTRUMENT PANEL (M548A3)

0019 00

THIS WORK PACKAGE COVERS:

- Removal (page 0019 00-1).
- Disconnect Instrument Panel Wiring Harness (page 0019 00-3).
- Disconnect Main Wiring Harness (page 0019 00-6).
- Connect Main Wiring Harness (page 0019 00-8).
- Connect Instrument Panel Wiring Harness (page 0019 00-10).
- Installation (page 0019 00-13).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

Automotive Fuel and Electrical System Repair Tool Kit
(WP 0078 00, Item 64)

Personnel Required

Fuel and Elec Sys Rep 63G

References

- See your -10
- See your -20
- See M548A3 wiring diagram (see your -20, FO-2)

References

- See your -10
- See your -20

Equipment Condition

- Engine stopped (see your -10)
- Carrier blocked (see your -10)
- Master switch off
- Both battery negative leads disconnected (see your -20)
- Instrument panel partially removed (see your -20)

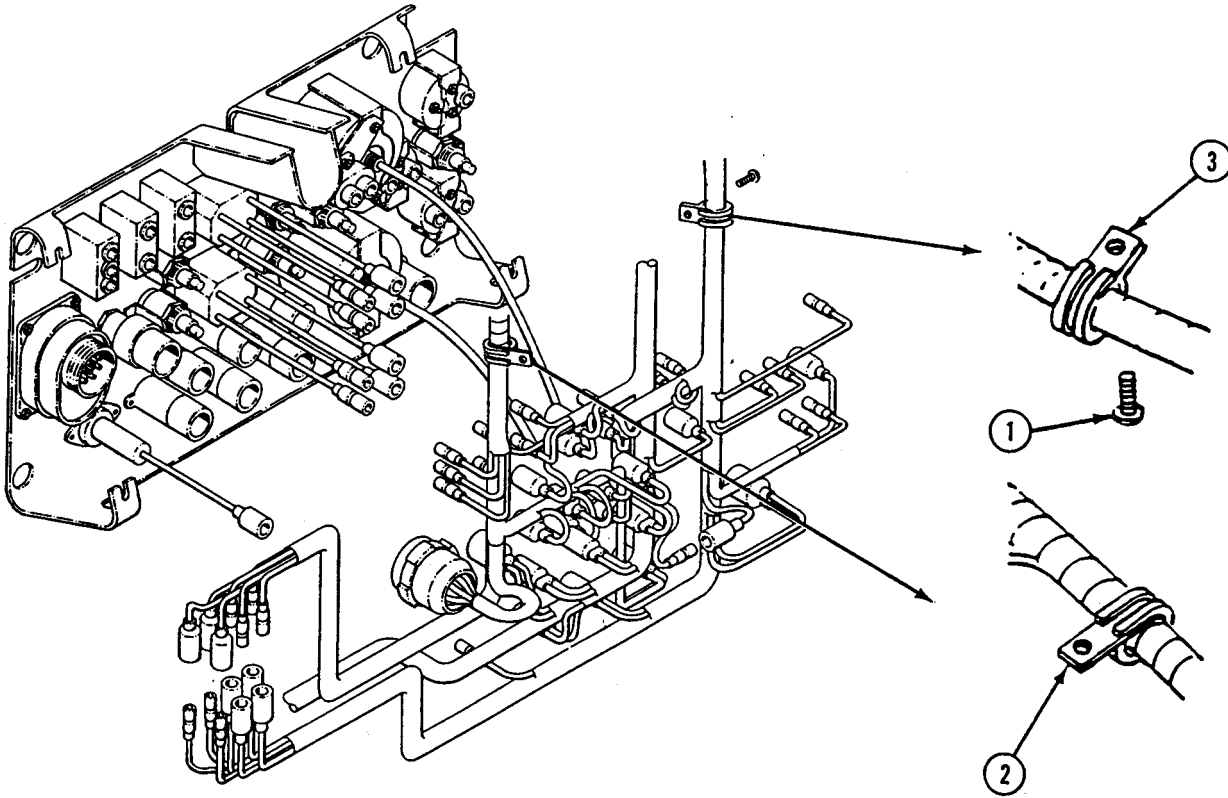
REMOVAL

1. Rest instrument panel on mounts and do Steps 2 - 8.

NOTE

For proper grounding of electrical components, the back side of instrument panel should not be painted.

2. Remove harness clamp screw (1) securing power wiring harness clamp (2) and main wiring harness clamp (3) to hull.

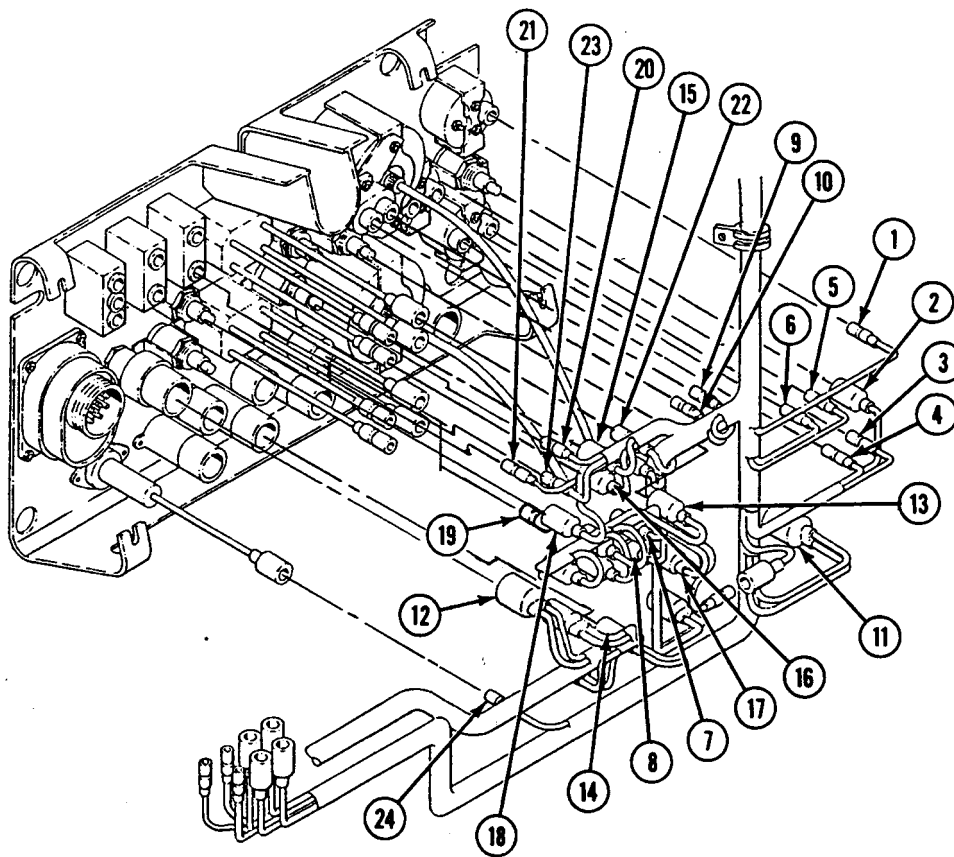


DISCONNECT INSTRUMENT PANEL WIRING HARNESS

NOTE

For proper installation, tag all electrical leads when removed.

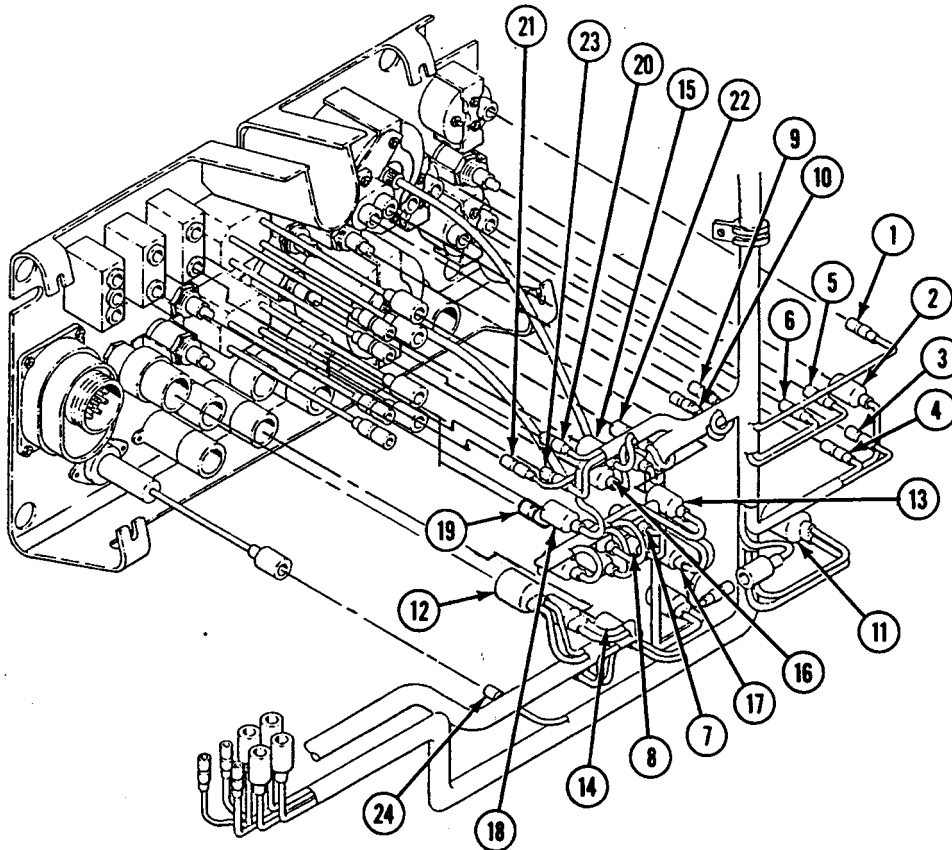
1. Disconnect circuit 27E lead (1) from battery generator regulator.
2. Disconnect circuit 40 lead (2) from left instrument panel light.
3. Disconnect circuit 27B lead (3) and circuit 33 lead (4) from coolant temperature indicator.
4. Disconnect circuit 27A lead (5) and circuit 28 lead (6) from fuel quantity indicator.
5. Disconnect circuit 450 lead (7) and circuit 450B lead (8) from bilge pump switch.



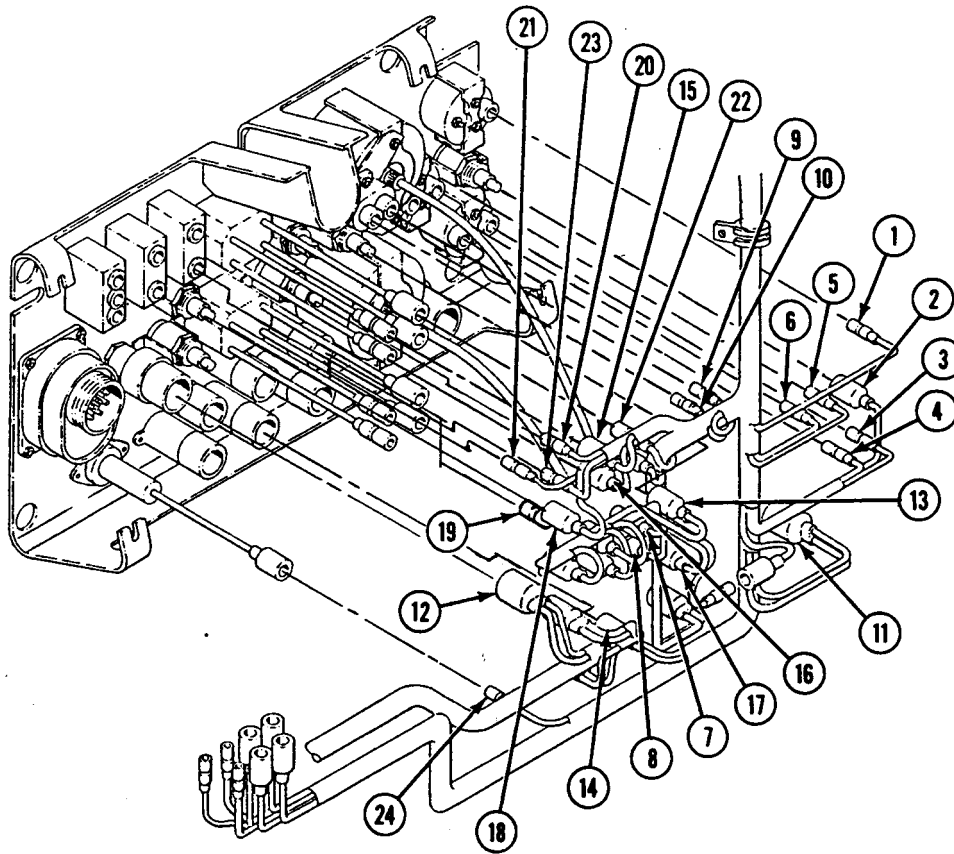
REPLACE INSTRUMENT PANEL (M548A3) — Continued

0019 00

6. Disconnect circuit 10 lead (9) and circuit 27 lead (10) from instrument panel circuit breaker on tachometer.
7. Disconnect circuit 25 and 25A double connector (11) from horn switch.
8. Disconnect circuit 14 and 14A double connector (12) from starter switch.
9. Disconnect circuit 40A lead (13) from center instrument panel light.
10. Disconnect circuit 34 and 27J double connector (14) from engine oil low pressure warning light.



11. Disconnect circuit 406 lead (15) and circuit 400B lead (16) from air box heater switch.
12. Disconnect circuit 327 and 27G double connector (17) from transmission oil temperature warning light.
13. Disconnect circuit 27D lead (18) from master switch ON indicator light.
14. Disconnect circuit 27-71A lead (19) from windshield wiper switch.
15. Disconnect circuit 74 lead (20), circuit 77-78 lead (21), circuit 76 lead (22), and circuit 14A lead (23) from fuel pump switch.
16. Disconnect circuit 37 lead (24) from utility outlet receptacle.

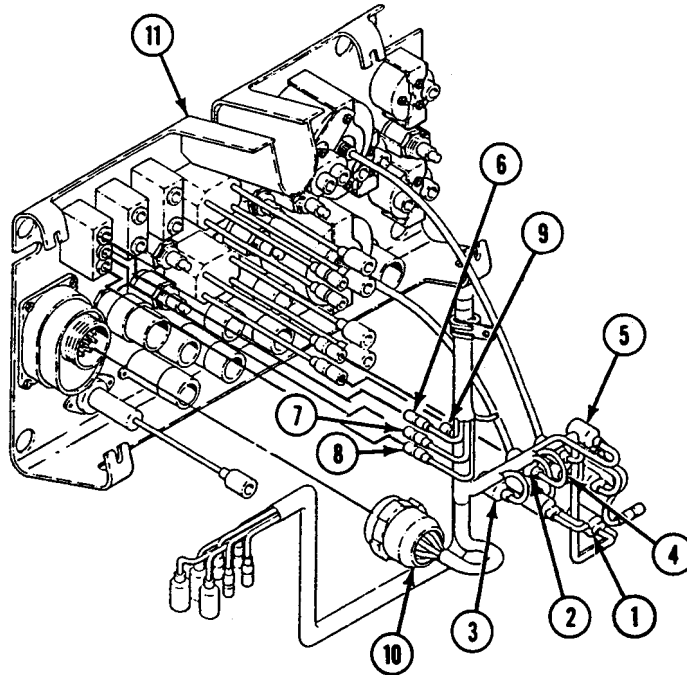


DISCONNECT MAIN WIRING HARNESS

NOTE

For proper installation, tag all electrical leads when removed.

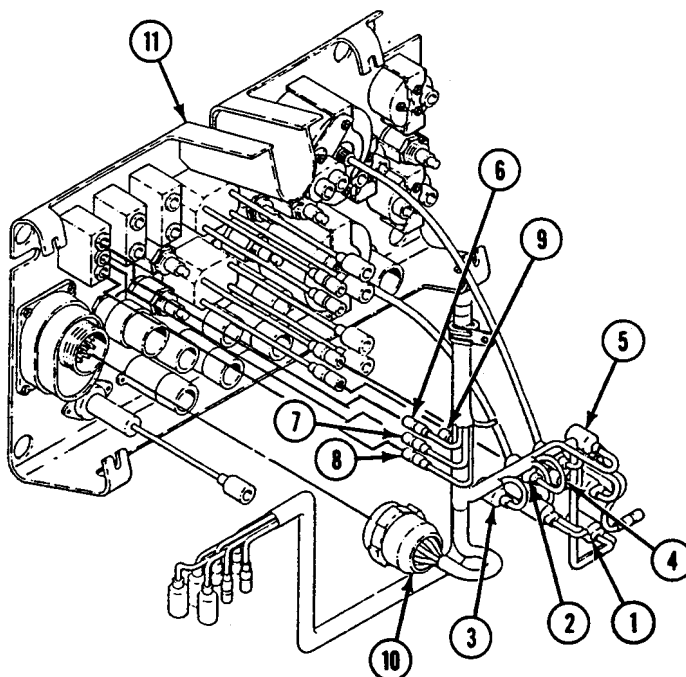
1. Disconnect circuit 519 and 519A double connector (1) from headlight high beam indicator light.
2. Disconnect circuit 451 lead (2) from rear bilge pump ON indicator light.
3. Disconnect circuit 452 lead (3) from front bilge pump ON indicator light.
4. Disconnect circuit 451 lead (4) and circuit 452 lead (5) from bilge pump switch.



REPLACE INSTRUMENT PANEL (M548A3) — Continued

0019 00

5. Disconnect circuit 19 lead (6), circuit 520 lead (7), and circuit 514-515 lead (8) from infrared-blackout selector switch.
6. Disconnect circuit 71 lead (9) from windshield wiper switch.
7. Disconnect main light switch connector (10) from main light switch.
8. Remove instrument panel (11) from mounts.



CONNECT MAIN WIRING HARNESS

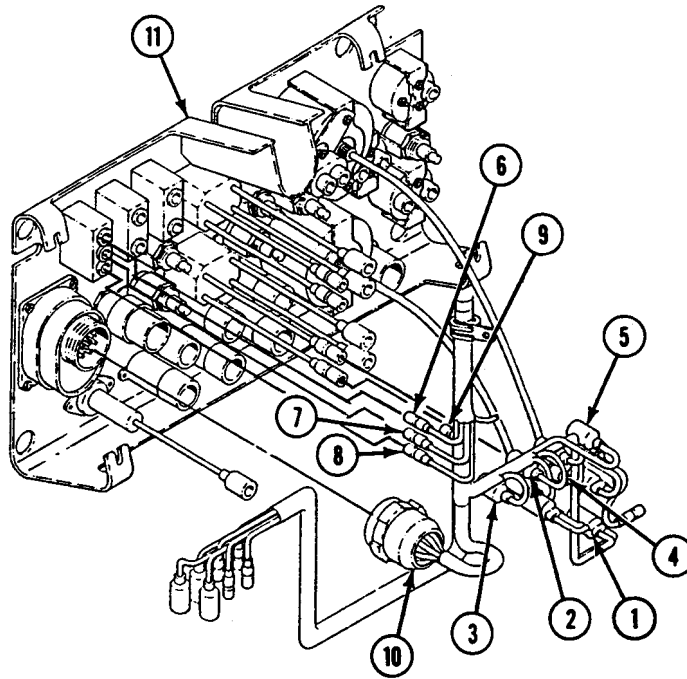
1. Position new instrument panel (11) on mounts.

NOTE

For proper grounding of electrical components, the back side of instrument panel should not be painted.

Use tags to ensure correct connections.

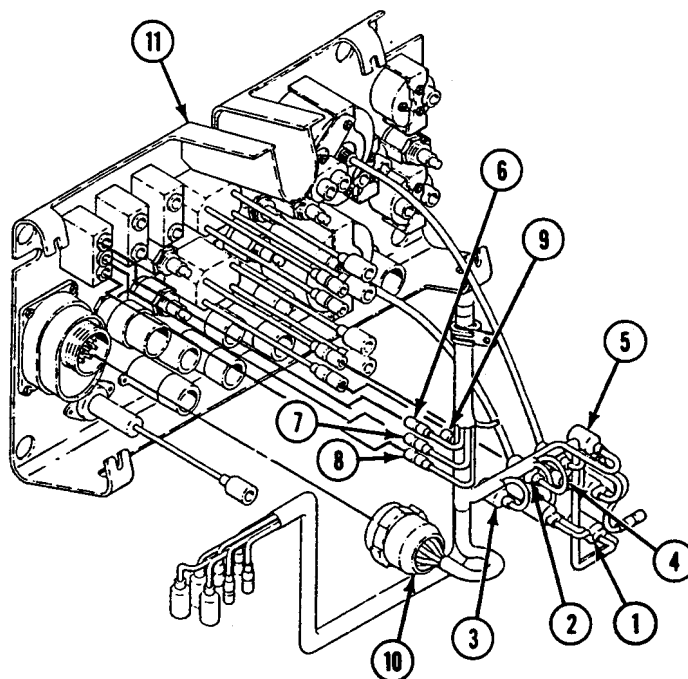
2. Connect main light switch connector (10) to main light switch.
3. Connect circuit 71 lead (9) to windshield wiper switch.
4. Connect circuit 19 lead (6), circuit 520 lead (7), and circuit 514-515 lead (8) to infrared-blackout selector switch.
5. Connect circuit 452 lead (5) and circuit 451 lead (4) to bilge pump switch.



REPLACE INSTRUMENT PANEL (M548A3) — Continued

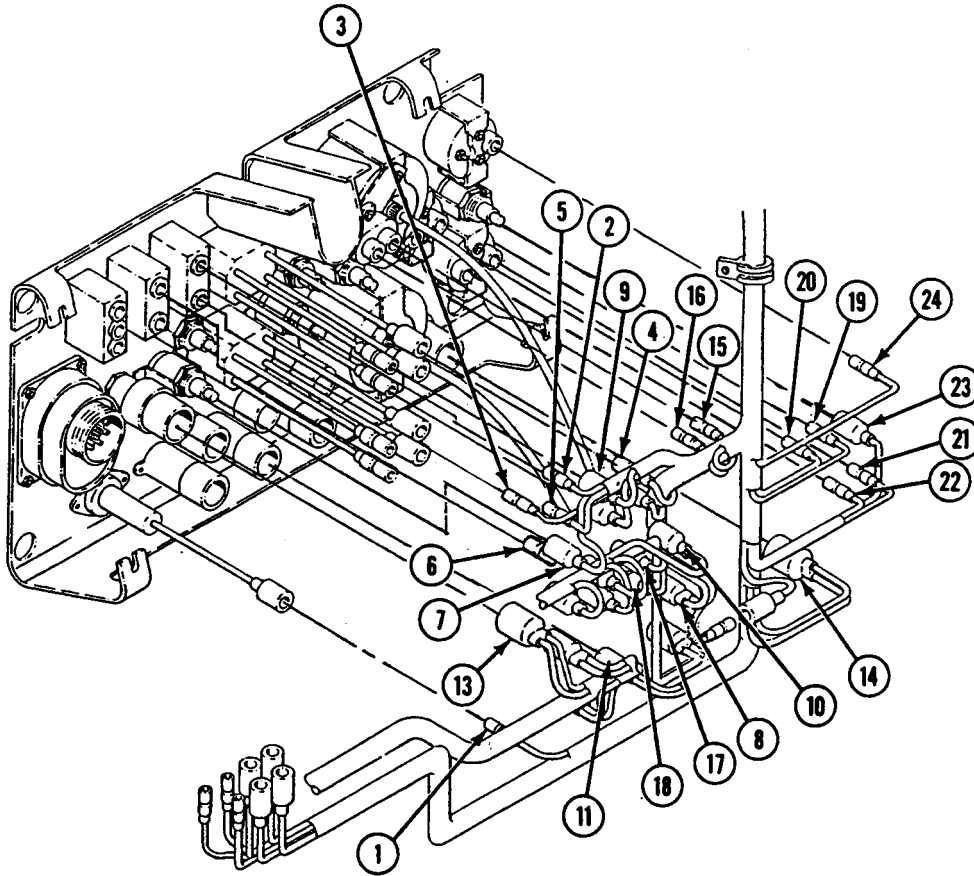
0019 00

6. Connect circuit 452 lead (3) to front bilge pump ON indicator light.
7. Connect circuit 451 lead (2) to rear bilge pump ON light.
8. Connect circuit 519 and 519A double connector (1) to headlight high beam indicator light.

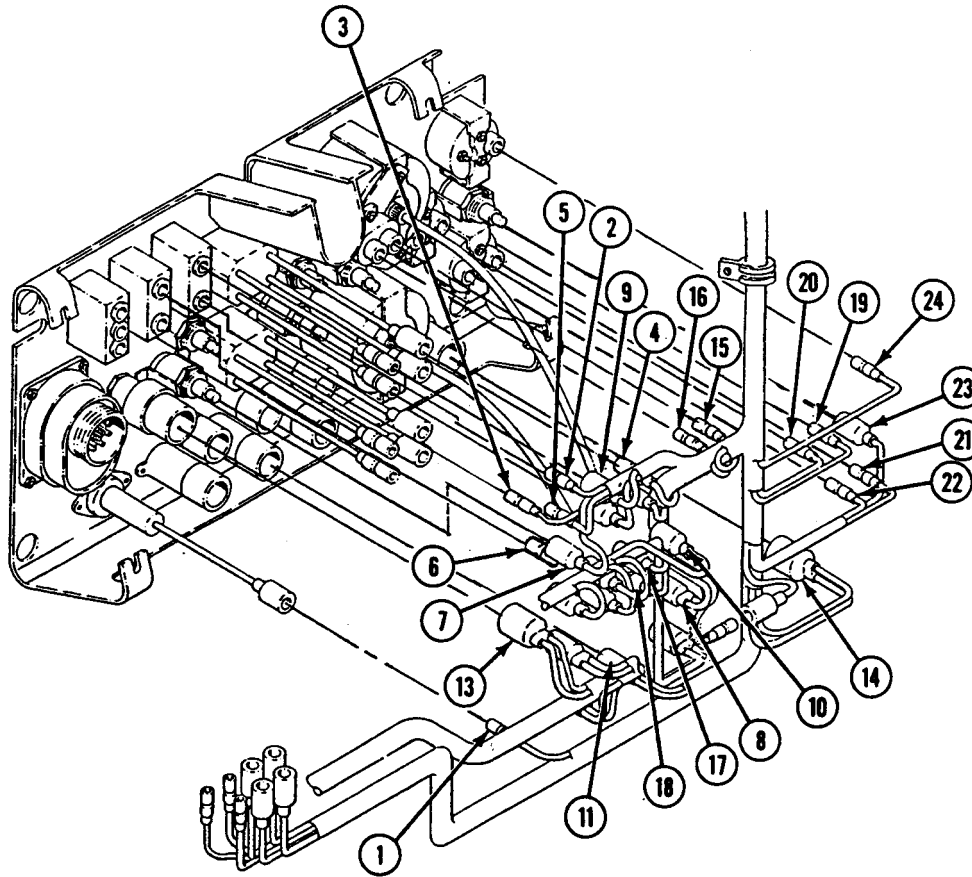


CONNECT INSTRUMENT PANEL WIRING HARNESS

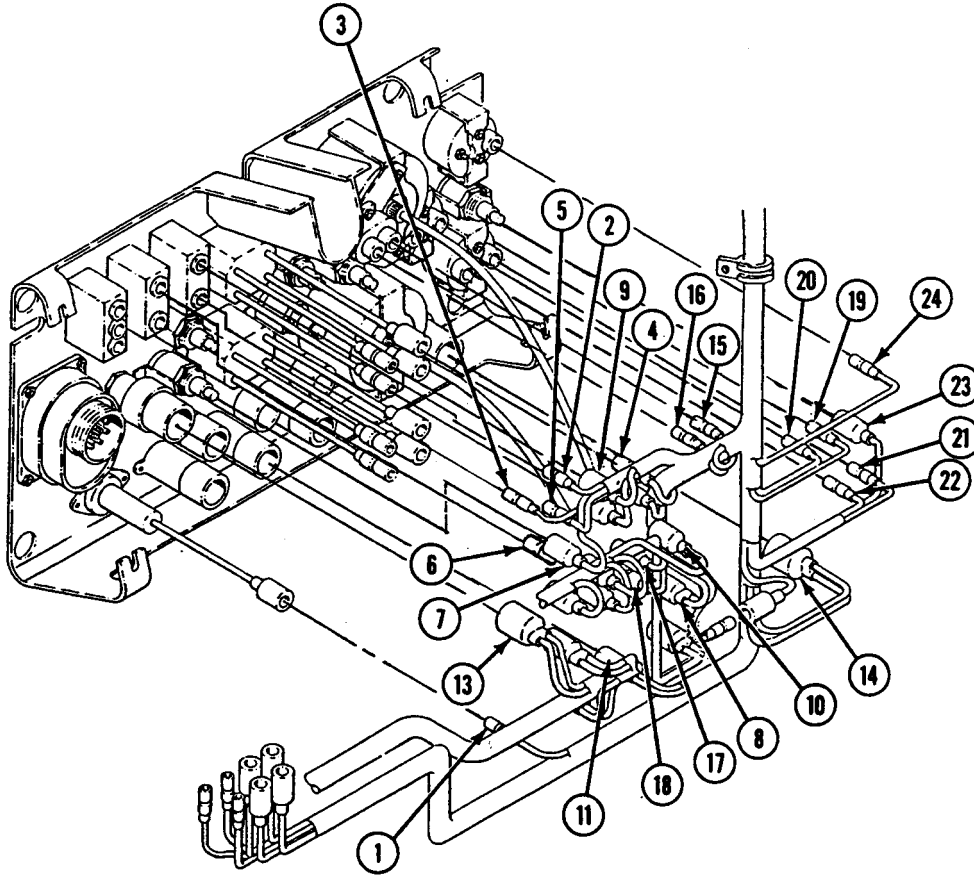
1. Connect circuit 37 lead (1) to utility outlet receptacle.
2. Connect circuit 74 lead (2), circuit 77-78 lead (3), circuit 76 lead (4), and circuit 14A lead (5) to fuel pump switch.
3. Connect circuit 27-71A lead (6) to windshield wiper switch.
4. Connect circuit 27D lead (7) to master switch ON indicator light.
5. Connect circuit 327 and 27G double connector (8) to transmission oil temperature warning light.



6. Connect circuit 406 lead (9) and circuit 400B lead (10) to air box heater switch.
7. Connect circuit 34 and 27J double connector (11) to engine oil low pressure warning light.
8. Connect circuit 40A lead (12) to center instrument panel light.
9. Connect circuit 14 and 14A double connector (13) to starter switch.
10. Connect circuit 25 and 25A double connector (14) to horn switch.
11. Connect circuit 10 lead (15) and circuit 27 lead (16) to instrument panel circuit breaker on tachometer.
12. Connect 450 lead (17) and circuit 450B lead (18) to bilge pump switch.

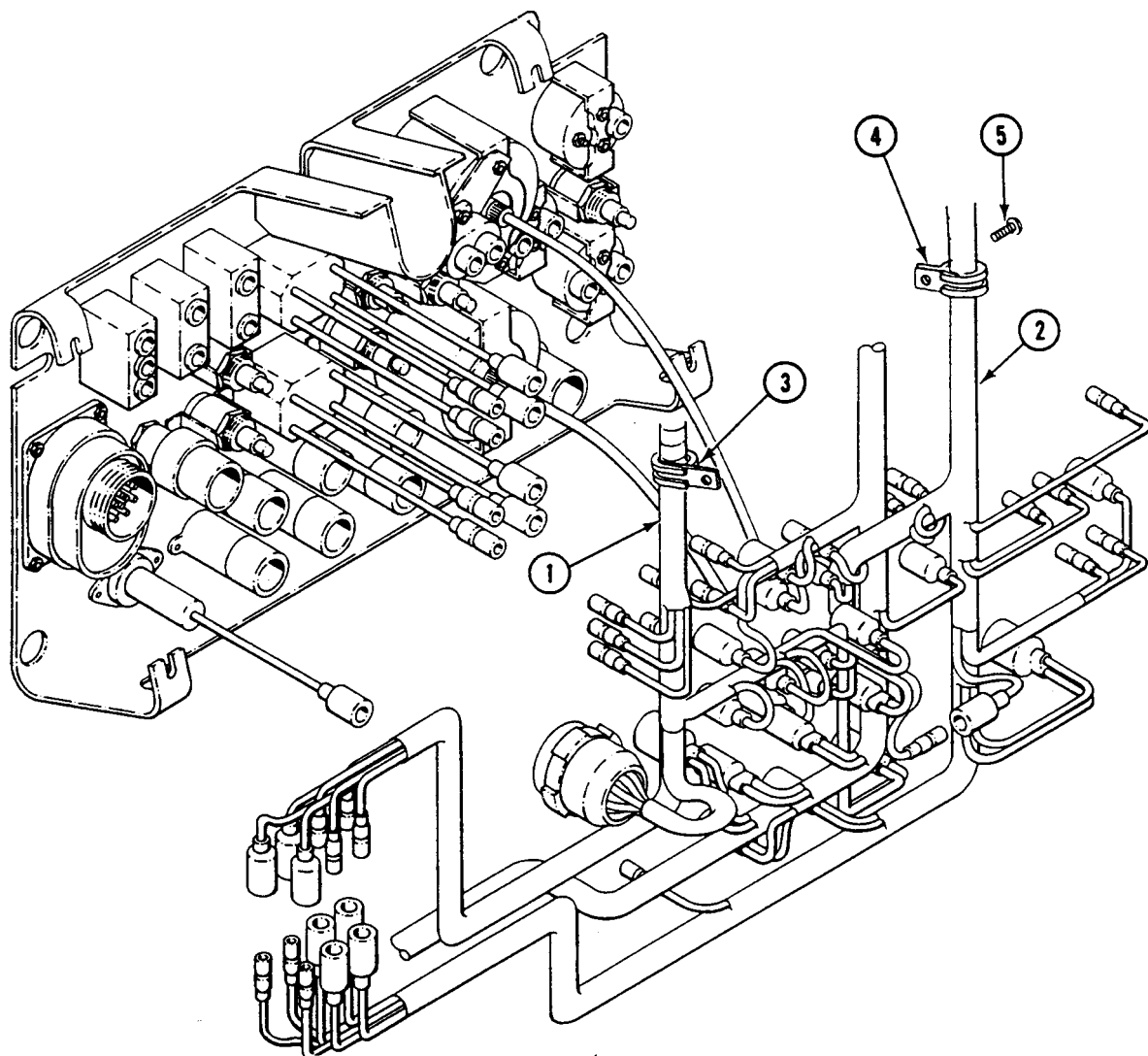


13. Connect circuit 27A lead (19) and circuit 28 lead (20) to fuel quantity indicator.
14. Connect circuit 27B lead (21) and circuit 33 lead (22) to coolant temperature indicator.
15. Connect circuit 40 lead (23) to left instrument panel light.
16. Connect circuit 27E lead (24) to battery generator regulator.



INSTALLATION

1. Position main wiring harness (1) and power wiring harness (2) on hull. Secure with main wiring harness clamp (3), power wiring harness clamp (4) and harness clamp screw (5).
2. Complete instrument panel installation (see your -20).

**FOLLOW-THROUGH STEPS**

1. Connect both battery negative leads (see your -20).

END OF TASK

REPLACE POWER WIRING HARNESS (M548A1)

0020 00

THIS WORK PACKAGE COVERS:

Removal (page 0020 00-2).
 Installation (page 0020 00-8).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

Automotive Fuel and Electrical System Repair Tool Kit
 (WP 0078 00, Item 64)

Materials/Parts

Grommet
 Grommet
 Lock nut (2)
 Lock washer (2)
 Lock washer (5)

Personnel Required

Fuel and Elec Sys Rep 63G

References

See your -10
 See your -20
 See M548A1 wiring diagram (see your -20, FO-1)

Equipment Condition

Engine stopped (see your -10)
 Carrier blocked (see your -10)
 Master switch off
 Cab personnel center seat and driver's seat raised
 (see your -10)
 Batteries removed (see your -20)
 Cab left floor plate removed (see your -20)

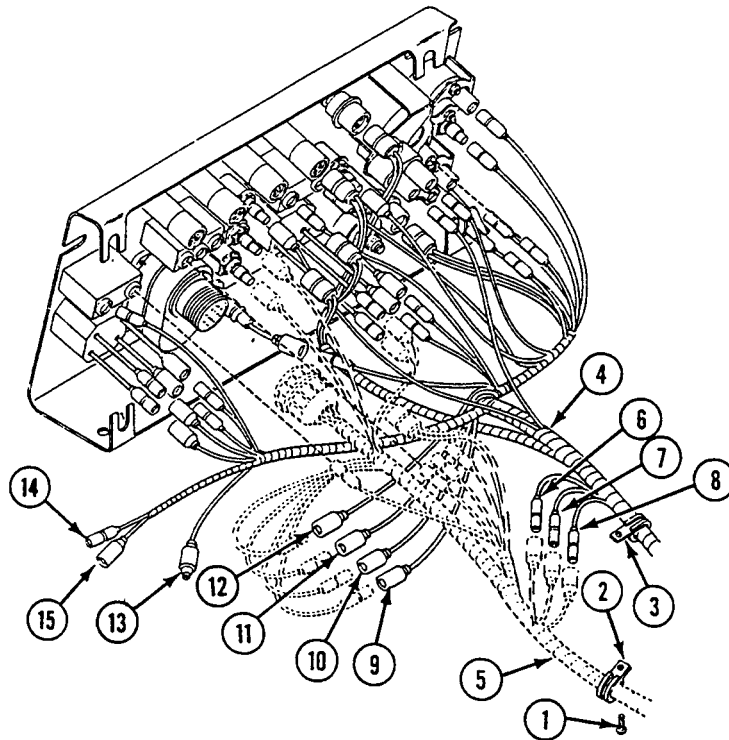
REMOVAL

1. Remove screw (1) securing main wiring harness clamp (2) and power wiring harness clamp (3) to hull.
2. Disconnect power wiring harness from instrument panel (WP 0017 00).
3. Disconnect power wiring harness (4) from main wiring harness (5).
 - a. Disconnect circuit 28 lead (6), circuit 25 lead (7), circuit 27-38 lead (8), circuit 15 lead (9), circuit 75 lead (10), circuit 75A lead (11), and circuit 40 lead (12) on power wiring harness (4) from connectors on main wiring harness (5).

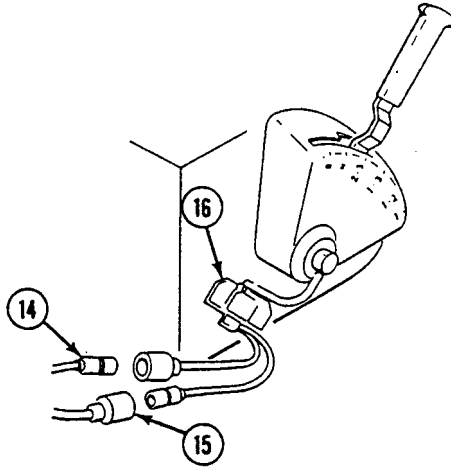
NOTE

Do Step 4 only if air brake kit is installed.

4. Disconnect circuit 40 lead (13) from air brake kit instrument panel light.



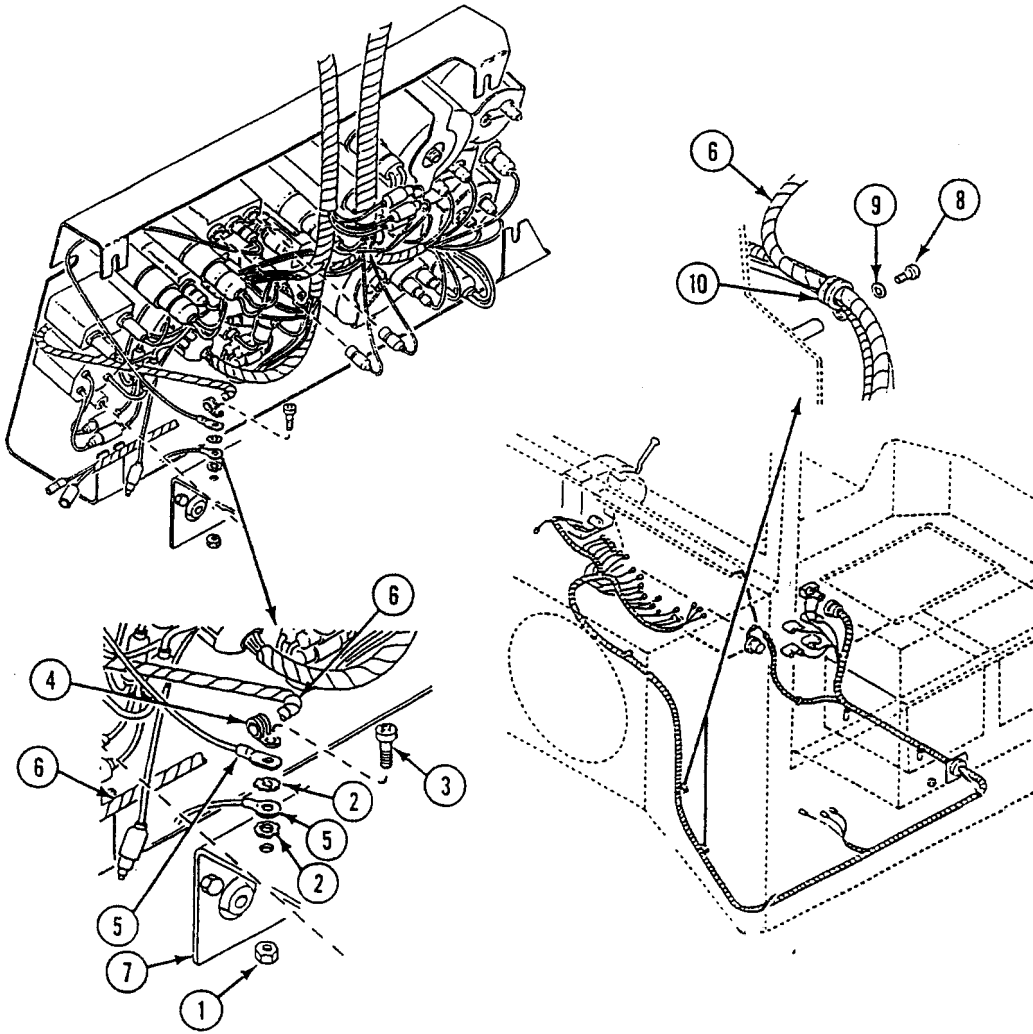
5. Disconnect circuit 74 lead (14) and circuit 74A lead (15) from neutral start switch (16).



REPLACE POWER WIRING HARNESS (M548A1) — Continued

0020 00

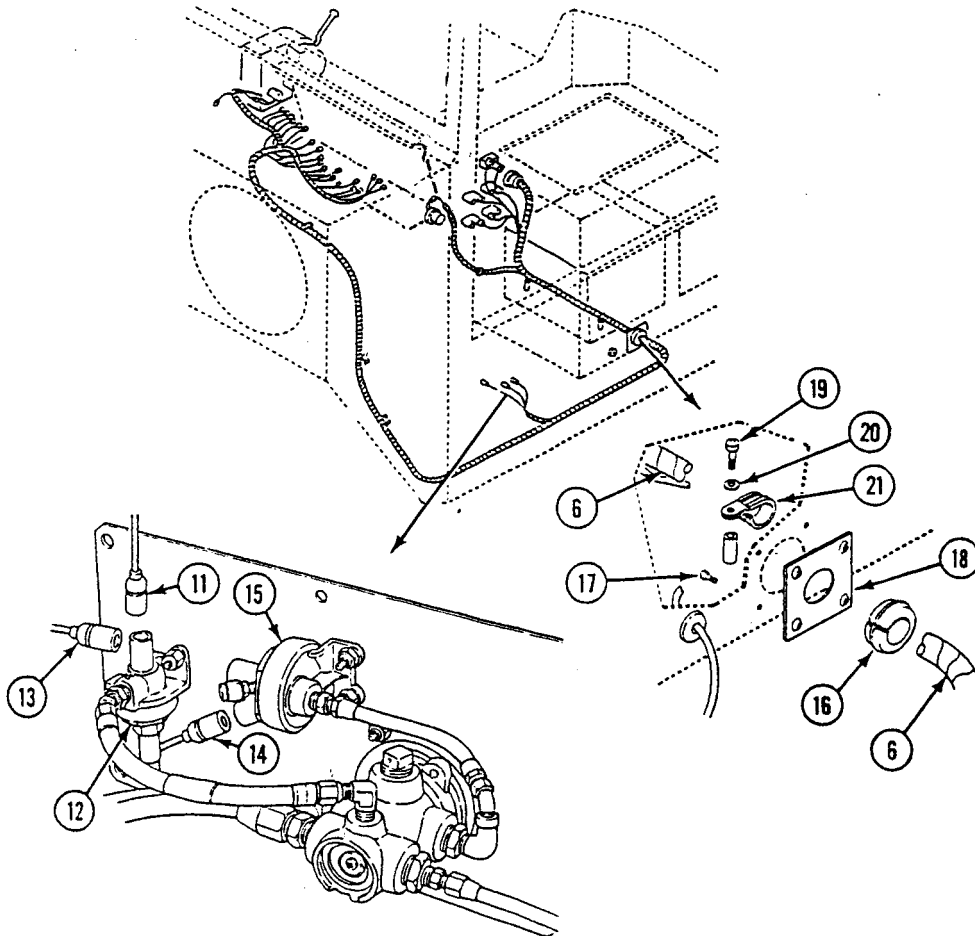
6. Remove nut (1), two lock washers (2), screw (3), clamp (4), two leads (5), and power wiring harness (6) from instrument panel bracket (7). Discard lock washers.
7. Remove three screws (8), lock washers (9) and clamps (10) securing power wiring harness (6) to bulkhead. Discard lock washers.



NOTE

Do Step 8 only if air brake is installed.

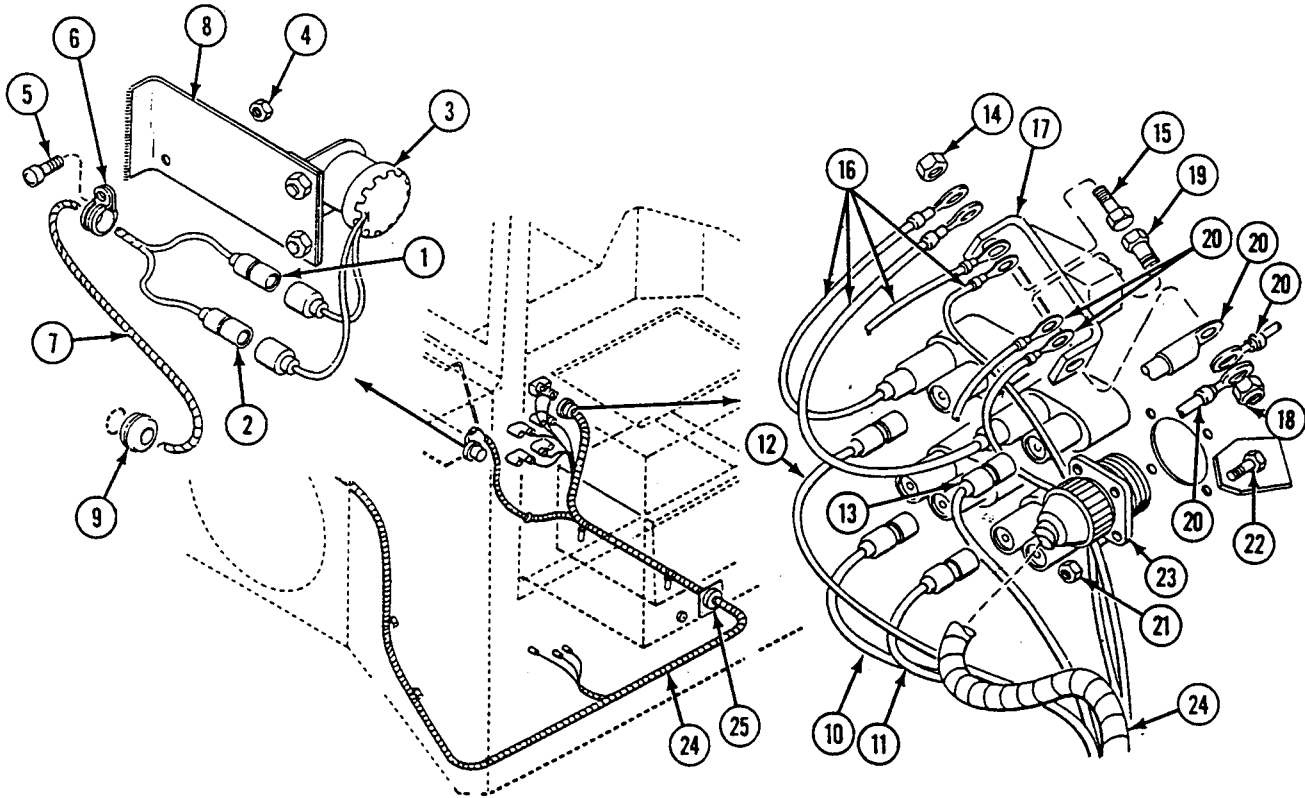
8. Disconnect circuit 1B lead (11) from air low pressure switch (12), and circuit 75 lead (13) and circuit 75A lead (14) from stoplight switch (15) on treadle valve assembly.
9. Remove grommet (16), four screws (17), and bulkhead cover (18) from battery compartment bulkhead. Discard grommet.
10. Remove two screws (19), lock washers (20), and clamps (21) securing power wiring harness (6) to battery compartment floor. Discard lock washers.



REPLACE POWER WIRING HARNESS (M548A1) — Continued

0020 00

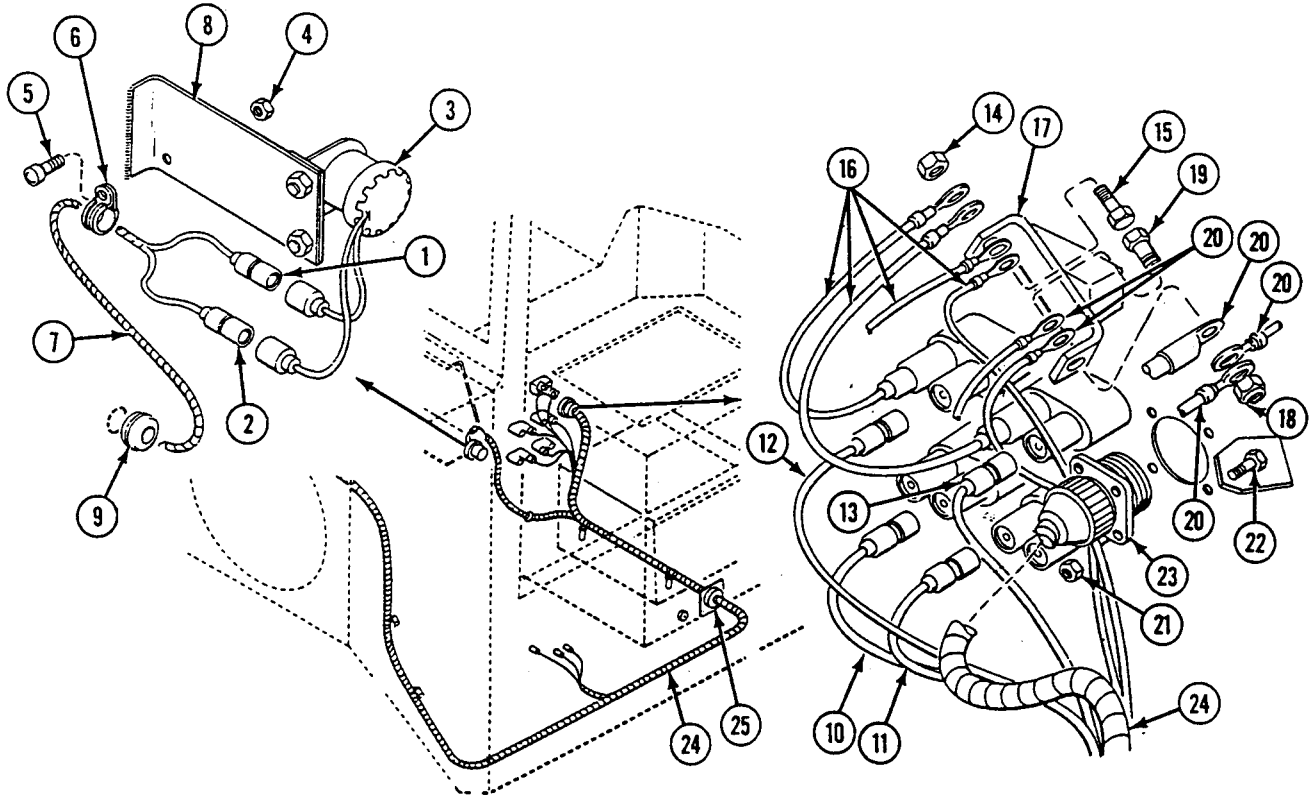
11. Disconnect circuit 75 lead (1) and circuit 75A lead (2) from stoplight switch (3).
12. Remove nut (4), screw (5), clamp (6), and lead (7) from bracket (8).
13. Remove grommet (9) securing lead (7) to bulkhead and pull lead through bulkhead. Discard grommet.
14. Disconnect circuit 77 lead (10), circuit 78 lead (11), circuit 450 lead (12), and circuit 450B (13) from circuit breakers.



REPLACE POWER WIRING HARNESS (M548A1) — Continued

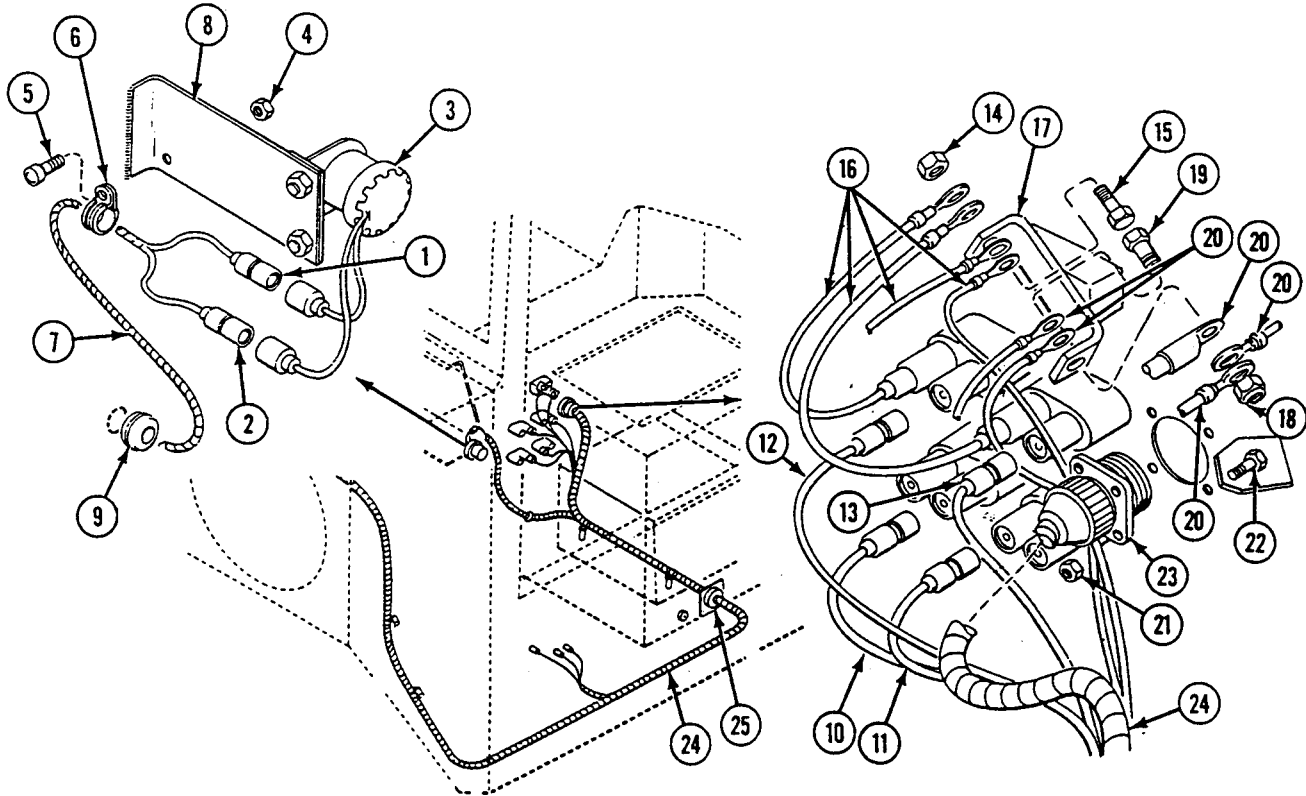
0020 00

15. Remove lock nut (14), screw (15), and four leads (16) from bus bar (17). Discard lock nut.
16. Remove lock nut (18), screw (19), and five leads (20) from bus bar (17). Discard lock nut.
17. Remove four nuts (21), screws (22), and receptacle (23) from bulkhead.
18. Pull power wiring harness (24) and bulkhead cover (25) from battery compartment into cab and remove wiring harness.



INSTALLATION

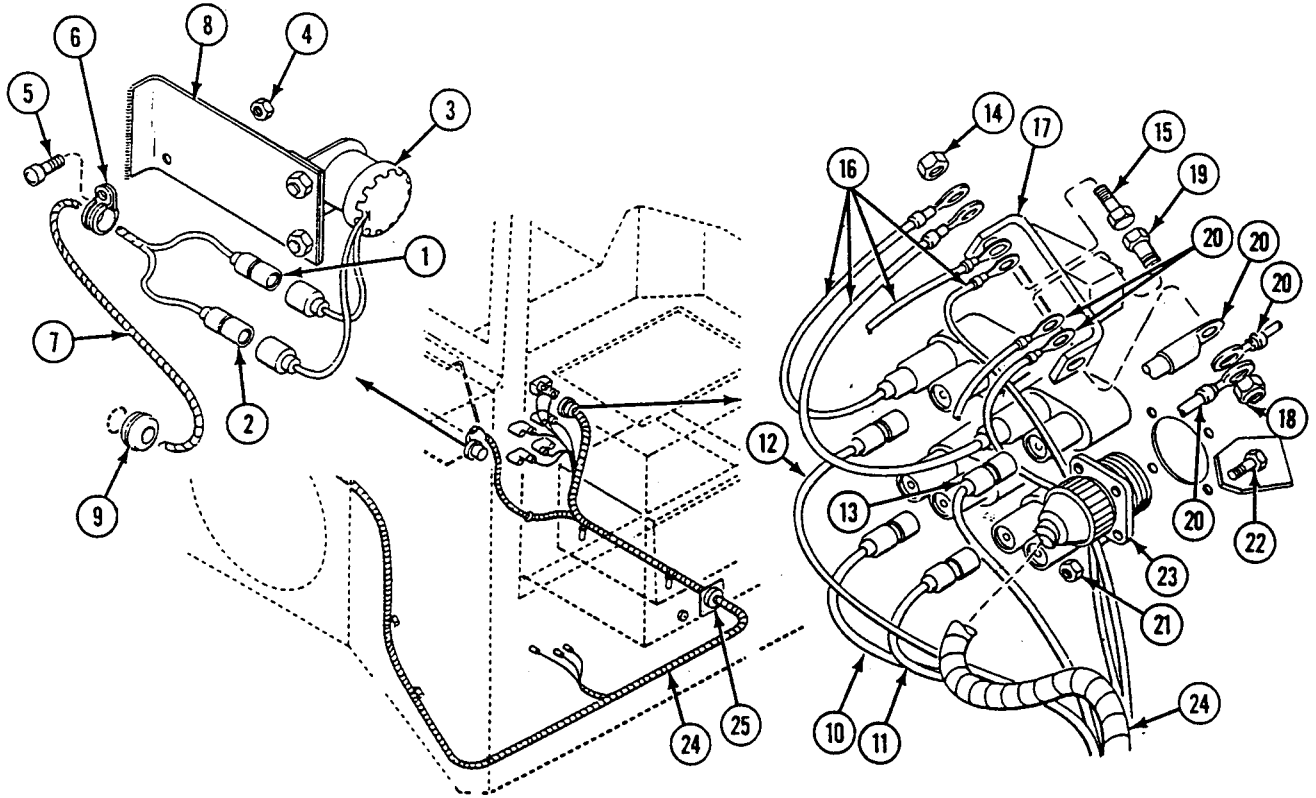
1. Position power wiring harness (24) in carrier and thread bus bar end of harness through bulkhead cover (25) and opening for bulkhead cover into battery compartment under battery frame.
2. Install receptacle (23), four screws (22), and nuts (21) on bulkhead.
3. Install five leads (20), screw (19), and new lock nut (18) on bus bar (17).
4. Install four leads (16), screw (15), and new lock nut (14) on bus bar (17).



REPLACE POWER WIRING HARNESS (M548A1) — Continued

0020 00

5. Connect circuit 77 lead (10), circuit 78 lead (11), circuit 450 lead (12), and circuit 450B (13) to circuit breakers.
6. Thread lead (7) through bulkhead and install new grommet (9) on lead (7) and bulkhead.
7. Install lead (7), clamp (6), screw (5), and nut (4) on bracket (8).
8. Connect circuit 75A lead (2) and circuit 75 lead (1) to stoplight switch (3).

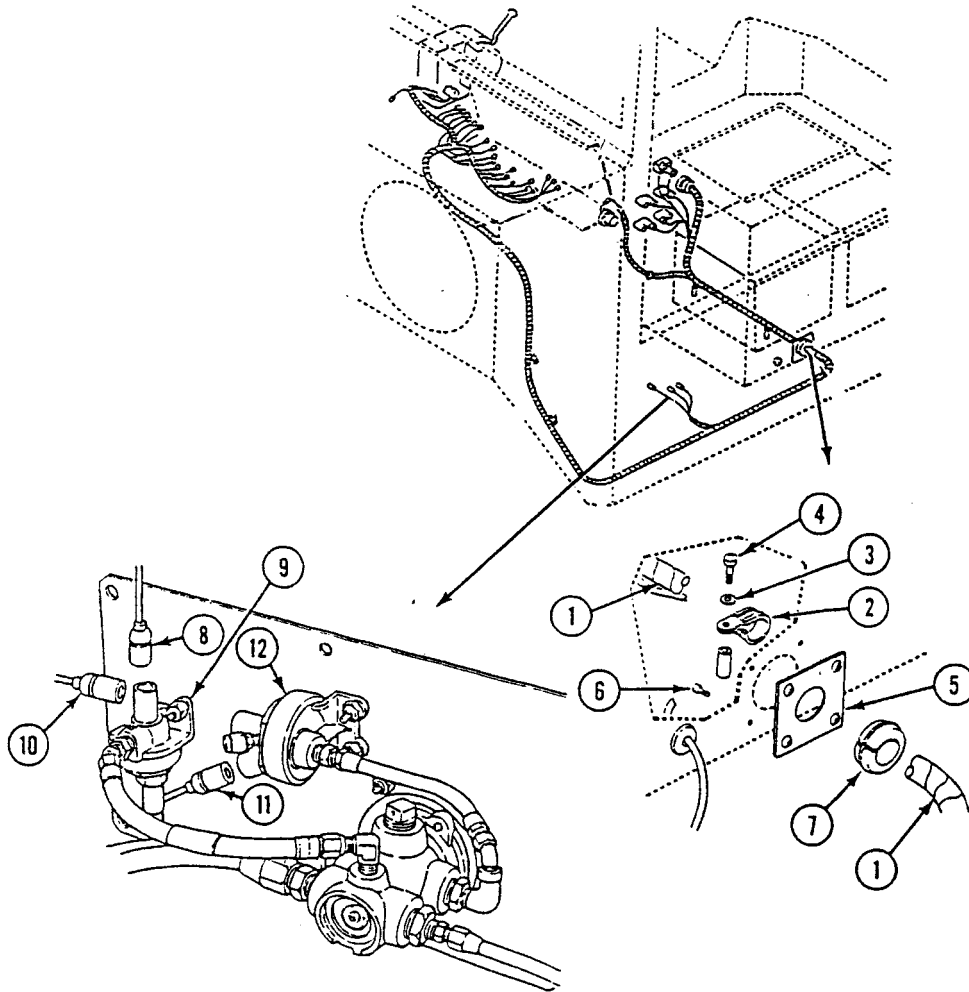


9. Install power wiring harness (1), two clamps (2), new lock washers (3), and screws (4) to battery compartment floor.
10. Install bulkhead cover (5) and four screws (6) on battery compartment bulkhead.
11. Install new grommet (7) on bulkhead cover (5).

NOTE

Do Step 12 only if air brake is installed.

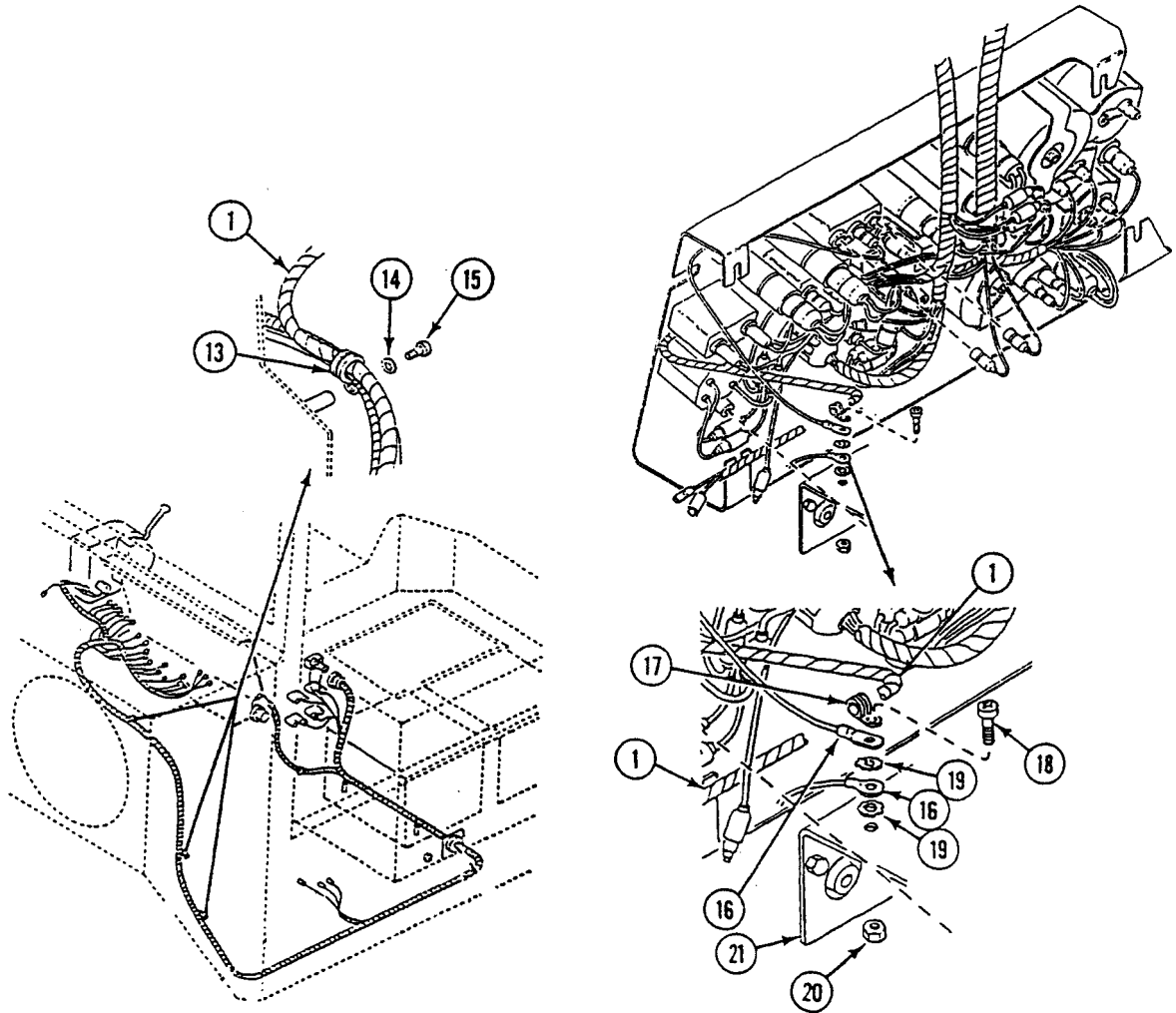
12. Connect circuit 1B lead (8) to air low pressure switch (9), and circuit 75 lead (10) and circuit 75A lead (11) to stoplight switch (12) on treadle valve assembly.



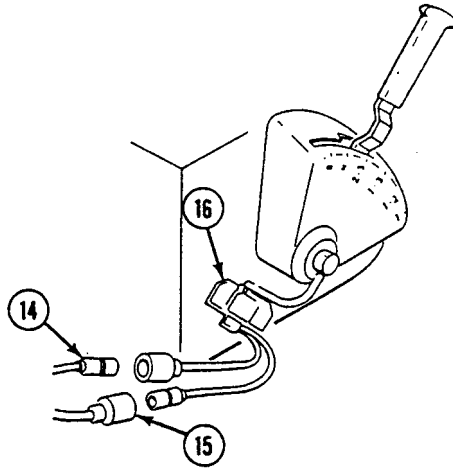
REPLACE POWER WIRING HARNESS (M548A1) — Continued

0020 00

13. Install three clamps (13), new lock washers (14), and screws (15) to secure power wiring harness (1) to bulkhead.
14. Install power wiring harness (1), two leads (16), clamp (17), screw (18), two new lock washers (19), and nut (20) to instrument panel bracket (21).



15. Connect circuit 74 lead (14) and circuit 74A lead (15) to neutral start switch (16).

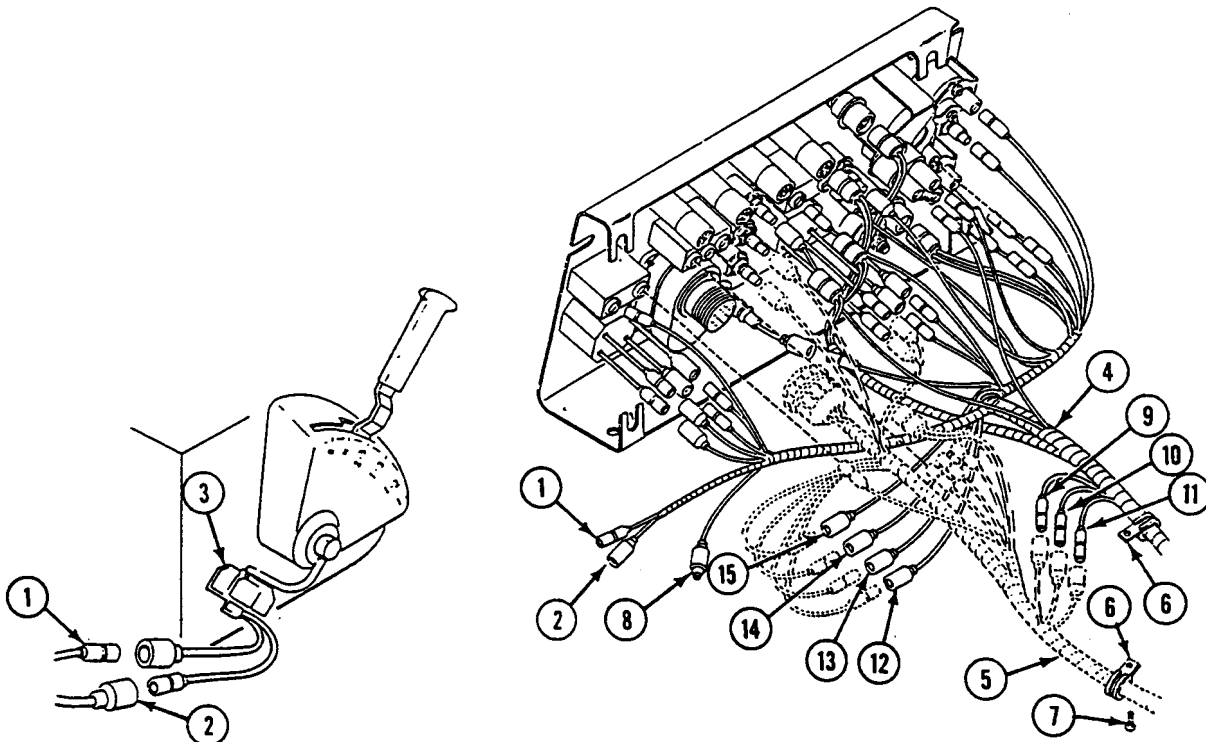


16. Install wiring harness (4) and wiring harness (5), two clamps (6), and screw (7) to hull.

NOTE

Do Step 17 only if air brake kit is installed.

17. Connect circuit 40 lead (8) to air brake kit instrument panel light.
18. Connect power wiring harness (4) to main wiring harness (5).
- a. Connect circuit 28 lead (9), circuit 25 lead (10), circuit 27-38 lead (11), circuit 15 lead (12), circuit 75 lead (13), circuit 75A lead (14), circuit 40 lead (15) on power wiring harness (4) to connectors on main wiring harness (5).



REPLACE POWER WIRING HARNESS (M548A1) — Continued

0020 00

19. Connect power wiring harness to instrument panel (WP 0019 00).

FOLLOW-THROUGH STEPS

1. Install batteries (see your -20).
2. Install cab left floor plate (see your -20).
3. Lower cab personnel center seat and driver's seat (see your -10).

END OF TASK

REPLACE INSTRUMENT PANEL WIRING HARNESS (M548A3)

0021 00

THIS WORK PACKAGE COVERS:

Removal (page 0021 00-2).
 Installation (page 0021 00-5).

INITIAL SETUP:

Maintenance Level

Direct Support

References

See your -10
 See your -20

Tools and Special Tools

Automotive Fuel and Electrical System Repair Tool Kit
 (WP 0078 00, Item 64)

Equipment Condition

Engine stopped (see your -10)
 Carrier blocked (see your -10)
 Master switch off
 Cab personnel center seat and driver's seat raised
 (see your -10)
 Both battery negative leads disconnected (see your -20)
 Batteries removed from left side of carrier (see your -20)
 Cab left floor plate removed (see your -20)
 Instrument panel removed (WP 0019 00)

Materials/Parts

Grommet
 Lock nut
 Lock nut (4)
 Lock washer (5)

Personnel Required

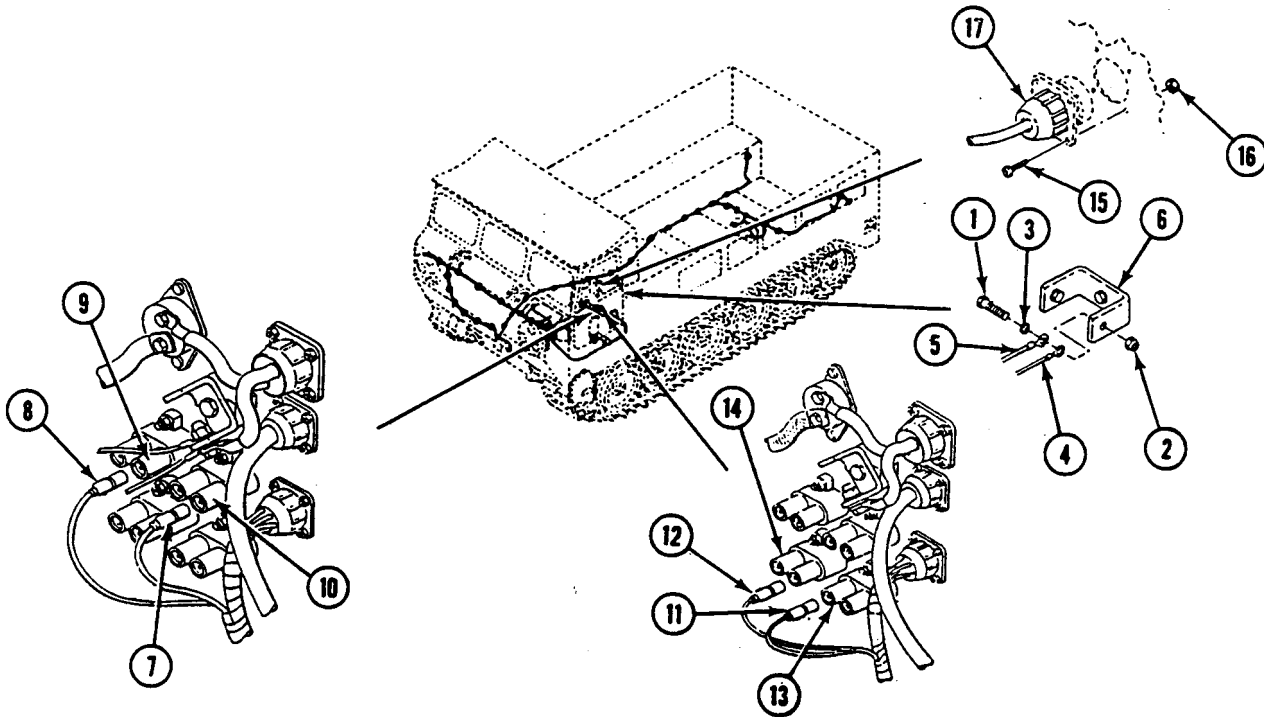
Fuel and Elec Sys Rep 63G

REMOVAL

NOTE

Tag all leads and connectors to assist in installation.

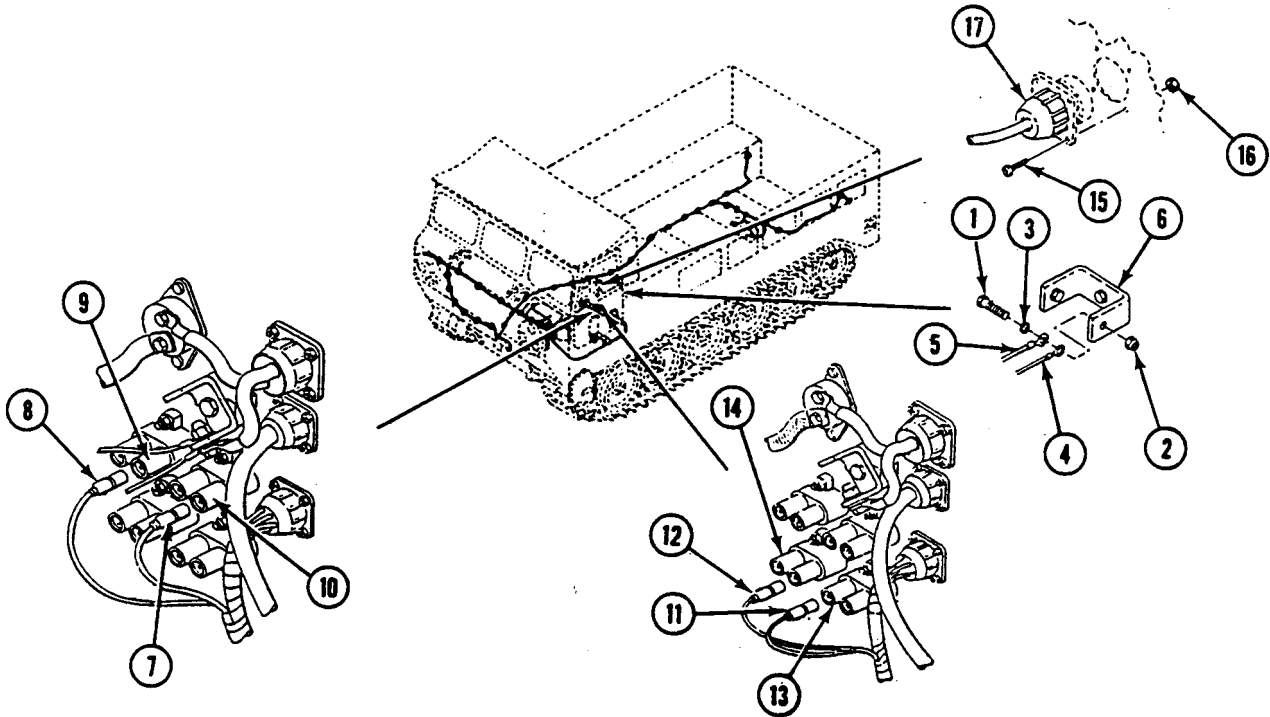
1. Remove screw (1), lock nut (2), washer (3), and circuit 10 lead (4) and circuit 76 lead (5) from bus bar (6) in battery box. Discard lock nut.
2. Disconnect circuit 450B (7) and circuit 450 (8) leads from front bilge pump circuit breaker (9) and rear bilge pump circuit breaker (10).



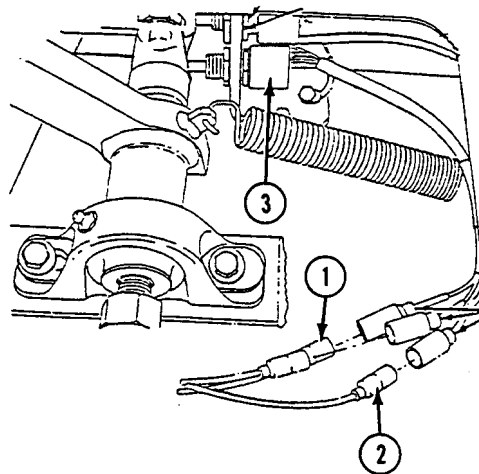
REPLACE INSTRUMENT PANEL WIRING HARNESS (M548A3) — Continued

0021 00

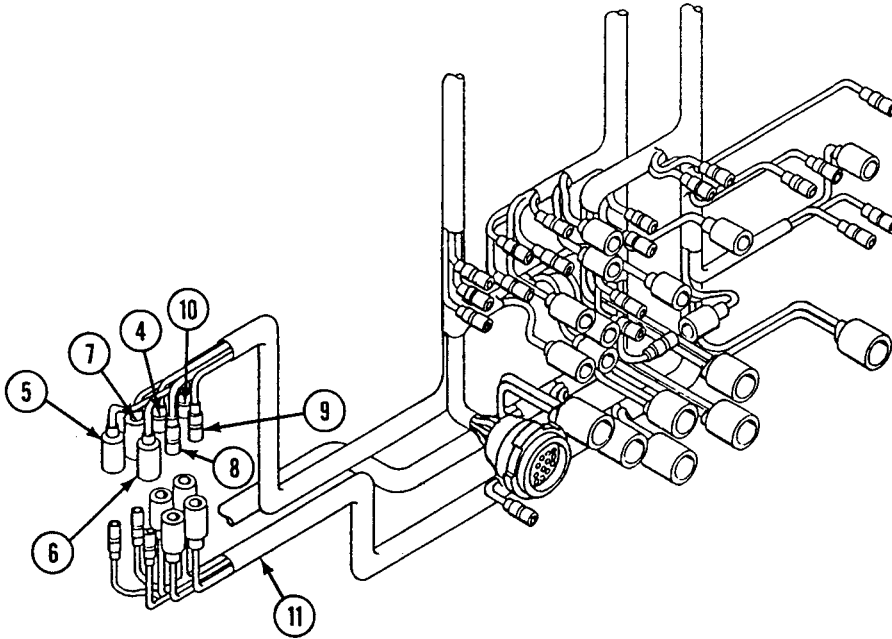
3. Disconnect circuit 77 (11) and circuit 78 (12) leads from left fuel pump circuit breaker (13) and right fuel pump circuit breaker (14).
4. Remove four screws (15), lock nuts (16) and wiring harness connector (17) from battery box bulkhead. Discard lock nuts.



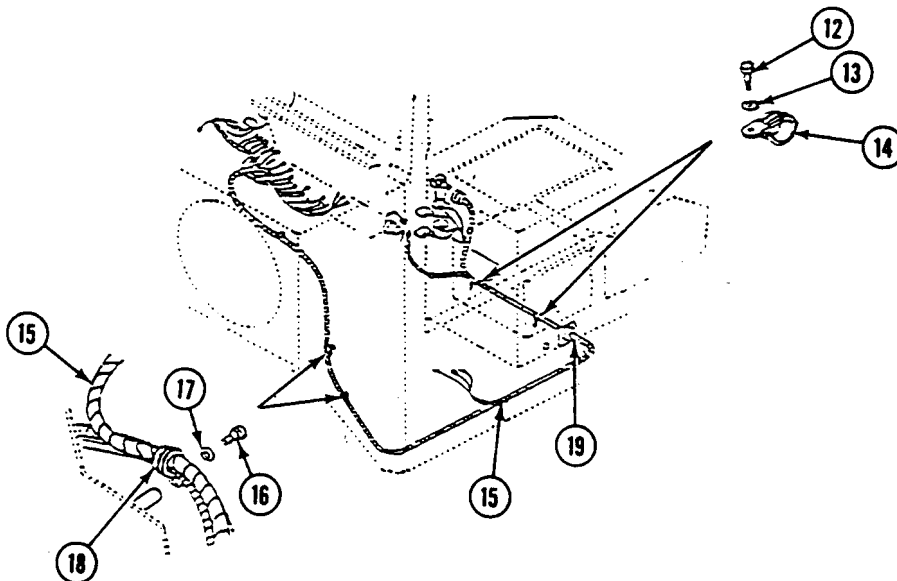
5. Disconnect circuit 75 (1) and circuit 75A (2) leads from stop light switch (3).



6. Disconnect seven circuit leads 75A (4), 15 (5), 75 (6), 40 (7), 27-38 (8), 25 (9), and 28 (10) from circuit leads on main wiring harness (11).



7. Remove three screws (12), lock washers (13) and clamps (14) from wiring harness (15) and bulkhead. Discard lock washers.
8. Remove two screws (16), lock washers (17), and clamps (18) from wiring harness (15) and battery compartment floor. Discard lock washers.
9. Remove grommet (19) securing wiring harness (15) to bulkhead. Discard grommet.
10. Pull wiring harness (15) into cab and remove from carrier.

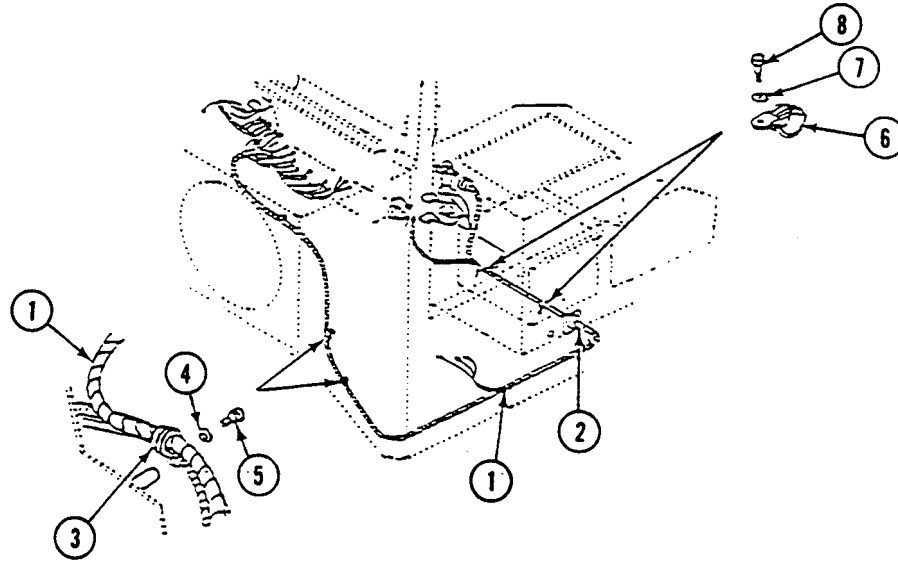


INSTALLATION

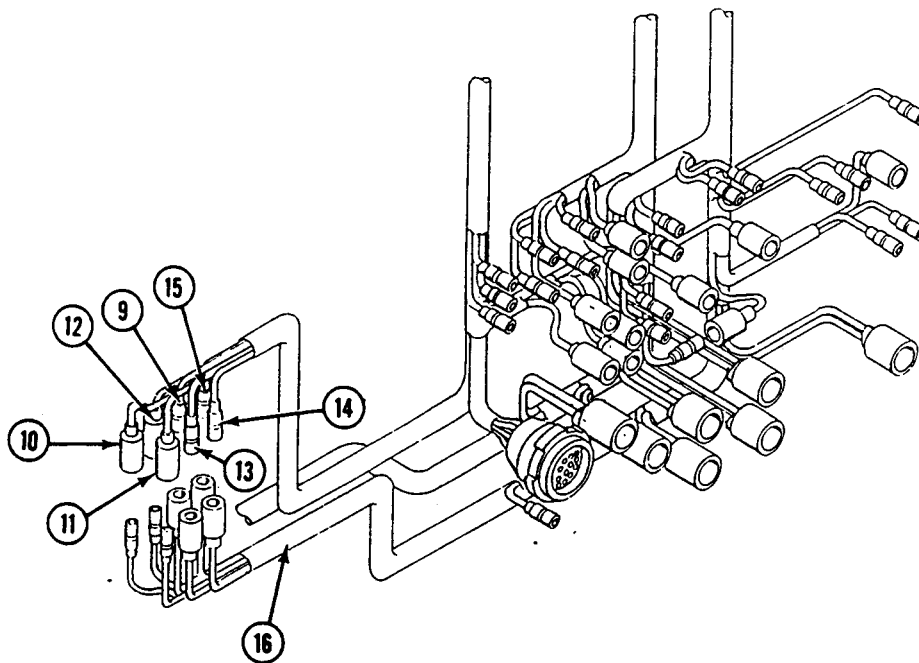
NOTE

Use tags on leads to install them properly.

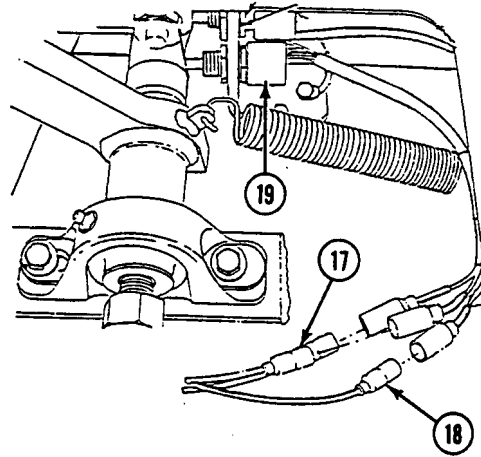
1. Position wiring harness (1) in carrier cab and thread leads through battery box.
2. Place new grommet (2) on wiring harness (1) and install in bulkhead.
3. Install two clamps (3) on wiring harness (1) and secure to battery box floor with two new lock washers (4) and screws (5).
4. Install three clamps (6) on wiring harness (1) and secure to bulkhead with three new lock washers (7) and screws (8).



5. Connect seven circuit leads 75A (9), 15 (10), 75 (11), 40 (12), 27-38 (13), 25 (14), and 28 (15) on main wiring harness (16).



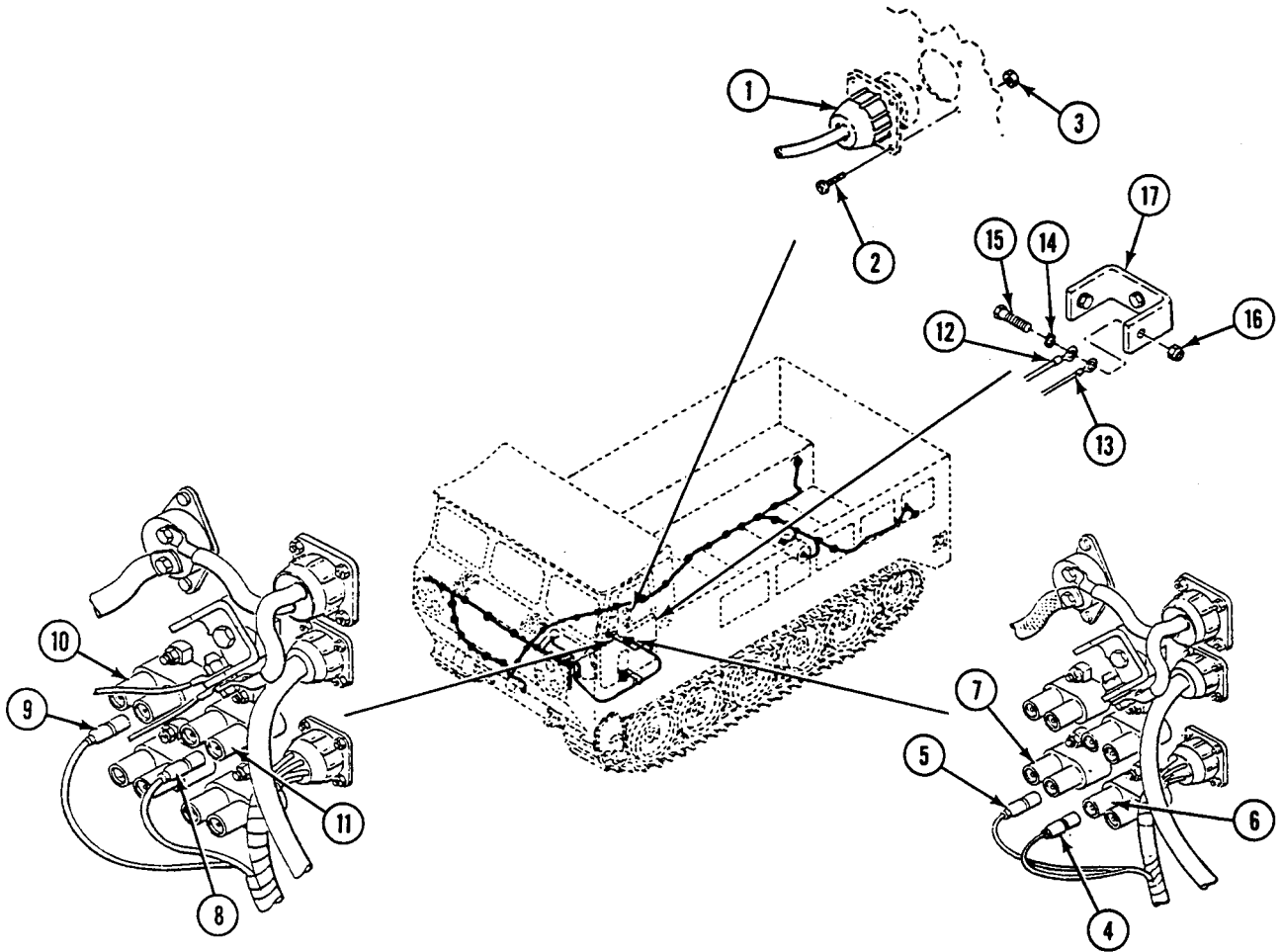
6. Connect circuit 75 (17), and circuit 75A (18) to stop light switch (19).



REPLACE INSTRUMENT PANEL WIRING HARNESS (M548A3) — Continued

0021 00

7. Install wiring harness connector (1), four screws (2) and new lock nuts (3) on battery box bulkhead.
8. Connect circuit 77 (4) and circuit 78 (5) leads on left fuel pump circuit breaker (6) and right fuel pump circuit breaker (7).
9. Connect circuit 450B (8) and circuit 450 (9) leads to front bilge pump circuit breaker (10) and rear bilge pump circuit breaker (11).
10. Install circuit 76 (12) and circuit 10 (13) leads, washer (14), screw (15) and new lock nut (16) on bus bar (17) in battery box.



FOLLOW-THROUGH STEPS

1. Install instrument panel (WP 0019 00).
2. Install cab left floor plate (see your -20).
3. Install left side carrier batteries (see your -20).
4. Connect both battery negative leads (see your -20).
5. Lower cab personnel center seat and driver's seat (see your -10).

END OF TASK

REPLACE TRANSMISSION SHIFT TOWER WIRING HARNESS (M548A3)

0022 00

THIS WORK PACKAGE COVERS:

Removal (page 0022 00-2).
 Installation (page 0022 00-5).

INITIAL SETUP:

Maintenance Level

Direct Support

References

See your -10
 See your -20

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)

Equipment Condition

Engine stopped (see your -10)
 Carrier blocked (see your -10)
 Master switch off
 Cab personnel center seat and driver's seat raised
 (see your -10)
 Both battery negative leads disconnected (see your -20)
 Front left side battery removed (see your -20)
 Cab left floor plate removed (see your -20)
 Instrument panel partially removed (see your -20)

Materials/Parts

Lock washer

Personnel Required

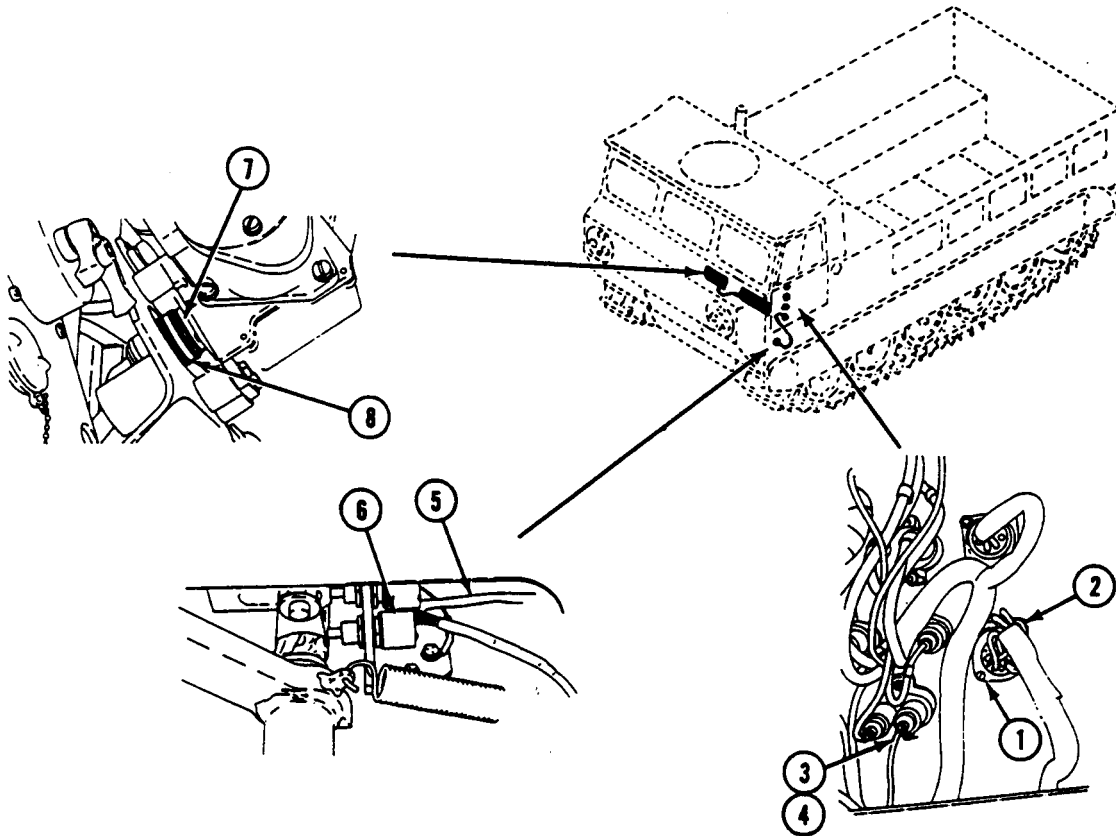
Track Vehicle Repairer 63H

REMOVAL

NOTE

Tag all leads and connectors to assist in installation.

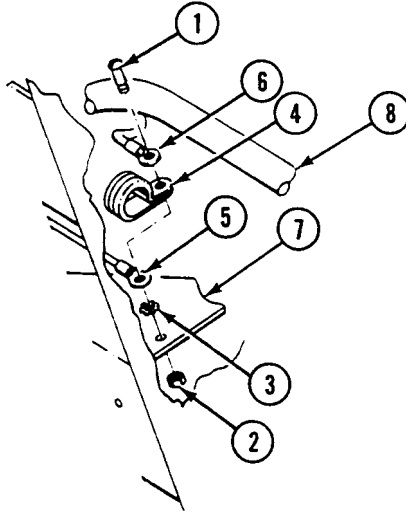
1. Disconnect wiring harness connector P2 (1) from bulkhead receptacle (2) inside left battery box.
2. Disconnect circuit 10 lead (3) from circuit breaker (4).
3. Disconnect circuit 11 lead (5) from parking break switch (6).
4. Disconnect wiring harness connector P1 (7) from transmission shift tower receptacle (8).



REPLACE TRANSMISSION SHIFT TOWER WIRING HARNESS (M548A3) — Continued

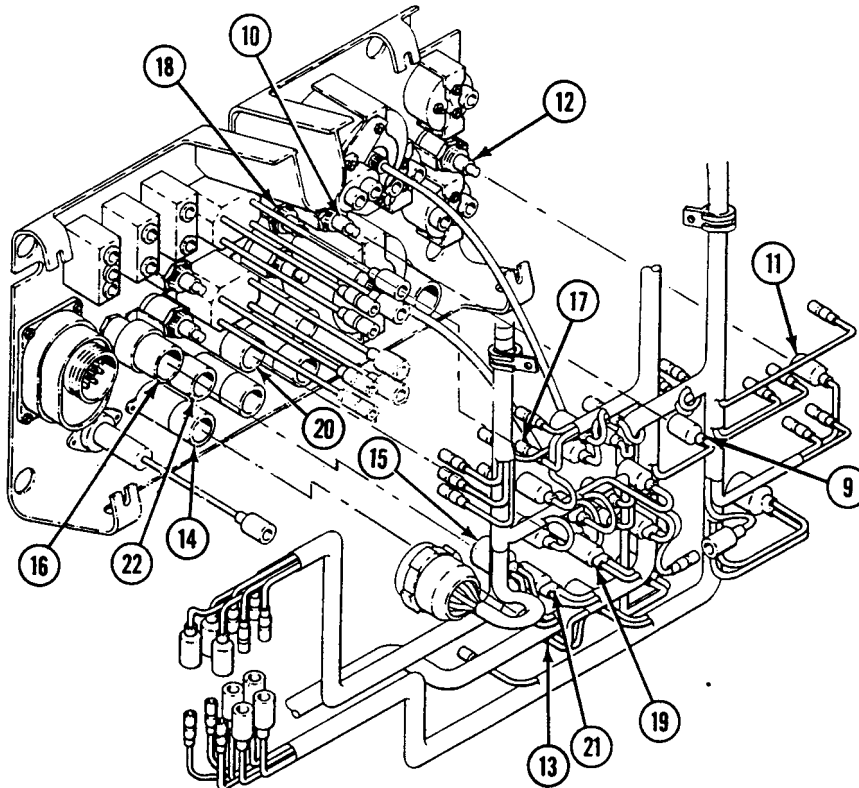
0022 00

5. Remove screw (1), nut (2), lock washer (3), loop clamps (4), and lug terminal (5) and lug terminal (6) from top of bracket (7) and wiring harness (8). Discard lock washer.



6. Remove the following wiring harness leads from components on the instrument panel as follows:

| Disconnect Circuit | From Component |
|--------------------|---|
| 40A (9) | Panel light (10) |
| 40B (11) | Panel light (12) |
| 10A/11 (13) | Hand brake light (14) |
| 14/14A (15) | Start switch (16) |
| 14A (17) | Fuel pump switch (18) |
| 10B/366 (19) | Transmission low oil pressure light (20) |
| 10C/323 (21) | Transmission oil high pressure light (22) |



7. Pull wiring harness into cab compartment, and remove wiring harness from carrier.

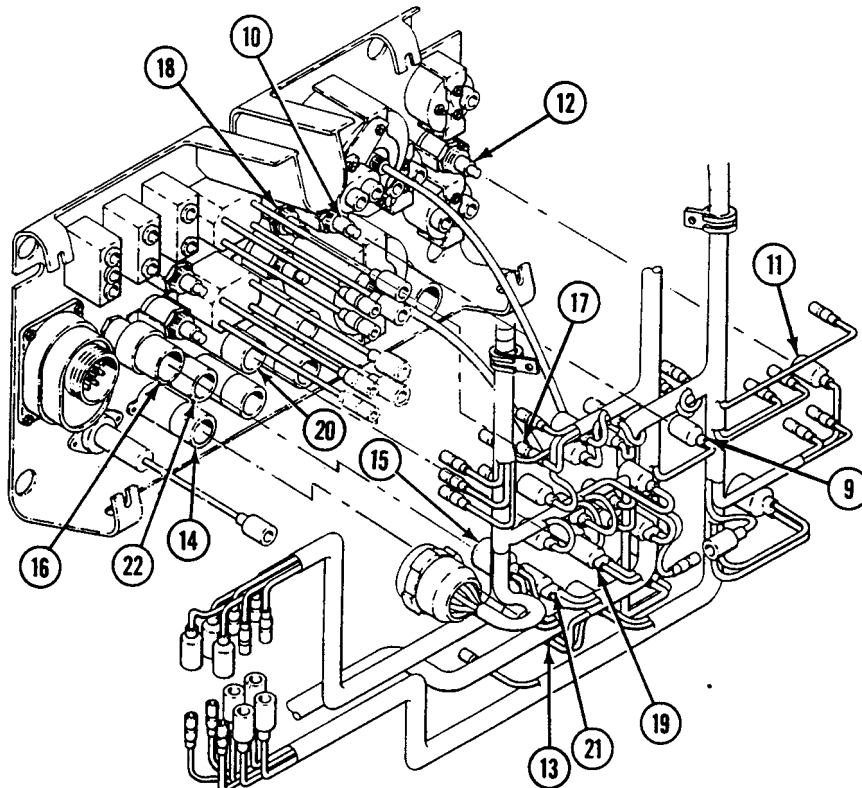
INSTALLATION

NOTE

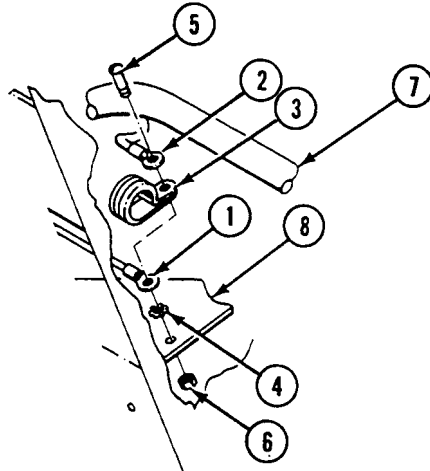
Use tags on leads to install them properly.

1. Position wiring harness in carrier cab and thread leads through battery box and cab.
2. Connect wiring harness circuit leads to components on the instrument panel as follows:

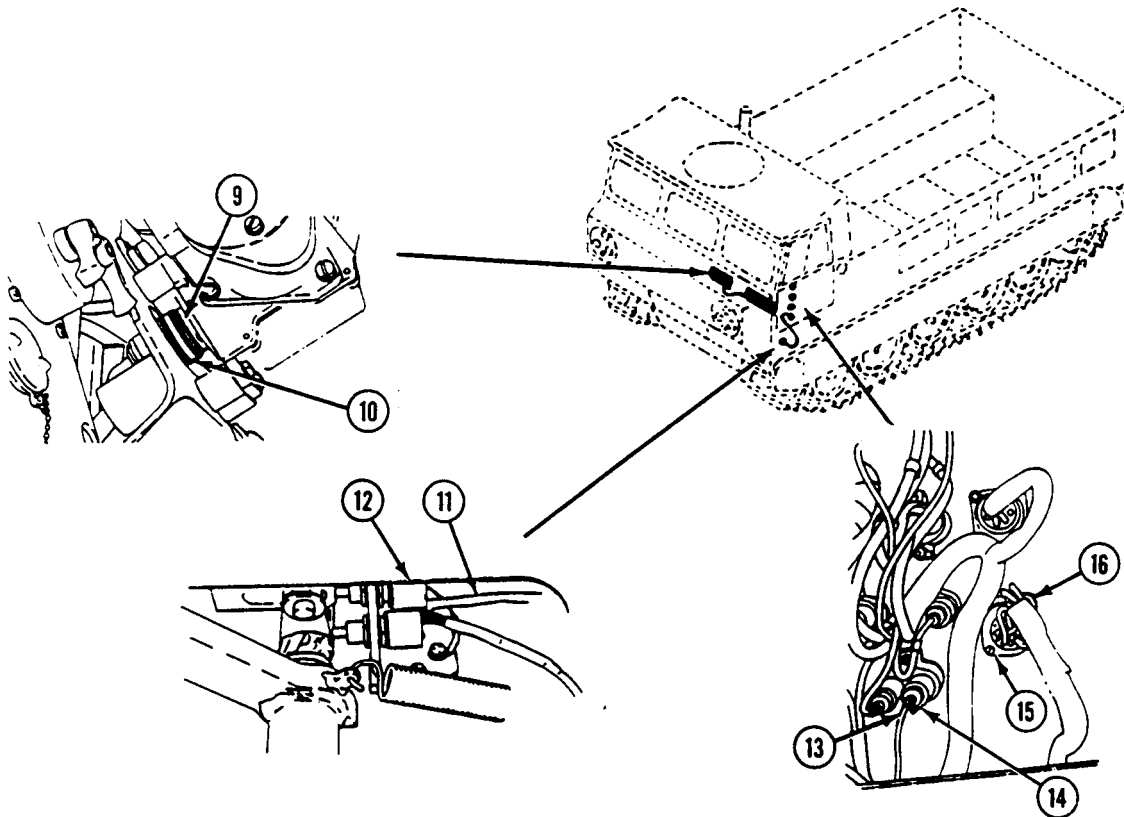
| Connect Circuit | To Component |
|-----------------|---|
| 40A (9) | Panel light (10) |
| 40B (11) | Panel light (12) |
| 10A/11 (13) | Hand brake light (14) |
| 14/14A (15) | Start switch (16) |
| 14A (17) | Fuel pump switch (18) |
| 10B/366 (19) | Transmission low oil pressure light (20) |
| 10C/323 (21) | Transmission oil high pressure light (22) |



3. Install lug terminal (1), lug terminal (2), loop clamp (3), new lock washer (4), screw (5), and nut (6) with wiring harness (7) on bracket (8) on instrument panel.



4. Connect wiring harness connector P1 (9) on transmission shift tower receptacle (10).
5. Connect circuit 11 lead (11) on parking brake switch (12).
6. Connect circuit 10 lead (13) on circuit breaker (14).
7. Connect wiring harness connector P2 (15) to bulkhead receptacle (16) inside battery box.



FOLLOW-THROUGH STEPS

1. Install instrument panel (see your -20).
2. Install cab left floor plate (see your -20).
3. Install front left side battery (see your -20)
4. Connect both battery negative leads (see your -20).
5. Lower cab personnel center seat and driver's seat (see your -10).

END OF TASK

REPLACE FUEL PUMP WIRING HARNESS (M548A1)

0023 00

THIS WORK PACKAGE COVERS:

Removal (page 0023 00-1).
 Installation (page 0023 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)

Materials/Parts

Lock washer (3)

Personnel Required

Track Vehicle Repairer 63H

References

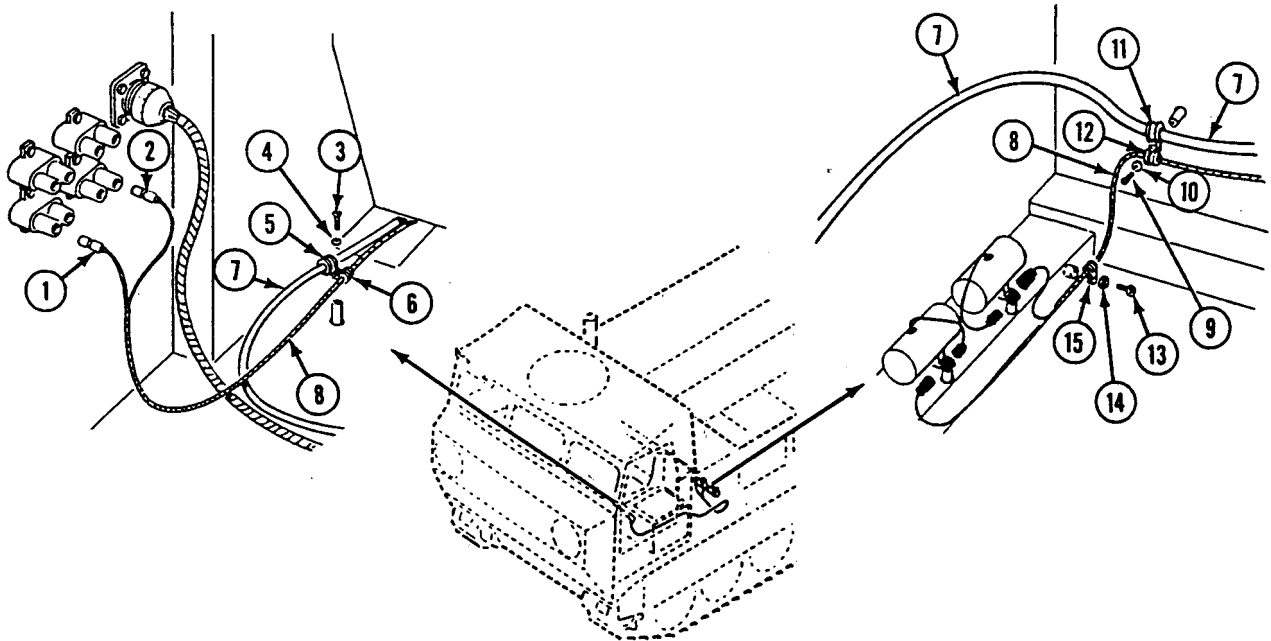
See your -10
 See your -20
 See M548A1 wiring diagram (see your -20, FO-1)

Equipment Condition

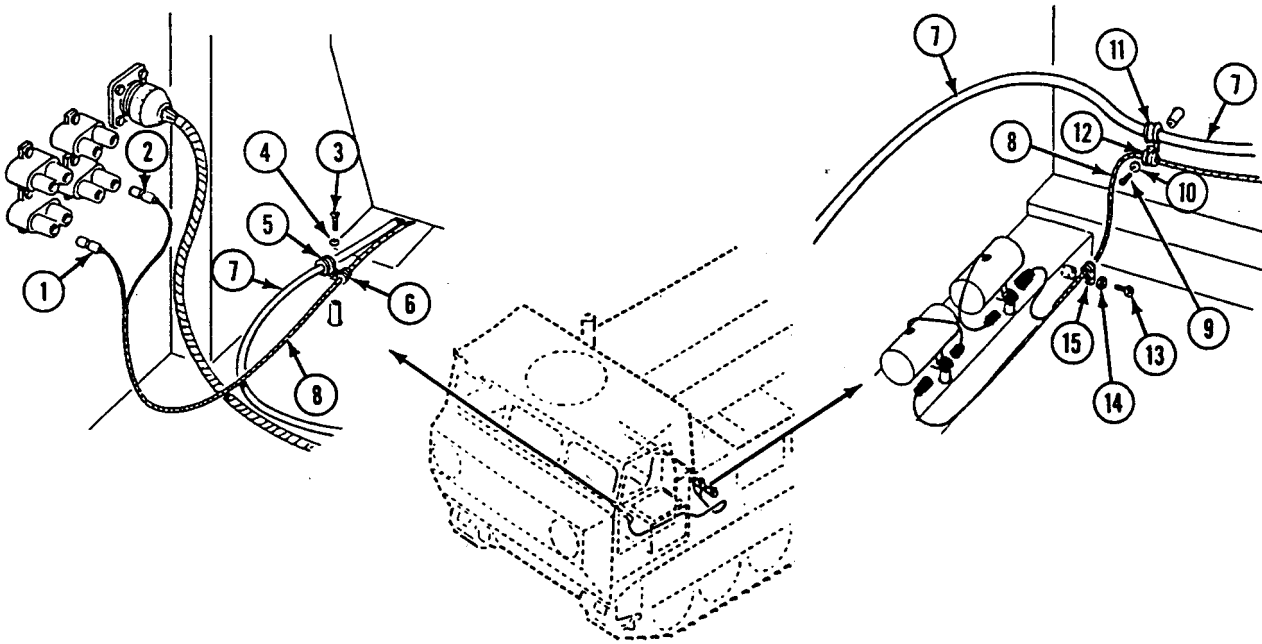
Engine stopped (see your -10)
 Carrier blocked (see your -10)
 Power plant rear access door/cover removed
 (see your -10)
 Batteries removed (see your -20)

REMOVAL

1. Disconnect circuit 77A lead (1) from right fuel pump circuit breaker (see wiring diagram, FO-1, in your -20).
2. Disconnect circuit 78A lead (2) from left fuel pump circuit breaker (see wiring diagram, FO-1, in your -20).
3. Remove clamp screw (3) and lock washer (4) securing flexible shaft clamp (5) and harness clamp (6) to floor in battery compartment and remove flexible shaft (7) harness clamp from harness (8). Discard lock washer.

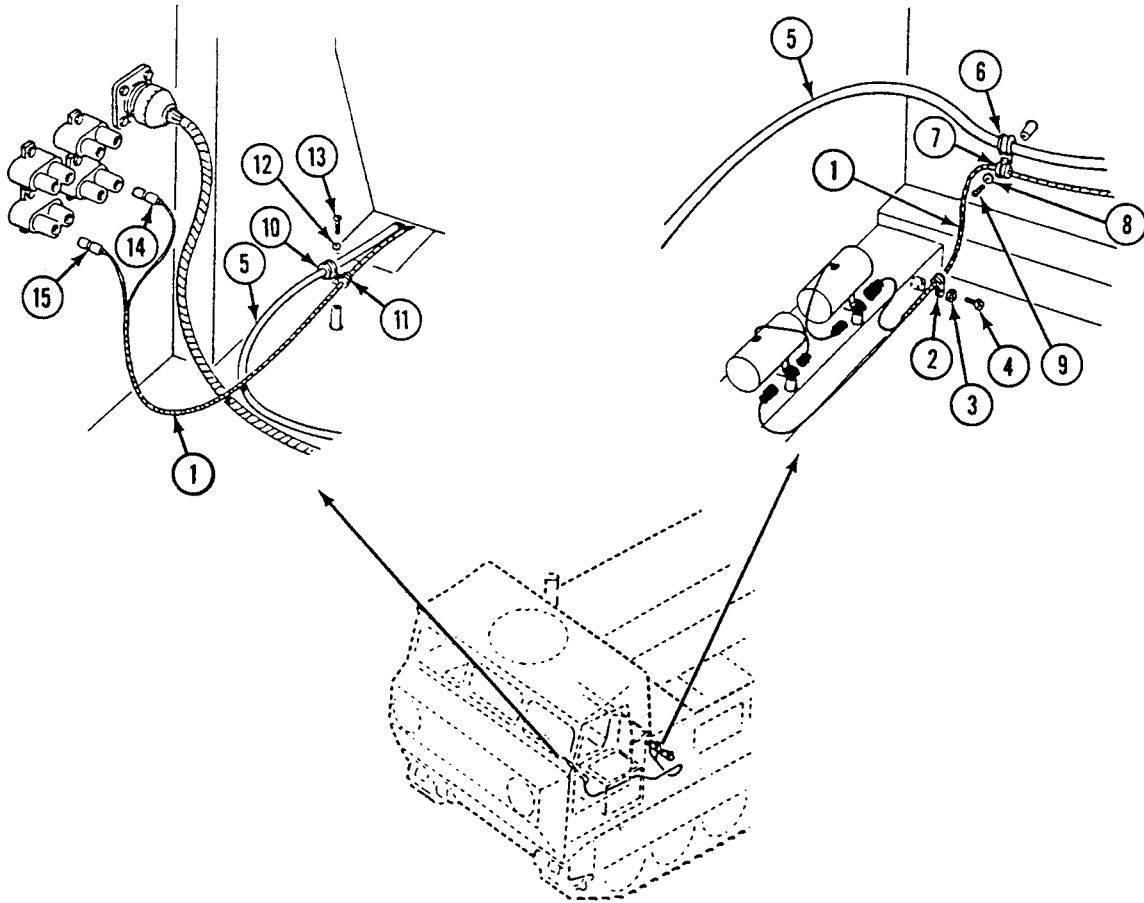


4. Remove bulkhead clamp screw (9) and lock washer (10) securing bulkhead flexible shaft clamp (11) and harness clamp (12) to hull in power plant compartment, and remove clamp from harness. Discard lock washer.
5. Remove support clamp screw (13), lock washer (14), and harness clamp (15) securing harness to floor support in power plant compartment. Discard lock washer.
6. Pull wiring harness into power plant compartment and remove harness.



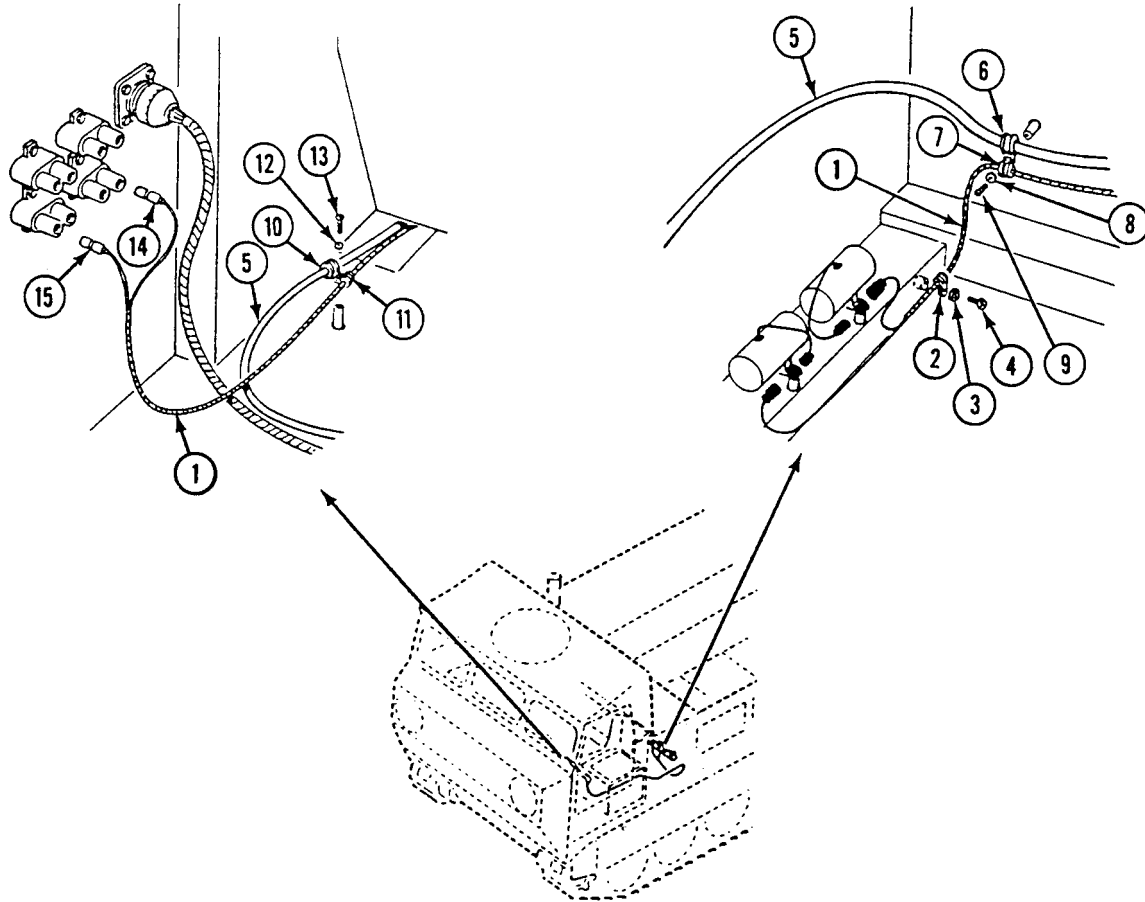
INSTALLATION

1. Position wiring harness (1) on floor support in power plant compartment and secure with support harness clamp (2), new lock washer (3) and screw (4).
2. Position wiring harness (1) and tachometer flexible shaft (5) on bulkhead in power plant compartment and secure with flexible shaft clamp (6), bulkhead harness clamp (7), new lock washer (8) and screw (9).



REPLACE FUEL PUMP WIRING HARNESS (M548A1) — Continued**0023 00**

3. Position wiring harness (1) and tachometer flexible shaft (5) on floor in battery compartment and secure with flexible shaft clamp (10), harness clamp (11), new lock washer (12) and screw (13).
4. Connect circuit 78A lead (14) to left fuel pump circuit breaker (see wiring diagram, FO-1, in your -20).
5. Connect circuit 77A lead (15) to right fuel pump circuit breaker (see wiring diagram, FO-1, in your -20).

**FOLLOW-THROUGH STEPS**

1. Install batteries (see your -20).
2. Install power plant rear access cover/door (see your -10).
3. Start engine (see your -10).
4. Check fuel pumps for proper operation.
5. Stop engine (see your -10).

END OF TASK

REPLACE RADIO RECEPTACLE/HEATER WIRING HARNESS

0024 00

THIS WORK PACKAGE COVERS:

Removal (page 0024 00-2).
 Installation (page 0024 00-7).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

Automotive Fuel and Electrical System Repair Tool Kit
 (WP 0078 00, Item 64)

Materials/Parts

Lock washer (10)
 Grommet

Personnel Required

Fuel and Elec Sys Rep 63G

References

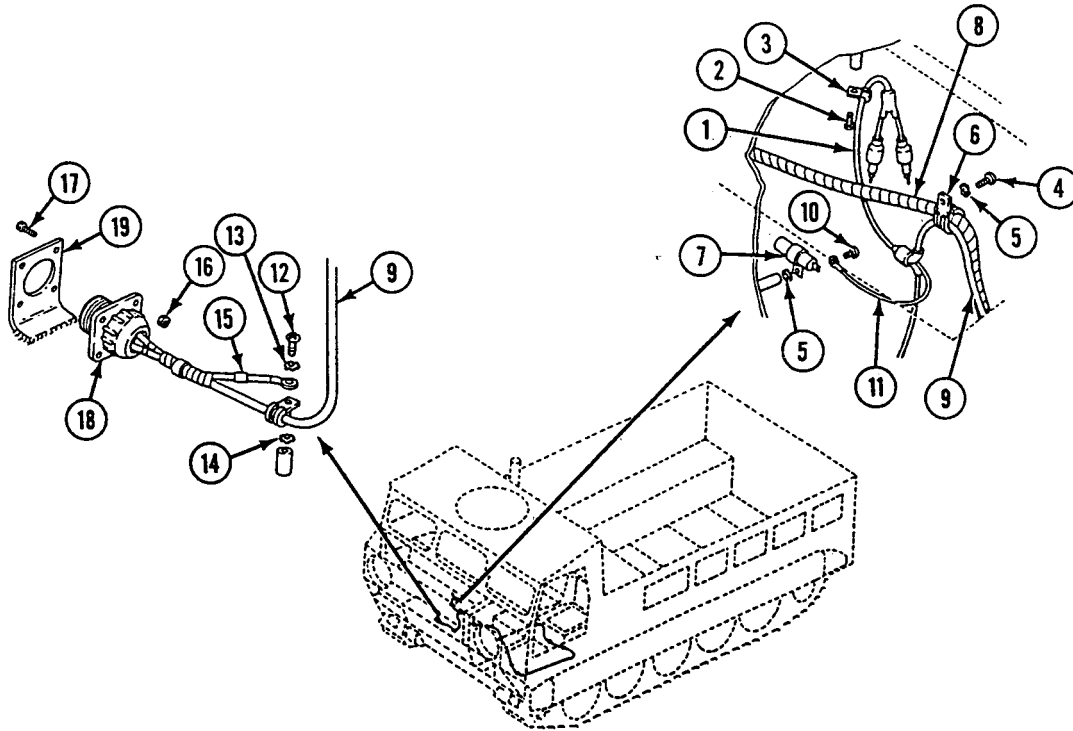
See your -10
 See your -20

Equipment Condition

Engine stopped (see your -10)
 Carrier blocked (see your -10)
 Cab personnel center seat and driver's seat raised
 (see your -10)
 Batteries removed (see your -20)
 Instrument panel removed (WP 0018 00) or
 (WP 0019 00)
 Cab left floor plate removed (see your -20)

REMOVAL

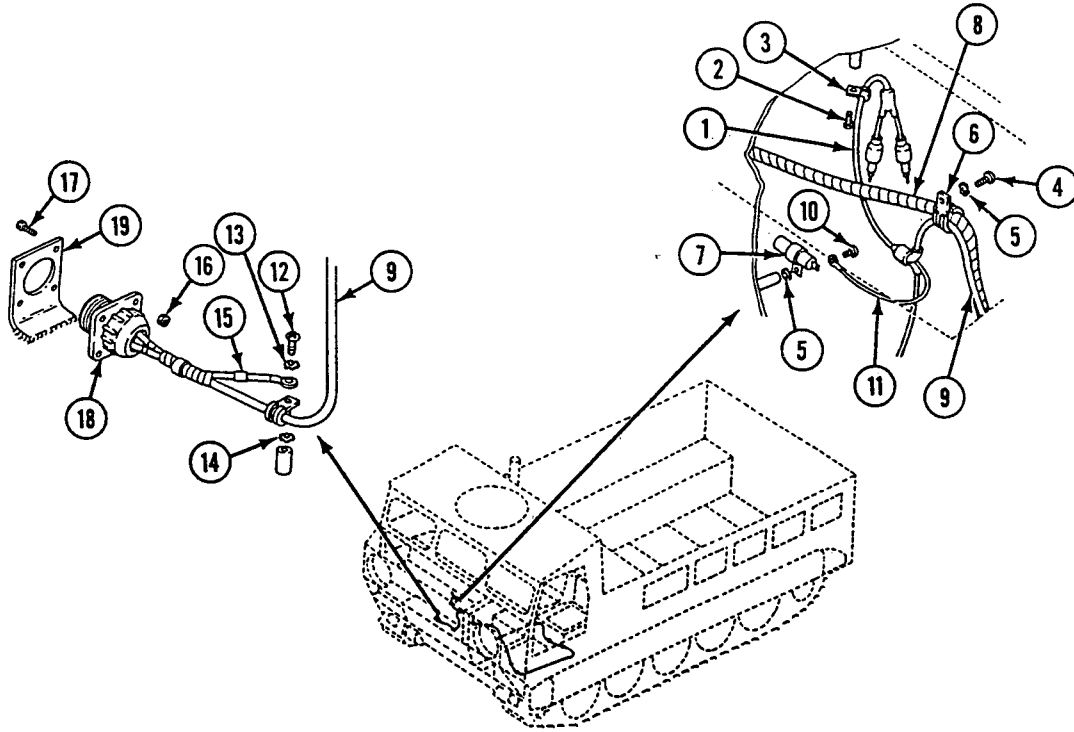
1. If heaters are installed, disconnect circuit 400 and 400A lead (1) from vehicle compartment and engine coolant heater control boxes.
2. Remove circuit 400 clamp screw (2) and clamp (3) securing circuit 400 and 400A lead (1) to hull in cab.
3. Remove capacitor clamp screw (4), two lock washers (5), and clamp (6) securing radio capacitor (7), main wiring harness (8), radio receptacle and heater wiring harness (9), and radio capacitor (7) to hull. Discard lock washers.



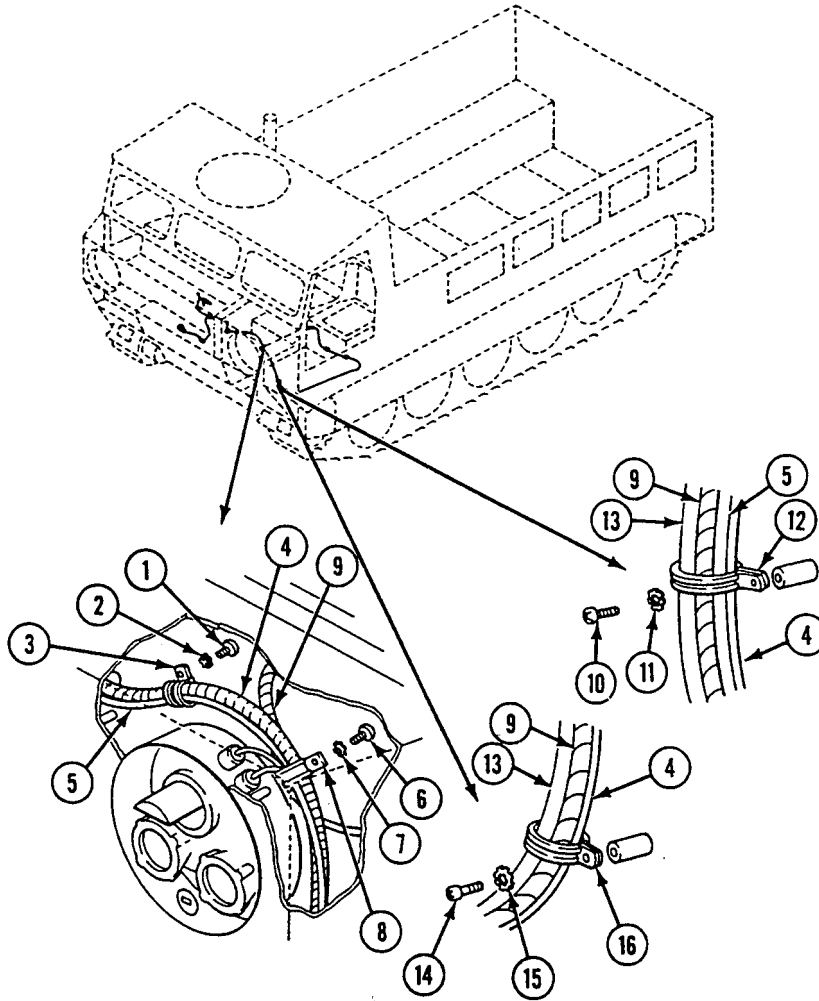
REPLACE RADIO RECEPTACLE/HEATER WIRING HARNESS — Continued

0024 00

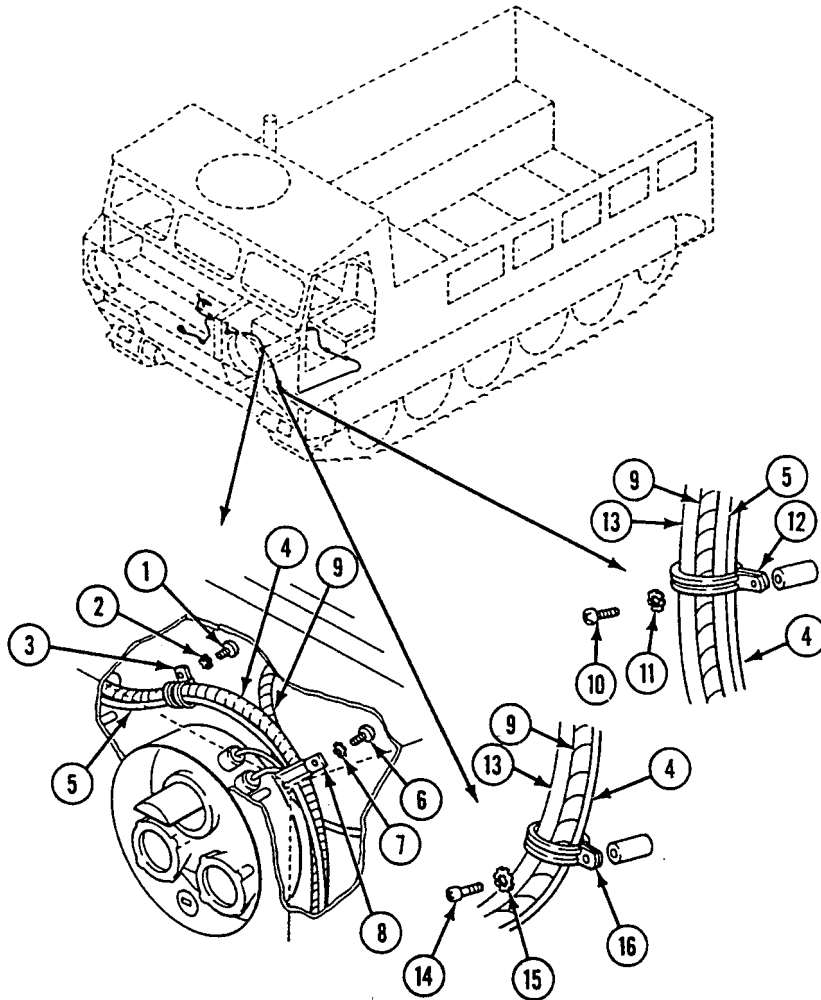
4. Remove capacitor screw (10) securing radio capacitor (7) to capacitor circuit 48 lead (11).
5. Remove ground screw (12) and lock washers (13) and lock washer (14) securing ground lead (15) or heater wiring harness (9) to hull. Discard lock washers.
6. Remove four receptacle nuts (16) and screws (17) securing radio receptacle (18) to receptacle bracket (19).



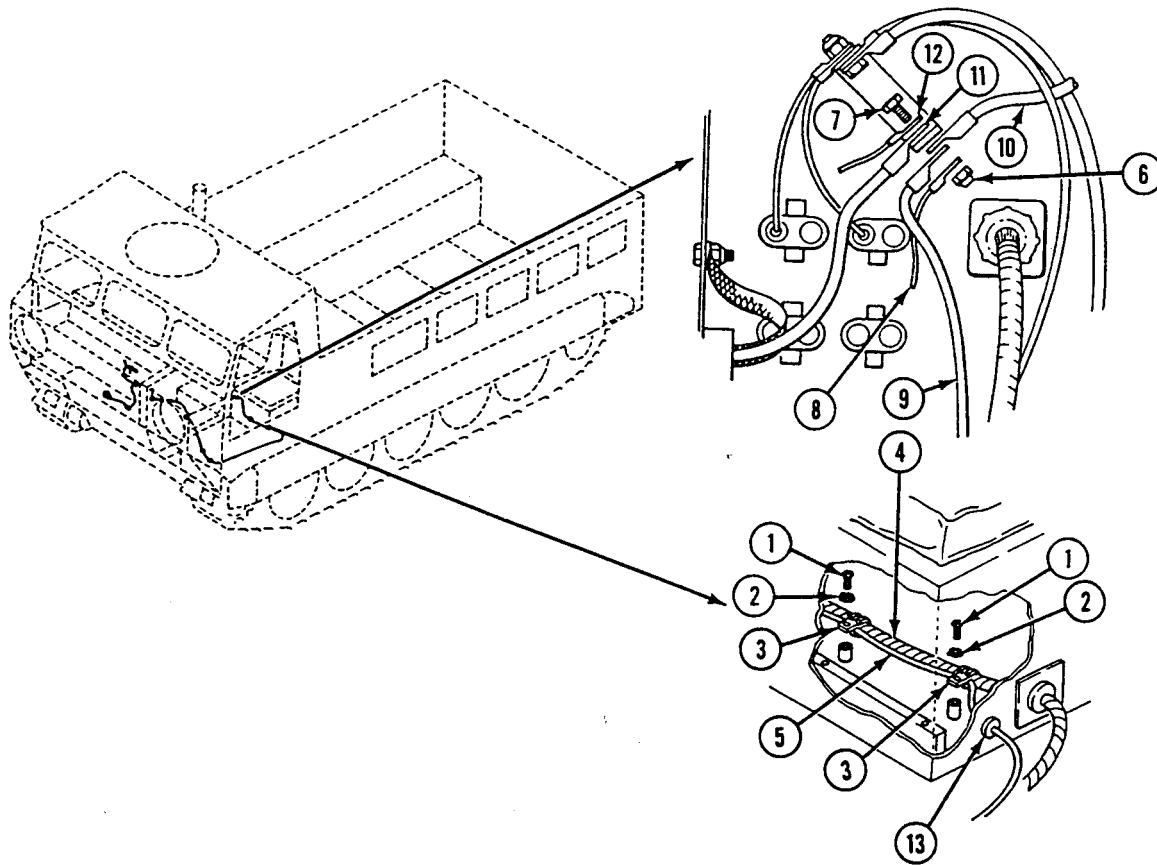
7. Remove harness clamp screw (1), lock washer (2) and clamp (3) securing main wiring harness (4) and radio receptacle and heater wiring harness (5) on hull to right of left light well. Discard lock washer.
8. Remove light well clamp screw (6), lock washer (7), and clamp (8) securing main wiring harness (4), power wiring harness (9), and radio receptacle and heater wiring harness (5) to right of left light well. Discard lock washer.



9. Remove upper clamp screw (10), lock washer (11), and clamp (12) securing main wiring harness (4), power wiring harness (9), tachometer flexible shaft (13) and radio receptacle and heater wiring harness (5) on hull to left and above beam selecting switch. Discard lock washer.
10. Remove lower clamp screw (14), lock washer (15), and clamp (16) securing power wiring harness (9), tachometer flexible shaft (13), and radio receptacle and heater wiring harness (5) on hull to left and below beam selecting switch. Discard lock washer.

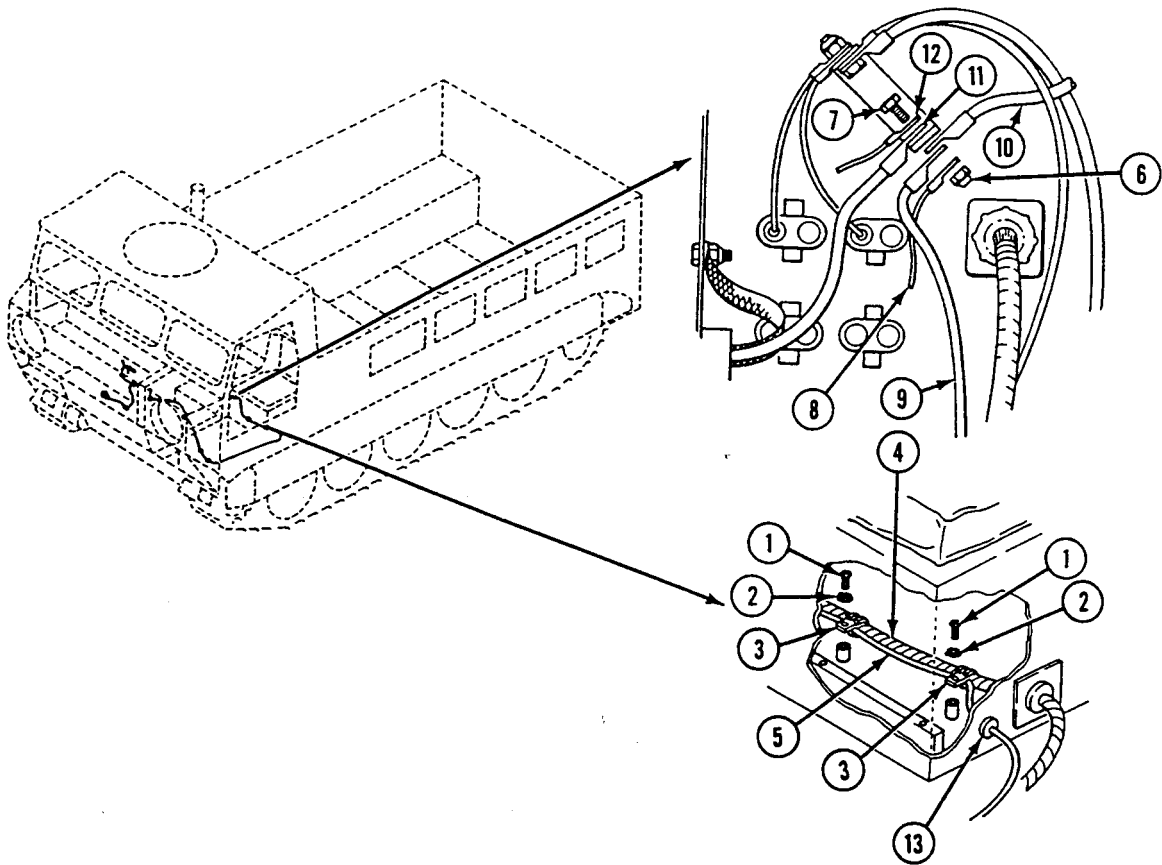


11. Remove two battery compartment screws (1), lock washers (2), and clamps (3) securing power wiring harness (4) and radio receptacle and heater wiring harness (5) on battery compartment floor. Discard lock washers.
12. Remove bus bar nut (6) and screw (7) securing circuit 400C lead (8) (if cargo area heater is installed), radio receptacle and heater wiring harness circuit 48 lead (9), circuit 2 lead (10), circuit 49 lead (11) and battery lead (12) to bus bar in battery compartment.
13. Remove battery compartment grommet (13) securing radio receptacle and heater wiring harness (5) in battery compartment bulkhead. Discard grommet.
14. Pull radio receptacle and heater wiring harness (5) into cab, and remove harness.

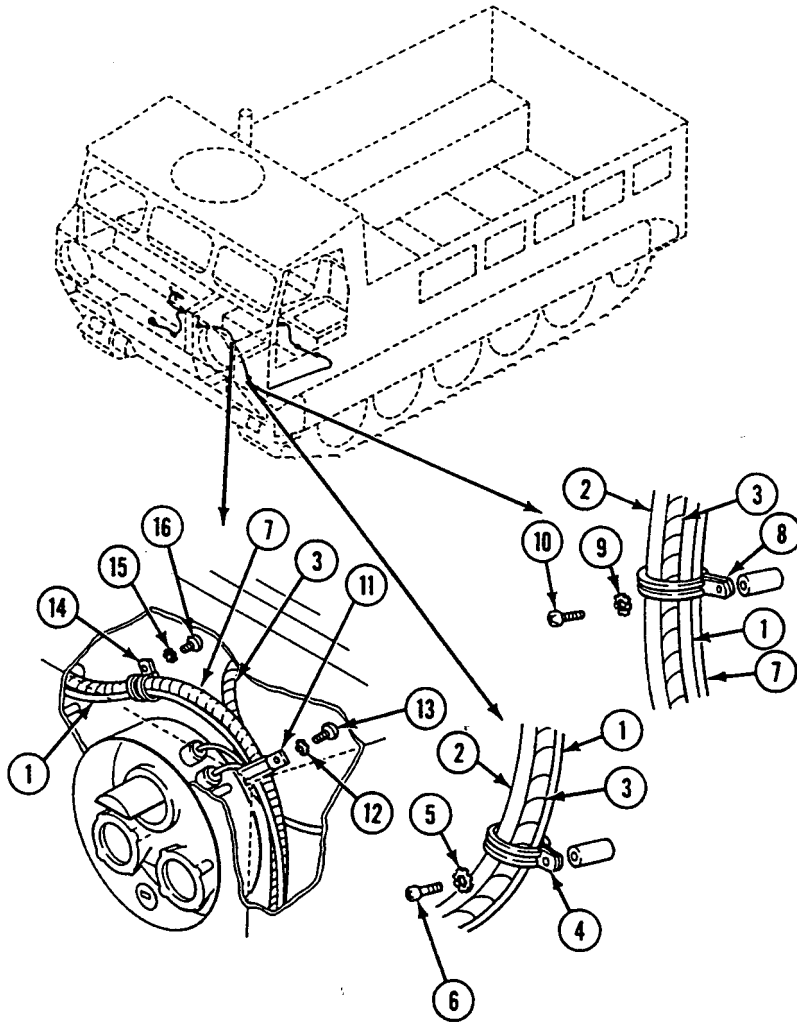


INSTALLATION

1. Place radio receptacle and heater wiring harness (5) in cab and thread bus bar end of harness through opening for battery compartment grommet (13).
2. Position battery lead (12), circuit 49 lead (11), circuit 2 lead (10), radio receptacle and heater wiring harness circuit 48 lead (9), and circuit 400C lead (8) (if cargo area heater is installed) and secure with screw (7) and nut (6).
3. Position radio receptacle and heater wiring harness (5) and power wiring harness (4) on battery compartment floor. Secure with two battery compartment clamps (3), new lock washers (2), and screws (1).
4. Install new split battery compartment grommet (13) to secure radio receptacle and heater wiring harness (5) in battery compartment bulkhead.



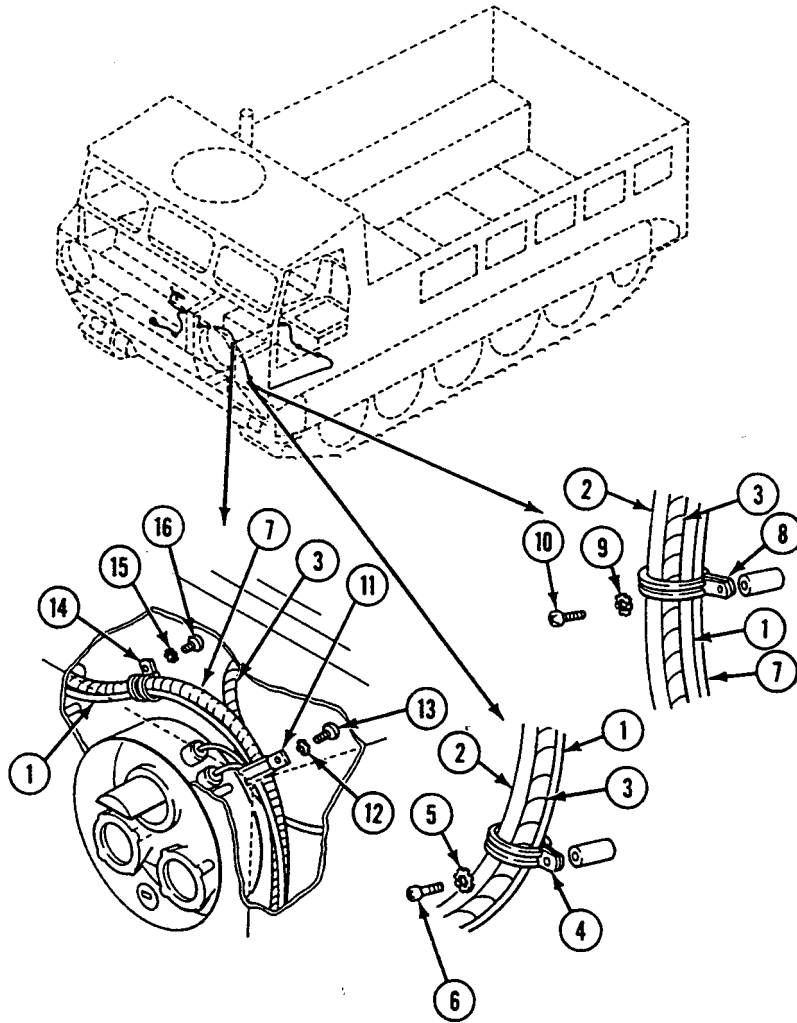
5. Position radio receptacle and heater wiring harness (1), tachometer flexible shaft (2), and power wiring harness (3) on hull to left and below beam selecting switch. Secure with lower clamp (4), new lock washer (5), and screw (6).
6. Position radio receptacle and heater wiring harness (1), tachometer flexible shaft (2), power wiring harness (3) and main wiring harness (7) on hull to left and above beam selecting switch, and secure with upper clamp (8), new lock washer (9), and screw (10).



REPLACE RADIO RECEPTACLE/HEATER WIRING HARNESS — Continued

0024 00

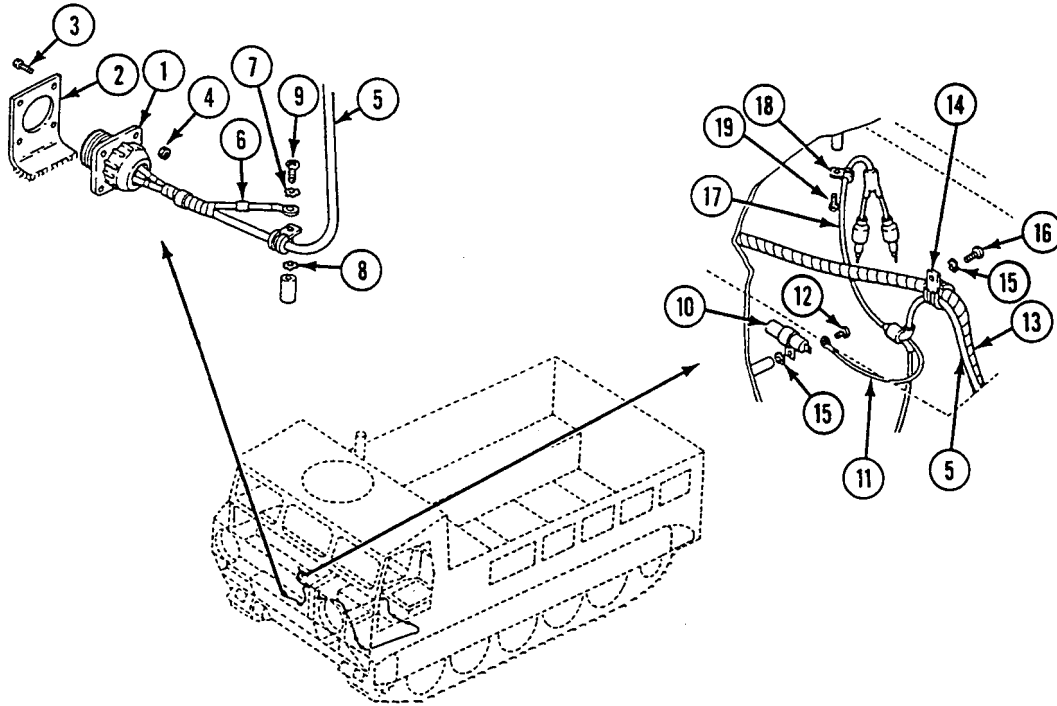
7. Position radio receptacle and heater wiring harness (1), power wiring harness (3), and main wiring harness (7) on hull to left of left light well and secure with light well clamp (11), new lock washer (12) and screw (13).
8. Position radio receptacle and heater wiring harness (1) and main wiring harness (7) on hull to right of left light well and secure with harness clamp (14), new lock washer (15) and screw (16).



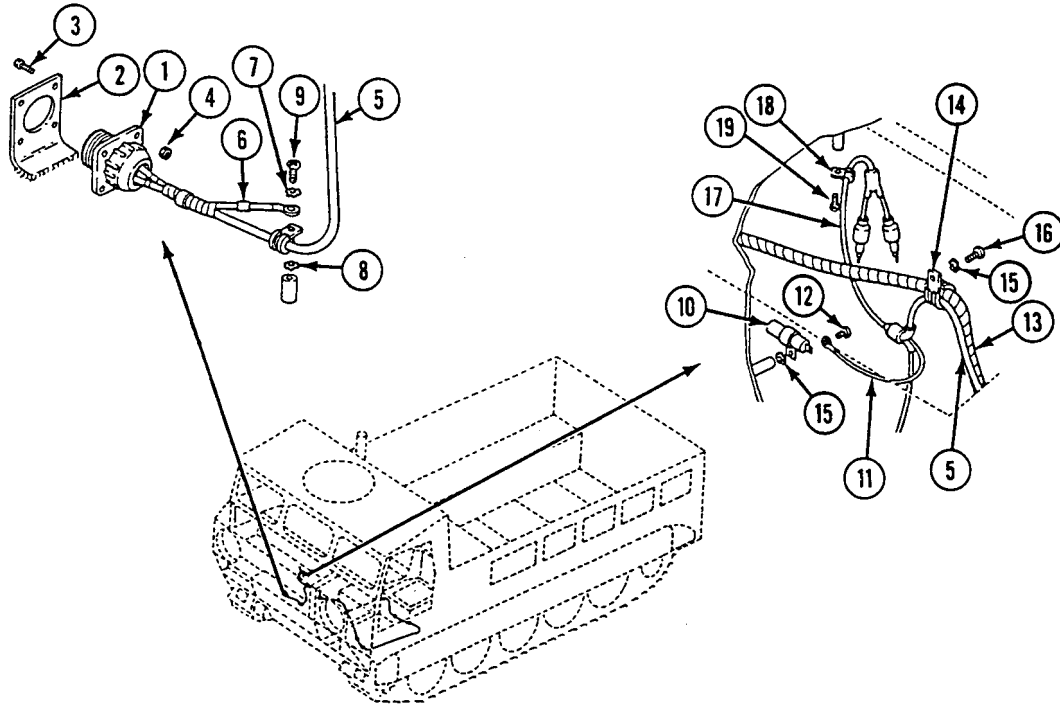
REPLACE RADIO RECEPTACLE/HEATER WIRING HARNESS — Continued

0024 00

9. Position radio receptacle (1) on receptacle bracket (2) and secure with four receptacle screws (3) and nuts (4).
10. Position radio receptacle and heater wiring harness (5) and ground lead (6) on hull behind radio receptacle (1) and secure with new lock washer (7) and new lock washer (8) and screw (9).
11. Position radio capacitor (10) on capacitor circuit 48 lead (11) and secure with capacitor screw (12).



12. Position radio capacitor (10), radio receptacle and heater wiring harness (5) and main wiring harness (13) on hull above radio receptacle (1) and secure with capacitor clamp (14), two new lock washers (15) and screw (16).
13. Position circuit 400 and 400 A lead (17) on hull and secure with circuit 400 clamp (18) and screw (19).
14. If heaters are installed, connect circuit 400 and 400A lead (17) to vehicle compartment and engine coolant heater control boxes.



FOLLOW-THROUGH STEPS

1. Install batteries (see your -20).
2. Install cab left floor plate (see your -20).
3. Lower cab personnel center seat and driver's seat (see your -20).
4. Install instrument panel (WP 0018 00) or (WP 0019 00).
5. Connect battery negative lead(s) (see your -20).

END OF TASK

REPLACE MAIN WIRING HARNESS

0025 00

THIS WORK PACKAGE COVERS:

Removal (page 0025 00-2).
 Installation (page 0025 00-12).

INITIAL SETUP:

Maintenance Level

Direct Support

References

See your -10
 See your -20
 See M548A1 and M548A3 wiring diagrams (see your
 -20, FO-1 and FO-2)

Tools and Special Tools

Automotive Fuel and Electrical System Repair Tool Kit
 (WP 0078 00, Item 64)

Equipment Condition

Engine stopped (see your -10)
 Carrier blocked (see your -10)
 Master switch off
 Cargo compartment floor plates removed
 (see your -10)
 Cab personnel center seat and driver's seat raised
 (see your -10)
 Battery negative lead(s) disconnected (see your -20)
 Cab floor plates raised/removed (see your -10)
 Right and left taillights removed (see your -20)
 Main wiring harness disconnected from instrument panel
 (WP 0018 00) or (WP 0019 00)

Materials/Parts

Grommet
 Lock washer (3)
 Lock washer (31)
 Packing (4)

Personnel Required

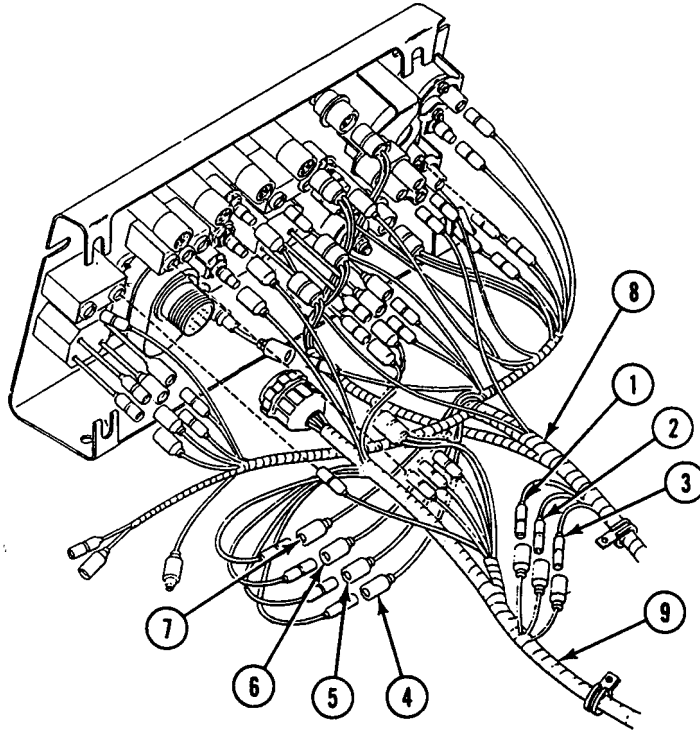
Fuel and Elec Sys Rep 63G

REMOVAL

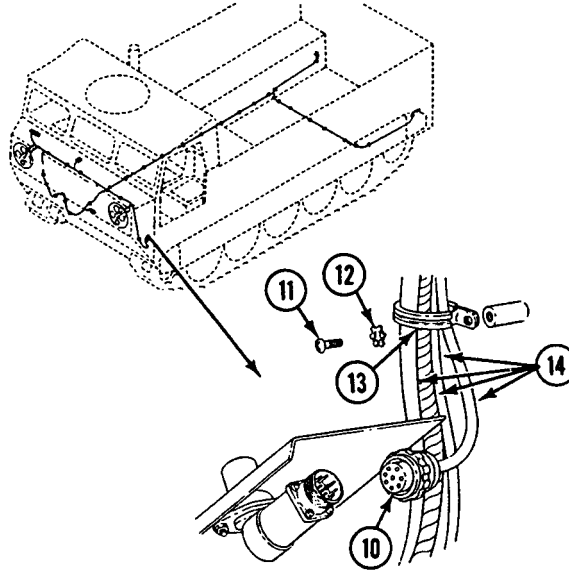
NOTE

Tag all wires and connectors to assist in installation.

1. Disconnect circuit 28 lead (1), circuit 25 lead (2), circuit 27-38 lead (3), circuit 15 lead (4), circuit 75 lead (5), circuit 75A lead (6), circuit 40 lead (7) on power wiring harness (8) from connectors on main wiring harness (9).



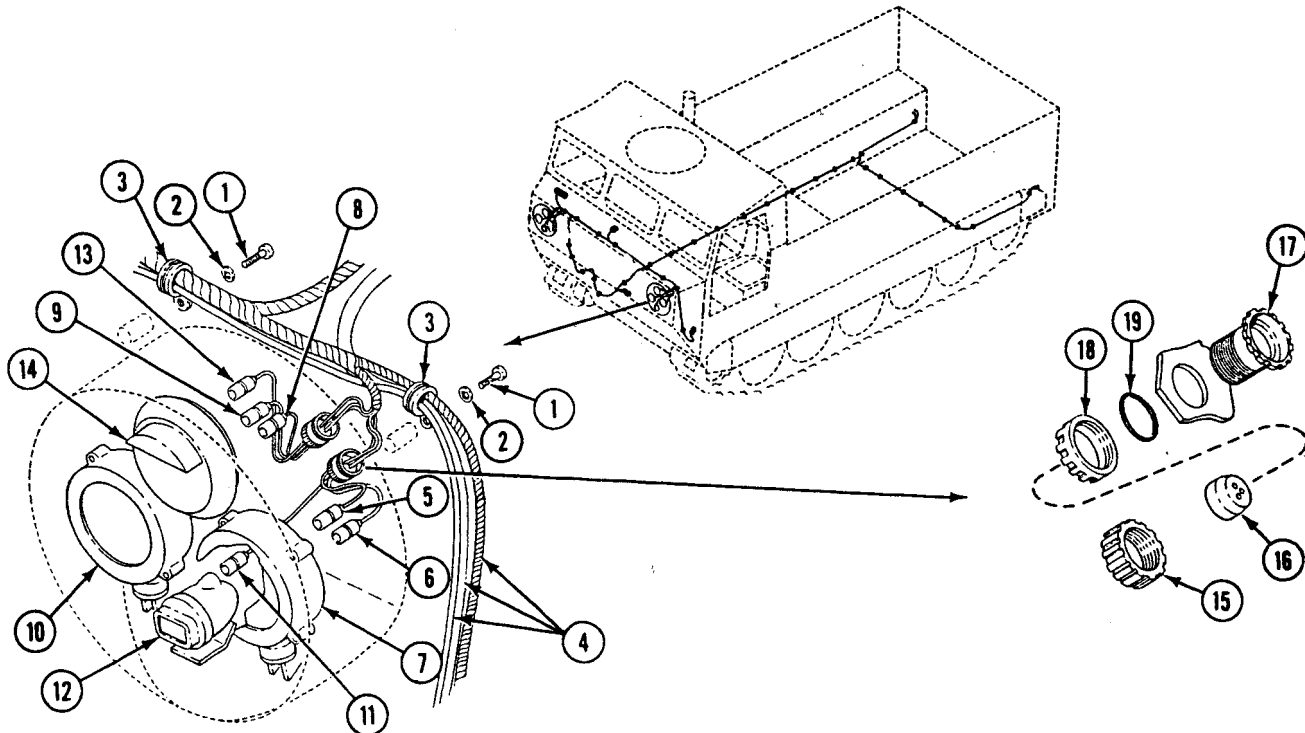
2. Disconnect head lamp dimmer switch connector (10) from head lamp dimmer switch.
3. Remove screw (11), lock washer (12), clamp (13), and cables (14) from hull. Discard lock washer.



REPLACE MAIN WIRING HARNESS — Continued

0025 00

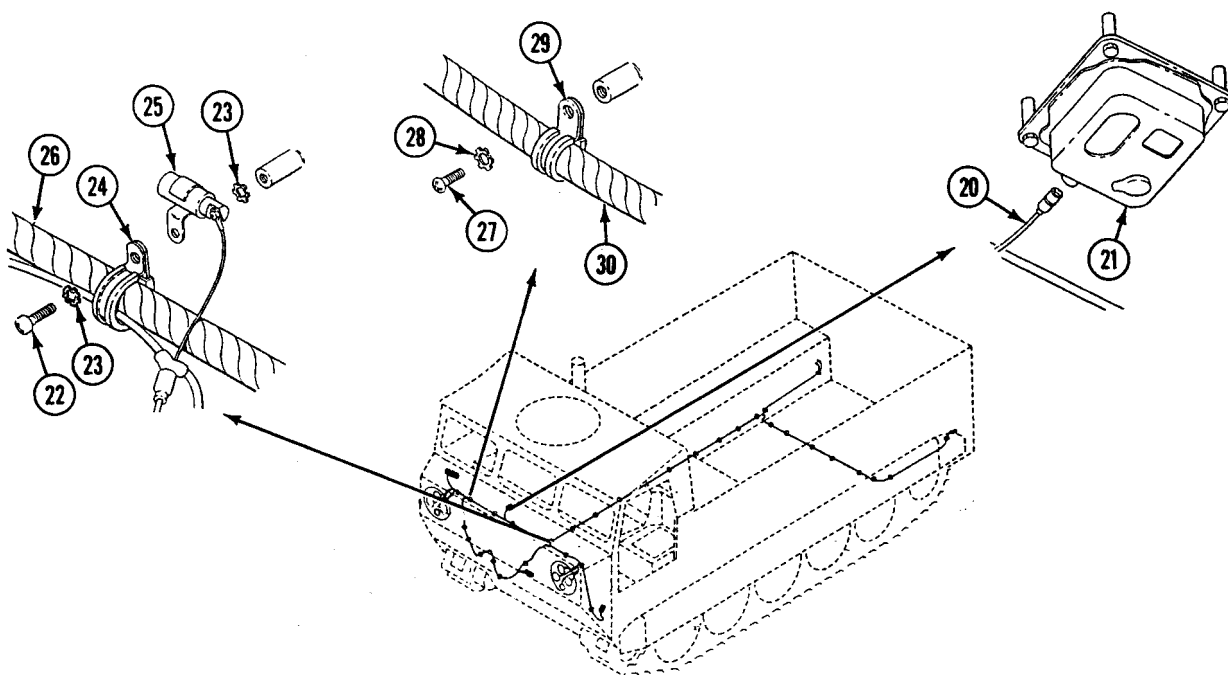
4. Remove two screws (1), lock washers (2), clamps (3), and cables (4) from hull. Discard lock washers.
5. Disconnect circuit 17 lead (5) and circuit 18 lead (6) from left service headlight (7).
6. Disconnect circuit 514 lead (8) and circuit 515 lead (9) from left infrared headlight (10).
7. Disconnect circuit 19 lead (11) from left blackout headlight (12).
8. Disconnect circuit 20 lead (13) from left blackout marker light (14).
9. Remove two stuffing tube caps (15) securing two rubber bushings (16) in two stuffing tubes (17) from wiring harness.
10. Remove two stuffing tube lock nuts (18), packings (19), and stuffing tubes (17) from hull. Remove lock nuts and packings from wiring harness. Discard packings.



REPLACE MAIN WIRING HARNESS — Continued

0025 00

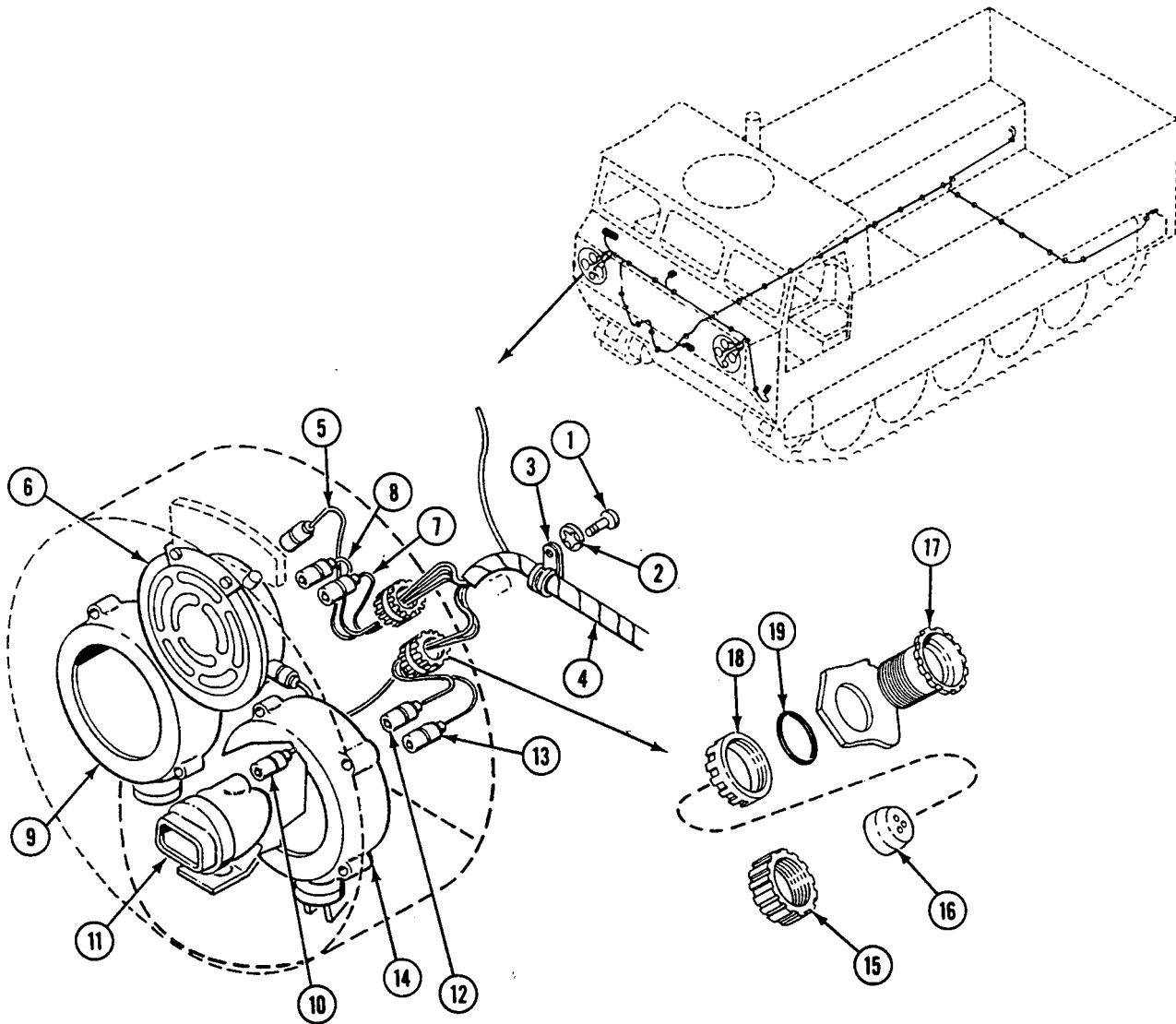
11. Pull ends of wiring harness through two light well openings.
12. Disconnect circuit 38 lead (20) from dome light (21).
13. Remove screw (22), two lock washers (23), clamp (24), capacitor (25), and cables (26) from hull. Discard lock washers.
14. Remove three screws (27), lock washers (28), clamps (29), and main wiring harness (30) from hull. Discard lock washers.



REPLACE MAIN WIRING HARNESS — Continued

0025 00

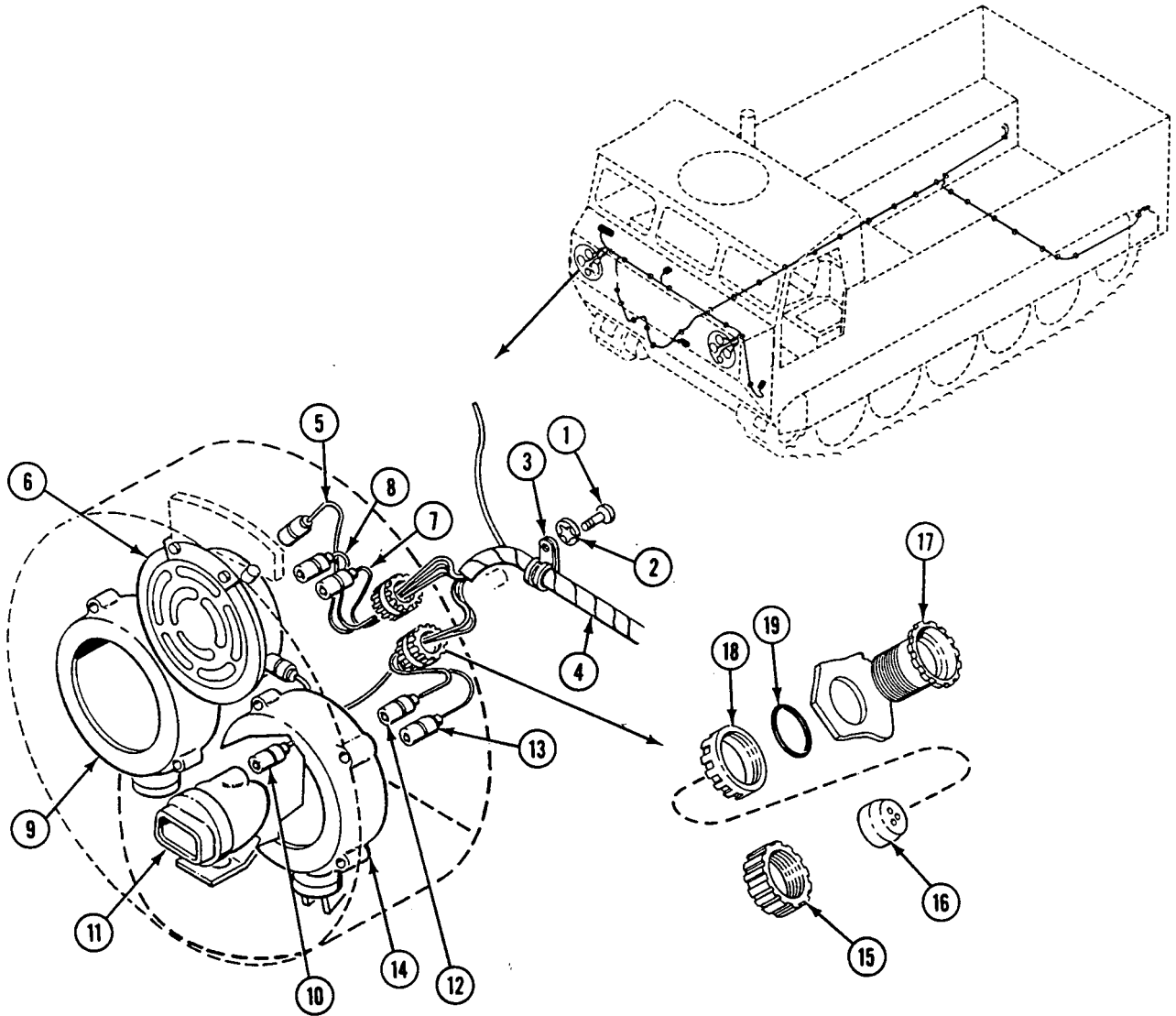
15. Remove screw (1), lock washer (2), clamp (3), and main wiring harness (4) from hull. Discard lock washer.
16. Disconnect circuit 25 lead (5) from horn (6).
17. Disconnect circuit 514 lead (7) and circuit 515 lead (8) from right infrared headlight (9).
18. Disconnect circuit 20 lead (10) from right blackout headlight (11).
19. Disconnect circuit 17 lead (12) and circuit 18 lead (13) from right service headlight (14).



REPLACE MAIN WIRING HARNESS — Continued

0025 00

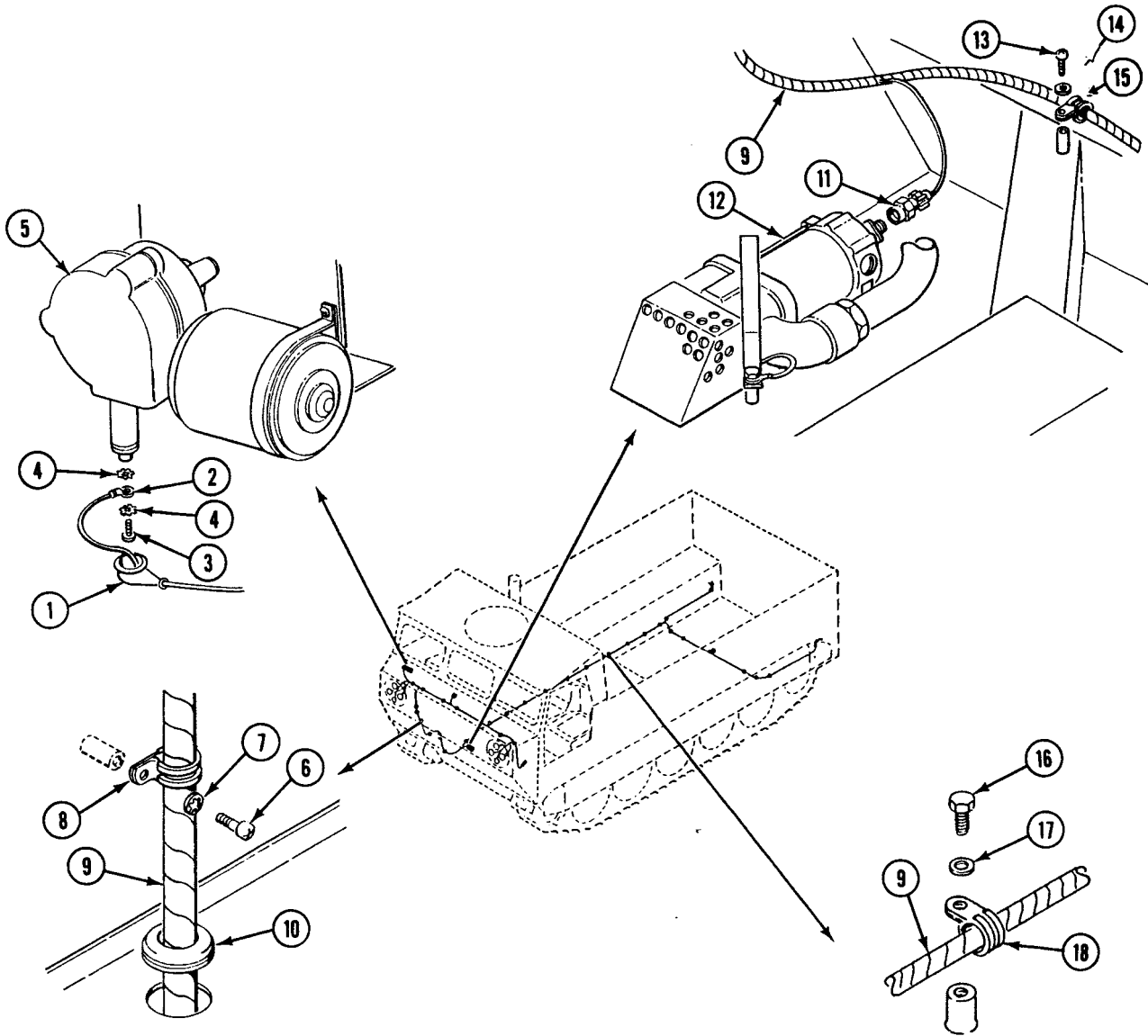
20. Remove two stuffing tube caps (15) securing two rubber bushings (16) in two stuffing tubes (17) from wiring harness. Remove rubber bushings from wiring harness.
21. Remove two stuffing tube lock nuts (18), packings (19), and stuffing tubes (17) from hull. Remove lock nuts and packings from wiring harness. Discard packings.
22. Pull ends of wiring harness through two light well openings and two stuffing tubes (17).



REPLACE MAIN WIRING HARNESS — Continued

0025 00

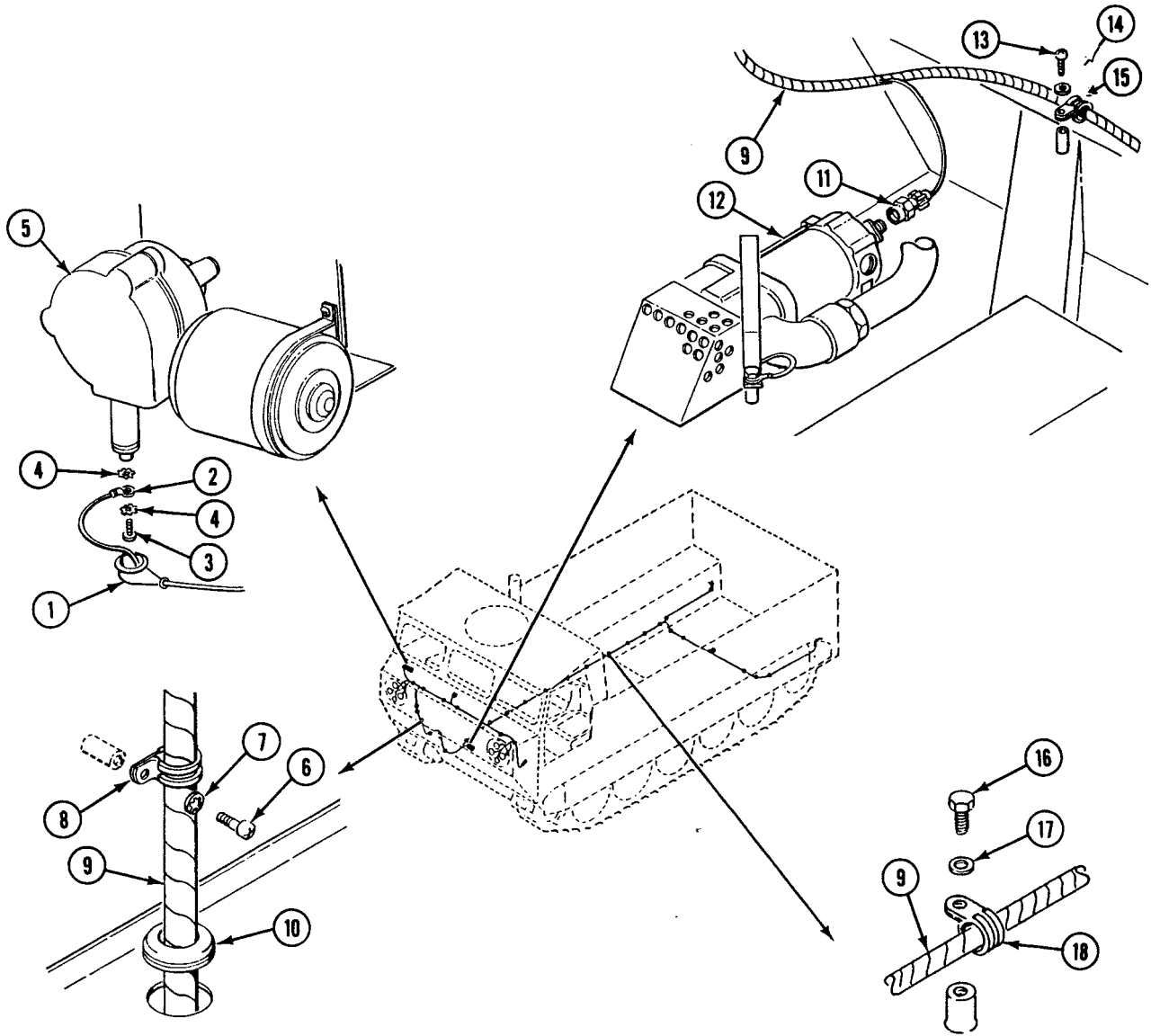
23. Slide rubber shield (1) back on circuit 71 lead (2), and remove screw (3), two lock washers (4), and lead (2) from windshield wiper motor (5). Discard lock washers.
24. Remove screw (6), lock washer (7), and clamp (8) securing main wiring harness (9) to hull. Discard lock washer.
25. Remove grommet (10) from cab floor and main wiring harness (9). Discard grommet.
26. Disconnect circuit 452 lead (11) from forward bilge pump (12).



REPLACE MAIN WIRING HARNESS — Continued

0025 00

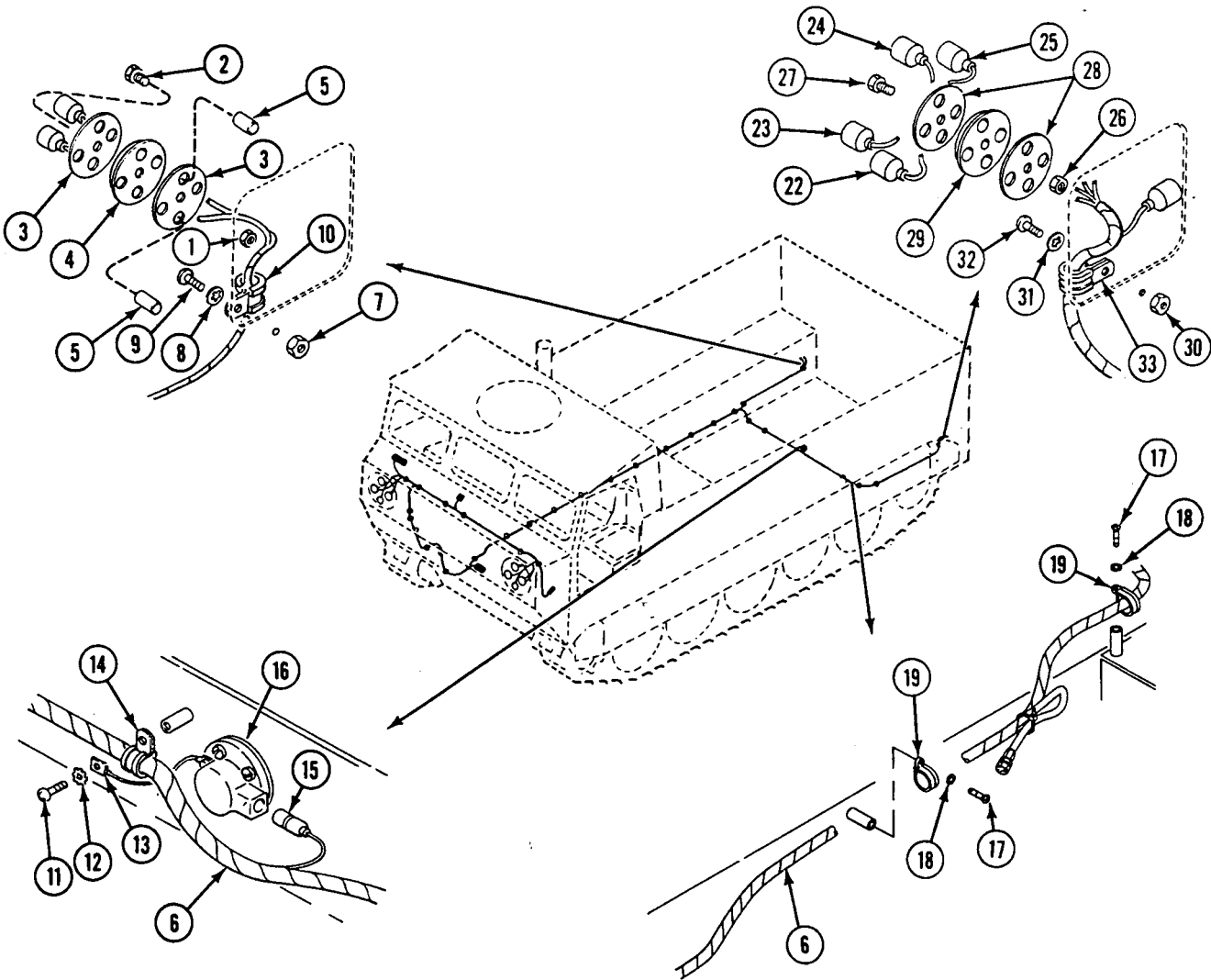
27. Remove nine screws (13), lock washers (14), and clamps (15) securing main wiring harness (9) to front section of carrier hull. Discard lock washers.
28. Remove six screws (16), lock washers (17), and clamps (18) securing main wiring harness (9) to box beam on right side of carrier. Discard lock washers.



REPLACE MAIN WIRING HARNESS — Continued

0025 00

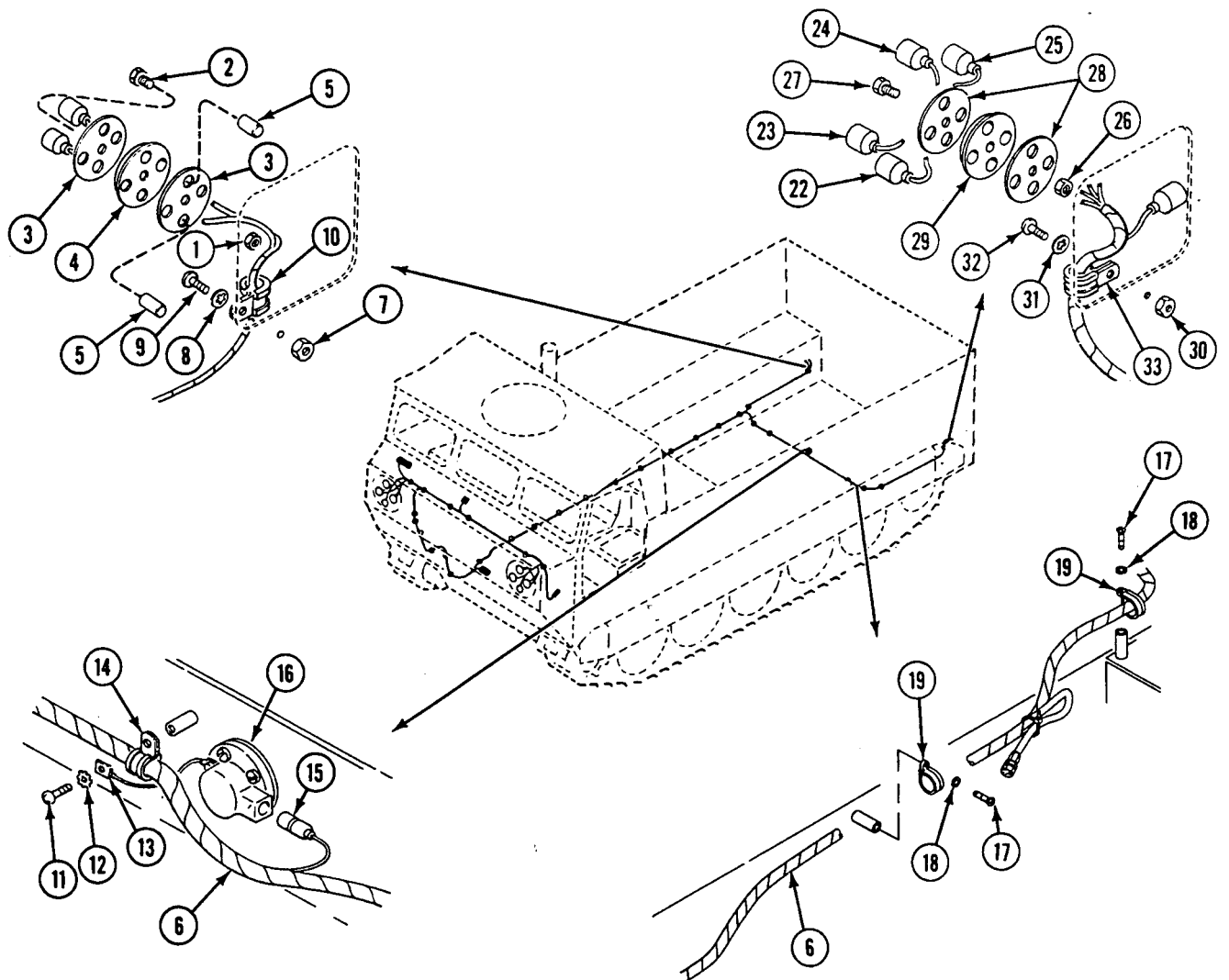
29. Remove nut (1), screw (2), two bushing retainers (3), and bushing (4) from hull. Remove bushing and two bushing plugs (5) from main wiring harness (6).
30. Remove nut (7), lock washer (8), screw (9), and clamp (10) from hull. Discard lock washer.
31. Remove screw (11), lock washer (12), lead (13), and clamp (14) securing main wiring harness (6) to hull. Discard lock washer.
32. Disconnect circuit 28 lead (15) from fuel quantity transmitter (16).



REPLACE MAIN WIRING HARNESS — Continued

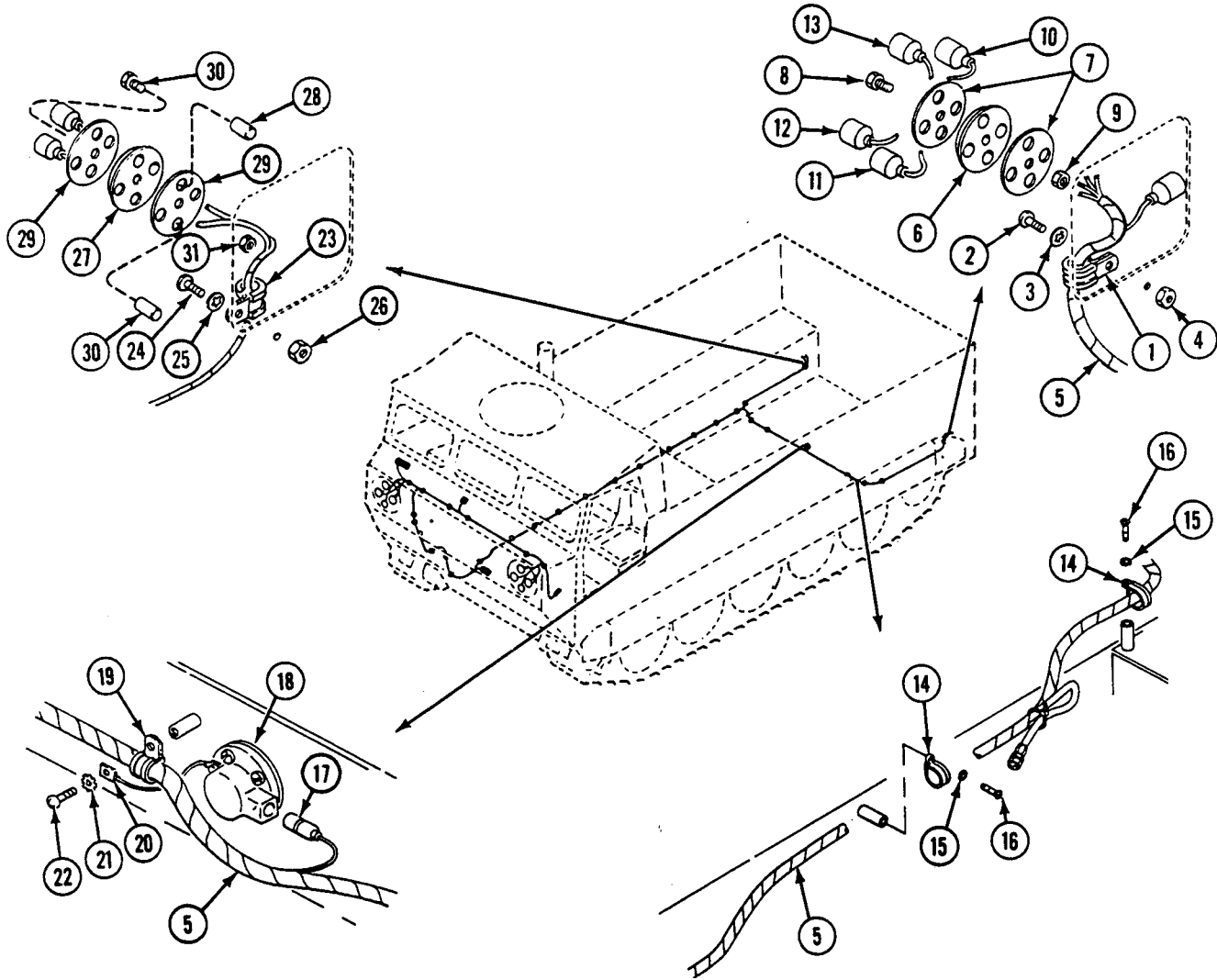
0025 00

33. Remove four screws (17), lock washers (18), and clamps (19) securing main wiring harness (6) to hull. Discard lock washers.
34. Disconnect circuit 21 lead (20), circuit 22 lead (21), and circuit 24 lead (22) from taillight-to-trailer receptacle wiring harness.
35. Disconnect circuit 23 lead (23) from trailer wiring harness.
36. Remove nut (24), screw (25), two bushing retainers (26), and bushing (27) from hull. Remove bushing from main wiring harness.
37. Remove nut (28), lock washer (29), screw (30), and clamp (31) securing main wiring harness to hull. Discard lock washer.
38. Pull main wiring harness from two taillight well openings, through opening in cab floor, and remove harness from carrier.



INSTALLATION

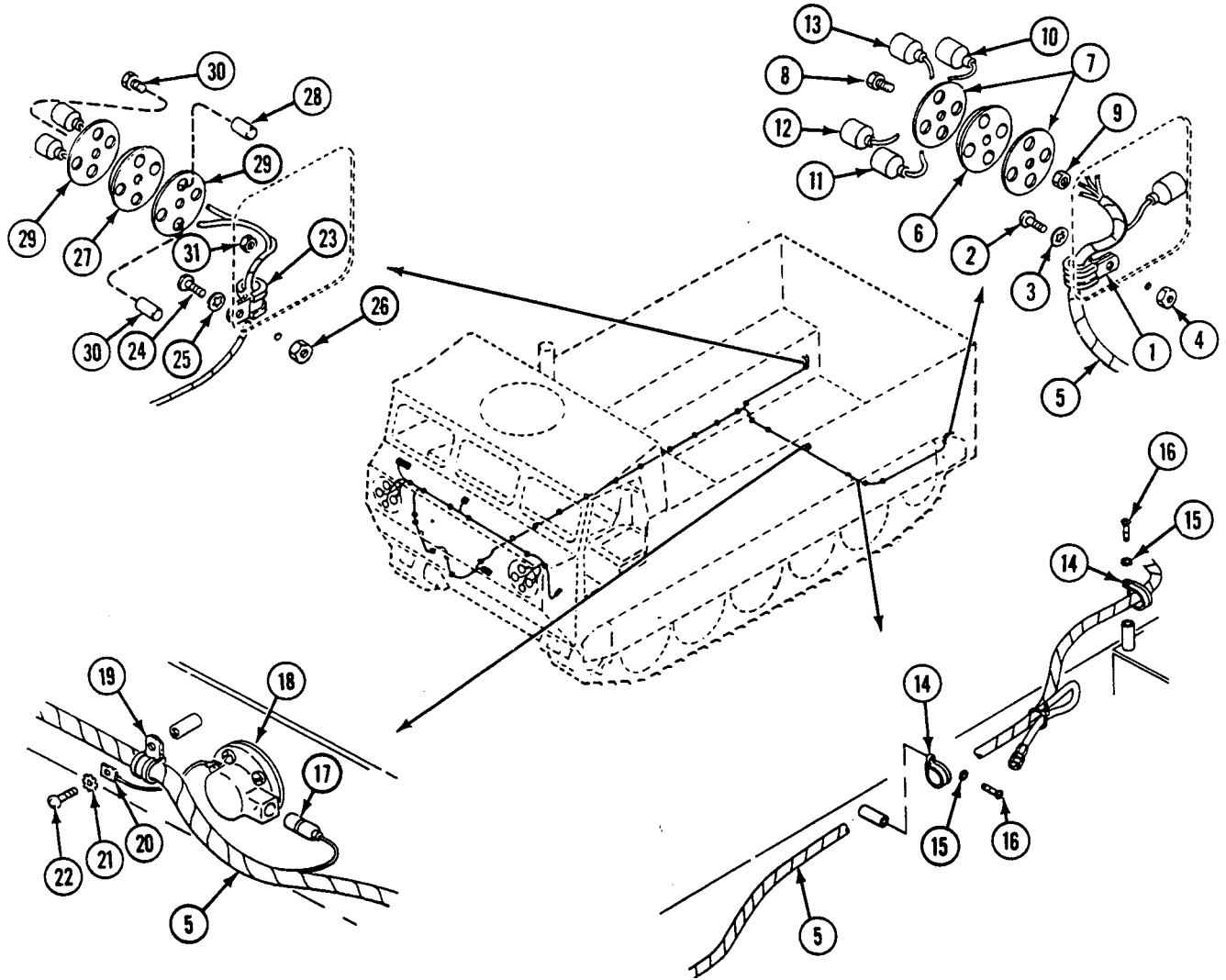
1. Position main wiring harness in carrier, threading harness through opening in cab floor, and two taillight well openings.
2. Install clamp (1), screw (2), new lock washer (3), and nut (4) securing main wiring harness (5) to hull.
3. Install bushing (6) on main wiring harness and install bushing, two bushing retainers (7), screw (8), and nut (9) on hull.
4. Connect circuit 23 lead (10) to trailer wiring harness.
5. Connect circuit 21 lead (11), circuit 22 lead (12), and circuit 24 lead (13) to taillight-to-trailer receptacle wiring harness.



REPLACE MAIN WIRING HARNESS — Continued

0025 00

6. Install four clamps (14), new lock washers (15), and screws (16) securing main wiring harness (5) to hull.
7. Connect circuit 28 lead (17) to fuel quantity transmitter (18).
8. Install clamp (19), lead (20), new lock washer (21), and screw (22) securing main wiring harness (5) to hull.
9. Install clamp (23), screw (24), new lock washer (25), and nut (26) on hull.
10. Install bushing (27) and two bushing plugs (28) on main wiring harness (5) and install bushing, two bushing retainers (29), screw (30), and nut (31) on hull.



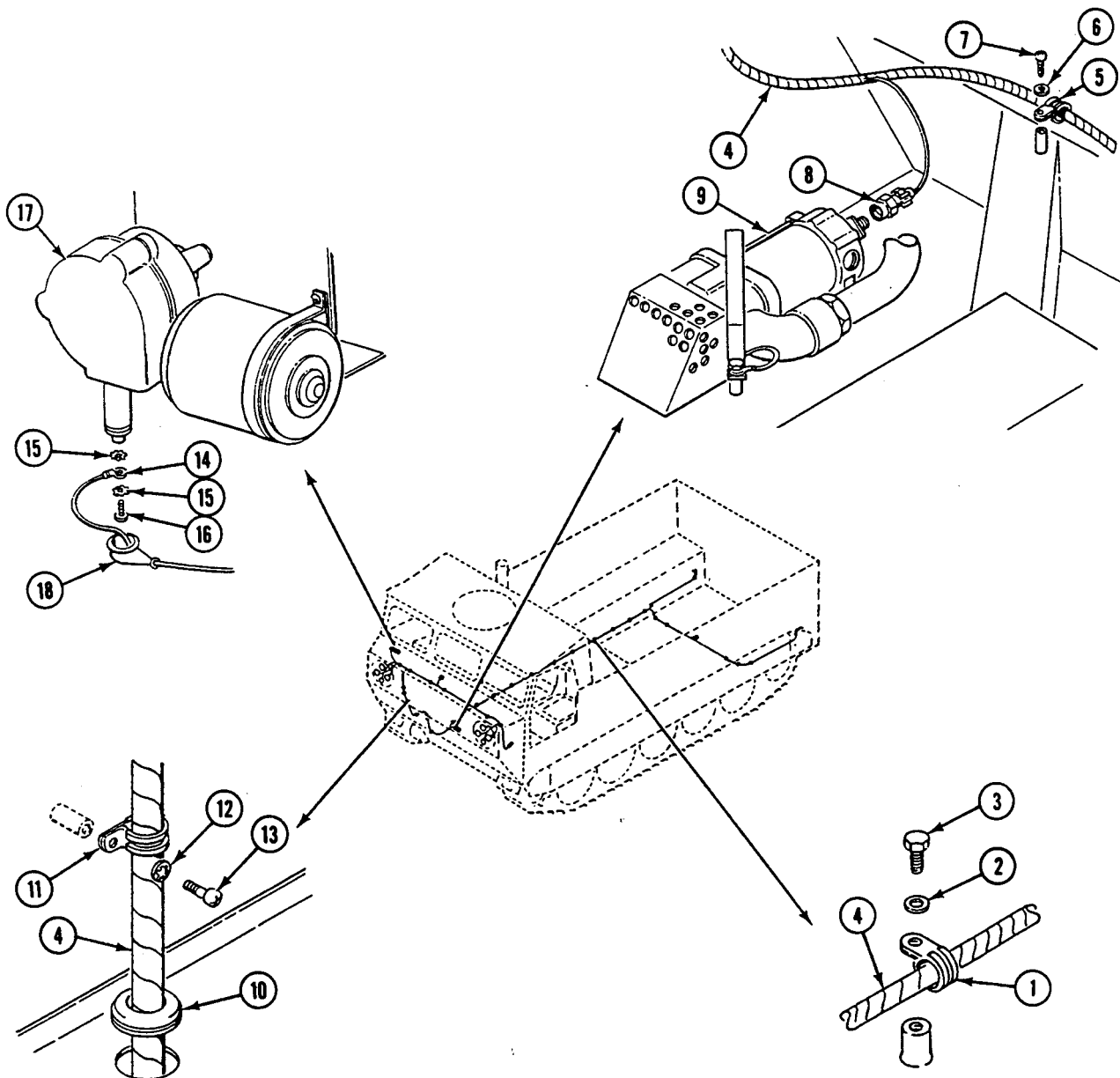
11. Install six clamps (1), new lock washers (2), and screws (3) securing main wiring harness (4) to box beam on right side of carrier.

NOTE

Two clamps and main harness on box beam next to battery box should be on right side of weldnuts to eliminate interference with air cleaner assembly.

12. Install nine clamps (5), new lock washers (6), and screws (7) securing main wiring harness (4) to front section of carrier hull.

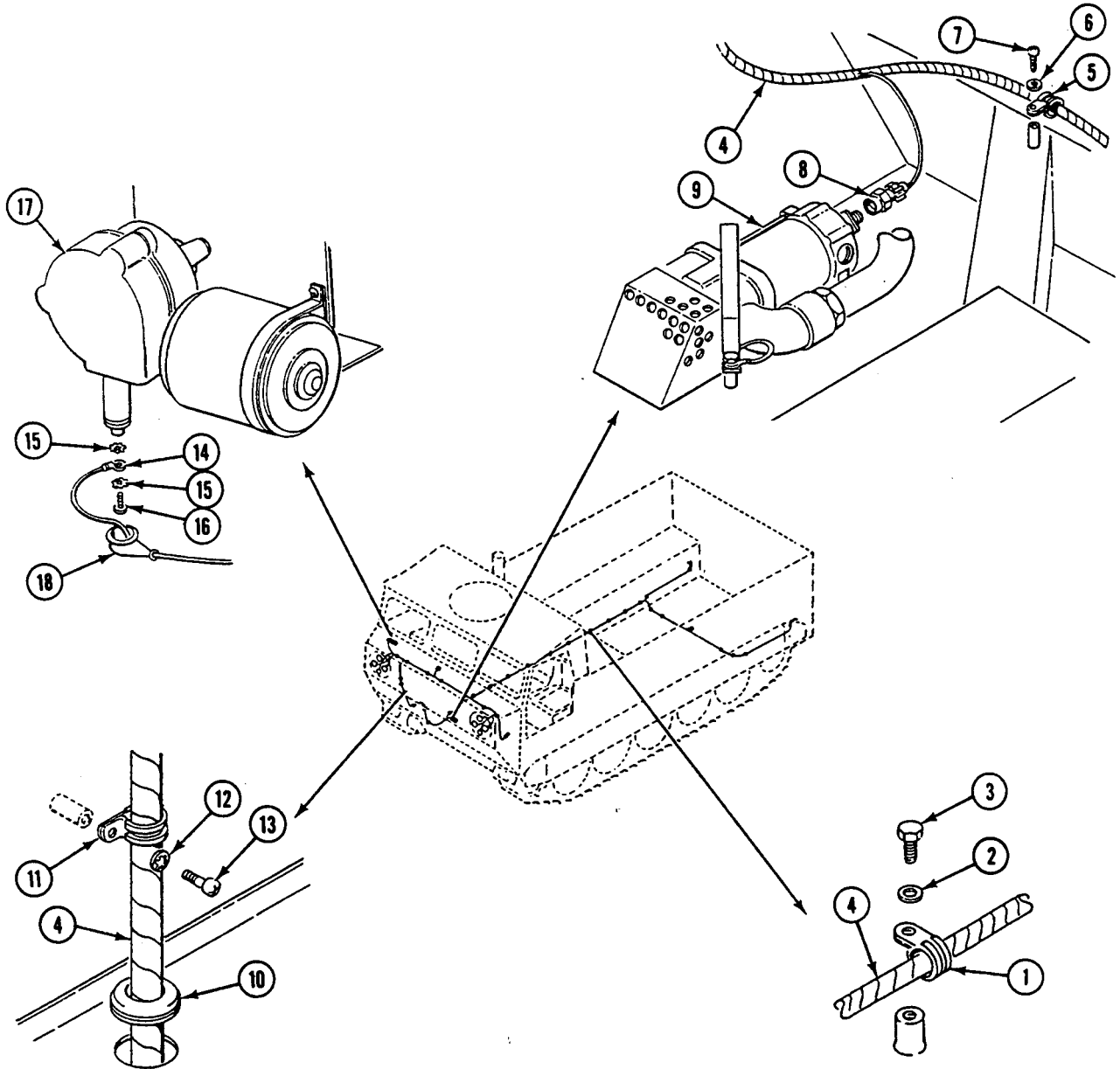
13. Connect circuit 452 lead (8) to front bilge pump (9).



REPLACE MAIN WIRING HARNESS — Continued

0025 00

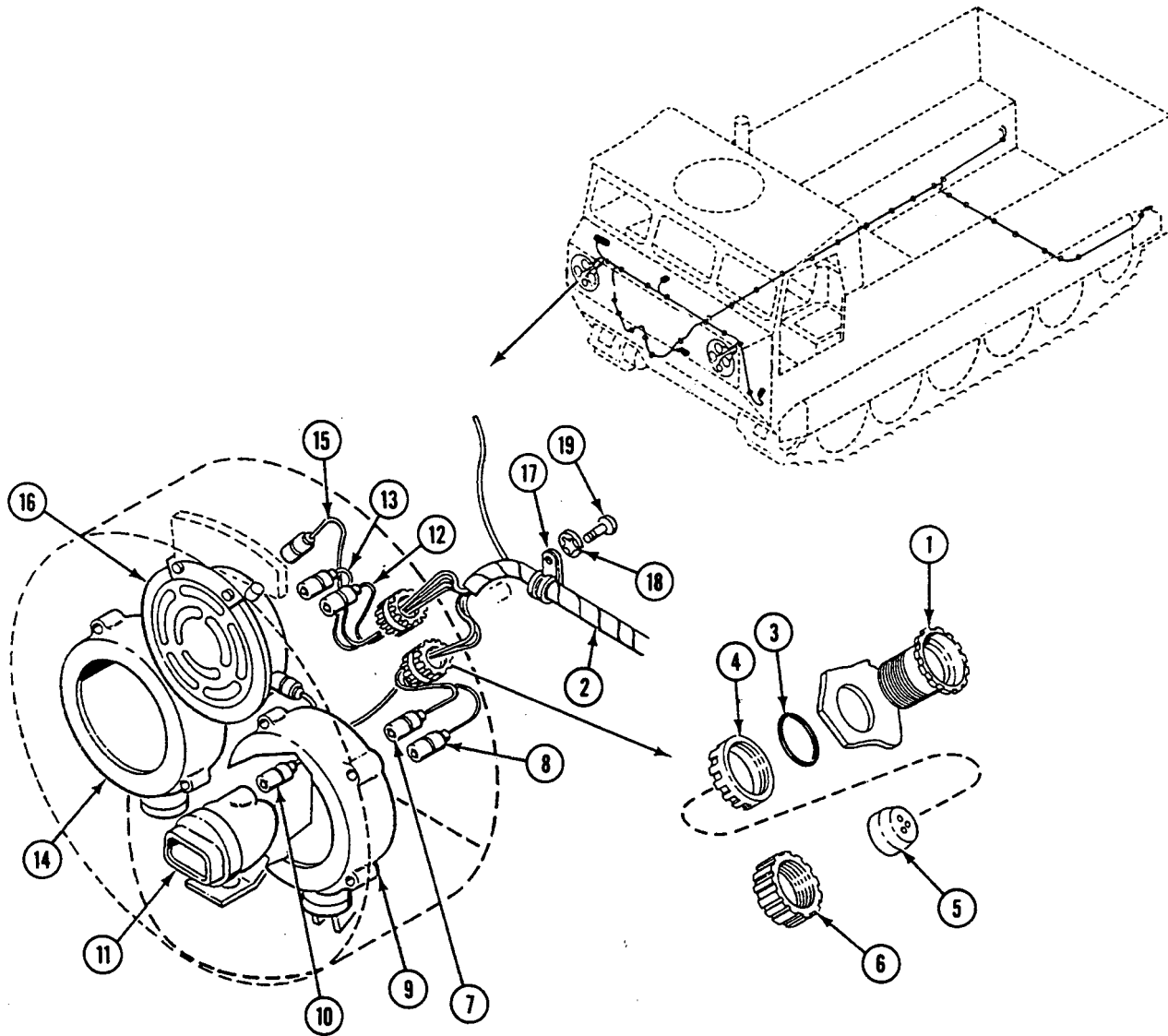
14. Install new grommet (10) on main wiring harness (4) and cab floor.
15. Install clamp (11), new lock washer (12), and screw (13) securing main wiring harness (4) to hull.
16. Install circuit 71 lead (14), two new lock washers (15), and screw (16) on windshield wiper motor (17) and slide rubber shield (18) over end of lead.



REPLACE MAIN WIRING HARNESS — Continued

0025 00

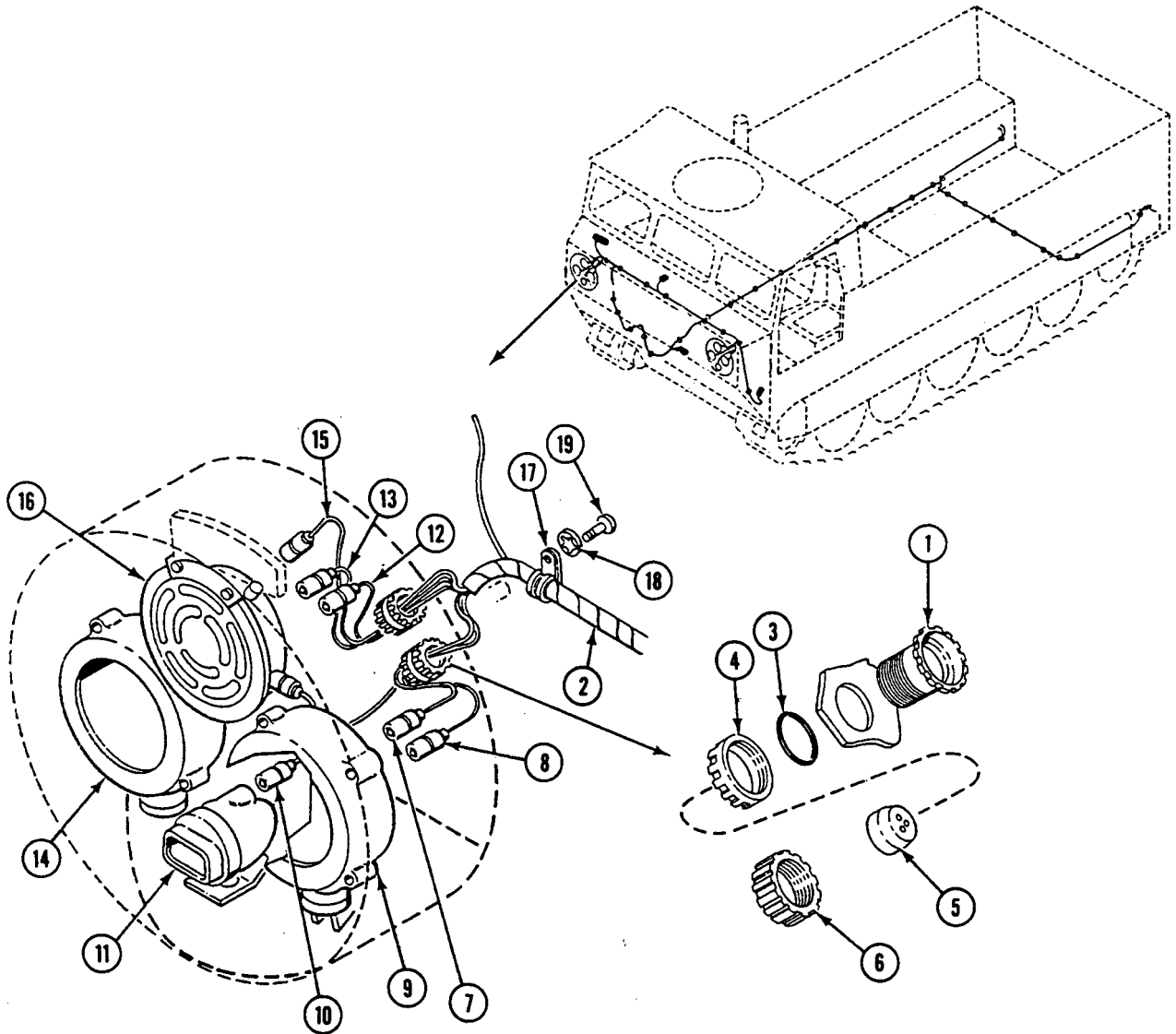
17. Install two stuffing tubes (1) in two light well openings and thread ends of wiring harness (2) through stuffing tubes.
18. Thread two new packings (3) and stuffing tube lock nuts (4) on wiring harness (2) and install packings and lock nuts on two stuffing tubes (1).
19. Install two rubber bushings (5) on wiring harness (2).
20. Install two stuffing tube caps (6) on two stuffing tubes (1).



REPLACE MAIN WIRING HARNESS — Continued

0025 00

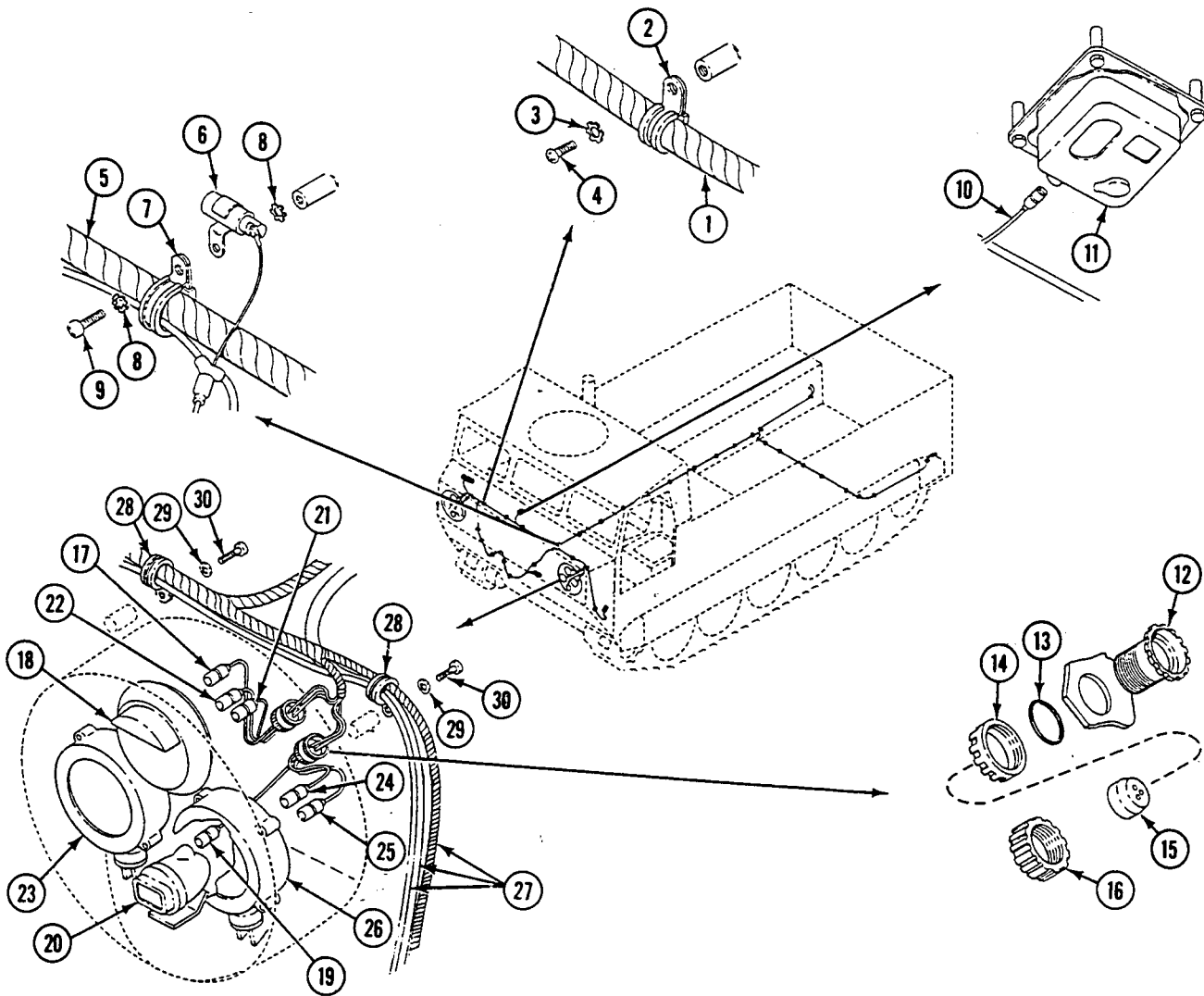
21. Connect circuit 17 lead (7) and circuit 18 lead (8) to right service headlight (9).
22. Connect circuit 20 lead (10) to right blackout headlight (11).
23. Connect circuit 514 lead (12) and circuit 515 lead (13) to right infrared headlight (14).
24. Connect circuit 25 lead (15) to horn (16).
25. Install main wiring harness (2), clamp (17), new lock washer (18), and screw (19) on hull.



REPLACE MAIN WIRING HARNESS — Continued

0025 00

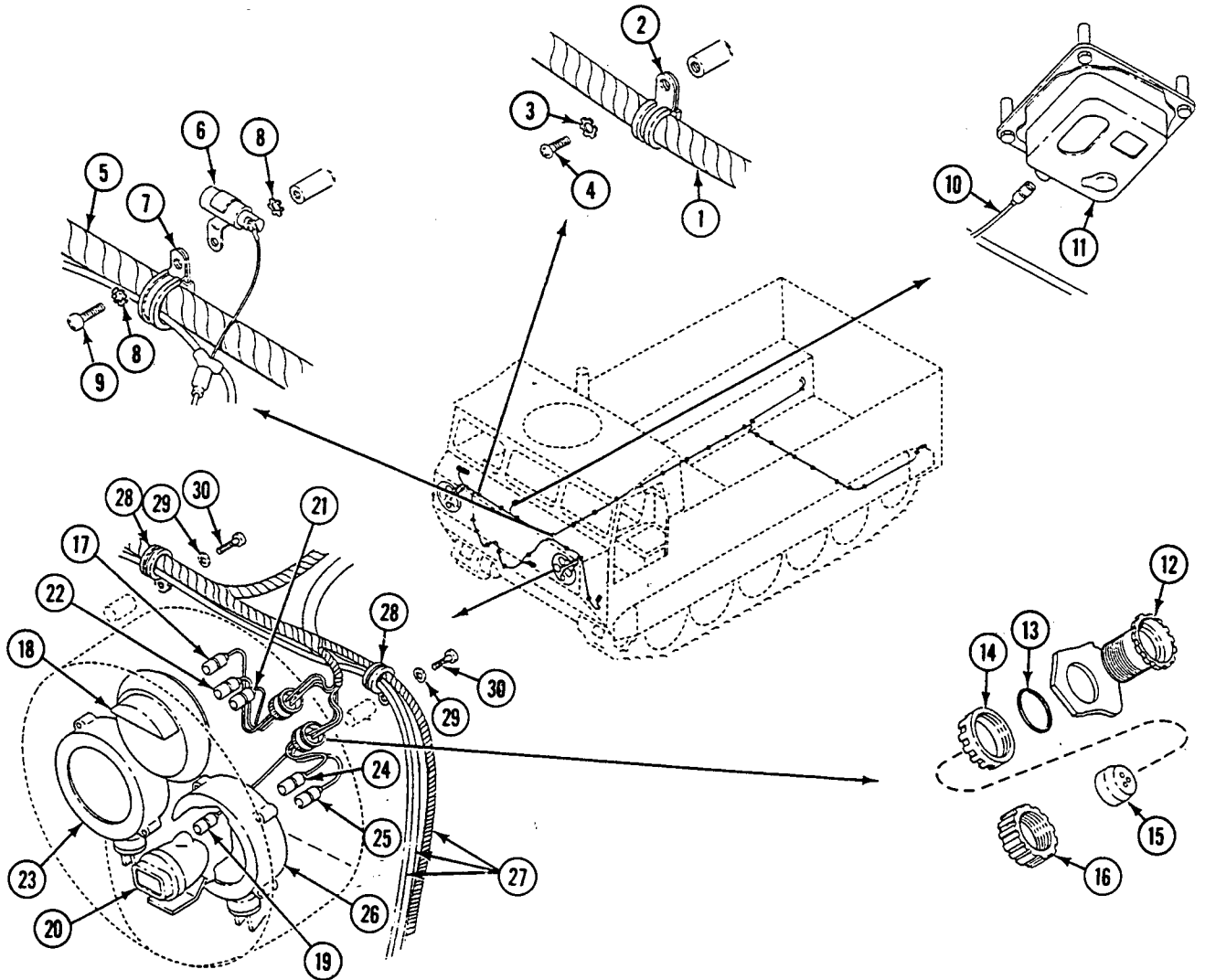
26. Install main wiring harness (1), three clamps (2), new lock washers (3), and screws (4) on hull.
27. Install cables (5), capacitor (6), clamp (7), two new lock washers (8), and screw (9) on hull.
28. Connect circuit 38 lead (10) to dome light (11).
29. Thread ends of wiring harness through two light well openings.
30. Install two stuffing tubes (12) in two light well openings and thread ends of wiring harness (1) through stuffing tubes (12).
31. Thread two new packings (13) and stuffing tube lock nuts (14) on wiring harness (1) and install packings and lock nuts on two stuffing tubes (12).



REPLACE MAIN WIRING HARNESS — Continued

0025 00

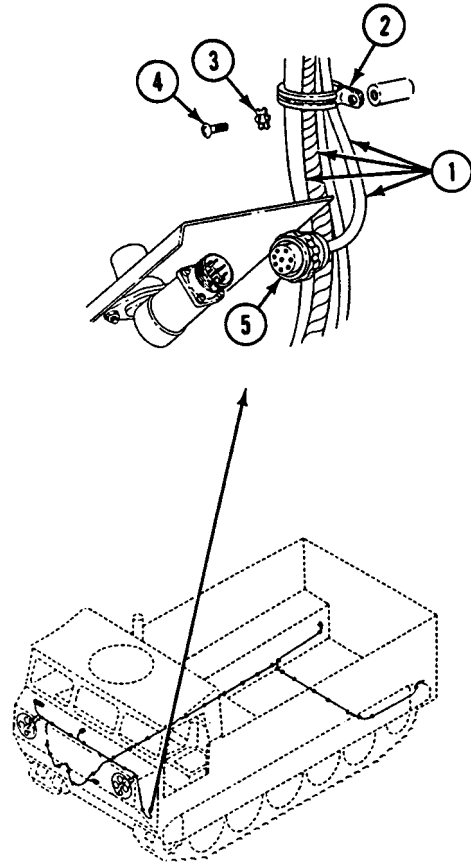
32. Install two rubber bushings (15) on wiring harness (1).
33. Install two stuffing tube caps (16) on two stuffing tubes (12).
34. Connect circuit 20 lead (17) to left blackout marker light (18).
35. Connect circuit 19 lead (19) to left blackout headlight (20).
36. Connect circuit 514 lead (21) and circuit 515 lead (22) to left infrared headlight (23).
37. Connect circuit 17 lead (24) and circuit 18 lead (25) to left service headlight (26).
38. Install cables (27), clamps (28), new lock washers (29), and screws (30) on hull.



REPLACE MAIN WIRING HARNESS — Continued

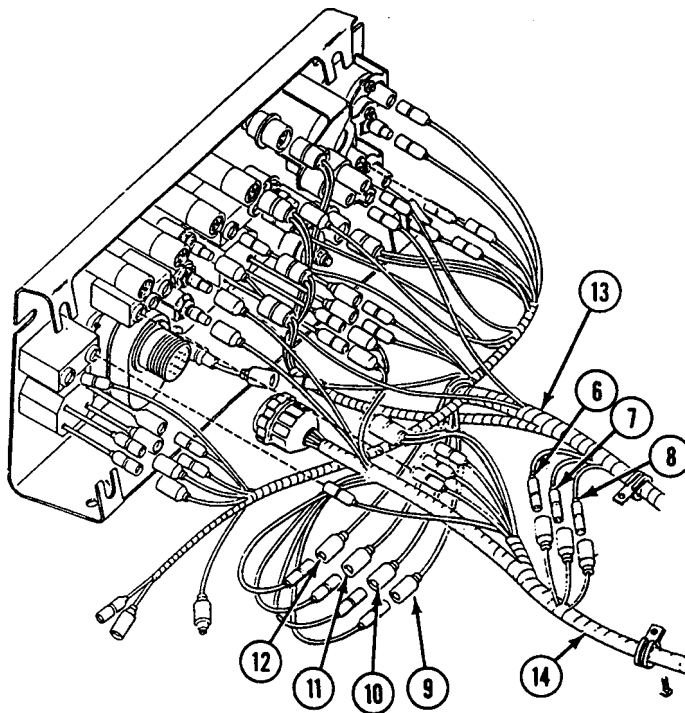
0025 00

39. Install cables (1), clamp (2), new lock washer (3), and screw (4) on hull.
40. Connect beam selecting switch connector (5) to beam selecting switch.



REPLACE MAIN WIRING HARNESS — Continued**0025 00**

41. Connect circuit 28 lead (6), circuit 25 lead (7), circuit 27-38 lead (8), circuit 15 lead (9), circuit 75 lead (10), circuit 75A lead (11), circuit 40 lead (12) on power wiring harness to (13) connectors on main wiring harness (14).

**FOLLOW-THROUGH STEPS**

1. Connect main wiring harness to instrument panel (WP 0018 00) or (WP 0019 00).
2. Install right and left taillights (see your -20).
3. Install cargo compartment floor plates (see your -10).
4. Install/lower cab floor plates (see your -10).
5. Connect battery negative lead(s) (see your -20).
6. Lower cab personnel center seat and driver's seat (see your -10).

END OF TASK

REPLACE POWER PLANT WIRING HARNESS (M548A1)

0026 00

THIS WORK PACKAGE COVERS:

Removal (page 0026 00-2).
 Installation (page 0026 00-6).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

Automotive Fuel and Electrical System Repair Tool Kit
 (WP 0078 00, Item 64)

Materials/Parts

Lock nut (6)
 Lock washer (4)

Personnel Required

Fuel and Elec Sys Rep 63G

References

See your -10
 See your -20

Equipment Condition

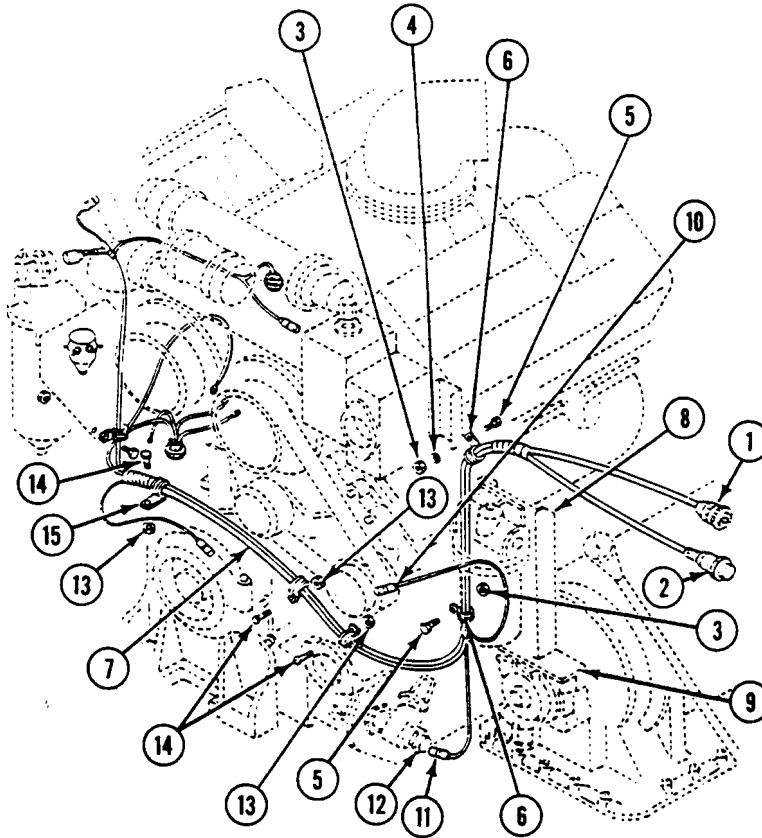
Engine stopped (see your -10)
 Carrier blocked (see your -10)
 MASTER SWITCH OFF
 Cab personnel center seat and driver's seat raised
 (see your -10)
 Battery negative lead disconnected (see your -20)
 Hull bottom access cover removed (see your -10)

REMOVAL

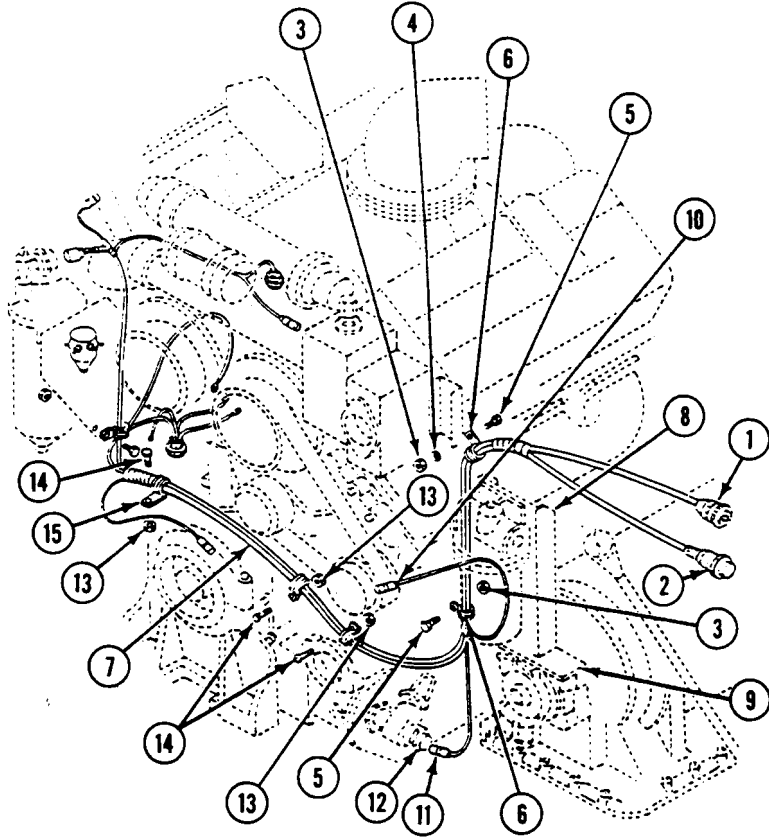
NOTE

Tag all wires and connectors.

1. Disconnect circuit 6 connector (1) and multiple connector (2) from battery compartment bulkhead.
2. Remove two lock nuts (3), lock washer (4), screws (5), and clamps (6) securing power plant wiring harness (7) to top of bracket (8) and cross-shaft (9). Discard lock nuts and lock washer.
3. Disconnect circuit 328 lead (10) from differential oil high temperature switch.



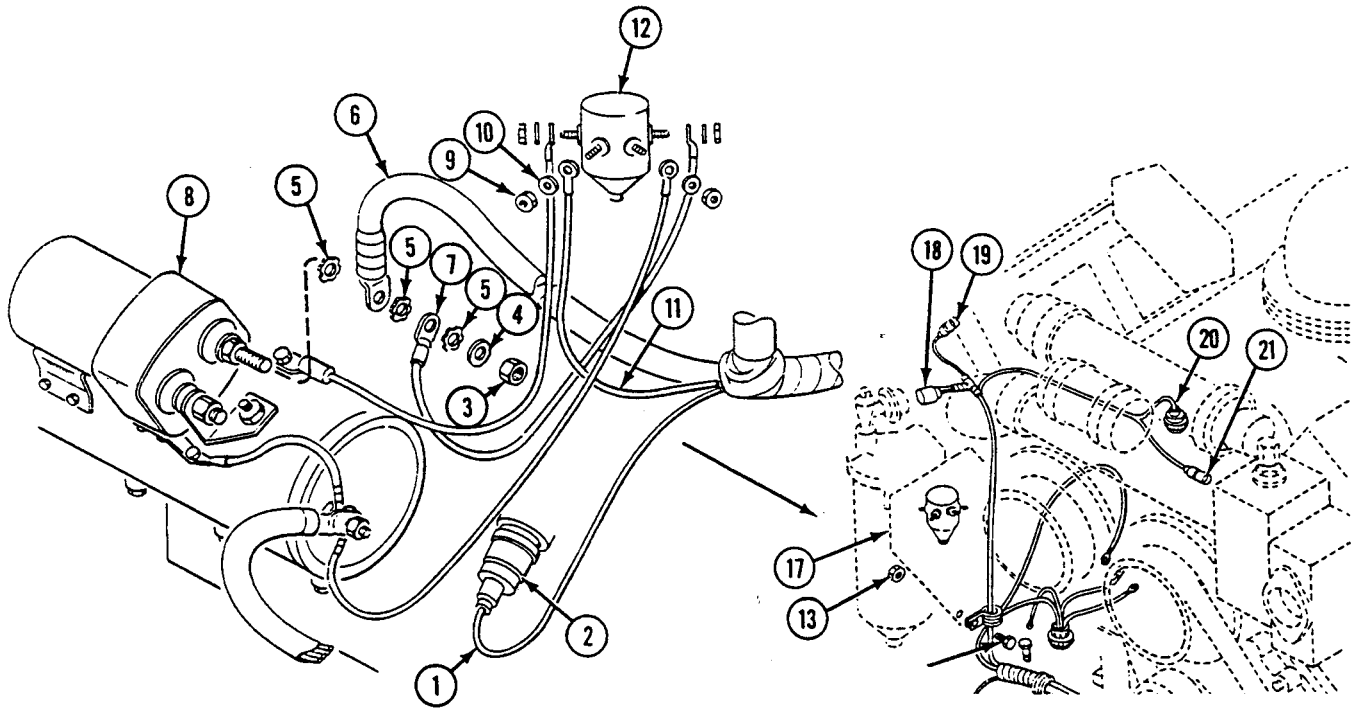
4. Disconnect circuit 327 lead (11) from transmission oil high temperature switch (12).
5. Remove three lock nuts (13), screws (14), and clamps (15) securing power plant wiring harness (7) to brackets. Discard lock nuts.



REPLACE POWER PLANT WIRING HARNESS (M548A1) — Continued

0026 00

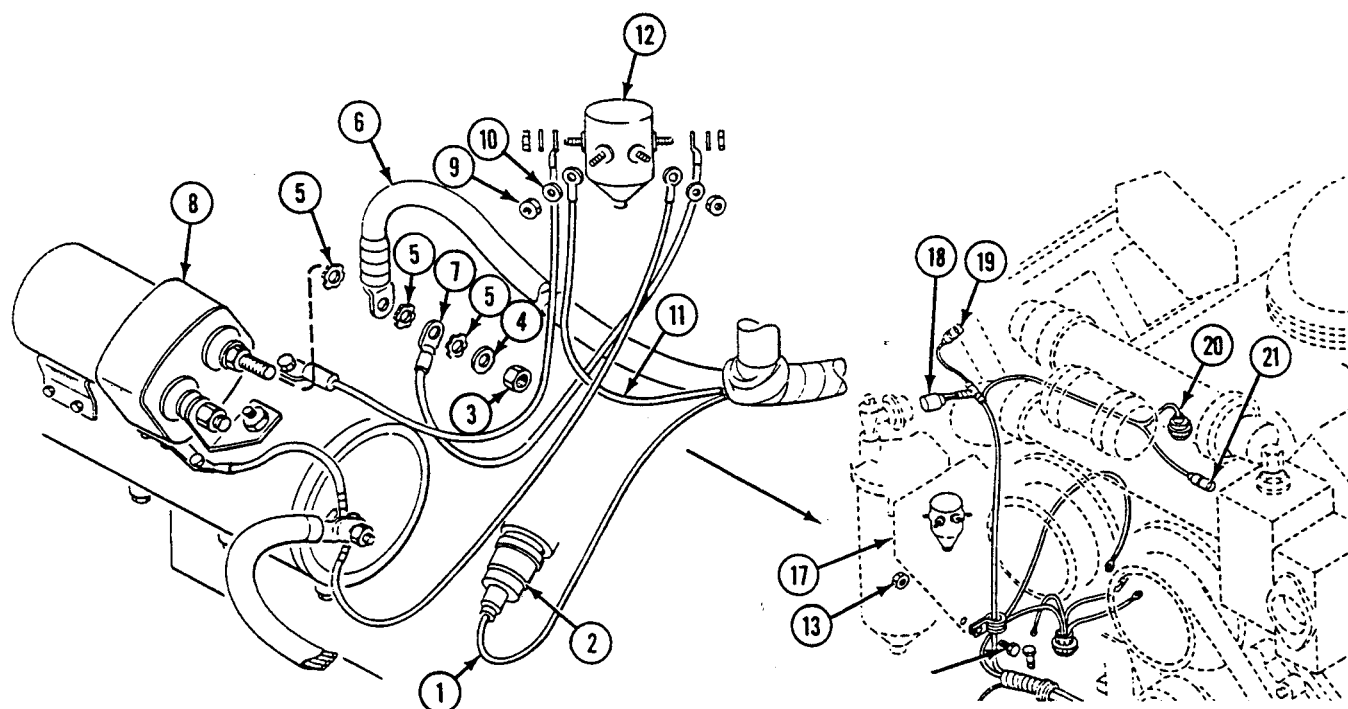
6. Disconnect circuit 34 lead (1) from engine oil low pressure switch (2).
7. Remove nut (3), washer (4), three lock washers (5), circuit 6 lead (6) and circuit 74 C lead (7) from starter solenoid (8). Discard lock washers.
8. Remove nut (9), washer (10), and circuit 74A lead (11) from starter relay (12).
9. Remove lock nut (13), screw (14), and clamp (15) securing power plant wiring harness (16) to fuel filter bracket (17). Discard lock nut.



REPLACE POWER PLANT WIRING HARNESS (M548A1) — Continued

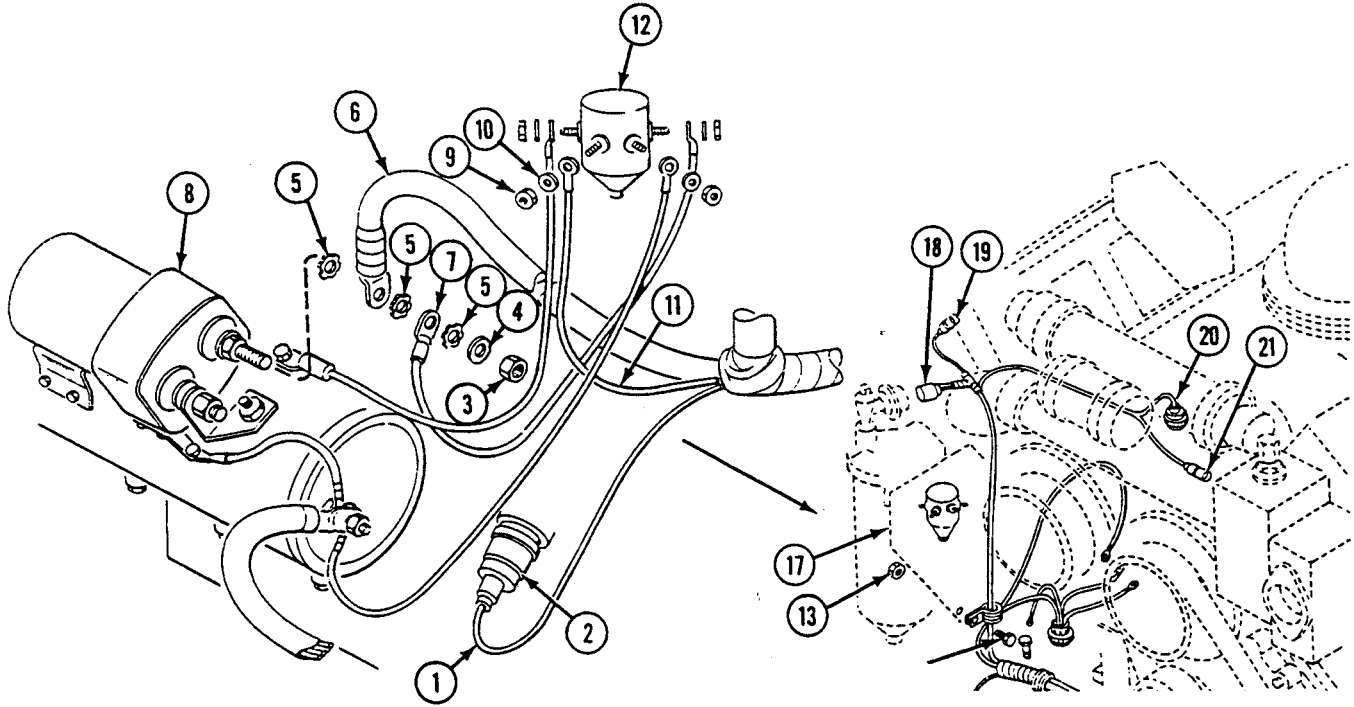
0026 00

10. Disconnect circuit 1A/1B connector (18) from generator field switch.
11. Disconnect circuit 1B lead (19) from regulator wiring harness.
12. Disconnect connector (20) from air box heater.
13. Disconnect circuit 33 lead (21) from coolant temperature transmitter.
14. Remove power plant wiring harness (16) from carrier.



INSTALLATION

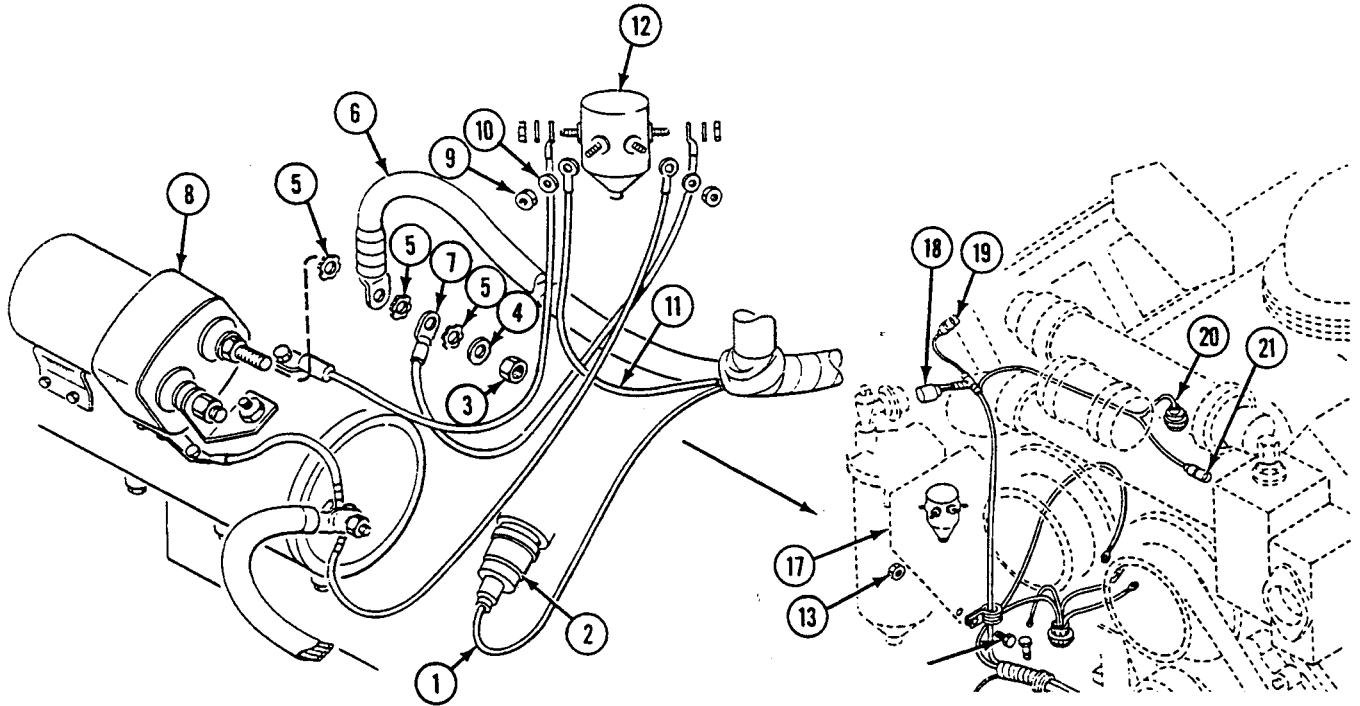
1. Position power plant wiring harness (16) in carrier.
2. Connect circuit 33 lead (21) to coolant temperature transmitter.
3. Connect connector (20) to air box heater.
4. Connect circuit 1B lead (19) to regulator wiring harness.
5. Connect circuit 1A/1B connector (18) to generator field switch.



REPLACE POWER PLANT WIRING HARNESS (M548A1) — Continued

0026 00

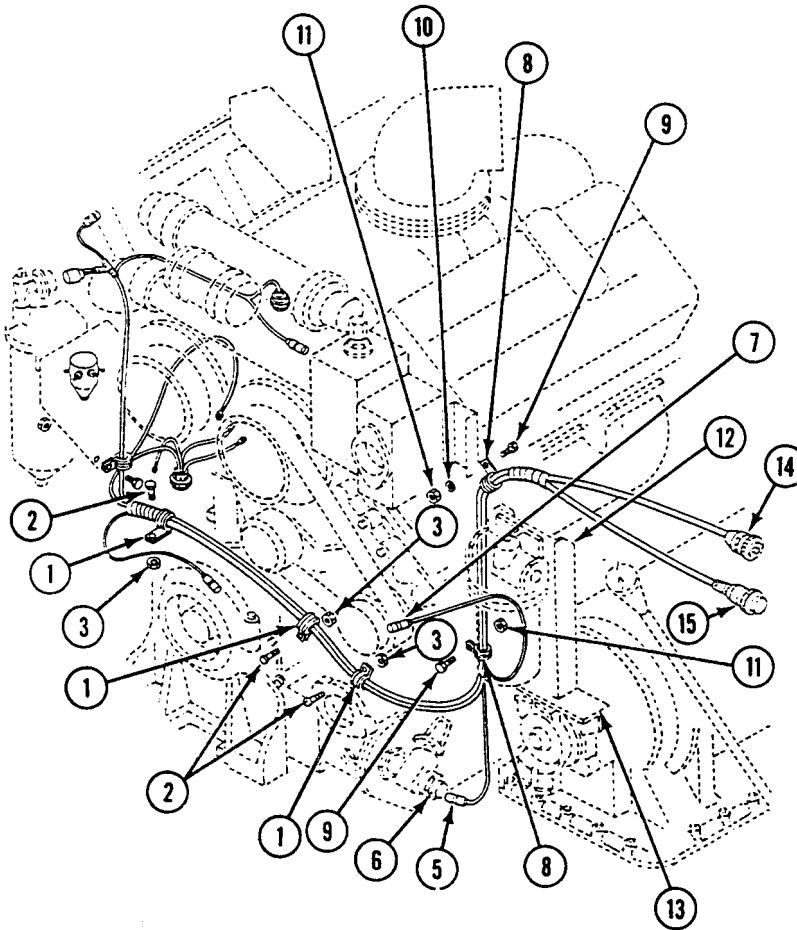
6. Install clamp (15), screw (14), and new lock nut (13) securing power plant wiring harness (16) to fuel filter bracket (17).
7. Install circuit 74A lead (11), washer (10), and nut (9) on starter relay (12).
8. Install circuit 74C lead (7), circuit 6 lead (6), three new lock washers (5), washer (4), and nut (3) on starter solenoid (8).
9. Connect circuit 34 lead (1) to engine oil low pressure switch (2).



REPLACE POWER PLANT WIRING HARNESS (M548A1) — Continued

0026 00

10. Install three clamps (1), screws (2), and new lock nuts (3) securing power plant wiring harness (4) to brackets.
11. Connect circuit 327 lead (5) to transmission oil high temperature switch (6).
12. Connect circuit 328 lead (7) to differential oil high temperature switch.
13. Install two clamps (8), screws (9), new lock washer (10), and new lock nuts (11) securing power plant wiring harness (4) on top of bracket (12) and cross-shaft (13).
14. Connect circuit 6 connector (14) and multiple connector (15) to battery compartment bulkhead.



FOLLOW-THROUGH STEPS

1. Install hull bottom access cover (see your -10).
2. Connect battery negative lead (see your -20).
3. Lower cab personnel center seat and driver's seat (see your -10).

END OF TASK

CHAPTER 7

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR TRANSMISSION

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|---|---------------------|
| REMOVE/INSTALL TRANSMISSION (M548A1)..... | 0027 00 |
| REPLACE TRANSMISSION (M548A1)..... | 0028 00 |
| REPLACE TRANSMISSION (M548A3)..... | 0029 00 |

REMOVE/INSTALL TRANSMISSION (M548A1)

0027 00

THIS WORK PACKAGE COVERS:

Removal (page 0027 00-2).
 Installation (page 0027 00-9).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H
 Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Transmission Hoisting Adapter (WP 0078 00, Item 1)
 Socket Wrench Set, 3/8 Inch Drive
 (WP 0078 00, Item 79)
 Torque Wrench (WP 0078 00, Item 83)
 Torque Wrench (WP 0078 00, Item 85)
 Lifting device with rated lift capability of at least 400 lb
 (182 kg)

References

See your -20

Equipment Condition

Power plant removed from carrier (see your -20)
 Power plant blocked (see your -20)
 Winch power takeoff removed (see your -20)

Materials/Parts

Antiseize compound (WP 0080 00, Item 6)
 Sealing compound (WP 0080 00, Item 35)
 Sealing compound primer (WP 0080 00, Item 37)
 Container, 1 quart (1 liter)
 Key washer (2)
 Key washer
 Key washer
 Lock nut (2)
 Lock nut (3)
 Lock nut (6)
 Lock nut
 Lock nut
 Washer (12)

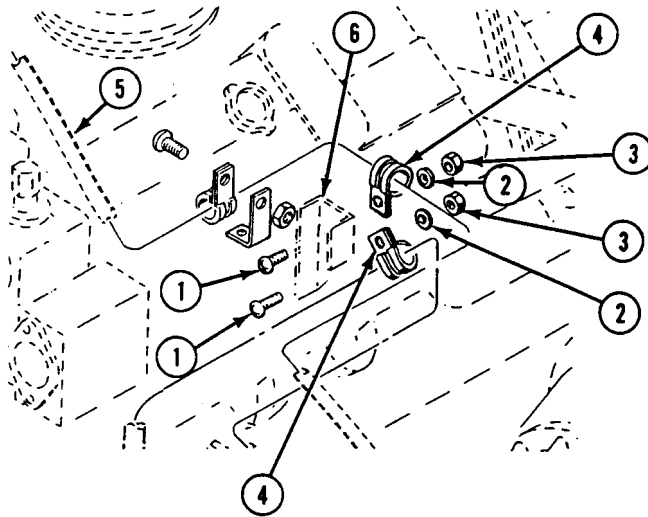
REMOVAL

NOTE

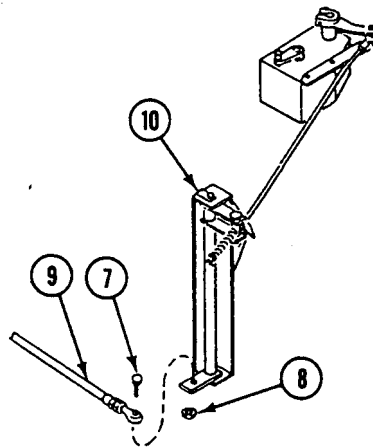
If you need to replace the engine, transmission, or transfer gearcase, drain the oil from each BEFORE power plant is removed from carrier.

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

1. Remove two screws (1), washers (2), lock nuts (3), clamps (4), and power plant wiring harness (5) from bracket (6). Discard lock nuts.



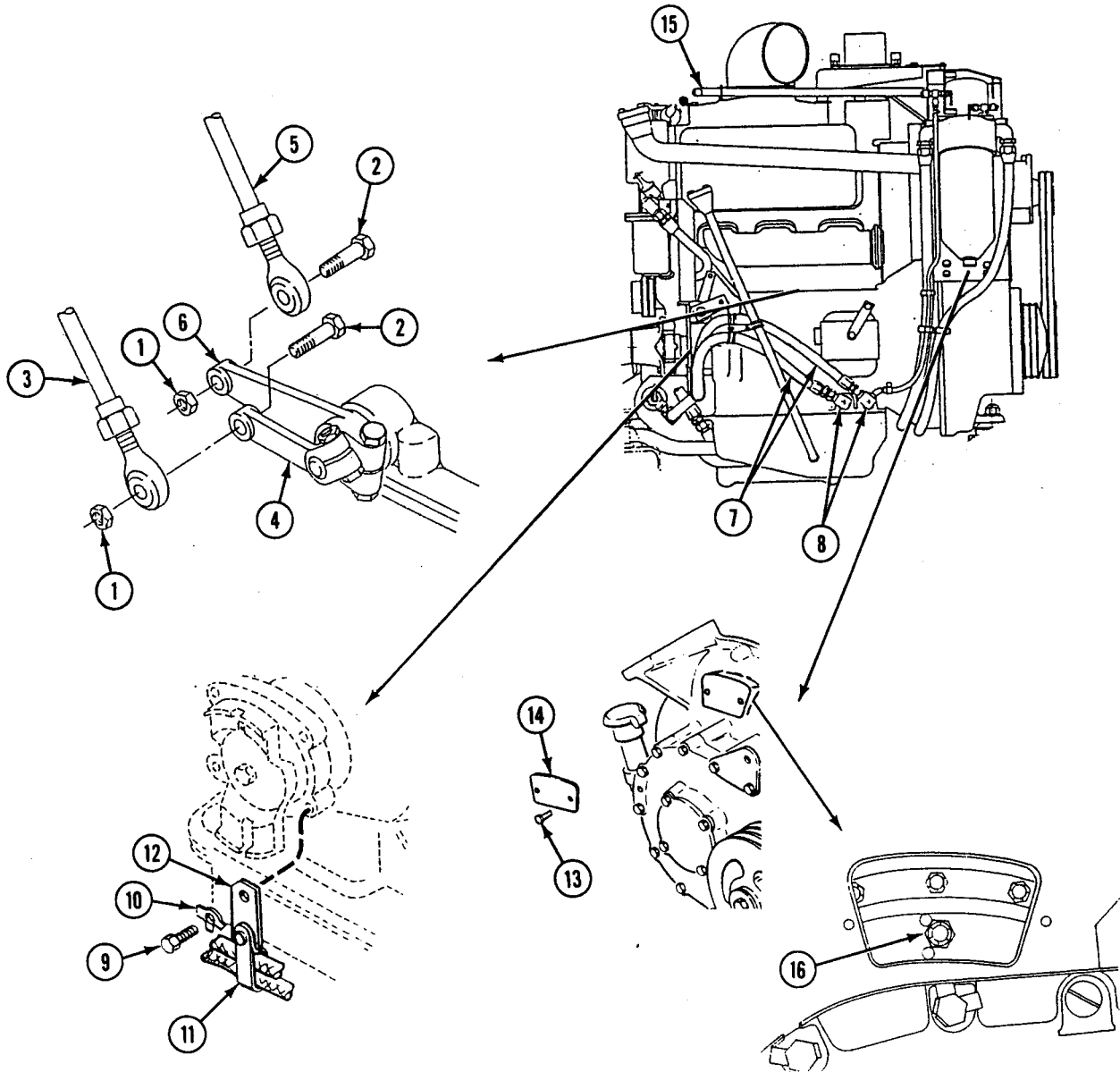
2. Remove screw (7), lock nut (8), and governor lever (9) from bracket (10). Discard lock nut.



REMOVE/INSTALL TRANSMISSION (M548A1) — Continued

0027 00

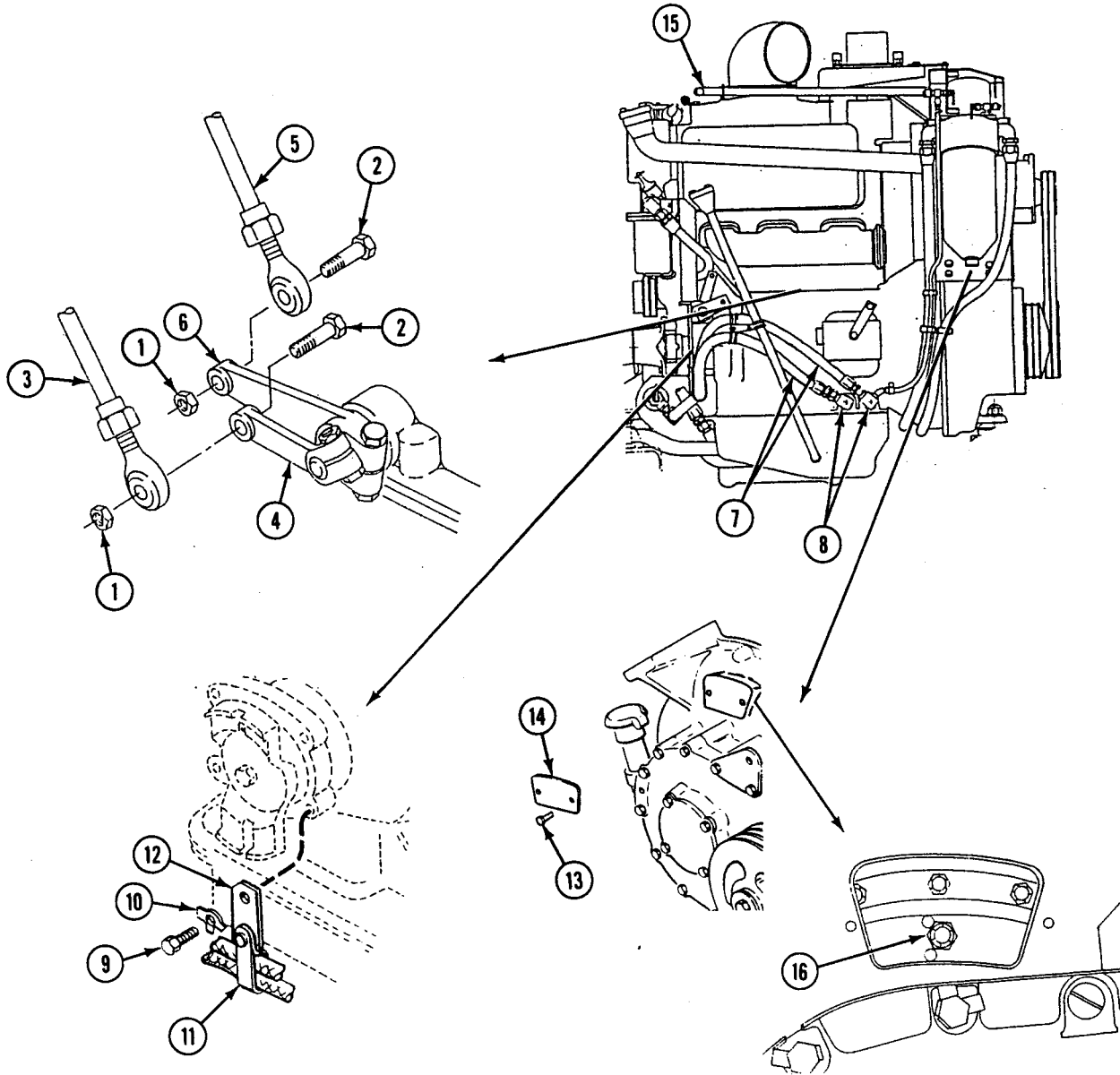
3. Remove two lock nuts (1) and screws (2). Remove throttle valve link (3) from throttle valve arm (4). Remove range selector control link (5) from range selector control arm (6). Discard lock nuts.
4. Remove two oil cooler hoses (7) from two elbows (8).
5. Remove screw (9), key washer (10), clamp (11), and bracket (12) from transmission. Discard key washer.



REMOVE/INSTALL TRANSMISSION (M548A1) — Continued

0027 00

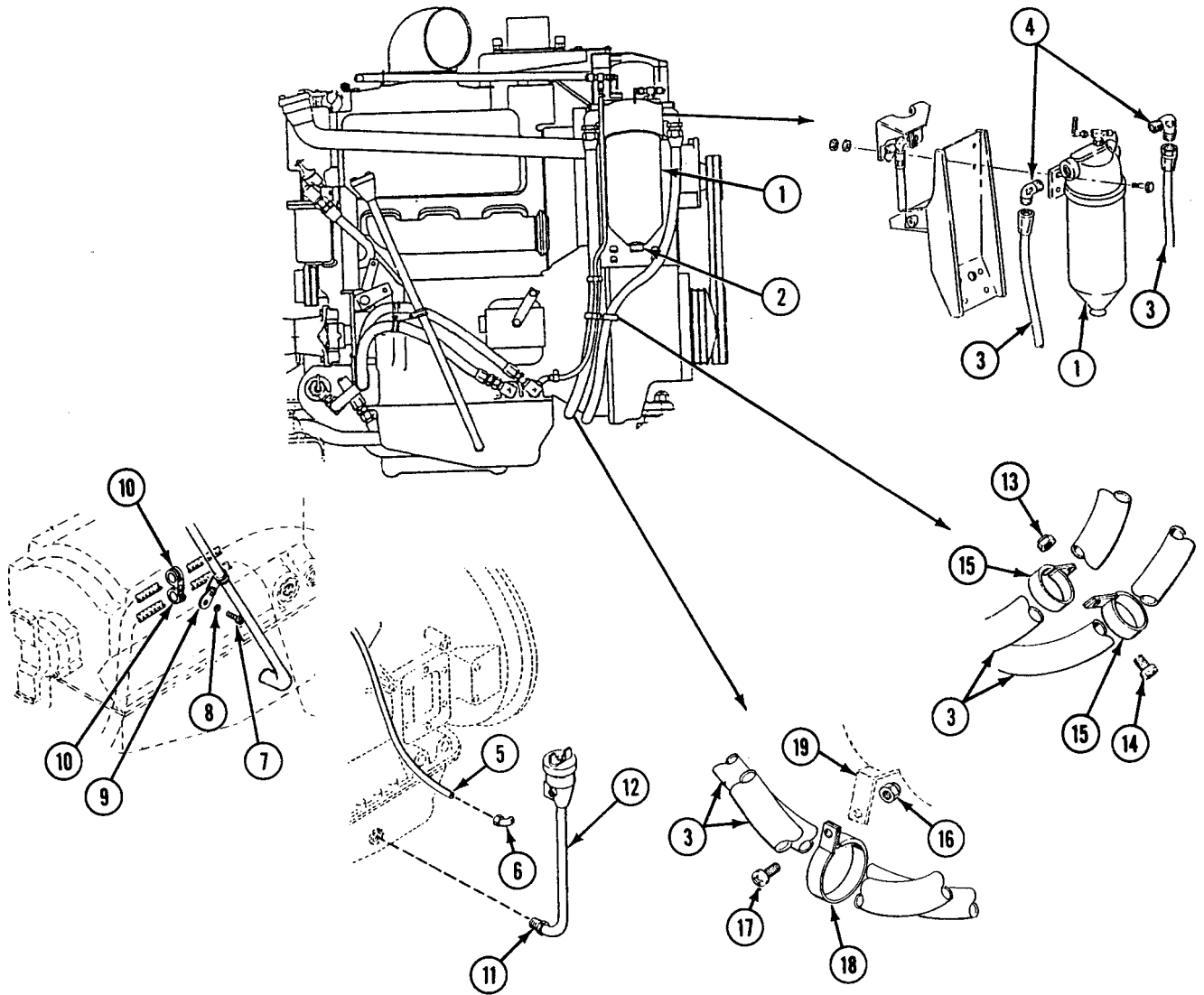
6. Remove two screws (13) and access cover (14) from transfer gearcase.
7. Release engine disconnect lever (15).
8. Turn transmission drive shaft and remove six lock nuts (16) as they appear in the access opening. Discard lock nuts.



REMOVE/INSTALL TRANSMISSION (M548A1) — Continued

0027 00

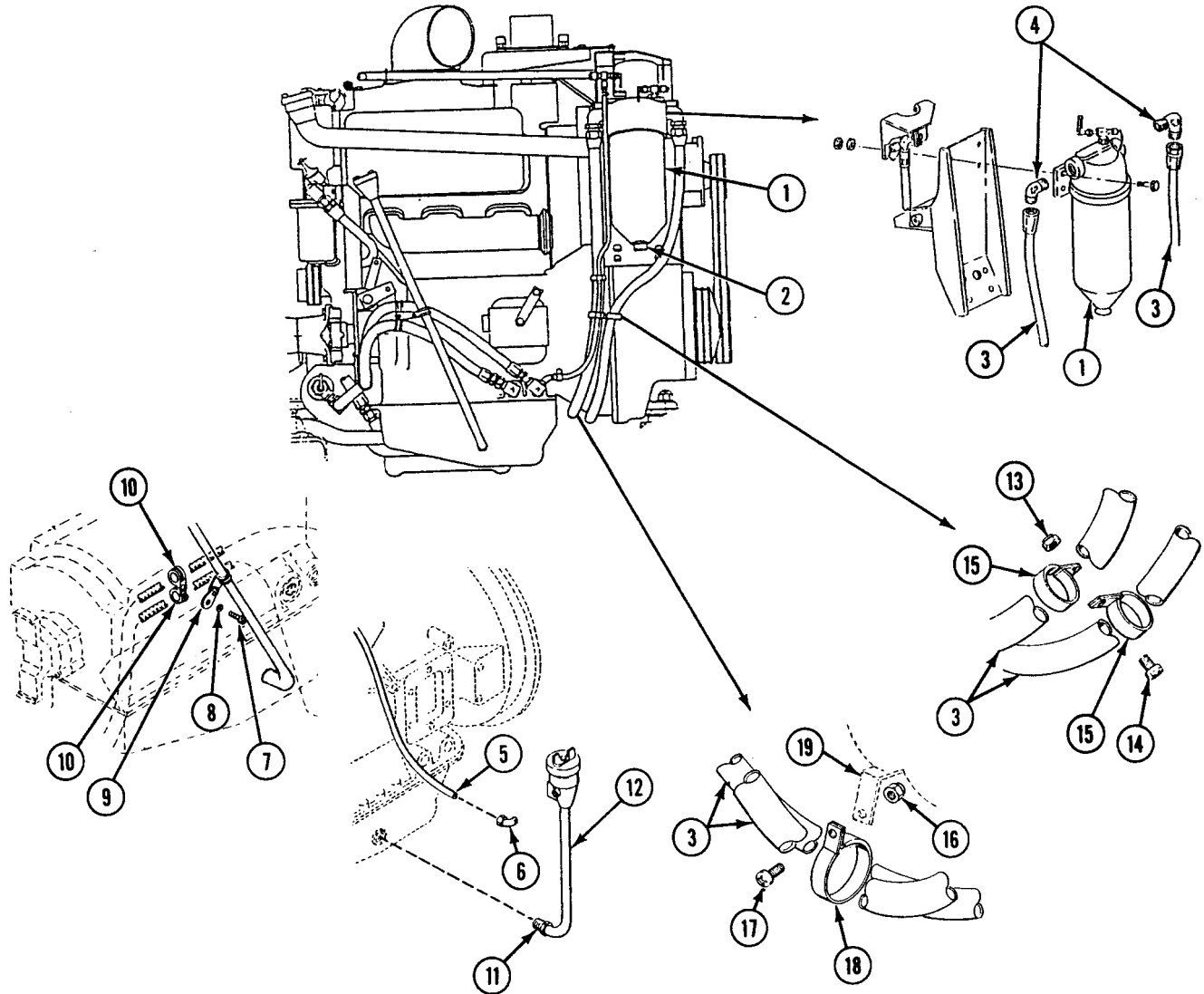
9. Place a 1-quart (1 liter) container under engine oil filter (1).
10. Remove drain plug (2) from engine oil filter (1). Allow oil to drain. Apply primer and sealing compound to threads of drain plug (2) and install in engine oil filter.
11. Disconnect two engine oil hoses (3) from two pipe-to-tube elbows (4) on engine oil filter (1).
12. Disconnect vent tube (5) from elbow (6).



REMOVE/INSTALL TRANSMISSION (M548A1) — Continued

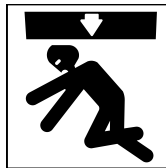
0027 00

13. Remove screw (7), key washer (8), filler tube bracket (9), and two clamps (10) from transmission. Discard key washer.
14. Loosen filler tube nut (11). Remove filler tube (12) from transmission.
15. Remove lock nut (13), screw (14), two clamps (15), and hoses (3) from transmission. Discard lock nut.
16. Remove lock nut (16), screw (17), clamp (18), and hoses (3) from bracket (19). Discard lock nut.



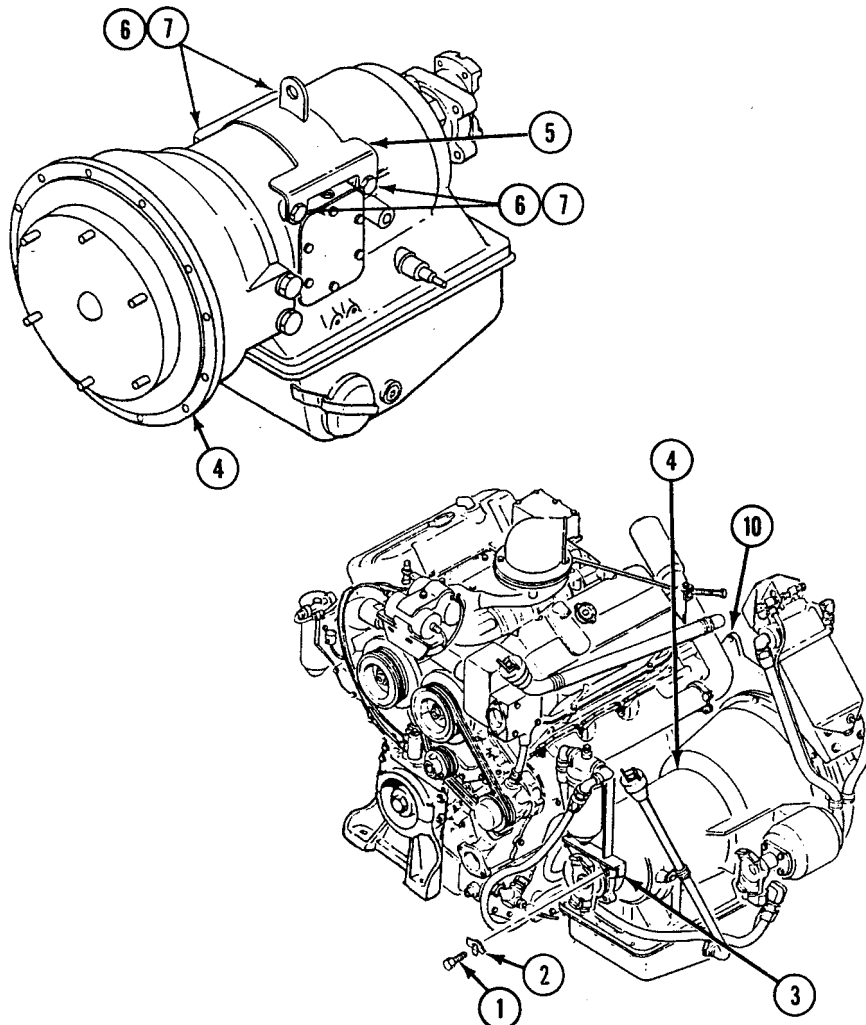
17. Remove two screws (1) and key washers (2) securing cross shaft bracket (3) to transmission (4) and position bracket with attached hoses, wiring harness, and differential oil filter to clear transmission. Discard key washer.
18. Install transmission hoisting adapter (5), four washers (6), and screws (7) to transmission (4).

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 assist. Use a lifting device.

19. Attach a lifting device of at least 400 lb (182 kg) capacity to transmission hoisting adapter (5). Have helper assist.

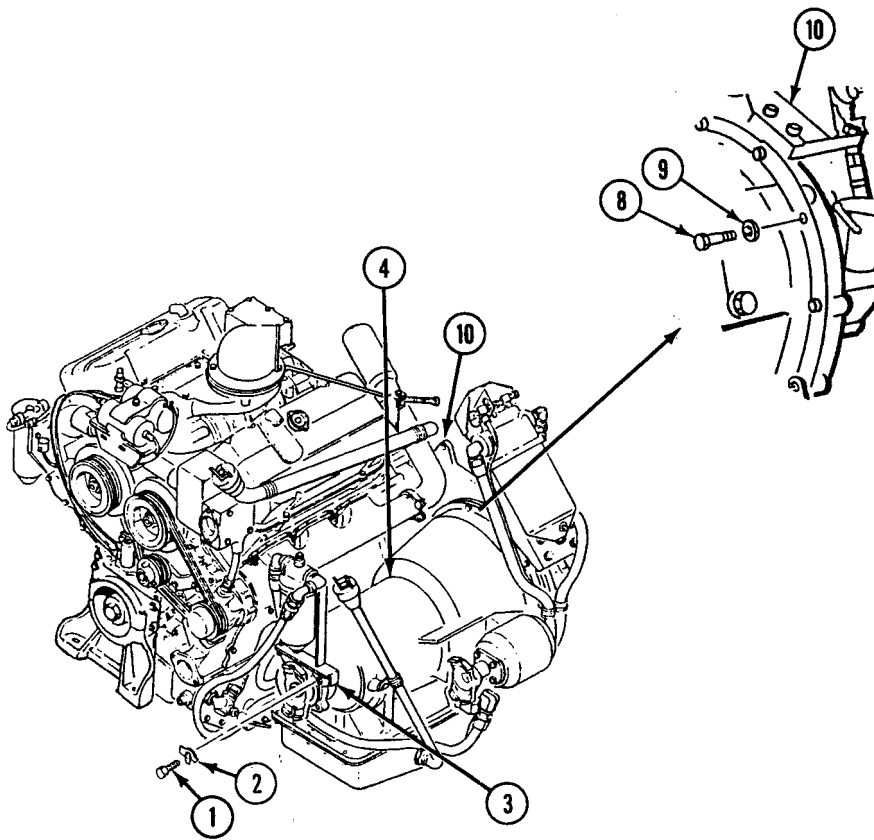


WARNING



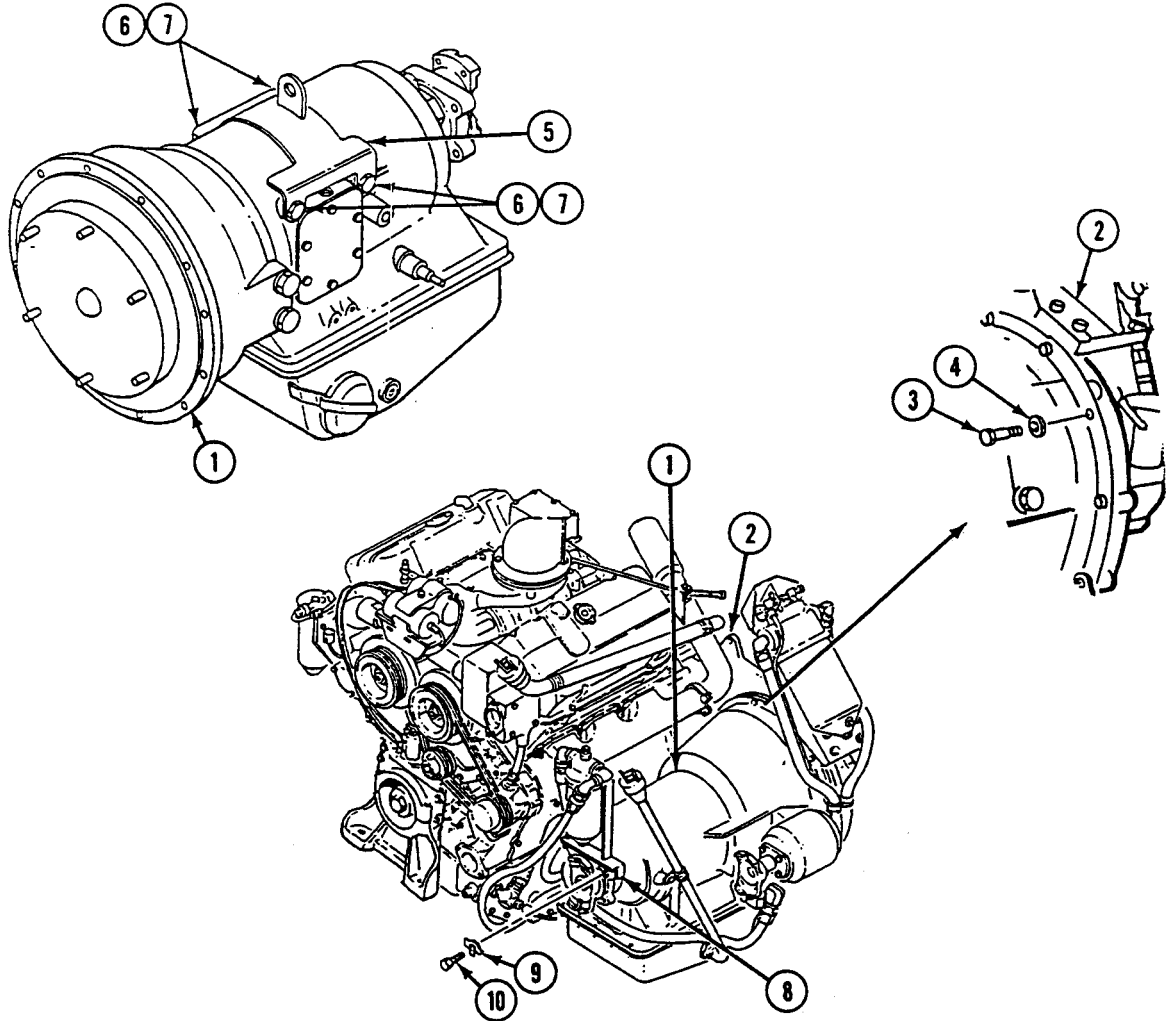
Soldiers can be injured or equipment damaged if engine or transfer gearcase falls. Ensure engine and transfer gearcase are properly blocked before removing transmission mounting screws.

20. Remove 12 screws (8), washers (9), and transmission (4) from transfer gearcase (10). Discard washers.



INSTALLATION

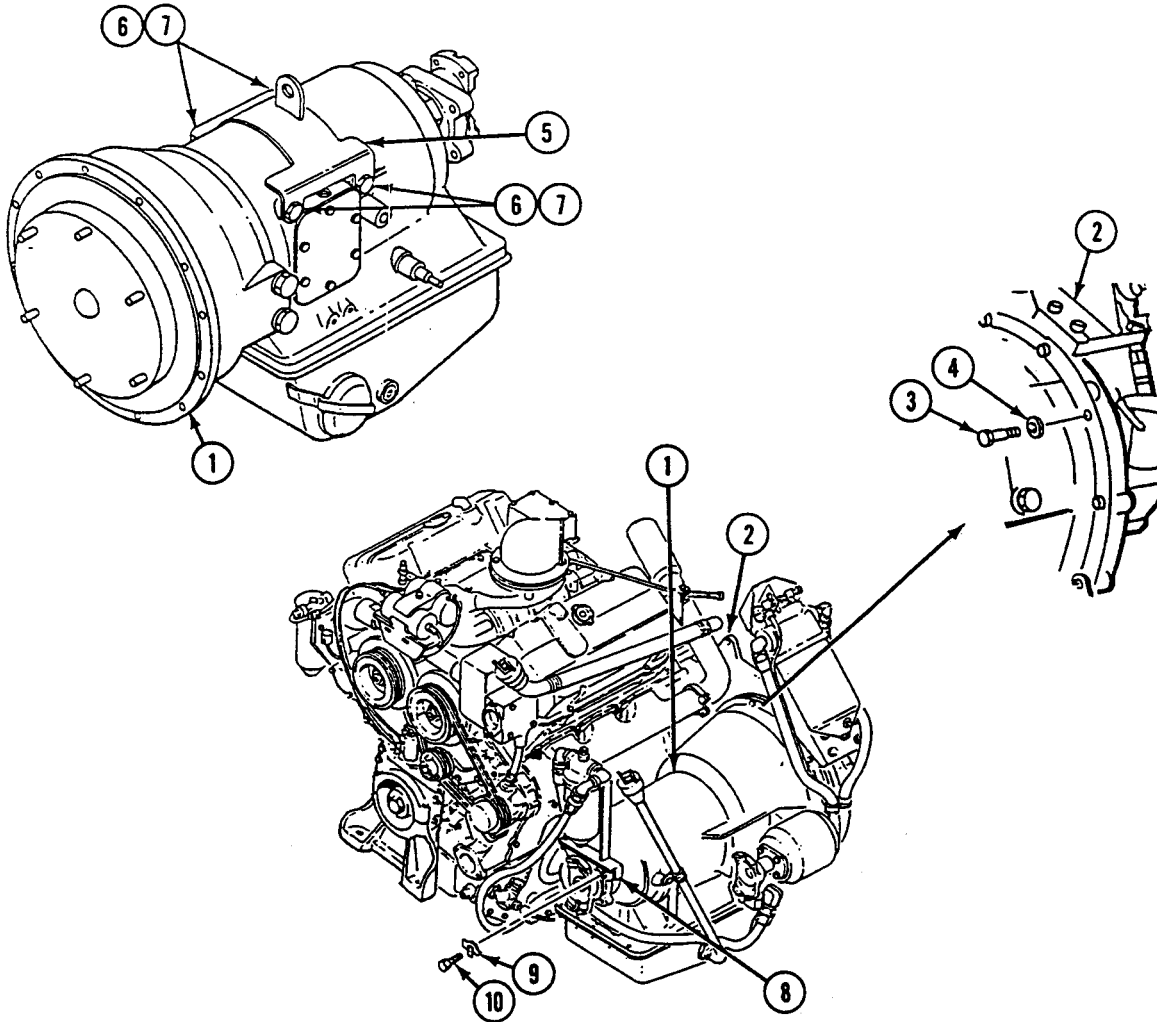
1. Position transmission (1) on transfer gearcase (2). Turn transmission drive shaft until transmission torque converter studs align with transfer gearcase drive plate holes. Have helper assist.
2. Apply a thin coat of antiseize compound to cleaned threads of 12 screws (3).



REMOVE/INSTALL TRANSMISSION (M548A1) — Continued

0027 00

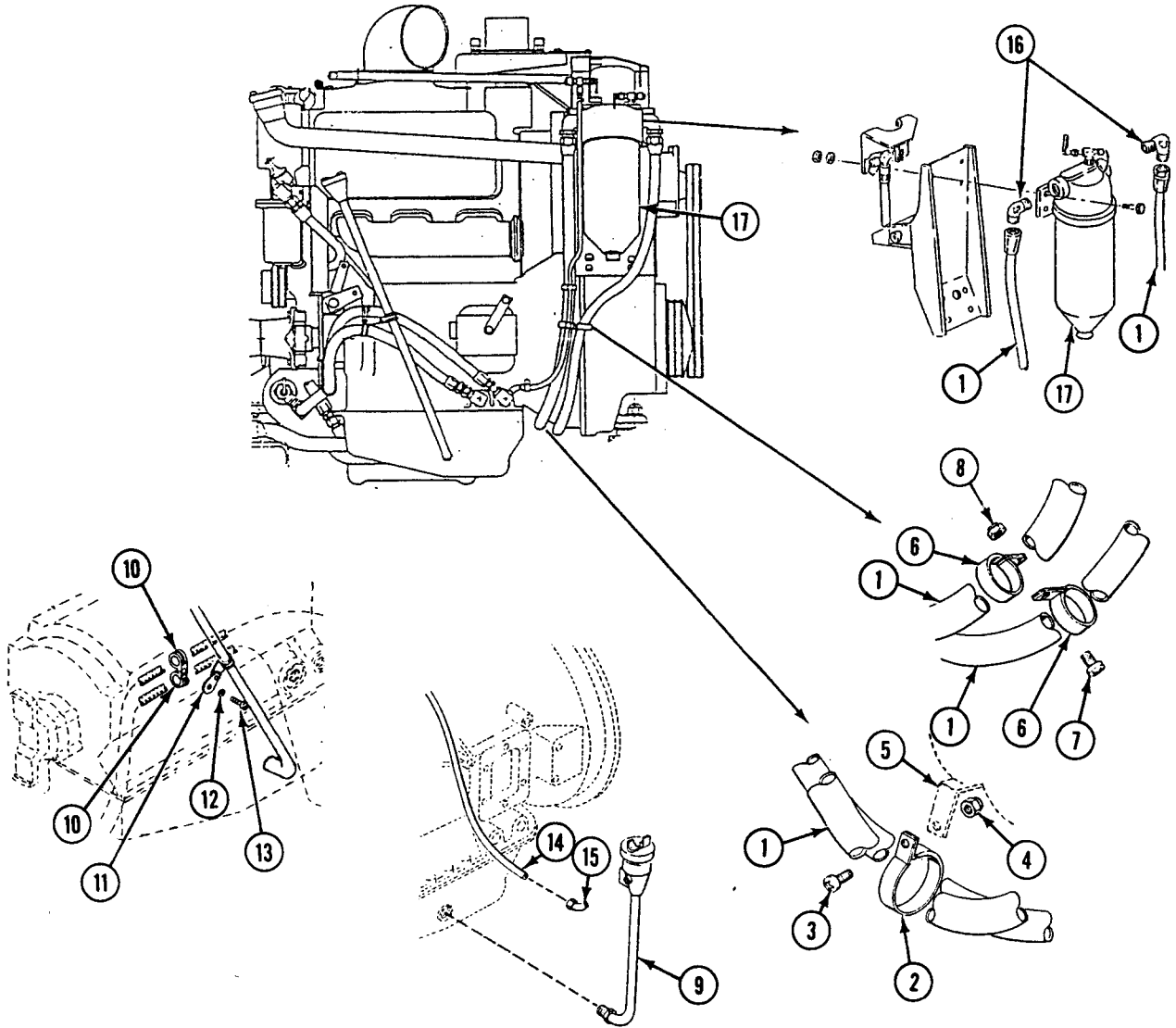
3. Install 12 screws (3), new washers (4), and transmission (1) on transfer gearcase. Have helper (H) assist. Tighten screws to 252-300 lb-in (28-34 N•m) torque. Loosen screws and retighten to 252-300 lb-in (28-34 N•m) torque.
4. Remove hoisting adapter (5), four screws (6), and washers (7) from transmission.
5. Position cross shaft bracket (8) with attached hoses, wiring harness, and differential oil filter on transmission and install with two new key washers (9) and screws (10).



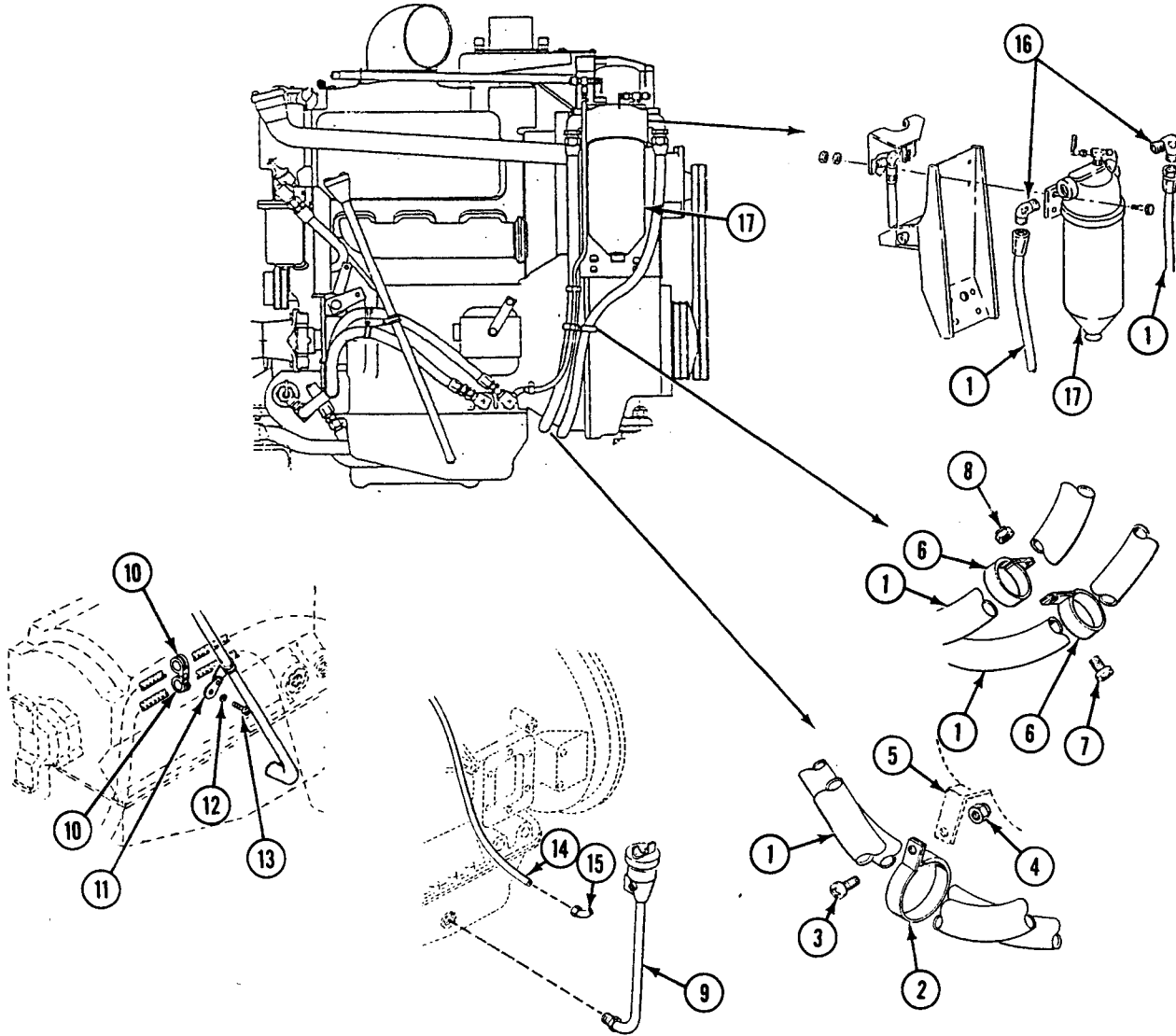
REMOVE/INSTALL TRANSMISSION (M548A1) — Continued

0027 00

6. Install two engine oil hoses (1), clamp (2), screw (3), and new lock nut (4) on bracket (5).
7. Install two engine oil hoses (1), two clamps (6), screw (7), and new lock nut (8) on transmission.
8. Install filler tube (9) on transmission.



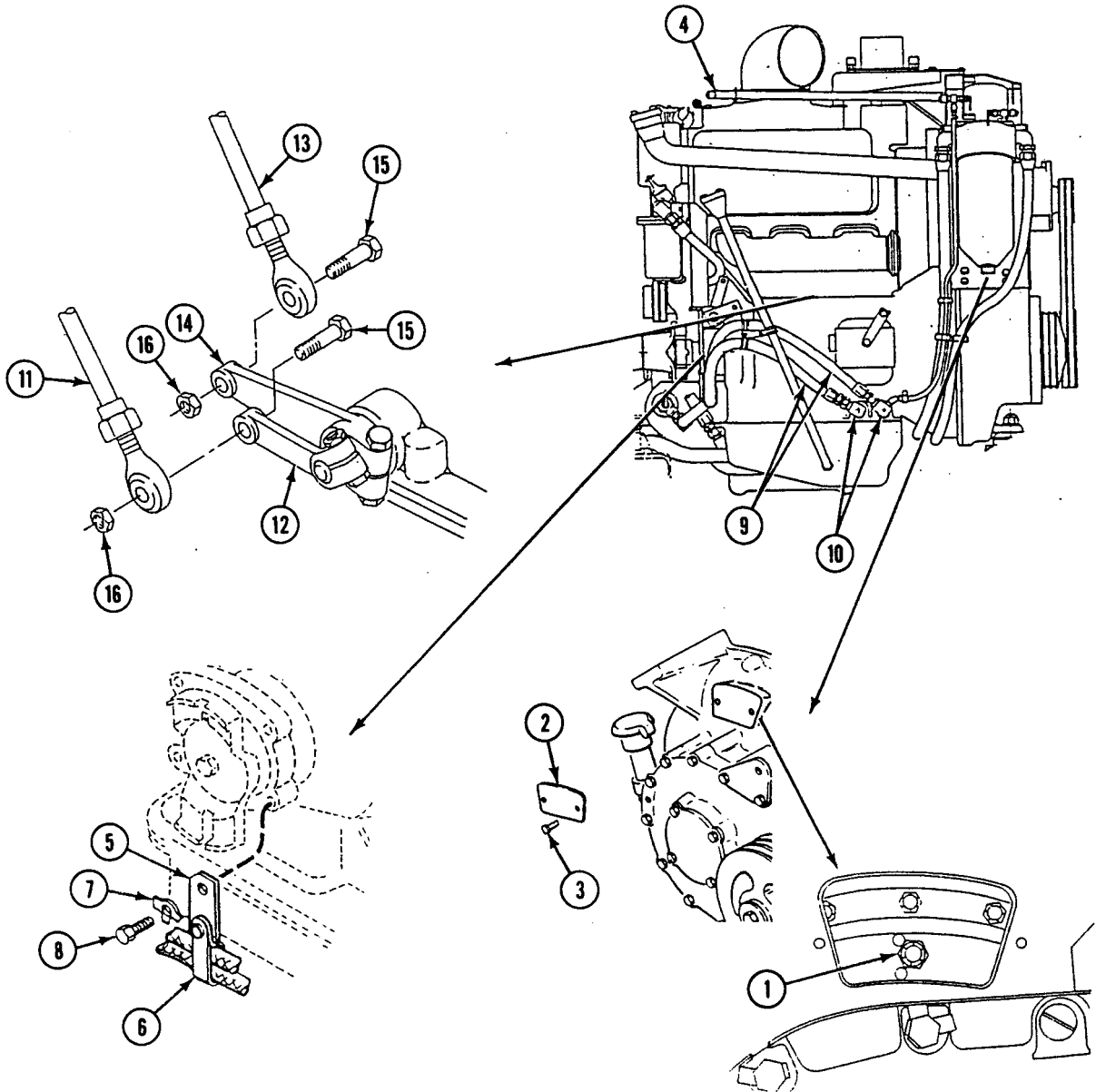
9. Install two clamps (10), filler tube bracket (11), new key washer (12), and screw (13) on transmission.
10. Connect vent tube (14) to elbow (15).
11. Connect two engine oil hoses (1) to two pipe-to-tube elbows (16) on engine oil filter (17).



REMOVE/INSTALL TRANSMISSION (M548A1) — Continued

0027 00

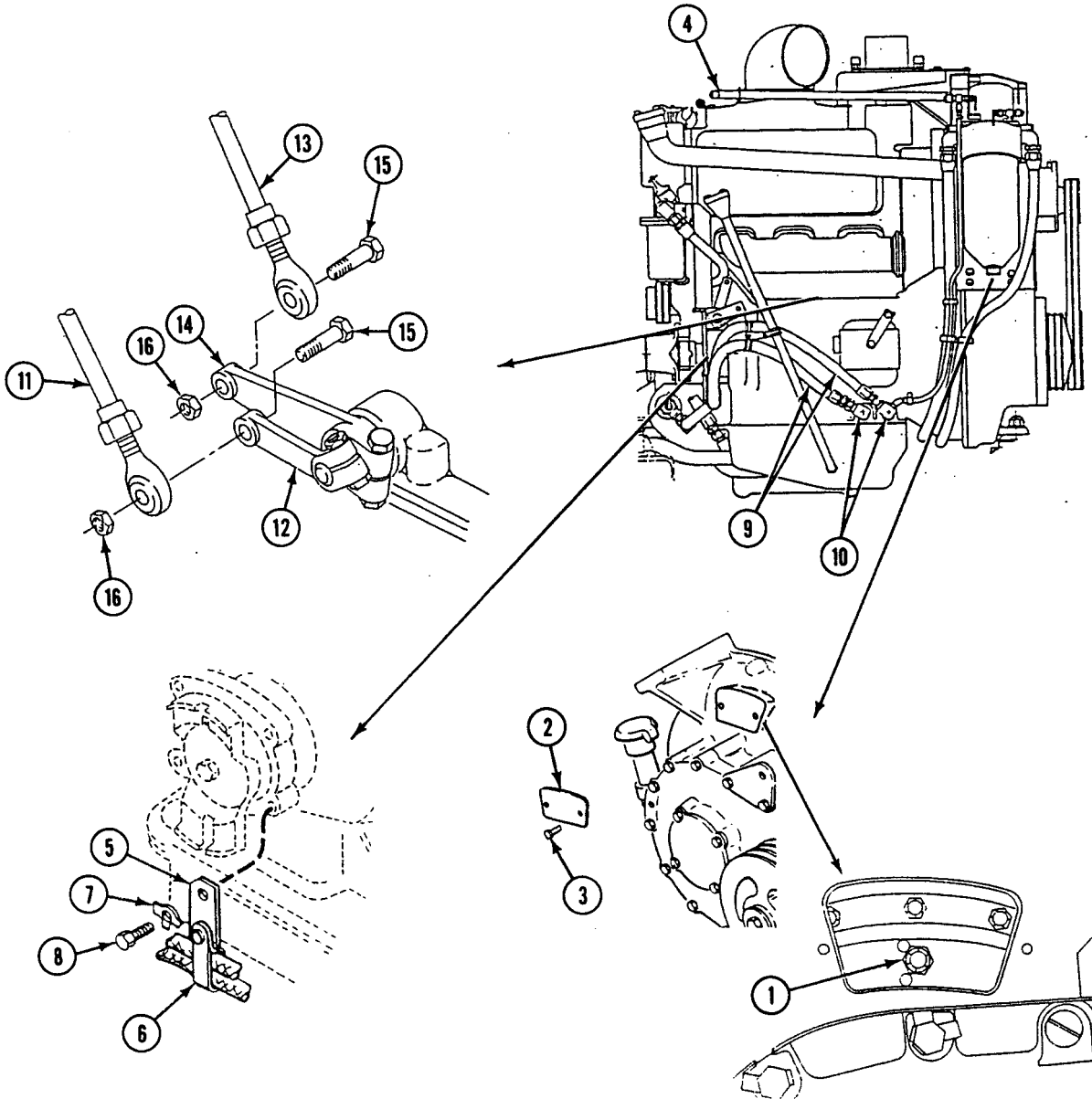
12. Turn transmission drive shaft and install six new lock nuts (1) on converter studs. Tighten nuts to 37-40 lb-ft (50-54 N•m) torque.
13. Install access cover (2) and two screws (3) on transfer gearcase.
14. Engage engine disconnect lever (4).



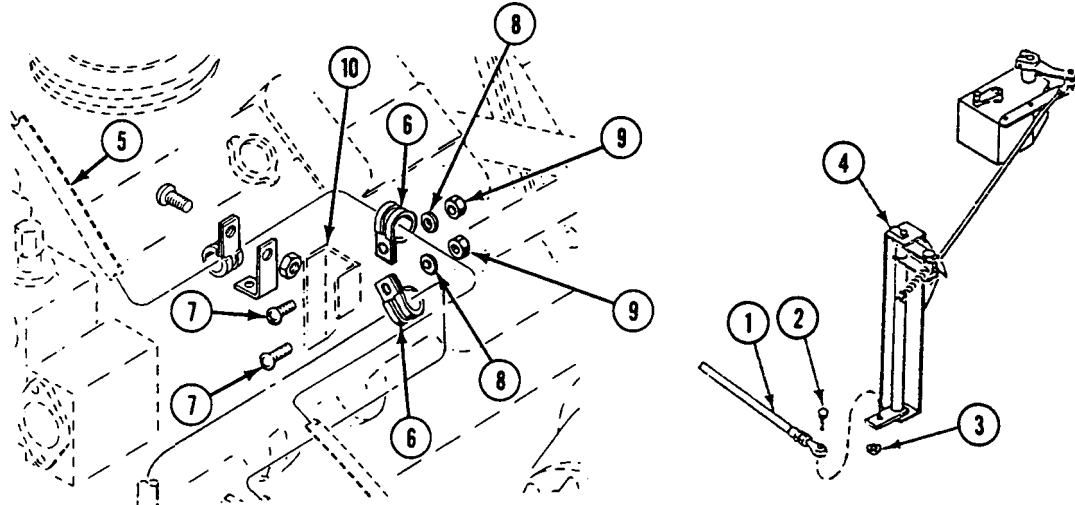
REMOVE/INSTALL TRANSMISSION (M548A1) — Continued

0027 00

15. Install bracket (5), clamp (6), new key washer (7), and screw (8) on transmission.
16. Install two oil cooler hoses (9) to two elbows (10).
17. Install throttle valve link (11) on throttle valve arm (12). Install range selector control link (13) on range selector control arm (14). Secure with two screws (15) and new lock nuts (16).



18. Install governor lever (1), screw (2), and new lock nut (3) on bracket (4).
19. Install power plant wiring harness (5), two clamps (6), screws (7), washers (8), and new lock nuts (9) to bracket (10).

**FOLLOW-THROUGH STEPS**

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

END OF TASK

REPLACE TRANSMISSION (M548A1)

0028 00

THIS WORK PACKAGE COVERS:

Removal (page 0028 00-2).
Installation (page 0028 00-4).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)

References

See your -20

Materials/Parts

Antiseize compound (WP 0080 00, Item 6)
Sealing compound (WP 0080 00, Item 35)
Sealing compound primer (WP 0080 00, Item 37)
Key washer (2)
Lock nut
Packing (2)

Equipment Condition

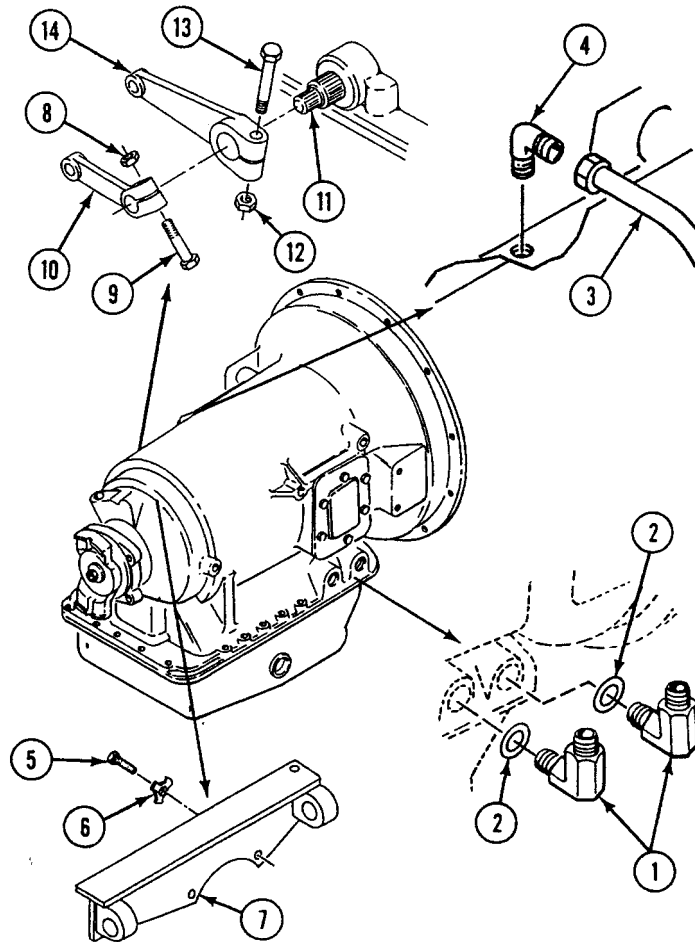
Transmission oil drained (see your -20)
Power plant removed (see your -20)
Power plant blocked (see your -20)
Transmission removed from transfer gearcase
(WP 0027 00)

REMOVAL

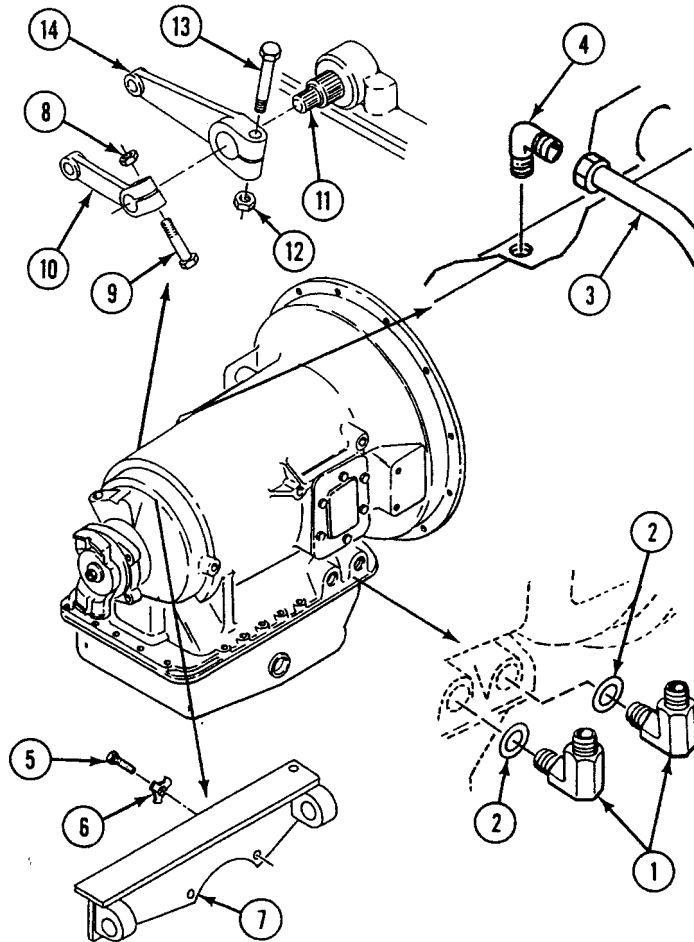
CAUTION

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.

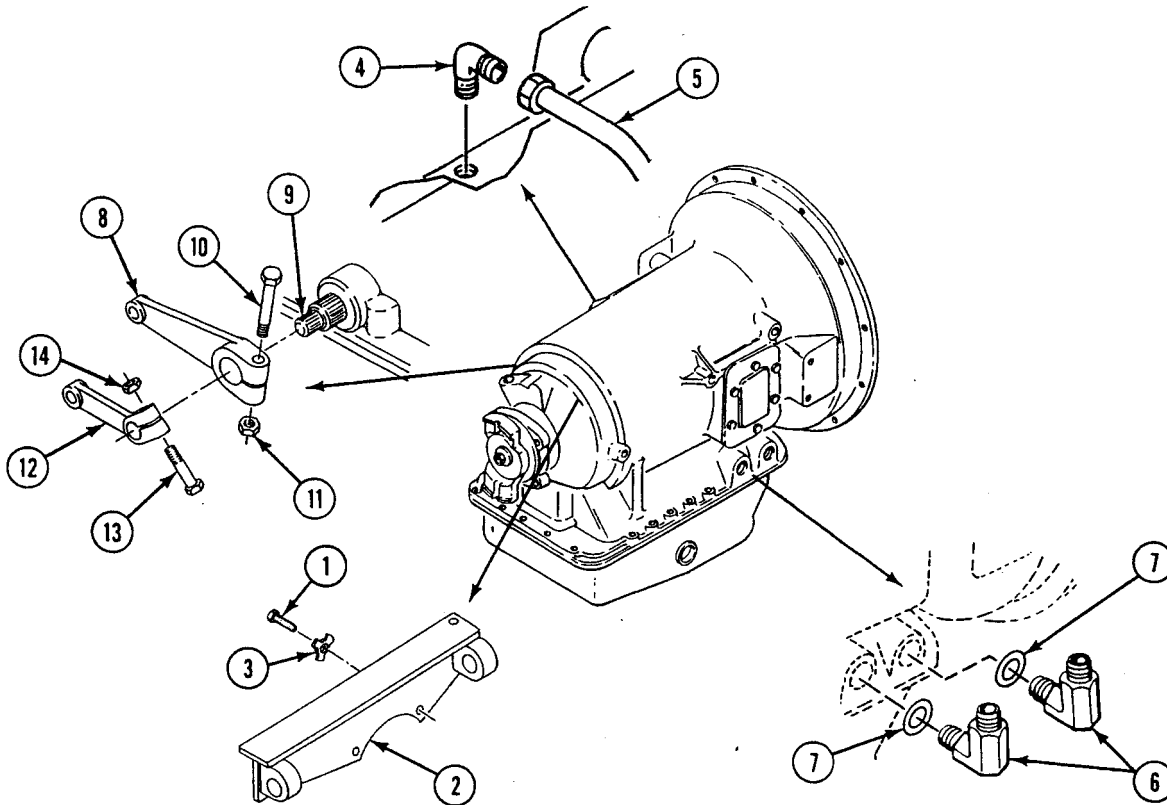


4. Remove two screws (5), key washers (6), and cross-shaft bracket (7) from transmission.
5. Remove lock nut (8), screw (9), and throttle valve arm (10) from transmission shaft (11). Discard lock nut.
6. Remove nut (12), screw (13), and range selector arm (14) from transmission shaft (11).

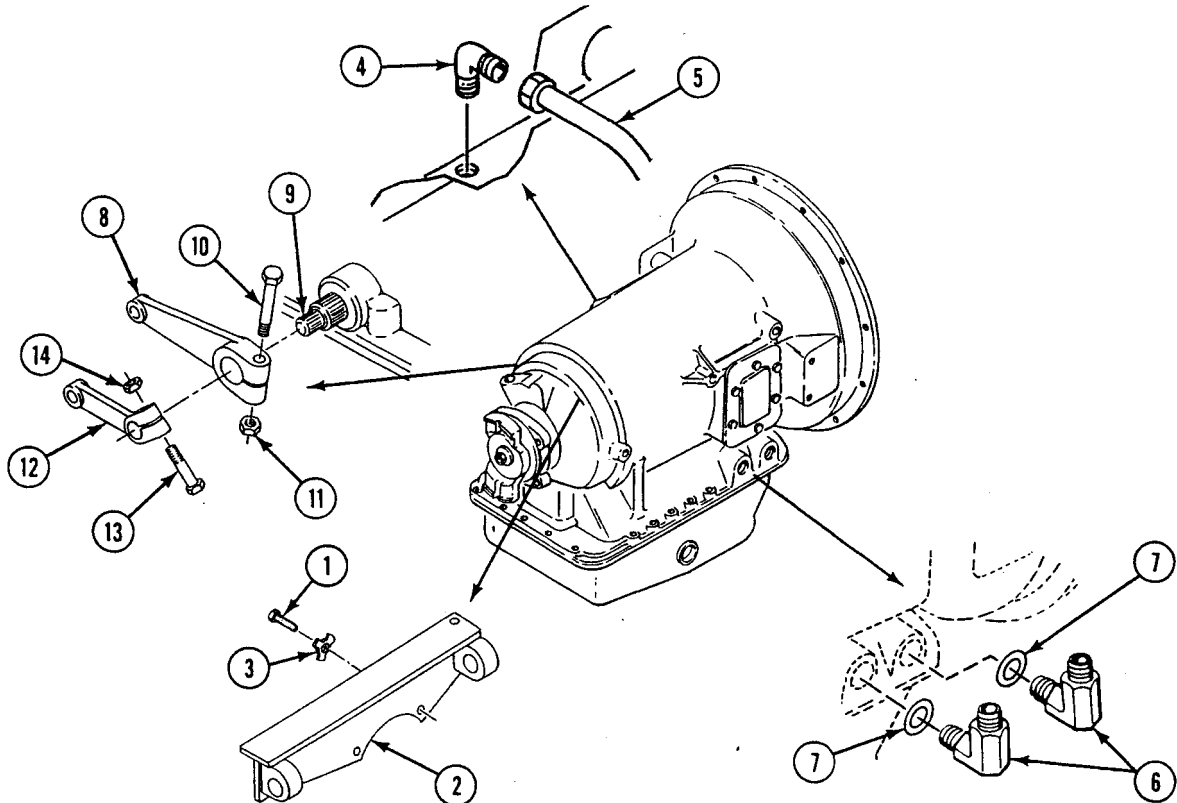


INSTALLATION

1. Apply a thin coat of antiseize compound to cleaned threads of two screws (1).
2. Install cross-shaft bracket (2) on transmission. Secure with two screws (1) and new key washers (3).
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 (5) to vent tube elbow (4).



6. Apply a thin, even coat of primer and then sealing compound to cleaned external threads of elbows (6). Do not apply primer or sealing compound beyond small end of threads.
7. Install two new packings (7) and elbows (6) in transmission.
8. Position range selector arm (8) on transmission shaft (9) with offset side of arm toward transmission and clamping screw hole aligned with flat on shaft. Secure with screw (10) and nut (11).
9. Position throttle valve arm (12) on transmission shaft (9) with offset side of arm away from transmission and clamping screw hole aligned with flat on shaft. Secure with screw (13) and new lock nut (14).



FOLLOW-THROUGH STEPS

1. Install transmission on transfer gearcase (WP 0027 00).
2. Install power plant in carrier (see your -20).
3. Fill transmission (see your -20).

END OF TASK

REPLACE TRANSMISSION (M548A3)

0029 00

THIS WORK PACKAGE COVERS:

Removal (page 0029 00-2).
 Installation (page 0029 00-6).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H
 Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Engine and Transmission Sling (WP 0078 00, Item 51)
 Torque Wrench (WP 0078 00, Item 85)
 Lifting device with rated capacity of 1700 lbs (772 kg)

References

See your -20
 TM 9-2520-272-34&P

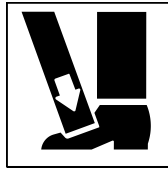
Materials/Parts

Antiseize compound (WP 0080 00, Item 6)
 Lock nut (2)
 Lock screw (10)
 Packing
 Packing
 Packing (2)

Equipment Condition

Transmission oil drained (see your -20)
 Power plant on the power plant stand (WP 0052 00)
 Transmission dipstick and filler neck removed
 (see your -20)
 Transmission wiring harness removed (see your -20)

REMOVAL

WARNING

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

CAUTION

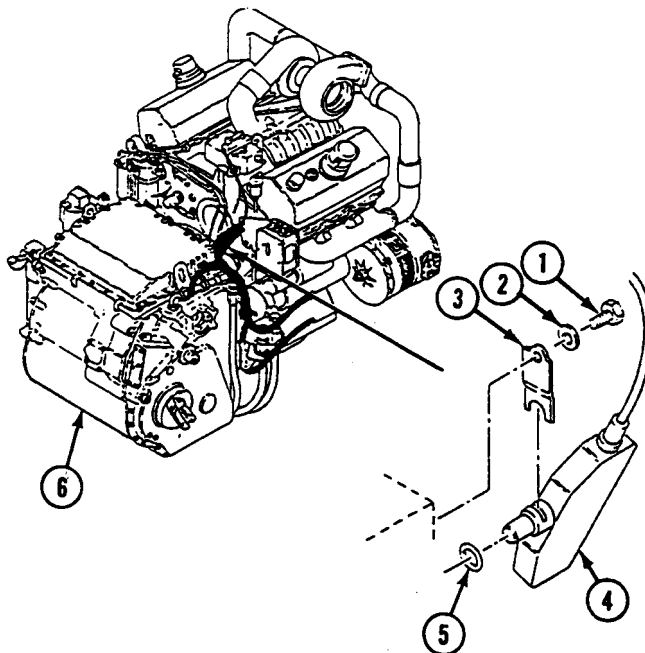
Engine jack screw could be damaged if the two screws and nuts attaching the jack screw to the main frame are not removed. Remove the screws and nuts before towing, lifting or transporting an empty engine stand.

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

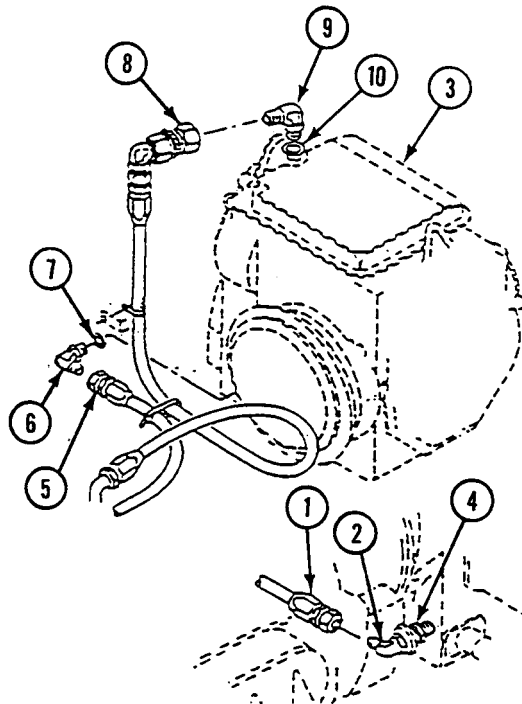
NOTE

Wiring harnesses and hoses connected to both engine and transmission are removed from transmission in this procedure and stay attached to engine.

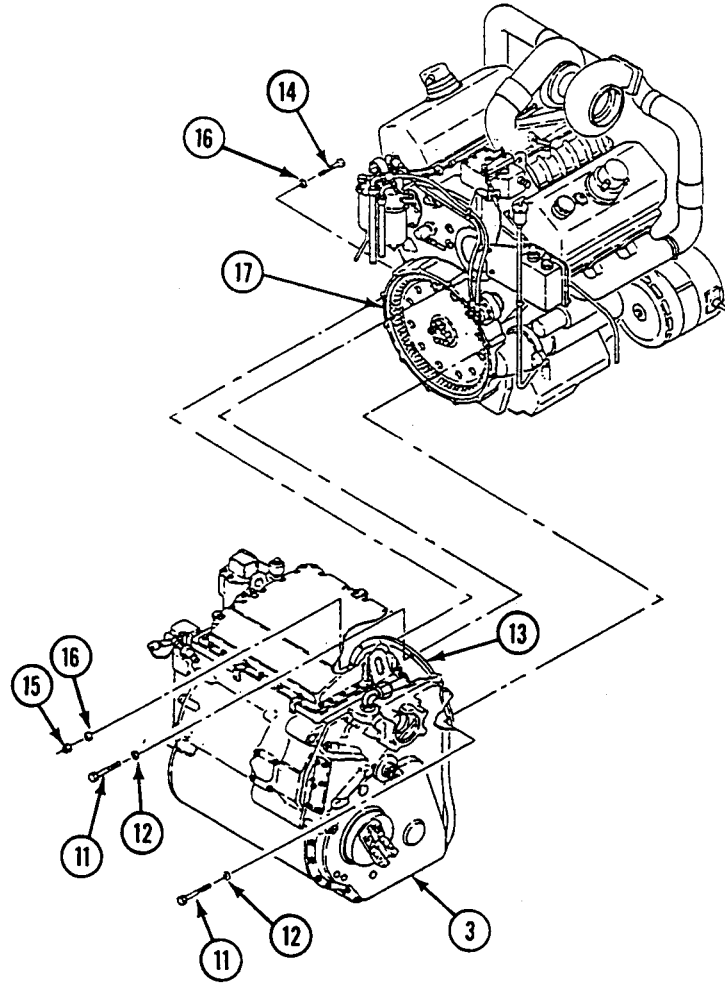
1. Remove screw (1), washer (2), and retainer (3) from throttle valve modulator (4).
2. Remove throttle valve modulator (4) and packing (5) from transmission (6). Remove packing from throttle valve modulator. Discard packing.



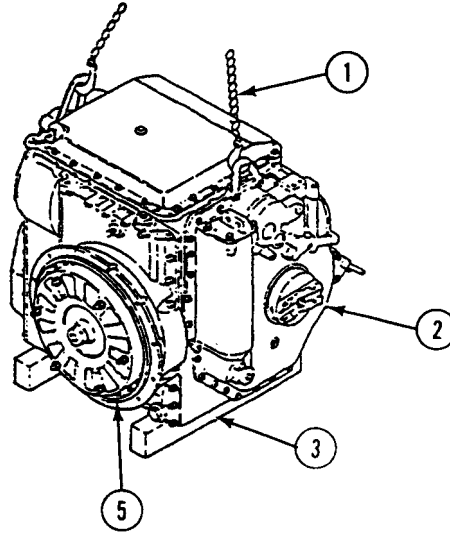
3. Disconnect hose (1) from elbow adapter (2) on bottom of transmission (3).
4. Remove elbow adapter (2) and packing (4). Discard packing.
5. Disconnect hose (5) from elbow adapter (6) on bottom of transmission (3).
6. Remove elbow adapter (6) and packing (7) from housing. Discard packing.
7. Disconnect hose (8) from elbow adapter (9) on top of transmission (3).
8. Remove elbow adapter (9) and packing (10) from housing. Discard packing.



9. Remove 10 lock screws (11) and washers (12) from transmission input housing (13). Discard lock screws.
10. Remove two screws (14), lock nuts (15), and four washers (16) from transmission (3) and engine flywheel housing (17). Discard lock nuts.
11. Move engine away from transmission (3) until splined coupling separates.

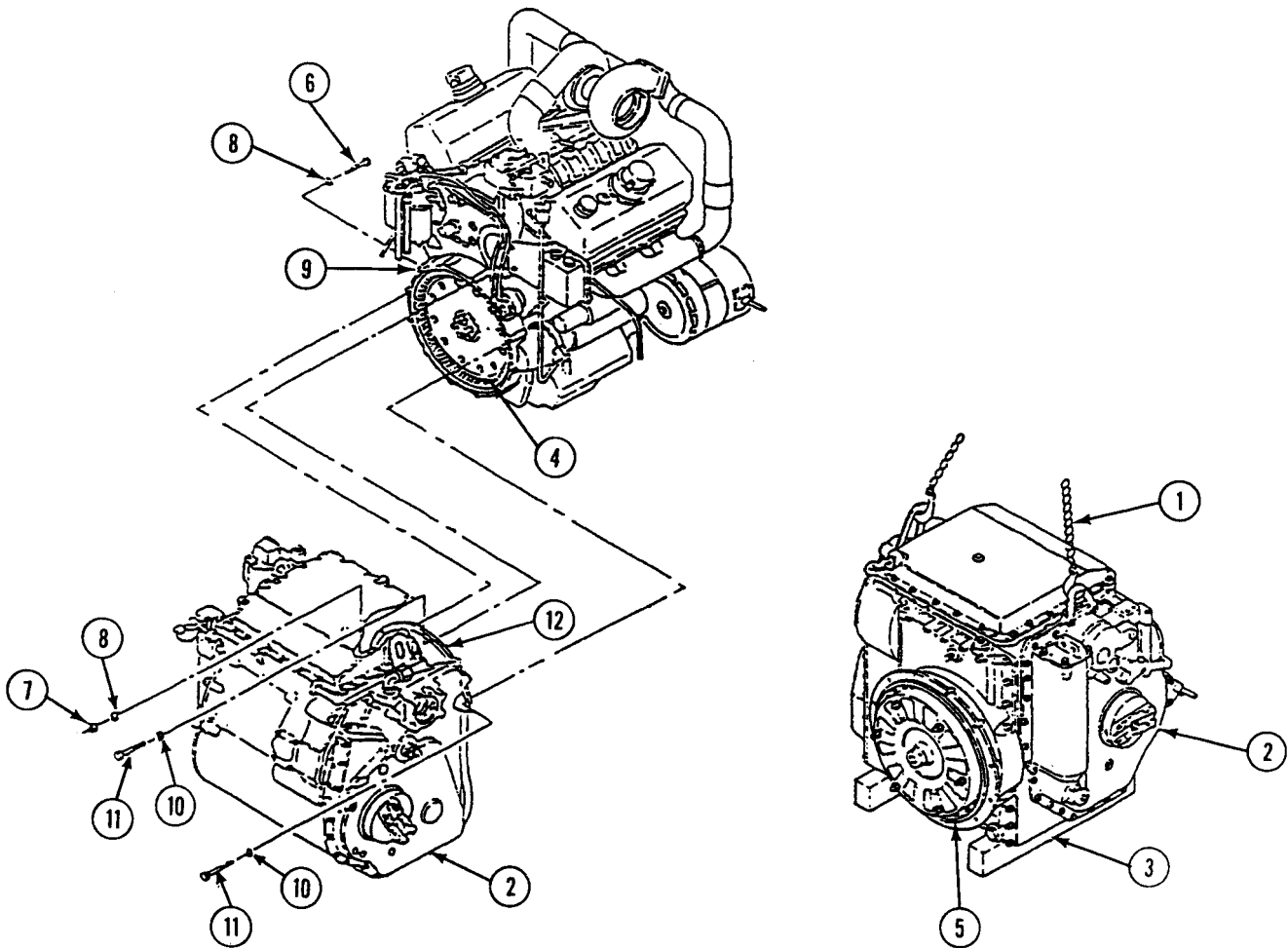


12. Attach lifting device and sling (1) to transmission (2). Have helper assist.
13. Remove transmission (2) from power plant stand and set on two blocks (3). Remove sling. Have helper assist.

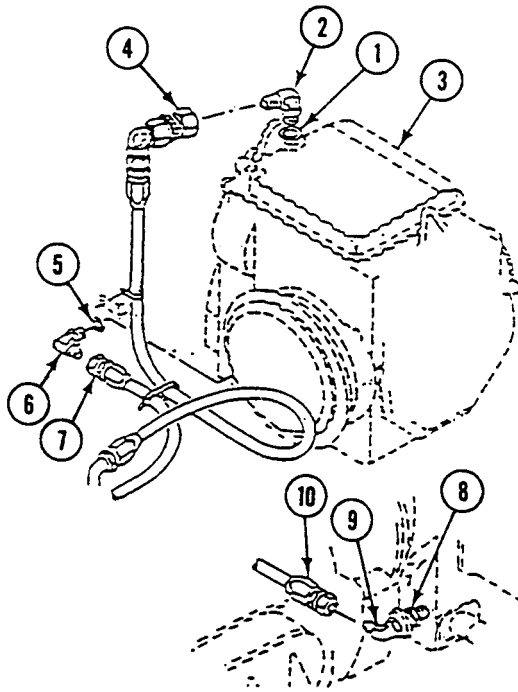


INSTALLATION

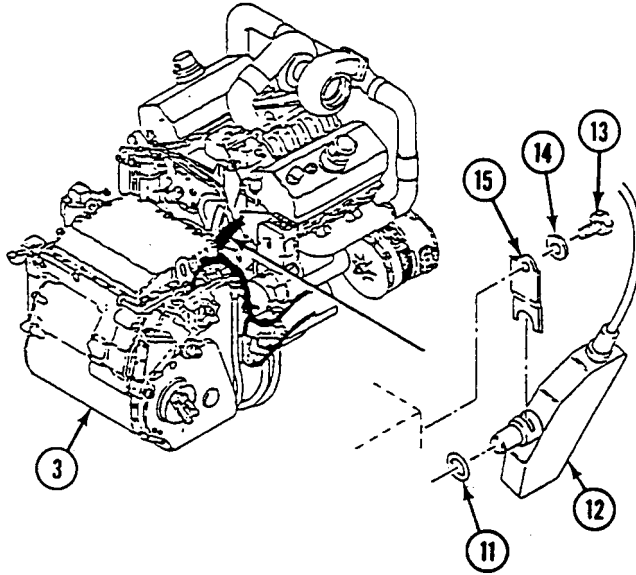
1. Remove new transmission from shipping container. See TM 9-2520-272-34&P. Set transmission on power plant stand. Use lifting device. Have helper assist.
2. Clean engine splined coupling (4) and transmission splined coupling grooves (5). Apply antiseize compound to splines.
3. Move transmission (2) onto engine splined coupling (4). Install two screws (6), new lock nuts (7) and four washers (8) holding transmission to engine flywheel housing (9). Tighten screws to 25-27 lb-ft (34-37 N•m) torque. Have helper assist.
4. Install 10 washers (10) and new lock screws (11) holding transmission to input housing (12). Tighten screws to 38-41 lb-ft (52-55 N•m) torque.



5. Install new packing (1) in housing. Install elbow adapter (2) on transmission (3).
6. Connect hose (4) to elbow adapter (2).
7. Install new packing (5) and elbow adapter (6) in housing.
8. Connect hose (7) to elbow adapter (6).
9. Install new packing (8) and elbow adapter (9) in housing.
10. Connect hose (10) to elbow adapter (9).



11. Install new packing (11) on throttle valve modulator (12). Install throttle valve modulator in transmission (3).
12. Install screw (13), washer (14), and retainer (15) on throttle valve modulator (12) and transmission (3).

**FOLLOW-THROUGH STEPS**

1. Install transmission wiring harness (see your -20).
2. Install transmission dipstick and filler neck (see your -20).
3. Fill transmission (see your -20).

END OF TASK

CHAPTER 8

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR TRANSFER AND FINAL DRIVE ASSEMBLIES

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|--|---------------------|
| REMOVE/INSTALL TRANSFER GEARCASE (M548A1)..... | 0030 00 |
| REPLACE TRANSFER GEARCASE (M548A1)..... | 0031 00 |

REMOVE/INSTALL TRANSFER GEARCASE (M548A1)

0030 00

THIS WORK PACKAGE COVERS:

Removal (page 0030 00-2).
 Installation (page 0030 00-7).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H
 Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Socket Wrench Set, 3/8 Inch Drive
 (WP 0078 00, Item 79)
 Torque Wrench (WP 0078 00, Item 83)
 Lifting device with rated lift capability of at least 200 lb
 (91 kg)

References

See your -20

Equipment Condition

Power plant removed from carrier (see your -20)
 Power plant blocked (see your -20)
 Air compressor drive belts and air compressor with
 mount removed, if equipped with air brake kit
 (see your -20)
 Engine oil filter with bracket and hoses removed
 (see your -20)
 Generator drive belts removed (see your -20)
 Transmission removed from transfer gearcase
 (WP 0027 00)

Materials/Parts

Antiseize compound (WP 0080 00, Item 6)
 Suitable container
 Cotter pin
 Lock nut
 Packing (3)

REMOVAL

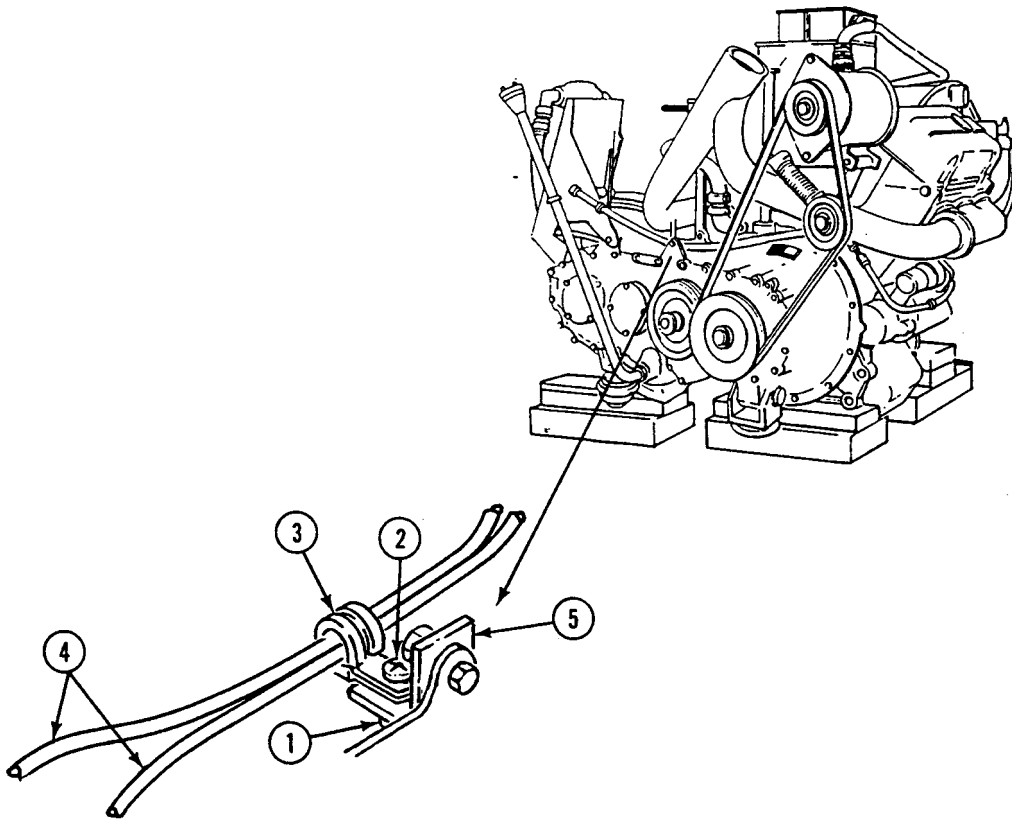
CAUTION

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.

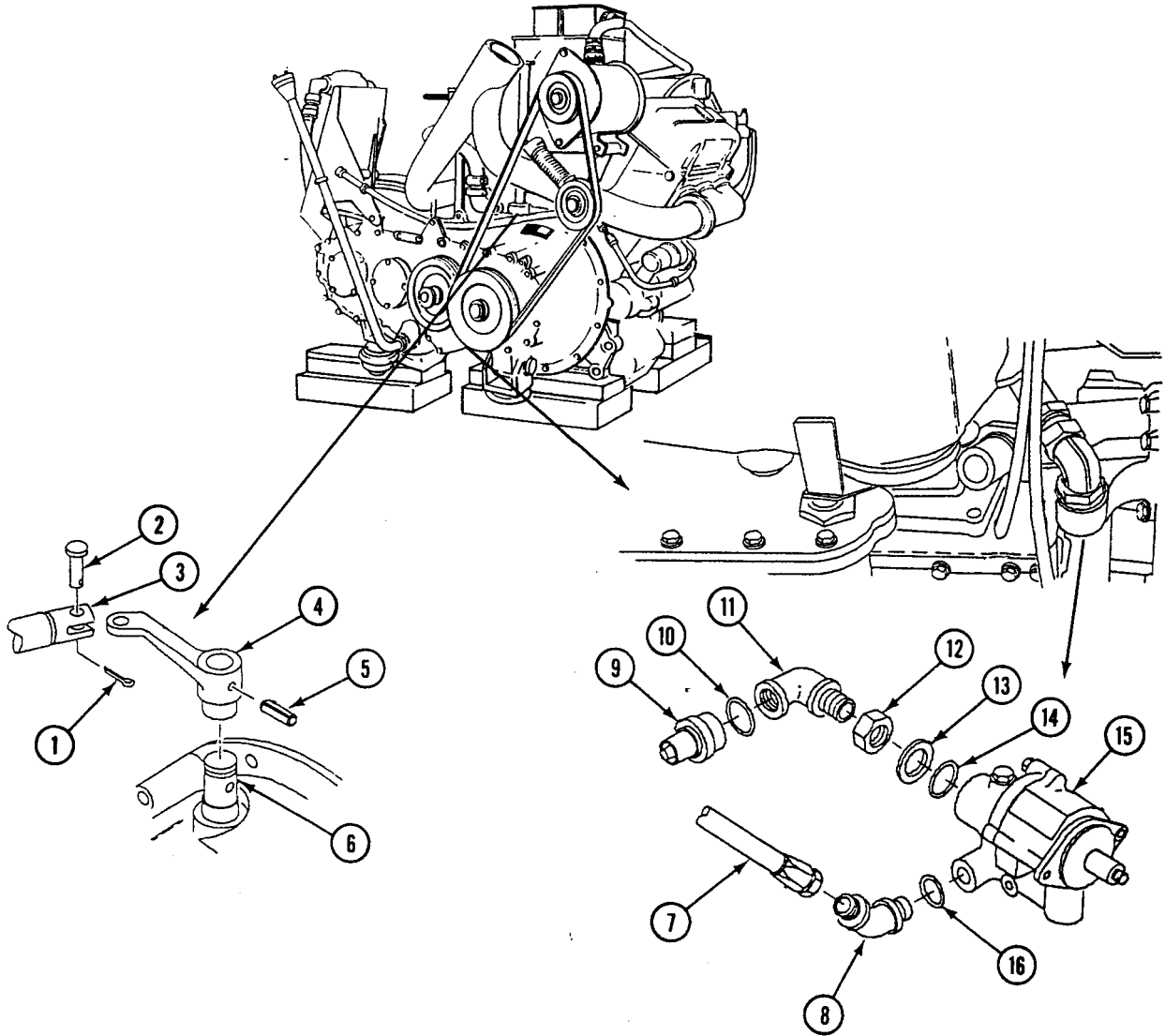
1. Remove lock nut (1), screw (2), and clamp (3) securing hoses (4) to bracket (5). Discard lock nut.



REMOVE/INSTALL TRANSFER GEARCASE (M548A1) — Continued

0030 00

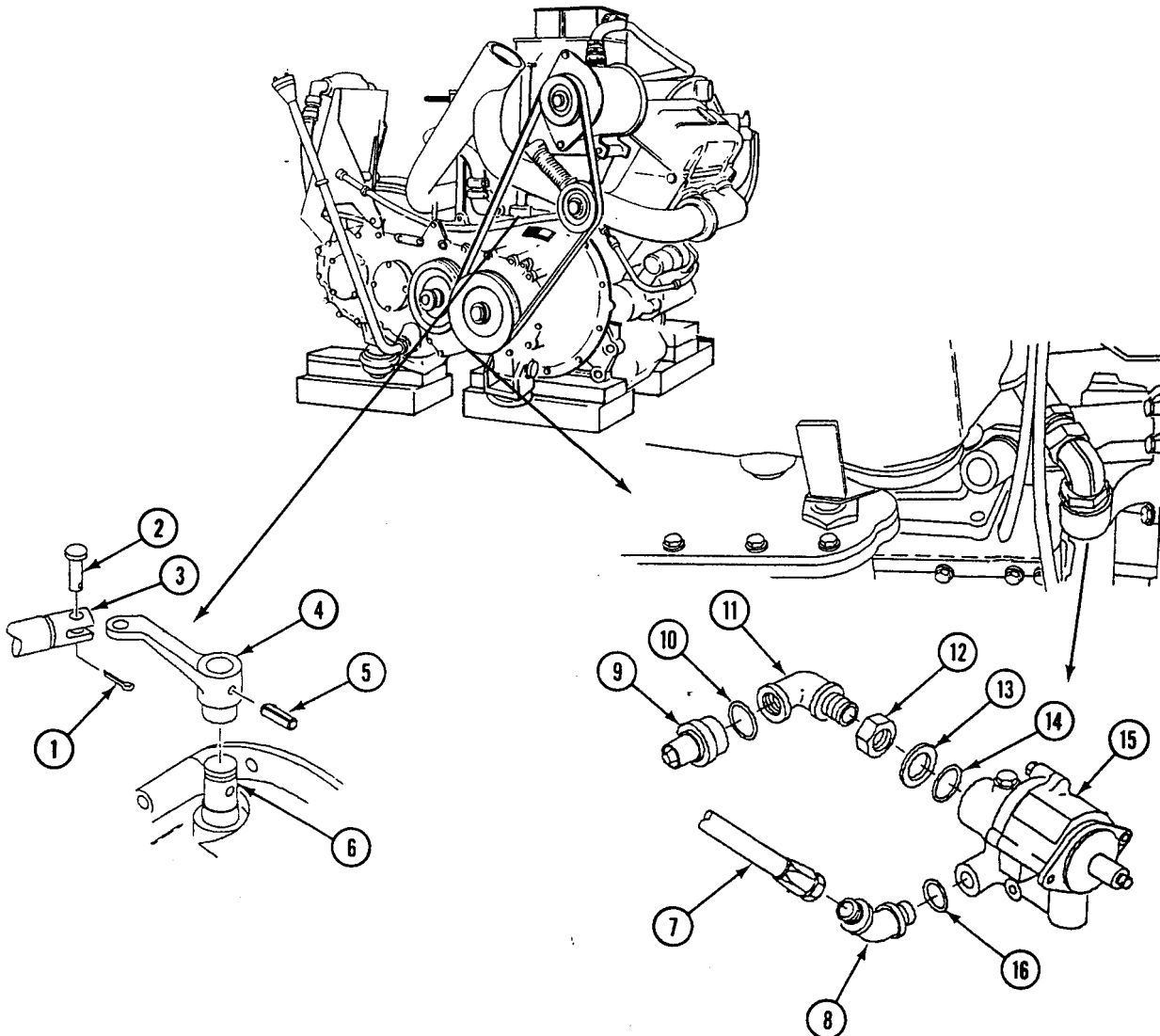
2. Remove cotter pin (1) and headed pin (2) that secure engine disconnect handle (3) to disconnect arm (4). Discard cotter pin.
3. Remove headless pin (5) securing disconnect arm (4) to shaft (6) on transfer gearcase. Remove arm.



NOTE

If pump needs to be replaced, do Steps 4 - 8.

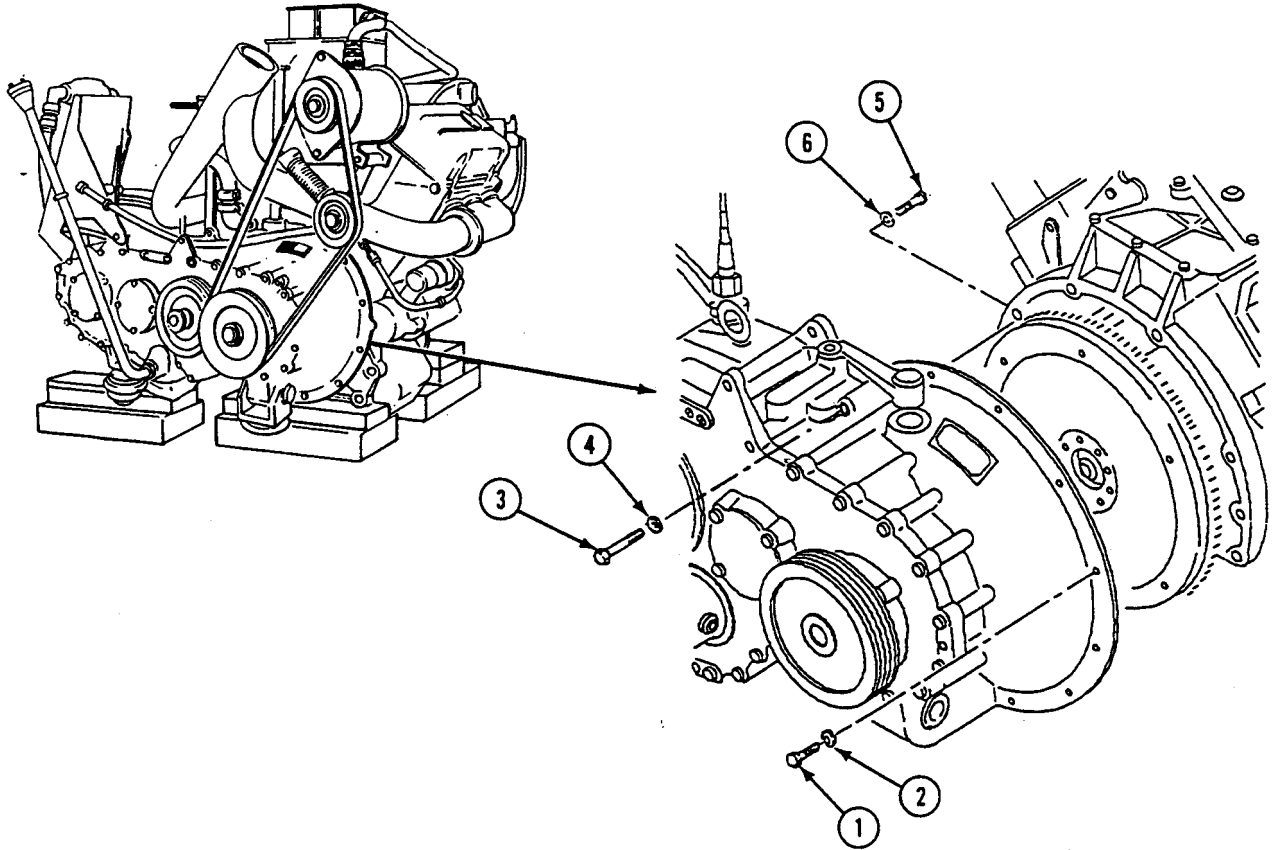
4. Drain transfer gearcase (see your -20).
5. Disconnect differential oil hose (7) from elbow (8).
6. Remove quick-disconnect half (9) and packing (10) from elbow (11). Discard packing.
7. Remove nut (12), elbow (11), retainer (13), and packing (14) from differential oil pump (15). Discard packing.
8. Remove elbow (8) and packing (16) from differential oil pump (15). Discard packing.



REMOVE/INSTALL TRANSFER GEARCASE (M548A1) — Continued

0030 00

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



WARNING

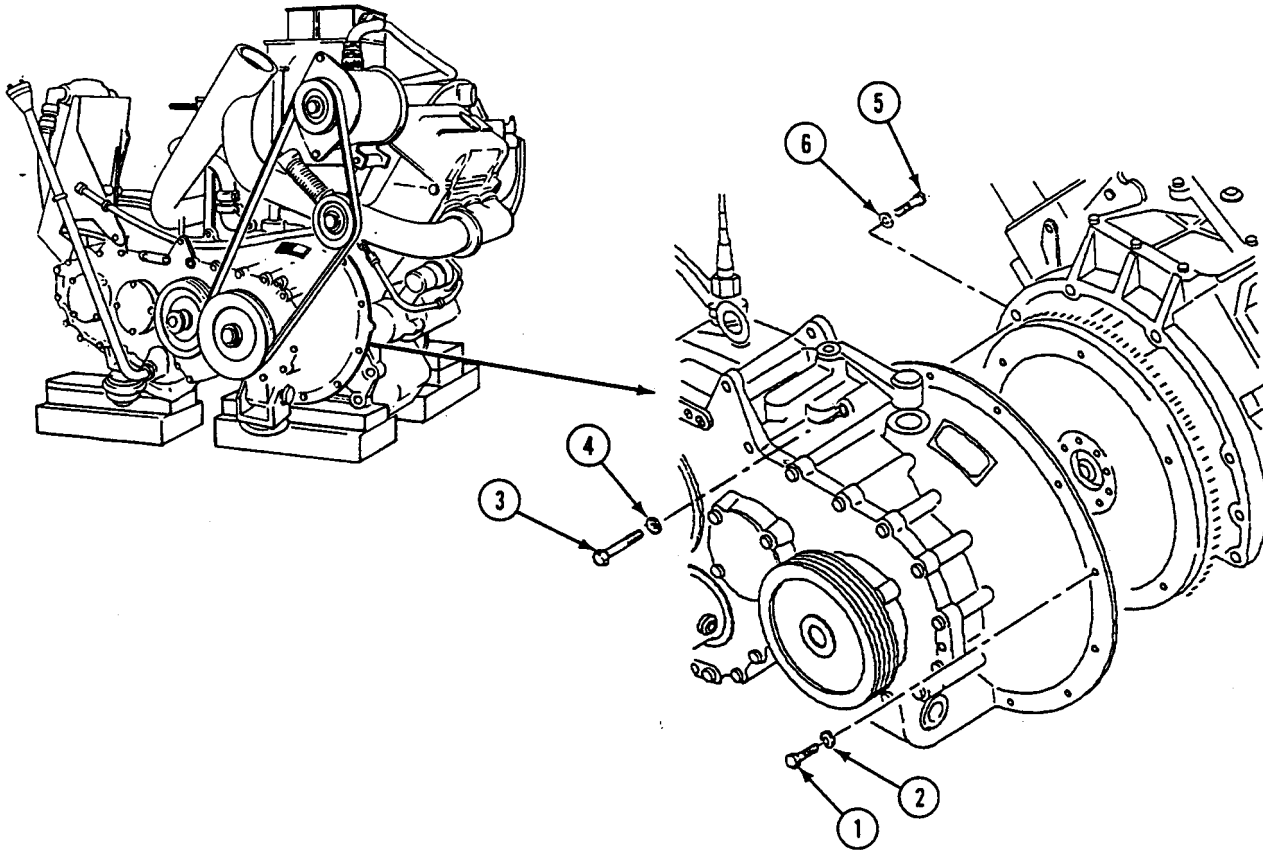
Lifting or moving objects in excess of 70 pounds (31.8 kg) could injure you. Make sure to get an assistant and use a lifting device to move transfer gearcase or other heavy objects.

11. Attach a lifting device of at least 200 lb (91 kg) capacity to the transfer gearcase. Have helper assist.

NOTE

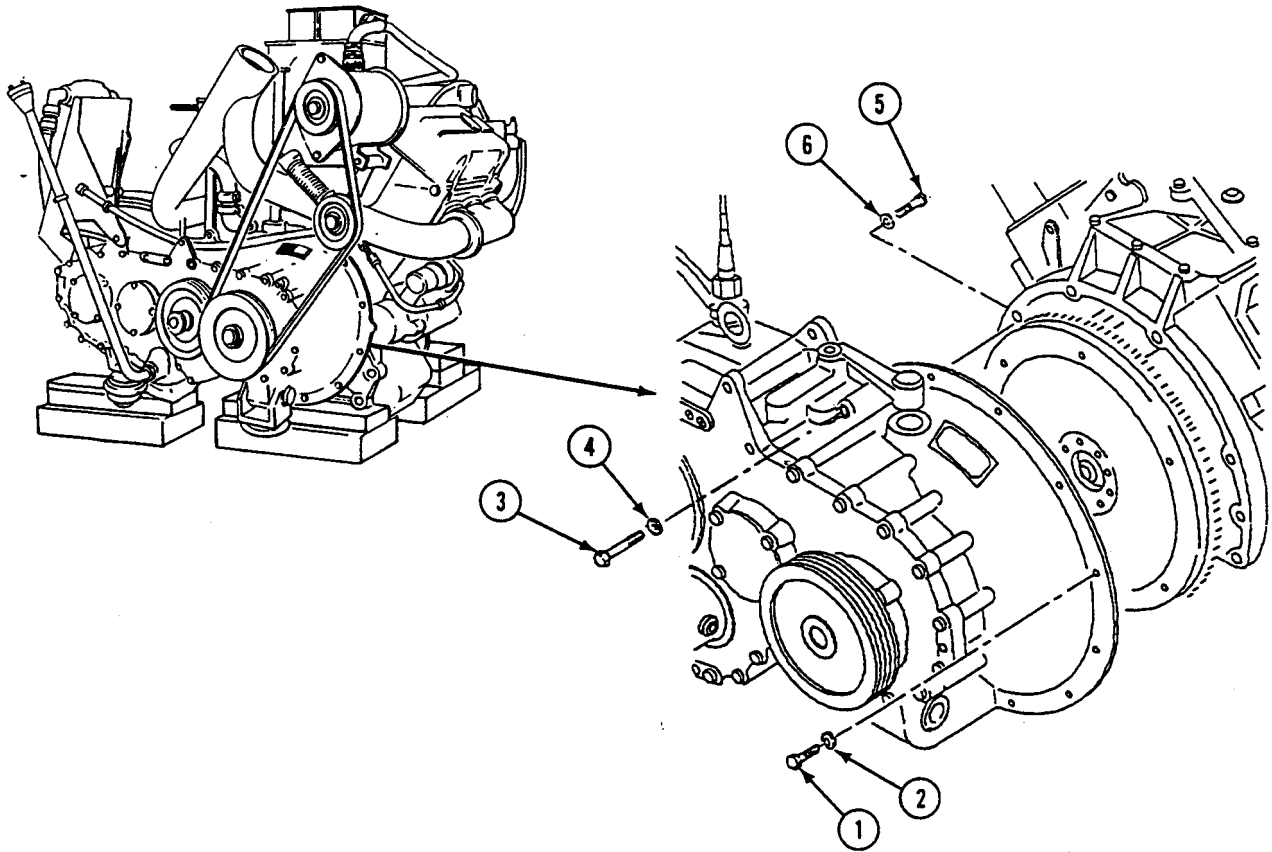
One screw and washer is trapped in engine bell housing.

12. Remove two screws (5) and washers (6). Detach transfer gearcase from engine. Have helper assist.



INSTALLATION

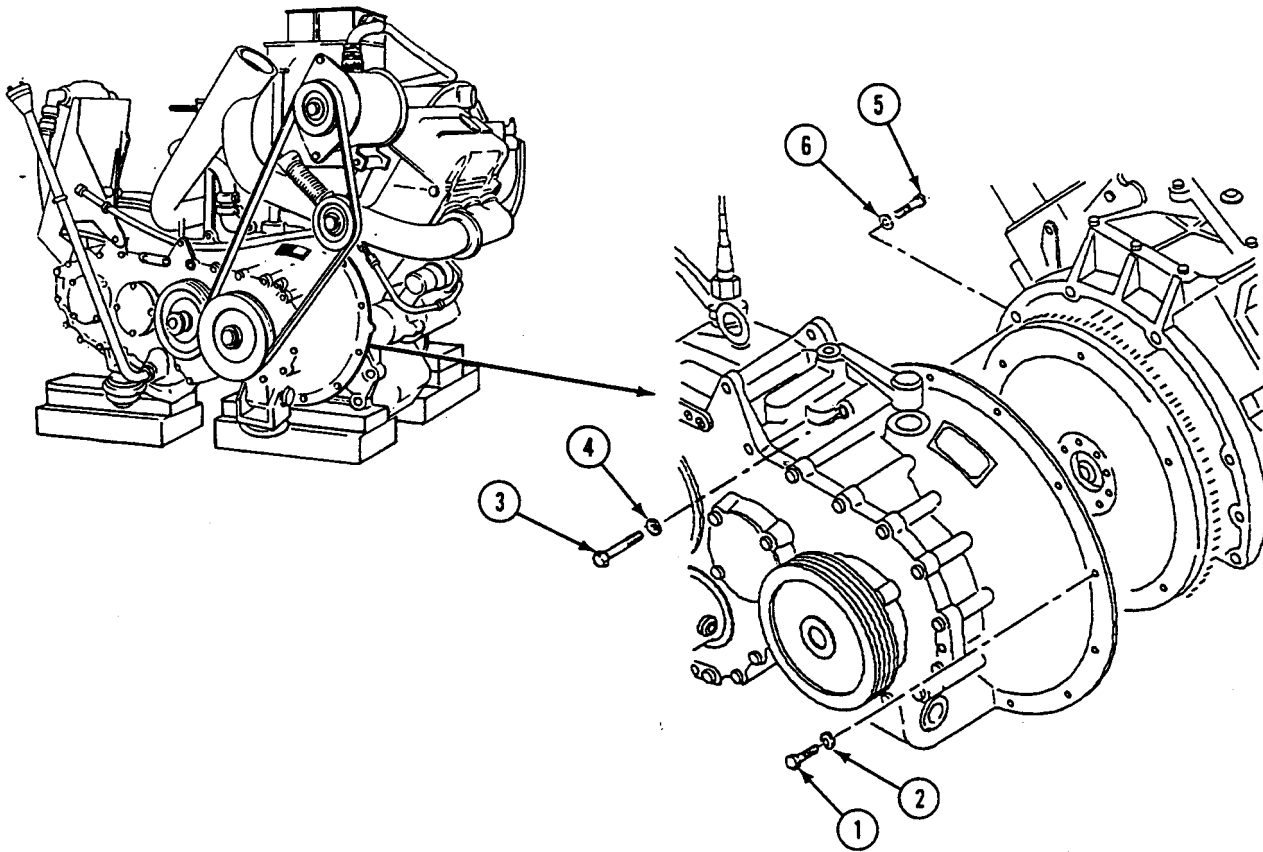
1. Apply a thin coat of antiseize compound to cleaned threads of four screws (1), four screws (3), and four screws (5).



REMOVE/INSTALL TRANSFER GEARCASE (M548A1) — Continued

0030 00

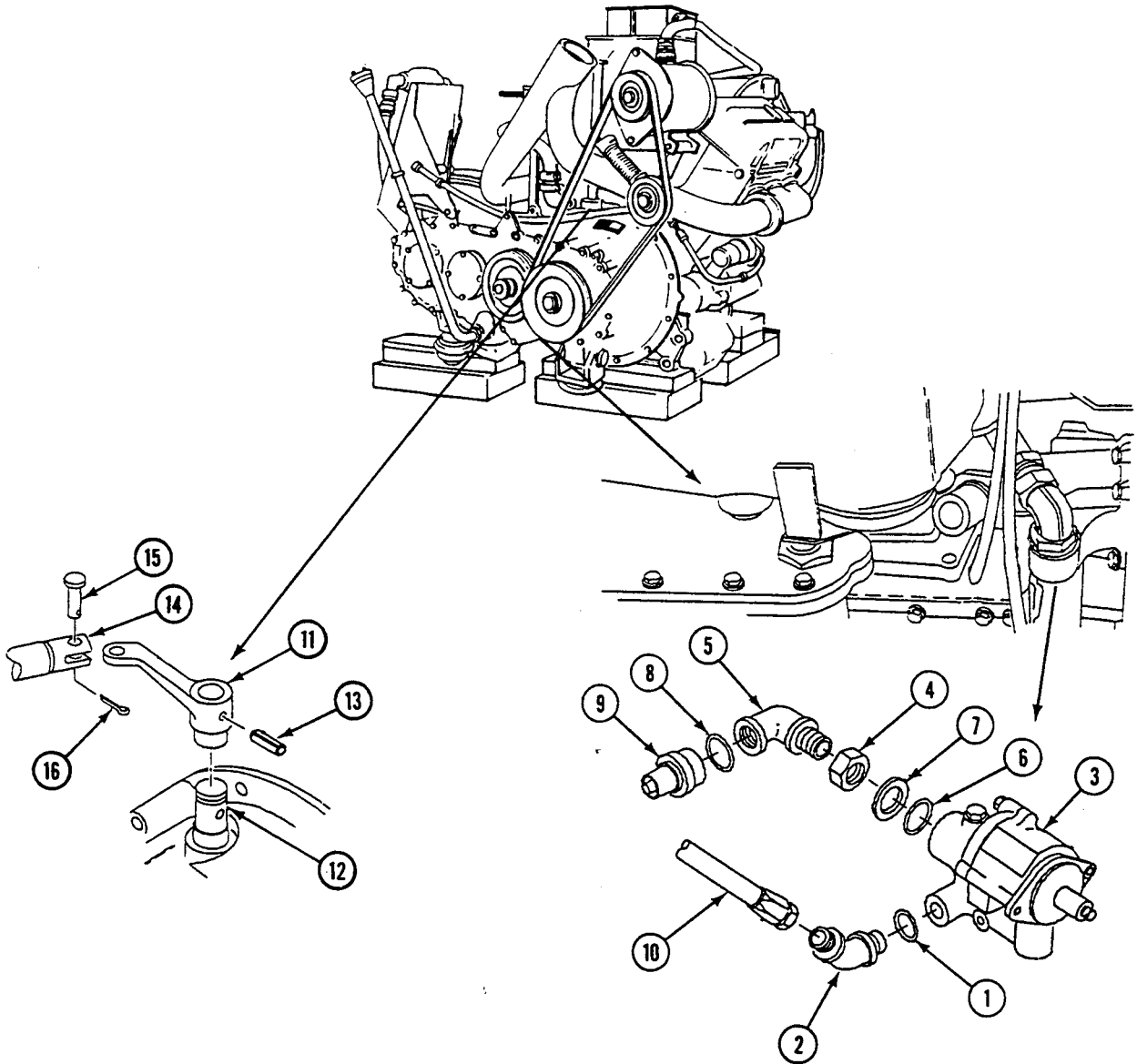
2. Attach a lifting device of at least 200 lb (91 kg) capacity to the transfer gearcase. Have helper assist.
3. Align transfer gearcase with engine. Have helper assist.
4. Install two screws (5) and washers (6).
5. Install one long screw (3) and washer (4).
6. Secure transfer gearcase to engine with nine screws (1) and washers (2). Tighten all 12 screws to 252-300 lb-in (28-34 N•m) torque. Loosen and retighten to 252-300 lb-in (28-34 N•m) torque.



NOTE

If pump has been replaced, do Steps 7 - 11.

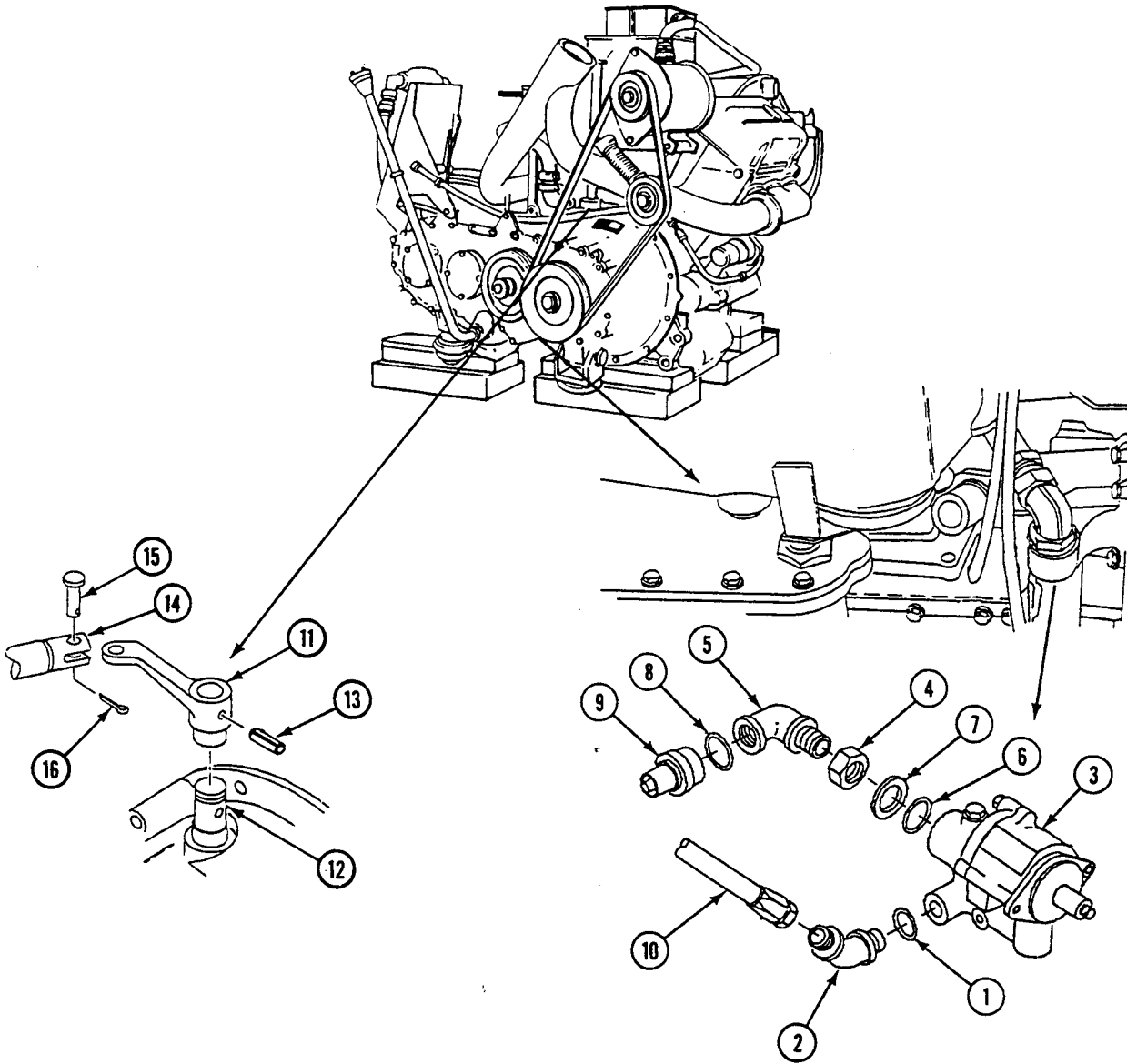
7. Install new packing (1) and elbow (2) in differential oil pump (3).
8. Install nut (4) on elbow (5).
9. Install new packing (6), retainer (7), and elbow (5) in differential oil pump (3).



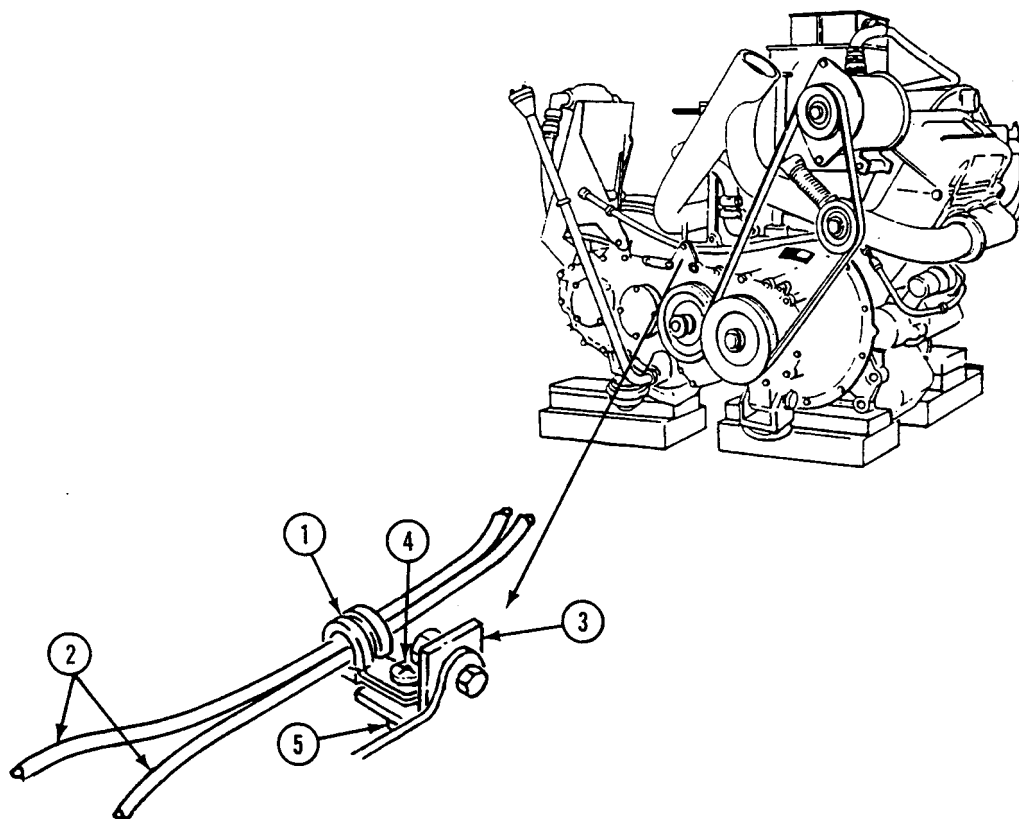
REMOVE/INSTALL TRANSFER GEARCASE (M548A1) — Continued

0030 00

10. Install new packing (8) and quick-disconnect half (9) on elbow (5).
11. Connect differential oil hose (10) to elbow (2).
12. Install disconnect arm (11) to shaft (12) on transfer gearcase. Secure with headless pin (13).
13. Install engine disconnect handle (14) on disconnect arm (11). Secure with headed pin (15) and new cotter pin (16).



14. Install clamp (1) on hoses (2). Secure to bracket (3) with screw (4) and new lock nut (5).



FOLLOW-THROUGH STEPS

1. Install transmission on transfer gearcase (WP 0027 00).
2. Install generator drive belts (see your -20).
3. Install engine oil filter with bracket and hoses (see your -20).
4. Install air compressor with mount and air compressor drive belts, if equipped with air brake kit (see your -20).
5. Install power plant in carrier (see your -20).

END OF TASK

REPLACE TRANSFER GEARCASE (M548A1)

0031 00

THIS WORK PACKAGE COVERS:

Removal (page 0031 00-2).
 Installation (page 0031 00-4).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H
 Helper (H)

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Socket Wrench Set, 3/8 Inch Drive
 (WP 0078 00, Item 79)
 Torque Wrench (WP 0078 00, Item 83)

References

See your -20

Materials/Parts

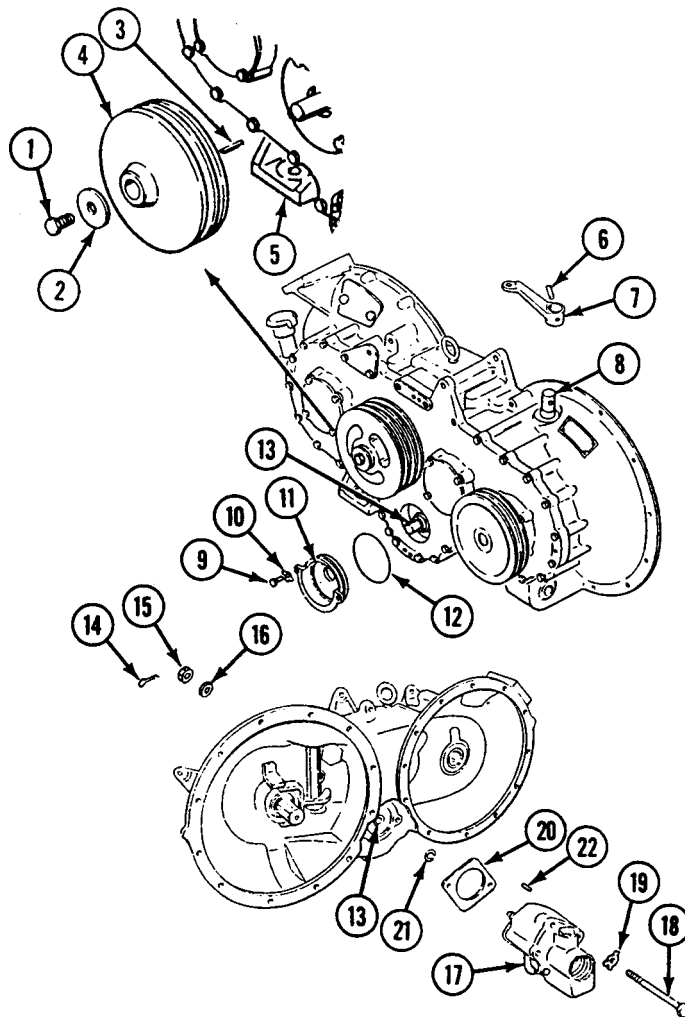
Antiseize compound (WP 0080 00, Item 6)
 Cotter pin
 Gasket
 Key washer (4)
 Packing
 Spring pin

Equipment Condition

Transfer gearcase oil drained (see your -20)
 Power plant removed (see your -20)
 Power plant blocked (see your -20)
 Transmission removed from transfer gearcase
 (WP 0027 00)
 Transfer gearcase removed from engine (WP 0030 00)

REMOVAL

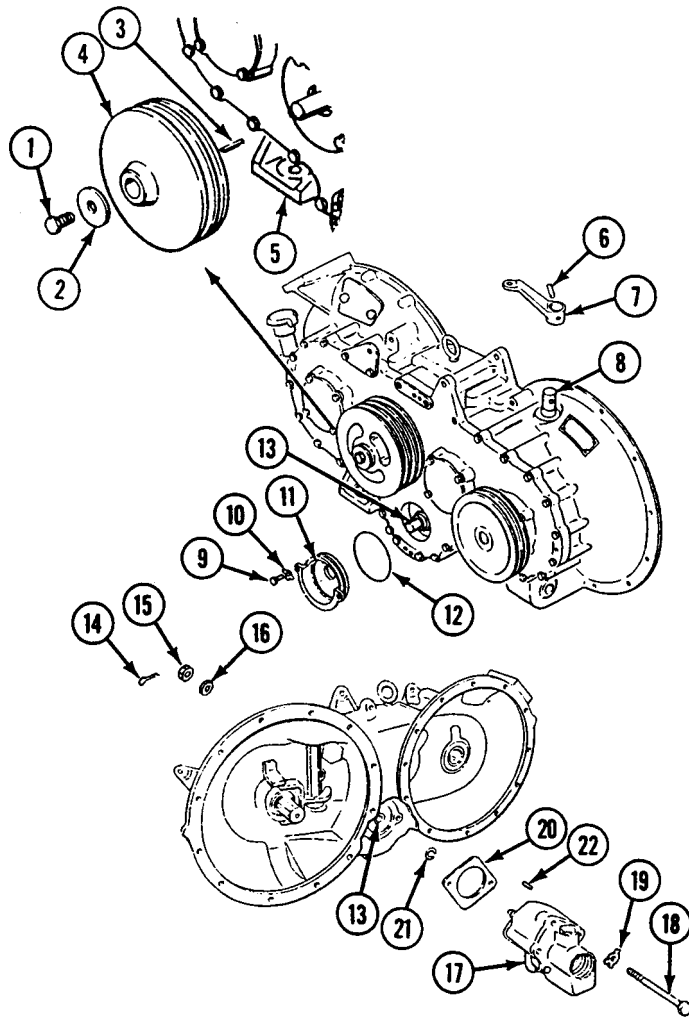
1. Remove screw (1), washer (2), key (3), and fan drive pulley (4) from secondary intermediate gear (5).
2. Remove spring pin (6) and lever (7) from actuator (8).
3. Remove two screws (9), key washers (10), flange (11), and packing (12) from secondary pump drive gear (13). Discard key washers and packing.
4. Remove cotter pin (14), nut (15), and washer (16) that secure differential oil pump (17) to secondary pump drive gear (13). Discard cotter pin.



REPLACE TRANSFER GEARCASE (M548A1) — Continued

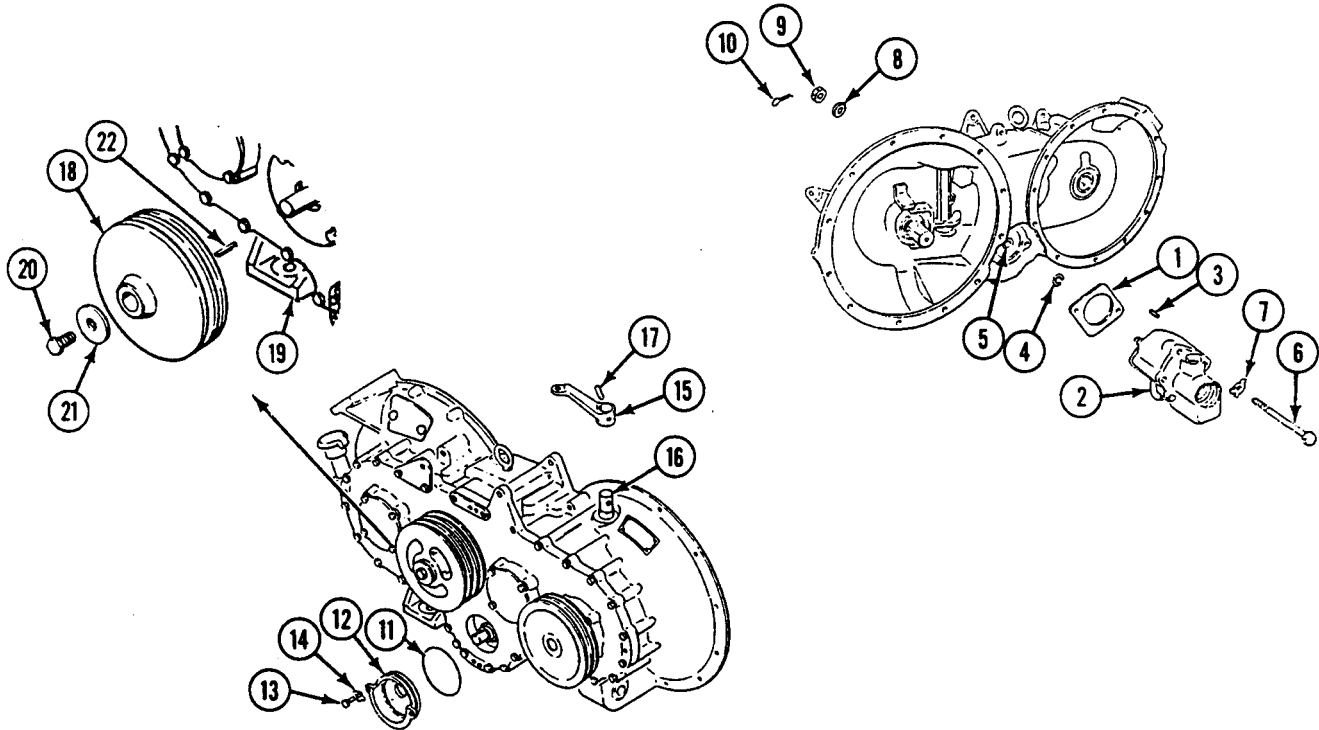
0031 00

5. Remove two screws (18) and key washers (19) that secure differential pump (17) and gasket (20) to transfer gearcase. Discard gasket and key washers.
6. Remove differential oil pump (17), retaining ring (21), and key (22) from drive gear (13).



INSTALLATION

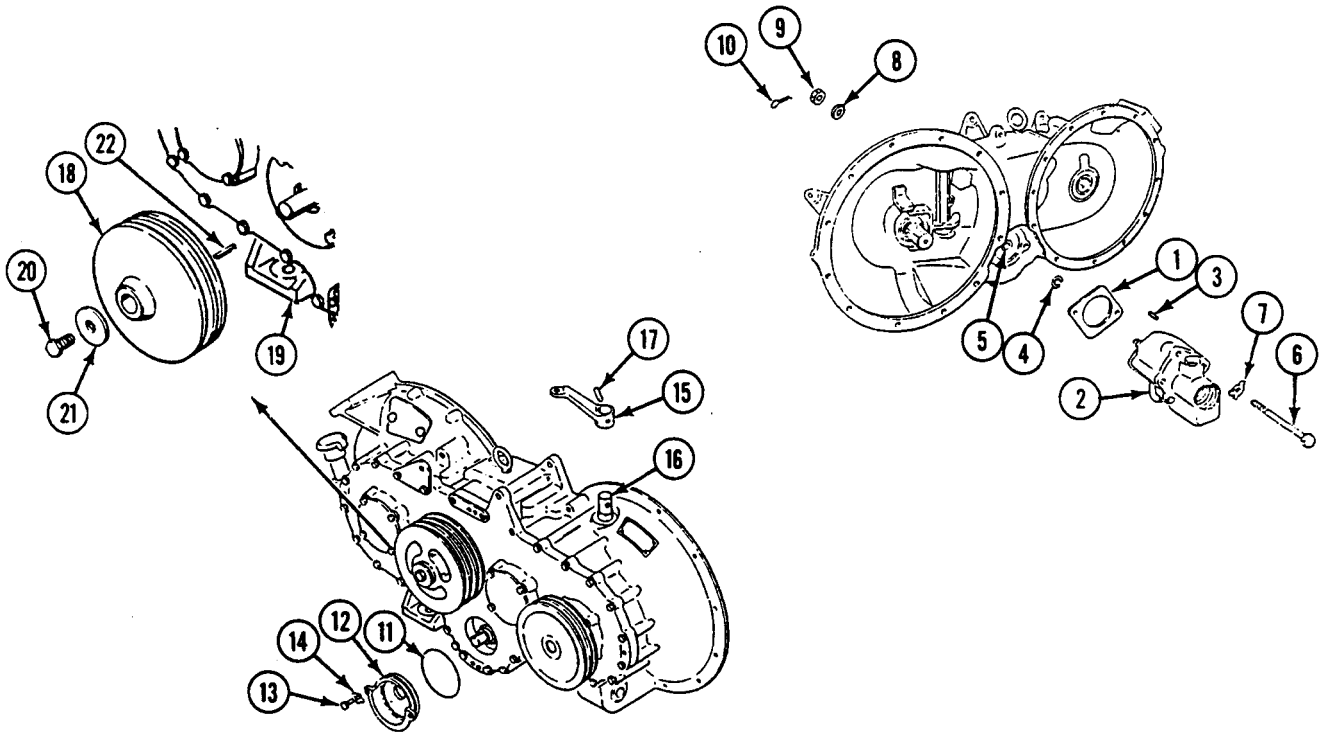
1. Place new gasket (1) on differential oil pump (2).
2. Install differential pump (2) with key (3) and retaining ring (4) in secondary pump drive gear (5).
3. Apply a thin coat of antiseize compound to cleaned threads of two screws (6).
4. Install differential oil pump (2) on transfer gearcase. Secure with two screws (6) and new key washers (7). Tighten screws to 420-480 lb-in (47-54 N•m) torque.



REPLACE TRANSFER GEARCASE (M548A1) — Continued

0031 00

5. Install differential pump (2) on drive gear (5). Secure with washer (8), nut (9), and new cotter pin (10).
6. Place new packing (11) on flange (12).
7. Install flange (12) on transfer gearcase. Secure with two screws (13) and new key washers (14). Tighten screws to 144-180 lb-in (16-20 N•m) torque.
8. Secure lever (15) on actuator (16) with new spring pin (17).
9. Install fan drive pulley (18) on secondary intermediate gear (19). Secure with screw (20), washer (21), and key (22).

**FOLLOW-THROUGH STEPS**

1. Install transfer gearcase on engine (WP 0030 00).
2. Install transmission on transfer gearcase (WP 0027 00).
3. Install power plant in carrier (see your -20).
4. Fill transfer gearcase (see your -20).

END OF TASK

CHAPTER 9

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR WHEELS AND TRACKS

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|------------------------------------|---------------------|
| REPAIR TRACK IDLER ARM..... | 0032 00 |
| REPAIR TRACK TENSION ADJUSTER..... | 0033 00 |

REPAIR TRACK IDLER ARM

0032 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0032 00-1).
 Inspection-Acceptance and Rejection Criteria (page 0032 00-2).
 Assembly (page 0032 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Micrometer Caliper Set (WP 0078 00, Item 8)
 Vernier Caliper (WP 0078 00, Item 9)

References

See your -20

Materials/Parts

Packing
 Seal

Equipment Condition

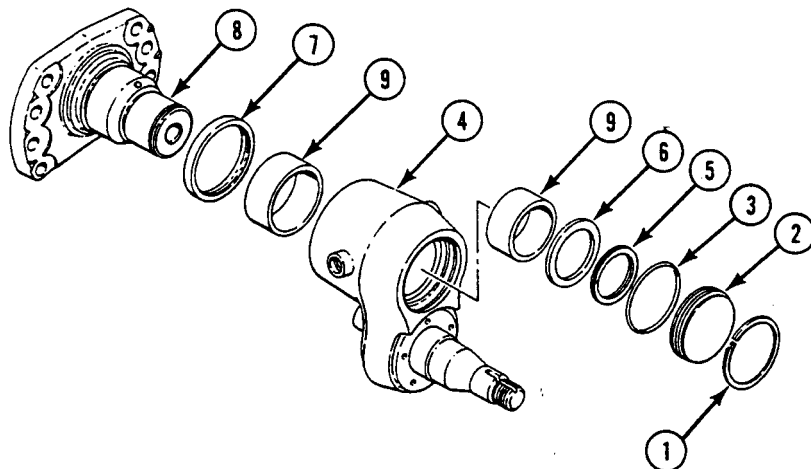
Track idler arm assembly removed (see your -20)
 Hub assembly removed (see your -20)

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 (4). Discard packing.
2. Remove retaining ring (5), spacer (6), arm (4), and seal (7) from spindle (8). Discard seal.
3. Remove two bearings (9) from arm (4).



INSPECTION-ACCEPTANCE AND REJECTION CRITERIA

1. Check parts shown in figure on next page that have reference letters.
2. Check the parts dimensions with chart on next page to determine replacement.

ASSEMBLY

1. Install two bearings (9) in arm (4).
2. Install new seal (7) and arm (4) on spindle (8). Secure with spacer (6) and retaining ring (5).
3. Install new packing (3) in arm (4).
4. Secure cover (2) in arm (4) with retaining ring (1).

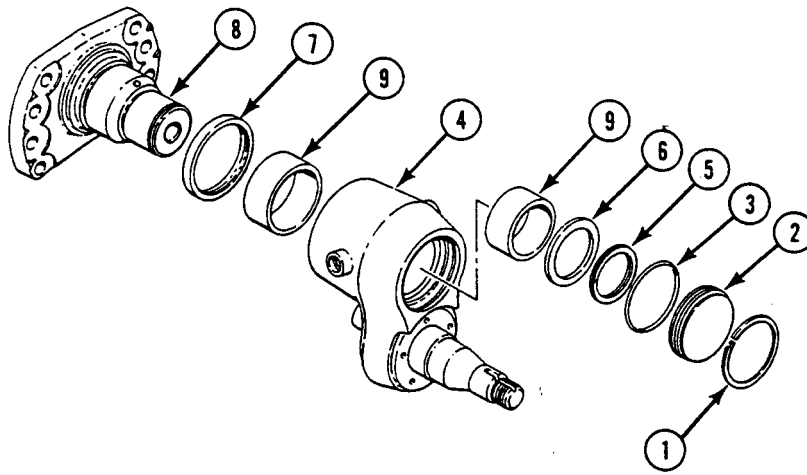


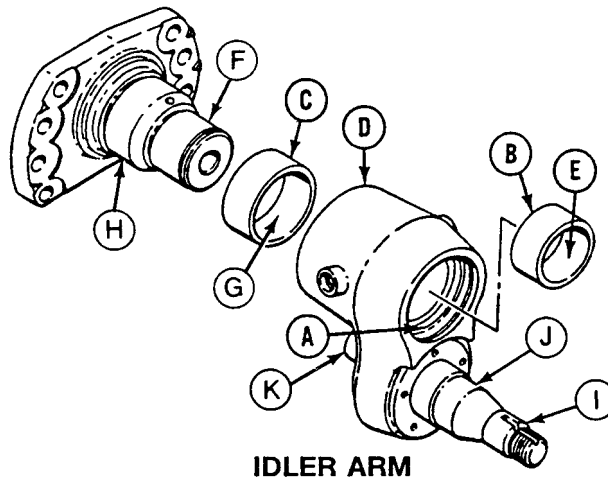
Table 1. IDLER ARMS

| Reference Letter | Point of Measurement | New Part Size/Fit | Wear Limit |
|------------------|---|--------------------|-------------|
| 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 surface | 3.809 to 3.812 | * |
| A-B | Fit of bearing in arm bore | 0.0005T to 0.0075T | |
| 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 bearings | 3.3855 to 3.4015 | 3.403** |
| H | Outside diameter of inner spindle surface | 3.375 to 3.377 | See Note*** |
| E-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 part dimensions.

** Measured in assembly

*** A used idler spindle shall not be put back into service if the nickel plating (0.001 to 0.002 thick) is worn through. However, a used spindle can be switched to the opposite side of the carrier, which places the load on an unused plated surface.



FOLLOW-THROUGH STEPS

1. Install track idler arm assembly (see your -20).
2. Install hub assembly (see your -20).
3. Lubricate track idler arm (see your -20).

END OF TASK

REPAIR TRACK TENSION ADJUSTER

0033 00

THIS WORK PACKAGE COVERS:

- Disassembly (page 0033 00-2).
- Inspection-Acceptance and Rejection Criteria (page 0033 00-4).
- Assembly (page 0033 00-6).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0078 00, Item 68)
- Micrometer Caliper Set (WP 0078 00, Item 8)
- Vernier Caliper (WP 0078 00, Item 9)
- Arbor Press (WP 0078 00, Item 42)
- Screw Threading Set (WP 0078 00, Item 63)

References

- See your -10
- See your -20

Materials/Parts

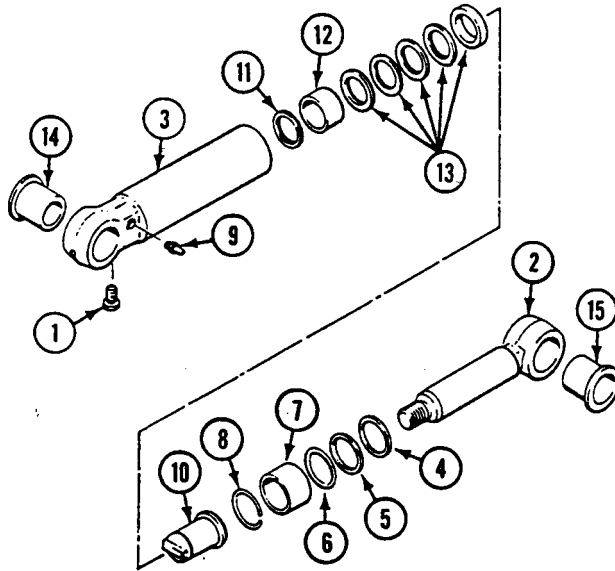
- Automotive grease GAA (WP 0080 00, Item 8)
- Engine lube oil OE/HDO (WP 0080 00, Item 17)
- Wiping rag (WP 0080 00, Item 46)
- Repair kit P/N 5703829

Equipment Condition

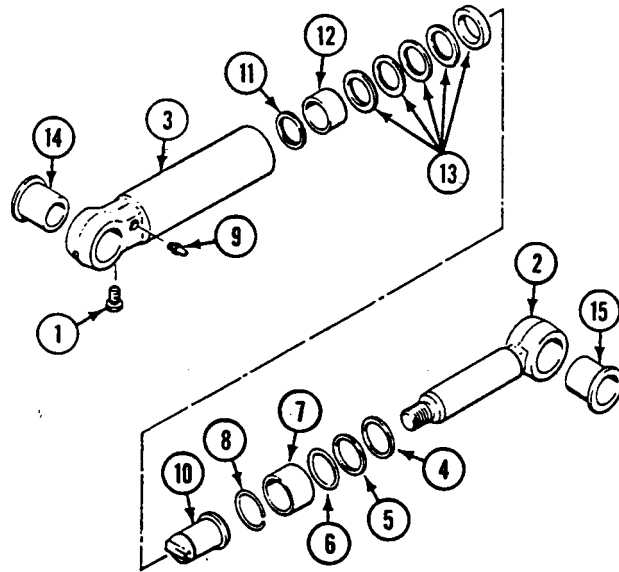
Track tension adjuster removed (see your -20)

DISASSEMBLY

1. Loosen bleeder valve (1). Push piston rod (2) in as far as it will go.
2. Maintain inward pressure on piston rod (2) and rotate counterclockwise until piston rod rotates freely.
3. Pull piston rod (2) from cylinder (3).
4. Remove retaining ring (4), wiper ring (5), and packing (6) from cylinder (3). Discard packing, wiper ring, and retaining ring.
5. Press bearing (7) about 1 inch (25 mm) in cylinder (3) to force retaining ring (8) from groove in cylinder.



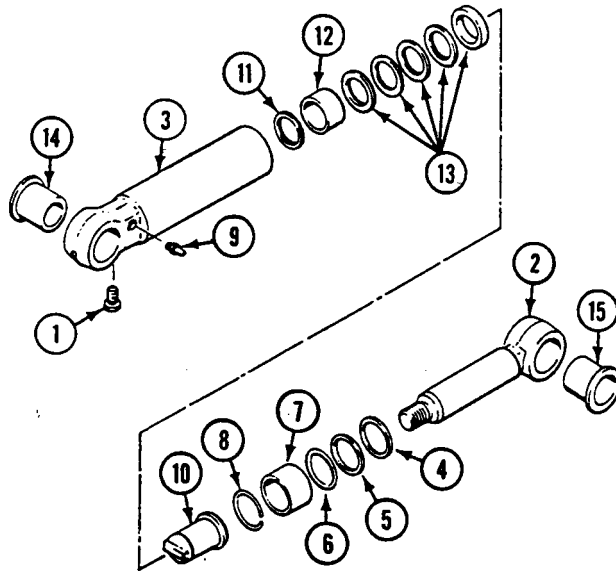
6. Pull bearing (7) from cylinder (3). Discard bearing.
7. Turn retaining ring (8) 90° in cylinder (3). Remove ring from cylinder. Discard retaining ring.
8. Close bleeder valve (1). Force grease through lube fitting (9) until piston (10) is forced from cylinder (3).
9. Use a wiping rag to remove excess grease from piston (10) and cylinder (3).



NOTE

Packing set may be a five or seven piece design.

10. Remove retaining ring (11), bearing (12), and five (or seven) packings (13) from piston (10). Discard packings, bearing, and retaining ring.
11. Remove bleeder valve (1) and lube fitting (9) from cylinder (3).
12. If damaged or worn, press sleeve bushing (14) from cylinder (3). Discard bushing.
13. If damaged or worn, press sleeve bushing (15) from piston rod (2). Discard bushing.



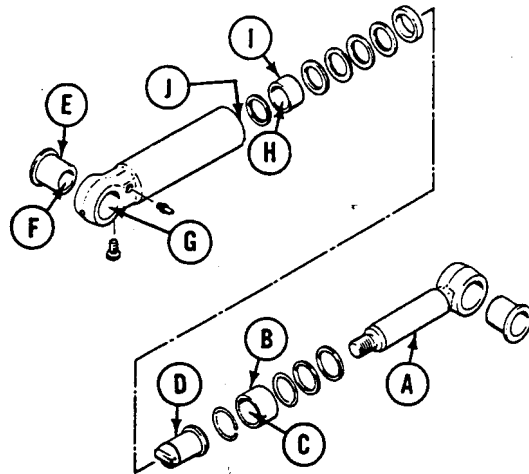
INSPECTION-ACCEPTANCE AND REJECTION CRITERIA

1. Check threads of piston and piston rod. 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 figure below that have reference letters.
3. Check the parts dimensions with chart below to determine replacement.

Table 1. TRACK TENSION ADJUSTER

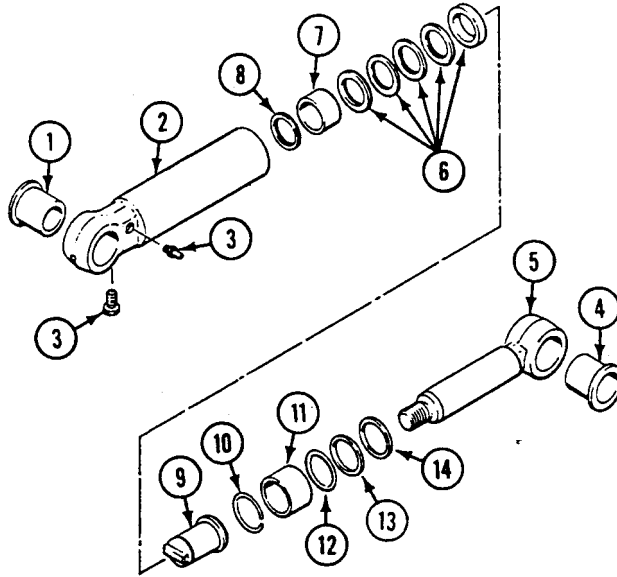
| Reference Letter | Point of Measurement | New Part Size/Fit | Wear Limit |
|------------------|--|-------------------|------------|
| A | Outside diameter of piston rod | 1.7580 to 1.7600 | 1.7560 |
| B | Outside diameter of piston rod bearing | 1.9940 to 1.9970 | 1.9930 |
| C | Inside diameter of piston rod 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 bushing | 1.8780 to 1.8830 | * |
| F | Inside diameter of sleeve bushing | 1.5200 to 1.5300 | 1.5450 |
| G | Inside diameter of cylinder or piston rod 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 part dimensions.



ASSEMBLY

1. If removed, press new sleeve bushing (1) in cylinder (2) from side opposite lube fitting (3).
2. If removed, press new sleeve bushing (4) into piston rod (5).

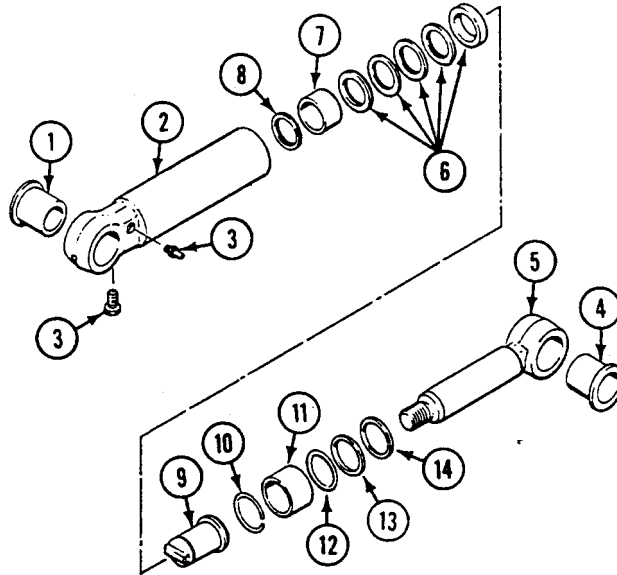


NOTE

Packings, bearings, and retaining rings are part of repair kit.

Install new packings (6) with sealing lips facing away from flange on piston (9). Lips face toward inside of cylinder (2).

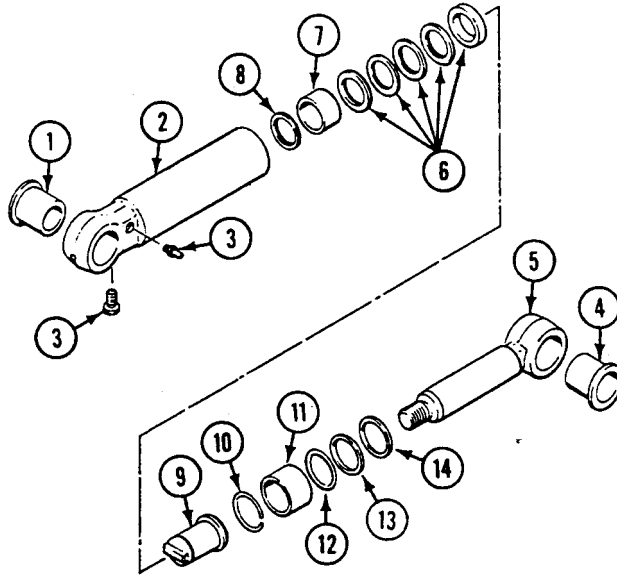
3. Install five (or seven) new packings (6), new bearing (7), and new retaining ring (8) on piston (9).
4. Apply a light coat of lube oil to piston (9) and to inside of cylinder (2).
5. Install piston (9) in cylinder (2).
6. Install new retaining ring (10) in cylinder (2). Make sure it seats in groove.
7. Apply a light coat of lube oil to new bearing (11).
8. Install new bearing (11) in cylinder (2).



NOTE

Install new wiper ring (13) with grooved edge facing out of cylinder toward retaining ring.

9. Install new packing (12), new wiper ring (13), and new retaining ring (14) in cylinder (2).
10. Apply a light coat of lube oil to piston rod (5).
11. Install piston rod (5) in cylinder (2). Maintain inward pressure on piston rod and rotate clockwise until secure.
12. Install bleeder valve (15) and lube fitting (3) in cylinder (2).

**FOLLOW-THROUGH STEPS**

1. Install track tension adjuster (see your -20).
2. Adjust track tension (see your -10).

END OF TASK

CHAPTER 10

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR SHOCK ABSORBERS

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|----------------------------|---------------------|
| REPAIR SHOCK ABSORBER..... | 0034 00 |

REPAIR SHOCK ABSORBER

0034 00

THIS WORK PACKAGE COVERS:

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

INITIAL SETUP:

Maintenance Level

Direct Support

Materials/Parts

Bearing (2)

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Bearing and Bushing Inserter (Staker)
 (WP 0078 00, Item 31)
 Bearing Positioner (WP 0078 00, Item 41)
 Arbor Press (WP 0078 00, Item 42)

References

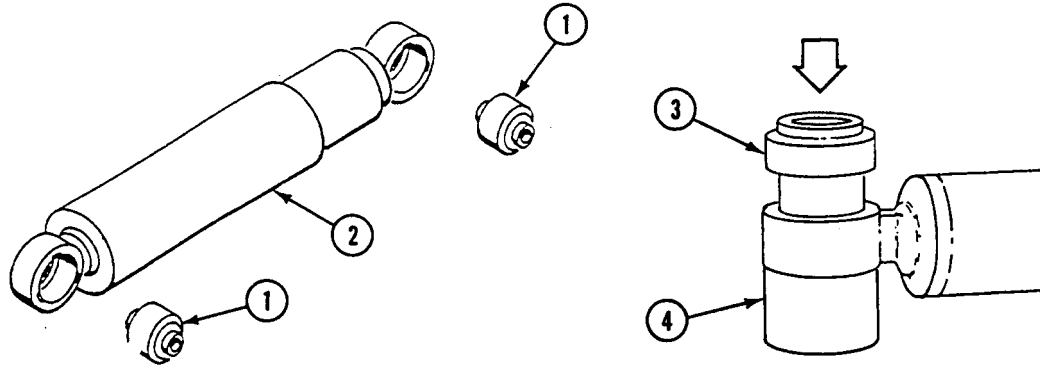
See your -20

Equipment Condition

Shock absorber removed (see your -20)

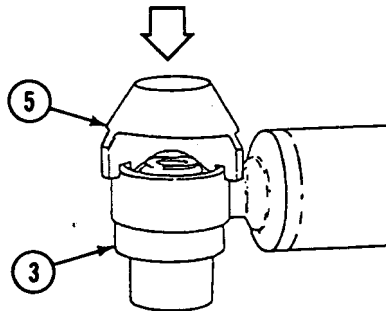
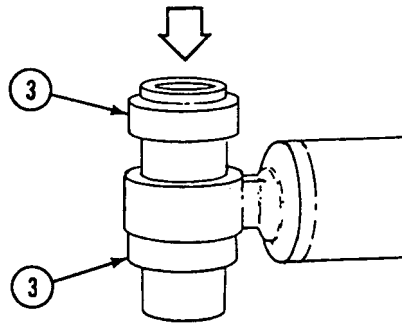
REMOVAL

1. Press two bearings (1) from shock absorber (2). Use bearing positioner (3) with a standard support (4). Discard bearings.



INSTALLATION

1. Press two new bearings (1) in shock absorber (2). Use two positioners (3).
2. Stake bearings (1) into shock absorber (2). Use staker (5) with a positioner (3).

**FOLLOW-THROUGH STEPS**

1. Install shock absorber on carrier (see your -20).

END OF TASK

CHAPTER 11

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR HULL

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|---|---------------------|
| REPLACE SERRATED LOCK RING SCREW THREAD INSERTS..... | 0035 00 |
| REPLACE KEY-LOCKED SCREW THREAD INSERTS..... | 0036 00 |
| REPLACE OVERSIZE SCREW THREAD INSERTS WITH LOCK RING..... | 0037 00 |
| REPLACE LOCKED-IN STUDS..... | 0038 00 |
| REPAIR CAB DOOR..... | 0039 00 |
| REPAIR SEAT CUSHIONS/BACKRESTS..... | 0040 00 |

REPLACE SERRATED LOCK RING SCREW THREAD INSERTS

0035 00

THIS WORK PACKAGE COVERS:

Removal (page 0035 00-1).
 Installation (page 0035 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Portable Electric Drill (WP 0078 00, Item 12)
 Portable Electric Drill (WP 0078 00, Item 13)
 Twist Drill Set (WP 0078 00, Item 15)
 Twist Drill Set (WP 0078 00, Item 16)
 Screw Extractor Set (WP 0078 00, Item 18)

References

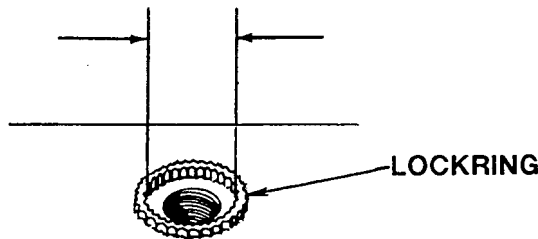
See your -10

Equipment Condition

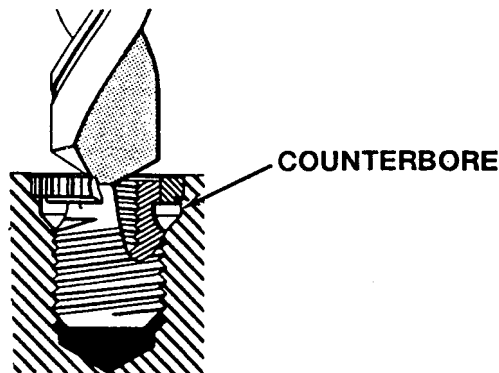
Engine stopped (see your -10)
 Carrier blocked (see your -10)

REMOVAL

1. Drill out inside serrations of lock ring. Use drill the same diameter as inside serrations.

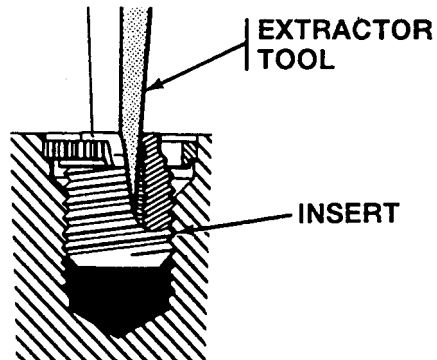


2. Drill to depth of counterbore.



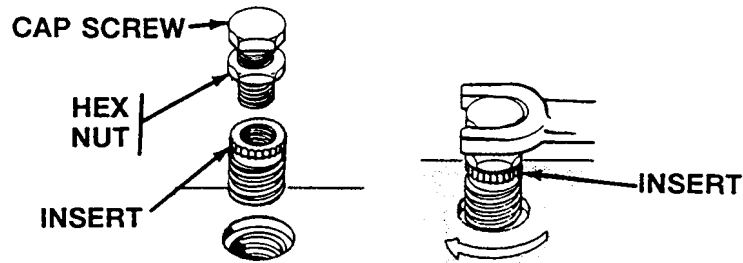
3. Drive in extractor tool to screw out insert. As insert comes out, it will push out lock ring.

- If lock ring does not come out with insert, hit ring with a punch and hammer to collapse ring. Remove ring.



INSTALLATION

- Install insert in threaded hole. Use a cap screw or bolt and a hex nut.



NOTE

Lock ring must be flush or no more than 1/32 inch (0.8 mm) below hull surface.

- Install lock ring. Use a hammer and a flat piece of steel. Drive straight into surface.

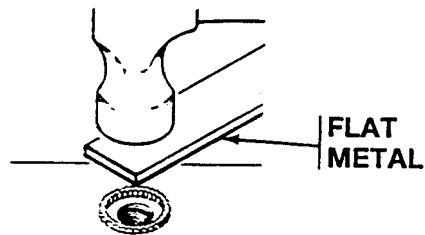


Table 1. SERRATED LOCK RING SCREW THREAD INSERT TECHNICAL DATA

| Internal Thread Size | Part Number/NSN | External Thread Size | Application |
|----------------------|--|---|-----------------------------------|
| 1/4-28 UNF-3B | 10947291-7 (19207) 5340-00-930-1616 | 3/8-16 UNC-3A (27/64 dia counterbore) | Fuel pump mounting pad |
| 3/8-16 UNC-3B | 10947291-5 (19207) 5340-00-930-1615 | 9/16-12 UNC-3A (19/32 dia counterbore) | Cab floor plate mounting pads |
| 3/8-16 UNC-3B | 10947291-4 (19207) 5340-00-930-1619 | 9/16-12 UNC-3A (19/32 dia counterbore) | Radiator assembly mounting flange |
| 1/2-20 UNF-3B | 10947291-3 (19207) 5340-00-930-1618 | 3/4-10 UNC-3A (7/8 dia counterbore) | Differential steering controls |

END OF TASK

REPLACE KEY-LOCKED SCREW THREAD INSERTS

0036 00

THIS WORK PACKAGE COVERS:

Removal (page 0036 00-1).
 Installation (page 0036 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Portable Electric Drill (WP 0078 00, Item 12)
 Portable Electric Drill (WP 0078 00, Item 13)
 Twist Drill Set (WP 0078 00, Item 15)
 Twist Drill Set (WP 0078 00, Item 16)
 Screw Extractor Set (WP 0078 00, Item 18)
 Screw Threading Set (WP 0078 00, Item 63)

References

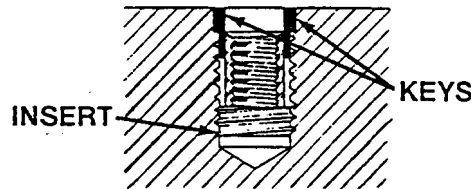
See your -10

Equipment Condition

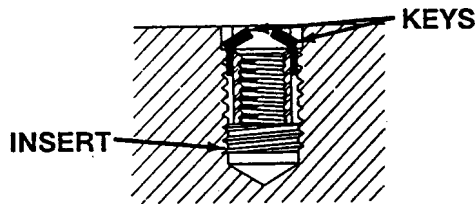
Engine stopped (see your -10)
 Carrier blocked (see your -10)

REMOVAL

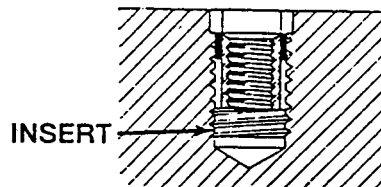
1. Drill out insert to depth of keys. Use drill the same diameter as distance between keys.



2. Bend keys in to unlock insert. Break off bent portions of keys.

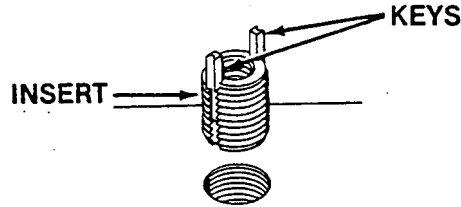


3. With all keys broken off, remove insert. Use an extractor tool to screw out insert.

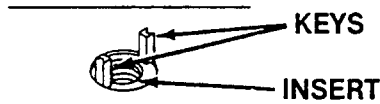


INSTALLATION

1. Drill correct size hole for insert and tap threads.



2. Install insert. If insert cannot be turned flush to surface by hand, use pliers across keys.



CAUTION

Take care not to break keys.

3. Drive keys flush with surrounding surface.

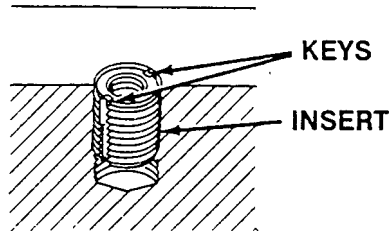


Table 1. KEY-LOCKED SCREW THREAD INSERT TECHNICAL DATA

| Internal Thread Size | Part Number/NSN | External Thread Size | Application |
|----------------------|--|----------------------|--|
| 1/4-28 UNF-2B | 7771298-16 (19207) 5340-00-933-8912 | 3/8-16 UNC-2A | Fuel pump mounting pad |
| 3/8-16 UNC-3B | 7771298-4 (19207) 5340-00-106-4453 | 9/16-12 UNC-2A | Power plant cover mounting pads |
| 3/8-16 UNC-3B | 7771298-8 (19207) 5340-00-931-7253 | 9/16-12 UNC-2A | Cooling fan pulley mounting |
| 1/2-20 UNF-3B | 7771298-1 (19207) 5340-00-115-9420 | 3/4-10 UNC-2A | Fan drive shaft mounting pad Final drive mounting flanges Cargo floor plate mounting flange Cargo bow mounting pads Winch guard mounting pad Starter ground lead mounting pad Track wear plate mountings Floor plate mounting |

END OF TASK

REPLACE OVERSIZE SCREW THREAD INSERTS WITH LOCK RING

0037 00

THIS WORK PACKAGE COVERS:

Installation(page 0037 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0078 00, Item 68)
- Thread Insert Tool Kit (WP 0078 00, Item 70)
- Portable Electric Drill (WP 0078 00, Item 12)
- Portable Electric Drill (WP 0078 00, Item 13)
- Twist Drill Set (WP 0078 00, Item 15)
- Twist Drill Set (WP 0078 00, Item 16)
- Twist Drill (WP 0078 00, Item 17)
- Bearing Inserter (WP 0078 00, Item 30)
- Screw Thread Inserter (WP 0078 00, Item 32)
- Screw Threading Set (WP 0078 00, Item 63)

References

- See your -10
- See your -20

Equipment Condition

- Engine stopped (see your -10)
- Carrier blocked (see your -10)
- Road wheel support arm removed (see your -20)

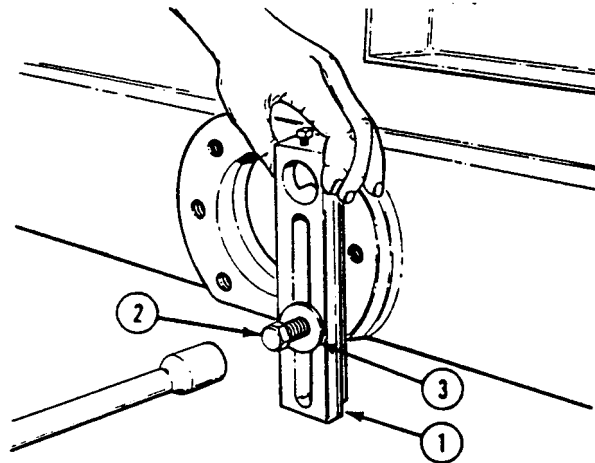
INSTALLATION

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 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).

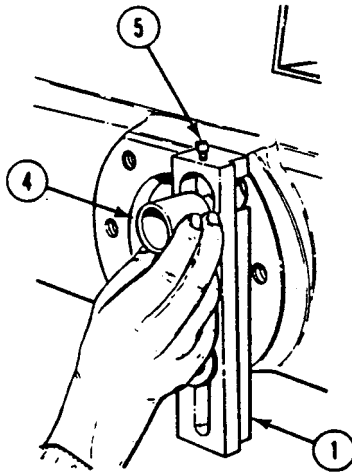
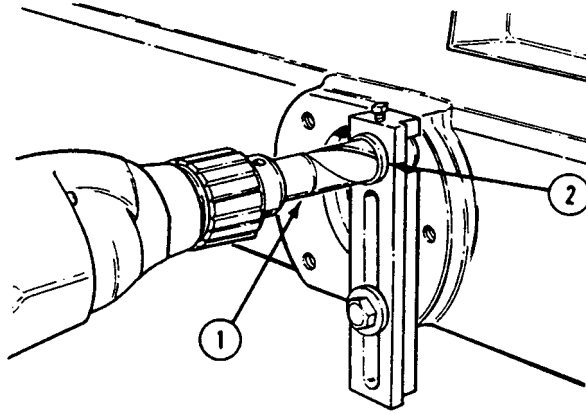


Table 1. OVERSIZE INSERT TECHNICAL DATA

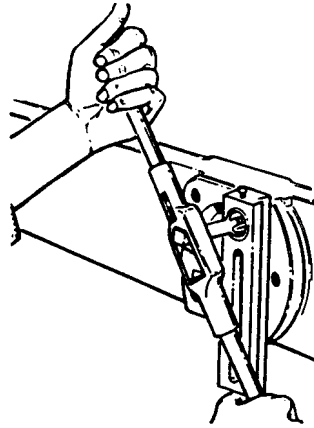
| Internal Thread Size | Part Number/NSN | Removal Drill Diameter/ App B Item | Inserter Part No/App B Item | Lock Ring Drive Tool Part No/App B Item | Application |
|----------------------|------------------|---------------------------------------|-----------------------------|---|---|
| 5/8-18 UNF | CR312SB16L | 57/64 | CR12W | R212D | SUSPENSION SYSTEM |
| | 5340-00-921-6094 | Item 17 | Item 32 | Item 30 | Road wheel arm mounting Shock absorber bracket mtg Track tension adjuster bkt mtg |

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.

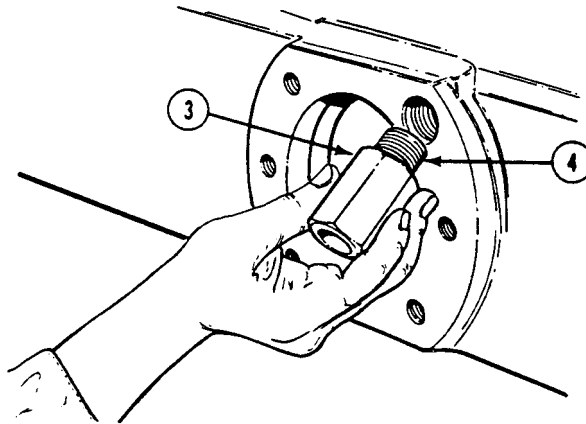
5. Counterbore to depth of lock ring thickness plus 0.010 to 0.020 inch (.254 to .508 mm).



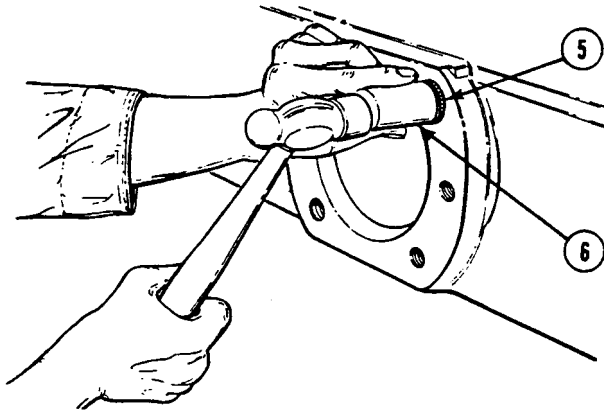
6. Hand tap correct size threads.



7. Use wrench (3) to install oversize insert (4) in threaded hole.



8. Install oversize lock ring (5) flush with hull surface. Use drive tool (6).

**FOLLOW-THROUGH STEPS**

1. Install road wheel support arm (see your -20).

END OF TASK

REPLACE LOCKED-IN STUDS

0038 00

THIS WORK PACKAGE COVERS:

- Removal (page 0038 00-1).
- Installation (page 0038 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

- General Mechanic’s Tool Kit (WP 0078 00, Item 68)
- Portable Electric Drill (WP 0078 00, Item 12)
- Twist Drill Set (WP 0078 00, Item 15)
- Screw Extractor Set (WP 0078 00, Item 18)
- Hacksaw Frame (WP 0078 00, Item 21)
- Screw Threading Set (WP 0078 00, Item 63)
- Hacksaw Blade (WP 0080 00, Item 19)
- Lock Ring Drive Tool (WP 0079 00, Figure 0079 00-2)

References

See your -10

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 lock ring is being removed, punch center of remaining stud. Drill a pilot hole.

NOTE

Key-locked studs have predrilled pilot holes.

3. Use an extractor to remove stud.

INSTALLATION

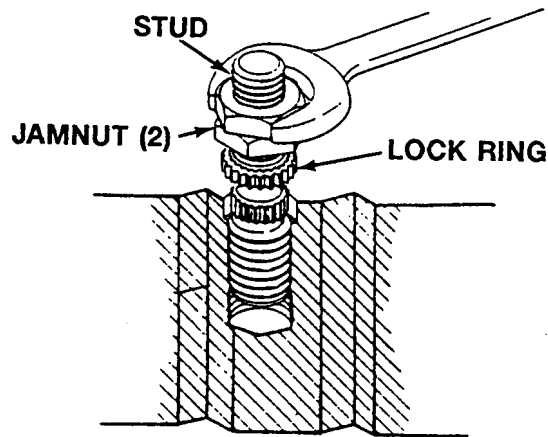
1. Use correct size tap drill (see table below) to drill hole for stud.
2. Tap threads. See table below for correct thread size.
3. Install stud in threaded hole.

Table 1. LOCKED-IN STUDS TECHNICAL DATA

| Nut End Thread Size | Part Number/NSN | Stud End Thread Size | Nut End Length | Application |
|--|---|-------------------------------------|----------------|-------------------------------|
| 1/2-20 UNF-3A | * 11597873 (19207) 5307-00-112-0473 | 3/4-10 UNC-3A (7/8 dia counterbore) | 2-1/4 inch | Winch transfer gearcase mount |
| | ** 10947253 (19207) NSN not assigned | 7/8-14 UNS-2A | 2-1/4 inch | |
| * Screw thread stud with serrated lock ring. | | | | |
| ** Key-locked screw thread stud. | | | | |

4. If stud cannot be turned by hand, lock two jamnuts on nut end of stud. Then turn with a wrench as shown in view A below.

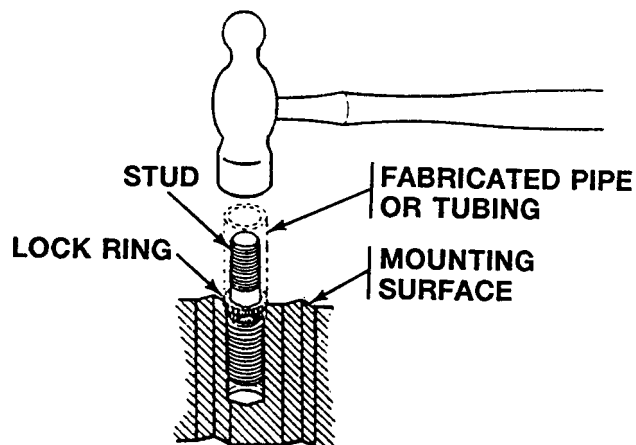
5. Remove jamnuts.
6. If stud with serrated lock ring is to be installed, place lock ring on stud.
7. Cut off a piece of heavy walled pipe or tubing to fit over stud. Install stud using two jamnuts (2). See fabrication instructions (WP 0079 00).

**NOTE**

Do not drive upper edge of lock ring below upper edge of serrated part of stud. Drive straight down.

Installation of key-locked stud is similar to installation of stud with serrated lock ring. Make sure fabricated pipe or tubing bears on keys. Drive straight down. Avoid breaking keys.

8. Use a hammer to drive keys or lock ring down to secure stud. Place tube on lock ring and drive flush with mounting surface.
9. Drive keys flush with mount surface.



END OF TASK

REPAIR CAB DOOR

0039 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0039 00-1).
 Assembly (page 0039 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Metal Worker 44B

Tools and Special Tools

Metal Worker's Tool Kit (WP 0078 00, Item 69)
 Trailer Mounted Welding Shop (WP 0078 00, Item 74)
 Plastic Apron (WP 0078 00, Item 3)
 Utility Apron (WP 0078 00, Item 5)
 Chemical Protective Gloves (WP 0078 00, Item 22)
 Welder's Gloves (WP 0078 00, Item 23)
 Industrial Goggles (WP 0078 00, Item 24)
 Welder's Helmet (WP 0078 00, Item 26)
 Electrical Disc Sander (WP 0078 00, Item 48)

References

See your -10
 See your -20
 TC 9-237

Materials/Parts

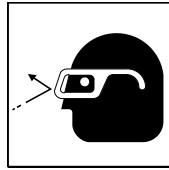
Cushioning material (polyurethane foam)
 (WP 0080 00, Item 13)
 Denatured alcohol (WP 0080 00, Item 14)
 Cleaning compound (WP 0080 00, Item 49)
 Welding electrode (WP 0080 00, Item 45)

Equipment Condition

Engine stopped (see your -10)
 Carrier blocked (see your -10)
 Cab door removed from carrier (see your -20)

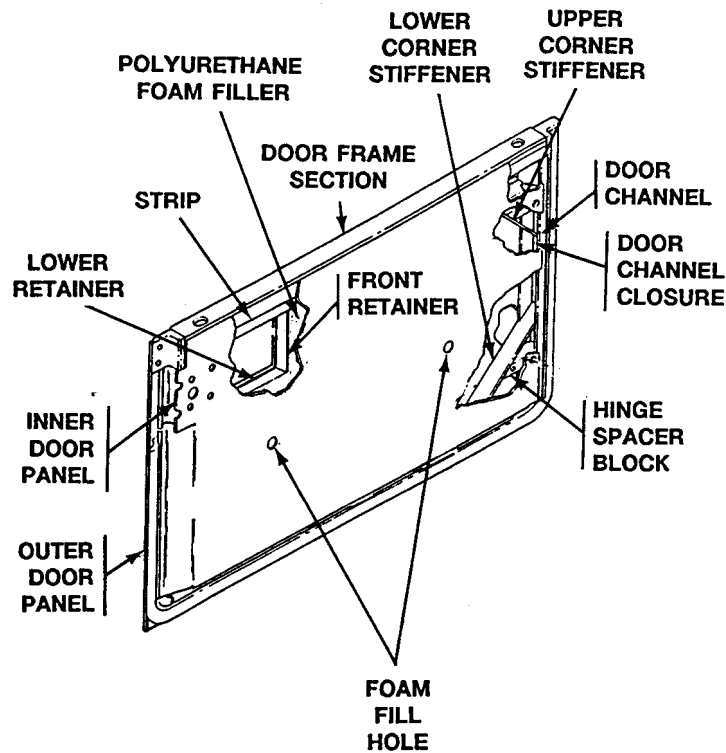
DISASSEMBLY

1. Grind off weld beads, and remove inner door panel from outer door panel and door frame section.

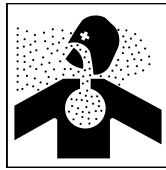
WARNING

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

- Scrape all polyurethane foam filler from door cavity, and wash door with cleaning compound. Dry thoroughly with 15 psi (104 kPa) compressed air.

**ASSEMBLY**

- Position inner door panel on outer door panel and door frame section, and secure by welding. See WP 0005 00 and TC 9-237 for aluminum welding instructions.
- Observe the following warnings while working with polyurethane foam filler:

WARNING

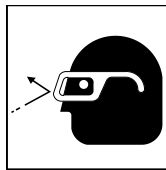
The following first aid supplies should be supplied, with instructions for use, to personnel working with polyurethane foam:

Respirator - to be worn at all times unless forced ventilation is available.

Goggles - TO BE WORN AT ALL TIMES.

Plastic laboratory apron or suitable coveralls and neoprene gloves.

At least 1 gallon of isopropanol (rubbing alcohol) for washing material from skin.

WARNING

Observe the following basic rules for safe handling of polyurethane foam:

Work in well-ventilated area, preferably one which is force-ventilated.

Do not breathe fumes from products. Avoid standing directly over containers and rising masses of foam.

Wear goggles at all times when using these products.

Wash all resins from skin with isopropanol (rubbing alcohol) in plentiful quantities immediately after contact.

In cases of contact with eyes, seek immediate medical assistance, but try to get as much material as possible out of eye by washing with water. Do not blink – hold eyelid open by hand.

3. Fill cab door cavity with polyurethane foam filler as follows:
 - a. Preheat cab door assembly to 120°F (48°C) before pouring polyurethane foam filler.
 - b. Place door, with inner surface facing up, on a horizontal flat surface.
 - c. Mix foam filler, to produce rigid polyurethane foam of 2-3 pounds/cubic foot (32-48 kg/cubic meter) density, as follows:
 - 1) Weigh out 12.8 ounces (363 grams) of resin.
 - 2) Weigh out 0.07 ounce (2 grams) of catalyst.
 - 3) Mix resin with catalyst either by hand with a spatula or tongue blade, or with a mechanical mixer. Mix well. If using mechanical mixer, batches should be mixed and poured before signs of foaming appear (small white bubbles form).

- d. Pour polyurethane foam mixture into 3/4 inch (1.9 cm) diameter holes in inner door panel to produce parallel foam ribbons. Distribution should be as uniform as possible. Do not pour from a height more than 36 inches (91.4 cm) to minimize density buildup and shear effects on the bond.
- e. Allow to cure at room temperature at least 15 minutes before moving. The rigid mass will have approximately 75 percent of its final physical properties.
- f. Allow to cure at room temperature at least 36 hours before using. The rigid mass will have approximately 90 percent of its final physical properties after 24 hours.
- g. Scrape off excess foam from exterior surfaces of cab door.

FOLLOW-THROUGH STEPS

1. Install cab door (see your -20).

END OF TASK

REPAIR SEAT CUSHIONS/BACKRESTS

0040 00

THIS WORK PACKAGE COVERS:

Repair or Replacement (page 0040 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fabric Repairman 43M

Tools and Special Tools

Canvas Worker's Tool Kit (WP 0078 00, Item 65)
Industrial Sewing Machine (WP 0078 00, Item 49)

References

See your -20
FM 10-16

Materials/Parts

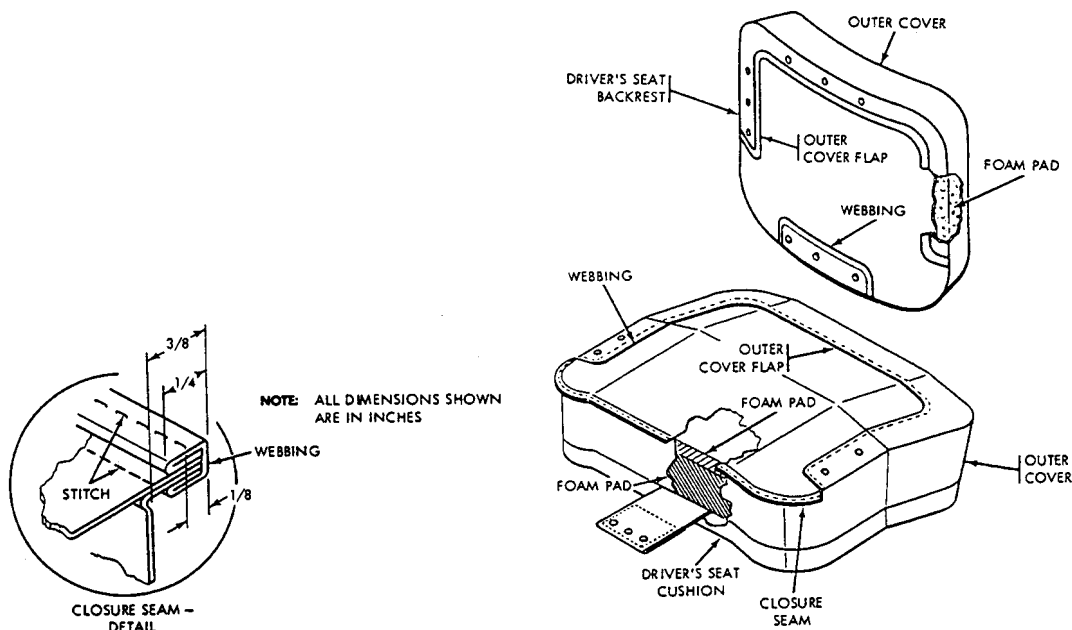
Thread (WP 0080 00, Item 42)

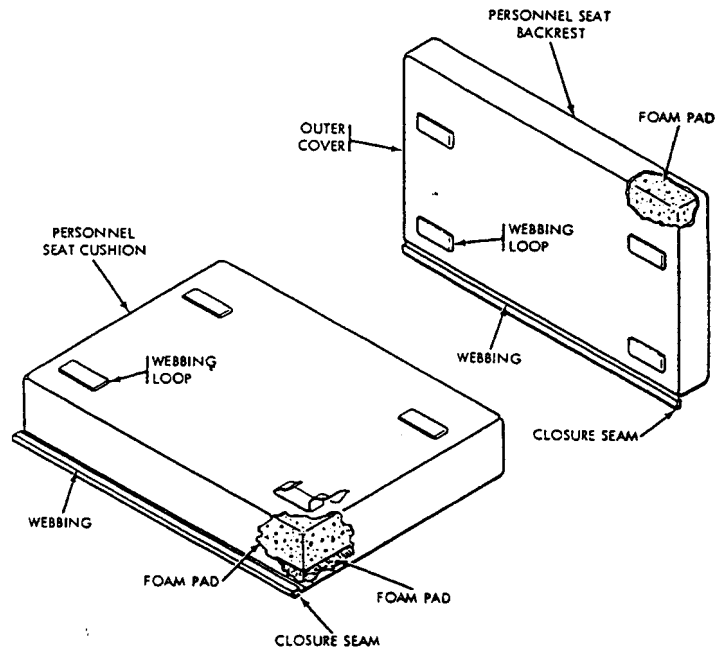
Equipment Condition

Seat cushion/backrest removed (see your -20)

REPAIR OR REPLACEMENT

1. Repair of driver's and personnel seat cushion and backrest consists of replacing the covers, webbing loops, and pads. Refer to FM 10-16 and the following instructions:
 - a. Open full length of cover closure seam.
 - b. Remove foam pad(s) from cover.
 - c. Stitch webbing loop(s) to cover as outlined in step e. Stitch in rectangular pattern with crossing diagonal pattern in center of rectangle.
 - d. Install foam pad(s) in cover.
 - e. Stitch closure seam by lockstitching. Use 5 to 7 stitches per inch (2.54 cm). Maintain thread tension so there is no loose stitching and lock is embedded in center of material. Trim all thread ends. When restitching, take care that original needle holes are well covered and that replacement stitching does not fall directly on original stitch lines. All external parts of cushion or backrest will be the same color.





FOLLOW-THROUGH STEPS

1. Install seat cushion/backrest (see your -20).

END OF TASK

CHAPTER 12

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR WINCH (M548A1)

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|---|---------------------|
| REPAIR WINCH ENDFRAME ASSEMBLY (M548A1)..... | 0041 00 |
| REPAIR WINCH DRUM (M548A1)..... | 0042 00 |
| REPAIR WINCH GEARCASE ASSEMBLY (M548A1)..... | 0043 00 |
| REPAIR WINCH TRANSFER GEARCASE (M548A1)..... | 0044 00 |
| ADJUST WINCH POWER TAKEOFF (M548A1)..... | 0045 00 |
| REPAIR WINCH POWER TAKEOFF SHIFTER ASSEMBLY (M548A1)..... | 0046 00 |
| REPAIR WINCH POWER TAKEOFF GEAR ASSEMBLY (M548A1)..... | 0047 00 |

REPAIR WINCH ENDFRAME ASSEMBLY (M548A1)

0041 00

THIS WORK PACKAGE COVERS:

- Removal (page 0041 00-2).
- Disassembly (page 0041 00-4).
- Assembly (page 0041 00-6).
- Installation (page 0041 00-8).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0078 00, Item 68)
- Arbor Press (WP 0078 00, Item 42)

References

- See your -10
- See your -20

Materials/Parts

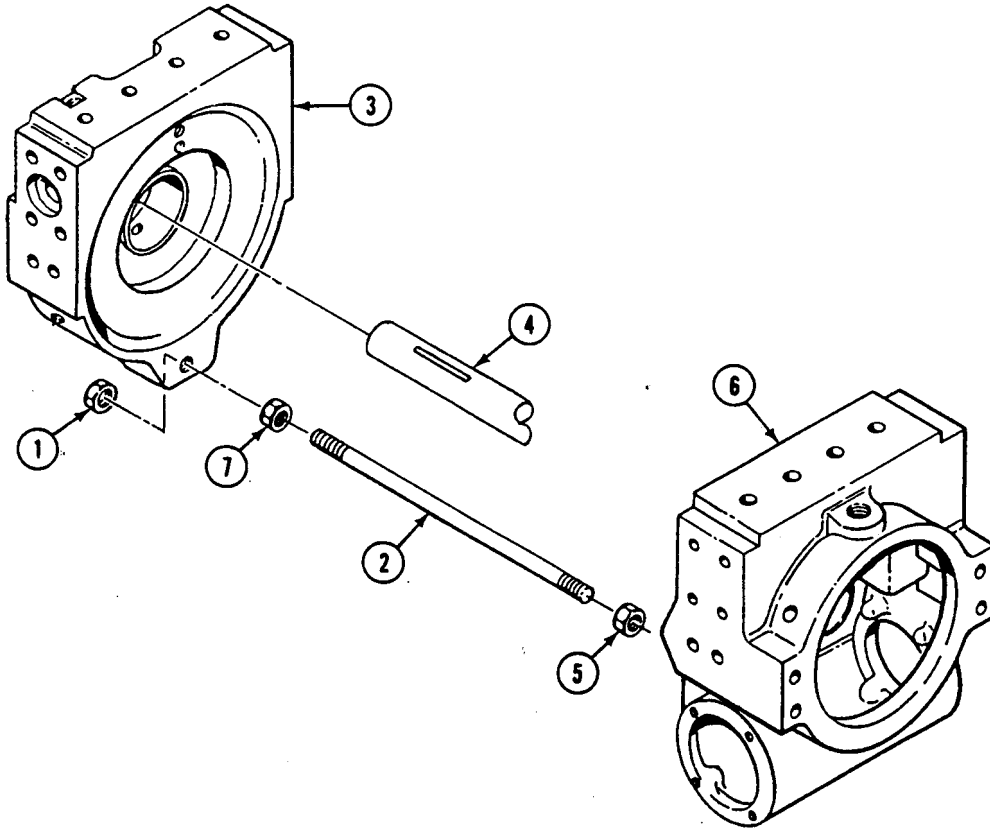
- Bearing
- Lock nut (3)
- Oil seal
- Oil seal

Equipment Condition

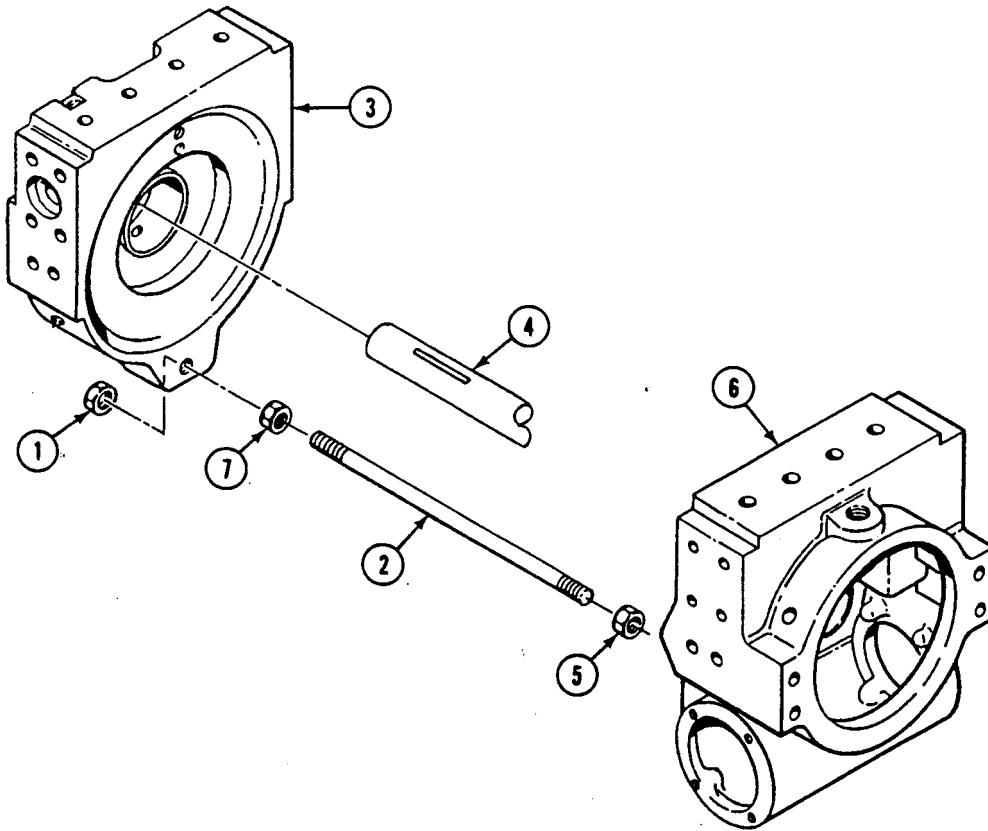
- Engine stopped (see your -10)
 - Carrier blocked (see your -10)
 - Winch cable removed (see your -20)
 - Winch removed from carrier (see your -20)
 - Endframe and gearcase oil drained (see your -20)
-

REMOVAL

1. Remove lock nut (1) from tie rod (2) on endframe housing (3). Discard lock nut.
2. Remove endframe housing (3) from drum shaft (4).

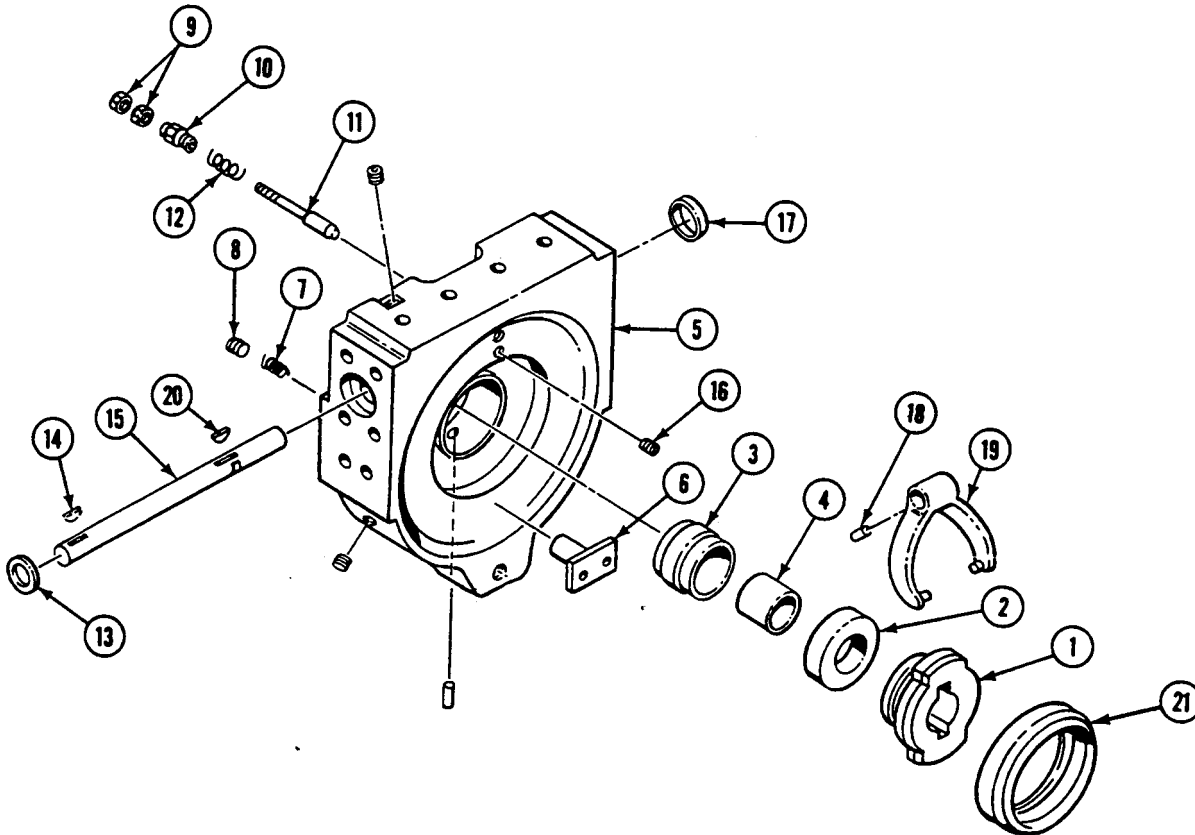


3. Loosen lock nut (5) securing tie rod (2) to gearcase housing (6). Turn rod (2) counterclockwise and remove from gearcase housing (6).
4. Remove lock nut (5) and lock nut (7) from tie rod (2). Discard lock nuts.

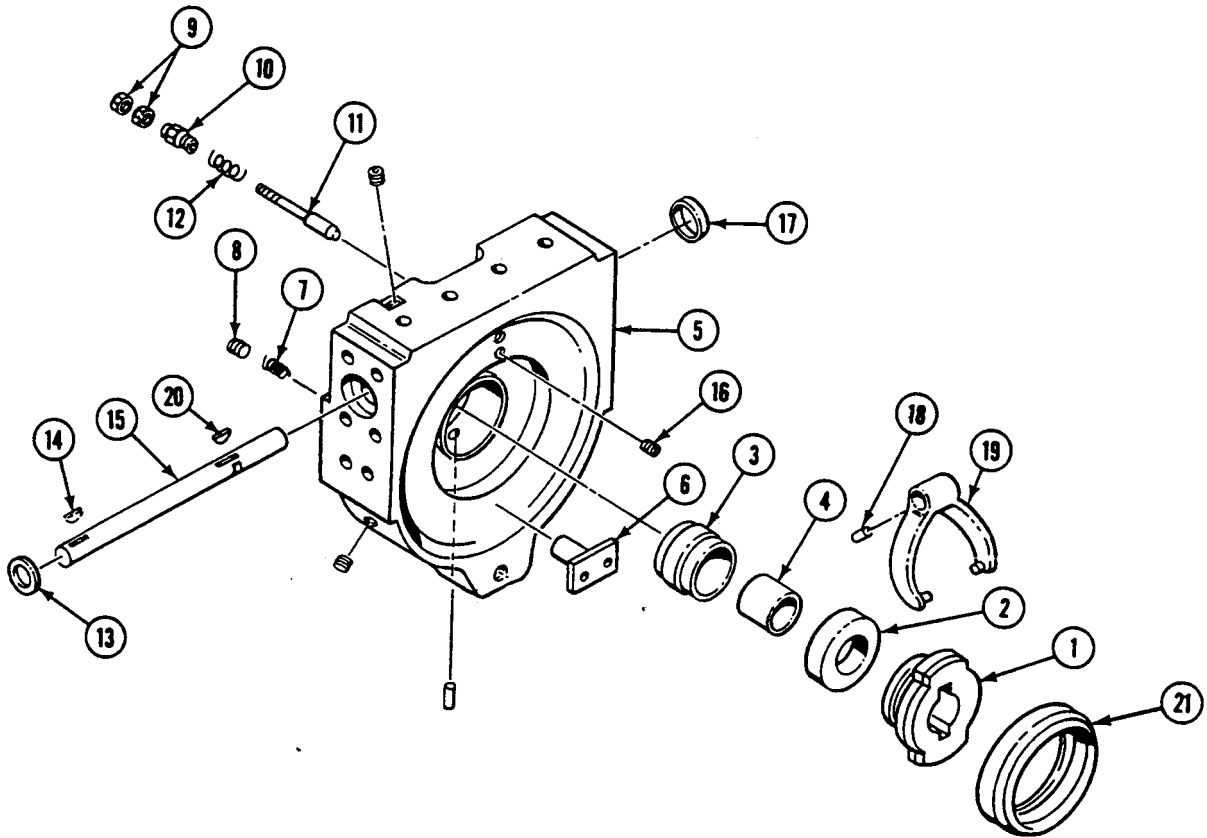


DISASSEMBLY

1. Remove sliding clutch (1), thrust ring (2), and sleeve (3), with sleeve bearing (4) installed, from endframe housing (5).
2. Press sleeve bearing (4) from sleeve (3). Discard bearing.
3. Remove drag brake shoe assembly (6) and spring (7) from endframe housing (5).
4. Remove drag brake adjusting screw (8) from endframe housing (5).
5. Remove two nuts (9), bolt (10), poppet (11), and spring (12) from endframe housing (5).

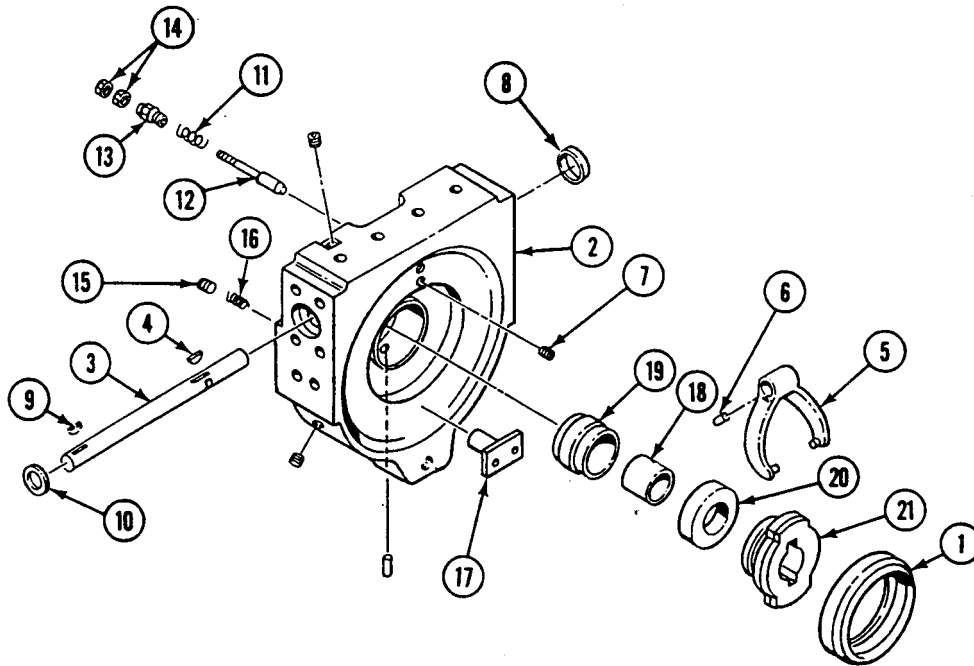


6. Remove oil seal (13) and key (14) from shifter shaft (15). Discard oil seal.
7. Remove setscrew (16) and plug (17) from endframe housing (5).
8. Remove setscrew (18) securing yoke (19) to shifter shaft (15).
9. Remove yoke (19), key (20), and shifter shaft (15) from endframe housing (5).
10. Press oil seal (21) from endframe housing (5). Discard oil seal.

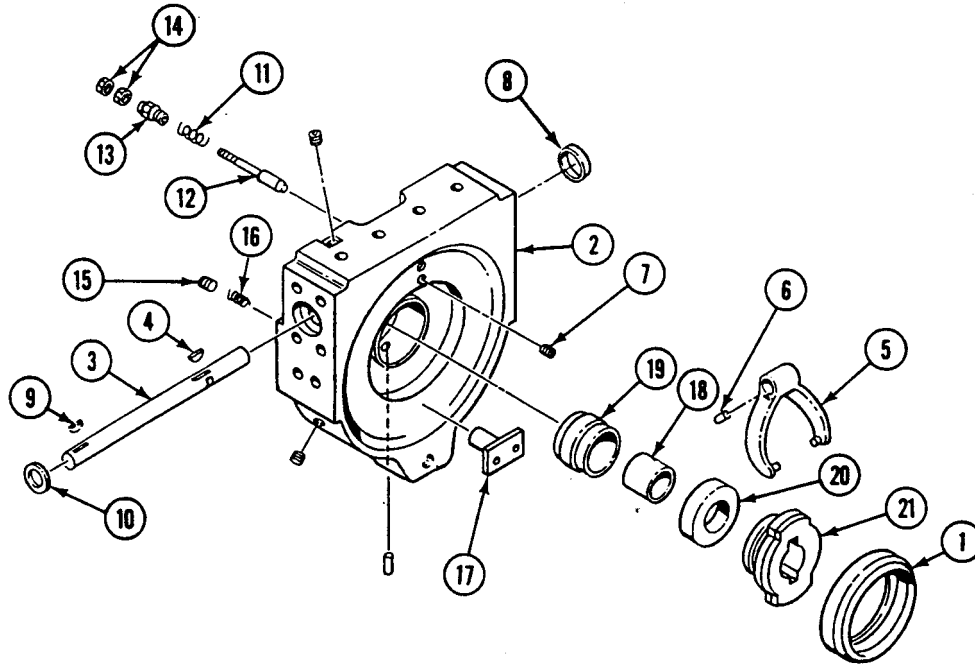


ASSEMBLY

1. Position new oil seal (1) on endframe housing (2) with inner lip of seal facing toward inside of endframe housing, and press seal on shoulder of endframe housing.
2. Install shifter shaft (3), key (4), and yoke (5) in endframe housing (2).
3. Install setscrew (6) securing yoke (5) to shifter shaft (3).
4. Install setscrew (7) and plug (8) on endframe housing (2).
5. Install key (9) and new oil seal (10) on shifter shaft (3).

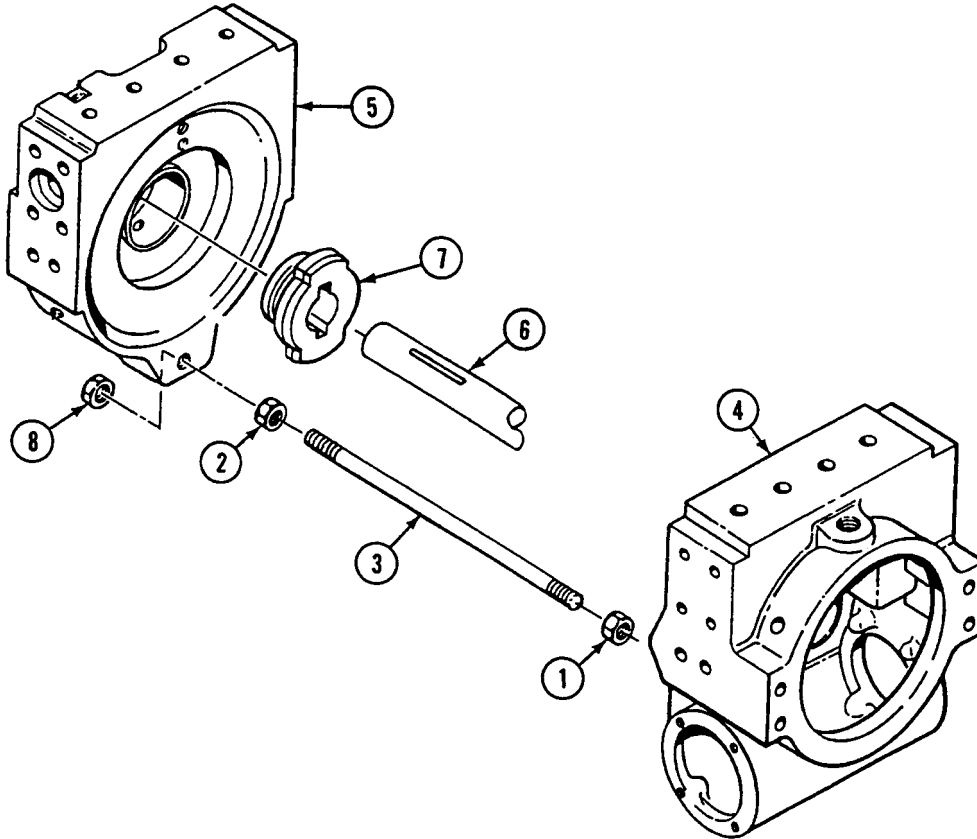


6. Install spring (11), poppet (12), bolt (13), and two nuts (14) in endframe housing (2).
7. Install drag brake adjusting screw (15) in endframe housing (2).
8. Install spring (16) and drag brake shoe assembly (17) in endframe housing (2).
9. Press new sleeve bearing (18) into sleeve (19).
10. Position sleeve (19) with notch on installed bearing (18) facing toward yoke (5).
11. Install thrust ring (20) and sliding clutch (21) in endframe housing (2). Engage clutch with yoke (5).



INSTALLATION

1. Install new lock nut (1) and new lock nut (2) on tie rod (3).
2. Install tie rod (3) in gearcase housing (4) and tighten lock nut (1) to secure tie rod to housing.
3. Install endframe housing (5) on drum shaft (6) and tie rod (3) so that drum shaft is aligned with keyway of sliding clutch (7). Check drum for freedom of movement.
4. Install new lock nut (8) on end of tie rod (3) and tighten lock nut (8) and lock nut (2) against endframe housing (5).

**FOLLOW-THROUGH STEPS**

1. Fill endframe and gearcase with oil (see your -20).
2. Install winch on carrier (see your -20).
3. Install winch cable (see your -20).
4. Adjust winch (see your -20).

END OF TASK

REPAIR WINCH DRUM (M548A1)

0042 00

THIS WORK PACKAGE COVERS:

Removal (page 0042 00-2).
 Installation (page 0042 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Arbor Press (WP 0078 00, Item 42)

Materials/Parts

Lock nut
 Oil seal
 Sleeve bearing (2)

Personnel Required

Track Vehicle Repairer 63H

References

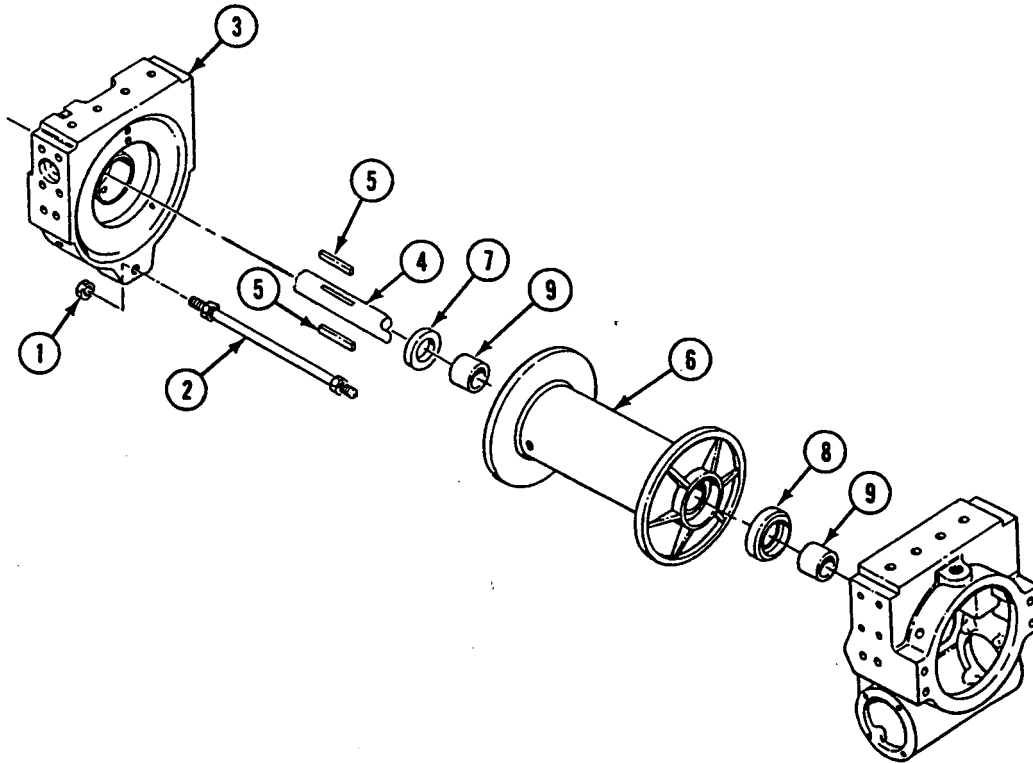
See your -10
 See your -20

Equipment Condition

Engine stopped (see your -10)
 Carrier blocked (see your -10)
 Winch cable removed (see your -20)
 Winch removed from carrier (see your -20)
 Endframe and gearcase oil drained (see your -20)

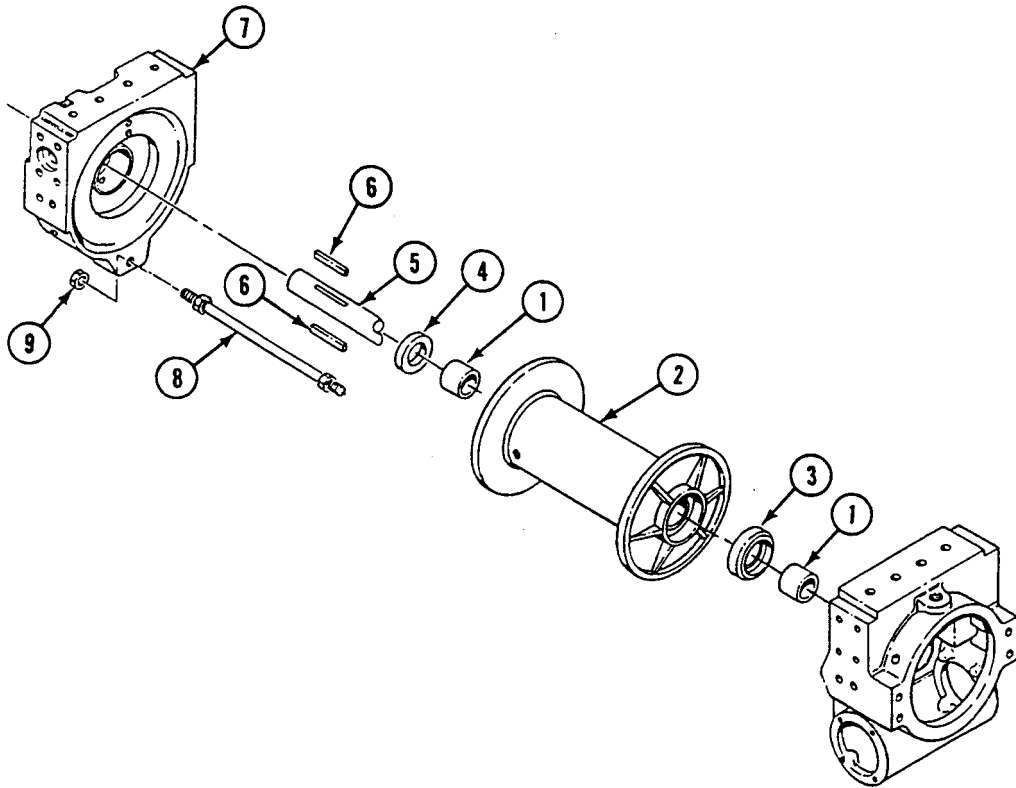
REMOVAL

1. Remove lock nut (1) from tie rod (2) on endframe housing (3). Discard lock nut.
2. Remove endframe housing (3) from drum shaft (4).
3. Remove two sliding clutch keys (5) securing drum (6) on drum shaft (4).
4. Remove drum (6) and thrust ring (7) from drum shaft (4).
5. Press oil seal (8) and two sleeve bearings (9) from drum (6). Discard oil seal and sleeve bearings.



INSTALLATION

1. Press two new sleeve bearings (1) in drum (2) with notch of each bearing facing away from drum.
2. Press new oil seal (3) in drum (2) with lip of oil seal facing away from drum.
3. Install thrust ring (4) and drum (2) on drum shaft (5).
4. Install two sliding clutch keys (6) securing drum (2) on drum shaft (5).
5. Install endframe housing (7) on drum shaft (5) and tie rod (8). Be sure drum shaft is aligned with keyway of sliding clutch. Check drum (2) for freedom of movement.
6. Install new lock nut (9) on end of tie rod (8) and tighten nut (9) and nut (10) against endframe housing (7).

**FOLLOW-THROUGH STEPS**

1. Fill endframe and gearcase with oil (see your -20).
2. Install winch on carrier (see your -20).
3. Install winch cable (see your -20).
4. Adjust winch (see your -20).

END OF TASK

REPAIR WINCH GEARCASE ASSEMBLY (M548A1)

0043 00

THIS WORK PACKAGE COVERS:

- Removal (page 0043 00-2).
- Disassembly (page 0043 00-3).
- Assembly (page 0043 00-7).
- Installation (page 0043 00-11).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0078 00, Item 68)
- Arbor Press (WP 0078 00, Item 42)
- Blind Riveter (WP 0078 00, Item 47)

References

- See your -10
- See your -20
- TM 9-214

Materials/Parts

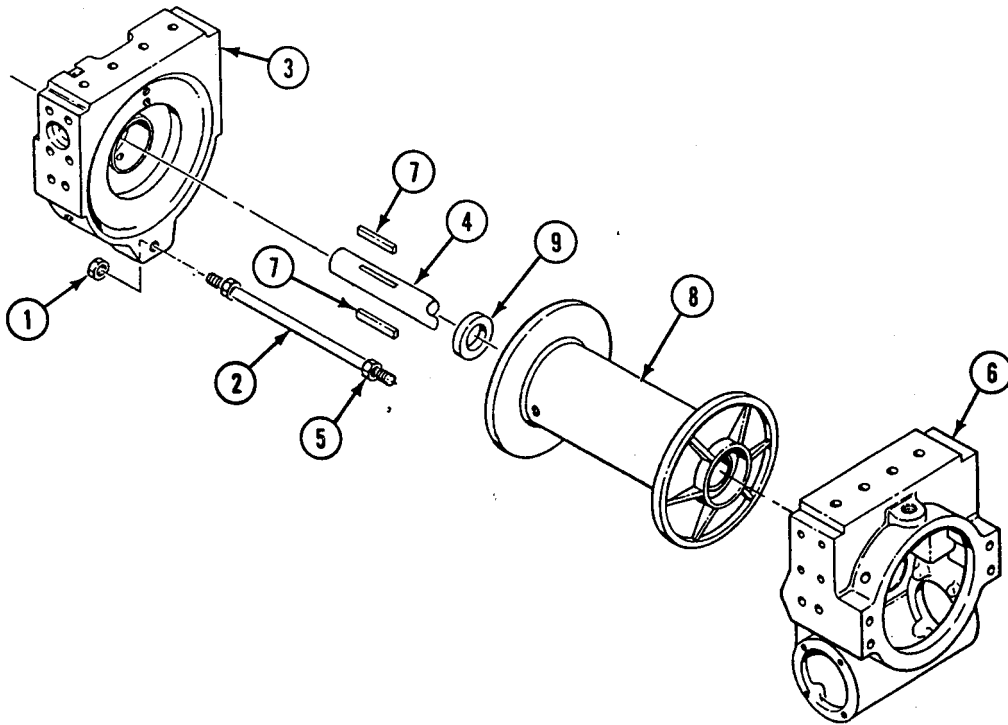
- Drum shaft
- Gasket
- Gasket
- Gasket
- Gasket
- Lock nut
- Lock washer (4)
- Lock washer (6)
- Lock washer (9)
- Oil seal
- Oil seal
- Packing
- Sleeve bearing (2)

Equipment Condition

- Engine stopped (see your -10)
 - Carrier blocked (see your -10)
 - Winch cable removed (see your -20)
 - Winch removed from carrier (see your -20)
 - Endframe and gearcase oil drained (see your -20)
-

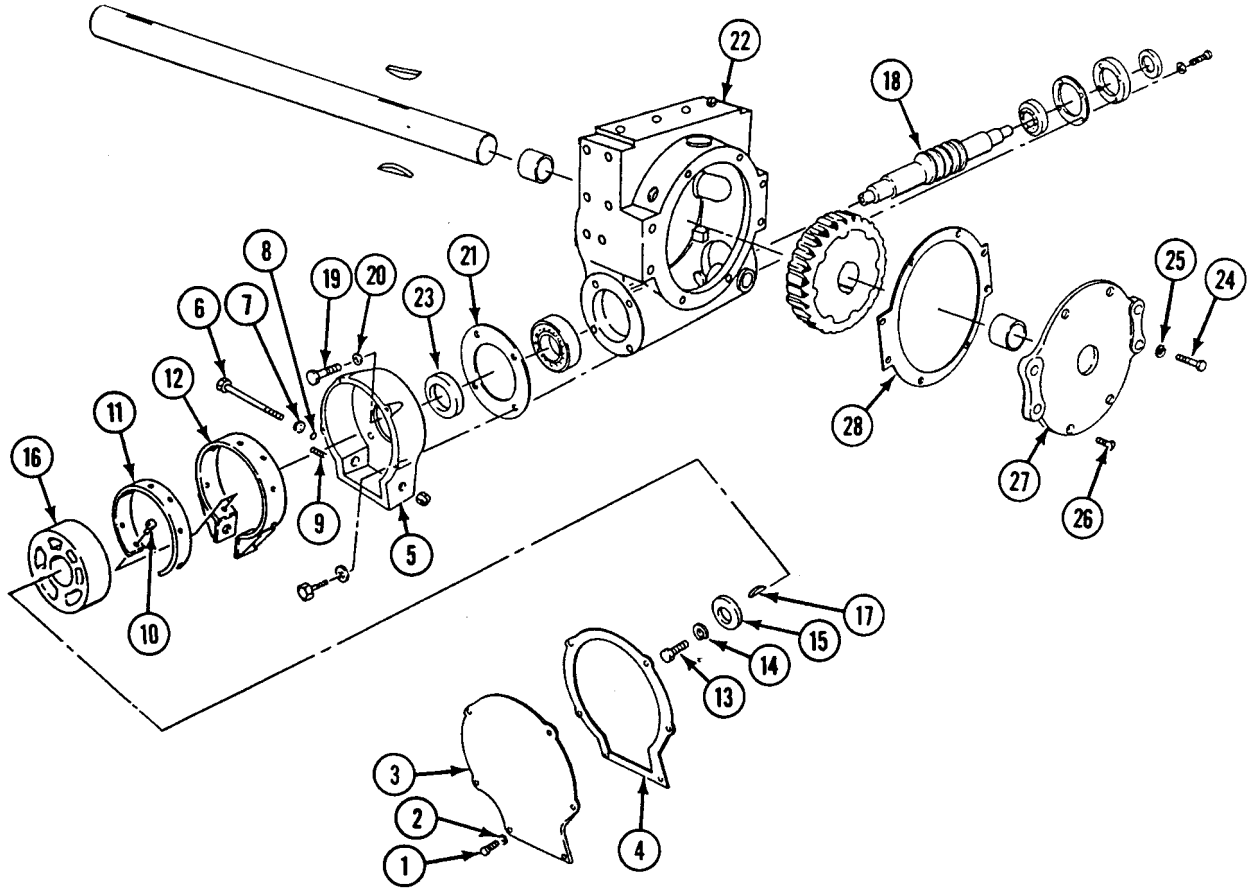
REMOVAL

1. Remove lock nut (1) from tie rod (2) on endframe housing (3). Discard lock nut.
2. Remove endframe housing (3) from drum shaft (4).
3. Loosen lock nut (5) securing tie rod (2) to gearcase housing (6). Remove tie rod from gearcase housing by turning rod counterclockwise.
4. Remove two sliding clutch keys (7) securing drum (8) on drum shaft (4).
5. Remove drum (8), and thrust ring (9) from drum shaft (4).



DISASSEMBLY

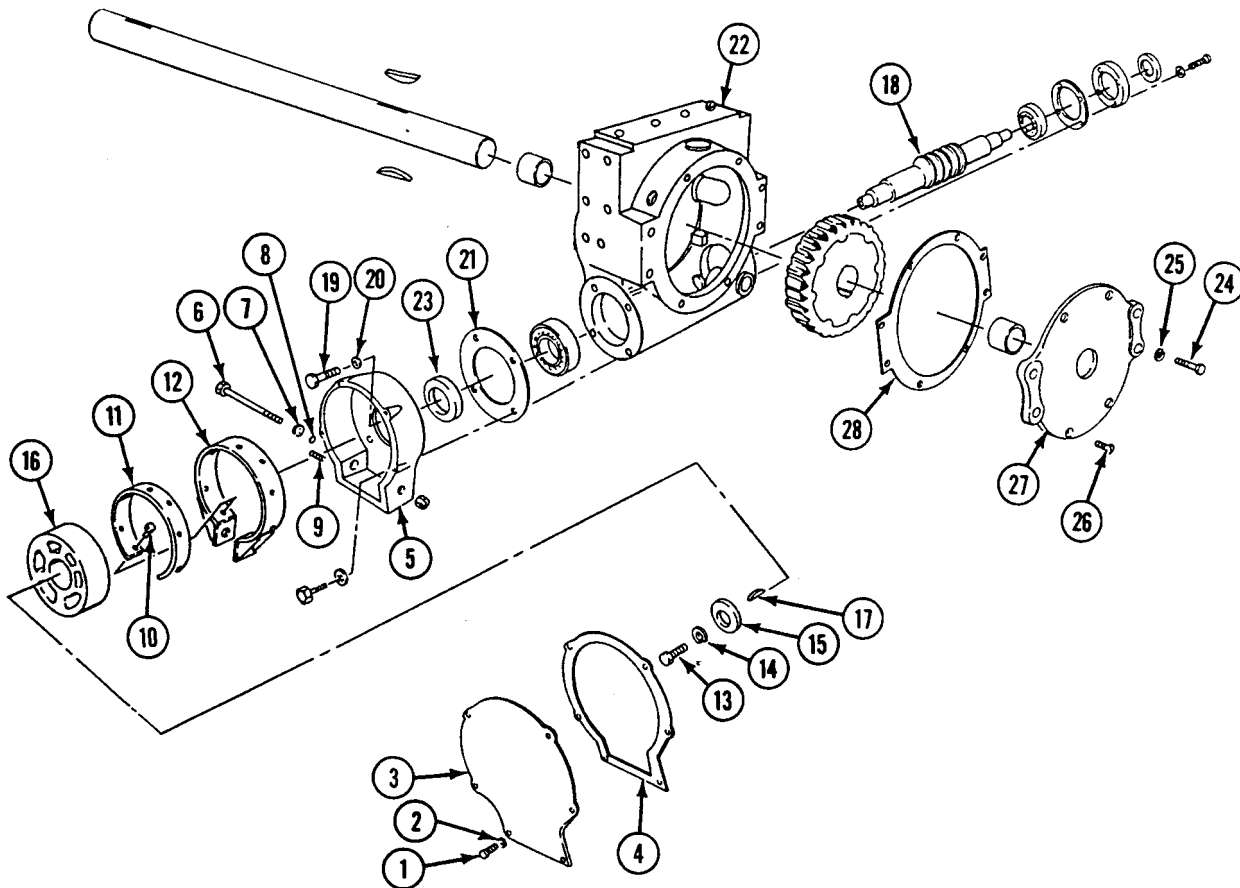
1. Remove six screws (1), lock washers (2), cover (3), and gasket (4) from brake case (5). Discard lock washers and gasket.
2. Remove adjusting screw (6), washer (7), packing (8), spring (9), rivet (10), lining (11), and brake band (12) from brake case (5). Discard packing.
3. Remove bolt (13), lock washer (14), washer (15), brake drum (16), and key (17) from drive worm gear (18). Discard lock washer.



REPAIR WINCH GEARCASE ASSEMBLY (M548A1) — Continued

0043 00

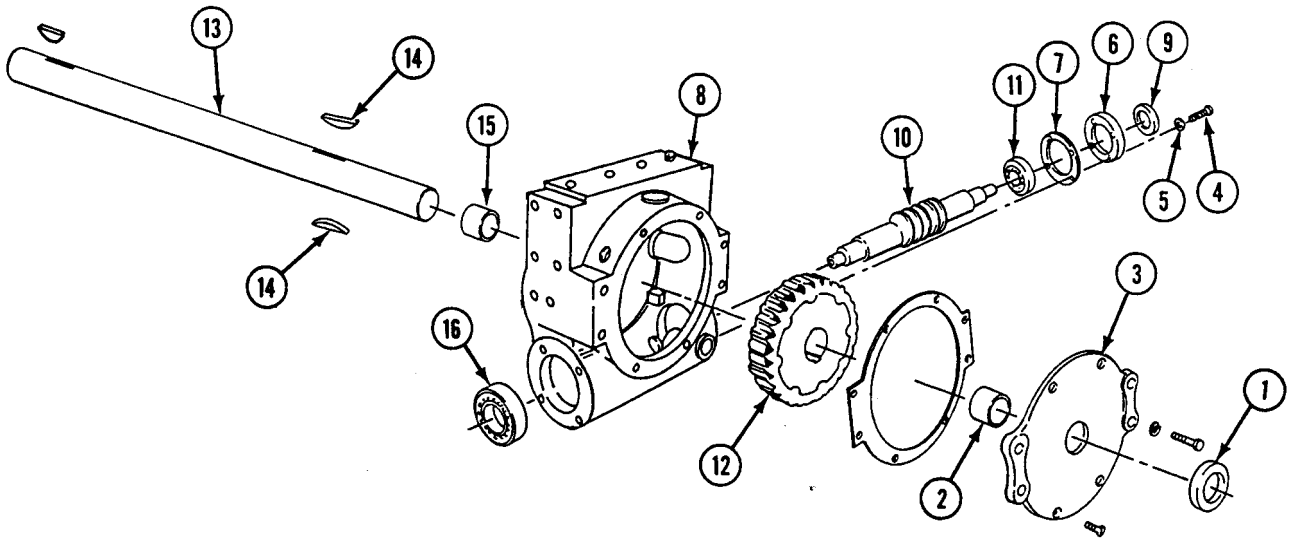
4. Remove four bolts (19), lock washers (20), brake case (5), and gasket (21) from housing (22). Discard lock washers and gasket.
5. Press oil seal (23) from brake case (5). Discard seal.
6. Remove four bolts (24), lock washers (25), screws (26), gearcase cover (27), and gasket (28) from housing (22). Discard lock washers and gasket.



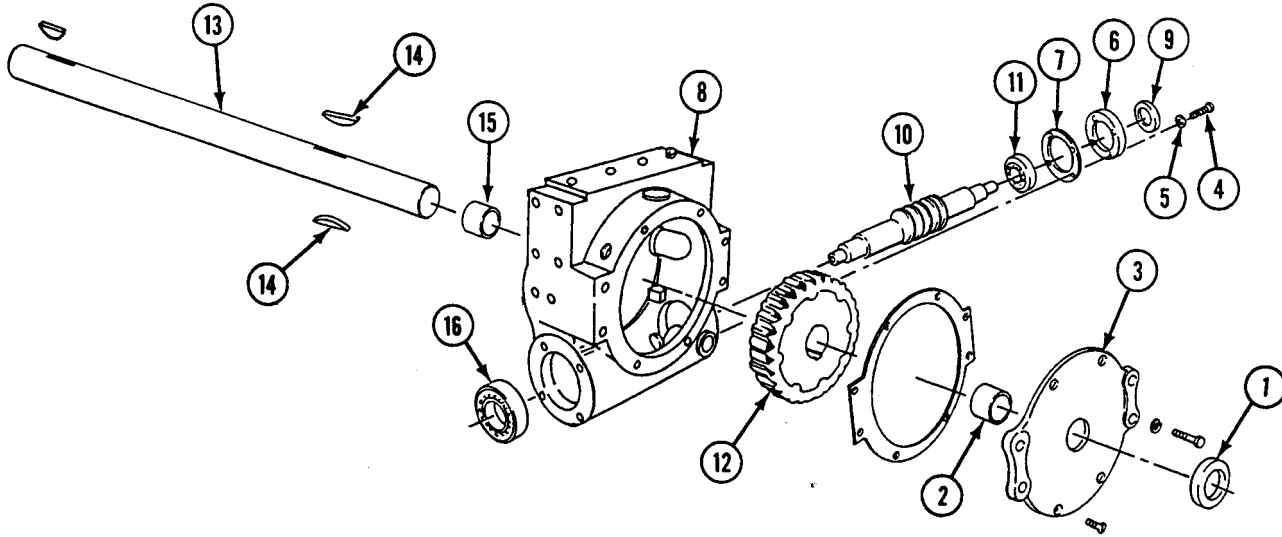
NOTE

There are two types of gearcase covers. Do Step 7 only if gearcase cover has oil seal and sleeve bearing.

7. Press oil seal (1) and sleeve bearing (2) from gearcase cover (3). Discard seal and bearing.
8. Remove four bolts (4), lock washers (5), end cap (6), and gasket (7) from housing (8). Discard lock washers and gasket.
9. Press oil seal (9) from end cap (6). Discard seal.
10. Remove drive worm gear (10) from housing (8) by turning worm gear counterclockwise.

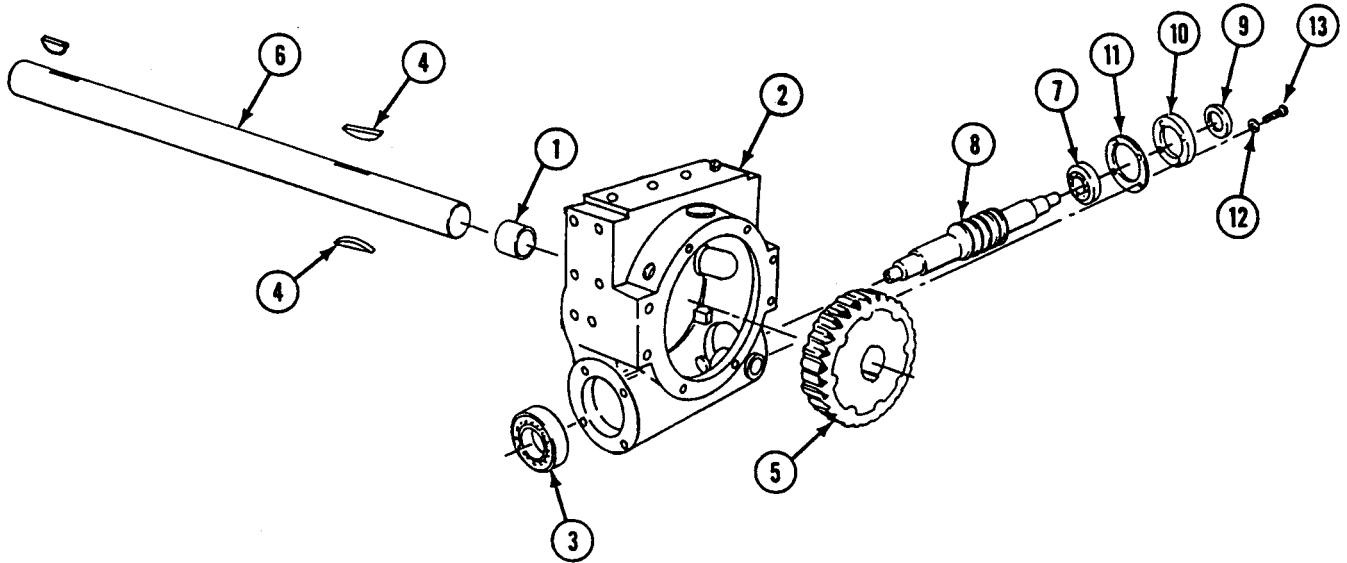


11. Press thrust bearing (11) from drive worm gear (10).
12. Remove worm gear (12) with drum shaft (13) from housing (8).
13. Mark face of worm gear (12) and end of drum shaft (13) for reassembly alignment.
14. Remove worm gear (12) and two keys (14) from drum shaft (13). Discard drum shaft.
15. Press sleeve bearing (15) and thrust bearing (16) from housing (8). Discard sleeve bearing.

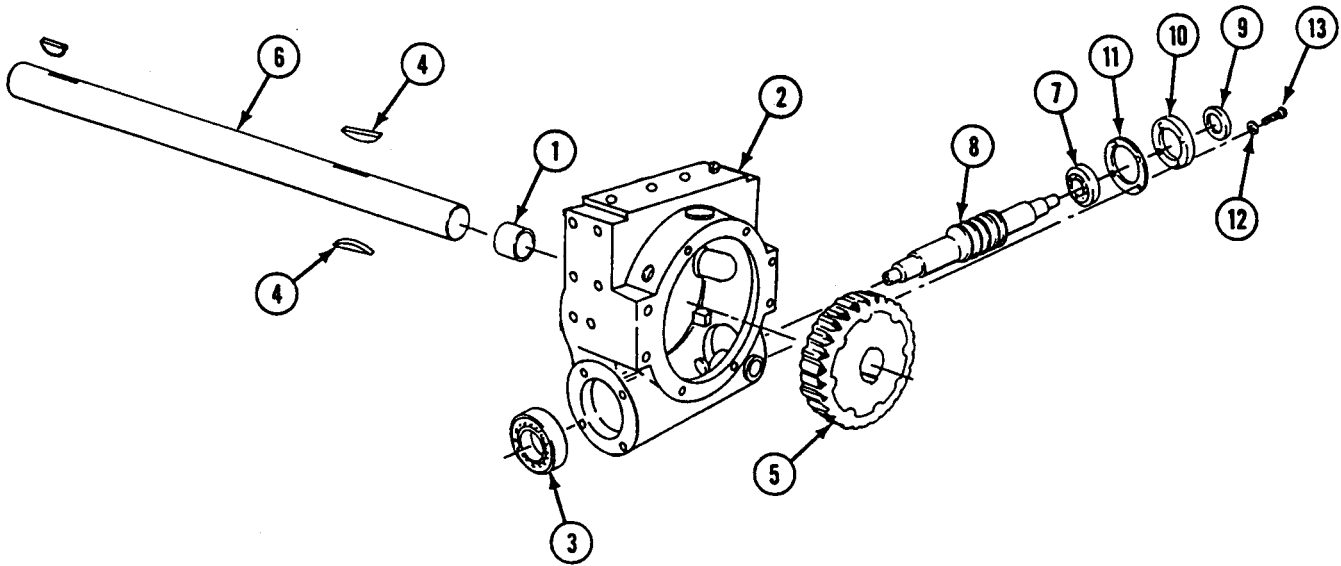


ASSEMBLY

1. Press new sleeve bearing (1) in housing (2) with notch on bearing facing toward inside of housing.
2. Press thrust bearing (3) in housing (2) with words THRUST HERE facing away from housing.
3. Install two keys (4) and worm gear (5) on drum shaft (6). Align marked face of gear to marked end of shaft.



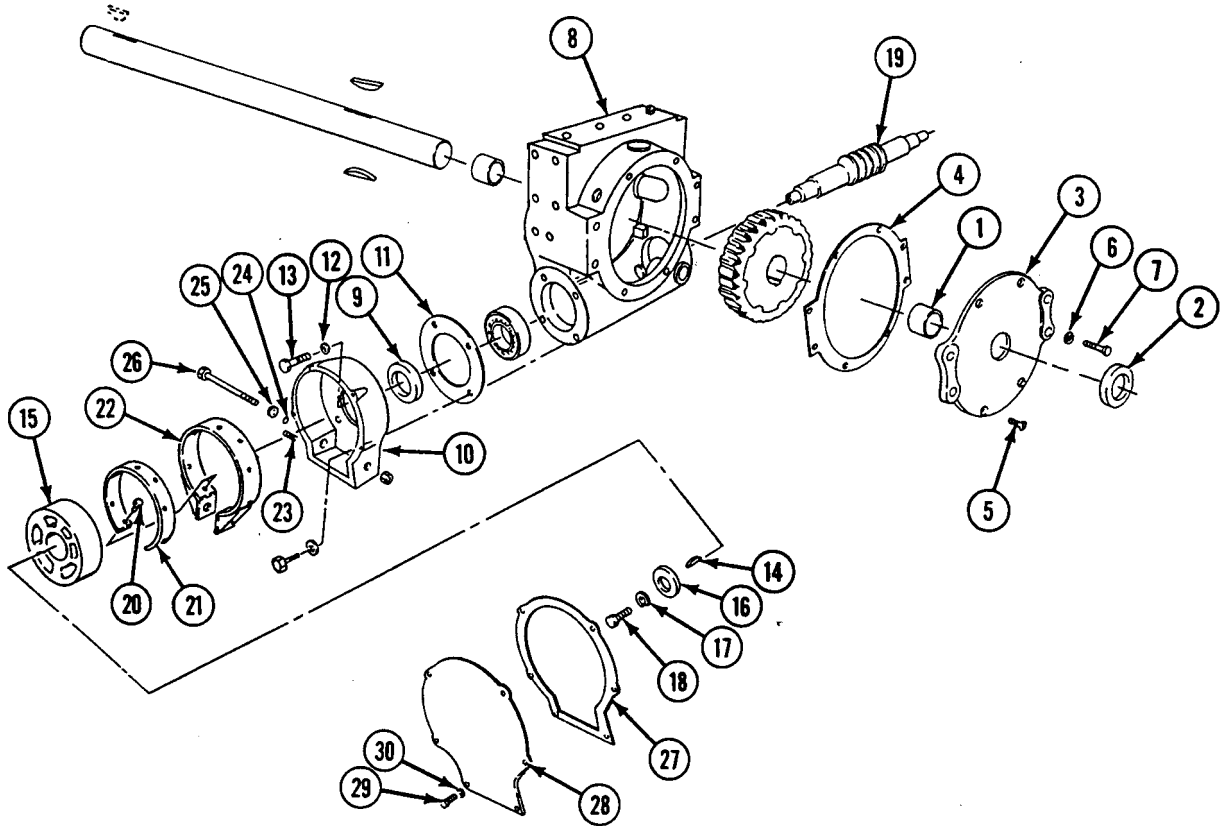
4. Install new drum shaft (6) with worm gear (5) in housing (2).
5. Press thrust bearing (7) on drive worm gear (8).
6. Install drive worm gear (8) in housing (2) by turning worm gear clockwise.
7. Press new oil seal (9) in end cap (10).
8. Install new gasket (11), end cap (10), four new lock washers (12), and bolts (13) on housing (2).



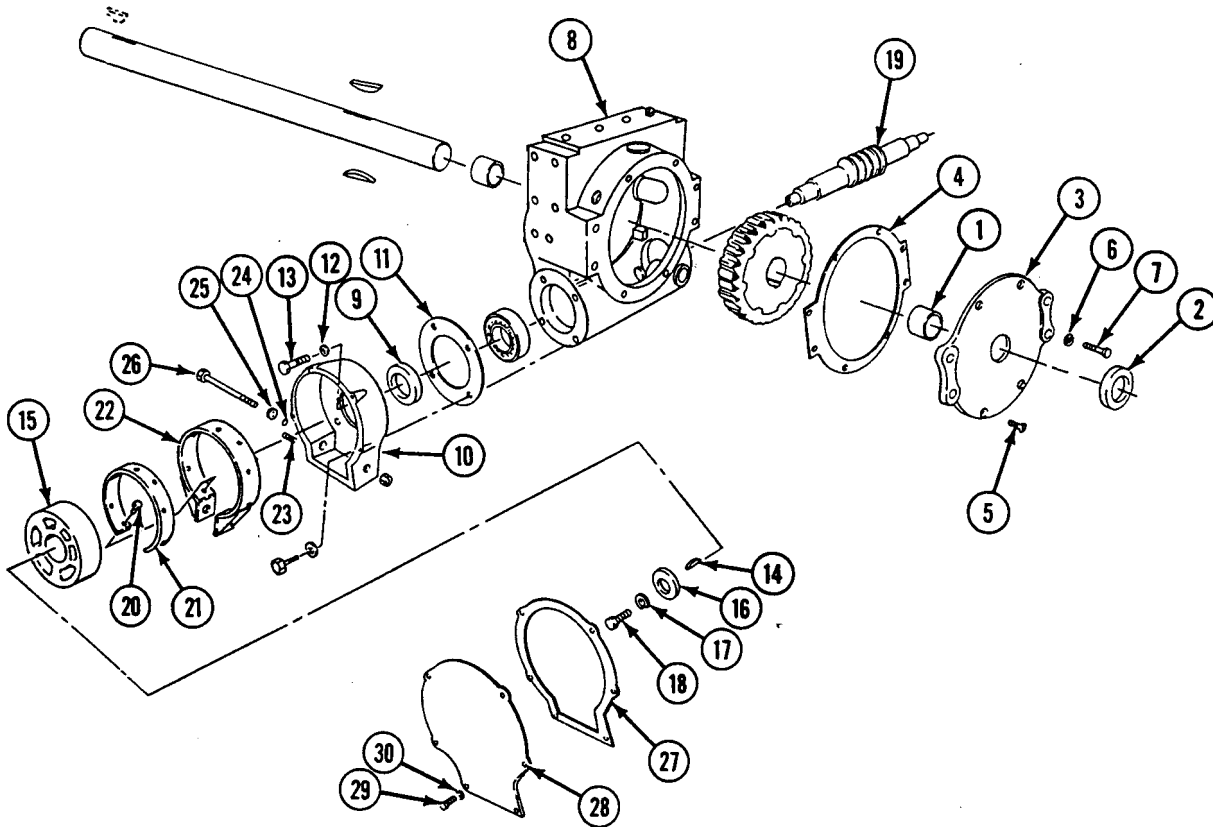
NOTE

There are two types of gearcase covers. Do Step 9 only if gearcase cover has oil seal and sleeve bearing.

9. Press new sleeve bearing (1) and new oil seal (2) in gearcase cover (3).
10. Install new gasket (4), gearcase cover (3), four screws (5), new lock washers (6), and bolts (7) on housing (8).
11. Press new oil seal (9) in brake case (10).

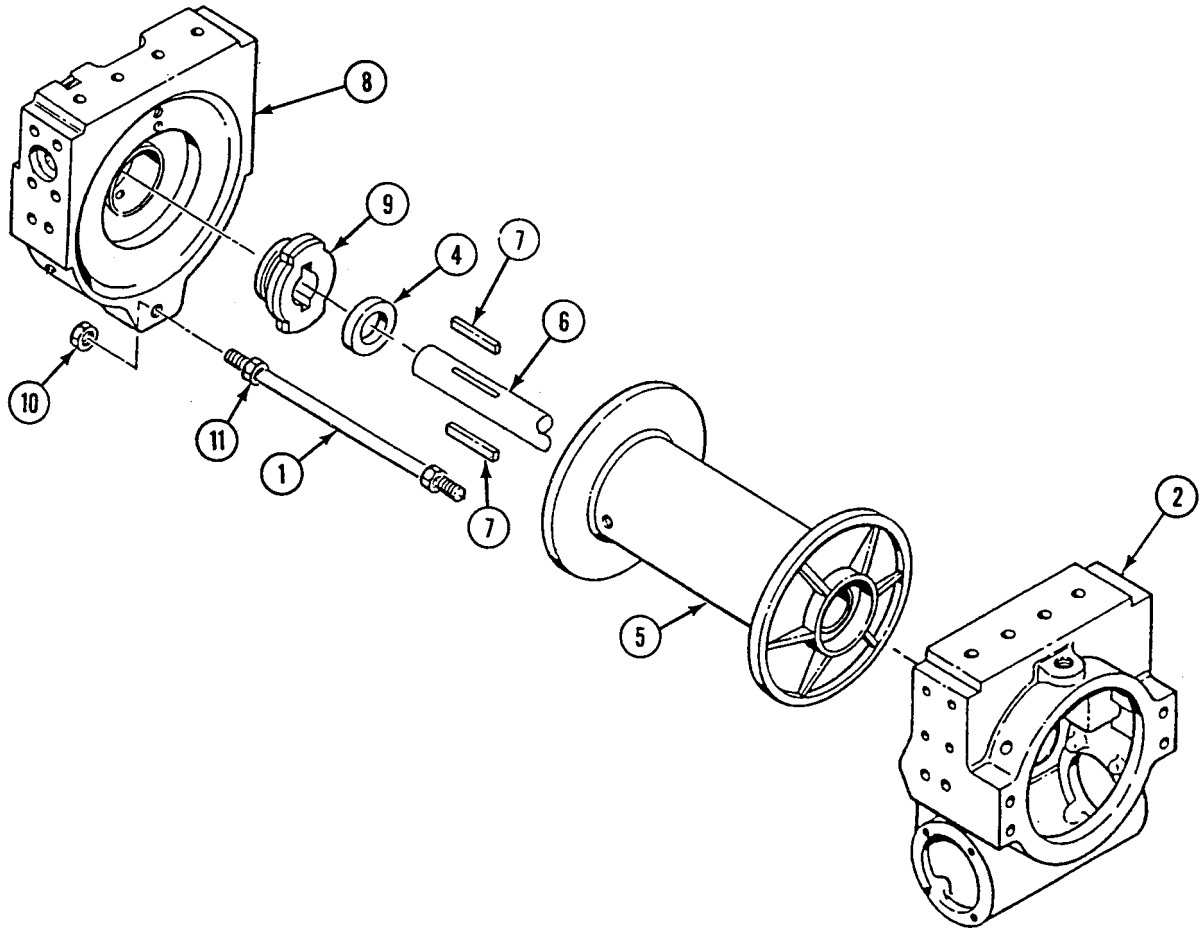


12. Install new gasket (11), brake case (10), new lock washers (12), and bolts (13) on housing (8).
13. Install key (14), brake drum (15), washer (16), new lock washer (17), and bolt (18) on worm gear (19).
14. Install rivet (20) and lining (21) in brake band (22). Install brake band (22), spring (23), new packing (24), washer (25), and adjusting screw (26) in brake case (10).
15. Install new gasket (27), cover (28), six new lock washers (29), and screws (30) on brake case (10).

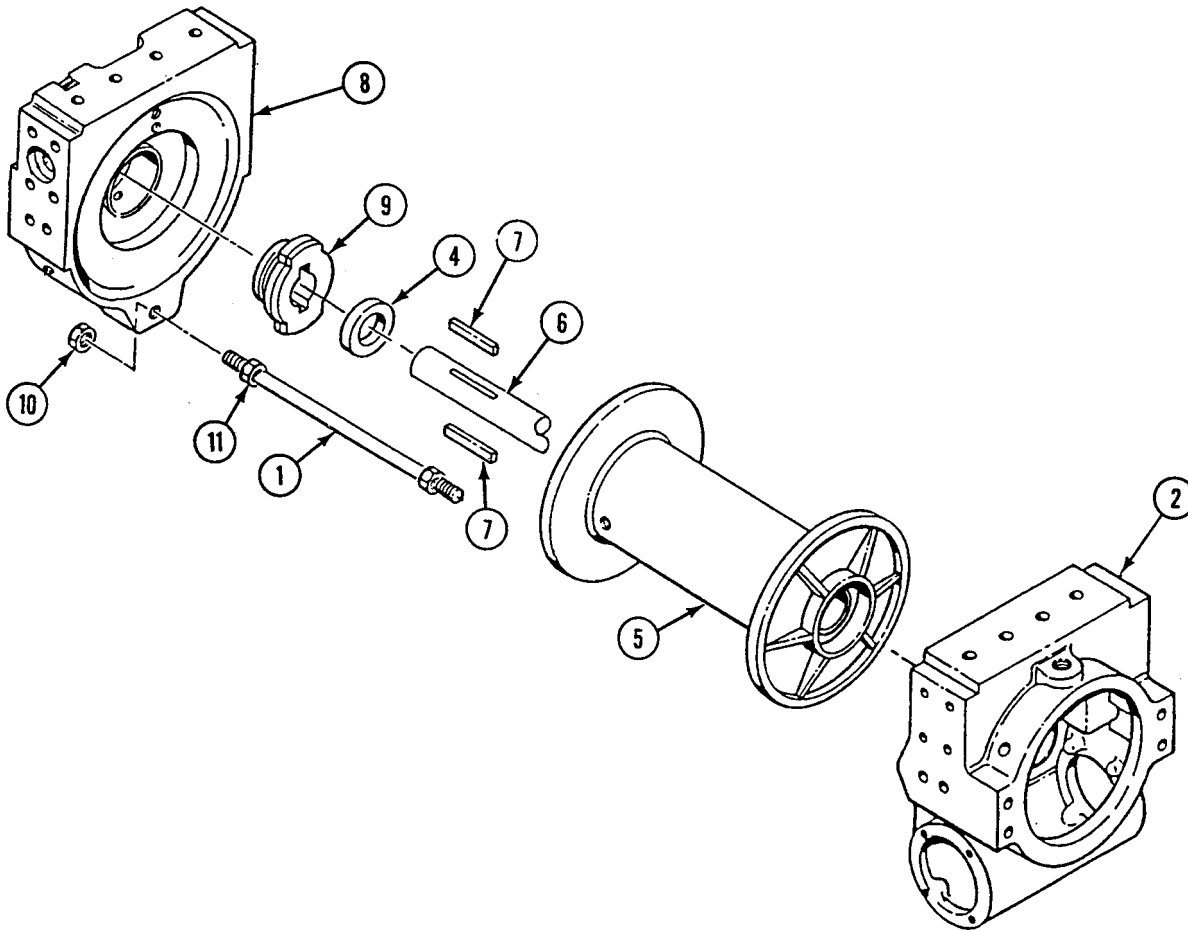


INSTALLATION

1. Install tie rod (1) in gearcase housing (2) and tighten lock nut (3) to secure tie rod to housing.
2. Install thrust ring (4) and drum (5) on drum shaft (6).
3. Install two sliding clutch keys (7) securing drum (5) on drum shaft (6).



4. Install endframe housing (8) on drum shaft (6) and tie rod (1). Make sure drum shaft is aligned with keyway of sliding clutch (9). Check drum for freedom of movement.
5. Install new lock nut (10) on end of tie rod (1) and tighten lock nut (10) and lock nut (11) against endframe housing (8).



FOLLOW-THROUGH STEPS

1. Fill endframe and gearcase with oil (see your -20).
2. Install winch on carrier (see your -20).
3. Install winch cable (see your -20).
4. Adjust winch (see your -20).

END OF TASK

REPAIR WINCH TRANSFER GEARCASE (M548A1)

0044 00

THIS WORK PACKAGE COVERS:

- Disassembly (page 0044 00-2).
- Cleaning (page 0044 00-3).
- Inspection-Acceptance and Rejection Criteria (page 0044 00-4).
- Assembly (page 0044 00-6).

INITIAL SETUP:

Maintenance Level

Direct Support

Packing

Packing (2)

Oil seal

Oil seal (2)

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0078 00, Item 68)
- Micrometer Caliper Set (WP 0078 00, Item 8)
- Vernier Caliper (WP 0078 00, Item 9)
- Arbor Press (WP 0078 00, Item 42)
- Universal Puller Kit (WP 0078 00, Item 43)
- Socket Wrench Set, 3/8 Inch Drive
(WP 0078 00, Item 79)
- Torque Wrench (WP 0078 00, Item 83)

Personnel Required

Track Vehicle Repairer 63H

References

- See your -10
- See your -20
- TM 9-214

Materials/Parts

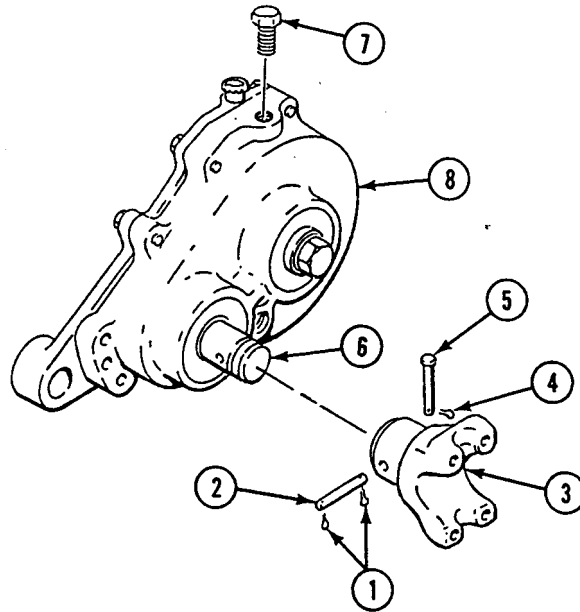
- Antiseize compound (WP 0080 00, Item 6)
- Sealing compound (WP 0080 00, Item 33)
- Cotter pin
- Cotter pin (2)
- Gasket
- Key washer (8)

Equipment Condition

- Engine stopped (see your -10)
 - Carrier blocked (see your -10)
 - Winch transfer gearcase removed from carrier
(see your -20)
 - Winch transfer gearcase oil drained (see your -20)
-

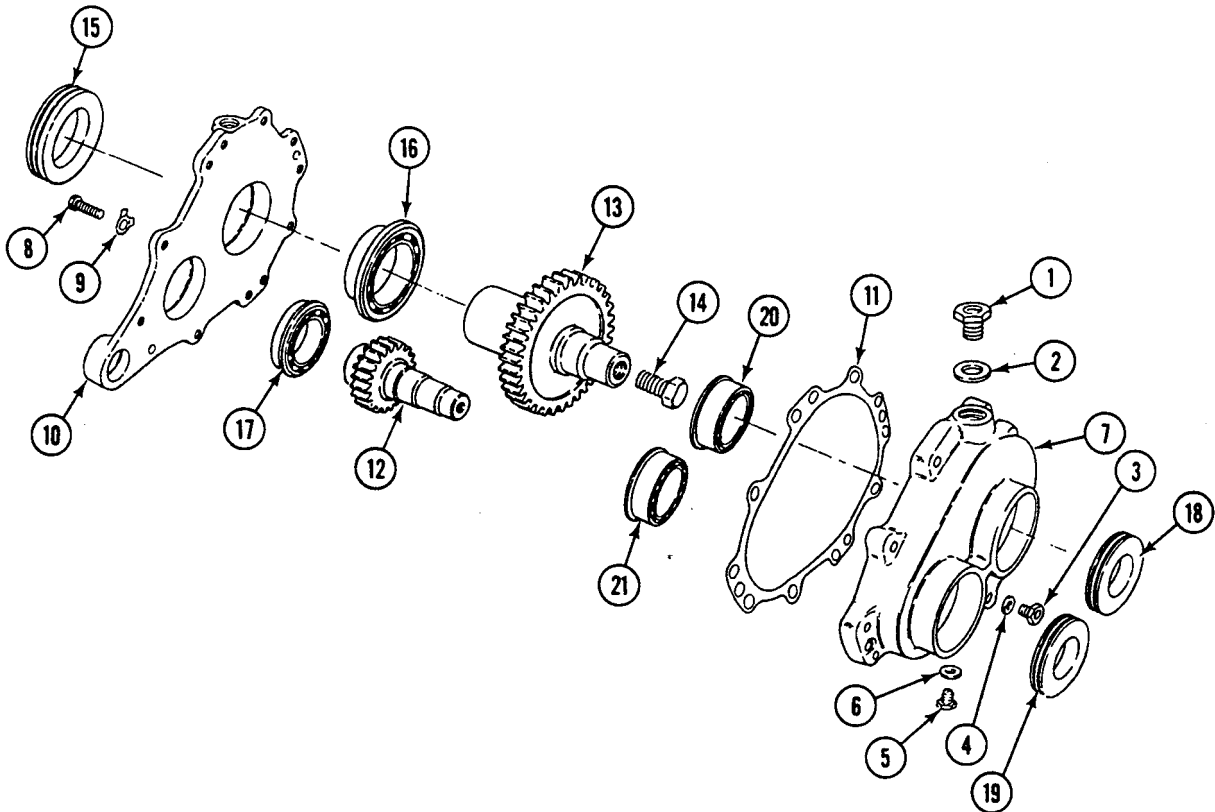
DISASSEMBLY

1. Remove two cotter pins (1) and shear pin (2) from input yoke (3). Discard cotter pins.
2. Remove cotter pin (4), pin (5), and yoke (3) from input gear shaft (6). Discard cotter pin.
3. Remove gearcase breather (7) from gearcase cover (8).



4. Remove filler plug (1), packing (2), level plug (3), packing (4), drain plug (5), and packing (6) from gearcase housing (7). Discard packings.
5. Remove eight screws (8), and key washers (9) securing cover (10) to gearcase housing (7). Discard key washers.
6. Install three screws (8) as jackscrews in pusher holes of cover (10) and one screw (8) in pusher hole of gearcase housing (7).
7. Turn each screw (8) equally to prevent binding and separate cover (10) from gearcase housing (7).
8. Remove gearcase gasket (11), input gear (12), and output gear (13) from gearcase housing (7). Discard gasket.

9. Remove turning screw (14) from output gear (13).
10. Remove oil seal (15) from cover (10). Discard seal.
11. Press bearing (16) from cover (10).
12. Remove bearing (17) from cover (10). Use puller.
13. Remove oil seal (18) and oil seal (19) from gearcase housing (7). Discard seals.
14. Press two bearing (20) and bearing (21) from gearcase housing (7).



CLEANING

1. Clean all parts shown in figure below. See and TM 9-214 for cleaning instructions.

INSPECTION-ACCEPTANCE AND REJECTION CRITERIA

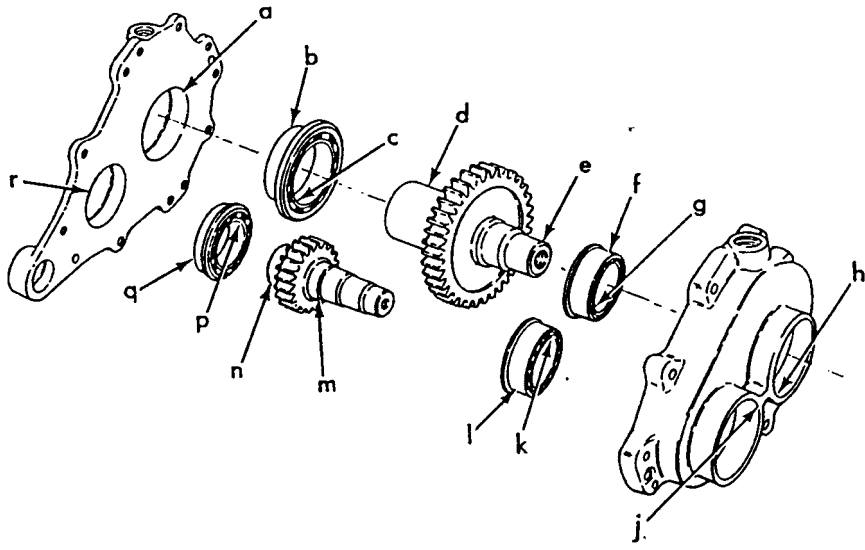
1. Check parts shown in figure below that have reference letters.
2. Check the parts dimensions with chart below to determine replacement.

Table 1. WINCH TRANSFER GEARCASE

| Reference Letter | Point of Measurement | New Part Size/Fit | Wear Limits | |
|------------------|--|--------------------|-------------|--------|
| | | | Field | Depot |
| A | Inside diameter of output gear bearing cover bore | 3.7387 to 3.7393 | ** | 3.7394 |
| B | Outside diameter of output gear cover bearing | 3.7396 to 3.7402 | ** | * |
| A-B | Fit of output gear cover bearing to cover bore | 0.0003T to 0.0015T | ** | * |
| C | Inside diameter of output gear (cover bearing side) | 2.3616 to 2.3622 | ** | * |
| D | Outside diameter of output gear (cover bearing side) | 2.3610 to 2.3616 | ** | 2.3608 |
| C-D | Fit of output gear cover bearing to output gear | 0.0000 to 0.0012L | 0.0018L | * |
| E | Outside diameter of output gear (housing bearing side) | 1.5738 to 1.5743 | ** | 1.5736 |
| F | Outside diameter of output gear housing bearing | 2.6767 to 2.6772 | ** | * |
| G | Inside diameter of output gear housing bearing | 1.5743 to 1.5748 | ** | * |
| E-G | Fit of output gear to output gear housing bearing | 0.0000 to 0.0010L | 0.0015L | * |
| H | Inside diameter of output gear housing bore | 2.6759 to 2.6764 | ** | * |
| F-H | Fit of output gear housing bearing to housing bore | 0.0003T to 0.0013T | ** | * |
| J | Inside diameter of input gear bearing housing bore | 2.6759 to 2.6764 | ** | 2.6765 |
| K | Inside diameter of input gear housing bearing | 1.5743 to 1.5748 | ** | * |
| L | Outside diameter of input gear housing bearing | 2.6767 to 2.6772 | ** | * |
| J-L | Fit of input gear housing bearing to housing bore | 0.0003T to 0.0013T | ** | * |
| M | Outside diameter of input gear (housing bearing side) | 1.5738 to 1.5743 | * | 1.5736 |
| K-M | Fit of input gear housing bearing to input gear | 0.0000 to 0.0010L | 0.0015L | * |
| N | Outside diameter of input gear (cover bearing side) | 1.5738 to 1.5743 | * | 1.5736 |
| P | Inside diameter of input gear cover bearing | 1.5743 to 1.5748 | ** | * |
| N-P | Fit of input gear to input gear cover bearing | 0.0000 to 0.0010L | 0.0015L | * |
| Q | Outside diameter of input gear cover bearing | 2.6767 to 2.6772 | ** | * |
| R | Inside diameter of input gear bearing cover bore | 2.6759 to 2.6764 | ** | 2.6765 |
| Q-R | Fit of input gear cover bearing to cover | 0.0003T to 0.0013T | ** | * |

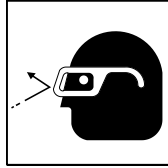
* Must be within new part dimensions.

** Wear is allowed on either or both mating parts within the specified fit limits.



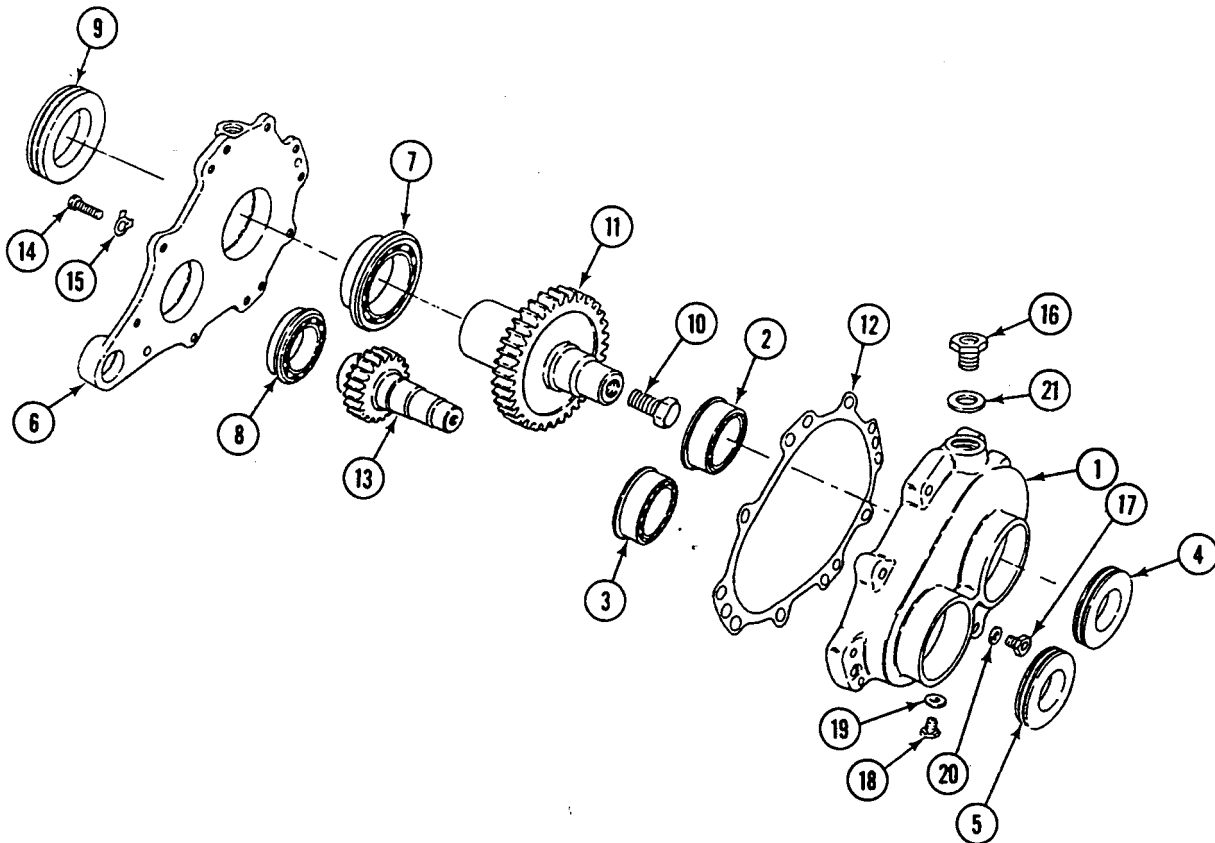
ASSEMBLY

WARNING

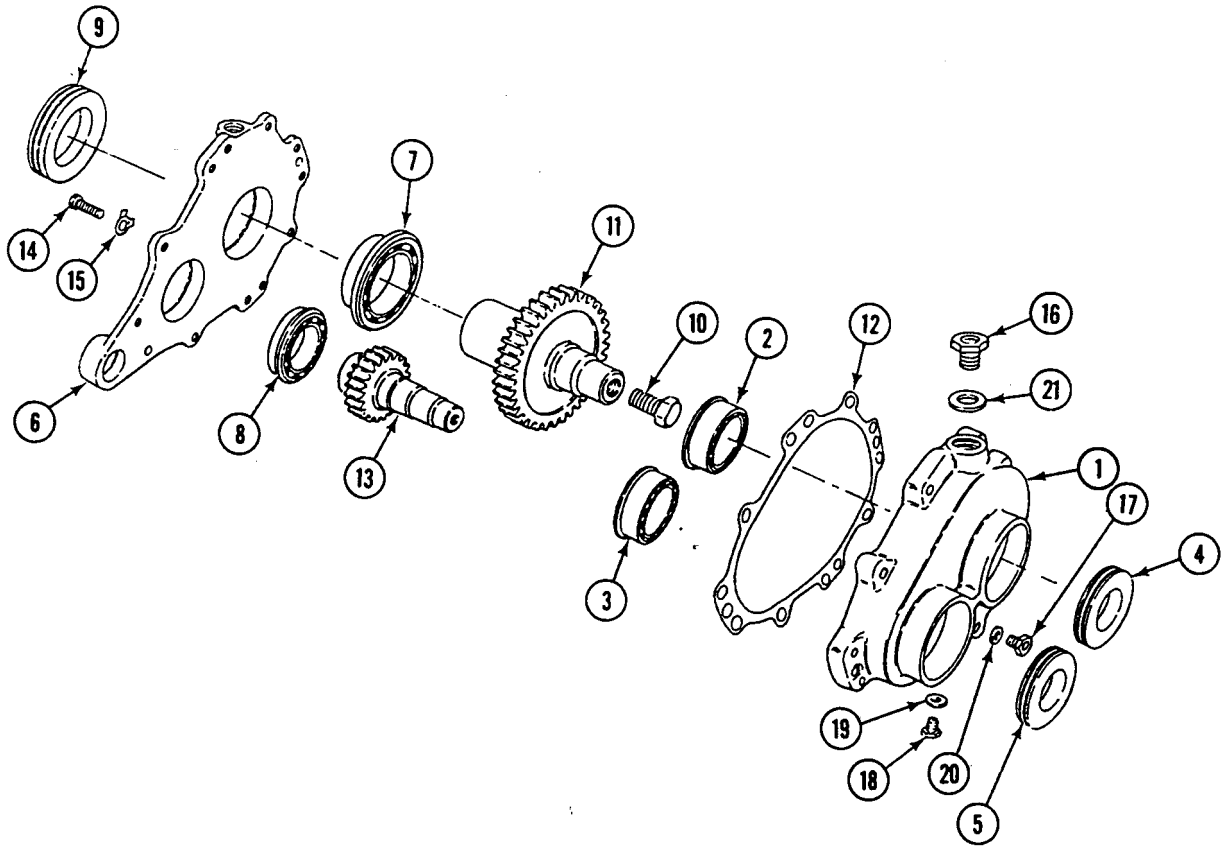


Oil can splash back and burn you. Always wear full eye protection.

1. Heat housing (1) in oil to 225-250° F, and install bearing (2) and bearing (3) in housing.
2. Apply light coat of sealing compound to outer circumference of new oil seal (4) and new oil seal (5).
3. Press oil seal (4) and oil seal (5) in housing (1) with lip of each seal facing away from housing.
4. Heat cover (6) in oil to 225-250° F, and press bearing (7) and bearing (8) in housing.
5. Apply light coat of sealing compound to outer circumference of new oil seal (9).
6. Press oil seal (9) in cover (6) with lip of seal facing away from housing.

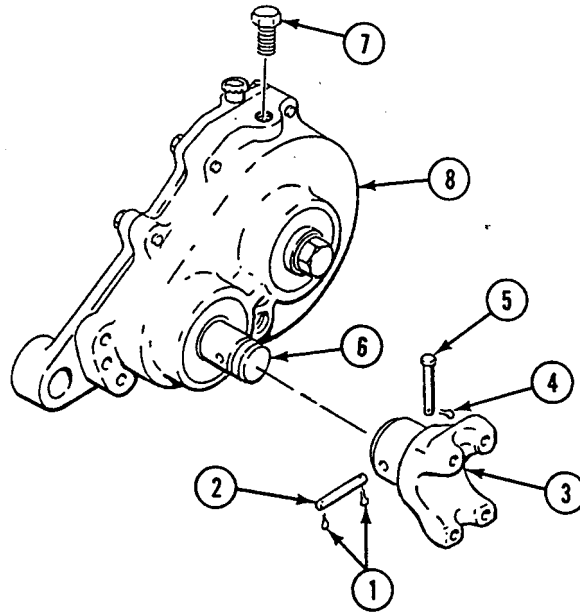


7. Install turning screw (10) in output gear (11).
8. Install gasket (12), input gear (13), and output gear (11) in housing (1).
9. Apply light coat of antiseize compound to threads of eight screws (14).
10. Install cover (6), eight new key washers (15), and screws (14) to housing (1). Torque screws to 144-180 lb-in (16-20 N•m).
11. Apply light coat of antiseize compound to threads of filler plug (16), level plug (17), and drain plug (18).
12. Install new packing (19), drain plug (18), new packing (20), level plug (17), new packing (21), and filler plug (16) in housing (1).



REPAIR WINCH TRANSFER GEARCASE (M548A1) — Continued**0044 00**

13. Apply light coat of sealing compound to threads of gearcase breather (1).
14. Install gearcase breather (1) in cover (2).
15. Install yoke (3), pin (4), and new cotter pin (5) on input gear shaft (6).
16. Install shear pin (7) and two new cotter pins (8) on input yoke (3).

**FOLLOW-THROUGH STEPS**

1. Fill winch transfer gearcase with oil (see your -20).
2. Install winch transfer gearcase on carrier (see your -20).

END OF TASK

ADJUST WINCH POWER TAKEOFF (M548A1)

0045 00

THIS WORK PACKAGE COVERS:

Adjustment (page 0045 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)

Materials/Parts

Lock washer

Lock washer (8)

Personnel Required

Track Vehicle Repairer 63H

References

See your -10

See your -20

Equipment Condition

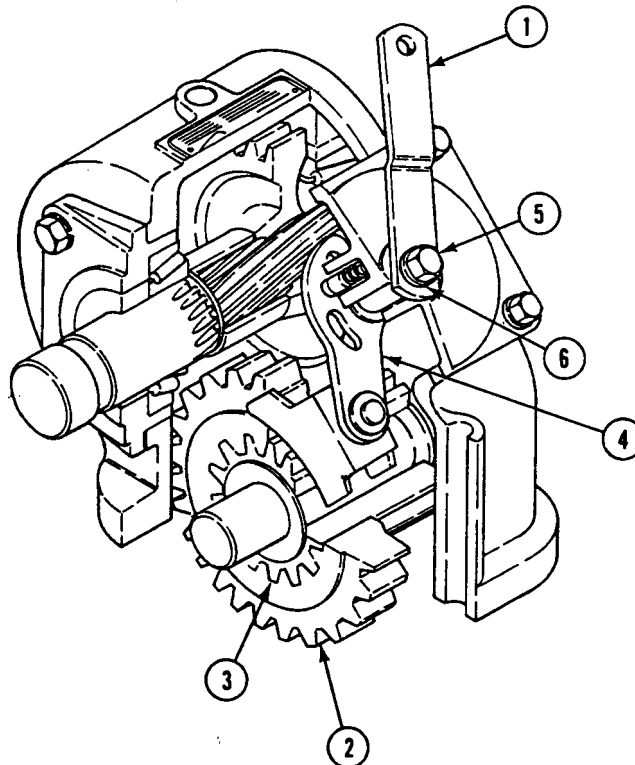
Engine stopped (see your -10)

Carrier blocked (see your -10)

Winch power takeoff removed from carrier
(see your -20)

ADJUSTMENT

1. Rotate shifter lever (1) clockwise until drive gear (2) is fully forward on driven gear (3) and shifter plate assembly (4) is in detent position.
2. Remove screw (5), lock washer (6), and lever (1) from shifter plate assembly (4). Discard lock washer.
3. Position lever (1) on post of shifter plate assembly (4) so lever is 30 degrees to right of vertical position.
4. Install new lock washer (6), screw (5) and lever (1) on shifter plate assembly (4).

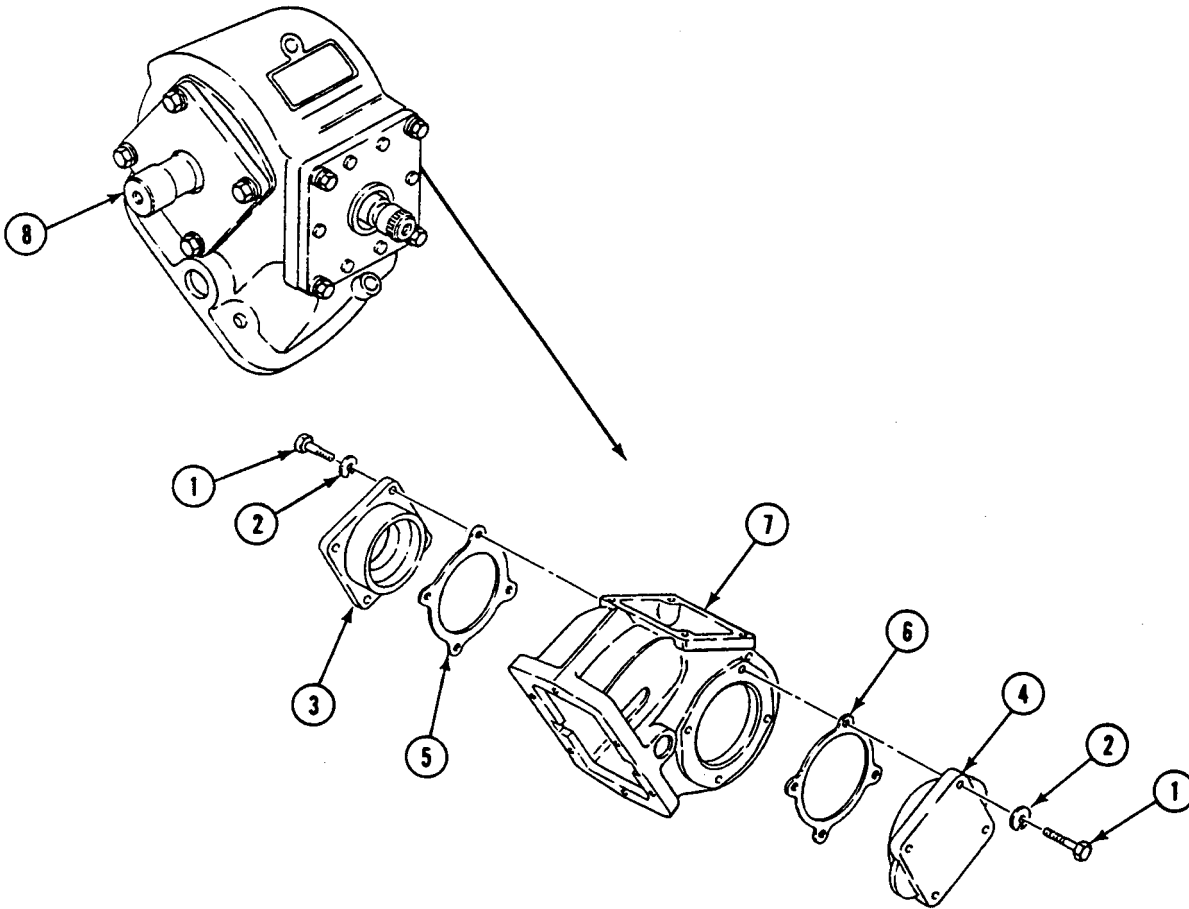


- Remove eight screws (1), lock washers (2), bearing cap (3) bearing cap (4), gasket (5), and gasket (6) from PTO housing (7). Discard lock washers.

NOTE

Bearing cap gaskets are available in 0.010 and 0.020 inch (.25 and .51 mm) thicknesses.

- Match and install gasket (5) and gasket (6) of equal thickness, bearing cap (4) and bearing cap (3), eight new lock washers (2), and screws (1) on PTO housing (7).
- Repeat Step 5 and Step 6 until drive shaft (8) rotates freely without end play, adding or removing gaskets as required.



FOLLOW-THROUGH STEPS

- Install winch power takeoff on carrier (see your -20).

END OF TASK

REPAIR WINCH POWER TAKEOFF SHIFTER ASSEMBLY (M548A1)

0046 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0046 00-2).
Assembly (page 0046 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)

References

See your -10

See your -20

Materials/Parts

Gasket (2)

Lock washer

Lock washer (4)

Packing

Poppet

Spring

Equipment Condition

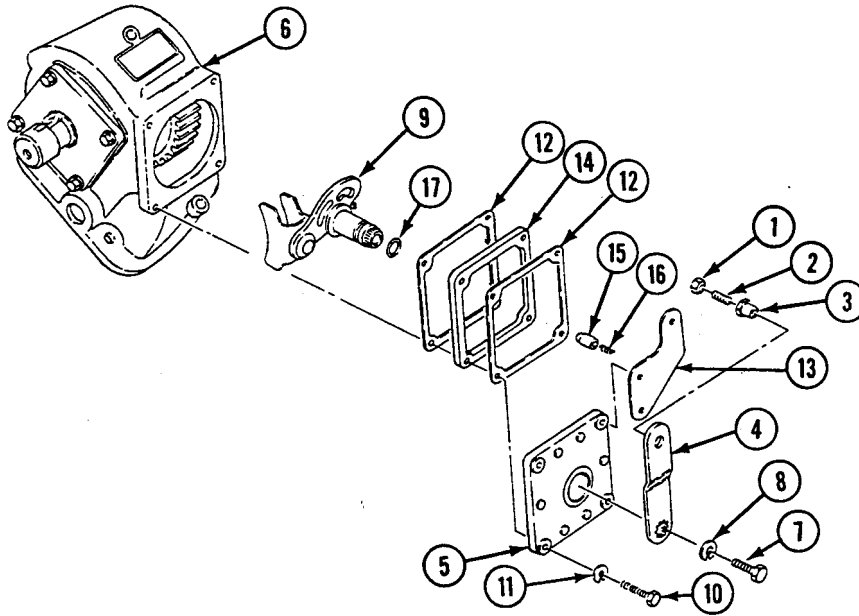
Engine stopped (see your -10)

Carrier blocked (see your -10)

Winch power takeoff removed from carrier
(see your -20)

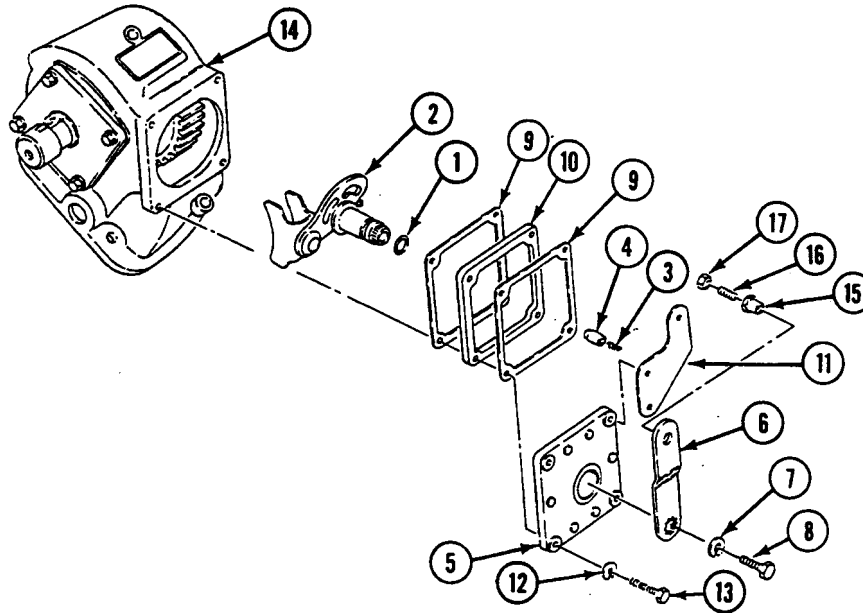
DISASSEMBLY

1. Remove nut (1), setscrew (2), and pin (3) from shifter lever (4).
2. Mark shifter cover (5) and PTO housing (6) for later reassembly.
3. Remove screw (7), lock washer (8), and shifter lever (4) from plate (9). Discard lock washer.
4. Remove four screws (10), lock washers (11), shifter cover (5), two gaskets (12), bracket (13) and spacer (14) from PTO housing (6). Discard lock washers and gaskets.
5. Remove plate (9), poppet (15), and spring (16) from shifter cover (5). Discard poppet and spring.
6. Remove packing (17) from plate (9). Discard packing.



ASSEMBLY

1. Install new packing (1) on plate (2).
2. Install new spring (3), new poppet (4), and plate (2) on shifter cover (5).
3. Install shifter lever (6), new lock washer (7), and screw (8) on plate (2).
4. Install two new gaskets (9), spacer (10), shifter cover (5), bracket (11), four new lock washers (12), and screws (13) on PTO housing (14). Use marks as reference for proper assembly.
5. Install pin (15), setscrew (16), and nut (17) on shifter lever (6).

**FOLLOW-THROUGH STEPS**

1. Install winch power takeoff in carrier (see your -20).
2. Adjust winch power takeoff (WP 0045 00).

END OF TASK

REPAIR WINCH POWER TAKEOFF GEAR ASSEMBLY (M548A1)

0047 00

THIS WORK PACKAGE COVERS:

Disassembly (page 0047 00-1).
 Assembly (page 0047 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Arbor Press (WP 0078 00, Item 42)

References

See your -10
 See your -20

Materials/Parts

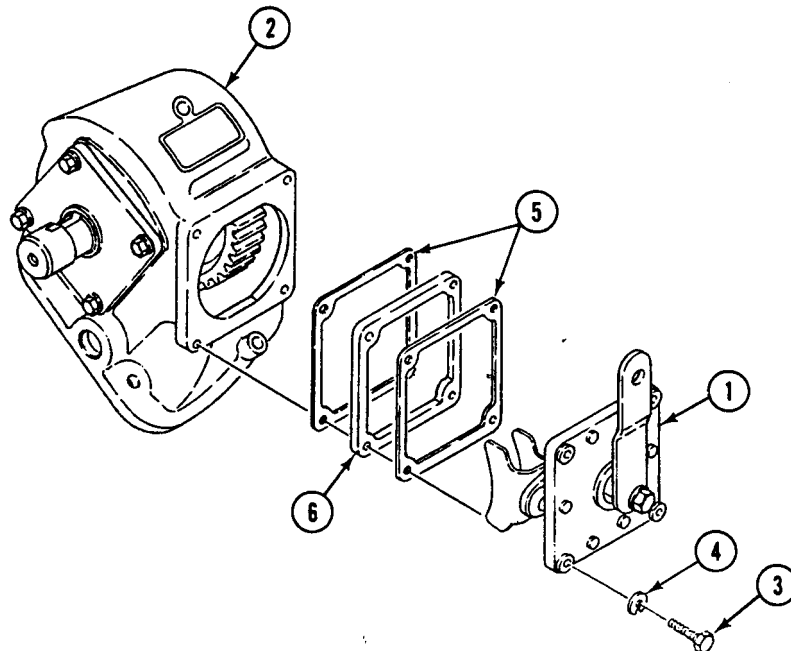
Gasket (2)
 Gasket (2)
 Lock washer (12)
 Oil seal

Equipment Condition

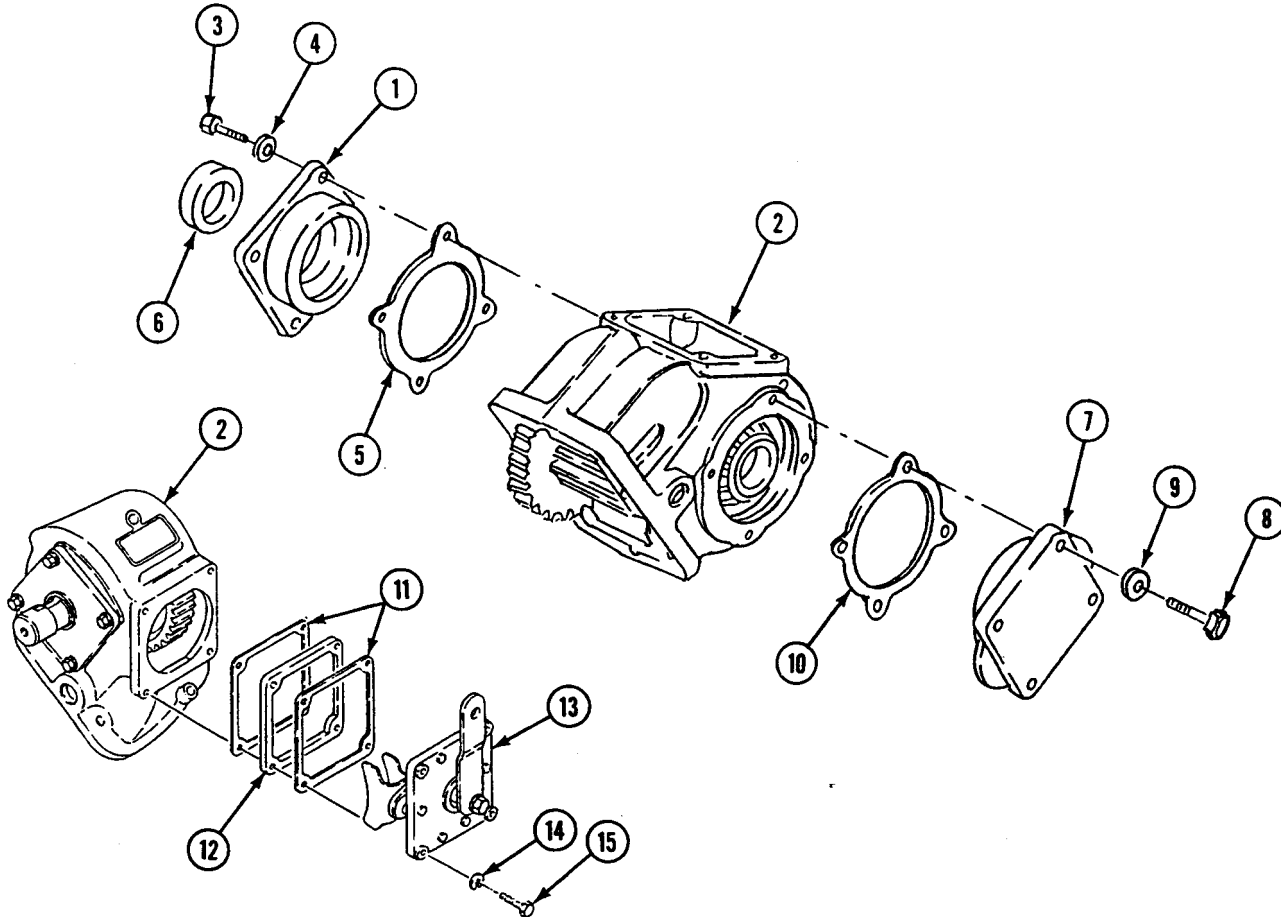
Engine stopped (see your -10)
 Carrier blocked (see your -10)
 Winch power takeoff removed from carrier
 (see your -20)

DISASSEMBLY

1. Mark shifter assembly (1) and PTO housing (2) for later reassembly.
2. Remove four screws (3), lock washers (4), shifter assembly (1), two gaskets (5), and spacer (6) from housing (2). Discard lock washers and gaskets. If shifter assembly needs repair, see WP 0046 00.
3. Mark edge of bearing cap (1) and housing (2) for later reassembly.
4. Remove four screws (3), lock washers (4), bearing cap (1), and gasket (5) from housing (2). Discard lock washers and gasket.

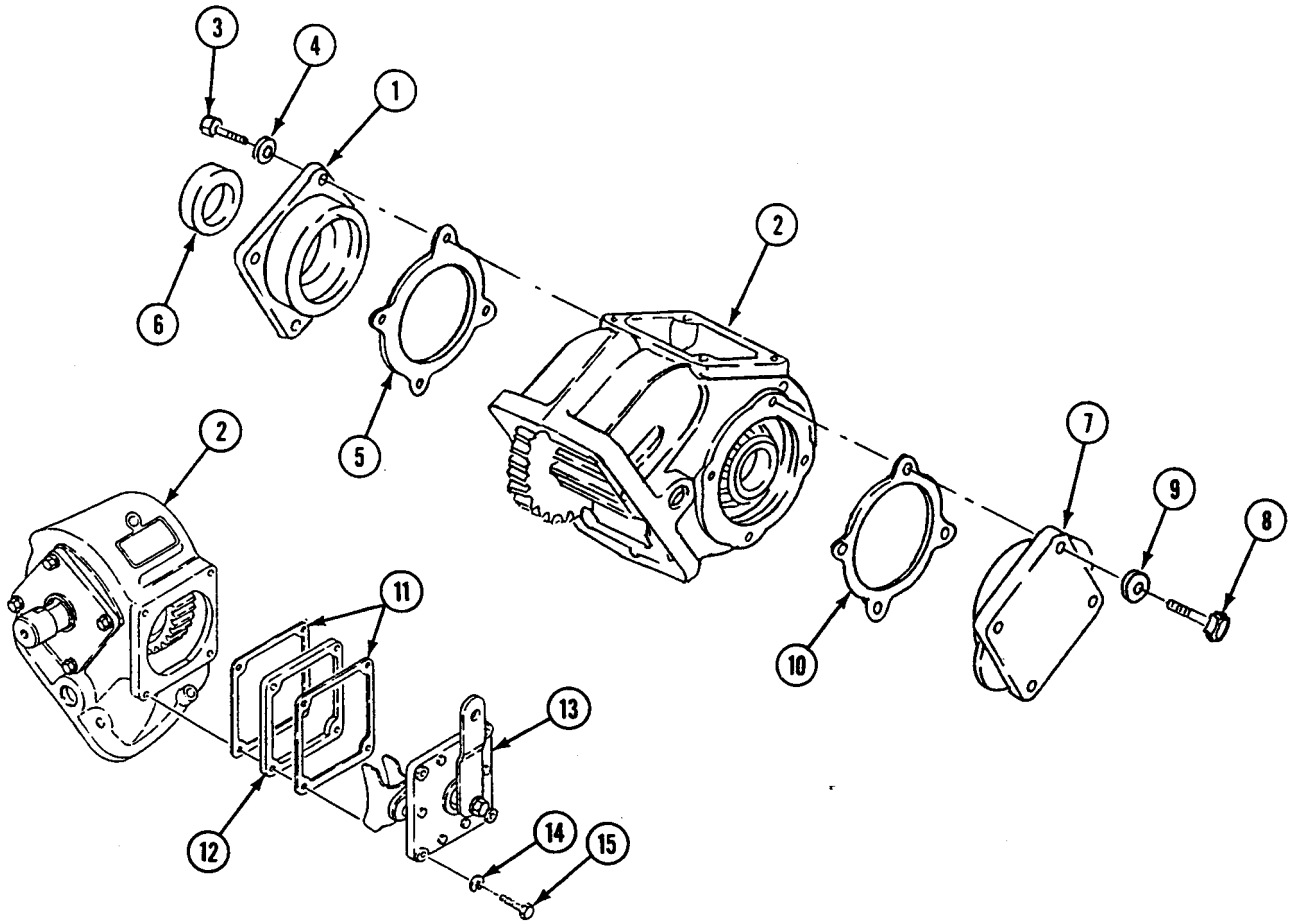


5. Remove oil seal (6) from bearing cap (1). Discard seal.
6. Mark edge of bearing cap (7) and housing (2) for later reassembly.
7. Remove four screws (8), lock washers (9), bearing cap (7), and gasket (10) from housing (2). Discard lock washers and gasket.



ASSEMBLY

1. Install new gasket (10), bearing cap (7), four new lock washers (9), and screws (8) on housing (2). Use mark on bearing cap for proper positioning.
2. Press new oil seal (6) in bearing cap (1) with lip of seal facing away from cap.
3. Install new gasket (5), bearing cap (1), four new lock washers (4), and screws (3) on housing (2). Use mark on bearing cap for proper positioning.
4. Install two new gaskets (11), spacer (12), shifter assembly (13), four new lock washers (14), and screws (15) on housing (2).

**FOLLOW-THROUGH STEPS**

1. Install winch power takeoff on carrier (see your -20).
2. Adjust winch power takeoff (WP 0045 00).

END OF TASK

CHAPTER 13

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR HULL ACCESSORY ITEMS

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|-------------------------|---------------------|
| REPAIR CAB COVER..... | 0048 00 |
| REPAIR CARGO COVER..... | 0049 00 |

REPAIR CAB COVER

0048 00

THIS WORK PACKAGE COVERS:

- Cleaning (page 0048 00-1).
 - Inspection-Acceptance and Rejection Criteria (page 0048 00-1).
 - Repair or Replacement (page 0048 00-2).
-

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fabric Repairman 43M

Tools and Special Tools

- Canvas Worker's Tool Kit (WP 0078 00, Item 65)
- Cleaning Brush (WP 0078 00, Item 6)
- Wire Brush (WP 0078 00, Item 7)
- Air Filtering Respirator (WP 0078 00, Item 45)
- Industrial Sewing Machine (WP 0078 00, Item 49)
- Paint Spray Outfit (WP 0078 00, Item 57)

References

- See your -20
- FM 10-16
- TB ORD 1032

Equipment Condition

Cab cover removed (see your -20)

Materials/Parts

- Adhesive (WP 0080 00, Item 2)
 - Canvas preservative (WP 0080 00, Item 9)
 - Duck cloth (cotton) (WP 0080 00, Item 16)
 - Coated cloth (nylon) (WP 0080 00, Item 12)
 - Cleaning compound (WP 0080 00, Item 49)
 - Sateen cloth (cotton) (WP 0080 00, Item 31)
 - Thread (polyester) (WP 0080 00, Item 42)
 - Grommet (AR)
-

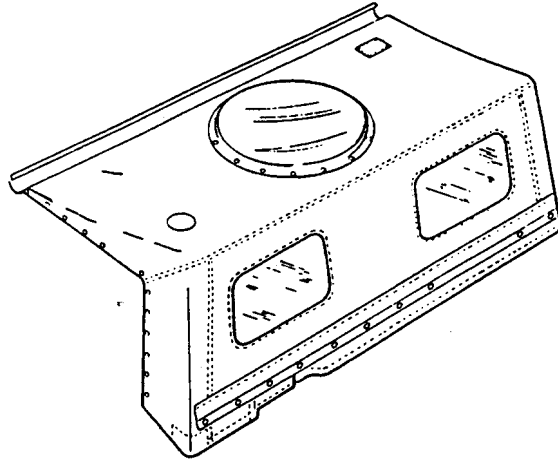
CLEANING

1. Clean cab cover: See FM 10-16 for cleaning instructions.

INSPECTION-ACCEPTANCE AND REJECTION CRITERIA

1. Check cab cover: Mark defects to be repaired.
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. 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 extend of damage. Weak sections must be replaced.
3. 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.
4. Check stitching: Repair runoffs and broken threads. Restitch weak stitching and open seams.

5. Check hardware: Replace parts that are broken, bent, corroded or missing.



REPAIR OR REPLACEMENT

1. Use lockstitching to install all patches, straps, and flaps and to repair open seams. Use smallest needle size you can to make weatherproof seams. Use 5 to 7 stitches per 1 inch (2.5 cm). Backstitch all thread breaks at least 1 inch (2.5 cm). Backstitch all ends at least 1 inch (2.5 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.

WARNING



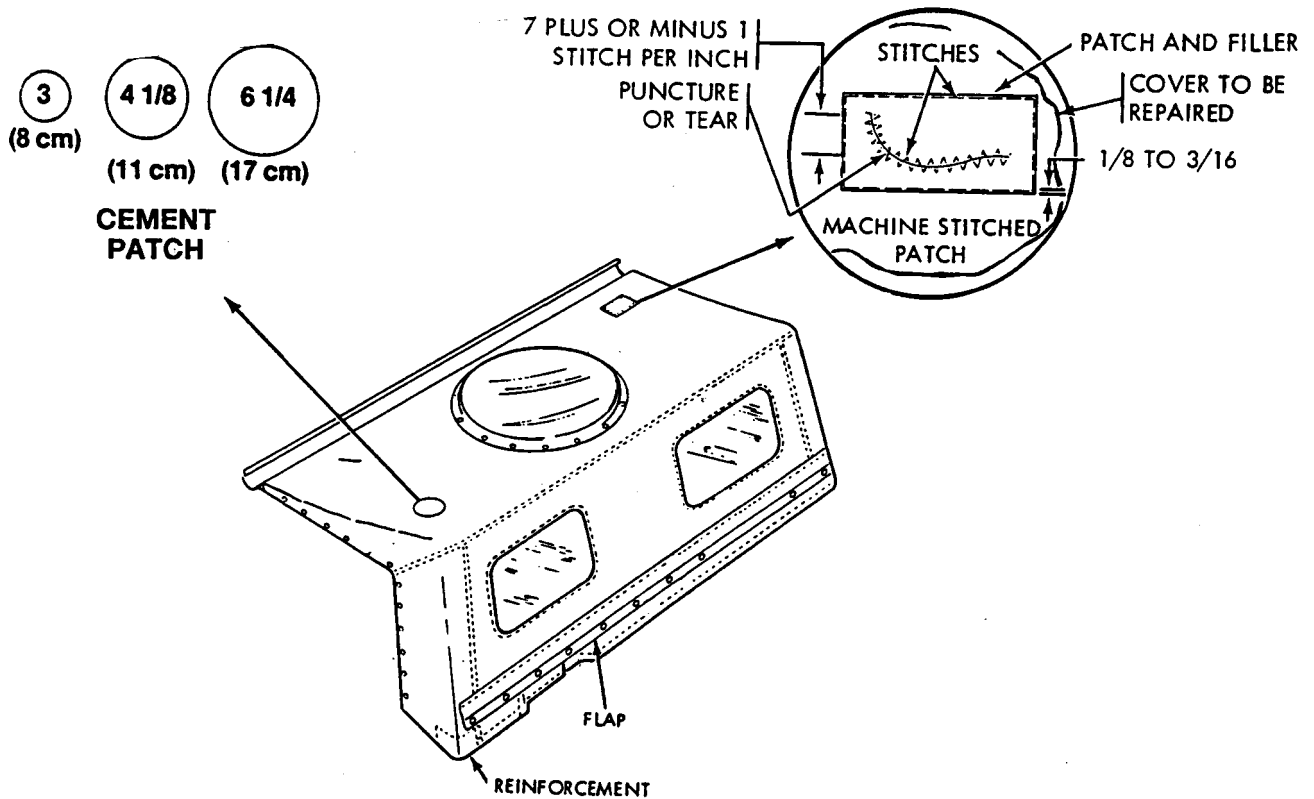
Adhesive is flammable and can injure you. Keep it away from heat, sparks, and open flame. Avoid repeated or prolonged breathing of vapors. Avoid contact with your skin.

NOTE

A hole or tear in the cab cover less 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. For cement patch repair, do Step 2.

2. Repair cab cover with cement patch as follows:

- a. Cut patch to one of three sizes that will overlap damaged area with a margin of at least 3/4 inch (19 mm) on all sides.



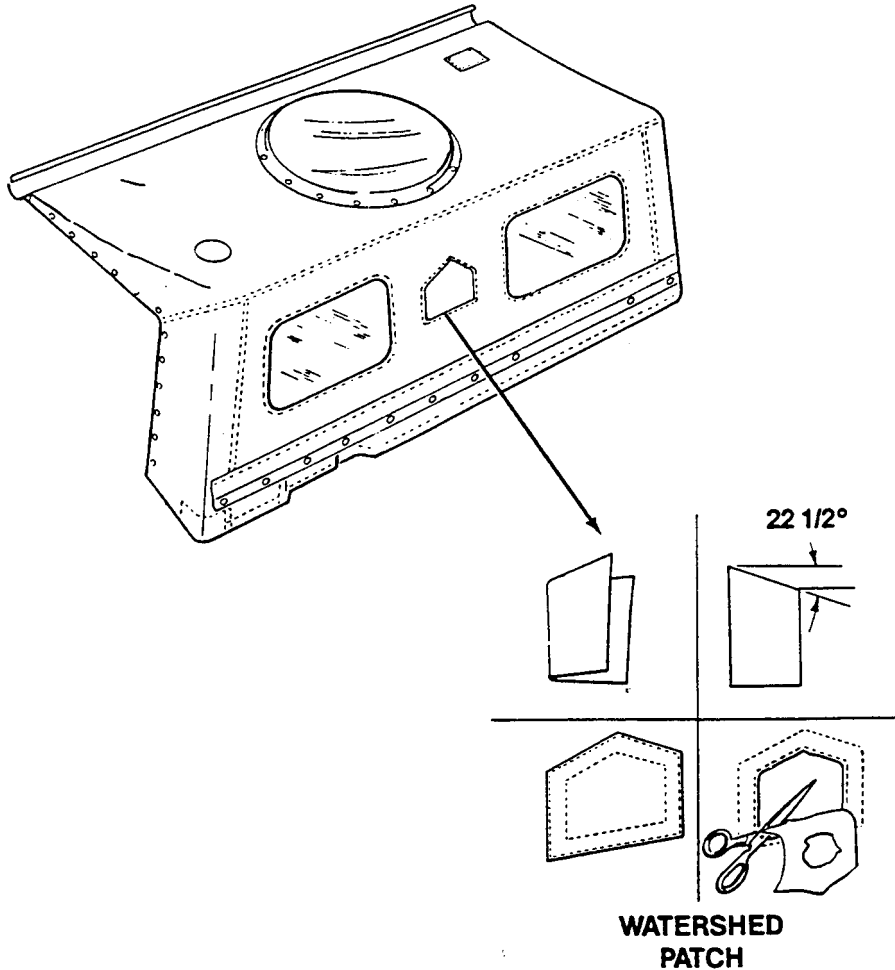
- b. Place board under damaged area for a flat working surface.
- c. Buff patch and damaged area of cab cover with a wire brush.
- d. Center patch over damaged area. Apply adhesive to patch and patch edge with a cleaning brush, making a circle on cab cover.
- e. Lift patch. Apply adhesive to area of cab cover inside adhesive circle.
- f. Allow adhesive to dry until tacky.
- g. Press cement surfaces together firmly with roller while tacky.
- h. Seal by wiping edge of patch with cleaning 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 Step 3.

3. Repair cab cover with watershed patch as follows:
 - a. 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.
 - b. Fold patch in half lengthwise. Cut from open edges to folded edge at 22-1/2° angle.
 - c. Center patch over damaged area on outside of cab cover. Turn under patch edges. Stitch in place with a row of stitching no more than 1/8 inch (3 mm) from the edge.

- d. Secure patch to cab cover with a second row of stitching. Place second row 3/8 to 1/2 inch (10 to 13 mm) from first row.
- e. 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 Step 4.

4. Repair cab cover with seam-to-seam patch as follows:
 - a. Open seam 2 inches (5 cm) beyond damaged area on both sides.
 - b. Square off damaged area from seam to seam.
 - c. Cut patch 2 inches (5 cm) wider than squared-off section. Allow for 3/4 inch (19 mm) turn-under on sides.
 - d. Center patch over cutaway section. Turn sides under and reform double-felled seams at top and bottom.
 - e. Finish by stitching patch into place.
5. 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.

WARNING

Canvas preservative is flammable. Keep it away from open flame. Keep compound off skin. Wash well after handling. Use solvent spray precautions.

NOTE

The cab cover must be treated with canvas preservative as needed. To apply preservative, do Step 6.

6. Apply canvas preservative to cab cover as follows:
 - a. Make sure cab cover is dry. Remove dirt, oil and grease stains.
 - b. Reduce canvas preservative to spray consistency by mixing with cleaning compound.
 - c. Apply preservative by spray gun. Operator should wear respirator.
 - d. Apply preservative to patches and newly repaired areas.
 - e. Allow at least 24 hours for cab cover to dry.

FOLLOW-THROUGH STEPS

1. Install cab cover (see your -20).

END OF TASK

REPAIR CARGO COVER

0049 00

THIS WORK PACKAGE COVERS:

- Cleaning (page 0049 00-1).
 - Inspection-Acceptance and Rejection Criteria (page 0049 00-1).
 - Repair or Replacement (page 0049 00-2).
-

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fabric Repairman 43M

Tools and Special Tools

- Canvas Worker's Tool Kit (WP 0078 00, Item 65)
- Cleaning Brush (WP 0078 00, Item 6)
- Wire Brush (WP 0078 00, Item 7)
- Air Filtering Respirator (WP 0078 00, Item 45)
- Industrial Sewing Machine (WP 0078 00, Item 49)
- Paint Spray Outfit (WP 0078 00, Item 57)

References

- See your -20
- FM 10-16
- TB ORD 1032

Materials/Parts

- Adhesive (WP 0080 00, Item 2)
- Canvas preservative (WP 0080 00, Item 9)
- Duck cloth (cotton) (WP 0080 00, Item 16)
- Coated cloth (nylon) (WP 0080 00, Item 12)
- Cleaning compound (WP 0080 00, Item 49)
- Sateen cloth (cotton) (WP 0080 00, Item 31)
- Thread (polyester) (WP 0080 00, Item 42)
- Grommet (AR)

Equipment Condition

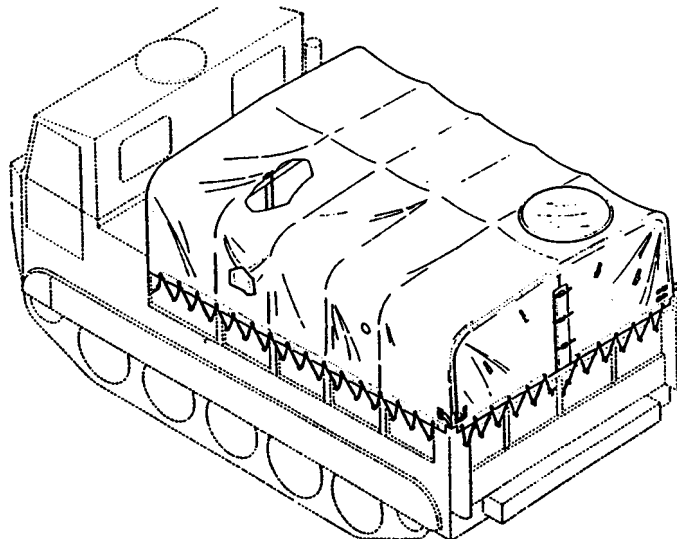
Cargo cover removed (see your -20)

CLEANING

1. Clean cargo cover: See FM 10-16 for cleaning instructions.

INSPECTION-ACCEPTANCE AND REJECTION CRITERIA

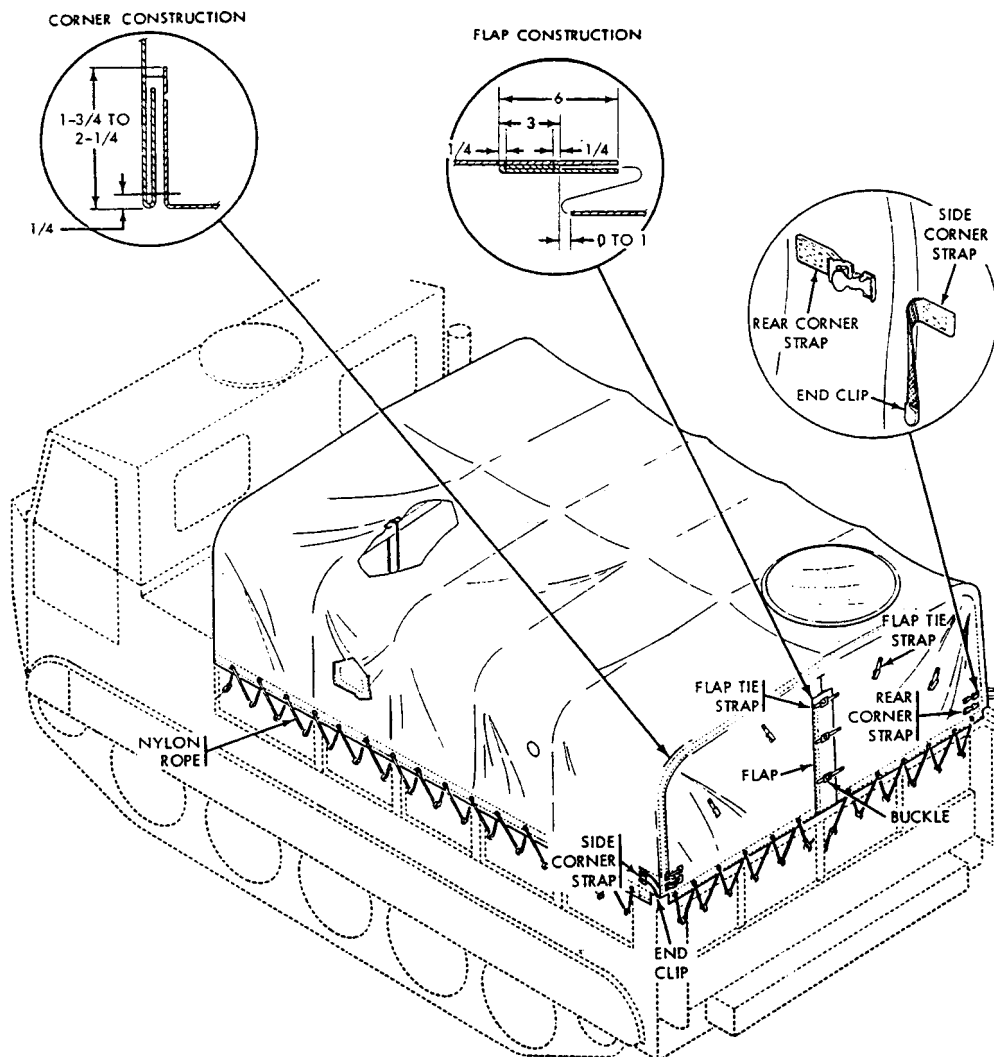
1. Check cargo cover: Mark defects to be repaired.

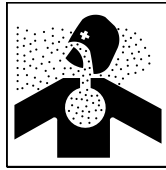


2. Check tensile strength of fabric: Grasp a small fold of fabric between thumb and forefinger of each hand, gripping it closely so tips of forefingers touch. Test material against threads that run the length of material. The weaker cross threads should not be used for testing tensile strength. Tug material several times. If it does not rip, it is repairable. If it tears on first tug, test several areas for extend of damage. Weak sections must be replaced.
3. 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.
4. Check stitching: Repair runoffs and broken threads. Restitch weak stitching and open seams.
5. Check hardware: Replace parts that are broken, bent, corroded or missing.

REPAIR OR REPLACEMENT

1. Use lockstitching to install all patches, straps, and flaps and to repair open seams. Use smallest needle size you can to make weatherproof seams. Use 5 to 7 stitches per 1 inch (2.5 cm). Backstitch all thread breaks at least 1 inch (2.5 cm). Backstitch all ends at least 1 inch (2.5 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.



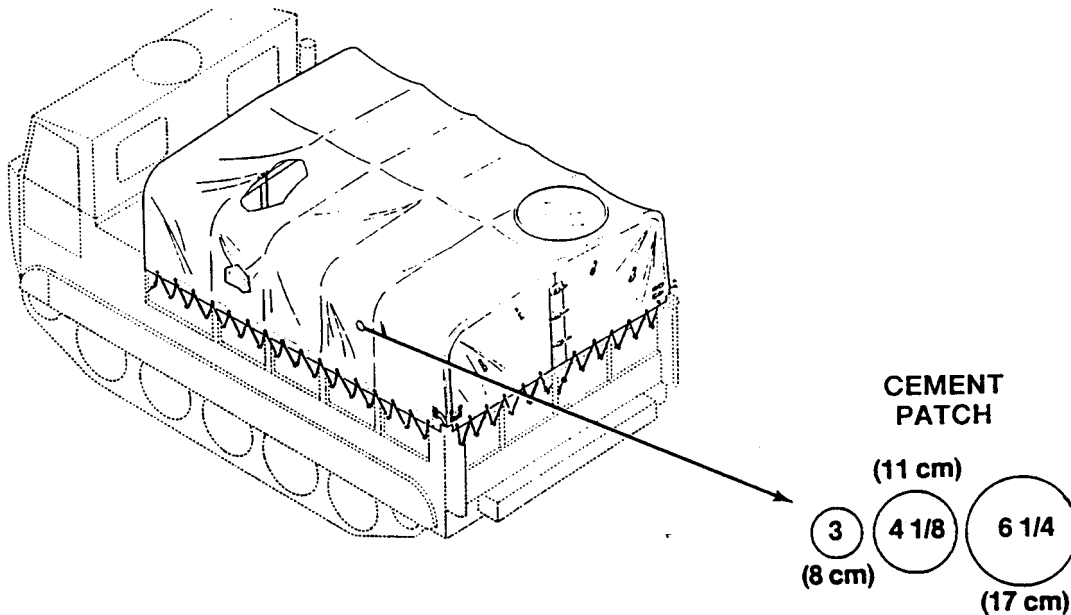
WARNING

Adhesive is flammable and can injure you. Keep it away from heat, sparks, and open flame. Avoid repeated or prolonged breathing of vapors. Avoid contact with your skin.

NOTE

A hole or tear in the cargo cover less 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. For cement patch repair, do Step 2.

2. Repair cargo cover with cement patch as follows:
 - a. Cut patch to one of three sizes that will overlap damaged area with a margin of at least 3/4 inch (19 mm) on all sides.

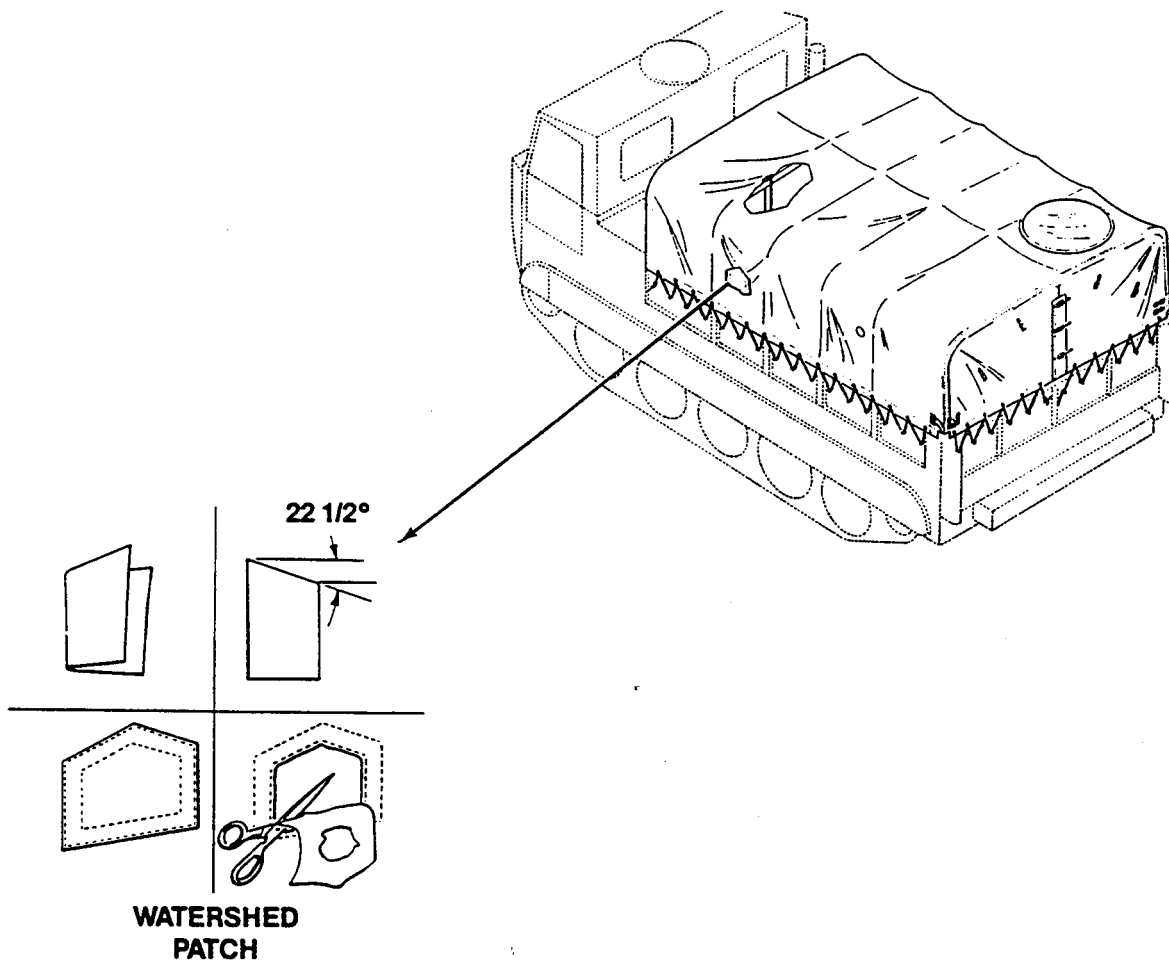


- b. Place board under damaged area for a flat working surface.
- c. Buff patch and damaged area of cargo cover with a wire brush.
- d. Center patch over damaged area. Apply adhesive to patch and patch edge with a cleaning brush, making a circle on cargo cover.
- e. Lift patch. Apply adhesive to area of cargo cover inside adhesive circle.
- f. Allow adhesive to dry until tacky.
- g. Press cement surfaces together firmly with roller while tacky.
- h. Seal by wiping edge of patch with cleaning 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 Step 3.

3. Repair cargo cover with watershed patch as follows:
 - a. 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.
 - b. Fold patch in half lengthwise. Cut from open edges to folded edge at $22\text{-}1/2^\circ$ angle.
 - c. Center patch over damaged area on outside of cargo cover. Turn under patch edges. Stitch in place with a row of stitching no more than 1/8 inch (3 mm) from the edge.
 - d. Secure patch to cargo cover with a second row of stitching. Place second row 3/8 to 1/2 inch (10 to 13 mm) from first row.
 - e. 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 Step 4.

4. Repair cargo cover with seam-to-seam patch as follows:
 - a. Open seam 2 inches (5 cm) beyond damaged area on both sides.
 - b. Square off damaged area from seam to seam.
 - c. Cut patch 2 inches (5 cm) wider than squared-off section. Allow for 3/4 inch (19 mm) turn-under on sides.
 - d. Center patch over cutaway section. Turn sides under and reform double-felled seams at top and bottom.
 - e. Finish by stitching patch into place.
5. Install end clips. Insert strap into ball-type end clip. Flatten clip with hammer.
6. 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.

WARNING

Canvas preservative is flammable. Keep it away from open flame. Keep compound off skin. Wash well after handling. Use solvent spray precautions.

NOTE

The cargo cover must be treated with canvas preservative as needed. To apply preservative, do Step 7.

7. Apply canvas preservative to cargo cover as follows:
 - a. Make sure cargo cover is dry. Remove dirt, oil and grease stains.
 - b. Reduce canvas preservative to spray consistency by mixing with cleaning compound.
 - c. Apply preservative by spray gun. Operator should wear respirator.
 - d. Apply preservative to patches and newly repaired areas.
 - e. Allow at least 24 hours for cargo cover to dry.

FOLLOW-THROUGH STEPS

1. Install cargo cover (see your -20).

END OF TASK

CHAPTER 14

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR TOOLS AND TEST EQUIPMENT

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|---|---------------------|
| TEST LOAD POWER PLANT SLING (M548A3)..... | 0050 00 |
| REPAIR POWER PLANT SLING (M548A3)..... | 0051 00 |
| ADJUST ENGINE AND TRANSMISSION STAND (M548A3)..... | 0052 00 |
| SERVICE ENGINE AND TRANSMISSION STAND (M548A3)..... | 0053 00 |
| REPAIR ENGINE AND TRANSMISSION STAND (M548A3)..... | 0054 00 |

TEST LOAD POWER PLANT SLING (M548A3)

0050 00

THIS WORK PACKAGE COVERS:

Test and inspect (page 0050 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Materials/Parts

Cotter pin

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)

Lifting device with rated lift capability of at least
6600 lb (2996 kg)

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

Suitable weight of 3000 lb (1362 kg)

References

TB 43-0142

Equipment Condition

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

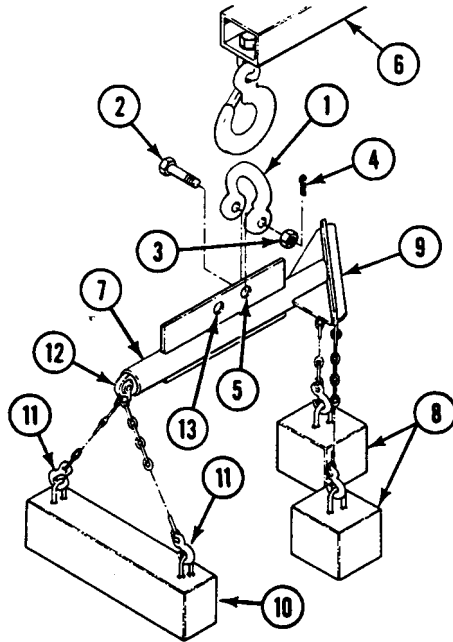
TEST AND INSPECTION

NOTE

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

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

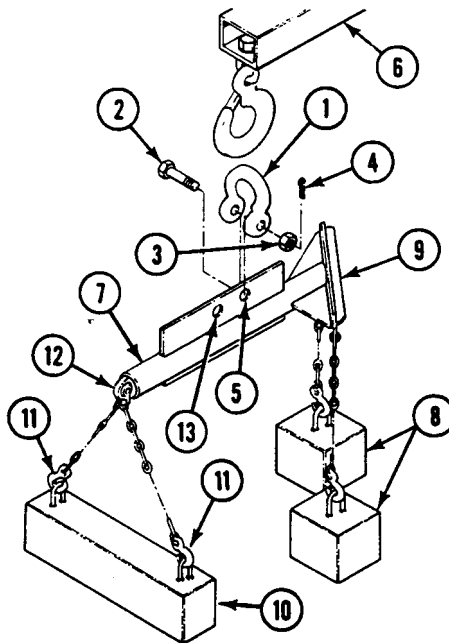
1. Install main lifting shackle (1), screw (2), nut (3), and new cotter pin (4) in hole (5).
2. Attach lifting device (6) to shackle (1) and raise sling (7).
3. Attach 1,500 pound (681 kg) weights (8) to each cross beam leg (9) and attach 3,000 pound (1362 kg) weight (10) to two legs (11) at tip of beam (12).



WARNING

Hanging loads could kill or injure you. Keep away from hanging loads and overhead equipment.

4. Raise sling (7) and weight (8) and weight (10) until weights clear 6 to 12 inches (15 to 30 cm) from surface.
5. Allow sling (7) to support weight(8) and weight (10) for a minimum of 10 minutes.
6. Inspect sling for distortion. See TB 43-0142.
7. Lower sling (7) to relieve weight (8) and weight (10). Repeat inspection of any areas of distortion found in Step 6. See TB 43-0142. No permanent distortion is allowed.
8. Remove cotter pin (4), nut (3), screw (2), and shackle (1) from hole (5). Discard cotter pin.
9. Repeat Step 1 for second hole (13).
10. Repeat Steps 4 - 7.
11. Remove weights (8) and weight (10) from sling (7).
12. Remove shackle (1) from lifting device (6).



END OF TASK

REPAIR POWER PLANT SLING (M548A3)

0051 00

THIS WORK PACKAGE COVERS:

- Remove Leg Assembly (page 0051 00-1).
- Install Leg Assembly (page 0051 00-2).
- Repair Chain Links (page 0051 00-2).
- Repair Hooks (page 0051 00-3).
- Replace Data Plate (page 0051 00-4).
- Repair Beam Assembly (page 0051 00-5).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H
Metal Worker 44B

Tools and Special Tools

Metal Worker's Tool Kit (WP 0078 00, Item 69)
Trailer Mounted Welding Shop (WP 0078 00, Item 74)

References

TC 9-237
TB 43-0142

Materials/Parts

Inspection penetrant kit (WP 0080 00, Item 21)
Sealing compound (WP 0080 00, Item 35)
Data plate
Drive screw (4)

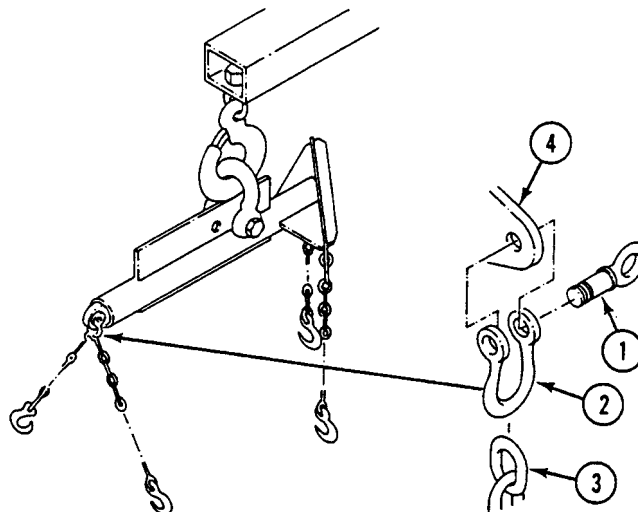
Equipment Condition

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

REMOVAL

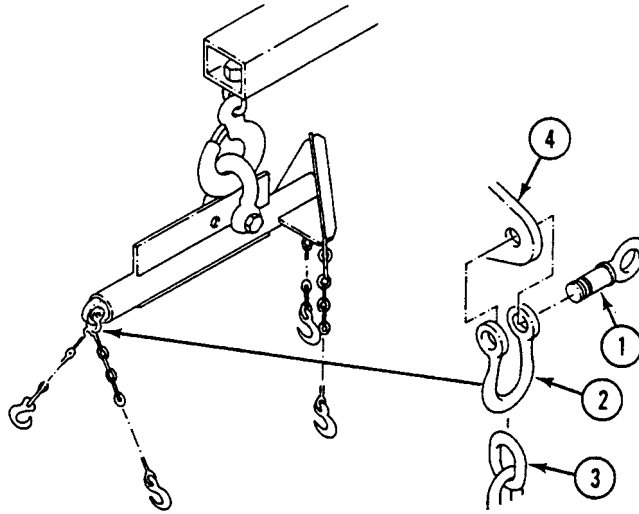
REMOVE LEG ASSEMBLY

1. Remove pin (1) from shackle (2).
2. Remove chain (3) from shackle (2).



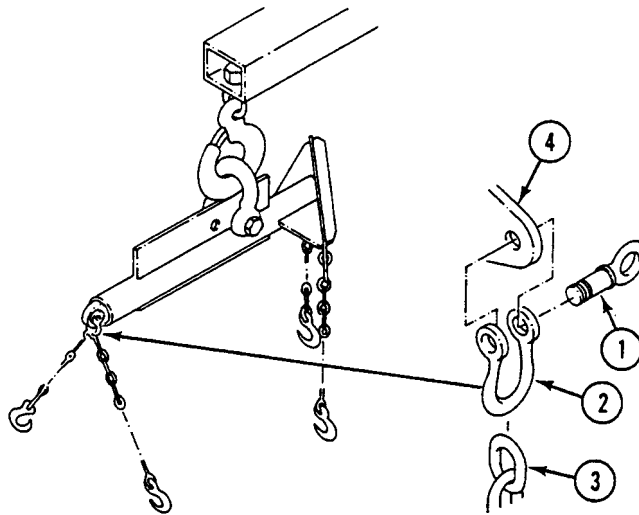
INSTALL LEG ASSEMBLY

1. Position chain (3) over shackle (2).
2. Add sealing compound to threads on pin (1).
3. Install pin (1) in shackle (2). Hook should point away from support beam (4).



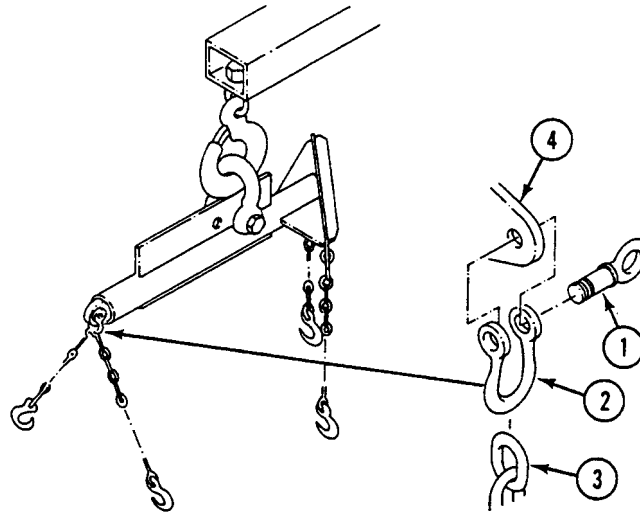
REPAIR CHAIN LINKS

1. Repair chain links (1) by draw filing to blend out nicks. Do not exceed wear limits for the size link used: 3/64 inch (1.2 mm) diameter for 9/32 inch (7.1 mm) chain and 5/64 inch (2.0 mm) diameter for 3/8 inch (9.5 mm) chain.



REPAIR HOOKS

1. Repair cracks, nicks, and gouges on hooks (2) by filing or grinding longitudinally, following contour of hook, provided no dimension is reduced more than 10% of its original value.
2. Perform dye-penetrant inspection to ensure repair of cracks has been completed.



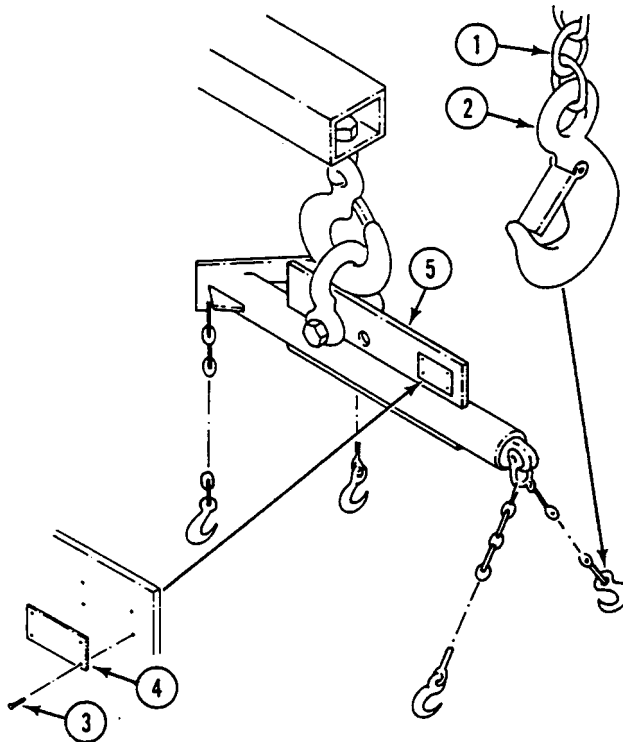
REPLACE DATA PLATE

1. Remove four drive screws (3) from data plate (4). Remove data plate. Discard plate and screws.

NOTE

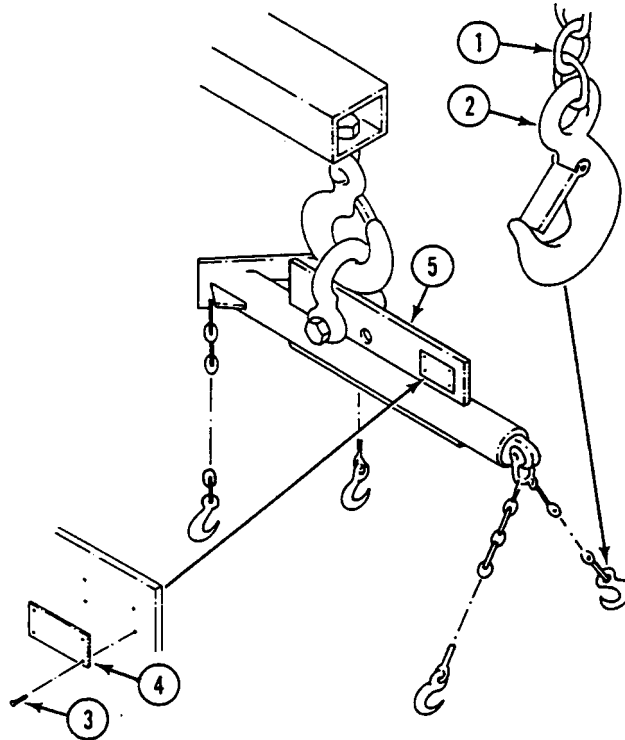
To order a new data plate, provide Depot with the same information contained on the original data plate: Contract Number, Serial Number, Date of Manufacture, Maximum Work Load, Proof Load, National Stock Number, Part Number, and Commercial and Government Entity Code.

2. Locate new data plate (4) in same location. Use the data plate as a template to drill four mounting holes $3/64$ to $1/16$ inch (1.2 to 1.6 mm) diameter and $5/32$ inch (4.0 mm) deep minimum.
3. Install four new drive screws (3) on data plate (4).



REPAIR BEAM ASSEMBLY

1. Repair cracked or torn welds by machining or grinding the defective beam assembly (5) to approximately 1.0 inch beyond the defect. Minimum root dimension should be 1/16 inch (1.6 mm) radius. The base metal is aluminum, class 5083-H32. Use gas metal-arc welding process (GMAW) and ANSI/AWS A5.10, class 5356 electrode, weld size 1/4 inch (6.4 mm) minimum per MIL-W-45305, class A.
2. Inspect beam assembly (5) for undercut, overlap, surface cavities, surface cracks in weld metal, or in heat-affected zone of base metal, and lack of weld penetration defects.

**FOLLOW-THROUGH STEPS**

1. Test load power plant sling (WP 0050 00).
2. Complete required forms.

END OF TASK

ADJUST ENGINE AND TRANSMISSION STAND (M548A3)

0052 00

THIS WORK PACKAGE COVERS:

Adjustment (page 0052 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0078 00, Item 68)
- Engine and Transmission Sling (WP 0078 00, Item 51)
- Lifting device with rated lift capability of at least 2,750 lb (1,249 kg)

References

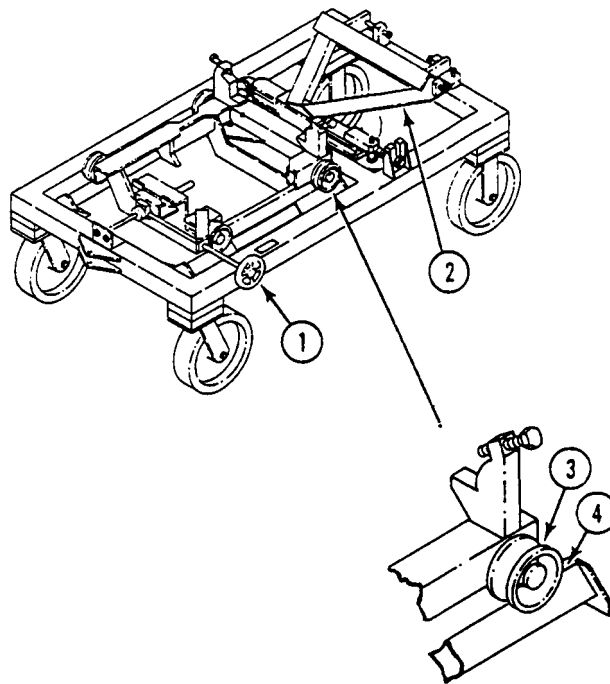
See your -20

Equipment Condition

- Engine and transmission stand blocked
- Power plant removed from carrier (see your -20)

ADJUSTMENT

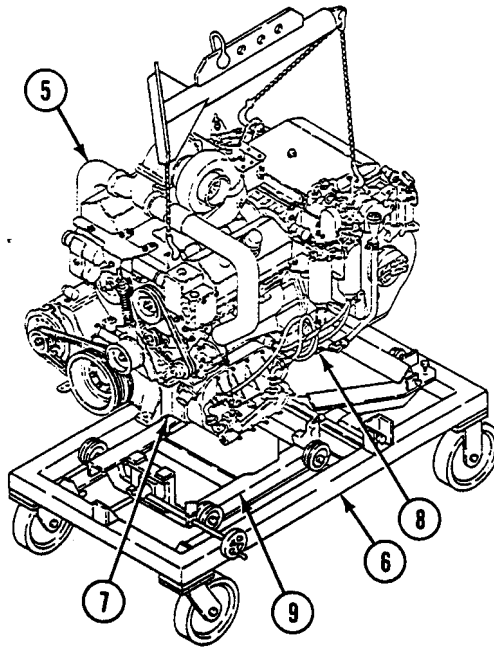
1. Turn the hand wheel (1) clockwise toward transmission support (2) until engine support wheels (3) are against the stops (4).



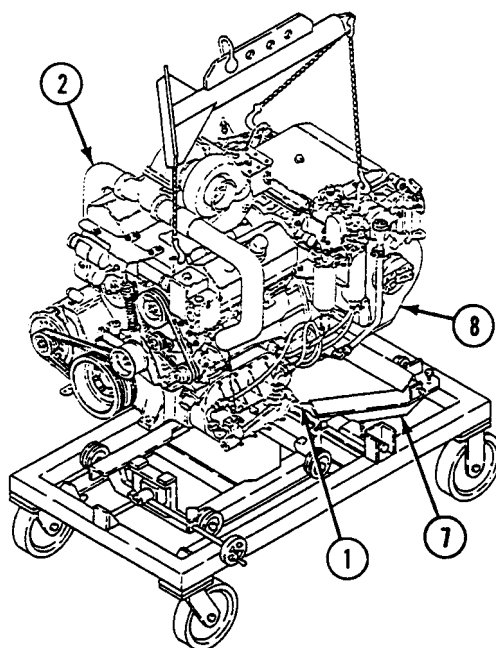
WARNING

Hanging loads could kill or injure you. Keep away from hanging loads and overhead equipment. Keep hands away from stand while engine is being lowered.

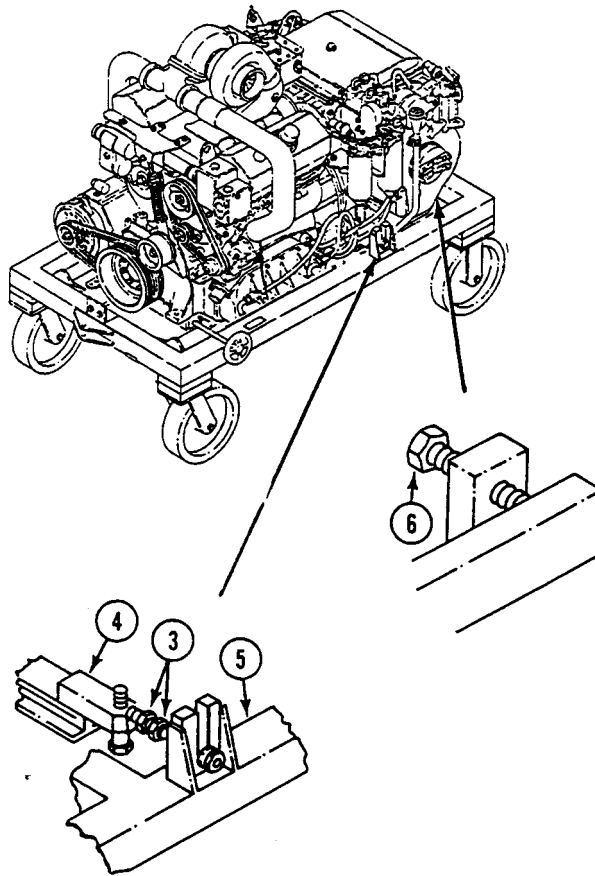
2. Slowly lower power plant (5) down on the engine and transmission stand (6). Make sure that hoses and harnesses do not get pinched or crushed as power plant is placed on the power plant stand.
3. Position the engine so that the edge of the engine oil pan (7) and each side of the engine flywheel housing (8) are seated completely on the engine support (9).



4. The lower rear side of the transmission should be against the edge of the transmission support stop (1).
5. Release all tension on the power plant sling. Remove the power plant sling from the power plant (2).
6. Loosen two jam nuts (3) securing beam assembly (4) to main frame (5). Loosen two screws (6) that hold transmission support (7).
7. Turn each leveling screw (6) until the transmission support (7) is supporting the bottom of the transmission (8). All three contact points of the engine support should still be supporting the engine.



8. Tighten two jam nuts (3) to secure beam assembly (4). Tighten two screws (6) securing the transmission support (7) evenly.
9. If the transmission (8) shifts up or down when separated from the engine, it will be necessary to adjust the transmission support (7) to allow the transmission spline coupling to mate with the engine splined coupling. Repeat Steps 6 - 8.
10. Adjust transmission to keep the transmission level with the engine during disassembly and assembly.



END OF TASK

SERVICE ENGINE AND TRANSMISSION STAND (M548A3)

0053 00

THIS WORK PACKAGE COVERS:

Servicing (page 0053 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

Lubricating Kit (WP 0078 00, Item 35)

Materials/Parts

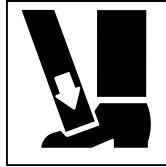
Automotive grease GAA (WP 0080 00, Item 7)

Engine lube oil OE/HDO (WP 0080 00, Item 17)

Personnel Required

Track Vehicle Repairer 63H

SERVICING

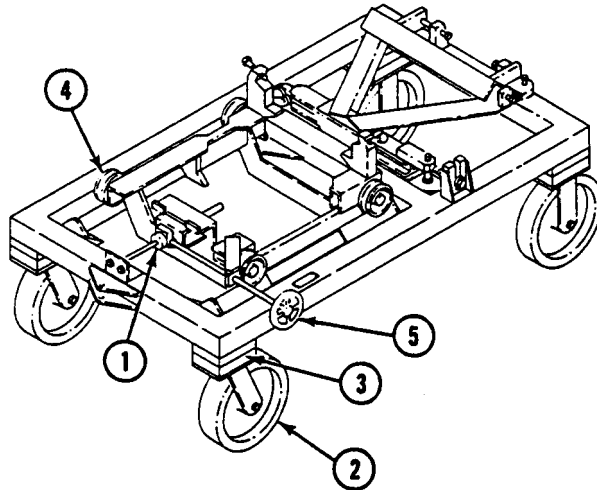
WARNING

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

CAUTION

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

1. Extend jack screw (1) and clean exposed threads and all lubrication fittings.
2. Apply grease to lubrication fittings on caster wheels (2), casters (3), vee wheels (4), and jack screw (1). Remove excess grease.
3. Apply engine lube oil to handwheel tube (5) at bushing point.



END OF TASK

REPAIR ENGINE AND TRANSMISSION STAND (M548A3)

0054 00

THIS WORK PACKAGE COVERS:

- Replace Caster Assembly (page 0054 00-2).
- Replace Engine Support Vee Wheels (page 0054 00-3).
- Replace Jack Screw (page 0054 00-6).
- Replace Beam Assembly Bearing (page 0054 00-10).
- Replace Data Plate (page 0054 00-14).
- Repair Engine And Transmission Stand By Welding (page 0054 00-14).

INITIAL SETUP:

Maintenance Level

Direct Support

Materials/Parts

- Automotive grease GAA WP 0080 00, Item 7
- Bearing
- Cotter pin
- Cotter pin (8)
- Drive screw (4)
- Headless pin (2)
- Lock washer (4)
- Lock nut
- Lock nut
- Lock nut
- Lock nut (2)
- Lock nut (4)
- Wooden block (2 x 4)

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0078 00, Item 68)
- Trailer Mounted Welding Shop (WP 0078 00, Item 74)
- Lubricating Kit (WP 0078 00, Item 35)
- Retaining Ring Pliers (WP 0078 00, Item 38)
- Arbor Press (WP 0078 00, Item 42)
- Trestle (WP 0078 00, Item 71)
- Open End Wrench, 1-5/16 x 1-1/2
(WP 0078 00, Item 78)
- Socket Wrench Set, 3/4 Inch Drive
(WP 0078 00, Item 80)

Personnel Required

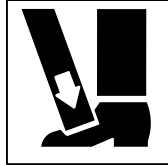
- Track Vehicle Repairer 63H
- Metal Worker 44B

References

- TC 9-237
-

REPAIR OR REPLACEMENT

REPLACE CASTER ASSEMBLY

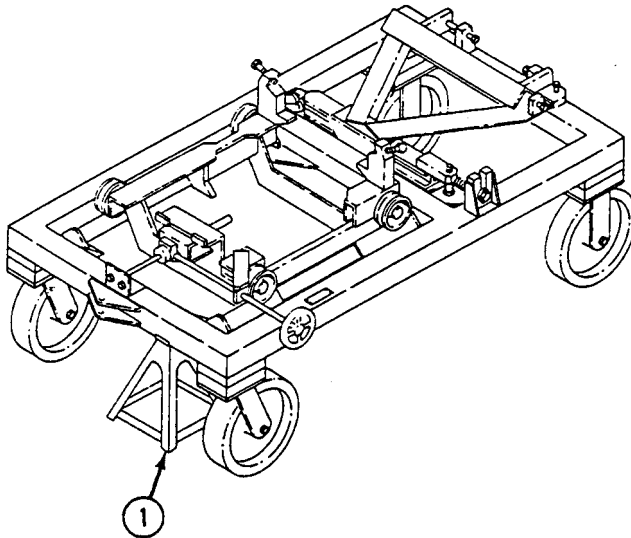
WARNING

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

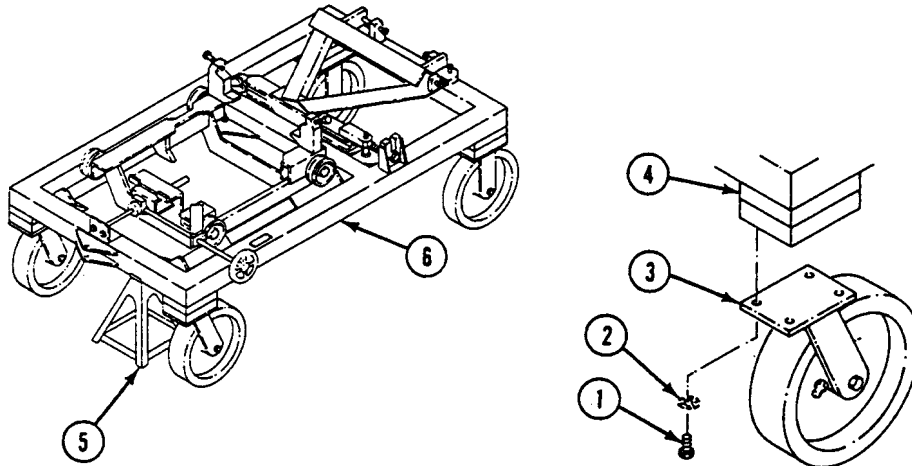
CAUTION

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

1. Raise corner of stand and install a trestle (1).

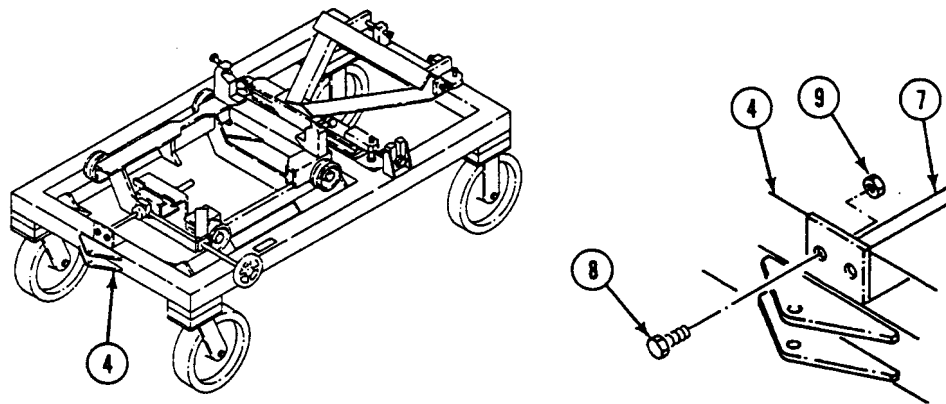


2. Remove four screws (1) and lock washers (2) securing the caster assembly (3) to main frame (4). Discard lock washers.
3. Locate caster (3) to main frame (4) and install four screws (1) with new lock washers (2).
4. Lubricate caster (3). Use automotive grease.
5. Remove trestle (5) and lower stand (6).

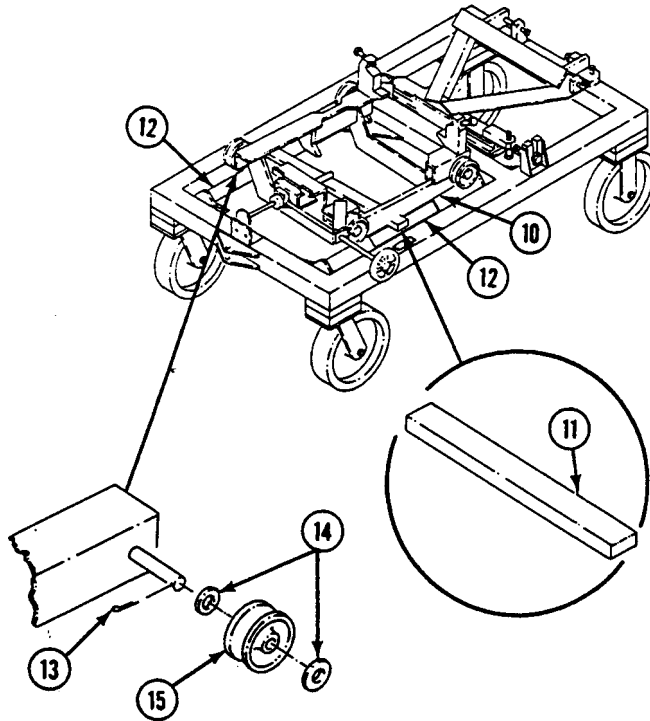


REPLACE ENGINE SUPPORT VEE WHEELS

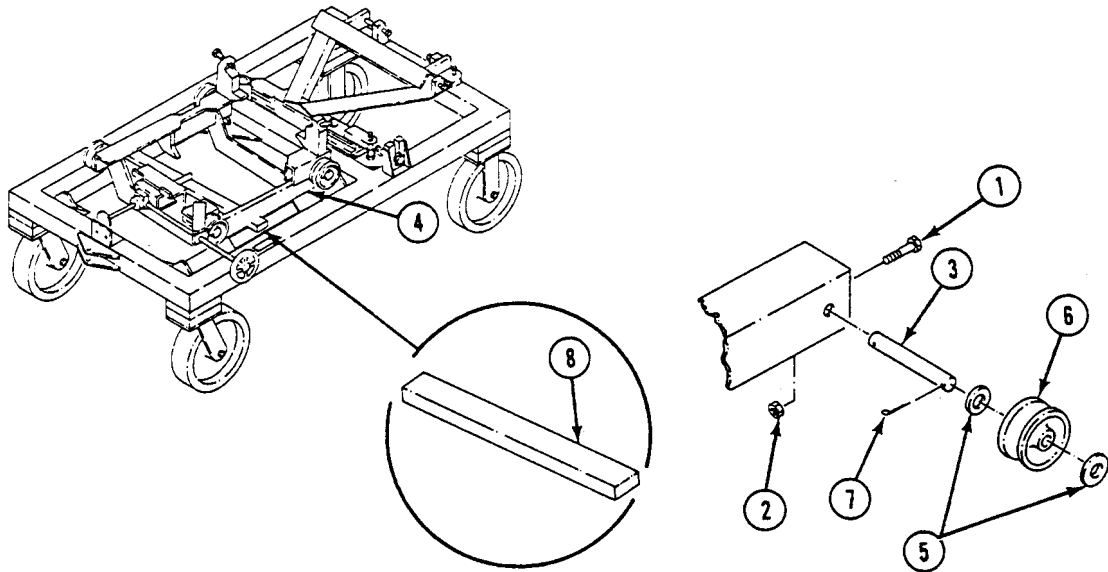
1. Retract jack screw (7).
2. Remove two screws (8) and lock nuts (9) securing jack screw (7) to main frame (4). Discard lock nuts.



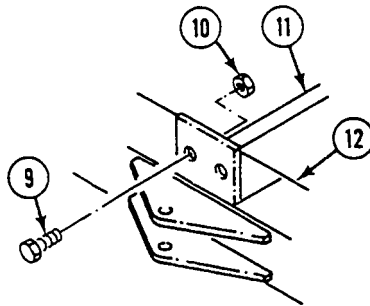
3. Raise support (10) and install wooden 2 x 4 (11) between frame rails (12). Rest support on 2 x 4.
4. Remove cotter pin (13), washer (14), vee wheel (15), and washer (14). Discard cotter pin.



5. Remove screw (1) and lock nut (2) securing axle (3) to support (4). Remove axle. Discard lock nut.
6. Install axle (3), screw (1), and new lock nut (2).
7. Install washer (5), vee wheel (6), washer (5), and new cotter pin (7).
8. Lubricate vee wheel (6). Use automotive grease.
9. Raise support (4), remove 2 x 4 (8), and lower wheels onto track.

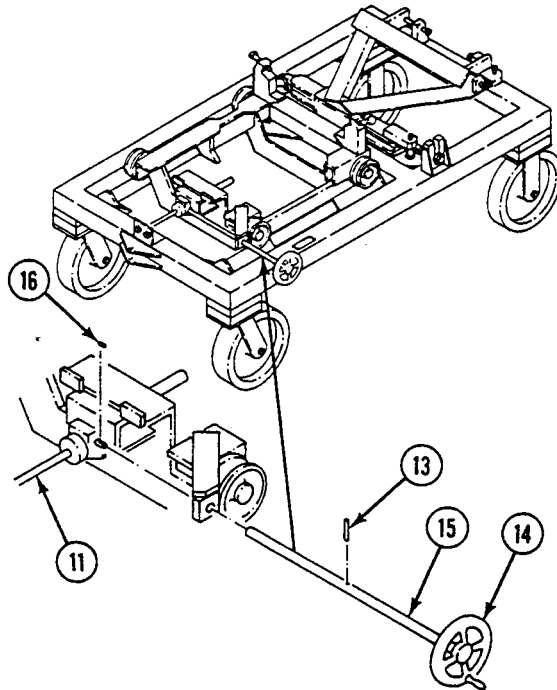


10. Install two screws (9) and new lock nuts (10) securing jack screw (11) to main frame (12).



REPLACE JACK SCREW

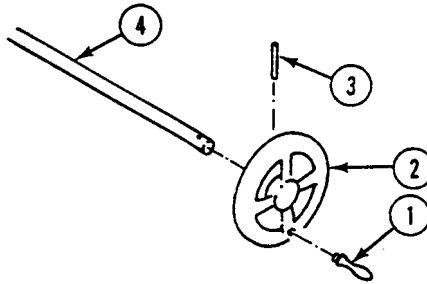
1. Retract jack screw (11). Dowel pin behind bracket bushing should be horizontal and keyway in end of hand wheel tube pointing up.
2. Drive out pin (13). Discard pin.
3. Remove hand wheel (14) and tube (15). Be careful not to lose key (16).



NOTE

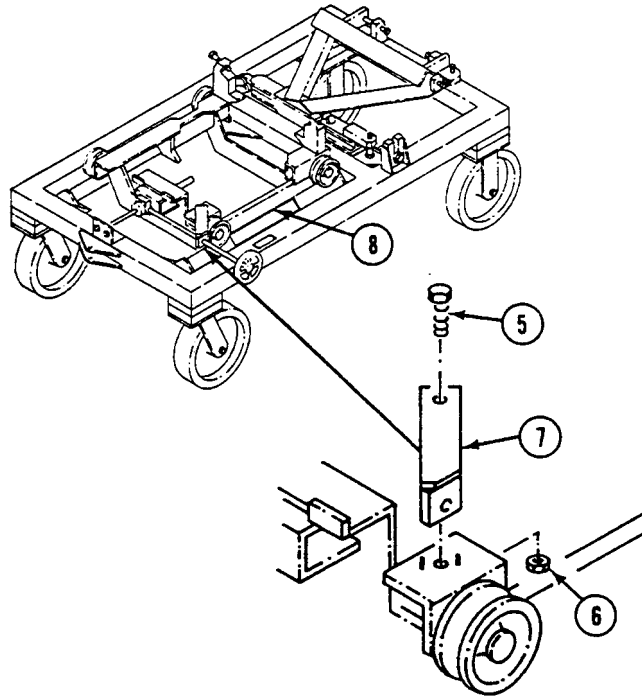
If hand wheel or tube requires replacement, go to Step 4, if not, go to next note.

4. Remove handle (1) from hand wheel (2).
5. Drive out pin (3) from hand wheel (2). Discard pin.
6. Install hand wheel (2) on tube (4). Align dowel holes and install new pin (3).

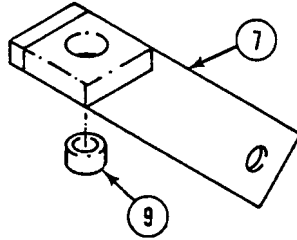
**NOTE**

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

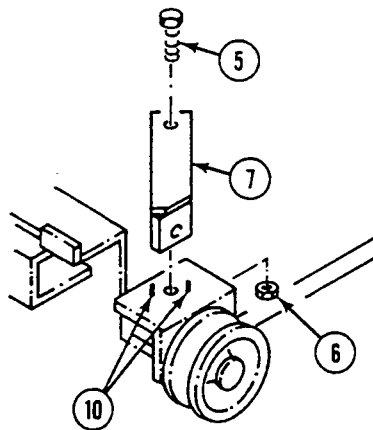
7. Remove screw (5) and lock nut (6) securing bracket (7) to engine support (8). Remove bracket. Discard lock nut.



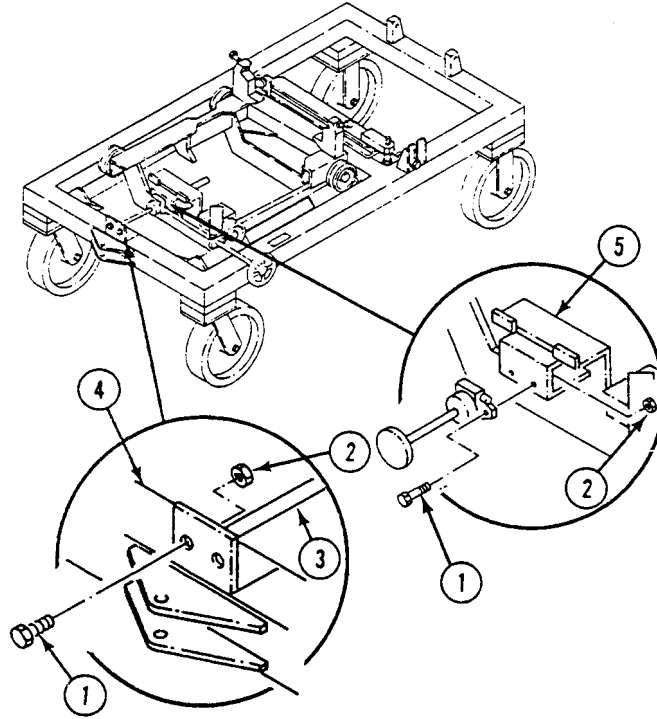
8. Place bracket (7) in press and push out bushing (9). Note which side of bracket bushing flange was on.
9. Press new bushing (9) into bracket (7).



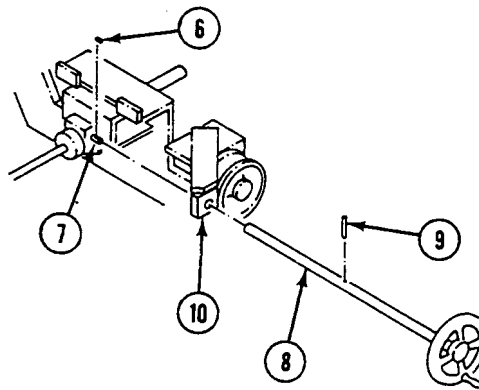
10. Place bracket (7) over dowels (10) and install screw (5) and new lock nut (6).



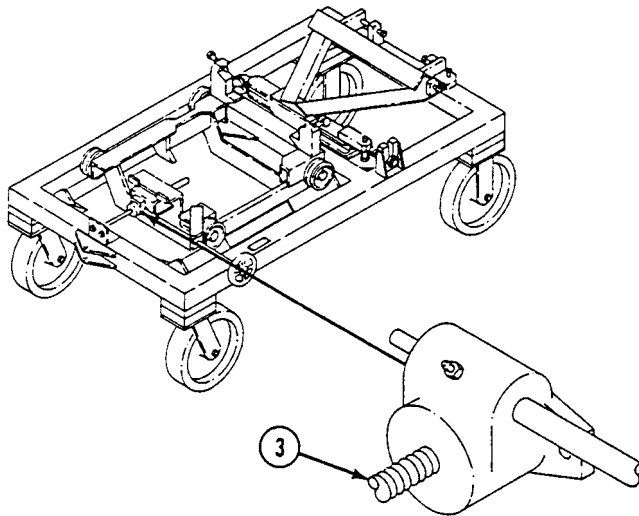
11. Remove four screws (1), lock nuts (2), and jack screw (3) from main frame (4) and engine support (5). Discard lock nuts.
12. Place new jack screw (3) on engine support (5) and main frame (4). Install four screws (1) and new lock nuts (2).



13. Install key (6) into jack screw keyway (7).
14. Install hand wheel tube (8).
15. Install new pin (9) behind bracket bushing (10).

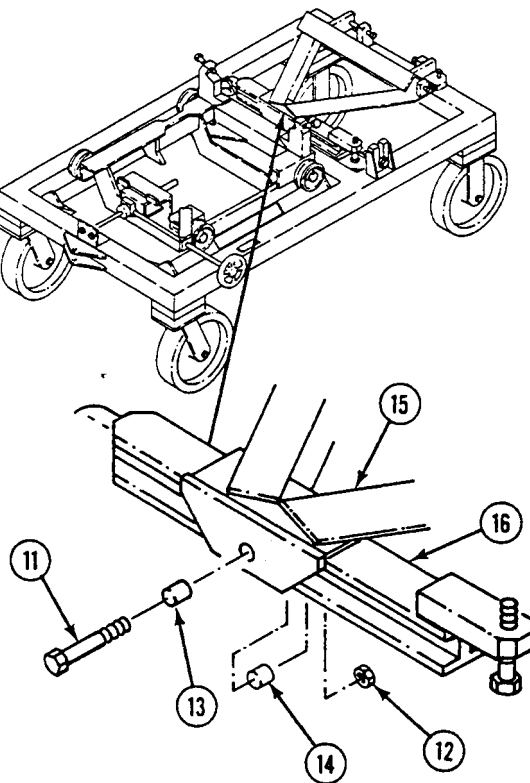


16. Lubricate jack screw (3). Use automotive grease.

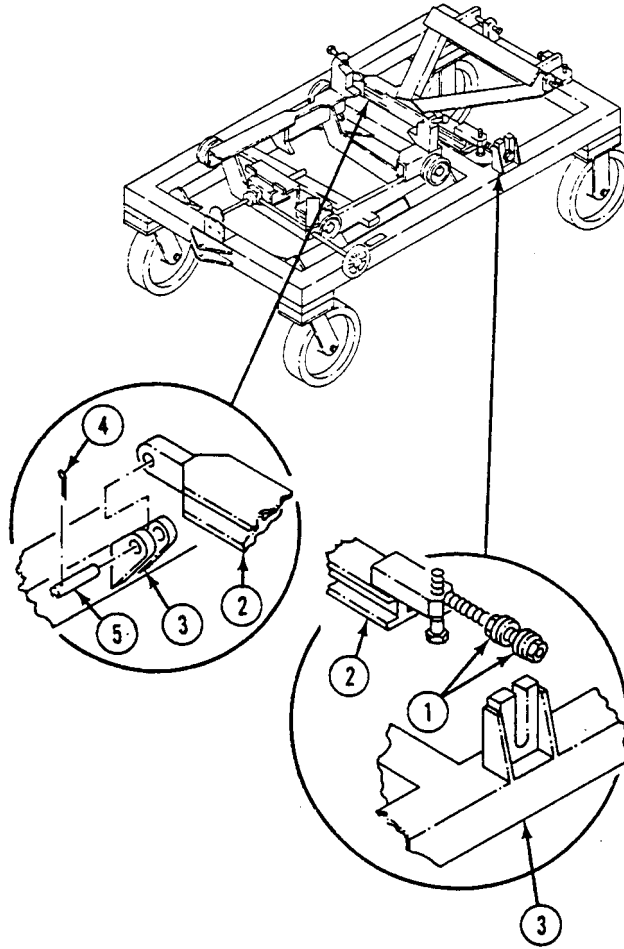


REPLACE BEAM ASSEMBLY BEARING

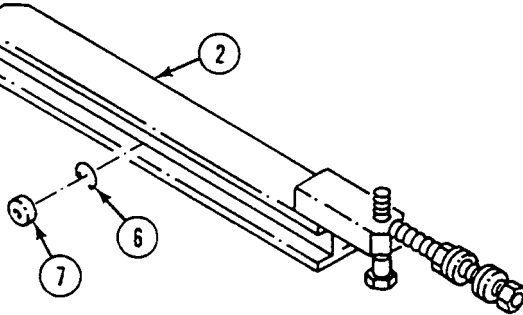
1. Remove screw (11), lock nut (12), long spacer (13), and short spacer (14) securing transmission support (15) to beam assembly (16). Discard lock nut. Remove support.



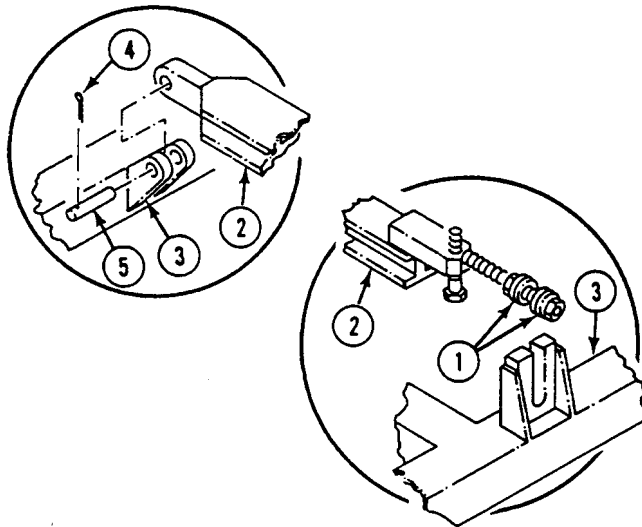
2. Loosen two jam nuts (1) securing beam assembly (2) to main frame (3).
3. Remove cotter pin (4) from headless pin (5) securing beam assembly (2) to main frame (3) and remove headless pin (5). Discard cotter pin. Remove beam from main frame.



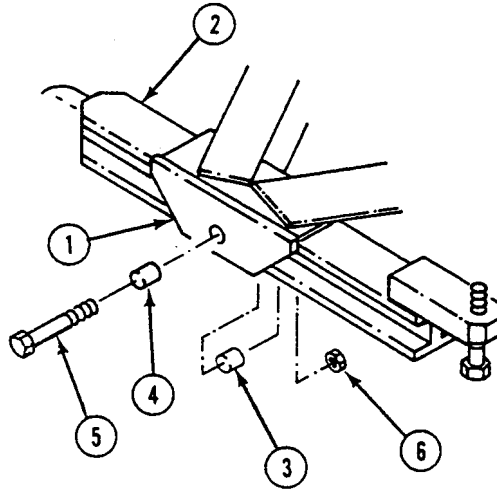
4. Place beam assembly (2) on workbench.
5. Remove retaining ring (6) securing bearing (7).
6. Push bearing (7) out of beam assembly (2).
7. Install new bearing (7).
8. Install retaining ring (6) on beam assembly (2).



9. Install beam assembly (2) on main frame (3) and install headless pin (5). Install new cotter pin (4).
10. Tighten jam nuts (1).

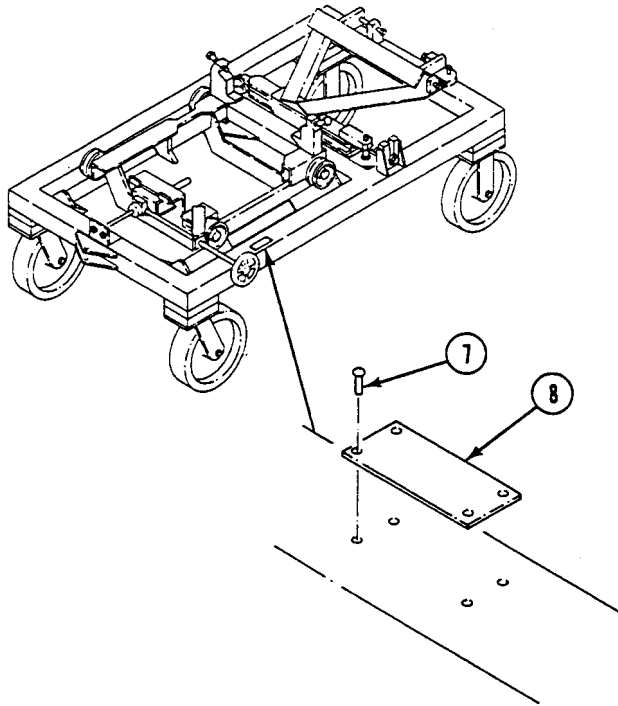


11. Position transmission support (1) on beam assembly (2). Install short spacer (3), beam assembly, long spacer (4), screw (5), and new lock nut (6) on transmission support.



REPLACE DATA PLATE

1. Remove four drive screws (7).
2. Locate new data plate (8) in same area. Using plate as a template, drill four mounting holes $3/64$ to $1/16$ inch (1.2 to 1.6 mm) diameter.
3. Install four new drive screws (7).

**REPAIR ENGINE AND TRANSMISSION STAND BY WELDING**

1. Weld in accordance with TC 9-237 using gas tungsten-arc welding (GTAW) process, shielded metal-arc welding (SMAW) process, or gas metal-arc welding (GMAW) process.
2. Material: bar and plate – hot rolled carbon steel AISI 1020; tubing – ASTM-A501; angle – ASTM-A36.

END OF TASK

CHAPTER 15

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
FOR SPECIAL PURPOSE KITS

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|---|---------------------|
| INSTALL VEHICLE COMPARTMENT HEATER KIT I (M548A1)..... | 0055 00 |
| INSTALL VEHICLE COMPARTMENT HEATER KIT II OR III (M548A1)..... | 0056 00 |
| INSTALL VEHICLE COMPARTMENT CAB COVER/INSULATION KIT (SECONDARY KIT)..... | 0057 00 |
| INSTALL CARGO AREA HEATER KIT..... | 0058 00 |
| INSTALL CARGO COVER/INSULATION KIT (SECONDARY KIT)..... | 0059 00 |
| REPLACE/FABRICATE CARGO COVER HEAT SHIELD..... | 0060 00 |
| INSTALL ENGINE COOLANT HEATER KIT (M548A1)..... | 0061 00 |
| INSTALL ENGINE COOLANT HEATER KIT (M548A3)..... | 0062 00 |
| COOLANT HEATER/PUMP DATA..... | 0063 00 |
| FINAL TEST — COOLANT HEATER..... | 0064 00 |
| REPLACE FUEL CONTROL VALVE..... | 0065 00 |
| REPLACE FLAME DETECTOR SWITCH..... | 0066 00 |
| REPLACE RESTRICTION THERMOSTAT..... | 0067 00 |
| REPLACE OVERHEAT THERMOSTAT..... | 0068 00 |
| REPLACE FIXED RESISTOR..... | 0069 00 |
| REPLACE BURNER PACKING AND GASKET..... | 0070 00 |
| REPLACE DIODE AND MOTOR RESISTOR..... | 0071 00 |
| REPLACE BLOWER MOTOR..... | 0072 00 |
| INSTALL AIR BRAKE KIT (M548A1)..... | 0073 00 |
| AIR BRAKE KIT DATA (M548A1)..... | 0074 00 |
| REMOVE/INSTALL TREADLE VALVE ASSEMBLY (M548A1)..... | 0075 00 |
| INSTALL TURN SIGNAL KIT..... | 0076 00 |

INSTALL VEHICLE COMPARTMENT HEATER KIT I (M548A1)

0055 00

THIS WORK PACKAGE COVERS:

Installation (page 0055 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0078 00, Item 68)
- Portable Electric Drill (WP 0078 00, Item 12)
- Twist Drill Set (WP 0078 00, Item 15)
- Suitable Container

Materials/Parts

- Adhesive (WP 0080 00, Item 4)
- Antiseize compound (WP 0080 00, Item 6)
- Sealing compound (WP 0080 00, Item 32)
- Heater kit I

Personnel Required

Track Vehicle Repairer 63H

References

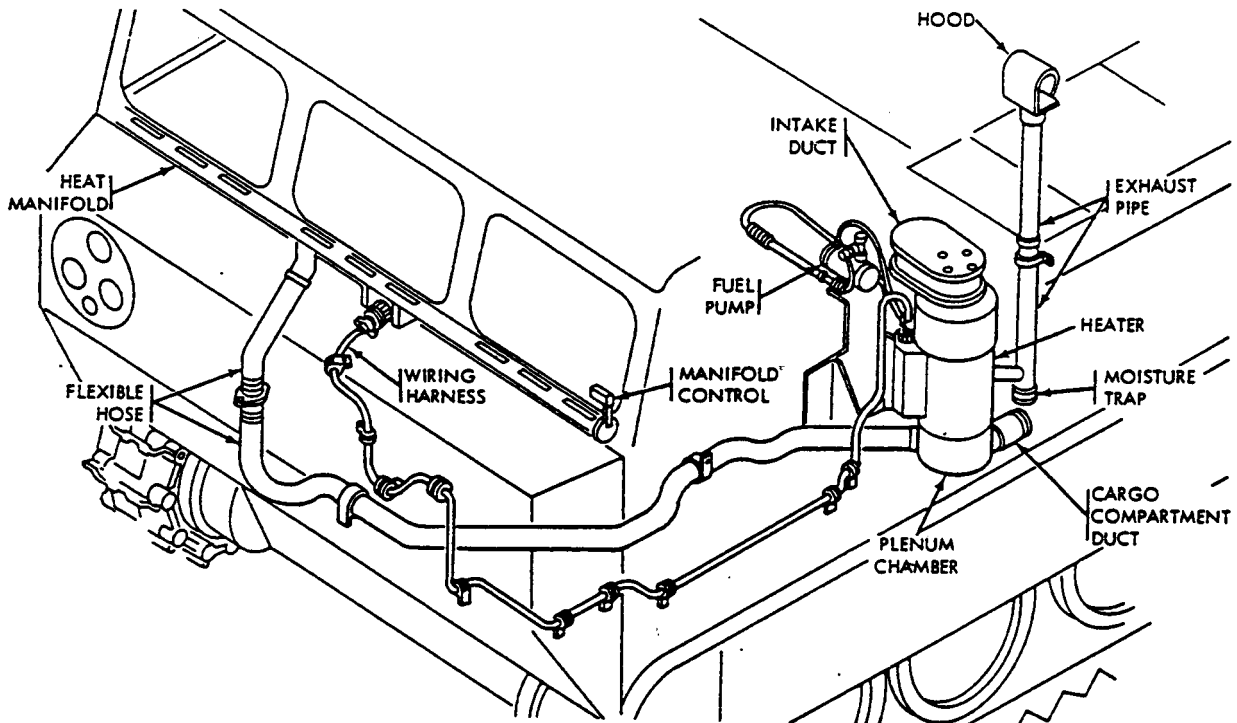
- See your -10
- See your -20

Equipment Condition

- Engine stopped (see your -10)
- Carrier blocked (see your -10)
- Master switch off
- Bulkhead protector removed, if material handling kit is installed (see your -20)
- Top left access grille removed (see your -10)
- Power plant upper rear access door opened (see your -10)
- Power plant left rear access cover removed and discarded (see your -20)
- Batteries removed (see your -20)

INSTALLATION

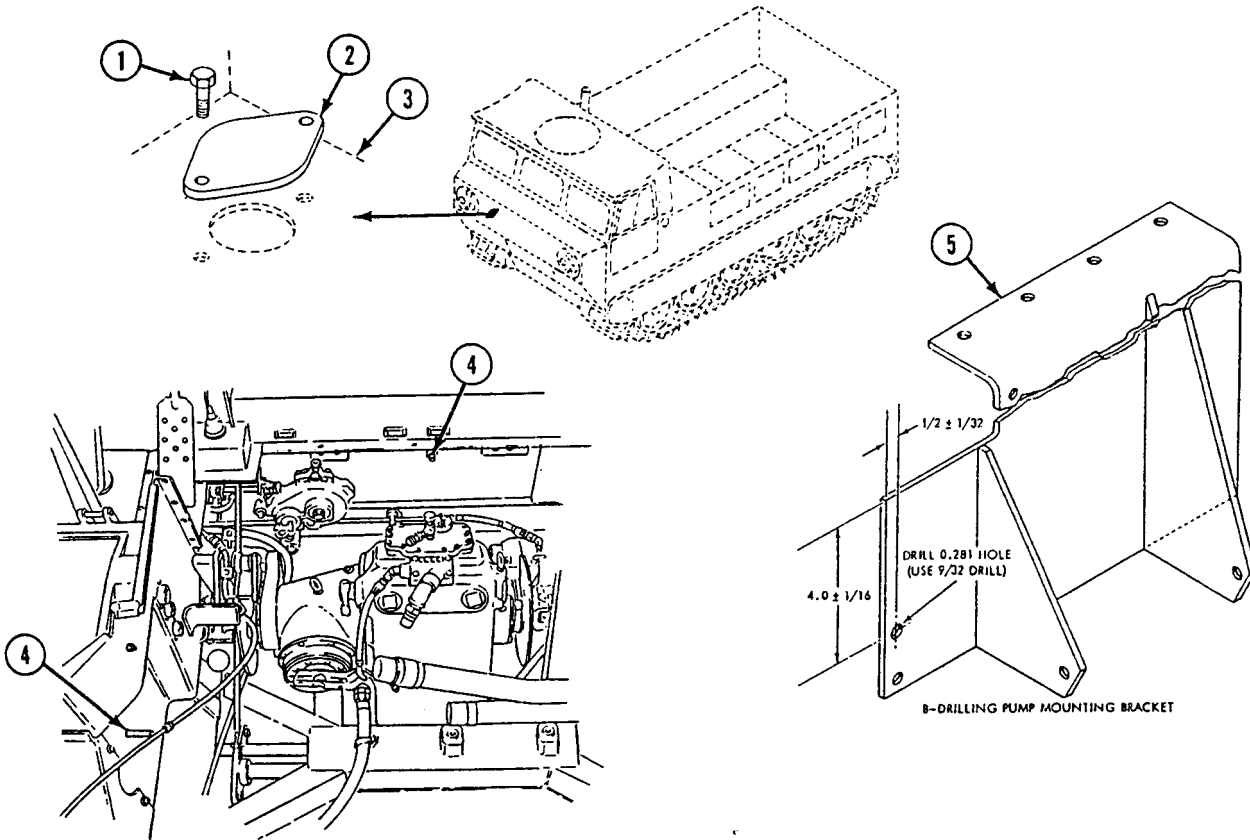
LOCATOR DIAGRAM – HEATER KIT I



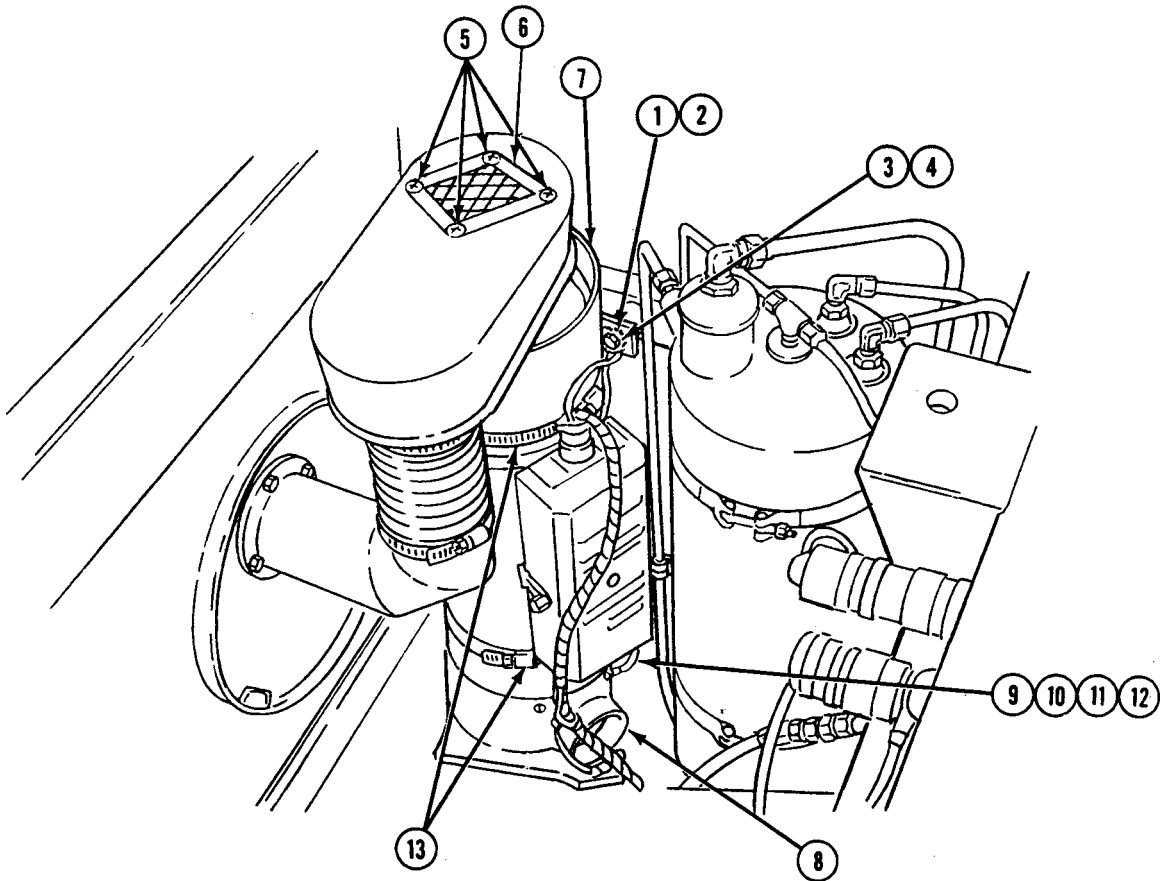
NOTE

Dispose of discarded parts in accordance with current directives.

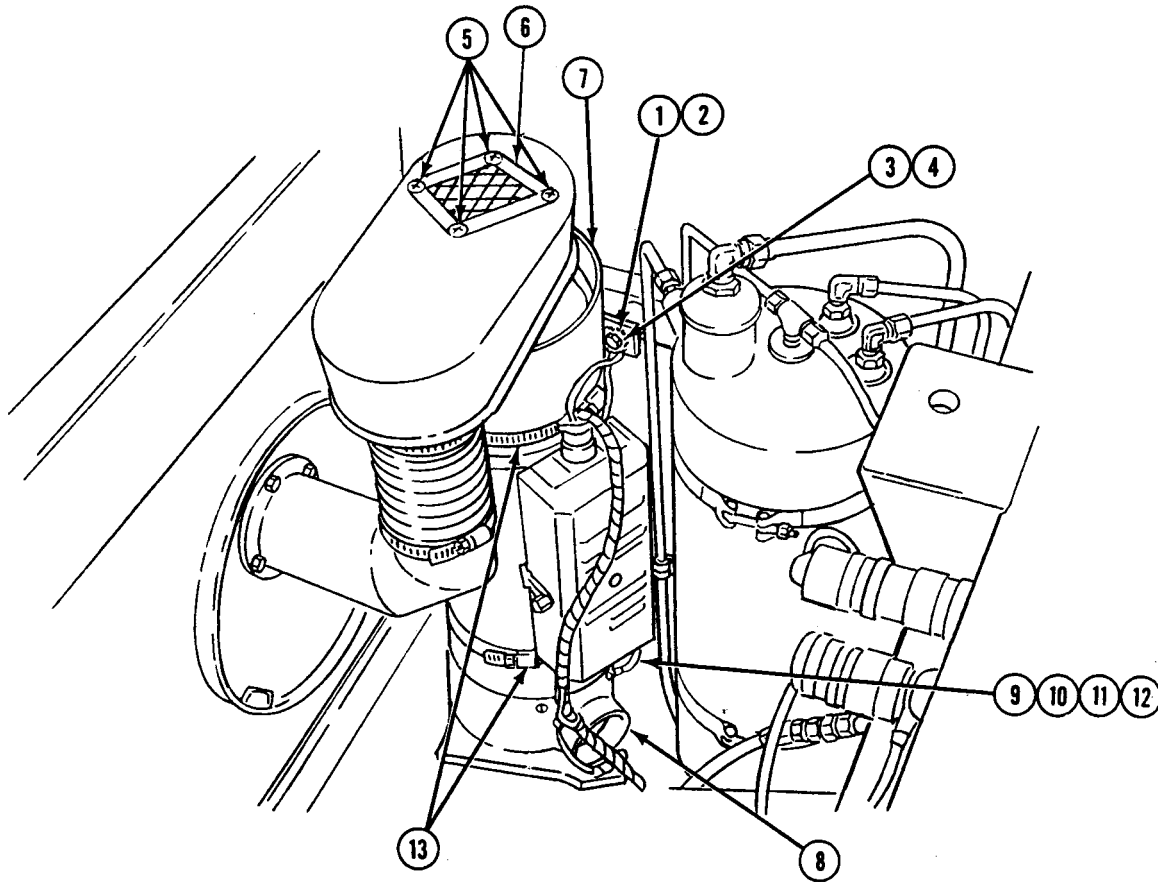
1. Remove and retain two screws (1) from cover plate (2) and hull (3). Discard plate.
2. Locate, position, and weld two weld nuts (4).
3. Locate and drill one 0.281 inch (7.1 mm) hole through pump mounting bracket (5).



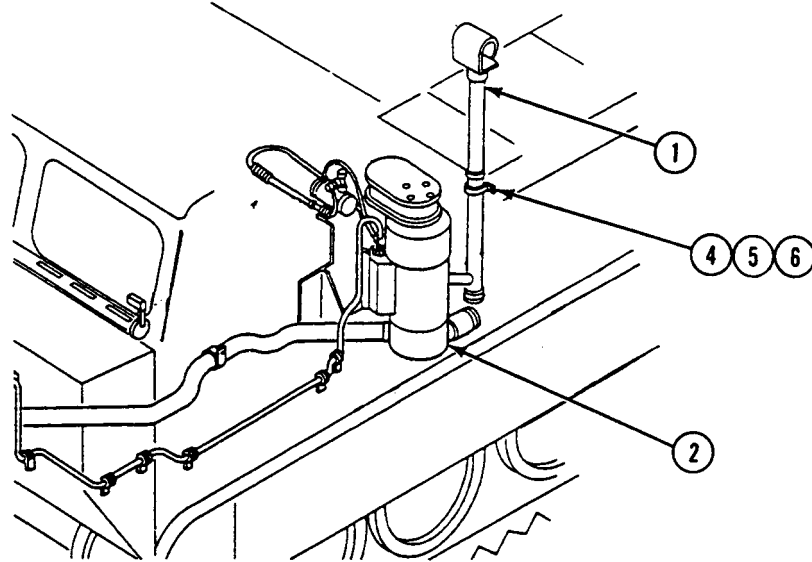
4. Install two mounting brackets (1) on hull mounts (2) with two washers (3) and four screws (4). Omit washers under forward screws at this time.
5. Remove and discard four screws (5) from intake grill (6) and heater assembly (7). Discard grille.
6. Install plenum chamber (8) on heater assembly (7) and install three washers (9), ground strap (10), washer (11), and four screws (12). Install washer and strap immediately to left of front outlet.



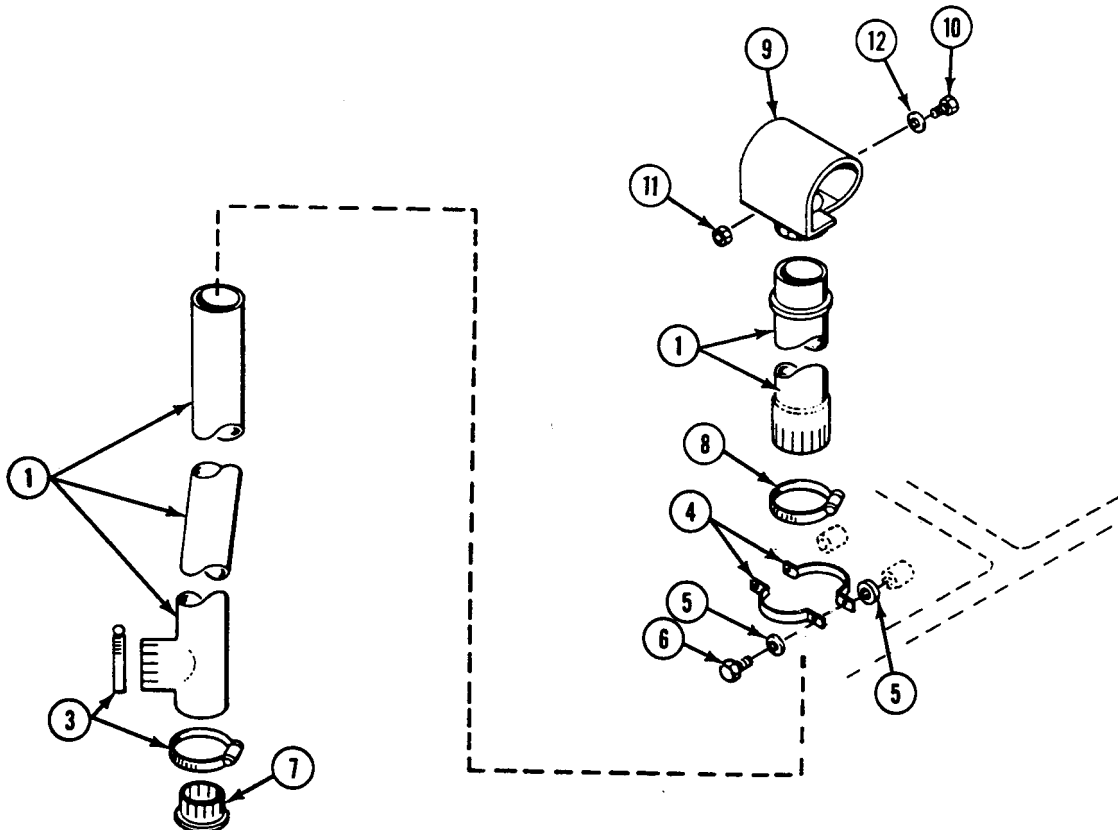
7. Install heater assembly (7) with plenum chamber (8) in carrier. Mark position of chamber on sponson and remove heater assembly with chamber.
8. Clean sponson thoroughly. Apply a coat of adhesive to sponson and press pad firmly into position at plenum chamber location.
9. Install heater assembly (7) with plenum chamber (8) in carrier and install two clamps (13) on brackets (1) and hull mounts (2).



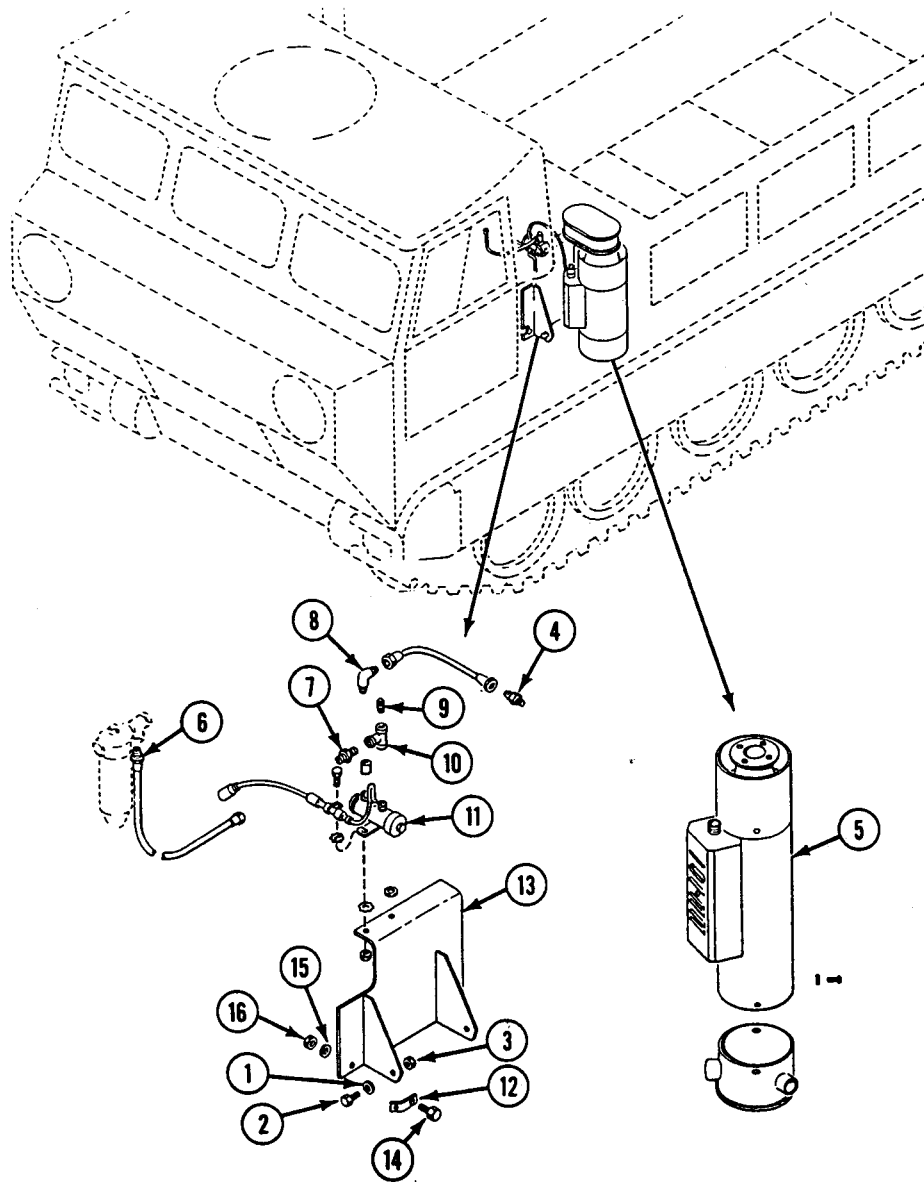
10. Install lower exhaust pipe (1) on heater (2) and install exhaust outlet clamp (3).
11. Install two pipe straps (4), spacer washers (5) as required (10 supplied), and two screws (6) on exhaust pipe (1).



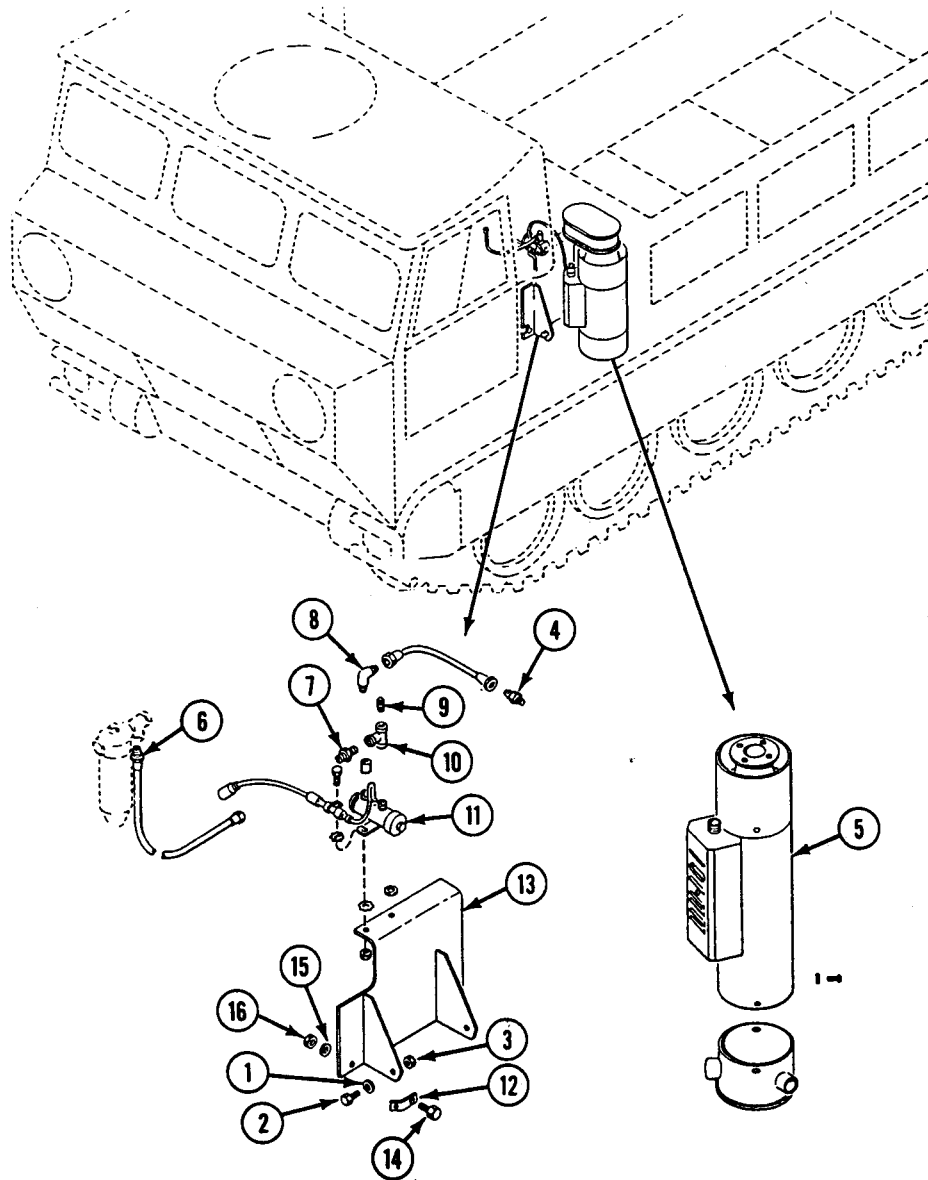
12. Install moisture trap adapter (7) and upper exhaust pipe on lower exhaust pipe (1) with two pipe clamps (8).
13. Install hood assembly (9) on upper exhaust pipe (1) and install two attached screws (10), nuts (11), and four washers (12).



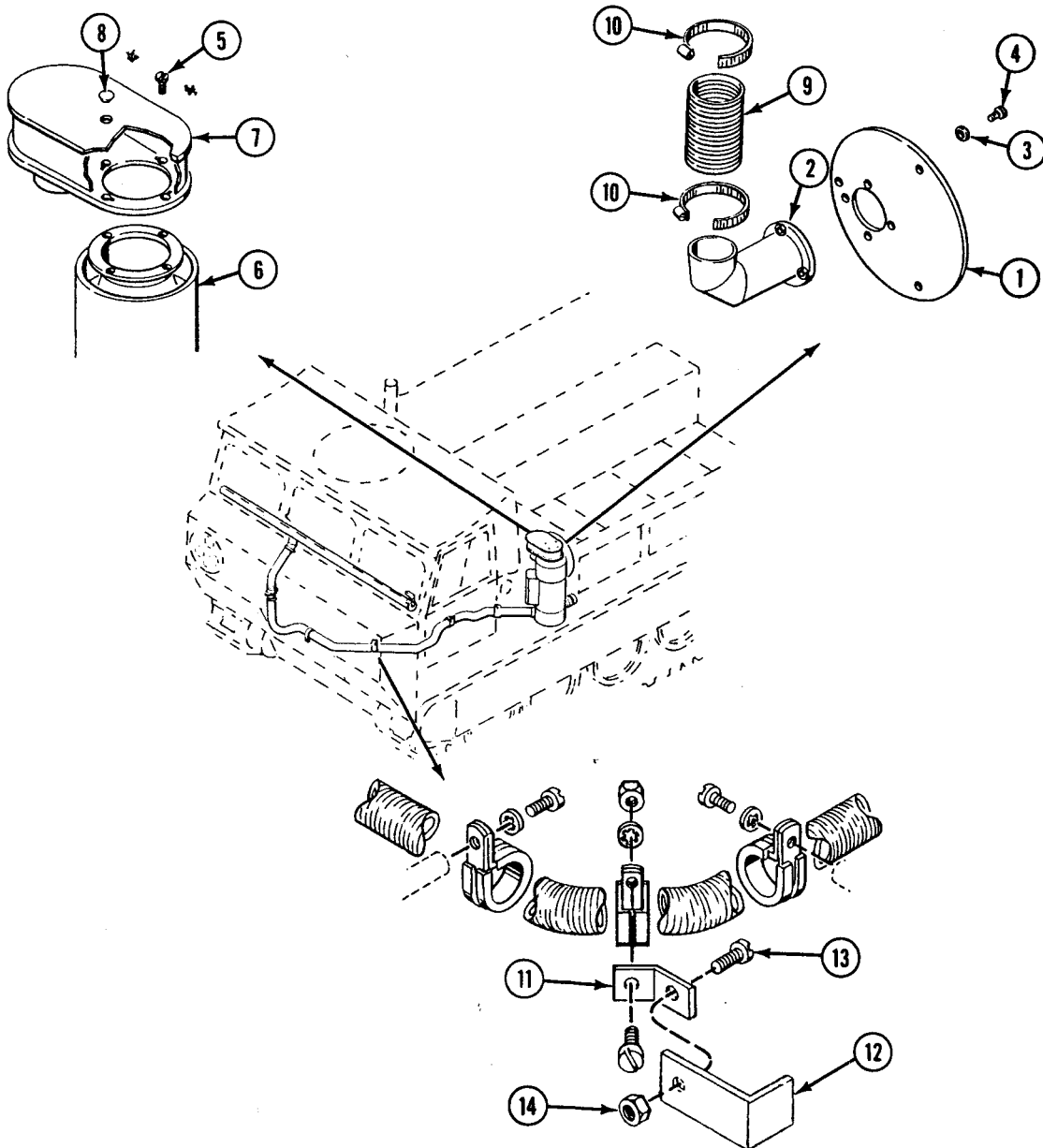
14. Apply sealing compound to tapered pipe threads and antiseize compound to straight thread fittings.
15. Install spacer washer (1), four screws (2), and nuts (3). Washer (1) is installed between left front hull mount and support leg of mounting assembly.
16. Install heater inlet nipple (4) on heater assembly (5).
17. Connect hose assembly (6) to nipple (7) and pump outlet elbow (8).



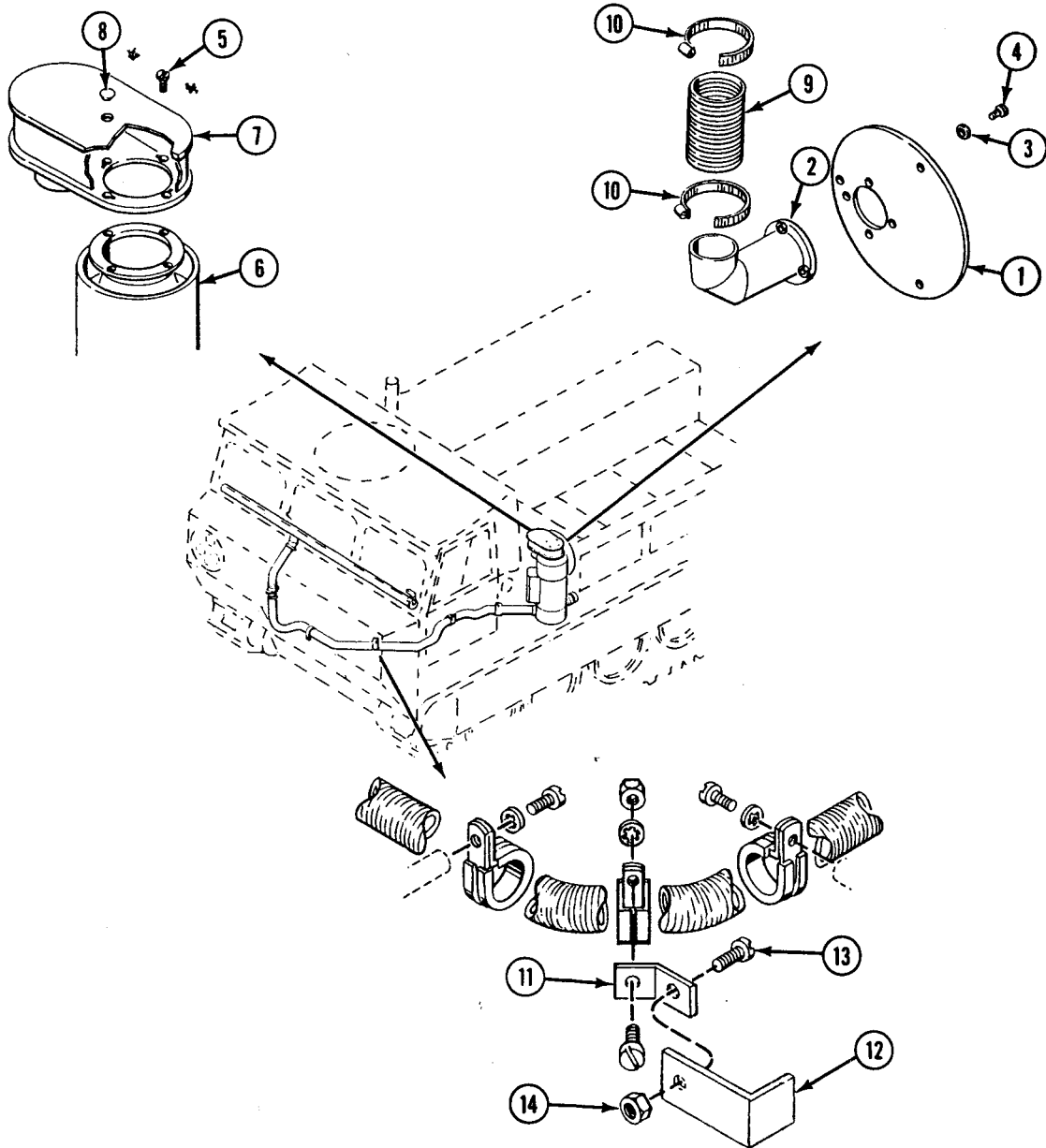
18. Remove and discard existing plug (9) from tee (10) on primary fuel filter (11). Catch any runoff fuel in a suitable container.
19. Connect hose assembly (6) to pump inlet nipple (7) and tee (10) on fuel filter (11).
20. Install hose mounting bracket (12) on 0.281 inch (7.1 mm) hole drilled in pump mounting bracket (13), with free end of mounting bracket (12) slanting toward center of carrier. Install screw (14), washer (15), and nut (16) on bracket (12) and bracket (13). Install entire mounting assembly on sponson.



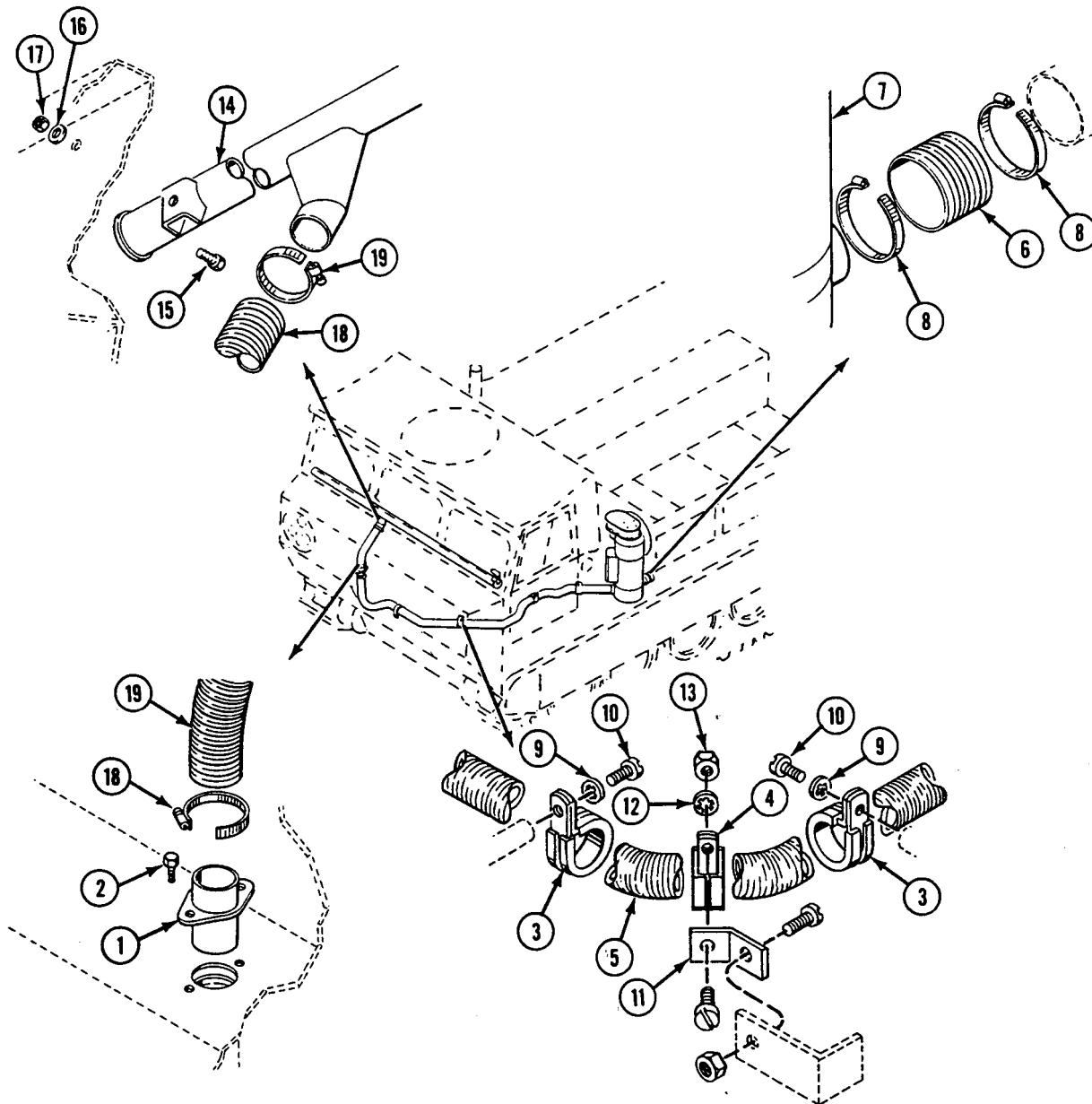
21. Install air intake cover assembly (1) in rear power plant compartment bulkhead and tighten three attached fasteners.
22. Install air intake elbow (2) on cover assembly (1) and install four washers (3) and screws (4).
23. Install four screws (5) on heater assembly (6). Do not tighten screws.
24. Install air intake duct (7) on heater assembly (6) and install screws (5) on intake duct (7) and air intake elbow (2). Turn air intake duct clockwise to engage screws. Tighten screws.



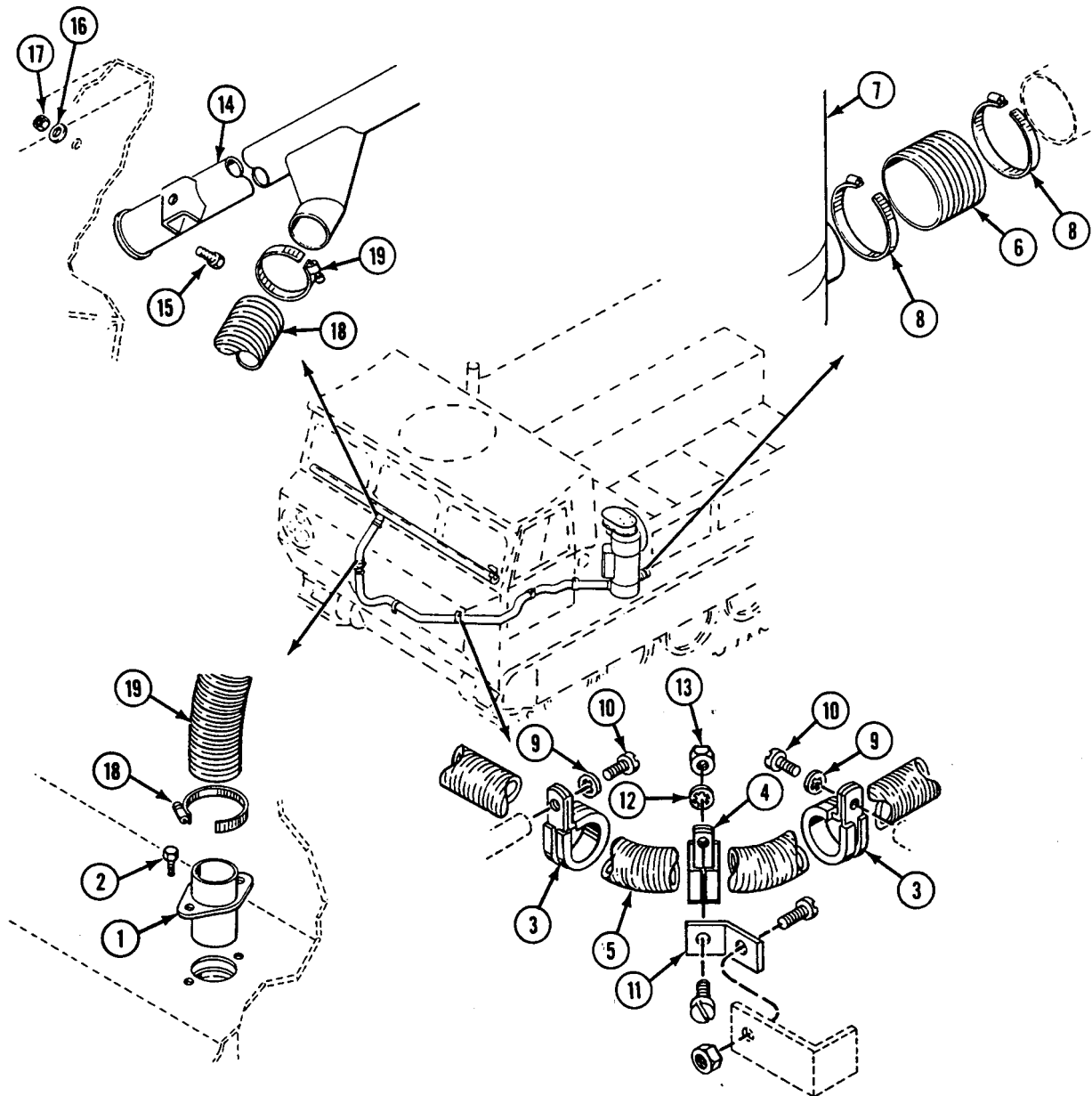
25. Install four plugs (8) in air intake duct (7).
26. Install 6-1/2 inch (16.5 cm) intake air hose (9) on air intake duct (7) and elbow (2). Install two intake hose clamps (10) on hose ends.
27. Remove stoplight switch (see your -20).
28. Install hose mounting bracket (11) on stoplight switch mounting bracket (12) with free end of mounting bracket slanting forward. Install screw (13), two stoplight switch mounting washers (not shown), and nut (14) on stoplight switch mounting bracket.



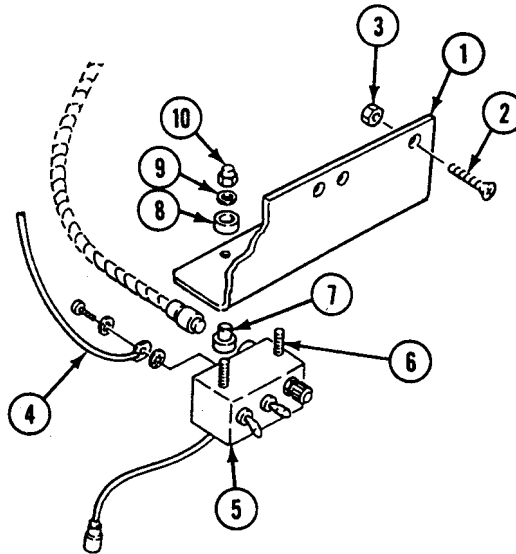
29. Install hose adapter tube (1) in carrier and install two cover plate screws (2).
30. Install two hose clamps (3) and two hose clamps (4) on 120 inch (3.0 m) outlet hose (5) and in carrier.
31. Install 4-3/4 inch (12.1 cm) cargo area outlet hose (6) in carrier.
32. Connect ends of outlet hose (5) to tube (1) and plenum chamber (7), ends of cargo area outlet hose (6) to plenum chamber and outlet on rear power plant compartment bulkhead. Install hose ends with four hose clamps (8).



33. Install two clamps (3) on two weld nuts on hull and install two washers (9) and screws (10).
34. Install two clamps (4) on mounting bracket (11) and stoplight switch bracket with washers (12) and nuts (13).
35. Install outlet manifold (14) in carrier and install five screws (15), washers (16) and nuts (17).
36. Install 18 inch (45.7 cm) manifold (18) on tube (1) and outlet manifold (14) and connect hose ends with two hose clamps (19).

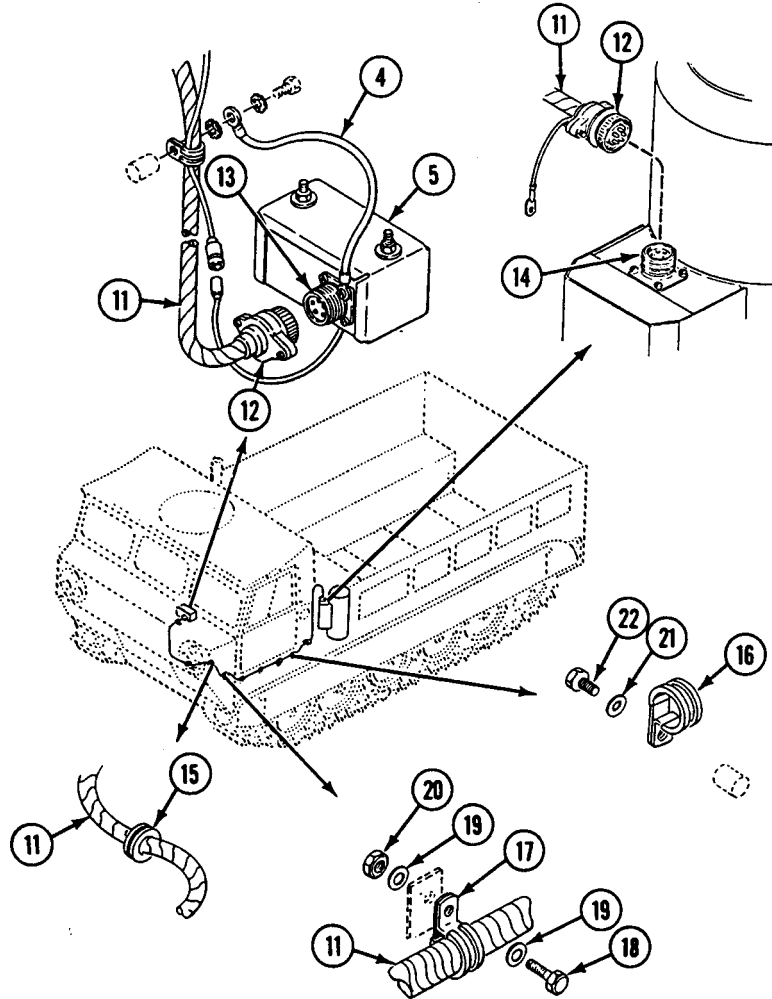


37. Install control box bracket (1) on cowl below center windshield section and install four screws (2) and nuts (3).
38. Remove control box panel (see your -20).
39. Remove two existing control box mounting screws and nuts (supplied with control box). Discard screws and nuts.
40. Connect ground strap (4) on control box case (5). Use receptacle attaching screw and washer.
41. Install control box case (5) on bracket (1) and install two screws (6), lower resilient mounts (7) upper resilient mounts (8), washers (9) and nuts (10). Tighten screws and nuts to compress resilient mounts to make 3/16 to 1/4 inch (4.8 to 6.4 mm) space between bracket and control box case.

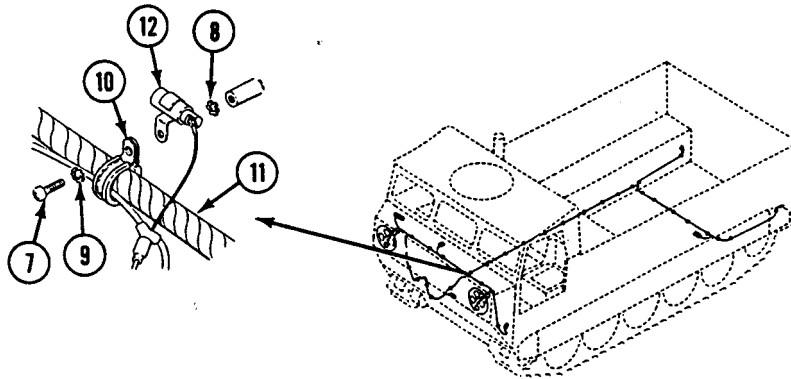


42. Install control box panel (see your -20).

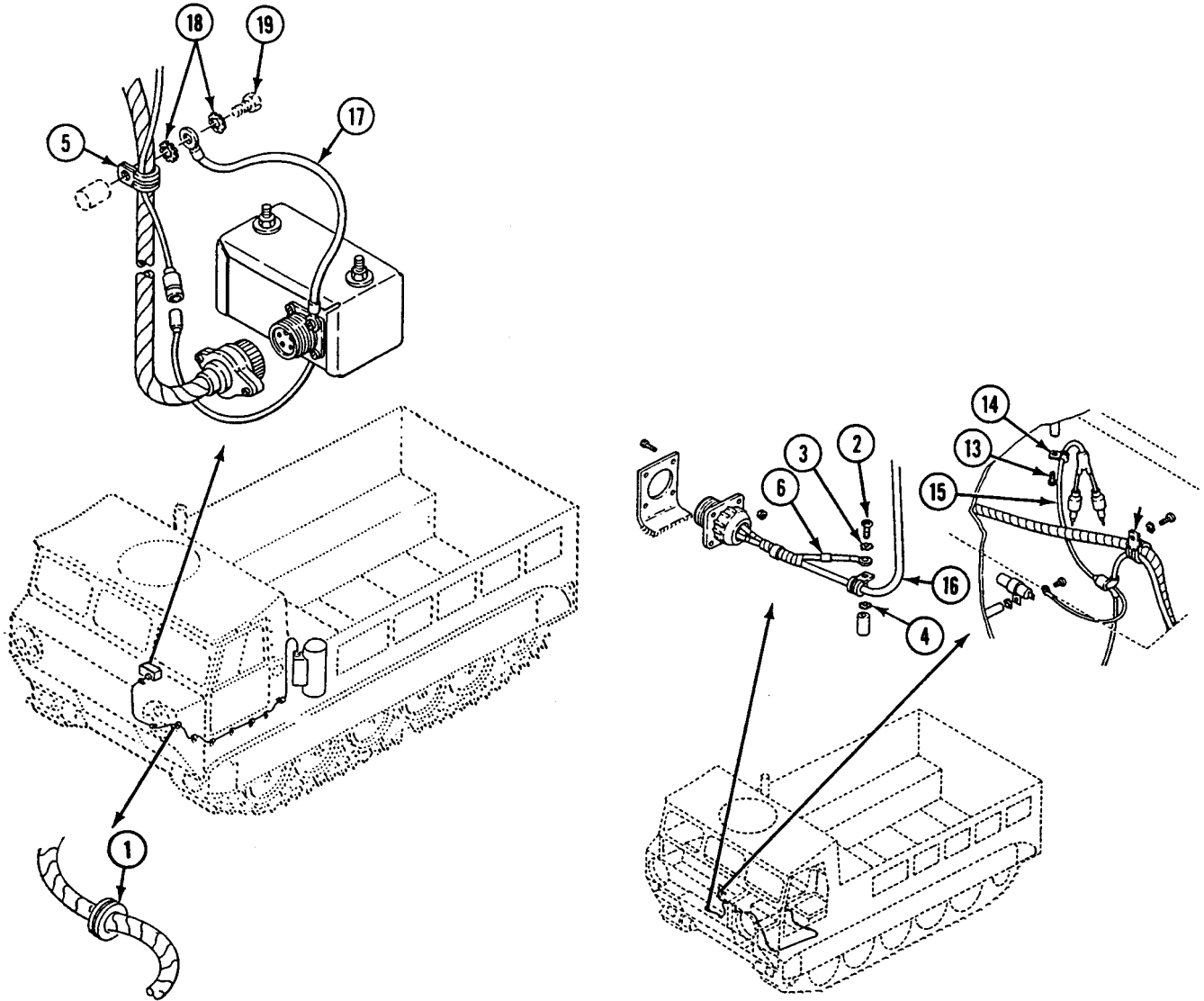
43. Install wiring harness (11) in carrier. Connect two harness connectors (12) on control box receptacle (13) and heater receptacle (14).
44. Install grommet (15) and four wiring harness clamps (16) and four wiring harness clamps (17) on wiring harness (11).
45. Install bracket harness clamp (17) on hull bracket at front of power plant compartment. Install screw (18), two washers (19), and nut (20) on clamp.
46. Install four harness clamps (16) on hull weld nuts at lower left side of power plant compartment. Install four washers (21) and screws (22) on clamps.



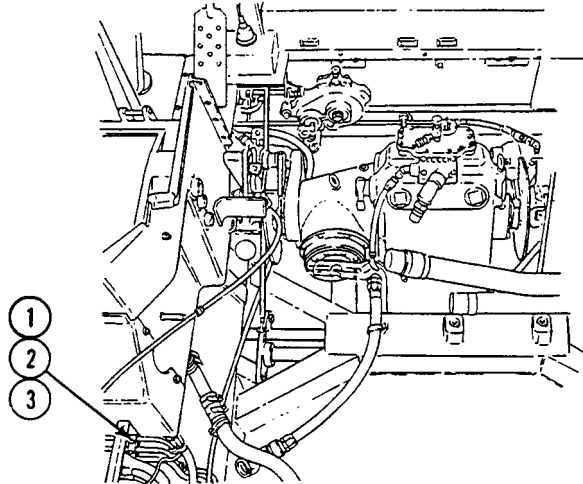
47. Install grommet (1) on cab bulkhead.
48. Remove screw (2), washer (3), and washer (4) from hull. Install clamp (5) on hull and install wiring harness ground lead (6), clamp, washer and screw.
49. Remove screw (7), washer (8), and washer (9) from main wiring harness clamp (10) and hull. Install clamp, screw and washers on hull and install main wiring harness (11) and noise suppression capacitor (12).



50. Remove screw (13) from lead clamp (14) on hull and discard clamp. Install circuit 400 and circuit 400A leads (15) with wiring harness (16), clamp (5), control box ground strap (17), two lock washers (18) and screw (19) on hull.

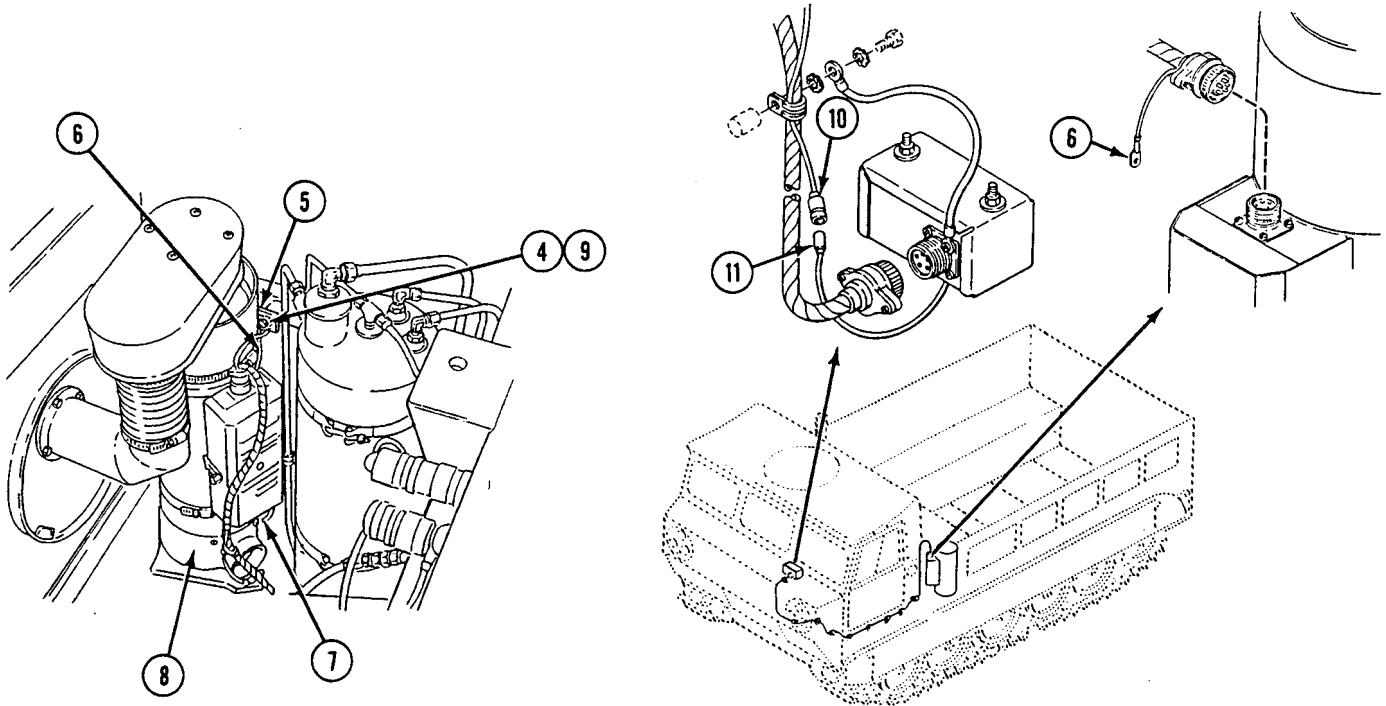


51. Remove tube tiedown screw (1) and washer (2) from fuel tube strap on sponson. Install clamp (3) on strap and install on hull.



52. Remove two front heater bracket screws (4) at upper hull mount (5). Connect wiring harness ground lead (6) at upper hull mount and heater ground strap (7) at lower hull mount (8) and install four washers (9) and screws (4).

53. Connect circuit 402 lead (10) to fuel pump lead (11).



FOLLOW-THROUGH STEPS

1. Install battery (see your -20).
2. Close power plant upper rear access door (see your -10).
3. Install top left access grille (see your -10).
4. Install bulkhead protector, if material handling kit is installed (see your -20).

END OF TASK

INSTALL VEHICLE COMPARTMENT HEATER KIT II OR III (M548A1)

0056 00

THIS WORK PACKAGE COVERS:

Installation (page 0056 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

- Drill, Electric, Portable, 1/2 inch (WP 0078 00, Item 12)
- Drill Set, Twist, 1/16 to 1/2 inch, Rnd Shank (WP 0078 00, Item 15)
- General Mechanic's Tool Kit (WP 0078 00, Item 68)
- Suitable Container

References

See your -20

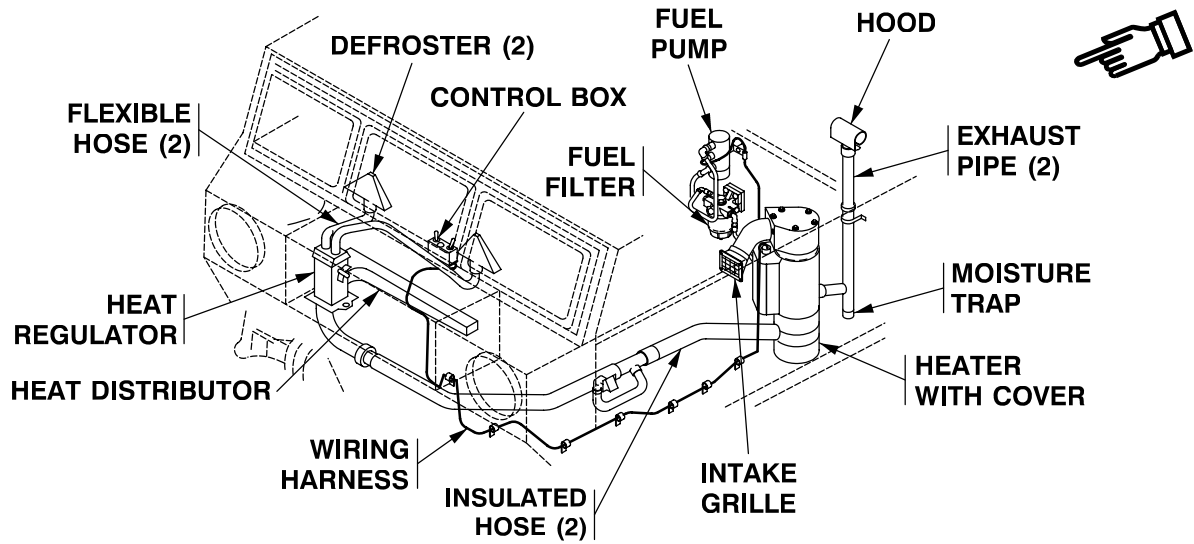
Equipment Condition

- Engine stopped (see your -10)
- Carrier blocked (see your -10)
- Master switch off
- Battery negative lead disconnected (see your -20)
- Bulkhead protector removed, if material handling kit is installed (see your -20)
- Top left access grille removed (see your -10)
- Power plant upper rear access door opened (see your -10)

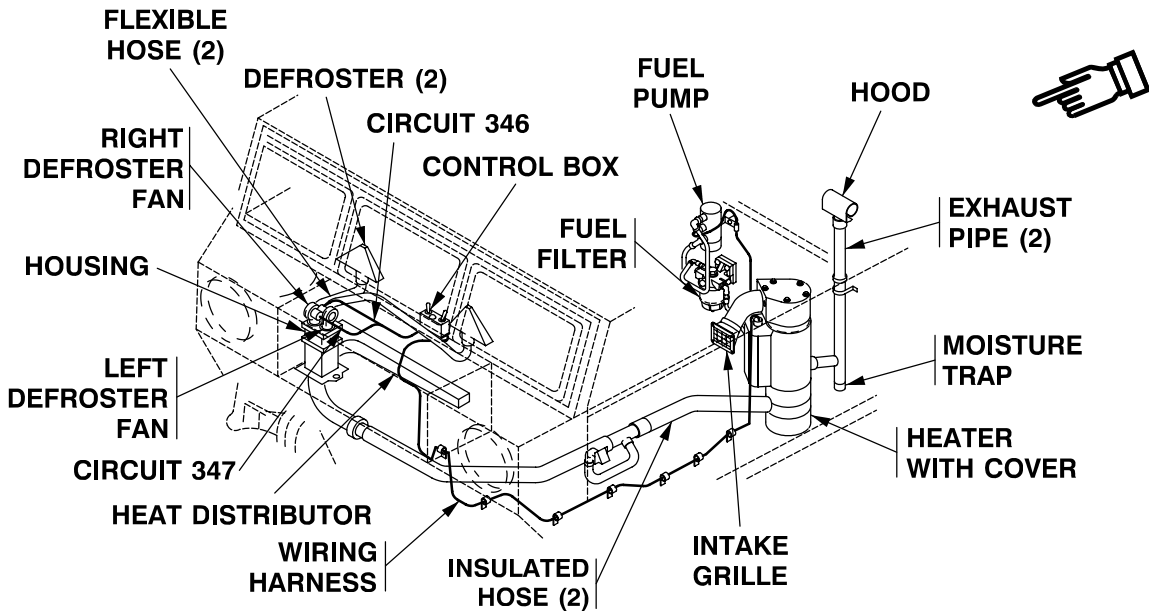
Materials/Parts

- Adhesive (RTV) (WP 0080 00, Item 4)
 - Antiseize compound (WP 0080 00, Item 6)
 - Sealing compound (WP 0080 00, Item 32)
 - Unreduced spar varnish (WP 0080 00, Item 23)
 - Heater kit II
 - Heater kit III P/N 12269525
-

INSTALLATION



LOCATOR DIAGRAM — HEATER KIT II

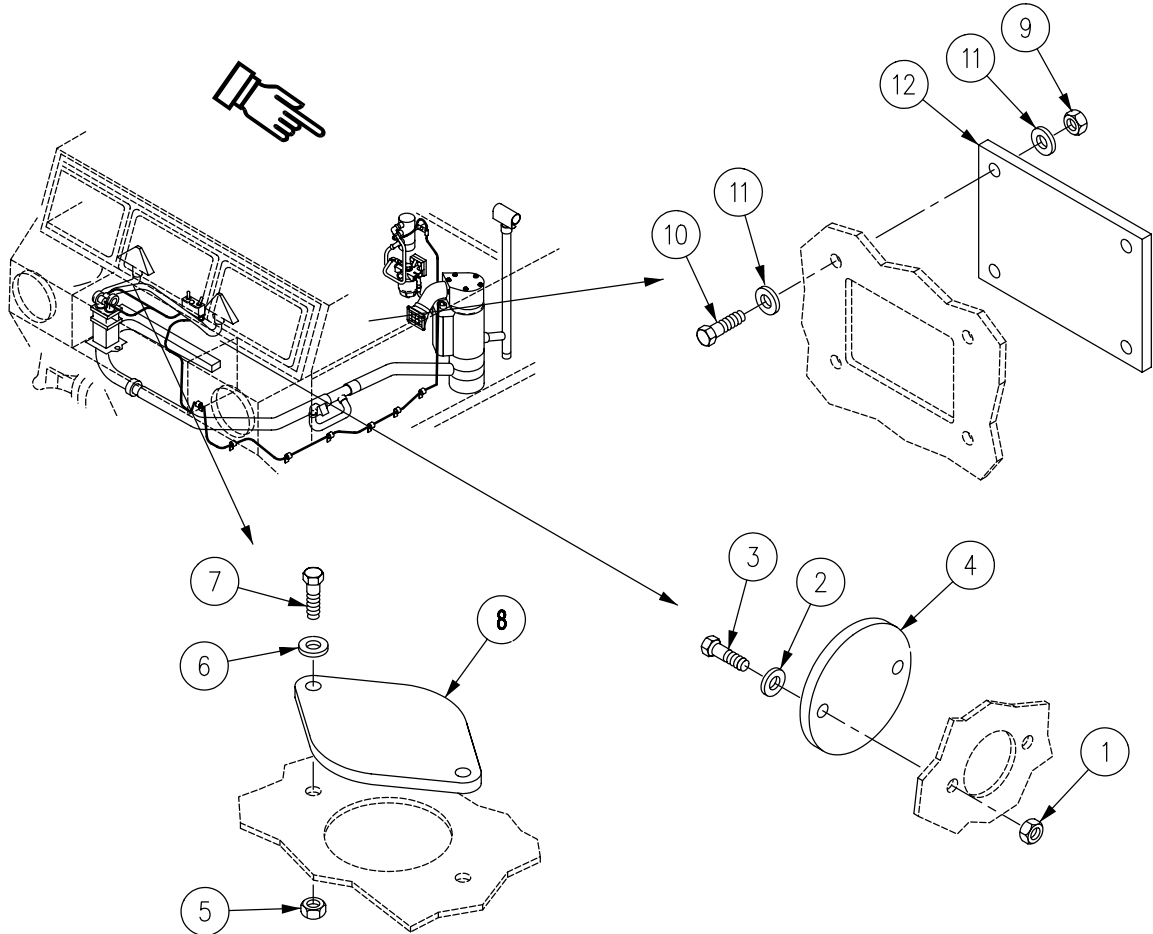


LOCATOR DIAGRAM — HEATER KIT III

NOTE

Dispose of discarded parts in accordance with current directives.

1. Remove two nuts (1), washers (2), and screws (3) from cover plate (4) and hull. Discard plate and nuts.
2. Remove two nuts (5), washers (6), and screws (7) from cover (8) at driver's foot well. Discard cover.
3. Remove four nuts (9), screws (10), and eight washers (11) from cover (12) behind driver's seat. Discard cover.



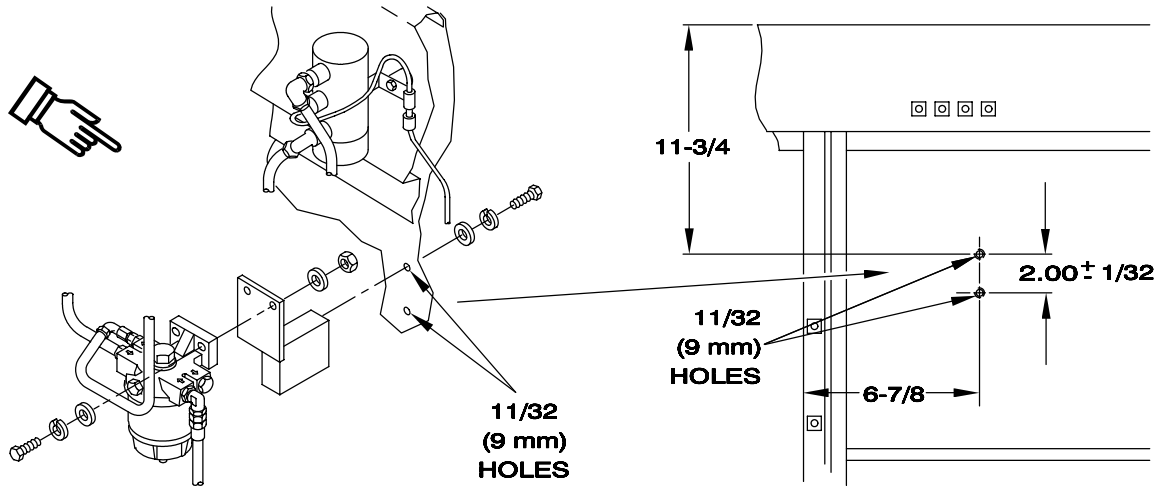
NOTE

Perform Step 4 if your vehicle does not have holes for mounting the fuel filter bracket.

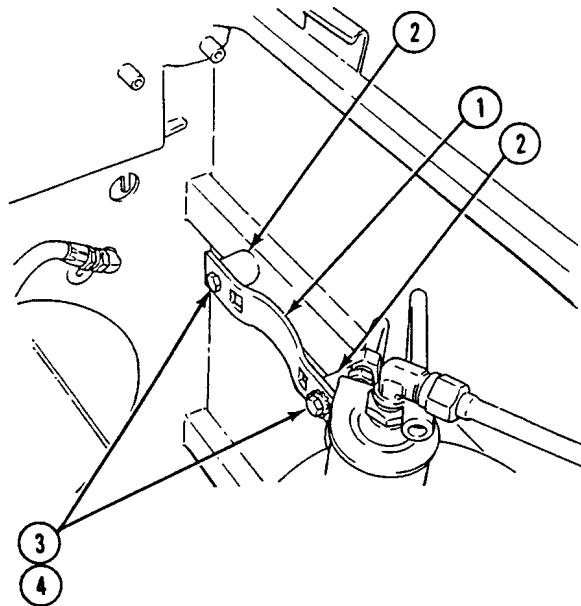
NOTE

Before drilling mounting holes, check layouts to assure centerlines are within 1/32 inch (1mm) tolerance of dimensions specified on illustration. Use bracket as template after locating hole pattern.

4. Locate and drill two 11/32 inch (9 mm) holes in rear bulkhead. Use bracket (12474772) as a template. Use drill and drill set. See illustration below for reference.



5. Install three brackets (1) on six hull mounting bosses (2) with five washers (3) and six screws (4). Omit washers on upper front screw at this time.



NOTE

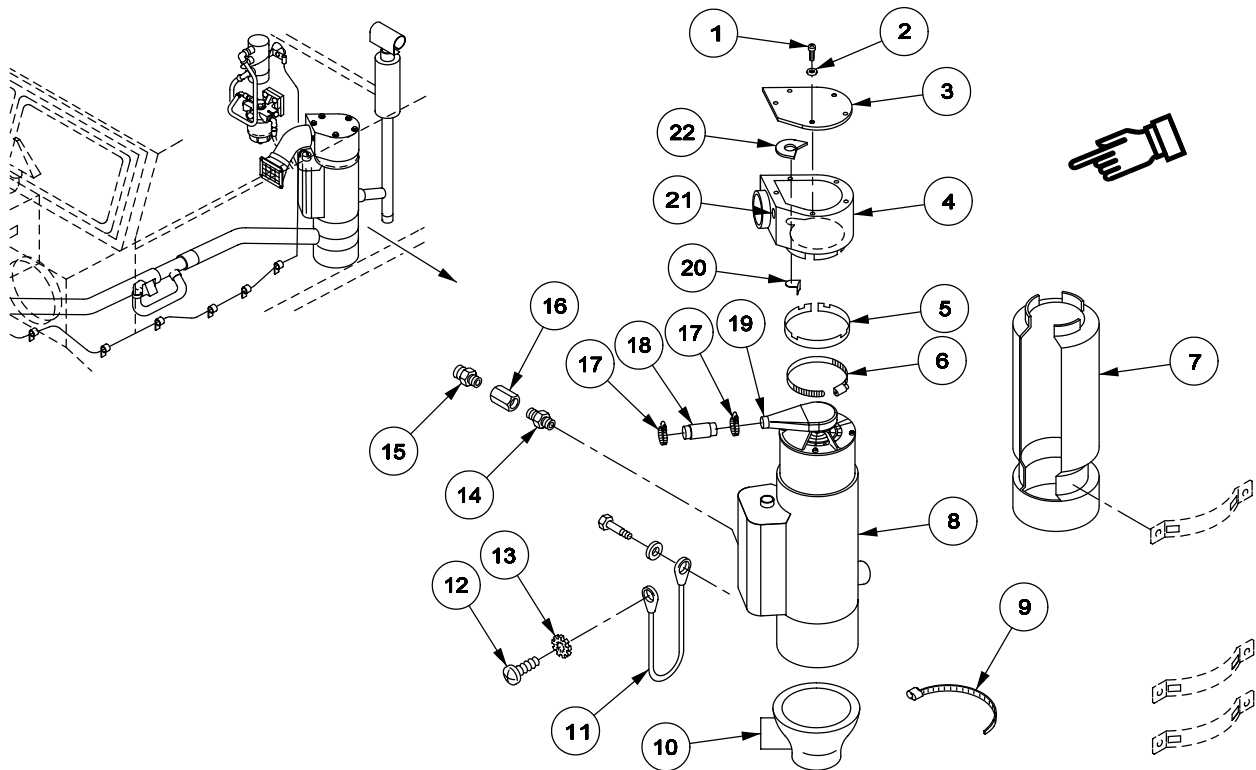
Apply sealing compound to tapered pipe threads, and antiseize compound to straight thread fittings.

6. Remove one screw (12) from base of heater assembly (8). Connect ground strap (11) to heater assembly (8) and install washer (13) and screw (12) on base of heater.
7. Install insulated heater cover (7) on heater assembly (8).
8. Install nipple (14), coupling (16), and nipple (15) in heater fuel inlet.
9. Install base assembly (10) on heater assembly (8) with attached duct clamp (9) on heater assembly (8).
10. Remove five screws (1), lockwashers (2), and plenum cover (3) from plenum body (4).

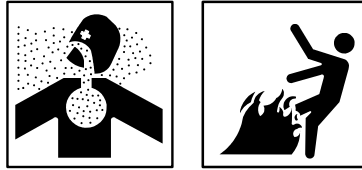
NOTE

The plug is only used in the plenum body to seal off the opening if a Model A-20 heater is being used.

11. Install the plenum body (4) and seal (5) on top of the heater (8). Secure plenum body (4) to heater (8) with clamp (6).
12. Install two clamps (17) and hose (18) on the air intake (19) of the heater (8) and inlet tube (21) in the plenum body (4). Tighten clamps.



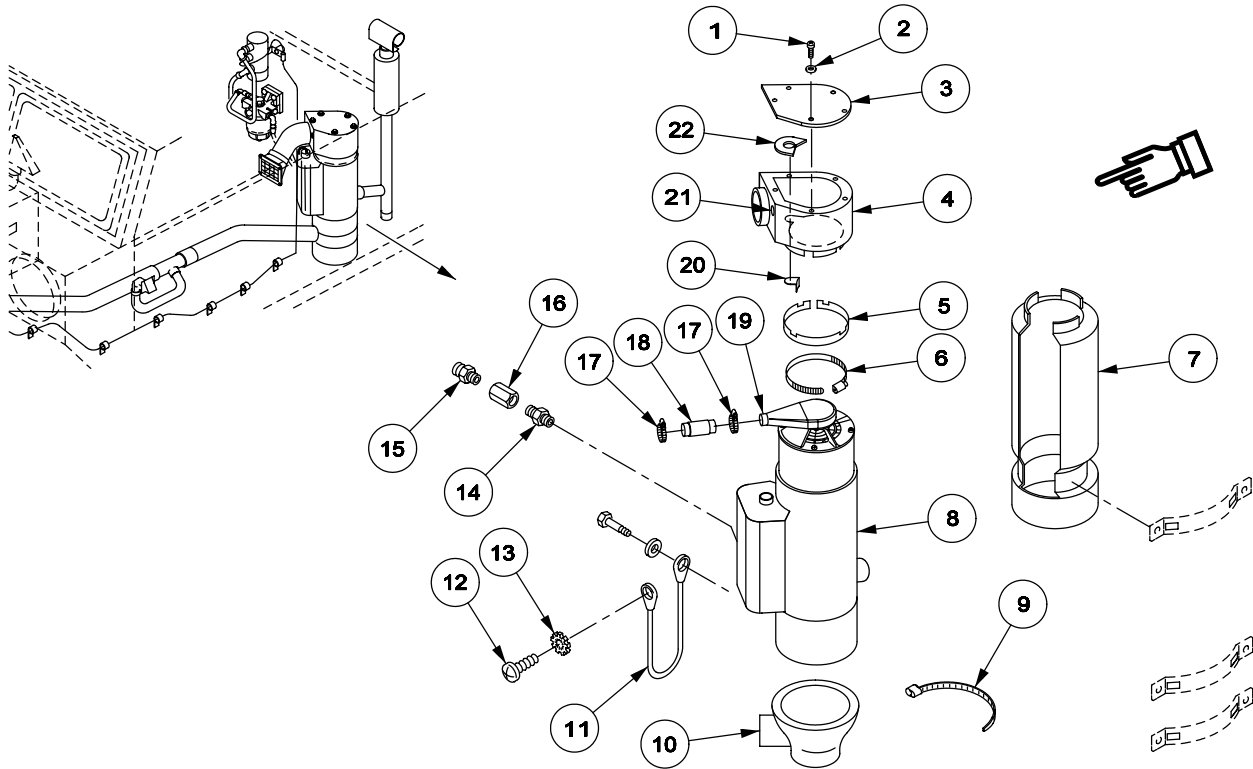
WARNING



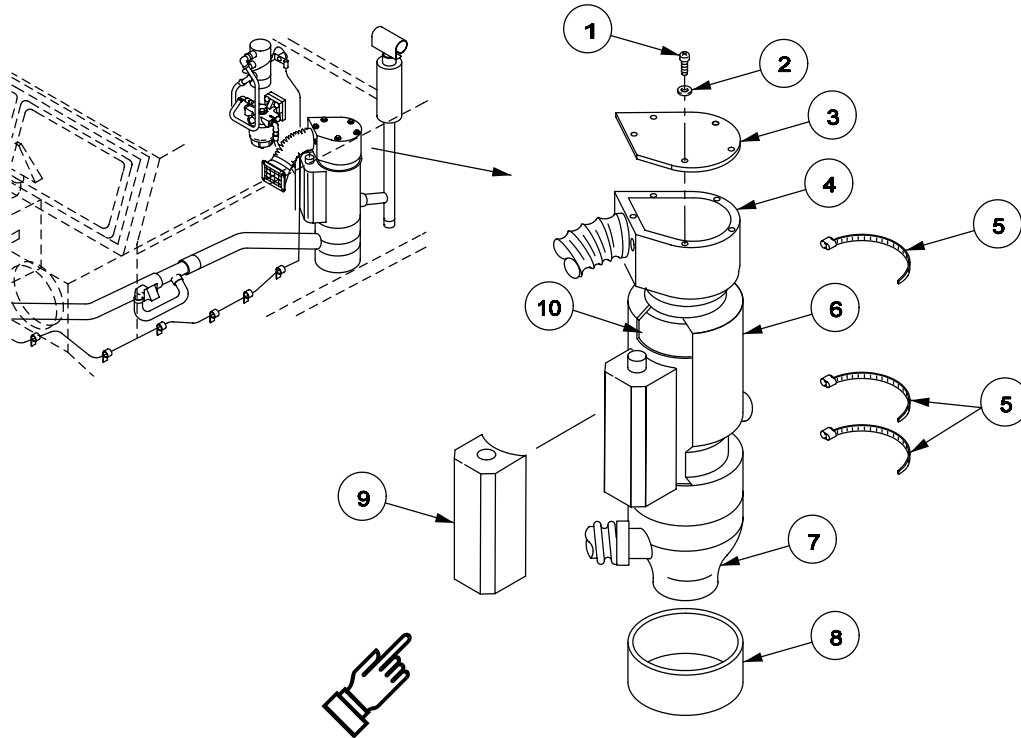
Adhesive, primer, sealant compounds, and isopropyl alcohol are toxic and flammable. These compounds are toxic to eyes, skin, and respiratory tract. Continued exposure can make you dizzy and irritate your eyes and throat.

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. Install plug (20) into plenum body (4). Place adhesive on the gasket (22) and place gasket on the inside bottom of the plenum body (4) to seal off the opening.



14. Install duct clamps (5) and secure the plenum body (4) and insulated heater cover (6) to the heater (10).
15. Install plenum cover (3) with five screws (1) and lockwashers (2) to the plenum body (4).
16. Position insulated base assembly cover (8) on sponson.
17. Install heater assembly (10), cover (6), base assembly (7), insulated control covers (9), with three clamps (5) on carrier.



18. Install lower exhaust pipe (4) and clamp (26) on heater assembly (1).
19. Install lower exhaust pipe (4), pipe straps (24), spacer washers (3) as required (10 supplied), and two screws (2) on hull.

NOTE

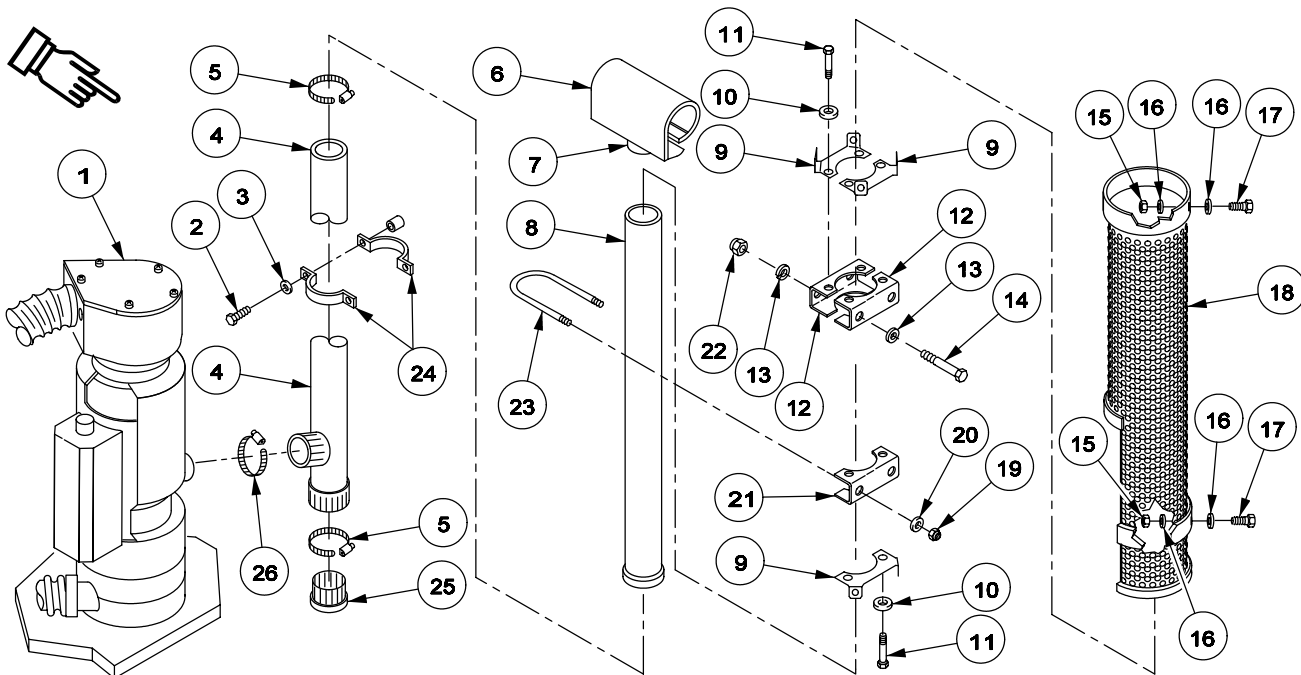
Be sure to install bracket clamp (21) and bracket clamp (12) so that guard brackets are attached above top clamp and below bottom clamp. Bracket clamp screws (14) should show through holes in exhaust guard.

20. Install U-bolt (23) and bracket clamp (21) with two new locknuts (19) and washers (20) to upper exhaust pipe (8) just above 5-1/2 inch (13.97 cm) mark.
21. Assemble two bracket clamps (12) with two cap screws (14), new locknuts (22), and four washers (13) to upper exhaust pipe (8) just above 25 inch (63.5 cm) mark.
22. Install three guard brackets (9) with six screws (11) and washers (10). Do not tighten screws.
23. Slide exhaust guard (18) onto exhaust pipe (8) from bottom of exhaust pipe.
24. Install six screws (17), 12 washers (16), and six new locknuts (15).
25. Secure upper exhaust pipe (8) with clamp (5).

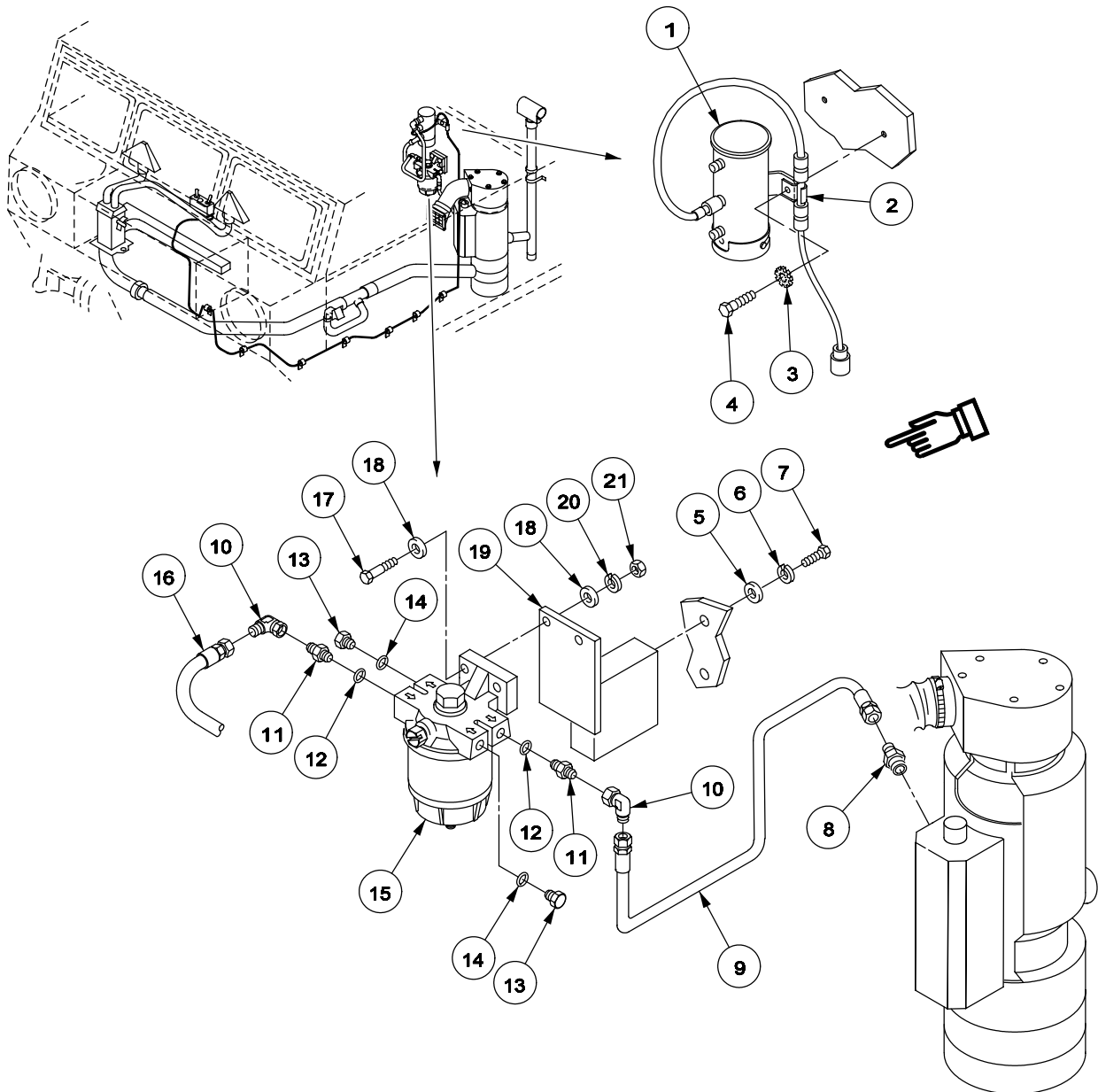
CAUTION

Do not allow exhaust to blow on canvas as fire could result.

26. Position hood (6) on upper exhaust pipe (8), with wide area forward and tighten nut (7).
27. Install moisture trap adapter (25), and upper exhaust pipe (8) with guard, on lower exhaust pipe (4) with two pipe clamps (5).



28. Install fuel pump (1) on rear power plant compartment bulkhead. Install pump with attached capacitor (2) to bulkhead with two washers (3) and screws (4).
29. Install bracket (19), two flat washers (5), lockwashers (6), screws (7) on bulkhead.
30. Install two packings (14) and plugs (13) on fuel filter (15).
31. Install two packings (12), adapters (11), and elbows (10), on fuel filter (15).
32. Install fuel filter (15), flat washers (18), lockwashers (20), screws (17), and two nuts (21) on bracket.
33. Install hose (16) on elbow (10) and hose (9) on other elbow (10) and nipple (8).



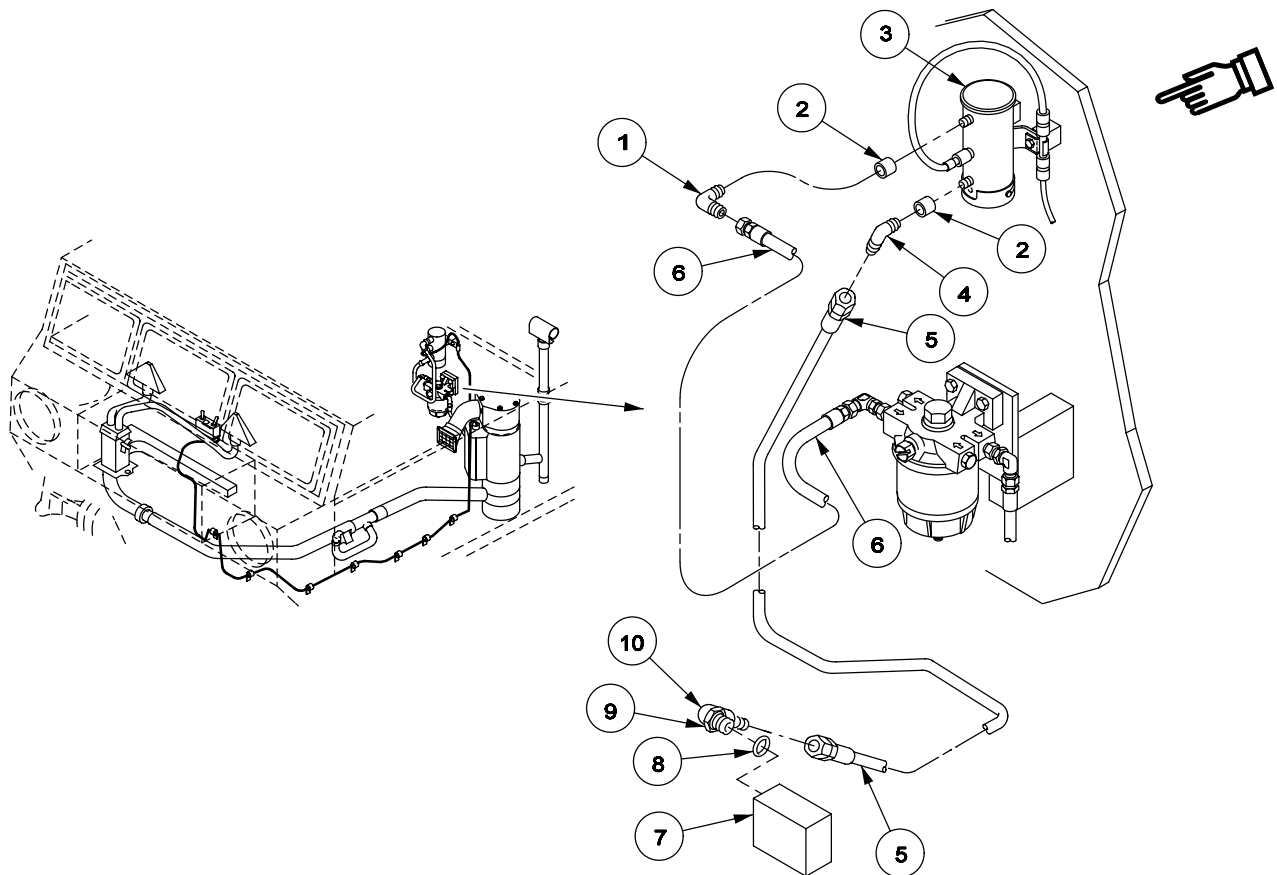
34. Install two couplings (2) on fuel pump (3).
35. Install elbow (1) and elbow (4) on two couplings (2).

WARNING



Diesel fuel can catch fire and seriously injure or kill soldiers and damage or destroy vehicles. Wipe up fuel spills immediately. Do not smoke near fuel or when working on the fuel system.

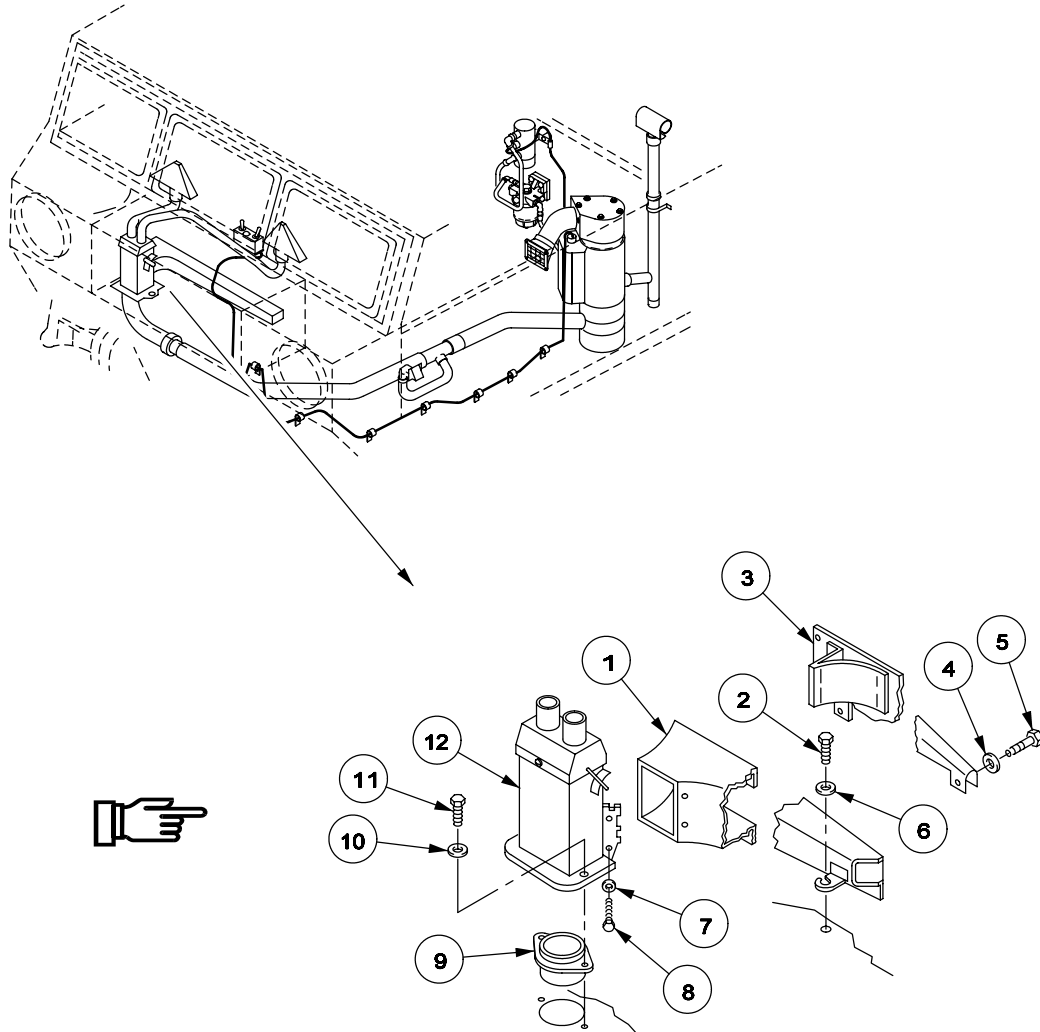
36. Remove and discard one existing plug and packing from heater fuel manifold (7) on left sponson. Catch any runoff fuel in a suitable container.
37. Install nut (9) and packing (8) on elbow (10) and heater fuel manifold (7).
38. Connect inlet fuel hose assembly (5) to elbow (10) and elbow (4).
39. Connect outlet fuel hose assembly (6) to elbow (1).



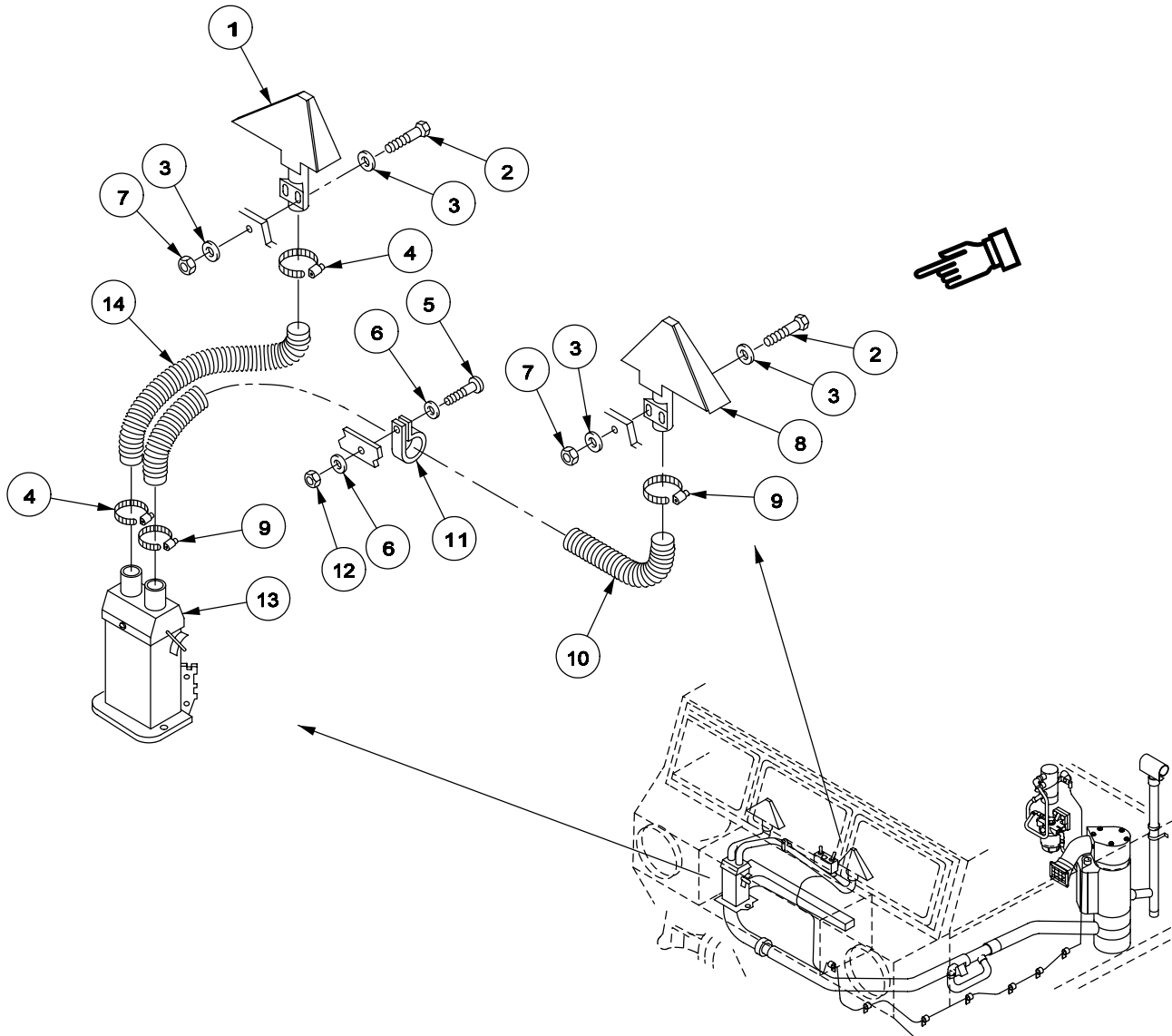
NOTE

Do Steps 40 - 46 for heater kit II only.

40. Install outlet hose adapter (9) on regulator assembly (12) with two cover plate washers (10) and screws (11) on cab floor.
41. Install heat distributor (1) on regulator assembly (12) with four washers (7) and screws (8). Install heat distributor and regulator on cab floor with three washers (6) and screws (2).
42. Install distributor cover (3), 11 washers (4), and screws (5) on heat distributor (1).



43. Install right defroster (1), left defroster (8), four screws (2), eight washers (3), and four nuts (7) on cab cowling.
44. Install 16 inch (41 cm) right defroster hose (14) with two clamps (4) on regulator cover (13) and right defroster (1).
45. Install 50 inch (127 cm) left defroster hose (10) and two clamps (9) on regulator cover (13) and left defroster (8).
46. Install left defroster hose (10), clamp (11), screw (5), two washers (6), and nut (12) on cowling. Go to Step 56.



NOTE

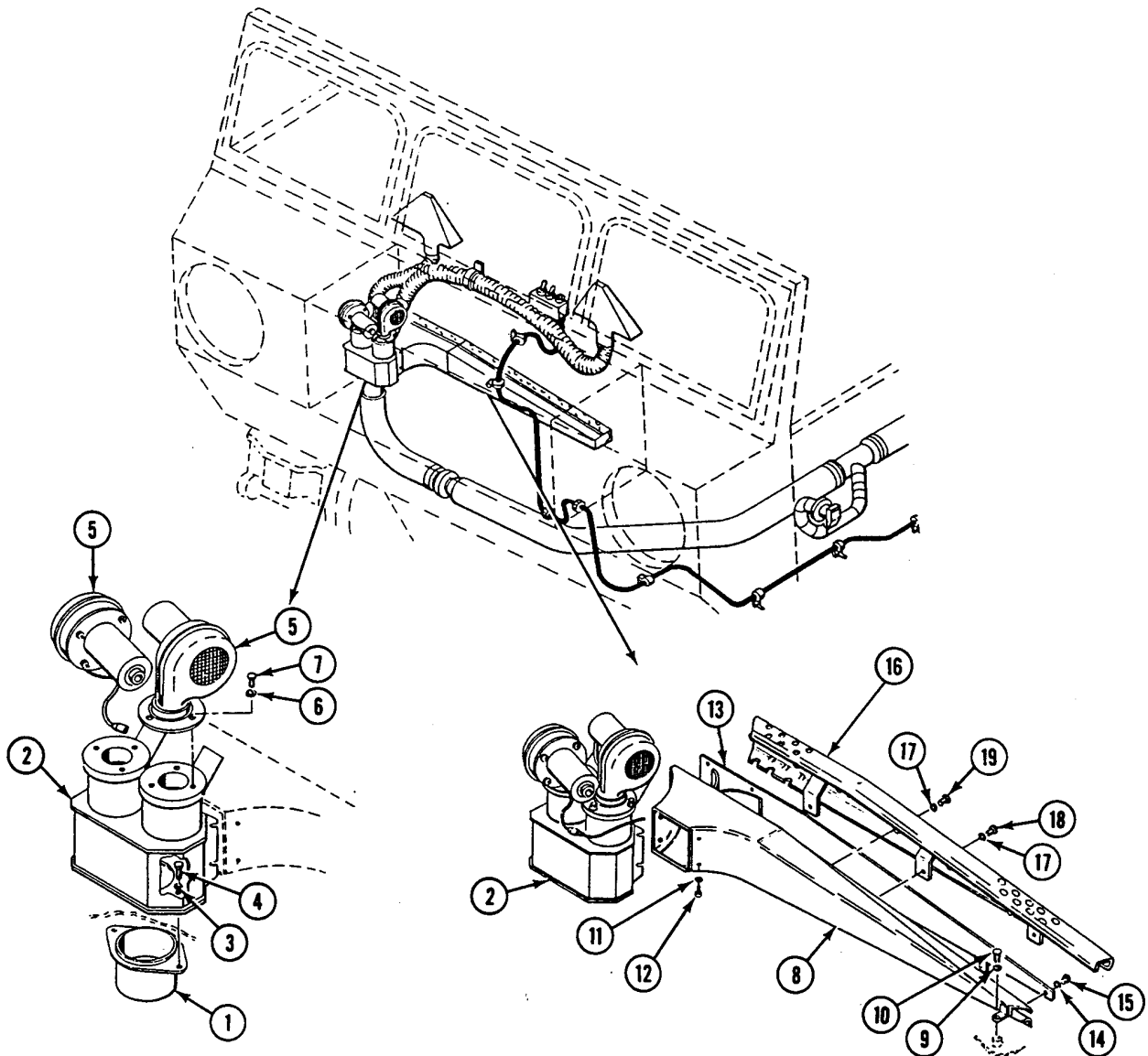
Do Steps 47 - 55 for heater kit III only.

47. Install outlet hose adapter (1), air flow housing (2), two cover plate washers (3), and screws (4) on cab floor.

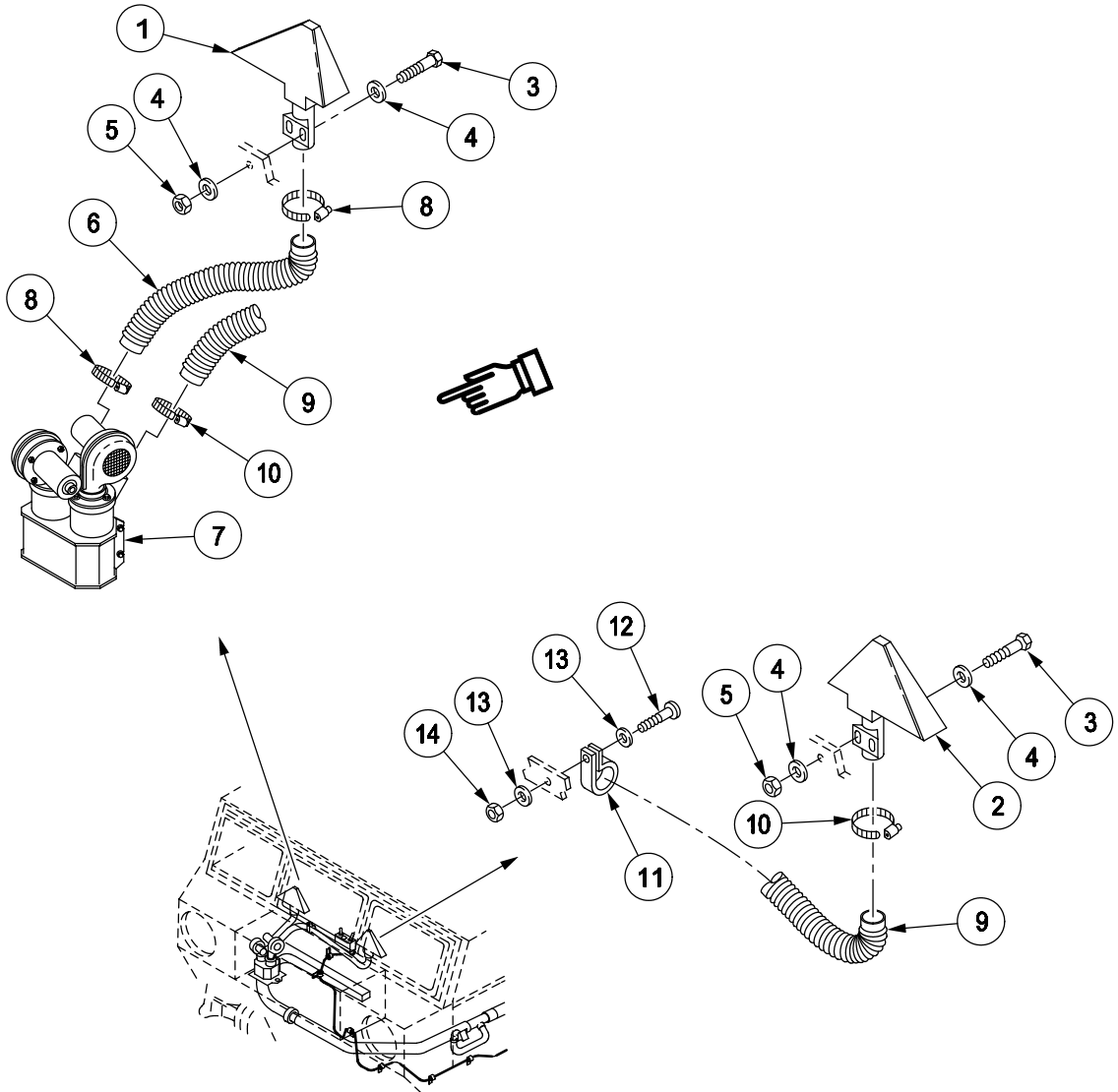
NOTE

When fans have external ground lead, secure ground lead with mounting screw. Place ground lead terminal under washer.

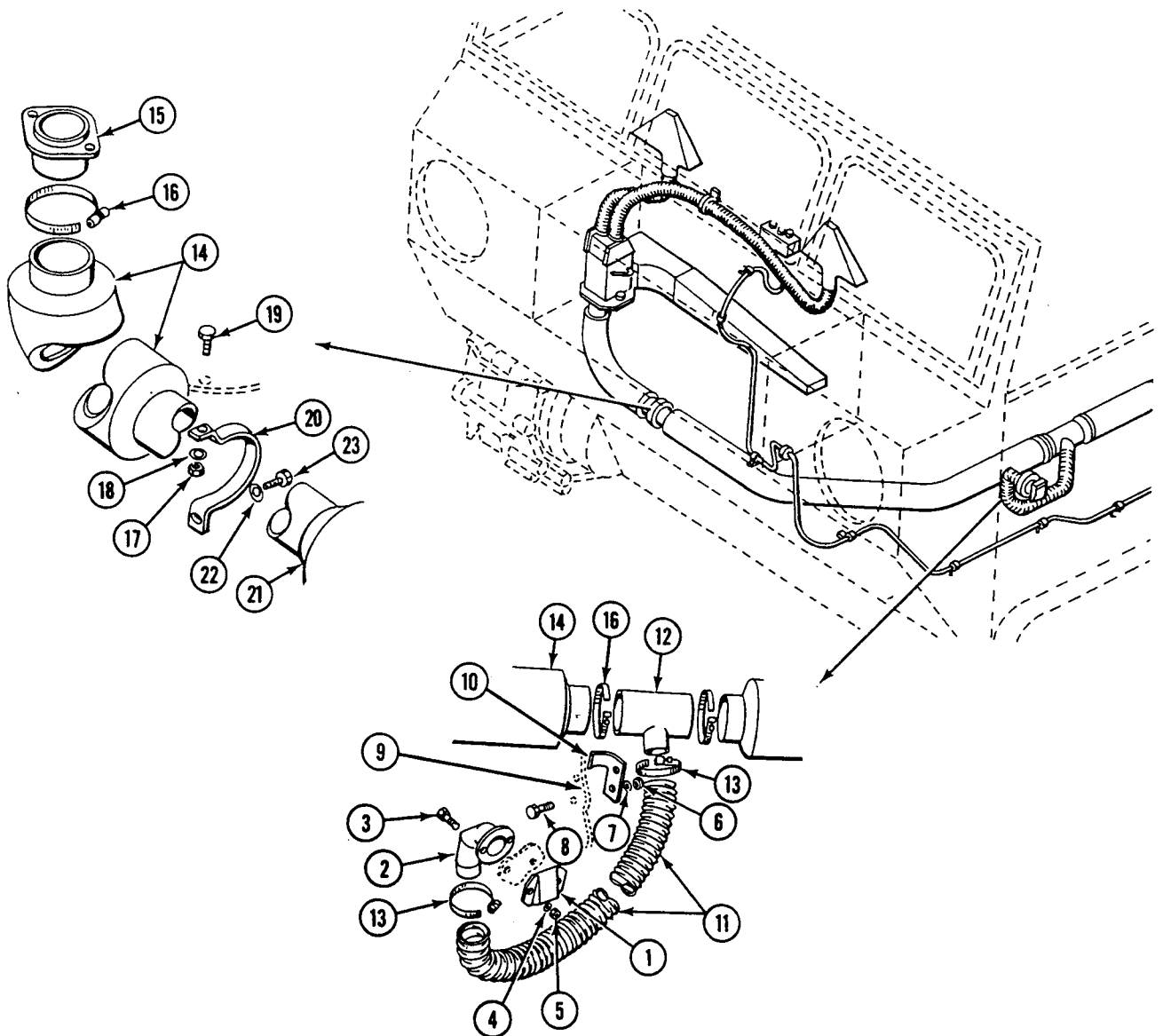
48. Install two defroster fans (5) on air flow housing (2) with six washers (6) and screws (7) on air flow housing.
49. Install heat distributor (8), four washers (9) and screws (10), air flow housing (2), three washers (11), and screws (12) on cab floor.
50. Install heat distributor cover (13) on heat distributor (8) with washer (14) and screw (15).
51. Install screen (16) on heat distributor cover (13) with 10 washers (17), three screws (18), and seven screws (19).



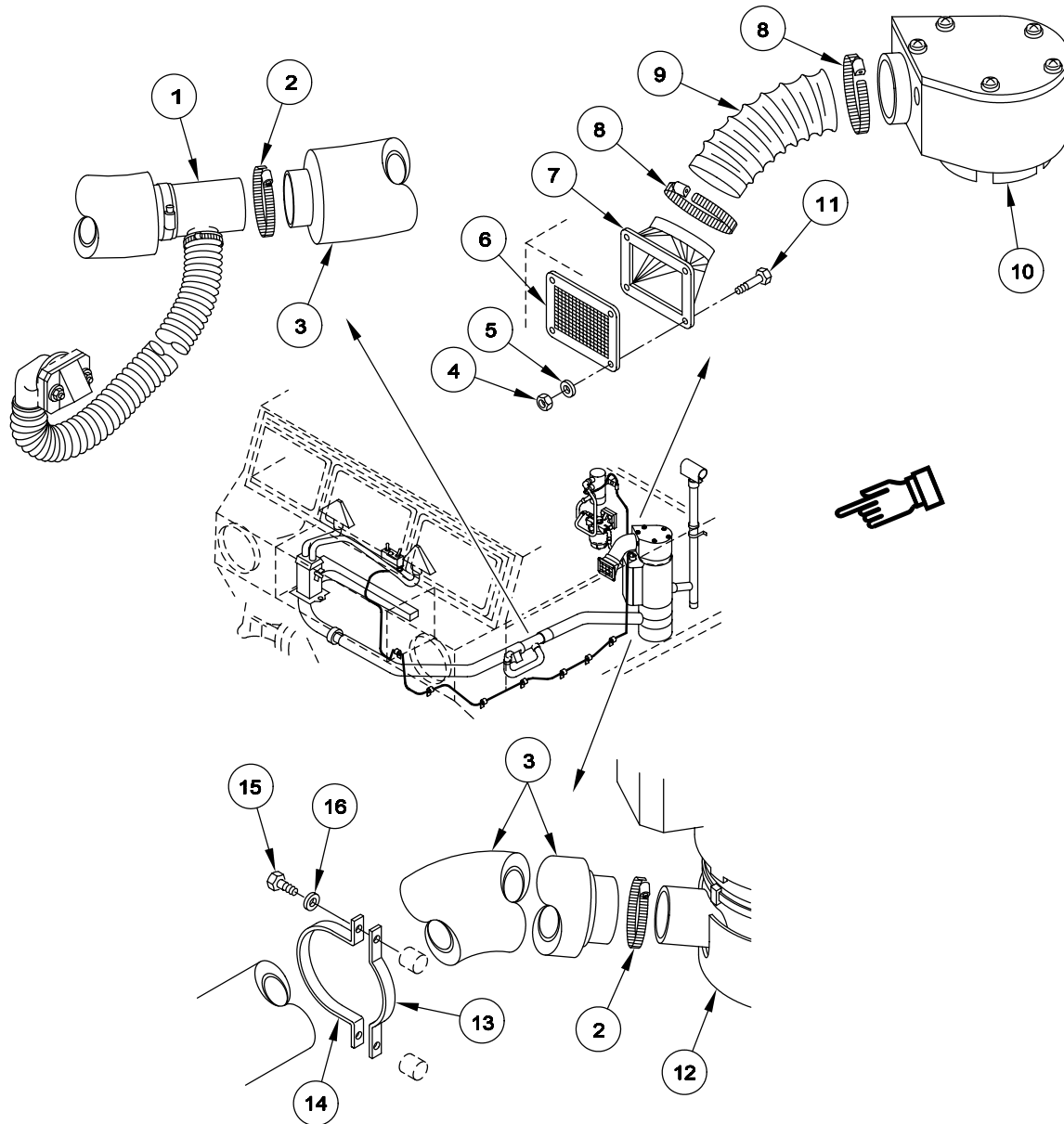
52. Install right defroster (1) and left defroster (2) on cab cowling with four screws (3), eight washers (4), and four nuts (5).
53. Install 16 inch (41 cm) right defroster hose (6) and two clamps (8) on air flow housing (7) and right defroster (1).
54. Install 50 inch (127 cm) left defroster hose (9) and two clamps (10) on air flow housing (7) and left defroster (2).
55. Install clamp (11) on left defroster hose (9) with screw (12), two washers (13), and nut (14) on cowling.



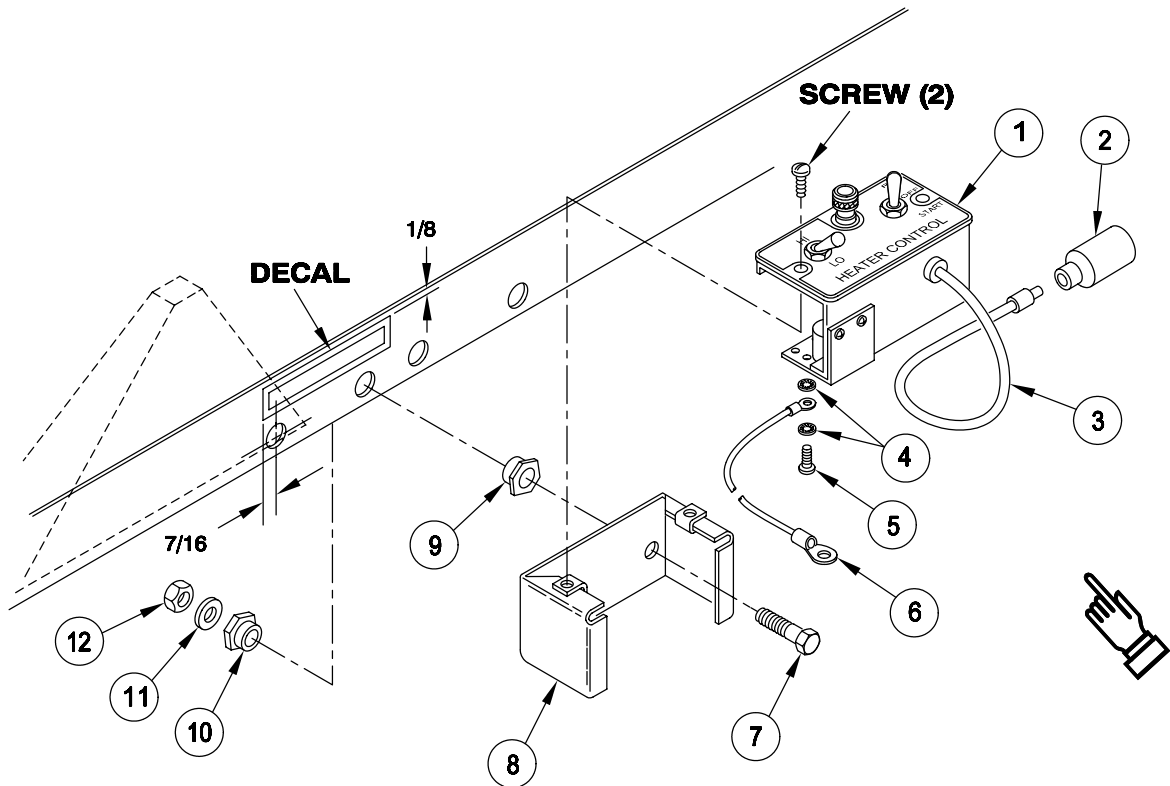
56. Install deflector (1) on elbow (2) with two screws (3), washers (4), and nuts (5) in carrier.
57. Remove two nuts (6), four washers (7), and two screws (8) from stoplight switch bracket (9). Discard screws. Remove stoplight switch (see your -20).
58. Install hose bracket (10) with two screws (8), four washers (7) and new nuts (6) on stoplight switch bracket (9). Install stoplight switch (see your -20).
59. Install front outlet hose (14) on adapter (15) with clamp (16). Install front outlet hose (14) on tee (12) with clamp (16) placed on hose bracket (10) projection to support tee and hose.
60. Remove nut (17), two washers (18), and screw (19) from front end of cab center floor brace.
61. Install clamp (20) on outlet hose (21) with washer (22), screw (23), screw (19), two washers (18), and nut (17).



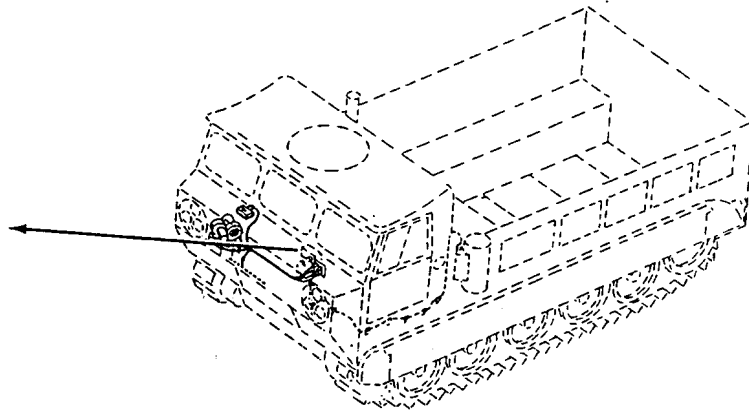
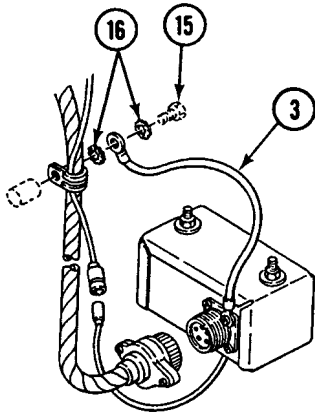
62. Install rear outlet hose (3) on tee (1) and base assembly (12) with two clamps (2).
63. Install support (13) and strap (14) on rear outlet hose (3) and cab floor with two washers (16) and screws (15).
64. Install inlet grille (6) and hose adapter (7) on bulkhead behind driver's seat with four screws (11), eight washers (5), and four nuts (4).
65. Install 24 inch (61 cm) intake hose (9) on inlet elbow (10) and hose adapter (7) with two clamps (8).



66. Clean surface of cowl at location of heater control box and to right of pivot steer caution.
67. Install heater control box decal on cowl as shown.
68. Apply one coat of un-reduced spar varnish over heater control box decal. Extend coating a minimum of 1/4 inch (6.4 mm) beyond decal edges.
69. Remove control box panel (1) from control box case (8) (see your -20).
70. Remove two existing mounting screws and nuts supplied with control box case (8). Discard screws and nuts.
71. Discard existing screw and washer supplied with control box case (8). Install ground strap (6) with new screw (5) and two washers (4).
72. Install control box case (8) with two screws (7), rear resilient mounts (9), front resilient mounts (10), washers (11), and nuts (12) on cowl. Compress resilient mounts by tightening screws and nuts to produce a distance of 3/16 to 1/4 inch (4.8 to 6.4 mm) between cowl and control box case.
73. Install control box panel (1) on control box cover (8) (see your -20).



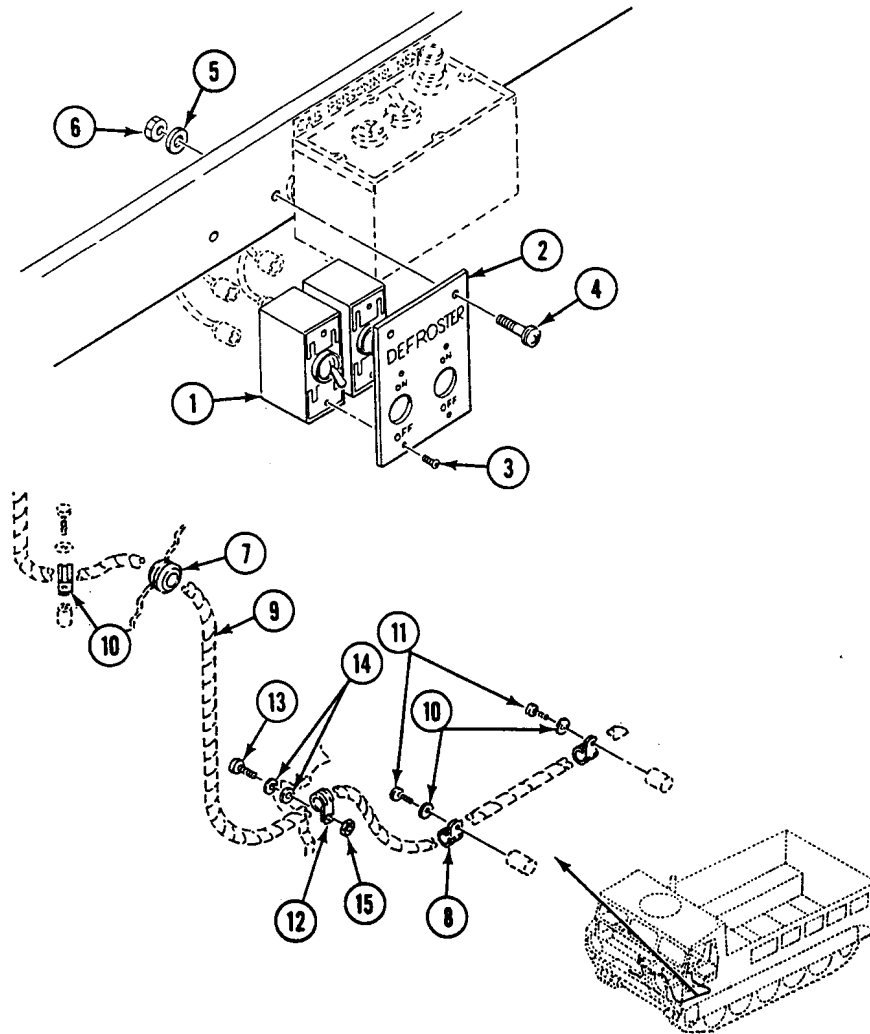
74. Install control box ground strap (3) to weld nut with existing screw (15) and two lock washers (16).



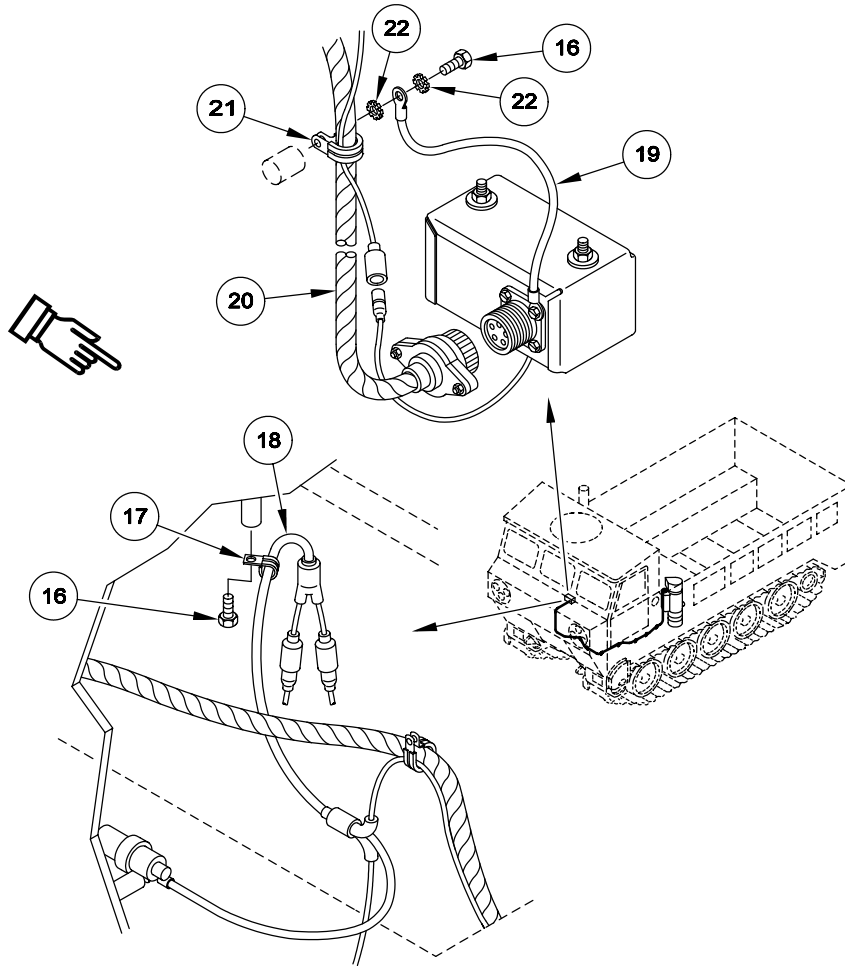
NOTE

Do Steps 75 - 76 for heater kit III only.

75. Install two switches (1) on plate (2) with four screws (3).
76. Install plate (2) with switches attached on cowl with two screws (4), washers (5), and nuts (6).
77. Install grommet (7) and eight clamps (8) on wiring harness (9).
78. Install grommet (7) on cab bulkhead.
79. □ Install five clamps (8) on weld nuts in power plant compartment with five washers (10) and screws (11).
80. Install clamp (12) on bracket at front of power plant compartment with screw (13), two washers (14), and locknut (15).
Install clamp (10) on weldnut in front cowling with existing hardware.

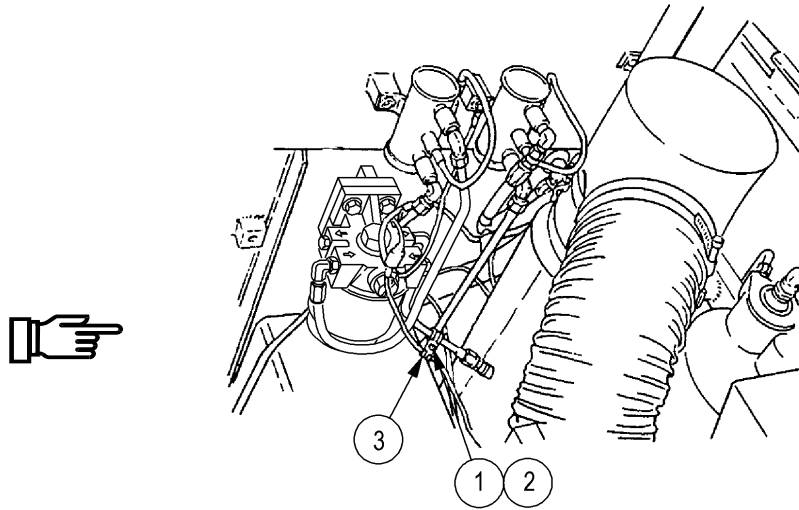


81. Remove screw (16) and clamp (17) from circuit 400 and 400A leads (18). Discard clamp.
82. Install ground strap (19), circuit 400 and 400A leads (18) and heater wiring harness (20) with new clamp (21), two lock washers (22) and screw (16).

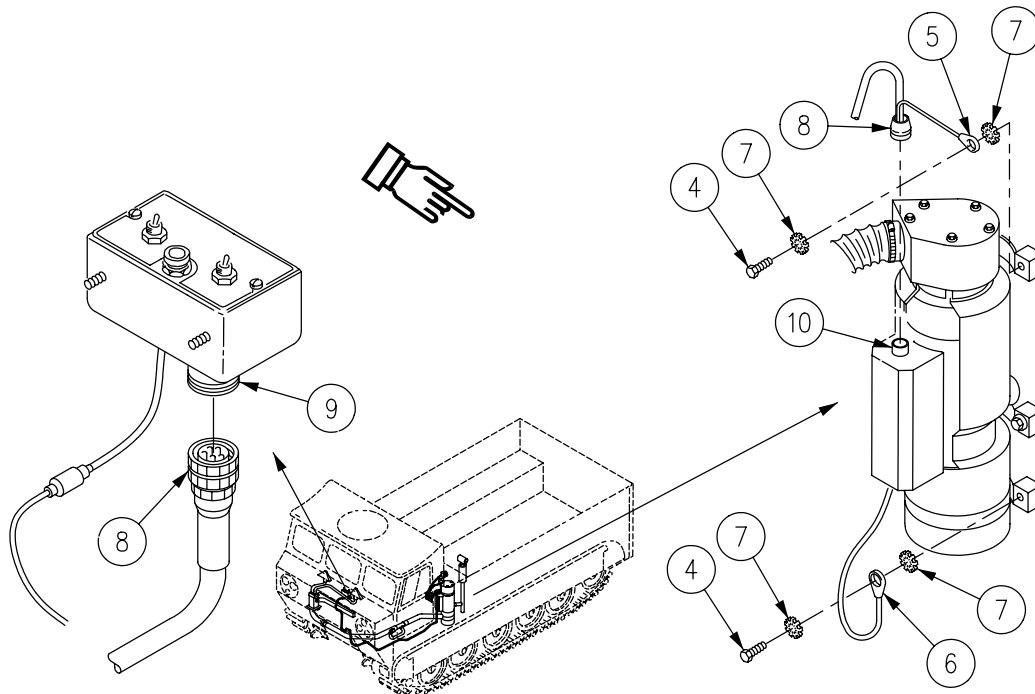


INSTALL VEHICLE COMPARTMENT HEATER KIT II OR III (M548A1) — Continued

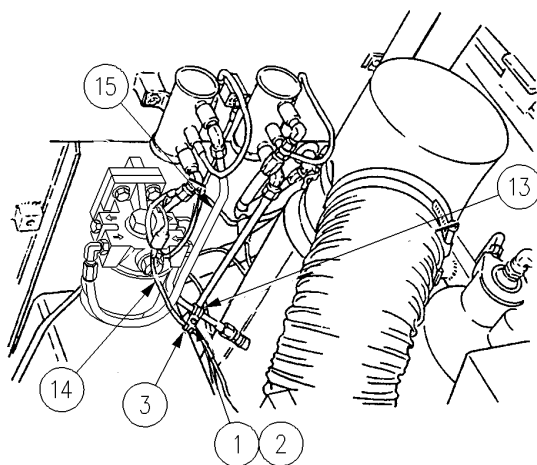
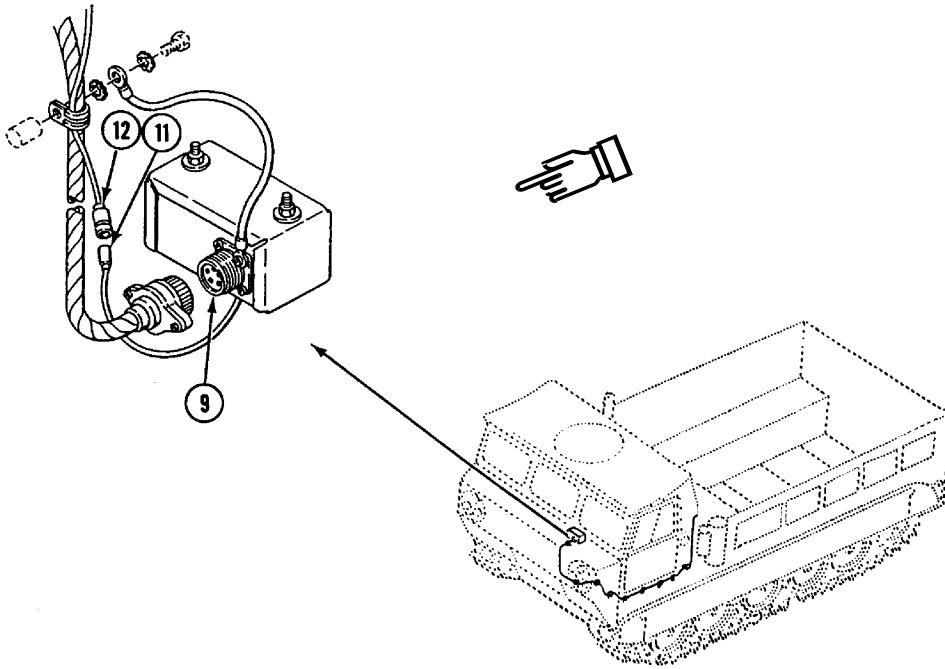
83. Remove rear tube tiedown screw (1) and washer (2) from fuel tube strap and sponson.
84. Install clamp (3) on strap and hull with washer (2) and screw (1).



85. Remove top and front heater bracket screws (4) and connect wiring harness ground lead (5) and heater ground strap (6) to upper and lower hull mounts with four washers (7) and two screws (4).
86. Connect two wiring harness connectors (8) to control box receptacle (9) and heater receptacle (10).



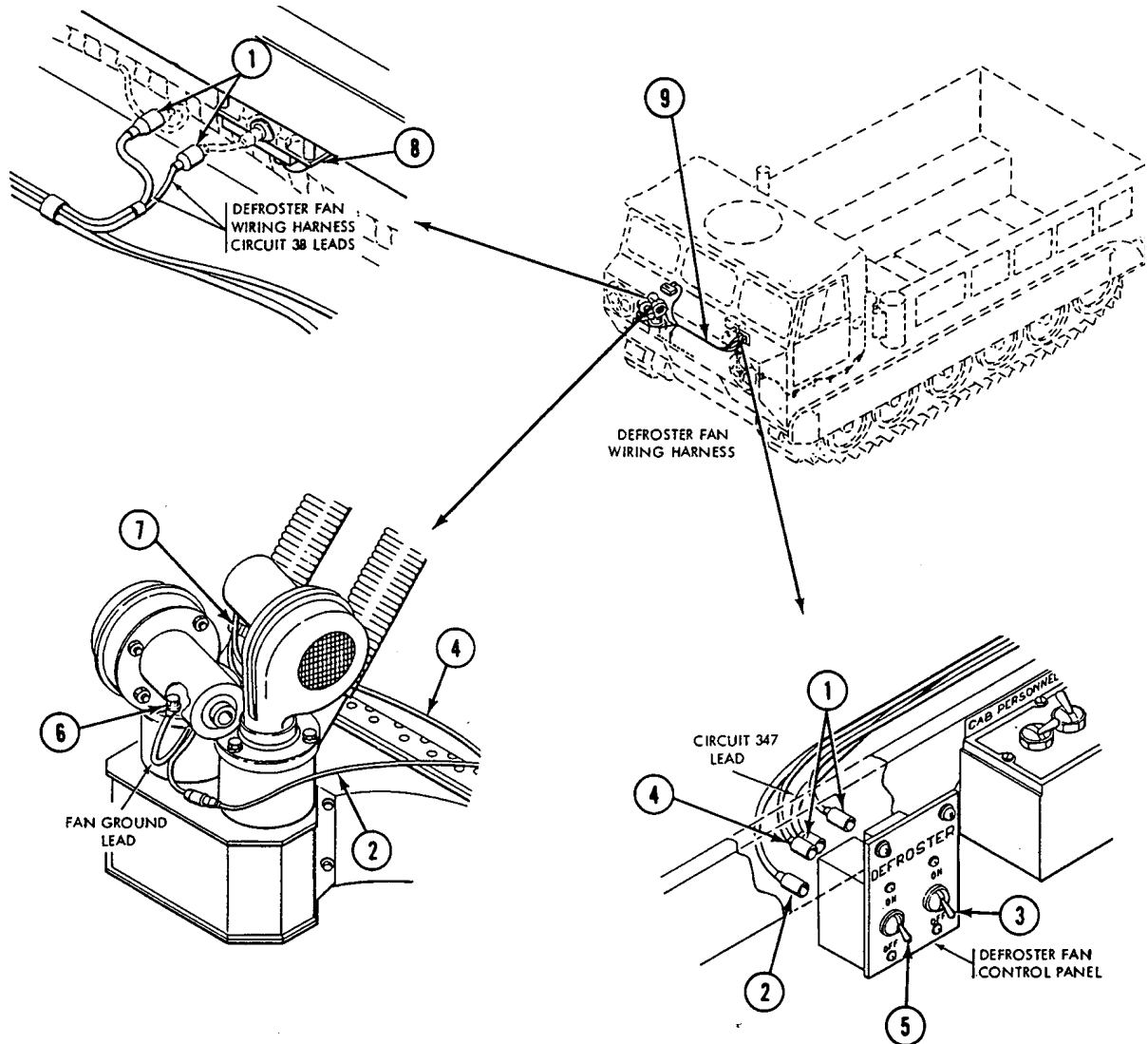
- 87. Connect fuel pump lead (12) to circuit 402 lead (11).
- 88. Install clamp (13) on circuit 402 lead (14) and clamp (3) on pump-to-filter hose (15) with screw (1) and nut (2).



NOTE

Do Steps 89 - 91 for heater kit III only.

89. Connect circuit 38 (1) and 346 (2) leads to right defroster fan switch (3), and circuit 38 and 347 (4) connectors to left defroster fan switch (5).
90. Connect circuit 346 (2) lead to right defroster fan connector (6), and circuit 347 connector (4) to left defroster fan connector (7).
91. Disconnect dome light lead (8) from carrier wiring harness circuit 38 (1), and connect defroster fan wiring harness circuit 38 to dome light lead (8) and carrier wiring harness circuit (9).



FOLLOW-THROUGH STEPS

1. Connect battery negative lead (see your -20).
2. Start heater (see your -10). Check for fuel or exhaust leaks and proper operation of heater, fuel pump, control box, and manifold or regulator. Turn heater off.
3. Close power plant upper rear access door (see your -10).
4. Install top left access grill (see your -10).
5. Install bulkhead protector, if material handling kit is installed (see your -20).

END OF TASK

**INSTALL VEHICLE COMPARTMENT CAB COVER/INSULATION KIT
(SECONDARY KIT)**

0057 00

THIS WORK PACKAGE COVERS:

Installation (page 0057 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Portable Electric Drill (WP 0078 00, Item 12)
 Twist Drill Set (WP 0078 00, Item 15)

Materials/Parts

Adhesive (WP 0080 00, Item 3)
 Cleaning compound (WP 0080 00, Item 49)
 M548A1 – Modification kit P/N 11616848
 M548A3 – Part of Winterization kit P/N 57K1410

Personnel Required

Track Vehicle Repairer 63H

References

See your -10
 See your -20

Equipment Condition

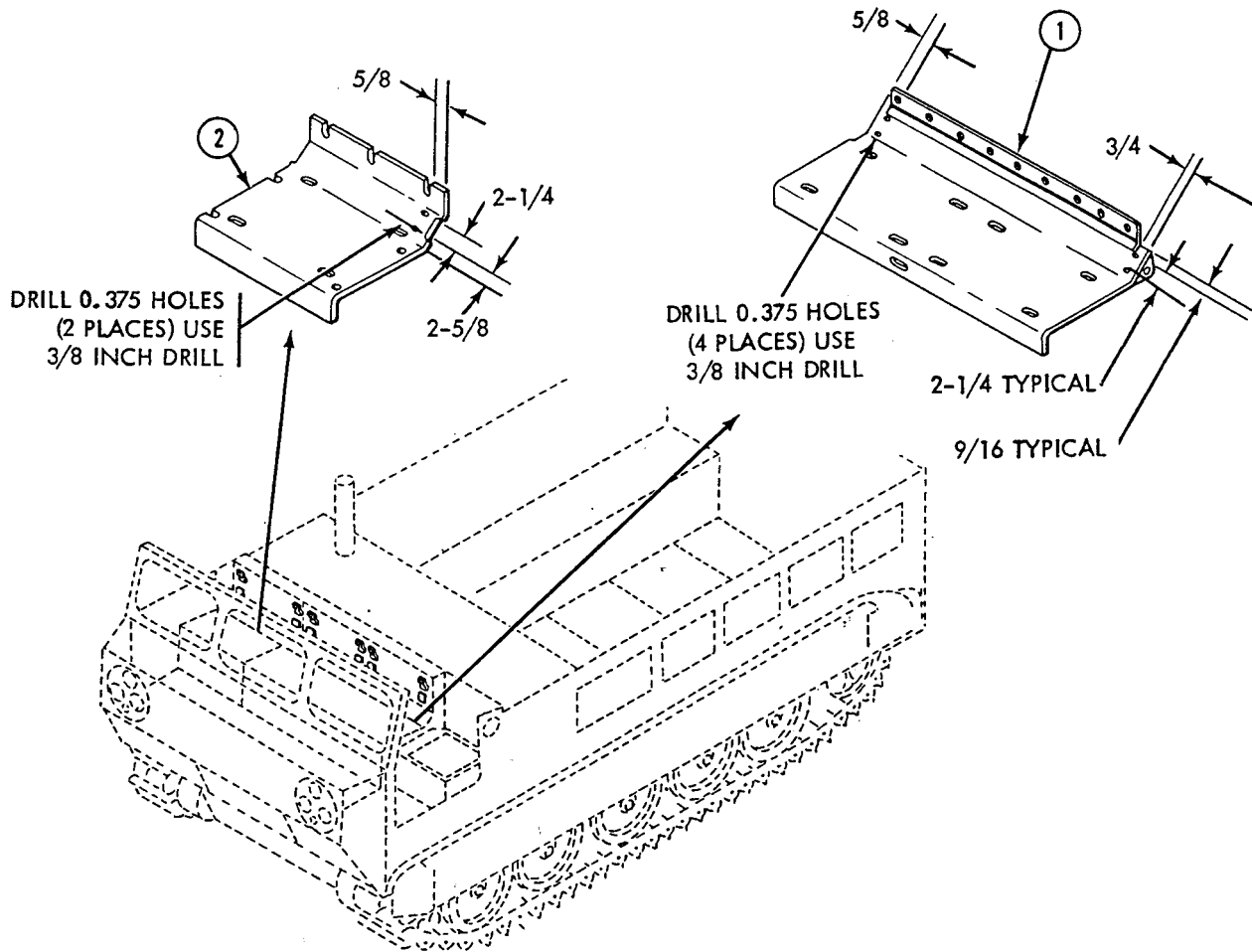
Engine stopped (see your -10)
 Carrier blocked (see your -10)
 Machine gun kit removed, if installed (see your -20)
 Cab cover and frame removed (see your -20)
 Top access cover and grilles removed (see your -10)
 Personnel seat and backrest cushions removed
 (see your -20)
 Right seat panel (M548A1) removed (see your -20)

INSTALL VEHICLE COMPARTMENT CAB COVER/INSULATION KIT (SECONDARY KIT) —
Continued

0057 00

INSTALLATION

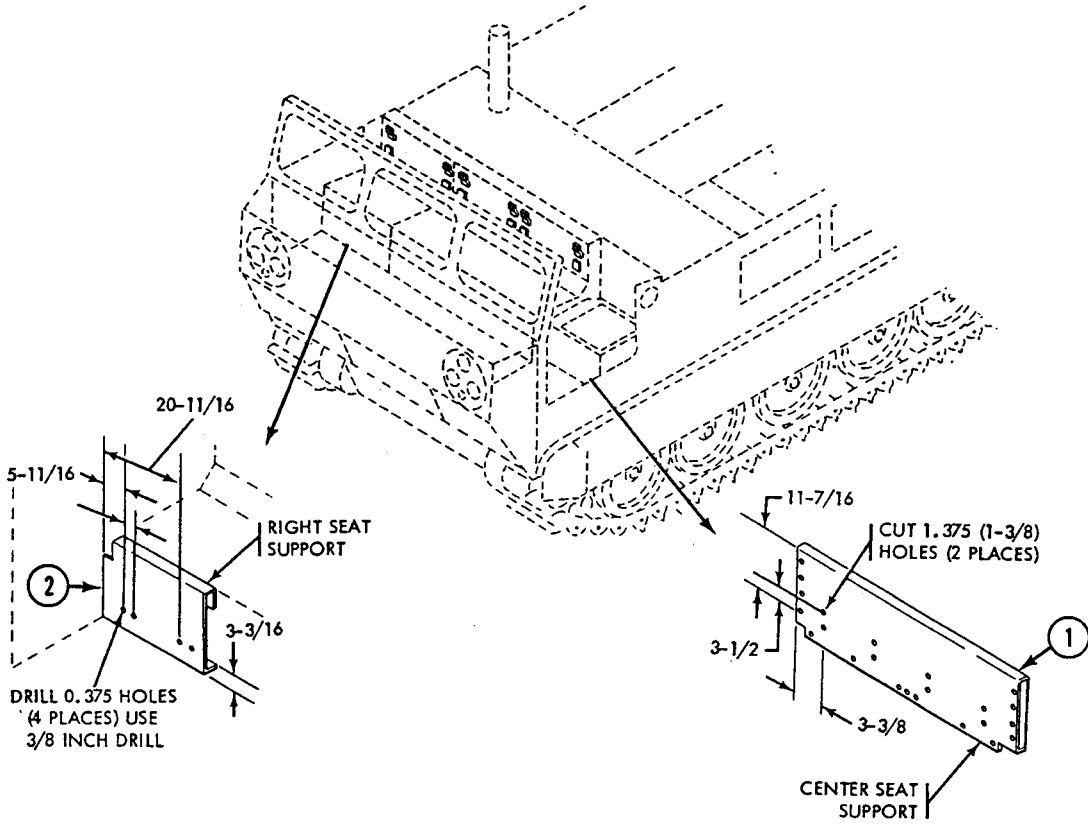
1. Drill four 3/8 inch (9.5 mm) diameter holes in center personnel seat panel (1).
2. Drill two 3/8 inch (9.5 mm) diameter holes in right seat panel (2).



INSTALL VEHICLE COMPARTMENT CAB COVER/INSULATION KIT (SECONDARY KIT) —
Continued

0057 00

3. Cut two 1-3/8 inch (3.5 cm) diameter holes in center personnel seat support plate (1).
4. Drill four 3/8 inch (9.5 mm) diameter holes in right personnel seat support plate (2).

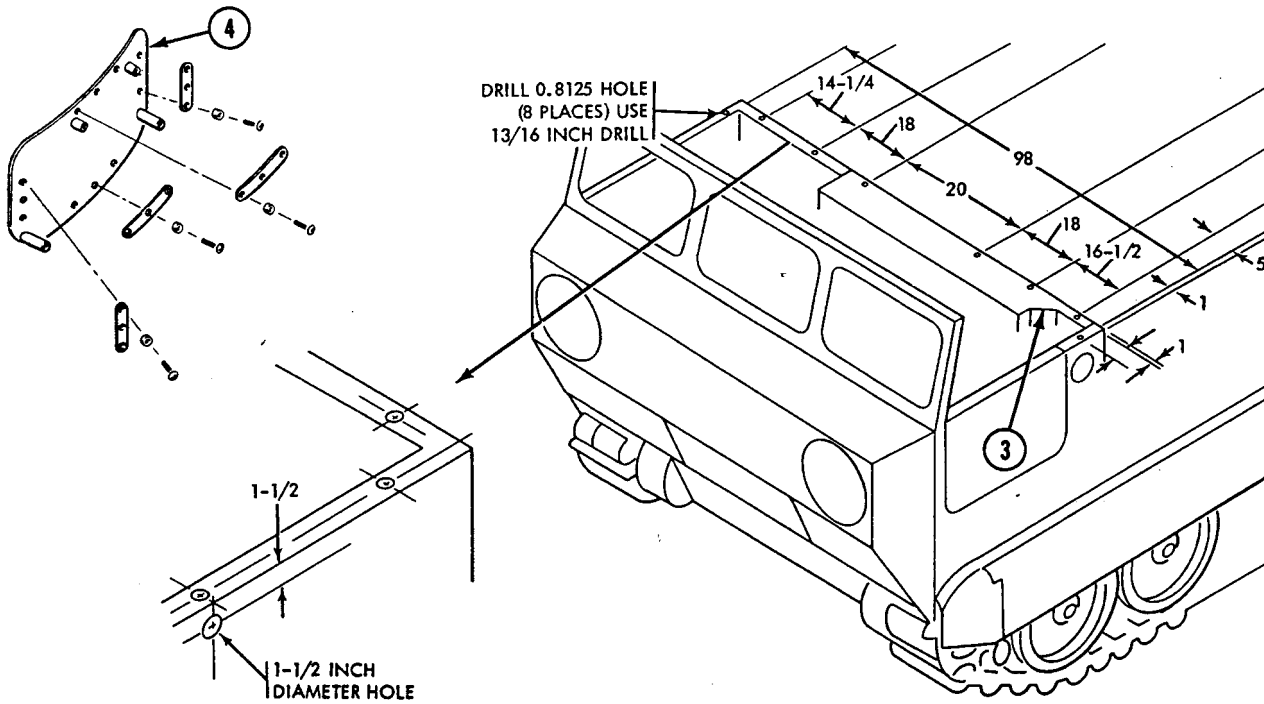


INSTALL VEHICLE COMPARTMENT CAB COVER/INSULATION KIT (SECONDARY KIT) —
Continued

0057 00

5. Drill eight 13/16 inch (20.6 mm) diameter holes in transverse beam (3) and right personnel seat backrest support (4).
6. Cut one 1-1/2 inch (3.8 cm) diameter hole in hull behind second hole (drilled in Step 5 above) from right side of carrier.

NOTE: ALL DIMENSIONS SHOWN ARE IN INCHES.

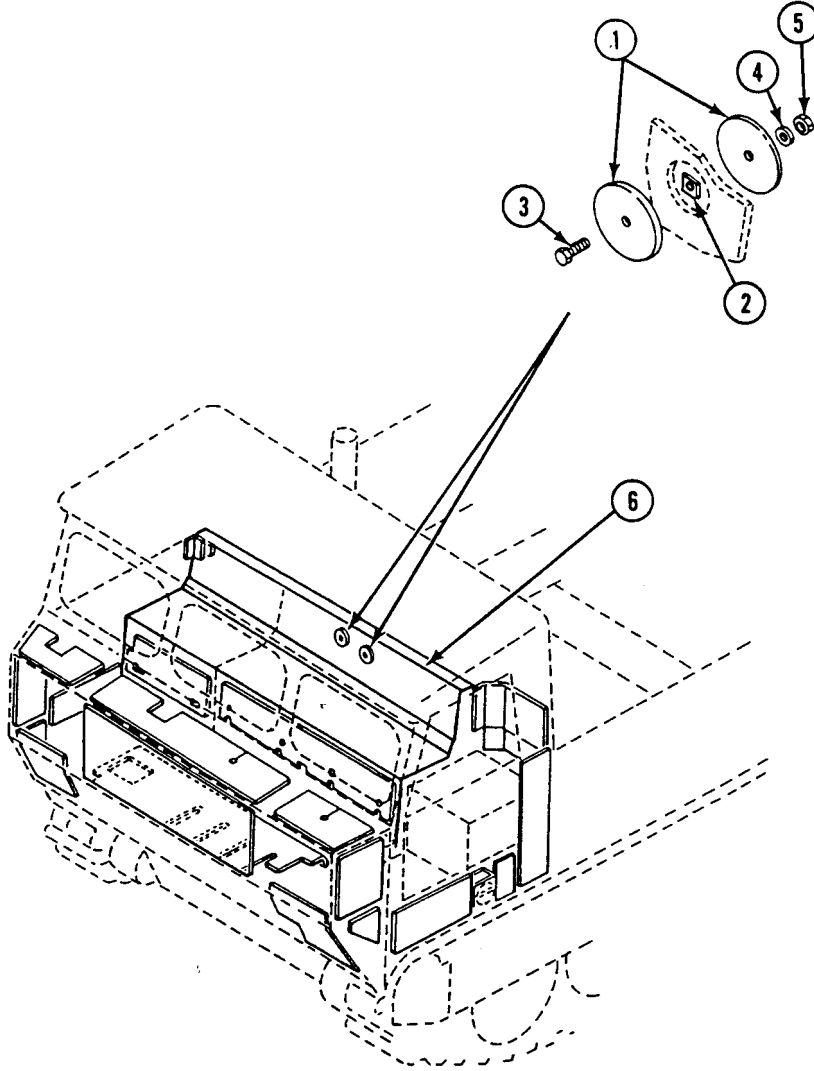


7. Install right seat panel (see your -20).
8. Install personnel seat and backrest cushions (see your -20).

INSTALL VEHICLE COMPARTMENT CAB COVER/INSULATION KIT (SECONDARY KIT) —
Continued

0057 00

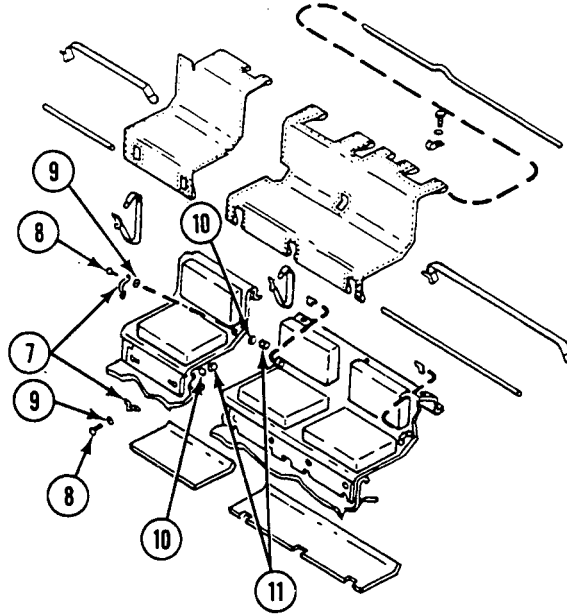
9. Install four cover plates, (1), two cover plate spacers (2), screws (3), flat washers (4), and nuts (5) on two openings in transverse beam (6).



INSTALL VEHICLE COMPARTMENT CAB COVER/INSULATION KIT (SECONDARY KIT) —
Continued

0057 00

10. Install two strap retaining loops (7), four loop retaining screws (8), upper washers (9), lower washers (10), and nuts (11) on center seat panel.
11. Install two strap retaining loops (7), four loop retaining screws (8), upper washers (9), lower washers (10), and nuts (11) on right seat panel.
12. Install two strap retaining loops (7), four loop retaining screws (8), upper washers (9), lower washers (10) and nuts (11) on right seat support plate.



13. Clean mounting surfaces for insulation with cleaning compound, and dry with clean cloth or compressed air.

NOTE

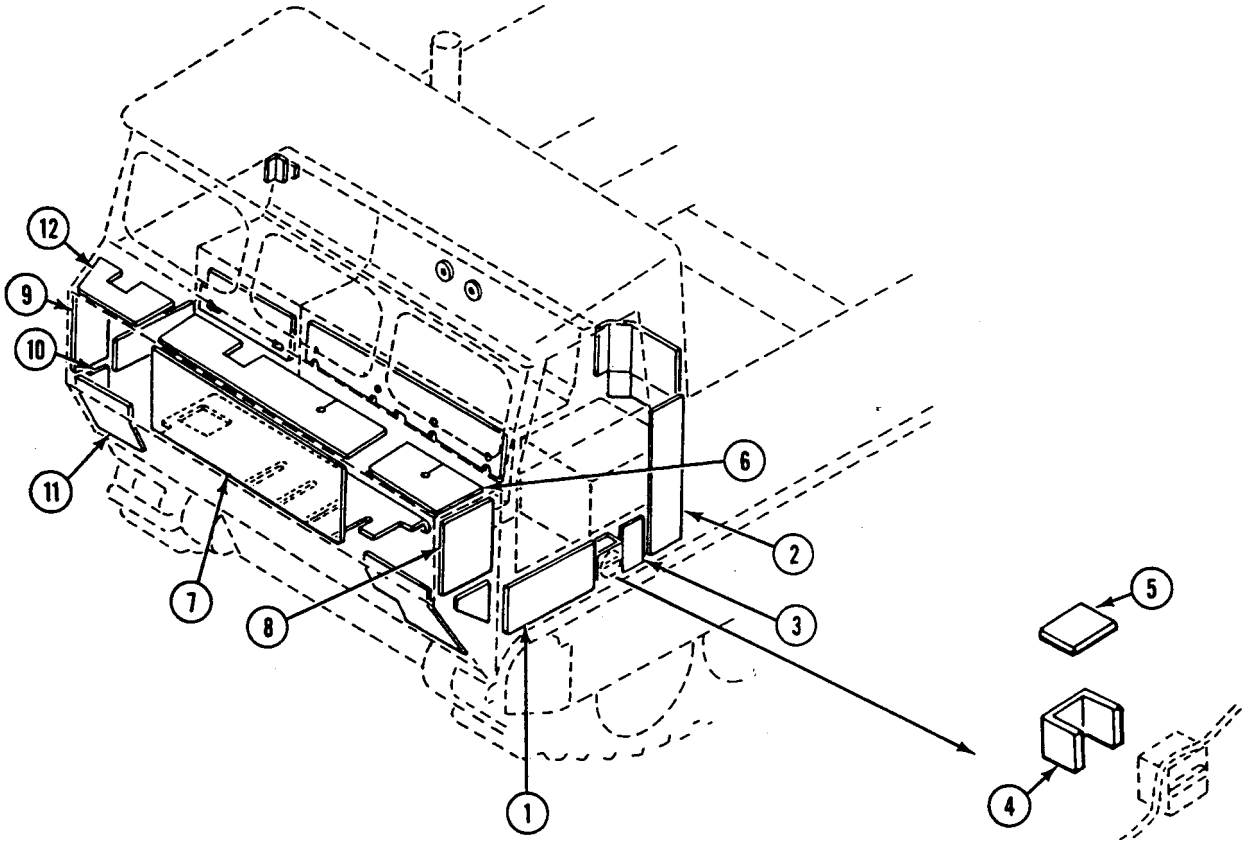
When installing insulation, work with only 3 square feet (.28 sq m) of insulation at a time. For ease of installation, insulation may be cut into smaller pieces and butted together.

14. Center insulation in designated location in respect to strap retaining loops, other hardware and hull structure. Trim to fit.

INSTALL VEHICLE COMPARTMENT CAB COVER/INSULATION KIT (SECONDARY KIT) —
Continued

0057 00

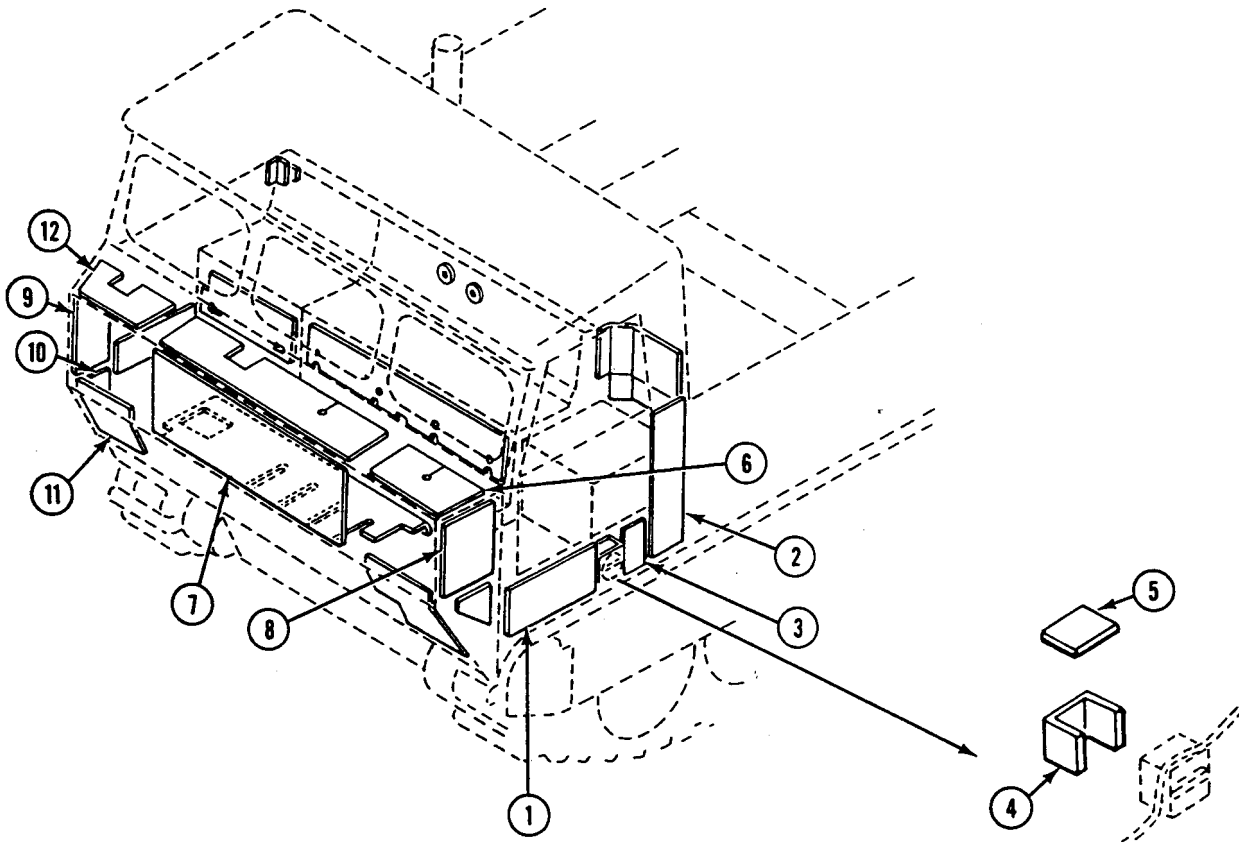
15. Spray or swab a maximum 3 foot (.91 m) square area of insulation on back side with cleaning compound. To activate dry back adhesive, allow 10 to 15 seconds for adhesive to become tacky, and immediately press insulation firmly.



NOTE

Installation must be installed in the sequence given in Steps 16 - 19.

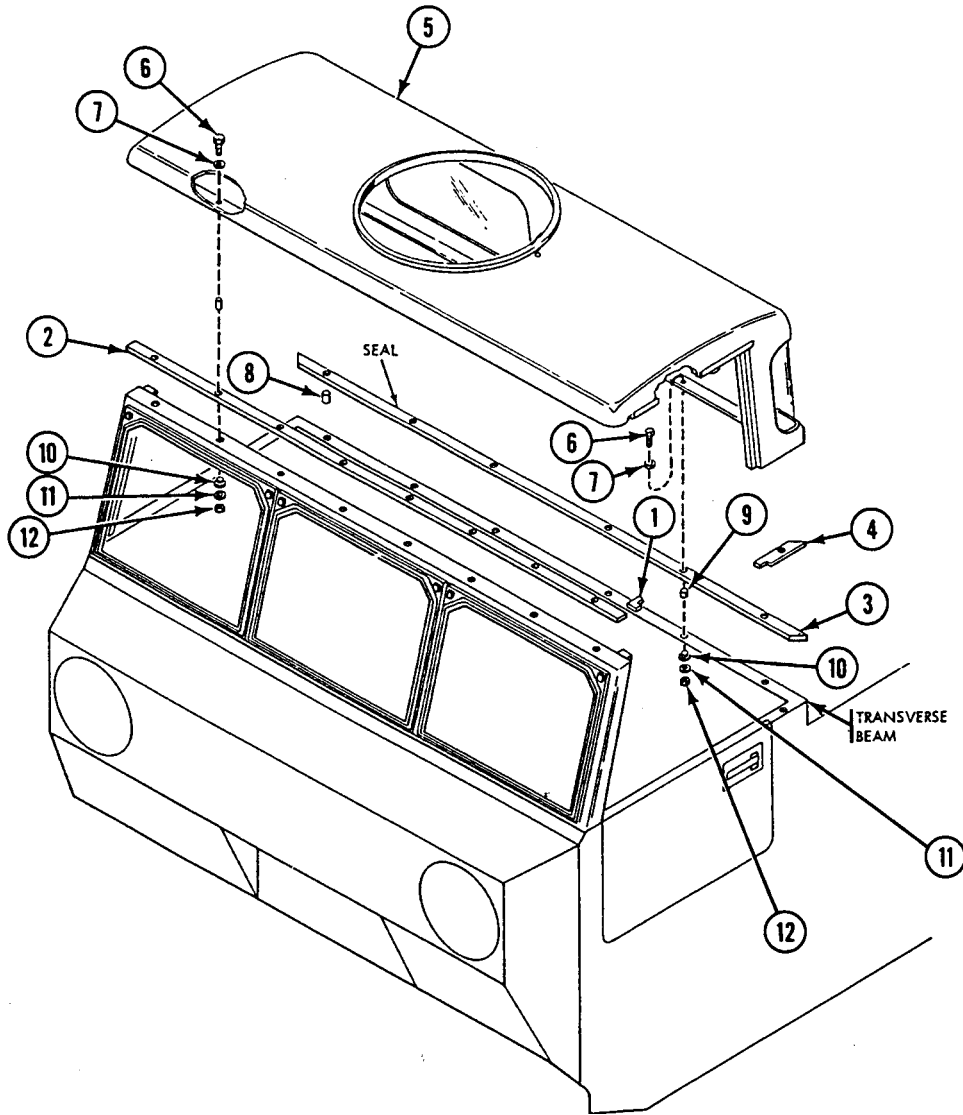
16. Install insulation (1) below left door, insulation (2) on left rear hull side, and insulation (3) to center left hull side.
17. Install insulation (4) to fire extinguisher well, insulation (5) to top well, and insulation (6) to left rear cab interior.
18. Install insulation (7) on front hull and insulation (8) on lower front hull.
19. Install insulation (9) on right upper hull, insulation (10) on lower right hull, insulation (11) on right front hull and insulation (12) on upper right front hull.



INSTALL VEHICLE COMPARTMENT CAB COVER/INSULATION KIT (SECONDARY KIT) —
Continued

0057 00

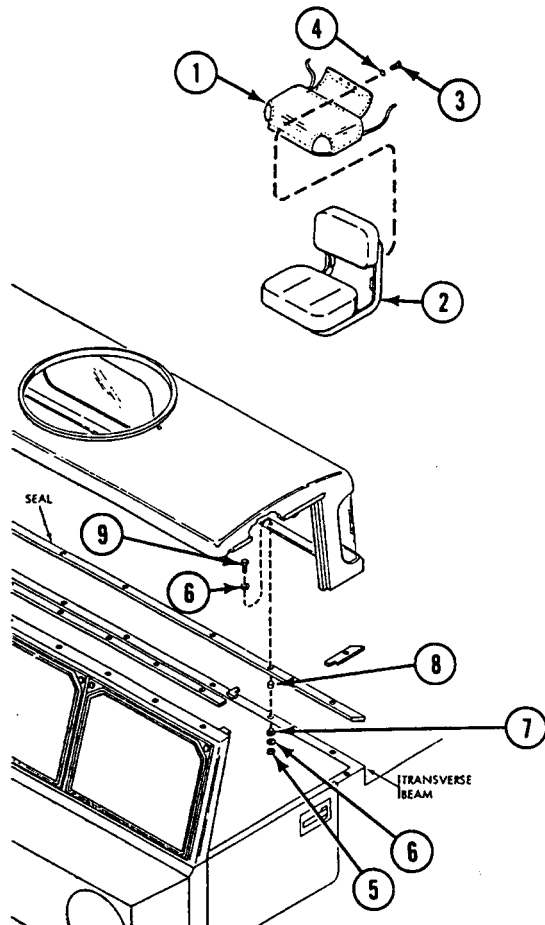
20. Clean end surface of windshield frame for two pads (1) with cleaning compound. Dry surface with clean cloth or compressed air and coat mounting surface of pads with adhesive. Allow adhesive to dry until tacky and mount pads firmly on frame.
21. Install front seal (2), rear seal (3), two rear corner seals (4), and fiberglass cover (5) with 16 screws (6), flat washers (7), large spacer (8), 15 spacers (9), 16 grommets (10), flat washers (11), and nuts (12).



INSTALL VEHICLE COMPARTMENT CAB COVER/INSULATION KIT (SECONDARY KIT) —
Continued

0057 00

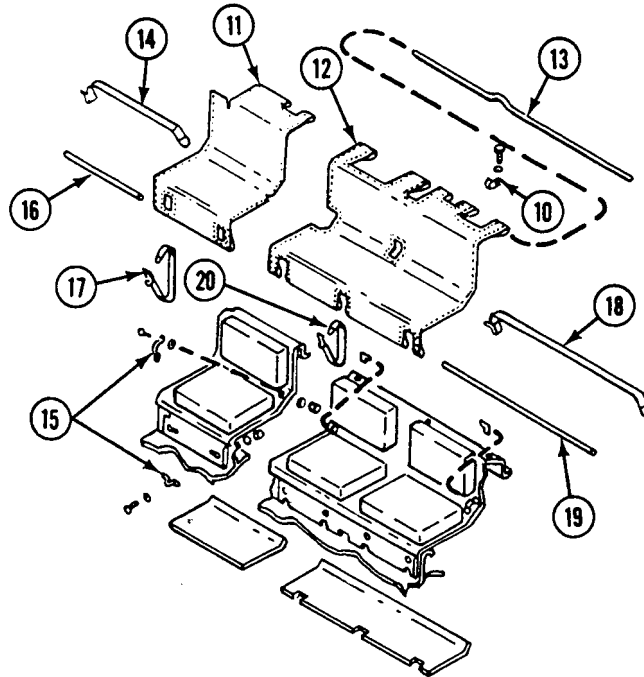
22. Slide driver's seat cover (1) on driver's seat (2) and install with two ties at back of cover.
23. Remove three existing screws (3) and flat washers (4). Discard screws.
24. Install seat cover assembly (1), three flat washers (4) and new screws (3).
25. Remove 5 right rear nuts (5), 10 flat washers (6), 5 grommets (7), spacers (8), and screws (9) from fiberglass cover at rear of hull.
26. Install 5 retaining rod clips (10) with 5 screws (9), spacers (8), grommets (7), 10 flat washers (6), and 5 right nuts (5).



INSTALL VEHICLE COMPARTMENT CAB COVER/INSULATION KIT (SECONDARY KIT) —
Continued

0057 00

27. Install right personnel seat cover assembly (11) and center personnel cover assembly (12) on upper seat cover retaining rod (13).
28. Install upper retaining rod (13) on five retaining rod clips (10).
29. Install right seat cover retaining strap assembly (14) over right seat cover (11) and through two loops (15) on right seat panel.
30. Install lower right seat cover rod (16) in right seat cover (11) and insert two right seat cover strap assemblies (17) through two loops (15) on right seat support and over rod and secure strap assemblies.
31. Install center seat cover retaining strap assembly (18) over center seat cover (12) and through two loops (15) on center seat panel and secure strap assembly.
32. Install center seat cover retaining rod (19) in center seat cover (12) and through one existing strap assembly (20).
33. Insert new center cover strap assemblies (20) through pairs of end holes in center seat support and over rod (19) and secure cover strap assemblies.

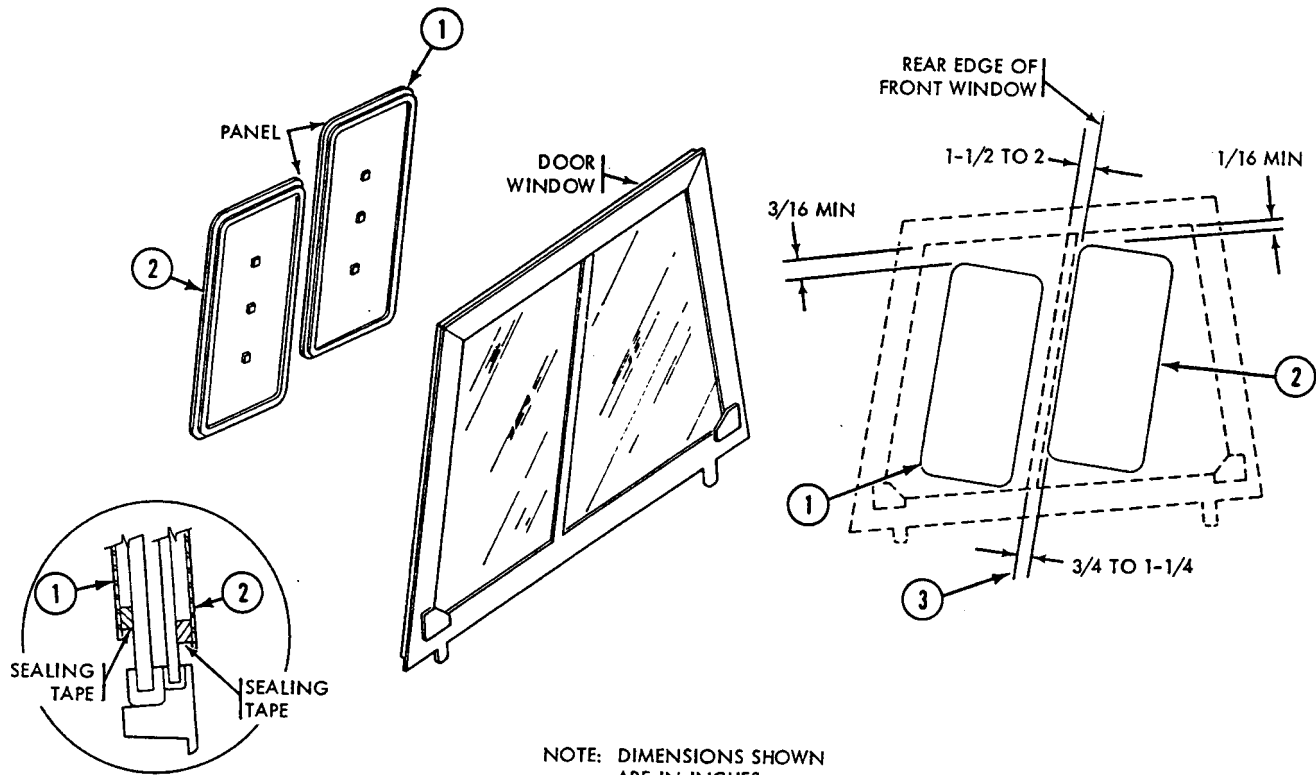


34. Thoroughly clean front and rear window glasses and wipe dry with clean dry, lint free cloths.
35. Remove protective backing from all sealing tape.

INSTALL VEHICLE COMPARTMENT CAB COVER/INSULATION KIT (SECONDARY KIT) —
Continued

0057 00

36. Install front thermal panel (1), rear thermal panel (2), and rear window glasses (3). Press panels securely into place.



1. Install top access cover and grilles (see your -20).
2. Install machine gun kit, if removed (see your -20).

END OF TASK

INSTALL CARGO AREA HEATER KIT

0058 00

THIS WORK PACKAGE COVERS:

Installation (page 0058 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)

References

See your -10
See your -20

Materials/Parts

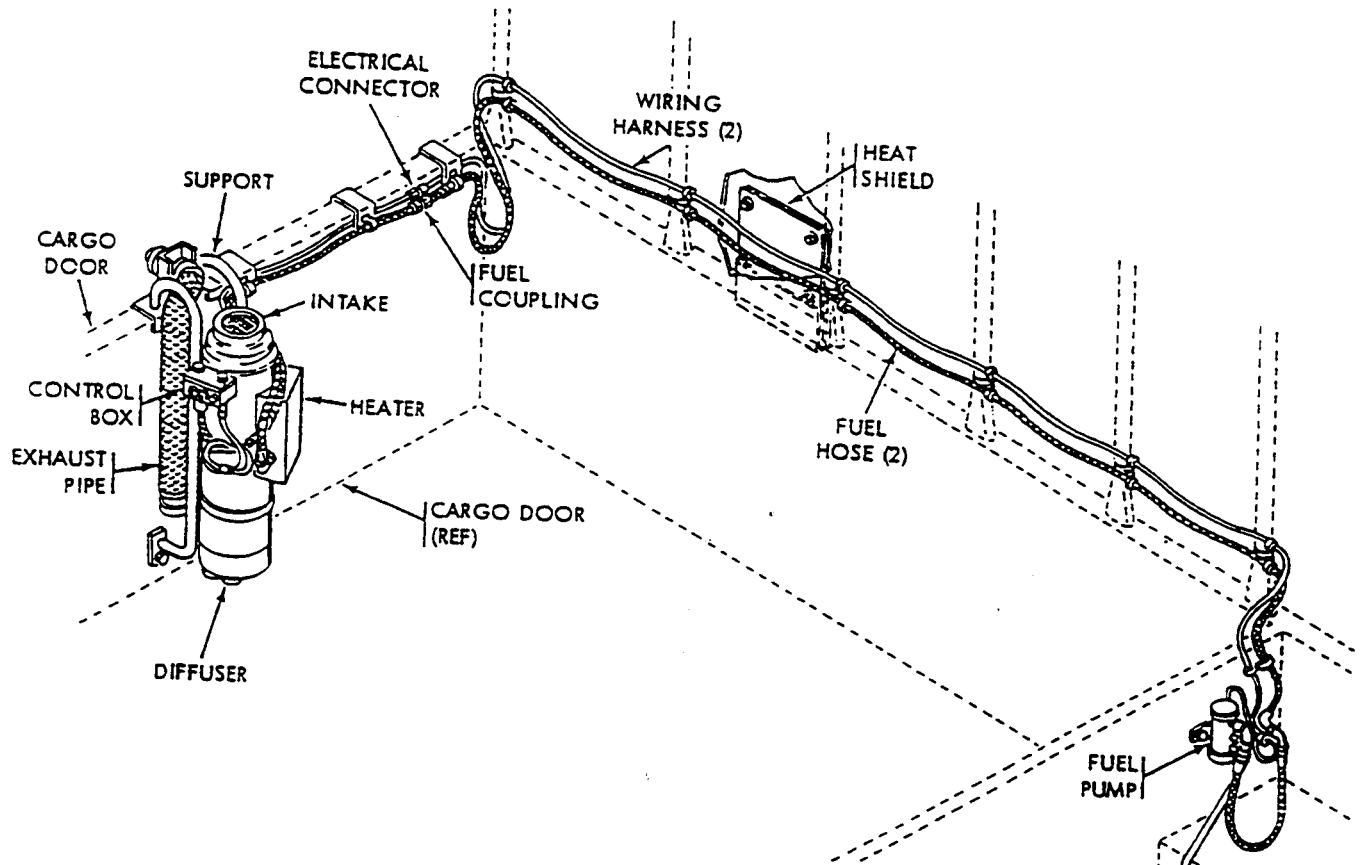
Antiseize compound (WP 0080 00, Item 6)
Sealing compound (WP 0080 00, Item 32)
M548A1 – Heater kit P/N 12269557
M548A3 – Part of Winterization kit P/N 57K1410

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Top left access grille removed (see your -10)
Cargo cover bows installed (see your -20)
Batteries removed (see your -20)

INSTALLATION

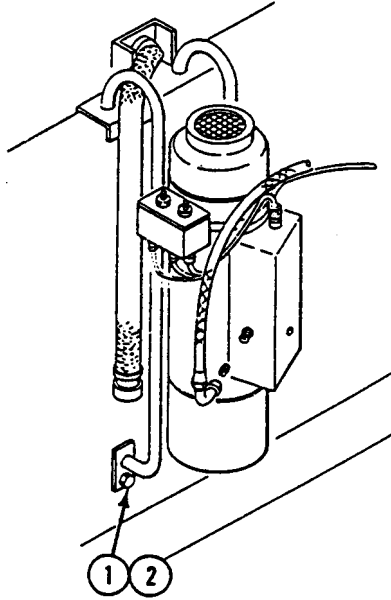
LOCATOR DIAGRAM — CARGO AREA HEATER KIT



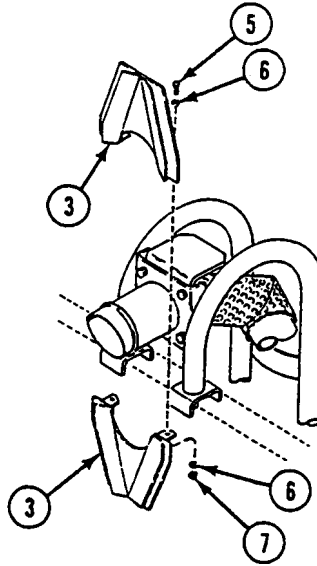
NOTE

Dispose of discarded parts in accordance with current directives.

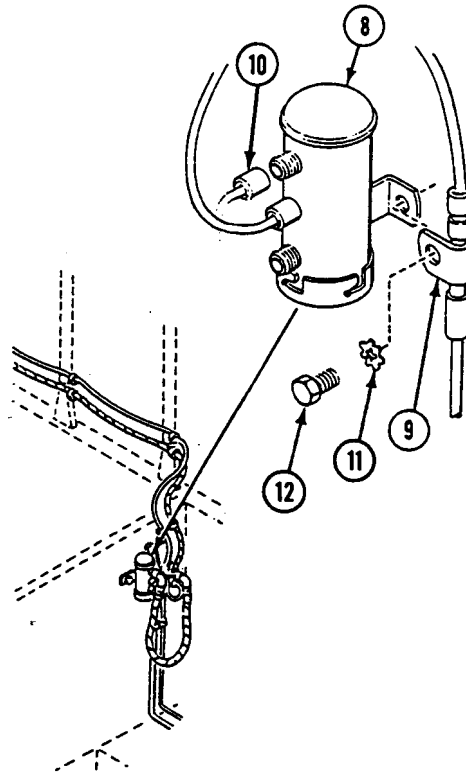
1. Install cargo compartment heater assembly on inside of cargo compartment door, with two pins at top of support in two openings in top of door.
2. Align two holes at bottom of support with two threaded holes in door with heater assembly and install two screws (1) and washers (2).



3. Install two curtain guards (3) on cargo compartment heater support with two screws (5), four washers (6), and two nuts (7).



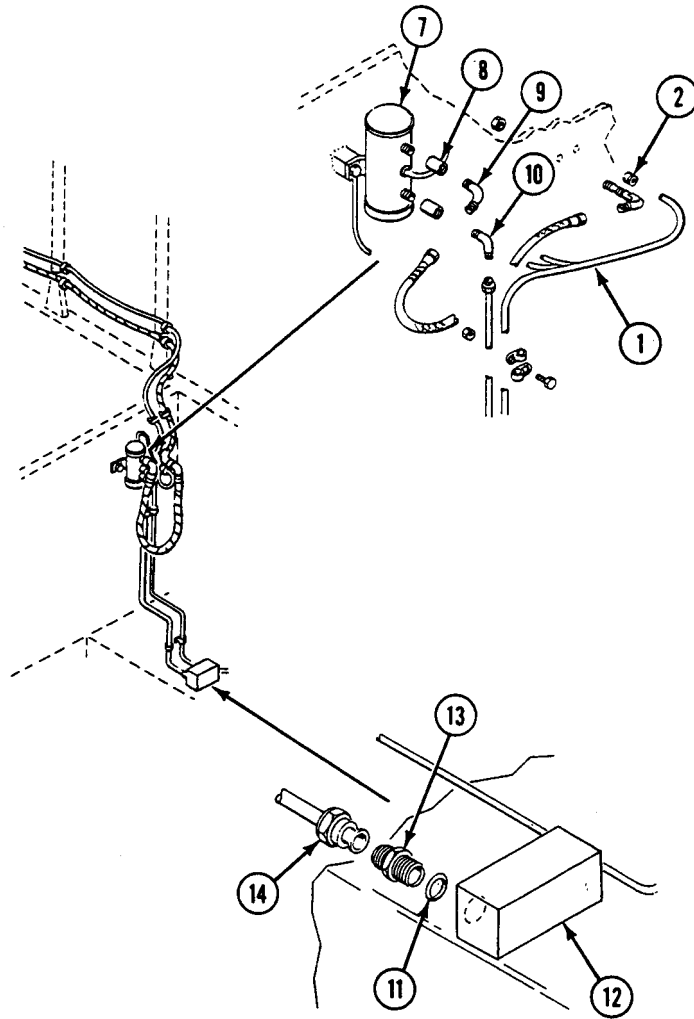
4. Place fuel pump (8) on bulkhead to left of cab heater fuel pump. Install capacitor (9) and ground lead (10) with two new lock washers (11) and screws (12).



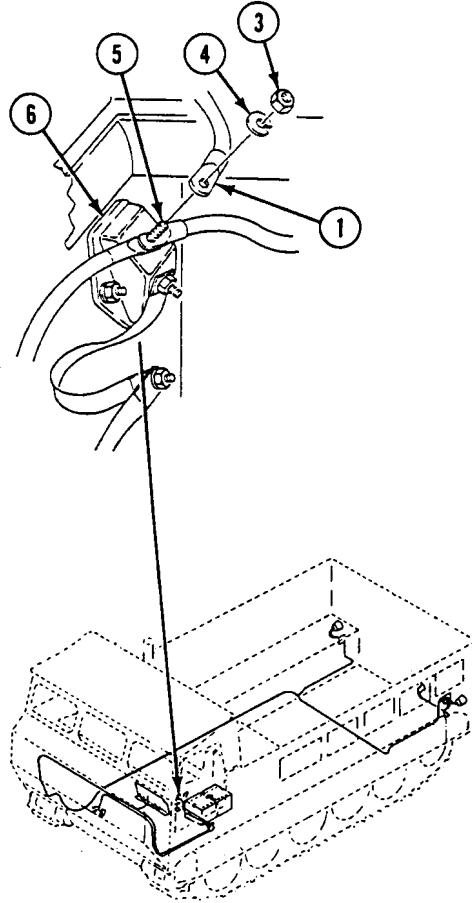
NOTE

Apply a light coat of sealing compound or antiseize compound to threads of tapered pipe and straight-threaded fittings before installation.

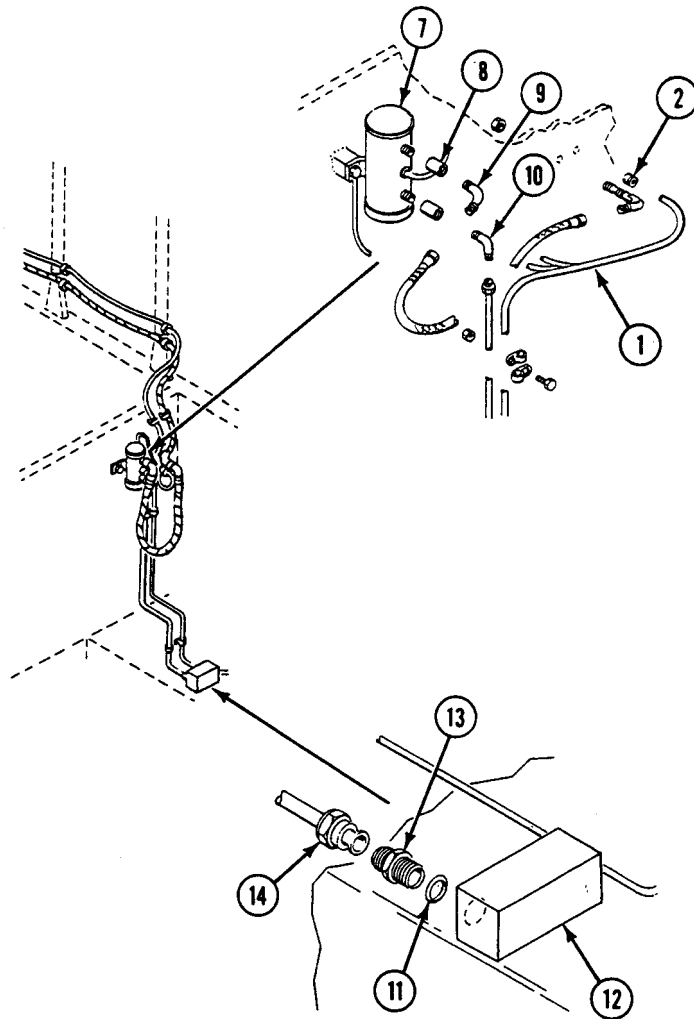
5. Thread cargo area wiring harness (1) through grommet (2), in bulkhead between cargo compartment and power plant, and into battery compartment.



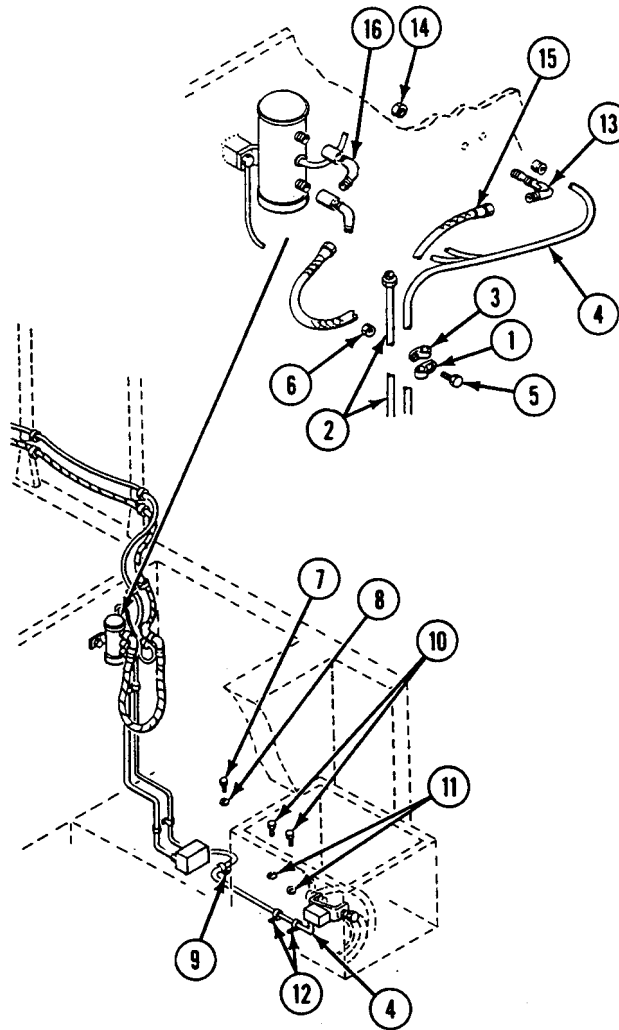
6. Remove nut (3) and washer (4) from terminal (5) of master switch (6). Install circuit 400C lead of cargo area wiring harness (1) on terminal (5) and secure with washer (4) and nut (3).



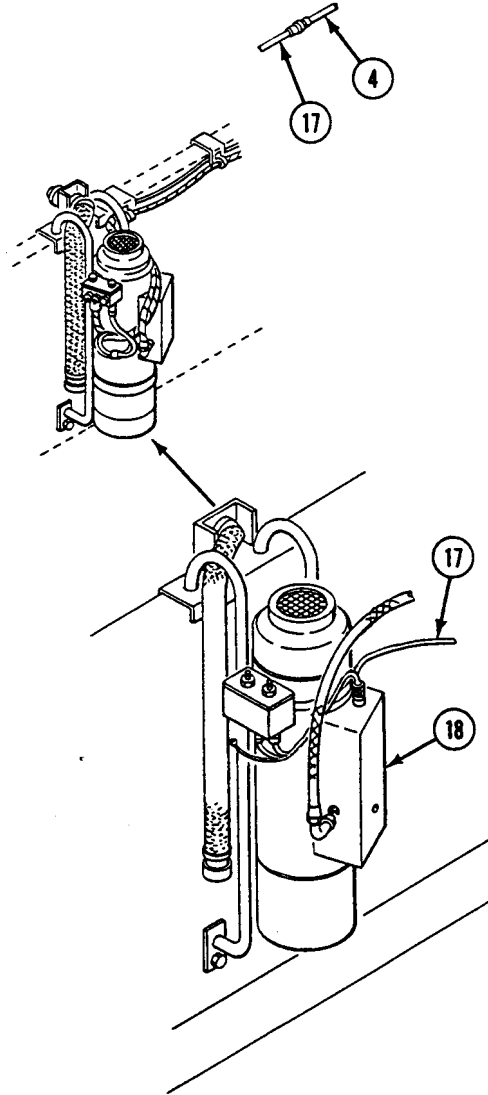
7. Connect circuit 402C lead of cargo area wiring harness (1) to connector on fuel pump (7).
8. Install two fuel pump couplings (8), pump outlet elbow (9), and pump inlet elbow (10) on fuel pump (7).
9. Remove and discard existing plug and preformed packing (11) from heater fuel manifold (12) on left sponson.
10. Install new preformed packing (11) and manifold union (13) on heater fuel manifold (12).
11. Connect fuel tube assembly (14) to manifold union (13) and fuel pump inlet elbow (10).



12. Install two fuel tube clamps (1) on fuel tube assembly (2) and two front harness clamps (3) on cargo area wiring harness (4). Install clamps together in pairs with two double clamp screws (5) and nuts (6).
13. Remove existing fuel tube clamp screw (7) and lock washer (8) securing existing cab heater harness clamp (9) on hull to left of air separator tank. Insert cargo area wiring harness (4) in clamp (9), and reinstall lock washer (8) and screw (7).
14. Remove two screws (10) and lock washers (11) securing two clamps (12) to bottom of battery compartment. Insert harness (4) in two clamps (12), and reinstall two new lock washers (11) and screws (10).
15. Install fuel bulkhead elbow (13) in opening in bulkhead between cargo area and power plant compartment with bulkhead elbow lock nut (14).
16. Connect front fuel hose assembly (15) to bulkhead elbow (13) and fuel pump outlet elbow (16).



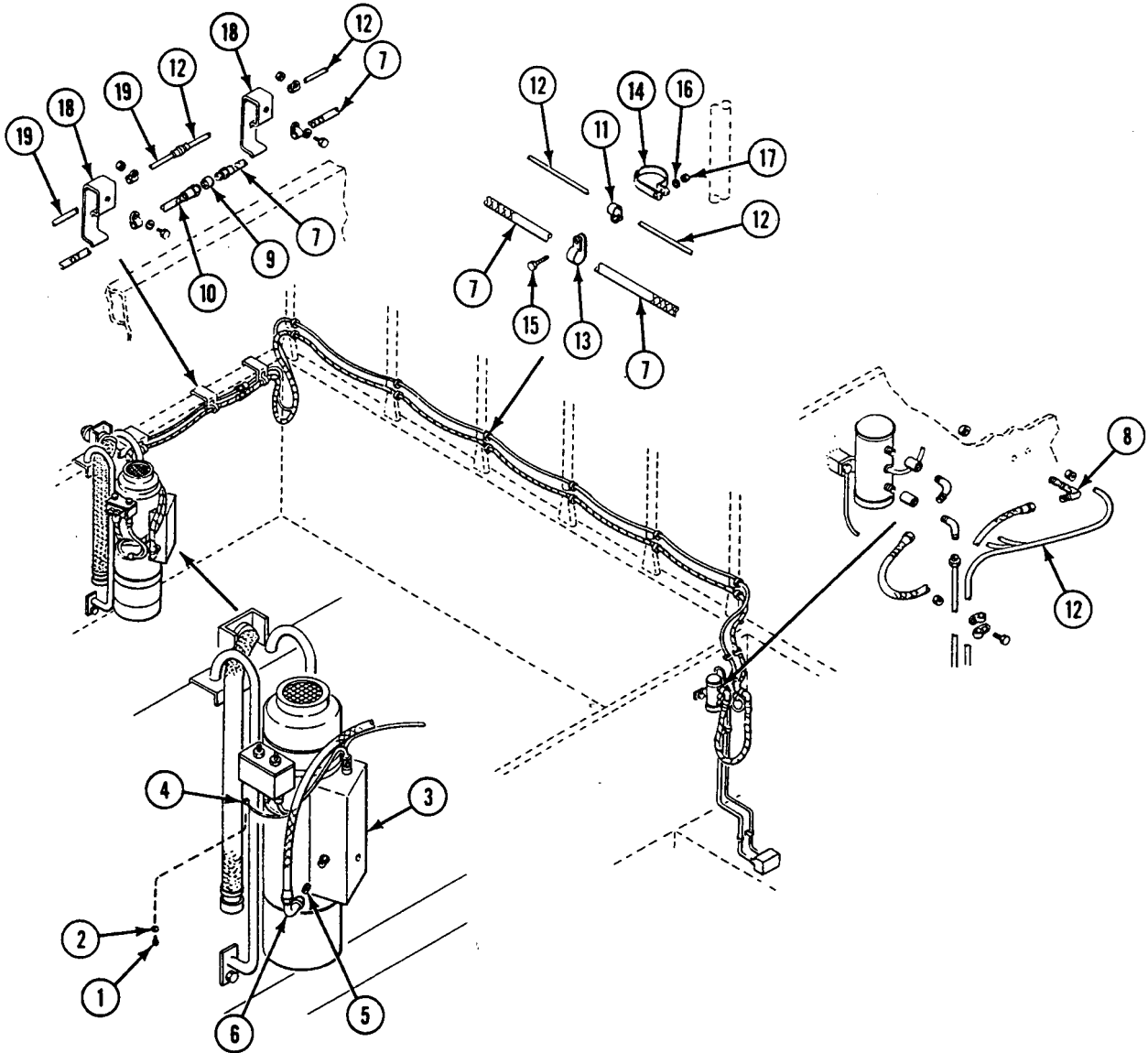
17. Connect cargo door wiring harness (17) to cargo area wiring harness (4).
18. Connect heater and control box ends of cargo door wiring harness (17) to heater and control box on cargo area heater assembly (18).



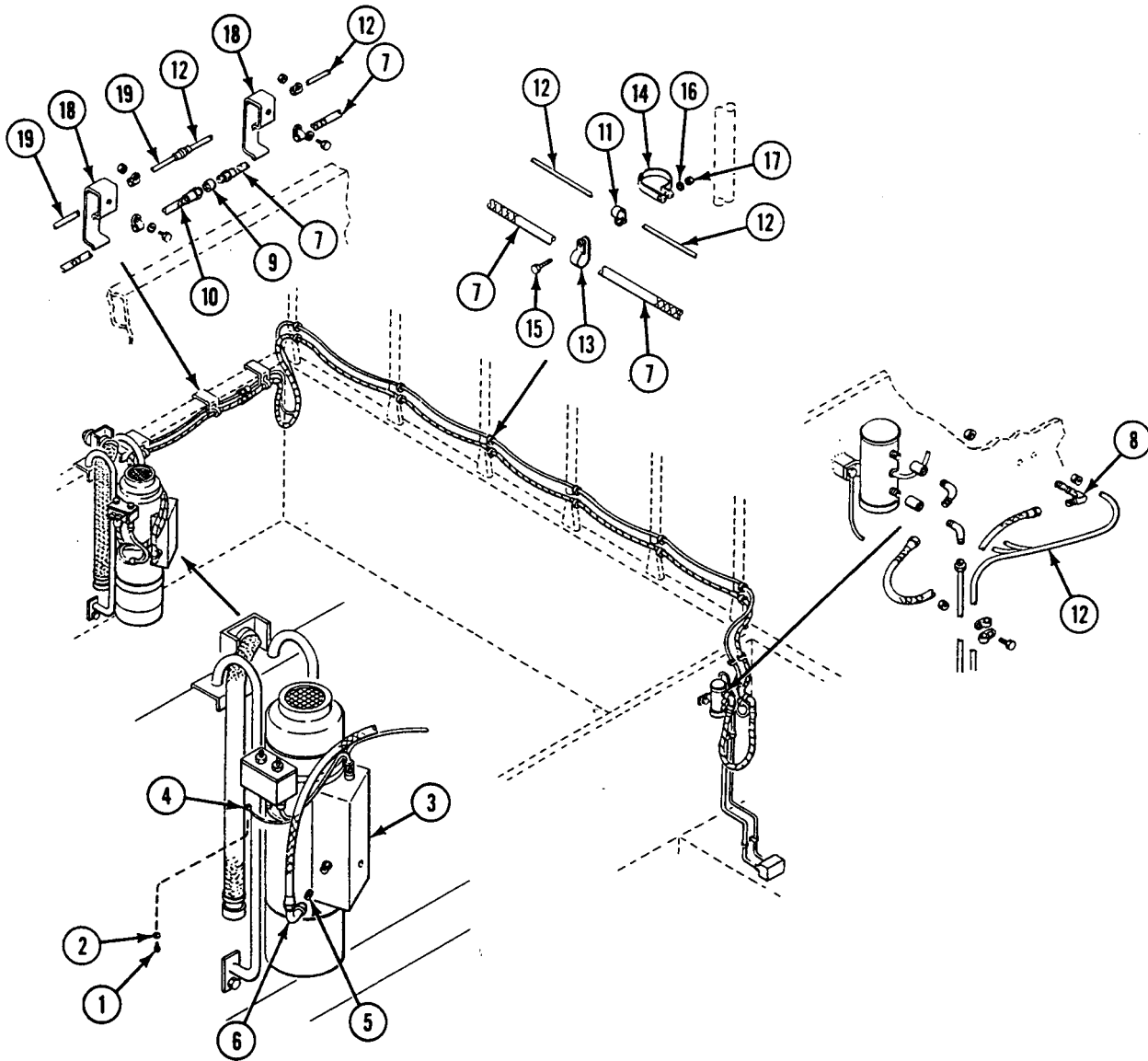
INSTALL CARGO AREA HEATER KIT — Continued

0058 00

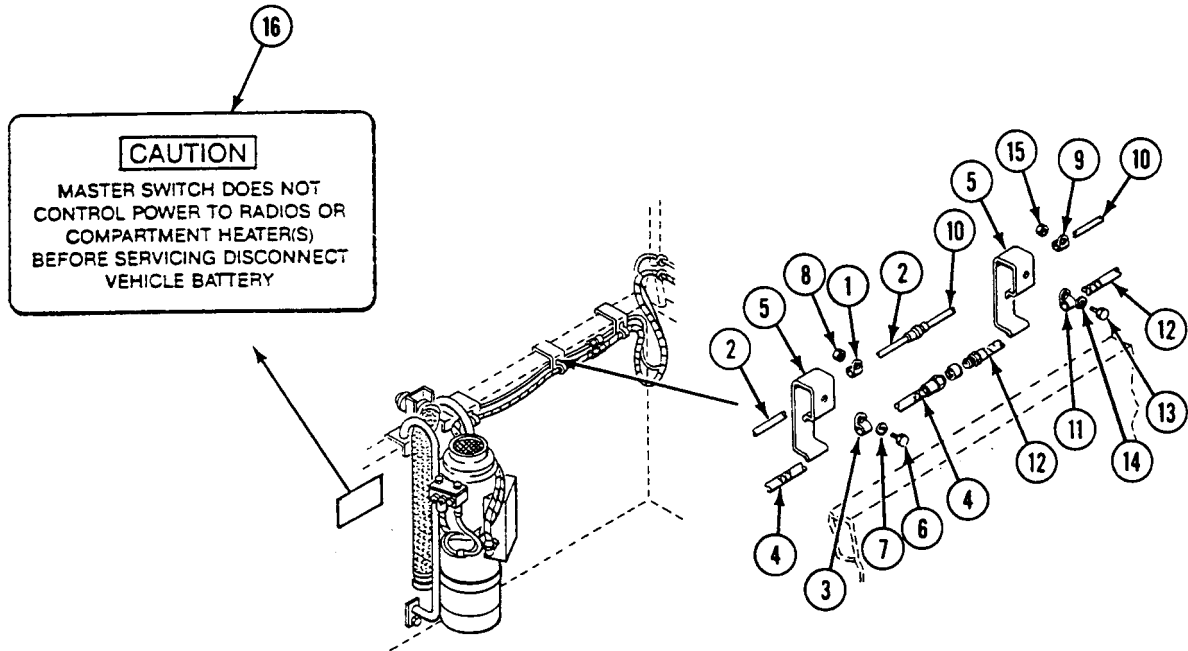
19. Remove screw (1) and lock washer (2) from bottom of control box on cargo area heater assembly (3). Install ground lead (4) on box with new lock washer (2) and screw (1).
20. Install heater inlet nipple (5) in fuel inlet of heater on cargo area heater assembly (3).
21. Connect cargo door fuel hose assembly (6) to heater on cargo area heater assembly (3).
22. Connect cargo area fuel hose assembly (7) to bulkhead elbow (8).



23. Install fuel hose coupler assembly (9) on cargo door fuel hose assembly (10) and cargo area fuel hose assembly (7).
24. Install six clamps (11) on cargo area wiring harness (12) and six clamps (13) on cargo area fuel hose assembly (7). Place six harness and hose clamps (14) 6-1/4 inches (15.9 cm) up on six cargo cover bows, six clamps (11) and clamps (13) to six clamps (14) with six harness and hose clamp screws (15), washers (16), and nuts (17).
25. Install three harness and hose clips (18) on cargo compartment door with wiring harness (19) and wiring harness (12) under clips (18).



26. Install two clamps (1) on wiring harness (2) and two clamps (3) on hose assembly (4) to two harness and hose clips (5) with two clip screws (6), washers (7), and nuts (8).
27. Install left rear harness clamp (9) on wiring harness (10). Install left rear hose clamp (11) on hose assembly (12) and secure to clip (5) with screw (13), washer (14), and nut (15).
28. Install caution sign (16) on inside of cargo door. Place sign 3/4 inch (1.9 cm) from top of door, and 8-1/2 inches (21.6 cm) to left of door centerline.



29. Install cargo cover heat shield (WP 0060 00).

FOLLOW-THROUGH STEPS

1. Install batteries (see your -20).
2. Start and operate heater on both high and low heat (see your -10). Check heater for proper operation and inspect for fuel leaks. If leaks are found, tighten connections. Turn heater off.
3. Install top left access grille (see your -10).

END OF TASK

INSTALL CARGO COVER/INSULATION KIT (SECONDARY KIT)

0059 00

THIS WORK PACKAGE COVERS:

Installation (page 0059 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Trailer Mounted Welding Shop (WP 0078 00, Item 74)
 Blind Riveter (WP 0078 00, Item 47)
 Socket Wrench Set, 3/8 Inch Drive
 (WP 0078 00, Item 79)
 Torque Wrench (WP 0078 00, Item 82)

Materials/Parts

Adhesive (WP 0080 00, Item 3)
 Cleaning compound (WP 0080 00, Item 49)
 M548A1 – Heater kit P/N 12269531
 M548A3 – Part of Winterization kit P/N 57K1410

Personnel Required

Track Vehicle Repairer 63H
 Helper (H)

References

See your -10
 See your -20

Equipment Condition

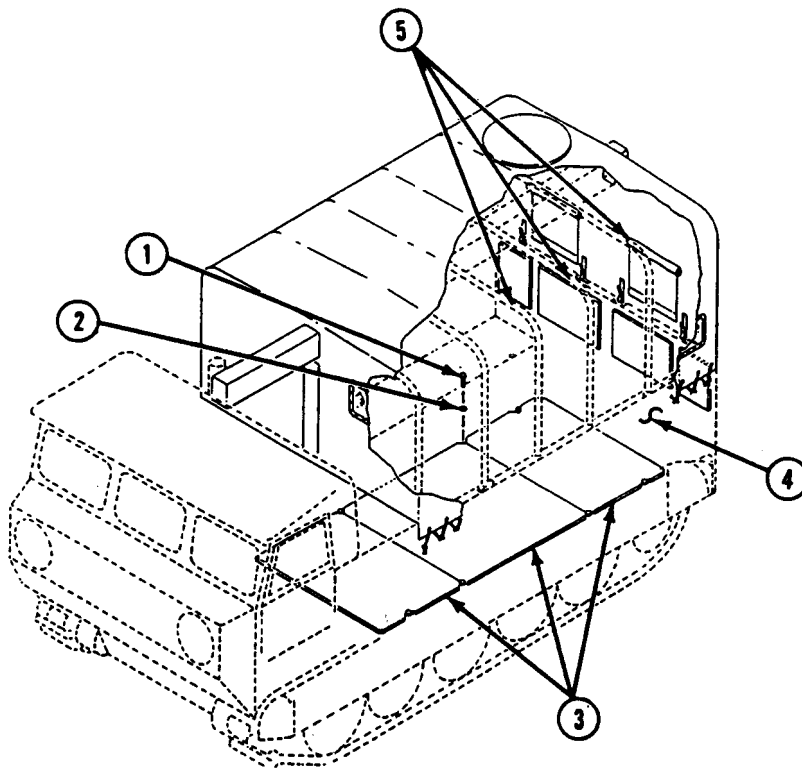
Engine stopped (see your -10)
 Carrier blocked (see your -10)
 Cargo cover removed (see your -20)

INSTALLATION

NOTE

Dispose of discarded parts in accordance with current directives.

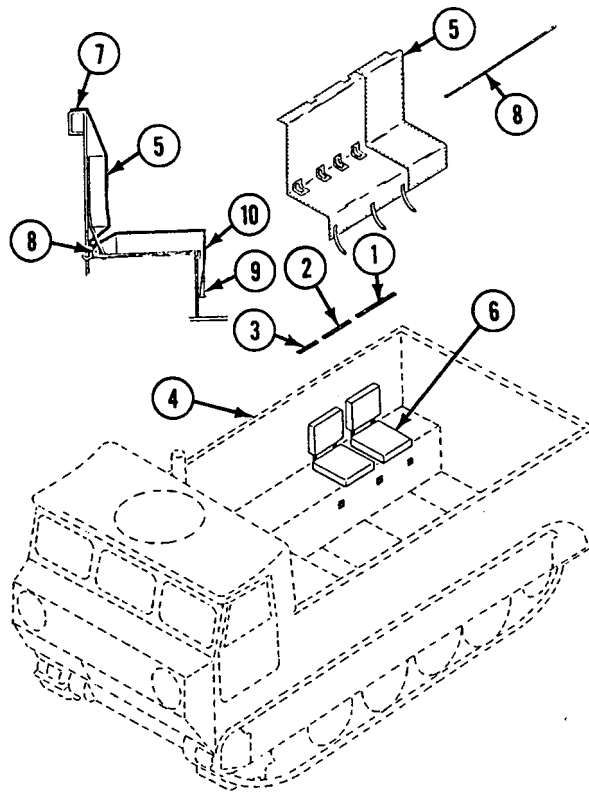
1. Remove eight floor plate screws (1) and spacer washers (2). Store screws and spacers with cover.
2. Position floor plates (3) in lower position (see your -10).
3. Clean inner face of cargo door (4) which is to be covered with insulation.
4. Remove paint from top of edge of hull between four rear cargo cover bows (5) on each side. Clean surface where paint was removed.



INSTALL CARGO COVER/INSULATION KIT (SECONDARY KIT) — Continued

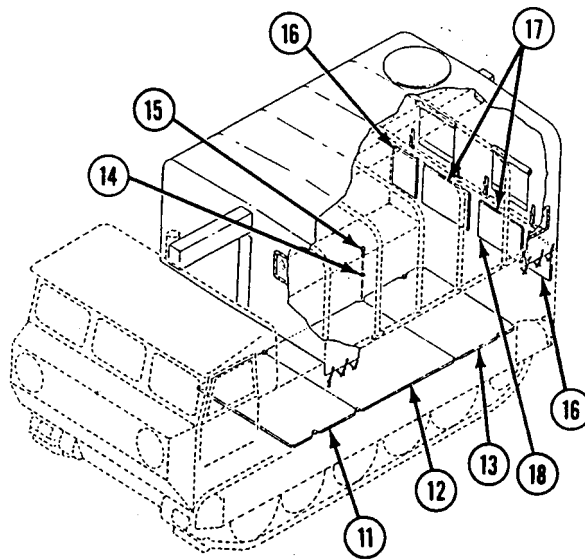
0059 00

5. On left and right sides of carrier, position six fastener tapes on top edge of hull. Position two tapes (1) between fifth and last cargo cover bows; two tapes (2) between fourth and fifth bows and two tapes (3) between third and fourth bows. Position the tapes with rear edges 3.00 to 3.50 inches (7.62 to 8.89 cm) forward of centerline of rear, fifth, and fourth bow pocket; position two tapes with rear edges of tapes 2.5 to 3.0 inches (6.35 to 7.62 cm) forward of centerline of fourth bow pocket.
6. Apply one coat of adhesive to top of hull (4) and backs of tape (1), tape (2), and tape (3) allow to dry until tacky, and press tapes firmly in position.
7. Position seat cover (5) on right personnel seats (6) and seat cover on left personnel seats, and press cover fastener tapes (7) onto hull fastener tape (1), tape (2), and tape (3) to secure top edges of covers (5).
8. Pull personnel seat belts through openings in covers (5).

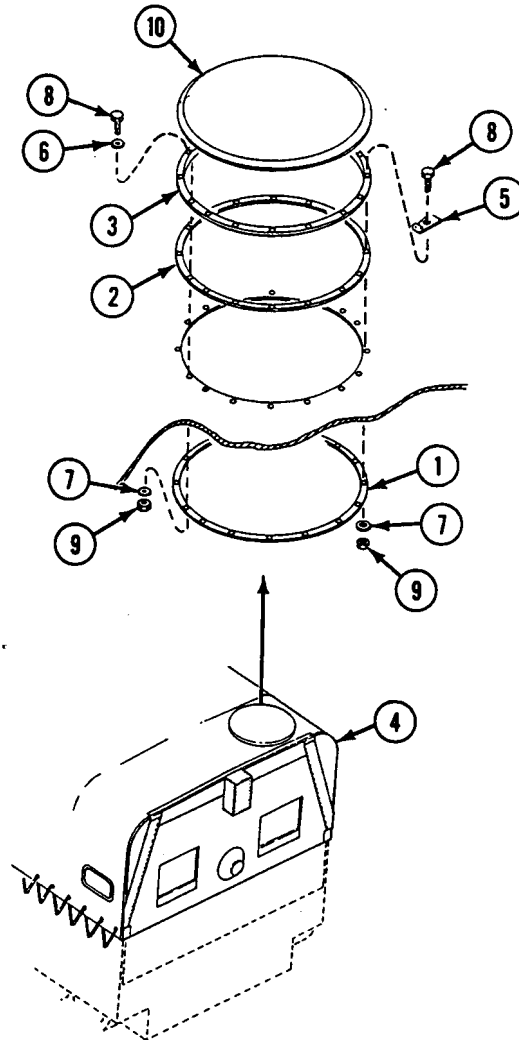


INSTALL CARGO COVER/INSULATION KIT (SECONDARY KIT) — Continued**0059 00**

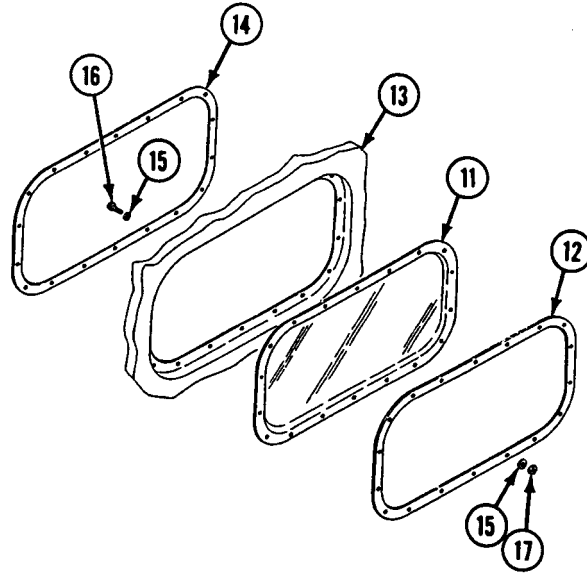
9. Install two tubes (8) between covers (5) and backrest cushion straps to secure covers at midpoints.
10. Pull two covers tight and secure to six tiedown eyes (9) with six cover straps (10).
11. Position front cover (11), center cover (12), and rear cover (13) in cargo compartment, and secure with eight cover washers (14) and cover screws (15).
12. Position two outer insulation panels (16) and two center insulation panels (17) on cargo door (18). Position bottom edges of all panels 14-5/8 inches (37.15 cm) from bottom of cargo door, inside edge of panels (17) 2-9/16 inches (6.51 cm) from centerline of door, and inside edges of panels (16) 3-1/4 inches (8.26 cm) from outside edges of panels (17). Panels must clear rifle racks and edge of door opening. Trim panels to fit if required.



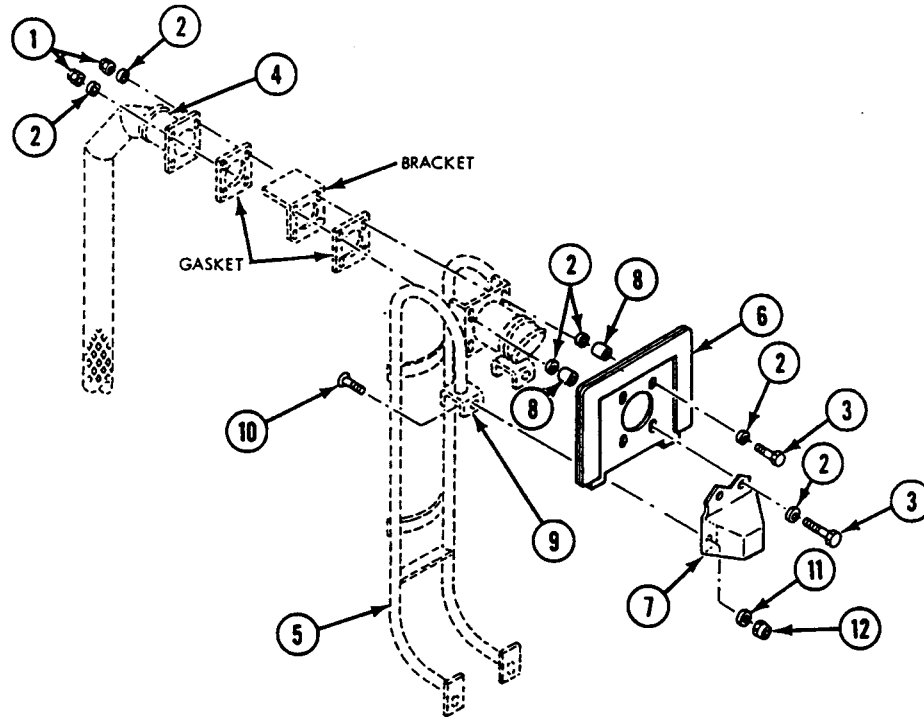
13. Cut fitted panels into working sections 2 to 3 square feet (.186 to .279 square meters) in area.
14. Spray or swab cleaning compound on back of panel to activate adhesive, allow 10 to 15 seconds for adhesive to become tacky, and immediately press insulation firmly into place. Butt working sections together.
15. Position lower frame ring (1), frame gasket (2), and upper frame ring (3) on insulated cargo cover (4), position cover retainer (5) left of center at rear of hatch, and secure ring (3), ring (1), gasket (2), and retainer (5) with 14 hatch washers (6) (except under head of screw securing retainer), 15 lock washers (7), 15 screws (8), and 15 nuts (9).
16. Install hatch cover (10) on ring (3), position retainer (5) to secure cover (10), and tighten nut (9) securing retainer (5). Torque nut (9) to 20-25 lb-in (2-3 N•m).



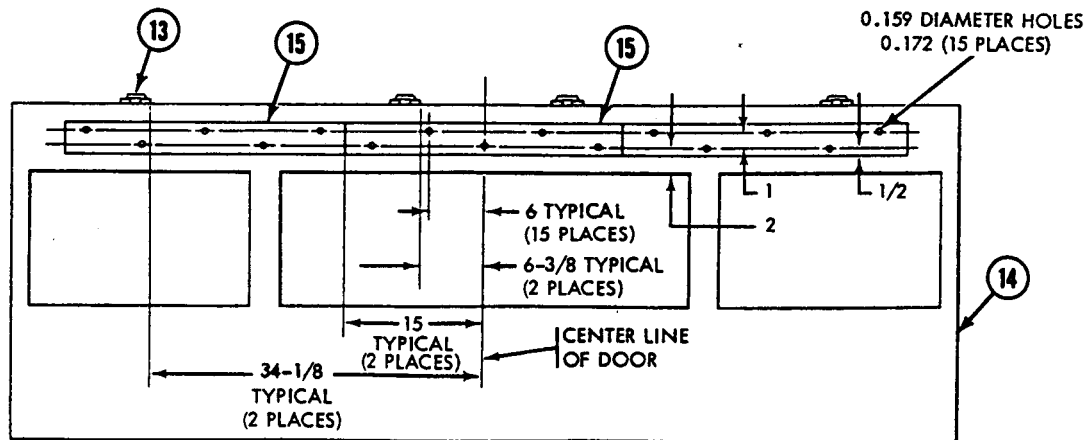
17. Position three windows (11) and frames (12) inside cover (13); position three frames (14) outside cover; and secure windows and frames with 108 washers (15), 54 screws (16), and 54 nuts (17). Store screws and nuts with nuts on inside of cover.



18. Remove four nuts (1), eight washers (2) and four screws (3) that secure heater exhaust (4) to heater support (5). Store nuts, screws, and washers with cover.
19. Position plate (6) and guard (7) on heater support (5) and secure with four screws (3), spacers (8), 12 washers (2) and four nuts (1). Use spacers (8) and washers (2) as required to obtain a common surface between the rear face of plate (6) and front face of rear flange of heater mounting bracket (9).
20. Install two screws (10), washers (11) and nuts (12) to secure guard (7) to flange of heater mounting bracket.

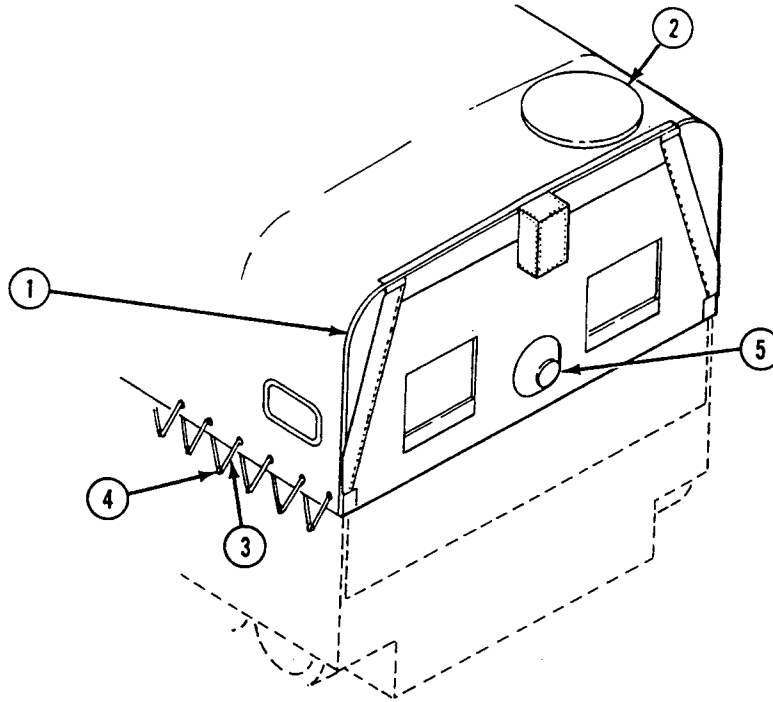


21. Plug weld four loops (13) to top of cargo door (14). Inside edges of inner loops should be 6-3/8 inches (16.19 cm) from center line of door. Inside edge of outer loops should be 34-1/8 inches (86.68 cm) from center line of cargo door. Rear edge of loops should be 3/8 inch (9.5 mm) from front side of door.
22. Position three fastener tapes (15) on rear of cargo door (14) and drill fifteen 0.159-0.172 inch (4.04-4.37 mm) diameter holes through tapes and other cargo door panel. Secure 3 tapes to cargo door with 15 blind rivets.

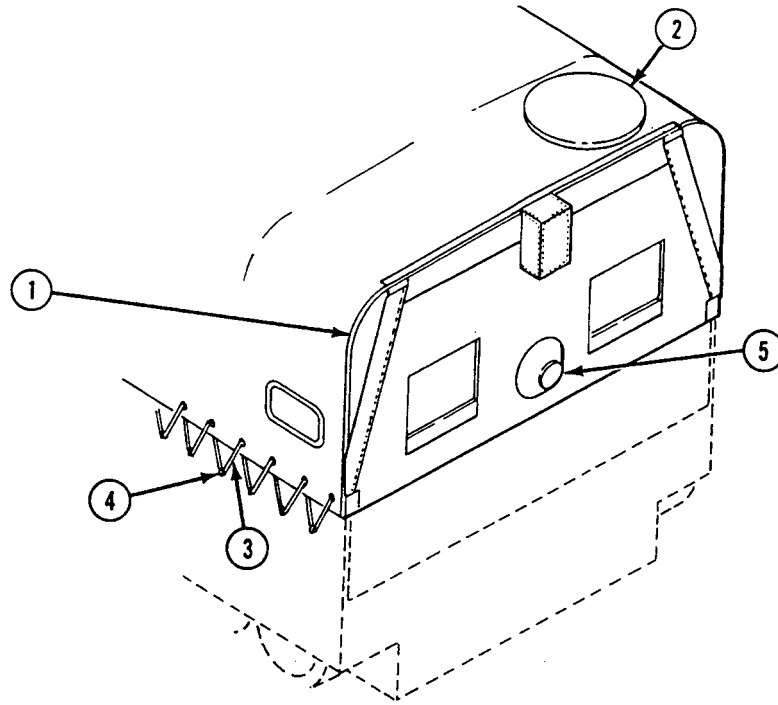


CARGO DOOR

23. Position cargo cover (1) on bows with escape hatch (2) at right rear. Make certain front pocket is properly fitted on material handling kit beam. A helper(s) assistance is required to install cargo cover.
24. Secure cover (1) to four intermediate bows with nine attached rope ties.
25. Engage three front straps on cover (1), and press fastener tape together to secure front cover flaps in closed position.
26. Install front tie-down rope on cover (1), engage rope with tie-down cleats on power plant compartment bulkhead, tighten rope until front flaps are correctly positioned, and tie rope ends securely. Stow free ends of rope by pulling between secured portion of rope and bulkhead.



27. Make certain cover (1) is correctly positioned and stretched smoothly over all bows.
28. Engage two web straps at front corners of cover, install two tie-down ropes (3), engage ropes with outside tie-down cleats (4), and tie rope ends securely. Stow free ends of rope by pulling between secured portion of rope and hull.
29. Make certain cover closure cone (5) is properly positioned on cargo compartment heater exhaust pipe, engage four straps to secure flap to cargo door, and press fastener tapes together to seal rear of cover.



END OF TASK

REPLACE/FABRICATE CARGO COVER HEAT SHIELD

0060 00

THIS WORK PACKAGE COVERS:

Fabricate (page 0060 00-2).
 Installation (page 0060 00-3).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
 Portable Electric Drill (WP 0078 00, Item 12)
 Twist Drill Set (WP 0078 00, Item 15)
 Rivet Set (WP 0078 00, Item 46)

References

See your -10
 See your -20

Materials/Parts

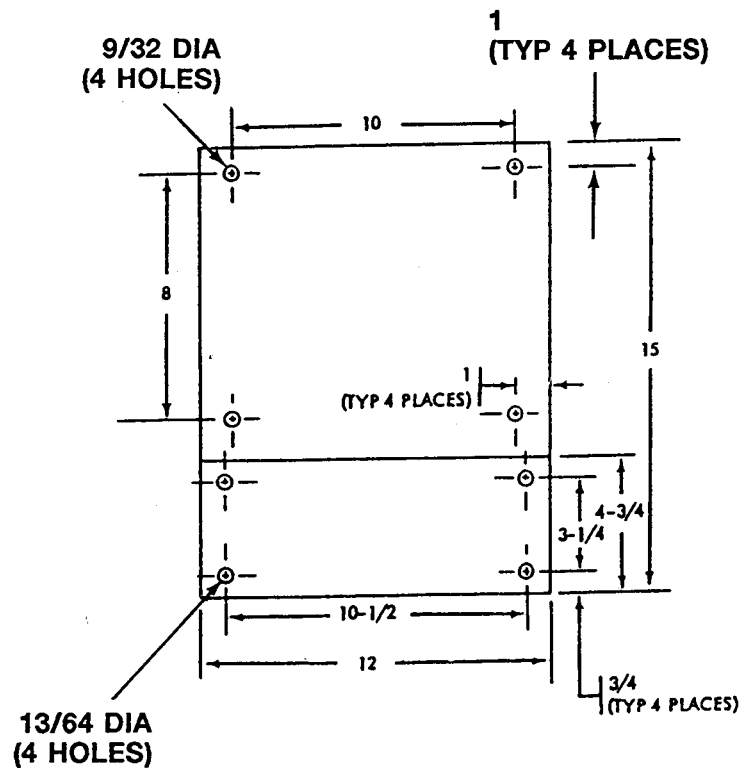
Metal sheet (WP 0080 00, Item 27)
 Rivet MS20613-6P14
 Lock nut (4)
 Screw (4)
 Washer (4)
 Washer (8)

Equipment Condition

Engine stopped (see your -10)
 Carrier blocked (see your -10)
 Cargo cover heat shield removed (see your -20)

FABRICATE

1. Cut two pieces of 0.090 inch (2.29 mm) thick aluminum sheet to 12 x 15 inches (30.48 x 38.1 cm).
2. Cut two pieces of 0.090 inch (2.29 mm) thick aluminum sheet to 4-3/4 x 12 inches (12.07 x 30.48 cm).
3. Lay out locations in one aluminum piece for four 13/64 inch (5.16 mm) holes as shown.
4. Sandwich four aluminum pieces at one end of 12 inch (30.48 cm) side, drill four 13/64 inch (5.16 mm) holes through, and install four rivets.
5. Lay out locations on one aluminum piece for four 9/32 inch (7.14 mm) holes as shown. Drill four 9/32 inch (7.14 mm) holes through the two larger aluminum sheets.



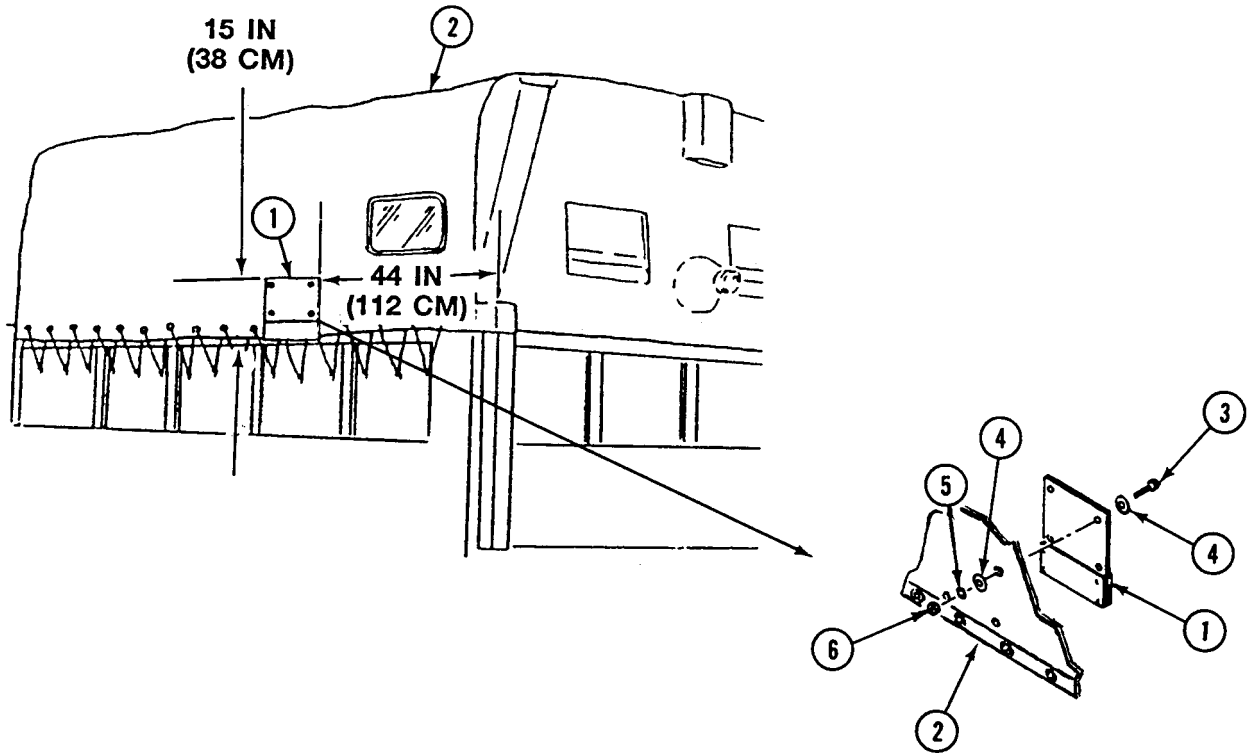
INSTALLATION

1. Mark location of heat shield (1) on left outer side of cargo cover as shown.
2. Position heat shield on outside of cargo cover, and mark locations for four 1/4 inch (6.4 mm) holes, using shield as template. Remove shield.
3. Cut four 1/4 inch (6.4 mm) holes in cargo cover.

NOTE

Install one large washer under each screw head and one at each location between the cover and small washer.

4. Position heat shield (1) on outside of cargo cover (2), and secure with four screws (3), eight large washers (4), four washers (5), and four lock nuts (6).



END OF TASK

INSTALL ENGINE COOLANT HEATER KIT (M548A1)

0061 00

THIS WORK PACKAGE COVERS:

Installation (page 0061 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

References

See your -10
See your -20

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
Multimeter (WP 0078 00, Item 36)

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Batteries and frame removed (see your -20)
Cooling system drained (see your -20)
Cab personnel center seat raised (see your -10)
Top left access grille removed (see your -10)
Cab center floor plate raised (see your -10)
Cab left floor plate removed (see your -20)
Throttle floor plate removed (see your -20)

Materials/Parts

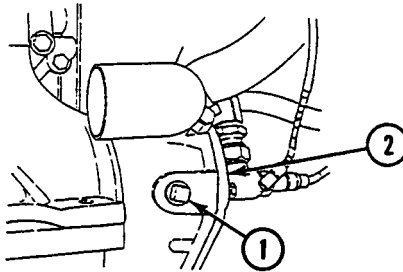
Adhesive (WP 0080 00, Item 3)
Antifreeze (WP 0080 00, Item 5)
Antiseize compound (WP 0080 00, Item 6)
Sealing compound (WP 0080 00, Item 32)
Engine coolant heater kit P/N 11598443
Lock washer (3)

Personnel Required

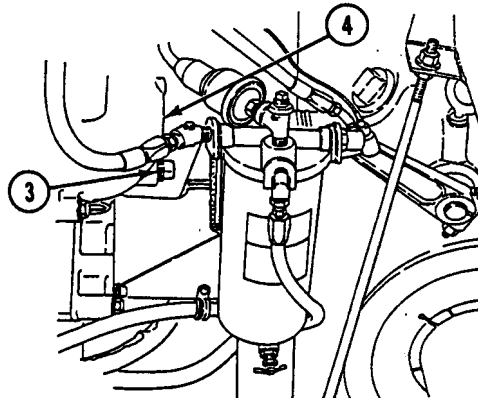
Track Vehicle Repairer 63H

INSTALLATION

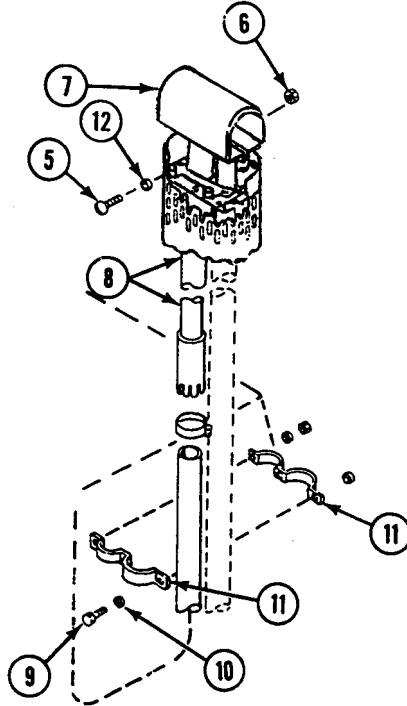
1. Remove plug (1) from engine oil cooler housing (2).



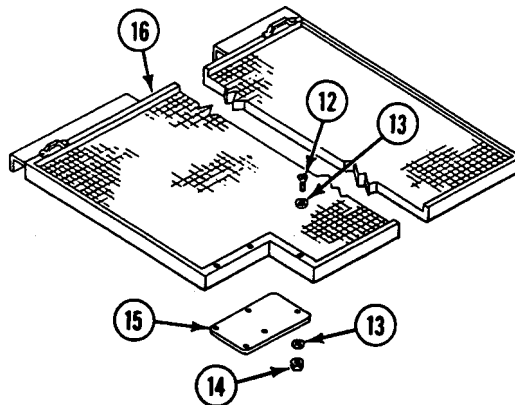
2. Remove plug (3) from engine coolant cover tube (4).



3. Loosen three screws (5), lock washers (12), and nuts (6) securing hood (7) to upper exhaust pipe (8). Discard lock washers.
4. Remove two screws (9), washers (10), and straps (11) from hull. Discard screws, washers, and straps.



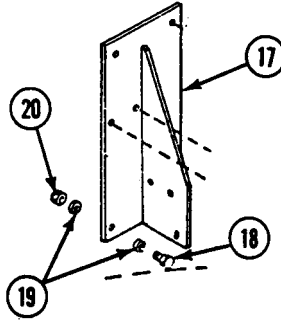
5. Remove three washers (12), six washers (13), and three nuts (14), securing cover sheet (15) to air intake grille (16). Discard washers, nuts, and sheet.



NOTE

Dispose of discarded parts in accordance with current directives.

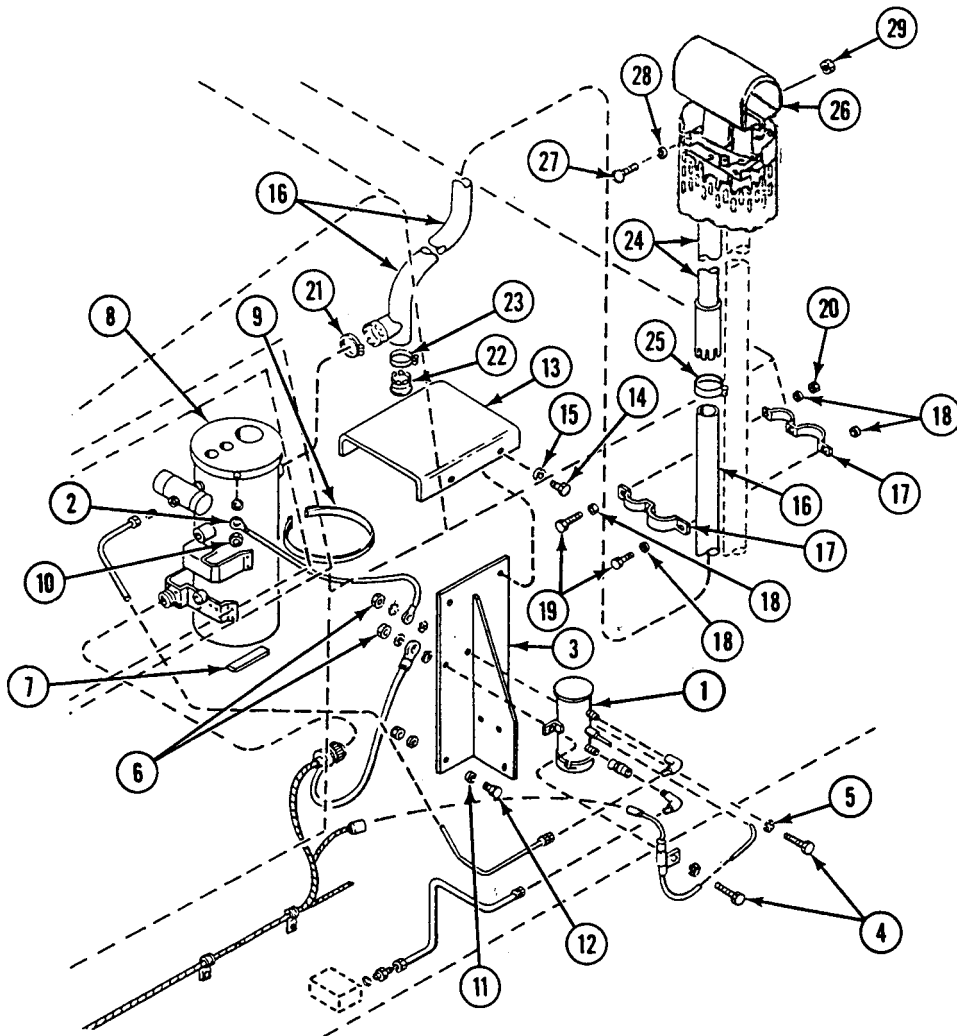
6. Install heater mounting bracket (17) on three hull brackets with three bracket mounting screws (18), six washers (19), and three nuts (20).



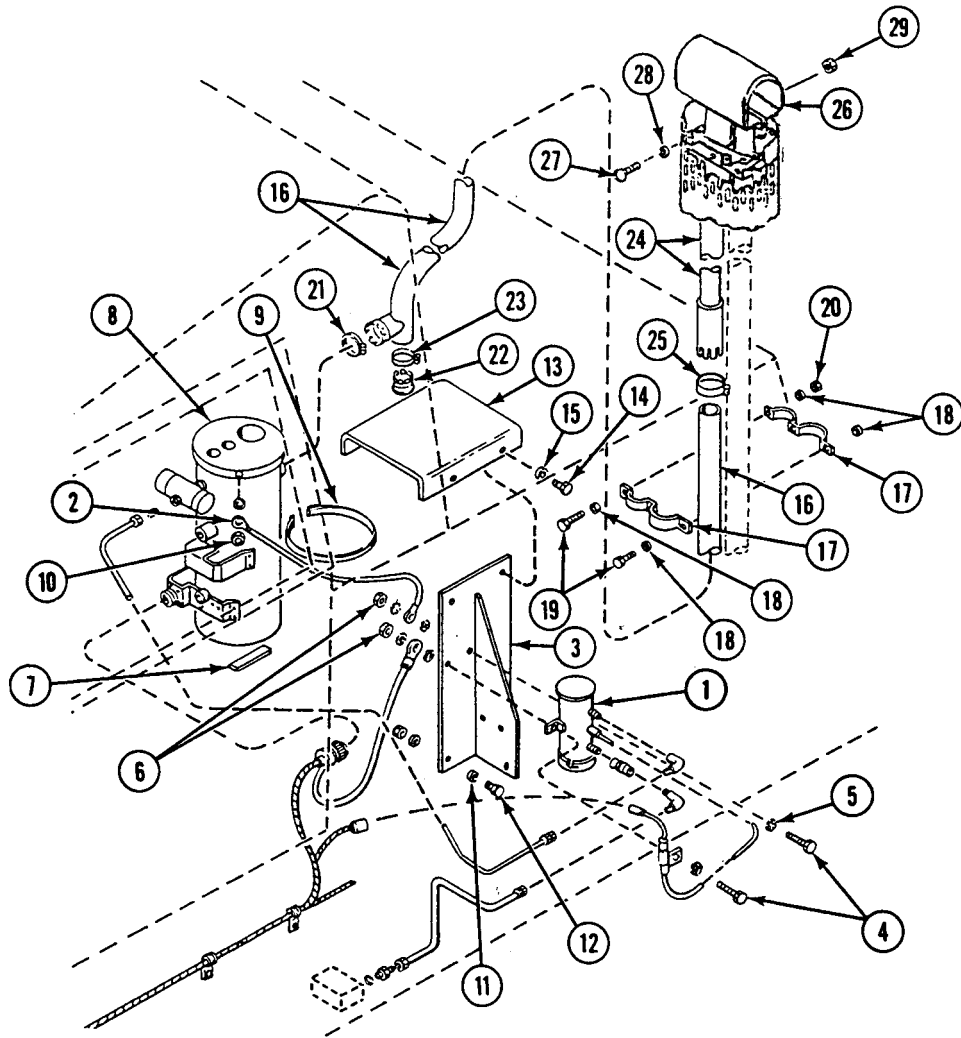
INSTALL ENGINE COOLANT HEATER KIT (M548A1) — Continued

0061 00

7. Install fuel pump (1) and heater ground strap (2) on heater mounting bracket (3) with two screws (4), six new lock washers (5), and two nuts (6). Do not tighten forward screw and nut.
8. Clean paint from surface of rubber strip (7). Coat one surface with rubber adhesive and position on sponson 1 inch (2.54 cm) to left and 1 1/4 inches (3.18 cm) from rear of heater mounting bracket (3).
9. Install coolant heater (8) on two saddles on mounting bracket (3) with two heater mounting clamps (9).
10. Remove heater nut (10) from coolant heater (8). Install heater ground strap (2) on heater (8) with new lock washer (11) and nut (12).
11. Install heater cover (13) on heater mounting bracket (3) with two cover mounting screws (14) and washers (15).



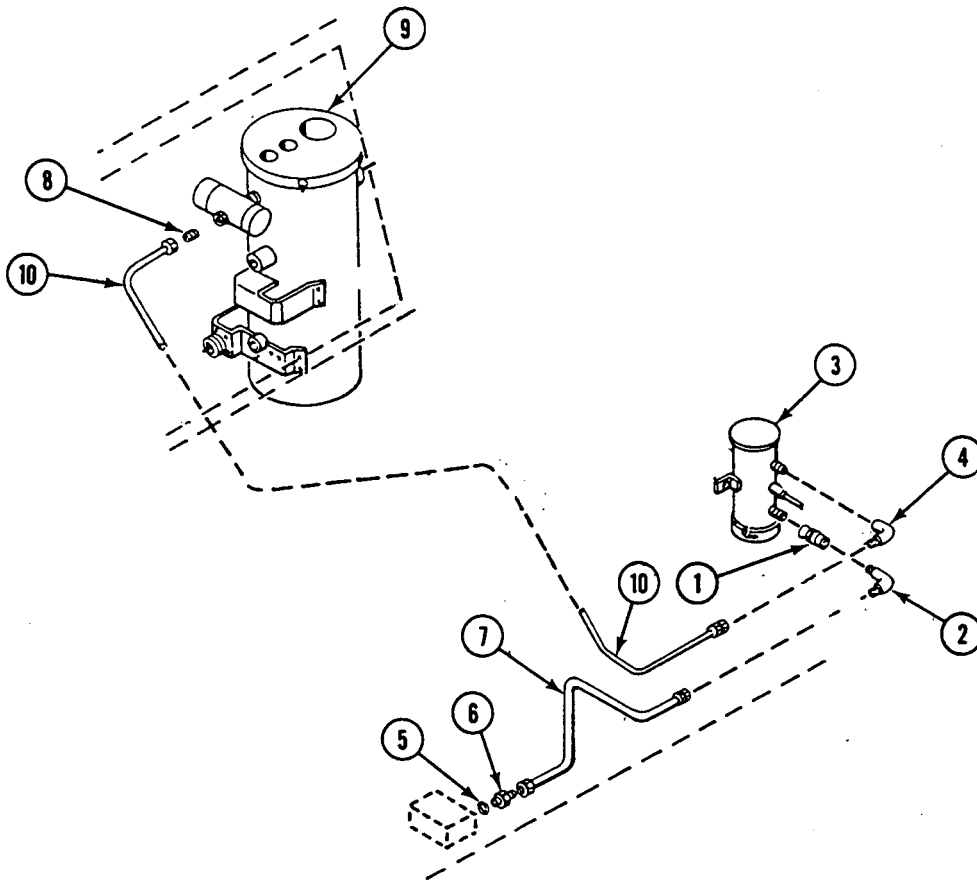
12. Install lower exhaust pipe (16), coolant heater (8), and personnel heater exhaust pipe on hull. Install two exhaust pipe straps (17), six washers (18), three screws (19) and one nut (20).
13. Install heater exhaust clamp (21) on lower exhaust pipe (16) and coolant heater (8).
14. Install exhaust pipe sump adapter (22) on lower exhaust pipe (16) and sump clamp (23).
15. Install upper exhaust pipe (24) on lower exhaust pipe (16), and secure with upper exhaust pipe clamp (25).
16. Install hood assembly (26) on upper exhaust pipe (24) and personnel heater upper exhaust pipe. Tighten three hood retaining screws (27), new lock washers (28), and nuts (29).



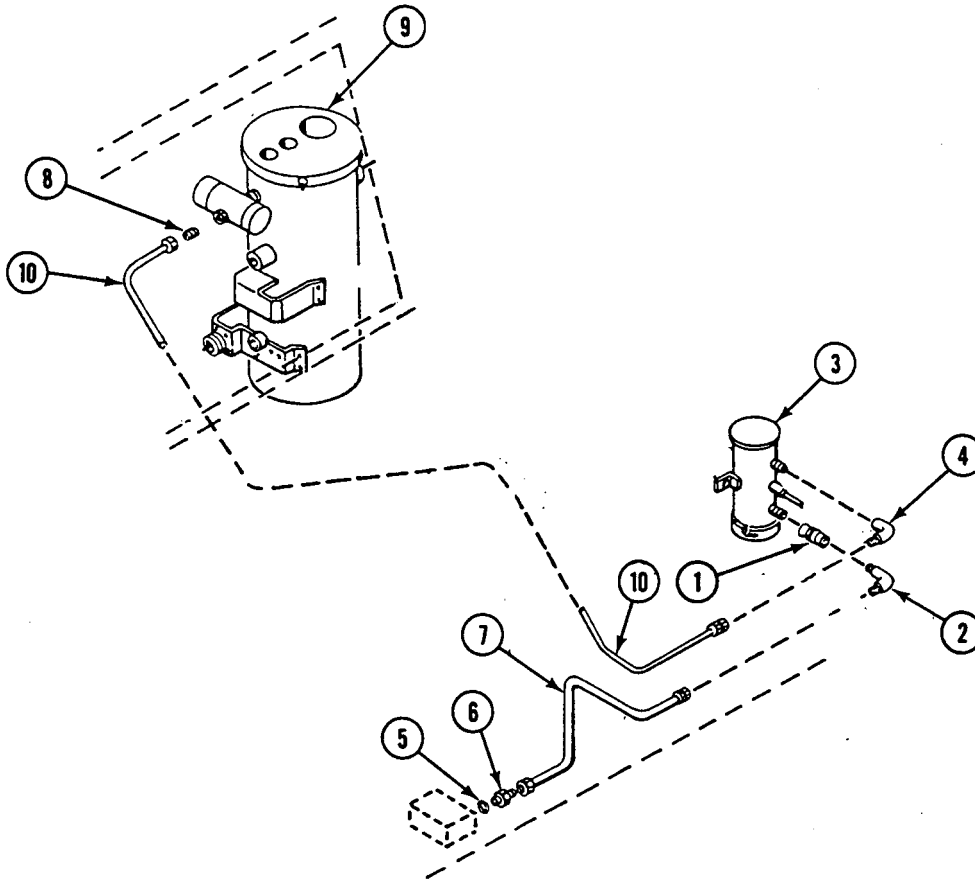
NOTE

Clean threads and apply light coat of sealing compound to threads of tapered pipe threads before installation. Apply a light coat of antiseize compound to threads of straight-threaded fittings before installation.

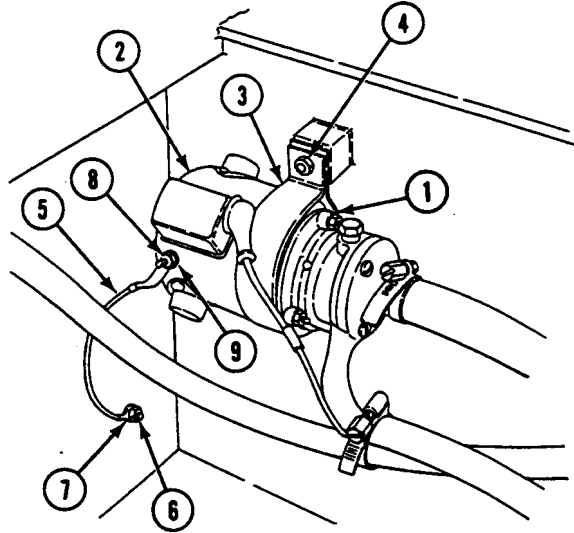
17. Install fuel pump inlet coupling (1) and fuel pump inlet elbow (2) on fuel pump (3).
18. Install fuel pump outlet elbow (4) on fuel pump (3).
19. Remove and discard plug and preformed packing (5) from fuel manifold.
20. Install new preformed packing (5) and manifold union (6) on fuel manifold.



21. Connect manifold-to-pump fuel tube assembly (7) to manifold union (6) and fuel pump inlet elbow (2).
22. Install heater fuel inlet nipple (8) on coolant heater (9).
23. Connect pump-to-heater fuel tube assembly (10) to fuel pump outlet elbow (4) and heater fuel inlet nipple (8).



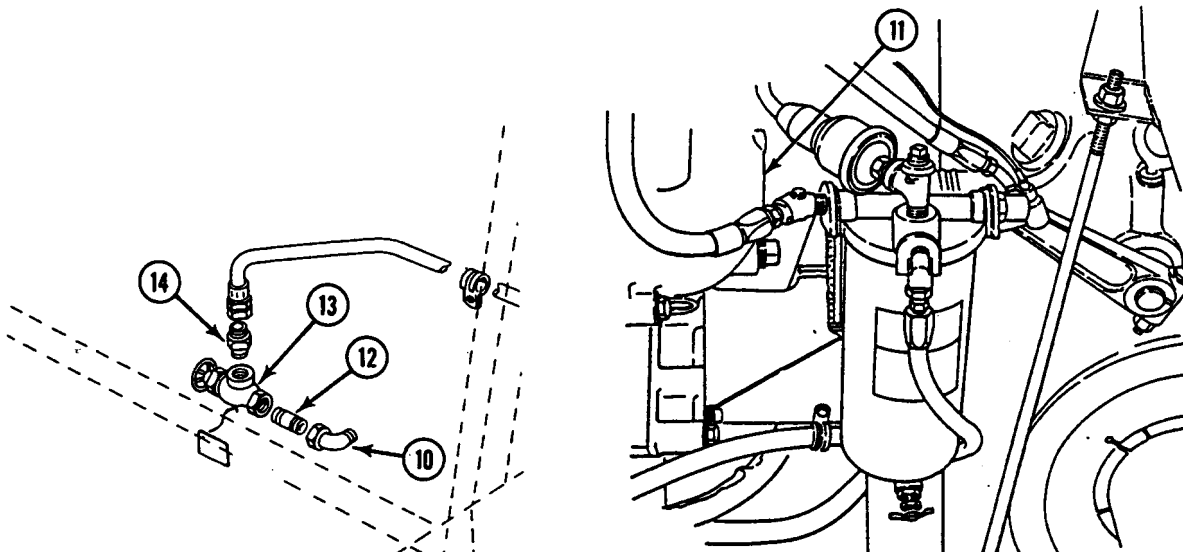
24. Install coolant pump support (1), coolant pump (2), and coolant pump clamp (3) on hull mounts with two coolant pump mounting screws (4).
25. Install pump ground lead assembly (5) on hull with ground lead screw (6) and ground lead washer (7).
26. Remove pump ground lead nut (8) from coolant pump (2). Install ground lead assembly (5) on pump (2) and secure with new lock washer (9) and nut (8).



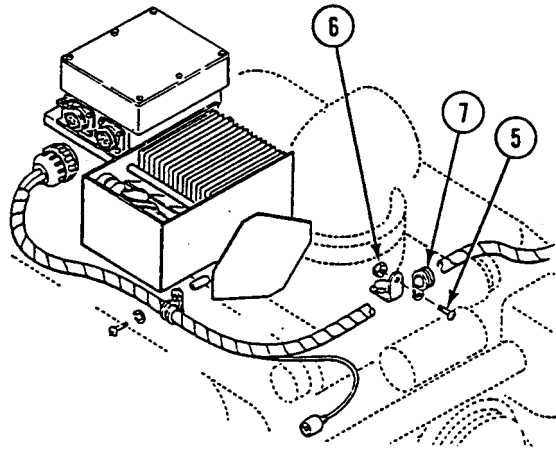
NOTE

Apply a light coat of sealing compound or antiseize compound to thread of tapered pipe or straight-threaded fittings before installation.

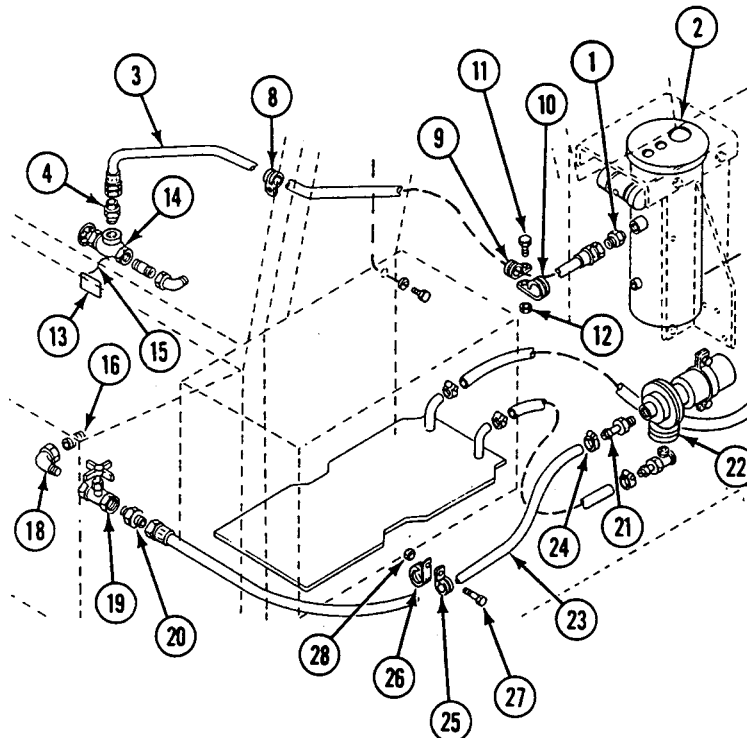
27. Install engine coolant inlet elbow (10) in right end of crossover tube (11).
28. Install engine coolant inlet nipple (12) on inlet elbow (10).
29. Install engine coolant inlet valve (13) on inlet nipple (12).
30. Install engine coolant inlet valve nipple (14) on inlet valve (13).



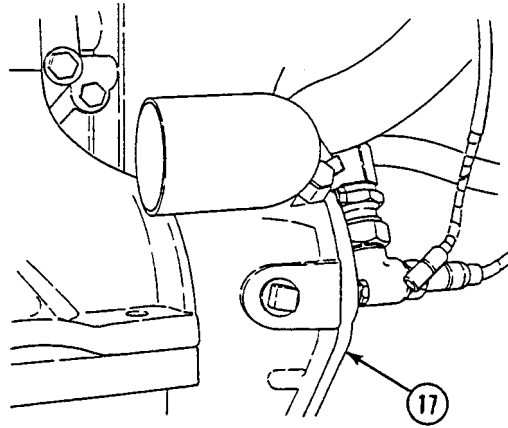
31. Install heater outlet nipple (1) in coolant heater (2).
32. Connect heater-to-engine hose assembly (3) to heater outlet nipple (1) and engine coolant valve nipple (4).
33. Remove screw (5) and nut (6) securing regulator branched wiring harness clamp (7) to engine. Install engine hose clamp (8) on heater-to-engine hose assembly (3) with screw (5) and nut (6).



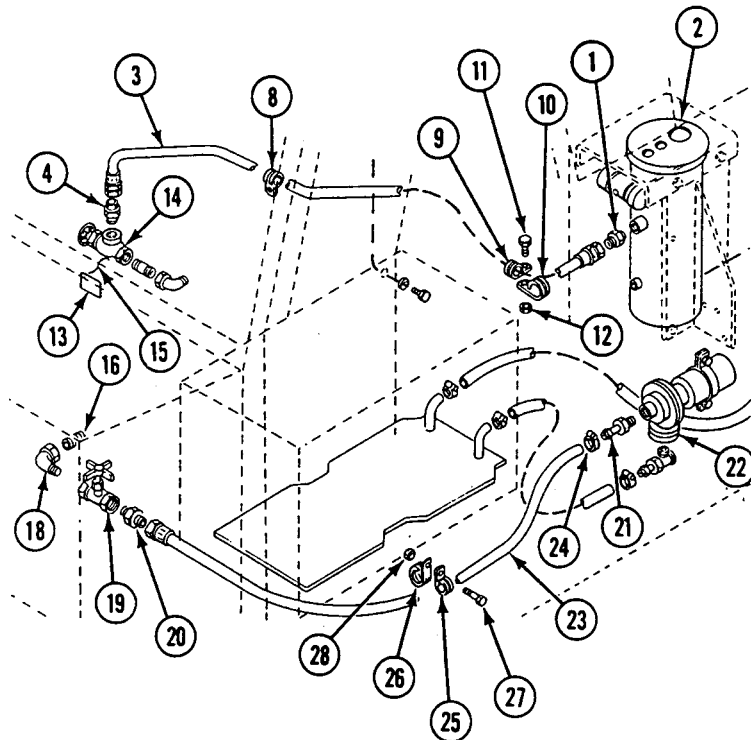
34. Install oil filler tube hose clamp (9) on heater-to-engine hose assembly (3) and oil filler tube clamp (10) on engine oil filler tube with oil filler tube clamp screw (11) and nut (12).
35. Install valve identification plate (13) on engine coolant inlet valve (14) with locking wire (15).



36. Install engine outlet nipple (16) in engine oil cooler housing (17).

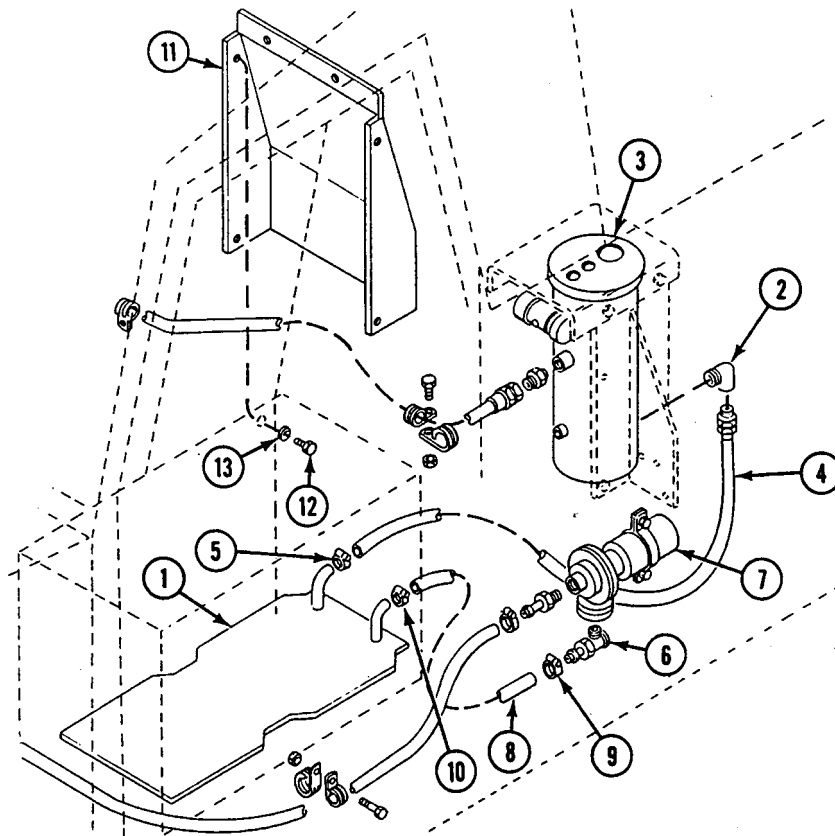


37. Install engine outlet elbow (18) on engine outlet nipple (16).
38. Install engine outlet valve (19) on engine outlet elbow (18).
39. Install engine outlet valve nipple (20) on engine outlet valve (19).
40. Install pump inlet hose adapter (21) in coolant pump (22).
41. Connect engine-to-pump hose assembly (3) to outlet valve nipple (20) and inlet hose adapter (21) with pump inlet hose clamp (23).
42. Install bilge pump tube hose clamp (24) on engine-to-pump hose assembly (3) and bilge pump tube clamp (25) on bilge pump tube with screw (26) and nut (27).



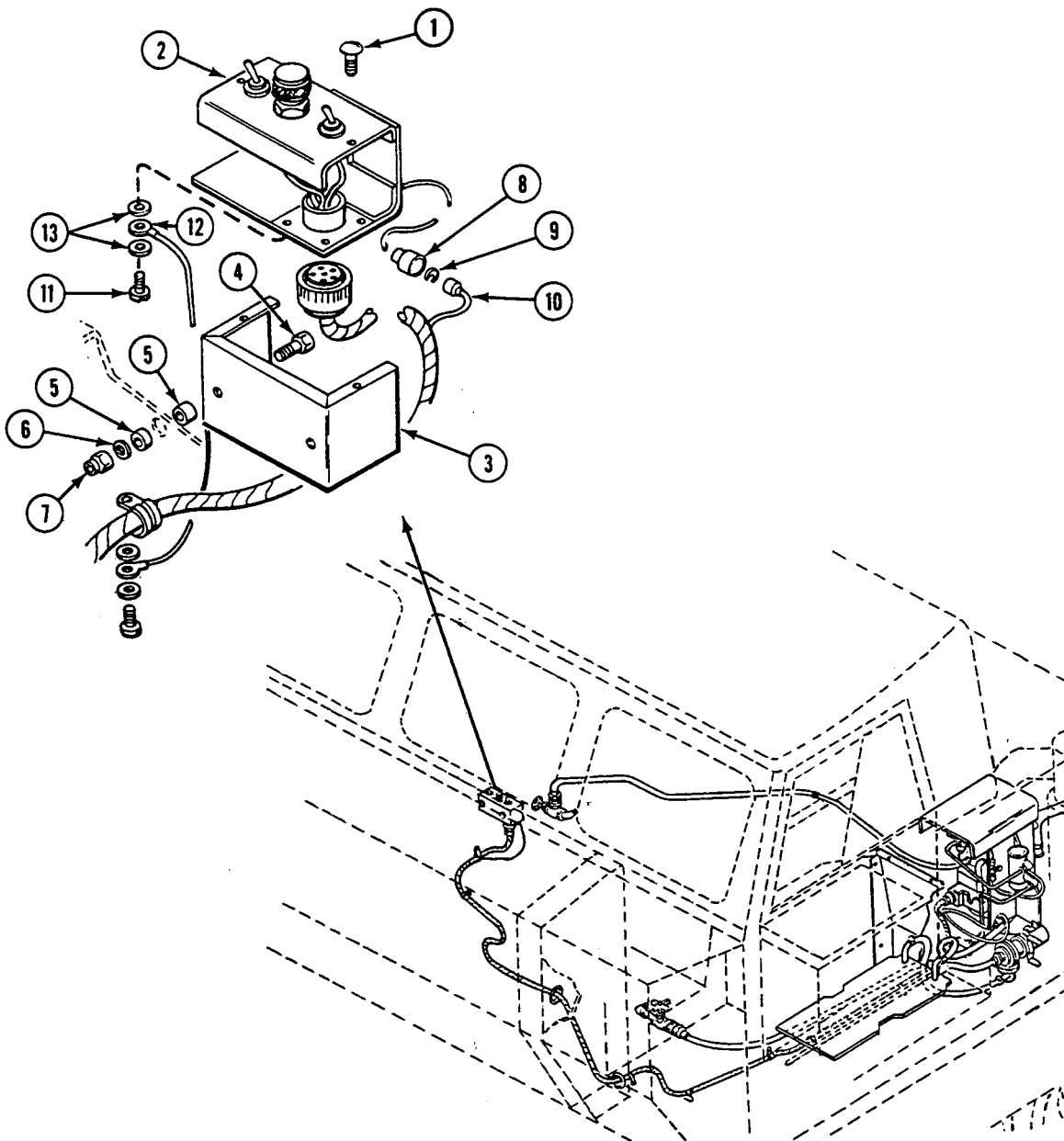
INSTALL ENGINE COOLANT HEATER KIT (M548A1) — Continued**0061 00**

43. Install heat exchanger plate (1) in battery frame in battery compartment. Install battery frame channel in battery compartment frame (see your -20).
44. Install heater inlet elbow (2) on coolant heater (3).
45. Connect plate-to-heater hose assembly (4) to heater inlet elbow (2) and exchanger plate (1) with plate outlet hose clamp (5).
46. Install pump outlet elbow (6) on coolant pump (7).
47. Install pump-to-plate hose (8) on pump outlet elbow (6), and exchanger plate (1) with pump outlet hose clamp (9) and plate inlet hose clamp (10).
48. Install battery compartment cover (11) on end of battery compartment with six cover screws (12) and washers (13).

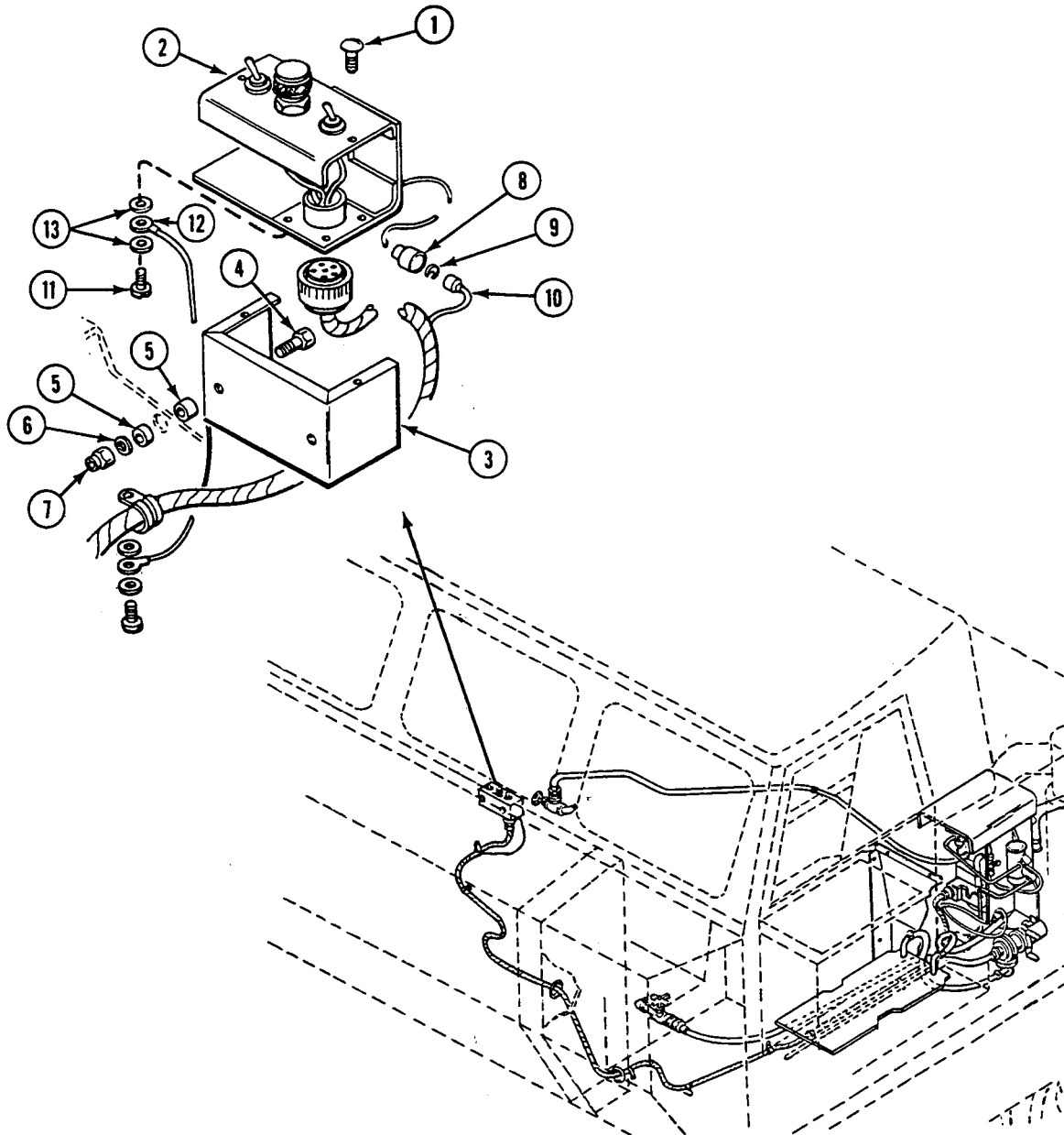


49. Disconnect right fuel inlet tube from fuel inlet elbow on air separator tank (see your -20).
50. Loosen right elbow retaining nut and remove right inlet elbow from air separator tank (see your -20). Discard right inlet elbow and packing. Retain ring and nut.
51. Install tee in top of air separator tank with new packing and retained ring and nut.
52. Install packing, nipple, and elbow on tee.

53. Install vacuum breaker valve and filter breather assembly in elbow.
54. Connect right fuel inlet tube on tee.
55. Remove two screws (1), control box panel (2), and control box cover (3). Remove panel.
56. Remove and discard two existing control box mounting nuts, washers, and screws from control box.
57. Install control box cover (3) on hull in cab with two control box mounting screws (4), rear mounts (5), washers (6), and nuts (7).
58. Install control box panel (2) in control box cover (3) with two screws (1).



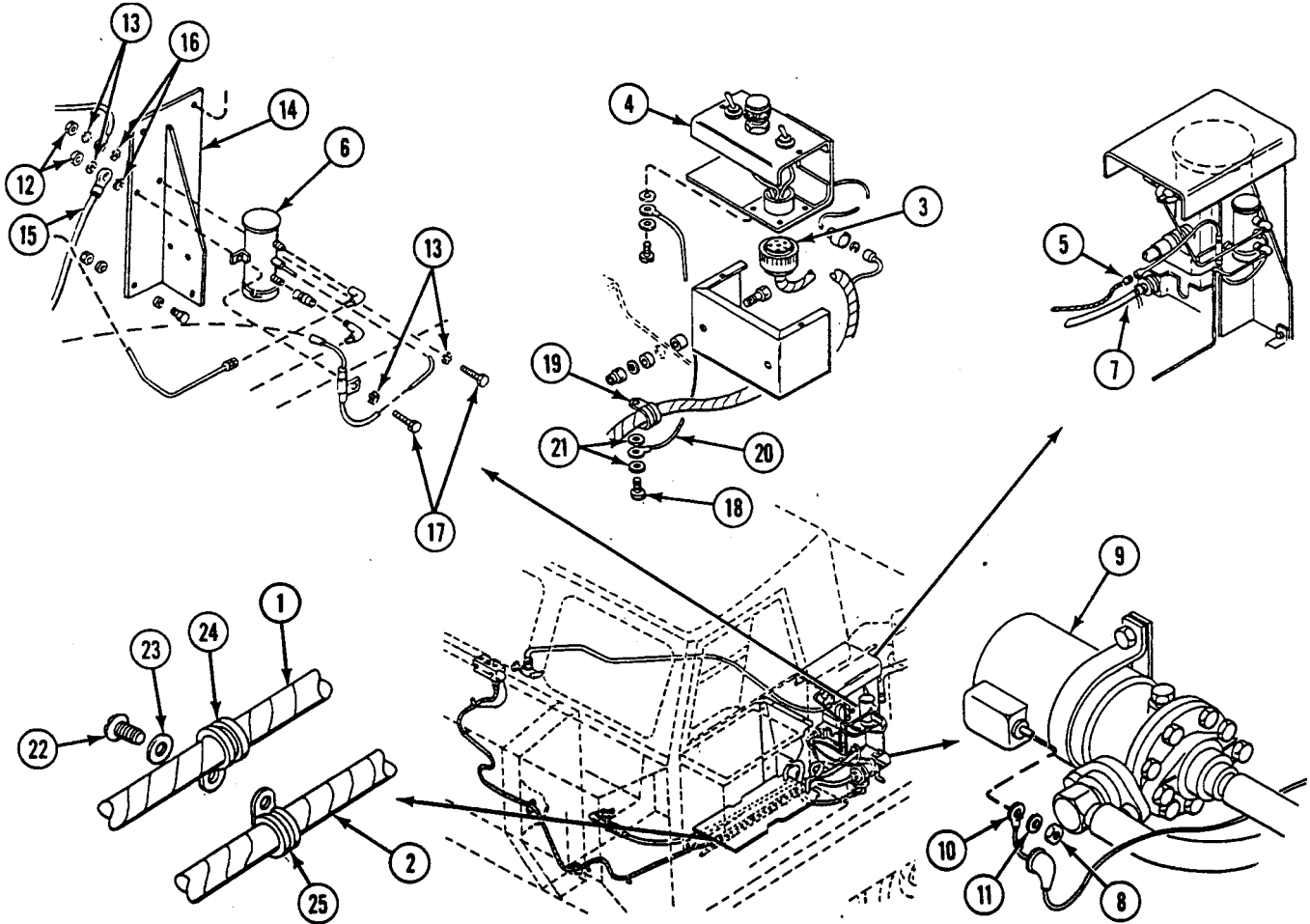
59. Remove and discard connector shell (8) and slotted washer (9) from control box lead (10).
60. Slide connector shell (8) on control box lead (10). Install slotted washer (9) on lead (10) and pull shell over washer.
61. Remove receptacle screw (11). Install control box ground strap (12) on control box panel (2) with two new lock washers (13) and screw (11).
62. Connect circuit 400A lead (10) to control box connector shell (8).



INSTALL ENGINE COOLANT HEATER KIT (M548A1) — Continued

0061 00

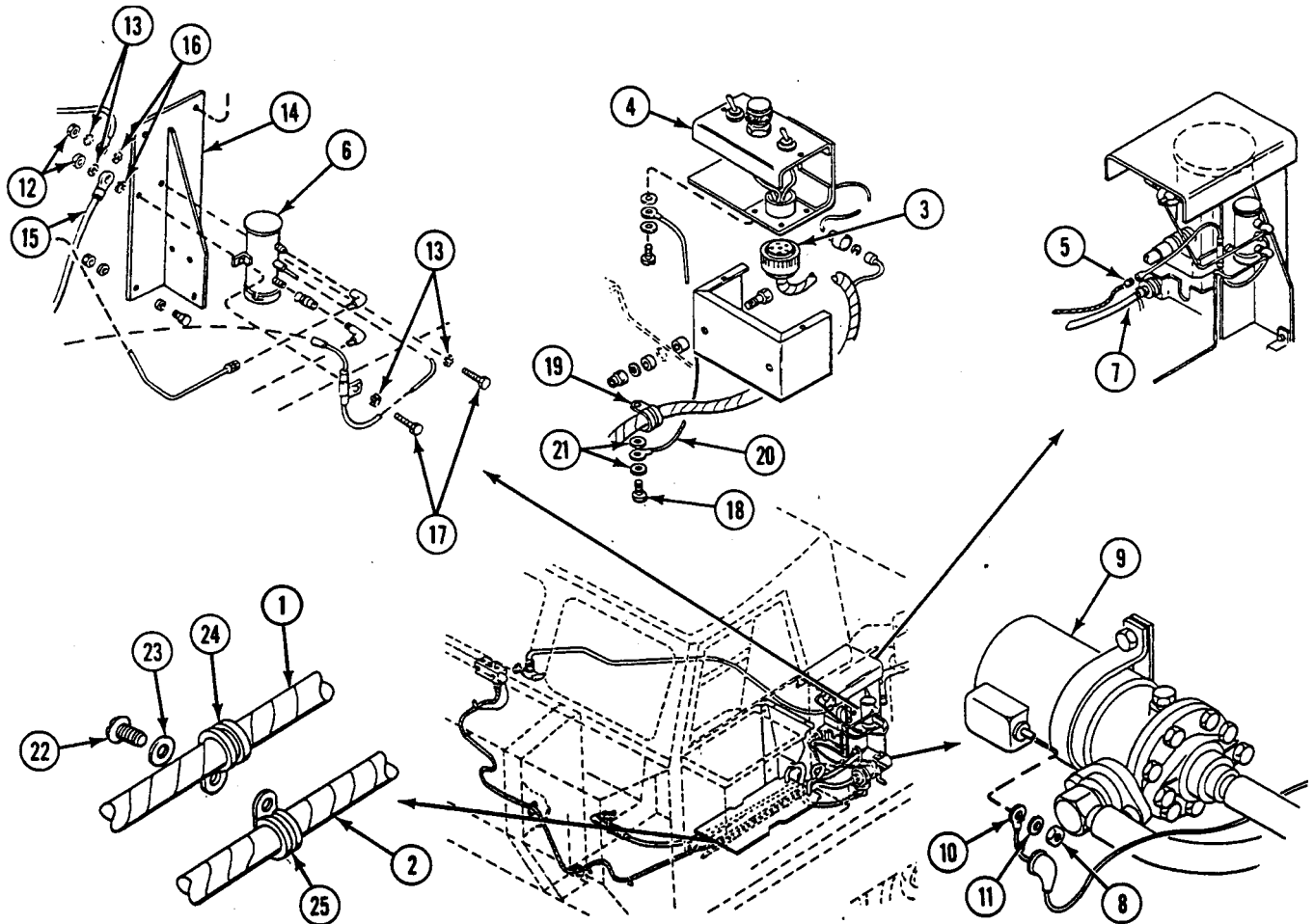
63. Route coolant heater wiring harness (1) in hull along cab heater wiring harness (2).
64. Connect control box connector (3) to control box panel (4).
65. Connect fuel pump circuit 402A lead (5) to fuel pump (6).
66. Connect heater connector (7) to coolant heater.



INSTALL ENGINE COOLANT HEATER KIT (M548A1) — Continued

0061 00

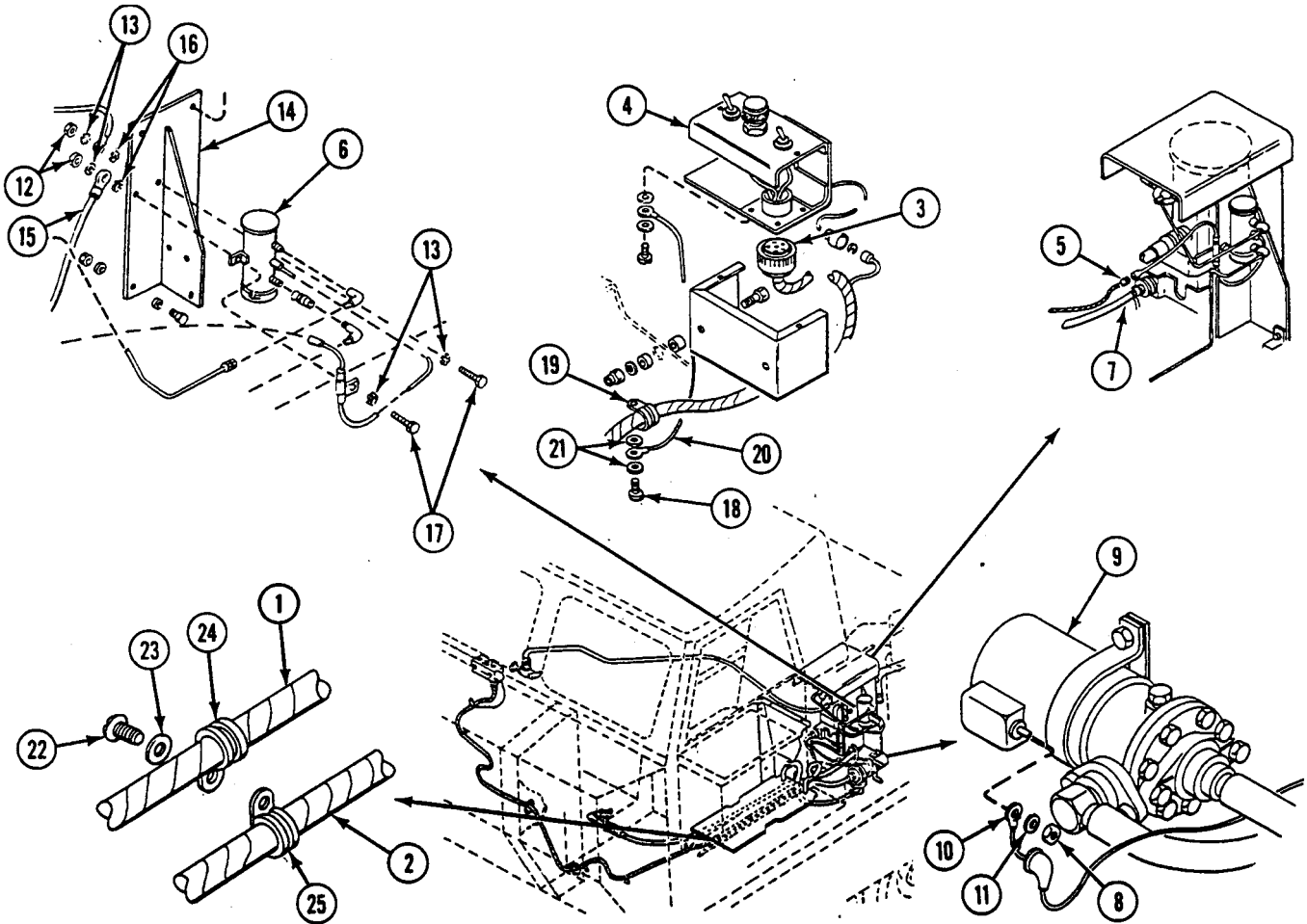
67. Remove lead nut (8) from coolant pump (9). Install coolant pump 402A lead (10) on coolant pump (9) with new lock washer (11) and nut (8).
68. Remove forward fuel pump nuts (12) and two lock washers (13) from fuel pump (6) and heater mounting bracket (14). Install wiring harness ground lead (15) and two new lock washers (16) on forward fuel pump screw (17) and nuts (12).
69. Remove ground strap screw (18) from cab heater ground strap behind control box. Install clamp (19) on wiring harness (1). Install clamp (19) and control box ground strap (20) on hull with two new lock washers (21) and screw (18).



INSTALL ENGINE COOLANT HEATER KIT (M548A1) — Continued

0061 00

70. Remove eight clamp screws (22) and lock washers (23) from cab heater wiring harness (2) and hull. Install eight coolant heater harness clamps (24) on wiring harness (1). Install eight cab heater harness clamps (25) and coolant heater harness clamps (24) on hull with eight screws (22) and new lock washers (23).
71. If cab personnel heater sign has not been installed, install caution sign 1/8 inch (3.18 mm) to left of pivot steer caution decal.
72. Install coolant heater warning decal 1/8 inch (3.18 mm) to right of pivot steer caution decal.
73. Install coolant heater control box decal on hull above control box with top of decal 1/8 inch (3.18 mm) below edge of hull.



FOLLOW-THROUGH STEPS

1. Fill cooling system (see your -20).
2. Install batteries (see your -20).
3. Start and operate heater on both high and low heat (see your -10). Check operation of heater and inspect for fuel and coolant leaks. If leaks are found, tighten connections. Turn heater off.
4. Install throttle floor plate (see your -20).
5. Install cab left floor plate (see your -20).
6. Lower cab center floor plate (see your -10).
7. Lower cab personnel center seat (see your -10).
8. Install top left access grille (see your -10).

END OF TASK

INSTALL ENGINE COOLANT HEATER KIT (M548A3)

0062 00

THIS WORK PACKAGE COVERS:

Installation (page 0062 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

References

See your -10
See your -20

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)
Torque Wrench (WP 0078 00, Item 84)

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Batteries and frame removed (see your -20)
Cooling system drained (see your -20)
Power plant removed from carrier (see your -20)
Radiator removed (see your -20)
Cab personnel center seat raised (see your -10)
Top left access grille removed (see your -10)
Cab center floor plate removed (see your -10)
Cab left floor plate removed (see your -20)
Throttle floor plate removed (see your -20)

Materials/Parts

Antifreeze (WP 0080 00, Item 5)
Antiseize compound (WP 0080 00, Item 6)
Heater kit – Part of Winterization kit P/N 57K1410

Personnel Required

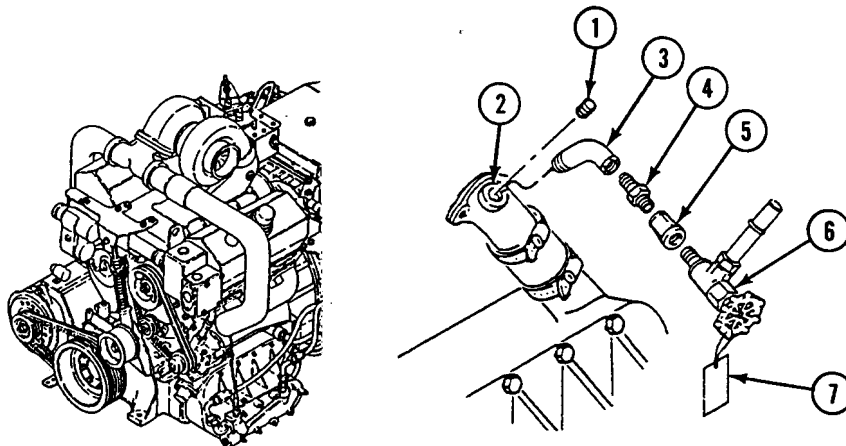
Track Vehicle Repairer 63H

INSTALLATION

NOTE

Apply a light coat of antiseize compound to threads of tapered pipe or straight- thread fittings before installation.

1. Remove plug (1) from transmission oil cooler to engine block inlet elbow (2). Save plug.
2. Install elbow (3) in inlet elbow (2).
3. Install nipple (4) and reducer (5) on elbow (3).
4. Install valve (6) at approximate angle shown. Safety wire tag (7) to valve.

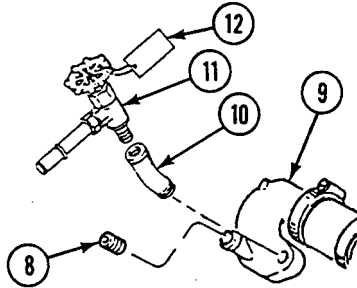


5. Remove plug (8) from left end of coolant crossover tube elbow (9). Save plug.

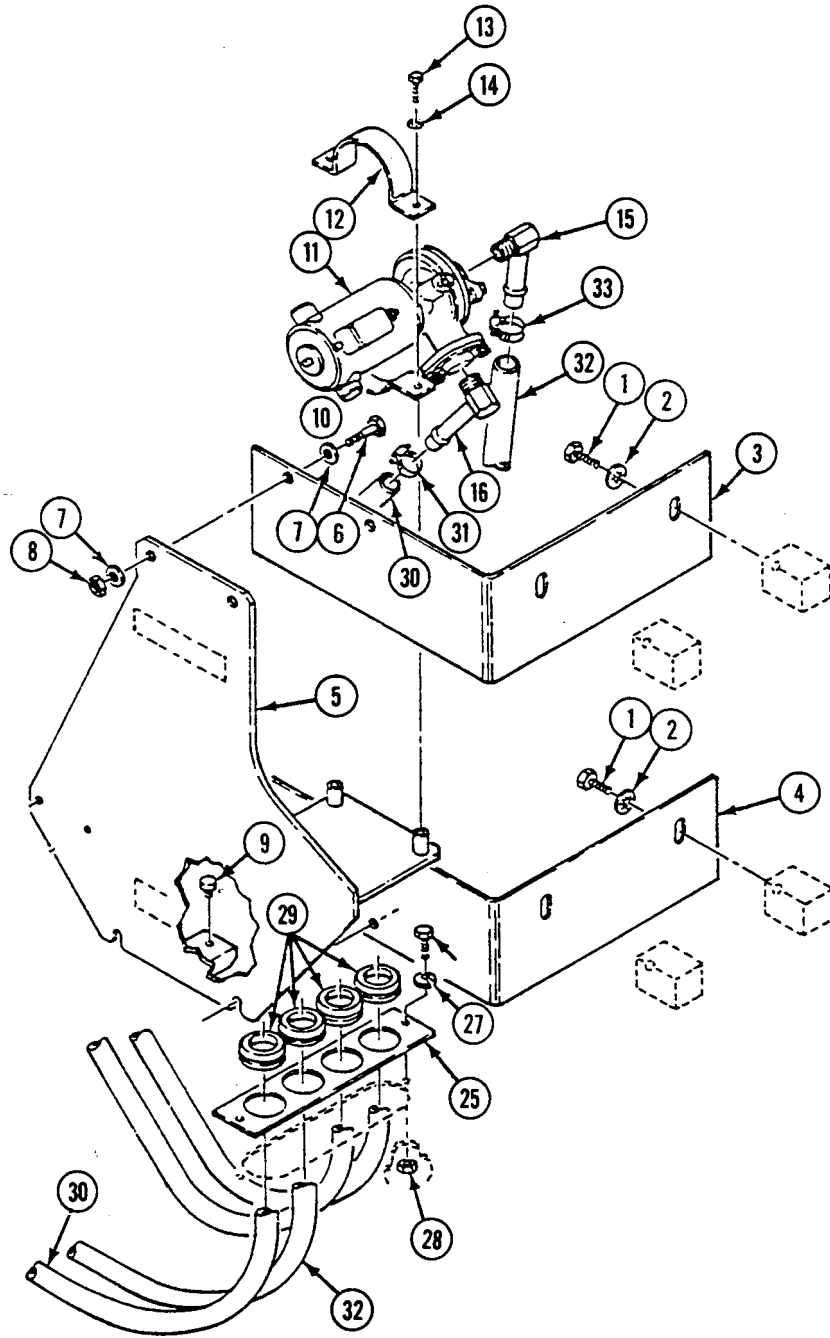
INSTALL ENGINE COOLANT HEATER KIT (M548A3) — Continued

0062 00

6. Install elbow (10) in crossover tube elbow (9).
7. Install valve (11) at approximate angle shown. Safety wire tag (12) to valve.

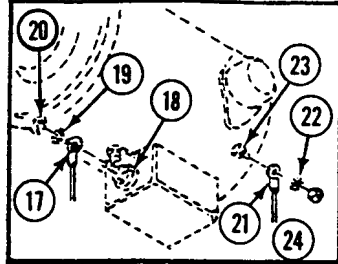


8. Install four screws (1), lock washers (2), bracket (3) and bracket (4) on bulkhead.
9. Install bracket (5) on bracket (3), bracket (4), with four screws (6), eight washers (7) and four lock nuts (8).
10. Install bumper (9) on bracket (5).
11. Install support (10), coolant pump (11), clamp (12), two screws (13) and lock washers (14) on bracket (5).
12. Install elbow (15) on inlet port and elbow (16) on outlet port of coolant pump.

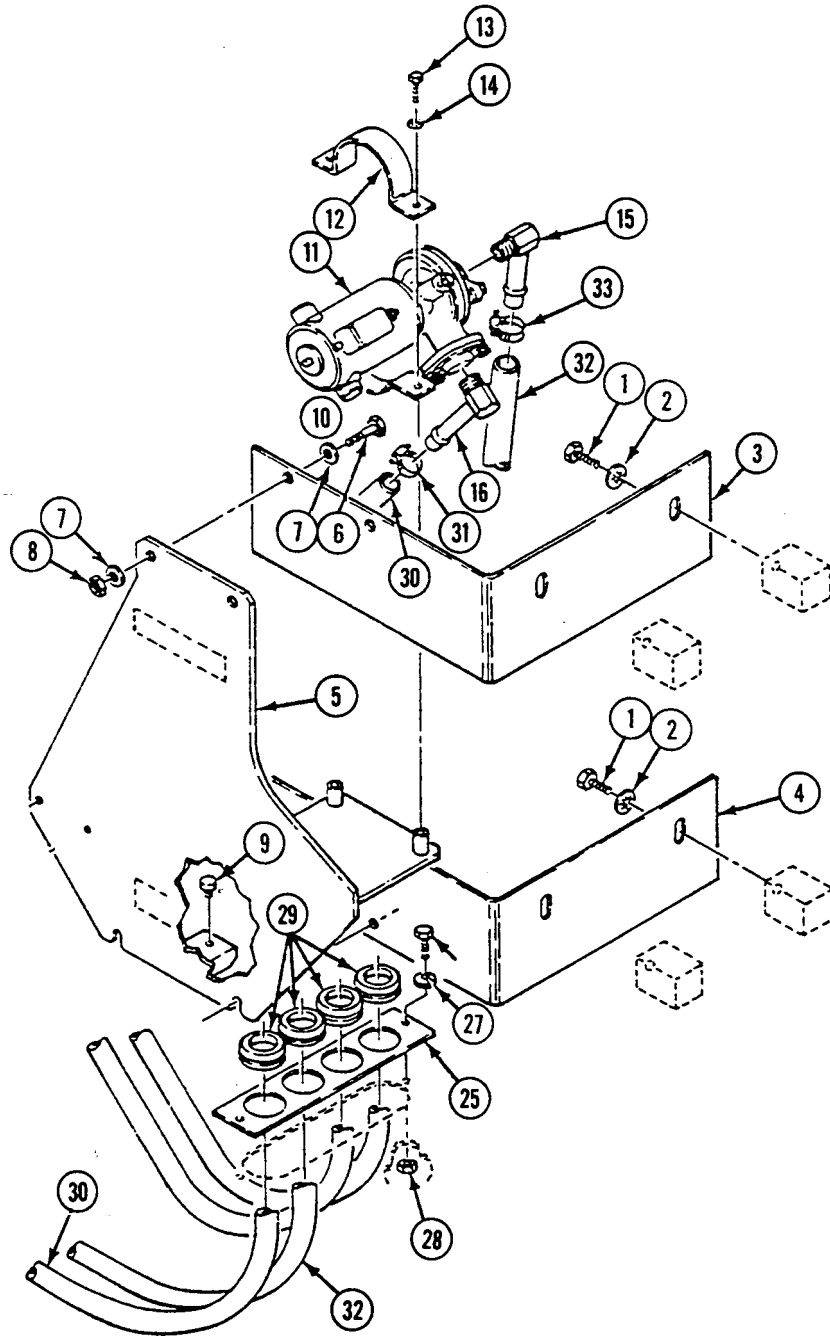


INSTALL ENGINE COOLANT HEATER KIT (M548A3) — Continued**0062 00**

13. Install circuit lead 402 (17) to coolant pump terminal (18). Secure with lock washer (19) and lock nut (20).
14. Install lead (21) and washer (22) on coolant pump terminal (23). Secure with lock nut (24).



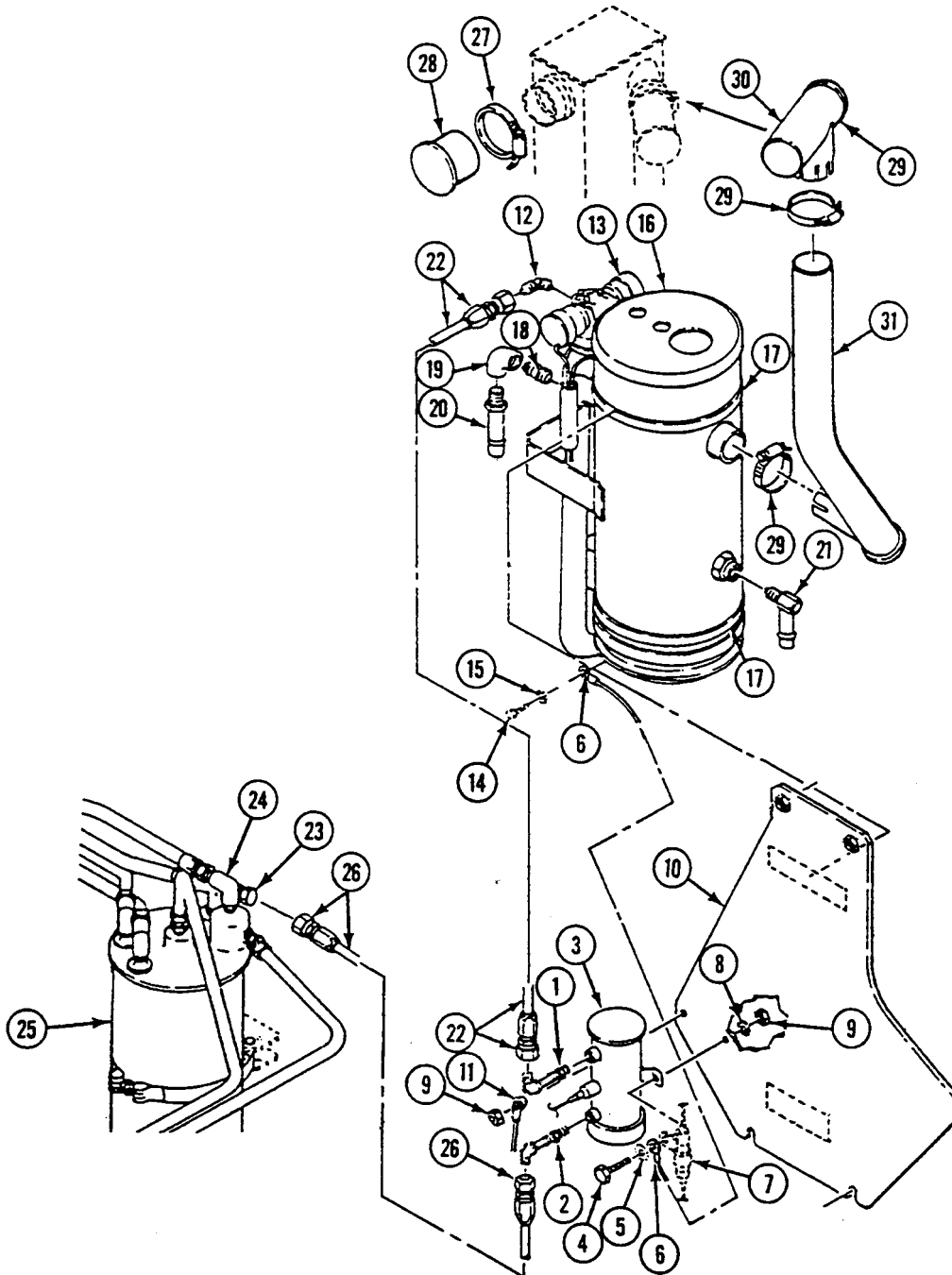
15. Install bracket (25), two screws (26), lock washers (27) and nuts (28) on floor plate.
16. Install four grommets (29) in bracket (25).
17. Route hose (30) to coolant pump outlet up through grommet (29). Install hose and clamp (31) on outlet port elbow (16). Tighten clamp.
18. Route hose (32) to coolant pump inlet up through grommet (29). Install hose and clamp (33) on inlet port elbow (15). Tighten clamp.



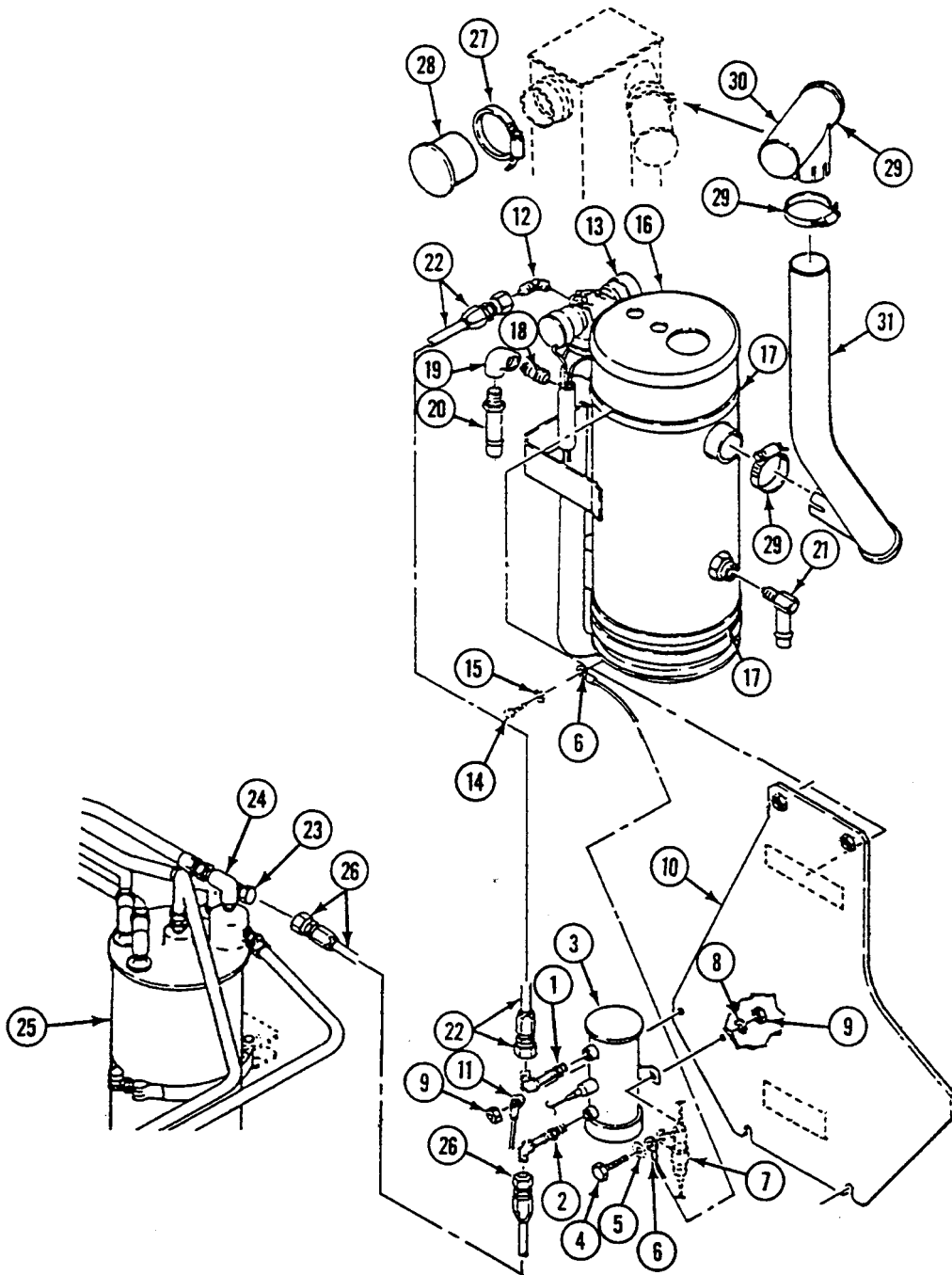
INSTALL ENGINE COOLANT HEATER KIT (M548A3) — Continued

0062 00

19. Install adapter (1) and adapter (2) on fuel pump (3).
20. Install fuel pump (3), screw (4), lock washer (5), coolant heater ground lead (6), capacitor (7), lock washer (8) and lock nut (9) on bracket (10). Do not tighten lock nut.
21. Install screw (4), lock washer (5), wiring harness ground lead (11), lock washer (8) and lock nut (9) on bracket (10).
22. Install elbow (12) on coolant heater fuel valve (13).
23. Install screw (14), lock washer (15) and ground lead (6) on coolant heater (16).

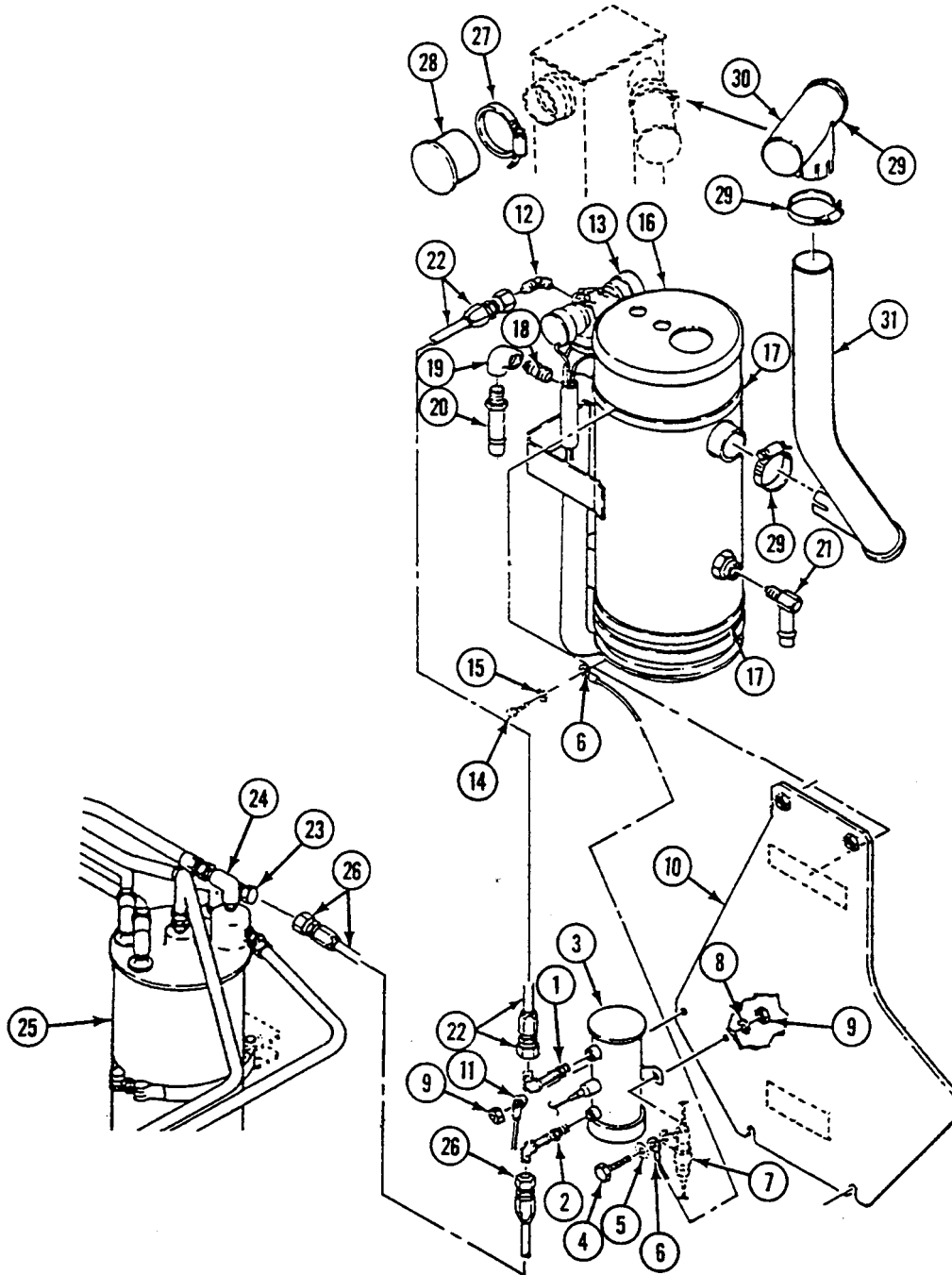


24. Set coolant heater on bracket (10) and tighten two clamps (17)
25. Install nipple (18) on coolant heater (16).
26. Install elbow (19) on nipple (18).
27. Install adapter (20) on elbow (19).
28. Install elbow (21) on coolant heater (16).
29. Install hose (22) on adapter (1) on fuel pump (3) and elbow (12) on fuel valve (13).
30. Remove cap (23) from tee (24) on air fuel separator (25).



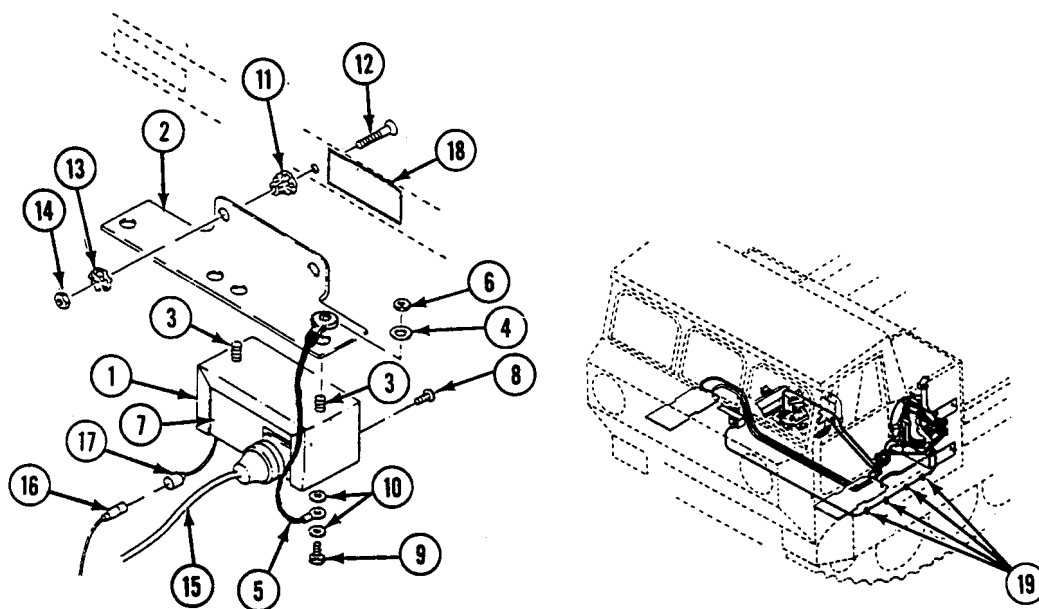
INSTALL ENGINE COOLANT HEATER KIT (M548A3) — Continued

31. Install hose (26) on adapter (2) on fuel pump (3) and tee (24) on air fuel separator (25).
32. Install clamp (27) and cap (28) on exhaust housing.
33. Place three clamps (29) and adapter (30) on exhaust pipe (31). Place clamp on adapter and align with coolant heater and exhaust housing. Tighten clamps.

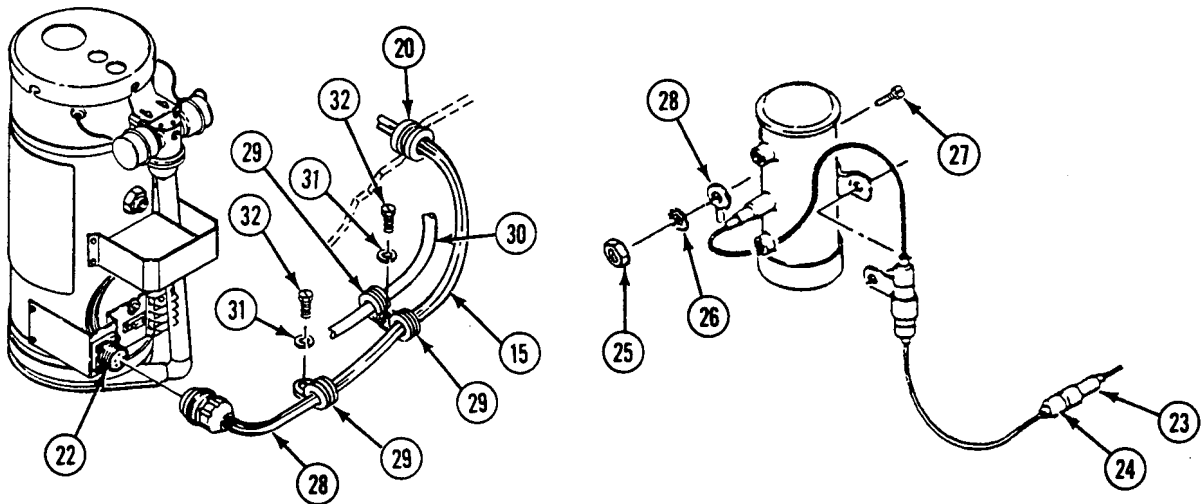


INSTALL ENGINE COOLANT HEATER KIT (M548A3) — Continued**0062 00**

34. Install personnel heater control box on mounting bracket (see your -20).
35. Install control box (1) on bracket (20) with two screws (3), lock washers (4), ground lead (5) and two nuts (6).
36. Install control box panel (7) in control box (1) with two screws (8).
37. Install ground lead (5) to control box (1) with screw (9) and two lock washers (10).
38. Press two mounts (11) into bracket (2).
39. Install bracket (2) on dashboard with two screws (12), lock washers (13) and nuts (14).
40. Connect coolant heater wiring harness (15) to control box (1).
41. Connect circuit 400A (16) to control box lead (17).
42. Place decal (18) over control box (1) on dashboard.
43. Route wiring harness (15) along existing harnesses and through left side battery box. Strap to existing harnesses with 10 tie straps (19).



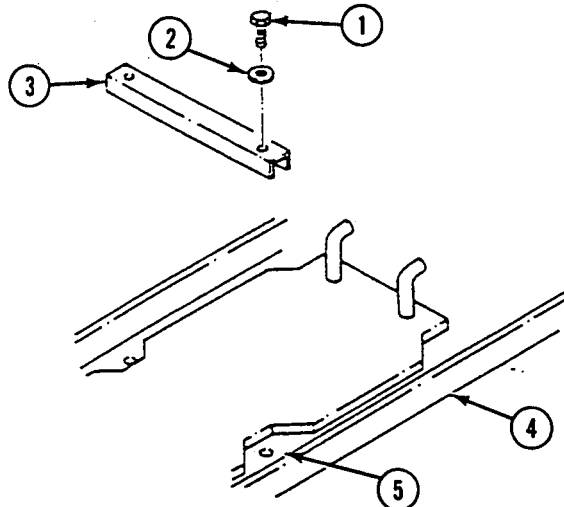
44. Press grommet (20) into rear bulkhead.
45. Route wiring harness (15) through grommet (20).
46. Install connector (21) on coolant heater receptacle (22).
47. Install lead (23) on fuel pump lead (24).
48. Remove lock nut (25) and lock washer (26) from screw (27). Install ground lead (28), lock washer (26) and lock nut (25) on screw (27).
49. Place three clamps (29) on wiring harness (15) and fuel hose (30). Secure with two lock washers (31) and screws (32).



NOTE

Install left and right heat exchanger the same way.

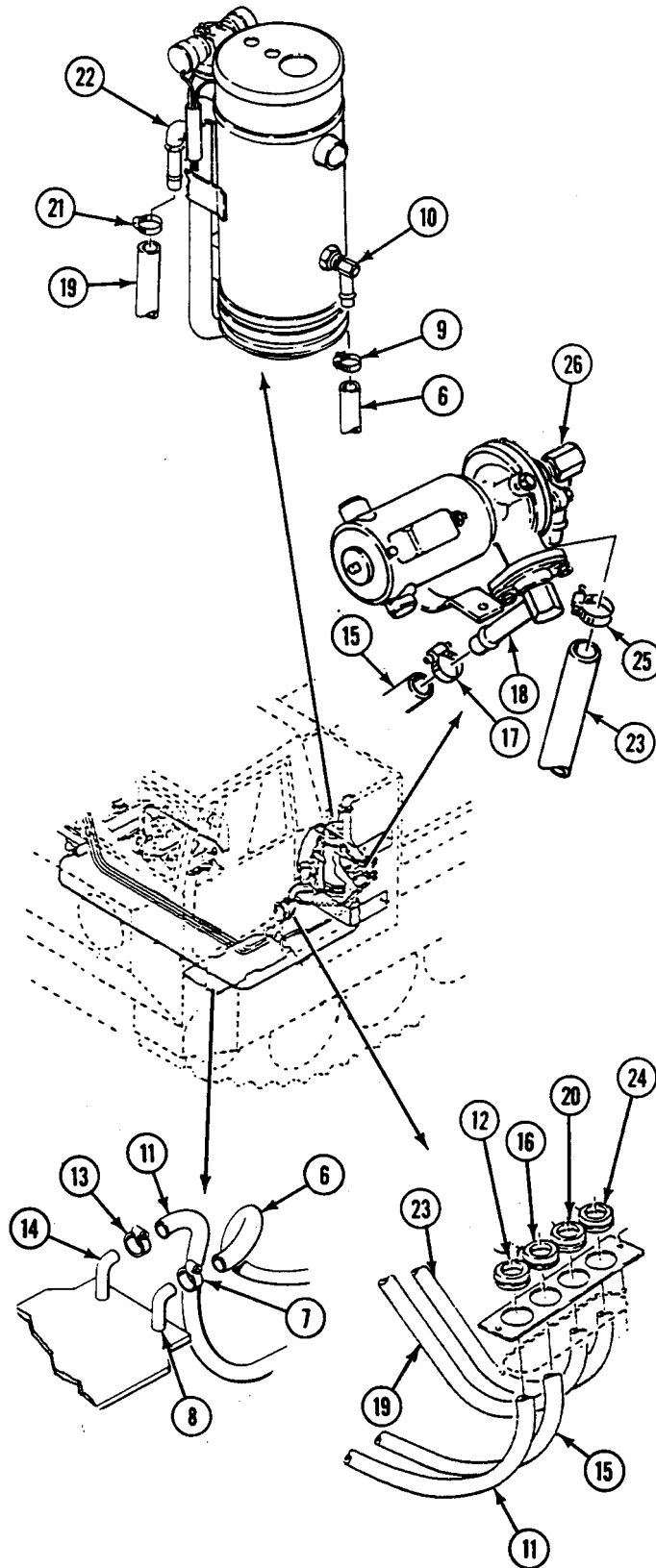
50. Remove two screws (1), washers (2) and channel (3) from battery box frame (4).
51. Place heat exchanger (5) outlets in frame with outlets toward rear of carrier.
52. Install channel (3), two washers (2) and screws (1) in frame (4). Tighten screws to 20-25 lb-ft (27-34 N•m) torque.



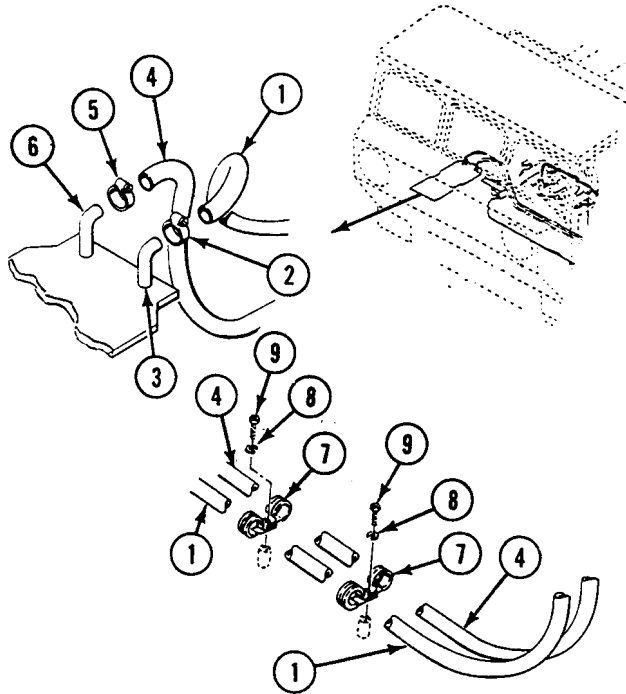
INSTALL ENGINE COOLANT HEATER KIT (M548A3) — Continued

0062 00

53. Install hose (6) and clamp (7) on left heat exchanger outlet tube (8). Tighten clamp.
54. Install hose (6) and clamp (9) on coolant heater inlet tube (10). Tighten clamp.
55. Route hose (11) up through grommet (12). Install hose (11) and clamp (13) on left heat exchanger inlet tube (14). Tighten clamp.
56. Route hose (15) up through grommet (16). Install hose (15) and clamp (17) on coolant pump outlet elbow (18). Tighten clamp.
57. Route hose (19) up through grommet (20). Install hose (19) and clamp (21) on coolant heater outlet elbow (22). Tighten clamp.
58. Route hose (23) up through grommet (24). Install hose (23) and clamp (25) on coolant pump inlet elbow (26). Tighten clamp.

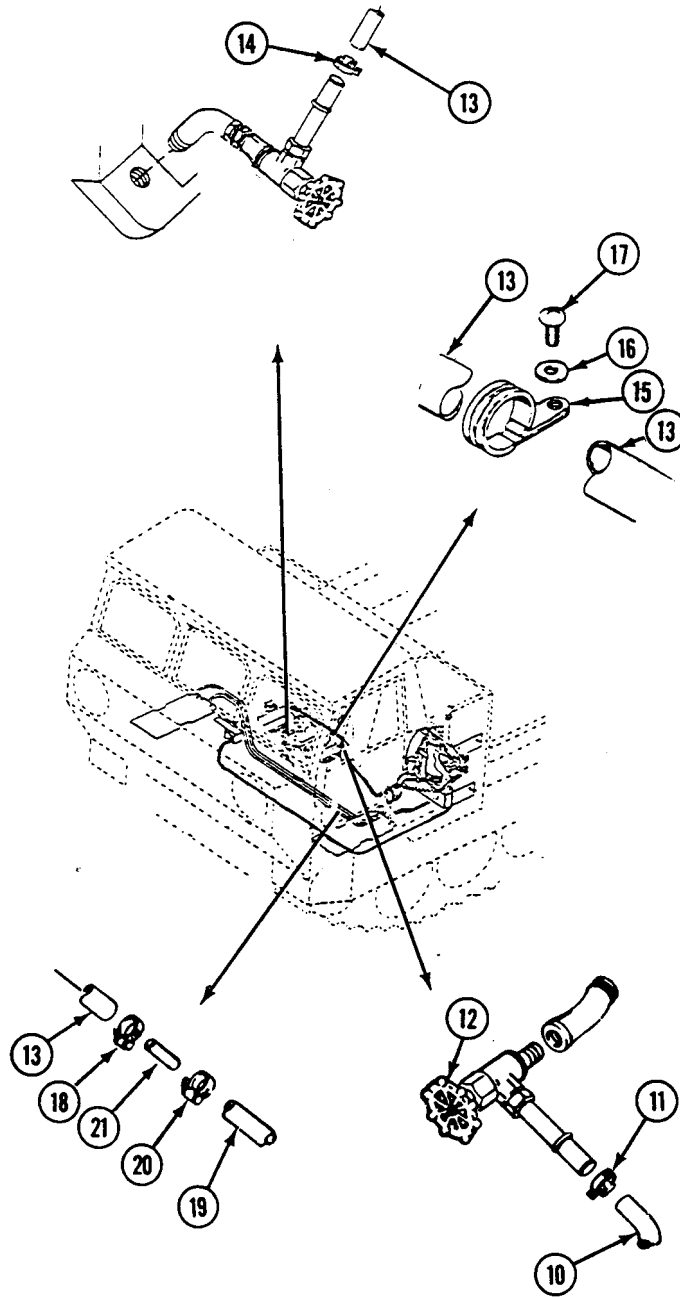


59. Route hose (1) across carrier. Install hose and clamp (2) on right battery heat exchanger tube (3). Tighten clamp.
60. Route hose (4) across carrier. Install hose and clamp (5) on right battery heat exchanger tube (6). Tighten clamp.
61. Install four clamps (7) on hose (1) and hose (4). Secure hoses to carrier with two lock washers (8) and screws (9).

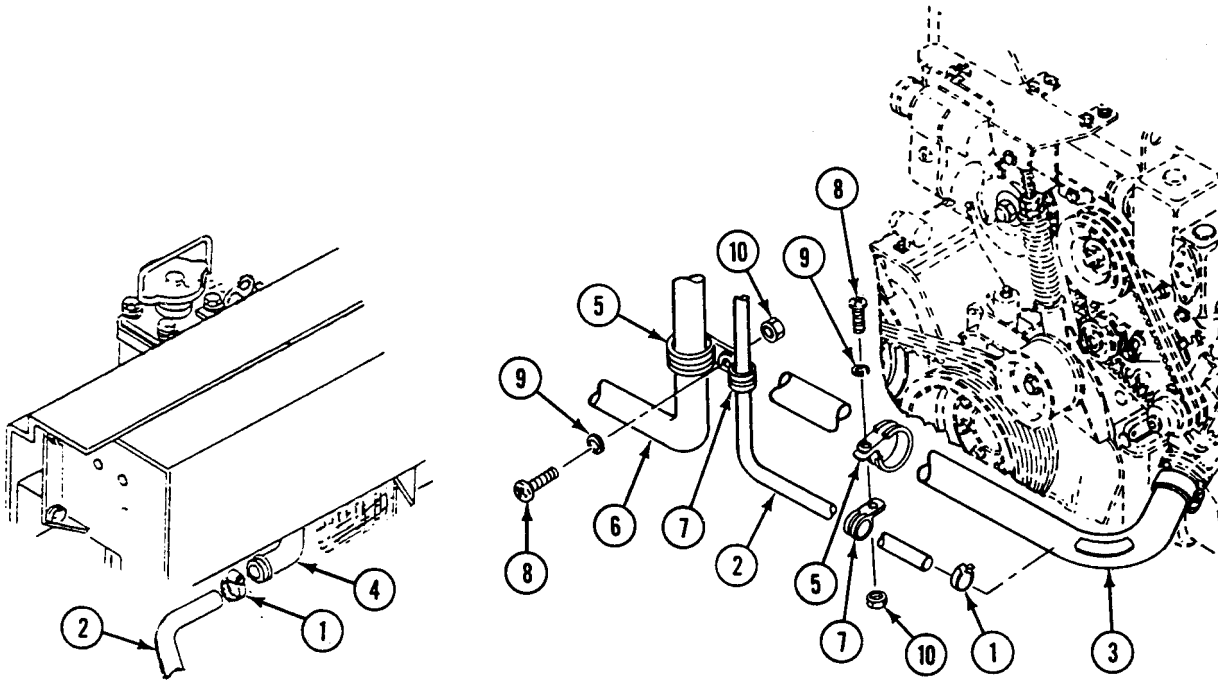


62. Install radiator (see your -20).
63. Remove and install new alternator drive belt (see your -20).
64. Install power plant (see your -20).
65. Remove and install new fan drive belt (see your -20).

66. Install hose (10) and clamp (11) on left side valve (12). Tighten clamp.
67. Install hose (13) and clamp (14) on right side valve (15). Tighten clamp.
68. Route hose (13) over top of power plant. Place clamp (15) on hose (13) and secure to carrier with lock washer (16) and screw (17).
69. Install hose (13) and clamp (18) and hose (19) and clamp (20) on union (21). Tighten clamps.



70. Loosen two clamps (1) and remove hose (2) from coolant tube (3) and auxiliary tank (4).
71. Install new hose (2) and two clamps (1) on coolant tube (3) and auxiliary tank (4).
72. Install two clamps (5) on coolant tube (3) and radiator tube (6). Install two clamps (7) on hose (2). Secure with two screws (8), washers (9) and lock nuts (10).



FOLLOW-THROUGH STEPS

1. Fill cooling system (see your -20).
2. Start and operate heater on both high and low heat (see your -10). Check operation of heater and inspect for fuel and coolant leaks. If leaks are found, tighten connections. Turn heater off.
3. Install throttle floor plate (see your -20).
4. Install cab left floor plate (see your -20).
5. Install cab center floor plate (see your -10).
6. Lower cab personnel center seat (see your -10).
7. Install top left access grille (see your -10).

END OF TASK

COOLANT HEATER/PUMP DATA

0063 00

THIS WORK PACKAGE COVERS:

Inspection-Acceptance and Rejection Criteria (page 0063 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

INSPECTION-ACCEPTANCE AND REJECTION CRITERIA

- The engine coolant heater/pump specifications are listed in the following table.

Table 1. 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 (21°C) | | |
| Start | 12.0 amp | |
| Run | 1.5 amp | |
| Ampere draw - maximum below 70°F (21°C) | | |
| Start | 15.0 amp | |
| Run | 3.5 amp | |
| Performance | | |
| Fuel | grades DF-1, DF-2, DFA, CIE, and JP-4 | |
| Fuel consumption: | | |
| 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: | | |

COOLANT HEATER/PUMP DATA — Continued

0063 00

| | | |
|--------------------------------|----------------|---------------------|
| Overheat thermostat (open) | 245°F | 118°C |
| Restriction thermostat setting | 160°F | 71°C |
| Dimensions and weight: | | |
| Height | 10 in. | 25 cm |
| Length | 15-5/16 in. | 39 cm |
| Width | 6-3/16 in. | 16 cm |
| Weight | 15 lb | 7 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

0064 00

THIS WORK PACKAGE COVERS:

- Test Setup (page 0064 00-2).
 - Testing (page 0064 00-4).
 - Burn Test (page 0064 00-4).
 - Testing Restriction and Overheat Thermostats (page 0064 00-6).
-

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G

Tools and Special Tools

Automotive Fuel and Electrical System Repair Tool Kit
(WP 0078 00, Item 64)

Multimeter (WP 0078 00, Item 36)

Heater Test Stand (WP 0078 00, Item 61)

Or

24 Vdc Power Source (assembled batteries)

Heater Control Box

Suitable Rack or Cradle

Suitable Coolant Container, 5 gallon (18.93 l) minimum

Suitable Exhaust Hose, 10 feet (3.1 m) maximum

Fuel Source

Fuel Filter

Fuel Pump

Thermometer (WP 0078 00, Item 62)

Stopwatch (or watch with second hand)

References

See your -10

See your -20

TM 9-4910-755-13&P

Equipment Condition

Coolant heater removed from carrier (see your -20)

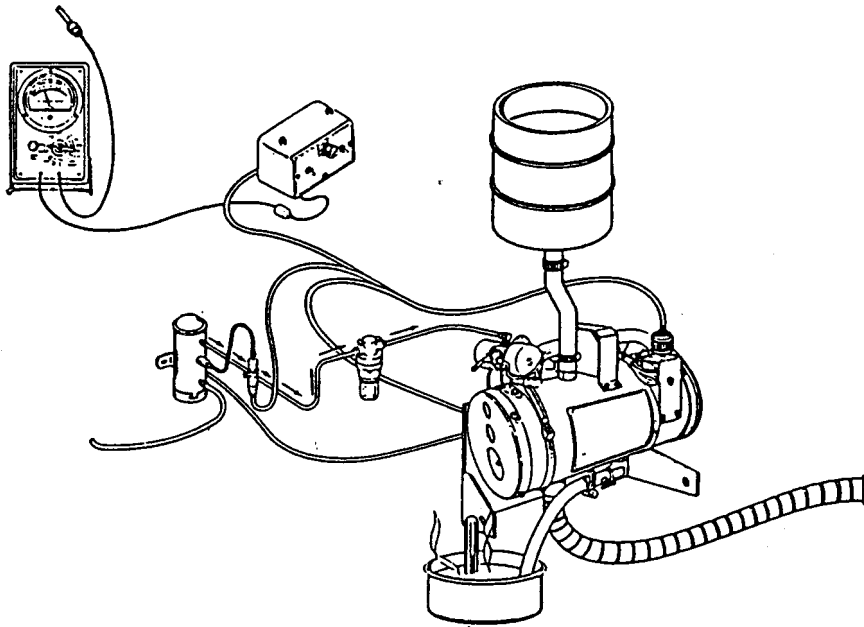
TEST AND INSPECTION

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. Use heater test stand. See TM 9-4910-755-13&P, or the suggested typical test setup shown.



COOLANT SYSTEM

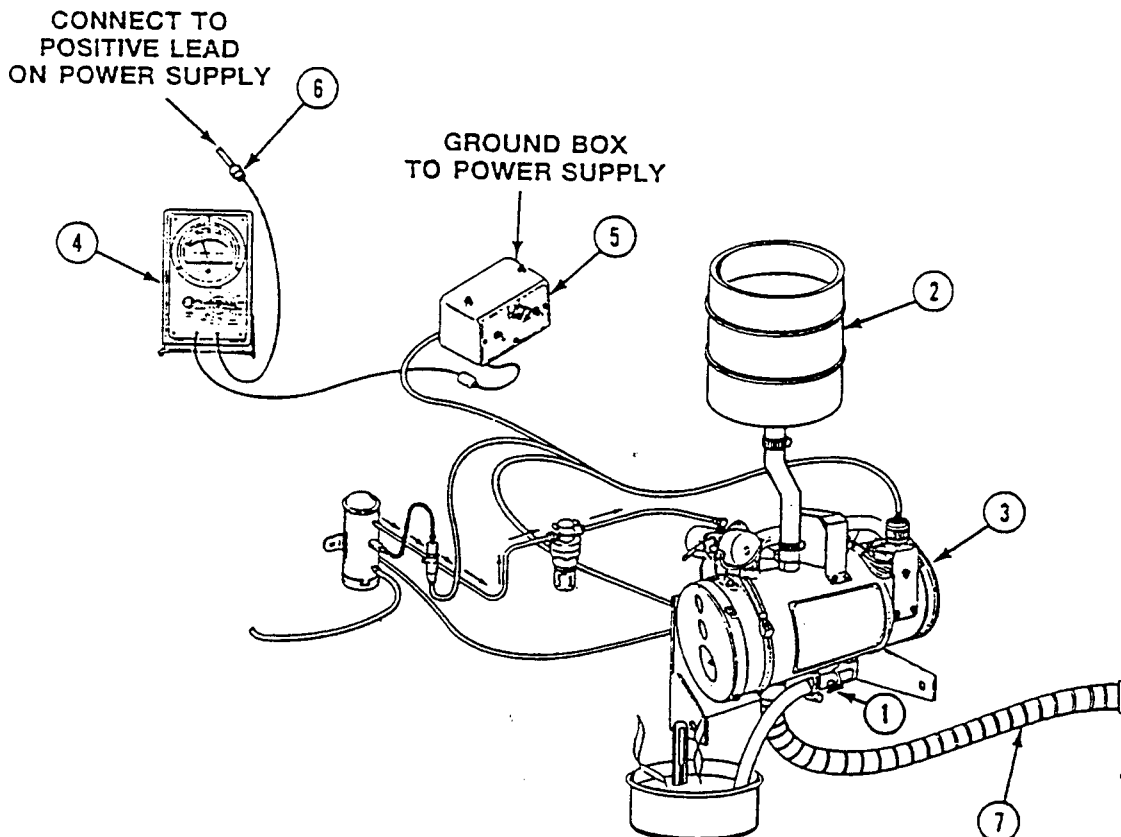
2. Do not use more than 5 gallons (18.93 l) of coolant. Use same coolant as in carrier. Do not use water.
3. Change coolant quickly. Allow coolant to cool between tests. The coolant system should have a shutoff valve (1).
4. Vent the coolant container (2) for air. The coolant container may remain open or closed. Use of a thermo-siphon type flow is allowed. No pump is required.

ELECTRICAL WIRING

5. Wire up heater (3) using regular wiring harness. Connect a multimeter (4) across circuit between hot lead of control box (5) and power source (6).
6. Use a fully charged battery for power source.

EXHAUST COLLECTOR

7. Conduct heater exhaust away from test area. Use an exhaust extension made of flexible hose (7) not more than 10 feet (3.1 m) long.

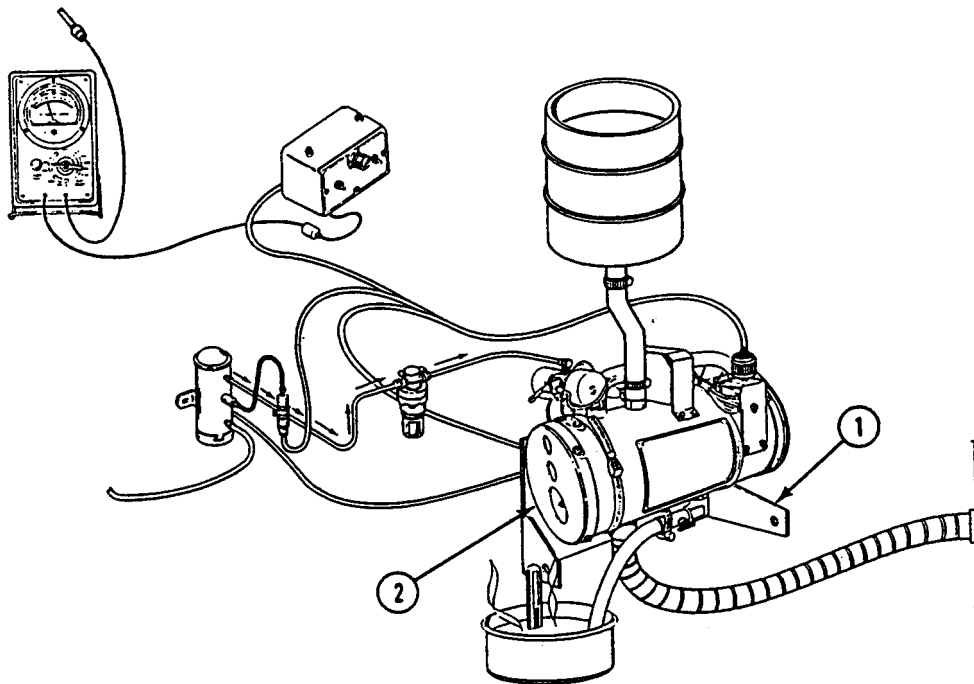


TESTING

1. A complete test of coolant heater consists of the following:
 - a. Fuel flow test (WP 0065 00).
 - b. Burn test.
 - c. Restriction thermostat test.
 - d. Overheat thermostat test.
 - e. Combustion air blower test.
2. Obtaining equipment for the combustion air blower test may be difficult. Do not do this test if heater burns properly and igniter cavity does not show undue carbon deposits.
3. Replace blower (WP 0072 00) if heater goes out during test or smokes a lot and has heavy carbon deposits in igniter cavity. Moderate carbon deposits are normal and do not indicate a bad blower.

BURN TEST

1. Secure coolant heater to test stand (1) and coolant, fuel, electrical, and exhaust connections. Do not start heater unless there is an ample supply of coolant.
2. Remove heater end cover (2) and check inside for coolant leakage before starting burn test. Replace heater if coolant has leaked.



3. Place heater control switch in START position and start timing heater immediately.
4. Note multimeter reading. Amperage draw must not exceed 12.8 amps (15.3 amps below 70°F (21°C)).
5. Heater should ignite within 40 seconds from time heater control switch is turned on.
6. The flame detector switch must transfer within 200 seconds. Transfer will be indicated by the pilot lamp and a drop in amperage draw. Move 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 0070 00).
7. If heater fails to ignite or is slow to set flame, clean igniter cavity and install a new igniter (see your -20).
8. If flame detector switch does not transfer within the required time limits, the burner is bad. Replace heater if burner is bad.
9. Allow 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 heater goes out, replace fuel control valve (WP 0065 00) and heater end cover.
10. Turn 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, adjust flame detector switch (see your -20). If blower still fails to work within limits, replace flame detector switch (WP 0066 00).

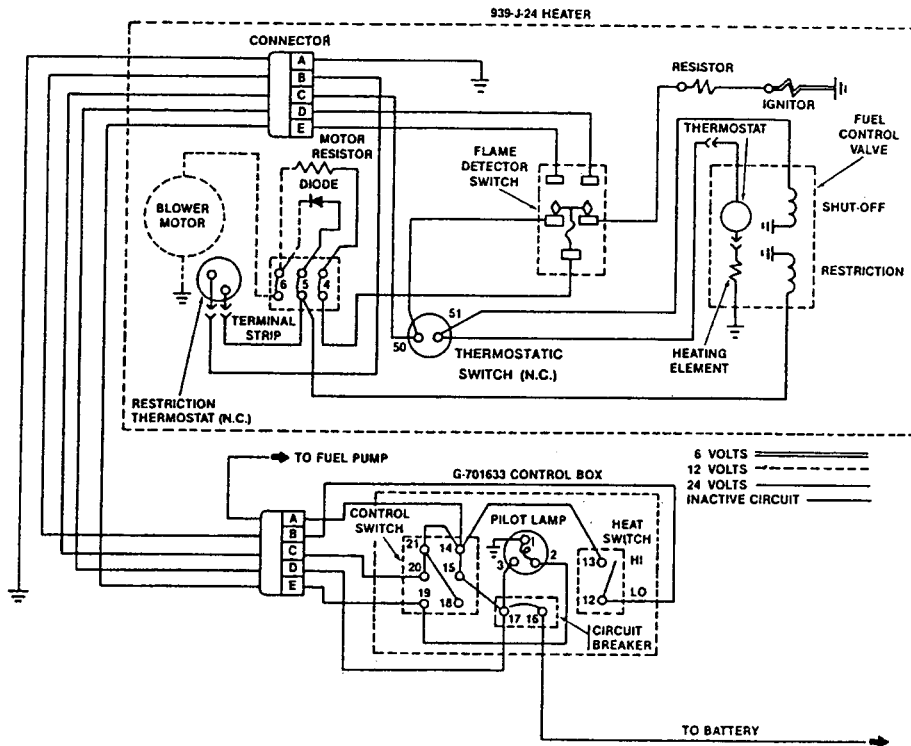
TESTING RESTRICTION AND OVERHEAT THERMOSTATS

1. Turn heater on and run it until coolant is hot enough to make heater cycle from high to low heat. Leave heater alone, then take temperature of 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 0067 00).

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.

2. After testing restriction thermostat, close circuit across terminal board terminals No. 4 and No. 5, to make heater stay on high heat. Heat coolant until heater burning stops. Check temperature of coolant which should be not less than 220°F (104°C) or not more than 250°F (121°C). If coolant temperature is not within these limits, replace overheat thermostat (WP 0068 00).



FOLLOW-THROUGH STEPS

1. Install coolant heater in carrier (see your -20).

END OF TASK

REPLACE FUEL CONTROL VALVE

0065 00

THIS WORK PACKAGE COVERS:

- Removal (page 0065 00-1).
- Fuel Flow Test (page 0065 00-3).
- Leak Test (page 0065 00-6).
- Installation (page 0065 00-7).

INITIAL SETUP:

Maintenance Level

Direct Support

Materials/Parts

Insulating varnish (WP 0078 00, Item 23)

Tools and Special Tools

- Automotive Fuel and Electrical System Repair Tool Kit (WP 0078 00, Item 64)
- Heater Test Stand (WP 0078 00, Item 61)
- Or
- 24 Vdc Power Source (assembled batteries)
- Fuel Source
- Fuel Filter
- Fuel Pump
- Graduated Cylinder, 100 ml (WP 0078 00, Item 11)
- Suitable Overflow Container
- Stopwatch (or watch with second hand)

Personnel Required

Fuel and Elec Sys Rep 63G

References

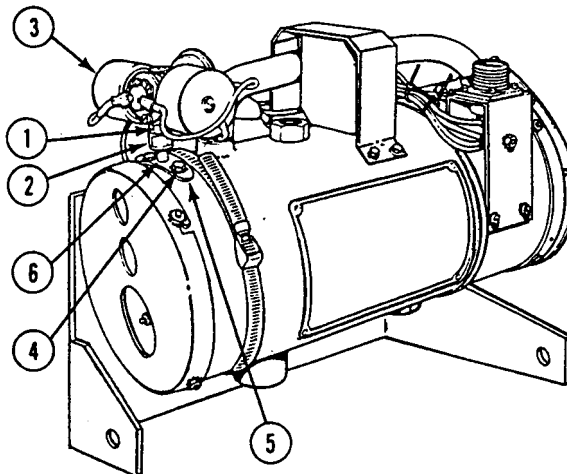
See your -20
TM 9-4910-755-13&P

Equipment Condition

Engine coolant heater removed from carrier
(see your -20)

REMOVAL

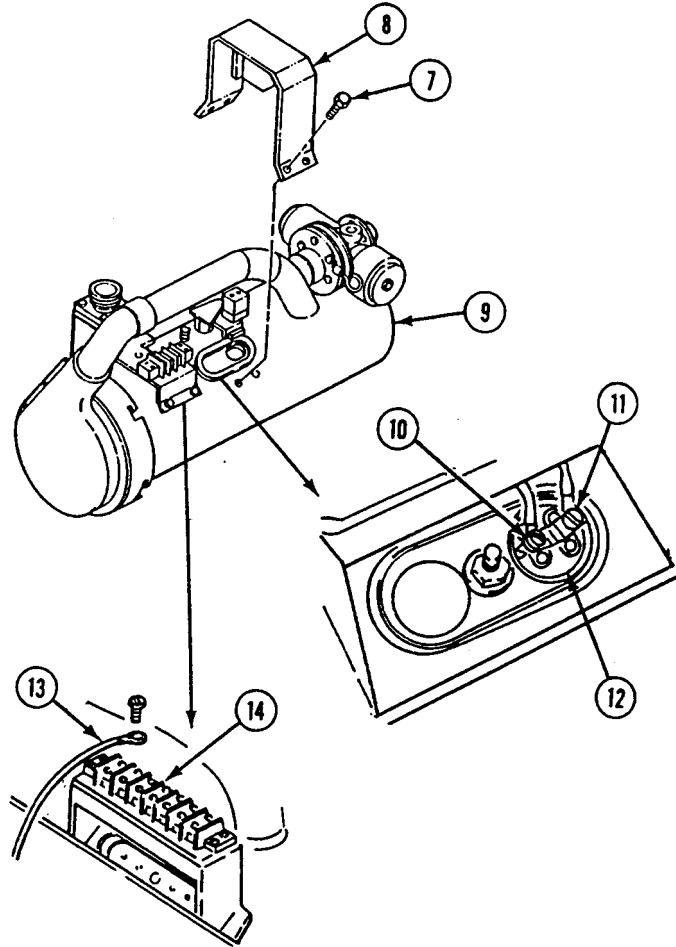
1. Remove nut (1) from union (2) beneath fuel control valve (3).
2. Remove two screws (4) and fuel control valve (3) from bracket (5) and fuel tube (6).



REPLACE FUEL CONTROL VALVE — Continued

0065 00

3. Remove four screws (7) and guard (8) from coolant heater (9).
4. Disconnect fuel control valve lead (10) and fuel control valve lead (11) from overheated thermostat (12).
5. Disconnect fuel control valve lead (13) from terminal strip (14).

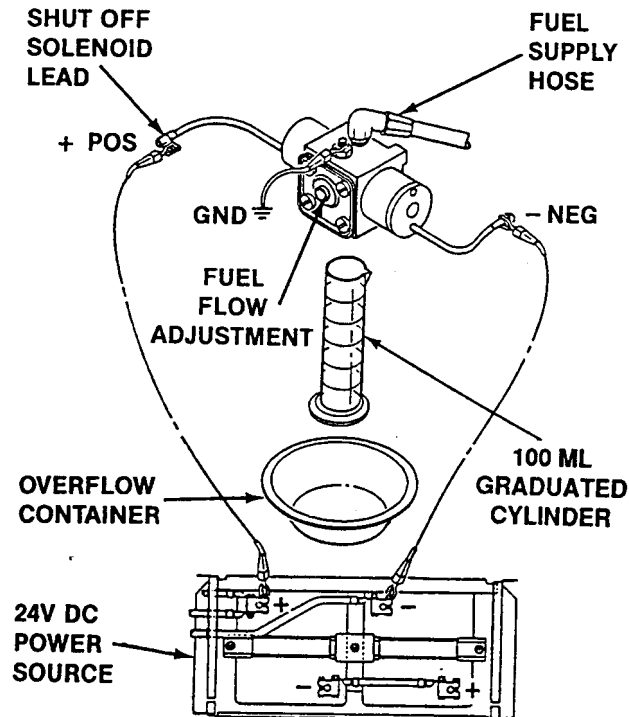


FUEL FLOW TEST

NOTE

If heater test stand is used, see TM 9-4910-755-13&P for test procedure.

1. Connect fuel control valve to coolant heater fuel hose. Fuel pressure must be 3-15 psi (21-103 kPa), when fuel valve is open.
2. Place fuel control valve outlet over graduated cylinder and overflow container.

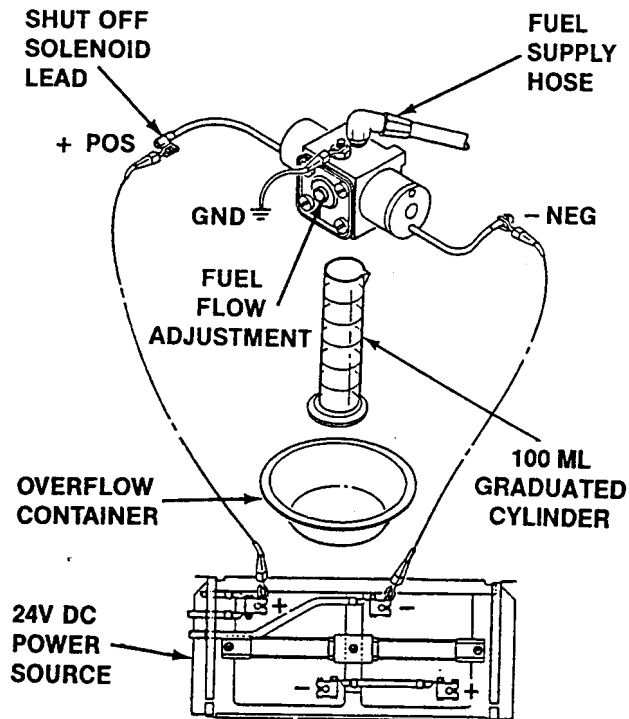


WARNING



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

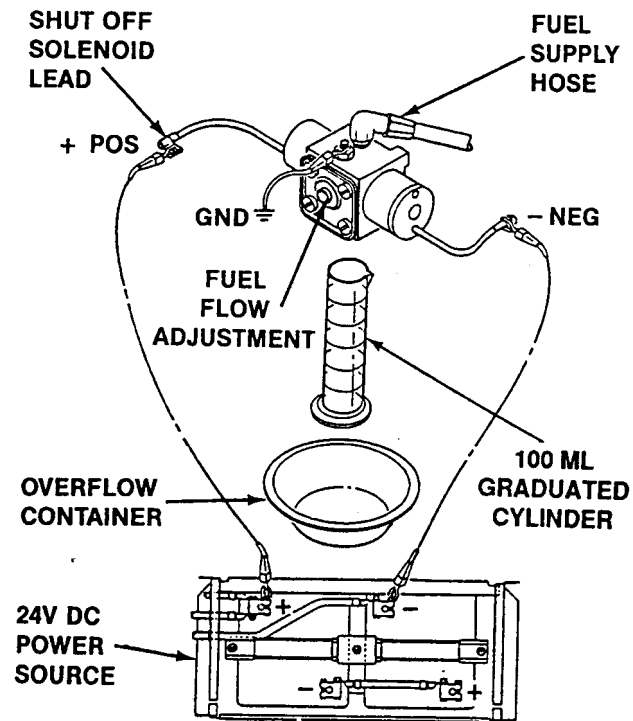
3. Make sure the body of fuel valve is grounded.
4. Energize fuel valve solenoids. Connect two solenoid leads to a 24 Vdc power source. Solenoids are now open for high heat fuel flow.
5. Open coolant heater fuel supply valve. Bleed fuel hose in a suitable container.
6. After fuel flow is stable, place graduated cylinder under fuel control valve.
7. Allow fuel to flow for exactly 1 minute, then close coolant heater fuel supply valve. Graduated cylinder should contain $0.85 \pm .12$ cubic inches (14 ± 2 milliliters) of fuel.



REPLACE FUEL CONTROL VALVE — Continued

0065 00

8. Repeat Steps 4 - 7 with shutoff solenoid side only of fuel control valve energized with 24 Vdc.
9. Graduated cylinder should now contain $0.52 \pm .12$ cubic inches (8.5 ± 2 milliliters) 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.

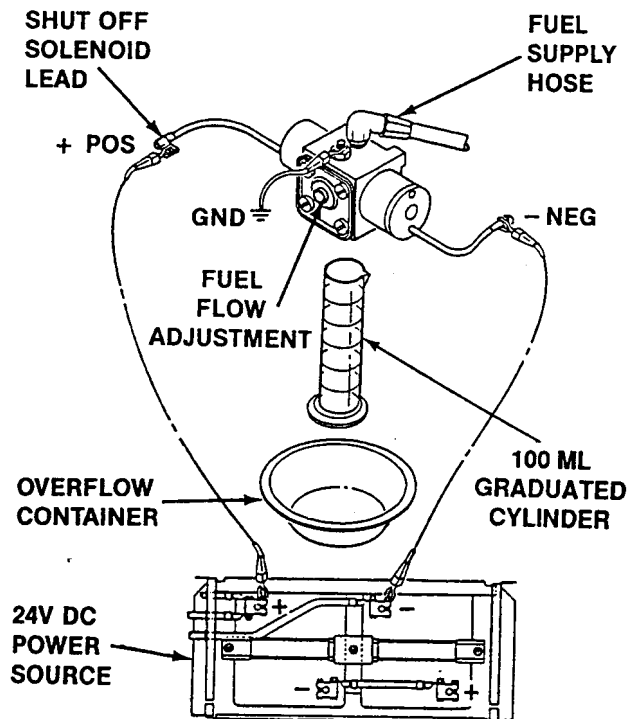


LEAK TEST

NOTE

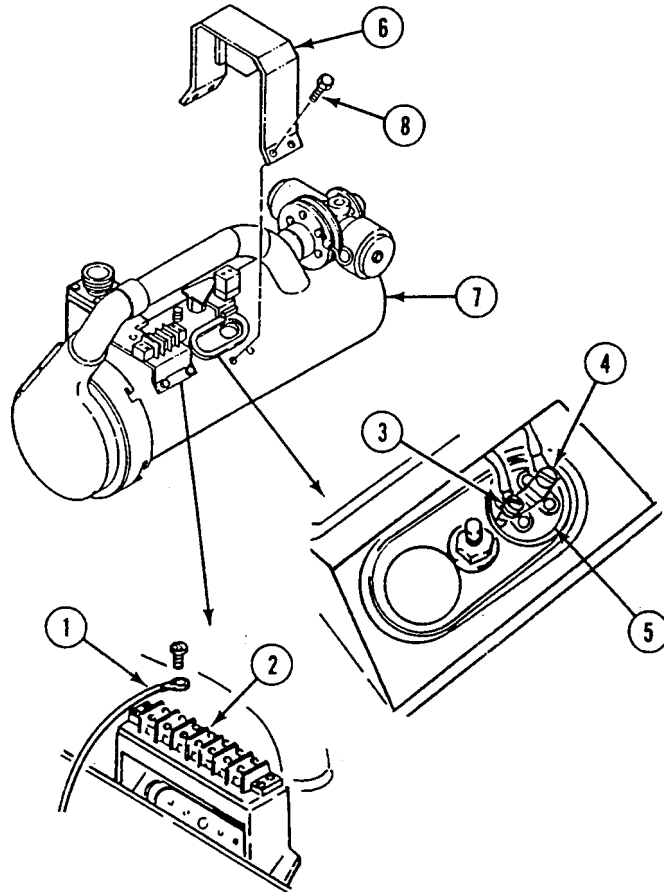
If heater test stand is used, see TM 9-4910-755-13&P for test procedure.

1. Repeat high heat fuel flow test. Disconnect both solenoid leads from 24 Vdc 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.

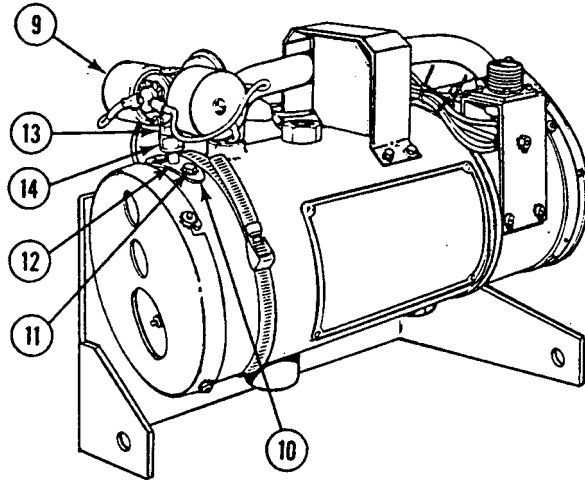


INSTALLATION

1. Connect fuel control valve lead (1) to terminal strip (2).
2. Connect fuel control valve lead (3) and fuel control valve lead (4) to overheat thermostat (5).
3. Install guard (6) on coolant heater (7). Secure with four screws (8).



4. Install fuel control valve (9) on bracket (10). Secure with two screws (11).
5. Install fuel control valve (9) on fuel tube (12). Tighten nut (13) on union (14) beneath fuel control valve.

**FOLLOW-THROUGH STEPS**

1. Install engine coolant heater in carrier (see your -20).

END OF TASK

REPLACE FLAME DETECTOR SWITCH

0066 00

THIS WORK PACKAGE COVERS:

Removal (page 0066 00-1).
 Installation (page 0066 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

References

See your -20

Tools and Special Tools

Automotive Fuel and Electrical System Repair Tool Kit
 (WP 0078 00, Item 64)

Equipment Condition

Engine coolant heater removed from carrier
 (see your -20)

Personnel Required

Fuel and Elec Sys Rep 63G

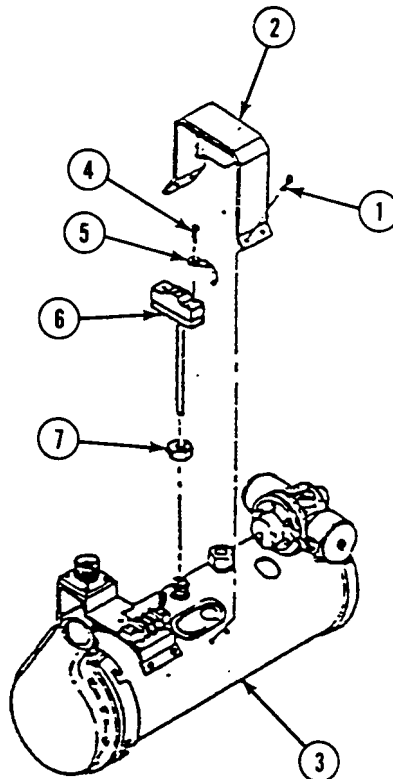
REMOVAL

1. Remove four screws (1) and guard (2) from heater (3).

CAUTION

Make sure all leads are tagged before removing them from switch.

2. Remove five screws (4) and leads (5) from flame detector switch (6).
3. Loosen nut (7) on flame detector switch (6). Pull switch straight out from heater (3).



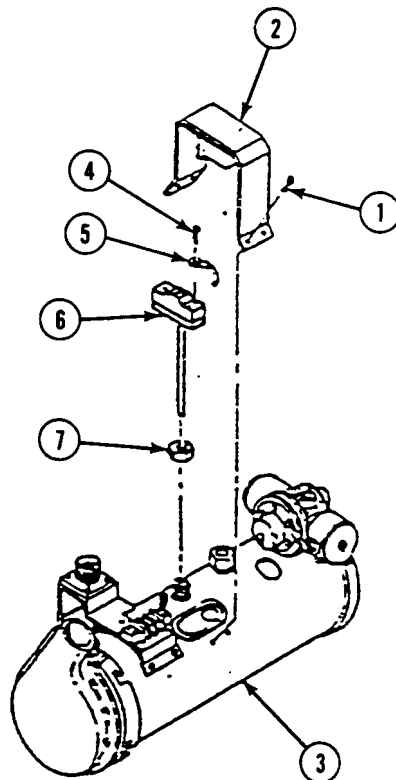
INSTALLATION

1. Install flame detector switch (6) in heater (3). Secure with nut (7) on switch.

CAUTION

Check tags on leads to make sure of proper connections.

2. Place five leads (5) on flame detector switch (6). Secure with five screws (4).
3. Place 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 RESTRICTION THERMOSTAT

0067 00

THIS WORK PACKAGE COVERS:

Removal (page 0067 00-1).
 Installation (page 0067 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G

Tools and Special Tools

Automotive Fuel and Electrical System Repair Tool Kit
 (WP 0078 00, Item 64)
 Metric Wrench Kit (WP 0078 00, Item 76)

References

See your -20

Materials/Parts

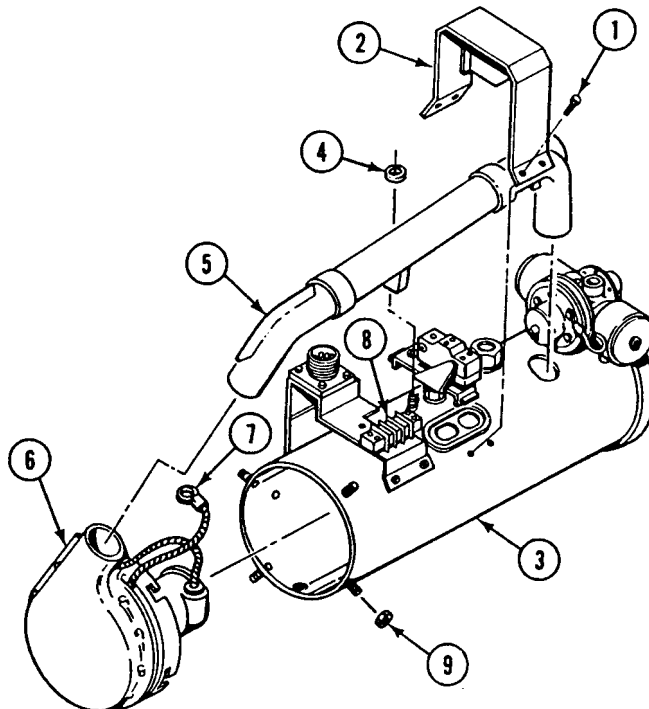
Restriction thermostat

Equipment Condition

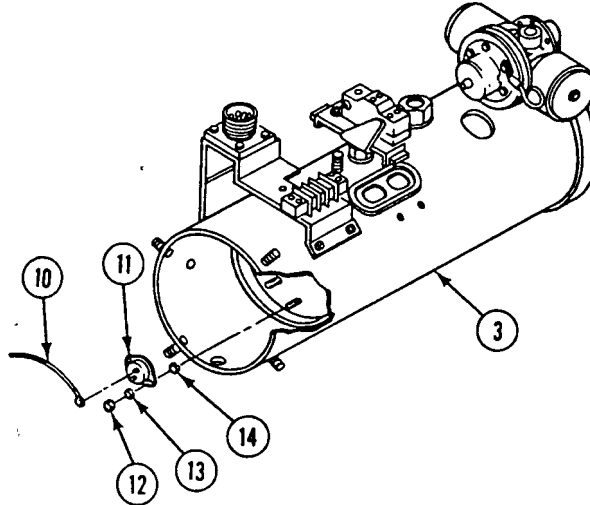
Engine coolant heater removed from carrier
 (see your -20)

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), turn blower assembly (6) counterclockwise to remove blower assembly from coolant heater (3).

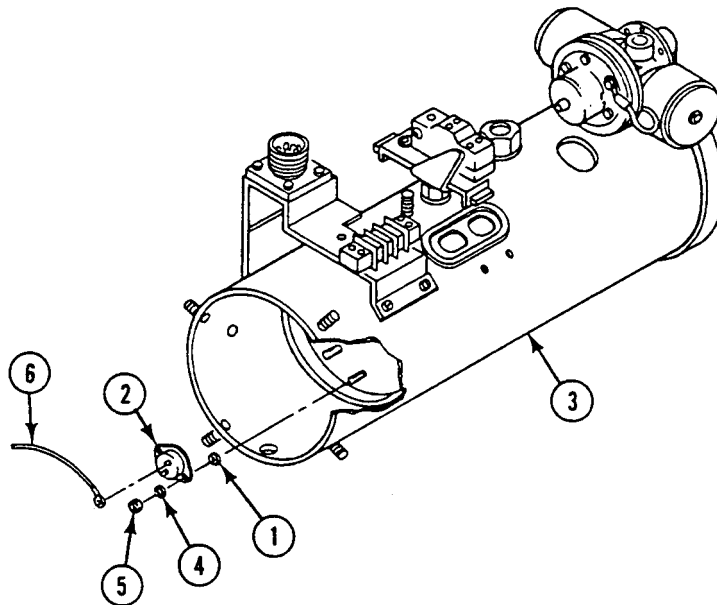


5. Disconnect two leads (10) from restriction thermostat (11).
6. Remove two nuts (12), washers (13), restriction thermostat (11), and two spacers (14) from heater (3).



INSTALLATION

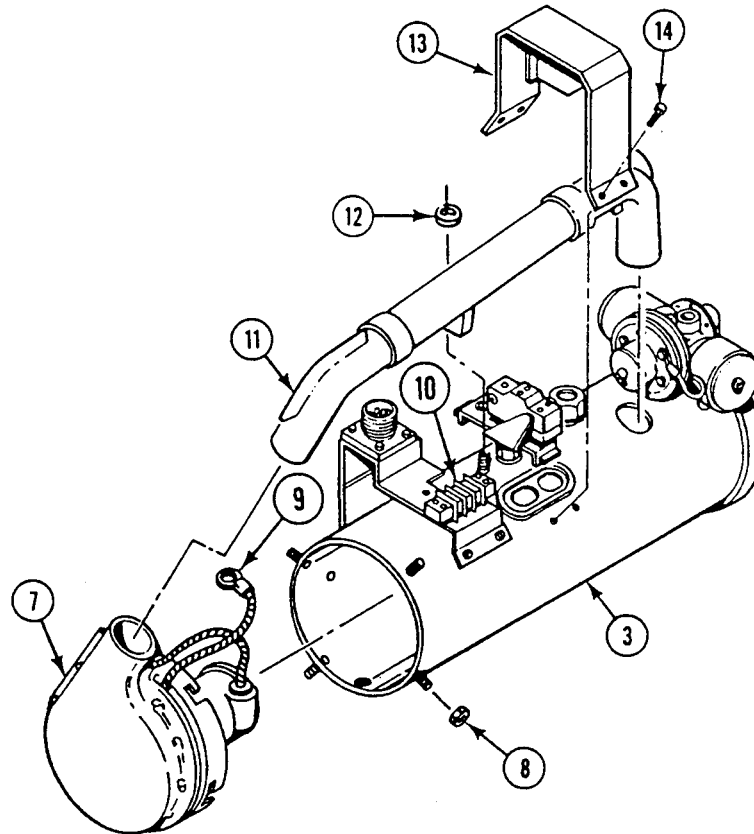
1. Place two spacers (1) and restriction thermostat (2) on studs of coolant heater (3). Secure with two washers (4) and nuts (5).
2. Connect two leads (6) to restriction thermostat (2).



REPLACE RESTRICTION THERMOSTAT — Continued

0067 00

3. Install blower assembly (7) on coolant heater (3) and turn clockwise. Secure with four nuts (8).
4. Connect blower assembly lead (9) to terminal number 6 of terminal strap (10).
5. Place combustion tube assembly (11) on coolant heater (3) and blower assembly (7). Secure with nut (12).
6. Install guard (13) on coolant heater (3). Secure with four screws (14).

**FOLLOW-THROUGH STEPS**

1. Install engine coolant heater in carrier (see your -20).

END OF TASK

REPLACE OVERHEAT THERMOSTAT

0068 00

THIS WORK PACKAGE COVERS:

- Removal (page 0068 00-2).
 - Cleaning (page 0068 00-2).
 - Inspection-Acceptance and Rejection Criteria (page 0068 00-2).
 - Installation (page 0068 00-3).
-

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G

Tools and Special Tools

- Automotive Fuel and Electrical System Repair Tool Kit
(WP 0078 00, Item 64)
- Multimeter (WP 0078 00, Item 36)

References

See your -20

Materials/Parts

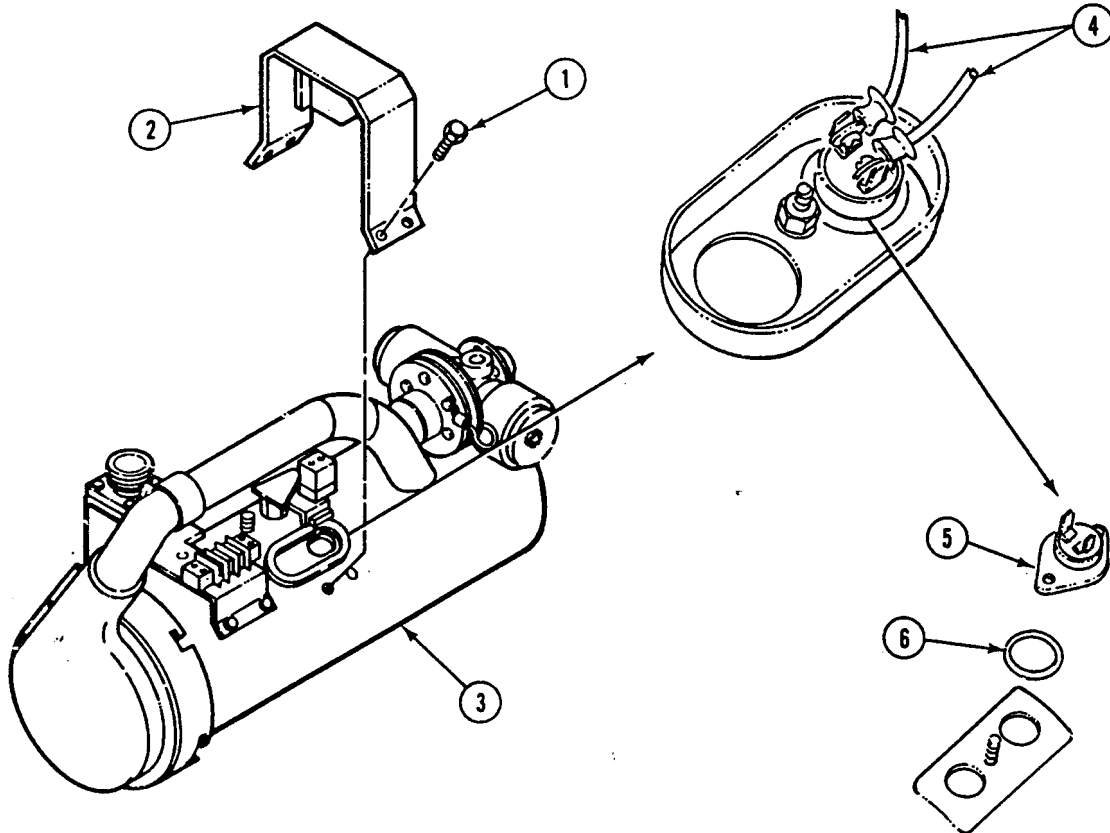
- Overheat thermostat
- Packing

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. Disconnect two leads (4) from overheated thermostat (5).
3. Remove overheated thermostat (5) and packing (6) from coolant heater (3). Discard packing.

**CLEANING**

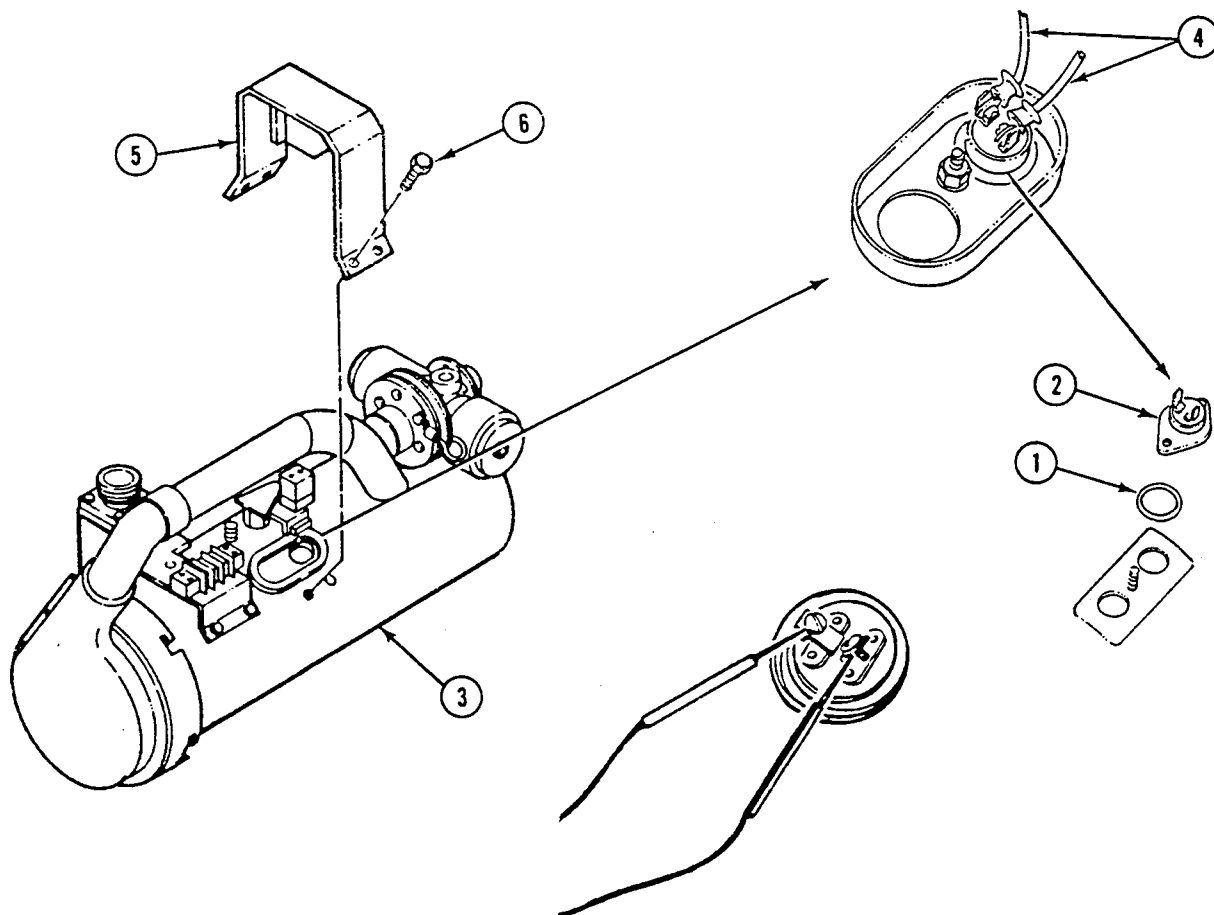
1. Clean overheated thermostat with clean, dry cloth.

INSPECTION-ACCEPTANCE AND REJECTION CRITERIA

1. Check resistance through overheated thermostat. Multimeter should read 0 ohms. If reading is infinity, replace overheated thermostat.

INSTALLATION

1. Install new packing (1) and overheat thermostat (2) in coolant heater (3).
2. Connect two leads (4) to overheat thermostat (2).
3. Install guard (5) on heater (3). Secure with four screws (6).

**FOLLOW-THROUGH STEPS**

1. Install engine coolant heater in carrier (see your -20).

END OF TASK

REPLACE FIXED RESISTOR

0069 00

THIS WORK PACKAGE COVERS:

- Removal (page 0069 00-1).
- Inspection-Acceptance and Rejection Criteria (page 0069 00-2).
- Installation (page 0069 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G

Tools and Special Tools

- Automotive Fuel and Electrical System Repair Tool Kit (WP 0078 00, Item 64)
- Multimeter (WP 0078 00, Item 36)
- Metric Wrench Kit (WP 0078 00, Item 76)

References

See your -20

Materials/Parts

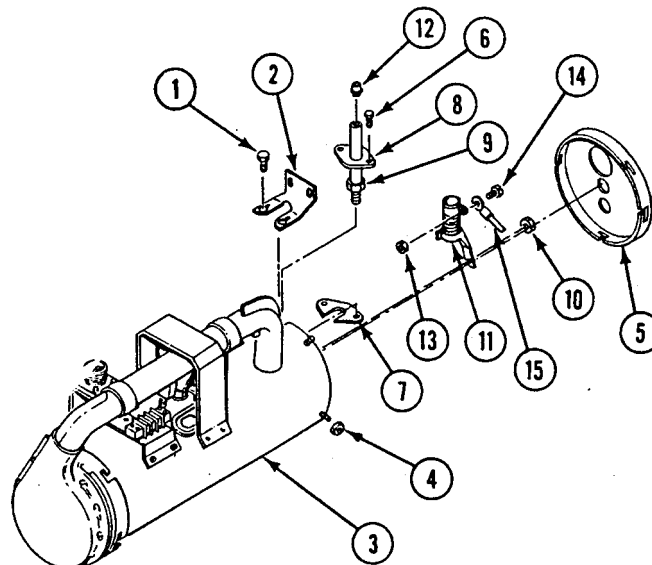
Sleeve

Equipment Condition

- Engine coolant heater removed from carrier (see your -20)
- Fuel control valve removed from coolant heater (WP 0065 00)

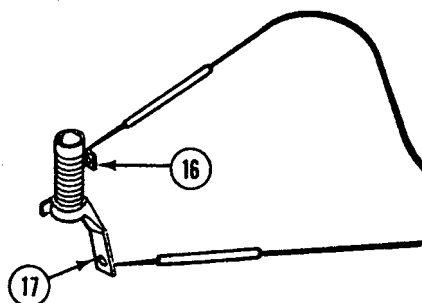
REMOVAL

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).

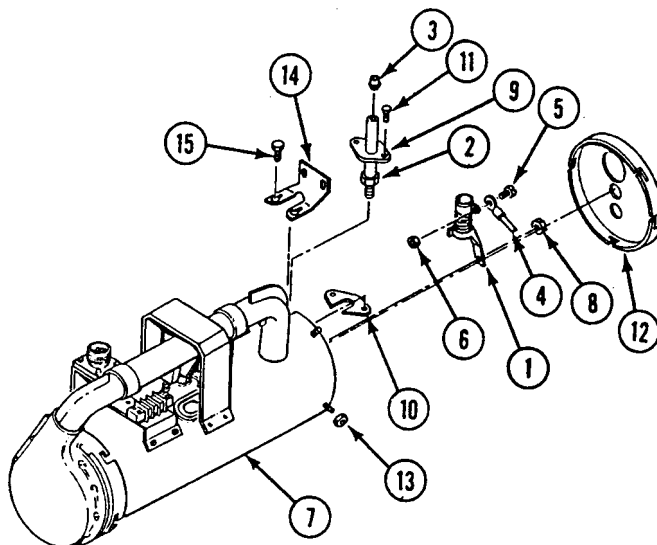


INSPECTION-ACCEPTANCE AND REJECTION CRITERIA

1. Check resistance from circuit 7 terminal end (16) to strap end (17) of fixed resistor (11). Multimeter should read 1.6 to 1.7 ohms. If reading is not in range, replace fixed resistor.

**INSTALLATION**

1. If fixed resistor (1) is to be replaced, grind or cut sleeve off of fuel tube (2). Discard sleeve.
2. Install fixed resistor (1) and new sleeve (3) on fuel tube (2).
3. Secure electrical lead (4) to fixed resistor (1) with screw (5) and nut (6).
4. Secure fixed resistor (1) to heater (7) with nut (8).
5. Secure fuel tube (2), flange (9), and tapping plate (10) to heater (7) with two screws (11).
6. Install end cover (12) on heater (7). Tighten four nuts (13).
7. Secure fuel control valve bracket (14) to heater (7) with two screws (15).

**FOLLOW-THROUGH STEPS**

1. Install fuel control valve on coolant heater (WP 0065 00).
2. Install engine coolant heater in carrier (see your -20).

END OF TASK

REPLACE BURNER PACKING AND GASKET

0070 00

THIS WORK PACKAGE COVERS:

Removal (page 0070 00-1).
 Installation (page 0070 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G

Tools and Special Tools

Automotive Fuel and Electrical System Repair Tool Kit
 (WP 0078 00, Item 64)

Metric Wrench Kit (WP 0078 00, Item 76)

References

See your -20

Materials/Parts

Gasket

Packing

Equipment Condition

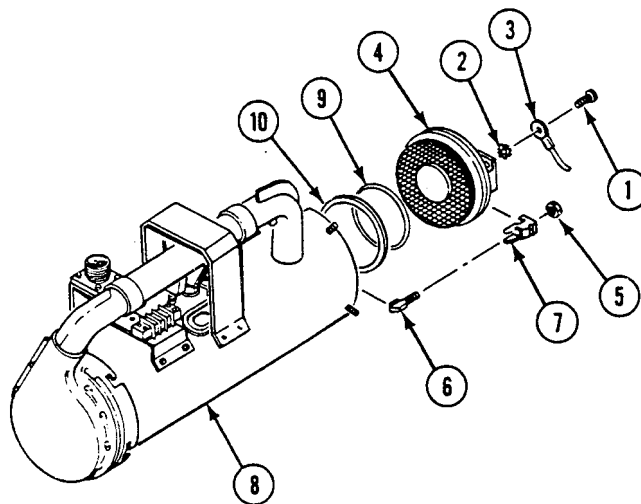
Engine coolant heater removed from carrier
 (see your -20)

Fixed resistor removed from heater (WP 0069 00)

Fuel control valve removed from heater (WP 0065 00)

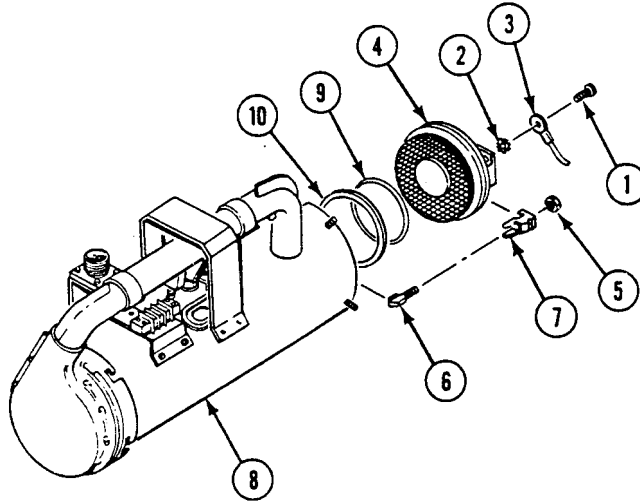
REMOVAL

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 packing (9) and gasket (10) from burner (4). Discard packing and gasket.



INSTALLATION

1. Install new 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 on heater (WP 0069 00).
2. Install fuel control valve on heater (WP 0065 00).
3. Install engine coolant heater in carrier (see your -20).

END OF TASK

REPLACE DIODE AND MOTOR RESISTOR

0071 00

THIS WORK PACKAGE COVERS:

- Removal (page 0071 00-1).
 - Inspection-Acceptance and Rejection Criteria (page 0071 00-2).
 - Installation (page 0071 00-3).
-

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G

Tools and Special Tools

- Automotive Fuel and Electrical System Repair Tool Kit
(WP 0078 00, Item 64)
- Multimeter (WP 0078 00, Item 36)
- Metric Wrench Kit (WP 0078 00, Item 76)

References

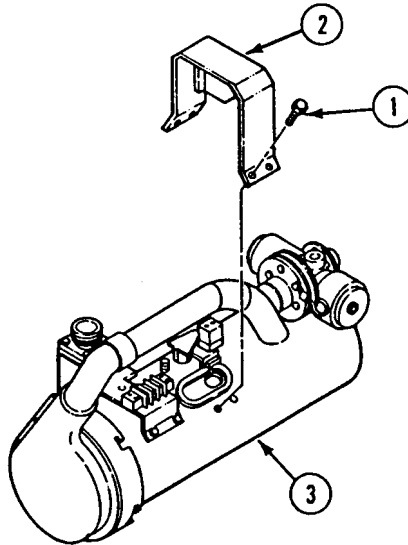
See your -20

Equipment Condition

Engine coolant heater removed from carrier
(see your -20)

REMOVAL

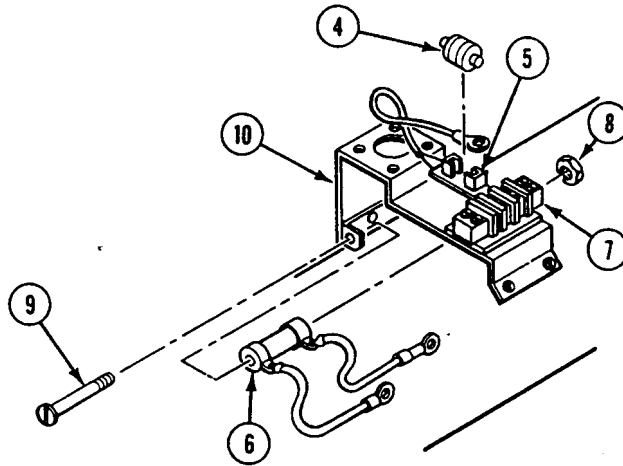
1. Remove four screws (1) and guard (2) from heater (3).



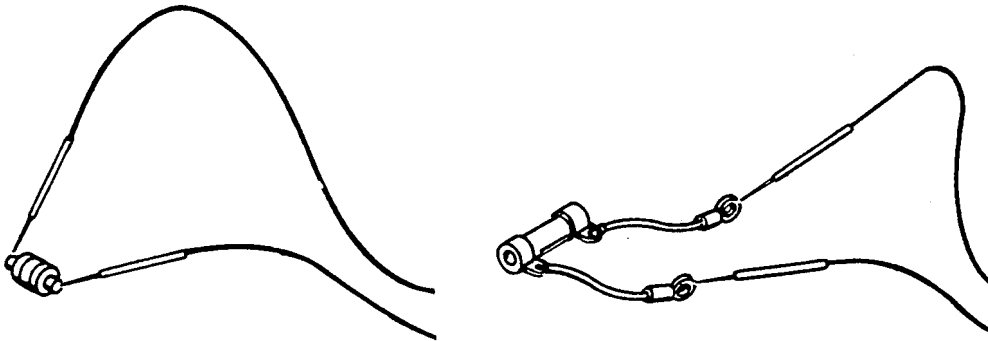
NOTE

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 No. 4 and No. 6 on terminal board (7).
4. Remove nut (8), screw (9), and motor resistor (6) from bracket (10).

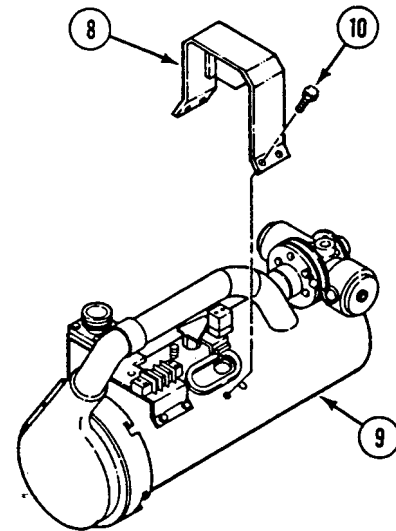
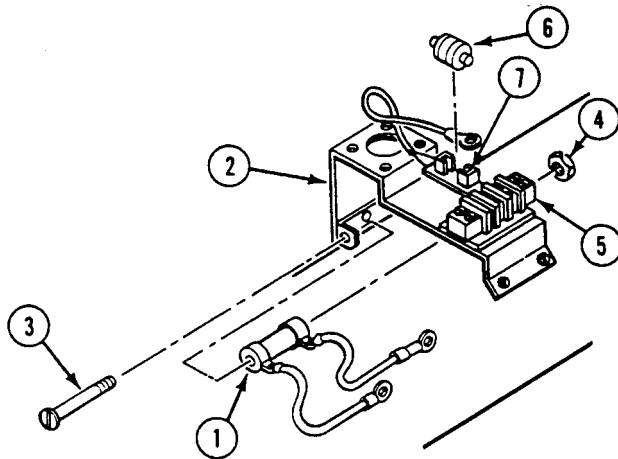
**INSPECTION-ACCEPTANCE AND REJECTION CRITERIA**

1. Use multimeter to check diode. Set meter to above 200 ohm scale. Place probes on each end of diode. Switch probes and note reading. Multimeter must indicate continuity in one position and high resistance in the other for diode to operate properly.
2. Check resistance of motor resistor. Multimeter should read 0 ohms resistance. Replace resistor if reading is infinity.



INSTALLATION

1. Install motor resistor (1) on bracket (2) with screw (3) and nut (4).
2. Secure motor resistor (1) leads to terminals No. 4 and No. 6 of terminal board (5).
3. Install diode (6) in holder (7).
4. Install guard (8) on heater (9). Secure with four screws (10).

**FOLLOW-THROUGH STEPS**

1. Install engine coolant heater in carrier (see your -20).

END OF TASK

REPLACE BLOWER MOTOR

0072 00

THIS WORK PACKAGE COVERS:

Removal (page 0072 00-1).
 Installation (page 0072 00-2).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Fuel and Elec Sys Rep 63G

Tools and Special Tools

Automotive Fuel and Electrical System Repair Tool Kit
 (WP 0078 00, Item 64)
 Metric Wrench Kit (WP 0078 00, Item 76)

References

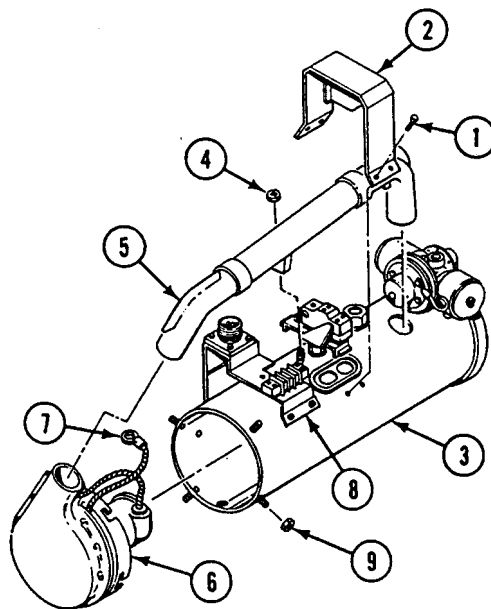
See your -20

Equipment Condition

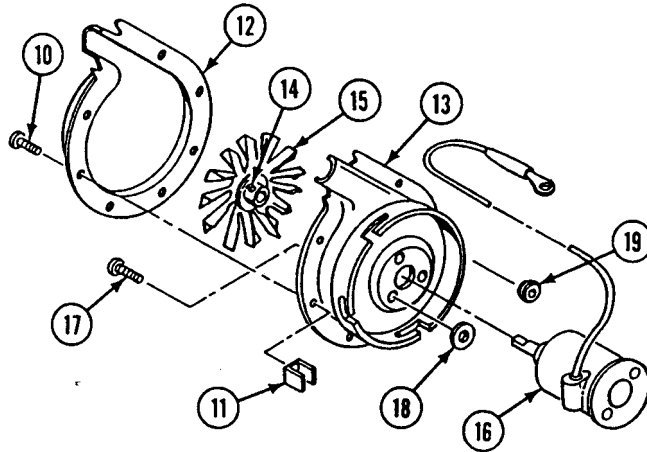
Engine coolant heater removed from carrier
 (see your -20)

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 strap (8) terminal No. 6.
4. Scribe a line on blower assembly (6) and on coolant heater (3) for proper alignment.
5. Loosen four nuts (9) and turn blower assembly (6) to the left and remove blower assembly from coolant heater (3).

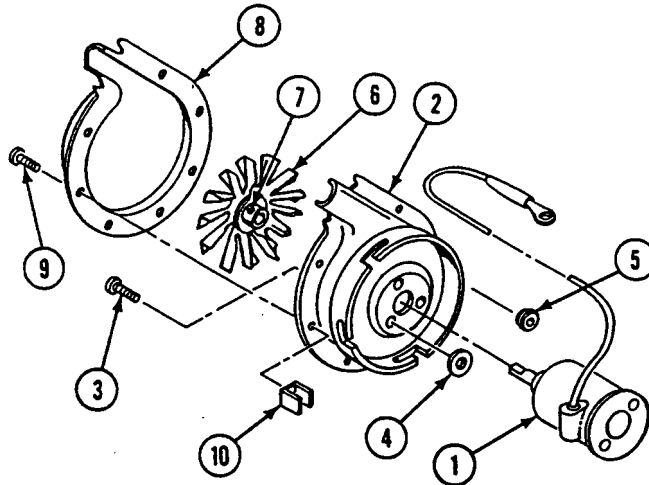


6. Remove seven screws (10), speed nuts (11), and cover (12) from blower plate (13).
7. Loosen set screw (14) and remove fan vane (15) from motor (16).
8. Remove three screws (17), spacers (18), grommets (19), and motor (16) from blower plate (13).



INSTALLATION

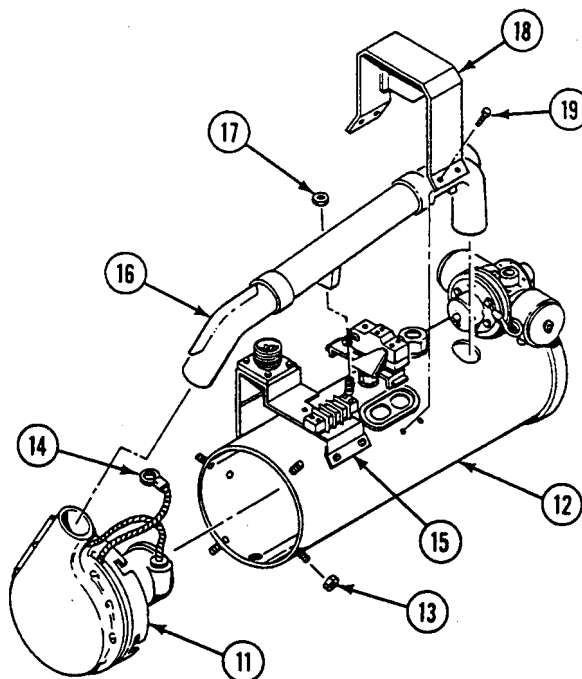
1. Install motor (1) in blower plate (2). Secure with three screws (3), spacers (4), and grommets (5).
2. Place fan vane (6) flush with end of motor shaft. Secure with set screw (7).
3. Install cover (8) on blower plate (2). Secure with seven screws (9) and speed nuts (10). Turn fan vane (6) through combustion tube opening to make sure fan vane is clear.



REPLACE BLOWER MOTOR — Continued

0072 00

4. Place blower assembly (11) on heater (12) and turn to the right. Secure with four nuts (13).
5. Connect blower assembly lead (14) to terminal strap (15) terminal No. 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

INSTALL AIR BRAKE KIT (M548A1)

0073 00

THIS WORK PACKAGE COVERS:

- Installation (page 0073 00-2).
- Adjust Drive Belts (page 0073 00-28).
- Test (page 0073 00-30).

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Track Vehicle Repairer 63H
 Helper (H)

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0078 00, Item 68)
- V-Belt Tensiometer WP 0078 00, Item 60
- Socket Wrench Set, 3/8 Inch Drive
 (WP 0078 00, Item 79)
- Torque Wrench (WP 0078 00, Item 83)
- Yardstick (WP 0078 00, Item 47)
- Yardstick (WP 0078 00, Item 48)

References

- See your -10
- See your -20

Materials/Parts

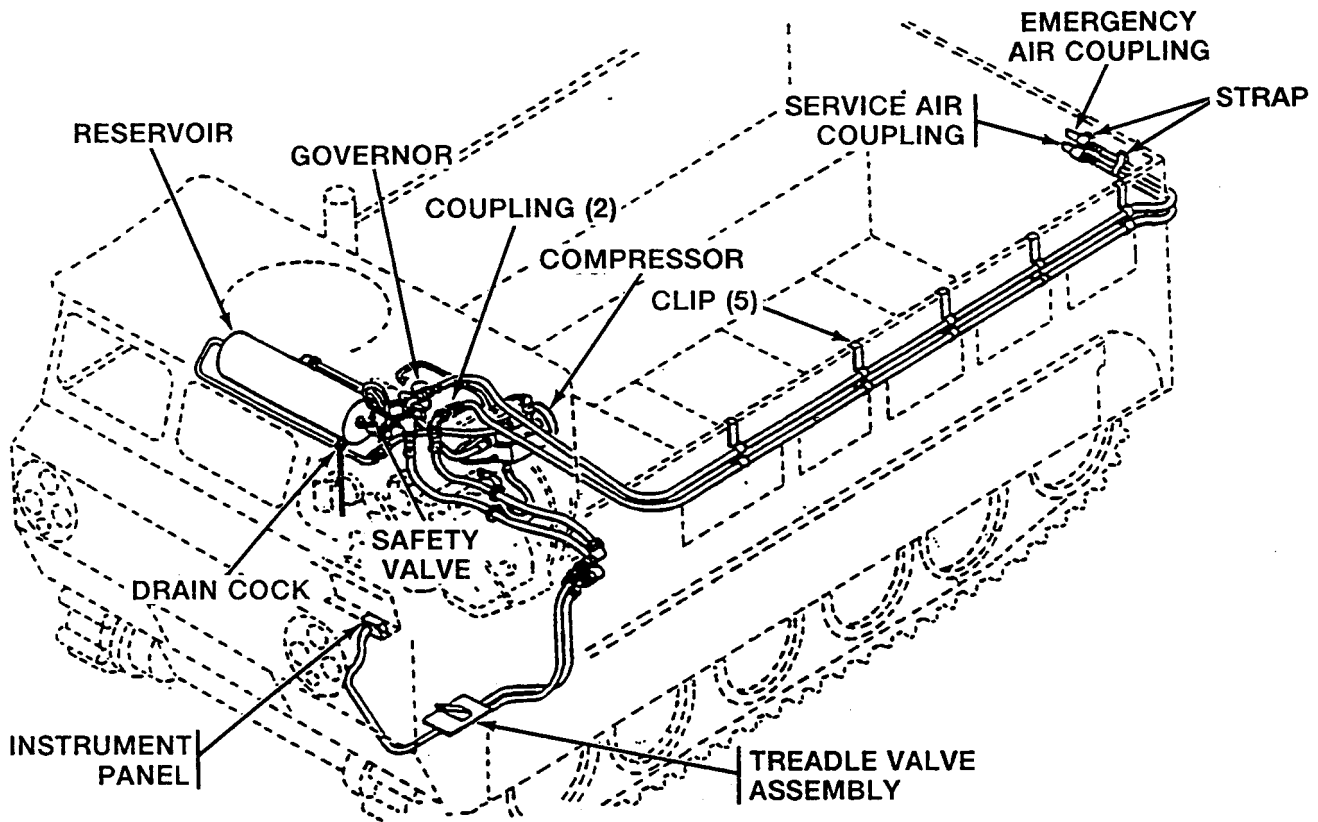
- Antiseize compound (WP 0080 00, Item 6)
- Nonelectrical wire (WP 0080 00, Item 30)
- Sealing compound (WP 0080 00, Item 32)
- Air brake kit P/N 12313255
- Key washer (4)
- Lock washer
- Packing

Equipment Condition

- Engine stopped (see your -10)
 - Carrier blocked (see your -10)
 - Top access cover and grilles removed (see your -10)
 - Cab personnel center seat raised (see your -10)
 - Cab center floor plate raised (see your -10)
 - Throttle floor plate removed (see your -20)
 - Power plant upper rear access door opened (see your -10)
 - Generator drive belts removed (see your -20)
 - Rear fan drive belts removed (see your -20)
-

INSTALLATION

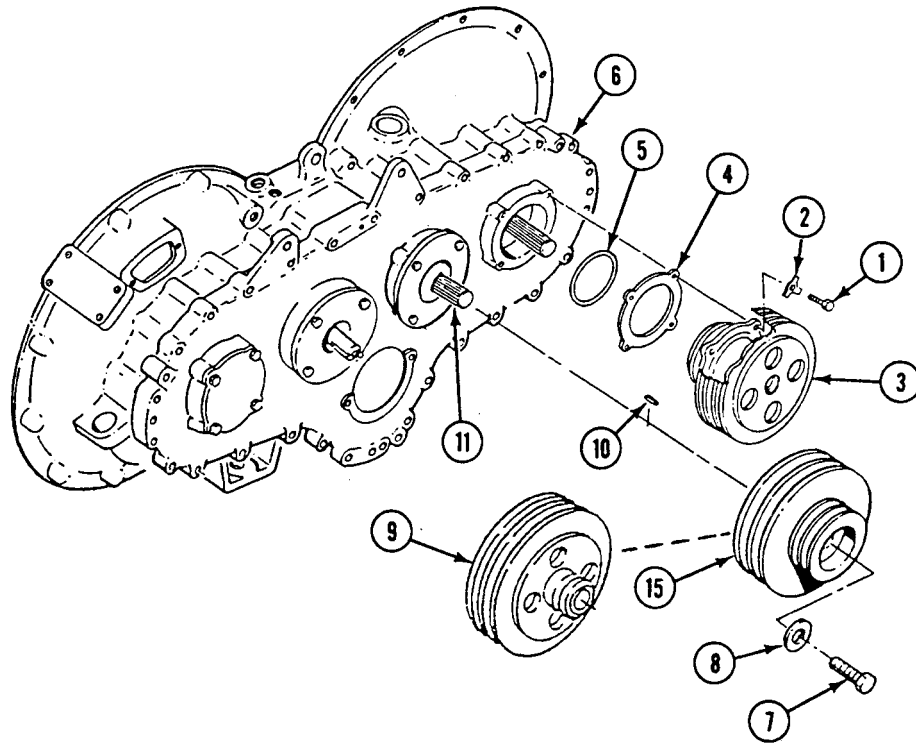
LOCATOR DIAGRAM — AIR BRAKE KIT



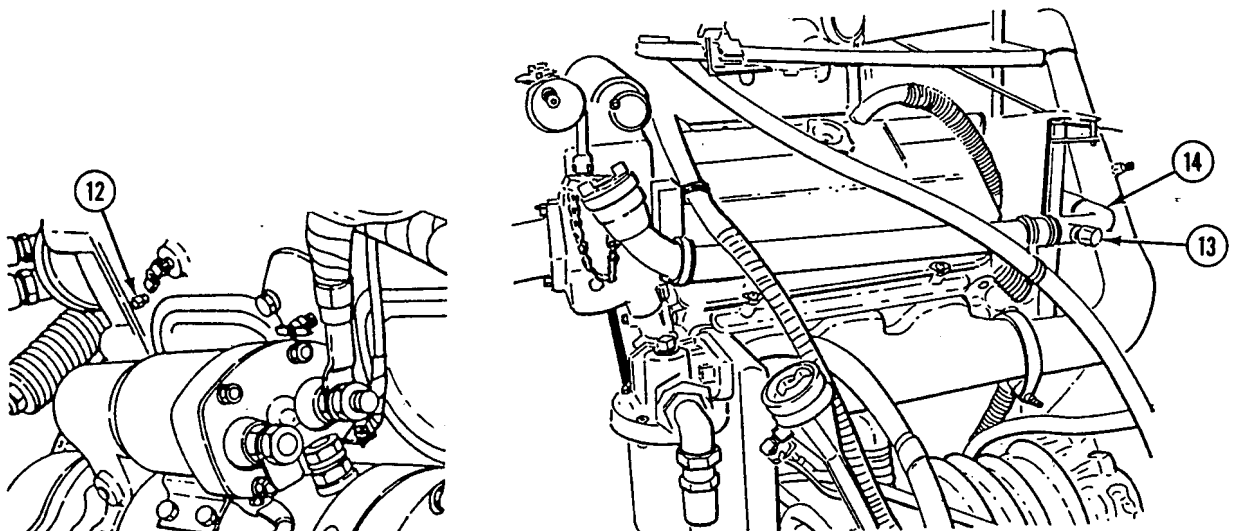
NOTE

Do not discard shim. Shim and drive assembly will be reinstalled on transfer gearcase.

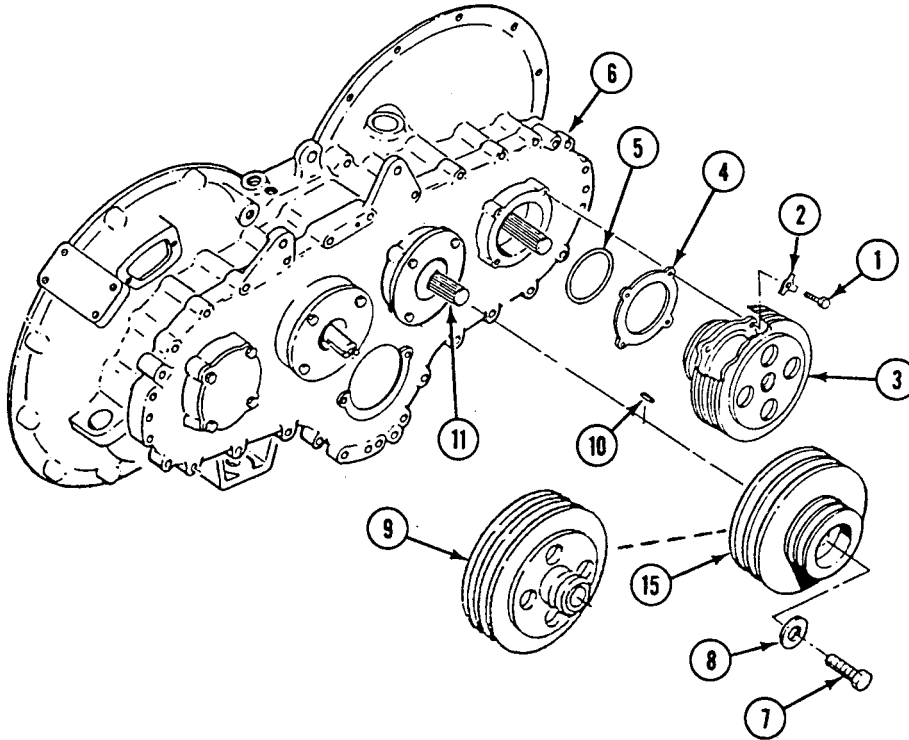
1. Remove four screws (1), key washers (2), generator drive assembly (3), shim (4), and packing (5) from transfer gearcase (6). Discard key washers and packing.
2. Remove screw (7), washer (8), and fan drive pulley (9) from transfer gearcase (6).
3. Remove key (10) from fan drive shaft (11).



4. Remove and discard plug (12) from right side of engine block.
5. Remove and discard plug (13) from engine oil filler tube (14).



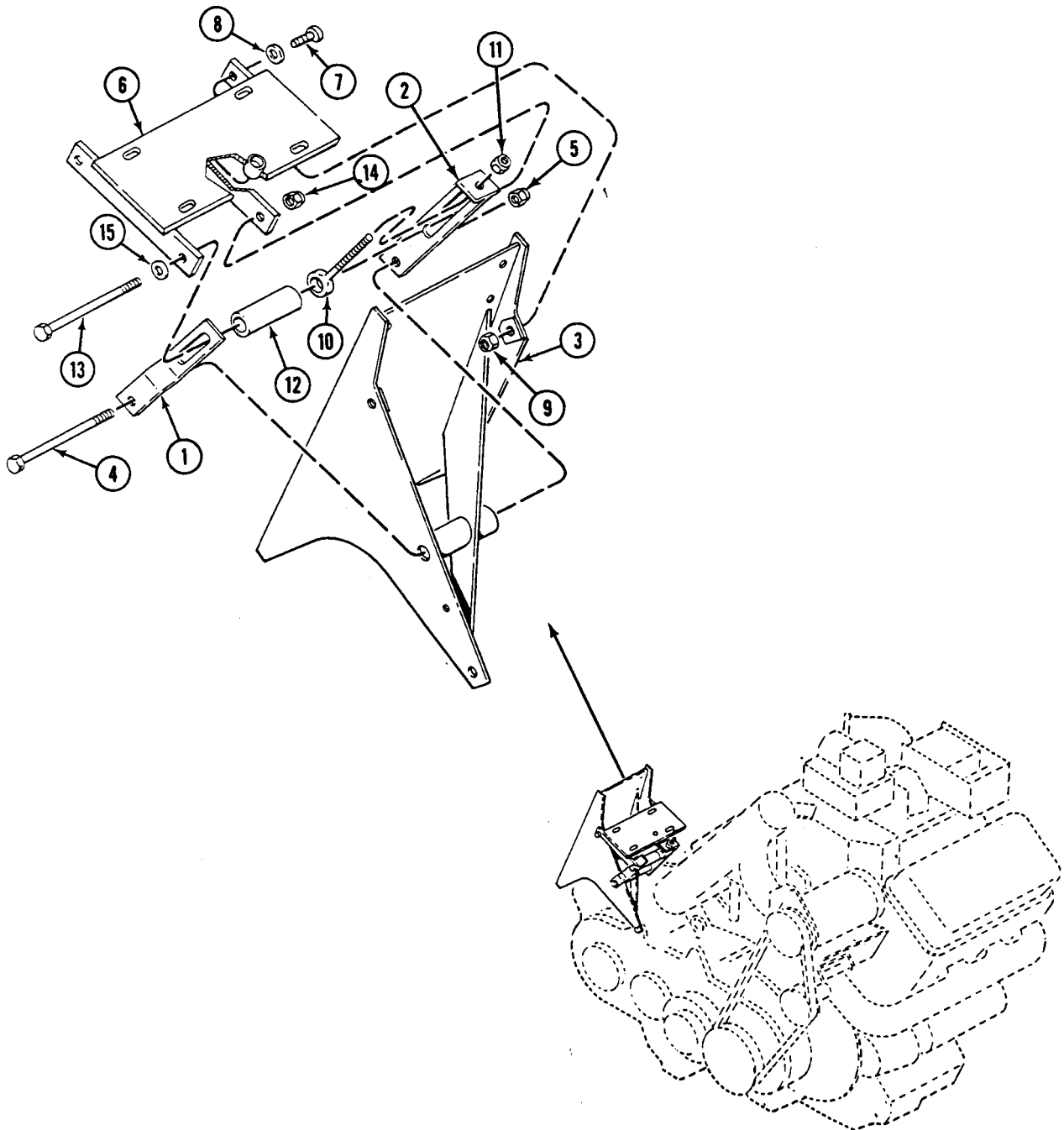
6. Install key (10) in fan drive shaft (11).
7. Install step pulley (15) on transfer gearcase (6) with washer (8) and screw (7). Torque screw to 144-180 lb-in (17 to 20 N•m).
8. Install shim (4), new packing (5), and generator drive assembly (3) on transfer gearcase (6) with four screws (1) and new key washers (2). Torque screws to 252-300 lb-in (29 to 33 N•m).



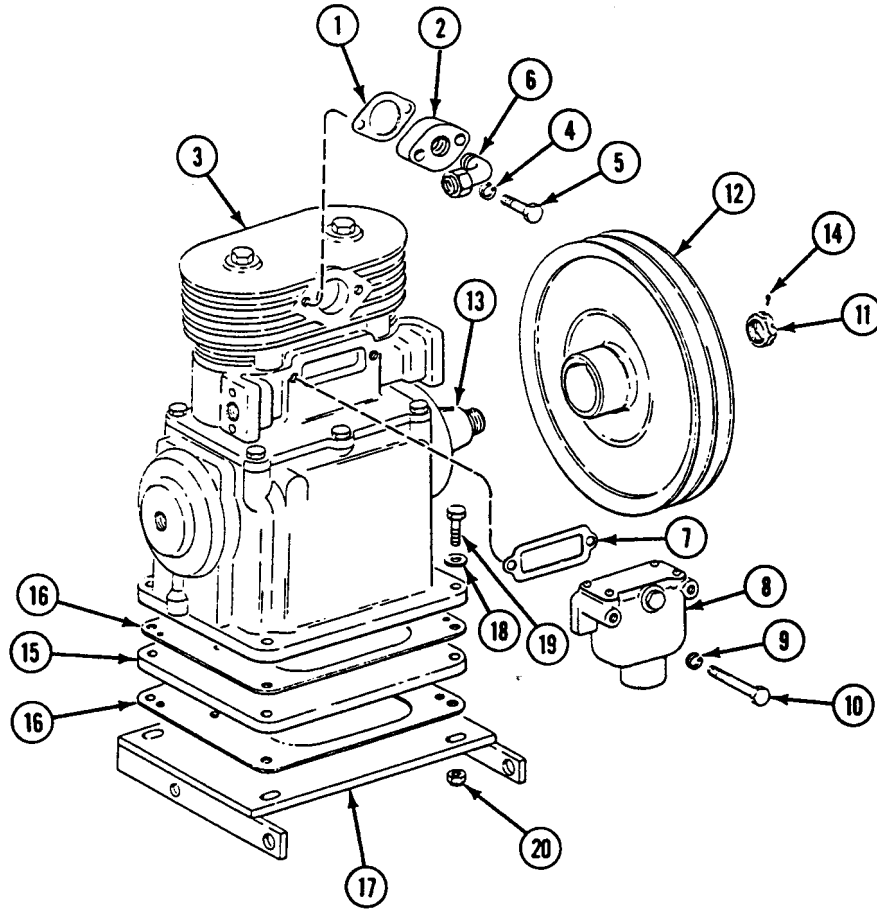
INSTALL AIR BRAKE KIT (M548A1) — Continued

0073 00

9. Install rear link (1) and front link (2) on engine oil filter bracket (3) with lower link screw (4) and nut (5).
10. Install compressor platform (6) on engine oil filter bracket (3) with two platform screws (7), washers (8), and nuts (9).
11. Install adjusting rod end (10) in front link (2), and start adjusting nut (11) on rod end.
12. Install rear link (1), front link (2), adjusting rod end (10), and link spacer (12) on compressor platform (6) with upper link screw (13), nut (14), and washers (15), as required to align links with platform.



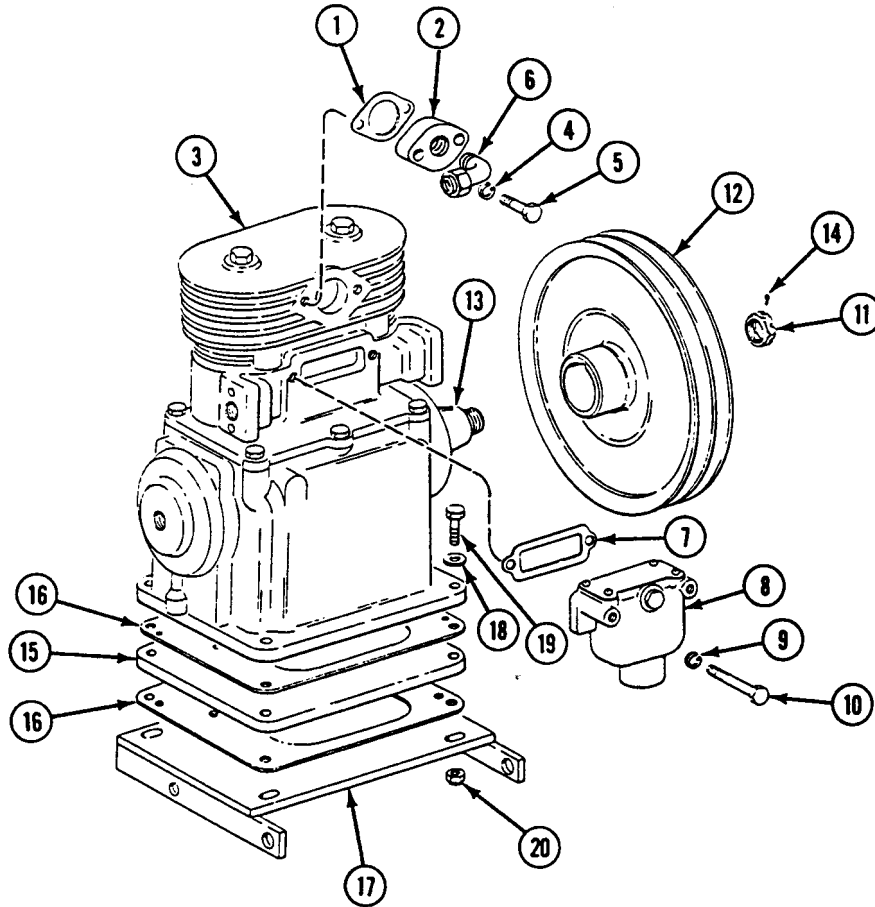
13. Install adapter gasket (1) and discharge adapter (2) on air compressor (3) with two lock washers (4) and screws (5).
14. Install discharge elbow (6) on discharge adapter (2).
15. Install air strainer gasket (7) and air strainer (8) on air compressor (3) with two lock washers (9) and screws (10).



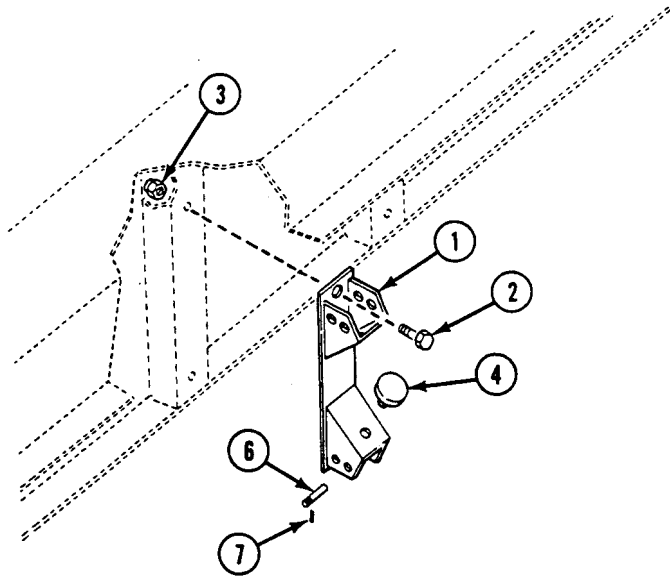
NOTE

Compressor pulley grooves are to be in the same plane as drive pulley grooves within 1/8 inch (3.2 mm) total.

16. Remove pulley nut (11) from shaft of air compressor (3). Install compressor pulley (12), pulley key (13), pulley nut (11) and cotter pin (14) on air compressor (3).
17. Install spacer (15), two compressor gaskets (16), and air compressor (3) on compressor platform (17) with four washers (18), screws (19), and nuts (20).



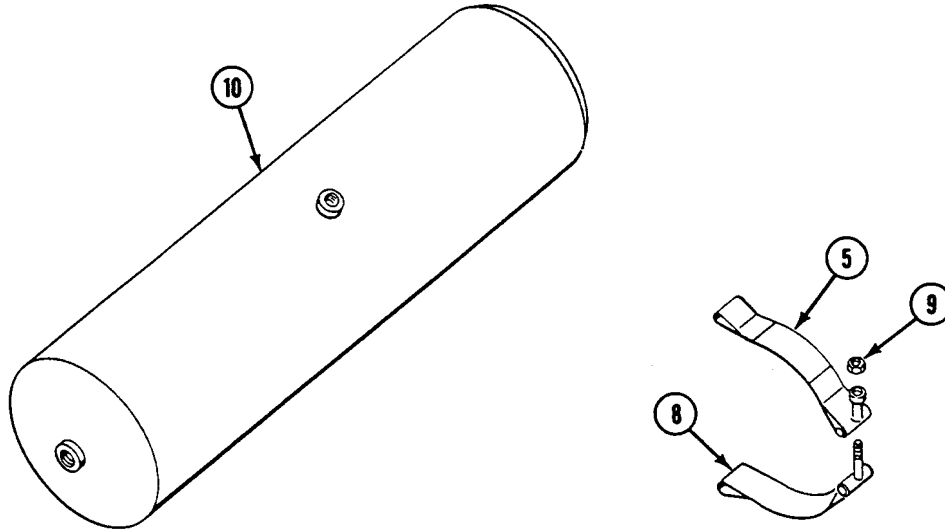
18. Install two reservoir brackets (1) on traverse beam with two screws (2) and nuts (3).
19. Install four reservoir pads (4) in two reservoir brackets (1).
20. Install two upper reservoir clamps (5) on two reservoir brackets (1) with two clamp straight pins (6) and cotter pins (7).
21. Install two lower reservoir clamps (8) on two reservoir brackets (1) with two clamp straight pins (6) and cotter pins (7).
22. Remove two clamp nuts (9) from two lower reservoir clamps (8).



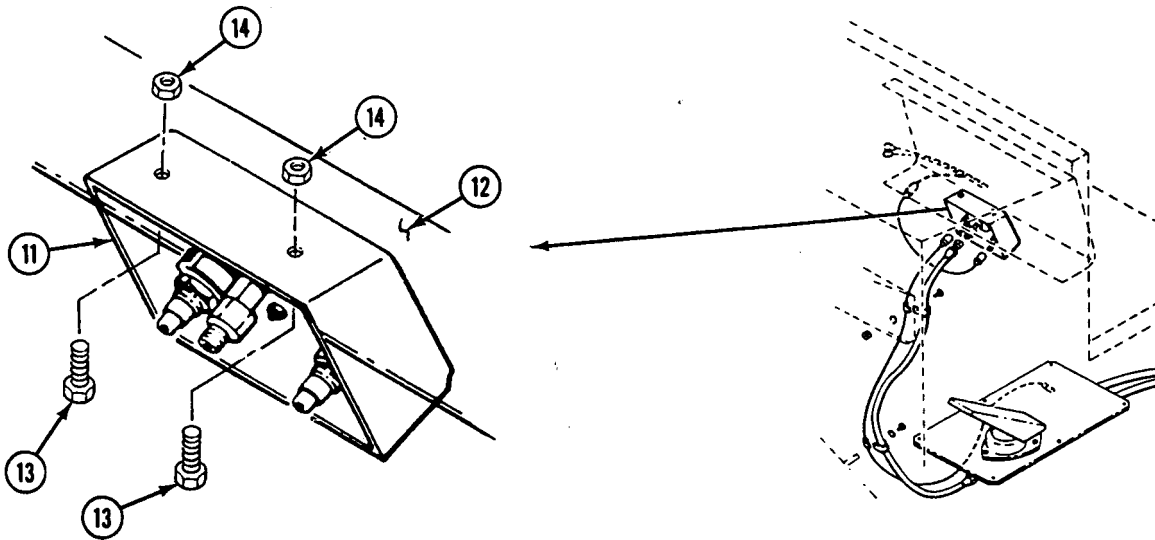
NOTE

Use helper to install air reservoir.

23. Install air reservoir (10) on two reservoir brackets (1) with two upper reservoir clamps (5), lower reservoir clamps (8), and clamp nuts (9).



24. Install air brake instrument panel (11) on carrier instrument panel (12) with two screws (13) and nuts (14).

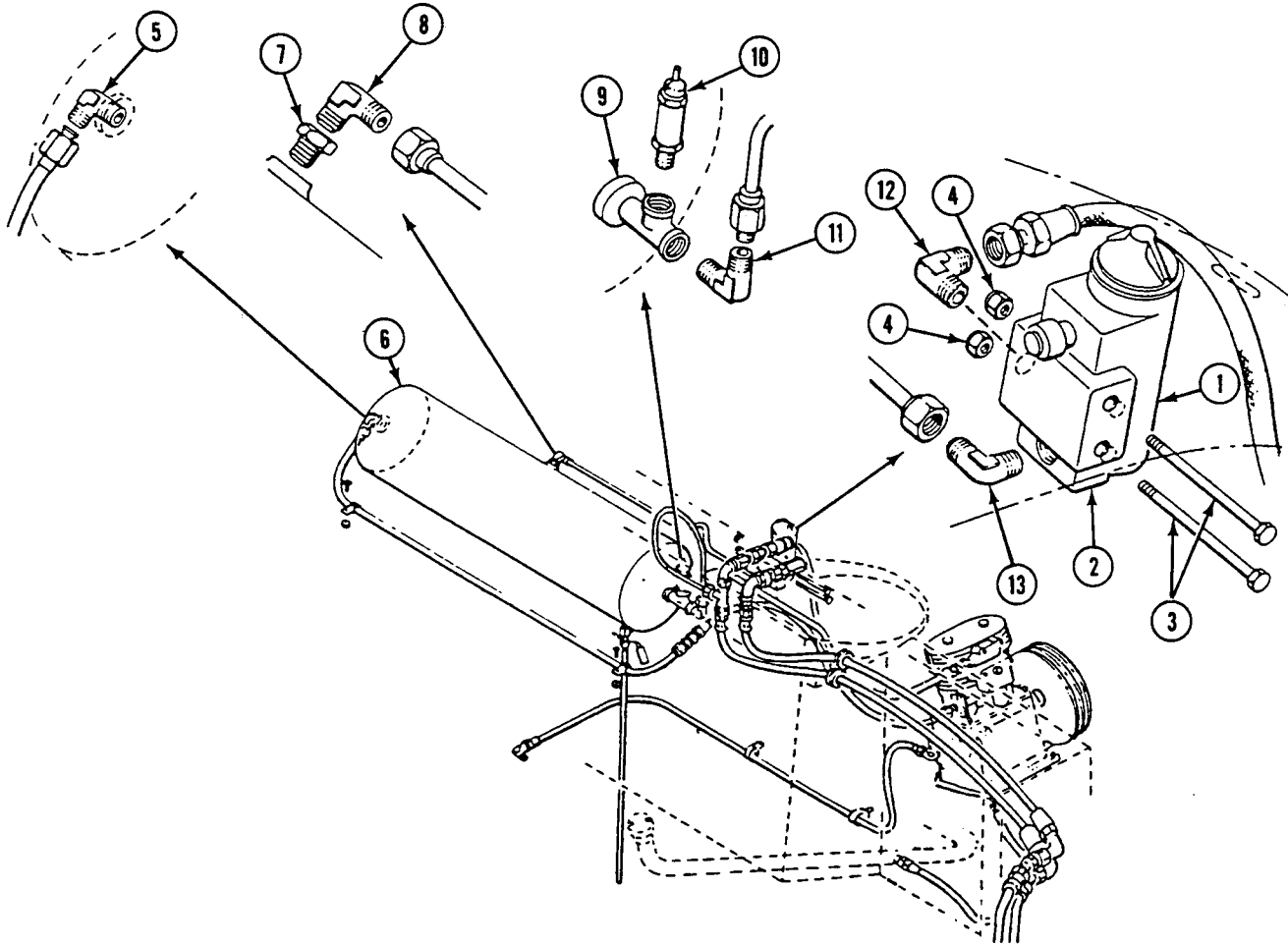


25. Install compressor governor (1) on air cleaner mounting bracket (2) with two governor mounting screws (3) and nuts (4).

NOTE

Apply light coat of sealing compound to threads of tapered pipe fittings and antiseize compound to straight threaded fittings before installation.

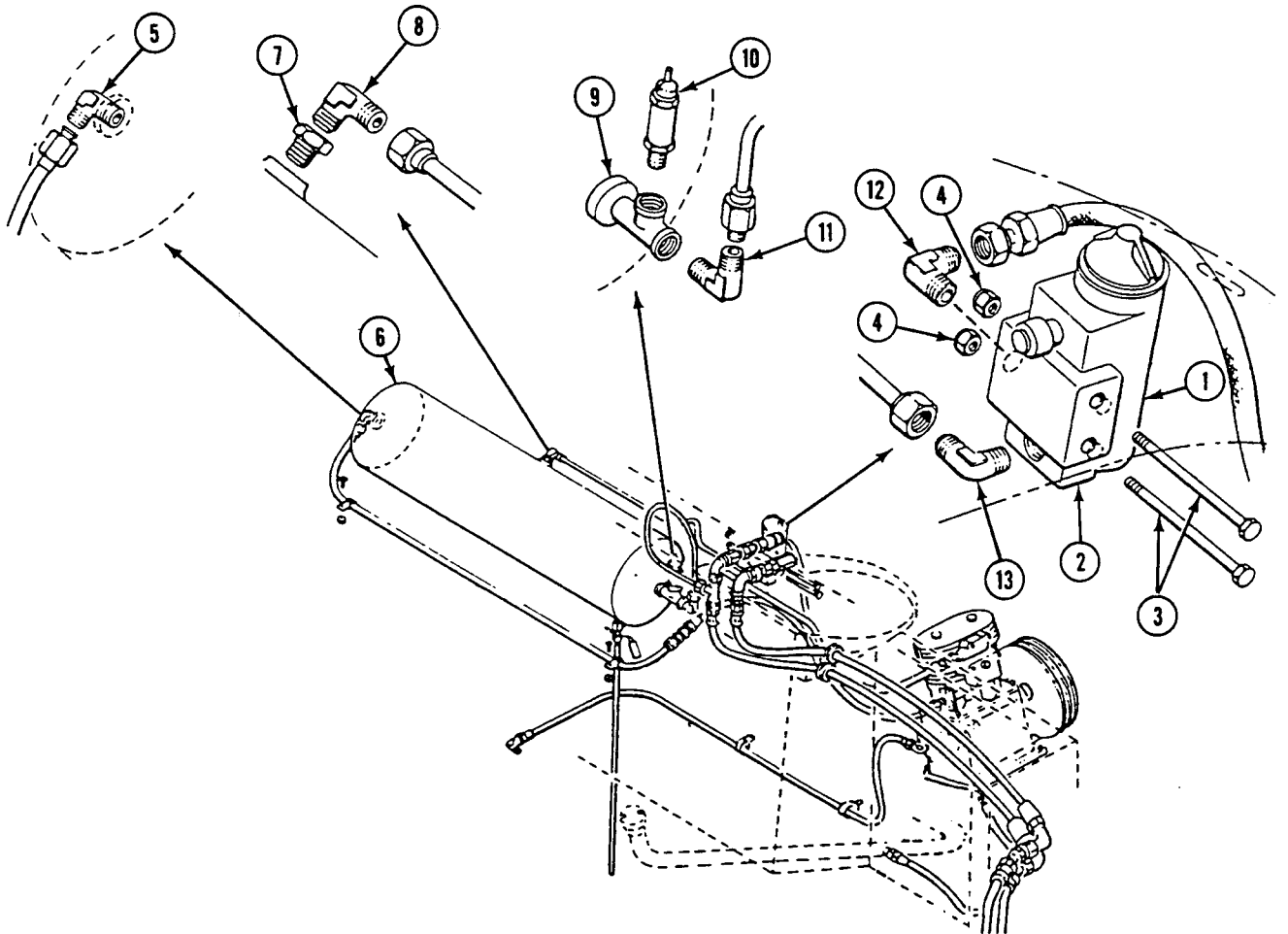
26. Install reservoir inlet elbow (5) in right end of air reservoir (6).
 27. Install reservoir outlet-to-governor bushing (7) in top of air reservoir (6).



INSTALL AIR BRAKE KIT (M548A1) — Continued

0073 00

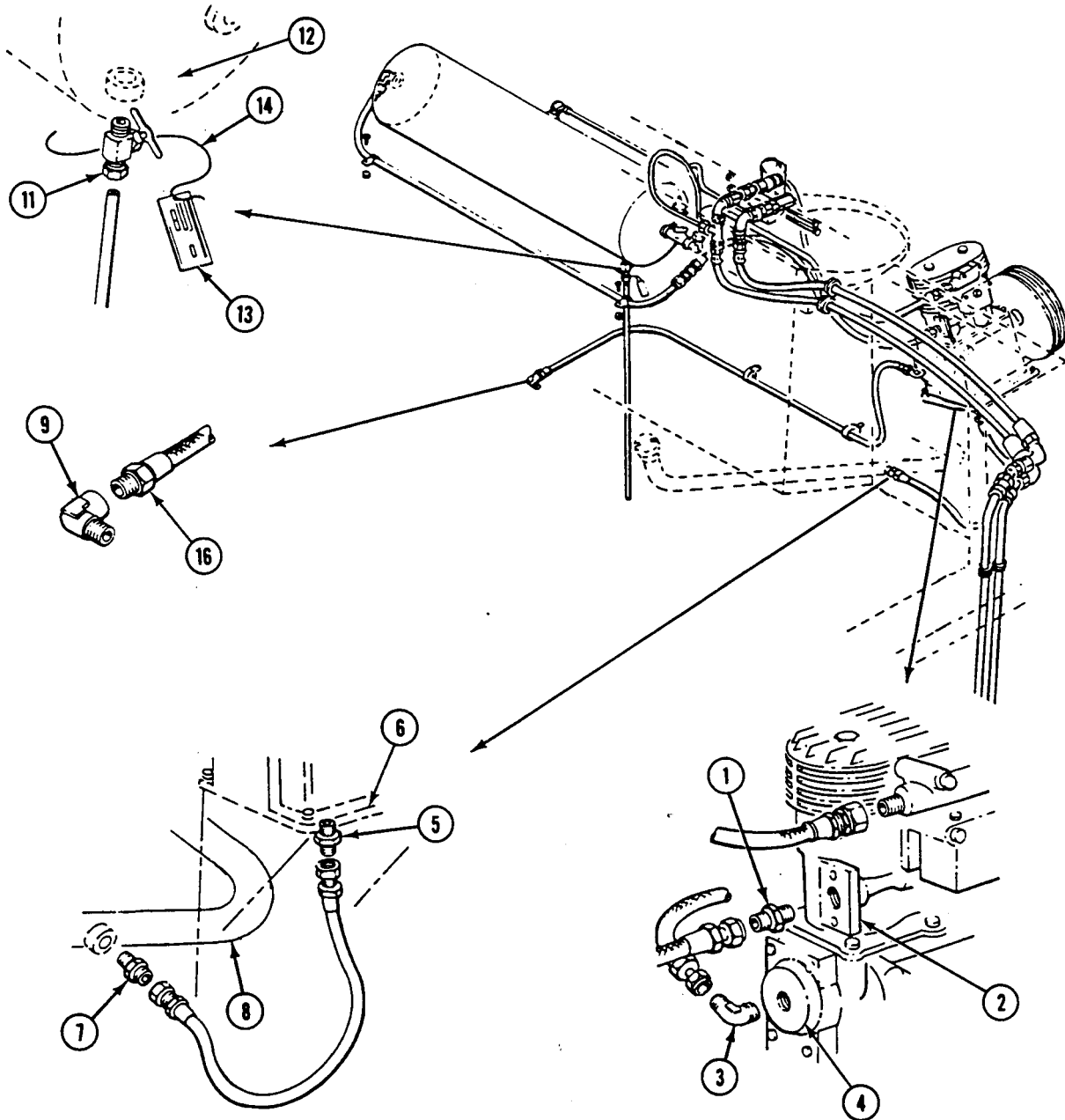
28. Install reservoir outlet-to-governor elbow (8) in reservoir outlet-to-governor bushing (7).
29. Install reservoir outlet tee (9) in left end of air reservoir (6).
30. Install safety valve (10) in reservoir outlet tee (9).
31. Install reservoir outlet elbow (11) in reservoir outlet tee (9).
32. Install governor outlet elbow (12) and governor inlet elbow (13) in compressor governor (1).



INSTALL AIR BRAKE KIT (M548A1) — Continued

0073 00

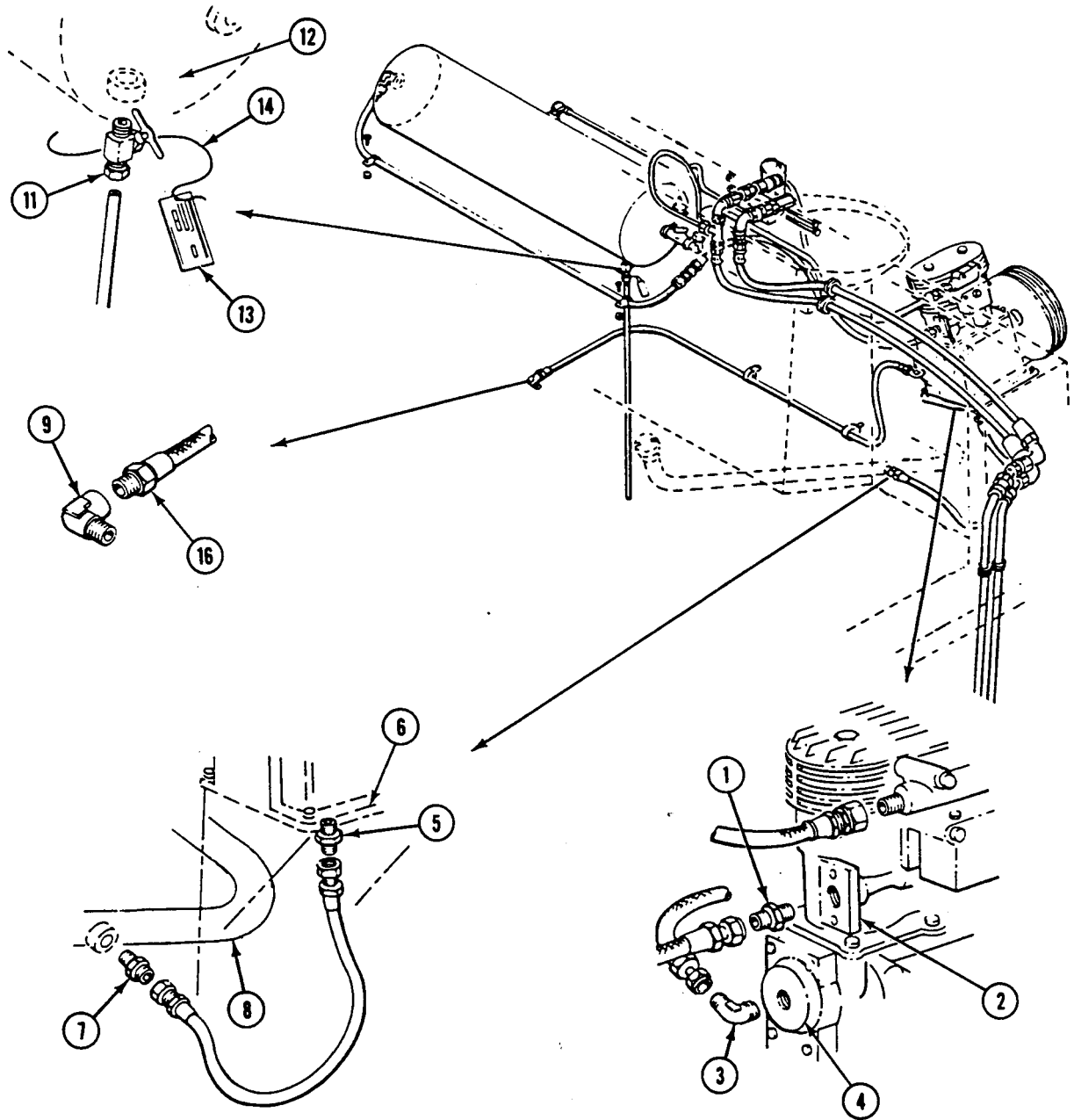
33. Install compressor nipple (1) in compressor governor inlet opening (2).
34. Install compressor oil inlet elbow (3) in compressor oil inlet opening (4).
35. Install oil return nipple (5) in bottom of compressor platform (6).
36. Install engine filler tube nipple (7) in engine oil filler tube (8).



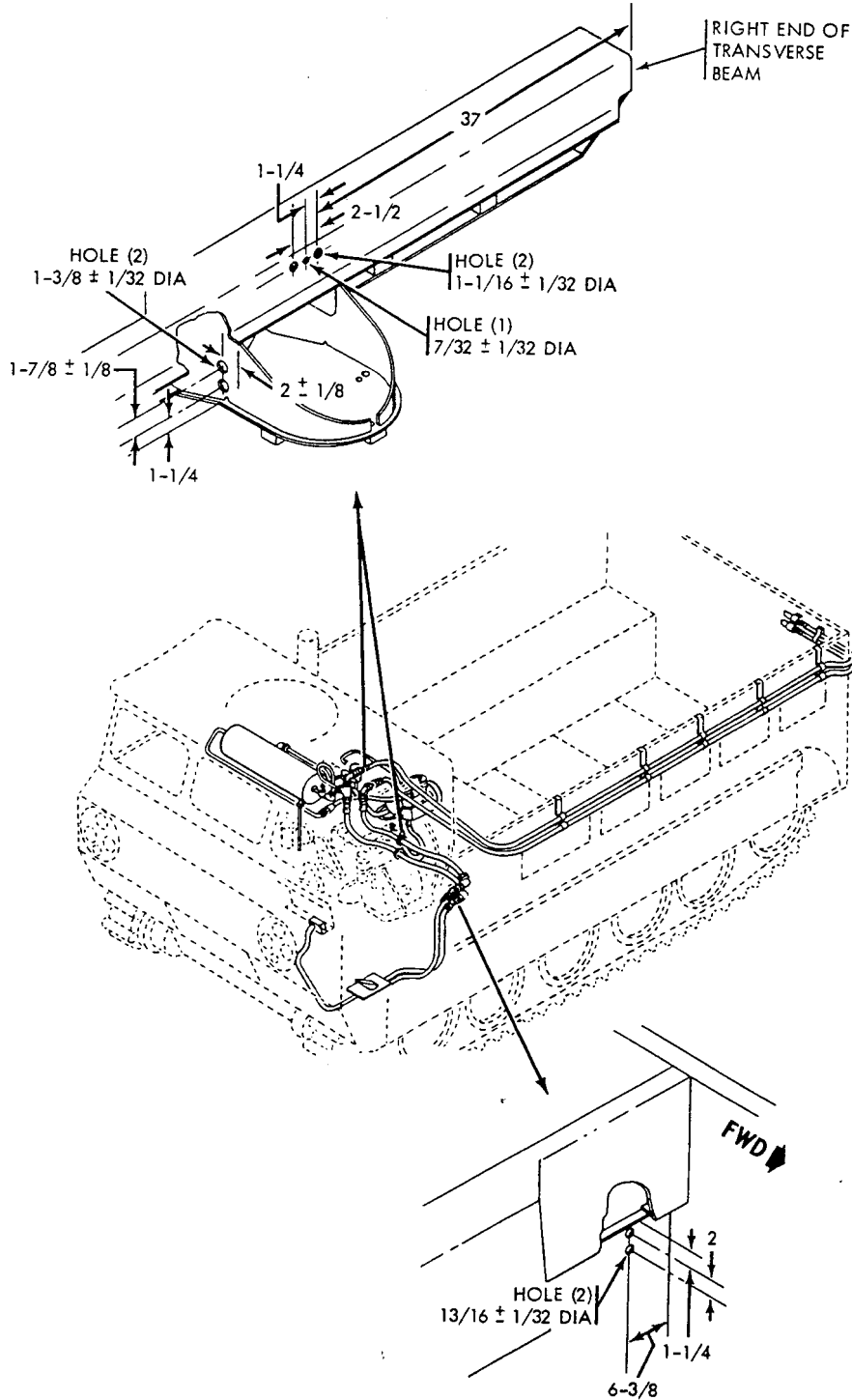
INSTALL AIR BRAKE KIT (M548A1) — Continued

0073 00

37. Install engine oil outlet elbow (9) in right side of engine block (10).
38. Install reservoir drain cock (11) in bottom of air reservoir (12).
39. Install reservoir instruction plate (13) on reservoir drain cock (11) with lock wire (14).



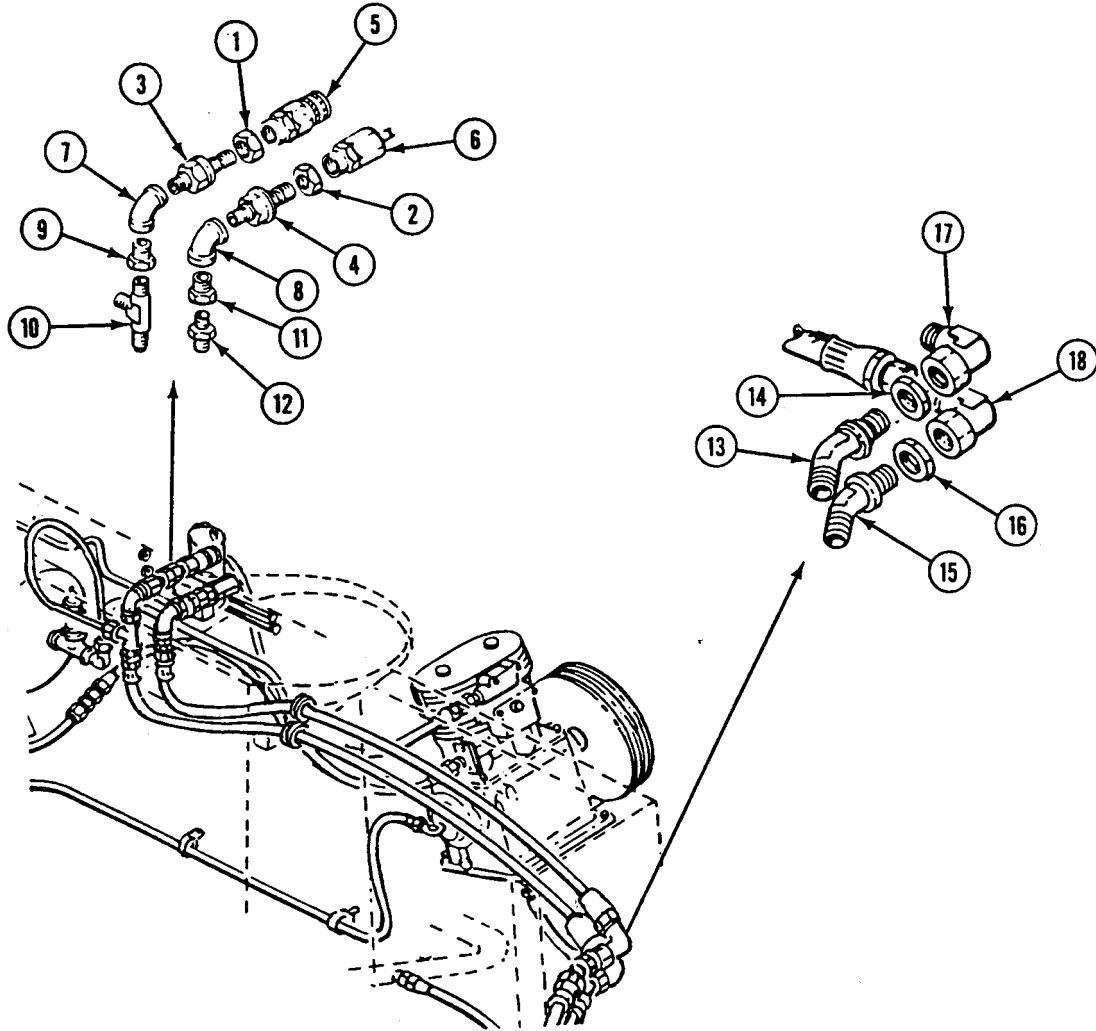
40. Check transverse beam, battery compartment bulkhead, and air cleaner mounting bracket to determine if holes have been drilled for mounting of air brake components. If holes have been drilled, go to next step. If holes have not been drilled, drill holes as shown in illustration below and go to next step.



INSTALL AIR BRAKE KIT (M548A1) — Continued

0073 00

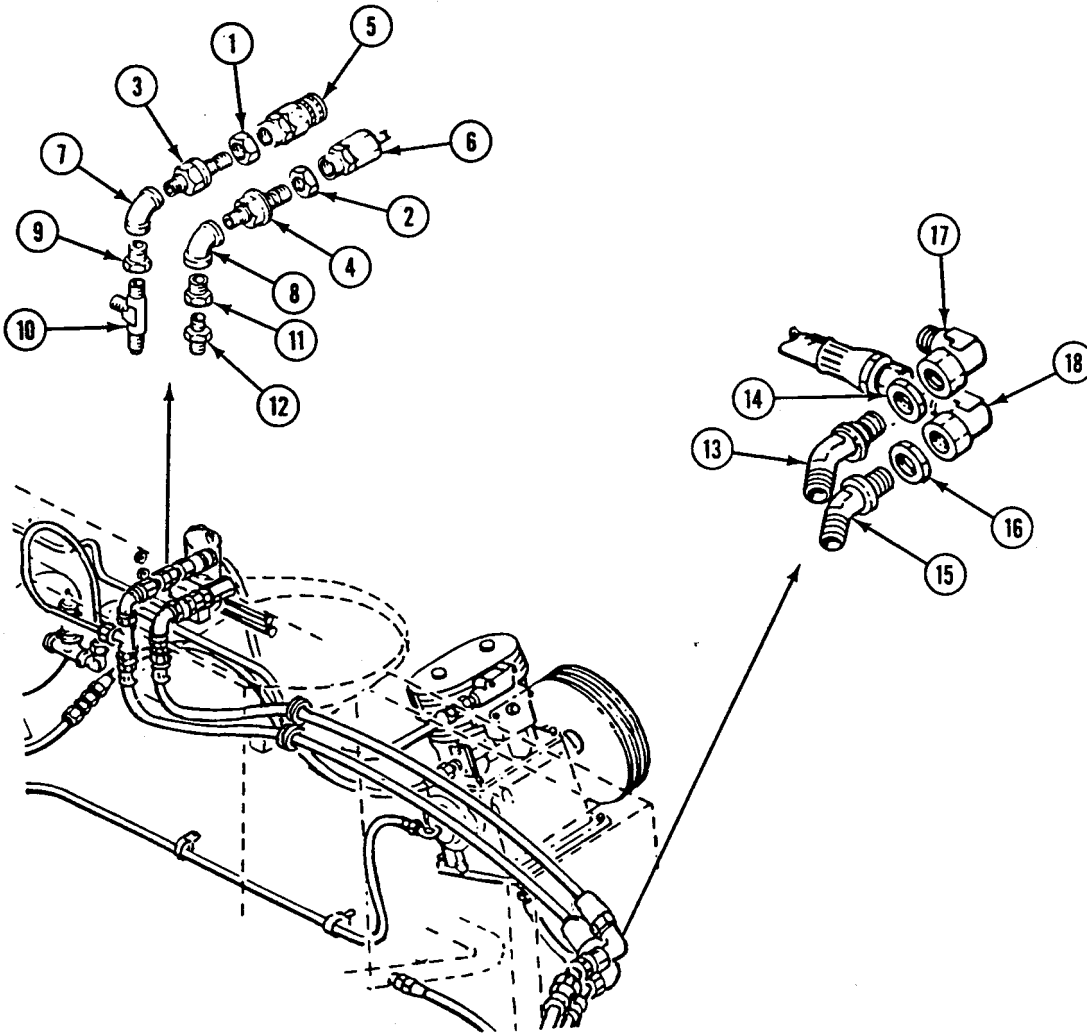
41. Remove emergency connector nut (1) and service connector nut (2) from emergency outlet connector (3) and service outlet connector (4). Install connector (3) and connector (4) in traverse beam with nut (1) and nut (2).
42. Install coupling (5) on emergency outlet connector (3).
43. Install nipple (6) on service outlet connector (4).
44. Install emergency outlet elbow (7) on emergency outlet connector (3).
45. Install service outlet elbow (8) on service outlet connector (4).



INSTALL AIR BRAKE KIT (M548A1) — Continued

0073 00

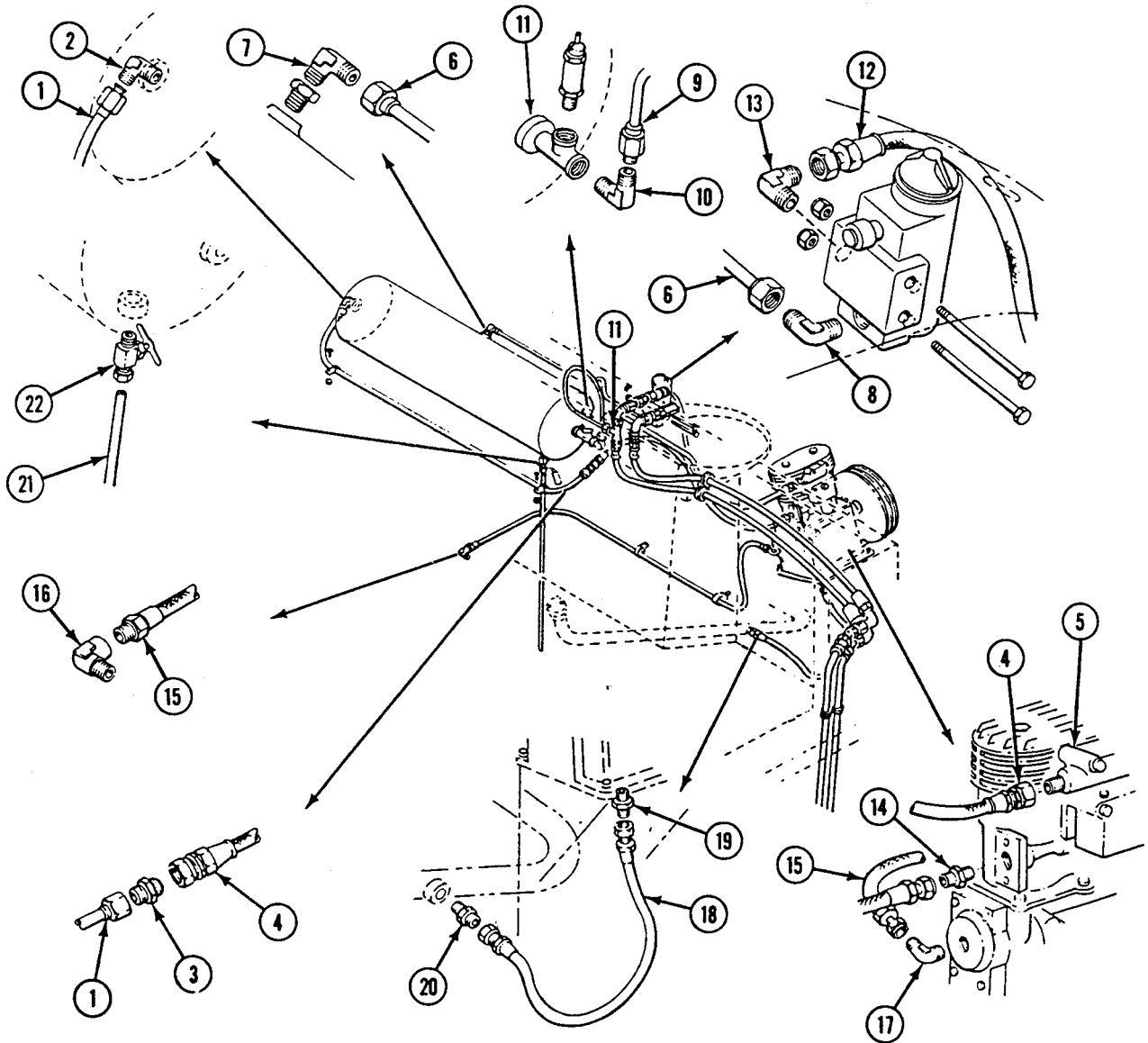
46. Install bushing (9) and tee (10) on emergency outlet elbow (7).
47. Install bushing (11) and nipple (12) on service outlet elbow (8).
48. Install service bulkhead elbow (13) in rear driver's area bulkhead with lock nut (14).
49. Install supply bulkhead elbow (15) in rear battery compartment bulkhead with lock nut (16).
50. Install service hose elbow (17) on service bulkhead elbow (13).
51. Install supply hose elbow (18) on supply bulkhead elbow (15).



INSTALL AIR BRAKE KIT (M548A1) — Continued

0073 00

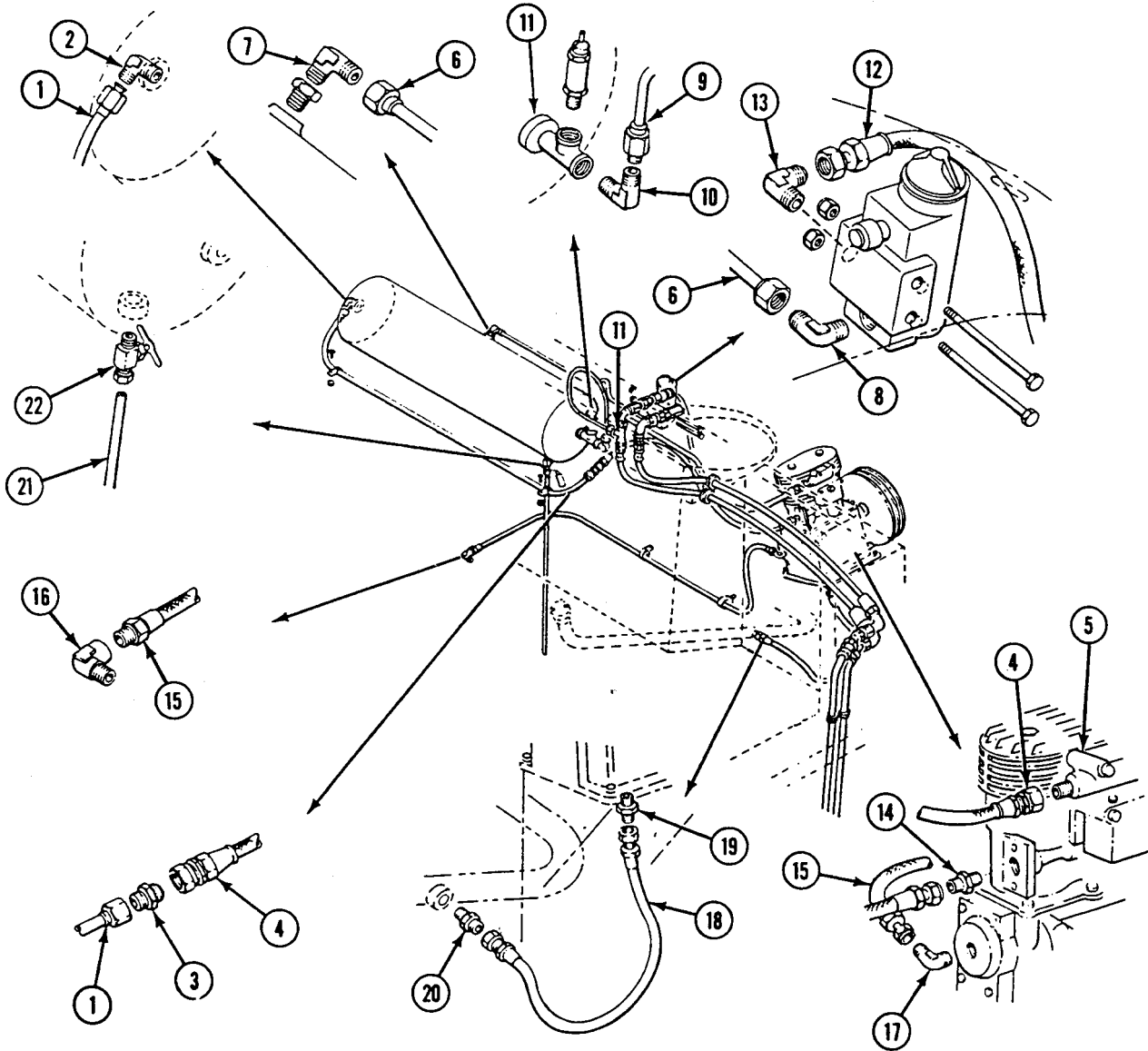
52. Connect reservoir inlet tube assembly (1) to reservoir inlet elbow (2).
53. Install hose-to-tube union (3) in reservoir inlet tube assembly (1).
54. Connect compressor discharge hose assembly (4) to hose-to-tube union (3) and pressure discharge elbow (5).
55. Connect reservoir-to-governor tube assembly (6) to reservoir outlet-to-governor elbow (7) and governor inlet elbow (8).
56. Connect reservoir outlet tube assembly (9) to reservoir outlet elbow (10) and emergency hose outlet tee (11).



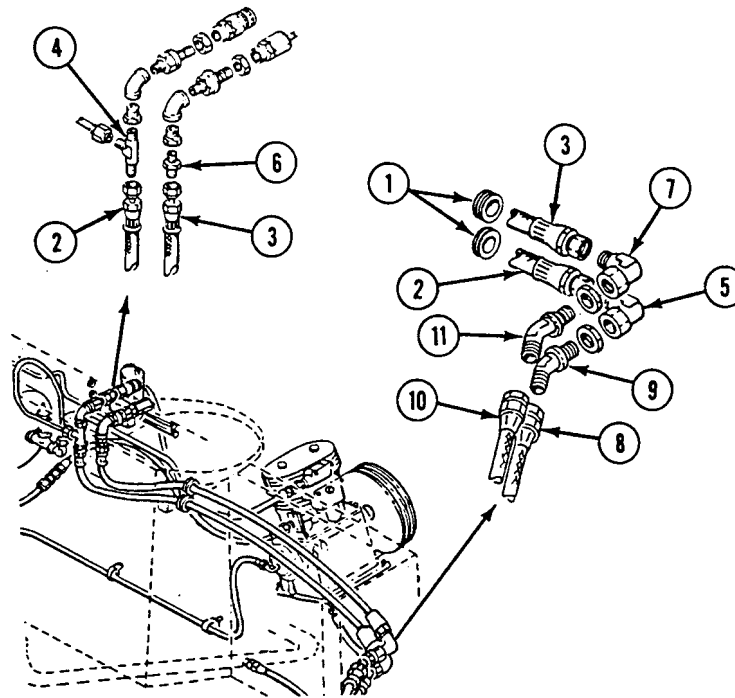
INSTALL AIR BRAKE KIT (M548A1) — Continued

0073 00

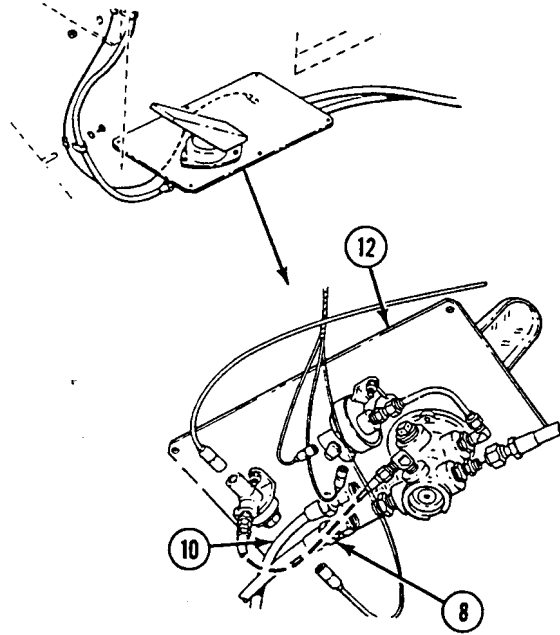
57. Connect governor-to-compressor hose assembly (12) to governor outlet elbow (13) and compressor nipple (14).
58. Connect engine-to-compressor oil hose assembly (15) to engine oil outlet elbow (16) and compressor oil inlet elbow (17).
59. Connect oil return hose assembly (18) to oil return nipple (19) and engine oil filler tube nipple (20).
60. Connect reservoir drain tube (21) to reservoir drain cock (22).



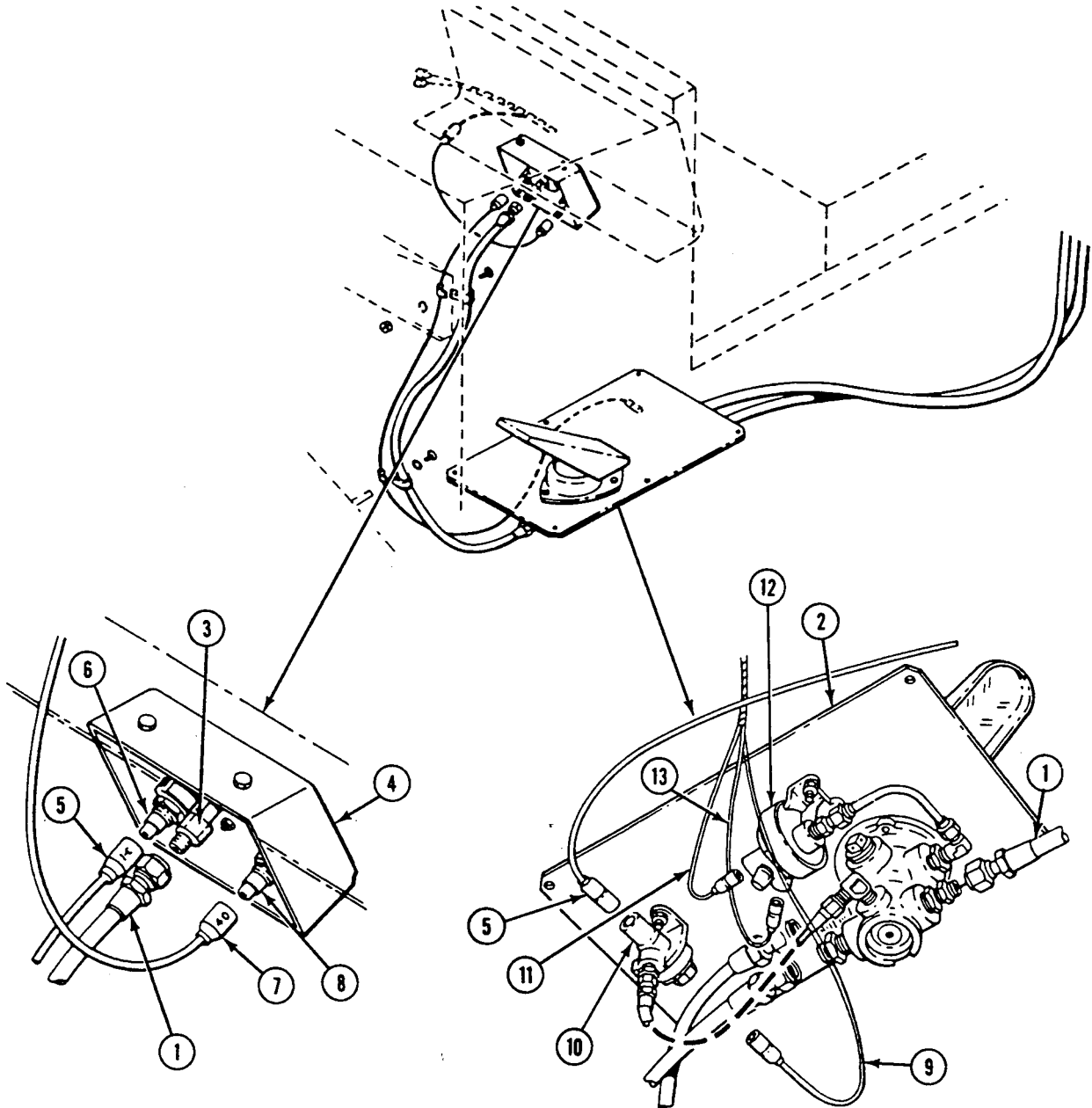
61. Install two grommets (1) on short supply and service hose assembly (2) and hose assembly (3).
62. Pass short supply hose assembly (2) through hole in air cleaner mounting bracket, and connect to emergency hose outlet tee (4) and supply hose elbow (5). Push grommet (1) into hole in air cleaner mounting bracket.
63. Pass short service hose assembly (3) through hole in air cleaner mounting bracket, and connect to service outlet nipple (6) and service hose elbow (7). Push grommet (1) into hole in air cleaner mounting bracket.
64. Connect long supply hose (8) to supply bulkhead elbow (9).
65. Connect long service hose assembly (10) to service bulkhead elbow (11).



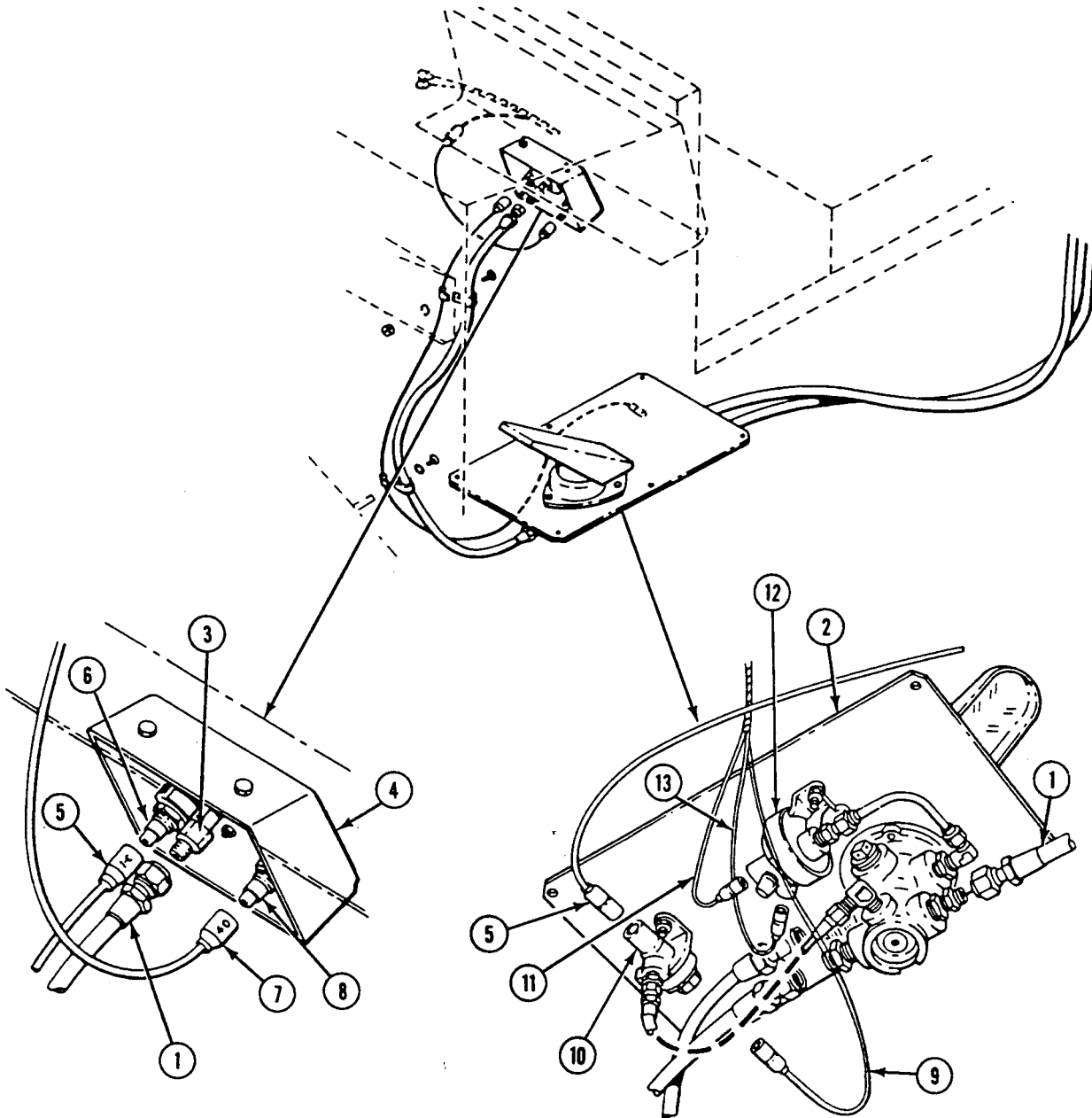
66. Position treadle valve assembly (12) on floor in cab in front of driver's seat.
67. Connect long supply hose assembly (8) to lower port on treadle valve assembly (12).
68. Connect long service hose assembly (10) to upper port on treadle valve assembly (12).



69. Connect valve-to-indicator hose assembly (1) to front port on treadle valve assembly (2) and air pressure indicator (3) on air brake kit instrument panel (4).
70. Connect valve-to-panel circuit 1C lead (5) to low pressure switch on treadle valve assembly (2) and to air low pressure warning light (6) on air brake kit instrument panel (4). Connect circuit 40 lead (7) to air brakes panel lamp (8) on air brake kit instrument panel (4).



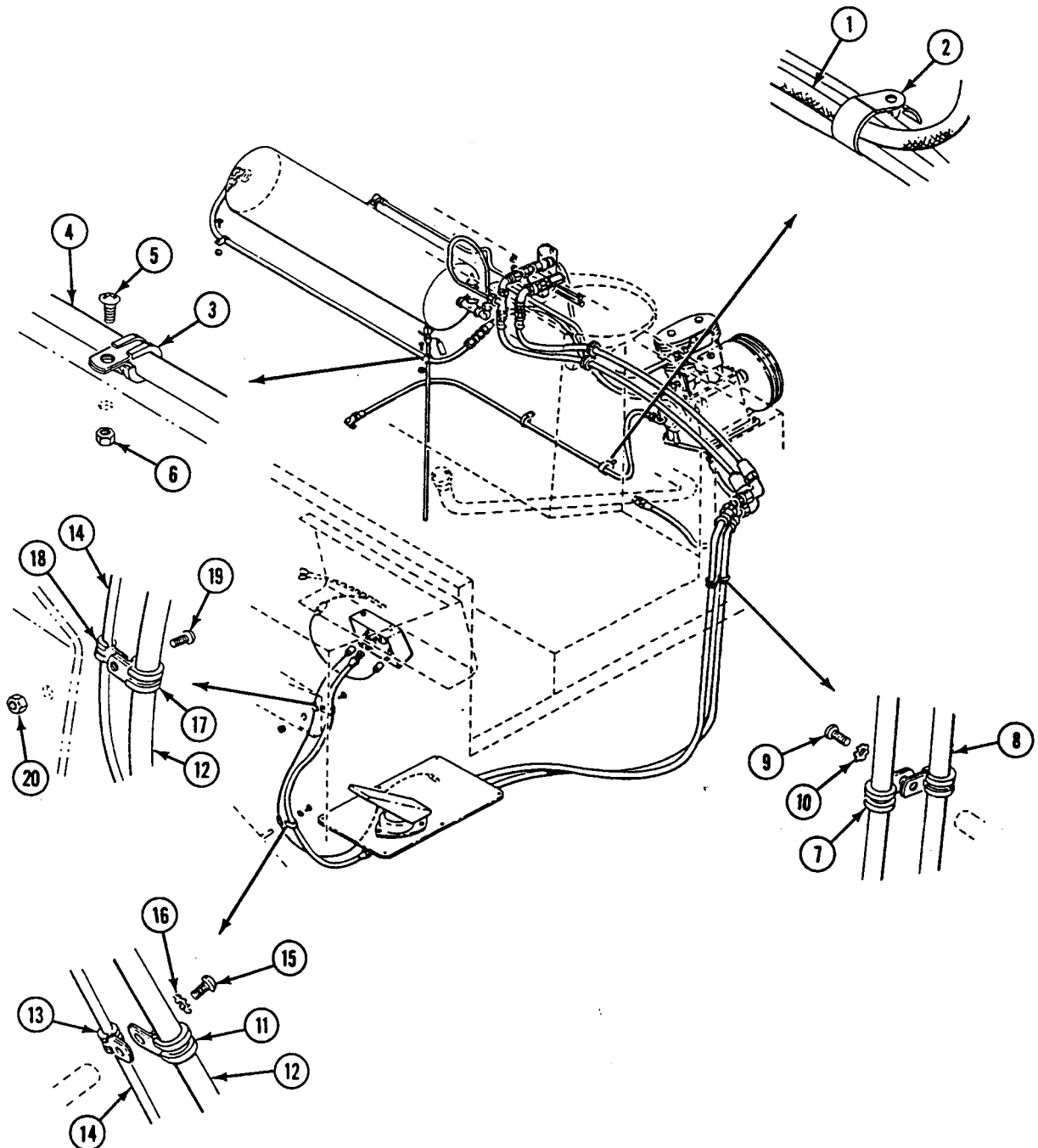
71. Connect circuit 1B lead (9) to air brake low pressure switch (10).
72. Connect circuit 75 lead (11) to stoplight switch (12).
73. Connect circuit 75A lead (13) to stoplight switch (12).
74. Install treadle valve (WP 0075 00).



INSTALL AIR BRAKE KIT (M548A1) — Continued

0073 00

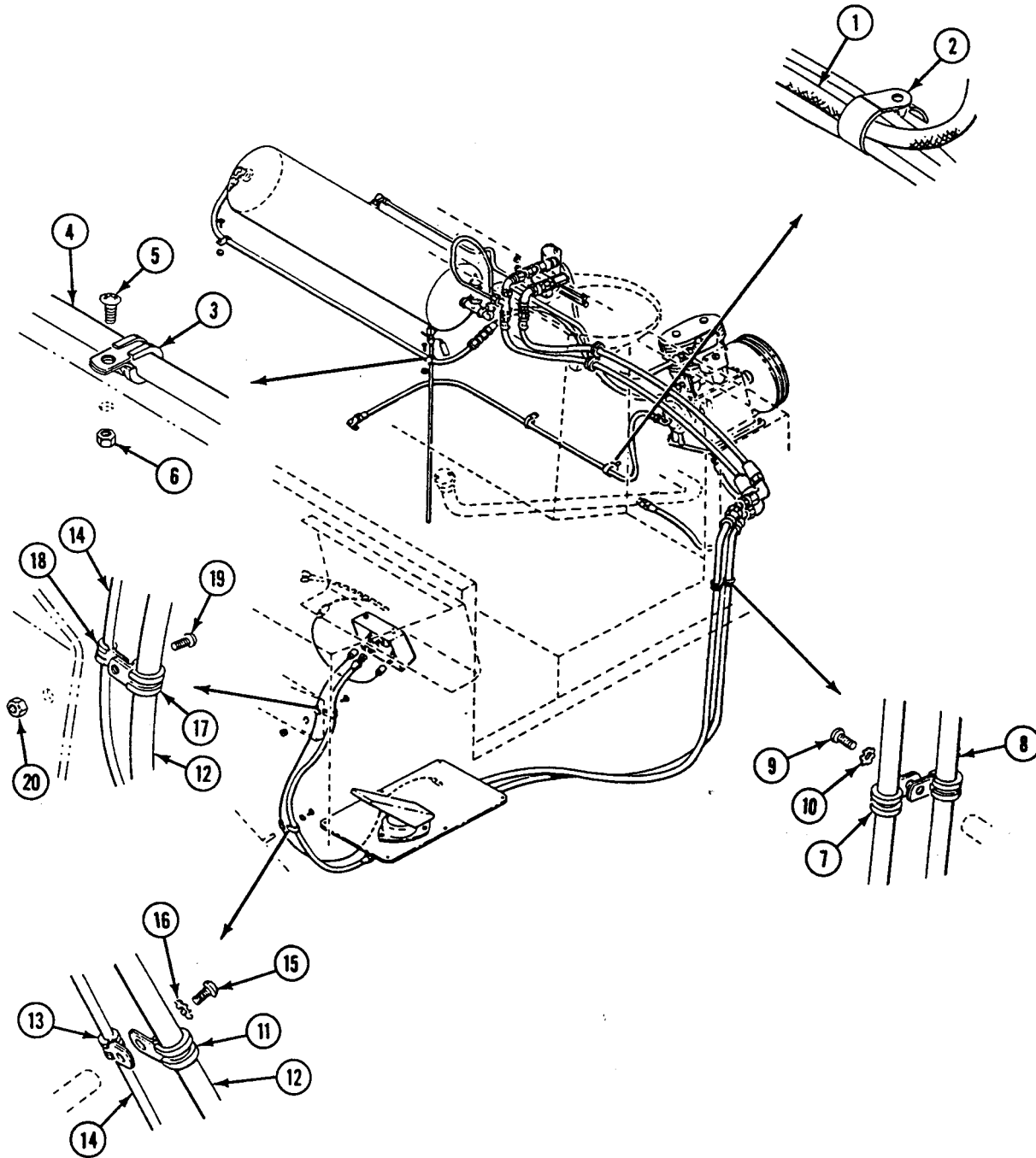
75. Attach compressor oil hose assembly (1) to fuel hoses attached to transfer gearcase using two strap assemblies (2). Space straps 6 inches (15 cm) on either side of center of transfer gearcase.
76. Install two inlet tube clamps (3) on reservoir inlet tube assembly (4). Install inlet tube clamps (3) on transverse beam with two screws (5) and nuts (6).
77. Install one middle tube clamp (7) on long service supply hose to treadle valve (8). Install clamps on left hull side of cab with screw (9) and lock washer (10).



INSTALL AIR BRAKE KIT (M548A1) — Continued

0073 00

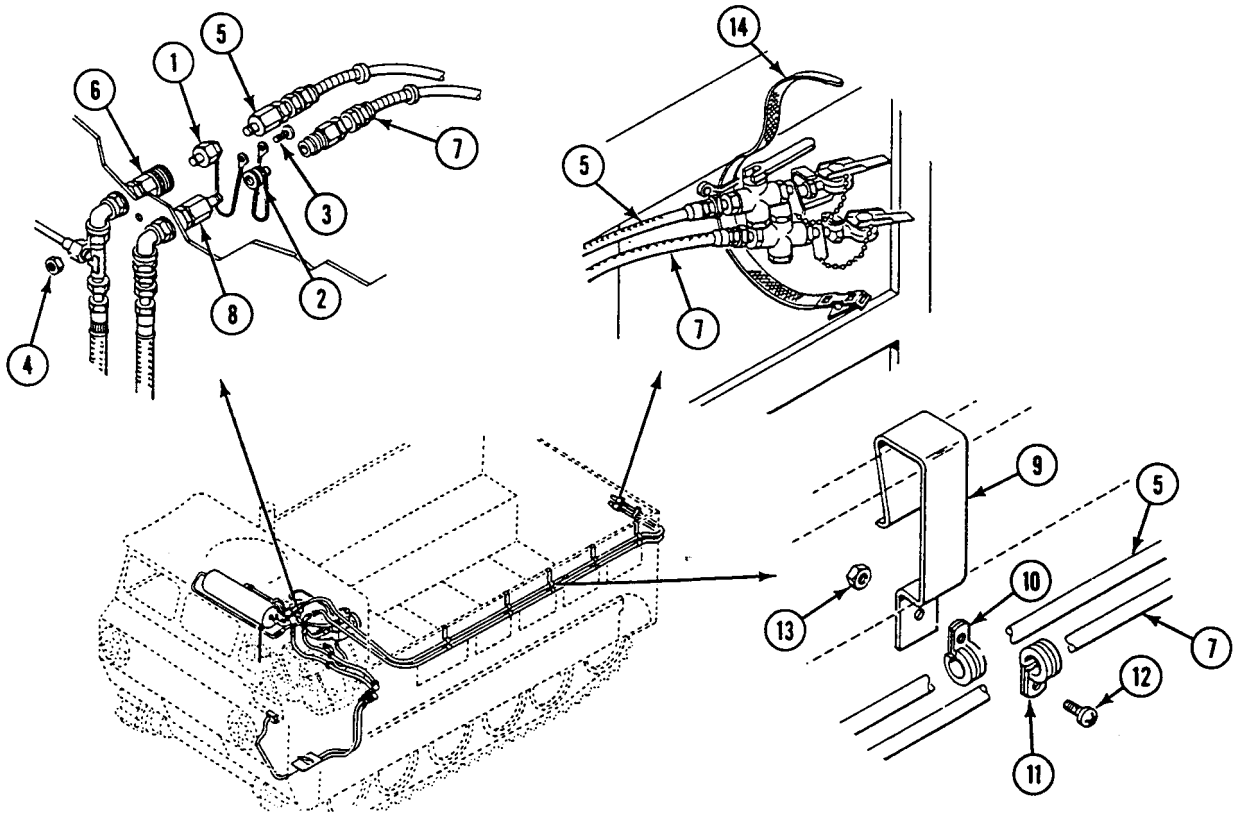
78. Install lower hose clamp (11) on valve-to-indicator hose assembly (12) and lower lead clamp (13) on valve-to-panel lead assembly (14). Install clamps on hull with screw (15) and lock washer (16).
79. Install upper hose clamp (17) on valve-to-indicator hose assembly (12) and upper lead clamp (18) on valve-to-panel lead assembly (14). Install clamps on hull with screw (19) and nut (20).



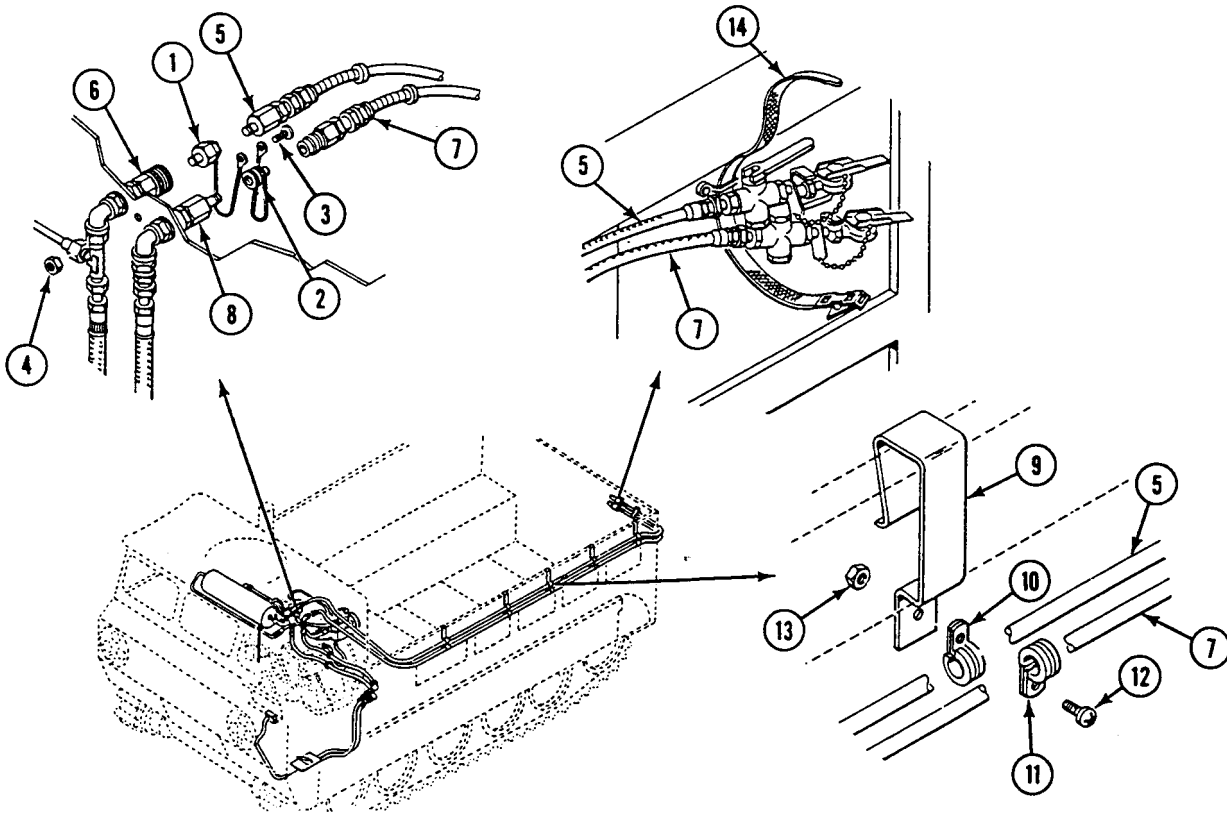
INSTALL AIR BRAKE KIT (M548A1) — Continued

0073 00

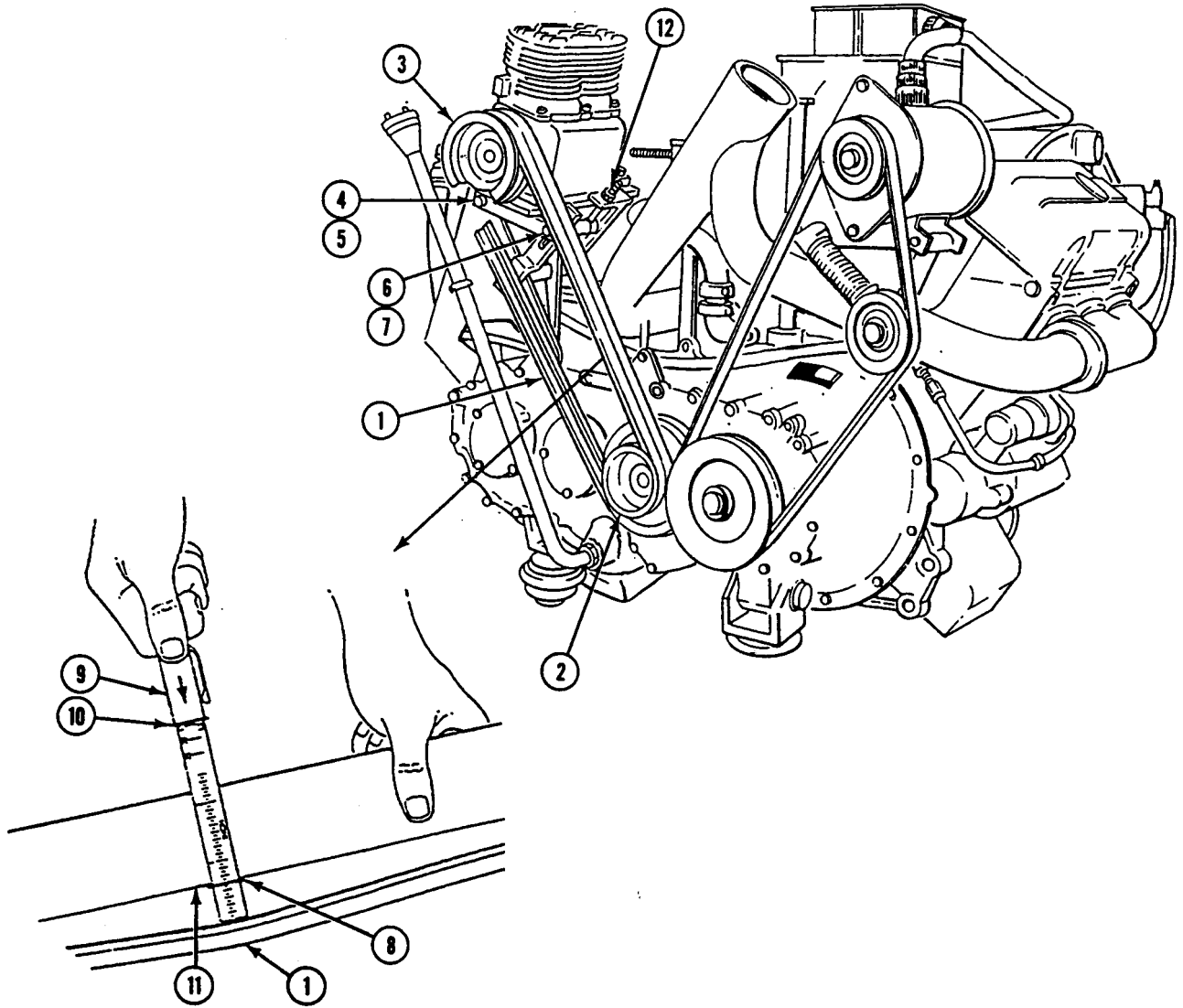
80. Install emergency coupling plug (1) and service nipple cap (2) on transverse beam with cap and plug retention screw (3) and nut (4).
81. Connect rear emergency hose assembly (5) to emergency female coupling (6).
82. Connect rear service hose assembly (7) to service outlet nipple (8).
83. Install five air hose clips (9) on left side of hull, with first clip 13 inches (33 cm) to rear of front cargo compartment bulkhead, and four remaining clips spaced at 24 inch (61 cm) intervals from first clip.



84. Install rear emergency hose assembly (5) and rear service hose assembly (7) on five clips (9) with five emergency hose clamps (10), service hose clamps (11), screws (12), and nuts (13).
85. Install rear emergency hose assembly (5) and rear service hose assembly (7) on cargo compartment door with two strap assemblies (14).
86. Install and adjust rear fan drive belts (see your -20).
87. Install and adjust generator drive belts (see your -20).

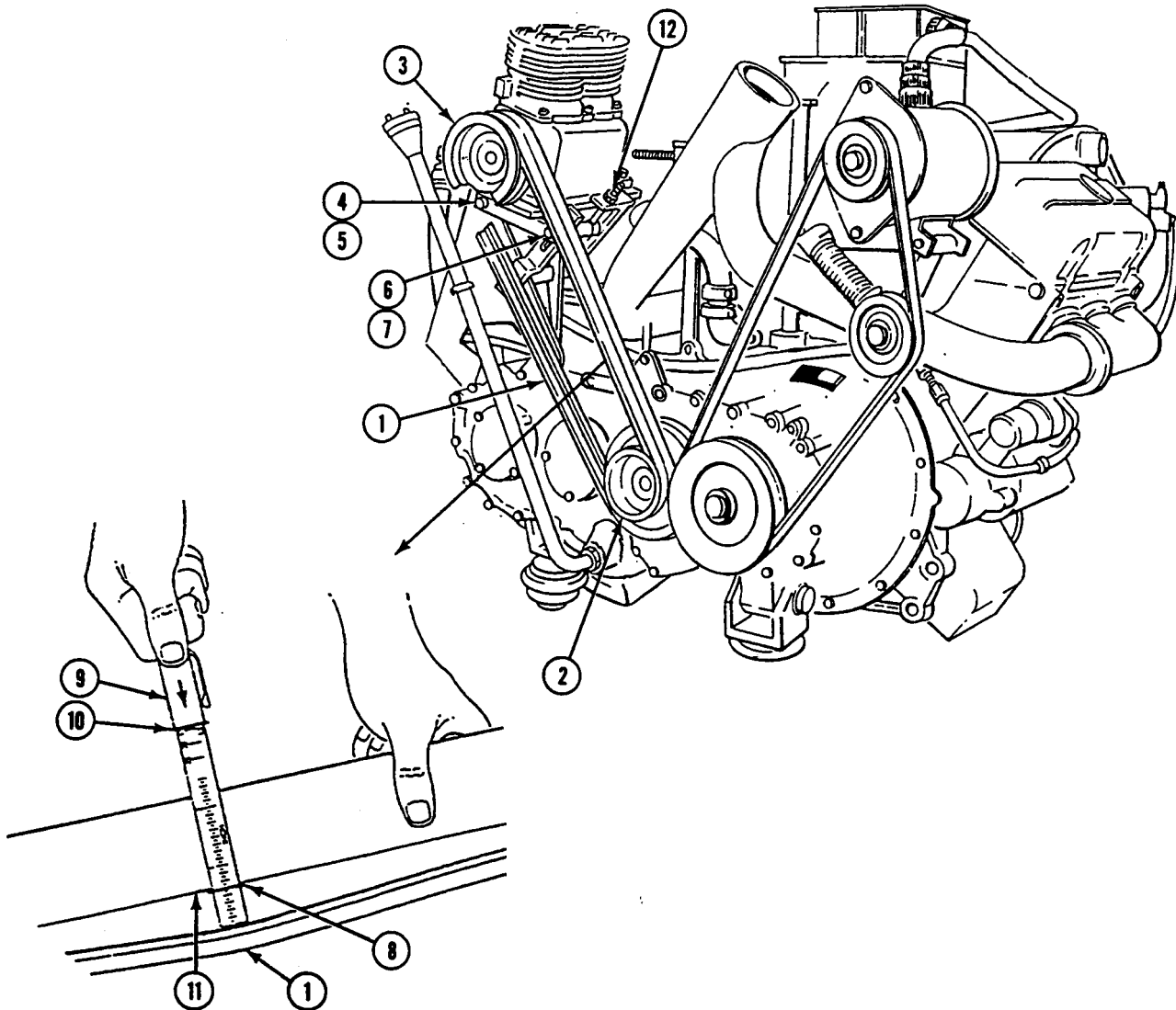


88. Install air compressor drive belts (1) on compressor drive step pulley (2) and compressor pulley (3).



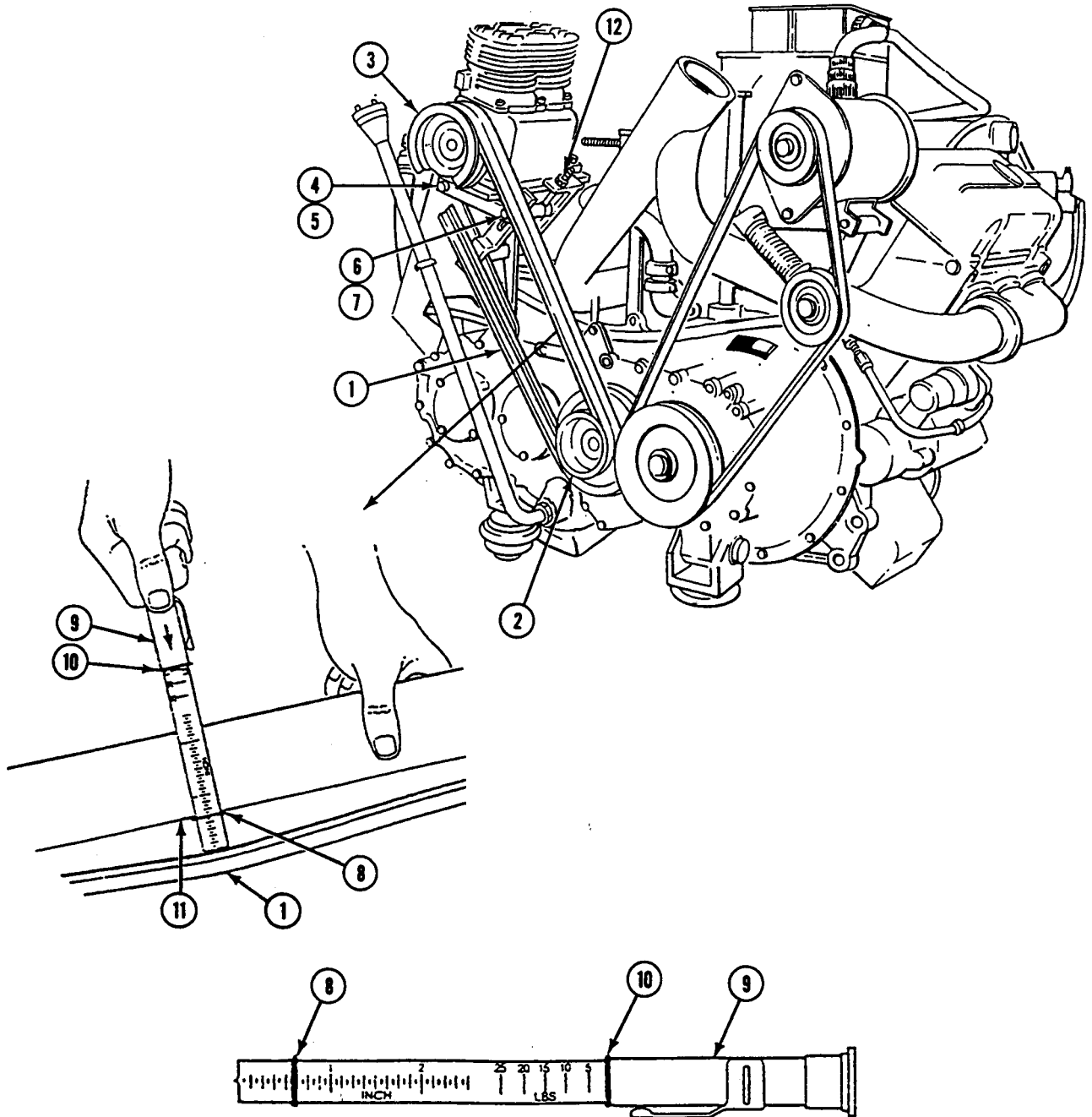
ADJUST DRIVE BELTS

1. Loosen two platform screws (4) and nuts (5).
2. Loosen upper link screw (6) and nut (7).



3. Check and adjust drive belts as follows:
 - a. Position lower O-ring (8) on tensiometer (9) at maximum allowable belt deflection of 5/8 inch (16 mm) to 3/4 inch (19 mm).
 - b. Position upper O-ring (10) on tensiometer (9) at zero.
 - c. Place yardstick (11) on pulley (2) and pulley (3).
 - d. Place tensiometer (9) on air compressor drive belt (1) at midspan and at right angle to belt.

- e. Press on top of tensiometer (9) until lower O-ring (8) aligns with bottom of yardstick (11). Remove tensiometer.
 - f. Take tensiometer reading at point where upper O-ring (10) stopped. Reading should not exceed 25 lbs (11.4 kg).
 - g. Adjust drive belts (1) by turning adjusting nut (12) as required.
4. Tighten screw (4), screw (6), nut (5), and nut (7).



TEST

1. Disengage engine disconnect, and start engine (see your -10) to fill air compressor oil reservoir (approximately 3 minutes).

NOTE

The low air pressure warning light should remain on until air pressure increases above 60 psi, and then it should go off.

2. Stop engine, engage engine disconnect, start engine and operate until air pressure reaches normal operating pressure (85 to 105 psi).
3. Check for oil leaks between compressor and engine.
4. Check for air leaks at all connections at compressor, reservoir, supply hose, tube-to-treadle valve, and rear of carrier. If leaks exist, tighten connections.

NOTE

With main light selector switch in stoplight position and differential steering levers released, carrier stoplight-taillight should come on when treadle is depressed.

5. Depress treadle, and check for air leaks in service tubes and hoses. If leaks exist, tighten connections.

FOLLOW-THROUGH STEPS

1. Close power plant upper rear access door (see your -10).
2. Install throttle floor plate (see your -20).
3. Lower cab center floor plate (see your -10).
4. Lower cab personnel center seat (see your -10).
5. Install top access cover and grilles (see your -10).

END OF TASK

AIR BRAKE KIT DATA (M548A1)

0074 00

THIS WORK PACKAGE COVERS:

Inspection-Acceptance and Rejection Criteria (page 0074 00-1).

INITIAL SETUP:

Maintenance Level

Direct Support

INSPECTION-ACCEPTANCE AND REJECTION CRITERIA

- The air brake kit component specifications are listed in the following table.

Table 1. EQUIPMENT DATA

| Description | Characteristics | Metric Equivalents |
|-------------------------|-------------------------------------|--------------------|
| Compressor: | | |
| Manufacturer | Bendix-Westinghouse | |
| Model | TRU-FLO Series 400 | |
| Part number | MS51322-1 | |
| Capacity | 7-1/4 cfm | 0.20 cubic m/min |
| Cylinders | 2 | |
| Cooling | Air-cooled | |
| Type | Single-acting, reciprocating | |
| Lubrication | Pressure from carrier engine | |
| Governor: | | |
| Manufacturer | Bendix-Westinghouse | |
| Model | 7003-001 | |
| Part number | MS53006-1 | |
| Type | Bourdon tube, exhaust to atmosphere | |
| Output pressure | 100 to 105 psi | 690 to 724 kPa |
| Cutin pressure | 80 to 85 psi | 552 to 586 kPa |
| Low Air Pressure Switch | | |
| Part number | MS27152-1 | |
| Contact open | 54 to 66 psi | 372 to 455 kPa |
| Stoplight Switch: | | |
| Manufacturer | Bendix-Westinghouse | |
| Model | 7014-01 | |
| Part number | MS75062-1 | |
| Contacts close | 5 psi | 35 kPa |

AIR BRAKE KIT DATA (M548A1) — Continued

0074 00

| | | |
|----------------|---------------------|--|
| Treadle Valve: | | |
| Manufacturer | Bendix-Westinghouse | |
| Model | 223349 | |
| Part number | 10947141 (19207) | |

END OF TASK

REMOVE/INSTALL TREADLE VALVE ASSEMBLY (M548A1)

0075 00

THIS WORK PACKAGE COVERS:

Removal (page 0075 00-1).
 Installation (page 0075 00-5).

INITIAL SETUP:

Maintenance Level

Direct Support

Tools and Special Tools

General Mechanic's Tool Kit (WP 0078 00, Item 68)

Materials/Parts

Sealing compound (WP 0080 00, Item 32)

Personnel Required

Track vehicle repairer 63H

References

See your -10
 See your -20

Equipment Condition

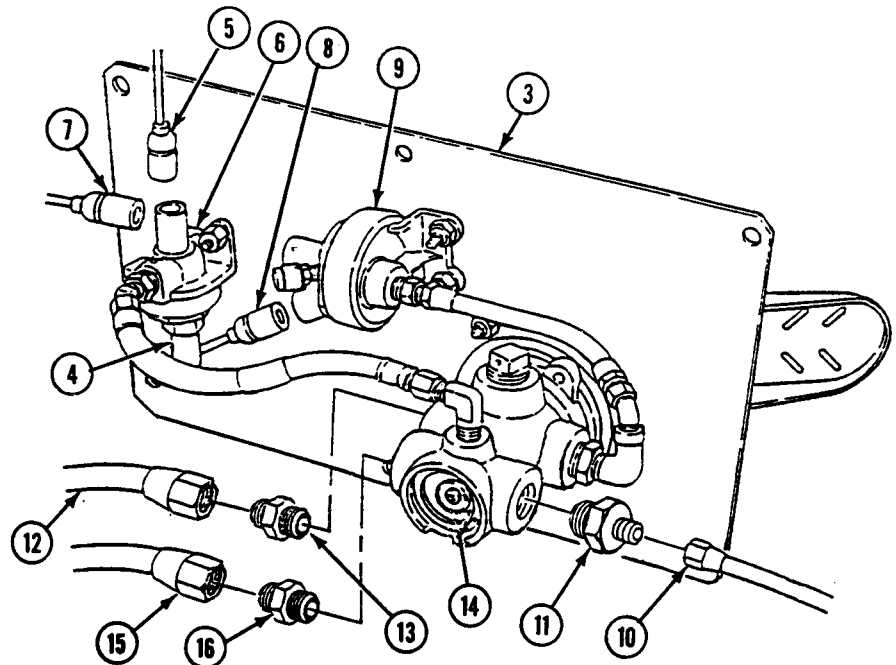
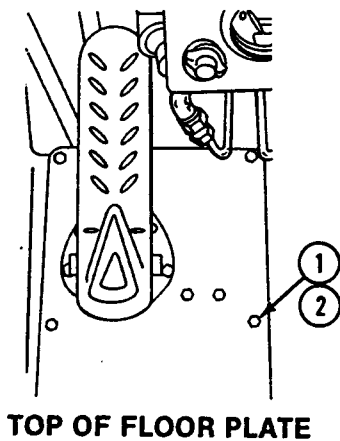
Engine stopped (see your -10)
 Carrier blocked (see your -10)
 Battery negative lead disconnected (see your -20)

REMOVAL

NOTE

If air brake system is pressurized, open drain cock on reservoir before removing treadle valve assembly.

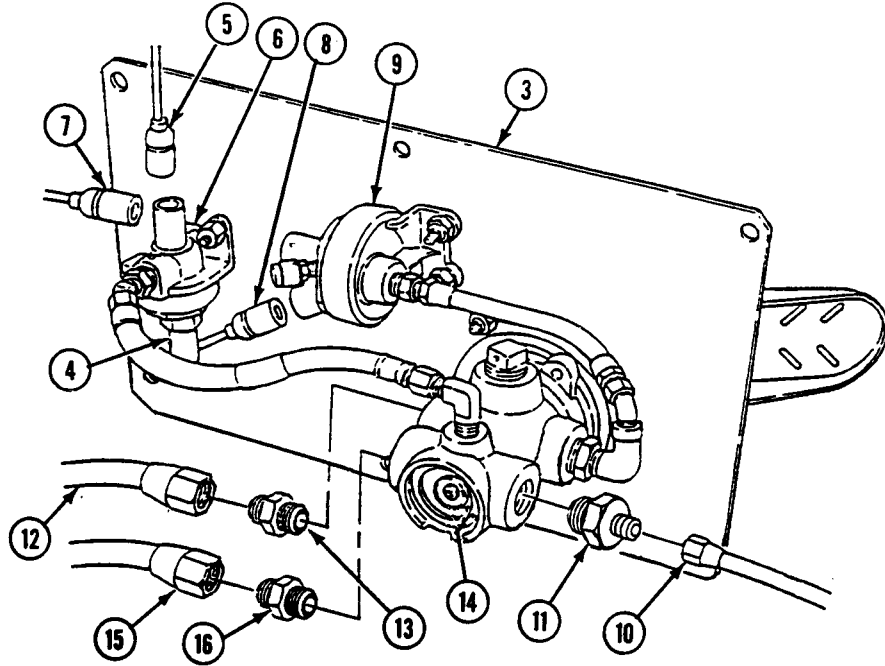
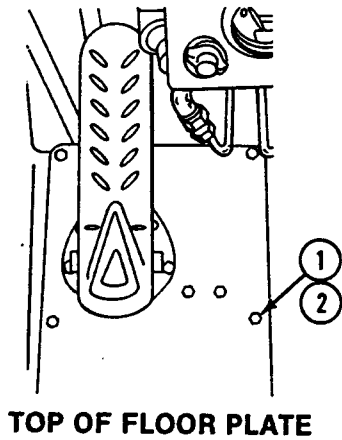
1. Remove six screws (1) and washers (2). Partially remove treadle valve assembly floor plate (3) to obtain access to bottom of valve.
2. Disconnect circuit 1C lead (4) and circuit 1B lead (5) from air low pressure switch (6).
3. Disconnect circuit 75 lead (7) and circuit 75A lead (8) from stoplight switch (9).



REMOVE/INSTALL TREADLE VALVE ASSEMBLY (M548A1) — Continued

0075 00

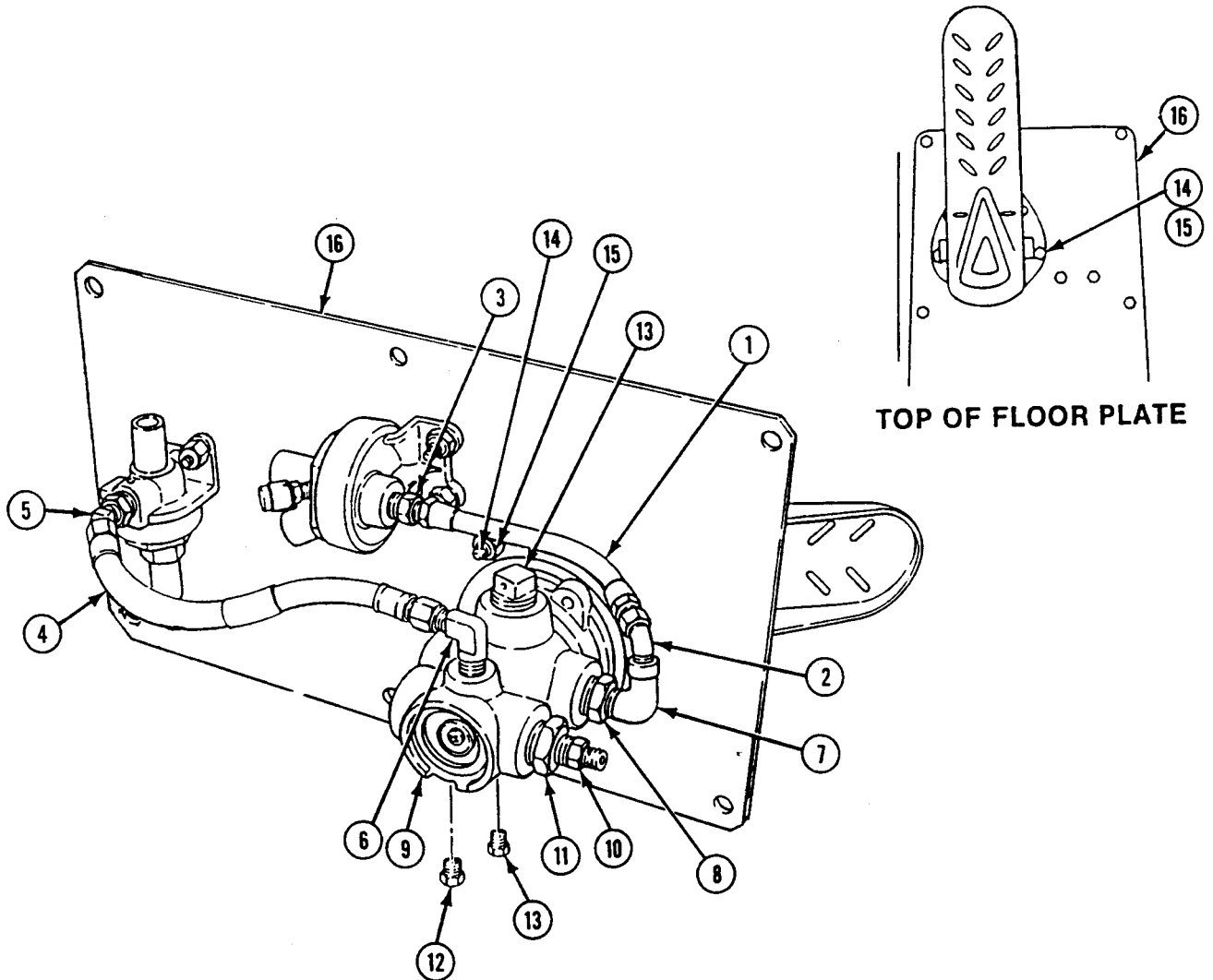
4. Disconnect treadle valve-to-indicator hose assembly (10) from pressure indicator nipple (11).
5. Disconnect service hose assembly (12) from service hose connector (13) on treadle valve (14).
6. Disconnect supply hose assembly (15) from supply hose connector (16) on treadle valve (14).
7. Remove treadle valve assembly from carrier.



REMOVE/INSTALL TREADLE VALVE ASSEMBLY (M548A1) — Continued

0075 00

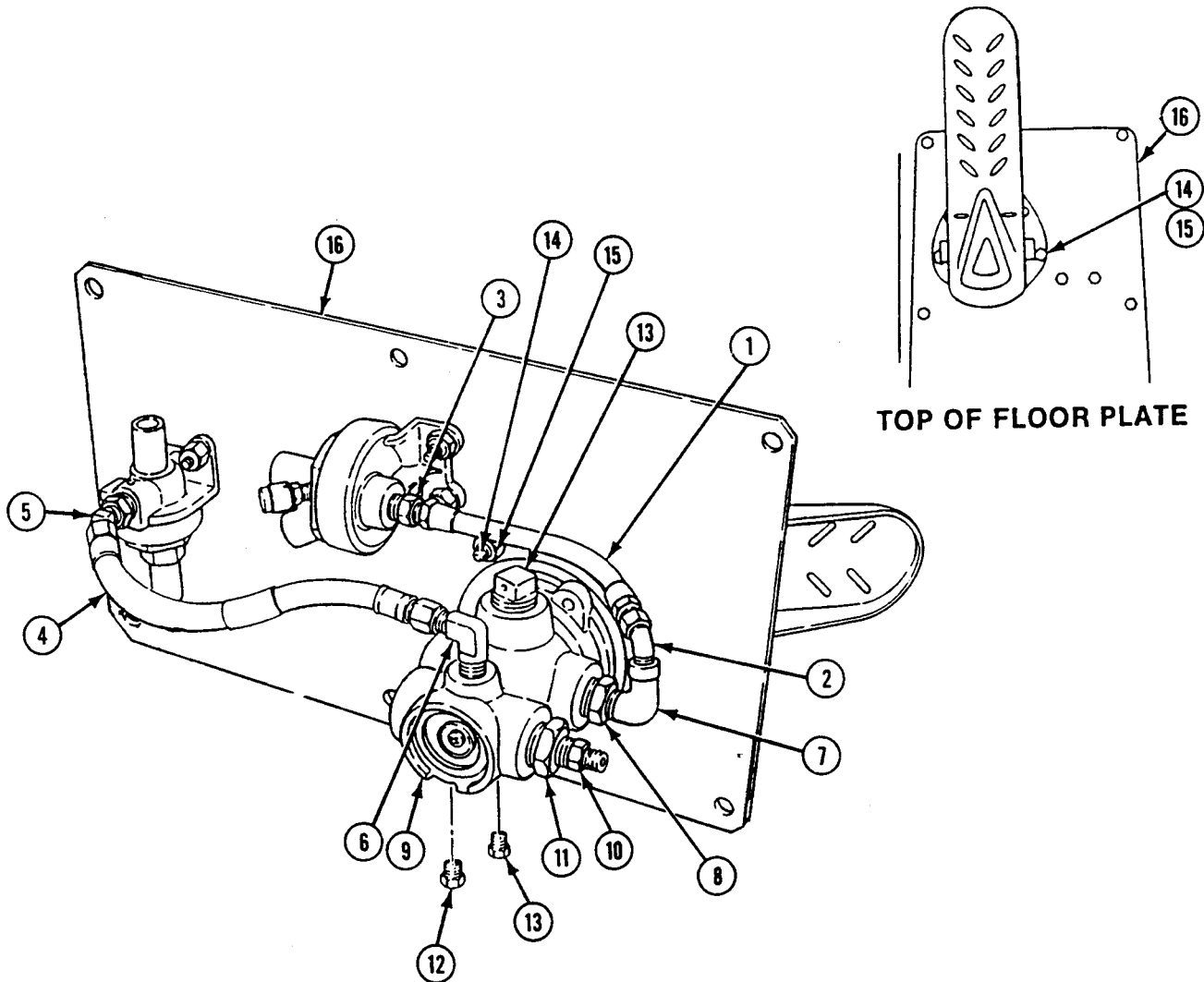
8. Disconnect stoplight switch hose assembly (1) from switch elbow (2) and stoplight switch nipple (3). Remove hose assembly.
9. Disconnect pressure switch hose assembly (4) from pressure switch inlet elbow (5) and pressure switch elbow (6). Remove hose assembly and elbow (6).
10. Remove switch elbow (2), stoplight switch elbow (7) and bushing (8) from treadle valve (9).



REMOVE/INSTALL TREADLE VALVE ASSEMBLY (M548A1) — Continued

0075 00

11. Remove pressure indicator nipple (10) and bushing (11) from treadle valve (9).
12. Remove pressure switch elbow (6) from treadle valve (9).
13. Remove one supply port plug (12) and two service port plugs (13) from treadle valve (9).
14. Remove three screws (14), nuts (15), and treadle valve (9) from treadle valve assembly floor plate (16). Remove treadle valve.

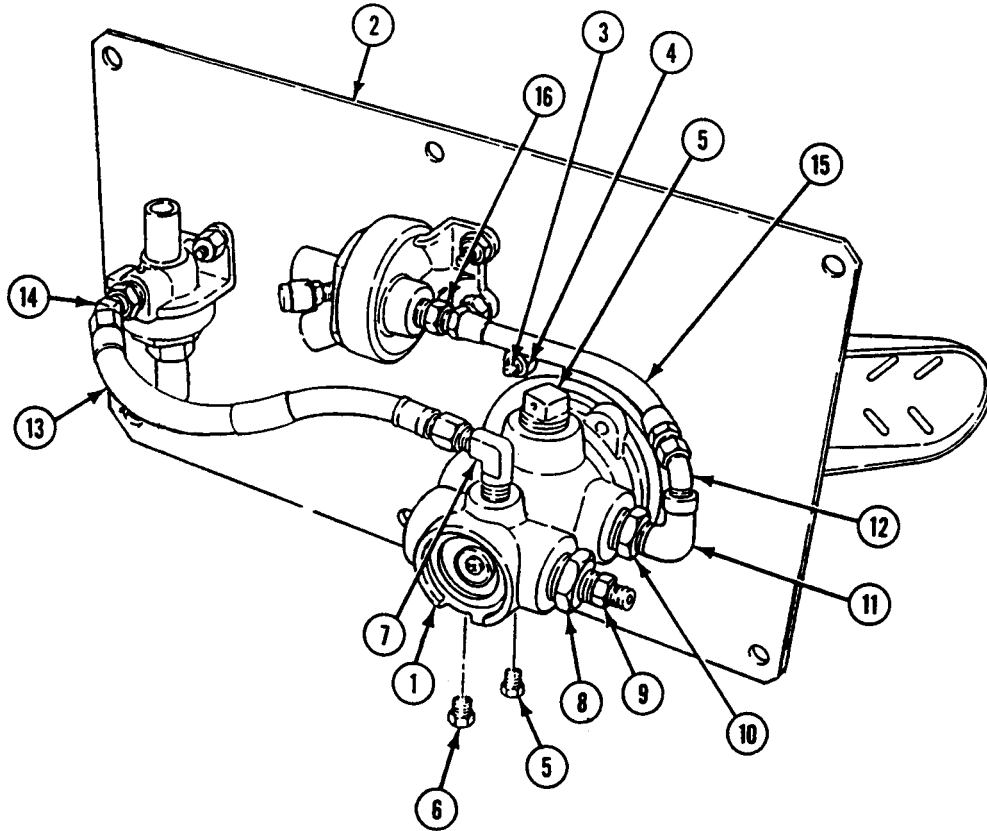


INSTALLATION

NOTE

Apply light coat of sealing compound to tapered pipe threads after cleaning.

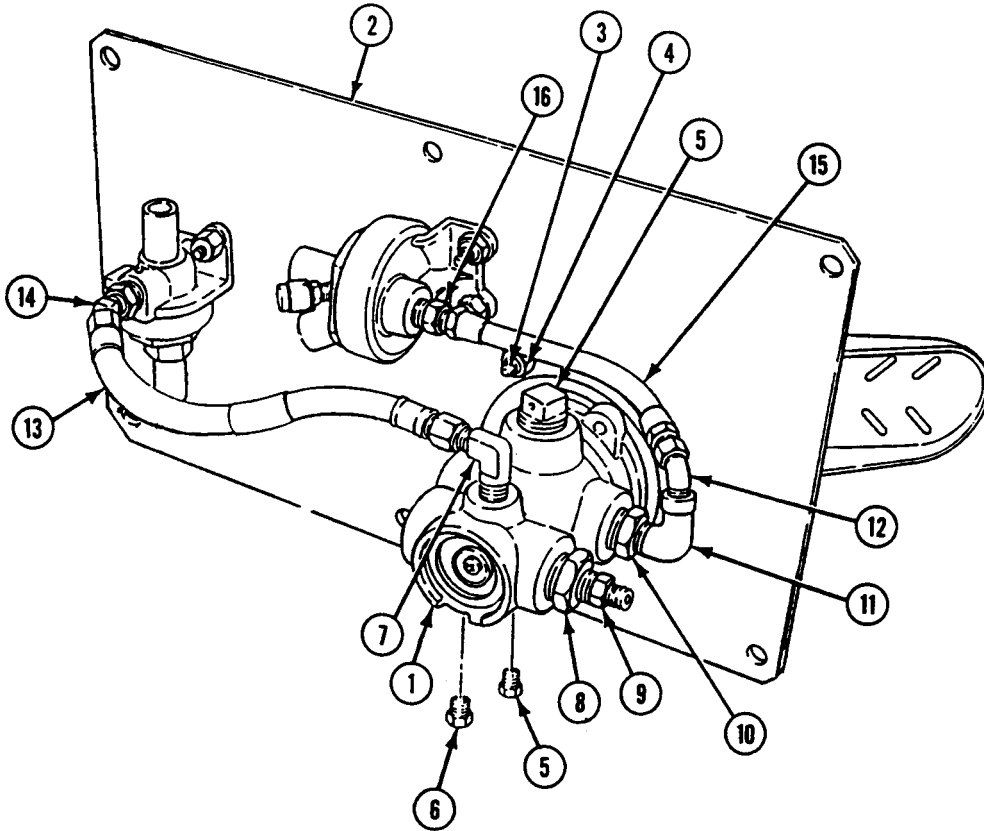
1. Install treadle valve (1) on assembly floor plate (2) with three screws (3) and nuts (4).
2. Install two service port plugs (5) and one supply port plug (6) in treadle valve (1).
3. Install pressure switch elbow (7) in treadle valve (1).



REMOVE/INSTALL TREADLE VALVE ASSEMBLY (M548A1) — Continued

0075 00

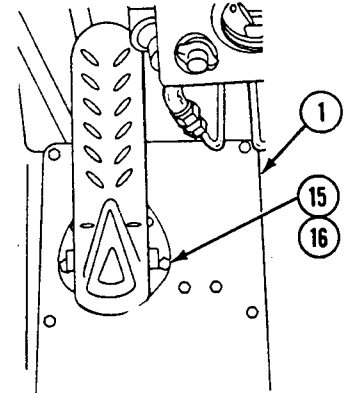
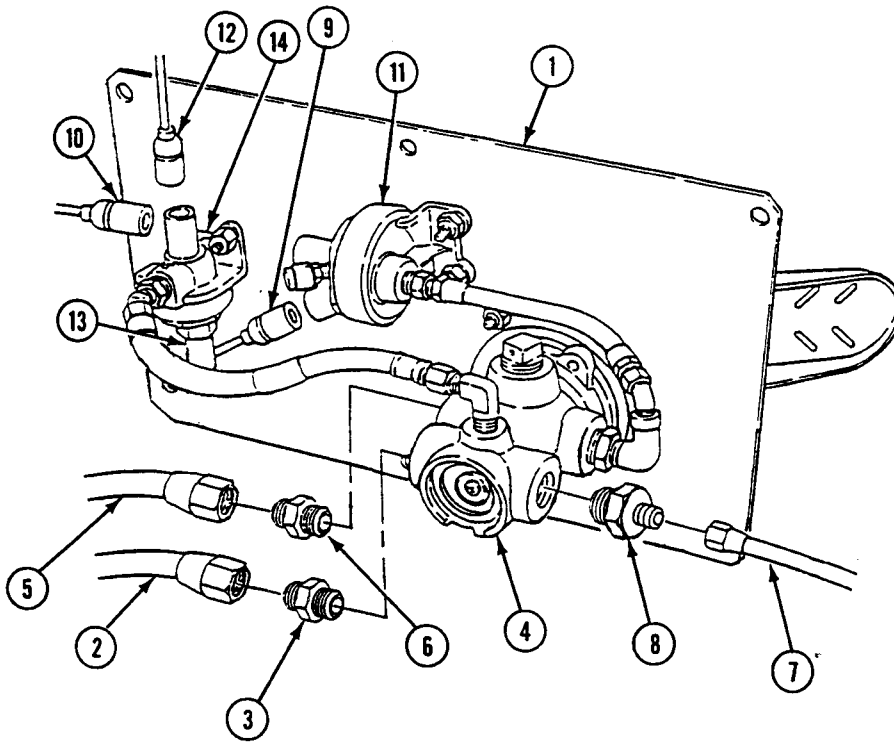
4. Install pressure indicator bushing (8) and nipple (9) on treadle valve (1).
5. Install stoplight switch bushing (10), stoplight switch elbow (11), and switch elbow (12) on treadle valve (1).
6. Connect pressure switch hose assembly (13) to pressure switch inlet elbow (14) and pressure switch elbow (7).
7. Connect stoplight switch hose assembly (15) to switch elbow (12) and nipple (16).



REMOVE/INSTALL TREADLE VALVE ASSEMBLY (M548A1) — Continued

0075 00

8. Place treadle valve assembly floor plate (1) next to opening in driver's floor plate.
9. Connect supply hose assembly (2) to supply hose connector (3) on treadle valve (4).
10. Connect service hose assembly (5) to service hose connector (6) on treadle valve (4).
11. Connect treadle valve-to-indicator hose assembly (7) to pressure indicator nipple (8).

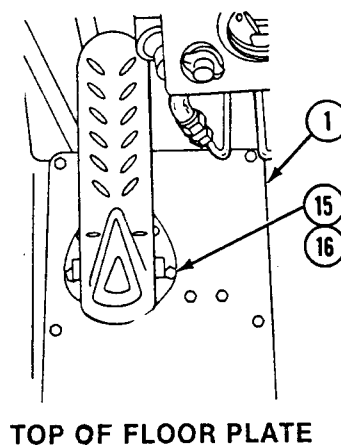
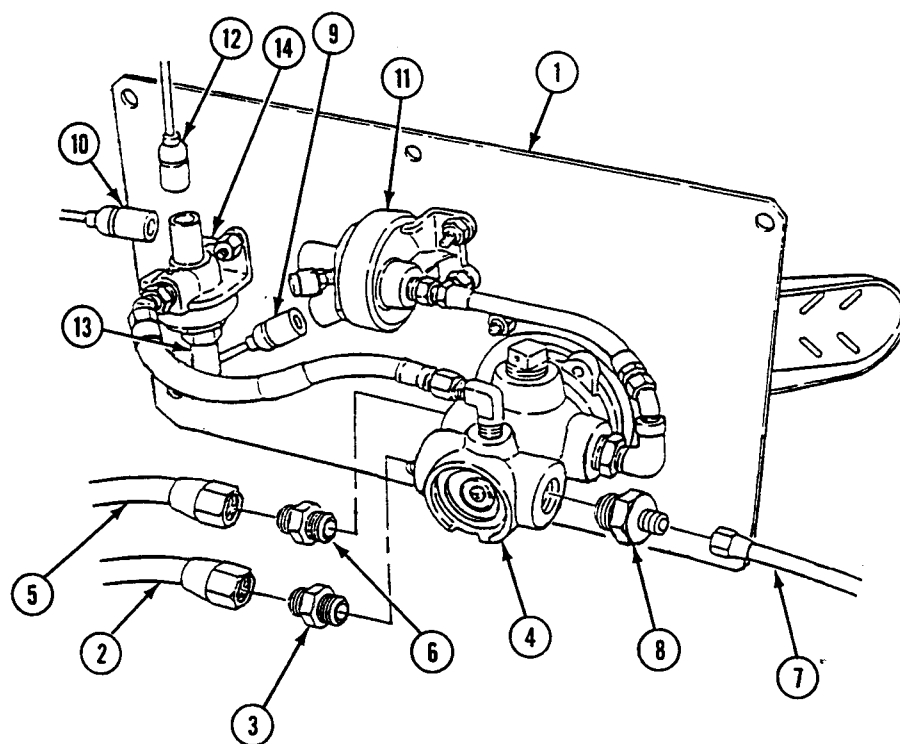


TOP OF FLOOR PLATE

REMOVE/INSTALL TREADLE VALVE ASSEMBLY (M548A1) — Continued

0075 00

12. Connect circuit 75A lead (9) and circuit 75 lead (10) to stop light switch (11).
13. Connect circuit 1B lead (12) and circuit 1C lead (13) to air low pressure switch (14).
14. Install treadle valve assembly floor plate (1) in opening in driver's floor plate with six washers (15) and screws (16).



FOLLOW-THROUGH STEPS

1. Connect battery negative lead (see your -20).
2. Start engine (see your -10).
3. Check treadle valve for proper operation.
4. Stop engine (see your -10).

END OF TASK

INSTALL TURN SIGNAL KIT

0076 00

THIS WORK PACKAGE COVERS:

- Prepare Carrier (page 0076 00-2).
 - Install (page 0076 00-8).
 - Inspect (page 0076 00-26).
 - Test (page 0076 00-26).
 - Paint (page 0076 00-26).
-

INITIAL SETUP:

Maintenance Level

Direct Support

Personnel Required

Unit Mechanic

Tools and Special Tools

- General Mechanic's Tool Kit (WP 0078 00, Item 68)
- Portable Electric Drill (WP 0078 00, Item 12)
- Twist Drill Set (WP 0078 00, Item 15)
- Soldering Gun (WP 0078 00, Item 56)

References

- See your -10
- See your -20
- TM 43-0139

Materials/Parts

- Calking compound (WP 0080 00, Item 8)
- Tin alloy solder (WP 0080 00, Item 43)
- Turn signal kit P/N 11660894
- Bushing
- Gasket
- Gasket
- Lock washer
- Lock washer (5)
- Retainer (2)

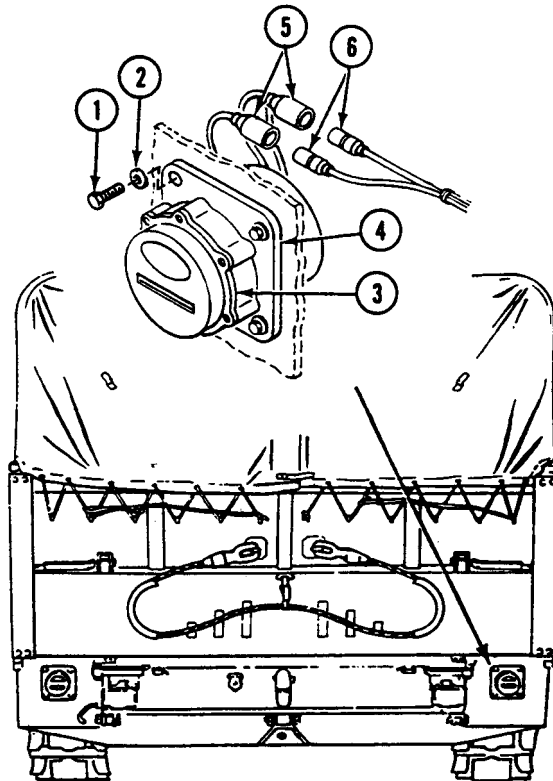
Equipment Condition

- Engine stopped (see your -10)
 - Carrier blocked (see your -10)
 - Battery negative lead(s) disconnected (see your -20)
 - Cargo compartment floor plates removed (see your -10)
-

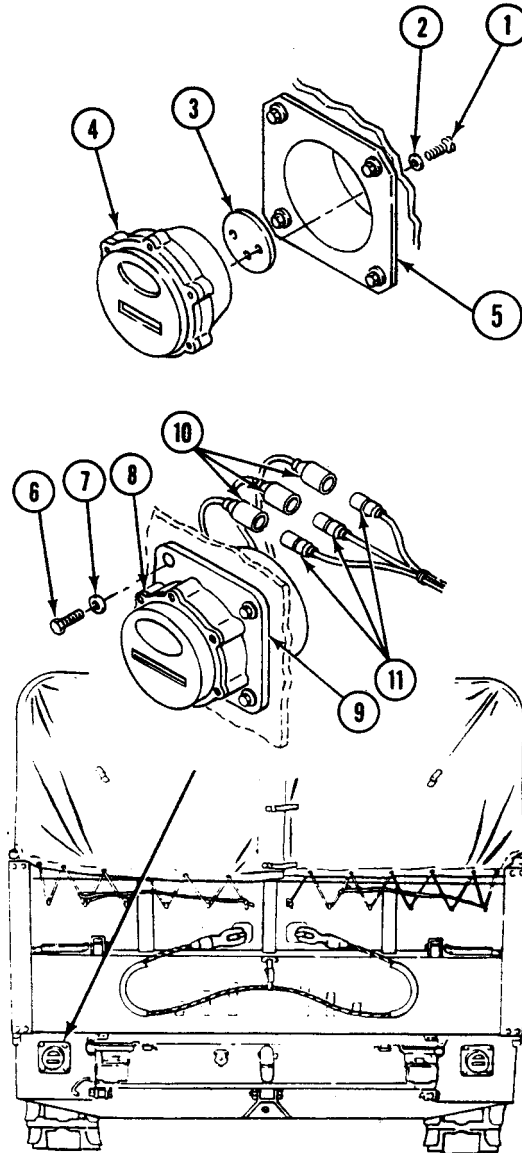
INSPECTION OF INSTALLED ITEMS

PREPARE CARRIER

1. Remove and retain four screws (1) and washers (2) that secure right stoplight-taillight (3) and bracket (4) to hull.
2. Remove electrical circuits 23 and 24 right stoplight-taillight connectors (5) from main wiring harness (6).



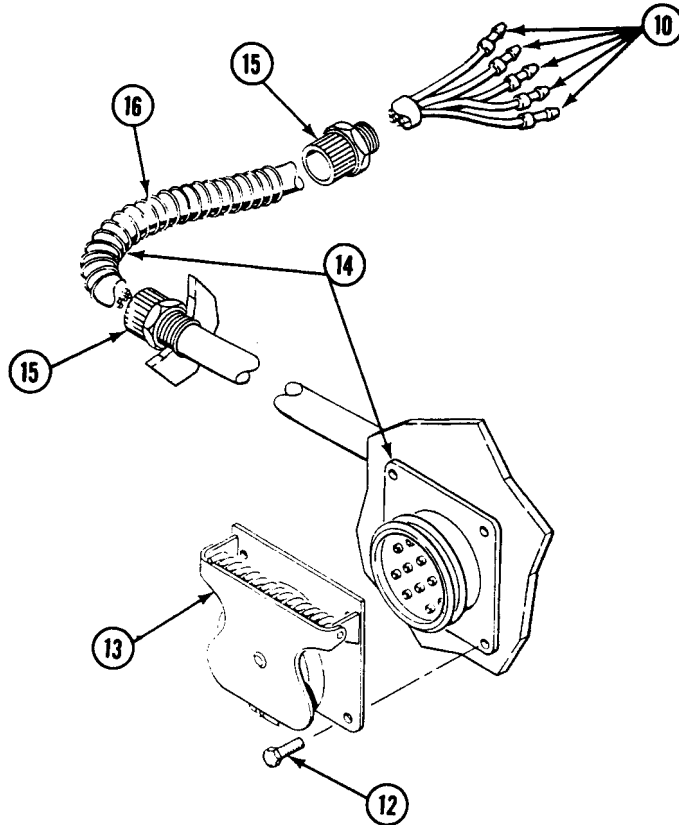
3. Remove two screws (1), washers (2), and gasket (3) which secure right stoplight-taillight (4) to bracket (5). Discard stoplight-taillight and gasket. Retain bracket, screws, and washers.
4. Remove and retain four screws (6) and washers (7) which secure left stoplight-taillight (8) and bracket (9) to hull.
5. Remove circuit 21, 22, and 24 left stoplight-taillight connectors (10) from main wiring harness (11).
6. Remove two screws (1), washers (2), and gasket (3) which secure left stoplight-taillight (8) to bracket (9). Discard gasket. Retain screws, washers, bracket, and left stoplight-taillight.



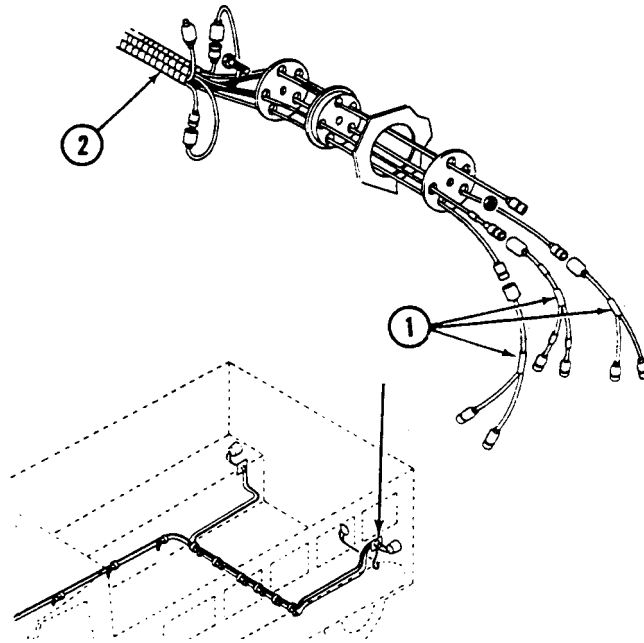
INSTALL TURN SIGNAL KIT — Continued

0076 00

7. Remove circuit 21, 22-460, 22-461, 23, and 24 connectors (10) from carrier wiring harness.
8. Remove and retain four screws (12) and cover (13) which secure trailer wiring harness (14) to hull.
9. Remove trailer wiring harness (14) from carrier.
10. Remove and retain two connectors (15) and spring (16) from trailer wiring harness (14). Discard trailer wiring harness.



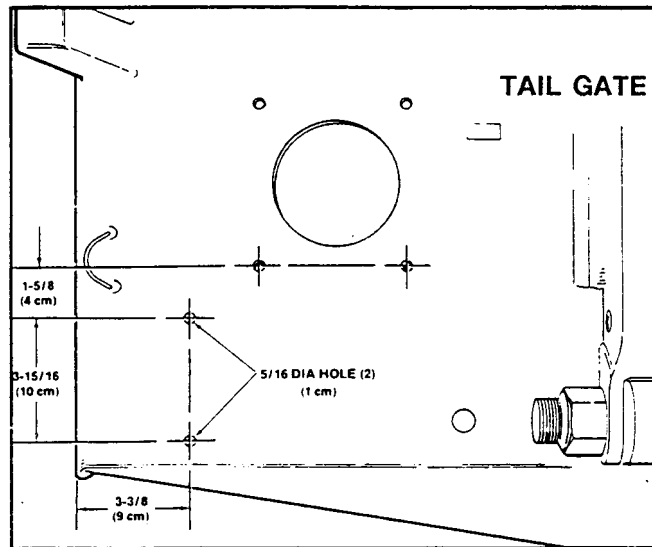
- Remove and retain three wiring harnesses (1) from main wiring harness (2).



NOTE

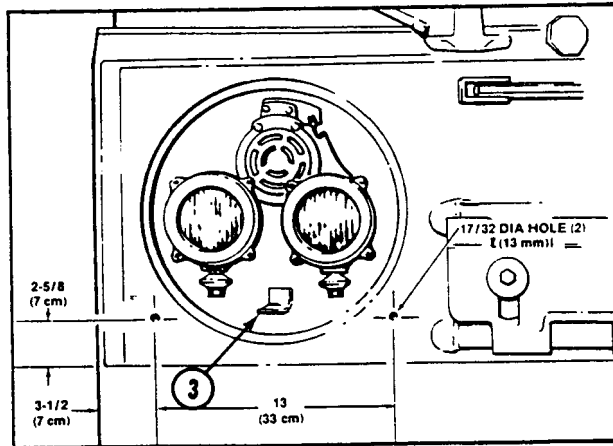
Before drilling mounting holes, check layouts to assure centerlines are within 1/16 inch (2 mm) tolerance of dimensions specified on illustrations. Use brackets or reflectors as templates after locating hole pattern.

- Locate and drill two 5/16 inch (8 mm) diameter holes in fender. Use reflector as a template. See illustration below for reference. Repeat procedure for left side of carrier.

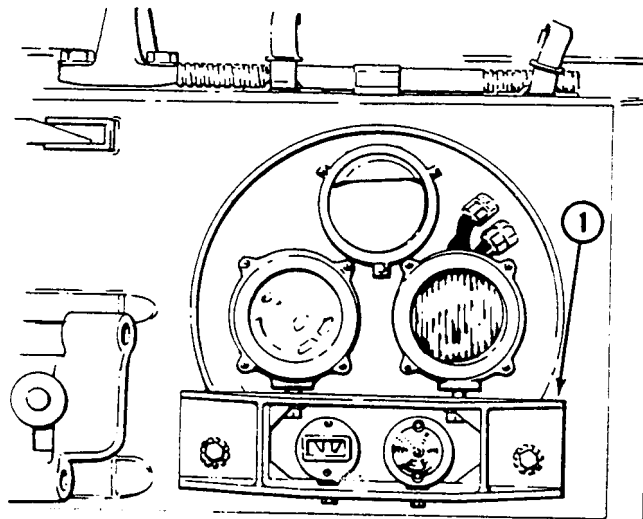


EXTERIOR LEFT REAR HULL

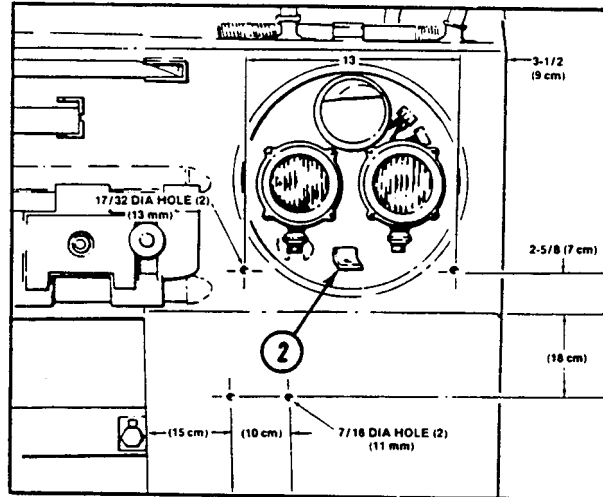
13. Disconnect circuit 20 lead from right marker light. Remove marker light from mounting bracket (see your -20).
14. Remove marker light mounting bracket (3) from hull. Discard bracket.



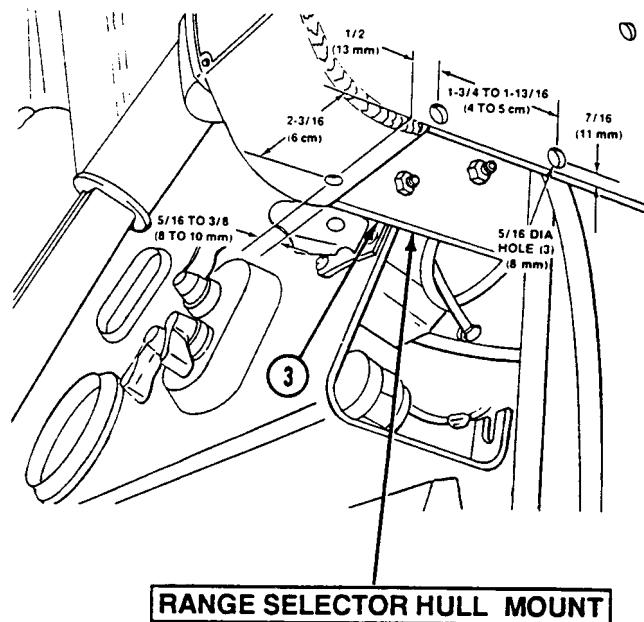
15. Locate and drill two 17/32 inch (13 mm) holes in hull under front right light and horn well. Use bracket (1) as a template to locate holes.



16. Disconnect circuit 20 lead from left marker light. Remove marker light from mounting bracket (see your -20).
17. Remove marker light mounting bracket (2) from hull. Discard bracket.



18. Locate and drill two 17/32 inch (13 mm) holes in hull under front left light well. Use bracket (3) as a template to locate holes.
19. Locate and drill two 7/16 inch (11 mm) holes in front of hull to left of carrier winch.
20. Locate and drill three 5/16 inch (8 mm) diameter holes in transmission range selector hull mount (M548A1).

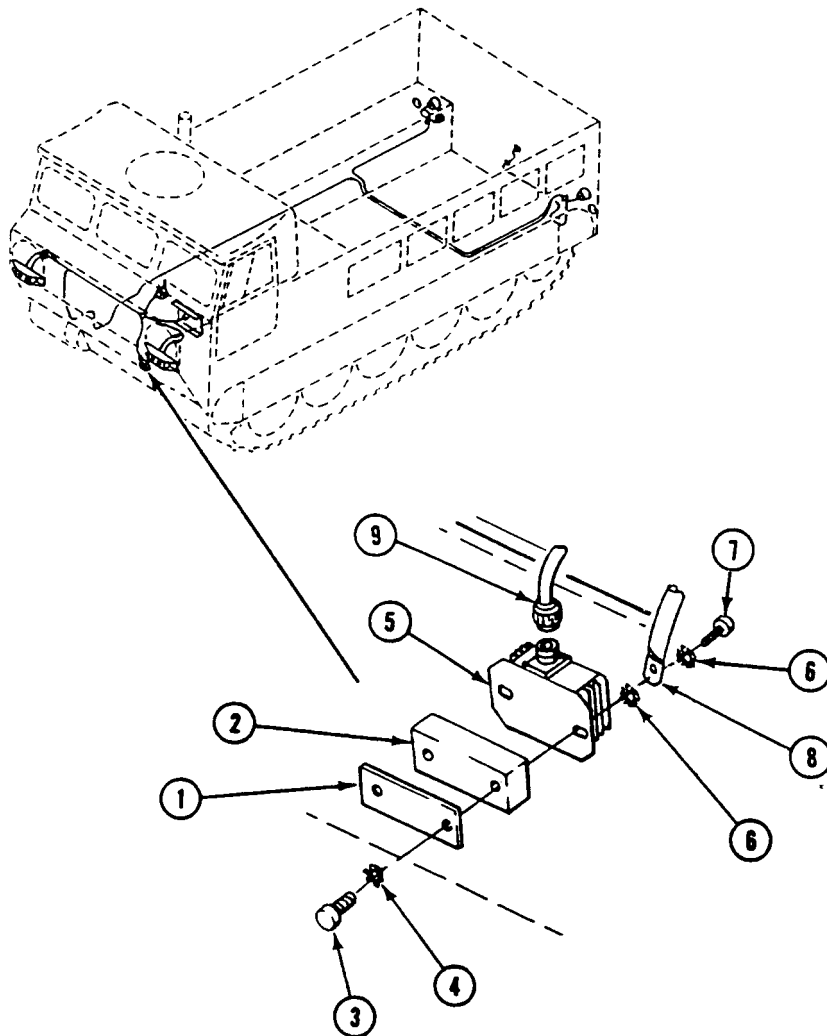


INSTALL

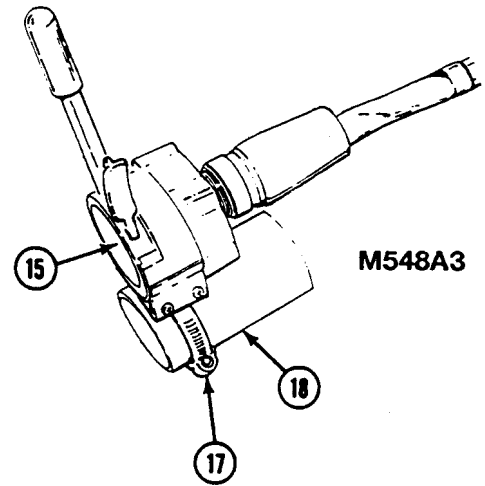
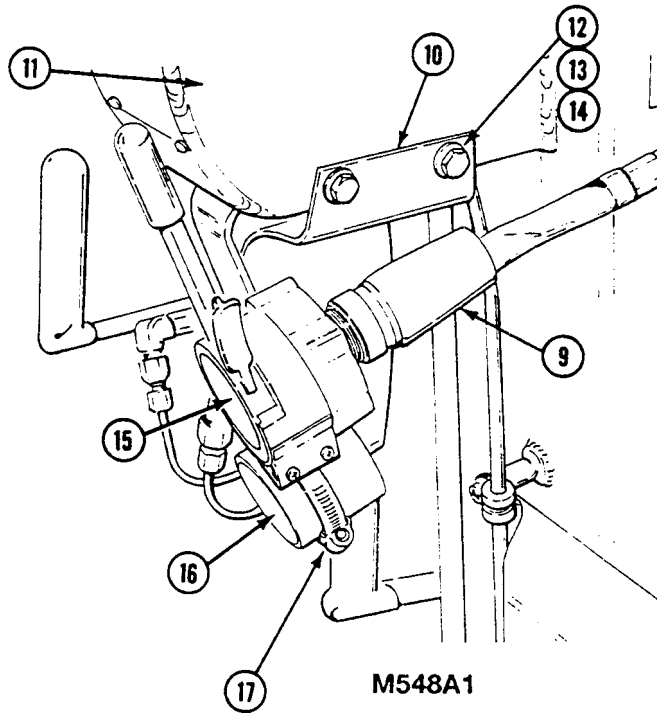
NOTE

Leave all electrical leads connected.

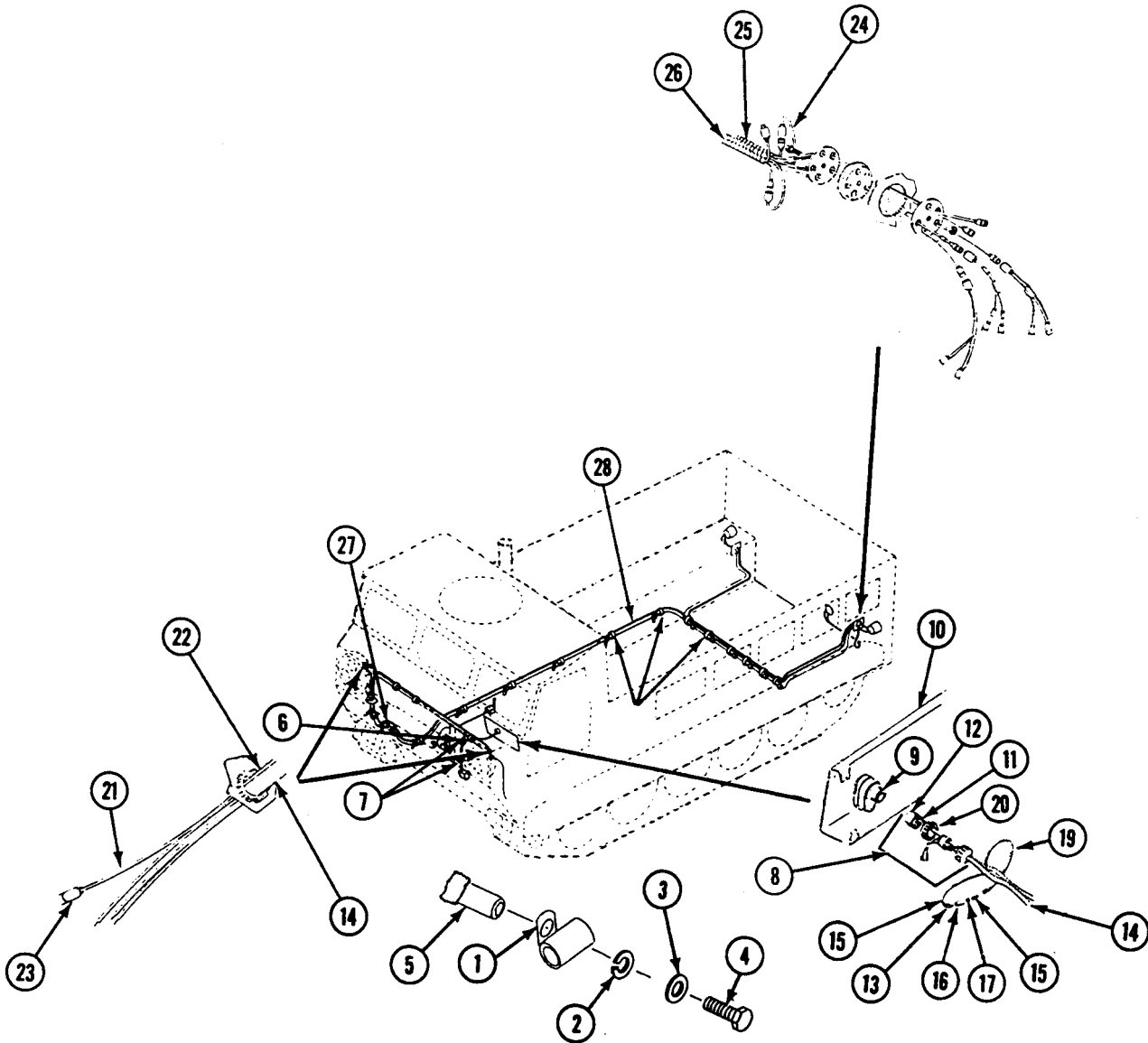
1. Partially remove instrument panel (see your -20).
2. Place new gasket (1) and bar (2) inside of hull. Secure from outside with two screws (3) and new lock washers (4).
3. Place flasher (5) on bar (2) with three new lock washers (6) and two screws (7). Install one washer on each side of harness ground lead (8).
4. Install flasher wiring harness (9) on flasher (5).



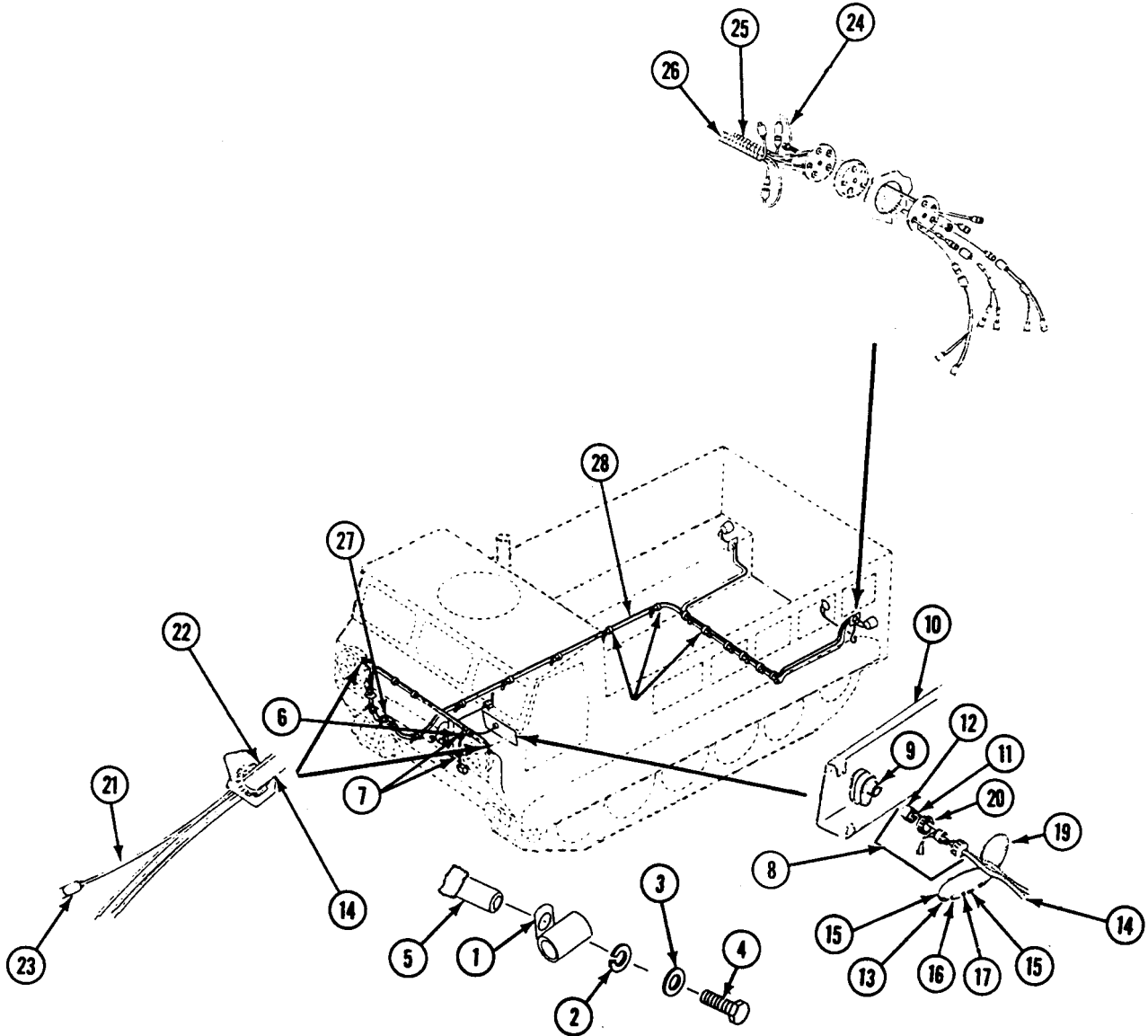
5. Place bracket (10) on control mount (11). Secure with three screws (12), six washers (13), and three nuts (14).
6. Place control assembly (15) on bracket (16) and tighten clamp (17) (M548A1).
7. Place control assembly (15) on post (18) and tighten clamp (17) (M548A3).
8. Connect flasher wiring harness (9) to control assembly (15).



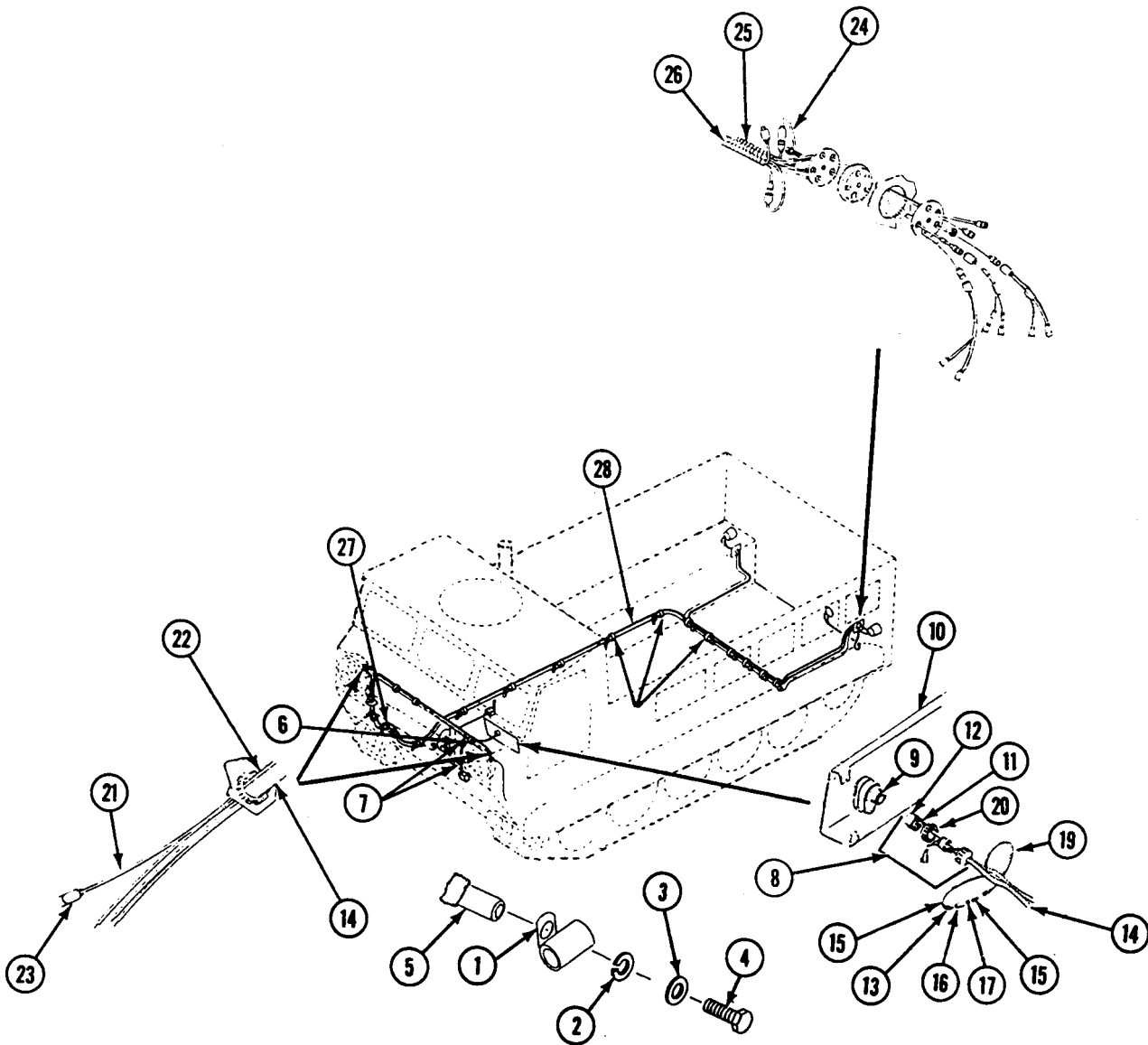
9. Install clamp (1), lock washer (2), washer (3) and screw (4) on weld nut (5) (M548A3).
10. Secure flasher wiring harness lead (6) with two straps (7).
11. Remove connector (8) from light selector switch (9) on back of instrument panel (10).
12. Separate connector (8). Unsolder main wiring harness circuit 22 lead (11) from pin C in connector. Pull lead from bushing (12).



13. Install marker (13) on main wiring harness (14) to reidentify circuit 22 lead (11) to circuit 22-461 lead (15). Install shell (16), washer (17), and terminal (18) on circuit 22-461 lead.
14. Connect front wiring harness circuit 22-461 lead (19) to new main wiring harness circuit 22-461 lead (15).
15. Thread wiring harness circuit 22 lead (11) through connector (8). Solder lead to pin C of connector with solder.
16. Thread wiring harness circuit 460-461 lead (20) through connector (8). Solder lead to pin J of connector with solder.
17. Assemble connector (8). Connect it to light selector switch (9).

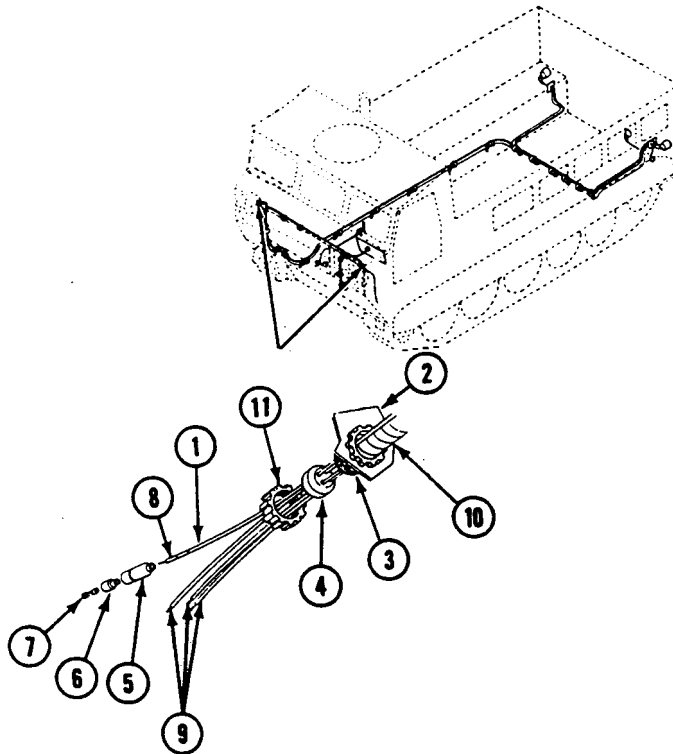


18. Route circuit 461 lead (21) of harness (22) along main wiring harness (14) to left headlight well.
19. Route circuit 460 lead (23) of harness (22) along main wiring harness (14) to right headlight well.
20. Route circuit 22-460 lead (24) of wiring harness (25) along rear main wiring harness (26), through grommet (27) in cab floor, along right side of carrier, and across front of fuel compartment.
21. Secure wiring harness (28) to main wiring harness (14) across front of carrier and back to fuel compartment with straps (7). Place strap next to each harness clamp as required.
22. Install instrument panel (see your -20).
23. Disconnect circuit 514 and 515 leads from left infrared headlight (see your -20).



INSTALL TURN SIGNAL KIT — Continued**0076 00**

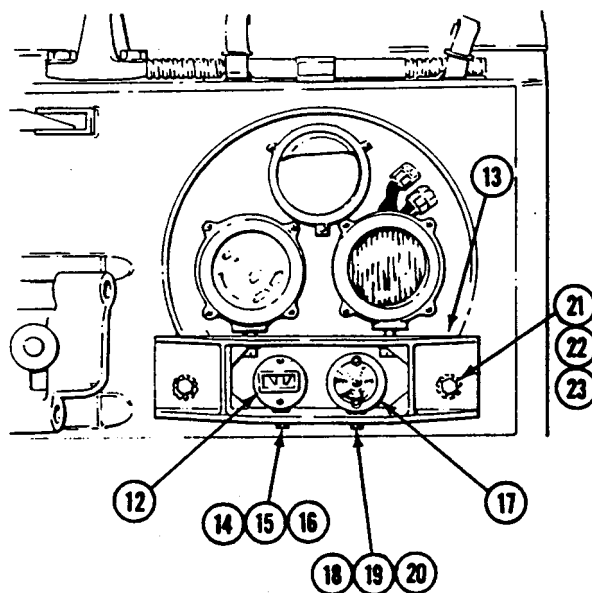
24. Thread circuit 461 lead (1) of wiring harness (2) through stuffing tube (3) and through one hole of new gasket (4).
25. Install shell (5), sleeve (6), and terminal (7) on end of circuit 461 lead (1). Slide sleeve and shell over terminal.
26. One at a time, remove terminals (7), sleeves (6), shells (5), and marker bands (8) from ends of circuit 20, 514, and 515 leads (9) of main wiring harness (10). Pull leads from gasket (4). Reinstall shells, sleeves, and marker bands on leads. Discard three terminals and one gasket.
27. Install three terminals (7) on ends of circuit 20, 514, and 515 leads (9). Slide sleeves (6) and shells (5) over terminals of main wiring harness (10).
28. Slide gasket (4) into stuffing tube (3). Install nut (11).
29. Connect circuit 514 and 515 leads (9) to left infrared headlight (see your -20)



NOTE

Both left and right sides of marker and turn signal lights install the same way. Left side is shown.

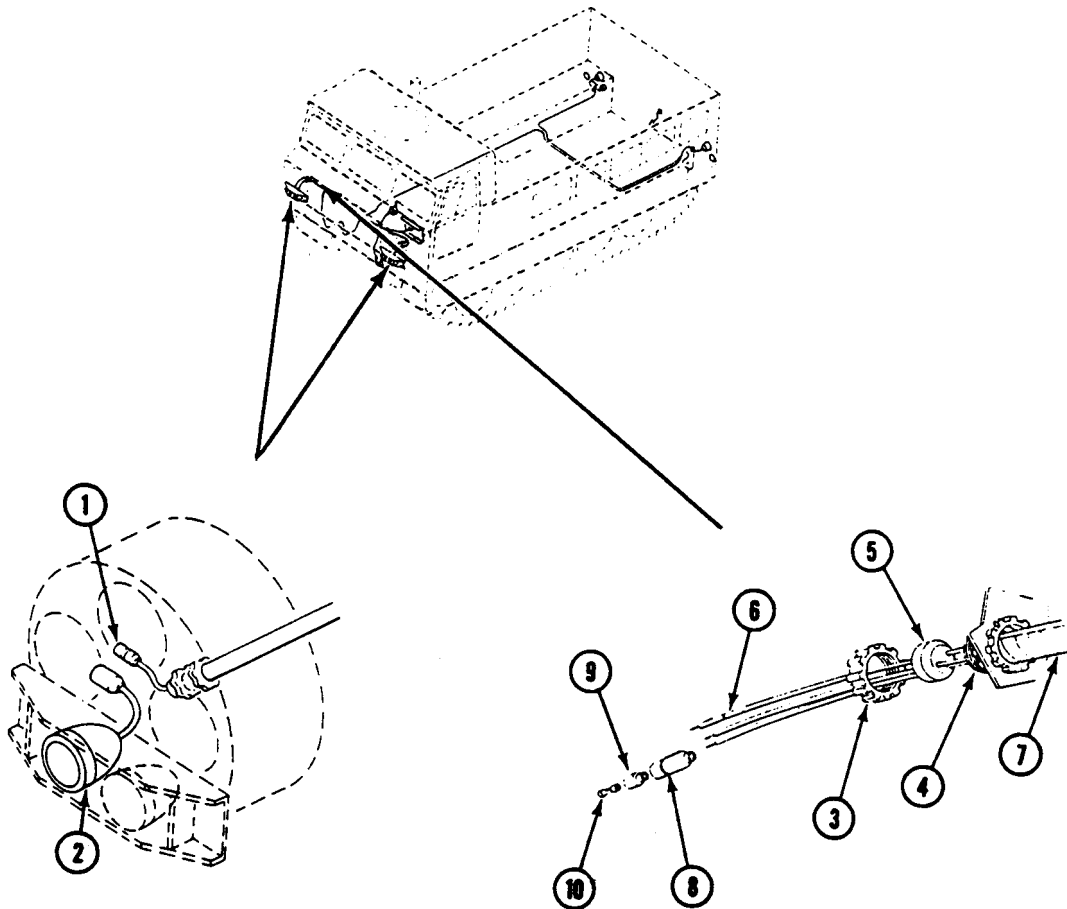
30. Install retained marker light (12) on bracket (13) with one new lock washer (14), one retained washer (15), and retained nut (16).
31. Install turn signal lamp (17) on bracket (13) with stud (18), two washers (19), and nut (20).
32. Apply caulking compound around bracket mounting holes. Place bracket (13) on hull. Secure with two screws (21), four washers (22), and two nuts (23).
33. Connect left marker light to circuit 20 lead (see your -20).



NOTE

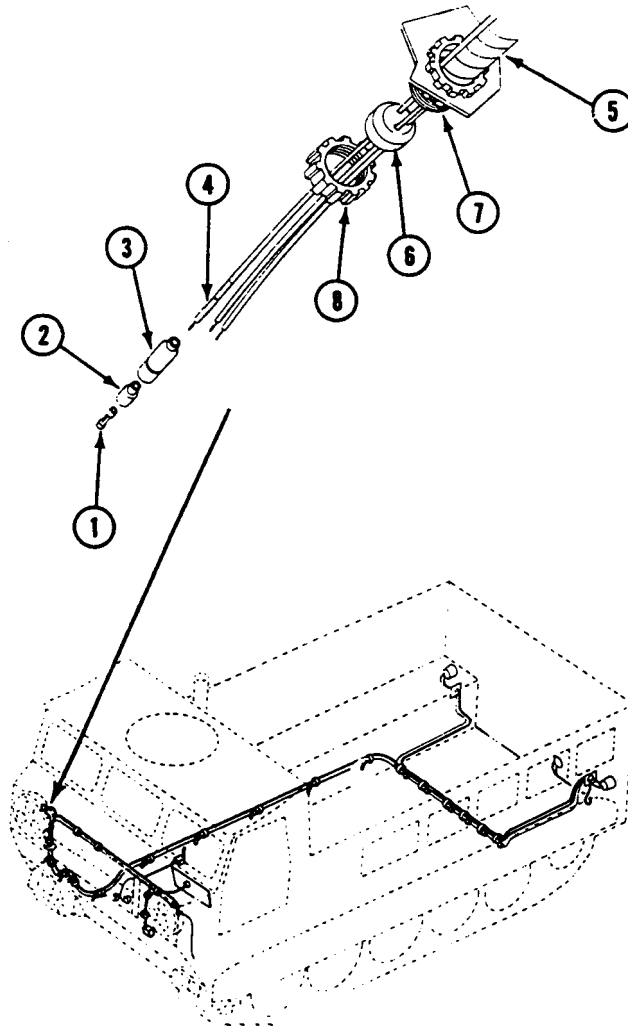
If circuit 20 lead cannot connect to relocated marker light, install a jumper lead to extend circuit 20.

34. Connect lead (1) to turn signal light (2). Circuit 461 to left side, circuit 460 to right.
35. Remove circuit 17 and 18 leads from left service head lamp (see your -20).
36. Unscrew nut (3) from stuffing tube (4). Slide gasket (5) down on leads. Discard gasket.
37. Thread circuit 460 lead (6) of wiring harness (7) through stuffing tube (4) and through one hole of new gasket (5).
38. Install shell (8), sleeve (9), and terminal (10) on end of circuit 460 lead (6). Slide sleeve and shell over terminal.

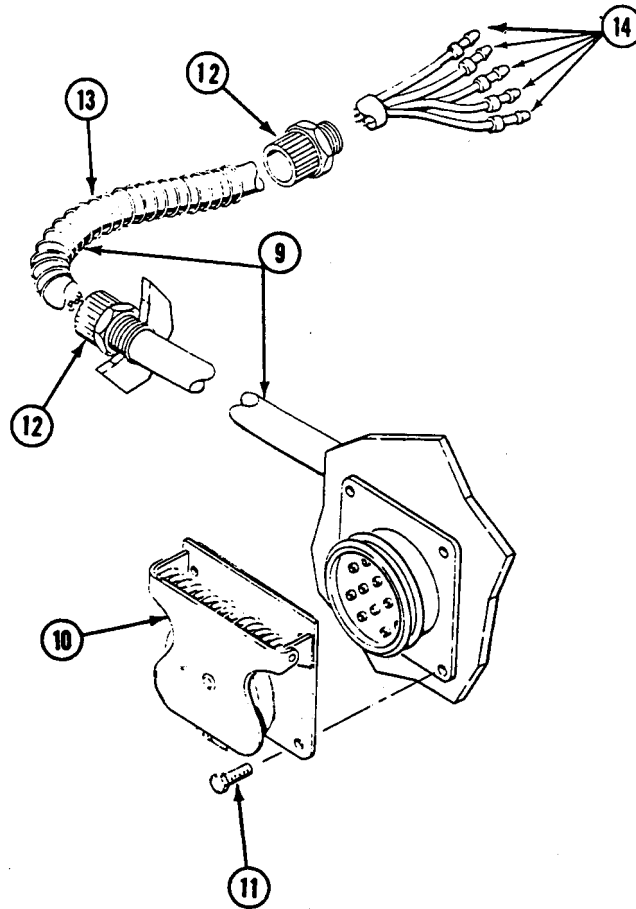


INSTALL TURN SIGNAL KIT — Continued**0076 00**

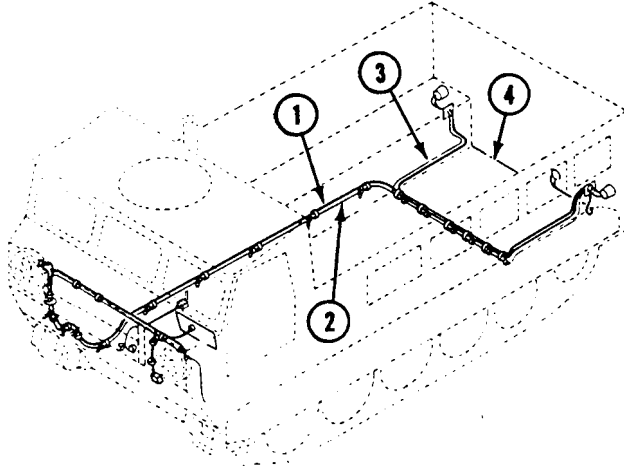
39. One at a time, remove three terminals (1), sleeves (2), shells (3), and marker bands (4) from ends of circuit 17, 18, and 20 leads of main wiring harness (5). Pull leads from gasket (6). Discard terminals and gasket. Thread leads through new gasket. Reinstall shells, sleeves, and marker bands on leads.
40. Install three terminals (1) on ends of circuit 17, 18, and 20 leads. Slide sleeves (2) and shells (3) over terminals.
41. Slide gasket (6) into stuffing tube (7). Install nut (8).
42. Connect circuit 17 and 18 leads to right service head lamp (see your -20).



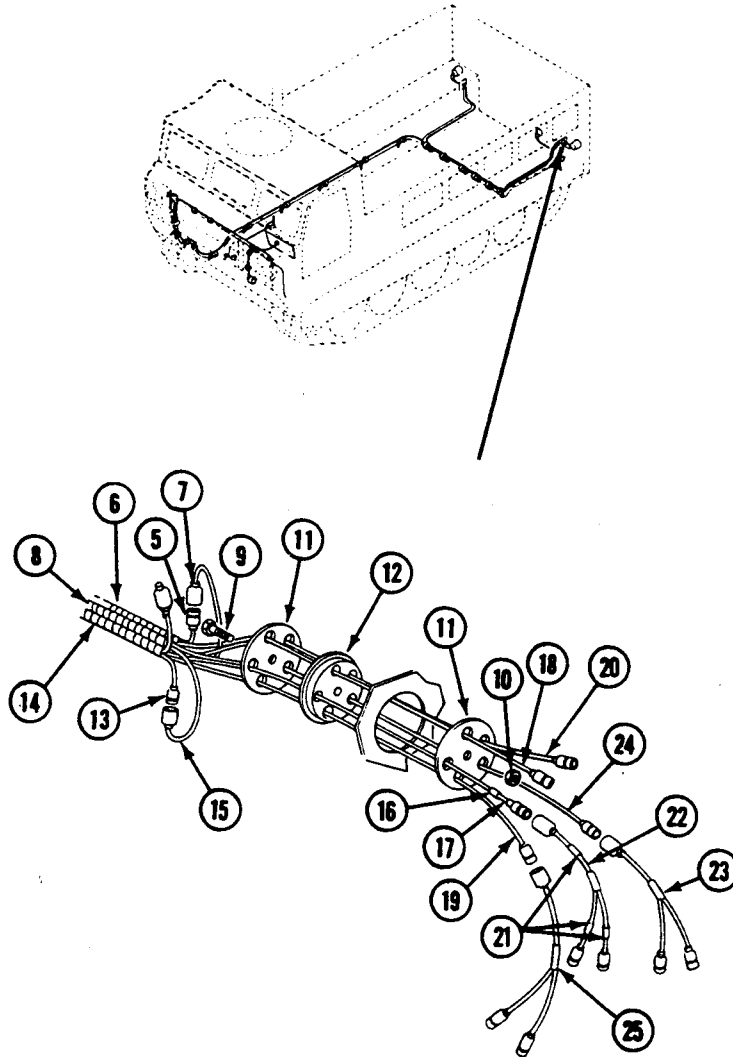
43. Thread new trailer light wiring harness (9) through tailgate. Secure with cover (10) and four screws (11).
44. Install two connectors (12) and spring (13) on trailer light wiring harness (9). Open tailgate to ensure enough harness length. Secure connectors to tailgate and hull.
45. Install circuit 21, 22, 23, and 24 connectors (14) to carrier wiring harness.



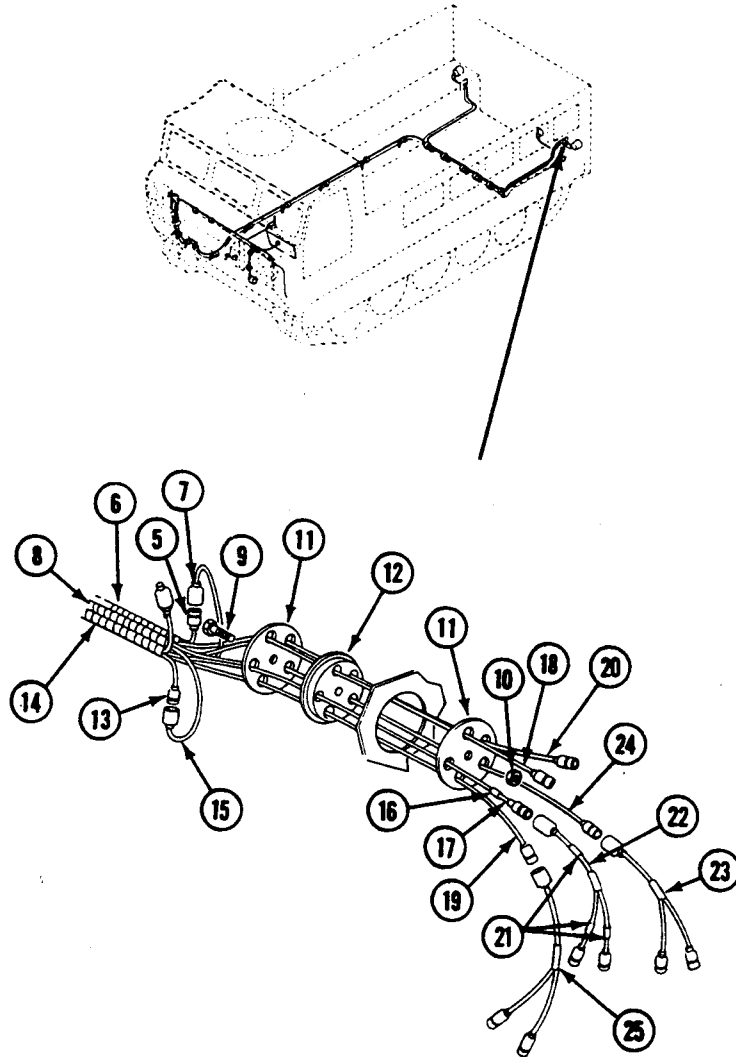
46. Thread circuit 22-460 leads of front wiring harness (1) through channel on left side of carrier along main wiring harness (2) to left rear corner of carrier. Thread two lead ends (without connectors) of rear wiring harness (3) from left rear of carrier through channel along main wiring harness to left front of fuel compartment (4).



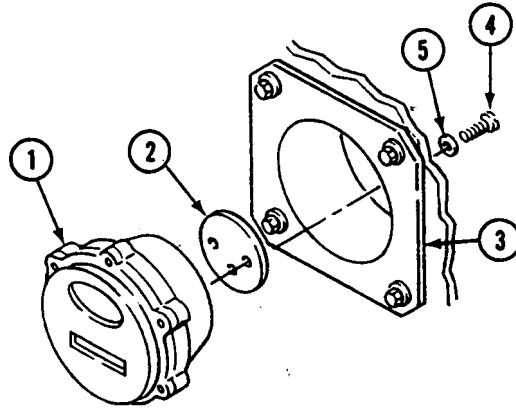
47. Connect circuit 22-460 lead (5) (short) of front wiring harness (6) to circuit 22-460 lead (7) of rear wiring harness (8).
48. Remove and retain screw (9) and nut (10) that secure two retainers (11) and one bushing (12) in hull. Remove and discard retainers and bushing.
49. Connect existing circuit 21 lead (13) of main wiring harness (14) to circuit 21 lead (15) of rear wiring harness (8).
50. Install marker (16) on circuit 22 lead of main wiring harness (14) to indicate circuit 22-461 lead (17).



51. Thread circuit 22-461 (17), 23 (18), and 24 (19) leads of main wiring harness (14); circuit 22-460 lead (20) of front wiring harness (6); and circuit 21 lead (15) of rear wiring harness (8) through two retainers (11) and bushing (12).
52. Place new bushing (12) and two new retainers (11) in hull. Secure with screw (9) and nut (10).
53. Install three markers (21) on wiring harness (22) to indicate circuit 22-461 leads. Connect harness to circuit 22-461 (17) lead of main wiring harness (14).
54. Connect retained wiring harness (23) to circuit 21 lead (24) of rear wiring harness (8). Connect retained wiring harness (25) to circuit 24 leads (19) of main wiring harness (14).

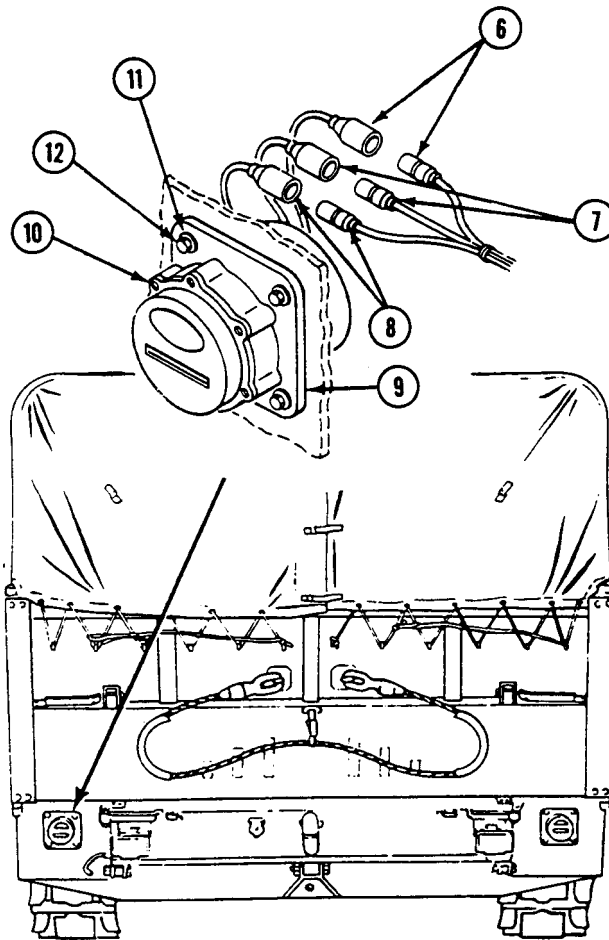


55. Place left rear stoplight-taillight (1) and new gasket (2) in bracket (3). Secure with two screws (4) and washers (5).

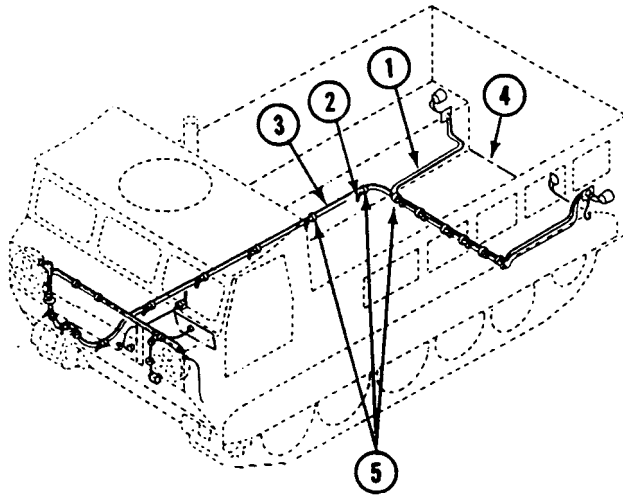


56. Install circuits 21 (6), 22 (7), and 24 (8) to circuits 21, 22-461 and 24, respectively, of wiring harness connectors.

57. Place housing bracket (9) and left stoplight-taillight (10) on hull. Secure with four washers (11) and screws (12).

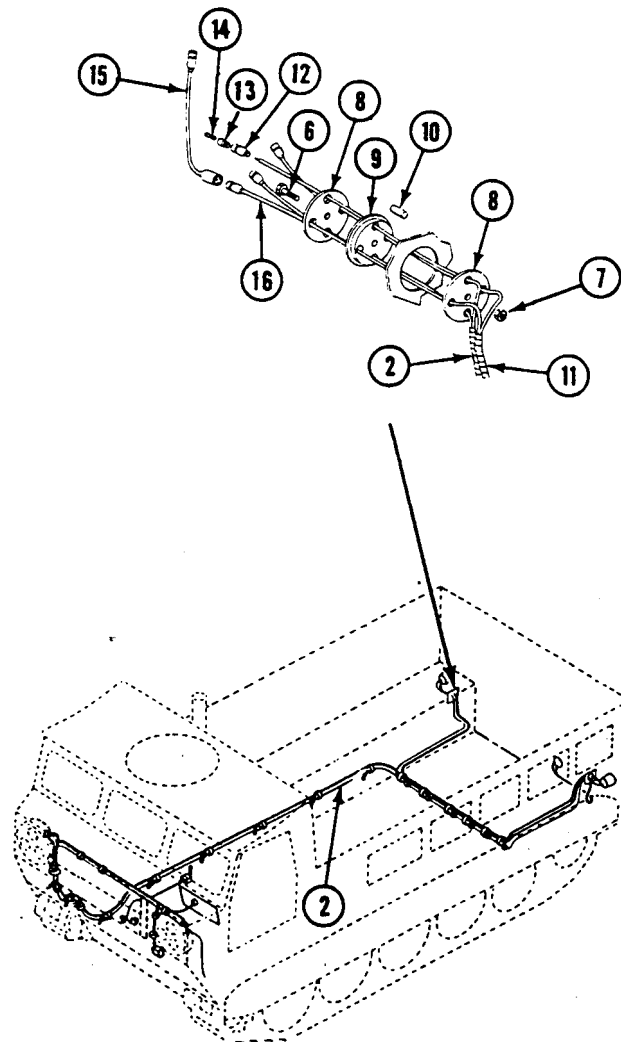


58. Route rear wiring harness (1) along main wiring harness (2) and wiring harness (3) across front of fuel compartment (4). Thread end of harness through channel on right side of carrier along main wiring harness.
59. Secure wiring harness (1) and wiring harness (3) to main wiring harness (2) with straps (5) next to each existing harness clamp.

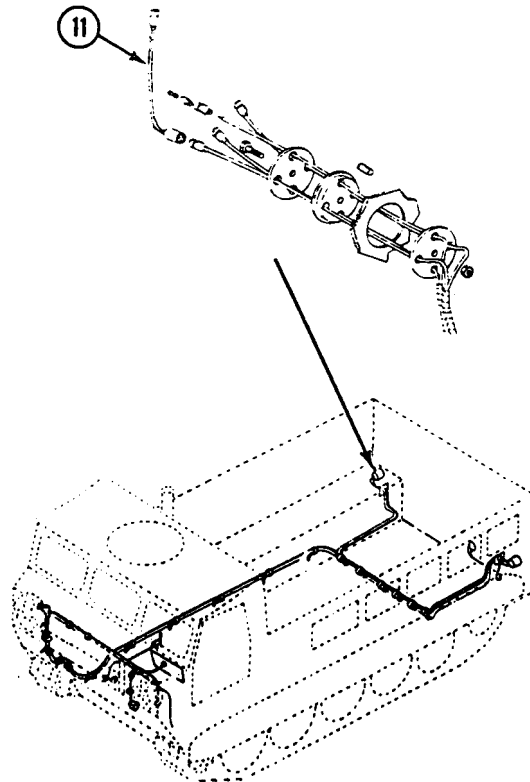
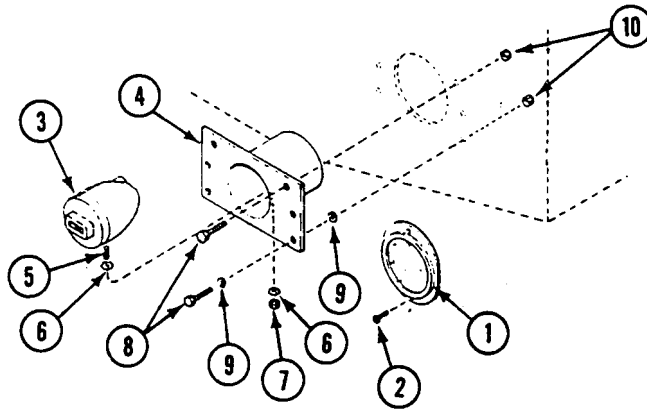


INSTALL TURN SIGNAL KIT — Continued**0076 00**

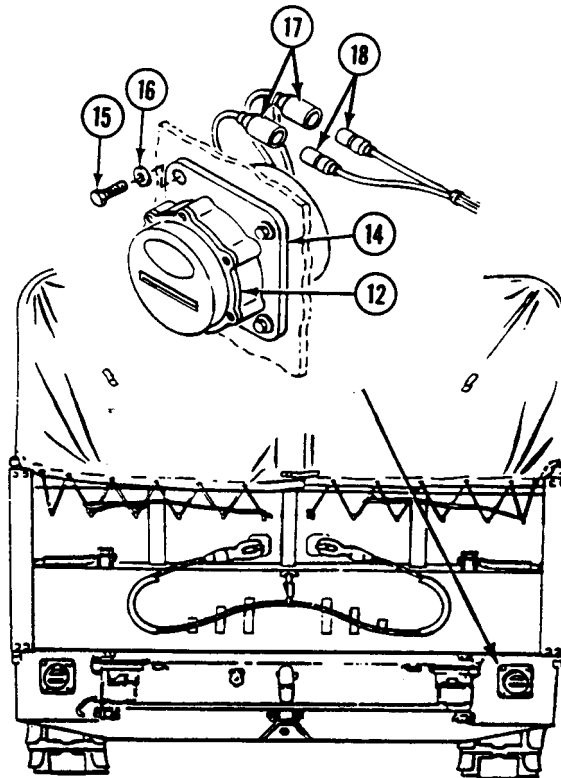
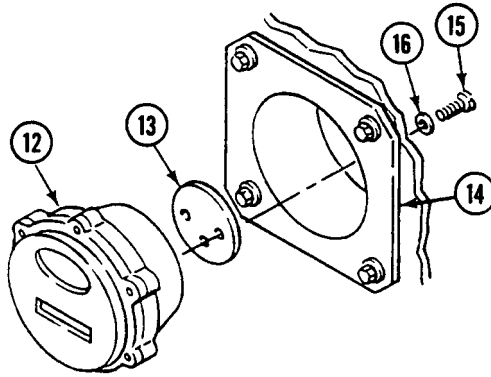
60. Remove screw (6) and nut (7) that secure two retainers (8) and one bushing (9) in hull. Remove and discard two rods (10) from bushing.
61. Thread circuit 22-460 and 21 leads of wiring harness (11) through bushing (9). Place bushing and two retainers (8) on hull. Secure with screw (6) and nut (7).
62. Install shell (12), sleeve (13), and terminal (14) on leads of wiring harness.
63. Connect cable (15) to main wiring harness circuit 23 lead (16).



64. Install right rear reflector (1) using two lock screws (2).
65. Install blackout stoplight-taillight (3) in bracket (4). Secure with stud (5), two washers (6), and one nut (7). Install one washer on each side of bracket. Make sure 1-1/2 threads extend through nut.
66. Position bracket (4) in hull opening. Secure with six screws (8), two new lock washers (9), and six nuts (10).
67. Connect circuit 23 lead (11) to blackout stoplight-taillight (3).



68. Place new right rear stoplight-taillight (12) and new gasket (13) in housing bracket (14). Secure with two screws (15) and washers (16).
69. Install circuit 23 and 24 right stoplight-taillight connectors (17) to wiring harness (18).
70. Place housing bracket (14) and new right stoplight-taillight (12) on hull. Secure with four washers (16) and screws (15).



INSPECTION-ACCEPTANCE AND REJECTION CRITERIA**INSPECT**

1. Check brackets, lights, control, and flasher. Look for secure mounting. Make sure all lock washers are installed under screw heads and nuts, or between brackets for proper grounding of parts.

TEST AND INSPECTION**TEST**

1. Connect battery negative lead(s) (see your -20).
2. Turn MASTER SWITCH ON.
3. Place main light selector switch in STOP or SER. DRIVE position.
4. Move lever control assembly to left. Check left front turn signal light and left rear stoplight-taillight. Control lever light, left front signal light, and left stoplight-taillight should flash intermittently. There should also be 24 volts intermittently at pin B of trailer light receptacle. If brakes are applied, left stoplight-taillight should be ON and 24 volts at pin B of trailer light receptacle.
5. Move lever on control assembly to right. Check right front turn signal light and right rear stoplight-taillight. Control lever light, right front turn signal light, and right stoplight-taillight should flash intermittently. There should also be 24 volts intermittently at pin B of the trailer light receptacle. If brakes are applied, left stoplight-taillight should be ON and 24 volts at pin B of trailer light receptacle.
6. Lift stop on lever on control assembly, and move lever to extreme right. Light on control lever, both front turn signal lights, and both rear stoplight-taillights should flash intermittently. There should also be 24 volts intermittently at pins B and J of the trailer light receptacle.
7. Place main light selector switch in B.O. DRIVE position and infrared blackout selecting switch in B.O. position. Front blackout marker lights, blackout headlights, and blackout marker lights in taillights should come on. In addition, new right blackout stoplight should come on when both differential steering levers are pulled to brake carrier.

PAINT

1. Clean and paint all exposed unpainted metal surfaces as needed after final inspection and test in accordance with TM 43-0139.

FOLLOW-THROUGH STEPS

1. Install cargo compartment floor plates (see your -10).

END OF TASK

CHAPTER 16

DIRECT SUPPORT SUPPORTING INFORMATION

WORK PACKAGE INDEX

| <u>Title</u> | <u>Sequence No.</u> |
|---|---------------------|
| REFERENCES..... | .0077 00 |
| COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES LIST..... | .0078 00 |
| FABRICATED TOOLS..... | .0079 00 |
| EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST..... | .0080 00 |

REFERENCES

0077 00

SCOPE

This work package lists all technical manuals, other publications, and forms 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 work package and for new publications relating to the material covered in this technical manual.

TECHNICAL MANUALS

- Destruction of Conventional Ammunition and Improved Conventional Munitions (ICM) to Prevent Enemy UseTM 43-0002-33
- Direct and General Support Maintenance Manual: Engine, Diesel with Container (2815-00-022-6732) Composed of: Engine, Diesel (Detroit Diesel Model 5063-5299 series 6V53) and Container Assembly (8115-00-202-8589) Engine Diesel with Container (2815-00-909-5949) Composed of: Engine, Diesel (Detroit Diesel Model 5063-5398 series 6V537) and Container Assembly (8115-00-999-5356).....TM 9-2815-205-34
- Direct and General Support Maintenance Manual: Generator, Engine Accessory Prestolite Model AMA-5102UT (2920-00-909-2483); Leece-Neville Models 3002AC and 3002AD (2920-00-909-2483), 5504AA and 5504AB (2920-00-475-1446), 2184AC (2920-00-782-1955) and 5300GP (2920-00-818-8635) Regulator, Generator Leece-Neville Model 3392R12P (2920-00-540-9476).....TM 9-2920-225-34
- Direct and General Support Maintenance Manual: Transmission, Automatic (2520-00-066-4240) (Allison Div., Model TX100-1).....TM 9-2520-254-34
- Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools List) for Angle Drive, Cooling Fan (NSN 2990-00-712-1280); Gearcase Transfer (2520-00-711-8377, 2520-00-179-5608, 2520-00-572-8605, 2520-00-800-3405, 2520-00-918-0599, 2520-00-933-6425, and 2520-00-177-9730); Differential, Steering Control (2520-00-714-6135); Drive Assembly, Output (2520-00-895-9164); Final Drive, Vehicular (2520-00-224-7952); Brake Assembly, Pivot Steer (2520-00-088-9866 and 2520-00-003-8334) and Cylinder Assembly, Hydraulic Brake Master (2530-00-679-9169).....TM 9-2520-238-34P
- Direct Support and General Support Maintenance Manual (Including Repair Parts and Special Tools Lists) for Cross Drive Transmissions W/Container Model X200-4.....TM 9-2520-272-34&P
- 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
- Direct Support and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools List) for Engine, Diesel w/Container (NSN 2815-00-124-5390) Composed of: Engine, Diesel (Detroit Diesel Model 5063-5299, Series 6V53) and Container (8145-00-138-7809); Engine, Diesel w/Container (2815-00-909-5949) Composed of: Engine, Diesel (Detroit Diesel Model 5063-5398, Series 6V53T) and Container Assembly (8145-00-999-5356) and Engine, Diesel w/Container (2815-01-031-6154) Composed of Engine, Diesel (Detroit Diesel Model 5063-5395, Series 6V53T) and Container (8145-00-999-5356).....TM 9-2815-205-34P
- Direct Support and General Support Maintenance, Repair Parts, and Special Tools Manual for Generator, Alternating Current, 200 AMPS (2920-01-147-1575) Leece-Neville Model A0012260.....TM 9-2920-257-30&P

REFERENCES — Continued

0077 00

Direct Support and General Support Maintenance Repair Parts and Special Tools Lists
(Including Depot Maintenance Repair Parts and Special Tools List) for Transmission,
Automatic w/Container (NSN 2520-00-066-4239) (Allison Div., Model TX 100-1)..... TM 9-2520-254-34P

Inspection, Care, and Maintenance of Antifriction Bearings..... TM 9-214

Intermediate Direct and General Support Maintenance Manual (Including Repair Parts
and Special Tools List): Cross Drive Transmission W/Container Model X200-4
(2520-01-201-4784) Allison Transmission Division, GMC..... TM 9-2520-272-34&P

Operator’s Manual: Cargo, Tracked, 6-Ton: M548A1 (2350-01-096-9356); Carrier, Cargo,
Tracked, 6-Ton: M548A3 (2350-01-369-6081)..... TM 9-2350-247-10

Operator’s Manual: Welding Theory and Application..... TC 9-237

Operator, Organizational, DS and GS Maintenance Manual for Lead-Acid Storage Batteries..... TM 9-6140-200-14

Operator’s, Unit and Direct Support Maintenance Manual (Including Repair Parts and Special
Tools List): Heater Test Stand Model VHVS-89102 (4910-01-318-4508)..... TM 9-4910-755-13&P

Painting Instructions for Field Use..... TM 43-0139

Procedures for Destruction of Electronics Material To Prevent Enemy Use (Electronics
Command)..... TM 750-244-2

Procedures for Destruction of Tank-Automotive Equipment to Prevent Enemy Use (US Army
Tank-Automotive Command)..... TM 750-244-6

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

Unit Maintenance: Carrier, Cargo, Tracked, 6-Ton, M548A1 (2350-01-096-9356); Carrier,
Cargo, Tracked, 6-Ton, M548A3 (2350-01-369-6081)..... TM 9-2350-247-20

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, Cargo, Tracked, 6-Ton, M548A1 (2350-01-096-9356); Carrier, Cargo, Tracked,
6-Ton, M548A3 (2350-01-369-6081)..... TM 9-2350-247-24P

FIELD MANUALS

General Fabric Repair..... FM 10-16

OTHER PUBLICATIONS

Accident Reporting and Records..... AR 385-40

The Army Maintenance Management System (TAMMS)..... DA PAM 738-750

Carrier, Cargo, Full-Tracked, M548A3 and M548A1..... ATPD 2228

Safety Inspection and Testing of Lifting Devices..... TB 43-0142

Soldering..... TB SIG 222

COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES LIST

0078 00

INTRODUCTION

Scope

This work package lists all common tools and supplements and special tools/fixtures needed to maintain the M548A1 and M548A3 Carriers.

Explanation of Columns in the Expendable/Durable Items List

Column (1) — Item Number. This number is assigned to the entry in the listing, and is referenced in the Initial Setup in the task under Tools to identify the item (e.g., "Torque wrench (Item 85)").

Column (2) — Name. This column lists the item by noun nomenclature and other descriptive features (e.g., "Wrench set, socket, 3/8 inch drive").

Column (3) — National Stock Number. This is the National Stock Number (NSN) assigned to the item. Use it to requisition the item.

Column (4) — Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

Column (5) — Reference. This column identifies the authorizing Supply Catalog (SC) or Repair Parts and Special Tools List (RPSTL) for items listed in this work package.

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 9-2350-247-24P |
| 2 | AMMETER, 0 TO 20 AMP AC | 6625-01-152-5678 | 7-50043 | TM 9-2350-247-24P |
| 3 | APRON, PLASTIC | 8415-00-222-8074 | E2-2845 | TM 9-2350-247-24P |
| 4 | APRON, UTILITY | 8415-00-082-6108 | MIL-A-41829 | SC 4910-95-CL-A01 |
| 5 | APRON, UTILITY | 8415-00-634-5023 | 021-758 | TM 9-2350-247-24P |
| 6 | BRUSH, CLEANING | 7920-00-205-2401 | MIL-B-43871 | TM 9-2350-247-24P |
| 7 | BRUSH, WIRE, SCRATCH | 7920-00-291-5815 | HB178 | SC 4940-95-CL-B04 |
| 8 | CALIPER SET, MICROMETER, OUTSIDE, 0 TO 6 INCH | 5210-00-554-7134 | GGG-C-105 | SC 4910-95-CL-A63 |
| 9 | CALIPER, VERNIER, 0 TO 6 INCH | 5210-01-113-1548 | GGG-C-111 | SC 4910-95-CL-A31 |
| 10 | CLAMP, C, 6 INCH | 5120-00-203-6431 | A-A-431 | SC 4910-95-CL-A31 |
| 11 | CYLINDER, GRADUATED, 100 ML | 6640-00-883-8516 | 3022-100 | TM 9-2350-247-24P |
| 12 | DRILL, ELECTRIC, PORTABLE, 1/2 INCH | 5130-00-889-9004 | WD00661 | SC 4910-95-CL-A31 |

COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES

0078 00

LIST—Continued

| (1) ITEM NO. | (2) ITEM NAME | (3) NATIONAL STOCK NUMBER | (4) PART NUMBER | (5) REFERENCE |
|--------------------|--|---------------------------------|-----------------------|-------------------|
| 13 | DRILL, ELECTRIC, PORTABLE, MORSE #2 | 5130-00-473-6228 | ES212WSTAND | SC 4910-95-CL-A31 |
| 14 | DRILL SET, TWIST, NO. 1 TO 60, RND SHANK | 5133-00-449-6775 | GGG-D-751 | SC 4910-95-CL-A01 |
| 15 | DRILL SET, TWIST, 1/16 TO 1/2 INCH, RND SHANK | 5133-00-293-0983 | DB129B | SC 4910-95-CL-A31 |
| 16 | DRILL SET, TWIST, 33/64 TO 3/4 INCH, MORSE #2 | 5133-00-596-8088 | GGG-D-751 | SC 4910-95-CL-A31 |
| 17 | DRILL, TWIST, 5/64 INCH, MORSE #2 | 5133-00-277-6942 | 74357 | TM 9-2350-247-24P |
| 18 | EXTRACTOR SET, SCREW | 5120-00-610-1888 | A-A-283 SZ1-9 | SC 4910-95-CL-A31 |
| 19 | FACE, HAMMER, INSERTED, MEDIUM PLASTIC | 5120-00-585-8202 | GGG-H-33 | SC 4910-95-CL-A31 |
| 20 | FLOW TEST MACHINE, RADIATOR | 4910-00-075-2395 | 35A | SC 4910-95-CL-A76 |
| 21 | FRAME, HACKSAW | 5110-00-289-9657 | 163-20 | SC 4910-95-CL-A31 |
| 22 | GLOVES, CHEMICAL PROTECTIVE | 8415-01-275-6400 | 118116 | TM 9-2350-247-24P |
| 23 | GLOVES, WELDER'S, LEATHER | 8415-00-268-7859 | A-A-50022 | SC 5910-95-CL-A31 |
| 24 | GOGGLES, INDUSTRIAL | 4240-00-269-7912 | A-A-1814 | SC 3431-95-CL-A31 |
| 25 | HEATER, GUN TYPE, ELECTRIC | 4940-00-561-1002 | 500A | SC 4910-95-CL-A31 |
| 26 | HELMET, WELDER'S | 4240-00-540-0623 | A-A-1994 | SC 4940-95-CL-B04 |
| 27 | HOLDER, INSERTED HAMMER FACE | 5120-00-903-8553 | GGG-H-33 | SC 4910-95-CL-A31 |
| 28 | HOLDER KIT, THREAD INSERTER (PART OF WP 0078 00, Item 70) | 5180-00-966-5958 | 10932383 | TM 9-2350-247-24P |
| 29 | INDICATOR, DIAL | 5210-00-277-8840 | MIL-I-18422 | SC 3470-95-CL-A02 |
| 30 | INSERTER, BEARING | 5120-00-378-4276 | R212D | TM 9-2350-247-24P |
| 31 | INSERTER, BEARING AND BUSHING (STAKER) | 5120-01-128-0094 | 12313102 | TM 9-2350-247-24P |
| 32 | INSERTER, SCREW THREAD | 5120-01-159-6487 | CR12W | TM 9-2350-247-24P |
| 33 | KEEPER, MAGNETIC | 5999-01-231-1787 | 12323453 | TM 9-2350-247-24P |
| 34 | LOAD BANK, ELECTRICAL | 6150-00-958-4173 | LB125 | TM 9-2350-247-24P |
| 35 | LUBRICATING KIT, BEARING | 4930-00-357-6301 | CS4930-0004 | SC 4910-95-CL-A31 |
| 36 | MULTIMETER, AN/PSM-45A | 6625-01-265-6000 | 27/FM W/ACCE | SC 4910-95-CL-A31 |
| 37 | PLIERS, RETAINING RING | 5120-00-595-9551 | APS10254 | SC 4910-95-CL-A31 |
| 38 | PLIERS, RETAINING RING, INTERNAL, 1 TO 1.4 INCH | 5120-00-293-0048 | 0100 | SC 4910-95-CL-A31 |

COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES
LIST—Continued

0078 00

| (1) ITEM NO. | (2) ITEM NAME | (3) NATIONAL STOCK NUMBER | (4) PART NUMBER | (5) REFERENCE |
|--------------------|---|---------------------------------|-----------------------|--------------------|
| 39 | PLIERS, RETAINING RING, INTERNAL, 3 TO 6.5 INCH | 5120-00-293-0186 | 7082060 | SC 4910-95-SC-A31 |
| 40 | PLUG SET, RADIATOR SET | 4910-00-273-3660 | 2005S-S | SC 4910-95-CL-A76 |
| 41 | POSITIONER, BEARING | 4910-01-128-0093 | 12313101 | TM 9-2350-247-24P |
| 42 | PRESS, ARBOR, HAND OPERATED, 60 TON | 3444-00-449-7295 | 26A49 | SC 4910-95-CL-A31 |
| 43 | PULLER KIT, UNIVERSAL | 5180-00-423-1596 | PE12 | SC 4910-95-CL-A31 |
| 44 | PULLER SET (STEERING WHEEL) | 5120-01-140-0950 | 4205A | TM 9-2350-247-24P |
| 45 | RESPIRATOR, AIR FILTERING | 4240-00-022-2524 | GGG-M-125/6 | TM 9-2350-247-24P |
| 46 | RIVET SET, HAND, #6 | 5120-00-222-3662 | GGG-R-400 | SC 3470-95-CL-A08 |
| 47 | RIVETER, BLIND, HAND | 5120-01-289-4310 | HP-2 | TM 9-2350-247-24P |
| 48 | SANDER, DISC, ELECTRICAL | 5130-00-596-9728 | 00-S-90 | SC 3431-95-CL-A01 |
| 49 | SEWING MACHINE, INDUSTRIAL | 3530-01-182-8560 | 206RB1 | TM 9-2350-247-24P |
| 50 | SLING, ENGINE AND DIFFERENTIAL | 3940-00-646-6893 | 10942647 | TM 9-2350-247-24P |
| 51 | SLING, ENGINE AND TRANSMISSION | 3940-01-240-2206 | 12350306 | TM 9-2350-247-24P |
| 52 | SOCKET, WRENCH, FACE SPANNER | 5120-01-245-2470 | 12335539 | TM 9-2350-247-24P |
| 53 | SOCKET, WRENCH, FACE SPANNER | 5120-01-244-9821 | 12335540 | TM 9-2350-247-24P |
| 54 | SOCKET, WRENCH, FACE SPANNER | 5120-01-224-7123 | 12323421 | TM 9-2350-247-24P |
| 55 | SOCKET, WRENCHING, TUBE FITTING | 5120-01-240-2202 | BAS-01 | TM 9-2350-247-24P |
| 56 | SOLDERING GUN | 3439-00-542-0396 | 8802G3 | SC 4910-95-CL-A31 |
| 57 | SPRAY OUTFIT, PAINT | 4940-00-066-4254 | 63160 | SC 4910-95-CL-A76 |
| 58 | STAND, RADIATOR TEST | 4910-00-078-9190 | MILS4534 | SC 4910-95-CL-A76 |
| 59 | TAPE, MEASURING | 5210-00-150-2920 | GGGT106 | SC 5180-90-CL-N34 |
| 60 | TENSIONMETER, V-BELT | 6635-00-921-6255 | 12998F | TM 9-2350-247-24P |
| 61 | TEST STAND, HEATER | 4910-01-318-4508 | VHTS-89102 | TM 9-4910-755-13&P |
| 62 | THERMOMETER, SELF-INDICATING, 50 TO 300°F | 6685-00-174-6239 | 2261-0010086 | TM 9-2350-247-24P |
| 63 | THREADING SET, SCREW | 5180-00-448-2362 | GGG-T-330 | SC 4910-95-CL-A31 |
| 64 | TOOL KIT, AUTOMOTIVE FUEL AND ELECTRICAL SYSTEM REPAIR | 5180-00-754-0655 | SC4910-95CLA50 | SC 5180-95-CL-B08 |
| 65 | TOOL KIT, CANVAS WORKER'S | 5180-00-754-0731 | 7540731 | SC 5180-90-CL-N07 |

COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES
LIST—Continued

0078 00

| (1) ITEM NO. | (2) ITEM NAME | (3) NATIONAL STOCK NUMBER | (4) PART NUMBER | (5) REFERENCE |
|--------------------|--|---------------------------------|-----------------------|-------------------|
| 66 | TOOL KIT, ELECTRICAL CONNECTOR REPAIR | 5180-00-876-9336 | 7550526 | SC 4910-95-CL-A31 |
| 67 | TOOL KIT, ELECTRONIC EQUIPMENT | 5180-00-610-8177 | TK-105/G | SC 5180-91-CL-R07 |
| 68 | TOOL KIT, GENERAL MECHANIC'S | 5180-00-177-7033 | SC5180-90-CL-N26 | SC 5180-90-CL-N26 |
| 69 | TOOL KIT, METAL WORKER'S | 5180-00-754-0643 | SC5180-90CLN34 | SC 5180-90-CL-N34 |
| 70 | TOOL KIT, THREAD INSERT (OVERSIZE ROSAN) | 5180-00-966-5961 | 10932474 | TM 9-2350-247-24P |
| 71 | TRESTLE, HOIST, PORTABLE, 7 TON | 4910-00-251-8013 | 306 | SC 4910-95-CL-A31 |
| 72 | WISE, MACHINIST'S | 5120-00-293-1439 | 504M2 | SC 4910-95-CL-A31 |
| 73 | WATTMETER, 0 TO 3.5 KW | 6625-00-898-1419 | CM29471-2 | TM 9-2350-247-24P |
| 74 | WELDING SHOP, TRAILER MOUNTED | 3431-00-935-7821 | MILW52629 | SC 3431-95-CL-A01 |
| 75 | WRENCH, ADJUSTABLE, 15 INCH | 5120-00-423-6728 | GGG-W-631 | SC 4910-95-CL-A31 |
| 76 | WRENCH KIT, METRIC | 5120-01-070-8954 | ES 860 MDFSS | SC 4910-95-CL-A31 |
| 77 | WRENCH, OPEN END, 1-1/8 X 1-5/16 INCH | 5120-00-184-8438 | 1037A | SC 4910-95-CL-A01 |
| 78 | WRENCH, OPEN END, 1-5/16 X 1-1/2 INCH | 5120-00-277-2323 | A-A-1356 | SC 4910-95-CL-A31 |
| 79 | WRENCH SET, SOCKET, 3/8 INCH DRIVE | 5120-00-322-6231 | GGG-W-641 | SC 4910-95-CL-A31 |
| 80 | WRENCH SET, SOCKET, 3/4 INCH DRIVE | 5120-00-204-1999 | GGG-W-641 | SC 4910-95-CL-A31 |
| 81 | WRENCH, SOCKET, SPLINE | 5120-01-223-7978 | 12323476 | TM 9-2350-247-24P |
| 82 | WRENCH, TORQUE, 3/8 INCH DRIVE, 0-150 LB-IN | 5120-00-230-6380 | TE12A | SC 4910-95-CL-A31 |
| 83 | WRENCH, TORQUE, 3/8 INCH DRIVE, 0-600 LB-IN | 5120-00-542-5681 | B58 | SC 5180-95-CL-A12 |
| 84 | WRENCH, TORQUE, 1/2 INCH DRIVE, 0-150 LB-FT | 5120-00-247-2540 | F150 | SC 4910-95-CL-A31 |
| 85 | WRENCH, TORQUE, 1/2 INCH DRIVE, 0-175 LB-FT | 5120-00-640-6364 | A-A-2411 | SC 4910-95-CL-A31 |
| 86 | MAGNETIC BASE DIAL INDICATOR | 5210-00-402-9619 | J7872 | TM 2815-205-34&P |

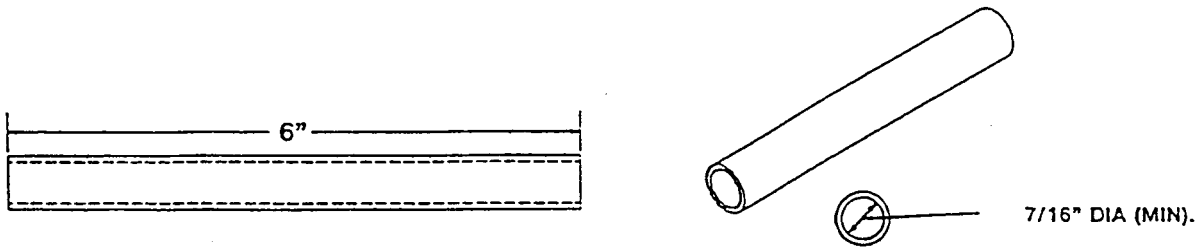
FABRICATED TOOLS

0079 00**INTRODUCTION****SCOPE**

This work package includes instructions for making tools authorized to be fabricated at DS or GS maintenance level. These tools are needed for specialized 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.

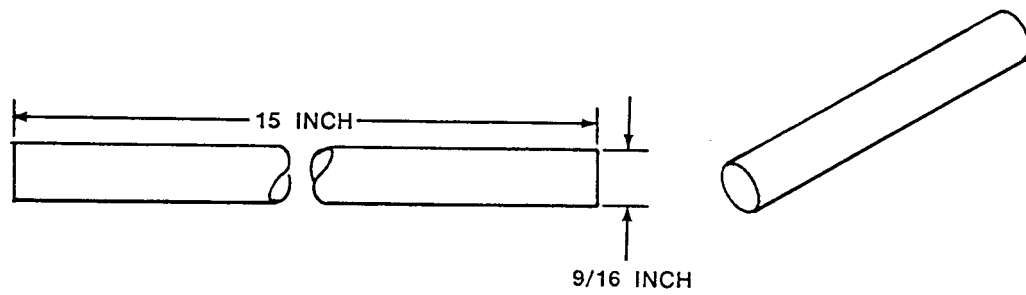
**MATERIAL REQUIRED**

Round steel stock 1020 or 1040, or locally procured steel pipe.

NOTES:

1. Remove all burrs.
2. Do not break sharp edges.
3. All dimensions are in inches.

Lock Ring Drive Tool for Stud Insert

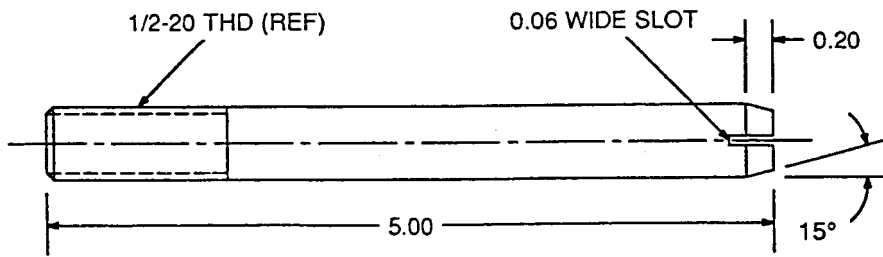
**MATERIAL REQUIRED**

Bronze rod, 9/16 inch diameter

NOTES:

1. Remove all burrs.
2. All dimensions are in inches.

Drift Punch for 60 KW Generator Stub Shaft

**PARTS REQUIRED**

Two 1/2-20 x 5-1/2 inch screws NSN 5305-00-719-5275.

NOTES:

1. Cut off head of bolt. Saw or file a 0.06-inch screwdriver slot in unthreaded end.
2. Quantity required - two.
3. All dimensions are in inches.

Clutch Guide Stud for 60 KW Generator Speed Increaser

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

0080 00

INTRODUCTION

Scope

This work package lists expendable/ durable items you will need to maintain the M548A1 and M548A3 Carriers. These items are authorized by CTA 50-970, *Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items)*.

Explanation of Columns in the Expendable/Durable Items List

Column (1) — Item Number. This number is assigned to the entry in the listing, and is referenced in the Initial Setup section of the task under Materials/Parts to identify the material (e.g., “Automotive grease (Item 7)”).

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. Also listed are the Commercial and Government Entity Code (CAGEC) in parentheses and the part number for the item.

Column (5) — Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Table 1. Expendable and Durable Items List

| (1) ITEM NUMBER | (2) LEVEL | (3) NATIONAL STOCK NUMBER | (4) ITEM NAME,DESCRIPTION,CAGE,PART NUMBER | (5) U/M |
|-----------------------|--------------|------------------------------------|---|------------|
| 1 | O | 5350-00-221-0872 | ABRASIVE CLOTH (CROCUS) (58536) A-A-1206 | SH |
| 2 | O | 8040-00-839-4919 | ADHESIVE (04963) EC1099 | QT |
| 3 | O | 8040-01-068-2423 | ADHESIVE (94960) 2141PT | PT |
| 4 | F | 8040-00-843-0802 | ADHESIVE (RTV) (80244) MIL-A-46106 GP1TY1 | OZ |
| 5 | O | 6850-00-181-7940 | ANTIFREEZE (81349) MILA46153 | GL |
| 6 | O | 8030-00-251-3980 | ANTISEIZE COMPOUND (81349) MIL-A-907 | LB |
| 7 | O | 9150-01-197-7692 | AUTOMOTIVE GREASE (GAA) (81349) MIL-G-10924 | LB |
| 8 | O | 8030-00-243-0956 | CAULKING COMPOUND (80244) TT-C-001796 TY1CLA | GL |

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST—Continued

0080 00

| (1) ITEM NUMBER | (2) LEVEL | (3) NATIONAL STOCK NUMBER | (4) ITEM NAME,DESCRIPTION,CAGE,PART NUMBER | (5) U/M |
|-----------------------|--------------|------------------------------------|--|------------|
| 9 | F | 8030-00-664-4944 | CANVAS PRESERVATIVE (80244) TT-P-595 TY3CL2 | GL |
| 10 | F | 6830-00-963-4248 | CARBON DIOXIDE GAS (N/A) | LB |
| 11 | O | 7920-00-044-9281 | CLEANING CLOTH (LOW LINT) (51200) MIRACLEWIPEL001 | LB |
| 12 | F | 8305-01-052-0788 | COATED CLOTH (NYLON) (92508) MIL-C-20696,TYPE1,CLASS2 | YD |
| 13 | F | 8135-01-137-4789 | CUSHIONING MATERIAL (80244) MIL-P-26514 TY2 CL1 | KT |
| 14 | O | 6810-00-205-6786 | DENATURED ALCOHOL (80244) O-E-760 TY4 | QT |
| 16 | F | 8305-00-170-3903 | DUCK CLOTH (COTTON) (81348) CCCC428 | YD |
| 17 | O | 9150-01-152-4119 | ENGINE LUB OIL (OE/HDO) (81349) MIL-L-2104GRADE15W40 | GL |
| 18 | O | 7930-00-282-9699 | GENERAL PURPOSE DETERGENT (81349) MIL-D-16791 | GL |
| 19 | O | 5110-00-277-4588 | HACKSAW BLADE (54940) 31-51024 | EA |
| 20 | F | 2510-01-178-9375 | HEAT SINK COMPOUND (23892) 5704556 | OZ |
| 21 | F | 6850-00-145-0255 | INSPECTION PENETRANT KIT (81349) MIL-I-25135 | EA |
| 22 | F | 5970-01-159-8000 | INSULATING COMPOUND (83574) PR1568AEROSOL | OZ |
| 23 | F | 5970-00-161-7422 | INSULATING VARNISH (24446) 1201 | GL |
| 24 | O | 5970-00-816-6056 | INSULATION TAPE (81348) HH-I-595-B-108-0 | FT |
| 25 | F | 3439-00-184-8960 | LEAD ALLOY SOLDER (ACID CR) (81348) SN40WACP6 0.125 1LB | LB |
| 26 | F | 9535-00-975-2723 | METAL PLATE (ALUM .375 THK) (81348) QQ-A-250/8 | SH |
| 27 | F | 9535-00-542-2634 | METAL SHEET (ALUM .090 THK) (81348) QQ-A-250/7 | SH |
| 28 | F | 9535-00-542-2636 | METAL SHEET (ALUM .125 THK) (81348) QQ-A-250/7 | SH |

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST—Continued

0080 00

| (1) ITEM NUMBER | (2) LEVEL | (3) NATIONAL STOCK NUMBER | (4) ITEM NAME,DESCRIPTION,CAGE,PART NUMBER | (5) U/M |
|-----------------------|--------------|------------------------------------|---|------------|
| 29 | O | 9150-00-754-2595 | MOLYBDENUM D GREASE (GMD) (81349) MIL-G-21164 | LB |
| 30 | O | 9505-00-293-4208 | NONELECTRICAL WIRE (96906) MS20995C32 | LB |
| 31 | F | 8305-01-068-1403 | SATEEN CLOTH (COTTON) (81349) MIL-C-12095F | YD |
| 32 | O | 8030-00-252-3391 | SEALING COMPOUND (81349) MIL-S-45180 TY2 | OZ |
| 33 | F | 8030-00-543-4384 | SEALING COMPOUND (81349) MIL-S-7916 | PT |
| 34 | O | 8030-00-656-1426 | SEALING COMPOUND (80244) MIL-S-45180 TY3 | PT |
| 35 | O | 8030-01-166-0675 | SEALING COMPOUND (05972) 567-47 | ML |
| 36 | O | 8030-00-723-5344 | SEALING COMPOUND (FUEL) (80244) MIL-S-8802 TY2CLA-2 | KT |
| 37 | O | 8030-00-980-3975 | SEALING COMPOUND PRIMER (05972) 764-56 | OZ |
| 38 | O | 3940-00-675-5003 | SLING (ENDLESS) (81996) PD101-96 | EA |
| 39 | F | 3439-01-219-7884 | SOLDERING FLUX (85150) DAYFLO STD | GL |
| 40 | F | 6830-00-169-0779 | TECHNICAL ARGON (81349) MIL-A-18455 | CF |
| 41 | F | 4920-01-212-9235 | TEFLON TAPE (22380) 2325179 | FT |
| 42 | F | 8310-00-988-1301 | THREAD (POLYESTER) (80244) V-T-285 TY1CL1SCA\$B | YD |
| 43 | O | 3439-00-453-5472 | TIN ALLOY SOLDER (ROSIN CR) (81348) SN60WRMAP2 0.036 1LB | LB |
| 44 | O | 3439-00-273-1637 | TIN ALLOY SOLDER (SOLID CR) (81348) SN50WS 0.125 5LB | LB |
| 45 | F | 3439-00-803-9498 | WELDING ELECTRODE (31505) AWSA5.10-69 ER5356 0.047 | OZ |
| 46 | O | 7920-00-205-1711 | WIPING RAG (COTTON) (58536) A-A-2522 | LB |
| 47 | O | 5210-00-985-6610 | YARDSTICK (ALUMINUM) (80244) GGG-Y-0035 TY2 | EA |

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST—Continued

0080 00

| (1) ITEM NUMBER | (2) LEVEL | (3) NATIONAL STOCK NUMBER | (4) ITEM NAME,DESCRIPTION,CAGE,PART NUMBER | (5) U/M |
|-----------------------|--------------|------------------------------------|---|------------|
| 48 | O | 5210-00-243-3349 | YARDSTICK (WOOD) (80244) GGG-Y-0035 TY1CL1 | EA |
| 49 | O | 6850-01-277-0595 | CLEANING COMPOUND (59557) 134-HI-SOLV | CN |

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| | | |
|--|---|------|
| RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4. | Use Part II (reverse) for Repair Parts and Special Tools Lists (RPSTL) and Supply Catalogs/Supply Manuals SC/SM). | Date |
| TO: (Forward to proponent of publication or form) (Include ZIP Code) | FROM: (Activity and location) (include ZIP code) | |

PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

| | | |
|--|-----------------------------|---|
| PUBLICATION/FORM NUMBER TM 9-2350-247-34 | DATE 30 June 2001 | TITLE Direct Support and General Support Maintenance Manual for Carrier, Cargo Tracked, 6-Ton M548A1 and M548A3 |
|--|-----------------------------|---|

| ITEM | PAGE | PARA | LINE | FIGURE NO. | TABLE | RECOMMENDED CHANGES AND REASON |
|-----------|------|------|------|------------|-------|---|
| 0052 00-4 | | | | | | Inspection Step 1 WP reference should be (WP 0003 00) |

SAMPLE

**Reference to line numbers within the paragraph or subparagraph.*

| | | |
|-----------------------|--|-----------|
| TYPED, GRADE OR TITLE | TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION | SIGNATURE |
|-----------------------|--|-----------|

| | | |
|--|---|-------------|
| TO: (Forward direct to addressee listed in publication) | FROM: (Activity and location) (Include Zip Code) | Date |
|--|---|-------------|

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

| | | |
|---|-----------------------------|---|
| PUBLICATION NUMBER TM 9-2350-247-34 | DATE 30 June 2001 | TITLE Direct Support and General Support Maintenance Manual for Carrier, Cargo Tracked, 6-Ton M548A1 and M548A3 |
|---|-----------------------------|---|

| PAGE NO. | COLM NO. | LINE NO. | NATIONAL STOCK NUMBER | REFERENCE NO. | FIGURE NO. | ITEM NO. | TOTAL NO. OF MAJOR ITEMS SUPPORTED | RECOMMENDED ACTION |
|----------|----------|----------|-----------------------|---------------|------------|----------|------------------------------------|--------------------|
| | | | | | | | | |

PART III – REMARKS (Any general remarks or recommendations for improvement of the publication, or suggestions for improvement of the space and blank forms.)

SAMPLE

| | | |
|----------------------|--|-----------|
| TYPED, GRADE OR FILE | TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION | SIGNATURE |
|----------------------|--|-----------|

| | | |
|--|---|------|
| RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4. | Use Part II (reverse) for Repair Parts and Special Tools Lists (RPSTL) and Supply Catalogs/Supply Manuals SC/SM). | Date |
|--|---|------|

| | |
|---|---|
| TO: (Forward to proponent of publication or form) (Include ZIP Code) | FROM: (Activity and location) (include ZIP code) |
|---|---|

PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

| | | |
|--|---------------------------------|---|
| PUBLICATION/FORM NUMBER TM 9-2350-247-34 | DATE 30 June 2001 | TITLE Direct Support and General Support Maintenance Manual for Carrier, Cargo Tracked, 6-Ton M548A1 and M548A3 |
|--|---------------------------------|---|

| ITEM | PAGE | PARA | LINE | FIGURE NO. | TABLE | RECOMMENDED CHANGES AND REASON |
|------|------|------|------|---------------|-------|--------------------------------|
| | | | | | | |

**Reference to line numbers within the paragraph or subparagraph.*

| | | |
|-----------------------|---|-----------|
| TYPED, GRADE OR TITLE | TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION | SIGNATURE |
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| TO: (Forward direct to addressee listed in publication) | FROM: (Activity and location) (Include Zip Code) | Date |
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PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

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|---|-----------------------------|---|
| PUBLICATION NUMBER TM 9-2350-247-34 | DATE 30 June 2001 | TITLE Direct Support and General Support Maintenance Manual for Carrier, Cargo Tracked, 6-Ton M548A1 and M548A3 |
|---|-----------------------------|---|

| 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).*

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| RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4. | Use Part II (reverse) for Repair Parts and Special Tools Lists (RPSTL) and Supply Catalogs/Supply Manuals SC/SM). | Date |
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| TO: (Forward to proponent of publication or form) (Include ZIP Code) | FROM: (Activity and location) (include ZIP code) |
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PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

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|--|---------------------------------|---|
| PUBLICATION/FORM NUMBER TM 9-2350-247-34 | DATE 30 June 2001 | TITLE Direct Support and General Support Maintenance Manual for Carrier, Cargo Tracked, 6-Ton M548A1 and M548A3 |
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| ITEM | PAGE | PARA | LINE | FIGURE NO. | TABLE | RECOMMENDED CHANGES AND REASON |
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**Reference to line numbers within the paragraph or subparagraph.*

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PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

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| PUBLICATION/FORM NUMBER TM 9-2350-247-34 | DATE 30 June 2001 | TITLE Unit Maintenance Manual for Carrier, Cargo Tracked, 6-Ton M548A1 and M548A3 |
|--|---------------------------------|---|

| ITEM | PAGE | PARA | LINE | FIGURE NO. | TABLE | RECOMMENDED CHANGES AND REASON |
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**Reference to line numbers within the paragraph or subparagraph.*

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By Order of the Secretary of the Army:

Official:



JOEL B. HUDSON

*Administrative Assistant to the
Secretary of the Army*

0105112

ERIC K. SHINSEKI
*General, United States Army
Chief of Staff*

DISTRIBUTION:

To be distributed in accordance with the initial distribution number (IDN) 370827,
requirements for TM 9-2350-247-34.

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

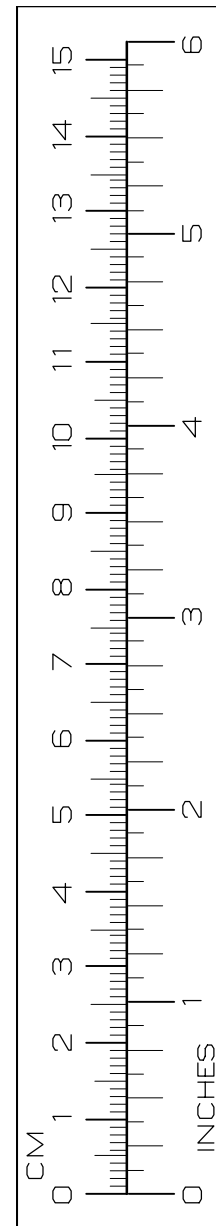
1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

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 |



PIN: 028683-000