TM 9-2350-247-20-1

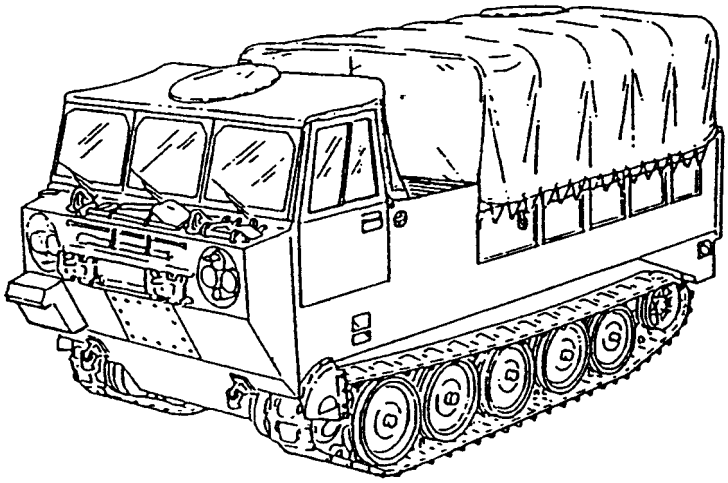
TECHNICAL MANUAL

UNIT MAINTENANCE MANUAL

FOR

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

M548A3
2350–01–369–6081 (EIC AE9)



SUPERSEDURE NOTICE — This manual supersedes TM 9–2350–247–20 dated August 1994, including all changes.
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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 with whom you work.

WARNING

Energized system and equipment can burn you. If MASTER POWER SWITCH is ON, electrical system and equipment will be energized. Make sure MASTER POWER SWITCH is OFF when you work on electrical systems or equipment.

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

Battery post and cables touched by metal objects can short circuit and burn you. Gas from batteries can explode and injure you. Battery acid can blind you or burn you.

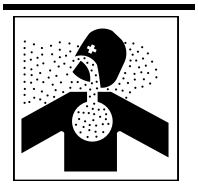
- **Do not wear jewelry when you work on electrical systems.**
- **Use caution when you work near battery or electrical system with tools or other metal objects.**
- **Do not get acid on your skin or in your eyes.**
- **Do not allow sparks near batteries.**

WARNING SUMMARY (cont)

WARNING

Heater and engine exhaust can kill or poison you. Close power plant access panel tight before you start engine. Do not run heater or engine indoors without very good fresh air flow. Keep power plant access cover closed when you run engine. Check for the smell of exhaust fumes. If you notice any fumes, open hatches and turn on vent fans.

WARNING

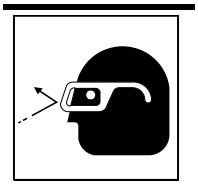


Exhaust gases can make you ill or kill you. Signs of exhaust gas poison are dizziness, headache, loss of muscle control, sleepiness, coma, or death. If anyone shows signs of exhaust gas poisoning:

(1) - Get all personnel out of carrier.
(2) - Get medical help.
(3) - Make sure personnel have lots of fresh air.
(4) - Keep personnel warm.
(5) - Do not let anyone do hard exercise.

If anyone stops breathing, give artificial respiration.

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

If you work on a carrier that has been running, you could be burned. All tasks begin with a cooled down carrier. Allow carrier to cool, or use care if you work on a hot carrier.

WARNING SUMMARY (cont)

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

Portable and fixed fire extinguisher cylinders are under pressure and can discharge and injury you. Handle cylinders with care.

WARNING

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

WARNING

Starting engine right after a fire could restart the fire and kill or injure you. Do not turn MASTER SWITCH ON until cause of fire has been repaired or removed.

WARNING SUMMARY (cont)

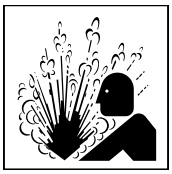
WARNING

Loctite sealing compound can damage your eyes. Before you handle loctite sealing compound, wear safety glasses/goggles and avoid contact with eyes. If it gets into your eyes, flush eyes with fresh water and get medical help.

WARNING

Loose clothing is dangerous around moving belts and pulleys. You could get badly hurt if your clothes get caught in moving parts.

WARNING



Hot radiator coolant can burn you. Use hand to remove cap ONLY if cool to touch. Turn cap slowly to release pressure. Replace cap by pressing down and turning until tight.

WARNING

Radiator is heavy and can cause back injury if handled improperly. Be sure to use a hoist and helper to remove radiator.

WARNING SUMMARY (cont)

WARNING

Do not work under power plant. Power plant is heavy and may cause personnel and equipment damage if it falls. Lower power plant close to the ground before starting task.

WARNING

Carbon Monoxide is poisonous and can kill you. Play it safe. Make sure power plant access covers and door are closed tight before you start engine. Do not idle engine with driver's power plant access panel off unless there is very good air flow.

WARNING

Damaged lifting slings can fail with load. Soldiers can be killed or injured. Inspect all slings before use. Do not use damaged slings.

WARNING

Do not touch exhaust pipes with bare hands. You could get a bad burn.

WARNING SUMMARY (cont)

WARNING

Gas from batteries can explode. Ventilate compartment before you disconnect of connect battery cables. Battery acid can burn or blind you. Do not get acid on your skin or eyes. ALWAYS disconnect battery negative leads first and connect them last.

WARNING

Lifting or moving objects in excess of 70 lb (32 kg) could injury you. Make sure to get an assistant or use a lifting device to move any heavy objects.

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 SUMMARY (cont)

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

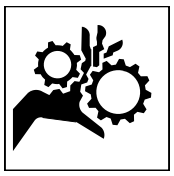
High-efficiency air purifying respirators should be used when grinding or sanding CARC-coated equipment. Failure to do so may result in injury or death to personnel.

WARNING

Carrier operation during hot weather may result in potential heat stress to crew members. Crew members should limit their exposure based on TB med 507 using PHEL Chart (WP 0542 00) curve as a guide.

WARNING SUMMARY (cont)

WARNING



Start up of equipment or moving parts could injure you or others. If other personnel are working on your carrier, be sure you know what they are doing. Place DO NOT OPERATE tags on MASTER SWITCH when needed to prevent startup.

WARNING

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

WARNING

Heat shield insulation may contain asbestos. Inhaled asbestos dust can cause permanent lung damage. Wear a filter mask approved for asbestos protection and rubber gloves during handling of asbestos. Wash skin and clothing with soap and water after handling asbestos. Dispose of asbestos material in accordance with approved hazardous waste disposal procedures.

WARNING SUMMARY (cont)

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 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 assists a technician, that operator must be warned about dangerous areas.

SHUT OFF POWER supply to equipment before beginning work. When working inside equipment with power off, take special care to ground every capacitor likely to hold a dangerous potential.

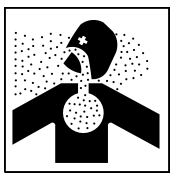
BE CAREFUL not to contact high-voltage connections when installing or operating this equipment.

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

WARNING

Magnesium may catch on fire and burn you if welded on or if exposed to high temperatures. Do not weld on magnesium casings or expose them to high temperature. Be careful when filing or grinding magnesium. Use grinding equipment marked FOR MAGNESIUM ONLY. Keep a Class D fire extinguisher of a sodium chloride base dry powder to fight magnesium fires. Water and foam-type fire extinguisher will cause magnesium fires to flare up and create toxic fumes which can result is death.

WARNING



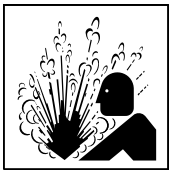
Do not weld on plastic molding material (foam filled) parts. Welding on plastic molding material (foam filled) parts creates toxic fumes. Fumes are hazardous to your health and can result in death.

WARNING SUMMARY (cont)

WARNING

Do not wear jewelry. It can get caught and cause electrical burns or may cause electrocution.

WARNING



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

WARNING

NBC agents can kill you. Do not service air cleaner or vent system after NBC attack until carrier has been decontaminated and filters disposed of by NBC team. Unit commander or officer in charge must assign NBC team to decontaminate system and dispose of filters. Unit commander of officer in charge must prescribe necessary protective clothing and safety measures for NBC team.

WARNING

M548A3 requires both battery negative leads disconnected before maintenance. Each side provides power that may kill or injure personnel if both negative leads are not completely disconnected.

WARNING SUMMARY (cont)

WARNING

Failure to lock right and left steering levers (M548A1) or apply parking brake (M548A3) and block the road wheels can allow the carrier to move and could result in injury or death. Always lock right and left steering levers (M548A1) or apply parking brake (M548A3) and block road wheels before working on the carrier.

WARNING

If road wheel lifters slips while lowering road arm, it could injure you. Stand clear before you lower or raise road arm.

WARNING

Do not handle wire rope with bare hands. Broken wires can rip your hands open. Wear leather gloves when handling wire rope.

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)

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 80 AND TOTAL NUMBER OF WORK PACKAGES IS 146 CONSISTING OF THE FOLLOWING:

Page / WP No.	* Change No.	Page / WP No.	* Change No.	Page / WP No.	* Change No.
Title	0				
a – k/l blank	0				
A/B	0				
i – xxii	0				
WP 0001 00 – 0146 00	0				
1 – 47	0				
DA 2028 (3 copies)	0				
Authentication	0				
Back cover (Metric)	0				
Back Cover (PIN)	0				

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

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

TECHNICAL MANUAL

UNIT MAINTENANCE MANUAL

CARRIER, CARGO TRACKED, 6–TON M548A1
NSN 2350–01–096–9356
(EIC AEU)

M548A3
NSN 2350–01–369–6081
(EIC AE9)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028–2 (Recommended Changes to Equipment Technical Publications), through the Internet, on the Army Electronic Product 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, DA Form 2028 or DA Form 2028–2 direct to: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-LC-CIP—WT (Tech Pubs Control Point), 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.

SUPERSEDURE NOTICE — This manual supersedes TM 9–2350–247–20 dated 15 August 1994.

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HOW TO USE THIS MANUAL

HOW TO USE THIS MANUAL

This manual tells you how to perform unit maintenance for the M548A1 and M548A3 carriers.

Before starting a task or procedure, read HOW TO USE THIS MANUAL and the General Maintenance Procedures Work Package.

USE YOUR MANUAL ON THE JOB

The best way to learn about this manual is to practice using it. Knowing how to use this manual will save both time and energy.

HOW TO USE THE WORK PACKAGES (WP)

How to find the Work Package you need

Pick a key word from the vehicle part or system to be used. Look in the INDEX for this key word or the name of the action you will perform. Turn to the Work Package and page indicated.

The INDEX lists each Work Package under one or more headings. For example, the WP titled REPLACE TOWING PINTLE could be found under the two headings “Pintle”, and “Towing”.

How to read the Work Package

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

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

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

Look at the illustrations. Locators show you where the equipment and parts are located on the vehicle. Closeup illustrations show the details you need to do the procedure.

Maintenance Procedures Work Packages

Maintenance Procedures Work Packages keep the carrier in shape to operate. Maintenance Procedures are used to present maintenance instructions. Each maintenance procedure details steps which you need to perform. If the vehicle and parts need maintenance that is not included in any procedure in the manual, notify your supervisor.

Read the INITIAL SETUP section carefully before you start any procedure. Get the tools and supplies listed and the personnel needed. Be sure the equipment is in the condition required.

Read all of the Work Package before starting. Follow the steps in the order given.

FOLLOW-THROUGH STEPS tell you what to do after the maintenance task is done. The words END OF TASK will tell you when you have finished the procedure.

Troubleshooting Work Packages

Troubleshooting Work Packages help you locate faulty parts. They direct you to the maintenance procedure to correct these faults. Chapter 2, Troubleshooting, contains detailed information on how to perform troubleshooting procedures. Read HOW TO USE TROUBLESHOOTING Work Package (WP 0005 00) before performing the troubleshooting procedures in the chapter.

Preventive Maintenance Checks and Services (PMCS) Work Package

Preventive maintenance is required to keep your carrier in good running condition. The PMCS procedures for unit maintenance are performed on a periodic basis.

HOW TO USE THIS MANUAL (cont)

If anything seems wrong with the carrier systems and you cannot fix it yourself, notify unit maintenance. Common things to watch for are loose bolts or damaged welds. Watch for worn insulation, loose clamps, and loose connectors when checking wiring harnesses.

DEFINITION OF WORK PACKAGE TERMS

Warnings, Cautions, And Notes

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

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

Helper

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

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

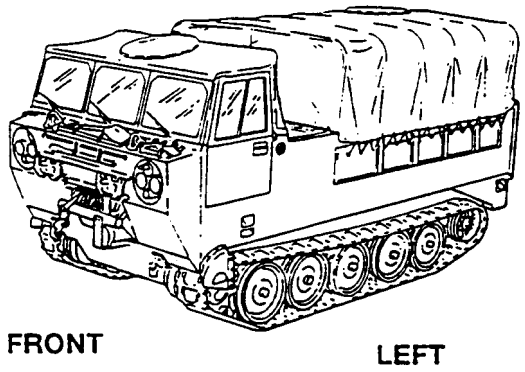
If a helper assists with a step or substep, the step or substep will include: “Have helper assist”.

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

Locational Terms

The terms FRONT, REAR, LEFT, and RIGHT are used to indicate where items are located on the vehicle. 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, transmission, differential, or transfer gearcase.)

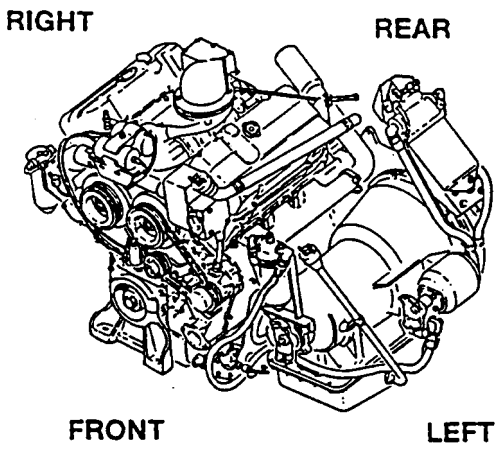
If you are working with carrier items, use this point of reference. Think of the location as if you were sitting in the driver’s seat looking forward.



M548A1 SHOWN

HOW TO USE THIS MANUAL (cont)

If you are working with power unit items, use this point of reference. Think of the location as if you were standing at the transfer gearcase 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 procedure refer to a different manual or to another procedure in the same manual. They are found in the INITIAL SETUP and in the FOLLOW-THROUGH steps. For example.

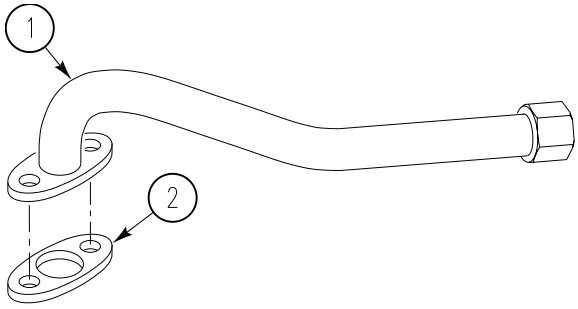
MASTER SWITCH OFF (see your -10)
Battery ground lead disconnected (WP 0310 00, WP 0311 00, or WP 0312 00)

For all procedures, the following comments apply:

- Parts which are discarded when removed will be referred to as “new” in the procedure step when installed. Examples are: gaskets, lockwashers, some preformed packings, and some retaining rings.
- These and other new parts are listed under MATERIALS/PARTS in the INITIAL SETUP.

GENERAL MAINTENANCE

Cleaning, inspecting, checking for leaks, and similar procedures which apply to most procedures are found in the GENERAL MAINTENANCE PROCEDURES section of the PMCS (WP 0128 00). Use these steps to clean and inspect any part being removed, repaired, or installed. Special cleaning will be covered in the procedure step. Below is a step that would require general cleaning.



5. Remove gasket (1) from upper tube flange (2). Discard gasket.

HOW TO USE THIS MANUAL (cont)

After performing this step, you would clean the mating surface with cleaning compound and a wiping rag according to the general cleaning procedures. In other procedures, hoses or rubber hatch seals will need to be checked for leaks. Refer to Chapter 3 for general procedures.

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

The RPSTL (TM 9-2350-247-24P) gives the National Stock Number (NSN) required to order parts used in the maintenance procedure. To use the RPSTL to identify and order a part, do the following:

1. In this manual, turn to the first page of the procedure to be performed.
2. Find Materials/Parts under INITIAL SETUP and read the part(s) that need replacement. If required, find the illustrated part in the procedure steps.
3. 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. Use the figure and item number index to find the NSN.
4. 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.
5. The usable on code in the RPSTL appears in the lower left corner of the Description column heading. Usable on codes are shown as 'UOC.....' in the Description column (justified left) on the first line following the item description/ nomenclature. Uncoded items are applicable to all models. Identification of the usable on codes in the RPSTL are:

Table 1. RPSTL Usable Codes

Code	Used On
V96	M548A1 Carrier, Cargo, tracked
AP4	M548A3 Carrier, Cargo, Tracked

CHAPTER 1

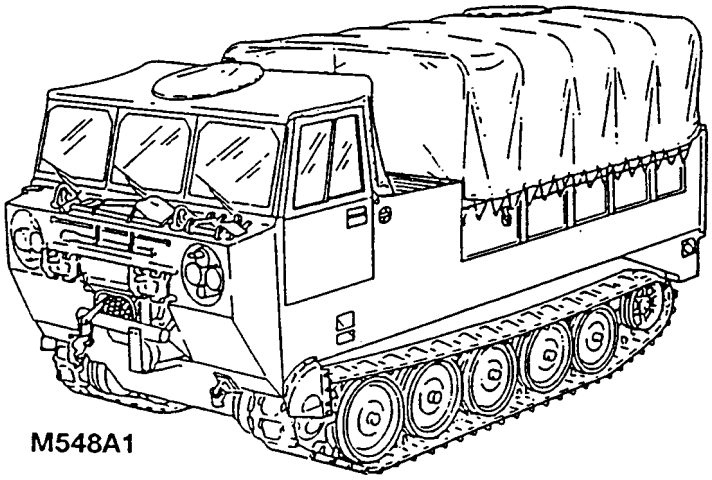
UNIT INTRODUCTORY INFORMATION WITH THEORY OF OPERATION

WORK PACKAGE INDEX

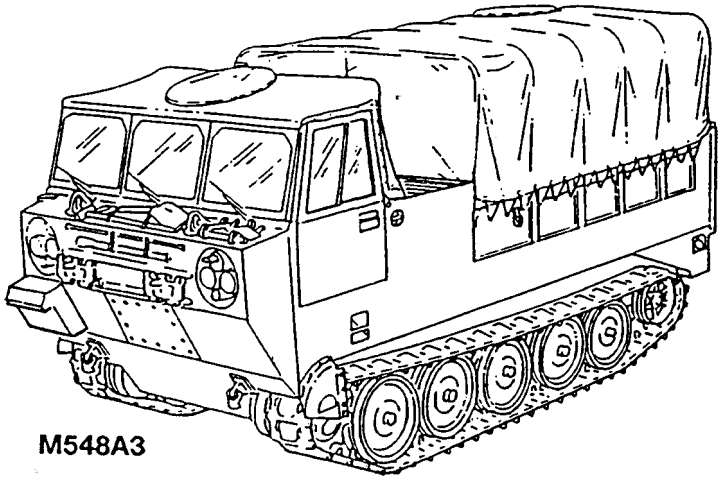
GENERAL INFORMATION 0001 00

SCOPE

Type of Manual: Unit Maintenance
Model Number and Equipment Name: M548A1/M548A3 - Carrier, Cargo Tracked, 6-Ton
Purpose of Equipment: Transportation and positioning combat troops and supplies.



M548A1



M548A3

The terms left and right as used in this manual are defined as standing at the rear and looking toward the front of the carrier.

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). Forms needed by units maintaining this material are listed in the References work package (WP 0539 00).

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your M548A1 or M548A3 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. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to: Commander, US Army Tank-Automotive Command, ATTN: AMSTA-TR-QCL, Warren, MI 48090. We will send you a reply.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

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

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

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

TM 750-244-7 Procedures for Destruction of Equipment in Federal Supply Classifications 1000, 1005, 1010, 1520, 2530, 5590, 5595 to Prevent Enemy Use.

PREPARATION FOR STORAGE OR SHIPMENT

See MIL-C-62015 for information about administrative storage or shipment of the M548A1 and M548A3 and their components.

NOMENCLATURE CROSS-REFERENCE

This listing includes nomenclature cross references used in this manual.

Adapter	Nipple, pipe, union
Air vent, personnel	Register, metal: personnel air vent
Assembly	Adapter assembly
Bilge pump	Rotary pump
Breather	Air filter intake
Bulb	Incandescent lamp
Coolant	Antifreeze and water
Coolant gauge	Temp indicator
Detector	Liquid transmitter
Dipstick	Liquid level gauge rod
Drain plug	Pipe plug
Engine oil filter	Fluid pressure filter
Engine oil gauge	Dial pressure gauge
Exhaust collector	Exhaust connection
Fastener	Toggle pin
Fire bottle	Compression gas cylinder
Fluid level detector	Liquid transmitter
Fuel control cable	Fuel control
Fuel filter	Fluid filter
Fuel gauge	Liquid quantity gauge
Fuel tank	Fuel compartment

Gear box	Mechanical housing
Grease fitting	Lubrication fitting
Hand brake	Parking brake lever
Hinge pin	Headless straight pin
Horn switch button	Push switch
Hub	Support
Indicator light	Indicator lamp
Inlet grille	Intake grille
Jack	Receptacle
Jam nut	Hexagonal nut
Key washer	Locking plates
Link	Plain rod bearing
Lock nut	Self-locking nut
Lock screw	Self-locking bolt
Lock washer	Self-locking washer
Lock wire	Non-electrical wire
Lubrication pump	Hydraulic pump
NBC	Nuclear, biological, and chemical
Plug	Connector
Propeller shaft	Flexible drive shaft
Quick disconnect	Quick coupling shaft
Radio	Receiver-transmitter
Road wheel	Solid rubber wheel
Road wheel arm	Support assembly
Rod	Connecting link
Screen	Metal grille
Screw	Machine bolt
Seat belt	Vehicular safety belt
Shim	Spacer
Shim pack	Spacer assortment
Slave cable	Adapter cable assembly
Splined shaft	Output carrier
Starter switch	Interlock switch
Stop light	Taillight
Stowage box	Vehicular accessory box

Switch	Circuit breaker
Throttle control cable	Throttle control
Tie strap	Electric tiedown strap
Towing pintle	Pintle hook latch
Turn signal assembly	Vehicle directional light
Universal joint	Universal joint spider

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 warnings in WARNING SUMMARY.

EQUIPMENT DESCRIPTION 0002 00

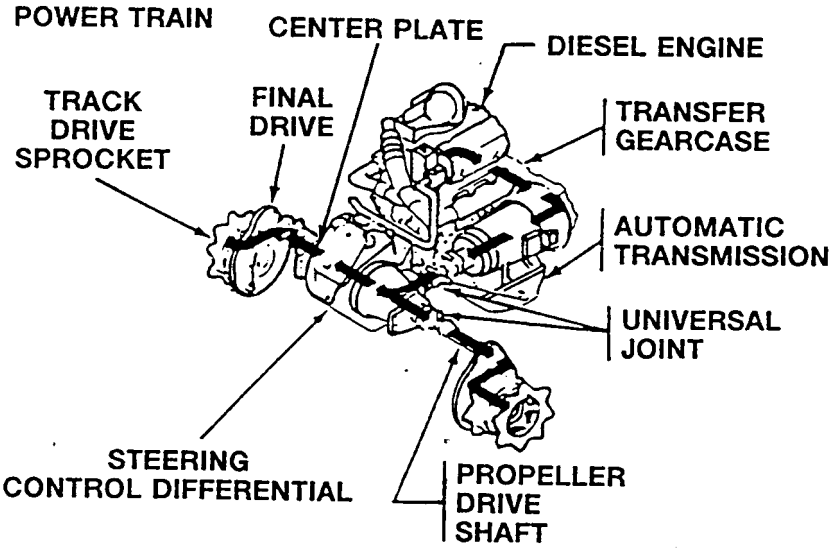
EQUIPMENT DATA

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

LOCATION AND DESCRIPTIONS OF MAJOR COMPONENTS

M548A1

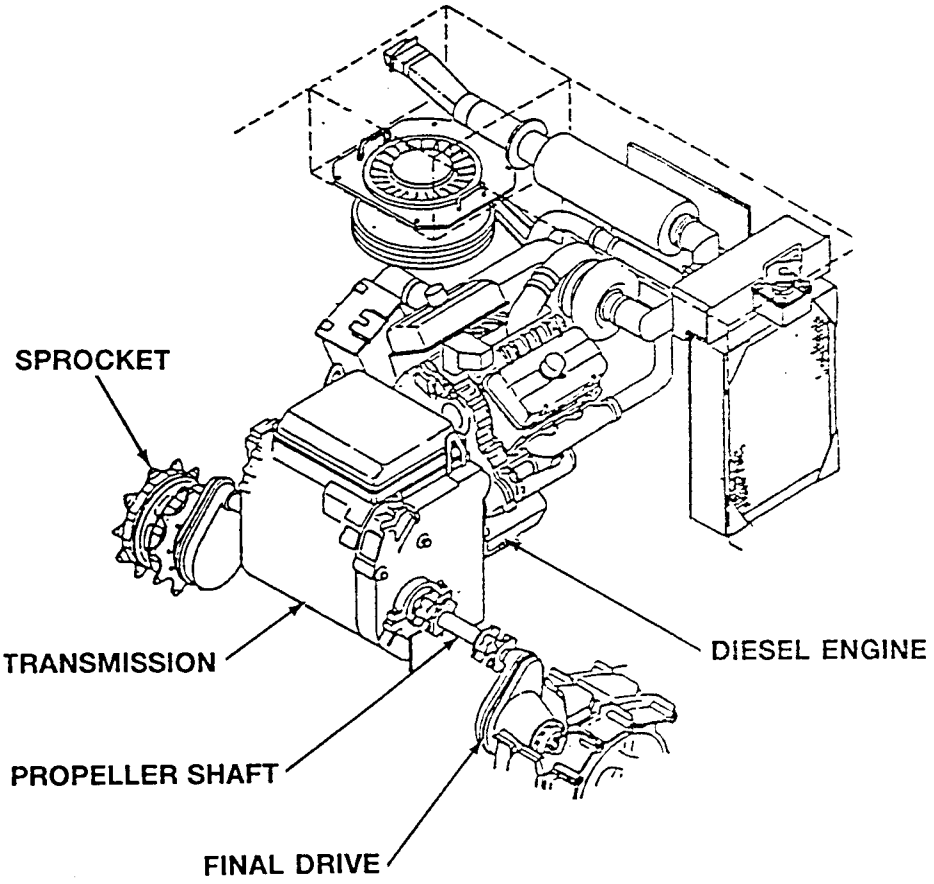
The major components of the M548A1 carrier are connected together to form the power train. The diesel engine, transfer gearcase, and automatic transmission form the power plant. The steering control differential, final drives, drive shafts, and universal joints complete the power train. A propeller drive shaft couples the steering control differential to the transmission. Power from the two differential output propeller drive shafts is transferred to the left and right final drives. The final drives turn the track drive sprockets.



EQUIPMENT DESCRIPTION — Continued **0002 00**

M548A3

The major components of the M548A3 carrier are connected together to form the power train. The power train furnishes and controls the power to drive and steer the carrier. A V6 diesel engine, transmission, connecting propeller shafts and left and right final drives make up the power train. The power plant consists of the diesel engine and automatic transmission. Power developed by the engine is transmitted to the transmission which delivers power through the final drives to the sprockets of the suspension system. The engine and transmission control the speed of power from one side to the other, providing the method of steering the carrier.



LOCATION OF COMPONENTS — LEFT FRONT VIEW

NOTE

Lifting eye may be removed if 50 caliber machine gun mount is installed. Cab cover may not be there if M2 machine gun is mounted.

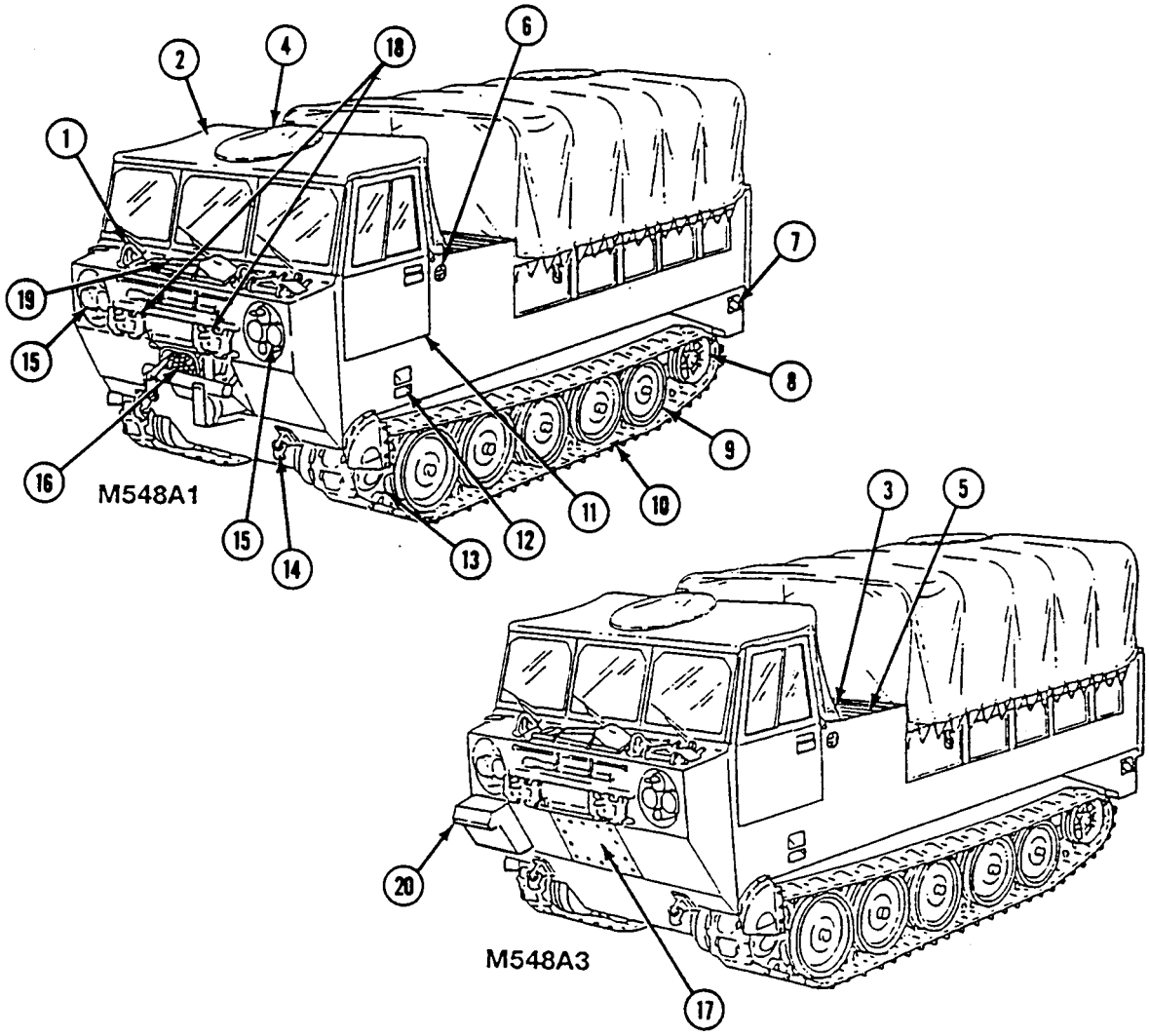


Table 1.

1. Lifting eye	6. Fire extinguisher outside handle
2. Cab cover	7. Fuel filler cap
3. Radiator filler cab (M548A3)	8. Idler wheel
4. Cab hatch cover	9. Road wheel
5. Air intake grille (M548A3)	10. Track

11. Cab door	16. Winch (M548A1)
12. Cab step	17. Vehicle compartment heater (M548A3)
13. Drive sprocket	18. Spare track shoe
14. Towing hooks	19. Pioneer tools
15. Lights	20. Decontamination guard (M548A3)

LOCATION OF COMPONENTS — RIGHT REAR VIEW

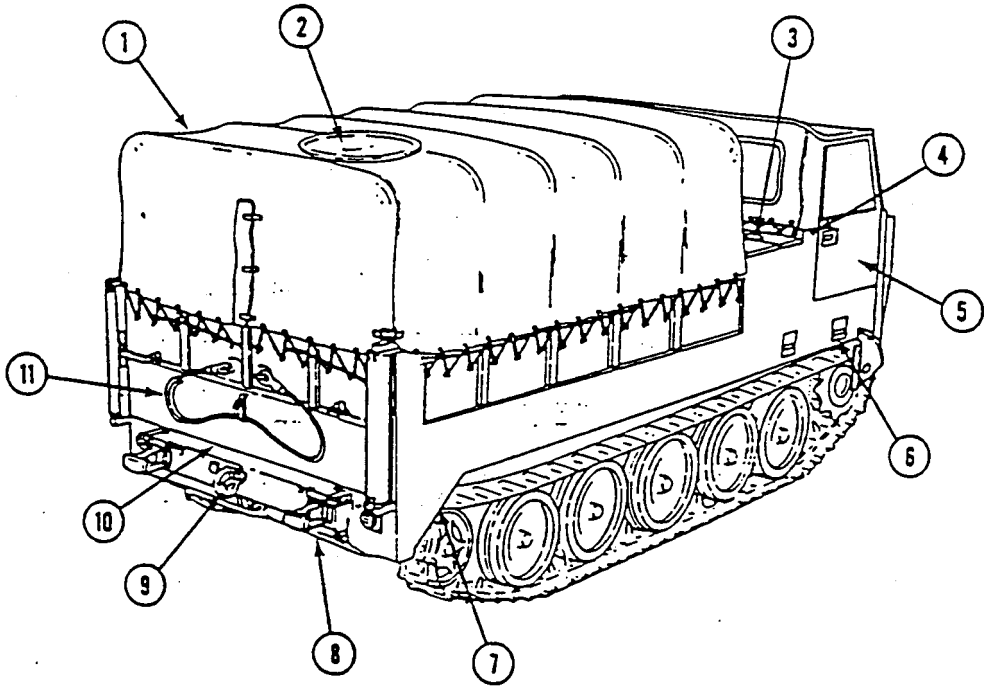


Table 2.

1. Cargo compartment cover	7. Track cover
2. Cargo compartment hatch cover	8. Tailgate
3. Radiator filler cap (M548A1)	9. Towing pintle
4. Front bilge pump outlet (hole in hull)	10. Cargo compartment door
5. Cab door	11. Towing cable
6. Cab step	

DIFFERENCES BETWEEN CARRIERS

This manual covers two different carriers. The major differences can be determined from the chart below.

DIFFERENCES BETWEEN CARRIERS

Carrier function	M548A1	M548A3
Personnel/Cargo	X	X
Winch	X	
Vehicle compartment heater installation		X
Special purpose kits:		
Air brake kit	X	
Caliber .50 machine gun mount kit	X	X
Engine heater coolant kit	X	X
Material handling kit	X	X
M66 ring mount kit	X	X
Vehicle compartment heater kit		
Cab (primary)	X	
Cab (secondary)	X	X
Cargo area (primary)	X	X
Cargo area (secondary)	X	X
7.62 mm machine gun mount kit	X	X
Turn signal kit	X	X

EQUIPMENT DATA

The following table lists data you may need to perform unit maintenance on M548A1 and M548A3. Other data necessary to operate and service your carrier is listed in -10, PMCS, and RPSTL.

EQUIPMENT DATA

Engine (M548A1)	Characteristics	Metric Equivalents
Manufacturer	Detroit Diesel Engine Corporation	
Model	5063-5299	
Series	6V53	
Type	two-cycle diesel compression-ignition	
Number of cylinders	6	
Bore	3.875 in	10 cm
Stroke	4.5 in	11 cm

Piston displacement	3.18 cu/in	5.2 liters
Compression ratio	21:1	
Injectors	M50	
Crankshaft rotation (viewed at pulley)	clockwise	
Compression pressure (minimum) speed 600 rpm, injectors removed)	510 psi	3516 kPa
Firing order	1L-3R-3L-2R-2L-1R	
Cylinder numbering left bank (front-to-rear)	1L-2L-3L	
Cylinder numbering right bank (front-to-rear)	1R-2R-3R	
Idle speed	650 to 700 rpm	
Governed speed (no load) with quick disconnect engaged	2925 to 2975 rpm	
Horsepower	210 at 2800 rpm	
Lubrication (type)	forced feed	
Lubrication pressure (normal at 2800 rpm)	40-60 psi	276 to 414 kPa
Lubricating pump type	rotary	
Stall speed	1900 to 2100 rpm	
Valves	overhead, rocker arm	
Dry weight	1345 lb	611 kg

Engine (M548A3)	Characteristics	Metric Equivalents
Manufacturer	Detroit Diesel Engine Corporation	
Model	5063-5292	
Series	6V53T	
Type	two-cycle diesel compression-ignition	
Number of cylinders	6	
Idle speed	650-700 rpm	
Horsepower	275 at 2800 rpm	
No-load governor speed	2,925-2,975 rpm	
Crankshaft location (viewed at pulley)	clockwise	
Cylinder number		
Left bank (front-to-rear)	1R-2R-3R	
Right bank (front-to-rear)	21L, 2L, 3L	
Firing order	1L, 3R, 3L, 2R, 2L, 1R	

Cooling System (M548A1)	Characteristics	Metric Equivalents
Capacity	9.5 gal	36 liters
Thermostat (closed)	161-169°F	72-76°C
Thermostat (open)	161-189°F	72-87°C
Normal operating temperature (engine)	160-230°F	71-110°C
Radiator cap (auxiliary tank) pressure rating	13-18 psi	90-124 kPa

Cooling System (M548A3)	Characteristics	Metric Equivalents
Capacity	58 quarts (14.4 gallons)	55 liters
Refill	(approx) 9.5 gallons	36 liters
Thermostat range (bypass type)	162-167° to 280-185°F	

Transfer Gearcase (M548A1)	Characteristics	Metric Equivalents
Type	four helical gears w/power takeoffs	
Transfer ratio	1:1.286	
Dry weight	118 lb	54 kg

Transmission (M548A1)	Characteristics	Metric Equivalents
Manufacturer	Allison Division GMC	
Model	TX 100-1	
Type	Straight through, torque converter, planetary gear, automatic	
Drive ranges	reverse, neutral, 2-3, 1-3, 1-2, 1	
Dry weight	309 lb	140 kg

Transmission (M548A3)	Characteristics	Metric Equivalents
Manufacturer	Allison Transmission Division, GMC	
Model	X-200-4	
Type	Hydromechanical cross drive	
Rating		
Input horsepower (max)	275	
Input speed	2975 rpm	
Gross vehicle weight	31,000 lb at 40 mph	1407 kg at 64.4 kph

Hydraulic torque converter		
Type	Single stage, thre element, polyphase	
Stall torque ratio	3.32:1	
Lockup clutch	Automatic second through fourth range	
Gearing type	Constant mesh, spur type, planetary	
Ranges	Four forward, one reverse	
Ratios		
First	4.16:1	
Second	2.34:1	
Third	1.46:1	
Fourth	1.04:1	
Reverse	6.62:1	
Steering Type	Infinitely variable hydrostatically controlled differential	
Range	Minimum Steer Ratio	
First	2.31:1	
Second	1.58:1	
Third	1.32:1	
Fourth	1.22:1	
Neutral	Pivot	
Brakes		
Type	Multiple wet plate	
Service apply	Dydraulic with mechanical actuation	
Parking/emergency apply	Mechanical back-up service brakes	
Deceleration Rate	16 ft/sec/sec	5 m/sec/sec
Oil System		
Capacity	12 gallons	45 liters
Sump	Integral	
Filter	Integral, two stage with differential pressure warning switch and automatic bypass	
Weight (dry)	975 lb	443 kg
with container	Approximately 1500 lb	681 kg

Steering Control (M548A1)	Characteristics	Metric Equivalents
Model	DS200	
Suspension	3-point	
Rating		
Input (maximum)	4675 lb-ft	6339 N•m
Input (maximum)	3825 rpm	
Net input (maximum)	215 hp	
Rotation		
Input shaft (in forward range)	clockwise	
Left output shaft (in forward range)	clockwise	
Right output shaft (in forward range)	counterclockwise	
Steering control (internal)	mechanical brakes	
Bevel gear ratio	1.28:1	
Suspension:		
Torsion bars	5 each side	
Shock absorbers, hydraulic, direct action	3 each side	
Road arm bumpers	3 each side	
Idler wheels	1 each side	
Sprocket wheels	1 each side	
Idler assemblies	1 each side	
Road wheels:		
Type	Aluminum disk with solid rubber tires (steel discs optional)	
Quantity	20 (10 duals)	
Size	24 in dia x 2 1/8 in wide	61 cm dia x 5 cm wide
Support assembly, road wheel	5 each side	
Track, flat, single pin, (removable rubber pads)		
Model	T130 5 1/4 in	13 cm
	T130E1 4 3/4 in	12 cm
Tread (centerline to centerline of tracks)	85 in	38 cm
Number of shoes (new)	66 each side	
Width	15 in	38 cm
Tension (between track and 2nd road wheel)	3/8-5/8 in	10-16 mm

Electrical System	Characteristics	Metric Equivalents
Batteries		
Type	M552149-1 (6140-01-210-1964)	
Voltage (M548A1)	24 Vdc (two 12-volt in series)	
Voltage (M548A3)	24 Vdc (four 12-volt in series/parallel)	
Generator (M548A1) 100 amp		
Manufacturer	Leece Neville (2920-00-782-1955)	
Model	2184A	
Generator 200 AMP (M548A3)		
Manufacturer	Leece Neville (2920-01-238-9710)	
Model	A0012266AA	
Manufacturer	C.E. Niehoff and Co. (2920-01-292-2993)	
Model	N1206	
Manufacturer	Prestolite Electric (2920-01-292-2994)	
Model	AMZ-4001	
Starter		
Manufacturer	Delco Remy Division GMC	
Model	16764-11663416 (MS53011-4)	
Optional manufacturer	Prestolite	
Model	11668641 (MS50311-4)	
Optional manufacturer	Leece Neville	
Model	12253404 (MS53011-4)	
Type	4-pole, 24 Vdc	
Brushes	8	
Rotation (viewed from drive end)	clockwise	
Type of engagement	shift lever solenoid plunger	
Internal wiring	series	
Engine low oil pressure switch (transmitter) breaks contact at	9-13 psi	62-90 kPa
Differential high oil temperature switch (transmitter) (M548A1) closes at	305°F + 5°	152°C
Transmission high oil temperature switch (transmitter) closes at	305°F + 5°	152°C

Winch (M548A1)	Characteristics	Metric Equivalents
Weight		
Complete	444 lb	202 kg
Less wire rope	313 lb	142 kg
Winch Transfer Gearcase		
Manufacturer	FMC	
Weight	21 1/2 lb	9.8 kg

Vehicle Compartment Heater Kit (Primary)	Characteristics	Metric Equivalents
Heater (South Wind)		
Manufacturer	Stewart-Warner	
Model	8460C24	
Part number	7748716	
Operating voltage	20.0-28.5 Vdc	
Current consumption above 30°F (1°C)		
Start	16.5 amp	
Run	10.0 amp	
Current consumption below 30°F (1°C)		
Start	20.0 amp	
Run	13.5 amp	
Heat output		
High heat	60,000 Btu	63,300 J
Low heat	30,000 Btu	31,650 J
Fuel pressure requirement	3-15 psi	21-103 kN/sq cm
Overheat switch setting (maximum)	475°F	246°C
Height	24 1/8 in	61 cm
Diameter (nominal)	8 in	20.3 cm
Width (maximum)	13 in	33 cm
Weight	32.75 lb	14.9 kg
Heater (Perfection)		
Manufacturer	Hupp	
Model	MF510A	
Part number	11601809	
Operating voltage	20-28.5 Vdc	

Current consumption above 30°F (1°C)		
Start	15 amp	
Run	9.5 amp	
Current consumption below 30°F (1°C)		
Start	19.5 amp	
Run	17 amp	
Heat output		
High heat	60,000 Btu	63,300 J
Low heat	30,000 Btu	31,650 J
Fuel pressure requirement	3-15 psi	21.0-103.0 kN/sq cm
Overheat switch setting (maximum)	475°F	246°C
Height	24 1/8 in	61 cm
Diameter (nominal)	8 in	20.3 cm
Width (maximum)	13 in	33 cm
Weight	31 lb	14 kg
Fuel pump		
Part number	MS5132-2 (96906)	
Output pressure	3-6 psi	21.0-41.0 kN/sq cm
Control box		
Part number	7748721 (19207)	
Part number (optional control box)	10947220 (19207)	
Fuel		
Usable fuel	Any hydrocarbon fuel at temperature down to cloud point except DFA down to -65°F	-54°C

Engine Coolant Heater Kit	Characteristics	Metric Equivalents
Manufacturer	Stewart-Warner	
Model	939-J24	
Part number	11601698	
Heat output (surrounding air temperature)	70°F	21°C
Coolant		
High heat	15,000 Btu/hr	4.4 kW/hr
Low heat	8,000 Btu/hr	2.3 kW/hr
Exhaust		
High heat	8,000 Btu/hr	2.3 kW/hr

Low heat	4,500 Btu/hr	1.3 kW/hr
Operating temperature range (surrounding)	-65° to +100°F	-54° to +38°C
Electrical requirements		
Operating voltage range	20-28.5 V	
Amperes draw (maximum above)	30°F	-1°C
Start	12.0 amp	
Run	3.5 amp	
Amperes draw (maximum below)	30°F	-1°C
Start	15.0 amp	
Run	3.5 amp	
Performance		
Fuel	grades DF-2, DFA, JP-5, JP-8	
Fuel flow rate		
High flow (normal)	0.021-0.031 lb/min	0.010-0.015 kg/min
Low flow (normal)	0.008-0.014 lb/min	0.004-0.007 kg/min
Fuel pressure (at fuel valve inlet)	3-15 psi	21-103 kN/sq cm
Fuel pump output pressure	3-6 psi	21-41 kN/sq cm
Temperature settings		
Overheat thermostat (opens)	245°F	118°C
Restriction thermostat		
Opens	220°F	104°C
Closes	190°F	88°C
Dimensions and weight		
Height	9 /12 in	34 cm
Length	15 5/16 in	38 cm
Width	6 3/4 in	17 cm
Weight	15 lb	7 kg
Operating capacity	Must be capable of operating against 0.75 in H2O exhaust restriction	19 mm H2O
Coolant pump		
Manufacturer	MP Pumps	
Model	12245	
Part number	10160875	
Electrical requirements		
Operate voltage range	20-28.5 V	

Ampere draw	2.0 amp	
Output	12-13 gpm	45-49 liter/min
Weight (maximum)	10 lb	5 kg

Air Brake Kit (M548A1)	Characteristics	Metric Equivalents
Compressor		
Manufacturer	Bendix-Westinghouse (P/N 11634086)	
Maximum operating speed	2,400 rpm	
Air delivery	100 psi	689 kN/sq cm
Weight	24 lb	11 kg
Nominal rating	7 1/4 cfm at 1,250 rpm	0.2 cm m at 1,250 rpm
Reservoir		
Manufacturer	Midland Steel Bendix-Westinghouse	
Maximum hydrostatic pressure	250 psi	1724 kN/sq cm
Air capacity	1.1 cu in	0.03 cu m
Safety valve		
Manufacturer	Bendix-Westinghouse Midland-Ross	
Type valve	Spring-loaded ball check valve	
Blowoff pressure	150 psi	1034 kN/sq cm
Panel Assembly		
Manufacturer	FMC	
Air pressure gauge	0-120 psi	0-827 kN/sq cm
Air Brake Treadle Valve		
Manufacturer	Bendix-Westinghouse Automotive Air Brake	
1st 3 degrees travel	5 psi	34 kN/sq cm
2nd 17 degrees travel	Graduating range 5-75 psi	34 kN/sq cm
Stop light switch		
Manufacturer	Bendix-Westinghouse	
Type of switch	Electro-pneumatic	
Point closing pressure	5 psi	34 kN/sq cm
Low Pressure Indicator		
Manufacturer	Bendix-Westinghouse	
Type of switch	Spring-loaded rubber diaphragm	
Point closing pressure	54-66 psi	372-455 kN/sq cm
Governor		

Manufacturer	Bendix-Westinghouse	
Cutout pressure	100-105 psi	689-724 kN/sq cm
Cut-in pressure	80-85 psi	552-586 kN/sq cm

Material Handling Kit	Characteristics	Metric Equivalents
Material Handling Kit	P/N 11633807	
Beam:		
Type	6 in x 4.3 lb per foot I-beam	15 cm x 2 kg per m I-beam
Length	158 3/8 in	402 cm
Weight	57 lb	26 kg
Hoist		
Capacity	1,500 lb	681 kg
Net weight	80 lb	36 kg
I-beam (minimum)	5 in x 3 in flange	13 x 8 cm
I-beam (maximum)	12 in x 5 in flange	30 x 13 cm
Chain length needed to lift load 1 foot	27.2 ft	8 m
Chain pull to lift capacity load	58 lb	26 kg
Hand chain drop	7 ft	2 m

Refer to your -10 for equipment data on caliber 0.50 or 7.62 mm machine gun mount kit and M66 ring mount kit. Refer to your RPSTL for equipment data on turn signal kit.

METRIC EQUIVALENTS

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

Metric Equivalents

SYMBOL	UNIT
C	Celsius
cc	cubic centimeter
cm	centimeter
j	joule
kg	kilogram
kg/min	kilogram per minute
km	kilometer
km/h	kilometer per hour
kPa	kilopascal
kw hr	kilowatt hour
l	liter
m	meter
mm	millimeter
N•m	Newton-meters

THEORY OF OPERATION 0003 00

SCOPE

This section describes how major systems and components of the carrier operate. An understanding of how each part functions in a system and how components relate to each other will help solve possible maintenance problems with the carrier.

INTEGRATED SYSTEMS AND COMPONENTS

POWER PLANT

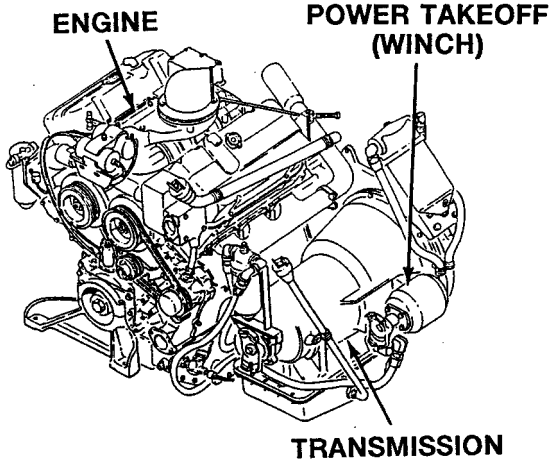
The M548A1 power plant consists of the diesel engine, transfer gearcase, and transmission. The M548A3 power plant consists of the diesel engine and hydromechanical cross drive transmission. The fuel, exhaust, cooling, starter, generator, and engine air systems are support systems are support systems for the power plant.

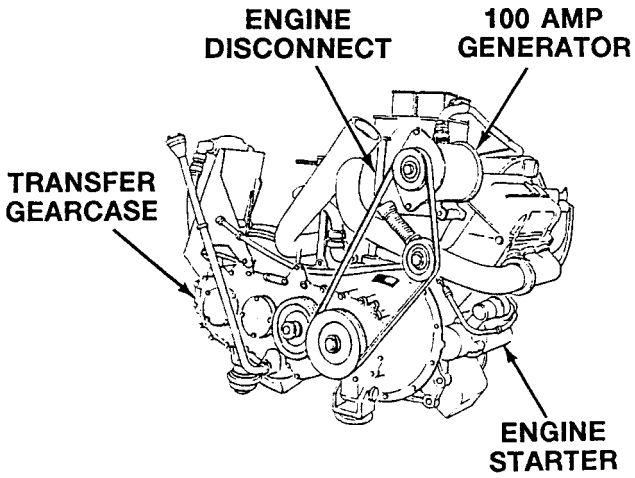
Engine power is supplied by a liquid cooled, 6–cylinder, V-type, compression ignition (diesel) unit. Starting is by a heavy duty 24 V starter. Engine is protected from low oil pressures and high temperatures by transmitters in the oil and cooling systems which activate warning light circuits.

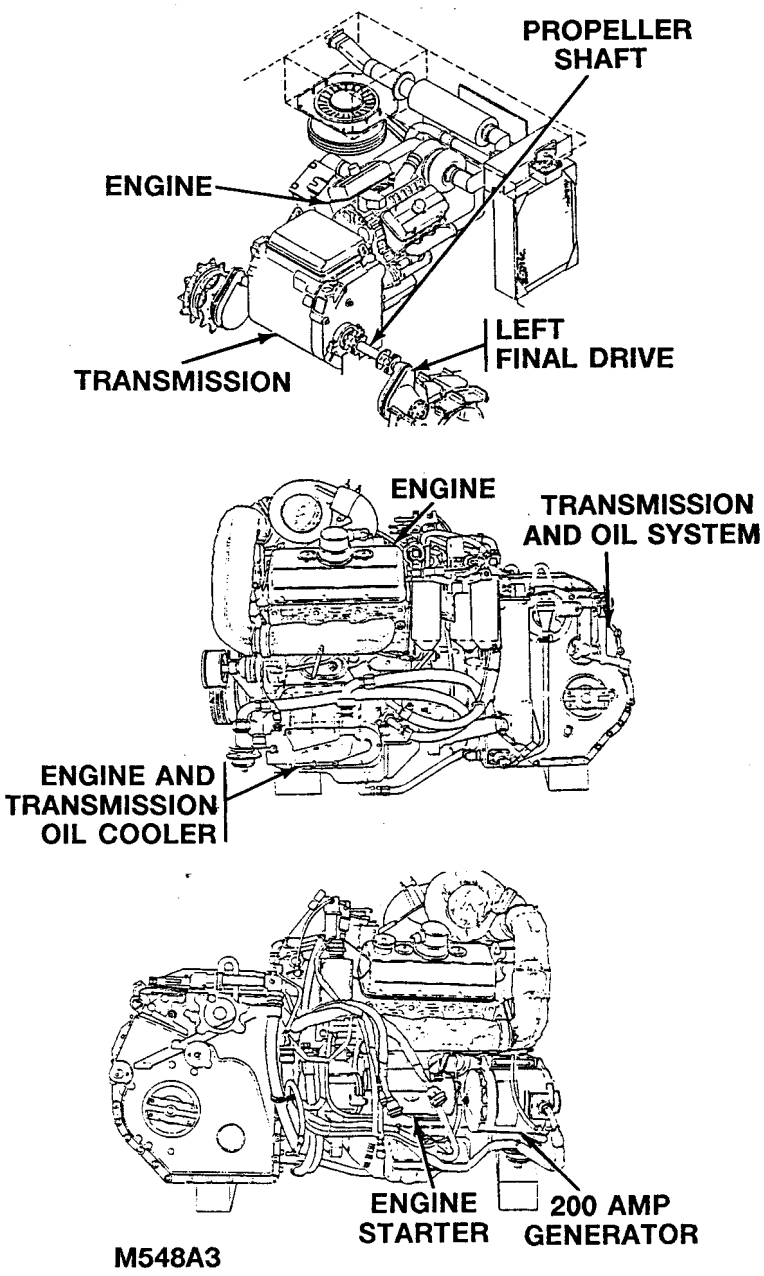
The M548A1 transfer gearcase transfers power from the engine flywheel to the transmission torque converter through four gears at a ratio of 1 to 1.286. An engine disconnect allows the engine to operate independently of the rest of the power plant. A power takeoff within the transfer gearcase drives the cooling fan through a pulley and drive belts. Another power takeoff within the transfer gearcase drives the 100 amp generator through a pulley and drive belts. A third power takeoff within the transfer gearcase drives the winch.

The M548A1 transmission is a three speed, constant mesh, planetary gear train with hydraulic torque converter and lockup clutch. It automatically selects the proper gear based on road and load conditions and range selected. The transmission delivers power from the transfer gearcase to the differential.

The M548A3 diesel engine delivers power directly to a hydromechanical cross drive transmission with hydrostatic steering. This transmission delivers power from the engine to the left and right final drives through the propeller shafts. The final drives power the drive sprockets in the suspension system. This transmission has its own oil system with filters and separately mounted engine and transmission oil cooler. The transmission oil system is separate from the engine oil system. The 200 amp generator and cooling fan are engine driven with drive belts and pulleys.







OIL COOLING SYSTEM COMPONENTS — ENGINE, TRANSMISSION, AND DIFFERENTIAL

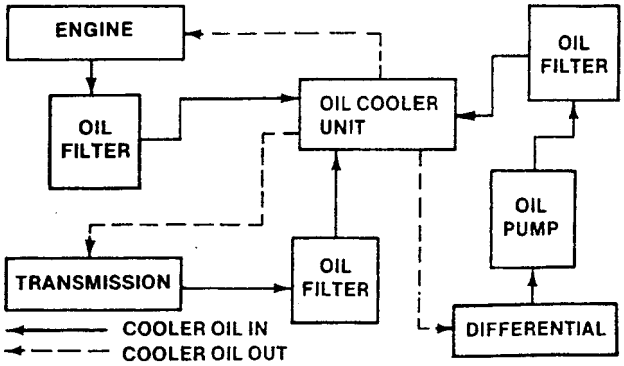
The M548A1 engine, transmission, and differential oil cooling systems keep the oil clean and within proper operating temperature range. The components of the system are the engine, transmission, and differential oil cooler unit is mounted on the engine. By circulating the hot oil through this unit, heat is given off to the surrounding engine coolant. Engine coolant is in turn cooled by the engine cooling system.

Oil cleanliness is maintained by circulating engine oil through the engine oil filter and differential oil through the differential oil filter. Transmission oil is cleaned by the transmission oil filter which is an integral part of the transmission.

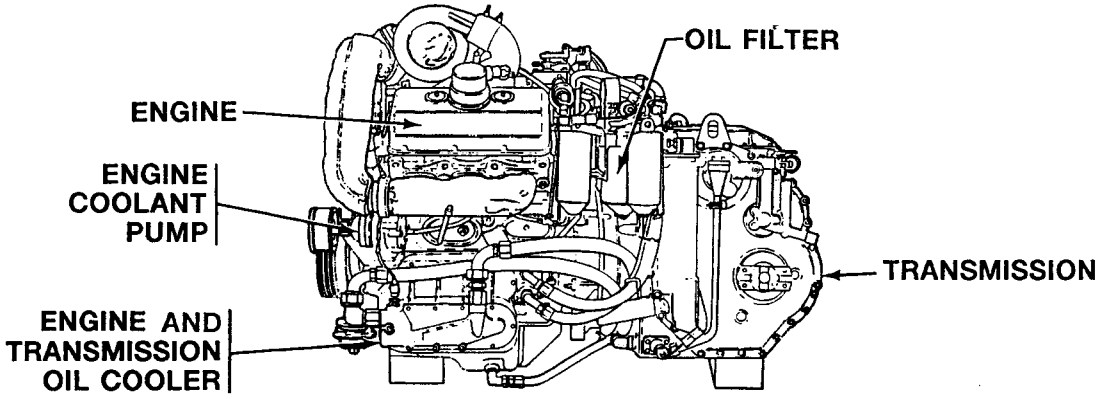
Differential oil pump is mounted on the transfer gearcase. It pumps oil from the bottom of the differential housing to the differential oil filter. Oil flows through the filter and cooler and back to top of differential. a power takeoff within the transfer gearcase drives the differential oil pump.

THEORY OF OPERATION — Continued **0003 00**

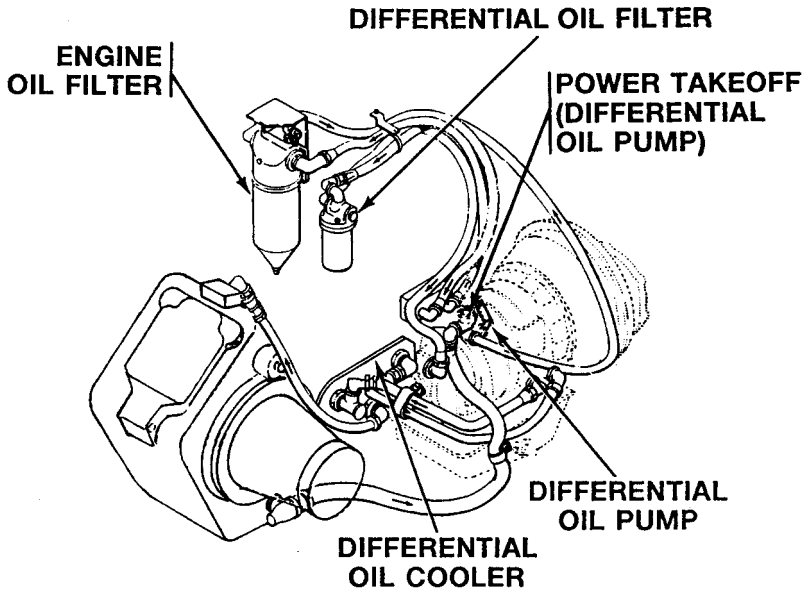
The M548A3 oil system provides lubrication for the engine. Oil is cycled throughout the engine by an engine oil pump. An oil filter cleans the oil, and engine oil cooler reduces oil temperature. The transmission oil system is incorporated in the hydromechanical cross drive transmission.



M548A1



M548A3

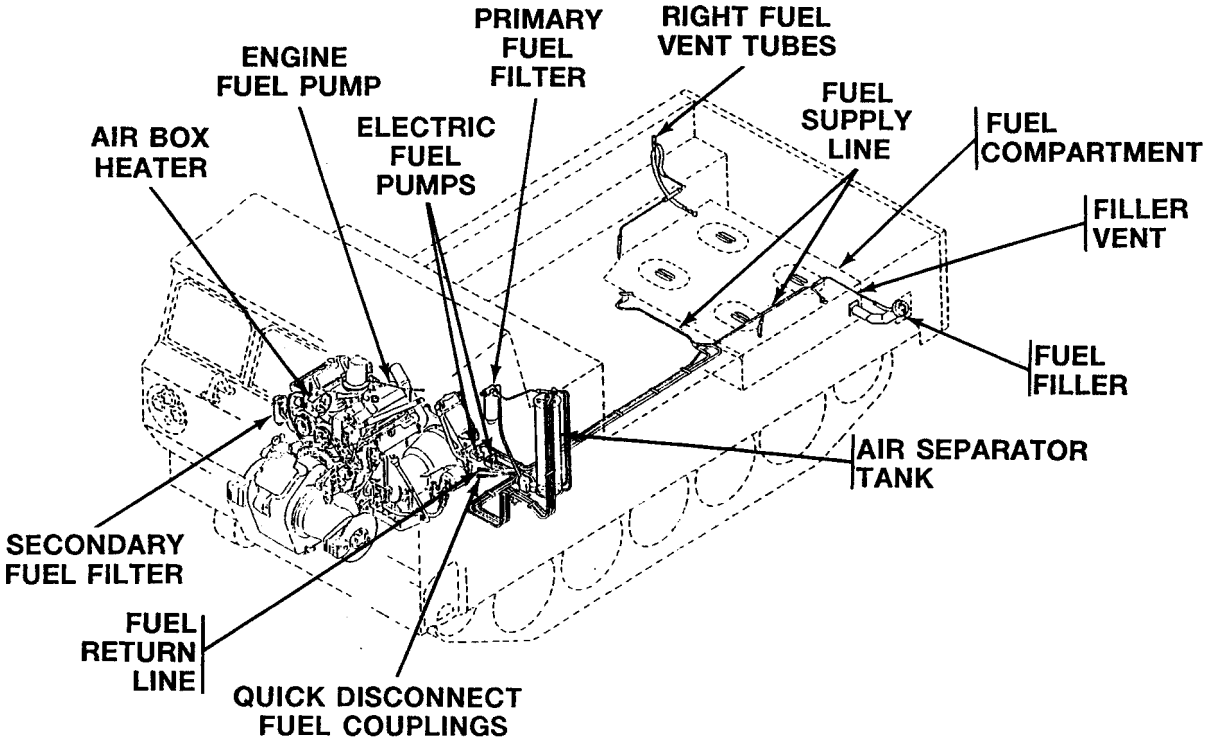


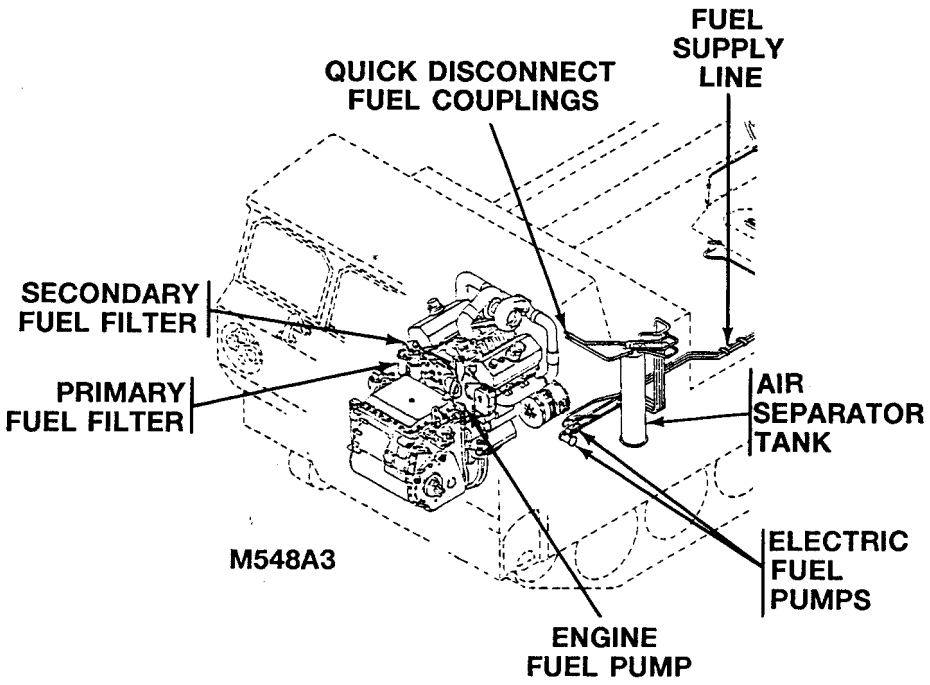
FUEL SYSTEM

The M548A1 fuel compartment is located at the rear of the carrier under the cargo compartment deck. Two electric fuel pumps supply fuel through fuel supply lines from the fuel compartment to an air separator tank. From the air separator tank, the engine fuel pump draws the fuel through the primary fuel filter. The engine fuel pump forces the fuel through the secondary fuel filter to the engine fuel injectors. It then returns surplus fuel through the air separator tanks and fuel return lines to the fuel compartment. Fuel for the air box heater is drawn from the secondary fuel filter. Quick disconnect fuel couplings are used to connect the supply and return lines to the engine. The fuel compartment is filled through a fuel filler at the left rear of the carrier and is drained through a fuel drain under the center tailgate hinge. The entire system is vented by tubes located at the right rear corner of the carrier and the fuel filler tube.

The air box heater preheats air entering the engine cylinders with an electric air pump, fuel pump, and igniter. This improves fuel ignition at low temperatures. Fuel is sprayed into the cylinder block air box and ignited to preheat incoming air.

The M548A3 fuel compartment and components are similar to M548A1. Only the front of carrier and its components are shown.



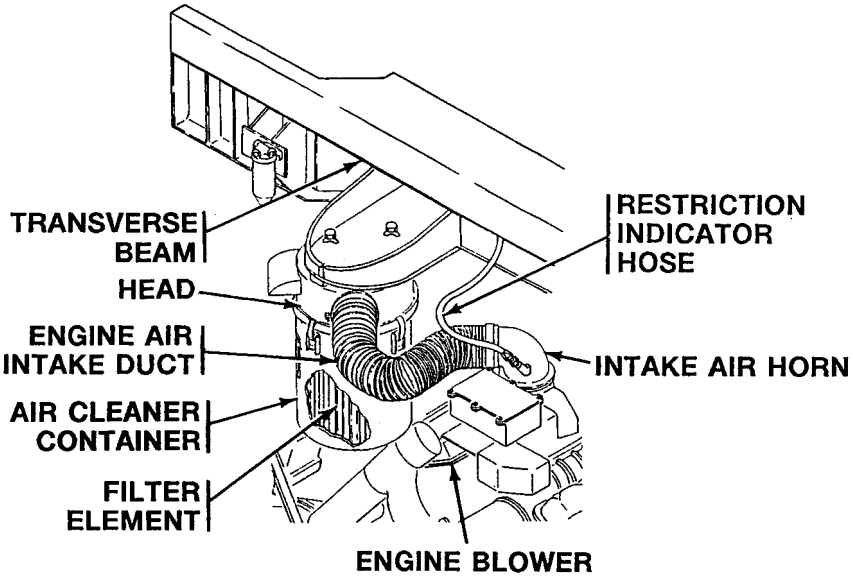


AIR INDUCTION AND EXHAUST SYSTEMS

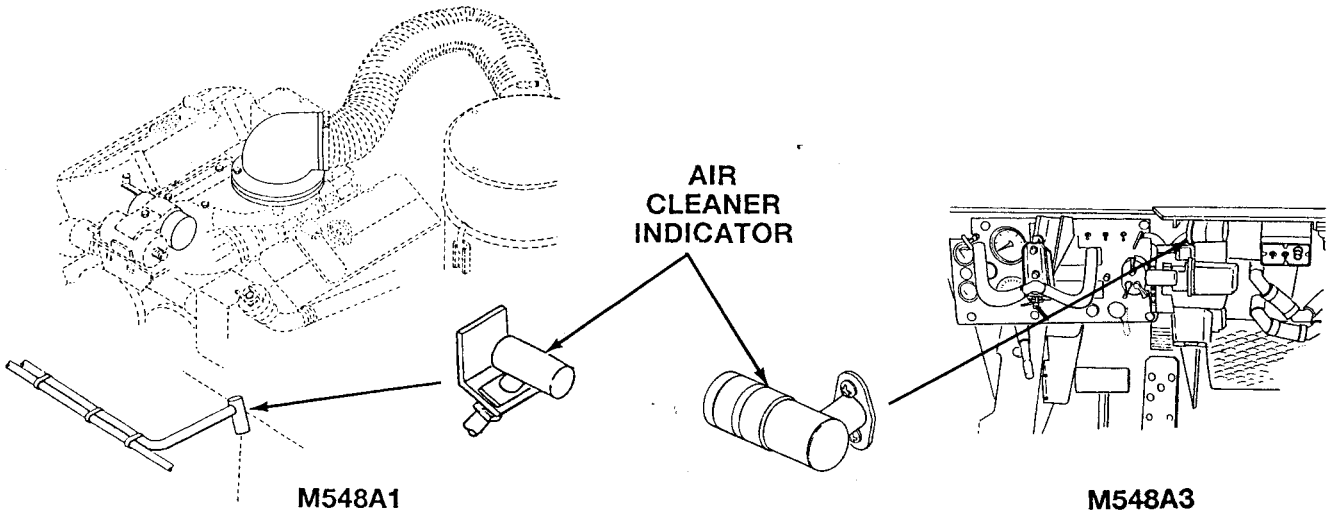
Air for M548A1 engine combustion is drawn and filtered through an air cleaner container mounted on the transverse beam. Air enters the air cleaner through an opening in the head and filters through the air cleaner filter element. It then flows into the engine blower through an engine air intake horn between the engine air intake and air cleaner. The restriction indicator hose connects to the air cleaner indicator in the cab area. When the air cleaner element gets too dirty or dusty, the restriction of air causes the air cleaner indicator to register the change. Air is discharged at the opposite side of the engine blower, creating air pressure in the air box under the engine blower. Pressurized air blows through ports in the engine cylinders. Exhaust gases are removed and fresh air for combustion is supplied.

THEORY OF OPERATION — Continued **0003 00**

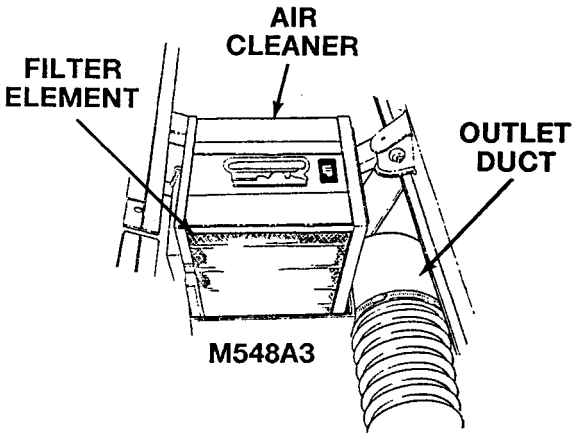
The M548A3 engine air system allows air to enter the engine. The air cleaner cleans air that enters the engine. Air is filtered through a reusable filter element before delivery to the engine. An air filter indicator shows when the element is clogged and needs cleaning or replacing. After being filtered, the air moves through the turbocharger to the engine blower and into the engine cylinders.

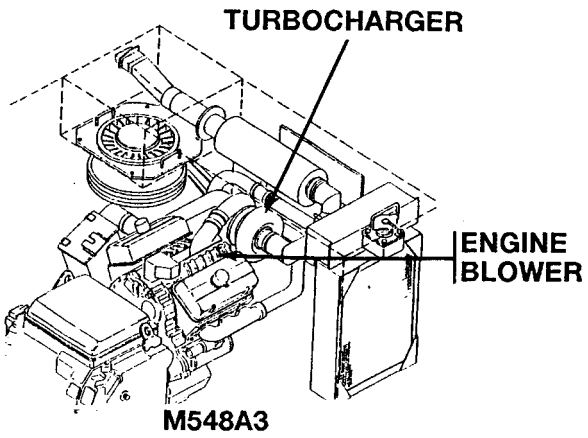


M548A1



M548A1 M548A3



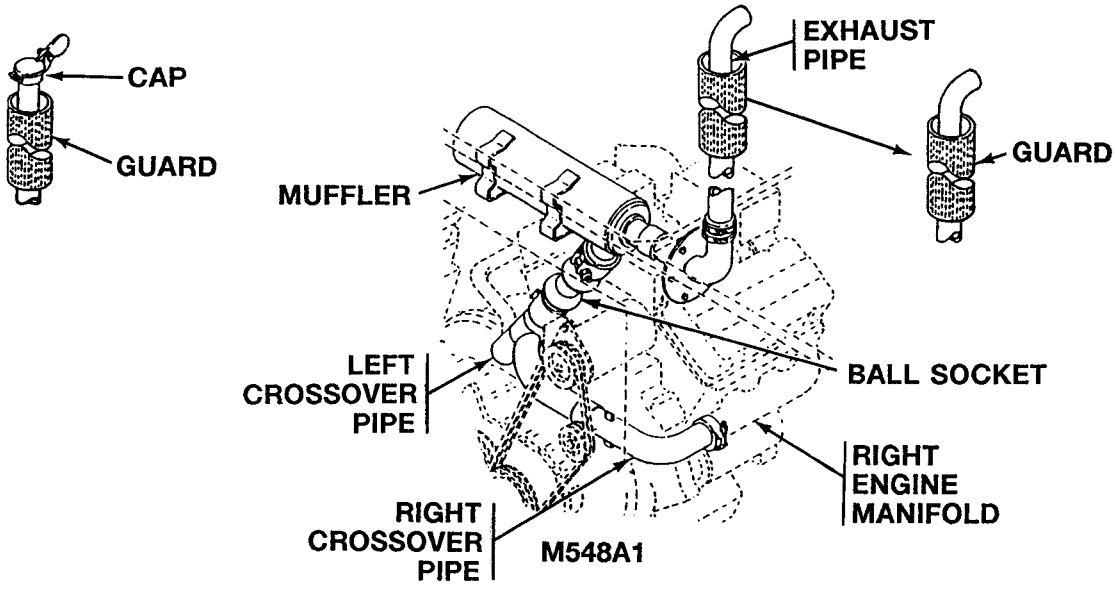


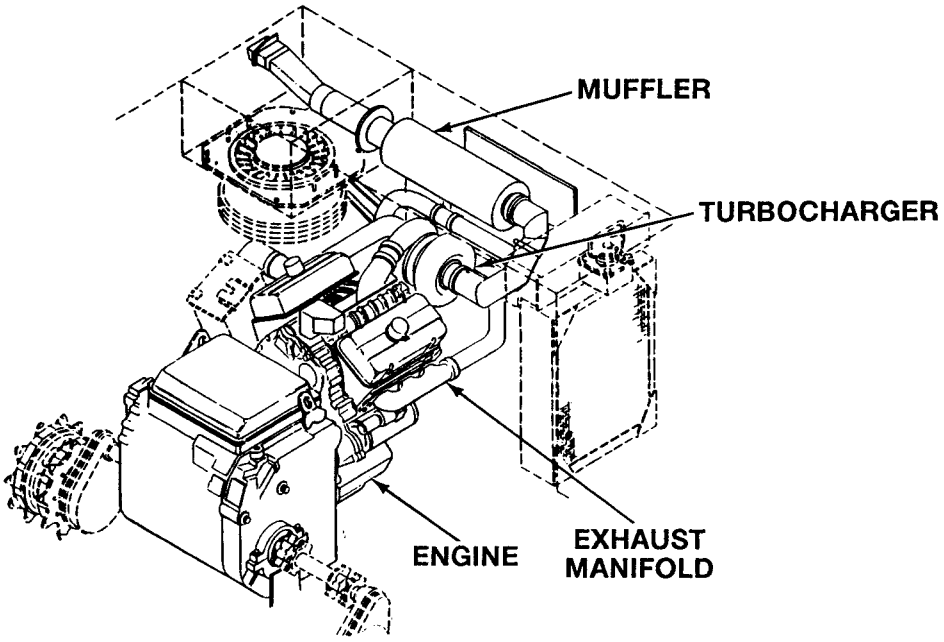
EXHAUST SYSTEM AND COMPONENTS

Burned fuel fumes from M548A1 carriers are exhausted through the right and left crossover pipes, into the muffler, and out the exhaust pipe. The crossover pipes extend from the rear of the right and left exhaust manifolds to the main exhaust pipe. The crossover pipes are joined together by sliding joints with a ball-and-socket type joint on the main exhaust pipe.

The exhaust muffler is bolted in the power plant compartment on the M548A1. An exhaust pipe (exhaust stack assembly) extends above the top of the exhaust well on both carriers. The exhaust pipe has a guard and a cap.

The M548A3 major exhaust system parts are the turbocharger, exhaust manifolds, and muffler. The turbocharger is driven by exhaust gases from the engine. The turbocharger helps the engine develop more power and operate more efficiently. The exhaust manifolds carry the exhaust gases to the turbocharger from the engine. The muffler cuts down engine noise and allows exhaust to escape outside the carrier.





M548A3

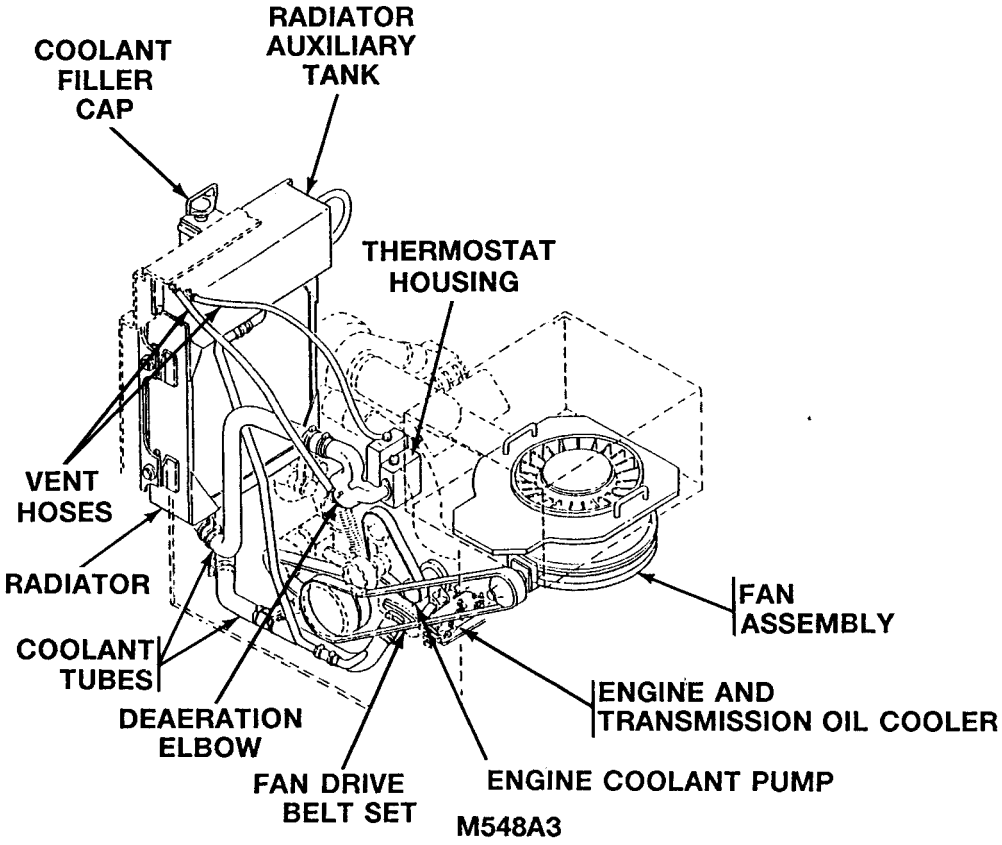
COOLING SYSTEM

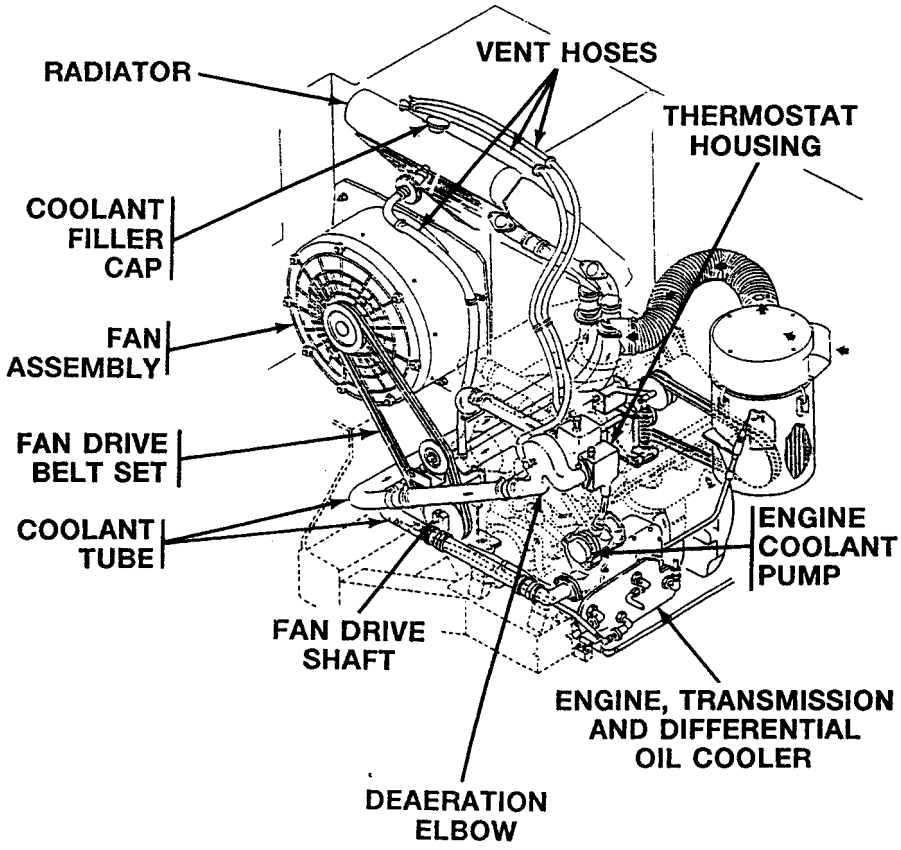
The M548A1 and M548A3 cooling system consists of a radiator, engine coolant pump, thermostat, engine, transmission and differential (M548A1) oil cooler, and connecting hoses and clamps. A fan assembly provides fresh air for the engine air intake and power plant cooling systems. The fan drive belt set connects the power from the fan drive shaft (M548A1) to the fan assembly. The belt set is a matched set. If one or more belts are bad, the whole set needs to be replaced.

The fan and radiator are mounted on the right side of the power plant compartment. The engine coolant pump, thermostat, and oil cooler are integral components of the engine assembly. The coolant filler cap is where the engine coolant is filled. Coolant is drawn by the pump from the bottom of the radiator and circulated through the oil cooler, cylinder block, and cylinder heads to the thermostat housing and back to top of radiator. The thermostat is a full bypass-type with a range of 161° – 169°F (72° – 76°C) for the M548A1 and 181° – 189°F (83° – 87°C) for the M548A3. The deaeration elbow helps to remove air from the coolant system.

THEORY OF OPERATION — Continued **0003 00**

The M548A3 radiator auxiliary tank acts as an overflow tank to keep the cooling system from overpressurizing. It also removes air from the engine coolant. There is a low coolant level transmitter to signal the operator if more coolant is needed.





M548A1

ELECTRICAL SYSTEM

A 24 volt direct current system supplies electrical current for the carrier. The M548A1 has two 12 volt wet-cell batteries, with an amperage capability of 100 amps per hour and connected in series. The M548A3 has four 12 volt wet-cell batteries with an amperage capability of 200 amps per hour and connected in series parallel.

The batteries supply the carrier with electricity. The vehicle compartment heater, cargo compartment heater kit, coolant heater kit, and engine starter are connected directly to the carrier batteries. See your –10 for location of all heaters. Electrical power flows from the batteries through the bus bar, cables, and wiring assemblies to the electrical equipment. The hull is a ground for the electrical system.

Battery drain is replenished and system voltage is maintained by an alternating current generator, which has 100 amps per hour capability in the M548A1 carrier and 200 amps per hour capability in the M548A3 carrier. The battery recharge current flow is regulated by the generator-regulator on top of the engine.

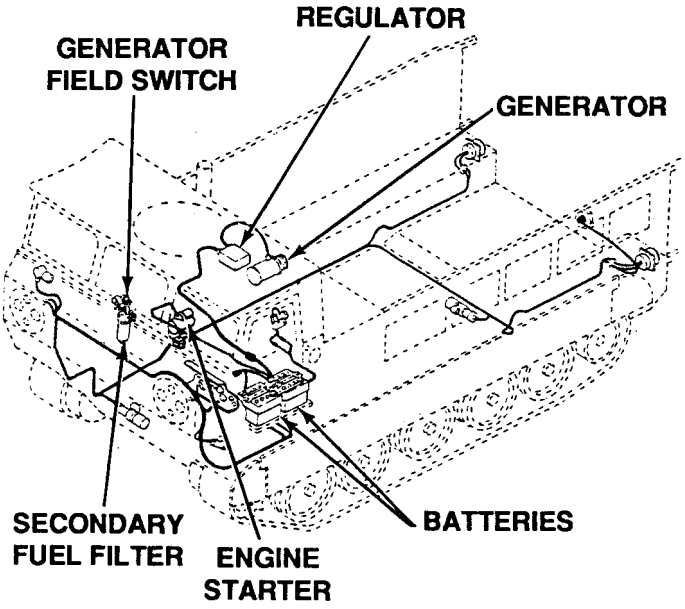
There are several electrical subsystems within the hull. Each subsystem contains at least one wiring assembly. A major electrical subsystem with assemblies is exterior lights, which include blackout lights, stoplight, and headlights, and interior lights, which include dome lights and panel lights.

GENERATOR

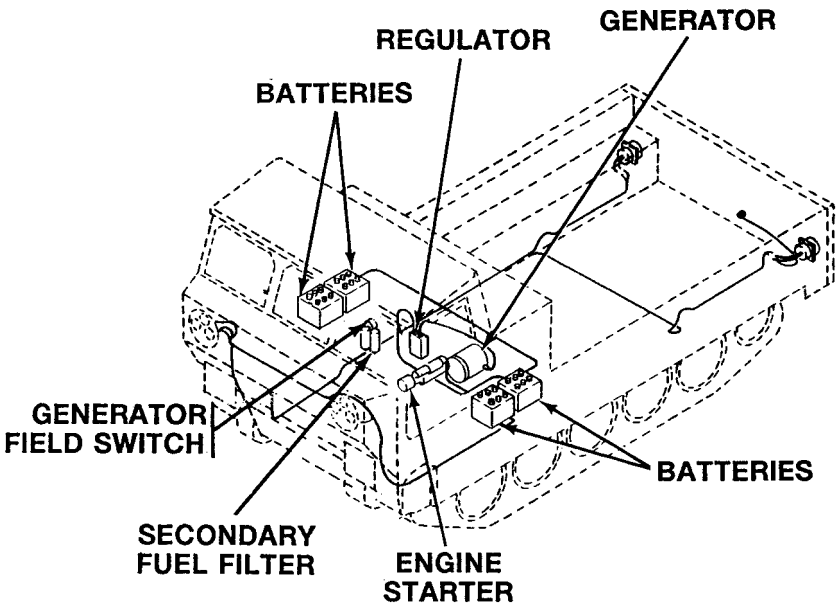
The generator is part of the carrier electrical system. It is driven by the transfer gearcase on the M548A1. On the M548A3, the generator is driven by a pulley on the crankshaft of the engine. The generator charges the batteries in the carrier when the engine is running. A regulator mounted on top of the engine keeps the voltage at correct levels.

GENERATOR FIELD SWITCH

The generator switch is mounted on the secondary fuel filter. When starting the engine, the field switch is open and the generator is not energized to allow the engine to start with less drag. When the secondary fuel filter is pressurized with fuel, the field switch closes and signals the regulator to energize the generator and start charging the batteries.



M548A1



M548A3

DIFFERENTIAL COMPONENTS (M548A1)

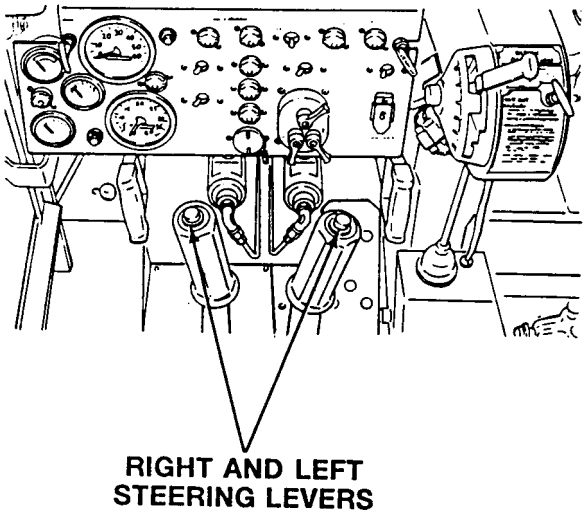
The differential consists of three major assemblies. These are the right angle gearbox, steering unit with brake shoes, and two output shafts.

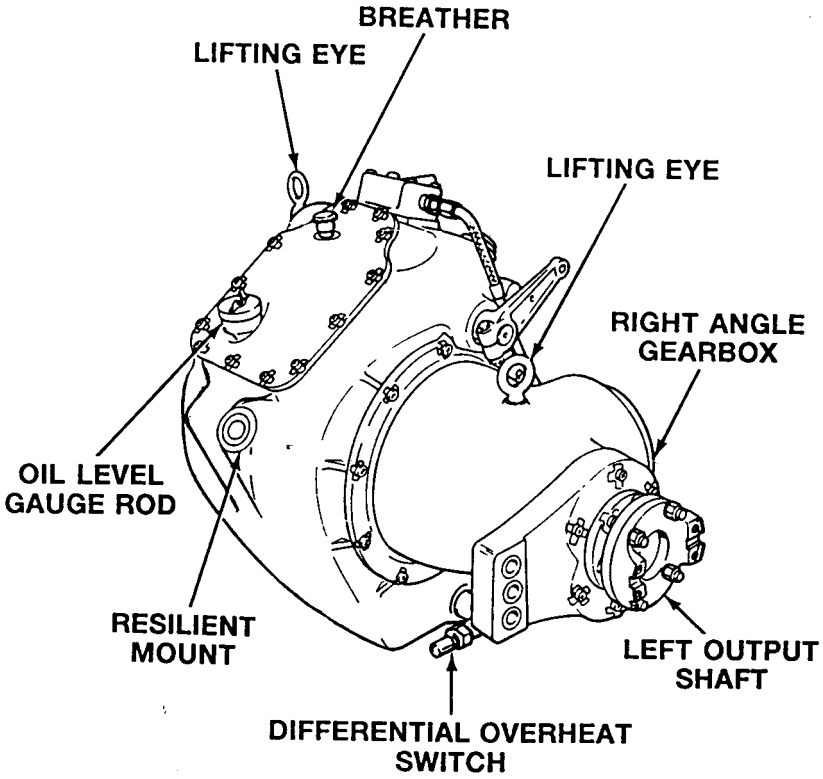
Power flows from the transmission to the right angle gearbox to the steering unit. When driving straight forward, the steering unit delivers equal power to both output shafts. Pressure on either right or left steering lever slows or stops the right or left brake drum inside the center steering unit and reduces the speed of the right or left output shaft. By slowing down one side, the differential action within the steering until increases the speed of the opposite output shaft and causes the carrier to turn in the direction of the applied brake. Pulling with equal pressure, exerted at the same time on both right and left steering levers, applies both brakes and slows or stops the carrier.

Differential is protected from high oil temperatures by a differential overheat switch connected to a warning light in the driver's compartment. The warning light comes on when the oil temperature is too high.

The breather needs to be kept clean and free of oil and dirt. If the breather is plugged, the oil inside the differential will build up pressure and low out a gasket, preformed packing, hose, oil level gauge rod.

The resilient mount reduces shocks to the differential housing. Two lifting eyes are provided for removal and installation of the differential from the carrier.





SUSPENSION SYSTEM AND COMPONENTS

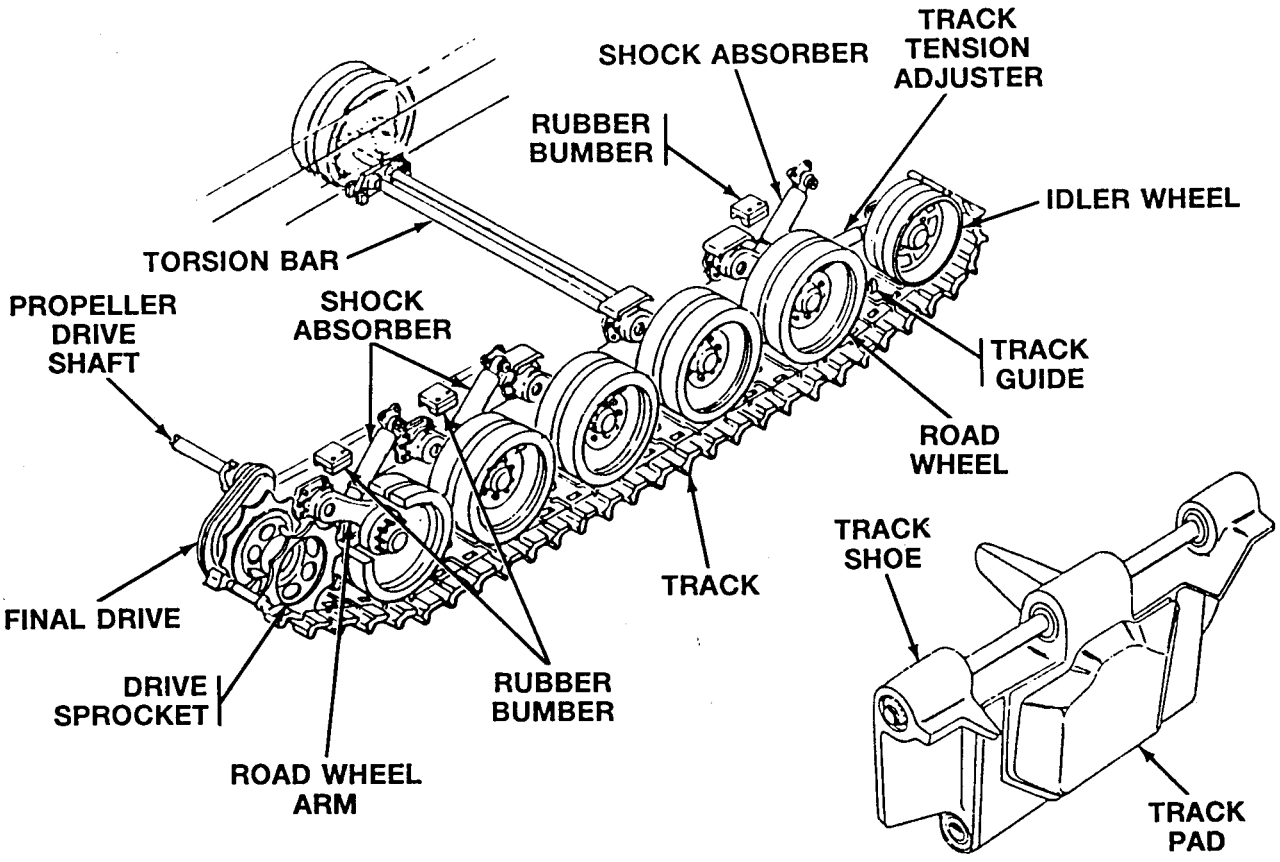
The suspension system supports the carrier and delivers engine power to the road. It allows the carrier to maneuver and be stable. Suspension system components are the drive sprockets, tracks, idler wheels, track tension adjuster, road wheels, road wheel arms, torsion bars, and shock absorbers.

The drive sprockets drive the tracks. The M548A1 drive sprockets are powered by left and right final drives from the differential. The M548A3 drive sprockets are powered by left and right final drives from the transmission. The tracks consist of two flexible chains of track shoes. The tracks ride on the drive sprockets and are guided by the road wheels and idler wheels. The idler wheels can be adjusted to maintain correct track tension.

The tracks consist of track pads bolted to track shoes that are linked together by pins to form a continuous track. The tracks, each driven by a track drive sprocket secured to the final drive, provide the surface on which the road wheels roll. Track guides keep the track centered under the road wheels. A track tension adjuster at each track idler wheel is used to adjust track tension. The track tension adjuster cylinders are filled with grease. Rubber bumpers cushion the road wheel arms when the suspension bottoms out in rough terrain.

There are five pairs of road wheels per side. Track center guides fit between each pair of road wheels. Road wheels mount on arms that are individually splined to the torsion bars. The torsion bars extend the width of the hull, are secured by torsion bar anchors bolted to the hull, and act as springs to keep the road wheels on the ground and from hitting the bottom of the carrier.

Shock absorbers stabilize the carrier when operating over rough terrain. Shock absorbers are at each first two road wheels and each rear road wheel.



PIVOT STEERING AND BRAKES (M548A1)

Pivot steering brakes are disk brakes and work like the differential brakes, but quicker. Only use disk brakes in the water or when stopped. Speeds above 10 mph (16 km/h) damage disk brakes.

AUXILIARY AUTOMOTIVE SYSTEM

The auxiliary automotive system includes driver controls, vehicle compartment heater, bilge pump, and fire suppression system.

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

The fuel shutoff control is used to stop the supply of fuel to the injectors. To start the engine, the driver must push in the fuel shutoff control. The throttle linkages are used to control the engine speed. The gear selector allows the driver to choose the proper gear for the carrier. The steering and braking levers control separate right and left steering brakes in the control differential on M548A1. By pulling the levers, you can slow or stop either track for steering, or both tracks at once for stopping. A lock button at the top of each lever lets you set and lock the brakes for parking. On M548A3, the steering wheel controls steering and pivoting turns. On the M548A3, when the brake pedal and parking brake are applied at the same time they will hold the carrier.

The vehicle compartment heater system provides heat inside the carrier. Major parts are the combination combustion chamber/heat exchanger, blowers, a fuel pump, and an electrical control. The heater operates using diesel fuel pumped from the fuel tank. Fuel is delivered to the combustion chamber from the fuel pump. Outside air is drawn into the combustion chamber by one of the blowers. A blower draws air from the crew compartment into the heater exchanger. The air is warmed by heat created by the combustion process and then returned to the crew compartment.

The electrically driven bilge pump removes water at a rate of 46 gpm (gallons per minute) and other liquids from the hull. Water enters the pump through a screened inlet. The pumps force water out of the carrier through an outlet tube. The bilge pump is controlled by a switch on the driver's panel.

The fire extinguisher system consists of Carbon Dioxide (CO2) cylinders; one fixed and one portable. CO2 can put out fires quickly and effectively. The fixed cylinder is located near the driver's compartment and is operated manually by pulling cables located on top of carrier next to driver's door. The fixed cylinder releases CO2 in the power plant compartment only. The portable fire extinguisher is located in the crew compartment and is manually discharged.

KIT INTEGRATED SYSTEMS

SPECIAL PURPOSE KITS

When special purpose kits are installed, their systems and components become integrated with the carrier's systems and components. The carriers may be equipped with any of the following special purpose kits.

VEHICLE COMPARTMENT (PRIMARY) KIT (M548A1)

The vehicle compartment (primary) heater kit provides heat for personnel and windshield defrosting in cold weather. The carrier can be equipped with any one of three vehicle compartment heater kits. Each kit includes a heater, fuel system, exhaust system, electrical system, and an air circulating system. Kit I takes in air through a duct in the power plant compartment and has a tubular heat defroster manifold which crosses the width of the cab below the windshields and a duct that supplies heated air to the crew compartment. Kit II takes in cab air through a duct behind the driver's seat and has two defroster ducts, a separate duct to heat the driver's footwell, and a crew compartment heat distribution duct or manifold. Kit III is identical to Kit II except that there is no regulator valve, and two fans with individual on-off switches circulate cab air to the defroster ducts instead of air from the heater.

One of two basic heater models are furnished with the vehicle compartment heater kits. Both heaters are electrically controlled multi-fuel heaters capable of burning any hydrocarbon fuel. Air is drawn in at the top for heating and combustion. Heated air is forced out the bottom. Combustion gases are discharged outside the carrier. The heaters contain an electric glow plug, flame detector switch, and an overheat switch.

All three heater kits have the same fuel, exhaust, and electrical systems. Heater fuel system consists of an electric fuel pump and related fuel lines and fittings. Exhaust system consists of an exhaust pipe which carries exhaust gases outside the carrier. Electrical system consists of a wiring harness and a heater control box, with the Kit III wiring harness also connecting the left and right defrost fans with two on-off control switches.

Air circulating system consists of a two stage blower, hoses and ducts, and an outlet manifold in the cab. In Kits II and III, air is drawn from behind the driver's seat into the heater. In Kit I, air is drawn from the cargo area. Kits I and II have adjustable outlet ducts in the manifold. Kit III has two defrost fans in the system.

VEHICLE COMPARTMENT (SECONDARY) HEATER KIT (M548A1)

The vehicle compartment (secondary) heater kit is used with the vehicle compartment (primary) heater during extremely cold weather, –25° to –65°F (–31° to –54°C). The kit contains a cab cover, fabric machine gun hatch cover, lower cab insulation and thermal door windows, and seat covers for driver and personnel seats.

ENGINE COOLANT HEATER KIT

Engine coolant heater kit provides heat for starting the carrier during extreme cold weather operation between –25° and –65°F (–31° and –54°C). Heater warms and circulates the engine coolant through the engine and a battery box heat exchanger which warms the engine block, lubricating oil, and battery electrolyte when the engine is not in operation.

Engine coolant heater produces heat by burning a mixture of fuel and air in a heat exchanger. Air is supplied for combustion by a blower through a connecting tube to the burner air inlet in the heat exchanger. Electrical components are connected to the wiring harness through a bracket mounted terminal strip located on the side of the heater.

Heater has fuel, exhaust, and electrical systems. Fuel system consists of a fuel pump, fuel manifold, fuel control valve, and related fuel lines and fittings. Exhaust system consists of an exhaust pipe with a removal moisture trap, which carries exhaust gases out of the heater. Electrical system consists of a coolant heater control box and a wiring harness which supplies power to heater control box, coolant heater fuel pump, and coolant pump.

Engine coolant heater kit has a coolant circulating system, which consists of an electrically operated coolant pump. The pump circulates coolant through the heater and engine battery box heat exchanger plate and back through the coolant heater.

AIR BRAKE KIT (M548A1)

The air brake kit provides regulated, pressurized air to operate the trailer equipment air brakes. The kit's main components are a compressor, reservoir, governor, safety valve, and stop light and air low pressure switches. Other components are a treadle valve pedal, dial-type air pressure indicator and warning light, disconnect and air couplings, and dummy fittings.

Compressor is engine driven and air cooled. It charges a 1,100 cubic inch (0.016 cu m) storage reservoir at the rate of 7 1/4 cfm (0.2 cu M) at an engine speed of 1250 rpm. Air is drawn through a strainer into compressor cylinders, compressed by pistons, and then forced through discharge valves and a hose and a tube into a reservoir.

Reservoir stores pressurized air for brake operation and is a place for air, heated during compression, to cool. Cooling causes oil and water to condense to form an oil-water emulsion.

The governor receives air from the reservoir at one of it reservoir ports. Air acts on the piston and the inlet and discharge valve. When air pressure reaches a cutout setting of the governor, piston and inlet and discharge valve move up. The discharge stem of the inlet passage opens and allows reservoir air to flow by the open inlet valve through a drilled passage in the piston and out to the unloading mechanism in the compressor. Air flows around the piston and acts on an additional area of the piston, assuring full opening of the inlet passage. As air pressure drops to governor cut-in setting, force exerted by air setting spring moves the piston down, which causes the inlet stem of the inlet and discharge valve to set. The discharge passage opens and allows air at the compressor unloader pistons to escape back through the piston and discharge stem and out the discharge port.

A spring-loaded ball check safety valve protects the air brake system against air pressure above 150 psi (1034 kN/sq cm). The valve lifts and lets air discharge if pressure in reservoir rises above 150 psi (1034 kN/sq cm).

The air brake kit has a stop light and air low pressure switches. The stop light switch is an electro-pneumatic switch, which operates in conjunction with the brake valve and stop light and closes the stop light electrical circuit when the brakes are applied. The air low pressure switch is a safety device, which lights a warning light on the air brake instrument panel when reservoir air pressure falls below 60 psi (418 kN/sq cm) and closes electrical contacts on the rubber diaphragm with spring pressure.

Other components are a treadle valve pedal, dial-type air pressure indicator and warning light, disconnect and air couplings, and dummy fittings. Compressed air flow to the towed load is controlled by foot pressure on the treadle valve pedal, which bears down on a plunger in the treadle valve. Treadle valve pressure also actuates the stop light switch. A dial-type air pressure indicator and warning light, which show condition of the air brake system, are on the air brake instrument panel. Disconnect couplings are located on the rear cab bulkhead above the left power plant compartment grille and connect to service and emergency air brake hoses that run along left side of hull to rear of carrier. Two air couplings on the hose ends permit connections to towed equipment brake couplings, are closed by dummy fittings when not in use, and are stowed on the cargo door.

TURN SIGNAL KIT

Turn signal kit provides directional turn signals and hazard warning lights on the carrier to comply with regulations for highway operation. Turn signal lights are added on front of carrier. Right stop light-taillight is replaced with a dual purpose stop light-taillight. A blackout stop light-taillight is added on right rear of carrier. Reflectors are added on rear of carrier. Trailer light wiring harness is replaced to provide for adaptation of turn signals on any towed load. A control and flasher are added in cab. A wiring harness an leads connect the control, flasher, and lights to carrier lighting system.

CARGO AREA (PRIMARY) HEATER KIT

Cargo area (primary) heater kit provides heat for personnel seated in the cargo area. Heater kit contains one of two model heaters: Model 8460C or MF510A. Both heaters are electrically controlled, multi-fuel burning units. Air is drawn at the top for heating and combustion. Heated air is forced out the bottom. Combustion gases are discharged outside the carrier. Heater contains an electric glow plug, detector switch, and an overheat switch. heater has fuel, exhaust, and electrical systems. Fuel system consists of an electric pump and related fuel lines and fittings. Exhaust system has an exhaust pipe, which is enclosed in a two-piece heat guard, with related clamps and brackets. Electrical system consists of a wiring harness and a heater control box.

CARGO AREA (SECONDARY) HEATER KIT

Cargo area (secondary) heater kit is used with the cargo area (primary) heater kit during very cold weather –25° to –65°F (–31° to –54°C). Kit consists of an insulated cargo compartment cover, heater exhaust closure cone, an insulated escape hatch cover, foam insulation for cargo door, plywood floor plate covers, and two cloth covers for the personnel seats.

CALIBER .50 MACHINE GUN MOUNT KIT

Caliber .50 machine gun mount kit consists of ring mount M49A1, four supports, pintle, and cradle. Each front support carries a tray for stowage of an ammo box and straps which secure the ammo boxes. ring mount M49A1 consists of a ring (track), carriage link, backrest, cradle, and ammo box tray. Carriage link and backrest rotate 360° on the ring and can be secured in any position by a hand brake. Cradle is installed in the carriage, mounts the machine gun, and permits 360° of traverse, 80° of elevation, and 20° of depression. Machine gun is fed by a tray supported ammo box mounted on the cradle's left side. A canvas deflector mounted under the carriage deflects ejected cartridges away from the operator.

M66 RING MOUNT KIT

M66 ring mount kit consists of ring mount M66, four supports, deflector support, cartridge deflector, four straps, and attaching hardware. Two front lifting eyes are stowed on a crossbeam in the cargo compartment. Two front supports are bolted to the lifting eye brackets forward of the windshield. Two rear supports are bolted to brackets on the cab transverse beam. Each front support carries a tray for stowage of an ammo box and straps which secure the ammo boxes.

M66 ring mount consists of a ring mount and a .50 caliber machine gun mount. M66 ring mount can also be used with 7.62 mm machine gun. The ring mount consists of a series of rings rotating on disks, a backrest, ring brake, and a pintle traverse lock. The cartridge deflector and deflector support are attached to the ring mount. The .50 caliber machine gun mount consists of a pintle, cradle equilibrator spring, ammo box tray, and mounting and locking pins.

7.62 MM MACHINE GUN MOUNT KIT

The 7.62 mm machine gun mount kit is used to mount a 7.62 mm machine gun M60 over the carrier cab. Kit consists of a pintle, platform, and cradle and holder. Kit does not contain a cartridge case deflector or tripod stowage bracket. A pintle connects other components of a gun mount to the ring mount assembly. A platform supports the 7.62 mm machine gun and retains the gun with a platform latch. The cradle and holder support and retain a box of 7.62 mm ammo. A screw on the pintle permits adjustment of maximum depression.

MATERIAL HANDLING KIT

Material handling kit is used to load and unload cargo. It provides seating for a four man crew and stowage for up to six rifles on the cargo floor. Beam supports are installed on the cargo/over bows and are adjustable. Beam can be set and locked in several positions. Hand operated hoist can be moved and secured in any position on the beam. Bulkhead protector prevents damage to the power plant compartment bulkhead during loading and unloading of cargo.

REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT 0004 00

COMMON TOOLS AND EQUIPMENT

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

SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Special tools and support equipment are needed for unit maintenance. They are listed in listed in Repair Parts and Special Tools List (RPSTL) TM 9-2350-247-24P. Common tools and supplements and special tools and fixtures are listed in WP 0541 00.

REPAIR PARTS

The Maintenance Allocation Chart lists those parts you are authorized to replace at the unit maintenance level. Repair parts for the M548A1 and M548A3 can be ordered from and are listed and illustrated in the Repair Parts and Special Tools List (RPSTL) TM 9-2350-247-24P.

SPECIAL PURPOSE KITS

For parts, tools, and equipment in the caliber .50 machine gun mount and M66 ring mount kits, see your -10.

CHAPTER 2

UNIT TROUBLESHOOTING PROCEDURES

WORK PACKAGE INDEX

CHAPTER 2

UNIT TROUBLESHOOTING PROCEDURES

WORK PACKAGE INDEX (Continued)

CHAPTER 2

UNIT TROUBLESHOOTING PROCEDURES

WORK PACKAGE INDEX (Continued)

CHAPTER 2

UNIT TROUBLESHOOTING PROCEDURES

WORK PACKAGE INDEX (Continued)

INTRODUCTION TO HOW TO USE TROUBLESHOOTING 0005 00

PURPOSE

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

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

DEFINITIONS AND DESCRIPTIONS OF TROUBLESHOOTING PROCEDURES

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

1. FAULT:	The part that is not operating correctly and is causing the problem.
2. SYMPTOM:	The problem reported to unit maintenance.
3. VERIFY NO FAULTS FOUND:	After you have completed the corrective action, you must verify that no faults exist. If the fault condition still exists, then the fault is not fixed or there is another fault. If this happens, start at the beginning of the troubleshooting procedure until you find and correct all faults. Always operate the system and/or carrier to make sure that you have corrected the reported problem. If troubleshooting does not identify a faulty part, the carrier is defective beyond the level of unit maintenance.
4. LIGHT BULB CHECK:	In troubleshooting tasks checking indicator lights, light bulb is good if multimeter indicates any continuity.

TROUBLESHOOTING BASICS

Troubleshooting Procedure

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

Legend

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

Locating the Correct Troubleshooting Procedure

(1) Carrier arrives at shop.
(2) Read DA form 2404.
(3) Verify that the problem on DA form 2404 exists.
(4) Look up the carrier symptom in Troubleshooting Task Index, (WP 0006 00), in this chapter and go to that task.

Doing the Troubleshooting Procedure

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

NOTE

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

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

TROUBLESHOOTING SAMPLE

The following description takes you through a typical troubleshooting procedure.

Finding the Right Troubleshooting Procedure

A carrier arrives at the shop. The DA form 2404 shows that the engine cranks but will not start. Engine cranks but will not start is part of the carrier Engine System. Therefore, you look up engine cranks but will not start listed under Engine System in Troubleshooting Task Index, (WP 0006 00), in this chapter.

Check title to make sure you are troubleshooting the correct system for the problem. Next, read the INITIAL SETUP carefully. Make sure you have all the items listed in the INITIAL SETUP. Some access steps in Equipment Conditions may not need to be performed depending on the fault location. The INITIAL SETUP also includes tools and references. In instances where STE/ICE-R troubleshooting may be more advantageous and time saving for the user, cross references to (WP 0107 00), STE/ICE-R troubleshooting, are given under references. (WP 0107 00) contains references to standard troubleshooting procedures. It's up to you to decide which are necessary for your particular problem.

Now you're ready to begin troubleshooting. Look at the first block. Do step 1. Does bilge pump fail to come on? If the answer is NO. Follow the NO arrow to the reference indicated. If the answer is YES. Follow the Yes arrow to the next box. Do steps 1 through 3. Let's say the multimeter reads 17 volts. The answer to the question, "Does multimeter read more than 17 volts," is NO. Follow the NO arrow to the reference indicated. Lets say the multimeter reads more than 17 volts. The answer to the question, "Does multimeter read more than 17 volts," is YES. Follow the YES arrow to the next box.

Follow the YES box on the following page. Do steps 1 and 3. In this sample, let's say the multimeter reads more than 1/2 volt. The answer to step 3 is NO. Follow the NO arrow to the the reference indicated.

The NO arrow takes you to the next box. This box gives you the step to correct the fault. Do step 1. It tells you to go to another task in the manual. Go to the page shown and perform the task. Return to this box when you have completed the task.

Step 2 in this box is "Verify no faults found." You must check to make sure you have correctly fixed the fault.

After no faults found has been verified, return carrier to operation. This is the end of the troubleshooting sample.

MALFUNCTION/SYMPTOM INDEX WP 0006 00

ENGINE SYSTEM

CHARGING SYSTEM

ELECTRICAL SYSTEM

TURN SIGNAL

STEERING SYSTEM

BILGE PUMPS SYSTEM

VEHICLE COMPARTMENT HEATER

WINTERIZATION SYSTEM

SPEEDOMETER/TACHOMETER

WINCH

AIR COMPRESSOR

NBC SYSTEM

STE/ICE-R TROUBLESHOOTING

ENGINE OVERHEATS (M548A1) 0007 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
Radiator Test Kit (WP 0541 00, Item 54)

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)
Power plant upper rear access door opened (see your -10)
Hull bottom access cover removed (WP 0383 00)

T

1. Check engine for over heating.
2. Does engine boil over?

NO → **TN**

1. Verify proper operation of coolant TEMP indicator before continuing. See task: Coolant TEMP indicator malfunctions (WP 0053 00).
2. Verify no faults found.

YES ↓

Y

1. Observe coolant TEMP indicator (see your -10).
2. Does coolant TEMP indicator indicate overheating?

NO → **YN**

1. Verify proper operation of coolant TEMP indicator before continuing. See task: Coolant TEMP indicator malfunctions WP 0053 00.
2. Verify no faults found.

YES ↓

2Y

1. Inspect power plant rear access covers, center seat cover, and bottom access cover seals.
2. Are all parts and seals in good condition?

NO → **2YN**

1. Repair, replace, and/or adjust faulty parts and/or seals, as required.
2. Verify no faults found.

YES ↓

3Y

1. Inspect power plant coolant hoses, radiator, and fittings for leaks.
2. Is power plant free of coolant leaks?

NO → **3YN**

1. Repair cooling system leaks (WP 0212 00 through WP 0225 00).
2. Verify no faults found.

YES ↓

4Y

1. Inspect engine coolant pump drive belt tension (see your -10).
2. Is drive belt serviceable and adjusted properly?

NO →

4YN

1. Replace and/or adjust coolant pump belt (WP 0223 00).
2. Verify no faults found.

YES ↓

5Y

1. Inspect ventilating fan drive belts tension (see your -10).
2. Are drive belts serviceable and adjusted properly?

NO →

5YN

1. Replace and/or adjust ventilating fan drive belt (WP 0226 00).
2. Verify no faults found.

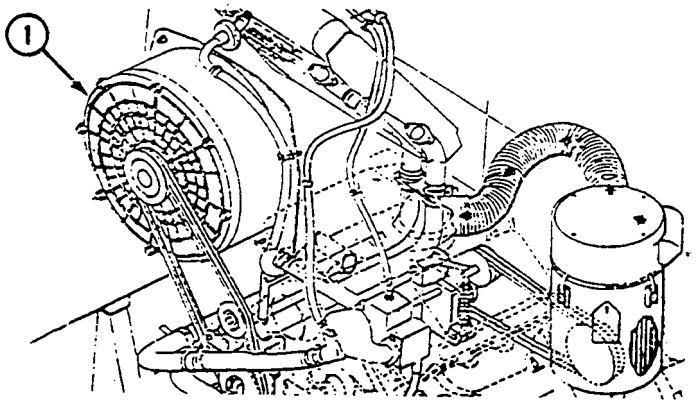
YES ↓

6Y

WARNING

Start up of equipment or moving parts can injure you. Stay clear of moving parts when power plant is running.

1. Start engine (see your -10).
2. Observe ventilating fan (1) operation.
3. Does ventilating fan rotate?



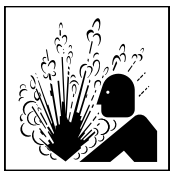
NO →

GO TO **BY** (PAGE 0007 00-5)

YES ↓

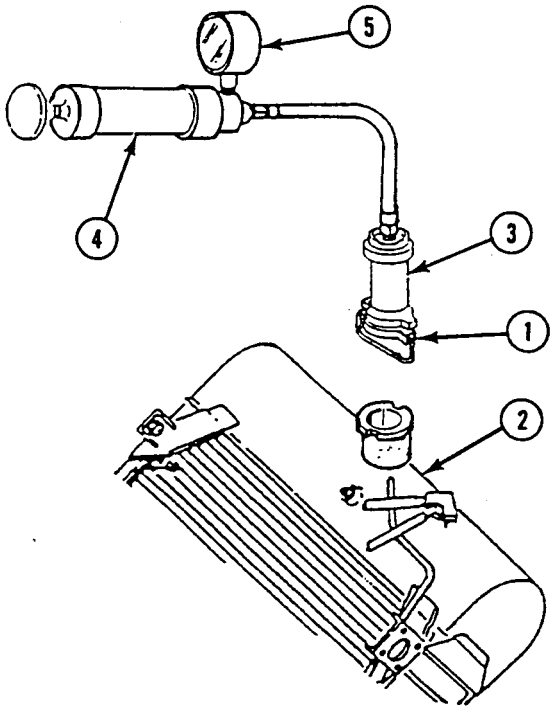
7Y

WARNING



Hot coolant can burn you. Let power plant cool before you remove radiator filler cap.

1. Stop engine (see your -10).
2. Remove filler cap (1) from radiator (2).
3. Install cap adapter (3) on pressure tester (4).
4. Install filler cap (1) on cap adapter (3).
5. Pump pressure tester (4) until gauge (5) indicates filler cap (1) is relieving pressure.
6. Does radiator filler cap relieve pressure between 13 psi (90 kPa) and 15 psi (103 kPa)?



NO →

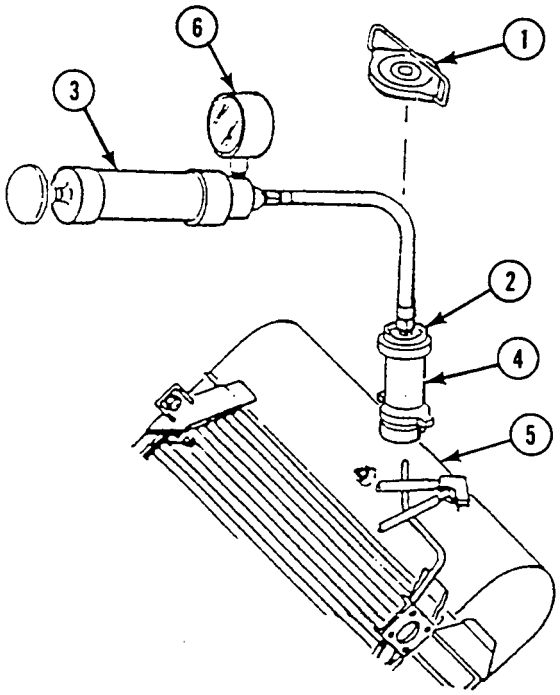
7YN

1. Replace radiator filler cap (WP 0215 00).
2. Verify no faults found.

YES ↓

8Y

1. Remove filler cap (1) and cap adapter (2) from pressure tester (3).
2. Install radiator adapter (4) on radiator (5).
3. Install pressure tester (3) on radiator adapter (4).
4. Pump pressure tester (3) until gauge (6) reads 15 psi (103 kPa). Allow system to remain pressurized for 5 minutes.
5. Does pressure drop less than 1 psi (7 kPa)?



NO →

8YN

1. Locate cooling system leaks.
2. Remove pressure tester and radiator adapter.
3. Repair cooling system leaks (WP 0212 00 through WP 0225 00).
4. Verify no faults found.

YES ↓

9Y

1. Remove pressure tester and radiator adapter.
2. Install filler cap on radiator.
3. Has thermostat been replaced?

NO →

9YN

1. Replace thermostat (WP 0218 00).
2. Verify no faults found.

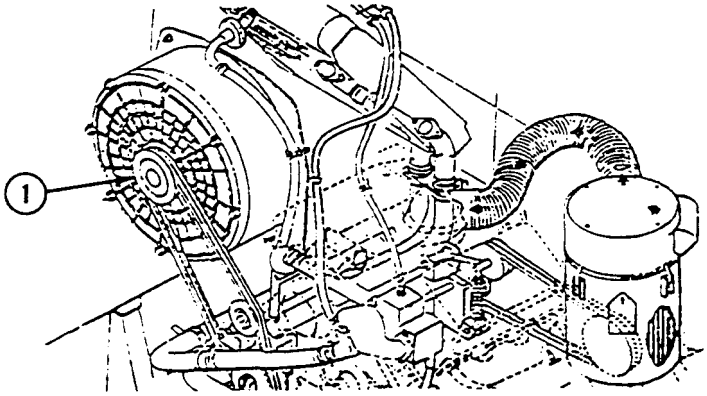
YES ↓

10Y

1. Replace coolant pump (WP 0221 00).
2. Verify no faults found.

BY

1. Stop engine (see your -10).
2. Remove ventilating fan drive belt (WP 0226 00).
3. Manually rotate ventilating fan drive shaft pulley (1).
4. Does fan spin freely?



NO

BYN

1. Faulty fan.
2. Notify your supervisor.

YES

B2Y

1. Faulty transfer gearcase. Beyond unit maintenance repair.
2. Notify your supervisor.

ENGINE OVERHEATS (M548A3) 0008 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
Radiator Test Kit (WP 0541 00, Item 54)

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)
Power plant rear access panel removed (see your -10)
Left grille removed (see your -10)
Hull bottom access cover removed (WP 0383 00)

T

1. Check engine for over heating.
2. Does engine boil over?

NO → **TN**

1. Verify proper operation of coolant TEMP indicator before continuing. See task: Coolant TEMP indicator malfunctions (WP 0053 00).
2. Verify no faults found.

YES ↓

Y

1. Observe coolant TEMP indicator (see your -10).
2. Does coolant TEMP indicator indicate overheating?

NO → **YN**

1. Verify proper operation of coolant TEMP indicator before continuing. See task: Coolant TEMP indicator malfunctions (WP 0053 00).
2. Verify no faults found.

YES ↓

2Y

1. Inspect power plant rear access covers, center seat cover, and bottom access cover seals.
2. Are all parts and seals in good condition?

NO → **2YN**

1. Repair, replace, and/or adjust faulty parts and/or seals, as required.
2. Verify no faults found.

YES ↓

3Y

1. Inspect power plant coolant hoses, radiator, and fittings for leaks.
2. Is power plant free of coolant leaks?

NO → **3YN**

1. Repair cooling system leaks (WP 0212 00 through WP 0225 00).
2. Verify no faults found.

YES ↓

4Y

1. Inspect engine coolant pump drive belt tension (see your -10).
2. Is drive belt serviceable and adjusted properly?

NO → **4YN**

1. Replace and/or adjust coolant pump belt (WP 0222 00).
2. Verify no faults found.

YES ↓

5Y

1. Inspect ventilating fan drive belts tension (see your -10).
2. Are drive belts serviceable and adjusted properly?

NO → **5YN**

1. Replace and/or adjust ventilating fan drive belt (WP 0227 00).
2. Verify no faults found.

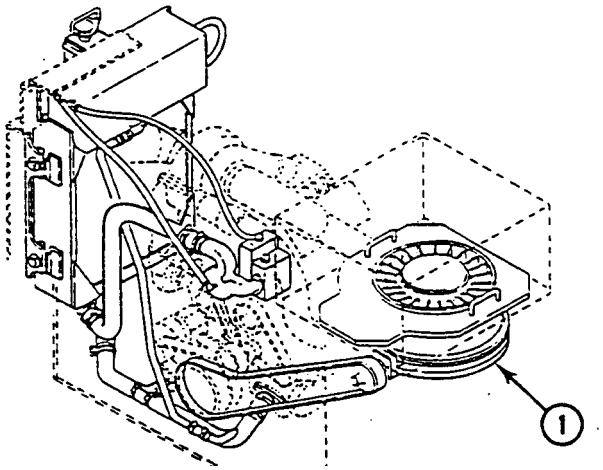
YES ↓

6Y

WARNING

Start up of equipment or moving parts can injure you. Stay clear of moving parts when power plant is running.

1. Start engine (see your -10).
2. Observe ventilating fan (1) operation.
3. Does ventilating fan rotate?

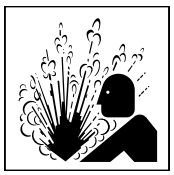


NO → GO TO **BY** (PAGE 0008 00-5)

YES ↓

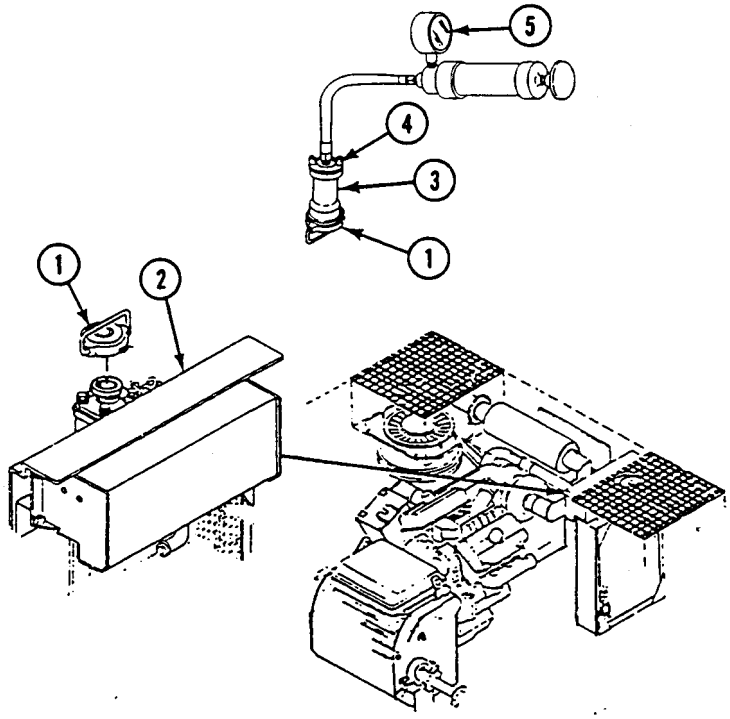
7Y

WARNING



Hot coolant can burn you. Let power plant cool before you remove auxiliary tank filler cap.

1. Stop engine (see your -10).
2. Remove filler cap (1) from auxiliary tank (2).
3. Install cap adapter (3) on pressure tester (4).
4. Install filler cap (1) on cap adapter (3).
5. Pump pressure tester (4) until gauge (5) indicates filler cap (1) is relieving pressure.
6. Does auxiliary tank filler cap relieve pressure between 13 psi (90 kPa) and 15 psi (103 kPa)?



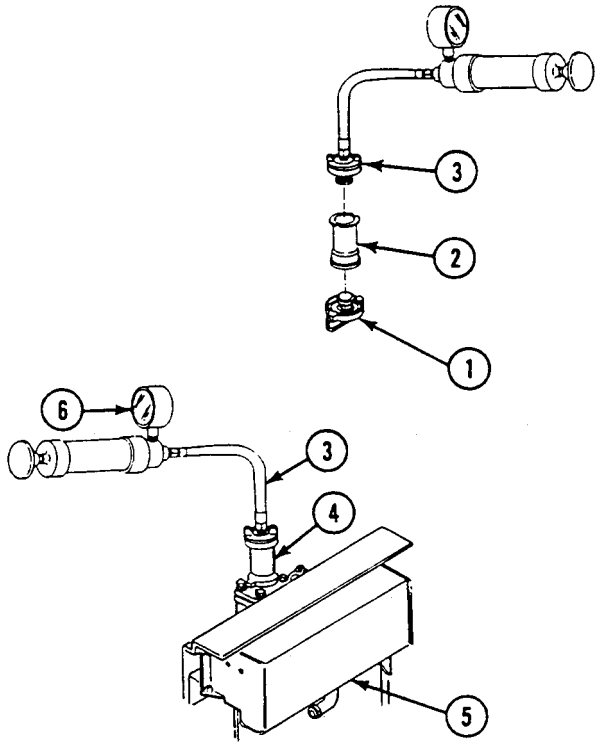
NO → **7YN**

1. Replace auxiliary tank filler cap (WP 0216 00).
2. Verify no faults found.

YES

8Y

1. Remove filler cap (1) and cap adapter (2) from pressure tester (3).
2. Install radiator adapter (4) on auxiliary tank (5).
3. Install pressure tester (3) on radiator adapter (4).
4. Pump pressure tester (3) until gauge (6) reads 15 psi (103 kPa). Allow system to remain pressurized for 5 minutes.
5. Does pressure drop less than 1 psi (7 kPa)?



NO

8YN

1. Locate cooling system leaks.
2. Remove pressure tester and radiator adapter.
3. Repair cooling system leaks (WP 0212 00 through WP 0225 00).
4. Verify no faults found.

YES

9Y

1. Remove pressure tester and radiator adapter.
2. Install filler cap on auxiliary tank.
3. Has thermostat been replaced?

NO

9YN

1. Replace thermostat.
2. Notify your supervisor.

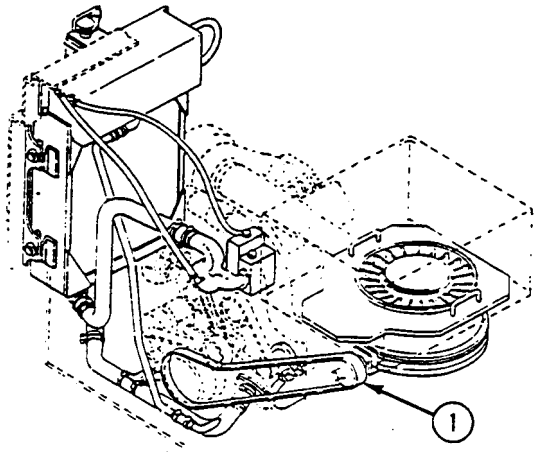
YES

10Y

1. Replace coolant pump (WP 0222 00).
2. Verify no faults found.

BY

1. Stop engine (see your -10).
2. Remove ventilating fan drive belt (WP 0227 00).
3. Manually rotate ventilating fan drive shaft pulley (1).
4. Does fan spin freely?



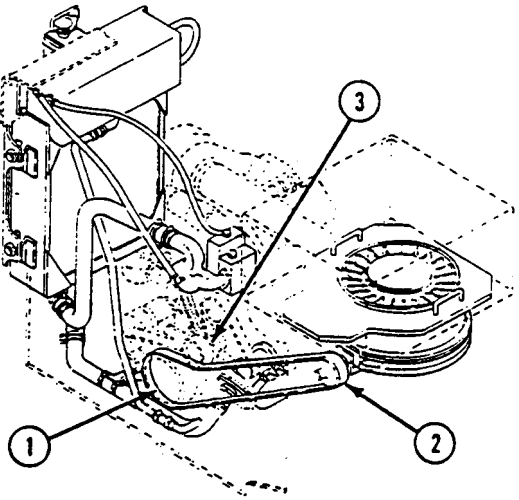
NO → **BYN**

1. Faulty fan.
2. Notify your supervisor.

YES ↓

2BY

1. Inspect drive pulley (1), drive pulley (2), and idler pulley (3).
2. Are pulleys secure and operating properly?



NO → **2BYN**

1. Replace crankshaft pulley (WP 0238 00), and/or fan pulley (WP 0236 00), and/or idler pulley (WP 0229 00).
2. Verify no faults found.

YES ↓

3BY

1. Faulty fan drive gearbox.
2. Notify your supervisor.

ENGINE WILL NOT REACH OPERATING TEMPERATURE 0009 00

INITIAL SETUP:

Maintenance Level
Unit

Personnel Required
Unit Mechanic

References
See your -10

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

NOTE

M548A1 and M548A3 troubleshooting procedures are the same.

T

1. Install air intake grille cover (see your -10).
2. Start and run engine for 3 to 5 minutes at 800 RPM (see your -10). On M548A1, run engine with right and left steering levers locked and transmission in 2-3 range.
3. Stop engine (see your -10).
4. Does engine reach operating temperature?

NO →

TN

1. Go to coolant temperature gauge malfunctions (WP 0053 00).
2.

YES ↓

Y

1. Replace engine thermostat (WP 0218 00 or notify your supervisor).
2. Verify no faults found.

ENGINE DOES NOT CRANK (M548A1) 0010 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
STE/ICE-R Test Set (WP 0541 00, Item 6)
Multimeter (WP 0541 00, Item 29)
Socket Wrench Set (WP 0541 00, Item 64)

Personnel Required

Unit Mechanic
Helper (H)

References

See your -10
(WP 0112 00)

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

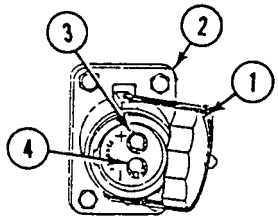
Center seat raised (see your -10)

T

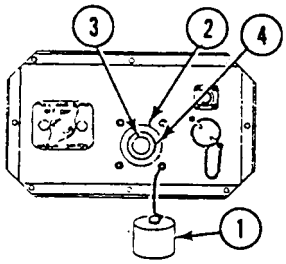
NOTE

There is an early and late model of auxiliary power receptacle. Both early and late models are shown.

1. Turn MASTER SWITCH ON.
2. Remove cover (1) from auxiliary power receptacle (2).
3. Measure voltage between positive (+) terminal (3) and negative (-) terminal (4).
4. Does multimeter read more than 17 volts?



EARLY MODEL



LATE MODEL

NO

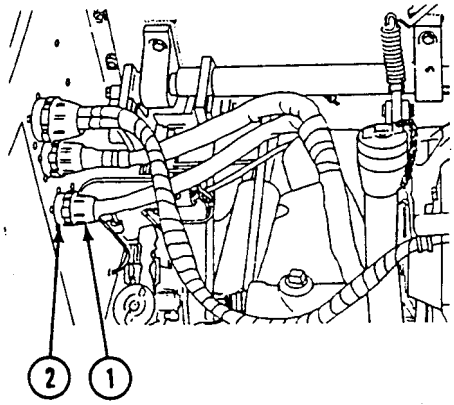
TN

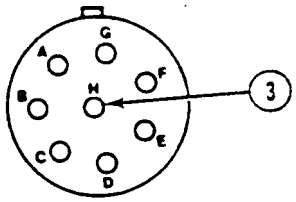
1. Clean, inspect and repair carrier batteries (WP 0290 00).
2. Verify no faults found.

YES

Y

1. Turn MASTER SWITCH OFF.
2. Remove engine harness plug (1) from front main harness jack (2) at carrier bulkhead.
3. Turn MASTER SWITCH ON.
4. (H) Press start switch and hold for test.
5. Measure voltage between front main harness jack (2), socket H (3), and ground.
6. Does multimeter read less than 17 volts?





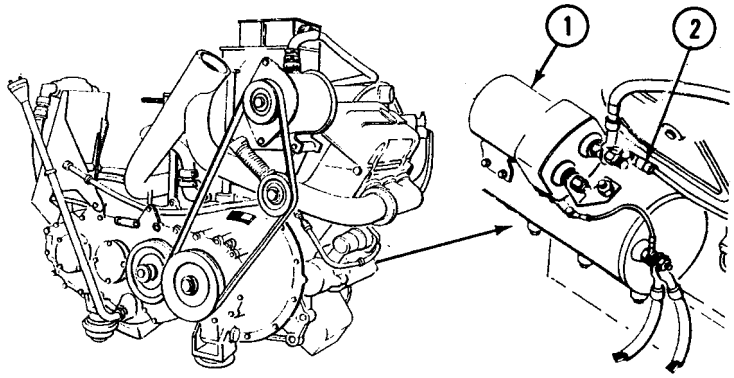
NO → GO TO **BY** (PAGE 0010 00-3)

YES

DY

BY

1. Turn MASTER SWITCH OFF.
2. Install engine harness plug in front main harness bulkhead jack.
3. Turn MASTER SWITCH ON.
4. (H) Press start switch and hold for test.
5. Measure voltage between starter solenoid (1) circuit 74A terminal (2) end of small wire and ground.
6. Does multimeter read more than 17 volts?



NO →

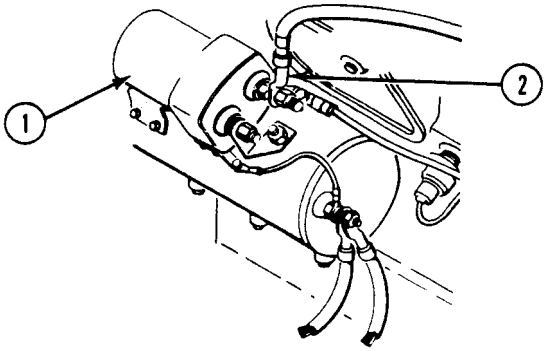
BYN

1. Repair engine harness circuit 74A (WP 0294 00).
2. Verify no faults found.

YES ↓

2BY

1. Measure voltage between starter solenoid (1) cable 6 terminal (2) and ground.
2. Does multimeter read less than 17 volts?

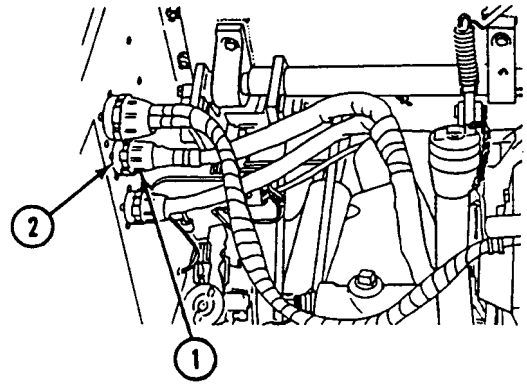


NO → GO TO **CY** (PAGE 0010 00-5)

YES ↓

3BY

1. Turn MASTER SWITCH OFF.
2. Remove engine harness circuit 6 plug (1) from front main harness circuit 6 jack (2) at carrier bulkhead.
3. Inspect plug and jack for corrosion or damage.
4. Are parts in good condition?



NO

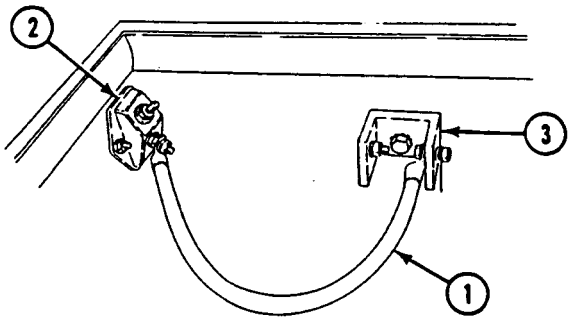
3BYN

1. Repair engine wiring harness or front main wiring harness circuit 6 (WP 0294 00).
2. Verify no faults found.

YES

4BY

1. Raise driver's seat (see your -10).
2. Inspect cable (1) between master switch (2) and bus bar (3).
3. Are cable and cable ends free from corrosion and damage?



UNDER DRIVER'S SEAT

NO

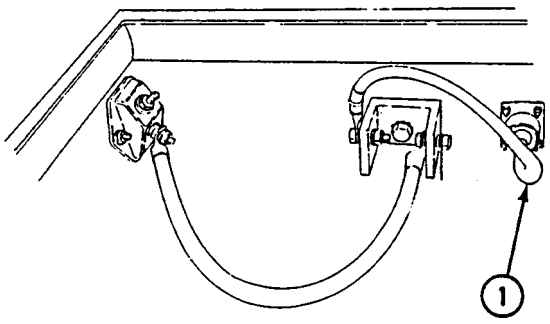
4BYN

1. Clean cable.
2. Repair cable (WP 0294 00).
3. Verify no faults found.

YES

5BY

1. Inspect engine harness circuit 6 (1) leads.
2. Are leads and terminal free of corrosion and damage?



UNDER DRIVER'S SEAT

NO → **5BYN**

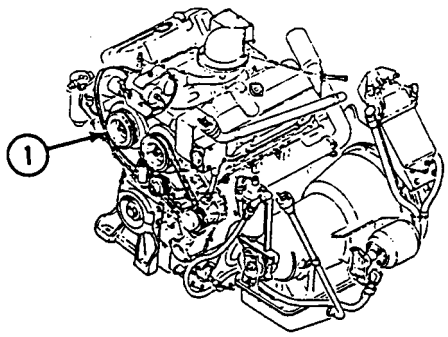
1. Repair engine harness circuit 6 (WP 0294 00).
2. Verify no faults found.

YES → **6BY**

1. Verify no faults found.

CY

1. Turn MASTER SWITCH OFF.
2. Manually rotate engine camshaft pulley (1) (use breaker bar, socket wrench set, and extension).
3. Does engine rotate?



NO → **CYN**

1. Engine or power train seized.
2. Notify your supervisor

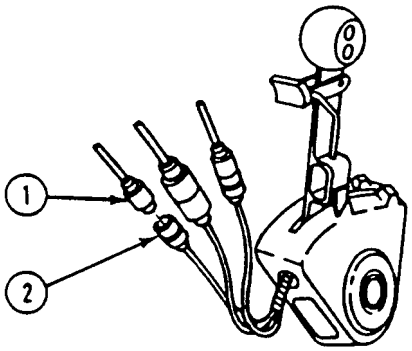
YES → **2CY**

1. Replace starter (WP 0253 00).
2. Verify no faults found.

ENGINE DOES NOT CRANK (M548A1)—Continued **0010 00**

DY

1. Turn MASTER SWITCH OFF.
2. Remove front main harness circuit 74A plug (1) from neutral start switch jack (2).
3. Turn MASTER SWITCH ON.
4. (H) Measure voltage between jack (2) and ground with start switch depressed.
5. Does multimeter read less than 17 volts?



NO →

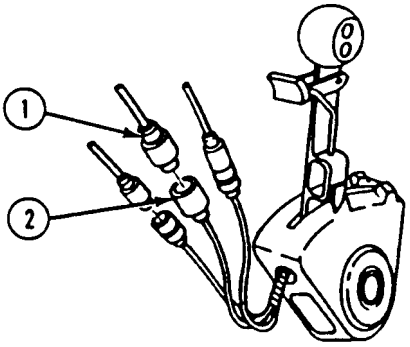
DYN

1. Repair front main wiring harness circuit 74A (WP 0294 00).
2. Verify no faults found.

YES ↓

2DY

1. Turn MASTER SWITCH OFF.
1. Remove front main wiring harness circuit 74 plug (1) from neutral start switch jack (2).
2. (H) Measure voltage between circuit 74 plug (1) with start switch depressed.
3. Does multimeter read less than 17 volts?

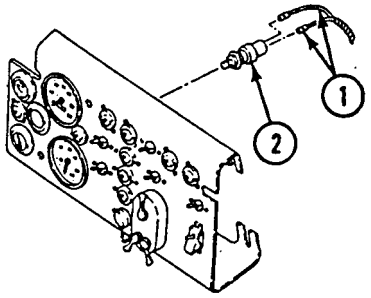


NO → GO TO **EY** (PAGE 0010 00-8)

YES ↓

3DY

1. Install circuit 74 and 74A plugs on neutral start switch.
2. Partially remove instrument panel for access (WP 0256 00).
3. Remove circuits 14/14A plug (1) from starter switch (2).
4. (H) Measure resistance between starter switch (2) jack pins with starter switch depressed.
5. Does multimeter read 0 ohms?



NO →

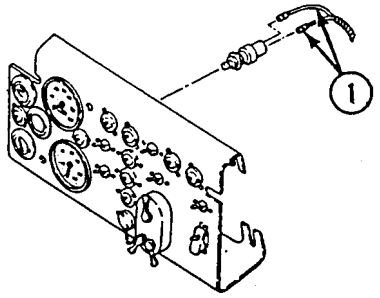
3DYN

1. Replace starter switch (WP 0259 00).
2. Verify no faults found.

YES ↓

4DY

1. Turn MASTER SWITCH ON.
2. Measure voltage from panel power harness circuit 14 plug pin (1) and ground.
3. Does multimeter read more than 17 volts?



NO →

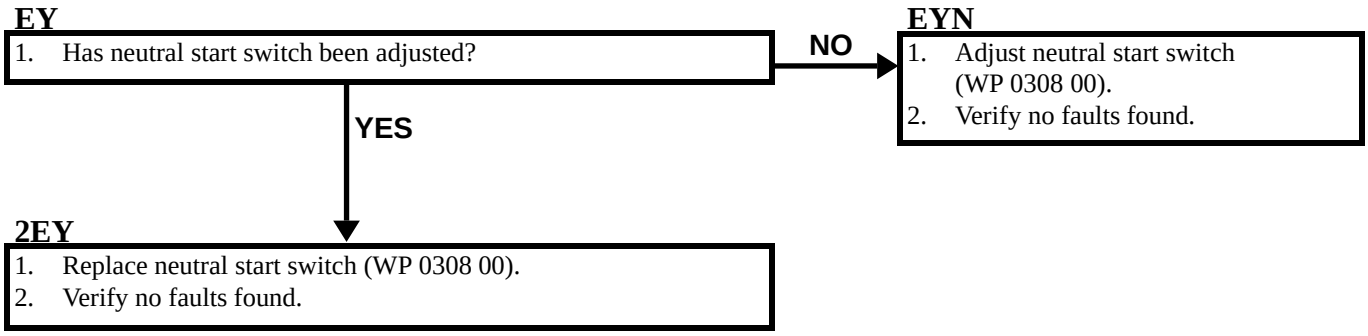
4DYN

1. Repair panel wiring harness circuit 14 (WP 0294 00).
2. Verify no faults found.

YES ↓

5DY

1. Turn MASTER SWITCH OFF.
2. Repair front main wiring harness circuit 14A (WP 0294 00).
3. Verify no faults found.


EY
1. Has neutral start switch been adjusted?
NO
EYN
1. Adjust neutral start switch (WP 0308 00).
2. Verify no faults found.
YES
2EY
1. Replace neutral start switch (WP 0308 00).
2. Verify no faults found.

ENGINE DOES NOT CRANK (M548A3) 0011 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic
Helper (H)

References

See your -10

Equipment Condition

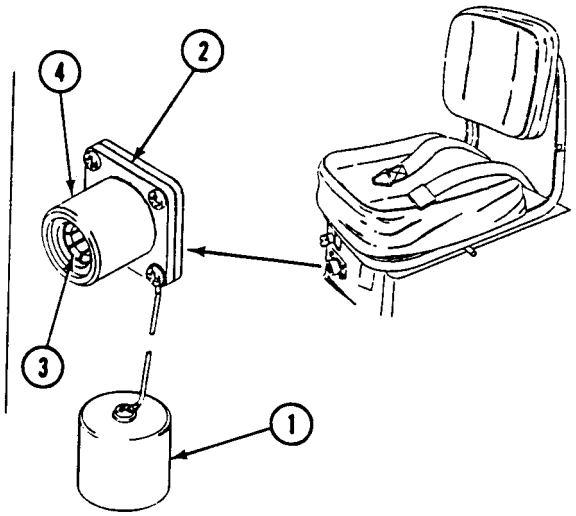
Engine stopped (see your -10)
Carrier blocked (see your -10)
Power plant rear access panel removed (see your -10)
Center and driver's seats raised (see your -10)
Hull bottom access cover removed (WP 0383 00)

NOTE

A helper is needed throughout task.

T

1. Remove cover (1) from auxiliary power receptacle (2).
2. Measure voltage between center contact (+) (3) and shell (-) (4) of auxiliary power receptacle (2).
3. Does multimeter read more than 17 volts?



NO → **TN**

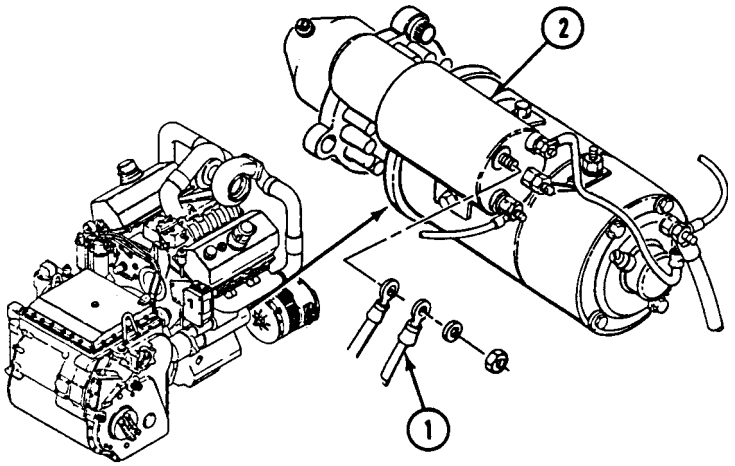
1. Replace batteries (WP 0293 00).
2. Verify no faults found.

YES

ENGINE DOES NOT CRANK (M548A3)—Continued **0011 00**

Y

1. Disconnect both battery negative leads (WP 0292 00).
2. Disconnect circuit 6 lead (1) from starter solenoid (2).
3. Measure resistance from circuit 6 lead (1) to ground.
4. Does multimeter read infinity?



NO →

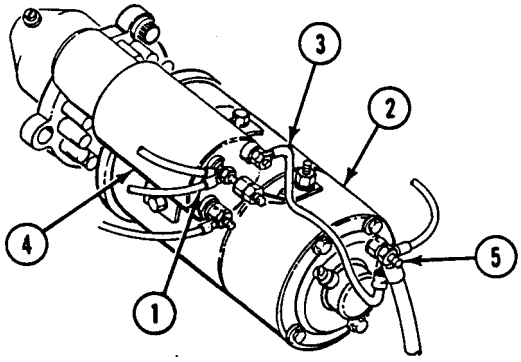
YN

1. Replace starter (WP 0254 00)
2. Verify no faults found.

YES ↓

2Y

1. Connect circuit 6 lead (1).
2. Measure resistance through starter (2) from connecting strap (3) between starter solenoid (4) and starter to ground post (5).
3. Does multimeter read 0 ohms?



NO →

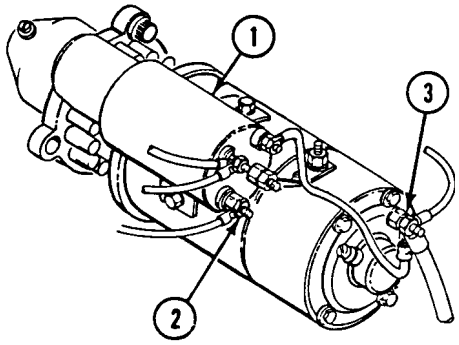
2YN

1. Replace starter (WP 0254 00).
2. Verify no faults found.

YES ↓

3Y

1. Measure resistance through starter solenoid(1) from circuit 74B lead (2) on solenoid to starter ground post (3).
2. Does multimeter read 1ohms?



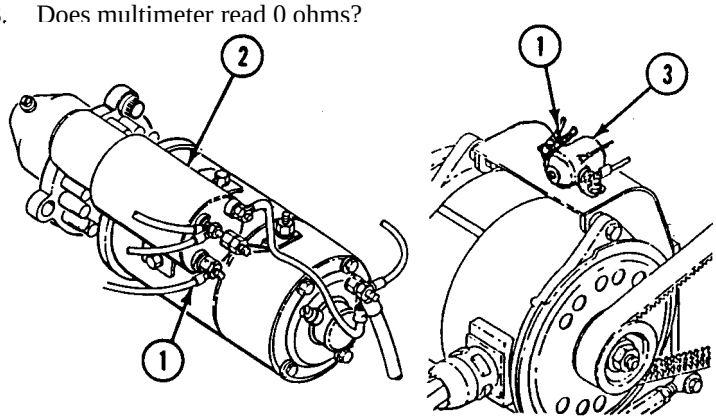
NO → **3YN**

1. Replace starter (WP 0254 00).
2. Verify no faults found.

YES ↓

4Y

1. Disconnect circuit 74B lead (1) from starter solenoid (2) and starter relay (3).
2. Measure resistance of circuit 74B lead (1).
3. Does multimeter read 0 ohms?



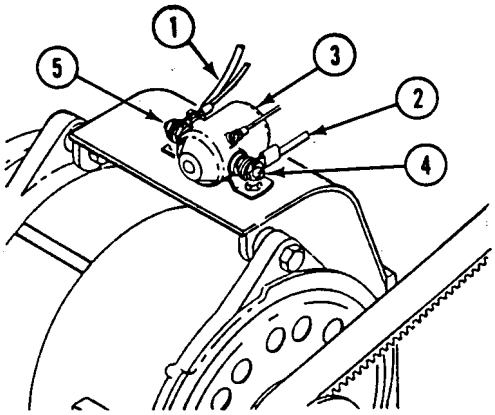
NO → **4YN**

1. Replace/repair circuit (WP 0294 00).
2. Verify no faults found.

YES ↓

5Y

1. Connect circuit 74B lead (1).
2. Disconnect circuit 74C lead (2) from starter relay (3).
3. Measure resistances between relay post (4) and relay post (5).
4. Does multimeter read infinity?



NO →

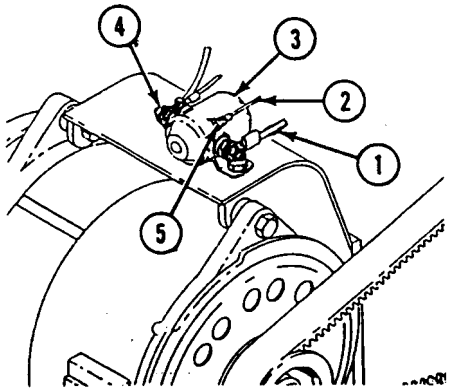
5YN

1. Replace starter relay (WP 0255 00).
2. Verify no faults found.

YES ↓

6Y

1. Connect circuit 74C lead (1).
2. Disconnect circuit 74A lead (2) from starter relay (3).
3. Measure resistance through starter relay (3) between relay post (4) and relay post(5).
4. Does multimeter read 28 ohms?



NO →

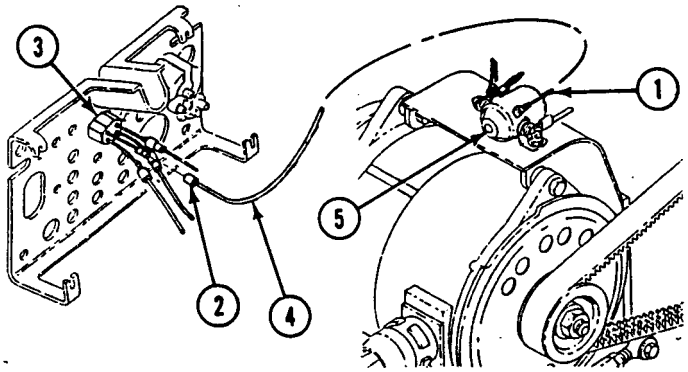
6YN

1. Replace starter relay (WP 0255 00).
2. Verify no faults found.

YES ↓

7Y

1. Connect circuit 74A lead (1).
2. Remove instrument panel for access (WP 0256 00).
3. Disconnect circuit 74 plug (2) from FUEL PUMP switch (3).
4. Measure resistance of circuit 74/74A lead (4) between circuit 74 plug (2) and circuit 74A lead (1) at starter relay (5).
5. Does multimeter read 0 ohms?



NO →

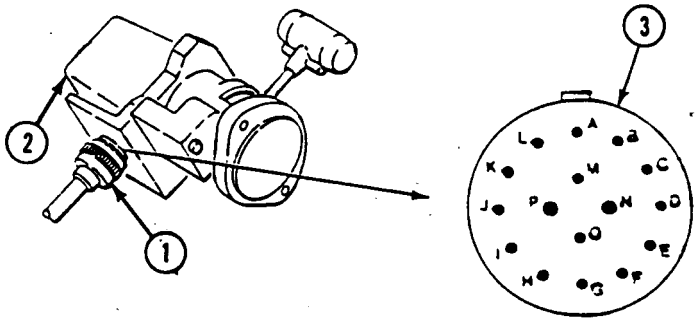
7YN

1. Repair wiring harness 12313524 circuit 74 or wiring harness 12313480 circuit 74A (WP 0294 00).
2. Connect circuit 74 plug to FUEL PUMP switch..
3. Install instrument panel (WP 0256 00).
4. Verify no faults found.

YES ↓

8Y

1. Remove transmission shift control (WP 0306 00).
2. Disconnect controller hasness plug (1) from transmission control (2).
3. Place transmission shift control (2) in SL.
4. Measure resistance between transmission shift control jack (3) pins M and N.
5. Does multimeter read 0 ohms?



NO →

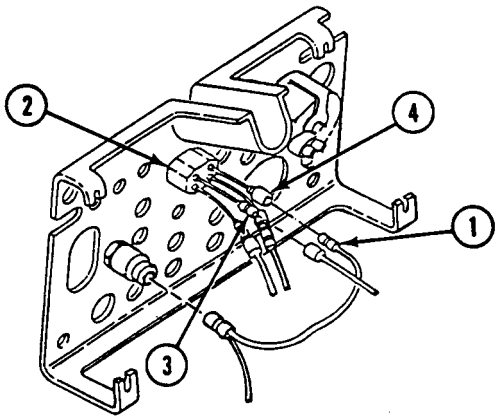
8YN

1. Replace transmission shift control (WP 0306 00).
2. Install instrument panel (WP 0256 00).
3. Verify no faults found.

YES ↓

9Y

1. Install transmission shift control and harness plug (WP 0306 00)
2. Disconnect circuit 14A plug (1) from FUEL PUMP switch.
3. Move FUEL PUMP switch (2) to ON.
4. Measure resistance through FUEL PUMP switch (2) terminal (3) and terminal (4).
5. Does multimeter read 0 ohms?



NO →

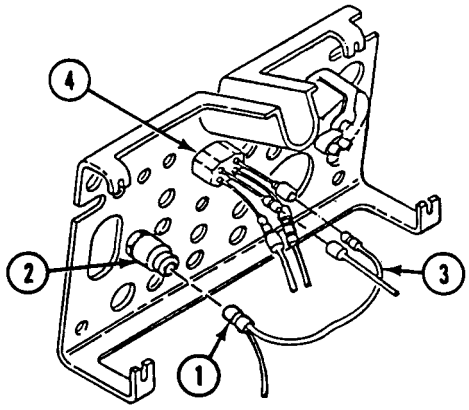
9YN

1. Replace FUEL PUMP switch (WP 0261 00).
2. Install instrument panel (WP 0256 00).
3. Verify no faults found.

YES ↓

10Y

1. Disconnect circuit 14/14A plug (1) from START switch (2).
2. Measure resistance of circuit 14A lead (3) disconnected from START switch (2) and FUEL PUMP switch (4).
3. Does multimeter read 0 ohms?



NO →

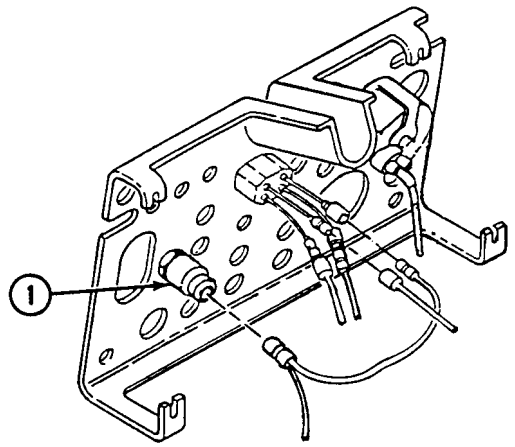
10YN

1. Repair harness circuit 14A (WP 0294 00).
2. Connect circuit 14/14A plug to START switch.
3. Install instrument panel (WP 0256 00).
4. Verify no faults found.

YES ↓

11Y

1. Depress START switch (1) and measure resistance through switch.
2. Does multimeter read 0 ohms?



NO

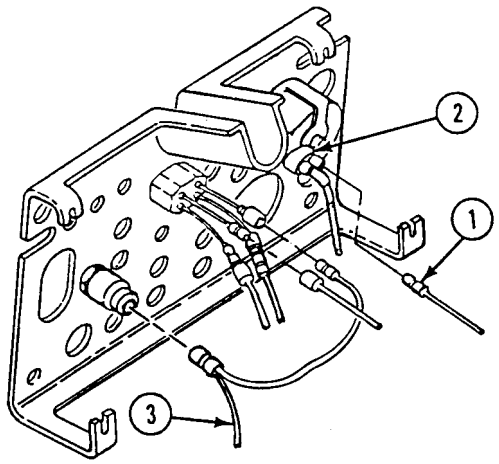
11YN

1. Replace START switch (WP 0259 00).
2. Install instrument panel (WP 0256 00).
3. Verify no faults found.

YES

12Y

1. Disconnect circuit 10 lead (1) from instrument panel circuit breaker (2).
2. Measure resistance through circuit 14 lead (3) and circuit 10 lead (1).
3. Does multimeter read 0 ohms?



NO

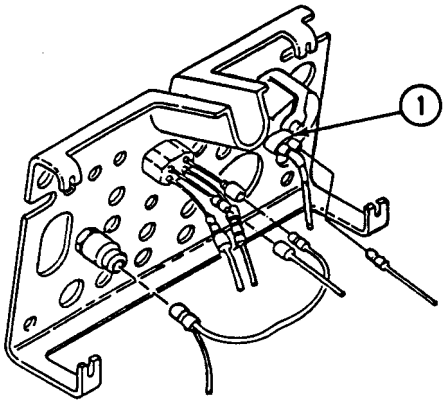
12YN

1. Repair circuit 14 lead and circuit 10 lead (WP 0294 00).
2. Connect circuit 10 lead to instrument panel circuit breaker.
3. Connect circuit 14/14A plug to START switch.lead and circuit 10 lead.
4. Install instrument panel (WP 0256 00).
5. Verify no faults found.

YES

13Y

1. Measure resistance through instrument panel circuit breaker (1).
2. Does multimeter read 0 ohms?



NO

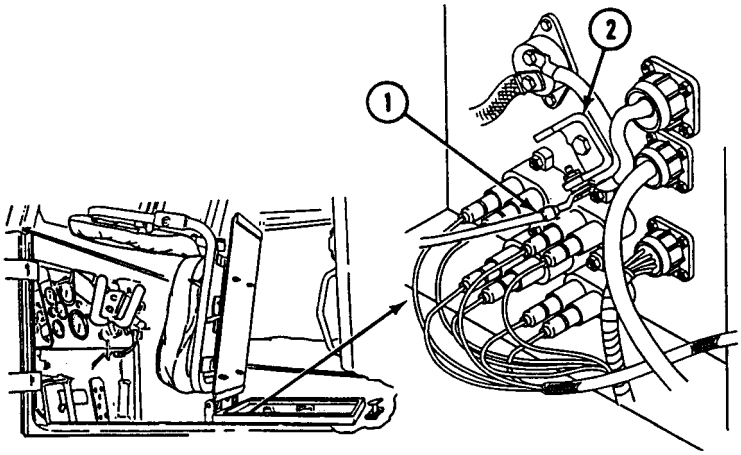
13YN

1. Replace instrument panel circuit breaker (WP 0267 00).
2. Install instrument panel (WP 0256 00).
3. Verify no faults found.

YES

14Y

1. Connect circuit 10 and 14A leads.
2. Install instrument panel (WP 0256 00).
3. Disconnect circuit 10D lead(1) from bus bar(2).
4. Measure resistance of circuit 10D lead (1).
5. Does multimeter read 0 ohms?



NO

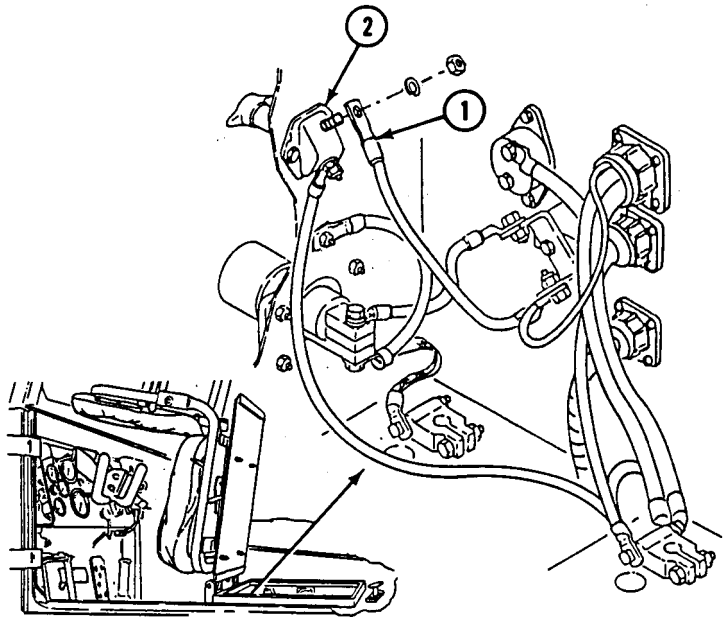
14YN

1. Replace/repair circuit 10D lead (WP 0294 00).
2. Verify no faults found.

YES

15Y

1. Connect circuit 10D lead.
2. Disconnect circuit 6 lead (1) from MASTER SWITCH (2).
3. Turn MASTER SWITCH ON.
4. Measure resistance through MASTER SWITCH (2) to ground.
5. Does multimeter read more than 0 ohms?



NO → **15YN**

1. Replace MASTER SWITCH (WP 0271 00).
2. Verify no faults found.

YES ↓

16Y

1. Fault beyond unit maintenance level.
2. Notify your supervisor.

ENGINE CRANKS SLOWLY (M548A1) 0012 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
STE/ICE-R Test Set (WP 0541 00, Item 6)
Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic
Helper (H)

References

See your -10
(WP 0109 00)

Equipment Condition

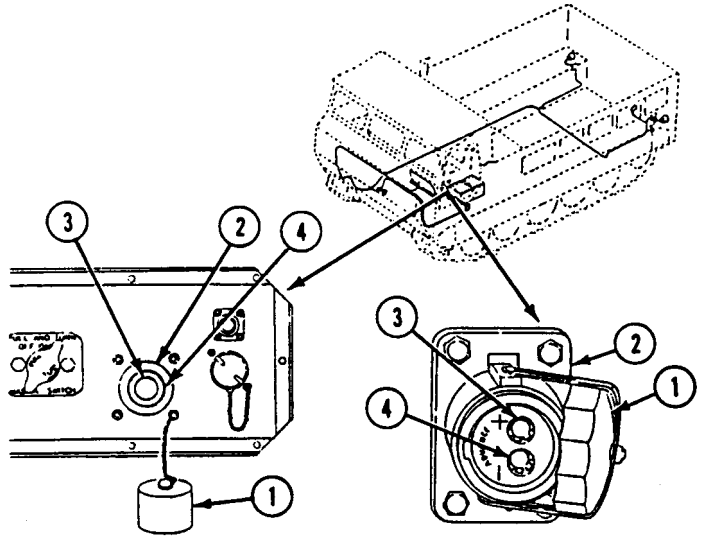
Engine stopped (see your -10)
Carrier blocked (see your -10)
Driver's seat raised (see your -10)
Power plant rear access door removed (see your -10)
Center seat raised (see your -10)

T

NOTE

There is an early and late model of auxiliary power receptacle. Both early and late models are shown.

1. Turn MASTER SWITCH ON.
2. Remove cover (1) from auxiliary power receptacle (2).
3. (H) Measure voltage between positive (+) terminal (3) and negative (-) terminal (4) with engine cranking for 3 to 5 seconds.
4. Does multimeter read more than 19 volts?



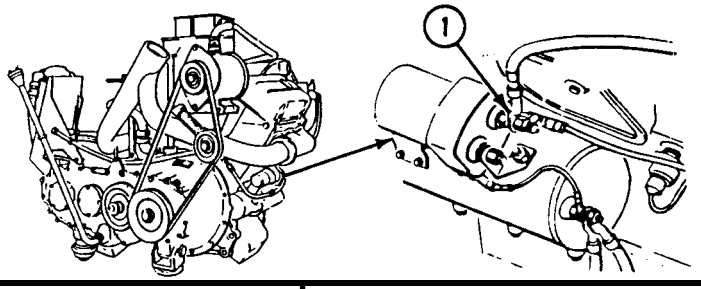
LATE MODEL EARLY MODEL

NO → GO TO **BY** (PAGE 0012 00-3)

YES

Y

1. Measure voltage between starter positive (+) terminal (1) and ground with engine cranking for 3 to 5 seconds.
2. Does multimeter read more than 17 volts?

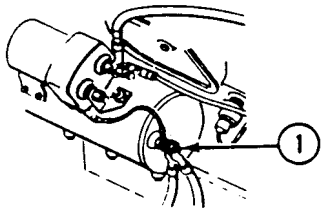


NO → GO TO **CY** (PAGE 0012 00-4)

YES

2Y

1. Measure voltage between starter ground (1) and carrier ground with engine cranking for 3 to 5 seconds.
2. Does multimeter read less than 1/2 volt?



NO → **2YN**

1. Replace/repair starter ground (WP 0294 00).
2. Verify no faults found.

YES

3Y

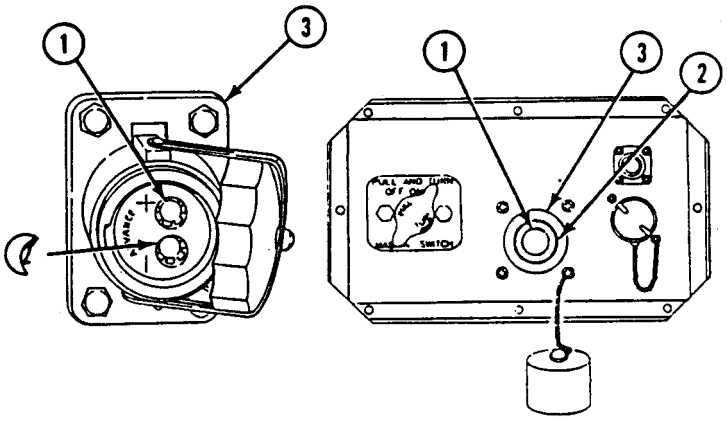
1. Replace starter (WP 0253 00).
2. Verify no faults found.

BY

NOTE

There is an early and late model of auxiliary power receptacle. Both early and late models are shown. shown.

1. Turn MASTER SWITCH OFF.
2. Clean, inspect, and repair carrier batteries (WP 0290 00).
3. Turn MASTER SWITCH ON.
4. (H) Measure voltage between positive (+) terminal (1) and negative (-) terminal (2) on auxiliary power receptacle (3) with engine cranking for 3 to 5 seconds.
5. Does multimeter read more than 19 volts?



EARLY MODEL LATE MODEL

NO → GO TO **DY** (PAGE 0012 00-6)

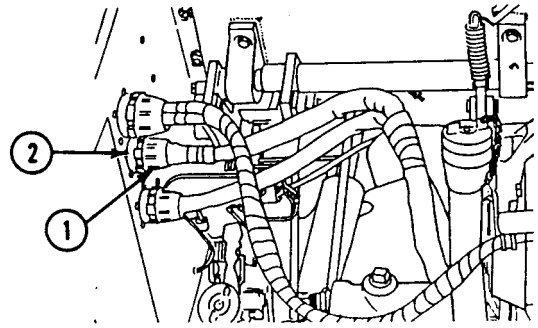
YES

2BY

1. Verify no faults found.

CY

1. Remove engine harness circuit 6 plug (1) from main harness circuit 6 jack (2) at carrier bulkhead.
2. Inspect plug and jack for corrosion or damage.
3. Are parts in good condition?



NO

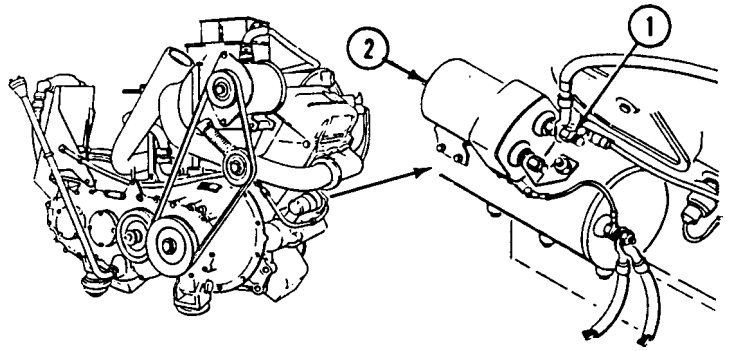
CYN

1. Front main and/or engine harness damaged.
2. Notify your supervisor

YES

2CY

1. Install front engine harness circuit 6 plug on main harness circuit 6 jack at carrier bulkhead.
2. Inspect engine harness circuit 6 terminal end (1) on starter (2).
3. Is terminal end free from corrosion or damage?



NO

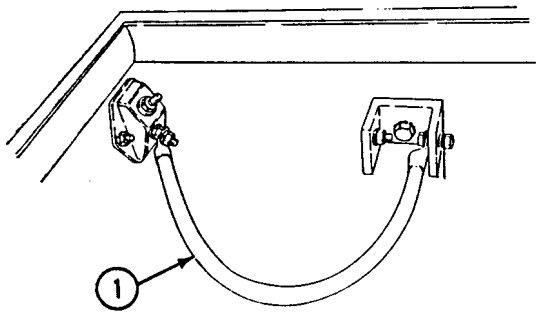
2CYN

1. Repair engine harness circuit 6 (WP 0294 00).
2. Verify no faults found.

YES

3CY

1. Inspect master switch to bus bar cable (1).
2. Are cable and cable ends free from corrosion and damage?



UNDER DRIVER'S SEAT

NO →

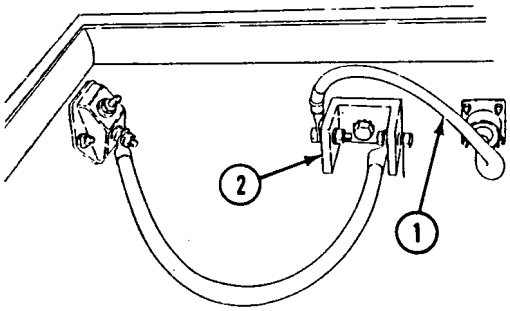
3CYN

1. Repair cable (WP 0294 00).
2. Verify no faults found.

YES ↓

4CY

1. Inspect front main harness circuit 6 (1) lead on bus bar (2).
2. Is lead terminal free from corrosion and damage?



UNDER DRIVER'S SEAT

NO →

4CYN

1. Repair front main harness circuit 6 (WP 0294 00).
2. Verify no faults found.

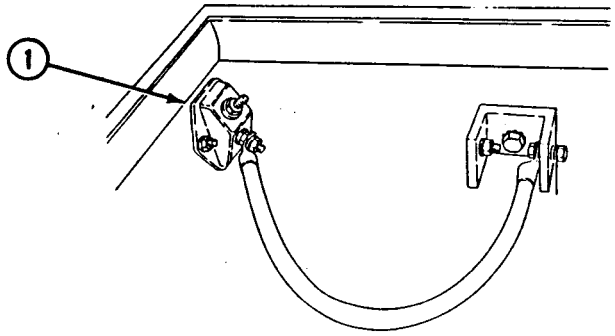
YES ↓

5CY

1. Replace starter assembly (WP 0253 00).
2. Verify no faults found.

DY

1. Inspect terminal ends on master switch (1).
2. Are terminal ends and master switch free from corrosion and damage?



UNDER DRIVER'S SEAT

NO

DYN

1. Repair battery to master power cable and/or master switch (WP 0294 00).
2. Verify no faults found.

YES

2DY

1. Verify no faults found.

ENGINE CRANKS SLOWLY (M548A3) 0013 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

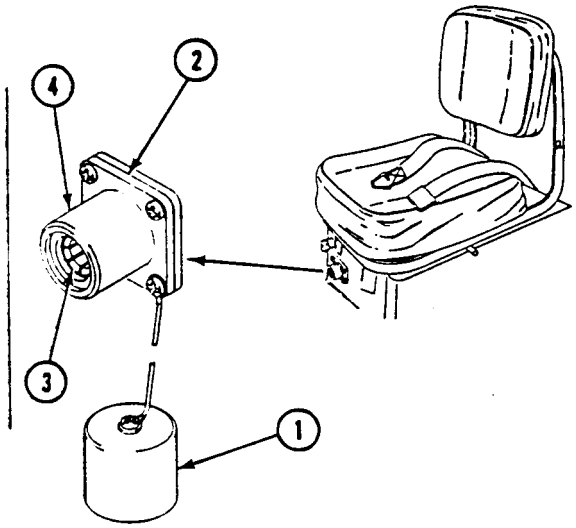
Personnel Required
Unit Mechanic
Helper (H)

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Power plant rear access panel removed (see your -10)
Center and driver's seats raised (see your -10)
Hull bottom access cover removed (WP 0383 00)

T

1. Turn MASTER SWITCH ON.
2. Remove cap (1) from auxiliary power receptacle (2).
3. Measure voltage between center contact (+) (3) and shell (-) (4) of auxiliary power receptacle (2).
4. Does multimeter read more than 17 volts?



NO →

TN

1. Service batteries (WP 0293 00).
2. Verify no faults found.

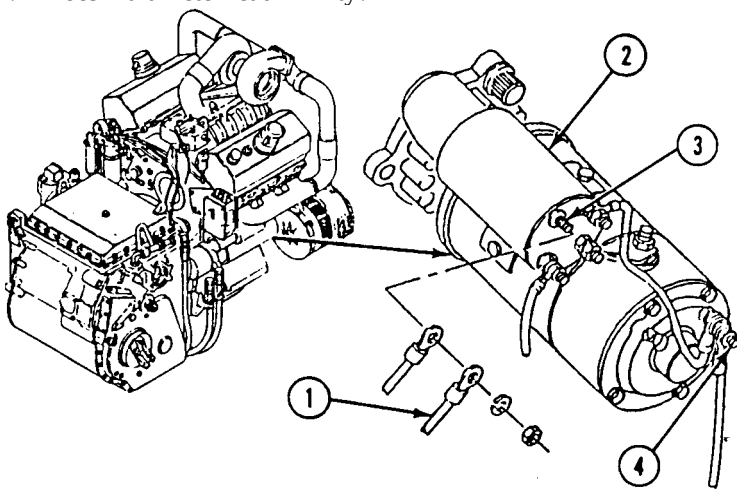
YES ↓

Y

WARNING

Battery post and cables touched by metal objects can short circuit and burn you. Gas from batteries can explode and injure you. Battery acid can blind or burn you. Do not wear jewelry when you work on electrical systems. Use caution when you work near battery or electrical system with tools or other metal objects. Do not get acid on your skin or in your eyes. Do not allow sparks near batteries.

1. Disconnect batteries (WP 0292 00)
2. Disconnect circuit 6 lead (1) from starter solenoid (2).
3. Measure resistance from circuit 6 terminal (3) to ground (4).
4. Does multimeter read infinity?



NO

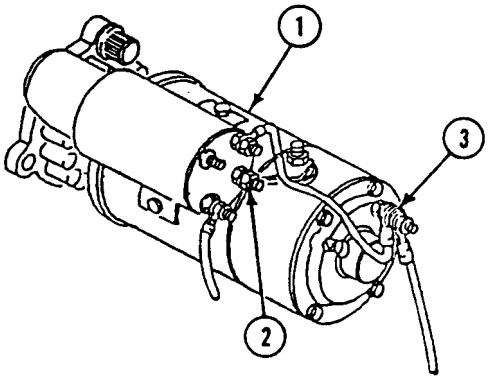
YN

1. Replace starter (WP 0254 00).
2. Verify no faults found.

YES

2Y

1. Connect circuit 6 lead to starter.
2. Measure resistance through starter (1) from connecting strap (2) to ground post (3).
3. Does multimeter read 0 ohms?



NO →

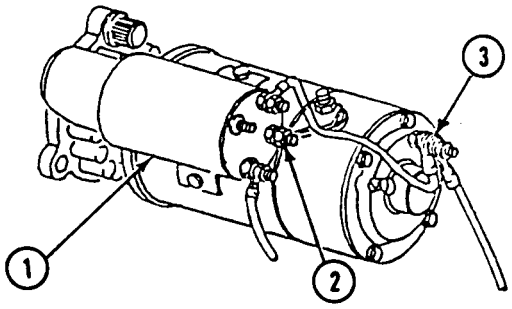
2YN

1. Replace starter (WP 0254 00).
2. Verify no faults found.

YES ↓

3Y

1. Measure resistance through starter solenoid (1) from circuit 74B terminal (2) on solenoid to starter ground post (3).
2. Does multimeter read approximately 1 ohm?



NO →

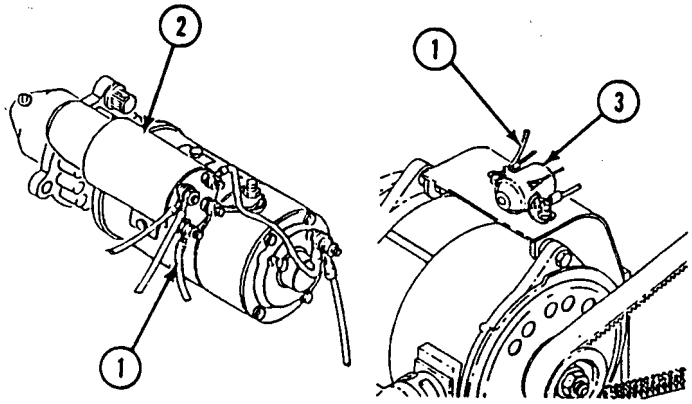
3YN

1. Replace starter (WP 0254 00).
2. Verify no faults found.

YES ↓

4Y

1. Disconnect circuit 74B lead (1) from starter solenoid (2) and starter relay (3).
2. Measure resistance of circuit 74B lead (1).
3. Does multimeter read 0 ohms?



NO

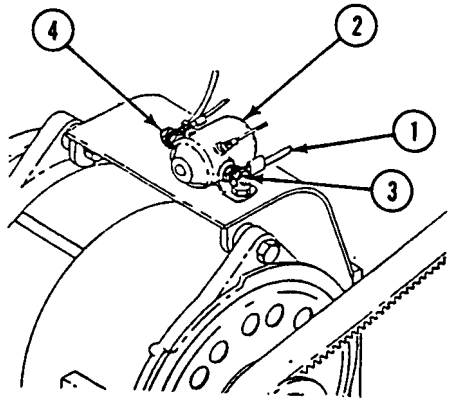
4YN

1. Replace/repair circuit 74B lead (WP 0294 00).
2. Verify no faults found.

YES

5Y

1. Connect circuit 74B lead to solenoid.
2. Disconnect circuit 74C lead (1) from starter relay (2).
3. Measure resistance between relay post (3) and relay post (4).
4. Does multimeter read infinity?



NO

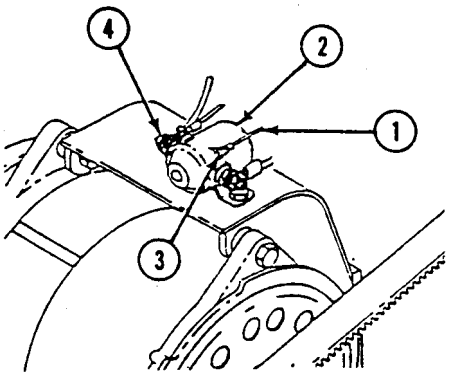
5YN

1. Replace starter relay (WP 0255 00).
2. Verify no faults found.

YES

6Y

1. Connect circuit 74C lead to relay.
2. Disconnect circuit 74A lead (1) from starter relay (2).
3. Measure resistance between relay post (3) and starter ground (4).
4. Does multimeter read 19.4 to 29 ohms?



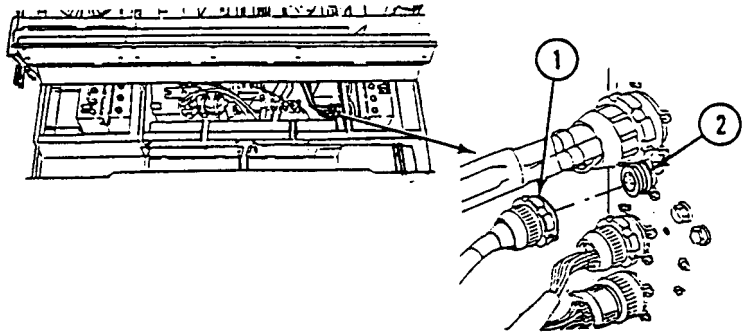
NO → **6YN**

1. Replace starter relay (WP 0255 00).
2. Verify no faults found.

YES ↓

7Y

1. Connect circuit 74A lead to relay.
2. Remove wiring harness circuit 6 plug 12313480 (1) from circuit 6 jack 11588765 (2) at carrier bulkhead.
3. Inspect plug and jack for corrosion or damage.
4. Are parts in good condition?



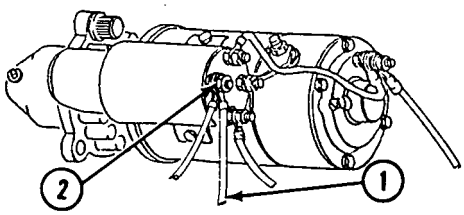
NO → **7YN**

1. Repair wiring harness 12313480 or electrical lead 11588765 (WP 0294 00).
2. Verify no faults found.

YES ↓

8Y

1. Install wiring harness circuit 6 plug 12313480 on electrical lead circuit 6 jack 11588765 at carrier bulkhead.
2. Inspect engine wiring harness circuit 6 terminal end (1) on starter positive (+) post (2).
3. Is terminal end free from corrosion or damage?



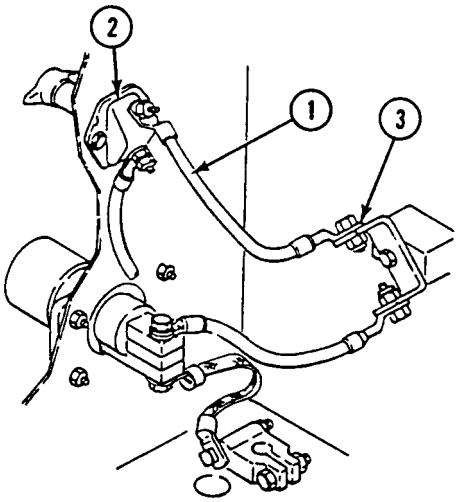
NO → **8YN**

1. Repair wiring harness circuit 6 12313480 (WP 0294 00).
2. Verify no faults found.

YES ↓

9Y

1. Inspect cable (1) between master switch (2) and bus bar (3).
2. Are cable and cable ends free from corrosion and damage?



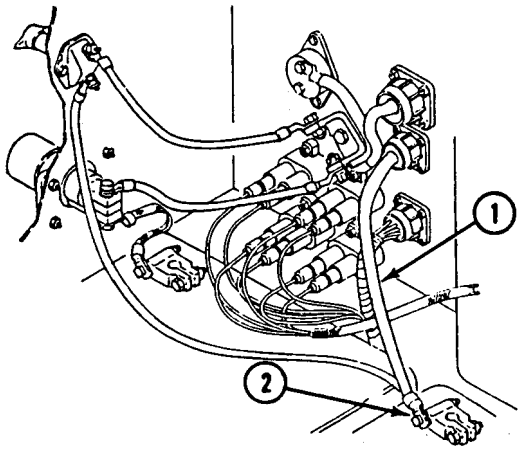
NO → **9YN**

1. Replace cable (WP 0254 00).
2. Verify no faults found.

YES ↓

10Y

1. Inspect electrical lead circuit 6 lead (1) at battery terminal (2).
2. Is lead terminal free from corrosion and damage?



NO

10YN

1. Repair electrical lead circuit 6 (WP 0294 00).
2. Verify no faults found.

YES

11Y

1. Replace starter (WP 0254 00).
2. Verify no faults found.

ENGINE CRANKS BUT WILL NOT START 0014 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
STE/ICE-R Test Set (WP 0541 00, Item 6)

Materials/Parts
Suitable container

Personnel Required
Unit Mechanic
Helper (H)

References
See your -10
(WP 0113 00)

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Power plant rear access door/panel removed (see your -10)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Inspect condition and operation of fuel cut off cable assembly (WP 0194 00 or WP 0205 00).
2. Is cable assembly in good condition and in proper adjustment?

NO →

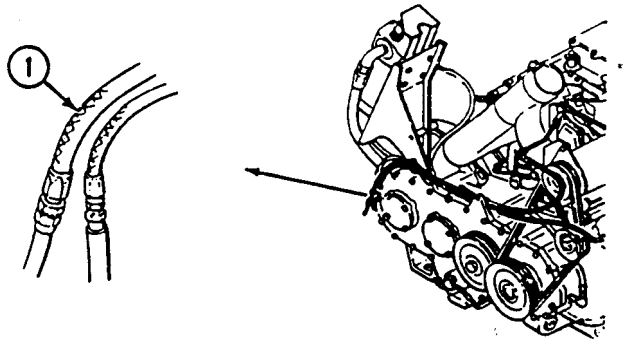
TN

1. Replace and/or adjust fuel cut off cable assembly (WP 0194 00 or WP 0205 00).
2. Verify no faults found.

YES ↓

Y

1. Remove engine fuel return line (1) from bulkhead fitting.
2. Depress plunger on return line (1) quick disconnect coupling. Catch fuel in suitable container.
3. Crank engine with plunger depressed. Have helper assist.
4. Does fuel flow out while cranking engine?



NO →

GO TO **BY** (PAGE 0014 00-2)

YES ↓

2Y

1. Drain fuel filters into suitable transparent container (see your -10).
2. Inspect fuel in container.
3. Is fuel clean and uncontaminated?

NO → **2YN**

1. Drain fuel tanks (WP 0162 00).
2. Replace primary and secondary fuel filters (WP 0176 00, WP 0177 00 and WP 0178 00).
3. Verify no faults found.

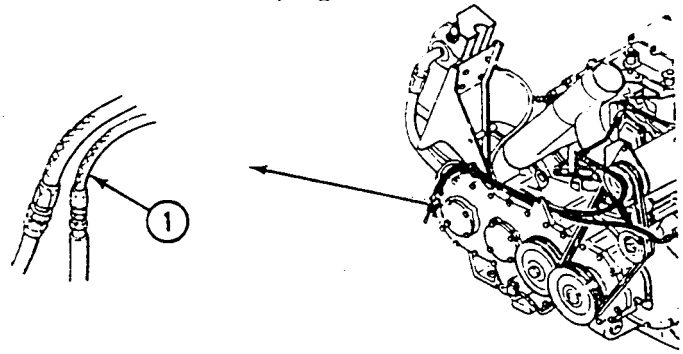
YES ↓

3Y

1. Engine does not start.
2. Notify your supervisor.

BY

1. Remove engine fuel supply line (1) from bulkhead fitting.
2. Manually depress plunger on bulkhead fitting quick disconnect coupling.
3. Does fuel flow from coupling?



NO → GO TO **CY** (PAGE 0014 00-3)

YES ↓

2BY

1. Inspect fuel lines between bulkhead fitting and primary filter.
2. Inspect fuel lines between primary filter and fuel pump.
3. Inspect fuel lines between fuel pump and secondary filter.
4. Inspect fuel lines between secondary filter and engine.
5. Are all lines free of kinks and other damage?

NO → **2BYN**

1. Replace engine fuel line(s) as required (WP 0167 00 or WP 0168 00).
2. Verify no faults found.

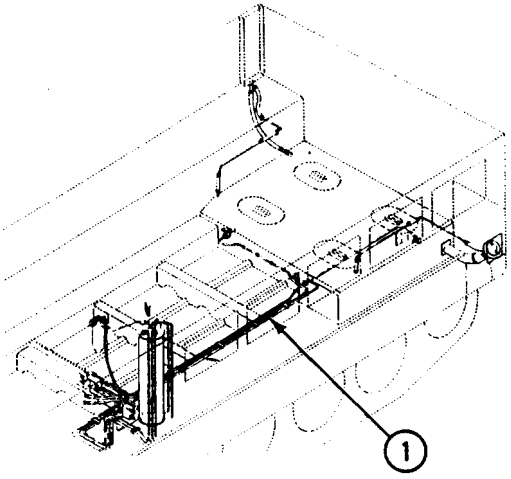
YES ↓

3BY

1. Replace fuel pump (WP 0149 00 or WP 0150 00).
2. Verify no faults found.

CY

1. Remove rear compartment floor plates (WP 0393 00).
2. Inspect fuel lines between fuel tank(s) (1) and bulkhead fittings.
3. Are all lines and fittings free from leaks and damage?



NO

CYN

1. Repair/replace fuel line(s) as required (WP 0167 00 or WP 0168 00).
2. Verify no faults found.

YES

2CY

1. Clear clogged fuel pickup inside fuel tank (WP 0166 00).
2. Verify no faults found.

ENGINE CRANKS BUT WILL NOT START BELOW 40°F (AIR BOX HEATER IS USED) 0015 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
STE/ICE-R Test Set (WP 0541 00, Item 6)
Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic
Helper (H)

References

See your -10
WP 0113 00

Equipment Condition

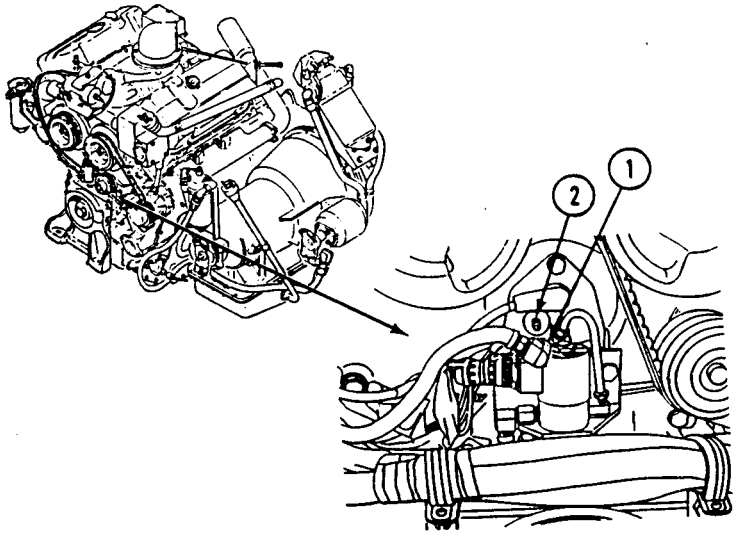
Engine stopped (see your -10)
Carrier blocked (see your -10)
Cab personnel seats raised (see your -10)
Power plant rear access door/panel removed (see your -10)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Remove air pump to air box heater hose (1) from air box (2).
2. Turn MASTER SWITCH ON.
3. Turn air box heater switch ON (see your -10).
4. Does air flow from end of hose?



NO → GO TO **BY** (PAGE 0015 00-5)

YES ↓

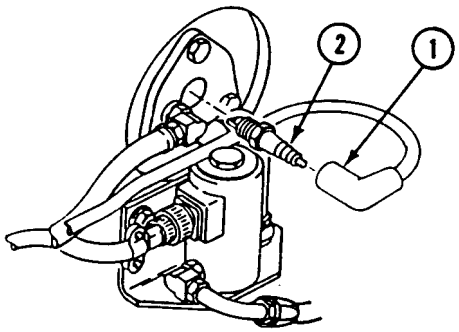
ENGINE CRANKS BUT WILL NOT START BELOW 40°F (AIR BOX HEATER IS USED)—Continued **0015 00**

Y

WARNING

High voltage. Keep hands clear.

1. Release air box heater switch.
2. Turn MASTER SWITCH OFF.
3. Install air pump to air box heater hose onto air box heater (WP 0180 00 or WP 0181 00).
4. Remove air box igniter high voltage wire (1) and igniter (2).
5. Install air box high voltage wire (1) on igniter (2).
6. Ground hex portion of igniter (2) on idler pulley pivot.
7. Turn MASTER SWITCH ON.
8. Turn air box heater switch ON (see your -10).
9. Does igniter produce a spark?



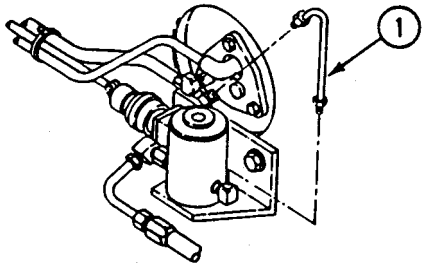
NO → GO TO **CY** (PAGE 0015 00-7)

YES

ENGINE CRANKS BUT WILL NOT START BELOW 40°F (AIR BOX HEATER IS USED)—Continued **0015 00**

2Y

1. Release air box heater switch.
2. Turn MASTER SWITCH OFF.
3. Install air box igniter.
4. Install air box heater harness plug wire on igniter coil.
5. Remove solenoid to air box heater tube assembly (1).
6. Turn MASTER SWITCH ON.
7. (H) Turn air box heater switch ON with engine cranking. Do not allow engine to start.
8. Does fuel fail to flow from solenoid with air box heater switch ON?



NO

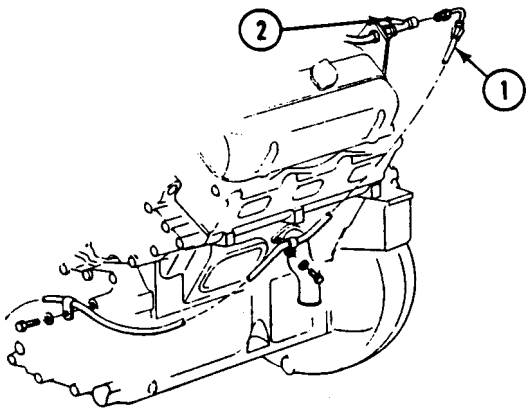
2YN

1. Air box heater is working properly. Go to engine cranks, but will not start (WP 0014 00).
2. Verify no faults found.

YES

3Y

1. Release air box heater switch.
2. Turn MASTER SWITCH OFF.
3. Remove fuel supply line to solenoid (1) at return tee (2).
4. Crank engine for 3-5 seconds.
5. Does fuel flow from return tee with engine cranking?



NO

3YN

1. Install solenoid fuel supply line on return tee.
2. Go to engine cranks, but will not start (WP 0014 00)

YES

ENGINE CRANKS BUT WILL NOT START BELOW 40°F (AIR BOX HEATER IS USED)—Continued **0015 00**

4Y

1. Inspect fuel supply line to solenoid.
2. Is line free from kinks or clogs?

NO →

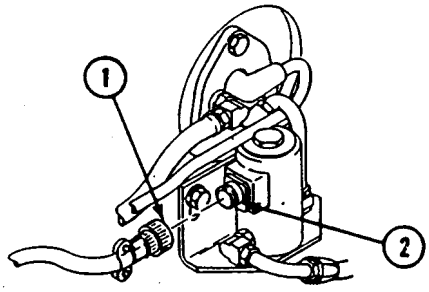
4YN

1. Clear or replace air box fuel supply line (WP 0180 00 or WP 0181 00).
2. Verify no faults found.

YES ↓

5Y

1. Install solenoid fuel supply line on return tee.
2. Remove air box heater harness plug (1) from solenoid (2).
3. Measure voltage between plug (1) sockets A (+) and B (-) with air box heater switch on.
4. Does multimeter read less than 17 volts?



NO →

5YN

1. Replace air box heater fuel supply solenoid (WP 0186 00 or WP 0187 00).
2. Verify no faults found.

YES ↓

6Y

1. Install solenoid to air box heater fuel line.
2. Install air box heater harness plug on to fuel solenoid.
3. Did multimeter read less than 17 volts?

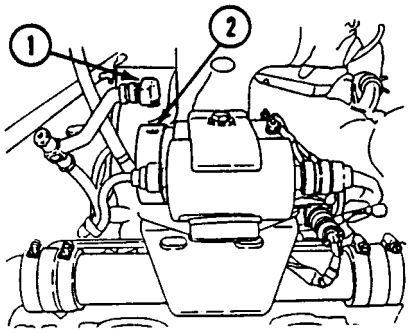
YES ↓

DY

ENGINE CRANKS BUT WILL NOT START BELOW 40°F (AIR BOX HEATER IS USED)—Continued **0015 00**

BY

1. Release air box heater switch.
2. Turn MASTER SWITCH OFF.
3. Remove air hose (1) from air pump (2).
4. Is hose free from restriction and damage?



NO

BYN

1. Replace air pump to air box heater hose (WP 0180 00 or WP 0181 00).
2. Verify no faults found.

YES

2BY

1. Turn MASTER SWITCH ON.
2. Listen to air pump with air box heater switch ON.
3. Is air pump silent?

NO

2BYN

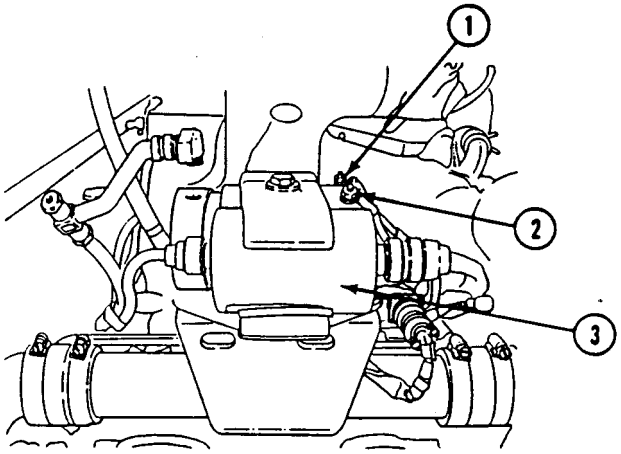
1. Turn MASTER SWITCH OFF.
2. Replace air pump vane set (WP 0190 00).

YES

ENGINE CRANKS BUT WILL NOT START BELOW 40°F (AIR BOX HEATER IS USED)—Continued **0015 00**

3BY

1. Measure voltage between power lead terminals 1 (+) (1) and 2 (-) (2) on air pump (3) with air box switch depressed.
2. Turn MASTER SWITCH OFF.
3. Did multimeter read less then 17 volts?



NO →

3BYN

1. Install air pump air box heater hose onto air box heater (WP 0180 00 or WP 0181 00).
2. Replace air pump (WP 0191 00).
3. Verify no faults found.

YES ↓

4BY

1. Install air pump to air box heater hose onto air box heater (WP 0180 00 or WP 0181 00).
2. Did multimeter read less than 17 volts?

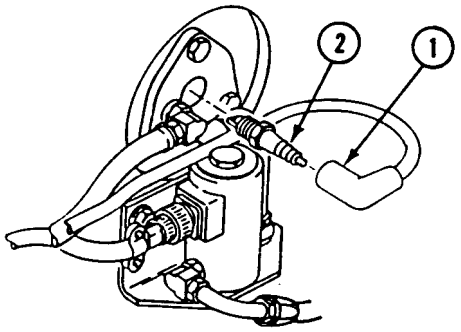
YES ↓

DY

ENGINE CRANKS BUT WILL NOT START BELOW 40°F (AIR BOX HEATER IS USED)—Continued **0015 00**

CY

1. Release air box heater switch.
2. Turn MASTER SWITCH OFF.
3. Remove air box heater assembly (WP 0180 00 or WP 0181 00).
4. Is igniter electrode (2) and spray nozzle (1) free of contamination and damage?



NO →

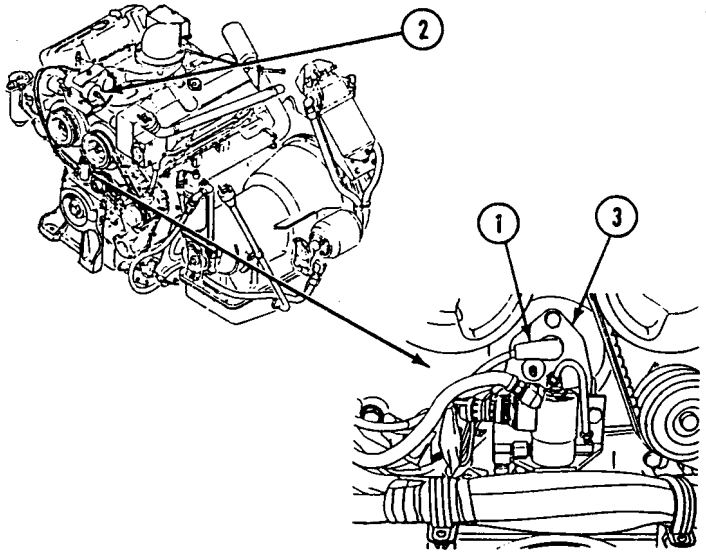
CYN

1. Clean and/or replace air box heater assembly (WP 0180 00 or WP 0181 00).
2. Verify no faults found.

YES ↓

2CY

1. Install air box heater assembly.
2. Disconnect ends of ignition wire (1) from coil (2) and air box heater (3).
3. Measure resistance between wire ends (2) and (3).
4. Is ignition wire in good condition and measure 0 ohms?



NO →

2CYN

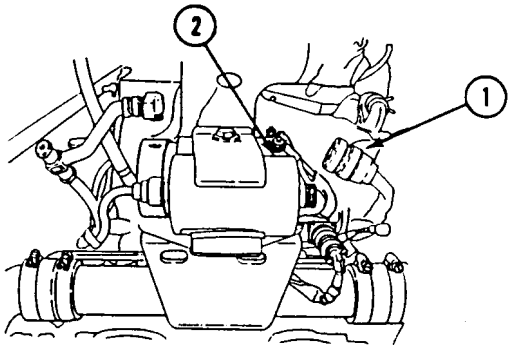
1. Replace igniter wire.
2. Verify no faults found.

YES ↓

ENGINE CRANKS BUT WILL NOT START BELOW 40°F (AIR BOX HEATER IS USED)—Continued **0015 00**

3CY

1. Install ignition wire on igniter.
2. Remove air box heater harness plug (1) from ignition coil (2).
3. Turn MASTER SWITCH ON.
4. Turn air box heater switch ON (see your -10).
5. Measure voltage between air box heater harness plug sockets A (+) and B (-).
6. Does multimeter read less than 17 volts?



NO →

3CYN

1. Replace ignition coil (WP 0184 00 or WP 0185 00).
2. Verify no faults found.

YES ↓

4CY

1. Release air box heater switch.
2. Turn MASTER SWITCH OFF.
3. Install ignition wire on coil.
4. Did multimeter read less than 17 volts?

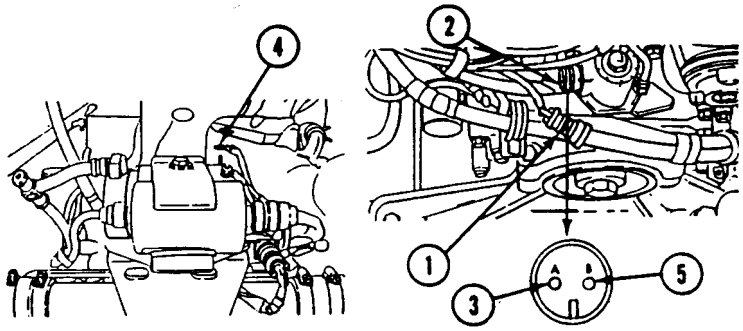
YES ↓

DY

ENGINE CRANKS BUT WILL NOT START BELOW 40°F (AIR BOX HEATER IS USED)—Continued **0015 00**

DY

1. Remove engine harness plug (1) from air box heater harness jack (2).
2. Turn MASTER SWITCH ON.
3. Measure voltage between engine harness plug (1) pin A (3) to ground (4) and pin B (5) to ground (4) with air box heater switch depressed.
4. Turn MASTER SWITCH OFF.
5. Did multimeter read less than 17 volts for both readings?



NO →

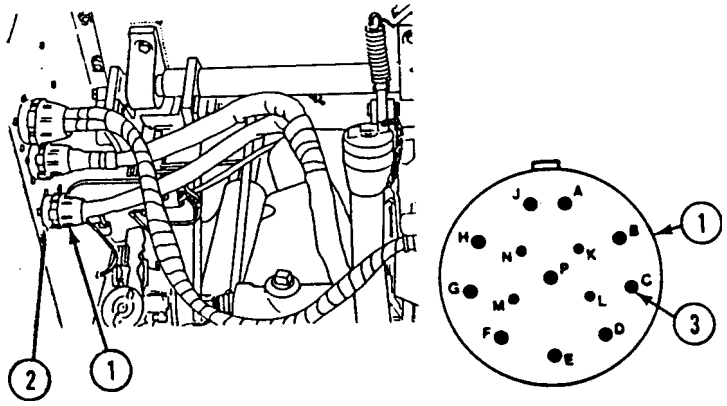
DYN

1. Replace air box heater wiring harness (WP 0183 00).
2. Verify no faults found.

YES ↓

2DY

1. Remove engine harness plug (1) from front main harness jack (2).
2. Turn MASTER SWITCH ON.
3. Measure voltage from front main harness jack (2) pin C (3) and ground with air box heater switch on.
4. Turn MASTER SWITCH OFF.
5. Did multimeter read less than 17 volts?



NO →

2DYN

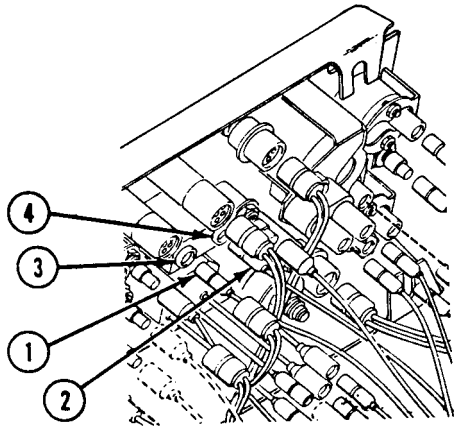
1. Faulty engine harness.
2. Notify your supervisor.

YES ↓

ENGINE CRANKS BUT WILL NOT START BELOW 40°F (AIR BOX HEATER IS USED)—Continued **0015 00**

3DY

1. Remove air box heater switch (WP 0184 00 or WP 0185 00).
2. Remove circuits 406 (1) and 400B (2) plugs from air box heater switch jacks (3) and (4).
3. Measure resistance between switch jacks (3) and (4) with air box heater ON.
4. Does multimeter read 0 ohms?



NO →

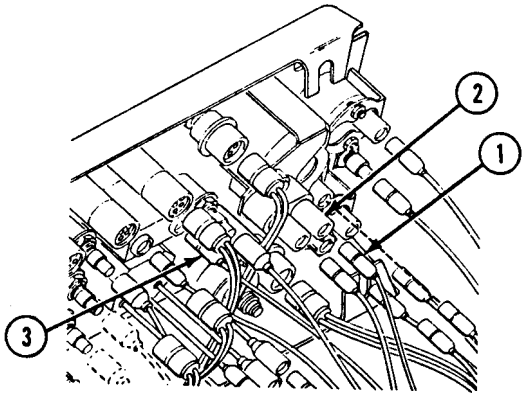
3DYN

1. Replace air box heater switch (WP 0184 00 or WP 0185 00).
2. Verify no faults found.

YES ↓

4DY

1. Remove circuit 27 plug (1) from instrument panel circuit breaker (2).
2. Measure resistance between instrument panel wiring harness circuit 27 (1) and 400B (3) plug pins.
3. Does multimeter read 0 ohms?



NO →

4DYN

1. Repair instrument panel wiring harness circuit 400B/27 (WP 0294 00).
2. Verify no faults found.

YES ↓

5DY

1. Repair front main harness circuit 406 (WP 0294 00).
2. Verify no faults found.

ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A1) 0016 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts
Wiping rag (WP 0542 00, Item 45)
Suitable container

Personnel Required
Unit Mechanic
Helper (H)

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Air cleaner element cleaned (see your -10)
Primary and secondary fuel filters serviced (see your -10)
Power plant rear access door removed (see your -10)

T

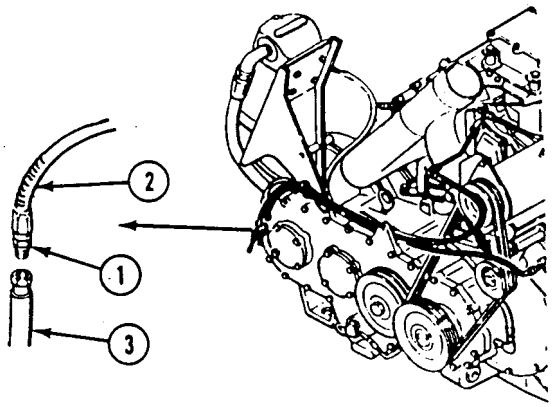
WARNING

Fuel flowing over a metal surface causes static electricity. This will cause a spark unless the surface is grounded.

WARNING

Loose clothing is dangerous around moving belts and pulley. You could get badly hurt if your clothes get caught in moving parts.

1. Push forward on quick disconnect coupling (1) to disconnect return hose (2) from fuel return line (3).
2. Remove half of quick disconnect coupling (1) from return hose (2) and retain.

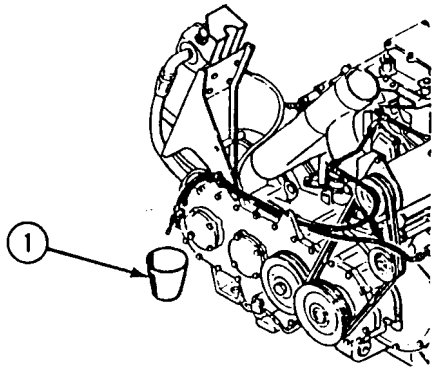


Continued

ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A1)—Continued **0016 00**

T Continued

3. Insert hose into metal container (1) with at least 1 gallon (4 liter) capacity.
4. Make sure container (1) is making metal-to-metal contact with carrier floor so there is a good ground.
5. Start engine (see your -10). Run engine at 1200 rpm for 1 minute. Hold end of fuel return hose in fuel. Have helper assist. Stop engine (see your -10).
6. Install rear half of quick disconnect on hose.
7. Connect hose to return line. Make sure quick disconnect snaps firmly in place.
8. Did fuel flow at least 1/2 gallon (2 liter) per minute?

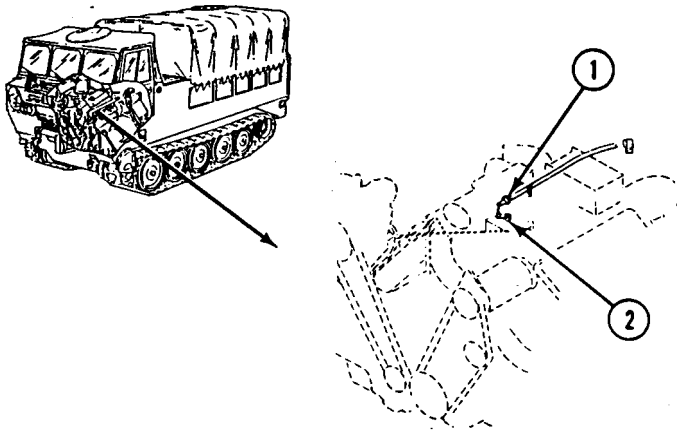


NO → GO TO **BY** (PAGE 0016 00-5)

YES

Y

1. Inspect fuel cut off control cable assembly (1) and fuel control arm (2).
2. Are fuel cut off control cable assembly and fuel control arm parts in good condition and working properly?



NO → **YN**

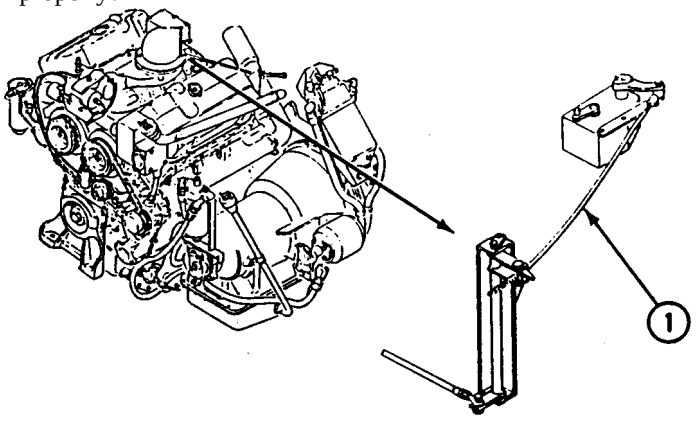
1. Adjust/replace fuel cutoff cable (WP 0193 00).
2. Verify no faults found.

YES

ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A1)—Continued **0016 00**

2Y

1. Inspect governor throttle linkage (1) for bent, loose, broken or missing parts.
2. Are governor throttle linkage parts in good condition and working properly?



NO

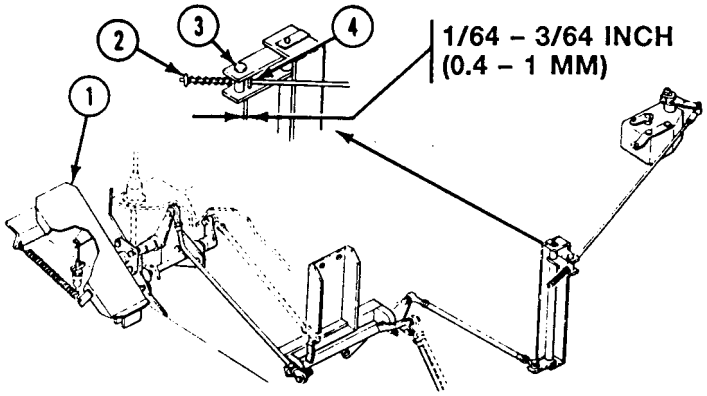
2YN

1. Repair/replace governor throttle linkage (WP 0198 00).
2. Verify no faults found.

YES

3Y

1. Inspect accelerator linkage for bent, loose, broken or missing parts.
2. With pedal (1) in full throttle position, travel spring (2) should be compressed so that a gap of 1/64 - 3/64 inch (0.4 - 1 mm) exists between pivot pin (3) and rod stop (4).
3. Are accelerator linkage parts in good condition, correctly adjusted, and working properly?



NO

3YN

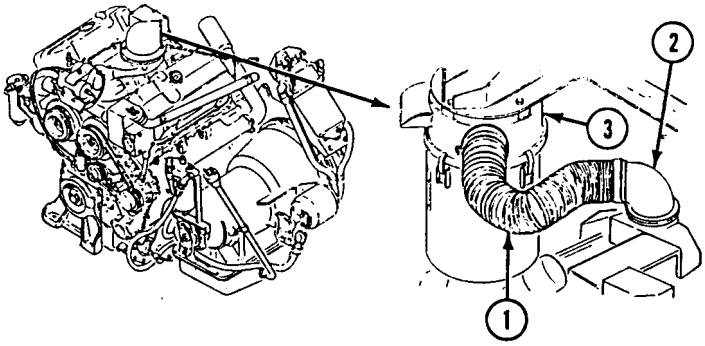
1. Repair/adjust accelerator linkage parts (WP 0197 00).
2. Verify no faults found.

YES

ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A1)—Continued **0016 00**

4Y

1. Remove air cleaner element (WP 0152 00).
2. Remove air cleaner hose (WP 0153 00).
3. Inspect air cleaner hose (1), engine intake (2), and air cleaner cover (3) for signs of obstruction or collapse.
4. Are air cleaner hose, engine intake, and air cleaner cover serviceable?



NO →

4YN

1. Remove any obstructions.
2. Replace unserviceable air cleaner hose or air cleaner cover (WP 0153 00).
3. Verify no faults found.

YES ↓

5Y

1. Install air cleaner hose (WP 0153 00).
2. Engine does not produce full power.
3. Notify your supervisor.

BY

1. Check for air bubbles.
2. Does fuel with no air bubbles come out of return fuel hose?

NO →

BYN

1. Air leak in suction side of fuel system.
2. Tighten all connections on valves, fuel hoses, filter and pump from fuel tank to fuel pump.
3. Replace damaged hoses and/or fittings (WP 0172 00).
4. Verify no faults found.

YES ↓

2BY

1. Check to see if primary and secondary fuel filter elements has been replaced.
2. Have primary and secondary fuel filter elements been replaced?

NO →

2BYN

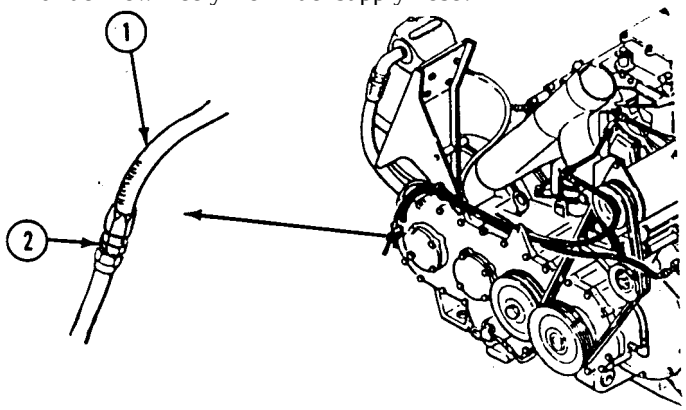
1. Replace primary and secondary fuel filter elements (WP 0179 00).
2. Verify no faults found.

YES ↓

ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A1)—Continued **0016 00**

3BY

1. Pull fuel supply hose (1) from quick disconnect coupling (2) in power plant compartment.
2. Place wiping rags under fuel supply hose quick disconnect coupling (2).
3. Turn MASTER SWITCH ON.
4. Depress plunger inside quick disconnect coupling (2) for about 5 seconds.
5. Turn MASTER SWITCH OFF.
6. Connect fuel supply hose (1) to quick disconnect coupling (2).
7. Did fuel flow freely from fuel supply hose?



NO

3BYN

1. Fuel supply hose or fuel tank pickup tube obstructed.
2. Replace obstructed fuel lines (WP 0167 00).
3. Verify no faults found.

YES

4BY

1. Replace engine fuel pump (WP 0149 00).
2. Verify no faults found.

ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A3) 0017 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts
Wiping rag (WP 0542 00, Item 45)
Suitable container

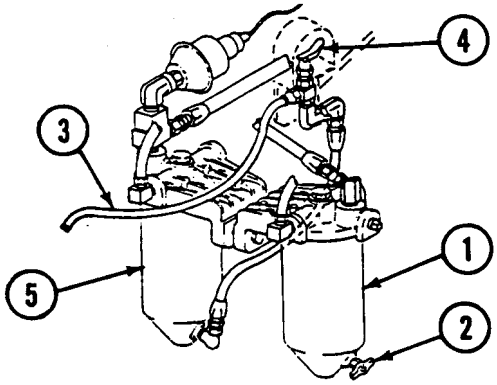
Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat and driver's seat raised (see your -10)
Air cleaner element cleaned (WP 0155 00)
Hull bottom access cover removed (WP 0383 00)
Primary and secondary fuel filters serviced (WP 0178 00)
Power plant rear access panel removed (see your -10)
Top left access grille removed (see your -10)

T

1. Turn MASTER SWITCH ON.
2. Place suitable container under primary fuel filter (1).
3. Open drain cock (2) and drain water and sediment from primary fuel filter.
4. Close drain cock (2) when clean fuel comes out.
5. Place a suitable container under secondary fuel filter drain hose (3).
6. Depress lever (4) and drain fuel from secondary fuel filter (5).
7. Check container for contaminated or improper fuel.
8. Turn MASTER SWITCH OFF.
9. Is contaminated or improper fuel being used?



NO → GO TO **AY** (PAGE 0017 00-2)

YES ↓

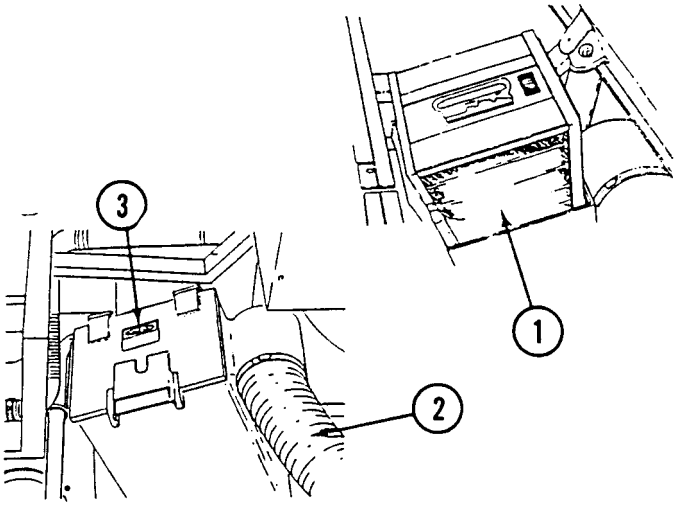
ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A3)—Continued **0017 00**

Y

1. Drain complete fuel system (WP 0162 00) and change filter elements (WP 0178 00).
2. Fill fuel tank with clean fuel (see your -10).
3. Verify no faults found.

AY

1. Remove air cleaner element (1).
2. Remove air cleaner hose (WP 0157 00).
3. Inspect air cleaner hose (2), element (1), and cover (3) for signs of obstruction and collapse.
4. Are air cleaner element, hose, and cover serviceable?



NO

AYN

1. Remove any obstruction.
2. Replace unserviceable air cleaner element, hose, or cover (WP 0156 00 and WP 0157 00).
3. Verify no faults found.

YES

2AY

1. Install air cleaner element and close cover (WP 0156 00).
2. Install air cleaner hose (WP 0157 00).
3. Check hand throttle adjustment (WP 0193 00).
4. Is hand throttle properly adjusted?

NO

2AYN

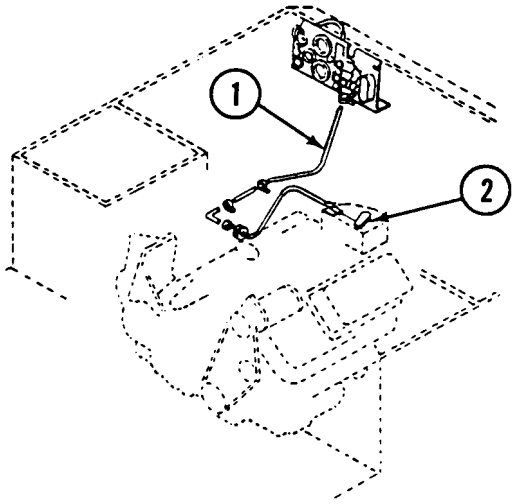
1. Adjust hand throttle (WP 0193 00).
2. Replace hand throttle if needed (WP 0192 00).
3. Verify no faults found.

YES

ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A3)—Continued **0017 00**

3AY

1. Inspect fuel cutoff control cable assembly (1) and fuel cutoff lever (2).
2. Is fuel cutoff control cable assembly and fuel cutoff lever in good condition and working properly?



NO

3AYN

1. Adjust/replace fuel cutoff cable (WP 0205 00).
2. Verify no faults found.

YES

4AY

1. Inspect accelerator linkage for bent, loose, broken, or missing parts.
2. Check accelerator linkage adjustment (WP 0200 00).
3. Are accelerator linkage parts in good condition, correctly adjusted, and working properly?

NO

4AYN

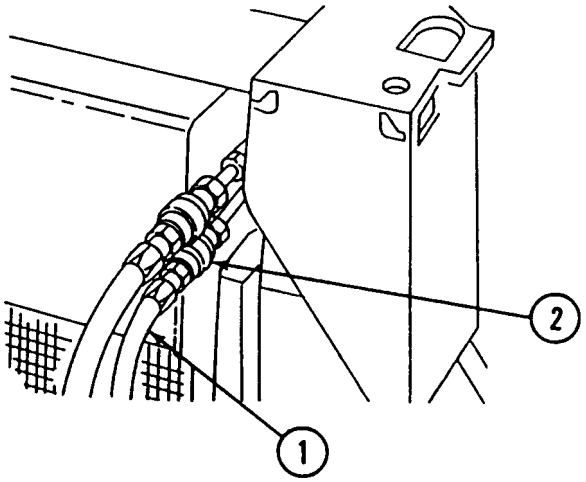
1. Repair/adjust accelerator linkage parts (WP 0200 00).
2. Verify no faults found.

YES

ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A3)—Continued **0017 00**

5AY

1. Open fuel return hose (1) at quick disconnect (2).
2. Remove half of quick disconnect coupling from fuel return hose.
3. Insert hose into suitable container of at least one gallon (4 liter) capacity.
4. Turn MASTER SWITCH ON.
5. Start and run engine at 2200 rpm for one minute (see your -10).
6. Stop engine (see your -10).
7. Did fuel flow at least 2/3 gallon (2.5 liters) per minute?



NO → GO TO **BY** (PAGE 0017 00-6)

YES

6AY

1. Submerge hose in fuel.
2. Start engine and run at 1200 rpm for 30 seconds (see your -10).
3. Stop engine (see your -10).
4. Are air bubbles appearing on the surface of the fuel?

NO →

6AYN

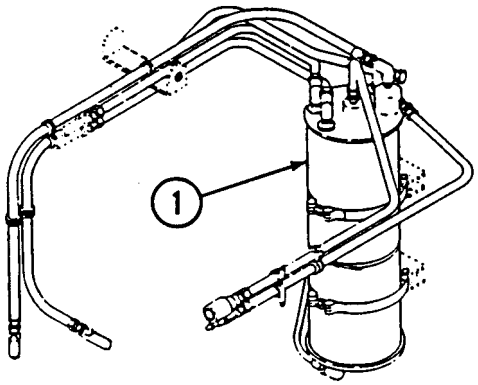
1. Problem is quick disconnect.
2. Remove and completely clean both supply and return quick disconnects.
3. Install quick disconnects on hoses.
4. Connect hoses to supply and return lines. Make sure quick disconnects snap firmly into place.
5. Verify no faults found.

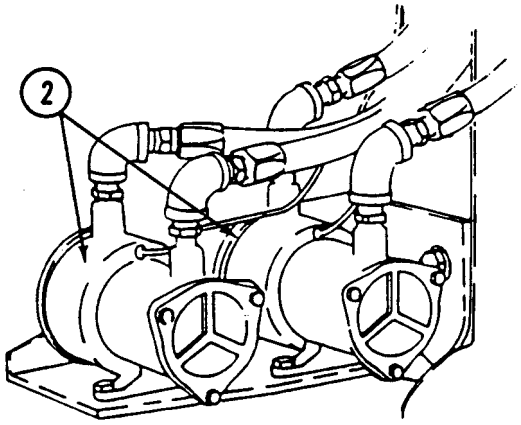
YES

ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A3)—Continued **0017 00**

7AY

1. Air leak in suction side of fuel system.
2. Tighten all connections from the air separator (1) to the electric fuel pumps (2).

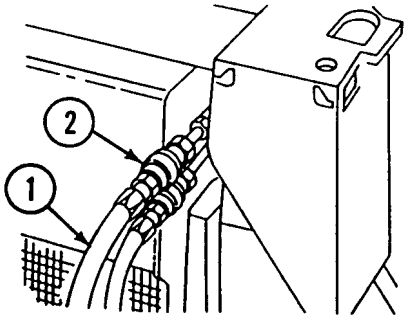




3. Verify no faults found.

BY

1. Install half of quick disconnect on hose.
2. Connect hose to fuel return line. Make sure quick disconnect snaps firmly into place.
3. Open fuel supply hose (1) at quick disconnect (2).
4. Remove half of quick disconnect coupling from fuel supply hose.
5. Insert hose into suitable container of at least one gallon (4 liter) capacity.
6. Turn MASTER SWITCH ON.
7. Run fuel pumps for one minute after fuel flow starts from hose.
8. Turn MASTER SWITCH OFF.
9. Did fuel flow at least $1\frac{1}{4}$ quarts (1.2 liters) per minute?

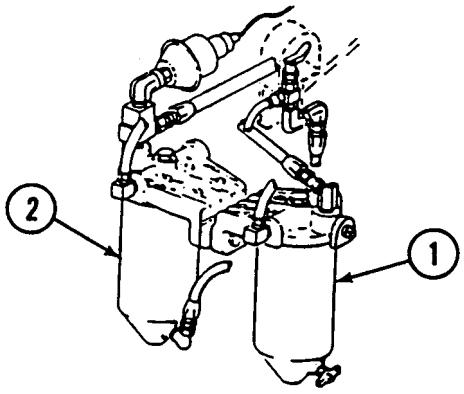


NO → GO TO **CY** (PAGE 0017 00-7)

YES

2BY

1. Bleed air from both primary (1) and secondary (2) fuel filters, or replace both filters (WP 0178 00), if needed.
2. Did fuel flow improve?



NO → GO TO **DY** (PAGE 0017 00-9)

YES

ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A3)—Continued **0017 00**

3BY

1. Insert hose into suitable container of at least one gallon (4 liter) capacity.
2. Turn MASTER SWITCH ON.
3. Start and run engine at 1200 rpm for one minute (see your -10).
4. Stop engine (see your -10).
5. Did fuel flow at least 2/3 gallon (2.5 liters) per minute?

NO → GO TO **EY** (PAGE 0017 00-10)

YES

4BY

1. Problem was clogged fuel filters.
2. Verify no faults found.

CY

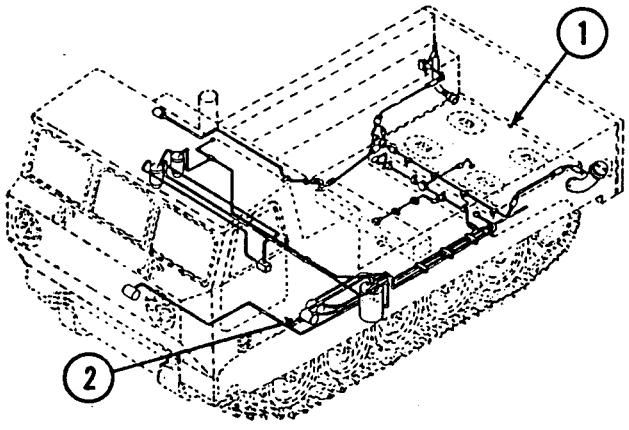
1. Submerge hose in fuel.
2. Turn MASTER SWITCH ON
3. Run fuel pumps for 30 seconds.
4. Turn MASTER SWITCH OFF.
5. Are air bubbles appearing on the surface of the fuel?

NO → GO TO **FY** (PAGE 0017 00-8)

YES

2CY

1. Air leak in suction side of fuel system.
2. Tighten all connections from the fuel tank (1) to electric fuel pumps (2).



3. Verify no faults found.

ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A3)—Continued **0017 00**

FY

1. Check and see if both electric fuel pumps are working.
2. Are both electric fuel pumps working?

NO → GO TO **GY** (PAGE 0017 00-9)

YES

2FY

1. Flow test electric fuel pumps (WP 0148 00).
2. Is fuel flow from electric fuel pumps $1\frac{1}{2}$ to $2\frac{1}{2}$ quarts (1.4 to 2.4 liters) per minute?

NO → **2FYN**

1. Replace defective electric fuel pumps (WP 0151 00).
2. Verify no faults found.

YES

3FY

1. Inspect fuel lines and connections.
2. Tighten hose connections between fuel compartment and electric fuel pumps if needed.
3. Remove left rear and right forward fuel access covers (WP 0163 00).
4. Clean screens at the end of each tube.
5. Remove blockage from pickup tubes.
6. Are any fuel lines kinked or leaking?

NO → **3FYN**

1. Internal fuel restriction. Beyond unit repair.
2. Notify your supervisor.

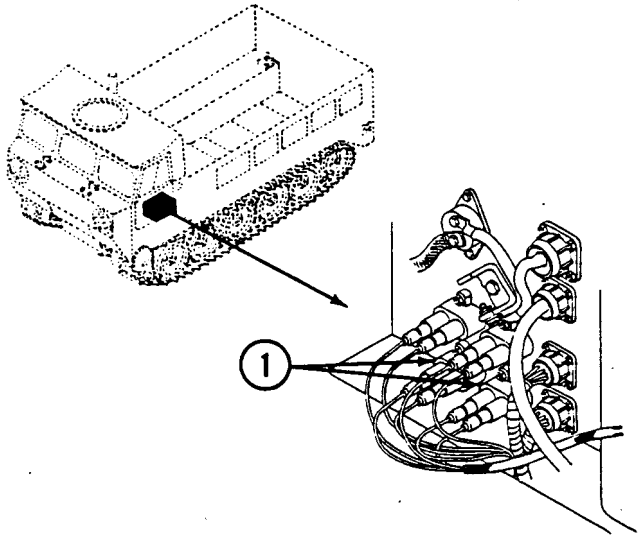
YES

4FY

1. Install left rear and right forward fuel compartment access covers (WP 0163 00).
2. Tighten and/or replace fuel lines as needed (WP 0168 00).
3. Verify no faults found.

GY

1. Check fuel pump circuit breakers (1).
2. Is one or both circuit breakers tripped?



NO →

GYN

1. Service electric fuel pumps (WP 0148 00) or replace fuel pumps (WP 0151 00).
2. Verify no faults found.

YES ↓

2GY

1. Problem was tripped circuit breaker.
2. If circuit breaker continues to trip, troubleshoot electric circuitry until fault is found.
3. Verify no faults found.

DY

1. Inspect fuel lines on engine between secondary fuel filter and engine cylinder heads.
2. Inspect fuel lines on engine between right engine cylinder head and left cylinder head.
3. Inspect fuel lines on engine between engine cylinder head and restrictor block.
4. Are any fuel lines kinked or leaking?

NO → GO TO **HY** (PAGE 0017 00-11)

YES ↓

ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A3)—Continued **0017 00**

2DY

1. Tighten and/or replace fuel lines as needed (WP 0168 00).
2. Verify no faults found.

EY

1. Inspect fuel lines on engine between secondary fuel filter and engine cylinder heads.
2. Inspect fuel lines on engine between right engine cylinder head and left cylinder head.
3. Inspect fuel lines on engine between engine cylinder head and restrictor block.
4. Are any fuel lines kinked or leaking?

NO

EYN

1. Replace engine fuel pump (WP 0150 00).
2. Verify no faults found.

YES

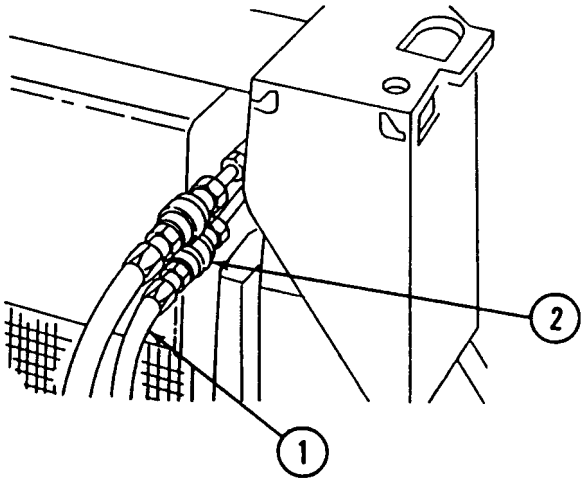
2EY

1. Tighten and/or replace fuel lines as needed (WP 0168 00).
2. Verify no faults found.

ENGINE RUNS ROUGH, STALLS, OR DOES NOT PUT OUT FULL POWER (M548A3)—Continued **0017 00**

HY

1. Replace engine fuel pump (WP 0150 00).
2. Open fuel return hose (1) at quick disconnect (2).
3. Remove half of quick disconnect coupling from fuel return hose.
4. Insert hose into suitable container of at least one gallon (4 liter) capacity.
5. Turn MASTER SWITCH ON.
6. Start and run engine at 2200 rpm for one minute (see your -10).
7. Stop engine (see your -10).
8. Did fuel flow at least 2/3 gallon (2.5 liters) per minute?



NO

HYN

1. Internal engine fuel restriction. Beyond unit repair.
2. Notify your supervisor.

YES

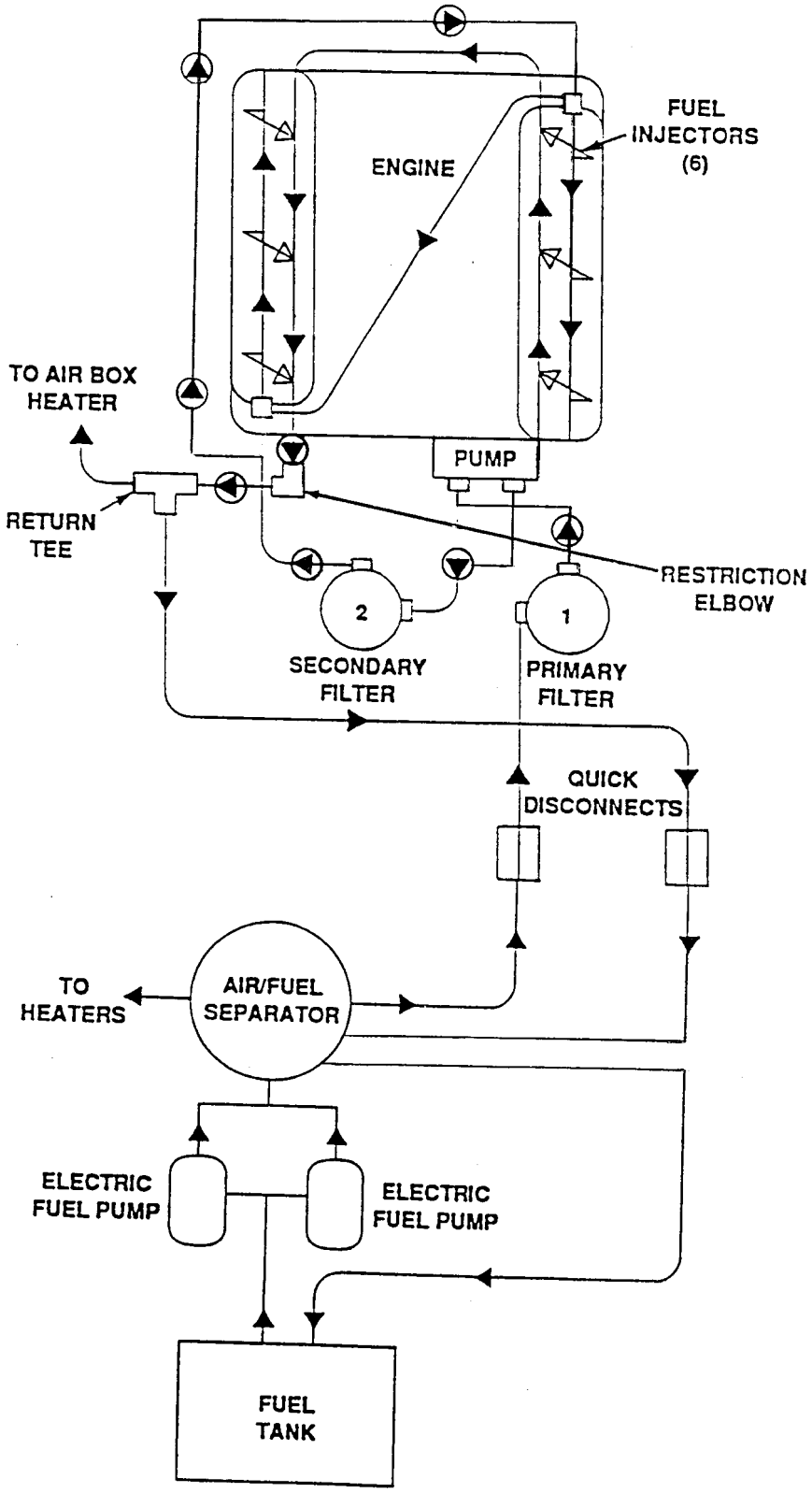
2HY

1. Problem was engine fuel pump.
2. Verify no faults found.

ENGINE FUEL SYSTEM SCHEMATIC 0018 00

DESCRIPTION

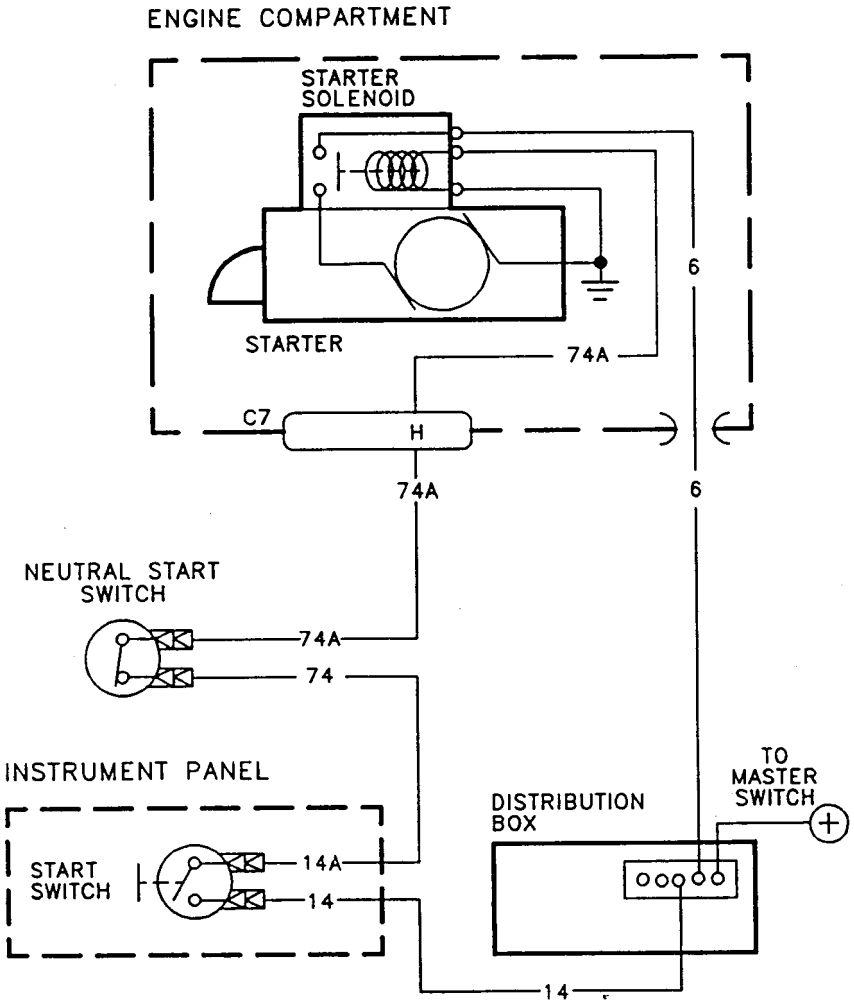
Use the schematic below as an aid for performing system troubleshooting procedures.



STARTING SYSTEM SCHEMATIC (M548A1) 0019 00

DESCRIPTION

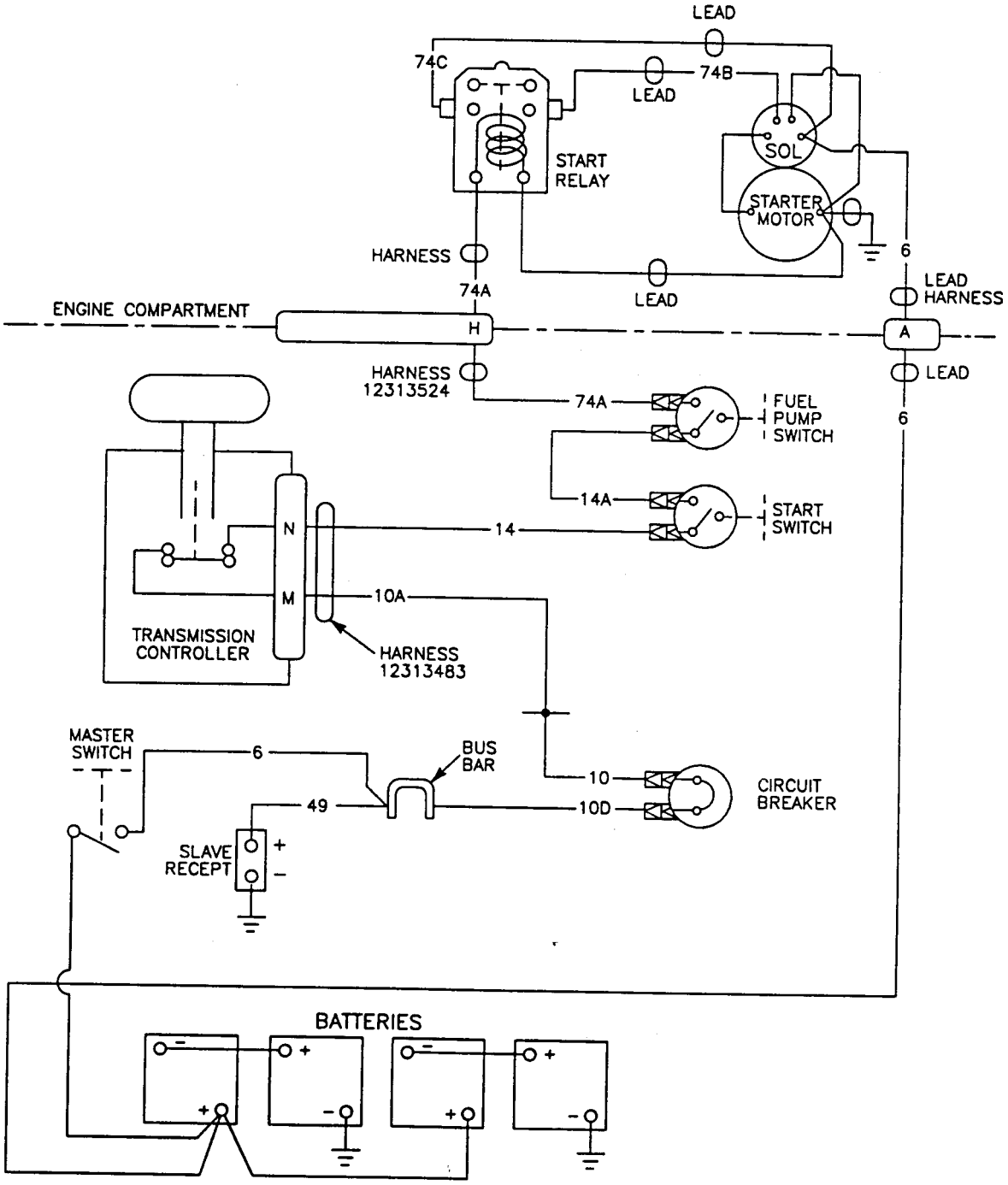
Use the schematic below as an aid for performing system troubleshooting procedures.



STARTING SYSTEM SCHEMATIC (M548A3) 0020 00

DESCRIPTION

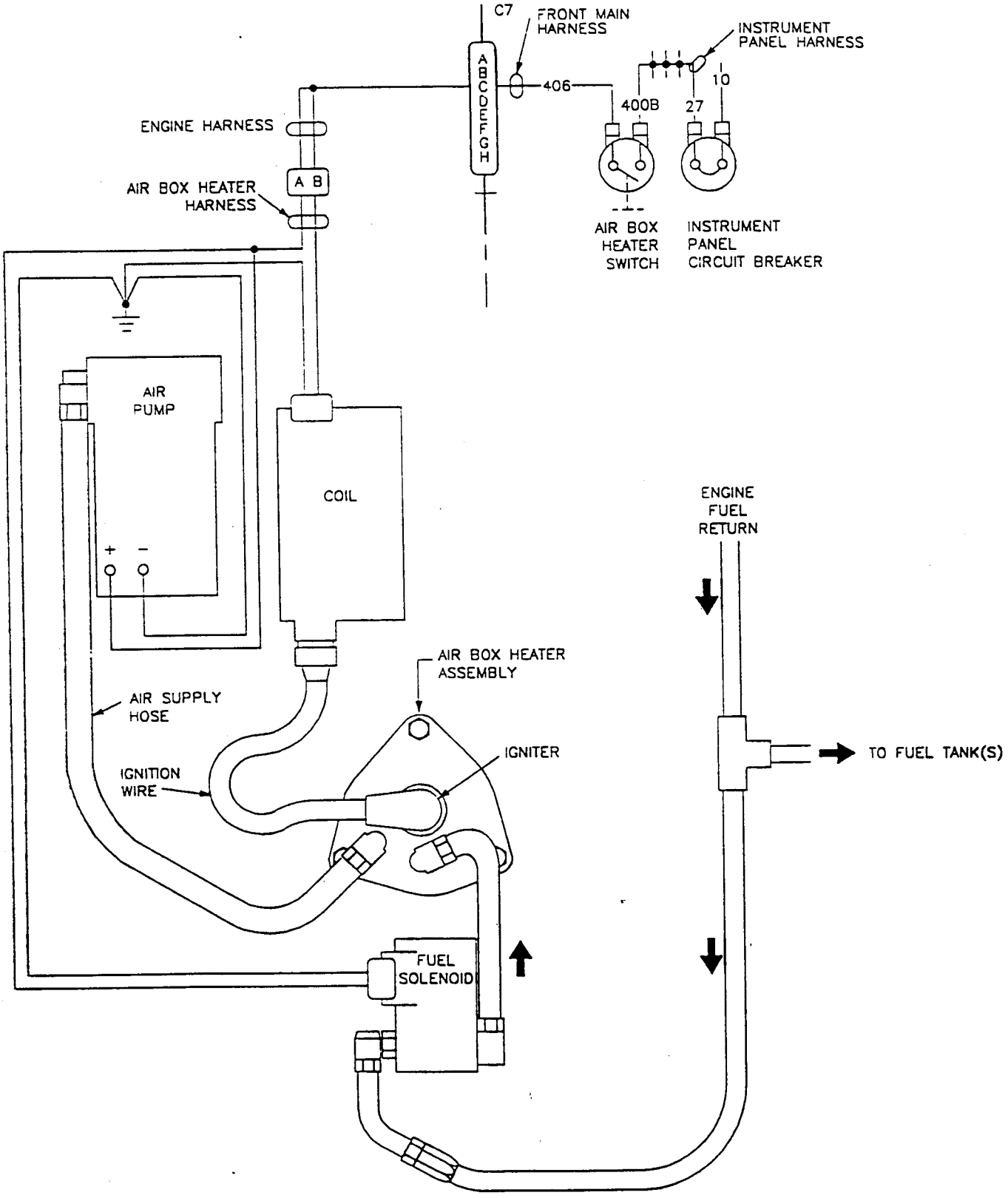
Use the schematic below as an aid for performing system troubleshooting procedures.



AIR BOX HEATER SYSTEM SCHEMATIC 0021 00

DESCRIPTION

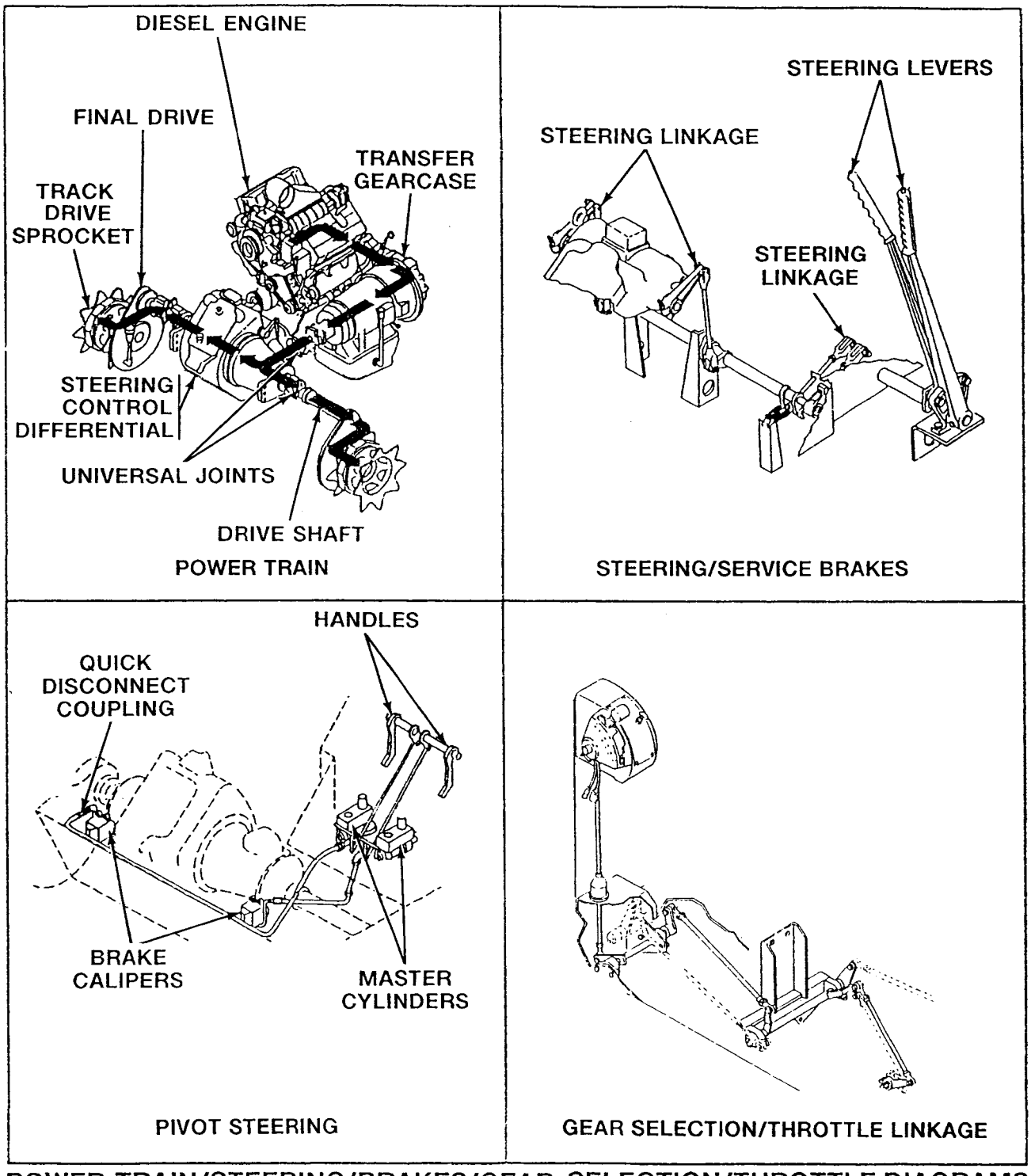
Use the schematic below as an aid for performing system troubleshooting procedures.



POWER TRAIN/STEERING/BRAKES/GEAR SELECTION/THROTTLE DIAGRAMS 0022 00

DESCRIPTION

Use the diagrams below as an aid for performing system troubleshooting procedures.



POWER TRAIN/STEERING/BRAKES/GEAR SELECTION/THROTTLE DIAGRAMS

100 AMP CHARGING SYSTEM MALFUNCTIONS (M548A1) 0023 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
STE/ICE-R Test Set (WP 0541 00, Item 6)
Multimeter (WP 0541 00, Item 29)
Jumper Wire

Personnel Required

Unit Mechanic

References

See your -10
(WP 0108 00)

Equipment Condition

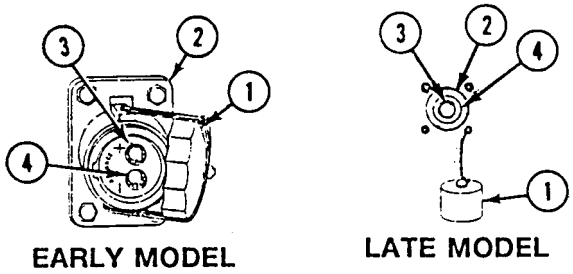
Engine stopped (see your -10)
Carrier blocked (see your -10)
Engine disconnect lever IN (see your -10)
Power plant rear access door/panel removed (see your -10)
Cab personnel seats raised (see your -10)

T

NOTE

There is an early and late model of auxiliary power receptacle. Both early and late models are shown.

1. Start engine and run at 1200 rpm (see your -10).
2. Remove cover (1) from auxiliary power receptacle (2).
3. Measure voltage between contacts (+) (3) and (-) (4) on auxiliary power receptacle (2).
4. Does multimeter read less than 26 or more than 29 volts?



NO → **TN**

1. Stop engine (see your -10).
2. Go to battery/generator indicator malfunctions (WP 0052 00).

YES ↓

Y

NOTE

If no voltage is present the generator field switch may be defective.

1. Check generator field switch (WP 0288 00).
2. Has regulator been adjusted?

NO → **YN**

1. Adjust regulator (WP 0249 00).
2. Verify no faults found.

YES ↓

2Y

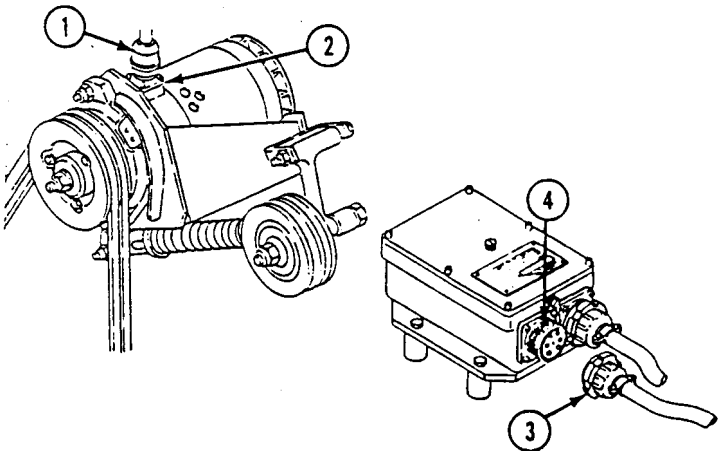
1. Check multimeter reading.
2. Does multimeter read less than 29 volts?

NO → GO TO **BY** (PAGE 0023 00-7)

YES

3Y

1. Stop engine (see your -10).
2. Remove harness plug C6 (1) from generator jack (2) and harness plug C3 (3) from regulator jack (4).
3. Inspect harness plugs C6 (1) and C3 (3), generator jack (2), and regulator jack (4) for corrosion and damage.
4. Are plugs and jacks clean and in good condition?



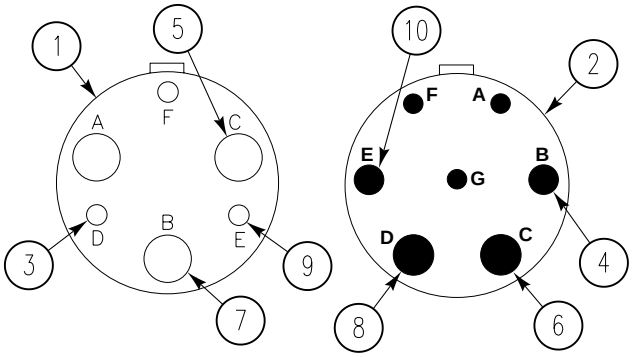
NO → **3YN**

1. Repair/replace harness and/or generator (WP 0242 00 or WP 0246 00).
2. Verify no faults found.

YES

4Y

1. Measure resistance between harness plug C6 (1) and plug C3 (2), sockets D (3) to B (4), C (5) to C (6), B (7) to D (8), and E (9) to E (10).
2. Does multimeter read 0 ohms each time?



NO →

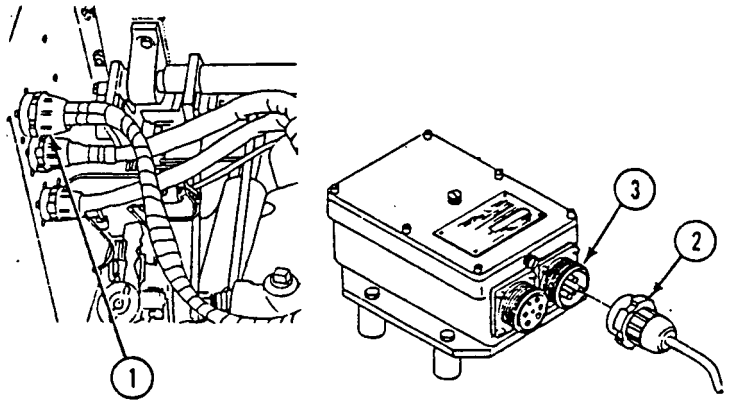
4YN

1. Repair/replace harness (WP 0294 00).
2. Verify no faults found.

YES ↓

5Y

1. Install harness plug C6 on generator jack.
2. Remove harness plug (1) from bulkhead and plug C2 (2) from regulator jack C2 (3).
3. Inspect harness plug C2 (2) and regulator jack C2 (3) for corrosion and damage.
4. Is plug and jack in clean and good condition?



NO →

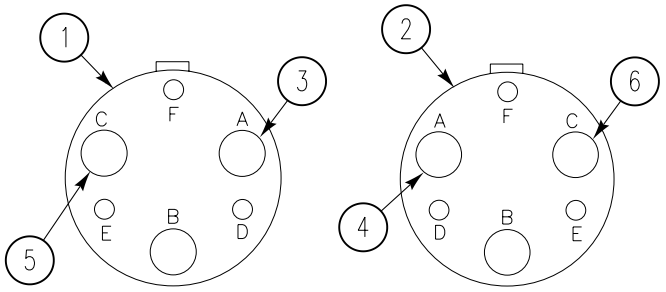
5YN

1. Repair/replace harness and/or regulator (WP 0294 00 or WP 0249 00).
2. Verify no faults found.

YES ↓

6Y

1. Measure resistance between harness plugs (1) and C2 (2), sockets A (3) to A (4) and C (5) to C (6).
2. Does multimeter read 0 ohms each time?



NO →

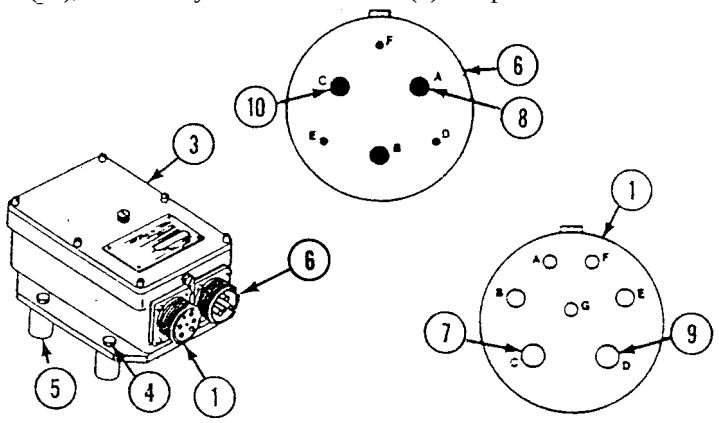
6YN

1. Repair/replace harness (WP 0294 00).
2. Verify no faults found.

YES ↓

7Y

1. Remove four screws (4) and regulator (3) from regulator plate (5).
2. Measure resistance between regulator jack (1), regulator jack (6), socket C (7) to pin A (8), and socket D (9) to pin C (10).
3. Does multimeter read 0 ohms between socket D (9) and pin C (10), and infinity between socket C (7) and pin A?



NO →

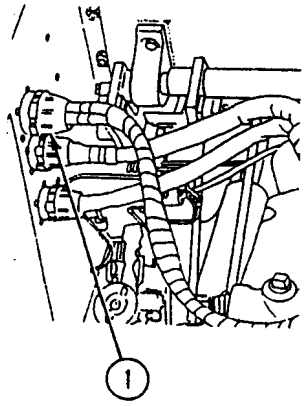
7YN

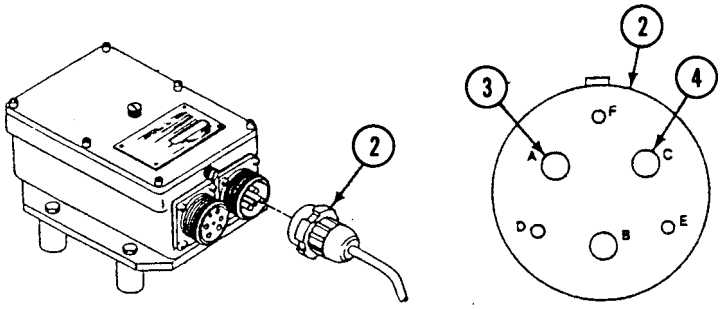
1. Replace regulator (WP 0249 00).
2. Verify no faults found.

YES ↓

8Y

1. Connect bulkhead connector (1) to bulkhead.
2. Measure voltage between harness plug C2 (2), socket A (+) (3) and ground, and socket C (+) (4) and ground.
3. Does multimeter read more than 17 volts?





NO →

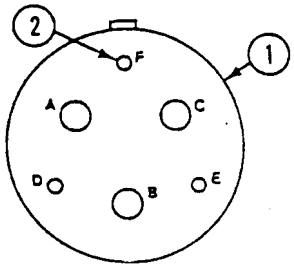
8YN

1. Repair wiring harness circuit 2 or 2A (WP 0294 00).
2. Verify no faults found.

YES ↓

9Y

1. Start engine and let idle (see your -10).
2. Measure voltage between harness plug C2 (1), socket F (2), and ground.
3. Does multimeter read less than 17 volts?



NO →

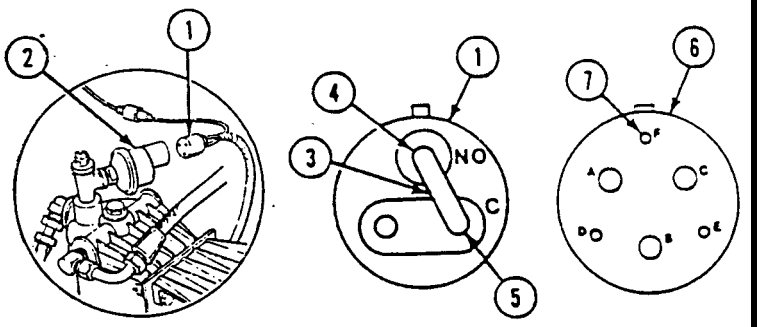
9YN

1. Stop engine (see your -10).
2. Replace generator and regulator assemblies (WP 0242 00 or WP 0246 00).
3. Verify no faults found.

YES ↓

10Y

1. Stop engine (see your -10).
2. Install regulator on regulator plate.
3. Remove engine harness plug (1) from generator field switch jack (2).
4. Install jumper (3) on engine harness plug (1) between pins NO (4) and C (5).
5. Turn MASTER SWITCH ON.
6. Measure voltage between harness plug C2 (6), pin F (7), and ground.
7. Does multimeter read less than 17 volts?



NO →

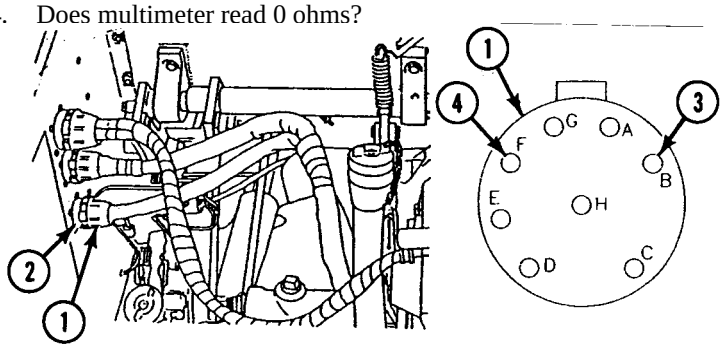
10YN

1. Replace generator field switch (WP 0288 00).
2. Verify no faults found.

YES ↓

11Y

1. Turn MASTER SWITCH OFF.
2. Remove engine harness plug C1 (1) from harness bulkhead jack C1 (2).
3. Measure resistance between C1 plug (1), pins B (3), and F (4).
4. Does multimeter read 0 ohms?



NO →

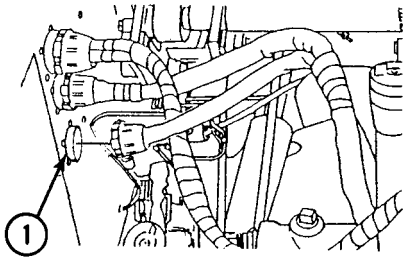
11YN

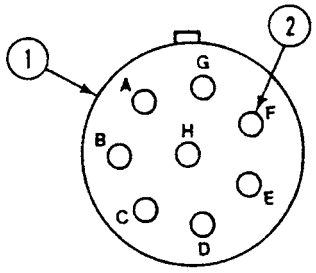
1. Remove jumper wire from generator field switch plug.
2. Measure resistance between plug C1, pin F, and engine harness plug socket NO. If multimeter reads 0 ohms, see step 4.
3. Measure resistance between plug C1, pin B, and engine harness plug socket C. If multimeter reads 0 ohms, see step 4.
4. Repair engine harness circuit 1A or 1B (WP 0294 00).
5. Verify no faults found.

YES ↓

12Y

1. Remove jumper wire from engine harness plug.
2. Install engine harness on generator field switch.
3. Turn MASTER SWITCH ON.
4. Measure voltage between harness bulkhead jack C1 (1) pin F (2) to ground.
5. Turn MASTER SWITCH OFF.
6. Did multimeter read more than 17 volts?





NO → **12YN**

1. Disconnect battery ground strap.
2. Install harness plug C2 on regulator jack.
3. Install battery ground strap.
4. Repair harness circuit 1A (WP 0294 00).
5. Verify no faults found.

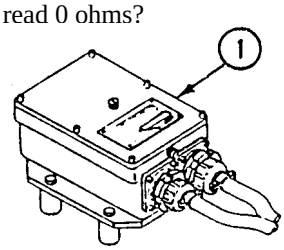
YES ↓

13Y

1. Repair harness circuit 1B (WP 0294 00).
2. Verify no faults found.

BY

1. Stop engine (see your -10).
2. Measure resistance between regulator housing (1) and ground.
3. Does multimeter read 0 ohms?



NO → **BYN**

1. Remove regulator (WP 0250 00 or WP 0251 00) and clean ground contacts (bolted surface).
2. Install regulator.
3. Verify no faults found.

YES ↓

2BY

1. Check regulator.
2. Has regulator been replaced?

NO → **2BYN**

1. Replace regulator (WP 0250 00 or WP 0251 00).
2. Verify no faults found.

YES ↓

3BY

1. Replace generator (WP 0242 00 or WP 0246 00).
2. Verify no faults found.

200 AMP CHARGING SYSTEM OPERATIONAL CHECK (M548A3) 0024 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

References

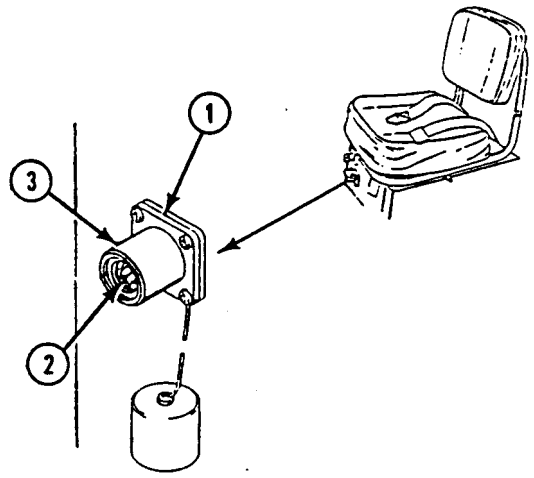
See your -10
TM 9-6140-200-14

Equipment Condition

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

T

1. Turn MASTER SWITCH ON.
2. Measure battery voltage at auxiliary power receptacle (1). Measure voltage between center contact (+) (2) and shell (-) (3) of receptacle.
3. Is battery voltage more than 24.8 volts?



NO

TN

1. Replace or charge batteries. See TM 9-6140-200-14.
2. Verify no faults found.

YES

Y

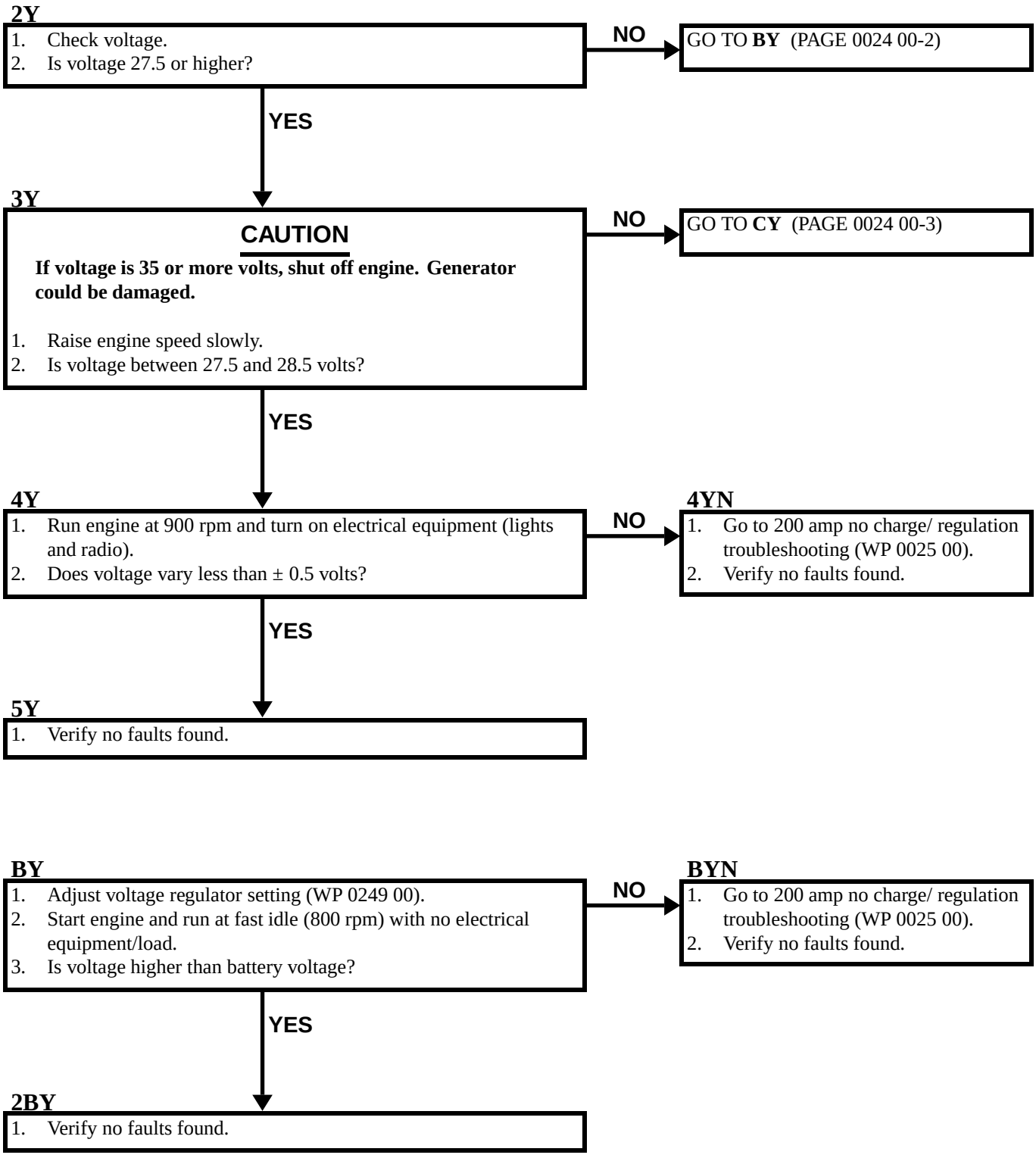
1. Start engine and run at fast idle (800 rpm) with no electrical equipment/load.
2. Is voltage higher than battery voltage?

NO

YN

1. Go to 200 amp no charge/ regulation troubleshooting (WP 0025 00).
2. Verify no faults found.

YES


2Y
1. Check voltage.
2. Is voltage 27.5 or higher?
NO
GO TO BY (PAGE 0024 00-2)
YES
3Y
CAUTION
If voltage is 35 or more volts, shut off engine. Generator could be damaged.
1. Raise engine speed slowly.
2. Is voltage between 27.5 and 28.5 volts?
NO
GO TO CY (PAGE 0024 00-3)
YES
4Y
1. Run engine at 900 rpm and turn on electrical equipment (lights and radio).
2. Does voltage vary less than ± 0.5 volts?
NO
4YN
1. Go to 200 amp no charge/ regulation troubleshooting (WP 0025 00).
2. Verify no faults found.
YES
5Y
1. Verify no faults found.
BY
1. Adjust voltage regulator setting (WP 0249 00).
2. Start engine and run at fast idle (800 rpm) with no electrical equipment/load.
3. Is voltage higher than battery voltage?
NO
BYN
1. Go to 200 amp no charge/ regulation troubleshooting (WP 0025 00).
2. Verify no faults found.
YES
2BY
1. Verify no faults found.

CY

1. Raise engine speed slowly.
2. Is voltage below 34 volts?

NO →

CYN

1. Replace voltage regulator (WP 0251 00).
2. Verify no faults found.

YES ↓

2CY

1. Check voltage.
2. Does voltage climb to 32 to 34 volts and immediately drop to battery voltage?

NO → GO TO **DY** (PAGE 0024 00-3)

YES ↓

3CY

1. Go to 200 amp over voltage troubleshooting (WP 0027 00).
2. Verify no faults found.

DY

1. Check voltage.
2. Does voltage climb above 28.5 volts but below 33 volts and remain constant?

NO →

DYN

1. Go to 200 amp over voltage troubleshooting (WP 0027 00).
2. Verify no faults found.

YES ↓

2DY

1. Go to 200 amp full field charge troubleshooting (WP 0026 00).
2. Verify no faults found.

200 AMP NO CHARGE/REGULATION TROUBLESHOOTING (M548A3) 0025 00

INITIAL SETUP:

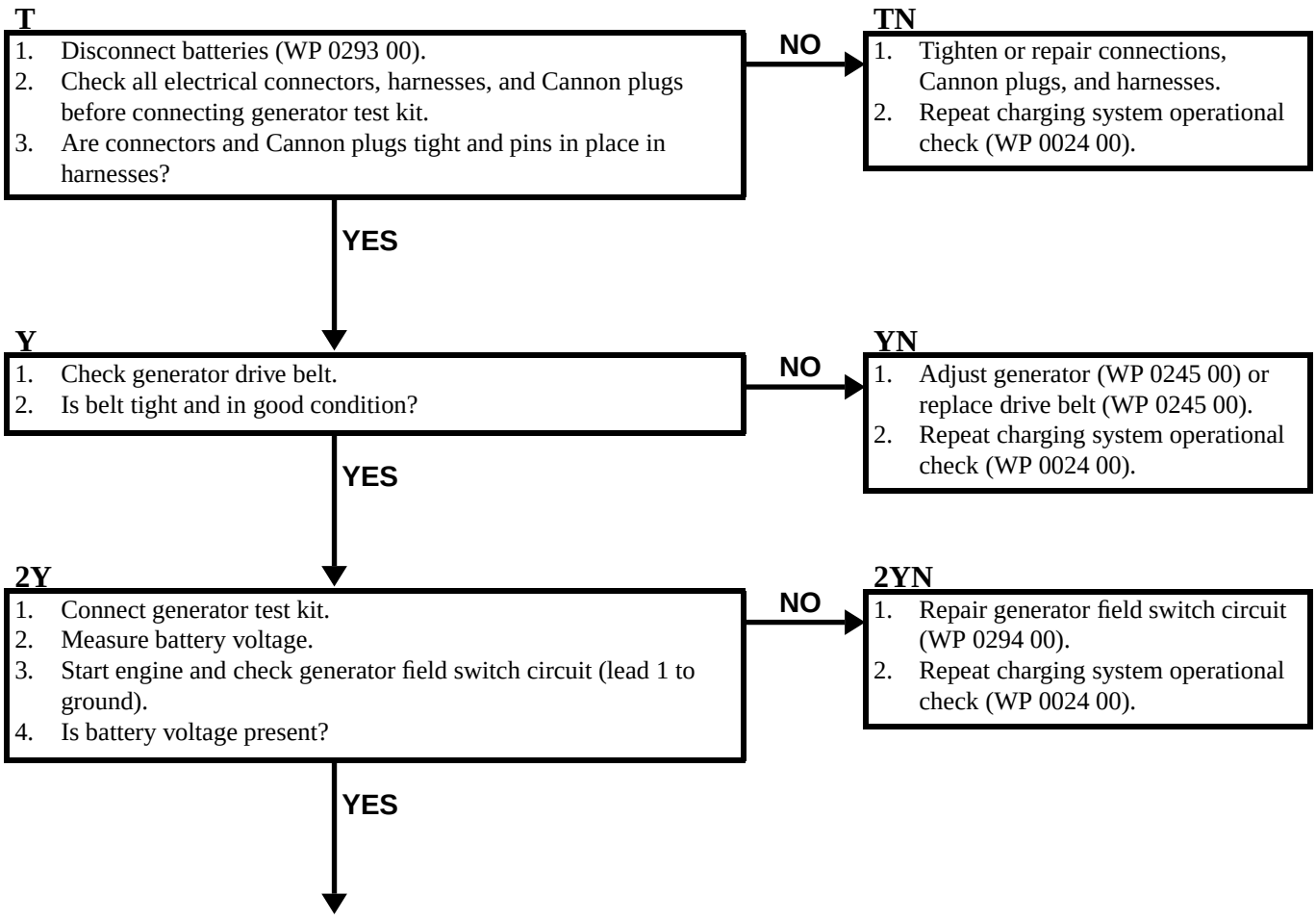
Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Slip Joint Pliers (WP 0541 00, Item 33)
Generator Test Kit (WP 0541 00, Item 53)

Personnel Required
Unit Mechanic

References
See your -10
TM 9-6140-200-14

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
All radios and heaters OFF (see your -10)



3Y

CAUTION

If voltage climbs above 33 or more volts, shut off engine. Generator could be damaged.

1. Check batteries to make sure they are fully charged TM 9-6140-200-14.
2. Turn off all electrical equipment/loads.
3. Adjust rheostat to maximum resistance.
4. Connect diagnostic test harness leads 1 and 4 together.
5. Start engine and run at 800 rpm and lower resistance.
6. Does voltage rise above battery voltage (test harness lead 3 to ground) to approximately 28 volts?

NO

3YN

1. Disconnect generator test kit.
2. Replace generator (200 amp) (WP 0246 00).
3. Repeat charging system operational check (WP 0024 00).

YES

4Y

1. Disconnect generator test kit.
2. Replace voltage regulator (200 amp generator) (WP 0251 00).
3. Repeat charging system operational check (WP 0024 00).

200 AMP FULL FIELD CHARGE TROUBLESHOOTING (M548A3) 0026 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Slip Joint Pliers (WP 0541 00, Item 33)
Generator Test Kit (WP 0541 00, Item 53)

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

All radios and heaters OFF (see your -10)

T

1. Disconnect batteries (WP 0293 00).
2. Check all electrical connectors, harnesses, and Cannon plugs before connecting generator test kit.
3. Are connectors and Cannon plugs tight and pins in place in harnesses?

NO →

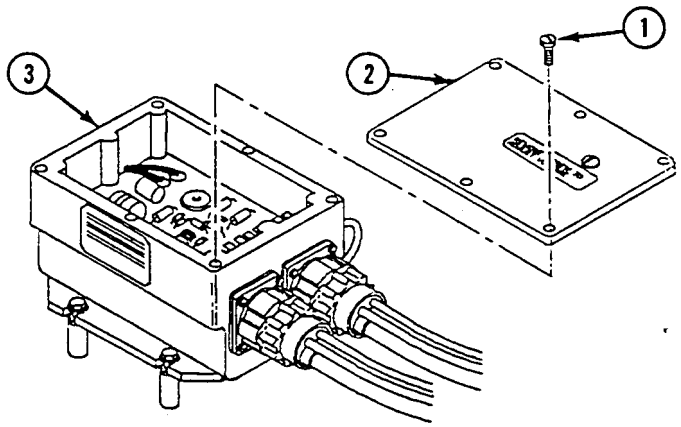
TN

1. Tighten or repair connections, Cannon plugs, and harnesses.
2. Repeat 200 amp charging system operational check (WP 0024 00).

YES ↓

Y

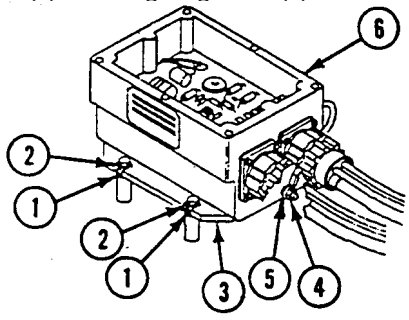
1. Remove six screws (1) and cover (2) from voltage regulator (3).
2. Connect multimeter to clean unpainted surface and carrier ground.
3. Does multimeter read 0.5 ohms or less?



NO →

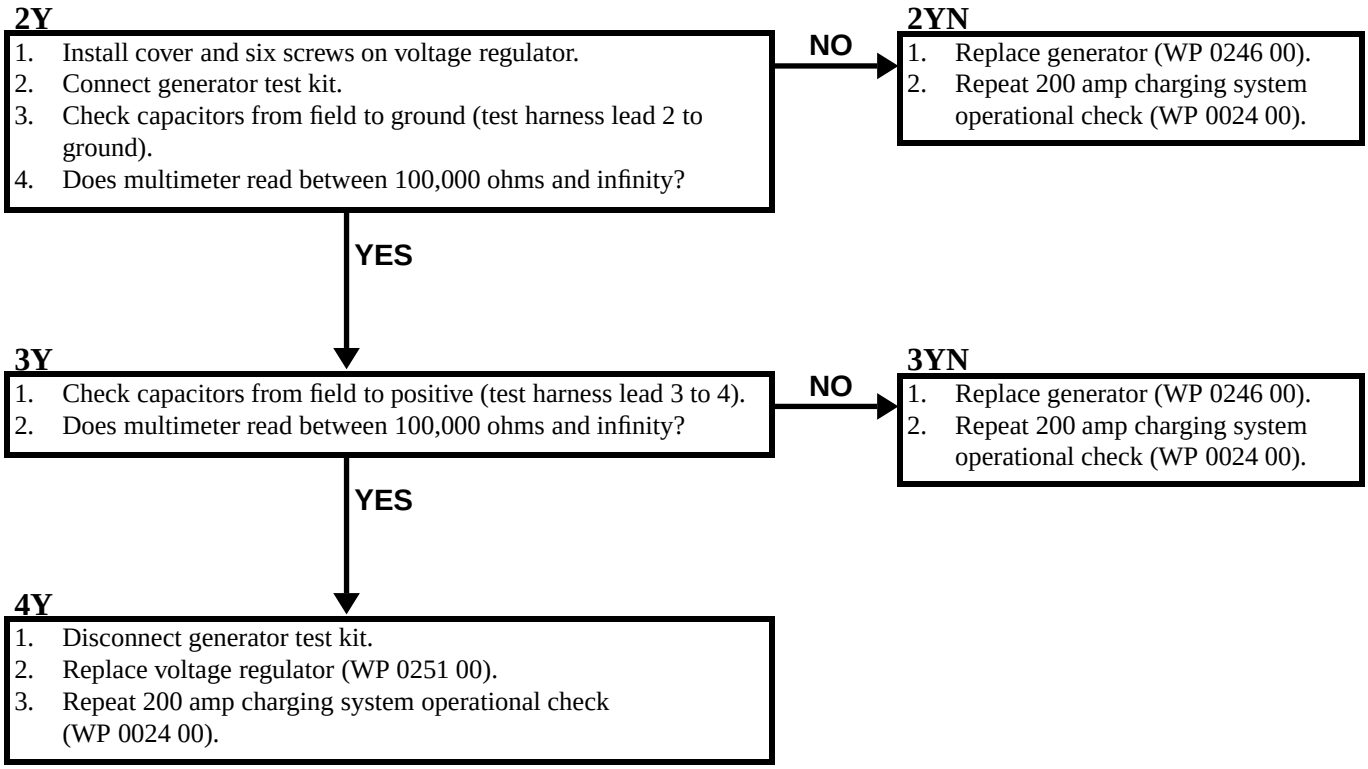
YN

1. Ensure lock washers (1) and screws (2) are tight on plate (3).
2. Tighten nut (4) securing ground lead (5) to voltage regulator (6).



3. Install cover and screws on voltage regulator.
4. Repeat 200 amp charging system operational check (WP 0024 00).

YES ↓


2Y
1. Install cover and six screws on voltage regulator.
2. Connect generator test kit.
3. Check capacitors from field to ground (test harness lead 2 to ground).
4. Does multimeter read between 100,000 ohms and infinity?
NO
2YN
1. Replace generator (WP 0246 00).
2. Repeat 200 amp charging system operational check (WP 0024 00).
YES
3Y
1. Check capacitors from field to positive (test harness lead 3 to 4).
2. Does multimeter read between 100,000 ohms and infinity?
NO
3YN
1. Replace generator (WP 0246 00).
2. Repeat 200 amp charging system operational check (WP 0024 00).
YES
4Y
1. Disconnect generator test kit.
2. Replace voltage regulator (WP 0251 00).
3. Repeat 200 amp charging system operational check (WP 0024 00).

200 AMP OVER VOLTAGE TROUBLESHOOTING (M548A3) 0027 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Generator Test Kit (WP 0541 00, Item 53)

Personnel Required
Unit Mechanic

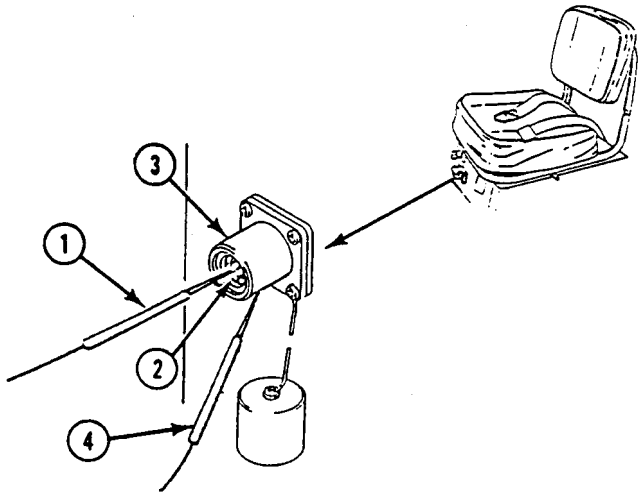
References
See your -10
TM 9-6140-200-14

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

T

1. Turn MASTER SWITCH ON.
2. Measure battery voltage by placing red lead (1) in positive socket of NATO plug (2) on auxiliary power (slave) receptacle (3). Touch black negative lead (4) to outside of NATO plug on receptacle.
3. Adjust 200 amp voltage regulator to lowest setting (WP 0249 00).
4. Start engine (see your -10) and accelerate.
5. Does voltage climb to 32 to 34 volts and suddenly drop to battery voltage?

NO → GO TO **BY** (PAGE 0027 00-3)

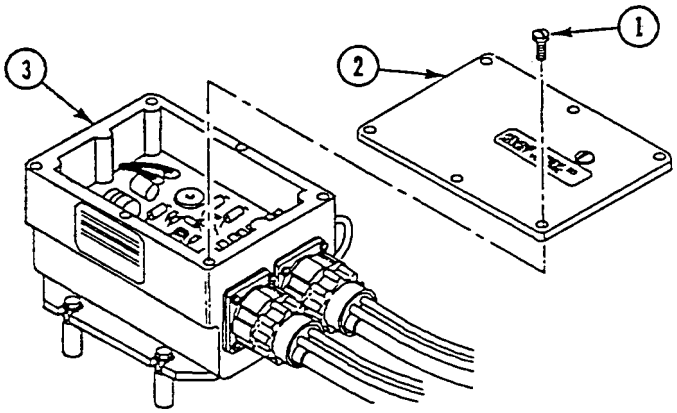


YES

200 AMP OVER VOLTAGE TROUBLESHOOTING (M548A3)—Continued 0027 00

Y

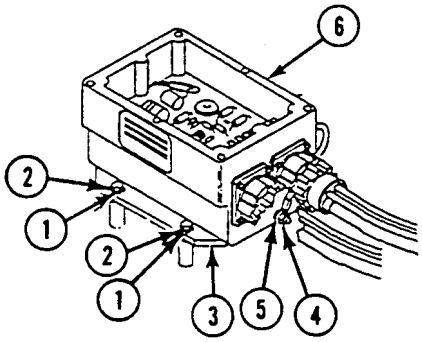
1. Remove six screws (1) and cover (2) from 200 amp voltage regulator (3).
2. Connect multimeter to clean unpainted surface and vehicle ground.
3. Does multimeter read 0.5 ohms or less?



NO

YN

1. Ensure lock washers (1) and screws (2) are tight on plate (3).
2. Tighten nut (4) securing ground lead (5) to 200 amp voltage regulator (6).



3. Install cover and screws on 200 amp voltage regulator.
4. Repeat charging system operational check (WP 0024 00).

YES

2Y

CAUTION

If voltage climbs above 33 or more volts, shut off engine. Generator could be damaged.

1. Install cover and six screws on 200 amp voltage regulator.
2. Connect generator test kit.
3. Check batteries to make sure they are fully charged (see TM 9-6140-200-14.
4. Turn off all electrical equipment/loads.
5. Adjust rheostat to maximum resistance.
6. Connect diagnostic test harness leads 1 and 4 together.
7. Start engine (see your -10) and run at 800 rpm and lower resistance.
8. Does voltage rise above battery voltage (test harness lead 3 to ground) to approximately 28 volts?

NO

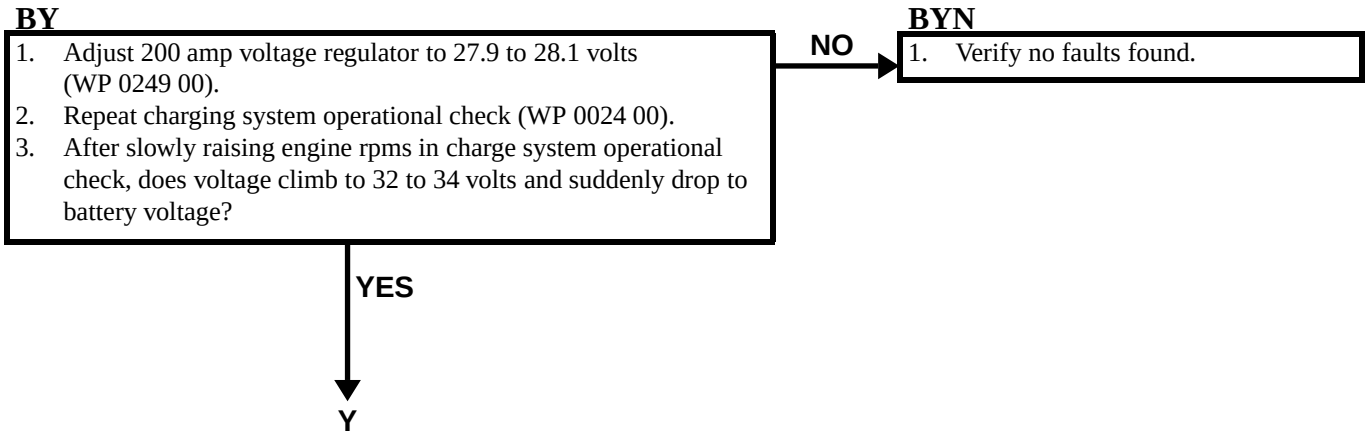
2YN

1. Remove generator test kit.
2. Replace 200 amp generator (WP 0246 00).
3. Repeat charging system operational check (WP 0024 00).

YES

3Y

1. Remove generator test kit.
2. Replace 200 amp voltage regulator (WP 0251 00).
3. Repeat charging system operational check (WP 0024 00).


BY
1. Adjust 200 amp voltage regulator to 27.9 to 28.1 volts (WP 0249 00).
2. Repeat charging system operational check (WP 0024 00).
3. After slowly raising engine rpms in charge system operational check, does voltage climb to 32 to 34 volts and suddenly drop to battery voltage?
NO
BYN
1. Verify no faults found.
YES
Y

CONNECT/DISCONNECT 200 AMP GENERATOR TEST KIT (M548A3) 0028 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Slip Joint Pliers (WP 0541 00, Item 33)
Generator Test Kit (WP 0541 00, Item 53)

Personnel Required
Unit Mech 63T10

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
All radios and heaters turned off (see your -10)
Center seat and driver's seat raised (see your -10)

HOOK-UP

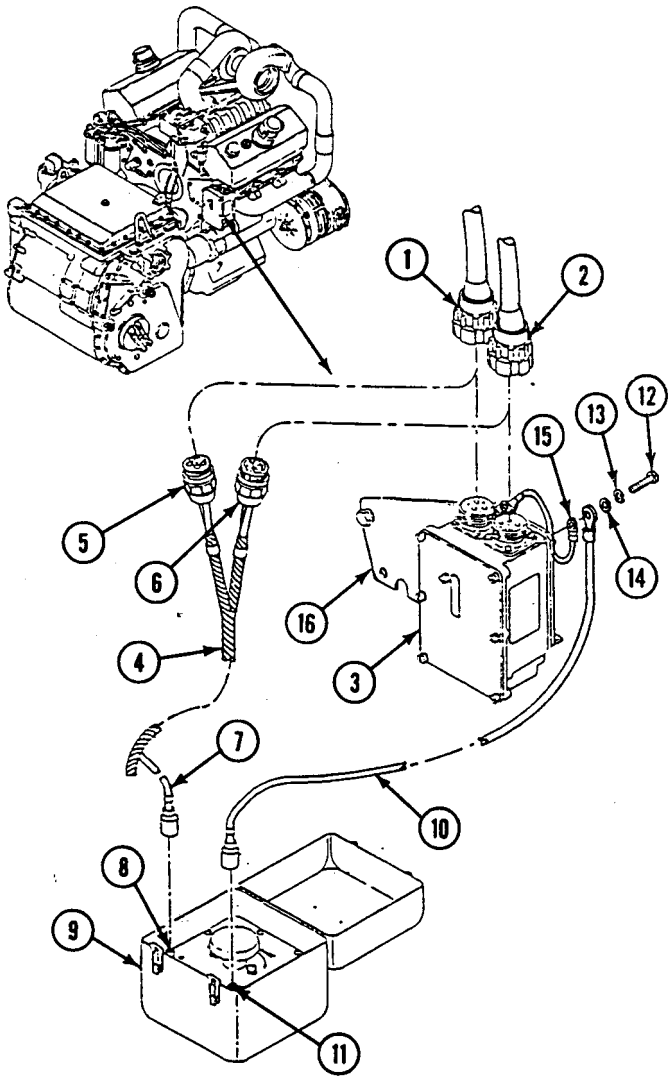
1. Disconnect both battery negative leads (WP 0292 00).
2. Check all electrical connectors and wiring harnesses before connecting generator test kit.
3. Remove plug (1) and plug (2) from voltage regulator (3).
4. Connect diagnostic test wiring harness (4) plug (5) and plug (6) to plug (1) and plug (2).
5. Connect diagnostic test wiring harness (4) lead 2(7) to terminal 5 (8) to test kit rheostat (9).

CAUTION

If ground lead (10) is not connected to chassis and kit rheostat, the generator could be damaged when engine is started.

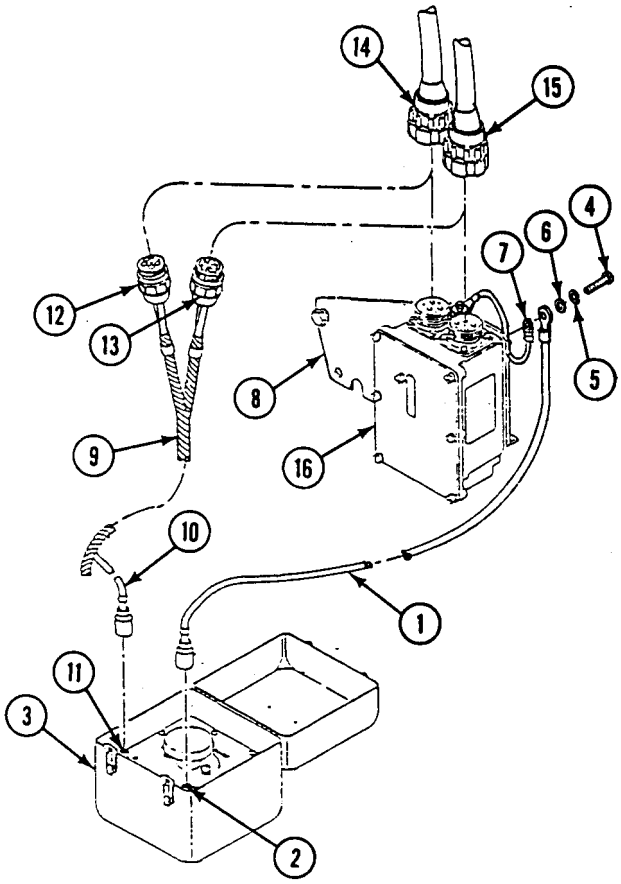
6. Connect kit ground lead (10) to terminal 6 (11) to test kit rheostat (9) and to ground.
   a. Remove screw (12), lock washer(13), washer (14), and ground lead (15) from voltage regulator mounting plate (16).
   b. Install ground lead (10) and ground lead (15) on voltage regulator mounting plate (16) with washer (14), lock washer (13) and screw (12).

7. Connect both battery negative leads (WP 0292 00).



DISCONNECT

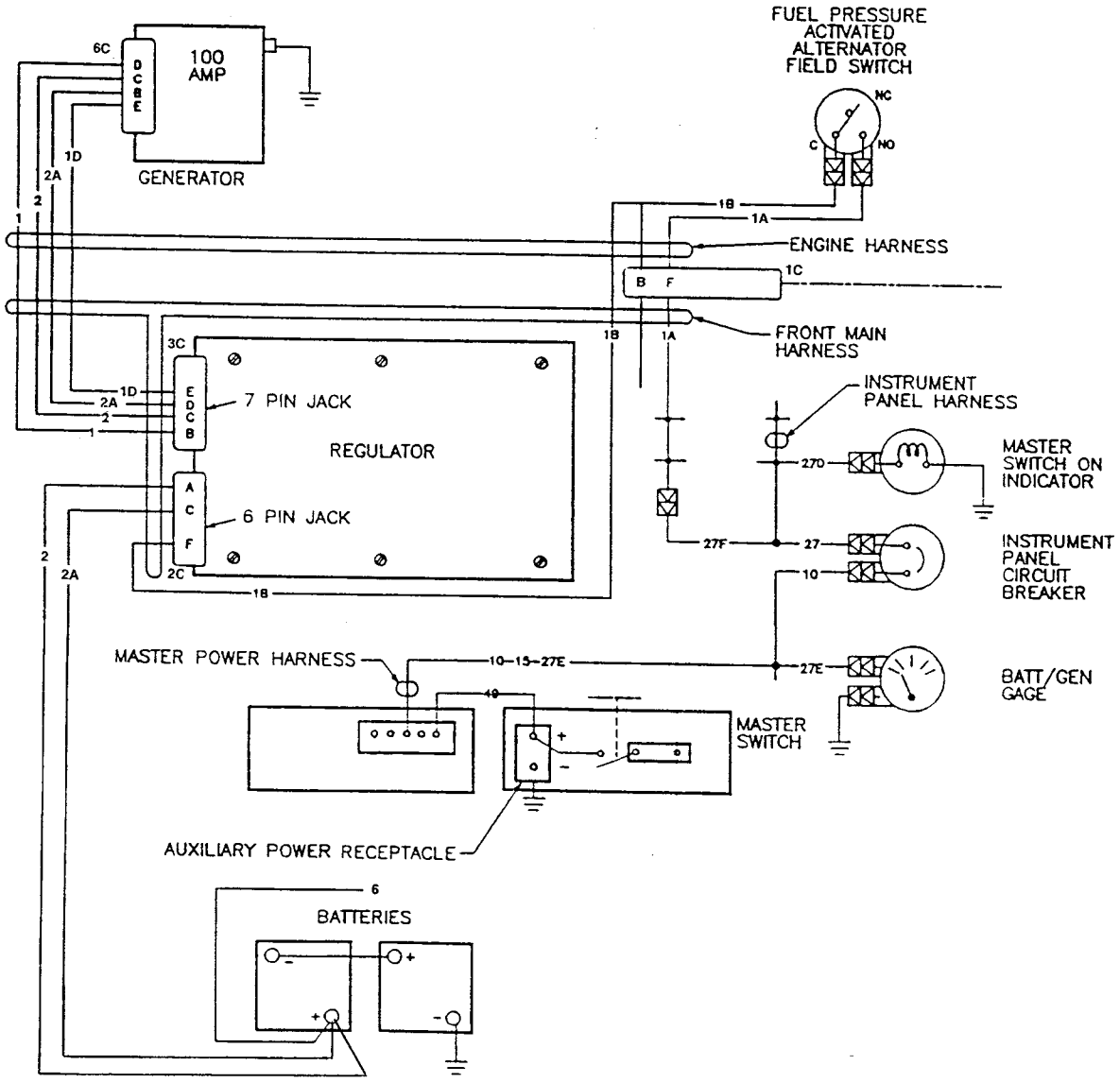
1. Disconnect both battery negative leads (WP 0292 00).
2. Disconnect ground lead (1) from terminal 6 (2) of test kit rheostat (3) and ground.
   a. Remove screw (4), lock washer (5), washer (6), ground lead (1) and ground lead (7) from voltage regulator mounting plate (8).
   b. Install ground lead (7) on voltage regulator mounting plate (8) with washer (6), lock washer (5), and screw (4).
3. Disconnect diagnostic test wiring harness (9) lead 2(10) from terminal 5 (11) of test kit rheostat (3).
4. Disconnect diagnostic test wiring harness (9) plug (12) and plug (13) from plug (14) and plug (15).
5. Connect plug (14) and plug (15) to voltage regulator (16).
6. Connect both battery negative leads (WP 0292 00).



100 AMP ENGINE CHARGING SYSTEM SCHEMATIC (M548A1) 0029 00

DESCRIPTION

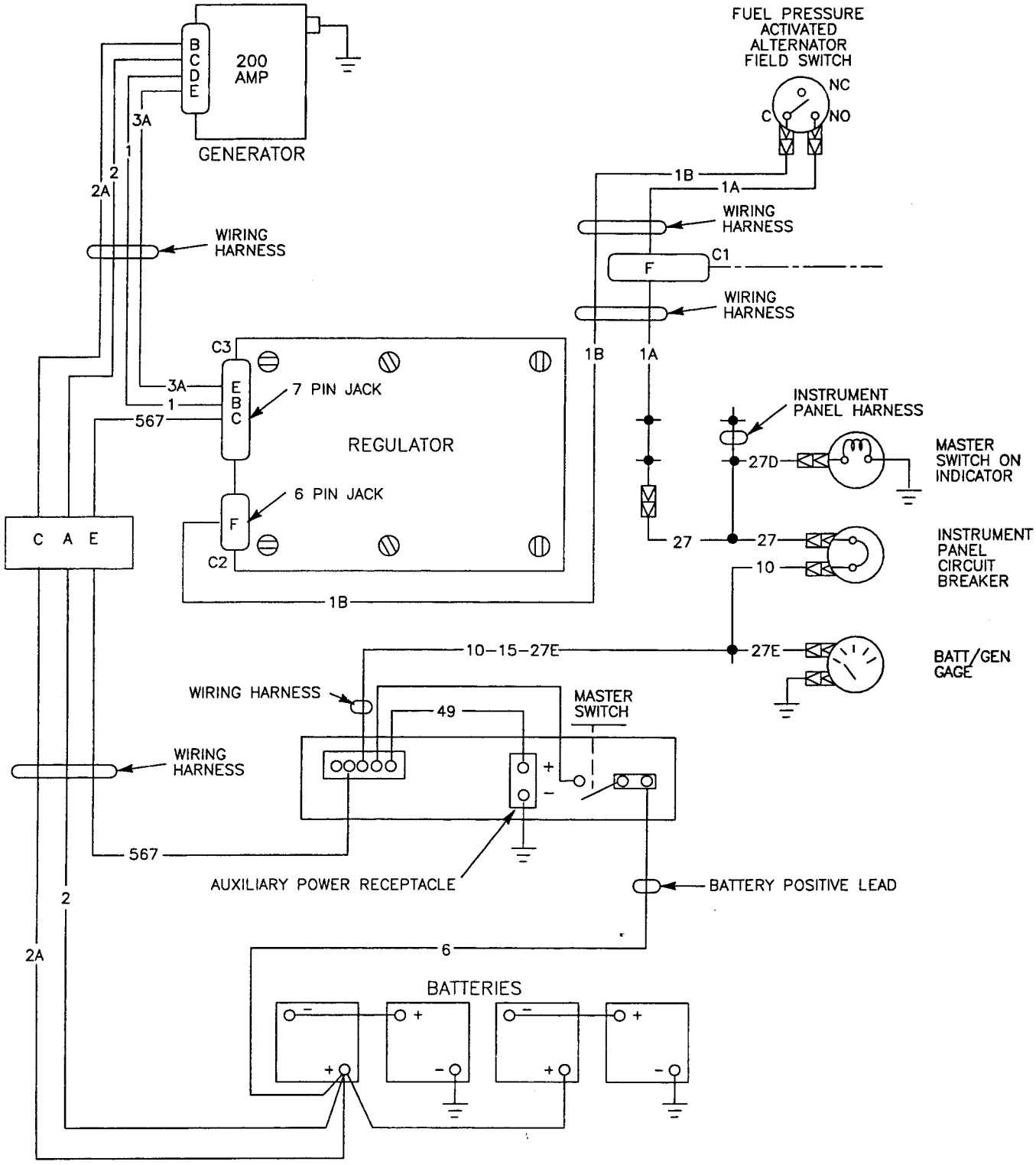
Use the schematic below as an aid for performing system troubleshooting procedures.



200 AMP ENGINE CHARGING SYSTEM SCHEMATIC (M548A3) 0030 00

DESCRIPTION

Use the schematic below as an aid for performing system troubleshooting procedures.



HI TEMP DIFF OIL INDICATOR COMES ON (M548A1) 0031 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

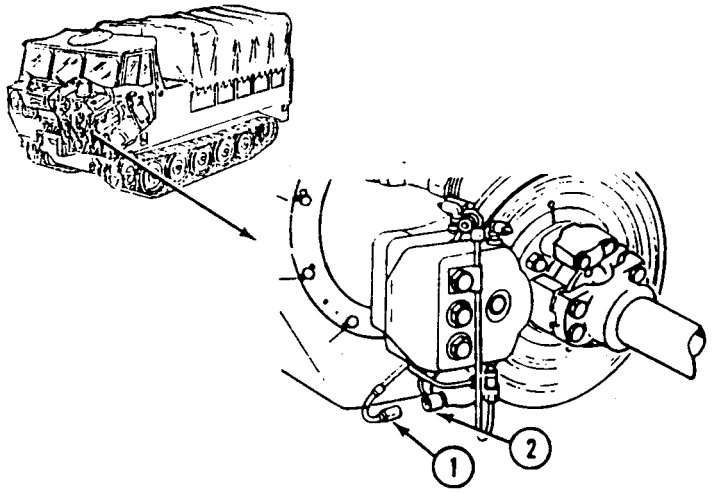
Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)
Differential oil filter replaced (WP 0337 00)

T

CAUTION

Do not operate carrier with HI TEMP DIFF OIL indicator on. Serious damage may result.

1. Disconnect engine harness circuit 328 (1) from differential oil high temperature thermostatic switch (2).
2. Turn MASTER SWITCH ON.
3. Is HI TEMP DIFF OIL indicator off?



NO

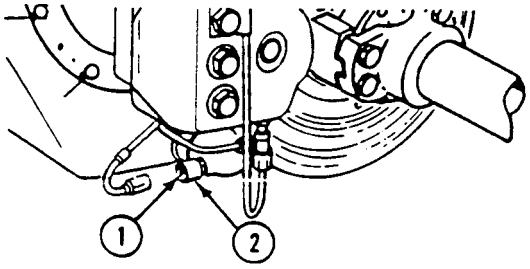
TN

1. Go to HI TEMP DIFF OIL indicator malfunctions WP 0058 00.

YES

Y

1. Turn MASTER SWITCH OFF.
2. Measure resistance between connector pin (1) and ground (2) of differential oil high temperature thermostatic switch.
3. Does multimeter read more than 5 ohms?



NO

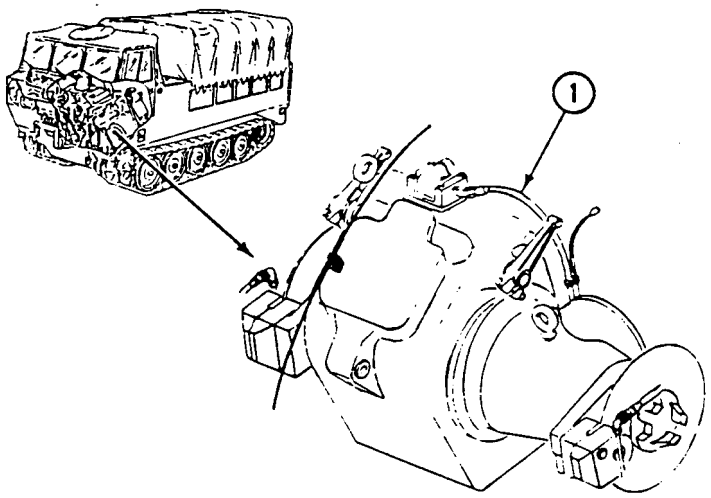
YN

1. Replace differential oil high temperature thermostatic switch (WP 0285 00).
2. Verify no faults found.

YES

2Y

1. Connect engine harness circuit 328 plug to differential oil high temperature thermostatic switch.
2. Inspect differential oil cooler hoses (1) for blockage and/or damage.
3. Are differential oil cooler hoses free from blockage and/or damage?

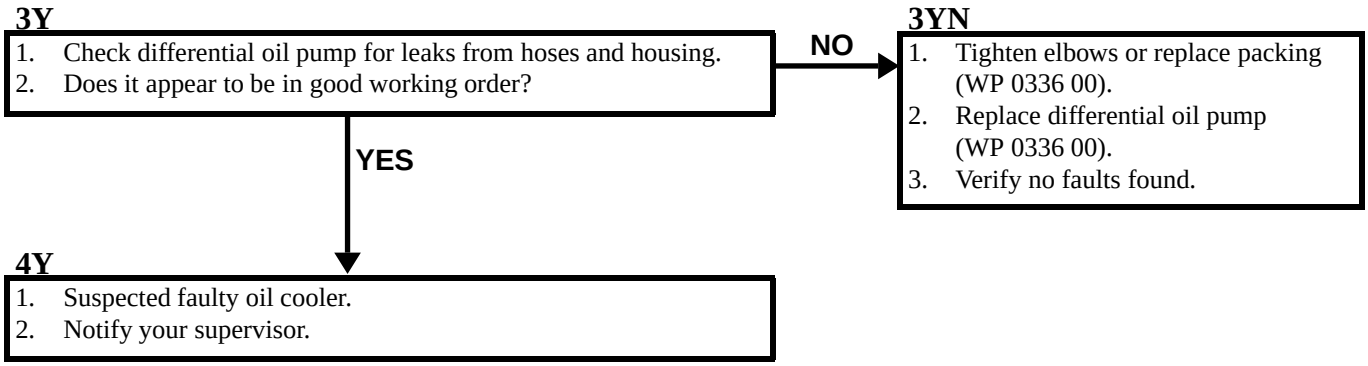


NO

2YN

1. Clear blockage or replace differential oil cooler hoses (WP 0340 00).
2. Verify no faults found.

YES


3Y
1. Check differential oil pump for leaks from hoses and housing.
2. Does it appear to be in good working order?
NO
3YN
1. Tighten elbows or replace packing (WP 0336 00).
2. Replace differential oil pump (WP 0336 00).
3. Verify no faults found.
YES
4Y
1. Suspected faulty oil cooler.
2. Notify your supervisor.

HI TEMP TRANS OIL INDICATOR COMES ON (M548A1) 0032 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

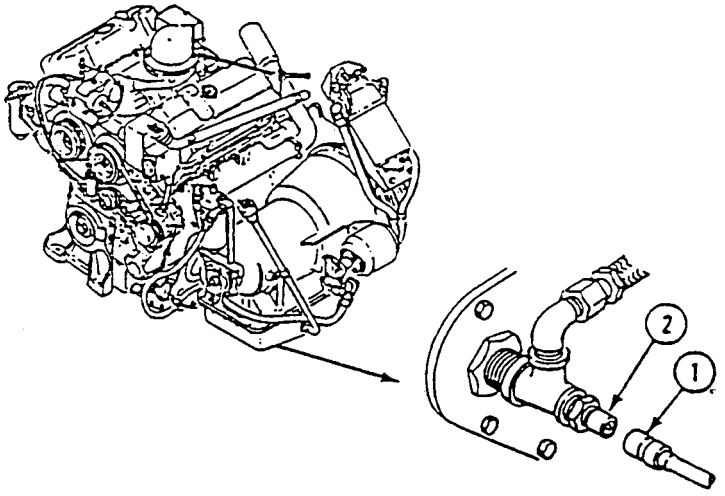
Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)
Transmission oil filter element replaced (WP 0320 00).

T

CAUTION

Do not operate carrier with HI TEMP TRANS OIL indicator on. Serious damage may result.

1. Disconnect engine harness circuit 327 (1) from transmission oil high temperature thermostatic switch (2).
2. Turn MASTER SWITCH ON.
3. Is HI TEMP TRANS OIL indicator off?



NO →

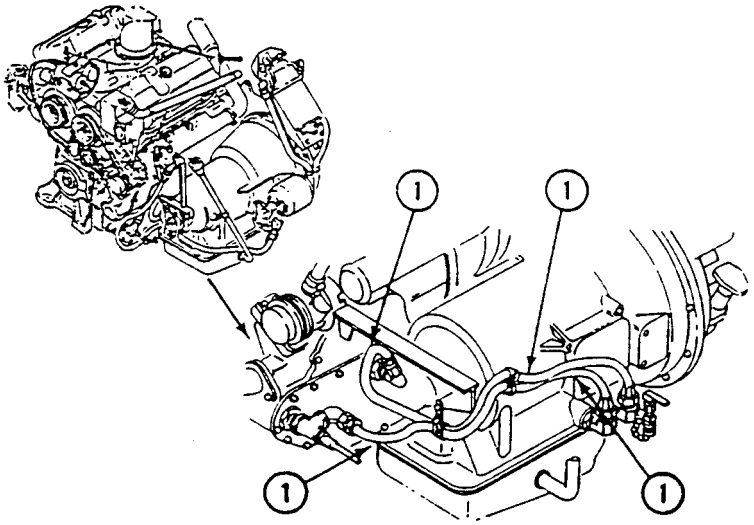
TN

1. Turn MASTER SWITCH OFF.
2. Go to HI TEMP TRANS OIL indicator malfunctions WP 0056 00.

YES ↓

Y

1. Turn MASTER SWITCH OFF.
2. Inspect transmission oil cooler hoses (1) for blockage and/or damage.
3. Are transmission oil cooler hoses free from blockage and serviceable?



NO

YN

1. Clear blockage or replace transmission oil cooler hoses (WP 0318 00).
2. Verify no faults found.

YES

2Y

1. Connect engine harness circuit 327 plug to transmission oil high temperature thermostatic switch.
2. Is HI TEMP TRANS OIL indicator off?

NO

2YN

1. Replace transmission oil high temperature thermostatic switch (WP 0286 00).
2. Verify no faults found.

YES

3Y

1. Suspected faulty oil cooler/oil pump.
2. Notify your supervisor

HI TEMP TRANS OIL INDICATOR COMES ON (M548A3) 0033 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
Pressure Gauge Kit (WP 0541 00, Item 34)

Personnel Required

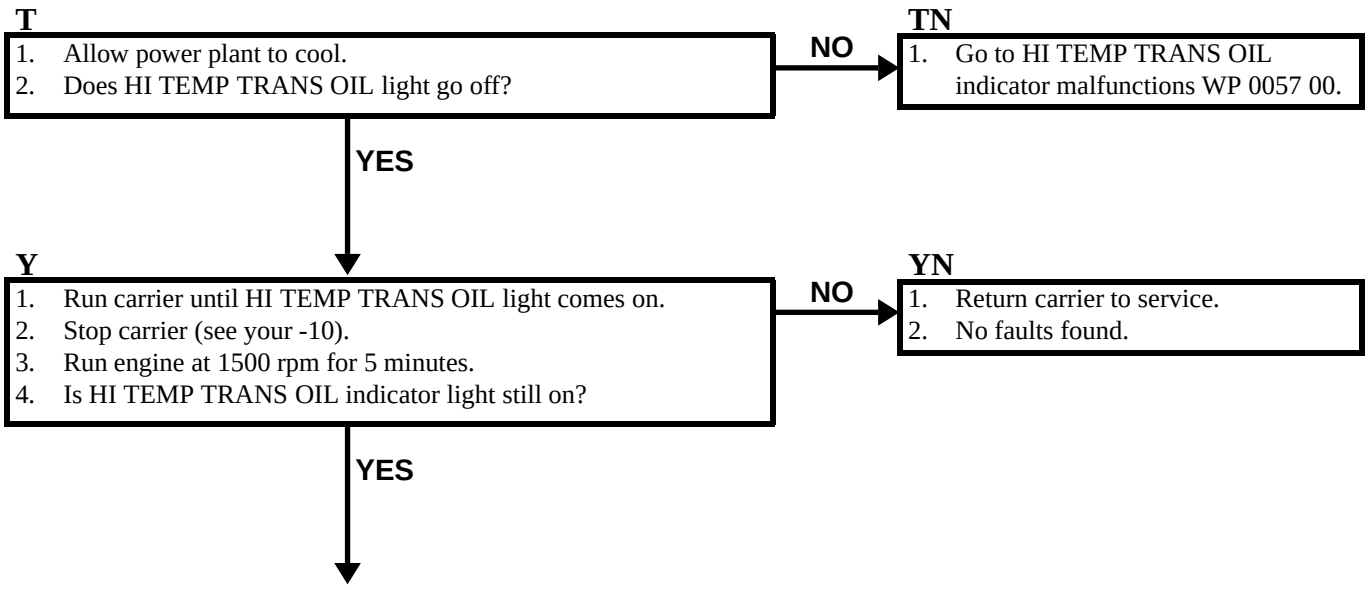
Unit Mechanic

References

See your -10
See your PMCS

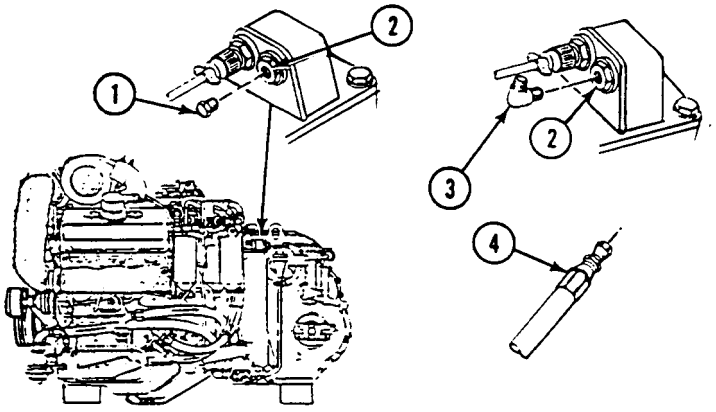
Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Transmission in SL (see your -10)
Transmission oil level checked (see your PMCS)
Cab floor plates raised (WP 0395 00)



2Y

1. Stop engine (see your -10).
2. Remove plug (1) from MAIN port (2) on top of filter housing.
3. Install 4730-231-5632 elbow (3) into MAIN port (2).
4. Install test hose (4) onto elbow (3).
5. Start engine (see your -10).
6. Measure MAIN pressure with engine at 600 rpm with transmission in R and then in 1-4 position. Pressure should be 280-325 psi (1931-2241 kPa) in R and 190-210 (1310-1448 kPa) in 1-4 position.
7. Does pressure tester indicate a fault?

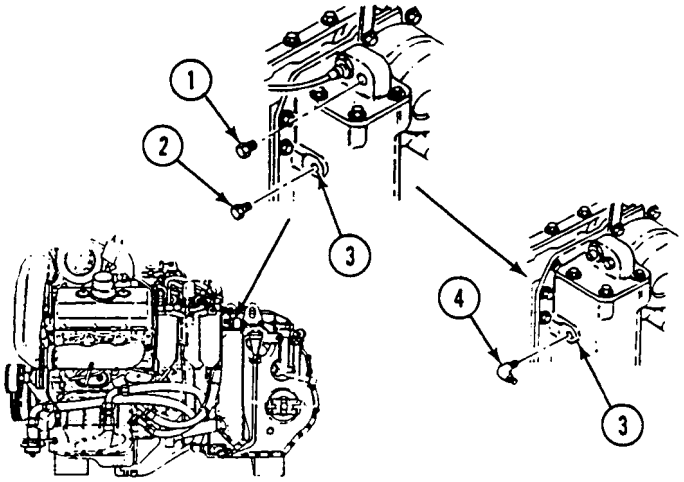


NO → GO TO **BY** (PAGE 0033 00-4)

YES

3Y

1. Stop engine (see your -10).
2. Remove pressure gauge and elbow and install MAIN port plug (1).
3. Remove plug (2) from FILTER IN port (3).
4. Install 4730-766-9000 elbow (4) into FILTER IN port (3).
5. Install pressure gauge in FILTER IN port.
6. Start engine (see your -10).
7. Measure FILTER IN pressure with engine at 600 rpm with transmission in R and then in 1-4 position. Pressure should be 280-325 psi (1931-2241 kPa) in R and 190-210 (1310-1448 kPa) in 1-4 position.
8. Is FILTER IN pressure 35 psi (241 kPa) or more greater than MAIN pressure?



NO → GO TO **CY** (PAGE 0033 00-4)

YES

4Y

1. Check to see if transmission oil filter clogged indicator comes on.
2. Is transmission oil filter clogged indicator on?

NO →

4YN

1. Go to transmission oil filter clogged indicator malfunctions (WP 0057 00).

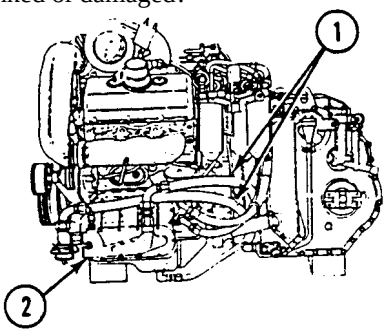
YES

5Y

1. Stop engine (see your -10).
2. Replace transmission oil filter element (WP 0321 00).
3. Verify no faults found.

BY

1. Stop engine (see your -10).
2. Inspect transmission oil lines (1) to transmission cooler (2).
3. Are lines kinked or damaged?



NO →

BYN

1. Faulty transmission beyond unit maintenance repair.
2. Notify your supervisor.

YES ↓

2BY

1. Replace transmission oil lines as required (WP 0319 00).
2. Verify no faults found.

CY

1. Check and see if FILTER IN pressure 20 psi to 35 psi (138 kPa to 241 kPa) is greater than main pressure.
2. Is FILTER IN pressure 20 psi to 35 psi (138 kPa to 241 kPa) greater than main pressure?

NO →

CYN

1. Faulty transmission beyond unit maintenance repair.
2. Notify your supervisor.

YES ↓

2CY

1. Replace clogged transmission oil filter (WP 0321 00).
2. Verify no faults found.

NO EXTERIOR LIGHTS OPERATE 0034 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10

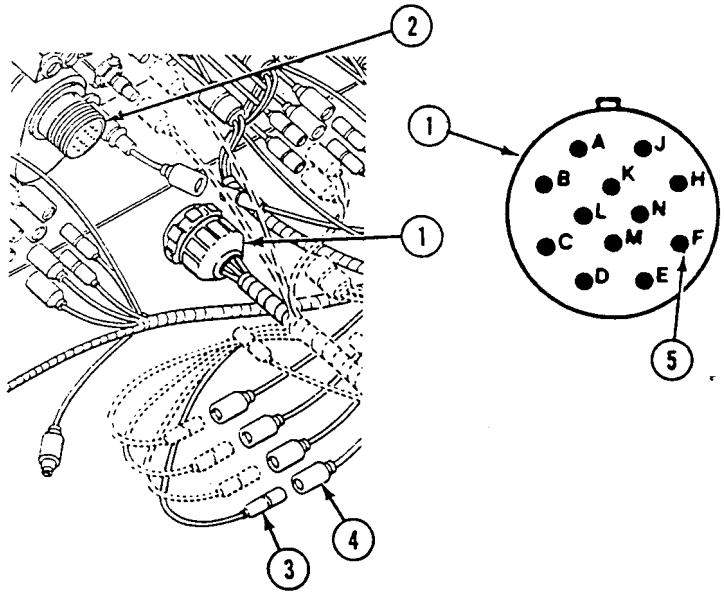
Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Instrument panel partially removed (WP 0256 00)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Remove main wiring harness plug (1) from light switch jack (2).
2. Remove main wiring harness circuit 15 plug (3) from power/ instrument panel wiring harness circuit 15 jack (4).
3. Measure resistance between main wiring harness circuit 15 plug (3) and plug (1) pin F (5).
4. Does multimeter read 0 ohms?



NO →

TN

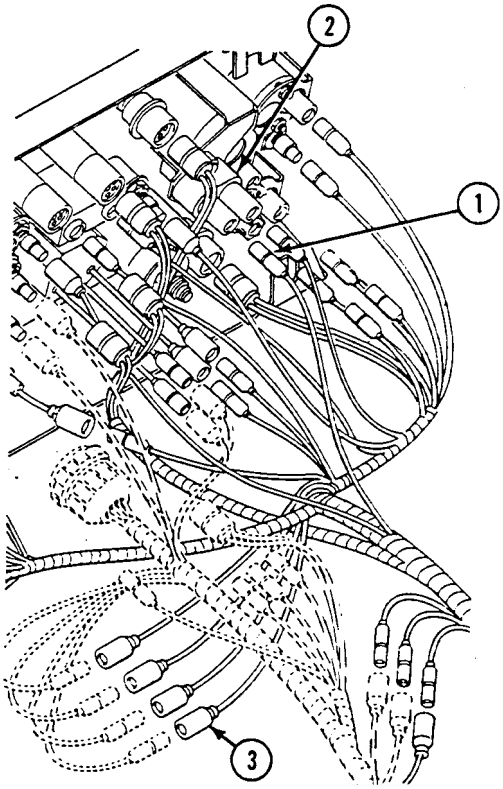
1. Repair main wiring harness circuit 15 (WP 0294 00).
2. Verify no faults found.

YES ↓

NO EXTERIOR LIGHTS OPERATE—Continued 0034 00

Y

1. Remove power/instrument panel wiring harness circuit 10 plug (1) from instrument panel circuit breaker (2).
2. Measure resistance between power/instrument panel wiring harness circuit 15 plug (3) and circuit 10 plug (1).
3. Does multimeter read 0 ohms?



NO

YN

1. Install main wiring harness plug on light switch.
2. Repair power/instrument panel wiring harness circuit 10/15 (WP 0294 00).
3. Verify no faults found.

YES

2Y

1. Install power/instrument panel wiring harness circuit 10 and 15 plugs.
2. Replace light switch (WP 0262 00).
3. Verify no faults found.

BLACKOUT DRIVE LIGHT DOES NOT WORK 0035 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
IR/BO select on BO (see your -10)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Operate exterior lights in all positions (see your -10).
2. Do any exterior lights operate in any light switch positions?

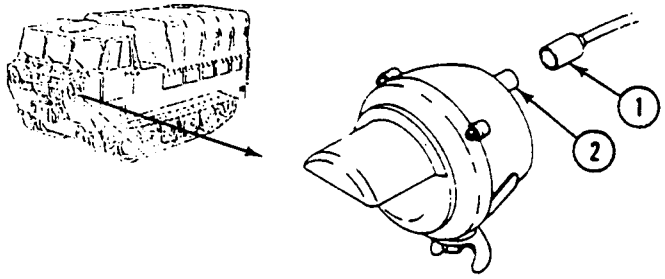
NO → **TN**

1. Go to no exterior lights operate (WP 0034 00).

YES

Y

1. Remove main harness plug (1) from BO DRIVE light jack (2).
2. Measure resistance between BO DRIVE light jack (2) and ground.
3. Does multimeter read less than infinity?



NO → **YN**

1. Install main harness plug on BO DRIVE light.
2. Replace blackout headlight lamp unit (WP 0275 00).
3. Verify no faults found.

YES

2Y

1. Check and see if multimeter read more than 0 ohms.
2. Does multimeter read more than 0 ohms?

NO → **2YN**

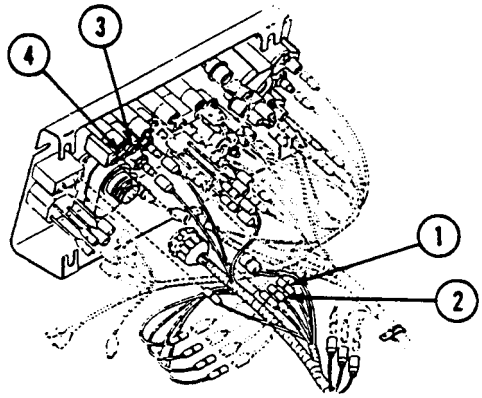
1. Replace blackout headlight (WP 0275 00).
2. Verify no faults found.

YES

BLACKOUT DRIVE LIGHT DOES NOT WORK—Continued 0035 00

3Y

1. Install main harness plug on BO DRIVE light.
2. Partially remove instrument panel (WP 0256 00).
3. Remove main harness circuit 19 (1) and 520 (2) from IR/BO select switch jacks (3) and (4).
4. Measure resistance between IR/BO select switch jacks (3) and (4) with select switch on BO.
5. Does multimeter read 0 ohms?



NO →

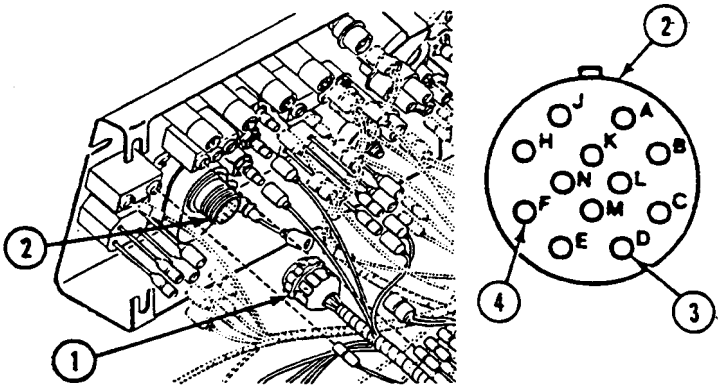
3YN

1. Install main harness plug on BO DRIVE light.
2. Replace infrared-blackout select switch (WP 0263 00).
3. Verify no faults found.

YES ↓

4Y

1. Remove main harness plug (1) from light switch jack (2).
2. Turn light switch to BO DRIVE.
3. Measure resistance between light switch jack (2) pins D (3) and F (4).
4. Does multimeter read 0 ohms?



NO →

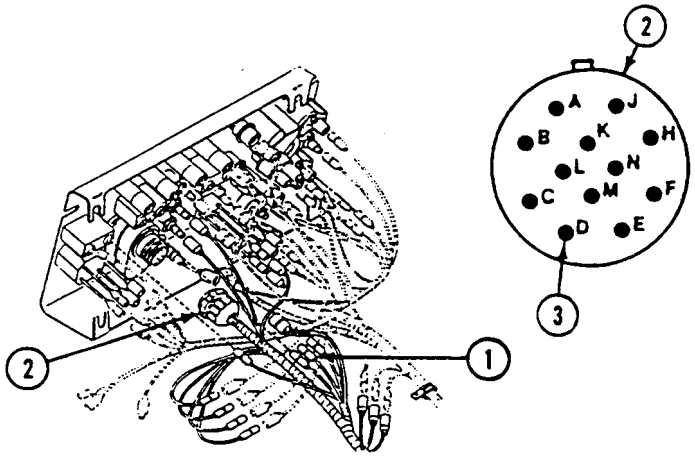
4YN

1. Install main harness plugs on IR/BO select switch jacks.
2. Replace light switch (WP 0262 00).
3. Verify no faults found.

YES ↓

5Y

1. Measure resistance between main harness circuit 520 plug (1) and light switch plug (2) pin D (3).
2. Does multimeter read 0 ohms?



NO

5YN

1. Install main harness circuit 19 plug on IR/BO select switch jack.
2. Repair main harness circuit 520 (WP 0294 00).
3. Verify no faults found.

YES

6Y

1. Install main harness circuit 520 plug on IR/BO select switch jack.
2. Install main harness plug on light switch jack.
3. Repair main harness circuit 19 (WP 0294 00).
4. Verify no faults found.

SERVICE HEADLIGHTS DO NOT OPERATE 0036 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10

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

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

6. Operate lights in all light switch positions (see your -10).
2. Do any exterior lights operate in any light switch positions?

NO → **TN**

1. Go to no exterior lights operate (WP 0034 00).

YES

Y

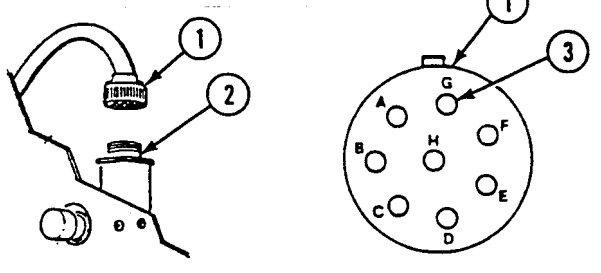
1. Turn main light switch to SER DRIVE.
2. Do both high beams and/or both low beams fail to come on?

NO → GO TO **BY** (PAGE 0036 00-3)

YES

2Y

1. Turn MASTER SWITCH OFF.
2. Remove main harness plug (1) from beam selector switch jack (2).
3. Turn MASTER SWITCH ON.
4. Measure voltage between front main harness plug (1) pin G (3) and ground.
5. Does multimeter read less than 17 volts?

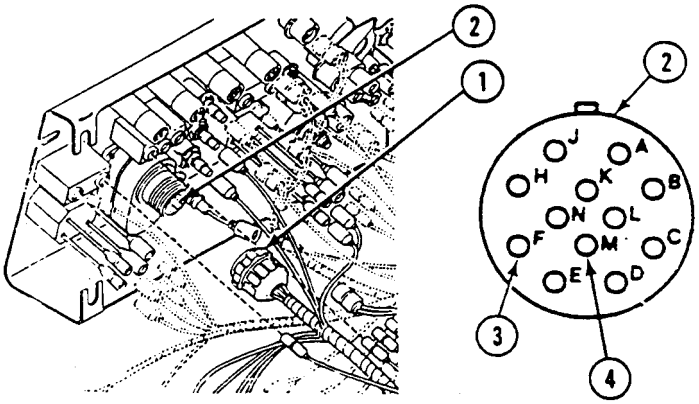


NO → GO TO **CY** (PAGE 0036 00-4)

YES

3Y

1. Turn MASTER SWITCH OFF.
2. Partially remove instrument panel (WP 0256 00).
3. Remove main harness plug (1) from light switch jack (2).
4. Measure resistance between light switch jack (2) pins F (3) and M (4).
5. Does multimeter read 0 ohms?



NO

3YN

1. Install main harness plug on beam selector switch jack.
2. Replace light switch (WP 0262 00).
3. Verify no faults found.

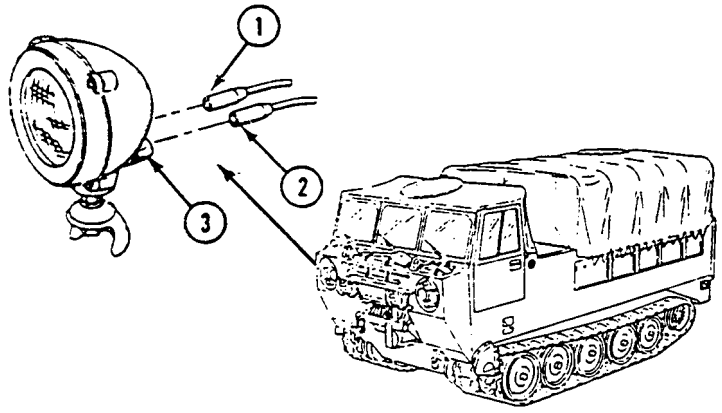
YES

4Y

1. Repair main harness circuit 16 (WP 0294 00).
2. Verify no faults found.

BY

1. Remove circuit 17 (high beam) plug (1) or circuit 18 (low beam) plug (2) from failing service headlight jack (3).
2. Measure voltage on main harness circuit 17 plug (1) or circuit 18 plug (2) and ground.
3. Does multimeter read less than 17 volts?



NO

BYN

1. Replace service headlight lamp unit (WP 0276 00).
2. Verify no faults found.

YES

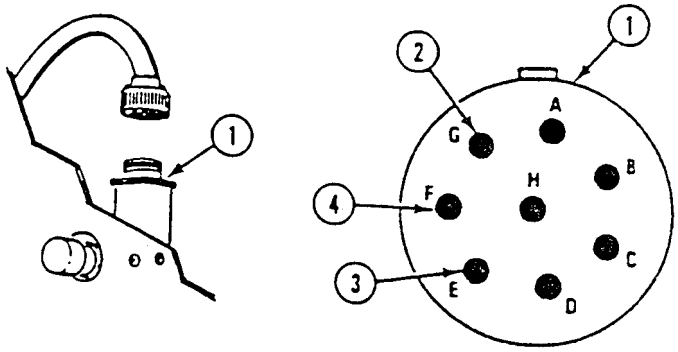
2BY

1. Turn MASTER SWITCH OFF.
2. Install wiring harness circuit 17 (high beam) or 18 (low beam) on service headlight.
3. Repair main wiring harness circuit 17 or 18 between bulkhead and beam selector switch (WP 0294 00).
4. Verify no faults found.

SERVICE HEADLIGHTS DO NOT OPERATE—Continued 0036 00

CY

1. Measure resistance between beam selector switch jack (1) pins G (2) and E (3) and between pins G (2) and F (4). Multimeter should read 0 ohms once and infinity once.
2. Click beam selector switch and measure resistance between beam selector switch jack (1) pins G (2) and E (3) and between pins G (2) and F (4). Multimeter should indicate infinity once and 0 ohms once.
3. Is high beam selector switch operating properly?



NO

CYN

1. Install main harness plug on light switch jack.
2. Replace beam selector switch (WP 0273 00).
3. Verify no faults found.

YES

2CY

1. Repair main wiring harness circuit 18 (low beam) or circuit 17 (high beam) (WP 0294 00).
2. Verify no faults found.

INFRARED HEADLIGHT(S) DOES NOT OPERATE 0037 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Slip Joint Pliers (WP 0541 00, Item 33)

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Operate all exterior lights (see your -10).
2. Do any exterior lights operate in any light switch positions?

NO →

TN

1. Go to no exterior lights operate (WP 0034 00).

YES ↓

Y

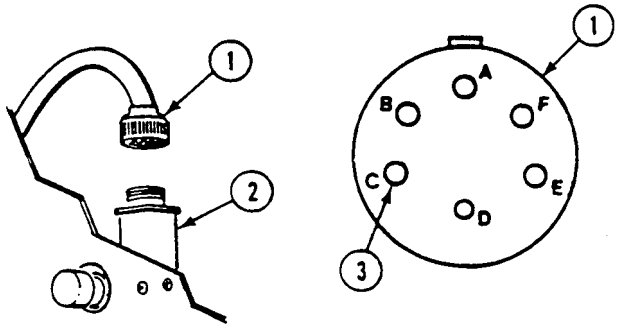
1. Turn master light switch to BO DRIVE.
2. Move IR/BO select switch to IR (see your -10).
3. Do both IR high beams and/or both IR low beams fail to come on?

NO → GO TO **BY** (PAGE 0037 00-4)

YES ↓

2Y

1. Turn MASTER SWITCH OFF.
2. Remove main harness plug (1) from beam selector switch jack (2).
3. Turn MASTER SWITCH ON.
4. Measure voltage between main harness plug (1) pin C (3) and ground.
5. Does multimeter read less than 17 volts?

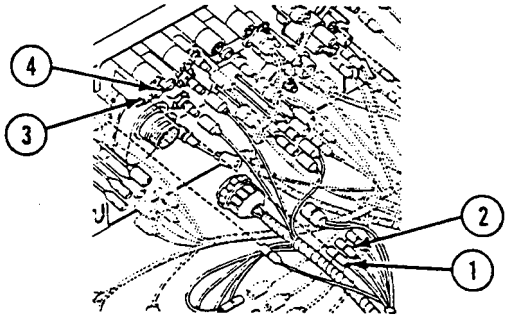


NO → GO TO **CY** (PAGE 0037 00-5)

YES

3Y

1. Turn MASTER SWITCH OFF.
2. Partially remove instrument panel (WP 0256 00).
3. Remove main harness circuit 514/515 (1) and 520 (2) from IR/BO select switch jack(3) and IR/BO select switch jack(4).
4. Measure resistance between IR/BO select switch jack (3) and IR/BO select switch jack (4).
5. Does multimeter read 0 ohms?



NO

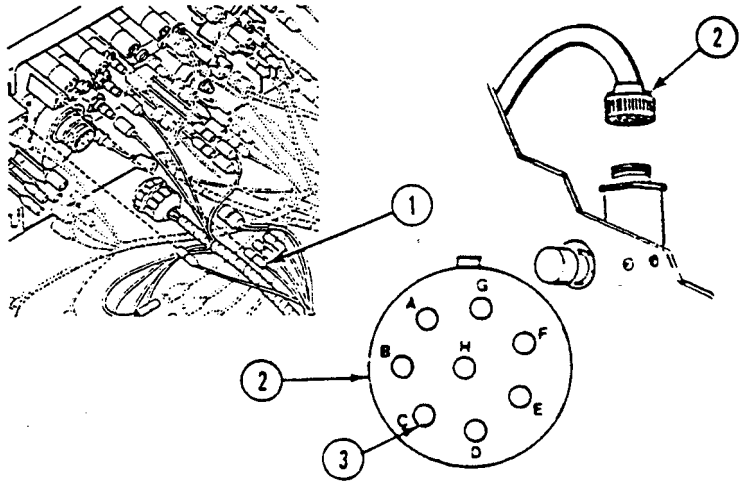
3YN

1. Install beam selector switch and main harness plug on beam selector switch.
2. Replace infrared-blackout select switch (WP 0263 00).
3. Verify no faults found.

YES

4Y

1. Measure resistance between main harness circuit 514/515 selector switch plug (1) and beam selector switch plug (2) pin C (3).
2. Does multimeter read 0 ohms?



NO →

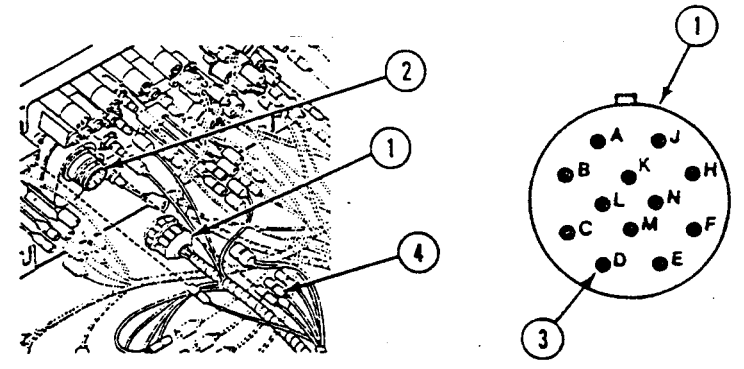
4YN

1. Install beam selector switch and main harness plug on beam selector switch.
2. Repair main harness circuit 514/515 (WP 0294 00).
3. Verify no faults found.

YES ↓

5Y

1. Install beam selector switch and main wiring harness plug on beam selector switch.
2. Install main wiring harness circuit 514/515 plug on IR/BO select switch jack.
3. Remove main harness plug (1) from light switch jack (2).
4. Measure resistance between wiring main harness light switch plug (1) pin D (3) and IR/BO select circuit 520 plug (4).
5. Does multimeter read 0 ohms?



NO →

5YN

1. Repair main wiring harness circuit 520 (WP 0294 00).
2. Verify no faults found.

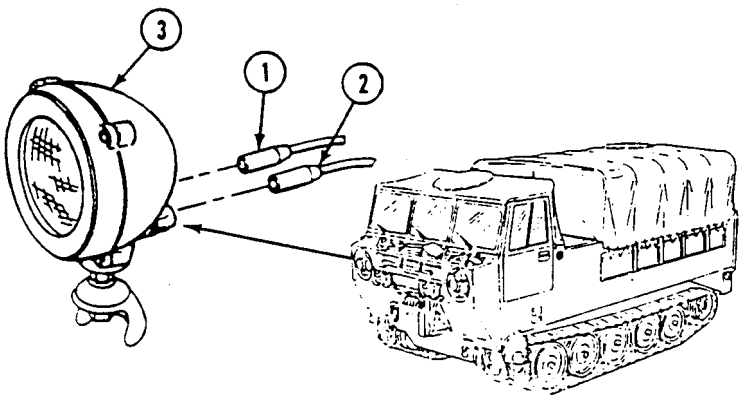
YES ↓

6Y

1. Install circuit 520 plug on IR/BO select switch.
2. Replace light switch (WP 0262 00).
3. Verify no faults found.

BY

1. Remove circuit 514 (high beam) plug (1) or 515 (low beam) plug (2) from failing infrared headlight (3).
2. Measure voltage between main harness circuit 514 plug (1) or 515 plug (2) and ground.
3. Does multimeter read less than 17 volts?



NO

BYN

1. Replace infrared headlights lamp unit (WP 0277 00).
2. Verify no faults found.

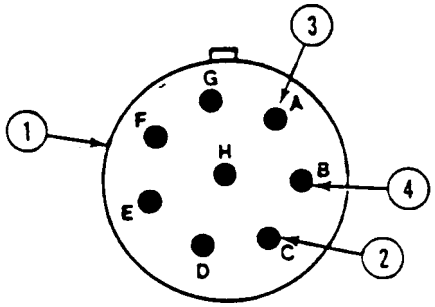
YES

2BY

1. Repair main harness circuit 514 or 515 (WP 0294 00).
2. Verify no faults found.

CY

1. Measure resistance between beam selector switch jack (1) pins C (2) to A (3) and between pins C (2) to B (4). Multimeter should read 0 ohms once and infinity once.
2. Click beam selector switch and repeat above test. Multimeter should indicate infinity once and 0 ohms once.
3. Is beam selector switch operating properly?



NO →

CYN

1. Replace beam selector switch (WP 0273 00).
2. Verify no faults found.

YES ↓

2CY

1. Faulty main wiring harness circuit 514 or 515.
2. Notify your supervisor.

SERVICE AND/OR BLACKOUT STOPLIGHTS MALFUNCTION 0038 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10

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

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1S procedure is shown.

T

1. Operate all exterior lights (see your -10).
2. Do any exterior lights operate in any light switch positions?

NO → **TN**

1. Go to no exterior lights operate (WP 0034 00).

YES

Y

1. Check to see if service stop and BO stoplights both malfunction.
2. Do service stop and BO stoplights both malfunction?

NO → GO TO **BY** (PAGE 0038 00-3)

YES

2Y

1. Check stoplight switch adjustment (WP 0274 00).
2. Is brake switch in proper adjustment?

NO → **2YN**

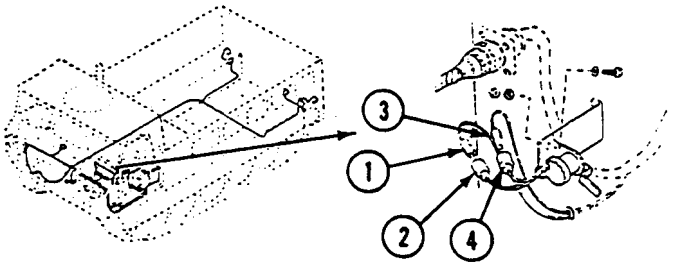
1. Adjust stoplight switch (WP 0274 00).
2. Verify no faults found.

YES

SERVICE AND/OR BLACKOUT STOPLIGHTS MALFUNCTION—Continued 0038 00

3Y

1. Turn MASTER SWITCH OFF.
2. Remove main harness circuit 75A plug (1) from stoplight switch jack (2).
3. Remove main harness circuit 75B plug (3) from stoplight switch jack (4).
4. Measure resistance between switch jacks (2) and (4) with switch depressed and with switch released.
5. Does multimeter read infinity with switch depressed and 0 ohms with switch released?



NO

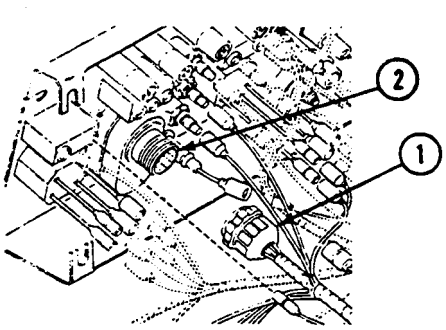
3YN

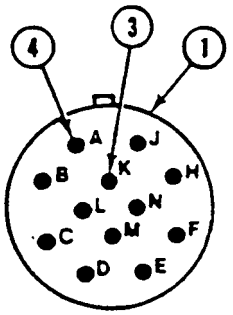
1. Replace stoplight switch (WP 0274 00).
2. Verify no faults found.

YES

4Y

1. Install main harness circuit leads 75A and 75B on stoplight switch.
2. Partially remove instrument panel (WP 0256 00).
3. Remove main harness plug (1) from light switch jack (2).
4. Measure resistance between main harness plug (1) pins K (3) and A (4) with both steering levers locked in parking brake position.
5. Does multimeter read 0 ohms?





NO

4YN

1. Faulty main harness circuit 75A and/or 75B.
2. Notify your supervisor.

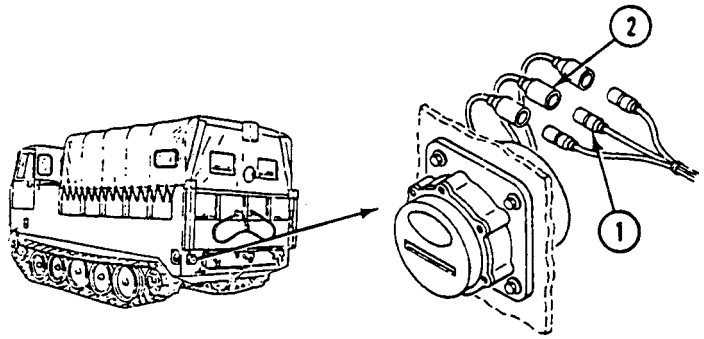
YES

5Y

1. Replace light switch (WP 0262 00).
2. Verify no faults found.

BY

1. Remove main harness circuit 22 plug (1) from jack (2) on malfunctioning left tail light, or circuit 23 plug from jack on malfunctioning right tail light.
2. Turn switch lever on light switch to STOP LIGHT or to BO MARKER.
3. Measure voltage between circuit 22 (left) plug (1) or circuit 23 (right) plug and ground with both steering levers locked in parking brake position.
4. Does multimeter read less than 17 volts?



NO →

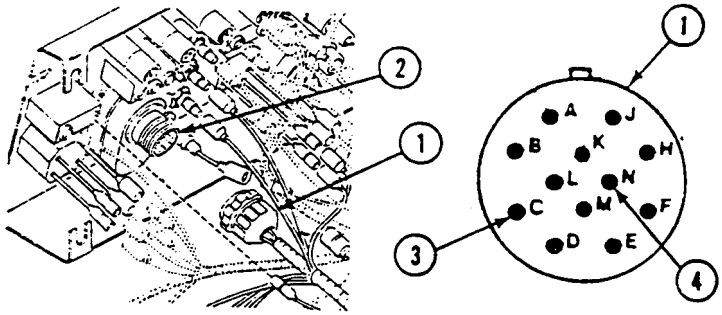
BYN

1. Install main harness jack on taillight.
2. Replace service stoplight or BO stoplight bulb (WP 0278 00 or WP 0280 00).
3. Verify no faults found.

YES ↓

2BY

1. Partially remove instrument panel (WP 0256 00).
2. Remove main harness plug (1) from light switch (2).
3. Measure resistance between light switch plug (1) pin C (3) to circuit 22 jack (service stop) or pin N (4) to circuit 23 jack (BO stop).
4. Does multimeter read 0 ohms?



NO →

2BYN

1. Install main harness on taillight.
2. Repair main harness circuit 22 or 23 (WP 0294 00).
3. Verify no faults found.

YES ↓

3BY

1. Install main harness plugs on jack and taillight.
2. Replace light switch (WP 0262 00).
3. Verify no faults found.

BLACKOUT STOPLIGHT DOES NOT WORK 0039 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Battery negative lead(s) disconnected (WP 0292 00)

T

1. Check for loose electrical connections.
2. Are electrical connections clean and tight?

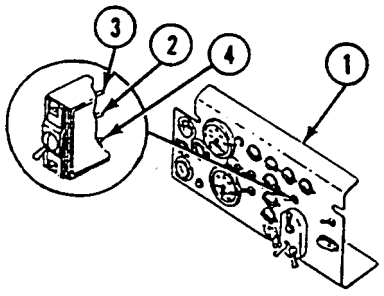
NO → **TN**

1. Clean and tighten loose electrical connections.
2. Verify no faults found.

YES ↓

Y

1. Partially remove instrument panel (1) (WP 0256 00).
2. Disconnect circuits 19 (2), 514-515 (3), and 520 (4) from infrared-blackout select switch.
3. With switch in BLACKOUT position, measure resistance between circuit 19 terminal (2) and circuit 520 (4) terminal. Reading should be 0 ohms.
4. Does multimeter show 0 ohms?



NO → **YN**

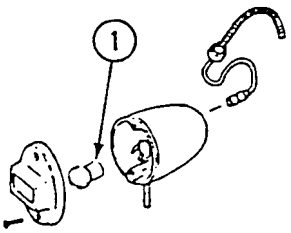
1. Replace infrared-blackout select switch (WP 0263 00).
2. Verify no faults found.

YES ↓

BLACKOUT STOPLIGHT DOES NOT WORK—Continued 0039 00

2Y

1. Connect circuits 19, 514-515, and 520 to infrared-blackout select switch.
2. Remove blackout stoplight-taillight bulb (1).
3. Measure resistance of bulb (1) for continuity.
4. Does multimeter indicate any continuity?



NO

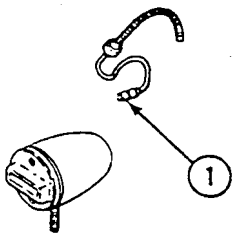
2YN

1. Replace blackout stoplight-taillight bulb (WP 0278 00).
2. Verify no faults found.

YES

3Y

1. Disconnect circuit 23 connector (1) from blackout stoplight-taillight.
2. Connect battery negative lead (WP 0292 00).
3. Turn MASTER SWITCH ON.
4. Measure voltage between circuit 23 connector (1) and ground.
5. Does multimeter show voltage on circuit 23 connector (1)?



NO

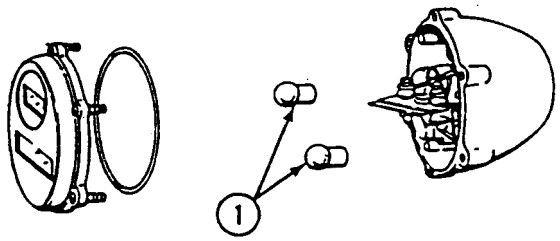
3YN

1. Repair wiring harness (WP 0294 00).
2. Verify no faults found.

YES

4Y

1. Remove service stoplight-taillight bulb (1).
2. Measure resistance of bulb (1) for continuity.
3. Does multimeter show 0 ohms?



NO

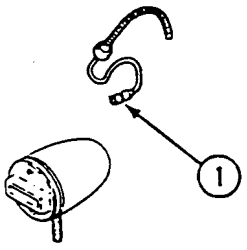
4YN

1. Replace service stoplight-taillight bulb (WP 0278 00).
2. Verify no faults found.

YES

5Y

1. Turn MASTER SWITCH OFF.
2. Disconnect circuit 23 (right) and circuit 22 (left) connectors (1) from service stoplight-taillights.
3. Turn MASTER SWITCH ON.
4. Measure voltage between circuit 23 or circuit 22 connectors (1) and ground.
5. Does multimeter show voltage on circuit 23 or circuit 22 connectors?



NO

5YN

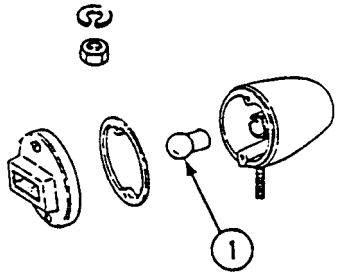
1. Repair wiring harness (WP 0294 00).
2. Verify no faults found.

YES

BLACKOUT STOPLIGHT DOES NOT WORK—Continued 0039 00

6Y

1. Connect circuit 23 (right) or circuit 22 (left) connectors to service stoplight-taillight.
2. Remove bulb (1) from blackout marker (WP 0280 00).
3. Measure for continuity.
4. Does multimeter indicate any continuity?



NO →

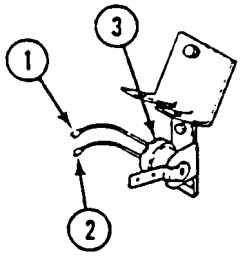
6YN

1. Replace faulty blackout marker bulb (WP 0280 00).
2. Verify no faults found.

YES ↓

7Y

1. Install bulb in blackout marker (WP 0280 00).
2. Disconnect circuit 75 lead (1) and circuit 75A lead (2) from stop light switch (3).
3. Measure resistance between circuits 75 and 75A. Multimeter should read infinity.
4. Press switch arm and measure resistance. Multimeter should show continuity.
5. Are readings correct?



NO →

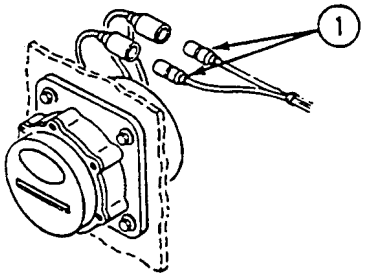
7YN

1. Replace faulty stoplight switch (WP 0274 00).
2. Verify no faults found.

YES ↓

8Y

1. Connect circuits 75 and 75A on stoplight switch.
2. Remove circuit 22 plug (1) from jack on left taillight, or circuit 23 plug (1) from jack on right taillight.
3. Turn main light selector switch lever on light switch to BO MARKER.
4. Measure voltage between circuit 22 (left) plug (1) or circuit 23 (right) plug (1) and ground with both steering levers locked in parking brake position. Reading should be less than 17 volts.
5. Is reading correct?



NO →

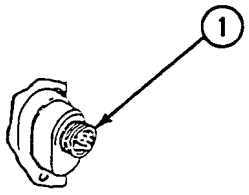
8YN

1. Install circuit plugs 22 (1) and 23 (1) on left and right taillights.
2. Replace service stop or BO stoplight bulb (WP 0278 00).
3. Verify no faults found.

YES ↓

9Y

1. Partially remove instrument panel (WP 0256 00).
2. Disconnect wiring harness connector from light select switch.
3. Place light panel switches in BO MARKER and PANEL BRT positions (see your -10).
4. Measure resistance between pins (1) (F, A),(F, B), and (F, E). Multimeter should show continuity.
5. Measure resistance between pins (1) (F, C),(F, D), (F, J),(F, H),(F, K), (F, L),(F, M), and (F, N). Multimeter should show infinity.
6. Move auxiliary switch to PARK (see your -10). Measure resistance between pins (1) F and L. Multimeter should show infinity.
7. Measure resistance between pins (1) K and N. Multimeter should show continuity.
8. Are readings correct?



NO →

9YN

1. Replace light switch (WP 0262 00).
2. Verify no faults found.

YES ↓

10Y

1. Adjust stoplight switch (WP 0274 00).
2. Verify no faults found.

BLACKOUT MARKER LIGHT(S) AND/OR TAILLIGHT(S) DO NOT OPERATE 0040 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10

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

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Operate all exterior lights (see your -10).
2. Do any exterior lights operate in any light switch positions?

NO → **TN**

1. Go to no exterior lights operate (WP 0034 00).

YES

Y

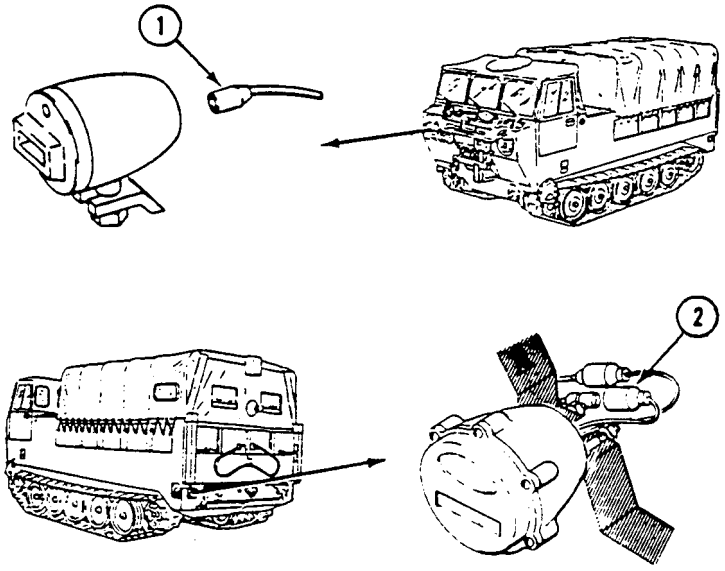
1. Turn light switch to BO MARKER.
2. Is just one BO marker and/or just one BO taillight out?

NO → GO TO **BY** (PAGE 0040 00-3)

YES

2Y

1. Locate failing light(s).
2. Remove circuit 20 plug (1) (BO marker) and/or circuit 24 plug (2) (BO taillight) from failing light jack.
3. Measure voltage between plug pin and ground.
4. Does multimeter read less than 17 volts?



NO

2YN

1. Replace faulty light bulb. For blackout marker light (WP 0280 00). For left/right taillight (WP 0278 00).
2. Verify no faults found.

YES

3Y

1. Check to see if BO marker light is not operating.
2. Is one BO marker light not operating?

NO

3YN

1. Repair main wiring harness circuit 24 (WP 0294 00).
2. Verify no faults found.

YES

4Y

1. Check and see if right BO marker light is out.
2. Is right BO marker light out?

NO

4YN

1. Repair main wiring harness circuit 20 (WP 0294 00).
2. Verify no faults found.

YES

5Y

1. Install wiring harness circuit 20 jack on right BO marker light.
2. Repair main harness circuit 20 (WP 0294 00).
3. Verify no faults found.

BY

1. Check and see if both BO taillights or both BO markers are out.
2. Are both BO taillights out or both BO markers out?

NO → GO TO **CY** (PAGE 0040 00-3)

YES

2BY

1. Check and see if both BO taillights are out.
2. Are both BO taillights out?

NO → **2BYN**

1. Repair main harness circuit 20 (WP 0294 00).
2. Verify no faults found.

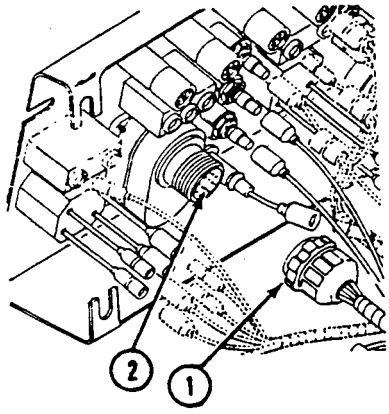
YES

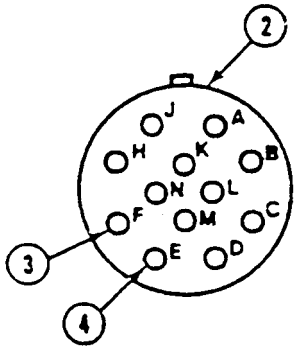
3BY

1. Repair main harness circuit 24 (WP 0294 00).
2. Verify no faults found.

CY

1. Turn MASTER SWITCH OFF.
2. Remove main harness plug (1) from light switch jack (2).
3. Measure resistance between switch jack (2) pins F (3) and E (4).
4. Does multimeter read 0 ohms?





NO → **CYN**

1. Replace light switch (WP 0262 00).
2. Verify no faults found.

YES

2CY

1. Repair main harness circuit 20/24 (WP 0294 00).
2. Verify no faults found.

SERVICE TAILLIGHT DOES NOT OPERATE 0041 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10

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

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Operate exterior lights in all positions (see your -10).
2. Do any exterior lights operate in any light switch positions?

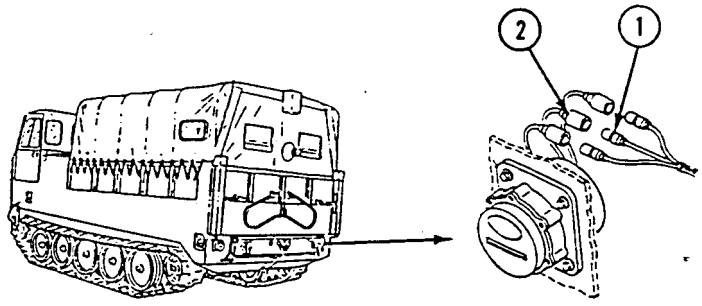
NO → **TN**

1. Go to no exterior lights operate (WP 0034 00).

YES

Y

1. Turn main light switch on light switch to SER DRIVE.
2. Remove main harness circuit 21 plug (1) from left taillight jack (2).
3. Measure voltage between main harness circuit 21 plug (1) and ground.
4. Does multimeter read less than 17 volts?



NO → **YN**

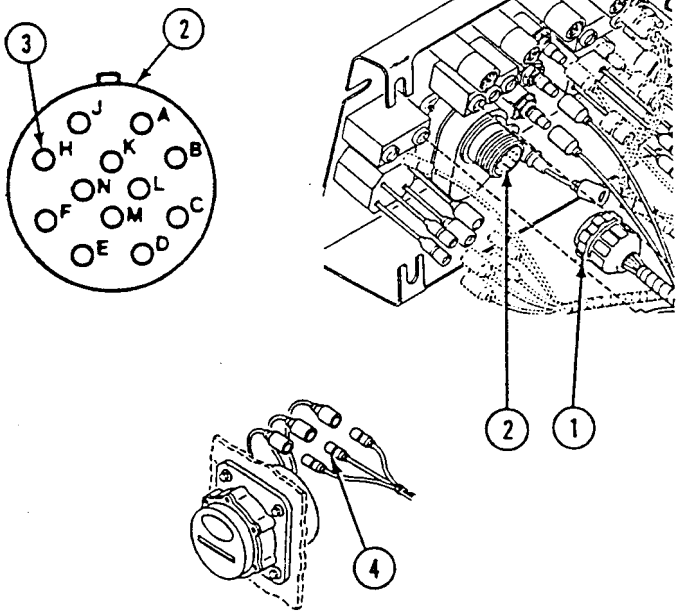
1. Replace service taillight bulb (WP 0278 00).
2. Verify no faults found.

YES

SERVICE TAILLIGHT DOES NOT OPERATE—Continued **0041 00**

2Y

1. Turn MASTER SWITCH OFF.
2. Partially remove instrument panel (WP 0256 00).
3. Remove main harness plug (1) from light switch jack (2).
4. Measure resistance between light switch jack (2) pin H (3) and circuit 21 jack (4).
5. Does multimeter read 0 ohms?



NO

2YN

1. Install main harness circuit 21 plug on left taillight jack.
2. Repair main harness circuit 21 (WP 0294 00).
3. Verify no faults found.

YES

3Y

1. Install main harness circuit 21 plug on left taillight jack.
2. Replace light switch (WP 0262 00).
3. Verify no faults found.

SERVICE STOPLIGHT DOES NOT WORK 0042 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Battery negative lead(s) disconnected (WP 0292 00)

T

1. Check for loose electrical connections.
2. Are electrical connections clean and tight?

NO →

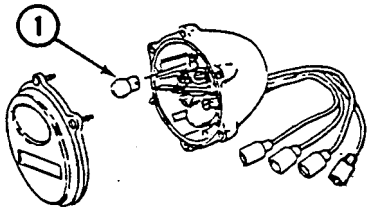
TN

1. Clean and tighten loose electrical connections.
2. Verify no faults found.

YES ↓

Y

1. Remove bulbs (1) from stoplight-taillight (WP 0278 00).
2. Check bulbs (1) for continuity.
3. Does multimeter indicate continuity?



NO →

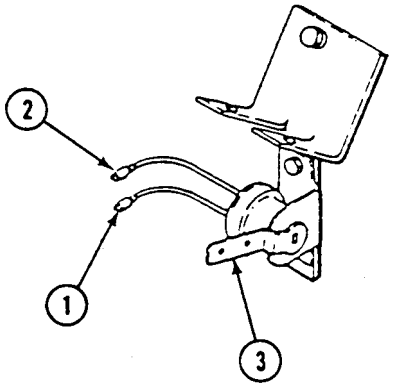
YN

1. Replace faulty stoplight- taillight bulb (WP 0278 00).
2. Verify no faults found.

YES ↓

2Y

1. Install bulbs in stoplight-taillight (WP 0278 00).
2. Disconnect circuit 75 lead (1) and circuit 75A lead (2) from stoplight switch (3).
3. Measure resistance between circuits 75 and 75A on stoplight switch. Multimeter should read infinity.
4. Depress switch arm and measure resistance. Multimeter should read continuity.
5. Are readings correct?



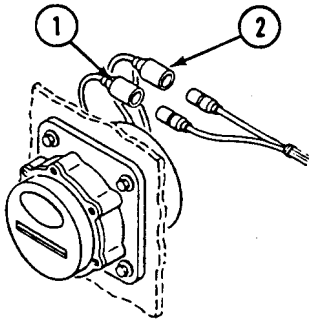
NO → **2YN**

1. Replace faulty stoplight switch (WP 0274 00).
2. Verify no faults found.

YES ↓

3Y

1. Connect circuit 75 and 75A leads to stoplight switch.
2. Remove circuit 22 plug (1) from left taillight or circuit 23 plug (2) from right taillight.
3. Turn main light selector switch lever on light switch to STOP LIGHT.
4. Measure voltage between circuit 22 (left) plug (1) or circuit 23 (right) plug (2) and ground with brakes applied (on M548A1 both right and left steering levers locked in park position).
5. Does multimeter read less than 17 volts?



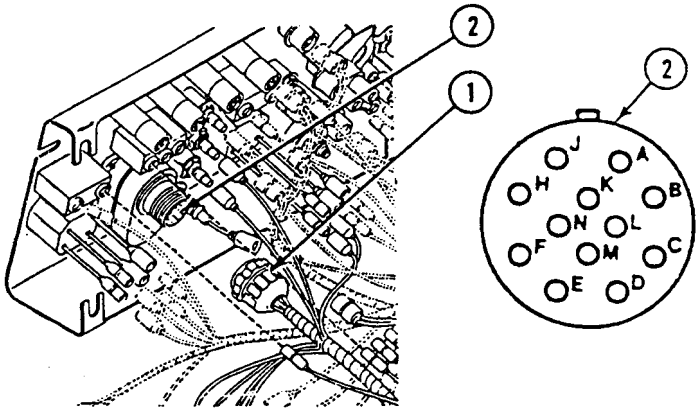
NO → **3YN**

1. Install circuit 22 and 23 plugs on left and right taillights.
2. Replace service or blackout stoplight bulb (WP 0278 00).
3. Verify no faults found.

YES ↓

4Y

1. Partially remove instrument panel (WP 0256 00).
2. Disconnect main wiring harness plug (1) from light switch jack (2).
3. Measure resistance between light switch jack (2) pins F and A, F and B, and F and J with light switch in the STOP LIGHT and PANEL BRT positions. Multimeter should read continuity.
4. Measure resistance between light switch jack (2) pins F and C, F and D, F and E, F and H, F and K, F and L, F and M, and F and N with light switch in the STOP LIGHT and PANEL BRT positions. Multimeter should read infinity.
5. Are readings correct?



NO →

4YN

1. Replace light switch (WP 0262 00).
2. Verify no faults found.

YES ↓

5Y

1. Connect main wiring harness plug to light switch.
2. Install instrument panel (WP 0256 00).
3. Verify no faults found.

TRAILER LIGHTS DO NOT OPERATE 0043 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic
Helper (H)

References

See your -10

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

T

1. Operate all exterior lights (see your -10).
2. Do any exterior lights operate in any light switch positions?

NO → **TN**

1. Go to no exterior lights operate (WP 0034 00).

YES

Y

1. Remove trailer plug from trailer receptacle.
2. Do all carrier exterior lights operate properly?

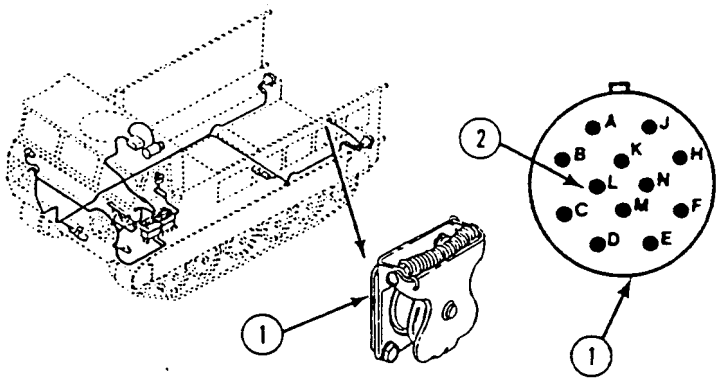
NO → **YN**

1. Troubleshoot carrier exterior lights (WP 0034 00).

YES

2Y

1. Turn MASTER SWITCH OFF.
2. Measure resistance between trailer receptacle (1) pin L (2) and ground.
3. Does multimeter read 0 ohms?



NO → **2YN**

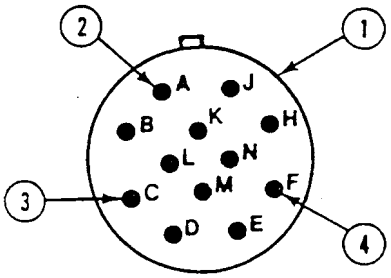
1. Replace trailer wiring harness (WP 0301 00).
2. Verify no faults found.

YES

TRAILER LIGHTS DO NOT OPERATE—Continued **0043 00**

3Y

1. Turn MASTER SWITCH ON.
2. Turn light switch to BO marker.
3. (H) Measure voltage between trailer receptacle (1) pins A (2), C (3), and F (4) to ground with steering levers pulled back.
4. Does multimeter read 17 volts or more for all readings?



NO

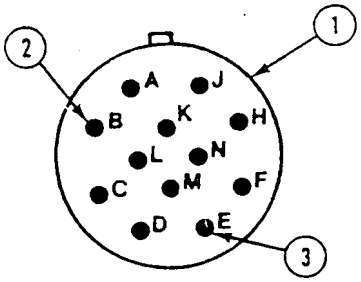
3YN

1. Replace trailer wiring harness (WP 0301 00).
2. Verify no faults found.

YES

4Y

1. Turn light switch to SER DRIVE.
2. (H) Measure voltage between trailer receptacle (1) pins B (2) and E (3) to ground with steering levers pulled back.
3. Does multimeter read 17 volts or more?



NO

4YN

1. Replace trailer wiring harness (WP 0301 00).
2. Verify no faults found.

YES

5Y

1. Faulty trailer harness(es) and/or lights.
2. Notify your supervisor.

HORN DOES NOT OPERATE 0044 00

INITIAL SETUP:

Maintenance Level
Unit

References
See your -10

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Jumper Wire

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

Personnel Required
Unit Mechanic
Helper (H)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Turn MASTER SWITCH ON.
2. Is MASTER POWER indicator on?

NO →

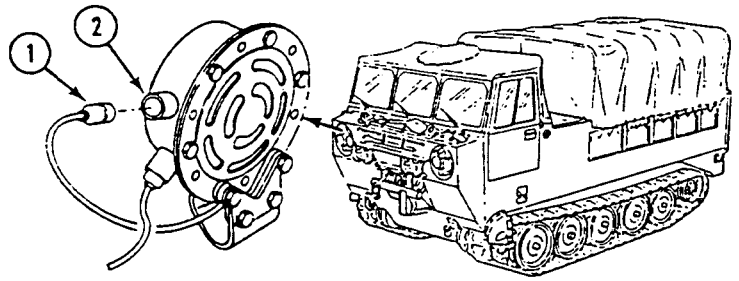
TN

1. Go to MASTER SWITCH ON indicator does not light (WP 0049 00).

YES ↓

Y

1. Remove horn ground lead plug (1) from horn jack (2).
2. Measure continuity between horn ground lead plug (1) and ground.
3. Does multimeter read 0 ohms?



NO →

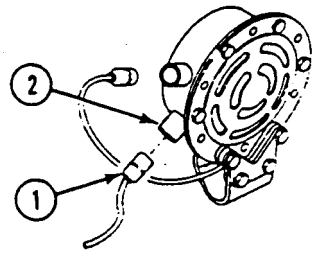
YN

1. Replace horn ground lead and/or connector (WP 0289 00).
2. Verify no faults found.

YES ↓

2Y

1. Remove right headlight wiring harness circuit 25 plug (1) from horn jack (2).
2. Turn MASTER SWITCH ON.
3. (H) Measure voltage between main wiring harness circuit 25 plug (1) and ground with horn button depressed.
4. Does multimeter read less than 17 volts?



NO

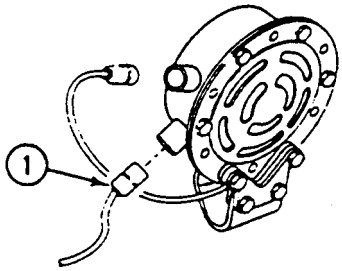
2YN

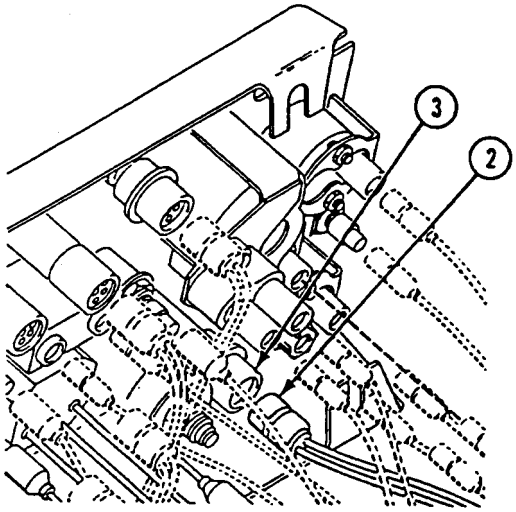
1. Replace horn (WP 0289 00).
2. Verify no faults found.

YES

3Y

1. Turn MASTER SWITCH OFF.
2. Install jumper wire between main wiring harness circuit 25 plug (1) and ground.
3. Partially remove instrument panel (WP 0256 00). Disconnect circuit 25/25A plug (2) from horn switch (3).
4. Measure resistance between circuit 25 lead and ground.
5. Does multimeter read 0 ohms?





NO →

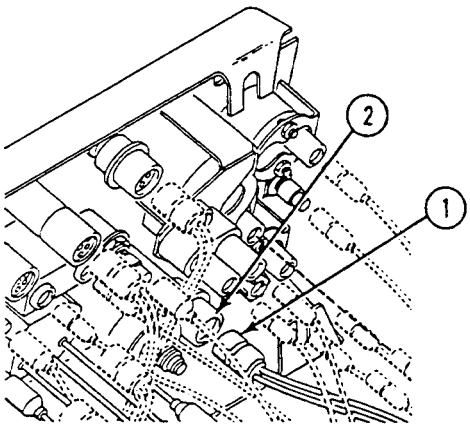
3YN

1. Remove jumper wire.
2. Repair main wiring harness circuit 25 (WP 0294 00).
3. Verify no faults found.

YES ↓

4Y

1. Remove circuit 25/25A plug (1) from horn switch jack (2).
2. (H) Measure resistance between horn switch jack (2) pins with horn switch depressed.
3. Does multimeter read 0 ohms?



NO

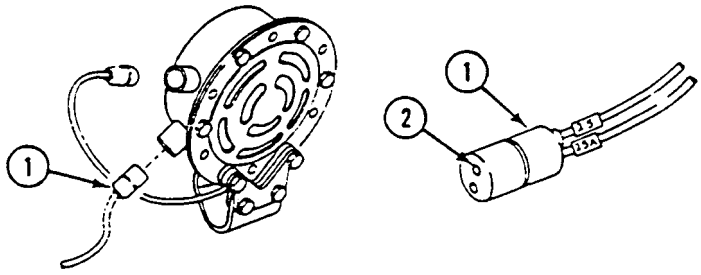
4YN

1. Install horn ground lead plug to horn jack.
2. Install main wiring harness circuit 25 plug onto horn jack.
3. Replace horn switch (WP 0259 00).
4. Verify no faults found.

YES

5Y

1. Remove jumper wire from main wiring harness circuit 25.
2. Install main wiring harness circuit 25 plug on horn jack.
3. Install a jumper wire between horn switch plug (1) circuit 25 pin (2) and ground.
4. Measure resistance between main wiring harness circuit 25 plug (2) and ground.
5. Does multimeter read 0 ohms?



NO

5YN

1. Remove jumper wire from horn switch plug.
2. Repair main wiring harness circuit 25 (WP 0294 00).
3. Verify no faults found.

YES

6Y

1. Remove jumper wire from circuit 25A.
2. Repair main wiring harness circuit 25A (WP 0294 00).
3. Verify no faults found.

INSTRUMENT PANEL ILLUMINATION LIGHTS MALFUNCTION 0045 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10

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

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Operate all exterior lights (see your -10).
2. Do any exterior lights operate in any light switch positions?

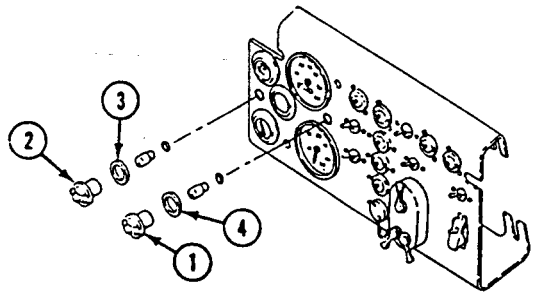
NO → **TN**

1. Go to no exterior lights operate (WP 0034 00).

YES ↓

Y

1. Remove instrument panel illumination light cover lense (1), illumination light cover lense (2), gasket (3), and gasket (4).
2. Operate light switch in DIM and BRT positions (see your -10).
3. Do both lights malfunction?

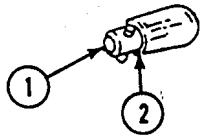


NO → GO TO **BY** (PAGE 0045 00-3)

YES ↓

2Y

1. Remove malfunctioning bulbs from instrument panel illumination light indicator assemblies.
2. Measure resistance between bulb center contact (1) and bulb base (2) of each bulb for continuity.
3. Does multimeter indicate any continuity?



NO

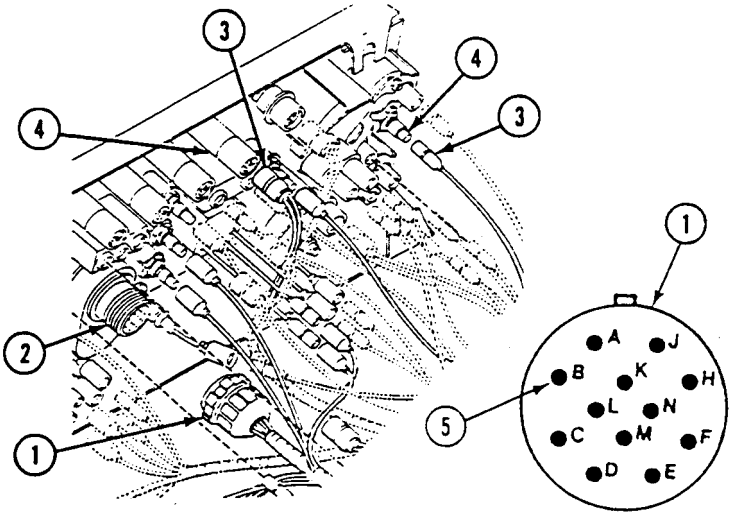
2YN

1. Replace panel light bulbs as required (WP 0264 00).
2. Verify no faults found.

YES

3Y

1. Turn MASTER SWITCH OFF.
2. Install instrument panel light bulbs.
3. Install instrument panel illumination light cover lenses and gaskets.
4. Partially remove instrument panel (WP 0256 00).
5. Remove main harness plug (1) from light switch jack (2).
6. Remove main harness circuit 40 plug (3) from either illumination light jack (4).
7. Measure resistance between main harness light switch plug (1) pin B (5) and illumination light plug circuit 40 (3).
8. Does multimeter read 0 ohms?



NO

3YN

1. Repair main harness circuit 40 (WP 0294 00).
2. Verify no faults found.

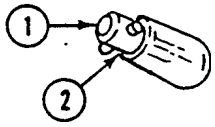
YES

4Y

1. Replace light switch (WP 0262 00).
2. Verify no faults found.

BY

1. Remove malfunctioning bulb from instrument panel illumination light indicator assembly.
2. Measure resistance between bulb center contact (1) and bulb base (2) for continuity.
3. Does multimeter indicate any continuity?



NO

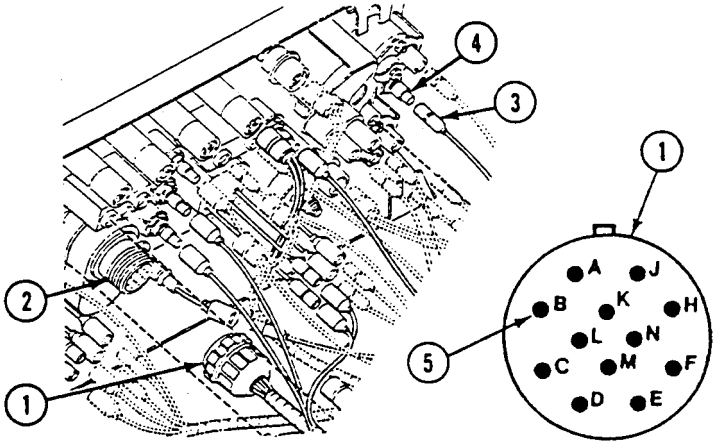
BYN

1. Replace panel light bulb as required (WP 0264 00).
2. Verify no faults found.

YES

2BY

1. Partially remove instrument panel (WP 0325 00).
2. Remove main harness plug (1) from light switch jack (2).
3. Remove main harness circuit 40 plug (3) from failing instrument panel light (4).
4. Measure resistance between main harness light switch plug (1) pin B (5) and failing circuit 40 light plug (3).
5. 5 Does multimeter read 0 ohms?



NO

2BYN

1. Install bulbs.
2. Repair main harness circuit 40 (WP 0294 00).
3. Verify no faults found.

YES

3BY

1. Install main harness plug on light switch jack.
2. Replace instrument panel light assembly (WP 0264 00).
3. Verify no faults found.

LOW PRESS ENGINE OIL INDICATOR FAILS TO GO OFF AFTER ENGINE STARTS 0046 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
STE/ICE-R Test Kit (WP 0541 00, Item 6)
Oil Pressure Gauge Kit (WP 0541 00, Item 34)

Personnel Required

Unit Mechanic

References

See your -10

See your -PMCS
(WP 0110 00)

Equipment Condition

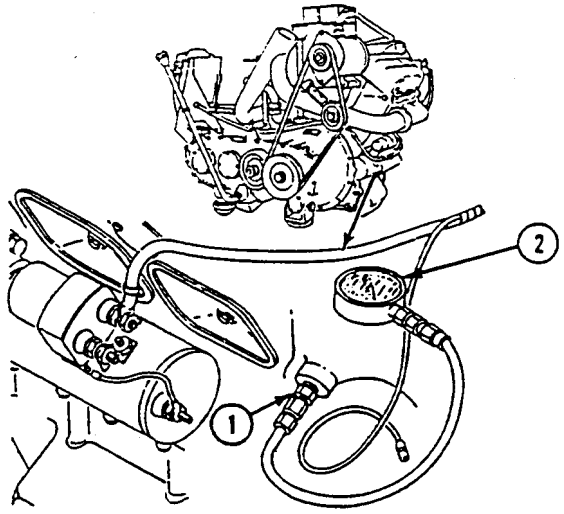
Engine stopped (see your -10)
Carrier blocked (see your -10)
Engine warm
Engine oil level checked (see your PMCS)
Engine idle speed checked (see your -10)
Cab personnel seats raised (see your -10)
Power plant rear access door/panel removed (see your -10)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Remove engine oil low pressure switch (WP 0281 00).
2. Install adapter (1) and oil pressure gauge (2).
3. Start engine and let idle (see your -10).
4. Does pressure gauge read less than 13 psi (90 kPa)?



NO → **TN**

1. Go to LOW PRESS ENGINE OIL indicator malfunctions WP 0046 00.

YES

LOW PRESS ENGINE OIL INDICATOR FAILS TO GO OFF AFTER ENGINE STARTS—Continued **0046 00**

Y

1. Low engine oil pressure.
2. Notify your supervisor.

TRANS LOW OIL PRESS INDICATOR COMES ON (M548A3) 0047 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
Tube-pipe Fitting Kit (WP 0541 00, Item 15)
Pressure Gauge Kit (WP 0541 00, Item 34)

Personnel Required

Unit Mechanic

References

See your -10
See your PMCS

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Parking brake off (see your -10)
Transmission in SL (see your -10)
Transmission oil level checked (see your PMCS)
Power plant warm
Idle speed set at 600 rpm (see your -10)
Center seat raised (see your -10)

T

1. Turn MASTER SWITCH ON.
2. Is TRANS LOW OIL PRESS light on?

NO →

TN

1. Go to TRANS LOW OIL PRESS indicator malfunctions WP 0055 00.

YES ↓

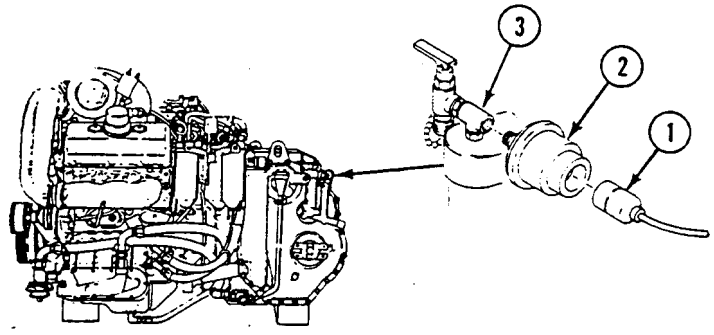
Y

1. Turn MASTER SWITCH OFF.
2. Remove plug (1) from lube port switch (2).
3. Remove lube port switch (2) from tee (3).
4. Install pressure tester in tee (3).
5. Start engine and run at 1500 rpm (see your -10).
6. Measure lube pressure with transmission in SL. Use 160 psi (1103 kPa) gauge. Pressure should be over 4 psi (28 kPa).
7. Does pressure tester measure less than 4 psi (28 kPa)?

NO →

YN

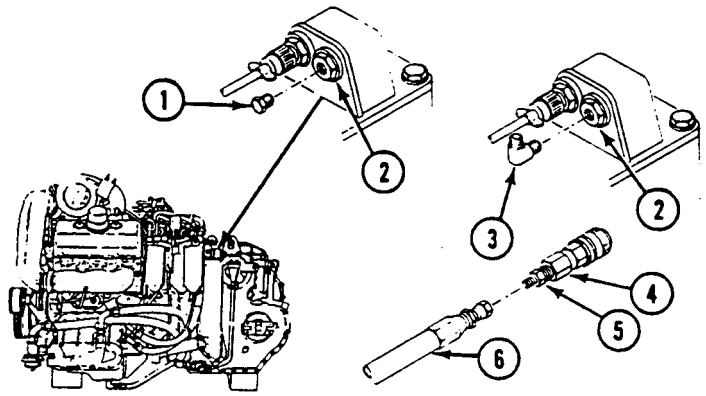
1. Go to TRANS LOW OIL PRESS indicator malfunctions WP 0055 00.



YES ↓

2Y

1. Stop engine (see your -10).
2. Remove pressure tester and install switch.
3. Remove plug (1) from MAIN port (2).
4. Install 4730-231-5632 elbow (3) into MAIN port (2).
5. Remove female quick disconnect (4) and adapter (5) from test hose (6).
6. Install test hose (6) on elbow (3).
7. Measure MAIN pressure with engine at 600 rpm with transmission in R and then in 1-4 position. Use 400 psi (2758 kPa) gauge. Pressure should be 280-325 psi (1930-2241 kPa) in R and 190-210 psi (1310-1448 kPa) in 1-4 position.
8. Does pressure tester indicate an incorrect reading?



NO

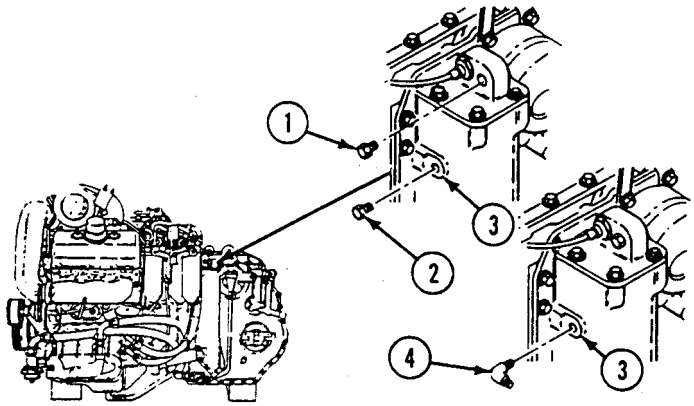
2YN

1. Transmission low lube pressure. Beyond unit maintenance repair.
2. Notify your supervisor.

YES

3Y

1. Stop engine (see your -10).
2. Remove pressure tester and install MAIN port plug (1).
3. Remove plug (2) from FILTER IN port (3).
4. Install 4730-766-9000 elbow (4) into FILTER IN port (3).
5. Install pressure tester onto elbow (4). Use 400 psi (2758 kPa) gauge.
6. Measure FILTER IN pressure with engine at 600 rpm with transmission in R and then in 1-4 position. FILTER IN pressure should be within 35 psi (241 kPa) of MAIN pressure.
7. Is FILTER IN pressure 35 psi (241 kPa) or more higher than MAIN pressure?



NO → GO TO **BY** (PAGE 0047 00-4)

YES

4Y

1. Check to see if TRANS OIL HI DIFF PRESS indicator is on.
2. Is TRANS OIL HI DIFF PRESS indicator on?

NO → GO TO **CY** (PAGE 0047 00-4)

YES

5Y

1. Stop engine (see your -10).
2. Replace transmission oil filter element (WP 0321 00).
3. Verify no faults found.

BY

1. Check to see if FILTER IN pressure is within 20 psi (138 kPa) of MAIN pressure.
2. Is FILTER IN pressure within 20 psi (138 kPa) of MAIN pressure?

NO →

BYN

1. Replace transmission filter element (WP 0321 00).
2. Verify no faults found.

YES ↓

2BY

1. Check transmission brake adjustment (WP 0314 00).
2. Are transmission brakes correctly adjusted?

NO →

2BYN

1. Adjust transmission brakes (WP 0314 00).
2. Verify no faults found.

YES ↓

3BY

1. Check service brake control linkage adjustment (WP 0347 00).
2. Is linkage properly adjusted?

NO →

3BYN

1. Adjust service brake control linkage (WP 0347 00).
2. Verify no faults found.

YES ↓

4BY

1. Verify no faults found.

CY

1. Check to see if FILTER IN pressure is 35 psi (241 kPa) or more greater than MAIN pressure.
2. Is FILTER IN pressure 35 psi (241 kPa) or more greater than MAIN pressure?

NO →

CYN

1. Go to TRANS OIL HI DIFF PRESS indicator malfunctions WP 0059 00.

YES ↓

2CY

1. Faulty transmission beyond unit maintenance repair.
2. Notify your supervisor.

DOME LIGHT WORKS IMPROPERLY 0048 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10

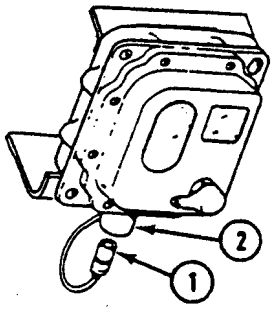
Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Remove main harness plug (1) from jack (2) on failing dome light.
2. Turn MASTER SWITCH ON.
3. Measure voltage between main harness plug (1) and ground.
4. Does multimeter read 17 volts or more?



NO → GO TO **3Y** (PAGE 0048 00-2)

YES

Y

1. Install main harness plug on dome light.
2. Have dome light bulbs been replaced?

NO → **YN**

1. Replace dome light bulbs (WP 0279 00).
2. Verify no faults found.

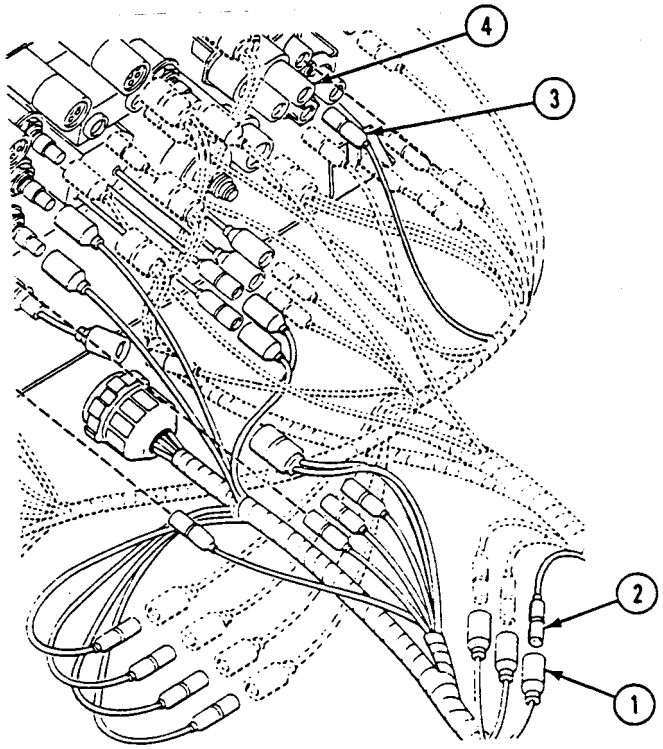
YES

2Y

1. Replace dome light assembly (WP 0279 00).
2. Verify no faults found.

3Y

1. Turn MASTER SWITCH OFF.
2. Partially remove instrument panel (WP 0256 00).
3. Remove main harness circuit 38 plug (1) from harness circuit 38/27 jack (2).
4. Remove instrument panel cable assembly circuit 27 plug (3) from instrument panel circuit breaker jack (4).
5. Measure resistance between harness circuit 38/27 jack (2) and circuit 27 plug (3).
6. Does multimeter read 0 ohms?



NO →

3YN

1. Install main harness plug on dome light jack.
2. Repair instrument panel cable assembly circuit 38 (WP 0294 00).
3. Verify no faults found.

YES ↓

4Y

1. Repair main harness circuit 38 (WP 0294 00).
2. Verify no faults found.

MASTER SWITCH ON INDICATOR DOES NOT LIGHT 0049 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10

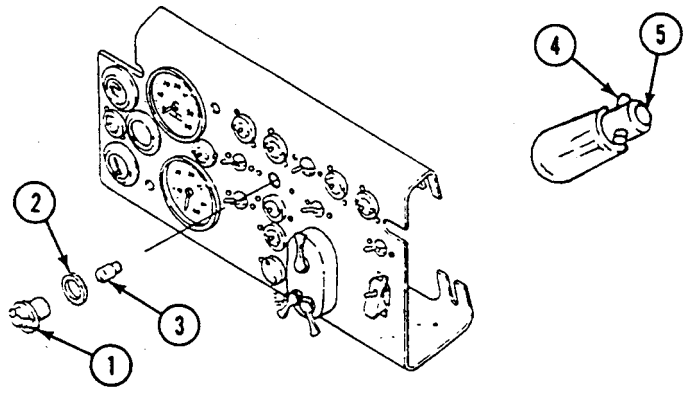
Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Remove MASTER SWITCH ON indicator cover lens (1), gasket (2), and bulb (3).
2. Check continuity between bulb center contact (4) and bulb base (5).
3. Does multimeter indicate any continuity?



NO → **TN**

1. Replace MASTER SWITCH ON bulb (WP 0271 00).
2. Verify no faults found.

YES

Y

1. Install MASTER SWITCH ON indicator bulb, gasket, and lens.
2. Turn MASTER SWITCH ON.
3. Is BATTERY-GENERATOR+4p gauge in the green zone?

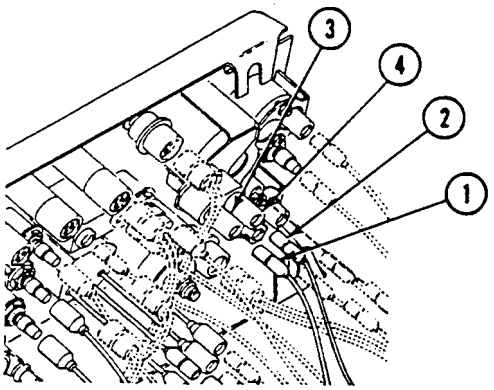
NO → GO TO **BY** (PAGE 0049 00-3)

YES

MASTER SWITCH ON INDICATOR DOES NOT LIGHT—Continued 0049 00

2Y

1. Turn MASTER SWITCH OFF.
2. Partially remove instrument panel (WP 0256 00).
3. Remove circuit 10 plug (1) and circuit 27 plug (2) from instrument panel circuit breaker jacks (3) and (4).
4. Measure resistance between circuit breaker jacks (3) and (4).
5. Does multimeter read less than infinity?



NO

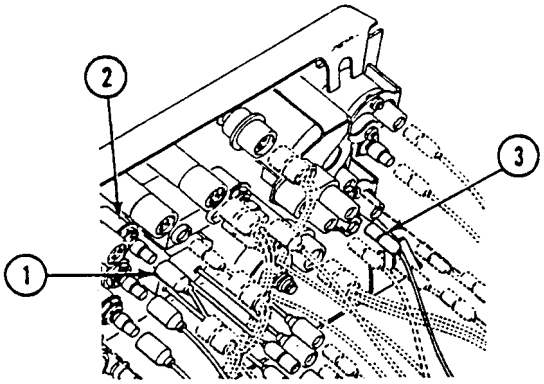
2YN

1. Replace instrument panel circuit breaker (WP 0267 00).
2. Verify no faults found.

YES

3Y

1. Remove circuit 27D plug (1) from MASTER SWITCH ON indicator jack (2).
2. Measure resistance between circuit 27 plug (3) and circuit 27D plug (1).
3. Does multimeter read 0 ohms?



NO

3YN

1. Repair power/instrument panel wiring harness (WP 0294 00).
2. Verify no faults found.

YES

4Y

1. Replace MASTER SWITCH ON indicator assembly (WP 0271 00).
2. Verify no faults found.

BY

1. Turn MASTER SWITCH OFF.
2. Inspect carrier batteries (WP 0290 00).
3. Are carrier batteries in proper maintenance and well charged?

NO →

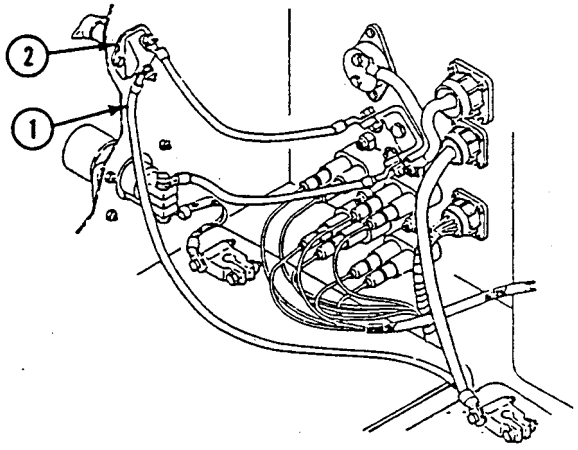
BYN

1. Service carrier batteries (see your -10).
2. Verify no faults found.

YES ↓

2BY

1. Raise driver's seat (see your -10).
2. Inspect lead terminal end (1) on MASTER SWITCH (2).
3. Is terminal end and MASTER SWITCH free from corrosion and/or other damage?



NO →

2BYN

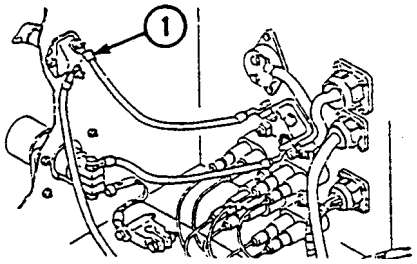
1. Repair battery to MASTER SWITCH lead (WP 0294 00).
2. Verify no faults found.

YES ↓

MASTER SWITCH ON INDICATOR DOES NOT LIGHT—Continued 0049 00

3BY

1. Turn MASTER SWITCH ON.
2. Measure voltage between MASTER SWITCH circuit 6 terminal (1) and ground.
3. Does multimeter read more than 17 volts?



NO →

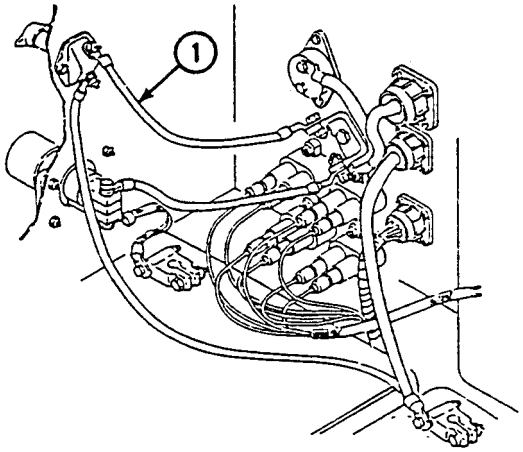
3BYN

1. Replace MASTER SWITCH assembly (WP 0271 00).
2. Verify no faults found.

YES ↓

4BY

1. Turn MASTER SWITCH OFF.
2. Inspect MASTER SWITCH to bus bar lead (1).
3. Are lead and lead ends free from corrosion and damage?



NO →

4BYN

1. Repair MASTER SWITCH to bus bar lead (WP 0294 00).
2. Verify no faults found.

YES ↓

5BY

1. Repair power/instrument panel wiring harness (WP 0294 00).
2. Verify no faults found.

FUEL LEVEL INDICATOR MALFUNCTIONS 0050 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Jumper Wire

Equipment Condition

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

Personnel Required

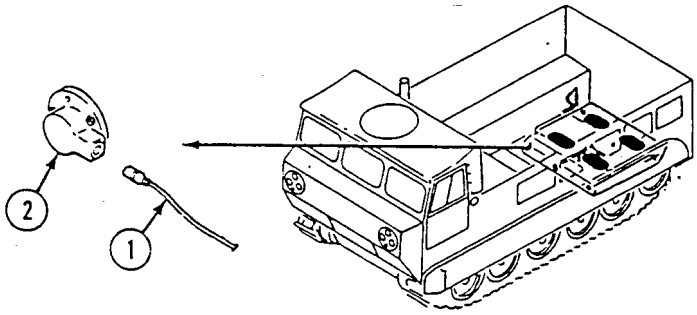
Unit Mechanic

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Remove circuit 28 plug (1) from fuel tank jack (2).
2. Turn MASTER SWITCH ON.
3. Does fuel indicator read full?



NO

TN

1. Repair circuit 28 lead to fuel tank sender (WP 0294 00).
2. Verify no faults found.

YES

Y

1. Install jumper wire between circuit 28 plug and ground.
2. Does fuel quantity gauge fail to read empty?

NO

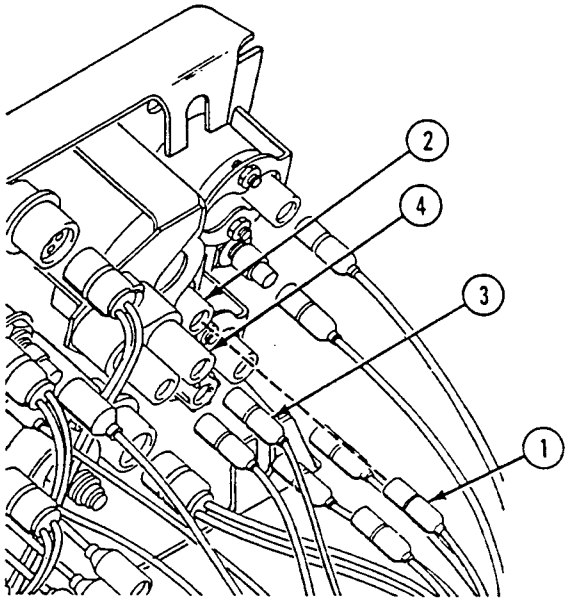
YN

1. Replace fuel quantity sending unit (WP 0149 00 or WP 0150 00).
2. Verify no faults found.

YES

2Y

1. Turn MASTER SWITCH OFF.
2. Partially remove instrument panel (WP 0256 00).
3. Remove circuit 27A plug (1) from fuel quantity gauge jack (2).
4. Remove circuit 27 plug (3) from instrument panel circuit breaker jack (4).
5. Measure continuity between circuit 27 plug (3) and circuit 27A plug (1).
6. Does multimeter read 0 ohms?



NO

2YN

1. Repair instrument panel cable assembly (WP 0294 00).
2. Verify no faults found.

YES

3Y

1. Replace fuel quantity gauge (WP 0266 00).
2. Verify no faults found.

HIGH BEAM INDICATOR LIGHT MALFUNCTIONS 0051 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Jumper Wire

Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
MASTER SWITCH OFF (see your -10)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Check service and infrared headlights (see your -10).
2. Do all lights operate properly?

NO →

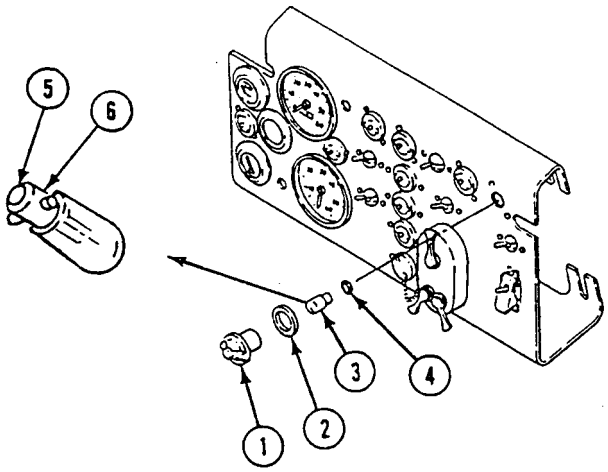
TN

1. Go to service headlights do not operate (WP 0036 00) or infrared headlights do not operate (WP 0037 00).
2. Verify no faults found.

YES ↓

Y

1. Remove high beam indicator light cover lens (1), gasket (2), bulb (3), and gasket (4).
2. Measure resistance between bulb center contact (5) and bulb base (6) for continuity.
3. Did multimeter indicate any continuity?



NO →

GO TO **AY** (PAGE 0051 00-2)

YES ↓

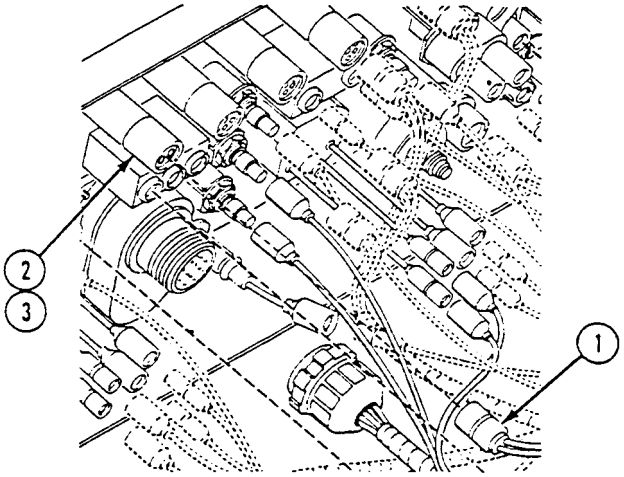
2Y

1. Replace high beam indicator light bulb (WP 0257 00).
2. Verify no faults found.

AY

1. Remove circuit 519/519A lead (1) from high beam indicator light.
2. Measure resistance between each terminal (2), (3), and ground.
3. Does multimeter read less than infinity?

NO → GO TO **BY** (PAGE 0051 00-3)



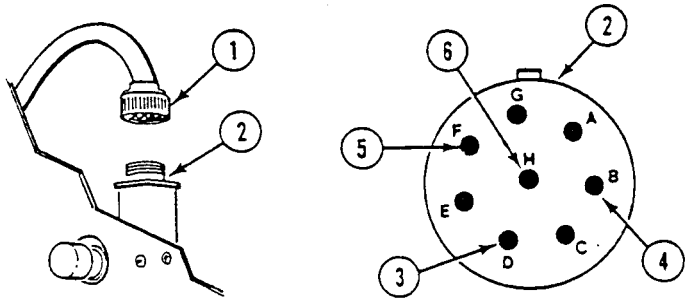
YES

2AY

1. Replace high beam indicator light (WP 0257 00).
2. Verify no faults found.

BY

1. Remove main harness plug (1) from beam selector switch jack (2).
2. Measure resistance between beam selector switch jack (2) pins D (3) and B (4) and between pins F (5) and H (6).
3. Did multimeter read 0 ohms for both measurements?



NO →

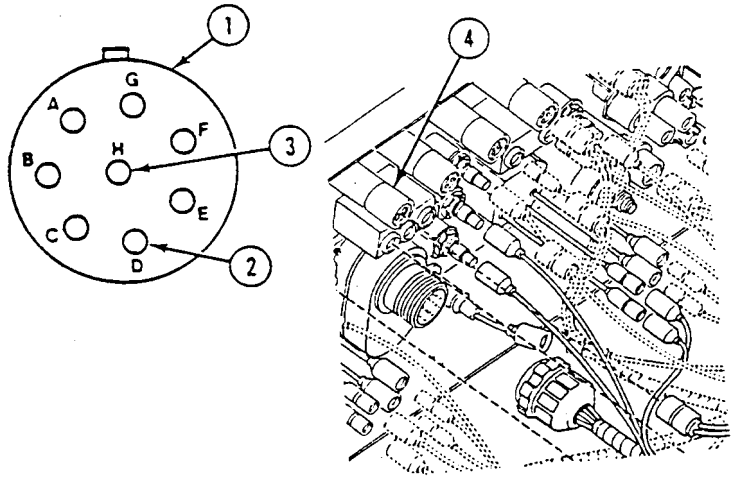
BYN

1. Replace beam selector switch (WP 0273 00).
2. Verify no faults found.

YES ↓

2BY

1. Install jumper wire between main harness beam selector switch plug (1) pins D (2) and H (3).
2. Measure resistance between pins on plug (4).
3. Does multimeter read 0 ohms?



NO →

2BYN

1. Repair main harness circuits 519 or 519A (WP 0294 00).
2. Verify no faults found.

YES ↓

3BY

1. Replace high beam indicator light (WP 0258 00).
2. Verify no faults found.

BATTERY/GENERATOR INDICATOR MALFUNCTIONS 0052 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
STE/ICE-R Test Kit (WP 0541 00, Item 6)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10
(WP 0052 00)

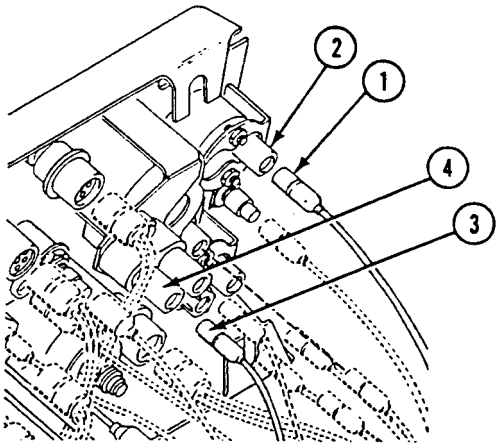
Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Remove circuit 27E plug (1) from battery generator indicator jack (2).
2. Remove circuit 10 plug (3) from instrument panel circuit breaker jack (4).
3. Measure resistance between circuit 27E plug (1) and circuit 10 plug (3).
4. Does multimeter read 0 ohms?



NO →

TN

1. Repair master power harness circuit 27E (WP 0294 00).
2. Verify no faults found.

YES ↓

BATTERY/GENERATOR INDICATOR MALFUNCTIONS—Continued **0052 00**

Y

1. Replace BATTERY/GENERATOR indicator panel light (WP 0264 00).
2. Verify no faults found.

COOLANT TEMPERATURE GAUGE MALFUNCTIONS 0053 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Jumper wire

Personnel Required

Unit Mechanic

References

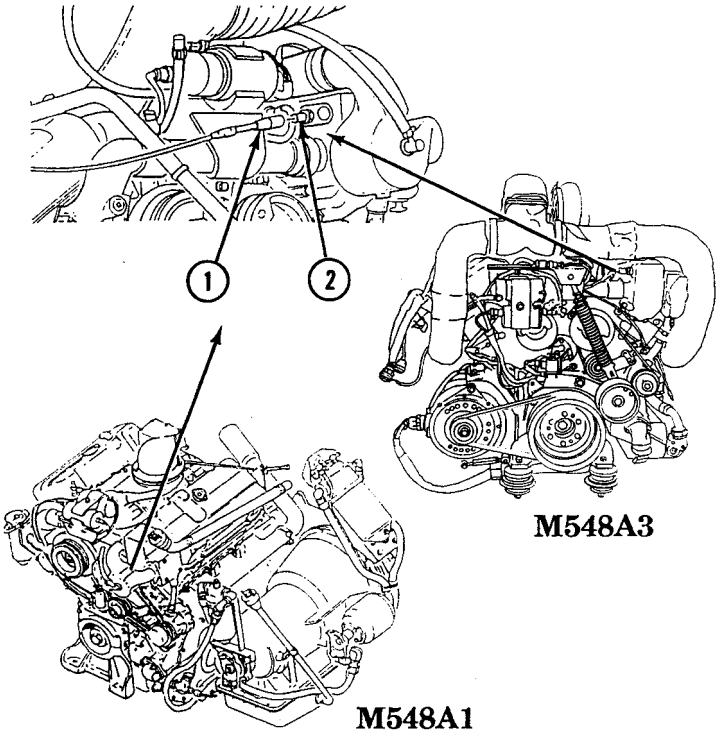
See your -10

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Cab personnel seats raised (see your -10)
Power plant rear access door/panel removed (see your -10)

T

1. Remove engine wiring harness circuit 33 plug (1) from engine coolant temperature transmitter jack (2).
2. Turn MASTER SWITCH ON.
3. Is TEMP gauge needle in full left (cold) position?



M548A3

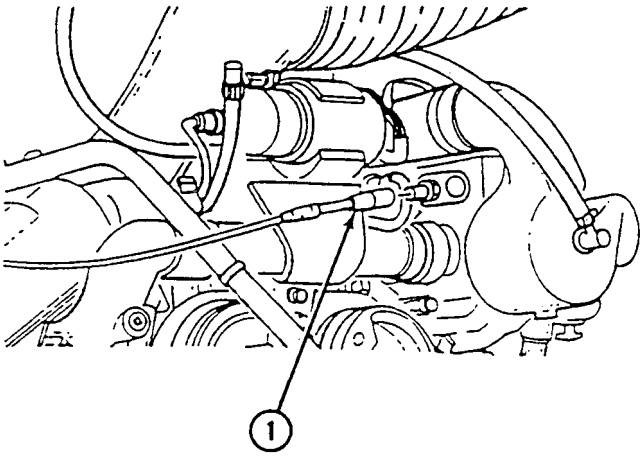
M548A1

NO → GO TO **BY** (PAGE 0053 00-3)

YES

Y

1. Turn MASTER SWITCH OFF.
2. Install jumper wire between engine wiring harness circuit 33 plug (1) and ground.
3. Observe TEMP gauge needle.
4. Turn MASTER SWITCH ON for two seconds.
5. Did TEMP gauge needle move to full right (hot) position?



NO → GO TO **CY** (PAGE 0053 00-5)

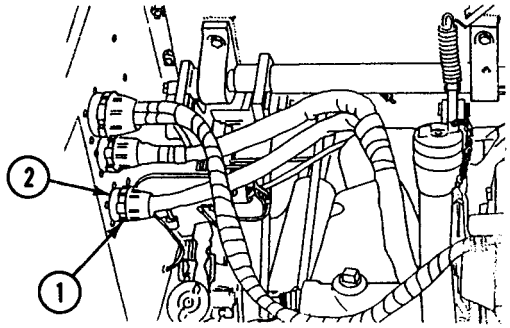
YES

2Y

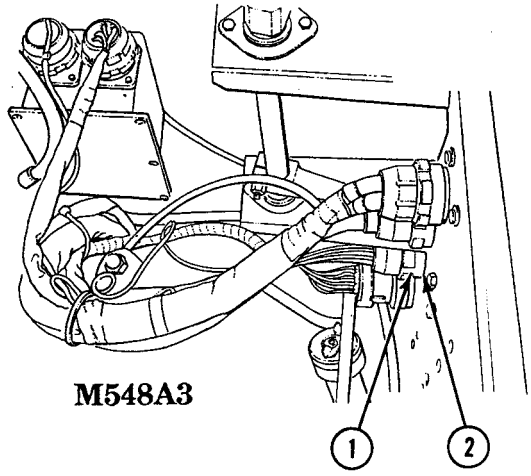
1. Turn MASTER SWITCH OFF.
2. Remove jumper wire.
3. Replace engine coolant temperature transmitter (WP 0283 00).
4. Verify no faults found.

BY

1. Turn MASTER SWITCH OFF.
2. Remove engine wiring harness plug (1) from power wiring harness jack (2) at battery box.
3. Turn MASTER SWITCH ON.
4. Is TEMP gauge still not in full left (cold) position?



M548A1



M548A3

NO

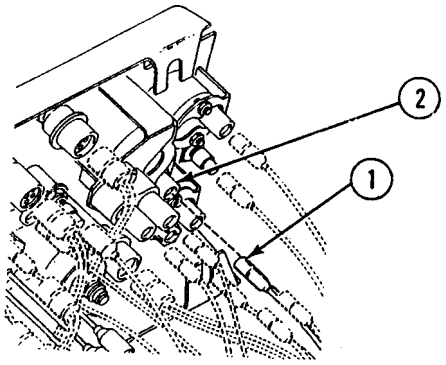
BYN

1. Wiring harness needs to be replaced.
2. Notify your supervisor.

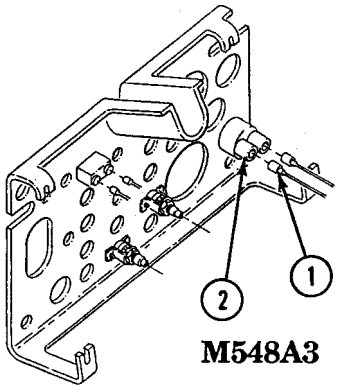
YES

2BY

1. Turn MASTER SWITCH OFF.
2. Partially remove instrument panel (WP 0256 00).
3. Remove power wiring harness circuit 33 plug (1) from TEMP gauge jack (2).
4. Measure resistance between power wiring harness circuit 33 plug (1) and ground.
5. Does multimeter read infinity?



M548A1



M548A3

NO

2BYN

1. Wiring harness needs to be replaced.
2. Notify your supervisor.

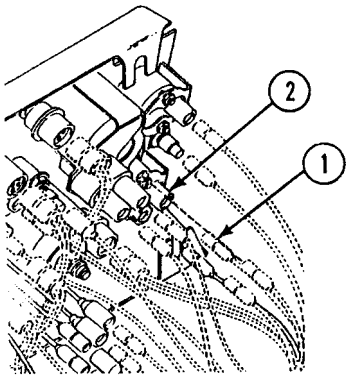
YES

3BY

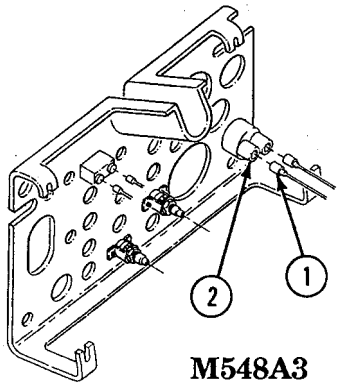
1. Install engine wiring harness plug on power wiring harness jack at battery box.
2. Install engine wiring harness circuit 33 plug on engine temperature transmitter jack.
3. Replace TEMP gauge (WP 0266 00).
4. Verify no faults found.

CY

1. Remove jumper wire.
2. Partially remove instrument panel (WP 0256 00).
3. Remove circuit 27B plug (1) from coolant temperature gauge (2).
4. Turn MASTER SWITCH ON.
5. Measure voltage between circuit 27B plug (1) pin and ground.
6. Does multimeter read at least 17 volts?



M548A1



M548A3

NO →

CYN

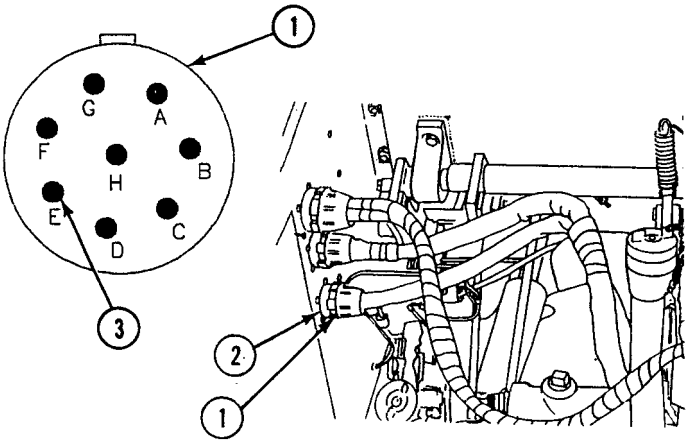
1. Wiring harness needs to be replaced.
2. Notify your supervisor.

YES ↓

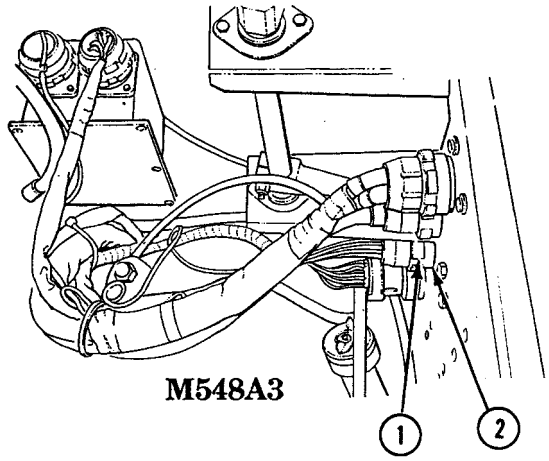
COOLANT TEMPERATURE GAUGE MALFUNCTIONS—Continued **0053 00**

2CY

1. Turn MASTER SWITCH OFF.
2. Remove engine wiring harness plug (1) from power wiring harness jack (2) at battery box.
3. Measure resistance between engine wiring harness plug (1) pin E (3) and ground.
4. Does multimeter read 0 ohms?



M548A1



M548A3

NO

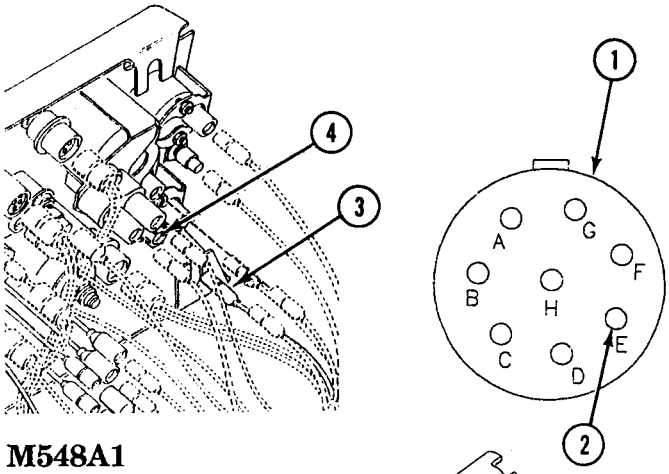
2CYN

1. Wiring harness needs to be replaced.
2. Notify your supervisor.

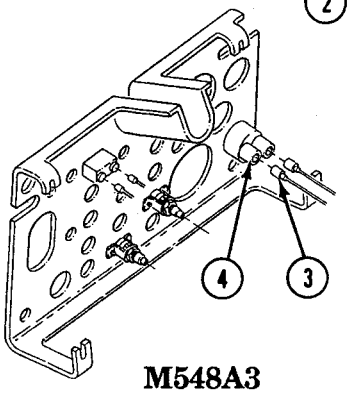
YES

3CY

1. Install engine wiring harness circuit 33 plug on engine coolant temperature transmitter.
2. Install jumper wire between power wiring harness jack (1) pin E (2) and ground (at battery box).
3. Remove power wiring harness circuit 33 plug (3) from TEMP gauge jack (4).
4. Measure resistance between power wiring harness circuit 33 (3) and ground.
5. Does multimeter read 0 ohms?



M548A1



M548A3

NO →

3CYN

1. Remove jumper wire.
2. Wiring harness needs to be replaced.
3. Notify your supervisor.

YES ↓

4CY

1. Remove jumper wire.
2. Install engine wiring harness plug onto power wiring harness jack at battery box.
3. Replace TEMP gauge (WP 0266 00).
4. Verify no faults found.

LO PRESS ENGINE OIL INDICATOR MALFUNCTIONS 0054 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Jumper Wire

Personnel Required
Unit Mechanic

References
See your -10

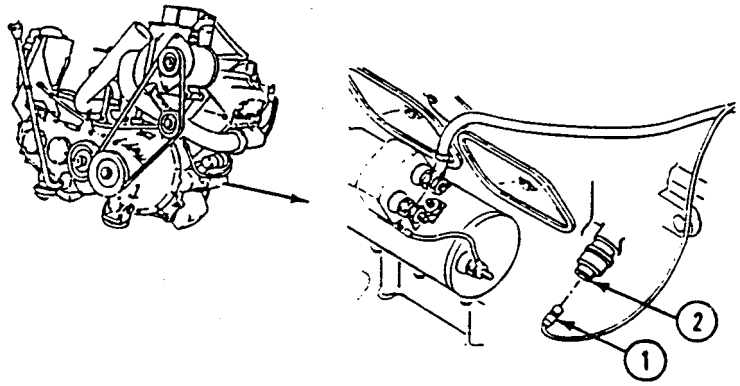
Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Remove engine harness circuit 34 plug (1) from engine oil low pressure switch (2).
2. Turn MASTER SWITCH ON.
3. Is LO PRESS ENGINE OIL indicator off?



NO → GO TO **AY** (PAGE 0054 00-2)

YES

Y

1. Install jumper wire between engine harness circuit 34 plug pin and ground.
2. Is LO PRESS ENGINE OIL indicator on?

NO → GO TO **BY** (PAGE 0054 00-3)

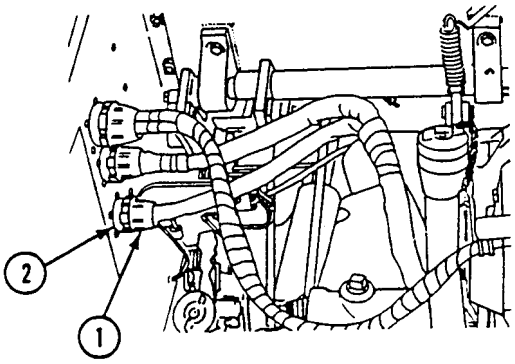
YES

2Y

1. Replace engine oil low pressure switch (WP 0281 00).
2. Verify no faults found.

AY

1. Remove engine harness plug (1) from power harness jack (2) at battery box.
2. Is LO PRESS ENGINE OIL indicator still on?



NO

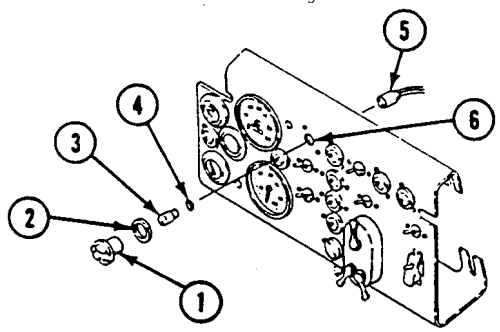
AYN

1. Repair engine harness circuit 34 (WP 0294 00).
2. Verify no faults found.

YES

2AY

1. Remove LO PRESS ENGINE OIL indicator cover lens (1) gasket (2), bulb (3), and gasket (4).
2. Remove power harness circuit 27J/34 plug (5) from LO PRESS ENGINE OIL indicator jack (6).
3. Measure resistance between indicator jack (6) pins and ground, one at a time.
4. Did multimeter read less than infinity for either measurement?



NO

2AYN

1. Repair power harness circuit 34 (WP 0294 00).
2. Verify no faults found.

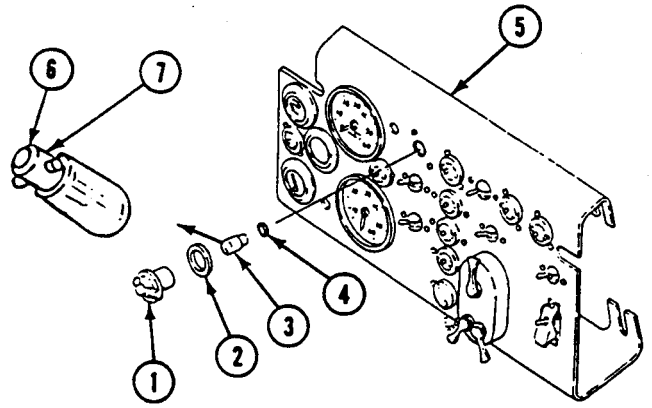
YES

3AY

1. Replace LO PRESS ENGINE OIL indicator panel light assembly (WP 0264 00).
2. Verify no faults found.

BY

1. Remove LO PRESS ENGINE OIL indicator cover lens (1), gasket (2), bulb (3), and gasket (4) from instrument panel (5).
2. Measure resistance between bulb center contact (6) and bulb base (7) for continuity.
3. Does multimeter indicate any continuity?



NO

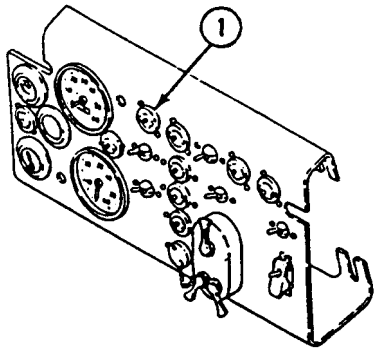
BYN

1. Replace LO PRESS ENGINE OIL indicator bulb (WP 0264 00).
2. Verify no faults found.

YES

2BY

1. Measure voltage between LO PRESS ENGINE OIL indicator (1) center contact and ground.
2. Does multimeter read less than 17 volts?



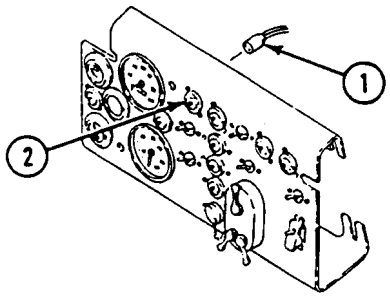
NO

GO TO **CY** (PAGE 0054 00-4)

YES

3BY

1. Remove power harness circuit 27J/34 plug (1) from LO PRESS ENGINE OIL indicator jack (2).
2. Measure voltage between circuit 27J plug pin and ground.
3. Does multimeter read less than 17 volts?



NO →

3BYN

1. Replace LO PRESS ENGINE OIL indicator panel light assembly (WP 0264 00).
2. Verify no faults found.

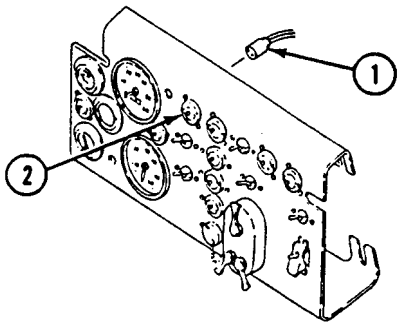
YES ↓

4BY

1. Repair power harness circuit 27F (WP 0294 00).
2. Verify no faults found.

CY

1. Remove power harness circuit 27J/34 plug (1) from LO PRESS ENGINE OIL indicator jack (2).
2. Measure resistance between circuit 34 plug pin and ground.
3. Does multimeter read more than 0 ohms?



NO →

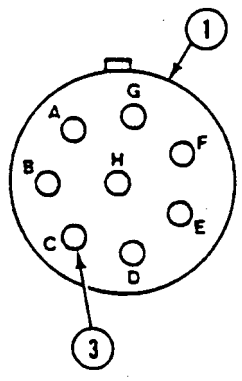
CYN

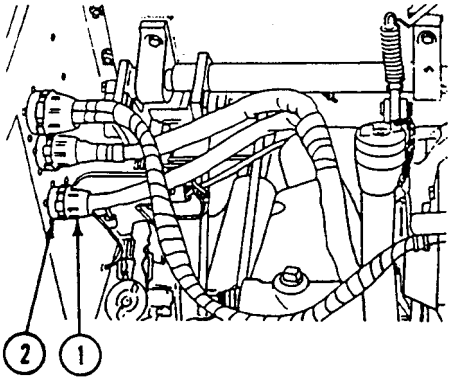
1. Install power harness plug on LO PRESS ENGINE OIL indicator jack.
2. Remove jumper wire.
3. Replace engine oil low pressure switch (WP 0281 00).
4. Verify no faults found.

YES ↓

2CY

1. Remove engine harness plug (1) from power harness jack (2) at battery box.
2. Measure resistance between engine harness plug (1) pin D (3) and ground.
3. Does multimeter read 0 ohms?





NO →

2CYN

1. Remove jumper wire.
2. Install power harness plug on LO PRESS ENGINE OIL indicator jack.
3. Install indicator cover lens and bulb.
4. Repair engine harness circuit 34 (WP 0294 00).
5. Verify no faults found.

YES ↓

3CY

1. Remove jumper wire.
2. Install engine harness onto LO PRESS ENGINE OIL switch.
3. Repair power harness circuit 34 (WP 0294 00).
4. Verify no faults found.

TRANS LOW OIL PRESS INDICATOR MALFUNCTIONS (M548A3) 0055 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanics Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Jumper Wire

Personnel Required

Unit Mechanic

References

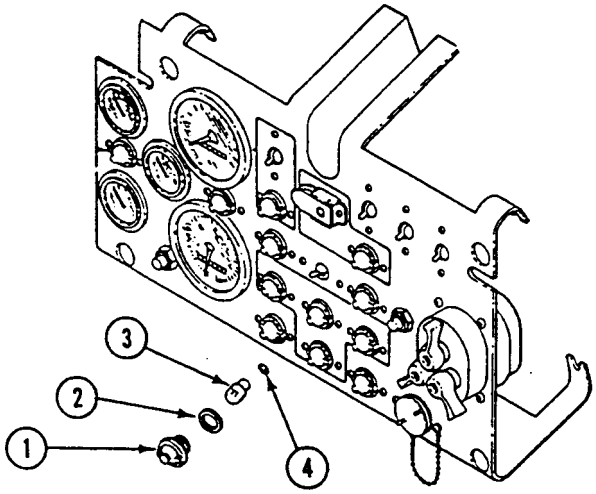
See your -10

Equipment Condition

Engine stopped (see your -10)
Parking brake off (see your -10)
Service brake off (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)
Floor plates removed (WP 0395 00)

T

1. Remove TRANS LOW OIL PRESS indicator lens (1), gasket (2), bulb (3), and gasket (4).
2. Measure resistance between bulb base and bulb center contact.
3. Does multimeter indicate any continuity?



NO →

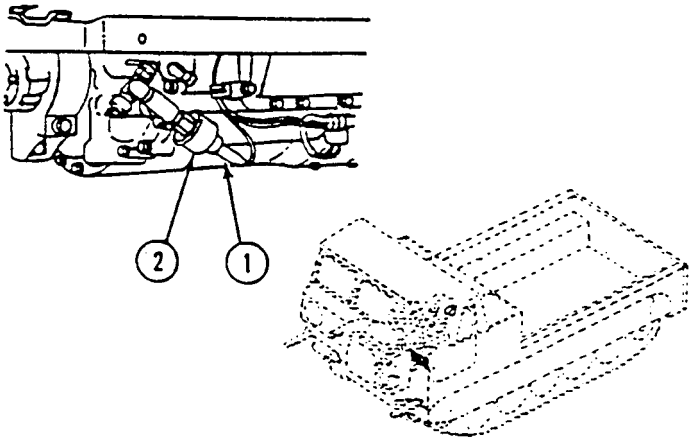
TN

1. Replace TRANS LOW OIL PRESS bulb (WP 0264 00).
2. Verify no faults found.

YES ↓

Y

1. Install TRANS LOW OIL PRESS bulb and cover lens.
2. Remove circuit 366 plug (1) from TRANS LOW OIL PRESS switch assembly jack (2).
3. Turn MASTER SWITCH ON.
4. Is TRANS LOW OIL PRESS indicator off?



NO → GO TO **BY** (PAGE 0055 00-3)

YES

2Y

1. Install jumper wire between circuit 366 plug and ground.
2. Is TRANS LOW OIL PRESS indicator on?

NO → GO TO **CY** (PAGE 0055 00-4)

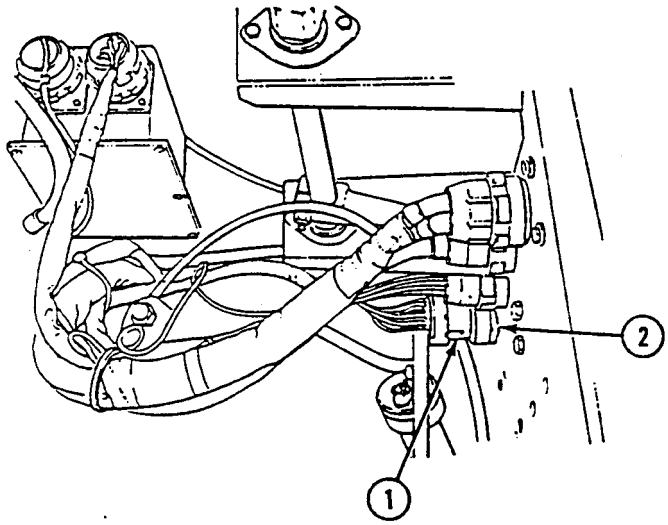
YES

3Y

1. Replace TRANS LOW OIL PRESS switch (WP 0323 00).
2. Verify no faults found.

BY

1. Remove wiring harness 12313482 plug (1) from wiring harness 12313483 jack (2) at carrier bulkhead.
2. Is TRANS LOW OIL PRESS indicator still on?



NO →

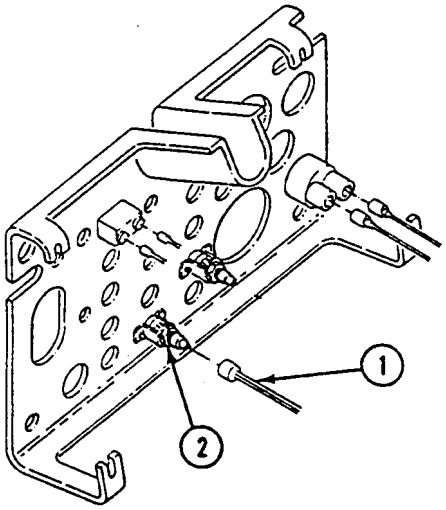
BYN

1. Replace wiring harness 12313482 (WP 0297 00).
2. Verify no faults found.

YES ↓

2BY

1. Remove circuit 366 plug (1) from TRANS LOW OIL PRESS indicator (2) behind instrument panel.
2. Is TRANS LOW OIL PRESS indicator still on?



NO →

2BYN

1. Replace wiring harness 12313483 (WP 0297 00).
2. Verify no faults found.

YES ↓

3BY

1. Replace TRANS LOW OIL PRESS indicator assembly (WP 0264 00).
2. Verify no faults found.

CY

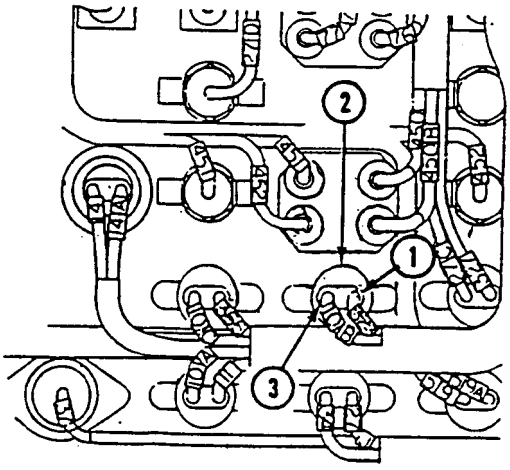
1. Remove TRANS LOW OIL PRESS lens, gasket, bulb, and gasket from indicator assembly.
2. Measure voltage between center contact on indicator assembly and ground.
3. Does multimeter read 17 volts or more?

NO → GO TO **DY** (PAGE 0055 00-5)

YES

2CY

1. Remove wiring harness 12313483 circuit plug (1) from TRANS LOW OIL PRESS indicator assembly (2).
2. Measure resistance between circuit 366/10B plug (3), circuit 366 pin, and ground.
3. Does multimeter read more than 0 ohms?



NO → **2CYN**

1. Remove jumper wire and install circuit 366 plug on trans low oil press switch.
2. Replace TRANS LOW OIL PRESS indicator assembly (WP 0264 00).
3. Verify no faults found.

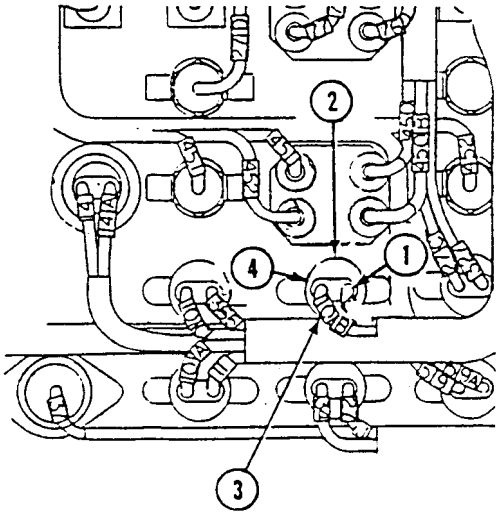
YES

3CY

1. Replace faulty wiring harness 12313483.
2. Notify your supervisor.

DY

1. Remove jumper wire and install circuit 366 plug on trans low oil press switch.
2. Remove instrument panel for access (WP 0256 00).
3. Remove circuit 10 plug (1) from circuit beaker (2).
4. Remove harness circuit 366/10B plug (3) from TRANS LOW OIL PRESS indicator jack (4).
5. Measure resistance between circuit 10 plug (1), circuit 366/10B plug (3), and circuit 10B pin.
6. Does multimeter read 0 ohms?



NO

DYN

1. Install gasket, bulb, gasket, and cover lens on TRANS LOW OIL PRESS indicator assembly.
2. Replace special wiring harness 12313483 circuit 10 (WP 0297 00).
3. Verify no faults found.

YES

2DY

1. Install circuit 10 plug on circuit breaker.
2. Replace TRANS LOW OIL PRESS indicator (WP 0264 00).
3. Verify no faults found.

HI TEMP TRANS OIL INDICATOR MALFUNCTIONS (M548A1) 0056 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Jumper Wire

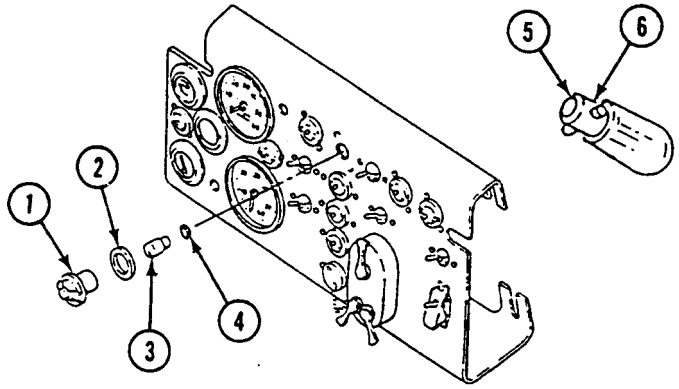
Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Engine and transmission cooled down
Center seat raised (see your -10)
Power plant rear access door removed (see your -10)

T

1. Remove HI TEMP TRANS OIL indicator cover lens (1), gasket (2), bulb (3), and gasket (4).
2. Measure resistance between bulb center contact (5) and bulb base (6) for continuity.
3. Does multimeter indicate any continuity?



NO →

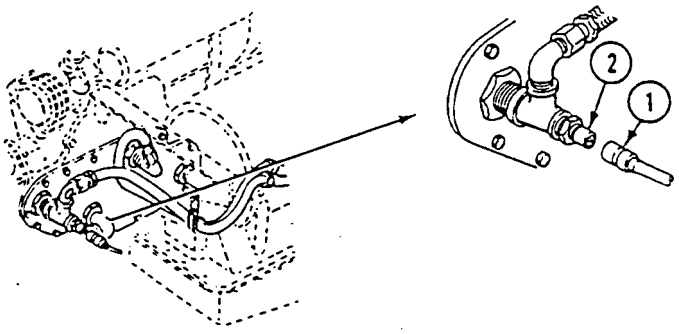
TN

1. Replace HI TEMP TRANS OIL indicator bulb (WP 0264 00).
2. Verify no faults found.

YES ↓

Y

1. Install HI TEMP TRANS OIL indicator cover lens bulb and gaskets.
2. Remove engine harness circuit 327 plug (1) from transmission oil high thermostatic switch (2).
3. Turn MASTER SWITCH ON.
4. Is HI TEMP TRANS OIL indicator off?



NO → GO TO **BY** (PAGE 0056 00-3)

YES

2Y

1. Install jumper wire between engine harness circuit 327 plug and ground.
2. Is HI TEMP TRANS OIL indicator on?

NO → GO TO **CY** (PAGE 0056 00-4)

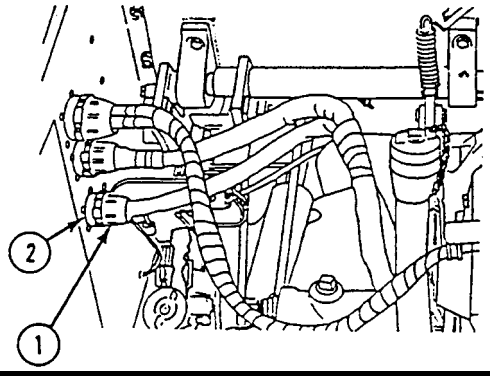
YES

3Y

1. Remove jumper wire.
2. Replace transmission oil high thermostatic switch (WP 0286 00).
3. Verify no faults found.

BY

1. Remove engine harness plug (1) from power harness jack (2) at battery box.
2. Is HI TEMP TRANS OIL indicator still on?



NO

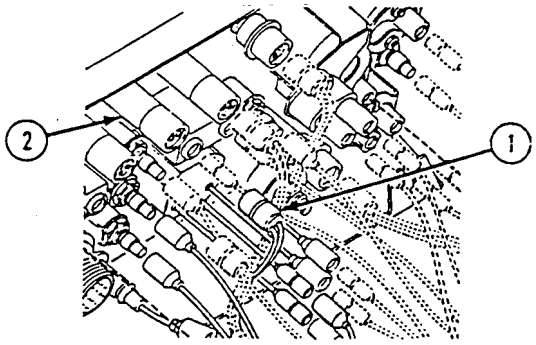
BYN

1. Repair engine harness (WP 0294 00).
2. Verify no faults found.

YES

2BY

1. Remove power harness circuit 327/27G plug (1) from HI TEMP TRANS OIL indicator (2).
2. Measure resistance between power harness circuit 327/27G plug (1) circuit 327 pin and ground.
3. Does multimeter read 0 ohms?



NO

2BYN

1. Replace transmission oil high thermostatic switch (WP 0286 00).
2. Verify no faults found.

YES

3BY

1. Shorted power harness circuit 327.
2. Notify your supervisor.

CY

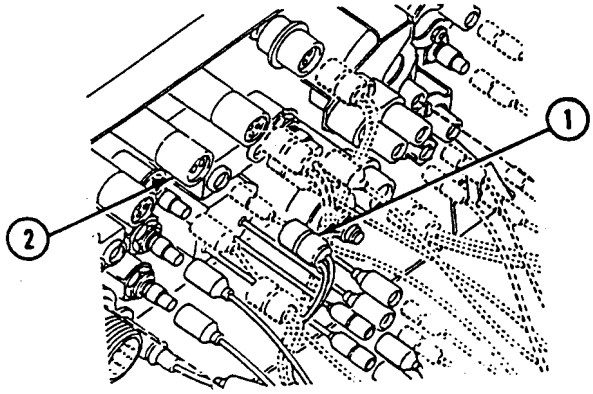
1. Remove HI TEMP TRANS OIL indicator cover lens, gasket, bulb, and gasket.
2. Measure voltage between indicator assembly center contact and ground.
3. Does multimeter read less than 17 volts?

NO → GO TO **DY** (PAGE 0056 00-5)

YES

2CY

1. Remove jumper wire and install engine harness circuit 327 plug on trans oil hi temp switch.
2. Remove power harness circuit 327/27G plug (1) from HI TEMP TRANS OIL indicator jack (2).
3. Measure voltage between power harness circuit 327/27G plug (1) circuit 27G pin and ground.
4. Does multimeter read less than 17 volts?



NO →

2CYN

1. Replace transmission oil high thermostatic switch (WP 0286 00).
2. Verify no faults found.

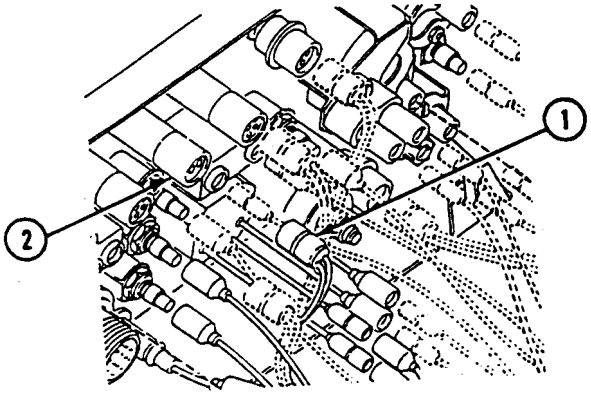
YES

3CY

1. Install power harness circuit 327/27G plug on HI TEMP TRANS OIL indicator jack.
2. Repair power harness circuit 27F (WP 0294 00).
3. Verify no faults found.

DY

1. Turn MASTER SWITCH OFF.
2. Remove power harness circuit 327/27G plug (1) from HI TEMP TRANS OIL indicator jack (2).
3. Measure resistance between power harness circuit 327/27G (1) circuit 327 pin and ground.
4. Does multimeter read more than 0 ohms?



NO

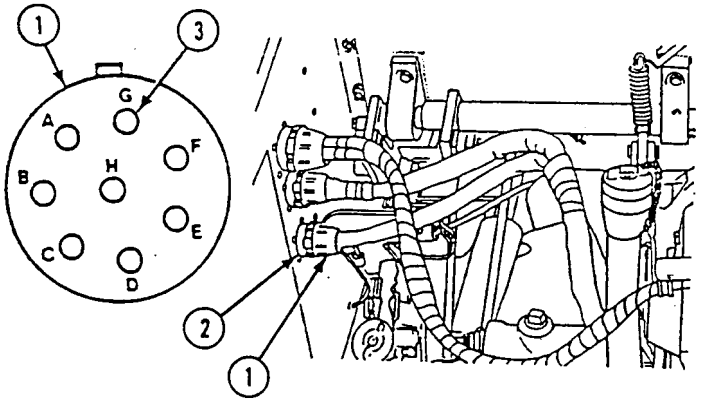
DYN

1. Remove jumper cable and install circuit 327 plug on transmission oil high thermostatic switch.
2. Replace HI TEMP TRANS OIL indicator panel light (WP 0264 00).
3. Verify no faults found.

YES

2DY

1. Install HI TEMP TRANS OIL indicator cover lens, gasket, bulb, and gasket.
2. Remove engine harness plug (1) from power harness jack (2) at battery box.
3. Measure resistance between engine harness plug (1) pin G (3) and ground.
4. Does multimeter read more than 0 ohms?



NO

2DYN

1. Remove jumper wire and install engine harness circuit 327 plug on transmission oil high thermostatic switch.
2. Repair power harness circuit 327 (WP 0294 00).
3. Verify no faults found.

YES

3DY

1. Install power harness circuit 327/27G plug on HI TEMP TRANS OIL indicator.
2. Repair engine harness circuit 327 (WP 0294 00).
3. Verify no faults found.

HI TEMP TRANS OIL INDICATOR MALFUNCTIONS (M548A3) 0057 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Jumper Wire

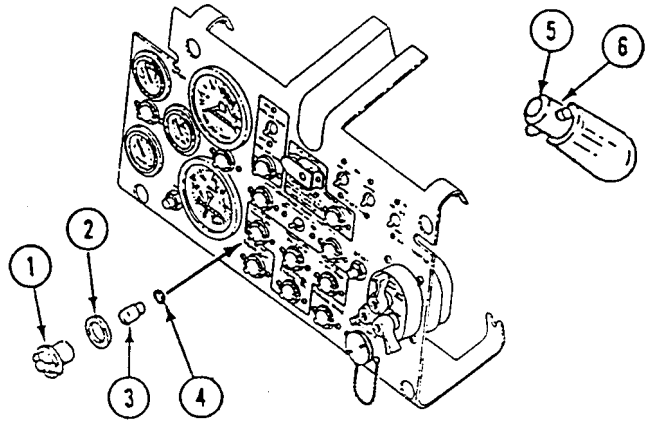
Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)
Cab floor plates removed (WP 0250 00)

T

1. Remove HI TEMP TRANS OIL indicator cover lens (1), gasket (2), bulb (3), and gasket (4).
2. Check continuity between bulb center contact (5) and bulb base (6).
3. Does multimeter indicate continuity?



NO →

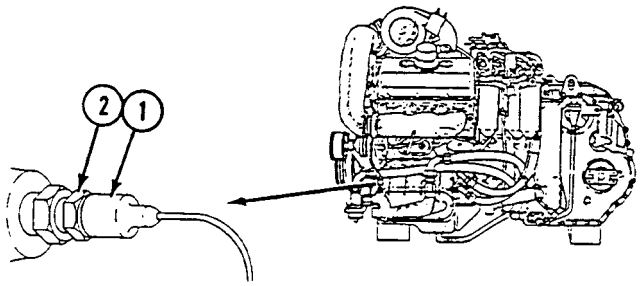
TN

1. Replace HI TEMP TRANS OIL indicator bulb (WP 0264 00).
2. Verify no faults found.

YES ↓

Y

1. Install HI TEMP TRANS OIL indicator cover lens, bulb, and gaskets.
2. Remove power plant wiring harness circuit 327 plug (1) from transmission oil high temperature switch (2).
3. Turn MASTER SWITCH ON.
4. Is HI TEMP TRANS OIL indicator off?



NO → GO TO **BY** (PAGE 0057 00-3)

YES

2Y

1. Install jumper wire between power plant wiring harness circuit 327 plug and ground.
2. Is HI TEMP TRANS OIL indicator on?

NO → GO TO **CY** (PAGE 0057 00-4)

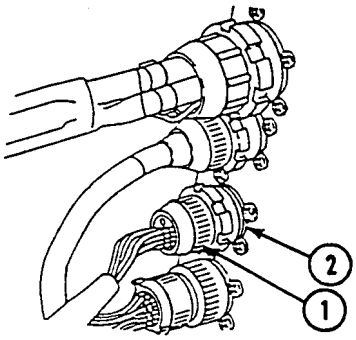
YES

3Y

1. Remove jumper wire.
2. Replace transmission oil high temperature switch (WP 0287 00).
3. Verify no faults found.

BY

1. Remove power plant wiring harness plug (1) from instrument panel wiring harness jack (2) at battery box.
2. Is HI TEMP TRANS OIL indicator still on?



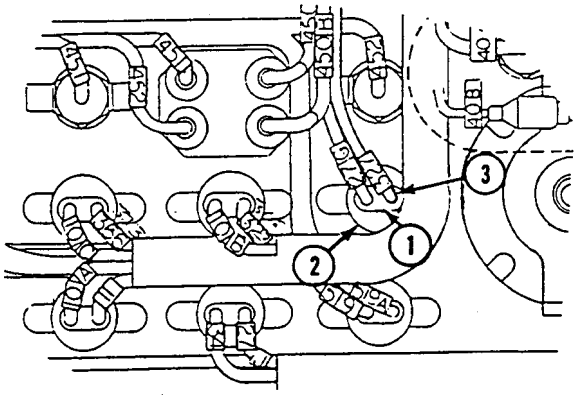
NO → **BYN**

1. Repair power plant wiring harness (WP 0294 00).
2. Verify no faults found.

YES ↓

2BY

1. Turn MASTER SWITCH OFF.
2. Remove instrument panel wiring harness circuit 327/27G plug (1) from HI TEMP TRANS OIL indicator assembly jack (2).
3. Measure resistance between instrument panel wiring harness circuit 327/27G plug (1) circuit 327 pin (3) and ground.
4. Does multimeter read 0 ohms?



NO → **2BYN**

1. Replace HI TEMP TRANS OIL indicator assembly (WP 0264 00).
2. Verify no faults found.

YES ↓

3BY

1. Shorted instrument panel wiring harness circuit 327.
2. Notify your supervisor.

CY

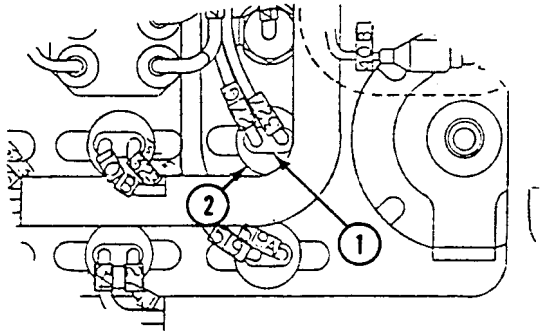
1. Remove HI TEMP TRANS OIL indicator cover lens, gasket, bulb, and gasket.
2. Measure voltage between indicator assembly center contact and ground.
3. Does multimeter read less than 17 volts?

NO → GO TO **DY** (PAGE 0057 00-5)

YES

2CY

1. Remove jumper wire and install power plant wiring harness circuit 327 plug on transmission oil high temperature switch.
2. Remove instrument panel wiring harness circuit 327/27G plug (1) from HI TEMP TRANS OIL indicator assembly jack (2).
3. Measure voltage between instrument panel wiring harness circuit 327/327G plug (1) circuit 27G pin and ground.
4. Does multimeter read less than 17 volts?



NO

2CYN

1. Turn MASTER SWITCH OFF.
2. Replace HI TEMP TRANS OIL indicator assembly (WP 0264 00).
3. Verify no faults found.

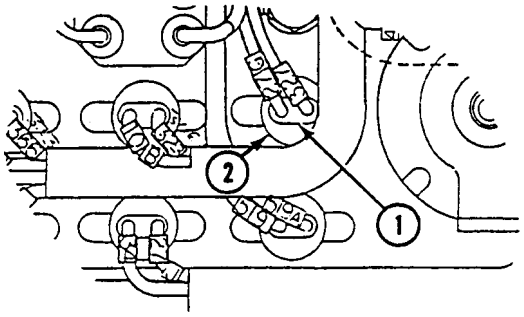
YES

3CY

1. Turn MASTER SWITCH OFF.
2. Repair instrument panel wiring harness circuit 27G (WP 0294 00).
3. Verify no faults found.

DY

1. Turn MASTER SWITCH OFF.
2. Remove instrument panel wiring harness circuit 327/27G plug (1) from HI TEMP TRANS OIL indicator assembly jack (2).
3. Measure resistance between instrument panel wiring harness circuit 327/27G (1) circuit 327 pin and ground.
4. Does multimeter read more than 0 ohms?



NO

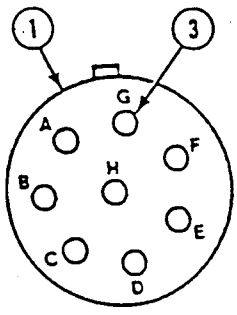
DYN

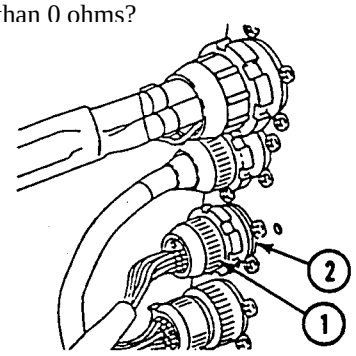
1. Remove jumper wire and install power plant wiring harness circuit 327 plug on transmission oil high temperature switch.
2. Repair instrument panel wiring harness circuit 327 (WP 0294 00).
3. Verify no faults found.

YES

2DY

1. Install HI TEMP TRANS OIL indicator cover lens, bulb, and gaskets.
2. Remove power plant wiring harness plug (1) from instrument panel wiring harness jack (2) at battery box.
3. Measure resistance between power plant wiring harness plug (1) pin G (3) and ground.
4. Does multimeter read more than 0 ohms?





NO

2DYN

1. Remove jumper wire and install power plant wiring harness circuit 327 plug on transmission oil high temperature switch.
2. Repair instrument panel wiring harness circuit 327 (WP 0294 00).
3. Verify no faults found.

YES

3DY

1. Install instrument panel wiring harness circuit 327/27G plug on HI TEMP TRANS OIL indicator.
2. Repair power plant wiring harness circuit 327 (WP 0294 00).
3. Verify no faults found.

HI TEMP DIFF OIL INDICATOR MALFUNCTIONS (M548A1) 0058 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

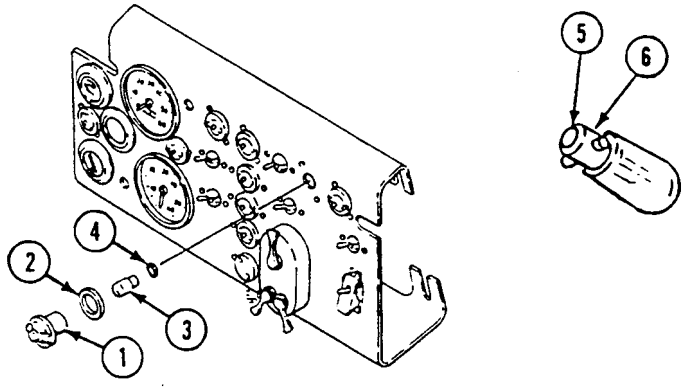
Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)

T

1. Remove HI TEMP DIFF OIL indicator cover lens (1), gasket (2), bulb (3), and gasket (4).
2. Measure resistance between bulb center contact (5) and bulb base (6) for continuity.
3. Does multimeter indicate any continuity?



NO →

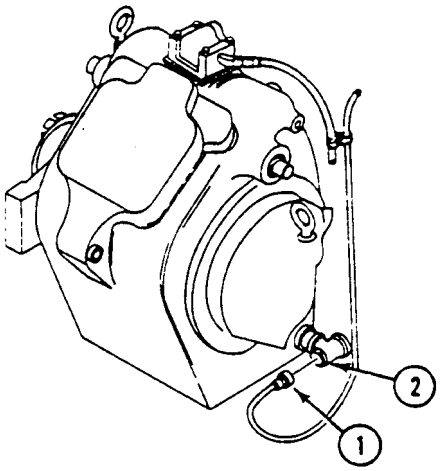
TN

1. Replace HI TEMP DIFF OIL bulb (WP 0264 00).
2. Verify no faults found.

YES ↓

Y

1. Install indicator bulb, gaskets, and lens.
2. Remove engine harness circuit 328 plug (1) from differential oil high temperature thermostatic switch (2).
3. Turn MASTER SWITCH ON.
4. Is HI TEMP DIFF OIL indicator off?



NO → GO TO **BY** (PAGE 0058 00-3)

YES

2Y

1. Install a jumper wire between engine harness circuit 328 plug pin and ground.
2. Is HI TEMP DIFF OIL indicator ON?

NO → GO TO **CY** (PAGE 0058 00-4)

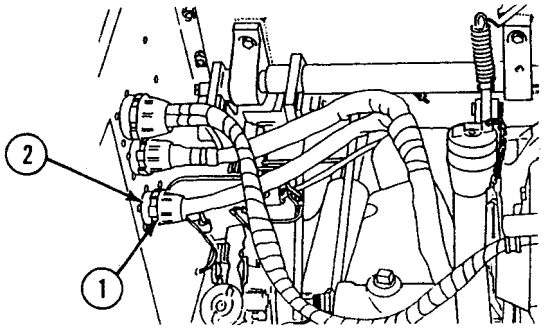
YES

3Y

1. Replace differential oil high temperature thermostatic switch (WP 0285 00).
2. Verify no faults found.

BY

1. Remove engine harness plug (1) from power harness jack (2) at battery box.
2. Is the HI TEMP DIFF OIL indicator still ON?



NO →

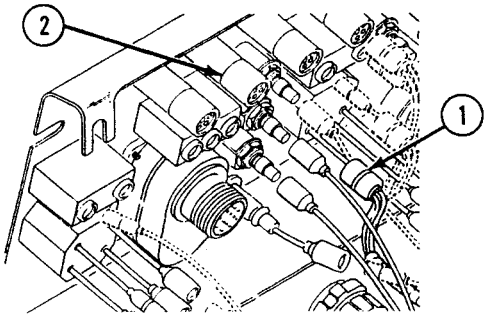
BYN

1. Repair engine harness circuit 328 (WP 0294 00).
2. Verify no faults found.

YES ↓

2BY

1. Turn MASTER SWITCH OFF.
2. Remove power harness circuit 328/27K plug (1) from HI TEMP DIFF OIL jack (2).
3. Measure resistance between indicator jack (2) pins and ground one at a time.
4. Did multimeter read 0 ohms for either measurement?



NO →

2BYN

1. Repair power harness circuit 328/27K (WP 0294 00).
2. Verify no faults found.

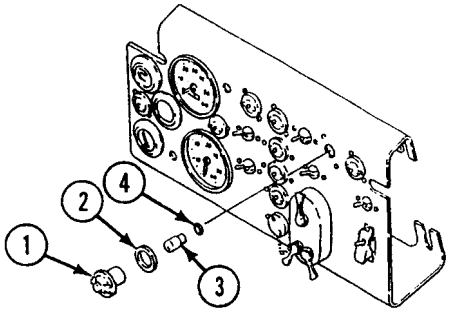
YES ↓

3BY

1. Install engine harness plug on power harness jack at battery box.
2. Replace HI TEMP DIFF OIL indicator light assembly (WP 0264 00).
3. Verify no faults found.

CY

1. Remove HI TEMP DIFF OIL indicator cover lens (1), gasket (2), bulb (3) and gasket (4) from indicator assembly.
2. Measure voltage between indicator center contact and ground.
3. Does multimeter read less than 17 volts?

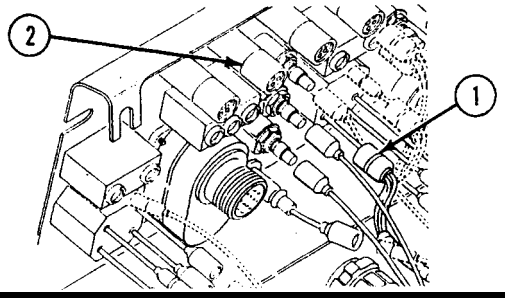


NO → GO TO **DY** (PAGE 0058 00-5)

YES

2CY

1. Remove power harness circuit 328/27K plug (1) from HI TEMP DIFF OIL indicator jack (2).
2. Measure voltage between circuit 27K pin and plug on ground.
3. Does multimeter read less than 17 volts?



NO → **2CYN**

1. Replace HI TEMP DIFF OIL indicator assembly (WP 0264 00).
2. Verify no faults found.

YES

3CY

1. Check to see if other indicators on the warning light panel is operate normally.
2. Do any of the other indicators on the warning light panel operate normally?

NO → **3CYN**

1. Repair power harness circuit 27F (WP 0294 00).
2. Verify no faults found.

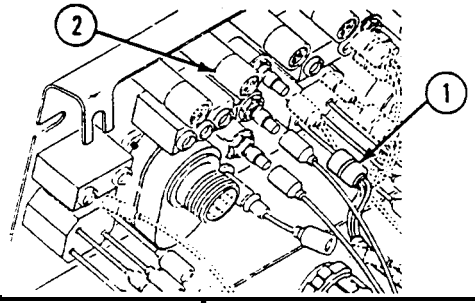
YES

4CY

1. Repair power harness circuit 27K (WP 0294 00).
2. Verify no faults found.

DY

1. Turn MASTER POWER SWITCH OFF.
2. Remove circuit 328/27K plug (1) from HI TEMP DIFF OIL indicator (2).
3. Measure resistance between circuit 328 and ground.
4. Does multimeter read more than 0 ohms?



NO →

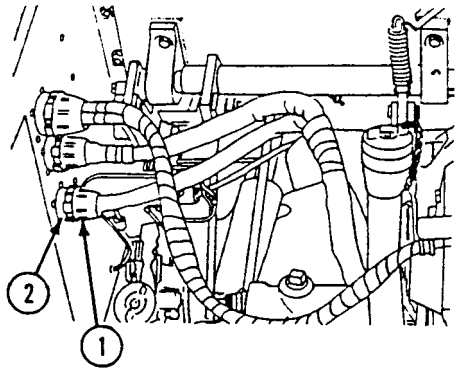
DYN

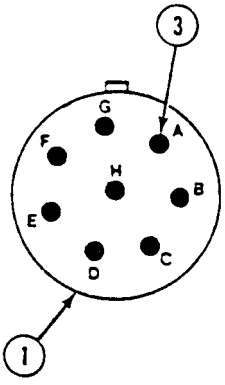
1. Remove jumper wire.
2. Install plug on differential oil high temperature thermostatic switch in engine compartment.
3. Replace HI TEMP DIFF OIL indicator assembly (WP 0264 00).
4. Verify no faults found.

YES ↓

2DY

1. Remove engine harness plug (1) from power harness jack (2) at battery box.
2. Measure resistance between engine harness plug (1) pin A (3) and ground.
3. Does multimeter read 0 ohms?





NO →

2DYN

1. Remove jumper wire.
2. Install plug on differential oil high temperature thermostatic switch in engine compartment.
3. Install indicator bulb, gaskets, and lens.
4. Repair engine harness circuit 328 (WP 0294 00).
5. Verify no faults found.

YES ↓

3DY

1. Remove jumper wire.
2. Install plug on HI TEMP DIFF OIL indicator assembly.
3. Repair power harness circuit 328 (WP 0294 00).
4. Verify no faults found.

TRANS OIL HI DIFF PRESS INDICATOR MALFUNCTIONS (M548A3) 0059 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Jumper Wire

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat and driver's seat raised (see your -10)

Personnel Required

Unit Mechanic
Helper (H)

T

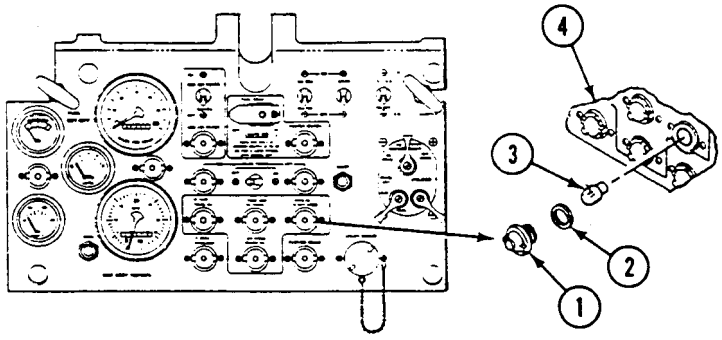
1. Turn MASTER SWITCH ON.
2. Is TRANS OIL HI DIFF PRESS indicator off?

NO → GO TO **BY** (PAGE 0059 00-4)

YES

Y

1. Turn MASTER SWITCH OFF.
2. Remove TRANS OIL HI DIFF PRESS indicator lens (1), gasket (2), and bulb (3) from instrument panel (4).
3. Check continuity between bulb base and bulb center contact.
4. Does multimeter indicate any continuity?



NO

YN

1. Replace TRANS OIL HI DIFF PRESS indicator bulb (WP 0264 00).
2. Verify no faults found.

YES

2Y

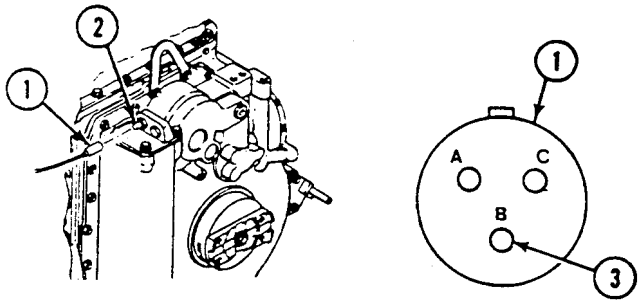
1. Turn MASTER SWITCH ON.
2. Measure voltage between TRANS OIL HI DIFF PRESS indicator assembly center contact and ground.
3. Does multimeter read 17 volts or more?

NO → GO TO **CY** (PAGE 0059 00-6)

YES

3Y

1. Turn MASTER SWITCH OFF.
2. Install TRANS OIL HI DIFF PRESS indicator bulb, gasket, and lens.
3. Remove harness 12313482 plug (1) from differential pressure switch (2).
4. Install jumper wire between harness 12313482 plug (1) circuit 323 pin B (3) and ground.
5. Turn MASTER SWITCH ON.
6. Is TRANS OIL HI DIFF PRESS indicator off?



NO

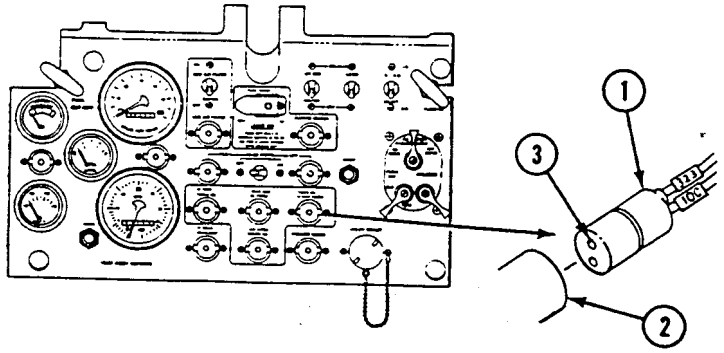
3YN

1. Turn MASTER SWITCH OFF.
2. Replace differential pressure switch (WP 0324 00).
3. Verify no faults found.

YES

4Y

1. Turn MASTER SWITCH OFF.
2. Remove harness 12313483 circuit 323/10C plug (1) from TRANS OIL HI DIFF PRESS indicator jack (2) behind instrument panel.
3. Measure resistance between harness 12313483 circuit 323/10C plug (1) circuit 323 pin (3) and ground.
4. Does multimeter read more than 0 ohms?



NO →

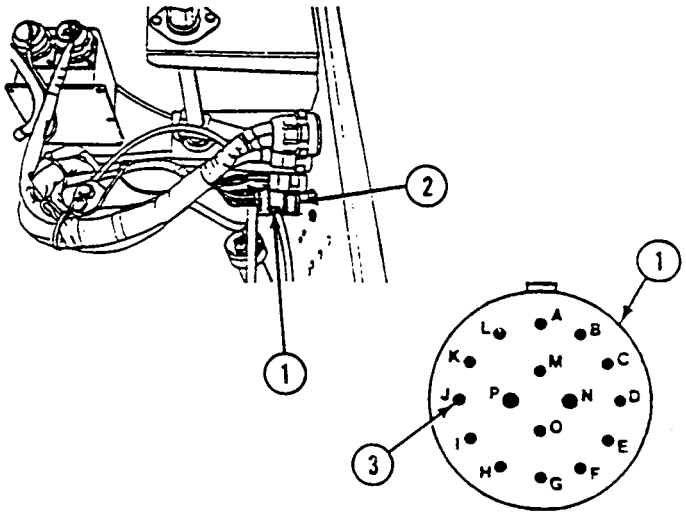
4YN

1. Remove jumper wire and install harness 12313482 plug on differential pressure switch.
2. Replace TRANS OIL HI DIFF PRESS indicator assembly (WP 0264 00).
3. Verify no faults found.

YES ↓

5Y

1. Remove harness 12313482 plug (1) from harness 12313483 jack (2) at carrier bulkhead.
2. Measure resistance between harness 12313482 plug (1) pin J (3) and ground.
3. Does multimeter read 0 ohms?



NO →

5YN

1. Install harness 12313483 circuit 323/10C plug on TRANS OIL HI DIFF PRESS indicator jack.
2. Remove jumper wire and replace harness 12313482 (WP 0297 00).
3. Verify no faults found.

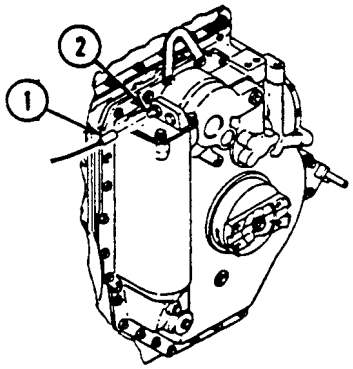
YES ↓

6Y

1. Remove jumper wire and install harness 12313482 plug on differential pressure switch.
2. Faulty harness 12313483 circuit 323.
3. Notify your supervisor.

BY

1. Remove harness 12313482 plug (1) from differential pressure switch (2).
2. Is TRANS OIL HI DIFF PRESS indicator still on?



NO

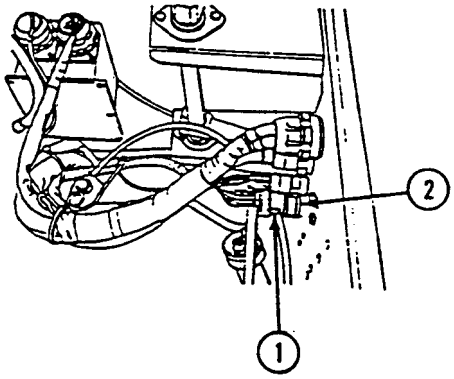
BYN

1. Turn MASTER SWITCH OFF.
2. Replace differential pressure switch (WP 0324 00).
3. Verify no faults found.

YES

2BY

1. Remove harness 12313482 plug (1) from harness 12313483 jack (2) at carrier bulkhead.
2. Is TRANS OIL HI DIFF PRESS indicator still on?



NO

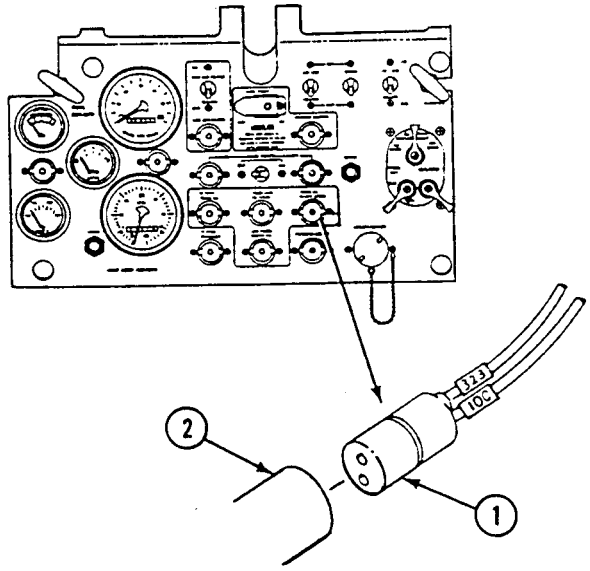
2BYN

1. Turn MASTER SWITCH OFF.
2. Replace harness 12313482 (WP 0297 00).
3. Verify no faults found.

YES

3BY

1. Install harness 12313482 plug on differential pressure switch.
2. Remove harness 12313483 circuit 323/10C plug (1) from TRANS OIL HI DIFF PRESS indicator jack (2) behind instrument panel.
3. Is TRANS OIL HI DIFF PRESS indicator still on?



NO →

3BYN

1. Turn MASTER SWITCH OFF.
2. Faulty harness 12313483.
3. Notify your supervisor.

YES ↓

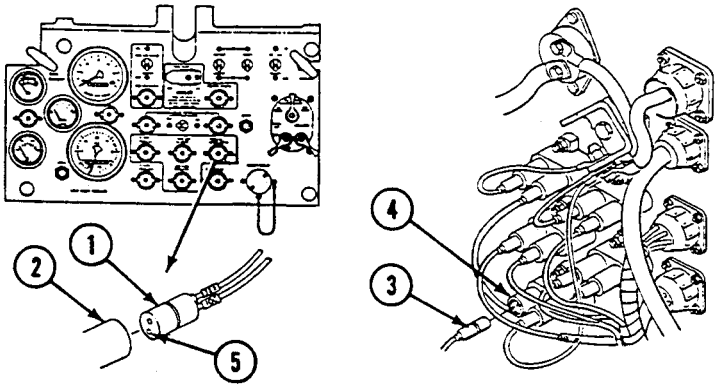
4BY

1. Turn MASTER SWITCH OFF.
2. Install harness 12313482 plug on harness 12313483 jack at carrier bulkhead.
3. Replace TRANS OIL HI DIFF PRESS indicator assembly (WP 0264 00).
4. Verify no faults found.

TRANS OIL HI DIFF PRESS INDICATOR MALFUNCTIONS (M548A3)—Continued 0059 00

CY

1. Turn MASTER SWITCH OFF.
2. Remove harness 12313483 circuit 323/10C plug (1) from TRANS OIL HI DIFF PRESS indicator jack (2) behind instrument panel.
3. Remove harness 12313483 circuit 10 plug (3) from circuit breaker jack (4) under driver's seat.
4. Measure resistance between harness 12313483 plug (1) circuit 10C pin (5) at instrument panel and circuit 10 plug (3) at circuit breaker under driver's seat.
5. Does multimeter read 0 ohms?



NO →

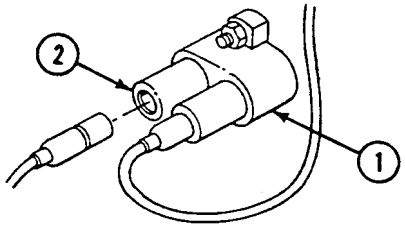
CYN

1. Faulty harness 12313483 circuit 10C/10.
2. Notify your supervisor.

YES ↓

2CY

1. Turn MASTER SWITCH ON.
2. Measure voltage between circuit breaker (1) jack (2) and ground.
3. Does multimeter read 17 volts or more?



NO →

2CYN

1. Turn MASTER SWITCH OFF.
2. Install harness 12313483 circuit 323/10C plug on TRANS OIL HI DIFF PRESS indicator jack.
3. Replace circuit breaker (WP 0267 00).
4. Verify no faults found.

YES ↓

3CY

1. Turn MASTER SWITCH OFF.
2. Install harness 12313483 circuit 10 plug on circuit breaker under driver's seat.
3. Replace TRANS OIL HI DIFF PRESS indicator assembly (WP 0264 00).
4. Verify no faults found.

WINDSHIELD WIPER DOES NOT OPERATE 0060 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10

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

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Check for loose or improper electrical connections.
2. Are electrical connections clean and tight?

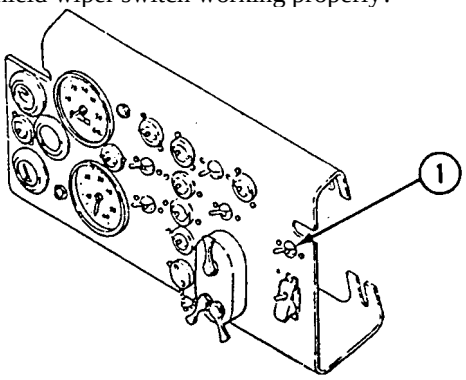
NO → **TN**

1. Clean, tighten, repair, or replace electrical connections on windshield wiper motor where needed (WP 0420 00).
2. Verify no faults found.

YES

Y

1. Check windshield wiper switch (1).
2. Check for +17 Vdc on leads behind panel to windshield wiper switch (1).
3. Is windshield wiper switch working properly?



NO → **YN**

1. Replace windshield wiper switch (WP 0260 00).
2. Verify no faults found.

YES

2Y

1. Check windshield wiper for motor movement (WP 0420 00).
2. Is wiper motor operating?

NO → **2YN**

1. Replace windshield wiper motor (WP 0420 00).
2. Verify no faults found.

YES

WINDSHIELD WIPER DOES NOT OPERATE—Continued **0060 00**

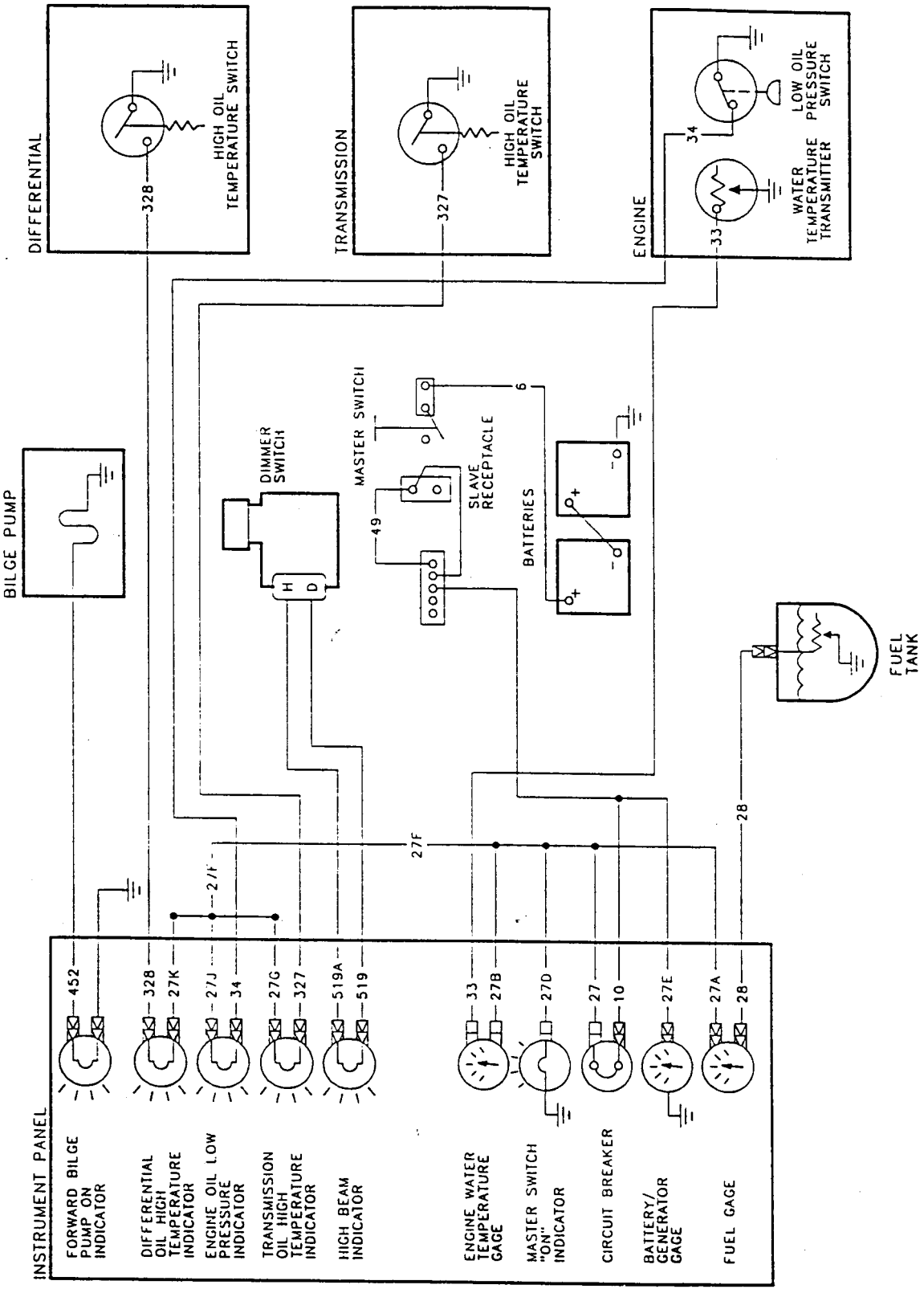
3Y

1. Repair windshield wiper linkage (WP 0421 00).
2. Verify no faults found.

INSTRUMENT PANEL INDICATORS SCHEMATIC (M548A1) 0061 00

DESCRIPTION

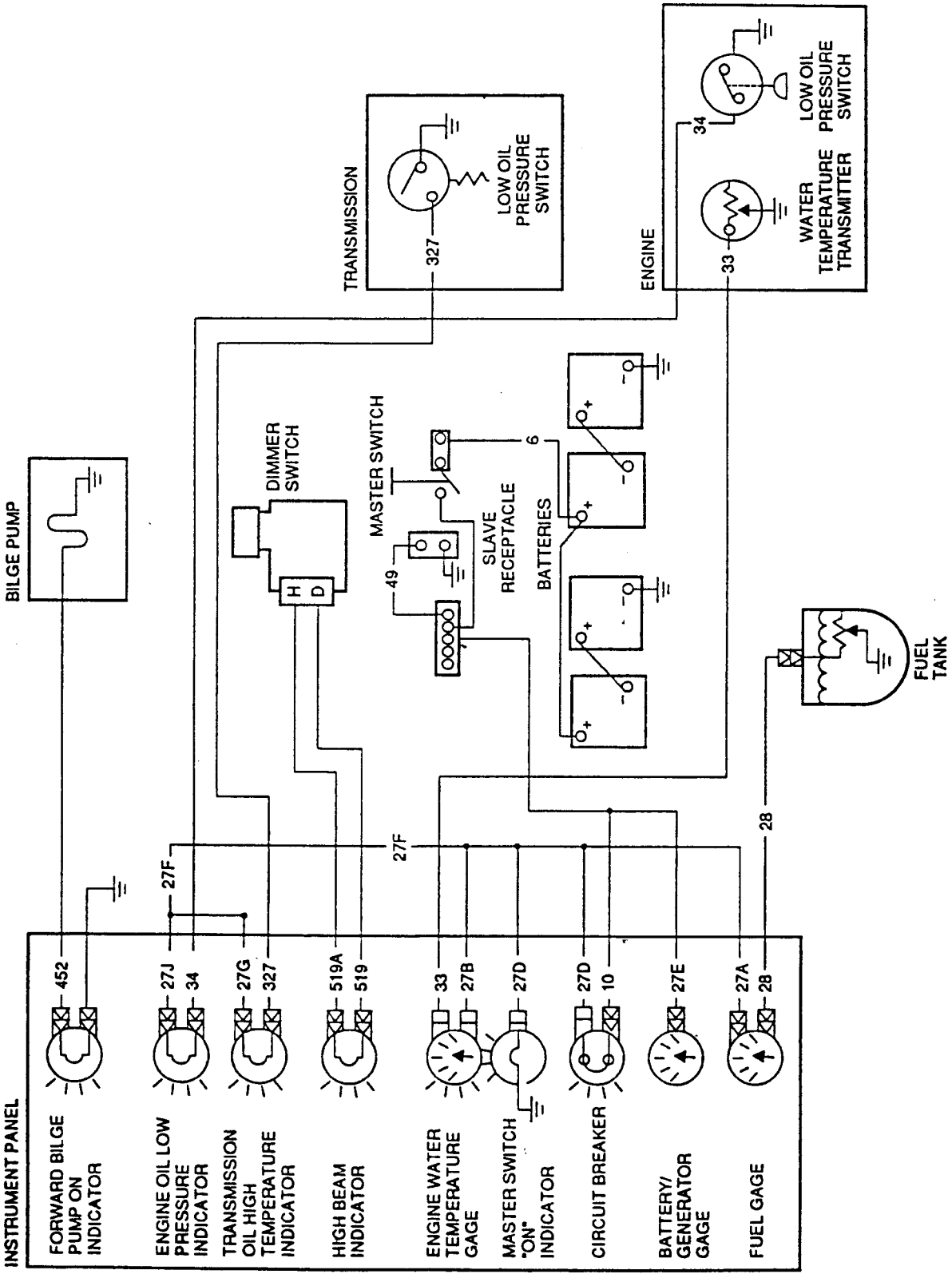
Use the schematic below as an aid for performing system troubleshooting procedures.



INSTRUMENT PANEL INDICATORS SCHEMATIC (M548A3) (SHEET 1 OF 2) 0062 00

DESCRIPTION

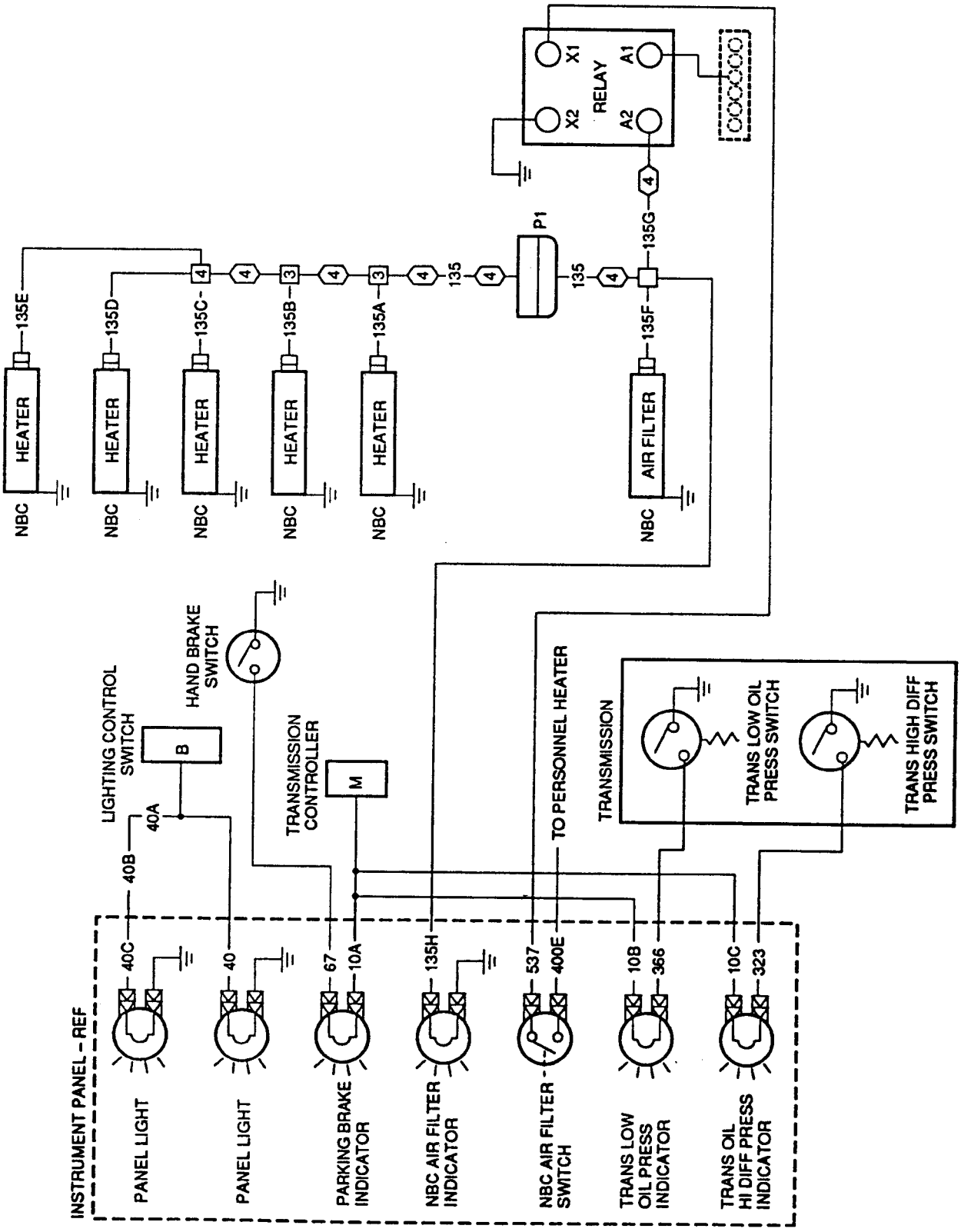
Use the schematic below as an aid for performing system troubleshooting procedures.



INSTRUMENT PANEL INDICATORS SCHEMATIC (M548A3) (SHEET 2 OF 2) 0063 00

DESCRIPTION

Use the schematic below as an aid for performing system troubleshooting procedures.



ELECTRICAL SYSTEM SCHEMATIC 0064 00

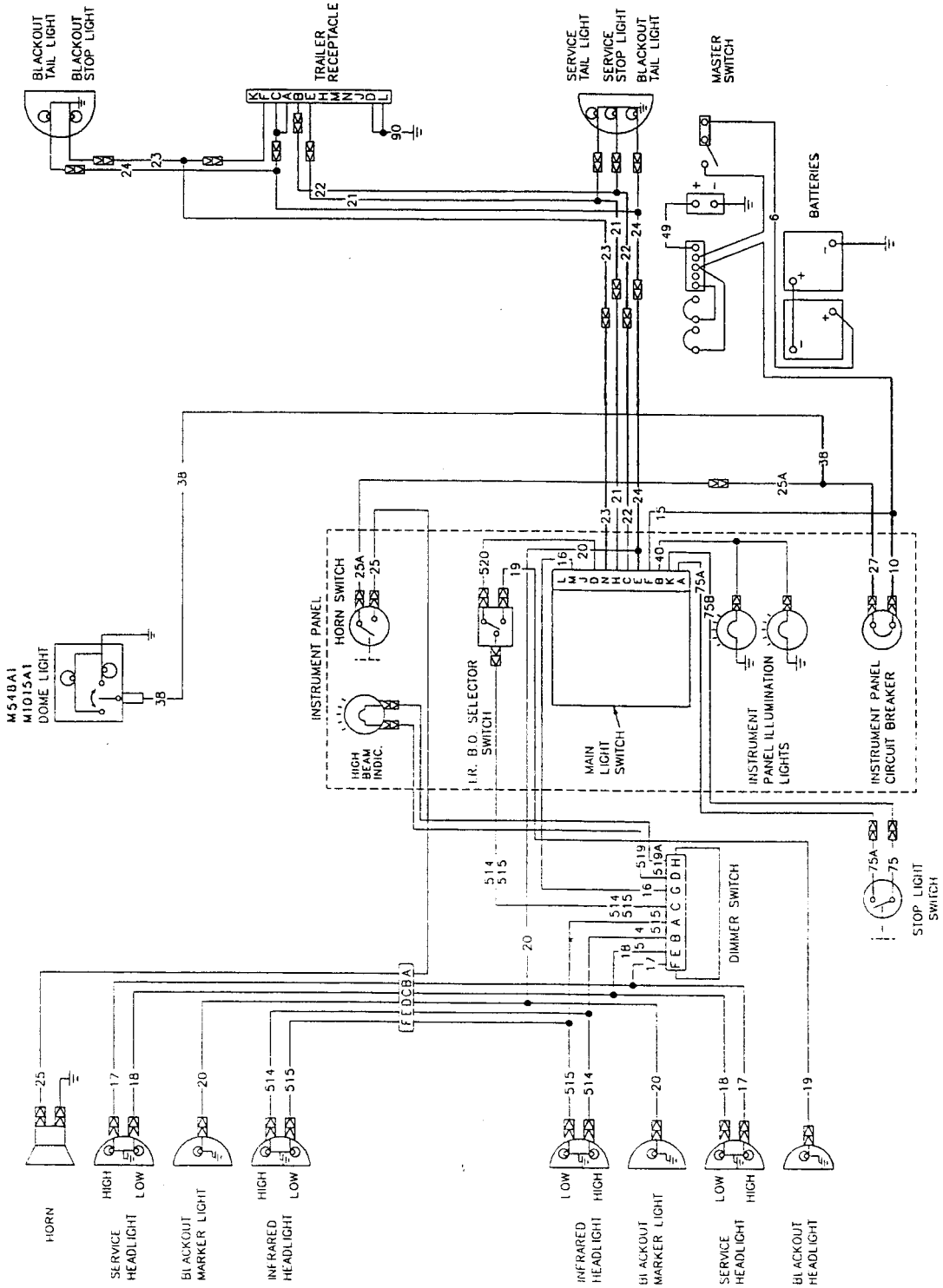
DESCRIPTION

Use the schematic below as an aid for performing system troubleshooting procedures.

ELECTRICAL SYSTEM SCHEMATIC—Continued **0064 00**

NOTE

M548A1 has two batteries. M548A3 has four batteries.



TURN SIGNAL LAMP, STOPLIGHT OR CONTROL LIGHT DOES NOT LIGHT OR FLASH WHEN CONTROL IS IN RIGHT OR LEFT TURN POSITION 0065 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
MASTER SWITCH OFF (see your -10)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Check for loose electrical connections.
2. Are all electrical connections clean and tight?

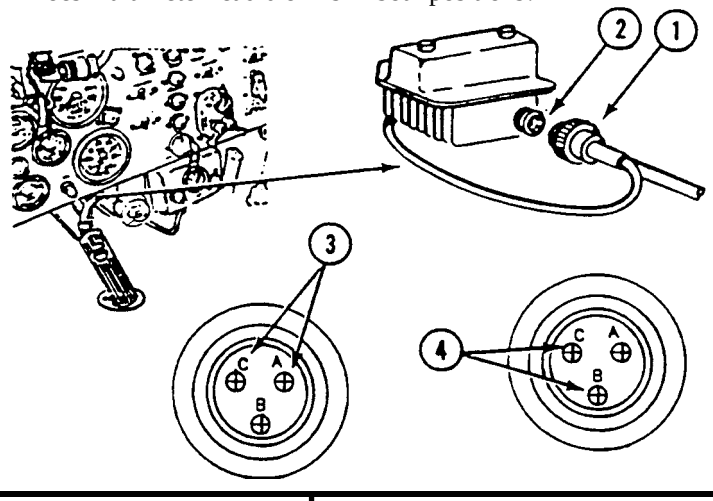
NO → **TN**

1. Clean and tighten faulty electrical connections.
2. Verify no faults found.

YES

Y

1. Remove harness connector (1) from flasher unit (2).
2. Measure resistance between pins (3) (A, C), and (B, C) (4). Multimeter reading should be 0 ohms.
3. Does multimeter read 0 ohms in both positions?



NO → **YN**

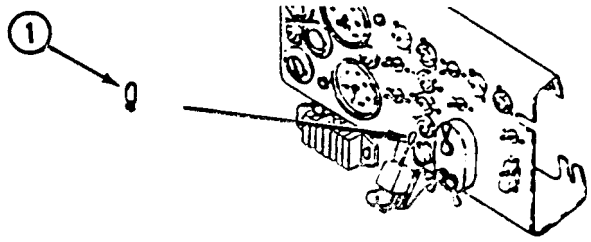
1. Replace turn signal flasher unit (WP 0509 00).
2. Verify no faults found.

YES

TURN SIGNAL LAMP, STOPLIGHT OR CONTROL LIGHT DOES NOT LIGHT OR FLASH WHEN CONTROL IS IN RIGHT OR LEFT TURN POSITION—Continued **0065 00**

2Y

1. Install harness connector on flasher unit.
2. Remove light bulb (1) from turn signal control unit (WP 0508 00).
3. Measure resistance of light bulb (1) for continuity.
4. Does multimeter indicate any continuity?



NO

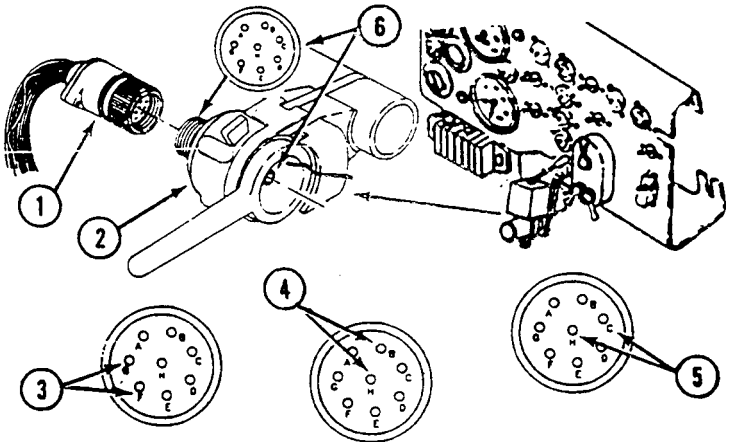
2YN

1. Replace light bulb (WP 0508 00).
2. Verify no faults found.

YES

3Y

1. Disconnect harness connector (1) from turn signal control unit (2).
2. Put turn signal control unit in left turn position.
3. Measure resistance between terminal pins (G, F) (3), (H, B) (4), (H, C) (5), and pin H and lamp socket (6). Reading should be 10 ohms or less.
4. Did multimeter show 10 ohms or less?



NO

3YN

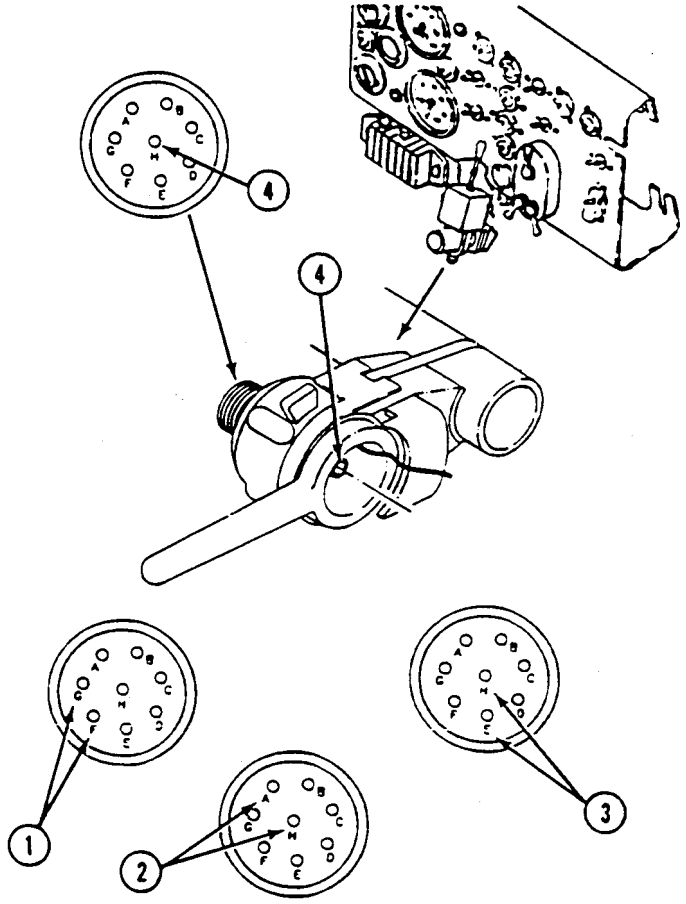
1. Replace faulty turn signal control unit (WP 0508 00).
2. Verify no faults found.

YES

TURN SIGNAL LAMP, STOPLIGHT OR CONTROL LIGHT DOES NOT LIGHT OR FLASH WHEN CONTROL IS IN RIGHT OR LEFT TURN POSITION—Continued **0065 00**

4Y

1. Put turn signal control unit in right turn position.
2. Measure resistance between terminal pins (G, F) (1), (H, A) (2), (H, E) (3), and pin H and lamp socket (4). Reading should be 10 ohms or less.
3. Did multimeter show 10 ohms or less?



NO

4YN

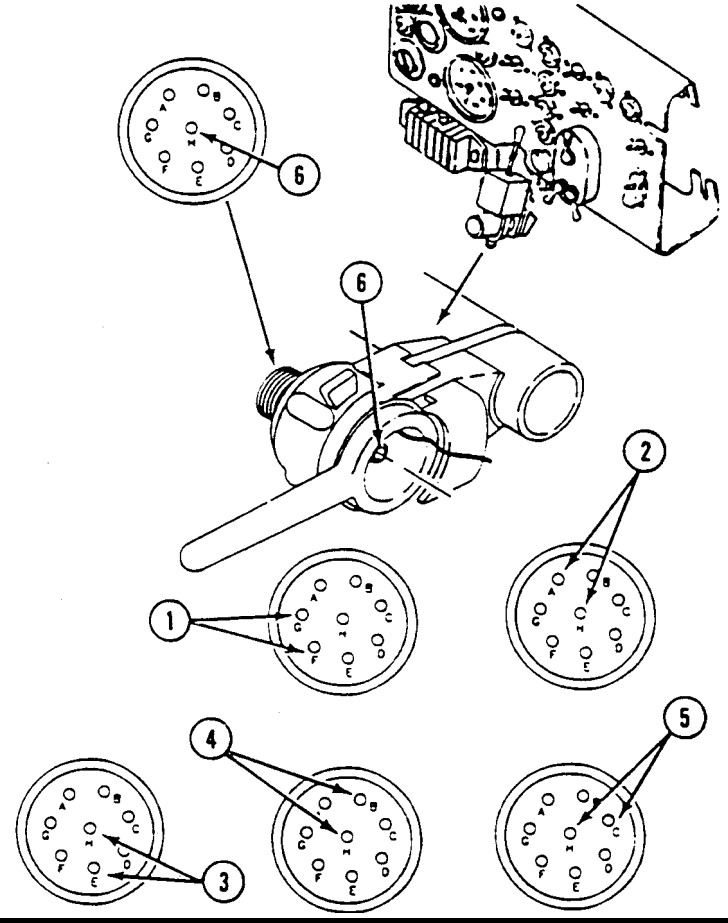
1. Replace faulty turn signal control unit (WP 0508 00).
2. Verify no faults found.

YES

TURN SIGNAL LAMP, STOPLIGHT OR CONTROL LIGHT DOES NOT LIGHT OR FLASH WHEN CONTROL IS IN RIGHT OR LEFT TURN POSITION—Continued **0065 00**

5Y

1. Put turn signal control unit in hazard light position.
2. Measure resistance between terminal pins (G, F) (1), (H, A) (2), (H, E) (3), (H, B) (4), (H, C) (5), and pin H and lamp socket (6). Reading should be 10 ohms or less.
3. Did multimeter show 10 ohms or less?



NO →

5YN

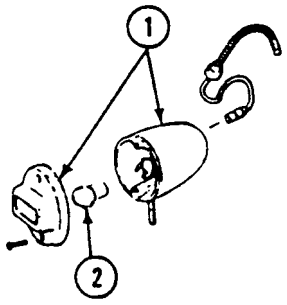
1. Replace faulty turn signal control unit (WP 0508 00).
2. Verify no faults found.

YES ↓

TURN SIGNAL LAMP, STOPLIGHT OR CONTROL LIGHT DOES NOT LIGHT OR FLASH WHEN CONTROL IS IN RIGHT OR LEFT TURN POSITION—Continued **0065 00**

6Y

1. Install harness connector on turn signal control unit.
2. Remove bulb (1) from blackout marker light (2) (WP 0280 00).
3. Measure resistance of bulb (1) for continuity.
4. Does multimeter indicate any continuity?



NO

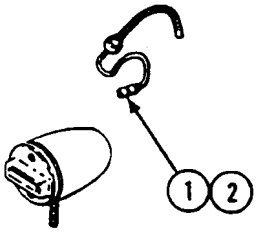
6YN

1. Replace faulty bulb (WP 0280 00).
2. Verify no faults found.

YES

7Y

1. Install bulb in blackout marker light (WP 0280 00).
2. Remove circuit 22 plug (1) from jack on left stoplight-taillight, or circuit 23 plug (2) from jack on right stoplight-taillight.
3. Turn MASTER SWITCH ON.
4. Turn main light switch lever on lighting control switch to BO MARKER.
5. Measure voltage between circuit 22 (left) plug (1) or circuit 23 (right) plug (2) and ground with both steering levers locked in parking brake position.
6. Does multimeter read less than 17 volts?



NO

7YN

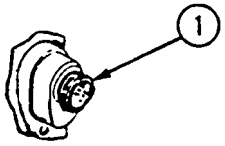
1. Turn MASTER SWITCH OFF.
2. Install circuits 22 and 23 on left and right stoplight-taillight.
3. Replace service stoplight or blackout bulb (WP 0276 00, WP 0275 00, or WP 0278 00).
4. Verify no faults found.

YES

TURN SIGNAL LAMP, STOPLIGHT OR CONTROL LIGHT DOES NOT LIGHT OR FLASH WHEN CONTROL IS IN RIGHT OR LEFT TURN POSITION—Continued **0065 00**

8Y

1. Partially remove instrument panel (WP 0256 00).
2. Disconnect wiring harness connector from light switch.
3. Measure resistance between pins (1) F and all of the remaining pins (1). Multimeter should show continuity when checking between pins (1) (F, A),(F, B), and (F, E) with light switch in the BO MARKER and PANEL BRT position. When measuring resistance between pins (1) (F, C), (F, D), (F, J), (F, H), (F, K), (F, L), (F, M), and (F, N), multimeter should show infinity.
4. Move auxiliary switch to PARK. Multimeter should show infinity when connected between pins (1) F and L.
5. Connect multimeter between pins (1) K and N, multimeter should show continuity.
6. Are readings correct?



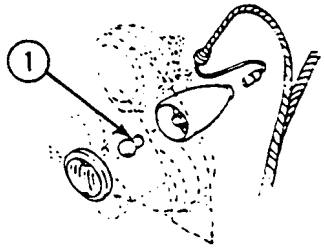
NO → **8YN**

1. Replace light switch (WP 0262 00).
2. Verify no faults found.

YES ↓

9Y

1. Install harness connector on light switch.
2. Install instrument panel (WP 0256 00).
3. Remove bulbs (1) from left and right turn signal light sockets and measure bulb for continuity.
4. Does multimeter indicate any continuity?



NO → **9YN**

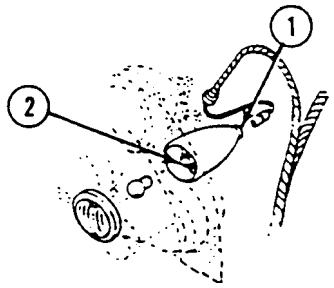
1. Replace faulty turn signal light bulb (WP 0505 00).
2. Verify no faults found.

YES ↓

TURN SIGNAL LAMP, STOPLIGHT OR CONTROL LIGHT DOES NOT LIGHT OR FLASH WHEN CONTROL IS IN RIGHT OR LEFT TURN POSITION—Continued **0065 00**

10Y

1. Disconnect front turn signal lamp connectors from rear of turn signal front lights (WP 0505 00).
2. Connect multimeter to turn signal circuit 460 (right) and 461 (left) terminal pins (1) and to socket center contact (2).
3. Do readings show 0 ohms for both pins (1)?



NO

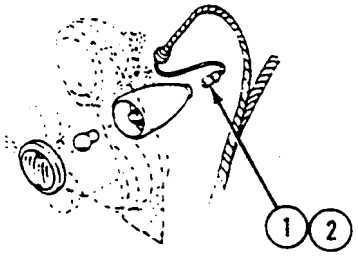
10YN

1. Replace faulty turn signal front light assembly (WP 0505 00).
2. Verify no faults found.

YES

11Y

1. Turn MASTER SWITCH ON.
2. Connect multimeter to circuit 460 (right) connector (1) and ground.
3. Set turn signal unit for right turn.
4. Connect multimeter to circuit 461 (left) connector (2) and ground.
5. Set turn signal unit for left turn.
6. Does multimeter show voltage at both connectors?



NO

11YN

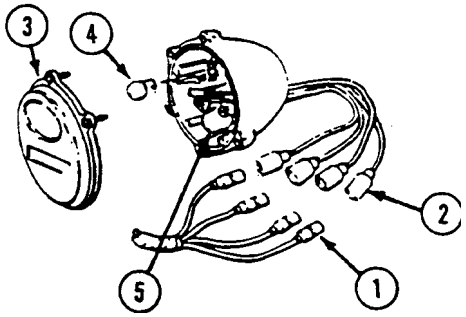
1. Repair wiring harness (WP 0294 00).
2. Verify no faults found.

YES

TURN SIGNAL LAMP, STOPLIGHT OR CONTROL LIGHT DOES NOT LIGHT OR FLASH WHEN CONTROL IS IN RIGHT OR LEFT TURN POSITION—Continued **0065 00**

12Y

1. Turn MASTER SWITCH OFF.
2. Install front turn signal lamp connectors and bulbs (WP 0505 00).
3. Disconnect circuit 22-460 (right) and circuit 22-461 (left) connectors (1) from circuit 22 connectors (2) of right and left stoplight-taillights (3) (WP 0278 00).
4. Remove bulb (4) from circuit 22-460 (right) and circuit 22-461 (left) light sockets (5).
5. Measure resistance of bulb (4) for continuity.
6. Does multimeter indicate any continuity?



NO

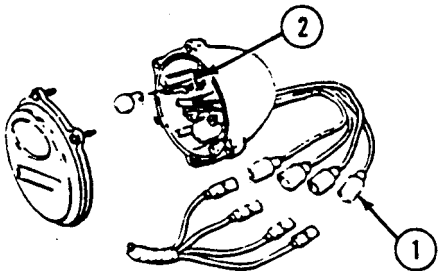
12YN

1. Replace faulty light bulb (WP 0278 00).
2. Verify no faults found.

YES

13Y

1. Connect multimeter to left and right stoplight-taillight circuits 22 connector terminal pins (1) and to socket center contact (2). Reading should be 0 ohms.
2. Does multimeter show 0 ohms?



NO

13YN

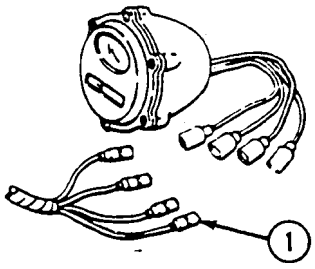
1. Replace faulty left stoplight-taillight assembly (WP 0278 00).
2. Verify no faults found.

YES

TURN SIGNAL LAMP, STOPLIGHT OR CONTROL LIGHT DOES NOT LIGHT OR FLASH WHEN CONTROL IS IN RIGHT OR LEFT TURN POSITION—Continued **0065 00**

14Y

1. Turn MASTER SWITCH ON.
2. Connect multimeter to circuit 22-460 (right) and 22-461 (left) harness connectors (1) and ground.
3. Set turn signal unit for right and left turn.
4. Does multimeter show voltage for each connector?



NO

14YN

1. Repair wiring harness (WP 0294 00).
2. Verify no faults found.

YES

15Y

1. Connect circuit 22-460 (right) and circuit 22-461 (left) connectors to circuit 22 connectors of right and left stoplight-taillights (WP 0278 00).
2. Verify no faults found.

TURN SIGNAL LAMPS AND STOPLIGHTS DO NOT FLASH WITH CONTROL IN HAZARD POSITION 0066 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
MASTER SWITCH OFF (see your -10)

T

1. Check for loose electrical connections.
2. Are all electrical connections clean and tight?

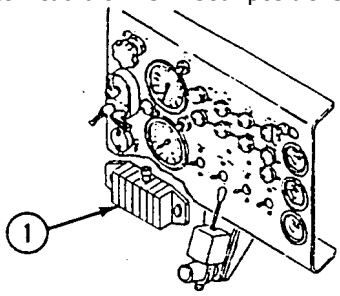
NO → **TN**

1. Clean and tighten faulty electrical connections.
2. Verify no faults found.

YES

Y

1. Remove harness connector from flasher (1).
2. Check continuity between pins A and C, and B and C.
3. Does multimeter read 0 ohms in both positions?



NO → **YN**

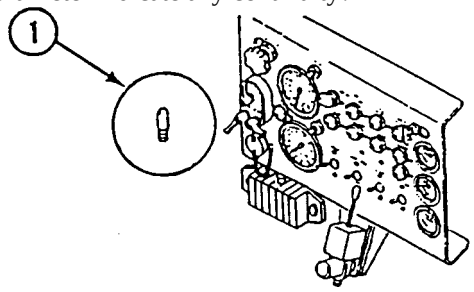
1. Replace flasher (WP 0509 00).
2. Verify no faults found.

YES

TURN SIGNAL LAMPS AND STOPLIGHTS DO NOT FLASH WITH CONTROL IN HAZARD POSITION—Continued **0066 00**

2Y

1. Install harness connector on flasher.
2. Remove light bulb from turn signal control (WP 0508 00).
3. Check light bulb (1) for continuity.
4. Does multimeter indicate any continuity?



NO

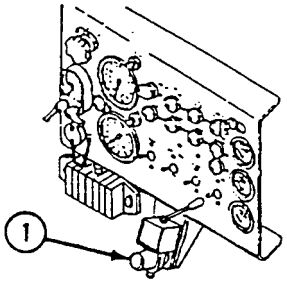
2YN

1. Replace light bulb (WP 0508 00).
2. Verify no faults found.

YES

3Y

1. Install light bulb in turn signal control (WP 0508 00).
2. Disconnect harness connector from turn signal control (1).
3. Put turn signal control unit (1) in left turn position.
4. Measure resistance between terminal pin G and terminal pin F. Note reading.
5. Measure resistance between terminal pin H and terminal pin B. Note reading.
6. Measure resistance between terminal pin H and terminal pin C. Note reading.
7. Measure resistance between terminal pin H and lamp socket. Note reading.
8. Did multimeter indicate 10 ohms or less for each reading?



NO

3YN

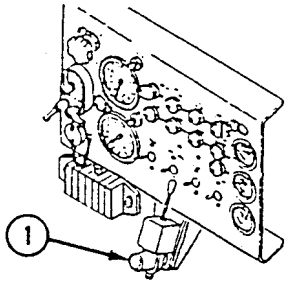
1. Replace faulty turn signal control (WP 0508 00).
2. Verify no faults found.

YES

TURN SIGNAL LAMPS AND STOPLIGHTS DO NOT FLASH WITH CONTROL IN HAZARD POSITION—Continued **0066 00**

4Y

1. Put turn signal control (1) in right turn position.
2. Measure resistance between terminal pin G and terminal pin F. Note reading.
3. Measure resistance between terminal pin H and terminal pin A. Note reading.
4. Measure resistance between terminal pin H and terminal pin E. Note reading.
5. Measure resistance between terminal pin H and lamp socket. Note reading.
6. Did multimeter indicate 10 ohms or less for each reading?



NO

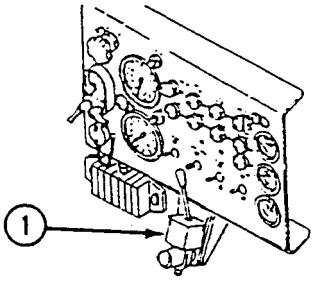
4YN

1. Replace faulty turn signal control (WP 0508 00).
2. Verify no faults found.

YES

5Y

1. Put turn signal control (1) in hazard light position.
2. Measure resistance between terminal pin G and terminal pin F. Note reading.
3. Measure resistance between terminal pin H and terminal pin A. Note reading.
4. Measure resistance between terminal pin H and terminal pin E. Note reading.
5. Measure resistance between terminal pin H and terminal pin B. Note reading.
6. Measure resistance between terminal pin H and terminal pin C. Note reading.
7. Measure resistance between terminal pin H and lamp socket. Note reading.
8. Did multimeter indicate 10 ohms or less for each reading?



NO

5YN

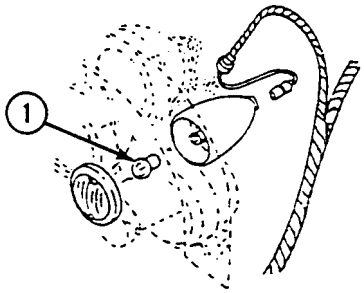
1. Replace faulty turn signal control (WP 0508 00).
2. Verify no faults found.

YES

TURN SIGNAL LAMPS AND STOPLIGHTS DO NOT FLASH WITH CONTROL IN HAZARD POSITION—Continued **0066 00**

6Y

1. Connect harness connector to turn signal control.
2. Remove bulbs (1) from left and right turn signal light sockets and measure bulb resistance for continuity.
3. Does multimeter indicate any continuity?



NO

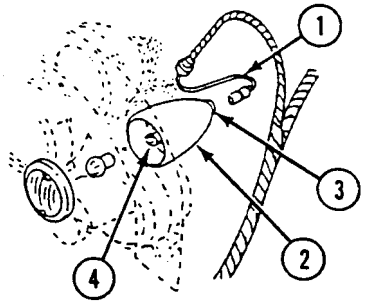
6YN

1. Replace faulty turn signal light bulb (WP 0505 00).
2. Verify no faults found.

YES

7Y

1. Install bulbs in left and right turn signal light sockets.
2. Disconnect front turn signal lamp connectors (1) from rear of turn signal front lights (2).
3. Connect multimeter to turn signal circuit 460 (right) and 461 (left) terminal pins (3) and to socket center contacts (4).
4. Does multimeter indicate 0 ohms for both positions?



NO

7YN

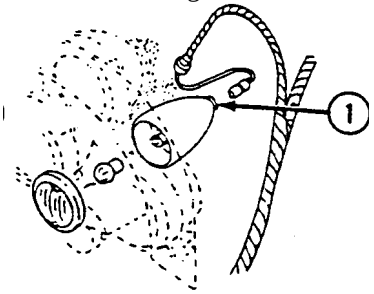
1. Replace faulty turn signal front light assembly (WP 0505 00).
2. Verify no faults found.

YES

TURN SIGNAL LAMPS AND STOPLIGHTS DO NOT FLASH WITH CONTROL IN HAZARD POSITION—Continued **0066 00**

8Y

1. Turn MASTER SWITCH ON.
2. Connect multimeter to circuit 460 (right) or 461 (left) connectors (1) and ground.
3. Set turn signal unit for right turn or left turn.
4. Does multimeter indicate voltage at both connectors (1)?



NO

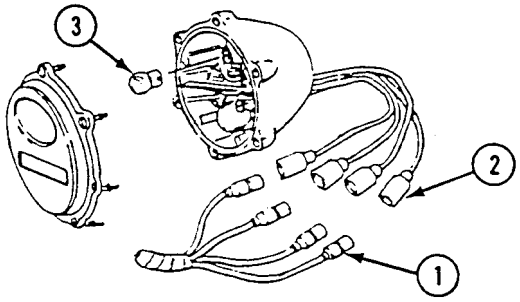
8YN

1. Repair wiring harness (WP 0294 00).
2. Verify no faults found.

YES

9Y

1. Turn MASTER SWITCH OFF.
2. Install front turn signal lamp connectors and bulbs (WP 0505 00).
3. Disconnect circuit 22-460 (right) and circuit 22-461 (left) connectors (1) from circuit 22 connectors (2) of right and left stop light-taillights (WP 0507 00).
4. Remove bulb (3) from circuit 22-460 (right) and circuit 22-461 (left) light sockets.
5. Measure bulb resistance for continuity.
6. Does multimeter indicate any continuity?



NO

9YN

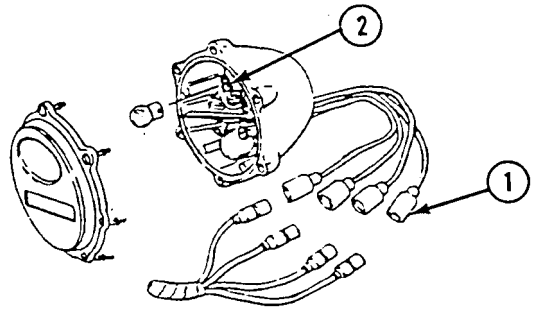
1. Replace faulty light bulb (WP 0507 00).
2. Verify no faults found.

YES

TURN SIGNAL LAMPS AND STOPLIGHTS DO NOT FLASH WITH CONTROL IN HAZARD POSITION—Continued **0066 00**

10Y

1. Connect multimeter to left and/or right stoplight-taillight circuits 22 connector terminal pins (1) and to socket center contacts (2).
2. Does multimeter indicate 0 ohms?



NO →

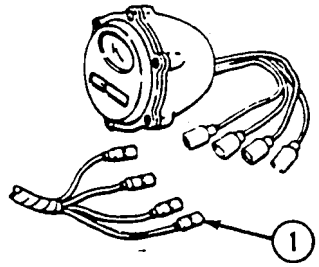
10YN

1. Replace faulty stoplight-taillight assembly (WP 0507 00).
2. Verify no faults found.

YES ↓

11Y

1. Turn MASTER SWITCH ON.
2. Connect multimeter to circuit 22-460 (right) or 22-461 (left) harness connectors (1) and ground.
3. Set turn signal unit for right or left turn.
4. Does multimeter indicate voltage?



NO →

11YN

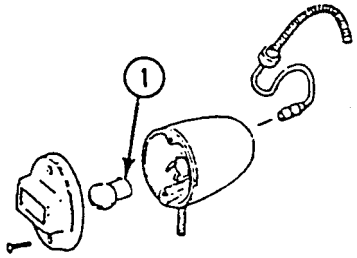
1. Repair wiring harness (WP 0294 00).
2. Verify no faults found.

YES ↓

TURN SIGNAL LAMPS AND STOPLIGHTS DO NOT FLASH WITH CONTROL IN HAZARD POSITION—Continued **0066 00**

12Y

1. Connect circuit 22-460 (right) and circuit 22-461 (left) connectors to circuit 22 connectors of right and left stoplight-taillights (WP 0507 00).
2. Remove blackout stoplight-taillight bulb (1).
3. Connect multimeter to bulb (1) and check for continuity.
4. Does multimeter indicate any continuity?



NO →

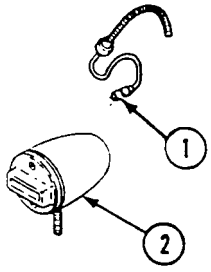
12YN

1. Replace blackout stoplight-taillight bulb (WP 0507 00).
2. Verify no faults found.

YES ↓

13Y

1. Disconnect circuit 23 connector (1) from blackout stoplight-taillight (2).
2. Turn MASTER SWITCH ON.
3. Connect multimeter between circuit 23 connector (1) and ground.
4. Does multimeter indicate voltage on circuit 23 connector?



NO →

13YN

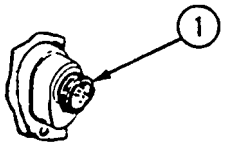
1. Repair wiring harness (WP 0294 00).
2. Verify no faults found.

YES ↓

TURN SIGNAL LAMPS AND STOPLIGHTS DO NOT FLASH WITH CONTROL IN HAZARD POSITION—Continued **0066 00**

14Y

1. Install light bulb and connect circuit 23 connector to blackout stoplight-taillight.
2. Partially remove instrument panel (WP 0256 00).
3. Disconnect wiring harness connector from light switch.
4. Place light switches in STOP LIGHT and PANEL BRT positions.
5. Check continuity between pin F and all remaining pins (1). Multimeter should indicate continuity when checking between pins (F, A), (F, B), and (F, J). When checking pins (F, C), (F, D), (F, E), (F, H), (F, K), (F, L), (F, M), and (F, N), multimeter should indicate infinity.
6. Move auxiliary switch to PARK. Multimeter should indicate infinity when connected between pins F and L.
7. Connect multimeter between pins K and C. Multimeter should read continuity.
8. Are readings correct?



NO

14YN

1. Replace light switch (WP 0262 00).
2. Verify no faults found.

YES

15Y

1. Connect wiring harness connector to light switch.
2. Install instrument panel (WP 0256 00).
3. Verify no faults found.

IN LEFT OR RIGHT TURN SIGNAL POSITION, INDIVIDUAL LIGHT DOES NOT FLASH 0067 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
MASTER SWITCH OFF (see your -10)

T

1. Check for loose electrical connections.
2. Are all electrical connections clean and tight?

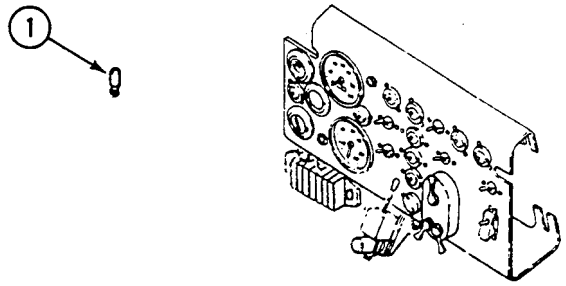
NO → **TN**

1. Clean and tighten faulty electrical connections.
2. Verify no faults found.

YES

Y

1. Remove light bulb from turn signal control unit (WP 0508 00).
2. Check light bulb (1) for continuity.
3. Does multimeter indicate any continuity?



NO → **YN**

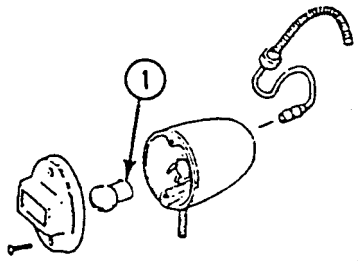
1. Replace light bulb (WP 0508 00).
2. Verify no faults found.

YES

IN LEFT OR RIGHT TURN SIGNAL POSITION, INDIVIDUAL LIGHT DOES NOT FLASH—Continued **0067 00**

2Y

1. Install light bulb in turn signal control unit (WP 0508 00).
2. Remove blackout stoplight-taillight bulb (1).
3. Connect multimeter to bulb (1) and check for continuity.
4. Does multimeter indicate any continuity?



NO

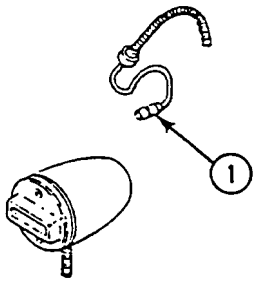
2YN

1. Replace blackout stoplight-taillight bulb (WP 0507 00).
2. Verify no faults found.

YES

3Y

1. Install light bulb in blackout stoplight-taillight (WP 0507 00).
2. Disconnect circuit 23 connector (1) from blackout stoplight-taillight.
3. Turn master switch ON (see your -10).
4. Connect multimeter between circuit 23 connector (1) and ground.
5. Does multimeter indicate voltage is present on circuit 23 connector (1)?



NO

3YN

1. Repair wiring harness (WP 0294 00).
2. Verify no faults found.

YES

4Y

1. Turn MASTER SWITCH OFF.
2. Connect circuit 23 connector to blackout stoplight-taillight.
3. Verify no faults found.

STEERING/BRAKES MALFUNCTION (M548A1) 0068 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

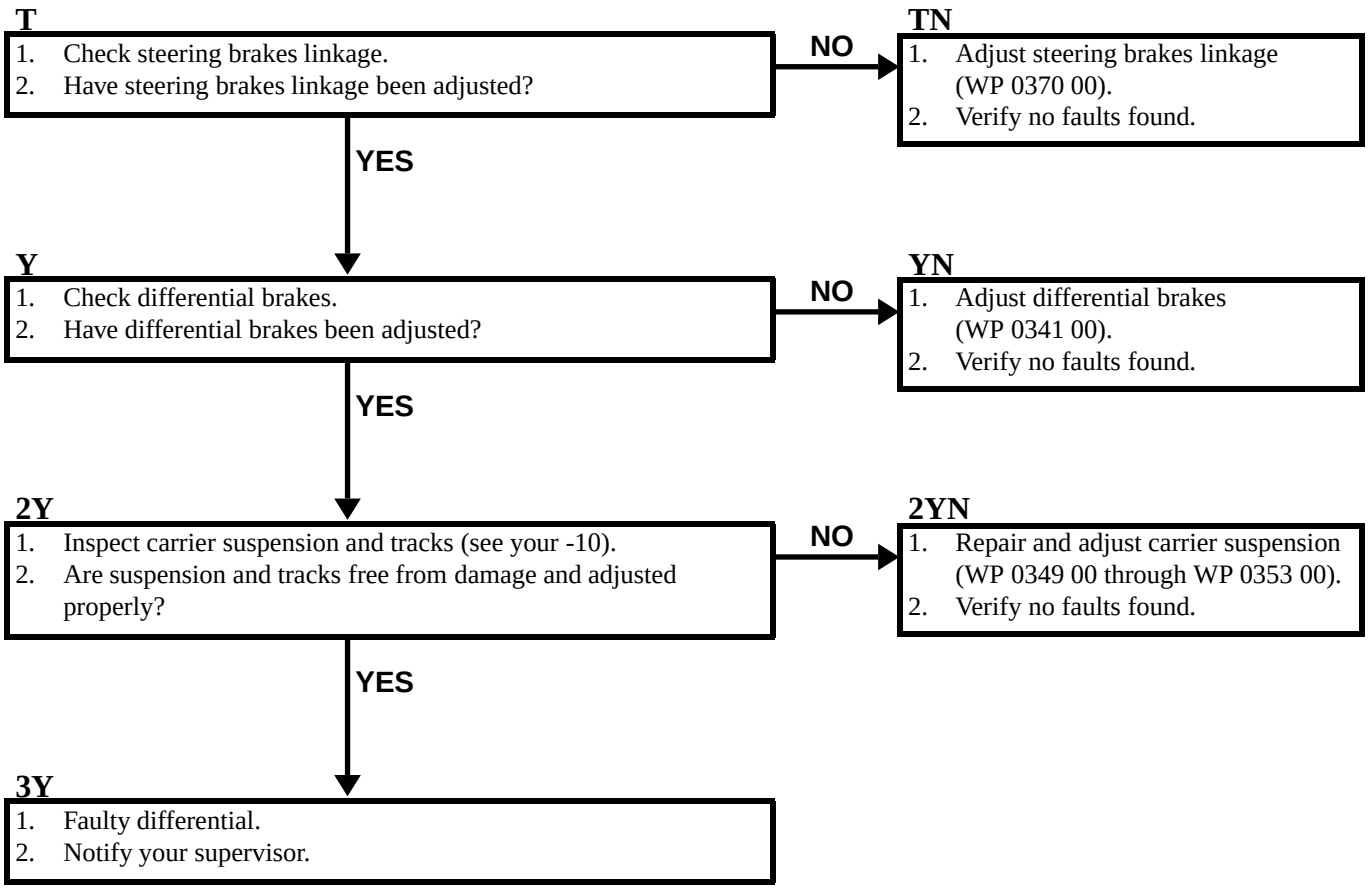
Unit Mechanic

References

See your -10

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)
Inspect suspension (see your -10)



CARRIER DOES NOT MOVE IN ANY SHIFT LEVER POSITION (M548A1) 0069 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

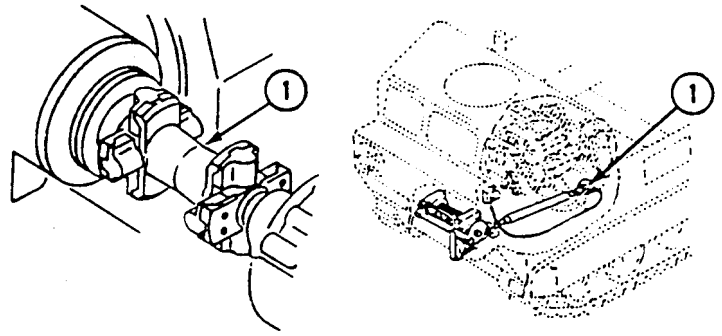
See your -10

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Engine disconnect lever IN (see your -10)
Center seat raised (see your -10)
Hull bottom access cover removed (WP 0383 00)

T

1. Inspect transmission to differential drive shaft (1).
2. Is drive shaft connected and serviceable?



NO →

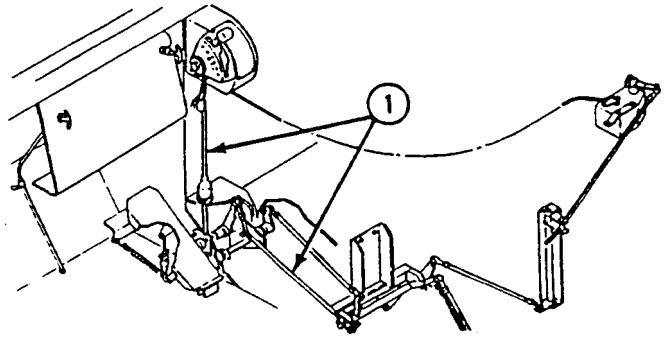
TN

1. Connect or replace drive shaft (WP 0332 00).
2. Verify no faults found.

YES ↓

Y

1. Inspect range selector linkage (1).
2. Is range selector linkage connected and serviceable?



NO

YN

1. Connect or replace range selector linkage (WP 0315 00).
2. Verify no faults found.

YES

2Y

1. Inspect range selector linkage.
2. Has range selector linkage been adjusted?

NO

2YN

1. Adjust range selector linkage (WP 0316 00).
2. Verify no faults found.

YES

3Y

1. Inspect differential brakes.
2. Have differential brakes been adjusted?

NO

3YN

1. Adjust differential brakes (WP 0341 00).
2. Verify no faults found.

YES

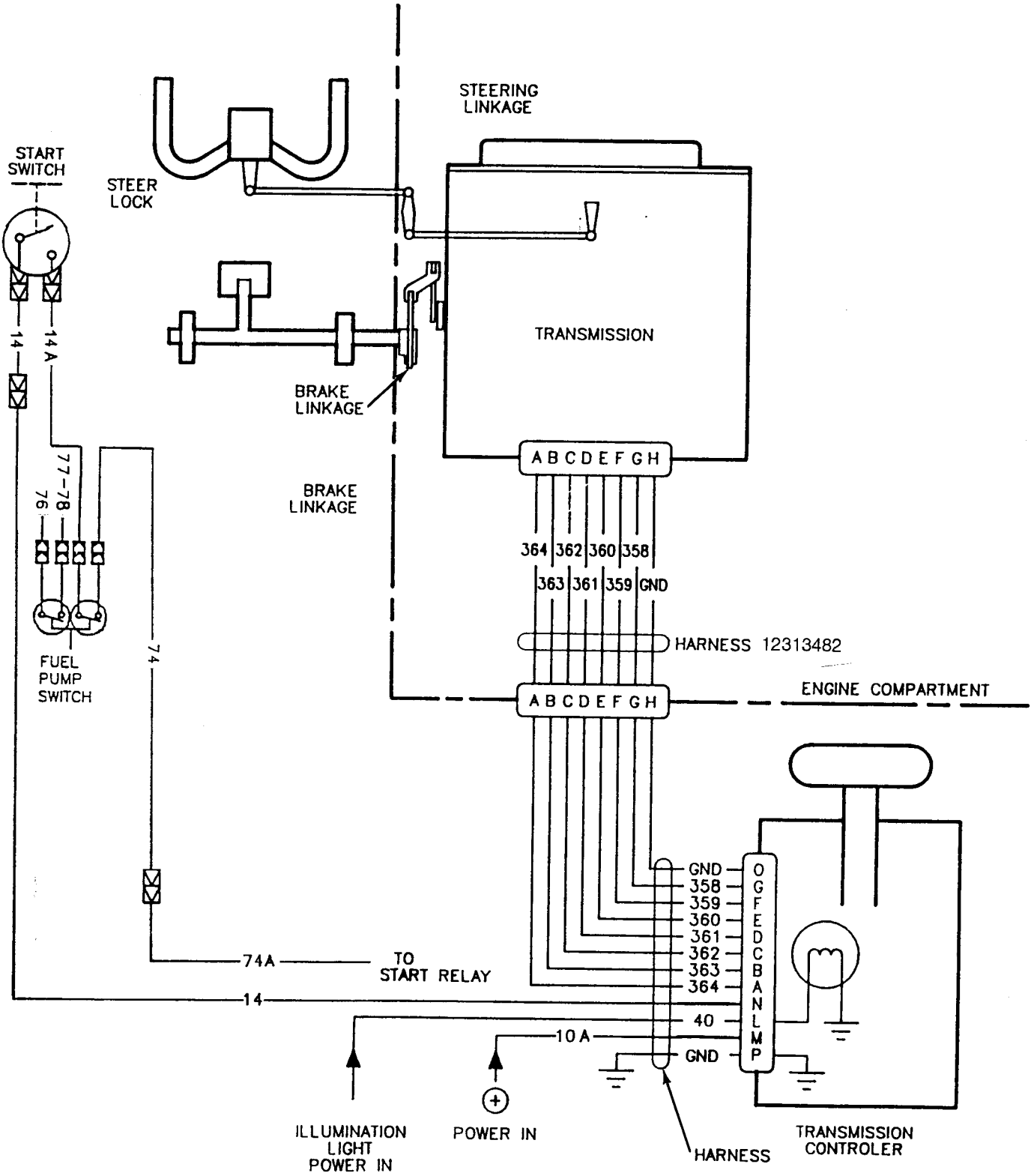
4Y

1. Faulty drive train.
2. Notify your supervisor.

TRANSMISSION SYSTEM SCHEMATIC (M548A3) 0070 00

DESCRIPTION

Use the schematic below as an aid for performing system troubleshooting procedures.



CARRIER DOES NOT MOVE IN ANY SHIFT LEVER POSITION (M548A3) 0071 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Slip Joint Pliers (WP 0541 00, Item 33)

Personnel Required
Unit Mechanic

References
See your -10

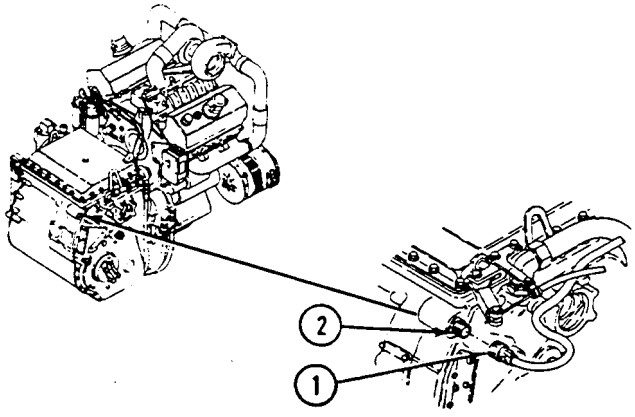
Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Transmission oil level normal
Center floor plates removed (WP 0395 00)
Center seat raised (see your -10)

T

WARNING

Carrier may move forward. Personnel may be injured or killed. Keep personnel away from front of carrier.

1. Remove wiring harness 12313482 plug (1) from transmission jack (2).
2. Pull TOW START cable and LOCK ON (see your -10).
3. Start engine (see your -10).
4. Release TOW START cable.
5. Release parking brake.
6. Apply throttle.
7. Does vehicle move forward?

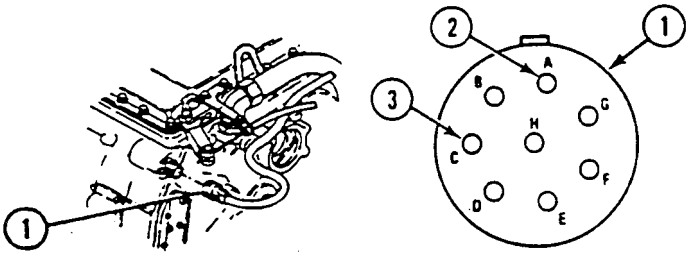


NO → GO TO **BY** (PAGE 0071 00-3)

YES ↓

Y

1. Shut down engine (see your -10).
2. Place transmission shift control in 1-4 position.
3. Turn MASTER SWITCH ON.
4. Measure voltage between each socket on wiring harness 12313482 plug (1) and ground. Multimeter should read 18 volts or more at sockets A (2) and C (3) and 0 volts for all remaining socket checks.
5. Does multimeter read less than 18 volts for sockets A and C and doesn't read 0 volts for all other sockets?



NO

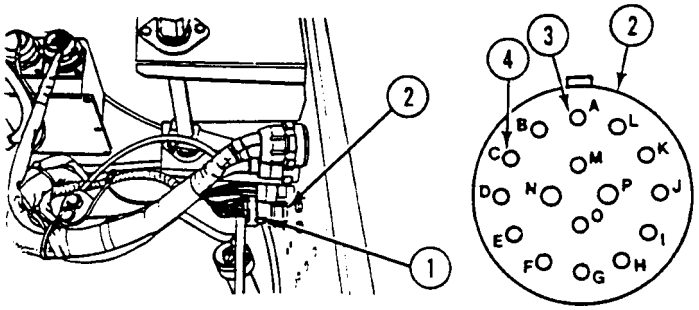
YN

1. Faulty transmission beyond unit maintenance repair.
2. Notify your supervisor.

YES

2Y

1. Turn MASTER SWITCH OFF.
2. Remove wiring harness 12313482 plug (1) from wiring harness 12313483 jack (2) at carrier bulkhead.
3. Turn MASTER SWITCH ON.
4. Measure voltage between each socket on wiring harness 12313483 jack (2) and ground. Multimeter should read 18 volts or more for socket A (3) and C (4) and 0 volts for all remaining socket checks.
5. Does multimeter read less than 18 volts for sockets A and C and doesn't read 0 volts for all other sockets?



NO

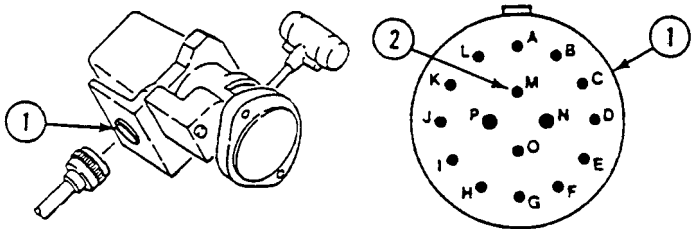
2YN

1. Faulty wiring harness 12313482 (transmission control wiring harness).
2. Notify your supervisor.

YES

3Y

1. Turn MASTER SWITCH OFF.
2. Remove transmission shift control (WP 0306 00).
3. Place transmission shift control in 1-4 position.
4. Measure resistance between transmission shift control jack (1) pin M (2) and pins A thru G and N. Multimeter should read 0 ohms for pins A and C and infinity for all remaining pin checks. See pin to pin check (WP 0309 00).
5. Does multimeter read more than 0 ohms for pins A and C and doesn't read infinity for all other pins?



NO →

3YN

1. Install transmission shift control (WP 0306 00).
2. Faulty wiring harness 12313483 (transmission wiring harness).
3. Notify your supervisor.

YES ↓

4Y

1. Install wiring harness 12313482 plug on wiring harness 12313483 jack at carrier bulkhead.
2. Replace faulty transmission shift control switch (WP 0309 00).
3. Verify no faults found.

BY

1. Stop engine (see your -10).
2. Check brake linkage and brake adjustment (WP 0347 00).
3. Is brake linkage free from damage and brakes properly adjusted?

NO →

BYN

1. Repair linkage and/or adjust brakes (WP 0347 00).
2. Verify no faults found.

YES ↓

2BY

1. Disconnect track (see your -10).
2. Disconnect propeller shaft (WP 0335 00).
3. Does final drive/sprocket turn?

NO →

2BYN

1. Replace faulty final drive (WP 0335 00).
2. Verify no faults found.

YES ↓

3BY

1. Faulty transmission beyond unit maintenance repair.
2. Notify your supervisor.

CARRIER DOES NOT PIVOT (M548A1) 0072 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

See your -10
See your PMCS

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Center floor plates raised (WP 0394 00)
Center seat raised (see your -10)

T

1. Inspect pivot steer brakes, hoses, tubes, brake discs, and fittings for leaks or serviceability (WP 0372 00, WP 0373 00, and WP 0374 00).
2. Are all parts serviceable?

NO →

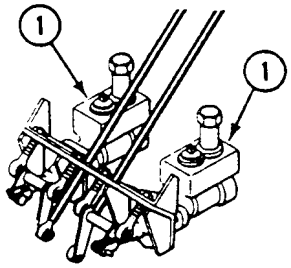
TN

1. Replace damaged parts as required (WP 0372 00, WP 0373 00, or WP 0374 00).
2. Verify no faults found.

YES ↓

Y

1. Inspect master cylinder (1) for leaks.
2. Is master cylinder serviceable?



NO →

YN

1. Replace master cylinder (WP 0371 00).
2. Verify no faults found.

YES ↓

2Y

1. Check hydraulic fluid level (see yourPMCS).
2. Is master cylinder full?

NO →

2YN

1. Bleed pivot steer system (WP 0370 00).
2. Verify no faults found.

YES ↓

3Y

1. Check pivot steer linkage.
2. Has pivot steer linkage been adjusted?

NO →

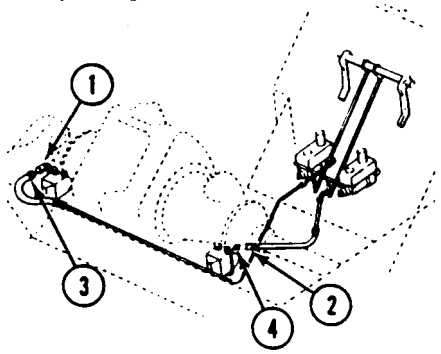
3YN

1. Adjust pivot steer linkage (WP 0370 00).
2. Verify no faults found.

YES ↓

4Y

1. Remove quick-disconnect coupling,(1) from right caliper (3) or quick-disconnect coupling (2) from left caliper (4) .
2. Pull left or right pivot steer handle and hold. Handle should stop about half way and not bleed off or feel spongy.
3. Does handle stop firmly and hold?



NO →

4YN

1. Replace master cylinder (WP 0371 00).
2. Verify no faults found.

YES ↓

5Y

1. Inspect pivot steer brake linings for wear (WP 0375 00).
2. Are brake linings serviceable?

NO →

5YN

1. Replace pivot steer brake linings (WP 0375 00).
2. Verify no faults found.

YES ↓

6Y

1. Faulty differential.
2. Notify your supervisor.

TRANSMISSION DOES NOT PIVOT STEER (M548A3) 0073 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Slip Joint Pliers (WP 0541 00, Item 33)

Personnel Required

Unit Mechanic

References

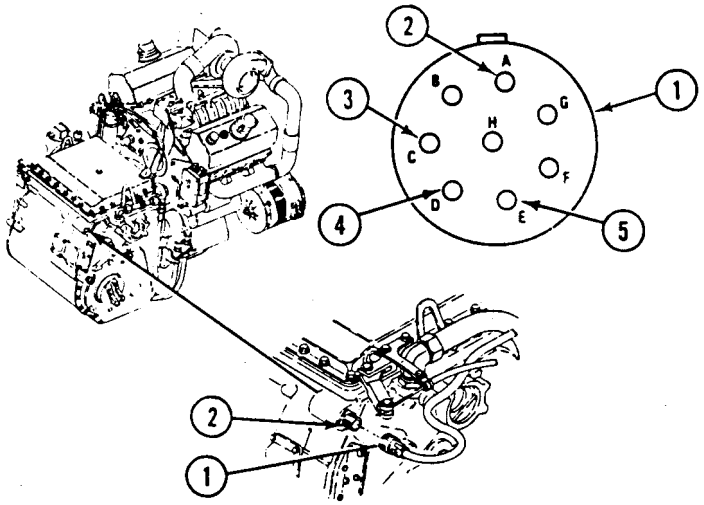
See your -10

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Transmission in PV position (see your -10)
Center seat raised (see your -10)
Center floor plates removed (WP 0395 00)

T

1. Remove wiring harness 12313482 plug (1) from transmission jack (2).
2. Turn MASTER SWITCH ON.
3. Measure voltage between each socket on wiring harness 12313482 plug (1) and ground. Multimeter should read 18 volts or more at sockets B (3), D (4), and E (5) and 0 volts for all remaining socket checks.
4. Does multimeter indicate an incorrect reading?



NO →

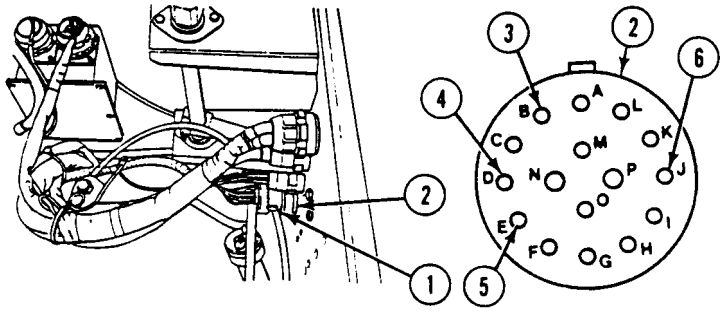
TN

1. Faulty transmission beyond unit maintenance repair.
2. Notify your supervisor.

YES ↓

Y

1. Remove wiring harness 12313482 plug (1) from wiring harness 12313483 jack (2) at carrier bulkhead.
2. Measure voltage between each socket on wiring harness 12313483 jack (2) and ground. Multimeter should read 18 volts or more for socket B (3), D (4), E (5) and J (6) and 0 volts for all remaining socket checks.
3. Does multimeter indicate an incorrect reading?



NO

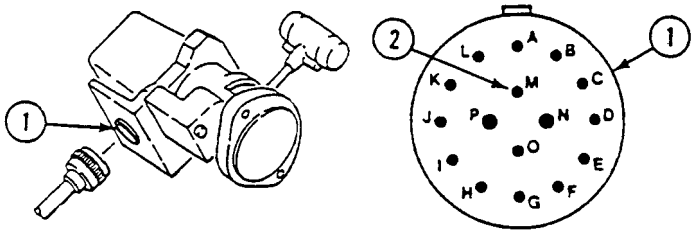
YN

1. Faulty wiring harness 12313482 (transmission control wiring harness).
2. Notify your supervisor.

YES

2Y

1. Turn MASTER SWITCH OFF.
2. Install wiring harness 12313482 plug on transmission jack.
3. Remove transmission shift control (WP 0306 00).
4. Place transmission shift control in PV position.
5. Measure resistance between transmission shift control jack (1), pin M (2), and pins A thru G and N. Multimeter should read 0 ohms for pins B, D, and E and infinity for all remaining pin checks. See pin to pin check (WP 0309 00).
6. Does multimeter indicate an incorrect reading?



NO

2YN

1. Install transmission shift control (WP 0306 00).
2. Faulty wiring harness 12313483 (transmission wiring harness).
3. Notify your supervisor.

YES

3Y

1. Install wiring harness 12313482 plug on wiring harness 12313483 jack at carrier bulkhead.
2. Replace faulty transmission shift control switch (WP 0309 00).
3. Verify no faults found.

CARRIER MOVES WITH TRANSMISSION IN SL (M548A3) 0074 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Slip Joint Pliers (WP 0541 00, Item 33)

Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Transmission in SL position (see your -10)
Cab floor plates raised (WP 0395 00)

T

1. Adjust steering wheel linkage (WP 0362 00).
2. Is steering linkage free from damage and in proper adjustment?

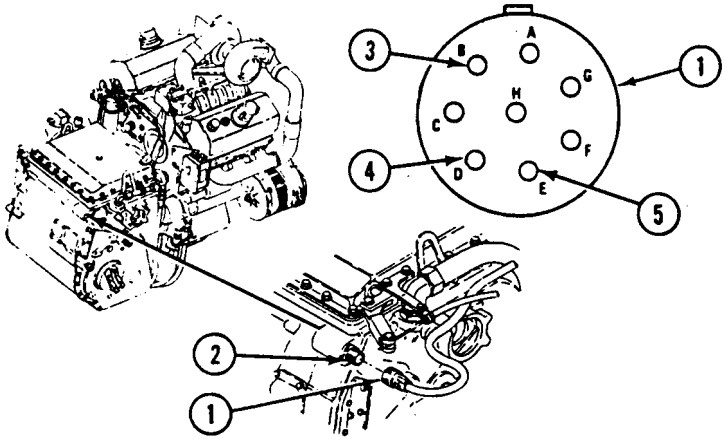
NO → **TN**

1. Replace steering wheel linkage (WP 0364 00).
2. Verify no faults found.

YES

Y

1. Remove wiring harness 12313482 plug (1) from transmission jack (2).
2. Turn MASTER SWITCH ON.
3. Measure voltage between each socket on wiring harness plug (1) and ground. Multimeter should read 18 volts or more at sockets B (3), D (4), and E (5) and 0 volts for all remaining socket checks.
4. Does multimeter read less than 18 volts for sockets B, D, and E and doesn't read 0 volts for all other sockets?



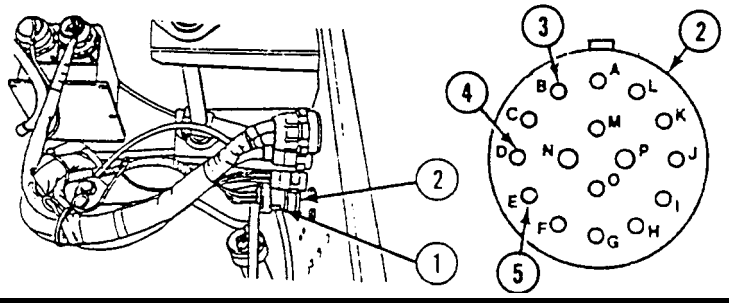
NO → **YN**

1. Faulty transmission beyond unit maintenance repair.
2. Notify your supervisor.

YES

2Y

1. Remove wiring harness 12313482 plug (1) from wiring harness 12313483 jack (2) at carrier bulkhead.
2. Measure voltage between each socket on wiring harness 12313483 jack (2) and ground. Multimeter should read 18 volts or more for sockets B (3), D (4), and E (5) and 0 volts for the remaining socket checks.
3. Does multimeter read less than 18 volts for sockets B, D, and E and doesn't read 0 volts for all other sockets?



NO

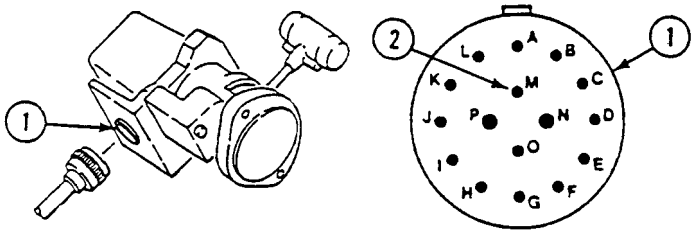
2YN

1. Replace faulty wiring harness 12313482 (transmission control wiring harness) (WP 0297 00).
2. Verify no faults found.

YES

3Y

1. Turn MASTER SWITCH OFF.
2. Install wiring harness 12313482 plug on transmission jack.
3. Remove transmission shift control (WP 0306 00).
4. Place transmission shift control in SL position.
5. Measure resistance between transmission shift control jack (1) pin M (2) and pins A thru N. Multimeter should read 0 ohms for pins B, D, E, and N and infinity for all remaining pin checks. See pin to pin check (WP 0309 00).
6. Does multimeter read more than 0 ohms for sockets B, D, E, and N and doesn't read infinity for all other pins?



NO

3YN

1. Install transmission shift control (WP 0306 00).
2. Replace faulty wiring harness 12313483 (transmission wiring harness) (WP 0297 00).
3. Verify no faults found.

YES

4Y

1. Install wiring harness 12313482 plug on wiring harness 12313483 jack at carrier bulkhead.
2. Replace faulty transmission shift control switch(WP 0309 00).
3. Verify no faults found.

CARRIER DRIFTS OR DOES NOT STEER (M548A3) 0075 00

INITIAL SETUP:

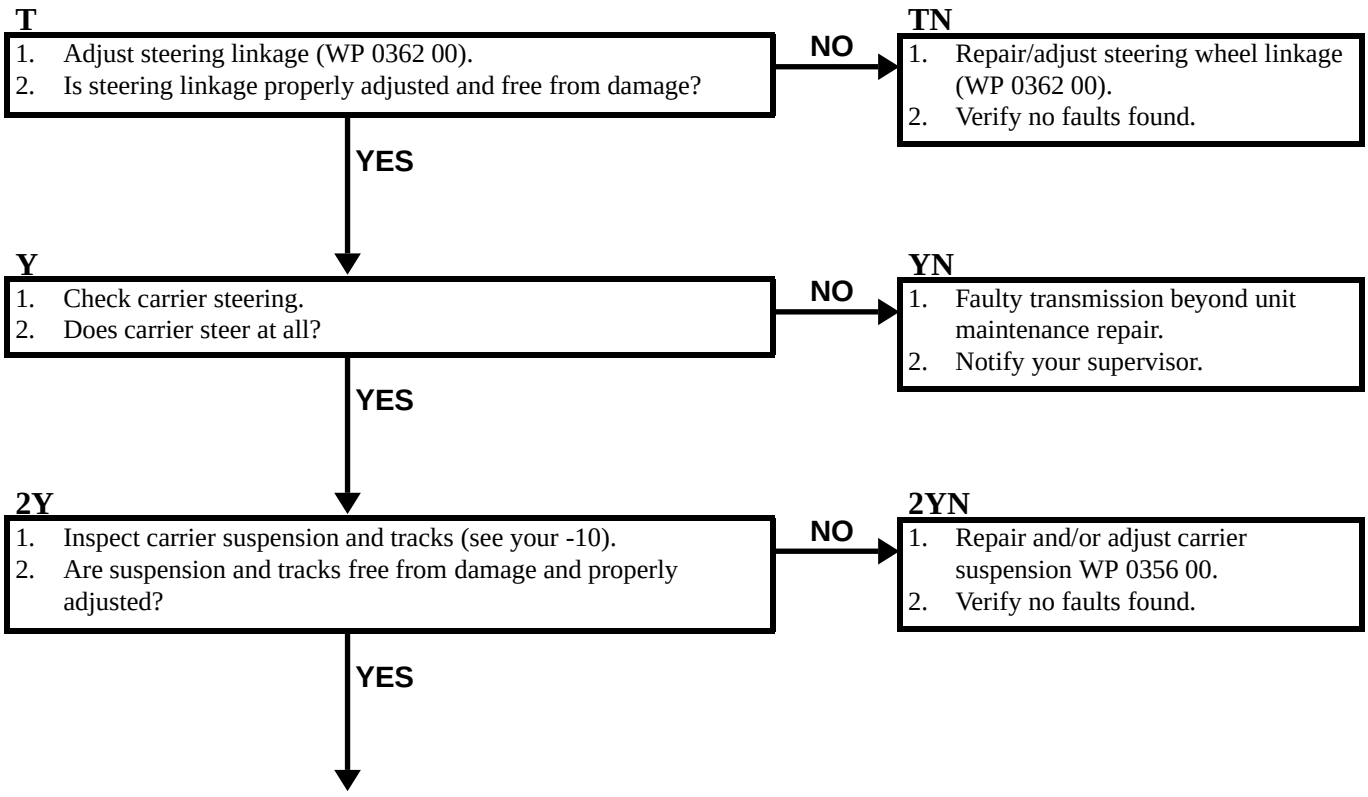
Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required
Unit Mechanic

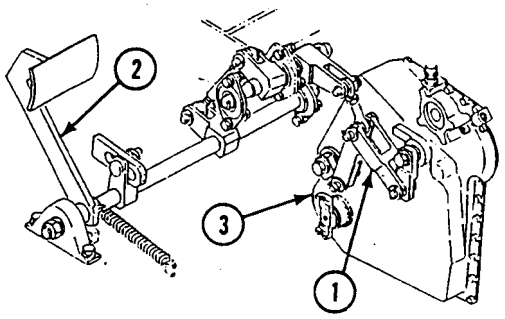
References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)



3Y

1. Check operation of service brake linkage (1) between brake pedal (2) and transmission (3).
2. Is linkage free from obstruction, binding, and damage?



NO →

3YN

1. Replace/adjust service brakes control linkage (WP 0347 00).
2. Verify no faults found.

YES ↓

4Y

1. Check steering .
2. Has steering been adjusted?

NO →

4YN

1. Adjust steering (WP 0306 00).
2. Verify no faults found.

YES ↓

5Y

1. Check transmission brake adjustment (WP 0313 00).
2. Did brakes require adjustment?

NO →

5YN

1. Faulty transmission brakes beyond unit maintenance repair.
2. Notify your supervisor.

YES ↓

6Y

1. Adjust service brake control linkage (WP 0347 00).
2. Verify no faults found.

SERVICE AND/OR PARKING BRAKE WILL NOT HOLD CARRIER (M548A3) 0076 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Cab floor plates raised (WP 0395 00)

T

WARNING

Carrier may move forward. Personnel may be injured or killed. Keep personnel away from front of carrier.

1. Start engine (see your -10).
2. Release parking brake.
3. Fully depress service brake pedal.
4. Shift transmission selector to 1-4 positions.
5. Depress accelerator fully or until carrier begins to move.
6. Release accelerator and stop engine.
7. Did carrier move forward?

NO →

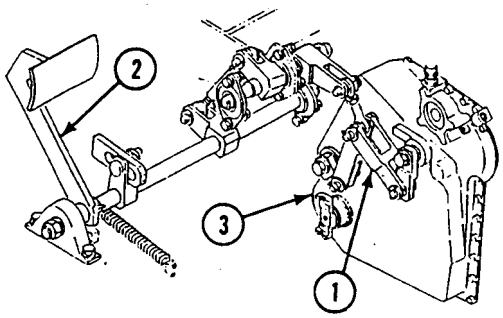
TN

1. Adjust parking brake (WP 0345 00).
2. Verify no faults found.

YES ↓

Y

1. Check operation of service brake linkage (1) between brake pedal (2) and transmission (3).
2. Is linkage free from obstruction, binding, and damage?



NO

YN

1. Replace/adjust service brakes control linkage (WP 0347 00 or WP 0348 00).
2. Verify no faults found.

YES

2Y

1. Check transmission brake adjustment (WP 0313 00).
2. Did brakes require adjustment?

NO

2YN

1. Faulty transmission brakes beyond unit maintenance repair.
2. Notify your supervisor.

YES

3Y

1. Check service brake control linkage adjustment (WP 0347 00).
2. Is service brake linkage properly adjusted?

NO

3YN

1. Adjust service brake control linkage (WP 0347 00).
2. Verify no faults found.

YES

4Y

1. Verify no faults found.

TRANSMISSION WILL NOT UPSHIFT OR SHIFTS ERRATICALLY IN 1-4 POSITION (M548A3) 0077 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
STE/ICE Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

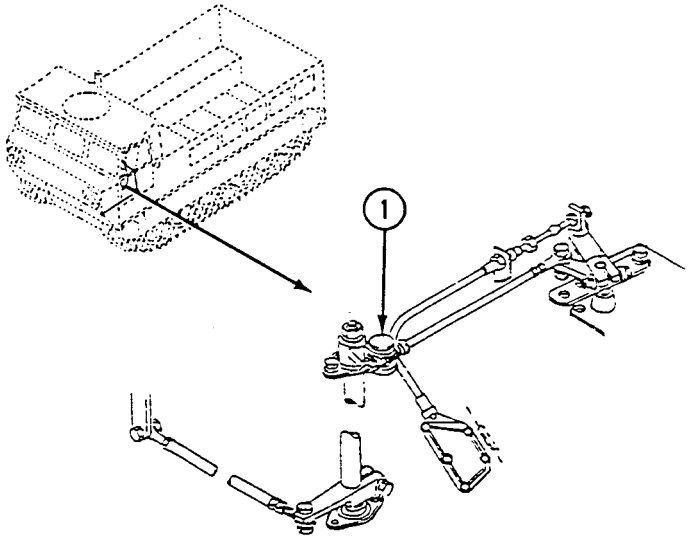
See your -10
TM 9-4910-571-12&P

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Transmission in SL (see your -10)
Power plant rear access panel removed (see your -10)
Center seat raised (see your -10)

T

1. Measure distance between center of throttle linkage pin (1) and bulkhead.
2. Is center or pin between 1 1/16-1 1/8 inches (2.70-2.86 cm) from bulkhead?



NO →

TN

1. Adjust throttle linkage (WP 0200 00).
2. Verify no faults found.

YES ↓

TRANSMISSION WILL NOT UPSHIFT OR SHIFTS ERRATICALLY IN 1-4 POSITION (M548A3)—Continued **0077 00**

Y

1. Adjust throttle valve modulator (WP 0204 00).
2. Can throttle valve modulator be adjusted?

NO →

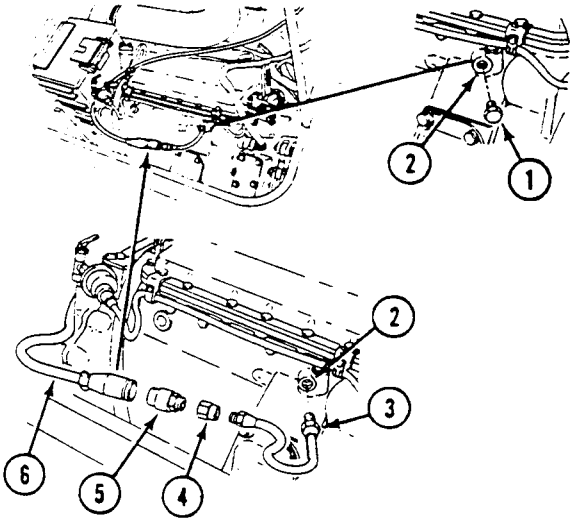
YN

1. Replace throttle valve modulator and lever (WP 0203 00).
2. Verify no faults found.

YES ↓

2Y

1. Remove plug (1) from GOVERNOR TWO (G2) pressure port (2).
2. Install STE/ICE 11669236 hose (3) into G2 port (2).
3. Install STE/ICE 444012 adapter (4) onto 11669236 hose (3).
4. Install STE/ICE 12258876 pressure transducer (5) onto 444012 adapter (4).
5. Hook up STE/ICE W4 cable (6) to transducer (5).
6. Install driver's rear access panel allowing W4 cable slack to reach VTM.
7. Close front power plant access door (see your -10).
8. Hook up VTM to DCA 6.
9. Hook up STE/ICE W4 cable (6) to VTM jack J2TK.
10. Perform STE/ICE test 50 TM 9-4910-571-12&P with carrier in motion over flat level terrain at 30 MPH with transmission selector in 1-4 position.
11. Does VTM read between 92-107 psi (634-738 kPa)?



NO →

2YN

1. Replace G2 assembly (WP 0317 00).
2. Verify no faults found.

YES ↓

TRANSMISSION WILL NOT UPSHIFT OR SHIFTS ERRATICALLY IN 1-4 POSITION (M548A3)—Continued **0077 00**

3Y

1. G2 pressure is OK.
2. Transmission faulty beyond unit repair.
3. Notify your supervisor.

TRANSMISSION DOES NOT DOWNSHIFT IN 1-4 POSITION (M548A3) 0078 00

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Pressure Gauge Kit (WP 0541 00, Item 34)

Personnel Required

Unit Mechanic

Equipment Condition

Engine stopped (see your -10)

Carrier blocked (see your -10)

Transmission in SL (see your -10)

Power plant rear access panel removed (see your -10)

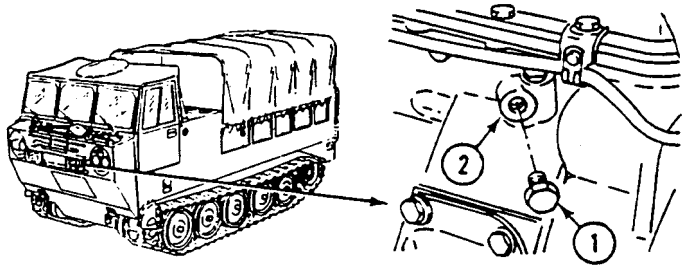
Center seat raised (see your -10)

NOTE

Pressure gauge must read 4 psi (28 kPa). Any other reading indicates a fault.

T

1. Remove plug (1) from GOVERNOR TWO (G2) port (2).
2. Install 1/16 inch (1.6 cm) pressure gauge adapter in G2 port (2).
3. Install pressure gauge on pressure gauge adapter.
4. Start engine and let idle (see your -10).
5. Does pressure gauge read more than 4 psi (28 kPa)?



NO →

TN

1. Faulty transmission beyond unit maintenance repair.
2. Notify your supervisor.

YES ↓

Y

1. Check GOVERNOR TWO (G2).
2. Has GOVERNOR TWO (G2) been replaced?

NO →

YN

1. Replace GOVERNOR TWO (G2) assembly (WP 0317 00).
2. Verify no faults found.

YES ↓

TRANSMISSION DOES NOT DOWNSHIFT IN 1-4 POSITION (M548A3)—Continued **0078 00**

2Y

1. Faulty transmission beyond unit maintenance repair.
2. Notify your supervisor.

TRANSMISSION DOES NOT HOLD 1ST POSITION (M548A3) 0079 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Slip Joint Pliers (WP 0541 00, Item 33)

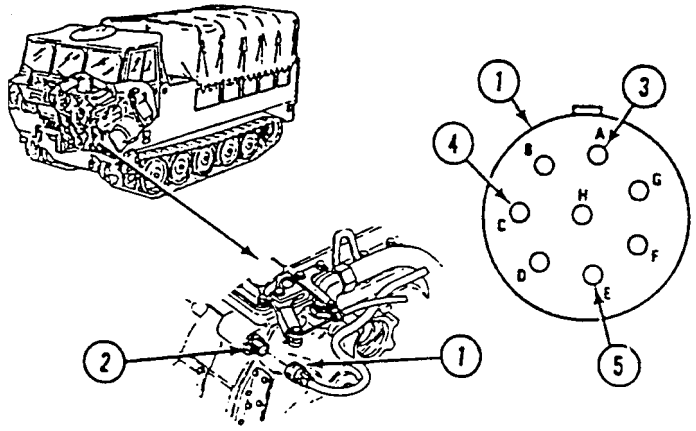
Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Transmission in 1st position (see your -10)
Cab floor plates raised (WP 0395 00)

T

1. Remove wiring harness 12313482 plug (1) from transmission jack (2).
2. Turn MASTER SWITCH ON.
3. Measure voltage between each socket on wiring harness 12313482 plug (1) and ground. Multimeter should read 18 volts or more at sockets A (3), C (4), and E (5) and 0 volts for all remaining socket checks.
4. Does multimeter indicate an incorrect reading?



NO →

TN

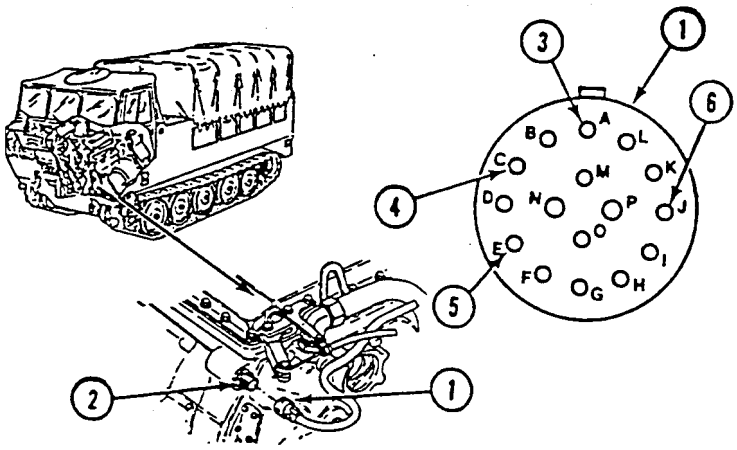
1. Faulty transmission beyond unit maintenance repair.
2. Notify your supervisor.

YES ↓

TRANSMISSION DOES NOT HOLD 1ST POSITION (M548A3)—Continued 0079 00

Y

1. Remove wiring harness 12313482 plug (1) from wiring harness 12313483 jack (2) at carrier bulkhead.
2. Measure voltage between each socket on wiring harness 12348313 jack (2) and ground. Multimeter should read 18 volts or more for sockets A (3), C (4), E (5) and J (6) and 0 volts for the remaining socket checks.
3. Does multimeter indicate an incorrect reading?



NO →

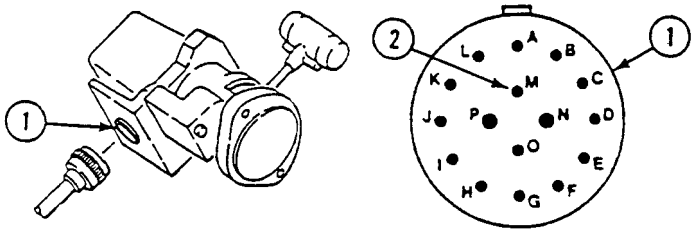
YN

1. Replace wiring harness 12313482 (transmission shift control wiring harness, WP 0297 00).
2. Verify no faults found.

YES ↓

2Y

1. Turn MASTER SWITCH OFF.
2. Install wiring harness 12313482 plug on transmission jack.
3. Remove transmission shift control (WP 0306 00).
4. Place transmission shift control in 1 position.
5. Measure resistance between transmission shift control jack (1), pin M (2), and pins A thru G and N. Multimeter should read 0 ohms for pins A, C, and E and infinity for all remaining pin checks. See pin to pin check (WP 0309 00)
6. Does multimeter indicate an incorrect reading?



NO →

2YN

1. Install transmission shift control (WP 0306 00).
2. Replace wiring harness 12313483 (transmission wiring harness, WP 0297 00).
3. Verify no faults found.

YES ↓

3Y

1. Install wiring harness 12313482 plug on wiring harness 12349813 jack at carrier bulkhead.
2. Replace faulty transmission shift control switch (WP 0309 00).
3. Verify no faults found.

TRANSMISSION DOES NOT HOLD 2ND POSITION (M548A3) 0080 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Slip Joint Pliers (WP 0541 00, Item 33)

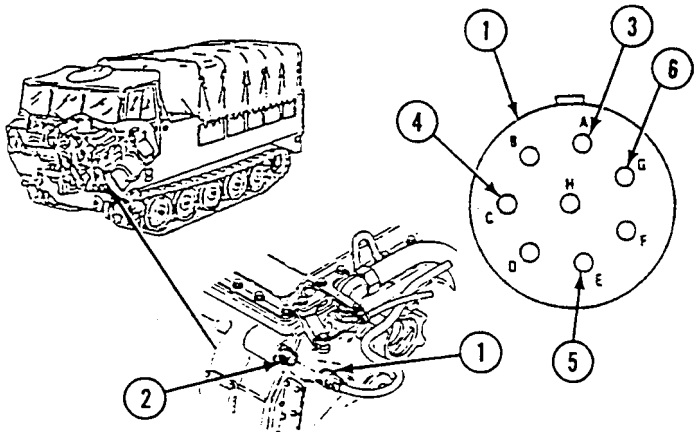
Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Transmission in 1-2 position (see your -10)
Cab floor plates raised (WP 0395 00)

T

1. Remove wiring harness 12313482 plug (1) from transmission jack (2).
2. Turn MASTER SWITCH ON.
3. Measure voltage between each socket on wiring harness 12313482 plug (1) and ground. Multimeter should read 18 volts or more at socket A (3), C (4), E (5), and G (6) and 0 volts for all remaining socket checks.
4. Does multimeter indicate an incorrect reading?



NO →

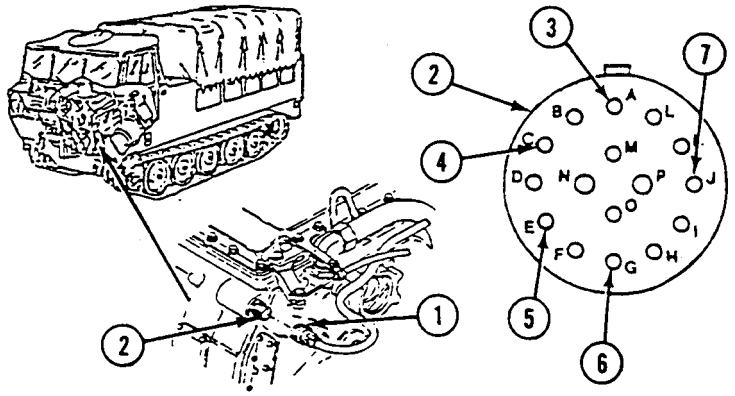
TN

1. Faulty transmission beyond unit maintenance repair.
2. Notify your supervisor.

YES ↓

Y

1. Remove wiring harness 12313482 plug (1) from wiring harness 12313483 jack (2) at carrier bulkhead.
2. Measure voltage between each socket on wiring harness 12313483 jack (2) and ground. Multimeter should read 18 volts or more for socket A (3), C (4), E (5), G (6), and J (7) and 0 volts for the remaining socket checks.
3. Does multimeter indicate an incorrect reading?



NO →

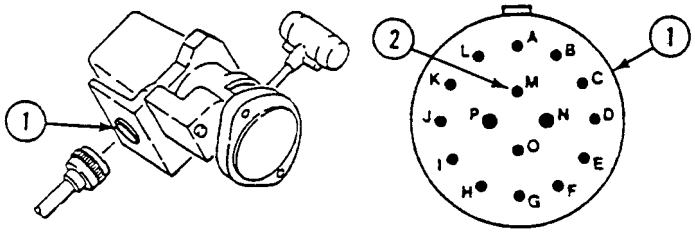
YN

1. Replace wiring harness 12313482 (transmission shift control wiring harness, WP 0297 00).
2. Verify no faults found.

YES ↓

2Y

1. Turn MASTER SWITCH OFF.
2. Install wiring harness 12313482 plug on transmission jack.
3. Remove transmission shift control (WP 0306 00).
4. Place transmission shift control in 1–2 position.
5. Measure resistance between transmission shift control jack (1) pin M (2) and pins A thru G and N. Multimeter should read 0 ohms for pins A, C, E and G and infinity for all remaining pin checks. See pin to pin check (WP 0309 00).
6. Does multimeter indicate an incorrect reading?



NO →

2YN

1. Install transmission shift control (WP 0306 00).
2. Replace wiring harness 12313483 (transmission wiring harness, WP 0297 00).
3. Verify no faults found.

YES ↓

3Y

1. Install wiring harness 12313482 plug on wiring harness 12313483 jack at carrier bulkhead.
2. Replace faulty transmission shift control switch (WP 0309 00).
3. Verify no faults found.

TRANSMISSION DOES NOT HOLD 3RD POSITION (M548A3) 0081 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Slip Joint Pliers (WP 0541 00, Item 33)

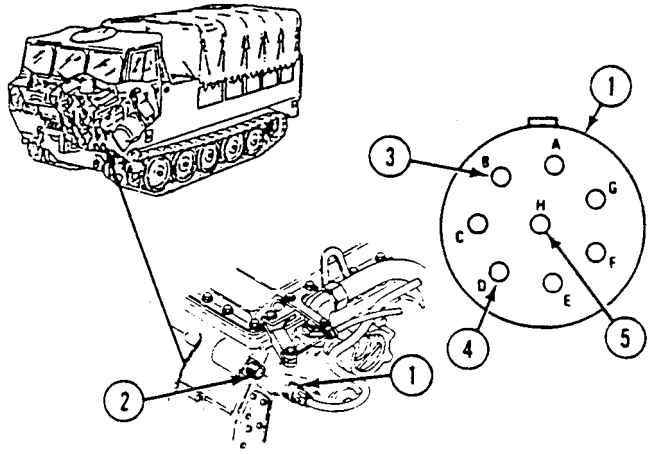
Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Transmission in 1-3 position (see your -10)
Cab floor plates raised (WP 0250 00)

T

1. Remove wiring harness 12313482 plug (1) from transmission jack (2).
2. Turn MASTER SWITCH ON.
3. Measure voltage between each socket on wiring harness 12313482 plug (1) and ground. Multimeter should read 0 volts at socket B (3), D (4), and H (5) and at least 18 volts for all remaining socket checks.
4. Does multimeter indicate an incorrect reading?



NO →

TN

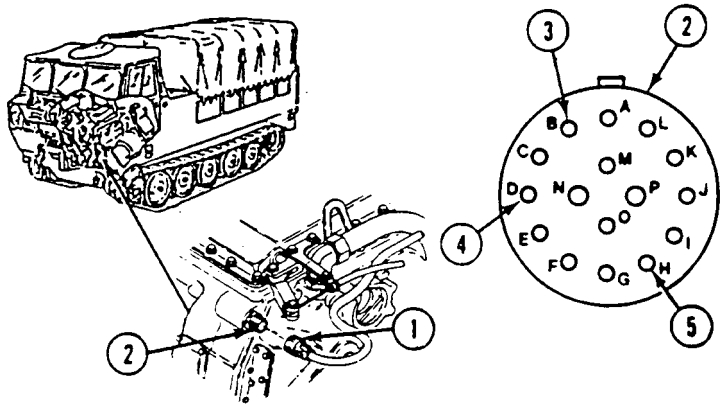
1. Faulty transmission beyond unit maintenance repair.
2. Notify your supervisor.

YES ↓

TRANSMISSION DOES NOT HOLD 3RD POSITION (M548A3)—Continued 0081 00

Y

1. Remove wiring harness 12313482 plug (1) from wiring harness 12313483 jack (2) at carrier bulkhead.
2. Measure voltage between each socket on wiring harness 12313483 jack (2) and ground. Multimeter should read 0 volts for sockets B (3), D (4), and H (5) and at least 18 volts for the remaining socket checks.
3. Does multimeter indicate an incorrect reading?



NO

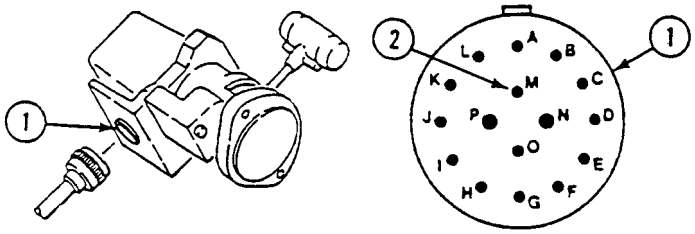
YN

1. Replace wiring harness 12313482 (transmission shift control wiring harness, WP 0297 00).
2. Verify no faults found.

YES

2Y

1. Turn MASTER SWITCH OFF.
2. Install wiring harness 12313482 plug on transmission jack.
3. Replace transmission shift control (WP 0306 00)
4. Place transmission shift control in 1–3 position.
5. Measure resistance between transmission shift control jack (1) pin M (2) and pins A thru G and N. Multimeter should read infinity for pins B and D, and 0 ohms for pins A, C, E, F, and G. See pin to pin check (WP 0309 00).
6. Does multimeter indicate an incorrect reading?



NO

2YN

1. Install transmission shift control (WP 0306 00).
2. Replace wiring harness 12313483 (transmission wiring harness, WP 0297 00).
3. Verify no faults found.

YES

3Y

1. Install wiring harness 12313482 plug on wiring harness 12313483 jack at carrier bulkhead.
2. Replace faulty transmission shift control switch (WP 0309 00).
3. Verify no faults found.

TRANSMISSION DOES NOT REVERSE (M548A3) 0082 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Slip Joint Pliers (WP 0541 00, Item 33)

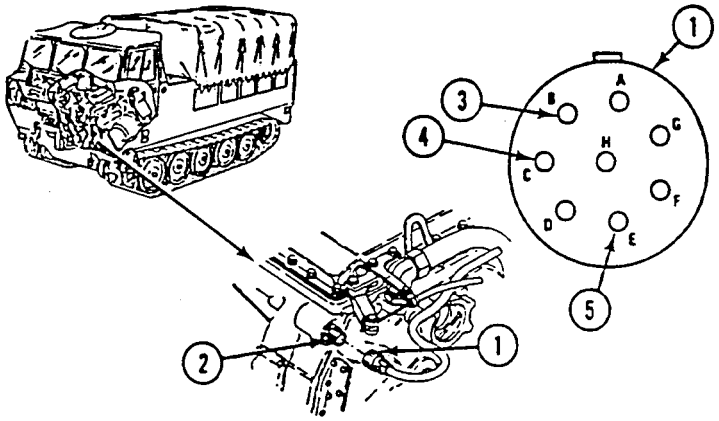
Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Transmission in R position (see your -10)
Cab floor plates raised (WP 0250 00)

T

1. Remove wiring harness 12313482 plug (1) from transmission jack (2).
2. Turn MASTER SWITCH ON.
3. Measure voltage between each socket on wiring harness 12313482 plug (1) and ground. Multimeter should read 18 volts or more at socket B (3), C (4), and E (5) and 0 volts for all remaining socket checks.
4. Does multimeter indicate an incorrect reading?



NO →

TN

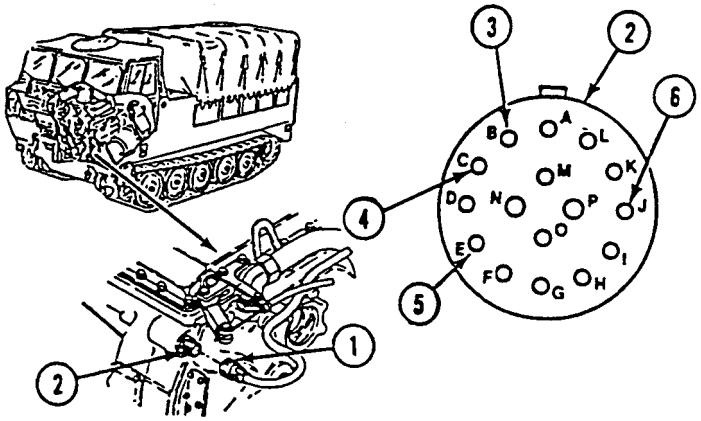
1. Faulty transmission beyond unit maintenance repair.
2. Notify your supervisor.

YES ↓

TRANSMISSION DOES NOT REVERSE (M548A3)—Continued 0082 00

Y

1. Remove wiring harness 12313482 plug (1) from wiring harness 12313483 jack (2) at carrier bulkhead.
2. Measure voltage between each socket on wiring harness 12313483 jack (2) and ground. Multimeter should read 18 volts or more for socket B (3), C (4), E (5), and J (6) and 0 volts for the remaining socket checks.
3. Does multimeter indicate an incorrect reading?



NO →

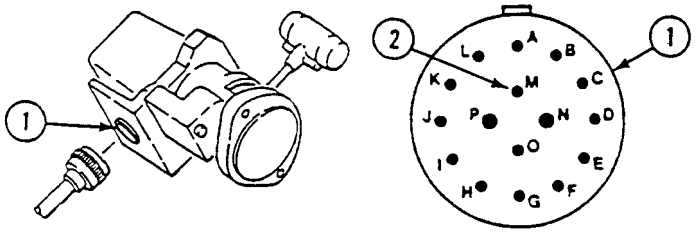
YN

1. Replace wiring harness 12313482 (transmission control wiring harness, WP 0297 00).
2. Verify no faults found.

YES ↓

2Y

1. Turn MASTER SWITCH OFF.
2. Install wiring harness 12313482 plug on transmission jack.
3. Remove transmission shift control (WP 0306 00).
4. Place transmission shift control in R position.
5. Measure resistance between transmission shift control jack (1) pin M (2) and pins A thru G and N. Multimeter should read 0 ohms for pins B, C, and E, and infinity for all remaining pin checks. See pin to pin check (WP 0309 00).
6. Does multimeter indicate an incorrect reading?



NO →

2YN

1. Install transmission shift control (WP 0306 00).
2. Replace wiring harness 12313483 (transmission wiring harness, WP 0297 00).
3. Verify no faults found.

YES ↓

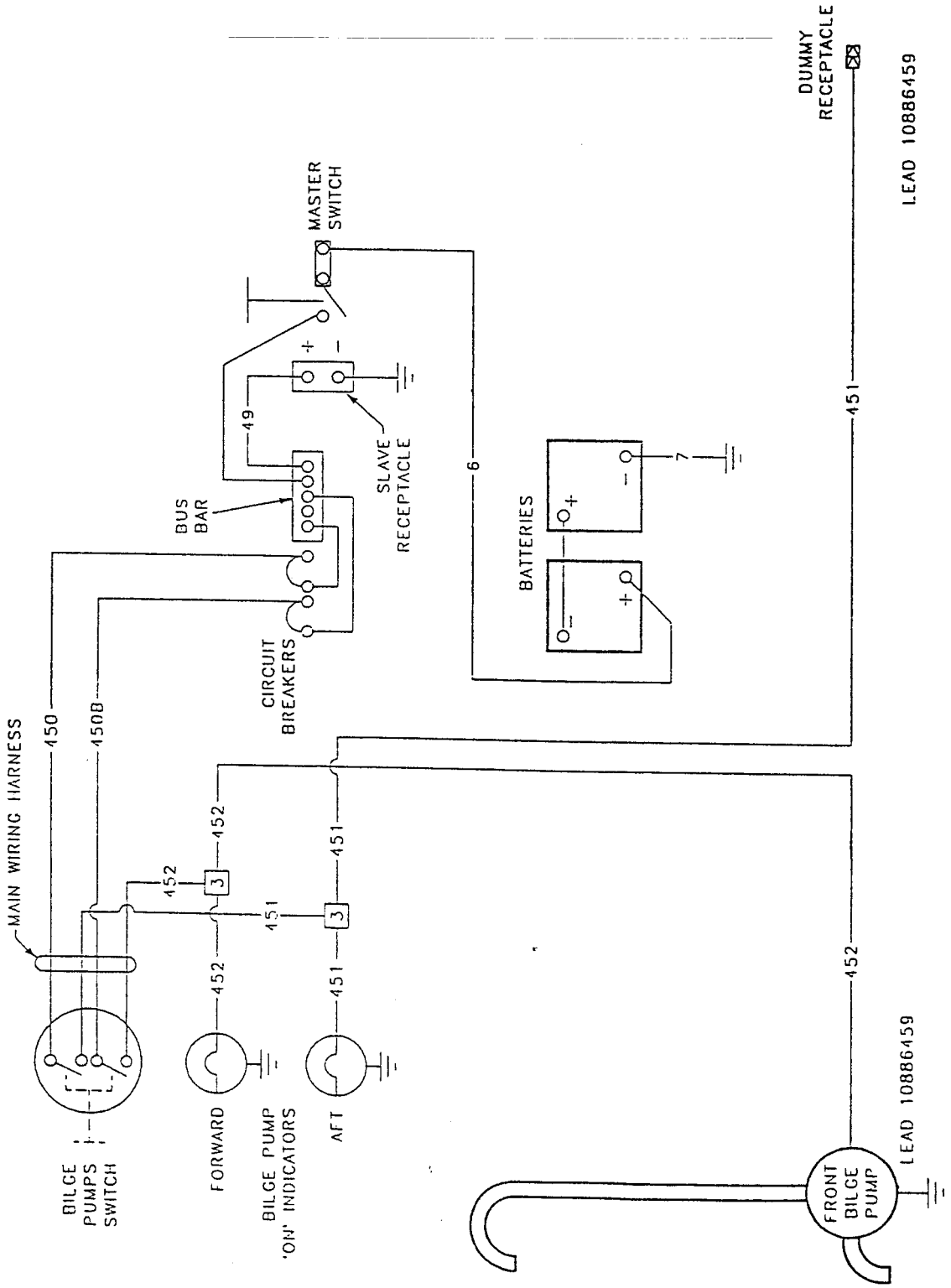
3Y

1. Install wiring harness 12313482 plug on wiring harness 12313483 jack at carrier bulkhead.
2. Replace faulty transmission shift control switch (WP 0309 00).
3. Verify no faults found.

BILGE PUMP SYSTEM SCHEMATIC 0083 00

NOTE

M548A1 has two batteries. M548A3 has four batteries. M548A1 bilge pump system schematic is shown.



FRONT BILGE PUMP AND/OR LIGHT DOES NOT OPERATE 0084 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
MASTER SWITCH OFF (see your -10)
Driver's seat raised (see your -10)
Center floor plates raised (WP 0394 00 or WP 0395 00)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

1. Turn MASTER SWITCH ON.
2. Turn BILGE PUMPS switch ON.
3. Does bilge pump light come on?

NO → GO TO **BY** (PAGE 0084 00-3)

YES

Y

1. Check bilge pump.
2. Does bilge pump fail to come on?

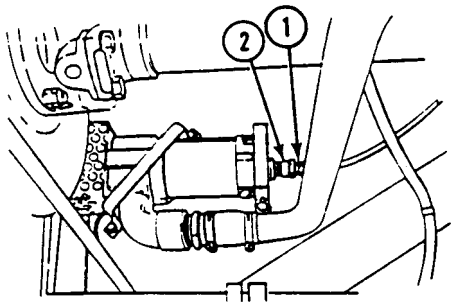
NO → GO TO **CY** (PAGE 0084 00-5)

YES

FRONT BILGE PUMP AND/OR LIGHT DOES NOT OPERATE—Continued 0084 00

2Y

1. Remove circuit 452 plug (1) from pump jack (2).
2. Measure voltage between plug 452 (1) and ground.
3. Does multimeter read more than 17 volts?



NO →

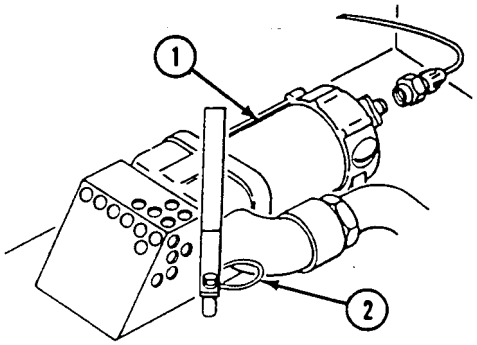
2YN

1. Repair main wiring harness (WP 0294 00).
2. Verify no faults found.

YES ↓

3Y

1. Turn MASTER SWITCH OFF.
2. Measure resistance between bilge pump body (1) and ground lead (2).
3. Does multimeter read 0 ohms?



NO →

3YN

1. Replace ground lead to bilge pump (WP 0424 00).
2. Verify no faults found.

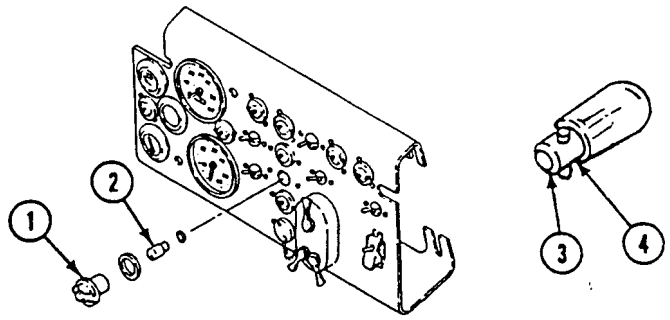
YES ↓

4Y

1. Replace bilge pump (WP 0424 00).
2. Verify no faults found.

BY

1. Remove BILGE PUMPS ON indicator lens (1) and bulb (2).
2. Measure resistance between bulb center contact (3) and bulb base (4).
3. Does multimeter read more than 5 ohms?



NO →

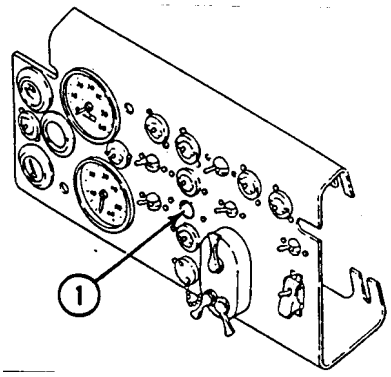
BYN

1. Replace BILGE PUMPS ON indicator light bulb (WP 0264 00).
2. Verify no faults found.

YES ↓

2BY

1. Measure voltage between bulb socket center contact (1) and ground.
2. Does multimeter read less than 17 volts?



NO →

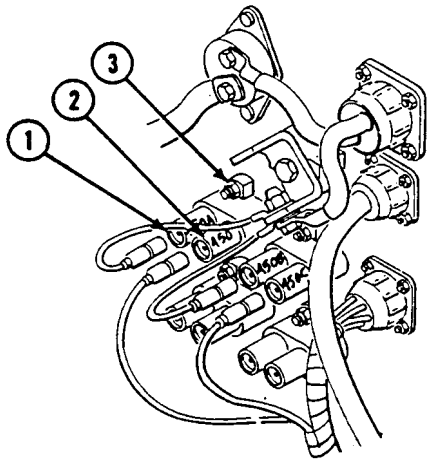
2BYN

1. Replace BILGE PUMPS ON indicator light assembly (WP 0264 00).
2. Verify no faults found.

YES ↓

3BY

1. Turn MASTER SWITCH OFF.
2. Remove plug 450A (1) and plug 450 (2) from bilge pump circuit breaker (3).
3. Measure resistance between circuit breaker jacks.
4. Does multimeter read 0 ohms?



NO →

3BYN

1. Replace bilge pump circuit breaker (WP 0268 00).
2. Verify no faults found.

YES ↓

4BY

1. Measure resistance between plug 450C to 450C lead end at bus bar.
2. Does multimeter read 0 ohms?

NO →

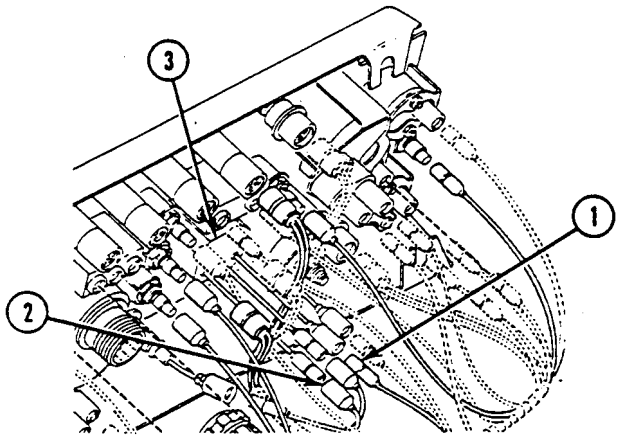
4BYN

1. Replace/repair circuit 450C lead (WP 0294 00).
2. Verify no faults found.

YES ↓

5BY

1. Partially remove instrument panel (WP 0256 00).
2. Remove plug 450B (1) and plug 452 (2) from bilge pump switch (3).
3. Measure resistance between bilge pump switch jacks with bilge pump switch on.
4. Does multimeter read 0 ohms?



NO → **5BYN**

1. Replace bilge pump switch (WP 0261 00).
2. Verify no faults found.

YES ↓

6BY

1. Repair main harness circuit 450B or 452 (WP 0294 00).
2. Verify no faults found.

CY

1. Check if bilge pump has been serviced.
2. Has bilge pump been serviced?

NO → **CYN**

1. Service bilge pump (see your -10).
2. Verify no faults found.

YES ↓

2CY

1. Inspect bilge pump discharge tubes and hoses.
2. Are bilge pump discharge tubes and hoses damaged?

NO → **2CYN**

1. Replace bilge pump (WP 0424 00).
2. Verify no faults found.

YES ↓

3CY

1. Replace bilge pump discharge tubes and hoses (WP 0425 00).
2. Verify no faults found.

VEHICLE COMPARTMENT HEATER MALFUNCTIONS 0085 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Slip Joint Pliers (WP 0541 00, Item 33)

Personnel Required
Unit Mechanic

References
See your -10
TM 9-2540-205-24&P

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Heater HI-LO switch in LO

NOTE

M548A1 and M548A3 troubleshooting procedures are the same even though component locations are different. When needed, locators are used to show the different component locations.

The M548A3 has a fuel filter in between the fuel pump and the heater.

T

1. Press heater-on indicator cover lens.
2. Does indicator light come on?

NO → GO TO **BY** (PAGE 0085 00-3)

YES

Y

1. Release heater-on indicator.
2. Move RUN-OFF-START switch to START.
3. Does heater blower come on?

NO → GO TO **CY** (PAGE 0085 00-5)

YES

2Y

1. Check if heater fuel pump comes on.
2. Does heater fuel pump come on?

NO → GO TO **EY** (PAGE 0085 00-7)

YES

3Y

1. Check on how many minutes it takes heater-on indicator to come on.
2. Does heater-on indicator come on in less than three minutes?

NO → GO TO **GY** (PAGE 0085 00-8)

YES

4Y

1. Move RUN-OFF-START switch to RUN. Do not stop at OFF position.
2. Does blower and pump stay on?

NO → **4YN**

1. Replace heater RUN-OFF- START switch. See task: Repair heater control box (WP 0472 00).
2. Verify no faults found.

YES ↓

5Y

1. Check how long heater produce hot air.
2. Does heater continue producing hot air for ten minutes?

NO → **5YN**

1. Heater shuts off prematurely. See TM 9-2540-205-24&P.

YES ↓

6Y

1. Listen to heater blower.
2. Turn HI-LO switch to HI.
3. Does blower speed increase?

NO → GO TO **FY** (PAGE 0085 00-8)

YES ↓

7Y

1. Feel heater hot air outlet.
2. Has air temperature increased?

NO → **7YN**

1. Shut off heater (see your -10).
2. Faulty heater restrictor solenoid. See TM 9-2540-205-24&P.

YES ↓

8Y

NOTE

Heater shuts off prematurely if air inlet temperature is 60 degrees or above. This is normal.

1. Run heater on HI for ten minutes.
2. Does heater continue producing hot air?

NO → **8YN**

1. Shut off heater (see your -10).
2. Insufficient heater operation. See TM 9-2540-205-24&P.

YES ↓

9Y

1. Turn RUN-OFF-START switch to OFF.
2. Does blower remain on?

NO → **9YN**

1. Heater does not purge. See TM 9-2540-205-24&P.

YES ↓

10Y

1. Listen to heater until blower shuts off.
2. Does blower shut off in less than five minutes?

NO → **10YN**

1. Faulty heater flame detector switch. See TM 9-2540-205-24&P.

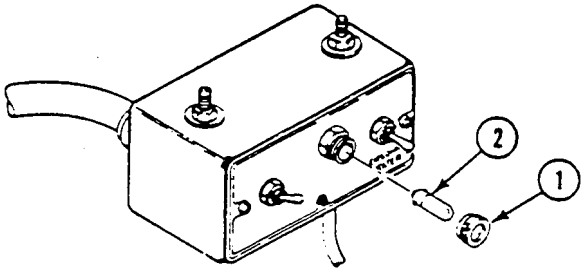
YES ↓

11Y

1. Heater is operating properly.
2. Verify no faults found.

BY

1. Remove heater-on indicator cover lens (1) and bulb (2).
2. Check continuity between bulb center contact and base.
3. Does multimeter indicate continuity?



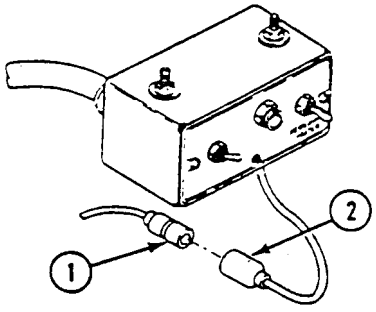
NO → **BYN**

1. Replace heater-on bulb (WP 0472 00).
2. Verify no faults found.

YES ↓

2BY

1. Remove main harness circuit 400 plug (1) from control box jack (2).
2. Measure voltage between main harness circuit 400 plug (1) pin and ground.
3. Does multimeter read 17 volts or more?



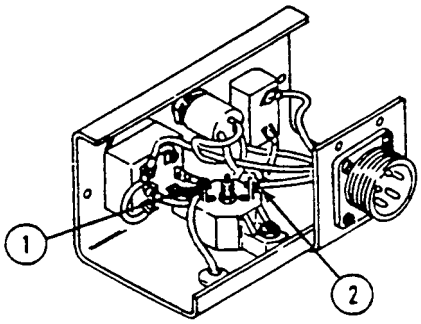
NO → **2BYN**

1. Repair main harness circuit 400 between master switch and heater control box (WP 0294 00).
2. Verify no faults found.

YES ↓

3BY

1. Remove heater control box (WP 0431 00).
2. Measure resistance between circuit breaker terminals 16 (1) and 17 (2).
3. Does multimeter read 0 ohms?



NO

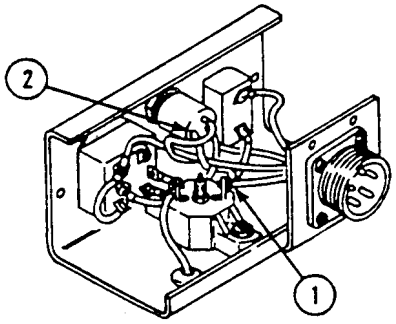
3BYN

1. Replace heater circuit breaker (WP 0472 00).
2. Verify no faults found.

YES

4BY

1. Measure resistance between lead ends from circuit breaker terminal 17 (1) to indicator light terminal 3 (2).
2. Does multimeter read 0 ohms?



NO

4BYN

1. Repair/replace faulty lead (WP 0294 00).
2. Verify no faults found.

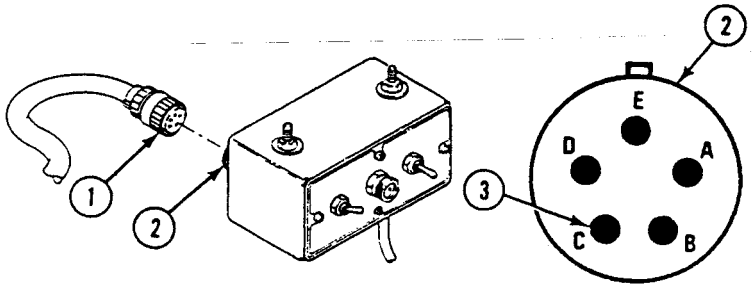
YES

5BY

1. Replace indicator light assembly (WP 0472 00).
2. Verify no faults found.

CY

1. Remove heater harness plug (1) from heater control box jack (2).
2. Measure voltage between heater control box jack (2) pin C (3) and ground with RUN-OFF-START switch in START.
3. Does multimeter read 17 volts or more?

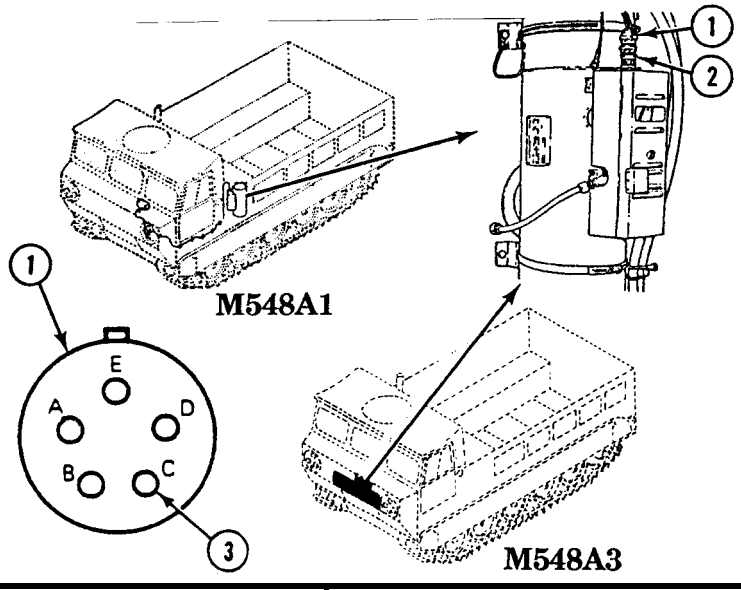


NO → GO TO **DY** (PAGE 0085 00-6)

YES

2CY

1. Install heater harness plug on heater control box jack.
2. Remove heater harness plug (1) from heater jack (2).
3. Measure voltage between heater harness plug (1) pin C (3) and ground with RUN-OFF-START switch in START.
4. Does multimeter read 17 volts or more?



NO → **2CYN**

1. Faulty heater wiring harness.
2. Notify your supervisor.

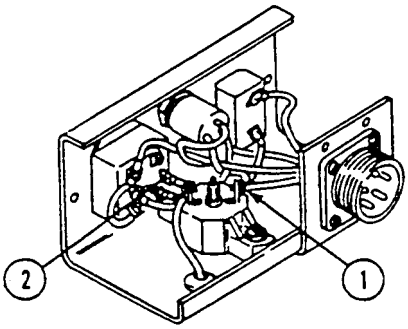
YES

3CY

1. Faulty vehicle compartment heater. Replace vehicle compartment heater (WP 0427 00, WP 0428 00, WP 0429 00, WP 0430 00, WP 0431 00, WP 0432 00, WP 0433 00, WP 0434 00, WP 0435 00, WP 0437 00, WP 0438 00, WP 0439 00,WP 0446 00 or WP 0447 00).
2. Verify no faults found.

DY

1. Remove heater control box (WP 0431 00).
2. Measure resistance between lead ends from circuit breaker terminal 17 (1) and RUN-OFF-START switch terminal 15 (2).
3. Does multimeter read 0 ohms?



NO

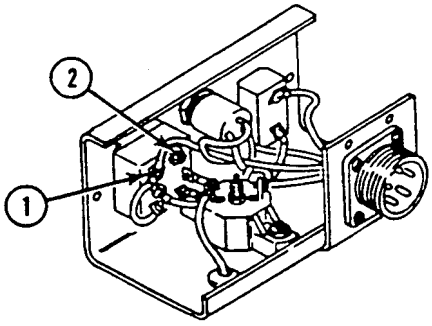
DYN

1. Repair faulty lead (WP 0294 00).
2. Verify no faults found.

YES

2DY

1. Measure resistance between lead ends from RUN-OFF-START switch terminals 21 (1) and 14 (2).
2. Does multimeter read 0 ohms?



NO

2DYN

1. Repair heater switch jumper lead between terminal 21 and 14 (WP 0294 00).
2. Verify no faults found.

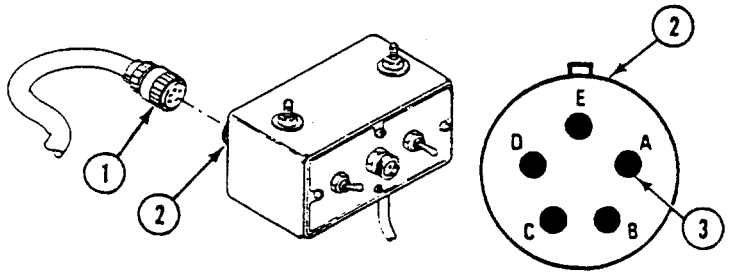
YES

3DY

1. Replace heater RUN-OFF-START switch (WP 0472 00).
2. Verify no faults found.

EY

1. Remove heater harness plug (1) from heater control jack (2).
2. With RUN-OFF-START switch in START, measure voltage between heater control jack (2) pin A (3) and ground.
3. Does multimeter read 17 volts or more?

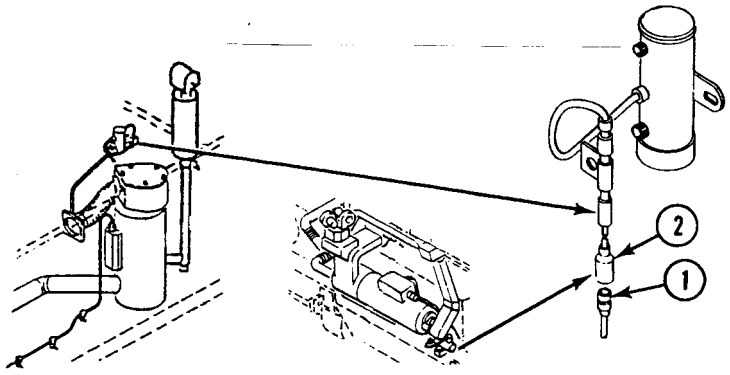


NO → GO TO **FY** (PAGE 0085 00-8)

YES

2EY

1. Install heater harness on heater control box jack.
2. Remove heater harness circuit 402 plug (1) from heater fuel pump jack (2).
3. With RUN-OFF-START switch in START, measure voltage between heater harness plug pin (1) and ground.
4. Does multimeter read 17 volts or more?



NO →

2EYN

1. Faulty control box to fuel pump harness circuit 402.
2. Notify your supervisor.

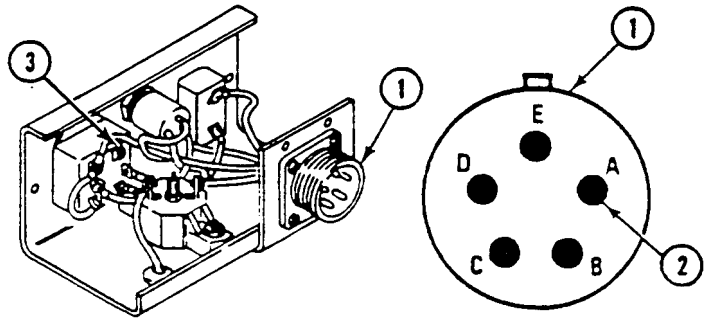
YES

3EY

1. Replace vehicle compartment heater fuel pump (WP 0448 00 or WP 0449 00).
2. Verify no faults found.

FY

1. Remove heater control box (WP 0431 00).
2. Measure resistance between lead ends of heater control jack (1) pin A (2) and RUN-OFF-START switch terminal 14 (3).
3. Does multimeter read 0 ohms?



NO → **FYN**

1. Replace faulty lead (WP 0294 00).
2. Verify no faults found.

YES

2FY

1. Replace heater RUN-OFF-START switch (WP 0472 00).
2. Verify no faults found.

GY

1. Check heater exhaust.
2. Is heater exhaust cold?

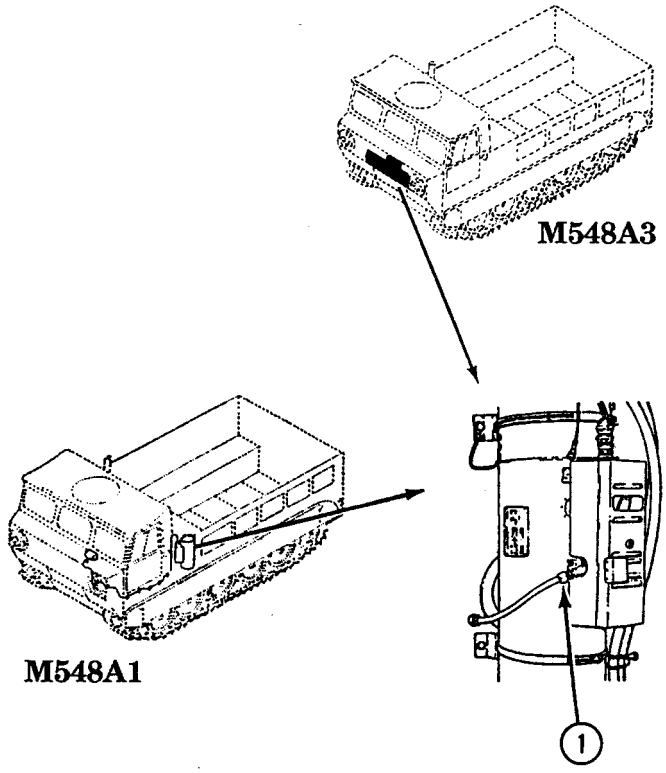
NO → **GYN**

1. Defective flame detector switch.
2. Notify your supervisor.

YES

2GY

1. Loosen fuel inlet line (1) to heater with heater switch on start.
2. Does fuel flow out of loosened fitting?



NO

2GYN

1. Replace clogged, kinked, or damaged fuel lines (WP 0439 00, WP 0444 00 or WP 0445 00).
2. Service heater fuel pump (WP 0448 00 or WP 0449 00).
3. Service personnel heater fuel filter (WP 0436 00).
4. Verify no faults found.

YES

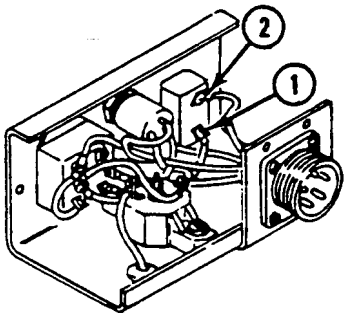
3GY

1. Heater does not start.
2. Notify your supervisor.

VEHICLE COMPARTMENT HEATER MALFUNCTIONS—Continued **0085 00**

HY

1. Remove heater control box (WP 0431 00).
2. Measure resistance between HI-LO switch terminals 12 (1) and 13 (2).
3. Does multimeter read 0 ohms?



NO →

HYN

1. Replace heater HI-LO switch (WP 0472 00).
2. Verify no faults found.

YES ↓

2HY

1. Repair lead between HI-LO switch and jack or between HI-LO switch and RUN-OFF-START switch (WP 0294 00).
2. Verify no faults found.

COOLANT HEATER MALFUNCTIONS 0086 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)
Slip Joint Pliers (WP 0541 00, Item 33)

Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Heater on HI (see your -10)
Engine cold

T

1. Press HEATER ON indicator cover lens (see your -10).
2. Does indicator light come on?

NO → GO TO **BY** (PAGE 0086 00-2)

YES

Y

1. Release HEATER ON indicator.
2. Move HEATER SWITCH to START.
3. Does heater blower come on?

NO → GO TO **CY** (PAGE 0086 00-4)

YES

2Y

1. Check if heater fuel pump comes on.
2. Does heater fuel pump come on?

NO → GO TO **EY** (PAGE 0086 00-6)

YES

3Y

1. Check if coolant circulating pump comes on.
2. Does coolant circulating pump come on?

NO → GO TO **GY** (PAGE 0086 00-8)

YES

4Y

1. Check if HEATER ON indicator comes on in less than 3 minutes.
2. Does HEATER ON indicator come on in less than 3 minutes?

NO → GO TO **HY** (PAGE 0086 00-9)

YES

5Y

1. Turn HEATER SWITCH ON. Do not stop at OFF position.
2. Does BLOWER stay ON?

NO → GO TO **IY** (PAGE 0086 00-9)

YES

6Y

1. Run heater on HI for ten minutes
2. Feel exhaust temperature. Does heater continue to produce hot exhaust for ten minutes?

NO → GO TO **JY** (PAGE 0086 00-10)

YES

7Y

1. Check to see if flame detector switch has been adjusted.
2. Has flame detector switch been adjusted?

NO → **7YN**

1. Flame detector switch needs adjustment.
2. Notify your supervisor.

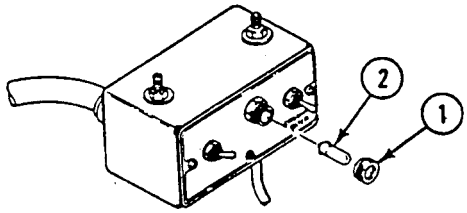
YES

8Y

1. Faulty flame detector switch.
2. Notify your supervisor.

BY

1. Remove indicator cover lens (1) and bulb (2).
2. Measure resistance between bulb center contact and base for continuity.
3. Does multimeter indicate any continuity?



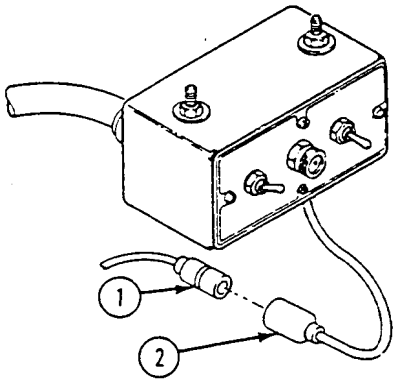
NO → **BYN**

1. Replace indicator bulb (WP 0472 00).
2. Verify no faults found.

YES

2BY

1. Remove rear main harness circuit 400A plug (1) from control box jack (2).
2. Measure voltage between main harness circuit 400A plug (1) pin and ground.
3. Does multimeter read more than 17 volts?



NO →

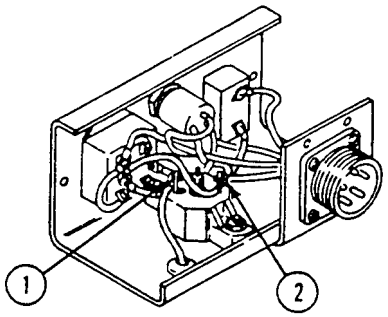
2BYN

1. Repair main harness circuit 400 between master switch and heater control box (WP 0294 00).
2. Verify no faults found.

YES ↓

3BY

1. Remove heater control box (WP 0474 00).
2. Measure resistance between lead ends from circuit breaker terminals 16 (1) and 17 (2).
3. Does multimeter read 0 ohms?



NO →

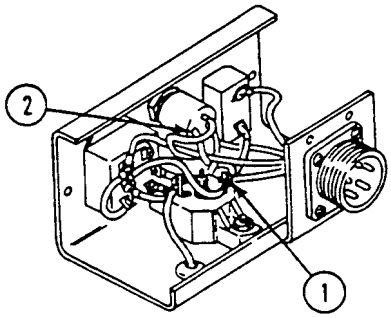
3BYN

1. Replace heater circuit breaker (WP 0472 00).
2. Verify no faults found.

YES ↓

4BY

1. Measure resistance between lead ends from circuit breaker terminal 17 (1) to indicator light terminal 3 (2).
2. Does multimeter read 0 ohms?



NO → **4BYN**

1. Repair/replace faulty lead (WP 0294 00).
2. Verify no faults found.

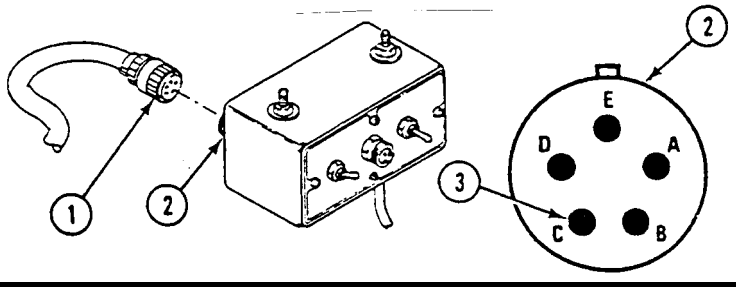
YES ↓

5BY

1. Replace indicator light assembly (WP 0472 00).
2. Verify no faults found.

CY

1. Remove heater harness plug (1) from heater control box jack (2).
2. Measure voltage between heater control box jack (2) pin C (3) and ground with HEATER switch on START.
3. Does multimeter read at more than 17 volts?

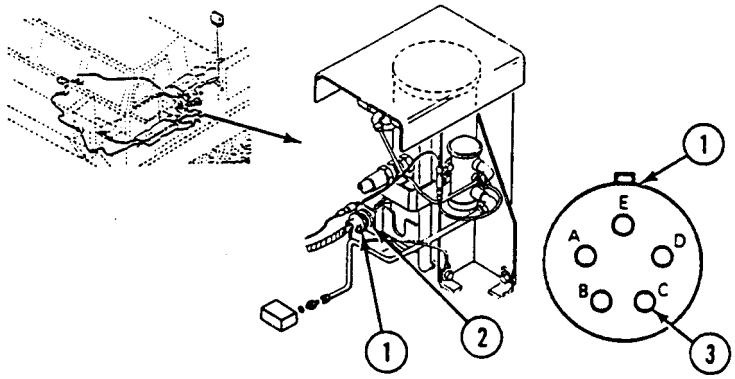


NO → GO TO **DY** (PAGE 0086 00-5)

YES ↓

2CY

1. Install heater harness plug on heater control box jack.
2. Remove heater harness plug (1) from heater jack (2).
3. Measure voltage between plug (1) pin C (3) and ground. With HEATER switch on START.
4. Does multimeter read at least 17 volts?



NO →

2CYN

1. Faulty coolant heater harness.
2. Notify your supervisor.

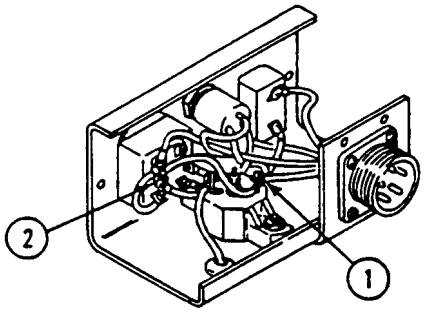
YES ↓

3CY

1. Replace coolant heater (WP 0477 00).
2. Verify no faults found.

DY

1. Remove heater control box (WP 0474 00).
2. Measure resistance between lead ends from circuit breaker terminal 17 (1) and ON/OFF/START switch terminal 15 (2) lead ends.
3. Does multimeter read 0 ohms?



NO →

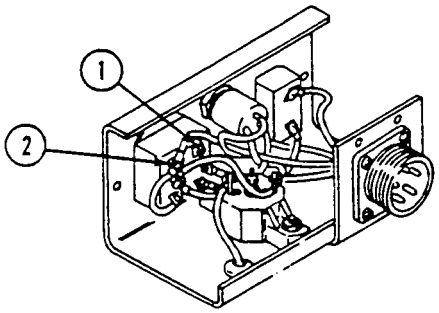
DYN

1. Repair faulty lead (WP 0294 00).
2. Verify no faults found.

YES ↓

2DY

1. Measure resistance between lead ends from ON/OFF/START switch terminals 21 (1) and 14 (2).
2. Does multimeter read 0 ohms?



NO →

2DYN

1. Repair heater switch jumper lead between terminal 21 and 14 (WP 0294 00).
2. Verify no faults found.

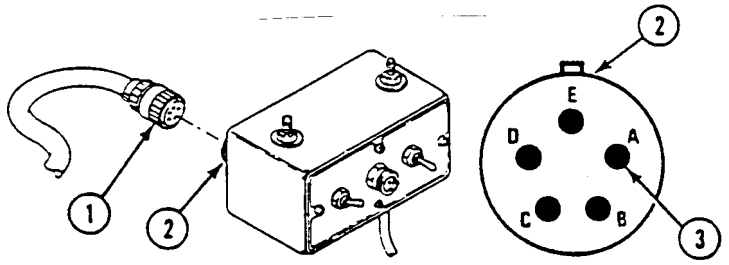
YES ↓

3DY

1. Replace heater ON/OFF/START switch (WP 0472 00).
2. Verify no faults found.

EY

1. Remove heater harness plug (1) from heater control jack (2).
2. Measure voltage between heater control jack (2) pin A (3) and ground with HEATER switch on START.
3. Does multimeter read more than 17 volts?



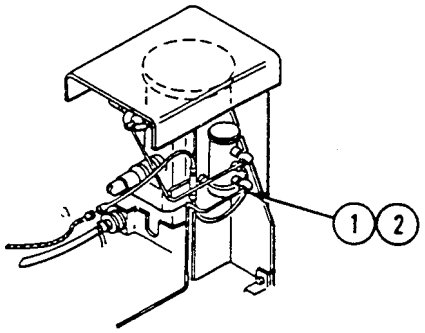
NO →

GO TO **FY** (PAGE 0086 00-7)

YES ↓

2EY

1. Install heater harness on heater control box jack.
2. Remove heater harness 402A plug (1) from heater fuel pump jack (2).
3. Measure voltage between plug (1) pin and ground with HEATER switch on START.
4. Does multimeter read more than 17 volts?



NO →

2EYN

1. Faulty heater harness circuit 402.
2. Notify your supervisor.

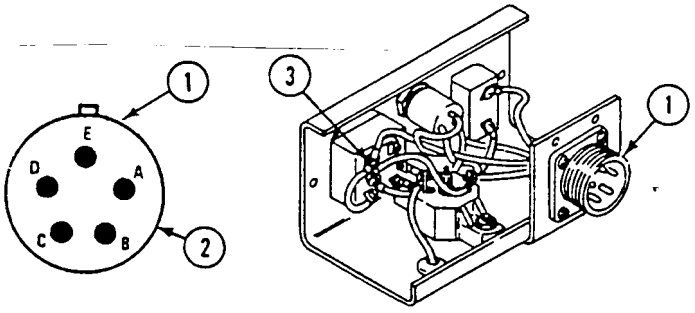
YES ↓

3EY

1. Replace coolant heater fuel pump (WP 0475 00).
2. Verify no faults found.

FY

1. Remove heater control box (WP 0474 00).
2. Measure resistance between lead ends of heater output jack (1) pin A (2) and ON/OFF/START switch terminal 14 (3).
3. Does multimeter read 0 ohms?



NO →

FYN

1. Repair/replace faulty lead (WP 0294 00).
2. Verify no faults found.

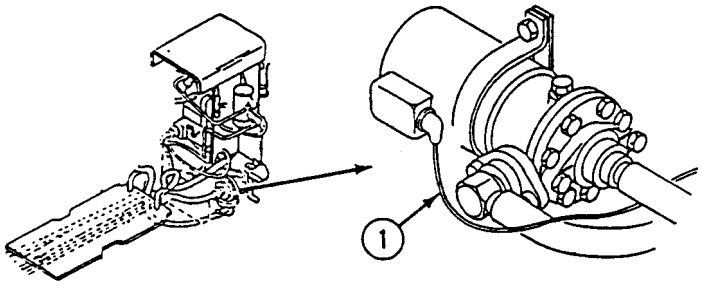
YES ↓

2FY

1. Replace heater ON/OFF/START switch (WP 0472 00).
2. Verify no faults found.

GY

1. Measure voltage between coolant pump to heater harness terminal circuit 402B (1) on coolant pump and ground with switch in start position.
2. Does multimeter read less than 17 volts?



NO

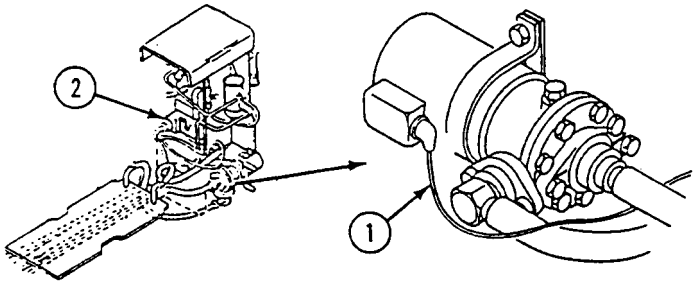
GYN

1. Replace coolant heater pump (WP 0478 00).
2. Verify no faults found.

YES

2GY

1. Measure voltage between coolant pump to heater harness circuit 402B (1) on terminal strip (2) and ground with switch in start position.
2. Does multimeter read less than 17 volts?



NO

2GYN

1. Replace coolant pump to heater harness (WP 0473 00).
2. Verify no faults found.

YES

3GY

1. Replace coolant heater (WP 0477 00).
2. Verify no faults found.

HY

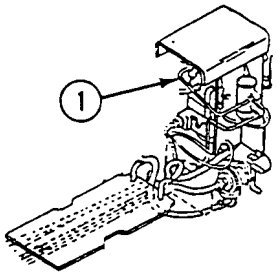
1. Check and see if heater exhaust is cold.
2. Is heater exhaust cold?

NO → GO TO **JY** (PAGE 0086 00-10)

YES

2HY

1. Loosen fuel inlet line (1) to heater with heater switch on START.
2. Does fuel fail to flow out of loosened fitting?



NO

2HYN

1. Faulty igniter.
2. Notify your supervisor.

YES

3HY

1. Inspect fuel lines and heater.
2. Are all lines free from kinks, restrictions, or other damage?

NO

3HYN

1. Replace heater fuel lines as required (WP 0475 00).
2. Verify no faults found.

YES

4HY

1. Replace coolant heater fuel pump (WP 0475 00).
2. Verify no faults found.

IY

1. Check and see if fuel pump stays on.
2. Does fuel pump stay on?

NO

IYN

1. Replace heater ON/OFF/START switch (WP 0472 00).
2. Verify no faults found.

YES

2IY

1. Check if flame detector switch has been adjusted.
2. Has flame detector switch been adjusted?

NO

2IYN

1. Flame detector switch needs adjustment.
2. Notify your supervisor.

YES

3IY

1. Faulty flame detector switch.
2. Notify your supervisor.

JY

1. Check fuel supply lines for clogged or unserviceable hoses or fittings.
2. Are fuel supply hoses and lines unclogged and serviceable?

NO

JYN

1. Clear obstruction or replace fuel hoses/tubing as required (WP 0475 00).
2. Verify no faults found.

YES

2JY

1. Replace coolant heater (WP 0477 00).
2. Verify no faults found.

SPEEDOMETER MALFUNCTIONS 0087 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts
Grease WP 0542 00, Item 14

Personnel Required
Unit Mechanic

References
See your -10
See your PMCS

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Instrument panel partially removed (WP 0256 00)
Left cab floor plate removed (WP 0394 00 or WP 0395 00)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

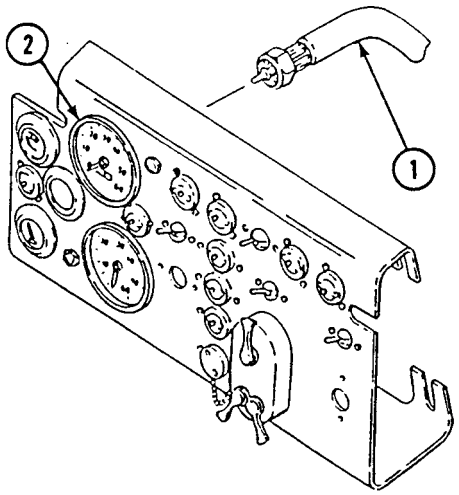
1. Check if speedometer fail to give any reading.
2. Does speedometer fail to give any reading?

NO → GO TO **BY** (PAGE 0087 00-2)

YES

Y

1. Remove speedometer cable (1) from speedometer (2).
2. Spin speedometer drive.
3. Does speedometer drive spin freely?



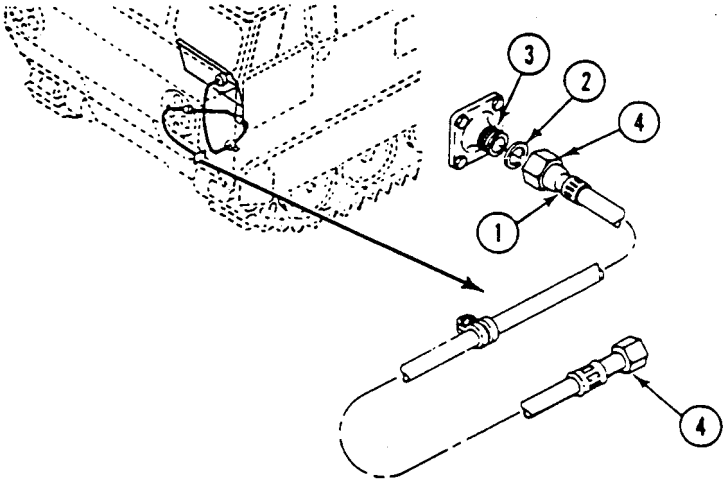
NO → **YN**

1. Replace speedometer (WP 0516 00).
2. Verify no faults found.

YES

2Y

1. Remove speedometer cable (1) and packing (2) from final drive adapter (3).
2. Check speedometer cable ends (4).
3. Does cable spin freely?



NO →

2YN

1. Replace speedometer cable (WP 0518 00).
2. Verify no faults found.

YES ↓

3Y

1. Remove speedometer drive adapter from final drive (WP 0517 00).
2. Inspect final drive adapter.
3. Is final drive adapter seized or damaged?

NO →

3YN

1. Replace speedometer (WP 0516 00).
2. Verify no faults found.

YES ↓

4Y

1. Install speedometer cable on speedometer.
2. Replace final drive adapter (WP 0517 00).
3. Verify no faults found.

BY

1. Check if speedometer cable flexible core has been serviced.
2. Has speedometer cable flexible core been serviced?

NO →

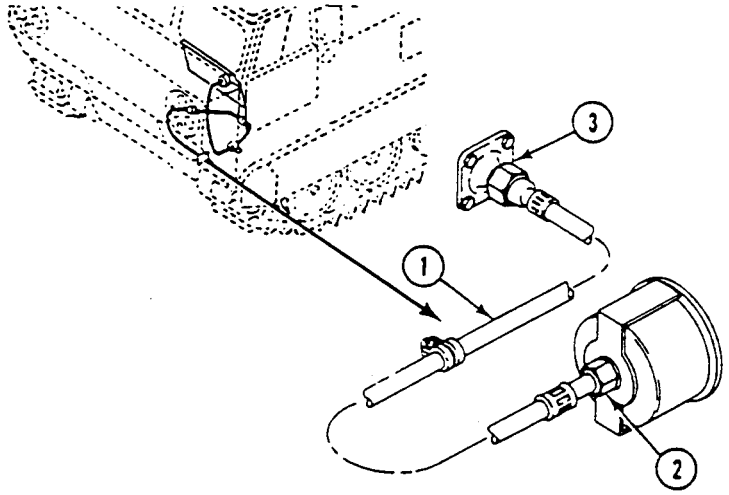
BYN

1. Grease speedometer cable flexible core (see your PMCS).
2. Verify no faults found.

YES ↓

2BY

1. Inspect speedometer cable assembly (1) for damage between speedometer (2) and final drive (3).
2. Is cable assembly free of damage?



NO

2BYN

1. Replace speedometer cable assembly (WP 0518 00).
2. Verify no faults found.

YES

3BY

1. Replace speedometer (WP 0516 00).
2. Verify no faults found.

TACHOMETER MALFUNCTIONS 0088 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts
Grease WP 0542 00, Item 14

Personnel Required
Unit Mechanic
Helper (H)

References
See your -10
See your PMCS

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Power plant rear access door/panel removed (see your -10)
Instrument panel partially removed (WP 0256 00)

NOTE

M548A1 and M548A3 troubleshooting procedures are the same. M548A1 procedure is shown.

T

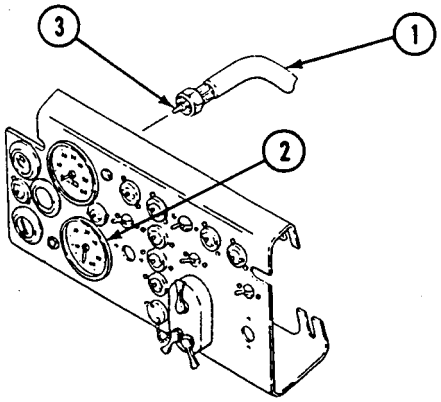
1. Start engine (see your -10).
2. Does tachometer fail to show any reading?

NO → GO TO **BY** (PAGE 0088 00-2)

YES

Y

1. Stop engine (see your -10).
2. Remove tachometer cable (1) from tachometer (2).
3. Start engine (see your -10).
4. Observe tachometer cable drive tip (3).
5. Does tachometer cable drive tip fail to rotate?



NO

YN

1. Stop engine (see your -10).
2. Replace tachometer (WP 0519 00).
3. Verify no faults found.

YES

2Y

1. Inspect tachometer flexible core.
2. Is flexible core serviceable?

NO →

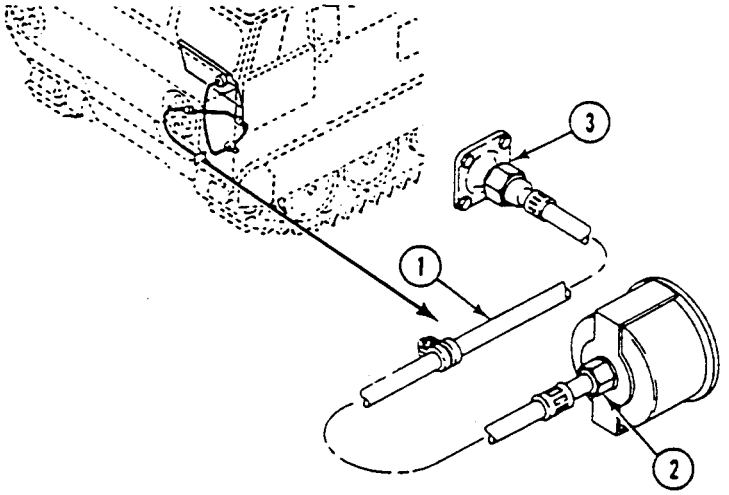
2YN

1. Replace tachometer cable (WP 0522 00 or WP 0523 00).
2. Verify no faults found.

YES ↓

3Y

1. Remove tachometer adapter from engine (WP 0520 00 or WP 0521 00).
2. Is tachometer adapter (1) serviceable?



NO →

3YN

1. Replace tachometer adapter (WP 0520 00 or WP 0521 00).
2. Verify no faults found.

YES ↓

4Y

1. Faulty shaft drive assembly.
2. Notify your supervisor.

BY

1. Check tachometer if it gives a steady reading.
2. Does tachometer fail to give a steady reading?

NO →

BYN

1. Replace tachometer (WP 0519 00).
2. Verify no faults found.

YES ↓

2BY

1. Check if tachometer cable flexible core has been serviced.
2. Has tachometer cable flexible core been serviced?

NO →

2BYN

1. Grease tachometer cable flexible core (see your PMCS).
2. Verify no faults found.

YES ↓

3BY

1. Replace tachometer cable (WP 0522 00 or WP 0523 00).
2. Verify no faults found.

WINCH CASE OVERHEATS (M548A1) 0089 00

INITIAL SETUP:

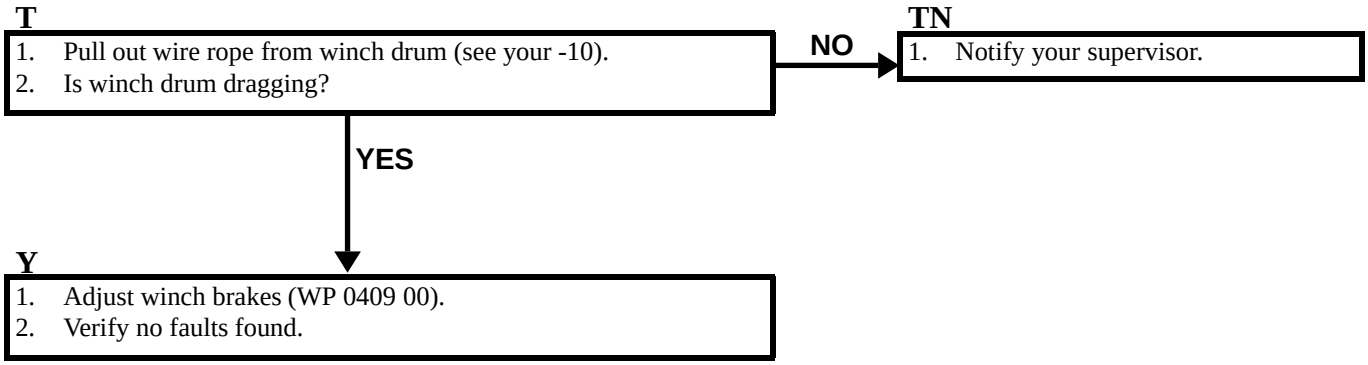
Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required
Unit Mechanic

References
See your -10

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



WINCH DRUM DOES NOT TURN WITH DRUM CLUTCH IN "CLUTCH IN" POSITION (M548A1) 0090 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Winch cable reeled out (see your -10)

T

1. Check winch cable (1) (WP 0416 00).
2. Has winch cable been released from carrier?

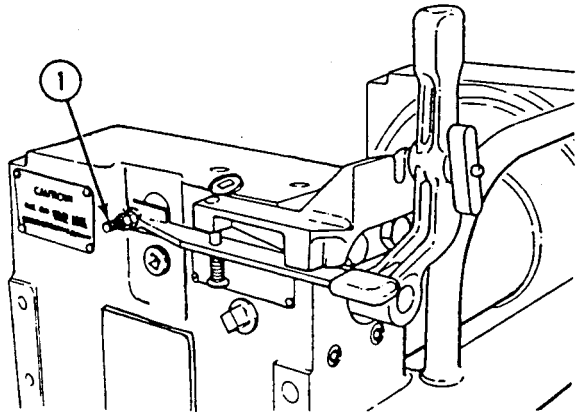
NO → **TN**

1. Release winch cable (see your -10).
2. Verify no faults found.

YES

Y

1. Verify proper operation (see your -10).
2. Check for faulty or broken poppet shaft (1).
3. Is poppet shaft in good condition?



NO → **YN**

1. Broken or stuck poppet shaft.
2. Notify your supervisor.

YES

2Y

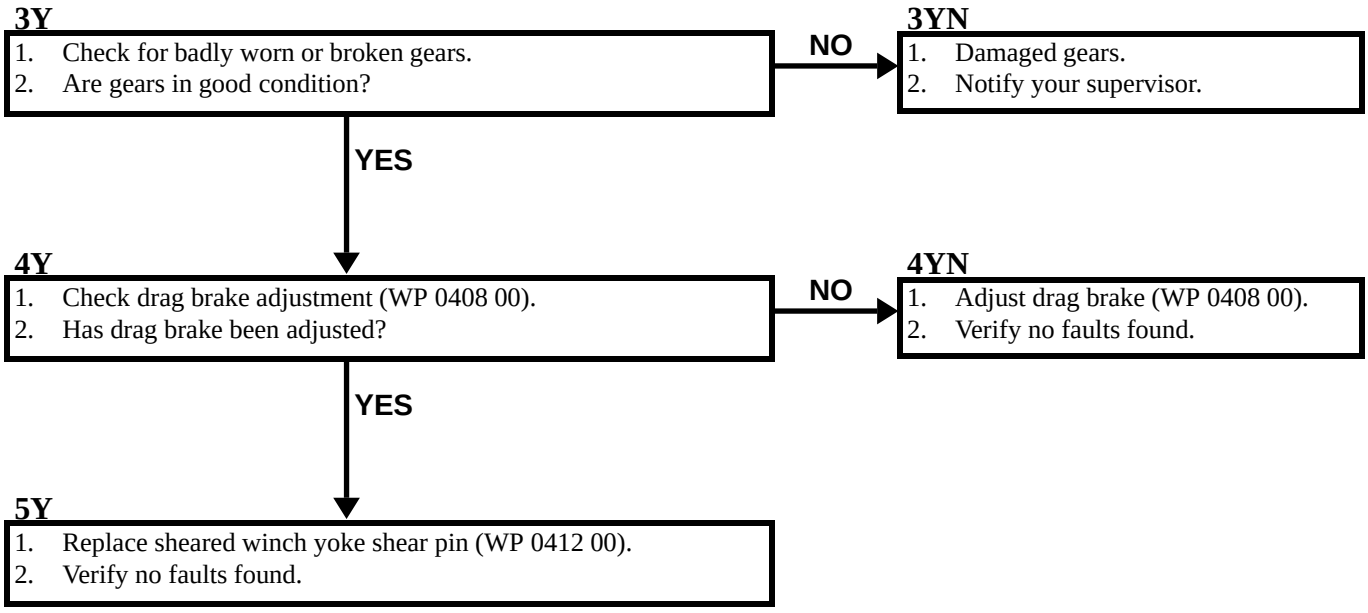
1. Check for worn or damaged drive clutch.
2. Is clutch holding?

NO → **2YN**

1. Damaged clutch.
2. Notify your supervisor.

YES

WINCH DRUM DOES NOT TURN WITH DRUM CLUTCH IN "CLUTCH IN" POSITION (M548A1)—Continued **0090 00**



WINCH DRUM DOES NOT TURN DRUM CLUTCH IN “CLUTCH OUT” POSITION (M548A1) 0091 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic’s Tool Kit (WP 0541 00, Item 57)

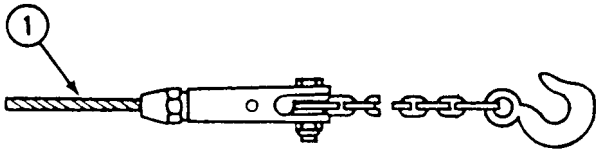
Personnel Required
Unit Mechanic

References
See your -10

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

T

1. Check winch cable (1) (WP 0416 00).
2. Has winch cable (1) been released?



NO

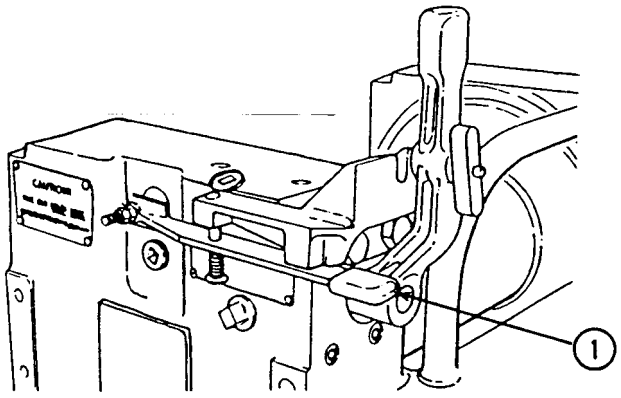
TN

1. Release winch cable (see your -10).
2. Verify no faults found.

YES

Y

1. Check drum lock handle (1).
2. Is drum lock released?



NO

YN

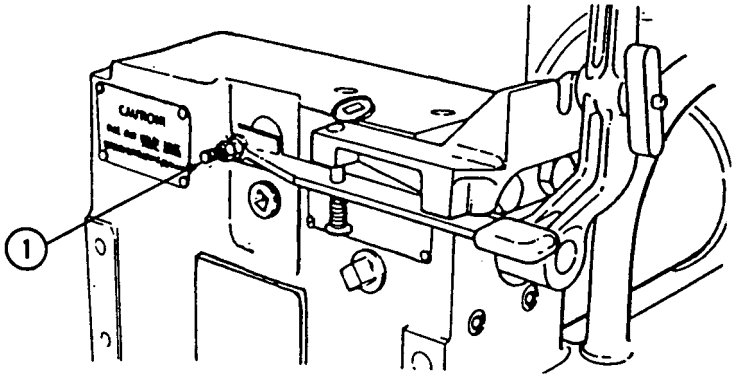
1. Release drum lock (see your -10).
2. Verify no faults found.

YES

WINCH DRUM DOES NOT TURN DRUM CLUTCH IN "CLUTCH OUT" POSITION (M548A1)—Continued **0091 00**

2Y

1. Check poppet screw (1) (WP 0410 00).
2. Is poppet screw (1) adjusted properly?



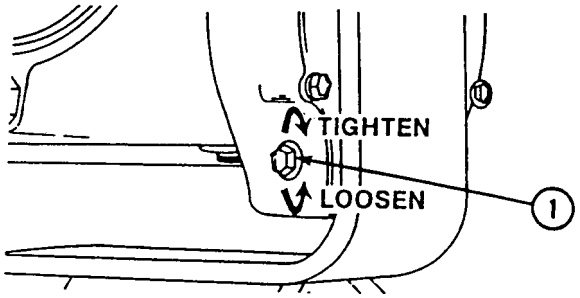
NO → **2YN**

1. Adjust poppet screw (WP 0410 00).
2. Verify no faults found.

YES ↓

3Y

1. Check drag brake (1) (WP 0408 00).
2. Has drag brake (1) been adjusted?



NO → **3YN**

1. Adjust drag brake (WP 0408 00).
2. Verify no faults found.

YES ↓

4Y

1. Notify your supervisor of worn drag brake shoe.
2. Verify no faults found.

WINCH BRAKE DOES NOT HOLD (M548A1) 0092 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

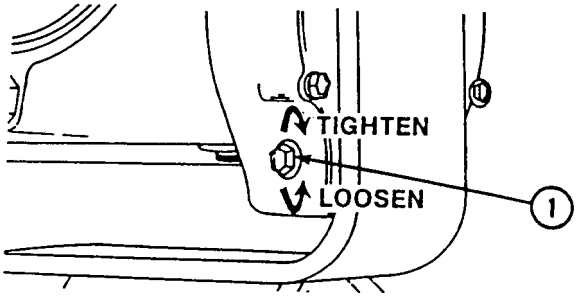
Personnel Required
Unit Mechanic

References
See your -10

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

T

1. Check winch brake (1) adjustment (WP 0409 00).
2. Has brake (1) been adjusted?



NO → **TN**

1. Adjust winch brake (WP 0409 00).
2. Verify no faults found.

YES ↓

Y

1. Check winch brake lining.
2. Is brake lining in good shape?

NO → **YN**

1. Notify your supervisor that brake lining needs replacing.
2. Verify no faults found.

YES ↓

2Y

1. Notify your supervisor that winch brake does not hold.
2. Verify no faults found.

POWER TAKEOFF DOES NOT ENGAGE WHEN WINCH CONTROL IS ACTUATED (M548A1) 0093 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

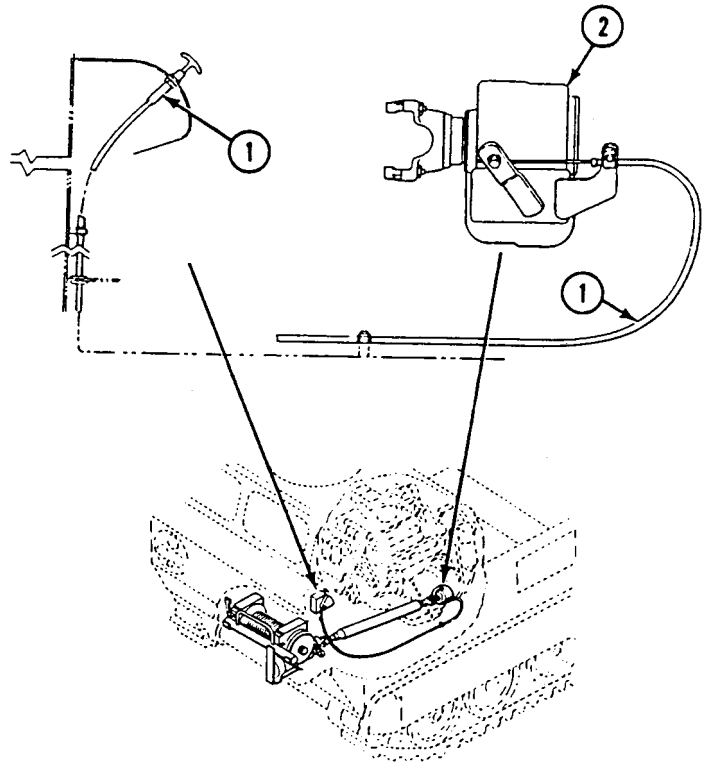
See your -10

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Power plant upper rear access door removed (see your -10)
Center seat raised (see your -10)
Center floor plates removed (WP 0394 00)

T

1. Check for broken winch control cable (1) on power takeoff control (2) (WP 0414 00).
2. Is control cable (1) properly connected?



NO →

TN

1. Replace or connect control cable (WP 0414 00).
2. Verify no faults found.

YES ↓

POWER TAKEOFF DOES NOT ENGAGE WHEN WINCH CONTROL IS ACTUATED (M548A1)—Continued **0093 00**

Y

1. Check to see if winch control cable needs adjusting (WP 0414 00).
2. Has control cable been adjusted?

NO

YN

1. Adjust control cable (WP 0414 00).
2. Verify no faults found.

YES

2Y

1. Notify your supervisor of damaged power takeoff.
2. Verify no faults found.

EXCESSIVE OIL LEAKS (WINCH TRANSFER GEARCASE AND POWER TAKEOFF) (M548A1) 0094 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

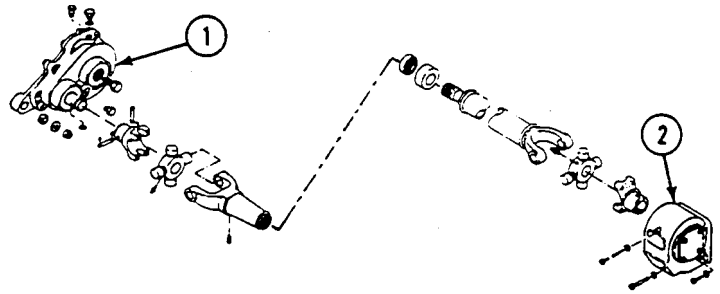
Personnel Required
Unit Mechanic

References
See your -10

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

T

1. Check for worn oil seals in winch transfer gearcase (1) and power takeoff (2).
2. Are seals in place and in good condition?



NO →

TN

1. Replace damaged seals.
2. Verify no faults found.

YES ↓

Y

1. Check for loose cover plates and damaged gaskets.
2. Are covers tight and gaskets in good condition?

NO →

YN

1. Replace gasket and tighten cover or replace transfer gearcase (WP 0413 00).
2. Verify no faults found.

YES ↓

2Y

1. Notify your supervisor of cracked housing.
2. Verify no faults found.

WINCH PROPELLER SHAFT NOISY DURING OPERATION (M548A1) 0095 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

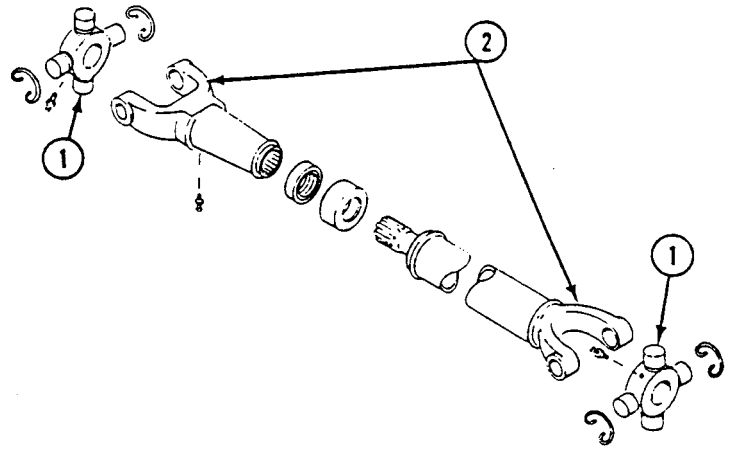
Personnel Required
Unit Mechanic

References
See your -10

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

T

1. Check for worn spiders (1) or yokes (2).
2. Are spiders and yokes in good condition?



NO →

TN

1. Replace worn or damaged spiders and yokes (WP 0412 00).
2. Verify no faults found.

YES ↓

Y

1. Check for loose or broken U-bolts and nuts.
2. Were U-bolts and nuts loose or broken?

NO →

YN

1. Replace spiders (WP 0412 00).
2. Verify no faults found.

YES ↓

2Y

1. Replace and torque any loose or broken U-bolts and nuts (WP 0412 00).
2. Verify no faults found.

COMPRESSOR AIR OUTPUT ADEQUATE, BUT NO AIR PRESSURE INDICATION ON PANEL AIR BRAKE PRESSURE INDICATOR (M548A1) 0096 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

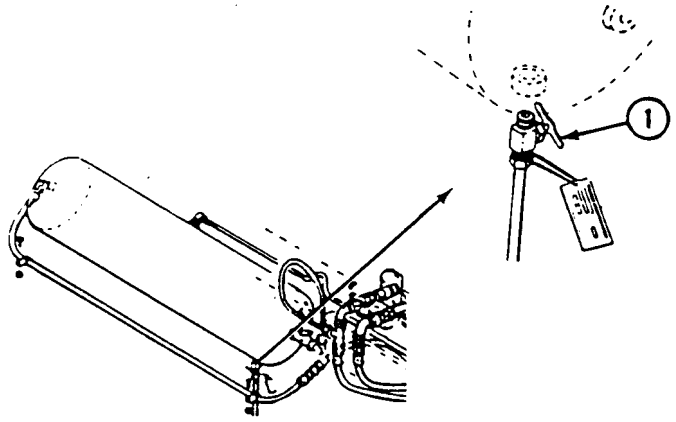
Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Power plant rear access door removed (see your -10)

T

1. Start engine (see your -10).
2. Build air pressure (80-111 psi) (552-765 kPa).
3. Stop engine (see your -10).
4. Check for loose or faulty air reservoir drain cock (1). Make sure drain cock is closed.
5. Check tubes, hoses, fittings, and parts for air leaks (WP 0495 00).
6. Are all parts tight and undamaged?



NO →

TN

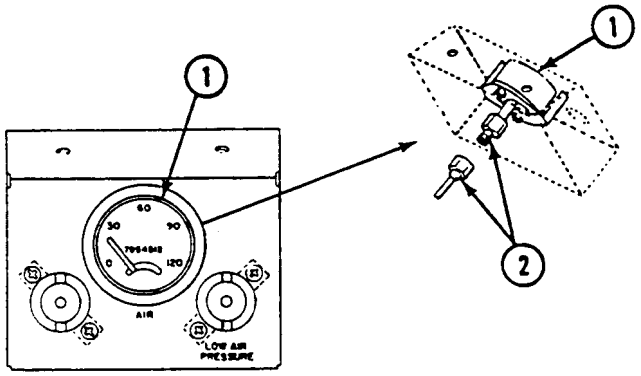
1. Replace faulty parts.
2. Verify no faults found.

YES ↓

COMPRESSOR AIR OUTPUT ADEQUATE, BUT NO AIR PRESSURE INDICATION ON PANEL AIR BRAKE PRESSURE INDICATOR (M548A1)—Continued **0096 00**

Y

1. Check for faulty air brake pressure indicator (1).
2. Is air brake pressure indicator (1) air hose (2) loose or damaged?



NO

YN

1. Tighten air hose to air brake pressure indicator (WP 0501 00).
2. Verify no faults found.

YES

2Y

1. Replace air brake pressure indicator (WP 0503 00).
2. Verify no faults found.

LOW AIR PRESSURE WARNING LIGHT DOES NOT LIGHT WHEN AIR PRESSURE FALLS BELOW 60 PSI (414 KPA) (M548A1) 0097 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

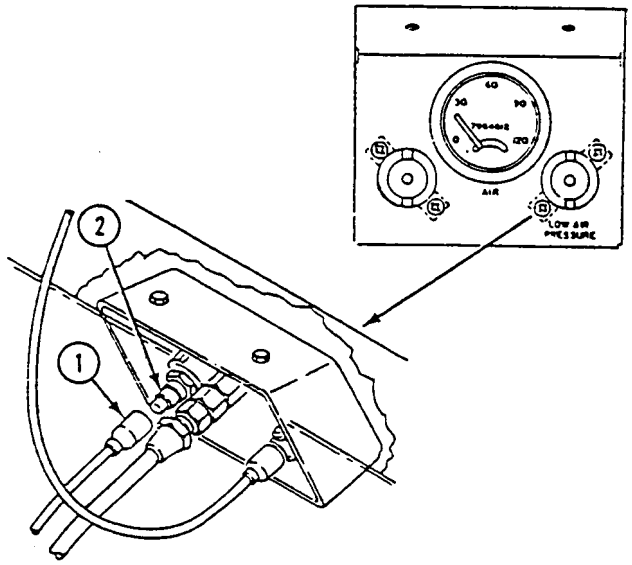
Personnel Required
Unit Mechanic

References
See your -10

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

T

1. Disconnect circuit 1C plug (1) from LOW AIR PRESSURE warning light (2).
2. Turn MASTER SWITCH ON.
3. Measure voltage between circuit 1C plug (1) and ground.
4. Does multimeter read 17 volts or more?



NO →

TN

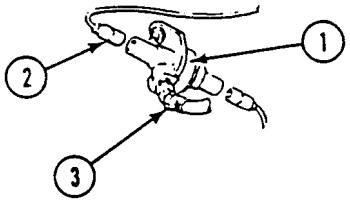
1. Repair faulty circuit 1C (WP 0294 00).
2. Verify no faults found.

YES ↓

LOW AIR PRESSURE WARNING LIGHT DOES NOT LIGHT WHEN AIR PRESSURE FALLS BELOW 60 PSI (414 KPA) (M548A1)—Continued **0097 00**

Y

1. Start engine (see your -10) and observe AIR pressure gauge. Stop engine (see your -10) when AIR pressure gauge reads above 60 psi (414 kPa).
2. Turn MASTER SWITCH OFF.
3. Check air low pressure switch (1) for air leakage, damaged body or electrical connectors (2), leaking fittings (3), or leaking tubing.
4. Is air low pressure switch (1), connectors (2), fittings (3), or tubing damaged or leaking?



NO

YN

1. Replace faulty air low pressure switch (WP 0494 00).
2. Verify no faults found.

YES

2Y

1. Replace damaged switch (WP 0494 00), faulty fittings or tubing (WP 0495 00), or faulty electrical connectors (WP 0294 00).
2. Verify no faults found.

COMPRESSOR DOES NOT MAINTAIN AIR PRESSURE (M548A1) 0098 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

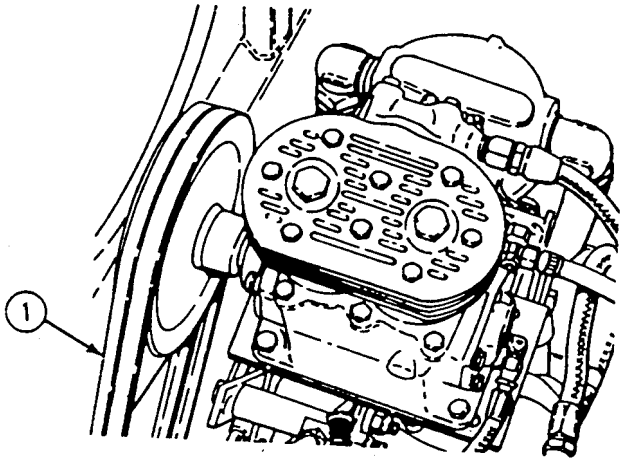
Personnel Required
Unit Mechanic

References
See your -10

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

T

1. Start engine (see your -10).
2. Check compressor drive belts (1) for slippage.
3. Are compressor drive belts (1) tight?



NO → **TN**

1. Stop engine (see your -10).
2. Adjust compressor drive belts to proper tension (WP 0498 00).
3. Verify no faults found.

YES ↓

Y

1. Check compressor drive belts for oil saturation.
2. Are compressor drive belts oil free?

NO → **YN**

1. Replace compressor drive belts (WP 0499 00).
2. Verify no faults found.

YES ↓

2Y

1. Look and listen for air leakage in air brake system.
2. Is brake system free of air leaks?

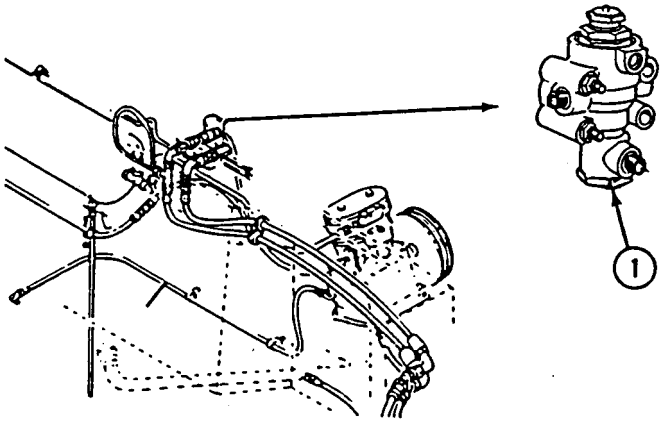
NO → **2YN**

1. Replace faulty air brake system parts (WP 0489 00 thru WP 0504 00).
2. Verify no faults found.

YES ↓

3Y

1. Check ports of air brake governor (1) for leakage and loose fittings.
2. Are ports of air brake governor (1) free of leaks and fittings tight?



NO

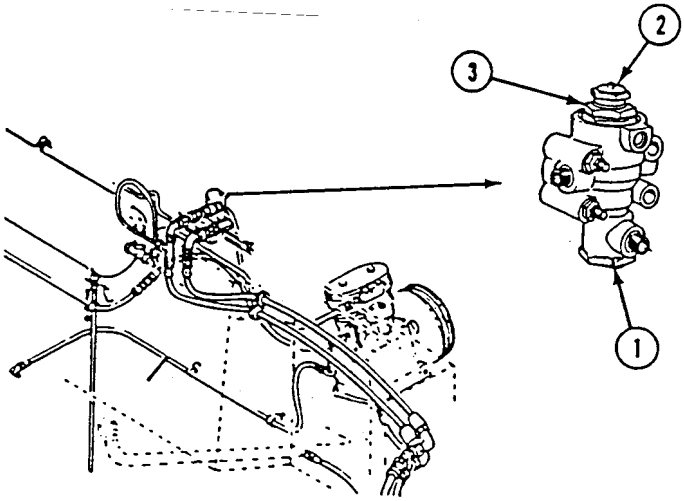
3YN

1. Tighten or replace fittings (WP 0495 00) or replace faulty air brake governor (WP 0490 00).
2. Verify no faults found.

YES

4Y

1. Remove adjusting screw cover from air brake governor (1) and check adjusting screw (2) for tightness.
2. Is lock nut (3) tight?



NO

4YN

1. Replace faulty air brake governor (WP 0490 00).
2. Verify no faults found.

YES

5Y

1. Listen for escaping air or signs of faulty operation.
2. Is air brake governor free of air leaks or signs of faulty operation?

NO

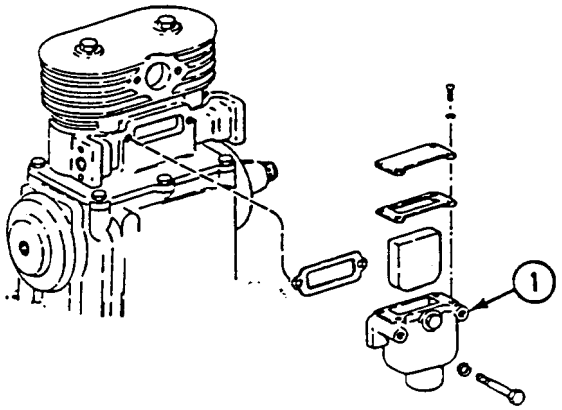
5YN

1. Replace faulty air brake governor (WP 0490 00).
2. Verify no faults found.

YES

6Y

1. Check for restricted or damaged air strainer (1).
2. Clean and oil air strainer (1) if contaminated (WP 0500 00).
3. Is air strainer (1) free of damage?



NO →

6YN

1. Replace faulty air strainer (WP 0500 00).
2. Verify no faults found.

YES ↓

7Y

1. Check for sheared woodruff key on compressor pulley shaft.
2. Is woodruff key free of damage?

NO →

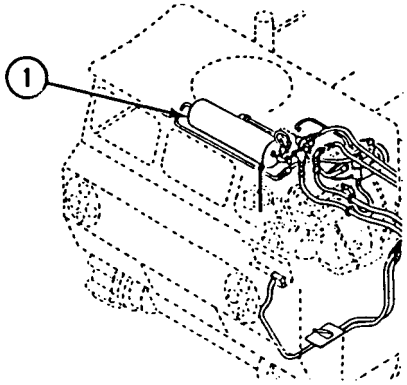
7YN

1. Replace compressor if pulley turns on shaft (WP 0489 00).
2. Verify no faults found.

YES ↓

8Y

1. Drain air reservoir (1) and check drain water for oil.
2. Are more than a few drops of oil mixed in water?



NO →

8YN

1. Compressor does not maintain air pressure.
2. Notify your supervisor.

YES ↓

9Y

1. Replace worn compressor (WP 0489 00).
2. Verify no faults found.

TOWED LOAD BRAKES DO NOT OPERATE WHEN PEDAL IS PRESSED; AIR PRESSURE ADEQUATE (M548A1) 0099 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

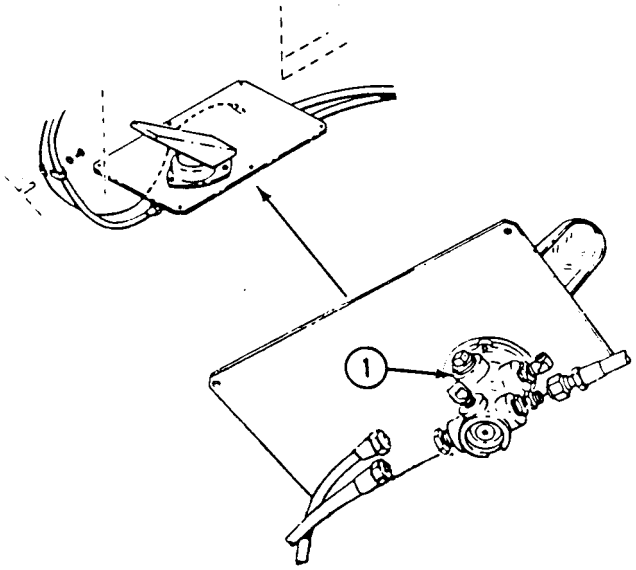
Personnel Required
Unit Mechanic

References
See your -10

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

T

1. Start engine (see your -10).
2. Check for faulty treadle valve (1).
3. While observing air indicator gauge, press brake pedal and release. Pressure should momentarily drop and stabilize. Air will also audibly exhaust from treadle valve (1) as air brake pedal is released. If no needle movement is noted, treadle valve is faulty.
4. Did treadle valve (1) cause needle movement?



NO →

TN

1. Stop engine (see your -10).
2. Notify your supervisor.

YES ↓

Y

1. Check air lines, tubings, fittings, and coupler to towed load for air leaks.
2. Is brake system free of air leaks?

NO →

YN

1. Stop engine (see your -10).
2. Replace faulty parts (WP 0495 00).
3. Verify no faults found.

YES ↓

TOWED LOAD BRAKES DO NOT OPERATE WHEN PEDAL IS PRESSED; AIR PRESSURE ADEQUATE (M548A1)—Continued **0099 00**

2Y

1. Stop engine (see your -10).
2. Notify your supervisor.

TOO MUCH OIL DRAINAGE FROM RESERVOIR DRAIN COCK (M548A1) 0100 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

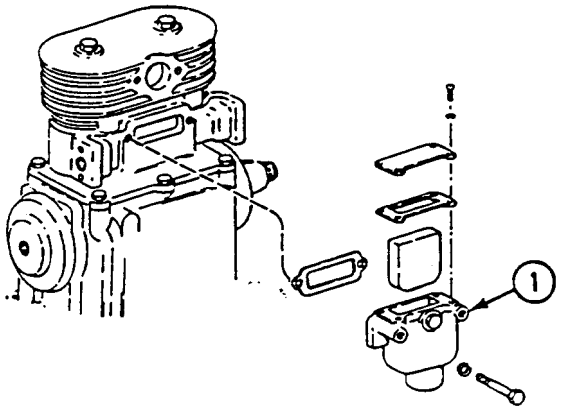
See your -10

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Power plant rear access door removed (see your -10)
Center seat raised (see your -10)

T

1. Check for restricted or damaged compressor air strainer (1).
2. Clean and oil air strainer (1) if contaminated (WP 0500 00).
3. Is air strainer free of damage?



NO →

TN

1. Replace faulty air strainer (WP 0500 00).
2. Verify no faults found.

YES ↓

Y

1. Check for restrictions in compressor-to-engine oil return line at compressor (WP 0496 00).
2. Is return line free of restrictions?

NO →

YN

1. Replace compressor-to- engine oil return line (WP 0496 00).
2. Verify no faults found.

YES ↓

2Y

1. Check for oil flow restriction (WP 0496 00).
2. Are hoses, tubes, and fittings free of restrictions?

NO

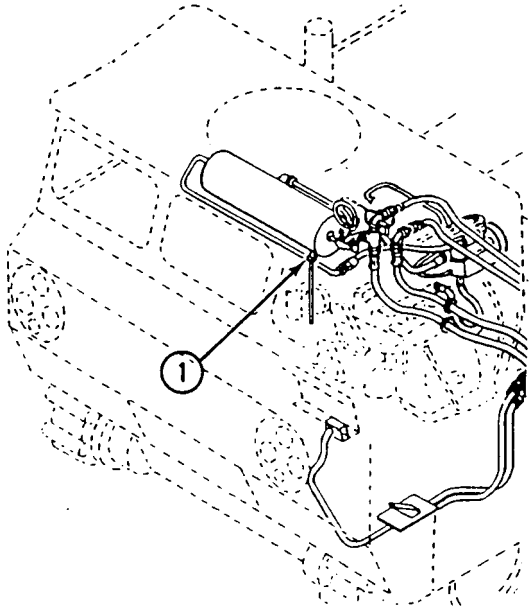
2YN

1. Clean or replace hoses, tubes, and fittings that are restricted (WP 0496 00).
2. Verify no faults found.

YES

3Y

1. Drain air reservoir (1) and check drain water for oil.
2. Are more than a few drops of oil mixed in water?



NO

3YN

1. Repeat troubleshooting procedure.
2. If results are the same, notify your supervisor.

YES

4Y

1. Replace worn compressor (WP 0489 00).
2. Verify no faults found.

TOO MUCH FOREIGN MATTER IN RESERVOIR (M548A1) 0101 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

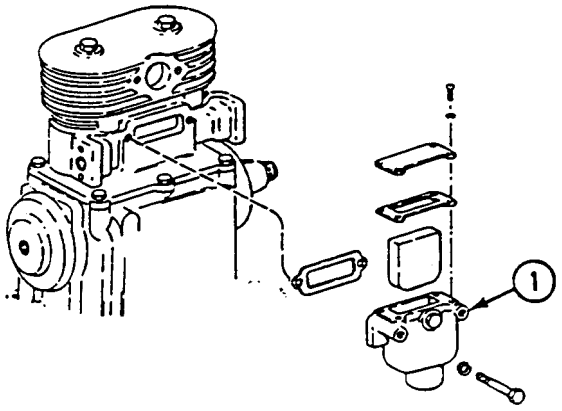
See your -10

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Power plant rear access door removed (see your -10)
Center seat raised (see your -10)

T

1. Check for restricted air strainer (1) (WP 0500 00).
2. Clean and oil air strainer (1), if contaminated.
3. Is air strainer (1) free of damage?



NO →

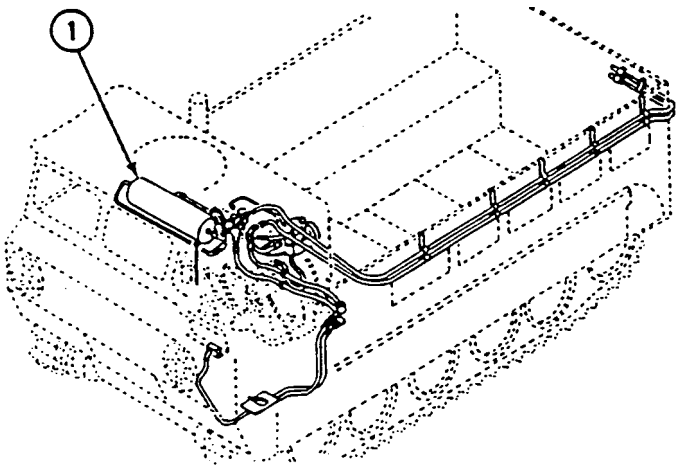
TN

1. Replace faulty air strainer (WP 0500 00).
2. Verify no faults found.

YES ↓

Y

1. Drain air reservoir (1) (WP 0491 00).
2. Is there more than a few drops of oil mixed in the water?



NO

YN

1. Notify your supervisor of foreign matter in air reservoir.
2. Verify no faults found.

YES

2Y

1. Replace worn compressor (WP 0489 00).
2. Verify no faults found.

COMPRESSOR OPERATION TOO NOISY (M548A1) 0102 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

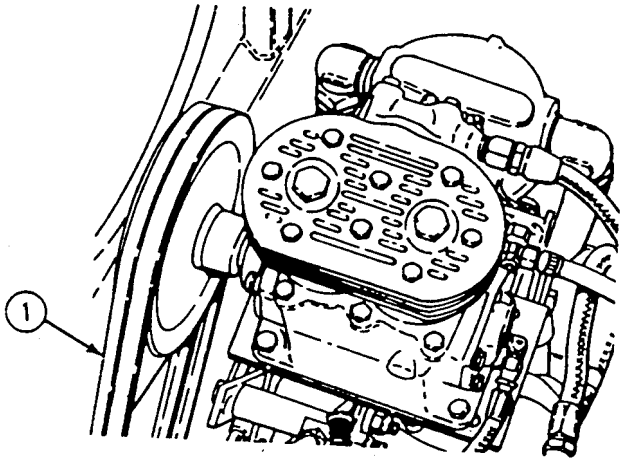
Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Power plant rear access door removed (see your -10)

T

1. Check compressor drive belts (1) for tension.
2. Are compressor drive belts (1) tight with equal tension on both pulleys (WP 0498 00)?



NO →

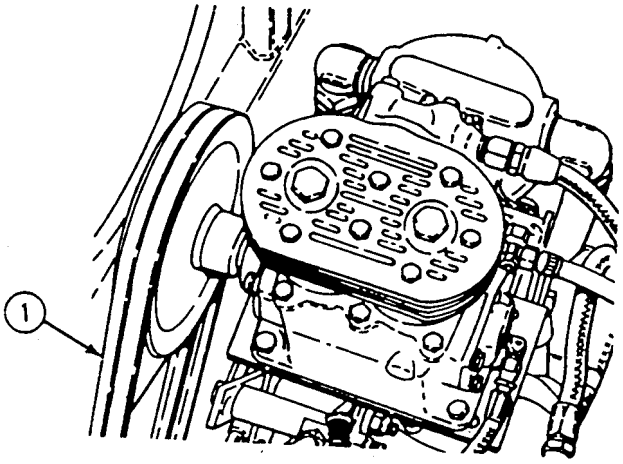
TN

1. Adjust drive belts to proper tension, if tension is equal (WP 0498 00).
2. If tension is unequal and cannot be adjusted, replace drive belts (WP 0499 00).
3. Verify no faults found.

YES ↓

Y

1. Check compressor drive belts (1) for oil saturation.
2. Are compressor drive belts (1) oil free?



NO

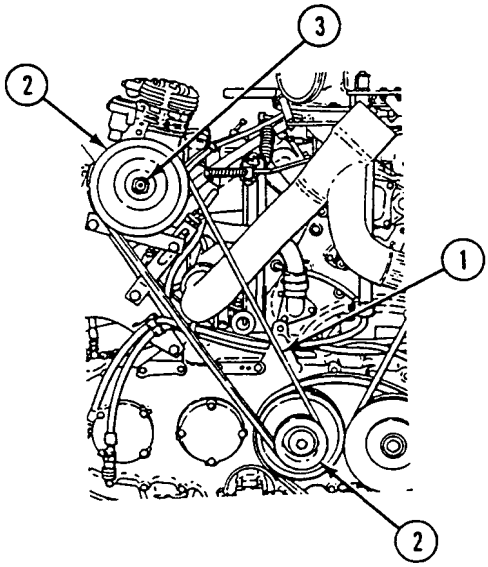
YN

1. Replace compressor drive belts (WP 0499 00).
2. Verify no faults found.

YES

2Y

1. Remove drive belts (1) and pulley (2). Check for sheared woodruff key on compressor pulley shaft (3) (WP 0499 00).
2. Is woodruff key free of damage?



NO

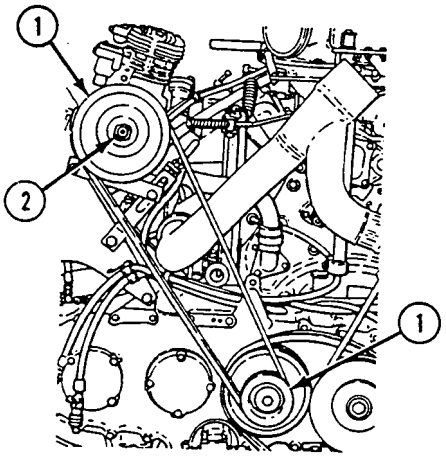
2YN

1. Replace compressor, if woodruff key is damaged (WP 0489 00).
2. Verify no faults found.

YES

3Y

1. Check for woodruff key or channel wear in either pulley (1) or shaft (2) (WP 0499 00).
2. Are woodruff key or channels showing signs of wear?



NO →

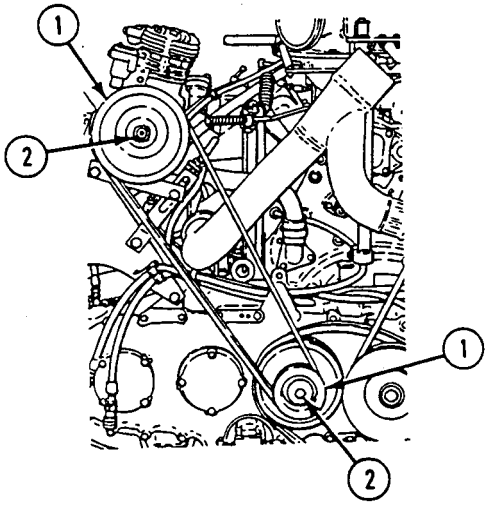
3YN

1. Replace compressor, if pulley, shaft, or woodruff key is damaged (WP 0489 00).
2. Verify no faults found.

YES ↓

4Y

1. Check drive pulley (1) for snug fit on shaft (2).
2. Is drive pulley (1) snug on shaft (2) (WP 0499 00)?



NO →

4YN

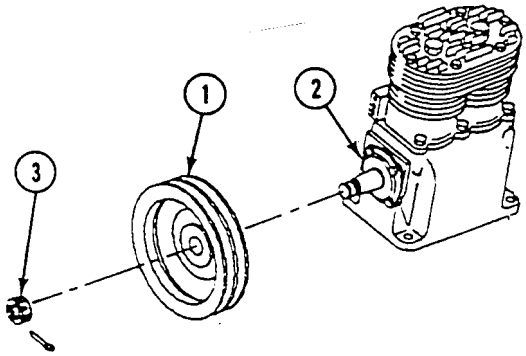
1. Replace compressor, if pulley turns on shaft (WP 0489 00).
2. Verify no faults found.

YES ↓

COMPRESSOR OPERATION TOO NOISY (M548A1)—Continued 0102 00

5Y

1. Make sure pulley (1) is flush against collar (2) when retaining nut (3) is tight (WP 0499 00).
2. Is pulley (1) tight against collar (2)?



NO →

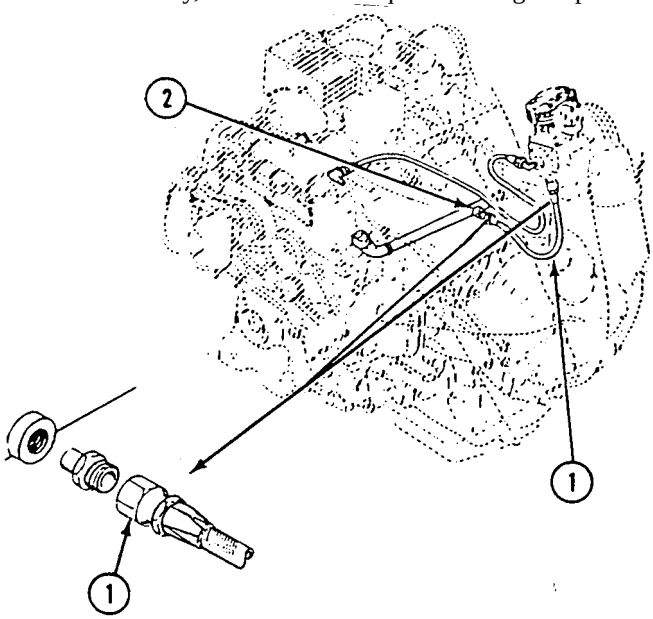
5YN

1. Replace compressor, if pulley is not snug against collar (WP 0489 00).
2. Verify no faults found.

YES ↓

6Y

1. Disconnect oil discharge hose (1) at engine filler tube (2) and place over suitable container to catch oil.
2. Start engine (see your -10).
3. Is oil flow a steady, smooth stream equal with engine speed?



NO →

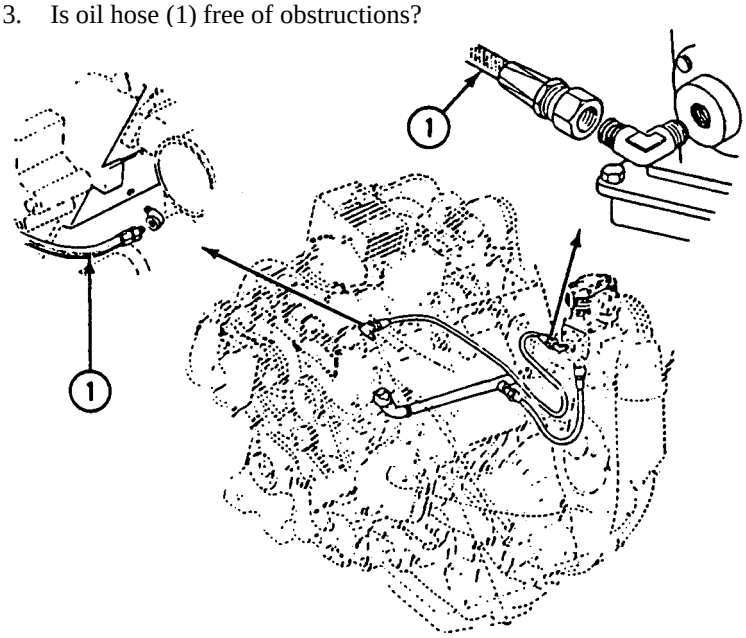
6YN

1. Stop engine (see your -10).
2. Replace compressor (WP 0489 00).
3. Verify no faults found.

YES ↓

7Y

1. Stop engine (see your -10)
2. Disconnect engine-to-compressor oil hose (1) and check for obstructions.
3. Is oil hose (1) free of obstructions?



NO

7YN

1. Replace oil hose (WP 0496 00).
2. Verify no faults found.

YES

8Y

1. Replace faulty compressor (WP 0489 00).
2. Verify no faults found.

PARTICULATE PRECLEANER MOTOR DOES NOT WORK (M548A3) 0103 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

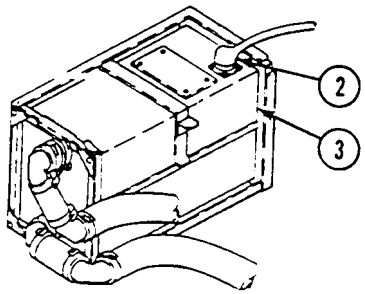
Personnel Required
Unit Mechanic

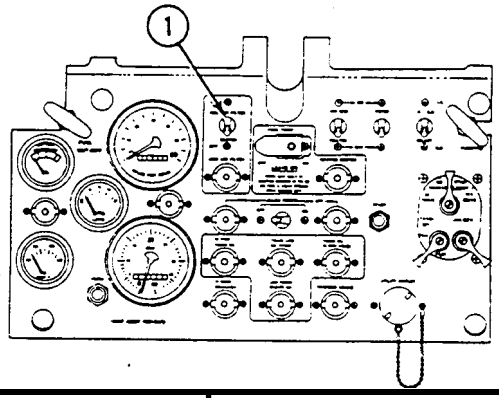
References
See your -10

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

T

1. Turn NBC AIR FILTER SWITCH (1) OFF (see your -10).
2. Turn MASTER SWITCH OFF.
3. Remove NBC wiring harness connector J1 (2) from particulate precleaner (3).
4. Turn MASTER SWITCH ON.
5. Turn NBC AIR FILTER SWITCH (1) ON (see your -10).
6. Measure voltage between wiring harness connector J1 (2) and ground.
7. Does multimeter read more than 17 volts?



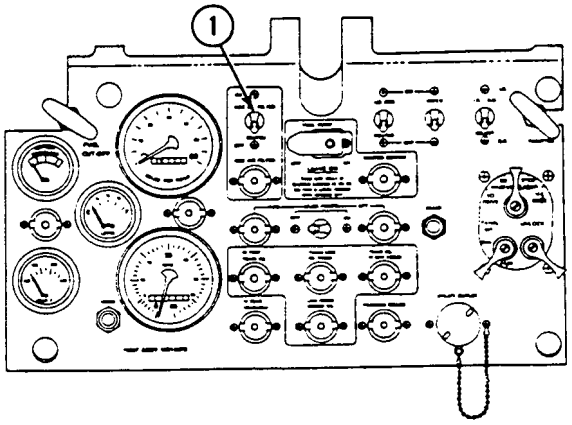


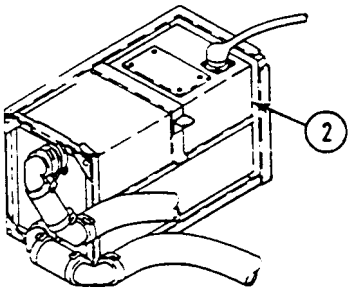
NO → GO TO **BY** (PAGE 0103 00-3)

YES ↓

Y

1. Turn NBC AIR FILTER SWITCH (1) OFF (see your -10).
2. Turn MASTER SWITCH OFF.
3. Measure resistance between particulate precleaner (2) and ground.
4. Does multimeter read 0 ohms?





NO

YN

1. Repair ground lead in heater harness (WP 0294 00).
2. Verify no faults found.

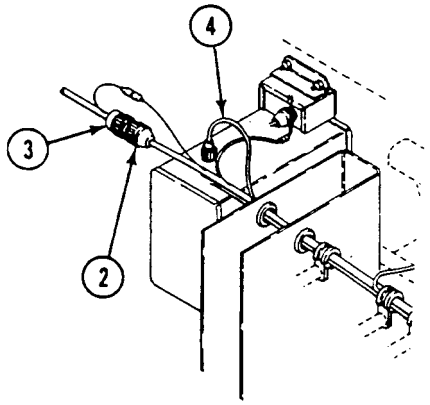
YES

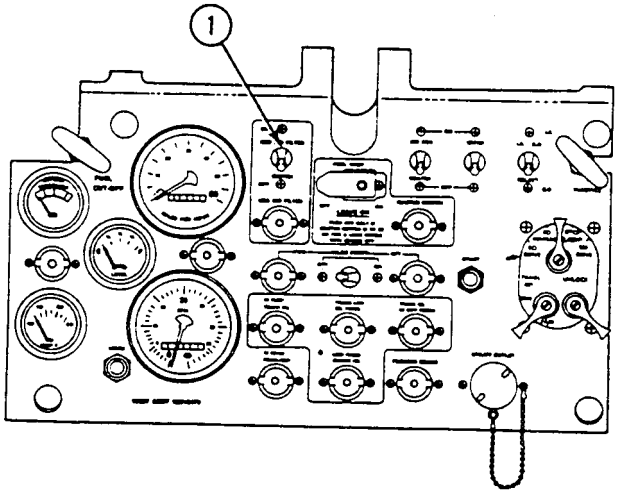
2Y

1. Replace particulate precleaner (WP 0534 00).
2. Verify no faults found.

BY

1. Turn NBC AIR FILTER SWITCH (1) OFF (see your -10).
2. Turn MASTER SWITCH OFF.
3. Disconnect NBC wiring harness connector P1 (2) from M3 heater wiring harness connector (3).
4. Measure resistance between wiring harness connector P1 (2) and J1 (4).
5. Does multimeter read 0 ohms?





NO →

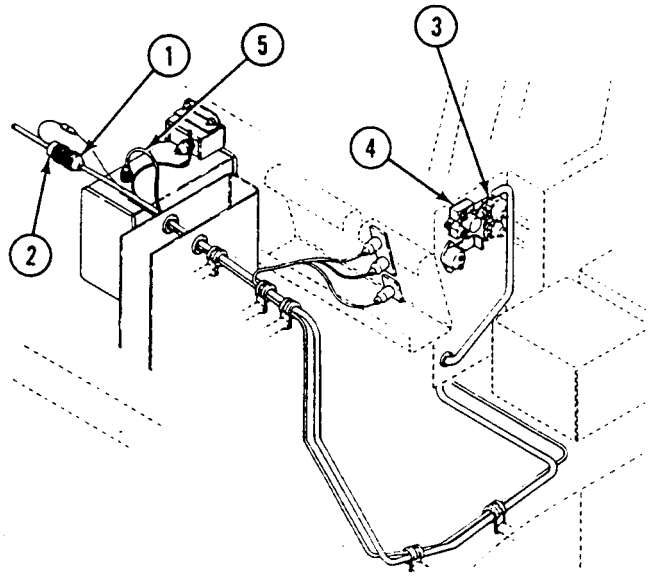
BYN

1. Replace NBC wiring harness (WP 0531 00).
2. Verify no faults found.

YES ↓

2BY

1. Connect NBC wiring harness connector P1 (1) to M3 heater wiring harness connector (2).
2. Remove circuit 135G lead (3) from relay terminal A2 (4).
3. Measure resistance between NBC wiring harness connector J1 (5) and circuit 135G lead (3).
4. Does multimeter read 0 ohms?



NO →

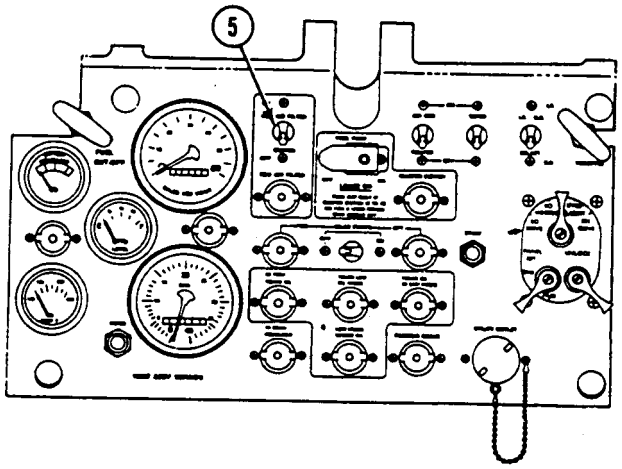
2BYN

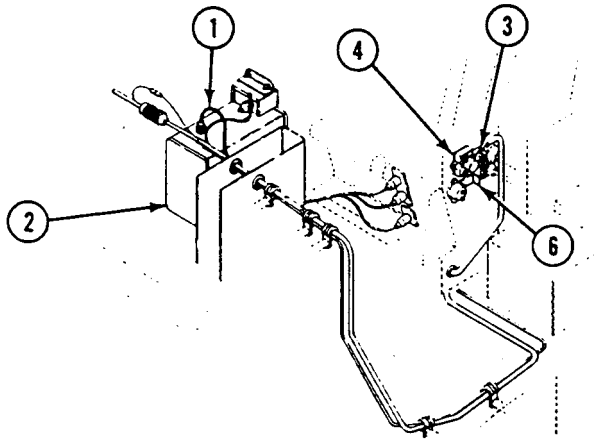
1. Replace NBC wiring harness (WP 0531 00).
2. Verify no faults found.

YES ↓

3BY

1. Connect NBC wiring harness connector J1 (1) to particulate precleaner (2).
2. Connect circuit 135G lead (3) to relay terminal A2 (4).
3. Turn MASTER SWITCH ON.
4. Turn NBC AIR FILTER SWITCH (5) ON (see your -10).
5. Measure voltage between bus bar (6) and ground.
6. Does multimeter read more than 17 volts?





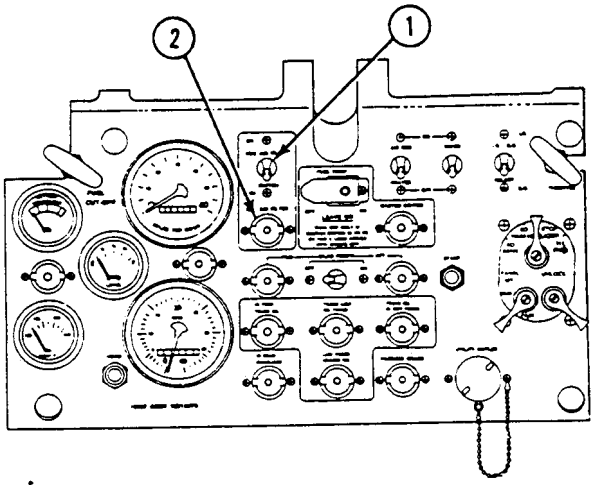
NO → **3BYN**

1. Service carrier's batteries (WP 0293 00).
2. Verify no faults found.

YES ↓

4BY

1. Turn NBC AIR FILTER SWITCH (1) OFF and ON (see your -10).
2. Is NBC AIR FILTER indicator (2) on?



NO → GO TO **CY** (PAGE 0103 00-7)

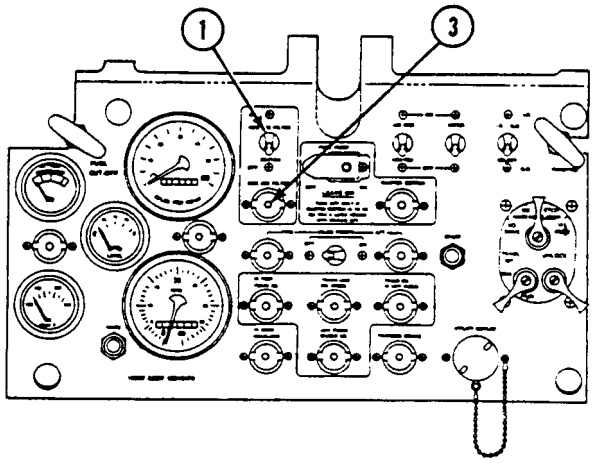
YES ↓

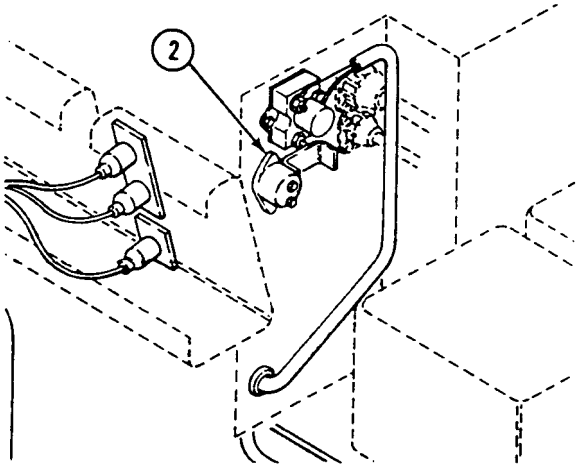
5BY

1. Replace relay (WP 0530 00).
2. Verify no faults found.

CY

1. Turn NBC AIR FILTER SWITCH (1) OFF (see your -10).
2. Reset circuit breaker (2).
3. Turn NBC AIR FILTER SWITCH (1) ON (see your -10).
4. Is NBC AIR FILTER indicator (3) on?





NO →

CYN

1. If circuit breaker continues to trip, notify your supervisor.
2. Verify no faults found.

YES ↓

2CY

1. Replace relay (WP 0530 00).
2. Verify no faults found.

M3 HEATER DOES NOT WORK (M548A3) 0104 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

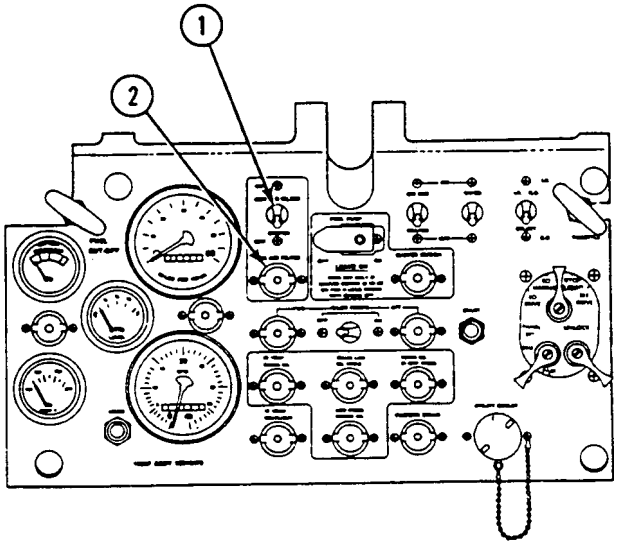
Personnel Required
Unit Mechanic

References
See your -10

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

T

1. Turn MASTER SWITCH ON.
2. Turn NBC AIR FILTER SWITCH (1) ON (see your -10).
3. Is NBC AIR FILTER (2) indicator on?

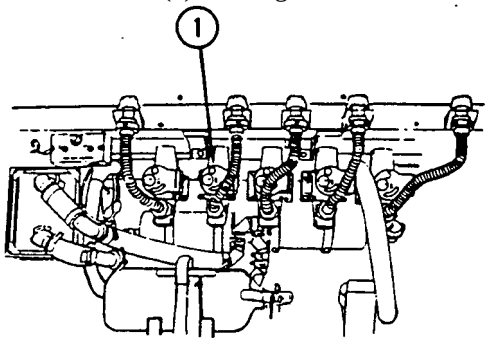


NO → GO TO **BY** (PAGE 0104 00-2)

YES ↓

Y

1. Turn on other M3 heaters (1).
2. Is any other M3 heater (1) working?



NO → GO TO **CY** (PAGE 0104 00-3)

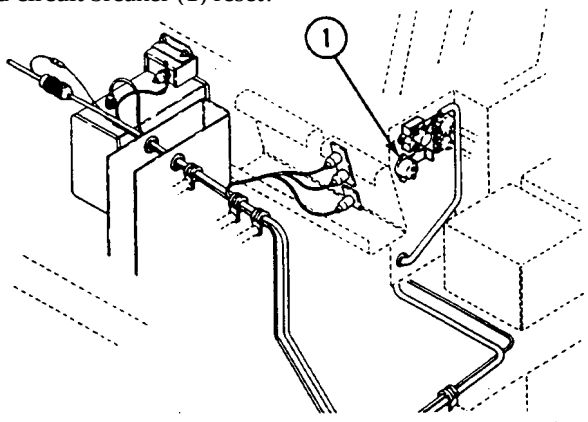
YES

2Y

1. Replace defective M3 heater (WP 0532 00).
2. Verify no faults found.

BY

1. Check and see if circuit breaker reset.
2. Did circuit breaker (1) reset?



NO →

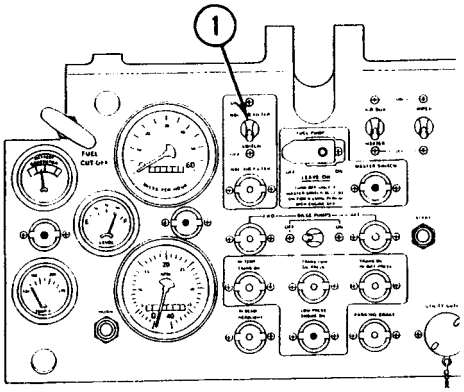
BYN

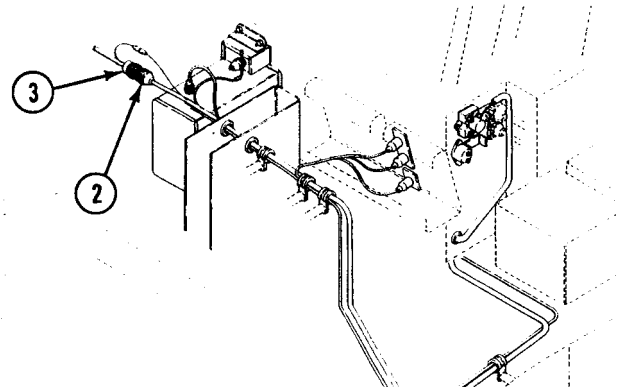
1. Replace circuit breaker (WP 0530 00).
2. Verify no faults found.

YES

CY

1. Turn NBC AIR FILTER SWITCH (1) OFF (see your -10).
2. Turn MASTER SWITCH OFF.
3. Disconnect NBC wiring harness connector P1 (2) from M3 heater wiring harness connector (3).
4. Turn MASTER SWITCH ON.
5. Turn NBC AIR FILTER SWITCH (1) ON (see your -10).
6. Measure voltage between any pin of NBC wiring harness connector P1 (2) except pin H and ground.
7. Does multimeter read 17 or more volts from more than one pin of NBC wiring harness connector P1 (2)?



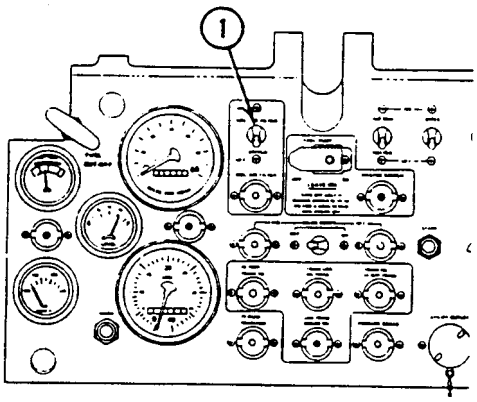


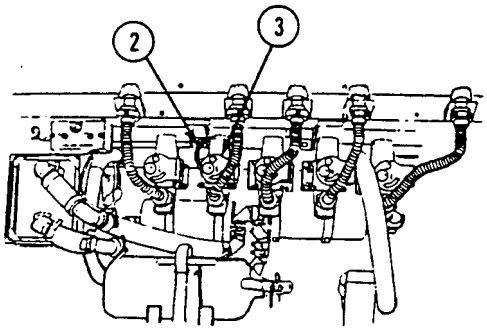
NO → GO TO **DY** (PAGE 0104 00-5)

YES

2CY

1. Turn NBC AIR FILTER SWITCH (1) OFF (see your -10).
2. Turn MASTER SWITCH OFF.
3. Connect NBC wiring harness connector P1 to M3 heater wiring harness connector.
4. Disconnect any circuit lead 135 (2) from M3 heater (3).
5. Turn MASTER SWITCH ON.
6. Turn NBC AIR FILTER SWITCH (1) ON (see your -10).
7. Measure voltage between circuit lead 135 (2) and ground.
8. Does multimeter read 17 or more volts?





NO →

2CYN

1. Repair NBC wiring harness (WP 0294 00).
2. Verify no faults found.

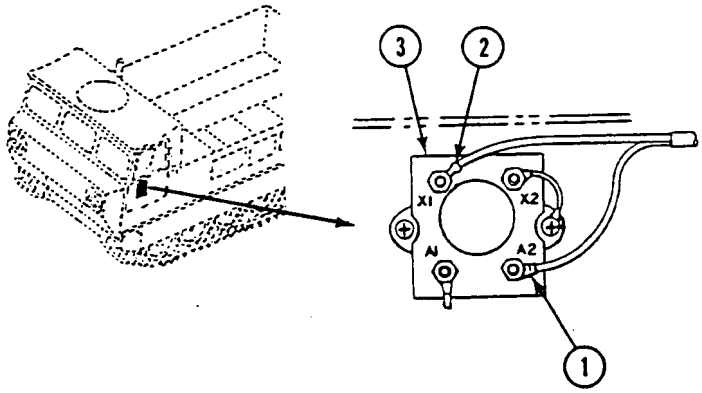
YES ↓

3CY

1. Replace defective M3 heater (WP 0532 00).
2. Verify no faults found.

DY

1. Turn NBC AIR FILTER SWITCH (1) OFF (see your -10).
2. Turn MASTER SWITCH OFF.
3. Connect NBC wiring harness connector P1 to M3 heater wiring harness connector.
4. Measure voltage between circuit lead 135G (1) to ground and circuit 537 (2) to ground on relay (3).
5. Turn MASTER SWITCH ON.
6. Turn NBC AIR FILTER SWITCH (1) ON (see your -10).
7. Does multimeter read 17 or more volts?



NO → GO TO **EY** (PAGE 0104 00-6)

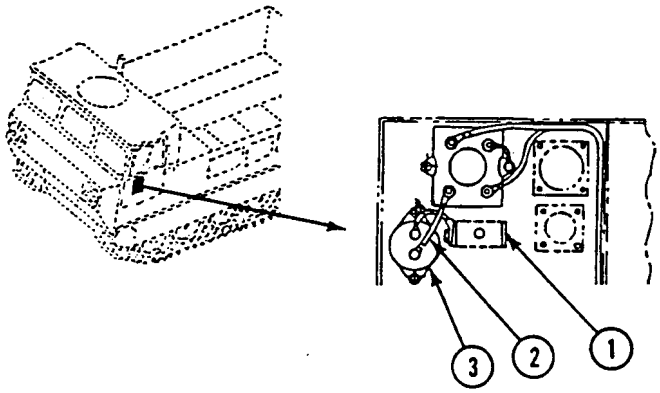
YES

2DY

1. Repair wiring harness (WP 0294 00).
2. Verify no faults found.

EY

1. Measure voltage from bus bar (1) to circuit output lead (2) on circuit breaker (3).
2. Does multimeter read 17 or more volts?



NO →

EYN

1. Replace circuit breaker (WP 0530 00).
2. Verify no faults found.

YES ↓

2EY

1. Replace relay (WP 0530 00).
2. Verify no faults found.

NO AIR FLOW AT ONE OR MORE OUTLETS (M548A3) 0105 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10
TM 3-6680-316-10

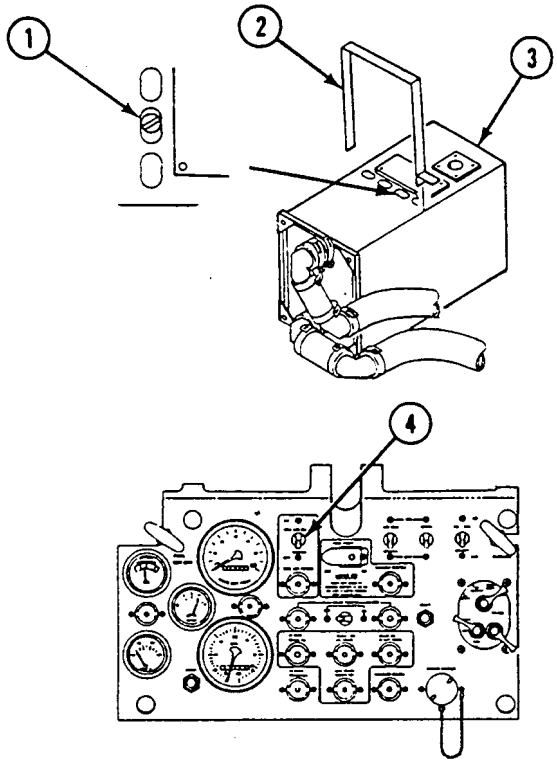
Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)

NOTE

Where more than one component exists, troubleshoot one path at a time.

T

1. Uncover air intake holes (1) by sliding spring clip (2) back on particulate precleaner (3).
2. Turn MASTER SWITCH ON.
3. Turn NBC AIR FILTER SWITCH (4) ON (see your -10).
4. Does fault still exist?



NO →

TN

1. Particulate precleaner adjustment needed. See TM 3-6680-316-10.
2. Verify no faults found.

YES ↓

NO AIR FLOW AT ONE OR MORE OUTLETS (M548A3)—Continued 0105 00

Y

1. Inspect all hoses and tighten all clamps.
2. Does fault still exist?

NO

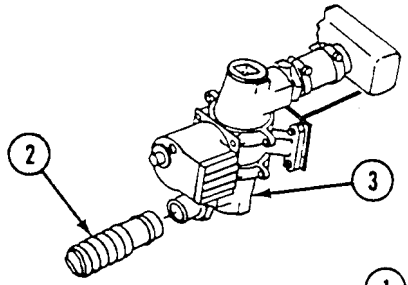
YN

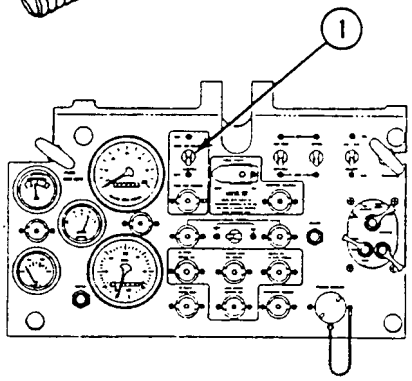
1. Clean, inspect, and repair all hoses (WP 0537 00).
2. Verify no faults found.

YES

2Y

1. Turn NBC AIR FILTER SWITCH (1) OFF (see your -10).
2. Remove outlet hose (2) from M3 heater (3) which has no air flow.
3. Turn NBC AIR FILTER SWITCH (1) ON (see your -10).
4. Does fault still exist?





NO

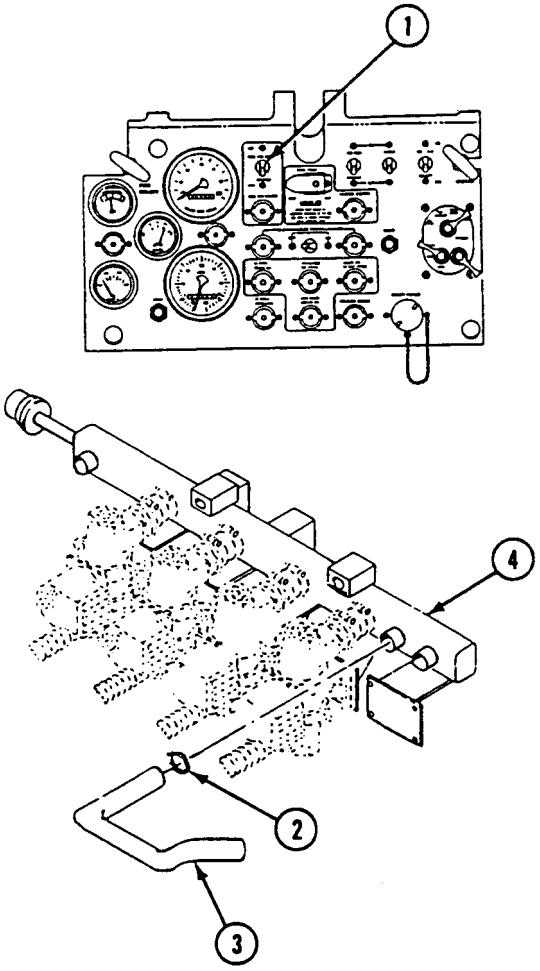
2YN

1. Repair and/or replace M3 heater outlet hose (WP 0537 00).
2. Verify no faults found.

YES

3Y

1. Turn NBC AIR FILTER SWITCH (1) OFF (see your -10).
2. Turn MASTER SWITCH OFF.
3. Loosen clamp (2) and remove hose (3) from manifold (4).
4. Turn MASTER SWITCH ON.
5. Turn NBC AIR FILTER SWITCH (1) ON (see your -10).
6. Is air flow from hose (3) restricted?



NO →

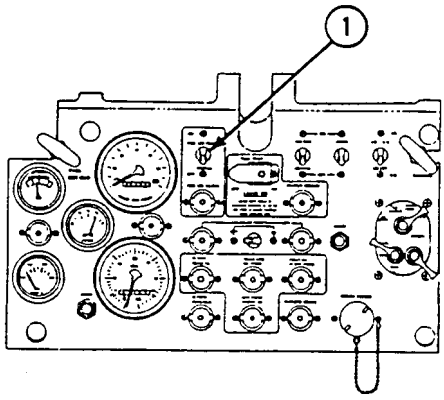
3YN

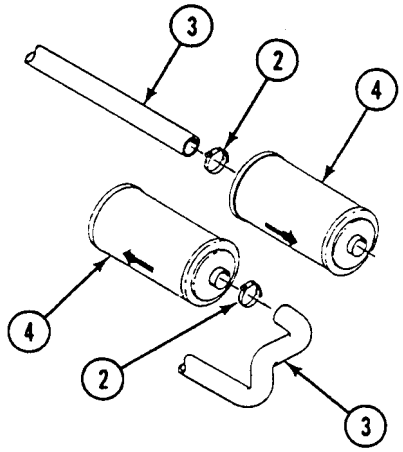
1. Turn NBC AIR FILTER switch OFF (see your -10).
2. Turn MASTER SWITCH OFF.
3. Cover air intake holes by sliding spring clip forward over holes on particulate precleaner.
4. Repair and/or replace manifold (WP 0533 00).
5. Verify no faults found.

YES ↓

4Y

1. Turn NBC AIR FILTER SWITCH (1) OFF (see your -10).
2. Loosen clamp (2) and remove inlet hose (3) from M18 filter (4).
3. Turn NBC AIR FILTER SWITCH (1) ON.
4. Is air flow from inlet hose (3) restricted?





NO

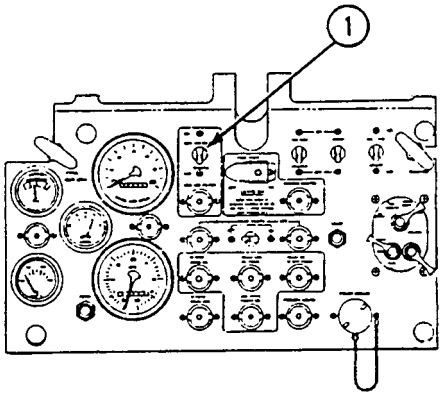
4YN

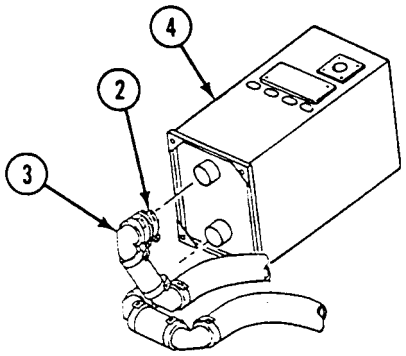
1. Turn NBC AIR FILTER SWITCH OFF (see your -10).
2. Turn MASTER SWITCH OFF.
3. Cover air intake holes by sliding spring clip forward over holes on particulate precleaner.
4. Repair and/or replace outlet hose from M18 filter (WP 0537 00).
5. Replace M18 filter (WP 0536 00).
6. Verify no faults found.

YES

5Y

1. Turn NBC AIR FILTER SWITCH (1) OFF (see your -10).
2. Loosen clamp (2) and remove outlet hose (3) from particulate precleaner (4).
3. Turn NBC AIR FILTER SWITCH (1) ON (see your -10).
4. Is air flow from particulate precleaner restricted?





NO

5YN

1. Turn NBC AIR FILTER SWITCH OFF (see your -10).
2. Turn MASTER SWITCH OFF.
3. Cover air intake holes by sliding spring clip forward over holes on particulate precleaner.
4. Repair and/or replace inlet hose from M18 filter (WP 0537 00).
5. Replace M18 filter (WP 0536 00).
6. Verify no faults found.

YES

6Y

1. Particulate precleaner adjustment needed. See TM 3-6680-316-10.
2. Verify no faults found.

LOW AIR FLOW AT ALL OUTLETS (M548A3) 0106 00

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Multimeter (WP 0541 00, Item 29)

Personnel Required
Unit Mechanic

References
See your -10
TM 3-6680-316-10

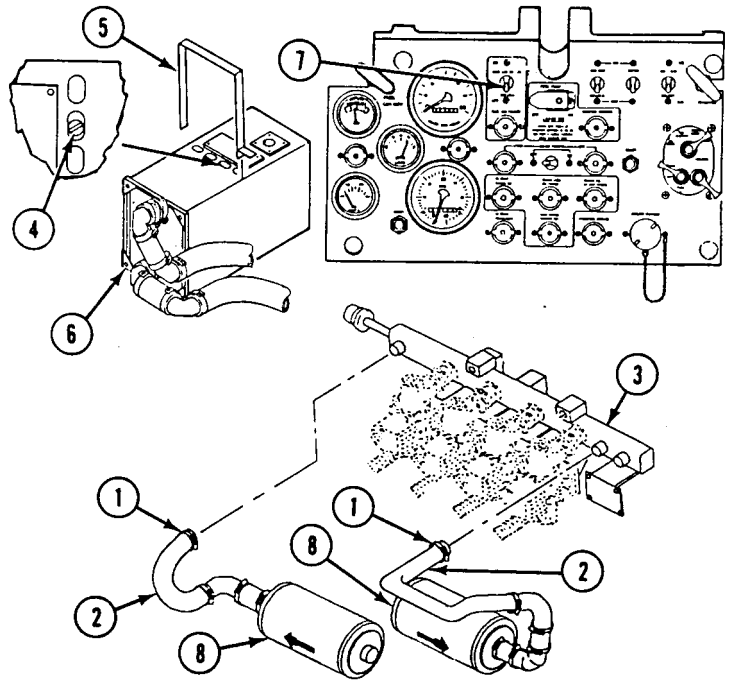
Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)

NOTE

Where more than one component exists, troubleshoot one path at a time.

T

1. Loosen clamp (1) and remove hose (2) from NBC manifold (3).
2. Uncover air intake holes (4) by sliding spring clip (5) back on particulate precleaner (6).
3. Turn MASTER SWITCH ON.
4. Turn NBC AIR FILTER SWITCH (7) ON (see your -10).
5. Is air flow from M18 filter (8) restricted?



NO →

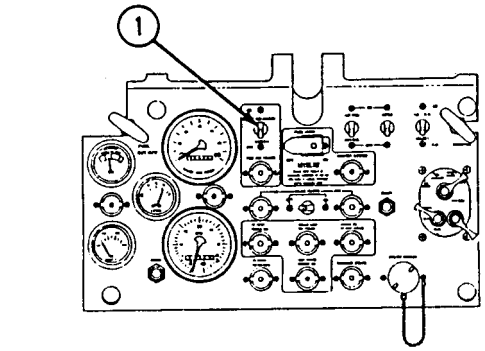
TN

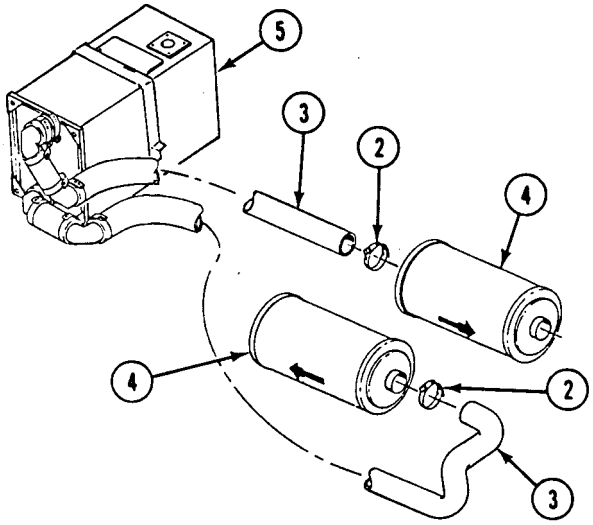
1. Turn NBC AIR FILTER SWITCH OFF (see your -10).
2. Turn MASTER SWITCH OFF.
3. Cover air intake holes by sliding spring clip forward over holes on particulate precleaner.
4. Replace manifold (WP 0533 00).
5. Verify no faults found.

YES ↓

Y

1. Turn NBC AIR FILTER SWITCH (1) OFF (see your -10).
2. Loosen clamp (2) and remove inlet hose (3) from M18 filter (4).
3. Turn NBC AIR FILTER SWITCH (1) ON (see your -10).
4. Is air flow from particulate precleaner (5) restricted?





NO

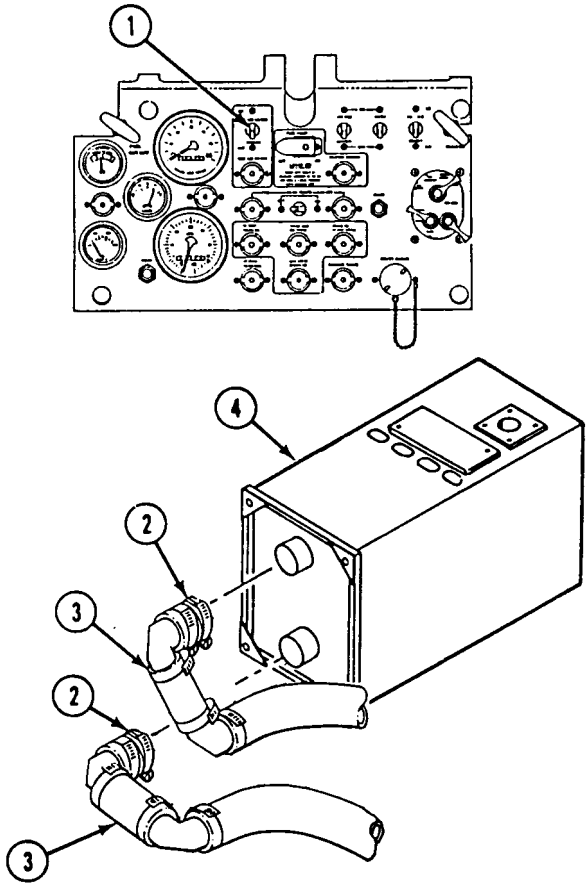
YN

1. Turn NBC AIR FILTER SWITCH OFF (see your -10).
2. Turn MASTER SWITCH OFF.
3. Cover air intake holes by sliding spring clip forward over holes on particulate precleaner.
4. Repair and/or replace outlet hoses from M18 filter.
5. Replace M18 filter (WP 0536 00).
6. Verify no faults found.

YES

2Y

1. Turn NBC AIR FILTER SWITCH (1) OFF (see your -10).
2. Loosen clamp (2) and remove outlet hose (3) from particulate precleaner (4).
3. Turn NBC AIR FILTER SWITCH (1) ON (see your -10).
4. Is air flow from particulate precleaner (4) restricted?



NO →

2YN

1. Turn NBC AIR FILTER SWITCH OFF (see your -10).
2. Turn MASTER SWITCH OFF.
3. Cover air intake holes by sliding spring clip forward over holes on particulate precleaner.
4. Repair and/or replace inlet hoses to M18 filter.
5. Replace M18 filter (WP 0536 00).
6. Verify no faults found.

YES ↓

3Y

1. Particulate precleaner adjustment needed. See TM 3-6680-316-10.
2. Verify no faults found.

INTRODUCTION STE/ICE–R (SIMPLIFIED TEST EQUIPMENT FOR INTERNAL COMBUSTION ENGINES-REPROGRAMMABLE) PROCEDURES 0107 00

GENERAL

STE/ICE–R, a testing system for internal combustion engines, provides measurements on voltage resistance, pressure, temperature and speed to analyze the condition of an engine system.

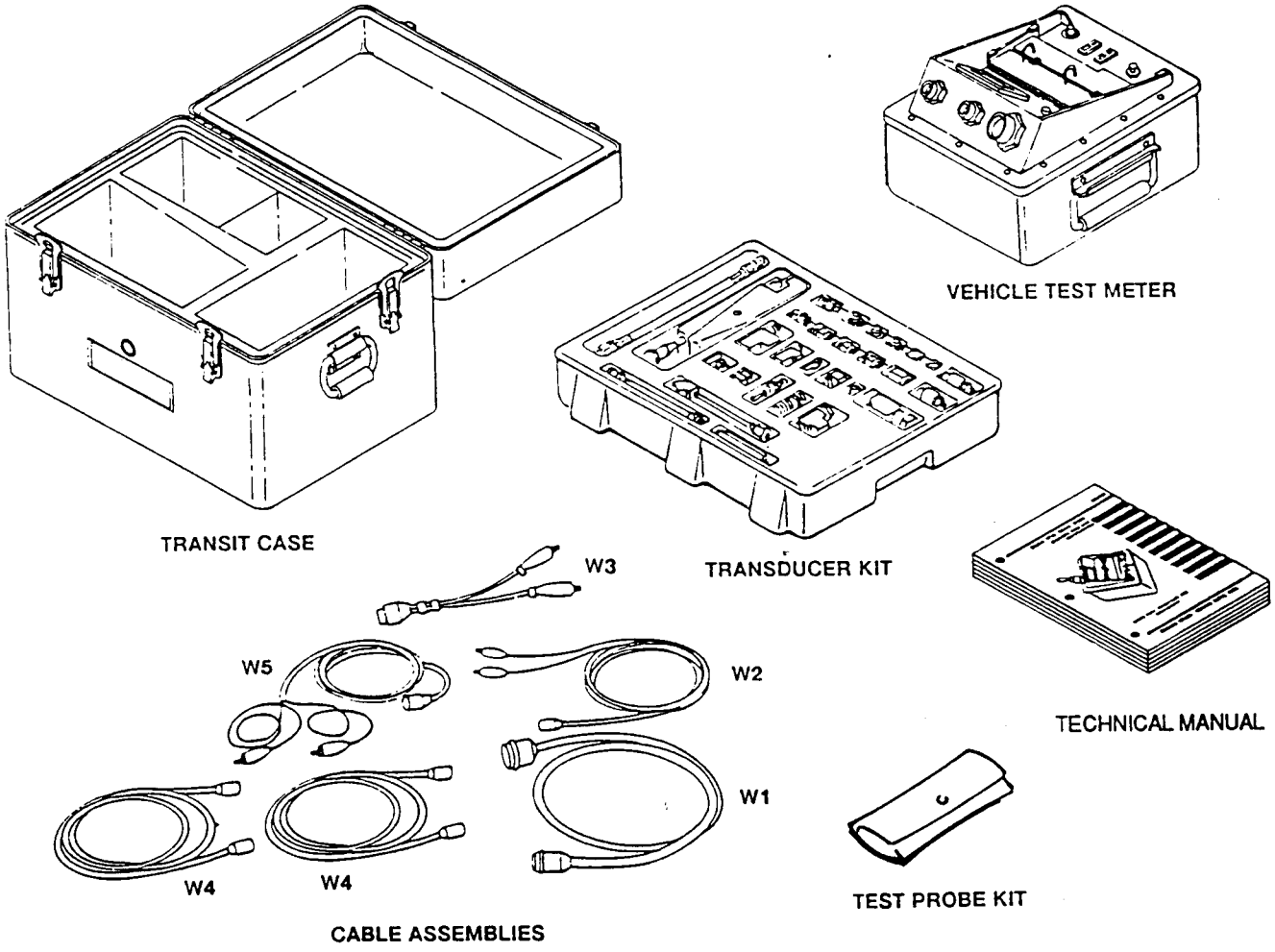
STE/ICE–R, a testing system for internal combustion engines, provides measurements on voltage resistance, pressure, temperature and speed to analyze the condition of an engine system.

This section provides a general overview of STE/ICE–R equipment and operations, along with specific procedures in diagnosing and isolating malfunctions of the M548A1 or M548A3 engine.

STE/ICE–R will also provide a thorough preventative maintenance check on the M548A1 or M548A3 engine as part of service upon receipt and as an annual check in the PMCS.

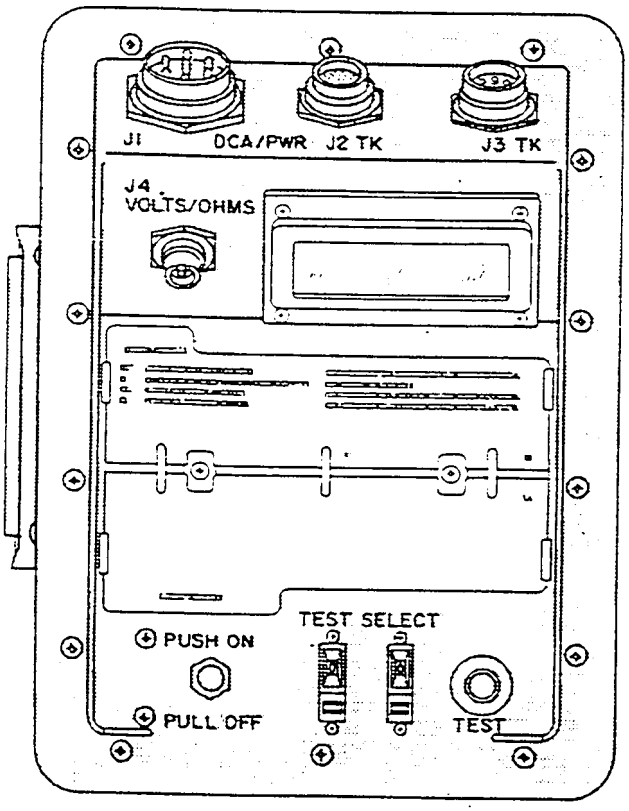
DESCRIPTION OF STE/ICE–R EQUIPMENT

The STE/ICE–R set consists of a vehicle test meter (VTM), five cable assemblies, transducer kit (TK), TM 9-4910-571-12&P manual, test probe kit and transit case.



Vehicle Test Meter (VTM)

The VTM is the diagnostic meter of STE/ICE–R used for testing electrical and mechanical components of the M548A1 or M548A3 engine. The VTM consists of three switches, a readout display, flip cards, and four cable connectors.



a. SWITCHES. The three switches are a PUSH ON/PULL OFF switch, TEST SELECT switch and TEST button. The PUSH ON/PULL OFF switch is used to control power to the VTM from the power source. The TEST SELECT switch are two ten-position switches used to select the test to be performed. The TEST button has two functions: (1) when pressed and released, it initiates selected test; (2) when pressed and held, it initiates an offset test.

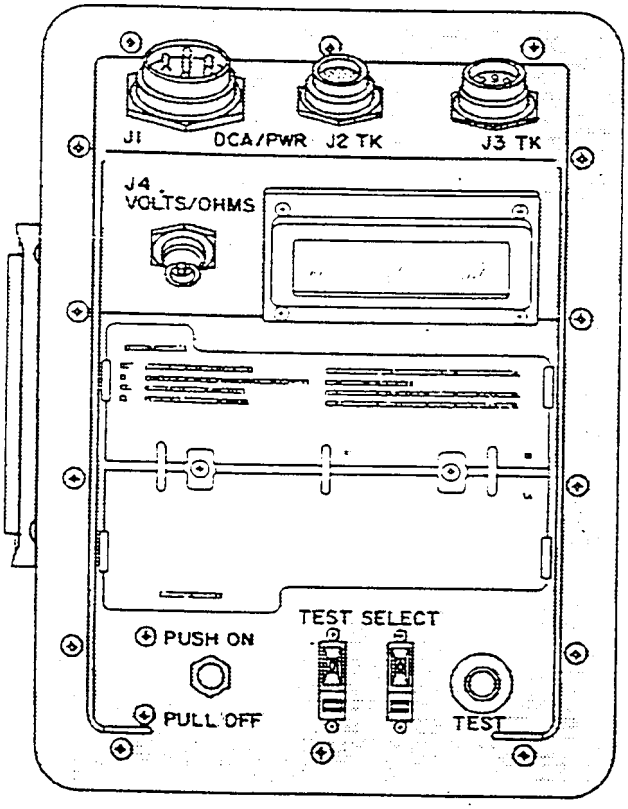
b. READOUT DISPLAY. The readout display gives five different types of messages during testing and up to a maximum of four characters per message. The readout display messages can be found on (WP 0107 00). The types of messages are:

- error,
- status,
- numerical,
- prompting, and
- confidence test error.

c. FLIP CARDS. The flip cards, attached to the front of the VTM, provide a quick but limited reference for the operator. These flip cards list test numbers, messages, and some procedures. Test limits are also provided for some vehicles.

d. CABLE CONNECTORS. The four cable connectors on the VTM are DCA/PWR J1, transducer cable connectors J2 TK and J3 TK, and VOLTS/OHMS J4.

- DCA/PWR connector J1 – used to connect VTM to either a vehicle diagnostic connector with the DCA cable W1 or to a DC power source with the power cable W5. The DC power source is usually the vehicle's batteries.
- Transducer cable connectors J2 TK and J3 TK – used to connect transducer cables W4 to VTM. Power and signals are routed through these connectors. Both connectors may be used when a test requires two measurements to be made at the same time.
- VOLTS/OHMS connector J4 – used to connect test probe cable W2 to VTM for voltage and resistance tests.



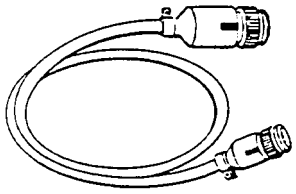
INTRODUCTION STE/ICE–R (SIMPLIFIED TEST EQUIPMENT FOR INTERNAL COMBUSTION ENGINES-REPROGRAMMABLE) PROCEDURES—Continued **0107 00**

Cable Assemblies

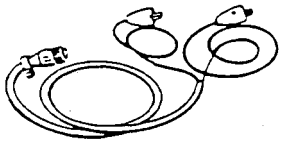
In procedures in this manual, the cable assemblies are referred to by a number for quick identification. Each cable also has a name which describes its use. A reference to W1, for example, would indicate the DCA cable. Connectors on the cable are identified by a number preceded by either a P or an E, such as P1 or E2.

The cable assemblies included in the STE/ICE–R are:

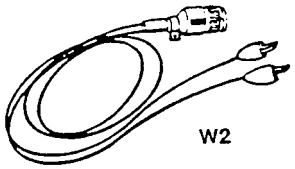
- W1 — DCA cable,
- W2 — test probe cable,
- W3 — ignition adapter cable,
- W4 — transducer cable (two), and
- W5 — power cable.



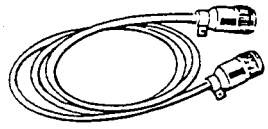
W1



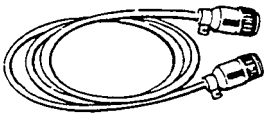
W5



W2



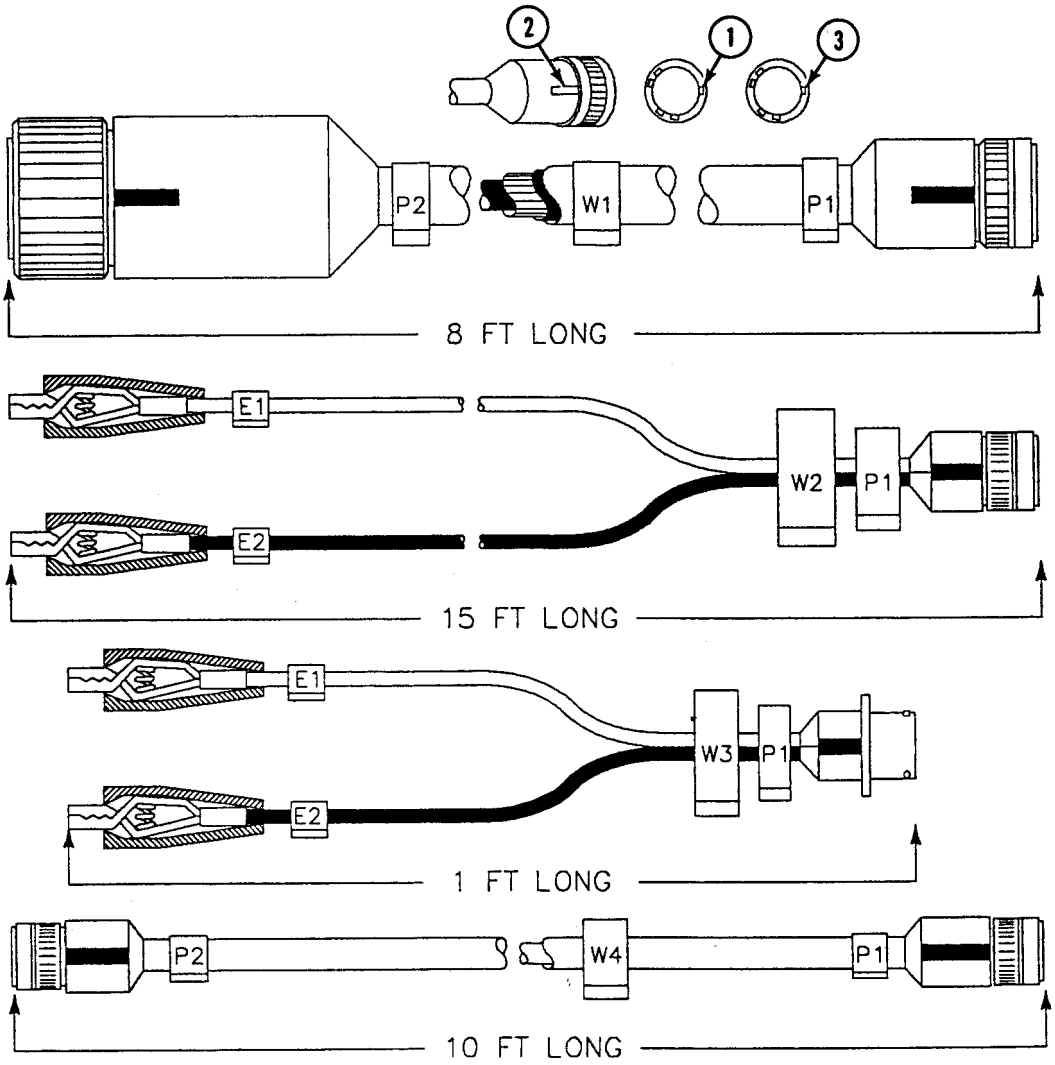
W4



W4

W3

When cables are connected, the large key (1) located by the white stripe (2) on the cable connector mates with large keyway (3) of connector on VTM or transducer.



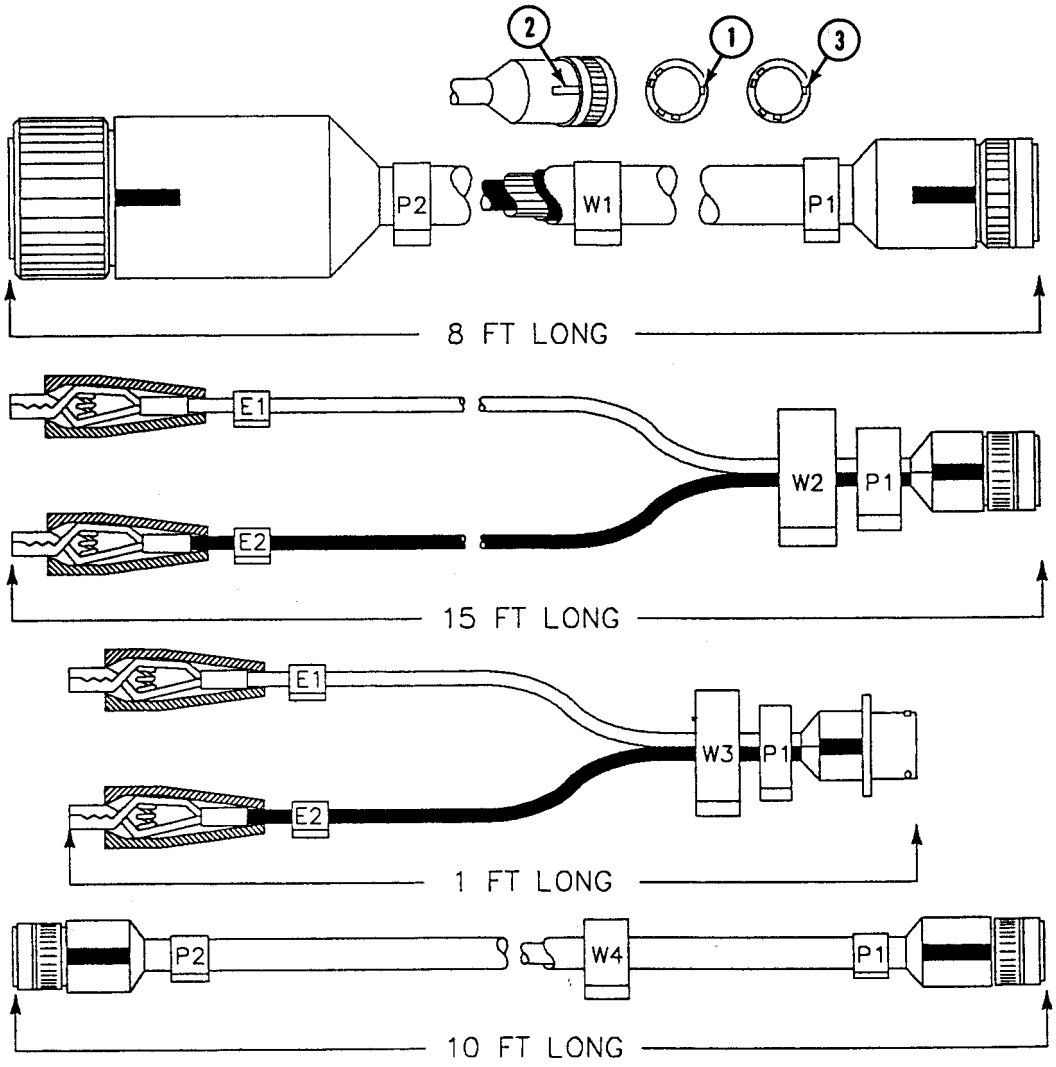
a. DIAGNOSTIC CNCTR ASSY CABLE W1. The W1 is used to power the VTM and provide access to test points and sensors connected to vehicle/equipment-mounted DCA.

b. TEST PROBE CABLE W2. The test probe cable for both general and special measurements. It is used for measuring voltages, frequency, resistance and continuity, and also for the first peak series and compression unbalance tests. W2 is divided into two color coded leads: red for E1 and black for E2. Test clips E1 and E2 of W2 attach to points on the vehicle/equipment being tested.

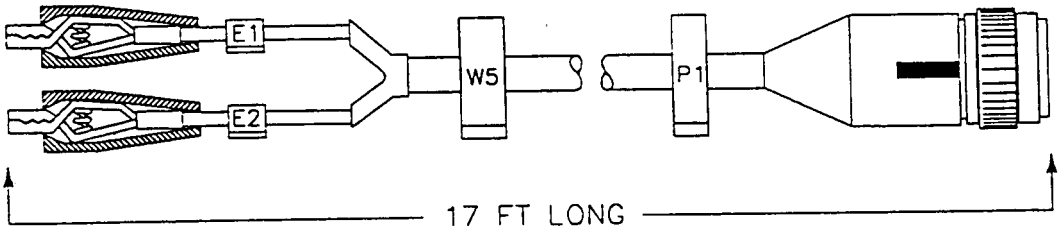
c. IGNITION ADAPTER CABLE W3. The ignition adapter cable W3 is used in measuring dwell angle, points voltage, engine rpm and power tests. W3 is divided into two color coded leads: red for E1 and black for E2.

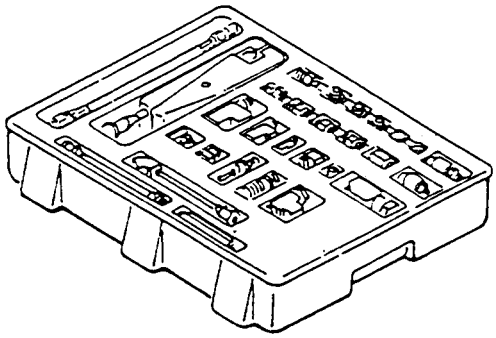
d. TRANSDUCER CABLES W4.

The transducer cables W4 are used as extensions to connect the VTM to a pressure transducer, pulse tachometer, current probe or ignition adapter cable. If necessary, two transducer cables can be joined using connector adapter, TK item 29.

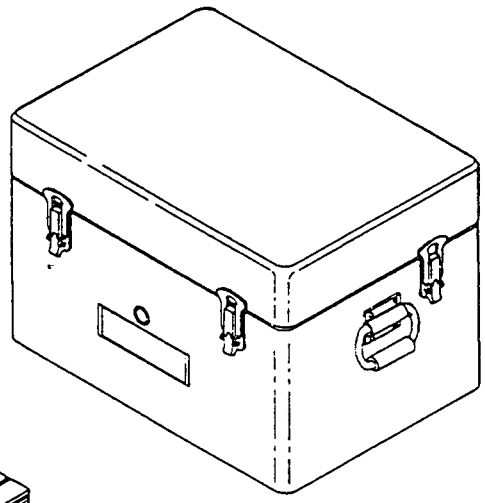


e. POWER CABLES W5. The power cable W5 is used to power the VTM when cable W1 is not being used. Cable W5 is divided into two leads with color coded clips: red for E1 and black for E2. Battery clips E1 and E2 are attached to a vehicle/equipment battery or a 9 to 32 volt 4A regulated power supply. Do not connect the VTM to a battery charger. Damage to the VTM may result.

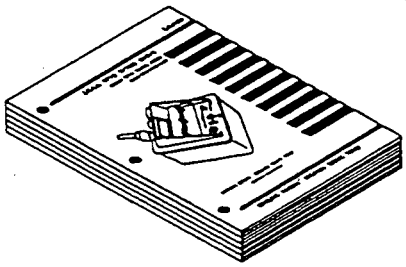




TRANSDUCER KIT



TRANSIT CASE



TECHNICAL MANUAL

Transducer Kit (TK)

The TK is a tray inside the transit case that contains transducers, adapters, and fittings. The TK is stored in a molded tray in the top of the case.

Many of the fittings do not have part number markings on them and are referred to by TK item number and name. Each fitting is identified by TK item number and part number.

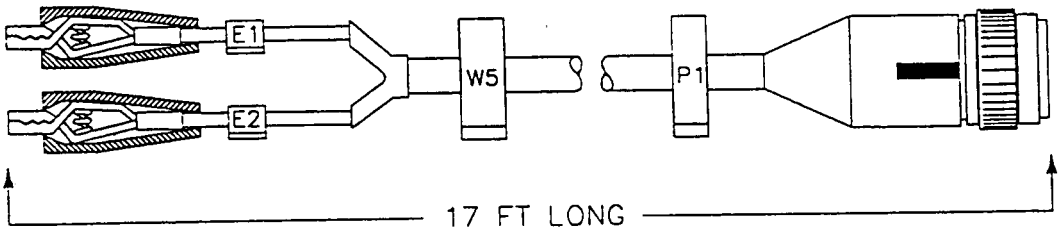
Manual

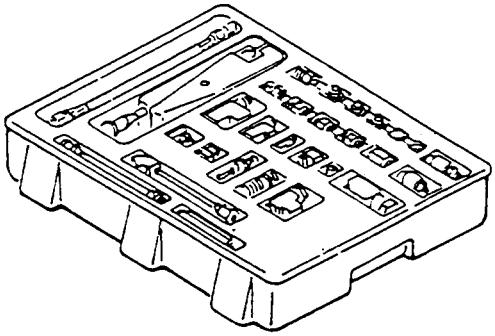
TM 9-4910-571-12&P contains operating instructions, operator and organizational maintenance instructions, and repair parts and special tools information.

Transit Case

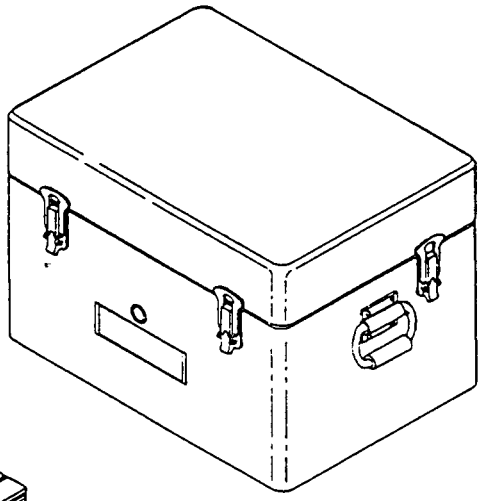
The STE/ICE–R is housed in a portable protective transit case which contains all necessary accessories and instructions.

A pressure relief valve located on the front of the case allows the operator to release any pressure or vacuum resulting from changes in climate during transit.

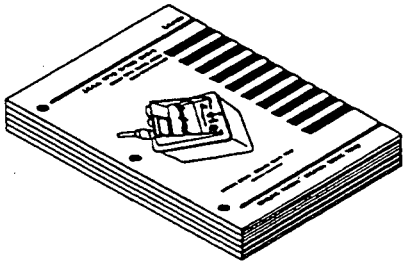




TRANSDUCER KIT



TRANSIT CASE



TECHNICAL MANUAL

READOUT DISPLAY MESSAGES

Error Messages

Error messages indicate the VTM needs additional or corrected information before testing can continue or additional procedures are required.

All error messages are displayed as an E followed by three numbers (for example, E003).

DISPLAY	MEANING
E000	VTM has been asked for information that it does not have. For example, you have requested the vehicle/equipment ID and it has not been entered.

E001	A test number which does not exist has been entered on the TEST SELECT switches.
E002	The required transducer is not connected.
E003	Test number wrong for DCA connected. This can occur if test selected does not apply to the class of vehicle/equipment under test or if the DCA harness does not have the required transducer.
E004	No longer used. If message appears turn in test set.
E005	Required offset test was not performed.
E007	The VID number and number-of-cylinders information entered do not agree.
E008	VTM is not receiving required voltage signal for selected test. This message can occur on tests, 14, 15, and 72 thru 79.
E009	VTM is not receiving engine speed signal. This applies only to engine power test and SI full power simulation.
E010	A wrong VID number was entered. The VTM will only accept numbers between 01 and 99. If E010 is displayed when the VID entered was between 01 and 99, it means that the VID does not agree with the identity of the DCA harness powering the VTM. The VTM will accept this, allowing you to power through the DCA while testing another vehicle.
E011	Throttle control was operated incorrectly. It was taking too long to accelerate or decelerate during power test.
E012	The SI ignition adapter, TK item 30, or CI pulse tachometer, TK item 34, is missing or is not connected to the VTM.
E013	VTM is unable to use data received.
E014	The wrong number of cylinders was entered.
E015	No longer used. If message appears, turn in test set.
E017	VTM is not receiving ignition information during dwell test.
E018	Test discontinued due to no information being detected by VTM. This will occur after several minutes of no-signal operation.
E020	No first peak information was detected by the VTM.
E021	VTM cannot calculate result. Current is over current probe’s range, and VTM did not sample correct portion of data.
E022	External voltage was detected in the circuit under test while measuring resistance.
E023	VTM’s constant voltage source is not working.
E024	Test is not valid for VID entered.
E027	Error is entry of compression unbalance constants.
E028	Test just entered cannot be used with control function 06.
E030	VID entered conflicts with speed transducer attached.
E032	Carrier’s cranking speed is varying too much for a compression unbalance measurement.

E033	Error in entry of power test constants.

Status Messages

Status messages keep the operator informed of what is happening.

DISPLAY	MEANING
.8.8.8.8	There is power to the VTM, and the display is working properly. This appears only for a short period after power is turned on.
.9.9.9.9	VTM is reading a test value beyond its range.
PASS	Unit under test has passed test, or VTM has accepted a control function entry.
FAIL	Unit under test has failed test.
CON	Accepted control function input.
AUE	Numerical display is an average value.
LO	Engine speed below 1600 rpm during SI power test indicates the engine failed the power test.
–1–1–1–1–1	VTM is busy.

Numerical Readouts

Units of measurement (psi, rpm, Volts, etc.) are not displayed. Numerical readouts indicate the measured value in units of the measurement being made. For example, if you are measuring 0–45 volts dc, 12.7 is volts dc. If you are measuring 0–25 psig pressure, 12.7 is psig. The units for each test are listed on the flip cards. Also, the readout will alternate between displaying values and displaying vehicle identification data (VID).

Prompting Messages

Prompting messages tell the operator to do something. After the operator action is completed, testing will continue. Some of the prompting messages and their meanings are as follows:

DISPLAY	MEANING
UEH	Tells the operator to enter VID on the TEST SELECT switches.
CYL	Tells the operator to enter the number-of-cylinders into the VTM.
GO	Tells the operator to crank engine.
0066	Tells the operator to set TEST SELECT switches to 99 during confidence test.
CAL	Tells the operator to release the TEST button during an offset test.
CIP	Tells the operator to apply full throttle in a CI power test.

Confidence Test Error Messages

Confidence test messages are displayed either as PASS or by a C followed by three numbers (#). A C### is an error message used by VTM repair personnel as an aid in troubleshooting.

If a C### message appears during confidence test or during normal operation, go to confidence test fault isolation, TM 9-4910-571-12&P, for the necessary corrective action.

TEST METHOD

The test method consists of a pre-test inspection and STE/ICE–R testing.

Pre-test Inspection

Before using STE/ICE–R to test the carriers, perform the following pre-test inspections:

a. FAN BELTS. Check for proper tension. Replace if cracked of frayed.

b. OIL LEVEL. Bring up to proper level if low.

c. FUEL LEVEL. Check that the fuel tank has enough fuel for testing.

d. RADIATOR. Bring up to proper level if low.

e. BATTERY. Replace the battery if the case is cracked or the terminal posts are damaged. Clean off all corrosion. Check that the battery connections to ground and starter motor are in good condition, securely connected, and clean. Check the electrolyte level. See TM 9-6140-200-14. If low, bring up to proper level with distilled water.

Vehicle Test Card (VTC)

Once familiar with STE/ICE–R testing procedures, the vehicle test card (located on (WP 0107 00)) can be used as a quick reference.

The front of the test card contains all of the information, in abbreviated format, that the user will need to perform common measurements on the carrier. The organization from the top of the card to the bottom represents a logical order of steps from powering up the VTM to completing a series of tests.

The top of the card describes the power up sequence of STE/ICE–R for the carrier. Next, a table is provided which lists many measurements that are useful in troubleshooting the carrier. The table includes the associated VTM test number, any required offset test limits, operating condition of the engine, special connections required, the expected limits for pass or fail, and the units of measurement. Also included on the front of the card are hook-up diagrams.

The organization of the table allows measurements with the carrier engine turned off to be performed first. These measurements will ensure that the starting system of the carrier is in working order before proceeding. The order of the other measurements is as follow:

Measurements with the engine running but not warm.
Measurements requiring the engine to be warm and running.
Measurements requiring the engine to be warm and not running.
Miscellaneous measurements.

The back of the VTC contains the hookups for measurements used to troubleshoot carrier components. Measurements that require special hookups are also included on this side of the VTC.

STE/ICE–R ENGINE TROUBLESHOOTING METHOD

When a malfunction in the engine is recognized by the mechanic, the “flip cards to Troubleshooting” will provide a reference to a specific procedure to isolate the cause of the malfunction.

To start the STE/ICE–R engine troubleshooting method, do the following:

a. PERFORM HOOK UP. First, perform HOOK UP to set up STE/ICE–R and check to see if it is in working order.

b. PERFORM PROCEDURE. Now that STE/ICE–R is hooked up properly and checks out, perform the procedure cited in the “Quick Guild Troubleshooting.”

The rules to follow when using STE/ICE–R engine troubleshooting method are:

(1) Never enter in the middle of a procedure.

(2) Follow each instruction in a procedure. Do not skip any instructions or procedures.
(3) After correcting a problem with a procedure, test run the component, engine or power plant to ensure the problem does not still exist.

BATTERY TEST CARDS

The STE/ICE–R battery test procedures allow the user to evaluate the condition and state of charge of carrier/equipment batteries. These procedures use the battery internal resistance and battery resistance change measurements. Battery internal resistance evaluates the state of charge of the battery. Battery resistance change evaluates the battery condition.

Battery state of charge is a measure of the amount of energy stored in the battery. A fully charged battery contains the maximum amount of energy stored. If the battery fails the battery state of charge evaluation, the battery may be recharged to return the battery to full charge.

The battery condition is a measure of the battery's ability to accept and maintain a good charge. A battery in poor condition may be able to be fully recharged. However, a battery in poor condition with a full charge will lose its charge more quickly than a better in good condition with a full charge. If a battery fails the battery condition evaluation, then the battery should be replaced.

The procedures for testing batteries are listed on three battery test cards. Each card describes procedures for evaluating different combinations of batteries:

Complete battery pack,
Series pair of batteries, and
Individual batteries.

BATTERY PARKS

A battery pack is the combination of four or more batteries in a particular circuit of a carrier/equipment, i.e. the starting circuit. Testing the batteries in a pack evaluates the general condition of the pack as a whole. Note, the results of a battery pack test may be misleading. A single battery from a pack of four may be bad even though the pack as a whole may pass the tests. This can happen if the other three batteries in the pack are in very good condition. In order to test a battery pack, the current probe must be clamped around a single cable carrying all of the starter current. If such a connection cannot be made, then test each pair of batteries separately.

SERIES PAIRS

A series pair is one in which the negative terminal of one battery is connected by a cable to the positive terminal of another battery. This test configuration should be used when any of the following conditions exists:

There are only two batteries (one series pair) in the carrier/equipment.
An evaluation of the pack is desired, but the current probe cannot measure the total starter current. This condition can occur if the cable is not readily accessible or if the cable is physically too large.
The battery pack test has failed, and the user wants to further identify any bad battery pair.

Note: Testing each series pair yields a better evaluation than testing the pack as a whole.

INDIVIDUAL BATTERIES

An individual battery test refers to the process of testing one battery at a time. The battery could be part of a pack, a series pair, or a single battery. Test the batteries individually if a battery series pair failed the tests and it is desired to isolate to a single battery (or if there is only one battery in the circuit). Testing individual batteries gives the best evaluation.

DESCRIPTION OF TEST CARDS

The front of each test card has three sections. The top of the card explains how to connect the VTM to the batteries being tested. The middle part of the card describes the procedure to follow in order to evaluate the batteries. The bottom of the card contains illustrations showing typical carrier hookups.

The back of each card also has three sections. The upper left-hand block lists the possible VTM displays and explains their meanings. This block suggests corrective action for the user. The right-hand side of the card contains battery test limits for three common military batteries. These limits may be used if the carrier/equipment TM does not provide limits. The lower left-hand portion of the card contains a table showing how to apply the limits to evaluate the battery condition and state of charge.

BATTERY EVALUATION PROCEDURE

Use Procedures On Battery Test Card To Hook-up VTM.

The following information will enable the user to determine the correct tests:

Use series 73 and 75 for the following conditions:

(1) Testing a battery pack that is also powering the VTM.
(2) Testing a battery series pair that is also powering the VTM.
(3) Testing an individual battery that is the only battery in the circuit and is powering the VTM.

Use series 77 and 79 for the following conditions:

(1) Testing a battery pack that is not powering the VTM.
(2) Testing a battery series pair that is not powering the VTM.
(3) Testing an individual battery that is not the only battery in a circuit or is not powering the VTM.

Use Test Procedure On Battery Test Card To Complete Evaluation.

Evaluate battery condition using battery resistance change test (#75 or #79). Note the result.
Evaluate battery state of charge using the battery internal resistance test (#73 or #77). Note the result.
Compare test results to limits in carrier/equipment TM. If carrier/equipment TM does not have test limits, use test limits provided in this section. If the battery internal resistance test passes, then the batteries are fully charged. If the battery internal resistance test fails, then the batteries are not adequately charged. If the battery resistance change test passes, then the batteries are good and will retain their charge. If the battery resistance change test fails, then the batteries are bad and will not retain their charge.
If batteries are out of limits, perform one or all of the following:

(1) Check battery electrolyte level.
(2) Check battery connections and terminals. Clean or tighten if necessary. Check connections between VTM and batteries.
(3) Refer to carrier/equipment TM to check battery specific gravity.
(4) Repeat battery resistance change and internal battery resistance tests one time. If internal battery resistance result (test #73 or #77) is out of limits, then charge batteries. If battery resistance change result (test #75 or #79) is out of limits, then continue testing to isolate bad batteries.

PRE-TEST INSPECTION

1 Fan Belts
2 Oil Level
3 Coolant Level
4 Fuel Level
5 Batteries

POWERING UP VTM

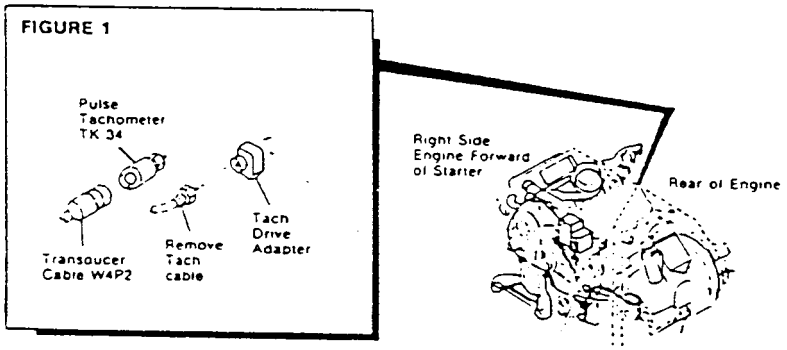
1 Connect VTM to W5 cable. W5 cable attaches to batteries as shown in figure 2.
2 Enter VID into VTM using test 60
3 Perform confidence test, test 66 (second entry 99)

MEASUREMENT NAME	VTM TEST NOS.	VTM OFFSET LIMITS	OPERATING CONDITION	SPECIAL CONNECTIONS REQUIRED	LIMITS MIN	LIMITS MAX	UNITS
Battery Voltage	67	–	Engine off		22	–	Volts
Current First Peak	72	±225	Crank on GO	Current probe — figure 2	700	1275	Amps
Vehicle Oil Pressure Warning Light	–	–	Idle-use test 10 to check idle speed	Pulse tachometer — figure 1	Light Goes Out		
Charging Voltage	01 67	–	Lights & accessories on 1000-1200 RPM	Pulse tachometer — figure 1	26.5	22.9	Volts
Vehicle Gage Coolant Temp	–	–	Warm engine		120	185	°F
Engine RPM (Average)	10	–	Governor	Pulse tachometer — figure 1	2950	3000	RPM
* Power	13	–	Engine warm	Pulse tachometer — figure 1	75	–	%
Engine RPM (Average)	10	–	Idle	Pulse tachometer — figure 1	650	700	RPM
Compression Unbalance	14	–	Warm Engine — Crank on GO		–	8	%
Cranking RPM	10	–	Cranking	Pulse tachometer — figure 1	100	–	RPM
Cranking Voltage	67	–	Cranking		18	–	Volts
Cranking Current	90	±225	Cranking	Current probe — figure 2	250	425	Amps
Battery Pack Internal Resistance	73	±225	Crank on GO	Current probe — figure 2	–	25.0	Milliohms
Starter Circuit Resistance	74	±225	Crank on GO	Current probe — figure 2	5	27.0	Milliohms
Battery Pack Resistance Change	75	±225	Crank on GO	Current probe — figure 2	–	50.0	Milliohms/sec

Test limits given are advisory only and are not necessarily the same as vehicle TM's specifications. If test limits are different, use vehicle TM's specifications.

* If vehicle has a turbocharger or fuel limiter, go to vehicle TM for procedure to do power test

FIGURE 1



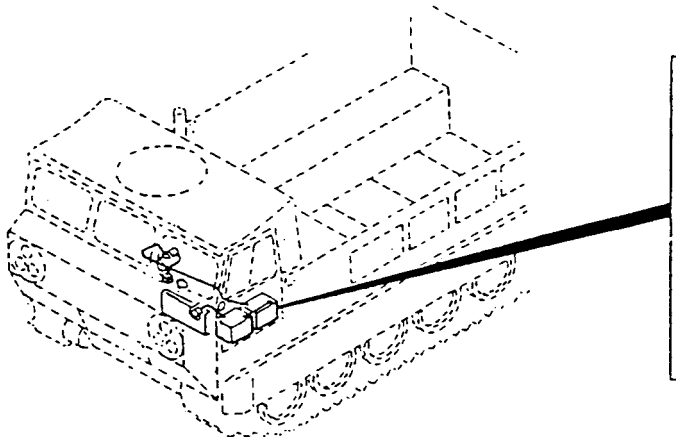
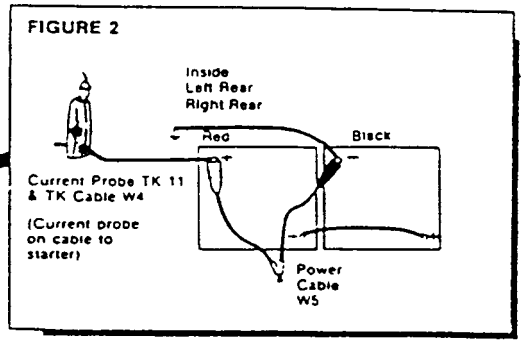
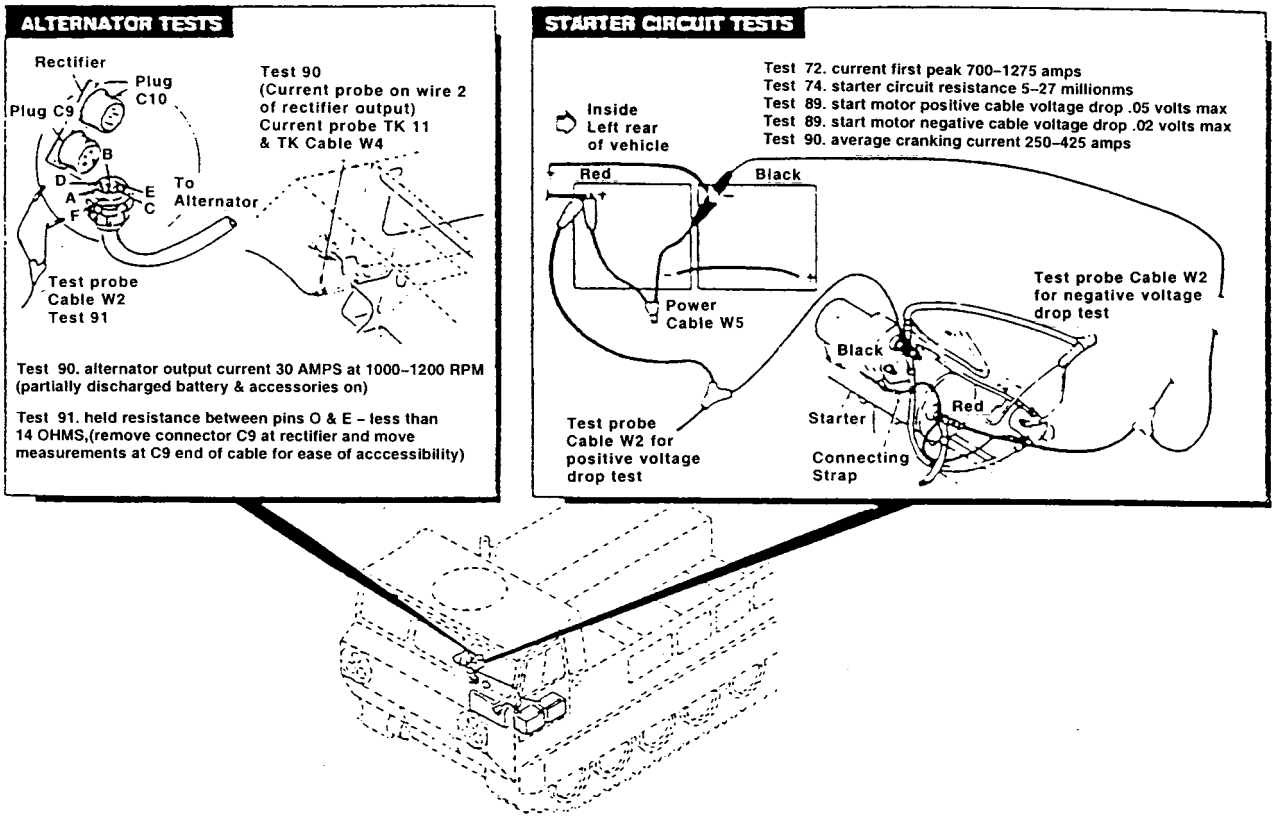
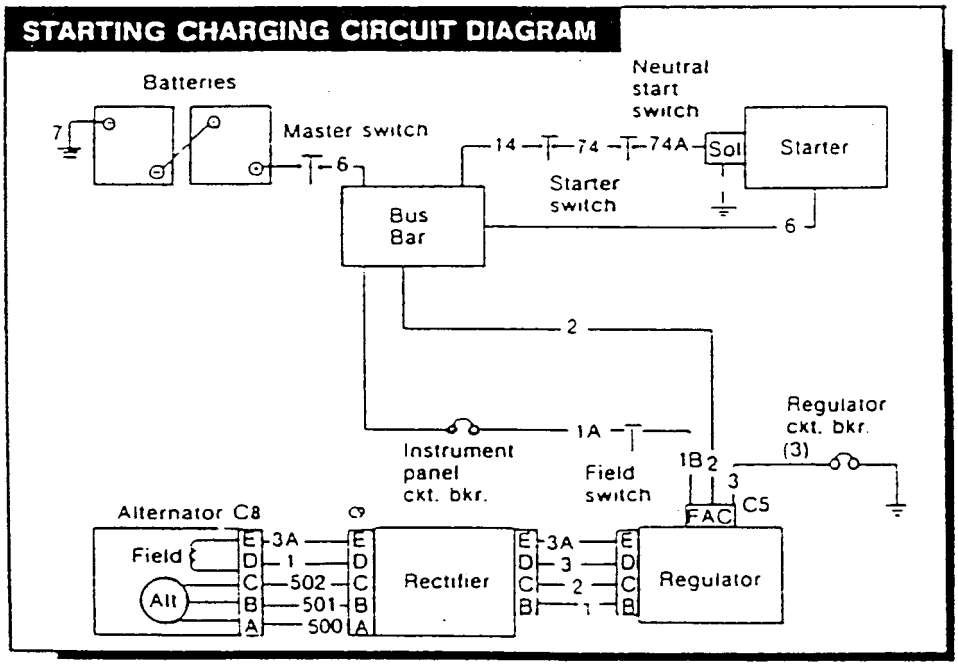


FIGURE 2



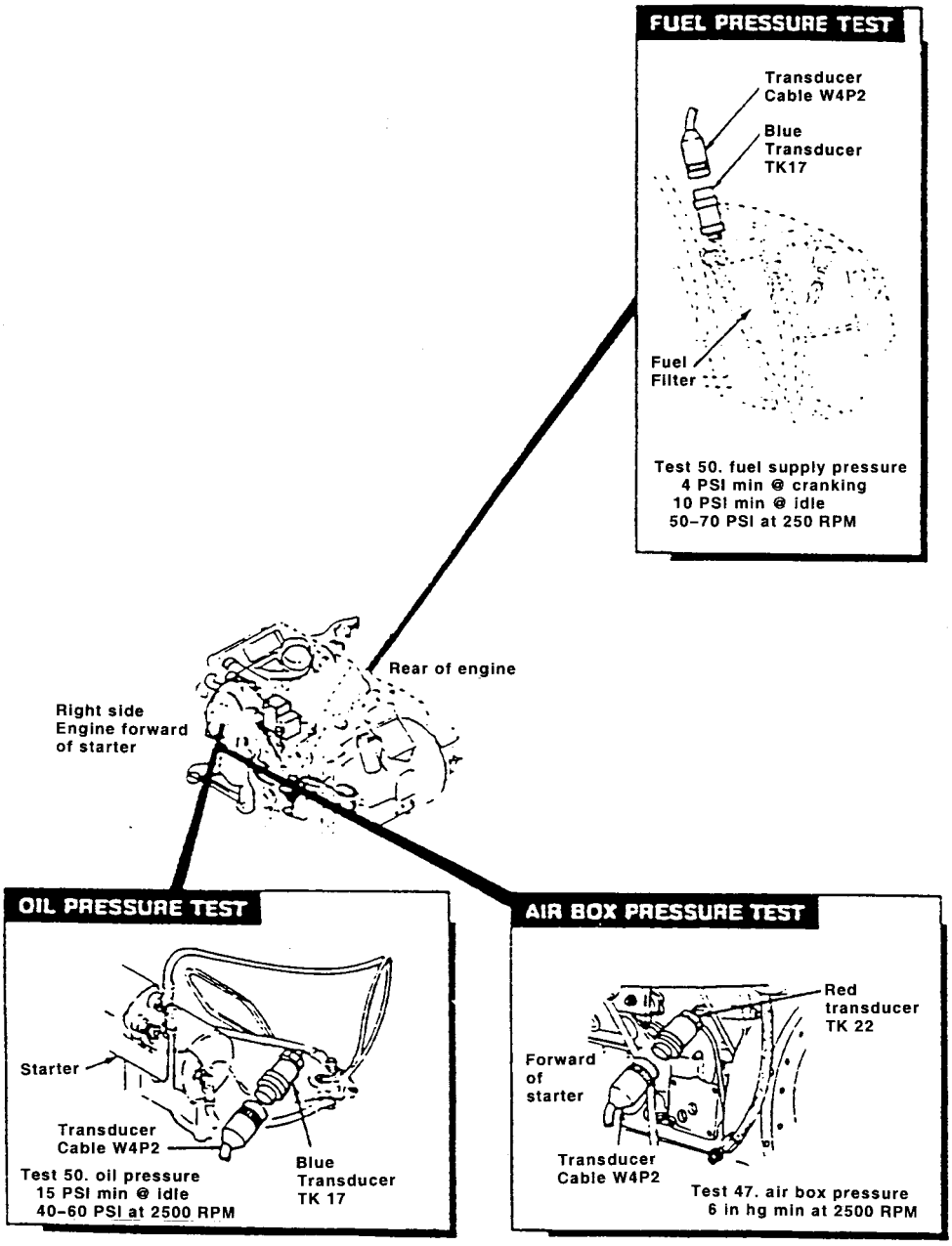
M113 (M548A1) VEHICLE TEST CARD – VID 03





Test limits given are advisory only and are not necessarily the same as vehicle TM's specifications. if test limits are different. use vehicle TM's specifications.

M113 (M548A1) VEHICLE TEST CARD – VID 03 ADDITIONAL TEST CONNECTIONS



Test limits given are advisory only and are not necessarily the same as vehicle TM's specifications. if test limits are different use vehicle TM's specifications.

M113 (M548A1) VEHICLE TEST CARD – VID 03 ADDITIONAL TEST CONNECTIONS

THE BATTERY INTERNAL RESISTANCE TEST (73 or 77) evaluates the state of charge of the battery series pair. The BATTERY RESISTANCE CHANGE TEST (75 or 79) evaluates whether the battery is good or bad, even if it is discharged. A good battery that is discharged may be recharged. A bad battery may hold a charge for a short time.

STE/ICE HOOKUP

1. The power to operate the STE/ICE-R VTM may be taken from the batteries being tested as shown in the appropriate figure below or from an alternate power source (such as another vehicle's batteries).
2. Perform VTM general setup, run confidence test, and enter vehicle ID.
3. Find a series pair of batteries. A battery series pair has the negative terminal of one battery connected to the positive terminal of another battery by a cable. For example, in figures 1 and 2 below, batteries A and B are a series pair; and in figure 1 below batteries C and D are a series pair.
4. a. If power to the VTM comes from a different set of batteries than the batteries under test, use tests 77 and 79 instead of tests 73 and 75. Connect test probe cable W2 to the batteries under test. Connect the red clip to the positive terminal closest to the starter and the black clip lead to the negative terminal closest to the ground.

   b. If power to the VTM comes from the same set of batteries as the batteries under test, use tests 73 and 75. The test probe cable W2 is not used.
5. Clamp the current probe around the cable connecting the two batteries. Point the arrow of the current probe along the cable leading towards the negative battery terminal as shown below in figures 1 and 2 for batteries A and B.

TEST PROCEDURE

1. Condition the current probe before running these tests.
2. Measure the battery resistance change by entering test number 75 or 79 (as described in the hookup procedure). Then engage the starter for about 5 seconds.
3. Measure the battery internal resistance by entering test number 73 or 77 (as described in the hookup procedure). Then engage the starter for about 5 seconds.
4. Compare the results of both measurements to limits in the vehicle/equipment TM or to limits on the reverse side of this card.
5. If either measurement is outside of normal limits, check battery terminals and connections, and check battery electrolyte level. Then perform both measurements a second time.
6. If the battery resistance change test (75 or 79) fails after the second measurement, then the battery series pair is in bad condition. Test each battery individually to determine which is good and which is bad or replace the battery series pair.
7. If the battery internal resistance test (73 or 77) fails after the second measurement, then the batteries should be recharged.

FIGURE 1

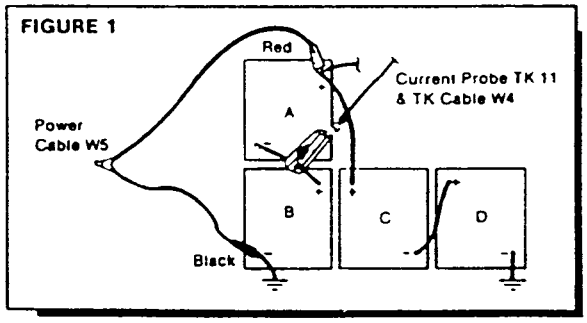
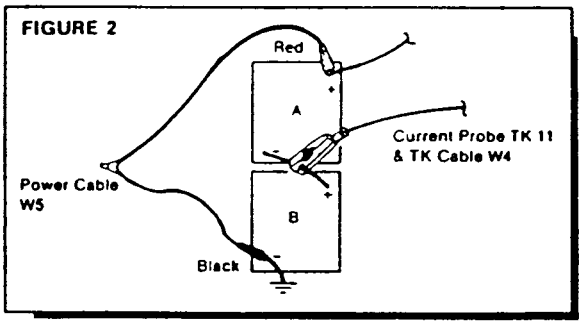


FIGURE 2



STE/ICE–R BATTERY SERIES PAIR TEST CARD

BATTERY TEST RESULTS

STE/ICE-R DISPLAY AFTER-TEST	WHAT IT MEANS
GO	1. The battery in series with the battery under test may be bad. Check that battery next. 2. There is a bad connection in the starter circuit somewhere. Check the battery negative cables, and cables to the starter for corroded or loose connections. If all of the cables and connections are o.k., then the starter is possibly faulty.
.9.9.9.9	1. There is a bad connection on the battery being tested. Clean and tighten the posts and clamps, and check the cable between the batteries. 2. The battery under test is in extremely poor condition.
14.2	If any number is displayed, then the number is a STE/ICE test result. Compare the test result to the values shown along the right edge of this card to determine a pass or fail. See table below to determine the condition of the battery.
E013	1. The battery being tested may be in a discharged state. Check battery electrolyte level; charge battery, and then retest. 2. If display shows E013 after battery has been charged, then the battery is in poor condition.
E002	The current probe is not connected. Connect current probe.
E005	Offset test for current probe has not been performed. Perform current probe offset test.
E008	Test leads are improperly connected. Check test leads.

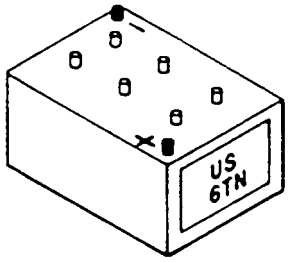
BATTERY CONDITION

TEST 77 BATTERY INTERNAL RESISTANCE TEST RESULT	TEST 79 BATTERY RESISTANCE CHANGE TEST RESULT	BATTERY CONDITION
PASS	PASS	The battery tested is o.k. and in good state of charge.
PASS	FAIL	The battery tested is in poor condition, but has a fresh charge.
FAIL	PASS	The battery tested is o.k., but needs to be recharged.
FAIL	FAIL	The battery tested is in poor condition and in a state of discharge.

STE/ICE–R INDIVIDUAL BATTERY TEST CARD

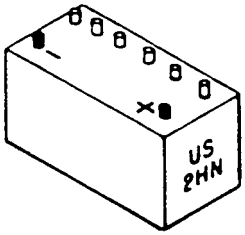
TEST LIMITS Individual Battery Test Limits

For Type 6TN Batteries



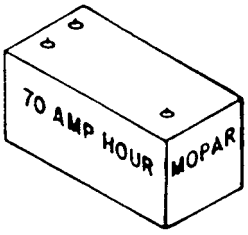
STE/ICE-R Test No	Maximum Acceptable Value to Pass Test
Battery Internal Resistance Test 77	13 Milliohms max
Battery Resistance Change Test 79	25 Milliohms/Sec max

For Type 2HN Batteries



STE/ICE-R Test No	Maximum Acceptable Value to Pass Test
Battery Internal Resistance Test 79	25 Milliohms max
Battery Resistance Change Test 79	70 Milliohms/Sec max

For Commerical 12 volt batteries in M880 vehicles



STE/ICE-R Test No	Maximum Acceptable Value to Pass Test
Battery Internal Resistance Test 77	13 Milliohms max
Battery Resistance Change Test 79	50 Milliohms/Sec max

STE/ICE–R INDIVIDUAL BATTERY TEST CARD

The BATTERY INTERNAL RESISTANCE TEST (73 or 77) evaluates the state of charge of an individual battery. The BATTERY RESISTANCE CHANGE TEST (75 or 79) evaluates whether the battery is good or bad, even if it is discharged. A good battery that is discharged bay be recharged. A bad battery may hold a charge for a short time.

STE/ICE HOOKUP

1. The power to operate the STE/ICE-R VTM may be taken from the batteries being tested as shown in the appropriate figure below or from an alternate power source (such as another vehicle's batteries).
2. Perform VTM general setup; run confidence test and enter vehicle ID.
3. If there is more than one battery in the vehicle/equipment, then find the battery series pair that includes the battery under test. A battery series pair is a pair of batteries for which the negative terminal of one battery is connected by a cable to the positive terminal of another battery. For example, in figure 1 and 2 below, batteries A and B are a series pair, and in figure 1 below, batteries C and D are a series pair.
4. a. If the vehicle/equipment under test has more than one battery or if the VTM is powered from an alternate power source, then use tests 77 and 79. Connect the red clip of test probe cable W2 to the positive terminal of the battery under test. Connect the black clip of test probe cable W2 to the negative terminal of the battery under test.
   b. If the vehicle/equipment under test has only one battery which is also supplying power to the VTM, use tests 73 and 75. The test probe cable W2 is not used.
5. a. If the vehicle/equipment under test has more than one battery, then the battery under test is part of a series pair of batteries. Clamp the current probe around the cable connecting the series pair. Point the arrow on the current probe along the cable leading towards the negative terminal as shown in figures 1 and 2.
   b. If the vehicle/equipment under test has only one battery, then clamp the current probe around the positive battery cable connected to the starter. Point the arrow on the current probe along the cable in the direction leading towards the starter as shown in figure 3.

TEST PROCEDURE

1. Condition the current probe before running these tests.
2. Measure the battery resistance change by entering test number 75 or 79 (as described in the hookup procedure). Then engage the starter for about 5 seconds.

   Measure the battery internal resistance by entering test number 73 or 77 (as described in the hookup procedure). Then engage the starter for about 5 seconds.

   Compare the results of both measurements to limits in the vehicle/equipment TM or to limits on the reverse side of this card.

   If either measurement is outside of normal limits, check battery terminals and connections, and check battery electrolyte level. Then perform both measurements a second time.
3. If the battery resistance change test (75 or 79) fails after the second measurement, then the battery is in bad condition. The battery may be able to accept and hold a charge, but it will quickly become discharged during use. A battery in bad condition should be replaced.
4. If the battery internal resistance test (73 or 77) fails after the second measurement, then the battery should be recharged.

FIGURE 1

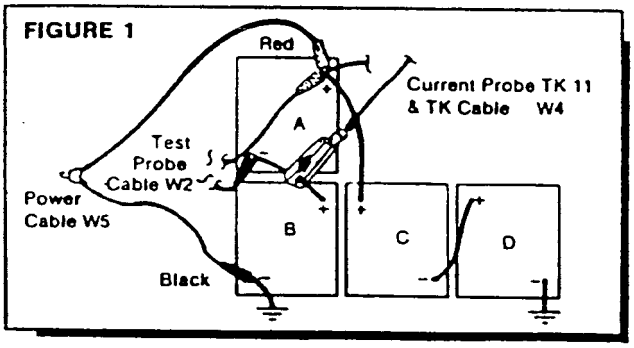


FIGURE 2

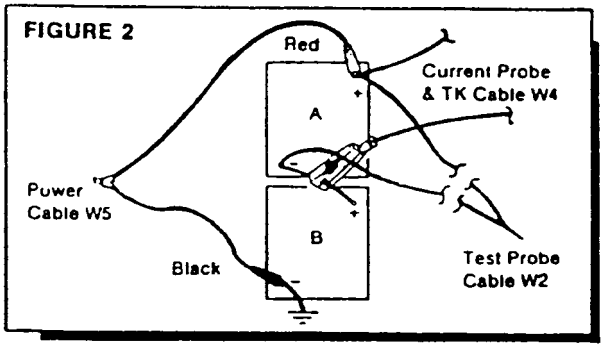
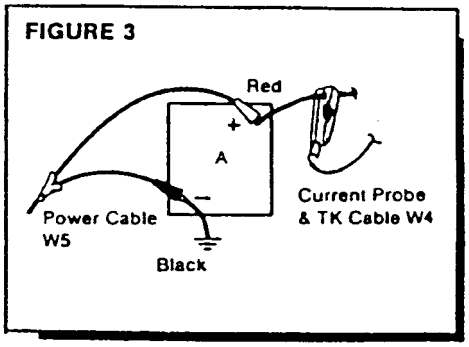


FIGURE 3



STE/ICE–R INDIVIDUAL BATTERY TEST CARD

BATTERY TEST RESULTS

STE/ICE-R DISPLAY AFTER-TEST	WHAT IT MEANS
GO	1. The battery in series with the battery under test may be bad. Check that battery next. 2. Check the battery negative cables and cables to the starter for corroded or loose connections. If all of the cables and connections are o.k., then the starter is possibly faulty. connections are o.k., it is possible that the starter is faulty.
.9.9.9.9	1. There is a bad connection on the battery being tested. Clean and tighten the posts and clamps, and check the cable between the batteries. 2. The battery under test is in extremely poor condition.
14.2	If any number is displayed, then the number is a STE/ICE test result. Compare the test result to the values shown along the right edge of this card to determine a pass or fail. See table below to determine the condition of the battery.
E013	1. The battery being tested may be in a discharged state. Check battery electrolyte level; charge battery, and then retest. 2. If display shows E013 after battery has been charged, then the battery is in poor condition.
E002	The current probe is not connected. Connect current probe.
E005	Offset test for current probe has not been performed. Perform current probe offset test.
E008	Test leads are improperly connected. Check test leads.

BATTERY CONDITION

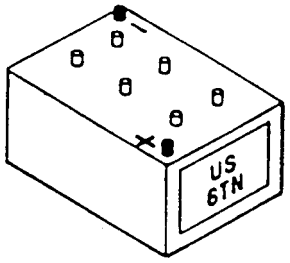
TEST 77 BATTERY INTERNAL RESISTANCE TEST RESULT	TEST 79 BATTERY RESISTANCE CHANGE TEST RESULT	BATTERY CONDITION
PASS	PASS	The battery tested is o.k. and in good state of charge.
PASS	FAIL	The battery tested is in poor condition, but has a fresh charge
FAIL	PASS	The battery tested is o.k., but needs to be recharged.
FAIL	FAIL	The battery tested is in poor condition and in a state of discharge.

STE/ICE–R BATTERY SERIES PAIR TEST CARD

TEST LIMITS

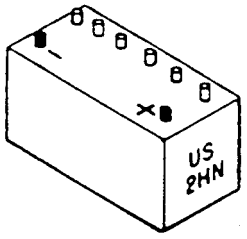
Battery Test Limits for a Series Pair

For Type 6TN Batteries



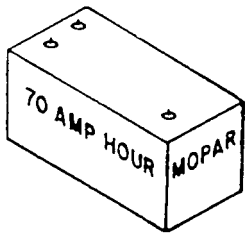
STE/ICE-R Test No	Maximum Acceptable Value to Pass Test
Battery Internal Resistance Test 77	25 Milliohms max
Battery Resistance Change Test 79	50 Milliohms/Sec max

For Type 2HN Batteries



STE/ICE-R Test No	Maximum Acceptable Value to Pass Test
Battery Internal Resistance Test 77	50 Milliohms max
Battery Resistance Change Test 79	140 Milliohms/Sec max

For Commerical 12 volt batteries in M880 vehicles



STE/ICE-R Test No	Maximum Acceptable Value to Pass Test
Battery Internal Resistance Test 77	25 Milliohms max
Battery Resistance Change Test 79	100 Milliohms/Sec max

STE/ICE–R BATTERY SERIES PAIR TEST CARD

The BATTERY INTERNAL RESISTANCE TEST (73 or 77) evaluates the state of charge of an individual battery. The BATTERY RESISTANCE CHANGE TEST (75 or 79) evaluates whether the battery is good or bad, even if it is discharged. A good battery that is discharged bay be recharged. A bad battery may hold a charge for a short time.

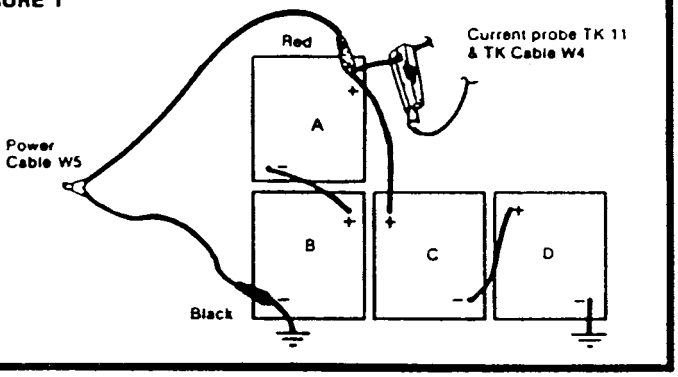
STE/ICE HOOKUP

1. The power to operate the STE/ICE-R VTM may be taken from the batteries being tested as shown in the appropriate figure below or from an alternate power source (such as another vehicle's batteries).
2. Perform VTM general setup; run confidence test, and enter vehicle ID.
3. a. If power to the VTM comes from a different set of batteries than the battery pack under test, use tests 77 and 79. Connect test probe cable W2 to the battery pack under test. Connect the red clip to the positive terminal closest to the starter. Connect the black clip to the negative terminal closest to vehicle/equipment ground.
   b. If power to the VTM comes from the battery pack under tests, use tests 73 and 75. The test probe cable W2 is not used.
4. Clamp the current probe around the positive cable connected to the starter. Point the arrow on the current probe along the cable leading towards the starter as shown in figure 1.

TEST PROCEDURE

1. Condition the current probe before running these tests.
2. Measure the battery resistance change by entering test number 75 or 79 (as described in the hookup procedure). Then engage the starter for about 5 seconds.
3. Measure the battery internal resistance by entering test number 73 or 77 (as described in the hookup procedure). Then engage the starter for about 5 seconds
4. Compare the results of both measurements to limits in the vehicle/equipment TM or to limits on the reverse side of this card.
5. If either measurement is outside of normal limits, check battery terminals and connections, and check battery electrolyte level. Then perform both measurements a second time.
6. If the battery resistance change test (75 or 79) fails after the second measurement, then the battery pack is in bad condition. Test each series pair to determine which is good and which is bad.
7. If the battery internal resistance test (73 or 77) fails after the second measurement, then the battery should be recharged.

FIGURE 1



STE/ICE–R BATTERY PACK TEST CARD

BATTERY TEST RESULTS

STE/ICE-R DISPLAY AFTER-TEST	WHAT IT MEANS
GO	1. The battery in series with the battery under test may be bad. Check that battery next. 2. There is a bad connection in the starter circuit somewhere. Check the battery negative cables, and cables to the starter for corroded or loose connections. If all of the cables and connections are o.k., then the starter is possibly faulty.
.9.9.9.9	1. There is a bad connection on the battery being tested. Clean and tighten the posts and clamps, and check the cable between the batteries. 2. The battery under test is in extremely poor condition.
14.2	If any number is displayed, then the number is a STE/ICE test result. Compare the test result to the values shown along the right edge of this card to determine a pass or fail. See table below to determine the condition of the battery.
E013	1. The battery being tested may be in a discharged state. Check battery electrolyte level; charge battery, and then retest. 2. If display shows E013 after battery has been charged, then the battery is in poor condition.
E002	The current probe is not connected. Connect current probe.
E005	Offset test for current probe has not been performed. Perform current probe offset test.
E008	Test leads are improperly connected. Check test leads.

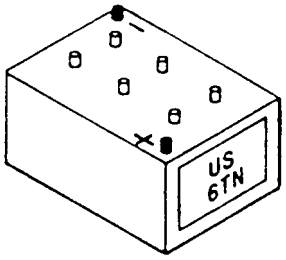
BATTERY CONDITION

TEST 77 BATTERY INTERNAL RESISTANCE TEST RESULT	TEST 78 BATTERY RESISTANCE CHANGE TEST RESULT	BATTERY CONDITION
PASS	PASS	The battery tested is o.k and in good state of charge.
PASS	FAIL	The battery tested is in poor condition, but has a fresh charge
FAIL	PASS	The battery tested is o.k., but needs to be recharged.
FAIL	FAIL	The battery tested is in poor condition and in a state of discharge.

STE/ICE–R BATTERY PACK TEST CARD

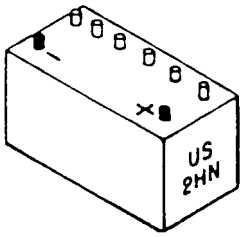
TEST LIMITS: Battery Test Limits for a Four Battery Pack *

For Type 6TN Batteries



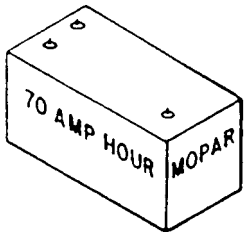
STE/ICE-R Test No	Maximum Acceptable Value to Pass Test
Battery Internal Resistance Test 77	13 Milliohms max
Battery Resistance Change Test 79	25 Milliohms/Sec max

For Type 2HN Batteries



STE/ICE-R Test No	Maximum Acceptable Value to Pass Test
Battery Internal Resistance Test 77	25 Milliohms max
Battery Resistance Change Test 79	70 Milliohms/Sec max

For Commerical 12 volt batteries in M880 vehicles



STE/ICE-R Test No	Maximum Acceptable Value to Pass Test
Battery Internal Resistance Test 77	13 Milliohms max
Battery Resistance Change Test 79	50 Milliohms/Sec max

*When a vehicle has more than four batteries in a pack, it is usually easier to test each series pair separately.

STE/ICE–R BATTERY PACK TEST CARD

STE/ICE-R CHARGING CIRCUIT TROUBLESHOOTING 0108 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10
TM 9-4910-571-12&P
(WP 0023 00)

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Power plant rear access door/panel removed (see your -10)
STE/ICE-R hooked up for power (WP 0114 00)

CONDITION CURRENT PROBE

1. Clamp current probe around battery positive cable.
2. Point arrow on current probe toward starter and clamp probe on battery positive cable to starter.
3. Ensure current probe is closed.
4. Crank engine for several cycles with fuel off.
5. Turn off all electrical power.
6. Set test select switches to 90.
7. Press and hold test until CAL appears on display.
8. Is offset value within limits of –225 to + 225?

NO

TN

1. Go to offset fault isolation. See TM 9-4910-571-12&P.
2. Repeat this troubleshooting.

YES

Y

1. Remove current probe from battery cable.
2. Start engine (see your -10).
3. Install current probe around circuit 2 lead of generator.
4. Point arrow on current probe toward battery.

STE/ICE-R CHARGING CIRCUIT TROUBLESHOOTING—Continued **0108 00**

OUTPUT CURRENT

1. Set test select switches to 01.
2. Press and release test button.
3. When CON appears, set test select switches to 90.
4. Press and release test button.
5. Turn on lights and accessories.
6. Set engine speed to 1000 to 1200 rpm.
7. Is output current below 70 amps?

NO → **BYN**

1. Go to battery/generator indicator malfunctions (WP 0052 00).
2. Verify no faults found.

YES ↓

2BY

1. Stop engine (see your -10).
2. Turn off lights and accessories.
3. Adjust generator drive belts (WP 0241 00 or WP 0245 00).
4. Are drive belts ok?

NO → **2BYN**

1. Replace generator drive belts (WP 0241 00 or WP 0245 00).
2. Verify no faults found.

YES ↓

3BY

1. Check operation of generator field switch (WP 0288 00).
2. Was generator field switch repaired?

NO → **3BYN**

1. Check charging system cables for loose or corroded connections.
2. Verify no faults found.

YES ↓

4BY

1. Verify no faults found.

FIELD CURRENT

1. Install current probe around circuit 1 lead of generator to regulator cable.
2. Point arrow on current probe toward generator.
3. Set test select switches to 01.
4. Press and release test button.
5. When PASS appears, set test select switches to 90.
6. Press and release test button.
7. Raise engine speed to 1000 to 1200 rpm and read rpm display.
8. Stop engine (see your -10).
9. Is current below 6 amps?

NO

CYN

1. Go to charging system malfunctions (WP 0023 00).
2. Verify no faults found.

YES

2CY

1. Check continuity of cables from regulator to generator.
2. If cables are ok, go to charging system malfunctions (WP 0023 00).
3. Verify no faults found.

STE/ICE-R STARTER CIRCUIT TROUBLESHOOTING 0109 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10
TM 9-4910-571-12&P
TM 9-6140-200-14
(WP 0012 00 or WP 0013 00)

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10))
All electrical power off (see your -10)
STE/ICE-R hooked up for tests 72 thru 75 (WP 0117 00)
STE/ICE-R hooked up for power (WP 0114 00)

T

1. Make sure all electrical accessories are off.
2. Set test select switches to 74.
3. Press and hold test button until CAL appears on display.
4. Release test button, wait for offset value to appear on display.
5. Is offset value within –225 to +225?

NO →

TN

1. Go to offset fault isolation TM 9-4910-571-12&P.
2. Verify no faults found.

YES ↓

Y

NOTE

While cranking engine with bad or discharged batteries, it is possible for VTM to lose power and come on again after cranking has stopped. If this occurs, clean battery posts and clamps. If they are loose or corroded, correct them and repeat test.

1. Install current probe on positive battery cable.
2. Shut off fuel.
3. Press and release test button.
4. When GO appears, crank engine until OFF or ERROR message is displayed (normally 5 seconds).
5. Is a number displayed?

NO → GO TO **EY** (PAGE 0109 00-6)

YES ↓

2Y

1. Check if starter circuit resistance is within 5 to 27.
2. Is starter circuit resistance within 5 to 27?

NO → GO TO **CY** (PAGE 0109 00-3)

YES

3Y

1. Check batteries to make sure they are fully charged TM 9-6140-200-14.
2. Verify no faults found.

BY

1. Check to see if E013 Is displayed.
2. Is E013 displayed?

NO → **BYN**

1. Check batteries to make sure they are fully charged TM 9-6140-200-14.
2. Verify no faults found.

YES

2BY

1. Crank engine (see your -10).
2. Does any message appear other than GO?

NO → GO TO **DY** (PAGE 0109 00-4)

YES

3BY

1. Check how many times E013 has been displayed
2. Is this the third time E013 was displayed?

NO → **3BYN**

1. Repeat this part of troubleshooting.
2. Verify no faults found.

YES

4BY

1. Turn off all electrical equipment.
2. Set test select switches to 90.
3. Press and hold test until CAL appears on display.
4. Is offset value within limits of –225 to +225?

NO → **4BYN**

1. Go to offset fault isolation TM 9-4910-571-12&P.
2. Verify no faults found.

YES

5BY

1. Press and release test button.
2. Crank engine for a few seconds with fuel off.
3. Is starter current above 100 amps?

NO →

5BYN

1. Check batteries TM 9-6140-200-14.
2. Verify no faults found.

YES ↓

6BY

1. Error message E013 displayed earlier indicates short circuit, frozen starter, or tight engine.
2. Check wiring to starter for short circuits.
3. If wiring is ok, engine may be tight.
4. Notify your supervisor.
5. Verify no faults found.

CY

1. Check to see if resistance is high.
2. Is resistance high?

NO →

CYN

1. Repair short circuit in starter circuit.
2. Verify no faults found.

YES ↓

2CY

1. Attempt to start engine while listening for clicking of starter solenoid.
2. Does starter solenoid click?

NO →

2CYN

1. Check switches, wiring, relays, and circuit breakers to starter solenoid.
2. Verify no faults found.

YES ↓

3CY

1. Connect test probe cable W2P1 to J4 on VTM.
2. Connect red and black clips together.
3. Set test select switches to 89.
4. Press and hold test until CAL appears on display.
5. Is offset value within limits of −6.8 to +6.8?

NO →

3CYN

1. Go to offset fault isolation TM 9-4910-571-12&P.
2. Verify no faults found.

YES ↓

4CY

1. Connect black clip of test probe cable W2 to the negative battery terminal.
2. Connect red clip of test probe cable W2 to the positive terminal of starter.
3. Press and release test button.
4. Crank engine and read displayed voltage.
5. Is starter voltage above 17 volts?

NO → GO TO **EY** (PAGE 0109 00-6)

YES

5CY

1. Move red clip of test probe cable W2 to ground terminal of starter.
2. Crank engine and read displayed voltage.
3. Is voltage drop less than 18 volts?

NO → **5CYN**

1. Clean, inspect, and repair cables as needed.
2. Verify no faults found.

YES

6CY

1. Replace starter (WP 0253 00 or (WP 0254 00).
2. Verify no faults found.

DY

1. Check to see if resistance is high.
2. Is resistance high?

NO → **DYN**

1. Repair short circuit in starter circuit.
2. Verify no faults found.

YES

2DY

1. Attempt to start engine while listening for clicking of starter solenoid.
2. Does starter solenoid click?

NO → **2DYN**

1. Check switches, wiring, relays, and circuit breakers to starter solenoid.
2. Verify no faults found.

YES

3DY

1. Connect test probe cable W2P1 to J4 on VTM.
2. Connect red and black clips together.
3. Set test select switches to 89.
4. Press and hold test until CAL appears on display.
5. Is offset value within limits of −6.8 to +6.8?

NO →

3DYN

1. Go to offset fault isolation TM 9-4910-571-12&P.
2. Verify no faults found.

YES ↓

4DY

1. Connect black clip of test probe cable W2 to the negative battery terminal.
2. Connect red clip of test probe cable W2 to the positive terminal of starter.
3. Press and release test button.
4. Crank engine and read displayed voltage.
5. Is starter voltage above 17 volts?

NO → GO TO **EY** (PAGE 0109 00-6)

YES ↓

5DY

1. Move red clip of test probe cable W2 to ground terminal of starter.
2. Crank engine and read displayed voltage.
3. Is voltage drop less than 18 volts?

NO →

5DYN

1. Clean, inspect, and repair cables as needed.
2. Verify no faults found.

YES ↓

6DY

1. Replace starter (WP 0253 00 or (WP 0254 00).
2. Verify no faults found.

EY

1. Move red clip of test probe cable W2 to positive terminal of starter solenoid.
2. Crank engine and read displayed voltage.
3. Is solenoid voltage above 18 volts?

NO → GO TO **FY** (PAGE 0109 00-6)

YES ↓

2EY

1. If GO message occurred during starter circuit resistance test, check switches and wiring to solenoid.
2. Voltage drop across a connection should be less than 0.1 volt and a voltage drop across a cable should be less than 0.2 volts. Check voltage drop across solenoid and all cables/connections in positive side if starter circuit.
3. Set test select switches to 89.
4. Connect clip leads of test probe W2 across part to be measured.
5. Press and release test button.
6. Engage starter.
7. Repair part if voltage drop is high.
8. If switches and wiring to solenoid are ok, replace solenoid and starter (WP 0253 00 or WP 0254 00).
9. Verify no faults found.

FY

1. Set test select switches to 67.
2. Press and release test button.
3. Crank engine and read displayed voltage?
4. Was battery voltage above 19 volts while cranking?

NO →

FYN

1. Check batteries TM 9-6140-200-14.
2. Verify no faults found.

YES ↓

2FY

1. Check switches and wiring to starter solenoid.
2. Repair if necessary.
3. Verify no faults found.

STE/ICE-R LOW OIL PRESSURE TROUBLESHOOTING 0110 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

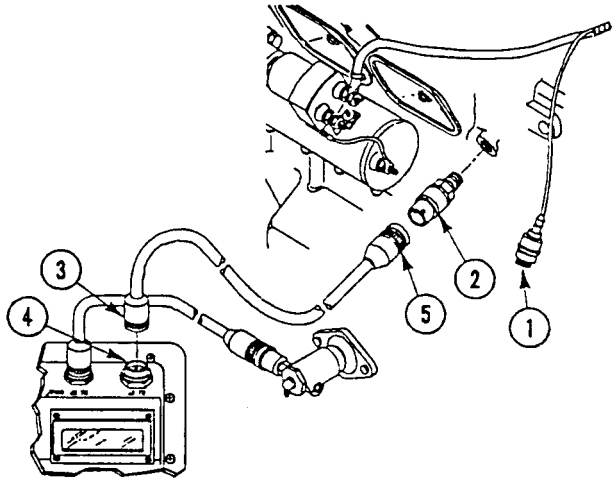
See your -10
TM 9-4910-571-12&P
(WP 0046 00)

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)
STE/ICE-R hooked up for power (WP 0114 00)
STE/ICE-R engine RPM test hooked up (WP 0115 00)

T

1. Remove oil pressure sending unit (1) from engine.
2. Install blue striped pressure transducer (2) in place of oil pressure sending unit (1).
3. Connect transducer cable W4P1 (3) to J3 (4) on VTM.
4. Connect transducer cable W4P2 (5) to blue striped pressure transducer (2).
5. Set test select switches to 50.
6. Press and hold test button until CAL appears on display.
7. Is offset value within −150 to + 150?



NO →

TN

1. Go to offset fault isolation. See TM 9-4910-571-12&P.
2. Verify no faults found.

YES ↓

STE/ICE-R LOW OIL PRESSURE TROUBLESHOOTING—Continued 0110 00

Y

1. Set test select switches to 01.
2. Press and release test button.
3. When CON appears, set test select switches to 50.
4. Press and release test button.
5. Start engine (see your -10).
6. Raise engine speed to 2500 rpm.
7. Is oil pressure within 40-60 psi (276-414 kPa)?

NO

YN

1. Stop engine (see your -10).
2. Replace engine oil filter element (WP 0143 00 or WP 0144 00).
3. Verify no faults found.
4. If oil pressure is not within 40-60 psi (276-414 kPa), notify your supervisor.

YES

2Y

1. Check oil pressure sending unit (WP 0281 00 or WP 0282 00) and engine wiring harness (see FO-1 or FO-2).
2. Verify no faults found.

STE/ICE-R BATTERY TROUBLESHOOTING 0111 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10
TM 9-4910-571-12&P
(WP 0052 00)

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Fuel off, engine must not start (see your -10)
All electrical power off (see your -10)
Driver's seat raised (see your -10)
STE/ICE-R starter circuit test hooked up (WP 0116 00)
STE/ICE-R power hooked up (WP 0114 00)

T

1. Make sure all electrical accessories are off.
2. Set test select switches to 75.
3. Press and hold test button until CAL appears on display.
4. Release test button, wait for offset value to appear on display.
5. Is offset value within –225 to +225?

NO →

TN

1. Go to offset fault isolation TM 9-4910-571-12&P.
2. Verify no faults found.

YES ↓

Y

NOTE

While cranking engine with bad or discharged batteries, it is possible for VTM to lose power and come on again after cranking has stopped. If this occurs, clean battery posts and clamps. If they are loose or corroded, correct them and repeat test.

1. Press and release test button.
2. When GO appears, engage starter switch for two seconds or until OFF is displayed.
3. Is test value displayed?

NO →

YN

1. If display shows GO, there is a bad connection in the starter circuit. Check cables and connections to starter and repeat test.
2. If GO is still displayed, then you may have a very poor battery in the series pair being tested.
3. If display shows .9.9.9.9., there may be a bad connection on the batteries being tested. Clean and tighten the connections on the batteries and repeat test.
4. If display shows ———— or .9.9.9.9., the batteries being tested may be in a discharged state. Check batteries' electrolyte level; charge batteries and repeat test.
5. If display shows E013 three times, or ————, or .9.9.9.9. after batteries have been charged, replace batteries.
6. Verify no faults found.

YES ↓

2Y

1. Check to see if batteries' resistance change less than 50 milliohms/seconds.
2. Do batteries' resistance change less than 50 milliohms/seconds?

NO →

2YN

1. If batteries fail in freezing weather, crank engine for five seconds and retest. This will warm the batteries slightly.
2. See TM 9-6140-200-14 for servicing, cleaning, and changing batteries.
3. Repeat test on this battery.
4. If batteries have been charged and batteries resistance change still exceeds limits, replace battery.
5. Verify no faults found.

YES ↓

3Y

1. Set test select switches to 73.
2. Press and release test button.
3. Is battery internal resistance less than 25 milliohms?

NO →

3YN

1. If batteries fail in freezing weather, crank engine for five seconds and retest. This will warm the batteries slightly.
2. See TM 9-6140-200-14 for servicing, cleaning, and changing batteries.
3. Repeat test on this battery.
4. If batteries have been charged and batteries resistance change still exceeds limits, replace battery.
5. Verify no faults found.

YES ↓

4Y

WARNING

Battery posts and cables touched by metal objects can short circuit and burn you. Do not wear jewelry, necklaces, or watches when working on the electrical system. Keep tools away from posts, wires, and terminals.

1. Batteries are OK.
2. If display shows GO, there is a bad connection in the starter circuit. Check cables and connections to starter and repeat test.
3. If GO is still displayed, then you may have a very poor battery in the series pair being tested. Test each battery individually.
4. If display shows .9.9.9.9., there may be a bad connection on the battery being tested. Clean and tighten the connections on the batteries and repeat test.
5. If display shows E013 or .9.9.9.9., the batteries being tested may be in a discharged state. Check batteries' electrolyte level; charge batteries and repeat test.
6. If display shows E013 three consecutive times, or ––––, or .9.9.9.9. after batteries have been charged, replace battery.
7. Clamp current probe between batteries and starter.
8. Point arrow on probe toward starter.
9. Set test select switches to 72.
10. Press and release test button.
11. Is a number displayed?

NO → GO TO **BY** (PAGE 0111 00-4)

YES

5Y

1. Check to see if first peak current reading is within 700 to 1275 amps.
2. Is the first peak current reading within 700 to 1275 amps?

NO → GO TO **CY** (PAGE 0111 00-5)

YES

6Y

1. Check electrolyte levels in batteries TM 9-6140-200-14.
2. Clean battery terminals TM 9-6140-200-14.
3. Check specific gravity in batteries TM 9-6140-200-14.
4. Charge batteries if necessary TM 9-6140-200-14.
5. Verify no faults found.

BY

1. Check to see if E013 is displayed.
2. Is E013 displayed?

NO →

BYN

1. Check electrolyte levels in batteries TM 9-6140-200-14.
2. Clean battery terminals TM 9-6140-200-14.
3. Check specific gravity in batteries TM 9-6140-200-14.
4. Charge batteries if necessary TM 9-6140-200-14.
5. Verify no faults found.

YES ↓

2BY

1. Check to see if E013 is displayed for the third time.
2. Is this the third time E013 was displayed?

NO →

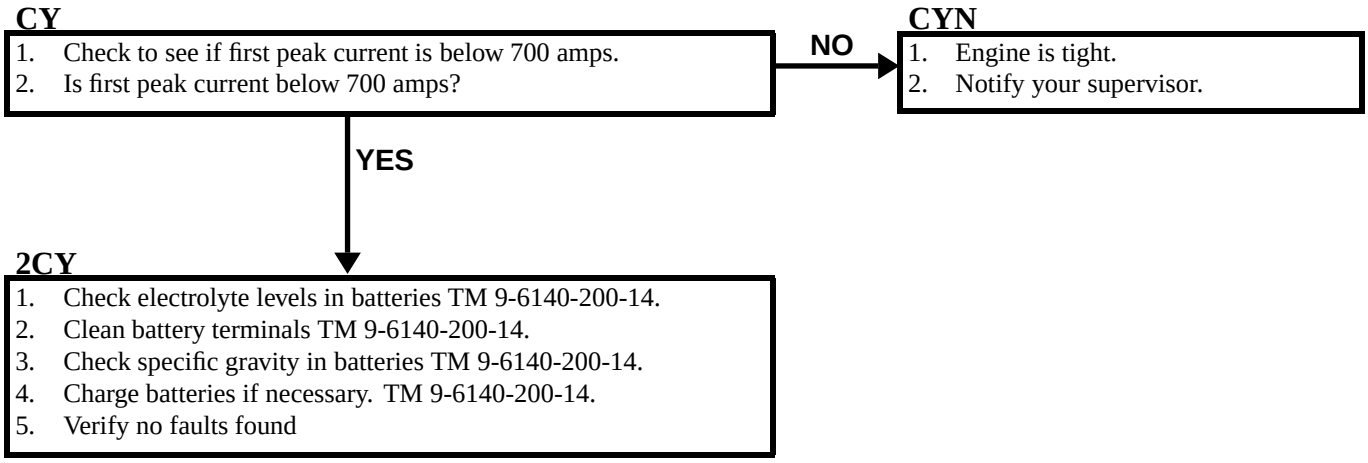
2BYN

1. Verify no faults found.

YES ↓

3BY

1. Check electrolyte levels in batteries TM 9-6140-200-14.
2. Clean battery terminals TM 9-6140-200-14.
3. Check specific gravity in batteries TM 9-6140-200-14.
4. Charge batteries if necessary TM 9-6140-200-14.
5. Verify no faults found.


CY
1. Check to see if first peak current is below 700 amps.
2. Is first peak current below 700 amps?
NO
CYN
1. Engine is tight.
2. Notify your supervisor.
YES
2CY
1. Check electrolyte levels in batteries TM 9-6140-200-14.
2. Clean battery terminals TM 9-6140-200-14.
3. Check specific gravity in batteries TM 9-6140-200-14.
4. Charge batteries if necessary. TM 9-6140-200-14.
5. Verify no faults found

STE/ICE-R ENGINE WILL NOT CRANK TROUBLESHOOTING 0112 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

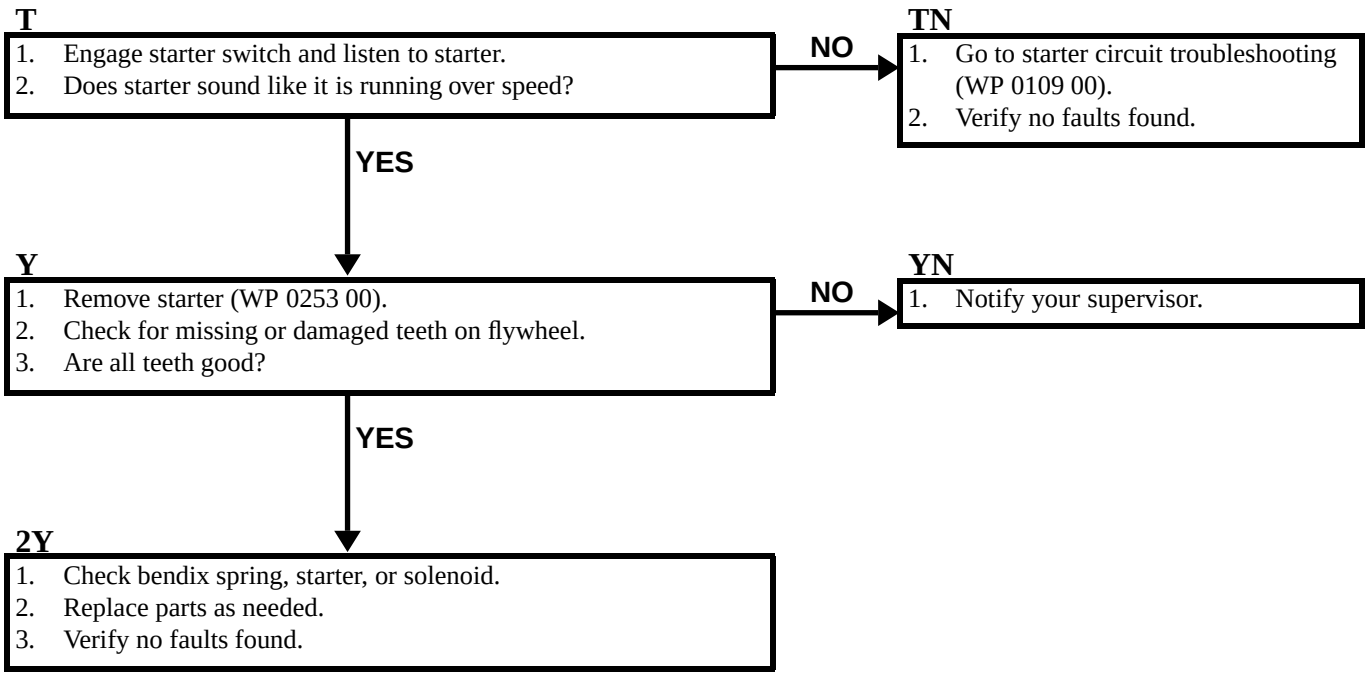
Unit Mechanic

References

See your -10
(WP 0010 00)

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)



STE/ICE-R ENGINE WILL CRANK BUT WILL NOT START TROUBLESHOOTING 0113 00

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10
TM 9-94910-571-12&P
(WP 0015 00)

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)
STE/ICE-R power hooked up (WP 0114 00)
STE/ICE-R engine RPM test hooked up (WP 0119 00)

T

1. Shut off fuel (see your -10).
2. Set test select switches to 10.
3. Press and release test button.
4. Crank engine and read display.
5. Is crank speed 100 rpm or more?

NO

TN

1. Go to STE/ICE-R starter circuit troubleshooting (WP 0109 00).
2. Verify no faults found.

YES

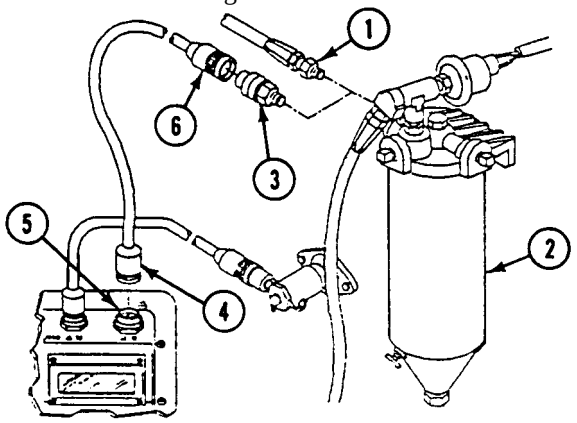
STE/ICE-R ENGINE WILL CRANK BUT WILL NOT START **0113 00**
TROUBLESHOOTING—Continued

Y

CAUTION

Operation of engine with red stripe transducer installed could damage transducer. Remove red stripe transducer before starting engine.

1. Verify that there is fuel in gas tank.
2. Bleed air out of fuel system as necessary.
3. Drain water from primary fuel filter (see your -10).
4. Check for kinked, flattened, or broken fuel lines.
5. Check quick disconnect fittings for blockage in fittings.
6. Check fuel shutoff cable (WP 0194 00 or WP 0205 00).
7. Check engine fuel pump (WP 0149 00 or WP 0150 00).
8. Disconnect fuel supply hose (1) from secondary fuel filter (2).
9. Connect red stripe pressure transducer (3) to secondary fuel filter outlet.
10. Connect transducer cable W4P1 (4) to J3 on VTM (5).
11. Connect transducer cable W4P2 (6) to red stripe pressure transducer (3).
12. Set test select switches to 49.
13. Press and hold test until CAL appears on display.
14. Is offset value within range of –4 to + 4?



NO

YN

1. Go to offset fault isolation TM 9-4910-571-12&P.
2. Verify no faults found.

YES

2Y

1. Turn on fuel and accessory switches.
2. Press and release test button.
3. Crank engine and read display.
4. Is fuel pressure greater than 4 psi (28 kPa)?

NO

GO TO **BY** (PAGE 0113 00-3)

YES

STE/ICE-R ENGINE WILL CRANK BUT WILL NOT START **0113 00**
TROUBLESHOOTING—Continued

3Y

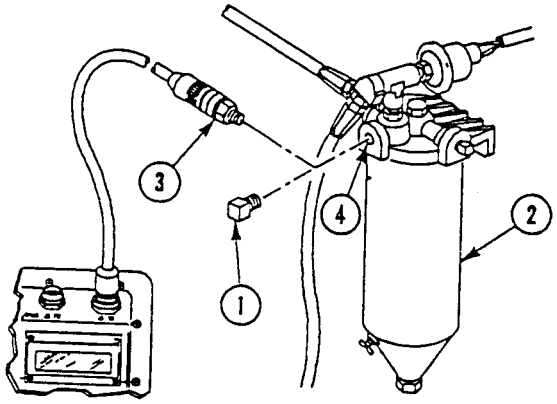
1. Remove red stripe pressure transducer from secondary fuel filter.
2. Check operation of engine shutoff cable (WP 0193 00).
3. Check restriction in air intake (WP 0193 00).
4. Check cold weather operation (see your -10).
5. If engine still does not start, notify your supervisor.
6. Verify no faults found.

BY

CAUTION

Pull fuel shutoff all the way out. Transducer will be damaged if engine starts.

1. Remove red stripe pressure transducer from secondary fuel filter.
2. Connect fuel supply hose to secondary fuel filter.
3. Remove inlet plug (1) from secondary fuel filter (2) and install red stripe pressure transducer (3) in inlet hole (4) of filter.
4. Pull fuel shutoff all the way out.
5. Crank engine and read display.
6. Is fuel pressure greater than 4 psi (28 kPa)?



NO

BYN

1. Remove red stripe pressure transducer from secondary fuel filter.
2. Check engine fuel pump (WP 0149 00 or WP 0150 00).
3. Check generator field switch (WP 0288 00).
4. In freezing temperatures, check fuel lines for ice blockage or coagulation of fuel.
5. Start engine (see your -10).
6. If engine still does not start, repair blockage in fuel line.
7. Verify no faults found.

YES

2BY

1. Remove red striped pressure transducer and install plug in secondary fuel filter.
2. Replace fuel filter element (WP 0178 00 or WP 0179 00).
3. Start engine (see your -10).
4. If engine still does not start, check fuel system (WP 0162 00 thru WP 0175 00).
5. Verify no faults found.

HOOK UP/REMOVE STE/ICE-R FOR POWER 0114 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set
WP 0541 00, Item NSN-4910-01-222-6589

Personnel Required

Unit Mechanic

References

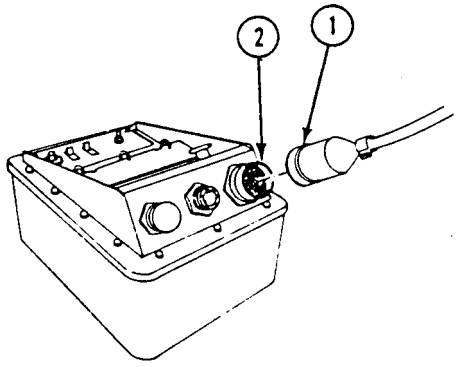
See your -10
TM 9-4910-571-12&P

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Driver's seat raised (see your -10)

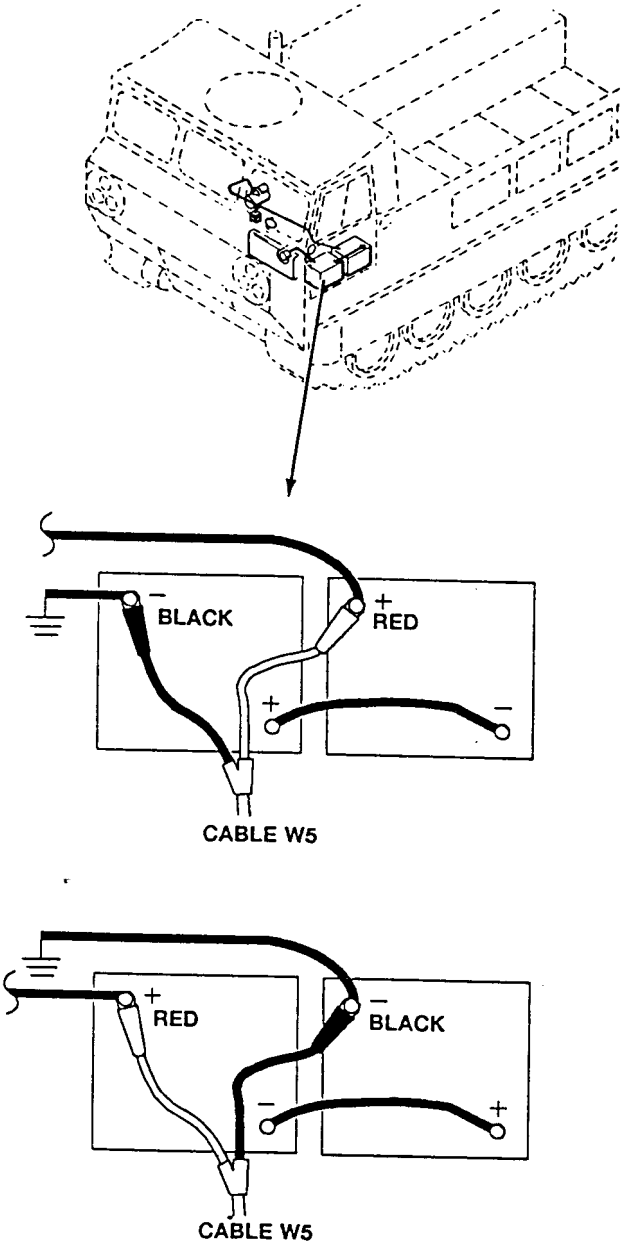
HOOK-UP

1. Remove VTM and power cable W5 from transit case.
2. Pull VTM circuit breaker to OFF.
3. Install plug W5P1 (1) on VTM jack J1 (2).



4. Connect red clip of power cable W5 to positive terminal of battery.

5. Connect black clip of power cable W5 to negative terminal of battery.



6. Push VTM circuit breaker to ON.

   a. If display reads **(8888)** and **(– – – –)**, go to Step 8.

   b. If display is not blank, but does not read **(8888)** and **(– – – –)**, write up DA form 2404 on faulty VTM display. Report problem to supervisor.

   c. If display is blank, go to VTM blank display diagnostic troubleshooting see TM 9-4910-571-12&P.

NOTE

If VTM fails to display current readouts, refer to confidence test fault isolation (see TM 9-4910-571-12&P).

NOTE

Intermediate test results are displayed indicating test in progress. The end result will alternately show software revision number and the PASS message. The displayed software revision number has a month (one digit), year (two digits), and the version number (zero). The software revision flashing on the display should match the software revision number on the label located on the side of the VTM. If they are different, return the STE/ICE-R set to your supervisor.

7. Perform VTM confidence check:
   a. Set test select switches to 66.
   b. Press and release test button.
   c. Wait for display to show 0066.
   d. Set test switches to 99.
   e. Press and release test button.
   f. Wait for the alternate display of the revision number and PASS message. Go to Step 9
   g. If PASS is not displayed, go to STE/ICE-R confidence test fault isolation (see TM 9-4910-571-12&P).
8. Select test 60, then press and release TEST button.
9. Enter carrier VID **(03)** into VTM, then press and release TEST button.
10. Select test 61, then press and release TEST button. If carrier VID **(03)** does not appear on VTM display, (see TM 9-4910-571-12&P).
11. Return to troubleshooting that referred you to this task.

REMOVAL

1. Pull VTM circuit breaker to OFF.
2. Remove power cable W5 from batteries and VTM. Use electrical connector pliers.
3. Stow VTM and power cable W5 in transit case.

HOOK UP/REMOVE STE/ICE-R FOR ENGINE RPM 0115 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

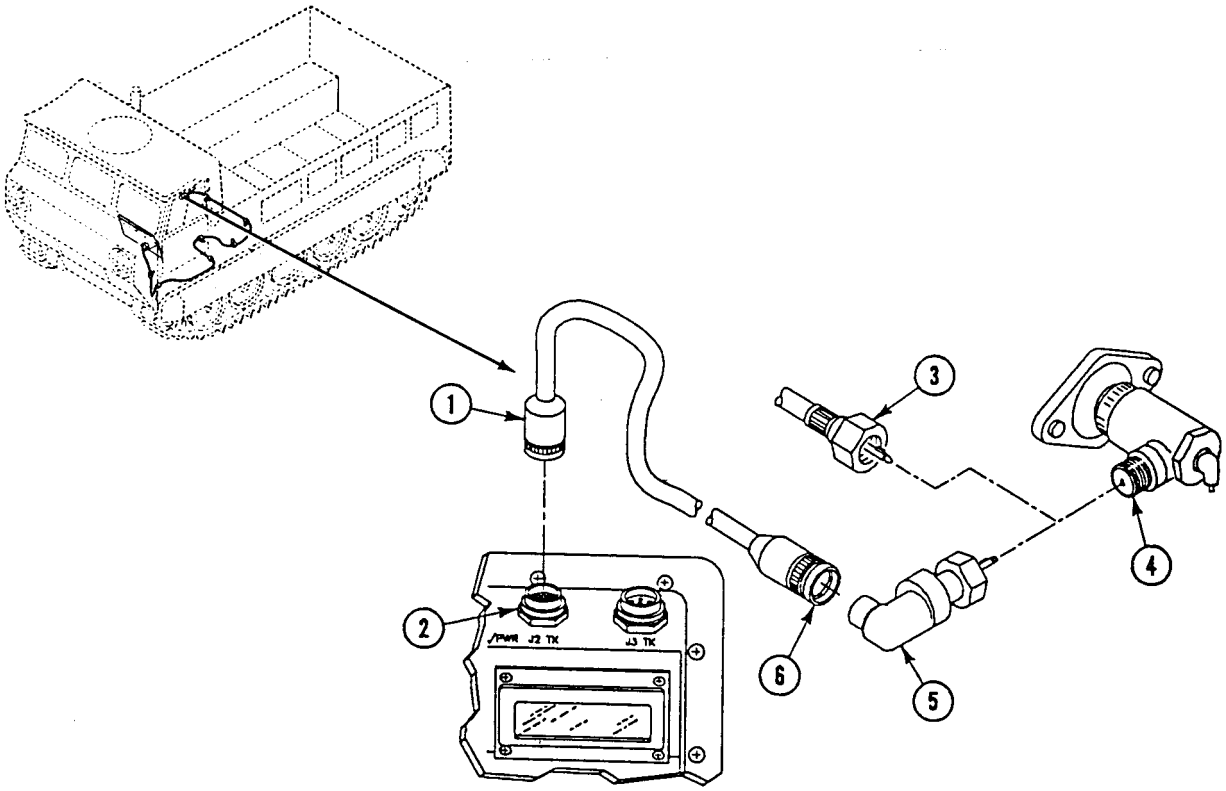
See your -10
TM 9-4910-571-12&P

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Driver's seat raised (see your -10)
STE/ICE-R power hooked up (WP 0114 00)
Power plant rear access door/panel removed (see your -10)

HOOK-UP

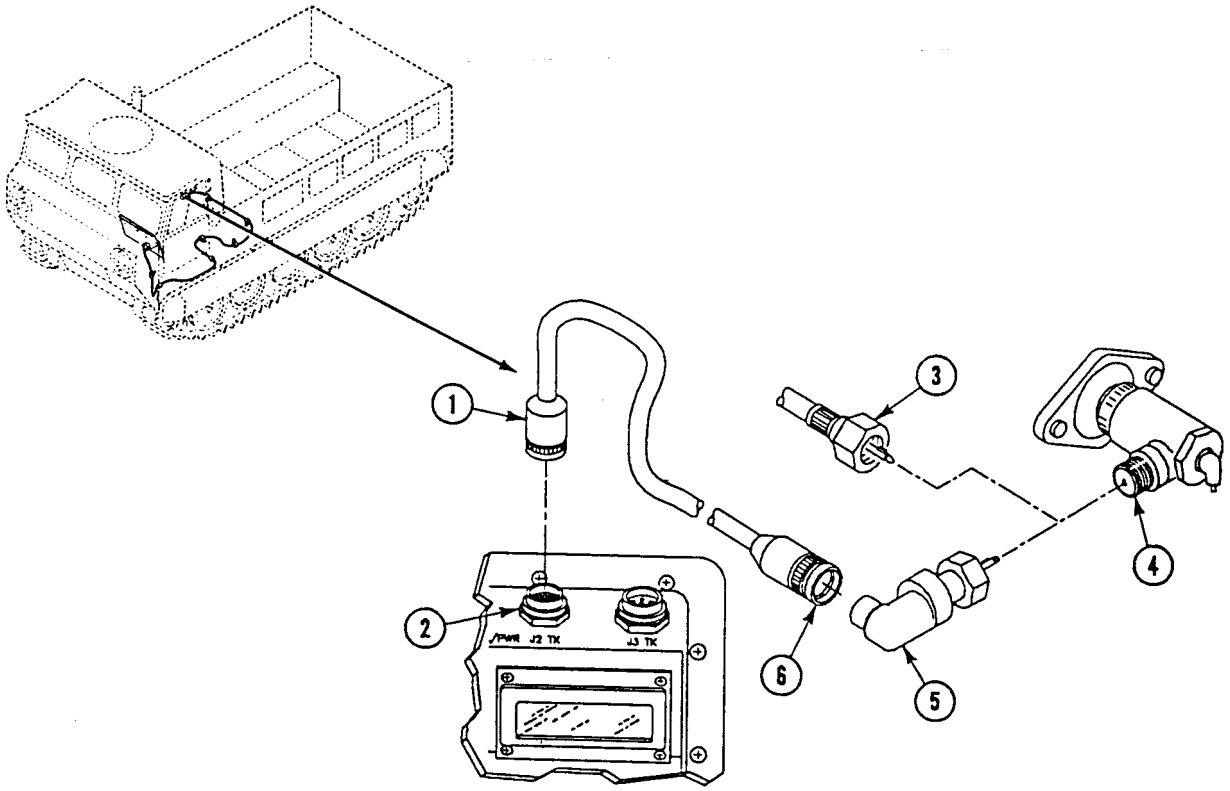
1. Remove transducer cable W4 and pulse tachometer from transit case.
2. Pull VTM circuit breaker to OFF.
3. Connect cable W4P1 (1) to jack J2 TK (2) on VTM.
4. Disconnect tachometer cable (3) from tachometer drive adapter (4) on engine (WP 0520 00 or WP 0521 00).
5. Install pulse tachometer (5) on tachometer drive adapter (4).



CAUTION

To prevent cable damage, make sure cable is clear of belts and fan blade.

6. Connect cable W4P2 (6) to pulse tachometer (5).
7. Push VTM circuit breaker to ON.
8. Return to troubleshooting task that referred you to this task.



REMOVAL

1. Pull VTM circuit breaker to OFF.
2. Disconnect cable W4P2 from pulse tachometer.
3. Remove pulse tachometer from tachometer drive adapter.
4. Install tachometer cable on drive adapter (WP 0520 00 or WP 0521 00).
5. Remove cable W4P1 from jack J2 TK on VTM.
6. Stow transducer cable and pulse tachometer in transit case.

HOOK UP/REMOVE STE/ICE-R FOR STARTER CIRCUIT TESTS 0116 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

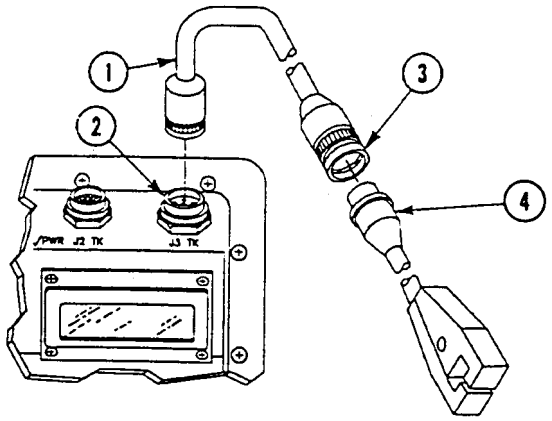
See your -10
TM 9-4910-571-12&P

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)
STE/ICE-R power hooked up (WP 0114 00)

HOOK UP

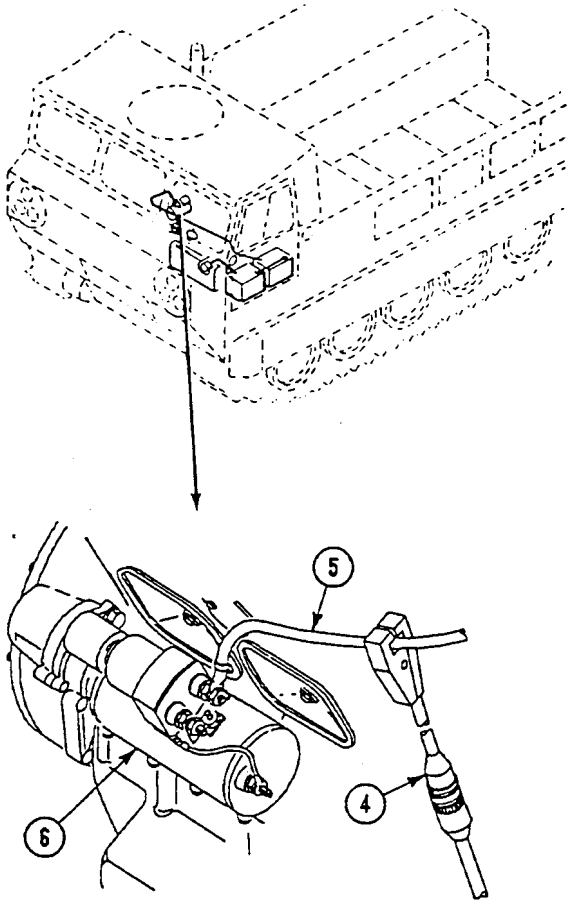
1. Remove transducer cable W4 from transit case.
2. Pull VTM circuit breaker to OFF.
3. Install cable W4P1 (1) on VTM jack J3 TK (2).
4. Attach cable W4P2 (3) to current probe (4).



NOTE

If current probe is below room temperature, wait at least 5 minutes after connecting probe to VTM before doing offset test, or perform offset within 30 seconds of starting each measurement.

5. Clamp current probe (4) around positive (+) battery cable (5) going to the starter (6). Point arrow on probe along cable to starter. Make sure probe is closed.



6. Push VTM circuit breaker to ON.
   a. If display reads **(8888)** and **(– – – –)**, go to Step 7.
   b. If display is not blank, but does not read **(8888)** and **(– – – –)**, write up DA form 2404 on faulty VTM display. Report problem to supervisor.
   c. If display is blank, go to VTM blank display diagnostic troubleshooting (See TM 9-4910-571-12&P).
7. Return to troubleshooting task that referred you to this task.

REMOVAL

1. Pull VTM circuit breaker to OFF.
2. Remove transducer cable W4 from battery cable and VTM.
3. Disconnect cable W4P2 from current probe.
4. Stow transducer cable W4 and current probe in transit case.

HOOK UP/REMOVE STE/ICE-R TEST SET FOR TEST NUMBERS 72 THRU 75 0117 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required
Unit Mechanic

References
See your -10

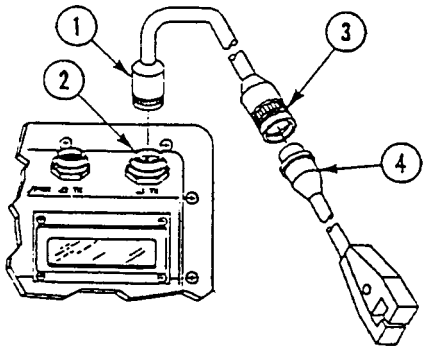
Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)
All electrical accessories turned off (see your -10)
Engine at operating temperature (see your -10)
Fuel off, engine must not start (see your -10)
STE/ICE-R power hooked up (WP 0114 00)

HOOK-UP

NOTE

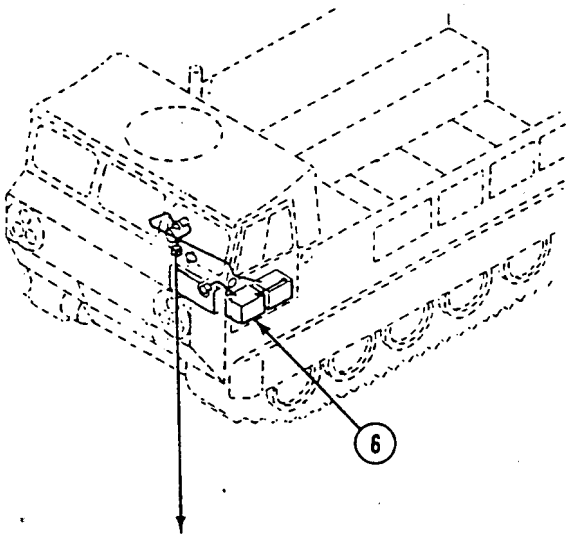
Do not have battery charger connected when performing test numbers 72 thru 75.

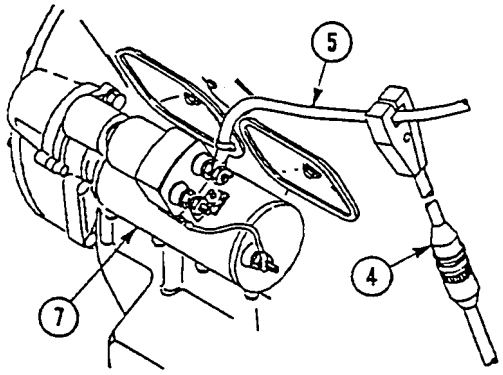
1. Remove transducer cable W4 and current probe from transit case.
2. Pull VTM circuit breaker to OFF.
3. Install cable W4P1 (1) on VTM jack J3 TK (2).
4. Attach cable W4P2 (3) to current probe (4).



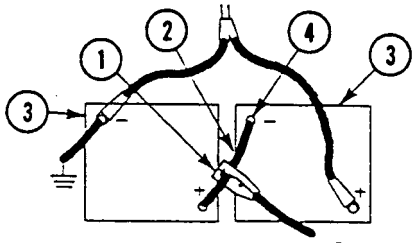
5. Push VTM circuit breaker to ON.

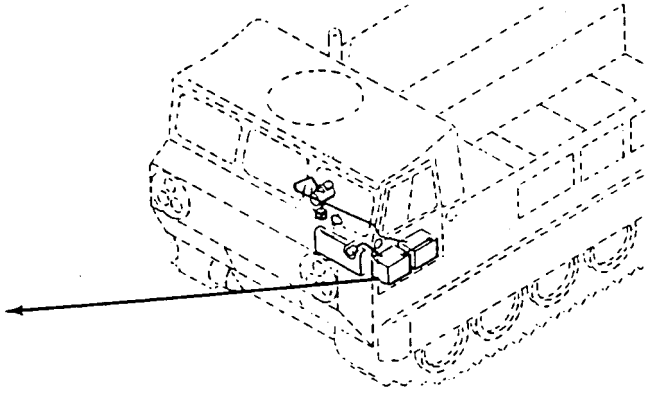
6. For test numbers 72 or 74, current probe (4) is connected to positive cable (5) between battery (6) and starter (7). Point arrow on current probe along cable to starter. Make sure current probe is closed.





7. For test numbers 73 or 75, clamp current probe (1) around cable (2) connecting series pair of batteries (3). Point arrow on current probe along cable toward negative terminal (4). Make sure current probe is closed.





NOTE

Engine must not start while cranking engine. If engine starts, repeat Step 8.

8. Continue current probe by engaging starter only long enough to briefly turn engine (approximately 1 second).

9. Return to troubleshooting task that referred you to this task.

REMOVE

1. Pull VTM circuit breaker to OFF.
2. Remove cable W4P1 from VTM jack J3 TK.
3. Remove cable W4P2 from current probe.
4. Stow transducer cable W4 and current probe in transit case.

STE/ICE-R TEST 01 DISPLAY ENGINE RPM WITH NEXT MEASUREMENT 0118 00

THIS WORK PACKAGE COVERS:

Test (page 0118 00-1)

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)
STE/ICE-R power hooked up (WP 0114 00)
STE/ICE-R engine RPM test hooked up (WP 0115 00)

1. Select TEST 01.
2. Press and release TEST button.
3. VTM will display **CON**.

NOTE

Hook up and offset steps should already have been completed. Do not repeat.

Go to desired measurement procedure. Follow that procedure. VTM will alternately display the engine speed and the desired measurement. The first number displayed will be RPM.

4. Return to troubleshooting task that referred you to this task.

STE/ICE-R TEST 10 ENGINE RPM 0119 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10
TM 9-4910-571-12&P

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
STE/ICE-R power hooked up (WP 0114 00)
STE/ICE-R starter circuit test hooked up (WP 0116 00)
STE/ICE-R engine RPM test hooked up (WP 0115 00)

1. Select TEST 10.
2. Press and release TEST button.

NOTE

At speeds below 50 RPM, the VTM will display 0. At speeds above 5000 RPM, the display may give a false reading.

3. VTM will display engine RPM:

Table 1.

CONDITIONS	ENGINE RPM
CRANKING	100 minimum
IDLE	650 – 700
GOVERNED SPEED (NO LOAD)	2975 – 3000

   a. If error message appears, see (WP 0107 00).

   b. If display is erratic or reads **0** with engine turning, see TM 9-4910-571-12&P.

4. Read cranking RPM while starting engine.
5. Check engine idle speed.

   a. Watch VTM for 10 seconds.

   b. If engine idle speed does not remain between 650 and 700 RPM, notify your supervisor.

6. Return to troubleshooting task that referred you to this task.

STE/ICE-R TEST 13 POWER (PERCENT) 0120 00

THIS WORK PACKAGE COVERS:

Test (page 0120 00-1)

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
STE/ICE-R power hooked up (WP 0114 00)
STE/ICE-R engine RPM test hooked up (WP 0115 00)
Warm engine to operating temperature (see your -10)

NOTE

If VID has been performed during power hook up procedure (WP 0114 00), go to Step 2 page 0120 00-0. If not, then continue to do Step 1 page 0120 00-0.

1. Enter VID.
   a. Set TEST SELECT switches to 60.
   b. Press and release TEST button.
   c. Wait for prompting message **UEH** to appear on display.
   d. Set TEST SELECT switches to 03.
   e. Press and release TEST button.
   f. Wait for **VTM** to display and hold VID number.

NOTE

Engine idle speed must be checked before performing power test. If idle speed is not within limits specified for vehicle/equipment, adjust idle speed to be within proper limits.

Do not run power test if idle speed cannot be properly adjusted.

2. Start and idle engine.
   a. Set TEST SELECT switches to 10.
   b. Press and release TEST button.
   c. Observe displayed value (rpm) and adjust idle speed if necessary.
   d. Observe displayed value (rpm).

CAUTION

Engine governor speed must be checked before performing power test. If governor speed is not within limits specified for vehicle/equipment, notify your supervisor.

Do not run power test if governor speed is not within specified limits. Damage to engine may result.

To prevent damage to equipment, allow engine to idle for at least two minutes after running power test.

3. Perform power test.

a. Set TEST SELECT switches to 13.

b. Press and release TEST button.

c. When **CIP** is displayed, sharply depress accelerator. Hold it to the floor. When VTM displays**OFF**, release accelerator.

d. A number will be displayed after engine has returned to idle speed. This number is the test result in units of percent of nominal rated power.

4. Return to troubleshooting task that referred you to this task.

Table 1.

% Power: Minimum Test Limit			
Vehicle	Altitude		
M113/M548 FOV	0 to 2000 feet	2000 feet to 4000 feet	Above 4000 feet
	75%	66%	60%
Test result appears in units of percent of nominal power			

STE/ICE-R TEST 14 COMPRESSION UNBALANCE (POWER CABLE) 0121 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
STE/ICE-R power hooked up (WP 0114 00)
Warm engine to operating temperature (see your -10)
Disengage transfer gearcase (see your -10)
Run test 72 (WP 0123 00)
Run test 73 (WP 0124 00)
Run test 74 (WP 0125 00)
Run test 75 (WP 0124 00)

NOTE

If VID has been performed during power hook up procedure (WP 0114 00), go to Step 2 page 0121 00-0. If not, then continue to do Step 1 page 0121 00-0.

1. Enter VID.
   a. Set TEST SELECT switches to 60.
   b. Press and release TEST button.
   c. Wait for prompting message UEH to appear on display.
   d. Set TEST SELECT switches to 03 for vehicle being tested.
   e. Press and release TEST button.
   f. Wait for VTM to display and hold VID number.

NOTE

Do not run more than two compression unbalance tests in a row. Idle engine between pairs of compression unbalance tests.

Crank engine without fuel for 5 seconds to clear fuel from cylinders.

NOTE

If E013 appears, test data cannot be analyzed because of weak batteries or interrupted cranking during test. Correct problem and repeat Step 2 page 0121 00-0.

2. Perform test.
   a. Set TEST SELECT switches to 14.
   b. Press and release TEST button.
   c. When GO appears, crank engine. Display will change to **(– – – –)** while engine is turning.
   d. When OFF or E013 appears, stop cranking. Wait for message to appear.

1) If a number is displayed, refer to the vehicle test card for its meaning (WP 0107 00).

2) If GO appears, go back to Step 2.c page 0121 00-0.

3) A FAIL message usually means compression is too far unbalanced to measure with STE/ICE-R. Occasionally, a FAIL message may be caused by carrier/equipment accessories that are activated during cranking or by imperfections in the starting system.

STE/ICE-R TEST 67 BATTERY VOLTAGE 0122 00

THIS WORK PACKAGE COVERS:

Test page 0122 00-1

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10
TM 9-4910-571-12&P

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
STE/ICE-R power hooked up (WP 0114 00)
STE/ICE-R starter circuit test hooked up (WP 0116 00)
STE/ICE-R engine rpm test hooked up (WP 0115 00)

1. Select TEST 67.
2. Press and release TEST button.

Table 1.

CONDITION	VOLTS
ENGINE OFF MASTER SWITCH OFF	22 or more
CRANKING ENGINE FUEL OFF	18 or more
CHARGING 1200 RPM SERVICE LIGHTS ON	26 to 29

   a. If display is erratic or shows **0** volts, see TM 9-4910-571-12&P.
   b. If error message appears, see (WP 0107 00).
   c. If **.9.9.9.9** is displayed, voltage is not within test range. Use test 89, see TM 9-4910-571-12&P.

3. Return to troubleshooting task that referred you to this task.

STE/ICE-R TEST 72 STARTER CURRENT (FIRST PEAK) 0123 00

THIS WORK PACKAGE COVERS:

Test (page 0123 00-1)

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10
TM 9-4910-571-12&P

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
All electrical accessories turned off (see your -10)
Fuel OFF, engine must not start (see your -10)
STE/ICE-R power hooked up (WP 0114 00)
STE/ICE-R starter circuit test hooked up (WP 0116 00)

1. Select TEST 72.
2. Perform offset test.
   a. Press and hold TEST button until **CAL** appears. Release TEST button.
   b. If VTM reads between **–225** and **+225**, offset test passes.
   c. If offset test fails, see TM 9-4910-571-12&P.
3. Press and release TEST button.
4. When GO appears, turn MASTER SWITCH ON and crank engine for 2 seconds or until one of the following appears on VTM:

Table 1.

DISPLAY	PERFORM/RESULT
a. OFF	**Stop cranking and wait for message to appear.**
b. A number	**CIRCUIT RESISTANCE (in amps)**
c. .9.9.9.9	**Beyand range of VTM, cannot be measured.**
d. Error message	**See (WP 0107 00)**

5. Turn MASTER SWITCH OFF.
6. Observe VTM reading.
   a. If VTM reading is between **700** and **1275**, test passes.
   b. If reading is erratic or cannot be obtained, see TM 9-4910-571-12&P.
7. Return to troubleshooting task that referred you to this task.

STE/ICE-R TEST 73 BATTERY RESISTANCE — STE/ICE-R TEST 75 BATTERY RESISTANCE CHANGE (PACK)

0124 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10
TM 9-4910-571-12&P

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Battery cover removed (see your -10)
STE/ICE-R power hooked up (WP 0114 00)
STE/ICE-R starter circuit test hooked up (WP 0116 00)

WARNING

Battery posts and cables touched by metal objects can short circuit and burn you. Do not wear jewelry, necklaces, or watches when working on the electrical system. Keep tools away from posts, wires, and terminals.

1. Reposition current probe.
   a. Pull VTM switch to OFF.
   b. Remove current probe from positive battery cable.
   c. Connect current probe to cable connecting series pair of batteries together.
   d. Push VTM switch to ON.
   e. Select TEST 73.

NOTE

Both TEST 73 and TEST 75 must be performed to determine condition of series pair of batteries.

2. Perform offset test.
   a. Press and hold TEST button until **CAL** appears. Release TEST button.
   b. If VTM reads between **–225** and **+225**, offset test passes.
   c. If offset test fails, see TM 9-4910-571-12&P.

STE/ICE-R TEST 73 BATTERY RESISTANCE — STE/ICE-R TEST 75 BATTERY RESISTANCE CHANGE (PACK)—Continued

0124 00

3. Press and release TEST button.
4. When GO appears, crank engine for two seconds or until one of the following appears on display:

Table 1.

DISPLAY	PERFORM/RESULT
a. OFF	**Stop cranking and wait for message to appear.**
b. A number	**CIRCUIT RESISTANCE (milliohms test 73; milliohms/ seconds test 75)**
c. .9.9.9.9	**Beyond range of VTM, cannot be measured.**
d. Error message	**See (WP 0107 00)**
e. (—-)	**VTM lost power during test. Batteries may be too weak. Try powering VTM using external source.**

5. Observe VTM reading.
   a. If test 73 VTM reading is **25** or less, test passes.
   b. If test 73 VTM reading is over **25**, test fails.
   c. If test 75 VTM reading is **50** or less, test passes.
   d. If test 75 VTM reading is over **50**, test fails.

Table 2.

TEST 73 BATTERY INTERNAL RESISTANCE TEST RESULT	TEST 75 BATTERY RESISTANCE CHANGE TEST RESULT	BATTERY PACK CONDITION
PASS	PASS	The batteries tested are ok and in good state of charge.
PASS	FAIL	The batteries tested are in poor condition, but have a fresh charge.
FAIL	PASS	The batteries tested are ok, but need to be recharged.
FAIL	FAIL	The batteries tested are in poor condition and in a state of discharge.

6. Select test 75.

STE/ICE-R TEST 73 BATTERY RESISTANCE — STE/ICE-R TEST 75 BATTERY RESISTANCE CHANGE (PACK)—Continued **0124 00**

7. Repeat Steps 2 page 0124 00-0 - 5 page 0124 00-0.
8. Determine condition of series pair of batteries using table.
   a. If batteries are in poor condition, go to individual battery tests 77 and 79 (see TM 9-4910-571-12&P).
9. Return to troubleshooting task that referred you to this one.

STE/ICE-R TEST 74 STARTER CIRCUIT RESISTANCE 0125 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10
TM 9-4910-571-12&P

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
All electrical accessories turned off (see your -10)
Fuel OFF, engine must not start (see your -10)
STE/ICE-R power hooked up (WP 0114 00)
STE/ICE-R starter circuit test hooked up (WP 0116 00)

1. Select TEST 74.
2. Perform offset test.
   a. Press and hold TEST button until **CAL** appears. Release TEST button.
   b. If VTM reads between **–225** and **+225**, offset test passes.
   c. If offset test fails, see TM 9-4910-571-12&P.
3. Press and release TEST button.
4. When GO appears, turn MASTER SWITCH ON and crank engine for 5 seconds or until one of the following appears on VTM:

Table 1.

DISPLAY	PERFORM/RESULT
a. OFF	**Stop cranking and wait for message to appear.**
b. A number	**CIRCUIT RESISTANCE (in milliohms)**
c. .9.9.9.9	**Beyond range of VTM, cannot be measured.**
d. Error message	**See (WP 0107 00)**

5. Turn MASTER SWITCH OFF.
6. Observe VTM reading.
   a. If VTM reading is between **5** and **27**, test passes.
   b. If reading is erratic or cannot be obtained, see TM 9-4910-571-12&P.
7. Return to troubleshooting task that referred you to this one.

STE/ICE-R TEST 90 DC CURRENT 0 TO 1500 AMP 0126 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

STE/ICE-R Test Set (WP 0541 00, Item 6)

Personnel Required

Unit Mechanic

References

See your -10
TM 9-4910-571-12&P

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
STE/ICE-R power hooked up (WP 0114 00)
STE/ICE-R starter circuit test hooked up (WP 0116 00)

NOTE

If current probe is below room temperature, wait at least 5 minutes after connecting probe to VTM before doing offset test, or perform offset within 30 seconds of starting each measurement.

1. Perform offset test.
   a. Set TEST select switches to 90.
   b. Push and hold TEST button until **CAL** appears. Release TEST button.
   c. If VTM reads between **–225** and **+225**, offset test passes.
   d. If offset test fails, see TM 9-4910-571-12&P.
2. Press and release TEST button
3. Turn on circuit used to condition current probe. If starter is used to condition probe, energize starter long enough to obtain a reading. Do not allow engine to start.
4. Note polarity sign of conditioning current. If readout is negative **(–)**, reverse current probe, and repeat Steps 1 page 0126 00-0 - 4 page 0126 00-0.
5. Turn off circuit used to condition current probe.
6. Perform offset test.

NOTE

Stray magnetic fields can affect the current reading. Such fields may exist within a foot or so of operating carrier generators and alternators, motor generators under load, and electric motors. Keep current probe at least one foot away from any operating generators, alternators, or electric motors.

7. During offset test, the component being tested must be off, and the circuit must be de-energized.
   a. Turn off component to be tested.
   b. Install current probe where current is to be measured.

c. Push and hold TEST button until **CAL** appears. Release TEST button.

d. If VTM reads between **–225** and **+225**, offset test passes.

e. If offset test fails, see TM 9-4910-571-12&P.

8. Press and release TEST button.

9. Turn on component to be tested.

NOTE

If .9.9.9.9 appears on display, the test current is greater than 1500 amp and cannot be measured with STE/ICE-R.

If display reads a value with a minus sign, current probe has been installed backwards. Repeat Steps 1 page 0126 00-0 - 5 page 0126 00-0. Be careful not to reinstall current probe backwards.

10. Observe VTM reading.

a. If VTM reads between **250** and **425** amp, test passes.

b. If reading is erratic or cannot be obtained, see TM 9-4910-571-12&P.

11. Turn off component in Step 9 page 0126 00-0.

12. Return to troubleshooting task that referred you to this one.

CHAPTER 3

UNIT MAINTENANCE INSTRUCTIONS FOR PMCS INCLUDING LUBRICATION INSTRUCTIONS

WORK PACKAGE INDEX

SERVICE UPON RECEIPT OF MATERIEL 0127 00

THIS WORK PACKAGE COVERS:

This section tells you how to service your carrier when it is first received from a depot. It also gives information on administrative storage.

INITIAL SETUP:

Maintenance Level

Unit

GENERAL INSTRUCTIONS

If you find anything wrong during this preliminary check and service, or during break-in period, report them to your supervisor. These deficiencies must be corrected before carrier can be placed in service.

You are required to report any serious problems which appear to involve unsatisfactory design or material. Prepare the Equipment Improvement Recommendations (EIR) using SF-369, Quality Deficiencies Report, as stated in DA PAM 738-750.

PRELIMINARY CHECKS AND ADJUSTMENTS

DEPROCESSING CARRIER

1. All new or reconditioned carriers, when first received by using soldiers, must be deprocessed. Unit Mechanics must decide if carrier has been properly prepared for service. The carrier must be in condition to perform its assigned mission.

   The carrier crew will assist in the performance of these checks and services.

   Remove rust preventive coatings from all exterior services. Use cleaning compound (WP 0542 00, Item 9).

   Read DD Form 1397 (Processing and Deprocessing record for Shipment, Storage, and Issue of Vehicles and Spare Engines). Follow precautions checked on the form. Form should be in a waterproof cover attached to one of the headlights. A duplicate copy should be in the driver’s compartment.

   Read and follow instructions on all warning tags attached to engine, radiator filler neck, and driver’s compartment.

   Follow procedures given in the Preventive Maintenance Checks and Services (WP 0128 00).

M548A1 AND M548A3 DEPROCESSING PROCEDURES

NOTE

The shipping closure and attaching hardware are reusable items. Do not damage. Keep attaching hardware with closure. Refer to your supervisor for disposition of these items.

One access panel is installed on each side of cab.

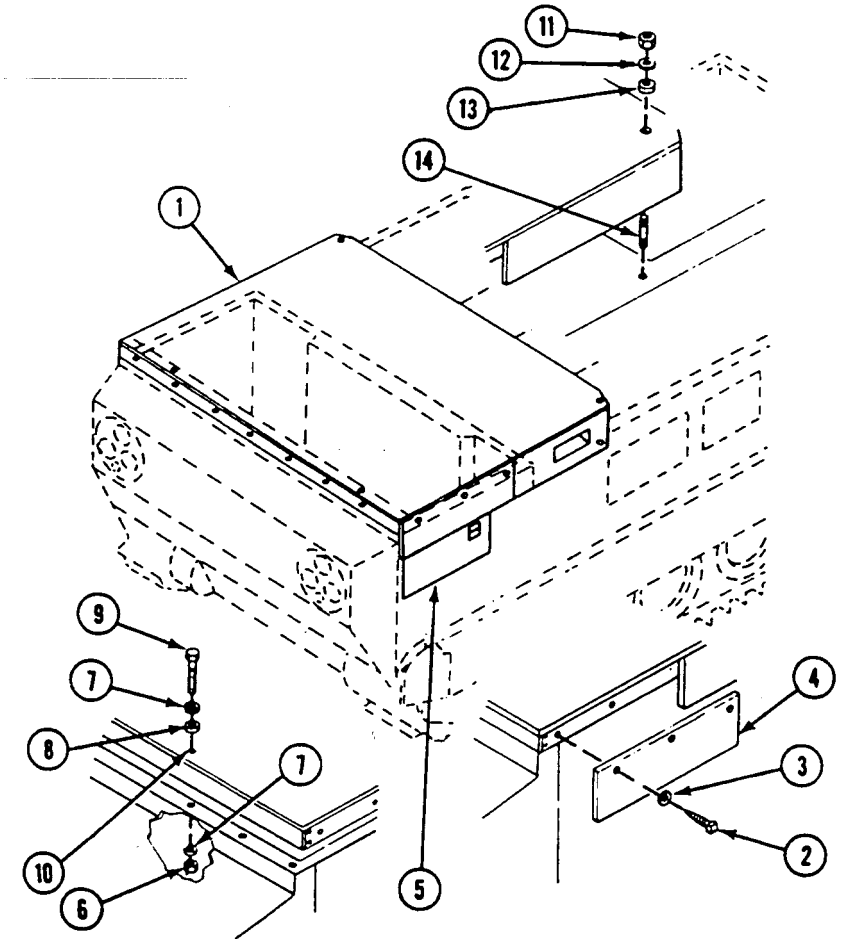
1. Remove shipping closure (1).

   a. Remove six lag bolts (2), washers (3), and two side access panels (4) from two cab doors (5). Open cab doors.

   b. Remove two nuts (6), four washers (7), two washers (8), screws (9), and front of shipping closure (1) from two windshield mounting holes (10).

   c. Remove two nuts (11), washers (12), washers (13), and rear of shipping closure (1) from two studs (14). Lift shipping closure from carrier.

   d. Before storage of shipping closure (1), install two side access panels on shipping closure with six washers (3) and lag bolts (2).



2. Remove equipment packages from driver's cab. Packages contain windshield wiper blades and arms with attaching nuts, exhaust pipe, and two hooks and pintle.

3. Remove equipment packages from cargo compartment. Packages contain cab cover, windshield, side door windows, on vehicle equipment (OVE), cargo cover, and, if so equipped, vehicle compartment heater kit defroster duct, machine gun mount kit, and material handling (hoist) kit.
4. Remove tape seals from exhaust outlet and engine air intake, oil filler cap, and oil dipstick.
5. Install air cleaner hose on engine air intake (WP 0153 00) or (WP 0159 00).
6. Check tension on drive belts for generator (WP 0241 00) or (WP 0245 00), fan and coolant pump (WP 0252 00).
7. Unpack batteries. Add electrolyte to batteries TM 9-6140-200-14 to 3/8 inch (9 mm) above bottom plates (about 2 gallons (8 liters) each). Install two batteries for M548A1 (WP 0290 00) and four batteries for M548A3 (WP 0293 00) in carrier battery compartment.
8. Unpack windshield and side door windows. Install windshield on carrier (WP 0392 00). Install side door windows on driver's cab doors (WP 0387 00).
9. Unpack windshield wiper blades and arms with attaching nuts. Install blades and arms on carrier (WP 0422 00).
10. Unpack exhaust pipe. Install pipe on exhaust muffler outlet (WP 0209 00) or (WP 0210 00).
11. Remove tape and paper wrappings from seat cushions and backrests.
12. Remove wire cloth screens from access and drain openings in hull. Install drain plugs, float valves, drain covers, and hull bottom access cover (WP 0383 00).
13. Unpack cab cover, left and right side frames, and rear crossbow. Install cover, frames, and crossbow on carrier (WP 0418 00).
14. Unpack and inventory basic issue items (BII) (see your -10). Record any missing or damaged items and stow BII on carrier.
15. If equipped (M548A1), unpack vehicle compartment heater kit defroster duct. Install defroster duct in carrier (WP 0432 00).
16. If equipped (M548A1), unpack machine gun mount kit. Install gun mount on carrier (WP 0513 00), (WP 0514 00), or (WP 0515 00).
17. Unpack towing hooks. Install hooks on towing eyes (WP 0376 00).
18. Unpack towing pintle. Install pintle on carrier tailgate (WP 0377 00).
19. Unpack cargo covers and bows. Install them over cargo compartment (WP 0417 00).
20. If equipped (M548A1), unpack material handling kit. Install hoist kit in cargo compartment (WP 0482 00).
21. Remove preservative coating from outer moving parts on winch (M548A1). Use cleaning compound (WP 0542 00, Item 9).
22. Clean pivot steering brake disks. Use cleaning compound (WP 0542 00, Item 9).
23. Perform Before PMCS (see your -10).
24. Check operation of all controls (see your -10).
25. Perform complete lube (WP 0128 00).
26. Start and run engine (see your -10). Check for oil leaks. Disregard smoky exhaust for first few minutes of operating. Some rust preventive fuel will be in the system when engine is started. It will burn along with the regular fuel.

WARNING

Do not handle wire rope with bare hands. Broken wires can rip your hands open. Wear leather gloves when handling wire rope.

27. Unreel winch cable (M548A1) (see your -10). Remove preservative coating from cable with cleaning compound (WP 0542 00, Item 9). Coat cable with preservative lubricating oil (WP 0542 00, Item 15). Rewind cables on drums.
28. Check pivot steering brakes (M548A1).
    a. Place transmission range selector lever in 1-2 range.
    b. Release differential brakes.
    c. Slowly press accelerator pedal until carrier reaches speed of 3 mph (5 km/h).
    d. Release accelerator pedal and pull back on both left and right steering levers evenly and firmly until carrier comes to a complete stop.

WARNING

Do not handle wire rope with bare hands. Broken wires can rip your hands open. Wear leather gloves when handling wire rope.

29. Unreel shelter puller winch cable (M548A1) (see your -10). Remove preservative coating from cable with cleaning compound (WP 0542 00, Item 9). Coat cable with preservative lubricating oil (WP 0542 00, Item 15). Rewind cables on drums.
30. Check operation of all controls (see your -10).

M548A1/M548A3 CALIBER .50 MACHINE GUN MOUNT KIT DEPROCESSING PROCEDURES

1. General procedures:
    a. Check material to make sure it is ready for use. Clean, lube as needed, and prepare material for service.
    b. List missing or damaged parts and any malfunctions.
    c. Report serious problems on DA Form 2404.
2. Specific procedures:
    a. Unpackage and inventory machine gun mount kit parts against packing list and TM 9-1005-245-14.
    b. Assemble ring mount. See TM 9-1005-245-14.
    c. Install supports and ring mount (WP 0514 00).
    d. Install pintle and cradle (WP 0515 00).

e. Lube ring mount (WP 0128 00).

f. Perform Before PMCS (see your -10).

M548A1/M548A3 M66 RING MOUNT KIT DEPROCESSING PROCEDURES

1. General procedures:
   a. Check material to make sure it is ready for use. Clean, lube as needed, and prepare material for service.
   b. List missing or damaged parts and any malfunctions.
   c. Report serious problems on DA Form 2404.
2. Specific procedures:
   a. Unpackage and inventory gun mount kit parts against packing list and TM 9-1005-245-14.
   b. Assemble ring mount. See TM 9-1005-245-14.
   c. Install supports and ring mount (WP 0514 00).
   d. Install deflector support and cartridge deflector (WP 0514 00).
   e. Install machine gun mount. See TM 9-1005-245-14.
   f. Lube gun mount (WP 0128 00).
   g. Perform Before PMCS (see your -10).

M548A1/M548A3 7.62 MM MACHINE GUN MOUNT KIT DEPROCESSING PROCEDURES

1. General procedures:
   a. Check material to make sure it is ready for use. Clean, lube as needed, and prepare material for service.
   b. List missing or damaged parts and any malfunctions.
   c. Report serious problems on DA Form 2404.
2. Specific procedures:
   a. Unpackage and inventory machine gun mount kit parts against packing list and RPSTL.
   b. Install M66 gun mount kit (WP 0514 00). Omit deflector and tripod brackets.
   c. Install 7.62 mm gun mount (WP 0515 00).
   d. Perform Before PMCS (see your -10).
   e. Perform After PMCS (see your -10).

M548A1/M548A3 MATERIAL HANDLING KIT DEPROCESSING PROCEDURES

1. General procedures:
   a. Check material to make sure it is ready for use. Clean and prepare material for service.
   b. List missing or damaged parts and any malfunctions. Correct deficiencies.
   c. Report serious deficiencies which appear to involve unsatisfactory design or material on SF-368, Quality Deficiencies Report.
2. Specific procedures:
   a. Unpack and inventory material handling kit parts against packing list and RPSTL.

M548A1/M548A3 TURN SIGNAL KIT DEPROCESSING PROCEDURES

1. General procedures:
    a. Check material to make sure it is ready for use. Clean and prepare material for service.
    b. List missing or damaged parts and any malfunctions. Correct deficiencies.
    c. Report serious deficiencies which appear to involve unsatisfactory design or material on SF-368, Quality Deficiencies Report.
2. Specific procedures:
    a. Check that all parts are properly assembled and installed.
    b. Test operation of turn signal (WP 0505 00).

ADMINISTRATIVE STORAGE

1. Instructions for administrative storage of your carrier are contained in MIL-C-62015.

END OF TASK

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

0128 00

THIS WORK PACKAGE COVERS:

Semi-Annual (Table 16, page 0128 00-20).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

Adapter (WP 0541 00)
Socket Set (WP 0541 00)
Socket Set (WP 0541 00, Item 64)
Torque Wrench (WP 0541 00)
Torque Wrench (WP 0541 00, Item 70)
Torque Wrench (WP 0541 00, Item 71)
Torque Wrench (WP 0541 00)
Torque Wrench (WP 0541 00, Item 69)

Materials/Parts

Automotive grease (WP 0542 00)
Cleaning compound (WP 0542 00, Item 9)
General purpose detergent (WP 0542 00, Item 16)
Sealing tape (WP 0542 00, Item 25)

Personnel Required

Unit Mechanic

References

FM 9-207
TM 9-214
TB 43-0211
TM 43-0319
TM-3-6680-316-10
TM 9-2350-247-10
TM 3-6665-224-12
TM 9-6100-200-14
TM 9-2350-247-24P
TM 9-2450-205-24&P
TM 3-4240-276-30
TM 3-4240-276-30P

Equipment Condition

Engine stopped (see your -10)

SCOPE

This section details preventive maintenance checks and services (PMCS) and lubrication procedures required for the M548A1 and M548A3 Carriers at the unit maintenance level. For crew level PMCS, see your -10.

MAINTENANCE FORMS AND RECORDS

The forms and records you fill out have many uses. They are a permanent record of the service, repairs, and changes made to your vehicle. They also tell you whether faults have been repaired. For information on forms and records, see DA Pamphlet 738-750.

WARNINGS AND CAUTIONS

Always observe the WARNINGS and CAUTIONS appearing in the PMCS tables BEFORE, DURING, and AFTER you operate the equipment. The WARNINGS and CAUTIONS appear before certain procedures. You must observe these WARNINGS and CAUTIONS to prevent serious injury to yourself and others or prevent your equipment from being damaged.

PMCS PROCEDURES

CAUTION

Water in engine exhaust system and heater exhaust will cause serious damage. Keep water out of engine exhaust system by either running the engine or taping over the exhaust outlet. Tightly cover heater exhaust wells.

Obey all WARNINGS and CAUTIONS when you do PMCS.

Name, caution, and instruction plates should be easy to read. If they are dirty or corroded, clean them, and coat them with lacquer. See TM 43-0319 for instructions.

If something doesn't work, troubleshoot it using the troubleshooting procedures (WP 0005 00).

Do the Semi-annual PMCS every 1500 miles (2414 km) of operation or 150 hours, whichever comes first, after the last Semi-annual PMCS. Complete forms DA Form 2404 and DD Form 314.

Always do your PMCS in the same order so it gets to be a habit. With practice, you'll spot anything that is wrong.

Keep your carrier clean. Dirt, grease, oil, and debris only get in the way, and may cover up a serious problem. Clean your vehicle as you work and as needed.

After operation in water, mud, or loose sand, clean and lube carrier as soon as possible. Do not wait for next scheduled PMCS.

Use cleaning compound (WP 0542 00, Item 9) on metal surfaces. Use general purpose detergent (WP 0542 00, Item 16) and water when you clean rubber or plastic parts.

You need to know how fluid leaks affect your vehicle. Definitions of the types and classes of leaks are given in General Maintenance Instructions below. You need to know them to determine the condition of your vehicle. Learn them. REMEMBER: WHEN IN DOUBT, NOTIFY YOUR SUPERVISOR!

NOTE

The carrier may continue to operate with minor water or oil 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. Any Class III leaks or any fuel leaks will make the carrier NOT READY/AVAILABLE.

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

CLASS II Leakage of fluid great enough to form drops, but not enough to cause drops to drip from item being checked/inspected.

CLASS III Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

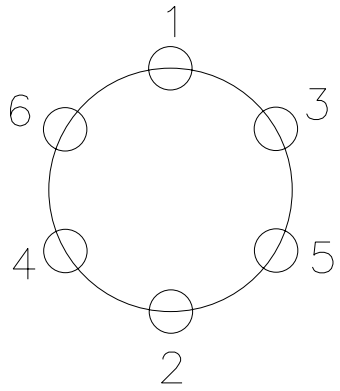
GENERAL MAINTENANCE INSTRUCTIONS

SCOPE

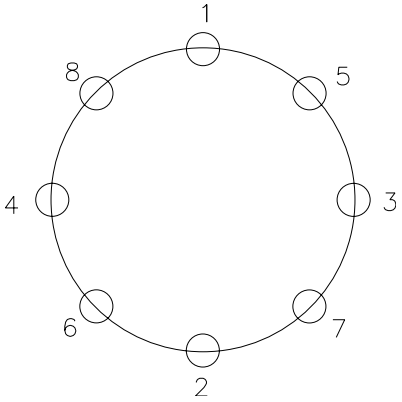
This section contains safety warnings, guidelines, and general maintenance instructions such as cleaning, inspection and repair. They should be followed when doing maintenance procedures. These instructions only apply to procedures authorized at unit maintenance level.

1. **PREPARATION FOR MAINTENANCE**
   a. *PERSONNEL SAFETY.* Practice all shop safety procedures and read all warnings in this manual.
   b. *PROPER EQUIPMENT.* Get tools and equipment before starting a maintenance task. See RPSTL, TM 9-2350-247-24P, and the maintenance task for tools, equipment, parts, and materials.
   c. *WHAT TO DISCARD.* Parts to discard, such as lock washers, lock nuts, 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.
   d. *HANDLING TECHNIQUES.*
      1) Avoid damage to parts during removal, cleaning, inspection, repair, and installation procedures. Nicks, scratches, and dents caused by careless handling could result in equipment failure.
      2) Dirt can damage parts and cause malfunctions. Make sure all air and fluid openings, lines, and hoses are capped or plugged during maintenance procedures.
   e. *IDENTIFICATION.*
      1) During removal, tag parts to ensure proper installation.
      2) During removal, tag leads on electrical parts to ensure proper installation. Tag each lead as it is removed.

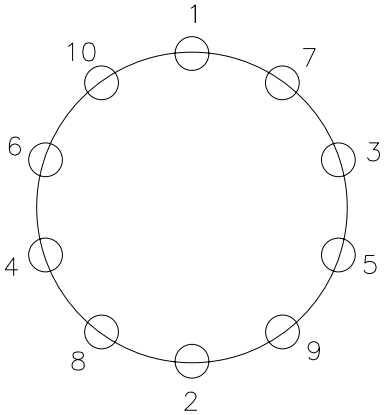
f. *TORQUING*. Where needed, torque values are listed in the maintenance task. When torquing, use one of the star pattern sequences below unless otherwise stated in the maintenance task.



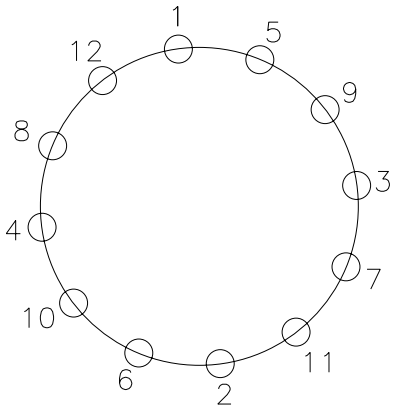
6–HOLE PATTERN



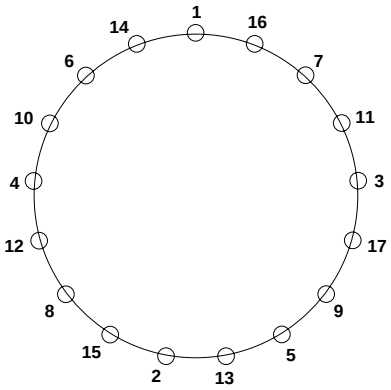
8–HOLE PATTERN



10–HOLE PATTERN



12–HOLE PATTERN



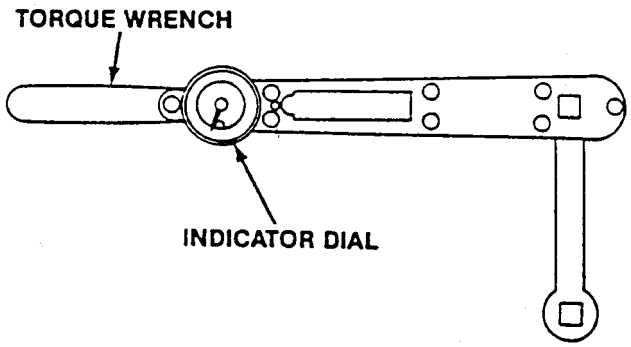
17–HOLE PATTERN

g. *USE OF TORQUE WRENCH ADAPTERS AND THE CONVERSION FORMULA.*

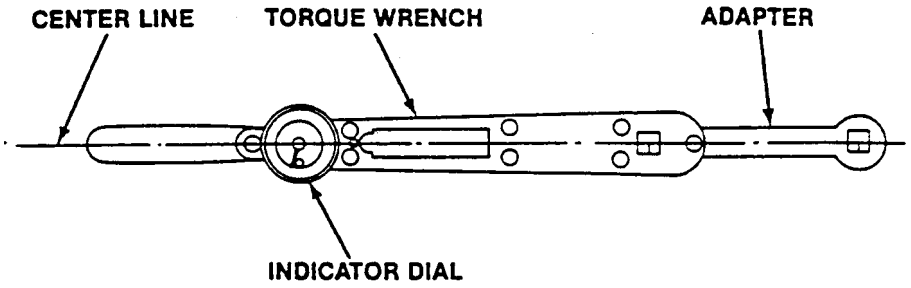
1) The torque values given in the text of this manual are the actual values that must be applied to the nut or screw for proper maintenance.

2) Some tasks require the use of a torque wrench adapter when the nut or screw cannot be reached with a regular socket on the end of the torque wrench. When an adapter is used on a torque wrench, definite rules must be followed or the nut or screw will be over- or under-torqued. The center line of the adapter should be used in one of two positions:

a) One position is to have the adapter center line at right angles to the center line of the torque wrench. In this position, the indicator reading does not have to be calculated and it may be read direct.



b) The other position is to have the center line of the adapter in line with the center line of the torque wrench. In this case, the adapter adds to the overall length of the torque wrench and makes the dial or scale reading less than the actual torque applied to the nut or screw. To prevent overtorquing and damage to equipment, you must calculate a corrected dial or scale reading.

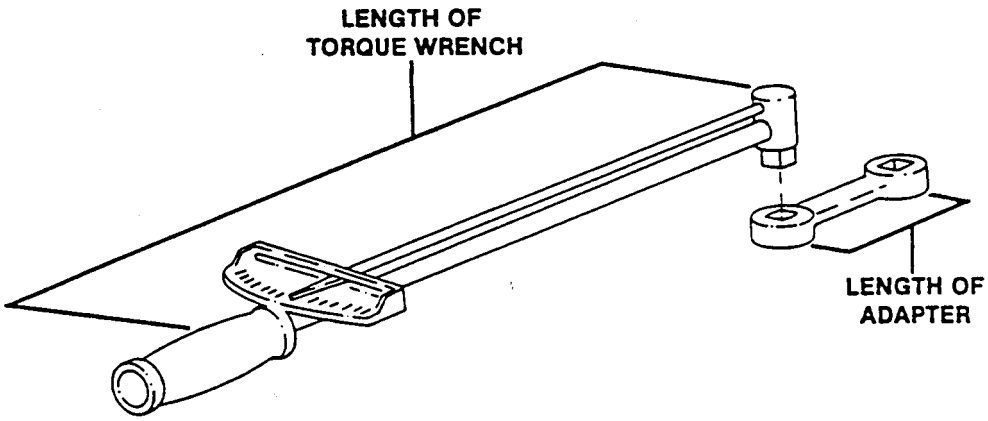


3) To determine the corrected scale or dial reading, use the following formula and refer to the example.

NOTE

The length of the torque wrench is measured from the center of the handle to the center of the drive. The length of the adapter is measured from the center of the drive to the center of the wrench.

$$\text{Corrected reading} = \text{Required torque value} \div \frac{\text{Length of torque wrench + length of adapter}}{\text{Length of torque wrench}}$$



In the following example, the torque wrench measured 12 inches (30 cm) and the adapter measured 3 inches (8 cm). From step (4), the required torque is 104 lb-ft (141 N•m).

4) Replace mission track tension adjuster mount screws (1). Tighten loose screws to 130–140 lb-ft (176–190 N•m) torque. Use adapter (WP 0541 00, Item 2) and torque wrench (WP 0541 00, Item 3).

Use 3 inch adapter.

Use 1/2 inch drive torque wrench.

To determine the corrected reading for this task, use the formula:

$$\text{Corrected reading} = \text{Required torque value} \div \frac{\text{Length of torque wrench + length of adapter}}{\text{Length of torque wrench}}$$

$$\text{Corrected reading} = 130 \text{ lb-ft} \div \frac{12 \text{ inches} + 3 \text{ inches}}{12 \text{ inches}}$$

$$\text{Corrected reading} = 130 \text{ lb-ft} \div \frac{15 \text{ inches}}{12 \text{ inches}}$$

$$\text{Corrected reading} = 130 \text{ lb-ft} \div 1.25$$

$$\text{Corrected reading} = 104 \text{ lb-ft}$$

Repeat above steps for other value.

2. **CLEANING**

a. *GENERAL.* Cleaning is very important. All parts must be cleaned well and kept clean during maintenance. Dirt or foreign matter can cause malfunctions and equipment failure. General cleaning procedures are detailed in steps b through n. Special cleaning procedures are covered in the task relating to the specific part.

1) Inspect and cap all air and fluid openings, lines, and hoses.

b. *CLEAN EVERY PART.* Clean every part well after removal and before installation. Clean parts such as housings, covers, and dipsticks before removal. Avoid getting dirt and foreign matter in a system.

1) Clean all parts before inspection, after repair, and before installation. Use cleaning compound or approved cleaner. Dry parts with wiping rag (WP 0542 00, Item 45).

c. *HANDLE WITH CARE.* Use care when handling parts during cleaning and maintenance. Nicks, scratches, dents, or burrs can prevent proper assembly or cause malfunctions after assembly.

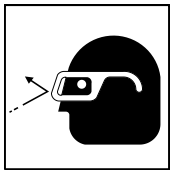
1) Keep hands free of grease; grease collects dirt.

2) After cleaning, cover or wrap parts to protect from dirt.

d. *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.

e. *REMOVAL AGENTS.* Remove gum or old grease deposits by soaking parts in cleaning compound (WP 0542 00, Item 9). Scrub with a brush (WP 0542 00, Item 30) Use cleaning cloth (WP 0542 00, Item 8) to remove minor surface defects.

WARNING



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

CAUTION

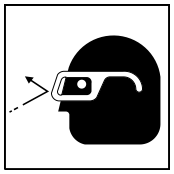
Lye or caustic mixtures will damage metal surfaces. Do not use lye or caustic mixtures to clean metal surfaces.

f. *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.

g. *LUBRICATION OF NEW BEARINGS.* See TM 9-214 for cleaning and lubrication procedures. Bearings that have been in service should also be lubricated.

h. *CASTINGS.*

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.

1) Clean inner and outer surfaces of casting with cleaning compound (WP 0542 00, Item 9). Dry casting with compressed air.

2) Remove sludge and gum deposits with brush (WP 0542 00, Item 30).

3) Blow out all tapped holes with compressed air.

i. *BEARINGS.* Bearings require special cleaning techniques. See TM 9-214 for cleaning and maintenance procedures for bearings.

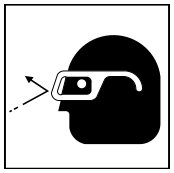
j. *BATTERIES.* See TM 9-6140-200-14 to service batteries.

k. *OIL PASSAGES.*

1) Make sure 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.

2) Flush oil passages with cleaning compound (WP 0542 00, Item 9). Dry parts with compressed air.

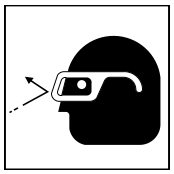
l. *OIL SEALS, ELECTRIC CABLES, AND FLEXIBLE HOSES.*

CAUTION

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

l. Clean seals, cables, and flexible hoses with general purpose detergent (WP 0542 00, Item 16) and water. Dry with wiping rag (WP 0542 00, Item 45).

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.

m. *INSERTS.* Blow out insert holes with compressed air.

n. *GASKETS.* If a gasket is being removed, scrape old gasket material and sealant off mating surface. Clean mating surface with cleaning compound (WP 0542 00, Item 9). Dry with wiping rag (WP 0542 00, Item 45).

3. **INSPECTION**

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 steps b through q below. Special inspection procedures are covered in the task as needed.

b. *CASTINGS.*

1) Inspect all castings and forgings for breaks, cracks, and wear or scoring that would impair function.

2) Inspect machined surfaces for nicks, burrs, and raised metal. Mark damaged areas for repair.

3) Use straightedge to check all mounting flanges on housings and supports for bends. Inspect mating flanges for stains which would indicate oil leakage.

4) Inspect all threaded parts for damaged or stripped threads.

c. *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.

d. *STUDS.* Inspect all studs for stripped or damaged threads, bent or loose condition, and signs of stretching.

e. *GEARS.* Inspect gears for burs, wear, cracked or broken teeth, and pitting at tooth contact areas.

f. *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, burs, 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.

g. *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.

h. *CORE HOLE PLUGS.* Inspect core hole plugs for signs of leakage. Replace damaged core hole plugs.

i. *INSERTS.*

1) Inspect inserts for cracks and stripped or damaged threads.

2) Check inserts for loose fit.

j. *GREASE SEALS, PREFORMED PACKINGS, AND GASKETS.*

1) Inspect seals that are composition—type, rings, and preformed packings for wear, brittleness, cracks, cuts, and damage.

2) Inspect lip seals for cracks, wear, cuts, and brittleness. Inspect springs and seal shells for damage.

3) Gaskets and seals on electrical parts may be reused. Inspect gaskets and seals for wear, nicks, cuts, and torn or missing gasket material. Replace gasket, if needed.

k. *SPLINED PARTS.* Inspect splined parts for burrs, wear, twisted, cracked, or broken splines.

l. *THREADED PARTS.* Inspect all threaded parts for burrs and stripped or damaged threads.

m. *RETAINING RINGS.* Inspect retaining rings for nicks, burrs, defects, loss of tension, and wear.

n. *SPRINGS.* Inspect springs visually for wear, defects, breaks, and loss of tension or compression.

o. *SHAFTS AND SPINDLES.* Inspect shafts and spindles for excessive wear, binding, scores, cracks, and burrs.

p. *ELECTRICAL PARTS.*

1) Inspect electrical parts before you install them. Look for mildewed, corroded, or burned parts.

2) Inspect electrical parts for pinched or loose wires and for cracked or broken wires, circuit cards, relays, and connectors.

3) Inspect insulation and heatshrink tubing for cracks, tears, burns, or missing material.

q. *CANVAS COVERS AND ROPES.*

1) Inspect canvas covers and webbing for holes, cuts, seam tears, and mildew.

2) Inspect ropes and webbing for broken strands. If more than half the strands are broken, replace rope or webbing.

4. **REPAIR**

a. *GENERAL.* General repair procedures are given in steps b through l below. Special procedures are covered in the task. After procedures, clean all parts well.

b. *CASTINGS.*

1) Replace all cracked or broken castings.

2) Repair minor damage to machined surfaces of castings with cleaning cloth (WP 0542 00, Item 8). Replace any part with defects that cannot be corrected or which will impair function.

c. Repair minor surface bends by working bent surface of casting across sheet of crocus cloth on surface plate. Replace bent castings which would impair assembly or function.

d. *BEARINGS.* See TM 9-214 for inspection and maintenance of needle roller or ball bearings.

e. *BUSHINGS AND BUSHING-TYPE BEARINGS.* 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.

f. *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, burs, and scratches with cleaning cloth (WP 0542 00, Item 8) dipped in cleaning compound (WP 0542 00, Item 9).

3) Install new oil seal in casting bore or adapter using suitable oil seal replacement tool.

g. *GREASE SEALS, PREFORMED PACKINGS, GROMMETS, AND GASKETS.* Preformed packings, seals, grommets, and gaskets should be replaced when removed unless otherwise stated in the maintenance task. They should not be reused.

h. *THREADED PARTS.* Replace all parts that have stripped or damaged threads. Replace parts that cannot be repaired by chasing threads with a used tap or die.

i. *RETAINING RINGS.*

1) Retaining rings that have defects 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.

j. *SPRINGS.* Discard springs that have defects. Load and height inspection data, where needed, are given in maintenance procedures.

k. *SHAFTS AND SPINDLES.*

1) Replace shafts and spindles that show signs of wear, binding, scores, cracks, burrs, or clogged oil passages.

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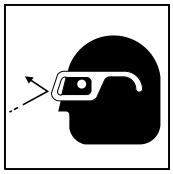


Air pressure in excess of 30 psi (207 kpa) can injure personnel. Do not direct pressurized air at yourself or others. Always wear goggles.

2) Remove obstructions with compressed air or by probing with soft wire.

3) Remove burrs and minor surface defects with a cleaning cloth (WP 0542 00, Item 8).

l. *ELECTRICAL PARTS.*

1) Replace corroded or burned parts and parts which show sings 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 heatshrink tubing.

m. *CANVAS COVERS AND ROPES.*

1) Repair canvas cover tears and ripped seams. See FM 10-16 for canvas and webbing repair.

2) Repair rope and faulty rope ends with twine or adhesive tape. Trim rope ends. Reverse rope that shows minor wear.

5. **FLUID LEAKS AND CHECKING FOR LEAKS**

a. *GENERAL.* Fluid leaks in hoses and fluid lines affect the carrier parts operation. The types and classes of leaks are given below.

CLASS I Fluid seepage is not great enough to form drops, but it is shown by wetness or color changes.

CLASS II	Fluid leakage is great enough to form drops. Drops do not drip from the item being checked or inspected.
CLASS III	Fluid leakage is great enough to form drops that fall from the item being checked or inspected

NOTE

You are allowed to operate equipment with minor water or oil 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. Any fuel or Class III leaks will make the vehicle NOT READY/ AVAILABLE.

b. *CHECKING FOR LEAKS AFTER A MAINTENANCE TASK.* After doing maintenance on a part which involves hoses or fluid lines, check for leaks. If leaks occur after you have done a replace or repair task, find the source of the leak. Correct the problem. Follow these procedures.

1) Do visual inspections to find the source of the leak.

a) Check for cracks on housing or cover.

b) Check that screws and any connections are not loose or overtight.

2) If you cannot see the source of the leak, check the items listed below.

a) Check that preformed gasket is not bent, or pinched.

b) Check machined surfaces for fit and cleanliness.

c) If leak persists, notify supervisor.

c. *CHECKING FOR LEAKS USING CHALK TEST.* Following replacement, repair, or adjustment of a door, access panel, or rubber seal, check for leaks by performing a chalk test. Use the following procedure:

1) Use chalk or chalk powder to coat area around seal.

2) Close door or panel.

3) Open door or panel.

4) Check for unbroken chalk line on mating surface. Where chalk does not stick to mating surface, there is a leak in the seal surface.

5) If a leak is found, perform adjustment to correct the problem.

6. **WARM-UP ENGINE (M548A1)**

To warm up the engine for a maintenance or troubleshooting task, do the following:

a. Cover air inlet grill.

b. Start engine (see your -10).

c. Lock left and right steering levers.

d. Move gear selector to 2-3 range. Do not release left and right steering levers.

e. Raise engine speed to 1500 rpm until normal operating temperature is reached.

f. Lower engine rpm to idle.

g. Move gear selector to NEUTRAL.

h. Stop engine (see your -10).

i. Uncover air inlet grill.

7. **WARM-UP ENGINE (M548A3)**

To warm up the engine for a maintenance or troubleshooting task, do the following:

a. Cover air inlet grill.

b. Start engine (see your -10).

c. Apply parking brake and foot brake.

d. Move gear selector to 2-3 range.

e. Run engine at approximately 800 rpm for 3 to 5 minutes, or until normal operating temperature is reached.

f. Lower engine rpm to idle.

g. Move gear selector to SL.

h. Stop engine (see your -10).

i. Uncover air inlet grill.

EXPLANATION OF PMCS TABLE ENTRIES

Item Number Column — Numbers in this column are for reference. When completing DA Form 2404 (Equipment Inspection and Maintenance Worksheet), include the item number for the check/service indicating a fault. Item numbers also appear in the order that you must do the checks and services for the intervals listed.

Interval Column — This column tells you how often you must perform the checks/services. Semi-Annual checks/services must be performed every six months or after 1500 (2400 km) of operation.

Man-Hour Column — This column gives the man-hours (to the nearest 10th of an hour) needed to complete the prescribed lubrication service. This column is used only for lubrication services.

Item To Be Checked or Serviced Column — This column lists the item to be checked or serviced.

Crewmember/Procedure Column — This column gives the procedure you must do to check or service the item listed in the *Item To Be Checked or Serviced* column to know if the equipment is ready or available for its intended mission or for operation. You must do the procedure at the time stated in the interval column.

Equipment Not Ready/Available If: Column — Information in this column tells you what faults will keep your equipment from being capable of performing its primary mission. If you perform check and service procedures that show faults as listed in this column, do not operate the equipment. Follow standard operating procedures for maintaining the equipment or reporting equipment failure.

ARMY OIL ANALYSIS PROGRAM (AOAP)

NOTE

Park carrier on level ground to check oil levels. Clean fittings with cleaning compound. Dry before lubricating. Check/lubricate all oil and grease fitting points after washing or fording.

AOAP is an effective maintenance diagnostic tool and not a maintenance substitute. TB 43-106 and TM 9-2300-422-23&P must not be interpreted to mean that AOAP minimizes in any way the need to employ good maintenance practices and strong maintenance discipline.

SAMPLING REQUIREMENTS

Samples may be taken without warming a component to operating temperature if the equipment has been operated within the last 30 days. If the equipment has not been operated within the last 30 days, these requisites apply to both routine and special sampling. Several hours of operation are needed to completely mix old and new oils.

SAMPLING PROCEDURES

Perform AFTER operation checks and services. See your -10.

NOTE

DO NOT ADD OIL immediately prior to taking oil samples. When AFTER operation checks and services indicate the need to replenish oil levels, WAIT until after taking samples. New oil added immediately prior to taking samples will adversely effect oil analysis results.

Obtain two sample bottles (NSN 8125–01–082–9697) and two DA Form 2026 from the unit AOAP monitor.

Start engine. See your -10 . If required (see Sampling Requirements above), drive carrier. See your -10 to bring engine and transmission up to normal operating temperatures.

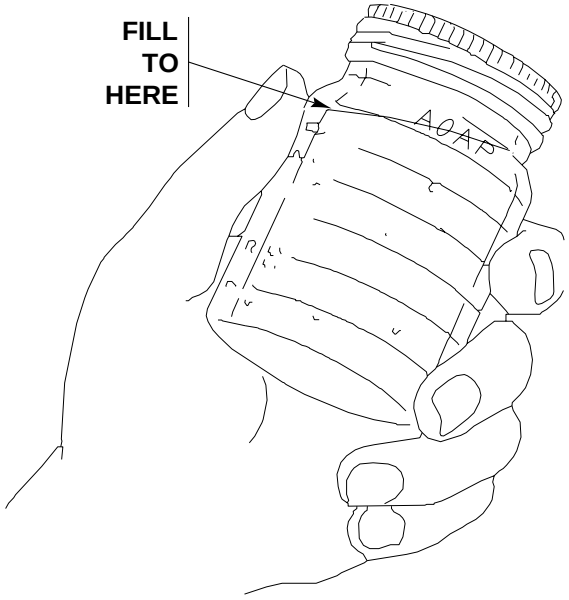
Stop carrier and set the brakes. See your -10.

Place range selector in the N (Neutral) position and keep engine running. On M548A3, lock the steering wheel. See your -10.

Raise crew seat and center floor plate. See your -10.

With engine operating, remove dust caps from the engine and transmission oil sampling valves.

Open sample valve on engine oil filter and drain a small amount of oil into a container to clear valve of grit and contamination. (Properly dispose of container and oil upon completion of sample taking.) Fill sampling bottle to the neck shoulder and seal it. Attach DA Form 2026 to sampling bottle.



Close oil sample valve and install dust cap.

Take oil sample from transmission in the same manner (see previous three steps).

Stop engine. See your -10.

Lower crew seat and center floor plate. See your -10.

Deliver sample bottles to the unit AOAP monitor.

NOTE

For location of nearest AOAP Laboratory and complete information about AOAP, refer to TB 43-0106. "Oil filters shall be serviced/cleaned/changed as applicable, when: (a) They are known to be contaminated, or clogged; (b) Service is recommended by AOAP Laboratory analysis, or (c) At prescribed hard time intervals."

LUBRICATION TABLES

Lubrication intervals will be indicated by one of the following symbols:

OC = AOAP On-Condition
B = Before
D = Daily
AF = After
W = Weekly
M = Monthly
S = 1,500 miles (2,400 km), Semi-annually
AN = Annually

The following tables are used during PMCS lubrication checks.

Table 1. LUBRICATION SYMBOLS

SYMBOL	NOMENCLATURE	SPECIFICATION
FRH	Hydraulic Fluid, Rust Inhibited, Fire Resistant	MIL-H-46170
GAA	Greas, Automotive and Artillery	MIL-G-10924
OE/HDO	Lubricating Oil, Internal Combustion Engine	MIL-L-2104
OEA	Lubricating Oil, Internal Combustion Engine	MIL-L-46167
PE	Preservation Oil	MIL-L-21260

Table 2. LUBRICANT USAGE: ENGINE (M548A3)

COMPONENTS INTERVALS = AF, OC	REFILL CAPACITY (APPROX)	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *	
		+5°F to +120°F (-15°C to +48.8°C)	+40°F to -60°F (+5°C to -51.1°C)
OE/HDO (MIL-L-2104) or OEA (MIL-L-46167)	18 qt.	OE/HDO-15/40	OEA
PE (MIL-L-21260)		PE 30-1	
* For Arctic Operation Refer to FM 9-207			

Table 3. LUBRICANT USAGE: ENGINE (M548A1)

COMPONENTS INTERVALS = D, S, OC	REFILL CAPACITY (APPROX)	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *		
		Above +32°F (Above 0°C)	+40°F to -10°F (+5°C to -23°C)	0°F to -65°F (-18°C to -54°C)
OE/HDO (MIL-L-2104) or OEA (MIL-L-46167)	18 qt.	OE/HDO-15/40	OE/HDO-15/40	OEA
* For Arctic Operation Refer to FM 9-207				

Table 4. LUBRICANT USAGE: TRANSMISSION (M548A3)

COMPONENTS INTERVALS = AF, S, AN, OC	REFILL CAPACITY (APPROX)	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *	
		+5°F to +120°F (-15°C to +48.8°C)	+40°F to -60°F (+5°C to -51.1°C)
OE/HDO (MIL-L-2104) or OEA (MIL-L-46167)	40 qt. or 10 gal.	OE/HDO-15/40	OEA
PE (MIL-L-21260)	See Note	PE 30-1	
NOTE: If transmission has been filled with preservation oil (MIL-L-21260) by the manufacturer or at time of overhaul, leave this oil in transmission until first scheduled oil change. Maintain operating oil level by adding same grade of PE oil. When first scheduled oil change is made, refill transmission with applicable grade oil (OE/HDO or OEA).			
* For Arctic Operation Refer to FM 9-207			

Table 5. LUBRICANT USAGE: TRANSMISSION (M548A1)

COMPONENTS INTERVALS = AF, S, OC	REFILL CAPACITY (APPROX)	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *		
		Above +32°F (Above 0°C)	+40°F to -10°F (+5°C to -23°C)	0°F to -65°F (-18°C to -54°C)
OE/HDO (MIL-L-2104) or OEA (MIL-L-46167)	16 qt.	OE/HDO-15/40	OE/HDO-15/40	OEA
* For Arctic Operation Refer to FM 9-207				

Table 6. LUBRICANT USAGE: TRANSFER GEARCASE

COMPONENTS INTERVALS = AF, S, OC	REFILL CAPACITY (APPROX)	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *		
		Above +32°F (Above 0°C)	+40°F to -10°F (+5°C to -23°C)	0°F to -65°F (-18°C to -54°C)
OE/HDO (MIL-L-2104) or OEA (MIL-L-46167)	2.5 qt.	OE/HDO-15/40	OE/HDO-15/40	OEA
* For Arctic Operation Refer to FM 9-207				

Table 7. LUBRICANT USAGE: DIFFERENTIAL

COMPONENTS INTERVALS = AF, S, OC	REFILL CAPACITY (APPROX)	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *		
		Above +32°F (Above 0°C)	+40°F to -10°F (+5°C to -23°C)	0°F to -65°F (-18°C to -54°C)
OE/HDO (MIL-L-2104) or OEA (MIL-L-46167)	20 qt.	OE/HDO-15/40	OE/HDO-15/40	OEA
* For Arctic Operation Refer to FM 9-207				

Table 8. LUBRICANT USAGE: FINAL DRIVES

COMPONENTS INTERVALS = D, S, OC	REFILL CAPACITY (APPROX)	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *		
		Above +32°F (Above 0°C)	+40°F to -10°F (+5°C to -23°C)	0°F to -65°F (-18°C to -54°C)
OE/HDO (MIL-L-2104) or OEA (MIL-L-46167)	3.5 qt. or 7 pt.	OE/HDO-15/40	OE/HDO-15/40	OEA
* For Arctic Operation Refer to FM 9-207				

Table 9. LUBRICANT USAGE: TACHOMETER AND SPEEDOMETER

COMPONENTS INTERVALS = AN, S	REFILL CAPACITY (APPROX)	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *	
		+5°F to +120°F (-15°C to +48.8°C)	+40°F to -60°F (+5°C to -51.1°C)
GIA (MIL-G-23827	As Required	All Temperatures	
GAA (MIL-G-10924)	As Required		
OE/HDO (MIL-L-2104) or OEA (MIL-L-46167)	As Required		
* For Arctic Operation Refer to FM 9-207			

Table 10. LUBRICANT USAGE: FAN GEAR BOX

COMPONENTS INTERVALS= M, S	REFILL CAPACITY (APPROX)	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *	
		+5°F to +120°F (-15°C to +48.8°C)	+40°F to -60°F (+5°C to -51.1°C)
OE/HDO (MIL-L-2104)	0.75 pt.	OE/HDO-15/40	OEA
* For Arctic Operation Refer to FM 9-207			

Table 11. LUBRICANT USAGE: PULLEY SUPPORT ARM

COMPONENTS INTERVALS = M, S	REFILL CAPACITY (APPROX)	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *	
		+5°F to +120°F (-15°C to +48.8°C)	+40°F to -60°F (+5°C to -51.1°C)
GAA (MIL-G-10924)	As Required	All Temperatures	
* For Arctic Operation Refer to FM 9-207			

Table 12. LUBRICANT USAGE: STEERING CONTROL BEARINGS; FOOT BRAKE PEDAL LINKAGE

COMPONENTS INTERVALS = S	REFILL CAPACITY (APPROX)	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *	
		+5°F to +120°F (-15°C to +48.8°C)	+40°F to -60°F (+5°C to -51.1°C)
GAA (MIL-G-10924)	As Required	All Temperatures	
* For Arctic Operation Refer to FM 9-207			

Table 13. LUBRICANT USAGE: PIVOT STEER SYSTEM

COMPONENTS INTERVALS = S	REFILL CAPACITY (APPROX)	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *		
		Above +32°F (Above 0°C)	+40°F to -10°F (+5°C to -23°C)	0°F to -65°F (-18°C to -54°C)
FRH (MIL-H-46170)	1 pt.	All Temperatures		
* For Arctic Operation Refer to FM 9-207				

Table 14. LUBRICANT USAGE: FAN DRIVE SHAFT; STEERING CONTROL LEVER

COMPONENTS INTERVALS = S	REFILL CAPACITY (APPROX)	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *		
		Above +32°F (Above 0°C)	+40°F to -10°F (+5°C to -23°C)	0°F to -65°F (-18°C to -54°C)
GAA (MIL-G-10924)	As Required	All Temperatures		
* For Arctic Operation Refer to FM 9-207				

Table 15. LUBRICANT USAGE: UNIVERSAL JOINT

COMPONENTS INTERVALS= S	REFILL CAPACITY (APPROX)	LUBRICANTS TO USE AT EXPECTED TEMPERATURES *	
		+5°F to +120°F (-15°C to +48.8°C)	+40°F to -60°F (+5°C to -51.1°C)
GAA (MIL-G-10924)	As Required	All Temperatures	
* For Arctic Operation Refer to FM 9-207			

Table 16. Semi-Annual Unit Level Preventive Maintenance Checks and Services for M548A1 and M548A3

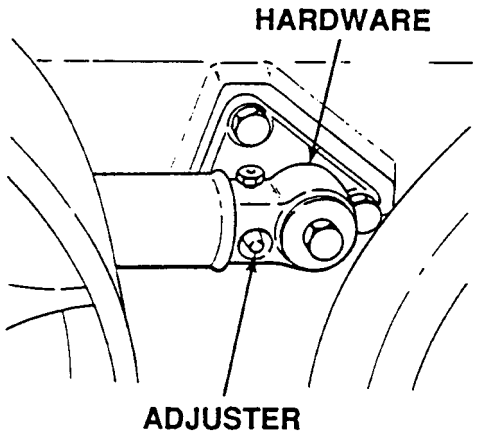
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
1	Semi-Annual		Road Test	**NOTE** **Be sure that all operator level PMCS in your -10 have been completed prior to performing unit level PMCS.** a. Perform a road test. Drive carrier at least 5 miles (8 km). **NOTE** **When conditions prevent a road test, perform engine idle (Step 82a.)and governed no-load test (Step 83a.).** Check instruments, gauges and warning lights for normal indications as outline in your -10. **CAUTION** **Do not allow engine to operate for prolonged periods if outside air temperature is less than 85 degrees F (29 degrees C) and gauge is above 200 degrees F (93 degrees C), or outside air temperature is above 85 degrees F (29 degrees C) and gauge is above 225 degrees F (107 degrees C). Serious damage to engine may result.**	
a	Semi-Annual		Left and Right Steering	**CAUTION** **Power plant can be damaged. Do not pivot steer when carrier is moving except in a track failure emergency.** a. Check steering in left and right turns. If carrier does not finish a complete turn when wheel/ laterals is turned to left or right, troubleshoot steering system (WP 0006 00).	Carrier does not turn properly.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
b	Semi-Annual		Steering in Forward and Reverse Range	a. For M548A3 Only. Check steering wheel in forward range and reverse range. If carrier does not make a complete turn after steering wheel is turned to the left and right, troubleshoot steering system (WP 0006 00).	Binding, grabbing, unusual noise, vibration or carrier fails to turn.
c	Semi-Annual		Carrier Braking	a. Check carrier braking. If carrier does not slow down or stop when brakes are slightly or fully depressed, troubleshoot brake system (WP 0006 00).	Carrier fails to stop.
d	Semi-Annual		Carrier Shifting in All Ranges	a. Check shifting of carrier in all ranges. If carrier does not respond properly to selected driving range, troubleshoot gear selection system (WP 0006 00).	Carrier fails to shift into selected range.
e	Semi-Annual		Shutdown	**CAUTION** **Turbo may be damaged by shutting down engine if engine is immediately stopped after periods of operation. Allow engine to run at idle speed (600–650 rpm) for 3 to 5 minutes before stopping.**	
				a. When shutting down engine: Check operation of fuel cutoff control.	Fuel cutoff control is inoperative.
2	Semi-Annual		After Road Test	**WARNING**  **Failure to set parking brake and block road wheels can allow carrier to move and could result in injury or death. Always set parking brake and block road wheels before working on carrier.**	

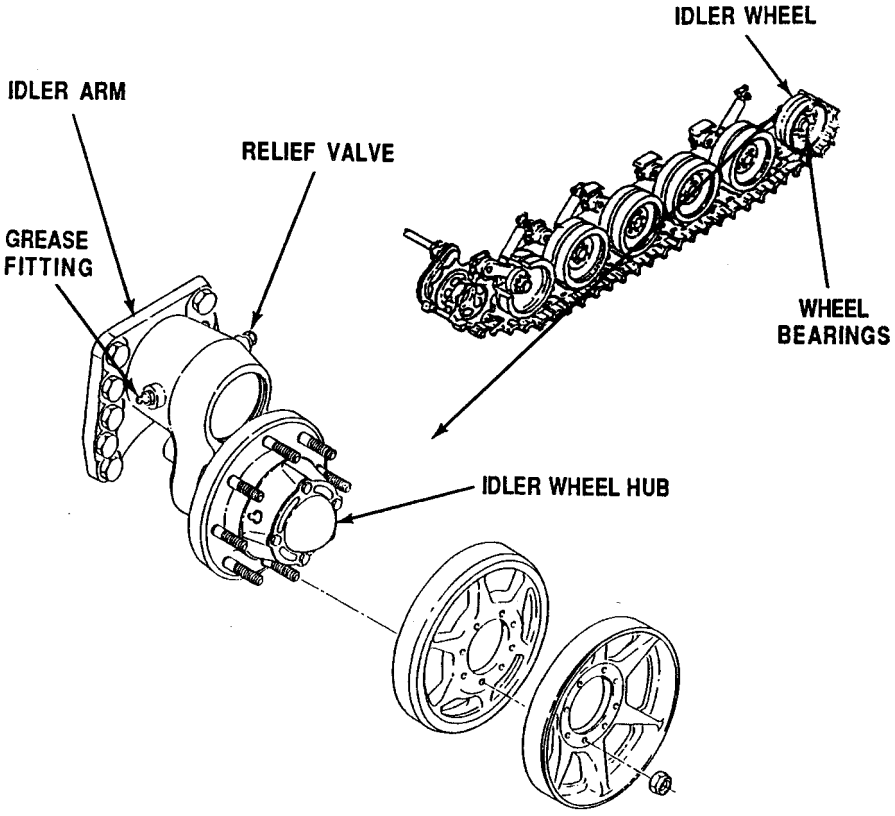
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
3	Semi-Annual		Idle Test	a. Immediately after road test cautiously feel all wheel and idler hub for noticeable difference in temperature between hubs. An overheated hub indicates that bearing is out of adjustment, poorly lubricated, or damaged. b. Check temperature of shock absorbers. Shock absorbers should be warm. A cold shock absorber is faulty. c. Visually check inside and outside of carrier for fuel, oil, or hydraulic leaks. **CAUTION** **Avoid lengthy engine idling. This causes coolant temperature to drop below operating temperature and can shorten engine life.** a. Run engine at 800 rpm for 3-5 minutes with range selector in 2 to 3 range and brakes locked until normal operating temperature is reached. b. If outside temperature is less than 85 degrees F (29 degrees C), normal operating temperature should be 160 degrees F to 200 degrees F (71 degrees to 93 degrees C). If outside air temperature is greater than 85 degrees F (29 degrees C), normal operating temperature should be 160 degrees to 225 degrees F (71 degrees to 107 degrees C). c. With range selector in N (M548A1) or SL (M548A3), engine should idle smoothly at 650 to 700 rpm. d. High or low engine idle speed is usually caused by accelerator linkage being out of adjustment. Adjust linkage if necessary (WP 0197 00 or WP 0200 00). e. Rough idling is usually caused by faulty injector timing and rack setting, faulty injectors or air in the injection system. Notify your supervisor.	Any Class III leaks, cold shocks, or bad bearings. Engine runs hot or rough.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

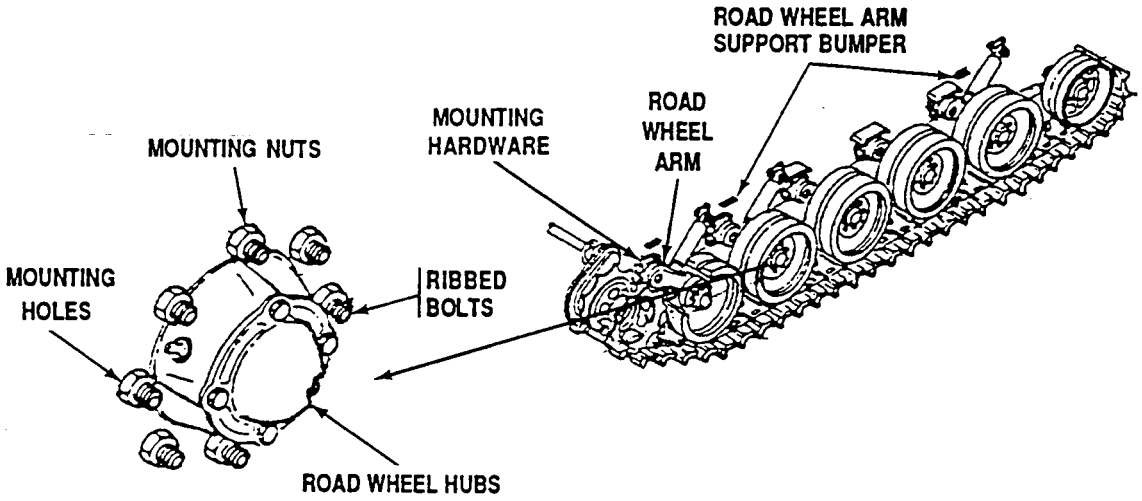
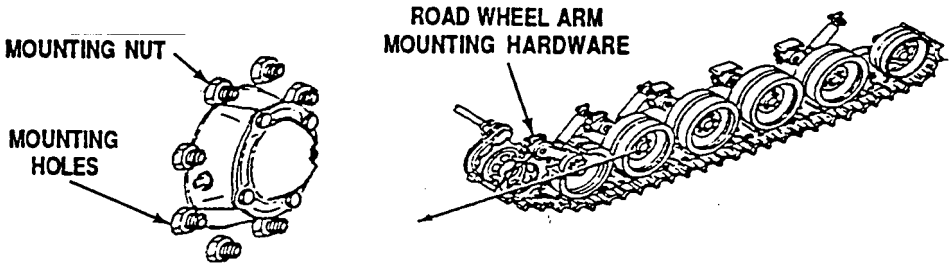
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
4	Semi-Annual	0.2	Transmission Oil	a. Sample transmission oil. Use procedures given in TB 43-0106. For lubricant information, see Table 4, page 0128 00-16 or Table 5, page 0128 00-16.	Hard time interval exceeded, AOAP recommends change.
5	Semi-Annual	0.2	Engine Oil	a. Sample engine oil. Use procedures given in TB 43-0106. For lubricant information, see Table 2, page 0128 00-15 or Table 3, page 0128 00-16.	Hard time interval exceeded, AOAP recommends change.
6	Semi-Annual	0.2	Final Drive Oil	a. Check left and right final drive oil level. Use procedures given in TB 43-0106. For lubricant information, see Table 8, page 0128 00-17.	Hard time interval exceeded, AOAP recommends change.
7	Semi-Annual		Track Tension Adjuster	a. Check adjuster for broken or cracked hardware on both carrier sides. Replace damaged parts (WP 0356 00).  	Adjuster or hardware is failed, leaking or missing.
8	Semi-Annual		Idler and road Wheel Arms	a. Check cracked or bent idler arm or road wheel arms. Check idler or road wheel arm relief valves and grease fittings if leaking. Check for leaking road wheel arm seals and gaskets.	Any bent, broken or cracked arm, leaking seal, or loose bearing.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
9	Semi-Annual		Idler and road Wheel Mounting Nuts	a. Check idler and road wheel mounting nuts for looseness. Tighten loose nuts to 150–170 lb-ft (203–230 N•m) torque.	Any missing or stripped nuts.
10	Semi-Annual		Idler/Road Wheels and Idler/Road Wheel Hubs	a. Check for cracked, broken or bent idler/road wheels and idler wheel hubs.	Any broken, bent or cracked idler road wheels or leaking hub seals.
				b. At each service, or whenever track is removed, adjust wheel bearings if looseness or end play is evident (WP 0351 00).	Any loose bearings or Class III leaks.
				c. Check for leaking seals and gaskets.	
				d. Check for leaking grease fittings and relief valves.	Any leaking grease fittings.

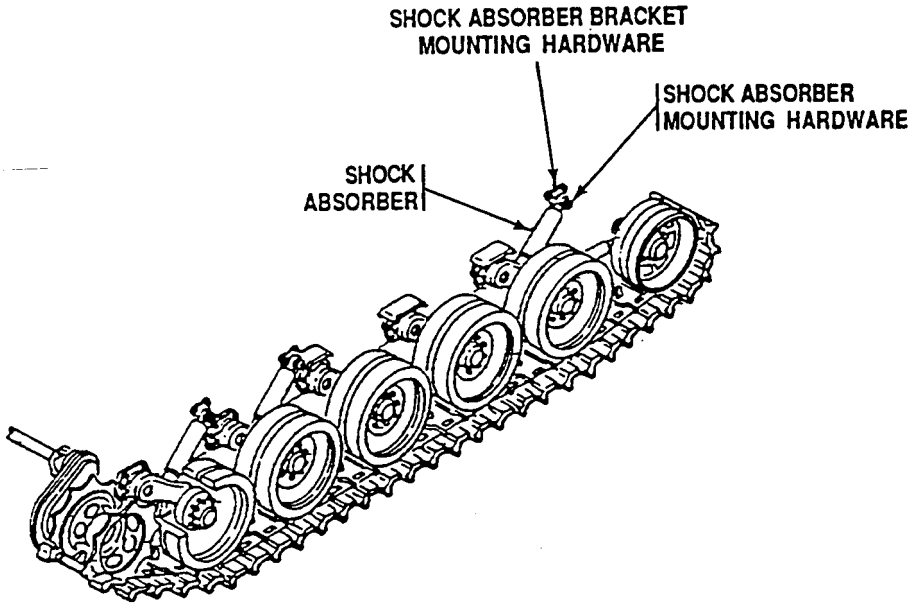


PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

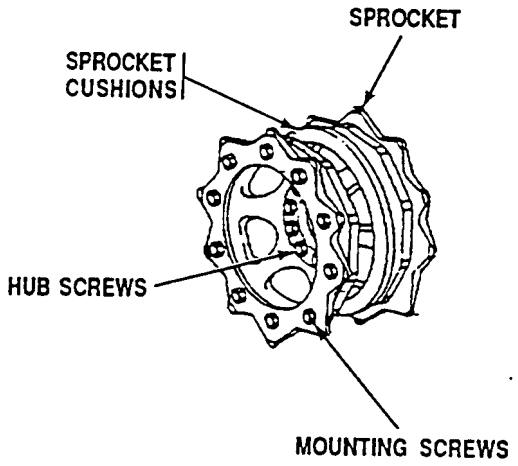
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
11	Semi-Annual		Idler and Road Wheel Hub Ribbed Bolts	a. Check for bent, broken or stripped idler/road wheel hub ribbed bolts.	Any broken, bent and stripped bolts.
					
12	Semi-Annual		Road Wheel Arm Mounting Hardware and Support Bumpers	a. Check and tighten loose road wheel arm mounting hardware to 130–140 lb-ft (176–190 N•m) torque. Check for missing or loose road wheel arm support bumpers.	Any loose mounting hardware.
13	Semi-Annual		Road Wheel Mounting Holes	a. Check for road wheel mounting holes extending beyond head of mounting nut.	Any elongated holes that extend beyond mounting nuts.
					
14	Semi-Annual		Shock Absorber	a. Check shock absorbers for leaks, dents, cracks, or loose bearings. Replace shock absorber that is bent, broken, cracked or dented enough to hinder operation. Replace worn bearing (WP 0379 00).	Any cracked, broken, bent or missing shocks or dents that hinder shock operation.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				b. Check shock absorbers for Class III fluid leaks or loose fitting bearings.	Any Class III fluid leaks.
				c. Check shock absorber mounting hardware for looseness. Tighten loose hardware to 130–140 lb-ft (176–190 N•m) torque.	
				d. Check shock absorber bracket mounting hardware for looseness. Tighten loose hardware to 130–140 lb-ft (176–190 N•m) torque.	
15	Semi-Annual		Sprocket and Cushion	a. Check and/or reverse sprocket teeth if their edges fall behind wear gauge (see your -10 PMCS). Check and replace sprocket cushions if gouges, chips, and cuts are enough to cause thumping.(WP 0357 00).	Sprocket is broken or cracked.
				b. Torque loose mounting screws to 110–115 lb-ft (149–156 N•m) torque.	Any screws are missing, loose or worn. Any elongated holes that extend beyond screw heads.
				c. Torque loose sprocket hub screws to 170–190 lb-ft (231–258 N•m) torque.	

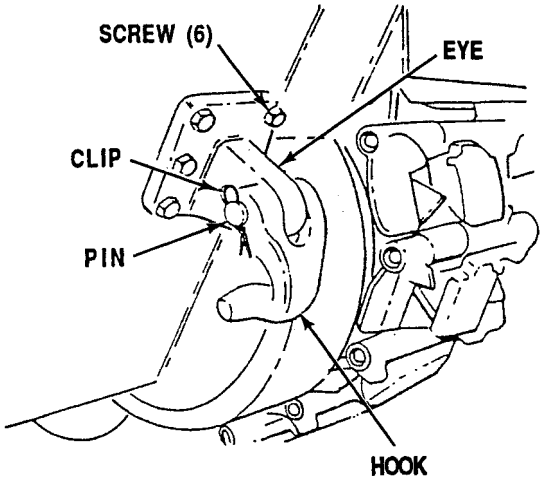


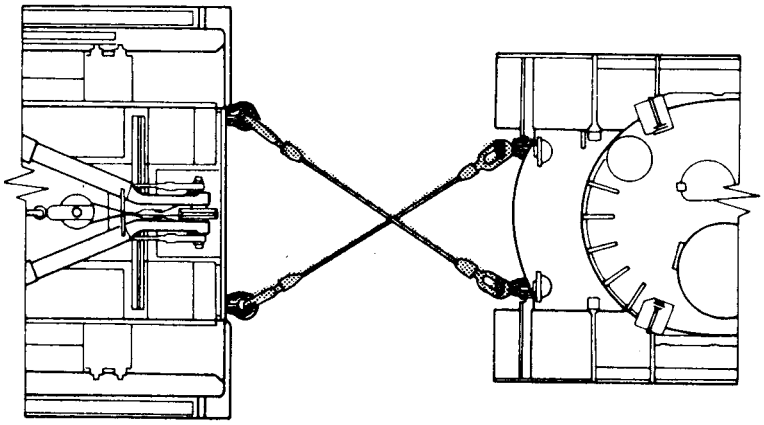
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

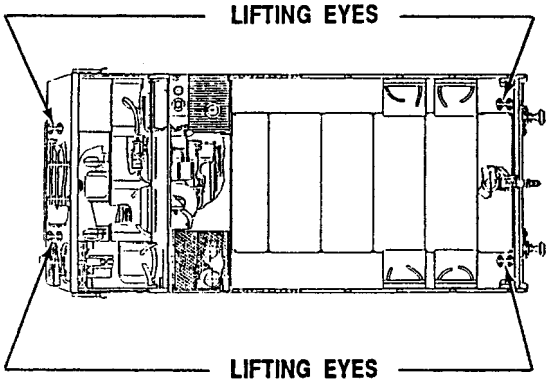
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
					
16	Semi-Annual		Towing Pintle, Tow Hooks and Lifting Eyes	a. Check and replace missing or damaged retaining pins and keys (WP 0377 00). Check if towing pintle is securely mounted and operates satisfactorily.	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:

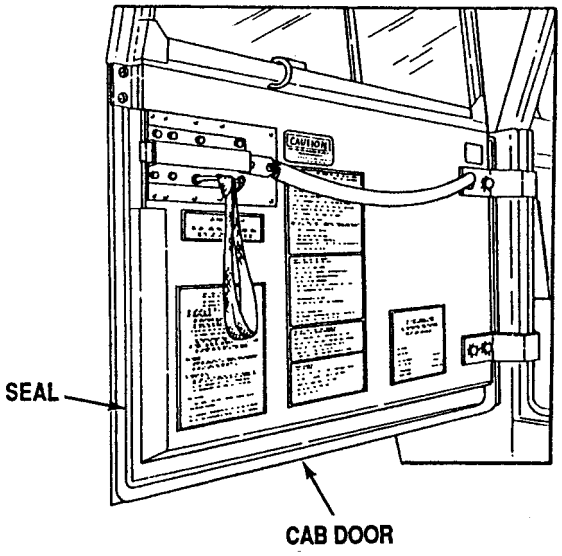


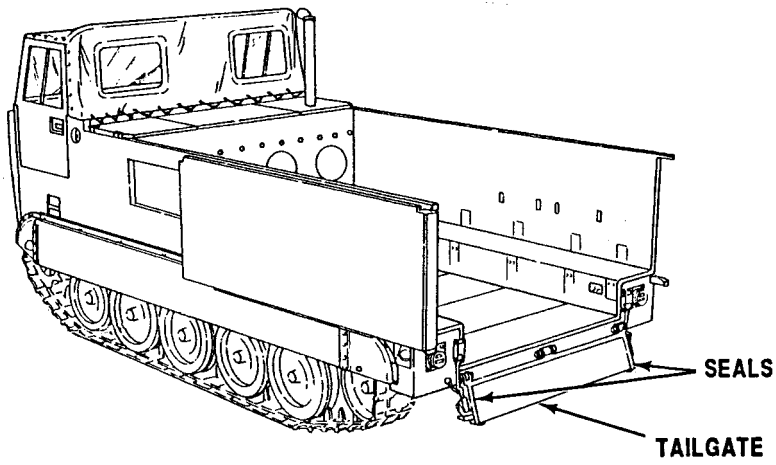




PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

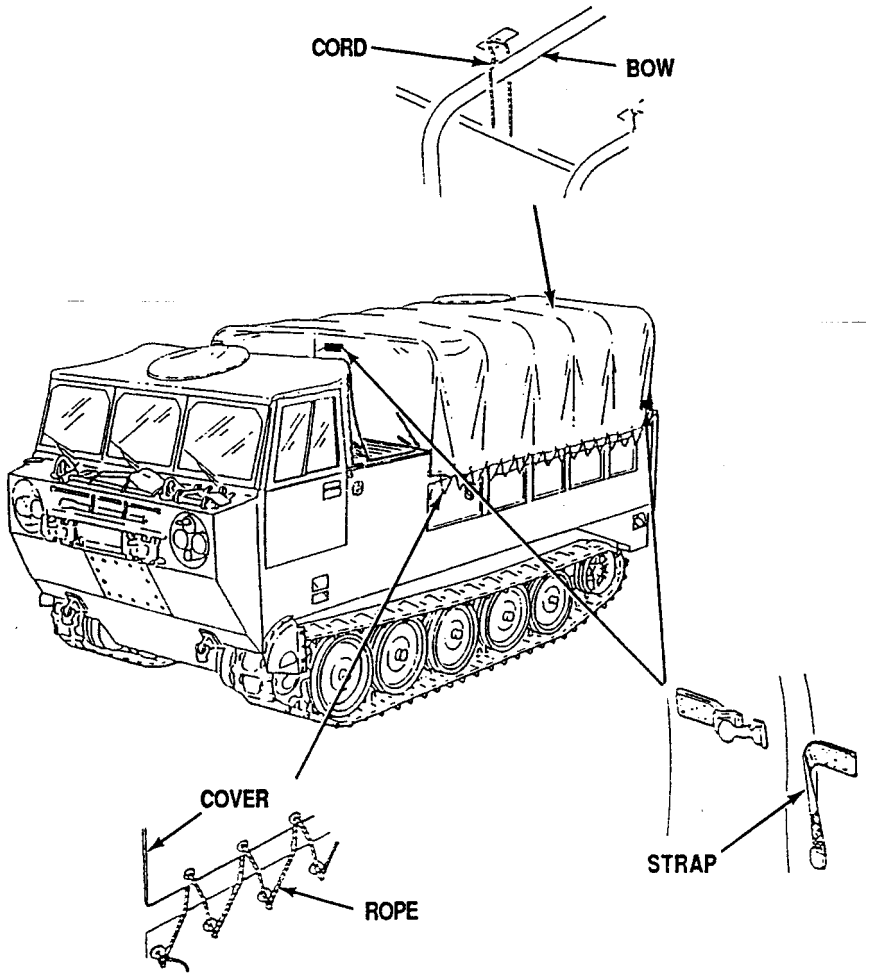
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
17	Semi-Annual		Tailgate and Cab Doors	a. Check cab doors and tailgate for ease of movement, damaged seals, and general condition. Tighten loose hardware and check adjustments for watertight fit. Adjust if required (WP 0388 00 and WP 0405 00).	





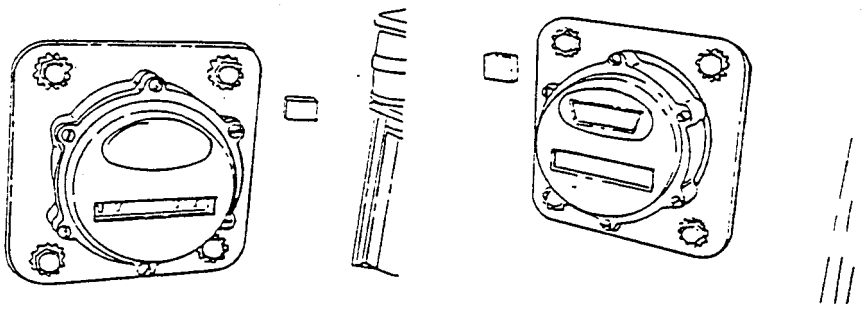
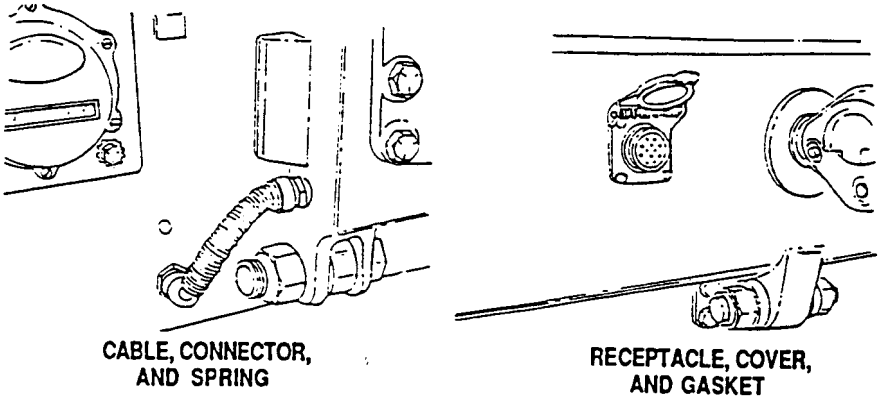
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

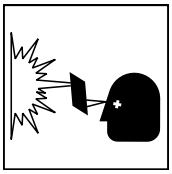
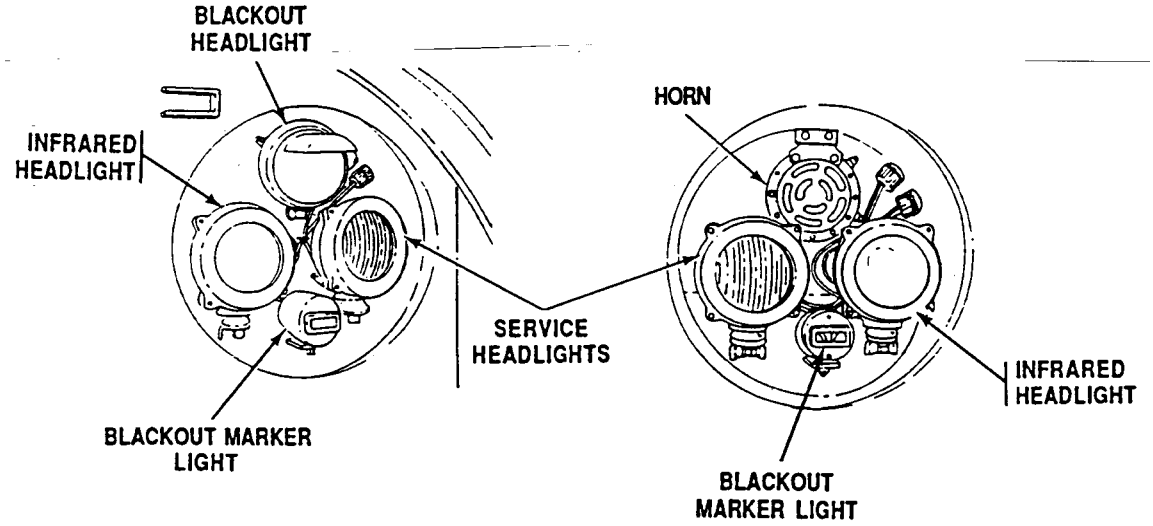
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
18	Semi-Annual		Cab and Rear Compartment Covers	a. Check covers for tears, loose straps, broken ropes, and damaged grommets. Replace broken rope. Replace covers that are damaged (WP 0417 00 and WP 0418 00).	
19	Semi-Annual		Taillights and Stoplights	a. Check and replace discolored and cracked taillight lens (WP 0278 00). With helper's assistance, check operation of service taillight, service stoplight, blackout taillight, and blackout stoplight (see your –10). Repair or replace lights that do not work. See (WP 0275 00, WP 0276 00, or WP 0278 00) as required.	



M548A3 SHOWN

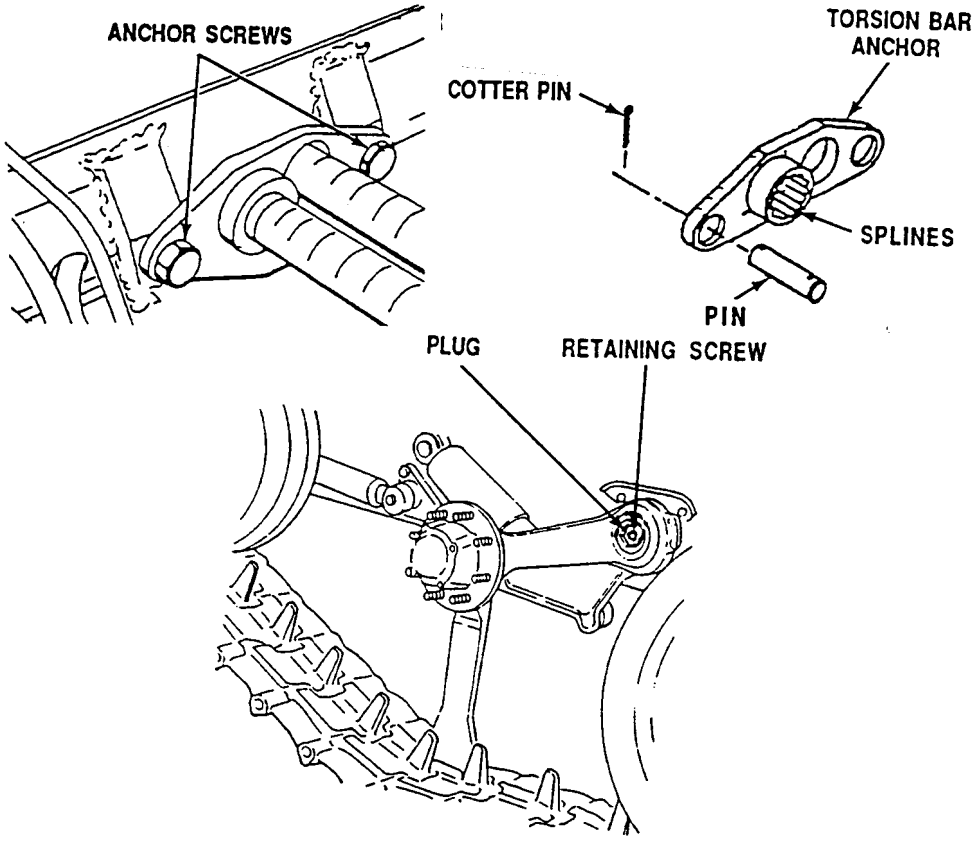
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				 LEFT STOPLIGHT-TAILLIGHT INSTALLED VIEW RIGHT STOPLIGHT-TAILLIGHT INSTALLED VIEW	
				b. Check and replace missing retaining pin or key (WP 0278 00).	
20	Semi-Annual		Trailer Wiring Harness Receptacle Cover	a. Check cover for tight seal on wiring harness receptacle. Replace leaky cover (WP 0301 00).	
				 CABLE, CONNECTOR, AND SPRING RECEPTACLE, COVER, AND GASKET	
21	Semi-Annual		Headlights, Blackout Lights, and Horn	a. Check and replace cracked or discolored lens in service headlights, blackout marker lights, or blackout headlight. See WP 0276 00, WP 0277 00, WP 0280 00, or WP 0275 00 as required.	

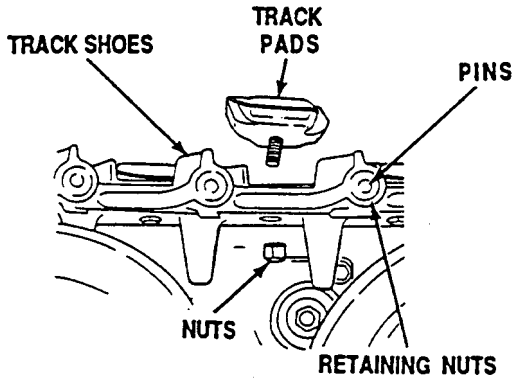
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				WARNING  **Looking directly at infrared headlights may burn your eyes. Do not look directly into infrared headlights. Use your hands to feel the heat.** b. With helper's assistance, check operation of service headlights, infrared headlights, blackout marker lights, blackout headlight, and horn. Repair or replace lights or horn that do not work (WP 0275 00), (WP 0276 00), (WP 0277 00), (WP 0280 00, and WP 0289 00).	
						
22	Semi-Annual		Pivot Steer	a. Remove plugs and check fluid in both master cylinders (WP 0371 00). Add fluid (FRH) as necessary to bring it within 1/2 to 3/4 inch (1.27–1.90 cm) from top cylinder.	Either master cylinder is empty or leaking. Any Class III leaks.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

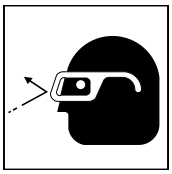
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
23	Semi-Annual		Torsion Bar, Anchors, or Splines	a. TORQUE ANCHOR SCREWS TO 320–330 LB-FT (434–447 N•M). When power plant is removed, torque power plant compartment anchor screws. b. If so equipped, replace missing or damaged pins or cotter pins on torsion bar anchors (WP 0350 00). c. Check that torsion bar plugs are fully seated and retaining screws are tight.	Any broken, bent, missing, stripped torsion bars or attaching hardware.

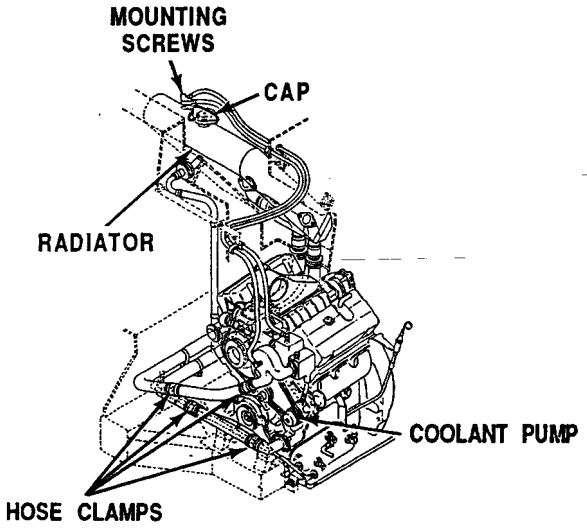
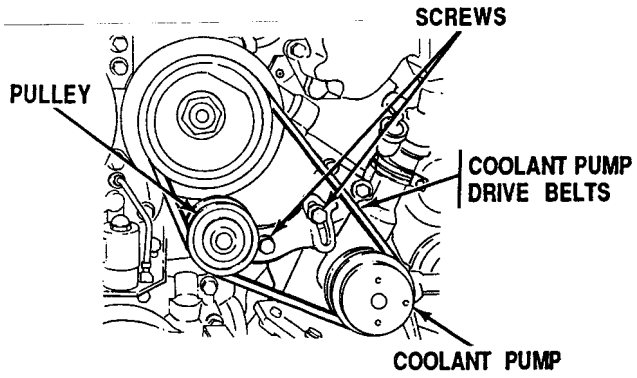
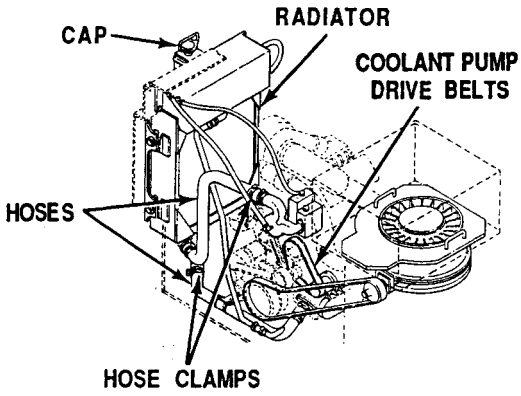
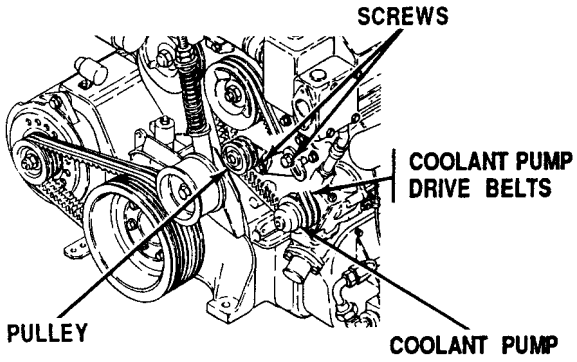


PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
24	Semi-Annual		Track	a. Torque loose track pin retaining nuts 115–135 lb-ft (156–183 N•m). Check for missing, damaged or worn track pads or track shoes. Torque loose retaining nuts to 135–155 lb-ft (183–210 N•m).  	Any pins/nuts that are cracked, broken, bent, stripped, missing or protruding.
25	Semi-Annual		Cooling System	a. Addition of extender to antifreeze is a one time service. When extender is added to antifreeze, the date must be recorded in the “remarks” block of DD Form 314. If DD Form 314 identifies the unsafe coolant as having been extended before or the coolant as arctic antifreeze, then the coolant must be drained and replace with fresh coolant. See WP 0212 00 and WP 0213 00, or WP 0214 00, as required.	
				b. Check coolant cleanliness by draining a small amount of coolant into a clean container and look for excessive rust, foreign particles, and/or sediments.	Excessive coolant contamination is found.

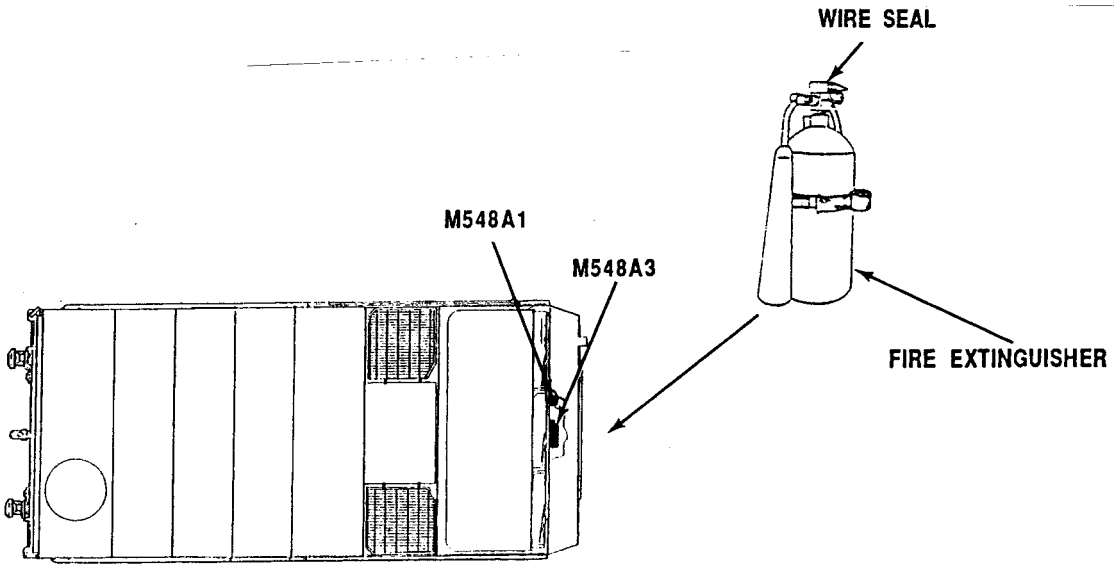
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
26	Semi-Annual		Cooling System Radiator Hoses, Pump, and pump Drive Belts	**NOTE** **M548A1 access is through the passenger seat. M548A3 access is through the rear power plant rear access panel.** a. Check radiator and coolant pump for leaks. Check that all hose clamps and mounting screws are tight. Check cooling pump drive belt for 3/8 inch (10 cm) deflection, cracks and looseness. Tighten loose belts by adjusting pulley. Secure belt adjustment by tightening screws. **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.** Clean outside of radiator with air gun. Check cap and seal for damage that allows leakage. Replace or repair damaged hardware (WP 0215 00 or WP 0216 00).	Any hardware is loose or missing or has any Class III fluid leaks.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				   	
27	Semi-Annual		Portable and Fixed Fire Extinguishers	**WARNING**  **You could be injured if cylinder discharges when it is out of its mounting brackets or is dropped. Handle with great care.**	

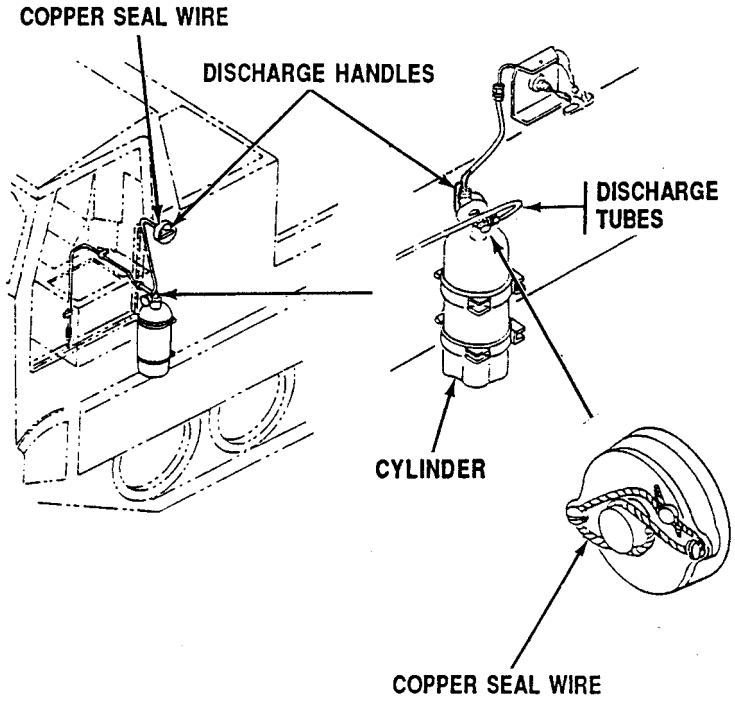
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				a. Weigh portable fire extinguishers. Replace fire extinguisher if weight loss is more than 10 percent of charged weight shown on cylinder (WP 0526 00). Fill out DA Form 2402 for recharging or DA 2407 to exchange cylinders. **CAUTION** **Fire extinguisher control valve sealed with wire will not work. Make sure seal wire is made out of light copper.** b. Check wire seal. Replace broken or damaged seal (WP 0527 00 or WP 0528 00).	

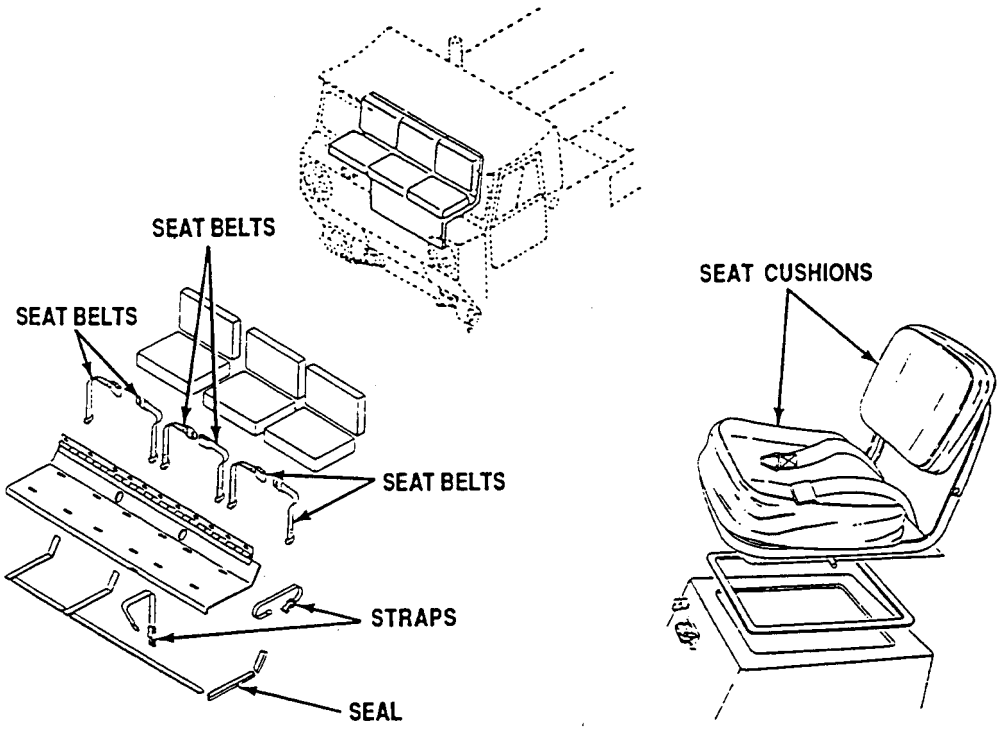


PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
28	Semi-Annual		Fixed Fire Extinguisher	a. Remove and weigh fixed fire extinguisher cylinder (WP 0526 00). If cylinder is low, refill. b. Before reconnecting or replacing cylinder, operate discharge handles and be sure cables and controls work right. c. Install cylinder and replace copper seal wires (WP 0527 00 or WP 0528 00). d. Replace discharge tubes that are crimped or cracked (WP 0524 00 or WP 0525 00).	



ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
29	Semi-Annual		Driver's and Cab Personnel Seats	**NOTE** **M548A1 carriers have two passenger seats. M548A3 has only one passenger seat.** a. Check and replace damaged seat cushions (WP 0397 00 or WP 0398 00). b. Check and replace damaged straps (WP 0397 00 or WP 0398 00). c. Check and replace damaged hinges (WP 0397 00 or WP 0398 00). d. Check and replace damaged seals (WP 0397 00 or WP 0398 00). e. Check and replace damaged belts (WP 0399 00).	

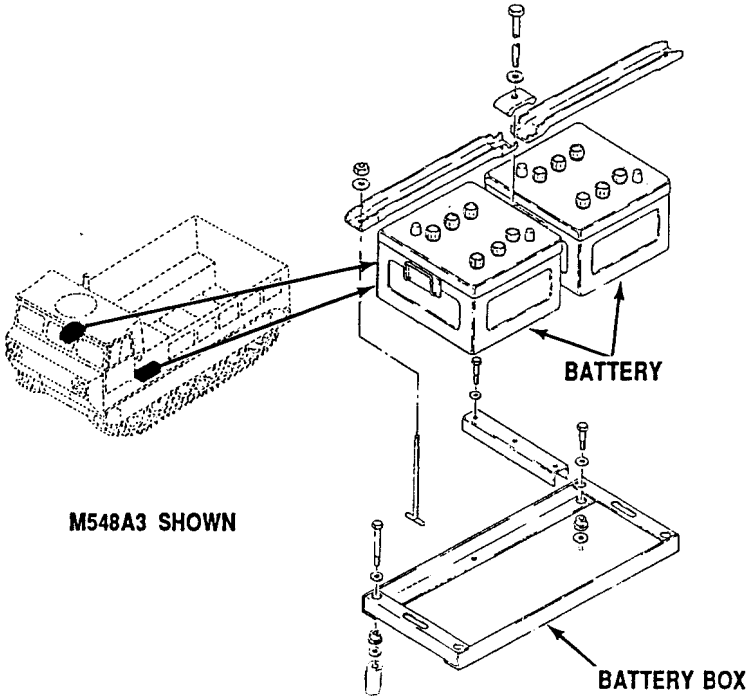


PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
30	Semi-Annual		Batteries	**WARNING**  **Before you connect or remove battery cables, ventilate battery compartment. Always disconnect the battery negative lead(s) first and connect it last. Don't cause sparks. Hydrogen explosions can cause serious injury. Battery acid can blind or burn you. Do not get acid on your skin or in your eyes.** **WARNING**  **Battery posts and cables touched by metal objects can short circuit and burn or injure you. Use caution when you work with tools and other metal objects. Do not wear jewelry when you work on electrical system.** **Electrical current can burn you. Remove both battery negative leads before you start task (WP 0292 00).** **NOTE** **M548A1 carriers have two batteries. M548A3 has four batteries.**	

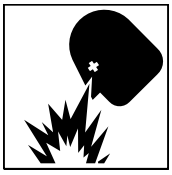
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				a. Clean batteries and battery box (WP 0290 00 or WP 0291 00). b. Check and replace batteries with leaks, cracked cases and/or burned posts.	Dead, cracked, or leaking batteries.



M548A3 SHOWN

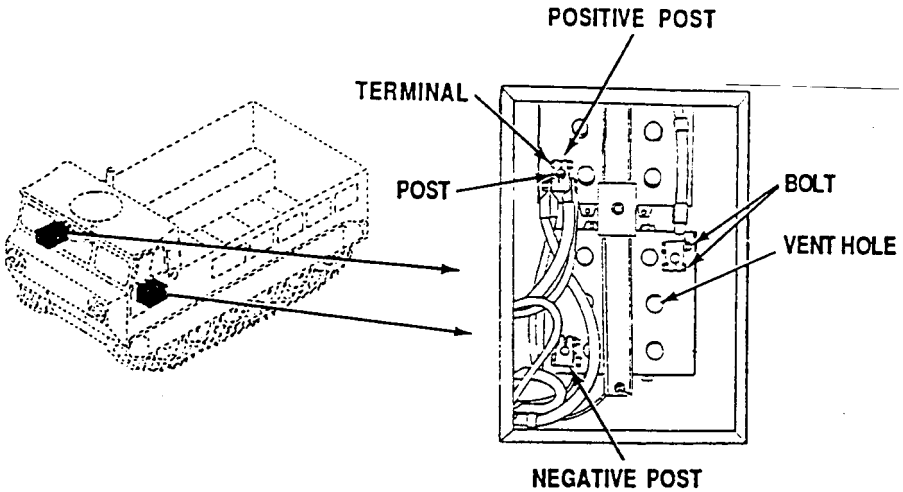
WARNING



Gas from batteries can explode and injure you. Do not allow sparks near batteries. Battery acid can blind or burn you. Do not get acid on your skin or eyes.

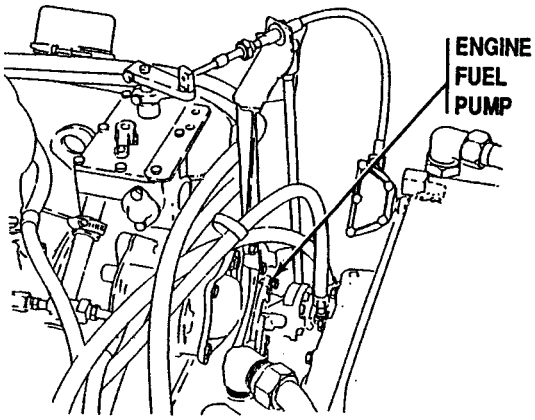
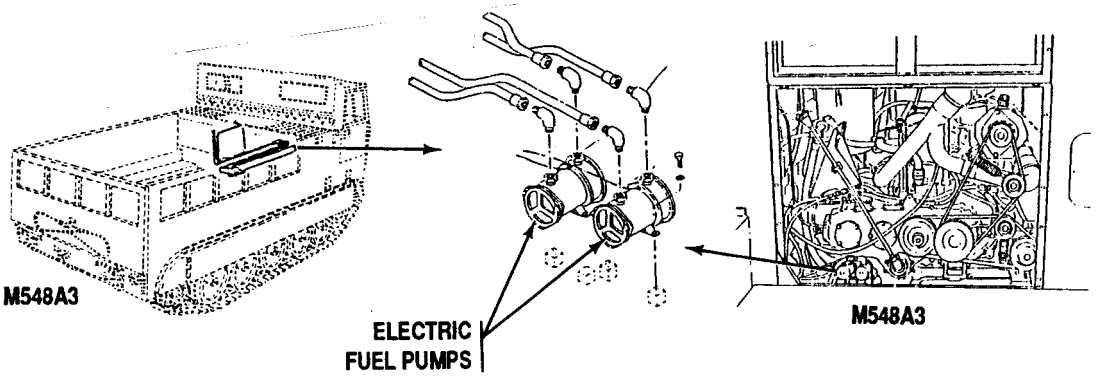
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				c. Check electrolyte level in all cells of batteries. Add distilled water as needed. See TM 9-6140-200-14.	Any leaks, loose, damaged, burned post, cracked, broken, missing batteries or hardware.
				d. Test specific gravity of batteries. See TM 9-6140-200-14.	Cell is below specific gravity.
				e. Clean vent holes in cell caps. See TM 9-6140-200-14.	
				f. Clean terminals, posts, and bolts. See TM 9-6140-200-14.	One or more batteries unserviceable, missing, broken, or frayed cables.
				g. Tighten terminals and bolts with care to avoid damage to batteries. Apply light coat of GAA grease (WP 0542 00, Item 14).	One or more batteries unserviceable, missing, broken, or frayed cables.

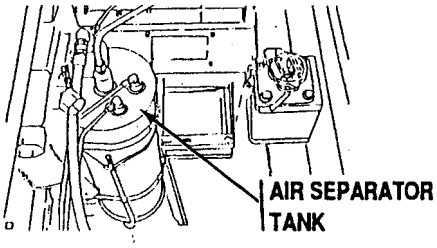


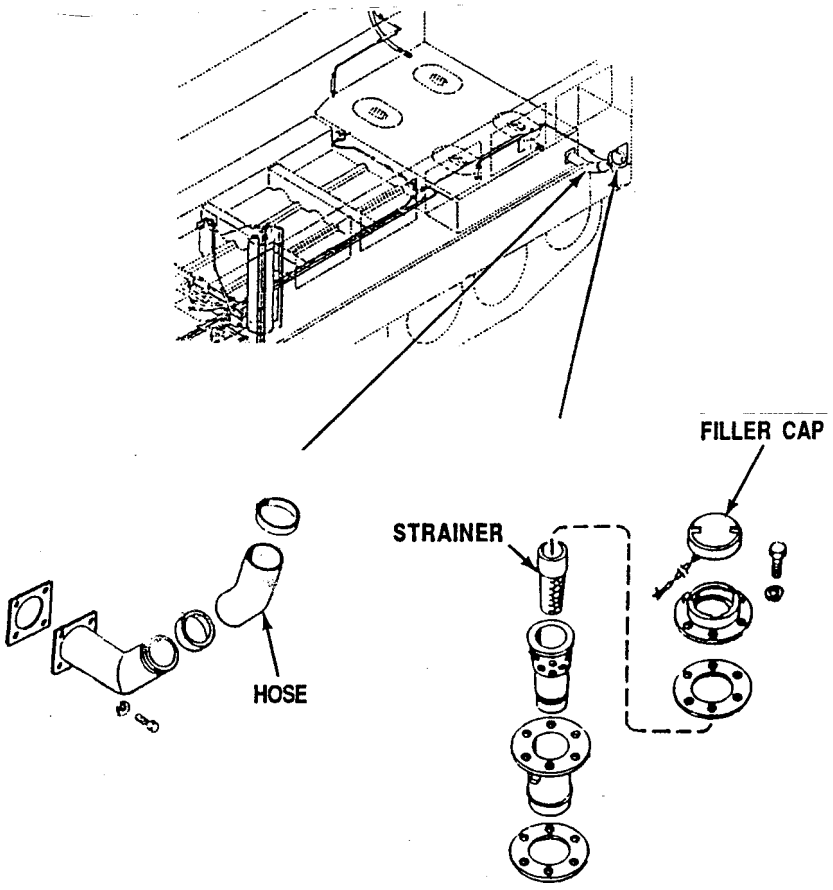
M548A3 SHOWN

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

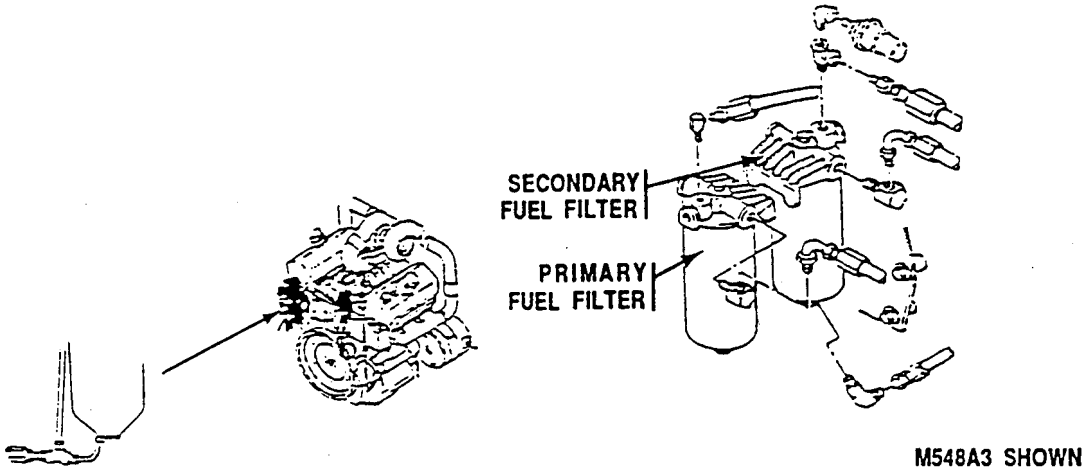
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
31	Semi-Annual		Fuel System	a. Inspect fuel lines, fuel pumps, and fuel cap for leaks, bent/buckled, deteriorated lines, chaffed hoses, fittings, electrical connectors and wires for security, looseness or frayed wires.	
32	Semi-Annual		Engine Fuel Pump	a. Check engine fuel pump for leaks.	Any fuel leak.
					
33	Semi-Annual		Electric Fuel Pumps	a. Check electric fuel pumps lines for leaks.	Any fuel leak.
					

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

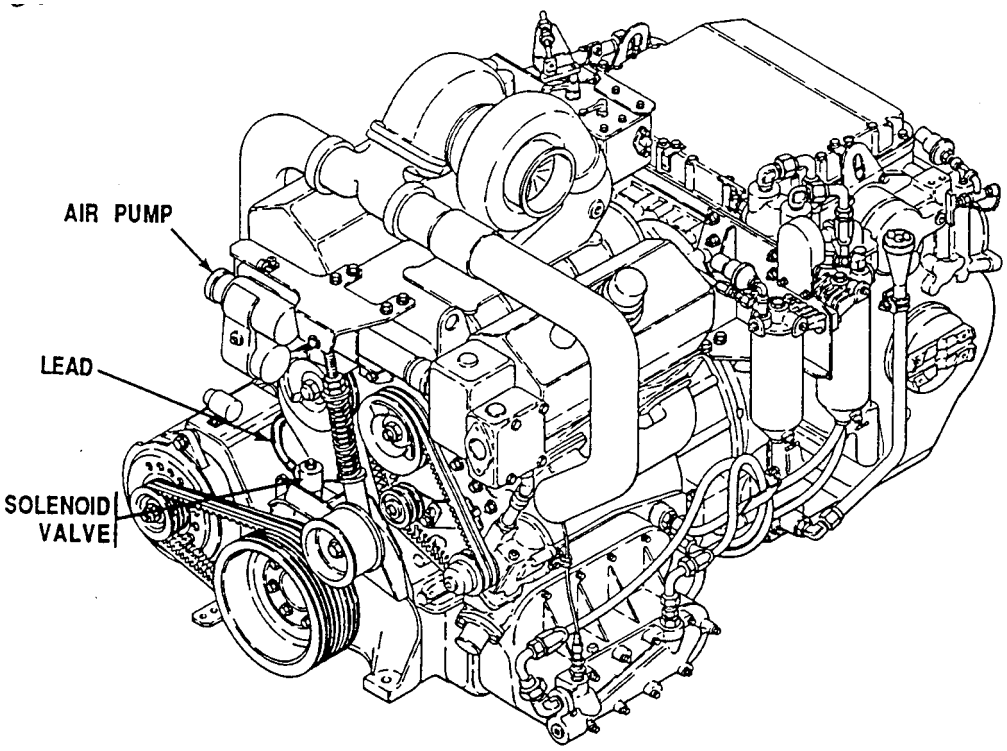
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
34	Semi-Annual		Air Separator Tank	a. Check air separator tank and lines for leaks. 	Any fuel leak.
35	Semi-Annual		Filler Cap	a. Check filler cap, strainer, and hoses for leaks and damage.	Missing filler cap. Any fuel leak.

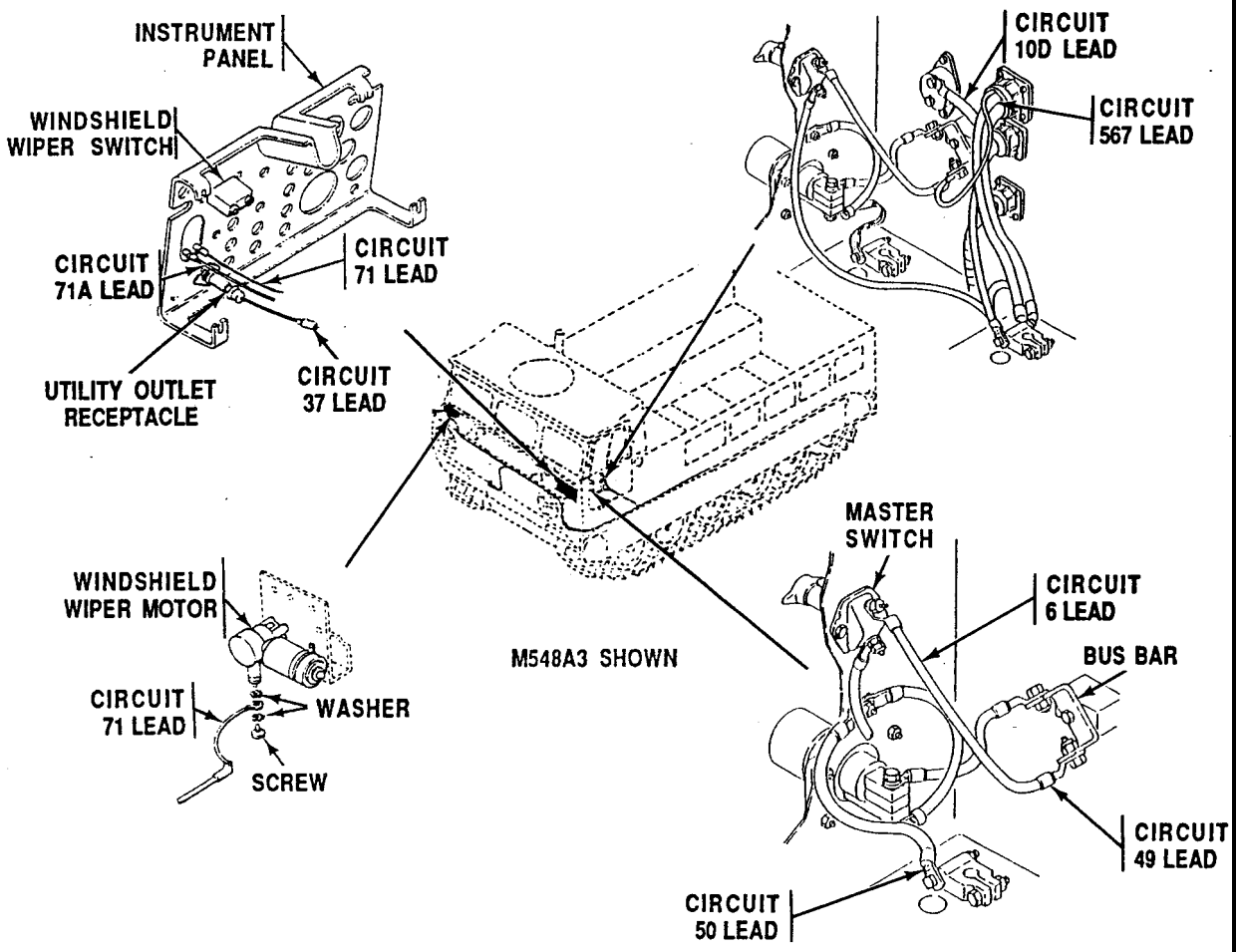


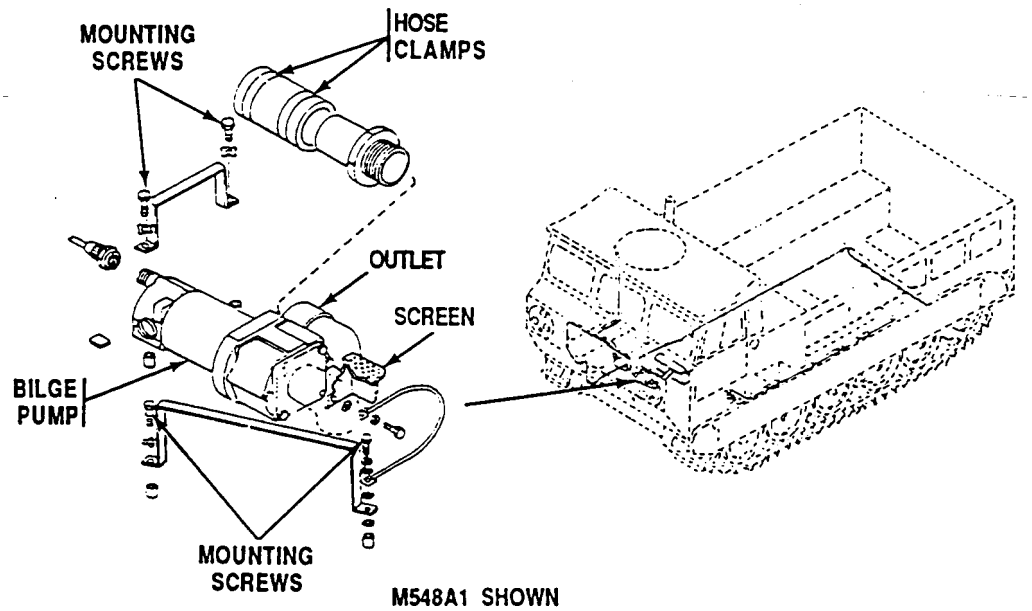
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
36	Semi-Annual		Fuel Filters Primary/ Secondary	a. Replace primary and secondary fuel filter elements (WP 0178 00 or WP 0179 00). Check for leaks.	Any fuel leak.
				 M548A3 SHOWN	
37	Semi-Annual		Air Box Heater Air Pump	a. Check operation of air box heater air pump (see your –10). Disconnect lead from fuel shutoff solenoid valve. Have helper pull out fuel shutoff and intermittently crank engine and run air pump at same time for total of 20 seconds. Connect lead to fuel shutoff solenoid valve.	Any fuel leak.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
					
38	Semi-Annual		Electrical Wiring, Interior Lights and Switches	a. Check and tighten electrical connections, radio suppression straps, and component mounting bracket screws. Tape frayed harness and replace missing or defective chassis grommets and connections. Secure, repair, or replace lights and switches that are insecurely mounted, inoperative, or damaged. See (WP 0240 00 thru WP 0303 00) for specific task.	

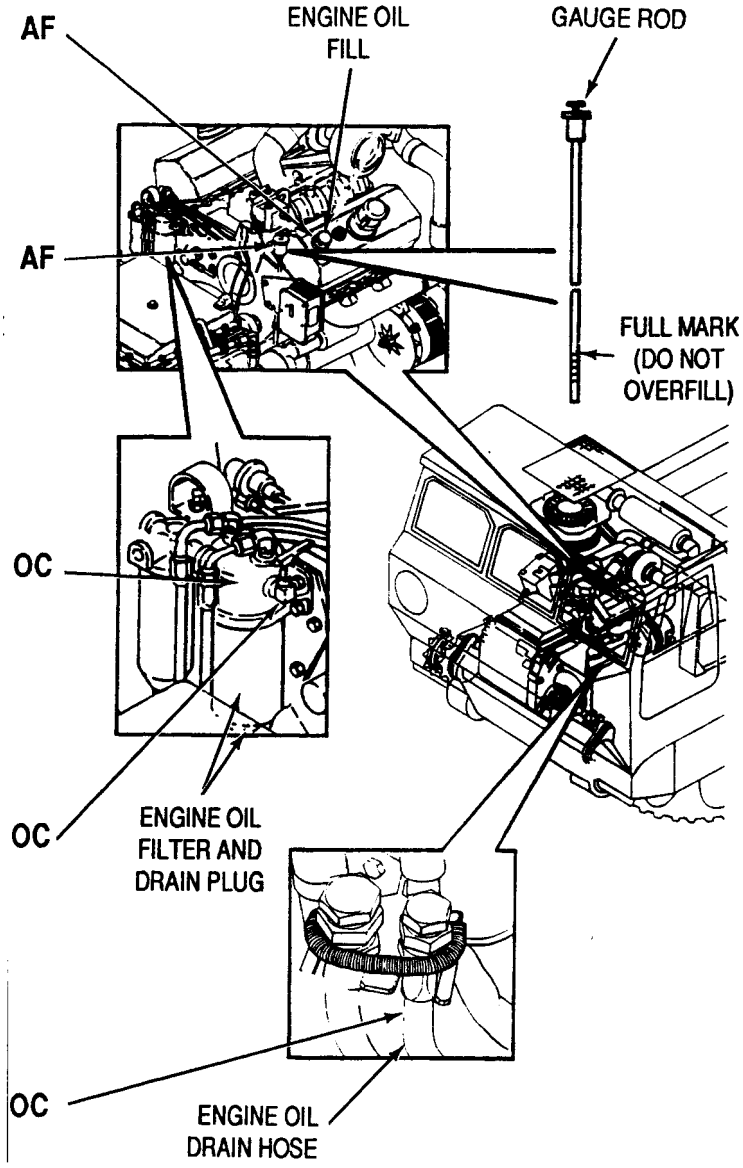
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
						
39	Semi-Annual		Bilge Pump	**NOTE** **Location of bilge pump is accessed through right floor plate on M548A1 and through hull bottom access cover on M548A3.** a. Check operation of fuel pump (see your –10). Turn MASTER SWITCH ON. Turn bilge pump switch ON. Make sure forward bilge pump light is on. Look for stream of water or feel for a stream of air at the bilge pump outlet. When finished with bilge pump checks, turn off bilge pump switch, turn MASTER SWITCH OFF.	

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				b. Clean debris from bilge pump protective wire mesh screen. Tighten loose hose clamps and mounting screws.	
				 M548A1 SHOWN	
40	Semi-Annual	0.4	Engine and Transmission	**WARNING**  **Hot parts can burn you. Use care when working near hot components.** a. With engine at idle, sample engine oil and transmission oil as instructed by your standard operating procedure. See TB 43-0106. For lubricant information, see Table 2, page 0128 00-15, Table 3, page 0128 00-16, Table 4, page 0128 00-16, or Table 5, page 0128 00-16.	AOAP recommends oil change.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				b. HARD TIME. Hard time interval may be shortened if equipment operates under adverse conditions (for arctic operations, refer to FM 9-207; for desert operations, refer to FM 90-3). **CAUTION** **Engine and transmission can be damaged if filled above the FULL (F) mark on the gauge rods.** **NOTE** **If AOAP laboratory is not available, drain engine oil and change filter element/ gaskets every 150 hours, 1500 miles (2414 km) or semi-annually. Transmission oil should be drained and filter element/ gaskets changed every 150 hours, 1500 miles (2414 km) or semi-annually.** **NOTE** **Always change filters on transmission and engine even when using AOAP every 150 hours, 1500 miles (2414 km) or semi-annually.** c. ON CONDITION. To drain engine or transmission oil, remove hull bottom access cover and drain plug. Inspect oil for metal particles. If metal particles are found, notify your supervisor. Replace engine or transmission oil filters each time an oil change is required.	Hard time interval exceeded.

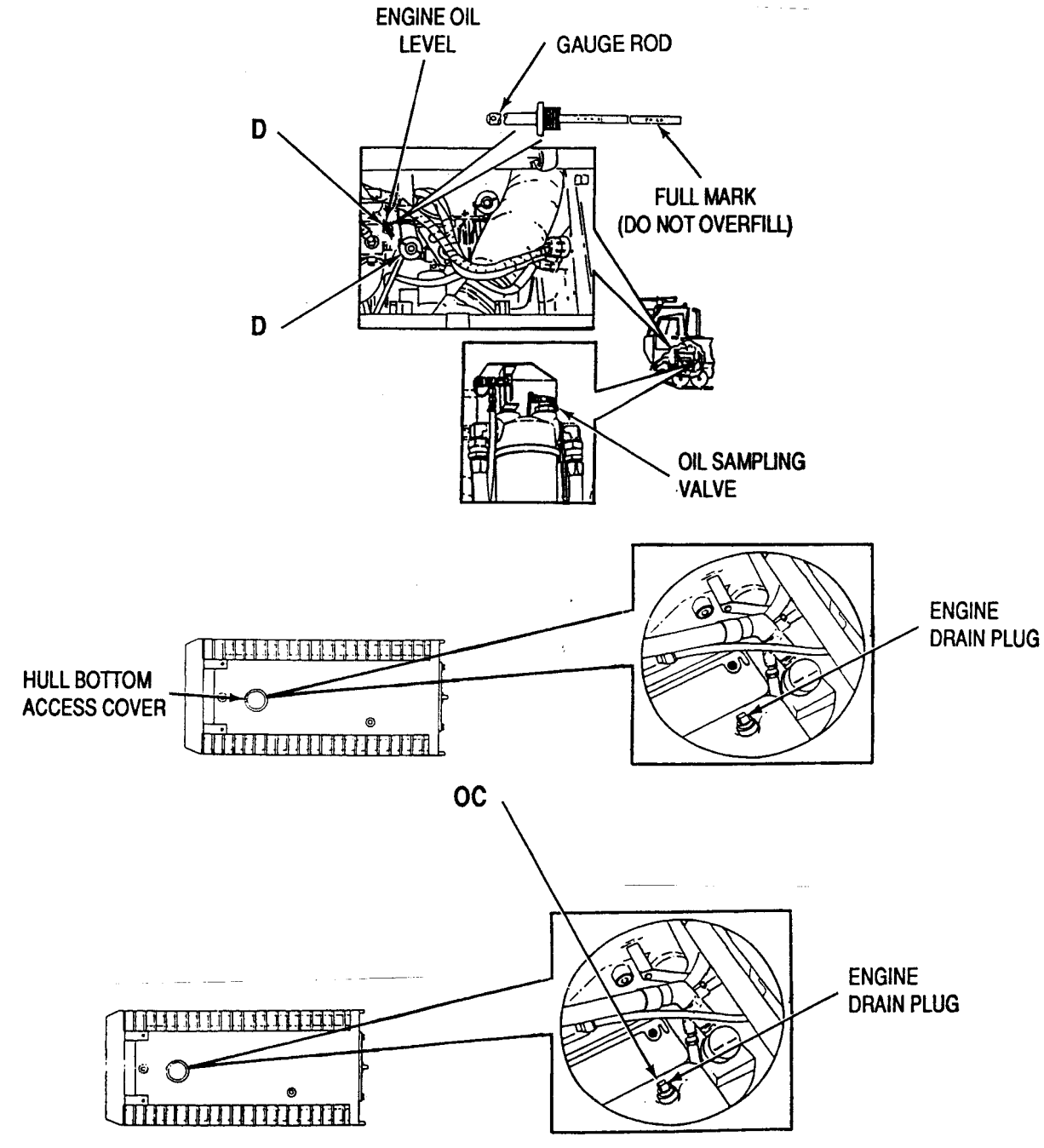
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:



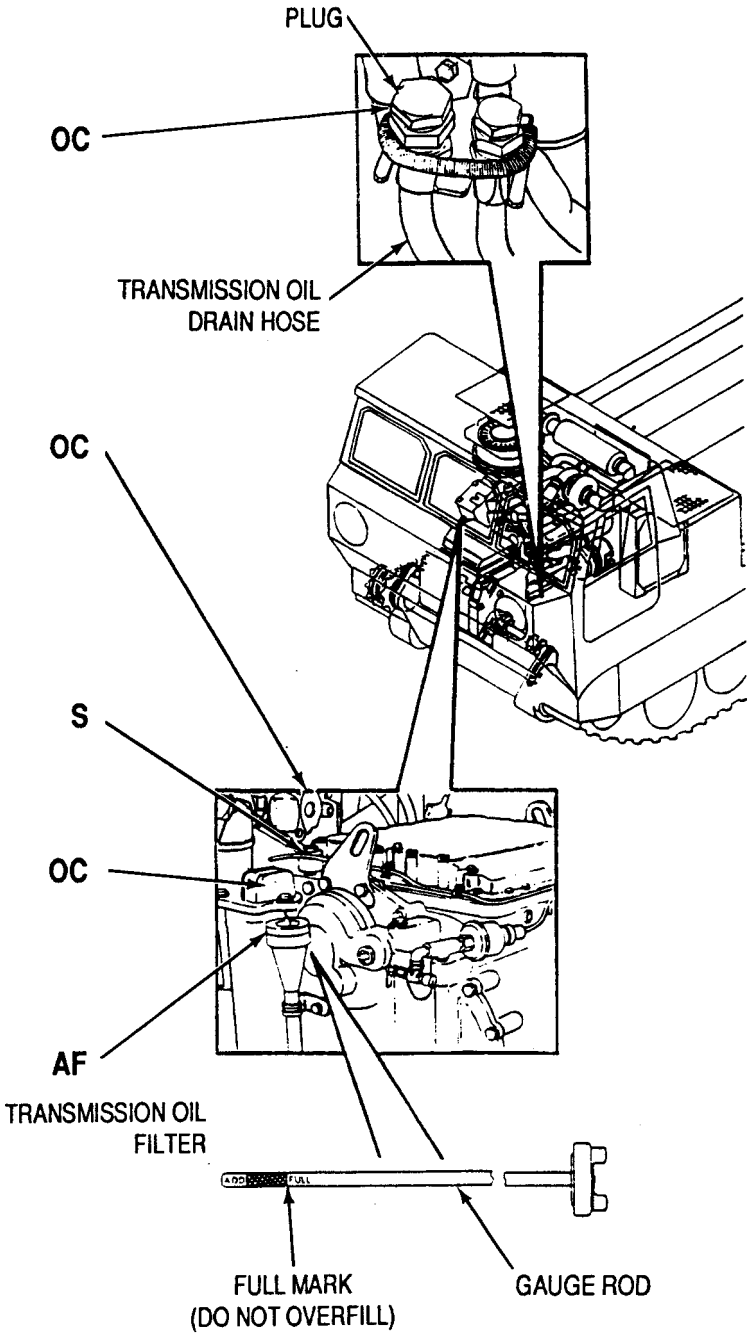
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

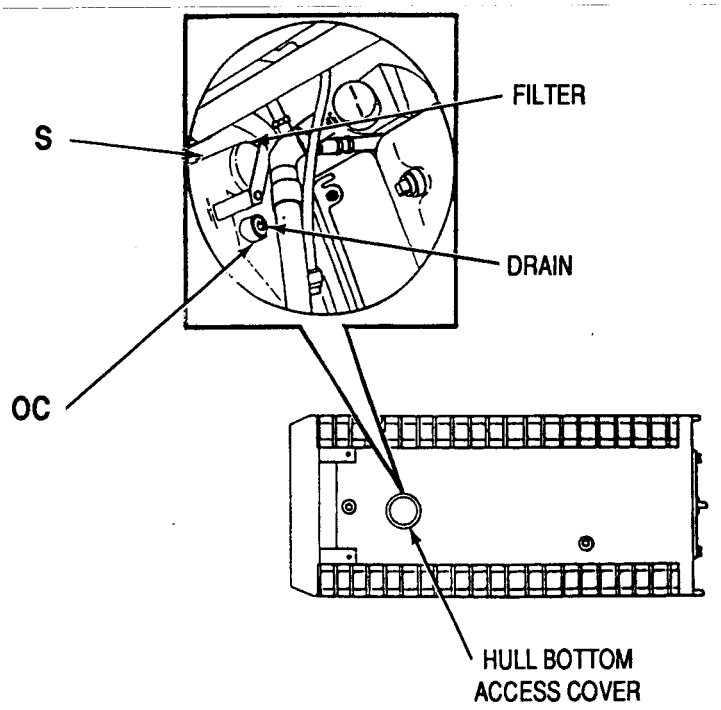
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:



PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:



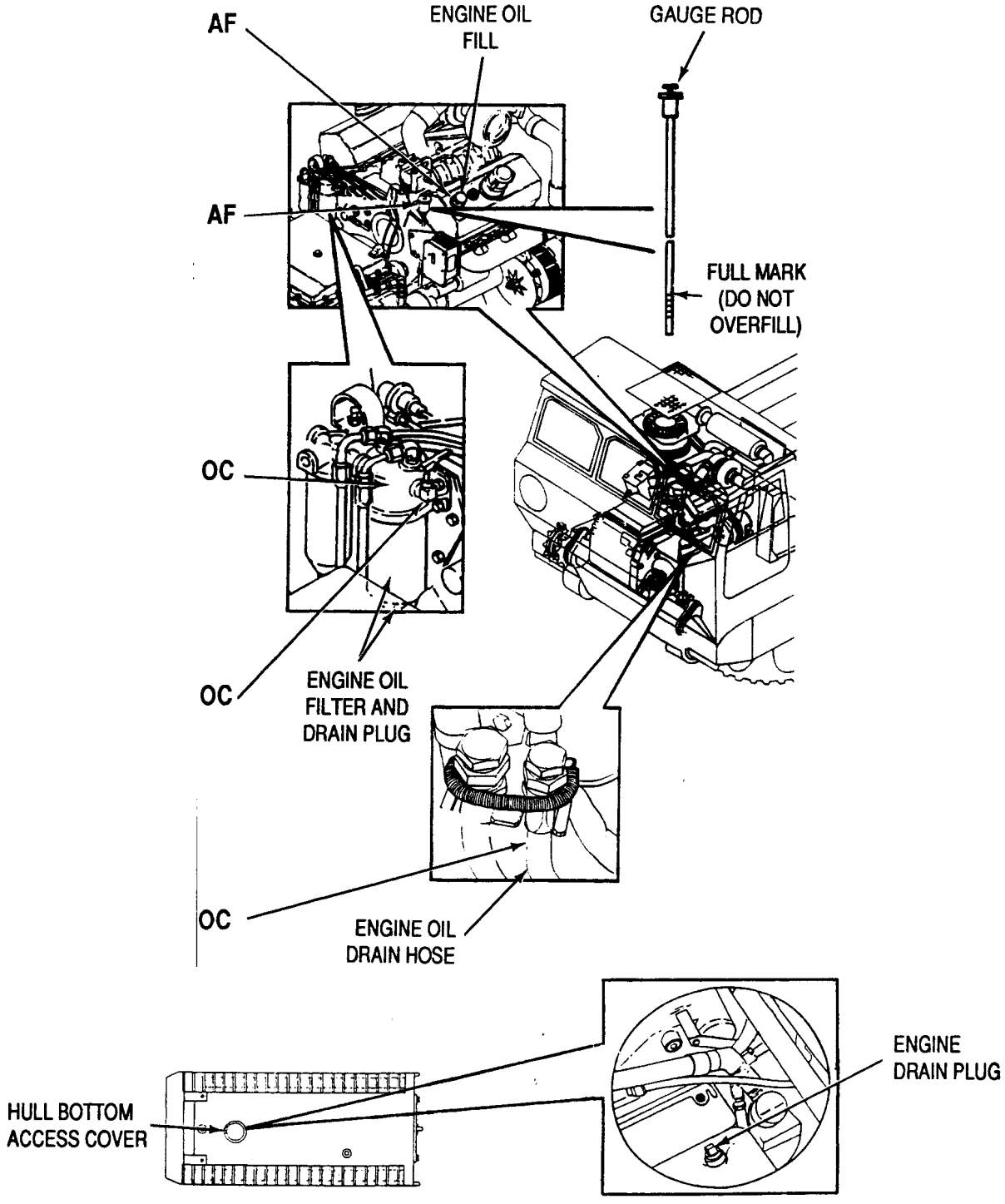
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
					
				NOTE **Drain oil only when hot after operation. Allow oil to drain for one hour if time permits. Do not mix multigrade lubricants with single grade lubricants.**	
				NOTE **Visual inspection of engine/transmission should not be justification to change oil. Detergent oils may appear dark in color due to additives. Change oil and filters when converting from OE/HDO to OEA or PE 30-1 to OE/HDO. For lubricant temperature key information, see Table 2, page 0128 00-15, Table 3, page 0128 00-16, Table 4, page 0128 00-16, or Table 5, page 0128 00-16.**	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

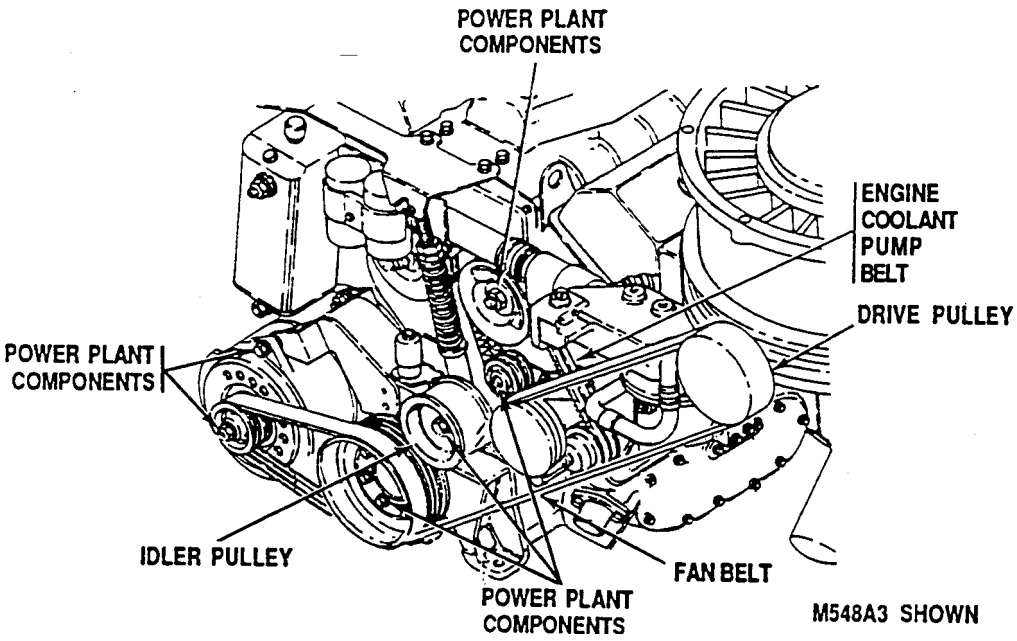
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				d. Clean inside of engine filter cover or transmission filter cavity with cleaning compound.	
				e. Install new engine filter element/gasket (WP 0145 00 or WP 0146 00) or transmission element/packings (WP 0320 00 or WP 0321 00).	
				f. Refill engine with approximately 18 quarts (17 liters) of OE/HDO or OEA. Bring level between full and low marks on gauge rod. Start and run engine (see your -10) and check for oil leaks.	Any Class III leaks.
				g. Refill transmission with approximately 16 quarts (15 liters) for M548A1) or 12 gallons (45 liters) for M548A3 of OE/HDO or OEA after oil change. Start and run engine (see your –10) and operate transmission through all gear selector positions.	Any Class III leaks.
				h. Check operation of engine and transmission. Run engine (see your –10) and check for oil leaks at filter and drain plug. Inspect access covers on hull bottom for leaks and replace gasket or cover if required (WP 0383 00).	Any Class III leaks.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

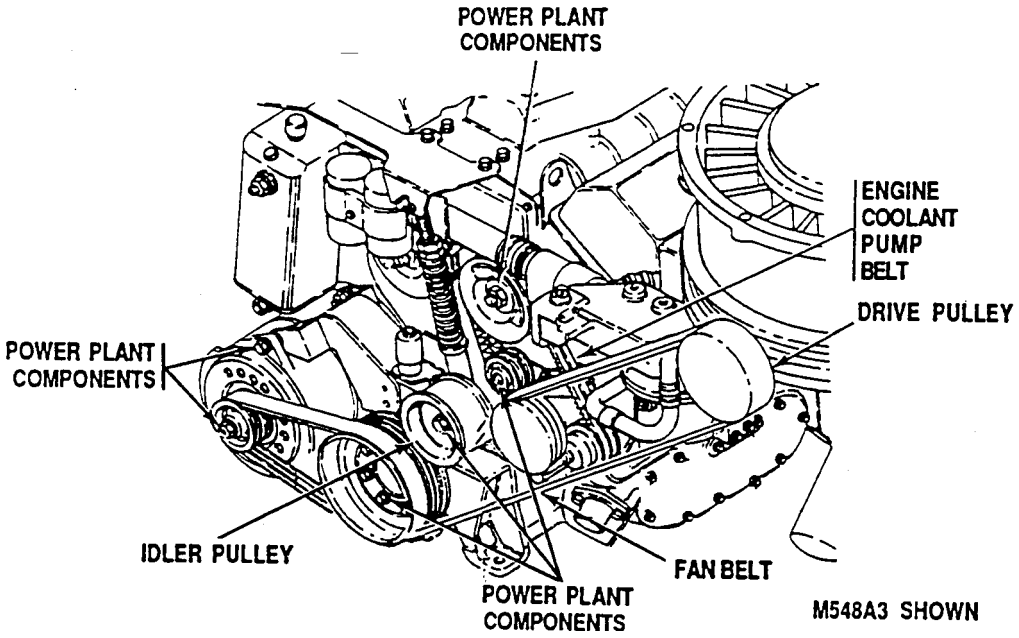
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:



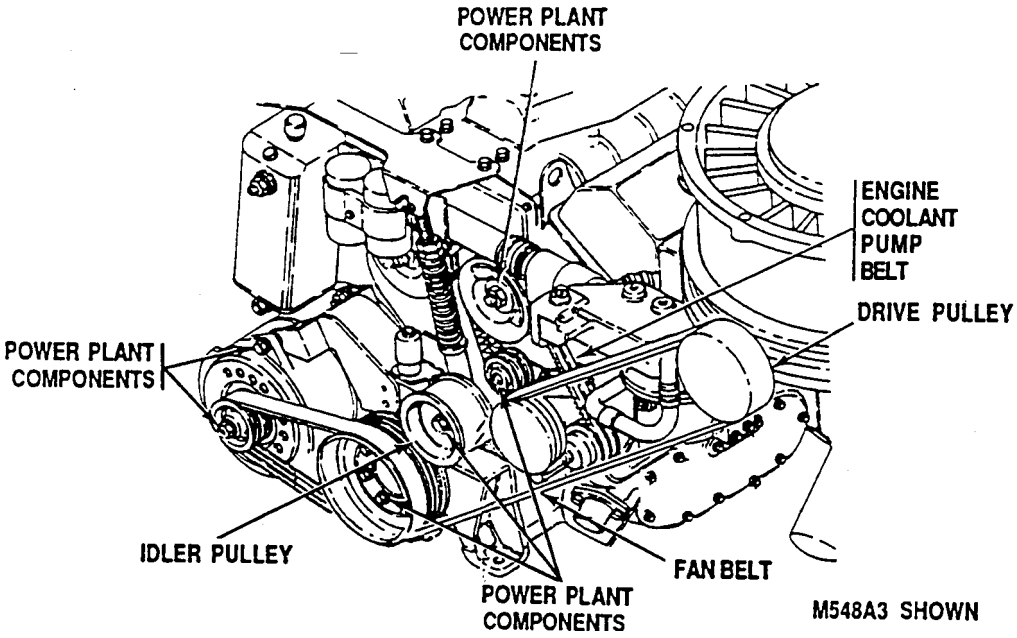
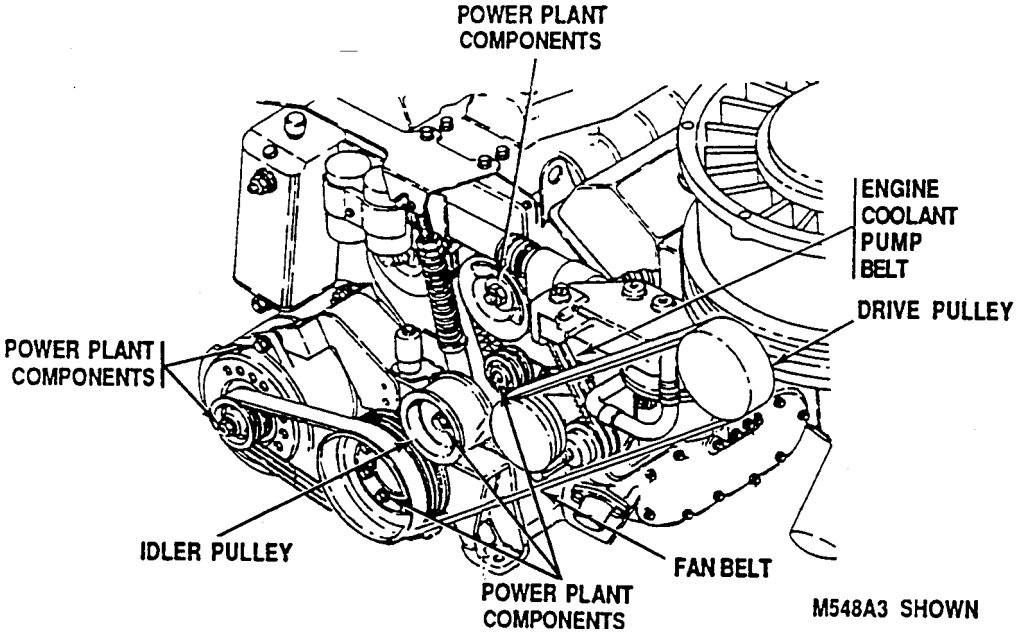
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
41	Semi-Annual		Power Plant Mounting Components	a. Check power plant components for looseness. If any of the mounting components on starter, generator, etc., are loose, tighten (WP 0142 00) (WP 0240 00) (WP 0244 00)(WP 0250 00) (WP 0251 00) (WP 0252 00) (WP 0253 00) (WP 0254 00).	
						
42	Semi-Annual (M548A3)		Engine Coolant Pump Belt	a. Check engine coolant pump belt tension (WP 0224 00).	Belts are cracked, frayed, broken or too loose.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
					
43	Semi-Annual (M548A3)		Drive Belts	a. Check fan belts for proper tension. Adjust, if needed (WP 0227 00). b. Check generator drive belts for proper tension. Adjust, if needed (WP 0245 00). c. Replace frayed or cracked belts (WP 0227 00 or WP 0245 00).	Belts are cracked, frayed, broken or too loose.

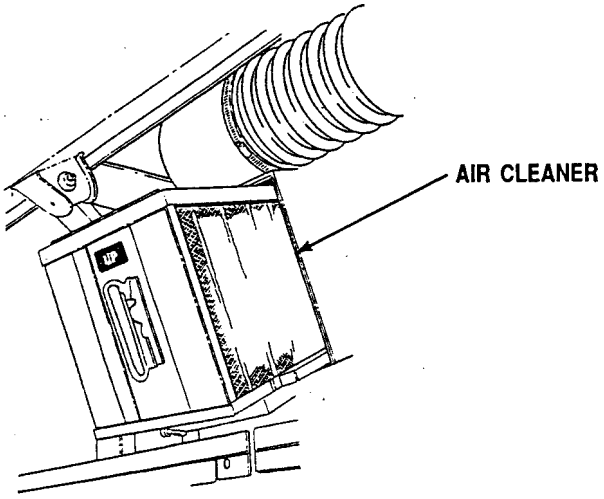
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
					
44	Semi-Annual (M548A3)		Cooling Fan	a. Check for cracked drive pulley and idler pulley (WP 0229 00).	Bent or cracked pulley.
					

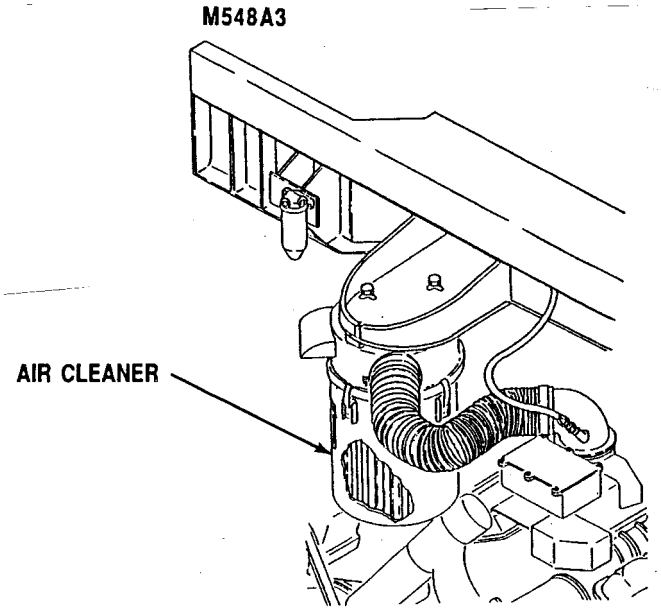
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
45	Semi-Annual		Air Cleaner	**CAUTION** **Operation with dirty or improper air cleaner element can cause poor performance and severe engine damage due to abrasive action. Make sure element is clean and properly installed.** a. Inspect air cleaner. Clean as required. b. Clean or replace air cleaner element(WP 0152 00 or WP 0156 00). c. Replace damaged air cleaner housing (WP 0152 00 or WP 0159 00). d. Check for cracked, broken, or brittle air cleaner hoses.	Air filter or hoses damaged or missing.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:



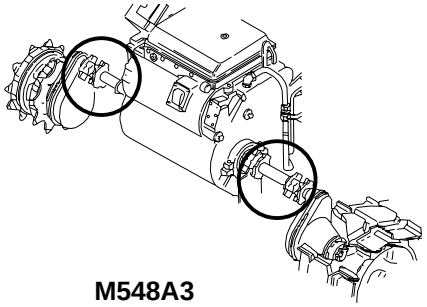
M548A3



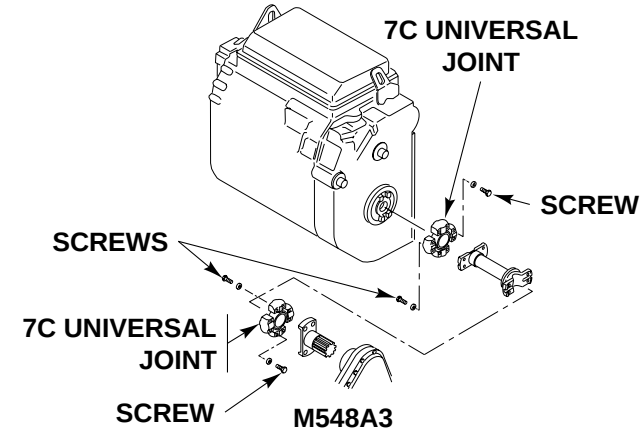
M548A1

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

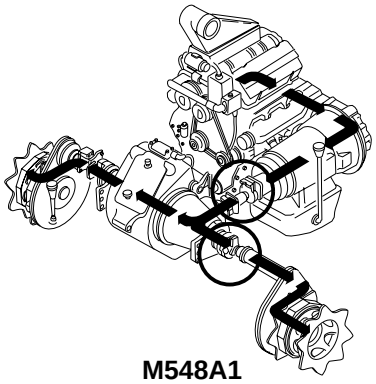
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
46	Semi-Annual		Drive Shaft	a. Check for loose screws on 7C universal joints. Tighten loose screws to 86–94 lb-ft (117–127 N•m) torque (M548A3) and 35–40 lb-ft (47–54 N•m) torque (M548A1). Loosen and retighten screws to the above torque value.	



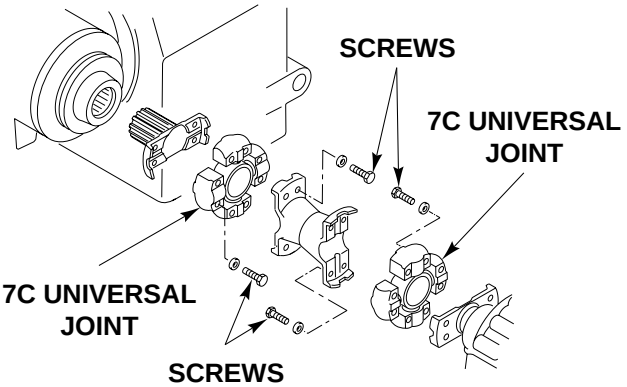
M548A3



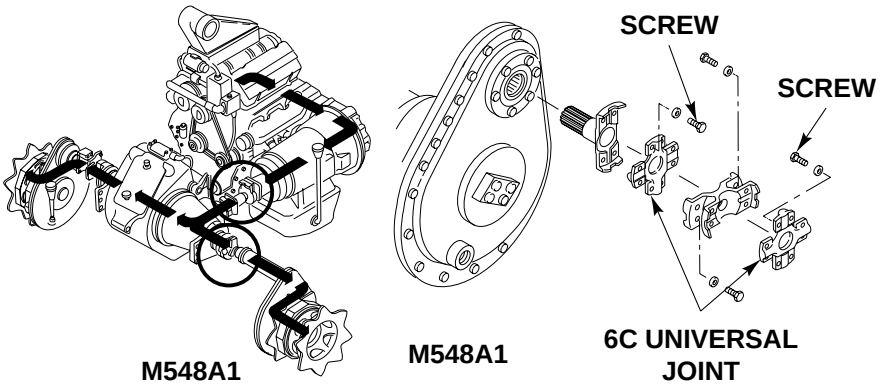
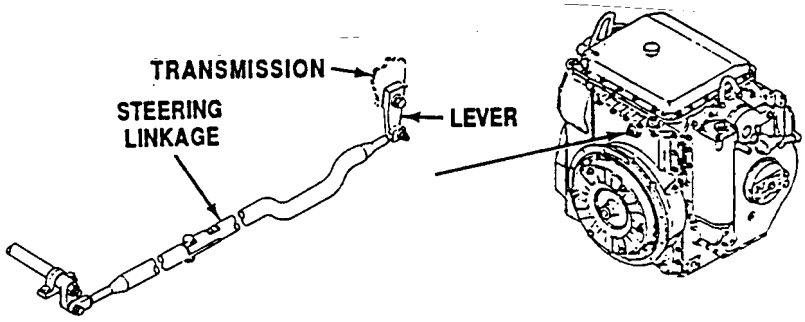
M548A3



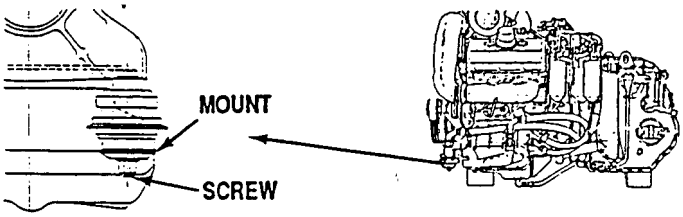
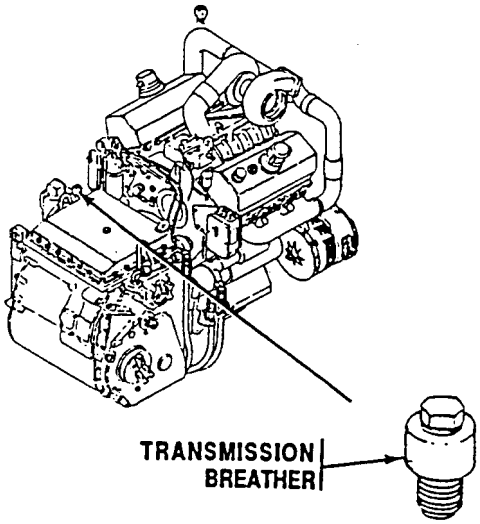
M548A1



M548A1

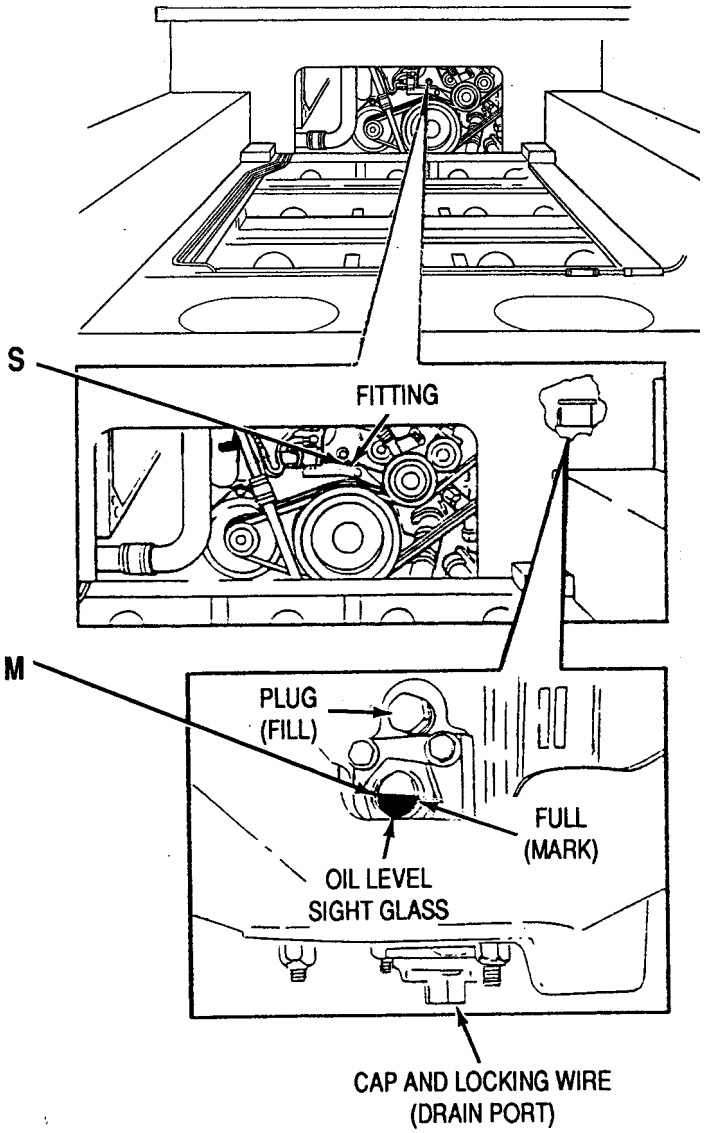
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				b. Check for loose screws on 6C universal joints. Tighten loose screws to 35–40 lb-ft (47–54 N•m) torque. Loosen and retighten screws to 35–40 lb-ft (47–54 N•m) torque (M548A1). c. If universal joint has lubrication fittings, lubricate with GAA (Table 15, page 0128 00-19).	
					
47	Semi-Annual (M548A3)		Steering Rod and Connecting Link	a. Check steering linkage lever on top of transmission for ease of movement from low to full position. If linkage does not move easily, troubleshoot steering system (WP 0006 00).	Loose or damaged steering rod and connecting link.
					
48	Semi-Annual (M548A3)		Power Plant Compartment	a. Clean power plant compartment with cleaning compound (WP 0542 00). Remove debris and wipe up spilled oil and fuel.	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

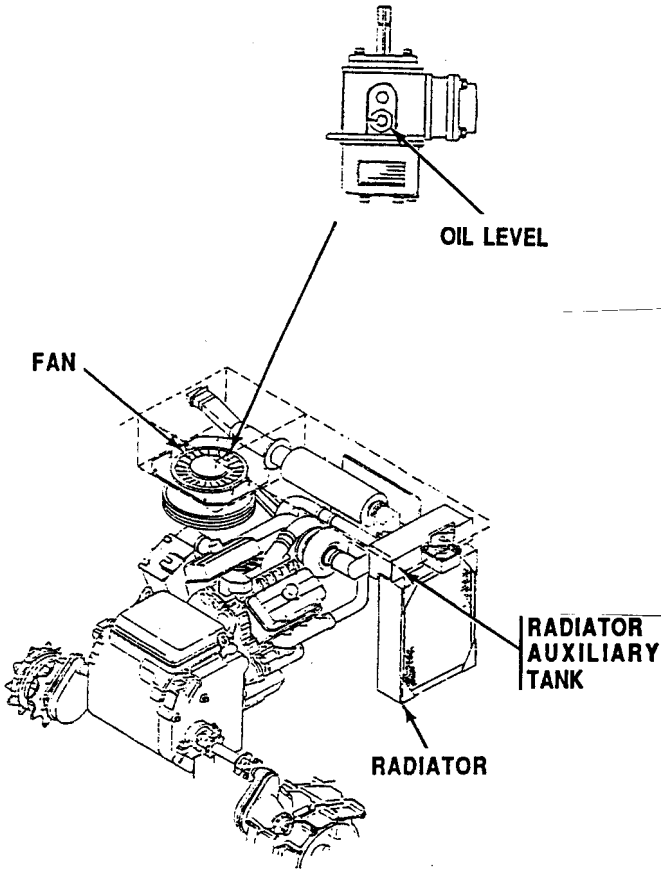
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
49	Semi-Annual (M548A3)		Power Plant Mount	a. Check mounts and screws for looseness. Tighten loose screws to 100–120 lb-ft (136–163 N•m) torque.	Loose or broken mounts or screws.
					
50	Semi-Annual (M548A3)		Transmission Breather	a. Remove transmission breather and check for cracks, dents, and stripped threads. Replace damaged breather (WP 0320 00) (WP 0321 00).	Breather broken or missing.
				b. Clean transmission breather with cleaning compound. Dry breather and install on transmission.	Breather broken or missing.
					

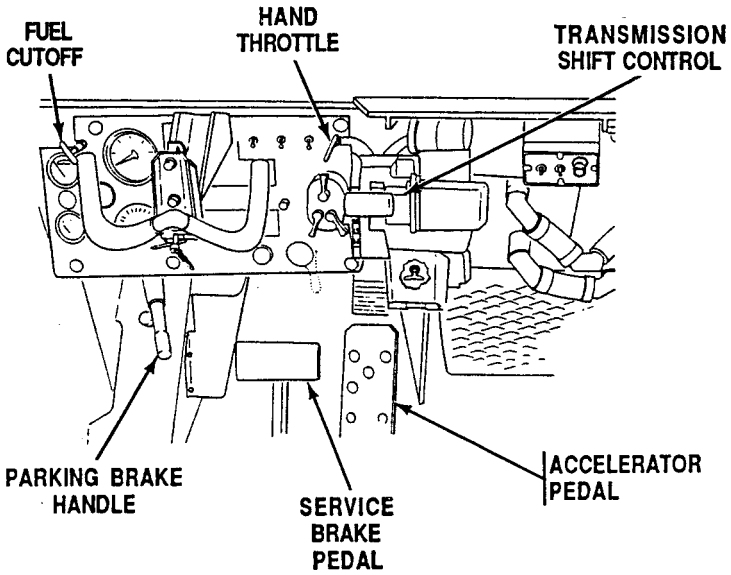
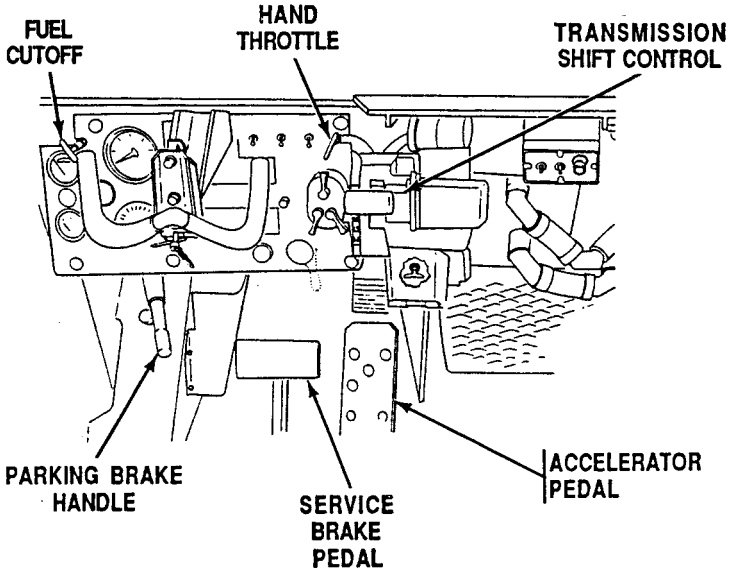
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
51	Semi-Annual (M548A3)	0.3	Fan Gearbox	a. Check fan gearbox oil level and add oil, if needed. For lubricant information, see Table 10, page 0128 00-18.	Empty or leaking fan gearbox.

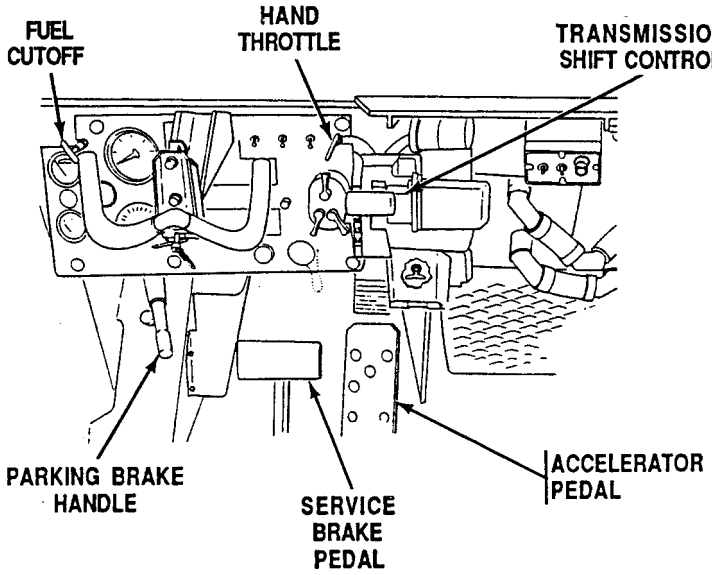


PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

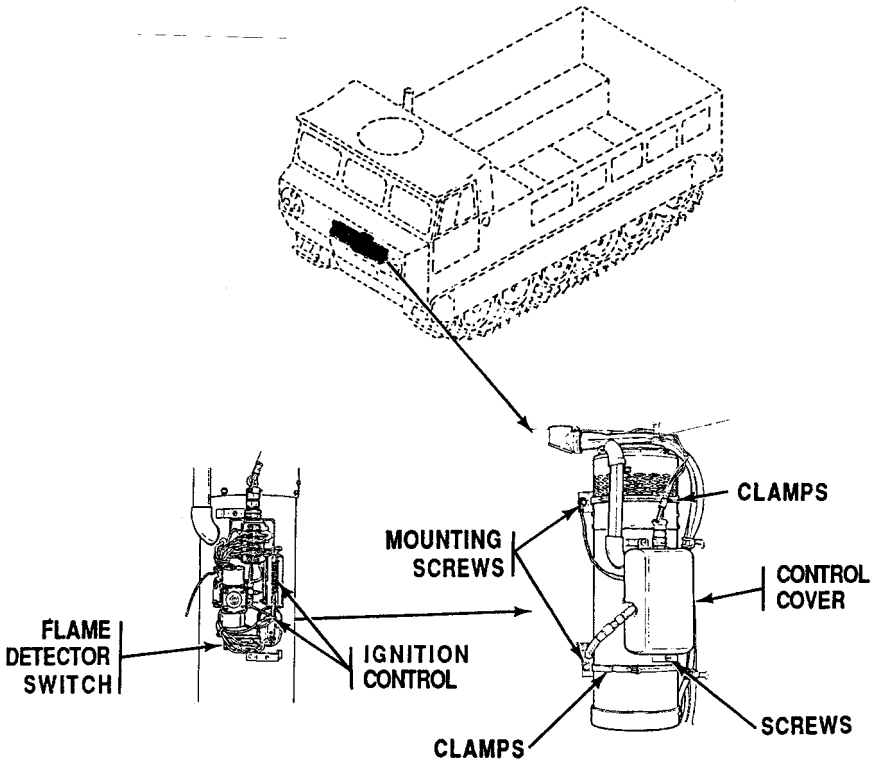
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
52	Semi-Annual (M548A3)		Radiator	a. Clean radiator (WP 0214 00). Check and replace leaking radiator (WP 0216 00).	Damaged or leaking radiator.
					
53	Semi-Annual (M548A3)		Parking Brake	a. Check parking brake linkage for proper adjustment. If parking brake handle does not move easily, adjust (WP 0345 00).	

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
					
54	Semi-Annual (M548A3)		Service Brake Linkage	a. Check service brake pedal and linkage for proper adjustment (WP 0347 00).	Broken, loose or missing parts.
55	Semi-Annual (M548A3)		Throttle Controls and Transmission Linkage	a. Check hand throttle for ease of movement from low to full position. If throttle does not move easily, adjust (WP 0192 00).	
					

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

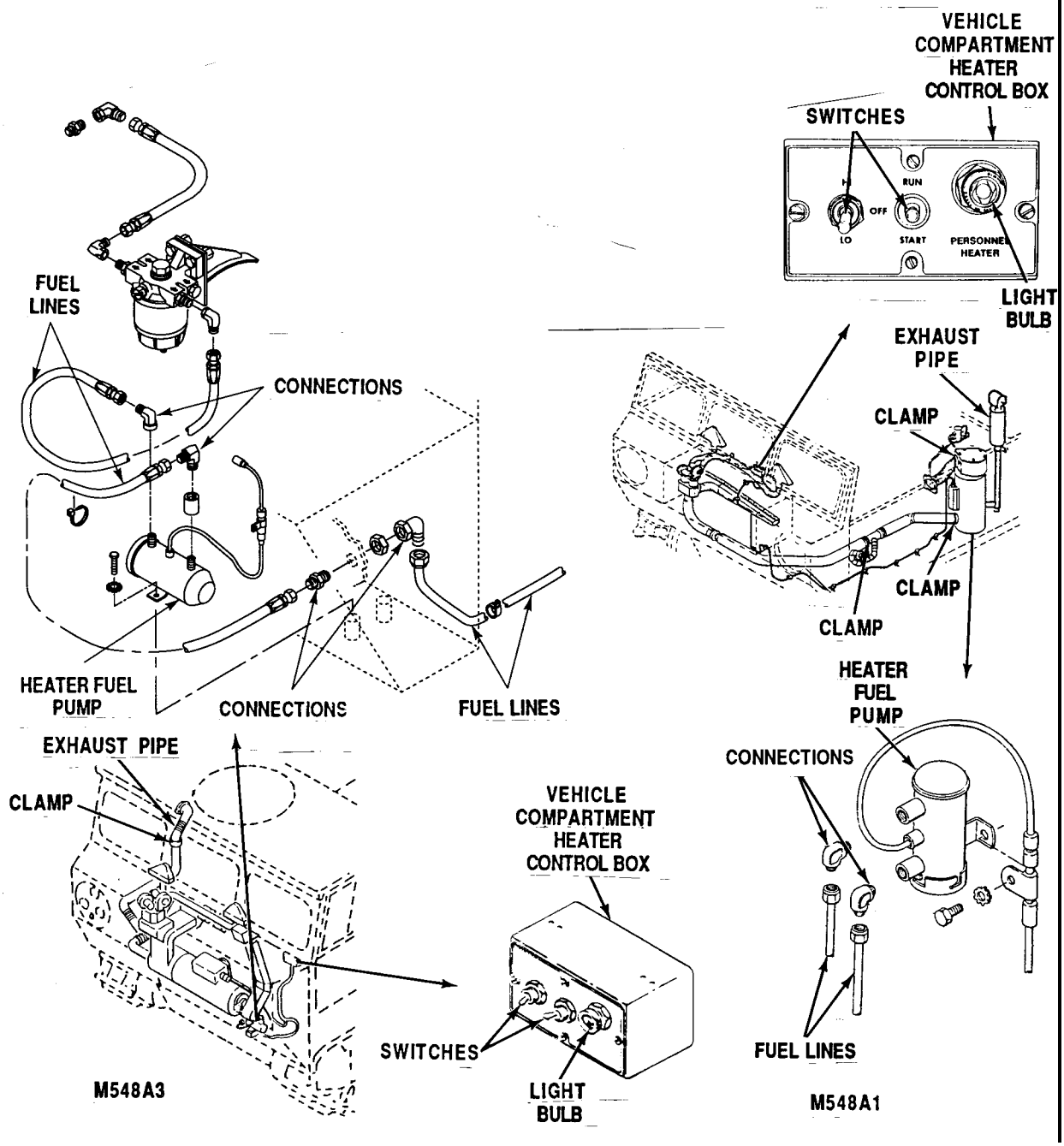
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
56	Semi-Annual (M548A3)		Fuel Cutoff	a. Operate fuel cutoff to check for binding. If binding occurs, adjust (WP 0205 00). b. Operate accelerator pedal to check for binding in linkage. If binding occurs, adjust (WP 0200 00). c. Move transmission shift control through all gears to check for binding. If grinding occurs, replace (WP 0306 00).	Binding, broken or missing parts.
					
57	Semi-Annual		Vehicle Compartment Heater	a. Tighten loose mounting screws and clamps on vehicle compartment heater. b. Remove control cover by turning two screws to the left. c. Check flame detector switch and ignition control. See TM 9-2540-205-24&P.	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

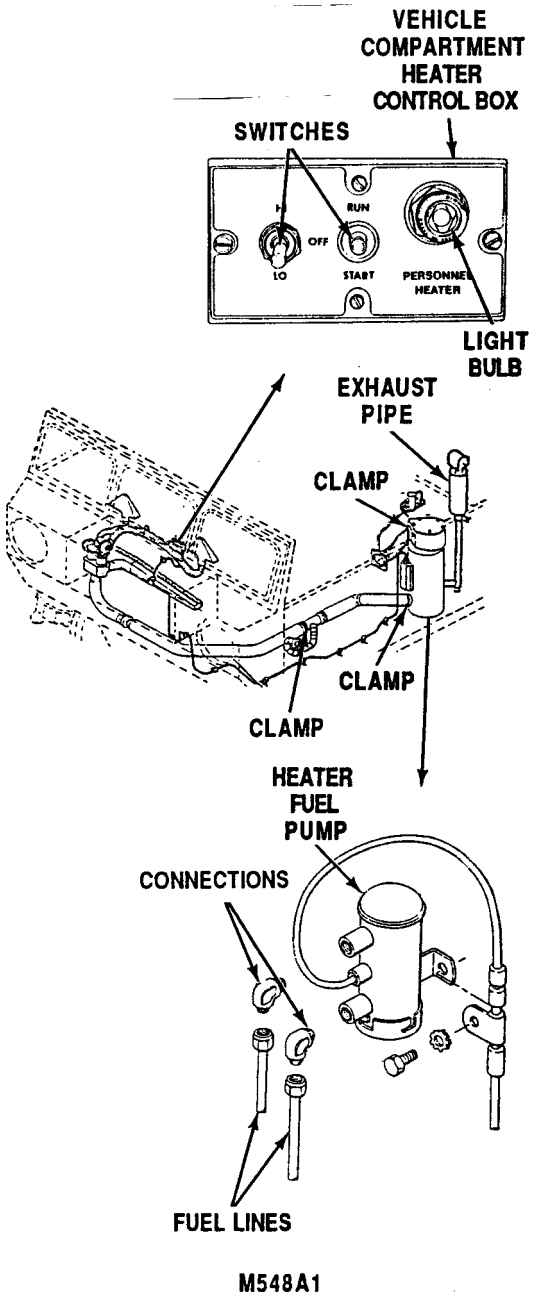
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				 M548A3	
				d. Replace vehicle compartment heater fuel filter (WP 0436 00). e. Check vehicle compartment heater fuel pump, fuel lines, fuel filter, and connections for leaks. Replace connections that continue to leak (WP 0427 00). f. Check for signs of exhaust leaks. Tighten clamps (WP 0427 00). g. Check vehicle compartment heater control box, switches, and light bulb. Tighten or replace bad switches and bulbs (WP 0431 00).	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:

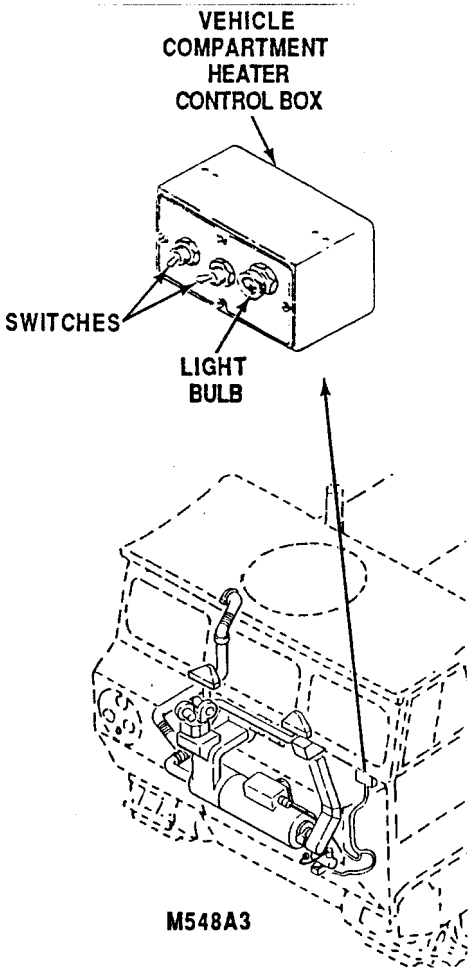


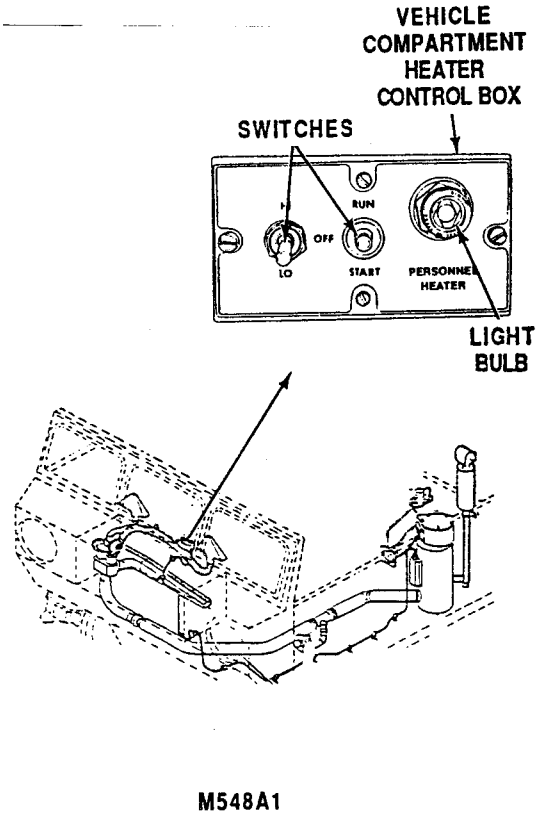
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				 M548A1	
				h. Start, run, and stop vehicle compartment heater (see your –10). During start cycle, check that switches and light bulb work properly. check for increase in blower speed after ignition.	

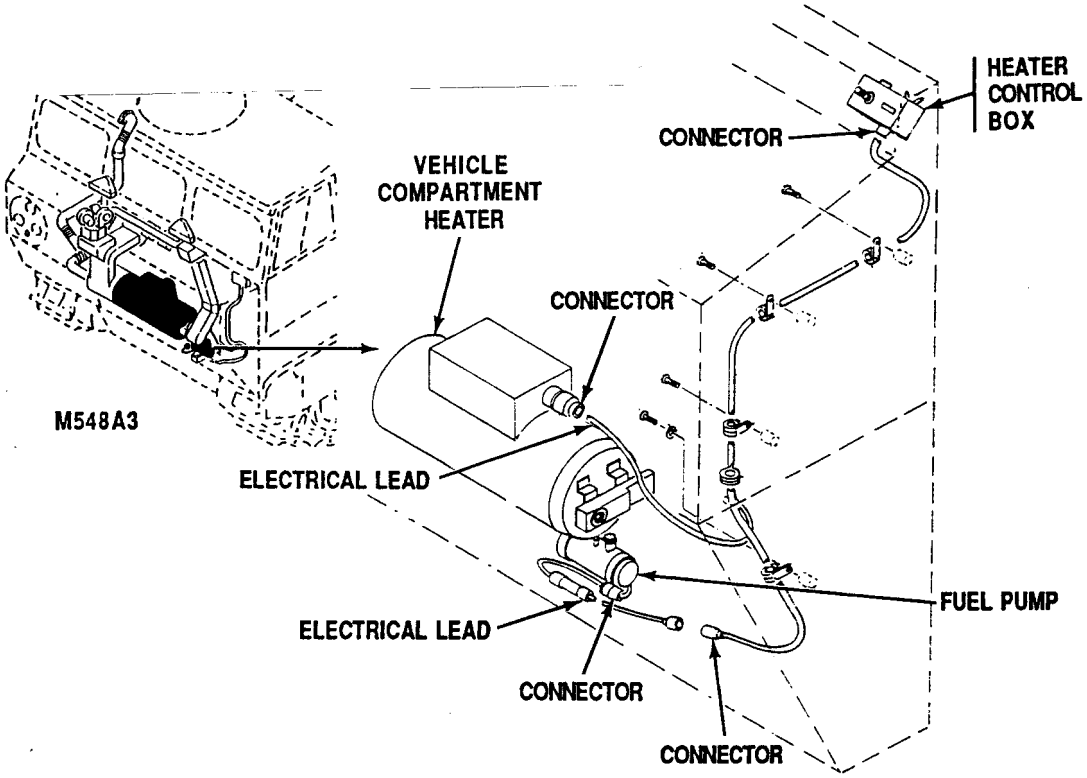
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

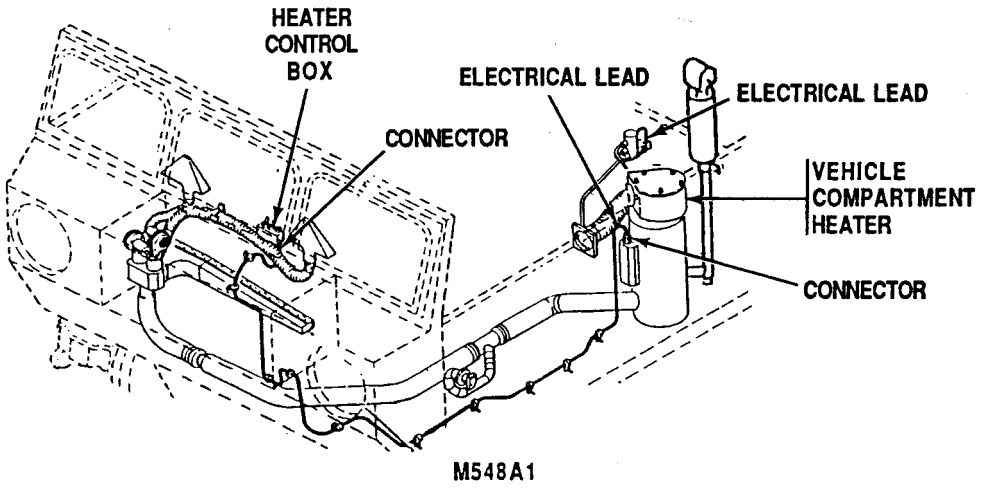
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				i. During operation, check for unusual noises. Check for differences between high and low heat levels. j. When stopping vehicle compartment heater, check for correct purge cycle and that indicator light bulb works right. If heater does not operate as specified above, perform troubleshooting (WP 0085 00).	



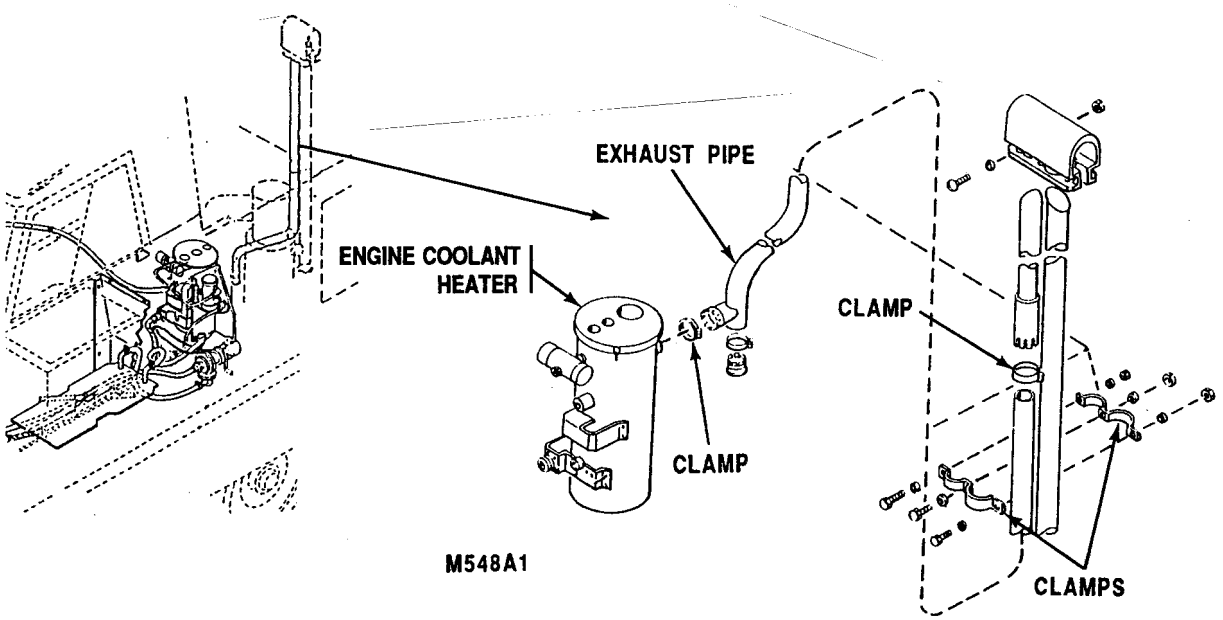


ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				k. Check electrical leads and connectors at vehicle compartment heater, heater control box, and fuel pump. Tape leads if frayed. Replace damaged connectors (WP 0431 00).	Any fuel leak.

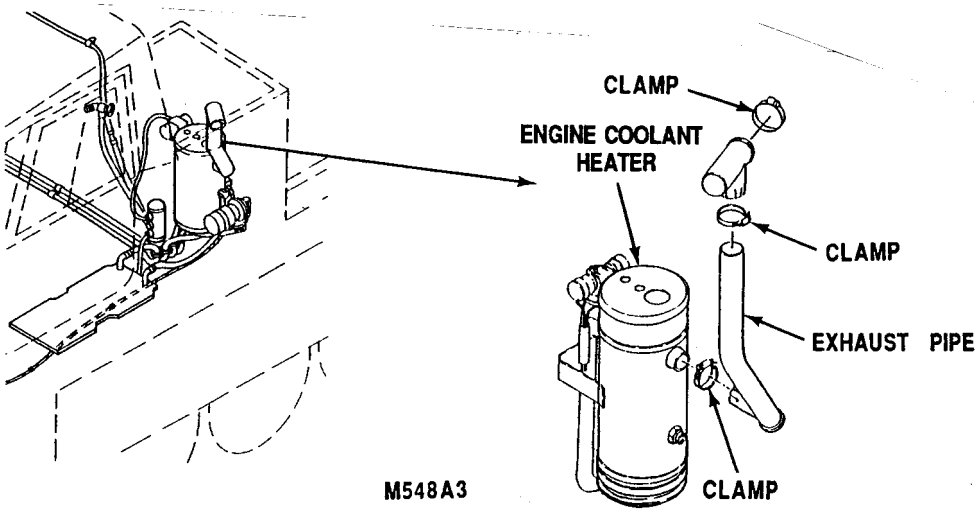




ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
58	Semi-Annual		Engine Coolant Heater Kit	**NOTE** **Coolant lines on right side of battery are for M548A3 engine coolant heater.** a. Check engine coolant heater clamps and exhaust pipes for exhaust leaks. Tighten clamps. Replace cracked or damaged pipe (WP 0480 00 or WP 0481 00).	Any exhaust leaks.



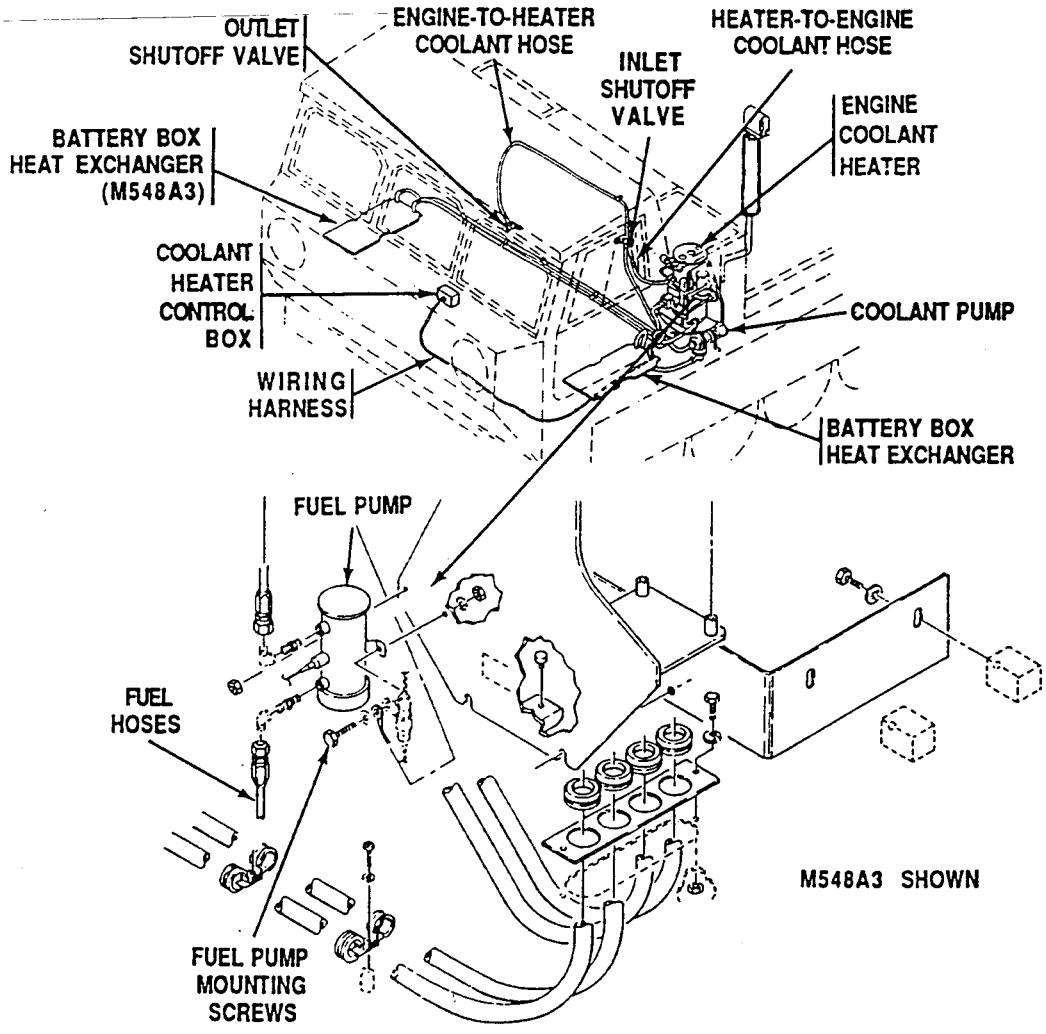
M548A1



M548A3

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				b. Check fuel hoses, hose connections, and fuel pump for leaks. Tighten connections that leak. Replace connections that continue to leak (WP 0475 00). c. Service fuel pump (WP 0148 00). d. Tighten fuel pump mounting screws.	

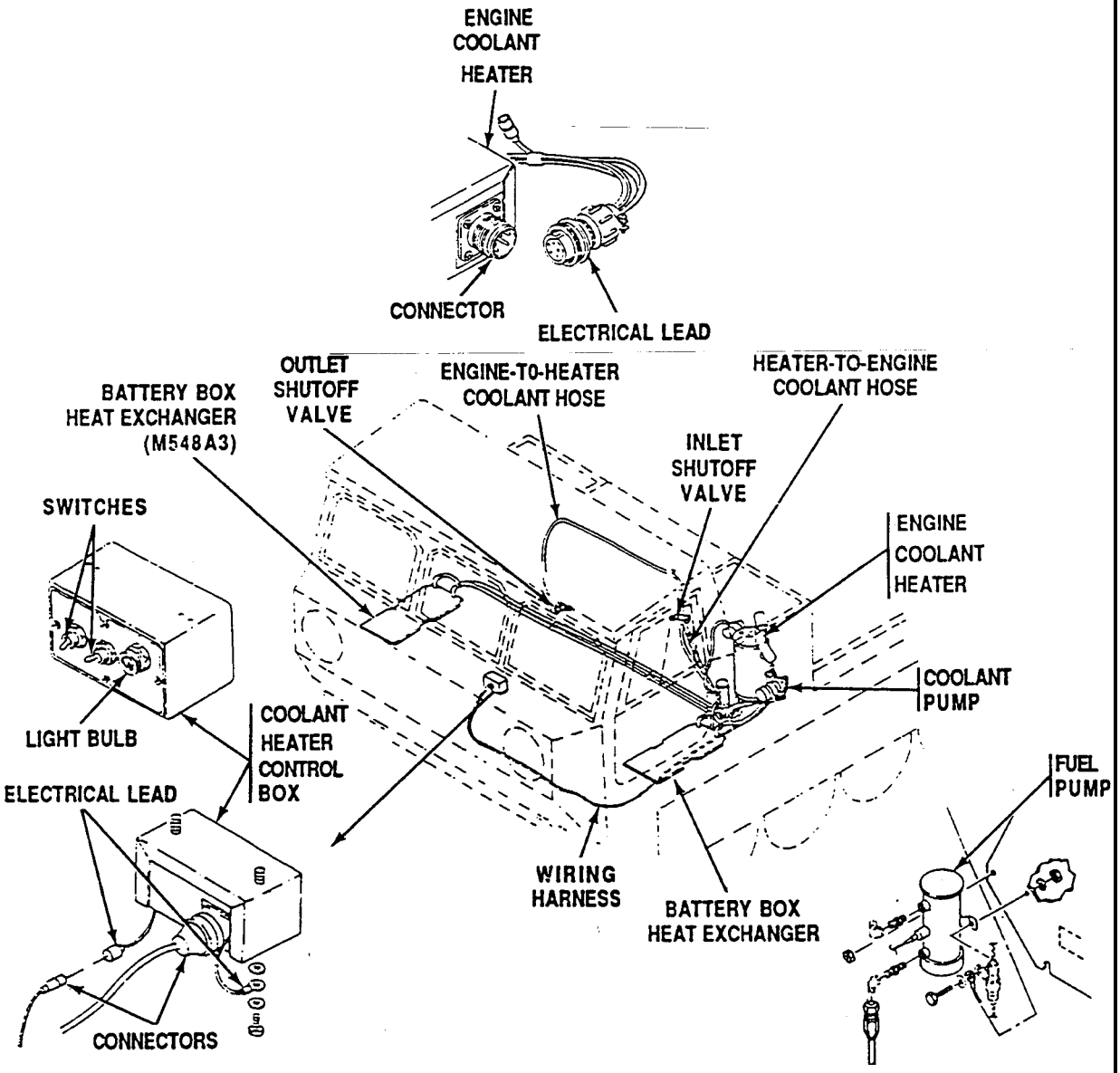


				e. Check electrical leads and connectors at engine coolant heater, heater control box, and fuel pump. Tape frayed leads. Replace damaged connectors (WP 0473 00).	

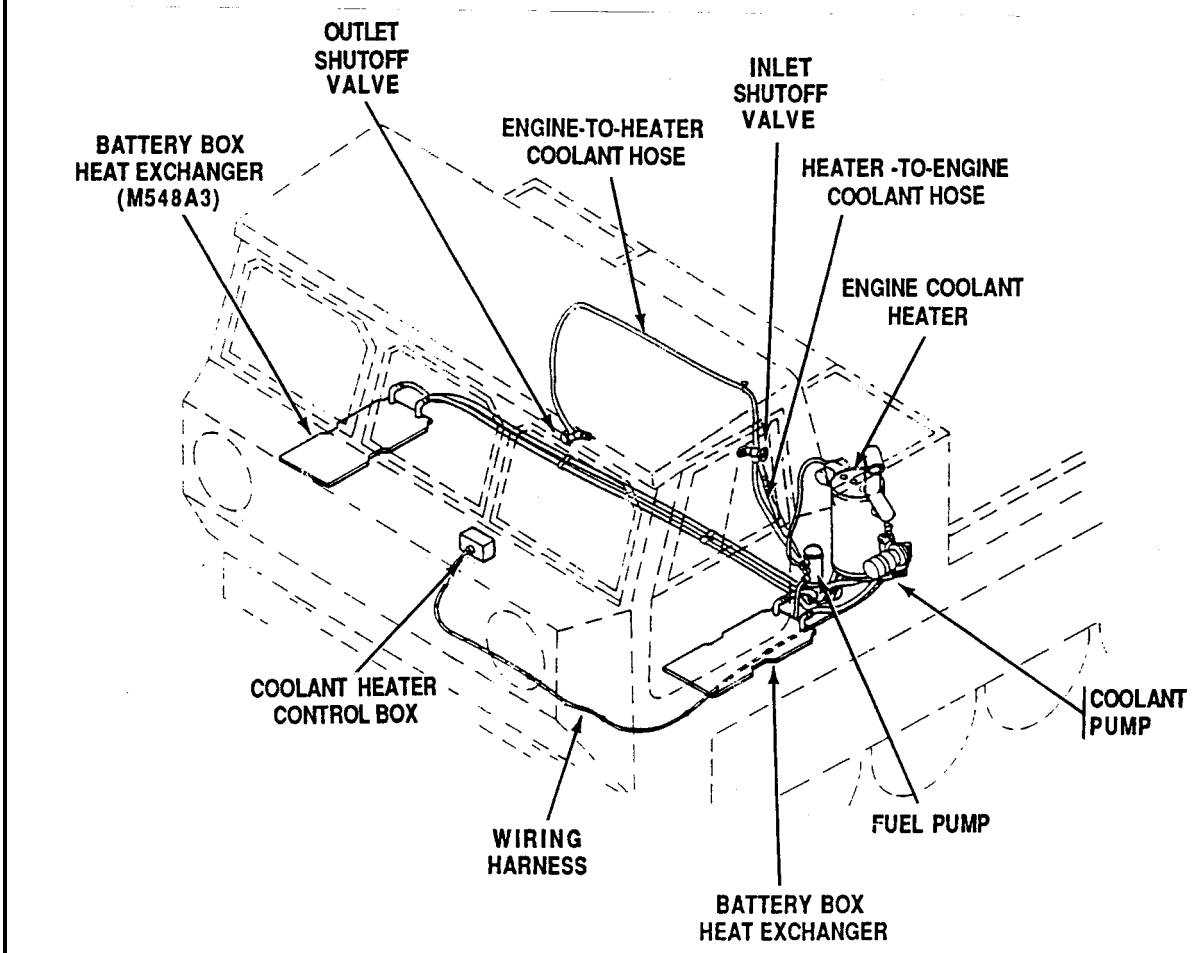
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				f. Check heater control box, switches, and light bulb. Tighten or replace bad switches and bulb (WP 0474 00). g. Start, run, and stop heater (see your –10). During start cycle, check that switches and lights work properly. h. During operation, check for unusual noises. Check for increase in coolant temperature. i. When stopping heater, check for correct purge cycle. Check that indicator light works right. If heater does not operate as specified above, perform troubleshooting (WP 0086 00).	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
					
				j. Check battery box heat exchangers and hose connections for leaks. Tighten connections that leak. Replace connections that continue to leak (WP 0476 00).	
				k. Check hose. Replace damaged hoses (WP 0476 00).	Any Class III coolant or fuel leaks.

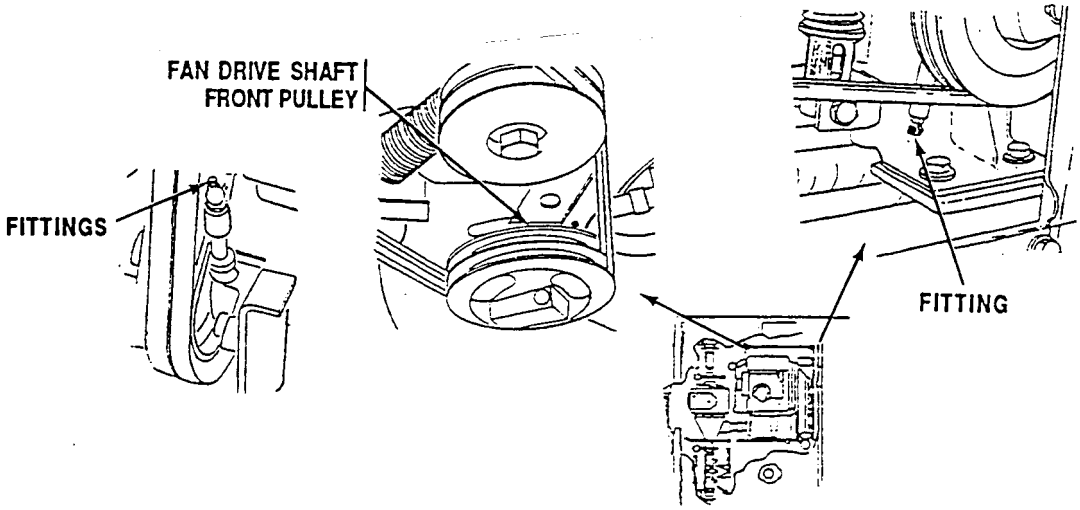
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

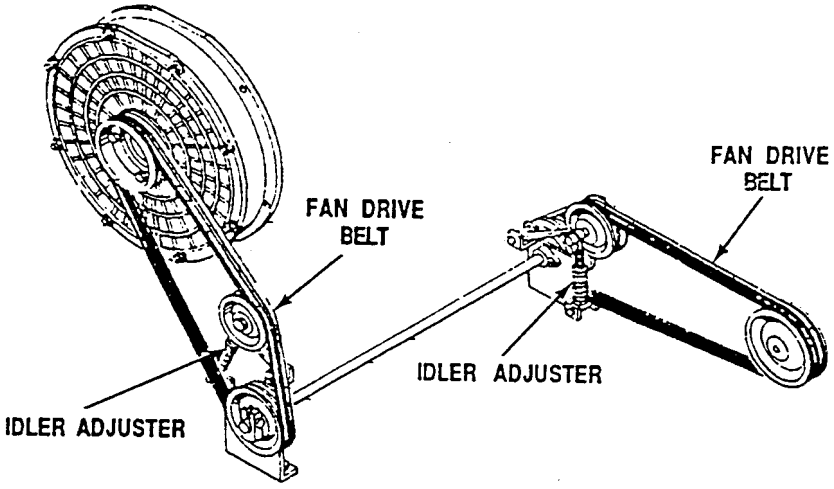
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
					
59	Semi-Annual (M548A3)		NBC M1A1–19 Precleaner Assembly	a. Check NBC M1A1–19 precleaner assembly for normal operation (blower running and air flow). Notify your supervisor for repair of precleaner.	
60	Semi-Annual (M548A3)		M3 Heater	a. Check NBC M3 heater for normal operation (heated air flow). Notify your supervisor for repair of NBC M3 heater.	
61	Semi-Annual (M548A3)		Switches and Indicators	a. Check for and tighten loose electrical connections and mountings. Replace broken indicator lights (WP 0264 00). Check indicator lights for normal operation.	
62	Semi-Annual (M548A3)		Hoses and Clamps	a. Check hoses for cracks and breaks. Replace cracked or broken hoses. check for leaks. Tighten hose clamps. Replace as required (WP 0537 00).	

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
63	Semi-Annual (M548A3)		Quick Disconnect Coupling	a. Check quick disconnect coupling for proper fit on protective mask and orifice connector assembly. Replace any defective coupling (WP 0538 00).	
64	Semi-Annual (M548A3)		Orifice Connector Assembly	a. Check valve and general condition of orifice connector. Replace valve or orifice connector as required (WP 0538 00).	
65	Semi-Annual (M548A3)		Air Flow (3.0–4.5 cfm) (.08–.13 cum)	**NOTE** **Air flow should be 3.0–4.5 cfm (.08–.13 cum) (cubic feet/meter per minute)** a. Check each station using M39 air flow tester TM 3-6680-316-10.	
66	Semi-Annual (M548A3)		ID Plate	a. Replace identification plate if not legible (WP 0440 00).	
67	Semi-Annual (M548A3)		Paint	a. Paint surface to prevent rust or corrosion TB 43-0209.	

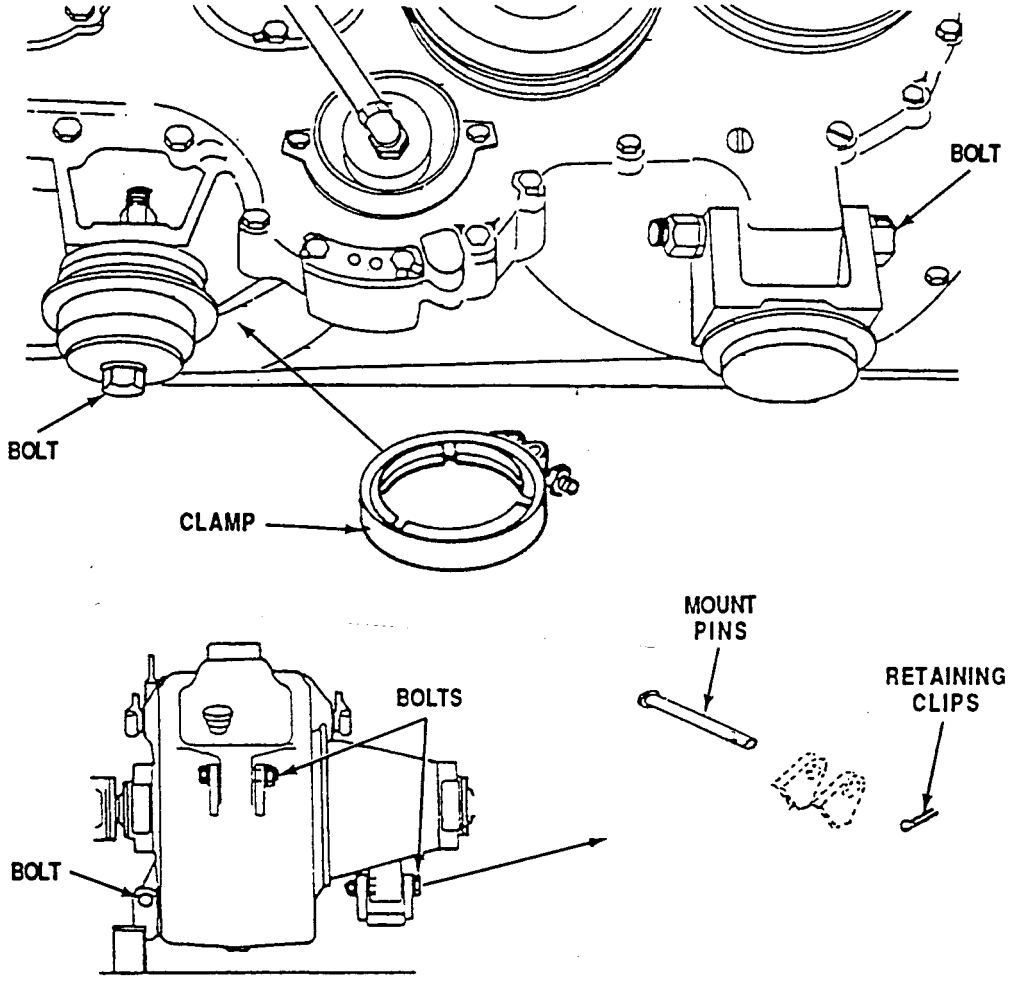
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
68	Semi-Annual (M548A1)		Fan Generator Drive and Air Compressor Belts	a. Check fan and generator drive belts for cracks or looseness. Check idler adjusters for correct belt tension. Adjust them so adjusting nut is within range on sleeve instruction plate (WP 0226 00), (WP 0241 00, or WP 0498 00). Every 500 miles (805 km), or semi-annually, lubricate fan drive shaft bearings with GAA grease through fittings at each end of shaft.	Any belt or pulley broken, cracked, bent, missing or out of adjustment.





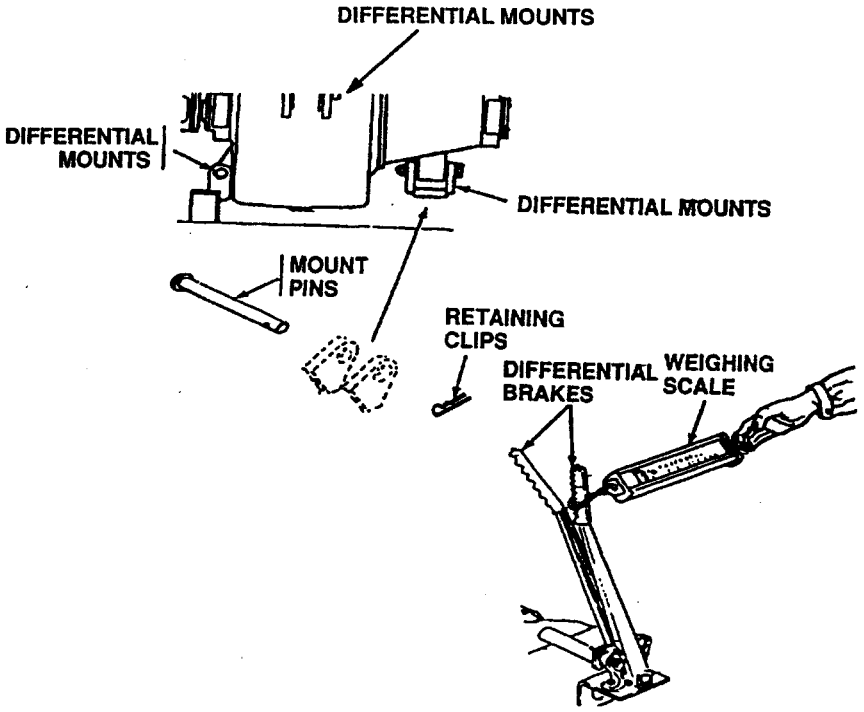
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
69	Semi-Annual (M548A1)		Transfer and Differential Gearcase Mounting	a. Check for loose mount pins or retaining clips on transfer and differential gearcases. Check for loose transfer clamps. Torque bolts to 75–80 lb-ft (102–108 N•m).	Any cracked, broken, missing, or binding hardware.



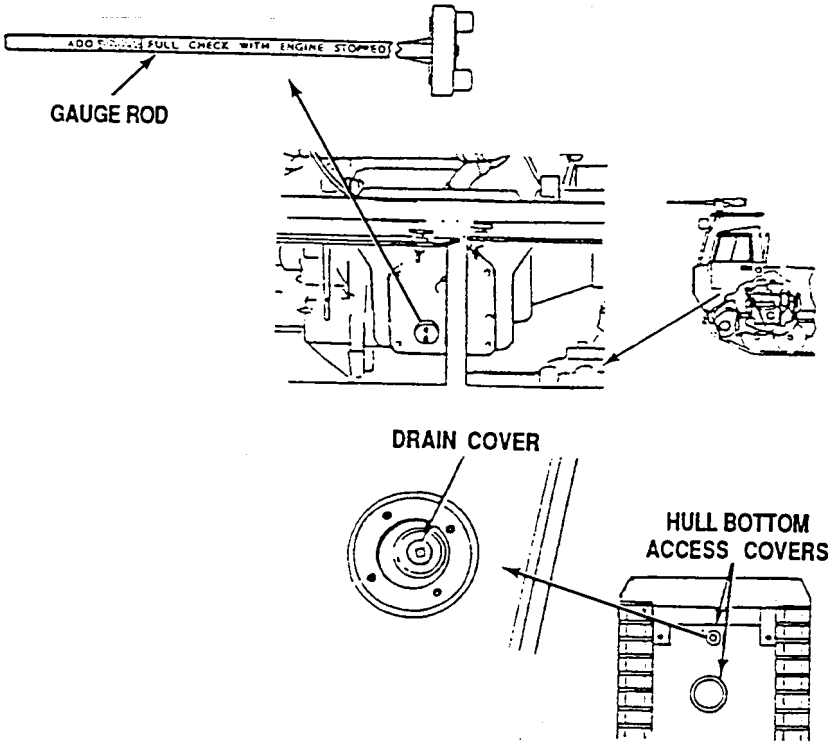
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
70	Semi-Annual (M548A1)		Differential Brake Adjustment	a. Using weighing scale (WP 0541 00, Item 43), perform pull test to inspect for proper operation of steering levers and differential brakes. With the levers locked at the second quadrant position, 10 to 30 pounds (4.5 to 14 kg) of pull should unlock the levers. Adjust differential brakes if needed (WP 0341 00).	



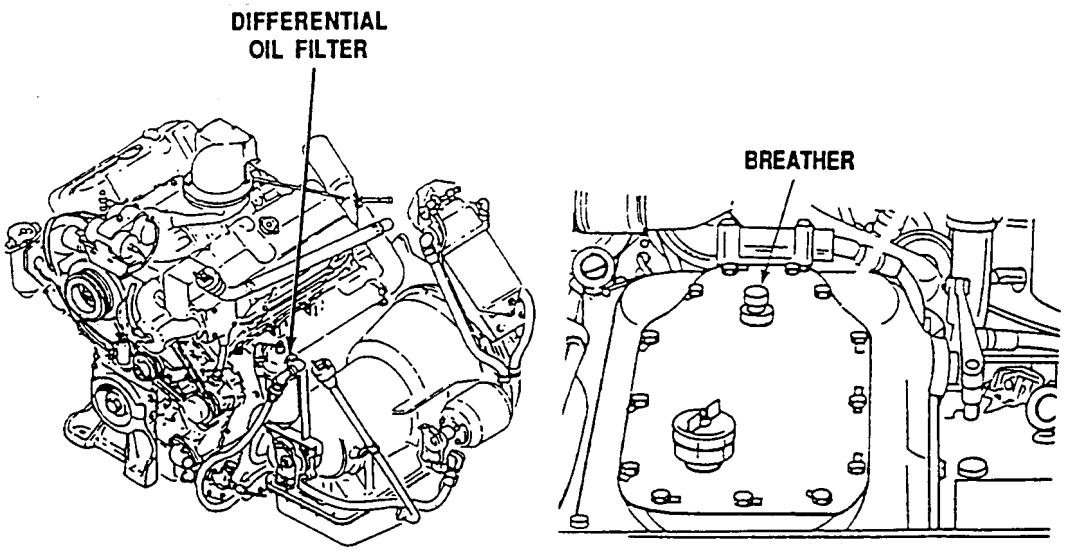
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
71	Semi-Annual (M548A1)		Differential Oil Drain	a. Differential oil every 150 hours, 1500 miles (2414 km), or semi-annually. Drain only when hot after operation. To drain, remove front hull bottom access cover and drain cover (WP 0337 00). Inspect drain cover and oil for metallic particles. If metal chips are found, notify your supervisor. b. Clean and install drain cover (WP 0383 00) Remove gauge rod from housing and add OE/ HDO oil (approximately 18 quarts) (17 liters). Check oil level and install gauge rod.	Any metal chips are present or Class III oil leaks are found.



PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				c. Remove differential oil filter (WP 0338 00). Clean differential oil filter and breather every 150 hours, 1500 miles (2414 km), or semi-annually, using cleaning compound (WP 0542 00).	

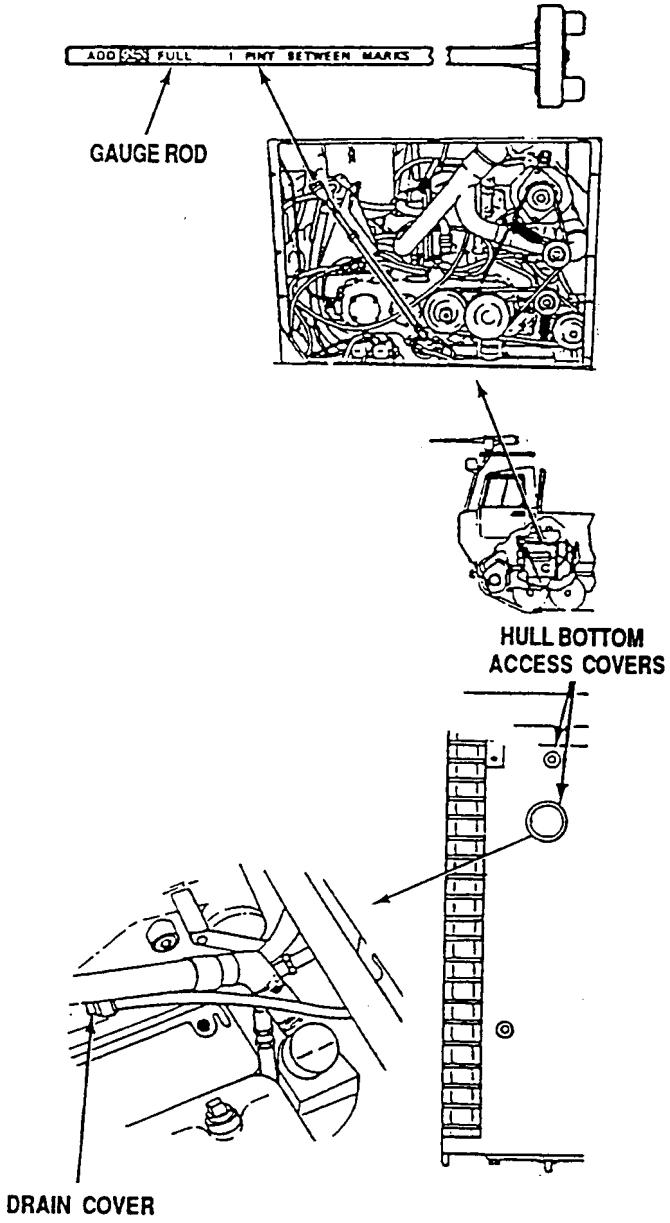


ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
72	Semi-Annual (M548A1)	1.2	Pivot Steer	**WARNING**  **FireResistantHydraulic (FRH) fluid may contain tricresyl phosphate which, if taken internally, can produce paralysis. Hydraulic fluid 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 your skin, thoroughly wash with soap and water. Wash hands thoroughly prior to eating or smoking. Application of these measures is considered an effective control of the hazard.** **CAUTION** **Use only FRH or OHA hydraulic fluid. Do not mix different types of hydraulic fluids. Do not overfill.** **NOTE** **If hydraulic fluid is contaminated, or fluid type is changed, drain pivot steer system, (WP 0371 00).** a. Remove fill plugs and check pivot steer master cylinders every 150 hours, 1500 miles or semi-annually. Add FRH as required to bring fluid within 1/2 to 3/4 inch from top of cylinder. For lubricant information, see Table 13, page 0128 00-19.	

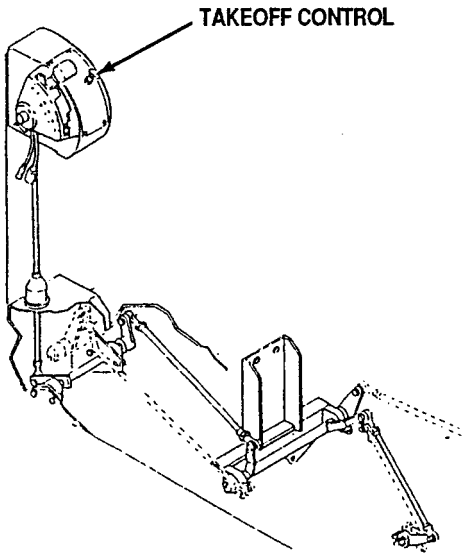
ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
73	Semi-Annual (M548A1)	0.5	Transfer Gearcase Drain	a. Drain gearcase oil. Drain only when hot after operation. Remove hull bottom access cover and drain cover (WP 0383 00). Inspect oil being drained for metal particles. If metal particles are found, notify your supervisor. b. Drain at least 15 minutes. Clean and install drain cover (WP 0383 00)Fill gearcase with approximately 2 1/2 quarts (2 liters) of OE/HDO oil. Make sure gearcase filler cap is closed and breather hole in gauge rod is open. Start engine (see your –10) and operate for one minute. Stop engine and check gearcase oil level. It should be between the gauge rod's FULL and ADD marks. Install hull bottom access cover securely. For lubricant information, see Table 6, page 0128 00-17 (WP 0383 00).	Any metal chips are present or Class III oil leaks are found.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:



PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS — Continued **0128 00**

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
74	Semi-Annual (M548A1)		Winch Power Takeoff Controls	a. Check winch power takeoff control for ease of operation and proper alignment. Adjust as needed (WP 0415 00).	
					
75	Semi-Annual		Decals, Instruction Plates, Stencils, and Paint	a. Replace unreadable decals, instruction plates, and stencil markings (WP 0440 00). Clean and paint bare spots on painted surfaces that might otherwise rust or corrode. See TB 43-0209.	
76	Semi-Annual		Final Road Test	a. Perform final carrier road test. Drive carrier at least 5 miles (8 km). b. Ensure correction of operational faults. pay close attention to those items that were faulty to begin with.	
77	Semi-Annual		Left and Right Steering	**CAUTION** **Power plant can be damaged. Do not pivot steer when carrier is moving except on a track failure emergency.**	
				a. Check steering in left and right turns. If carrier does not finish a complete turn, troubleshoot steering system (WP 0006 00).	Carrier does not turn properly.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
78	Semi-Annual		Steering Forward and Reverse Range	a. Check steering in forward range and in reverse range. If carrier does not make a complete turn, troubleshoot steering system (WP 0006 00).	Binding, grabbing, unusual noise, vibration or carrier fails to turn.
79	Semi-Annual		Carrier Braking	a. Check carrier braking. If carrier does not stop when brakes are applied, troubleshoot brake system (WP 0068 00).	Carrier fails to stop.
80	Semi-Annual		Carrier Shifting in All Ranges	a. Check shifting of carrier in all ranges. If carrier does not respond properly to selected driving range, troubleshoot gear selection (WP 0006 00).	Carrier fails to shift into selected range.
81	Semi-Annual		After Road Test	a. Immediately after road test, cautiously feel all wheel and idler hubs for noticeable difference in temperature between hubs. An overheated hub indicates that bearing is out of adjustment, poorly lubricated, or unserviceable.	Any Class III leaks, cold shocks, or bad bearings.
				b. Check temperature of shock absorbers. Shock absorbers should be warm. A cold shock absorber has failed, replace it (WP 0379 00).	
				c. Visually check inside, outside, and underneath of carrier for fuel, oil, or hydraulic leaks.	Any Class III leak or fuel leak.
82	Semi-Annual		Idle Test	**CAUTION** **Avoid lengthy engine idling. This causes coolant temperature to drop below operating temperature and can shorten engine life.**	
				NOTE **After a successful road test, perform engine idle and governed no load test only.**	
				a. Run engine at 800 to 1000 rpm for 3–5 minutes with range selector in 2–3 range and brakes locked until normal operating temperature is reached.	Engine runs hot or rough.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				b. If outside air temperature is less than 85 degrees F (29 degrees C), normal operating temperature should be 160 to 200 degrees F (71 to 93 degrees C). If outside air temperature is greater than 85 degrees F (29 degrees C), normal operating temperature should be 160 to 230 degrees F (71 to 110 degrees C). c. With range selector in N (M548A1) or SL (M548A3), engine should idle smoothly at 650 to 700 rpm. d. High and low engine idle speed is usually caused by accelerator linkage being out of adjustment. Adjust linkage if necessary (WP 0197 00 or WP 0200 00). e. Rough idling is usually caused by faulty injector timing and rack setting, faulty injectors, or air in the injection system. Notify your supervisor.	
83	Semi-Annual		Governed No-Load Test	a. Run engine at 800 to 1000 rpm for 3–5 minutes with range selector in 2–3 range and brakes locked until normal engine operating temperature is reached. b. If outside air temperature is less than 85 degrees F (29 degrees C), normal operating temperature should be 160 to 200 degrees F (71 to 93 degrees C). If outside air temperature is greater than 85 degrees F (29 degrees C), normal operating temperature should be 160 to 230 degrees F (71 to 110 degrees C). c. With range selector in N (M548A1) or SL (M548A3), slowly open throttle control until accelerator is fully depressed.	

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	CREWMEMBER PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				CAUTION **When you suspect a faulty governor, do not exceed 3,000 rpm on engine for more than 2 or 3 seconds.**	
				d. Engine speed may exceed 3,000 rpm momentarily, but should stabilize at 2,925 to 2,975 rpm.	If governor cuts in and out or surges at this speed, adjustments are needed. Notify your supervisor.

The following list of parts are required when performing semi-annual, annual, or on-condition PMCS. The semiannual parts list contain the mandatory replacement parts for one semi-annual PMCS. The annual parts list contains the mandatory replacement parts for one semi-annual PMCS combined with the mandatory replacement parts for one (1) annual PMCS. The on-condition parts list contains replacement parts that are required when engine and transmission oil changes are directed by the Army Oil Analysis Program (AOAP) Laboratory. If AOAP Laboratory support is not available, change oil and filter elements/gasket every 150 hours/1500 miles or annually.

Table 17. SEMIANNUAL (1500 MILES)

Item No.	Part Number	NSN	Nomenclature	Qty
1	MS28778-12	5330-00-251-8839	PACKING	1

Table 18. ANNUAL (1500 MILES)

Item No.	Part Number	NSN	Nomenclature	Qty
1	MS28778-12	5330-00-251-8839	PACKING	1
2	IO874832	4730-00-766-4714	FILTER	1
3	MS28775-231	5330-00-527-7025	PACKING	1
4	5574161	5330-00-846-9841	GASKET	1
5	CW226MP	2910-00-287-1912	FILTER, ELEMENT	1
6	5574126	5330-00-612-3123	GASKET	1
7	1503536	5330-00-551-0433	GASKET	1
8	T552	2940-00-745-7730	FILTER, ELEMENT	1
9	5703232	2940-01-214-9303	PARTS KIT, FLUID PRE	1

Table 19. ON-CONDITION (1500 MILES)

Item No.	Part Number	NSN	Nomenclature	Qty
1	57023089	2940-00-678-0641	PARTS KIT	1
2	FL804FP	2940-01-197-7106	FILTER ELEMENT, FLUID	1
3	5703232	2940-01-214-9303	PARTS KIT, FLUID PRE	1
4	MS28775-231	5330-00-527-7025	PACKING	1
5	10874832	4730-00-766-4714	FILTER	1
6	MS35338-45	5310-00-407-9566	WASHER , LOCK	1

MULTIPLE PIN AND SOCKET IDENTIFICATION 0129 00

THIS WORK PACKAGE COVERS:

Inspection-Acceptance and Rejection Criteria (page 0129 00-1).

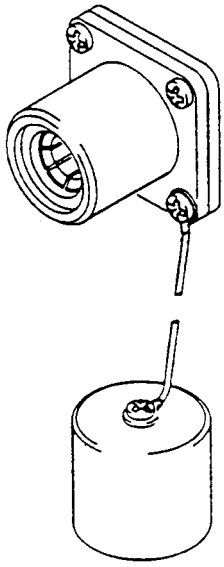
INITIAL SETUP:

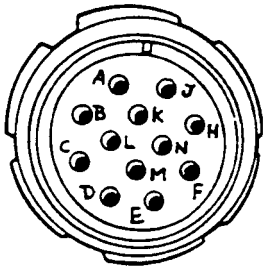
Maintenance Level

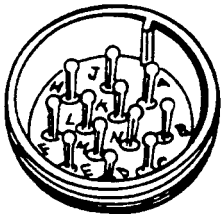
Unit

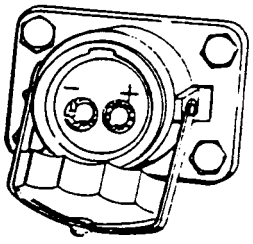
INSPECTION-ACCEPTANCE AND REJECTION CRITERIA

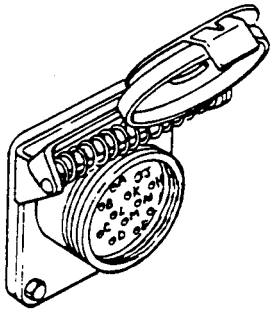
1. It is important to identify the correct pins and sockets for repair when troubleshooting electrical connectors and receptacles.
2. Letters or other markings are stamped next to each pin and corresponding socket to ensure proper identification.
3. Following are examples of typical connectors found in carriers.











END OF TASK

CHAPTER 4

UNIT MAINTENANCE INSTRUCTIONS FOR ENGINE

WORK PACKAGE INDEX

REMOVE/INSTALL POWER PLANT (M548A1) 0130 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level
- Unit

Tools and Special Tools
- General Mechanic's Tool Kit (WP 0541 00, Item 57)
- Beam Type Sling (WP 0541 00, Item 45)
- Socket Wrench Set (WP 0541 00, Item 64)
- Socket Wrench Set (WP 0541 00, Item 65)
- Torque Wrench (WP 0541 00, Item 71)
- Torque Wrench (WP 0541 00, Item 72)
- Lifting device with rated lift capacity of at least 2500 lb (1135 kg)

Materials/Parts
- Antifreeze (WP 0542 00, Item 4)
- Engine lubricating oil (WP 0542 00, Item 13)
- GAA grease (WP 0542 00, Item 14)
- Sealing compound (WP 0542 00, Item 37)
- Gasket
- Lock nut (2)
- Suitable container
- Washer (2)

Personnel Required
- Unit mechanic
- Helper (H)

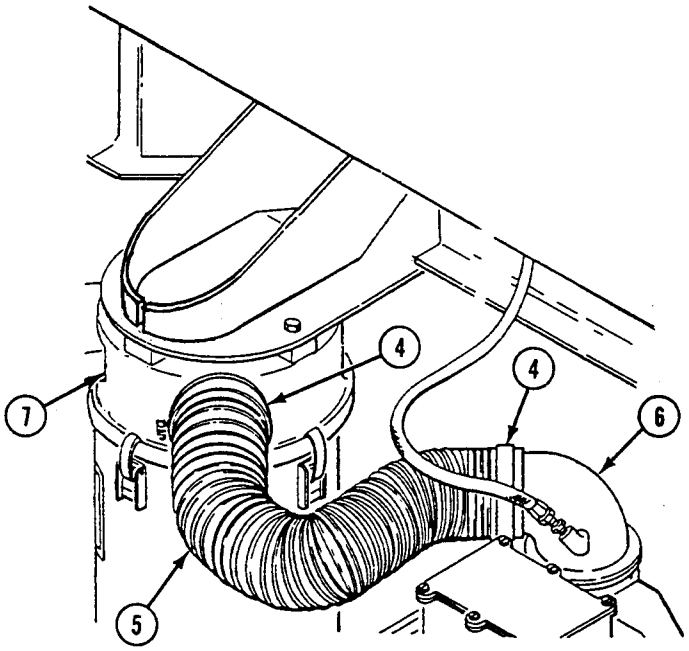
References
- See your -10

Equipment Condition
- Engine stopped (see your -10)
- Carrier blocked (see your -10)
- Both battery negative leads disconnected (WP 0292 00)
- Neutral safety switch disconnected (WP 0308 00)
- Machine gun mount kit removed, if equipped with machine gun mount kit (WP 0513 00), (WP 0514 00), and (WP 0515 00)
- Fabric and/or fiberglass cab covers and frame removed (WP 0418 00) and (WP 0456 00)
- Top access cover and grilles removed (WP 0390 00)
- Bulkhead protector removed, if equipped with material handling kit (WP 0487 00)
- Power plant rear access door removed (see your -10)
- Cab personnel seats removed (WP 0398 00)
- Cab floor plates removed (WP 0394 00)
- Hull bottom access cover removed (WP 0383 00)
- Air cleaner container and element removed (WP 0152 00)
- Air cleaner hose disconnected from engine air intake (WP 0153 00)
- Air cleaner filter indicator removed (WP 0154 00)
- Air pump hose disconnected (WP 0191 00)
- Transverse beam removed (WP 0384 00)
- Cooling system drained (WP 0213 00)

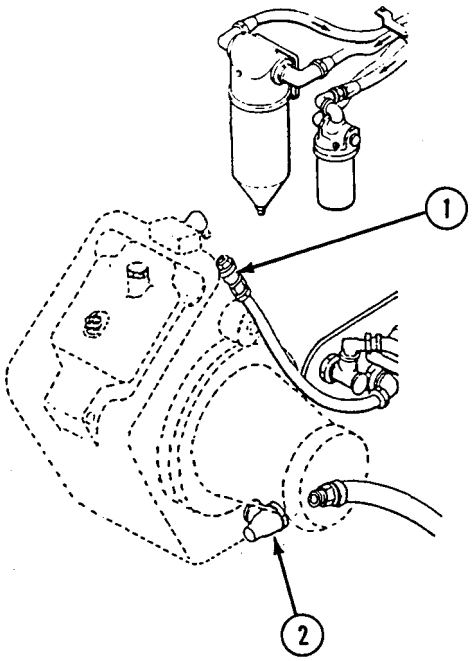
REMOVE/INSTALL POWER PLANT (M548A1) — Continued **0130 00**

REMOVAL

1. Loosen two clamps (4) that secure air cleaner hose (5) to air intake (6) and air cleaner head (7). Remove hose.
2. Drain oil from engine, transmission and transfer gearcase, if necessary (WP 0128 00).



3. Disconnect differential oil hoses at quick-disconnect coupling (1) and at right angle gearbox (2).



NOTE

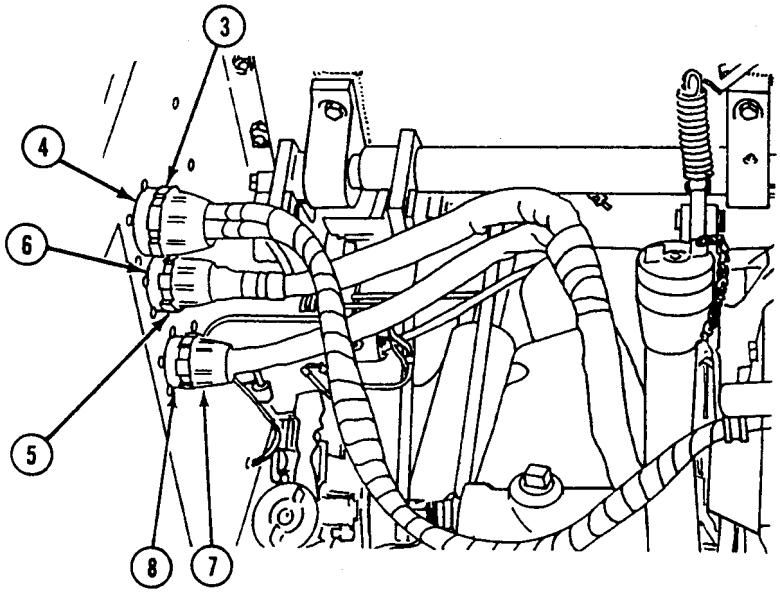
Tag and identify electrical connectors and cables for installation.

4. Disconnect power plant bulkhead connectors.

   a. Disconnect regulator-to-bulkhead cable connector (3) from bulkhead connector (4).

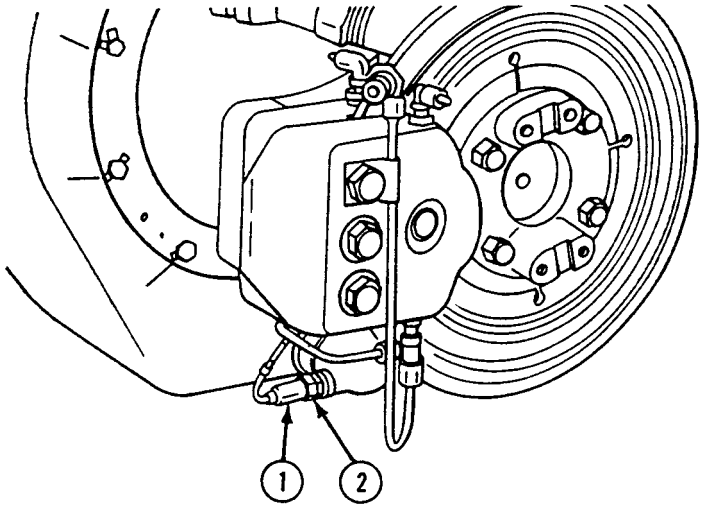
   b. Disconnect starter-to-bulkhead cable connector (5) from bulkhead connector (6).

   c. Disconnect power plant wiring harness connector (7) from bulkhead connector (8).

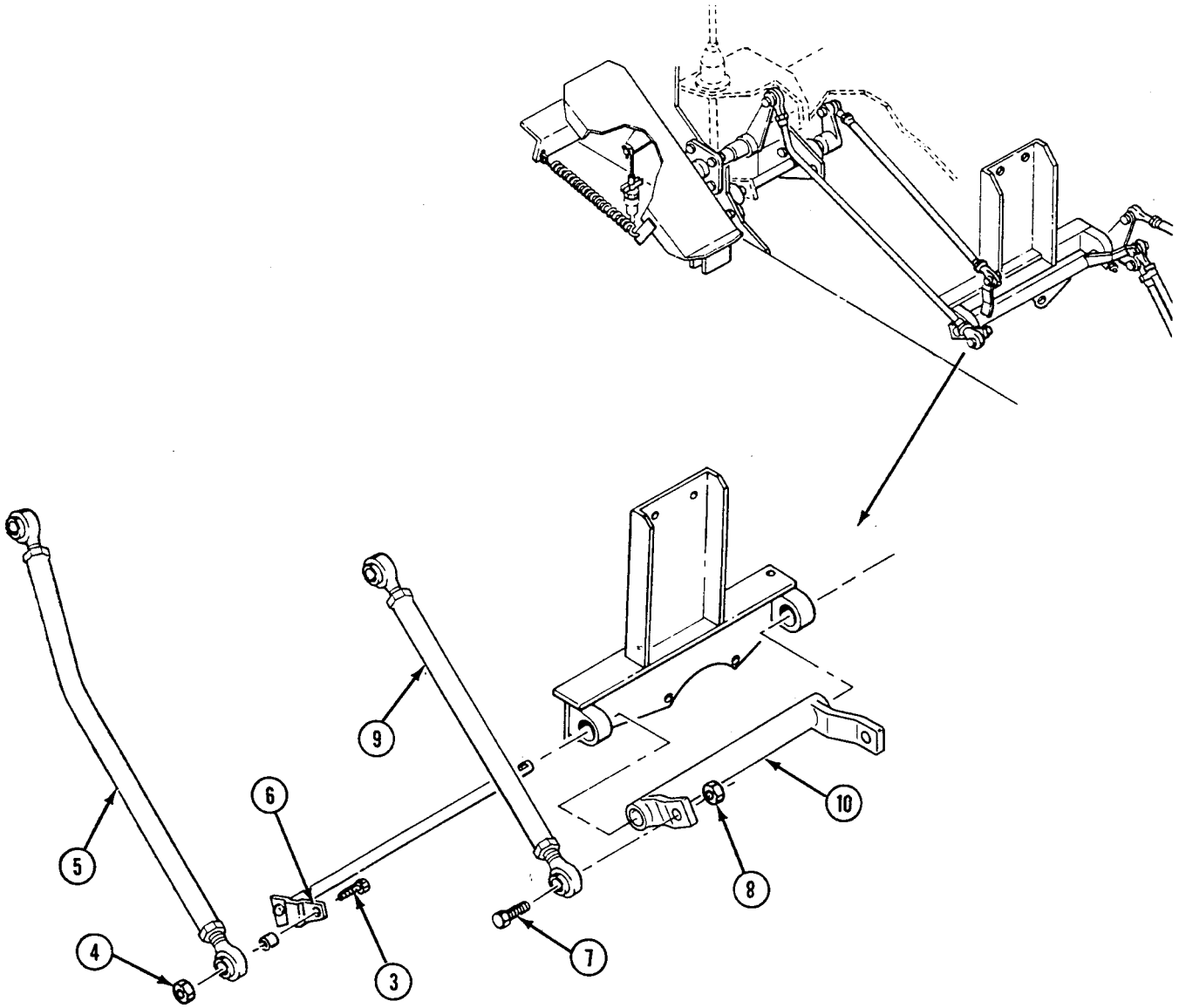


5. Disconnect differential oil high temperature switch circuit 328 lead (1) at connector (2).

6. Remove vehicle compartment heater duct (WP 0452 00), (WP 0453 00), or (WP 0454 00).



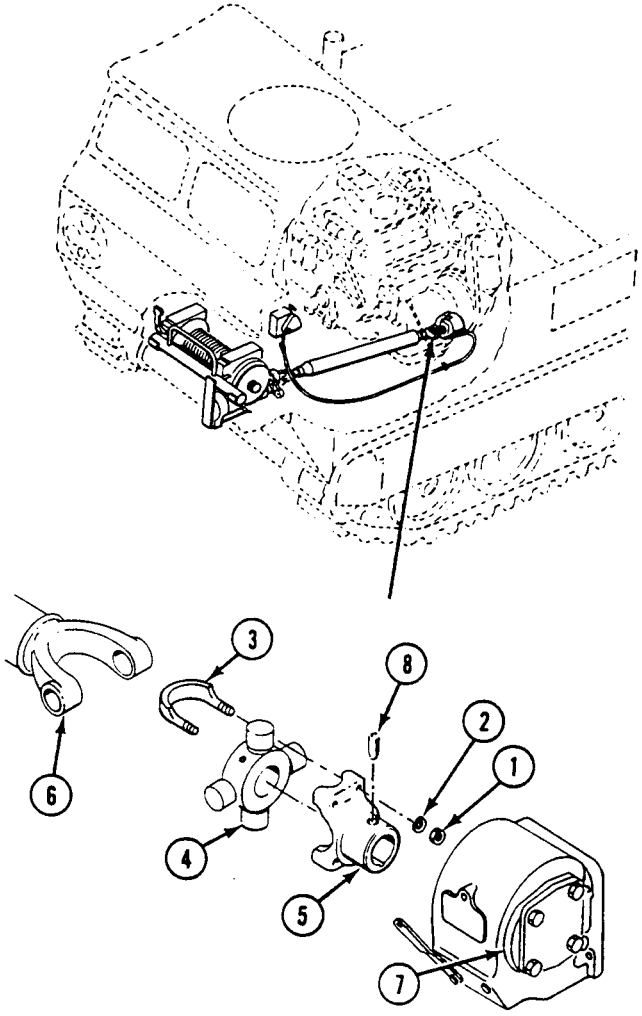
7. Remove screw (3) and nut (4) that secure accelerator pedal link (5) to inner cross shaft lever (6).
8. Remove screw (7) and nut (8) that secure gear selector link (9) at outer cross shaft lever (10).



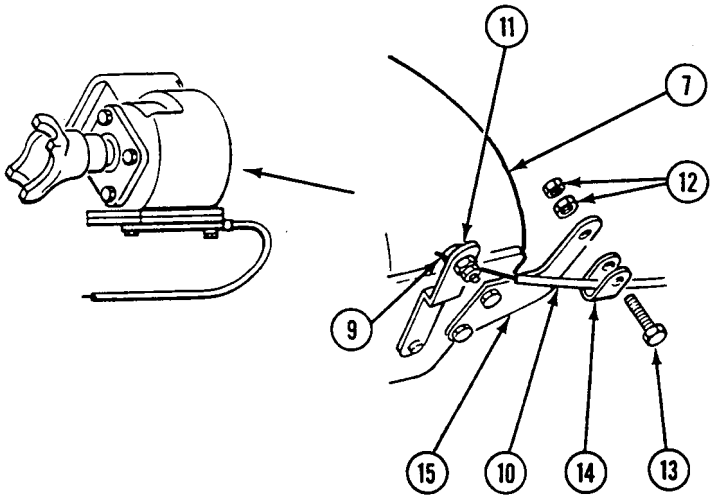
9. Disconnect winch propeller shaft from winch power takeoff.

   a. Remove four nuts (1) and lock washers (2) that secure two U-bolts (3) and universal joint (4) to power takeoff yoke (5).

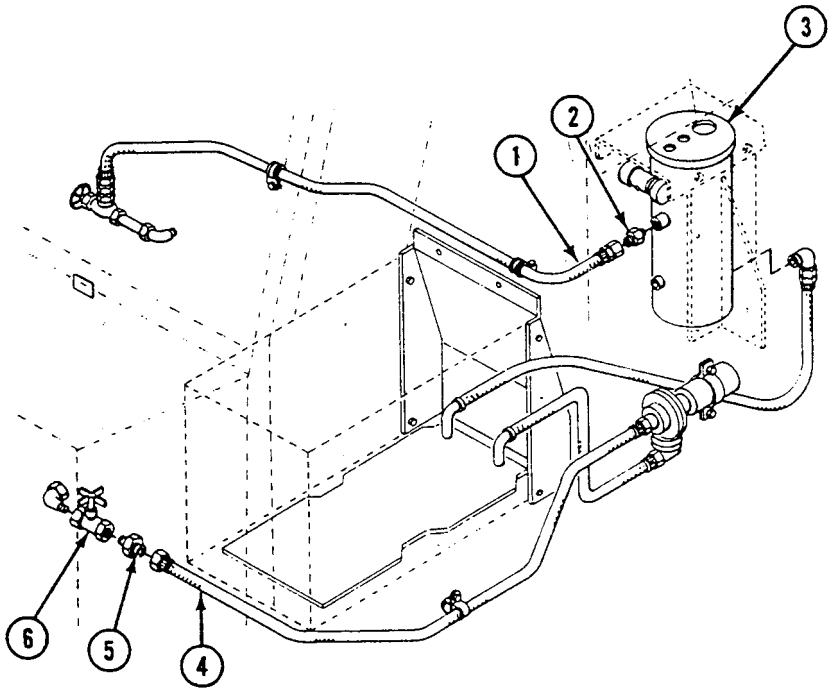
   b. Remove propeller shaft (6) and universal joint (4) from power takeoff yoke (5) on power takeoff (7). Loosen setscrew (8) if needed.



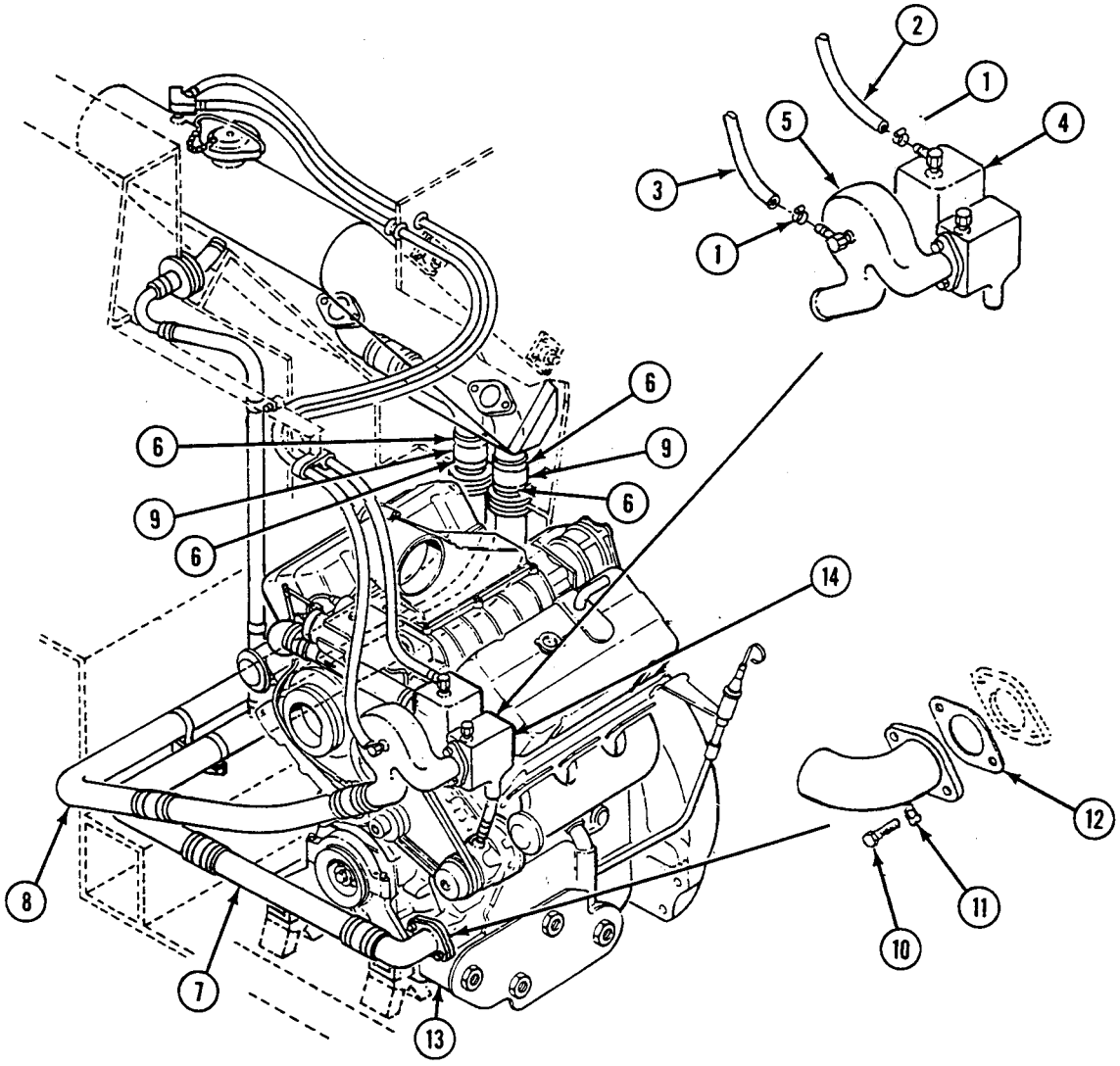
10. Disconnect winch power takeoff control cable from winch power takeoff.
    a. Loosen setscrew (9) that secures control cable (10) to actuating lever (11).
    b. Remove two nuts (12), screw (13), and clamp (14) that secure control cable (10) to control bracket (15).
    c. Remove control cable (10) from power takeoff (7).



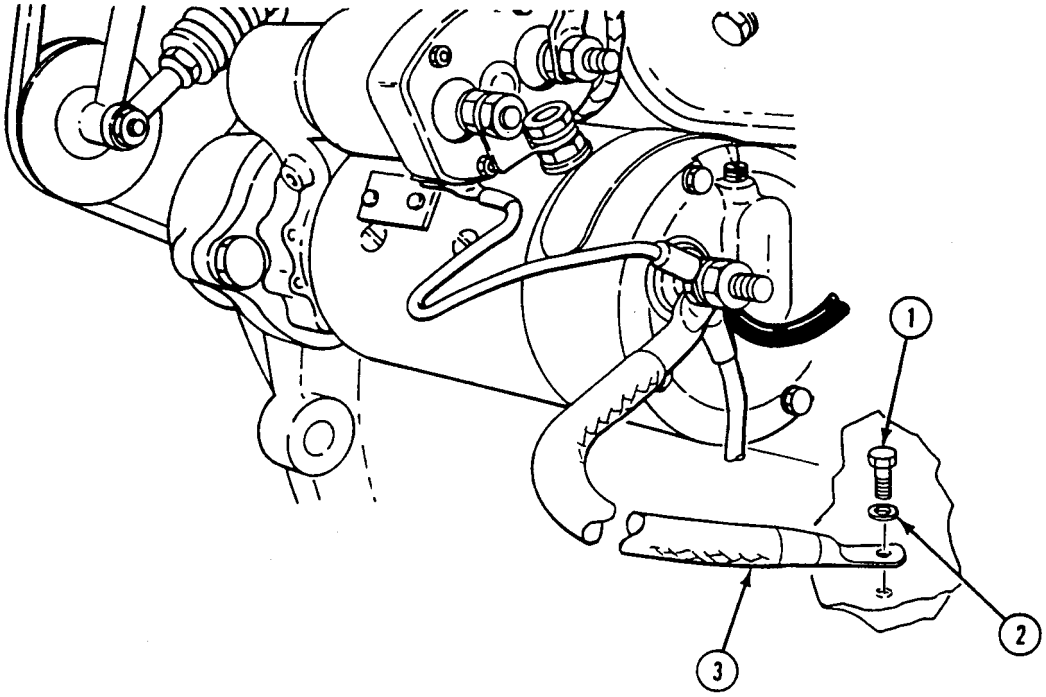
11. Remove transmission-to-differential propeller shaft (WP 0332 00).
12. If carrier is equipped with engine coolant heater kit, disconnect coolant hoses.
    a. Unscrew heater-to-engine coolant hose (1) from nipple (2) at engine coolant heater (3).
    b. Unscrew pump-to-engine outlet hose (4) from nipple (5) at engine outlet shutoff valve (6).

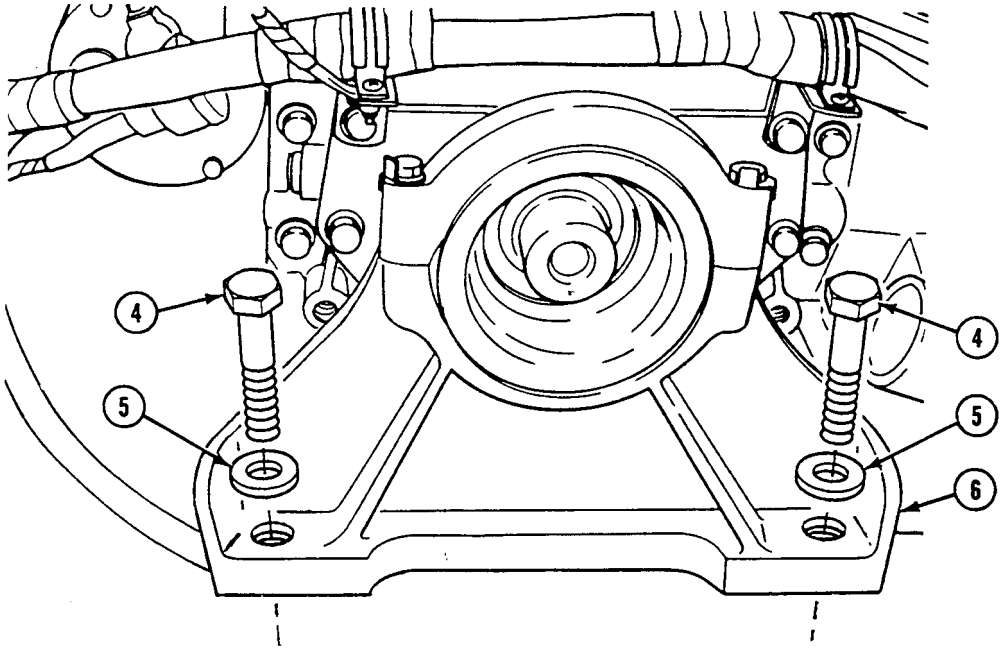


13. Disconnect radiator-to-thermostat housing coolant vent lines at thermostat housing.
    a. Loosen two clamps (1) that secure coolant vent line (2) and coolant vent line (3) at thermostat housing (4) and deaeration elbow (5). Remove vent lines.
14. Remove radiator-to-oil cooler tube and radiator-to-thermostat housing coolant tube.
    a. Loosen two hose clamps (6) that secure radiator-to-oil cooler tube (7) and radiator-to-thermostat housing tube (8) to two hoses (9).
    b. Remove four screws (10), washers (11), and two gaskets (12) that secure radiator-to-oil cooler tube (7) to oil cooler (13) and radiator-to-thermostat housing tube (8) to thermostat housing (14). Discard gaskets.

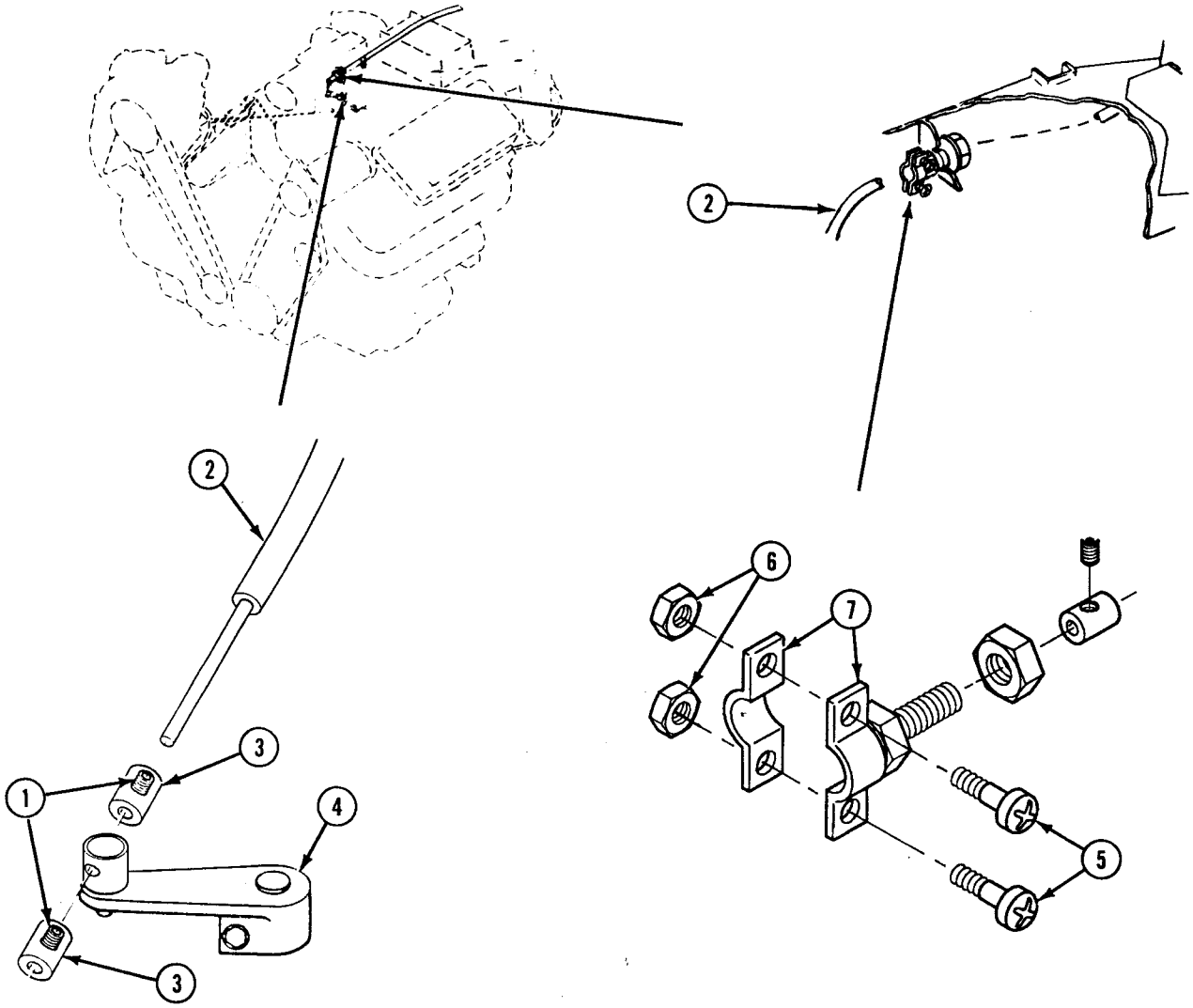


15. Remove screw (1) and washer (2) that secure starter ground lead (3) to hull. Remove starter ground wire.
16. Remove two screws (4) and washers (5) that secure front engine mount (6) to hull. Discard washers.

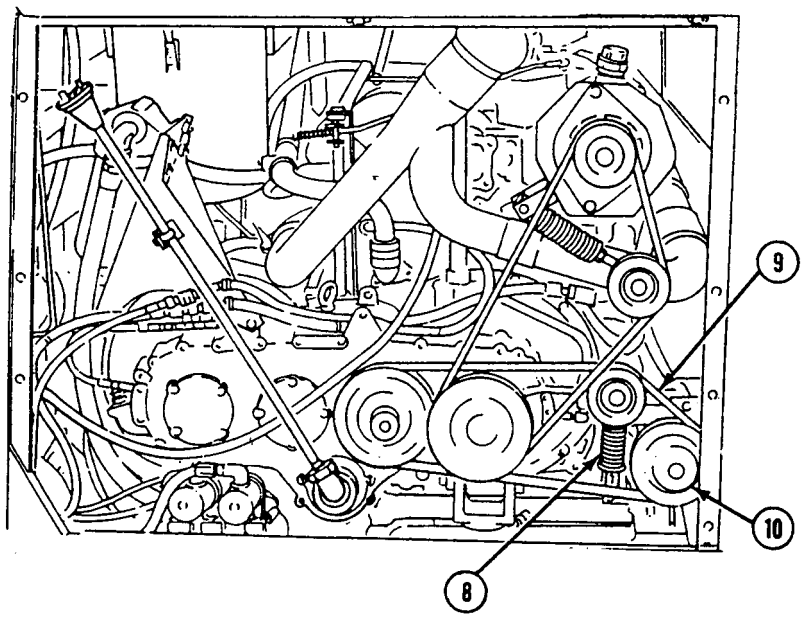




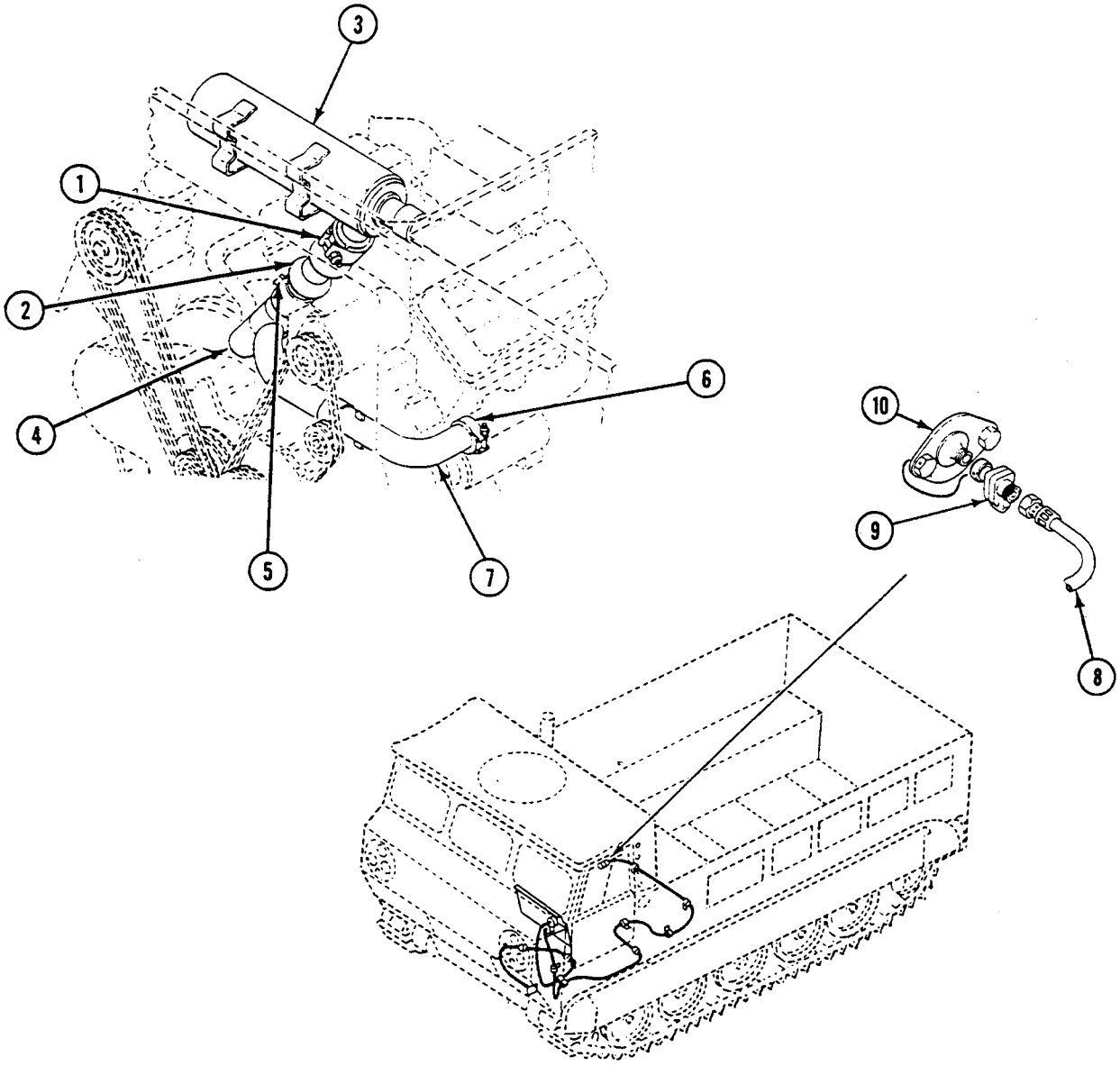
17. Remove fuel cutoff cable from power plant.
    a. Loosen two setscrews (1) that secure control cable (2) in two collars (3) and stop lever (4).
    b. Remove two screws (5) and lock nuts (6) that secure control cable (2) in clamp (7). Remove cable from power plant. Discard lock nuts.



18. Remove rear fan drive belts from jackshaft pulley.
    a. Loosen belt tension on belt adjuster (8).
    b. Remove two rear fan drive belts (9) from jackshaft pulley (10).



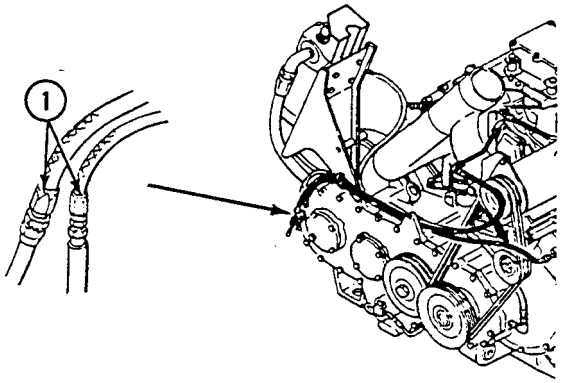
19. Remove engine exhaust pipe from muffler and left crossover pipe.
    a. Remove clamp (1) that secures exhaust pipe (2) to muffler (3).
    b. Remove exhaust pipe (2) from muffler (3) and left crossover pipe (4). If needed, loosen clamp (5) on left crossover pipe and clamp (6) on right crossover pipe (7) to remove exhaust pipe.
20. Disconnect tachometer drive cable (8) from tachometer drive adapter (9) at engine flywheel housing (10).



NOTE

Tag and cover all fuel lines.

21. Disconnect two fuel lines at quick-disconnect couplings (1) at rear of power plant.



NOTE

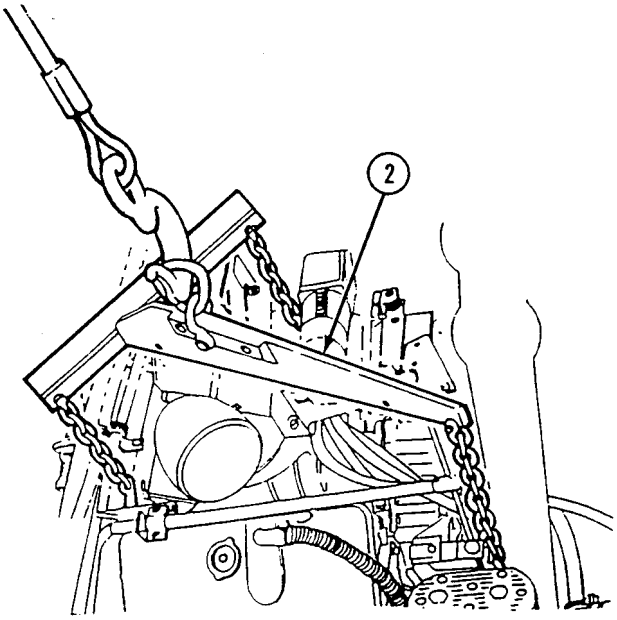
Have helper assist with Steps 22 - 25.

22. Attach beam type sling.

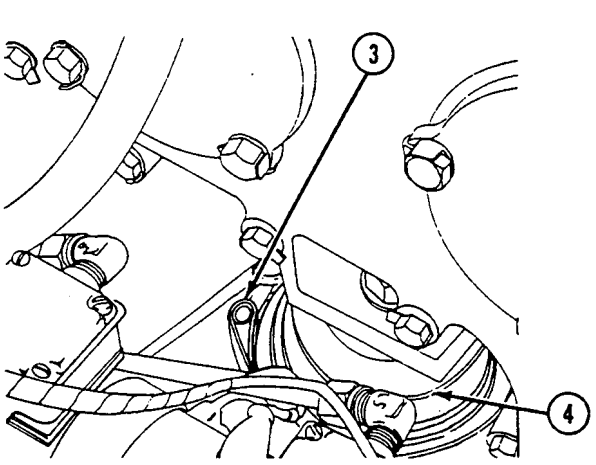
WARNING

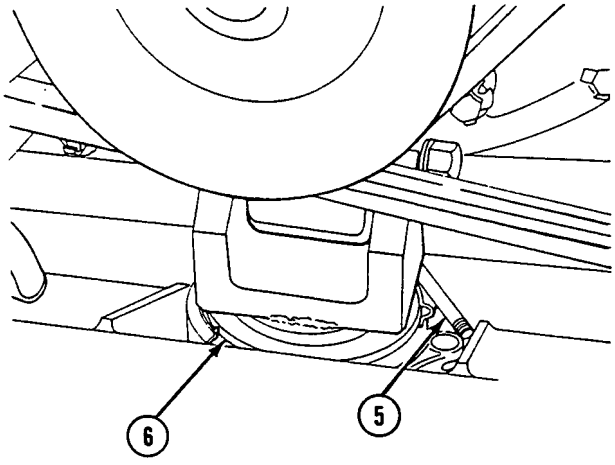
Make sure lifting device has rated lift capacity of at least 2500 lb (1135 kg) to safely raise the power plant. Keep all parts of body from under the suspended load.

23. Use lifting device and beam type sling (2) to lift power plant slightly to relieve pressure.



24. Remove transfer gearcase mounting clamps.
    a. Remove mounting clamp (3) that secures left transfer gearcase mount (4) to hull.
    b. Remove mounting clamp (5) that secures right transfer gearcase mount (6) to hull.
25. Carefully raise power plant out of power plant compartment.





INSPECTION-ACCEPTANCE AND REJECTION CRITERIA

CAUTION

Steam clean power plant only. Do not use cleaner or solvent which could damage rubber and plastic.

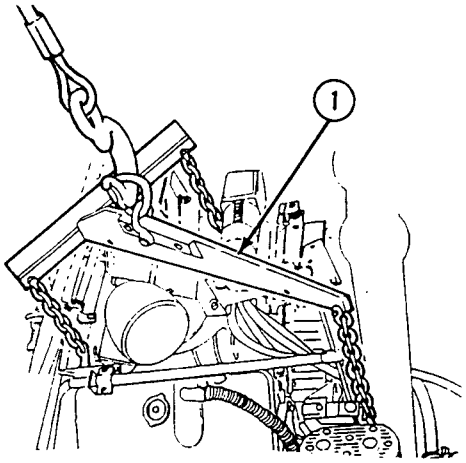
1. It tactical situation permits, steam clean power plant compartment. Make sure it is ready to receive power plant.

INSTALLATION

WARNING

Make sure lifting device has rated lift capacity of at least 2500 lb (1135 kg) to safely raise the power plant. Keep all parts of body from under the suspended load.

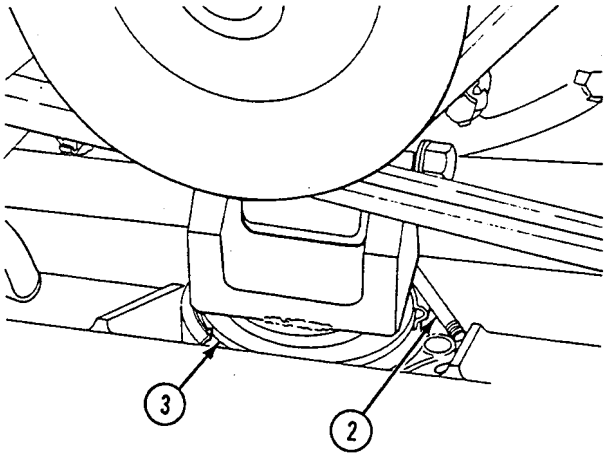
1. (H) Attach beam type sling (1) to lifting device. Slowly raise power plant and lower it into power plant compartment. Keep slight tension on sling.

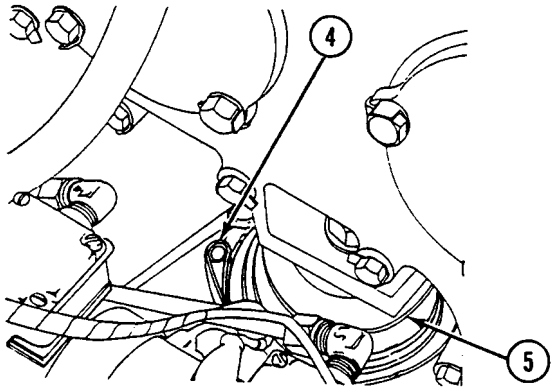


NOTE

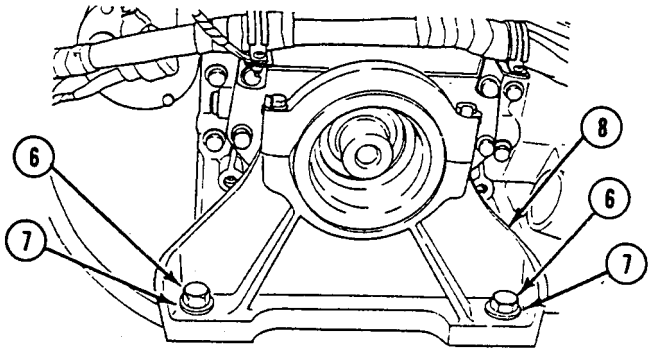
Install mounting clamps so nuts are on inboard and forward sides of mounts.

2. Install transfer gearcase mounting clamps.
   a. Install mounting clamp (2) to secure right transfer gearcase mount (3) to hull.
   b. Install mounting clamp (4) to secure left transfer gearcase mount (5) to hull.

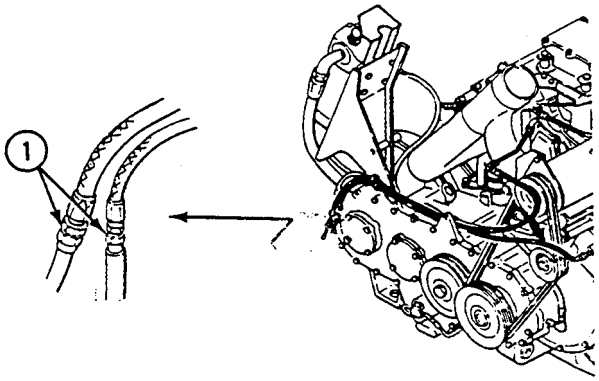




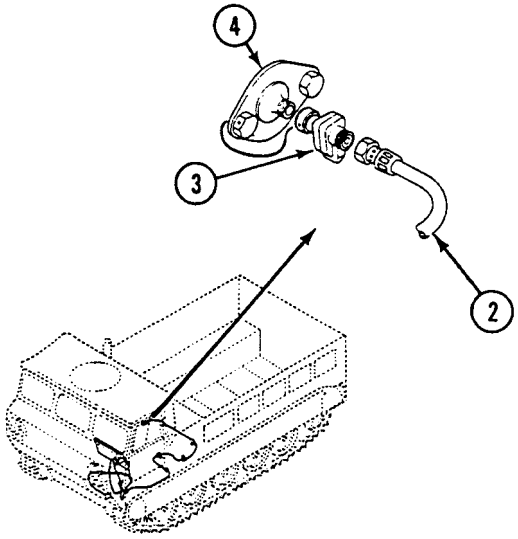
3. Install two screws (6) with two new washers (7) in front engine mount (8). Tighten screws finger tight.
4. (H) Lower beam type sling (1) and detach from power plant.
5. Tighten two screws (6) securing front engine mount (8) to hull to 120-130 lb-ft (163-176 N•m) torque.



6. Connect two fuel lines at quick-disconnect couplings (1) at rear of power plant.



7. Connect tachometer drive cable (2) to tachometer drive adapter (3) at engine flywheel housing (4).



NOTE

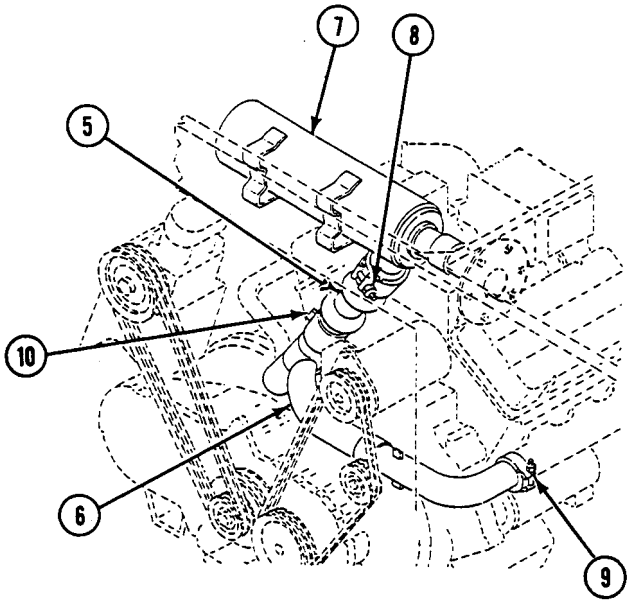
Make sure ball sockets of exhaust pipe (5) are lined up with left crossover pipe (6) before you tighten clamps. This is to keep ball sockets from leaking exhaust gases.

8. Install engine exhaust pipe on muffler and left crossover pipe.

   a. Install exhaust pipe (5) on left crossover pipe (6). Turn exhaust pipe install on ball joint to line up with muffler (7). Install clamp (8).

   b. Tighten nut on clamp (8) to 200-220 lb-in (23-25 N•m) torque.

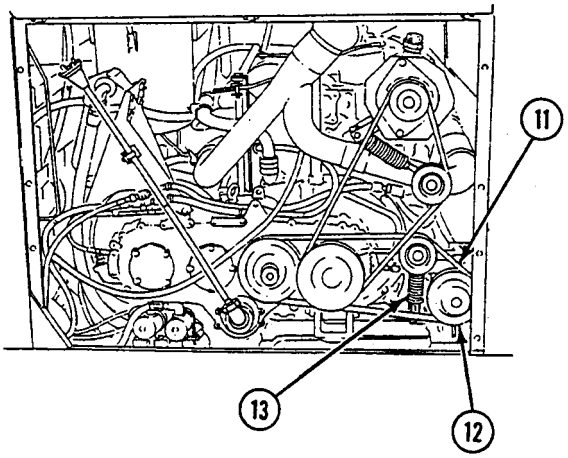
   c. If needed, tighten nuts on clamp (9) and clamp (10) to 200-220 lb-in (23-25 (N•m) torque to secure exhaust pipe (5) to right crossover pipe (6).



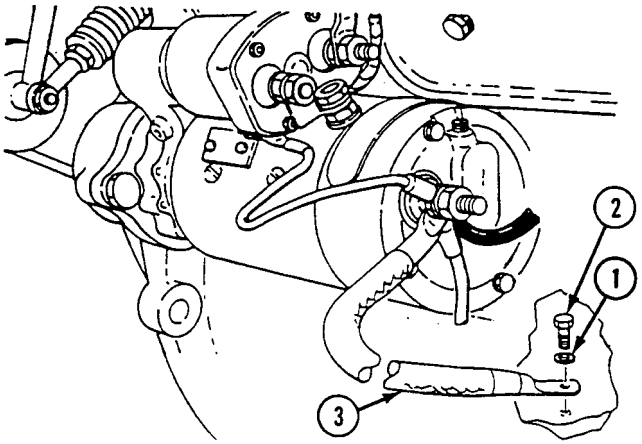
9. Install rear fan drive belts on jackshaft pulley.

   a. Install two rear fan drive belts (11) on jackshaft pulley (12).

   b. Adjust belt tension by turning belt adjuster (13) (WP 0226 00).



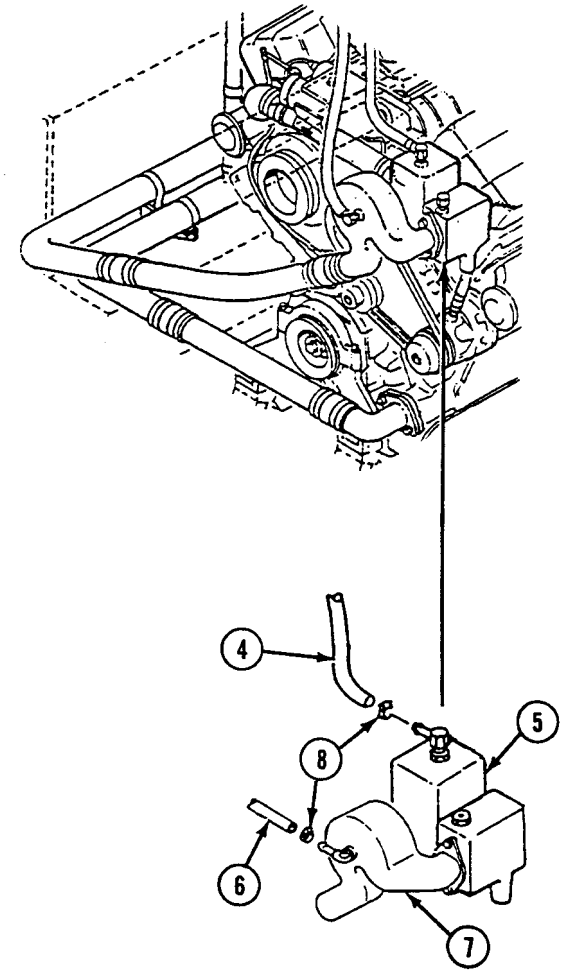
10. Install fuel cutoff cable on power plant (WP 0205 00).
11. Adjust fuel cutoff hand control (WP 0195 00).
12. Install washer (1) and screw (2) to secure starter ground lead (3) to hull.



13. Install radiator-to-oil cooler tube and radiator-to-thermostat housing coolant tube (WP 0219 00).

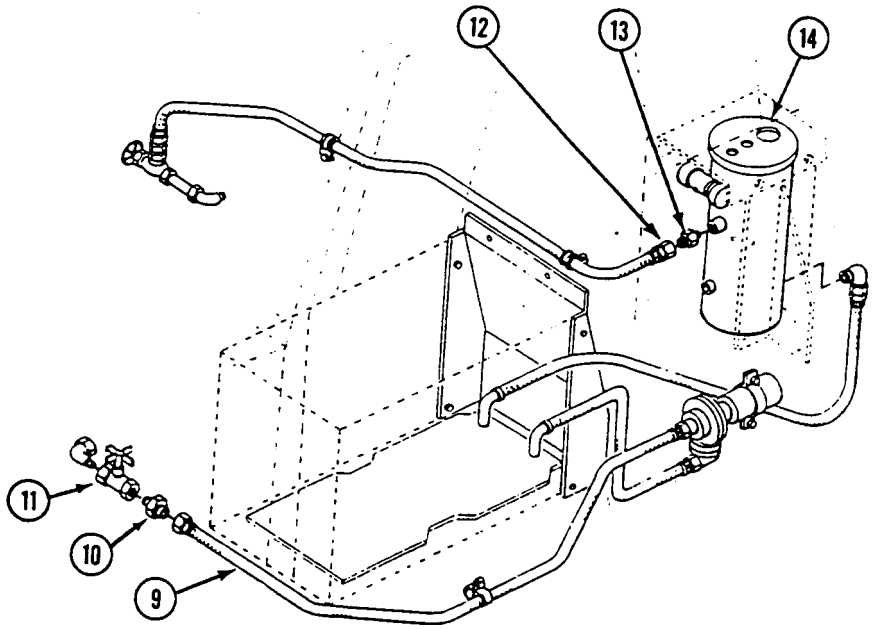
14. Connect radiator-to-thermostat housing coolant vent lines at thermostat housing.

    a. Install coolant vent line (4) on thermostat housing (5). Install coolant vent line (6) on deaeration elbow (7). Secure both lines with two clamps (8).

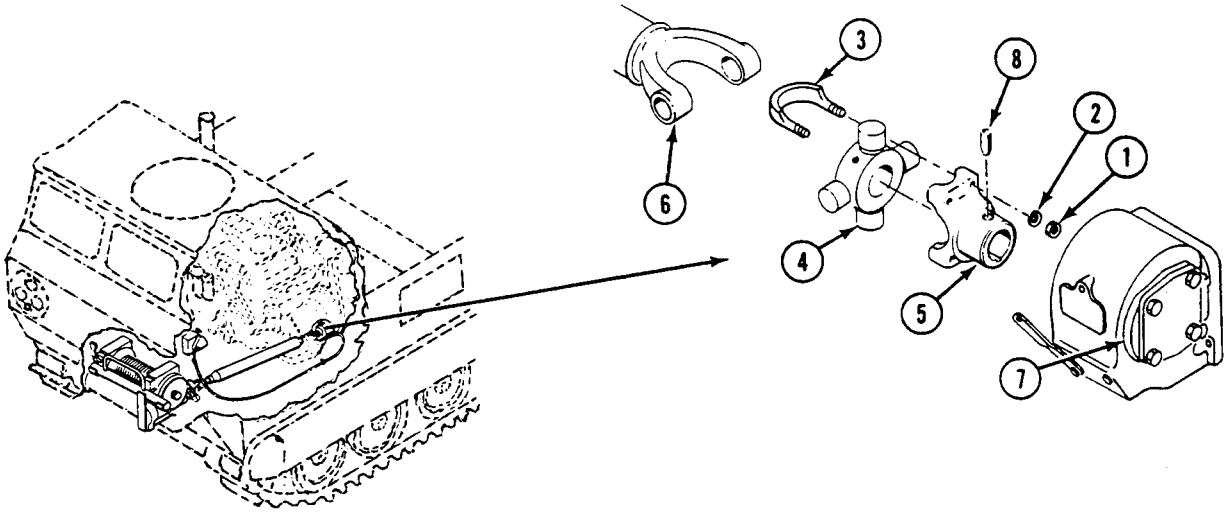


M548A1

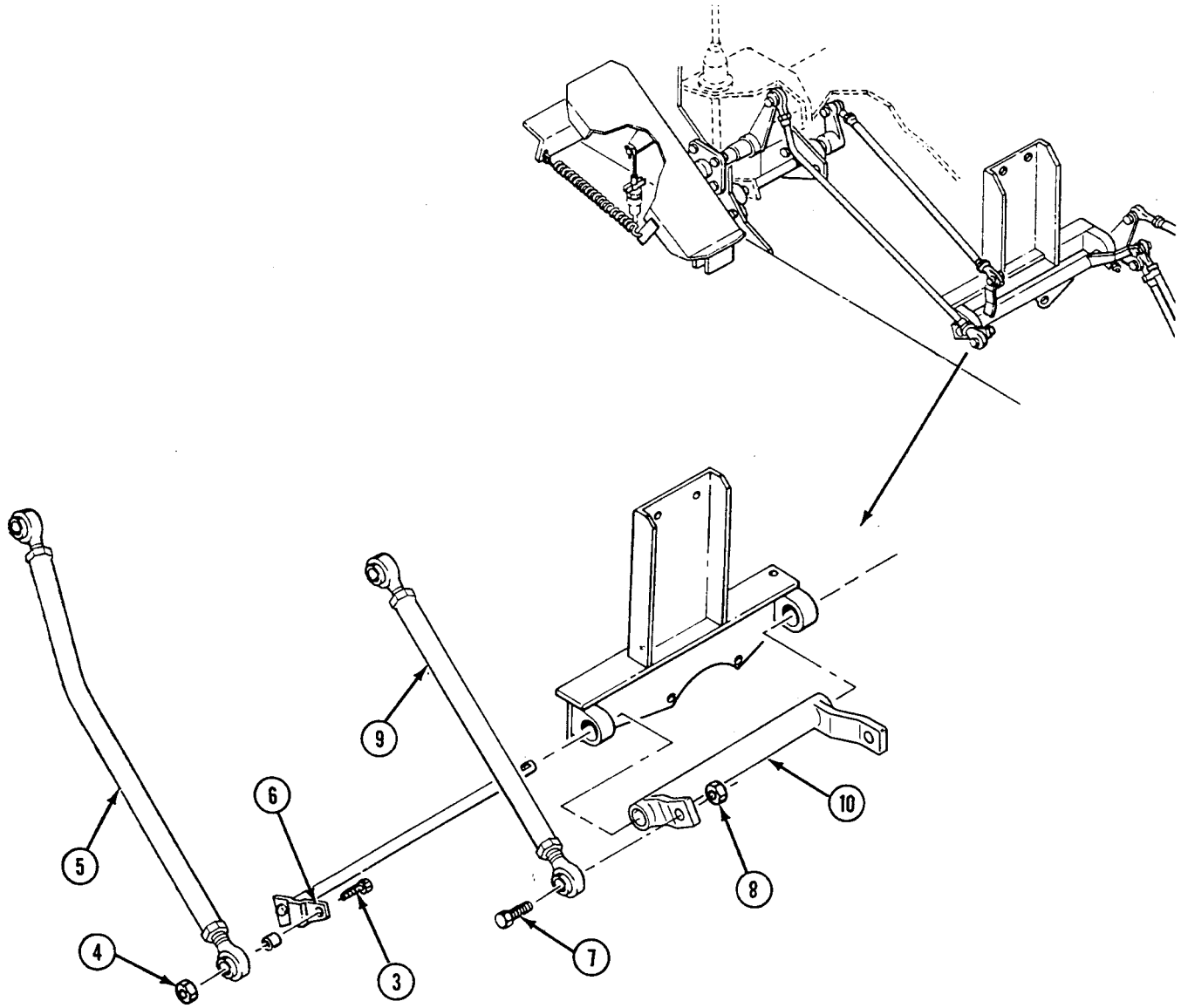
15. If carrier is equipped with engine coolant heater kit, connect coolant hoses.
    a. Connect pump-to-engine outlet hose (9) to nipple (10) at engine outlet shutoff valve (11).
    b. Connect heater-to-engine coolant hose (12) to nipple (13) at engine coolant heater (14).



16. Install transmission-to-differential propeller shaft (WP 0332 00).
17. Install winch power takeoff control cable to winch power takeoff (WP 0414 00).
18. Adjust winch control cable (WP 0414 00).
19. Connect winch propeller shaft to winch power takeoff.
    a. Install four lock washers (1) and nuts (2) to secure two U-bolts (3) and universal joint (4) to power takeoff yoke (5). Tighten nuts to 169-200 lb-in (19-23 N•m) torque.
    b. Install propeller shaft (6) and universal joint (4) on power takeoff yoke (5) on power takeoff (7).
    c. If needed, tighten setscrew (8) to secure power takeoff yoke (5) to power takeoff (7).



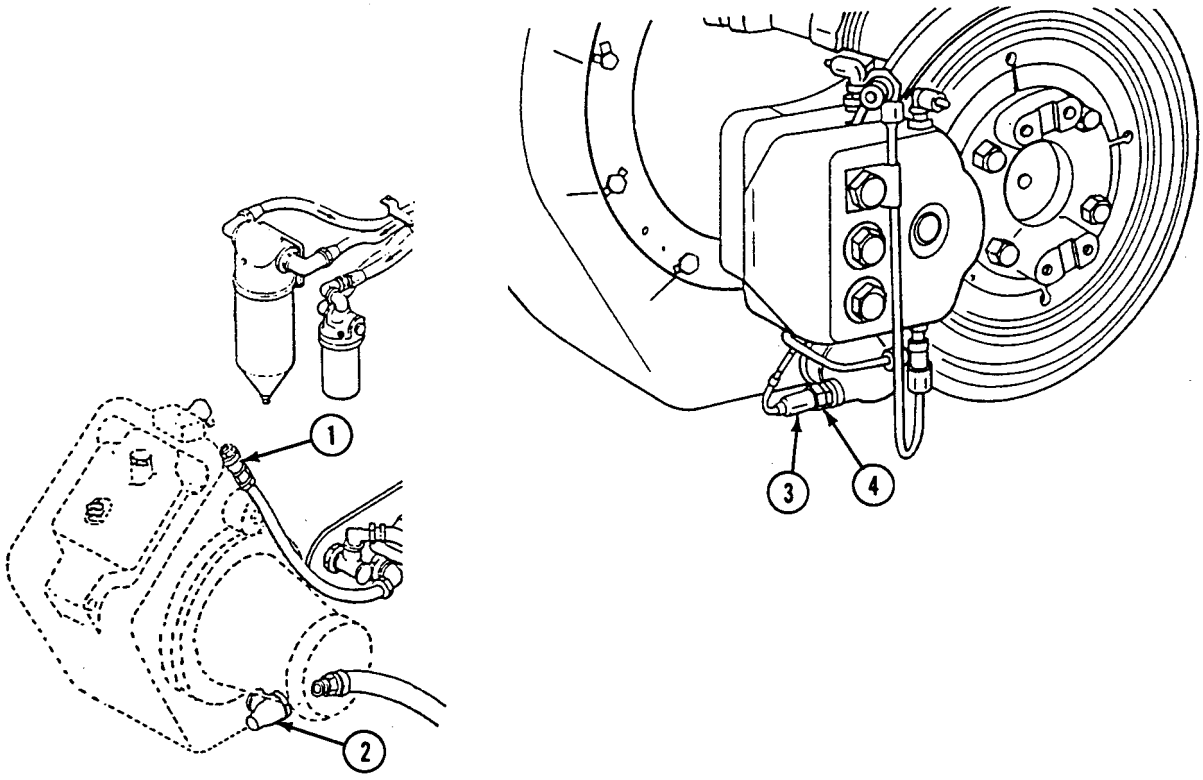
20. Install screw (3) and nut (4) to secure gear selector link (5) to outer cross shaft lever (6).
21. Install screw (7) and nut (8) to secure accelerator pedal link (9) to inner cross shaft lever (10).



CAUTION

Make sure differential oil hose quick disconnect coupling (1) is connected properly and secured. Connect coupling assemblies by aligning pin on body with groove on collar, pull back collar, and join two halves of quick disconnect. Release and rotate collar so pin does not align with groove.

22. Connect differential oil hoses to quick disconnect coupling (1) on differential and to right angle gear box (2).
23. Connect differential oil high temperature switch circuit 328 lead (3) to connector (4).



NOTE

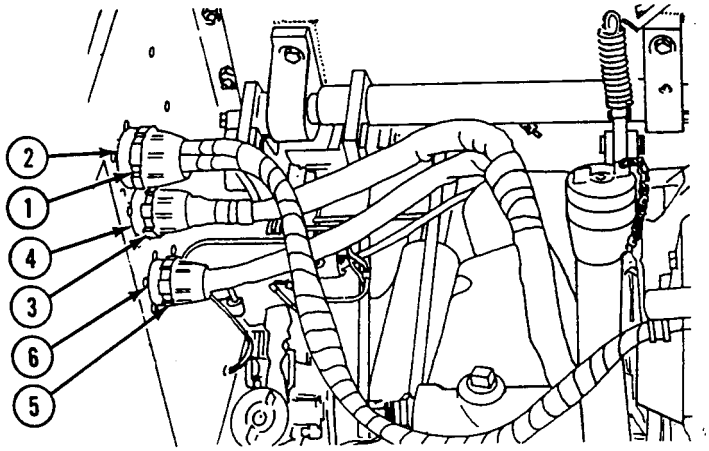
Use previously placed tags to identify cables and connectors.

24. Connect power plant bulkhead cable connector to bulkhead connectors.

    a. Connect regulator-to-bulkhead cable connector (1) to bulkhead connector (2).

    b. Connect starter-to-bulkhead cable connector (3) to bulkhead connector (4).

    c. Connect power plant wiring harness connector (5) to bulkhead connector (6).

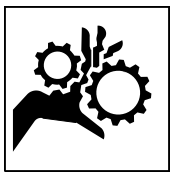


25. Close all cooling system drain valves. Fill cooling system (WP 0212 00).

26. Install all oil drain plugs (engine, transmission, and transfer gearcase) and fill engine transmission and transfer gearbox with oil (WP 0128 00).

27. Install air cleaner hose (WP 0153 00).

WARNING



Keep your hands, arms, and clothing away from rotating belts, pulleys, and shafts. Look, do not touch.

28. Start engine (see your -10).

29. Check fan, generator, and air compressor drive belts for proper operation. Adjust drive belts if necessary (WP 0226 00) and (WP 0240 00).

30. Check power plant operation for fuel, oil, and coolant leaks and loose parts.

31. Stop engine (see your -10).

FOLLOW-THROUGH STEPS

1. Install transverse beam (WP 0384 00).
2. Install cab floor plates, door, and seat support (WP 0394 00).
3. Install cab personnel seats (WP 0398 00).
4. Connect air pump hose at pump (WP 0191 00).
5. Connect air cleaner indicator hose to engine air intake (WP 0153 00).
6. Install air cleaner container and element (WP 0152 00).
7. Install hull bottom access cover (WP 0383 00).
8. Lower center seat (see your -10).
9. Install power plant rear access door (see your -10).
10. Install bulkhead protector, if equipped with material handling kit (WP 0487 00).
11. Install top access cover and grilles (WP 0390 00)
12. Install fabric and/or fiberglass cab covers and frame (WP 0418 00) or (WP 0456 00).
13. Install machine gun mount kit, if required (WP 0513 00), (WP 0514 00), or (WP 0515 00).
14. Connect neutral safety switch (WP 0308 00).
15. Test neutral safety switch and adjust if necessary (WP 0308 00).
16. Connect battery negative lead (WP 0292 00).
17. Road test carrier (WP 0128 00).

END OF TASK

REMOVE/INSTALL POWER PLANT (M548A3) 0131 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Engine and Transmission Sling (WP 0541 00, Item 47)
Torque Wrench (WP 0541 00, Item 68)
Lifting device with rated lift capacity of at least 3000 lb (1362 kg)

Materials/Parts
Antifreeze (WP 0542 00, Item 4)
Cotter pin (2)
Lock nut (2)
Lock nut (2)
Lock nut
Lock nut (4)
Lock washer
Lock washer (2)
Suitable containers

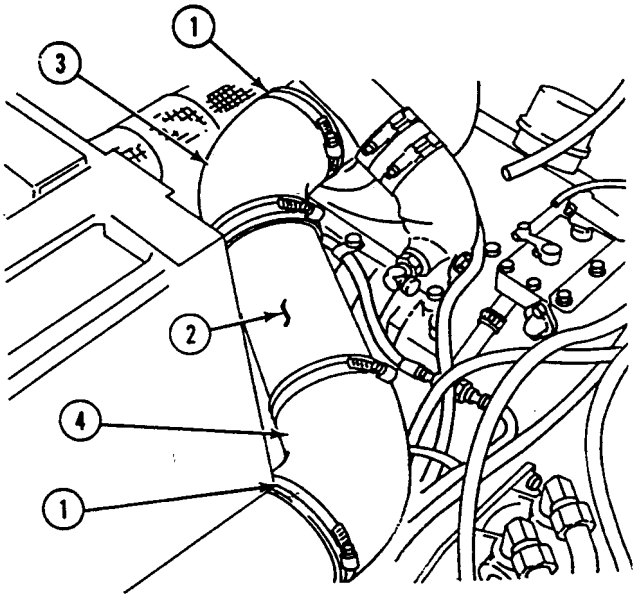
Personnel Required
Unit mechanic
Helper (H)

References
See your -10
See your PMCS

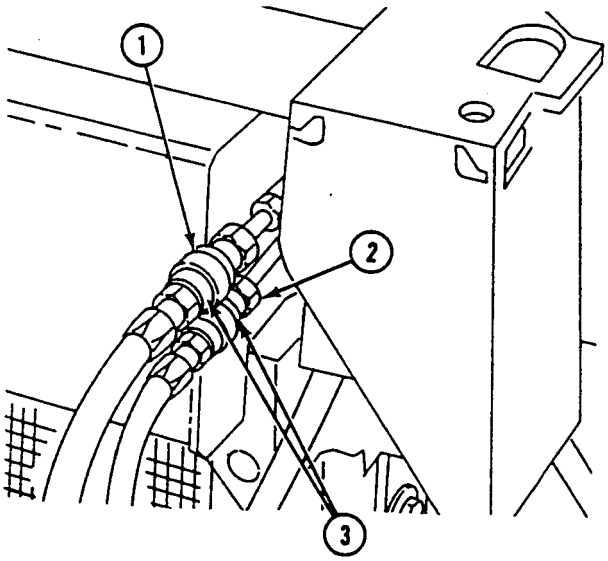
Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Both battery negative leads disconnected (WP 0292 00)
Cab cover and frame removed (see your -10)
Rear compartment cover folded back or rear compartment cover and bows removed (WP 0417 00)
Power plant rear access panel removed (see your -10)
Personnel seat and seat support removed (WP 0395 00), (WP 0398 00)
Transverse beam removed (WP 0385 00)
Two center floor plates removed (WP 0395 00)
Support from seat support and floor support removed (WP 0395 00)
Muffler removed (WP 0207 00)

REMOVAL

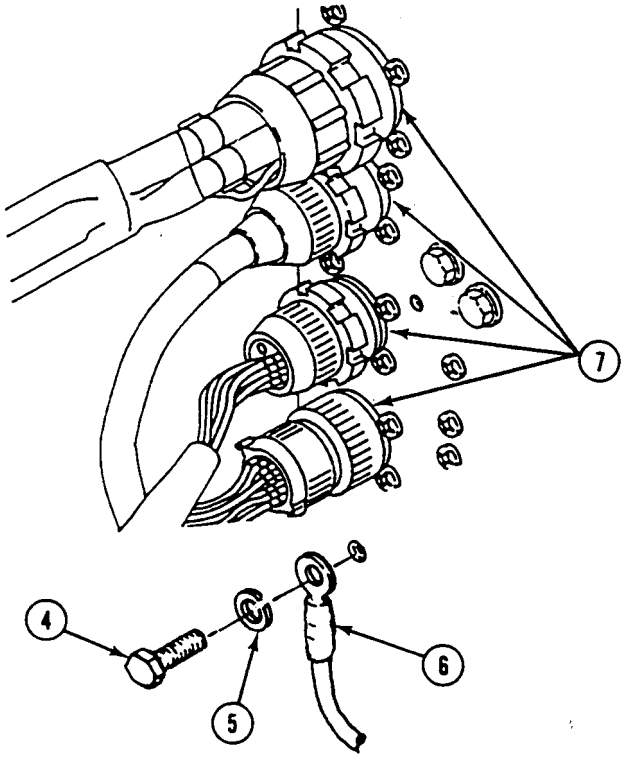
1. Loosen two clamps (1) and remove air filter-to-turbo hose (2), turbocharger outlet (3), and air cleaner outlet (4).



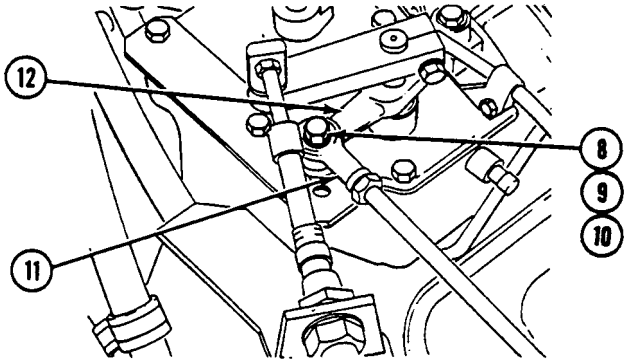
2. Disconnect engine fuel supply hose (1) and fuel return hose (2) from two quick disconnect couplings (3).



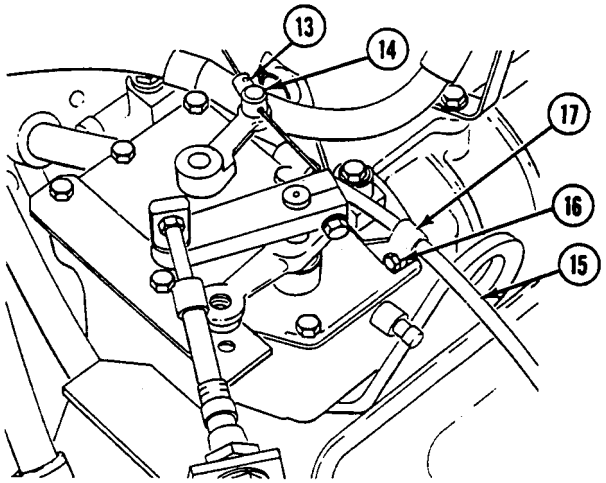
3. Remove screw (4), lock washer (5), ground lead (6), and four power plant wiring harnesses (7) from battery compartment bulkhead. Discard lock washer.



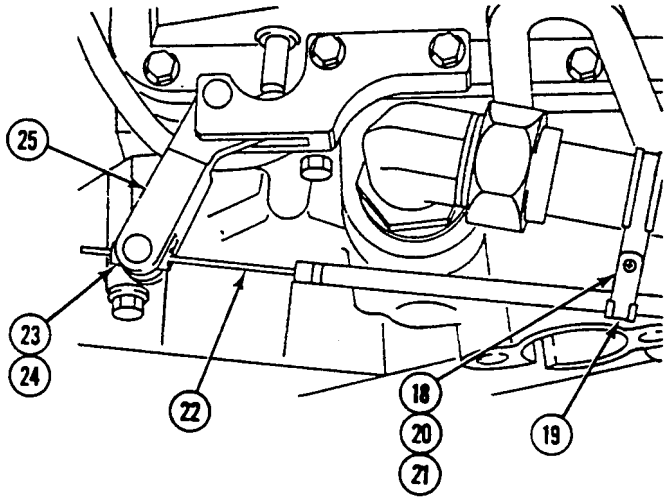
4. Remove lock nut (8), washer (9), screw (10), and throttle arm rod bearing (11) from governor lever arm (12). Discard lock nut.



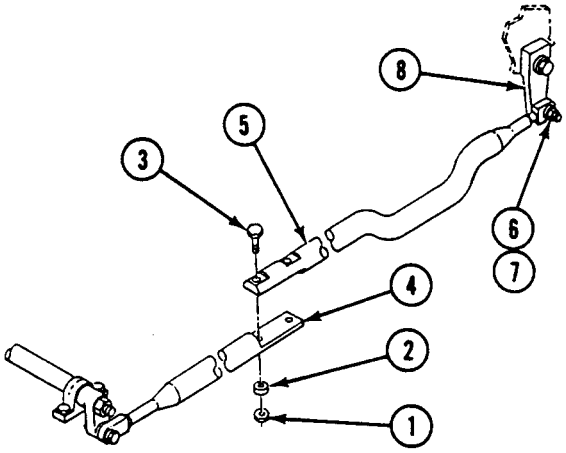
5. Loosen setscrew (13) and remove collar (14) from fuel cutoff cable (15).
6. Loosen clamp setscrew (16) and pull fuel cutoff cable (15) through guide clamp (17).



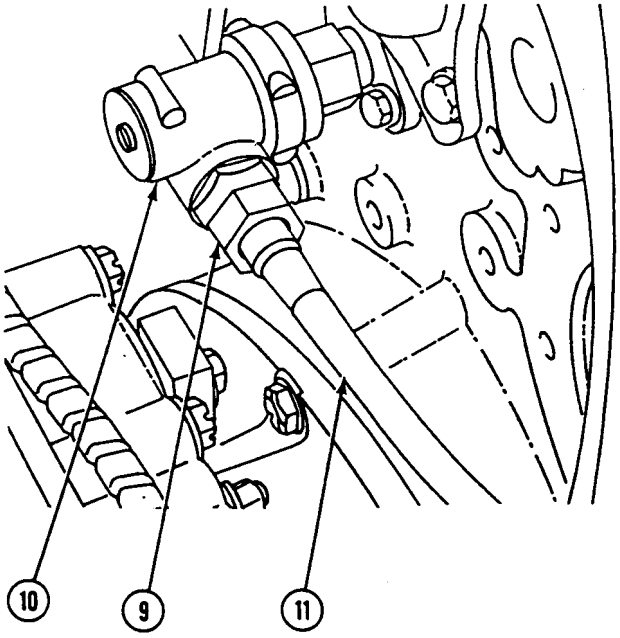
7. Remove screw (18), cable clamp (19), washer (20), and nut (21) from tow start cable (22).
8. Loosen setscrew (23) and remove collar (24) and tow start cable (22) from lever arm (25).



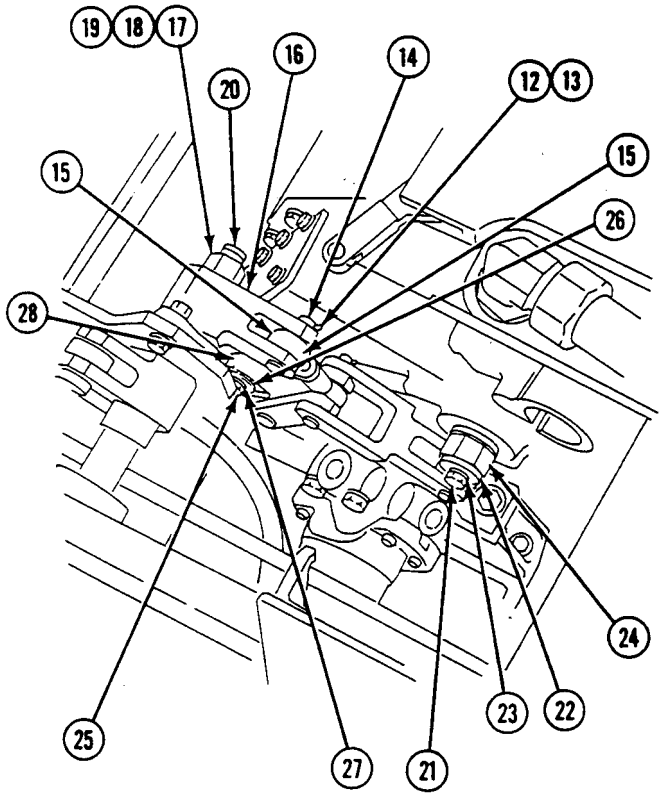
9. Remove two lock nuts (1), washers (2), and screws (3) and separate connecting link (4) and connecting link (5). Discard lock nuts.
10. Remove lock nut (6), washer (7), and connecting link (5) from lever (8). Discard lock nut.



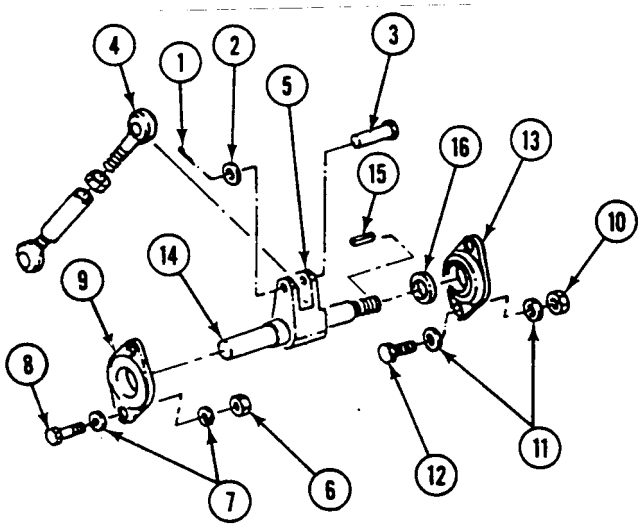
11. Loosen tachometer cable nut (9) at engine right angle adapter (10) and remove tachometer cable (11).



12. Remove cotter pin (12), washer (13), pin (14) and rod end (15) from connecting link (16). Discard cotter pin.
13. Remove lock nut (17), washer (18), link (16) and spacer (19) from shaft (20). Discard lock nut.
14. Remove screw (21), washer (22), and lock washer (23) from right brake arm (24). Discard lock washer.
15. Remove screw (25), washer (26), and lock washer (27) from left brake arm (28). Discard lock washer.
16. Remove brake linkage assembly from carrier.

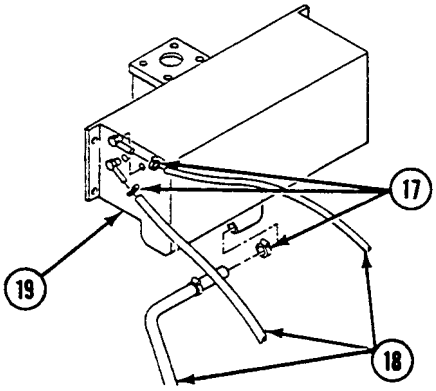


17. Remove cotter pin (1), washer (2), pin (3), and rod bearing (4) from link (5). Discard cotter pin.
18. Remove two lock nuts (6), four washers (7), and two screws (8) from bearing (9). Discard lock nuts.
19. Remove two lock nuts (10), four washers (11) and two screws (12) from bearing (13). Discard lock nuts.
20. Remove shaft (14) with link (5), bearing (9), and bearing (13) from carrier.
21. Separate key (15), bearing (13), and spacer (16) from shaft (14).

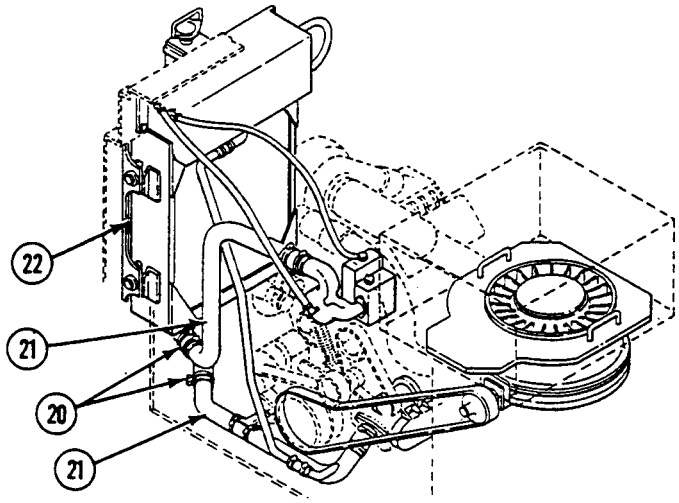


22. Remove two propeller shafts (WP 0335 00).
23. Remove hull bottom access cover (WP 0383 00).
24. Drain cooling system (WP 0213 00).

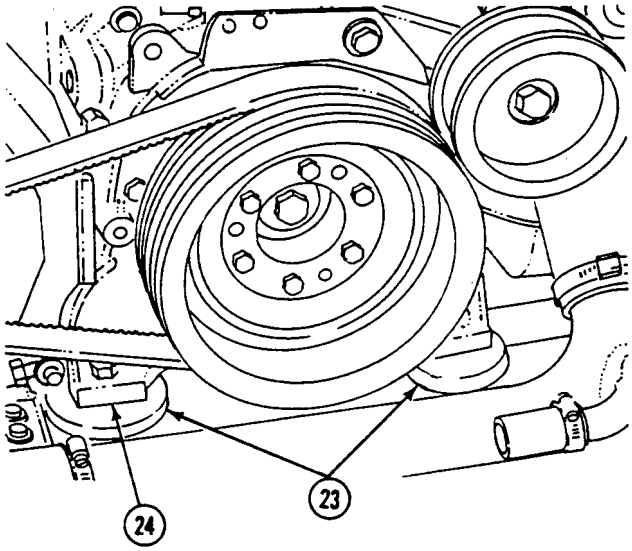
25. Loosen three clamps (17) and remove three coolant hoses (18) from radiator auxiliary tank (19).



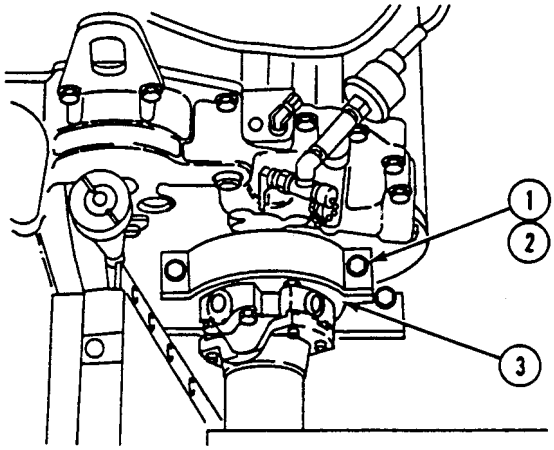
26. Remove four clamps (20) and slide two coolant hoses (21) back from radiator (22).



27. Remove cooling fan drive belt (WP 0227 00).
28. Remove two couplings (23) from rear engine mounts (24).



29. Remove four screws (1), washers (2), and two trunnion caps (3) from hull.



WARNING

Damaged lifting slings can fall with load. Personnel can be injured or killed. Inspect all slings. Do not use damaged slings.

30. Inspect sling for damage (WP 0443 00).

WARNING

Lifting sling may slip and allow power plant to drop. Personnel may be injured. Be sure sling is firmly attached and maintains engine support.

CAUTION

Visually monitor power plant clearance at rear bulkhead to avoid damage to components.

31. Attach sling to power plant lifting points, making sure shackle is in hole stamped B.
32. Carefully remove power plant from carrier with hoist and place on blocks.

INSTALLATION

WARNING

Damaged lifting slings can fall with load. Personnel can be injured or killed. Inspect all slings. Do not use damaged slings.

1. Inspect sling for damage (WP 0443 00).

CAUTION

Trunnion cap and spacer can get damaged. Make sure trunnion and spacer are positioned and installed correctly before you install mounting bolts.

NOTE

Make certain transmission aligning ring is installed in groove in lower half of right transmission mount or transmission trunnion.

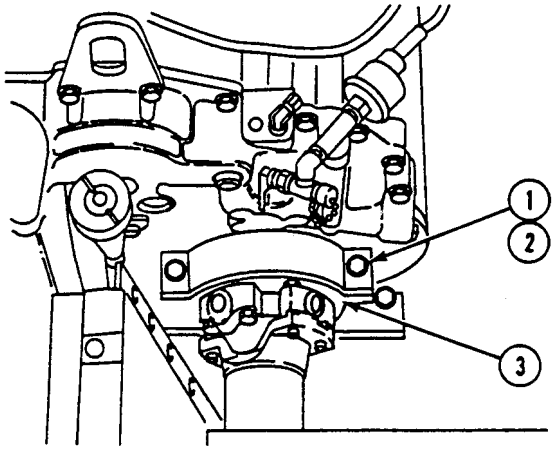
2. Attach sling to power plant lifting points, making sure shackle is in hole stamped B.

WARNING

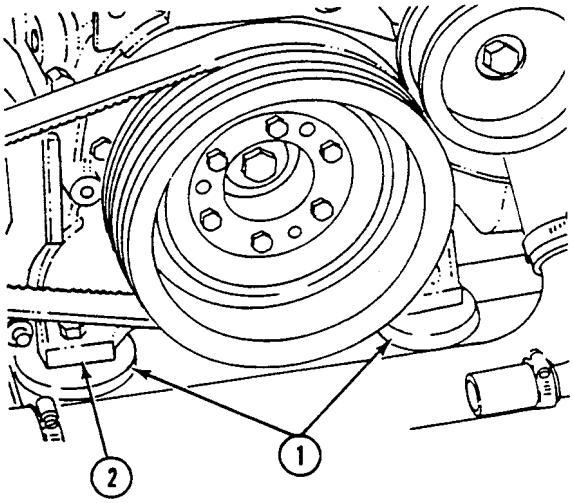
Lifting sling may slip and allow power plant to drop. Personnel may be injured. Be sure sling is firmly attached and maintains engine support.

3. Slowly lift and position power plant on its mounts inside carrier.

4. Install two trunnion caps (3), four washers (2) and screws (1) on hull. Tighten screws to 86-94 ft-lb (117-127 N•m) torque.

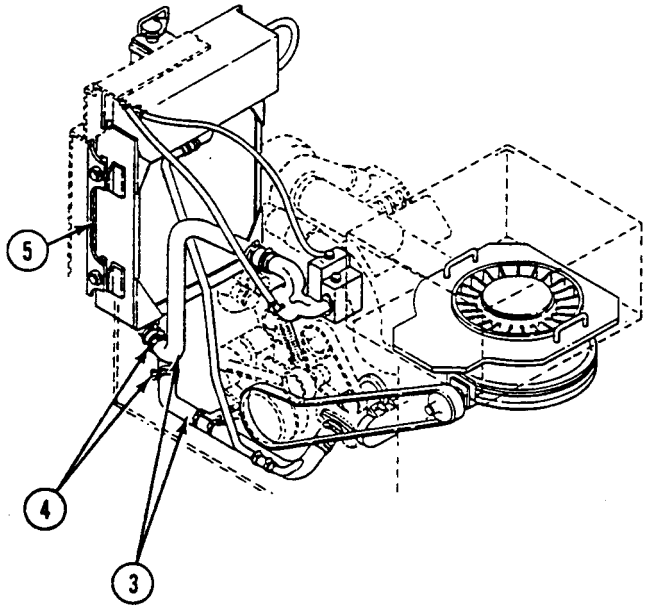


5. Install two couplings (1) on rear engine mounts (2).

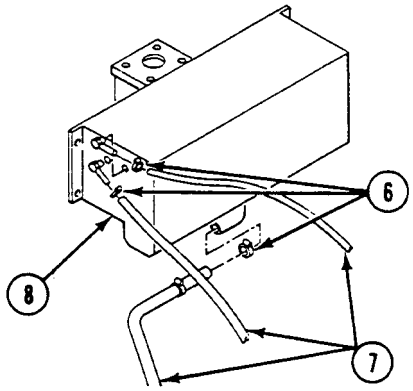


6. Remove lifting sling from power plant.
7. Install cooling fan drive belt (WP 0227 00)

8. Slide two coolant hoses (3) and four clamps (4) on radiator (5). Tighten clamps.

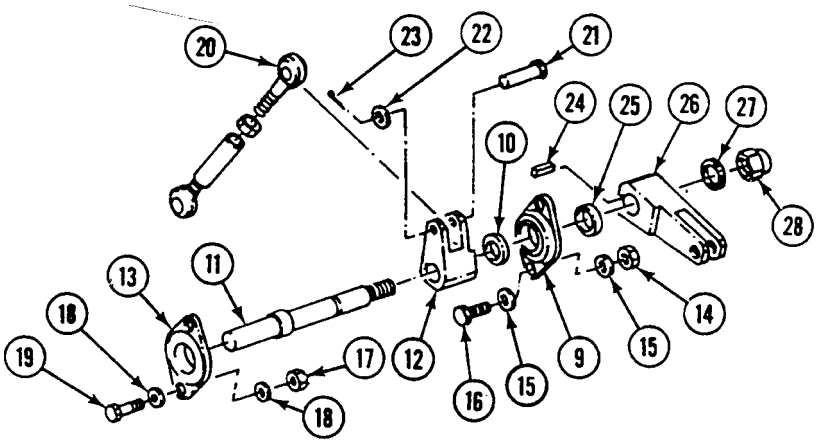


9. Install three clamps (6) and coolant hoses (7) on radiator auxiliary tank (8). Tighten clamps.

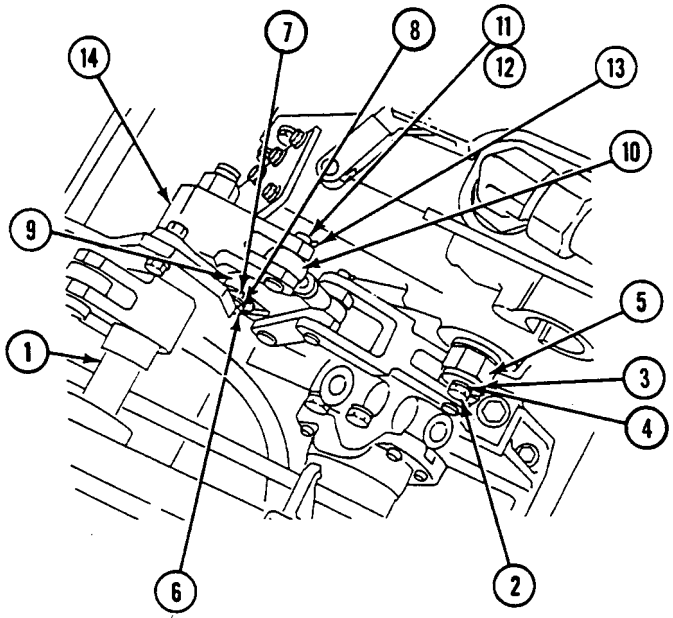


10. Service cooling system (WP 0214 00).
11. Install two propeller shafts (WP 0335 00).

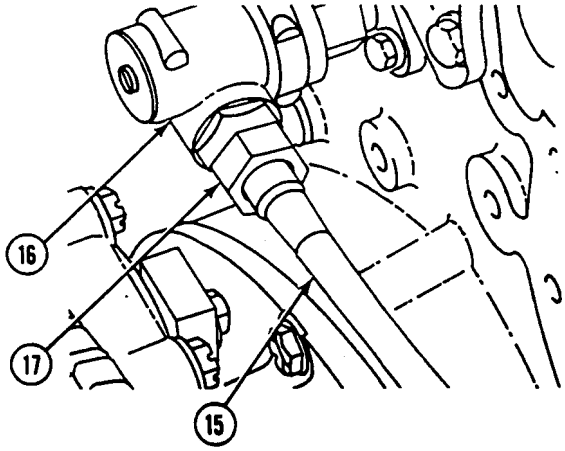
12. Install bearing (9) and spacer (10) on shaft (11).
13. Install shaft (11) with link (12), bearing (9), and bearing (13) in carrier.
14. Install two new lock nuts (14), four washers (15), two screws (16) and bearing (9) on bulkhead.
15. Install two new lock nuts (17), four washers (18), two screws (19) and bearing (13) on bulkhead.
16. Install rod bearing (20), pin (21), washer (22) and new cotter pin (23) on link (12).
17. Install key (24), spacer, (25), link (26), washer (27) and new lock nut (28) on shaft (11).



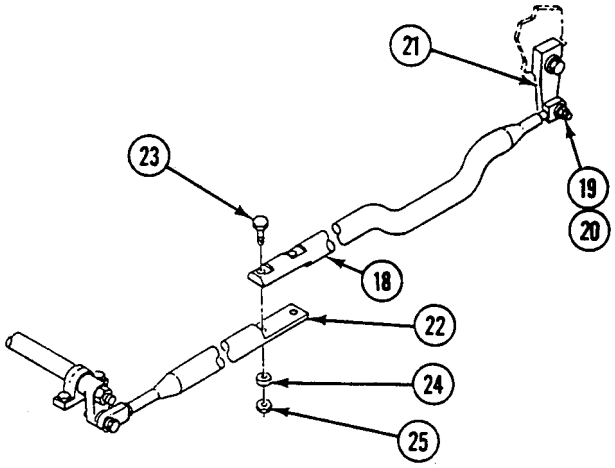
18. Position brake linkage assembly between brake arms on transmission and shaft (1).
19. Install screw (2), washer (3), new lock washer (4) and right brake arm (5) on transmission.
20. Install screw (6), washer (7), new lock washer (8) and left brake arm (9) on transmission.
21. Install rod end (10), pin (11), washer (12) and new cotter pin (13) on connecting link (14).



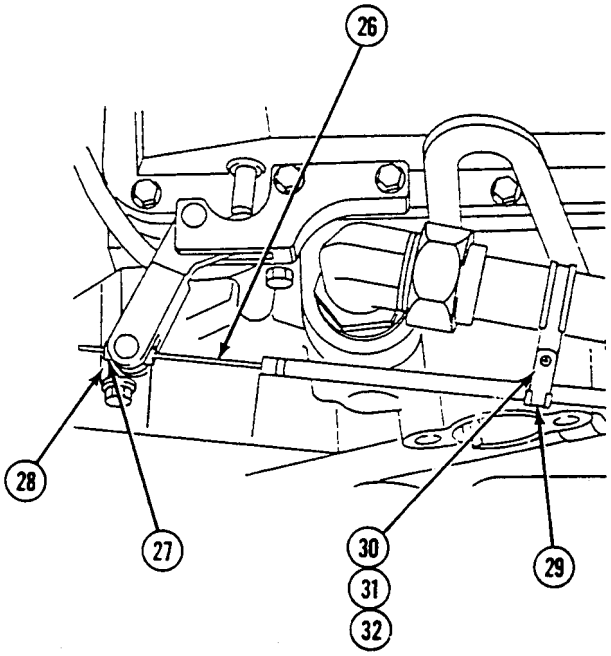
22. Install tachometer cable (15) on engine right angle adapter (16) and secure with tachometer cable nut (17).



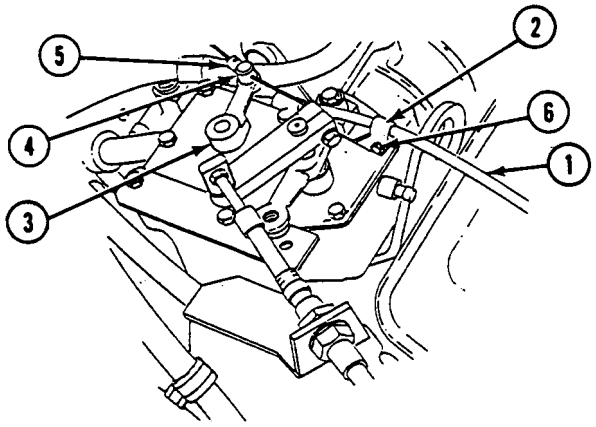
23. Install connecting link (18), washer (19), and new lock nut (20) on lever (21).
24. Join connecting link (18) and connecting link (22) and install two screws (23), washers (24) and new lock nuts (25).



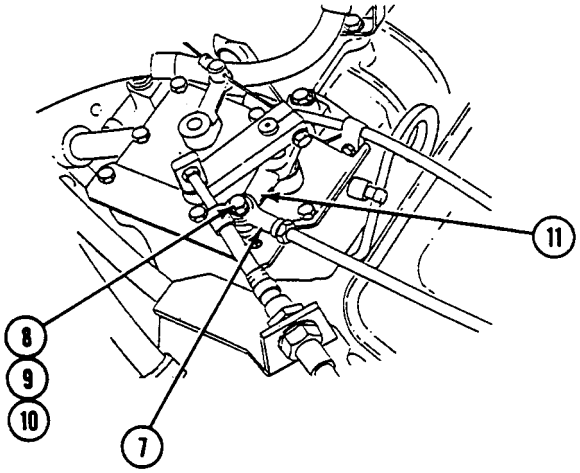
25. Install tow start cable (26) in collar (27). Tighten setscrew (28).
26. Install cable clamp (29), screw (30), washer (31) and nut (32) on tow start cable (26).



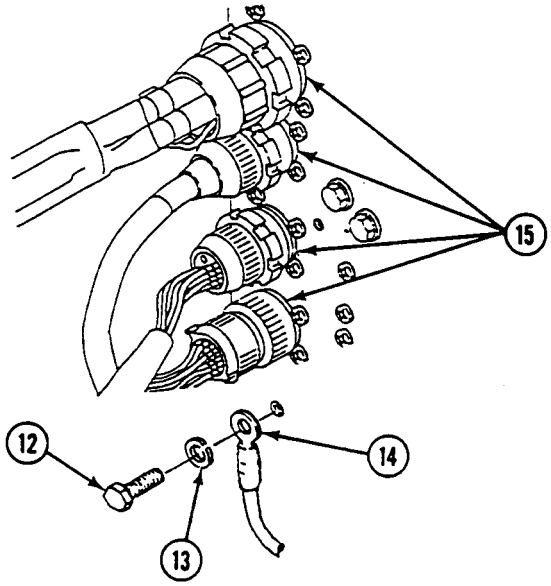
27. Push fuel cutoff cable (1) through guide clamp (2) and install in fuel cutoff lever (3).
28. Install collar (4) on fuel cutoff cable (1) and tighten setscrew (5).
29. Tighten screw (6) on guide clamp (2).



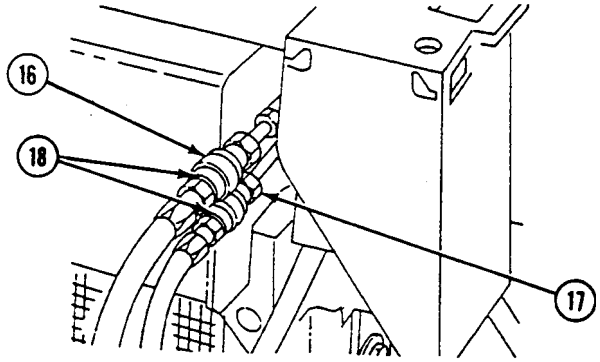
30. Install throttle arm rod bearing (7), washer (8), screw (9) and new lock nut (10) on governor lever arm (11).



31. Install screw (12), new lock washer (13), ground lead (14), and four power plant wiring harnesses (15) on battery compartment bulkhead.



32. Connect engine fuel supply hose (16) and fuel return hose (17) to two quick disconnect couplings (18).



33. Install two clamps (19) and air filter-to-turbo hose (20) on turbocharger outlet (21) and air cleaner outlet (22). Tighten clamps.

FOLLOW-THROUGH STEPS

1. Install hull bottom access cover (WP 0383 00).
2. Install muffler (WP 0207 00).
3. Install support from seat support and floor support (WP 0395 00).
4. Install two center floor plates (WP 0395 00).
5. Install transverse beam (WP 0385 00).
6. Install personnel seat and seat support (WP 0395 00), (WP 0398 00).
7. Unfold rear compartment cover forward or install rear compartment cover and bows (WP 0417 00).
8. Install cab cover and frame (see your -10)
9. Adjust throttle valve modulator (WP 0204 00).
10. Check engine and transmission fluid levels (see your PMCS).
11. Connect both battery negative leads (WP 0292 00)
12. Start engine (see your -10). Check for leaks.
13. Stop engine (see your -10).
14. Install power plant rear access panel (see your -10).

END OF TASK

BLOCK POWER PLANT (M548A1) 0132 00

THIS WORK PACKAGE COVERS:

Block (page 0132 00-1).

INITIAL SETUP:

Maintenance Level

Unit

Equipment Condition

Power plant removed from carrier (WP 0130 00)

Materials/Parts

Wood block (as necessary)

Personnel Required

Unit Mechanic

Helper (H)

JACKING

BLOCK POWER PLANT

WARNING

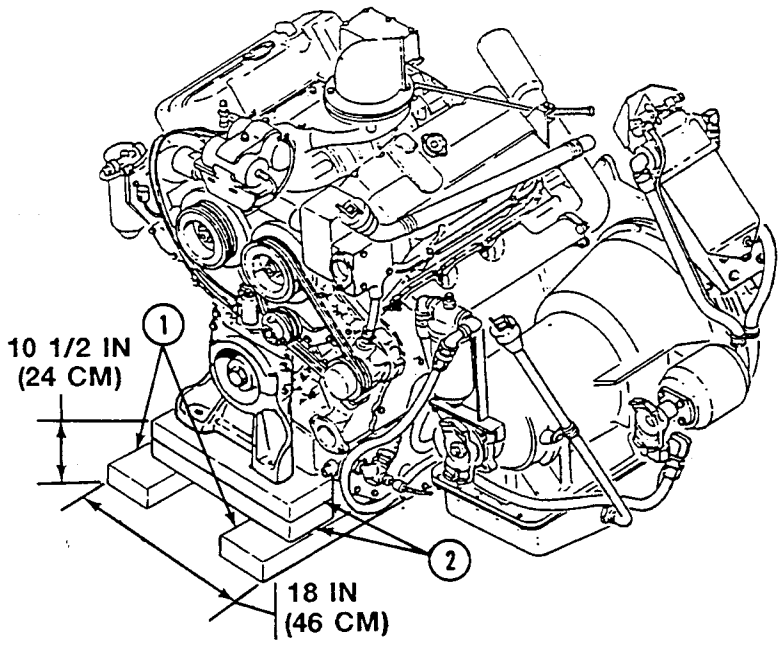
You could get hurt if power plant is not blocked to prevent sudden movement. Block power plant as shown before you attempt any disassembly.

WARNING

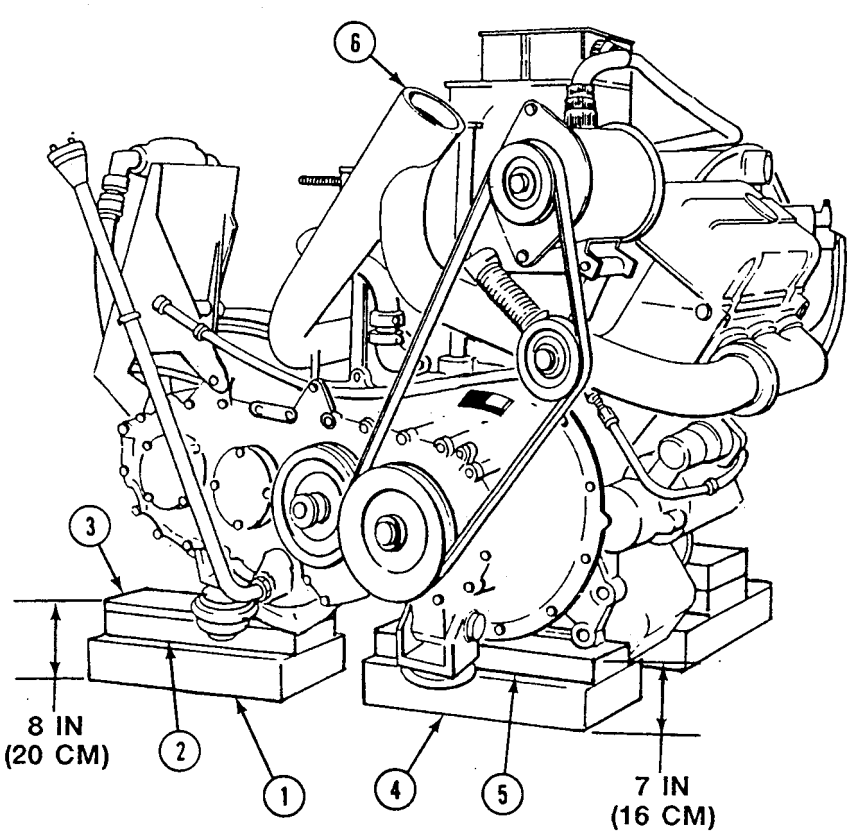
Hanging loads could kill or injure you. Keep away from hanging loads and overhead equipment. Keep hands out of engine compartment while power unit is being removed or installed.

1. Use a lifting device of at least 2,500 lb (1,135 kg) capacity and sling to lift power plant. Have helper assist.

2. On level ground place two 4 x 6 x 18 inch (10 x 15 x 46 cm) blocks (1) under front of engine. Place blocks parallel to each other with 6 inch (15 cm) side down. Blocks should be about 18 inches (46 cm) apart from outside edges.
3. Stack two 4 x 6 x 18 inch (10 x 15 x 46 cm) blocks (2) on top of each other. Place blocks on top of blocks (1) at a 90 degree angle. Blocks will be about 10 1/2 inches (24 cm) high.



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



FOLLOW-THROUGH STEPS

1. Install power plant in carrier (WP 0130 00).

END OF TASK

BLOCK POWER PLANT (M548A3) 0133 00

THIS WORK PACKAGE COVERS:

Block (page 0133 00-1).

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)
Engine and Transmission Sling (WP 0541 00, Item 47)
Lifting device with rated lift capacity of at least 3000 lb (1362 kg) capacity

Materials/Parts

All blocks are made from surfaced dimensioned lumber. Dimensions are in inches with metric equivalents.
Lumber 4 x 6 x 40 inch (10 x 15 x 102 cm)
Lumber 4 x 6 x 20 inch (10 x 15 x 51 cm)

Personnel Required

Unit Mechanic
Helper (H)

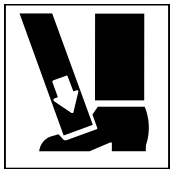
Equipment Condition

Power plant removed (WP 0131 00)

JACKING

BLOCK POWER PLANT

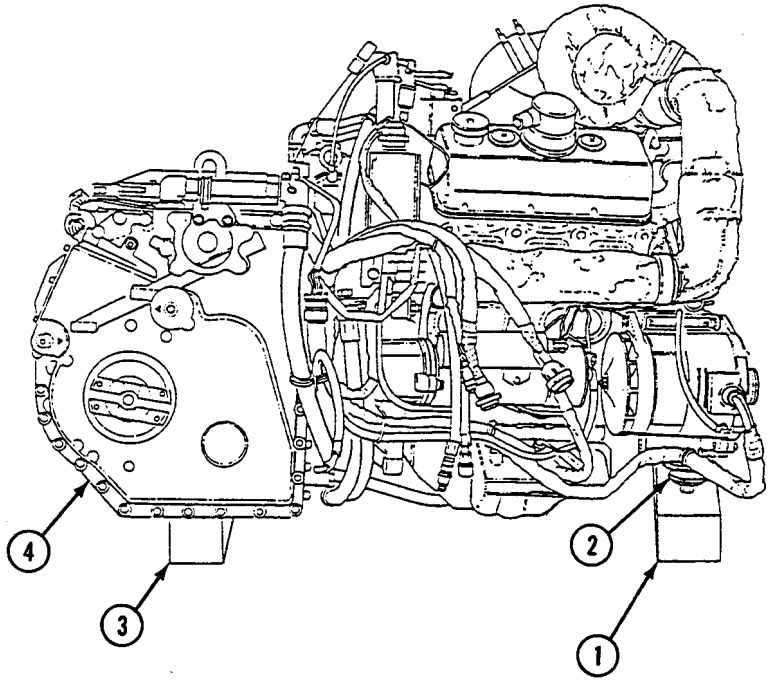
WARNING



Blocking power plant on unlevel, soft ground can cause power plant to sink and tip over. Personnel can be injured and power plant can be damaged. Make sure to block power plant on flat, hard ground.

1. Use a lifting device of at least 3000 lb (1362 kg) capacity and engine and transmission sling to lift power plant.

2. On level ground, place a 4 x 6 x 40 inch (10 x 15 x 102 cm) block (1) under motor mounts of engine (2).
3. On level ground, place two 4 x 6 x 20 inch (10 x 15 x 52 cm) blocks (3) under transmission (4).



4. Lower power plant down slowly onto blocks. Have helper assist.
5. Check that power plant is firmly supported by blocks.

END OF TASK

REPLACE AIR BOX DRAIN AND CRANKCASE BREATHER COLLECTOR CAN 0134 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

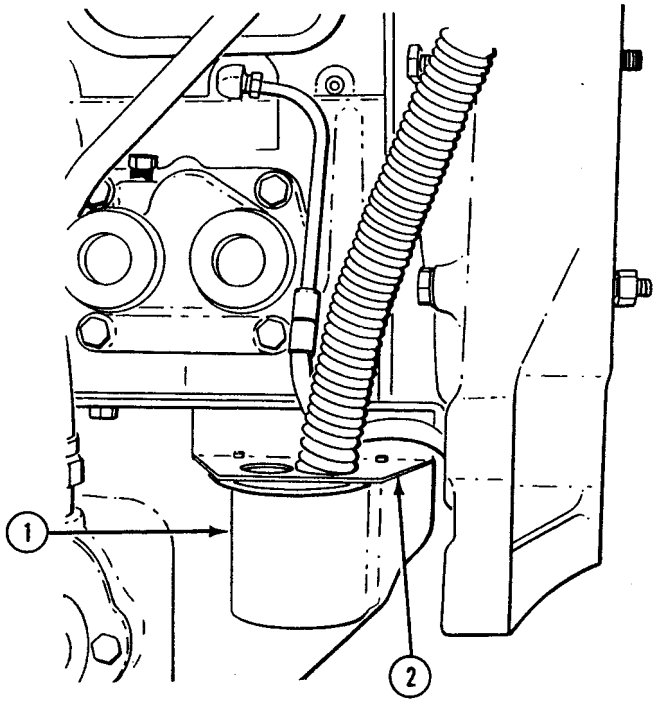
See your -10

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Battery ground lead(s) disconnected (WP 0292 00)
Hull bottom access cover removed (WP 0383 00)

REMOVAL

1. Turn collector can (1) to the left.
2. Remove collector can from mounting bracket (2).



INSTALLATION

1. Place collector can (1) on mounting bracket (2).
2. Secure collector can (1) by turning it to the right.

FOLLOW-THROUGH STEPS

1. Connect battery negative lead(s) (WP 0292 00).
2. Start engine (see your -10).
3. Check air box drain and crankcase breather collector can for proper operation.
4. Stop engine (see your -10).
5. Install hull bottom access cover (WP 0383 00).

END OF TASK

REPLACE AIR BOX DRAIN TUBES (M548A1) 0135 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level

Unit

References

See your -10

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

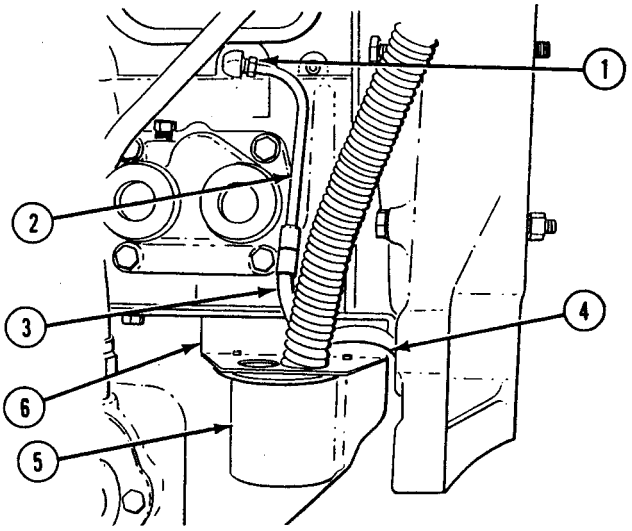
Unit Mechanic

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Battery ground lead disconnected (WP 0292 00)
Hull bottom access cover removed (WP 0383 00)

REMOVAL

1. Loosen two nuts (1) that secure two drain tubes (2) to each side of engine.
2. Loosen three clamps (3) that secure hose (4) between right drain tube (2) and collector can (5).
3. Remove two drain tubes (2) from air box. Remove hose (4) from crankcase breather collector can (5) through bracket (6).



INSTALLATION

1. Place drain tube (2), with hose (4), on each side of engine. Secure with three clamps (3) and two nuts (1).
2. Place ends of drain hose (4) through collector can (5) and bracket (6) into collector can.

FOLLOW-THROUGH STEPS

1. Connect battery negative lead (WP 0292 00).
2. Start engine (see your -10).
3. Check air box drain tubes for proper operation.
4. Stop engine (see your -10).
5. Install hull bottom access cover (WP 0383 00).

END OF TASK

REPLACE AIR BOX DRAIN CHECK VALVE AND TUBES (M548A3) 0136 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts
Lock washer

Personnel Required
Unit Mechanic

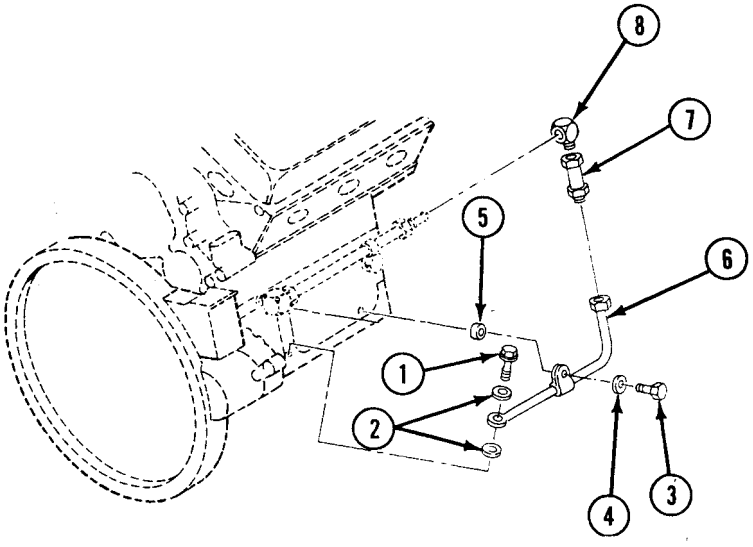
References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Both battery negative leads disconnected (WP 0292 00)
Hull bottom access cover removed (WP 0383 00)
Air cleaner assembly removed (WP 0159 00)
Center seat raised (see your -10)

REMOVAL

Left side

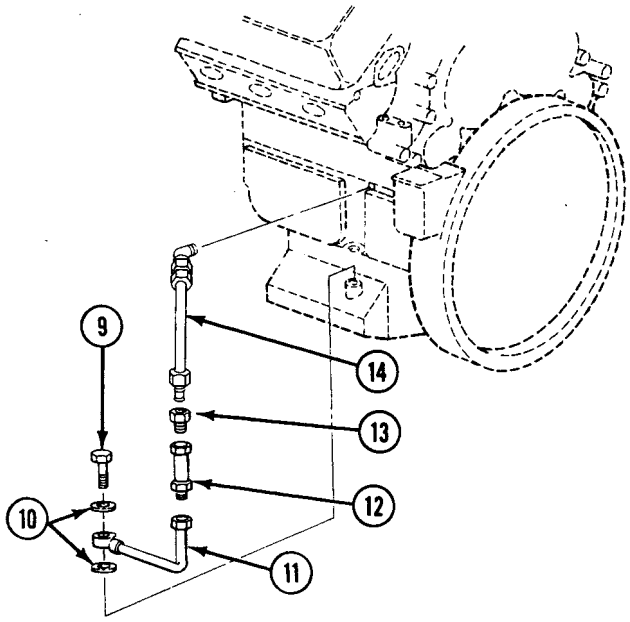
1. Remove adapter (1) and two washers (2) from engine.
2. Remove bolt (3), lock washer (4), and spacer (5) from engine. Discard lock washer.
3. Remove tube assembly (6) from check valve (7).
4. Remove check valve (7) from elbow (8).



REPLACE AIR BOX DRAIN CHECK VALVE AND TUBES (M548A3) — Continued 0136 00

Right side

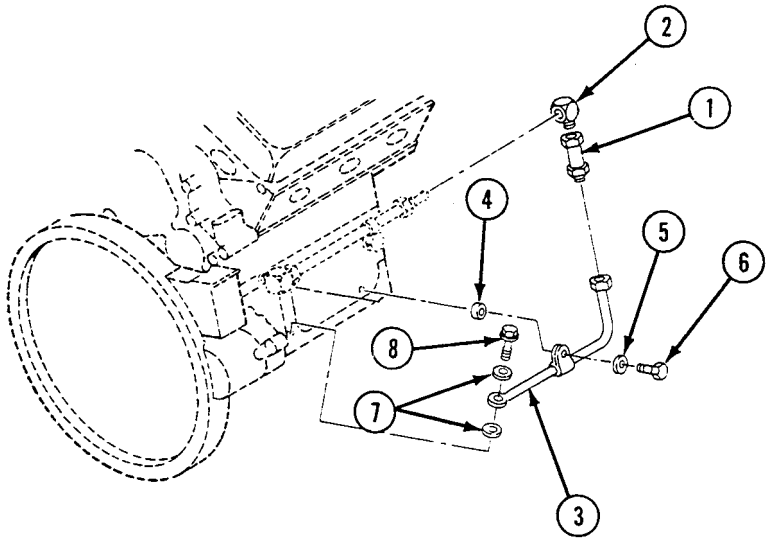
5. Remove adapter (9) and two washers (10) from engine.
6. Remove tube assembly (11) from check valve (12).
7. Remove check valve (12) and connector (13) from tube assembly (14).
8. Remove check valve (12) from connector (13).



INSTALLATION

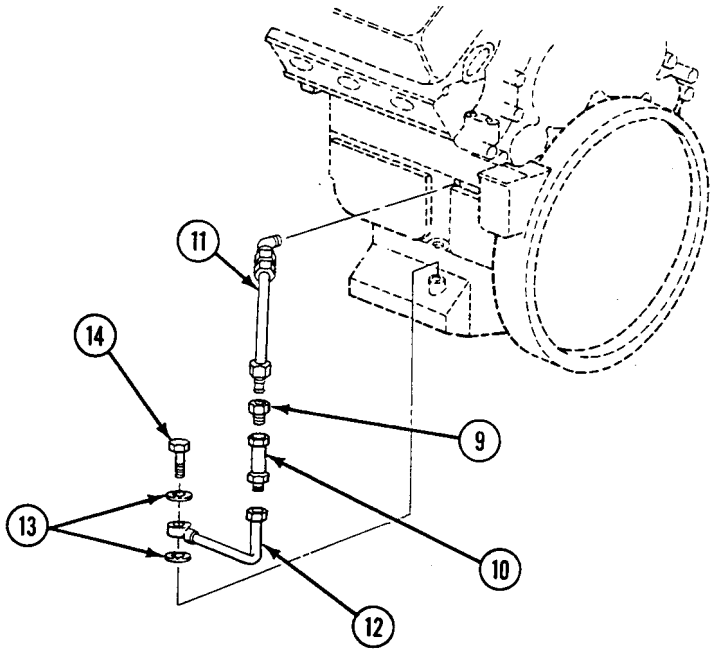
Left side

1. Install check valve (1) on elbow (2).
2. Install tube assembly (3) on check valve (1).
3. Install tube assembly (3) with spacer (4), new lock washer (5), and bolt (6) on engine.
4. Install tube assembly (3) with two washers (7) and adapter (8) on engine.



Right side

5. Install connector (9) on check valve (10).
6. Install connector (9) and check valve (10) on tube assembly (11).
7. Install tube assembly (12) on check valve (10).
8. Install tube assembly (12) with two washers (13) and adapter (14) on engine.



FOLLOW-THROUGH STEPS

1. Install air cleaner assembly (WP 0159 00).
2. Install hull bottom access cover (WP 0383 00).
3. Connect both battery negative leads (WP 0292 00).
4. Lower center seat (see your -10).

END OF TASK

REPLACE ENGINE CRANKCASE BREATHER HOSE 0137 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Personnel Required

Unit Mechanic

References

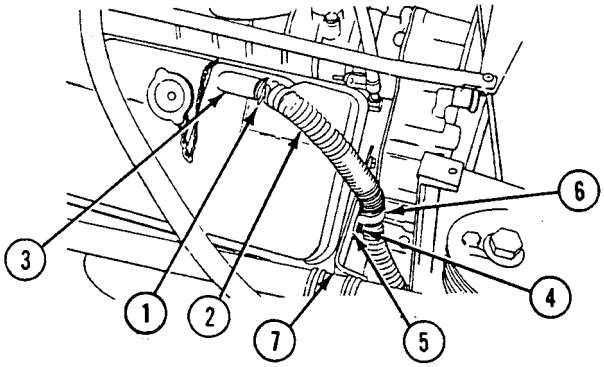
See your -10

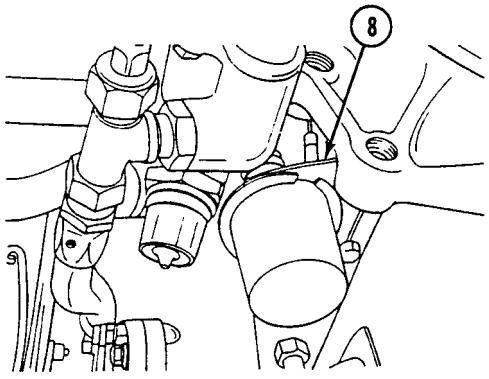
Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Battery ground lead(s) disconnected (WP 0292 00)
Top access cover and grilles removed (WP 0390 00)
Hull bottom access cover removed (WP 0383 00)

REMOVAL

1. Remove hose clamp (1) that secures breather hose (2) to valve cover ventilation outlet (3).
2. Remove two screws (4), washers (5), and clamps (6) from bracket (7).
3. Remove other end of breather hose (2) from collector can mount (8).

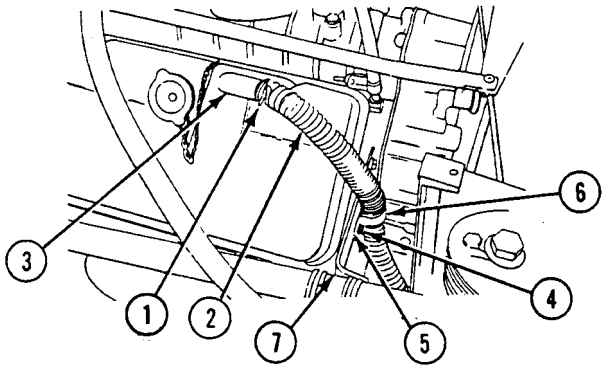


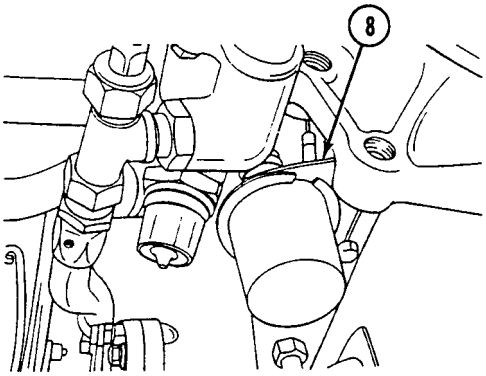


REPLACE ENGINE CRANKCASE BREATHER HOSE — Continued 0137 00

INSTALLATION

1. Place breather hose (2) on valve cover ventilation outlet (3).
2. Install other end of breather hose through collector can mount (8).
3. Place breather hose on bracket (7). Secure hose to bracket with two screws (4), washers (5), and clamps (6).





FOLLOW-THROUGH STEPS

1. Connect battery negative lead(s) (WP 0292 00).
2. Start engine (see your -10).
3. Check crankcase breather hose for proper operation.
4. Stop engine (see your -10).
5. Install top access cover and grilles (WP 0390 00).
6. Install hull bottom access cover (WP 0383 00).

END OF TASK

REPLACE ENGINE OIL GAUGE ROD AND TUBE (M548A1) 0138 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

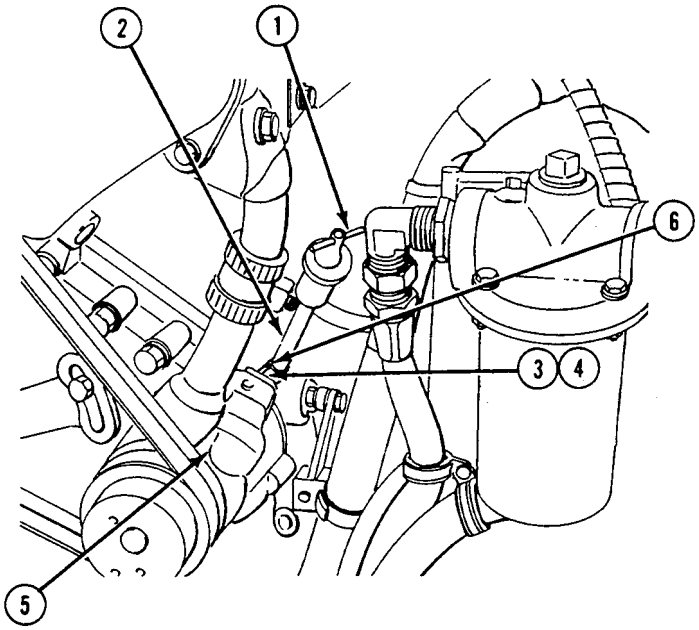
Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)

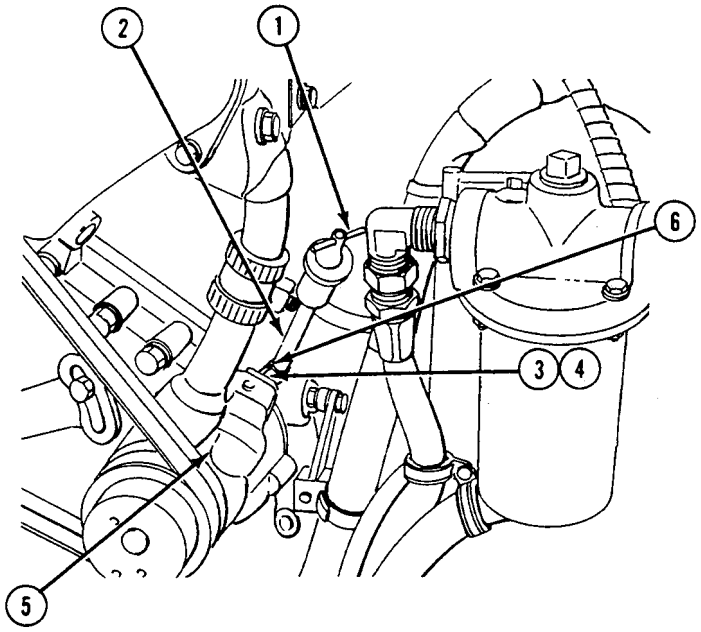
REMOVAL

1. Turn gauge rod handle (1) to the left to release. Lift gauge rod from tube (2).
2. Remove screw (3) that secures clamp (4) to coolant pump (5). Remove clamp.
3. Unscrew nut (6) that secures tube to engine. Remove tube.



INSTALLATION

1. Place tube (2) on engine. Secure with nut (6).
2. Place clamp (4) on tube on coolant pump (5). Secure with screw (3).
3. Insert gauge rod (1) in tube and turn gauge rod handle to the right.



FOLLOW-THROUGH STEPS

1. Lower center seat (see your -10).

END OF TASK

REPLACE ENGINE OIL GAUGE ROD AND TUBE (M548A3) 0139 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts
Adhesive (WP 0542 00, Item 1)
Self-locking screw

Personnel Required
Unit Mechanic

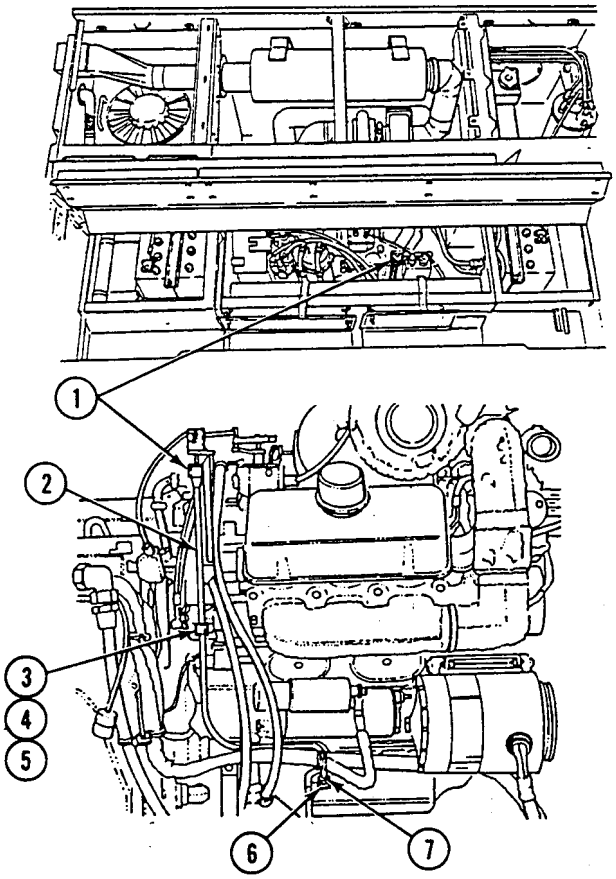
References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Both battery negative leads disconnected (WP 0292 00)
Center seat raised (see your -10)

REPLACE ENGINE OIL GAUGE ROD AND TUBE (M548A3) — Continued 0139 00

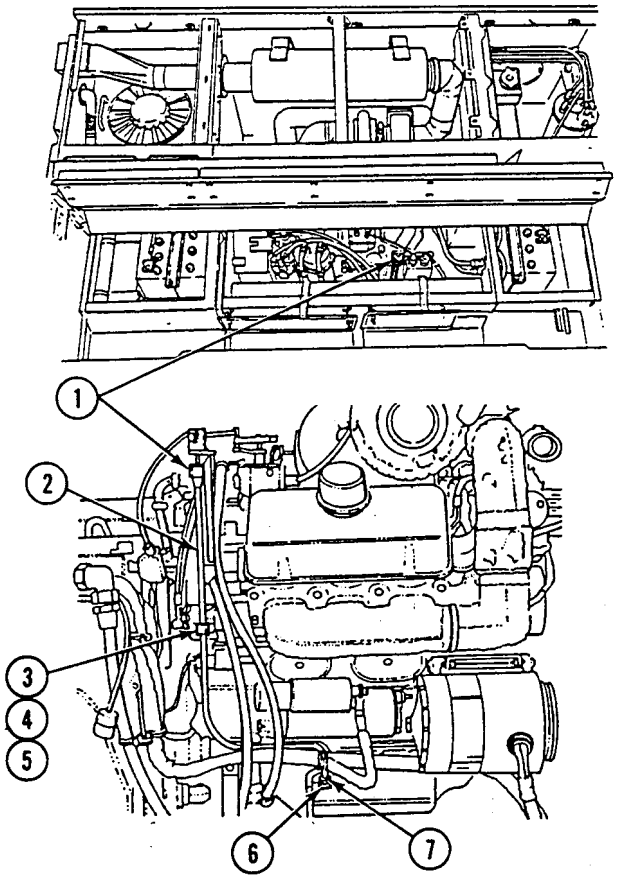
REMOVAL

1. Turn gauge rod (1) counterclockwise and remove from tube (2).
2. Remove self-locking screw (3), washer (4), and clamp (5) from engine. Remove clamp (5) from tube (2). Discard self-locking screw.
3. Loosen nut (6) and remove tube (2) from adapter (7).
4. Remove adapter (7) from oil pan.



INSTALLATION

1. Apply a thin coat of adhesive to external threads of adapter (7).
2. Install adapter (7) in oil pan.
3. Install tube (2) on adapter (7) and tighten nut (6).
4. Install clamp (5) on tube (2). Secure clamp and tube to engine with new self-locking screw (3) and washer (4).
5. Install gauge rod (1) in tube (2) and turn clockwise to tighten.



FOLLOW-THROUGH STEPS

1. Connect both battery negative leads (WP 0292 00).
2. Lower center seat (see your -10).

END OF TASK

REPLACE ENGINE OIL FILLER CAP AND TUBE 0140 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts
Gasket
Screws (2)
Washers (2)

Personnel Required
Unit Mechanic

References
See your -10

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)
Power plant rear access door/panel removed (see your -10)

REPLACE ENGINE OIL FILLER CAP AND TUBE — Continued 0140 00

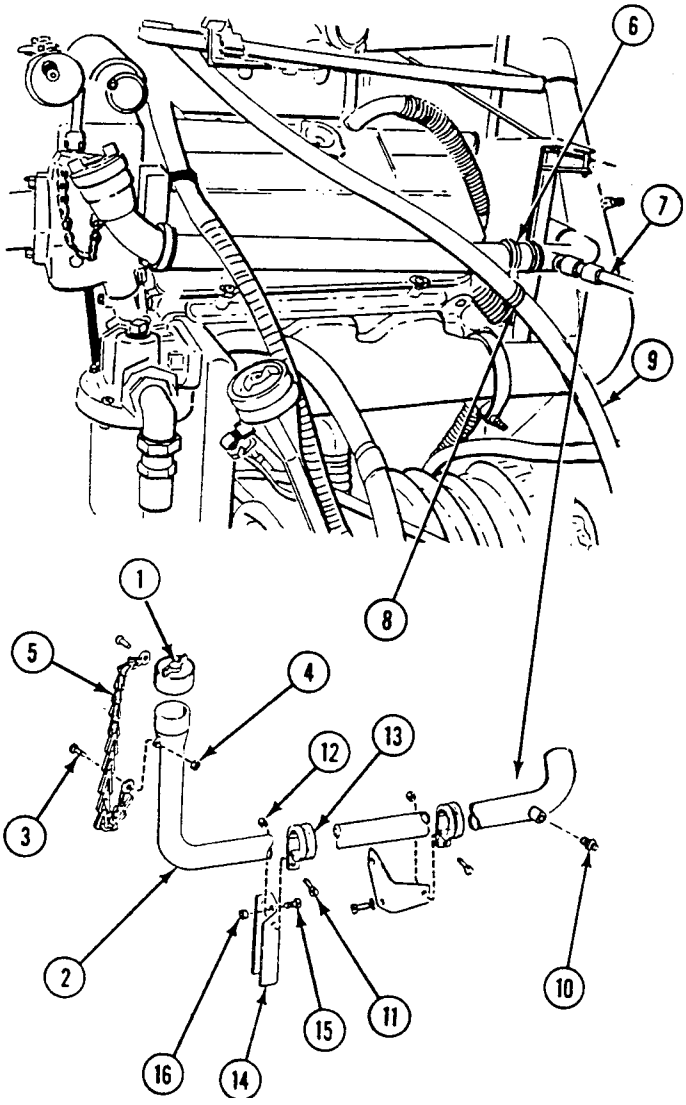
REMOVAL

1. Turn cap (1) left to release. Lift cap from filler tube (2).
2. Remove screw (3), nut (4), and cap retaining chain (5) from filler tube (2). Remove cap (1) with chain.

NOTE

If your carrier has an air compressor, do Step 3 and Step 4.

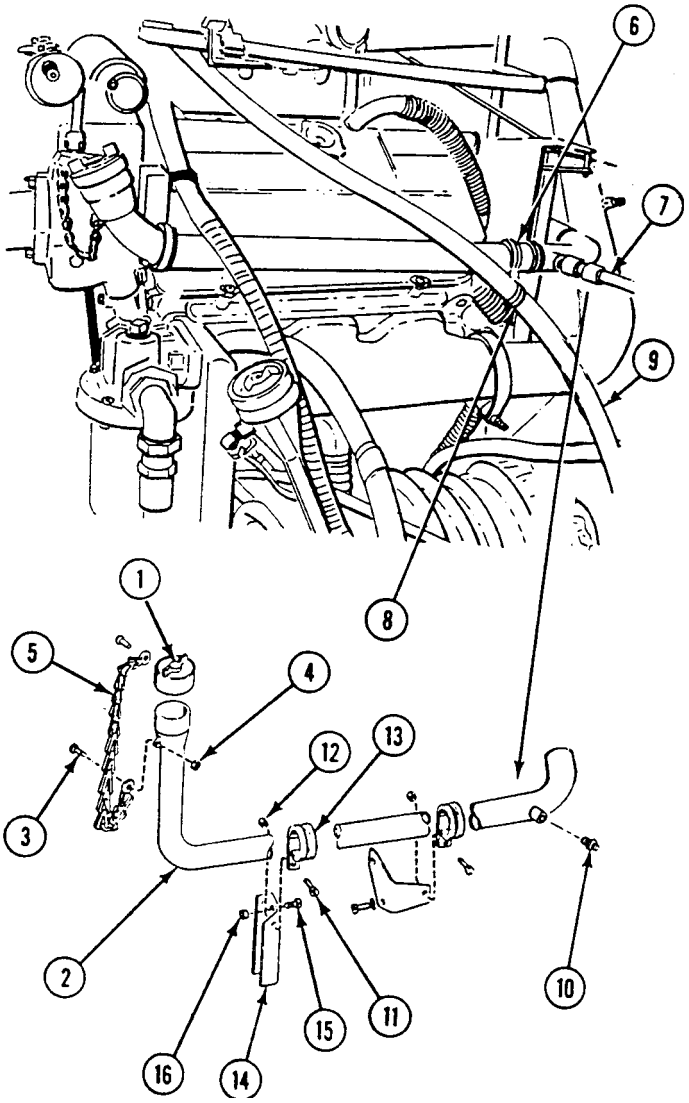
3. Remove clamp (6). Separate compressor outlet hose (7) from adapter. Remove adapter from filler tube (2).
4. Remove clamp (8). Separate coolant heater outlet hose (9) from filler tube (2).



NOTE

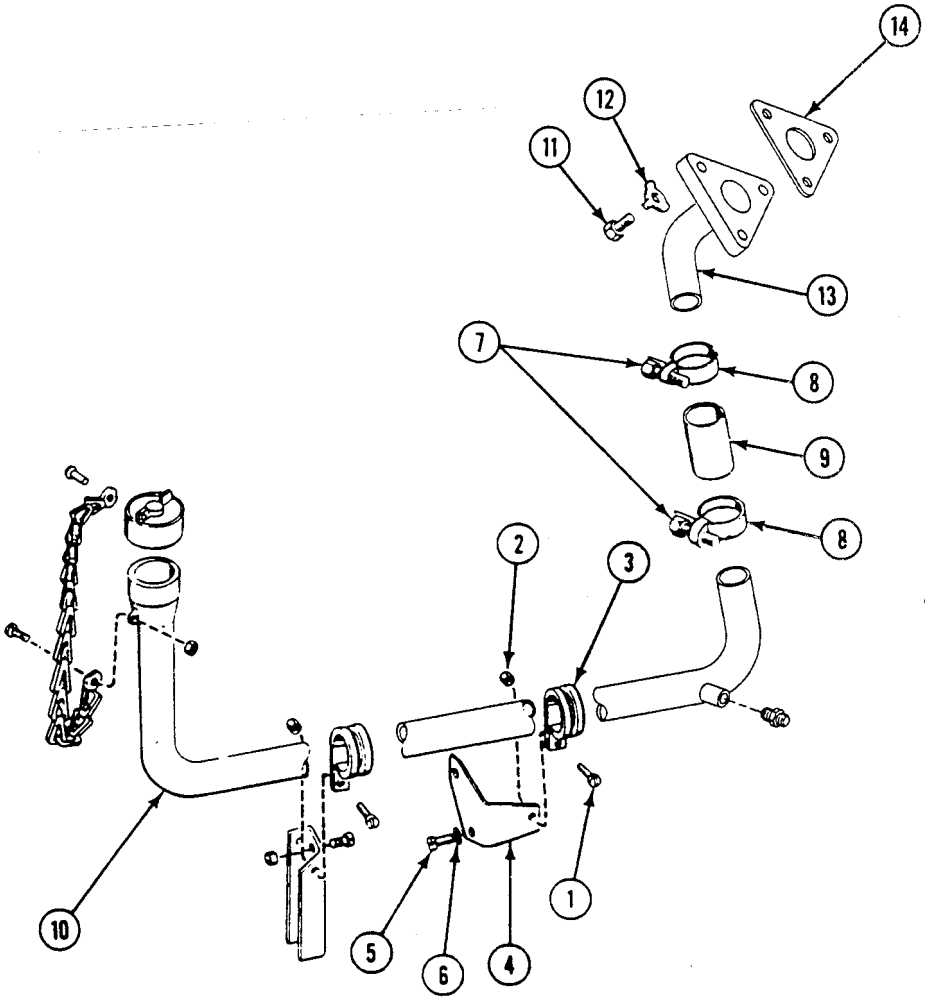
If your carrier does not have an air compressor do Step 5.

5. Remove pipe plug (10) from filler tube (2).
6. Remove screw (11), nut (12), and clamp (13) from front bracket (14).
7. Remove two screws (15), nuts (16), and front bracket (14) from engine.



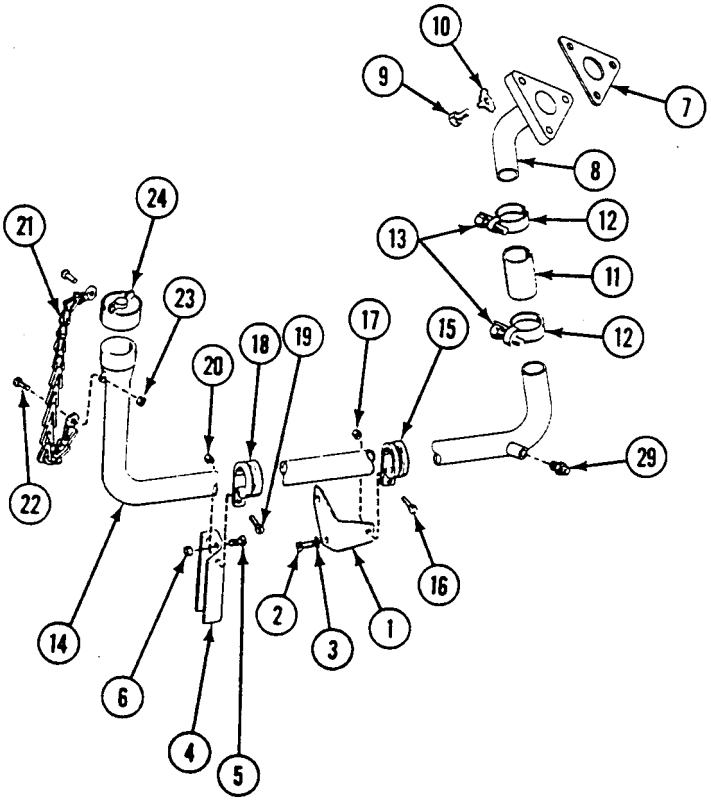
REPLACE ENGINE OIL FILLER CAP AND TUBE — Continued 0140 00

8. Remove screw (1), nut (2), and clamp (3) from rear bracket (4).
9. Remove two screws (5), washers (6), and rear bracket (4) from engine. Discard screws and washers.
10. Remove two screws (7) and clamps (8) from hose (9). Remove filler tube (10) from hose (9).
11. Remove three screws (11), and washers (12), from elbow (13), and gasket (14) from engine. Separate elbow from gasket. Discard gasket.



INSTALLATION

1. Install rear bracket (1) on engine with two new screws (2) and washers (3).
2. Install front bracket (4) on engine with two screws (5) and nuts (6).
3. Install new gasket (7) and elbow (8) on engine with three screws (9) and washers (10).
4. Install hose (11) on elbow (8) with clamp (12) and screw (13).
5. Install filler tube (14) on hose (11) with clamp (12) and screw (13).
6. Secure filler tube (14) to rear bracket (1) with clamp (15), screw (16), and nut (17).
7. Secure filler tube (14) to front bracket (4) with clamp (18), screw (19), and nut (20).
8. Install caps retaining chain (21) on filler tube (14) with screw (22) and nut (23).
9. Place cap (24) on filler tube (14) and turn right to secure.



NOTE

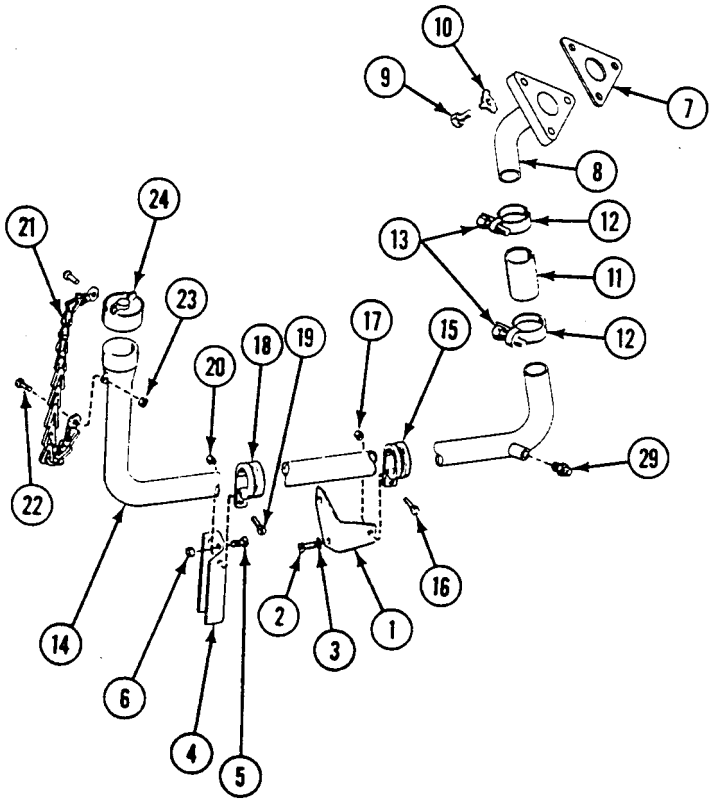
If your carrier has an air compressor, do Step 10 and Step 11.

10. Install compressor outlet hose (25) to filler tube (14) with clamp (26).
11. Install coolant heater outlet hose (27) to filler tube (14) with clamp (28).

NOTE

If your carrier does not have an air compressor, do Step 12.

12. Install pipe plug (29) in filler tube (14).



FOLLOW-THROUGH STEPS

1. Lower center seat (see your -10).
2. Install power plant rear access door/panel (see your -10).

END OF TASK

REPLACE ENGINE OIL FILTER HOSES (M548A1) 0141 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts

Antiseize compound (WP 0542 00, Item 6)
Cleaning compound (WP 0542 00, Item 9)
Sealing compound (WP 0542 00, Item 37)
Engine oil (WP 0128 00)
Self-locking nut (2)
Suitable container

Personnel Required

Unit Mechanic

References

See your -10
Standard Operating Procedures

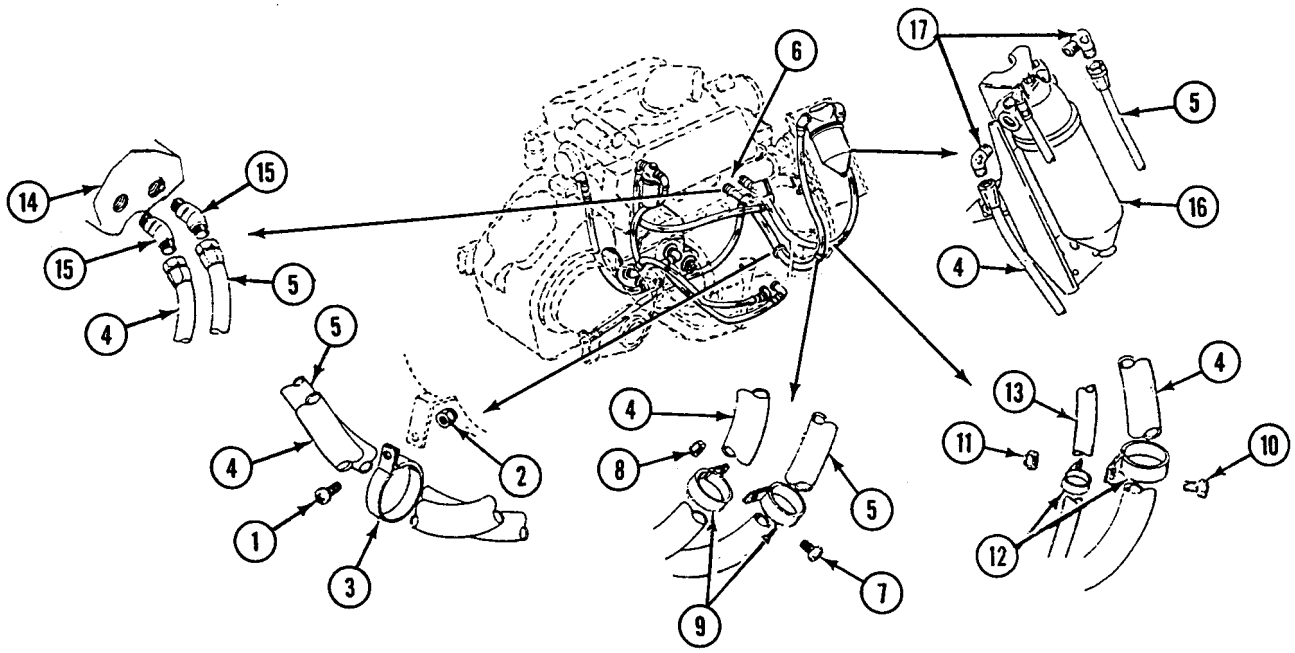
Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Battery ground lead disconnected (WP 0292 00)
Hull bottom access cover removed (WP 0383 00)
Power plant rear access door removed (see your -10)

REPLACE ENGINE OIL FILTER HOSES (M548A1) — Continued 0141 00

REMOVAL

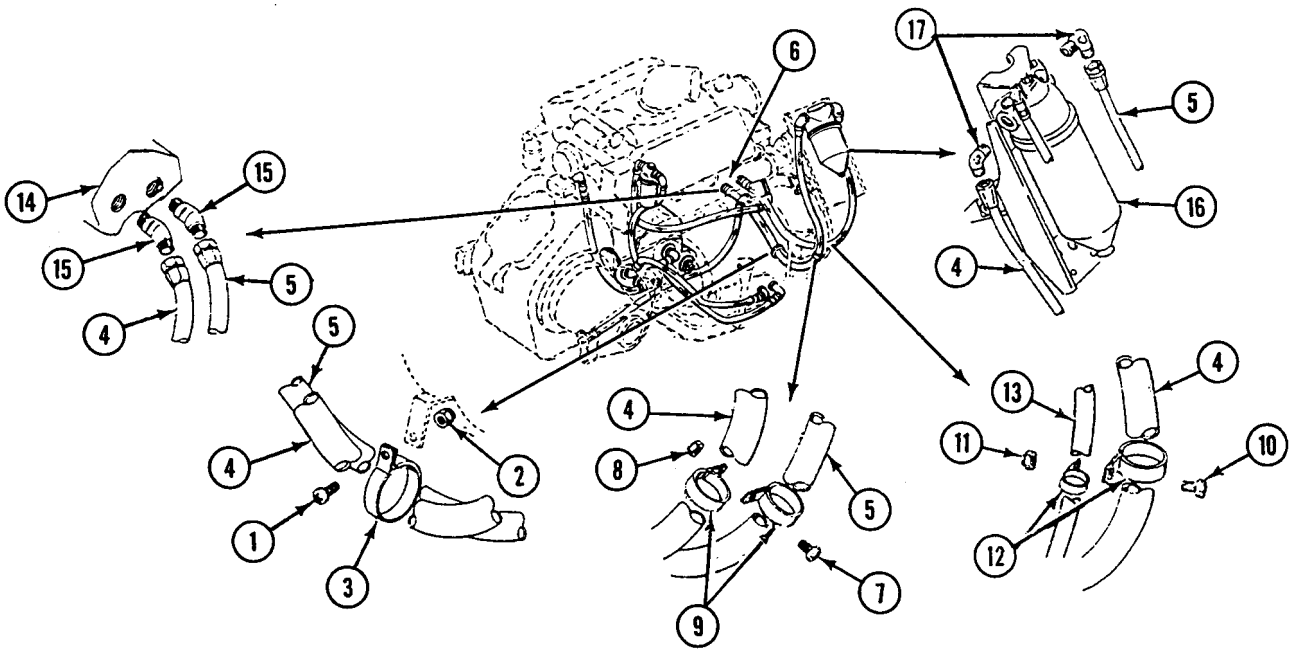
1. Remove screw (1) and nut (2). Remove clamp (3) that secures engine oil filter hose (4) and engine oil filter hose (5) to power plant (6).
2. Remove screw (7) and nut (8). Remove two clamps (9) that secure oil filter hose (4) and oil filter hose (5) to power plant (6).
3. Remove two screws (10), lock nuts (11), and clamps (12) from oil filter hose (4) and AOAP hose (13). Discard lock nuts.
4. Place container under hose (4), hose (5), and hose (13) to catch oil.



NOTE

Dispose of engine oil in accordance with Standard Operating Procedures.

5. Disconnect oil filter hose (4) and oil filter hose (5) at engine block (14). Hold hoses down to let oil drain.
6. Remove two elbows (15) from engine block (14).
7. Disconnect oil filter hose and oil filter hose (5) at oil filter (16). Remove two elbows (17) from oil filter (16).



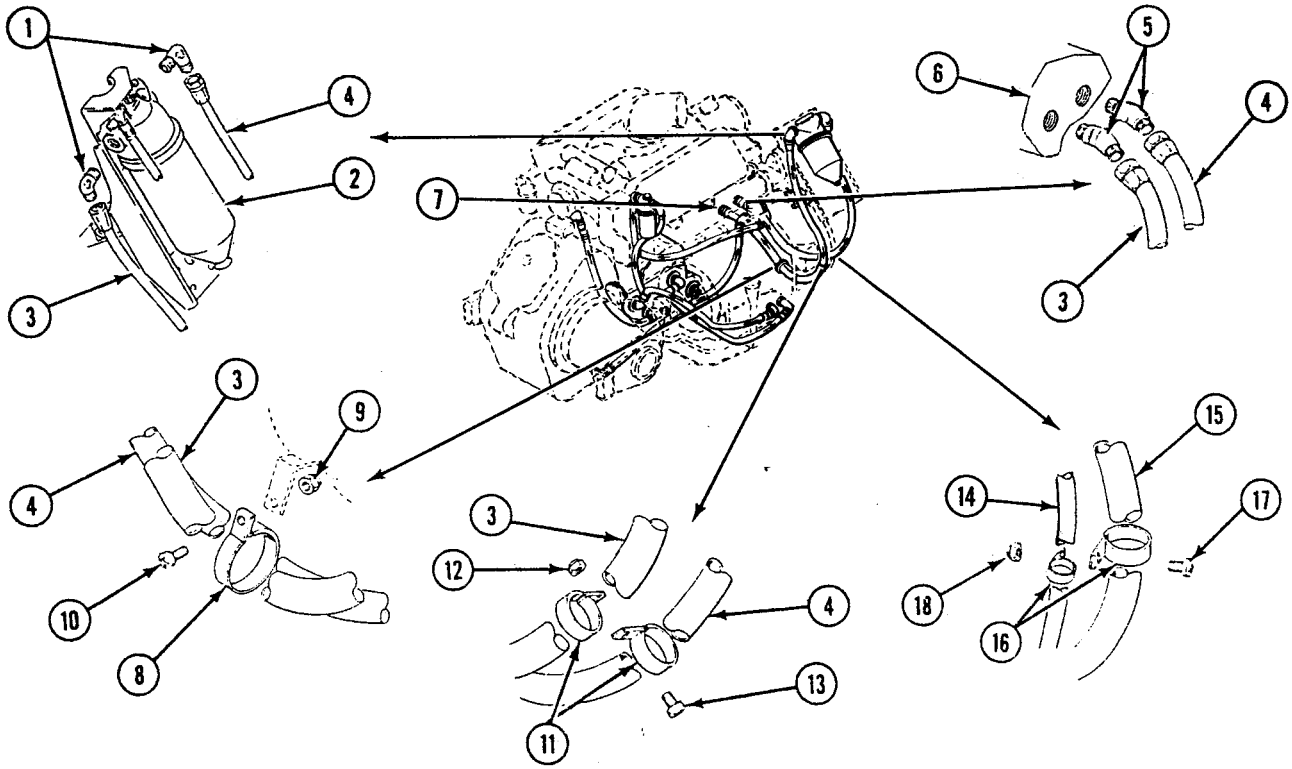
CLEANING

1. Clean outside threads of tapered and straight pipe fittings with cleaning compound.
2. Put sealing compound on outside threads of tapered pipe fittings.
3. Put light coat of antiseize compound on outside threads of straight pipe fittings.

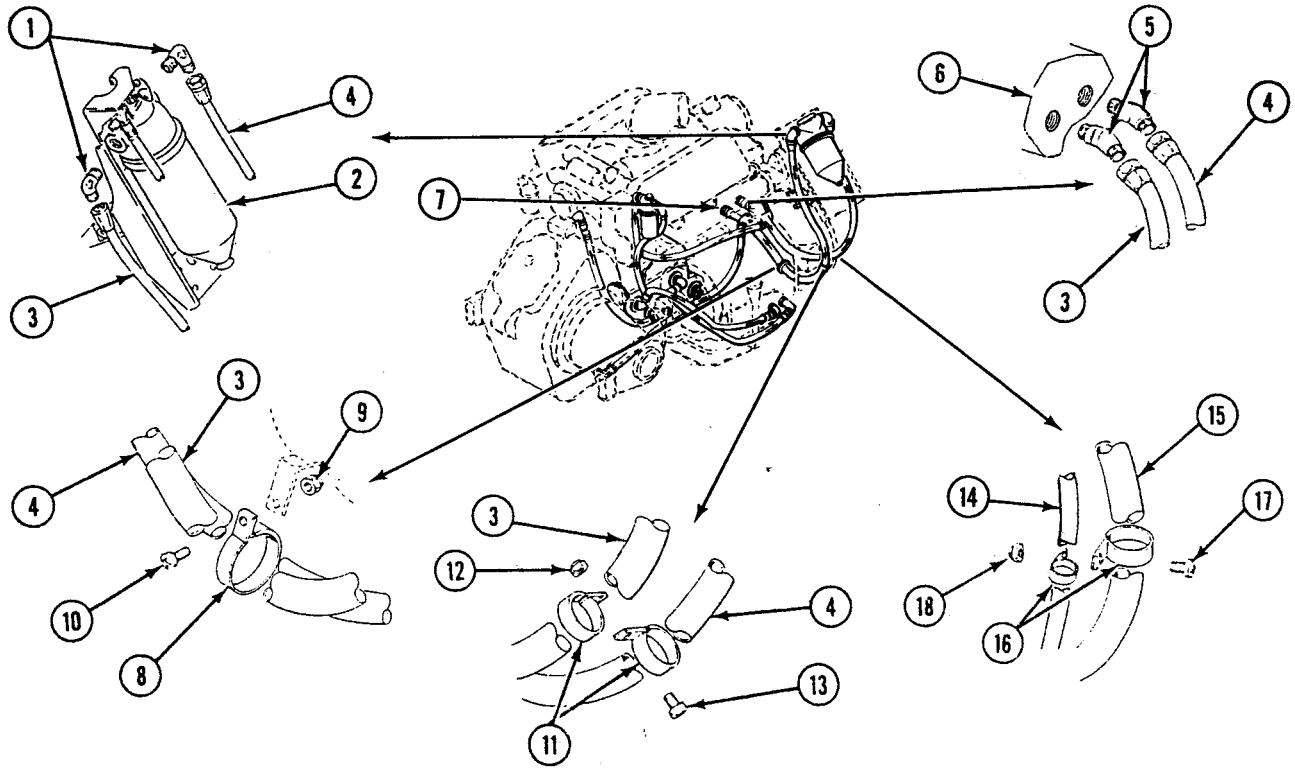
REPLACE ENGINE OIL FILTER HOSES (M548A1) — Continued 0141 00

INSTALLATION

1. Install two elbows (1) on engine oil filter (2). Connect oil filter hose (3) and oil filter hose (4) to elbows.
2. Install two elbows (5) on engine block (6). Connect oil filter hose (3) and oil filter hose (4) to elbows.
3. Secure oil filter hoses (3 and 4) to power plant (7) with clamp (8), nut (9), and screw (10).



4. Secure hoses (3 and 4) to power plant (7) with two clamps (11), one nut (12), and screw (13).
5. Secure AOAP hose (14) to outlet hose (15) with two clamps (16), screws (17), and new lock nuts (18).
6. Add engine oil (WP 0128 00).



FOLLOW-THROUGH STEPS

1. Connect battery negative lead (WP 0292 00).
2. Start engine (see your -10).
3. Check engine oil filter hoses for leaks.
4. Stop engine (see your -10).
5. Install hull bottom access cover (WP 0383 00).
6. Install power plant rear access door (see your -10).

END OF TASK

REPLACE ENGINE OIL FILTER ELEMENT HOSES AND FITTINGS (M548A3) 0142 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts
Antiseize compound (WP 0542 00, Item 6)
Sealing Compound (WP 0542 00, Item 37)
Suitable container
Strap (2)

Personnel Required
Unit Mechanic

References
See your -10
Standard Operating Procedures

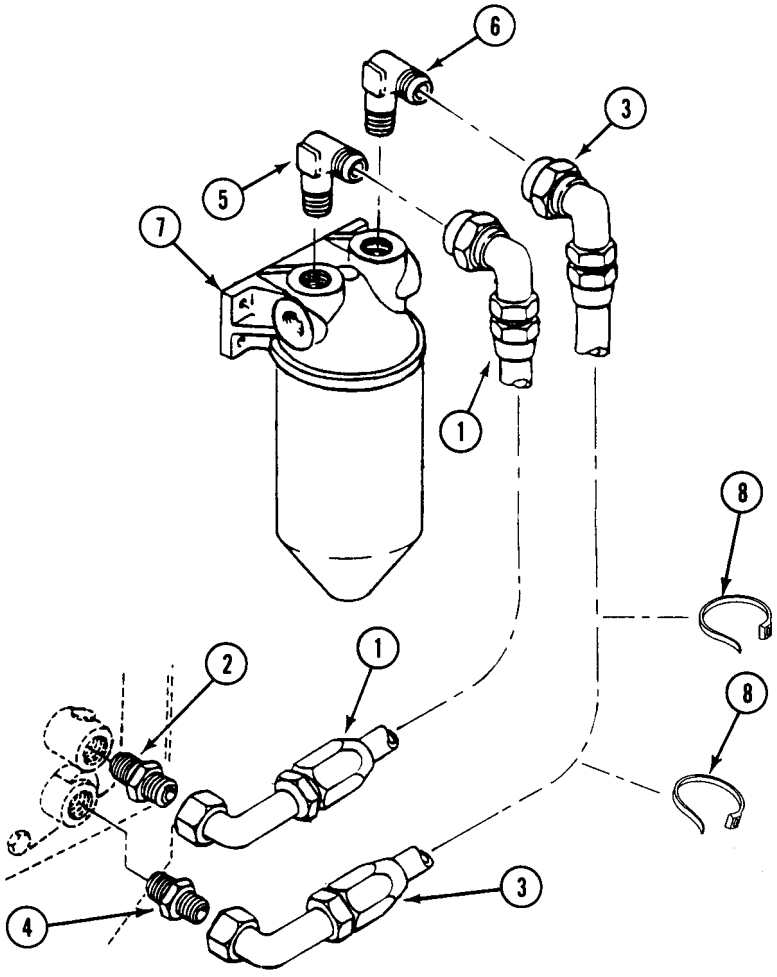
Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Both battery negative leads disconnected (WP 0292 00)
Center seat raised (see your -10)
Air cleaner assembly removed (WP 0159 00)

REMOVAL

NOTE

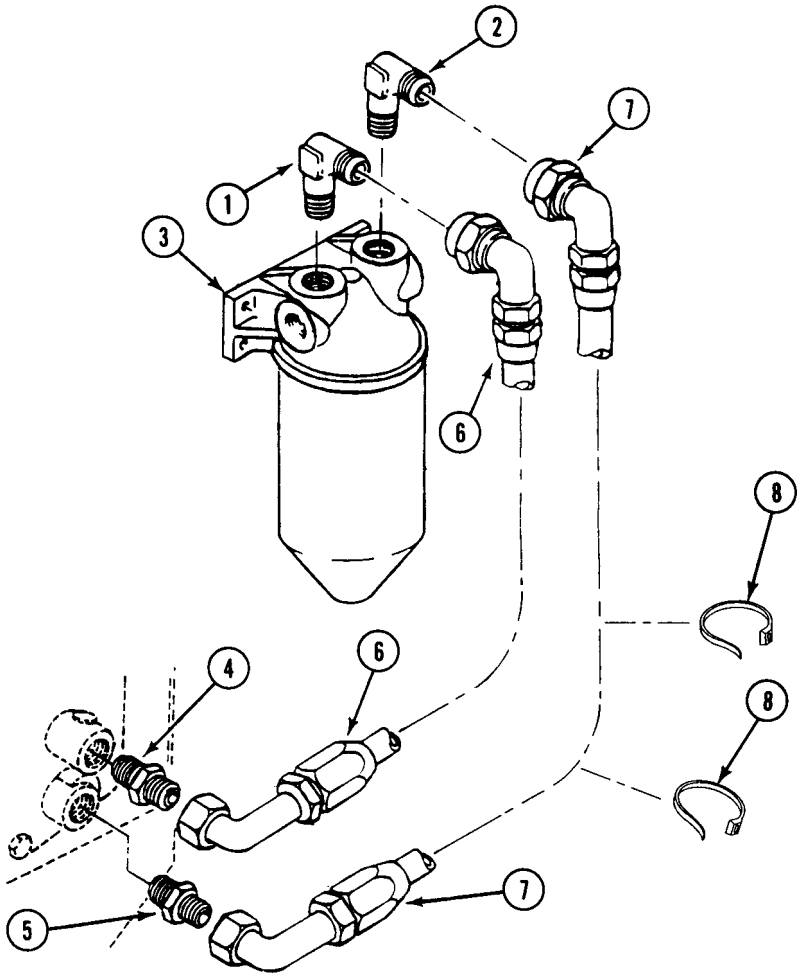
Dispose of engine oil in accordance with Standard Operating Procedures.

1. Place clean container of at least 1 quart (1 liter) capacity under engine oil cooler. Disconnect inlet hose (1) from adapter (2) and outlet hose (3) from adapter (4) on engine oil cooler.
2. Remove adapter (2) and adapter (4) from engine oil cooler.
3. Disconnect inlet hose (1) from elbow (5) and outlet hose (3) from elbow (6) on oil filter head (7).
4. Remove elbow (5) and elbow (6) from oil filter head (7).
5. Remove two straps (8) from hose (1) and hose (3). Discard straps.
6. Remove two straps (8) from hose (1) and hose (3). Discard straps.



INSTALLATION

1. Apply sealing compound to external tapered threads of elbow (1) and elbow (2) and install elbows in oil filter head (3).
2. Apply antiseize compound to external threads of adapter (4) and adapter (5) and install adapters in engine oil cooler.
3. Connect inlet hose (6) to elbow (1) and adapter (4).
4. Connect outlet hose (7) to elbow (2) and adapter (5).
5. Install two new straps (8) around hose (6) and hose (7).



FOLLOW-THROUGH STEPS

1. Connect both battery negative leads (WP 0292 00).
2. Add oil if needed (WP 0128 00).
3. Install air cleaner assembly (WP 0159 00).
4. Lower center seat (see your -10).
5. Start engine and check engine oil filter hoses for leaks (see your -10).
6. Stop engine (see your -10).

END OF TASK

REPLACE ENGINE OIL FILTER ELEMENT AND PARTS (M548A1) 0143 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)
Torque Wrench (WP 0541 00, Item 69)

Materials/Parts
Cleaning compound (WP 0542 00, Item 9)
Sealing compound (WP 0542 00, Item 39)
Sealing compound primer (WP 0542 00, Item 40)
Engine oil (WP 0128 00)
Gasket
Gasket
Preformed packing
Suitable container

Personnel Required
Unit Mechanic

References
See your -10
Standard Operating Procedures

Equipment Condition
Engine stopped (see your -10)
Battery negative lead(s) disconnected (WP 0292 00)
Power plant right rear access cover removed (see your -10)
Top access cover and grilles removed (WP 0390 00).

REMOVAL

1. Place suitable container under oil filter housing (1).

NOTE

Dispose of engine oil in accordance with Standard Operating Procedures.

2. Remove drain plug (2) from oil filter housing (1) and drain oil.

3. Back out retaining bolt (3). Remove oil filter housing (1), oil filter element (4), and bolt as an assembly. Discard oil filter element and gasket (5).

NOTE

If only oil filter element is being replaced, go to Step 9.

4. Remove nut (6) from retaining bolt (3).

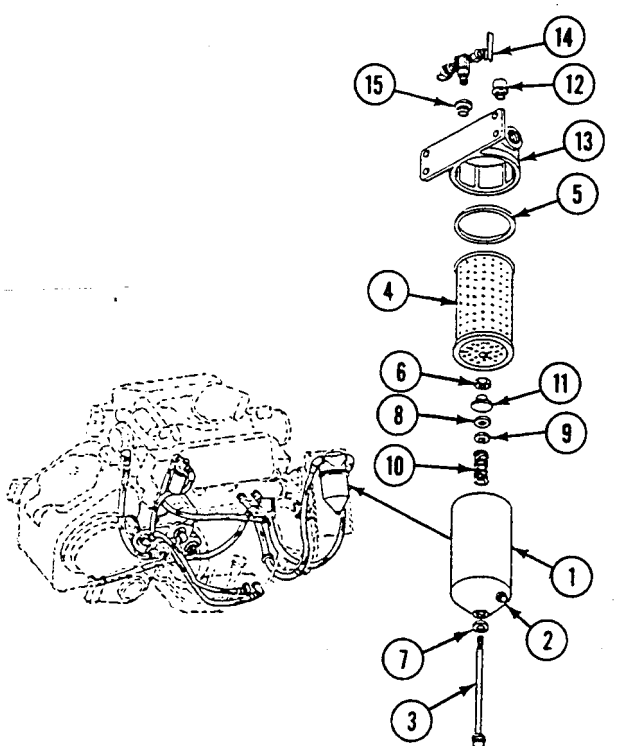
5. Remove retaining bolt (3) and gasket (7) from oil filter housing (1). Discard gasket.

6. Remove preformed packing (8) and retaining bolt (3). Discard preformed packing.

7. Remove washer (9), spring (10), and retainer (11) from retaining bolt (3).

8. If needed, remove plug (12) from filter head (13).

9. Remove valve (14) and bushing (15) from filter head (13).

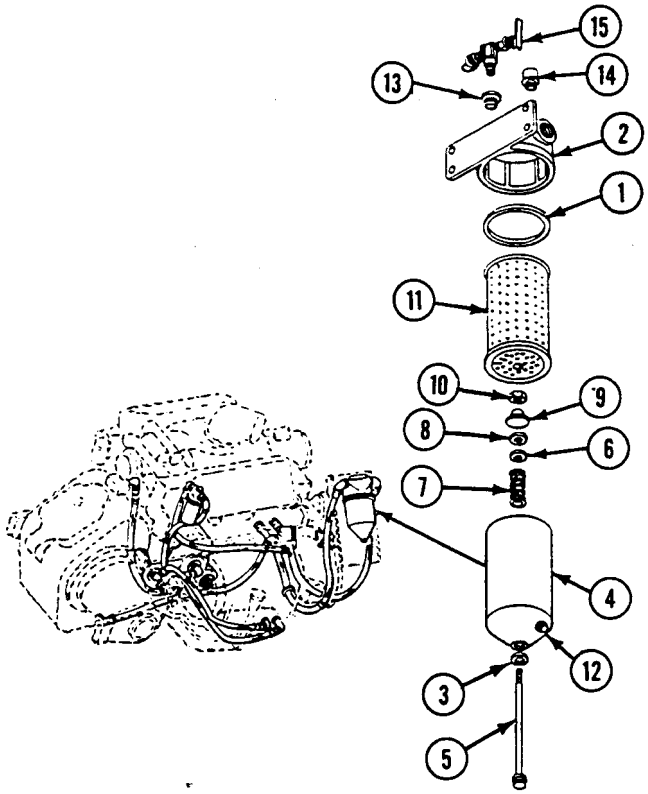


INSTALLATION

NOTE

If only oil filter element is being replaced, do Step 1, Step 4, Step 5, Step 6, and Step 7, and follow-through Steps 1 - 3.

1. Apply a thin coat of engine oil on new gasket (1). Install gasket in filter head (2).
2. Install new gasket (3) on oil filter housing (4). Install retaining bolt (5) in housing.
3. Install washer (6), spring (7), new preformed packing (8), and retainer (9) on retaining bolt (5). Secure with nut (10).
4. Place new oil filter element (11) very carefully over retaining bolt (5) in housing (4).
5. Install oil filter housing (4) with new oil filter element (11) on filter head (2).
6. Install drain plug (12) in oil filter housing (4).
7. Tighten retaining bolt (5) to 50-60 lb-ft (68-81 N•m) torque.
8. Clean external threads of plug (14) and bushing (13) with cleaning compound.
9. Apply a thin coat of sealing compound and sealing compound primer to cleaned external threads of plug (14) and bushing (13).
10. If removed, install plug (14) in filter head (2).
11. Install bushing (13) in filter head (2).
12. Install valve (15) in bushing (13) and filter head (2).



13. Add engine oil (WP 0128 00).

FOLLOW-THROUGH STEPS

1. Connect battery negative lead(s) (WP 0292 00).
2. Start engine (see your -10). Check for oil leaks.
3. Stop engine (see your -10). Wait about 20 minutes for engine oil to drain back to pan, then check engine oil level. Add oil if needed (WP 0128 00).
4. Install power plant right rear access cover (see your -10).
5. Install top access cover and grilles (WP 0390 00).

END OF TASK

REPLACE ENGINE OIL FILTER ELEMENT AND COVER (M548A3) 0144 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level

Unit

Tools and Special Tools

General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts

Cleaning compound (WP 0542 00, Item 9)
Gasket
Gasket
Preformed packing
Suitable container

Personnel Required

Unit Mechanic

References

See your -10
Standard Operating Procedures

Equipment Condition

Engine stopped (see your -10)
Carrier blocked (see your -10)
Both battery negative leads disconnected (WP 0292 00)
Center seat raised (see your -10)

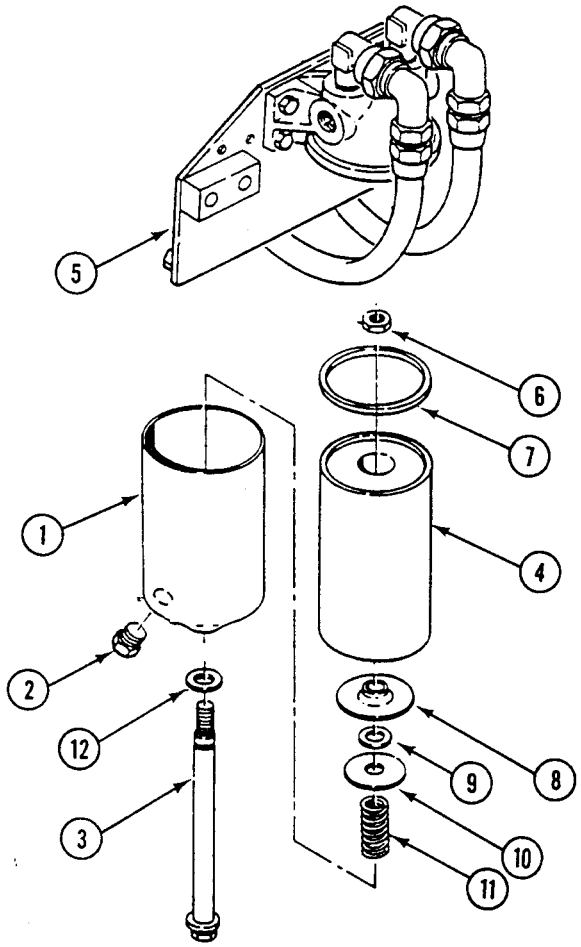
REMOVAL

1. Place clean container of at least 1 quart (1 liter) capacity under oil filter housing (1).

NOTE

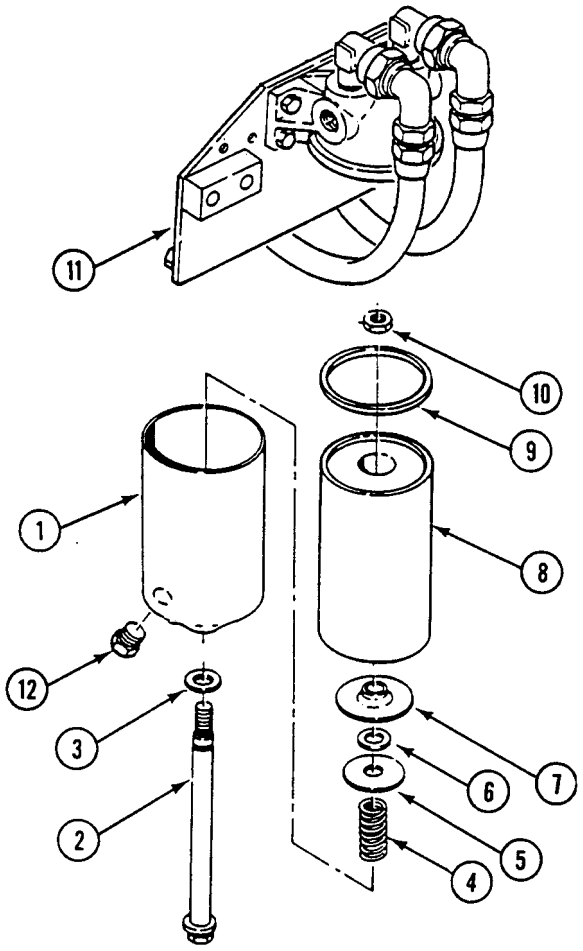
Dispose of engine oil in accordance with Standard Operating Procedures.

2. Remove drain plug (2) from oil filter housing (1) and drain oil.
3. Remove bolt (3) and oil filter housing (1) with oil filter element (4) from filter head (5).
4. Remove nut (6) and oil filter element (4) from bolt (3).
5. Remove oil filter element (4) and gasket (7) from oil filter housing (1). Discard element and gasket.
6. Remove packing retainer (8), spacer (9), preformed packing (10), and spring (11) from bolt (3). Discard preformed packing.
7. Remove bolt (3) and gasket (12) from oil filter housing (1). Discard gasket.



INSTALLATION

1. Clean oil filter housing (1) with cleaning compound.
2. Install bolt (2) and new gasket (3) in oil filter housing (1).
3. Install spring (4), new preformed packing (5), spacer (6), and packing retainer (7) on bolt (2).
4. Install new oil filter element (8), new gasket (9), and nut (10) in oil filter housing (4).
5. Install oil filter housing (1) with new oil filter element (8) on filter head (11).
6. Install drain plug (12) in oil filter housing (1).



FOLLOW-THROUGH STEPS

1. Connect both battery negative leads (WP 0292 00).
2. Add oil if needed (WP 0128 00).
3. Lower center seat (see your -10).

END OF TASK

REPLACE ENGINE OIL FILTER ASSEMBLY (M548A1) 0145 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts
Cleaning compound (WP 0542 00, Item 9)
Sealing compound (WP 0542 00, Item 39)
Sealing compound primer (WP 0542 00, Item 40)
Engine oil (WP 0128 00)
Suitable container

Personnel Required
Unit Mechanic

References
See your -10
Standard Operating Procedures

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Battery negative lead disconnected (WP 0292 00)
Power plant right rear access cover removed (see your -10)
Top access cover and grilles removed (WP 0390 00)

REPLACE ENGINE OIL FILTER ASSEMBLY (M548A1) — Continued 0145 00

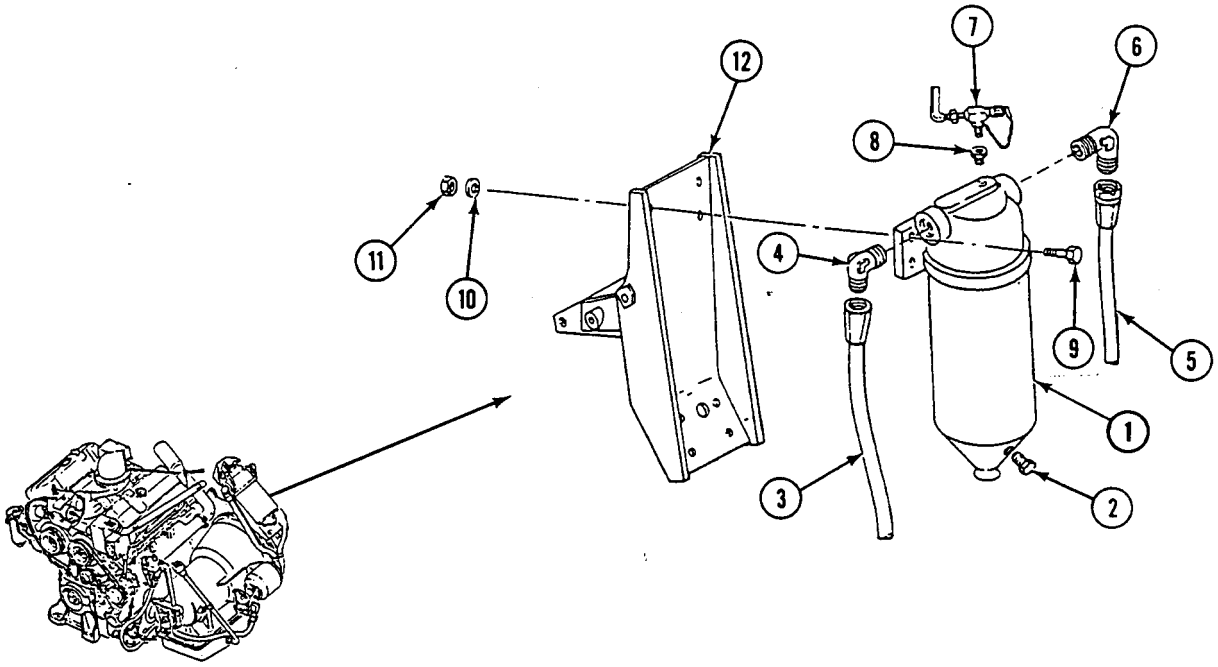
REMOVAL

1. Place suitable container under oil filter assembly (1).
2. Remove drain plug (2) from oil filter assembly (1). Allow engine oil to drain.

NOTE

Dispose of engine oil in accordance with Standard Operating Procedures.

3. Disconnect oil hose (3) and oil hose (5) from elbow (4) and elbow (6).
4. Remove elbows (4, 6) from oil filter assembly (1).
5. Remove sampling valve (7) and bushing (8) from oil filter assembly (1).
6. Remove four screws (9), two washers (10), four nuts (11), and oil filter assembly (1) from bracket (12).



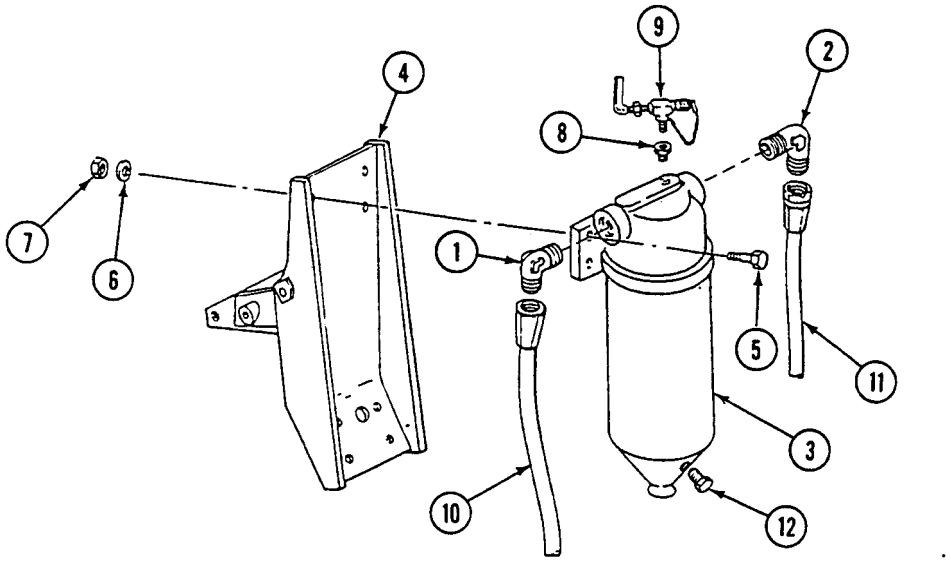
INSTALLATION

1. Clean external threads of elbow (1) and elbow (2) with cleaning compound.
2. Apply a thin even coat of sealing compound primer and sealing compound to cleaned external threads of elbow (1) and elbow (2) before installation.

NOTE

Washers (6) are used on the two top screws only.

3. Install oil filter assembly (3) on bracket (4) with four screws (5), two washers (6), and four nuts (7).
4. Install bushing (8) and sampling valve (9) on oil filter assembly (3).
5. Install elbow (1) and elbow (2) on oil filter assembly (3).
6. Install oil hose (10) and oil hose (11) on elbow (1) and elbow (2).
7. Install drain plug (12) in oil filter assembly (3)



8. Add engine oil (WP 0128 00).

FOLLOW-THROUGH STEPS

1. Connect battery negative lead (WP 0292 00).
2. Start engine (see your -10).
3. Check filter assembly for leaks.
4. Stop engine (see your -10). Wait about 20 minutes for engine oil to drain back to pan. Then check oil level. Add oil if needed (WP 0128 00).
5. Install top access cover and grilles (WP 0390 00).
6. Install power plant right rear access cover (see your -10).

END OF TASK

REPLACE ENGINE OIL FILTER ASSEMBLY (M548A3) 0146 00

THIS WORK PACKAGE COVERS:

INITIAL SETUP:

Maintenance Level
Unit

Tools and Special Tools
General Mechanic's Tool Kit (WP 0541 00, Item 57)

Materials/Parts
Sealing compound (WP 0542 00, Item 39)
Sealing compound primer (WP 0542 00, Item 40)
Lock nuts (4)
Suitable container

Personnel Required
Unit Mechanic

References
See your -10
See your PMCS
Standard Operating Procedures

Equipment Condition
Engine stopped (see your -10)
Carrier blocked (see your -10)
Center seat raised (see your -10)
Both battery negative leads disconnected (WP 0292 00)

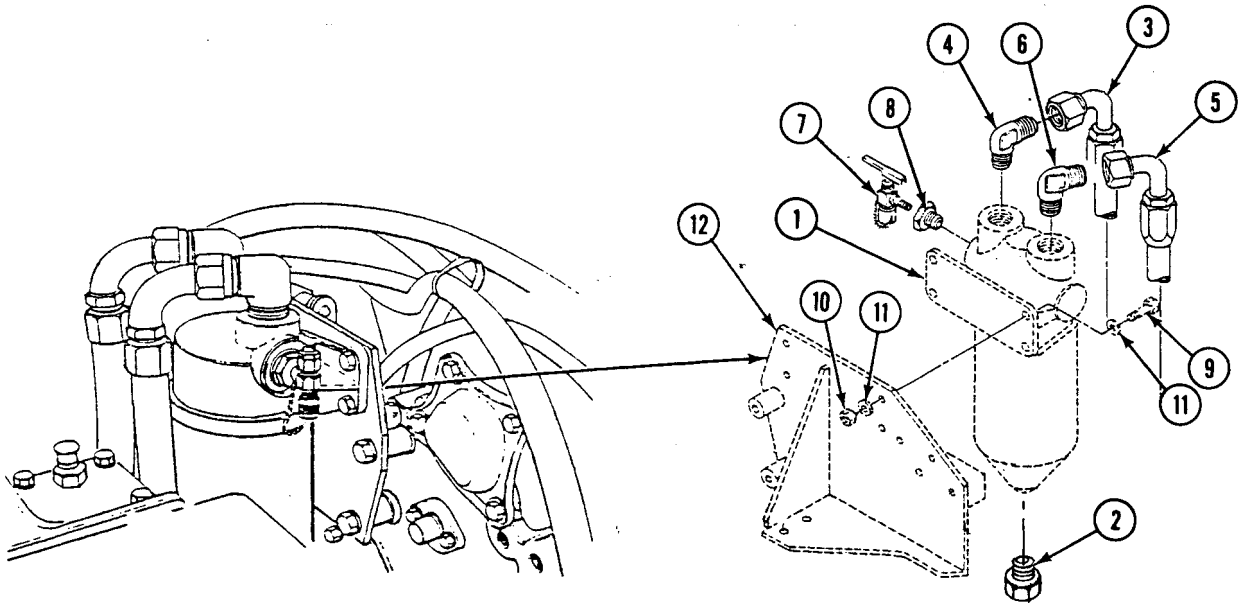
REMOVAL

1. Place a clean suitable container of at least 1 quart (1 liter) capacity under oil filter assembly (1).

NOTE

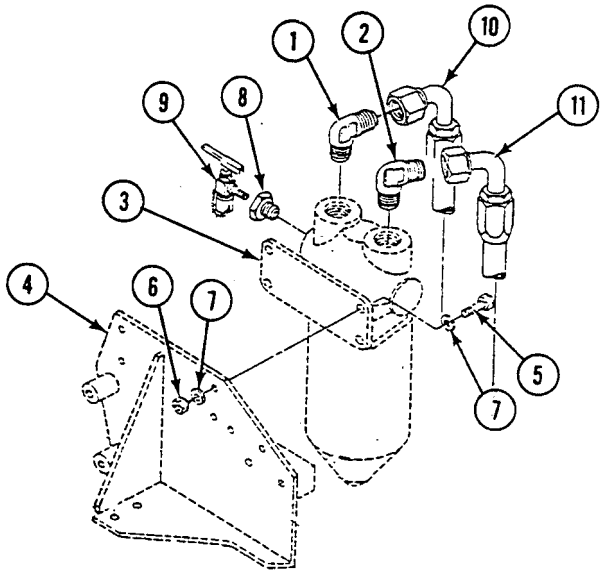
Dispose of engine oil in accordance with Standard Operating Procedures.

2. Remove drain plug (2) from oil filter assembly (1). And allow engine oil to drain from filter.
3. Disconnect inlet hose (3) from elbow (4).
4. Disconnect outlet hose (5) from elbow (6).
5. Remove elbows (4 and 6) from oil filter assembly (1).
6. Remove AOAP sampling valve (7) and bushing (8) from oil filter assembly (1).
7. Remove four screws (9), lock nuts (10), eight washers (11), and oil filter assembly (1) from bracket (12). Discard lock nuts.



INSTALLATION

1. Apply sealing compound primer and a thin even coat of sealing compound to cleaned external threads of elbow (1) and elbow (2) before installing.
2. Install oil filter assembly (3) on bracket (4) with four screws (5), new lock nuts (6), and eight washers (7).
3. Install bushing (8) and AOAP sampling valve (9) on oil filter assembly (3).
4. Install elbow (1) and elbow (2) on oil filter assembly (3).
5. Connect oil inlet hose (10) to elbow (1).
6. Connect oil outlet hose (11) on elbow (2).
7. Start engine (see your -10). Check oil filter assembly (3) for leaks.



8. Stop engine (see your -10). Wait about 20 minutes for oil to drain back to pan. Then check oil level. Add oil if needed (WP 0128 00).

FOLLOW-THROUGH STEPS

1. Connect both battery negative leads (WP 0292 00).
2. Lower center seat (see your -10)

END OF TASK

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By Order of the Secretary of the Army:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff

Official

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0105107

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PUBLICATION/FORM NUMBER	DATE	TITLE

ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON

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PUBLICATION NUMBER	DATE	TITLE

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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PUBLICATION/FORM NUMBER	DATE	TITLE

ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON

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PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE

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, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	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 OAASA	Use Part II *(reverse)* for Repair Parts and Special Tool 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	DATE	TITLE

ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON

** Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, 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	DATE	TITLE

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, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

METRIC CONVERSION CHART

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Centimeters	Cubic Inches	0.060
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621

TEMPERATURE CONVERSIONS

$5/9\ (^{\circ}F - 32) = {}^{\circ}C$
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
$9/5\ C^{\circ} + 32 = F^{\circ}$

PIN: 073084-000