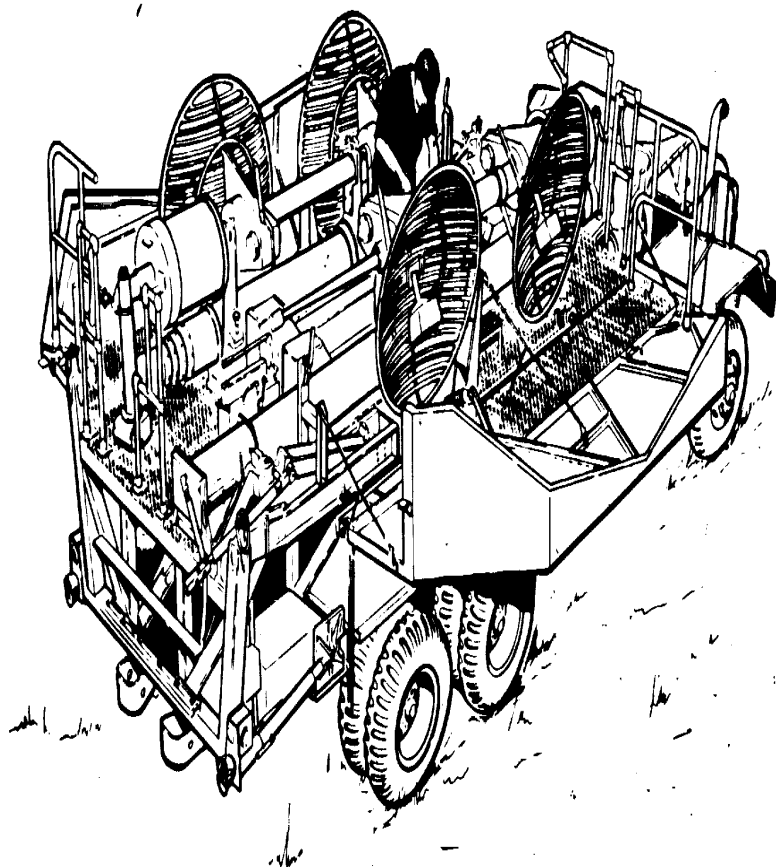


**DIRECT SUPPORT AND GENERAL
SUPPORT MAINTENANCE MANUAL
MAST GROUP, HYDRAULIC-PNEUMATIC
OA-9054(V)4/G
(NSN 5985-01-129-1794)**



This copy is a reprint which includes current pages from Changes 1 through 5.

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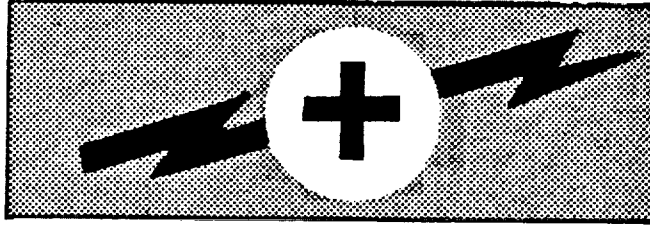
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HEADQUARTERS, DEPARTMENT OF THE ARMY

5 DECEMBER 1983

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 electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. When the technician is aided by operators, he must warn them about dangerous areas.

Whenever possible, the power supply to the equipment must be shut off before beginning work on the equipment. Take particular care to ground capacitors likely to hold a dangerous potential. When working inside the equipment, after the power has been turned off, always ground every part before touching it.

Be careful not to contact high-voltage connections or 115 volt ac input connections when installing or operating this equipment.

Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through the body.

WARNING: Do not be misled by the term "low voltage". Potential as low as 50 volts may cause death under adverse conditions.

For Artificial Respiration, refer to FM 21-11.

WARNING

**Position vehicle so there are no overhead obstructions
especially power lines!**

WARNING

Adequate ventilation should be provided while using TRICHLOROTRI-FLUOROTHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROE-THANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

CHANGE

No. 5

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DEPARTMENT OF THE ARMY
Washington, DC, 1 September 1988

DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL
MAST GROUP, HYDRAULIC-PNEUMATIC OA-9054(V)4/G
(NSN 5985-01.129-1794)

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Remove pages	Insert pages
iii and iv.....	iii and iv
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Maintenance Manual
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Remove pages	Insert pages
1-7 and 1-8	1-7 and 1-8
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CHANGE
NO. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 1 September 1986

Direct Support and General Support
Maintenance Manual
MAST GROUP, HYDRAULICPNEUMATIC OA.9054V)4/G
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1-7 through 1-10	1-7 through 1-10
1-15 through 1-19/(1-20 blank)	1-15 through 1-19/(1-20 blank)
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2-11 and 2-12	2-11 and 2-12
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2-149 through 2-155/(2-156 blank)	2-149 through 2-155/(2-156 blank)
2-157 through 2-160	None

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Change 3 7

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3-215 and 3-216
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Remove pages

v and vi

1-11 through 1-16

2-13 and 2-14

2-43 and 2-44

2-53 and 2-54

2-79 through 2-82

None

2-107 and 2-108

2-141 and 2-142

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Maintenance Manual
for
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Remove pages	Insert pages
None	A
iii through vi	iii through vi
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1-19/(1-20 blank)	1-19/(1-20 blank)
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Change 1

WARNING

NEVER attempt to open hydraulic bleed plugs on hydraulic cylinder, unless you have a crane or wrecker supporting mast, or mast is fully lowered. Mast can lower **VERY RAPIDLY** when bleed plugs are opened, severely injuring or killing personnel.

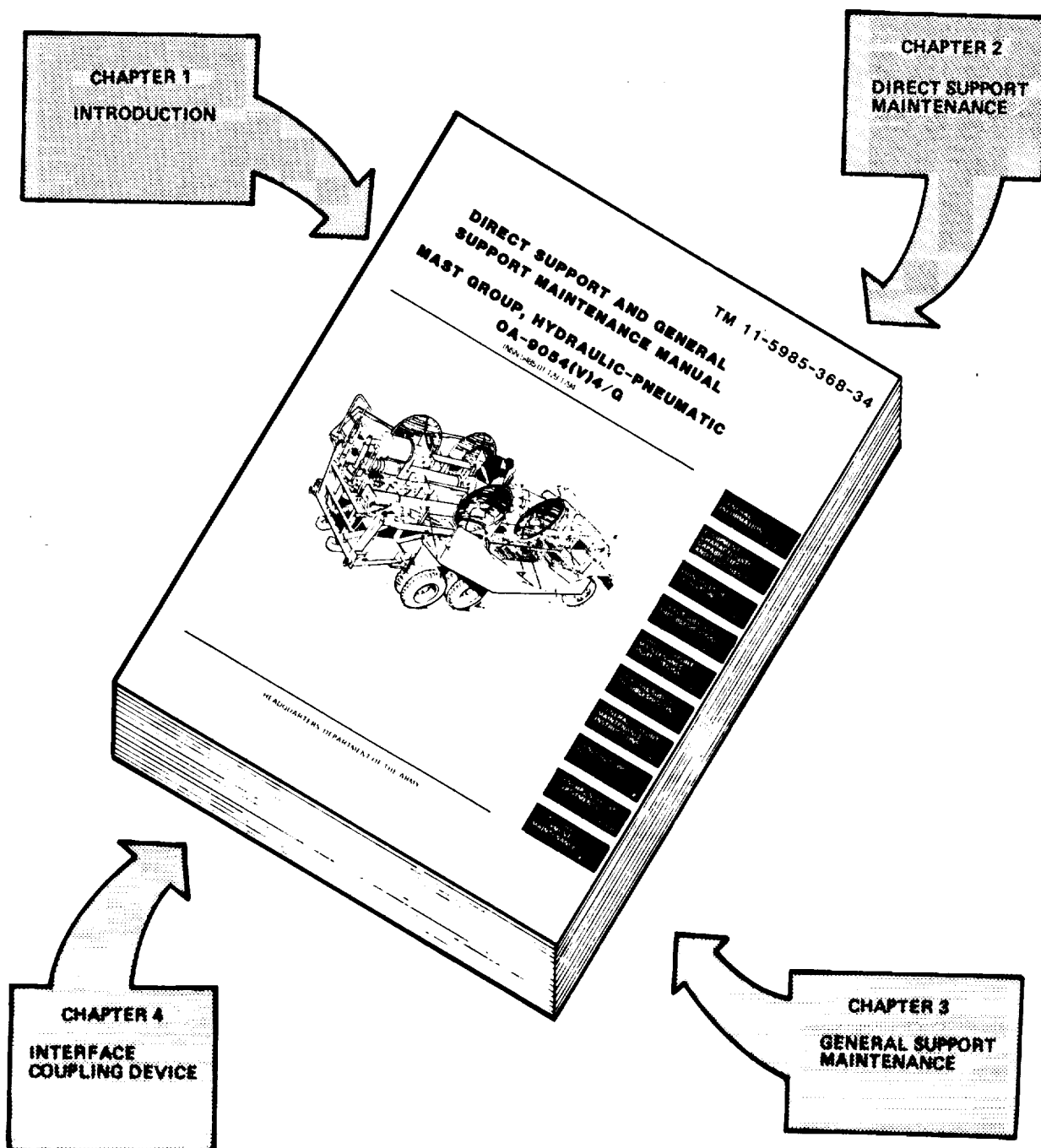
WARNING

Mast shall only be raised at a horizontal distance of more than twice the maximum height of the mast from power lines.

Change1

HOW TO USE THIS MANUAL

- This manual tells you how to repair your Hydraulic-Pneumatic Mast Group OA-9054(V)4/G at the Direct Support level and at the General Support level. Briefly, here's how the manual is organized:



- You will find information about the controls and indicators and how to operate the equipment in the Operator's and Organizational Maintenance Manual, TM 11-5985-368-12&P.
- **You must familiarize yourself with the entire maintenance procedures before beginning the maintenance task.**
- As a maintenance technician, you are responsible for maintaining and repairing equipment. During training they told you the surest and quickest way to fix your mast group was by using your manual, so you grab your manual.
- **How do you start?**
Turn to the cover of your manual.
On the right side find the index block for troubleshooting at your level of maintenance; for example GENERAL SUPPORT TROUBLESHOOTING. The block tells you to go to a page. To find that page quickly, open your manual to the black tab that lines up with the GENERAL SUPPORT TROUBLESHOOTING block.
- **What kind of problem do you have?**
Find the SYMPTOM INDEX on the page.
Find your symptom, for example: Mast fails to extend. Next to the symptom is the malfunction number of the troubleshooting procedure that will help you solve your problem.
- **How do you find out what is causing your problem?**
Turn to the procedure page.
Perform each step of the procedure until you find the defect. You will be directed to a maintenance instruction.
- **How do you fix it?**
Turn to the maintenance instruction.
Follow the instructions for correcting the problem. When required, you will be directed to a post-maintenance test. It will enable you to verify that the repair has actually corrected the problem. From post-maintenance test, you may be further directed to an adjustment procedure. It will tell you how to set an adjustment to bring operation within specified limits. Now-you are ready to go!

Technical Manual
No. 11-5985-368-34

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 5 December 1983

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL I
FOR
MAST GROUP, HYDRAULIC-PNEUMATIC
OA-9054(V)4/G
(NSN 5985-01-129-1794)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U S Army Communications-Electronics Command and Fort Monmouth, ATTN:AMSEL-LC-ME-PS, Fort Monmouth, New Jersey 07703-5000. In either case, a reply will be furnished direct to you.

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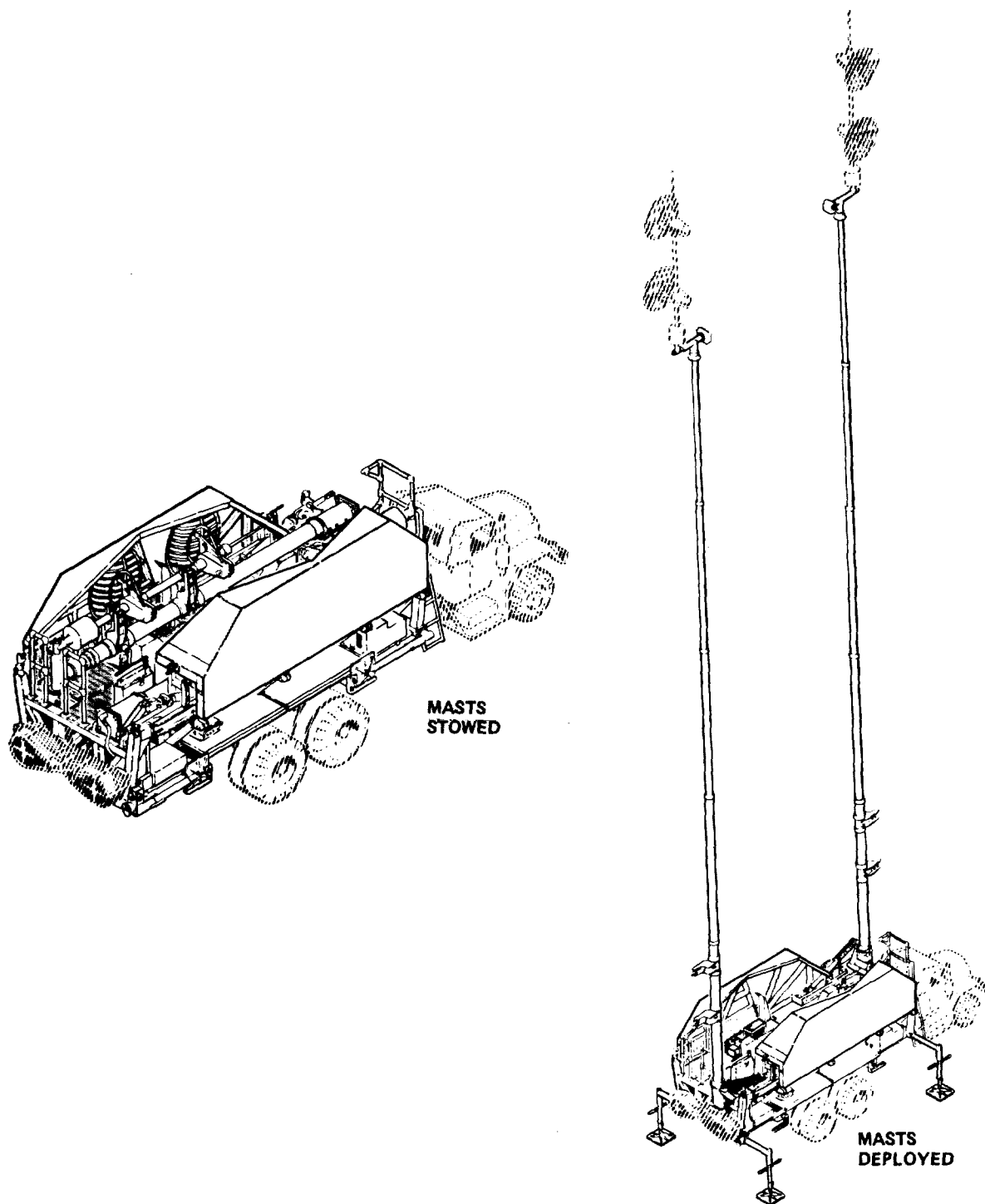


Figure 1-0. Hydraulic Pneumatic Mast Group OA-9054(V)4/G

CHAPTER 1

INTRODUCTION

SECTION I. GENERAL INFORMATION

1-1. SCOPE

Type of Manual:	Direct Support and General Support Maintenance
Equipment Name:	Mast Group, Hydraulic-Pneumatic OA-9054(V)4/G
Purpose of Equipment:	Supports and activates two telescoping masts for rapid elevation of communications antennas (see fig. 1-0)

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, as contained in Maintenance Management Update.

1-3. DESTRUCTION OF ARMY ELECTRONICS MATERIEL

Destruction of Army electronics material to prevent enemy use shall be in accordance with TM 750-244-2.

1-4. PREPARATION FOR STORAGE OR SHIPMENT

Refer to Section V for information about preparing the mast group for storage or shipment.

1-5. NOMENCLATURE CROSS-REFERENCE LIST

The listing which follows provides a cross-reference from the common names for the equipment in this manual, and the official nomenclature assigned to the equipment.

<u>Common Name</u>	<u>Official Nomenclature</u>
Antenna Clamp	Clamp, Antenna
Antenna Protective Cover Pump	Hydraulic Component Assembly
Antenna Protective Cover	Cover, Protective

<u>Common Name</u>	<u>Official Nomenclature</u>
Antitorque Plate	Plate, Keyway, Anti-Torque
Cable	Cable Assembly
Distribution Box	Distribution Box J-3747/G
HCA Protective Covers	Cover, Hydraulic Component
Hydraulic Component Assembly (HCA)	Hydraulic Component Assembly MX-10213/G
Hydraulic Cylinder	Cylinder, Actuating, Linear
Mast	Mast-Pneumatic-72 ft. AB-1294/G
Mast Clamp	Clamp, Mast
Mast Control	Control, Mast C-10963/G
Mast Group	Mast Group, Hydraulic-Pneumatic 0A-9054(V)4/G
Mast Protective Covers	Cover, Protective-Mast
PCA Protective Covers	Cover, Protective
Pneumatic Component Assembly (PCA)	Pneumatic Component Assembly MX-10203/G
Trunnion	Bar

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your mast group 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 the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-PA-MA-D, Fort Monmouth, New Jersey 07703-5023. We'll send you a reply.

Section II. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

1-7. SUMMARY

CHARACTERISTICS

- Provides self-contained mobile equipment for rapidly elevating and stowing four communications antennas.
- Consists of two identical telescoping masts with independent and identical support equipment.

CAPABILITIES

- Operates on truck battery 28 Vdc power if external source of 115 Vac fails.
- Can be removed from truck as a unit for shipment by rail or air.
- Operates in a wide range of environmental conditions.
- Can be stored outdoors with only a minimum of protection.

FEATURES

- Each mast may be operated independently
- Has built-in interlocks to prevent unsafe operation.
- Uses modular replaceable assemblies to reduce equipment downtime.

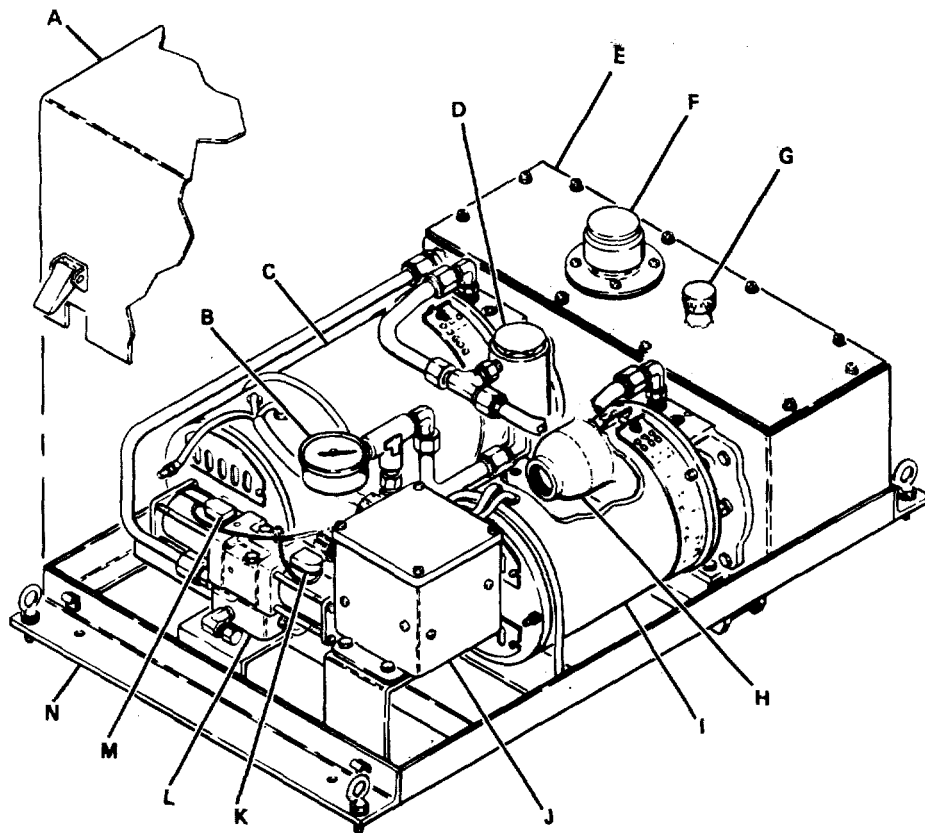
1-8. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

MAST GROUP

Refer to the Operator's and Organizational Maintenance Manual, TM 11-5985-368-12&P, for location and description of the major components of the mast group.

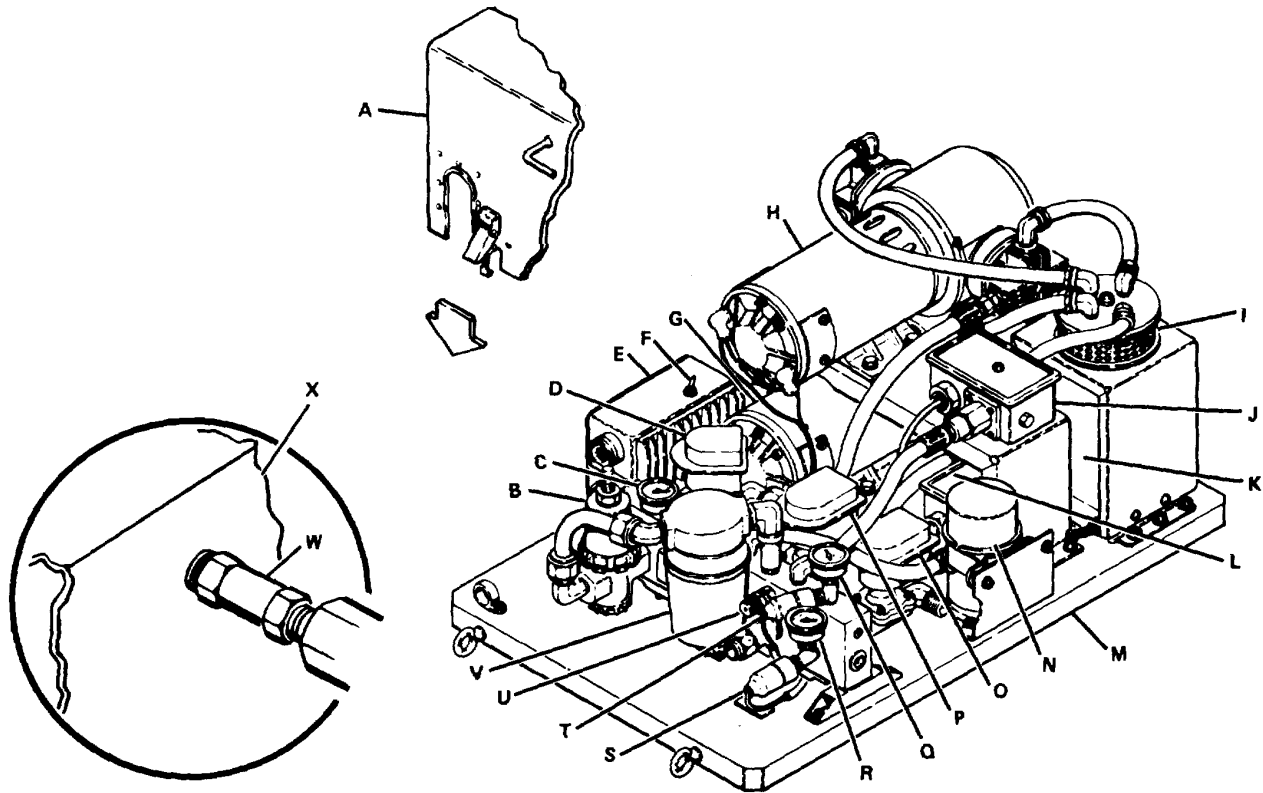
Location and description of major components of the Hydraulic Components Assembly (HCA) and Pneumatic Components Assembly (PCA) are provided in the two following paragraphs.

HYDRAULIC COMPONENTS ASSEMBLY (HCA)



- A COVER-Sheet metal, with four catches.
- B GAGE-Bourdon-tube type, dial indicating, 0-3000 psig.
- C 90 VDC PUMP MOTOR A1-Motor-driven gear pump.
- D FILTER-Inline wire mesh, cleanable.
- E TANK-Sheet metal reservoir, 2.1 gallon capacity.
- F CAP-Breather type with 40-micron filter, bayonet closure, retaining chain. Closes filler neck that has strainer basket.
- G CAP-Gage rod and cap (dipstick).
- H HEATER ELEMENT A3-Immersion type.
- I 24 VDC PUMP MOTOR A2-Motor-driven gear pump.
- J JUNCTION BOX-Includes two terminal boards (TB1 and TB2) and connector J1.
- K CONNECTOR A4P2-Two prong molded connector with integral molded leads.
- L VALVE A4-Three-position, four-port, double solenoid actuated.
- M CONNECTOR A4P1-Two prong molded connector with integral molded leads.
- N FRAME-Welded metal support frame with four hoisting eyes.

PNEUMATIC COMPONENTS ASSEMBLY (PCA)



- A COVER-Sheet metal, with four catches.
- B REGULATOR-Manually-adjustable, diaphragm-and-spring type, air pressure.
- C GAGE-Bourdon-tube type, dial indicating, 0-60 psig, placarded MANIFOLD PRESSURE.
- D VALVE A2 (extend valve)-Normally-closed, solenoid-actuated valve, opens electrically.
- E JUNCTION BOX-Includes rectifier (CR1), relay (K1), and two receptacles (J1 and J2).
- F SWITCH S6-Two-position toggle, placarded HEATER.
- G COMPRESSOR A1-Two-cylinder reciprocating air pump, driven by integral dc motor, protected by overpressure relief valve.
- H COMPRESSOR A5-Two-cylinder reciprocating air pump, driven by integral dc motor, protected by overpressure relief valve.
- I FILTER ELEMENT-Cartridge-type, disposable, fire-resistant paper, air filter.

PNEUMATIC COMPONENTS ASSEMBLY (PCA)-Continued

J	SWITCH S4-Pressure actuated, opens at preset pressure.
K	TRANSFORMER T1-Power line voltage stepdown transformer.
L	SWITCH S1-Pressure actuated, opens at preset pressure.
M	BASE-Sheet metal platform for PCA equipment, shock mounted, provided with four lifting eyes.
N	CAPACITOR C1-27,000 microfarad fixed electrolytic capacitor.
O	VALVE A3 (retract valve)-Normally-closed, solenoid valve, opens electrically.
P	VALVE A4 (safety valve)-Normally-open, solenoid valve, closes electrically.
Q	GAGE-Bourdon-tube type, dial indicating, 0-160 psig, placarded TANK PRESSURE.
R	GAGE-Bourdon-tube type, dial indicating, 0-60 psig, placarded MAST PRESSURE.
S	SWITCH S3-Pressure actuated, opens at preset pressure
T	SWITCH S2 (tank pressure indicating)-Pressure actuated, opens at preset pressure.
U	VALVE (safety relief)-Spring type, vents to atmosphere at preset pressure.
V	FILTER-Centrifugal type moisture filter
W	VALVE-One-way check valve, one each used in two compressor outlet lines.
X	MANIFOLD-Interconnects pneumatic components.

1-9. EQUIPMENT DATA

Refer to TM 11-5985-368-12&P, for equipment data for Operator and Organizational support of the Mast Group. Data for components maintained by Direct Support and General Support are given in table 1-1.

Table 1-1. EQUIPMENT DATA

Antenna Protective Cover	
Length	172.5 inches
Height	59 inches
Width	32 inches
Antenna Protective Cover Pump	
Maximum Pressure Rating	3000 psi
Reservoir Capacity	120 cubic inches
Handle Force	
@ 3000 psi (maximum)	128 lbs.
@ 1500 psi	64 lbs.
Cable Tray	
Length	120 inches
Height	18.5 inches
Width	8 inches
Linear Actuating Cylinder	
Normal Operating Pressure	1200 to 2000 psi
1000 Interlock Switch (part of cylinder assembly)	
Type . single pole, double throw, normally closed	
Rating (ac)	10 amp @ 125
Rating (dc)	3 amp @ 125
0° Interlock Switch (part of cylinder assembly)	
Type .double pole, double throw, normally closed	
Rating (both circuits, ac).....	10 amp @ 125
Rating (both circuits, dc).....	3 amp @ 125
Rod Travel	33.25 inches
Deleted	
Weight	150 lbs.
Distribution Box	
Circuit Breakers (trip amperage)	
CB1 and CB2	10 amps
CB3 and CB4	35 amps
CB54	50 amps
CB6 (later model only).....	5 amps
Relay (K1)	
Type	three
.....	pole, single throw
Capacity	50 amps @ 28Vdc

Table 1-1. EQUIPMENT DATA-Continued

Relay (K2)	
Type	single pole, single throw
Capacity	50 amps @ 28 Vdc
Diode (CR1) maximum capacity.....	35 amps @ 400V
Diode (CR2) maximum capacity.....	35 amps @ 1000V
Diode (CR3) maximum capacity.....	35 amps @ 1000V
Weight	23 lbs.
Pneumatic Components Assembly (PCA)	
Compressor (A1 or A5)	
Motor Rating	1/3 horsepower
Motor Operating Voltage	24 Vdc
Motor Speed.....	1725 rpm
Safety Valve Range (adjustable)	0 to 115 psi
Air Capacity @ 0 psi (open).....	2.4 cfm
Air Capacity @ 100 psi.....	1.10 cfm
Relay (K1)	
Type	single pole, single throw
Capacity	50 amps @ 28 Vdc
Pressure Switch (S1 and S4)	
Type	single pole, single throw
Pressure Range.....	10 to 180 psig
Pressure Setting.....	90 to 95 psi
Pressure Switch (S2 and S3) single pole,	
Maximum Pressure	150 psig
Pressure Setting (S3).....	5 to 10 psi
Pressure Setting (S2)	90 to 95 psi
Solenoids (all)	
Operating Voltage	24 Vdc
Power Rating.....	11.2 watts
Safe Working Pressure (maximum).....	300 psi
Transformer (information below is dependent on how transformer is hooked up)	
Primary Voltage Input (@ 50 to 500 Hz).....	115 Vac
Secondary Voltage Output (@ 50 to 500 Hz).....	24 Vac
Weight	164 lbs.
Hydraulic Component Assembly (HCA)	
24 Vdc Motor	
Voltage Rating.....	24 Vdc
Motor Rating.....	3/4 horsepower
Motor Speed.....	3600 rpm
Displacement (cyclic)	0.036 cubic inches

Table 1-1. EQUIPMENT DATA - Continued

90 Vdc motor	
Voltage rating	90 Vdc
Motor rating	1 1/2 horsepower
Motor Speed	3900 rpm
Displacement (cyclic)	0.072 cubic inches
Four way solenoid valve	
Valve type	spring centered
Voltage	24 Vdc
Flow capacity	1.5 gpm
Pressure rating (all ports) (maximum)	3000 psi
Heating Element	
Supply voltage (3 wire, single phase)	120 V rms
Power rating	250 watts
Thermostat setting	720 F
Weight	147.5 lbs.
Antenna Positioner Gear Assembly	
Type	worm gear
Gear ratio	60:1
Deleted	
Interface Coupling Device (ICD)	
Diode (CR1) maximum capacity	35 amps @ 400V
Diode (CR2) maximum capacity	5 amps @ 600V
Relay (K1)	
Type	single pole, single throw
Capacity	50 amps @ 28 Vdc
Circuit Breakers (trip amperage)	
CB1	35 amps
CB2	50 amps

1-10. SAFETY, CARE, AND HANDLING

SAFETY

- You must READ and OBSERVE all WARNINGS in the maintenance procedure you are performing. They are put there to help you avoid injury and possible death.
- You must always report unsafe equipment conditions to your supervisor.
- If equipment electrical power is on, find out where shutdown switches or circuit breakers are located before beginning maintenance. You must be able to turn power off quickly in an emergency.

CARE

- Keep all gages and indicators clean and in operating condition.
- Wipe up hydraulic fluid and lubricant spills immediately to avoid slippery handholds and footing.
- Keep your mast group clear of any object that could obstruct or be knocked off by moving equipment.

HANDLING

- Make certain that adequate clearance is available in the maintenance area before operating the mast group. See figure 1-1 for minimum clearances.
- When removing major components, make certain that lifting slings are securely attached. Alert others in the immediate area before moving the equipment. Place the component on a clean surface that is known to be capable of supporting the weight of the component.

SECTION III. PRINCIPLES OF OPERATION

1-11. MAST GROUP

Refer to the Operator's and Organizational Maintenance Manual, TM-11-5985-368-12&P, for the technical principles of operation of the mast group.

Principles of operation of the three functional systems: pneumatic, hydraulic, and electrical are provided in following paragraphs.

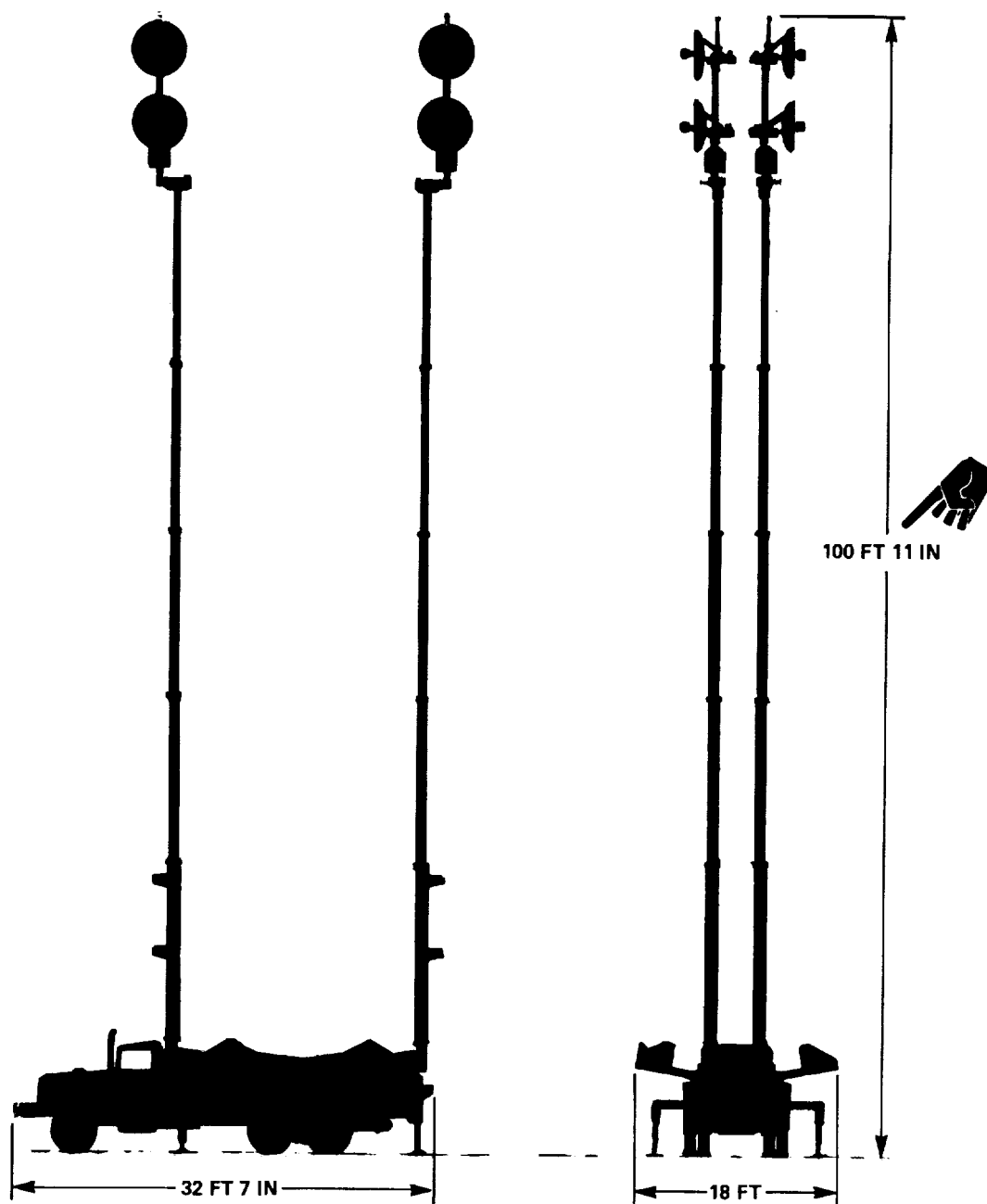
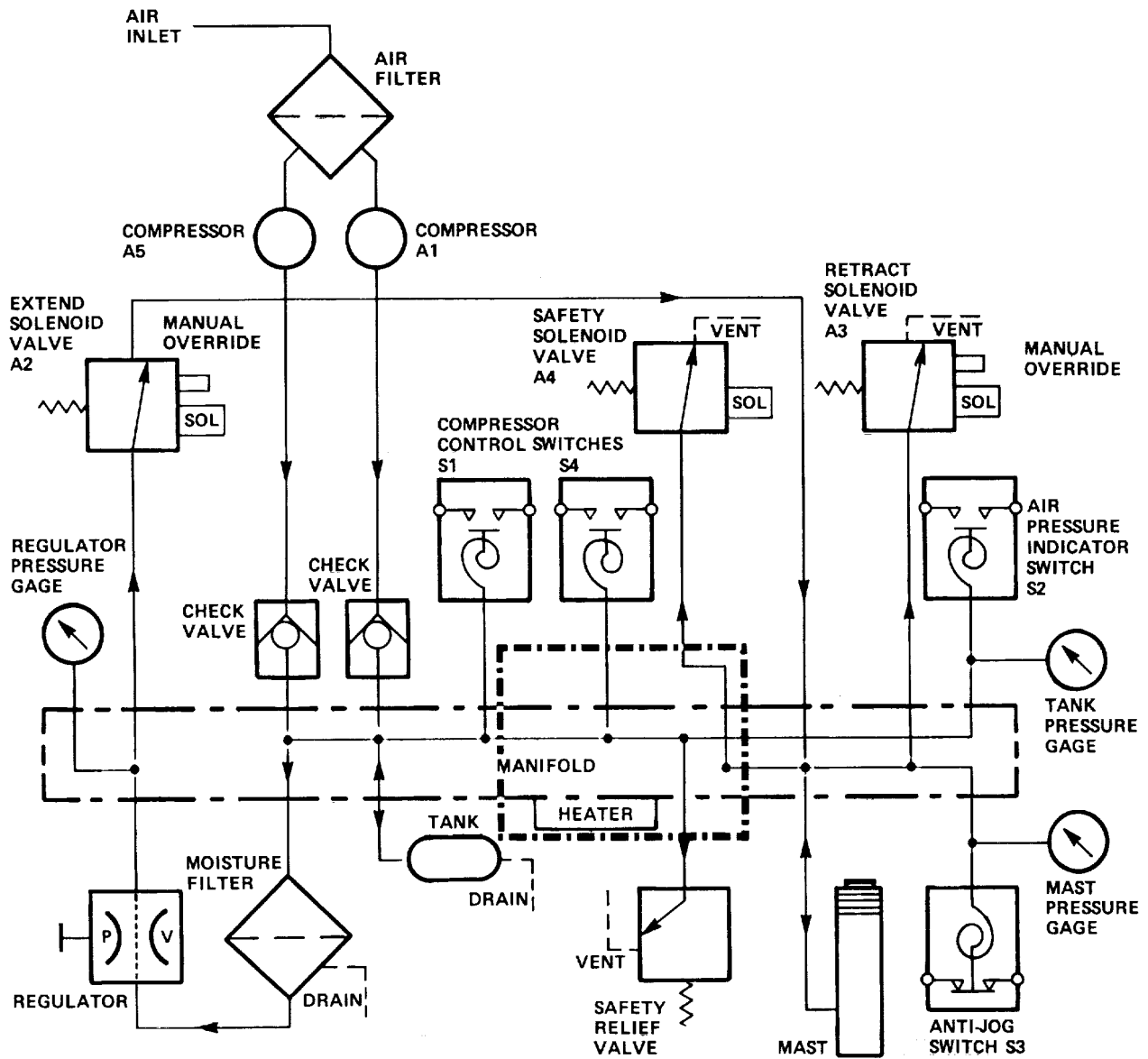


Figure 1-1. Minimum Clearances Required for Maintenance Operation of Mast Group

1-12. PNEUMATIC SYSTEM



INLET AIR FILTER - Removes dust and other airborne solids from compressor inlet air.

COMPRESSOR A5 - Compresses air used to extend mast. Operates on rectified alternating current (ac)

CHECK VALVE - Prevents air from venting from mast through compressor when compressor is not operating.

MANIFOLD - Interconnects air lines with control and operating devices.

COMPRESSOR A1 - Compresses air used to extend mast. Operates on direct current (dc). Provides alternate or additive source of compressed air.

TANK - Stores compressed air.

COMPRESSOR CONTROL SWITCH S4 - Senses tank air pressure and turns compressor A5 on and off to maintain tank air pressure.

COMPRESSOR CONTROL SWITCH S1 - Senses tank air pressure and turns compressor A1 on and off to maintain tank air pressure.

TANK PRESSURE GAGE - Measures and indicates tank air pressure.

AIR PRESSURE INDICATOR SWITCH S2 - Senses tank air pressure and provides a switch closure to light mast control panel AIR PRESSURE indicator when tank pressure is 80 - 85 psig.

MOISTURE FILTER - Removes water vapor from mast air pressure line.

REGULATOR - Regulates pressure of air supplied to mast after mast is fully extended.

REGULATOR PRESSURE GAGE - Measures and indicates pressure of compressed air supplied to mast.

SAFETY SOLENOID VALVE A4 - Vents compressed air to atmosphere if mast control MAST EXTENSION switch is accidentally set to OUT when mast is in horizontal position. Valve closes when mast has been erected to vertical position.

EXTEND SOLENOID VALVE A2 - When opened (electrically or manually), connects compressed air to mast.

MAST PRESSURE GAGE - Measures and indicates pressure of compressed air supplied to mast.

ANTI-JOG SWITCH S3 - Senses mast air pressure and opens a circuit when pressure exceeds 10 psig. The open circuit disables the hydraulic system to prevent hydraulically actuated movement of an extended mast.

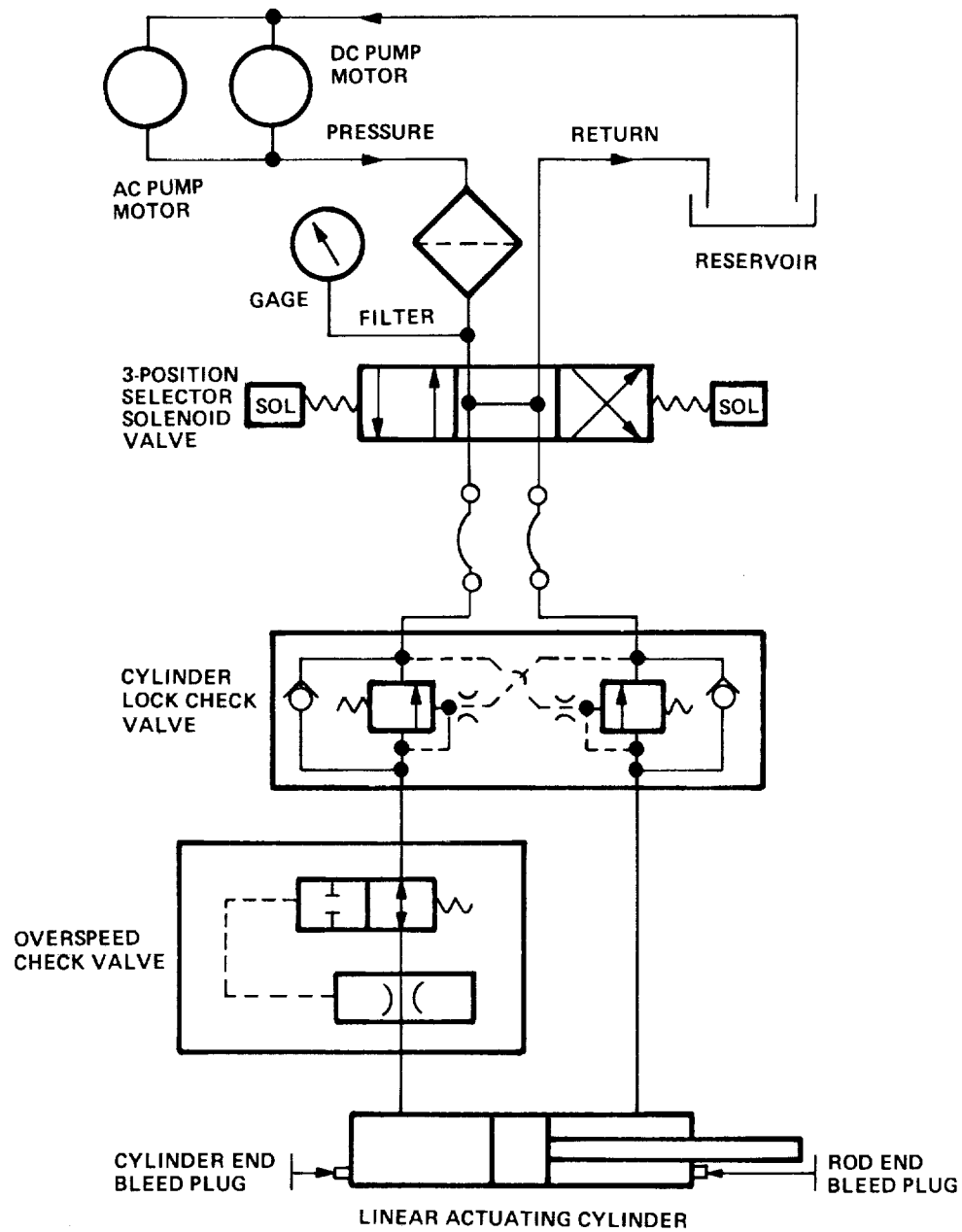
SAFETY RELIEF VALVE - Vents overpressurized air to atmosphere to prevent damage to pneumatic components.

MAST - Telescopes to extended position to elevate communication antennas.

RETRACT SOLENOID VALVE A3 - When opened (electrically or manually), vents compressed air from mast.

HEATER - Heats the manifold for cold weather operation. This prevents moisture in the air from freezing, which could cause pneumatic components to stick. Operates on ac power.

1-13. HYDRAULIC SYSTEM



AC PUMP MOTOR - Supplies pressurized hydraulic fluid for operating the actuating cylinder. Powered by rectified alternating current (ac).

DC PUMP MOTOR - Supplies pressurized hydraulic fluid for operating the actuating cylinder. Powered by truck battery.

FILTER - Removes solid impurities from the hydraulic fluid.

GAGE - Measures and indicates pressure of hydraulic fluid available for doing work.

3-POSITION SELECTOR SOLENOID VALVE - Controls motion and direction of motion of the actuating cylinder.

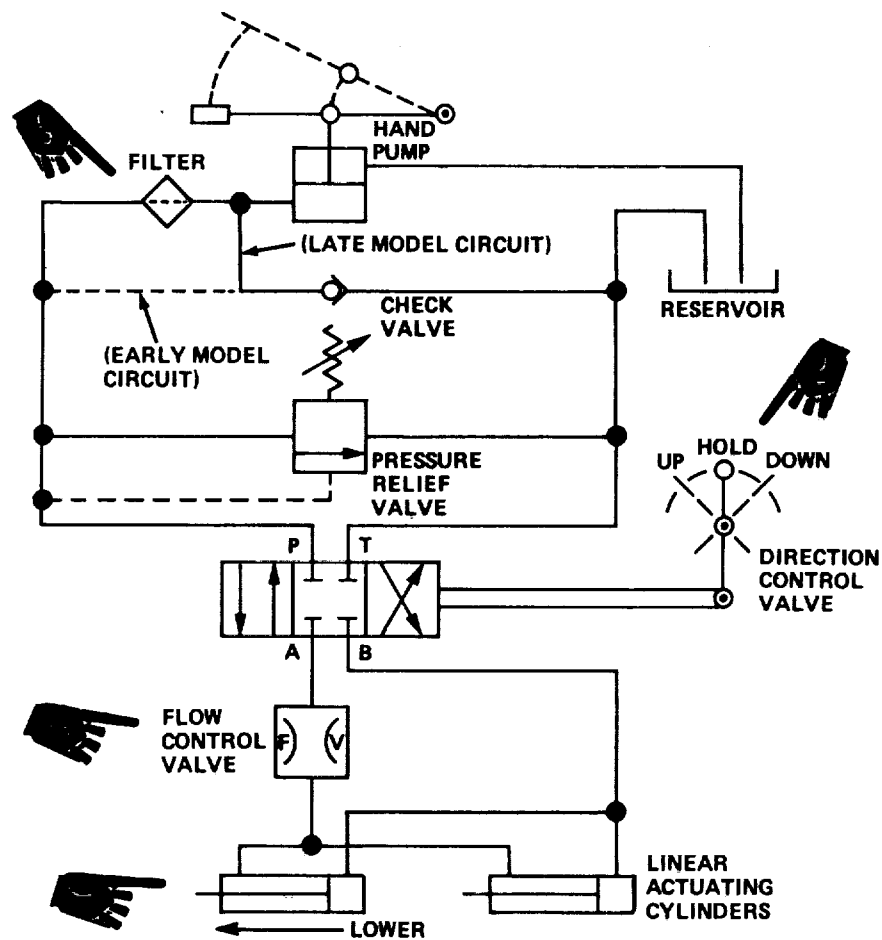
OVERSPEED CHECK VALVE - Limits rate of movement of linear actuating cylinder and mast. Closes hydraulic return line if rate of descent of mast exceeds safe speed (overspeed lockup).

CYLINDER LOCK CHECK VALVE - Shuts off hydraulic fluid flow to prevent creep of actuating cylinder piston from full-in or full-out position. Valve is unlocked when applied pressure is reversed by action of the selector solenoid valve.

ACTUATING CYLINDER - Piston moves when hydraulic pressure is applied to one end of cylinder. Piston rod is mechanically linked to mast to erect or lower mast. Bleed plugs are provided for releasing pressure trapped in the linear actuating cylinder.

RESERVOIR - Stores hydraulic fluid. Is vented to the atmosphere and has a heater that automatically comes on when the temperature drops below a preset point. Two filters inside the reservoir filter the hydraulic fluid to remove solid impurities. A refill cap and dipstick are provided to monitor fluid level and add fluid if required.

1-14. ANTENNA PROTECTIVE COVERS HYDRAULIC SYSTEM



RESERVOIR - Supplies unpressurized hydraulic fluid to hand pump and pressure line. Receives and stores fluid from return line.

HAND PUMP - Applies pressure to hydraulic fluid when pumped by hand. **CHECK VALVE** - Allows hand pump to draw fluid from reservoir during up (return) stroke and blocks flow to reservoir during down (pressure) stroke.

PRESSURE RELIEF VALVE - Senses line pressure and opens to vent excessive pressure into return line.

FILTER - Cleans the hydraulic fluid.

DIRECTION CONTROL VALVE - Controls connection of pressure and return lines to cylinders. Can be set to DOWN (crossover) position, HOLD (blocked) position, or UP (straight through) position.

DOWN - Connects valve port P (pressure) through port A to fixed end of cylinders. Connects valve port through port T (tank) to reservoir.

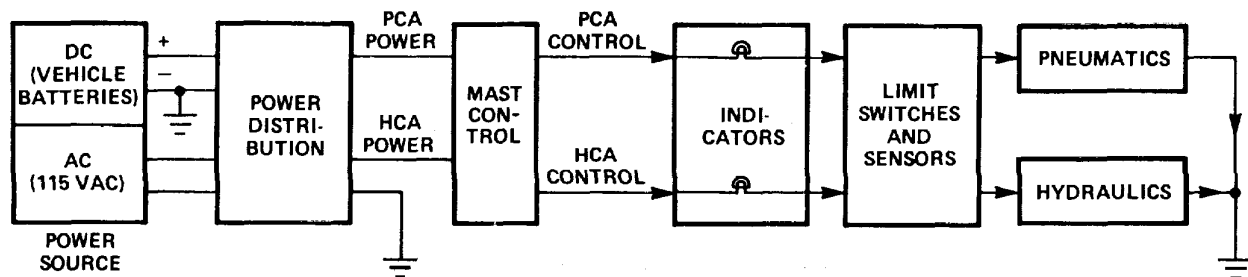
HOLD - Blocks all four ports of valve to lock cylinder pistons against movement.

UP - Connects valve port P through port B to rod end of cylinders. Connects valve port A through port T to reservoir.

FLOW VALVE - Controls rate of flow of hydraulic fluid forced from rod end of cylinders by weight of descending antenna protective covers, thereby controlling rate of descent.

LINEAR ACTUATING CYLINDERS - Provide mechanical force and motion to raise antenna protective covers. Note that covers lower under own weight (without pumping) after they have been physically moved past vertical centerline.

1-15. ELECTRICAL SYSTEM



POWER SOURCE. Uses AC power to control and operate the mast group. Also uses a DC source (vehicle batteries), or AC and DC sources combined.

ELECTRICAL SYSTEM - Continued

POWER DISTRIBUTION. Distributes electrical power for use by control devices, indicators, pumps, solenoids, etc.. Protects circuits against excessive current with circuit breakers.

MAST CONTROL. Permits the operator to control mast group operations with panel-mounted switches. Routes power to limit switches and sensors for control and operation of hydraulic and pneumatic systems.

INDICATORS. Indicate status and mode of mast group operations.

LIMIT SWITCHES AND SENSORS. Monitor the status of the mast group. Act as interlocks to inhibit or initiate mast group operations.

PNEUMATICS. Powers two air compressors.

HYDRAULICS. Powers two hydraulic pumps.

SECTION IV. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT**1-16. REPAIR PARTS**

Repair parts are listed and illustrated in the Repair Parts and Special Tools List (RPSTL), TM 11-5985-368-34P.

1-17. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Refer to the Repair Parts and Special Tools List (RPSTL), TM 11-5985-368-34P, for mast group special tools, TMDE, and support equipment.

1-18. COMMON TOOLS AND EQUIPMENT

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

SECTION V. PREPARATION FOR STORAGE AND SHIPMENT**1-19. STORAGE**

The mast group may be stored for up to 1 year when prepared for storage as follows:

- a. Verify that the mast group has been subjected to an Organizational Maintenance level Preventive Maintenance, Checks, and Services (PMCS) procedure within the preceding 25 days. If not, request that PMCS be performed.
- b. Check that all cable connectors are tight and waterproofed.

- c. Apply a coating of GAA Automotive and Artillery Grease on all unpainted exterior surfaces of mast group.
- d. Enter the name of the equipment, serial number, and date of storage on a large waterproof tag, and place the tag in an easily observable place on the mast group.
- e. Store the mast group on a level surface, using wooden blocks to elevate the structure above any expected accumulations of rainfall.
- f. Package all support equipment in waterproof containers and place containers on the mast group walkways. Where possible, store the mast group under protective cover. Use tarpaulins or waterproof barrier paper covering to protect mast groups stored in open areas.
- g. Inspect the mast group at 3-month intervals for rust, corrosion, and accumulations of dirt. Request corrective maintenance if any of these conditions are found.
- h. Check all appropriate systems manuals for additional storage procedures if mast system is stored with a payload, or if mast system is mounted on a vehicle or shelter.

1-20. SHIPMENT

Prepare the mast group for shipment in accordance with the following procedures:

- a. Perform an Organizational Maintenance level Preventive Maintenance, Checks, and Services (PMCS) procedure if maintenance schedules indicate that PMCS is due to be performed within next 90 days.
- b. Apply a coating of GAA Automotive and Artillery Grease on all unpainted surfaces of the mast group.
- c. Refer to the appropriate regulations in effect for your unit for instructions for loading and securing the mast group on the transport vehicle.

CHAPTER 2

DIRECT SUPPORT MAINTENANCE

SECTION I. DIRECT SUPPORT TROUBLESHOOTING

2-1. GENERAL

- Perform Organizational Preventive Maintenance Checks and Services (PMCS), except do not replace PCA inline filter element. If possible, find out from the operator what's wrong (symptom).
- Refer to SYMPTOM INDEX (para 2-2) and find applicable MALFUNCTION entry.
- Refer to INITIAL SETUP for preparation.
- Turn to referenced MALFUNCTION in table 2-1 and troubleshoot as directed.

WARNING

When disconnecting electrical cables during your PMCS tests, be aware that voltage may be present on electrical equipment connections. Contact could cause accidental injury or death.

WARNING

If wires are disconnected during maintenance and are not reconnected to the same points, the equipment may move unexpectedly. This could cause accidental injury or death.

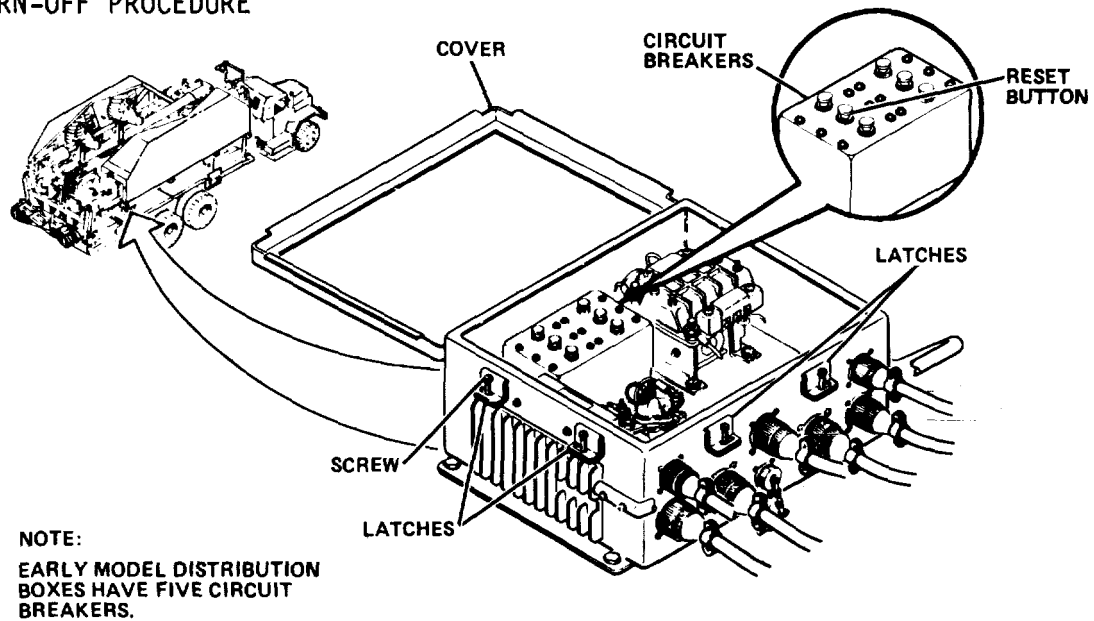
- When you disconnect a wire for any reason attach a tag to indicate the point from which it was disconnected.
- You can use a tie-on tag or even a piece of masking tape wrapped around the wire.
- Write the number or letter of the terminal, wire, or other connection point on the tag.
- Remove the tag after reconnecting the wire.
- Always tag a defective part telling what's wrong before sending the part to a higher level of maintenance. By giving them as much information as possible you can save them some time.
- After performing a troubleshooting procedure, be sure to reassemble any cables, components, etc.
- Unless otherwise indicated in the INITIAL SETUP, each direct support troubleshooting task has a personnel requirement of one Utilities Equipment Repairer.

2-2. MAST GROUP POWER TURN-OFF/TURN-ON PROCEDURES

WARNING

Dangerous ac and dc voltages are present in mast group circuits. When so stated in a maintenance procedure, remove ac and dc power before starting other steps in the procedure. This is done by opening five circuit breakers in the distribution box of the mast system, curbside or roadside, to be repaired. Failure to do so may result in serious injury or death.

POWER TURN-OFF PROCEDURE



1. Using a flat tip screwdriver, loosen six screws securing latches of distribution box cover.
2. Release six latches securing distribution box cover and open cover.
3. Pull reset buttons of all circuit breakers to outer (off) position.
4. Close distribution box cover and attach a tag to warn other personnel that maintenance is in progress.

POWER TURN-ON PROCEDURE

1. Remove warning tag from distribution box cover and open cover.
2. Push reset buttons of all circuit breakers to inner (on) position.
3. Close distribution box cover and secure with six latches.
4. Using a flat tip screwdriver, secure cover latches with six screws.

2-3. TROUBLESHOOTING PROCEDURES

SYMPTOM INDEX

SYMPTOM	MALFUNCTION NO. (table 2-1)
AC COMPRESSOR MODE indicator light will not illuminate	1
DC COMPRESSOR indicator light will not illuminate	2
DC COMPRESSOR MODE indicator light illuminated, but DC COMPRESSOR will not operate	3
AIR PRESSURE indicator light will not illuminate and compressors have stopped operating	4
Mast will raise to vertical, but AC HYDRAULIC pump mode indicator will not illuminate when HYDRAULIC PUMP mode switch is set to AC	5
Mast will not raise when HYDRAULIC PUMP MODE SWITCH is set to AC	6
Mast will raise to vertical, but DC HYDRAULIC pump mode indicator will not illuminate when HYDRAULIC PUMP mode switch is set to DC	7
Mast will not raise, HYDRAULIC PUMP mode switch is set to DC	8
Mast will not lower towards horizontal position	9
Mast will not extend, MAST EXTENSION switch set to OUT	10
Mast will not retract, MAST EXTENSION switch set to IN	11
Mast will not lower past 10 degrees above horizontal	12
AC COMPRESSOR MODE indicator light illuminated, but AC COMPRESSOR will not operate	13

INITIAL SETUPTest Equipment

Multimeter AN/URM-105,
6625-00-581-2036

Personnel Required

Utilities Equipment
Repairer, MOS 52C10 (two)

Tools

Refrig Unit Svce Tool Kit,
5180-000-596-1474
3/8 in. flat tip scdr
7/16 in. comb. wr.
7/16 in. skt
Rcht wr, 1/2 in. dr
No. 2 xtip scdr
5/16 in. flat tip scdr,
5120-00-278-1273

Equipment

Condition
(Para)
(TM 11-5985-
368-12&P
Chapter 3,
Section II)

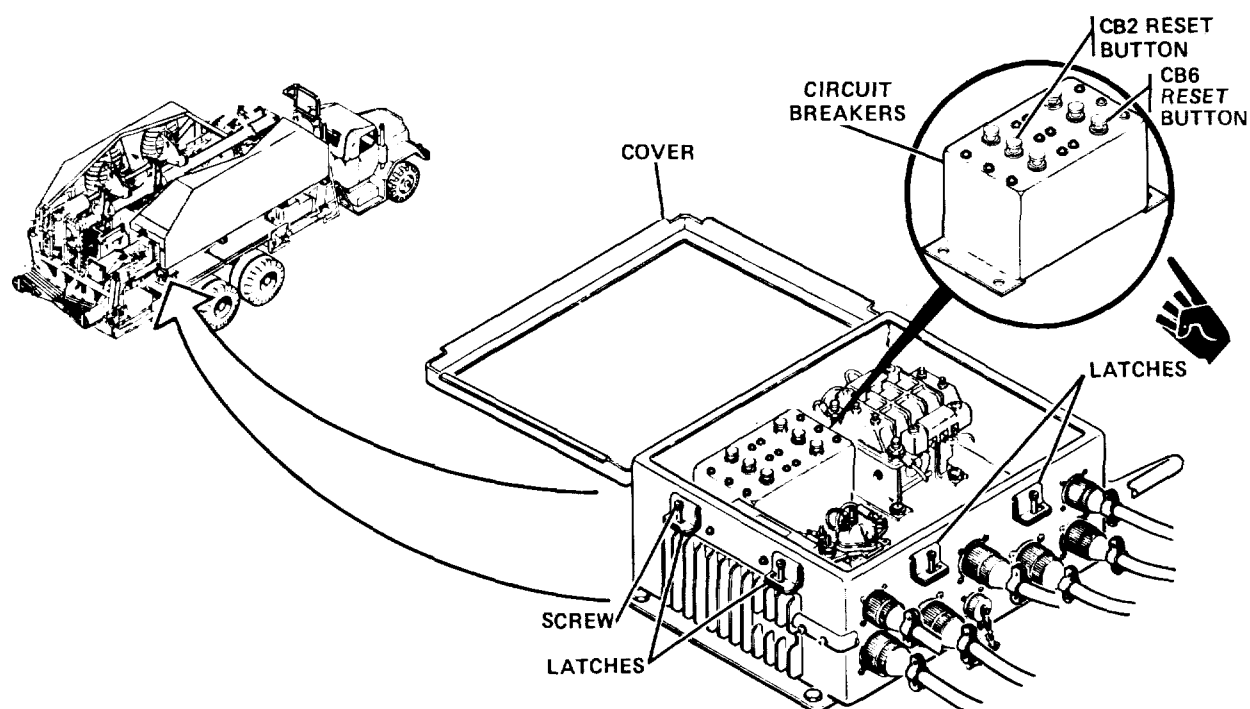
ConditionDescription

Organizational Preven-
tive Maintenance Checks
and Services (PMCS)
performed

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****1. AC COMPRESSOR MODE INDICATOR LIGHT WILL NOT ILLUMINATE**

Step 1. Loosen six screws and release six latches securing distribution box cover. Open cover. Check circuit breakers CB2 and CB6 reset buttons. If a reset button is out, push button in and try to operate equipment. If symptom persists check reset buttons again.

- If circuit breaker CB2 reset button is pushed out, replace PCA (see para 2-19) and push reset button in.
- If circuit breaker CB6 reset button is pushed out, go to step 2 and push reset button in.
- If circuit breaker CB2 reset button is not pushed out, go to step 2.



Step 2. Set COMPRESSOR MODE switch to DC.

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING - Continued

MALFUNCTION

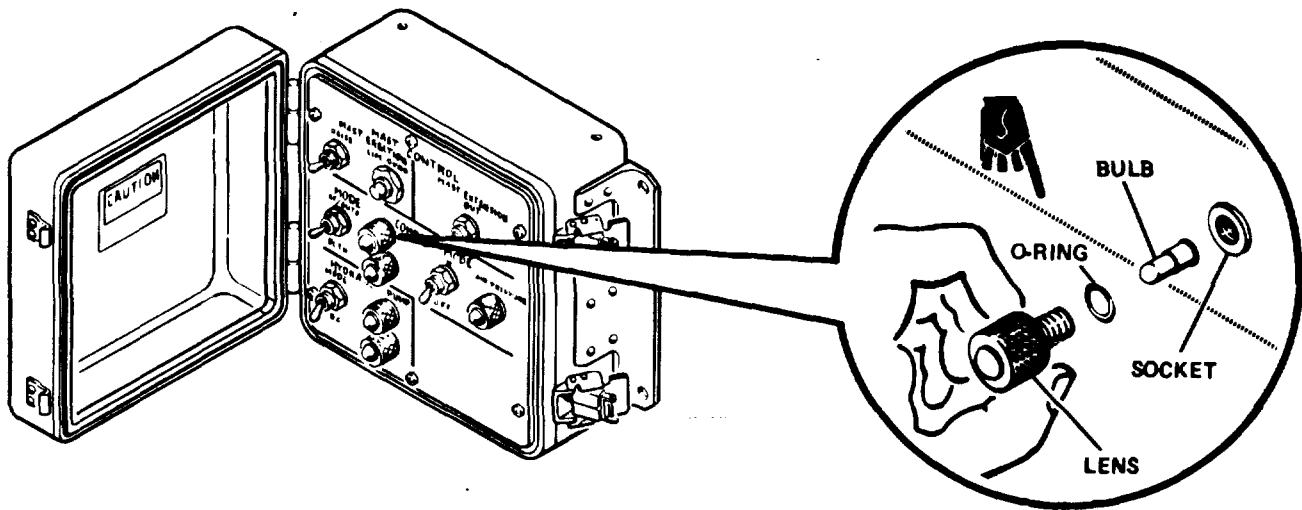
TEST OR INSPECTION

CORRECTIVE ACTION

NOTE

Do not discard O-ring. Reinstall It with new bulb.

- Step 3. Unscrew and remove lens from AC COMPRESSOR MODE indicator socket. Remove bulb from lens. Insert good bulb. Install lens with good bulb into AC COMPRESSOR MODE indicator socket.



- Step 4. Set COMPRESSOR MODE switch to AC/AUTO.

- If indicator fails to illuminate, go to step 5.

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****1. AC COMPRESOR MODE INDICATOR LIGHT WILL NOT ILLUMINATE - Continued**

- Step 5. Disconnect P2 end of cable assembly W24 (curbside) or W25 (roadside) from distribution box connector.

WARNING

Voltage is present which can cause injury or death to personnel.

- Step 6. Measure for 103.5 to 127.6 Vac between sockets A (+) and C (-) of P2 end of cable W24 or W25.
- If voltage is present, go to step 12.
 - If no voltage is present, go to step 7.

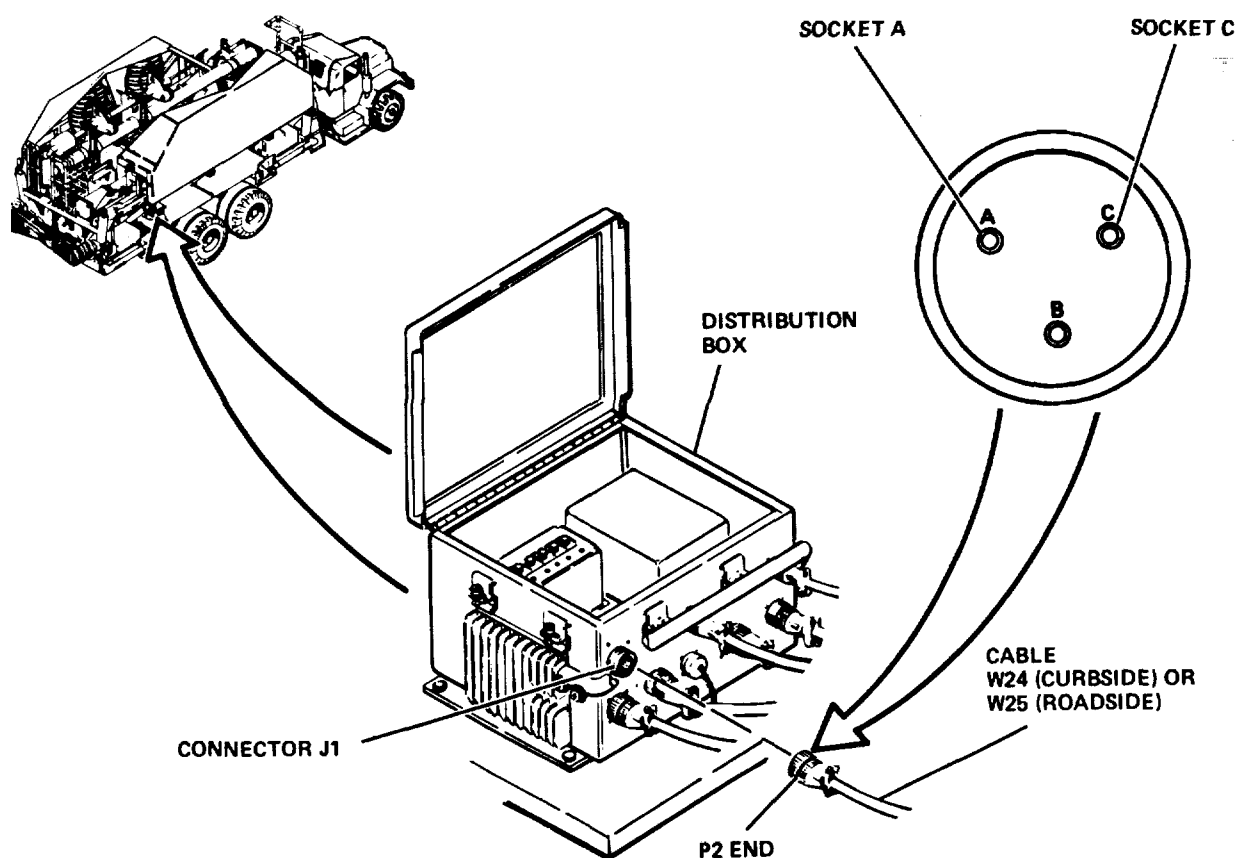
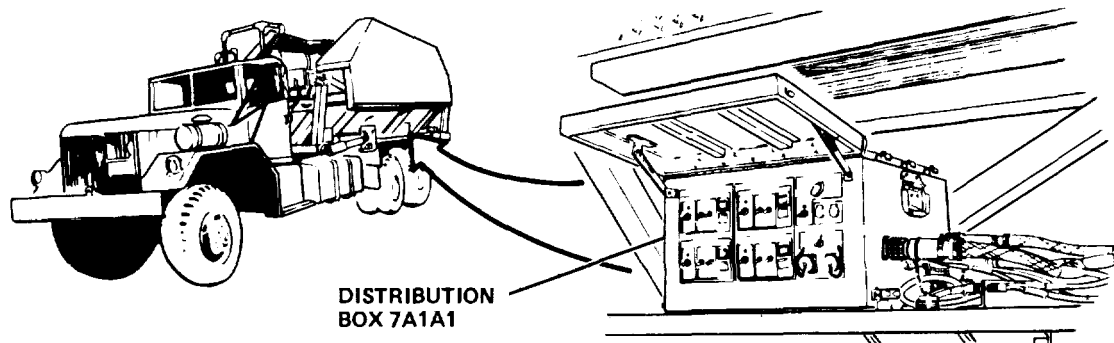


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

- Step 7. Disconnect P1 end of cable assembly W24 (curbside) or W25 (roadside) from AC power input connector (connector J2 if cable assembly W 24, connector J3 if cable assembly W25). AC power input connectors are part of distribution box 7A1A1. Refer to TM 9-1430-603-24 for information on distribution box 7A1A1.

**WARNING**

Tell personnel that P1 end of cable assembly W24 or W25 is disconnected. High voltage is present which can cause injury or death to personnel.

- Step 8. Cut a 4 inch length of 12 gage wire. Strip insulation off ends of wire.
- Step 9. Using wire made in step 8, install wire in sockets A and C of P2 end of cable assembly W24 or W25 (jumper from socket A to C).

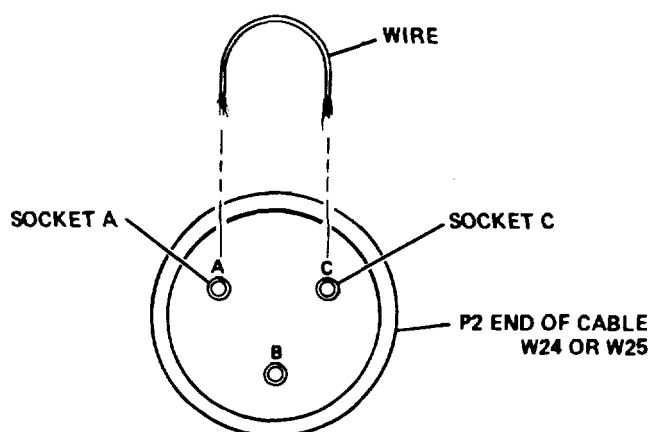


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****1. AC COMPRESSOR MODE INDICATOR LIGHT WILL NOT ILLUMINATE - Continued**

- Step 10. Check continuity between pins A and C of P1 end of cable W24 or W25 assembly.
- If there is continuity, AC input power has failed. Notify maintenance personnel that AC power has failed.
 - If there is no continuity, replace cable assembly W24 or W25 (para 2-26).
- Step 11. Remove jumper wire from P2 end of cable assembly W24 or W25. Reconnect cable assembly.
- Step 12. Disconnect P1 end of cable assembly W29 (curbside) or W34 (roadside) from distribution box connector J5.
- Step 13. Check continuity between pins F and G, and between pins D and H of P1 end of cable assembly W29 or W34.
- If there is continuity in both checks, go to step 14.
 - If there is no continuity in either check, go to step 16.

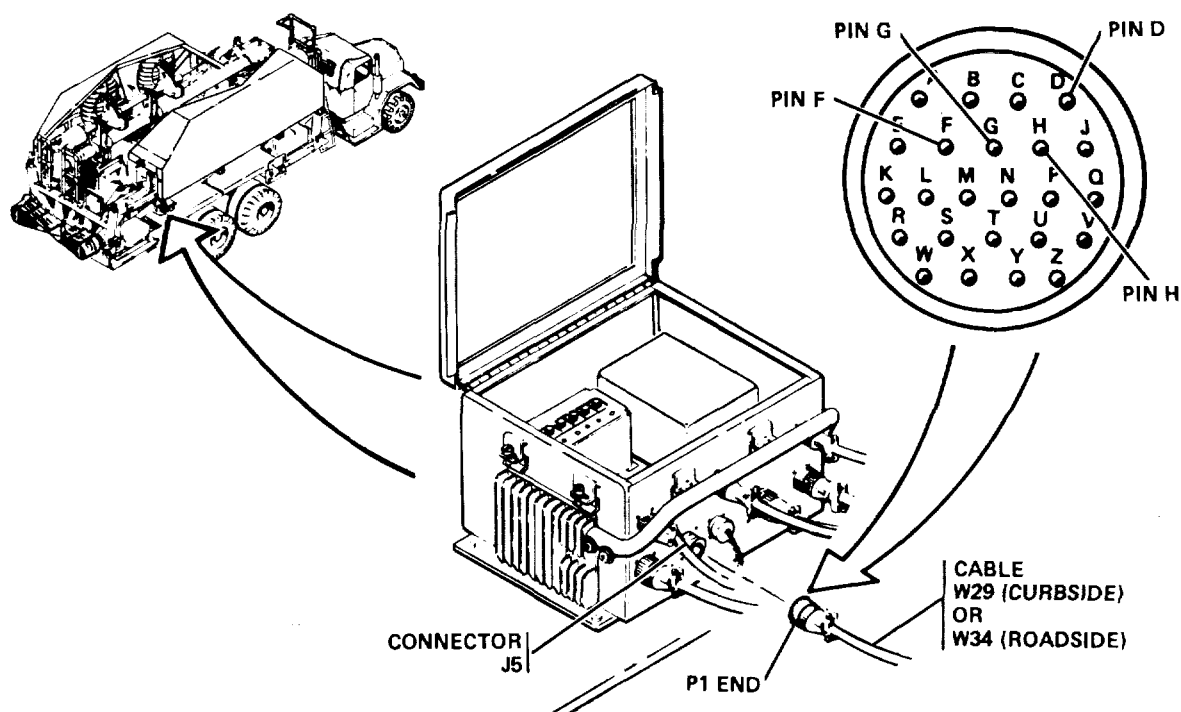


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING - Continued

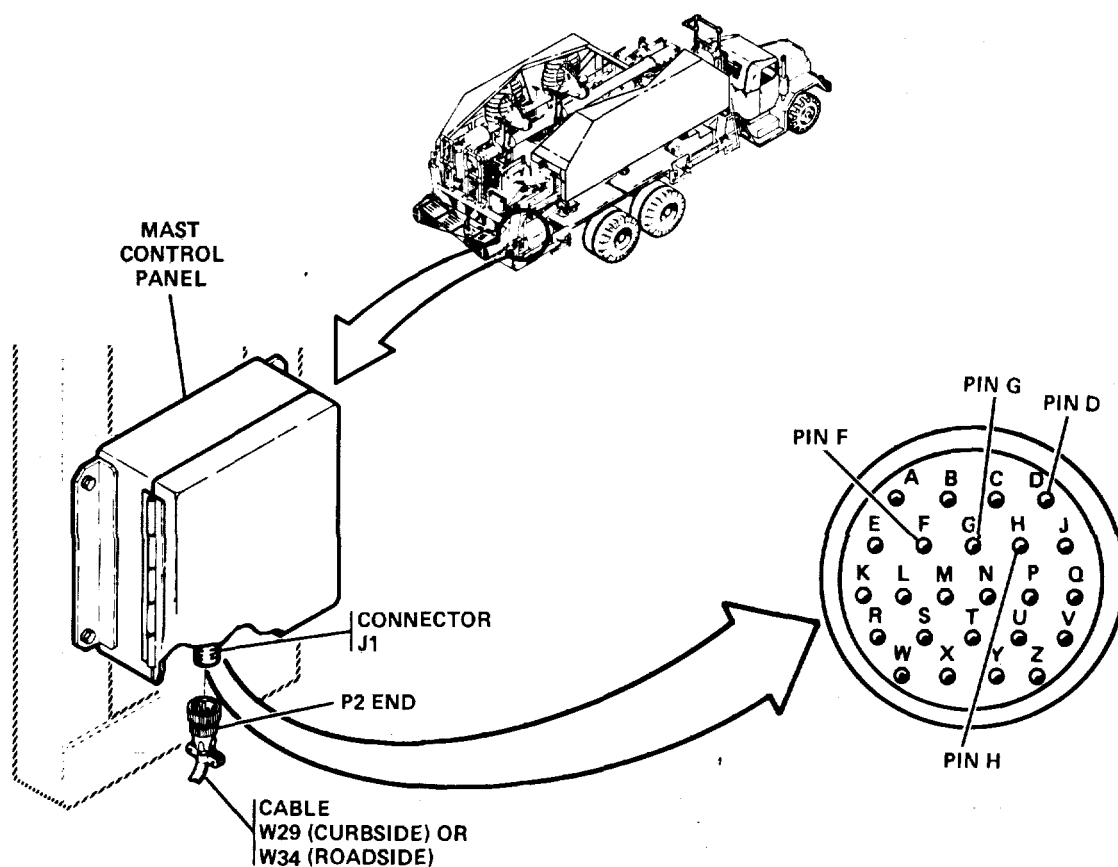
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

NOTE

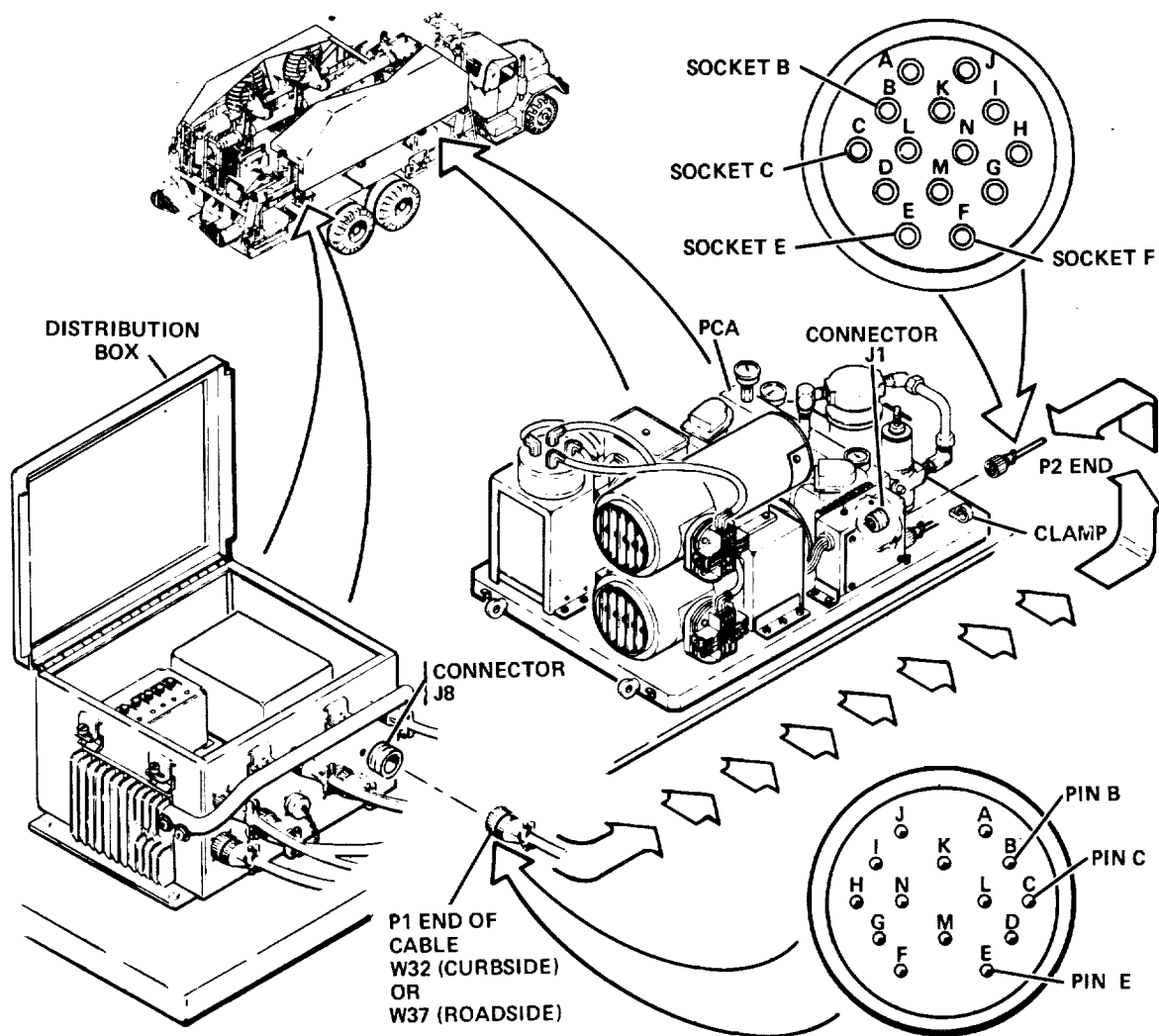
If necessary, remove mast control for access to connector for continuity check (para 2-21).



Step 14. Disconnect P2 end of cable assembly W29 or W34 from mast control connector J1. Check to see that COHIPRESSOR MODE switch is in AC/AUTO position.

Step 15. Check continuity between pins F and G and between pins D and H of mast control connector J1.

- If there is no continuity in either check, reconnect cable assembly to distribution box and replace mast control (para 2-21).
- If there is continuity in both checks, replace cable assembly W29 or W34 (para 2-26).

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****1. AC COMPRESSOR MODE INDICATOR LIGHT WILL NOT ILLUMINATE - Continued**

Step 16. Disconnect P1 end of cable assembly W32 (curbside) or W37 (roadside) from distribution box connector J8.

NOTE

Unstow stabilizing strut and remove PCA covers to access PCA connector.

Step 17. Disconnect P2 end of cable assembly W32 or W37 from PCA connector J1 and remove clamp securing cable to PCA base.

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

Step 18. Check continuity between the following:

<u>Pin</u>	of	<u>Connector</u>	and	<u>Socket</u>	of	<u>Connector</u>
B		P1		B		P2
C		P1		C		P2
E		P1		E		P2
F		P1		F		P2

- If there is no continuity in any check, replace cable assembly W32 or W37.
- If there is continuity in all checks, go to step 19.

NOTE

Disconnect P1 end of cable assembly W31 (curbside) or W36 (roadside) from distribution box connector J3.

Step 19. Check continuity between the following distribution box connectors:

<u>Socket</u>	of	<u>Connector</u>	and	<u>Socket</u>	of	<u>Connector</u>
B		J3		F		J5
C		J3		H		J5
F		J3		D		J5

- If there is no continuity in any check, reconnect cable to PCA and replace distribution box (para 2-18).
- If there is continuity in all checks, reconnect cables to distribution box and replace PCA (para 2-19).

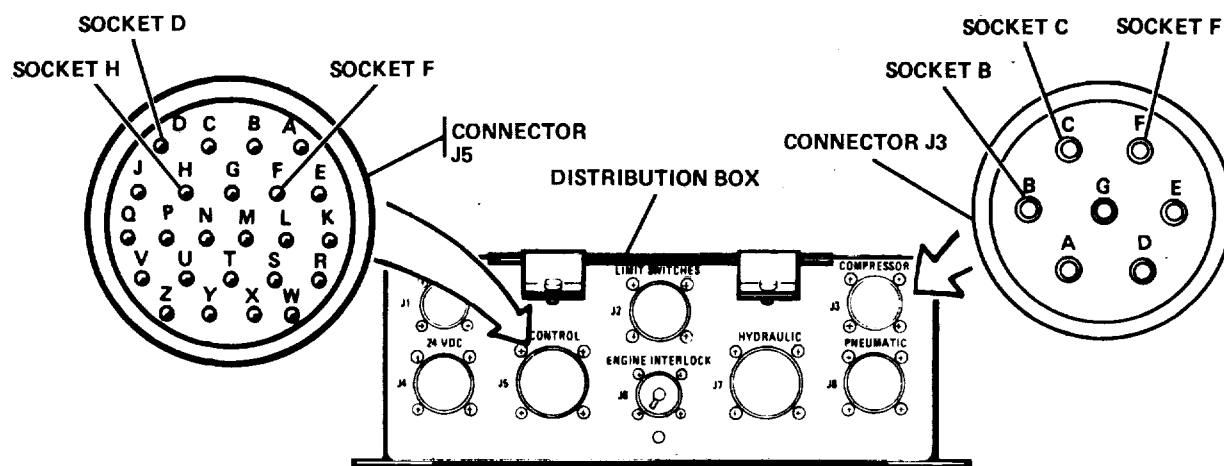


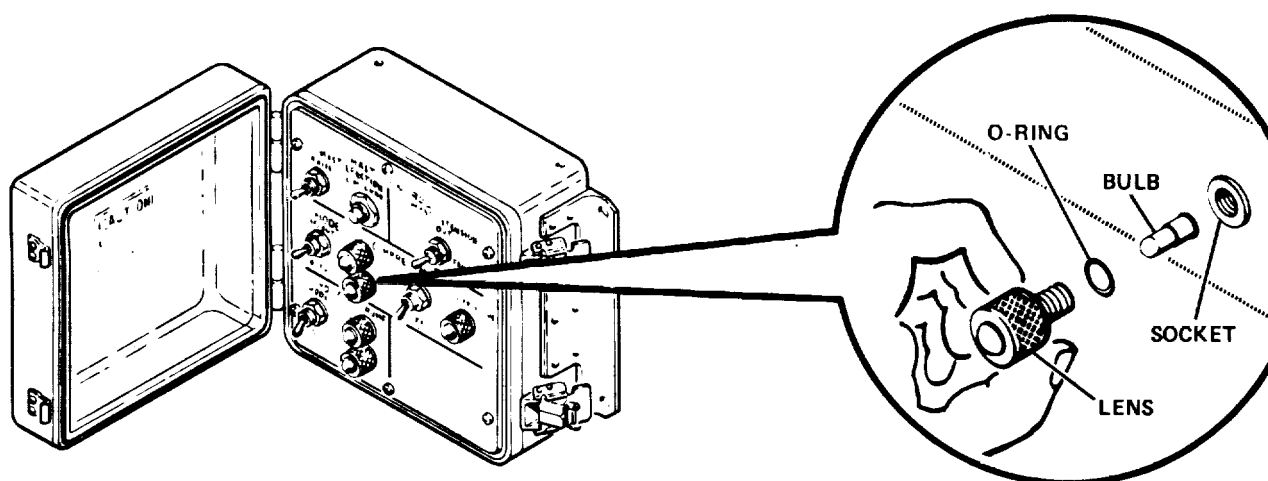
TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****2. DC COMPRESSOR INDICATOR LIGHT WILL NOT ILLUMINATE**

Step 1. Set DC MODE switch to OFF.

NOTE

Do not discard O-ring. Reinstall it with new bulb.

Step 2. Unscrew and remove lens from DC MODE indicator socket. Remove bulb from lens. Insert good bulb. Install lens with good bulb into DC MODE indicator socket.

**WARNING**

Voltage is present which can cause injury or death to personnel.

Step 4. Disconnect P1 end of cable assembly W28 (curbside) or W41 (roadside) from distribution box connector J4.

Step 5. Measure for 24 to 28 Vdc between sockets A (+) and C (-) of P1 end of cable assembly W28 (curbside) or W41 (roadside).

- If there is voltage, go to step 7
- If there is no voltage, go to step 6

WARNING

Voltage is present which can cause injury or death to personnel.

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING - Continued

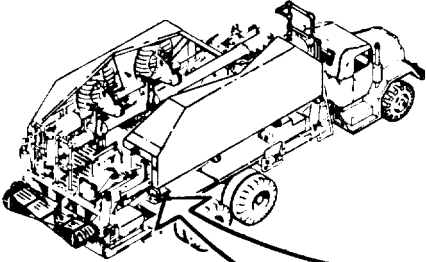
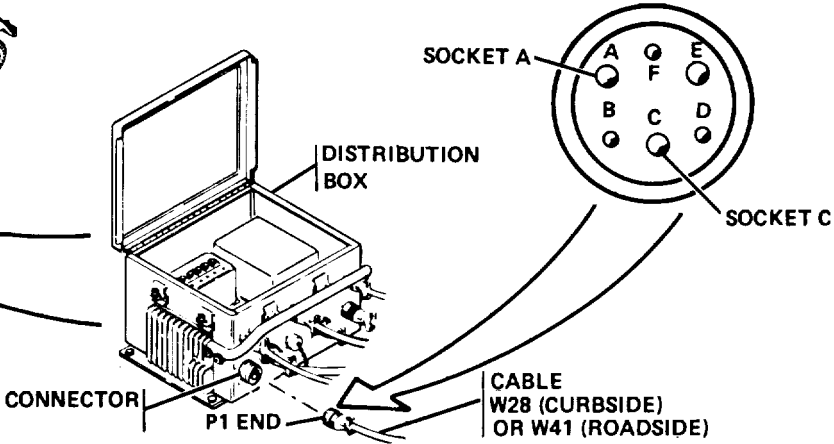
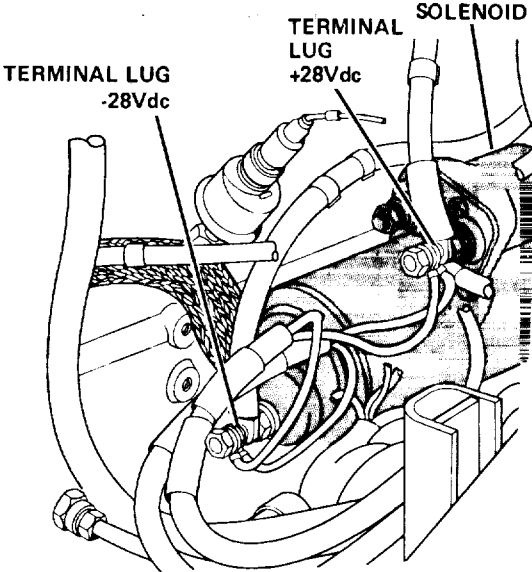
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
		
Step 6.	Access truck starter (see TM 9-2320-260-20 for M811 truck, see TM 9-2320-272-20-1 for M942 truck.). Measure for 24 to 28 Vdc between terminal lugs +28 Vdc and -28 Vdc at P2 end of cable assembly W28 (curbside) or W41 (roadside). Terminal lugs are attached to starter terminals at end of starter and on starter solenoid.	• If there is voltage, replace cable assembly W28 or W41 (para2-26). • If there is no voltage, reconnect cable assembly and notify maintenance personnel of dc power failure.
		

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****2. DC COMPRESSOR INDICATOR LIGHT WILL NOT ILLUMINATE - Continued**

Step 7. Disconnect P1 end of cable assembly W29 (curbside) or W34 (roadside) from distribution box connector J5.

Step 8. Check continuity between pins J and K, and between pins J and M of P1 end of cable assembly W29 (curbside) or W34 (roadside).

- If there is continuity in both checks, replace distribution box (para 2-18).
- If there is no continuity in either check, go to step 9.

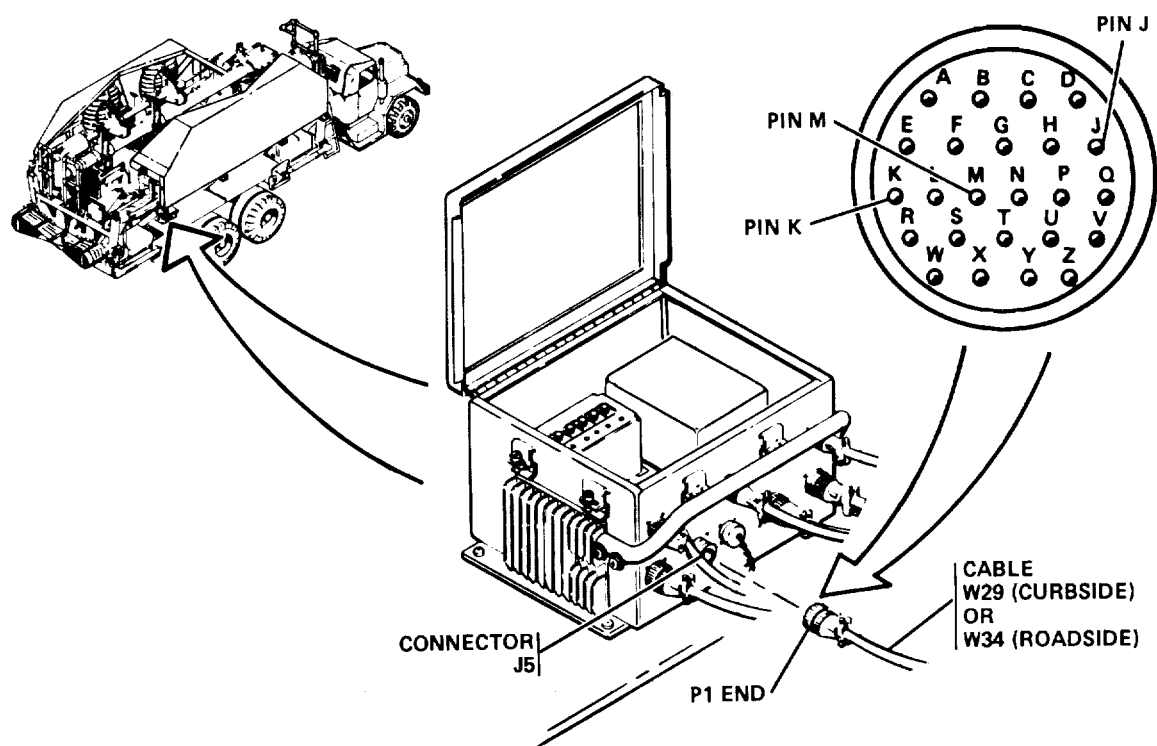


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

- Step 9. Disconnect P2 end of cable assembly W29 (curbside) or W34 (roadside) from mast control connector J1.

NOTE

If necessary, remove mast control to access connector for continuity check (para 2-21).

- Step 10. Check continuity between pins J and K, and between pins J and M of mast control connector J1.
- If there is continuity in both checks, replace cable assembly W29 (curbside) or W34 (roadside)
 - If there is no continuity in either check, reconnect cable assembly to distribution box and replace mast control (para 2-21).

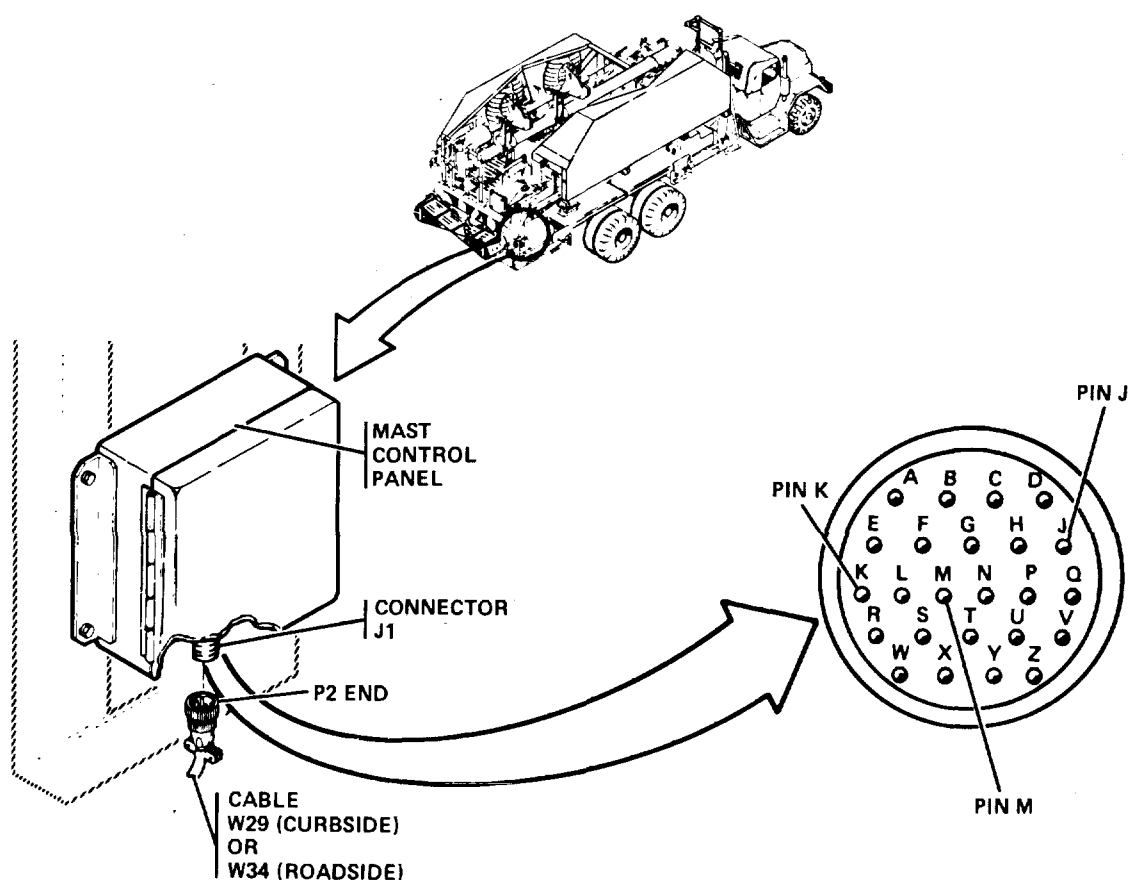


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

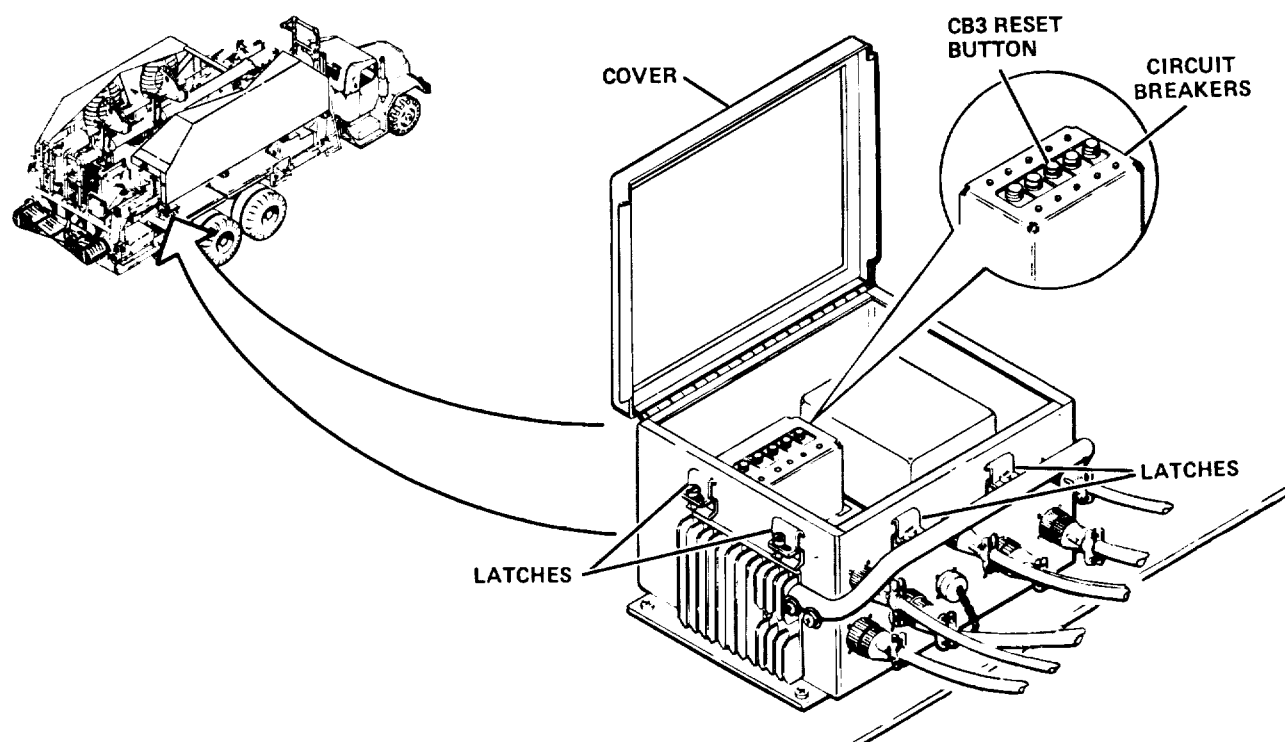
3. DC COMPRESSOR MODE INDICATOR LIGHT ILLUMINATED, BUT DC COMPRESSOR WILL NOT OPERATE

NOTE

Check to see that DC mode switch is set to ON.

Step 1. Loosen six screws and release six latches securing distribution box cover. Open cover. Check circuit breaker CB3 reset button. If reset button is out, push button in and try to operate equipment. If symptom persists check reset button again.

- If circuit breaker CB3 reset button is pushed out, replace PCA (para 2-19) and push reset button in.
- If circuit breaker CB3 reset button is not pushed out, go to step 2.

**NOTE**

Remove PCA covers for access to PCA connector.

Step 2. Disconnect P2 end of cable assembly W32 (curbside) or W37 (roadside) from PCA connector J1.

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

Step 3. Disconnect P2 end of cable assembly W31 (curbside) or W36 (roadside) from PCA connector J2.

Step 4. Measure for 24 to 28 VDC between sockets A (+) and D (-) of P2 end of cable assembly W31 or W36. Also measure for 24 to 28 VDC between socket A (+) of P2 end of cable assembly W32 or W37 and socket D (-) of P2 end of cable assembly W31 or W36.

- If both voltages are present, replace PCA (para 2-19).
- If there is no voltage in either measurement, go to step 5.

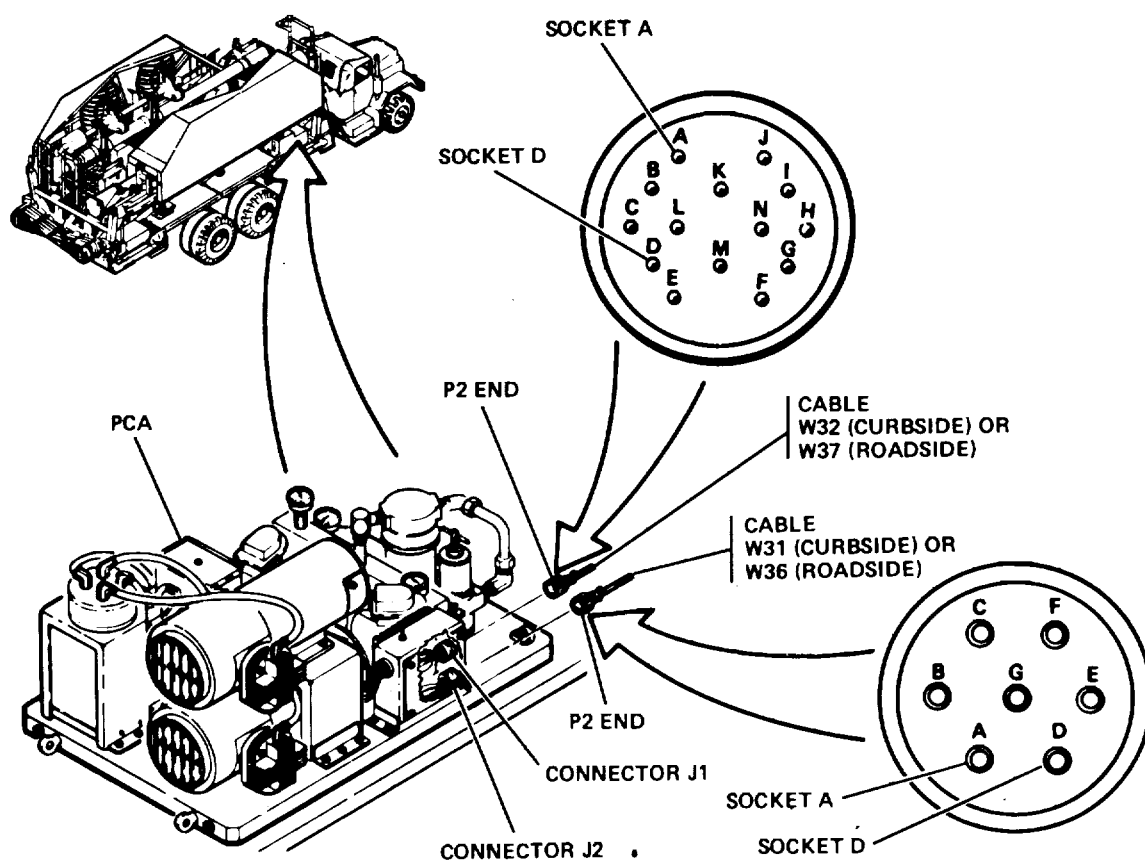
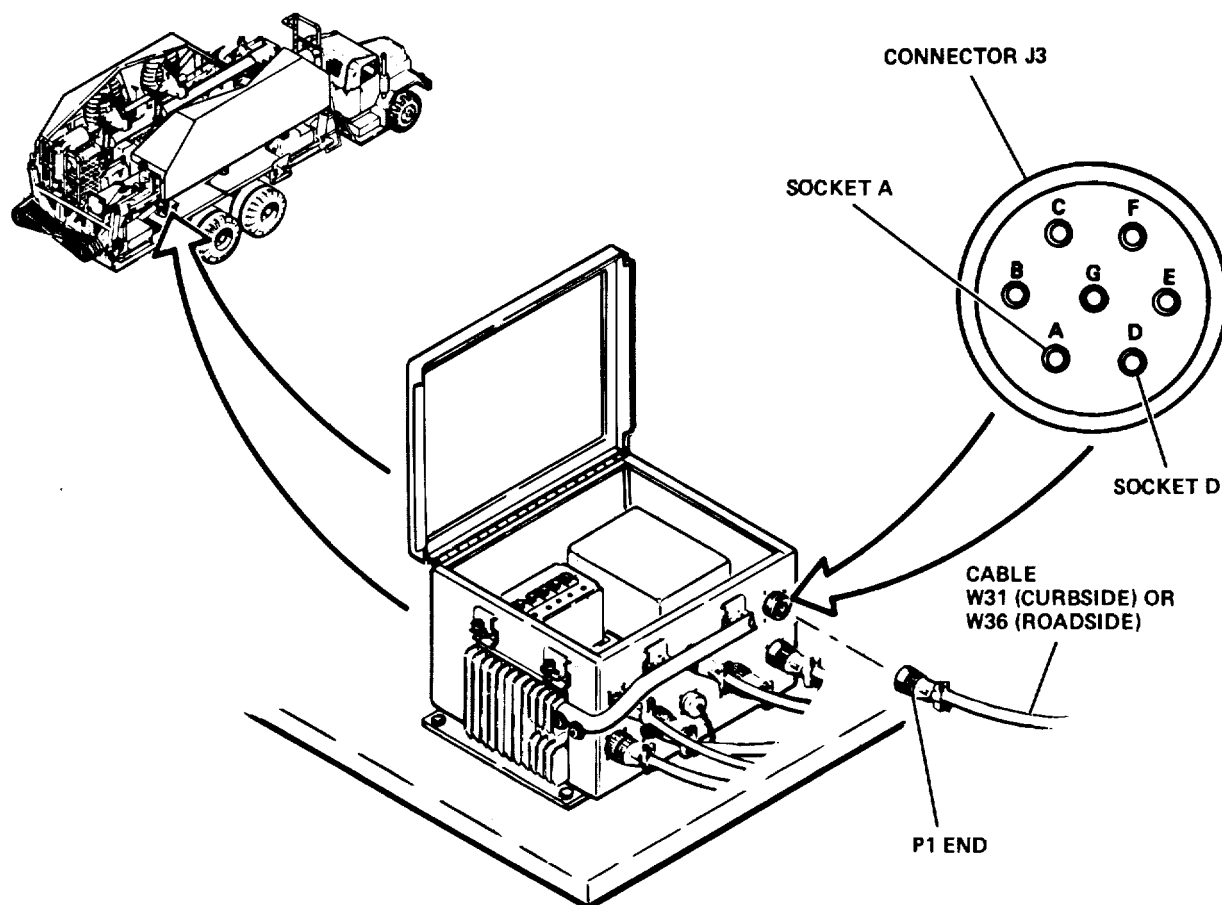


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

3. DC COMPRESSOR MODE INDICATOR LIGHT ILLUMINATED, BUT DC COMPRESSOR WILL NOT OPERATE - Continued



- Step 5. Disconnect the P1 end of cable assembly W31 (curbside) or W36 (roadside) from distribution box connector J3.
- Step 6. Measure for 24 to 28 VDC between sockets A (+) and D (-) of distribution box connector J3.
- If there is voltage, replace cable assembly W31 or W36.
 - If there is no voltage, go to step 7.
- Step 7. Disconnect P2 end of cable assembly W32 (curbside) or W37 (roadside) from PCA connector J1 and remove clamp securing cable to base of PCA.

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

Step 8. Disconnect P1 end of W32 or W37 from distribution box connector J8.

Step 9. Check continuity between pin A of P1 end of cable assembly W32 or W37 and socket A of P2 end of cable assembly W32 or W37.

- If there is no continuity, replace cable assembly W32 or W37 (para 2-26).
- If there is continuity, go to step 10.

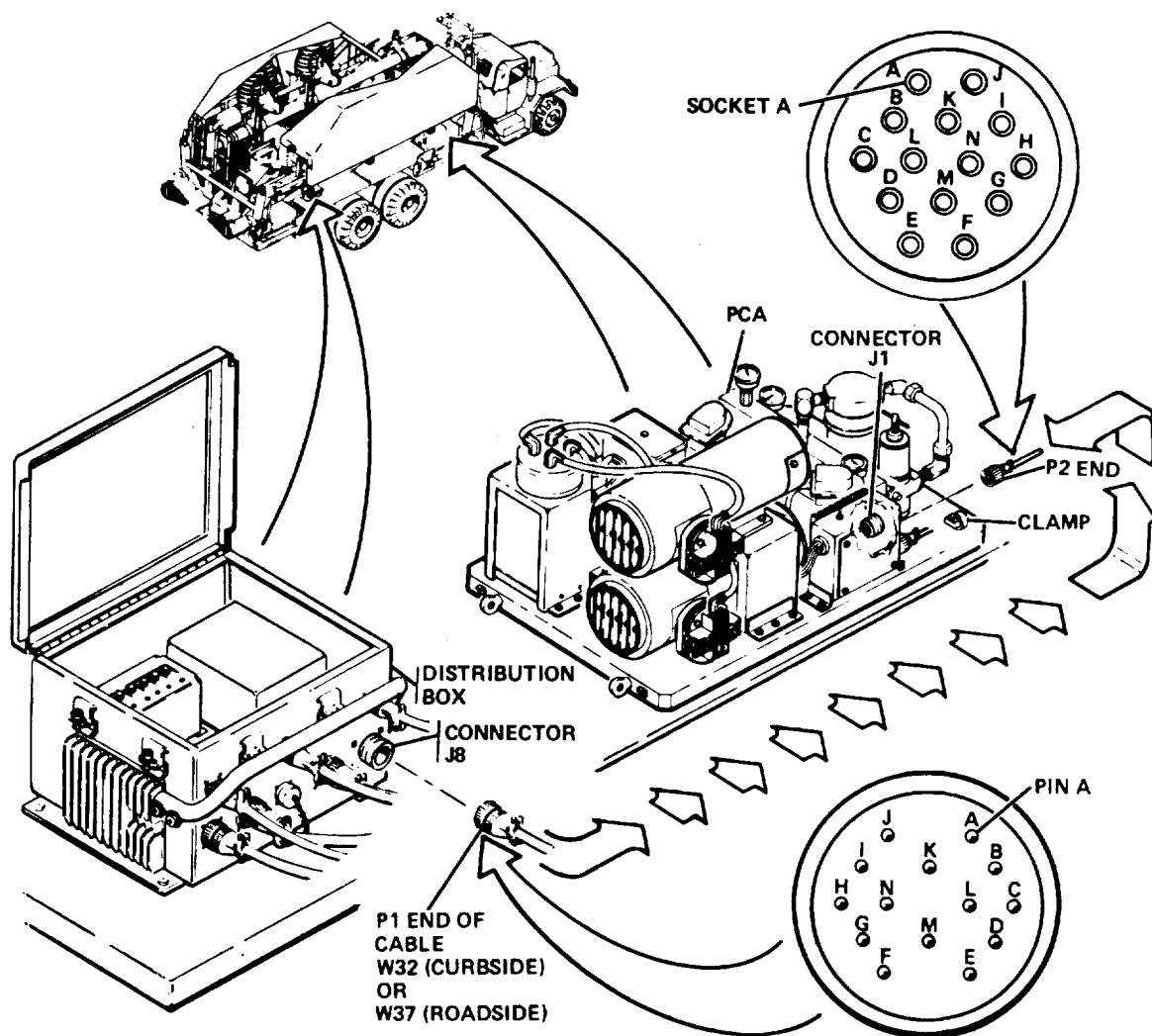


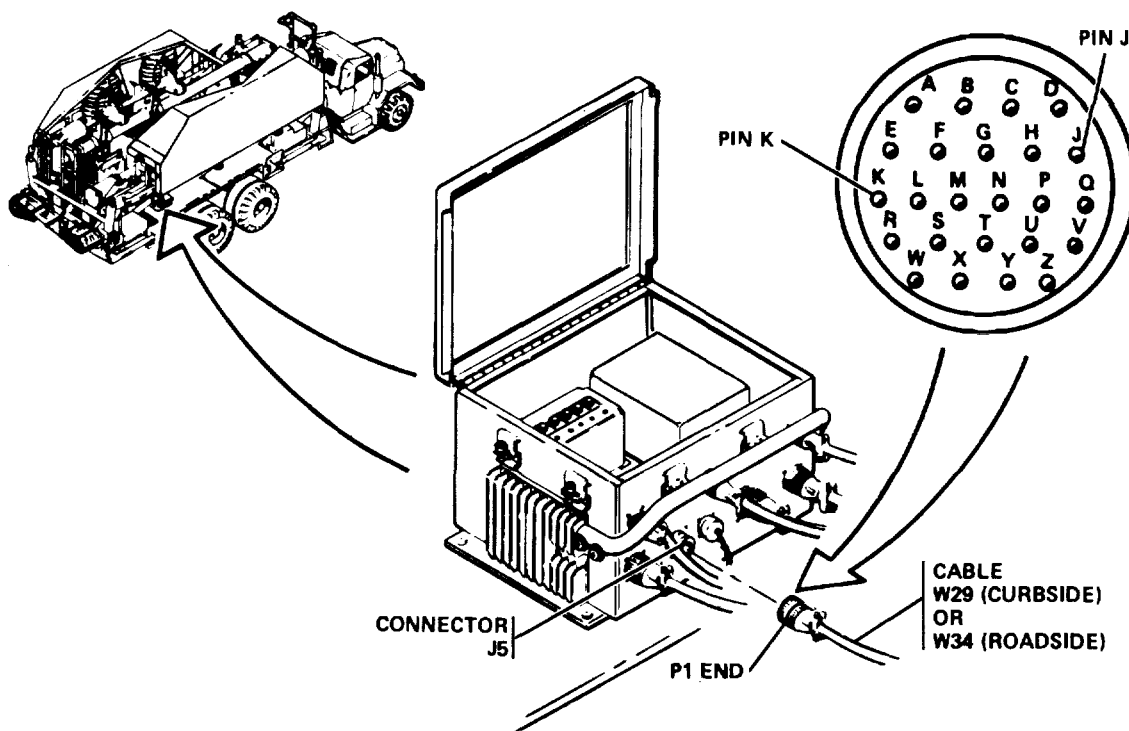
TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

3. DC COMPRESSOR MODE INDICATOR LIGHT ILLUMINATED, BUT DC COMPRESSOR WILL NOT OPERATE-Continued

Step 10. Disconnect P1 end of cable W29 (curbside) or W34 (roadside) from distribution box connector J5.

Step 11. Check continuity between pins J and K of P1 end of cable assembly W29 or W34.

- If there is continuity, reconnect cable assemblies to PCA and replace distribution box (para 2-18).
- If there is no continuity, reconnect cable assembly to PCA and distribution box and go to step 12.



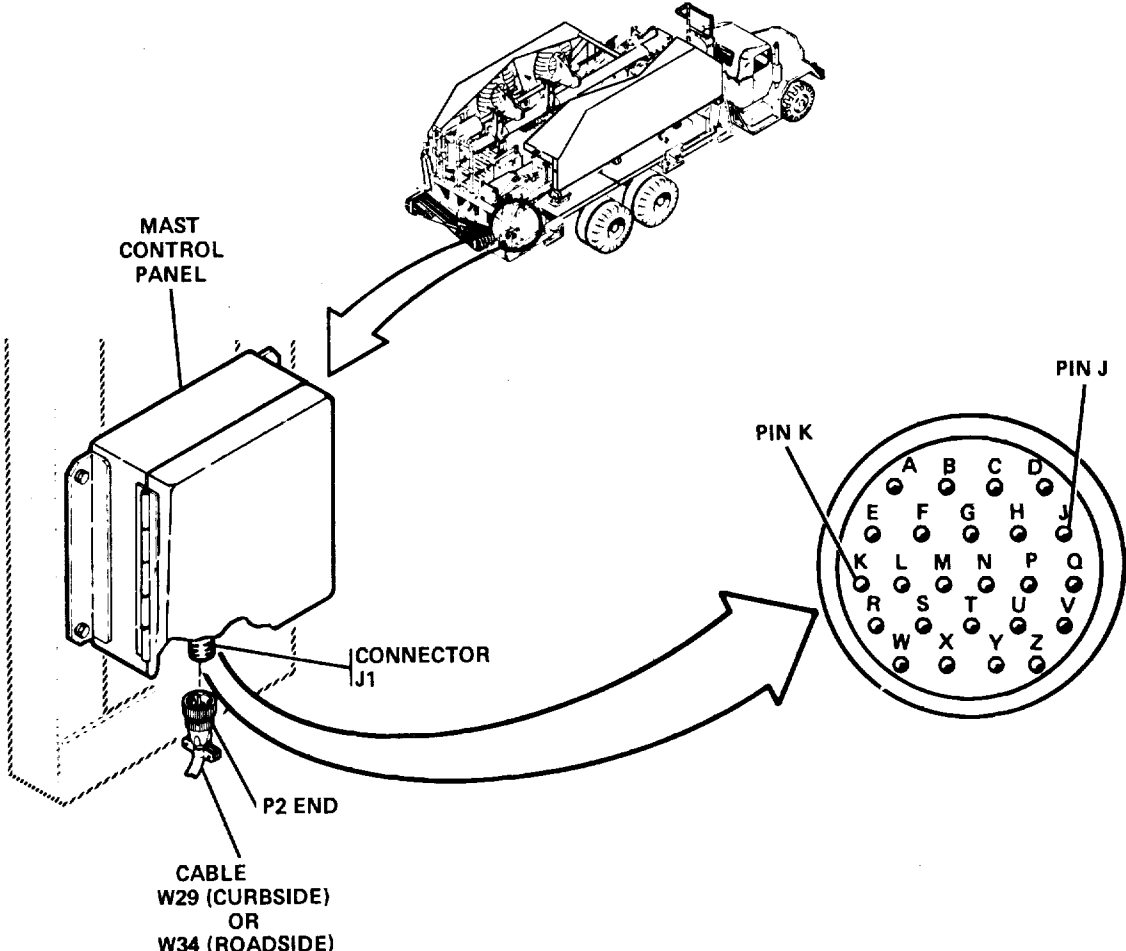
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
	Step 12. Disconnect P2 end of cable assembly W29 (curbside) or W34 (roadside) from mast control connector J1.	NOTE If necessary, remove mast control for access to connector for continuity check (para 2-21).
	Step 13. Check continuity between pins J and K of mast control connector J1. • If there is continuity, replace cable assembly W29 or W34 (para 2-26) • If there is no continuity, replace mast control (para 2-21)	

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

4. AIR PRESSURE INDICATOR LIGHT WILL NOT ILLUMINATE AND COMPRESSORS HAVE STOPPED OPERATING

Step 1. Loosen six screws and release six latches securing distribution box cover. Open cover. Check circuit breaker CB2 reset button. If reset button is out, push button in and try to operate equipment. If symptom persists check reset button again.

- If circuit breaker CB2 reset button is pushed out, replace PCA (see para 2-19) and push reset button in.
- If circuit breaker CB2 reset button is not pushed out, go to step 2.

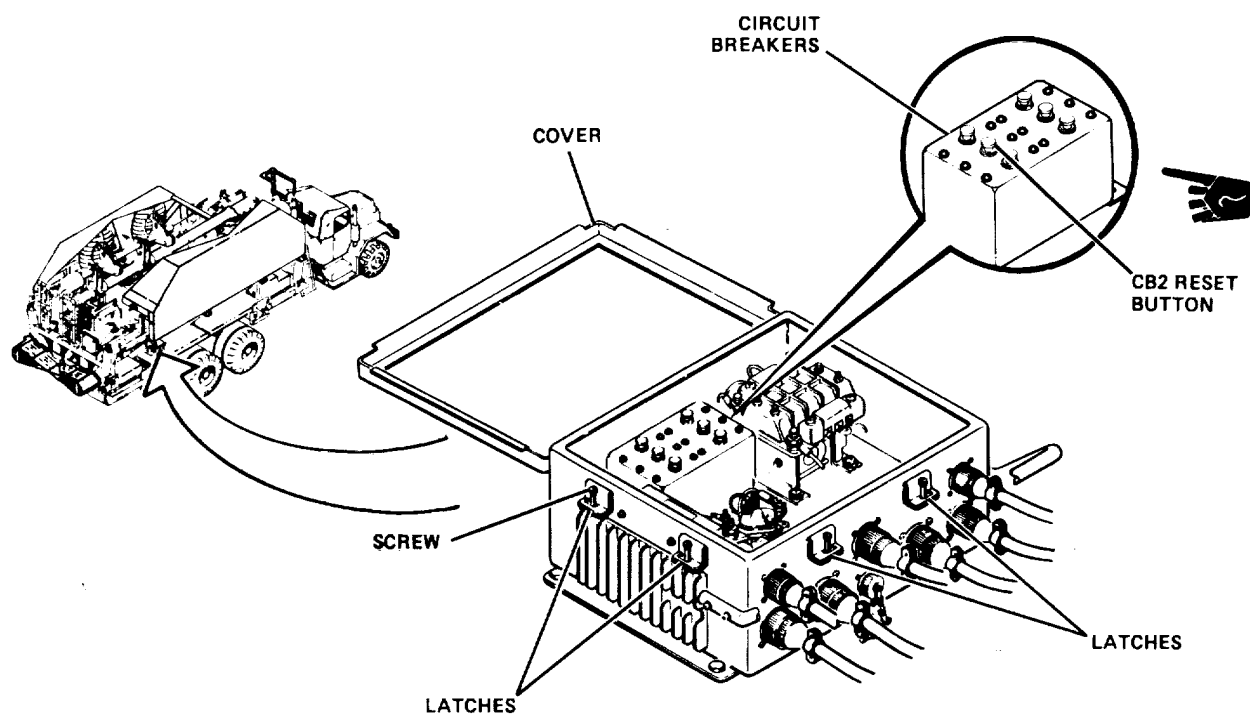


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

NOTE

Do not discard O-ring. Reinstall it with new bulb.

Step 2. Unscrew and remove lens from AIR PRESSURE indicator socket. Remove bulb from lens. Insert good bulb. Install lens with good bulb into AIR PRESSURE indicator socket.

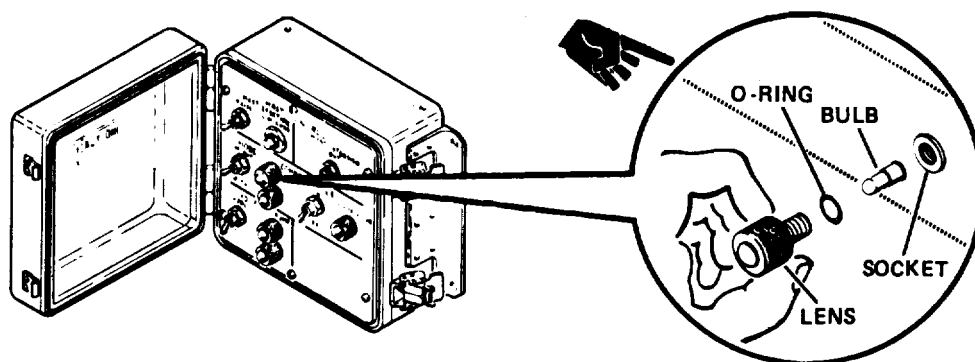


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

- Step 3. Push CB2 reset button in. Check AIR PRESSURE indicator light.
- Step 4. Disconnect P1 end of cable assembly W29 (curbside) or W34 (roadside) from distribution box connector J5.
- Step 5. Check continuity between pins E and M of the P1 end of cable assembly W29 or W34.
- If there is continuity, go to step 8
 - If there is not continuity, go to step 6

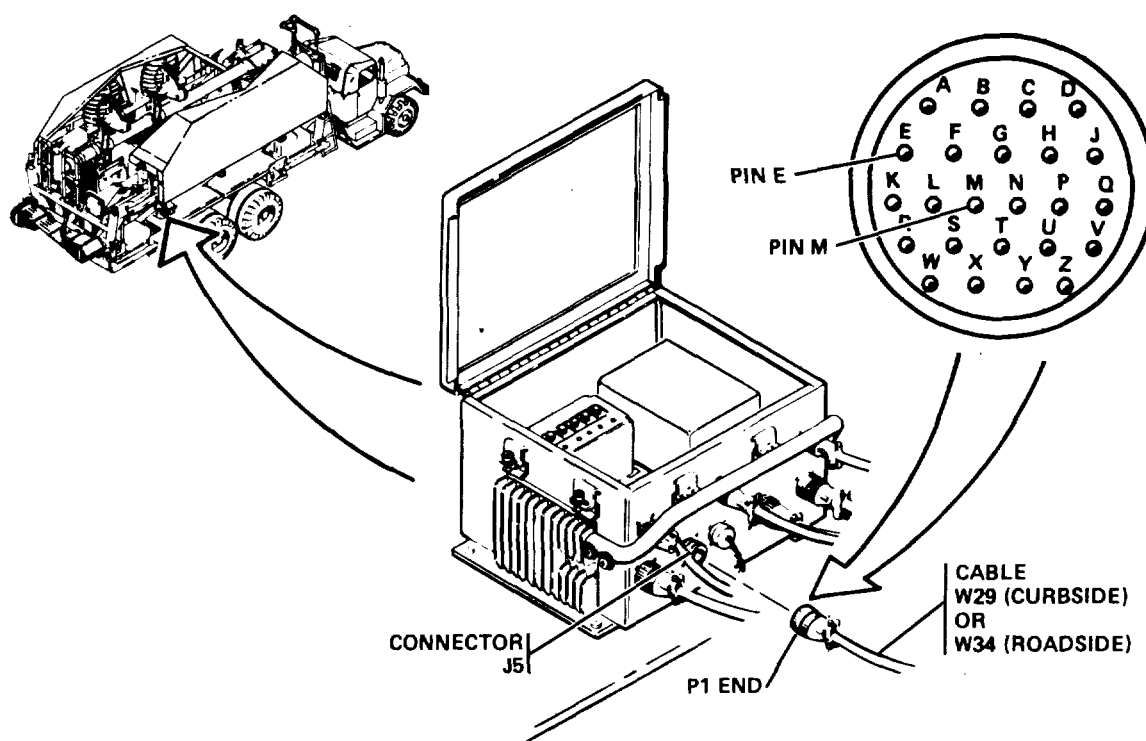


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

4. AIR PRESSURE INDICATOR LIGHT WILL NOT ILLUMINATE AND COMPRESSORS HAVE STOPPED OPERATING-Continued

Step 6. Disconnect 02 end of cable assembly W29 (curbside) or W34 (roadside) from mast control connector J1.

NOTE

If necessary, remove mast control-for access to connector for continuity check (para 2-21).

Step 7. Check continuity between pins E and M of the mast control connector J1.

- If there is continuity, replace cable assembly W29 or W34 (para 2-26)
- If there is no continuity, reconnect cable assembly to distribution box and replace mast control (para 2-21)

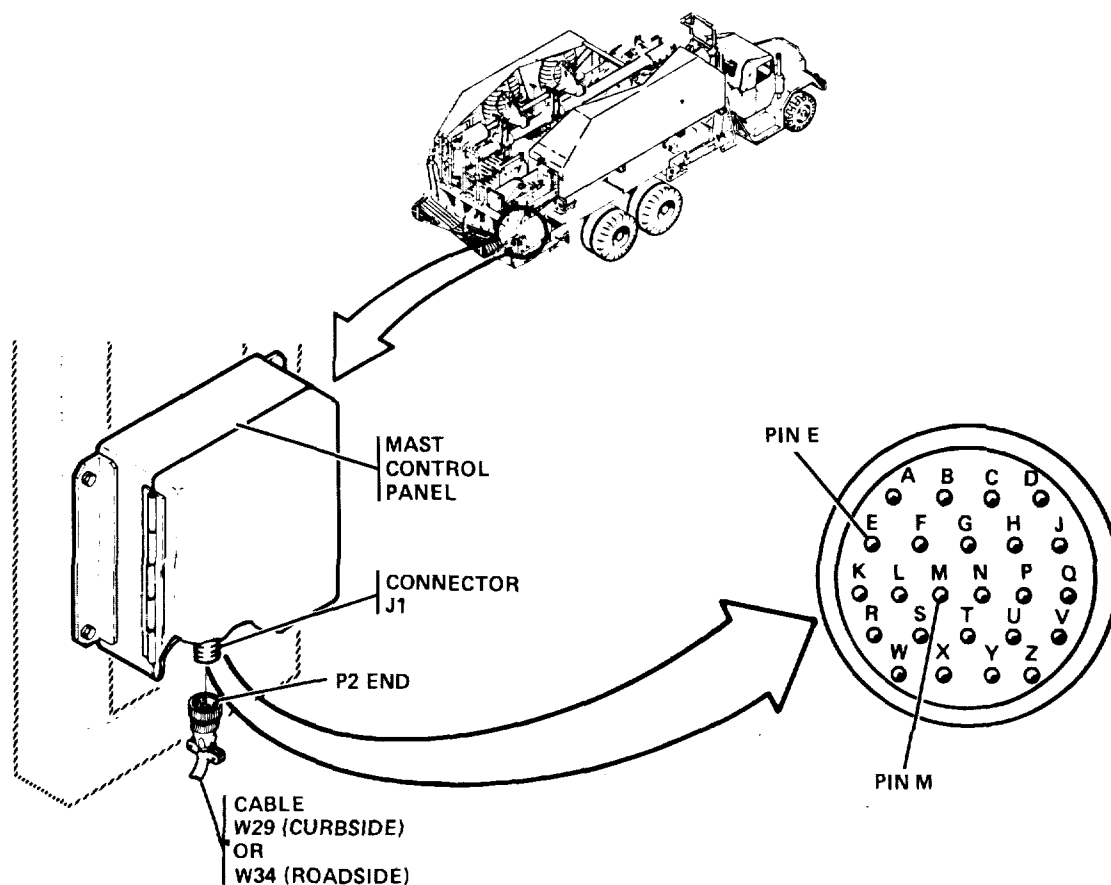


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

Step 8. Disconnect P1 end of cable assembly W32 (curbside) or W37 (roadside) from distribution box connector J8.

Step 9. Check continuity between pins M and N of the P1 end of cable assembly W32 or W37.

- If there is continuity, replace distribution box (para 2-18)
- If there is no continuity, go to step 10

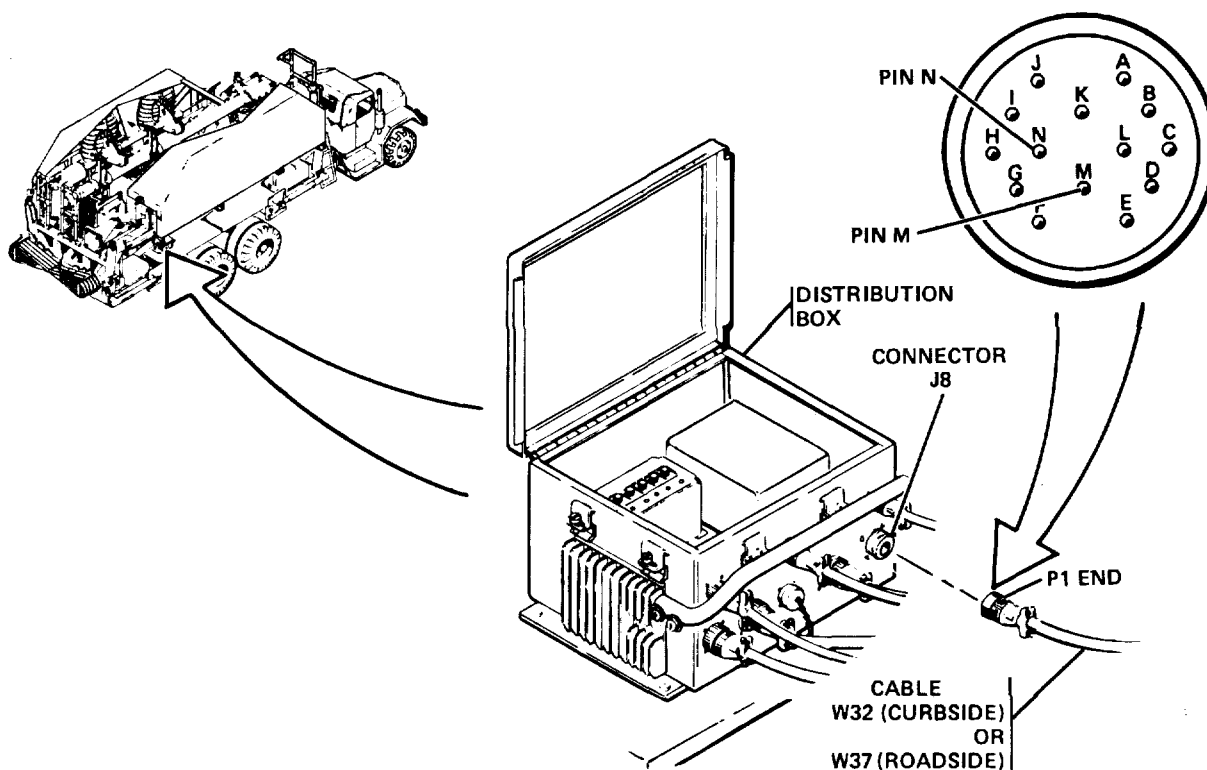
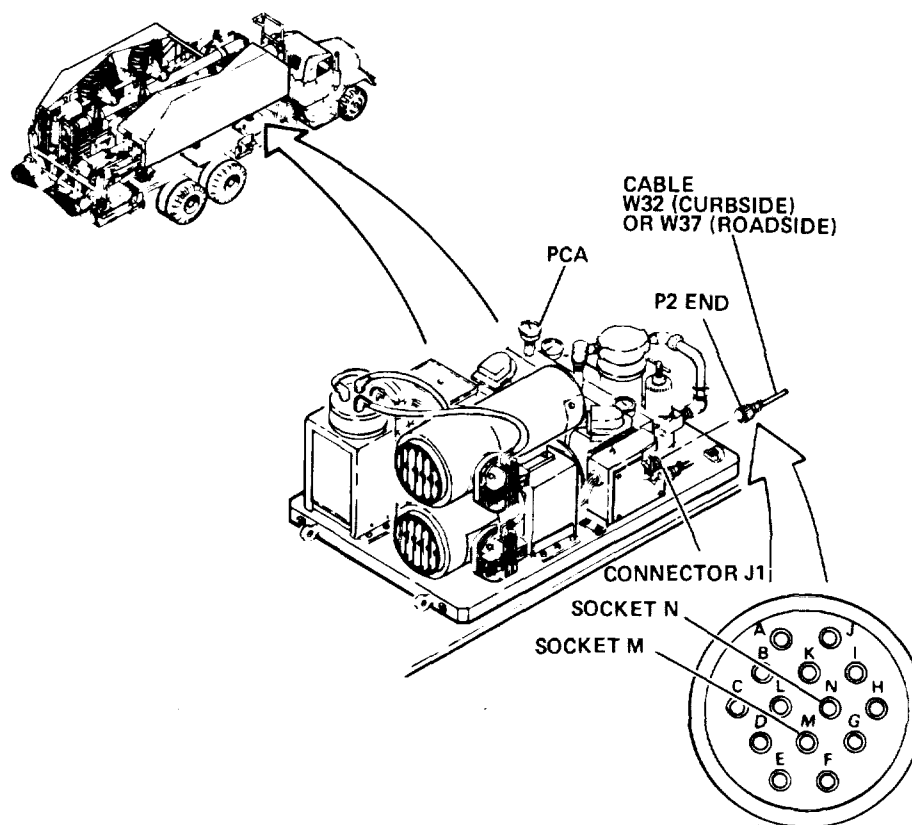


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

4. AIR PRESSURE INDICATOR LIGHT WILL NOT ILLUMINATE AND COMPRESSORS HAVE STOPPED OPERATING-Continued

**NOTE**

Unstow stabilizing strut and remove PCA covers for access to PCA connector.

- Step 10. Disconnect P2 end of cable assembly W32 (curbside) or W37 (roadside) from PCA connector J1.

NOTE

Air tank must be pressurized to 90 to 95 psi to get continuity reading.

- Step 11. Check continuity between sockets M and N of PCA connector J1.
- If there is continuity, replace cable assembly W32 or W37 (para 2-26)
 - If there is no continuity, reconnect cable assembly to distribution box and replace PCA (para 2-19)

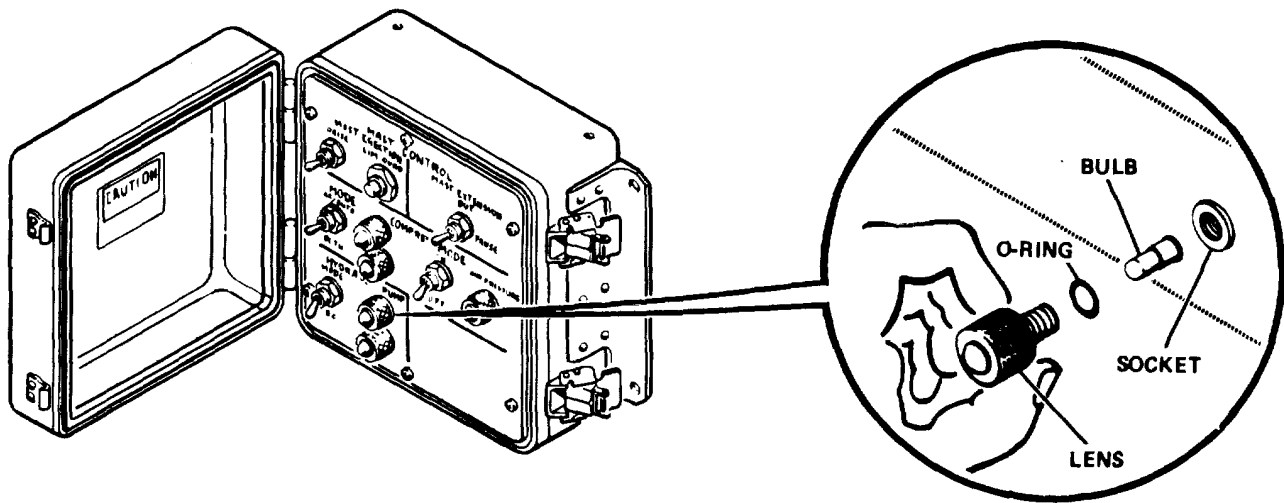
TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

5. MAST WILL RAISE TO VERTICAL, BUT AC HYDRAULIC PUMP MODE INDICATOR WILL NOT ILLUMINATE WHEN HYDRAULIC PUMP MODE SWITCH IS SET TO AC

NOTE

Do not discard O. ring. Reinstall It with new bulb.

- Step 1. Unscrew and remove lens from AC HYDRAULIC PUMP MODE indicator socket. Remove bulb from lens. Insert good bulb. Install lens with good bulb into AC HYDRAULIC PUMP MODE indicator socket.



- Step 2. Hold MAST ERECTION switch to RAISE.
- If indicator fails to illuminate, release MAST ERECTION switch and replace mast control (para 2-21).

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

6. MAST WILL NOT RAISE WHEN HYDRAULIC PUMP MODE SWITCH IS SET TO AC

- Step 1. Disconnect P1 end of cable assembly W32 (curbside) or W37 (roadside) from distribution box connector J8.
- Step 2. Check continuity between pins K and L of P1 end of cable assembly W32 or W37.
- If there is continuity, go to step 5.
 - If there is no continuity, go to step 3.

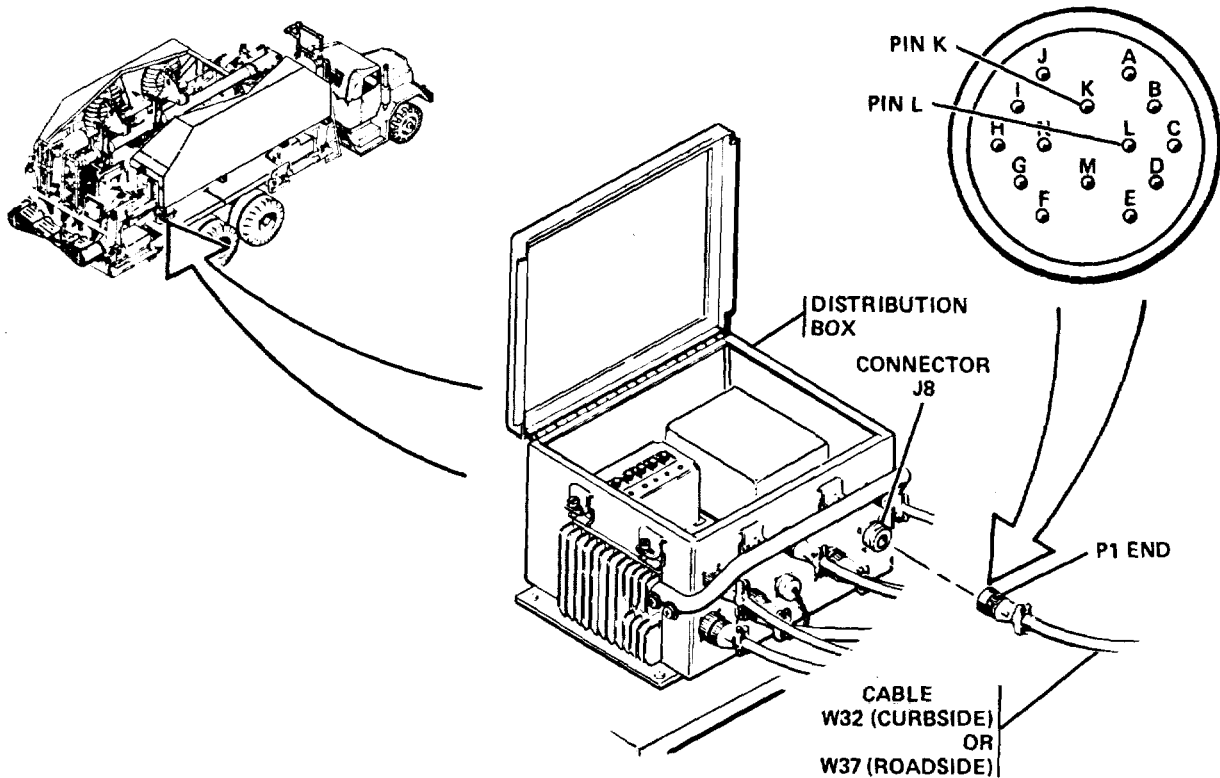
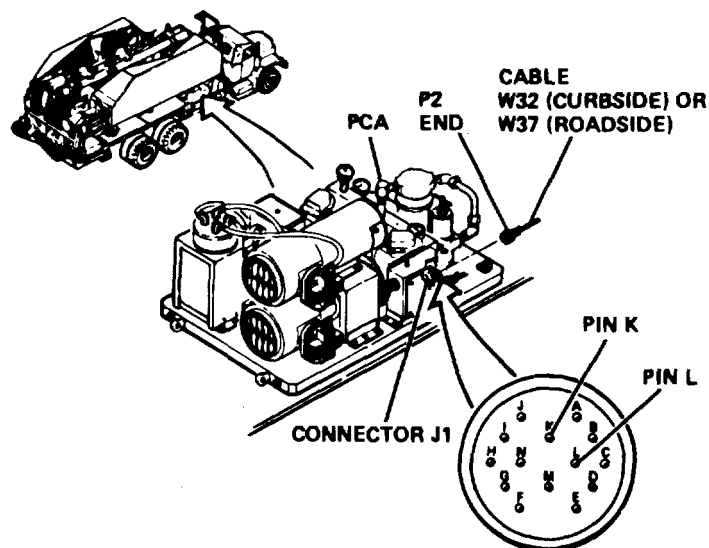


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****NOTE**

Unstow stabilizing strut and remove PCA covers for access to PCA connector.

- Step 3. Disconnect P2 end of cable assembly W32 (curbside) or W37 (roadside) from PCA connector J1.
- Step 4. Check continuity between pins K and L of PCA connector J1.
- If there is continuity, replace cable assembly W32 or W37 (para 2-26).
 - If there is no continuity, reconnect cable assembly to distribution box and replace the PCA (para 2-19).
- Step 5. Peel back edges of dust cover on HCA. Release latches. Remove HCA cover.
- Step 6. Hold the MAST ERECTION switch to RAISE.
- Step 7. Check that HCA AC hydraulic pump is operating. Check fluid pressure on hydraulic fluid pressure gage.

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued

MALFUNCTION

TEST OR INSPECTION

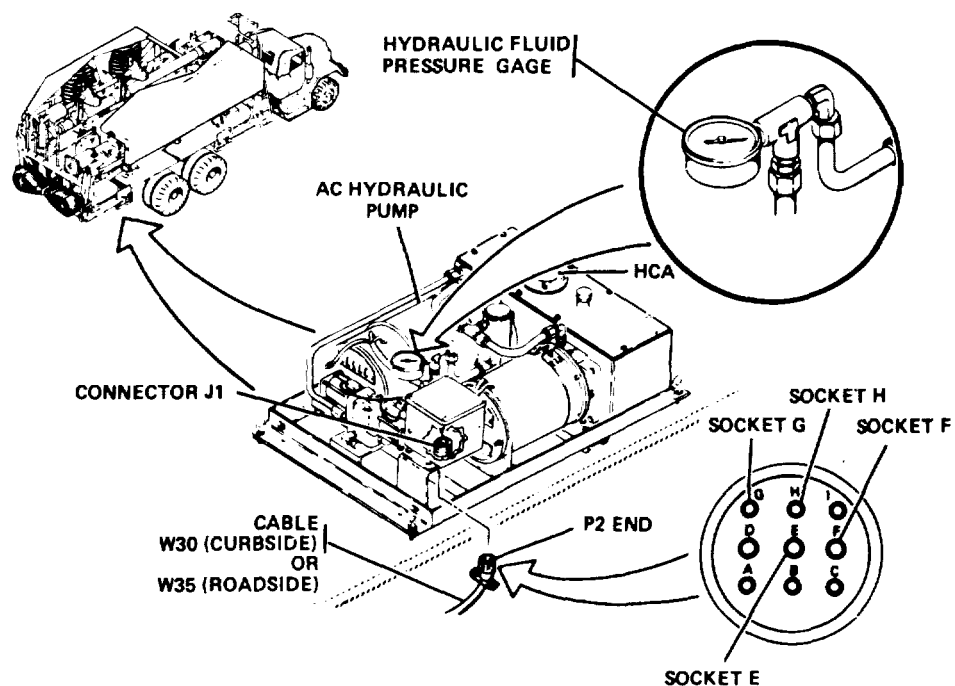
CORRECTIVE ACTION

6. MAST WILL NOT RAISE WHEN HYDRAULIC PUMP MODE SWITCH IS SET TO AC-Continued

NOTE

Record this Information. It will be helpful to higher level maintenance if the HCA is found to be defective.

- Step 8. Release MAST ERECTION switch.
- Step 9. Disconnect P2 end of cable assembly W30 (curbside) or W35 (roadside) from HCA connector J1.
- Step 10. Hold the MAST ERECTION switch to RAISE.
- Step 11. Measure for a minimum of 90 VDC between sockets G (-) and F (+) and for 24 to 28 VDC between sockets H (+) and E (-) at P2 end of cable assembly W30 or W35.
- If both voltages are present, replace HCA (para 2-8).
 - If either voltage is not present, go to step 12.



- Step 12. Release MAST ERECTION switch.

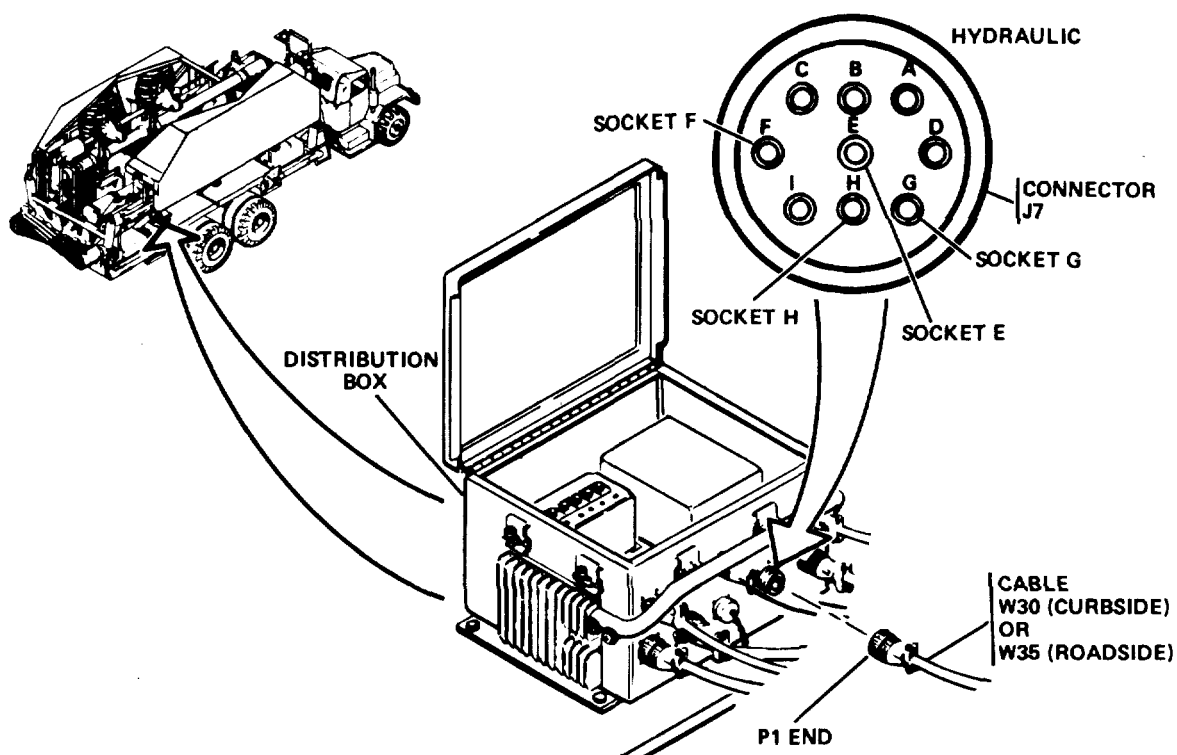
TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

- Step 13. Disconnect P1 end of cable assembly W30 (curbside) or W35 (roadside) from distribution box connector J7.
- Step 14. Hold MAST ERECTION switch to RAISE.
- Step 15. Measure for a minimum of 90 VDC between sockets G (-) and F (+) and for 24 to 28 VDC between sockets H (+) and E (-) of distribution box connector J7.
- If both voltages are present, replace cable assembly W30 or W35 (para 2-26).
 - If either voltage is not present, go to step 17.



- Step 16. Release MAST ERECTION switch.

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

6. MAST WILL NOT RAISE WHEN HYDRAULIC PUMP MODE SWITCH IS SET TO AC-Continued

Step 17. Disconnect P1 end of cable assembly W33 (curbside) or W38 (roadside) from distribution box connector J2.

Step 18. Check continuity between pins D and E at P1 end of cable assembly W33 or W38.

- If there is continuity, go to step 21.
- If there is no continuity, go to step 19.

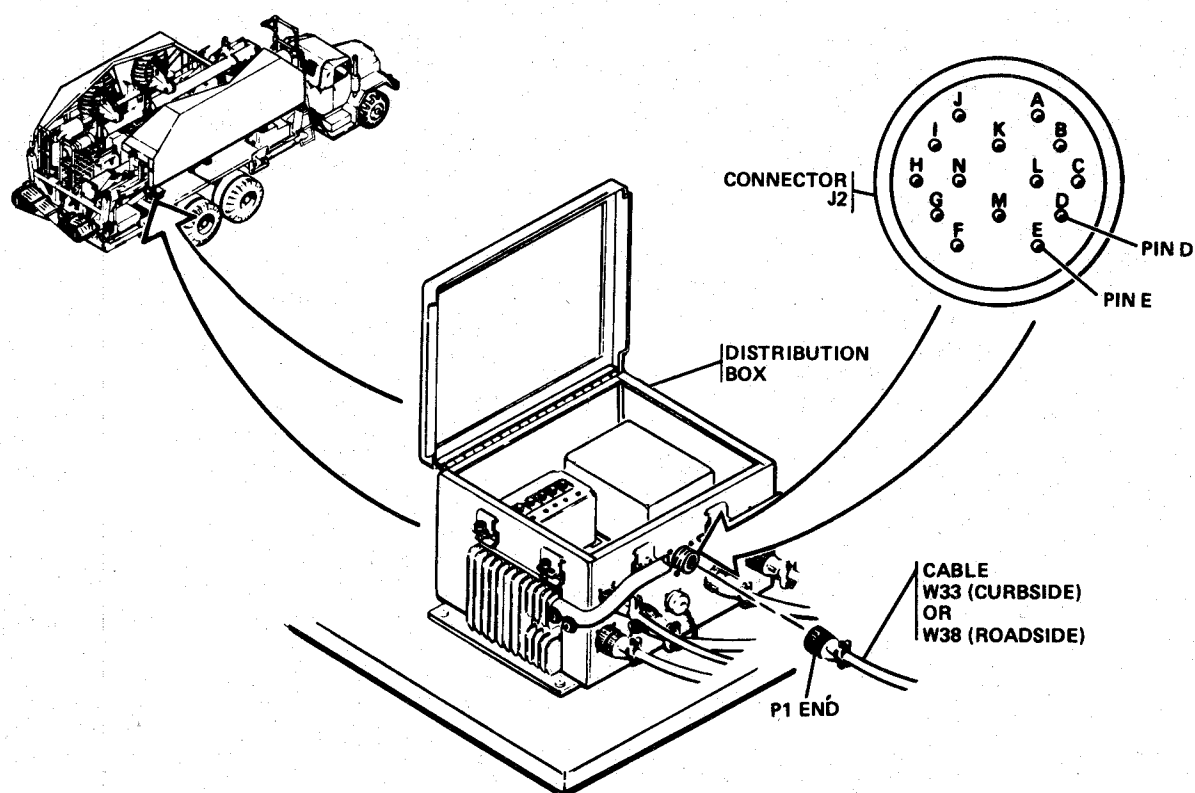


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
	Step 19.	Remove two screws and loosen two screws securing cover to 100 degree interlock switch. Remove cover.
	Step 20.	Check continuity between common (C) terminal and normally closed (NC) terminal or 100 degree interlock switch.

NOTE

If mast is vertical (or less than 100 degrees) switch should be closed (continuity)

- If there is no continuity, replace 100 degree interlock switch.
- If there is continuity, replace cable assembly W33 (curbside) or W38 (roadside) (para 2-26).

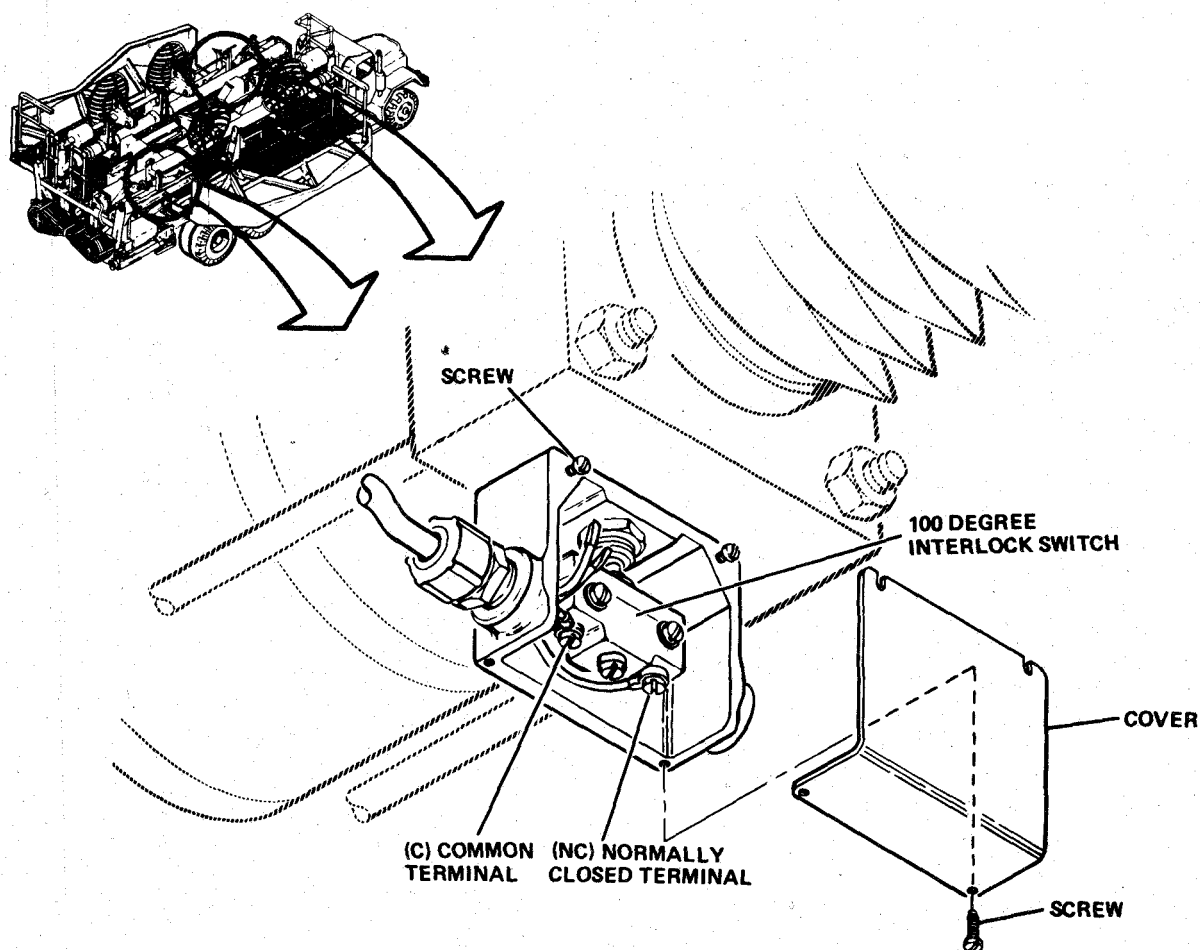


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
6.	MAST WILL NOT RAISE WHEN HYDRAULIC PUMP MODE SWITCH IS SET TO AC-Continued	
	Step 21. Disconnect P1 end of cable assembly W29 (curbside) or W34 (roadside) from distribution box connector J5.	
	Step 22. Hold MAST ERECTION switch to RAISE.	
	Step 23. Check continuity between pins R and P, between R and Q, and between pins R and M at P1 end of cable assembly W29 or W34.	• If there is continuity in both checks, replace distribution box (para 2-18). • If there is no continuity in either check, go to step 24.
	Step 24. Release MAST ERECTION switch.	

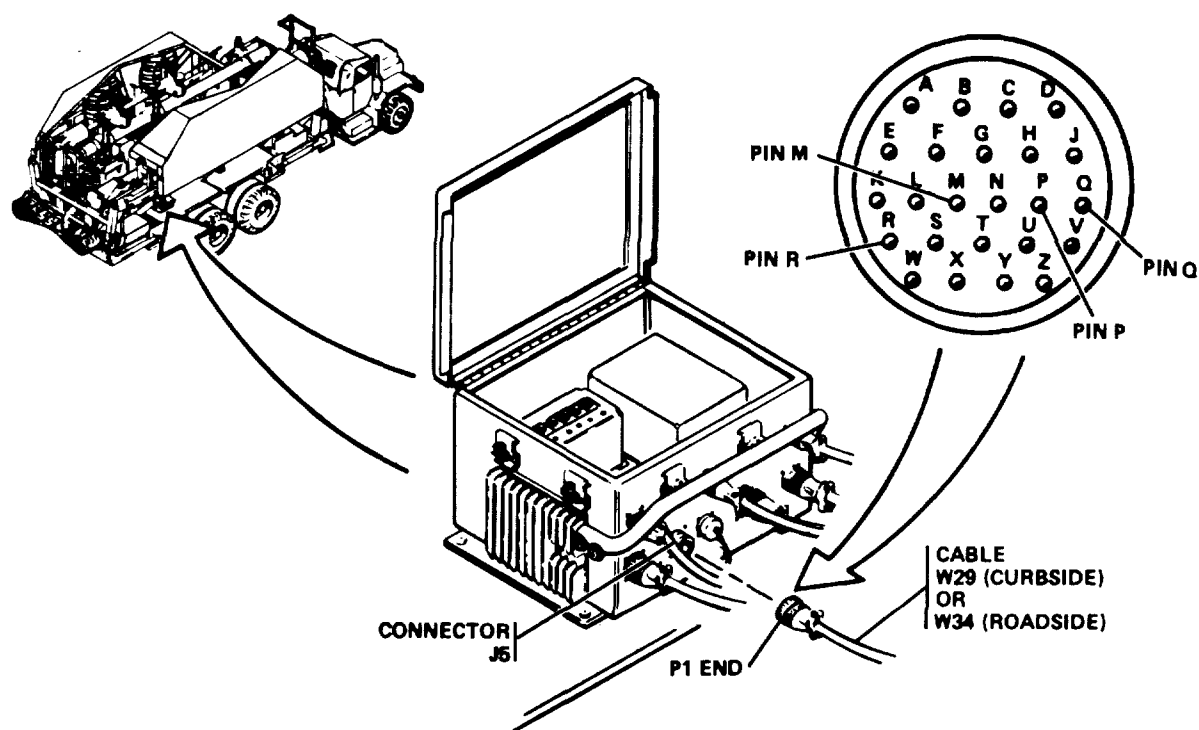


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****NOTE**

If necessary, remove mast control for access to connector for continuity check (para 2.21).

- Step 25. Disconnect P2 end of cable assembly W29 (curbside) or W34 (roadside) from mast control connector J1.
- Step 26. Hold MAST ERECTION switch to RAISE.
- Step 27. Check continuity between pins R and P and between pins R and M at mast control connector J1.
- If there is continuity in both checks, replace cable assembly W29 or W34 (para 2-26).
 - If there is no continuity in either check, reconnect cable assembly to distribution box and replace mast control (para 2-21).

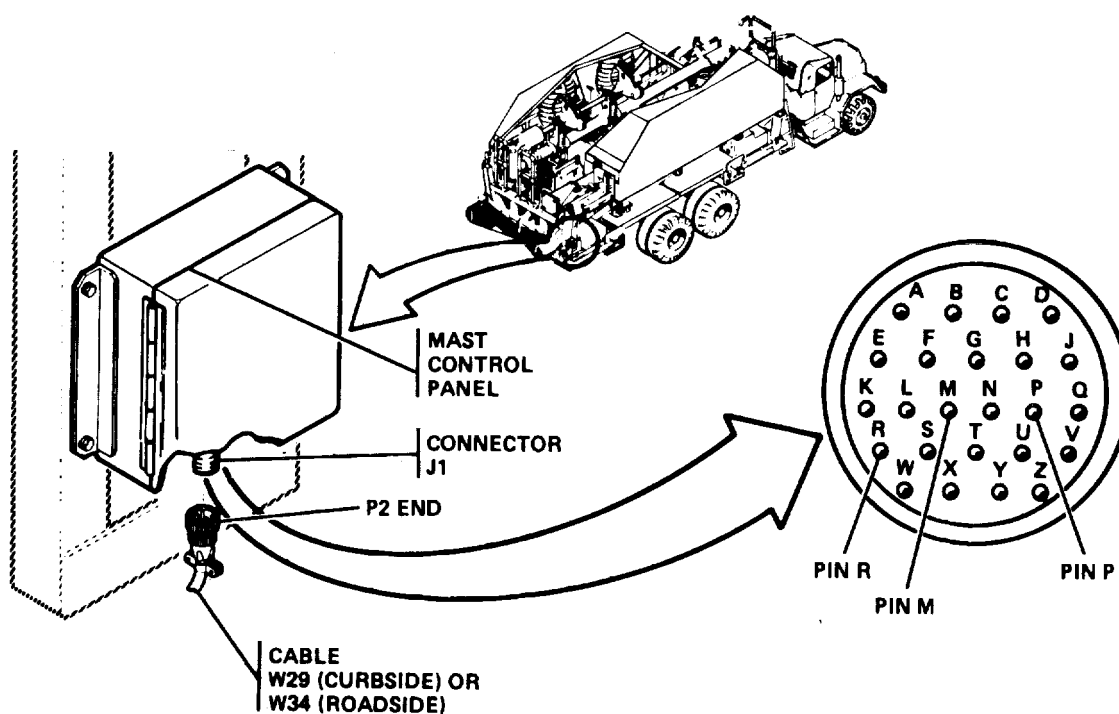


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

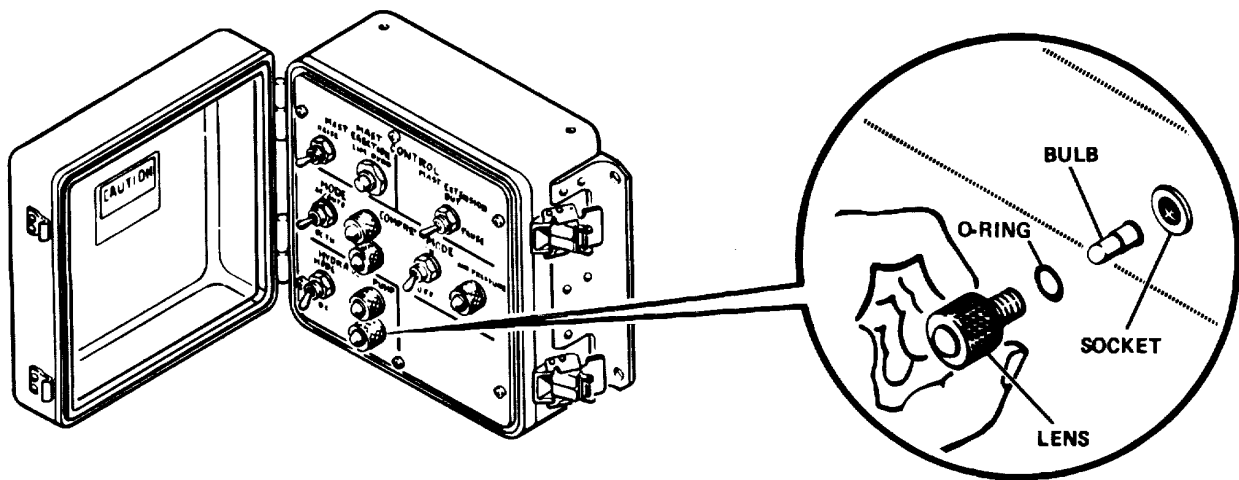
7.

MAST WILL RAISE TO VERTICAL, BUT DC HYDRAULIC PUMP MODE INDICATOR WILL NOT ILLUMINATE WHEN HYDRAULIC PUMP MODE SWITCH IS SET TO DC

NOTE

Do not discard O-ring. Reinstall it with new bulb.

- Step 1. Unscrew and remove lens from DC HYDRAULIC PUMP MODE indicator socket. Remove bulb from lens. Insert good bulb. Install lens with good bulb into DC HYDRAULIC PUMP MODE indicator socket.



- Step 2. Hold MAST ERECTION switch to RAISE.

- If indicator fails to illuminate, release MAST ERECTION switch and replace mast control (para 2-21).

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

8. MAST WILL NOT RAISE, HYDRAULIC PUMP MODE SWITCH IS SET TO DC.

NOTE

Remove HCA cover for access to HCA connector.

- Step 1. Disconnect P2 end of cable assembly W30 (curbside) or W35 (roadside) from HCA connector J1.
- Step 2. Hold MAST ERECTION switch to RAISE.
- Step 3. Measure for 24 to 28 Vdc between sockets D (+) and E (-) at the P2 end of cable assembly W30 or W35.
- If there is voltage, replace HCA (para 2-8).
 - If there is little or no voltage, go to step 4.
- Step 4. Release MAST ERECTION switch.

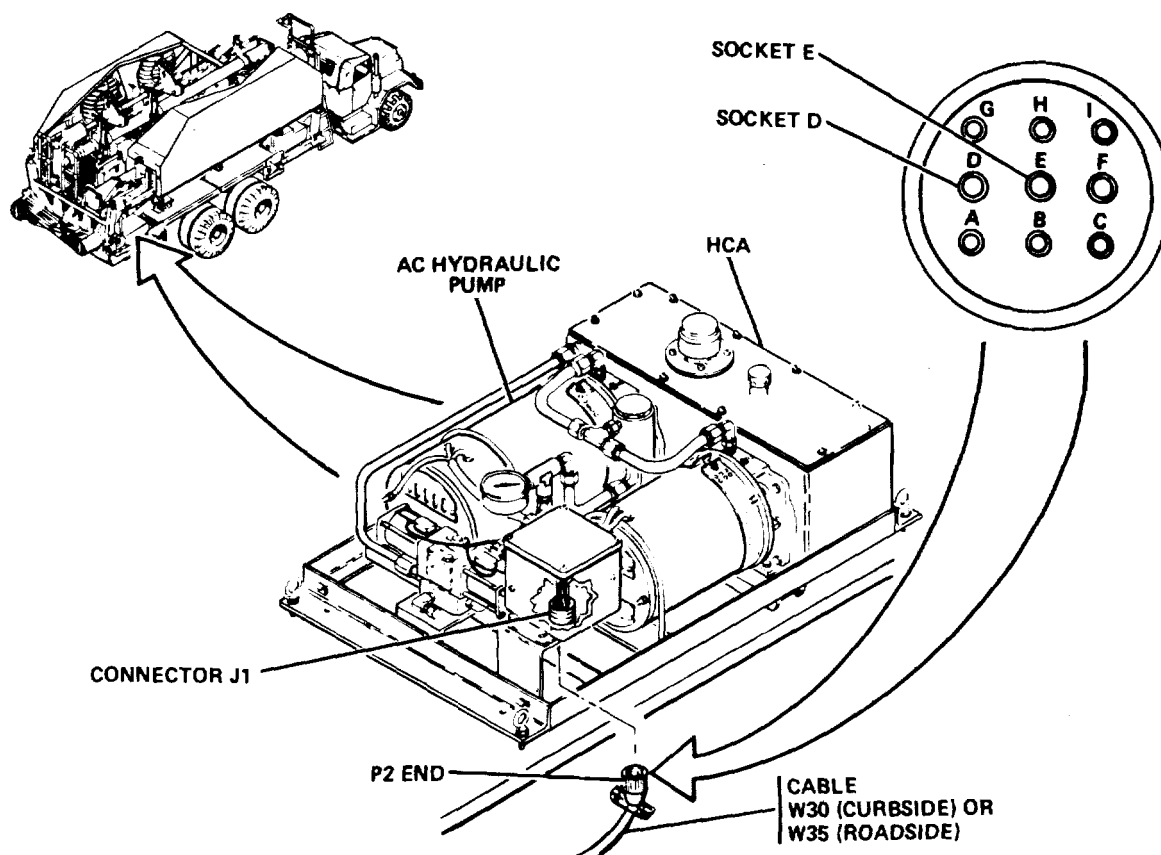


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
	Step 5.	Disconnect P1 end of cable assembly W30 (curbside) or W35 (roadside) from distribution box connector J7.
	Step 6.	Hold MAST ERECTION switch to RAISE.
	Step 7.	Measure for 24 to 28 VDC between sockets D (+) and E (-) of distribution box connector J7.
		• If voltage is present, replace cable W30 or W35 (para 2-26) • If voltage is not present, reconnect cable assembly to HCA and go to step 8
	Step 8.	Release MAST ERECTION switch.

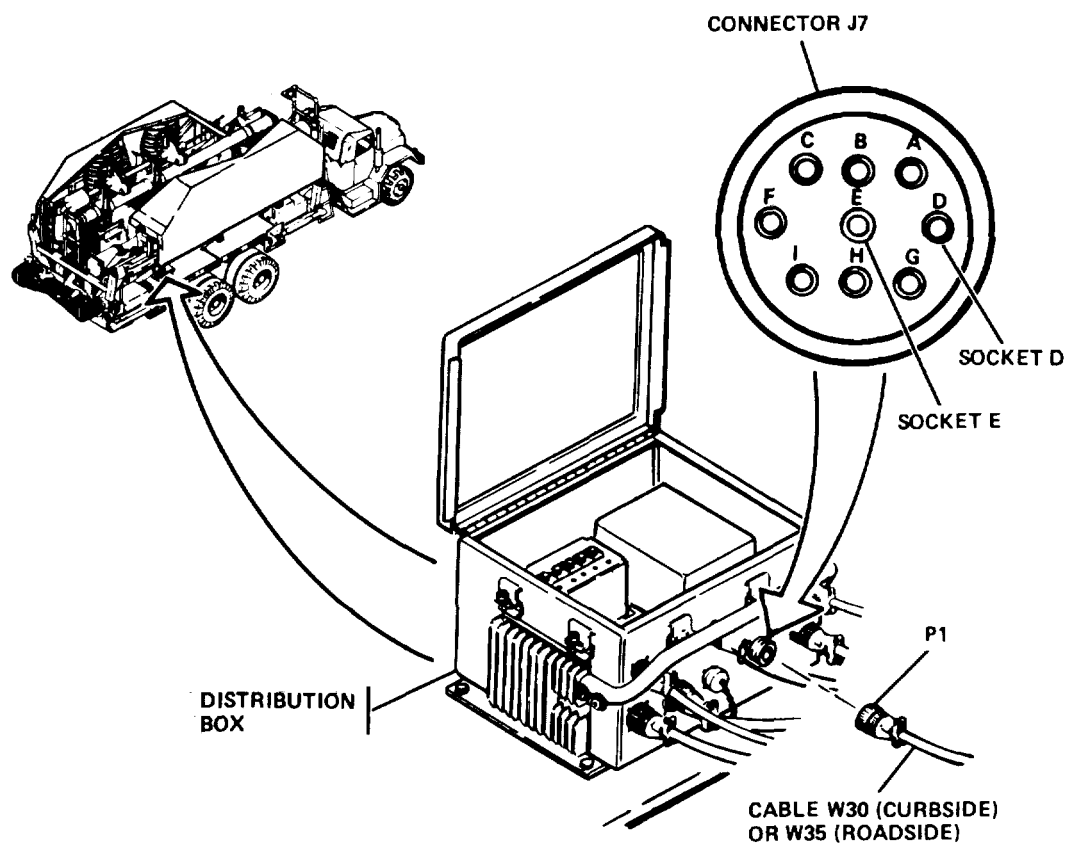


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

8. MAST WILL NOT RAISE, HYDRAULIC PUMP MODE SWITCH IS SET TO DC-Continued
- Step 9. Disconnect P1 end of cable assembly W29 (curbside) or W34 (roadside) from distribution box connector J5.
- Step 10. Hold MAST ERECTION switch to RAISE.
- Step 11. Check continuity between pins R and N at P1 end of cable assembly W29 or W34.
- If there is continuity, replace distribution box (para 2-18).
 - If there is no continuity, reconnect cable assembly to distribution box connector J7 and go to step 12.
- Step 12. Release MAST ERECTION switch.

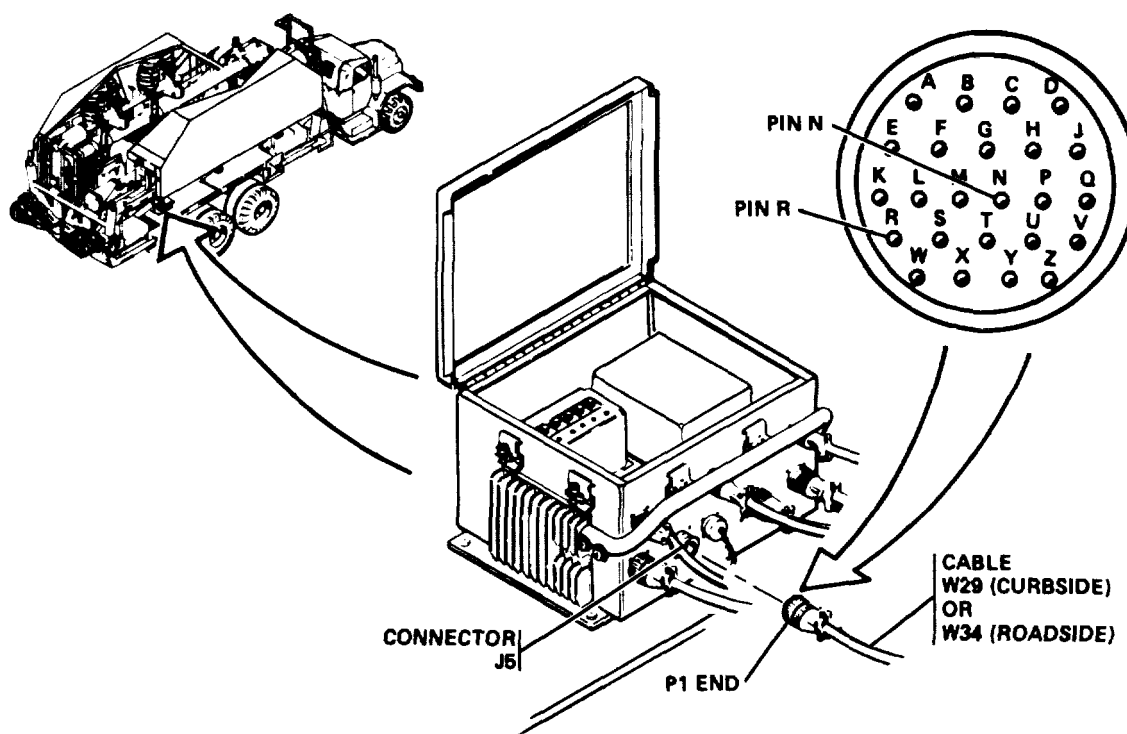


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****NOTE**

If necessary, remove mast control for access to connector for continuity check (para 2-21).

Step 13. Disconnect P2 end of cable assembly W29 (curbside) or W34 (roadside) from mast control connector J1.

Step 14. Hold MAST ERECTION switch to RAISE.

Step 15. Check continuity between pins R and N of mast control connector J1.

- If there is continuity, replace cable assembly W29 or W34 (para 2-26)
- If there is no continuity, reconnect cable assembly to distribution box and replace mast control (para 2-21)

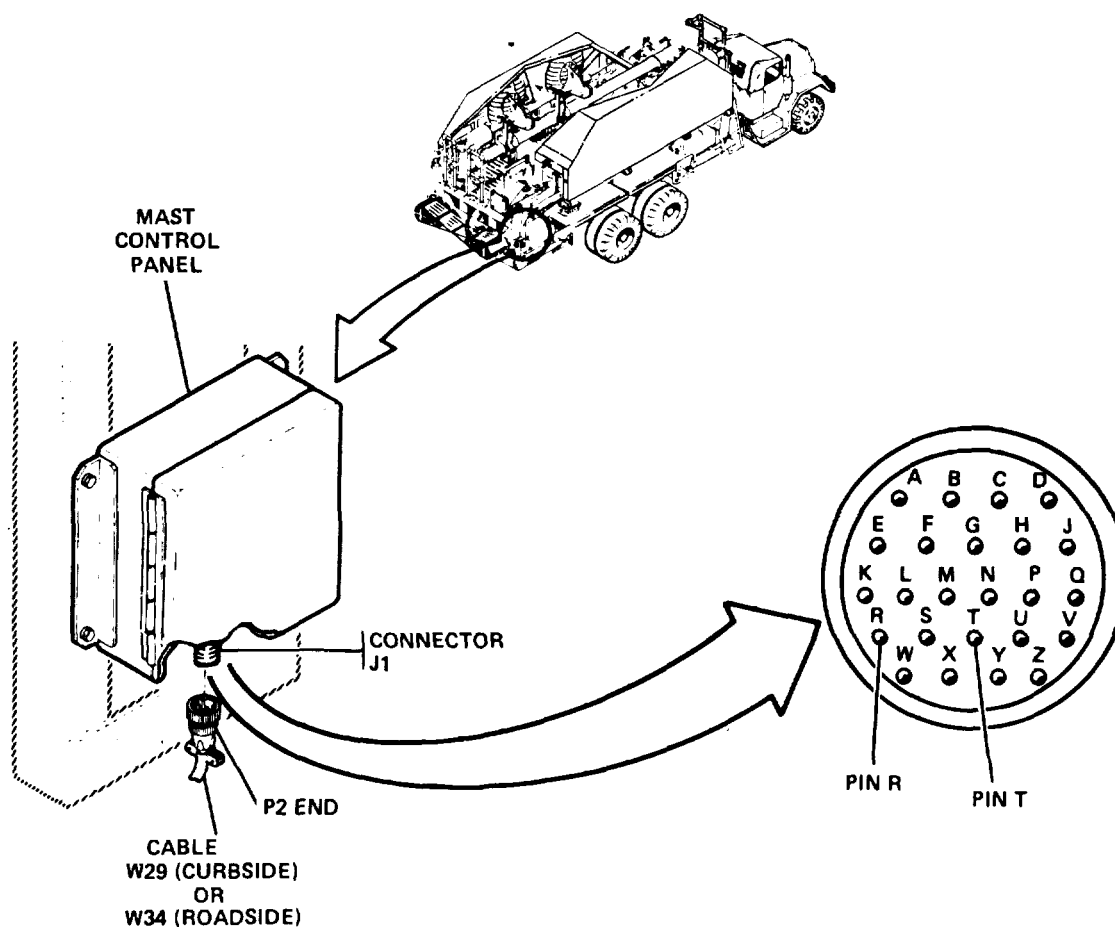


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

9. MAST WILL RAISE, BUT NOT LOWER

NOTE

Remove HCA covers to gain access.

- Step 1. Disconnect P2 end of cable assembly W30 (curbside) or W35 (roadside) from HCA connector J1.
- Step 2. Hold the MAST ERECTION switch to LOWER.
- Step 3. Measure for 24 to 28 VDC between sockets I and E at P2 end of cable assembly W30 or W35.
- If voltage is present, replace HCA (para 2-8)
 - If there is little or no voltage, go to step 4
- Step 4. Release MAST ERECTION switch.

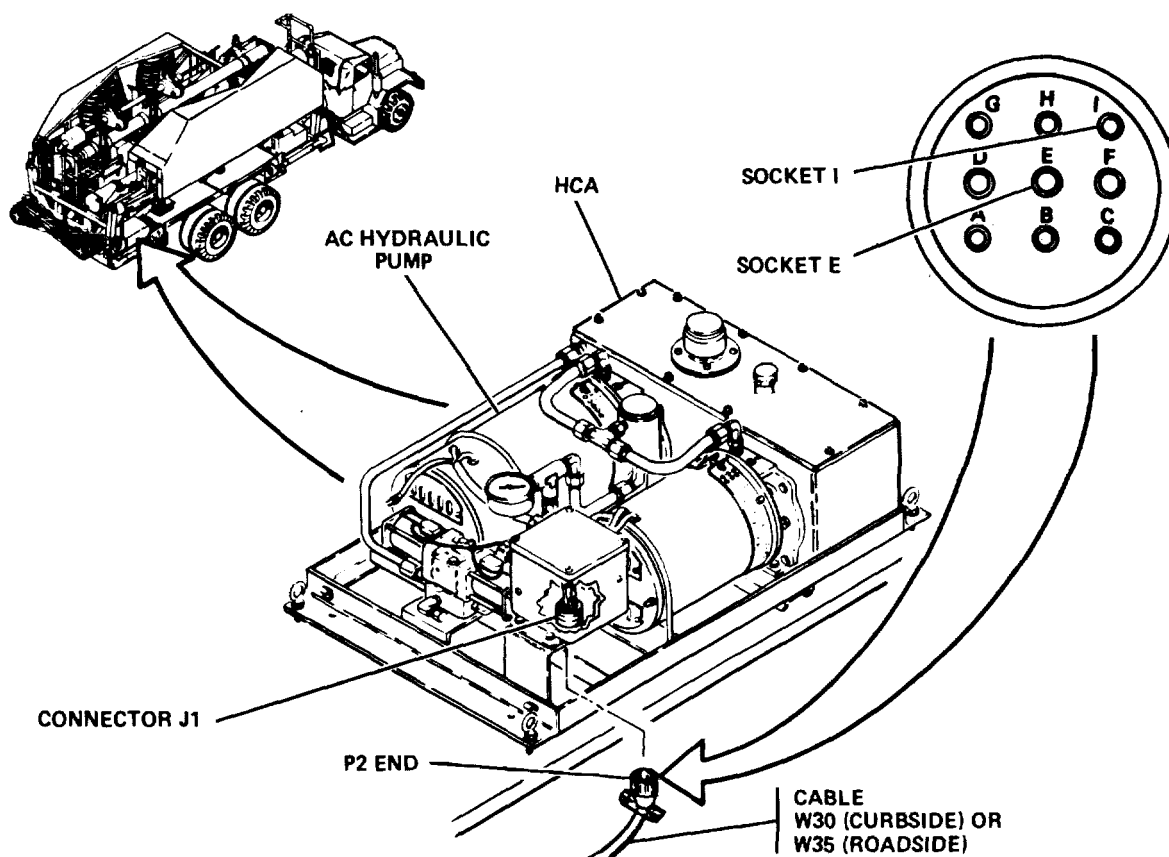


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

- Step 5. Disconnect P1 end of cable assembly W30 (curbside) or W35 (roadside) from distribution box connector J7.
- Step 6. Hold MAST ERECTION switch to LOWER.
- Step 7. Measure for 24 to 28 VDC between sockets I (+) and E (-) of distribution box connector J7.
- If voltage is present, replace cable assembly W30 or W35 (para 2-26)
 - If there is little or no voltage, reconnect cable assembly to HCA and go to step 8
- Step 8. Release MAST ERECTION switch.

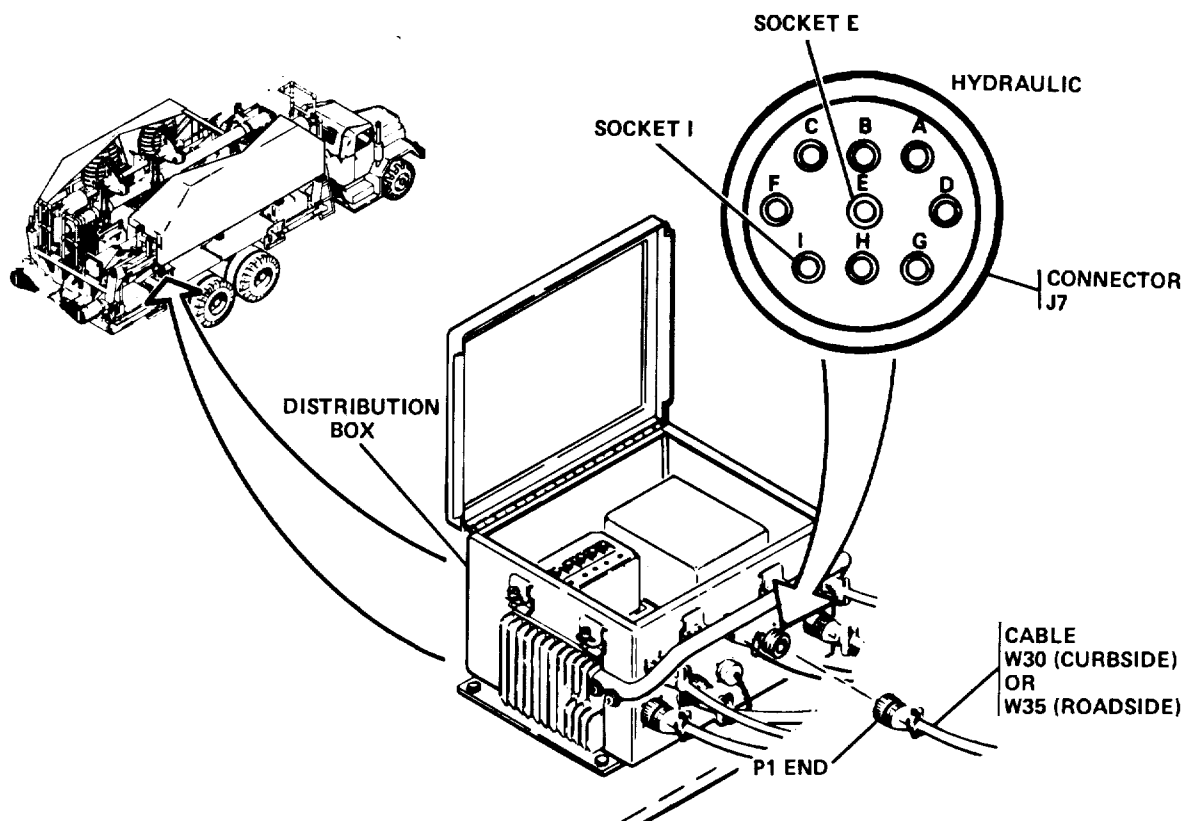


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
9.	MAST WILL RAISE, BUT NOT LOWER-Continued	
	Step 9. Disconnect P1 end of cable assembly W29 (curbside) or W34 (roadside) from distribution box connector J5.	
	Step 10. Hold MAST ERECTION switch to LOWER.	
	Step 11. Check continuity between pins R and T at P1 end of cable assembly W29 or W34.	
		• If there is continuity, go to step 16 • If there is no continuity, go to step 12
	Step 12. Release MAST ERECTION switch.	

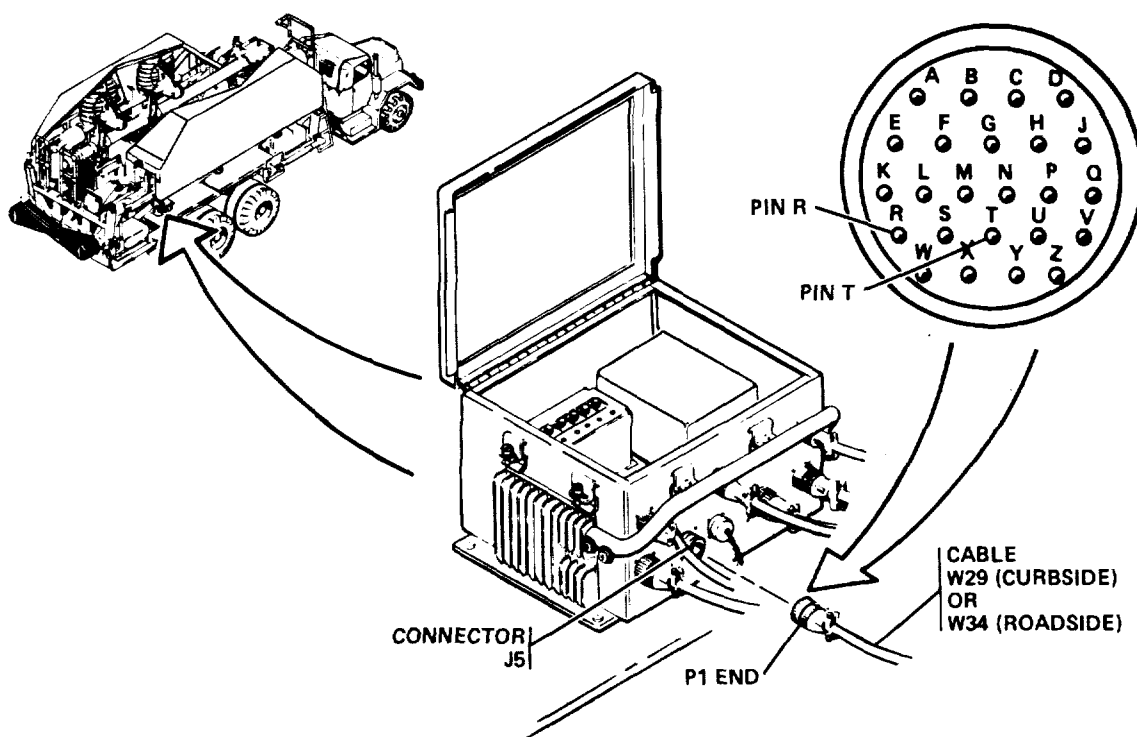


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****NOTE**

Remove mast control for access to connector for continuity check.

- Step 13. Disconnect P2 end of cable assembly W29 (curbside) or W34 (roadside) from mast control connector J1.
- Step 14. Hold MAST ERECTION switch to LOWER.
- Step 15. Check continuity between pins R and T of mast control connector J1.
- If there is continuity, replace cable assembly W29 or W34 (para 2-26)
 - If there is no continuity, reconnect cable assembly to distribution box and replace mast control (para 2-21)
- Step 16. Release MAST ERECTION switch..

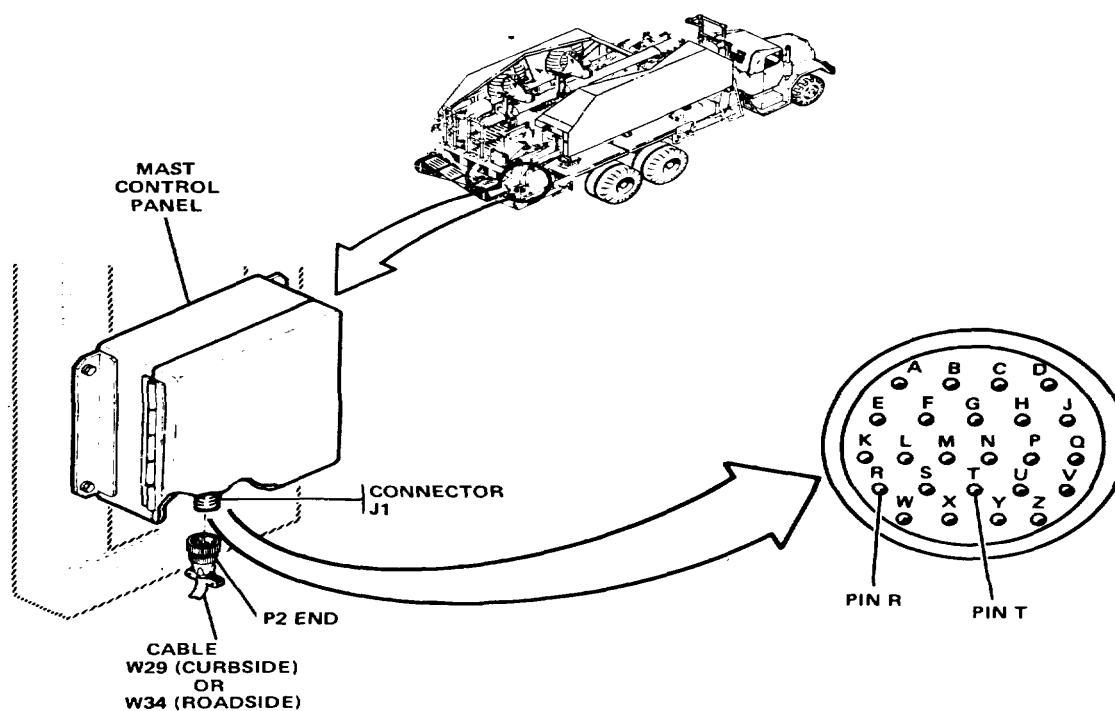


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
9.	MAST WILL RAISE, BUT NOT LOWER-Continued	
	Step 17. Disconnect P1 end of cable assembly W33 (curbside) or W38 (roadside) from distribution box connector J2.	
	Step 18. Check continuity between sockets F and G at the P1 end of cable assembly W33 or W38.	
		• If there is continuity; replace distribution box (para 2-18) • If there is no continuity, reconnect cable assembly to distribution box and go to step 19

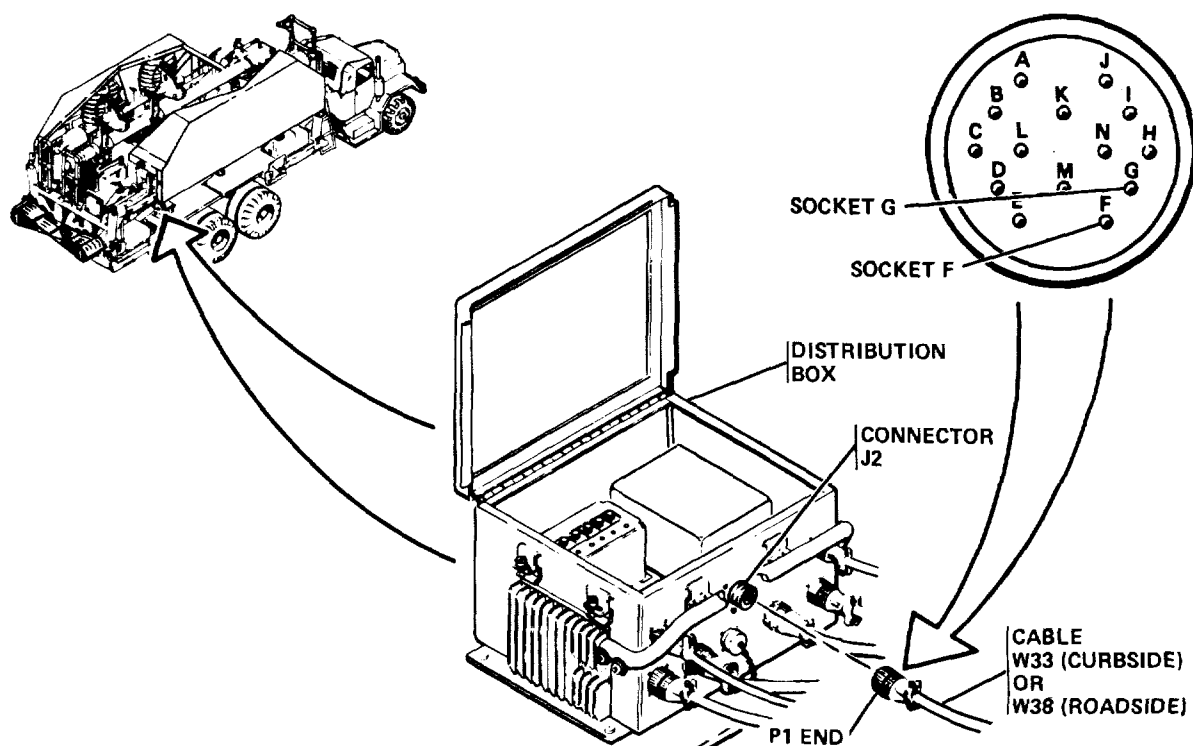


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

- Step 19. Remove two screws and flat washers securing 10 degree limit switch cover. Remove cover.
- Step 20. Pull actuating arm in toward cover.
- Step 21. Check continuity between terminals of 10 degree limit switch.
- If there is continuity, replace cable assembly W33 or W38 (para 2-26).
 - If there is no continuity, replace 10 degree limit switch (para 2-28).

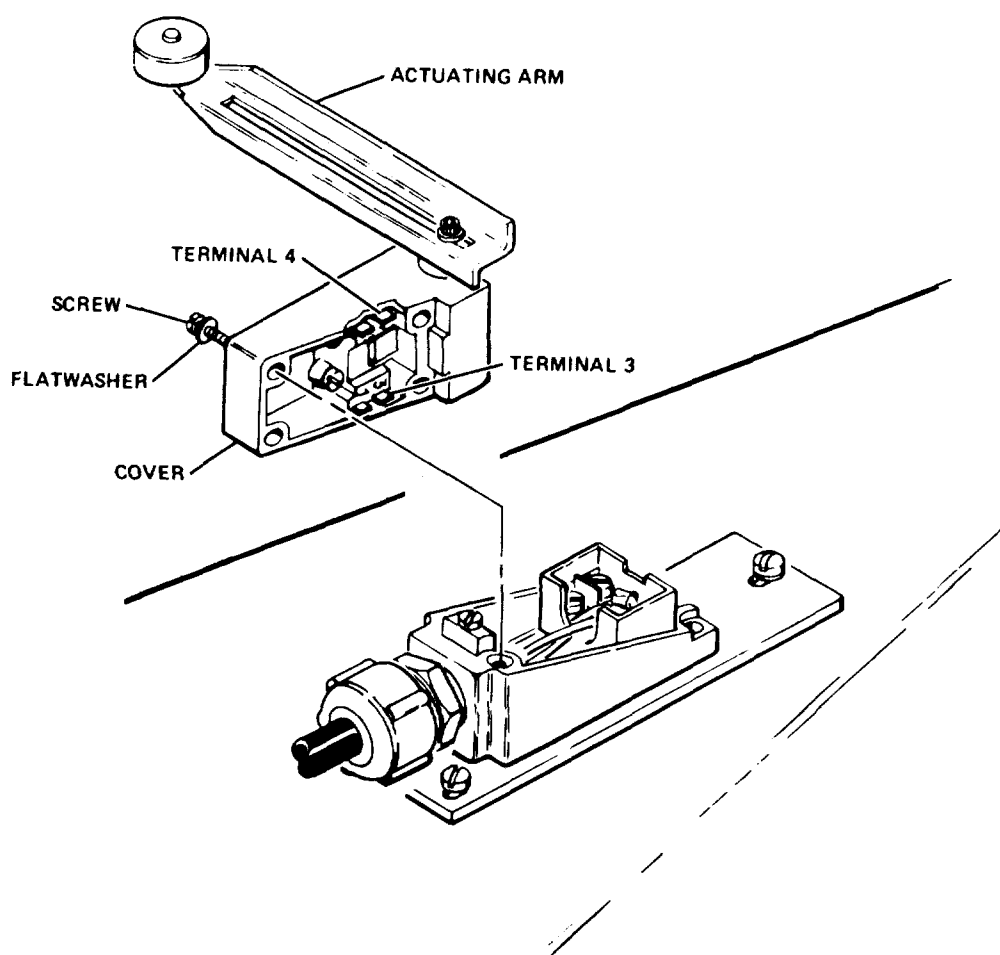


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

10.

MAST WILL NOT EXTEND, MAST EXTENSION SWITCH SET TO "OUT"

Step 1. Disconnect P2 end of cable assembly W33 (curbside) or W38 (roadside) from interconnect box connector J3.

Step 2. Check continuity between sockets A and B of interconnect box connector J3.

- If there is no continuity, go to step 19.
- If there is continuity, go to step 3.

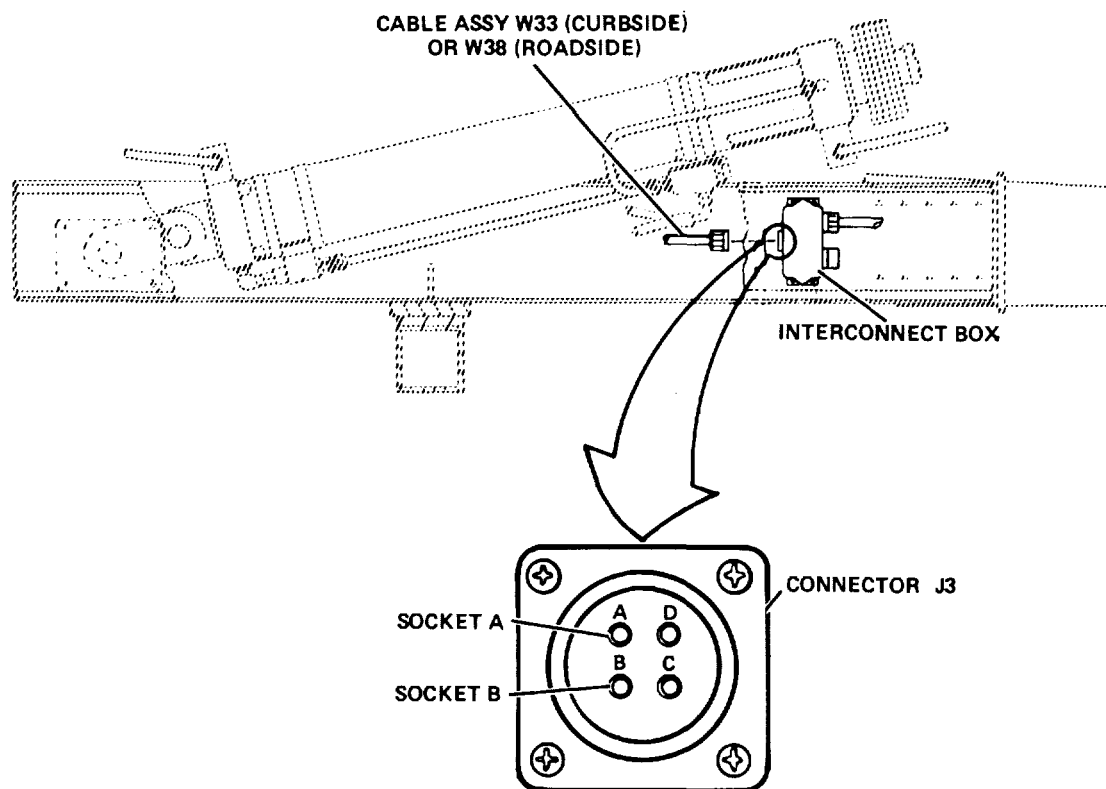


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

Step 3. Remove two screws and loosen two screws securing cover to zero degree interlock switch. Remove cover.

Step 4. Check continuity between the common (C) terminal and the normally closed (NC) terminal of the zero degree interlock switch.

- If there is no continuity, replace zero degree interlock switch (para 2-27)
- If there is continuity, go to step 5

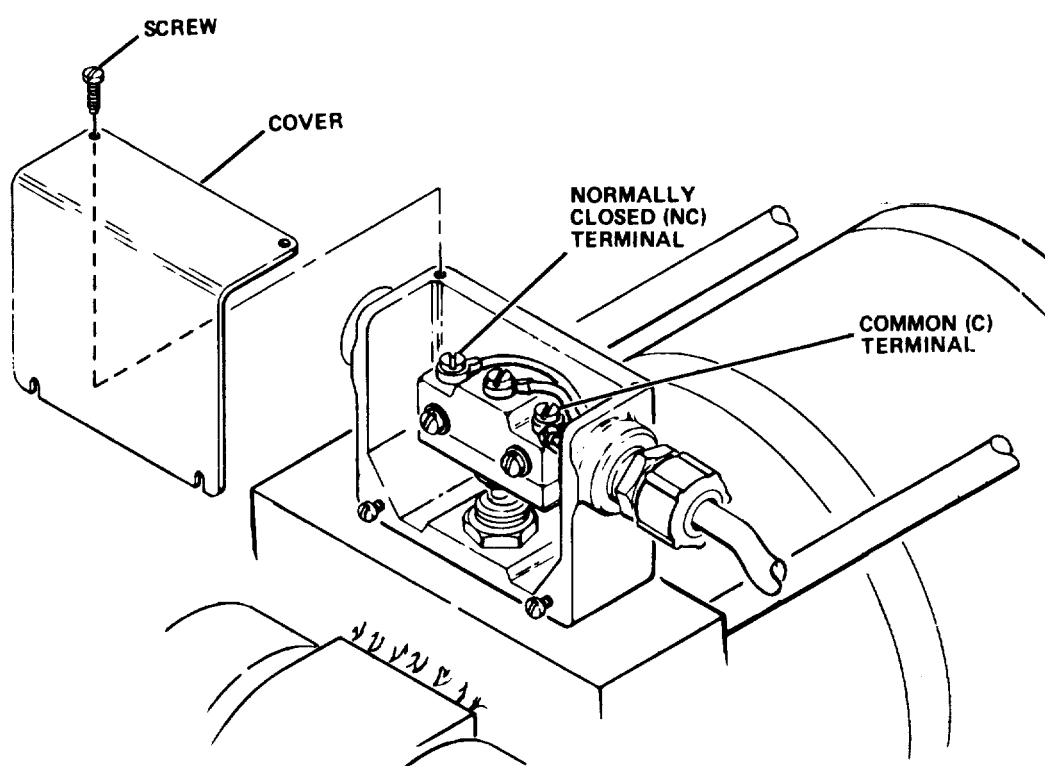


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

10. MAST WILL NOT EXTEND, MAST EXTENSION SWITCH SET TO "OUT" - Continued

- Step 5. Disconnect P1 end of cable assembly W33 (curbside) or W38 (roadside) from distribution box connector J2.
- Step 6. Measure for 24 to 28 VDC between pins M (-) and N (+) and between pins H (-) and I (+) of distribution box connector J2.
- If both voltages are present, replace cable assembly W33 or W38 (para 2-26)
 - If there is little or no voltage in either check, reconnect cable assembly and go to step 7

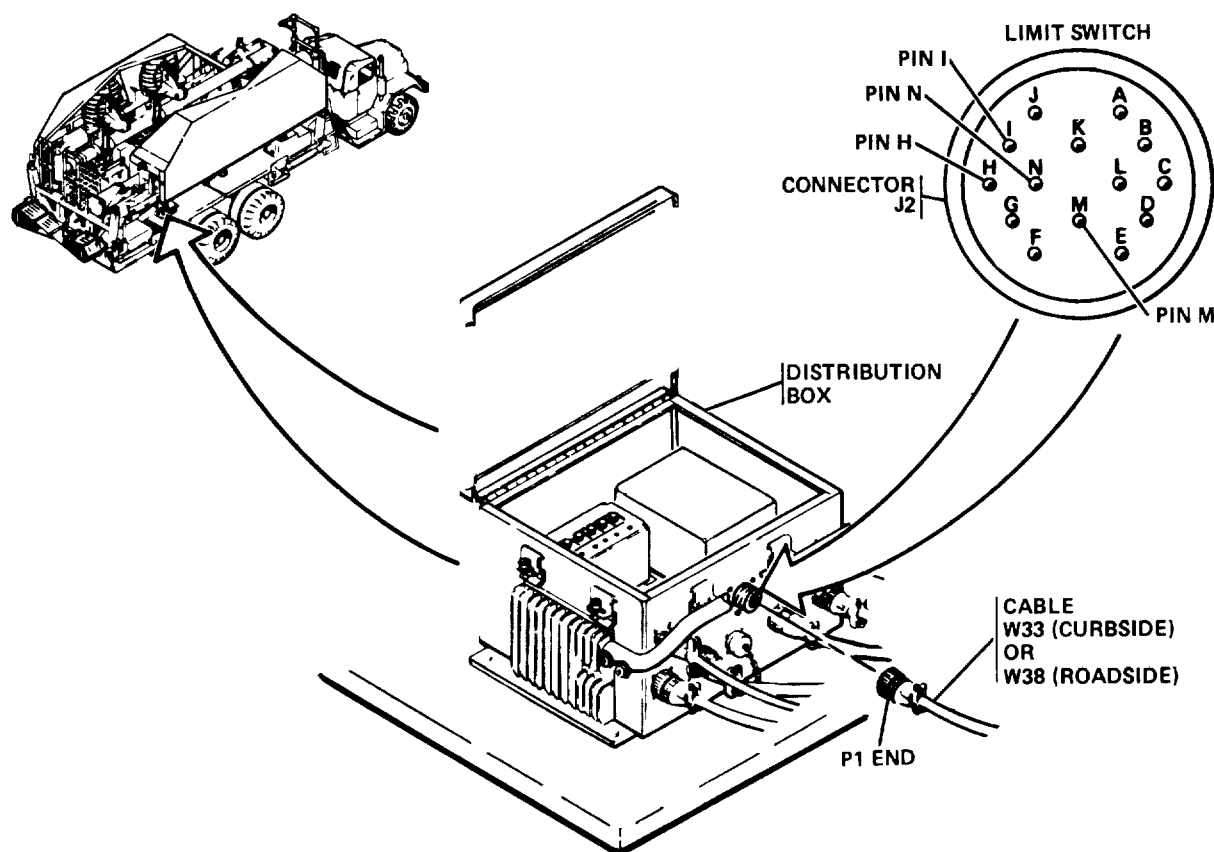


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

Step 7. Disconnect P1 end of cable assembly W32 (curbside) or W37 (roadside) from distribution box connector J8.

Step 8. Check continuity between pins B and C and between pins I and J of P1 end of cable assembly W32 or W37.

- If there is no continuity in both checks, go to step 9.
- If there is continuity in either check, go to step 11.

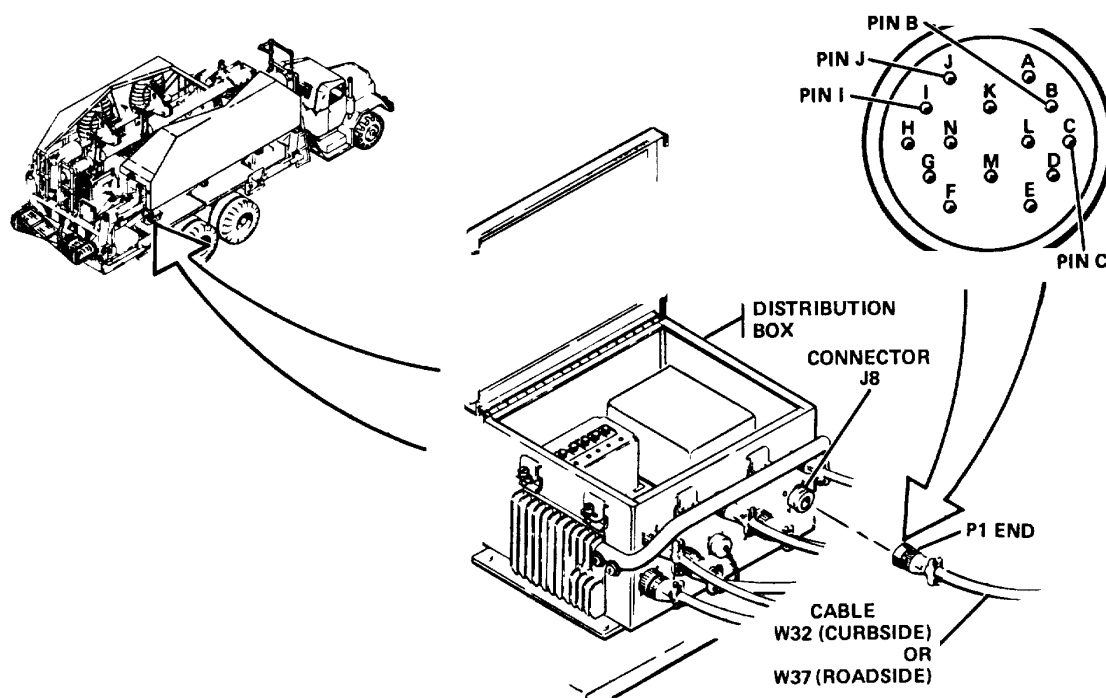


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****10. MAST WILL NOT EXTEND, MAST EXTENSION SWITCH SET TO OUT - Continued**

Step 9. Disconnect P2 end of cable assembly W32 (curbside) or W37 (roadside) from PCA connector J1.

Step 10. Check continuity between pins B and C and between pins I and J of PCA connector J1.

- If there is continuity in both checks, replace cable assembly W32 or W37 (para 2-26)
- If there is no continuity in either check, reconnect cable assembly to distribution box and replace PCA (para 2-19)

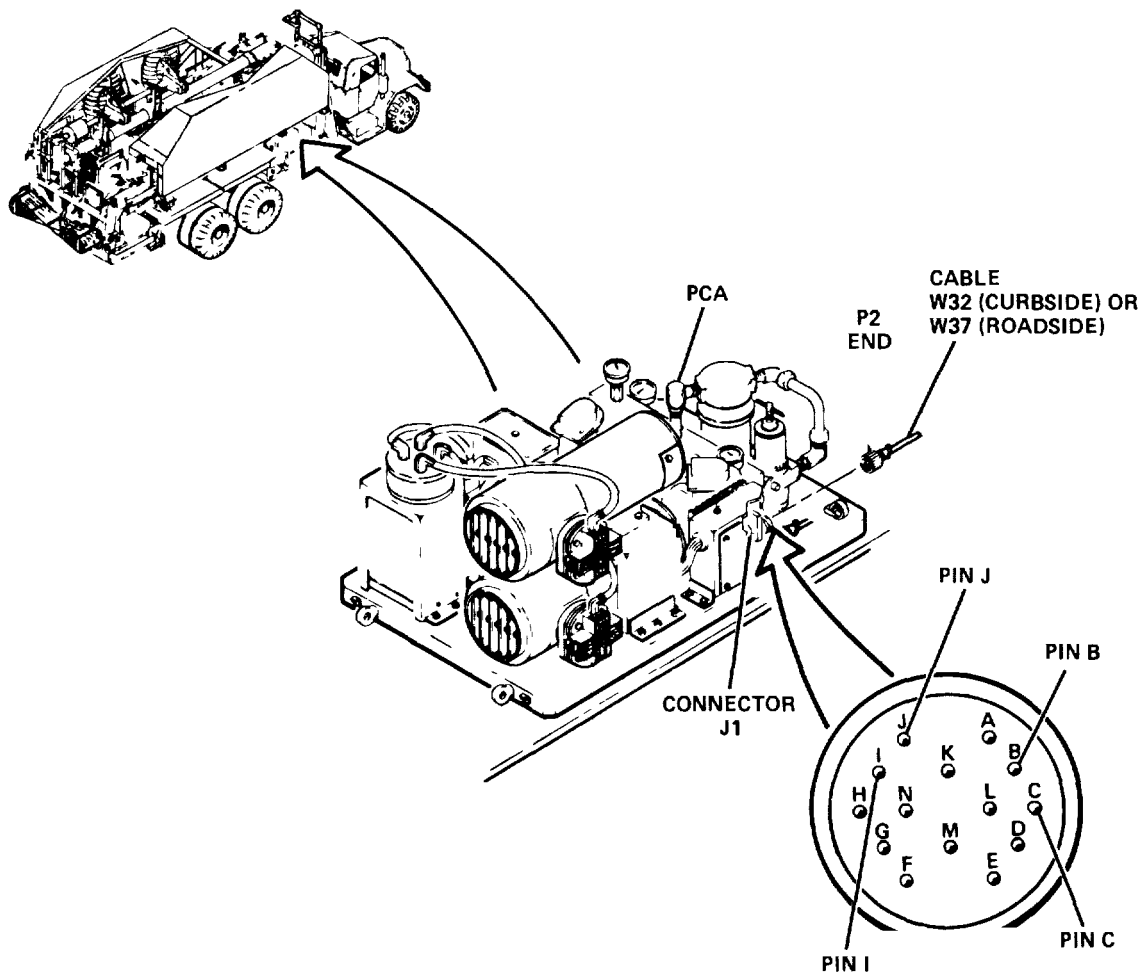


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

Step 11. Disconnect P1 end of cable assembly W29 (curbside) or W34 (roadside) from distribution box connector J5.

Step 12. Check continuity between pins A and B at the P1 end of cable assembly W29 or W34.

- If there is continuity, replace distribution box (para 2-18)
- If there is no continuity, go to step 13

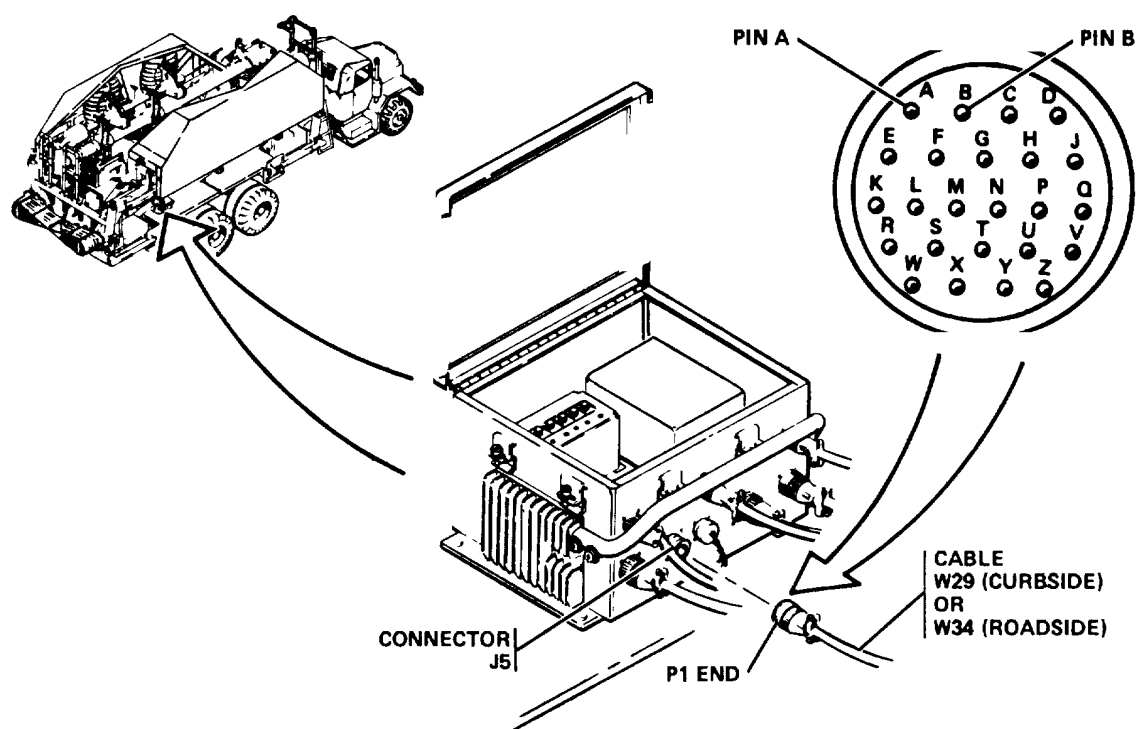
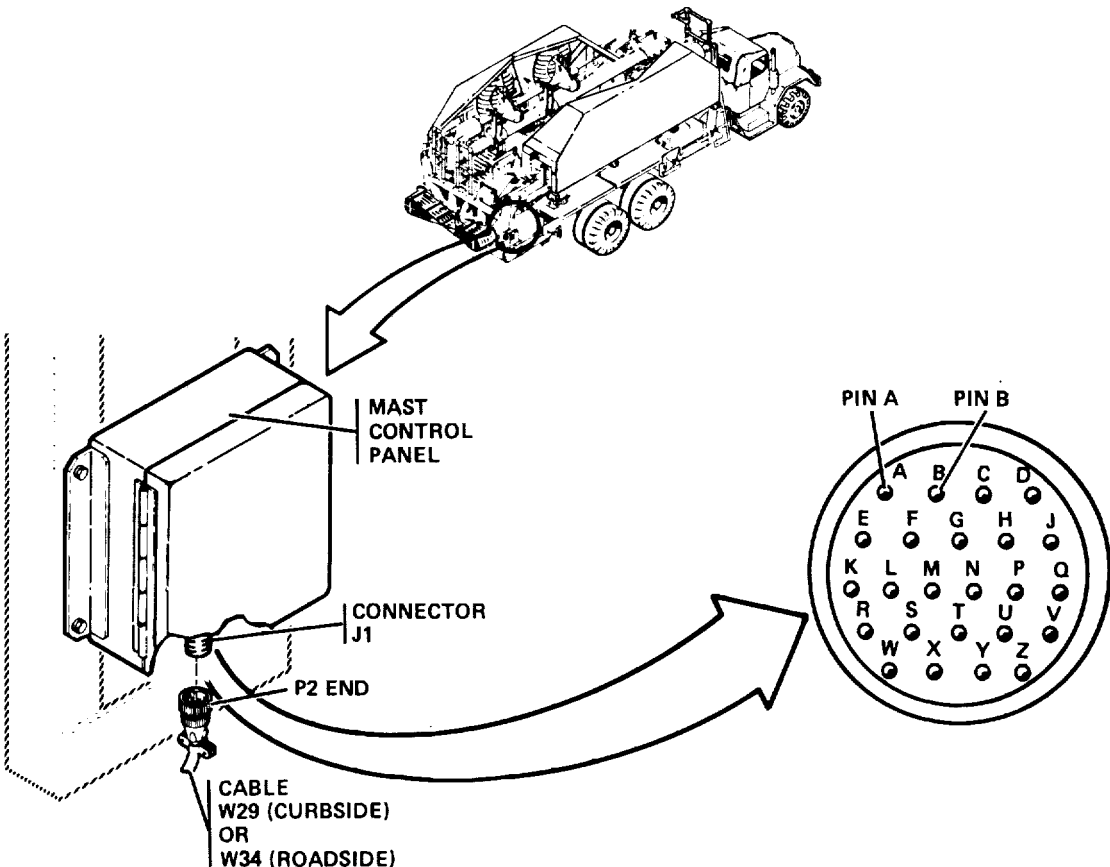


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued

TEST OR INSPECTION		CORRECTIVE ACTION
10. MAST WILL NOT EXTEND, MAST EXTENSION SWITCH SET TO OUT-Continued		
NOTE Remove mast control for access to connector for continuity check (para 2-21).		
Step 13.	Disconnect P2 end of cable assembly W29 (curbside) or W34 (roadside) from mast control connector J1.	• If there is continuity, replace cable assembly W29 or W34 (para 2-26) • If there is no continuity, reconnect cable assembly to distribution box and replace mast control (para 2-21)
Step 14.	Check continuity between pins A and B of mast control connector J1.	
 The diagram illustrates the location of the mast control panel and connector J1 on a truck. An arrow points from the truck to the mast control panel. The panel is labeled "MAST CONTROL PANEL". Below it, the connector is labeled "CONNECTOR J1". A cable is connected to the connector, labeled "CABLE W29 (CURBSIDE) OR W34 (ROADSIDE)". The cable is also labeled "P2 END". An arrow points from the connector to a detailed view of the connector pins. The pins are arranged in a circular pattern and labeled with letters A through Z. Pins A and B are specifically labeled as "PIN A" and "PIN B".		

2-50

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued

MALFUNCTION	
TEST OR INSPECTION	CORRECTIVE ACTION
Step 15. Deleted.	
Step 16. Deleted.	
Change 1 2-51	

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued		
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
10. MAST WILL NOT EXTEND, MAST EXTENSION SWITCH SET TO OUT - Continued		
	Step 17. Deleted.	
	Step 18. Deleted.	

Change 1

2-52

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

Step 19. Disconnect P1 end of cable assembly W27 (curbside) or W40 (roadside) from interconnect box connector J2.

Step 20. Check continuity between pins A and B at P1 end of cable assembly W27 or W40.

- If there is continuity, replace interconnect box (para 2-11).
- If there is no continuity, go to step 21.

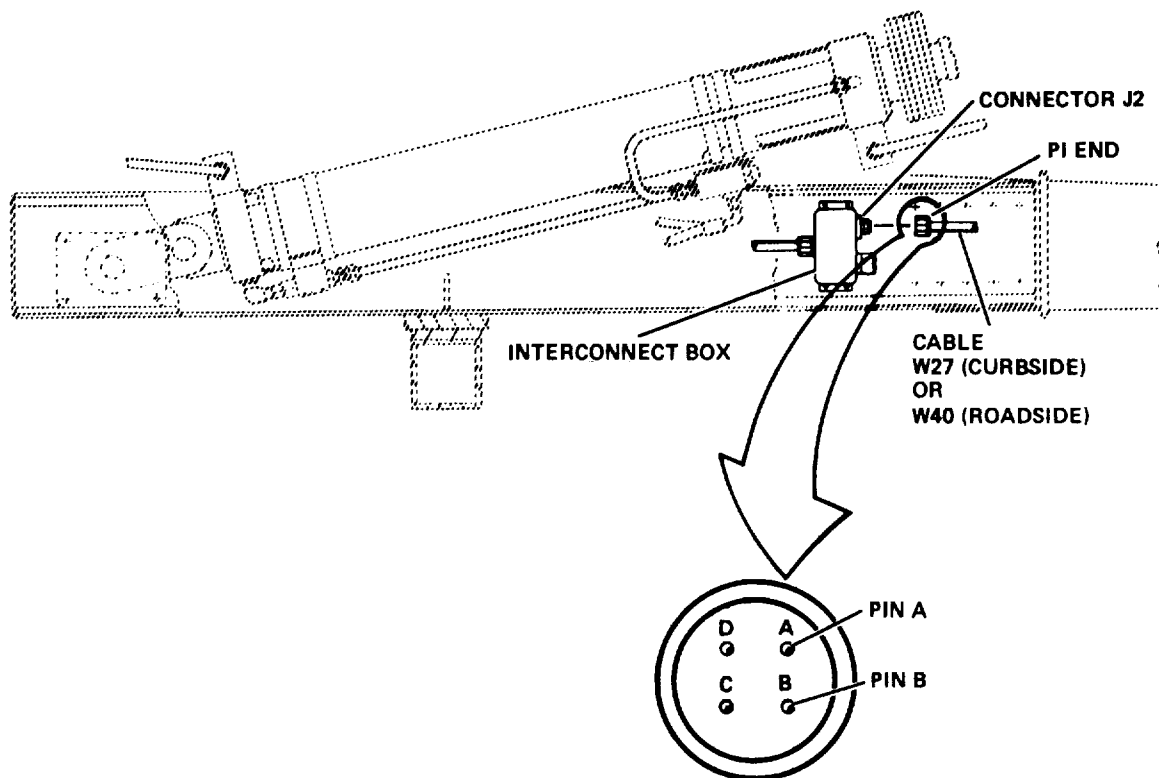


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****10. MAST WILL NOT EXTEND, MAST EXTENSION SWITCH SET TO OUT - Continued**

Step 21. Remove two screws securing cover to lock strut interlock switch. Remove cover. Hold actuating arm in towards switch cover (you will hear a click).

Step 22. Check continuity between lock strut interlock terminals 3 and 4.

- If there is continuity, replace cable assembly W27 or W40 (para 2-26)
- If there is no continuity, replace lock strut interlock switch (para 2-29)

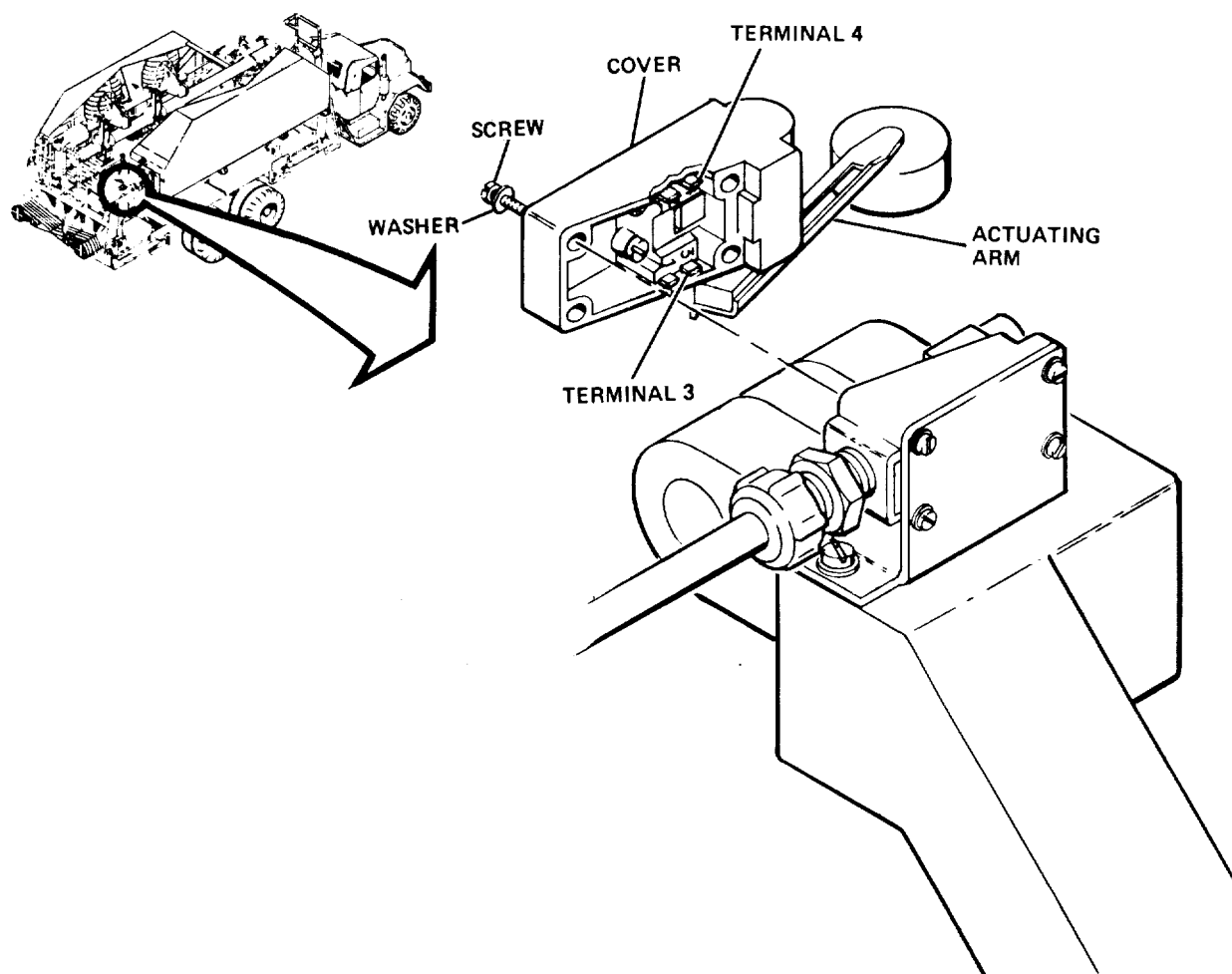


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

11. MAST WILL NOT RETRACT, MAST EXTENSION SWITCH IS SET TO IN

- Step 1. Disconnect P1 end of cable assembly W29 (curbside) or W34 (roadside) from distribution box connector J5.
- Step 2. Check continuity between pins A and C at the P1 end of cable assembly W29 or W34.
- If there is continuity, go to step 5
 - If there is no continuity, go to step 3

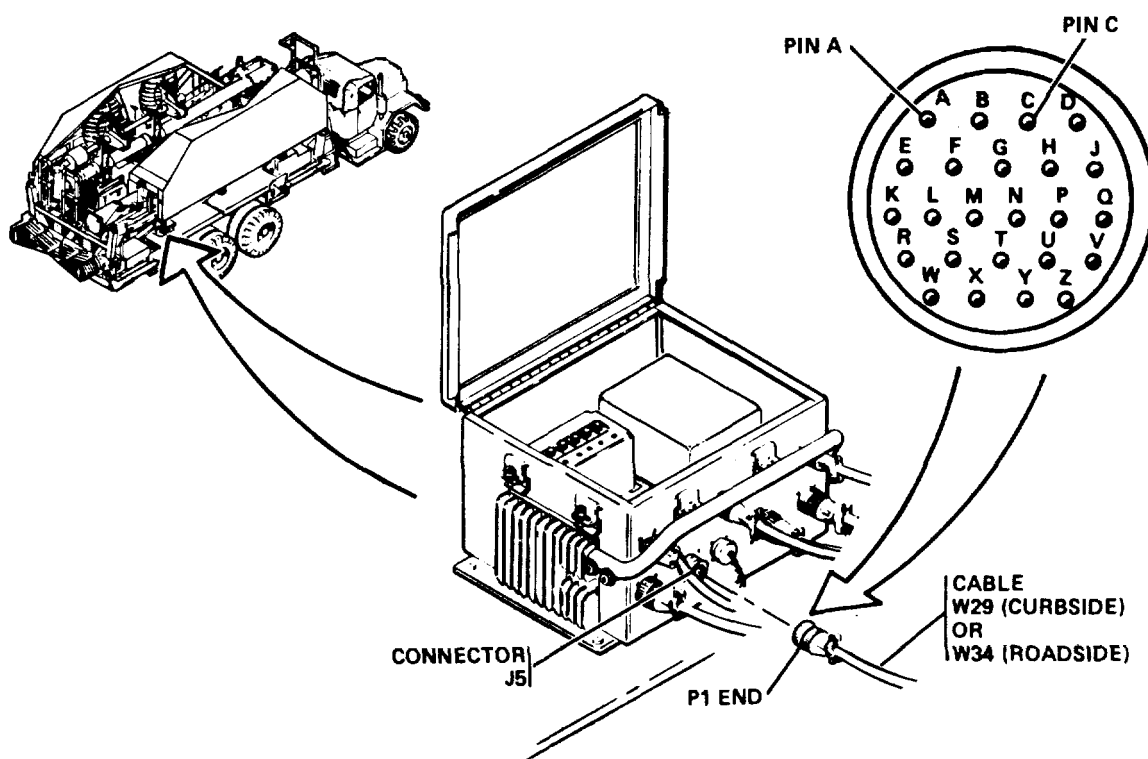


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

11. MAST WILL NOT RETRACT, MAST EXTENSION SWITCH IS SET TO IN - Continued

NOTE

If necessary, remove mast control for access to connector for continuity check (para 2-21).

Step 3. Disconnect P2 end of cable assembly W29 (curbside) or W34 (roadside) from mast control connector J1.

Step 4. Check continuity between pins A and C of mast control connector J1.

- If there is continuity, replace cable assembly W29 or W34 (para 2-26)
- If there is no continuity, reconnect cable assembly to distribution box and replace mast control (para 2-21)

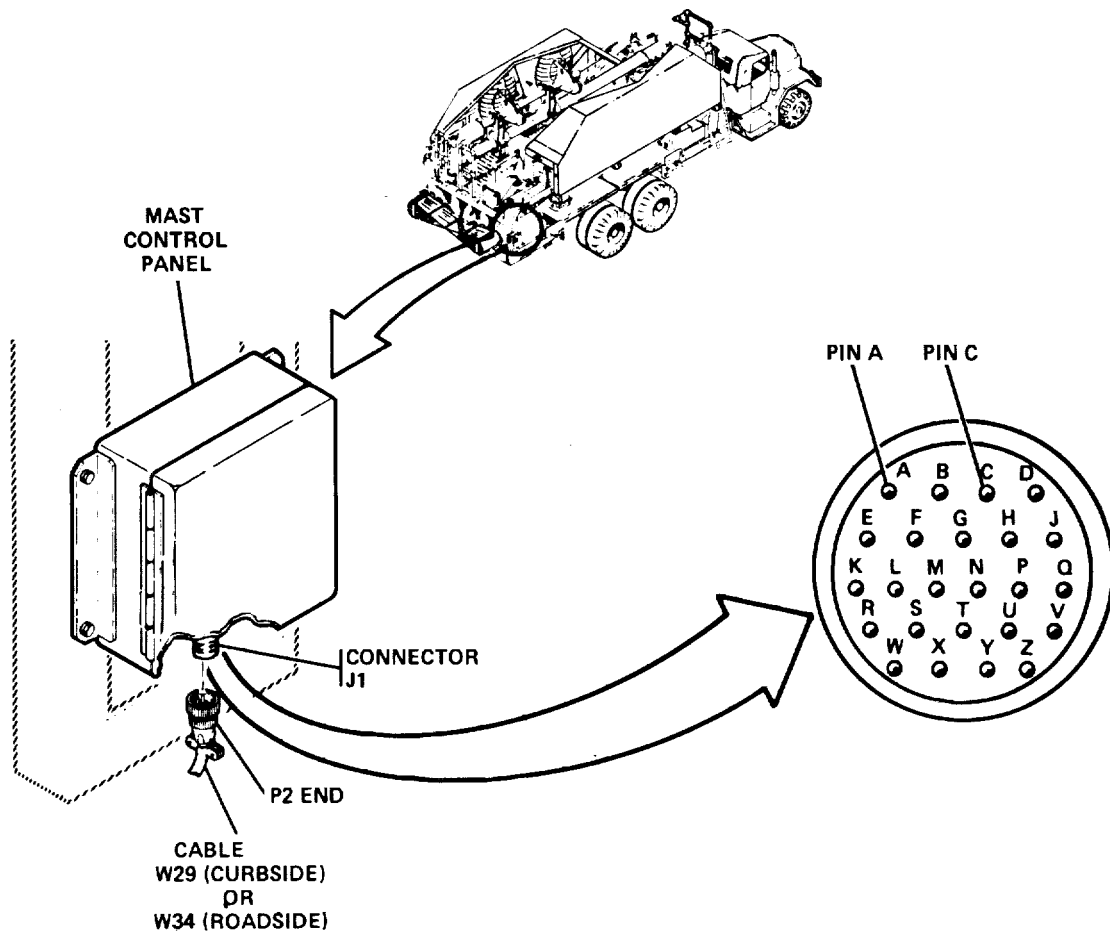


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

Step 5. Disconnect P1 end of cable assembly W32 (curbside) or W37 (roadside) from distribution box connector J8.

Step 6. Check continuity between pins H and C, at the P1 end of cable assembly W32 or W37.

- If there is continuity, replace distribution box (para 2-18)
- If there is no continuity, go to step 7

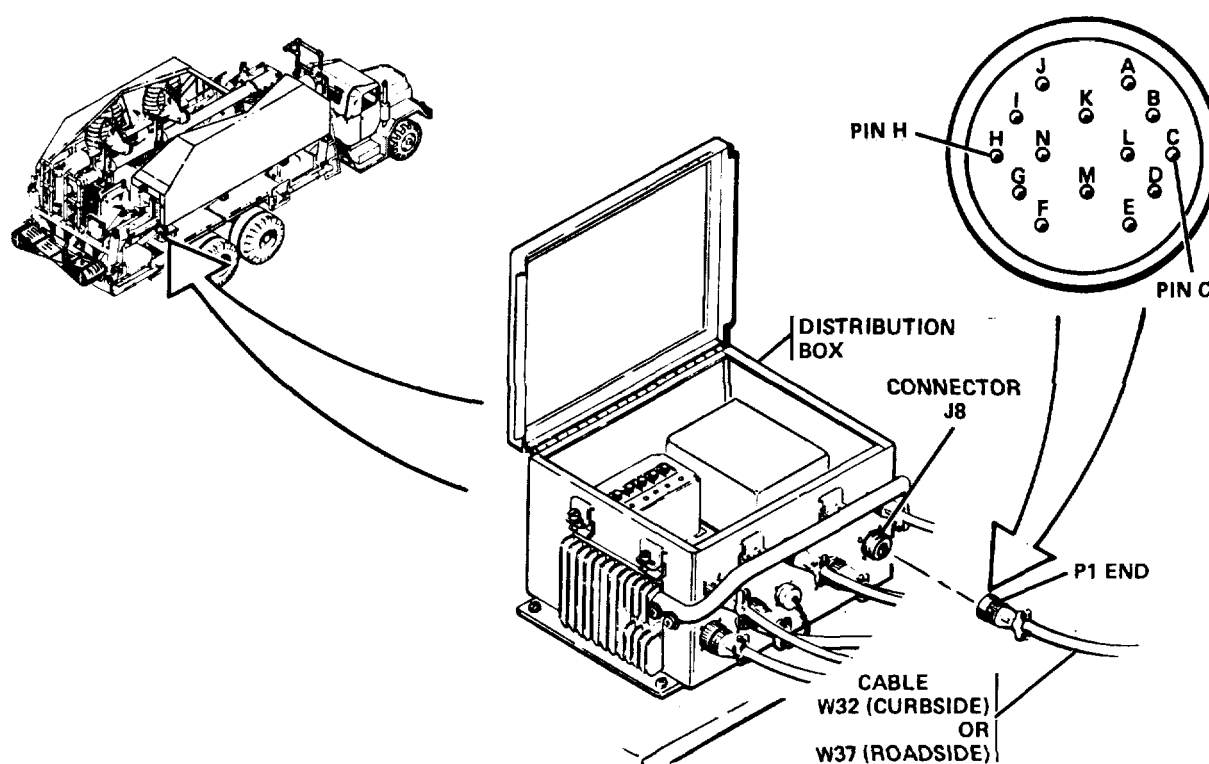


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****11. MAST WILL NOT RETRACT, MAST EXTENSION SWITCH IS SET TO IN - Continued**

Step 7. Disconnect P2 end of cable assembly W32 or W37 from PCA connector 31.

Step 8. Check continuity between pins H and C of PCA connector J1.

- If there is continuity, replace cable assembly W32 or W37 (para 2-26)
- If there is no continuity, reconnect cable assembly to distribution box and replace PCA (para 2-19)

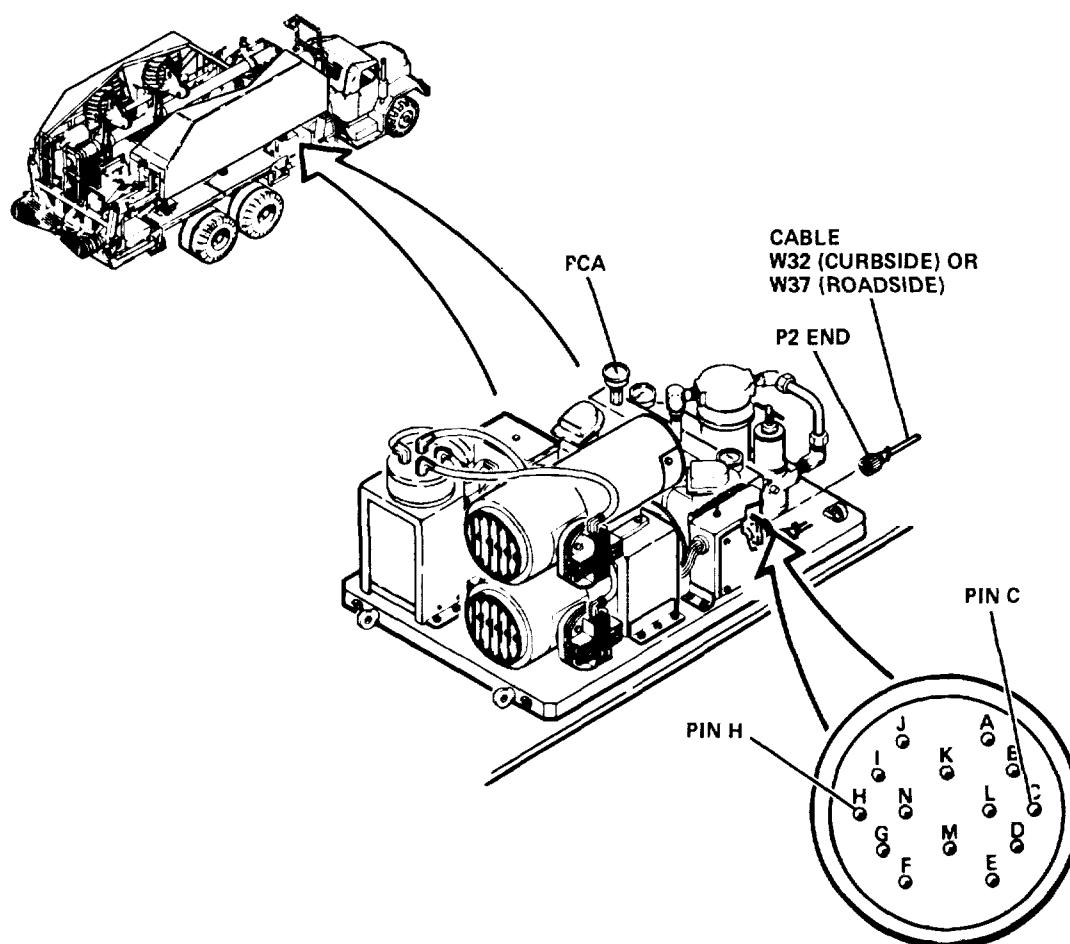


TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****12. MAST WILL NOT LOWER PAST 10 DEGREES ABOVE HORIZONTAL**

- Step 1. Disconnect P1 end of cable assembly W29 (Curbside) or W34 (roadside) from distribution box connector J5.
- Step 2. Hold MAST ERECTION switch to LOWER and, at the same time, push LIMIT OVRD button.
- Step 3. Check continuity between pins R and S at the P1 end of cable assembly W29 or W34.
- If there is continuity, replace distribution box (para 2-18).
 - If there is no continuity, go to step 4.

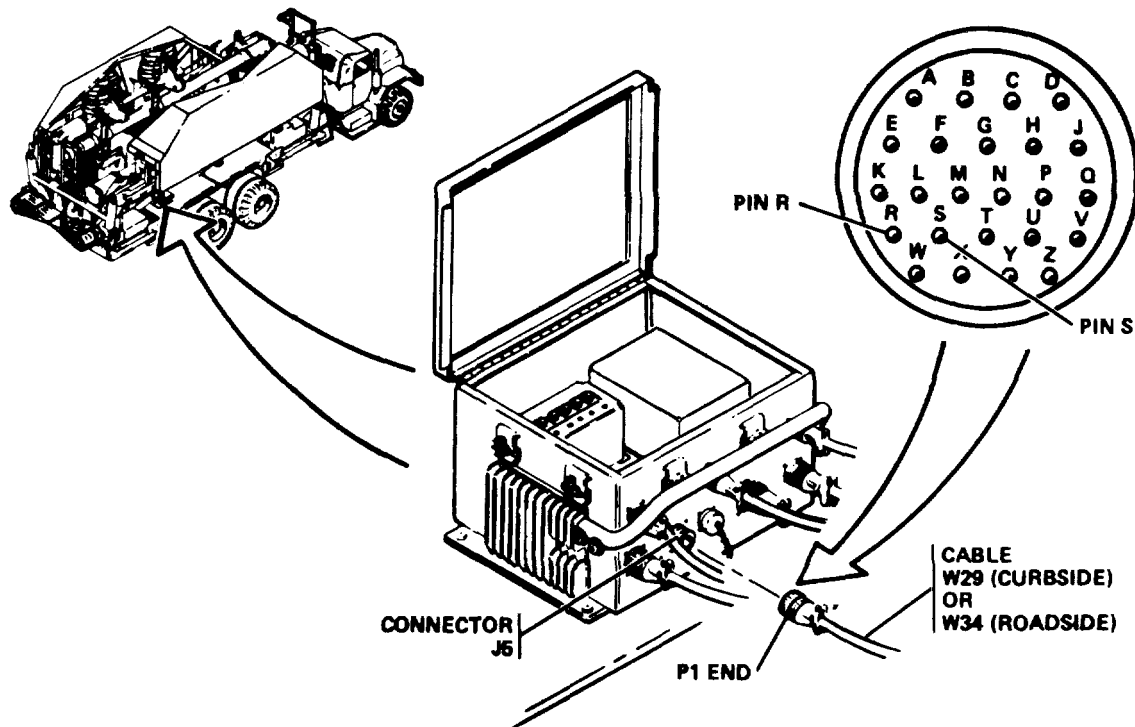


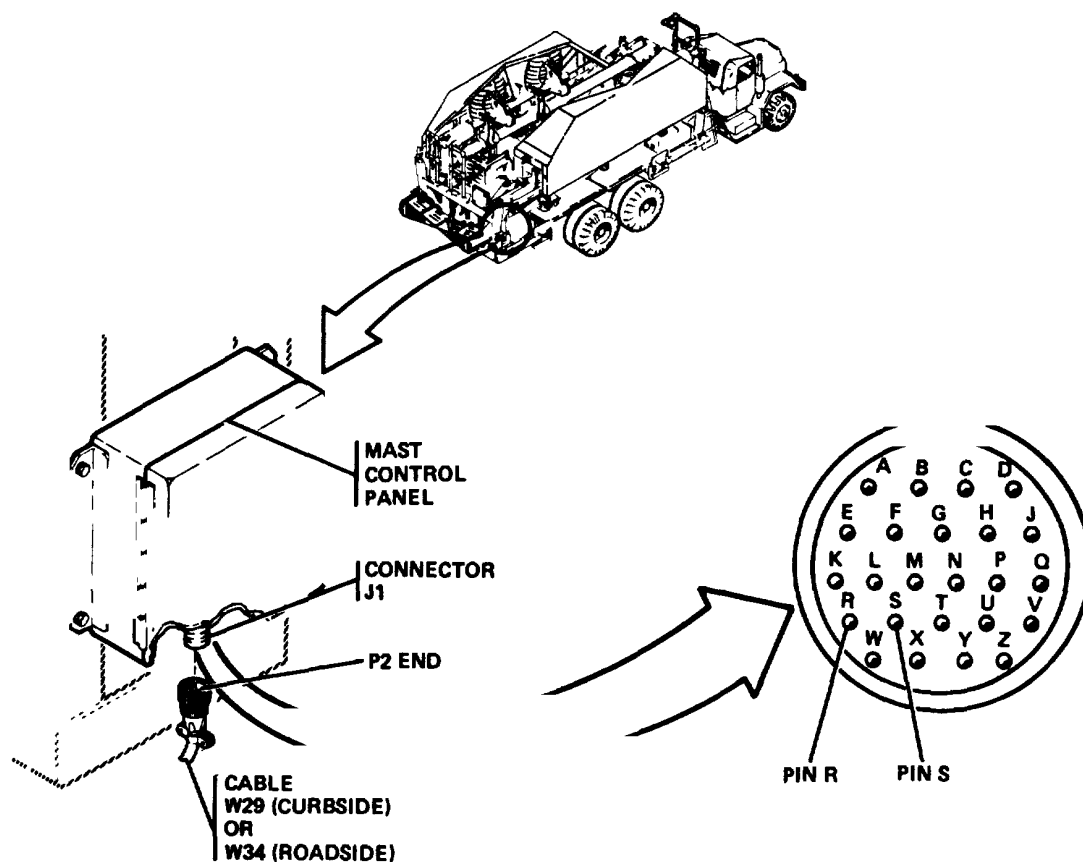
TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued		
MALFUNCTION	TEST OR INSPECTION	
	CORRECTIVE ACTION	
12. MAST WILL NOT LOWER PAST 10 DEGREES ABOVE HORIZONTAL - Continued		
NOTE		
If necessary, remove mast control for access to connector for continuity check (para 2.21).		
	Step 4.	Release MAST ERECTION switch and LIMIT OVRD push button.
	Step 5.	Disconnect P2 end of cable assembly W29 (curbside) or W34 (roadside) from mast control connector J1.
	Step 6.	Hold MAST ERECTION switch to LOWER and, at the same time, push LIMIT OVRD button.
	Step 7.	Check continuity between pins R and S of mast control connector J1. • If there is continuity, replace cable assembly W29 or W34 (para 2-26). • If there is no continuity, reconnect cable assembly to distribution box and replace mast control (para 2-21).
Change 1 2-60		

TABLE 2-1. DIRECT SUPPORT TROUBLESHOOTING-Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION



13. AC COMPRESSOR MODE INDICATOR LIGHT ILLUMINATED, BUT AC COMPRESSOR WILL NOT OPERATE

Replace PCA (para 2-19).

Section II. MAINTENANCE INSTRUCTIONS

OVERVIEW

- This section provides instructions you will need for repairing the mast group when a malfunction has occurred during operation, or when Organizational maintenance has found the need for repair.
- At the Direct Support level of maintenance, you will repair the mast group by replacing a defective part or assembly with a new or repaired part or assembly.
- In many cases, you will send the defective assembly to General Support Maintenance for repair.

To repair a malfunction in the mast group, you will proceed as follows:

- Refer to the List of Tasks and find the procedure that applies to the faulty part or assembly.
- Note the summary of tools, parts and materials, and other information provided in the INITIAL SETUP block at the beginning of the referenced procedure to help you prepare for the job.
- Unless otherwise indicated in the INITIAL SETUP block, each direct support maintenance task has a personnel requirement of one Utilities Equipment Repairer.
- For part number and description of parts listed in the INITIAL SETUP block, refer to the RPSTL, TM 11-5985-368-34P.
- Follow the instructions provided for, REMOVAL, REPLACEMENT, INSTALLATION, and TEST (if applicable) of the faulty equipment.

LIST OF TASKS	
Task	Paragraph No.
Maintenance of:	
100 degree interlock switch	2-30
10 degree limit switch	2-28
Antenna clamp	2-7
Antenna positioner	2-22
Antenna protective cover	2-6
Antenna protective cover pump	2-20
Cable assemblies	2-26
Cover lock	2-11
Cylinder lock strut	2-24
Distribution box	2-18
Deleted	
HCA	2-8
Interconnect box..	2-9
Linear actuating cylinder	2-12

LIST OF TASKS - Continued	
Task	Paragraph No.
Lock strut interlock switch	2-29
Lubrication fittings	2-4
Maintenance Tray	2-31
Mast	2-17
Mast clamp	2-15
Mast clamp	2-15
Mast control	2-21
Mast protective covers	2-25
PCA.....	2-19
Reflectors	2-14
Stabilizing strut	2-10
Taillight	2-13
Deleted	2-16
Walkway ladder	2-5
Zero degree interlock switch	2-27

2-4. REPLACE LUBRICATION FITTINGS**This task covers:****Removal****Replacement****Installation****INITIAL SETUP**ToolsRefrig Unit Svce Tool Kit,
5180-00-596-1474

7/16 in. comb. wr

3/8 in. comb. wr

5/16 in. comb. wr

Materials/Parts

Lubrication fitting

STEP**PROCEDURE****NOTE**

All the lubrication fittings are replaced in the same way. See the illustration for locations of lubrication fittings.

REMOVAL

Remove fitting.

REPLACEMENT

Replace faulty fitting with a new fitting.

INSTALLATION

Install fitting.

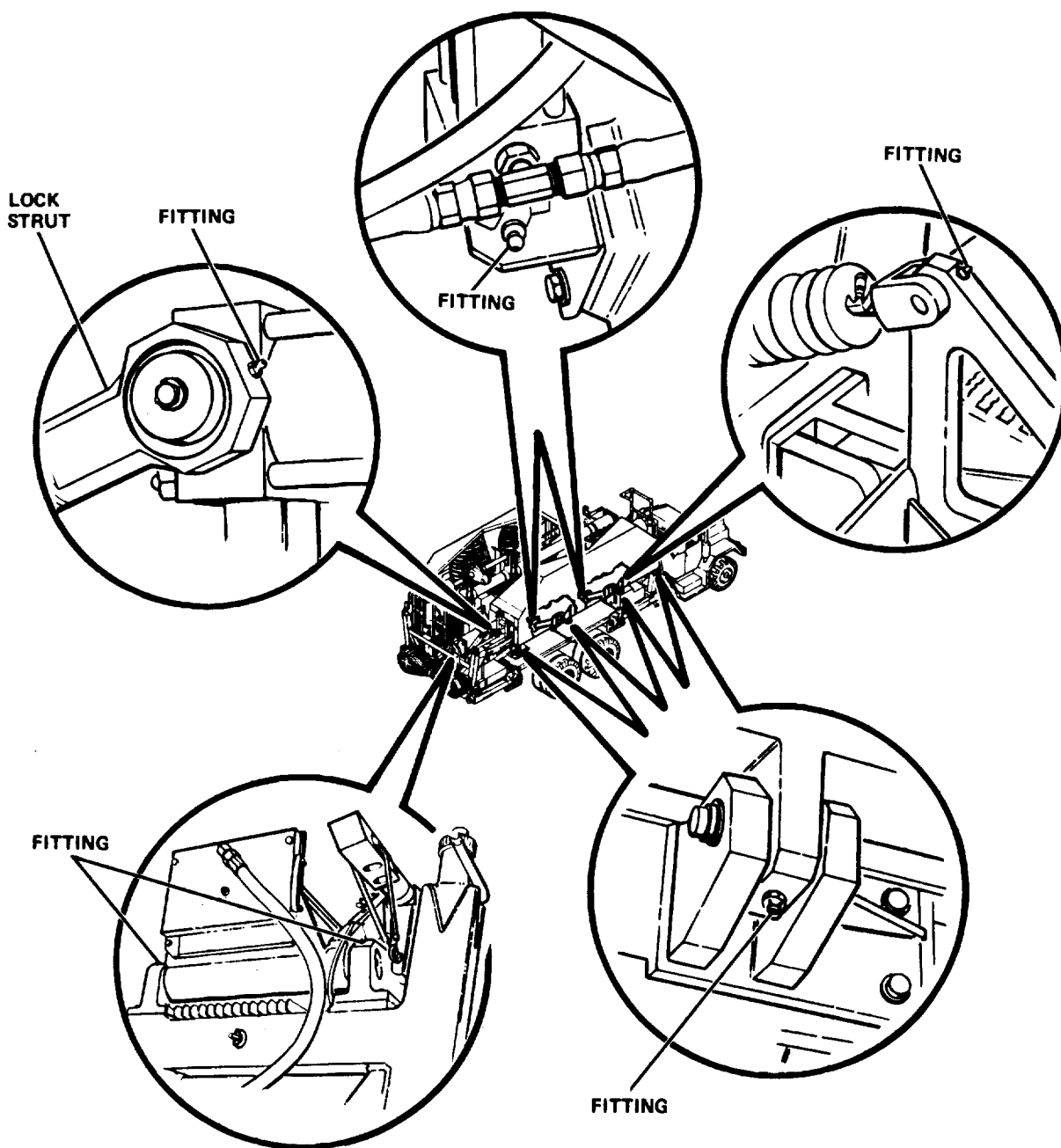
CAUTION

There are two fittings on the antenna positioner (not shown). Do not lubricate these fittings. The antenna positioner gearbox contains fluid, not grease.

2-4. REPLACE LUBRICATION FITTINGS-Continued

STEP

PROCEDURE

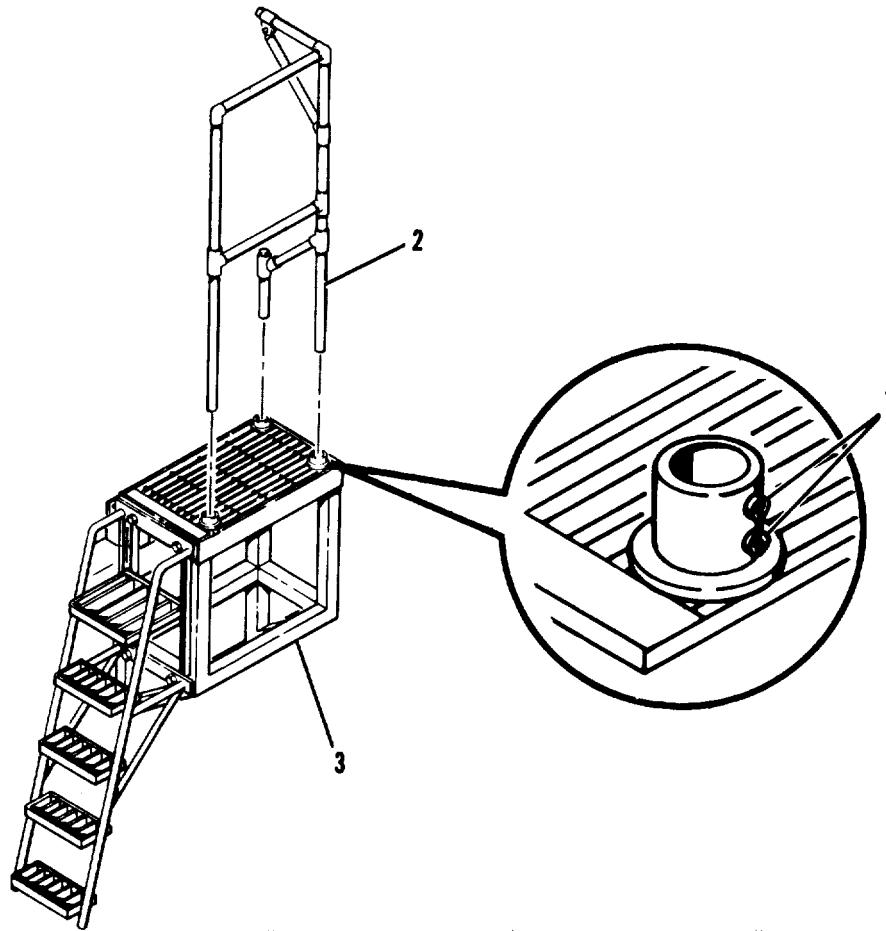


2.5. REPAIR OF WALKWAY LADDER		
This task covers:		
Removal	Replacement	Installation
<u>INITIAL SETUP</u>		
<u>Tools</u> Refrig Unit Svce Tool Kit 3/16 in. skt hd scr key		<u>Materials/Parts</u> Handrail Sealing compound (appx B, item 25)
STEP	PROCEDURE	
REMOVAL 1. Loosen six set screws (1) securing handrail (2) to ladder support (3). 2. Remove handrail. REPLACEMENT Replace faulty handrail with a new handrail. INSTALLATION 1. Remove six set screws (1) from ladder support (3). 2. Position new handrail (2) to ladder support (3). 3. Coat threads of six set screws (1) with sealing compound and install set screws (1) to secure handrail.		
Change 5 2-66		

2-5. REPAIR OF WALKWAY LADDER-Continued

STEP

PROCEDURE



2-6. REPAIR OF ANTENNA PROTECTIVE COVER**a. HANDRAIL STRAP****This task covers:**
Removal**Replacement****Installation****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 2 xtip scdr
3/8 in. comb. wr

Equipment

Condition
Para
TM 11-5985-
368-12&P

Condition Description
Antenna protective cover
deployed

Materials/Parts

Handrail strap

STEP**PROCEDURE****REMOVAL**

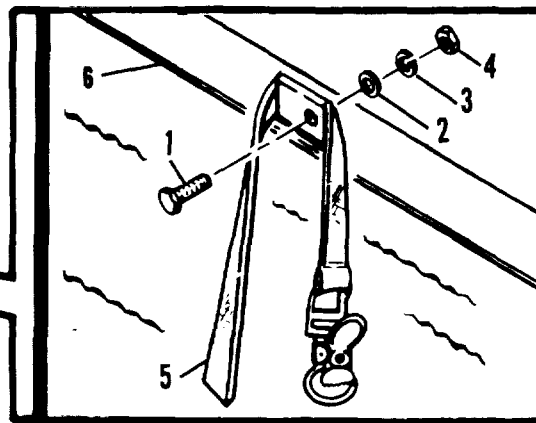
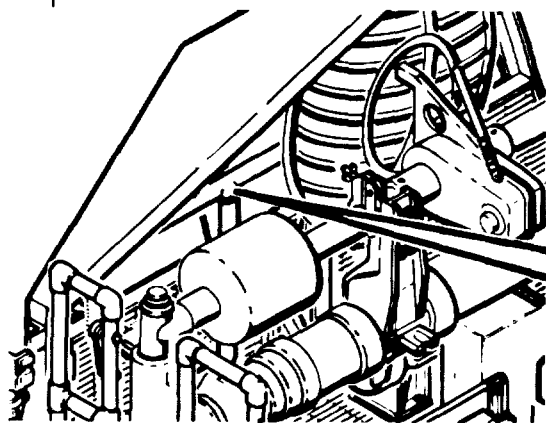
1. Remove screw (1), flat washer (2), lock washer (3), and nut (4) securing strap (5) to handrail (6).
2. Remove strap (5).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

1. Position strap (5) on handrail (6).
2. Secure strap with screw (1), flat washer (2), lock washer (3) and nut (4).



2-6. REPAIR OF ANTENNA PROTECTIVE COVER-Continued**b. HANDRAIL****This task covers:****Removal****Replacement****Installation****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
lg rd nose plr
Slipjoint plr

EquipmentConditionPara

TM 11-5985-
368-12&P

Condition Description

Antenna protective cover
deployed
Strap unbuckled

Materials/Parts

Handrail

STEP**PROCEDURE****REMOVAL**

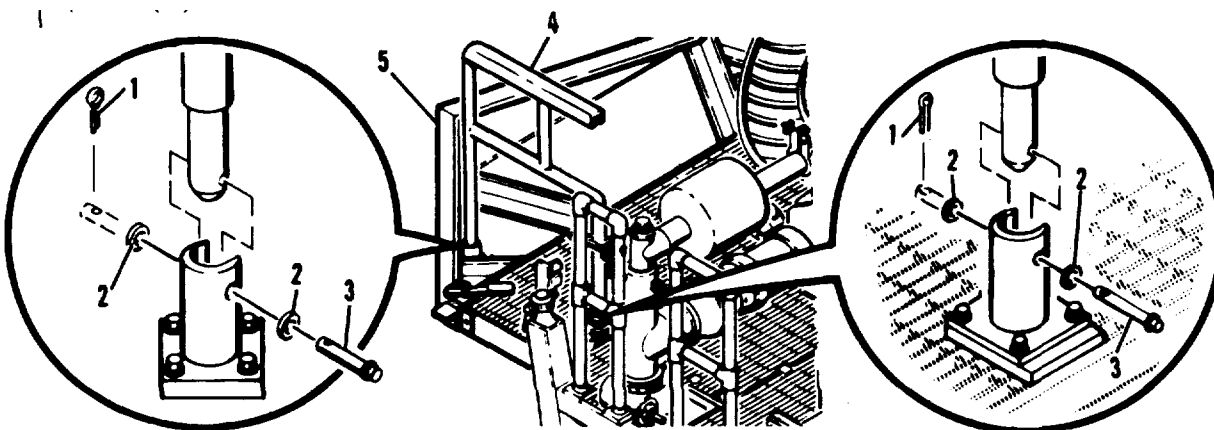
1. Remove two cotter pins (1), four flat washers (2), and two headed pins (3) securing handrail (4) to cover (5).
2. Remove handrail (4).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

1. Position handrail (4) on cover (5).
2. Secure handrail with two pins (3), four flat washers (2) and two new cotter pins (1).



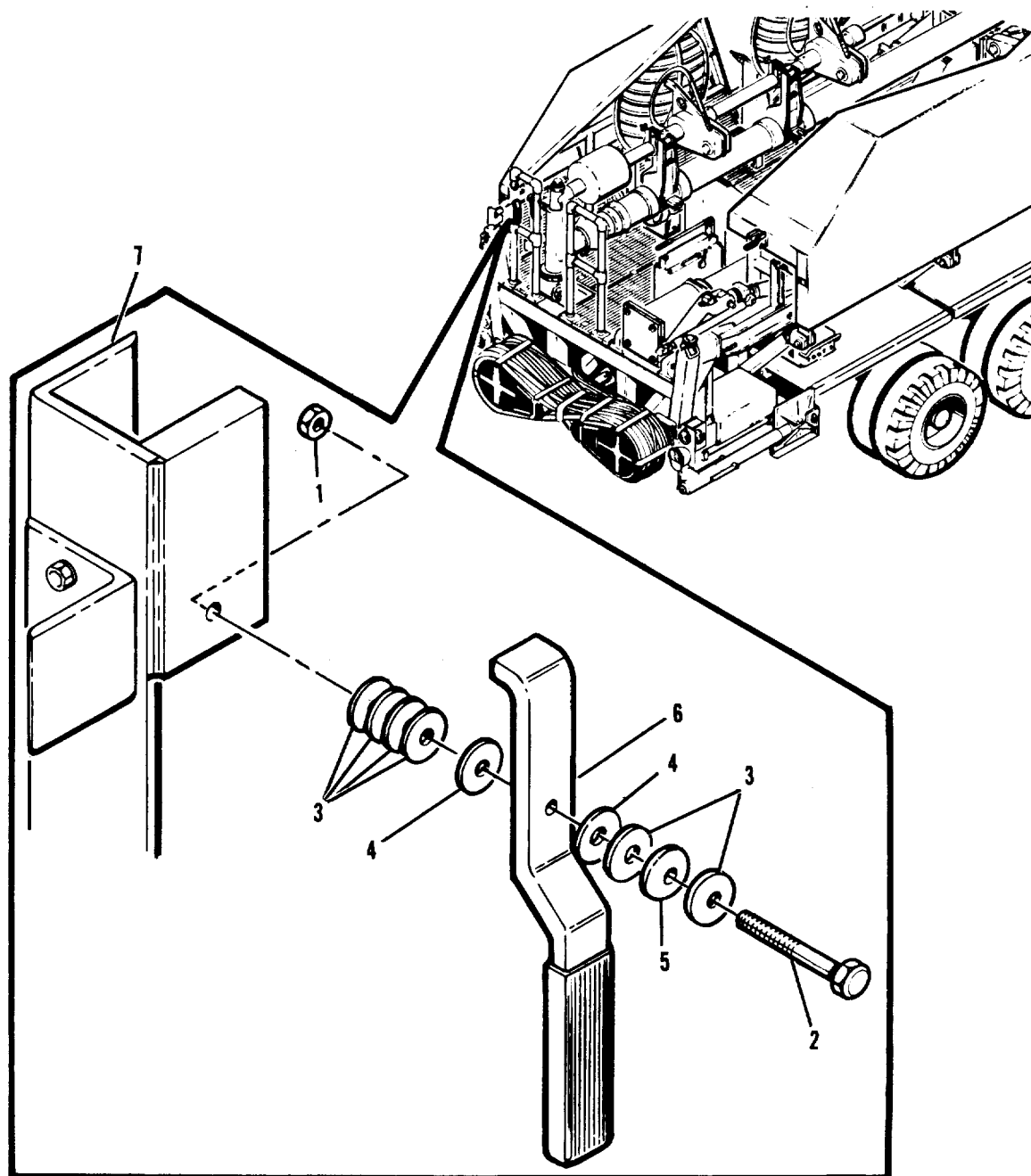
2-6. REPAIR OF ANTENNA PROTECTIVE COVER-Continued		
c. LOCK HANDLE		
This task covers:		
Removal	Replacement	Installation
<u>INITIAL SETUP</u> <u>Tools</u> Refrig Unit Svce Tool Kit, 5180-00-596-1474 3/4 in. skt rcht wr, 1/2 in. dr 3/4 in. comb. wr <u>Materials/Parts</u> Lock Handle		
STEP	PROCEDURE	
	REMOVAL Remove nut (1), screw (2), flat washers (3), plastic washers (4), and rubber bushing (5) securing handle (6) to cover (7). Remove handle. REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Position flat washer (3), rubber bushing (5), flat washer (3), two plastic washers (4), handle (6) and remaining flat washers (3) on screw (2). 2. Position screw (2) to cover (7) and secure with nut (1). 3. Check that handle locks cover properly. If handle does not properly lock cover remove handle and add or subtract flat washers (3) as needed to adjust handle position.	

2-6. REPAIR OF ANTENNA PROTECTIVE COVER-Continued

c. LOCK HANDLE-Continued

STEP

PROCEDURE

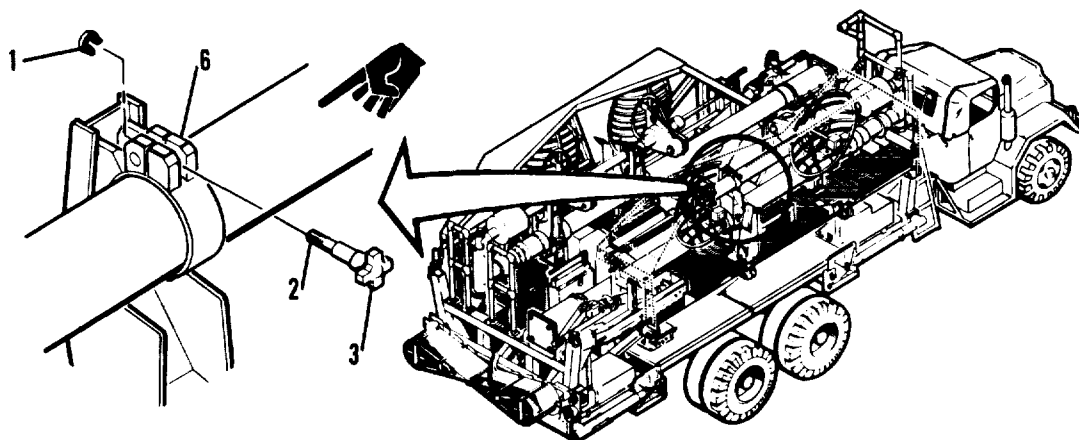


2-7. ANTENNA CLAMP REPAIR**a. REPLACE HAND KNOB ASSEMBLY****This task covers:****Removal****Replacement****Installation**INITIAL SETUPTools

Refrig Unit Svce Tool Kit,
Snap ring plr

Materials/Parts

Hand knob
Retaining ring

STEP**PROCEDURE****REMOVAL**

1. Remove retaining ring (1) from screw (2) and discard.
2. Turn hand knob (3) and remove screw (2) from antenna clamp (6).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

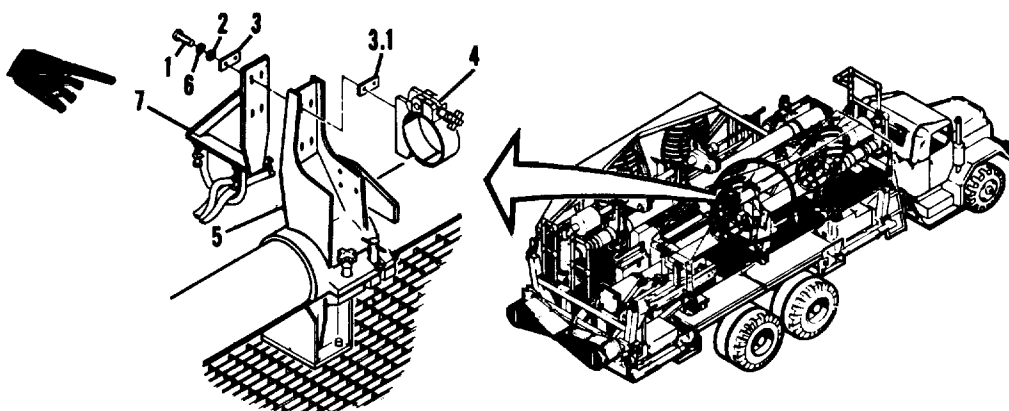
1. Turn hand knob (3) and install screw (2) in antenna clamp (6).
2. Install new retaining ring (1) on screw (2).

2-7 ANTENNA CLAMP REPAIR-Continued**b. REPLACE ANTENNA CLAMP****This task covers:****Removal****Replacement****Installation****INITIAL SETUP****Tools**

Refrig Unit Svce Tool Kit
 1/2 in. skt
 Skt wr, 1/2 in. dr

Materials Parts

Antenna clamp

STEP**PROCEDURE****REMOVAL**

1. Remove four screws (1), flat washers (2), two spacers (3), and, if installed, spacers (3.1), securing antenna clamp assembly (4) to mast clamp (5). On later models, screws (1) also secure four lockwashers (6) and cable retainer bracket (7) to upper mast clamps (5).
2. Remove antenna clamp assembly (4) and, if installed, cable retainer bracket (7) from mast clamp (5).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

1. Position antenna clamp assembly (4) and, if removed, cable retainer bracket (7) to mast clamp (5). Insert spacers (3.1) as required to align antenna clamp assembly (4).

NOTE

Adjust position of antenna clamp assembly (4) in slotted holes in mast clamp (5) so that antenna clamp secures antenna amplifier assemblies.

2. Install two spacers (3), four flat washers (2), lockwashers (6) (if removed), and screws (1) to secure antenna clamp assembly (4) to mast clamp (5).

2-8. REPLACE HCA**This task covers:****Removal****Replacement****Installation****INITIAL SETUP****Tools**

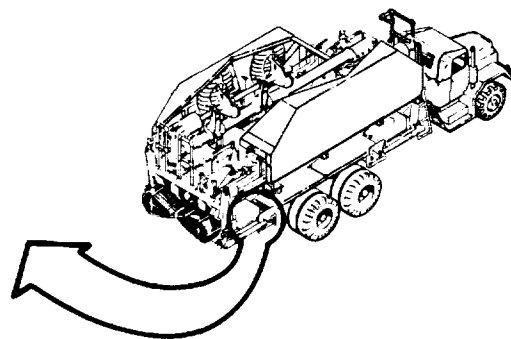
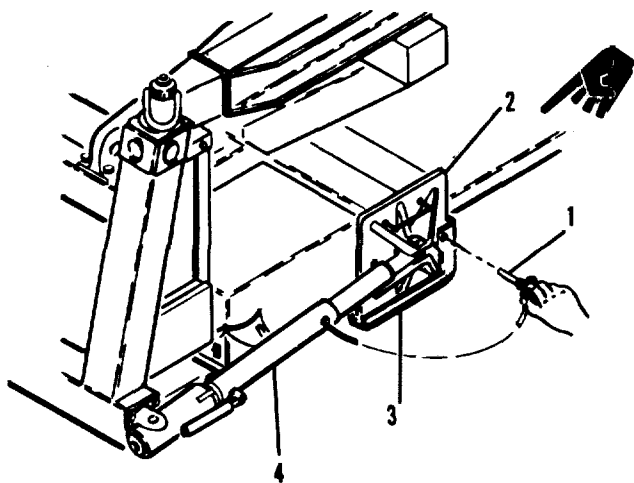
Refrig Unit Svce Tool Kit,
 5180-00-596-1474
 3/8 in. flat tip scdr
 7/16 in. comb. wr.
 1/4 in. skt hd scr key
 5/8 in. comb. wr
 pinch bar
 Endless loop sling,
 EN1-62x96IN (two)
 Wrecker truck M819A1
 Anchor shackle, 5935-00080 (four)
 Liquid measure

Personnel Required

Utilities Equipment Repairer,
 MOS 52C10 (two)
 Wrecker Operator

Materials/Parts

Rope, 20 feet (two) (appx B, item 16)
 Shop cloths (appx B, item 17)
 Hydraulic fluid (appx B, item 5)
 HCA
 Pipe plug (appx B, item 28)

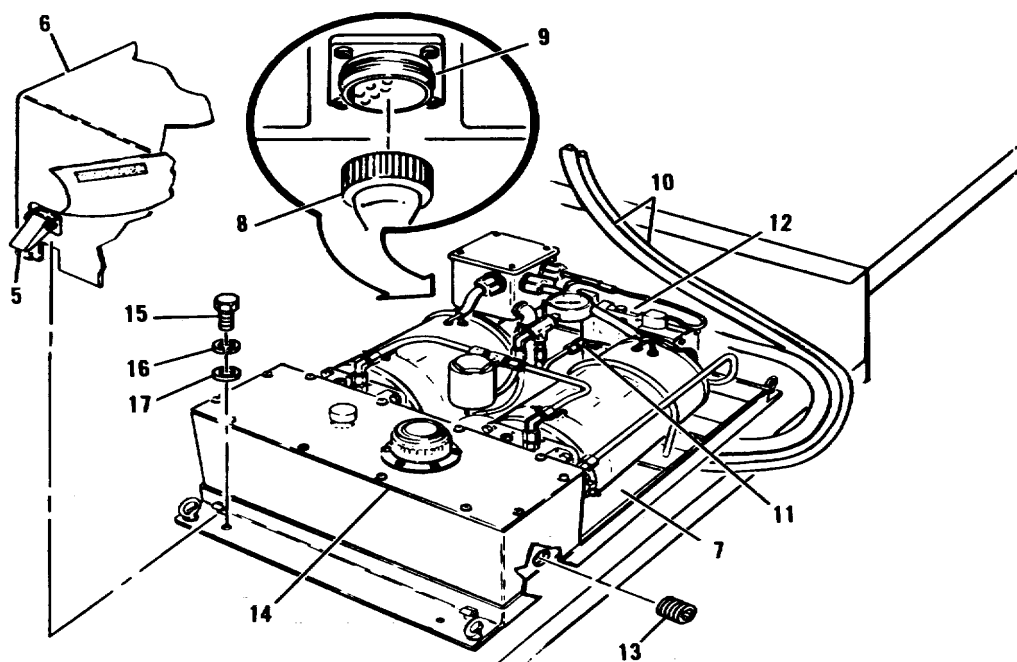
STEP**PROCEDURE****REMOVAL**

1. Turn off mast group power (para 2-2).
2. Remove pin (1) from strut pad (2).
3. Lift strut pad (2) from bracket (3) and swing strut (4) into place.

2-8. REPLACE HCA-Continued

STEP

PROCEDURE

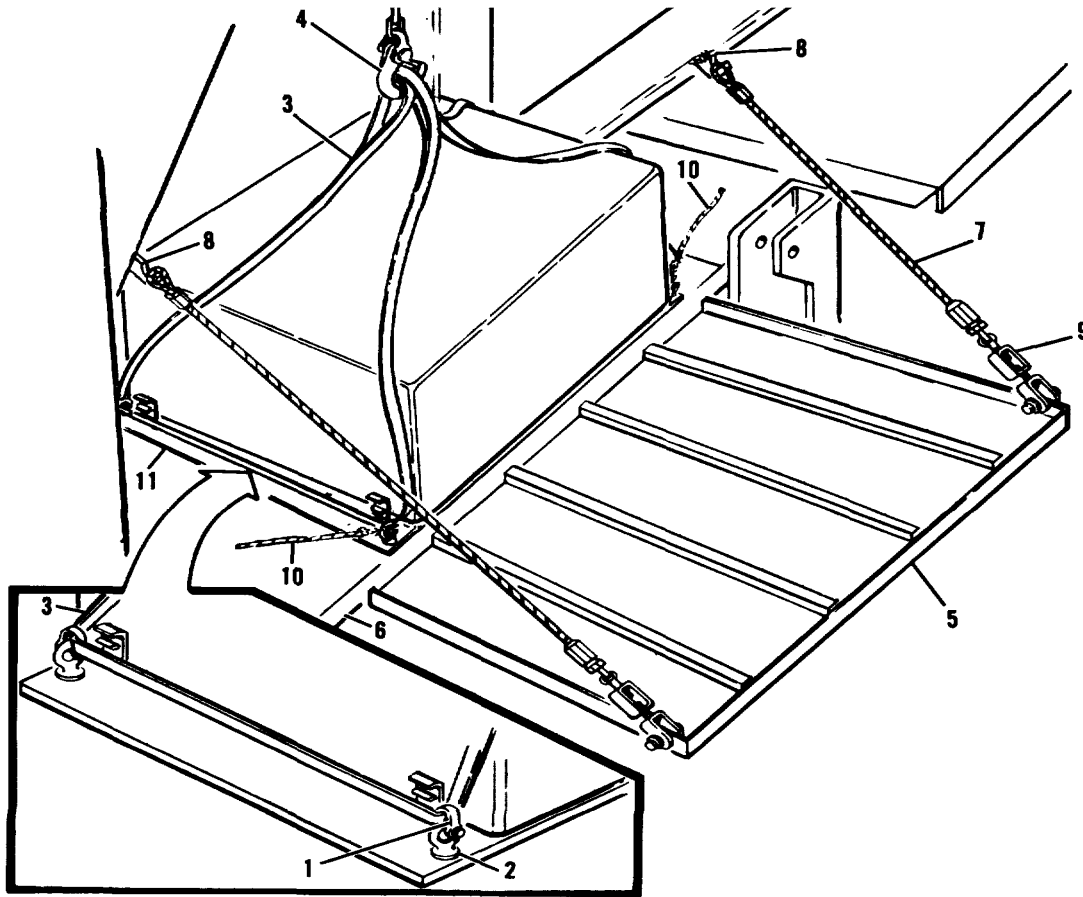


4. Release four clamps (5) and remove covers (6) from assembly (7).
5. Disconnect connector P2 (8) on cable W30 /W35 from connector J1 (9) on HCA (7).
6. Tag and disconnect hydraulic lines (10) from adapters (11) on 4-way valve (12).
7. Install caps on hydraulic lines (10) and adapters (11) to prevent contamination.
8. Remove four bolts (15), lockwasher (16), and flat washers (17) from HCA (7).
9. Pry HCA (7) up and remove connector P2 (8) from under HCA.
10. Install covers (6) on HCA (7) and secure four clamps (5).

2-8. REPLACE HCA-Continued

STEP

PROCEDURE



11. Install shackles (1) in four eyebolts (2).
12. Install each sling (3) through two shackles (1).

CAUTION

Do not overtighten turnbuckles on maintenance tray,

13. Install maintenance tray (5) on frame (6) and connect wire ropes (7) to hooks (8) on frame. Adjust turnbuckles (9), if necessary, to adjust tension of wire rope.
14. Tie a guide rope (10) to each end of assembly (11).

2-8. REPLACE HCA-Continued**STEP****PROCEDURE**

15. Connect lifting hook (4) to slings (3) and take up slack.

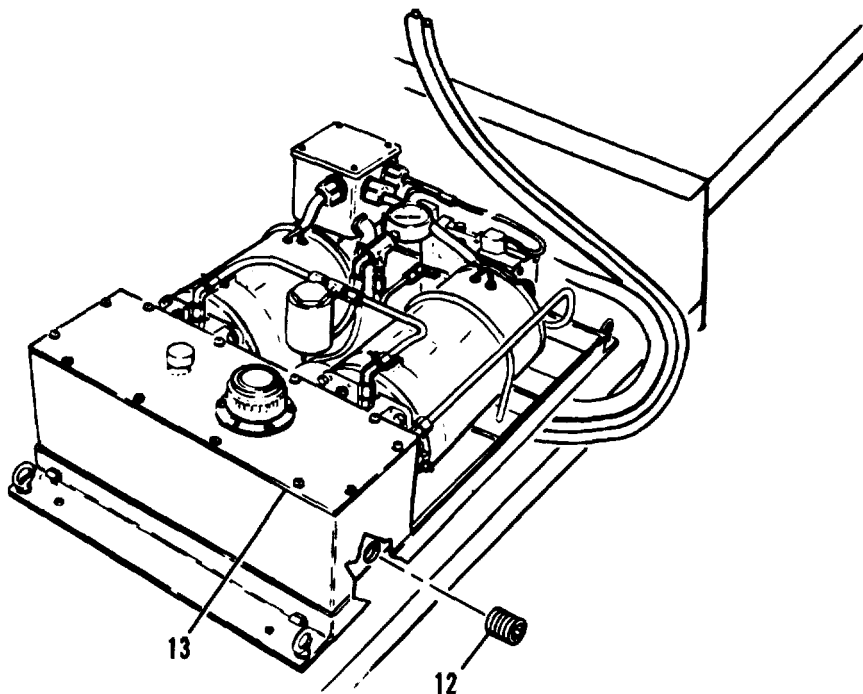
CAUTION

Lift cover with handles only when cover is disconnected from the assembly.

NOTE

You may need to raise assembly slightly to slide it onto the maintenance tray. Do not let assembly swing.

16. Slide HCA (11) onto maintenance tray (5) and set HCA down away from system. Use ropes (10) to guide HCA and prevent swinging.
17. Remove ropes (10), slings (3) and shackles (1) from lifting hook (4) and HCA (11).
18. Remove plug (12) and drain reservoir (13) into container.



2-8. REPLACE HCA-Continued**STEP****PROCEDURE****REPLACEMENT**

Replace faulty part with a new part.

INSTALLATION

1. Install shackles (1) in four eyebolts (2).
2. Install each sling (3) through two shackles (1).
3. Tie a guide rope (10) to each end of HCA (11).
4. Install maintenance tray (5) on frame (6) and connect wire ropes (7) to hooks (8) on frame.
5. Connect lifting hook (4) to slings (3) and take up slack.

CAUTION

Do not lift HCA with cover handles. The handles should only be used to lift the cover when it is disconnected from the assembly.

NOTE

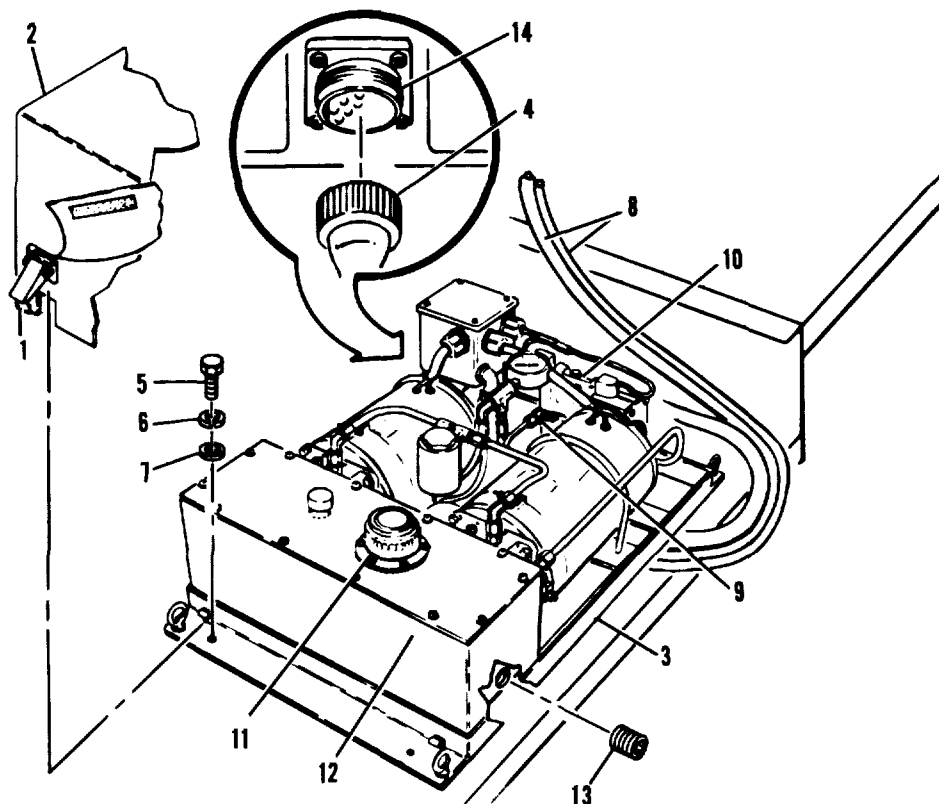
You may need to raise assembly slightly to slide it onto the mast group frame.

6. Lift HCA (11) and set HCA down on maintenance tray (5). Use guide ropes (10) to guide HCA and prevent swinging.
7. Line up HCA (11) with frame (6) and slide HCA into place on frame.
8. Remove wire ropes (7) from hooks (8) on frame (6) and remove maintenance tray (5) from frame.

2-8. REPLACE HCA-Continued

STEP

PROCEDURE



9. Release four clamps (1) and remove covers (2) from HCA (3).
10. Raise HCA (3) with pinch bar and place connector P2 (4) under HCA.
11. Install four bolts (5), lockwashers (6), and flatwashers (7) in HCA (3).
12. Remove caps from hydraulic lines (8) and adapters (9).
13. Connect tagged hydraulic lines (8) to adapters (9) on 4-way valve (10).
14. Remove filler cap (11) and fill reservoir (12) to full level with new hydraulic fluid. Make sure plug (13) is installed before adding fluid. Replace filler cap.
15. Install connector P2 (4) of cable W30/W35 to J1 (14) on HCA (3).

2-8. REPLACE HCA-Continued

STEP

PROCEDURE

16. Prime both HCA pumps:

CAUTION

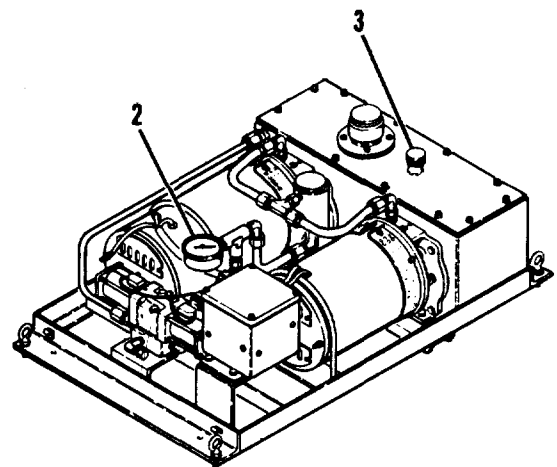
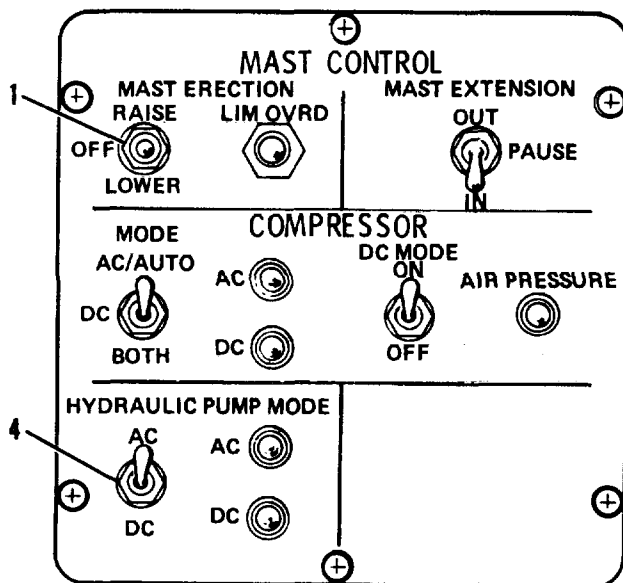
Even though the HCA pump motors may be self-priming, both pump motors must be primed before they can be used. Failure to do so will destroy pump motors.

- Turn on mast group power (see para 2-2).
- Flip MAST ERECTION switch (1) between RAISE and LOWER several times until pressure is indicated on pressure gage (2).
- Check hydraulic fluid level on dipstick (3). Add fluid as required to bring fluid level to between 2.1 GAL mark and MAX mark on dipstick.

NOTE

Add hydraulic fluid to HCA with mast in horizontal position only.

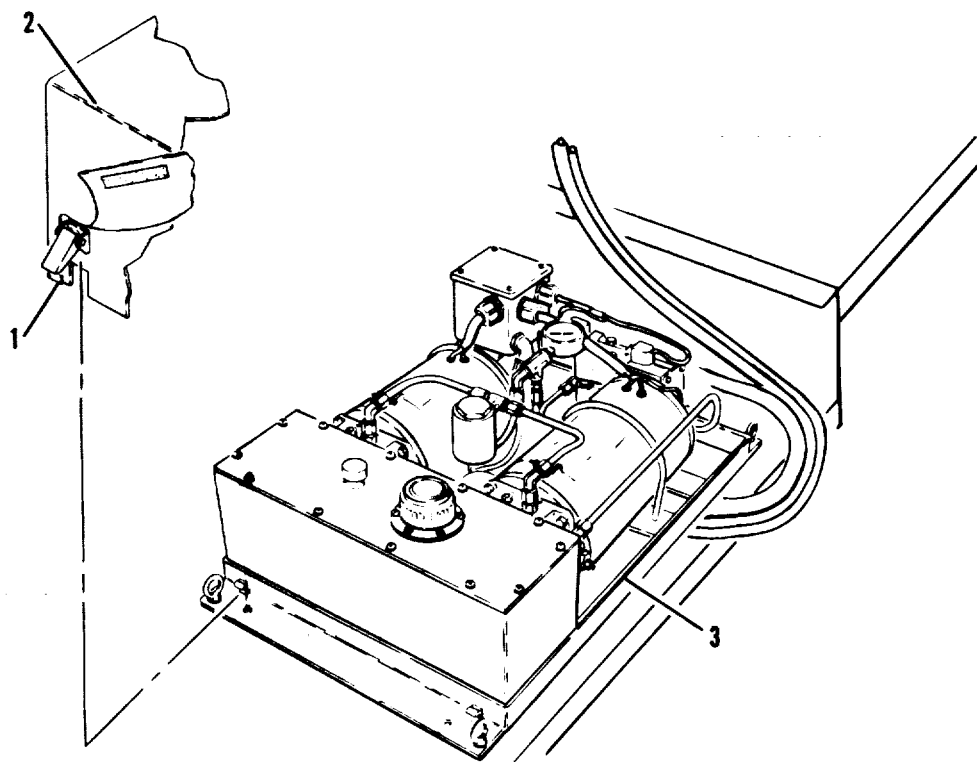
- Place HYDRAULIC PUMP MODE switch (4) to DC and prime the DC pump motor in the same manner as for the AC pump motor.



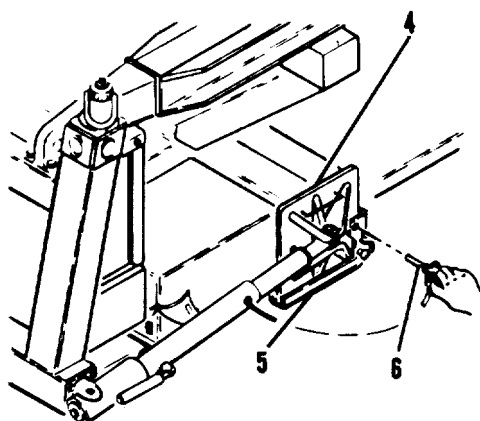
2-8. REPLACE HCA-Continued

STEP

PROCEDURE



17. Install covers (2) on HCA (3) and secure with four clamps (1).
18. Lift strut pad (4) and install pad in bracket (5) with pin (6).



2-8. REPLACE HCA-Continued

STEP	PROCEDURE
TEST Raise and lower mast (see applicable portions of paragraphs entitled Mast Deployment and Mast Stowage in TM 11-5985-368-12&P) and check HCA for leaks. Check HCA fluid level (see Operator's Preventive Maintenance Checks and Services (PMCS) in TM 11-5985-368-12&P).	

2-9. REPLACE INTERCONNECT BOX**STEP****PROCEDURE****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 2 xtip scdr
3/8 in. comb. wr

Materials/Parts

Interconnect box

REMOVAL**WARNING**

Make certain that cylinder lock strut is installed when mast is vertical.

1. Raise mast to vertical position (see applicable portions of paragraph entitled Mast Deployment in TM 11-5985-368-12&P).
2. Turn off mast group power (para 2-2).
3. Tag cables (1) with J-number of mating connector. Unscrew and disconnect cables (1) from interconnect box connectors J2 and J3.
4. Remove four screws (2), eight flatwashers (3), four lockwashers (4) and four nuts (5), securing interconnect box (6) to cylinder support.
5. Remove interconnect box (6).

REPLACEMENT

Replace faulty part with a new part.

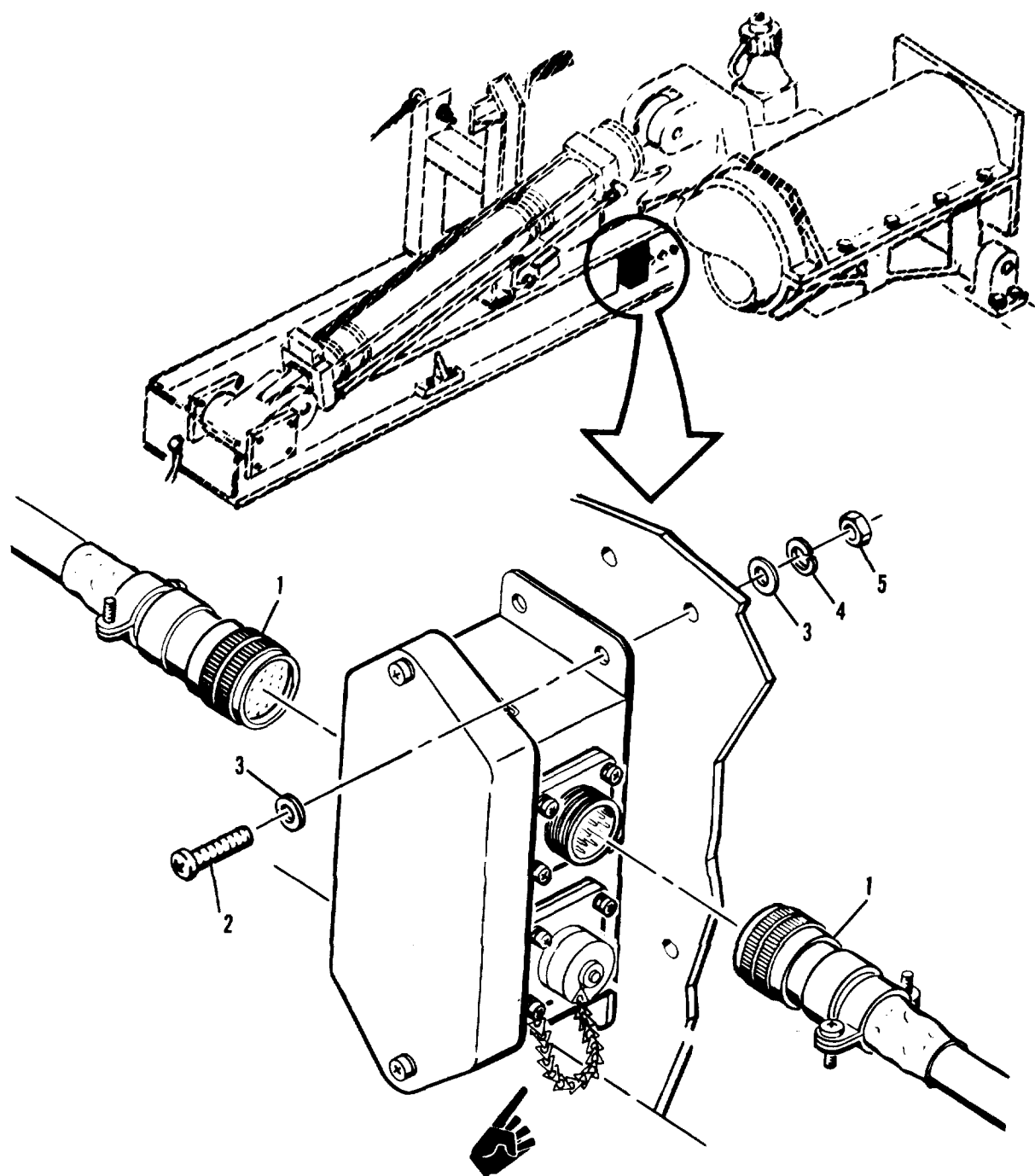
INSTALLATION

1. Position interconnect box (6) on cylinder support.
2. Secure box (6) with four screws (2), eight flatwashers (3), four lockwashers (4) and four nuts (5).
3. Using tags to identify mating connector, connect cables (1) to interconnect box connectors J2 and J3.
4. Turn on mast group power (para 2-2).
5. Lower mast (see applicable portions of paragraph entitled Mast Stowage in TM 11-5985-368-12&P).

2-9. REPLACE INTERCONNECT BOX-Continued

STEP

PROCEDURE



2-10. STABILIZING STRUT REPAIR**a. REPLACE HANDLE****This task covers:****Removal****Replacement****Installation****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
7/16 in. comb. wr

Materials/Parts

Handle

STEP**PROCEDURE****REMOVAL**

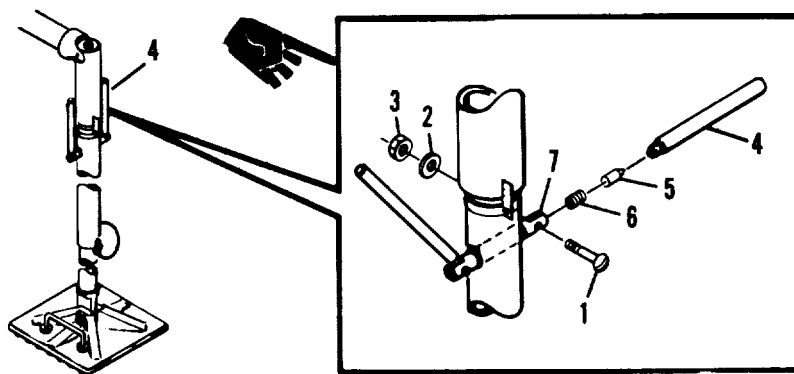
1. Remove bolt (1), flat washer (2), locknut (3), handle (4), locking pin (5), and spring (6) from bar (7).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

1. Position spring (6) and locking pin (5) on bar (7) and install handle (4), bolt (1), flat washer (2), and locknut (3).



2-10. STABILIZING STRUT REPAIR-Continued**b. REPLACE QUICK RELEASE PIN**

This task covers:

Removal

Replacement

Installation

INITIAL SETUPTools

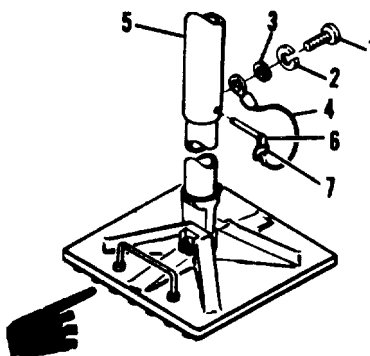
Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 2 xtip scdr

Materials/Parts

Quick release pin

STEP**PROCEDURE****REMOVAL**

1. Remove screw (1), lockwasher (2), and flat washer (3) securing chain (4) to strut assembly tube (5).
2. Remove quick release pin (6) from strut assembly tube (5).
Remove ring (7) from quick release pin (6) and from chain (4).

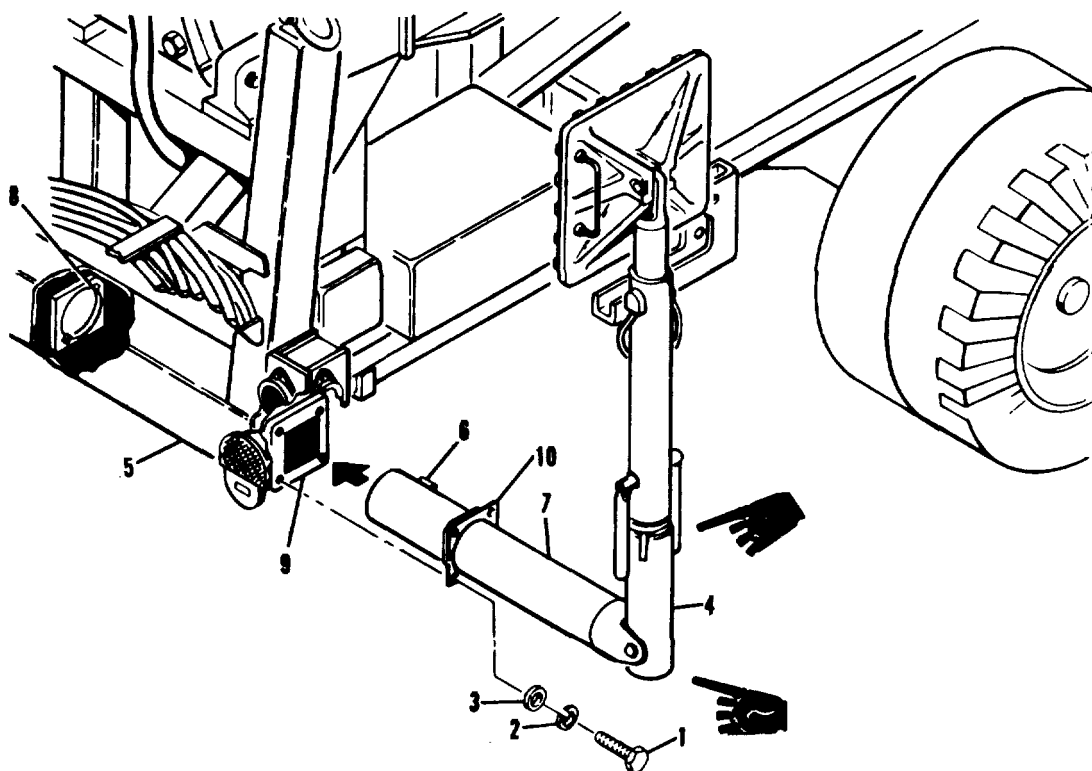
**REPLACEMENT**

Replace faulty part with a new part.

INSTALLATION

1. Position chain (4) on strut assembly tube (5) and secure with flat washer (3), lockwasher (2), and screw (1).
2. Install ring (7) on quick release pin (6) and chain (4).
3. Install quick release pin (6) in strut assembly tube (5).

2-10 STABILIZING STRUT REPAIR-Continued			
c. REPLACE STABILIZING STRUT			
This task covers:			
Removal	Replacement	Installation	
<u>INITIAL SETUP</u>			
<u>Tools</u> Refrig Unit Svce Tool Kit, 5180-00-596-1474 7/16 in. comb. wr		<u>Equipment</u> Condition <u>Para</u> (TM 11-5985-368-12&P)	
<u>Materials/Parts</u> Solid film lubricant (appx B, item 20) Stabilizing strut		<u>Condition Description</u> Pull quick release pin lift stabilizing strut from its stowage bracket	
STEP		PROCEDURE	
REMOVAL			
1.	Remove four screws (1), lockwashers (2), flat washers (3) securing stabilizing strut (4) to support structure (5).		
WARNING			
Stabilizing strut is heavy. To avoid injury, don't handle strut alone. Get another soldier to help.			
2.	Rotate strut to upside down position until key (6) on stabilizing strut tube (7) engages slot (8) in support structure tube (9).		
3	Pull stabilizing strut (4) from support structure (5).		
REPLACEMENT			
Replace faulty part with a new part.			
INSTALLATION			
1.	Coat the inside of the support structure tube (9) with solid film lubricant. Coat the outside of the stabilizing strut tube (7) with solid film lubricant.		
WARNING			
Stabilizing strut is heavy. To avoid injury, don't handle strut alone. Get another soldier to help.			

2-10. STABILIZING STRUT REPAIR-Continued**C. REPLACE STABILIZING STRUT-Continued****STEP****PROCEDURE**

2. Rotate strut to upside down position to align key (6) on strut tube (7) with slot (8) in support structure tube (5).
3. Slide strut tube (7) into support structure (5) until key (6) passes through slot (8).
4. Position strut stop (10) against mating surface of support structure tube (9) with screw holes aligned, and install four flat washers (3), lockwashers (2), and screws (1).

TEST

Deploy stabilizing strut (TM 11-5985-368-12&P, para 2-15) several times. Make sure strut slides easily in support structure tube.

2-11. COVER LOCK REPAIR**a. REPLACE LOCK HANDLE****This task covers:****Removal****Replacement****Installation****INITIAL SETUP****Tools**

Refrig Unit Svce Tool Kit,
5180-00-596-1474
3/4 in. comb. wr
3/4 in. socket
rcht wr, 1/2 in. dr

Material s/Parts

Lock handle
Rubber bushing
Plastic washer

STEP**PROCEDURE****REMOVAL**

1. Loosen and remove two nuts (1) securing handle (2) to cover lock (3).
2. Remove screw (4), flat washers (5), rubber bushing (6), plastic washers (7) and handle (2) from cover lock (3).

NOTE

If handle is to be replaced discard plastic washers and rubber bushing.

REPLACEMENT

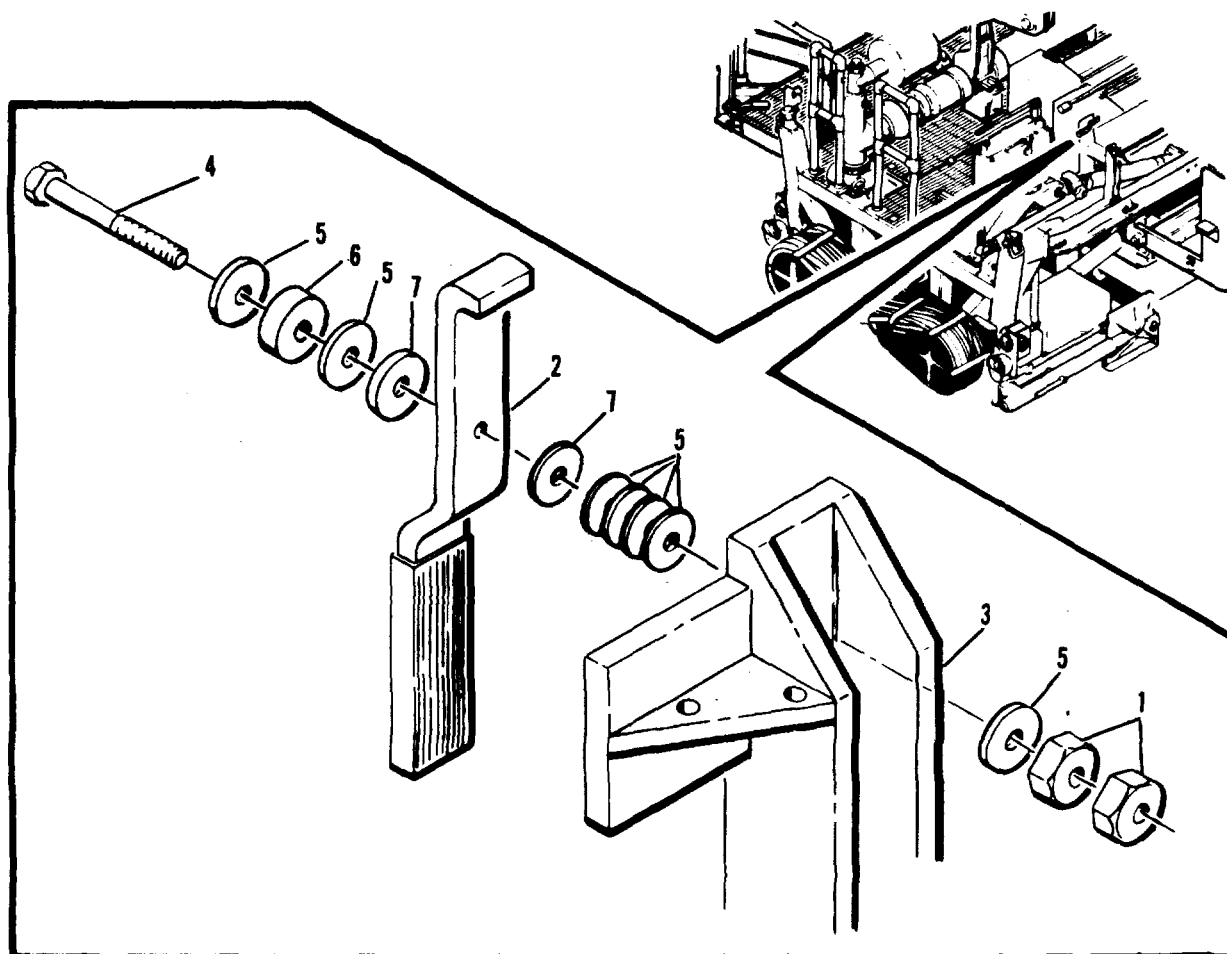
Replace faulty part with a new par t.

INSTALLATION

1. Install flat washers (5), rubber bushing (6), plastic washers (7), and handle (2) on screw (4).
2. Install screw (4) in cover lock (3) and secure with flat washer (5) and two nuts (1).
3. Check to see that handle locks the cover properly. If handle does not lock the cover properly, remove handle and add or subtract flat washers (5) as needed to adjust handle position.

2-11. COVER LOCK REPAIR-Continued**a. REPLACE LOCK HANDLE-Continued****STEP****PROCEDURE****NOTE**

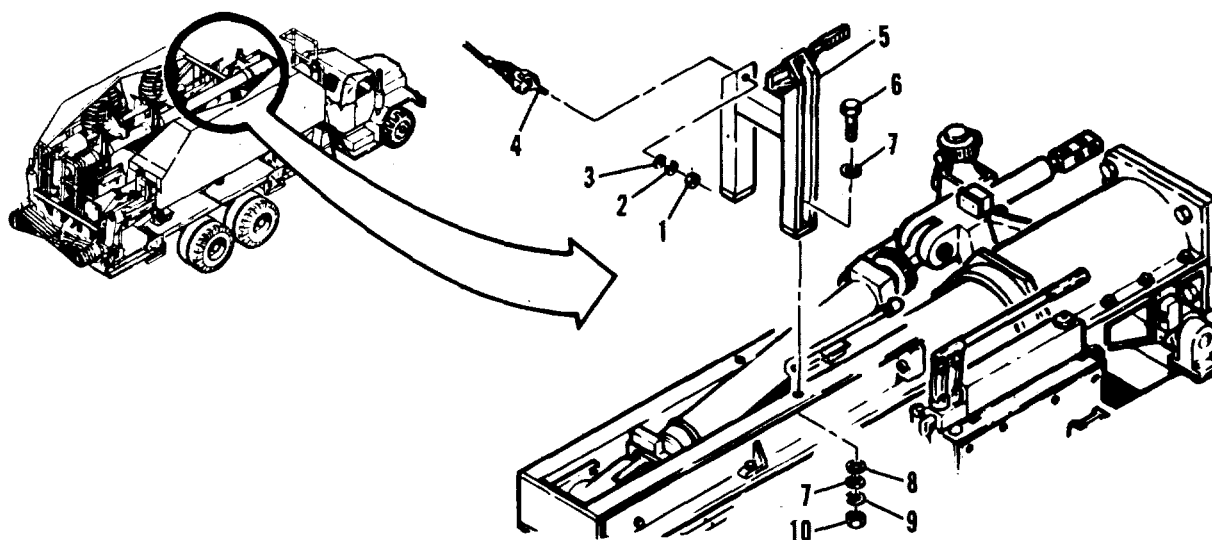
If handle was replaced install new plastic washers and rubber bushing.



2-11. COVER LOCK REPAIR-Continued**b. REPLACE COVER LOCK****This task covers:****Removal****Replacement****Installation****INITIAL SETUP**

Tools
 Refrig Unit Svce Tool Kit,
 5180-00-596-1474
 7/16 in. comb. wr
 1/2 in. comb. wr

Materials/Parts
 Cover lock

STEP**PROCEDURE****REMOVAL**

1. Remove nut (1) lockwasher (2), and flat washer (3) securing eyebolt (4) to cover lock (5). Remove eyebolt (4) with cable attached from cover lock.
2. Remove two bolts (6), four washers (7), two bevel washers (8), lockwashers (9), nuts (10), and cover lock (5) from cylinder support.

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

1. Position cover lock (5) on cylinder support and install two bolts (6), four washers (7), two bevel washers (8), lockwasher (9), and nuts (10).
2. Position eyebolt (4) with cable to cover lock (5). Secure eyebolt with flat washer (3), lockwasher (2) and nut (1).

2-11. COVER LOCK REPAIR-Continued	
b. REPLACE COVER LOCK-Continued	
STEP	PROCEDURE
3.	Operate antenna protective cover (see TM 11-5985-368-12&P) and check that handle on cover lock securely latches antenna protective cover. If not, remove handle and add or subtract flat washers as needed to adjust handle (see paragraph 2-11a, Replace Lock Handle, step 3).

2-12. REPLACE LINEAR ACTUATING CYLINDER**This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit

No. 2 xtip scdr

9/16 in. rcht wr

1/4 in. flat tip scdr

lg rd nose plr

3/8 in. flat tip scdr

No. 3 xtip scdr

3/4 in. comb. wr

3/8 in. comb. wr

Pipe wr

1 in. comb. wr

1/2 in. flat tip scdr,

9 in. lg

5/8 in. comb. wr

11/16 in. comb. wr

9/16 in. comb. wr

1/2 in. comb wr

3/16 in. skt hd scr key

Endless loop sling

EN1-62-X96 in. (two)

Wrecker truck M819A Sealing compound (appx B, item 25.3)

3/8 in. punch, 10-12 in. lg

Liquid measure

1-7/8 in. open end wr

1-7/8 crowfoot wr

Torque wr, 0-150 ft-lbs

Personnel Required

Utilities Equipment Repairer (two)

Wrecker Operator

Equipment

Condition

(Para)

TM 11-5985-

368-12&P

Condition Description

Mast lower to

horizontal

Mast group power off

Materials/Parts

Rope, 20 ft. (two) (appx B, item 16)

Protective caps

Shop cloths (appx B, item 17)

Hydraulic fluid (appx B, item 5)

Tags

GAA Grease (appx B, item 2)

Thread sealing compound (appx B,

item 21)

Pipe plug (appx B, item 28)

I

WARNING

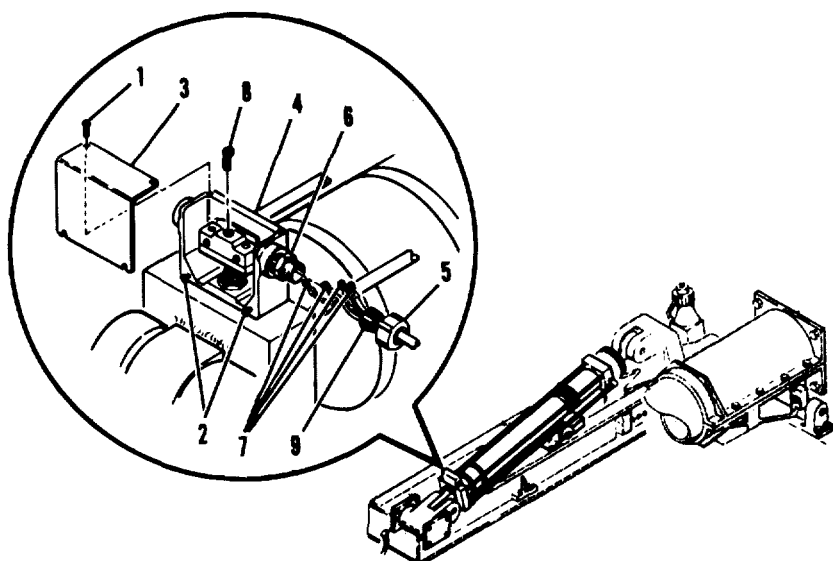
NEVER attempt to open bleed plugs unless you have a crone or wrecker supporting the mat, or when mat is fully lowered. Mast can lower VERY RAPIDLY when bleed plugs are opened, severely Injuring or kill ing personnel.

CAUTION

Place protective caps on hydraulic parts to protect hydraulic components from contamination.

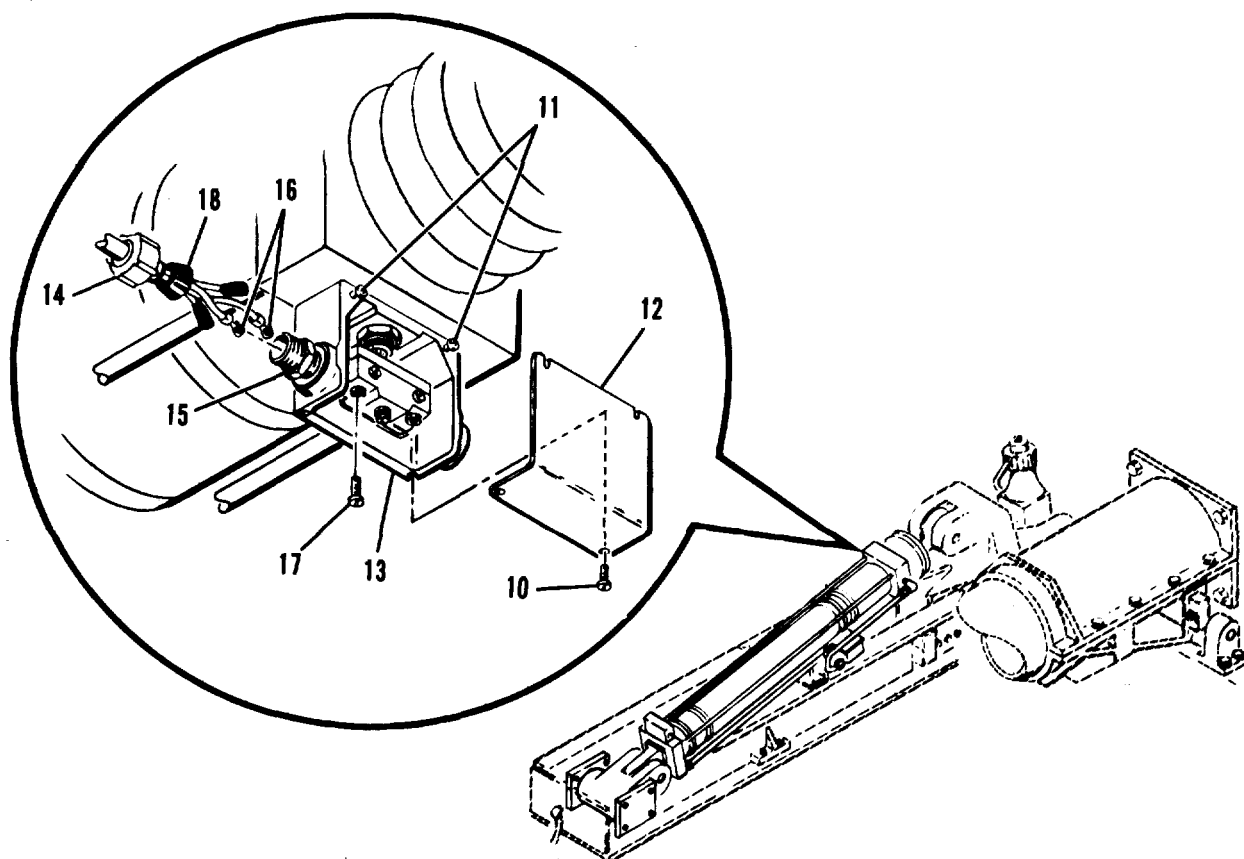
2-12. REPLACE LINEAR ACTUATING CYLINDER-Continued**STEP****PROCEDURE****REMOVAL**

1. Turn off mast group power (para 2-2).
2. Remove cover lock (para 2-11).
3. Remove cylinder lock strut (para 2-24).
4. Disconnect wires from zero degree interlock switch:
 - a. Remove two screws (1) and loosen two screws (2) securing cover (3) to switch box (4). Remove cover.
 - b. Remove cable strain relief nut (5) from bushing (6).
 - c. Tag leads (7) according to terminal labels on switch to aid assembly. Remove three screws (8) securing four cable leads (7). Pull leads (7) and grommet (9) from bushing (6).
 - d. Install screws (8) on switch. Install cover (3) and screws (1) on switch box (4).
 - e. Remove bushing (6) from switch box (4).



2-12. REPLACE LINEAR ACTUATING CYLINDER-Continued**STEP****PROCEDURE**

5. Disconnect wires from 100 degree interlock switch:
- Remove two screws (10) and loosen two screws (11) securing cover (12) to switch box (13). Remove cover.
 - Remove cable strain relief nut (14) from bushing (15).
 - Tag leads (16) according to terminal labels on switch to aid assembly. Remove two screws (17) securing two cable leads (16). Remove leads. Pull leads (16) and grommet (18) from bushing (15).
 - Install screws (17) on switch. Install cover (12) and screws (10) on switch box (13).
 - Remove bushing (15) from switch box (13).



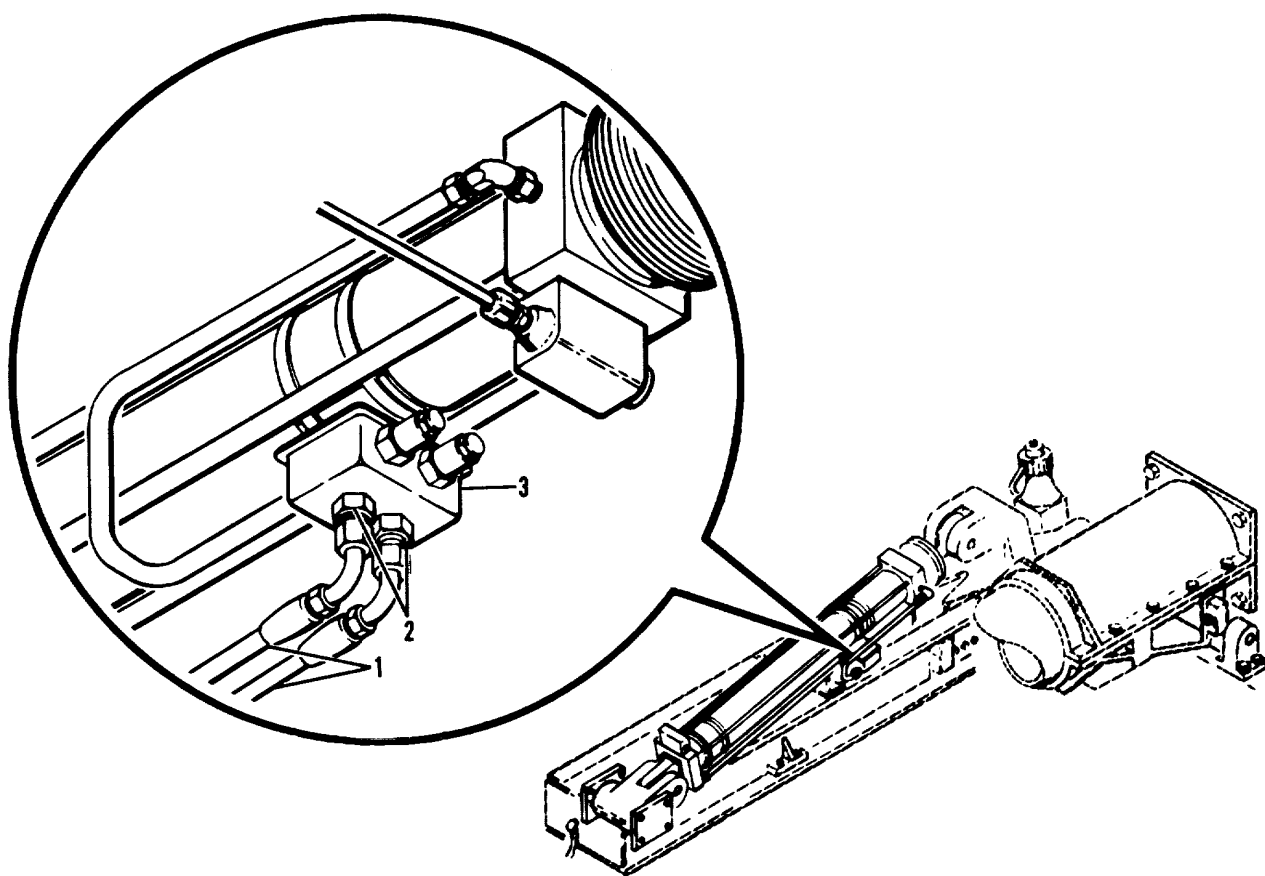
2-12. REPLACE LINEAR ACTUATING CYLINDER-Continued**STEP****PROCEDURE**

6. Disconnect hydraulic lines from cylinder lock check valves:
- Tag two hydraulic lines (1) according to labels on ports on check valve (3).

NOTE

Use a liquid measure to catch any hydraulic fluid that drains from cylinder when hydraulic lines are disconnected.

- Disconnect two hydraulic lines (1) from adapters (2) on check valve (3).
- Install protective caps on adapters (2) and lines (1).



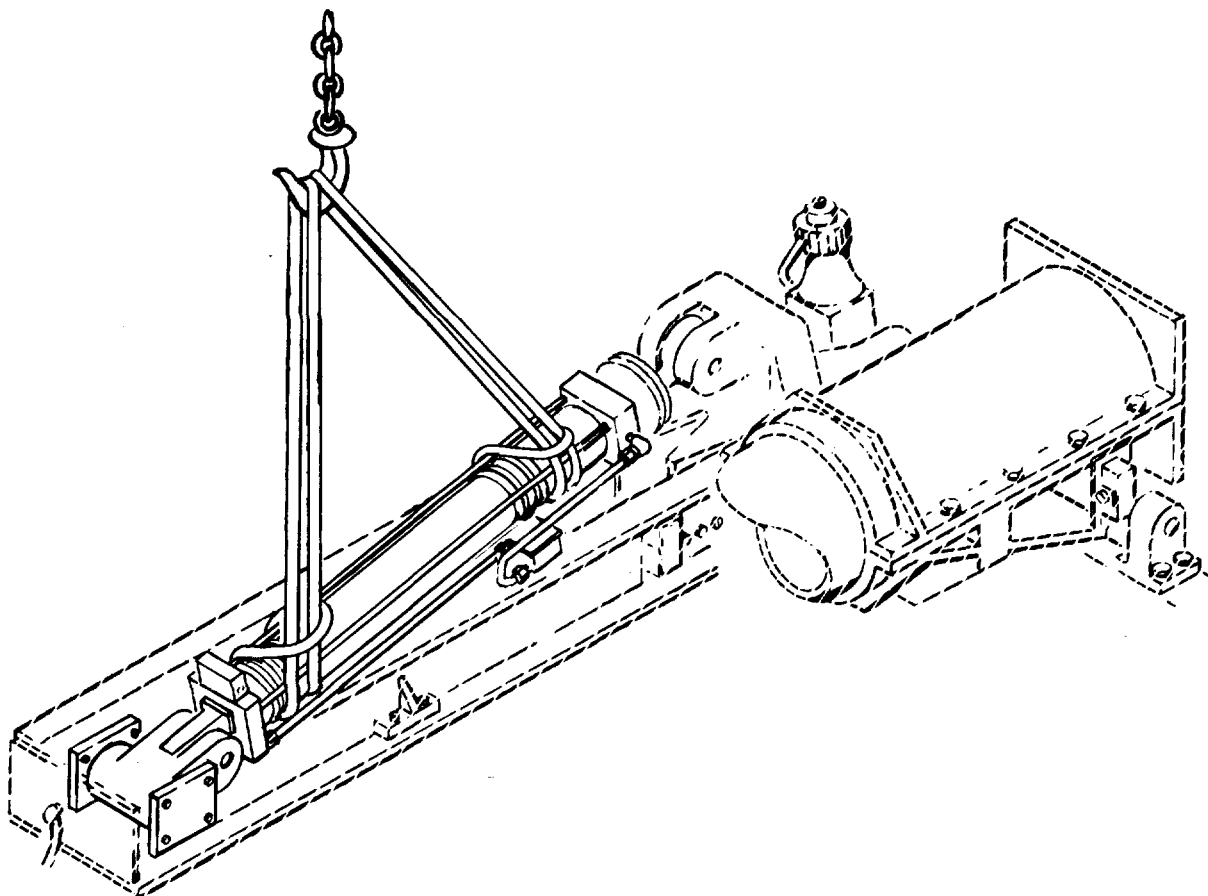
2-12. REPLACE LINEAR ACTUATING CYLINDER-Continued**STEP****PROCEDURE**

7. Connect slings to cylinder:
- Attach two endless loop slings to hydraulic cylinder (one at each end) in a choker configuration.

CAUTION

Make certain slings are BETWEEN hydraulic lines and cylinder to avoid damaging lines when lifting cylinder.

- Attach two ends of slings to truck wrecker hook.

**NOTE**

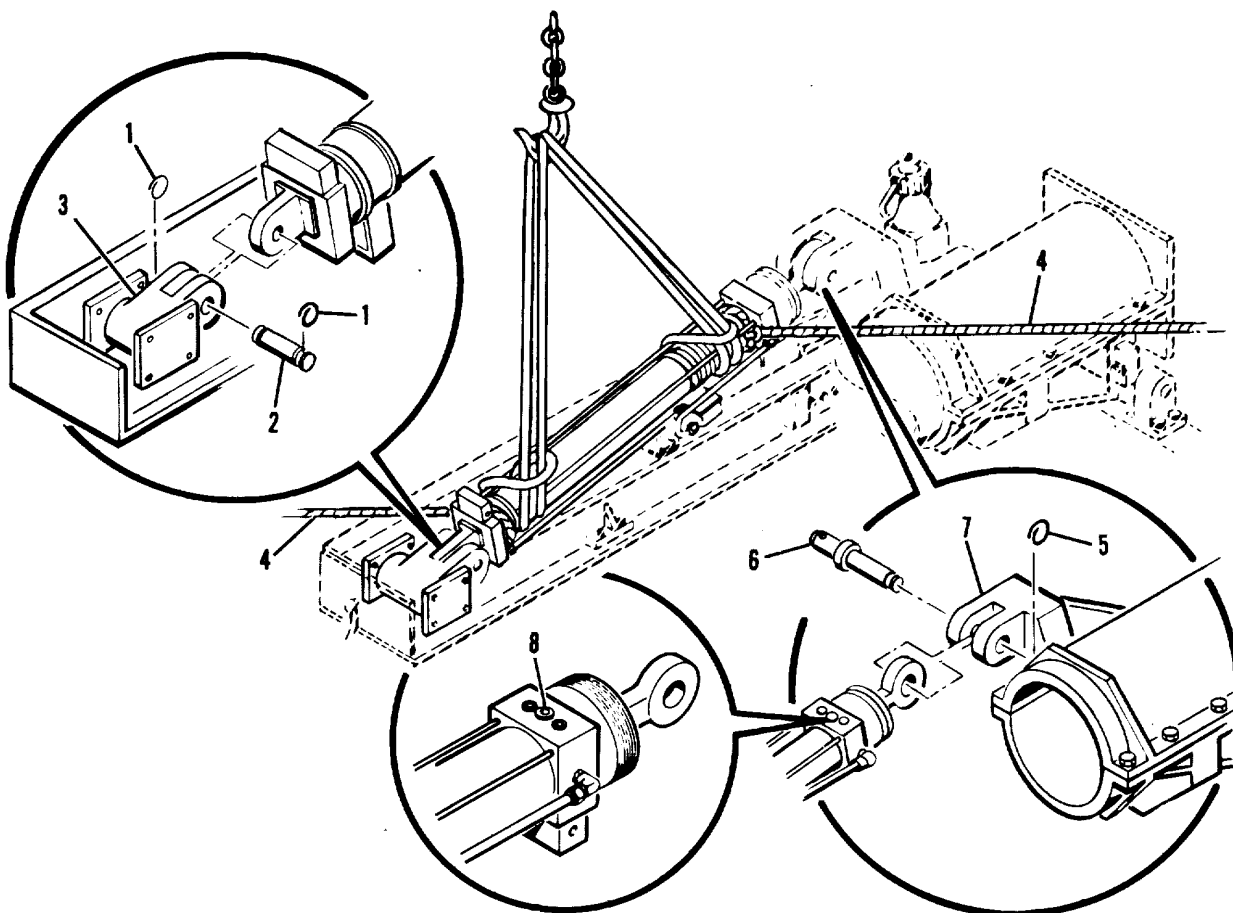
Slings may tighten unevenly.

- Take up slack in slings.

2-12. REPLACE LINEAR ACTUATING CYLINDER-Continued**STEP****PROCEDURE****CAUTION**

Slings must be supporting end of cylinder being disconnected.

8. Remove two retaining rings (1) securing straight pin (2) to cylinder pivot (3). Remove straight pin (2).
9. Using wrecker, raise hydraulic cylinder to horizontal position.
10. Tie one 20 ft length of guide rope (4) to each end of hydraulic cylinder.
11. Remove retaining ring (5) securing straight pin (6) to clevis (7) on mast clamp. Remove straight pin (6).



2-12 REPLACE LINEAR ACTUATING CYLINDER-Continued**STEP****PROCEDURE****WARNING**

Use extreme care when lifting hydraulic cylinder. Make sure personnel are not in the way. Do not allow anyone to walk under a raised load. Be aware that load can shift.

12. Lift cylinder from Mast Group. Guide hydraulic cylinder with guide ropes as cylinder is lifted.

CAUTION

Do not set cylinder down on fittings or hydraulic lines.

13. Set cylinder down on a clean surface for disassembly. Disconnect guide ropes and slings from cylinder.

WARNING

NEVER attempt to open bleed plugs (8) unless you have a crane or wrecker supporting the mast, or mast is fully lowered. Mast can lower VERY RAPIDLY when bleed plugs are open, severely injuring or killing personnel.

2-12. REPLACE LINEAR ACTUATING CYLINDER-Continued**STEP****PROCEDURE****DISASSEMBLY****WARNING**

Do not attempt to remove any cylinder tube or fitting before relieving cylinder pressure.

NOTE

You must remove hardware from the old cylinder and retain for installation on the new cylinder.

1. Slowly open two bleed plugs (1), one at each end of cylinder, to relieve cylinder pressure. Do not remove plugs. A small amount of fluid may spray or seep from the cylinder. Tighten plug (1) after bleeding cylinder.
2. Disconnect ends of tube assembly (2) at elbow (3) and adapter on check valve (4). Remove tube assembly. Install protective caps on ends of tube assembly.
3. Remove elbow (3) and packing (5) from rod end of hydraulic cylinder. Install protective cap in hydraulic port of cylinder. Wrap elbow in clean shop cloth. Discard packing.
4. Loosen two hose clamps (6) securing cylinder lock check valve (4) and bracket (7) to cylinder.
5. Disconnect ends of tube assembly (8) at adapters on check valves (4 and 9). Remove tube assembly. Install protective caps on ends of tube assembly and on check valve adapters.

2-12. REPLACE LINEAR ACTUATING CYLINDER-Continued**STEP****PROCEDURE****ASSEMBLY****NOTE**

You must install hardware from the old cylinder onto the new cylinder.

1. Coat new packing (1) with clean hydraulic fluid. Coat threads of elbow (3) with thread sealing compound. Remove protective caps from hydraulic cylinder port and check valve (2).
2. Install packing (1), elbow (3) with check valve (2), and associated hardware on pivot end of hydraulic cylinder.
3. Slide valve bracket assembly (4) over check valve (2). Install two clamps (5) to secure bracket assembly to cylinder.

NOTE

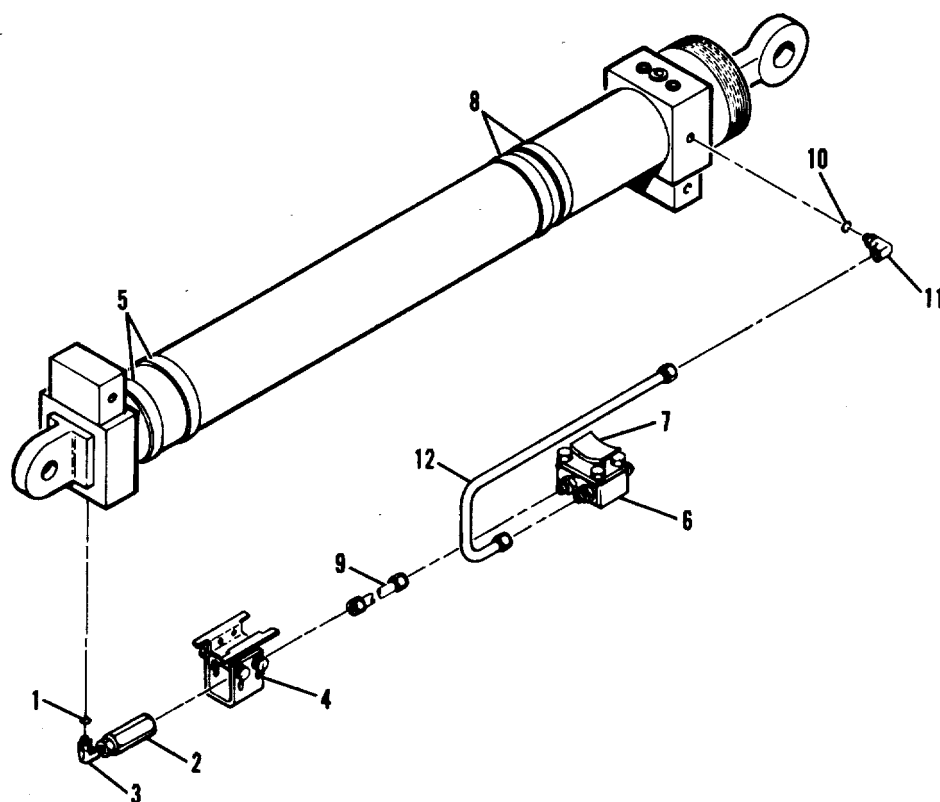
One hose clamp (8) goes through bracket (7).

4. Position cylinder check valve (6) with bracket (7) to cylinder and secure with two clamps (8). Do not tighten clamps (8) at this time.
5. Remove protective caps from tube assembly (9) and check valve (6). Install tube assembly (9) to adapters on check valves (2 and 6).
6. Tighten clamps (8) securing check valve (6) and bracket (7) to cylinder.
7. Coat new preformed packing (10) with clean hydraulic fluid. Install packing (10) and elbow (11) in port at rod end of cylinder.
8. Install tube assembly (12) to elbow (11) on cylinder and adapter on check valve (6).

2-12. REPLACE LINEAR ACTUATING CYLINDER - Continued

STEP

PROCEDURE



2-12. REPLACE LINEAR ACTUATING CYLINDER - Continued**STEP****PROCEDURE****INSTALLATION**

1. Connect guide ropes (1) and slings (2) to hydraulic cylinder:
 - a. Tie one 20 ft length of guide rope to each end of hydraulic cylinder.

CAUTION

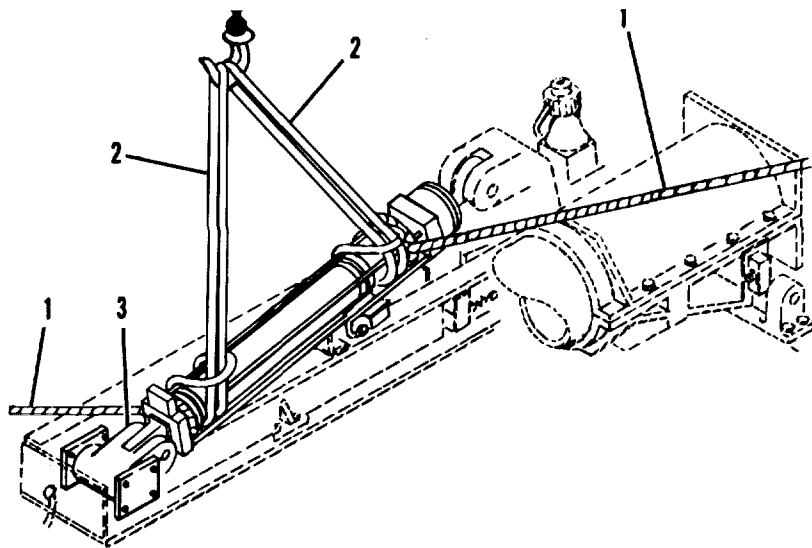
Make certain slings are BETWEEN hydraulic lines and cylinder to avoid damaging lines when lifting cylinder.

- b. Attach two endless loop slings (2) to hydraulic cylinder (one at each end) in a choker configuration.
- c. Attach two ends of slings to wrecker truck hook.

WARNING

Use extreme care when lifting hydraulic cylinder. Make sure personnel are not in the way. Do not allow anyone to walk under a raised load. Be aware that load can shift.

2. Carefully lift cylinder and position it on Mast Group so hole at pivot end of cylinder is aligned with hole in cylinder pivot (3).



3. Install straight pin (4) securing pivot end of cylinder to cylinder pivot (5). Install two retaining rings (6) to secure pin (4).

2-12. REPLACE LINEAR ACTUATING CYLINDER - Continued

STEP

PROCEDURE

NOTE

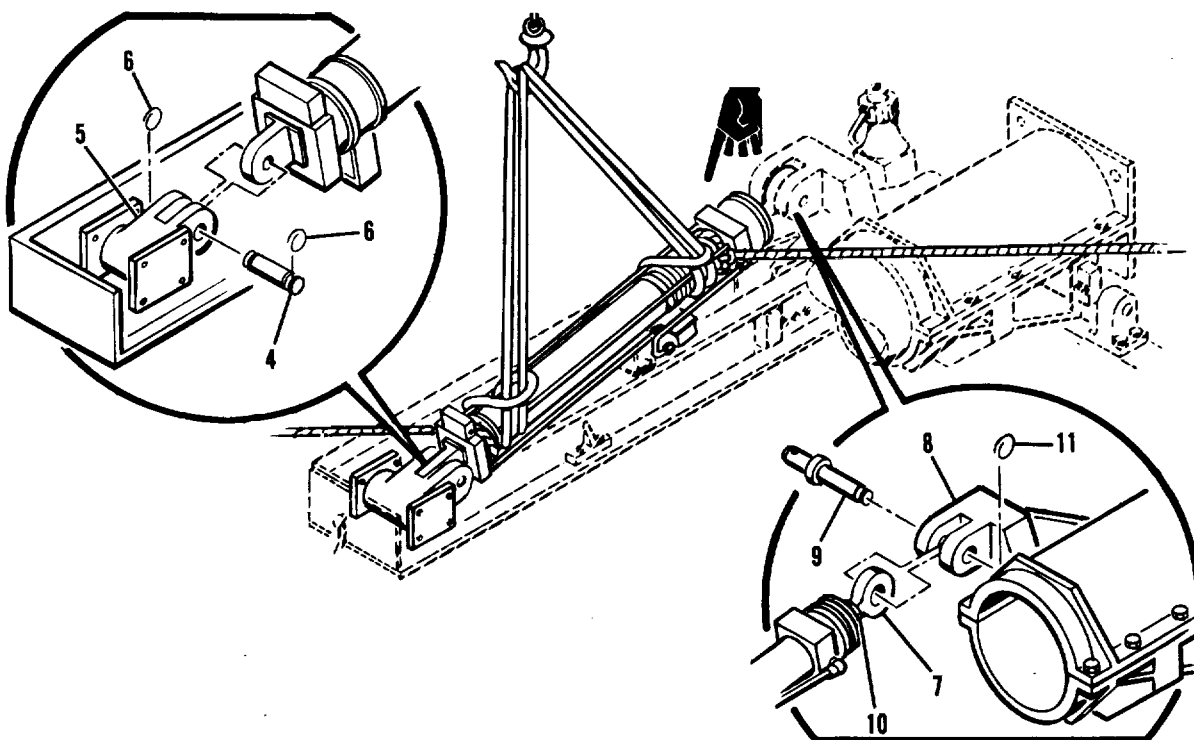
Coat pin (4) with grease to aid installation..

4. Using wrecker and guide ropes, aline rod end of cylinder (7) to mast clamp clevis (8).

WARNING

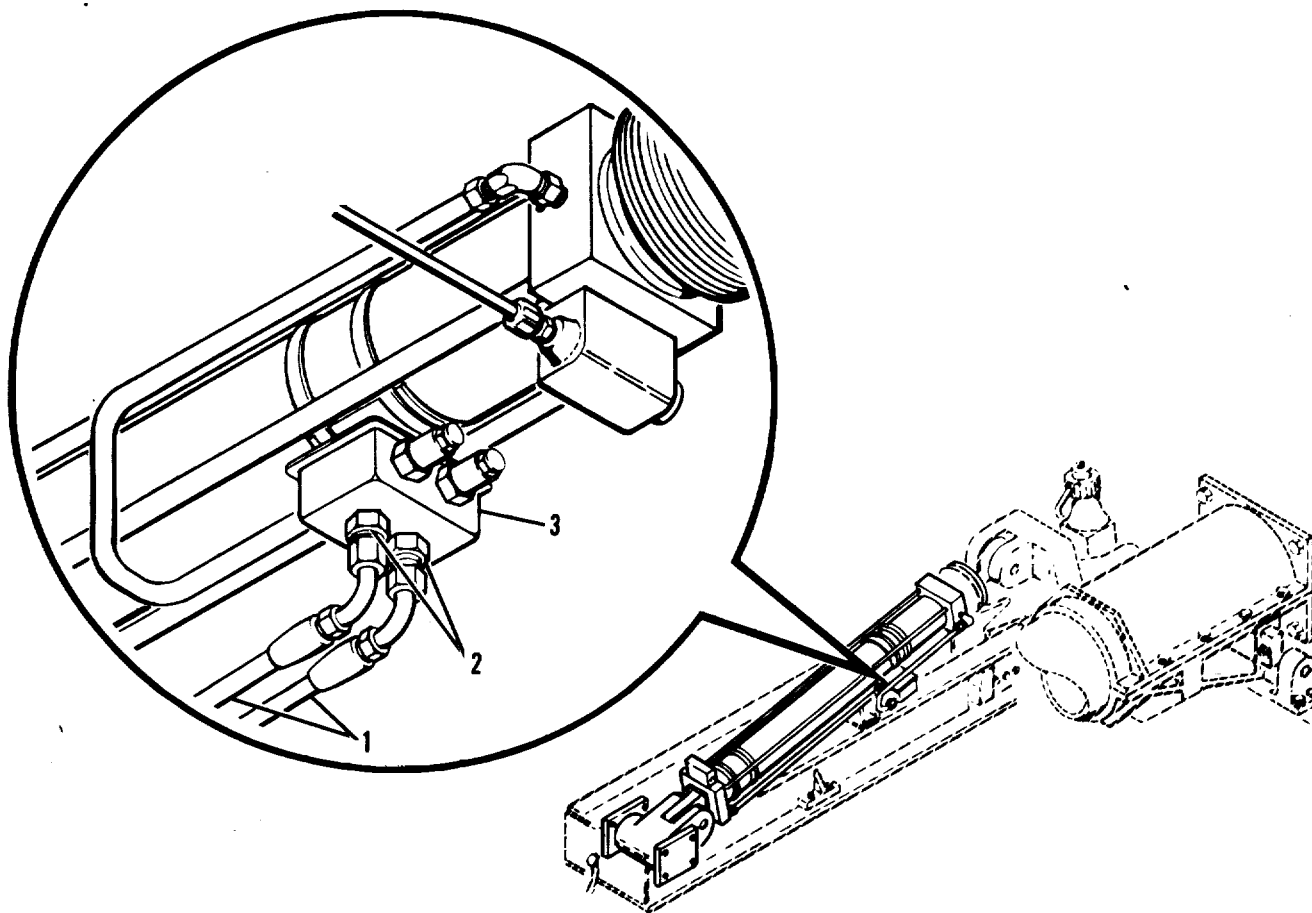
When installing pin (9), only use pin with 300 bevelled edges at both ends and a split ring. Do not reinstall pin with sharp edges at one end and a pressed ring. Failure to observe this warning may result in failure of pin resulting In Injury or death.

5. Try to slide pin (9) into clevis (8) and rod end of cylinder (7). If pin (9) will not slide in, adjust throw by loosening nut (10) and aline rod end of cylinder (7) with clevis (8) so pin (9) slides in. Apply sealing compound to threads of rod end of cylinder and tighten nut (10) to 83 to 51 ft. lbs. torque.
- 5.1 Install retaining ring (11) securing pin (9).



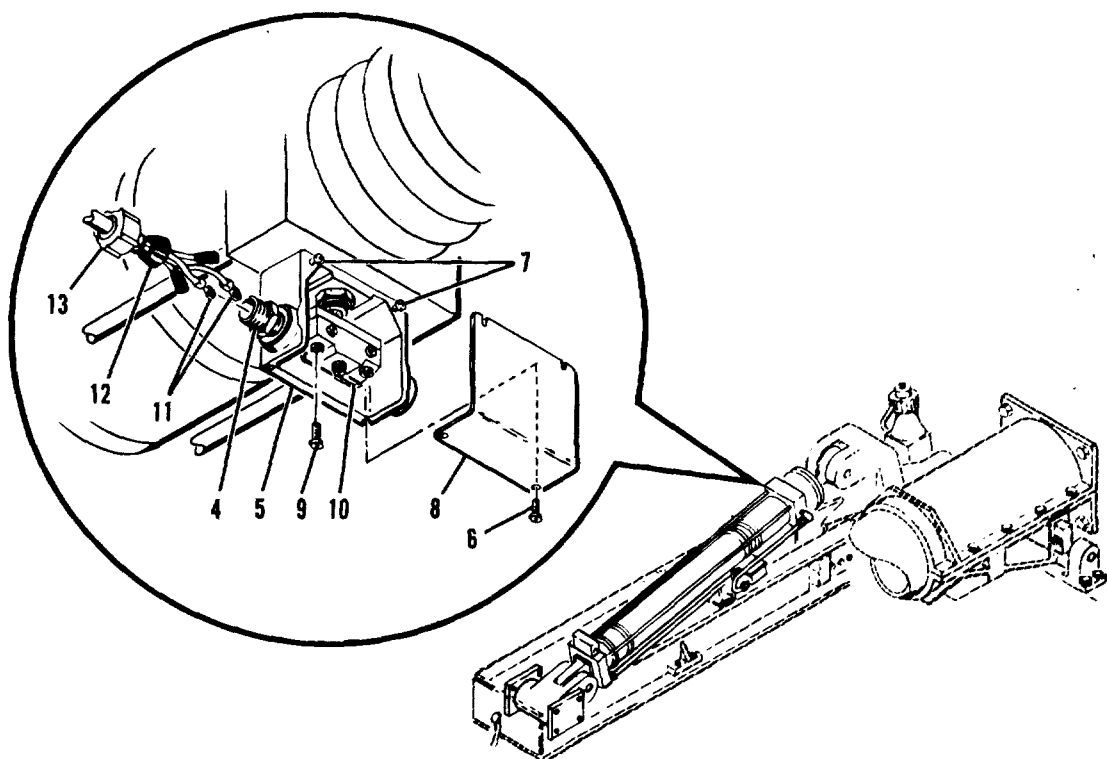
2-12. REPLACE LINEAR ACTUATING CYLINDER - Continued**STEP****PROCEDURE**

- 5.2 Disconnect slings from wrecker hook. Disconnect guide ropes and slings from cylinder.
6. Connect two hydraulic lines (1) to adapters (2) on check valve (3). Use tags on lines to assure correct assembly.



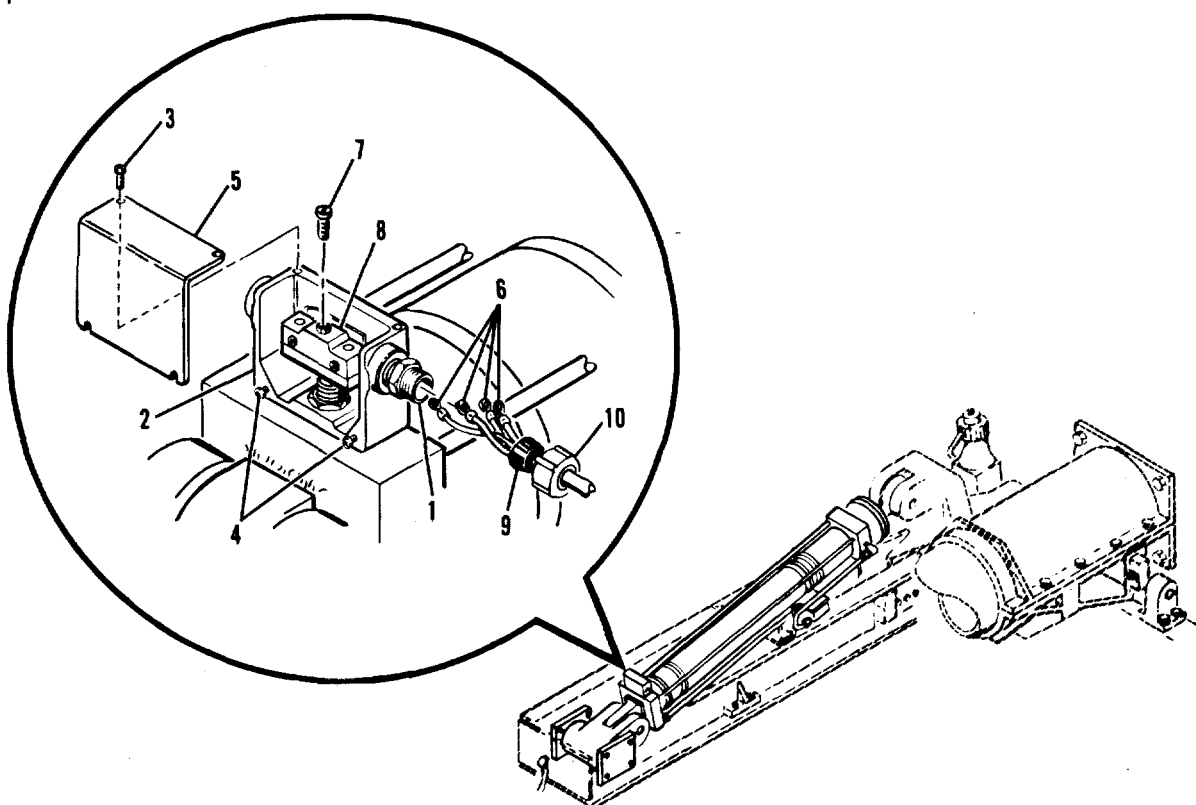
2-12. REPLACE LINEAR ACTUATING CYLINDER - Continued**STEP****PROCEDURE**

7. Connect wires to 100 degree interlock switch:
 - a. Install bushing (4) on 100 degree interlock switch box (5).
 - b. Remove two screws (6) and loosen two screws (7) securing cover (8) to switch box (5). Remove cover.
 - c. Remove two screws (9) from switch (10). Thread four cable leads (11) (two leads are not used) through bushing (4). Position two leads on terminals of switch. Use tags on wires to assure correct assembly. Secure leads with screws (9).
 - d. Position grommet (12) on cable strain relief nut (13). Install cable strain relief nut (13) on bushing (4).
 - e. Position cover (8) on switch box (5). Install two screws (6) and tighten two screws (7) to secure cover.



2-12. REPLACE LINEAR ACTUATING CYLINDER - Continued**STEP****PROCEDURE**

8. Connect wires to zero degree interlock switch:
 - a. Install bushing (1) on zero degree interlock switch box (2).
 - b. Remove two screws (3) and loosen two screws (4) securing cover (5) to switch box (2). Remove cover.
 - c. Thread four cable leads (6) through bushing (1). Remove three screws (7) from switch (8). Position leads on terminals of switch. Use tags on wires to assure correct assembly. Secure leads with screws (7).
 - d. Position grommet (9) on cable strain relief nut (10). Install cable relief nut (10) on bushing (1).



- e. Position cover (5) on switch box (2). Install two screws (3) and tighten two screws (4) to secure cover.
9. Install cylinder lock strut (para 2-24).
10. Install cover lock (para 2-11).

2-12. REPLACE LINEAR ACTUATING CYLINDER - Continued**STEP****PROCEDURE**

11. Turn on mast group power (para 2-2).

NOTE

Add hydraulic fluid to HCA with mast in horizontal position only.

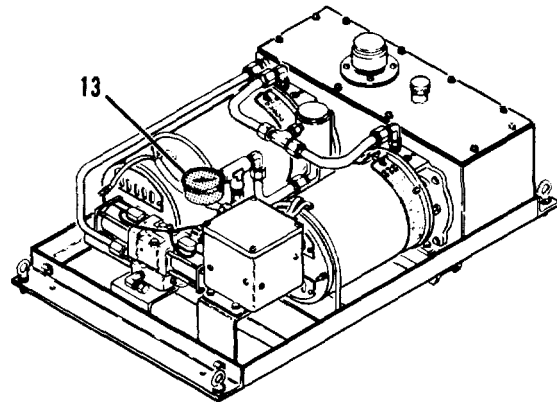
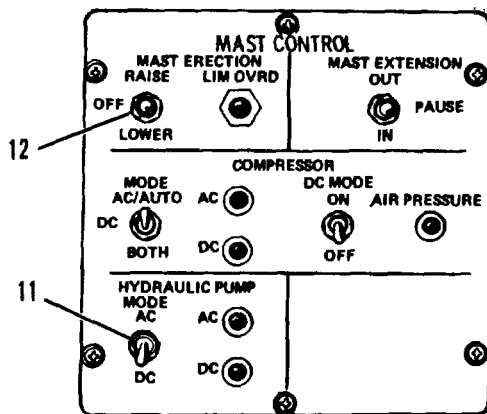
12. Add hydraulic fluid to HCA (TM 11-5985-368-12&P, Operator's PMCS table, item 2).

CAUTION

Even though the HCA pump motors may be self-priming, both pump motors must be primed before they can be used. Failure to do so will destroy pump motors.

13. Prime both HCA pumps:

- Remove HCA covers. Set HYDRAULIC PUMP MODE switch (11) to AC.
- Flip MAST ERECTION switch (12) between RAISE and LOWER several times until pressure is indicated on pressure gage (13).
- Set HYDRAULIC PUMP MODE switch (11) to DC and repeat step b above.



14. Raise and lower mast. Add more hydraulic fluid to HCA as necessary (TM 11-5985-368-12&P).

2-13. REPLACE TAILLIGHT

This task covers:

Removal

Replacement

Installation

Test

INITIAL SETUPTools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
9/16 in. comb. wr

Materials/Parts

Taillight

STEP**PROCEDURE****REMOVAL**

1. Tag vehicle wiring harness leads (2) to assure proper reconnection. Disconnect four taillight leads (1) from vehicle wiring harness leads (2).
2. Remove two bolts (3), lockwashers (4), flat washers (5) and toothed lockwasher (5.1) securing taillight (6) to taillight bracket. Remove taillight.

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

1. Position taillight (6) on taillight bracket and secure with two flat washers (5), toothed lockwasher (5.1), lockwashers (4) and bolts (3).
2. Connect four taillight leads (1) to vehicle wiring harness leads (2).

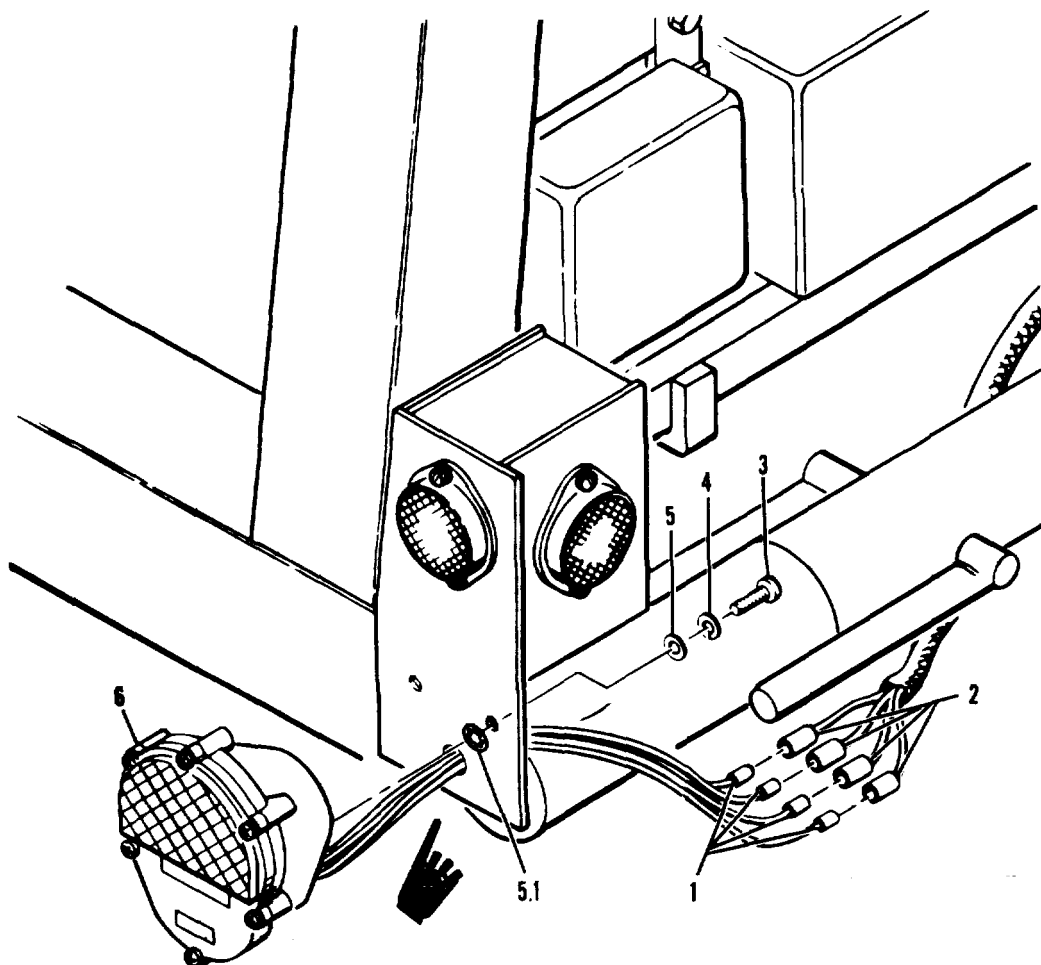
TEST

Operate truck turn signals and taillights (see TM 9-2320-260-10 for M811 truck, see TM 9-2320-272-10 for M942 truck). Check that replaced taillight assembly works properly.

2-13. REPLACE TAILLIGHT - Continued

STEP

PROCEDURE

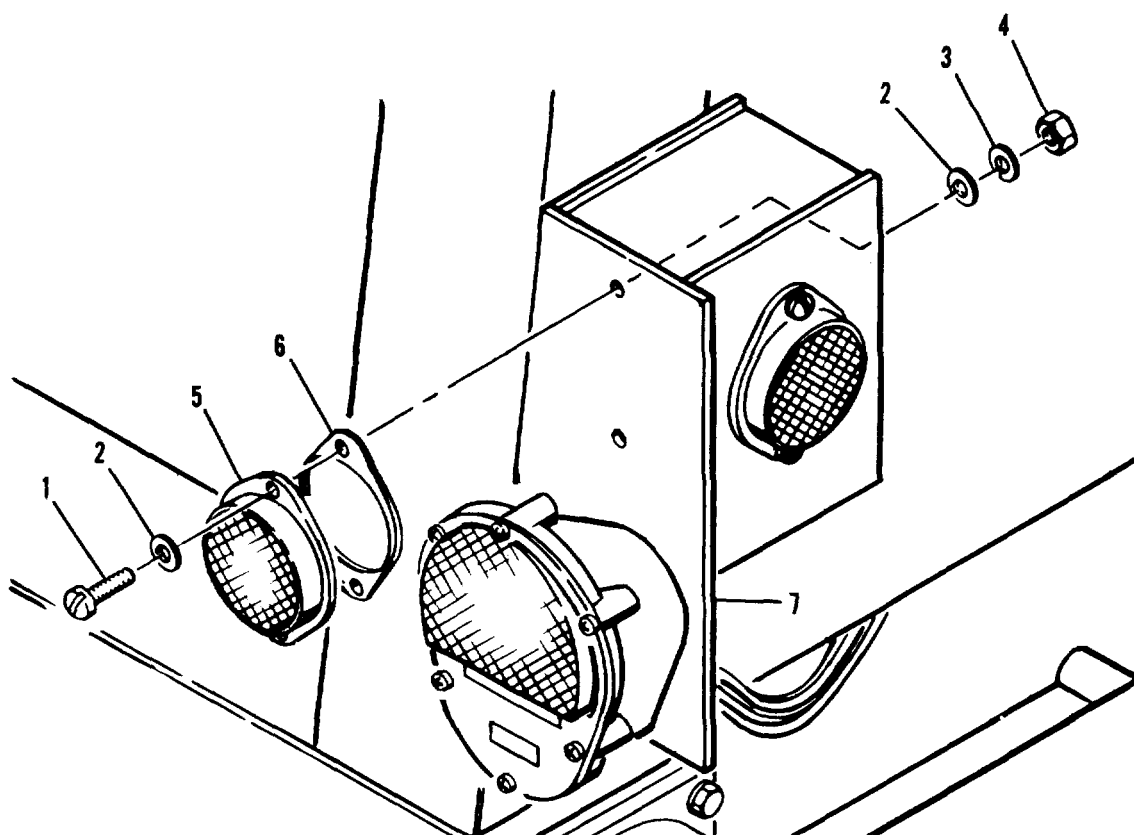


2-14. REPLACE REFLECTORS		
a. TAILLIGHT REFLECTORS		
This task covers:		
Removal	Replacement	Installation
<u>INITIAL SETUP</u>		
<u>Tools</u> Refrig Unit Srvce Tool Kit, 5180-00-596-1474 3/8 in. flat tip scdr 7/16 skt rcht wr, 1/2 in. dr rcht wr ext	<u>Materials/Parts</u> Reflector	
STEP	PROCEDURE	
REMOVAL		
NOTE		
There are four taillight assembly reflectors. They are all removed and replaced in the same way.		
1.	Remove two screws (1), four flat washers (2), two lockwashers (3) and two nuts (4) securing reflector (5) and gasket (6) to taillight assembly (7).	
2.	Remove reflector (5).	
REPLACEMENT		
Replace faulty part with a new part.		
INSTALLATION		
1.	Position gasket (6) and reflector (5) to taillight assembly (7).	
2.	Secure reflector with two screws (1), four flat washers (2), two lock- washers (3), and two nuts (4).	

2-14. REPLACE REFLECTORS - Continued**a. TAILLIGHT REFLECTORS - Continued**

STEP

PROCEDURE

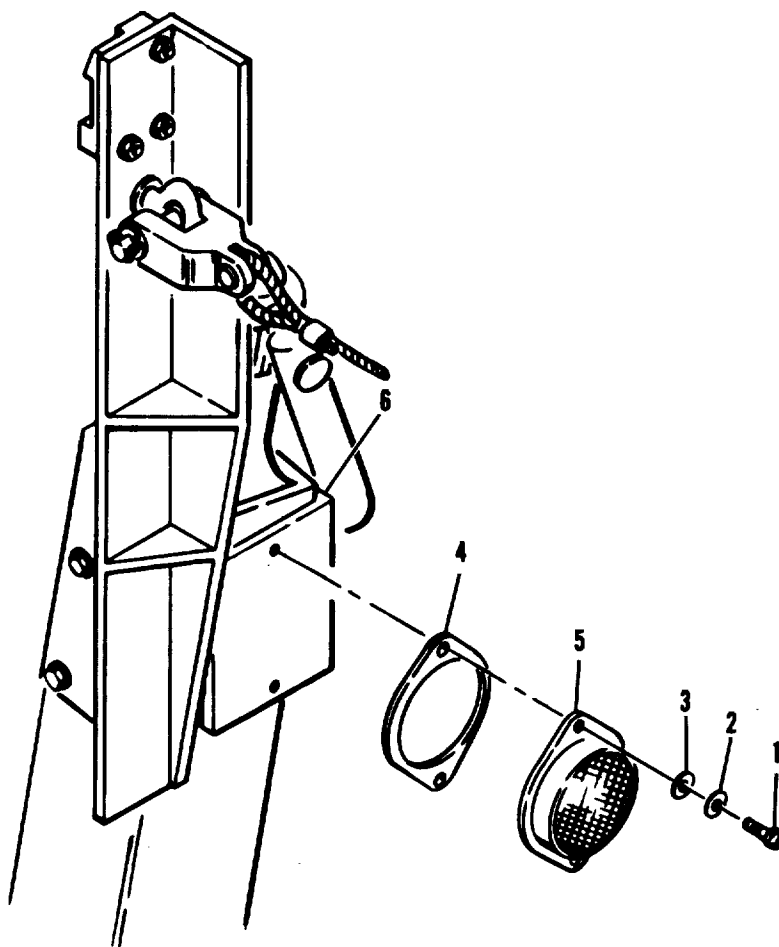


2-14. REPLACE REFLECTORS - Continued		
b. ANGLE BRACKET REFLECTORS		
This task covers:		
Removal	Replacement	Installation
<u>INITIAL SETUP</u>		
<u>Tools</u> Refrig Unit Svce Tool Kit, 5180-00-596-1474 No. 2 xtip scdr	<u>Materials/Parts</u> Reflector Thread sealing compound (appx B, item 21)	
STEP	PROCEDURE	
REMOVAL		
NOTE		
There are four angle bracket reflectors. They are all removed and replaced in the same way.		
1.	Remove two screws (1), lockwashers (2), and flat washers (3) securing gasket (4) and reflector (5).	
2.	Remove reflector (5) from angle bracket (6).	
REPLACEMENT		
Replace faulty part with a new part.		
INSTALLATION		
1.	Coat the threads of screws (1) with thread sealing compound.	
2.	Position gasket (4) and reflector (5) on angle bracket (6). Secure with two flat washers (3), lockwashers (2), and screws (1).	

2-14. REPLACE REFLECTORS - Continued**b. ANGLE BRACKET REFLECTORS**

STEP

PROCEDURE



2-15. MAST CLAMP REPAIR**a. REPLACE HANDKNOB AND TEE SCREW ASSEMBLIES**

This task covers:

Removal

Replacement

Installation

INITIAL SETUPToolsRefrig Unit Svce Tool Kit,
Snap ring plr 67-983Materials/PartsRetaining ring
Tee screw
Handknob**STEP****PROCEDURE****REMOVAL****NOTE**

The lower mast clamps do not have handknob assemblies (1) installed and have mast guide plates (1.1) installed on outside of mast clamp.

If removing tee screw (2) go to steps 1 and 2. If removing handknob assembly (1) go to step 3.

1. Remove retaining ring (3) securing tee screw (2) to mast clamp (4).
2. Unscrew tee screw (2).
3. Unscrew and remove handknob assembly (1) and spring (5) from mast clamp (4).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION**NOTE**

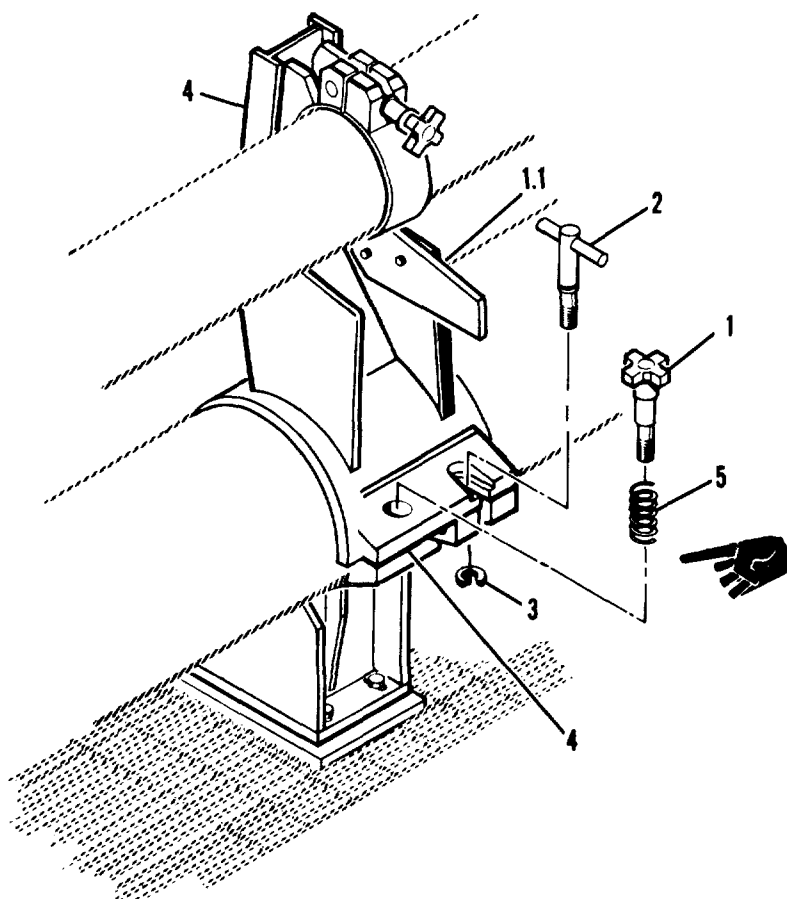
If Installing tee screw (2) go to step 1. If Installing handknob assembly (1) go to step 2.

1. Install tee screw (2) in mast clamp (4). Secure with new retaining ring (3).

2-15. MAST CLAMP REPAIR - Continued**a. REPLACE HANDKNOB AND TEE SCREW ASSEMBLIES - Continued**

STEP

PROCEDURE

**NOTE**

The lower mast clamps do not have handknob assemblies (1) installed and have mast guide plates (1.1) installed on outside of mast clamp.

2. Position spring (5) on handknob assembly (1). Screw handknob assembly (1) to mast clamp (4).

2-15. MAST CLAMP REPAIR - Continued**b. REPLACE MAST CLAMP**

This task covers:

Removal

Replacement

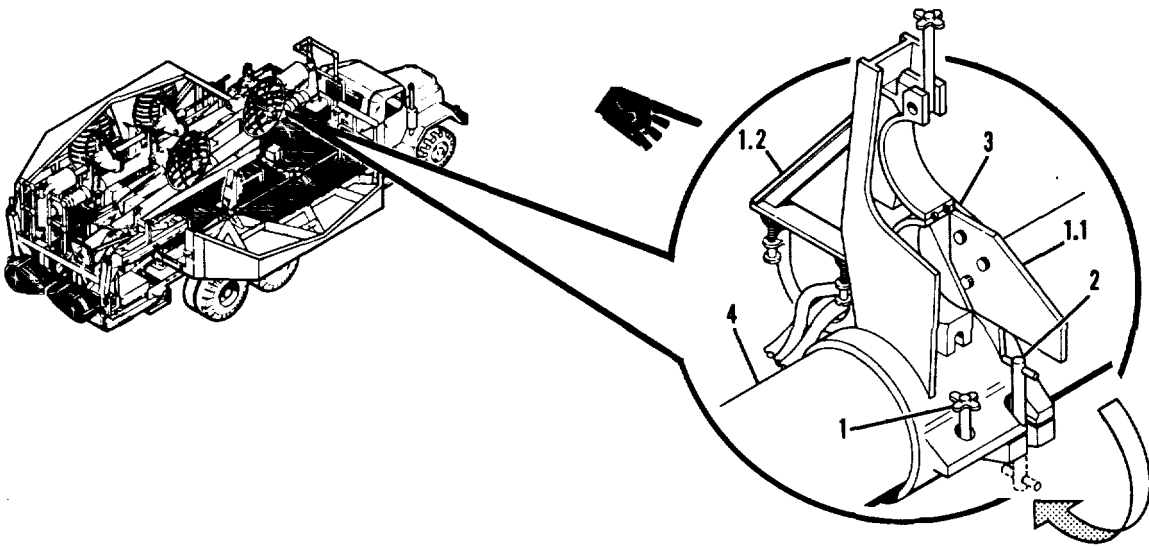
Installation

INITIAL SETUPTools

Mast clamp

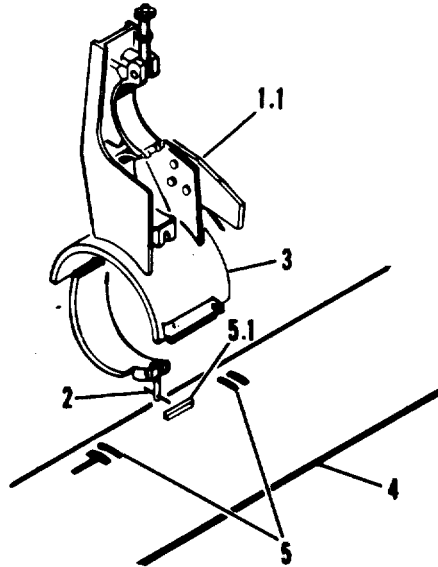
Materials/Parts

Utilities Equipment Repairer

STEP**PROCEDURE****REMOVAL****NOTE**

The lower mast clamps do not have handknob assemblies (1) and have mast guide plates (1.1) on outside of mast clamp. Later model upper mast clamps also have a cable retainer bracket (1.2).

1. Raise mast to 10 degrees and unfold antenna amplifier assemblies (TM 11- 5985-368-12&P, see para 2-15).
2. If installed, remove cable retainer bracket (1.2) (see para 2-7).
3. Loosen tee screw (2) and swing tee screw open.
4. Remove mast clamp (3) from mast (4).

2-15. MAST CLAMP REPAIR - Continued**b. REPLACE MAST CLAMP - Continued****STEP****PROCEDURE****REPLACEMENT**

Replace faulty part with a new part.

INSTALLATION**CAUTION**

To avoid damaging mast, install same mast clamp in same position on mast.

NOTE

The lower mast clamps do not have handknob assemblies (1) installed and have mast guide plates (1.1) installed on outside of mast clamp.

1. Position mast clamp (3) between white lines (5) on mast (4). Rotate clamp until key (5.1) on mast is seated in slot on clamp.

NOTE

If your mast clamp has flanges, position between outside lines; if your mast clamp does not have flanges, position between Inside lines.

2. Swing tee screw (2) closed and tighten tee screw.
- 2-1 If removed, install cable retainer bracket (1.2) (see para 2-7).

2-15. MAST CLAMP REPAIR - Continued**b. REPLACE MAST CLAMP - Continued**

STEP

PROCEDURE

NOTE

Antenna amplifier assemblies may not align with antenna clamps when assemblies are being stowed. If needed, loosen tee handle on mast clamps and reposition mast clamps on mast. Secure mast clamps when properly positioned.

3. Fold antenna amplifier assemblies and stow mast (TM 11-5985-368-12&P, see para 2-17).

NOTE

Handknobs on upper mast clamp may not align with their holes when mast is fully lowered. If needed, raise mast slightly, loosen antenna clamps, loosen mast clamp and reposition mast clamp on mast. Secure mast clamp and antenna clamps when properly positioned on mast.

2-17. REPLACE MAST

This task covers:

Removal

Replacement

Installation

INITIAL SETUPTools

Refrig Unit Svce Tool Kit,

11/16 in. comb. wr

No. 2 xtip scdr T

9/16 in. comb. wr

15/16 in. comb. wr

15/16 in. skt

Skt wr 1/2 in. dr

Pinch bar

5 in. skt wr ext

10 in. skt wr ext

Feeler gage

Adapter

3/4 in. comb. wr, long handle

1-1/2 in. comb. wr

1-3/8 in. comb. wr

11/16 in. skt, 12 point

10 in. skt wr ext

Adapter, torque, 9/16 in.

Machinist level

Endless loop sling (two), EN1-62 x

96 in.

Tools (Continued)

Wrecker truck, M819A1

Torque wrench, 0-150 ft-lbs

Torque wrench, 0-600 ft-lbs

Rubber mallet

Materials/Parts

Rope, 20 ft. (three) (appx B, item 16)

Thread sealing compound (appx B, item 21)

Mast

Spacer assortment

Mast clamp hardware, 10 sets (bolts, nuts, washers, recessed washers)

24"-36" section of 1 in. pipe

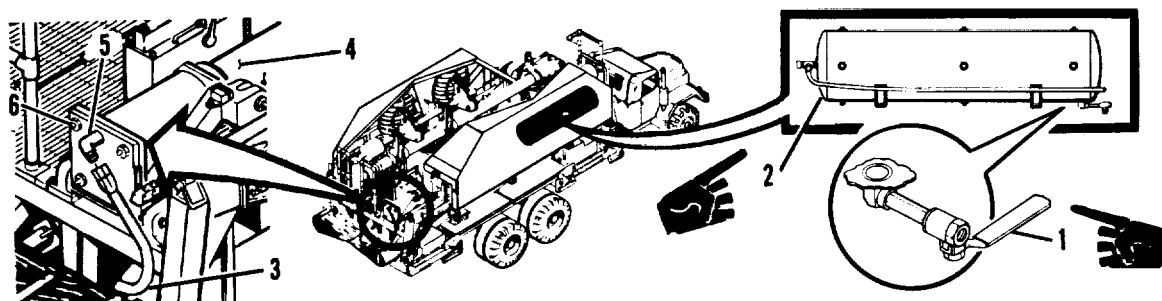
Wood blocks

Personnel Required

Utilities Equipment Repairer (three)

Wrecker Operator

Supervisor

STEP**PROCEDURE****REMOVAL****NOTE**

Remove positioner and protective cover only from the mast to be removed.

2-17. REPLACE MAST-Continued**STEP****PROCEDURE****NOTE**

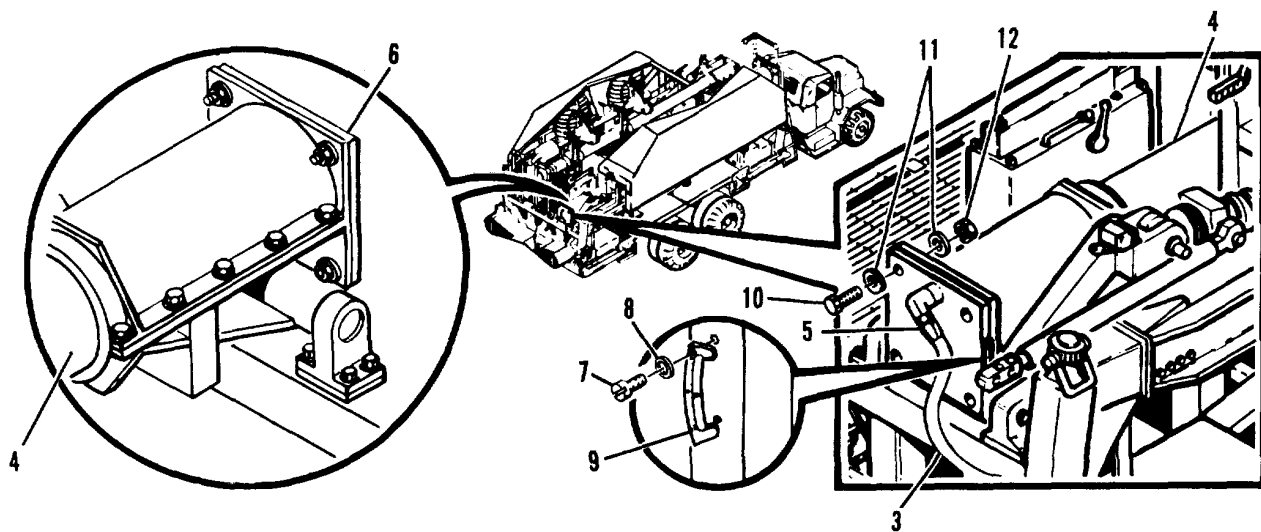
Remove positioner and protective cover only from the mast to be removed.

1. Remove the antenna positioner (see pare 2-22b).
2. Remove the mast protective cover (see pare 2-25).
3. Lower mast to full horizontal position (TM 11-5985-368-12&P, see pare 2-17).
4. Turn off mast group power (see pare 2-2).
5. Open ball valves (or petcocks, if early model) (1) on both air tanks (2) to release all air pressure.

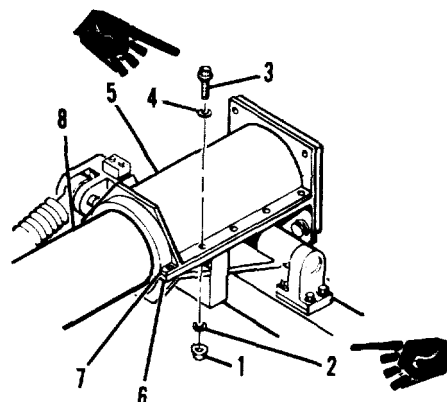
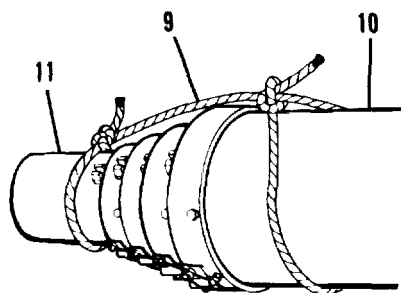
WARNING

To avoid injury from pressurized hose, waft for all air pressure to be released from air tanks.

6. Remove air hose (3) from mast (4) and remove elbow fitting (5) at base of mast (6). Plug hole in mast and air hose with protective cap and plug to prevent entry of foreign matter.



7. Position the wrecker to remove the mast (4).
8. Remove two screws (7), washers (8) and inclinometer (9) from base of mast (6).
9. Remove four bolts (10), eight washers (11), and four locknuts (12) from base of mast (6).

2-17. REPLACE MAST-Continued**STEP****PROCEDURE****NOTE**

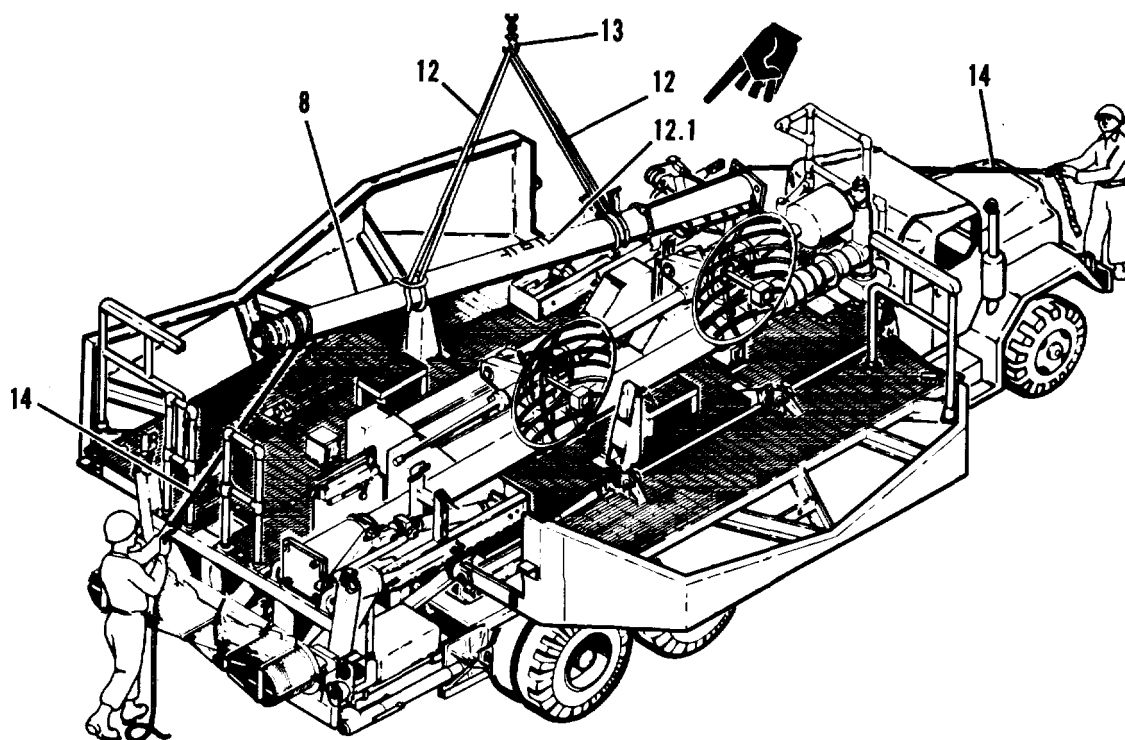
If necessary, use the section of pipe for leverage when removing bolts from the mast clamp.

10. Remove 10 nuts (1), washers (2), bolts (3), and recessed washers (4) from upper and lower sections of mast clamp (5 and 6).
11. Remove upper section of mast clamp (5), and shims (7) from mast (8). Use pinch bar if necessary.
12. Tie rope (9) between mast section no. 1 (10) and mast section no. 5 (11). Make sure rope is securely tied to prevent mast sections from sliding out.
13. Attach slings (12) approximately 3 feet from mast clamp marks (12-1) in center of mast (8), and connect slings to wrecker lifting hook (13).
14. Attach one 20-foot rope (14) to each end of mast (8) for use as guide ropes.
15. Position truck with replacement mast so that the mast (8) being removed can be placed in the bed of the truck with the replacement mast.

WARNING

**Keep personnel away from mast and the areas that it may swing into.
Death or serious injury can result if mast is dropped or strikes personnel.**

16. Take up slack on slings (12) and slowly lift the mast (8). Use assistants to keep tension on ropes (14) to prevent mast from swinging.

2-17. REPLACE MAST-Continued**STEP****PROCEDURE**

17. Move mast (8) over truck carrying the replacement mast and lower mast onto truck with wood blocks, or a suitable support, under top end of mast. Use assistants to guide mast.
18. Remove slings (12) from mast (8) and from lifting hook of wrecker.
19. Remove all ropes from mast (8).

REPLACEMENT

Replace faulty part with a new part.

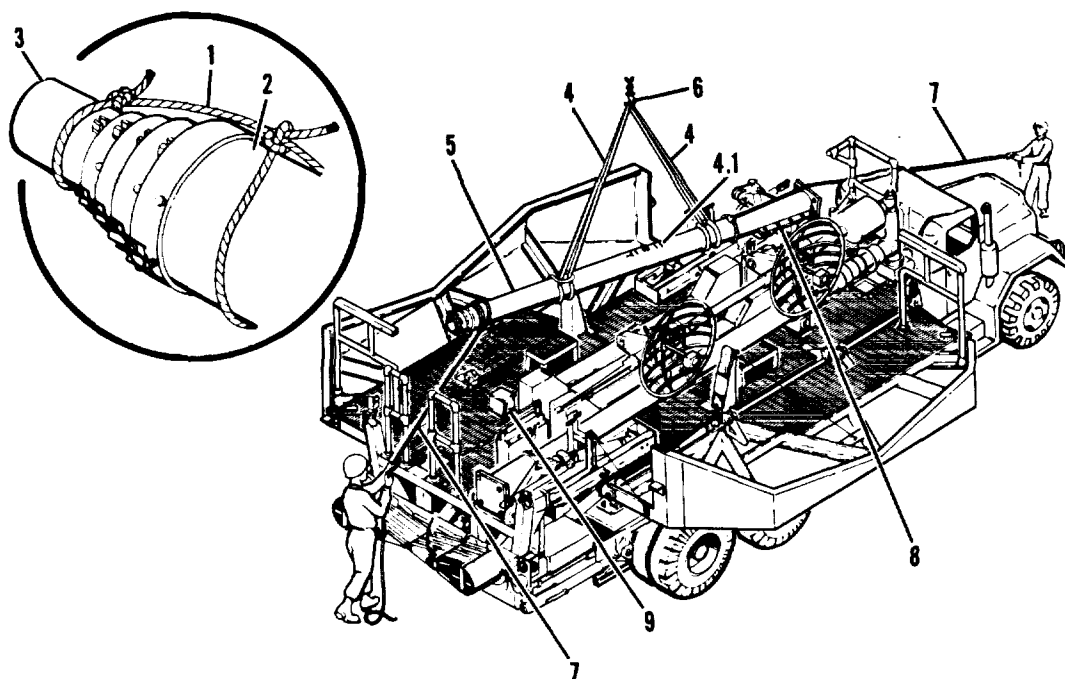
2-17. REPLACE MAST-Continued**STEP****PROCEDURE****INSTALLATION**

1. Tie rope (1) between mast section no. 1 (2) and mast section no. 5 (3). Make sure rope is securely tied to prevent mast sections from sliding out.
2. Attach slings (4) approximately 3 feet from mast clamp marks (4.1) in center of mast (5), and connect slings to wrecker lifting hook (6).
3. Attach one 20-foot rope (7) to each end of mast for use as guide ropes.
4. Take up slack on slings (4) and slowly lift mast (5). Use assistants to keep tension on ropes (7) to prevent mast from swinging.

CAUTION

Make sure inner surface of lower mast clamp (8), lower 36 inches of mast and mast base plate are smooth and free of dirt, point build up, or other debris. Foreign matter can cause binding and damage the mast clamp.

5. Lift mast (5) high enough to clear system and slowly lower mast so the upper portion of mast lies in support (9) and the lower portion of mast lies in mast clamp (8). Mast base plate (10) must be in contact with back plate portion of lower mast clamp (8). Use assistants to control ropes (7)



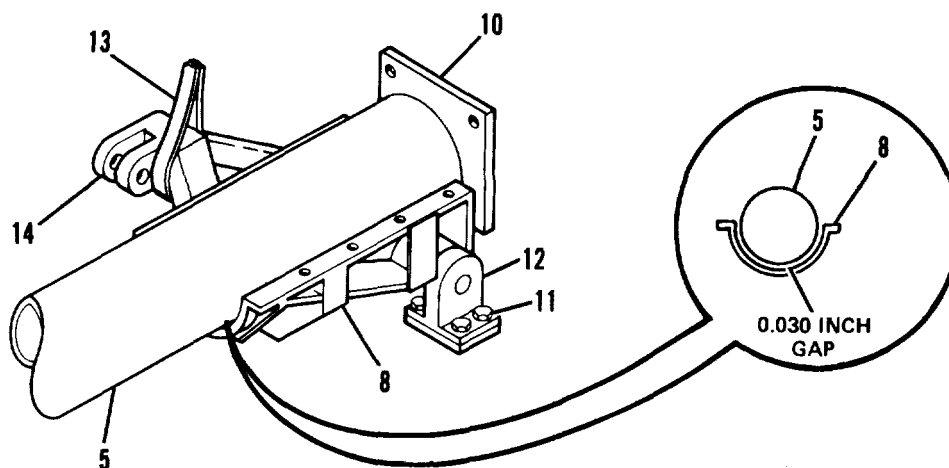
2-17. REPLACE MAST-Continued**STEP****PROCEDURE**

6. Remove slings (4) and ropes (7) from mast.
7. While supporting linear actuating cylinder, remove straight pin securing cylinder to clevis on mast clamp (see pare 2-12, step 11). Carefully lift end of linear actuating cylinder out of mast clamp clevis.

CAUTION

Do not allow linear actuating cylinder to rest on hydraulic lines or fittings: they may be damaged.

8. Carefully push end of cylinder outboard until it clears mast clamp clevis, then block and lower linear actuating cylinder. This will allow free movement of mast clamp during mast installation.



9. Loosen, but do not remove, eight bolts (11) securing two bearing housings (12) to frame.
10. Attach wrecker slings (13) to lower mast clamp clevis (14).
11. Using wrecker, adjust height of lower mast clamp (8) so about a 0.030 inch gap exists between mast (5) and front portion of lower mast clamp (8). Use feeler gage to measure gap.

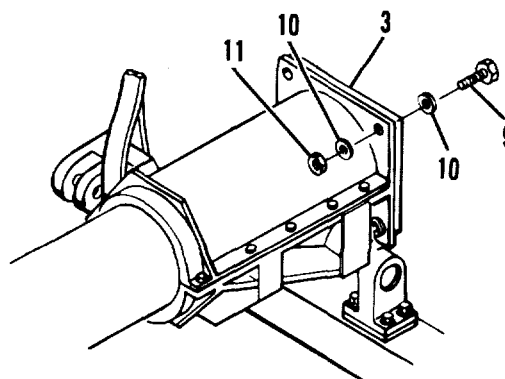
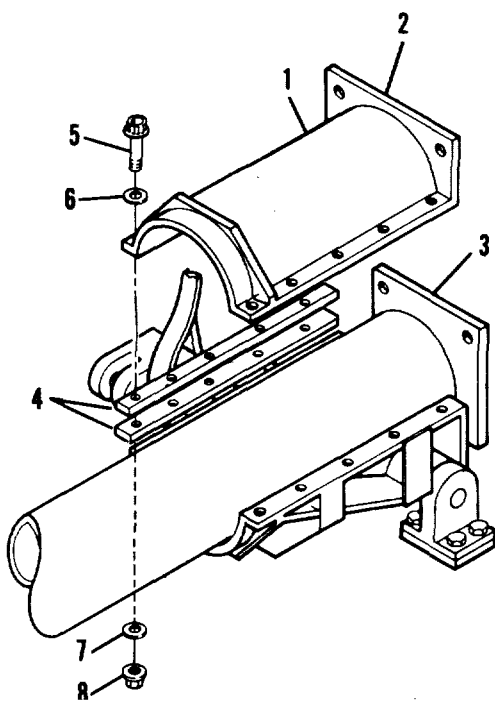
2-17. REPLACE MAST-Continued**STEP****PROCEDURE**

12. Position upper half (1) of mast clamp on mast so bottom edge (2) butts up against mast base plate (3).

CAUTION

Most clamp bolts must be clean and free of rust, grease and oil.

13. Install two 0213-3-3122-2 shims (spacers) (4) on outboard side of mast clamp only. Install five bolts (5) (with bolt heads up), recessed washers (6) (with recess up), flatwashers (7), and nuts (8) on the shimmed (out-board) side of mast clamp. Do not tighten bolts (5).

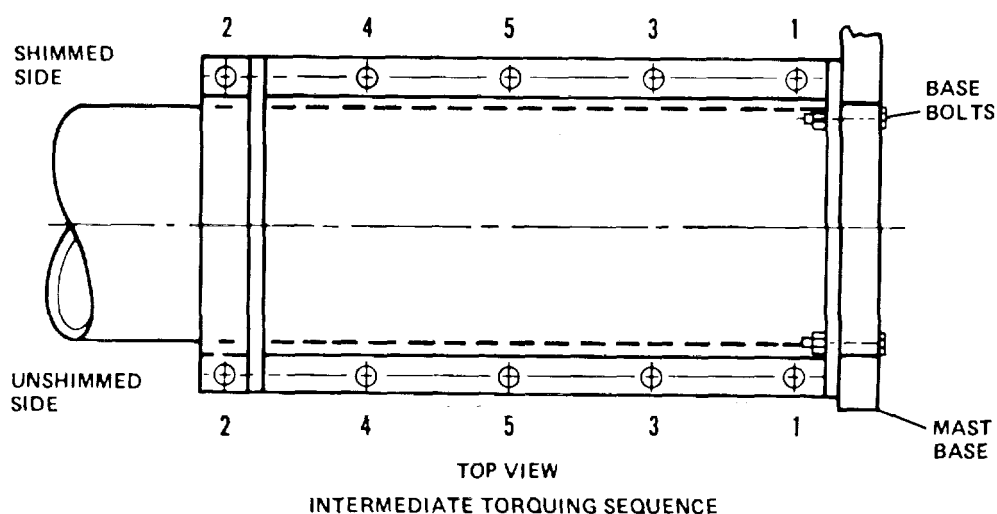
**NOTE**

The upper screws (9) are longer than the other two.

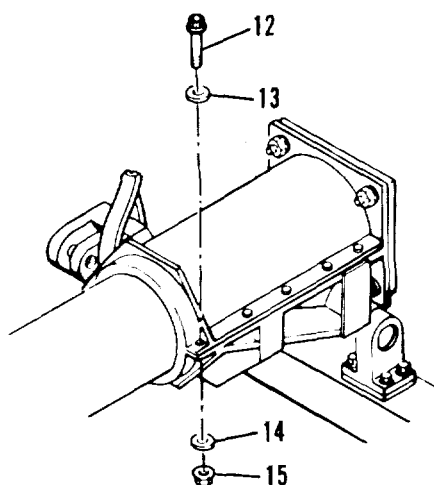
14. Install four bolts (9), eight washers (10), and four locknuts (11) into holes of the mast base plate (3). Torque bolts (9) to 26-30 ft-lbs for seating, then loosen to finger tightness.

2-17. REPLACE MAST-Continued**STEP****PROCEDURE**

15. Tighten five bolts (5) on shimmed side of mast clamp to 140-160 ft-lbs torque using intermediate torquing sequence below.



16. Install five bolts (12) (with bolt heads up), recessed washers (13) (with recess up), flatwashers (14), and nuts (15) in unshimmed (inboard) side of mast clamp.
17. If using 6-point bolts tighten five bolts on unshimmed side of mast clamp to 18-22 ft-lbs torque using intermediate torquing sequence above. If using 12-point bolts tighten bolts to 53-57 ft-lbs torque using intermediate torquing sequence above. Repeat torquing sequence once to make sure all bolts are tightened correctly.

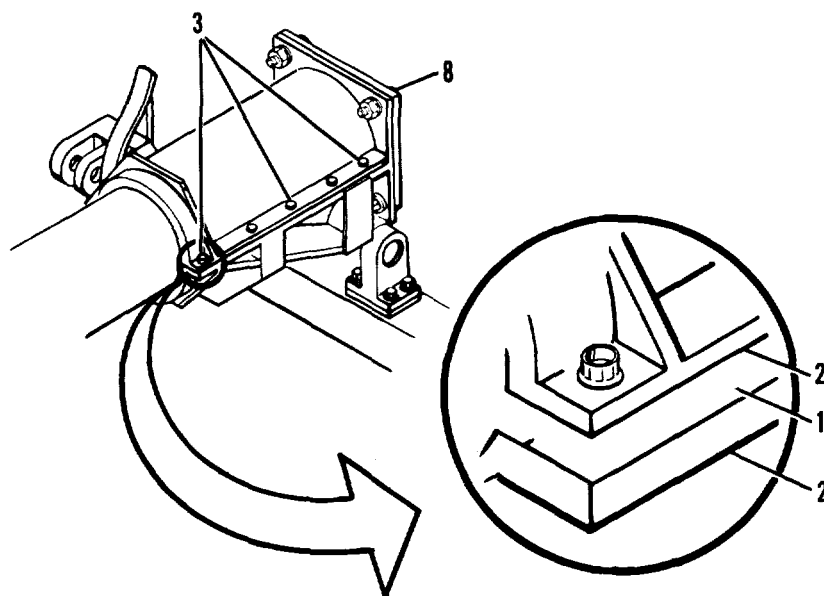


2-17. REPLACE MAST-Continued**STEP****PROCEDURE**

18. Measure the gap (I) between mast clamp flanges (2) on the unshimmed (inboard) side of mast clamp with a feeler gage. Measure the gap at the bolts (3) on both ends of the mast clamp and at the middle.

NOTE

If there is no Sop, remove hardware securing upper mast clomp to lower mast clomp and remove one of the 0213-3-3122.2 shims installed in step 13. Repeat steps 13 thru 18.



19. Record the gap measurements taken above. A worksheet and a sample is provided on page 2-126.4 for your convenience. Add the three measurements and divide by three to get the average gap. Record the average gap. (Example: 1st measurement .070, plus 2nd measurement .074, plus 3rd measurement .078 = .222 total. Divide by 3 equals .074 average gap.)

NOTE

If the overage gap is greater than 0.250 inch, remove hardware securing upper mast clomp to lower mast clomp and add a third shim (0213-3-3122-2) to the shimmed side (see step 13). Repeat steps 13 thru 19.

2-17. REPLACE MAST-Continued

STEP	PROCEDURE
20.	Determine how many 0213-3-3122-2 shims are installed in the shimmed side of the mast clamp. Multiply the number of shims by .063 to obtain preliminary shim thickness (Example: 2 shims times .063 equals .126 inch preliminary shim thickness).
21.	Add the preliminary shim thickness to the average gap to arrive at the total gaps (Example: .074 average gap plus .126 preliminary shim thickness equals .200 total gap).
22.	The total gap must be between .090 inch and .450 inch. If the total gap is not within this range, disassemble mast clamp and repeat steps 12 thru 22 to assure proper assembly and that all measurements were accurate. If total gap is still out of range, mast clamp or mast is out of tolerance. Notify your supervisor.
23.	Using the shim stack in Table 2-1.1 determine the correct shim combination to be used for final assembly by finding the total gap (from step 22) in the left hand column. Read across the row from left to right to find the shim combination to be used on either side of the clamp. The correct shims are described as either -1, -2, or -3, in the second and third columns of the appropriate row. (These dash numbers refer to the 0213-3-3122-1, -2, and -3 shims.) Prepare the two shim stacks by selecting the quantity of identified shims (spacers) from the shim (spacer) assortment.
NOTE There are several combinations of shims which may be used for any given total Sop number. Usually, the second shim combination listed in the total gap column of the shim stock table is the best.	

2-17. REPLACE MAST - Continued

STEP	PROCEDURE
	TOTAL GAP WORKSHEET AND SAMPLE WORK SHEET <u>Determining Average Gap</u> 1st Measurement _____ 2nd Measurement _____ 3rd Measurement _____ Total _____ Total of three measurements _____ divide by three = _____ Average Gap <u>Determining Total Gap</u> Total number of shims _____ multiply by .063 inch = _____ Preliminary Shim Thickness Preliminary Shim Thickness _____ + Average Gap _____ Total Gap _____ WORK SHEET <u>Determining Average Gap</u> 1st Measurement <u>.070 in.</u> 2nd Measurement <u>.074 in.</u> 3rd Measurement <u>.078 in.</u> Total <u>.222 in.</u> Total of three measurements <u>.222</u> divide by three = <u>.074 in.</u> Average Gap <u>Determining Total Gap</u> Total number of shims <u>2</u> multiply by .063 inch = <u>.126 in.</u> Preliminary Shim Thickness Preliminary Shim Thickness <u>.126</u> + Average Gap <u>.074</u> Total Gap <u>.200</u>

2.17. REPLACE MAST - Continued				
Table 2-1.1. Shim Stack				
Unshimmed (inboard) Side			Shimmed (outboard side) Side	
Total Gap	Shim Type	Quantity	Shim Type	Quantity
.090-.105"	-1	2	-1	2
.090-.113"	-1	1	-2	1
.110-.125"	-1	2	-2	1
.116-.135"	-1	1	-3	1
.130-.148"	-1	3	-2	1
.133-.151"	-2	1	-2	1
.137-.155"	-1	2	-3	1
.150-.168"	-1	4	-2	1
.153-.171"	-1	1	-2	1
	-2	1		
.157-.175"	-1	3	-3	1
.160-.178"	-2	1	-3	1
.172-.191"	-1	1	-1	1
	-2	1		
.177-.195"	-1	4	-3	1
.180-.198"	-1	1	-3	1
	-2	1		
.187-.205"	-3	1	-3	1
.193-.211"	-1	2	-1	1
	-2	1		
.196-.214"	-2	2	-2	1
.200-.218"	-1	2	-3	1
	-2	1		
.207-.225"	-1	1	-3	1
	-3	1		
.213-.231"	-1	2	-1	2
	-2	1		
.218-.234"	-1	1	-2	2
	-2	1		

2.17. REPLACE MAST - Continued

Table 2-1.1. Shim Stack

Total Gap	Unshimmed (inboard) Side		Shimmed (outboard side) Side	
	Shim Type	Quantity	Shim Type	Quantity
.220-.238"	-1	2	-1	1
	-2	1	-3	1
.223-.241"	-2	2	-3	1
.227-.245"	-1	1	-1	1
	-3	1	-3	1
.236-.254"	-2	2	-1	2
			-2	1
.240-.258"	-1	3	-1	1
	-2	1	-3	1
.243-.261"	-1	1	-2	2
	-3	1		
.247-.265"	-1	1	-1	2
	-3	1	-3	1
.250-.268"	-2	1	-3	1
	-3	1		
.256-.274"	-1	3	-2	2
	-2	1		
.259-.277"	-2	2	-2	2
.263-.281"	-2	2	-1	2
			-3	1
.267-.285"	-1	2	-1	2
	-3	1	-3	1
.270-.288"	-1	1	-2	1
	-3	1	-3	1
.276-.294"	-1	4	-2	2
	-2	1		
.277-.295"	-3	1	-3	2
.279-.297"	-1	1	-2	2
	-2	2		

2.17. REPLACE MAST - Continued

Table 2-1.1. Shim Stack - Continued

Total Gap	Unshimmed (inboard) Side Shim Type	Quantity	Shimmed (outboard side) Side Shim Type	Quantity
.283-.301"	-2	2	-1 -3	3 1
.286-.304"	-2	2	-2 -3	1 1
.290-.308"	-1 -3	2 1	-2 -3	1 1
.297-.315"	-1 -3	1 1	-3	2
.299-.317"	-1 -2	1 2	-1 -2	1 2
.303-.321"	-1 -2	4 1	-2 -3	1 1
.306-.324"	-1 -2	1 2	-2 -3	1 1
.310-.328"	-1 -3	3 1	-2 -3	1 1
.313-.331"	-2 -3	1 1	-2 -3	1 1
.317-.335"	-1 -3	1 1	-3 -1	2 1
.319-.337"	-1 -2	2 2	-1 -2	1 2
.326-.344"	-2 -3	1 1	-1 -2	2 2
.330-.348"	-1 -3	4 1	-2 -3	1 1
.333-.351"	-2 -3	1 1	-1 -2 -3	1 1 1

2.17. REPLACE MAST - Continued

Table 2-1.1. Shim Stack - Continued

Unshimmed (inboard) Side			Shimmed (outboard) Side	
Total Gap	Shim Type	Quantity	Shim Type	Quantity
.337-.355"	-1	3	-3	2
	-3	1		
.339-.357"	-1	2	-1	2
	-2	2		
.340-.358"	-2	1	-3	2
	-3	1		
.346-.364"	-1	1	-1	2
	-2	3		
.349-.367"	-2	3	-2	1
			-3	1
.353-.371"	-1	1	-1	1
	-2	1	-2	1
	-3	1	-3	1
.357-.375"	-1	4	-3	2
	-3	1		
.360-.378"	-1	1	-3	2
	-2	1		
	-3	1		
.366-.384"	-1	1	-1	3
	-2	1	-2	2
	-3	1		
.367-.385"	-3	2	-3	2
.369-.387"	-1	1	-2	3
	-2	1		
	-3	1		
.373-.391"	-1	2	-1	1
	-2	1	-2	1
	-3	1	-3	1

2.17. REPLACE MAST - Continued				
Table 2-1.1. Shim Stack - Continued				
Unshimmed (inboard) Side			Shimmed (outboard) Side	
Total Gap	Shim Type	Quantity	Shim Type	Quantity
.376-.394"	-2	1	-2	2
	-3	1	-3	1
.380-.398"	-3	2	-1	2
			-2	1
			-3	1
.387-.405"	-1	1	-3	2
	-3	2		
.389-.407"	-1	2	-2	3
	-2	1		
	-3	1		
.393-.411"	-1	2	-1	2
	-2	1	-2	1
	-3	1	-3	1
.396-.414"	-2	3	-1	1
			-3	2
.400-.418"	-1	1	-1	2
	-3	2	-2	1
			-3	1
.403-.421"	-2	2	-3	2
	-3	1		
.407-.425"	-1	1	-1	1
	-3	2	-3	2
.409-.427"	-1	1	-1	2
	-2	3	-2	1
			-3	1
.416-.434"	-1	1	-1	1
	-3	2	-2	3
.423-.441"	-2	2	-1	1
	-3	1	-3	2

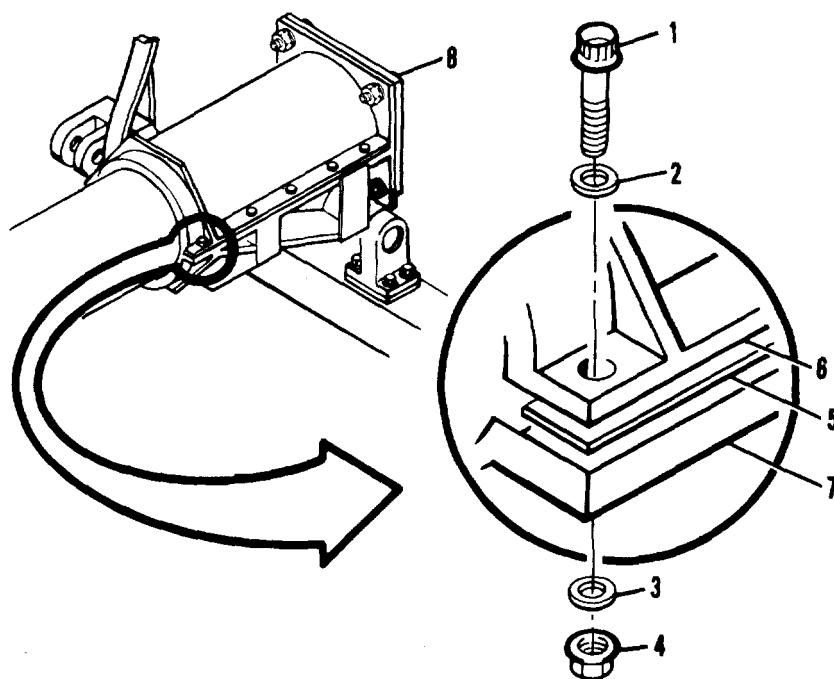
2.17. REPLACE MAST - Continued

Table 2-1.1. Shim Stack - Continued

Unshimmed (inboard) Side			Shimmed (outboard) Side	
Total Gap	Shim Type	Quantity	Shim Type	Quantity
.427-.445"	-1	2	-1	1
	-3	2	-3	2
.429-.447"	-2	2	-1	4
	-3	1	-2	2
.430-.448"	-2	1	-3	2
	-3	2		
.436-.450"	-1	2	-1	1
	-3	2	-2	3
.450"	-2	2	-2	2
	-3	1	-3	1
.450"	-1	2	-2	2
	-3	2	-3	1
.450"	-1	2	-1	2
	-3	2	-3	2
.450"	-2	1	-1	1
	-3	2	-3	2

2-17. REPLACE MAST - Continued

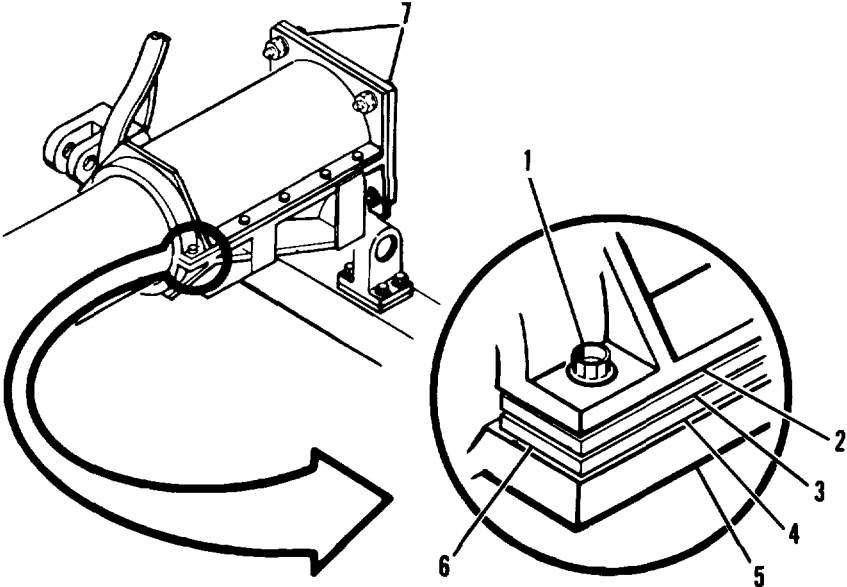
STEP	PROCEDURE
24.	Remove 10 previously installed bolts (1), recessed washers (2), flat-washers (3), nuts (4), and the shim(s) previously installed on the outboard side.
25.	Insert the selected shim stacks (5) into their appropriate sides between the upper clamp flange (6) and the lower clamp flange (7).
25.1	Install 10 bolts (1), recessed washers (with recess up) (2), flat-washers (3), and nuts (4) finger tight.
25.2	Tighten four bolts (8) to 26-30 ft-lbs torque to assure seating of mast base plate against upper and lower mast clamps.



2-17. REPLACE MAST - Continued

STEP	PROCEDURE
	NOTE If necessary, use the 24"-36" pipe for leverage when torquing mast clamp bolts.
25.3	Using the final torquing sequence below, tighten the mast clamp bolts (1) to 90-110 ft-lbs torque.
25.4	Again, using the final torquing sequence, tighten the mast clamp bolts (1) to 190-200 ft-lbs torque.
	WARNING If using 6-point bolts DO NOT over tighten mast clamp bolts (1) to 240.260 ft-lbs torque; bolt failure may result in personal injury or death.
25.5	If using 12-point bolts, tighten mast clamp bolts (1) to 240-260 ft-lbs torque using the final torquing sequence below. TOP VIEW FINAL TORQUING SEQUENCE

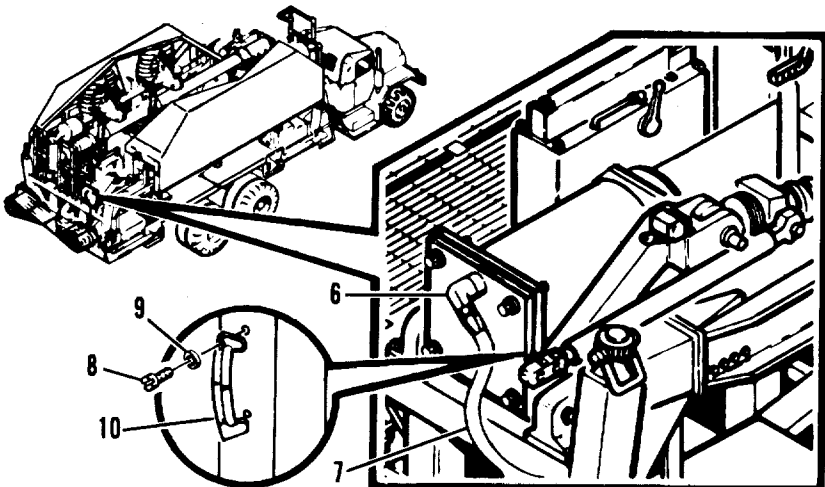
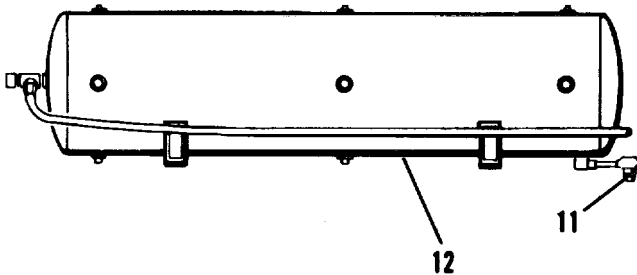
2-17. REPLACE MAST - Continued

STEP	PROCEDURE
25.6	Repeat steps 25.2 and 25.4 to ensure proper torque of 6-point bolts. Repeat steps 25.2 and 25.5 to ensure proper torque of 12-point bolts.
25.7	Using a .0015 inch feeler gage, check for within 1/2 inch of each bolt (1) for a gap between the upper clamp flange (2) and shim (3), between each shim (3, 4, etc. as required), and between shim (4) and lower clamp flange (5). CAUTION Never exceed the maximum torque of 240-260 ft-lbs in an attempt to reduce a gap between mast clamp flanges. NOTE When checking for gaps, ensure end edges (6) are checked along with the side. 
25.8	If there is any gap larger than .0015 anywhere in step 25.7 above, loosen two bolts (7), disassemble and repeat entire installation procedure, steps 24 thru 25.7, using the next thicker shim stack, within your total gap range, from the s shim stack table to eliminate gaps. Otherwise go to step 25.10.
25.9	If after repeating entire installation procedure, using thicker shim stack, gaps greater than .0015 inch still exist, then notify your supervisor.

2-17. REPLACE MAST - Continued

STEP	PROCEDURE
25.10	Tighten eight bolts (1) securing two bearing housings (2) to frame to 66-70 ft-lbs torque. NOTE When using the torque wrench adppter, connect it at a right angle to the torque wrench to prevent a change in the torque value from occurring.
25.11	Remove slings (3) from lower mast clamp clevis (4).
26.	Install linear actuating cylinder (see para 2-12).

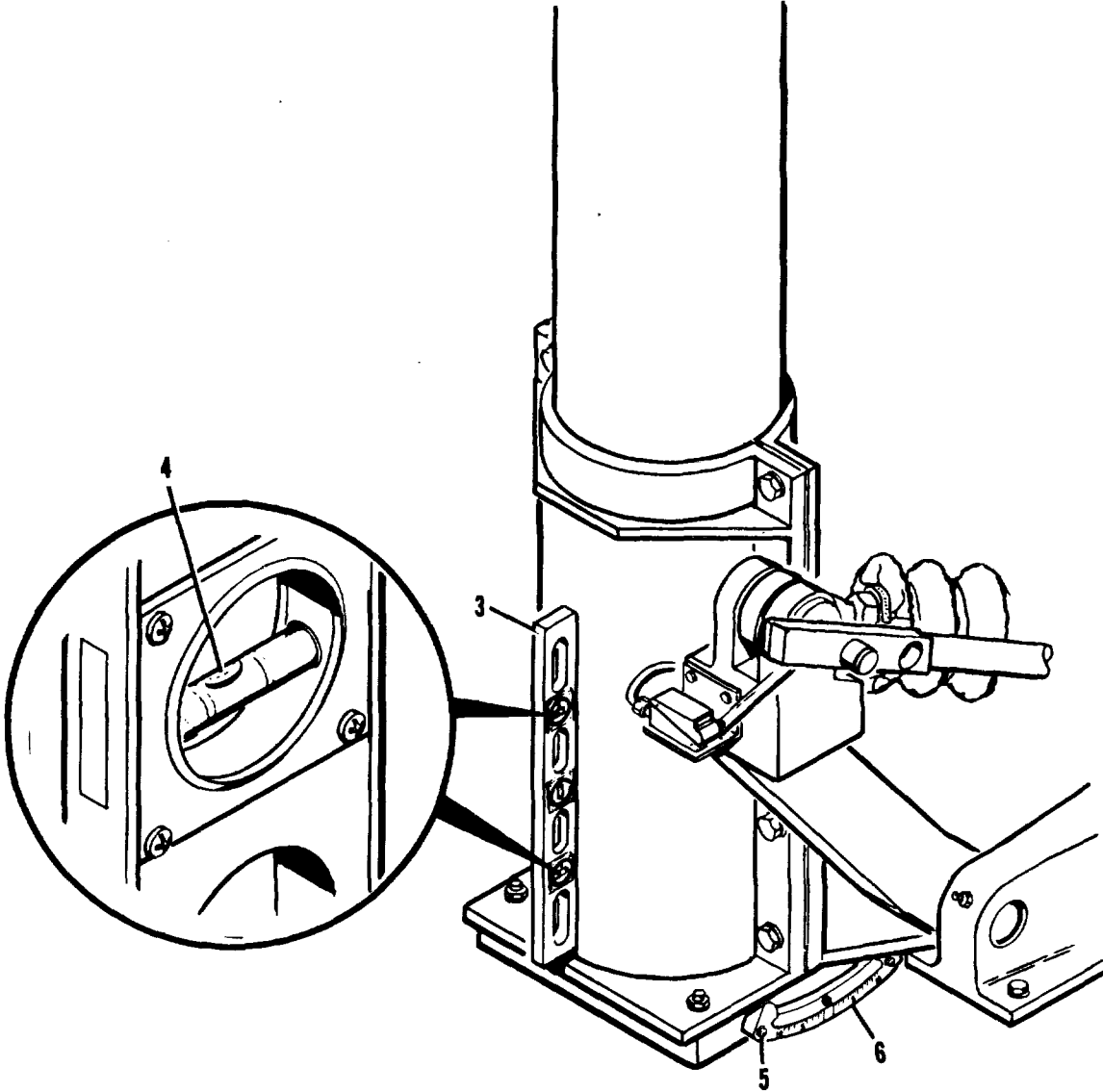
2-17. REPLACE MAST - Continued

STEP	PROCEDURE
27.	Apply a coat of thread sealing compound on threads of elbow fitting (6) and install elbow fitting on base of mast.
28.	Install air hose (7) on elbow fitting (6).
29.	Install two screws (8), washers (9) and inclinometer (10) on base of mast.
	
30.	Close ball valve (or petcock if early models) (11) on both air tanks (12).
	

2-17. REPLACE MAST - Continued

STEP	PROCEDURE
31.	Turn on mast group power (see para 2-2).
32.	Raise mast to vertical (TM 11-5985-368-12&P).
33.	Extend and retract mast (TM 11-5985-368-12&P), repeat this step several times to ensure bottom mast section does not bind. If mast section binds at anytime, stow mast, turn off mast group power, open ball valves (or petcocks in early models), disassemble and repeat entire installation procedure, steps 24 thru 32, using next thicker shim stack, within your total gap range, from the shim stack table. Otherwise go to step 35.
34.	If after repeating entire installation procedure using the next thicker shim stack, mast sections still bind, then notify your supervisor.
35.	Lower mast to about 10 degrees (TM 11-5985-368-12&P).
36.	Install mast protective cover (see para 2-25).
37.	Install antenna positioner (see para 2-22).
38.	Raise mast to vertical. Place a level (3) on the mast as shown. Level must be placed parallel to the mast and in the same plane as mast travels. Mast is vertical when bubble (4) in level is perfectly centered between lines (see illustration). Verify mast is vertical, readjust if necessary.
39.	Loosen two screws (5) securing inclinometer (6) to base of mast. Adjust position of the inclinometer (6) so it indicates zero degrees. Tighten two screws (5).
40.	Lower mast (TM 11-5985-368-12&P).

2-17. REPLACE MAST - Continued

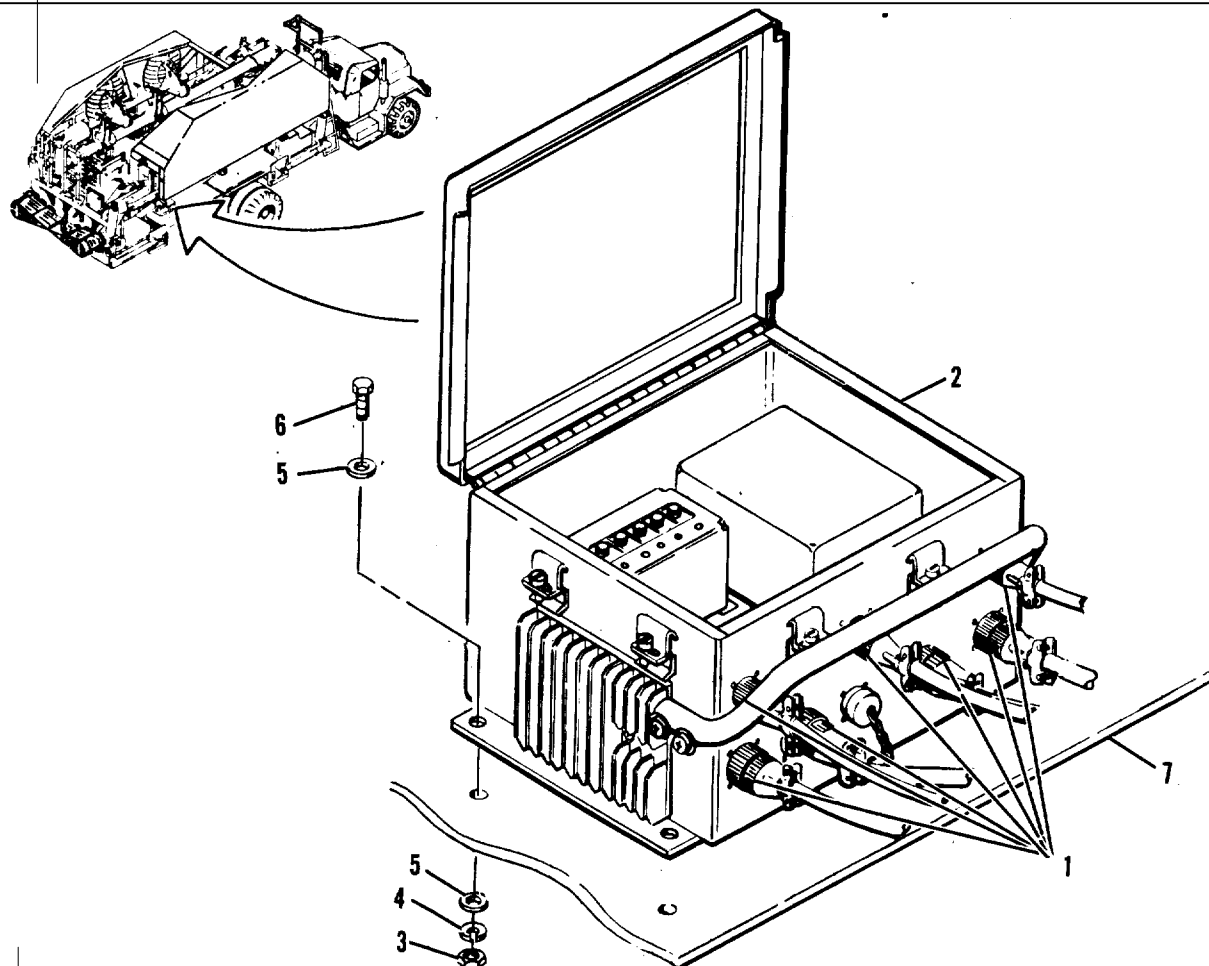
STEP	PROCEDURE
	 The diagram illustrates the assembly of a mast. A vertical mast tube is shown with a bracket (3) attached to its side. A circular inset provides a magnified view of the bracket's attachment point, showing a pin (4) passing through the bracket and the mast tube. At the base of the mast, a horizontal support structure is shown, with a pin (5) passing through it and the mast tube. A curved bracket (6) is also shown, which appears to be part of the base assembly. A hand is shown holding a pin or bolt, likely for the bracket (6).

2-18. REPLACE DISTRIBUTION BOX			
This task covers:			
Removal	Replacement	Installation	Test
<u>INITIAL SETUP</u> <u>Tools</u> Refrig Unit Svce Tool Kit, 5180-00-596-1474 3/8 in. flat tip scdr 7/16 in. comb. wr No. 3 xtip scdr 7/16 in. skt rcht wr, 1/2 in. dr elec conn plr <u>Materials/Parts</u> Distribution box			
STEP	PROCEDURE		
	NOTE There are two distribution boxes on the mast group. They are both replaced in the same way. REMOVAL - Turn off mast group power (para 2-2). - Disconnect seven cable assemblies (1) from distribution box (2). - Remove four nuts (3), eight flat washers (4), four lockwashers (5) and four screws (6) securing distribution box (2) to support frame (7). - Remove distribution box (2). REPLACEMENT Replace faulty part with a new part.		

2-18. REPLACE DISTRIBUTION BOX - Continued

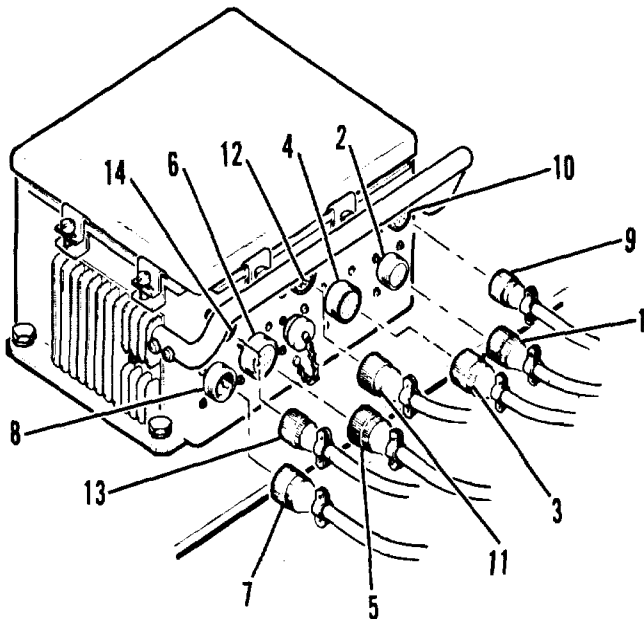
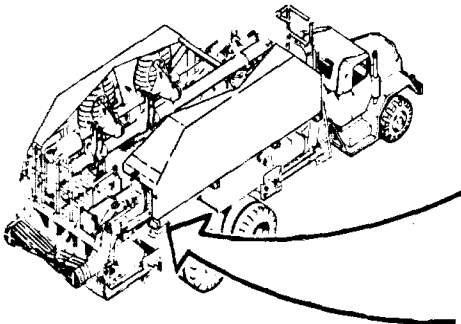
STEP

PROCEDURE

**INSTALLATION**

1. Position distribution box (2) on support frame (7) and secure with four screws (6), eight flat washers (5); four lockwashers (4), and four nuts (3).
2. Turn off mast group power (para 2-2).

2-18. REPLACE DISTRIBUTION BOX - Continued

STEP	PROCEDURE																																
3.	Connect the cables to the distribution box in accordance with the following table: <table><tr><th>CABLE</th><th>CONNECTOR</th><th>TO DISTRIBUTION BOX</th><th>CONNECTOR</th></tr><tr><td>W32 or W37 (1)</td><td>P1</td><td></td><td>J8 (2)</td></tr><tr><td>W30 or W35 (3)</td><td>P1</td><td></td><td>J7 (4)</td></tr><tr><td>W29 or W34 (5)</td><td>P1</td><td></td><td>J5 (6)</td></tr><tr><td>W28 or W41 (7)</td><td>P1</td><td></td><td>J4 (8)</td></tr><tr><td>W31 or W36 (9)</td><td>P1</td><td></td><td>J3 (10)</td></tr><tr><td>W33 or W38 (11)</td><td>P1</td><td></td><td>J2 (12)</td></tr><tr><td>W24 or W25 (13)</td><td>P1</td><td></td><td>J1 (14)</td></tr></table>	CABLE	CONNECTOR	TO DISTRIBUTION BOX	CONNECTOR	W32 or W37 (1)	P1		J8 (2)	W30 or W35 (3)	P1		J7 (4)	W29 or W34 (5)	P1		J5 (6)	W28 or W41 (7)	P1		J4 (8)	W31 or W36 (9)	P1		J3 (10)	W33 or W38 (11)	P1		J2 (12)	W24 or W25 (13)	P1		J1 (14)
CABLE	CONNECTOR	TO DISTRIBUTION BOX	CONNECTOR																														
W32 or W37 (1)	P1		J8 (2)																														
W30 or W35 (3)	P1		J7 (4)																														
W29 or W34 (5)	P1		J5 (6)																														
W28 or W41 (7)	P1		J4 (8)																														
W31 or W36 (9)	P1		J3 (10)																														
W33 or W38 (11)	P1		J2 (12)																														
W24 or W25 (13)	P1		J1 (14)																														
4.	Turn on mast group power (para 2-2). 																																

2-18. REPLACE DISTRIBUTION BOX - Continued

STEP	PROCEDURE
	TEST Perform Organizational Preventive Maintenance Checks and Services (PMCS), except do not replace PCA inline filter element (TM 11-5985-368-12&P).

2-19. REPLACE PCA**This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
 3/8 in. flat tip scdr
 3/4 in. comb. wr
 5/8 in. comb. Wr
 7/8 in comb. Wr
 9/16 in. skt
 skt wr
 No. 2 xtip scdr
 Endless loop sling EN1-62X96IN (two)
 Wrecker truck, M819A1
 1-1/2 in. comb. Wr
 Anchor shackles 5935-00080 (four)

Personnel Required

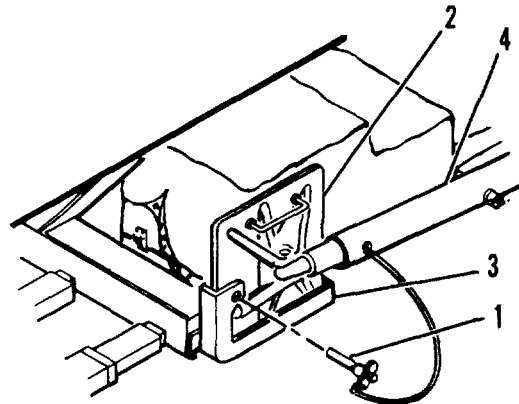
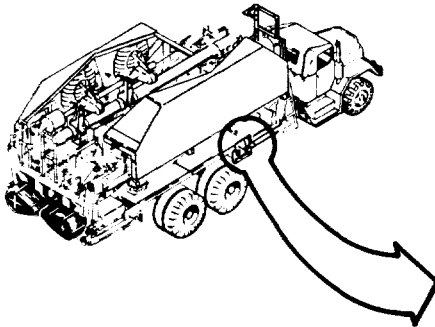
Utilities Equipment Repairer, (two)
 Wrecker Operator

Materials/Parts

Rope, 20 foot (two) (appx B, item 16)
 Strap, Tiedown (appx B, item 22)

EquipmentCondition

<u>(Para)</u>	<u>Condition Description</u>
2-2	Master group power off

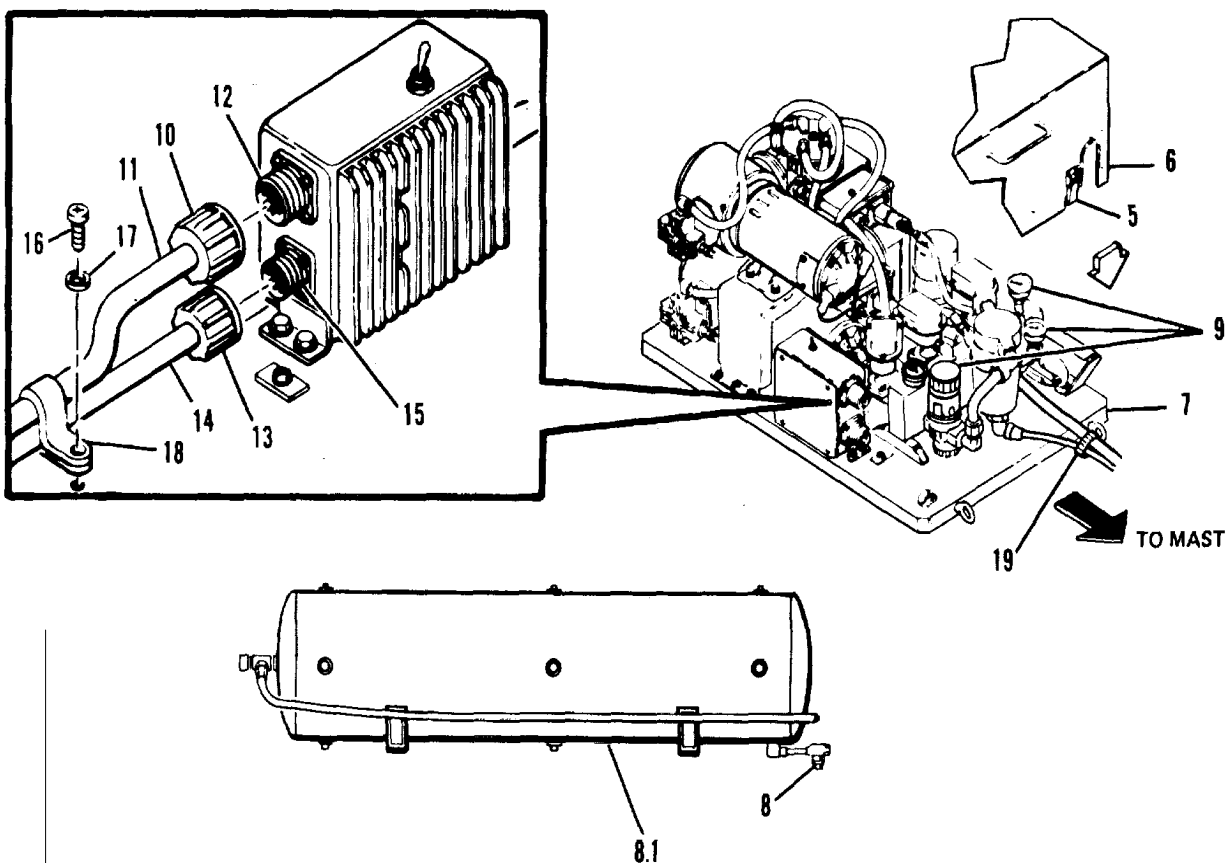
STEP**PROCEDURE****REMOVAL**

1. Remove pin (1) from strut pad (2) and bracket (3).
2. Lift strut pad (2) from bracket (3) and swing strut (4) down into place.
3. Release four clamps (5) and remove covers (6) from PCA (7).
4. Open ball valve (or petcock if early model) (8) on air tanks (8.1) until all gages (9) read $\varnothing$ psi. Close ball valve.

2-19. REPLACE PCA - Continued

STEP

PROCEDURE

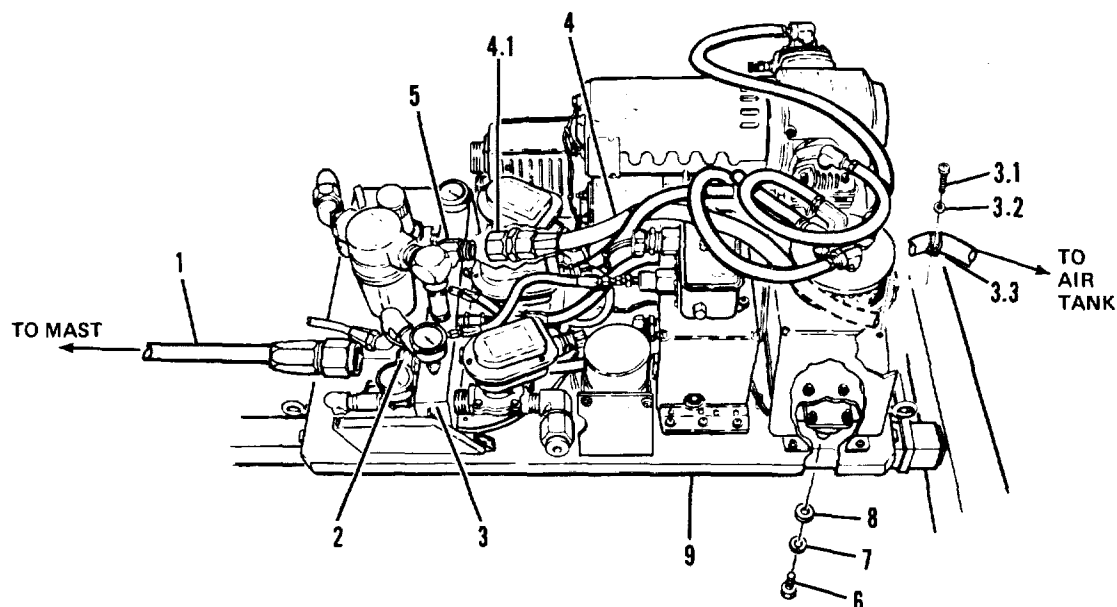


5. Disconnect connector P2 (10) on cable W32/W37 (11) from connector J1 (12) on PCA (7).
6. Disconnect connector P2 (13) on cable W31/W36 (14) from connector J2 (15) on PCA (7).
7. Remove screw (16) and washer (17) from clamp (18) and PCA (7).
- 7.1 Cut tiedown strap (19) securing hoses.

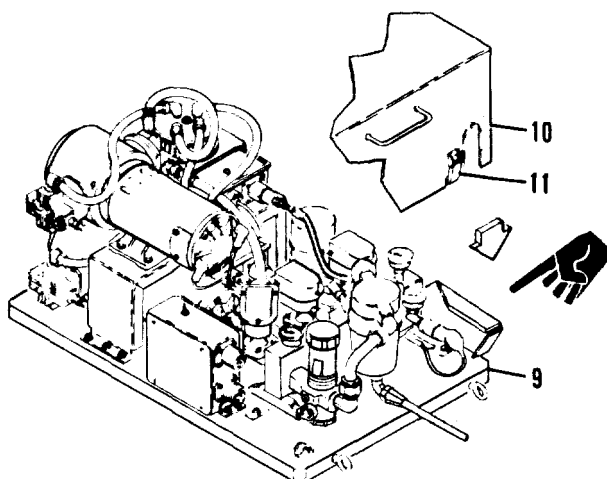
2-17. REPLACE PCA - Continued

STEP

PROCEDURE



8. Disconnect hose (1) from adapter (2) on manifold (3).
- 8.1 Remove screw (3.1) and flat-washer (3.2) securing tiedown strap (3.3).
9. Disconnect hose (4) (if later model, with adapter (4.1) connected) from elbow (5) on manifold (3).
10. Remove four bolts (6), lockwashers (7), and flat-washers (8) from PCA (9).



11. Install covers (10) on PCA (9) and fasten four clamps (11).

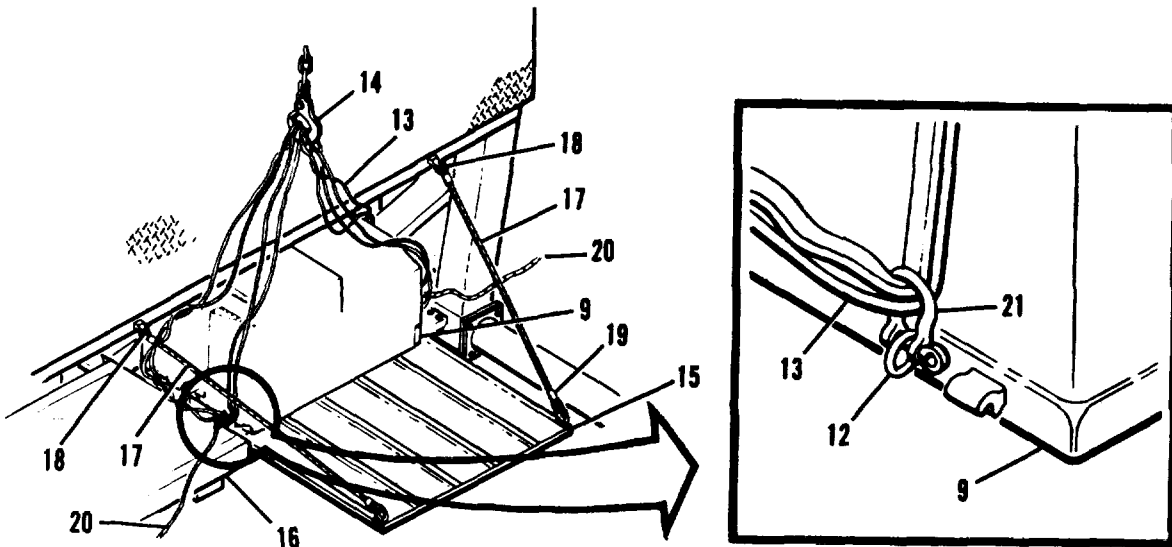
2-19. REPLACE MAST - Continued

STEP	PROCEDURE
	12. Install four shackles (21) on eyebolts (12). 13. Install each sling (13) in shackles (21) at each end of the PCA (9). CAUTION Do not overtighten turnbuckles on maintenance tray. 14. Install maintenance tray (15) on frame (16) and connect wire ropes (17) to hooks (18) on frame. 15. Adjust turnbuckles (19) if necessary, to adjust tension of wire ropes (17). 16. Tie a 20-foot length of rope (20) to each end of PCA (9) to use as guide ropes. 17. Connect sling (13) to crane hook (14) and take up slack.

2-19. REPLACE PCA - Continued

STEP

PROCEDURE

**WARNING**

You may need to raise PCA slightly to slide it onto maintenance tray. Do not let PCA swing, this could cause injury to personnel or damage to equipment.

18. Slide PCA (1) onto maintenance tray (2).
19. Lift PCA (1) from maintenance tray (2) and set PCA down away from system. Use ropes (3) to guide PCA and prevent swinging.
20. Remove crane hook (4), ropes (3), slings (5), and shackles (6), from PCA (1).

REPLACEMENT

Replace faulty part with a new part.

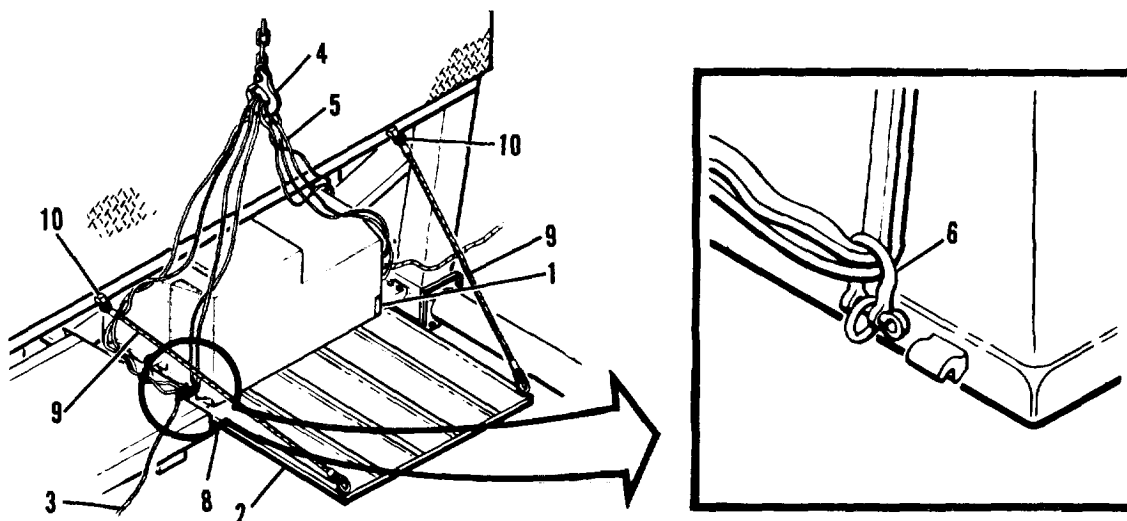
INSTALLATION

1. Install four shackles (6) on eyebolts (7).
2. Install each sling (5) in shackles (6) at each end of PCA (1).
3. Attach guide ropes (3) to both ends of PCA (1).
4. Attach slings (5) to crane hook (4) and take up slack.
5. Lift PCA (1) and set PCA down on maintenance tray (2). Use guide ropes (3) to guide PCA and prevent swinging.

2-19. REPLACE PCA - Continued

STEP

PROCEDURE

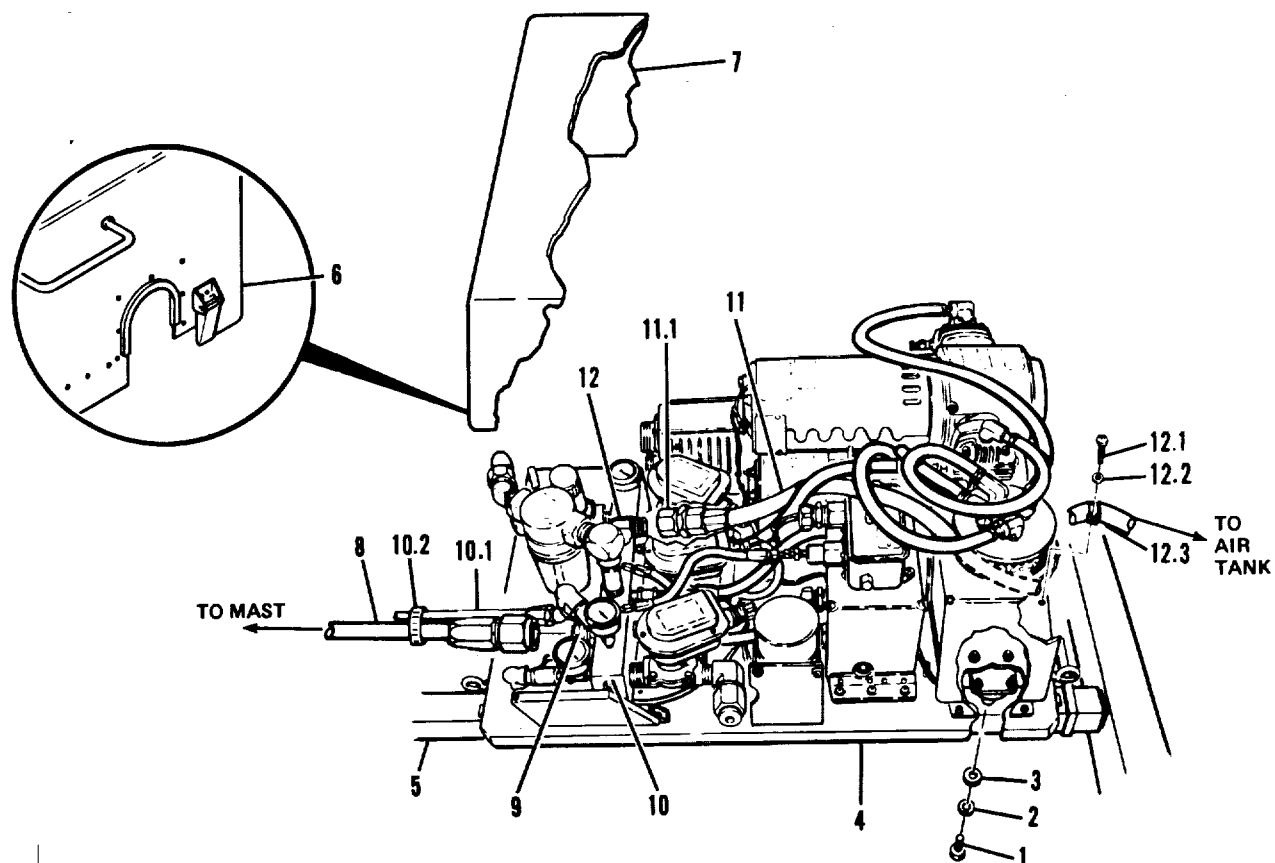


6. Line up PCA (1) with frame (8) and slide PCA into place on frame.
7. Remove wire ropes (9) from hooks (10).
8. Remove maintenance tray (2) from frame (8).
9. Remove crane hook (4), slings (5), shackles (6), and ropes (3) from PCA (1).
10. Slide PCA (1) on frame (8) and line up holes for mounting.

2-19. REPLACE PCA - Continued

STEP

PROCEDURE

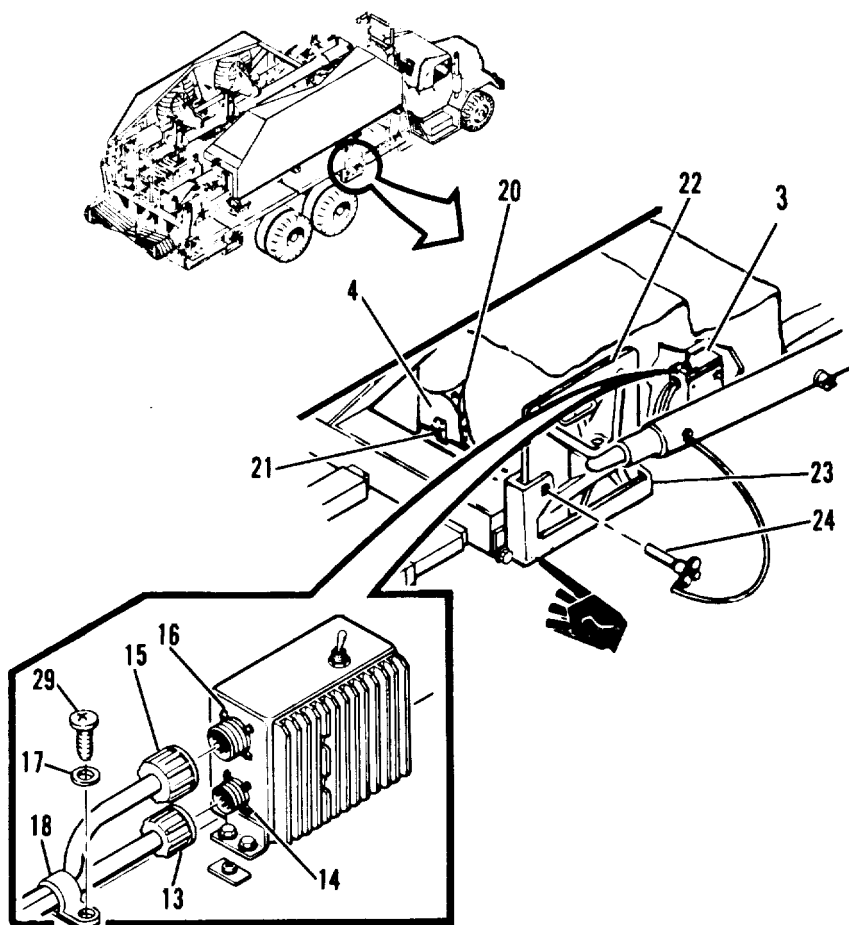


11. Install four bolts (1), lockwashers (2), and flatwashers (3) in PCA (4) and frame (5).
12. Release four clamps (6) and remove covers (7) from PCA (4).
13. Connect hose (8) to adapter (9) on manifold (10).
- 13.1. Secure hoses (8 and 10.1) together with tiedown strap (10.2).
14. Connect hose (11) (if later model, with adapter (11.1) connected) to elbow (12) on manifold (10).
- 14.1. Secure hose (11) to PCA (4) with screw (12.1), flatwasher (12.2), and tiedown strap (12.3).
15. Connect connector P2 (13) on cable W31/W36 to connector J2 (14) on PCA (4).
16. Connect connector P2 (15) on cable W32/W37 to connector J1 (16) on PCA (4).
17. Install screw (29) and washer (17) in clamp (18) and PCA (4).

2-19. REPLACE PCA - Continued

STEP

PROCEDURE



NOTE

Make sure all valves on PCA are closed before installing covers.

18. Install covers (20) on PCA (4) and fasten four clamps (21).
19. Lift strut pad (22) and secure pad in bracket (23) with pin (24).
20. Turn on mast group power (para 2-2).

TEST

Perform Organizational Preventive Maintenance Checks and Services (PMCS) except do not replace PCA inline filter element (see TM 11-5985-368-12&P).

2-20. REPLACE PCA

This task covers:

Removal

Replacement

Installation

Test

INITIAL SETUP

Tools

Refrig Unit Svce Tool Kit,
No. 2 xtip scdr
3/16 in. skt hd scr key
7/16 in. skt
7/16 in comb. Wr
Rcht wr, 1/2 in dr
11/16 in. Comb. Wr
Wrecker truck, M819A1
Endless loop sling EN1-62X96IN
1-3/8 in. comb. wr, 5120-00-277-8833

Personnel Required

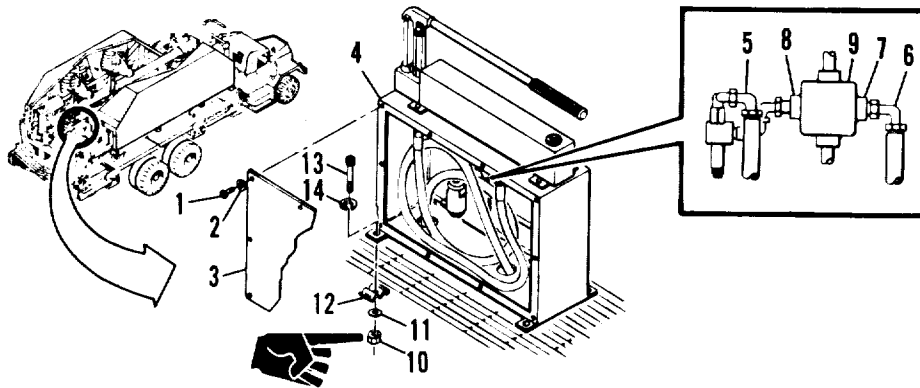
Utilities Equipment Repairer,
MOS 52C10 (two)

Materials/Parts

Antenna protective cover pump
Rope, 20 foot (two) (appx B, item 16)
Shop cloth (appx B, item 17)
Protective plugs (appx B, item 13)
Hydraulic fluid (appx B, item 5)
Pipe plug (appx B, item 28)

STEP

PROCEDURE



REMOVAL

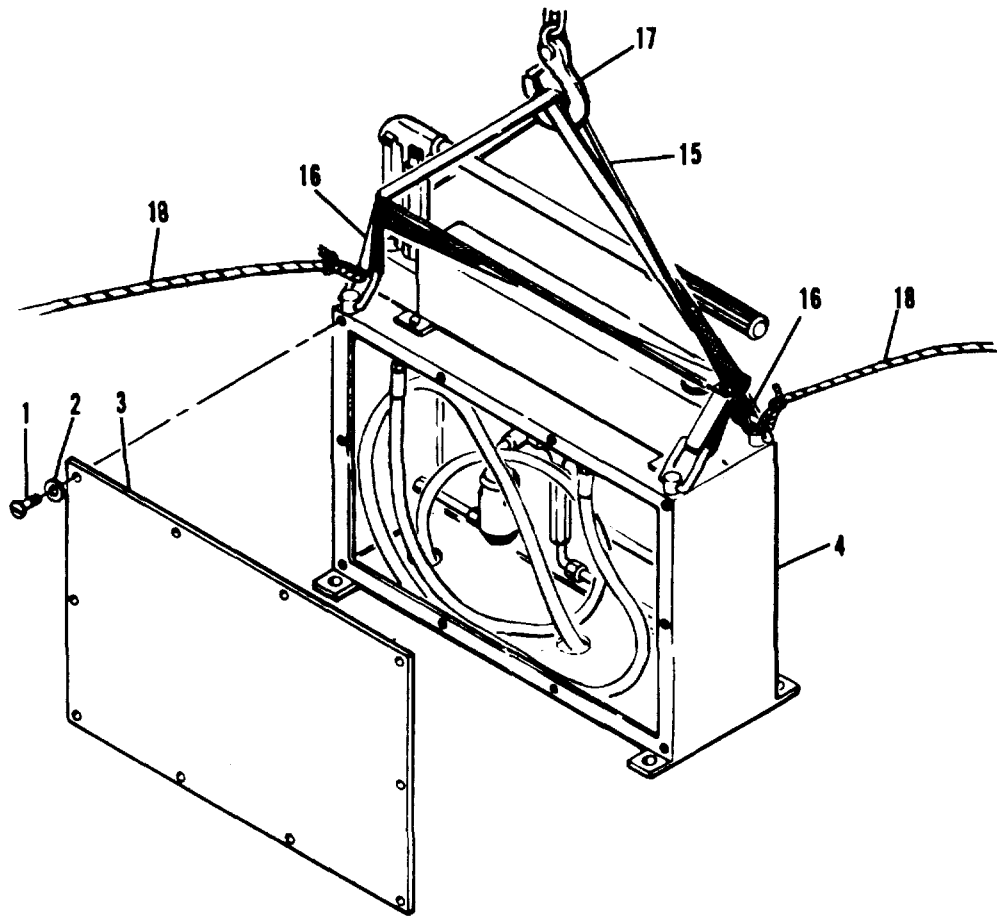
1. Remove 10 screws (1), washers (2), and cover (3) from pump (4).

NOTE

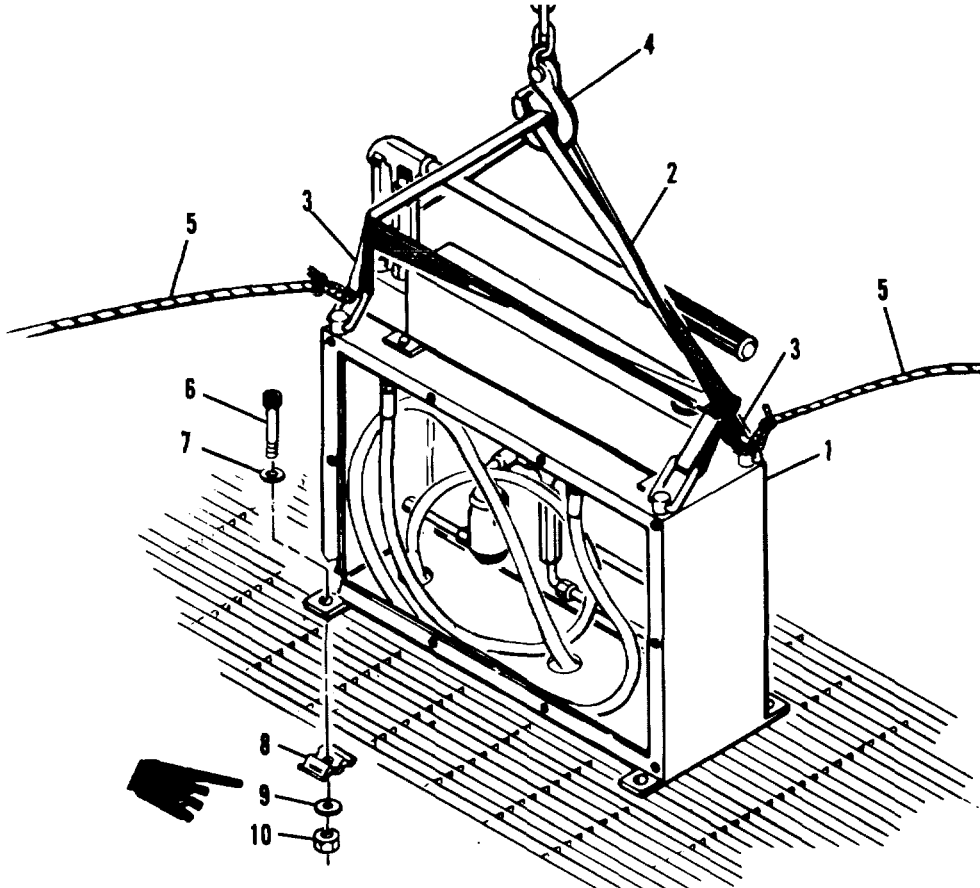
Make sure lever stays in the HOLD position to prevent leakage of hydraulic fluid.

2. Remove metal tubes (5 and 6) from upper port (7) and lower port (8) of directional control valve (9). Install protective plugs in ports to prevent contamination, and tag metal tubes.
3. Remove four nuts (10), washers (11), clips (12), screws (13), and washers (14).

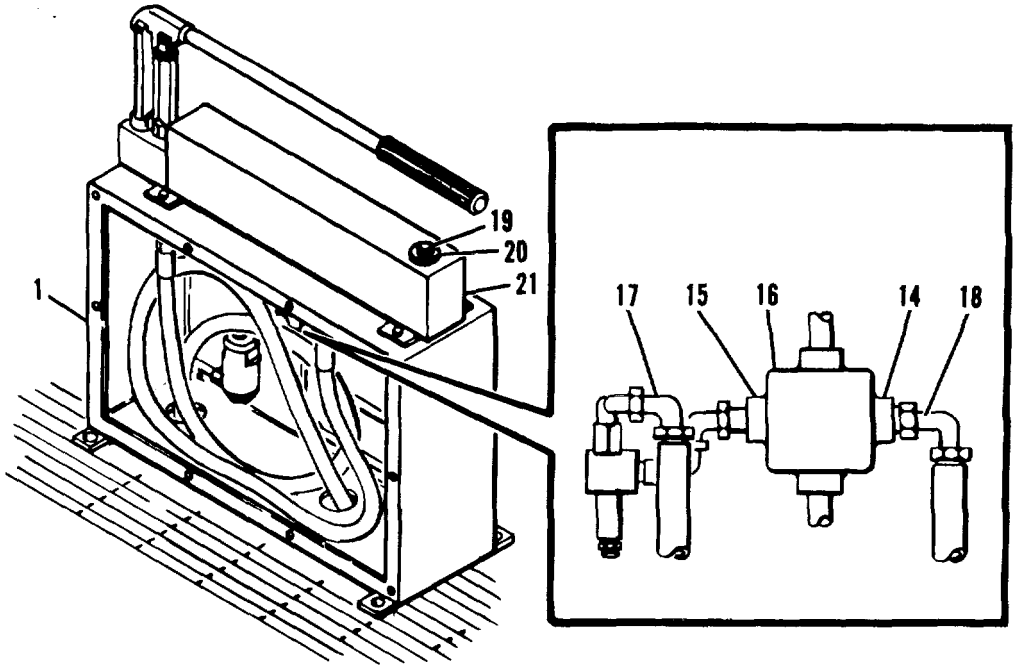
2-20. REPLACE ANTENNA PROTECTIVE COVER PUMP - Continued

STEP	PROCEDURE
	 4. Position wrecker, and install sling (15) through slings (16) and to lifting hook (17) of wrecker. 5. Attach two ropes (18) to pump (4) to guide pump when lifting. 6. Take up slack in sling (15) and lift pump (4). Use assistant to keep pump from swinging when lifting. 7. Lower pump (4) to ground and remove sling (15) and ropes (18). 8. Install 10 screws (1), washers (2), and cover (3) on pump (4).

2-20. REPLACE ANTENNA PROTECTIVE COVER PUMP - Continued

STEP	PROCEDURE
	 REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Position wrecker near replacement pump assembly (1) and attach sling (2) to pump assembly slings (3) and to lifting hook (4) of wrecker. 2. Attach two ropes (5) to pump assembly (1) to guide pump assembly when lifting. 3. Take up slack in sling (2) and lift pump assembly (1) into position on frame of mast group. Use assistant to keep pump assembly from swinging when lifting. 4. Keep tension on sling (2) and loosely install four screws (6) and washers (7) in pump assembly (1), then relieve tension on sling.

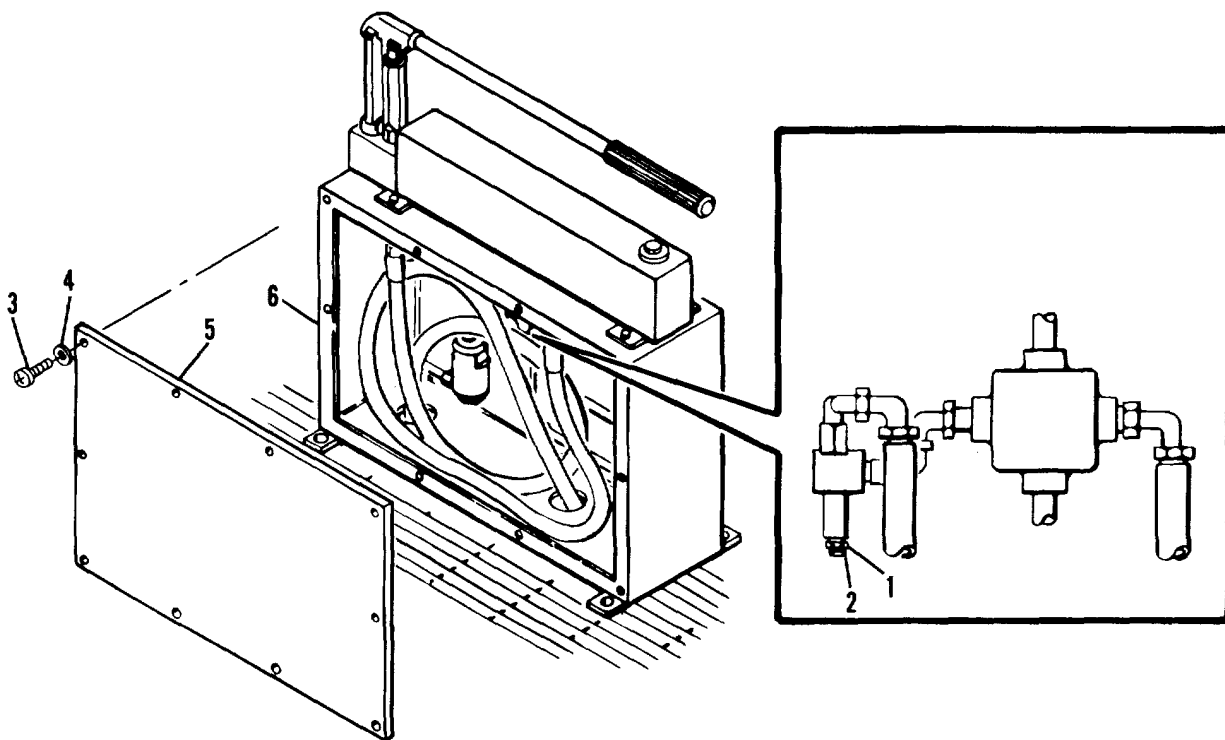
2-20. REPLACE ANTENNA PROTECTIVE COVER PUMP - Continued

STEP	PROCEDURE
5.	Remove sling (2) and ropes (5).
6.	Install four clips (8), washers (9) and nuts (10) on screws (6).
	
7.	Remove 10 screws (11) and washers (12), and remove cover (13) from pump assembly (1).
8.	Remove protective plugs from upper port (14) and lower port (15) of directional control valve (16).
9.	Install metal tubes (17 and 18) to upper port (14) and lower port (15) of directional control valve (16).
10.	Adjust flow control valve (see below).
	ADJUSTMENT OF FLOW CONTROL VALVE
1.	Remove plug (19) and washer (20), fill interior of reservoir (21) with hydraulic fluid, and replace washer (20) P-n plug (21).

2-20. REPLACE ANTENNA PROTECTIVE COVER PUMP - Continued

STEP	PROCEDURE
	WARNING Antenna protective cover may drop VERY RAPIDLY. Make sure all personnel are cleared from antenna protective cover area before lowering cover. If you don't, someone could be injured or killed. 2. Unlatch antenna protective cover. 3. Place directional control valve to DOWN and allow cover to lower. Place directional control valve lever to UP and operate pump handle to raise cover. Recheck fluid level and add fluid if required (add fluid with cover in UP position only). Raise and lower cover several times to purge air from the system, recheck and add fluid if required. 4. Lower cover. Using a stop watch (or by counting), count how many seconds it takes for the cover to lower. The cover must lower within 10 to 20 seconds. If it doesn't, you need to adjust the flow control valve. Here's how: • Loosen locknut (1). • Turn screw (2) in to increase the cover's rate of descent. • Turn screw (2) out to reduce the cover's rate of descent. • Recheck the cover's rate of descent (step 4 above). • If needed, readjust flow control valve. • Tighten locknut (1) when flow control valve is properly adjusted. 5. Install 10 screws (3) and washers (4) securing cover (5) to pump (6). TEST Operate antenna protective cover to test the pump assembly (see applicable portions of paragraph entitled Mast Stowage in TM 11-5985-368-12&P).

2-20. REPLACE ANTENNA PROTECTIVE COVER PUMP - Continued

STEP	PROCEDURE
	 The diagram illustrates the process of removing the antenna protective cover pump. The main drawing shows a pump assembly with a cover being removed. Callouts 3, 4, 5, and 6 point to specific components. An inset drawing shows a detailed view of the pump assembly with callouts 1 and 2.

2-21. REPLACE MAST CONTROL**This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
7/16 in. comb. wr
7/16 skt
skt wr extension
rcht wr, 1/2 in. dr

Materials/Parts

Mast control

STEP**PROCEDURE****REMOVAL****NOTE**

There are two mast control on the Mast Group. They are both replaced in the same way.

1. Disconnect cable W29 (curbside) or W34 (roadside) (1) from connector J1 of mast control (2).
2. Remove four screws (3), eight flat washers (4), four lockwashers (5), and four nuts (6) securing mast control (2) to mast support frame (7).
3. Remove mast control (2).

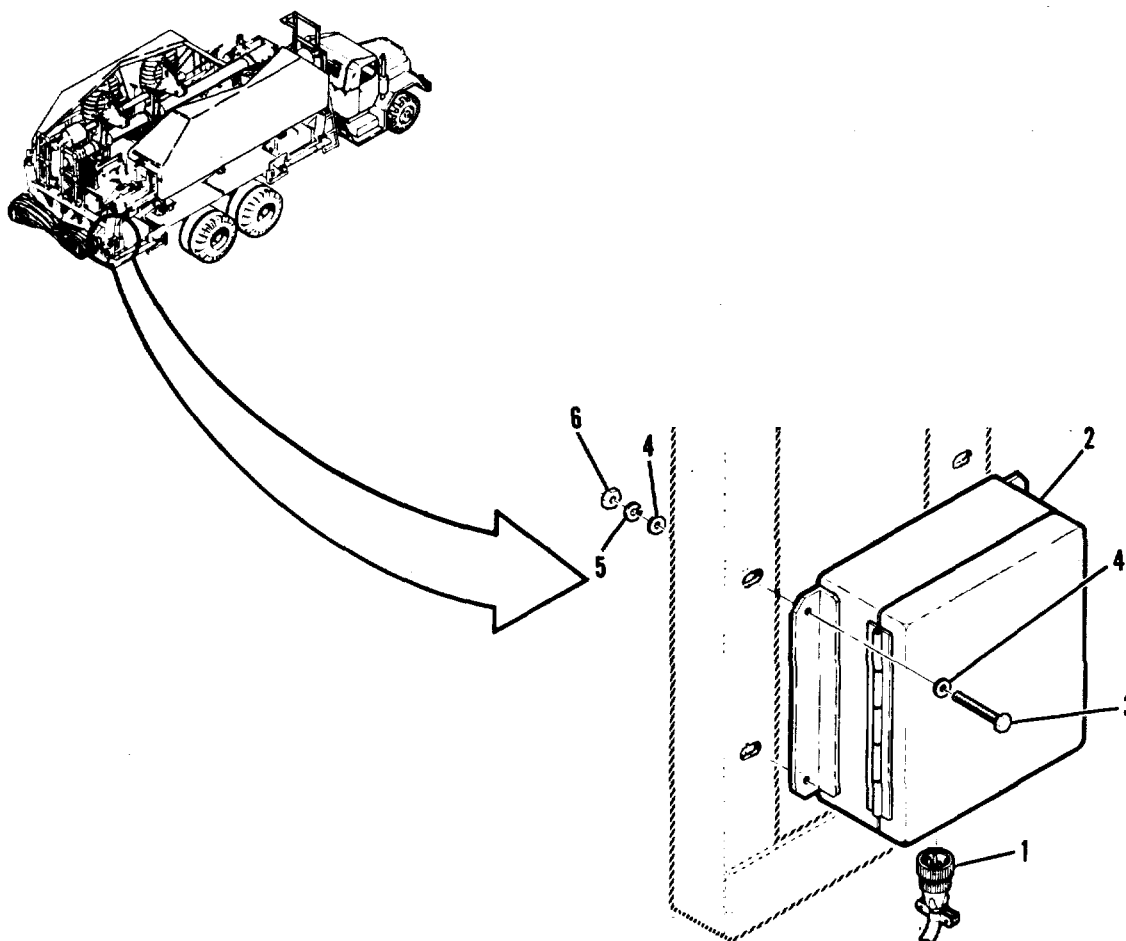
REPLACEMENT

Replace faulty part with a new part.

2-21. REPLACE MAST CONTROL Continued

STEP

PROCEDURE

**INSTALLATION**

1. Position mast control (2) on support frame (7) and secure with four screws(3), eight flat washers (4), four lockwashers (5), and four nuts (6).
2. Connect cable W29 or W34 (1) to connector J1 of mast control (2).

TEST

Perform Organizational Preventive Maintenance Checks and Services (PMCS) except do not replace in PCA inline filter element (TM 11-5985-368-12&P).

2-22. ANTENNA POSITIONER REPAIR**a. REPLACE SWIVEL HANDLE****This task covers:****Removal****Replacement****Installation****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit
 15/16 comb. wr
 3/4 skt
 Skt wr ext
 Skt wr 1/2 in. dr

Materials/Parts

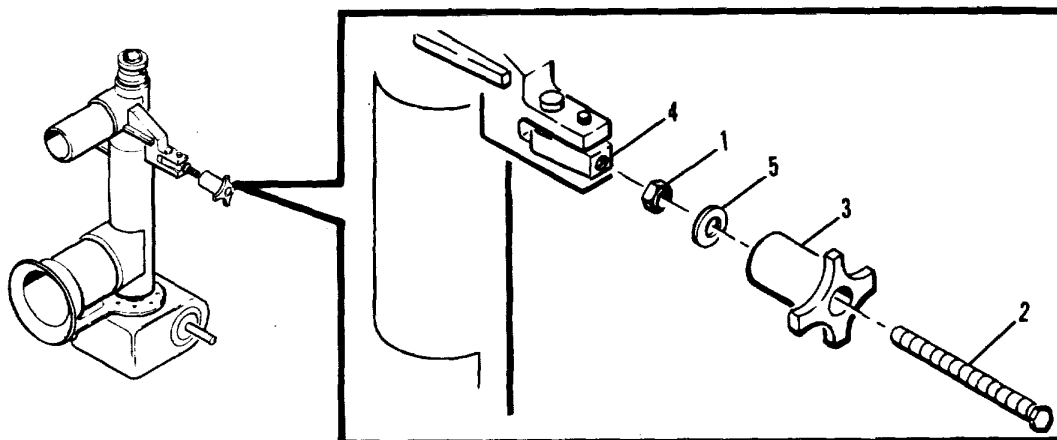
Sealing compound (appx B, item 25)
 Swivel handle

STEP**PROCEDURE****REMOVAL**

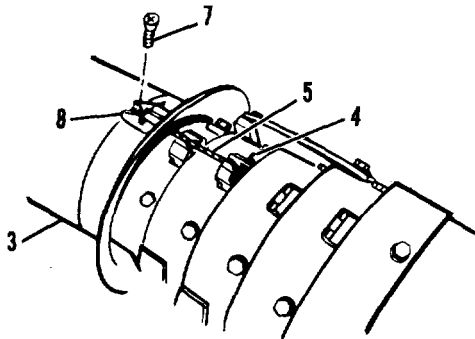
1. Loosen jam nut (1) and remove machine bolt (2), with handle (3) attached, from swivel eye (4).
2. Remove Jam nut (1) and flat washer (5) from machine bolt (2). Separate swivel handle (3) from machine bolt (2).

REPLACEMENT

Replace faulty part with a new part.



2-22. ANTENNA POSITIONER REPAIR - Continued	
a. REPLACE SWIVEL HANDLE - Continued	
This task covers:	
Removal	Replacement Installation
STEP	PROCEDURE
	INSTALLATION 1. Position handles (3) on machine bolt (2). Install flat washer (5) and jam nut (1) on machine bolt (2). 2. Coat internal threads of swivel eye (4) with sealing compound. Install machine bolt (2) in swivel eye (4).

2-22. ANTENNA POSITIONER REPAIR - Continued			
b. REPLACE ANTENNA POSITIONER			
This task covers:			
Removal	Replacement	Installation	Test
<u>INITIAL SETUP</u>			
<u>Tools</u> Refrig Unit Svce Tool Kit, 3/4 in. skt 15/16 in. skt 3/8 in. flat tip scdr 5/16 in. skt hd scr key Wrecker truck, M819A1 Endless loop sling EN1-62X96 in.		<u>Personnel Required</u> Utilities Equipment Repairer, Wrecker Operator <u>Materials/Parts</u> Antenna positioner Rope, 20 feet (two) (appx B, item 16) Rope, 4 feet (appx B, item 16) Sealing compound (appx B, item 25)	
STEP	PROCEDURE		
	REMOVAL		
			
1.	Have organizational maintenance remove antenna amplifier assemblies and cables.		
1.1	Raise mast to 10 degree position (TM 11-5985-368-12&P, para 2-15).		
2.	Deleted.		
3.	Unfasten pin (4) and remove pin and wire rope (5) from mast (6).		
4.	Remove screw (7), restrainer (8), and wire rope (5) from positioner (3).		

2-22. ANTENNA POSITIONER REPAIR - Continued

b. REPLACE ANTENNA POSITIONER - Continued

This task covers:

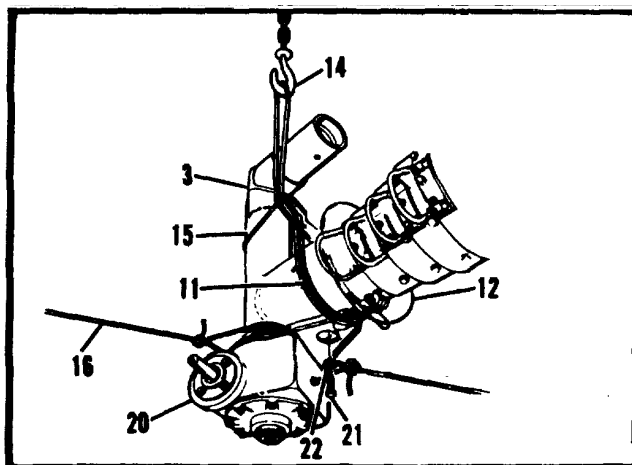
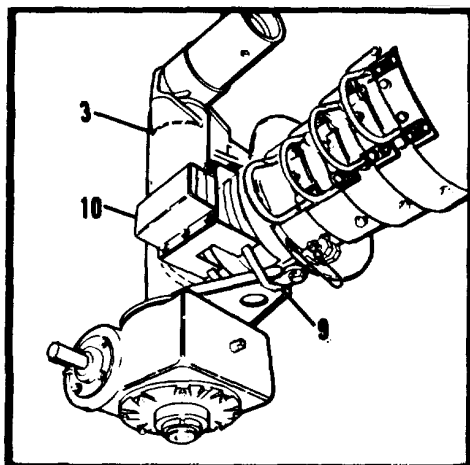
Removal

Replacement

Installation

STEP

PROCEDURE



5. Remove two clamps (9) and bracket assembly (10) from positioner (3).

NOTE

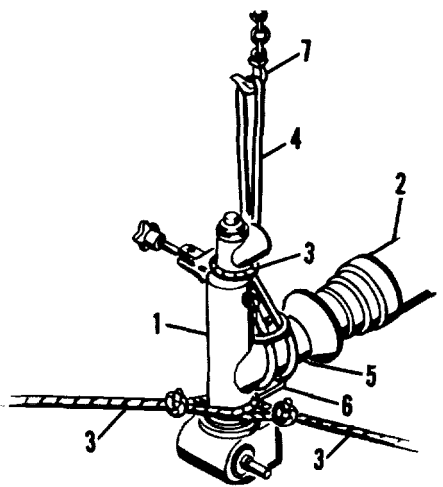
Double over sling to make handling of antenna positioner easier.

6. Install sling (11) on lower arm (12) of positioner (3) in a choker configuration.

WARNING

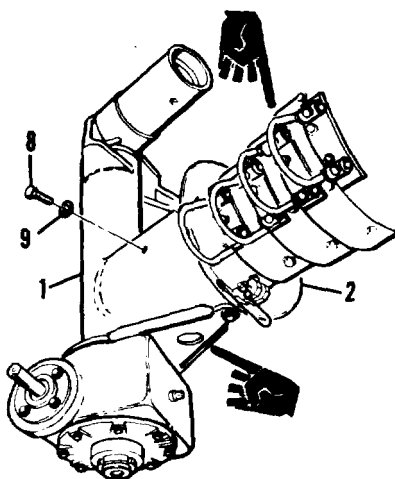
Keep personnel away from positioner when it is being lifted.

7. Position wrecker to lift positioner (3) and connect lifting hook (14) to sling (11). Take up slack in sling.
8. Tie sling (11) to upper part of positioner (3) with rope (15).
9. Tie two ropes (16) to positioner (3) with one rope on each side of positioner.
10. Remove four bolts (21) and washers (22) from lower arm (12) of positioner (3).

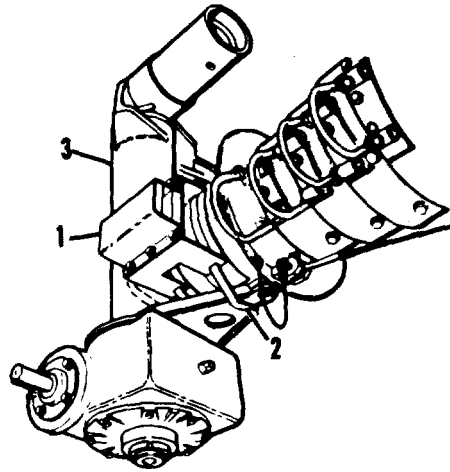
2-22. ANTENNA POSITIONER REPAIR - Continued	
b. REPLACE ANTENNA POSITIONER - Continued	
This task covers:	
Removal	Replacement Installation
STEP	PROCEDURE
	 11. Slide positioner (1) off end of mast (2) and slowly lift positioner. Use assistants to keep tension on ropes (3) and prevent swinging. 12. When positioner (1) is clear of vehicle, lower positioner to ground. 13. Remove sling (4) and ropes (3) from positioner (1). REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Install sling (4) on lower arm (5) of positioner (1) in a choker configuration. Make sure sling is between bracket (6) and lower arm. 2. Position wrecker to lift positioner (1). WARNING Keep personnel away from positioner when it is being lifted. NOTE Double over sling to make handling of antenna positioner easier.

2-22. ANTENNA POSITIONER REPAIR - Continued**b. REPLACE ANTENNA POSITIONER - Continued****This task covers:****Removal****Replacement****Installation****STEP****PROCEDURE**

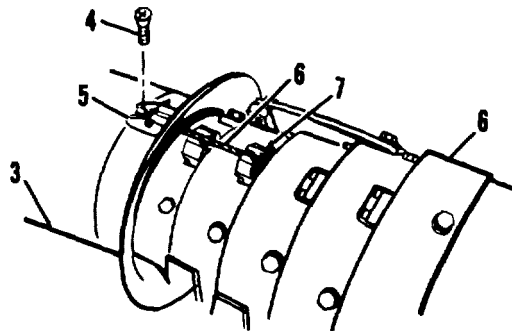
3. Install sling (4) on lifting hook (7) and take up slack in sling.
4. Tie sling (4) to upper part of position er (1) with rope (3).
5. Tie two ropes (3) to positioner (1), with one rope on each side of positioner.
6. Slowly lift positioner (1). Use assistants to keep tension on ropes (3) and prevent swinging.
7. Move positioner (1) just above mast (2) and guide positioner into place on mast while lowering positioner.



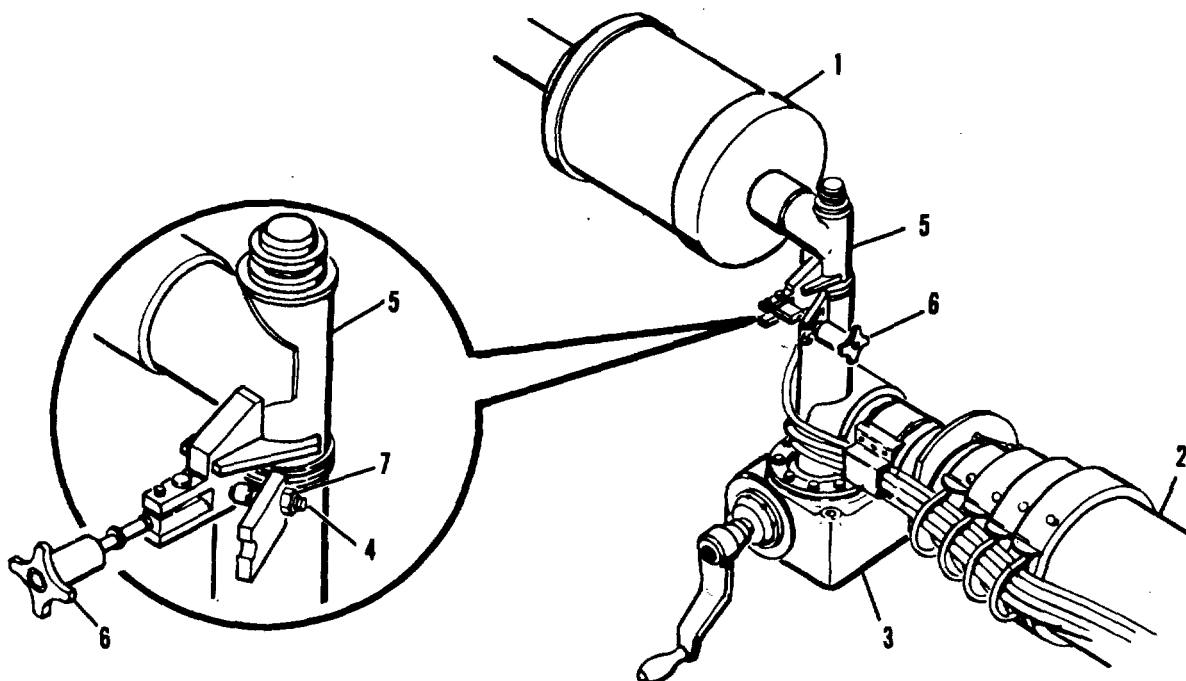
8. Line up holes in mast (2) with antenna positioner (1) and secure with four washers (9) and screws (8).
9. Remove slings (4) and ropes (3) from positioner (1).
10. Deleted.
11. Deleted.
12. Deleted.
13. Deleted.

2-22. ANTENNA POSITIONER REPAIR - Continued**b. REPLACE ANTENNA POSITIONER - Continued****This task covers:****Removal****Replacement****Installation****STEP****PROCEDURE**

14. Install bracket assembly (1) and two clamps (2) on antenna positioner (3).



15. Clean and apply sealing compound to threads of screw (4). Position wire rope (6) and retainer (5) on antenna positioner (3) and secure with screw (4).
16. Install wire rope (6) and pin (7) and fasten pin.
17. Deleted.
18. Have organizational maintenance install antenna amplifier assemblies and cables.

2-22. ANTENNA POSITIONER REPAIR - Continued**b. REPLACE ANTENNA POSITIONER - Continued****This task covers:****Removal****Replacement****Installation****STEP****PROCEDURE****NOTE**

**If antenna amplifier (1) is installed on antenna positioner, go to step 1.
If not, go to step 2.**

1. Raise mast (2) to approximately 25 degrees then lower mast until it automatically stops.
2. Operate antenna positioner (3) to full unfolded position with setscrew (4) against arm of upper support (5). Do not secure handle (6).
3. Using visual sightings, check alinement of upper support (5) with mast (2). Centerline of upper support must be parallel to centerline of mast in plane of rotation. If centerlines are not parallel, go to step 4. If centerlines are parallel, go to step 5.
4. Loosen nut (7), turn setscrew (4) in or out as required to stop rotation of upper support (5) at point where centerlines are parallel, and tighten.
5. Operate antenna positioner (3) to folded position.
6. Lower mast (TM 11-5985-368-12&P, para 2-17).

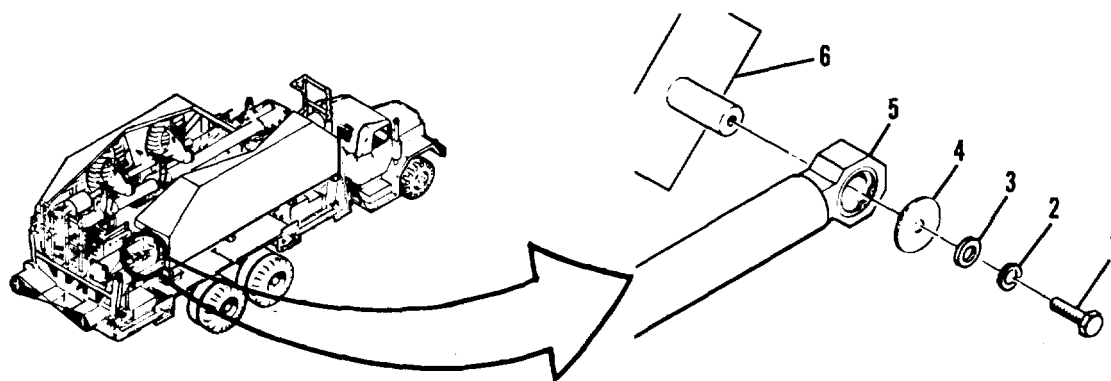
All data on pages 2-156 thru 2-160 deleted

2-24. REPLACE CYLINDER LOCK STRUT**This task covers:****Removal****Replacement****Installation****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
9/16 in comb. wr

Materials/Parts

Cylinder lock strut

STEP**PROCEDURE****REMOVAL**

Remove screw (1), lockwasher (2), flat washer (3), and plate (4) securing strut (5) to bracket (6). Remove strut.

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

1. Position strut (5) on bracket (6). Secure with plate (4), flat washer (3), lockwasher (2), and screw (1).
2. Lubricate new cylinder lock strut bearing (see Lubrication Instructions, TM 11-5985-368-12&P).

2-25. REPLACE MAST PROTECTIVE COVERS

This task covers:
Removal

Replacement

Installation

INITIAL SETUPTools

None required

Personnel Required

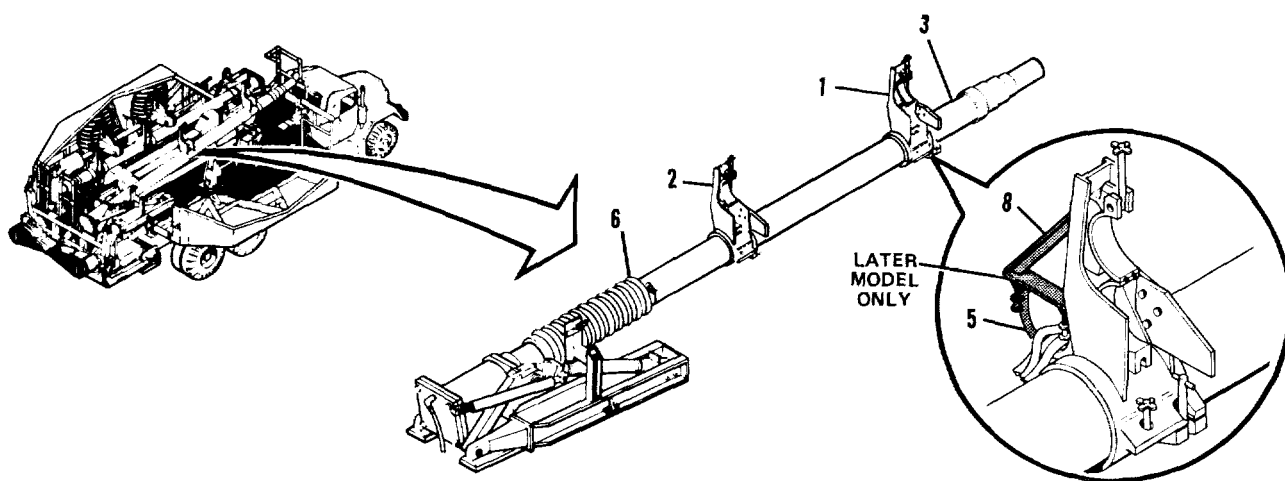
Utilities Equipment Repairer (two)

Materials/Parts

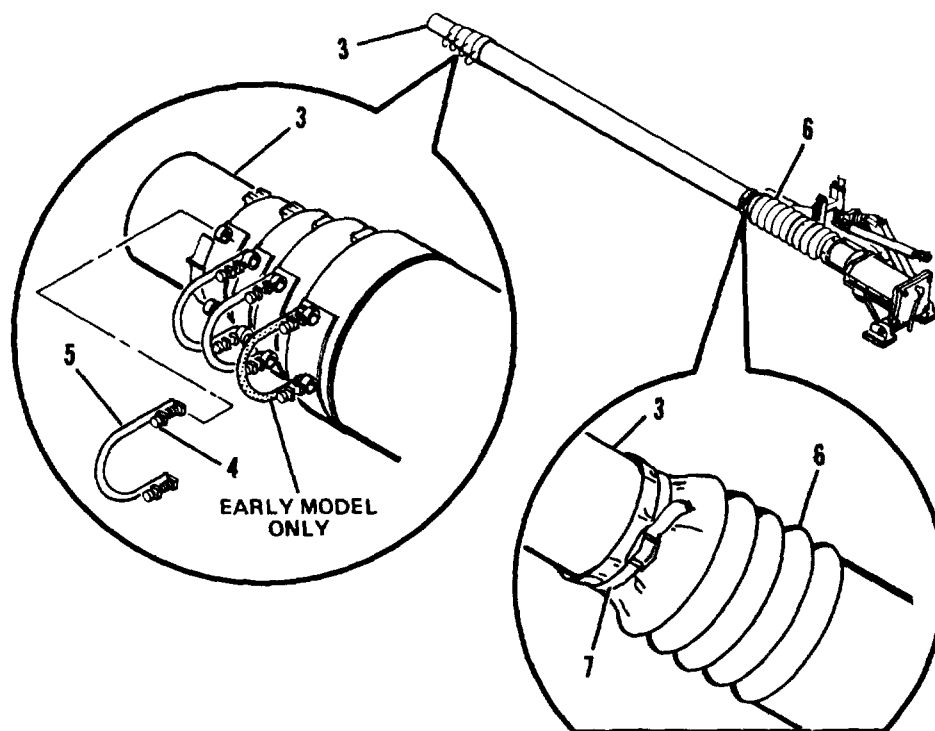
Protective cover

STEP

PROCEDURE

REMOVAL

1. Raise mast to about 10 degrees above horizontal (TM 11-5985-368-12&P, see para 2-15).
2. Remove antenna positioner (see para 2-22b).
3. Remove upper and lower mast clamps (1, 2) from mast (3) (see para 2-15b).

2.25. REPLACE MAST PROTECTIVE COVERS - Continued**STEP****PROCEDURE**

4. Pull two screws (4) on each retainer (5) and remove retainers from mast (3) or from mast cover (6) if retainers are installed on mast cover.
5. Loosen strap (7) and slide protective cover (6) off mast (3).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

1. Slide protective cover (6) over and down mast (3) to the stowed position.

NOTE

Early model mast groups have four retainers (5) on most (3), later model mast groups have three retainers on most and one on cable retainer bracket (8).

2. Pull two screws (4) on each retainer (5) and install three retainers on mast (3) and one on cable retainer bracket (8).

2.25. REPLACE MAST PROTECTIVE COVERS - Continued

STEP	PROCEDURE
	CAUTION To avoid damaging mast, install same mast clamp in same position on mast. NOTE Lower mast clamps do not have handknob assemblies and have most guide plates on outside of mast clamp. Later model upper mast clamps have a cable retainer bracket. 3. Install upper and lower mast clamps (1, 2) on mast (3) (see para 2-15b) 4. Install antenna positioner (see para 2-22b). 5. Lower mast to horizontal (TM 11-5985-368-12&P, see para 2-17).

2-26. REPLACE CABLE ASSEMBLIES**This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
 5180-00-596-1474
 9/16 in. comb. wr
 1/2 in. comb. wr
 7/16 in. comb. wr
 Diagonal cutters
 No. 2 xtip scdr

Equipment
Condition
Para
 2-2
Condition Description

Mast group power turned
 off

STEP**PROCEDURE**

The following table is provided to help you remove and install the cable assemblies on your Mast Group. Here's how to use the table:

After you have located a fault to a particular cable assembly, look the cable up in the CABLE ASSEMBLY column and go to the CONNECTION POINTS column. This column will tell you what components and their connectors are connected by the cable assembly.

NOTE

The illustration at the end of the table shows you the location of all components connected by the cable assemblies.

Then go to the REFERENCES column. This tells you where in the manual you find instructions for connecting or disconnecting the cable from a component.

Disconnect and connect the cable assembly according to the procedures referenced in the REFERENCES column.

Here are some helpful hints on replacing a cable assembly:

- Tag cable leads to help you assemble the cable correctly
- Mark the location of cable clamps or tie-wraps, this will make sure of correct installation
- Lay the new cable along side the old cable before disconnecting the old cable. This will help you route the new cable correctly.

2-26. REPLACE CABLE ASSEMBLIES - Continued**Table 2-2. Cable Assembly Connection Points**

CABLE ASSEMBLY	CONNECTION POINTS		REFERENCES
	FROM (connector P1)	TO (connector P2)	
W24	Amplifier Distribution Box (7A1A1) connector J2	Curbside Distribution Box (A5) connector J1	Amplifier Distribution Box (7A1A1) - See Systems Manual (TM 9-1430-603-34) Distribution Box para 2-18
W25	Amplifier Distribution Box (7A1A1)- connector J3	Roadside Distribution Box (A11)- connector J1	Amplifier Distribution Box (7A1A1) - See Systems Manual (TM 9-1430-603-34) Distribution Box - para 2-18
DELETED	DELETED	DELETED	DELETED
W27	Curbside Interconnect Box (A18) connector J2	Curbside Cylinder Lock Strut Interlock switch (S3)	Interconnect Box - para 2-9 Lock Strut Interlock Switch - para 2-29
W28	Curbside Distribution Box (A5) connector J4	Truck Starter Terminals	Distribution Box - para 2-18 Truck Starter - See TM 9-2320-260-24 for M811 truck, see TM 9-2320-272-20-1 for M942 truck
W29	Curbside Distribution Box (A5)- connector J5	Curbside Mast Control Panel (A6) connector J1	Distribution Box - para 2-18 Mast Control - para 2-21

2-26. REPLACE CABLE ASSEMBLIES - Continued**Table 2-2. Cable Assembly Connection Points- Continued**

CABLE ASSEMBLY	CONNECTION POINTS		REFERENCES
	FROM (connector P1)	TO (connector P2)	
W30	Curbside Distribution Box (A5) connector J7	Curbside Hydraulic Component Assembly (A7) connector J1	Distribution Box - para 2-18 Hydraulic Component Assembly - para 2-8
W31	Curbside Distribution-Box (A5) connector J3	Curbside Pneumatic Component Assembly (A9) connector J2	Distribution Box - para 2-18 Pneumatic Component Assembly - para 2-19
W32	Curbside Distribution Box (A5) connector J8	Curbside Pneumatic Component Assembly (A9) connector J2	Distribution Box - para 2-18 Pneumatic Component Assembly para 2-19
W33	Curbside Distribution Box (A5)- connector J2	Curbside 100 Degree Limit (Switch A8S1)	100 Degree Limit Switch - para 2-30
		Curbside Zero Degree Limit Switch (A8S2)	Zero Degree Limit Switch - para 2-27
		Curbside Interconnect Box (A17) connector J3	Interconnect Box - para 2-18
		10 Degree Limit Switch	10 Degree Limit Switch - para 2-28 Distribution Box - para 2-18
W34	Roadside Distribution Box (A11) connector J5	Roadside Mast Control Panel (A12) connector J1	Distribution Box - para 2-18 Mast Control Panel - para 2-21

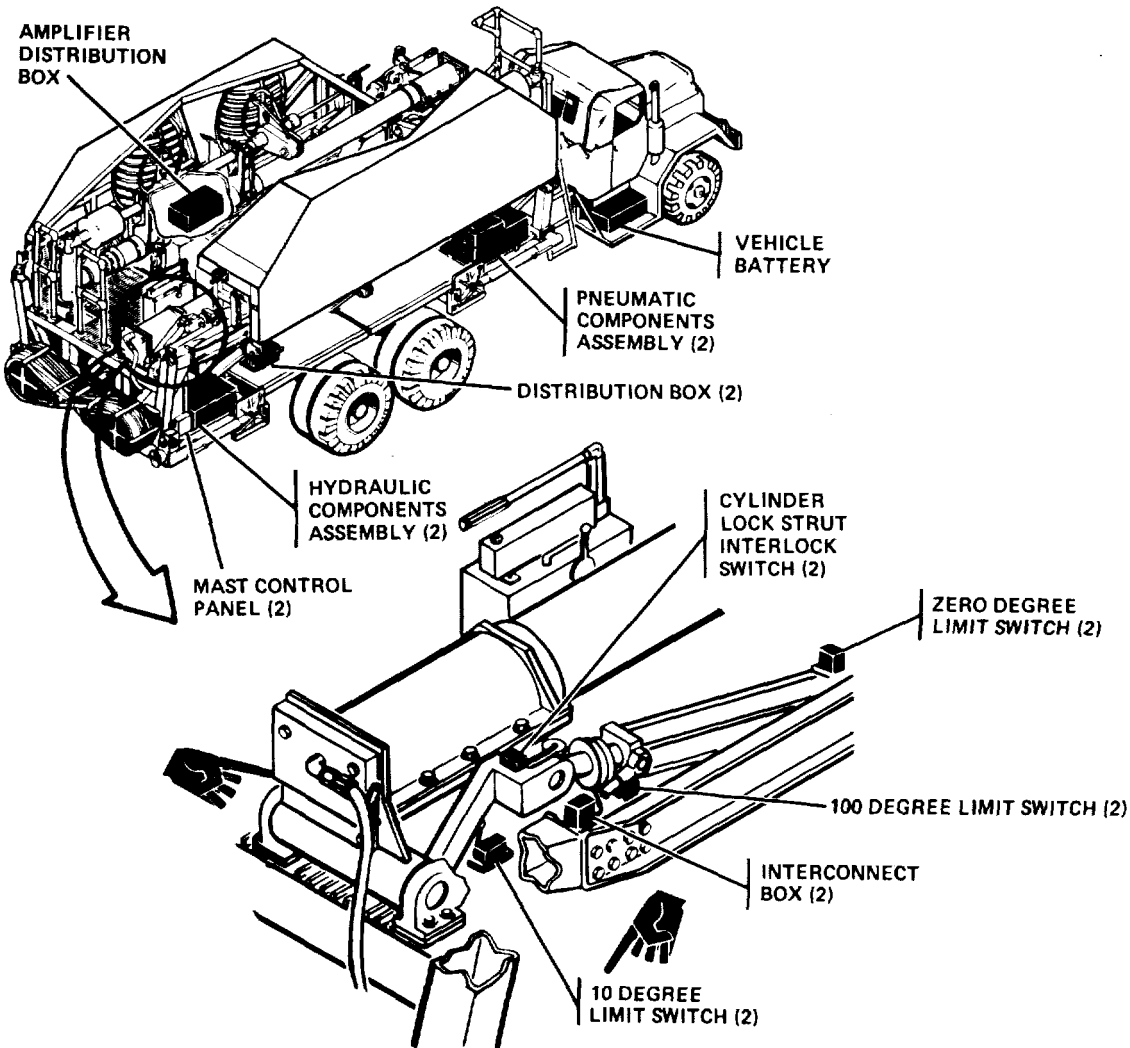
2-26. REPLACE CABLE ASSEMBLIES - Continued**Table 2-2. Cable Assembly Connection Points**

CABLE ASSEMBLY	CONNECTION POINTS		REFERENCES
	FROM (connector P1)	TO (connector P2)	
W35	Roadside Distribution - Box (All) connector J7	Roadside Hydraulic Component Assembly connector J1	Distribution Box - para 2-18 Hydraulic Component Assembly - para 2-8
W36	Roadside Distribution Box (A11) - connector J3	Roadside Pneumatic Component Assembly (A15) connector J2	Distribution Box - para 2-18 Pneumatic Component Assembly para 2-19
W37	Roadside Distribution Box (A11) connector J8	Roadside Pneumatic Component Assembly (A15) connector J1	Distribution Box - para 2-18 Pneumatic Component - Assembly - para 2-19
W38	Roadside Distribution Box (All) connector J2	Roadside 100 Degree Limit Switch(A14S1)	100 Degree Limit Switch - para 2-30
		Roadside 10 Degree Limit Switch (S2)	10 Degree Limit Switch - para 2-28
		Roadside Zero Degree Limit Switch(A14S2)	Zero Degree Limit Switch - para 2-27
		Roadside Interconnect Box (A18) connector J3	Interconnect Box - para 2-9
DELETED	DELETED	DELETED	DELETED

2.26. REPLACE CABLE ASSEMBLIES - Continued**Table 2-2. Cable Assembly Connection Points**

CABLE ASSEMBLY	CONNECTION POINTS		REFERENCES
	FROM (connector P1)	TO (connector P2)	
W40	Roadside Interconnect Box (A17) connector J2	Roadside Cylinder Lock Strut Interlock Switch (S4)	Interconnect Box - para 2-9 Lock Strut Interlock Switch - para 2-29
W41	Roadside Distribution (A11) connector J4	Truck Starter Terminals	Distribution Box - para 2-18 Truck Starter - See TM 9-2320-260-24 for M811 truck, see TM 9-2320-272-20-1 for M942 truck
DELETED	DELETED	DELETED	DELETED

2.26. REPLACE CABLE ASSEMBLIES - Continued

STEP	PROCEDURE
	 The diagram illustrates the mast group components of a vehicle, showing the connection points for cable assemblies. The components are labeled as follows: - AMPLIFIER DISTRIBUTION BOX - VEHICLE BATTERY - PNEUMATIC COMPONENTS ASSEMBLY (2) - DISTRIBUTION BOX (2) - HYDRAULIC COMPONENTS ASSEMBLY (2) - MAST CONTROL PANEL (2) - CYLINDER LOCK STRUT INTERLOCK SWITCH (2) - ZERO DEGREE LIMIT SWITCH (2) 100 DEGREE LIMIT SWITCH (2) - INTERCONNECT BOX (2) 10 DEGREE LIMIT SWITCH (2) Mast Group Components Connected by Cable Assemblies

2-27. REPLACE ZERO DEGREE INTERLOCK SWITCH**This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
flat tip scdr
slip joint plr

Equipment
ConditionPara

2-2

Condition Description

Mast group power turned
off

Materials/Parts

Zero degree limit switch

STEP**PROCEDURE****REMOVAL**

1. Remove two screws (1) and loosen two screws (2) securing cover (3) to switch box (4). Remove cover.

NOTE

Screws (5) may or may not have washers.

2. Tag leads to aid in assembly. Remove three screws (5) securing four cable leads (6).
3. Remove two screws (7) and washers (8) securing switch (9) to bracket in box (4). Remove switch.

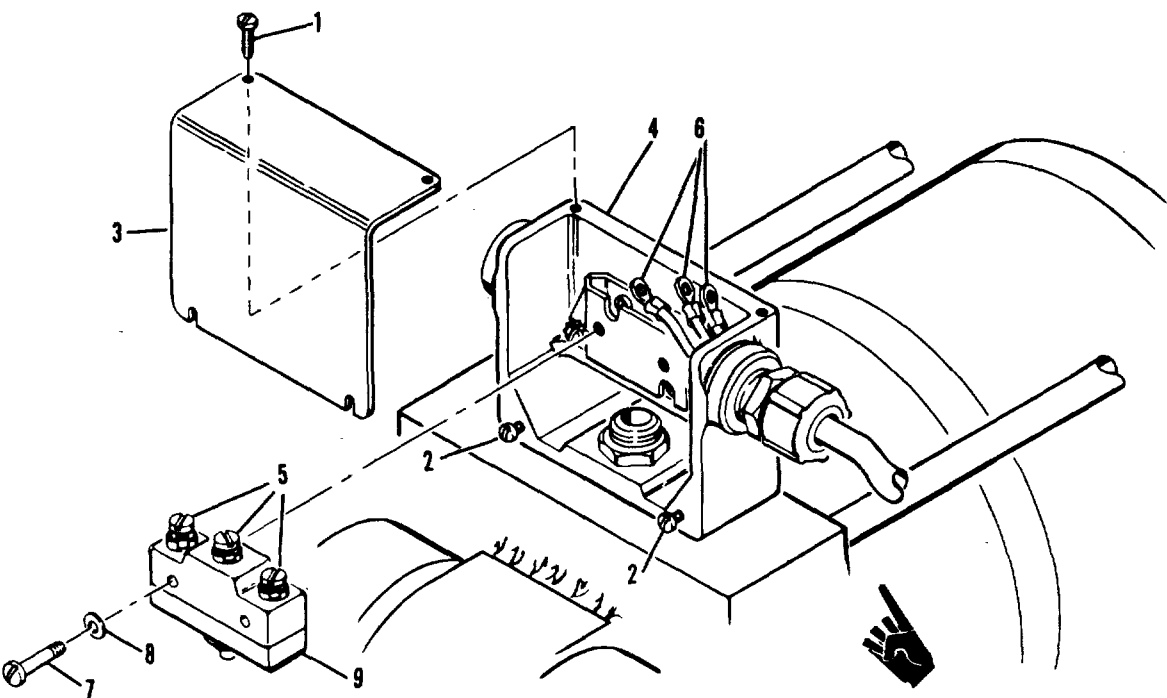
REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

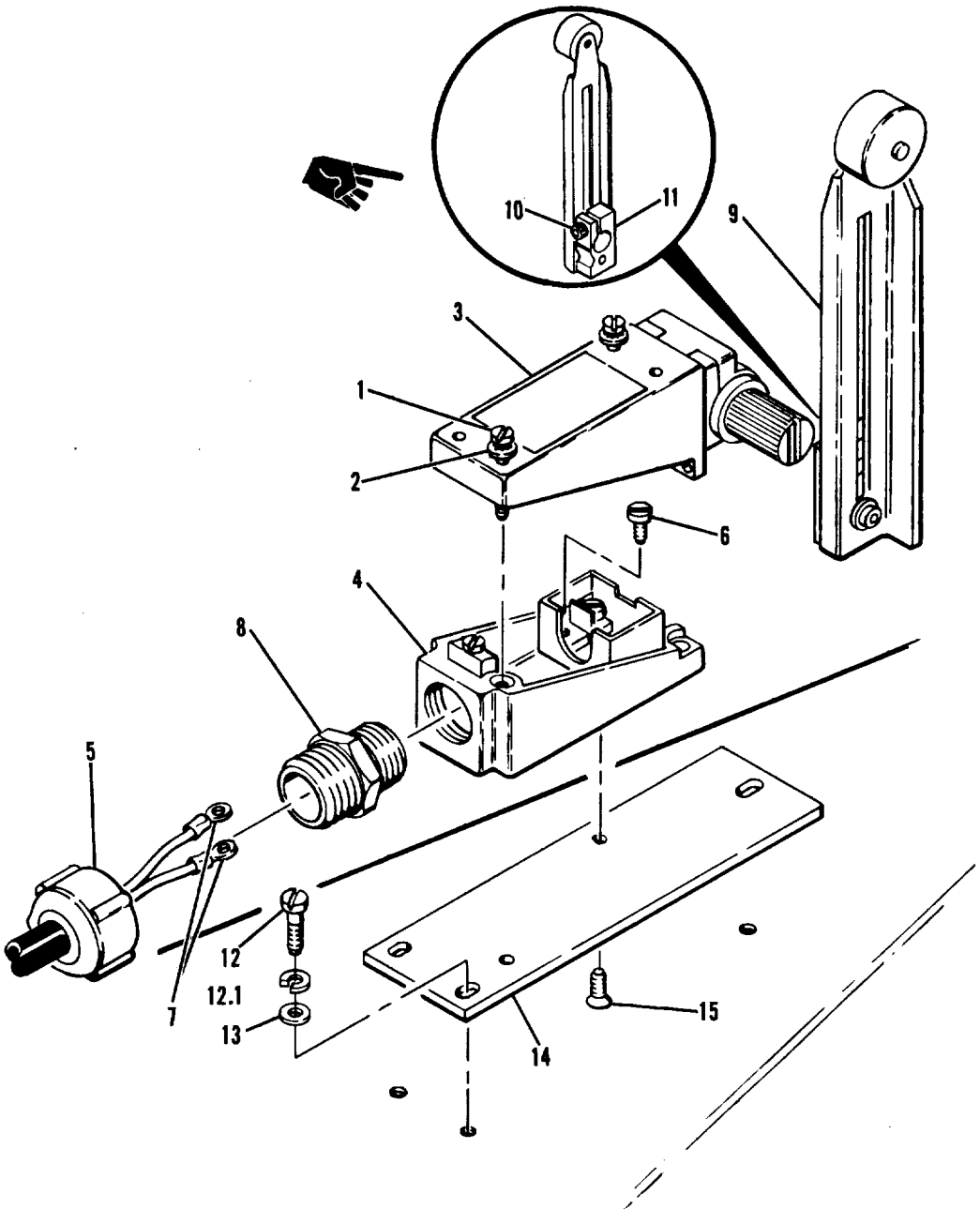
1. Position switch (9) on bracket in box (4). Secure with two washers (8) and screws (7).

2-27. REPLACE ZERO DEGREE INTERLOCK SWITCH - Continued

STEP	PROCEDURE
	 2. Using tags on leads to assure correct connections, position cable leads (6) on terminals of switch (9) and secure with three screws (5). 3. Position cover (3) on box (4). Secure cover with four screws (1 and 2). 4. Turn on mast group power (para 2-2). TEST Perform Organizational Preventive Maintenance Checks and Services (PMCS) except do not replace PCA inline filter element (TM 11-5985-368-12&P).

2-28. REPLACE 10 DEGREE LIMIT SWITCH			
This task covers:			
Removal	Replacement	Installation	Test
<u>INITIAL SETUP</u> Tools Refrig Unit Svce Tool Kit, 1/4 in. flat tip scdr No. 2 xtip scdr 9/64 in. skt hd scr key 1 in. comb. wr Equipment Condition <u>Para</u> 2-2 <u>Condition Description</u> Mast group power turned off <u>Materials/Parts</u> Sealing compound (appx B, item 25) 10 degree limit switch			
STEP	PROCEDURE		
	WARNING To avoid electrical shock, make sure mast group power is off. See para 2.2. REMOVAL - Remove two screws (1) and washers (2) securing cover (3) to switch (4). Remove cover. - Remove cable strain relief nut (5). - Tag wires for future assembly. Remove two screws (6) securing wire leads (7) to switch (4). Pull wires through bushing (8). - Remove strain relief bushing (8) from switch (4). - Note angle of arm (9) on cover (3) to assure proper positioning during assembly. Loosen screw (10) securing clamp (11) and arm (9) to cover. Remove clamp and arm. - Remove three screws (12), lockwashers (12.1), and flatwashers (13) securing plate (14) to cylinder support. Remove plate (14) with switch (4) attached. - Remove two screws (15) securing switch (4) to plate (14). REPLACEMENT Replace faulty part with a new part.		

2-28. REPLACE 10 DEGREE LIMIT SWITCH - Continued

STEP	PROCEDURE
	

2.28. REPLACE 10 DEGREE LIMIT SWITCH - Continued

STEP	PROCEDURE
	INSTALLATION 1. Remove two screws (10) and washers (11) securing cover (12) of new switch and remove cover (12). 2. Coat threads of screws (1) with sealing compound. 3. Position plate (2) on switch (3) and secure with two screws (1). 4. Position plate (2) with switch (3) on cylinder support. Secure with three screws (4), lockwashers (5), and flatwashers (5.1). NOTE Make sure clamp (7) is at bottom of arm (6) before positioning arm (6) to cover (12). 5. Position arm (6) and clamp (7) to cover (12) and secure by tightening screw (8). 6. Install strain relief bushing (9) in switch (3). 7. Thread wire leads (13) through bushing (9) in switch (3). Install and tighten nut (15) on bushing (9). 8. Position leads on switch terminals and secure leads with two screws (14). Check tags to insure proper connection. NOTE Rotate arm on switch away from mast base to fit cover on switch. 9. Position cover (12) on switch (3) and secure with two screws (10) and washers (11). 10. Turn on mast group power (see para 2-2).
	TEST AND ADJUSTMENT 1. Raise mast (TM 11-5985-368-12&P) to about 45 degree position, then lower mast until it automatically stops (10 degree limit switch actuates). 2. Measure the distance between the bottom of the antenna positioner and the mast group walkway. The distance should be between 34 and 40 inches. 3. If distance is not between 34 and 40 inches, loosen screw (8) and reposition clamp (7) on shaft of cover (12) as required. Tighten screw (8). 4. Do steps 1 and 2 above, readjust 10 degree limit switch if required.

2.28. REPLACE 10 DEGREE LIMIT SWITCH - Continued

STEP	PROCEDURE
	The diagram illustrates the assembly of a 10-degree limit switch. Key components include: 1: Mounting screw for the base plate. 2: Base mounting plate. 3: Main switch body with a threaded port. 4: Screw for the internal bracket. 5 and 5.1: Washers and spacers for the base plate. 6: Vertical adjustment arm with a roller. 7 and 8: Internal contact components (shown in inset). 9: Threaded connector for the limit switch. 10 and 11: Screws for the upper housing. 12: Upper housing component. 13 and 15: Electrical wiring connections. 14: Small screw for the internal bracket.

2-29. REPLACE LOCK STRUT INTERLOCK SWITCH**This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
1/4 in. flat tip scdr
7/16 in. comb. wr
No. 2 xtip scdr
5/16 in. flat tip scdr
9/64 in. skt hd scr wr

Equipment
ConditionPara

2-2

Condition Description

Mast group power turned
off

Materials/Parts

Sealing compound (appx B, item 25)
Lock strut interlock switch

STEP**PROCEDURE****REMOVAL**

1. Remove two screws (1), two washers (2), and cover (3) from switch (4).
2. Loosen cable strain relief nut (5).
3. Tag leads (6), remove two screws (7) from switch (4), and remove leads from bushing (8).
4. Remove bushing (8) from switch (4).
5. Note angle of arm (9) for proper positioning during assembly. Loosen screw (10) and remove clamp (11) and arm from cover.
6. Remove two screws (12), two lockwashers (13), two flatwashers (14), and bracket (15) from support (16).
7. Remove two screws (17), two washers (18), and switch (4) from bracket (15).

REPLACEMENT

Replace faulty part with a new part.

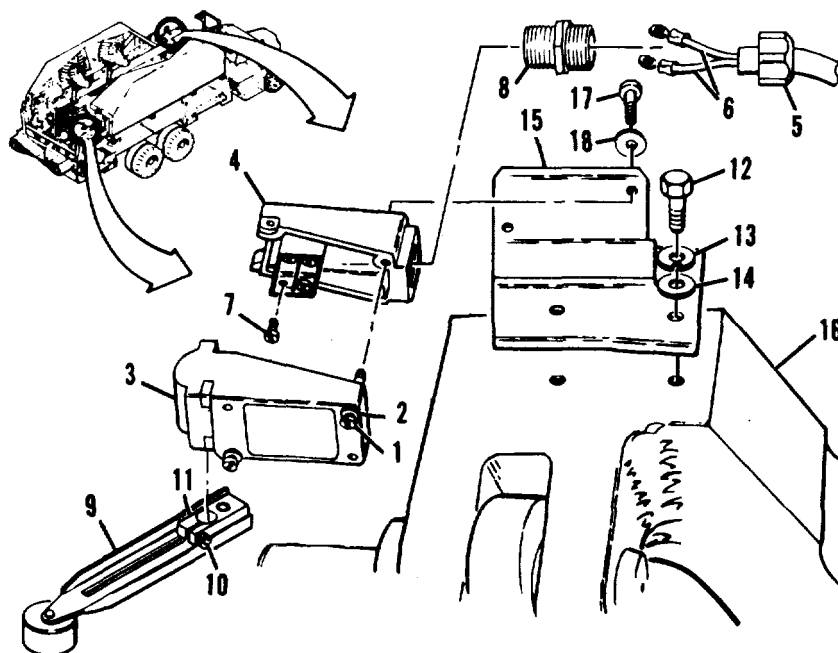
INSTALLATION

1. Coat threads of screws (17) with sealing compound and install two screws (17), two washers (18), and bracket (15) on switch (4).
2. Position bracket (15) on support (16) and secure with two screws (12), lockwashers (13), and flat washers (14).

2-29. REPLACE LOCK STRUT INTERLOCK - Continued

STEP

PROCEDURE



NOTE

Make sure clamp (11) is at bottom of arm (9) before positioning arm (9) to cover (3).

3. Position arm (9) and clamp (11) on cover (3) and secure by tightening screw (10).
4. Install bushing (8) in switch (4).
5. Thread leads (6) through bushing (8) and connect to terminals of switch (4) with two screws (7). Check to insure proper connections and remove tags.
6. Install cable strain relief nut (5) on switch (4).
7. Install two screws (1), washers (2), and cover (3) on switch (4).
8. Turn on mast group power (para 2-2).

TEST

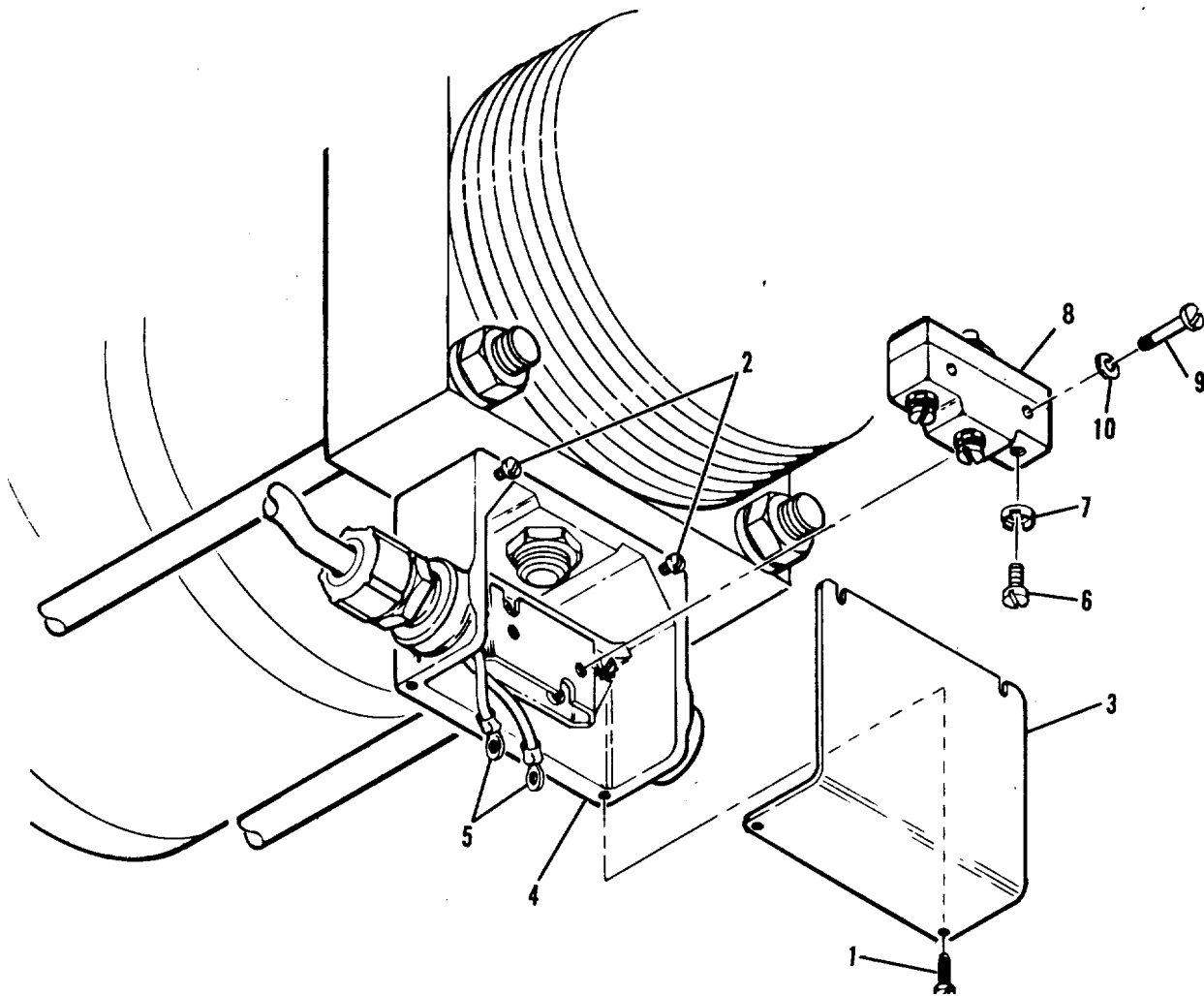
1. Raise mast (TM 11-5985-368-12&P), ensure lock strut activates switch.
2. If switch does not activate, loosen screw (10) and reposition clamp (11) as required. Tighten screw (10).

2-30. REPLACE 100 DEGREE INTERLOCK SWITCH		
This task covers:		
Removal	Replacement	Installation
<u>INITIAL SETUP</u> <u>Tools</u> Refrig Unit Svce Tool Kit, 5180-00-596-1474 1/4 in. flat tip scdr <u>Materials/Parts</u> 100 degree limit switch		
	Equipment Condition <u>Para</u> 2-2	<u>Condition Description</u> Mast group power turned off
STEP	PROCEDURE	
	REMOVAL 1. Remove two screws (1) and loosen two screws (2) securing cover (3) to switch box (4). Remove cover. 2. Tag leads (5) to aid assembly. Remove two screws (6), washers (7), and leads from switch (8). 3. Remove two screws (9) and washers (10) securing switch (8) to bracket in switch box (4). REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Position switch (8) on bracket in switch box (4). Secure with two washers (10) and screws (9). 2. Install leads (5) on switch (8) terminals with two screws (6) and washers (7). Check tags to assure correct assembly. 3. Position cover (3) on box (4). Secure cover with four screws (1 and 2). 4. Turn on mast group power (para 2-2). TEST Perform Organizational Preventive Maintenance Checks and Services (PMCS) except do not replace PCA inline filter element (TM 11-5985-368-12&P).	

2-30. REPLACE 100 DEGREE INTERLOCK SWITCH - Continued

STEP

PROCEDURE



2-31. REPAIR MAINTENANCE TRAY**This task covers:****Removal****Replacement****Installation**INITIAL SETUPTools

Refrig Unit Svce Tool Kit,
 5180-00-596-1474
 1/2 in. comb. wr
 No. 3 xtip scdr

EquipmentConditionPara

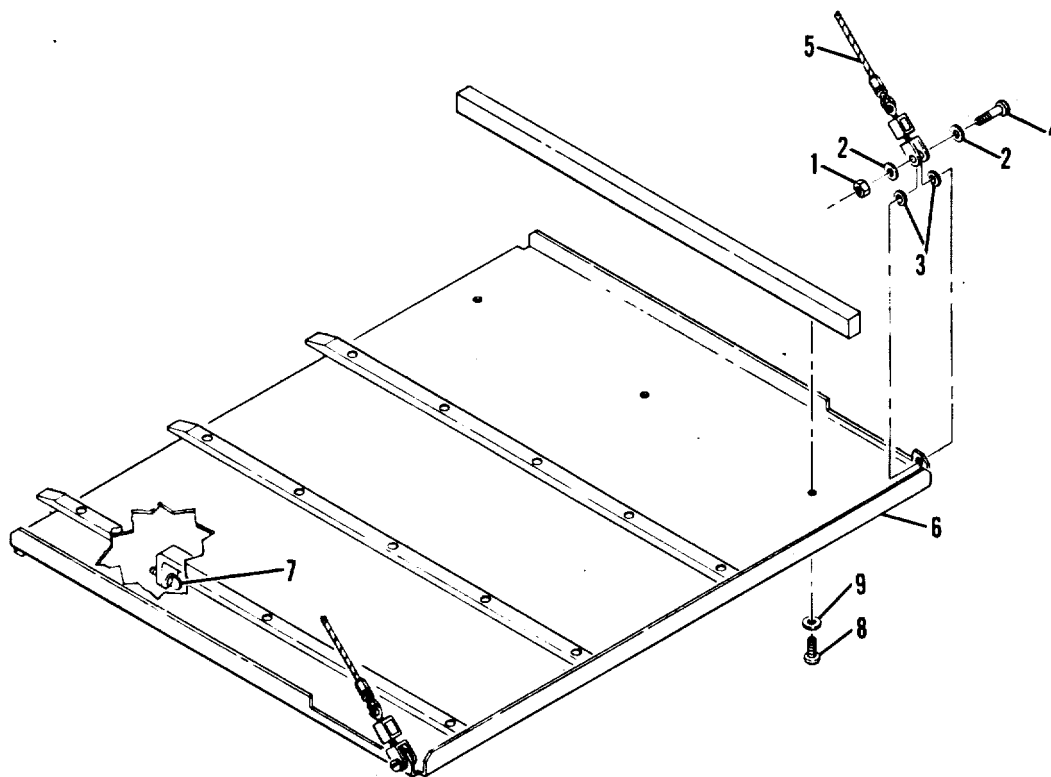
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Condition Description

Maintenance tray removed
 from mast group

Materials/Parts

Maintenance tray parts, as needed

STEP**PROCEDURE****DISASSEMBLY**

1. Remove two nuts (1), four flat washers (2), four plastic washers (3), and two screws (4); and remove two wire rope assemblies (5) from tray (6).

2-31. REPAIR MAINTENANCE TRAY - Continued	
STEP	PROCEDURE
2.	Unscrew two thumbscrews (7) from brackets on tray (6).
3.	Remove three screws (8) and washers (9), and remove slide (10) from tray (6).
	REPLACEMENT
	Replace faulty part with a new part.
	ASSEMBLY
1.	Position slide (10) on tray (6) and secure with three washers (9) and screws (8).
2.	Screw two thumbscrews (7) into brackets on tray (6).
3.	Position one wire rope assembly (5) and two plastic washers (3) on tray (6) and secure with two flat washers (2), screw (4) and nut (1). Repeat for second wire rope assembly.

CHAPTER 3

GENERAL SUPPORT MAINTENANCE

SECTION I. SERVICE UPON RECEIPT

Upon receipt of a mast group that has been shipped to your unit, the following service is required to prepare the equipment for installation and use:

- a. Remove protective covers, if used.
- b. Remove padding, protective blocks, and strapping, if used.
- c. Remove any packaged support equipment shipped with the mast group.
- d. Inventory all received items to verify that all items listed on shipping documents were received.
- e. Inspect all items received for shipping damage and for damage from exposure during shipping.

WARNING

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

- f. Clean exterior surfaces of the mast group with trichlorotrifluoroethane.
- g. Request performance of an operator/crew - Organizational Maintenance, Preventive Maintenance, Checks, and Services (PMCS), excluding the functional test portion of the procedure.

SECTION II. TROUBLESHOOTING

OVERVIEW

- This section provides instructions you will need to find the specific cause of a malfunction in equipment that has been found faulty by the mast group operator, Organizational level, or Direct Support maintenance personnel.
- You should begin by looking for a tag attached to the equipment that will tell you how the mast group failed to operate, or will give a general indication of what is wrong with the equipment. If equipment is not tagged, perform a functional test (Section III) to determine what is wrong with the equipment.
- Go to the paragraph listed in the List of Tasks, below, for the equipment that needs repair.
- Gather the tools and test equipment listed in the INITIAL SETUP block and perform the troubleshooting indicated in the procedure for the MALFUNCTION listed on the tag.
- When you troubleshoot, you will check each functional part until the faulty part is found. You will use a multimeter to check power and control circuits for opens or shorts, or perform simple mechanical checks and inspections.
- When you find the fault, you will be directed to the applicable repair procedure by a reference in the troubleshooting table.

WARNING

When disconnecting electrical cables during your troubleshooting tasks, be aware that voltage may be present on electrical equipment connectors. Contact could cause accidental Injury or death.

WARNING

If wires disconnected during maintenance are not reconnected to the same points, the equipment may move in an unexpected manner. This could cause accidental Injury or death.

- When you disconnect a wire for any reason, attach a tag to indicate the point from which it was disconnected.
- You can use a tie-on tag or even a piece of masking tape wrapped around the wire.
- Write the number or letter of the terminal, wire, or other connection point on the tag.
- Remove the tag after reconnecting the wire.

LIST OF TASKS

Task	Paragraph No.
Troubleshoot:	
Distribution box	3-2
HCA	3-4
Mast Control	3-5
PCA	3-3
Support frame	3-1

3-1. SUPPORT FRAME TROUBLESHOOTING

- Read failure symptom recorded on tag attached to faulty interconnect box.
- Refer to SYMPTOM INDEX and find applicable MALFUNCTION entry.
- Refer to INITIAL SETUP for preparation.
- Turn to referenced MALFUNCTION in Table 3-1 and troubleshoot as directed.

SYMPTOM INDEX

Symptom	Malfunction No. (Table 3-1)
Mast will not extend (fault in interconnect box) Deleted	1

INITIAL SETUPTest Equipment

Multimeter AN/URM-105
NSN 6625-00-581-2036

Equipment
Condition

Para
3-7f

Condition Description
Interconnect box cover
removed
Deleted

Tools

Refrig Unit Svce Tool Kit,
NSN 5180-00-596-1474
No. 3 xtip scdr
Sldr and desldr set,
3439-00-460-7198

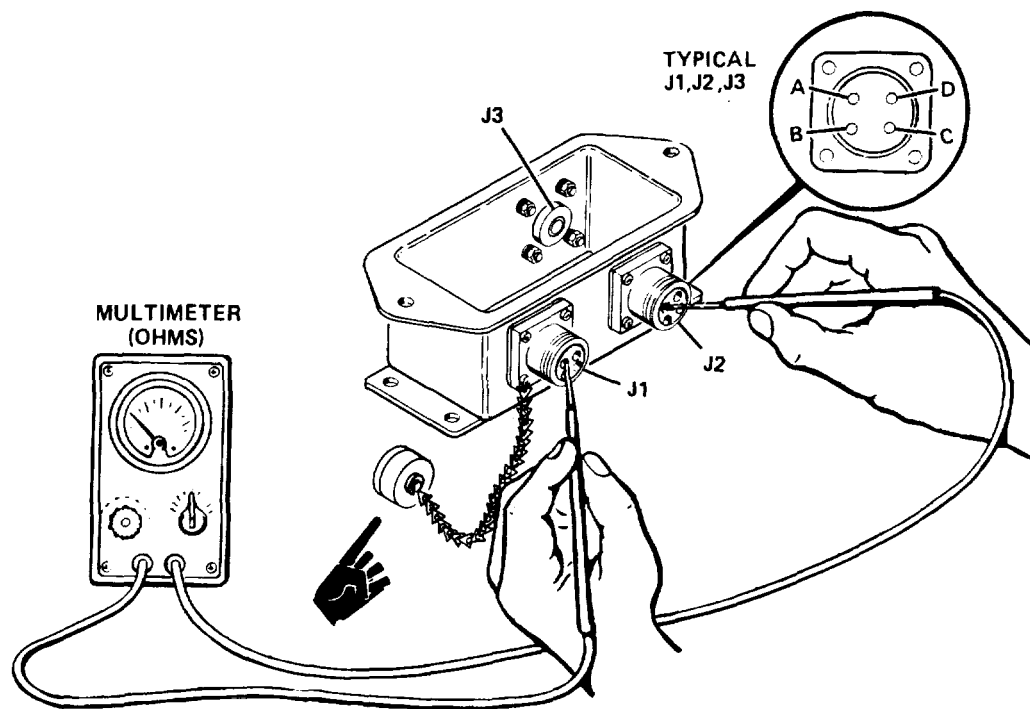
TABLE 3-1. SUPPORT FRAME TROUBLESHOOTING		
MALFUNCTION	TEST OR INSPECTION	
	CORRECTIVE ACTION	
1.	MAST WILL NOT EXTEND (FAULT IN INTERCONNECT BOX)	
	Step 1.	Inspect interconnect box connector J1 for damaged or unseated pins or broken solder connections.
		• If connector J1 is damaged or pins are unseated, replace connector (para 3-7f). • If there is a broken solder connection, resolder connection (para 3-7f). • If connector and solder connections appear good, go to step 2.
	Step 2.	Inspect connector J2 for damaged or unseated pins or broken solder connections.
		• If connector J2 is damaged or pins are unseated, replace connector (para 3-7f). • If there is a broken solder connection, resolder connection (para 3-7f). • If connector and solder connections appear good, go to step 3.
	Step 3.	Inspect connector J3 for damaged or unseated pins or broken solder connections.
		• If connector J3 is damaged or pins are unseated, replace connector (para 3-7f). • If there is a broken solder connection, resolder connection (para 3-7f). • If connector and solder connections appear good, go to step 4.

TABLE 3-1. SUPPORT FRAME TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

Step 4. Check for continuity (resistance less than 0.5 ohms) between the following connector pins:

J1-C and J2-C
J1-D and J2-C

J2-A and J3-A
J2-B and J3-B



- Replace the wire between those two pins having no continuity (para 3-7f).

2.

Deleted.

3-2. DISTRIBUTION BOX TROUBLESHOOTING

- Read failure symptom recorded on tag attached to faulty distribution box
- Refer to SYMPTOM INDEX and find applicable MALFUNCTION entry
- Refer to INITIAL SETUP for preparation
- Turn to referenced MALFUNCTION in Table 3-2 and troubleshoot as directed

SYMPTOM INDEX	
Symptom	MALFUNCTION NO. (Table 3-2)
NOTE VERIFY YOU HAVE A FAULTY DISTRIBUTION BOX, using the ICD per the Distribution Box Post-Maintenance Test, before you begin troubleshooting procedures. Also, make the necessary voltage and/or continuity checks in addition to the troubleshooting procedures to verify you have isolated the faulty part. This will help prevent you from accidentally replacing a good part (such as the wiring harness, which is difficult to replace).	
Mast cannot be extended, MAST EXTENSION switch S3 in OUT position	9
Mast cannot be lowered below 10 degrees	11
Mast cannot be lowered, MAST ERECTION RAISE/OFF/LOWER switch S1 in LOWER position	8
Mast cannot be raised when HYDRAULIC PUMP MODE switch S6 is in DC	7
Mast cannot be retracted, MAST EXTENSION switch S3 in IN position	10
Mast control, AIR PRESSURE indicator DS3 does not light	4
Mast control, COMPRESSOR AC indicator DS1 does not light	1
Mast control, COMPRESSOR DC indicator DS2 does not light	2
Mast control, COMPRESSOR DC indicator DS2 is on but compressor is not operating	3
Mast control, HYDRAULIC PUMP AC indicator DS4 does not light when MODE switch S6 is in AC (hydraulic pressure is normal)	6
Mast control, MODE switch S6 in AC, hydraulic pump does not raise mast	5

INITIAL SETUPTest Equipment

Multimeter AN/URM-105

Equipment

Condition

Para

3-9a

Condition Description

Cover removed

Tools

Refrig Unit Svce Tool Kit,
 3/8 in. flat tip scdr
 No. 2 xtip scdr
 No. 1 xtip scdr

CAUTION

When removing parts, use care not to drop hardware into bottom of distribution box.

NOTE

Before replacing the wiring harness or starting other difficult repair tasks, make certain you have found the part causing the malfunction. Complete the troubleshooting procedure and make any other voltage or continuity checks on the distribution box in order to isolate the faulty part. If you are in doubt about the malfunction, do a distribution box post-maintenance test to confirm it.

NOTE

Remove and reinstall cable clamps as necessary to gain access to required items.

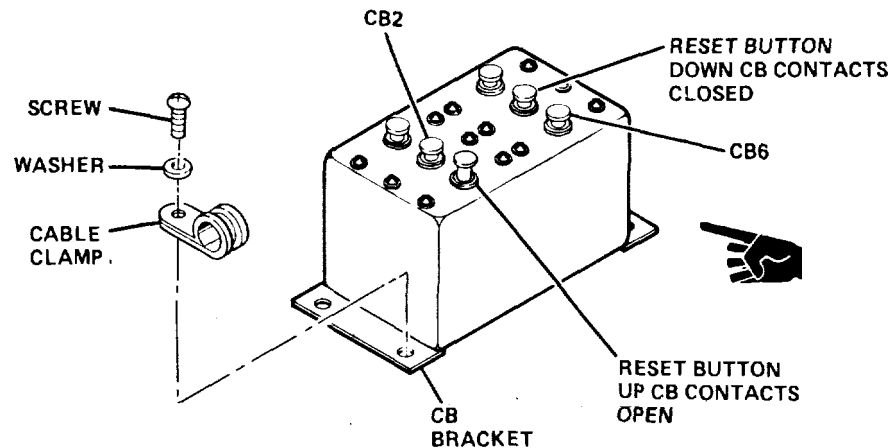
NOTE

Early model distribution boxes have five circuit breakers, a cover over relay K1, and tie down straps installed.

TABLE 3-2. DISTRIBUTION BOX TROUBLESHOOTING		
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1.	MAST CONTROL, COMPRESSOR AC INDICATOR DS1 DOES NOT LIGHT	
	Step 1.	Visually inspect distribution box 115 VAC connector J1 for damaged or unseated pins, or broken solder connections. • If connector J1 is damaged or pins are unseated, replace connector (para 3-9b). • If there is a broken solder connection, resolder connection (para 3-9b). • If connector J1 is good, go to step 2.
	Step 2.	Visually inspect CONTROL connector J5 for damaged or unseated pins D, F, G and H, or broken solder connections. • If connector J5 is damaged or pins are unseated, replace connector (para 3-9f). • If there is a broken solder connection, resolder connection in paragraph 3-9f. • If connector J5 is good, go to step 3.
	Step 3.	Visually inspect COMPRESSOR connector J3 for damaged or unseated pins B, C, E and F, or broken solder connections. • If connector J3 is damaged or pins are unseated, replace connector (para 3-9d). • If there is a broken solder connection, resolder connection (para 3-9d). • If connector J3 is good, go to step 4.

TABLE 3-2. DISTRIBUTION BOX TROUBLESHOOTING -Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****1. MAST CONTROL, COMPRESSOR AC INDICATOR DS1 DOES NOT LIGHT - Continued**

Step 4. Remove CB bracket by removing four bracket screws, flat washers, and cable clamp. Turn bracket over to see CB terminals.



Step 5. Close CB2, then check continuity between terminals 1 and 2.

- If there is continuity, go to step 6.
- If there is no continuity, replace circuit breaker CB2 (see para 3-91).

Step 6. Close CB6, then check continuity between terminals 1 and 2.

- If there is continuity, replace wiring harness (see para 3-9n).
- If there is no continuity, replace circuit breaker CB6 (see para 3-91).

TABLE 3-2. DISTRIBUTION BOX TROUBLESHOOTING - Continued

	TEST OR INSPECTION	CORRECTIVE ACTION
2.	MAST CONTROL, COMPRESSOR DC INDICATOR DS2 DOES NOT LIGHT	
	Step 1.	Visually inspect distribution box 24 VDC connector J4 for damaged or unseated pins A or C, or broken solder connections. • If connector J4 is damaged or pins are unseated, replace connector (para 3-9e). • If there is a broken solder connection, resolder connection (para 3-9e). • If connector J4 is good, go to step 2.
	Step 2.	Visually inspect CONTROL connector J5 for damaged or unseated pins J or M, or broken solder connections. • If connector J5 is damaged or pins are unseated, replace connector (para 3-9f). • If there is a broken solder connection, resolder connection (para 3-9f). • If connector J5 is good, go to step 3.

The diagram illustrates the testing procedure for the MAST CONTROL, COMPRESSOR DC INDICATOR DS2. It shows two circular inset views of the internal components. The left inset shows the 24 VDC connector J4-A being tested with a multimeter. The right inset shows the internal components CR3 and ANODE being tested with a multimeter. A hand is shown holding the multimeter probes, and the multimeter is labeled 'MULTIMETER (OHMS)'.

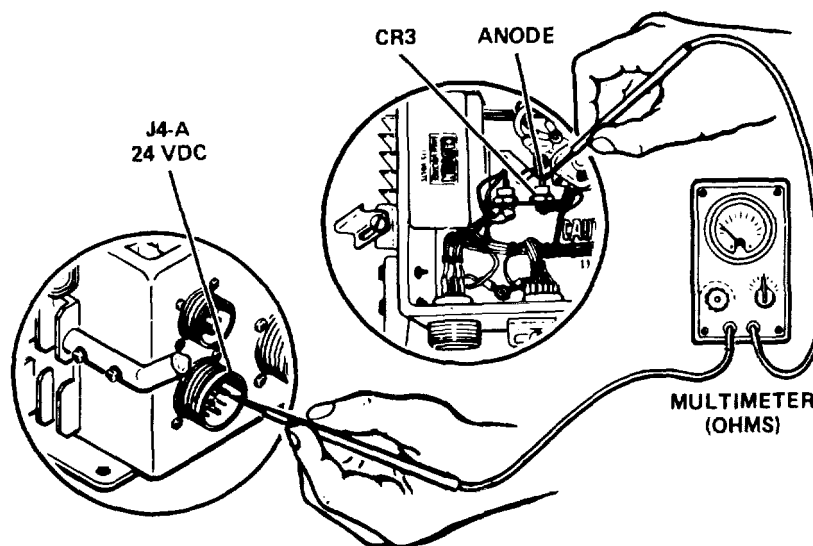


TABLE 3-2. DISTRIBUTION BOX TROUBLESHOOTING - Continued

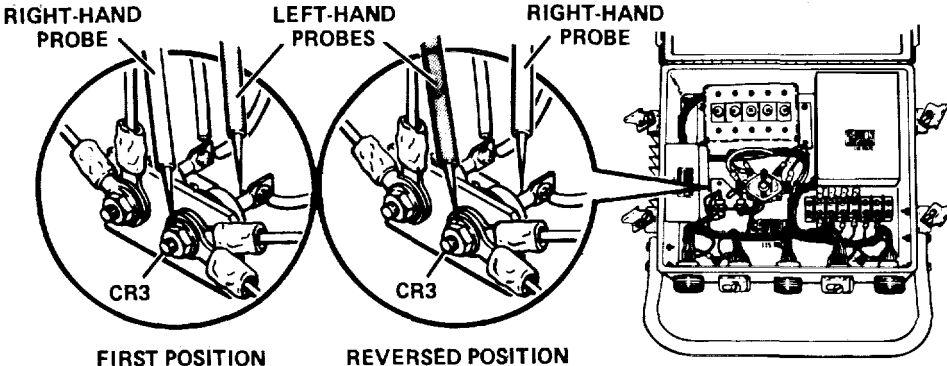
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2.	MAST CONTROL, COMPRESSOR DC INDICATOR DS2 DOES NOT LIGHT - Continued	
	Step 3. Check continuity between J4-A and CR3 anode. Be sure that plunger on circuit breaker CB1 is down (closed). • If there is continuity, go to step 4. • If there is no continuity, go to step 5.	
	 The diagram illustrates the testing of diode rectifier CR3. It shows two circular insets: 'FIRST POSITION' and 'REVERSED POSITION'. In the first position, a right-hand probe is on the anode and a left-hand probe is on the cathode. In the reversed position, the probes are swapped. A larger diagram of a distribution box shows the internal components, with a line indicating the location of CR3.	
	Step 4. Check continuity of diode rectifier CR3. Check resistance across diode CR3 in first position; then reverse leads and check resistance in reverse position across diode. CR3 is good if the ratio between the two ohmmeter readings is at least 100:1. For example: If leads in first position read approximately 10 ohms, the leads in the reverse position should read greater than 1000 ohms. • If CR3 is not good, replace it (para 3-9m). • If CR3 is good, go to step 5.	
	Step 5. Remove CB bracket by removing four bracket screws and flat washers. (See step 5 of malfunction 1.) Turn bracket over to see CB terminals.	
	Step 6. Check continuity between terminals 1 and 2 of circuit breaker CB1. • If there is continuity, replace wiring harness (para 3-9n). • If there is no continuity, replace circuit breaker CB1 (para 3-9i, steps 4 and 5).	

TABLE 3-2. DISTRIBUTION BOX TROUBLESHOOTING - Continued		
MALFUNCTION	TEST OR INSPECTION	
	CORRECTIVE ACTION	
3.	MAST CONTROL, COMPRESSOR DC INDICATOR DS2 IS ON BUT COMPRESSOR IS NOT OPERATING	
	Step 1.	Visually inspect distribution box 24 VDC connector J4 for damaged or unseated pins A or C, or broken solder connections. • If connector J4 is damaged or pins are unseated, replace connector (para 3-9e). • If there is a broken solder connection, resolder connection (para 3-9e). • If connector J4 is good, go to step 2.
	Step 2.	Visually inspect CONTROL connector J5 for damaged or unseated pins A or D, or broken solder connections. • If connector J5 is damaged or pins are unseated, replace connector (para 3-9f). • If there is a broken solder connection, resolder connection (para 3-9f). • If connector J5 is good, go to step 3.
	Step 3.	Visually inspect COMPRESSOR connector J3 for damaged or unseated pins A or D, or broken solder connections. • If connector J3 is damaged or pins are unseated, replace connector (para 3-9d). • If there is a broken solder connection, resolder connection (para 3-9d). • If connector J3 is good, go to step 4.

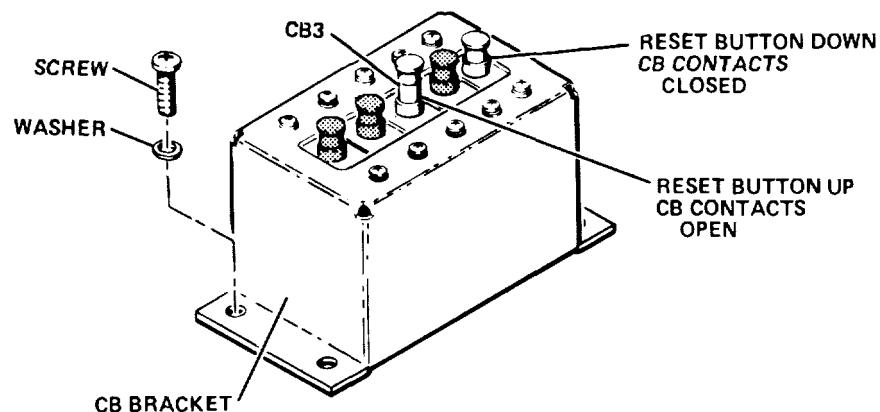
TABLE 3-2. DISTRIBUTION BOX TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

3. MAST CONTROL, COMPRESSOR DC INDICATOR DS2 IS ON BUT COMPRESSOR IS NOT OPERATING - Continued-

Step 4. Visually inspect PNEUMATIC connector J8 for damaged or unseated pin A, or broken solder connections.

- If connector J8 is damaged or pin A is unseated, replace connector (para 3-9h).
- If there is a broken solder connection, resolder connection (para 3-9h).
- If connector J8 is good, go to step 5.

Step 5. Remove CB bracket by removing four bracket screws and flat washers. Turn bracket over to see CB terminals.



Step 6. Close CB3, then check continuity between terminals 1 and 2.

- If there is continuity, replace wiring harness (para 3-9n).
- If there is no continuity, replace circuit breaker CB3 (para 3-91, steps 4 and 5).

TABLE 3-2. DISTRIBUTION BOX TROUBLESHOOTING - Continued		
MALFUNCTION	TEST OR INSPECTION	
	CORRECTIVE ACTION	
4.	MAST CONTROL, AIR PRESSURE INDICATOR DS3 DOES NOT LIGHT	
	Step 1.	Visually inspect distribution box PNEUMATIC connector J8 for damaged or unseated pins M or N, or broken solder connections. • If connector J8 is damaged or pins are unseated, replace connector (para 3-9h). • If there is a broken solder connection, resolder connection (para. 3-9h). • If connector J8 is good, go to step 2.
	Step 2.	Visually inspect CONTROL connector J5 for damaged or unseated pin E, or broken solder connection. • If connector J5 is damaged or pin E is unseated, replace connector (para 3-9f). • If there is a broken solder connection, resolder connection (para 3-9f). • If connector J5 is good, replace wiring harness (para 3-9n).

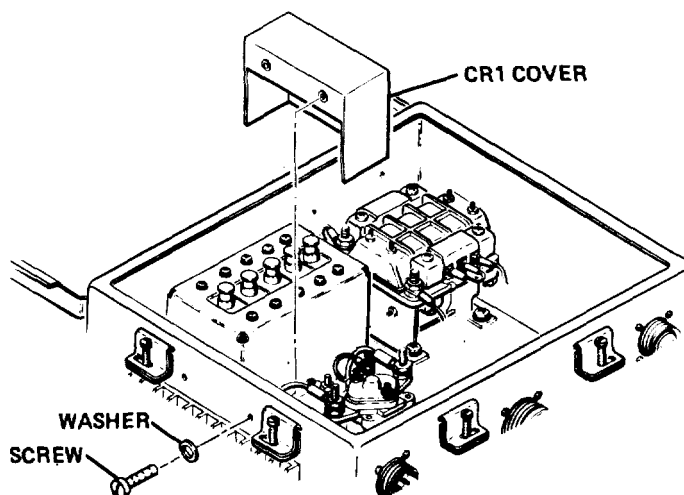
TABLE 3-2. DISTRIBUTION BOX TROUBLESHOOTING - Continued		
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
5.	MAST CONTROL, MODE SWITCH S6 IN AC, HYDRAULIC PUMP DOES NOT RAISE MAST	NOTE With MODE switch S6 in DC, the 24 Vdc hydraulic pump raises the mast normally. Step 1. Visually inspect distribution box CONTROL connector J5 for damaged or unseated pins R, P and Q, or broken solder connections. • If connector J5 is damaged or pins are unseated, replace connector (para 3-9f). • If there is a broken solder connection, resolder connection (para 3-9f). • If connector J5 is good, go to step 2. Step 2. Visually inspect HYDRAULIC connector J7 for damaged or unseated pins G, F, H and I, or broken solder connections. • If connector J7 is damaged or pins are unseated, replace connector (para 3-9g). • If there is a broken solder connection, resolder connection (para 3-9g). • If connector J7 is good, go to step 3. Step 3. Visually inspect COMPRESSOR connector J8 for damaged or unseated pins K and L, or broken solder connections. • If connector J8 is damaged or pins are unseated, replace connector (para 3-9h). • If there is a broken solder connection, resolder connection (para 3-9h). • If connector J8 is good, go to step 4.

TABLE 3-2. DISTRIBUTION BOX TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION



Step 4. Remove CR1 cover by removing two cover screws and flat washers.

Step 5. Check continuity of diode rectifier CR1. Check resistance across diode CR1 in first position; then reverse leads and check resistance in reverse position across diode.

CR1 is good if the ratio between the two ohmmeter readings is at least 100:1. For example: If leads in first position read approximately 10 ohms, the leads in the reverse position should read greater than 1000 ohms.

- If CR1 is not good, replace it (para 3-9j).
- If there is continuity, go to step 6.

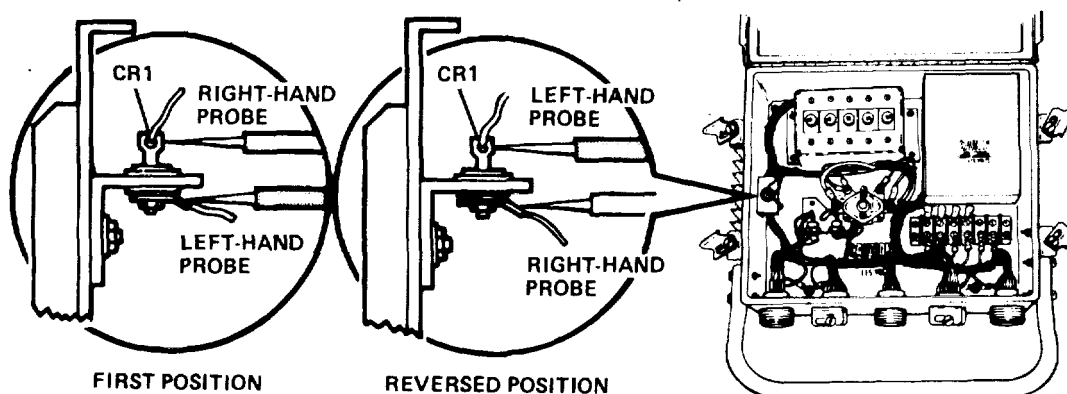
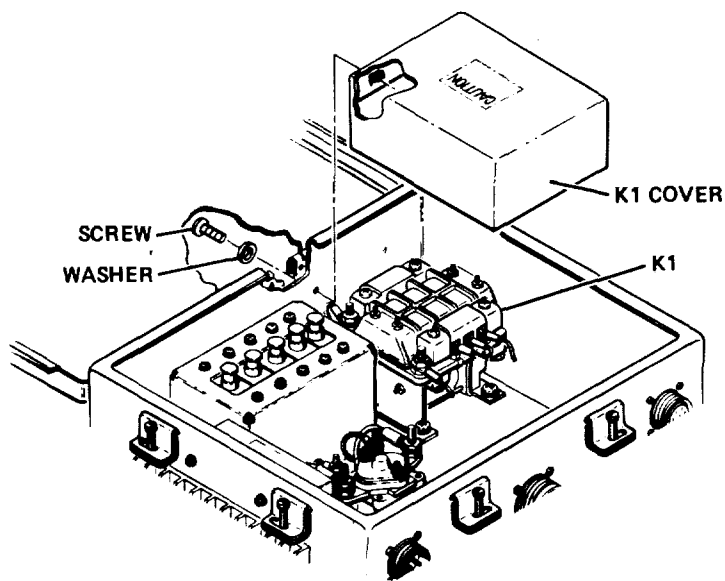


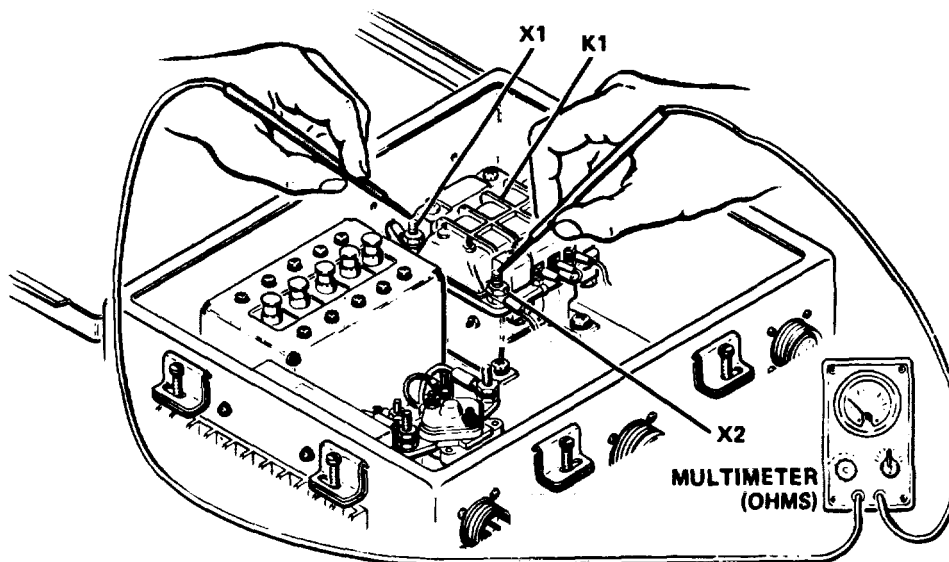
TABLE 3-2. DISTRIBUTION BOX TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

5. MAST CONTROL, MODE SWITCH S6 IN AC, HYDRAULIC PUMP DOES NOT RAISE MAST - Continued

Step 6. Install CR1 cover by inserting two cover screws (1) with flat washers (2).



Step 7. Remove K1 cover by removing two cover screws and flat washers.

TABLE 3.2. DISTRIBUTION BOX TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

Step 7.1 Remove lead wire from terminal X1.

Step 8. Set ohmmeter on X1 scale. Check resistance between terminals K1-X1 and K1-X2.

- If there is an open, replace relay K1 (para 3-9k).
- If there is a normal resistance reading of between 10 and 18 ohms, go to step 9.

Step 8.1 Reinstall lead wire onto terminal X1.

TABLE 3.2. DISTRIBUTION BOX TROUBLESHOOTING * Continued		
MALFUNCTION	TEST OR INSPECTION	
	CORRECTIVE ACTION	
5.	MAST CONTROL, MODE SWITCH S6 IN AC, HYDRAULIC PUMP DOES NOT RAISE MAST - Continued Step 9. Remove CB bracket by removing four bracket screws and flat washers, Turn bracket over to see CB4 terminals. Step 10. Close CB4, then check continuity between terminals 1 and 2. • If there is continuity, replace wiring harness (para 3-9n). • If there is no continuity, replace circuit breaker CB4 (para 3-9i, steps 4 and 5).	
6.	MAST CONTROL, HYDRAULIC PUMP AC INDICATOR DS4 DOES NOT LIGHT WHEN MODE SWITCH S6 IS IN AC (HYDRAULIC PRESSURE IS NORMAL) Visually inspect distribution box CONTROL connector J5 for damaged or unseated pin M, or broken solder connection. • If connector J5 is damaged or pin M is unseated, replace connector (para 3-9f). • If there is a broken solder connection, resolder connection (para 3-9f). • If connector J5 is good, replace wiring harness (para 3-9n).	

TABLE 3-2. DISTRIBUTION BOX TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

7. MAST CANNOT BE RAISED WHEN HYDRAULIC PUMP MODE SWITCH S6 IS IN DC

Step 1. Visually inspect distribution box HYDRAULIC connector J7 for damaged or unseated pin D, or broken solder connection.

- If connector J7 is damaged or pins are unseated, replace connector (para 3-99).
- If there is a broken solder connection, resolder connection (para 3-9g).
- If connector J7 is good, go to step 2.

Step 2. Visually inspect CONTROL connector J5 for damaged or unseated pin N, or broken solder connection.

- If connector J5 is damaged or pin N is unseated, replace connector (para 3-9f).
- If there is a broken solder connection, resolder connection (para 3-9f).
- If connector J5 is good, go to step 3.

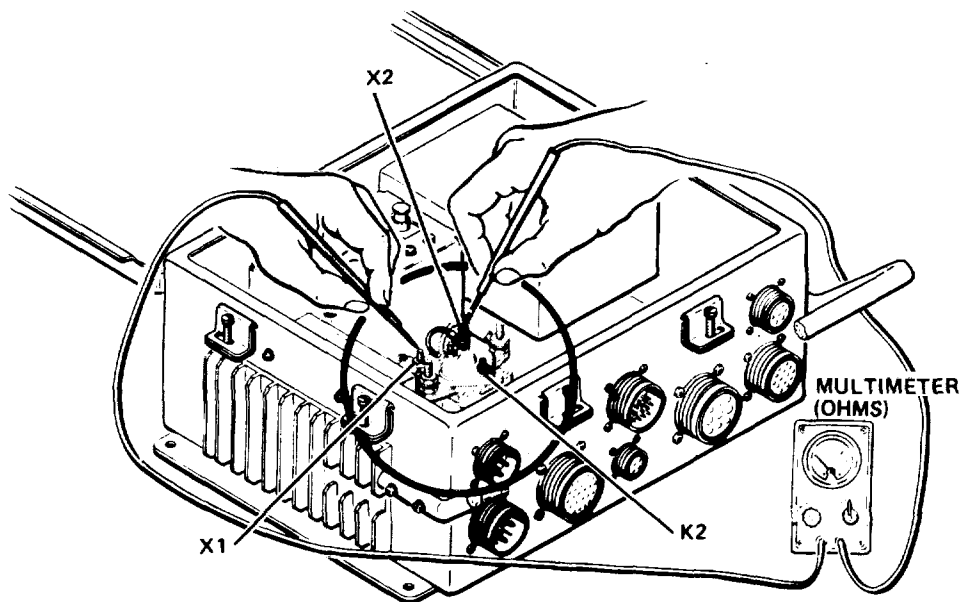
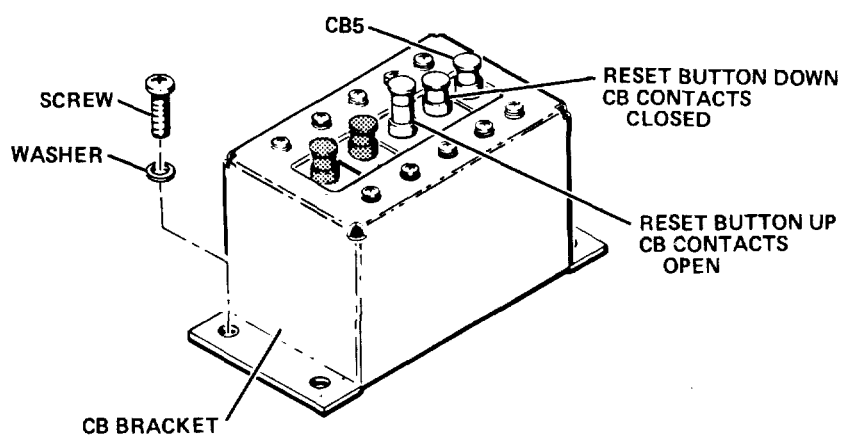


TABLE 3-2. DISTRIBUTION BOX TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

7. MAST CANNOT BE RAISED WHEN HYDRAULIC PUMP MODE SWITCH S6 IS IN DC

Step 3. Check resistance between terminals K2-X1 and K2-X2. Then reverse leads, and check resistance. Set ohmmeter on X10 scale.

- If there is an open, replace relay K2 (para 3-91).
- If there is a normal resistance reading of between 85 and 108 ohms in both directions, go to step 4.



Step 4. Remove CB bracket by removing four bracket screws and flat washers. Turn bracket over to see CB terminals.

Step 5. Check continuity between terminals 1 and 2 of circuit breaker CB5. Be sure that CB5 is closed.

- If there is continuity, replace wiring harness (para 3-9n).
- If there is no continuity, replace circuit breaker CB5 (para 3-9i, steps 4 and 5).

TABLE 3-2. DISTRIBUTION BOX TROUBLESHOOTING - Continued		
MALFUNCTION	TEST OR INSPECTION	
	CORRECTIVE ACTION	
8.	MAST CANNOT BE LOWERED, MAST ERECTION RAISE/OFF/LOWER SWITCH S1 IN LOWER POSITION	
	Step 1.	Visually inspect distribution box CONTROL connector J5 for damaged or unseated pin T, or broken solder connection.
		• If connector J5 is damaged or pin T is unseated, replace connector (para 3-9f). • If there is a broken solder connection, resolder connection (para 3-9f). • If connector J5 is good, go to step 2.
	Step 2.	Visually inspect LIMIT SWITCHES connector J2 for damaged or unseated pins F or G, or broken solder connections.
		• If connector J2 is damaged or pins are unseated, replace connector (para 3-9c). • If there is a broken solder connection, resolder connection (para 3-9c). • If connector J2 is good, go to step 3.
	Step 3.	Visually inspect HYDRAULIC connector J7 for damaged or unseated pin I, or broken solder connection.
		• If connector J7 is damaged or pin I is unseated, replace connector (para 3-9g). • If there is a broken solder connection, resolder connection (para 3-9g). • If connector J7 is good, replace wiring harness (para 3-9n).

TABLE 3-2. DISTRIBUTION BOX TROUBLESHOOTING - Continued		
MALFUNCTION	TEST OR INSPECTION	
	CORRECTIVE ACTION	
9.	MAST CANNOT BE EXTENDED, MAST EXTENSION SWITCH S3 IN OUT POSITION	
	Step 1.	Visually inspect distribution box CONTROL connector J5 for damaged or unseated pin B, or broken solder connection. • If connector J5 is damaged or pin B is unseated, replace connector (para 3-9f). • If there is a broken solder connection, resolder connection (para 3-9f). • If connector J5 is good, go to step 2.
	Step 2.	Visually inspect LIMIT SWITCHES connector J2 for damaged or unseated pins M or N, or broken solder connections. • If connector J2 is damaged or pins are unseated, replace connector (para 3-9c). • If there is a broken solder connection, resolder connection (para 3-9c). • If connector J2 is good, go to step 3.
	Step 3.	Visually inspect PNEUMATIC connector J8 for damaged or unseated pins B or C, or broken solder connection. • If connector J8 is damaged or pins are unseated, replace connector (para 3-9h). • If there is a broken solder connection, resolder connection (para 3-9h). • If connector J8 is good, replace wiring harness (para 3-9n).

TABLE 3-2. DISTRIBUTION BOX TROUBLESHOOTING - Continued		
MALFUNCTION	TEST OR INSPECTION	
	CORRECTIVE ACTION	
10.	MAST CANNOT BE RETRACTED, MAST EXTENSION SWITCH S3 IN IN POSITION	
	Step 1.	Visually inspect distribution box CONTROL connector J5 for damaged or unseated pin C, or broken solder connection. • If connector J5 is damaged or pin C is unseated, replace connector (para 3-9f). • If there is a broken solder connection, resolder connection (para 3-9f). • If connector J5 is good, go to step 2.
	Step 2.	Visually inspect PNEUMATIC connector J8 for damaged or unseated pin H, or broken solder connection. • If connector J8 is damaged or pin H is unseated, replace connector (para 3-9h). • If there is a broken solder connection, resolder connection (para 3-9h). • If connector J8 is good, replace wiring harness (para 3-9n).

TABLE 3.2. DISTRIBUTION BOX TROUBLESHOOTING - Continued		
MALFUNCTION	TEST OR INSPECTION	
	CORRECTIVE ACTION	
11.	MAST CANNOT BE LOWERED BELOW 10 DEGREES	
	Step 1.	Visually inspect distribution box CONTROL connector J5 for damaged or unseated pin S, or broken solder connection. • If connector J5 is damaged or pin S is unseated, replace connector (para 3-9f). • If there is a broken solder connection, resolder connection (para 3-9f). • If connector J5 is good, replace wiring harness (para 3-9n).

3-3. PNEUMATIC COMPONENT ASSEMBLY TROUBLESHOOTING

- Read failure symptom recorded on tag attached to faulty PCA.
- Refer to SYMPTOM INDEX and find applicable MALFUNCTION entry.
- Refer to INITIAL SETUP for preparation.
- Turn to referenced MALFUNCTION in Table 3-3 and troubleshoot as directed.

SYMPTOM INDEX

SYMPTOM	MALFUNCTION NO. (Table 3-3)
NOTE VERIFY YOU HAVE A FAULTY PCA, using the ICD for the Pneumatic Component Assembly Post-Maintenance Test, before you begin troubleshooting procedures. Also, make the necessary voltage and/or continuity checks in addition to the troubleshooting procedures to verify you have isolated the faulty part. This will help prevent you from accidentally replacing a good part (such as the wiring harness, which is difficult to replace).	
AIR PRESSURE indicator on mast control panel fails to light	3
Manifold heater does not heat when HEATER is set to ON	7
Mast fails to extend	5
Mast fails to retract	6
No compressed air output in ac mode (indicated by 0 psig at TANK PRESSURE gage)	1
No compressed air output in dc mode (indicated by 0 psig at TANK PRESSURE gage)	2
PCA fails to send run-enable signal to HCA (mast cannot be raised or lowered)	4

INITIAL SETUPTest Equipment

Multimeter AN/URM-105,
6625-00-581-2036

Sldr and desldr set, 3439-00-460-7198

Tools Heat gun HG-501

Refrig Unit Svce Tool Kit,
5180-00-596-1474

3/8 in. flat tip scdr

1/4 in. flat tip scdr

No. 2 xtip scdr

adj wr

Tools (Cont.)

lg rd nose plr
pocket knife

Equipment

Condition

Para

3-10a

Condition Description

PCA cover removed

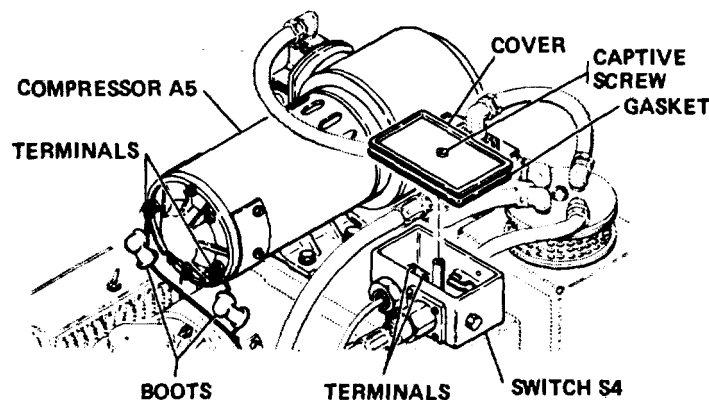
TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

1. NO COMPRESSED AIR OUTPUT IN AC MODE (INDICATED BY 0 PSIG AT TANK PRESSURE GAGE)

NOTE

If the AC compressor will not operate but you know the AC compressor indicator light was illuminated, you can presume the PCA transformer, rectifier, and capacitor are good. Therefore, you can skip troubleshooting steps 3 through 9. If the AC compressor indicator light was illuminated and there is continuity in steps 1 and 2 below, replace wire harness (para 3-10aa).

**WARNING**

Capacitor C1 stores a moderate electrical charge. Using a Screwdriver with a plastic handle, short capacitor terminals together before doing the following troubleshooting steps (see illustration accompanying step B for view of capacitor).

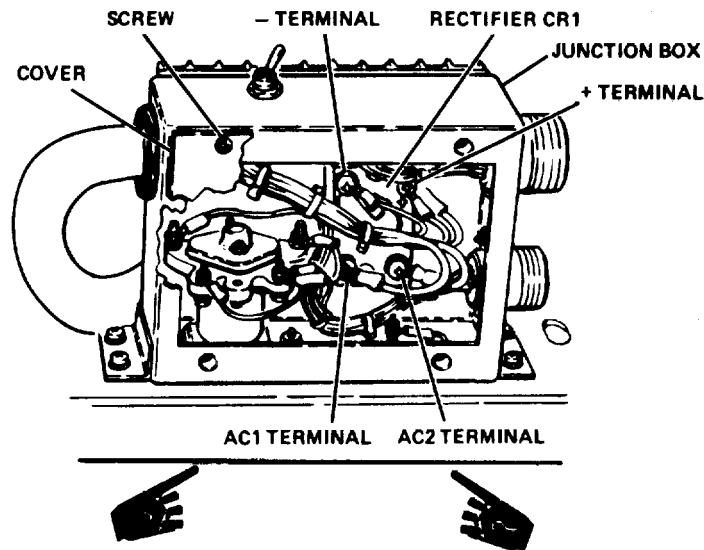
- Step 1. Slip two boots off terminals of compressor A5 and check continuity between terminals.
- If continuity is not present, either one or both compressor motor brushes are faulty. Remove and replace brushes (para 3-10b). If trouble is still present during post-maintenance test, compressor is faulty. Replace compressor A5 (para 3-10c).
 - If continuity is present, slip boots over terminals and go to next step.
- Step 2. Release captive screw, remove cover and gasket from switch S4, and check continuity between two switch terminals.
- If continuity is not present, switch S4 is faulty. Replace switch (para 3-10d).
 - If continuity is present, replace gasket and cover, secure with captive screw, and go to next step.

TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION



- Step 3. Remove four screws and remove cover from junction box.
- Step 4. Check for continuity between pin J2-B and each of terminals AC and AC on rectifier CR1.
- If continuity is present in either measurement, transformer T1 is shorted between windings. Replace transformer (para 3-10h).
 - If continuity is not present in either measurement, go to next step.
- Step 5. Check for continuity between pin J2-B and pin J2-E.
- If continuity is not present, primary winding of transformer T1 is open. Replace transformer (para 3-10h).
 - If continuity is present, go to next step.
- Step 6. Check for continuity between + and - terminals of rectifier CR1.
- If continuity is not present, secondary winding of transformer T1 is open. Replace transformer (para 3-10h).
 - If continuity is present, go to next step.

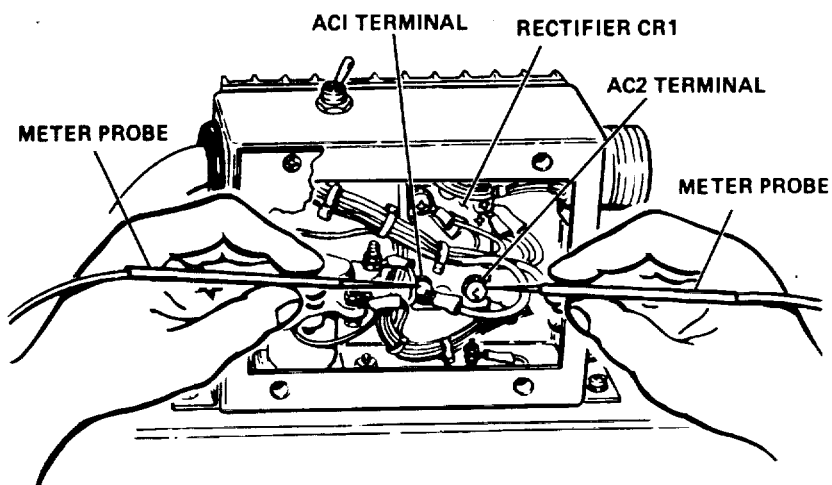
TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

1. NO COMPRESSED AIR OUTPUT IN AC MODE (INDICATED BY 0 PSIG AT TANK PRESSURE GAGE) - Continued



(TYPICAL CONTINUITY CHECK)

NOTE

The terminals of rectifier CR1 are identified as follows:

DC + = Red dot AC1 = Yellow dot (term. next to no dot term.)
 DC - = no dot AC2 = Yellow dot (term. next to red dot term.)

- Step 7. Tag and disconnect six wires from four terminals of rectifier CR1, then check resistance between terminals of rectifier as follows:

<u>pos probe</u> <u>on term</u>	<u>neg probe</u> <u>on term</u>	<u>resistance</u> <u>requirement</u>
+	AC1	high
+	AC2	high
AC1	+	low
AC2	+	low
-	AC1	low
-	AC2	low
AC1	-	high
AC2	-	high

- If any resistance is not as required, rectifier CR1 is faulty. Replace rectifier (para 3-10w).
- If all resistances are as required, go to next step.

TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

WARNING

Capacitor C1 stores a moderate electrical charge. using a screwdriver with a plastic handle, short capacitor terminals together before each measurement in step 8.

- Step 8. Loosen two retaining clamp screws, slide capacitor C1 up and out of retaining clamp, remove screw, lockwasher, flat washer and disconnect two wires at + terminal. Measure resistance, with positive probe at + terminal and negative probe at ground.
- If meter shows no resistance, steady high resistance, or steady low resistance; capacitor C1 is faulty. Replace capacitor (para 3-10i).
 - If meter shows a short surge in resistance, capacitor C1 is good. Reconnect wires and reinstall capacitor in retaining clamp. Go to next step.

- Step 9. Check J2 pins J2-B, C, E, and F for loose wire connections and loose or broken pins.
- If a defect is found, replace connector J2 (3-10z).
 - If no defects are found, replace wire harness (para 3-10aa).

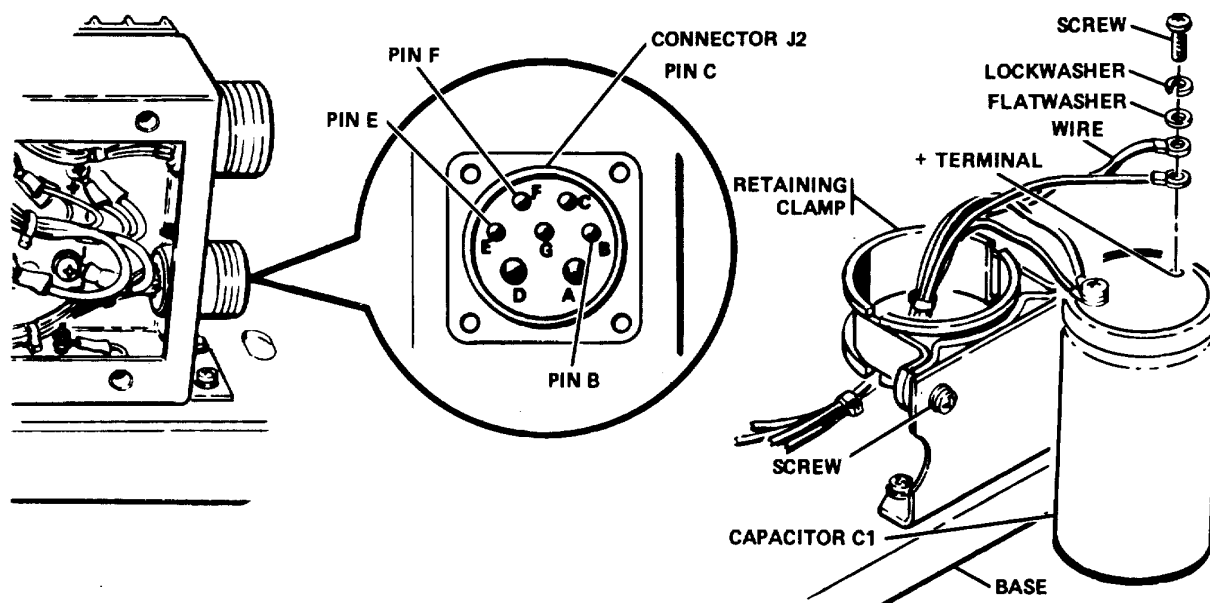
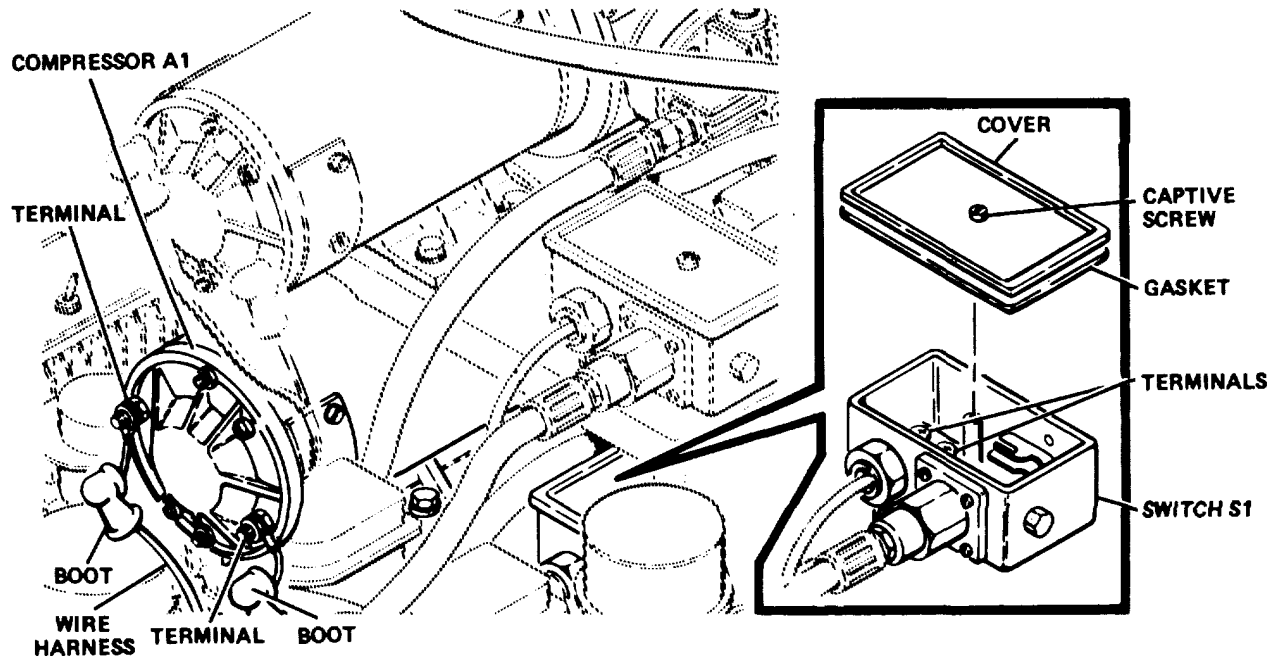


TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

2. NO COMPRESSED AIR OUTPUT IN DC MODE (INDICATED BY 0 PSIG AT TANK PRESSURE GAGE)



- Step 1. Slip two boots off terminals of compressor A1 and check continuity between terminals.
- If continuity is not present, winding in motor of compressor A1 is open. Replace compressor (para 3-10e).
 - If continuity is present, slip boots over terminals and go to next step.
- Step 2. Release captive screw, remove cover and gasket from switch S1, and check continuity between two terminals of switch.
- If continuity is not present, switch S1 is faulty. Replace switch (para 3-10f).
 - If continuity is present, replace gasket and cover, secure with captive screw, and go to next step.
- Step 3. Remove four screws and remove cover from junction box.

TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

- Step 4. Check pins J1-A and J2-A and D for loose wire connections and loose or broken pins.
- If a defect is found, replace connector J1 or J2 (para 3-10y or 3-10z) in which fault is found.
 - If no defects are found, go to next step.

- Step 5. Check continuity between the following:

<u>from pin</u>	<u>to relay K1, terminal</u>
J1-A	X2
J2-A	A1
J2-D	X1
J-A	X1

- If any continuity is not present, relay K1 is faulty. Replace relay (para 3-10v).
- If all continuities are present, wire harness is faulty. Replace wire harness (para 3-10aa).

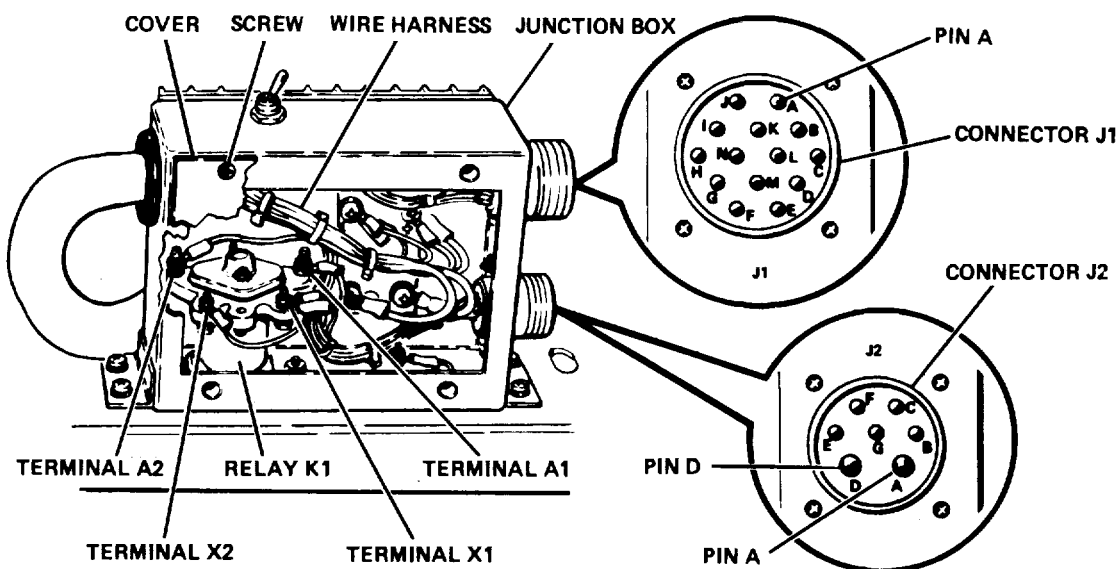


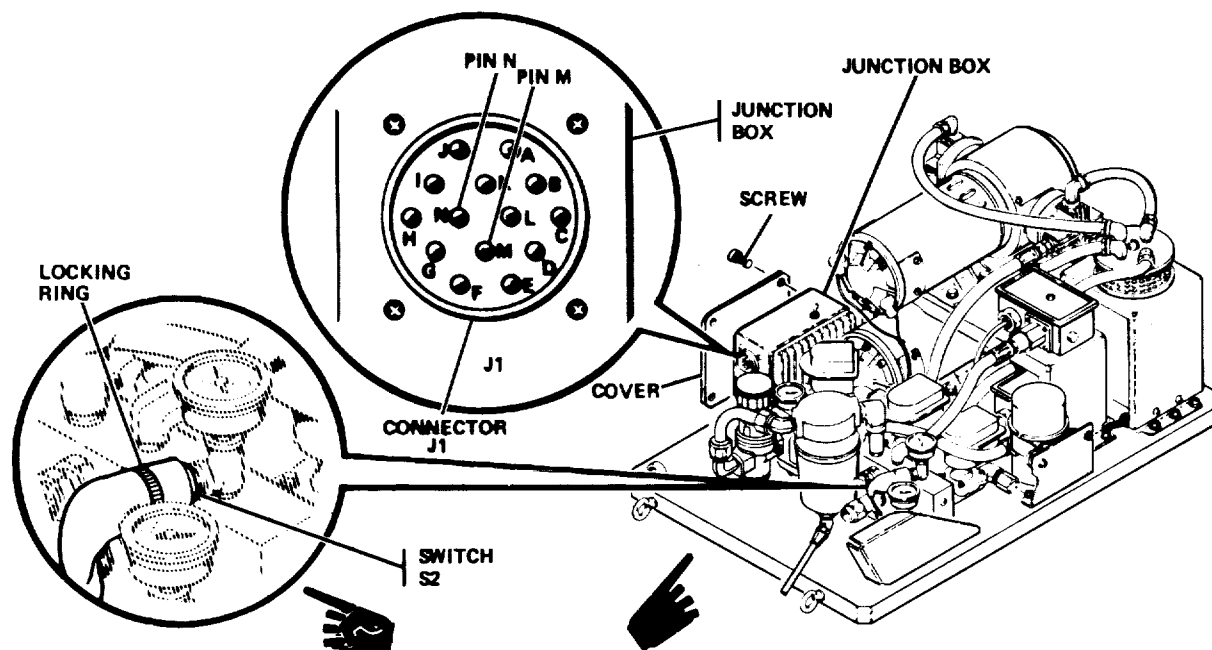
TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

3. AIR PRESSURE INDICATOR ON MAST CONTROL PANEL FAILS TO LIGHT



- Step 1 Loosen locking ring on switch S2, rotate inside portion of switch fully clockwise, (if early model, loosen setscrew on side of switch S2, rotate body of switch fully counterclockwise), and check continuity between connector pins J1-M and J1-N.
- If continuity is not present, switch S2 is faulty. Replace switch (see para 3-10K),
 - If continuity is present, go to next step.
- Step 2. Remove four screws that secure cover to junction box and remove cover.
- Step 3. Check connector pins J1-M and J1-N for loose, bent, or broken pins.
- If either pin is defective, connector J1 is faulty. Replace connector (see para 3-10y).
 - If both pins are good, wire harness is faulty. Replace wire harness (see para 3-10aa).
- Step 4. Adjust switch S2 (see para 3-23c).

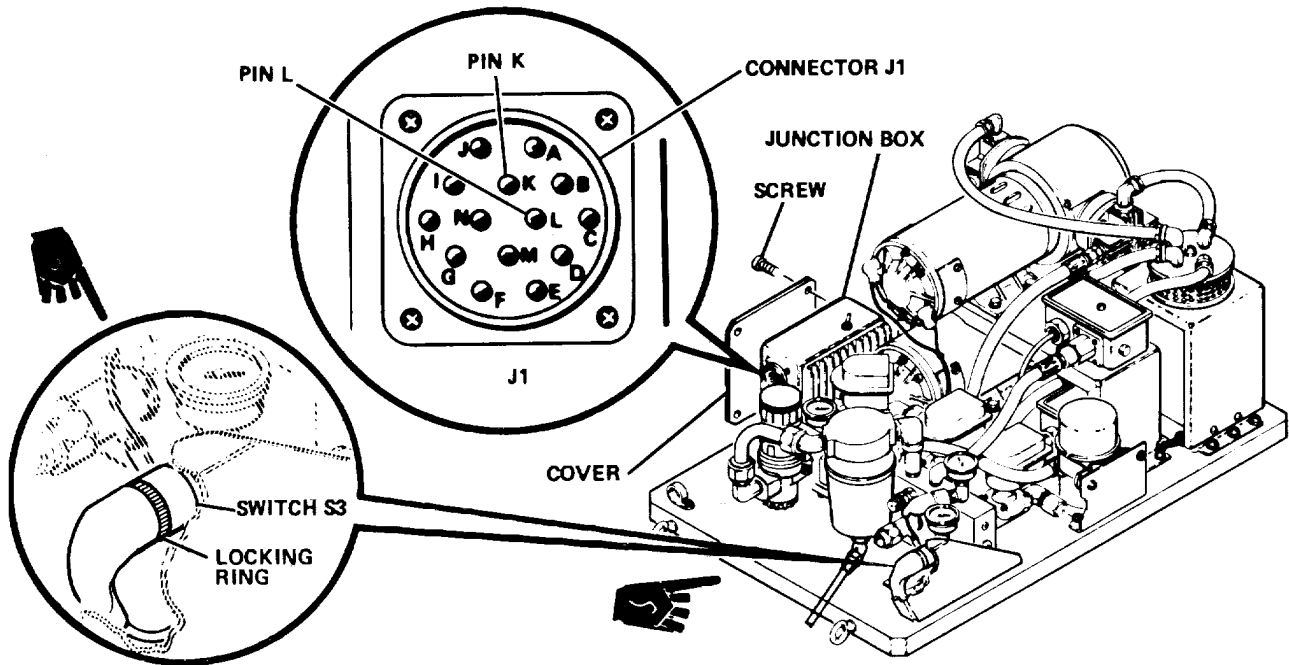
TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

4. PCA FAILS TO SEND RUN-ENABLE SIGNAL TO HCA (MAST CANNOT BE RAISED OR LOWERED)



- Step 1. Loosen locking ring on switch S3, rotate inside portion of switch fully clockwise, (if early model, loosen setscrew on side of switch S3, rotate body of switch fully counterclockwise), and check continuity between connector pins J1-K and J1-L.
- If continuity is not present, switch S3 is faulty. Replace switch (see para 3-10k).
 - If continuity is present, go to next step.
- Step 2. Remove four screws that secure cover to junction box and remove cover.
- Step 3. Check connector pins J1-K and J1-L for loose, bent, or broken pins.
- If a defect is found, connector J1 is faulty. Replace connector (see para 3-10y).
 - If both pins are good, wire harness is faulty. Replace wire harness (see para 3-10aa).
- Step 4. Adjust switch S3 (see para 3-23d).

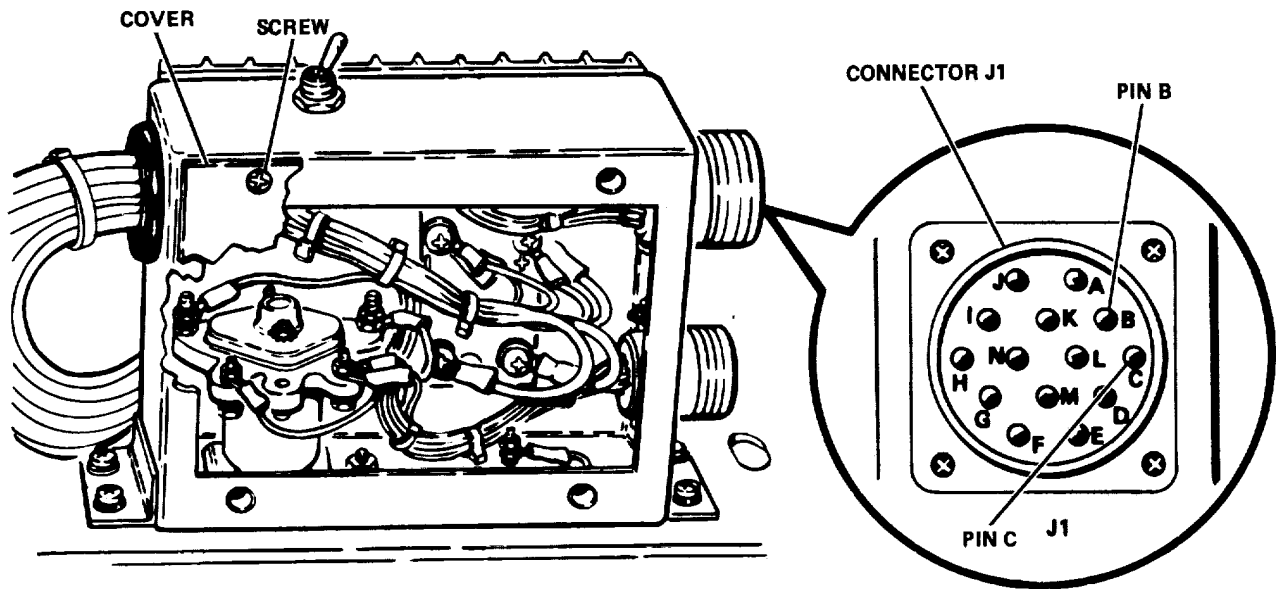
TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

5. MAST FAILS TO EXTEND (AIR PRESSURE IS AVAILABLE)



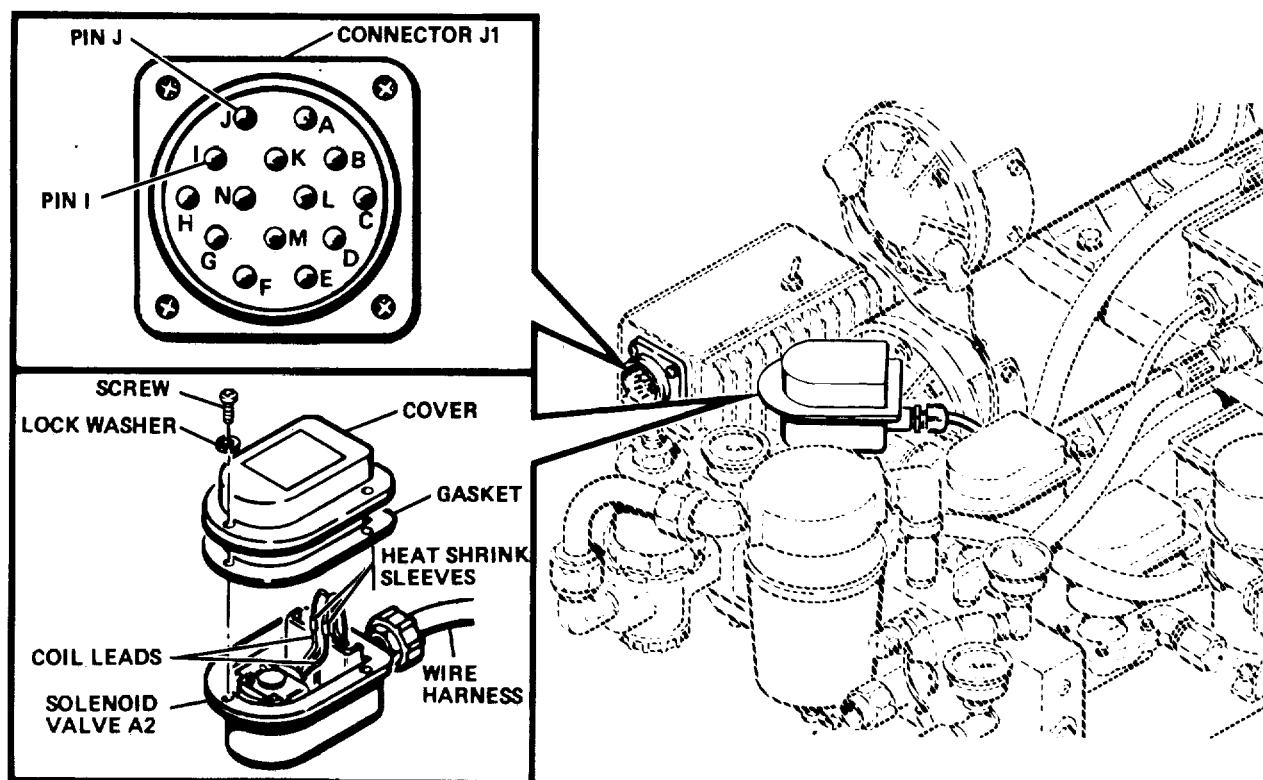
- Step 1. Check continuity between pins J1-B and C.
- If continuity is present, go to step 8.
 - If continuity is not present, go to next step.
- Step 2. Remove four screws that secure cover to junction box and remove cover.
- Step 3. Check pins J1-B and C for loose connections and loose or broken pins.
- If a defect is found, replace connector J1 (para 3-10y).
 - If no defects are found, go to next step.

TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION



- Step 4. Remove three screws and lockwashers that secure cover to solenoid valve A2 and remove cover and gasket.
- Step 5. Pull two wires out of solenoid valve A2, and carefully cut and remove two heat shrink sleeves.
- Step 6. Unsolder and disconnect two wires from solenoid valve A2 coil leads.
- Step 7. Check continuity of coil.
- If continuity is not present, solenoid valve A2 is faulty. Replace solenoid valve (para 3-10n).
 - If continuity is present, slip one piece of heat shrink sleeving over coil wires, resolder wires (either wire to either harness wire), apply heat to shrink sleeving, install cover, and go to next step.
- Step 8. Check continuity between pins J1-I and J.
- If continuity is not present, go to next step.
 - If continuity is present, go to step 10.

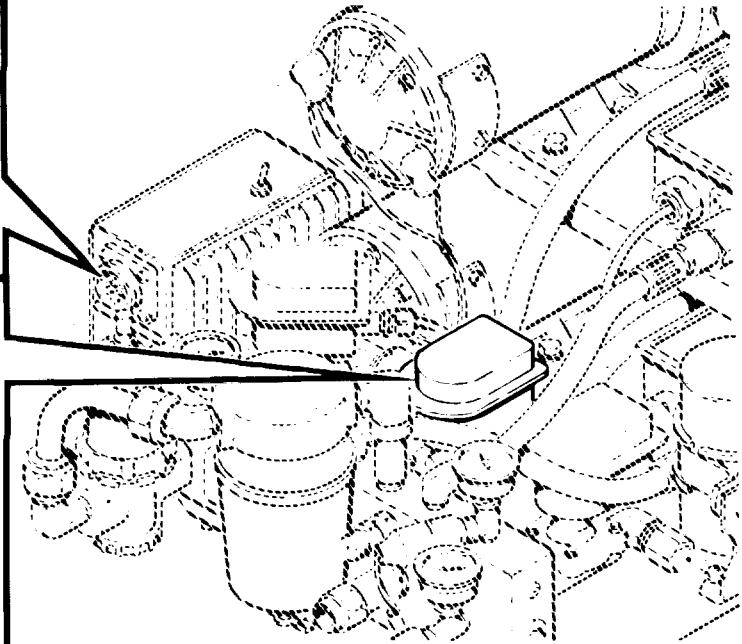
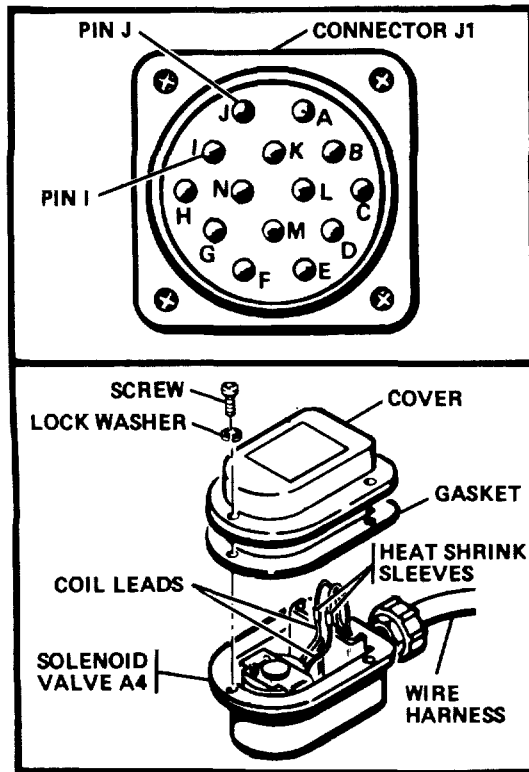
TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

5. MAST FAILS TO EXTEND - Continued



- Step 9. Check pins J1-I and J for loose connections and loose or broken pins.
- If defect-is found, replace connector J1 (para 3-10y).
 - If no defects are found, go to next step.
- Step 10. Remove three screws and lockwashers that secure cover to solenoid valve A4 and remove cover and gasket.
- Step 11. Pull two wires out of solenoid valve A4 and carefully cut and remove two heat shrink sleeves.
- Step 12. Unsolder and disconnect two wires from coil lead wires of solenoid valve A4.

TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
Step 13.	Check continuity of coil. • If continuity is not present, solenoid valve A4 is faulty. Replace solenoid valve (para 3-101). • If continuity is present, wire harness is faulty. Replace wire harness (para 3-10aa).	

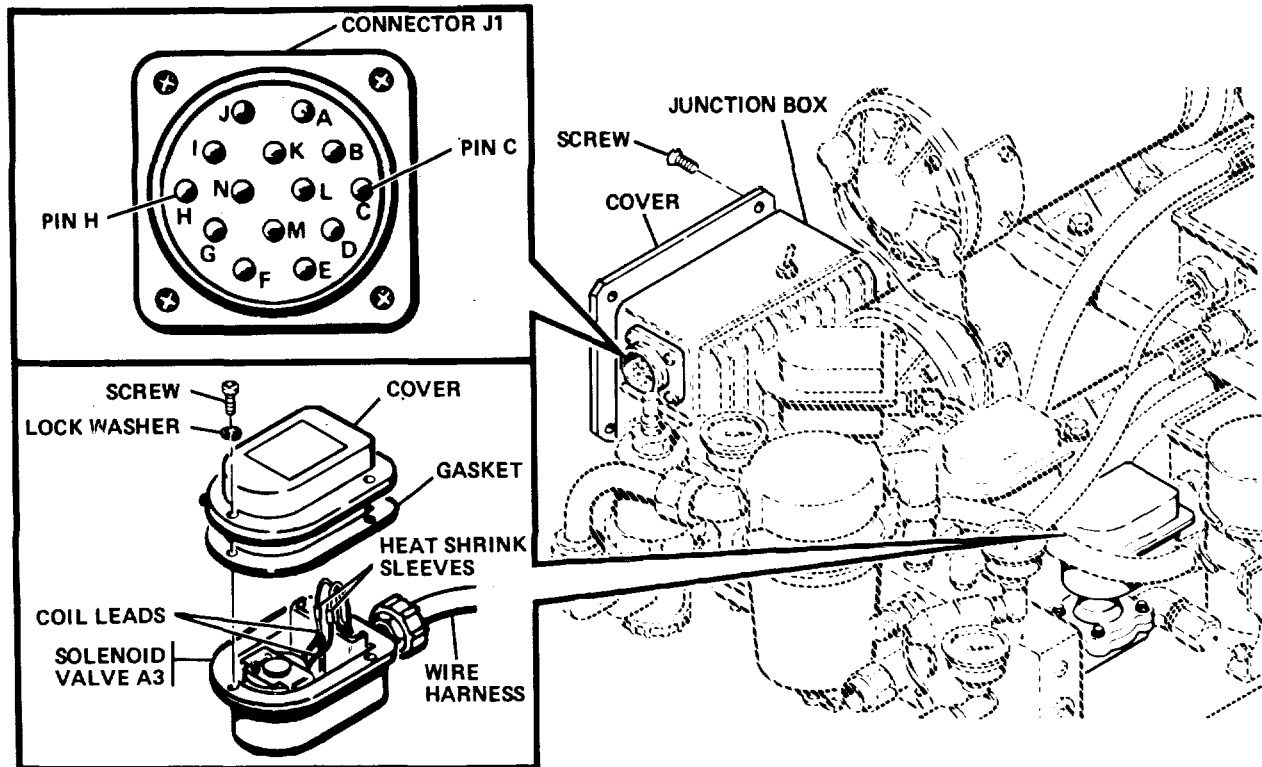
TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

6. MAST FAILS TO RETRACT



- Step 1. Check continuity between pins J1-C and H.
- If continuity is present, go to step 4.
 - If continuity is not present, go to next step.
- Step 2. Remove four screws that secure cover to junction box and remove cover.

TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
Step 3.	Check pins J1-C and H for loose connections and loose or broken pins. • If a defect is found, replace connector J1 (para 3-10y). • If no defects are found, go to next step.	
Step 4.	Remove three screws and lockwashers that secure cover to solenoid valve A3 and remove cover and gasket.	
Step 5.	Pull two wires out of solenoid valve A3 and carefully cut and remove two heat shrink sleeves.	
Step 6.	Unsolder and disconnect two wires from leads of solenoid valve A3 coil.	
Step 7.	Check continuity of coil. • If continuity is not present, solenoid valve A3 is faulty. Replace solenoid valve A3 (para 3-10m). • If continuity is present, wire harness is faulty. Replace wire harness (para 3-10aa).	

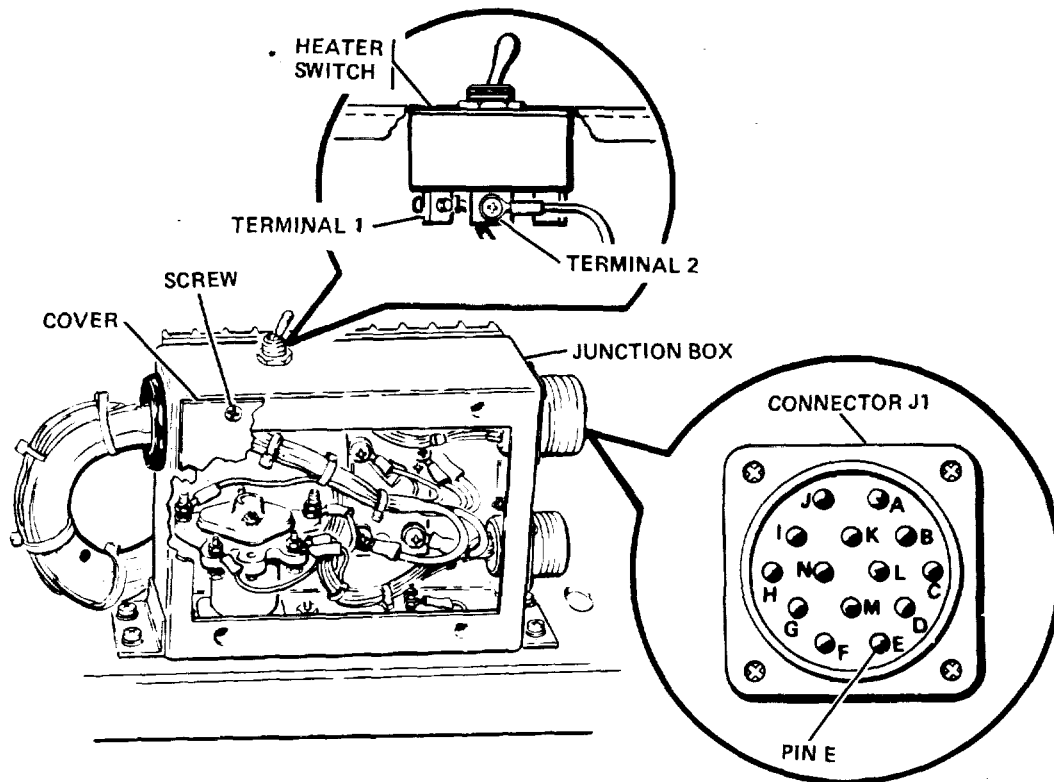
TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

7. MANIFOLD HEATER DOES NOT HEAT WHEN HEATER SWITCH IS SET TO ON



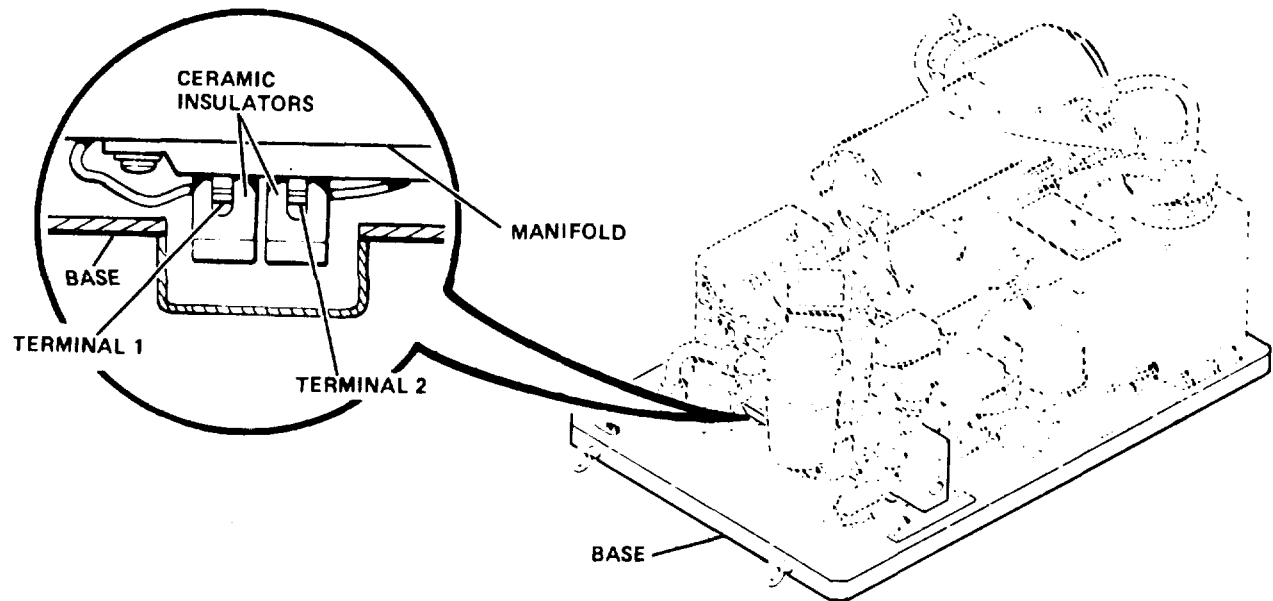
- Step 1. Remove four screws that secure cover to junction box and remove cover.
- Step 2. Check pin J1-E for loose connection and loose or broken pin.
- If a defect is found, replace connector J1 (para 3-10y).
 - If no defect is found, go to next step.
- Step 3. Set HEATER switch on junction box to ON.
- Step 4. Check continuity (on 2K ohm range) between terminals 1 and 2 of HEATER switch.
- If continuity is not present, switch is faulty. Re place switch (para 3-10x).
 - If continuity is present, go to next step.

TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

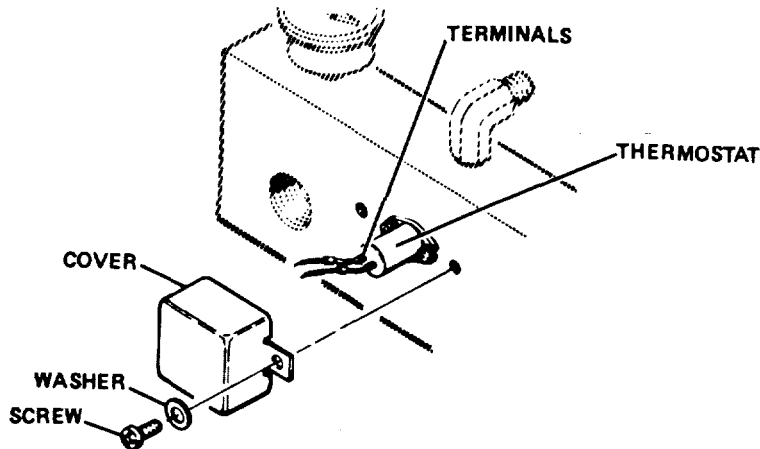


- Step 5. Using holes in ceramic insulators for access, check continuity (on 2K ohm range) between terminals 1 and 2 of manifold heater.
- If continuity is not present, manifold heater element is faulty. Replace manifold heater element (para 3-10u).
 - If continuity is present, go to next step.

TABLE 3-3. PCA TROUBLESHOOTING - Continued

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

7. MANIFOLD HEATER DOES NOT HEAT WHEN HEATER SWITCH IS SET TO ON - Continued



Step 6. Remove two screws and washers that secure thermostat cover to manifold and remove cover.

Step 7. Turn heater switch off. Check continuity between thermostat terminals.

- If continuity is present, wire harness is faulty. Replace wire harness (para 3-10aa).
- If continuity is not present, thermostat is faulty. Replace thermostat (para 3-10t).

NOTE

Perform additional continuity checks on wire homes as required before condemning wire harness.

3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING

- Read failure symptom recorded on tag attached to faulty Hydraulic Component Assembly (HCA).
- Refer to SYMPTOM INDEX and find applicable MALFUNCTION entry.
- Refer to INITIAL SETUP for preparation.
- Turn to referenced MALFUNCTION in Table 3-4 and troubleshoot as directed.

SYMPTOM INDEX	
SYMPTOM	MALFUNCTION NO. (Table 3-4)
NOTE VERIFY YOU HAVE A FAULTY HYDRAULIC COMPONENT ASSEMBLY using the ICD per the Hydraulic Component Assembly Post-Maintenance Test before you begin troubleshooting procedures. Also, make the necessary voltage and/or continuity checks in addition to the troubleshooting procedures to verify you have isolated the faulty part. This will help prevent you from accidentally replacing a good part (such as the wiring harness, which is difficult to replace). HCA oil reservoir does not heat during cold weather operation No hydraulic control to lower mast (pump is operating) No hydraulic power in ac mode (pump is operating) No hydraulic power in ac mode (pump is not operating) No hydraulic power in dc mode (pump is not operating)	
	5
	4
	2
	1
	3

INITIAL SETUPTest Equipment

Multimeter AN/URM-105,
6625-00-581-2036

Equipment

Condition
Para
3-11a

Condition Description

HCA cover removed

Tools

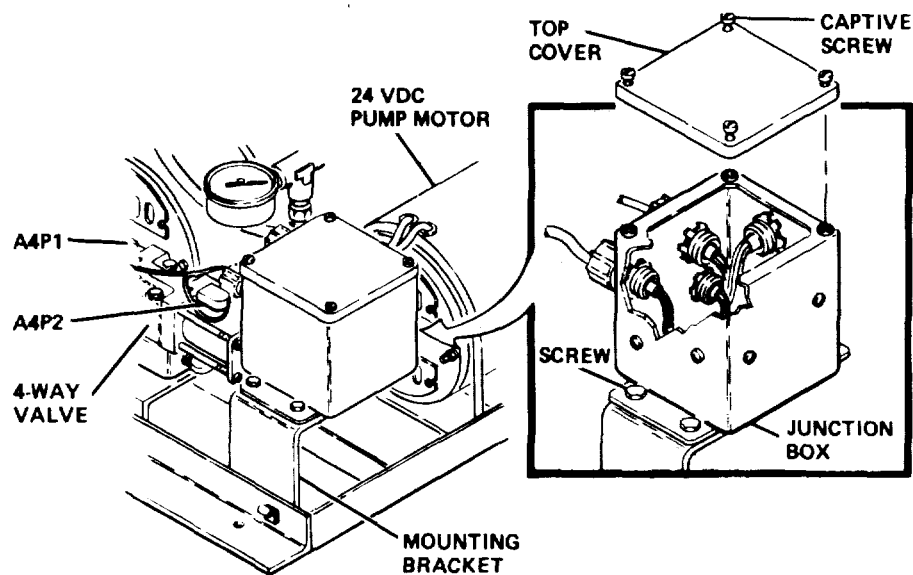
Refrig Unit Svce Tool Kit,
5180-00-596-1474
1/4 in. flat tip scdr
No. 2 xtip scdr
3/8 in. comb. wr
1/2 in. comb. wr
Long nose plr
1/2 in. skt
3/8 in. skt
Rcht wr
Rcht wr ext

TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING - Continued

MALFUNCTION**TEST OR INSPECTION****CORRECTIVE ACTION**

1. NO HYDRAULIC POWER IN AC MODE (PUMP IS NOT OPERATING)

Step 1. Loosen four captive screws securing top cover of junction box, and remove cover.



Step 2. Remove two screws with nuts and washers securing junction box to mounting bracket. (Use 1/2 in. comb. wrench if needed to keep nuts from turning.)

Step 3. Disconnect A4P1 and A4P2 from 4-way valve.

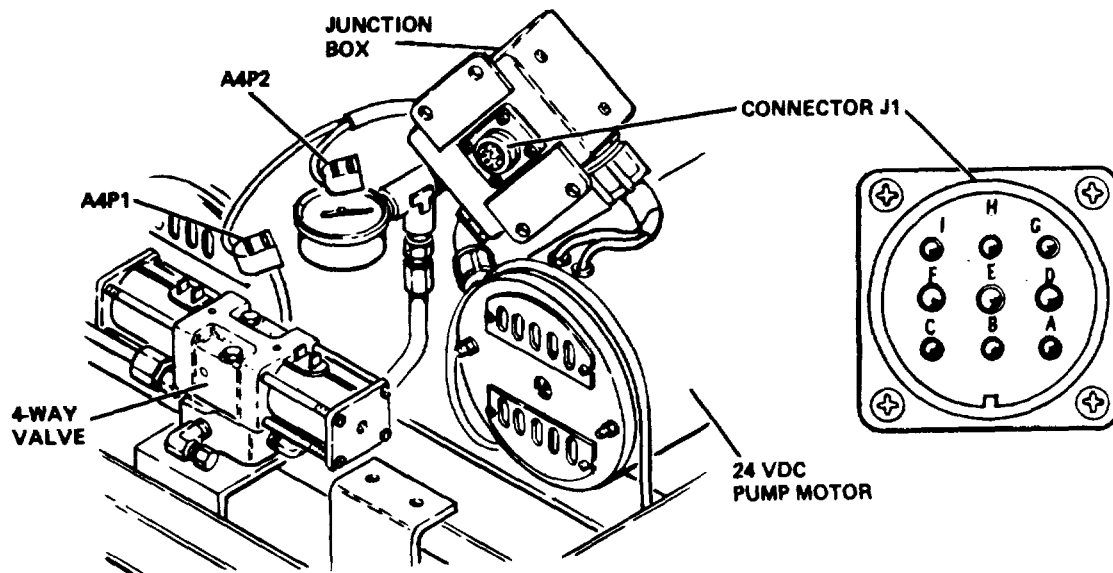
TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

- Step 4. Remove connector J1 by removing four nuts, screws and washers securing connector in junction box.
- Step 5. Lift and rotate junction box up and lay it over the 24 Vdc pump motor so connector J1 is visible.



- Step 6. Inspect connector J1 for damaged or unseated pins, or broken solder connections.
- If connector J1 is damaged or pins are unseated, replace wire harness W1 (para 3-11k).
 - If there is a broken solder connection, resolder connection.
 - If connector J1 is good, go to step 7.

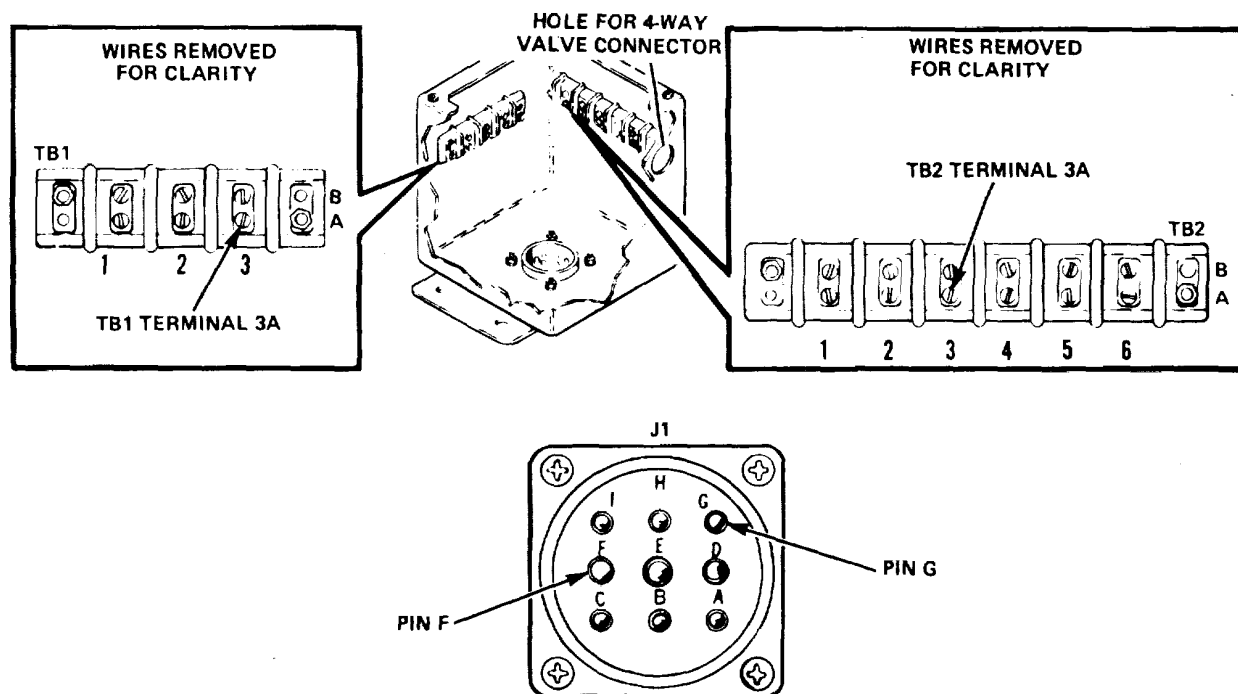
TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

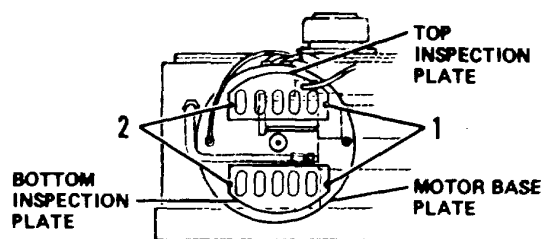
1. NO HYDRAULIC POWER IN AC MODE (PUMP IS NOT OPERATING) - Continued



Step 7. Check continuity between connector J1 pin F and TB1 terminal 3A, and between connector J1 pin G and TB2 terminal 3A.

- If there is no continuity in either check, replace wiring harness W1 (para 3-11k).
- If there is continuity in both checks, go to step 8.

Step 8.



Remove two inspection plates from 90 Vdc pump motor base plate:

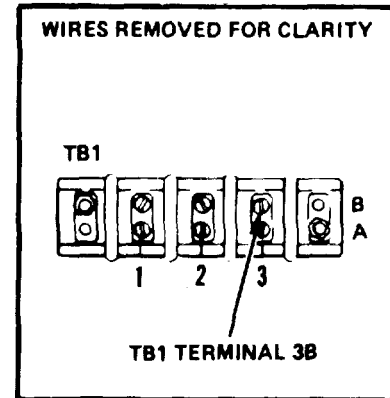
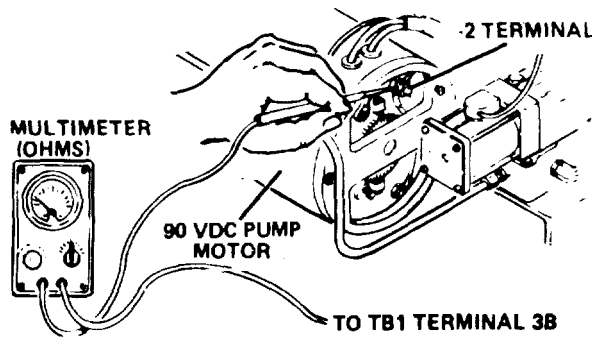
- a. Loosen two screws (1) in top and bottom inspection plates.
- b. Remove two screws (2) from top and bottom inspection plates, and then remove both plates.

TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING - Continued

MALFUNCTION

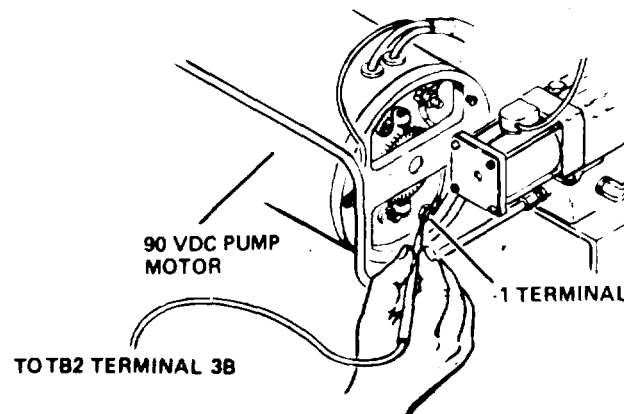
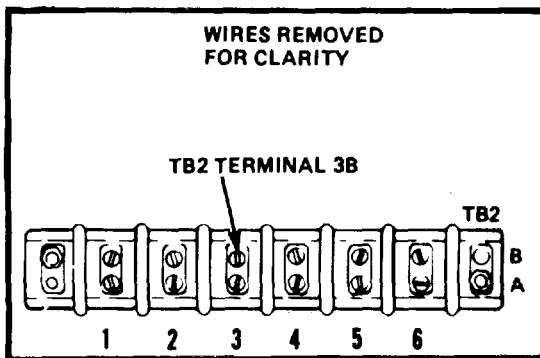
TEST OR INSPECTION

CORRECTIVE ACTION



Step 9. Check for closed circuit (continuity) between TB1 terminal 3B and 90 Vdc pump motor -2 terminal.

- If circuit is open (no continuity or no resistance indication), replace cable assembly W4 (para 3-11h).
- If circuit is closed, go to step 10.



Step 10. Check for closed circuit (continuity) between TB2 terminal 3B and 90 Vdc pump motor -1 terminal.

- If circuit is open (no continuity or no resistance indication), replace cable assembly W4 (para 3-11h).
- If circuit is closed, replace 90 VDC pump motor (para 3-11p).

TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING - Continued

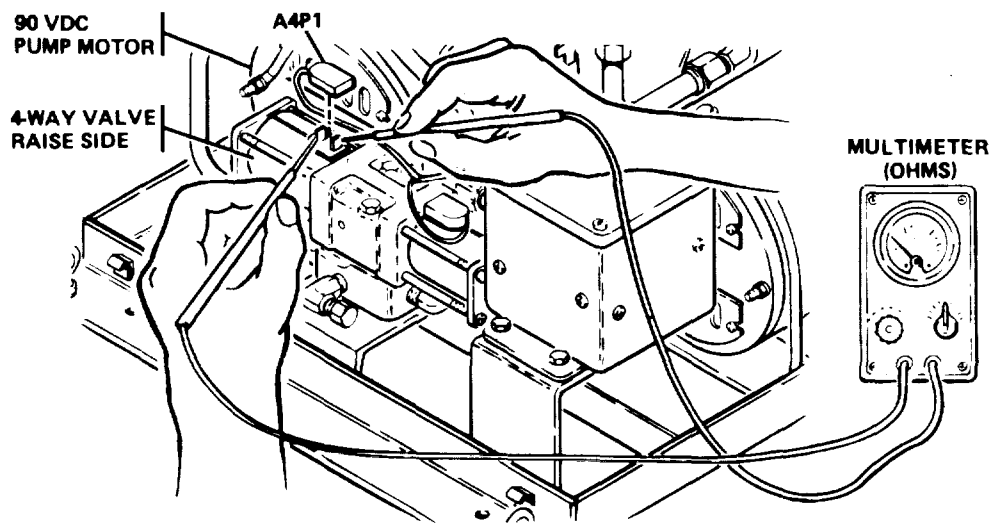
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

2. NO HYDRAULIC POWER IN AC MODE (PUMP IS OPERATING)

Step 1. Disconnect connector A4P1 from the A side (raise side) of the 4-way valve.



Step 2. Check continuity between + and - terminals of raise side of the 4-way valve.

- If there is no continuity, replace 4-way valve (para 3-11e).
- If there is continuity, reconnect connector A4P1 to the A side (raise side) of the 4-way valve and go to step 3.

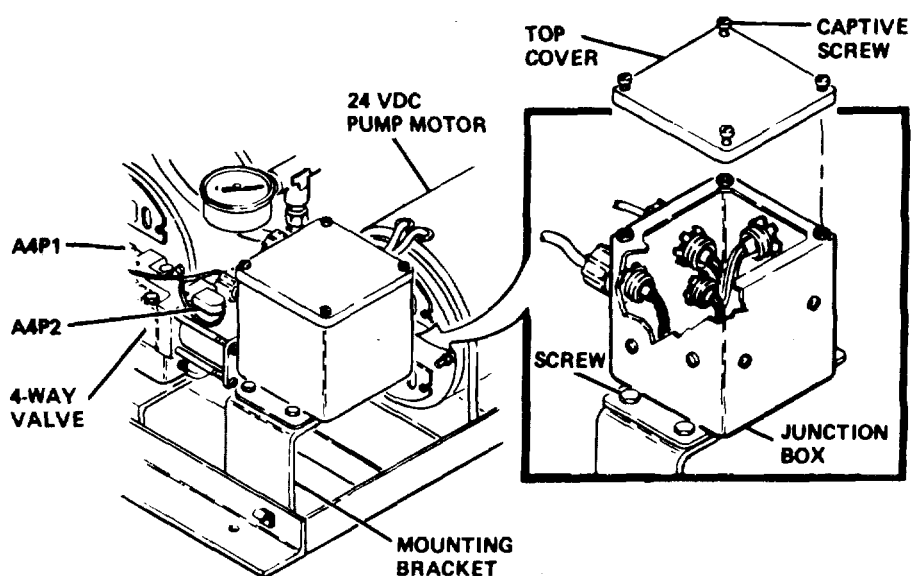
TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

Step 3. Loosen four captive screws securing top cover of Junction box, and remove cover.



Step 4. Check continuity between TB2 terminal 2B and TB1 terminal 1B.

- If there is no continuity, replace cable assembly W5 (para 3-11j).
- If there is continuity, replace wire harness W1 (para 3-11k).

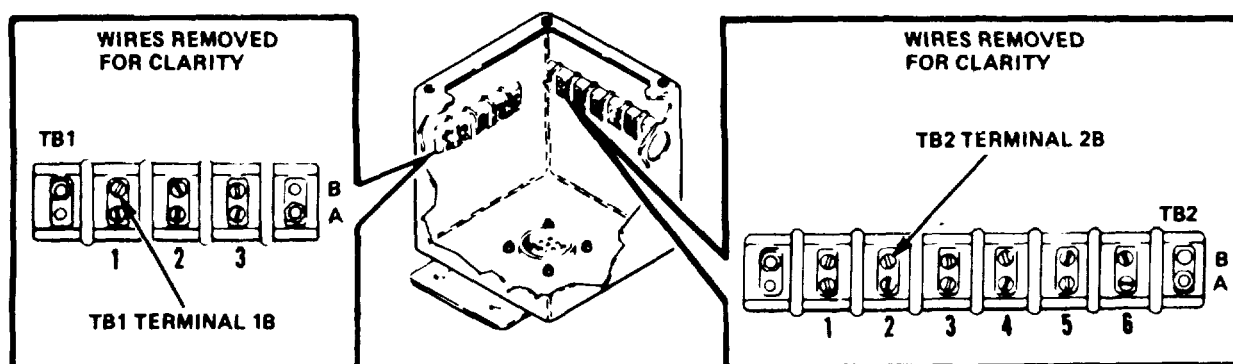


TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING - Continued

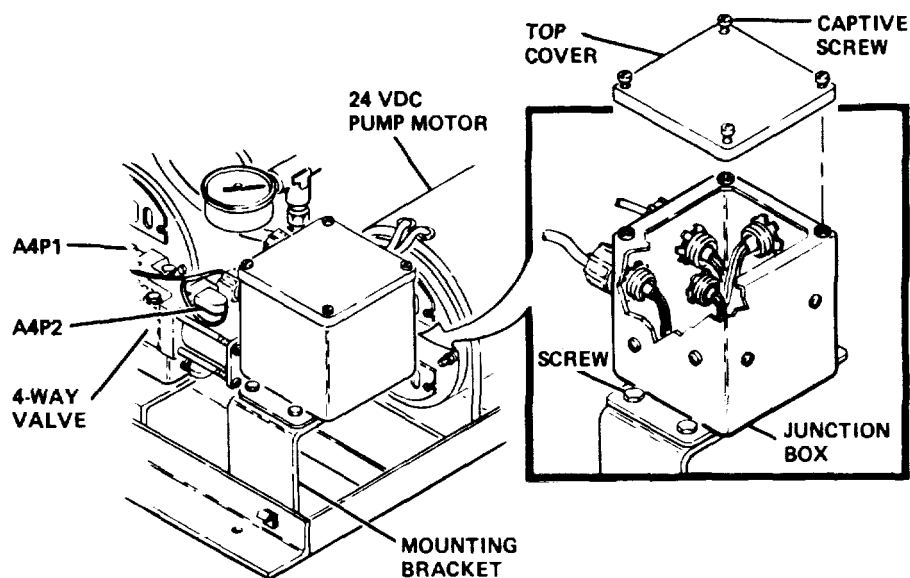
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

3. NO HYDRAULIC POWER IN DC MODE (PUMP IS NOT OPERATING)

Step 1. Loosen four captive screws securing top cover of junction box and remove cover.



Step 2. Remove two screws with nuts and washers securing junction box to mounting bracket. (Use 1/2 in. comb. wrench if needed to keep nuts from turning.)

Step 3. Disconnect A4P1 and A4P2 from 4-way valve.

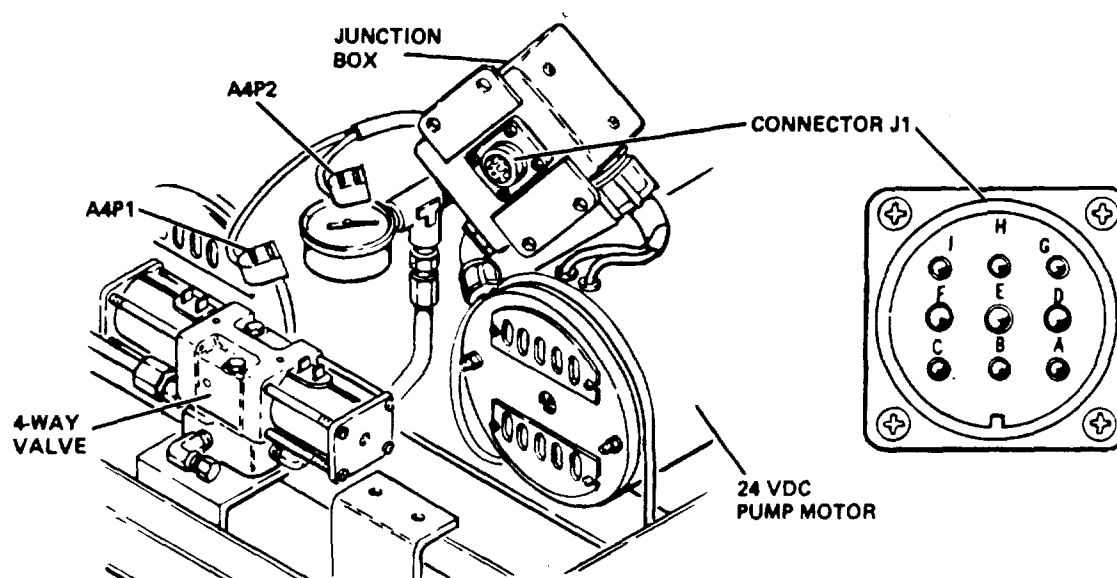
TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

- Step 4. Remove connector J1 by removing four nuts, screws and washers securing connector in junction box.
- Step 5. Lift and rotate junction box up and lay it over the 24 Vdc pump motor so connector J1 is visible.



- Step 6. Visually inspect connector J1 for damaged or unseated pins, or broken solder connections.
- If connector J1 is damaged or pins are unseated, replace wire harness W1 (para 3-11k).
 - If there is a broken solder connection, resolder connection.
 - If connector J1 is good, go to step 7.

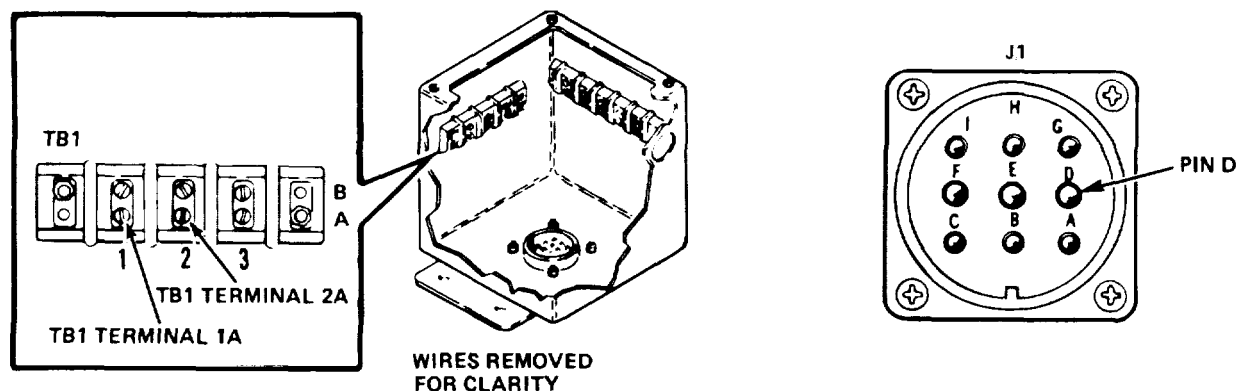
TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

3. NO HYDRAULIC POWER IN DC MODE (PUMP IS NOT OPERATING) - Continued



Step 7. Check continuity between connector J1 pin E and TB 1 terminal 1A, and between connector J1 pin D and TB1 terminal 2A.

- If there is no continuity in either check, replace wire harness W1 (para 3-11k).
- If there is continuity in both checks, go to step 8.

Step 8. Remove top inspection plate from 24 Vdc pump motor base plate:

- Loosen screw (1) in top inspection plate.
- Remove screw (2) from top inspection plate and then remove top plate.

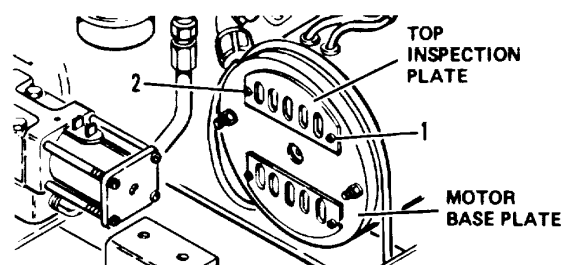
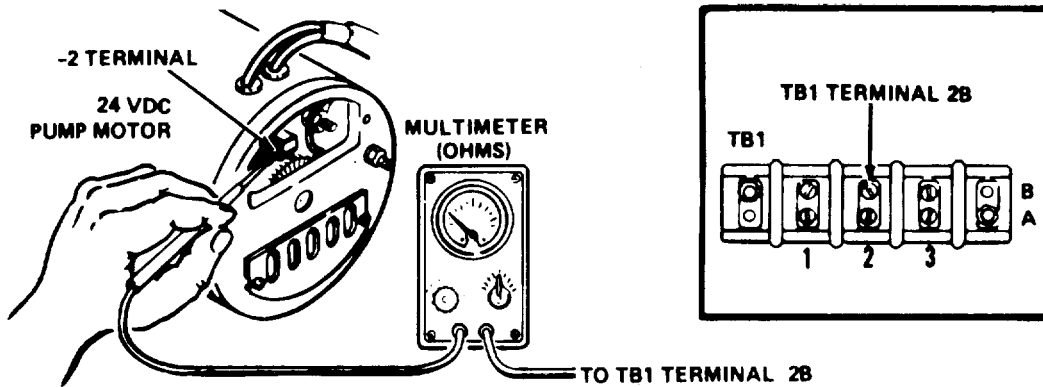


TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING - Continued

MALFUNCTION

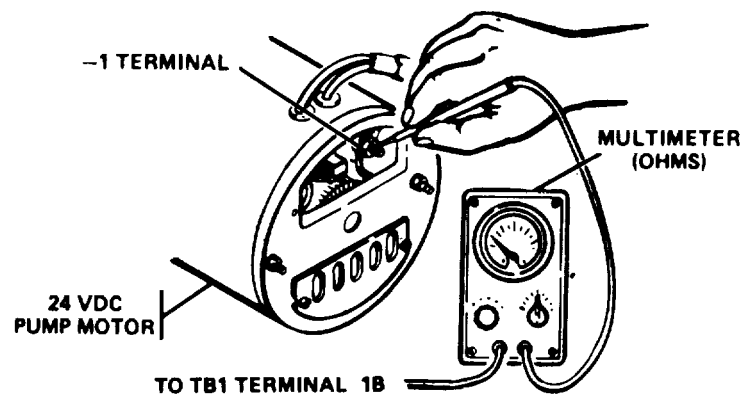
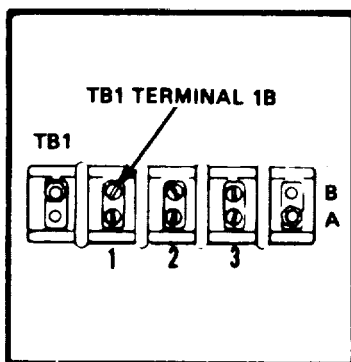
TEST OR INSPECTION

CORRECTIVE ACTION



Step 9. Check for closed circuit (continuity) between TB1 terminal 2B and 24 Vdc pump motor -2 terminal.

- If circuit is open (no continuity or no resistance indication), replace cable assembly W3 (para 3-11g).
- If circuit is closed, go to step 10.



Step 10. Check for closed circuit (continuity) between. TB1 terminal 1B and 24 Vdc pump motor -1 terminal.

- If circuit is open (no continuity or no resistance indication), replace cable assembly W3 (para 3-11g).
- If circuit is closed, replace 24 Vdc pump motor (para 3-11o).

TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING - Continued

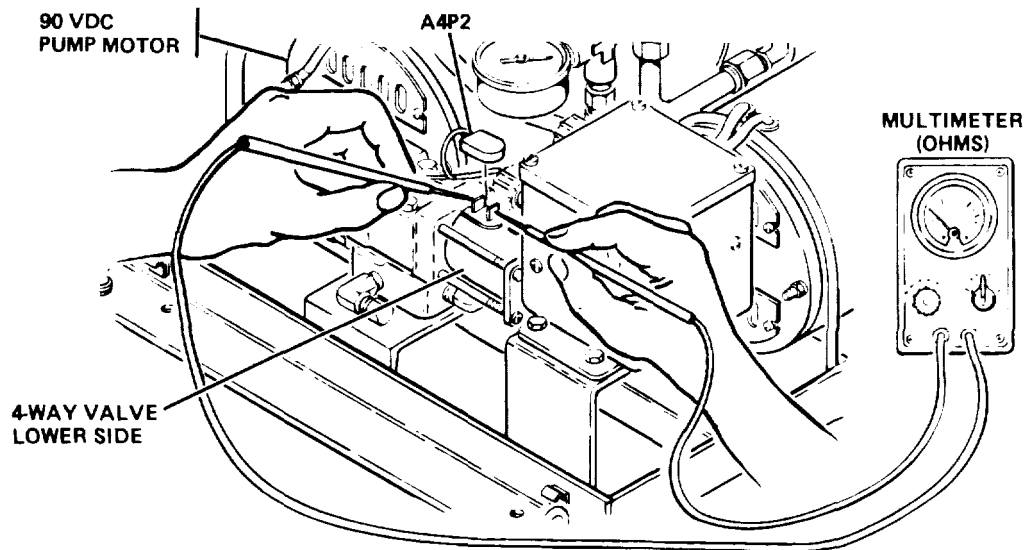
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

4. NO HYDRAULIC CONTROL TO LOWER MAST (PUMP IS OPERATING)

Step 1. Disconnect connector M P2 from the B side (lower side) of the 4-way valve.

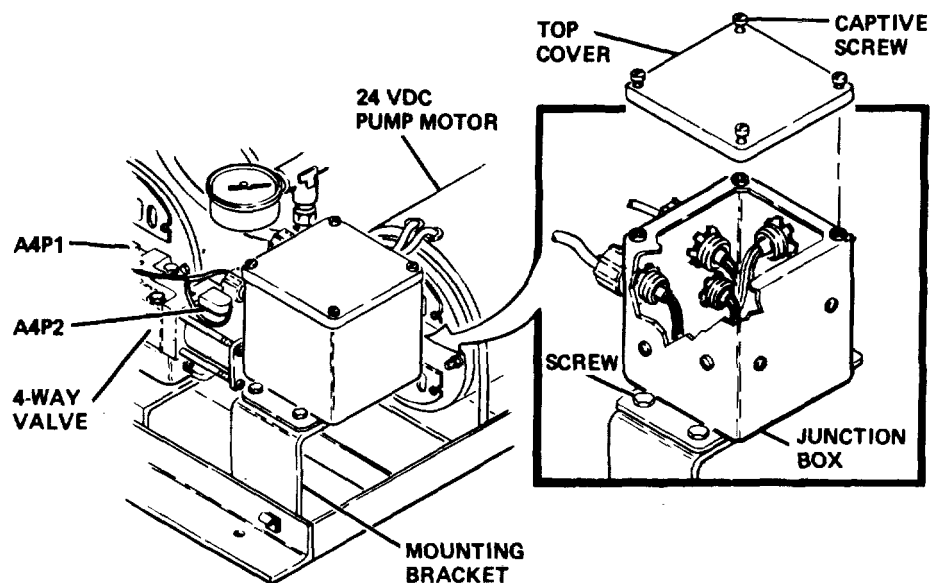


Step 2. Check continuity between + and - terminals of lower side of the 4-way valve.

- If there is no continuity, replace 4-way valve (para 3-11e).
- If there is continuity, reconnect connector A4P2 to the 4-way valve and go to step 3.

TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION**

Step 3. Loosen four captive screws securing top cover of junction box, and remove cover.



Step 4. Check continuity between TB1 terminal 1B and TB2 terminal 1B.

- If there is no continuity, replace cable assembly W5 (para 3-11j).
- If there is continuity, replace wiring harness W1 (para 3-11k).

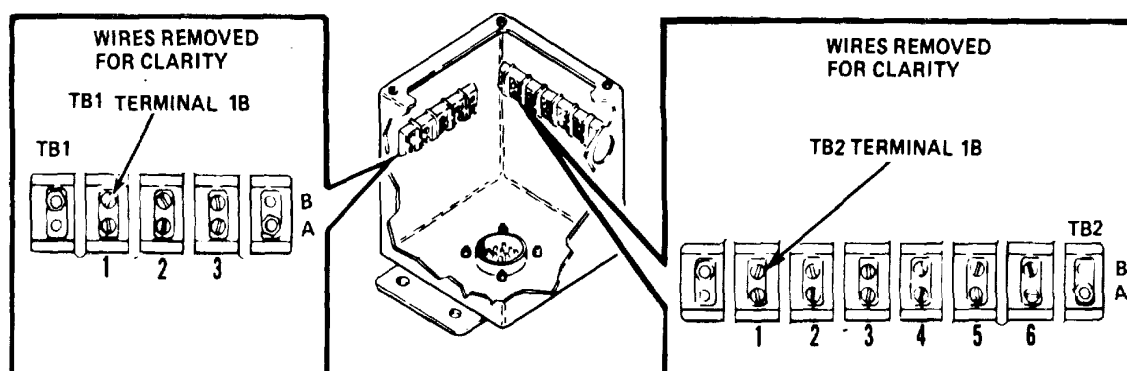
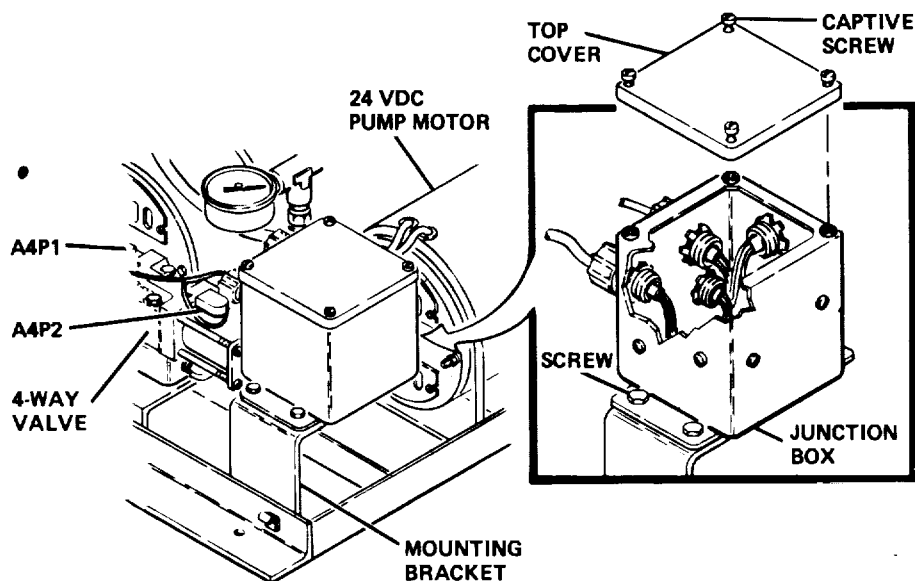


TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****5. HCA OIL RESERVOIR DOES NOT HEAT DURING COLD WEATHER OPERATION**

Step 1. Loosen four captive screws securing top cover of junction box, and remove cover.



Step 2. Remove two screws with nuts and washers securing junction box to mounting bracket. (Use 1/2 in. comb. wrench if needed to keep nuts from turning.)

Step 3. Disconnect A4P1 and A4P2 from 4-way valve.

TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING-Continued

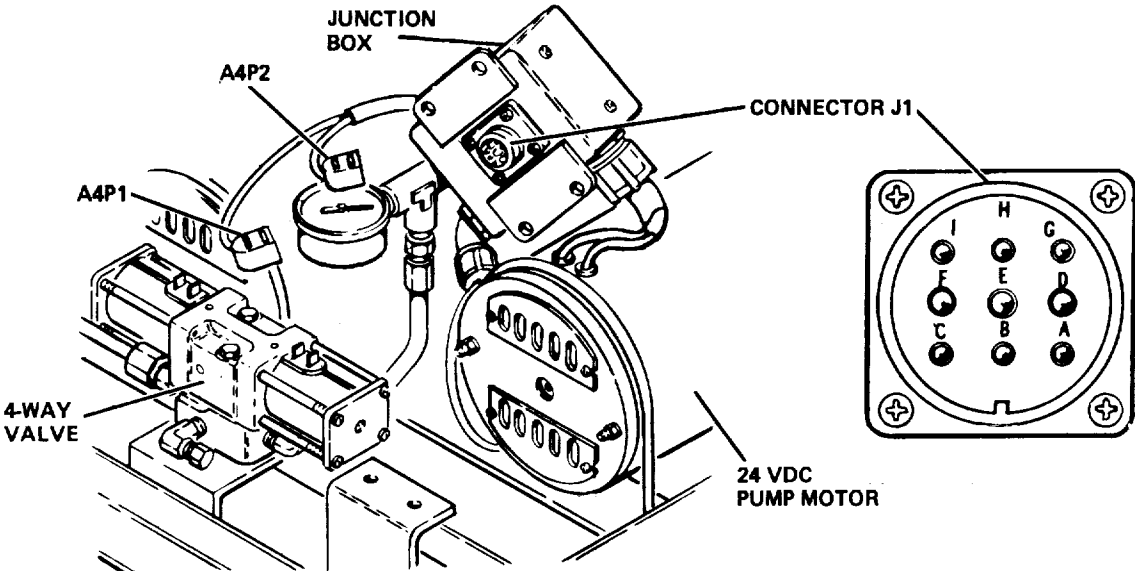
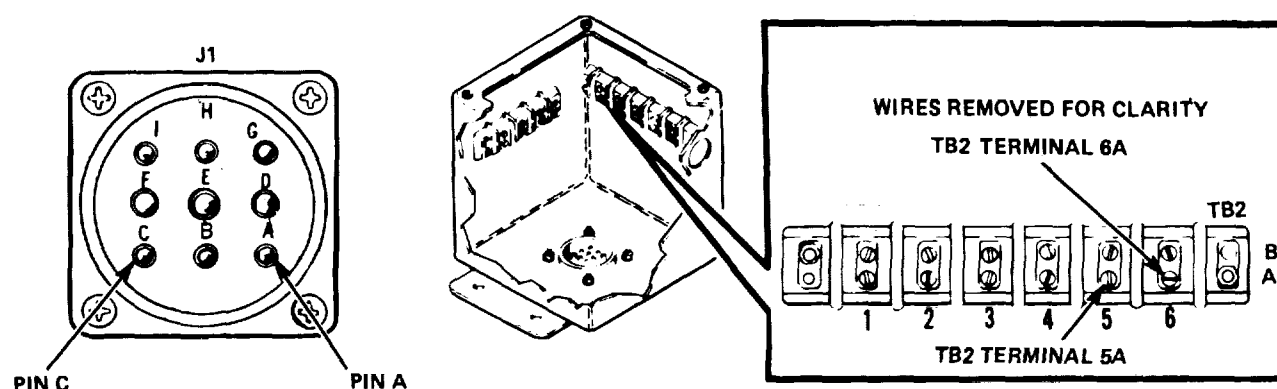
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
Step 4.	Remove connector J1 by removing four nuts, screws and washers securing connector in junction box.	
Step 5.	Lift and rotate junction box up and lay it over the 24 Vdc pump motor so connector J1 is visible.	
 The diagram illustrates the assembly of hydraulic components. A junction box is shown being lifted and rotated over a 24 VDC pump motor. The junction box contains connector J1, which is a circular connector with pins labeled A through I. The 4-way valve is also shown, with connectors A4P1 and A4P2. The 24 VDC pump motor is a cylindrical component with a circular face. The diagram shows the junction box being positioned over the pump motor to inspect connector J1.		
Step 6.	Inspect connector J1 for damaged or unseated pins, or broken solder connections.	• If connector J1 is damaged or pins are unseated, replace wire harness W1 (para 3-11k). • If there is a broken solder connection, resolder connection. • If connector J1 is good, go to step 7.

TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****5. HCA OIL RESERVOIR DOES NOT HEAT DURING COLD WEATHER OPERATION - Continued**

Step 7. Check continuity between connector J1 pin A and TB2 terminal 6A, and between connector J1 pin C and TB2 terminal 5A.

- If there is no continuity, replace wire harness W1 (para 3-11k).
- If there is continuity, go to step 8.
-

Step 8. Remove either one screw (1) and washer (2), or two screws (3) (depending upon which model heater you have) securing cover (4) to heater (5). Remove cover (4).

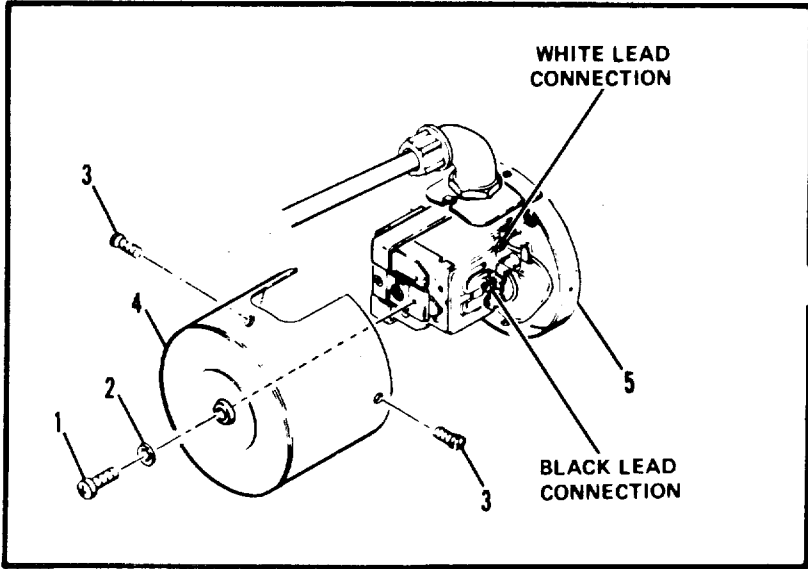
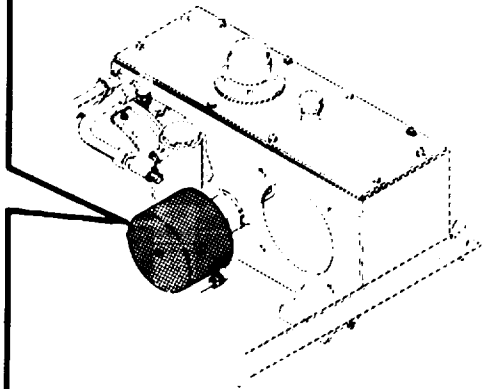
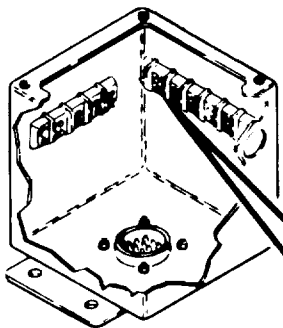
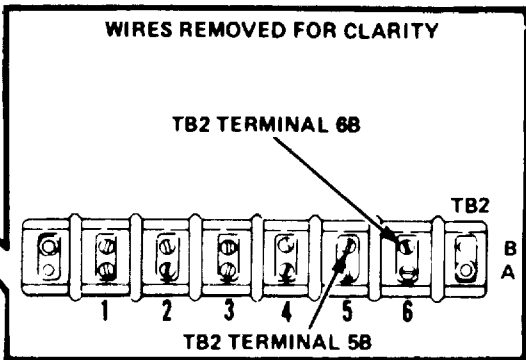
Step 9. Check continuity between TB2 terminal 6B and where black lead connects to heater, and between TB2 terminal 5B and where white lead connects to heater.

NOTE

A bare wire connects the brass terminal of the heater thermostat to the silver terminal of the heater element.

- If there is not continuity in either check, replace cable assembly W2 (para 3-11i).
- If there is continuity in both checks, replace heater (para 3-11m).

TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
		
		

3-5. MAST CONTROL TROUBLESHOOTING

- Read failure symptom recorded on tag attached to faulty Mast Control.
- Refer to SYMPTOM INDEX and find applicable MALFUNCTION entry.
- Refer to INITIAL SETUP for preparation.
- Turn to referenced MALFUNCTION in Table 3-5 and troubleshoot as directed.

SYMPTOM INDEX	
SYMPTOM	MALFUNCTION NO. (Table 3-5)
NOTE VERIFY YOU HAVE A FAULTY MAST CONTROL, using the ICD per the Mast Control Post. Maintenance test, before you begin troubleshooting procedures. Also, make the necessary voltage and/or continuity checks in addition to the troubleshooting procedures to verify you have isolated the faulty port. This will help prevent you from accidentally replacing a good port (such as the wiring harness, which is difficult to replace).	
Air pressure indicator DS3 does not light	3
Compressor ac mode indicator DS1 does not light	1
Compressor dc mode indicator DS2 does not light	2
Cannot lower mast	7
Cannot lower mast below 10 degrees above horizontal	10
Dc compressor mode indicator DS2 illuminates but dc compressor A1 does not operate	4
Mast cannot be extended	8
Mast cannot be raised in ac mode	5
Mast cannot be raised in dc mode	6
Mast cannot be retracted	9

INITIAL SETUPTest Equipment

Multimeter AN/URM-105,
6625-00-581-2036

Equipment

Condition

Para

3-12a

Condition Description

Mast control cover

opened

Front panel removed

Tools

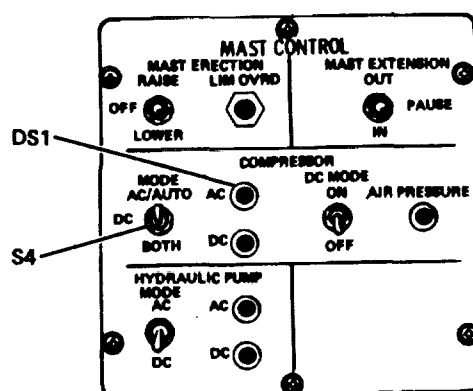
Refrig Unit Svce Tool Kit,
5180-00-596-1474
1/4 in. flat tip scdr
No. 2 xtip scdr
lq rd nose plr
pocket knife
3/4 in. comb. wr
9/16 in. comb. wr
5/16 comb. wr
Sldr and desldr set

3-12b

NOTE

Before replacing the wiring harness or starting other difficult repair tasks, make certain you have found the part causing the malfunction. complete the troubleshooting procedure and make any other voltage or continuity checks on the mast control in order to isolate the faulty part. If you are in doubt about the malfunction, do a mast control post-maintenance test to confirm it.

Malfunction No. 10 requires two Utilities Equipment Repairers

**TABLE 3-4. MAST CONTROL TROUBLESHOOTING-
MALFUNCTION**
TEST OR INSPECTION
CORRECTIVE ACTION
1. COMPRESSOR AC MODE INDICATOR DS1 DOES NOT LIGHT


Step 1. Set COMPRESSOR MODE AC/AUTO-DC-BOTH switch S4 to AC/AUTO.

Step 2. Visually inspect connections on COMPRESSOR MODE switch S4 for loose or open connections, broken wires or damaged terminals.

- If connections to S4 are loose, open or damaged, replace, tighten or repair as required.
- If visual inspection shows switch S4 good, go to step 3.

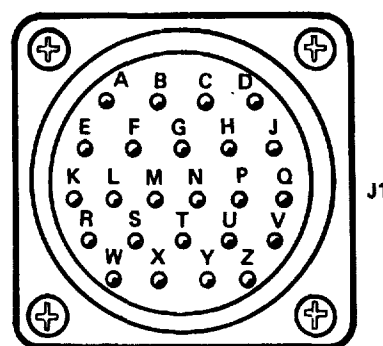
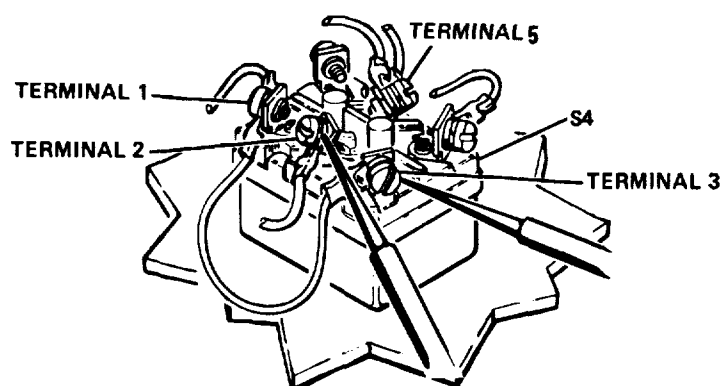


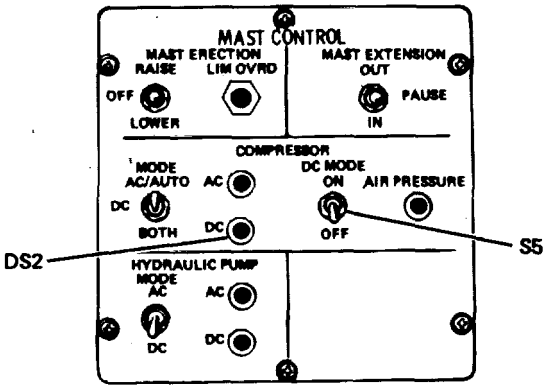
TABLE 3-4. MAST CONTROL TROUBLESHOOTING-Continued		
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
Step 3.	Check continuity between terminals 2 and 3 of COMPRESSOR MODE switch S4.	
	- If there is no continuity, replace S4 (para 3-12f). - If there is continuity, go to step 4.	
Step 4.	Set COMPRESSOR MODE switch S4 to BOTH.	
Step 5.	Check continuity between terminals 1 and 2 of COMPRESSOR MODE switch S4.	
	- If there is no continuity, replace S4 (para 3-12f). - If there is continuity, go to step 6.	
Step 6.	Set COMPRESSOR MODE switch S4 to AC/AUTO.	
Step 7.	Check continuity between J1-F and J1-G.	
	- If there is no continuity, go to step 8. - If there is continuity, go to step 9.	
Step 8.	Visually inspect connector J1 for damaged or unseated pins or broken solder connections for pins D, F, G and H.	
	- If connector J1 is damaged or any pins are unseated, replace connector J1 (para 3-12g). - If solder connections are broken or damaged, repair as required. - If connector J1 is good, go to step 9.	
Step 9.	Check continuity between J1-D and center contact of socket XDS1.	
	- If there is no continuity, replace wire harness (para 3-12i). - If there is continuity, go to step 10.	
Step 10.	Check continuity between J1-H and terminal 5 of COMPRESSOR MODE switch S4.	
	- If there is no continuity, replace wire harness (para 3-12i). - If there is continuity, check socket XDS1 and repair or replace as required.	

TABLE 3-4. MAST CONTROL TROUBLESHOOTING-Continued
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

2. COMPRESSOR DC MODE INDICATOR DS2 DOES NOT LIGHT



- Step 1. Set COMPRESSOR DC MODE ON-OFF switch S5 to ON.
- Step 2. Visually inspect connections on COMPRESSOR DC MODE switch S5 for loose or open connections, broken wires or damaged terminals.
- If connections to S5 are loose, open or damaged, replace, tighten or repair as required.
 - If visual inspection shows switch S5 good, go to step 3.

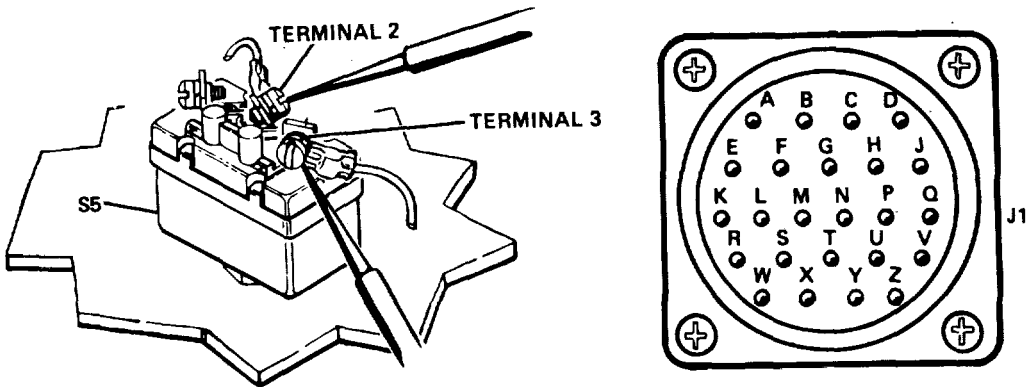


TABLE 3-4. MAST CONTROL TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
Step 3.	Check continuity between terminals 2 and 3 of COMPRESSOR DC MODE switch S5. • If there is no continuity, replace S5 (para 3-12e). • If there is continuity, go to step 4.	
Step 4.	Visually inspect connector J1 for damaged or unseated pins or broken solder connections for pins J or M. • If connector J1 is damaged or any pins are unseated, replace connector J1 (para 3-12g). • If solder connections are broken or damaged, repair as required. • If connector J1 is good, go to step 5.	
Step 5.	Check continuity between relay K1 terminal D3 and J1-K. • If there is no continuity, replace wire harness (para 3-12i). • If there is continuity, go to step 6.	
Step 6.	Check continuity between relay K1 terminal D2 and J1-J. • If there is no continuity, replace wire harness (para 3-12i). • If there is continuity, go to step 7.	

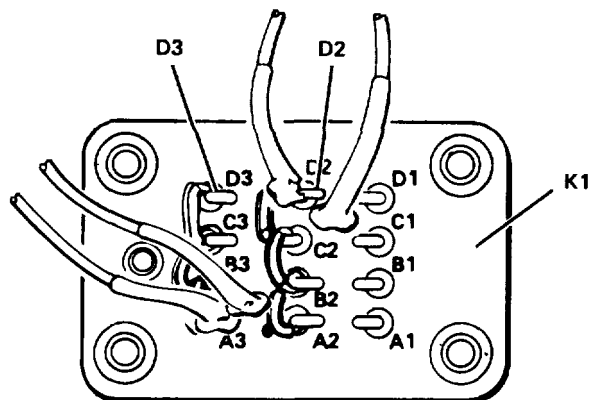
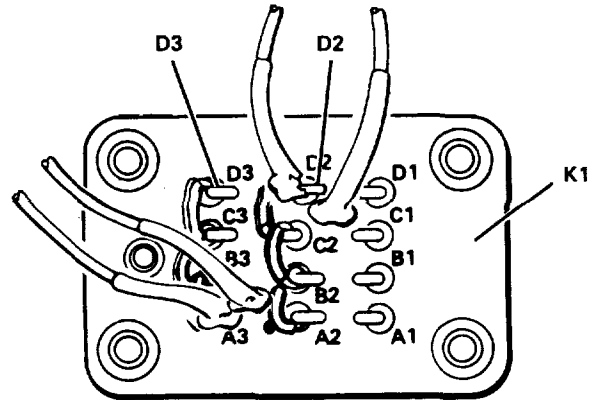


TABLE 3-4. MAST CONTROL TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****2 COMPRESSOR DC MODE INDICATOR DS2 ODES NOT LIGHT - Continued**

Step 7. Check continuity between terminals D3 and D2 of relay K1.

- If there is no continuity, replace K1 (pare 3 -12h).
- If there is continuity, replace wire harness (pare 3 -12i).

3. AIR PRESSURE INDICATOR DS3 DOES NOT LIGHT

Visually inspect connector J1 for damaged or unseated pins or broken solder connections for pins E and M.

- If connector J1 is damaged or any pins are unseated replace connector J1 (pare 3 -12g).
- If solder connections -are broken or damaged, repair as required.
- If connector J1 is good, replace wire harness (pare 3 -12i).

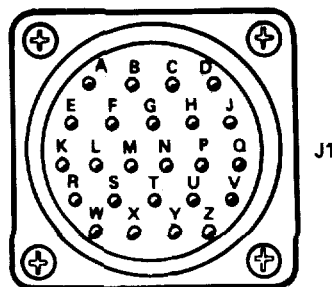
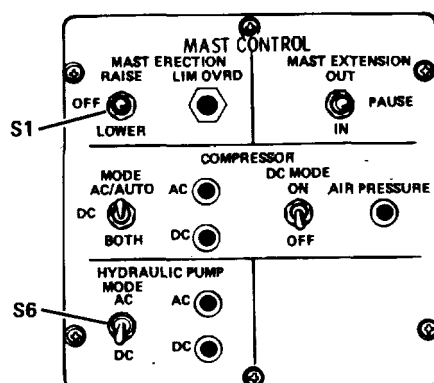


TABLE 3-4. MAST CONTROL TROUBLESHOOTING-Continued		
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
4. DC COMPRESSOR MODE INDICATOR DS2 ILLUMINATES BUT DC COMPRESSOR AI DOES NOT OPERATE	Visually inspect connector J1 for damaged or unseated pin or broken solder connection for pin K.	
	• If connector J1 is damaged or pin K is unseated, replace connector J1 (para 3-12g). • If solder connections are broken or damaged, repair as required. • If connector J1 is good, replace wire harness (para 3-12i).	

TABLE 3-4. MAST CONTROL TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****5. MAST CANNOT BE RAISED IN AC MODE**

- Step 1. Set HYDRAULIC PUMP MODE AC-DC switch S6 to AC.
- Step 2. Set MAST ERECTION RAISE-OFF-LOWER switch S1 to RAISE and hold.
- Step 3. Visually inspect connections on MAST ERECTION switch S1 for loose or open connections, broken wires or damaged terminals.
- If connections to S1 are loose, open or damaged, replace, tighten or repair as required.
 - If visual inspection shows switch S1 good, go to step 4.

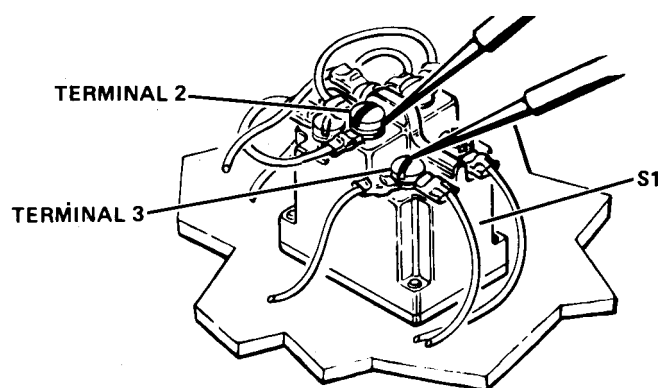


TABLE 3-4. HYDRAULIC COMPONENT ASSEMBLY TROUBLESHOOTING-Continued

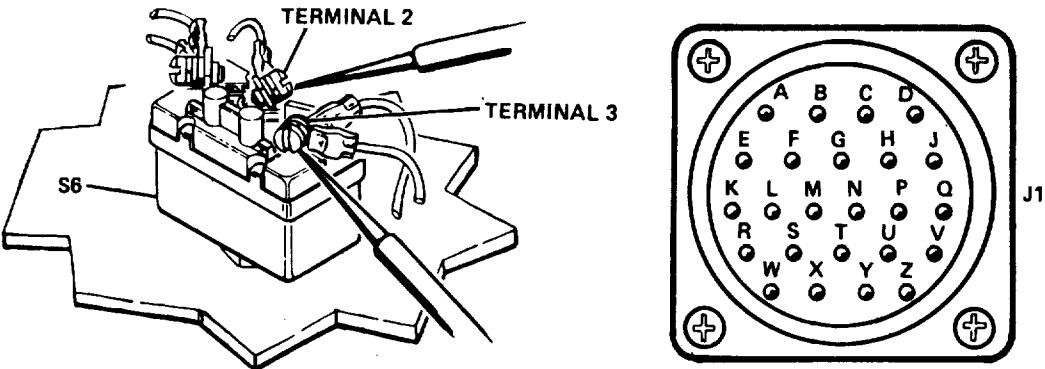
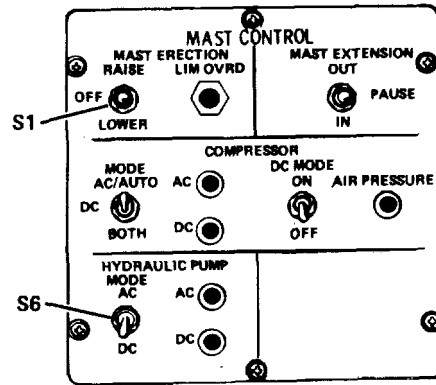
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
	Step 4. Check continuity between terminals 2 and 3 of switch S1. • If there is no continuity, replace S1 (para 3-12c). • If there is continuity, go to step 5.	
	Step 5. Check continuity between terminals 2 and 3 of HYDRAULIC PUMP MODE switch S6. • If there is no continuity, replace S6 (para 3-12e). • If there is continuity, go to step 6.	
	Step 6. Visually inspect connector J1 for damaged or unseated pins or broken solder connections for pins R, P and Q. • If connector J1 is damaged or any pins are unseated, replace connector J1 (para 3-12q). • If solder connections are broken or damaged, repair as required. • If connector J1 is good, replace wire harness (para 3-12i).	

TABLE 3-4. MAST CONTROL TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****6. MAST CANNOT BE RAISED IN DC MODE**

- Step 1. Set HYDRAULIC PUMP MODE AC-DC switch S6 to DC.
- Step 2. Set MAST ERECTION RAISE-OFF-LOWER switch S1 to RAISE and hold.
- Step 3. Visually inspect connections on MAST ERECTION switch S1 for loose or open connections, broken wires or damaged terminals,.
- If connections to S1 are loose, open or damaged, replace, tighten or repair as required.
 - If visual inspection shows switch S1 good, go to step 4.

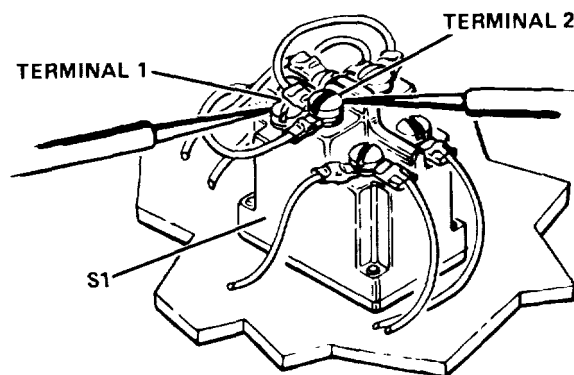


TABLE 3-4. MAST CONTROL TROUBLESHOOTING-Continued

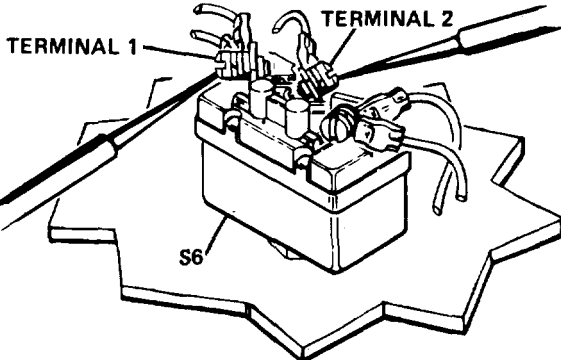
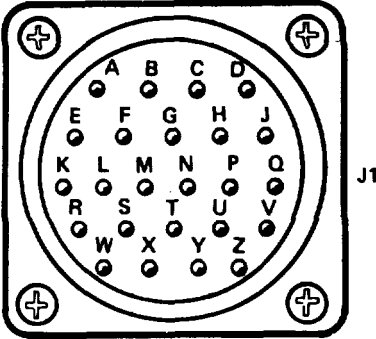
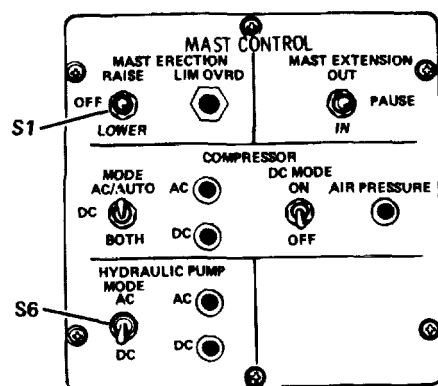
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
Step 4.	Check continuity between terminals 1 and 2 of ERECTION switch S1.	• If there is no continuity, replace S1 (para 3-12c).
		• If there is continuity, go to step 5.
		
Step 5.	Check continuity between terminals 1 and 2 of HYDRAULIC PUMP MODE switch S6.	• If there is no continuity, replace S6 (para 3-12e).
		• If there is continuity, go to step 6.
Step 6.	Visually inspect connector J1 for damaged or unseated pins or broken solder connections for pins R, N and Q.	• If connector J1 is damaged or any pins are unseated, replace connector J1 (para 3-12g).
		• If solder connections are broken or damaged, repair as required.
		• If connector J1 is good, replace wire harness (para 3-12i).

TABLE 3-4. MAST CONTROL TROUBLESHOOTING-Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****7. CANNOT LOWER MAST**

Step 1. Set HYDRAULIC PUMP MODE AC-DC switch S6 to either AC or DC.

Step 2. Visually inspect connections on MAST ERECTION switch S1 for loose or open connections, broken wires or damaged terminals.

- If connections to S1 are loose, open or damaged, replace, tighten or repair as required.
- If visual inspection shows switch S1 good, go to step 4.

Step 3. Set MAST ERECTION RAISE-OFF-LOWER switch S1 to LOWER and hold.

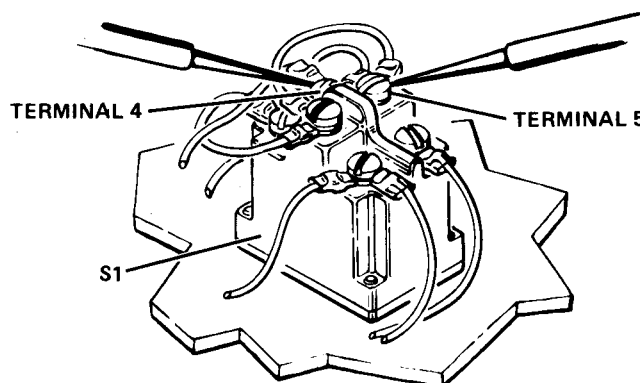


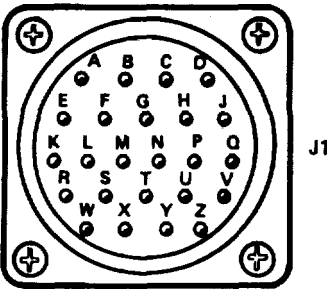
TABLE 3-4. MAST CONTROL TROUBLESHOOTING-Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

- Step 4. Check continuity between terminals 4 and 5 of switch S1.
- If there is no continuity, replace S1 (para 3-12c).
 - If there is continuity, go to step 5.

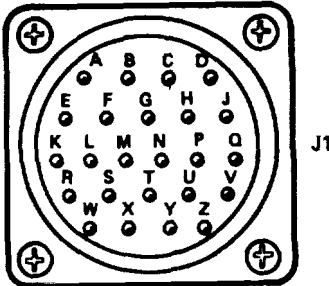


- Step 5. Visually inspect connector J1 for damaged or unseated pins or broken solder connections for pins R and T.
- If connector J1 is damaged or any pins are unseated, replace connector J1 (para 3-12g).
 - If solder connections are broken or damaged, repair as required.
 - If connector J1 is good, replace wire harness (para 3-12i).

TABLE 3-4. MAST CONTROL TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
8. MAST CANNOT BE EXTENDED		Step 1. Set MAST EXTENSION OUT-PAUSE-IN switch S3 to OUT. Step 2. Visually inspect connections on MAST EXTENSION switch S3 for loose or open connections, broken wires or damaged terminals. • If connections to S3 are loose, open or damaged, replace, tighten or repair as required. • If visual inspection shows switch S3 good, go to step 3.
3-82		

TABLE 3-4. MAST CONTROL TROUBLESHOOTING-Continued

TABLE 3-1. WIRE HARNESS CONTROL TROUBLESHOOTING CONTINUED		
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
	Step 3. Check continuity between terminals 2 and 3 of switch S3. • If there is no continuity, replace S3 (para 3-12e). • If there is continuity, go to step 4.	
		
	Step 4. Visually inspect connector J1 for damaged or unseated pins or broken solder connections for pins A and B. • If connector J1 is damaged or any pins are unseated, replace connector J1 (para 3-12g). • If solder connections are broken or damaged, repair as required. • If connector J1 is good, replace wire harness (para 3-12i).	

3-83

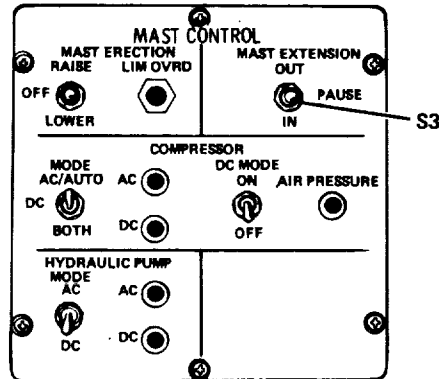
TABLE 3-4. MAST CONTROL TROUBLESHOOTING-Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

9. MAST CANNOT BE RETRACTED



Step 1. Set MAST EXTENSION OUT-PAUSE-IN switch S3 to IN.

Step 2. Visually inspect connections on MAST EXTENSION switch S3 for loose or open connections, broken wires or damaged terminals.

- If connections to S3 are loose, open or damaged, replace, tighten or repair as required.
- If visual inspection shows switch S3 good, go to step 3.

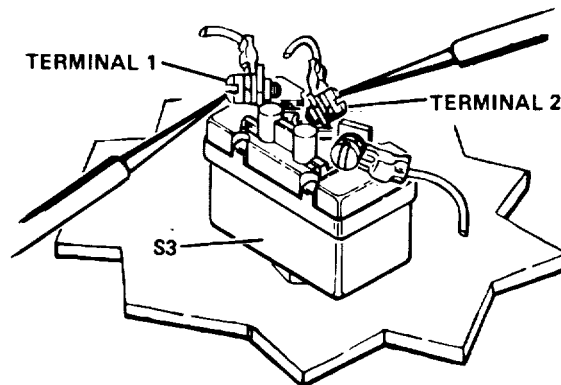
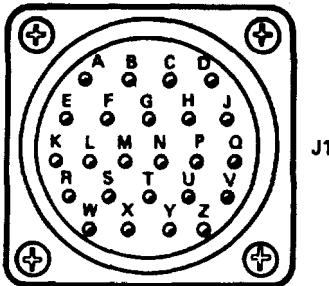


TABLE 3-4. MAST CONTROL TROUBLESHOOTING-Continued

TABLE 3-1. WIRE HARNESS CONTROL TROUBLESHOOTING CONTINUED		
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
	Step 3. Check continuity between terminals 1 and 2 of switch S3. • If there is no continuity, replace S3 (para 3-12e). • If there is continuity, go to step 4.	
		
	Step 4. Visually inspect connector J1 for damaged or unseated pins or broken solder connections for pins A and C. • If connector J1 is damaged or any pins are unseated, replace connector J1 (para 3-12g). • If solder connections are broken or damaged, repair as required. • If connector J1 is good, replace wire harness (para 3-12i).	

3-85

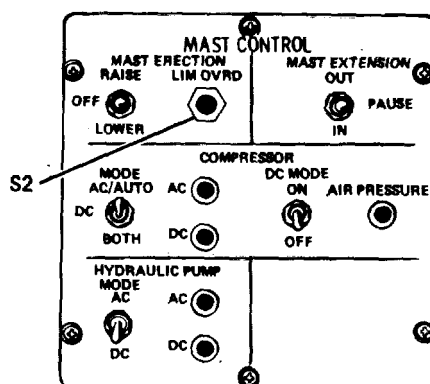
TABLE 3-4. MAST CONTROL TROUBLESHOOTING-Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

10. CANNOT LOWER MAST BELOW 10 DEGREES ABOVE HORIZONTAL



Step 1.

Visually inspect connections on MAST ERECTION LIM OVRD switch S2 for loose or open connections, broken wires or damaged terminals.

- If connections to S2 are loose, open or damaged, replace, tighten or repair as required.
- If visual inspection shows switch S2 good, go to step 2.

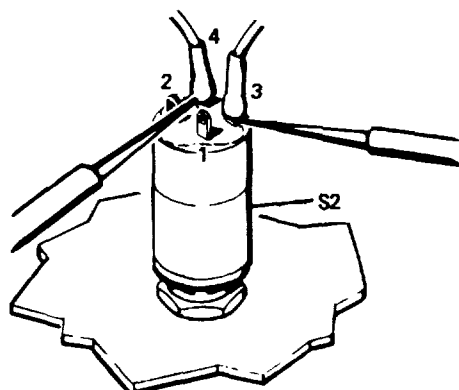
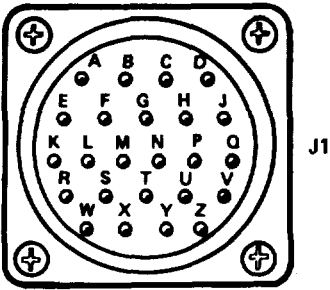


TABLE 3-4. MAST CONTROL TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
Step 2.	Check continuity between terminals 3 and 4 of MAST ERECTION LIM ORVD switch S2. Work meter probes under shrink sleeving to make contact. A second technician presses LIM OVRD switch when probes are set to check continuity. • If there is no continuity, replace S2 (para 3-12d). • If there is continuity, go to step 3.	
Step 3.	Visually inspect connector J1 for damaged or unseated pin or broken solder connection for pin S. • If connector J1 is damaged or pin S is unseated, replace connector J31 (para 3-12g). • If solder connections are broken or damaged, repair as required. • If connector J1 is good, replace wire harness (para 3-12i).	

Section III. MAINTENANCE INSTRUCTIONS

OVERVIEW

- This section provides instructions you need to repair parts or assemblies found to be faulty during troubleshooting or inspection.
- Refer to the applicable procedure referenced in the List of Tasks, below.
- Refer to the OVERVIEW and INITIAL SETUP blocks at the beginning of each referenced procedure for information needed to prepare to do the task.
- Refer to Appendix B for identification and description of materials (expendable Items). Each item listed is followed by an item number in parentheses that corresponds with the item number in Appendix B.
- To repair the equipment, you will remove parts as specified for access to the faulty part, remove the part, replace the part with a new part, install the new part, and reinstall the parts removed for access.

WARNING

If wires disconnected during maintenance are not reconnected to the same points, the equipment may move in an unexpected manner. This could cause accidental injury or death.

- When applicable, you will be referred to a procedure for testing the equipment to verify that the repair has returned the equipment to proper operating condition.

LIST OF TASKS

Task	Paragraph No.
Repair of:	
Antenna positioner	3-13
Distribution box	3-9
HCA	3-11
Mast	3-8
Mast clamp	3-14
Mast control	3-12
Mast group	3-6
Mast ice covers	3-15
PCA	3-10
Support frame 3-7	3-7

3-6 REPLACE MAST GROUP**This task covers:****Removal****Installation****INITIAL SETUP**Tools

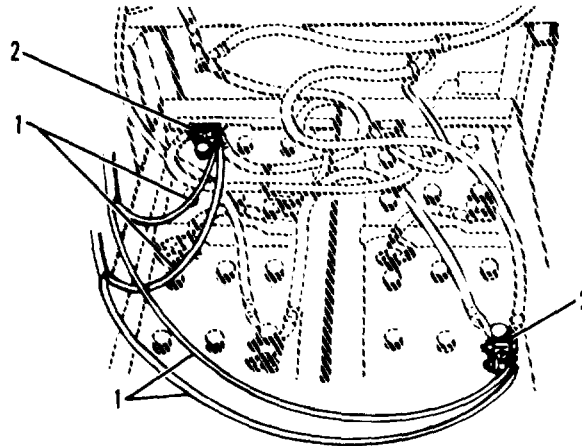
Refrig Unit Svce Tool Kit,
5180-00-596-1474
9/16 in. skt
Skt wr hdl
3/4 in. skt
3/4 in. comb. wr
1/2 in. skt
1/2 in. comb. wr
Adj wr, 8 in.
Pinch bar
9/16 in. comb. wr
10 in. skt wr ext
15/16 in. deep-well skt
Bridle assembly, 2 leg -EE2-802-9FT (two)
Wrecker truck M819A1 (two)
Pry bar 5120-00-228-9504

Personnel Required

Utilities Equipment Repairer
MOS 52C10 (Six for removal,
seven for installation)
Wrecker Operator (two)

Materials/Parts

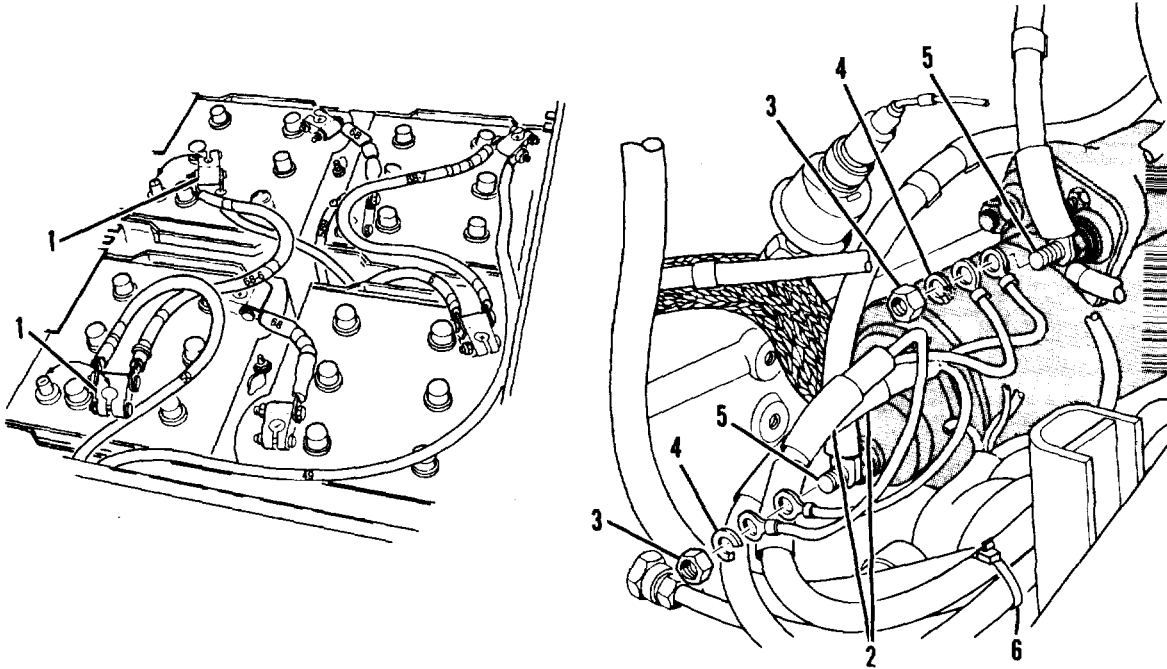
Rope, 20 feet (four) (appx B,
item 16)
Mast group - 5035700-1

STEP**PROCEDURE****REMOVAL**

1. Park vehicle so that it can be driven away from under mast group when mast group is lifted clear of the truck frame.
2. Remove battery compartment cover. See TM 9-2320-260-10.
3. Disconnect battery leads (1) from battery terminals (2) and secure to mast group.

3-6 REPLACE MAST GROUP-Continued**STEP****PROCEDURE**

3. Disconnect battery ground cables (1). See TM 9-2320-260-20 for procedure.



- 3.1 Access truck starter motor. See TM 9-2320-260-20.
- 3.2 Tag mast group cables (2). Remove two nuts (3) and lockwashers (4); and disconnect mast group cables (2) from starter terminal studs (5). Reinstall nuts (3) and lockwashers (4) on studs (5).

NOTE

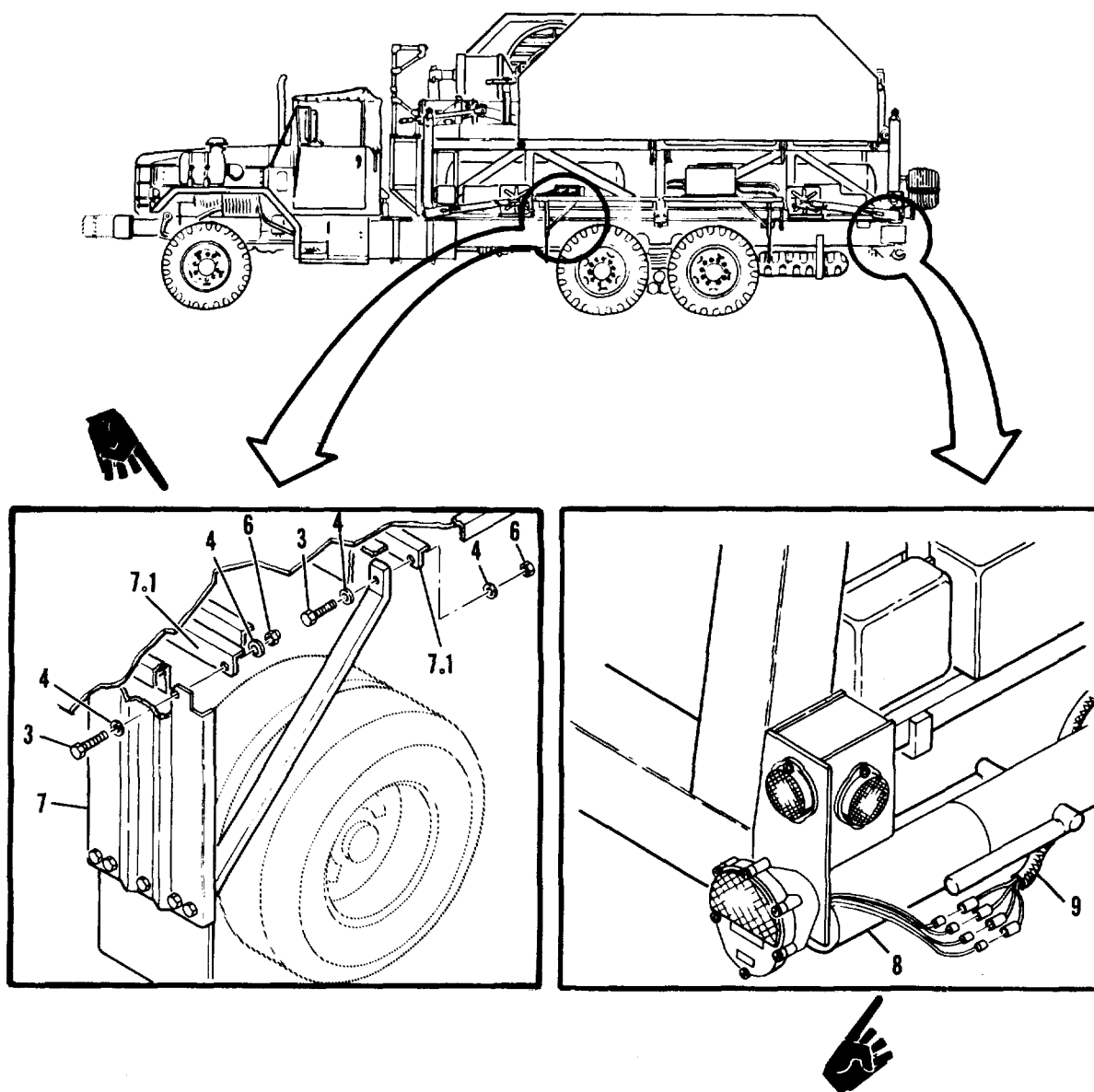
Note routing of mast group cables for installation.

- 3.3 Cut wire ties (6) as required and carefully remove mast group cables (2) from truck. Secure mast group cables (2) to mast group with wire ties.

3-6 REPLACE MAST GROUP-Continued

STEP

PROCEDURE

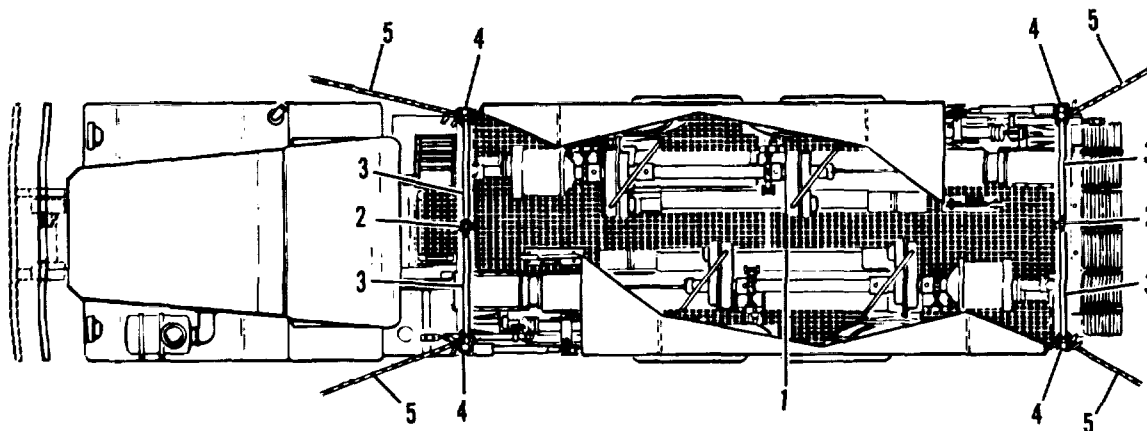


4. Remove 20 bolts (3), 40 washers (4), and 20 locknuts (6); and remove four mud flaps (7) from brackets (7.1).
5. Tag and disconnect four taillight leads (8) from truck wiring harness (9) on each side of truck.

3-6 REPLACE MAST GROUP-Continued

STEP

PROCEDURE

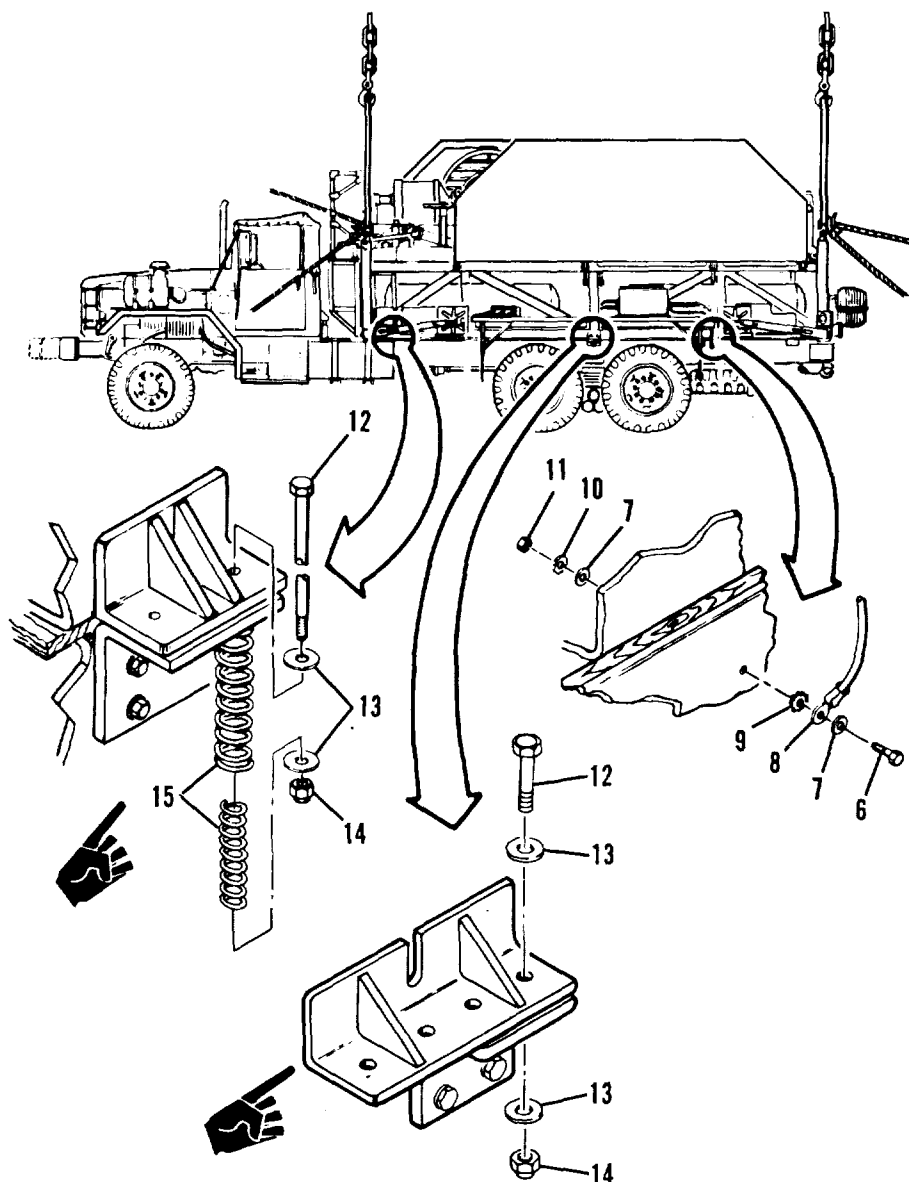


6. Position a wrecker at each end of mast group (1) with lifting hooks (2) centered over truck.
7. Connect bridle assemblies (3) to lifting points (4) at each end of mast group (1).
8. Connect lifting hook (2) of each wrecker to bridle assemblies. Raise hooks to take up slack.
9. Connect four ropes (5) to lifting points (4).
10. Remove ladder from mast group (para 3-7b, removal step 2).

3-6. REPLACE MAST GROUP MOUNTED ON M811 TRUCK - Continued

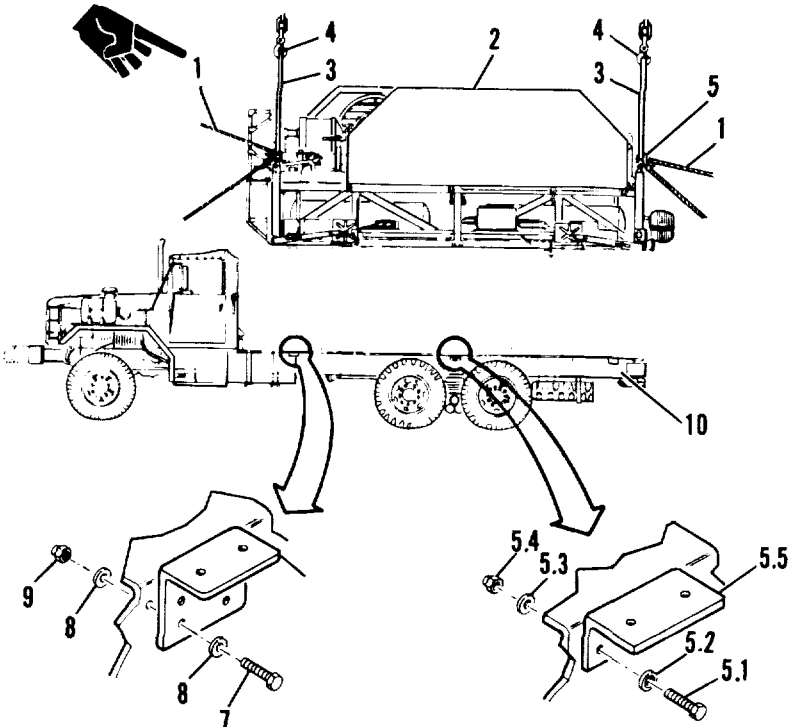
STEP

PROCEDURE



11. Remove screw (6), two washers (7), ground strap (8), toothed washer (9), lockwasher (10), and nut (11) from truck.
12. Remove 16 bolts (12), 32 washers (13), 16 locknuts (14) and four spring sets (15) from truck.

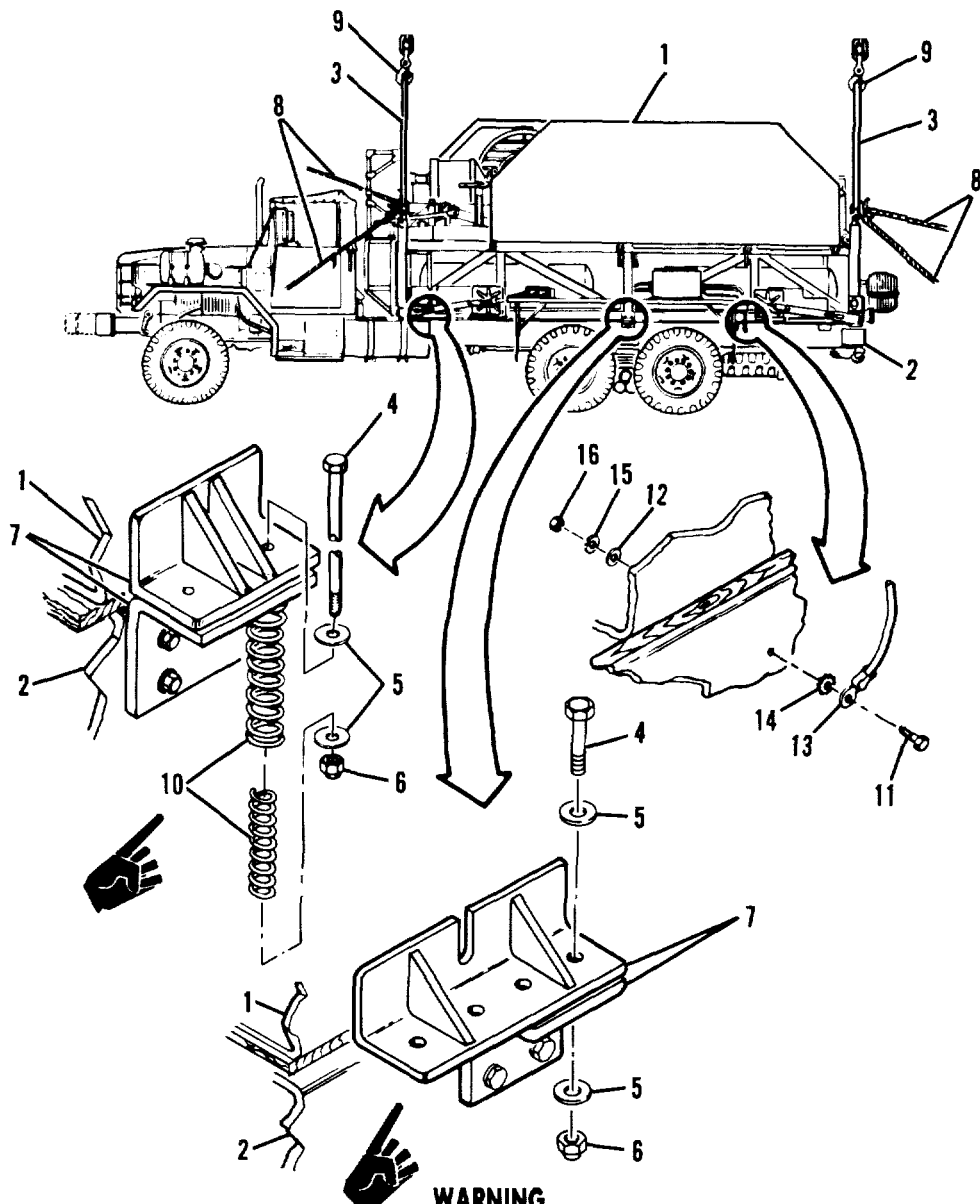
3-6. REPLACE MAST GROUP MOUNTED ON M811 TRUCK - Continued

STEP	PROCEDURE
	
13.	Hold four ropes (1) tight to prevent mast group (2) from swinging when mast group is lifted from truck.
	WARNING Keep personnel away from mast group when it is lifted from truck. Serious injury or death may occur if personnel do not stay clear.
14.	Slowly lift the mast group (2) until it is clear of truck. Drive truck away from under mast group.
15.	Slowly and evenly lower the mast group (2) onto wood blocks or other suitable support. Keep tension on ropes to prevent swinging.
16.	Remove bridle assemblies (3) from lifting hooks (4) and lifting points (5). Remove four ropes (1) from lifting points (5).
17.	Inspect wood sills underneath mast group frame. Replace wood sills if they are severely splintered or damaged.
17.1	Remove four tension bolts (5.1), countersunk washers (5.2), flat washers (5.3), locknuts (5.4), and two brackets (5.5).
18.	Remove 16 bolts (7), 32 flat washers (8), 16 locknuts (9), and six brackets (6) from truck.

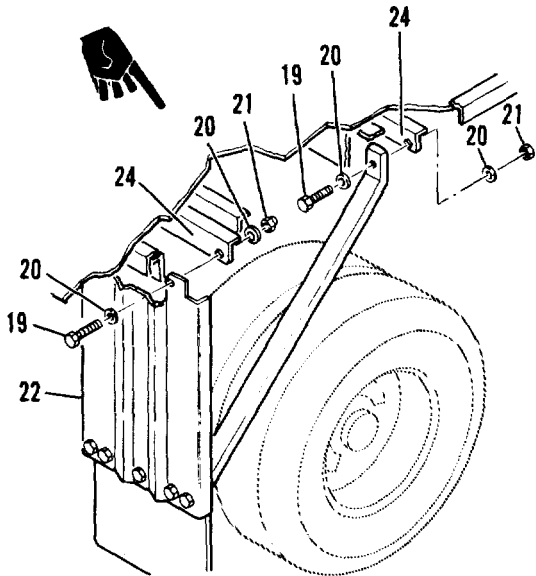
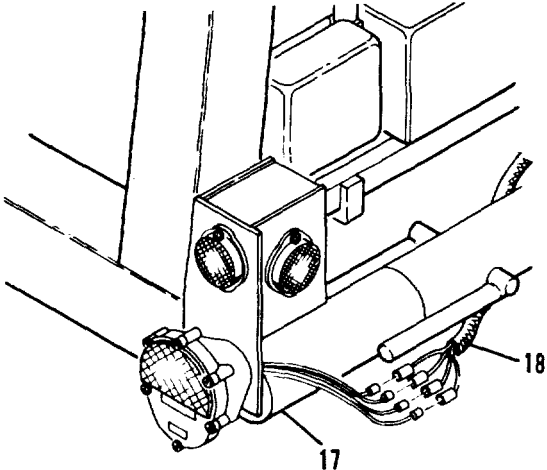
3-6. REPLACE MAST GROUP MOUNTED ON M811 TRUCK - Continued

STEP	PROCEDURE
19.	If you are going to ship mast group, pack all mounting hardware with the mast group, and inspect mast group to make sure it is ready for transport.
	INSTALLATION
1.	Inspect mast group (2) for damage that may have occurred during shipment. Check mast group against packing list for missing parts and inspect for fluid leaks.
2.	Position truck so it can be driven under mast group (2) after mast group is lifted.
3.	If installed, remove two existing brackets (5.5) (one on each side of frame) between the truck wheels. Stow the brackets and hardware in case you ever want to restore the truck to its original configuration.
4.	Position two new brackets (5.5) (new brackets are thicker than old brackets) to truck frame. Install four tension bolts (5.1), countersunk washers (5.2), flat washers (5.3), and locknuts (5.4). Make sure countersunk side of countersunk washers (5.2) are facing bolt heads of tension bolts (5.1). Tighten tension bolts to between 85 and 90 ft lbs.
5.	Position six brackets (6) to truck frame and secure with 16 screws (7), 32 flat washers (8), and 16 locknuts (9).
6.	Connect bridle assemblies (3) to lifting points (5). Center each lifting hook (4) over ends of mast group (2). Connect lifting hook (4) of each wrecker to bridle assemblies (3) and raise hook to take up slack. Connect four ropes (1) to ends of mast group (2) at lifting points (5). Have four soldiers hold ropes (1) tight to prevent mast group (2) from swinging when mast group is lifted.
	WARNING Keep personnel away from frame of mast group when frame is lifted from truck. Serious injury or death may occur if personnel do not stay clear.
7.	Slowly lift mast group (2) (both wreckers lifting equally) until it clears truck frame. Keep tension on ropes (1).
8.	Slowly back the truck into position under the mast group (2). Move truck back and forth, if necessary, to position mast group for mounting.

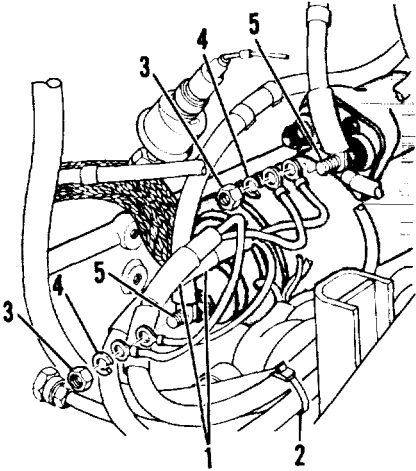
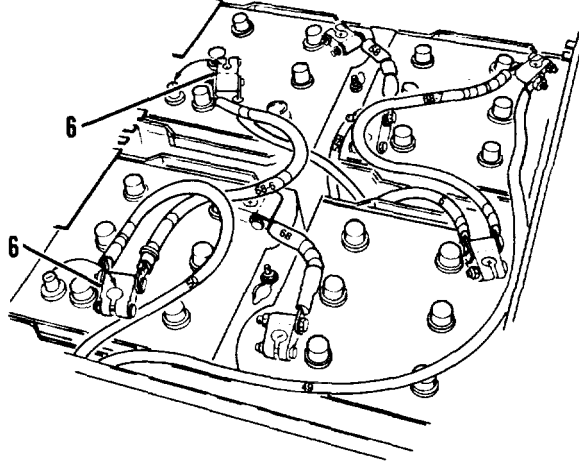
3-6. REPLACE MAST GROUP MOUNTED ON M811 TRUCK - Continued

STEP	PROCEDURE
	 WARNING Make sure personnel are clear of mast group before lowering mast group. 9. Slowly lower the mast group (1) onto the truck frame (2) until it just makes contact with the truck frame. Keep weight of mast group on bridle assemblies (3). NOTE Do not tighten any bolts or nuts until step 13.

3-6. REPLACE MAST GROUP MOUNTED ON M811 TRUCK - Continued

STEP	PROCEDURE
10.	Use pinch bars, if necessary, to line up frame of mast group (1) with truck frame (2). Install 16 bolts (4), 28 washers (5), and 12 locknuts (6) through brackets (7) on mast group (1) and truck frame (2). Do not install locknuts and washers on threads of long bolts in front brackets at this time.
11.	Lower mast group (1) and remove bridle assemblies (3) and ropes (8) from mast group (1) and from lifting hooks (9).
12.	Install four spring sets (10), washers (5), and locknuts (6) on long front bolts (4).
13.	Tighten 16 locknuts (6). Bolts with springs should have 1/2 to 3/4 inch of threads showing below the locknut.
14.	Install screw (11), two washers (12), ground strap (13), toothed washer (14), lockwasher (15), and nut (16) on truck frame.  
15.	Connect four taillight leads (17) to truck wiring harness (18) on each side of truck.
16.	Install 20 bolts (19), 40 washers (20), locknuts (21), and four mud flaps (22) on brackets (23).

3-6. REPLACE MAST GROUP MOUNTED ON M811 TRUCK - Continued

STEP	PROCEDURE
	  17. Access truck starter. See TM 9-2320-260-20. 18. Route mast group cables (1) along truck frame, and attach to existing electrical cables with wire ties (2). Do not attach to movable parts, hydraulic lines or pneumatic lines. Coil excess cable in a loop and secure with wire ties (2). 19. Remove two nuts (3) and lockwashers (4) from starter terminal studs (5). Position mast group cables (1) to starter terminal studs (5), and install lockwashers (4) and nuts (3). Secure cables (1) with wire ties (2) as required. WARNING Do not allow tools to touch vehicle when disconnecting battery ground cables. A direct short can result, causing instant heating of tools, tool damage, battery damage, or battery explosion, which can injure personnel. Remove all jewelry, watches, rings, etc. when working on batteries. 20. Connect battery ground cables (6). See TM 9-2320-260-20. 21. Install ladder on mast group (para 3-7b, installation step 5). 22. Perform Operator's Preventive Maintenance Checks and Services. See TM 11-5985-368-12&P. 23. Perform Organizational Preventive Maintenance Checks and Services. See TM 11-5985-368-12&P.

3-6.1 REPLACE MAST GROUP MOUNTED ON M942 TRUCK

This task covers:

Removal

Installation

INITIAL SETUPTools

Refrig Unit Svce Tool Kit,

5180-00-596-1474

9/16 in. skt

11/16 in. skt

15/16 in. skt

1-1/8 in. skt

9/16 in. 12 pt skt

Skt wr hdl

3/4 in. skt

3/4 in. comb. wr

1/2 in. skt

1/2 in. comb. wr

Adj wr, 8 in.

Pinch bar

9/16 in. comb. wr

10 in. skt wr ext

15/16 in. deep-well skt

Bridle assembly, 2 leg

-EE2-802-9FT (two)

Tools (Continued)

Wrecker truck, M819A1 (two)

Pry bar, 5120-00-228-9504

Diagonal cutters

Breaker bar

Torque wrench

Personnel Required

Utilities Equipment Repairer,

MOS 52C10 (six for removal,
seven for installation)

Wrecker Operator (two)

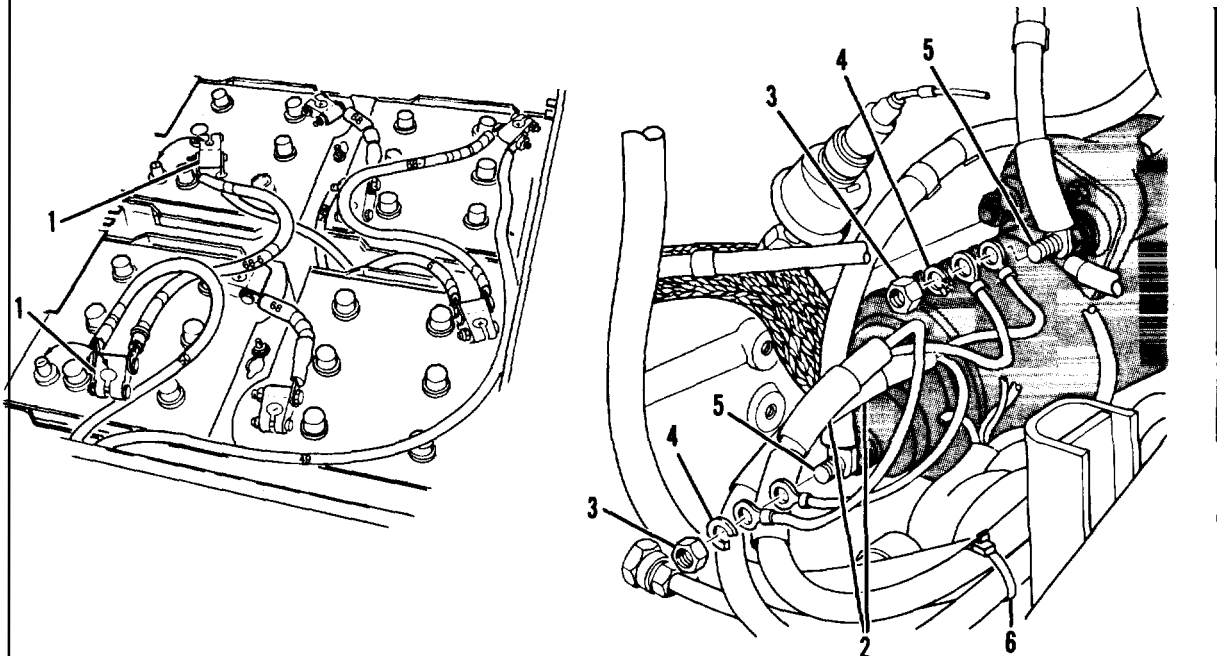
Materials/PartsRope, 20 feet (four) (appx B,
item 16)

Mast group - 5035700-1

Tiedown straps

STEP	PROCEDURE
	REMOVAL
1.	Park truck so it can be driven out from under mast group after mast group is lifted from truck. WARNING Battery ground cables must be disconnected before disconnecting most group cables to avoid electrical shock.
2.	Access truck batteries. See TM 9-2320-272-20-1. WARNING Do not allow tools to touch vehicle when disconnecting battery ground cables. A direct short can result, causing instant heating of tools, tool damage, battery damage, or battery explosion, which can injure personnel. Remove all jewelry, watches, rings, etc. when working on batteries.

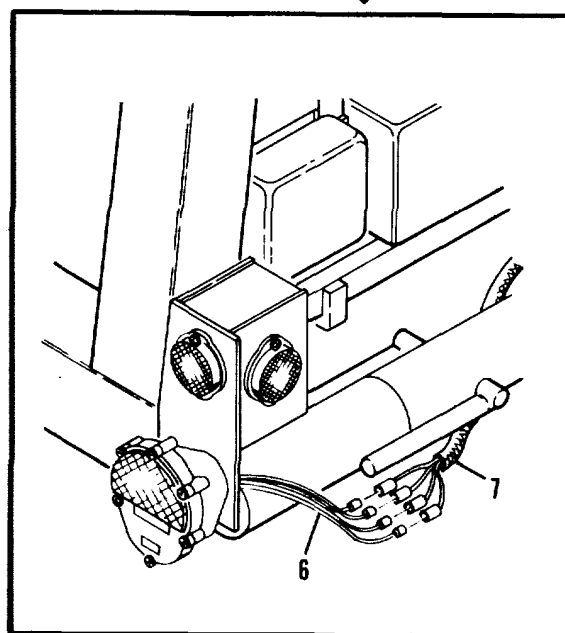
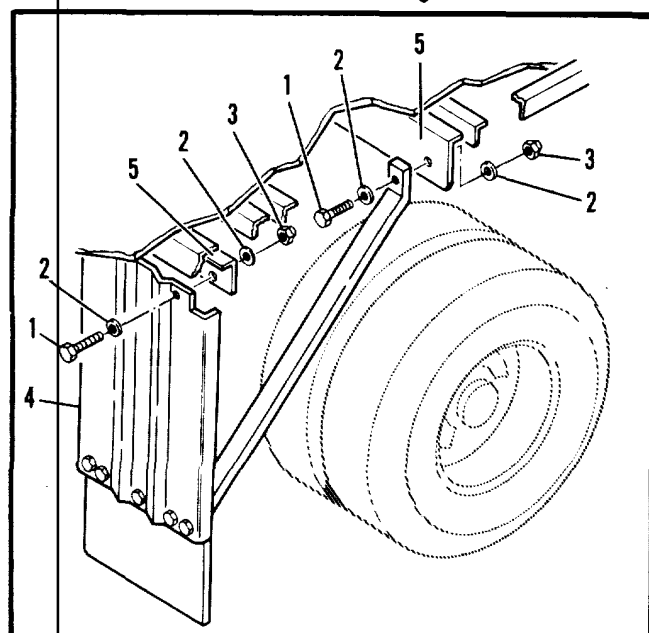
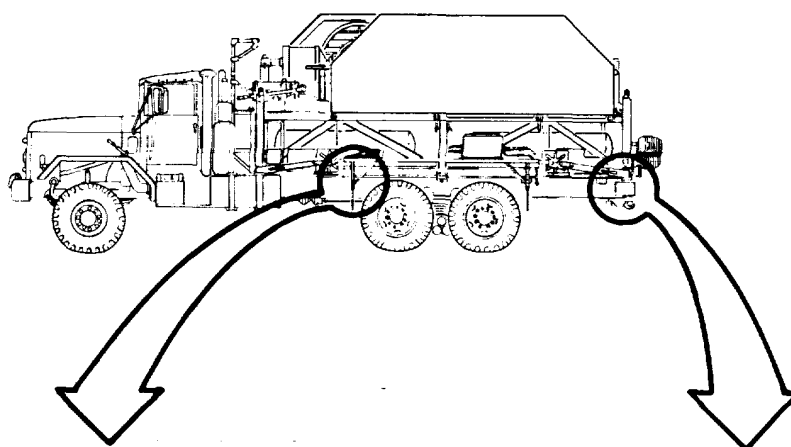
3-6.1 REPLACE MAST GROUP MOUNTED ON M942 TRUCK - Continued

STEP	PROCEDURE
3.	Disconnect battery ground cables (1). See TM 9-2320-272-20-1 for procedure and use of cable clamp puller.  4. Access truck starter motor. See TM 9-2320-272-20-1. 5. Tag mast group cables (2). Remove two nuts (3) and lockwashers (4); and disconnect mast group cables (2) from starter terminal studs (5). Reinstall nuts (3) and lockwashers (4) on studs (5). NOTE Note routing of mast group cables for installation. 6. Cut wire ties (6) as required and carefully remove mast group cables (2) from truck. Secure mast group cables (2) to mast group with wire ties.

3-6.1 REPLACE MAST GROUP MOUNTED ON M942 TRUCK - Continued

STEP

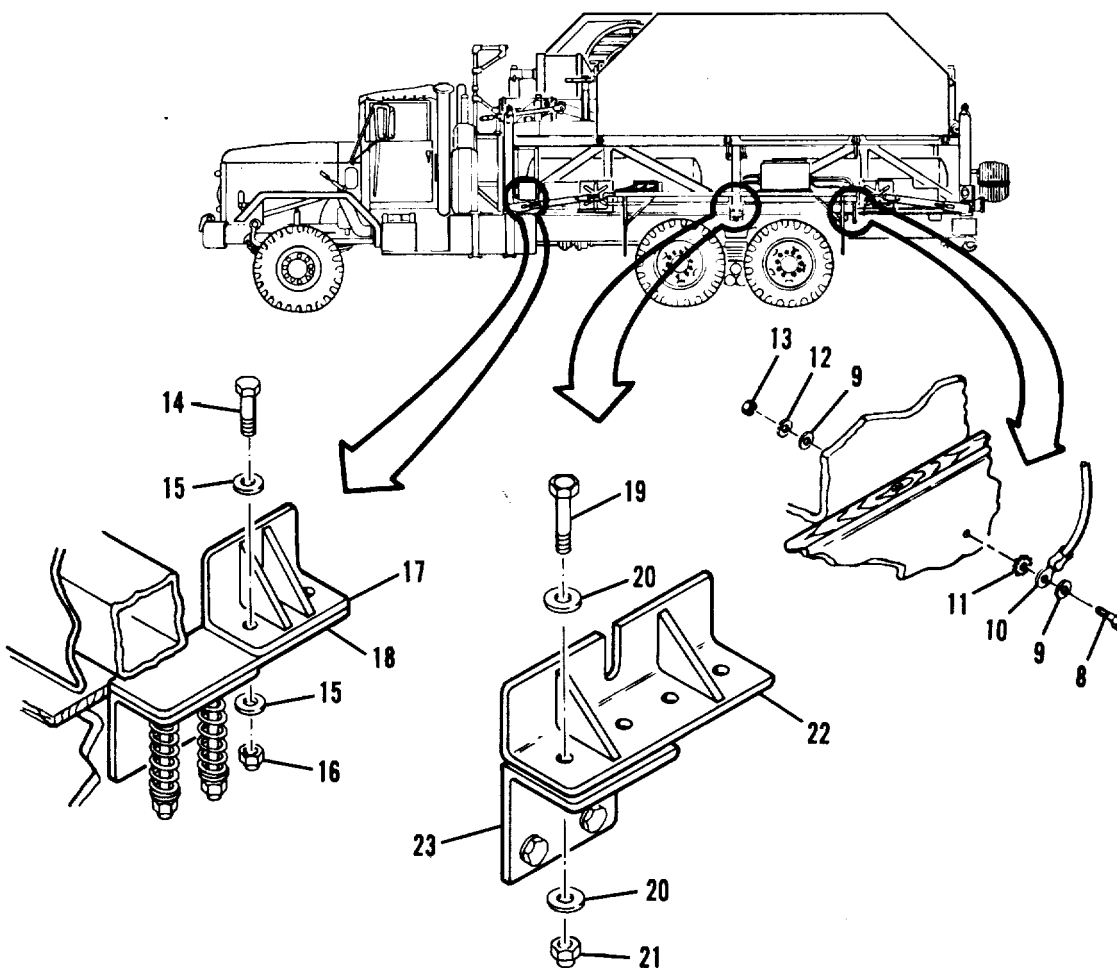
PROCEDURE



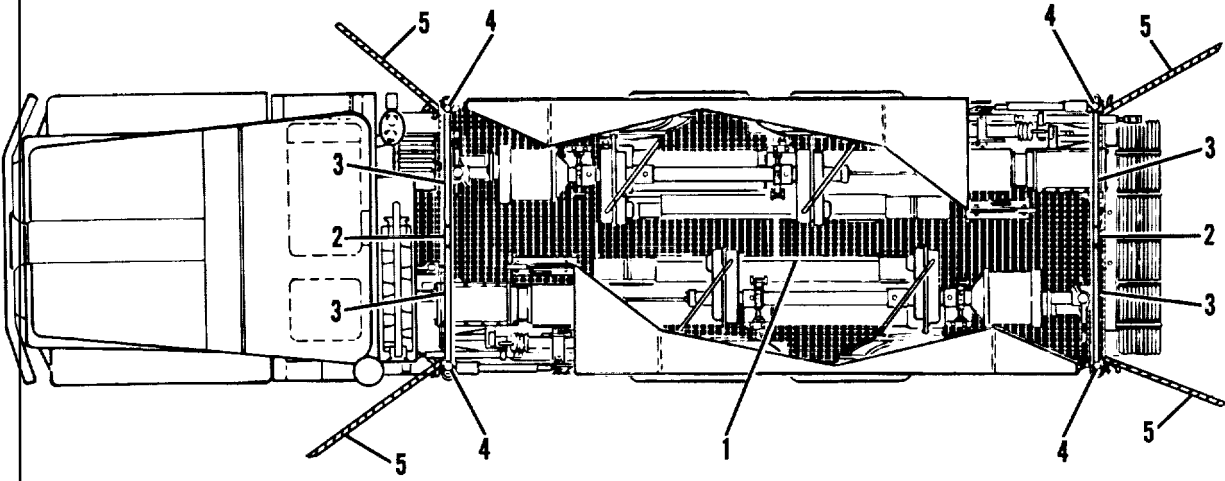
7. Remove 20 bolts (1), 40 washers (2), and 20 locknuts (3), and remove four mud flaps (4) from brackets (5).
8. Tag and disconnect four taillight leads (6) from truck wiring harness (7) on each side of truck.

3-6.1 REPLACE MAST GROUP MOUNTED ON M942 TRUCK - Continued

STEP	PROCEDURE
9.	Remove ladder from mast group (para 3-7b, removal step 2).
10.	Remove vehicular accessory box, hangers, and supports from mast group (para 3-6.2).
11.	Remove screw (8), two washers (9), ground strap (10), toothed washer (11), lockwasher (12), and nut (13) from truck frame.
12.	Remove four screws (14), eight flat washers (15), and four locknuts (16), securing mast group brackets (17) to adapter brackets (18).
13.	Remove 12 screws (19), 24 flat washers (20), and 12 nuts (21) securing mast group brackets (22) and truck brackets (23) together.



3-6.1 REPLACE MAST GROUP MOUNTED ON M942 TRUCK - Continued

STEP	PROCEDURE
	
14.	Position a wrecker at each end of mast group (1) with lifting hooks (2) centered over truck.
15.	Connect bridle assemblies (3) to lifting points (4) at each end of mast group (1).
16.	Connect lifting hook (2) of each wrecker to bridle assemblies. Raise hooks to take up slack.
17.	Connect four ropes (5) to lifting points (4).
18.	Hold four ropes (5) tight to prevent mast group (1) from swinging when mast group is lifted from truck.
	WARNING Keep personnel away from mast group when it is lifted from truck. Serious injury or death may occur if personnel do not stay clear.
19.	Slowly lift the mast group until it is clear of truck. Drive truck away from under mast group.
20.	Slowly and evenly lower the mast group onto wood blocks or a suitable support when truck is clear of mast group. Keep tension on ropes to prevent swinging.
21.	Remove bridle assemblies (3) from lifting hooks (2).
22.	Remove bridle assemblies (3) from lifting points (4) at each end of frame.
23.	Remove four ropes (5) from lifting points (4).

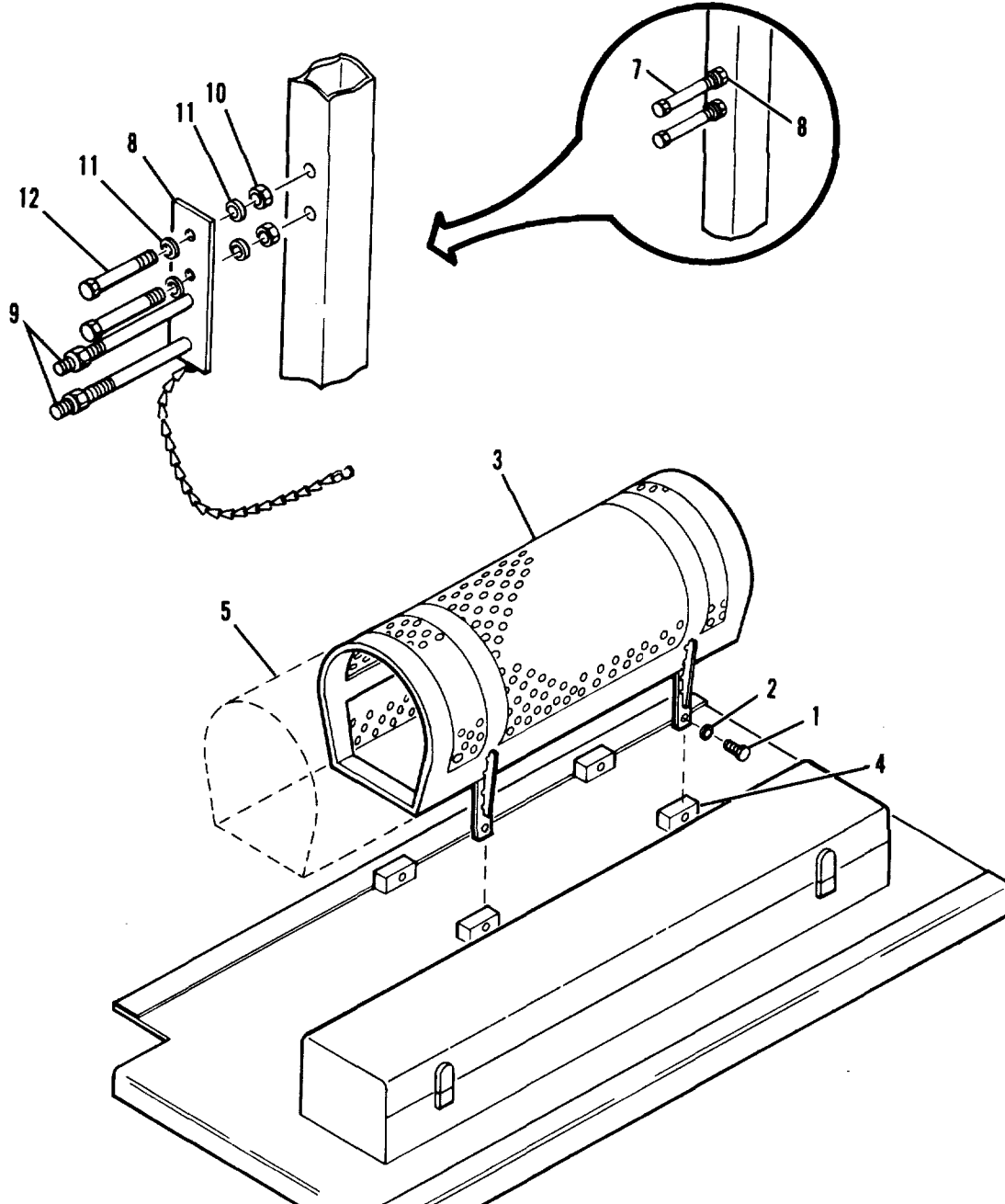
3-6.1 REPLACE MAST GROUP MOUNTED ON M942 TRUCK - Continued

STEP	PROCEDURE
	24. Remove four nuts (6), eight flat washers (7), four springs (8), four springs (9), and two adapter brackets (10) from front brackets (11). 25. Remove four tension bolts (12), countersunk washers (13), flat washers (14), locknuts (15), and two brackets (16). 26. Remove 16 bolts (17), 32 flat washers (18), 16 locknuts (19), and six brackets (11) from truck, NOTE Brackets and hardware removed in steps 25 and 26 above must accompany the mast group. Also, see step 34 on page 3.97.8 for stowage of adapter brackets (10). 27. Inspect wood sills underneath mast group frame. Replace wood sills if they are severely splintered or damaged. 28. If you are going to ship mast group, install vehicular accessory box supports upside down (see para 3-6.2), pack all mounting hardware with the mast group, and inspect mast group to make sure it is ready for transport.

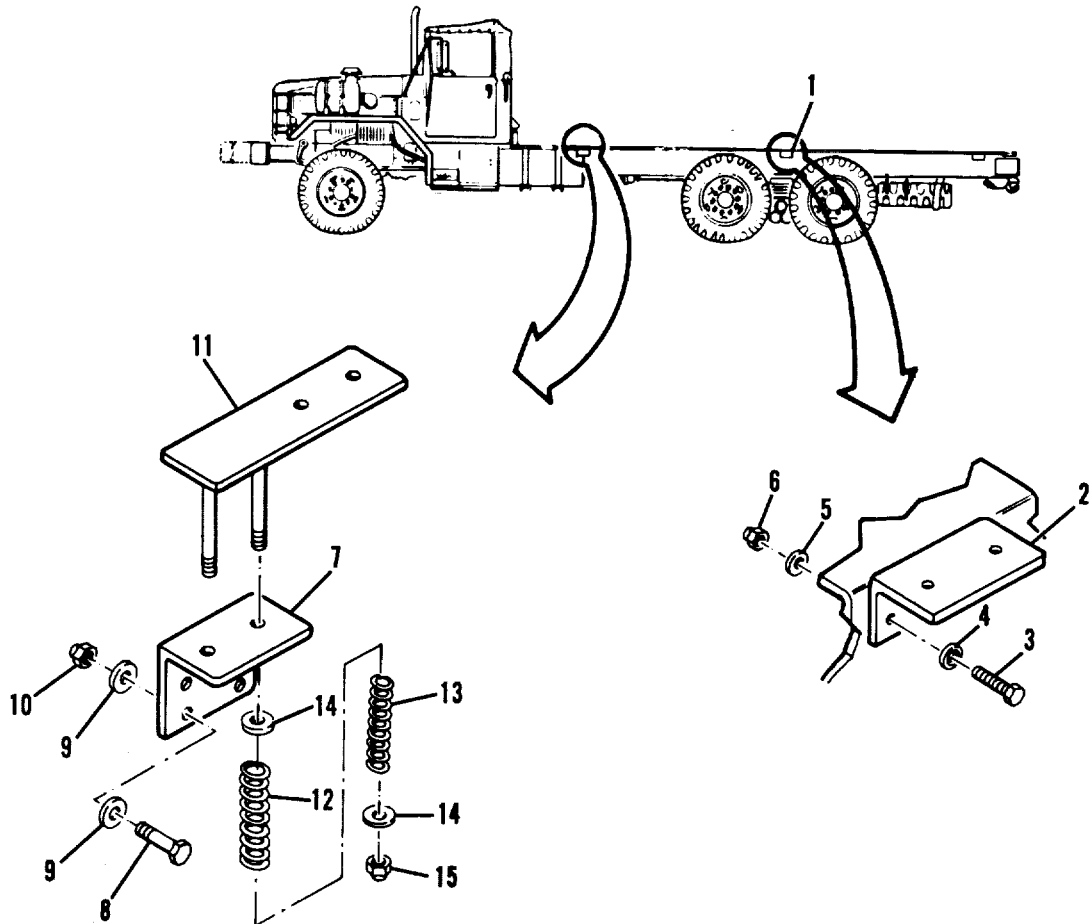
3-6.1 REPLACE MAST GROUP MOUNTED ON M942 TRUCK - Continued

STEP	PROCEDURE
	WARNING Muffler can be extremely hot after truck has been running. Let the truck muffler cool before exchanging heat shield and muffler shield so you won't get burned. NOTE If your M942 truck is no longer going to carry a mast group you will need to restore it to its original configuration. Steps 29 through 37 below show you how. NOTE The heat shield always accompanies the mast group and remains in the stowed position when the mast group is installed on an M811 truck. When the mast group is installed on an M942 truck the heat shield is mounted around the truck muffler and the original muffler shield is stowed on the mast group. 29. Remove heat shield from muffler and retain hardware. The procedure is the same as for the muffler shield. See TM 9-2320-272-20-1. 30. Remove four screws (1) and flat washers (2) securing muffler shield (3) to stowage mounting blocks (4). 31. Install muffler shield around muffler, using the same hardware that secured the heat shield. See TM 9-2320-272-20-1. 32. Position heat shield (5) to stowage mounting blocks (4) and secure with four flat washers (2) and screws (1). Position screw heads outboard. NOTE Adapter brackets are used when the mast group is mounted on an M942 truck. Otherwise, they are stowed on the mast group. 33. Loosen four jam nuts (6) and remove four bolts (7) from their stowage locations on the mast group. 34. If installed, remove two adapter brackets (8) from truck frame. Screw four locknuts (9) onto adapter brackets (8). Position two adapter brackets (8) to their stowage locations on mast group and secure with four locknuts (10), eight flat washers (11), and four screws (12).

3-6.1 REPLACE MAST GROUP MOUNTED ON M942 TRUCK - Continued

STEP	PROCEDURE
35.	Remove gas/water can bracket from mast group (para 3-6.3).
36.	Install vehicular accessory box on M942 truck (para 3-6.2).
37.	Install gas/water can bracket to vehicular accessory box (para 3-6.3). 

3-6.1 REPLACE MAST GROUP MOUNTED ON M942 TRUCK - Continued

STEP	PROCEDURE
	 The diagram illustrates the removal of the mast group from an M942 truck. The top portion shows a side profile of the truck with two curved arrows indicating the location of the mast assembly (1) and the rear axle area. Below this, two exploded views provide a detailed look at the components. The left exploded view shows the mast (11) being detached from the frame (7). This process involves removing bolts (9, 10) and washers (14) that secure the mast to the frame. Springs (12, 13) and nuts (15) are also shown as part of the assembly. The right exploded view shows the frame (2) being secured with bolts (3, 4, 5, 6).

3-6.1 REPLACE MAST GROUP MOUNTED ON M942 TRUCK - Continued

STEP	PROCEDURE
	INSTALLATION 1. Inspect the mast group for damage that may have occurred during shipment. Check the mast group against the packing list for missing parts and inspect for fluid leaks. NOTE If you are installing a mast group on an M942 truck that is not configured for a mast group, you must prepare the truck in accordance with steps 2 through 9 below. If you are replacing the mast group on the same truck you can skip steps 2 through 9 below. 2. If installed, remove gas/water can bracket from vehicular accessory box (para 3-6.3). 3. Remove vehicular accessory box and hangers from truck frame (para 3-6.2). 4. Remove existing muffler shield from truck muffler (TM 9-2320-272-20-1). 5. If installed, remove two existing brackets (1) (one on each side of frame) between the truck wheels. Stow the brackets and hardware in the vehicular accessory box in case you ever want to restore the truck to its original configuration. 6. Position two new brackets (2) (new brackets are thicker than old brackets) to truck frame. Install four tension bolts (3), countersunk washers (4), flat washers (5), and locknuts (6). Make sure countersunk side of countersunk washers (4) are facing bolt heads of tension bolts (3). Tighten tension bolts to between 85 and 90 ft lbs. 7. Position six brackets (7) to truck frame and secure with 16 screws (8), 32 flat washers (9), and 16 locknuts (10). 8. If stowed on the mast group, remove hardware securing bracket adapters (11) from their stowage locations (page 3-97.8). 9. Position two bracket adapters (11) to brackets (7) as shown. Secure with four springs (12), four springs (13), eight flat washers (14), and four locknuts (15). Finger tighten locknuts (15).

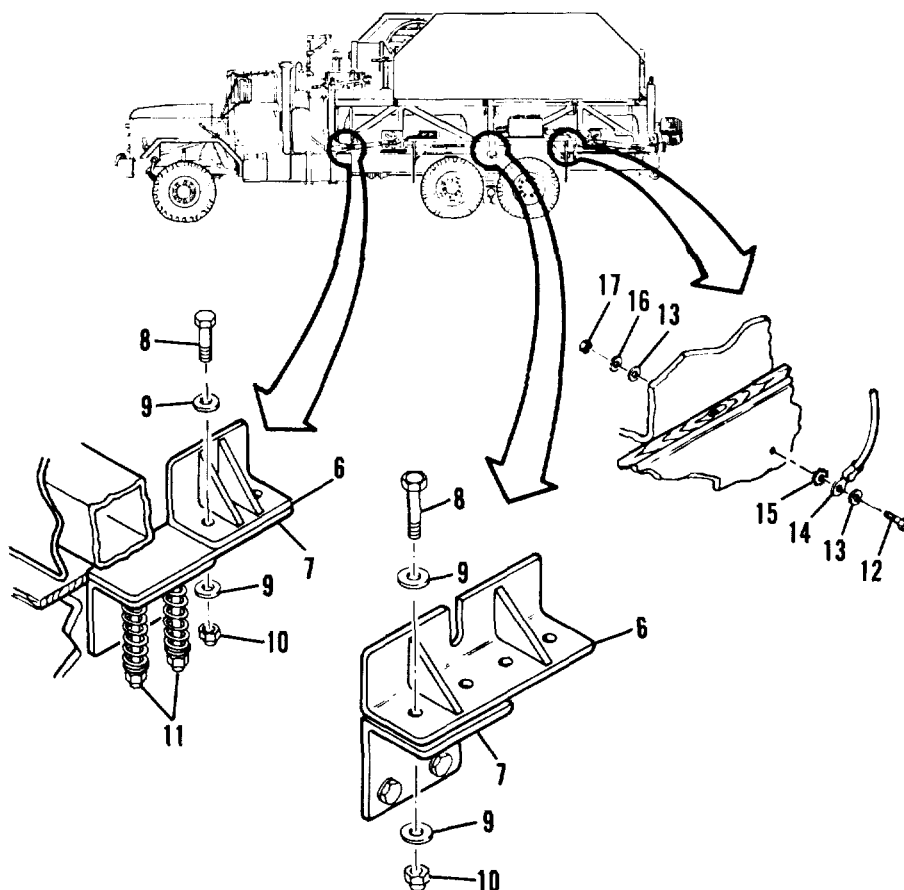
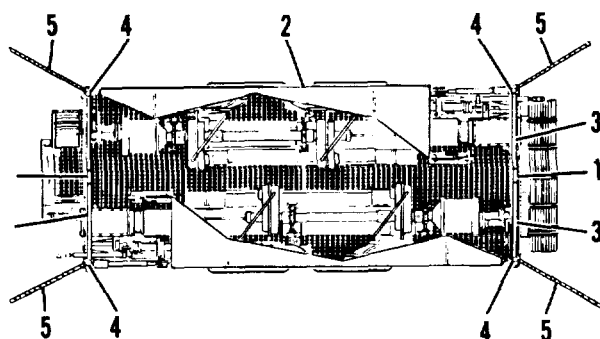
3-6.1 REPLACE MAST GROUP MOUNTED ON M942 TRUCK - Continued

STEP	PROCEDURE
10.	Position the truck so it can be driven under the mast group after mast group is lifted.
11.	Center each lifting hook (1) over ends of mast group (2).
12.	Connect bridle assemblies (3) to lifting points (4).
13.	Connect lifting hook (1) of each wrecker to bridle assemblies (3) and raise hooks to take up slack.
14.	Connect four ropes (5) to ends of mast group (2) at lifting points (4).
	WARNING Keep personnel away from frame of mast group when frame is lifted from truck. Serious Injury or death may occur if personnel do not stay clear.
15.	Hold four ropes (5) tight to prevent mast group (2) from swinging when mast group is lifted. Use assistants to hold all four ropes tight.
16.	Slowly lift the mast group (2) with both wreckers lifting equally. Keep tension on ropes (5) and lift the mast group high enough to clear the truck frame.
17.	Slowly back the truck into position under the mast group (2). Move truck back and forth, if necessary, to position mast group for mounting.
	WARNING Make sure personnel are clear of mast group before lowering mast group.
18.	Slowly lower the mast group (2) onto the truck frame until it just makes contact with the truck frame. Keep weight of mast group on bridle assemblies (3).
19.	Use pinch bars, if necessary, to line up brackets (6) on mast group with brackets (7) on truck. Install 16 bolts (8), 28 washers (9), and 12 locknuts (10) through brackets (6 and 7). Use long bolts for brackets between truck rear wheels. Finger tighten locknuts (10).
20.	Lower mast group (2) and remove bridle assemblies (3) and ropes (5) from mast group (2) and lifting hooks (1).
21.	Tighten 16 locknuts (10). Tighten four locknuts (11) so 1/2 to 3/4 inch of threads are shown below locknut (11).

3-6.1 REPLACE MAST GROUP MOUNTED ON M942 TRUCK - Continued

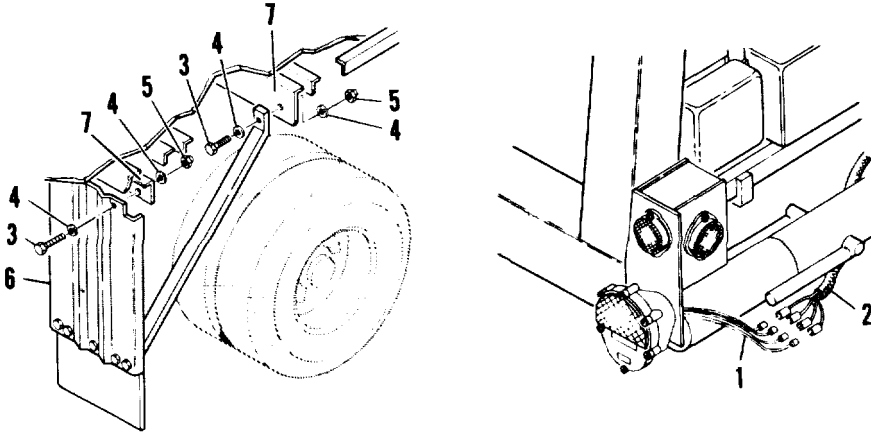
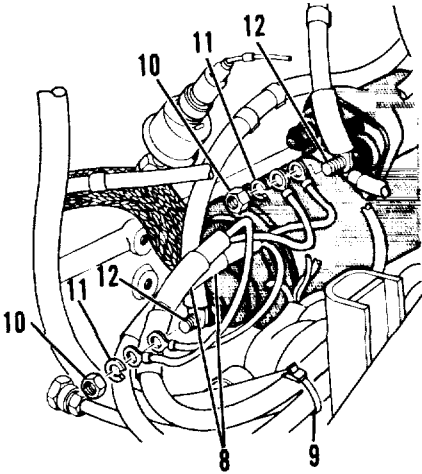
STEP

PROCEDURE



22. Install screw (12), two washers (13), ground strap (14), toothed washer (15), lockwasher (16), and nut (17) on truck frame.

3-6.1 REPLACE MAST GROUP MOUNTED ON M942 TRUCK - Continued

STEP	PROCEDURE
	
23.	Connect four taillight leads (1) to truck wiring harness (2) on each side of truck.
24.	Install 20 bolts (3), 40 washers (4), locknuts (5), and four mud flaps (6) on brackets (7) as shown.
	
25.	Access truck starter. See TM 9-2320-272-20-1.
26.	Route mast group cables (8) along truck frame, and attach to existing electrical cables with wire ties (9). Do not attach to movable parts, hydraulic lines or pneumatic lines.
27.	Remove two nuts (10) and lockwashers (11) from starter terminal studs (12). Position mast group cables (8) to starter terminal studs (12) and install lockwashers (11) and nuts (10). Secure cables (8) with wire ties (9) as required.

3-6.1 REPLACE MAST GROUP MOUNTED ON M942 TRUCK - Continued

STEP	PROCEDURE
	WARNING Do not allow tools to touch vehicle when connecting battery ground cables. A direct short can result, causing Instant heating of tools, tool damage, battery damage, or battery explosion, which can injure personnel. Remove all jewelry, watches, rings, etc. when working on batteries. 28. Connect battery ground cables (13). See TM 9-2320-272-20-1. 29. Install ladder on mast group (para 3-7b, installation step 5). 30. Install supports, hangers, and vehicular accessory box on mast group (para 3-6.2). 31. Install gas/water can bracket to liquid container bracket on mast group (para 3-6.3). 32. Install heat shield around muffler, using the same hardware that secured the muffler shield. See TM 9-2320-272-20-1. 33. Install muffler shield to stowage location on mast group. See page 3-97.8. 34. Install four bolts to their stowage locations on mast group. See page 3-97.8. 35. Perform Operator's Preventive Maintenance Checks and Services. See TM 11-5985-368-12&P. 36. Perform Organizational Preventive Maintenance Checks and Services. See TM 11-5985-368-12&P.

3-6.2 REPLACEMENT OF VEHICULAR ACCESSORY BOX (M942 TRUCK ONLY)

This task covers
Removal

Replacement

Installation

INITIAL SETUP**Tools**

Refrig Unit Svce Tool Kit,
5180-00-596-1474
9/16 in. comb. wr
1/2 in. comb. wr
9/16 in. skt
1/2 in. skt
skt adapter

STEP

PROCEDURE

NOTE

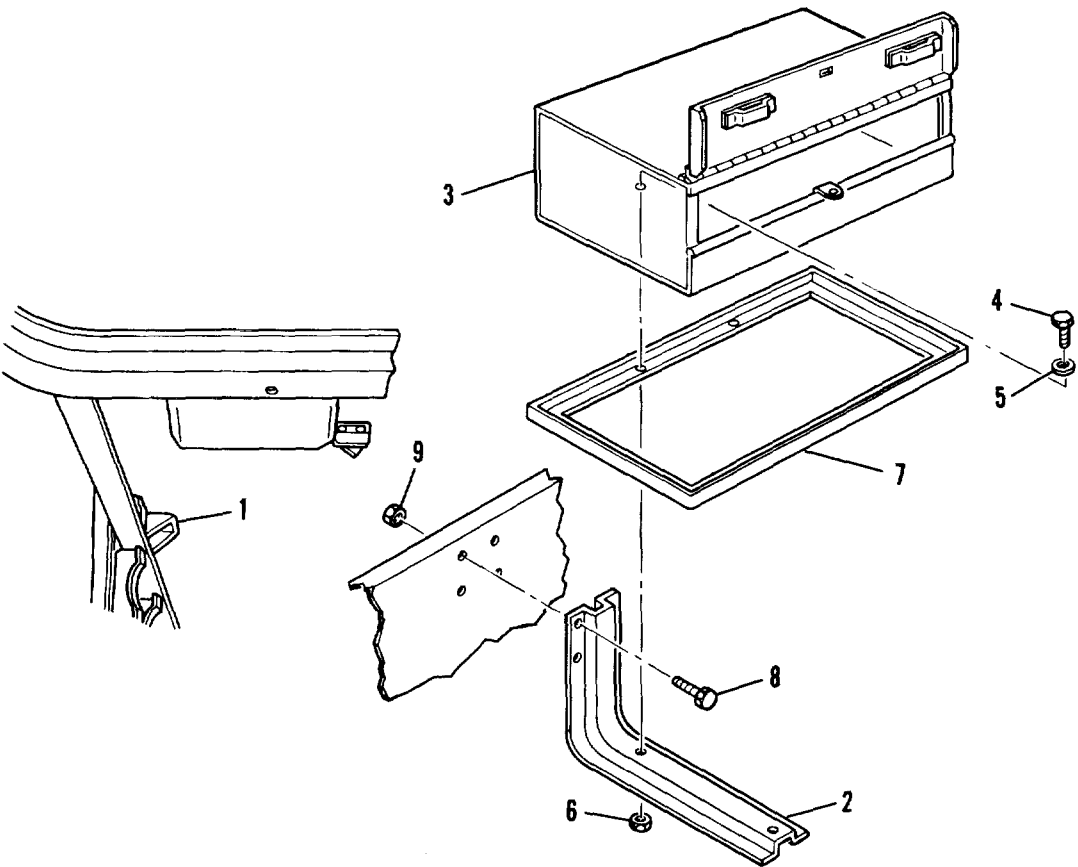
When the mast group is Installed on an M942 truck, the vehicular accessory box is relocated from the truck to the mast group. The procedures in this paragraph tell you how to:

- **Remove vehicular accessory box from M942 truck.**
- **Install vehicular accessory box to M942 truck.**
- **Remove vehicular accessory box from mast group.**
- **Install vehicular accessory box to mast group.**
- **Stow supports when mast group is to be shipped.**

REMOVAL FROM M942 TRUCK

1. Remove transfer case (see TM 9-2320-272-34-2, transfer case replacement).
2. Remove hardware securing right rail assembly frame support (1).
3. Move right rail assembly frame support (1) as required to gain access to vehicular accessory box hanger (2) mounting hardware.

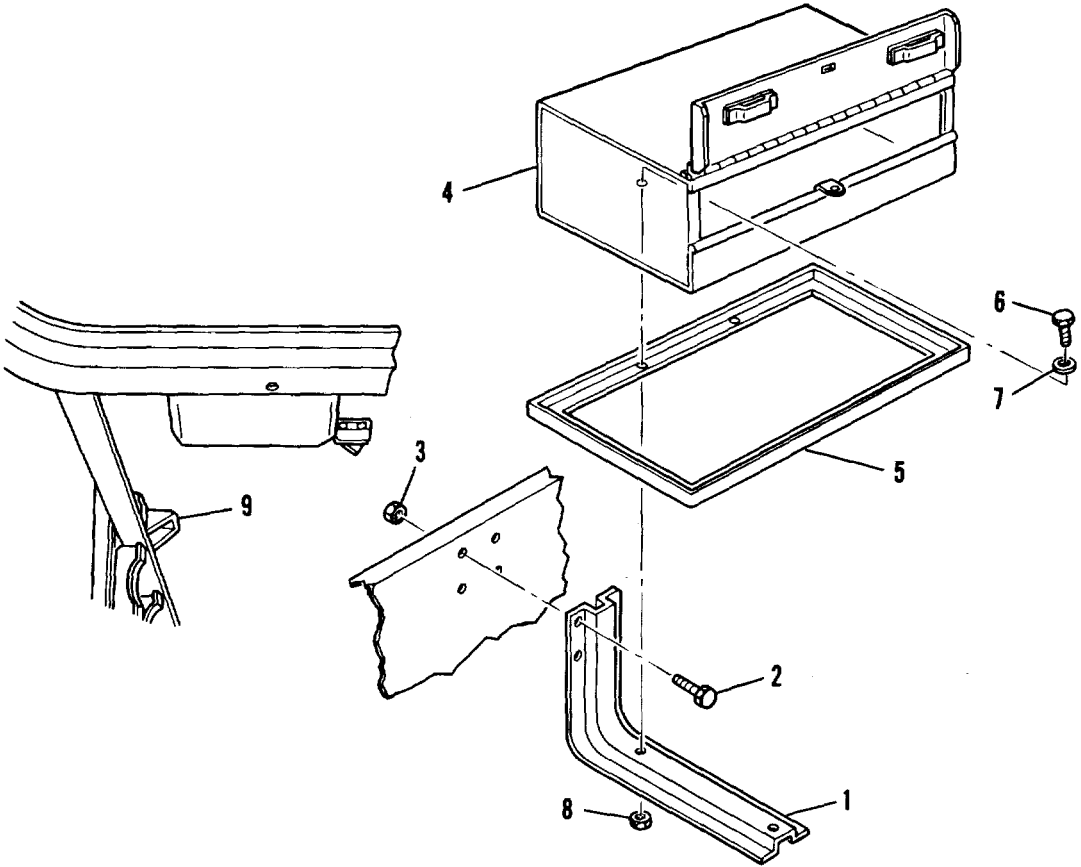
3-6.2 REPLACEMENT OF VEHICULAR ACCESSORY BOX (M942 TRUCK ONLY) - Continued

STEP	PROCEDURE
4.	Remove contents from vehicular accessory box (3) to make it lighter. WARNING The vehicular accessory box is heavy. Get a forklift or several soldiers to help lift it. If you don't, someone could get hurt. 5. Support the vehicular accessory box (3) with a forklift or several soldiers. 6. Remove four screws (4), flat washers (5), and locknuts (6). 7. Remove vehicular accessory box (3) and reinforcement frame (7) from hangers (2). 8. Remove eight screws (8), eight locknuts (9), and two hangers (2) from truck frame. 

3-6.2 REPLACEMENT OF VEHICULAR ACCESSORY BOX (M942 TRUCK ONLY) - Continued

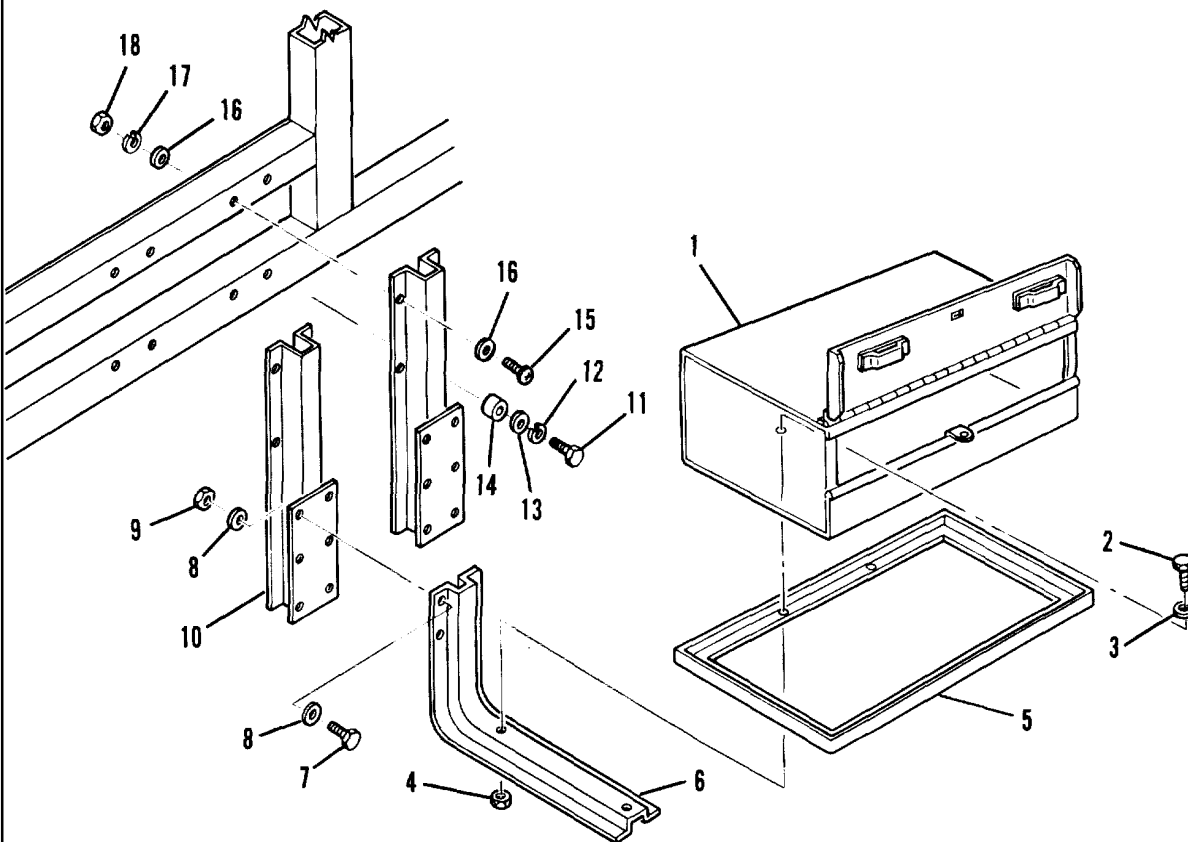
STEP	PROCEDURE
	CAUTION Be sure to secure right rail assembly frame support, install transfer case, and remove hydraulic lack and fixture (see TM 9.2320-272-34.2, transfer case replacement) before moving truck. REPLACEMENT Replace faulty part with a new part. See TM 9-2320-272-34P-1 for part numbers. INSTALLATION ON M942 TRUCK 1. If needed, remove transfer case (see TM 9-2320-272-34-2) and move right rail assembly frame support (steps 2 and 3, REMOVAL FROM M942 TRUCK). 2. Position two hangers (1) to truck frame and secure with eight screws (2) and locknuts (3). WARNING The vehicular accessory box is heavy. Get a forklift or several soldiers to help lift it. If you don't, someone could get hurt. 3. Support the vehicular accessory box (4) with a forklift or several soldiers. 4. Position reinforcement frame (5) and vehicular accessory box (4) to hangers (1) and secure with four screws (6), flat washers (7), and locknuts (8). 5. Position right rail assembly frame support (9) to truck frame and install hardware removed in step 2, REMOVAL FROM M942 TRUCK. 6. Install transfer case (see TM 9-2320-272-34-2, transfer case replacement).

3-6.2 REPLACEMENT OF VEHICULAR ACCESSORY BOX (M942 TRUCK ONLY) - Continued

STEP	PROCEDURE
	 REMOVAL FROM MAST GROUP 1. Remove contents from vehicular accessory box to make it lighter. WARNING The vehicular accessory box is heavy. Get a forklift or several soldiers to help lift it. If you don't, someone could get hurt.

3-6.2 REPLACEMENT OF VEHICULAR ACCESSORY BOX (M942 TRUCK ONLY) - Continued

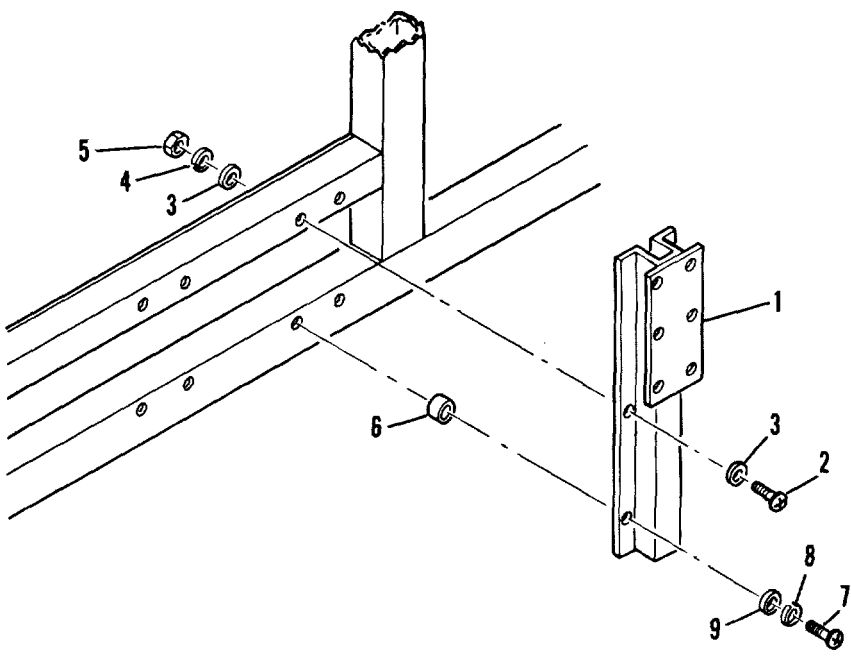
STEP	PROCEDURE
2.	Support the vehicular accessory box (1) with a forklift or several soldiers.
3.	Remove four screws (2), flat washers (3), and locknuts (4).
4.	Remove vehicular accessory box (1) and reinforcement frame (5) from hangers (6).
5.	Remove 12 screws (7), 24 flat washers (8), and 12 locknuts (9) securing hangers (6) to supports (10); and remove hangers (6).
6.	Remove four screws (11), lockwashers (12), flat washers (13), and spacers (14).
7.	Remove four screws (15), eight flat washers (16), four lockwashers (17), and four nuts (18); and remove supports (10).



3-6.2 REPLACEMENT OF VEHICULAR ACCESSORY BOX (M942 TRUCK ONLY) - Continued

STEP	PROCEDURE
	REPLACEMENT Replace faulty part with a new part. See TM 9-2320-272-34P-1 and TM 11-5985-368-34P for part numbers. INSTALLATION ON MAST GROUP - Position supports (10) to mast group and secure with four screws (15), eight flat washers (16), four lockwashers (17), and four nuts (18). - Install four screws (11), lockwashers (12), flat washers (13), and spacers (14). - Position hangers (6) to supports (10) and secure with 12 screws (7), 24 flat washers (8), and 12 locknuts (9). WARNING The vehicular accessory box is heavy. Get a forklift or several soldiers to help lift it. If you don't, someone could get hurt. - Support the vehicular accessory box (1) with a forklift or several soldiers. - Position reinforcement frame (5) and vehicular accessory box (1) to hangers (6) and secure with four screws (2), flat washers (3), and locknuts (4).

3-6.2 REPLACEMENT OF VEHICULAR ACCESSORY BOX (M942 TRUCK ONLY) - Continued

STEP	PROCEDURE
	STOWAGE OF SUPPORTS NOTE When the most group is to be shipped, supports must be installed upside down. 1. To install supports in stowage position: • Position two supports (1), upside down, to mast group. • Install four screws (2), eight flat washers (3), four lockwashers (4), and four nuts (5). • Install four spacers (6) between supports (1) and mast group; and secure with four screws (7), lockwashers (8), and flat washers (9). 2. To remove supports in stowage position: • Remove four screws (7), lockwashers (8), flat washers (9), and spacers (6). • Remove four screws (2), eight flat washers (3), four lockwashers (4), four nuts (5); and remove two supports (1). 

3-6.3 REPLACEMENT OF GAS/WATER CAN BRACKET (M942 TRUCK ONLY)

This task covers:

Removal

Replacement

Installation

INITIAL SETUPTools

Refrig Unit Svce Tool Kit,

5180-00-596-1474

9/16 in. skt

9/16 in. comb. wr

STEP	PROCEDURE
	NOTE When the mast group is installed on an M942 truck, the gas/water can bracket (if installed) is relocated from the truck vehicular accessory box to the mast group. The procedures in this paragraph tell you how to: • Remove gas/water can bracket from truck vehicular accessory box. • Install gas/water can bracket to truck vehicular accessory box. • Remove gas/water can bracket from mast group. • Install gas/water can bracket to mast group. REMOVAL FROM VEHICULAR ACCESSORY BOX 1. If installed, remove gas or water can from bracket (1). 2. Open vehicular accessory box (2). 3. Remove four screws (3), flat washers (4), nuts (5), and plate (6) secure bracket (1) to vehicular accessory box (2). Remove bracket (1). REPLACEMENT Replace faulty part with a new part. INSTALLATION ON VEHICULAR ACCESSORY BOX 1. Position bracket (1) and plate (6) to vehicular accessory box (2) and secure with four screws (3), flat washers (4), and nuts (5). 2. If applicable, install gas or water can on bracket (1).

3-6.3 REPLACEMENT OF GAS/WATER CAN BRACKET (M942 TRUCK ONLY - Continued)

STEP	PROCEDURE
	REMOVAL FROM MAST GROUP 1. If installed, remove gas or water can from bracket (7). 2. Remove four screws (8), flat washers (9), nuts (10), and plate (11) securing bracket (7) to liquid container bracket (12). Remove bracket (7). 3. Remove four screws (13), lockwashers (14), flat washers (15), and bracket (12). REPLACEMENT Replace faulty part with a new part. INSTALLATION ON MAST GROUP 1. Position bracket (12) to mast group and secure with four screws (13), lockwashers (14), and flat washers (15). 2. Position bracket (7) and plate (11) to liquid container bracket (12) and secure with four screws (8), flat washers (9), and nuts (10). 3. If applicable, install gas or water can on bracket (7).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS

- You will find procedures for repairing major parts of the Support Frame in this paragraph.
- If a part is found to be faulty during troubleshooting, you will be referred directly to the repair procedure.
- If a part is found to be faulty during inspection, refer to the List of Tasks. It will tell you the subparagraph of the repair procedure for the part.
- When required, you will be referred to test procedures.

OVERVIEW

To repair the support frame, you must:

- Remove the subassembly or unit from the Support Frame (if it was not previously removed at direct support level).
- Remove the faulty part.
- Install a new part.
- Reinstall the subassembly or unit on the Support Frame (or return to direct support maintenance).
- Test the unit to verify repair, (para 3-16) when required.

LIST OF TASKS

Task	Paragraph No.
Aft Curbside Air Tank Skid Replacement	3-7a, 17
Aft Curbside Control Unit Bracket Replacement	3-7a, 15
Aft Curbside HCA Support Replacement	3-7a, 16
Aft Curbside Platform Angle Bracket Replacement	3-7a, 13
Aft Roadside Air Tank Skid Replacement	3-7a, 18
Aft Roadside Platform Angle Bracket Replacement	3-7a, 1 or 13
Aft Roadside PCA Support Replacement	3-7a, 2
Amplifier-Distribution Support Replacement	3-7a, 4
Antenna Clamp	3-7d
Antenna Cover Pump	3-7e
Antenna Protective Cover	3-7c
Antenna Protective Cover Hydraulic Cylinder	3-7s
Bearing Housing Replacement	3-7n
Bottom Cable Support Bracket Replacement	3-7a, 22
Cable Stowage Tray	3-7i
Chain Assembly	3-7q
Curbside Distribution Box Support Replacement	3-7a, 14
Cylinder Support	3-7h
Forward Curbside Air Tank Skid Replacement	3-7a, 20
Forward Curbside Platform Angle Bracket Replacement	3-7a, 9 or 11
Forward Curbside PCA Support Replacement	3-7a, 10
Forward Roadside Air Tank Skid Replacement	3-7a, 19
Forward Roadside Control Unit Bracket Replacement	3-7a, 7
Forward Roadside HCA Support Replacement	3-7a, 8
Forward Roadside Platform Angle Bracket Replacement	3-7a, 5
Ground Rod Box Support Replacement	3-7a, 12
Interconnect Box	3-7f
Ladder-Walkway	3-7b
Lock Bracket	3-7r
Mast Base Clamp	3-7p
Mast Clamp	3-7l
Reflector Assembly	3-7k
Replace Air Tanks	3-7o
Roadside Distribution Box Support Replacement	3-7a, 6
Stabilizing Strut	3-7g
Taillight Assembly	3-7j
Top Cable Support Bracket Replacement	3-7a, 21
Deleted	

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS- Continued**a. SUPPORT STRUCTURE SUBASSEMBLY**

This task covers:

Removal

Replacement

Installation

INITIAL SETUPToolsRefrig Unit Svce Tool Kit,
5180-00-596-1474

9/16 in. comb. wr

No. 2 xtip scdr

3/8 in. comb. wr

9/16 in. skt

1/2 in. skt

skt wr hdl

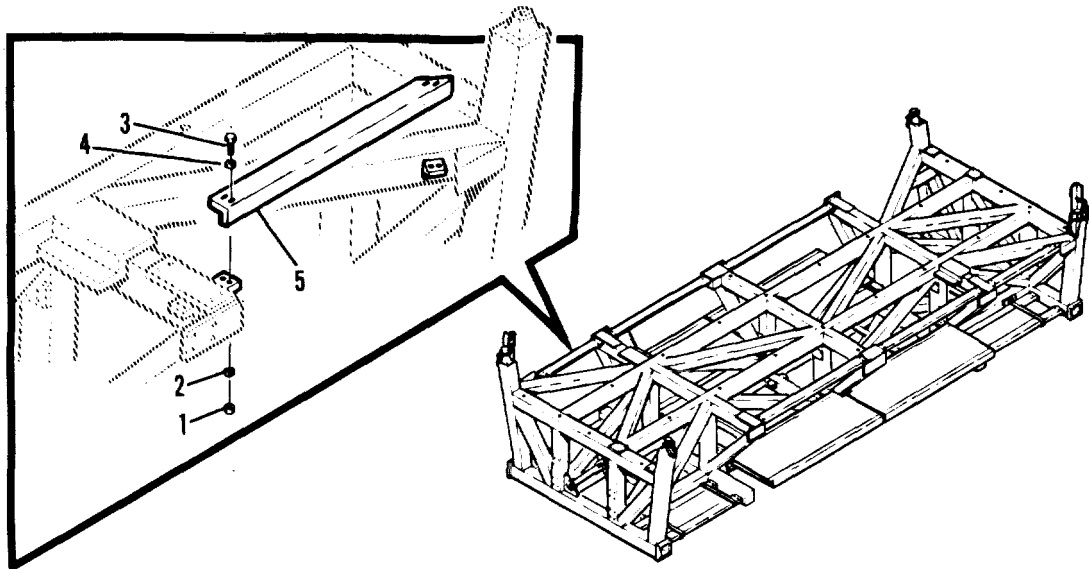
2 in. skt wr ext

Materials/Parts

Bracket or support as needed

STEP**PROCEDURE**

1. PLATFORM ANGLE BRACKET - AFT ROADSIDE
REMOVAL



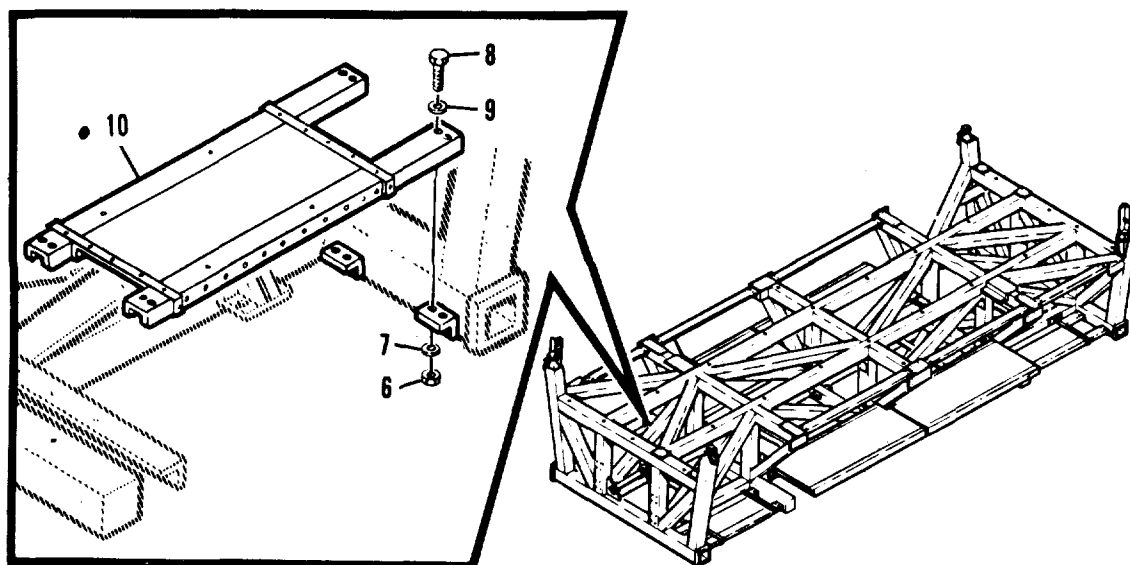
Remove four self locking nuts (1), four flat washers (2), four screws (3), and four flat washers (4) and remove aft roadside platform angle bracket (5).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued****STEP****PROCEDURE****REPLACEMENT**

Replace faulty part with a new part.

INSTALLATION

Install aft roadside platform angle bracket (5) with four flat washers (4), four screws (3), four flat washers (2), and four self locking nuts (1).

2. PCA SUPPORT - AFT ROADSIDE**REMOVAL**

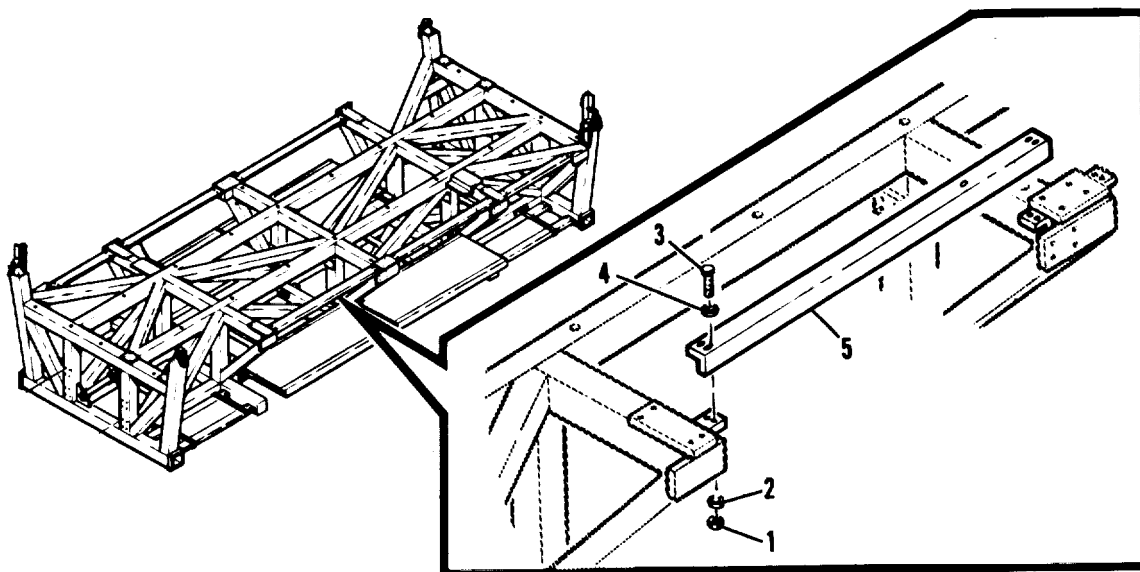
Remove eight self locking nuts (6), eight flat washers (7), eight screws (8), and eight flat washers (9) and remove aft roadside PCA support (10).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

Install aft roadside PCA support (10) with eight flat washers (9), eight screws (8), eight flat washers (7), and eight self locking nuts (6).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued****STEP****PROCEDURE****3. PLATFORM ANGLE BRACKET - AFT CURBSIDE
REMOVAL**

Remove four self locking nuts (1), four flat washers (2), four screws (3), and four flat washers (4) and remove aft curbside platform angle bracket (5).

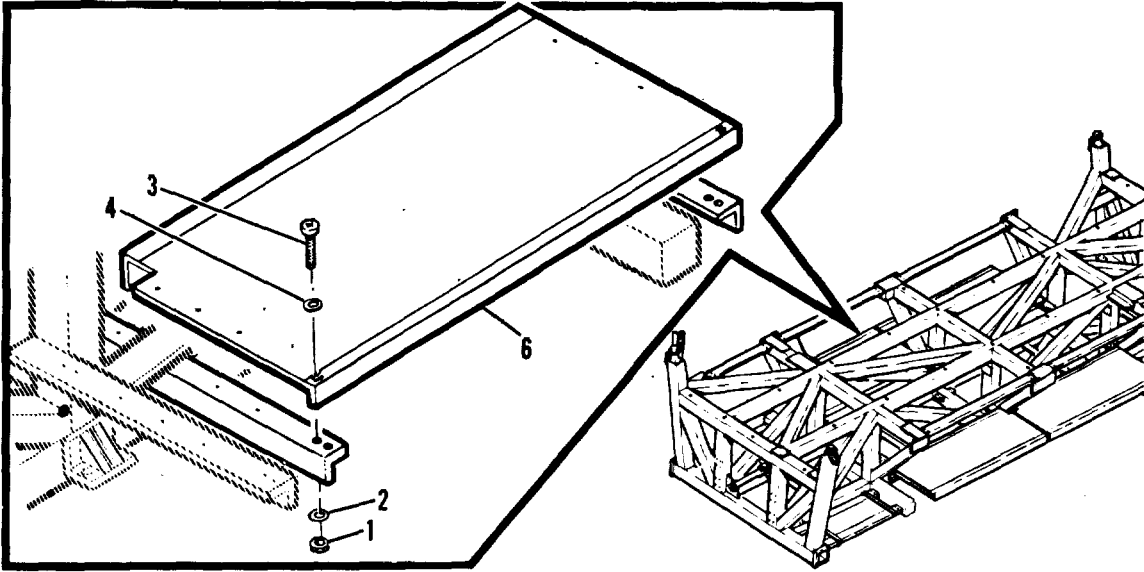
REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

Install aft curbside platform angle bracket (5) with four flat washers (4), four screws (3), four flat washers (2), and four self locking nuts.

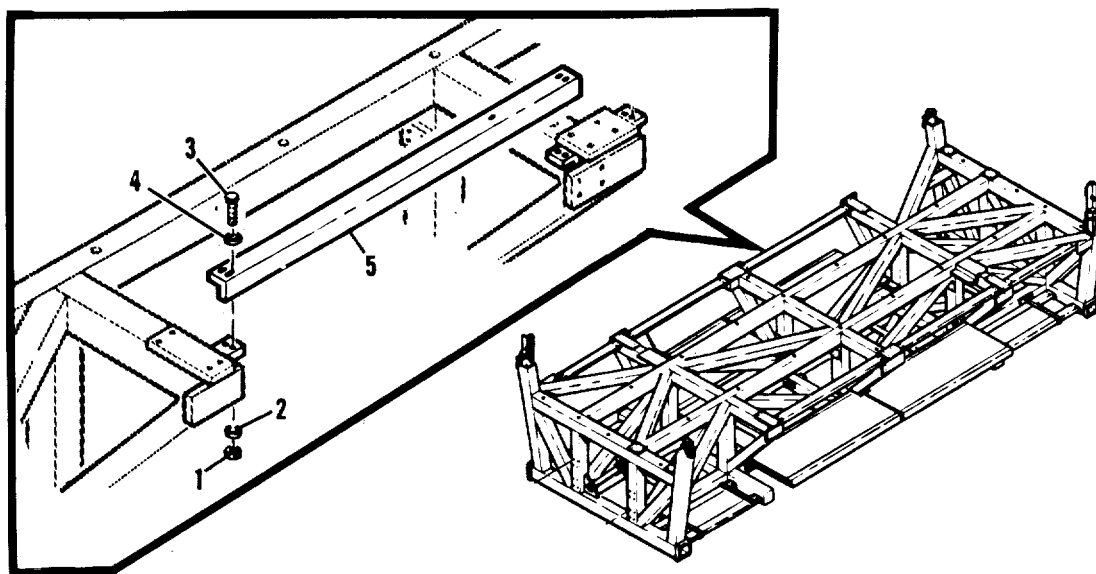
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued**

STEP	PROCEDURE
4. AMPLIFIER/DISTRIBUTION SUPPORT REMOVAL  Remove 14 self locking nuts (1), 14 flat washers (2), 14 screws (3), and 14 flat washers (4) and remove the amplifier/distribution support (6). REPLACEMENT Replace faulty part with a new part. INSTALLATION Install amplifier/distribution support (6) with 14 flat washers (4), 14 screws (3), 14 flat washers (2), and 14 self locking nuts (1).	

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued**

STEP

PROCEDURE

5. PLATFORM ANGLE BRACKET - FORWARD ROADSIDE**REMOVAL**

Remove four self locking nuts (1), four flat washers (2), four screws (3), and four flat washers (4) and remove forward roadside platform angle bracket (5).

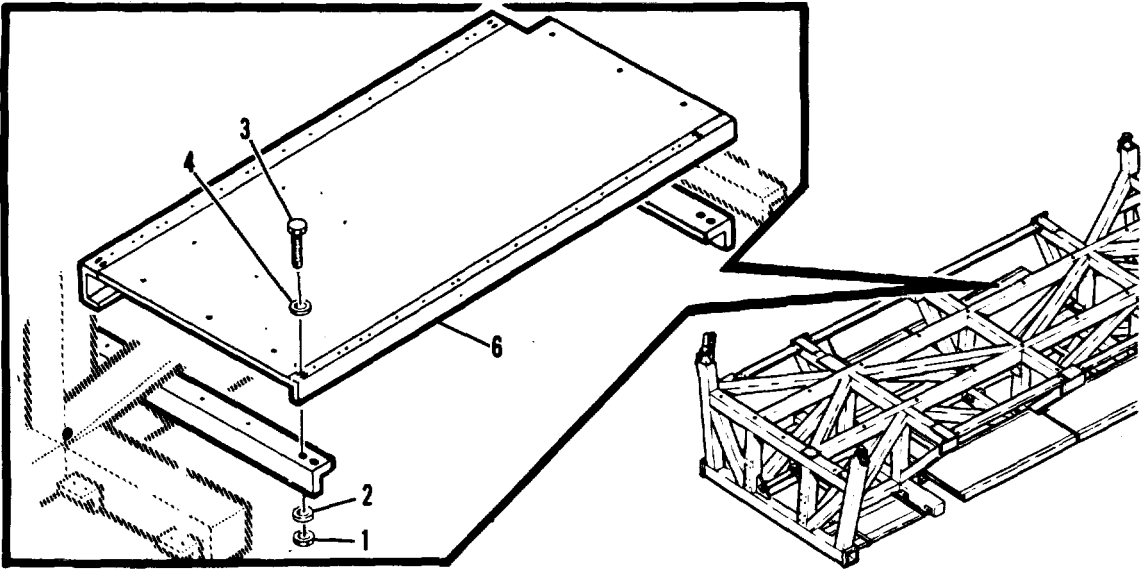
REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

Install forward roadside platform angle bracket (5) with four flat washers (4), four screws (3), four flat washers (2), and four self locking nuts (1).

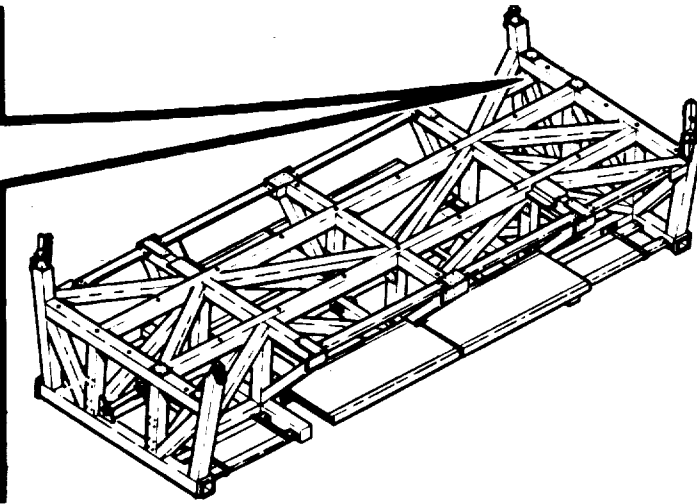
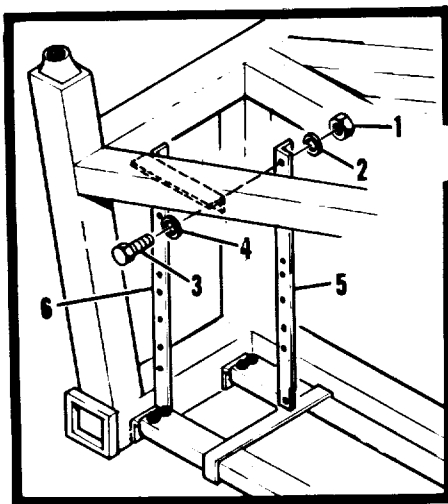
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued**

STEP	PROCEDURE
6. DISTRIBUTION BOX SUPPORT - ROADSIDE REMOVAL  Remove 14 self locking nuts (1), 14 flat washers (2), 14 screws (3), and 14 flat washers (4) and remove roadside distribution box support (6). REPLACEMENT Replace faulty part with a new part. INSTALLATION Install roadside distribution box support (6) with 14 flat washers (4), 14 screws (3), 14 flat washers (2), and 14 self locking nuts (1).	

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued**

STEP

PROCEDURE

7. CONTROL UNIT BRACKET - ROADSIDE**REMOVAL**

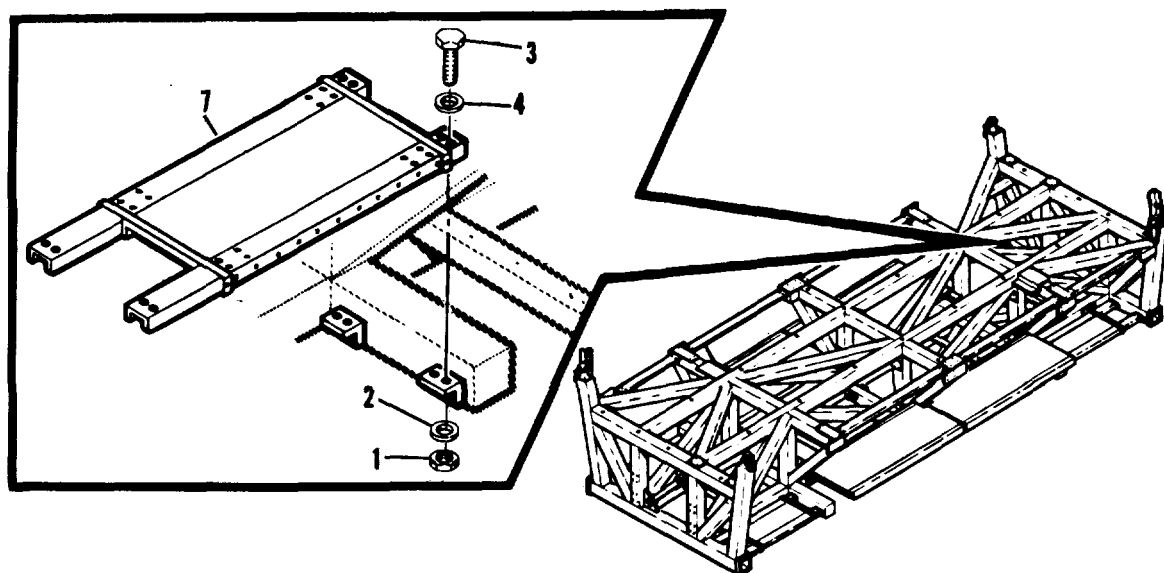
Remove four self locking nuts (1), four flat washers (2), four screws (3), and four flat washers (4) and remove forward roadside control unit bracket (5) or (6).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

Install forward roadside control unit bracket (5) or (6) with four flat washers (4), four screws (3), four flat washers (2), and four self locking nuts (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued****STEP****PROCEDURE****8. HCA SUPPORT-- FORWARD ROADSIDE
REMOVAL**

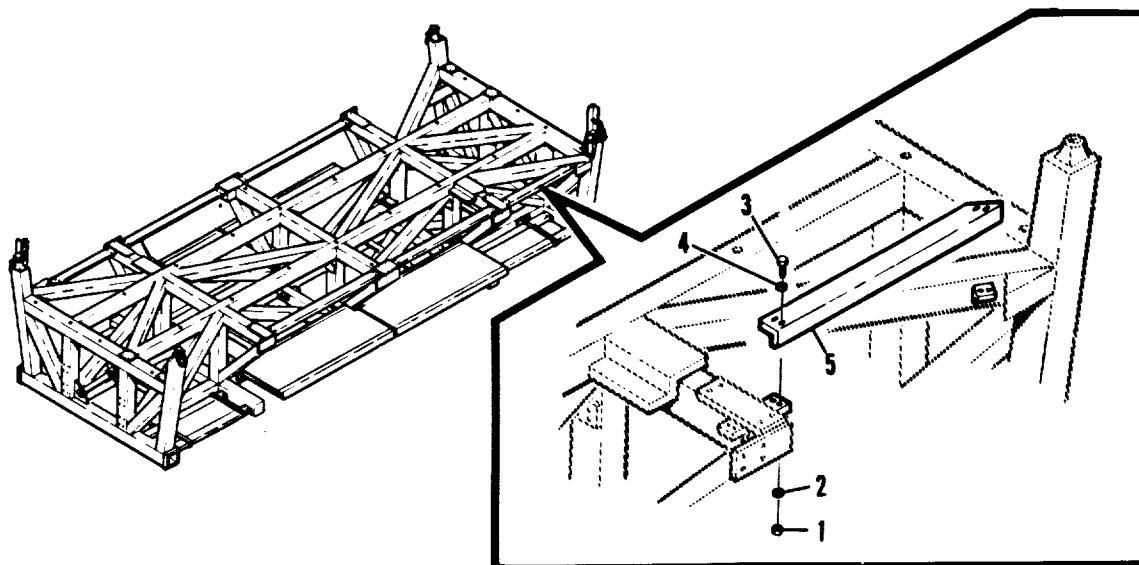
Remove 10 self locking nuts (1), 10 flat washers (2), 10 screws (3), and 10 flat washers (4) and remove forward roadside HCA support (7).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

Install forward roadside hydraulic component assembly support (7) with 10 flat washers (4), 10 screws (3), 10 flat washers (2), and 10 self locking nuts (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued****STEP****PROCEDURE****9. PLATFORM ANGLE BRACKET - FORWARD CURBSIDE****REMOVAL**

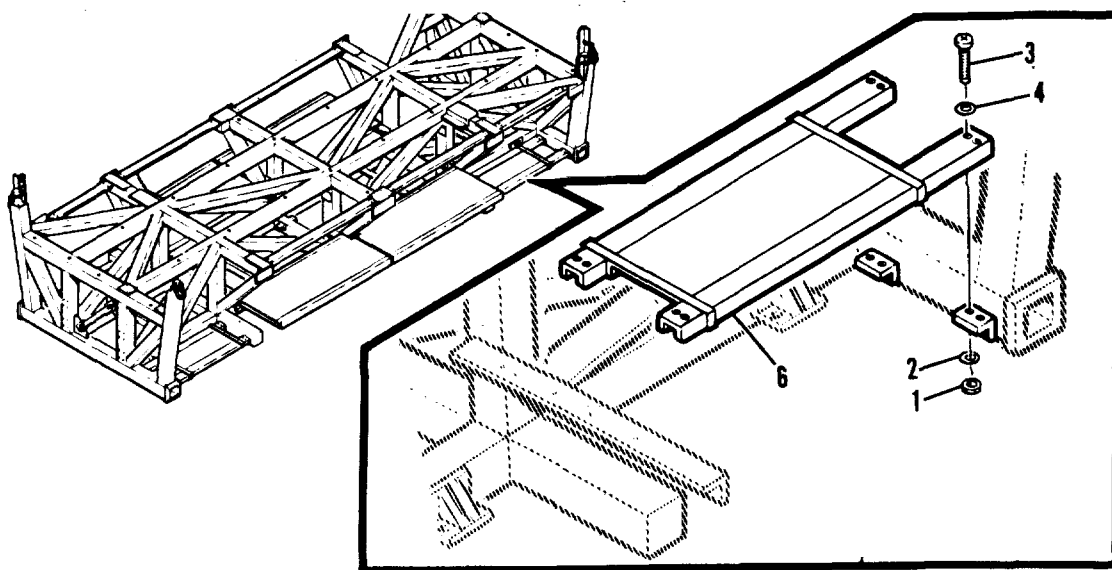
Remove four self locking nuts (1), four flat washers (2), four screws (3), and four flat washers (4) and remove forward curbside platform angle bracket (5).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

Install forward curbside platform angle bracket (5) with four flat washers (4), four screws (3), four flat washers (2), and four self locking nuts (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued****STEP****PROCEDURE****10. PCA SUPPORT - FORWARD CURBSIDE
REMOVAL**

Remove eight self locking nuts (1), eight flat washers (2), eight screws (3), and eight flat washers (4) and remove forward curbside PCA support (6).

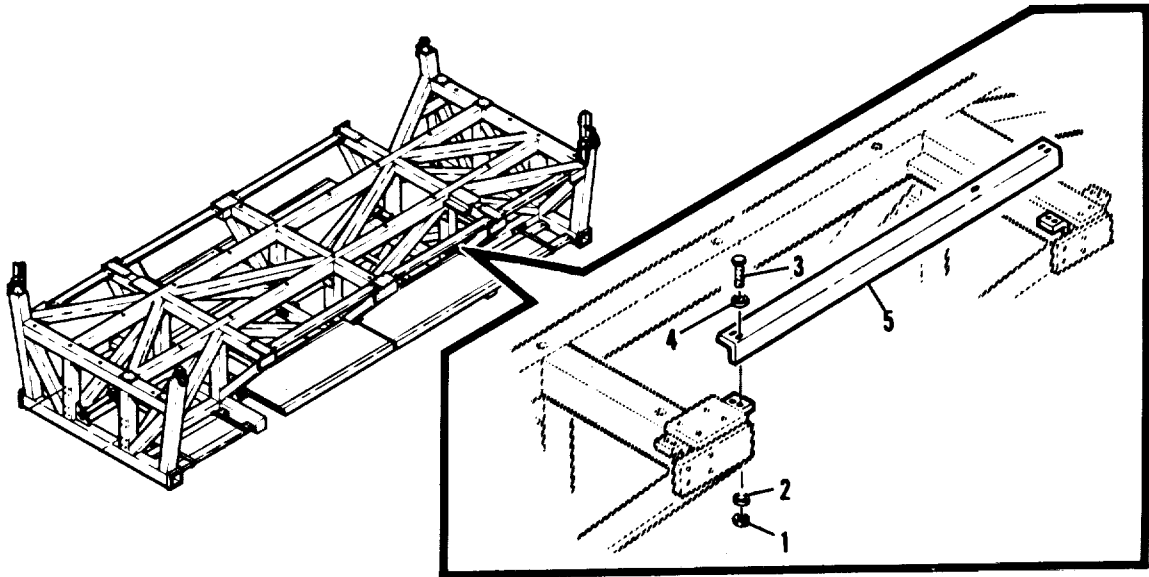
REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

Install forward curbside pneumatic component assembly support (6) with eight flat washers (4), eight screws (3), eight flat washers (2), and eight self locking nuts (1).

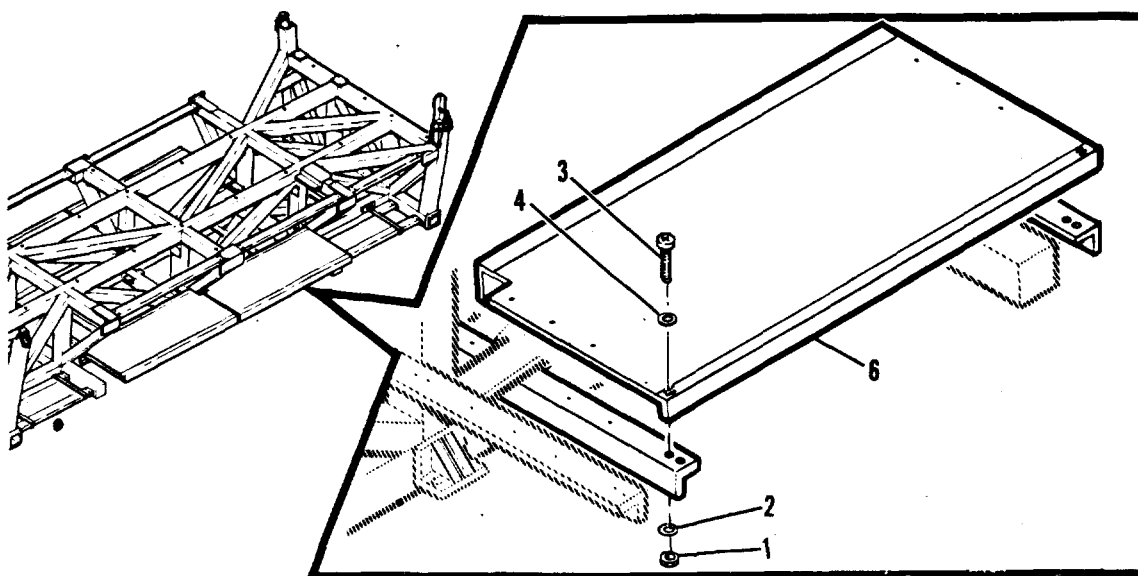
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued**

STEP	PROCEDURE
11. PLATFORM ANGLE BRACKET - FORWARD CURBSIDE REMOVAL 	Remove four self locking nuts (1), four flat washers (2), four screws (3), and four flat washers (4) and remove forward curbside platform angle bracket (5). REPLACEMENT Replace faulty part with a new part. INSTALLATION Install forward curbside platform angle bracket (5) with four flat washers (4), four screws (3), four flat washers (2), and four self locking nuts (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued**

STEP

PROCEDURE

12. GROUND ROD BOX SUPPORT**REMOVAL**

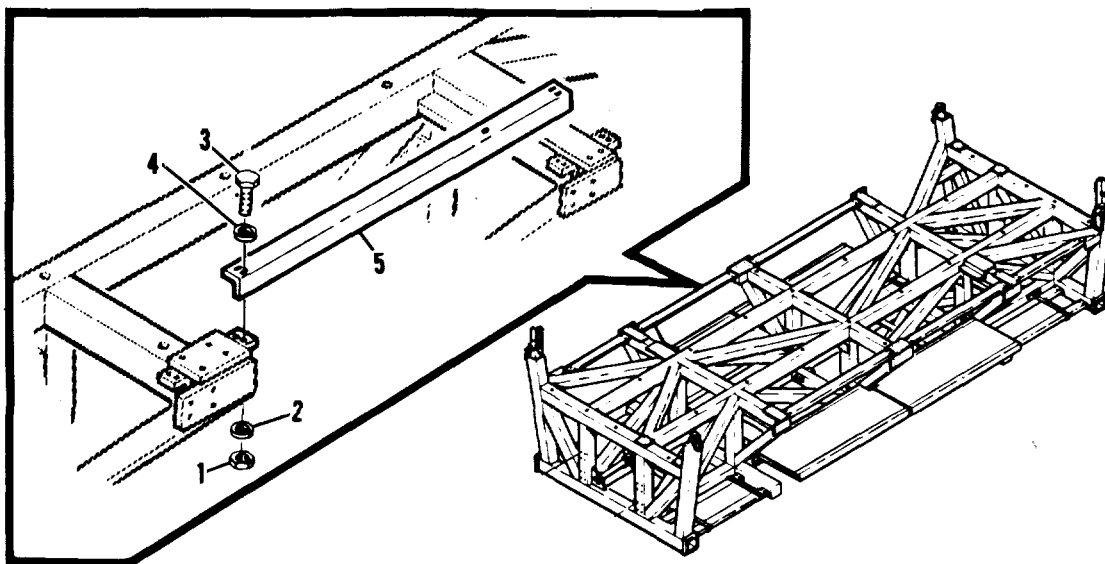
Remove 14 self locking nuts (1), 14 flat washers (2), 14 screws (3), and 14 flat washers (4) and remove ground rod box support (6).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

Install ground rod box support (6) with 14 flat washers (4) 14 screws (3), 14 flat washers (2), and 14 self locking nuts (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued****STEP****PROCEDURE****13. PLATFORM ANGLE BRACKET - AFT ROADSIDE****REMOVAL**

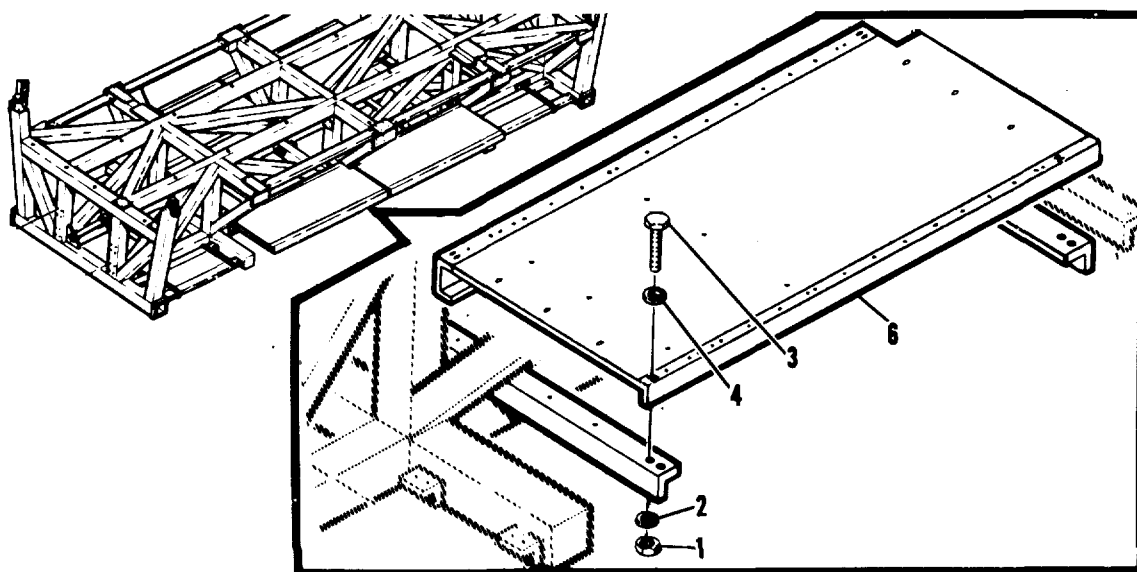
Remove four self locking nuts (1), four flat washers (2), four screws (3), and four flat washers (4) and remove aft roadside platform angle bracket (5).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

Install aft roadside platform angle bracket (5) with four flat washers (4), four screws (3), four flat washers (2) and four self locking nuts (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued****STEP****PROCEDURE****14. DISTRIBUTION BOX SUPPORT - CURBSIDE****REMOVAL**

Remove 14 self locking nuts (1), 14 flat washers (2), 14 screws (3) and 14 flat washers (4) and remove curbside distribution box support (6).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

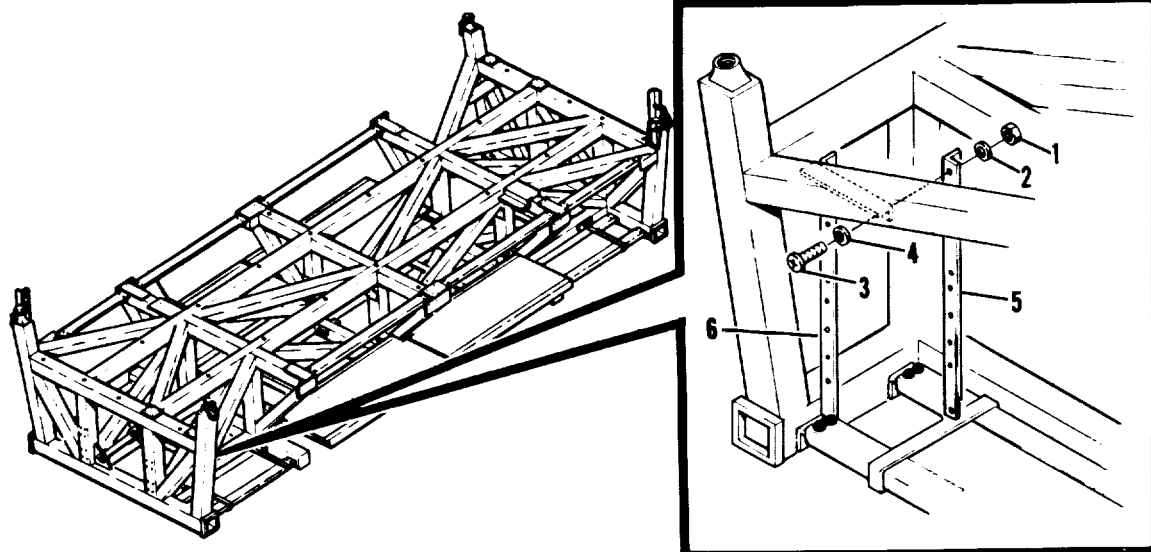
Install curbside distribution box support (6) with 14 flat washers (4), 14 screws (3), 14 flat washers (2), and 14 self locking nuts (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued**

STEP

PROCEDURE

15. **CONTROL UNIT ANGLE BRACKET - AFT CURBSIDE
REMOVAL**



Remove four self locking nuts (1), 4 flat washers (2), 4 screws (3), and four flat washers (4) and remove aft curbside control unit angle bracket (5) or (6).

REPLACEMENT

Replace faulty Dart with a new part.

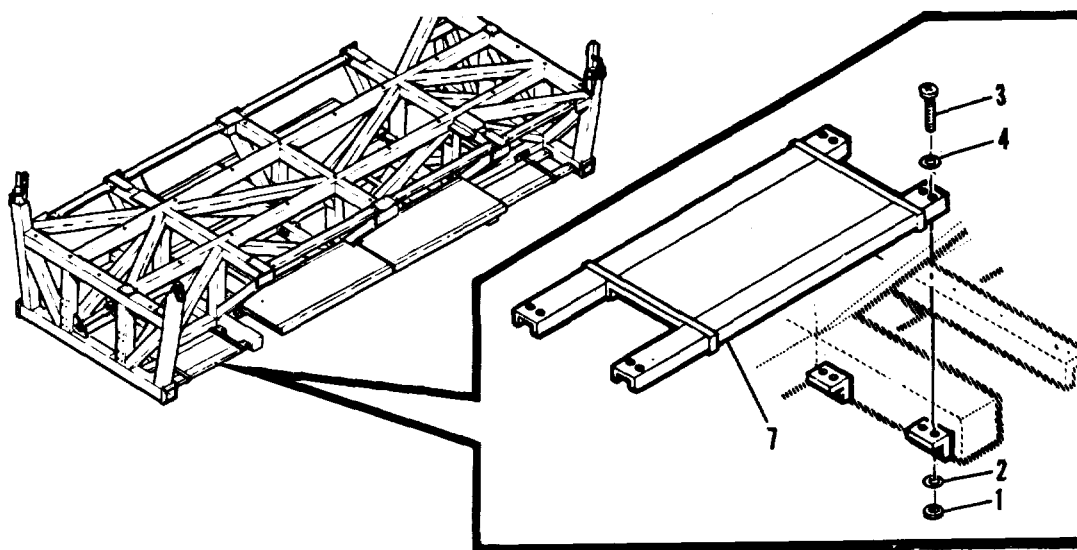
INSTALLATION

Install aft curbside control unit angle bracket (5) or (6) with four flat washers (4), four screws (3), four flat washers (2) and four self locking nuts (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued**

STEP

PROCEDURE

16. HCA REMOVAL - AFT CURBSIDE**REMOVAL**

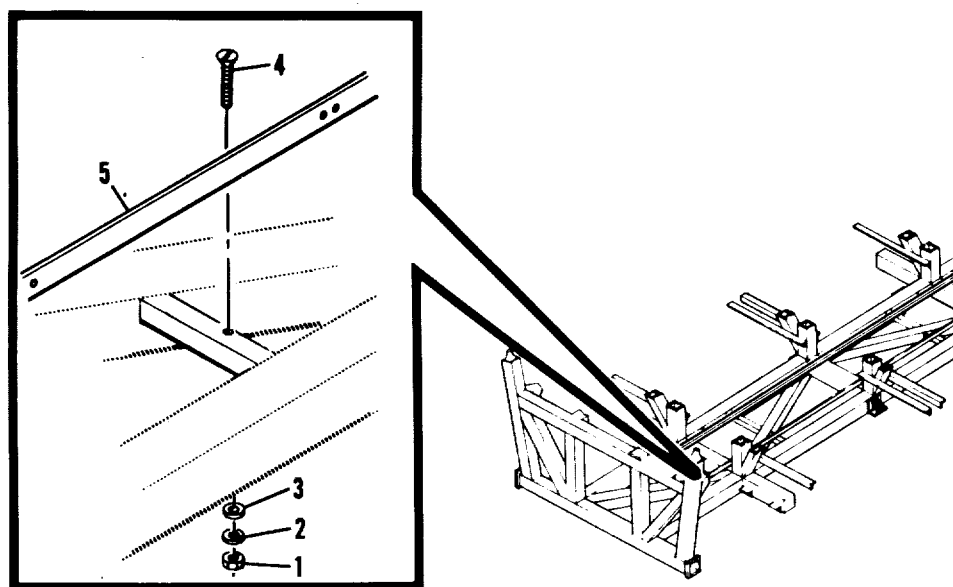
Remove 8 self locking nuts (1), 8 flat washers (2), 8 screws (3), and 8 flat washers (4) and remove aft curbside HCA support (7).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

Install aft curbside HCA support (7) with 10 flat washers (4), 10 screws (3), 10 flat washers (2), and 10 self locking nuts (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued****STEP****PROCEDURE****17. AIR TANK SKID - AFT CURBSIDE****REMOVAL**

Remove two nuts (1), two lockwashers (2) two flat washers (3), and three flathead screws (4) and remove aft curbside air tank skid (5).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

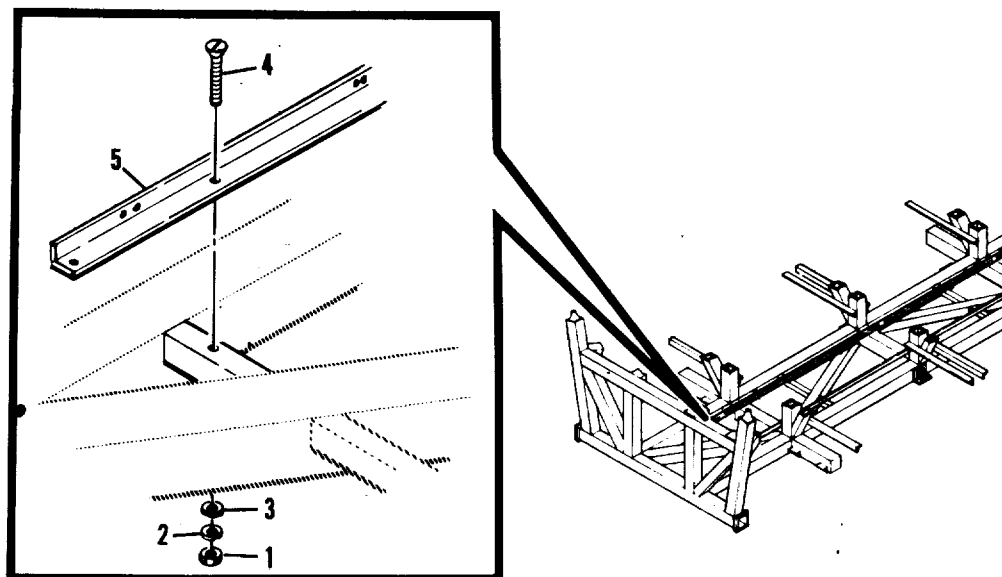
Install aft curbside air tank skid (5) with three flathead screws (4), two flat washers (3), two lockwashers (2) and two nuts (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued**

STEP

PROCEDURE

18. **AIR TANK SKID - AFT ROADSIDE**
REMOVAL



Remove one nut (1) one lockwasher (2), one flat washer (3) and two flat head screws (4) and remove aft roadside air tank skid (5).

REPLACEMENT

Replace faulty part with a new part.

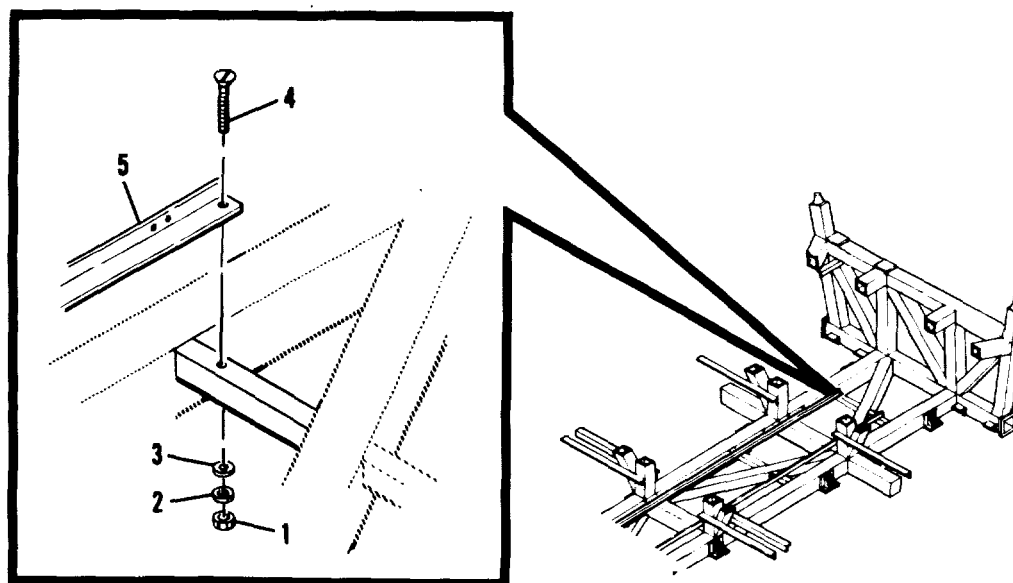
INSTALLATION

Install aft roadside air tank skid (5) with two flathead screws (4), one flat washer (3), one lockwasher (2), and one nut (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued**

STEP

PROCEDURE

19. AIR TANK SKID - FORWARD ROADSIDE**REMOVAL**

Remove one nut (1), one lockwasher (2), one flat washer (3), and two flathead screws (4) and remove forward roadside air tank skid (5).

REPLACEMENT

Replace faulty part with a new part.

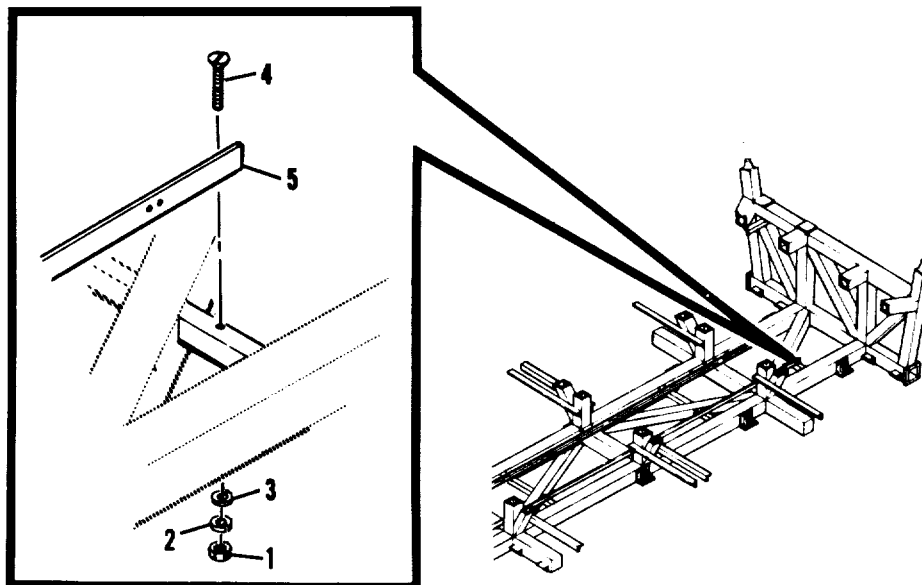
INSTALLATION

Install forward roadside air tank skid (5) with two flat head screws (4), one flat washer (3), one lockwasher (2), and one nut (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued**

STEP

PROCEDURE

20. AIR TANK SKID - FORWARD CURBSIDE**REMOVAL**

Remove one nut (1) one lockwasher (2) one flat washer (3) and two flathead screws (4) and remove forward curbside air tank skid (5).

REPLACEMENT

Replace faulty part with a new part.

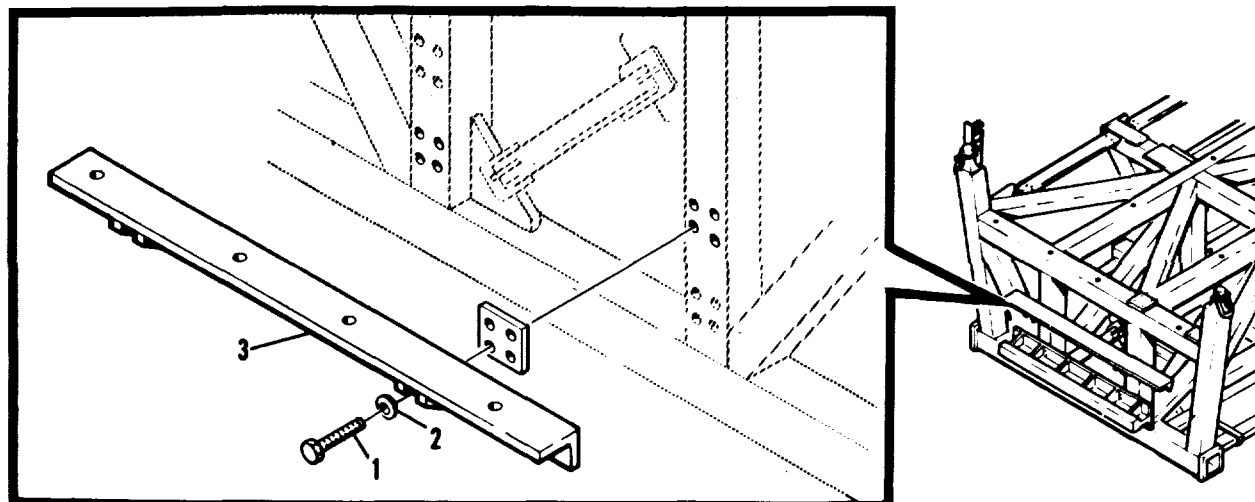
INSTALLATION

Install forward curbside air tank skid (5) with two flathead screws (4), one flat washer (3), one lockwasher (2), and one nut (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORTT STRUCTURE SUBASSEMBLY - Continued**

STEP

PROCEDURE

21. CABLE SUPPORT BRACKET - TOP**REMOVAL**

Remove eight screws (1), and eight flat washers (2) and remove top cable support bracket (3).

REPLACEMENT

Replace faulty part with a new part.

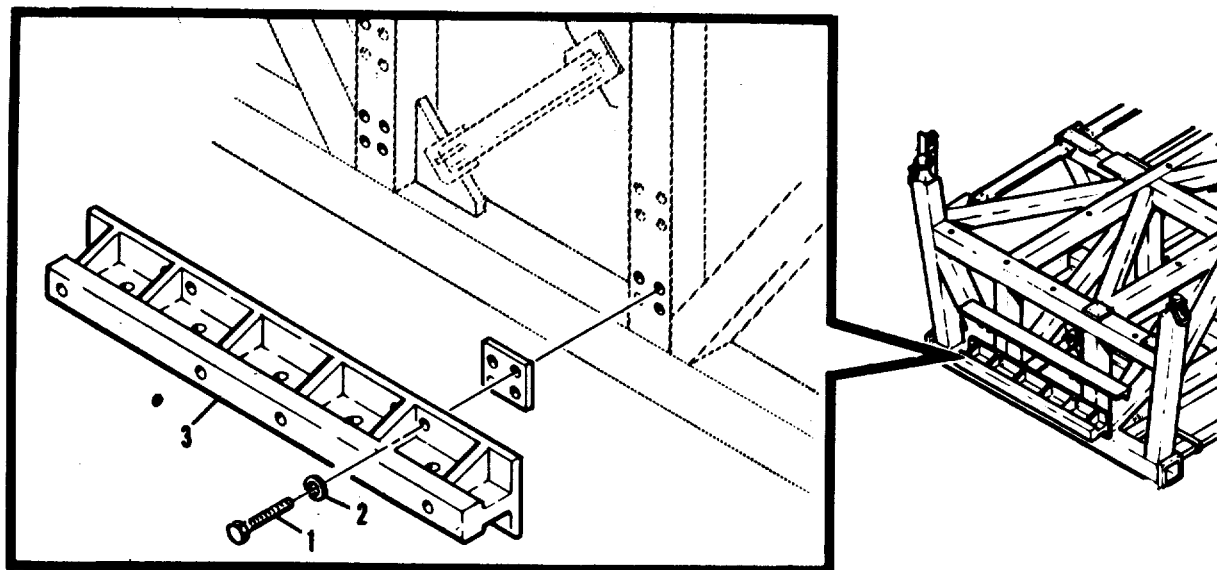
INSTALLATION

Install top cable support bracket (3) with eight flat washers (2) and eight screws (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**a. SUPPORT STRUCTURE SUBASSEMBLY - Continued**

STEP

PROCEDURE

22. CABLE SUPPORT BRACKET BOTTOM**REMOVAL**

Remove eight screws (1) and eight flat washers (2) and remove bottom cable support bracket (3).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

Install bottom cable support bracket (3) with eight flat washers (2) and screws (1).

3.7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

b. LADDER.WALKWAY REPAIR

This task covers:

Removal

Replacement

Installation

INITIAL SETUP

Tools

Refrig Unit Svce Tool Kit

1/2 in. comb wr

1/2 in. skt wr

Skt wr hdl

3/16 in. skt hd scr key

Wrecker truck M819A

Endless loop sling EN1-62X96 in.

Personnel Required

Wrecker Operator

Materials/Parts

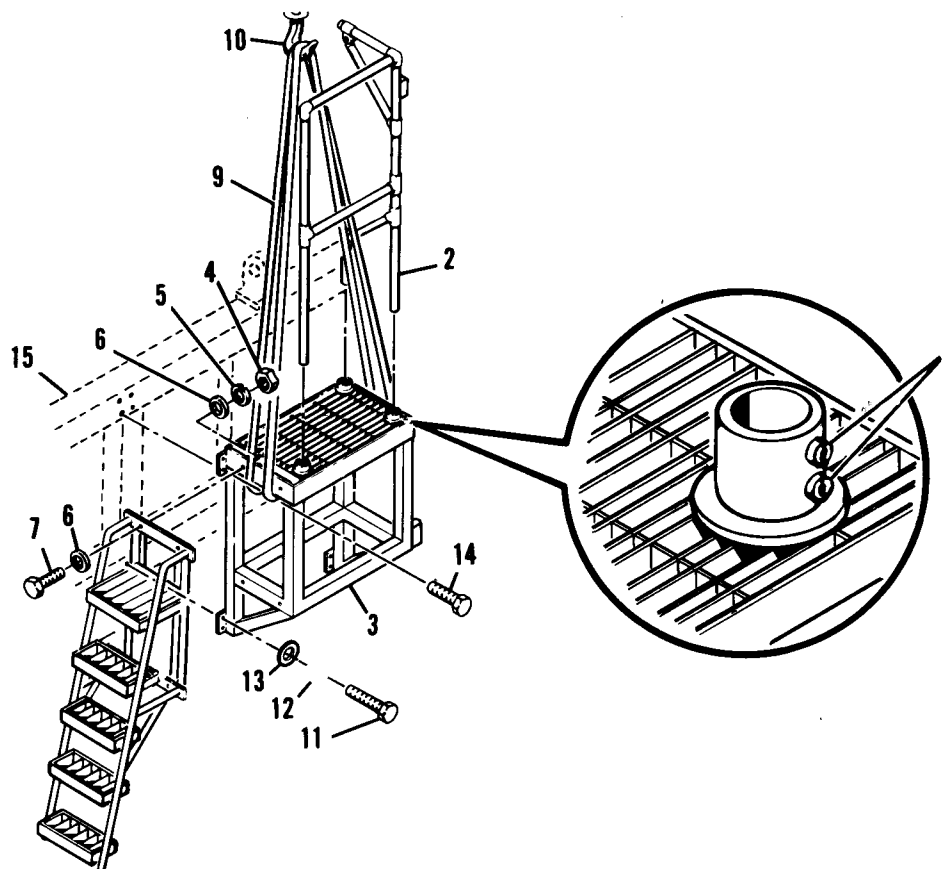
Ladder-walkway parts as required

Sealing compound (appx B, item 25)

STEP

PROCEDURE

REMOVAL



3.7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**b. LADDER-WALKWAY REPAIR - Continued**

STEP	PROCEDURE
1.	Remove six setscrews (1), and remove handrail (2) from support (3).
2.	Remove four nuts (4), four lockwashers (5), eight flat washers (6), and four screws (7); and remove ladder (8) from support (3).
3.	Place sling (9) on support (3) as shown and connect ends to wrecker lifting hook (10). Take slack out of sling.
4.	Remove 15 cap screws (11), 15 lockwashers (12) and 15 flat washers (13).
5.	Remove one screw (14) and lift support (3) from support frame (15).
6.	Lower support (3) to ground away from vehicle, and remove sling (9) from lifting hook (10) and support (3) .
	REPLACEMENT Replace faulty part with a new part.
	INSTALLATION
1.	Connect sling (9) around support (3) as shown and connect ends to wrecker lifting hook (10). Lift support (3) into position on support frame (15).
2.	Install 15 cap screws (11), 15 lockwashers (12), and 15 flat washers (13).
3.	Install one screw (14).
4.	Remove sling (9) from lifting hook (10) and support (3).
5.	Install ladder (8) on support (3) with four screws (7), eight flat washers (6), four lockwashers (5), and four nuts (4).
6.	Position handrail (2) to support (3). Coat threads of six setscrews (1) with sealing compound, and install setscrews (1) to secure handrail (2) to support (3).

3-7. SUPPORT JFRAME MAINTENANCE INSTRUCTIONS Continued**c. ANTENNA PROTECTIVE COVER**

This task covers:

Removal

Replacement

Installation

INITIAL SETUPToolsRefrig Unit Svce Tool Kit,
5180-00-596-1474

9/16 in. comb. wr

Slipjoint plr

Lg nose plr

3/4 in. skt wr

3/4 in. comb. wr

1/2 in. comb. wr

1/2 in. skt wr

7/16 in. comb. wr

3/8 in. comb. wr

skt wr hdl

2 in. skt wr ext

No. 2 xtip scdr

1/4 in. skt hd scr key

3/16 in. flat tip scdr

Measuring tape

Wrecker truck, 2320-00-0509-004

Endless loop sling (3)

11/32 in. comb. wr

Personnel Required

Wrecker Operator

Materials/PartsRope, 1/4 in. 20 ft. (two) (appx B,
item 16)

Anchor shackle

Antenna protective cover

Parts as required

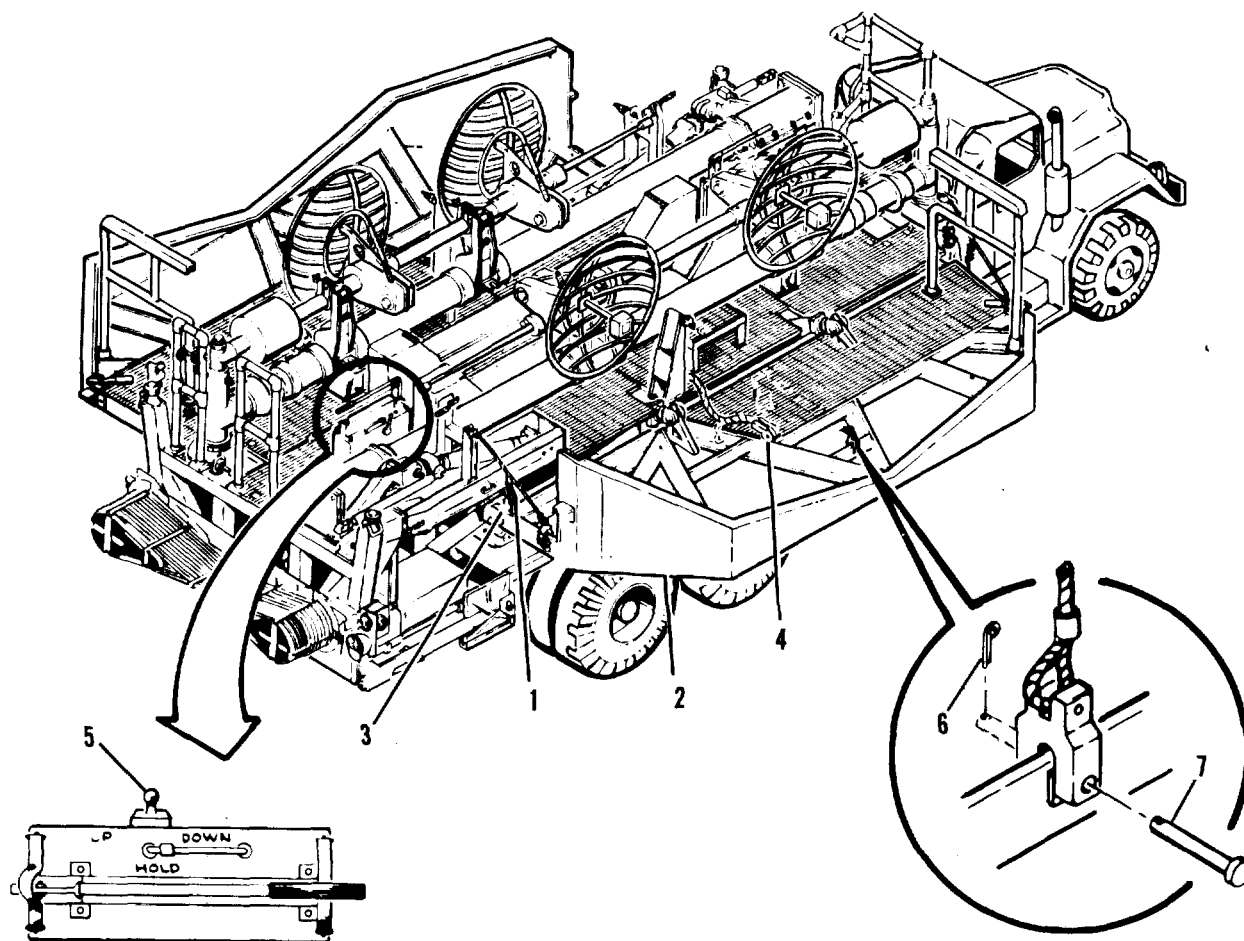
STEP**PROCEDURE****REMOVAL**

1. Disconnect three cable springs (1) from antenna protective cover (2).
2. Lower antenna protective cover (TM 11-5985-368-12&P).
3. Raise antenna protective cover slightly to put slack in cables (3 and 4).
Set control valve lever (5) to HOLD.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**c. ANTENNA PROTECTIVE COVER - Continued**

STEP

PROCEDURE



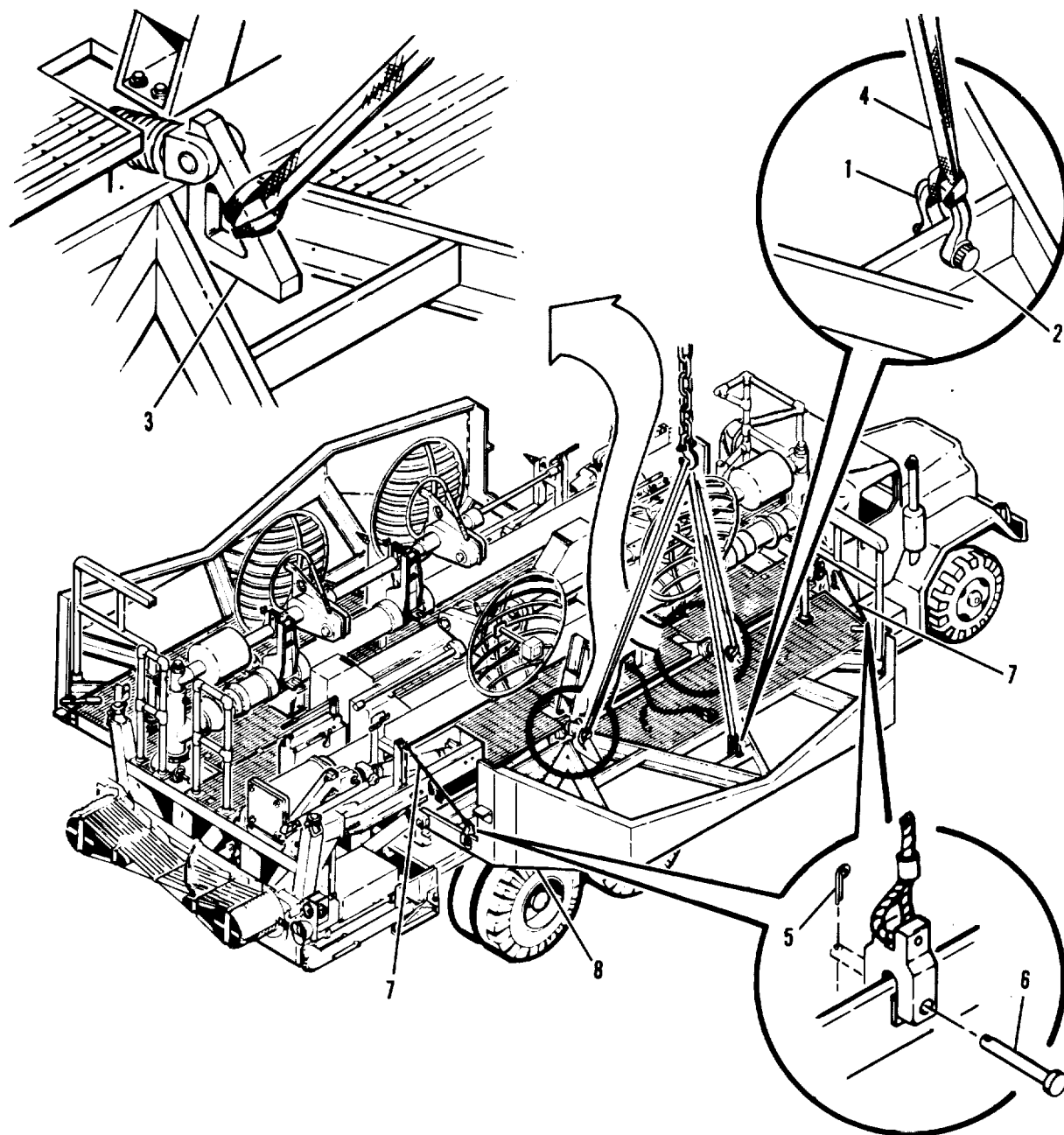
4. Remove cotter pin (6) and headed pin (7) that secures middle cable (4) to antenna protective cover (2).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

c. ANTENNA PROTECTIVE COVER - Continued

STEP

PROCEDURE



3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**c. ANTENNA PROTECTIVE COVER - Continued**

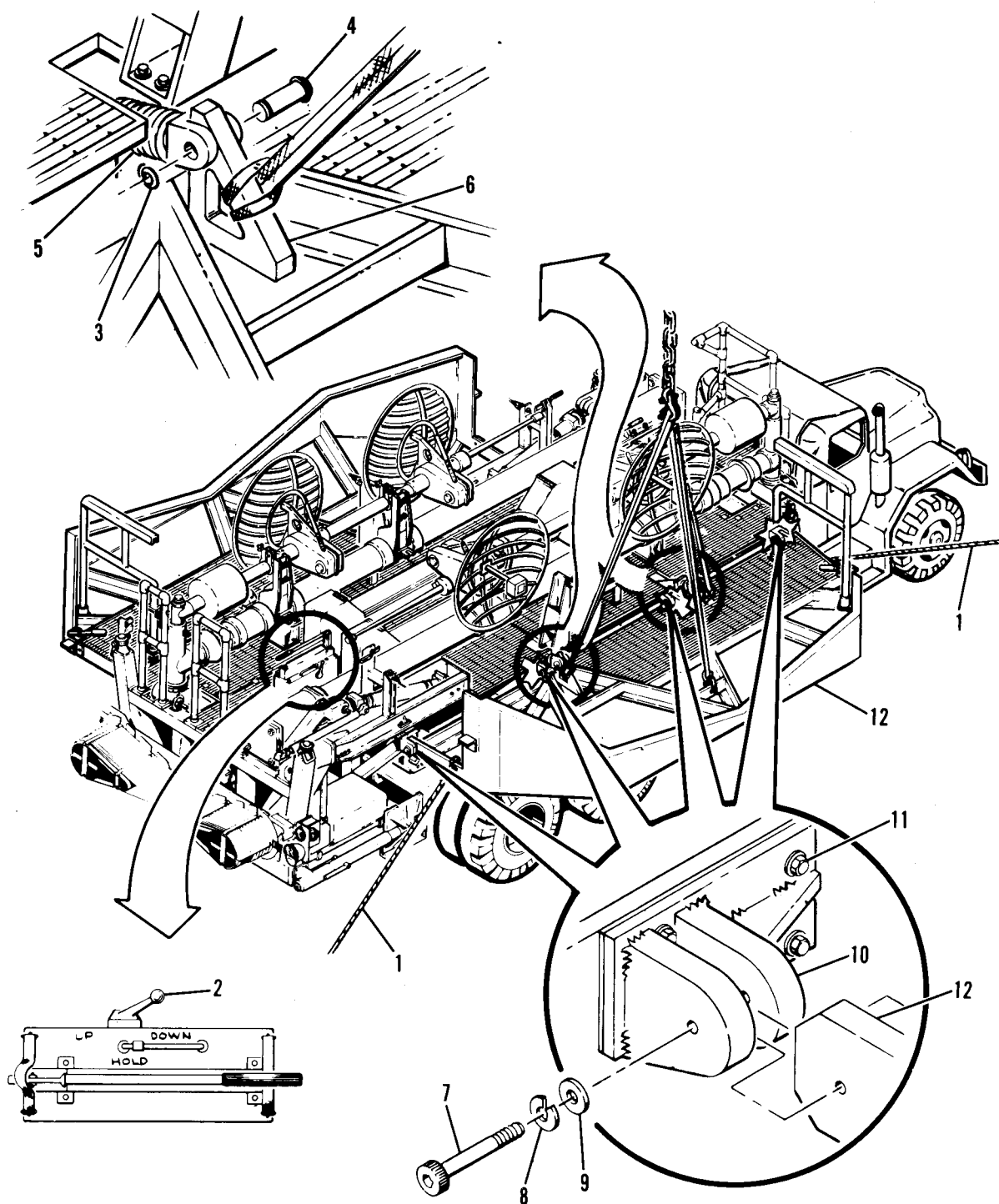
STEP	PROCEDURE
5.	Connect a shackle (1) to where the middle cable was connected on the antenna protective cover. Secure shackle with pin (2).
6.	Connect two slings to brackets (3) on antenna protective cover and one sling to shackle (1). Connect slings in a choker (see illustration) configuration.
NOTE It may be necessary to twist middle sling (4) slightly to make it a little shorter than the other two slings. You want the middle sling to be slightly more taut than the other two when cover is first lifted.	
7.	Connect ends of the three slings to wrecker hook. Lift cover with wrecker just enough to put the weight of the cover on the wrecker crane.
8.	Remove two cotter pins (5) and headed pins (6) that secure cables (7) to ends of cover (8).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

c. ANTENNA PROTECTIVE COVER - Continued

STEP

PROCEDURE

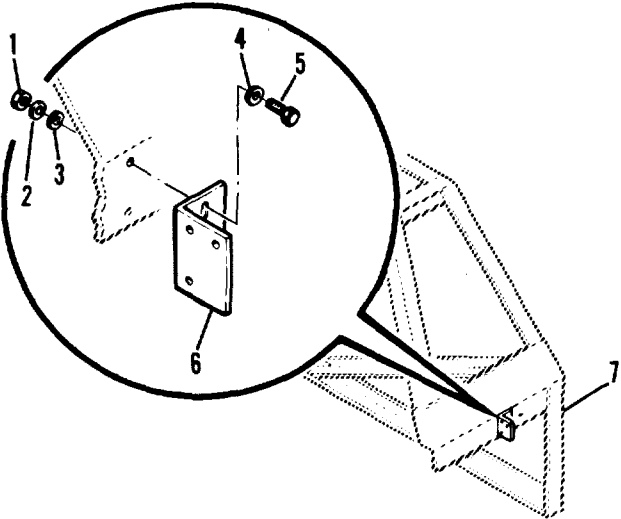


3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**c. ANTENNA PROTECTIVE COVER - Continued**

STEP	PROCEDURE
9.	Tie a guide rope (1) to each end of cover. Use holes, in cover, from which end cables were disconnected.
10.	Set control valve lever (2) to DOWN.
11.	Remove two spiral retaining rings (3) and pins (4) that secure cylinders (5) to brackets (6). Disconnect cylinders from cover.
	WARNING Use extreme caution when removing screws. Do not stand under the suspended cover.
12.	Remove four screws (7), four lockwashers (8), and four flat washers (9) that secure cover (12) to pivot bracket (10). Remove two center screws first and then the end screws. NOTE If screws are binding and hard to remove, loosen (but don't remove) screws (11) that secure pivot bracket to support frame. Be sure to tighten pivot bracket screws after cover (12) has been removed.
13.	Lift and remove cover from support frame.

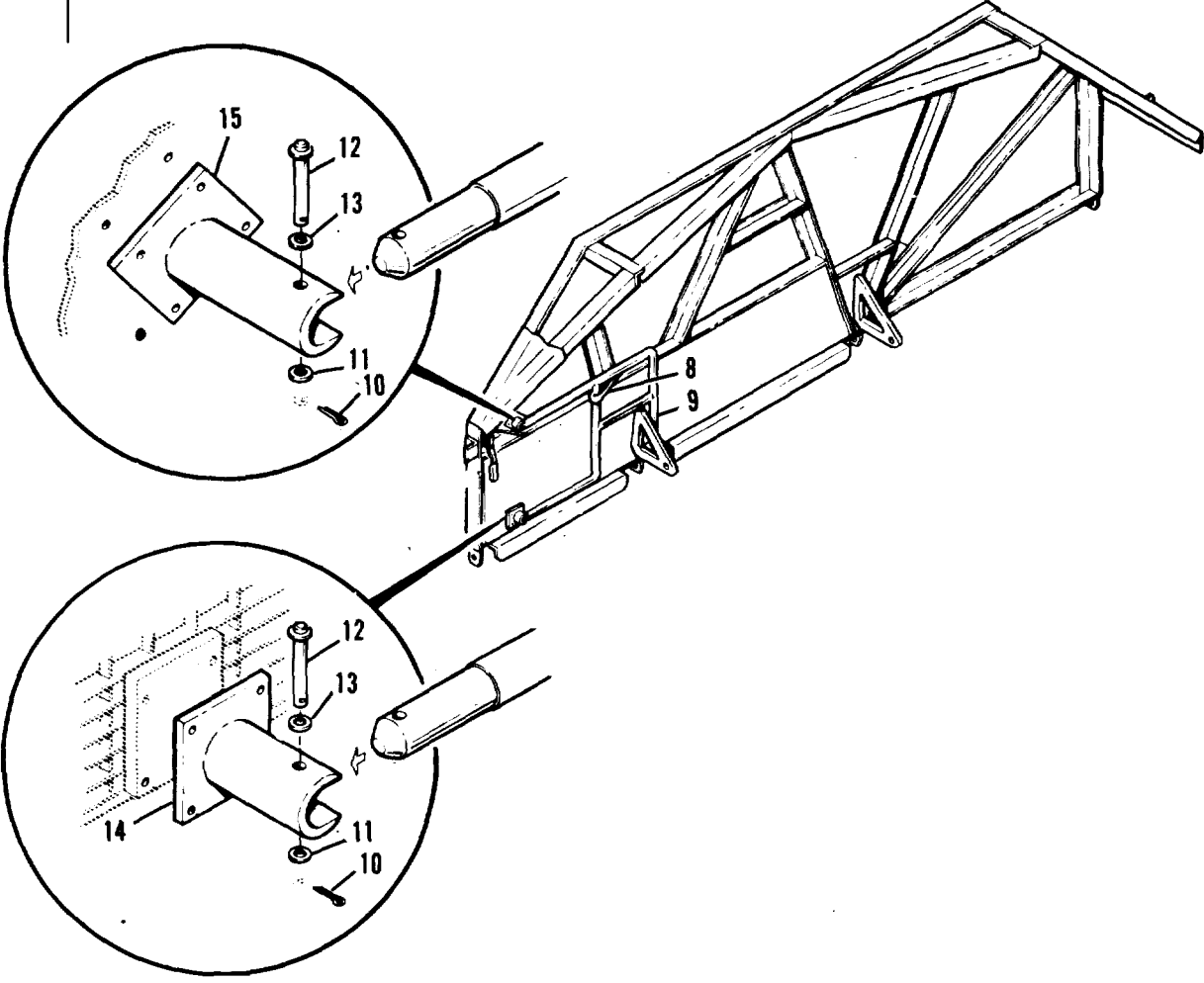
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

c. ANTENNA PROTECTIVE COVER - Continued

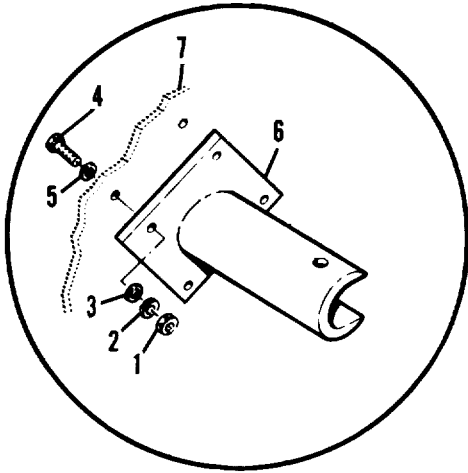
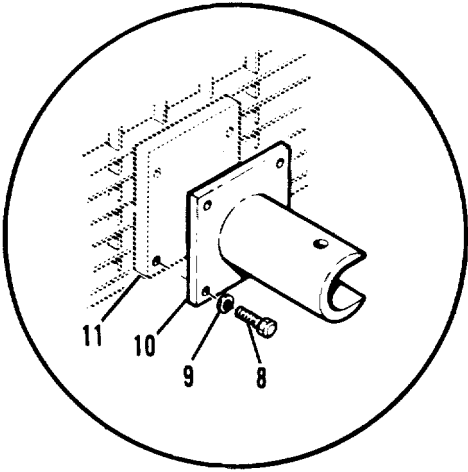
STEP	PROCEDURE
	DISASSEMBLY NOTE Repair consists of removing a faulty component and installing a new component.  1. Remove two nuts (1), two lockwashers (2), two flat washers (3), two cap screws (5), and two flat washers (4). Remove striker plate (6) from protective cover (7). 2. Unclip strap (8) from handrail (9). 3. Remove two cotter pins (10), two flat washers (11), and two pins (12), and two flat washers (13). Remove handrail (9) from the inner handrail clevis (14) and the outer handrail clevis (15).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

c. ANTENNA PROTECTIVE COVER - Continued

STEP	PROCEDURE
	

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**c. ANTENNA PROTECTIVE COVER - Continued**

STEP	PROCEDURE
4.	
	Remove four nuts (1), lockwashers (2), flat washers (3), screws (4), and flat washers (5). Remove outer handrail clevis (6) from protective cover (7).
5.	
	Remove four screws (8) and lockwashers (9). Remove inner handrail clevis (10) from protective cover (11).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

c. ANTENNA PROTECTIVE COVER - Continued

STEP	PROCEDURE
	An exploded view diagram of a mechanical assembly, likely a protective cover. The diagram shows various components labeled with numbers: 12 (nut), 13 (seven flat washers), 14 (plastic flat washer), 15 (lock handle), 16 (plastic flat washer), 17 (rubber bushing), 18 (flat washer), 19 (cap screw), 20 (protective cover), 21 (pin), 22 (two nuts), 23 (two lockwashers), 24 (two flat washers), 25 (two cap screws), 26 (two flat washers), 27 (cover stop bracket), and 28 (spacer). The diagram illustrates the spatial relationship and assembly sequence of these parts. 6. Remove nut (12), seven flat washers (13), plastic flat washer (14), lock handle (15), plastic flat washer (16) rubber bushing (17), flat washer (18), and cap screw (19) from protective cover (20). 7. Remove pin (21), two nuts (22), two lockwashers (23), two flat washers (24), two cap screws (25), and two flat washers (26). Remove cover stop bracket (27) and spacer (28) from protective cover (20).

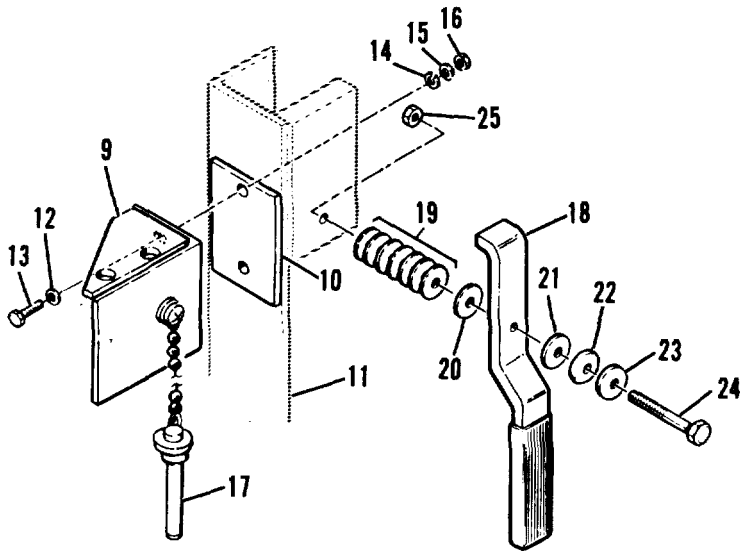
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

c. ANTENNA PROTECTIVE COVER - Continued

STEP	PROCEDURE
8.	Remove nut (1), lockwasher (2), flat washer (3), and screw (4). Remove handrail strap (5) from protective cover (6).
9.	Remove lube fittings (7) from hinge blocks (8). REPLACEMENT Replace faulty parts with new p arts. ASSEMBLY 1. Insert lube fittings (7) into hinge blocks (8) and tighten.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

c. ANTENNA PROTECTIVE COVER - Continued

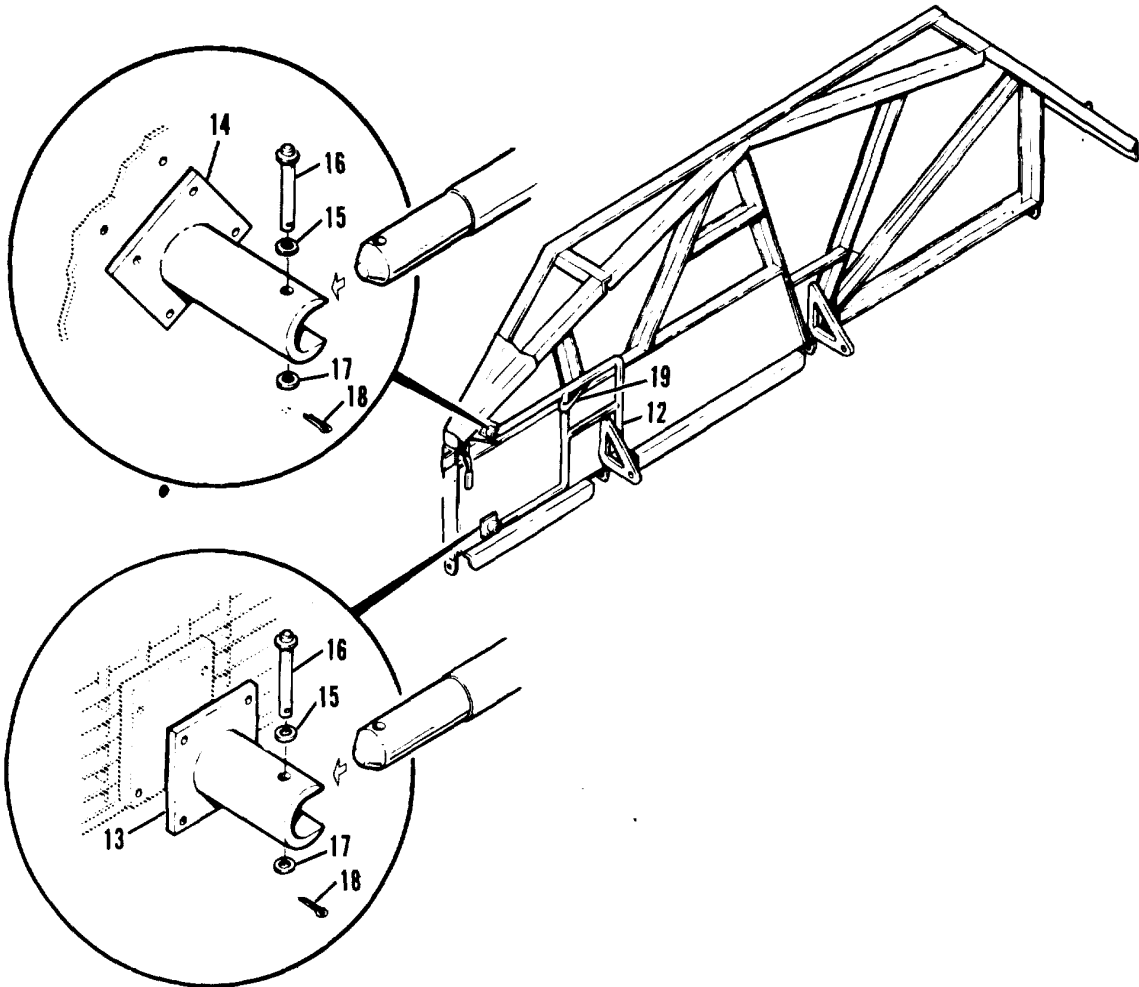
STEP	PROCEDURE
2.	Install handrail strap (5) on protective cover (6) with screw (4), flat washer (3), lock washer (2), and nut (1).  The diagram shows an exploded view of the antenna protective cover assembly. Components are labeled with numbers: 9 (cover stop bracket), 10 (spacer), 11 (protective cover), 12 (flat washer), 13 (screw), 14 (flat washer), 15 (lockwasher), 16 (nut), 17 (pin), 18 (lock handle), 19 (flat washer), 20 (plastic flat washer), 21 (plastic flat washer), 22 (rubber bushing), 23 (flat washer), 24 (cap screw), and 25 (nut). The diagram illustrates the assembly of these components onto the protective cover (11).
3.	Install cover stop bracket (9) with spacer (10) (if necessary) on protective cover (11) with two flat washers (12), screws (13), flat washers (14), lockwashers (15), and nuts (16). Install pin (17).
4.	Install lock handle (18) on protective cover (11) with seven flat washers (19), plastic flat washer (20), plastic flat washer (21), rubber bushing (22), flat washer (23), cap screw (24), and nut (25).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**c. ANTENNA PROTECTIVE COVER - Continued**

STEP	PROCEDURE
5.	Install inner handrail clevis (3) on protective cover (4) with four lockwashers (1) and four screws (2).
6.	Install outer handrail clevis (10) on protective cover (11) with four flat washers (9), four cap screws (8), four flat washers (7), four lockwashers (6), and four nuts (5).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

c. ANTENNA PROTECTIVE COVER - Continued

STEP	PROCEDURE
	 7. Install handrail (12) in inner handrail clevis (13) and outer handrail clevis (14) and secure with two flat washers (15), headed pins (16), flat washers (17) and new cotter pins (18). 8. Clip strap (19) to secure handrail (12).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**c. ANTENNA PROTECTIVE COVER - Continued**

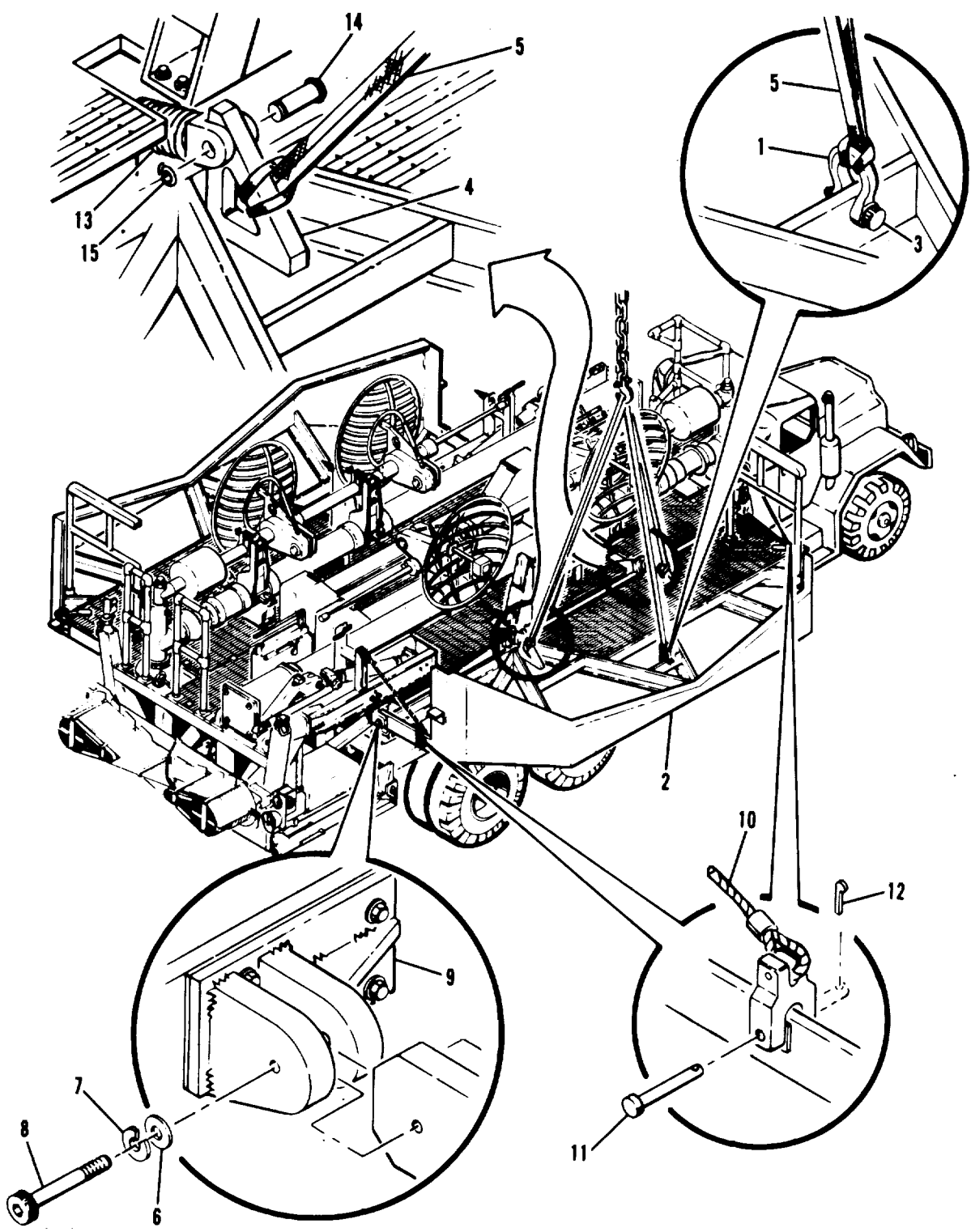
STEP	PROCEDURE
9.	Install striker plate (1) on protective cover (2) with two flat washers (3), two screws (4), two flat washers (5), two lockwashers (6), and two nuts (7).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**c. ANTENNA PROTECTIVE COVER - Continued**

STEP	PROCEDURE
	INSTALLATION 1. Connect shackle (1) to middle cable connection point on cover and secure shackle with pin (3). 2. Connect three slings (5) to cover in a choker configuration. Connect two slings to brackets (4) and the third to shackle (1). Attach guide ropes to each end of cover. (Use holes in which end cables are attached.) 3. Attach ends of three slings to wrecker hook and lift cover into position on vehicle.
	WARNING Use extreme caution when installing screws. Do not stand under the suspended cover. 4. Install, four screws (8), four lockwashers (7), and four flat washers (6), to secure cover (2) to bracket (9). Install the two end screws first and then the center screws. 5. Position two end cables (10) to cover. Install headed pin (11) and cotter pin (12) to secure. 6. Place control valve lever to DOWN. 7. Position hydraulic cylinders (13) (one at a time) to pivot point brackets (4) on cover. Install two pins (14) and spiral retaining rings (15) to secure. 8. Place control valve lever to HOLD. 9. Disconnect slings (5) from cover. Remove shackle (1) from cover.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

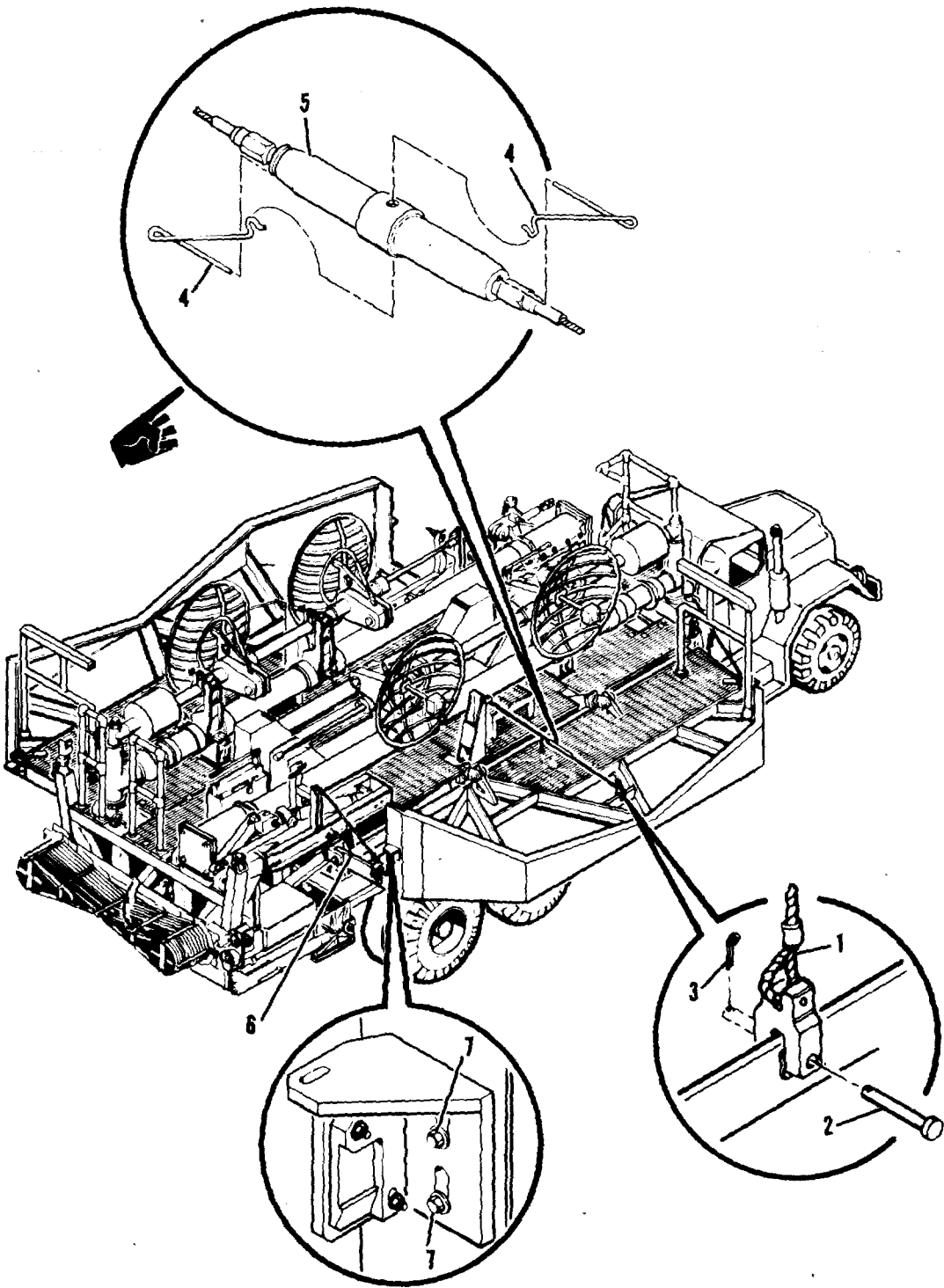
c. ANTENNA PROTECTIVE COVER - Continued

STEP	PROCEDURE
	 The diagram illustrates the maintenance of the antenna support frame. It shows a side view of the frame with various components labeled with numbers. A large curved arrow indicates the movement of the antenna assembly. Two circular insets provide detailed views of specific components: the top inset shows a close-up of a bracket (1) and a pin (3) being inserted into a frame member (5); the bottom inset shows a close-up of a bracket (10) being secured with a pin (11) and a nut (12). Other components shown include a spring (8), a pin (6), a bracket (7), a bracket (9), a bracket (13), a bracket (14), and a bracket (15).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued	
c. ANTENNA PROTECTIVE COVER - Continued	
STEP	PROCEDURE
10.	Position middle cable (1) to cover. Secure with headed pin (2) and cotter pin (3).
11.	Check the tension on the three cables (1). If any of the cables are loose (do not have tension) the weight of the antenna positioner cover is not distributed evenly among the three cables (1) and you will have to adjust cable tension. Here's how: ● Determine which cables are too long and which are too short (cables without tensions are too long). ● Make sure handrail is down, raise cover. ● Remove two turnbuckle locking clips (4) from turnbuckle (5). ● Rotate turnbuckle (5) in direction required to either shorten or lengthen cable (1). ● Install new turnbuckle locking clip (4) in turnbuckle (5). ● Lower cover, check cables tension and readjust cable tension if necessary. NOTE Only two of the cables have turnbuckles (5). The third cable can be adjusted by repositioning the lock bracket (see para 3.7o entitled Lock Bracket).
12.	Raise cover. Install three cable springs (6) to cover.
13.	Distance between the outside edges of the two antenna protective covers must be 96 inches. Loosen striker bracket screws (7) and adjust striker bracket position until 96 inch dimension is obtained. Tighten screws (7).
14.	Lubricate antenna protective cover pivot points (see LUBRICATION INSTRUCTIONS in TM 11-5985-368-12&P).
15.	Operate cover (see applicable portions of paragraph entitled Mast Deployment in TM 11-5985-368-12&P) and check for binding.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

c. ANTENNA PROTECTIVE COVER - Continued

STEP	PROCEDURE
	 The diagram illustrates the assembly of the antenna protective cover on a support frame. The main view shows a truck-mounted frame with various components labeled 1 through 8. Two circular callouts provide detailed views: one shows a hand pointing to a component labeled 5, and another shows a close-up of a bracket labeled 1 being secured with a bolt labeled 2. A third callout shows a control panel with two switches labeled 7.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

d. ANTENNA CLAMP

This task covers:

Removal

Replacement

Installation

INITIAL SETUP

Tools

Refrig Unit Svce Tool Kit
 No. 3 xtip scdr
 7/16 in. comb. wr
 Snap ring plr 67-983

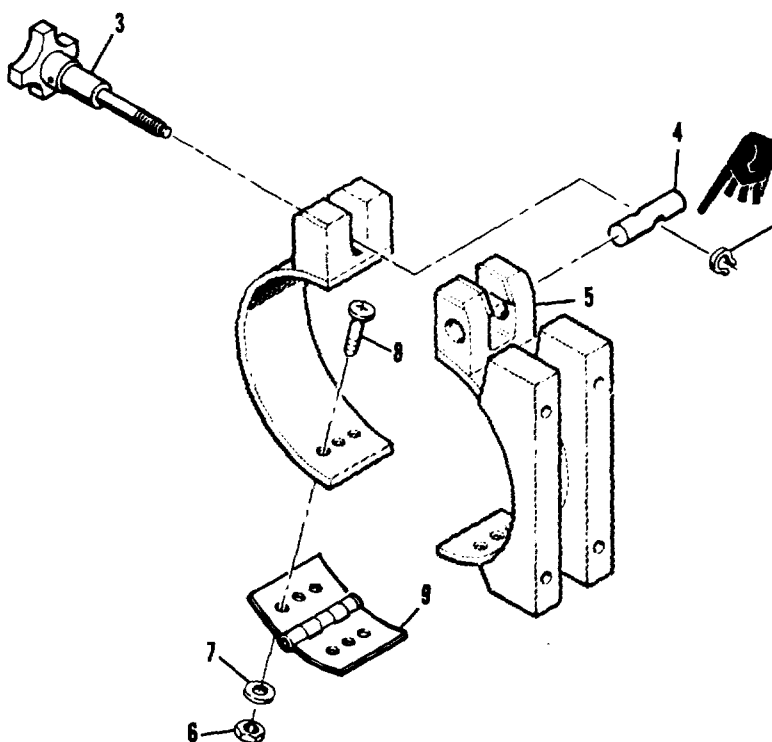
Materials/Parts

Retaining ring
 Antenna clamp parts as required

STEP

PROCEDURE

REMOVAL



3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**d. ANTENNA CLAMP - Continued**

STEP	PROCEDURE
1.	Remove retaining ring (1) from handknob screw (3).
2.	Unscrew handknob screw (3) from antenna clamp pivot (4). Remove clamp pivot (4), from antenna clamp (5).
3.	Remove six self locking nuts (6), six flatwashers (7), and six flathead screws (8). Remove butt hinge (9) from antenna clamp (5).
	REPLACEMENT Replace faulty part with a new part. INSTALLATION
1.	Install butt hinge (9) on antenna clamp (5) with six flathead screws (8), six flatwashers (7), and six self locking nuts (6).
2.	Install antenna clamp pivot (4) in antenna clamp (5) and screw handknob screw (3) into antenna clamp pivot (4).
3.	Install new retaining ring (1) on handknob screw (3).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

e. ANTENNA COVER PUMP - Continued

This task covers:

Disassembly

Replacement

Assembly

INITIAL SETUPTools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 2 xtip scdr
11/16 in. flair nut wr
3/4 in. flair nut wr
3/4 in. comb. wr
10 in. pipe wr
15/16 in. comb. wr
1 in. comb. wr
7/16 in. comb. wr
No. 3 xtip scdr
1 in. comb. wr
1/2 in. comb. wr
1/2 in. skt
skt wr hdl
3/8 in. comb. wr

Tools (Continued)

7/8 in. comb. wr
13/16 in. comb. wr
5/16 in. skt hd scr wr
1/2 in. internal pipe wr,
5120-00-288-8775
3/4 in. internal pipe wr,
5120-00-288-8776
1-3/8 in. comb. wr
1-1/8 in. comb. wr
Slipjoint plr
Clean container

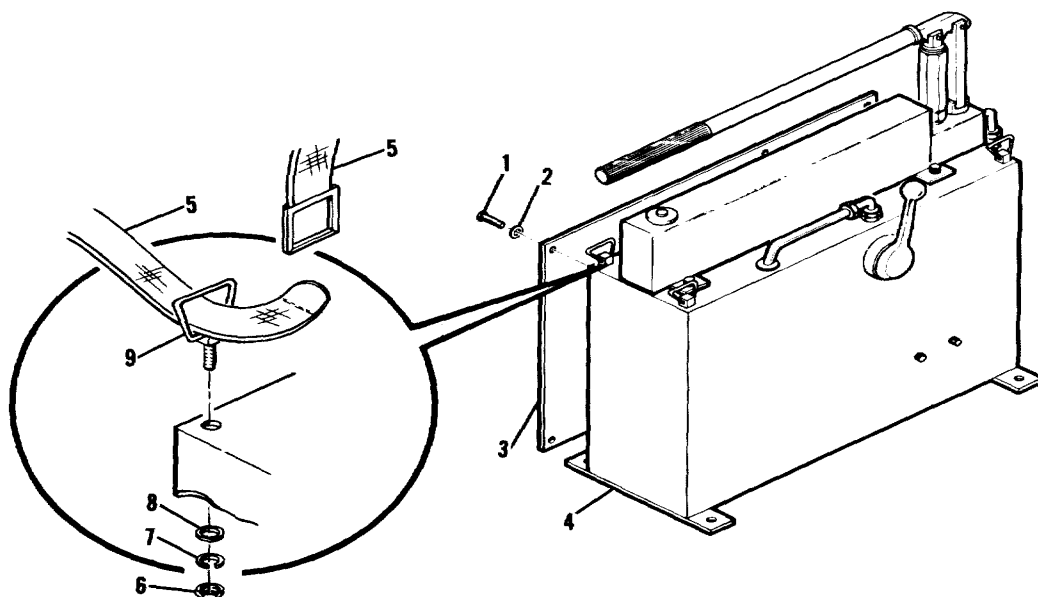
Materials/Parts

Thread sealing compound (appx B,
item 21)

STEP

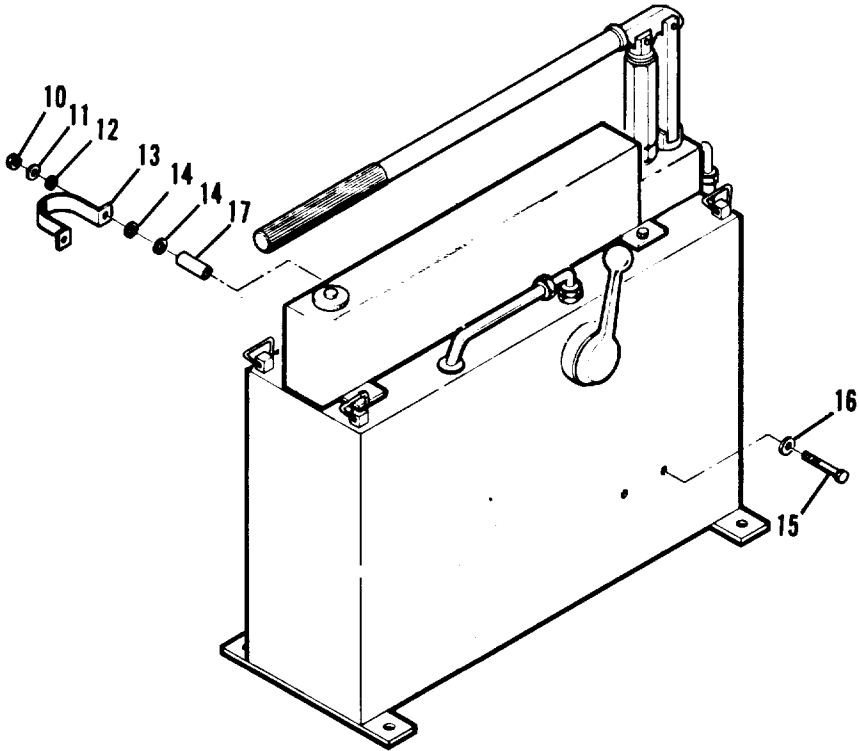
PROCEDURE

DISASSEMBLY



3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

e. ANTENNA COVER PUMP - Continued

STEP	PROCEDURE
1. 2.	Remove 10 screws (1) and 10 flat washers (2), and remove cover (3) from chassis (4). Remove web strap (5). Remove four nuts (6), four lockwashers (7), four flat washers (8); and remove strap loop (9). 
3.	Remove two nuts (10), two lockwashers (11), two flat washers (12), retaining strap (13), four flat washers (14), two screws (15), two flat washers (16), and two sleeve spacers (17).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**e. ANTENNA COVER PUMP - Continued**

STEP	PROCEDURE
	NOTE This procedure covers two versions of the antenna cover pump - 5035746.1 (early model) and 5035746-2 (late model).
4.	If you have an early model pump, unscrew nut (1) of hose assembly (2) from adapter (3). If you have a late model pump, unscrew nut (1) from tee (3.1).
4.1	Place control valve handle in UP position and operate handle to pump fluid out of hose (2) and into a clean container.
5.	Unscrew nut (4) of hose assembly (5) from elbow (6).
6.	Unscrew nut (7) of hose assembly (5) from adapter (8). Remove hose assembly (5).
	NOTE Hose assembly (10) is routed to adapter (13) in early model pumps. Hose assembly (10) is routed to tee (3.1) in later model pumps, and adapter (13) is replaced with a plug. In later model pumps, nipple (21) is replaced with tube assembly (21).
7.	Unscrew nut (9) of hose assembly (10) from elbow (11).
8.	If you have an early model pump, unscrew nut (12) of hose assembly (10) from adapter (13). If you have a late model pump, unscrew nut (12.1) of hose assembly (10) from tee (3.1).
9.	Unscrew check valve (14) and elbow (11) from nipple (15). Hold nipple with slipjoint pliers if it turns.
10.	Unscrew elbow (11) from check valve (14).
11.	Unscrew nut (16) of hose assembly (17) from elbow (18).
12.	Unscrew pipe cross (19) with elbow (18), nipple (15), and adapter (8) from nipple (21) (early model) or tube assembly (21) (late model). Hold nipple (21) with slipjoint pliers if it turns. Remove elbow (18), nipple (15), and adapter (8) from pipe cross (19).
13.	If you have an early model pump, unscrew and remove nipple (21). If you have a late model pump, unscrew and remove tube assembly (21).
13.1	If you have a late model pump, unscrew and remove tee (3.1).

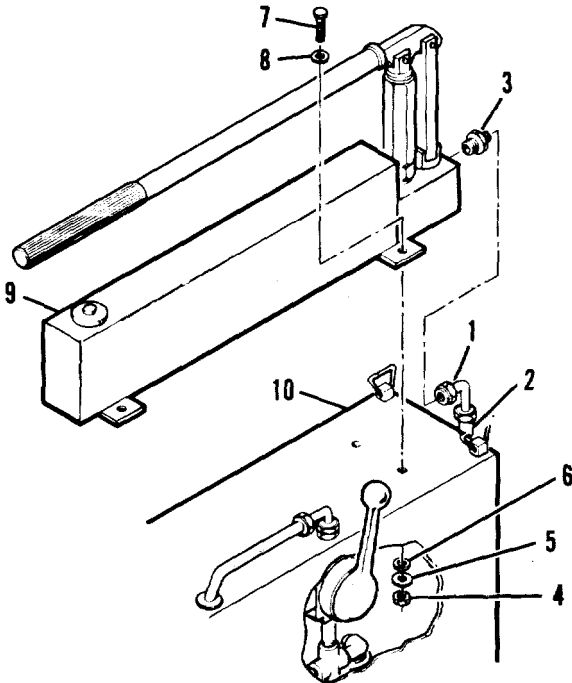
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

e. ANTENNA COVER PUMP - Continued

STEP	PROCEDURE

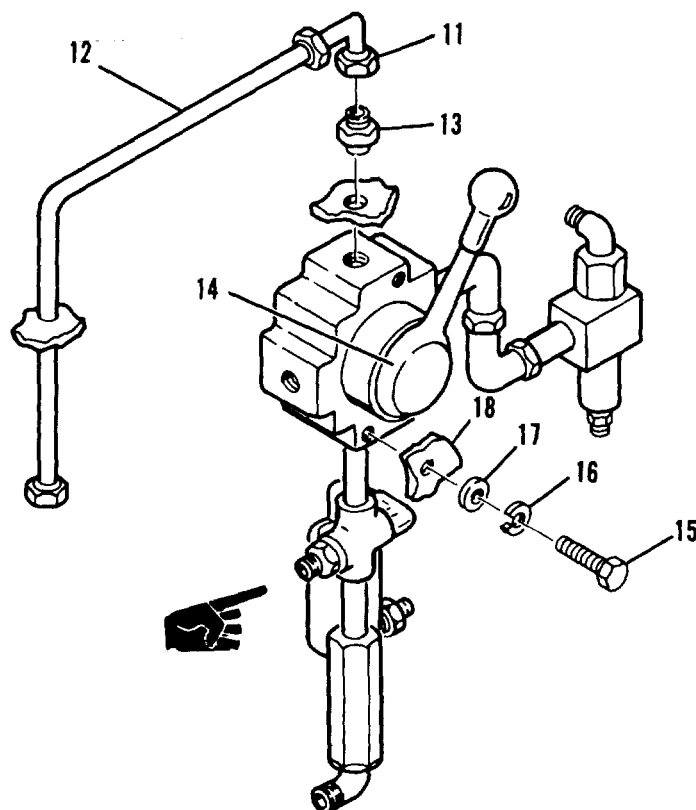
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

e. ANTENNA COVER PUMP - Continued

STEP	PROCEDURE
	 14. Unscrew nut (1) of hose assembly (2) from adapter (3). 15. Remove four nuts (4), four lockwashers (5), four flat washers (6), four screws (7) and four flat washers (8) and remove hydraulic pump (9) from chassis (10). 16. Remove adapter (3) from hydraulic pump (9).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**e. ANTENNA COVER PUMP - Continued**

STEP	PROCEDURE
17.	Unscrew nut (11) of hose assembly (12) from adapter (13). Remove hose assembly (12).
18.	Unscrew adapter (13) from direction control valve (14).
19.	Remove two bolts (15), two lockwashers (16), and two flat washers (17); and remove direction control valve (14) and associated plumbing from chassis (18).



3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**e. ANTENNA COVER PUMP - Continued**

STEP	PROCEDURE
20.	Unscrew safety relief valve (1) and elbow (2) from nipple (3). Hold nipple (3) with slipjoint pliers if it turns. Remove elbow (2) from safety relief valve (1).
21.	Unscrew flow filter (4) from nipple (5) .
NOTE If nipple (5) turns, hold elbow (6) and remove nipple along with flow filter (4).	
22.	Remove adapter (7) (early model) or pipe bushing (7) (late model) from flow filter (4). If nipple (5) was removed with flow filter, remove nipple from flow filter.
23.	Unscrew elbow (6) from elbow (8). Nipple (5) may or may not be with elbow (6). If it is, remove nipple from elbow (6). Remove elbow (8) from pipe cross (9).
24.	Unscrew pipe cross (9) with adapter (10) (early model) or pipe plug (10) (late model), and nipple (3) from nipple (11). Hold nipple (11) with slipjoint pliers if it turns.
25.	Remove adapter (10) or pipe plug (10) and nipple (3) from pipe cross (9).
26.	Remove nipple (11) from direction control valve (12).
27.	Unscrew flow valve (13) and elbow (14) from nipple (15). Hold nipple (15) with slipjoint pliers if it turns. Remove elbow (14) from flow valve (13).
28.	Remove nipple (15) from elbow (16). Remove elbow (16) from elbow (17). Remove elbow (17) from pipe bushing (18). Remove pipe bushing (18) from direction control valve (12).
29.	Remove adapter (19) from direction control valve (12).
REPLACEMENT Replace faulty part with a new part.	

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

e. ANTENNA COVER PUMP - Continued

STEP	PROCEDURE
	Exploded view diagram of the antenna cover pump assembly. The diagram shows the main pump body (12) with a handle, and various fittings and connectors. Key components labeled include: 1. Long vertical tube 2. Elbow fitting 3. Short vertical tube 4. Cylindrical component 5. Small fitting 6. Elbow fitting 7. Small fitting (labeled for both early and late models) 8. Small fitting 9. Tee fitting 10. Small fitting (labeled for both early and late models) 11. Short vertical tube 13. Small fitting 14. Elbow fitting 15. Small fitting 16. Tee fitting 17. Elbow fitting 18. Small fitting 19. Small fitting Dashed lines indicate the assembly path for each component.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued	
e. ANTENNA COVER PUMP - Continued	
STEP	PROCEDURE
	ASSEMBLY NOTE Apply pipe sealing compound to pipe threads of parts before installing. 1. Install adapter (1) in directional control valve (2). 2. Install pipe bushing (3) in directional control valve (2). Install elbow (4) to pipe bushing (3). Install elbow (5) to elbow (4). Install nipple (6) to elbow (5). 3. Install elbow (7) to flow valve (8). Install flow valve (8) to nipple (6). 4. Install nipple (9) to directional control valve (2). 5. Install adapter (10) (early model) or pipe plug (10) (late model) to pipe cross (11). Install nipple (12) to pipe cross (11). 6. Install pipe cross (11) to nipple (9). 7. Install elbow (13) to pipe cross (11). Install elbow (14) to elbow (13). Install nipple (15) to elbow (14). 8. Install adapter (16) (early model) or pipe bushing (16) (late model) to flow filter (17). 9. Install flow filter (17) to nipple (15). 10. Install safety relief valve (18) to nipple (12). Install elbow (19) to safety relief valve (18).

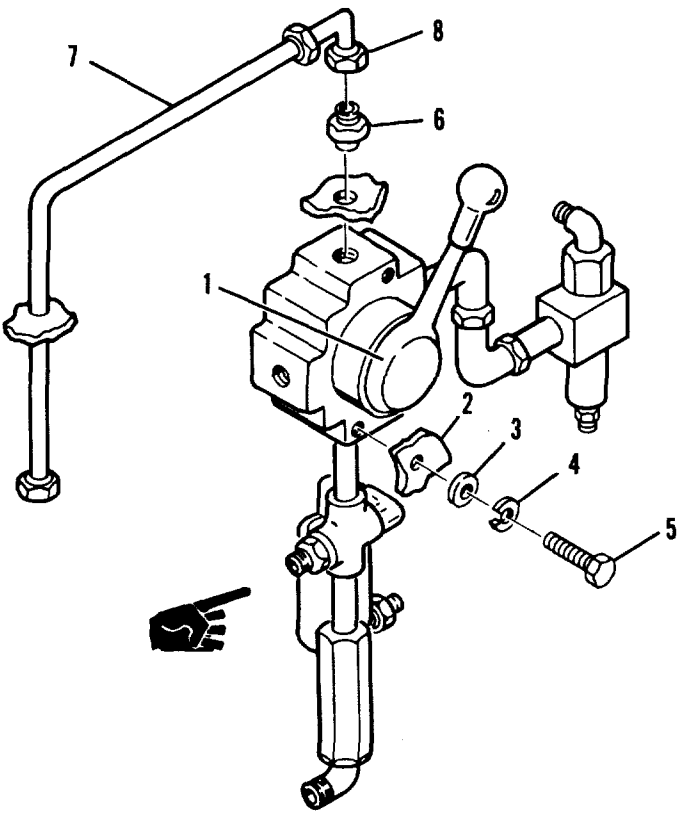
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

e. ANTENNA COVER PUMP - Continued

STEP	PROCEDURE

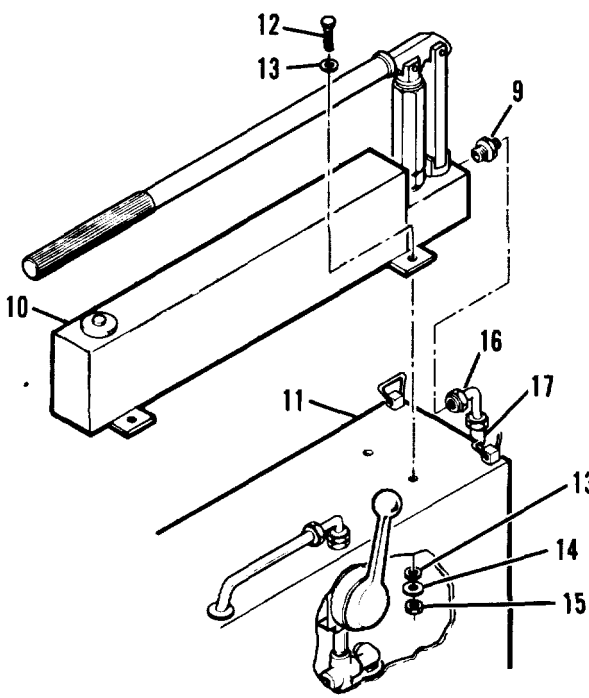
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

e. ANTENNA COVER PUMP - Continued

STEP	PROCEDURE
	 11. Install direction control valve (1) on inside wall of chassis (2) with two flat washers (3), two lockwashers (4), and two bolts (5). 12. Install adapter (6) on direction control valve (2). 13. Install hose assembly (7) and connect nut (8) to adapter (6).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

e. ANTENNA COVER PUMP - Continued

STEP	PROCEDURE
	 14. Install pipe-tube adapter (9) in hydraulic pump (10). 15. Install hydraulic pump (10) on chassis (11) using four screws (12), eight flat washers (13), four lockwashers (14), and four nuts (15). 16. Connect nut (16) of hose assembly (17) to adapter (9).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**e. ANTENNA COVER PUMP - Continued**

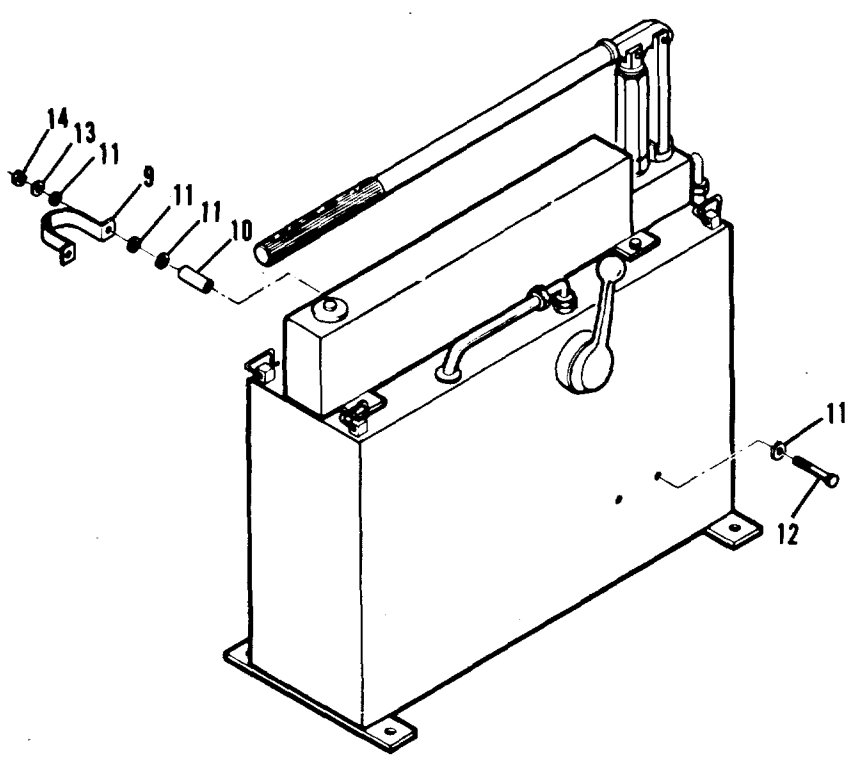
STEP	PROCEDURE
17.	If you have a late model pump, install tee (1) on pipe bushing (2).
18.	Position nipple (3) (early model) or tube assembly (3) (late model).
19.	Install adapter (4), nipple (5), and elbow (6) on pipe cross (7). Install pipe cross on nipple (3) (early model) or tube assembly (3) (late model).
20.	Position hose assembly (8) and connect nut (9) to elbow (10) and nut (11) to adapter (4).
21.	Install elbow (12) on check valve (13).
22.	Install check valve (13) on nipple (5).
23.	Position hose assembly (14) and connect nut (15) to elbow (12) and nut (16) to adapter (17) (early model) or tee (1) (late model).
23.1	Connect nut (18) of hose assembly (19) to tee (1) (late model) or adapter (2) (early model).
23.2	Connect nut (20) of hose assembly (21) to elbow (6).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

e. ANTENNA COVER PUMP - Continued

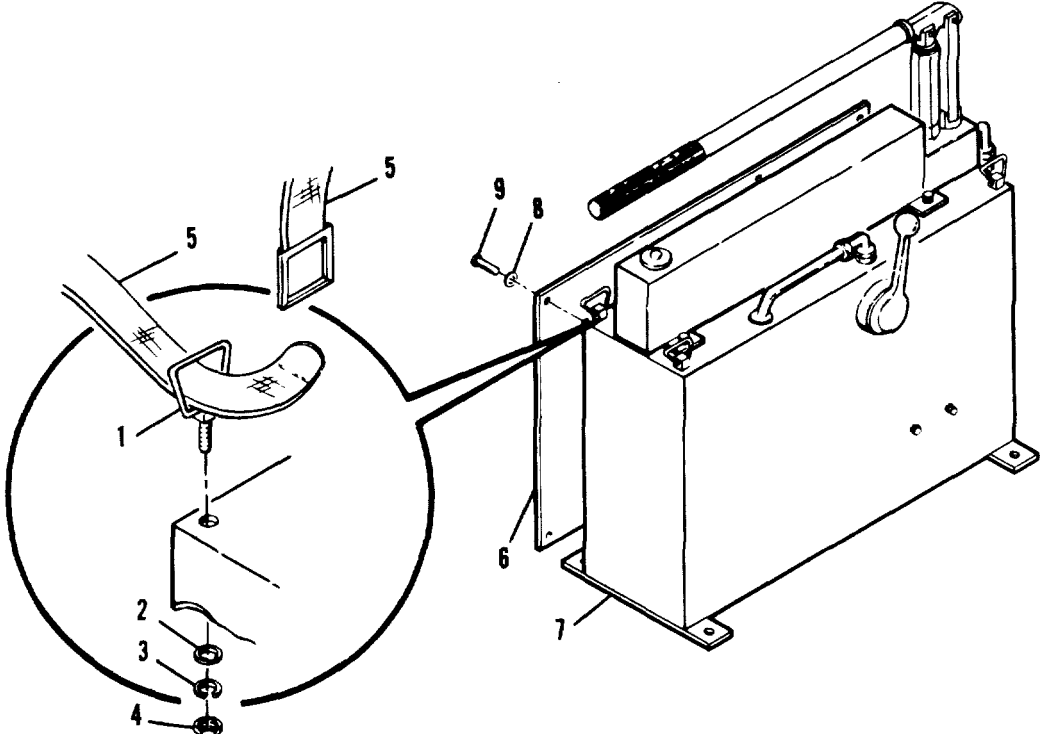
STEP	PROCEDURE

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**e. ANTENNA COVER PUMP - Continued**

STEP	PROCEDURE
24.	 Install retaining strap (9) using two sleeve spacers (10), four flat washers (11), two screws (12), two lockwashers (13), and two nuts (14).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

e. ANTENNA COVER PUMP - Continued

STEP	PROCEDURE
	 25.. Install four strap loops (1) using four flat washers (2), four lockwashers (3), and four nuts (4). Install web strap (5). 26. Install cover (6) on chassis (7) using 10 flat washers (8) and 10 screws (9).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**f. INTERCONNECT BOX****This task covers:****Removal****Replacement****Installation**INITIAL SETUPTools

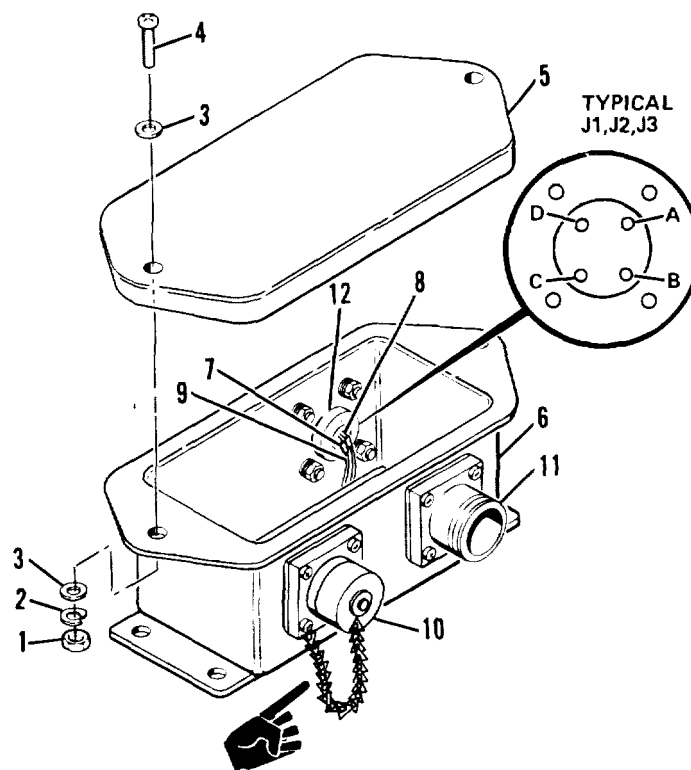
Refrig Unit Svce Tool Kit,
5180-00-596-1474
pocket knife
No. 1 xtip scdr
No. 2 xtip scdr
1/4 in. comb. wr, 5120-00-288-9997
Diag ctg plr, 5110-00-965-0974
Sldr and desldr set,
3439-00-400-7198
Heat gun HG-501

Materials/Parts

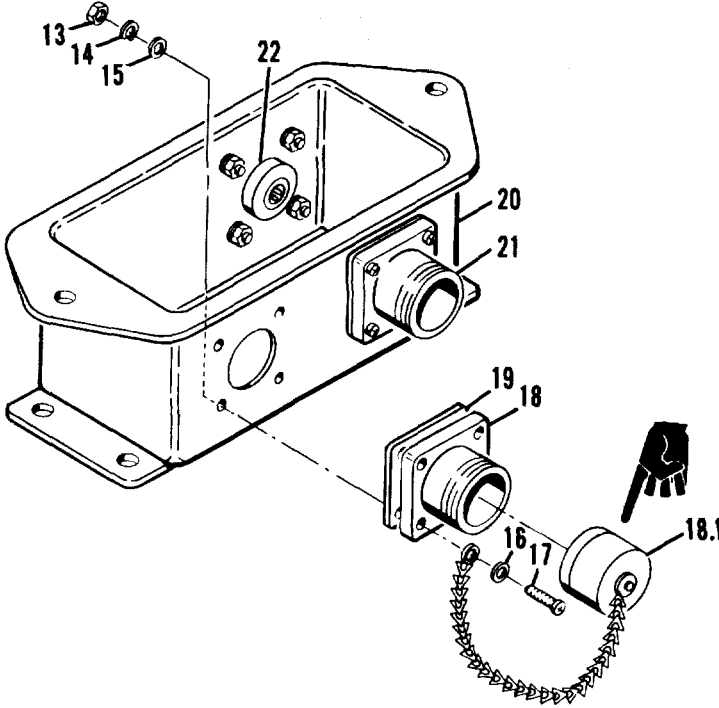
Shrink sleeving (appx B, items 7-12)
Solder (appx B, item 19)
Interconnect box parts as needed

Troubleshooting Reference

Table 3-1, Malfunction 1

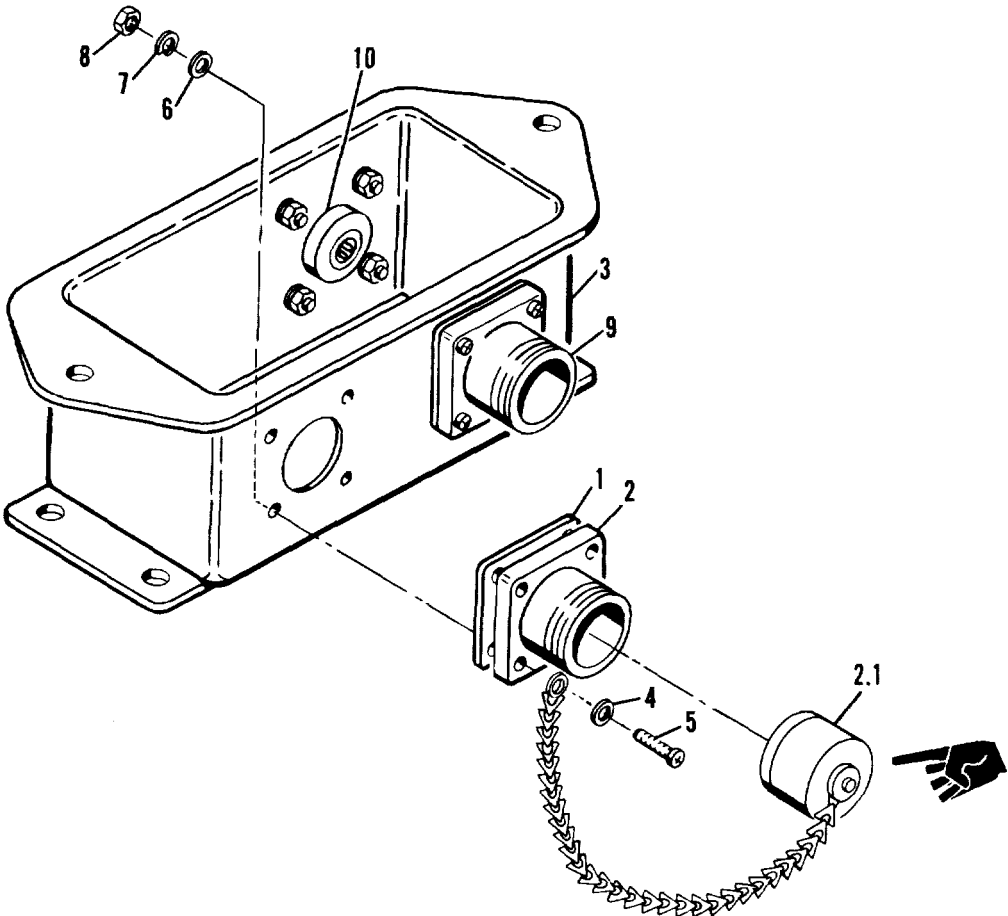
STEP**PROCEDURE****REMOVAL**

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**f. INTERCONNECT BOX - Continued**

STEP	PROCEDURE
1. 2. 3.	Remove two nuts (1), two lockwashers (2), four flat washers (3), and two screws (4). Remove cover (5) from interconnect box (6). Carefully cut away shrink sleeving (7) from connector pins (8) and wires (9) at connector J1 (10), connector J2 (11), and connector J3 (12). Unsolder two wires (9) at connector J1 (10), connector J2 (11), and connector J3 (12).
	
4. 5.	Remove four nuts (13), four lockwashers (14), four flat washers (15), four screws (16), and four flat washers (17). Remove connector J1 (18), cover (18.1), and gasket (19) from interconnect box (20).
	NOTE Only connector J1 has cover.
6.	Repeat steps 4 and 5 for connector J2 (21) and connector J3 (22). REPLACEMENT Replace faulty part with a new part.

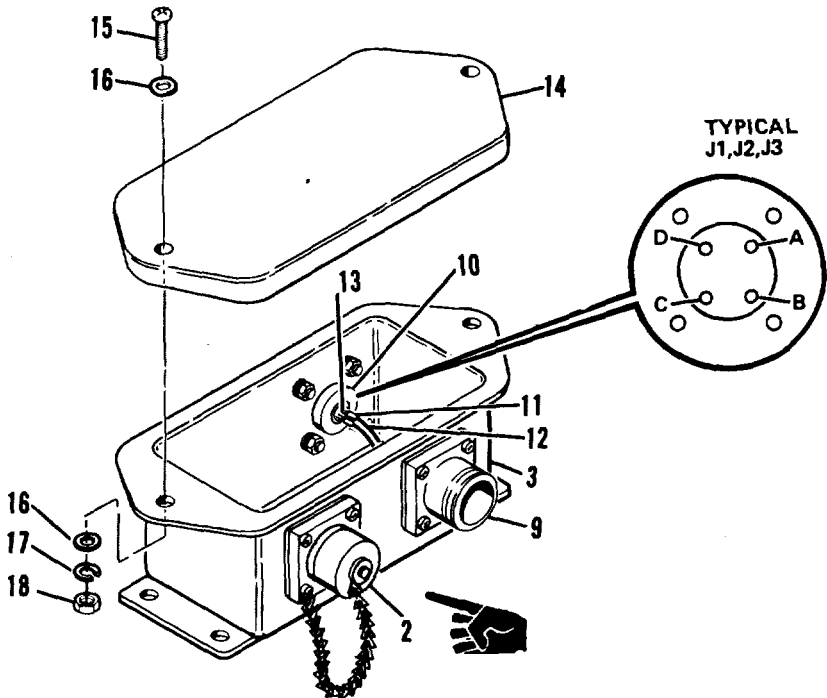
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

f. INTERCONNECT BOX - Continued

STEP	PROCEDURE
	INSTALLATION  1. Install new gasket (1), connector J1 (2), and cover (2.1) on interconnect box (3) with four flat washers (4), four screws (5), four flat washers (6), four lockwashers (7), and four nuts (8). NOTE Only connector J1 has cover. Use long screw to secure cover lanyard. 2. Repeat step 1 for connector J2 (9) and connector J3 (10).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

f. INTERCONNECT BOX - Continued

STEP	PROCEDURE								
	 3. Install two 1/2 inch pieces of shrink sleeving (11) on each of three wires (12). 4. Solder the ends of the three wires (12) to connector pins (13) per the following table. <table border="1"> <thead> <tr> <th><u>From</u></th><th><u>To</u></th></tr> </thead> <tbody> <tr> <td>J1(9)-A</td><td>J2(10)-A</td></tr> <tr> <td>J1(9)-B</td><td>J3(11)-A</td></tr> <tr> <td>J2(10)-B</td><td>J3(11)-B</td></tr> </tbody> </table> 5. Slide shrink sleeving (11) over each of six soldered connections. Shrink sleeving. 6. Install cover (14) on interconnect box (3) with two screws (15), four flat washers (16), two lockwashers (17), and two nuts (18). TEST Test interconnect box (para 3-16) to verify repair.	<u>From</u>	<u>To</u>	J1(9)-A	J2(10)-A	J1(9)-B	J3(11)-A	J2(10)-B	J3(11)-B
<u>From</u>	<u>To</u>								
J1(9)-A	J2(10)-A								
J1(9)-B	J3(11)-A								
J2(10)-B	J3(11)-B								

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**g. STABILIZING STRUT****This task covers:****Removal****Replacement****Installation****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit

7/16 in. comb. wr.

1/16 in. skt hd scr key

Hammer

Pin punch

No. 3 cross-tip screwdriver

Lineman's pliers

7/16 in. socket

Skt wr handle

3/8 in. flat tip screwdriver

9/16 in. comb. wr

1/2 in. comb. wr

Long nose pliers

No. 2 cross-tip screwdriver

7/32 in. flat tip screwdriver

Pinch bar

7/16 in. ratchet wr

5/32 in. skt hd scr key

15/16 in. comb wr

Snap ring pliers 67-983

1-1/4 in. comb. wr

Torque wr, 0-150 ft-lbs

Materials/Parts

Sealing compound (appx B, item 25)

Sealing compound (appx B, item 25.2)

Stabilizing strut parts as needed

Shop cloth (appx B, item 17)

Cleaning solvent (appx B, item 1)

Grease, Aircraft Instrument (appx B, item 26)

Deleted

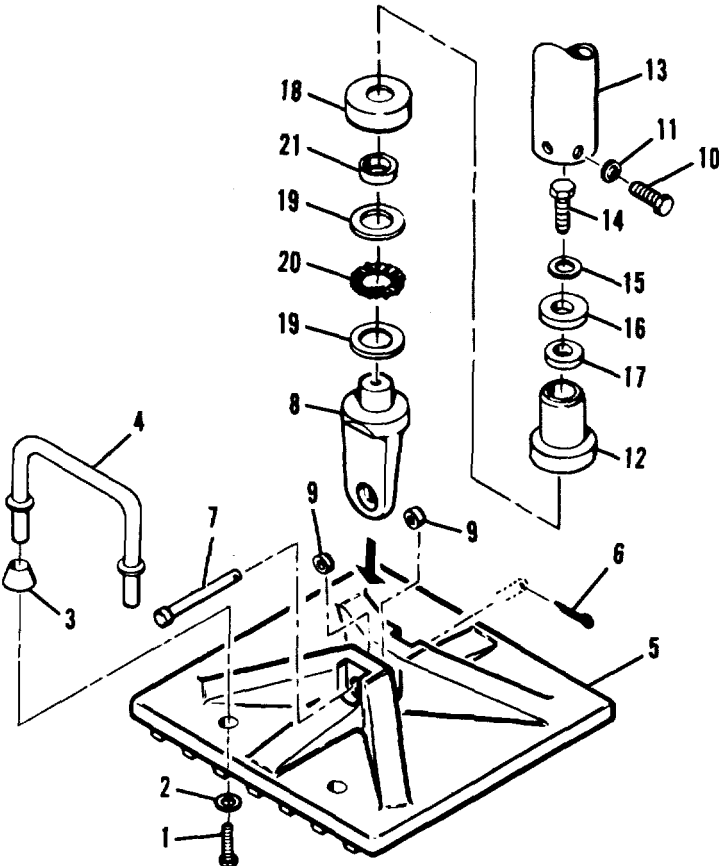
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

g. STABILIZING STRUT - Continued

STEP	PROCEDURE
	NOTE Make sure quick release pin is installed in strut tube assembly to prevent tubes from sliding apart. REMOVAL 1. Remove two screws (1), flat washers (2), locknuts (3), and key (4) from yoke (5). If key is stuck, use solvent and hammer and drive key out of keyway in yoke. 2. Remove stop (6) from yoke (5).

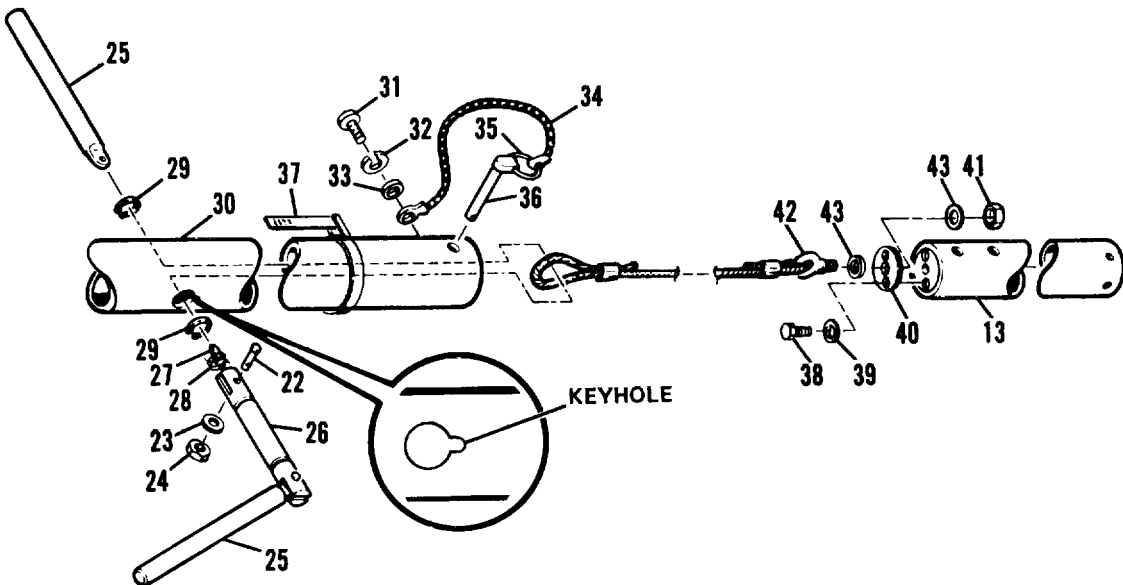
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

g. STABILIZING STRUT - Continued

STEP	PROCEDURE
	 3. Remove two screws (1), flat washers (2), ferrules (3), and handle (4) from pad (5). 4. Remove cotter pin (6) from straight pin (7) and drive straight pin out of pad (5) and tube cap (8). Discard cotter pin. 5. Remove two sleeve bushings (9) and pad (5) from tube cap (8). 6. Remove four screws (10), flat washers (11), and tube cap (8) with bushing (12) from strut tube (13). 7. Remove bolt (14), flat washer (15), retainer (16), and spacer (17) from cap (8). 8. Remove tube bushing (12), cover (18), thrust washer bearings (19), needle roller bearing (20), and bearing spacer (21) from cap (8).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

g. STABILIZING STRUT - Continued

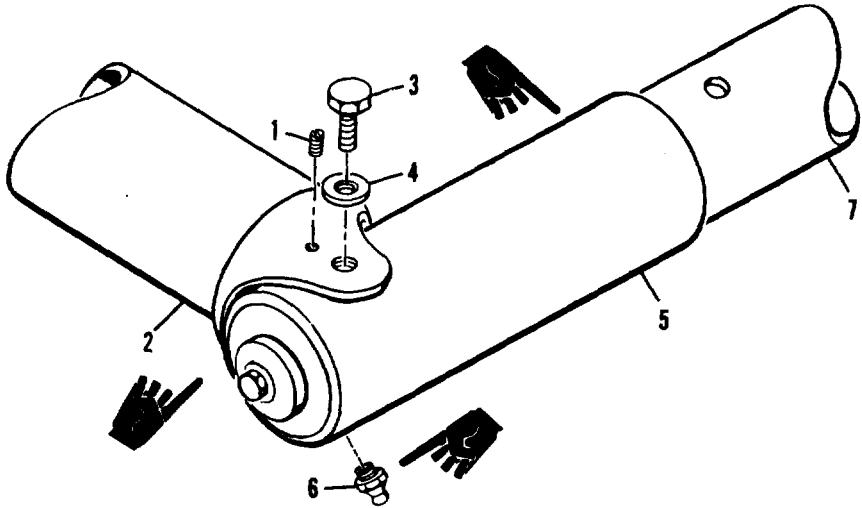
STEP	PROCEDURE
	 9. Remove bolt (22), flatwasher (23), locknut (24) from handle (25) that is on opposite side of tube (30) from keyhole (see illustration). 10. Remove two locking pins (27) and springs (28) from bar (26). 11. Remove two retaining rings (29) and bar (26) from tube (30). Pull bar (26) out through keyhole side of tube (30). See illustration. 12. Remove screw (31), lockwasher (32), flatwasher (33), and retaining chain (34) from strut assembly tube (30). 13. Remove ring (35) from quick release pin (36) and from retaining chain (34) and remove quick release pin (36) from tube (30). 14. Slide strut tube (13) out of tube (30). 15. Slide height guide (37) off strut assembly tube (30). 16. Remove two screws (38), flatwashers (39), and plate (40) from strut tube (13). 17. Remove locknut (41), eyebolt (42), and two washers (43) from plate (40).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**g. STABILIZING STRUT - Continued**

STEP	PROCEDURE
18.	Remove two bolt stops (1) from yoke (2).
19.	Remove two bolts (3), recessed washers (4), and strut arm (5) from yoke (2).
20.	Remove lubrication fitting (6) from strut arm (5).
	REPLACEMENT Replace faulty part with a new part. If either the strut assembly tube or strut arm are damaged, send the entire stabilizer strut to a depot maintenance facility for repair. If one of the thrust washers or the needle roller bearing is worn, replace both washers and bearing. INSTALLATION
1.	Apply sealing compound (appx B, item 25) to threads of lubrication fitting (6) and install fitting in strut arm (5).
2.	Apply sealing compound (appx B, item 25) to threads of two bolts (3) and install bolts and recessed washers (4) in yoke (2) and strut arm (5). Torque bolts to 750-850 in-lb.
3.	Apply sealing compound (appx B, item 25.2) to threads of two bolt stops (1) and install bolt stops in yoke (2). Back off bolts (3) slightly , if necessary, to install bolt stops.

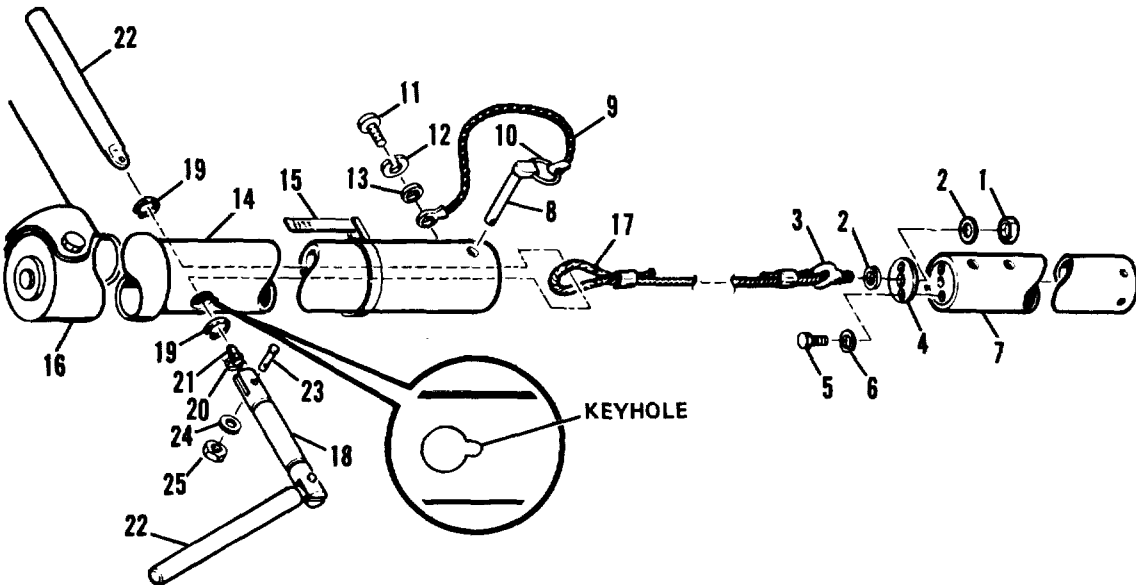
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

g. STABILIZING STRUT - Continued

STEP	PROCEDURE
	 The diagram illustrates the assembly of a stabilizing strut. It shows a cylindrical strut (5) with a mounting bracket (4) attached to its side. A bolt (1) is shown passing through the bracket and the strut. A nut (3) is shown being tightened onto the bolt. A washer (2) is shown being placed between the bracket and the strut. A pin (6) is shown being inserted into the end of the strut. A hand icon is shown pointing to the pin. A label (7) is shown pointing to the end of the strut.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

g. STABILIZING STRUT - Continued

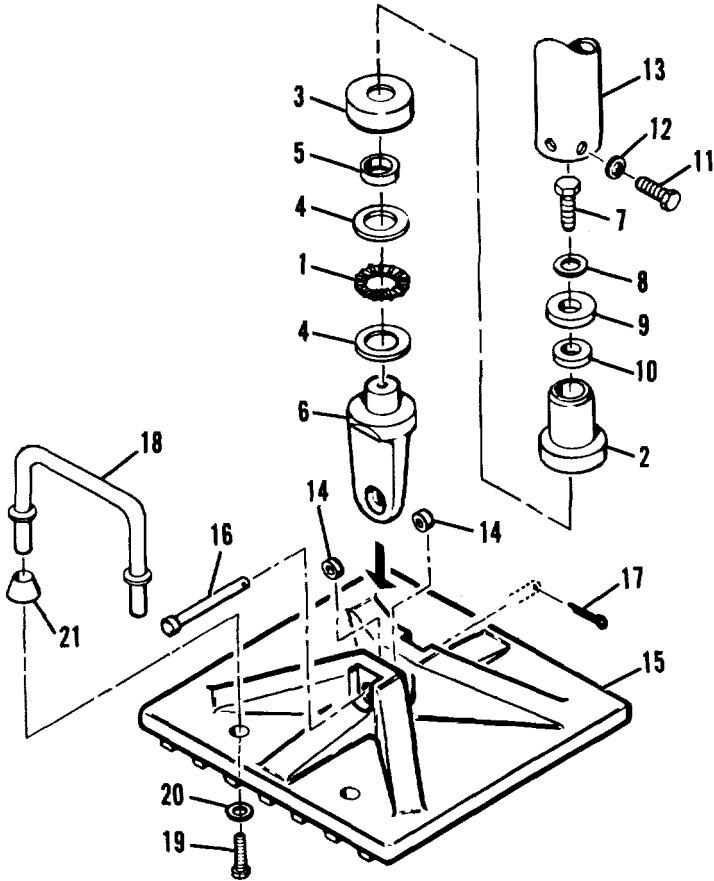
STEP	PROCEDURE
	 4. Install locknut (1), two nylon washers (2), and eyebolt (3) on plate (4). 5. Apply sealing compound (appx B, item 25) to threads of two screws (5) and install screws, flat washers (6), and plate (4) to strut tube (7). 6. Slide height guide (15) onto tube (14) and up against strut arm (16). 7. Connect quick release pin (8) to retaining chain (9) with ring (10). 8. Install screw (11), lockwasher (12), and flat washer (13) securing chain to strut assembly tube (14). 9. Install strut tube (7) into tube (14) with wire rope (17) installed first.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**g. STABILIZING STRUT - Continued**

STEP	PROCEDURE
10.	Install bar (18) through hole in side of tube (14) that has keyhole, with bar through loop in wire rope (17), and install two retaining rings (19) on bar.
11.	Install quick release pin (8) in tube (14).
12.	Apply grease to ends of handles (22) that bear against locking pins (21). Position springs (20) and locking pins (21) on bar (18) and install each handle (22) with bolt (23), flat washer (24), and locknut (25).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

g. STABILIZING STRUT - Continued

STEP	PROCEDURE
	 13. Apply grease to needle roller bearing (1) and install bearing, bushing (2), new cover (3), thrust washer bearings (4), and bearing spacer (5) on cap (6). Apply sealing compound (appx B, item 25) on threads of bolt (7) and install bolt, flatwasher (8), retainer (9), and spacer (10) on cap (6). 14. Apply sealing compound (appx B, item 25) to four bolts (11) and install bolts and flat washers (12) through strut tube (13) and into bushing (2). 15. Position sleeve bushings (14) on pad (15) and drive straight pin (16) through pad (15) bushings (14), and cap (6). 16. Secure straight pin (16) with cotter pin (17). 17. Apply sealing compound (appx B, item 25) on threads and install handle (18), two screws (19), flat washers (20), and ferrules (21) on pad (15).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

g. STABILIZING STRUT - Continued

STEP	PROCEDURE
	18. Install stop (22) on yoke (23). 19. Install key (24), two screws (25), flat washers (26), and locknuts (27) on yoke (23). 20. Apply oil on shop cloth and wipe all unpainted surfaces of yoke (23) with cloth. 21. Apply grease at grease fitting (28).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**h. CYLINDER SUPPORT****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
 5180-00-596-1474
 3/8 in. flat tip scdr
 9/16 in. comb. wr
 9/16 in. skt Equipment
 10 in. skt ext
 Skt wr hdl
 Feeler gage
 Endless loop sling EN1-62X96IN
 Rubber mallet, 5120-00-293-3399
 Wrecker truck M819
 Torque wr, 5120-00-247-2540
 Torque wr adapter, 5120-00-867-5518
 Adapter skt 5120-00-240-8702

Personnel Required

Utilities Equipment Repairer,
 MOS 52C10 (two)
 Wrecker Operator

ConditionPara

2-12

2-9

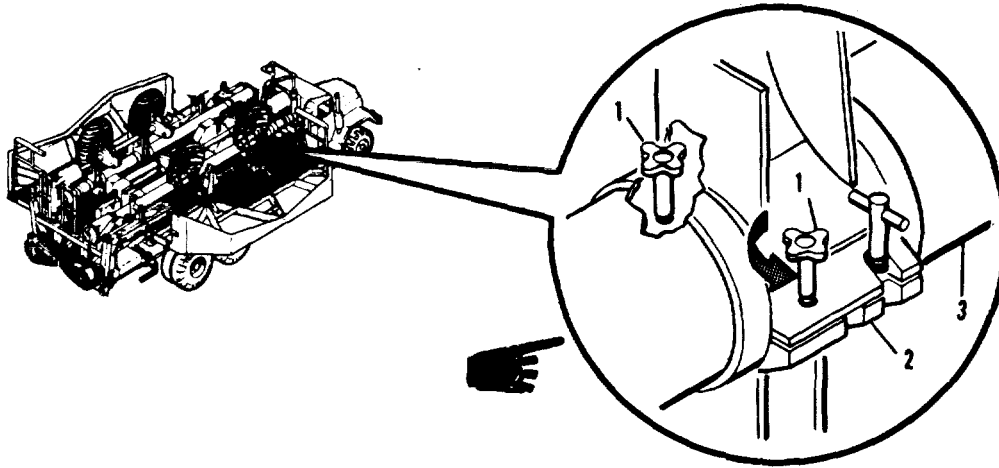
Condition Description

Linear actuating
 cylinder removed

Interconnect box removed

Materials/Parts

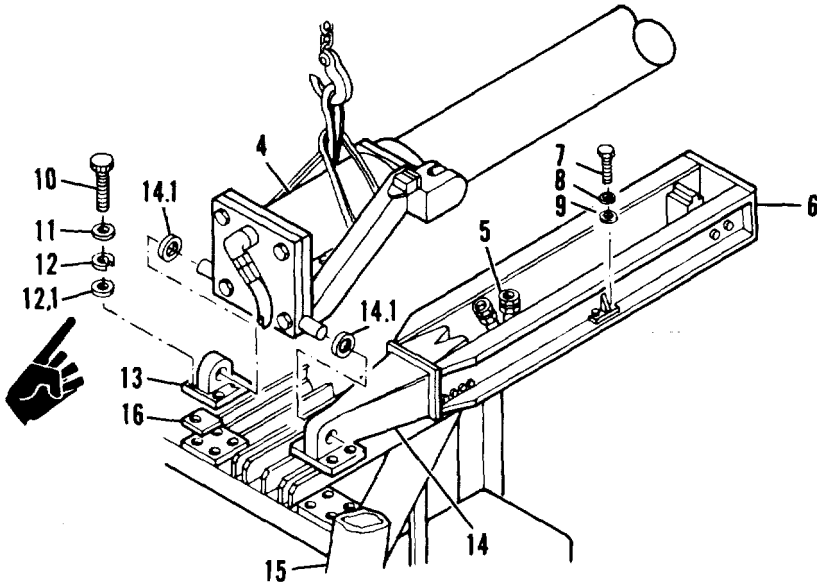
Rope, 20 feet (two)
 (appx B, item 16)

STEP**PROCEDURE****REMOVAL**

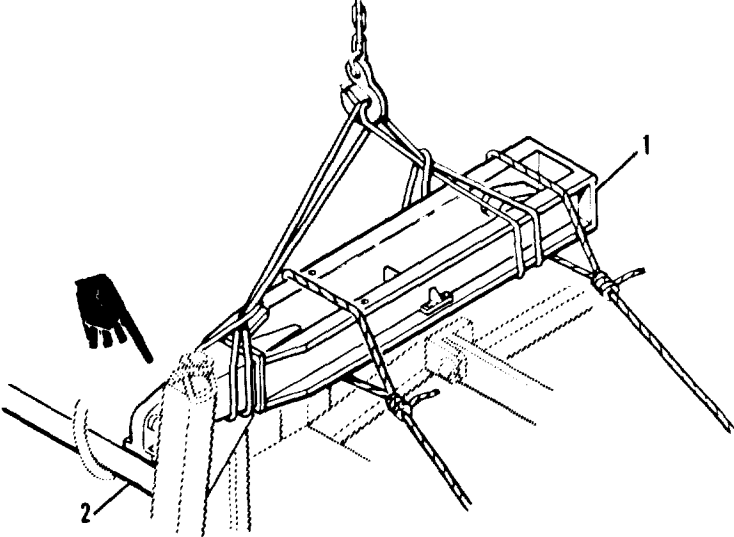
1. Unscrew two captive bolts (1) on mast clamp (2) back to release mast (3).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

h. CYLINDER SUPPORT - Continued

STEP	PROCEDURE
	 The diagram illustrates the cylinder support assembly. A crane hook is attached to a mast clamp (4), which is being hoisted. The assembly includes a cylinder support (6) mounted on a frame (15). Various bolts (7, 10), washers (8, 9, 11, 12, 12.1), and bearing housings (13, 14) are shown. A hand icon points to component 12.1, indicating a specific step in the procedure. 2. Position wrecker for hoisting mast clamp (4). 3. Secure one endless loop sling around mast clamp (4), attach sling to hook of wrecker crane, and take up slack in sling. 4. Pull hydraulic hoses (5) out through bottom of cylinder support (6). 5. Remove four bolts (7), lockwashers (8), and flat washers (9) securing cylinder support (6) to frame. 6. Remove eight bolts (10), countersunk washers (11), lockwashers (12), and flat washers (12.1) securing bearing housings (13 and 14) to frame. 7. Hoist mast clamp (4) just enough to lift bearing housings (13 and 14) off frame (15). 8. Remove bearing housing (13) from mast clamp (4). If installed, remove spacer(s) (16) from frame (15). 9. Carefully separate mast clamp (4) from bearing housing (14). Remove rings (14.1). 10. Slide cylinder support about 6 inches toward opposite end of frame (15). 11. Move mast clamp (4) back into mounting position on frame (15) and slip wooden blocks under mast clamp to support it in slightly elevated position. 12. Slacken sling and remove it from crane hook and mast clamp.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**h. CYLINDER SUPPORT - Continued**

STEP	PROCEDURE
	 13. Secure two endless loop slings, one at each end, to cylinder support (1), and attach slings to crane hook. Tie two 20-foot guide ropes to cylinder support (1), one to each end. 14. Using guide ropes to prevent swinging, remove cylinder support (1) from frame (2) and lower it to a clean level space away from mast group. 15. Remove slings and guide ropes from cylinder support (1). REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Secure two endless loop slings, one at each end, to cylinder support (1) and attach slings to crane hook. 2. Tie two 20-foot guide ropes, one to each end, to cylinder support (1). 3. Using guide ropes to prevent swinging, hoist cylinder support (1) into position about six inches toward opposite end of frame (2) from mounting holes, and lower to frame. 4. Slacken slings and remove slings from crane hook and cylinder support (1). 5. Remove guide ropes from cylinder support (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

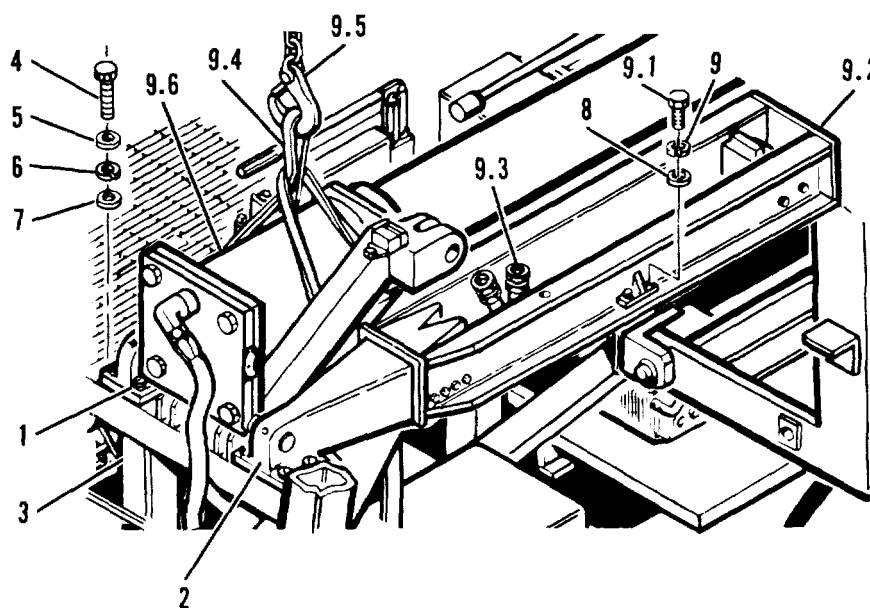
h. CYLINDER SUPPORT - Continued

STEP	PROCEDURE
	6. Slide cylinder support into position for mounting to support frame (2). 7. Attach one endless loop sling around mast base clamp (3), attach sling to crane hook and take up slack in sling. NOTE Apply GAA grease to inner surfaces of bearing housings. 8. Install rings (5.1) on mast clamp pivot bars (4 and 7). Lift mast base clamp (3) slightly, remove wooden blocks, and move mast base clamp as required to insert pivot bar (4) into bearing housing (5). 9. Install bearing housing (6) on pivot bar (7). 10. Lower mast base clamp (3) so bearing housings (5 and 6) are resting on frame (2). Check to see if there are any gaps between support frame (2) and bearing housings (6 and 5). If there are any gaps greater than .020 inch, lift mast base clamp (3) and use spacer(s) (8) as required to fill gaps. Trim off any excess portion of spacer(s) that may stick-out between support frame (2) and bearing housings (6 and 5). Lower mast base clamp (3).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

h. CYLINDER SUPPORT - Continued

STEP	PROCEDURE
11.	Secure bearing housings (1 and 2) to support frame (3) with eight bolts (4), countersunk washers (5), lockwashers (6), and flatwashers (7). Tighten bolts (4) to between 67 and 70 ft-lbs torque. NOTE Position countersunk washers with countersunk side up. NOTE When using the torque wrench adapter, connect it at a right angle to the torque wrench to prevent a change in the torque value from occurring.
12.	Install four flatwashers (8), lockwashers (9), and screws (9.1) securing cylinder support (9.2) to support frame (3). Tighten screws (9.1) to between 40 and 43 ft-lbs torque.
13.	Insert hydraulic hoses (9.3) into cylinder support (9.2).
14.	Remove sling (9.4) from hook (9.5) and mast base clamp (9.6).



3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

h. CYLINDER SUPPORT - Continued

STEP	PROCEDURE
	The diagram illustrates the assembly of the mast clamp (10) and captive bolts (11) on the cylinder support frame. A perspective view on the left shows the entire support frame assembly. A circular callout on the right provides a detailed view of the mast clamp (10) being secured with two captive bolts (11) to the side of the cylinder support frame. 15. Close mast clamp (10) and secure with two captive bolts (11). 16. Install interconnect box (para 2-9). 17. Install linear actuating cylinder (para 2-12). 18. Lubricate mast clamp bearings on the side of vehicle you are working on (see LUBRICATION INSTRUCTIONS in TM 11-5985-368-12&P). 19. Perform Organizational Preventive Maintenance Checks and Services (PMCS) except do not replace PCA inline filter element (see TM 11-5985-368-12&P).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

i. CABLE STOWAGE TRAY

This task covers:

Removal

Replacement

Installation

This task covers:

Removal Repair Installation

INITIAL SETUPTools

Refriq Unit Svce Tool Kit,
5180-00-596-1474
No. 2 flat tip scdr
5/6 in. comb. wr
3/16 in. skt hd scr key
7/16 in. comb. wr
1/4 in. comb. wr

Materials/Parts

Cable Stowage Tray parts as needed
Rope 1/4 in. (two 20-ft. lengths)
Endless loop sling (two)

Personnel Required

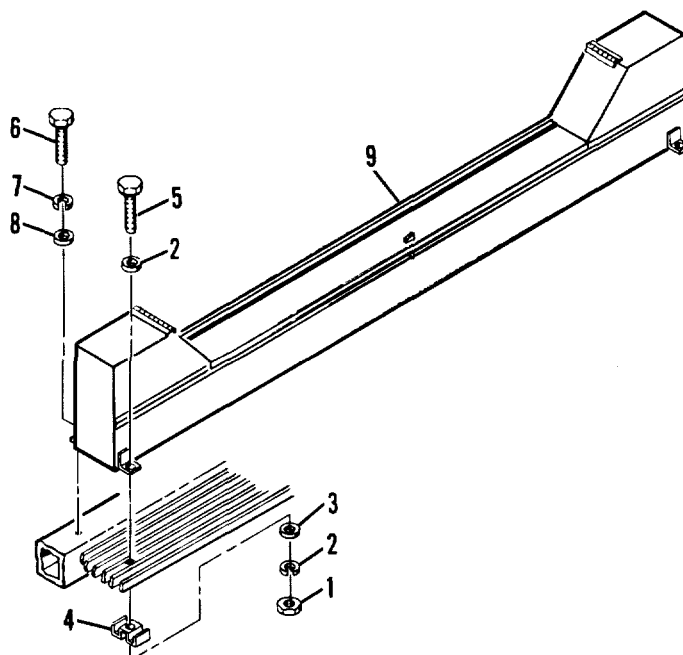
Utilities Equipment Repairer,
MOS 52C10 (two)
Wrecker Operator

Condition Description

Antenna cable disconnected and
removed (Organizational
Maintenance)

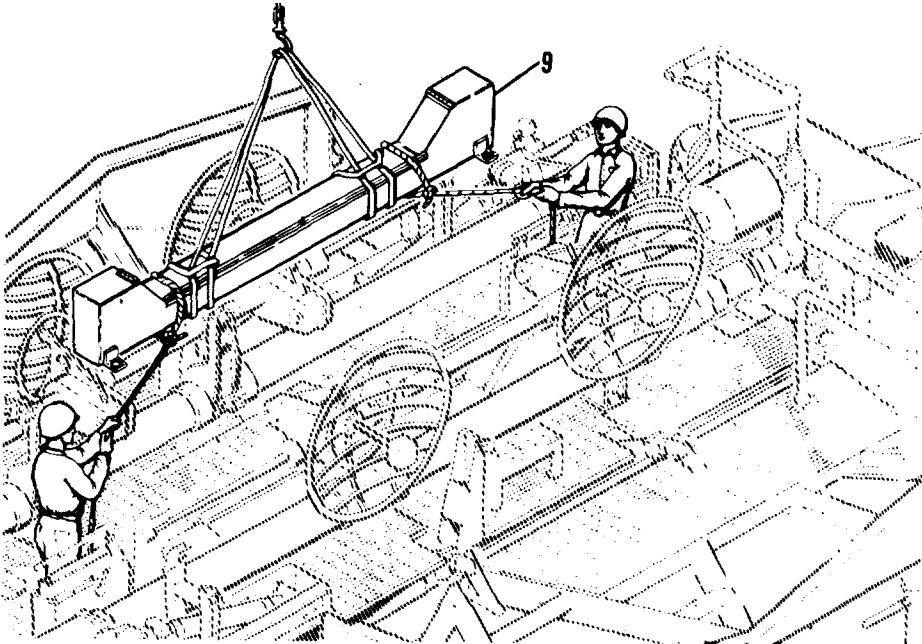
STEP

PROCEDURE



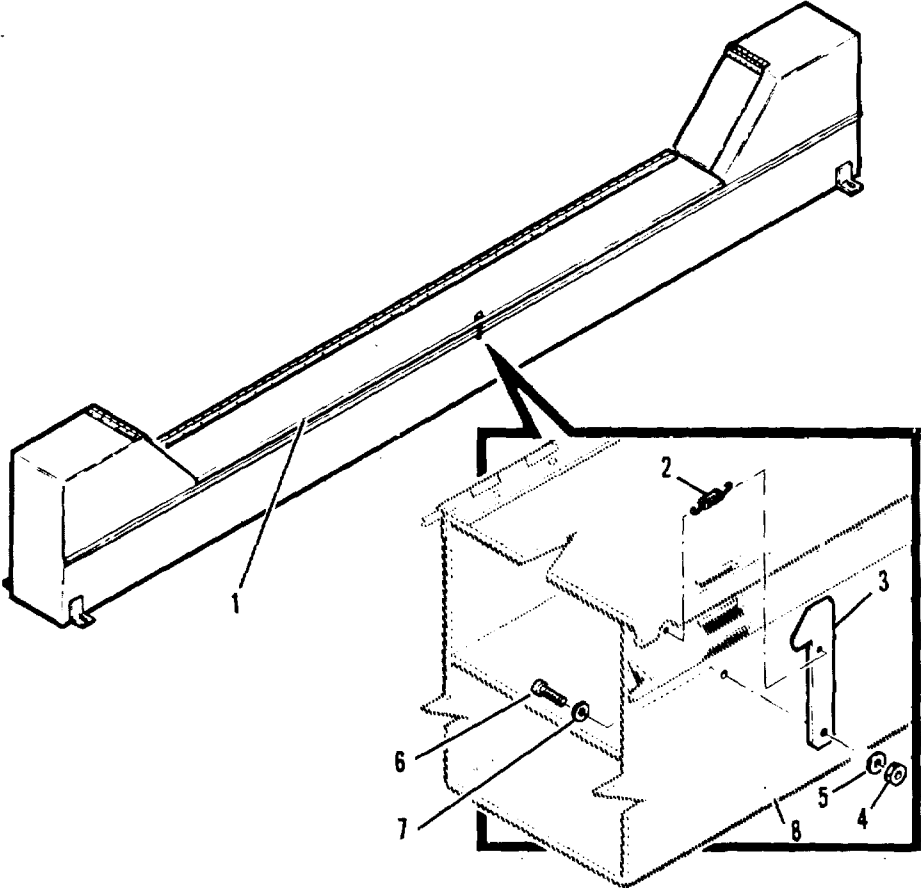
1. Remove three nuts (1), six flat washers (2), three lockwashers (3), three clips (4), and three screws (5).
2. Remove two screws (6), lockwashers (7), and flat washers (8).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**i. CABLE STOWAGE TRAY - Continued**

STEP	PROCEDURE
	 3. Position wrecker for hoisting cable stowage tray (9). 4. Attach two endless loop slings, one at each end, to cable stowage tray (9), attach slings to crane hook of wrecker, and take up slack in slings. 5. Tie two guide ropes, one at each end, to cable stowage tray (9). 6. Using guide ropes to prevent swinging, hoist cable stowage tray (9) from mast group and place on a clean level surface a way from mast group. 7. Remove guide ropes and slings from cable stowage tray (9).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

i. CABLE STOWAGE TRAY - Continued

STEP	PROCEDURE
	REPAIR NOTE Repair consists of replacement of a faulty part with a new part.  Remove parts as follows: 1. Open cable tray lid (1), remove helical spring (2), and remove latch (3) by removing nut (4), flat washer (5), screw (6), and flat washer (7). 2. Turn cable stowage tray on its side.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

i. CABLE STOWAGE TRAY - Continued

STEP	PROCEDURE
	3. Remove four screws (9), four lockwashers (10), and four flat washers (11) to remove lower cable clamp (12) from upper cable clamp (13). 4. Remove two screws (14), two lockwashers (15), and two flat washers (16) to remove inner pivot clamp (17) from cable stowage tray (18). 5. Remove two nuts (19), two lockwashers (20), two flat washers (21), two screws (22), and two flat washers (23) to remove upper cable clamp (13) and outside pivot clamp (24) from cable stowage tray (18).

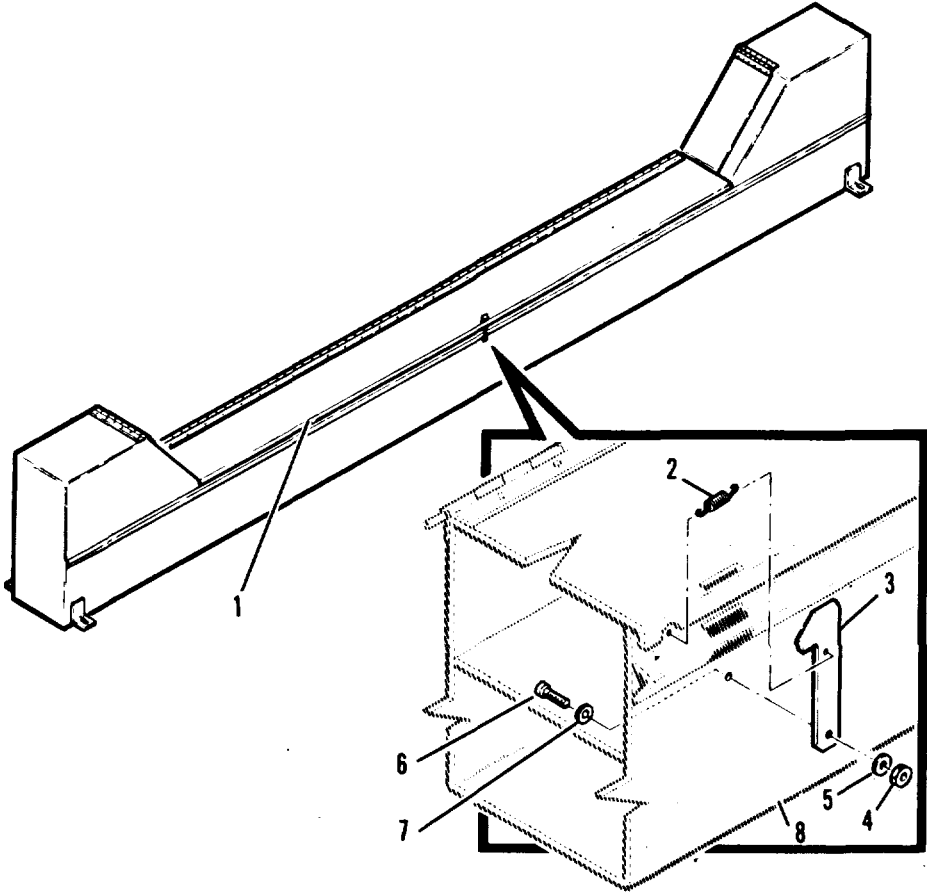
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

i. CABLE STOWAGE TRAY - Continued

STEP	PROCEDURE
	Install parts as follows: 1. Install outer pivot clamp (16) on cable storage tray (10) with two flat washers (15), two screws (14), two flat washers (13), two lockwashers (12) and two nuts (11). 2. Install upper cable clamp (5) in outer pivot clamp (16) and inner pivot clamp (9) and secure inner pivot clamp (9) to cable storage tray (10) with two flat washers (8), two lockwashers (7), and two screws (6). 3. Install lower cable clamp (4) to upper cable clamp (5) with four flat washers (3), four lockwashers (2), and four screws (1).

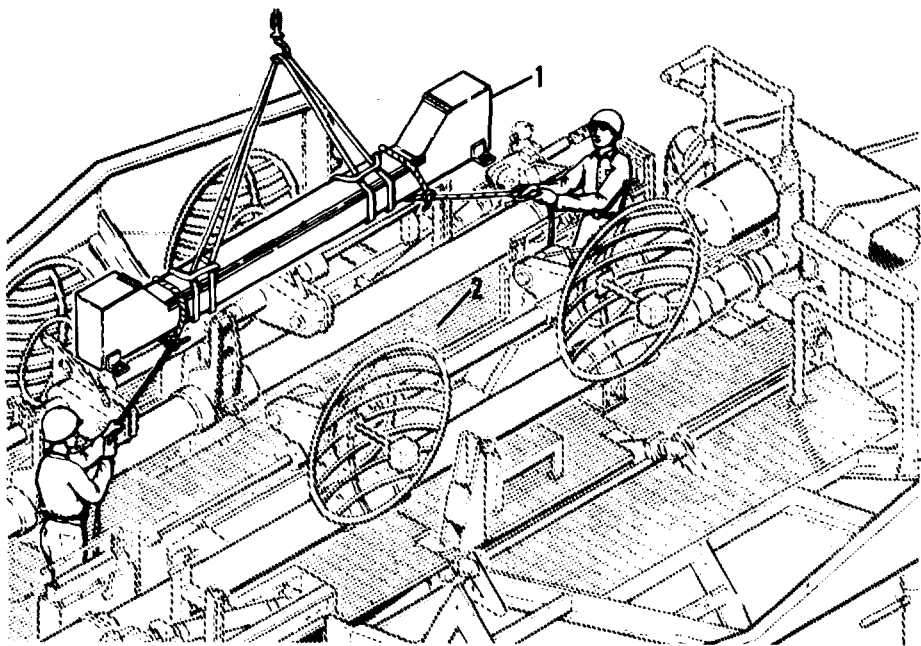
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

i. CABLE STOWAGE TRAY - Continued

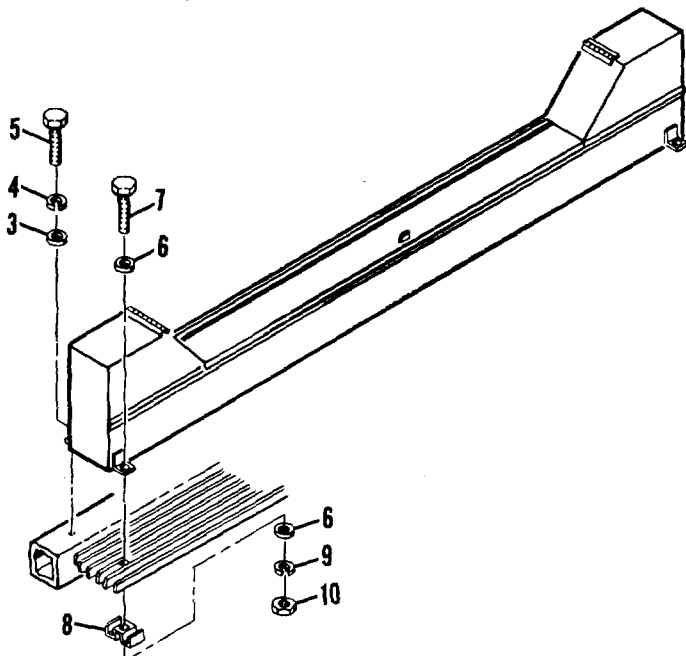
STEP	PROCEDURE
	 The diagram illustrates the assembly of a cable stowage tray. The main view shows a long, narrow tray (1) with a lid (17) at one end. A callout provides a detailed view of the latch mechanism. In this view, a helical spring (18) is shown engaging a latch (19) and the cable stowage tray (24). The latch (19) is secured to the tray (24) using a flat washer (23), a screw (22), another flat washer (21), and a nut (20). Other components labeled include a screw (2), a latch (3), a screw (6), a nut (7), a flat washer (8), a screw (5), a nut (4), and a flat washer (10). 4. Open cable stowage tray lid (17) and engage helical spring (18) to both latch (19) and cable stowage tray (24). 5. Secure latch (19) to cable stowage tray (24) with flat washer (23), screw (22), flat washer (21), and nut (20). Do not tighten nut (20) so as to restrict movement of latch (19). 6. Close cable stowage tray lid (17).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

i. CABLE STOWAGE TRAY - Continued

STEP	PROCEDURE
	INSTALLATION  1. Position wrecker for hoisting cable stowage tray (1). 2. Attach two endless loop slings, one at each end, to cable stowage tray (1), attach slings to crane hook of wrecker, and take up slack in slings. 3. Tie two guide ropes, one at each end, to cable stowage tray (1). 4. Using guide ropes to prevent swinging, hoist cable stowage tray (1) onto mast group and into mounting position on frame (2). 5. Remove guide ropes and slings from cable stowage tray (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**i. CABLE STOWAGE TRAY - Continued**

STEP	PROCEDURE
	 6. Install two flat washers (3), lockwashers (4), and screws (5). 7. Install six flat washers (6) three screws (7), three clips (8), three lockwashers (9), and three nuts (10).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

j. TAIL LIGHT ASSEMBLY

This task covers:

Removal

Replacement

Installation

INITIAL SETUPTools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
7/16 in. comb. wr
9/16 in. comb. wr
No. 3 xtip scar

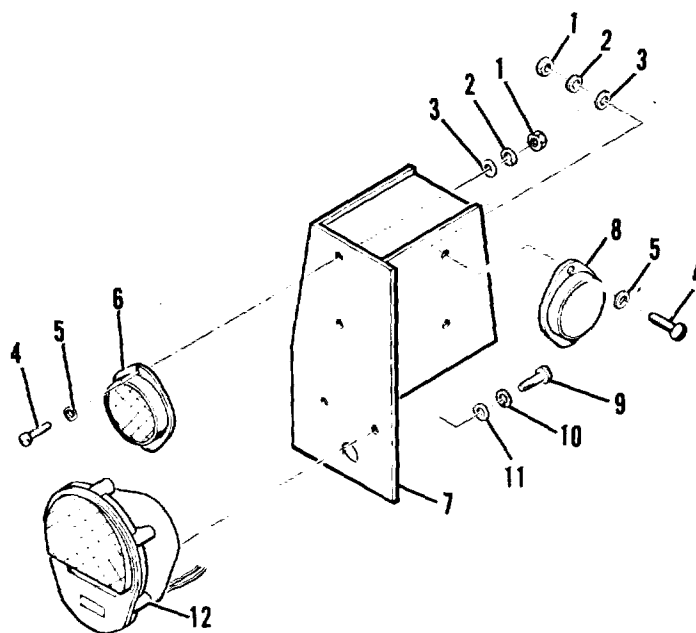
Materials/Parts

Tail light assembly parts as needed

STEP

PROCEDURE

REMOVAL



1. Remove two nuts (1), two lockwashers (2), two flat washers (3), two machine screws (4), and two flat washers (5); and remove reflector (6) from tail light assembly bracket (7).
2. Repeat step 1 for reflector (8).
3. Remove two screws (9), two lockwashers (10), and two flat washers (11); and remove lamp assembly (12) from tail light assembly bracket (7).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**j. TAIL LIGHT ASSEMBLY - Continued**

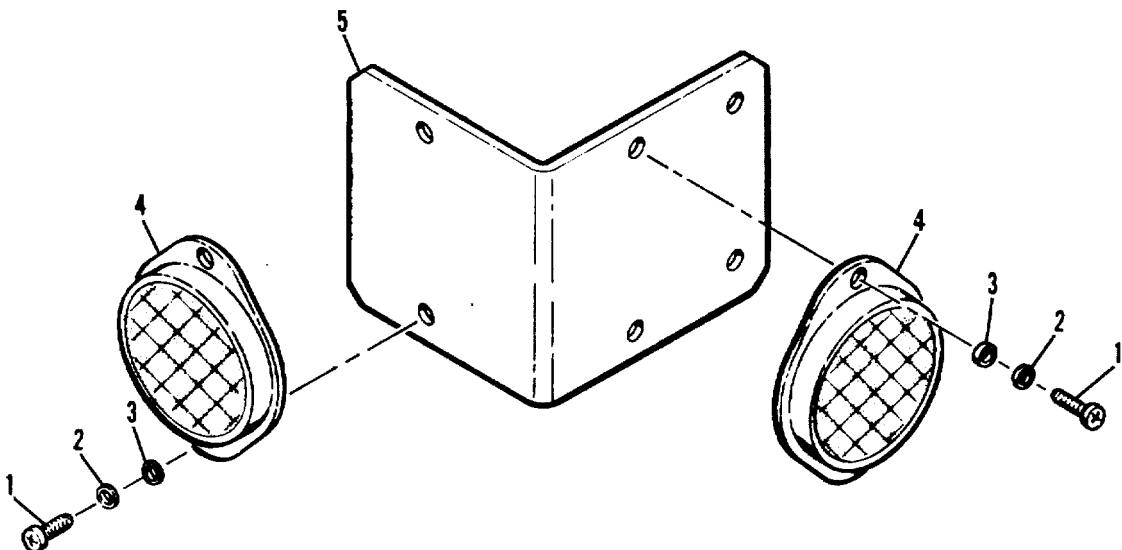
STEP	PROCEDURE
	REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Install lamp assembly (12) on tail light assembly bracket (7) with two flat washers (11), two lockwashers (10), and two screws (9). 2. Install reflector (6) on tail light assembly (7) with two flat washers (5), two screws (4), two flat washers (3), two lockwashers (2), and two nuts (1) . 3. Repeat step 2 for reflector (8).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**k. REFLECTOR ASSEMBLY****This task covers:****Removal****Replacement****Installation****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 3 xtip scar

Materials/Parts

Reflector assembly parts as needed

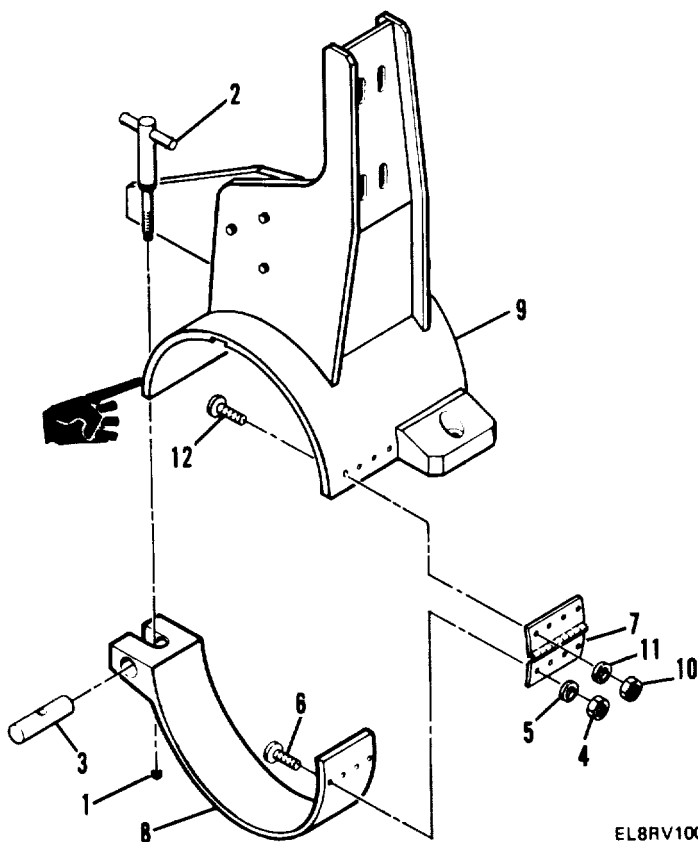
STEP	PROCEDURE
1.	REMOVAL  Remove four screws (1), lockwashers (2), and flat washers (3) and remove light reflectors (4), from angle bracket (5). REPLACEMENT Replace faulty part with a new part. INSTALLATION Install light reflectors (4) on angle bracket (5) with flat washers (3), lockwashers (2), and screws (1).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**I. MAST CLAMP****This task covers:****Removal****Replacement****Installation****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 3 xtip scar
7/16 in. comb. wr
Snap ring plr 67-983

Materials/Parts

Mast clamp parts as needed

STEP**PROCEDURE**

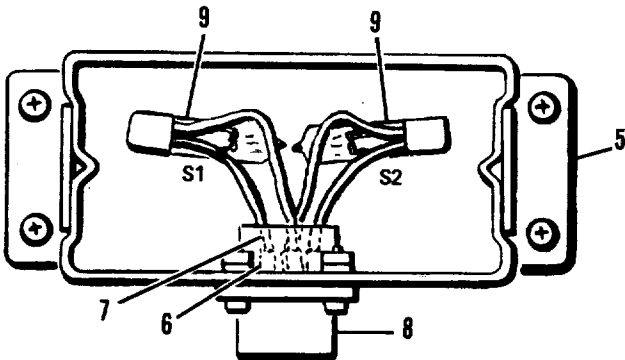
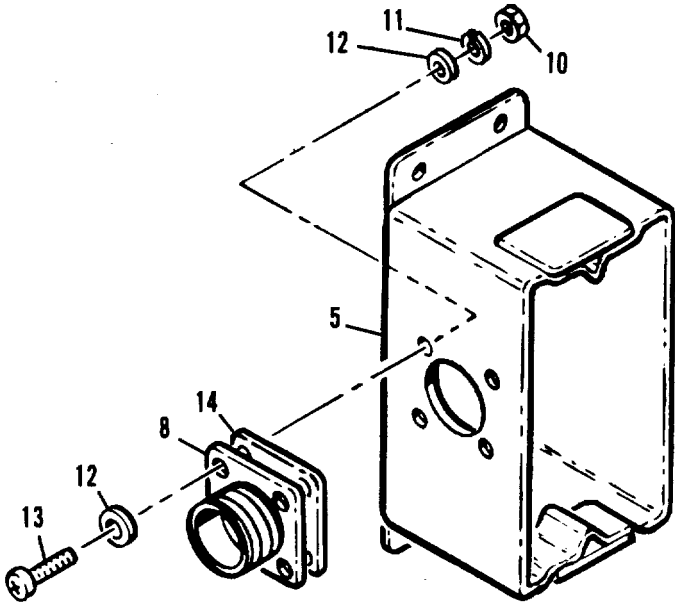
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**I. MAST CLAMP - Continued**

STEP	PROCEDURE
	REMOVAL 1. Remove retaining ring (1) and unscrew tee screw (2) from mast clamp pivot (3). 2. Remove mast clamp pivot (3). 3. Remove four nuts (4), flat washers (5), and screws (6); and separate hinge (7) from tube (8), 4. Remove four nuts (10), flat washers (11), and screws (12); and separate hinge (7) from mast clamp (9). REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Install hinge (7) on mast clamp (9) with four screws (12), flat washers (11), and nuts (10). 2. Install hinge (7) on tube (8) with four screws (6), flat washers (5), and nuts (4). 3. Install mast clamp pivot (3) in tube (8). 4. Screw tee screw into mast clamp pivot (3). 5. Install retaining ring (1) on tee screw (2).

All data on pages 3-198 thru 3-203 deleted

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

m. VERTICAL INTERLOCK SWITCH - Continued

STEP	PROCEDURE
	 2. Carefully cut and remove shrink sleeving (6) from four wires (7) at connector J1 (8) and unsolder wires from connector. 3. Carefully pull two mercury switches (9) out of clips in junction box (5) and remove switches from junction box.
4.	 Remove four nuts (10), four lockwashers (11), eight flat washers (12), and four screws (13); and remove connector (8) and gasket (14) from junction box (5). REPLACEMENT Replace faulty part with a new part.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

m. VERTICAL INTERLOCK SWITCH - Continued

STEP	PROCEDURE
	INSTALLATION 1. Clean two clips (1) and apply silicone adhesive to inside area of clips. 2. Install two mercury switches (2) in clips (1) of junction box (3). 3. Install new gasket (4) and connector (5) on junction box (3) with eight flat washers (6), four screws (7), four lockwashers (8), and four nuts

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

m. VERTICAL INTERLOCK SWITCH - Continued

STEP	PROCEDURE
	4. Install three 1/2 inch pieces of shrink sleeving (10) on the four, wires (11) (two each) from the switches S1 (12) and S2 (13). One piece goes on the wires from S1-B and S2-B. 5. Prepare and tin the ends of the four wires (11) and three pins (14) on connector J1 (15). Tin wires and pins. NOTE After soldering Iron is hot enough to melt solder, apply solder to its tip. Keep tip bright and shiny by wiping frequently on 0 wiping pod (clomp sponge pod), 6. Solder wires (11) to pins A, B. and C (14) of J1 (15) as follows: S1-A to J1-A S2-A to J1-B S1-B and S2-B to J1-C 7. Slide heat shrink sleeving (10) over connections and heat to shrink.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

m. VERTICAL INTERLOCK SWITCH - Continued

STEP	PROCEDURE
8.	A technical line drawing showing an exploded view of a junction box assembly. On the left is a rectangular junction box (8) with a circular port on its front face. To its right is a rectangular cover plate (7). Further to the right are the fasteners: a flat washer (9), a lockwasher (10), and a screw (11). Dashed lines indicate the alignment and assembly path: from the screw (11) through the lockwasher (10) and flat washer (9) into the cover plate (7), which is then positioned to be attached to the junction box (8). Install cover (7) on junction box (8) with flat washers (9), lockwashers (10), and screws (11). TEST Test per paragraph 3-16.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

n. BEARING HOUSING REPLACEMENT

This task covers:

Removal

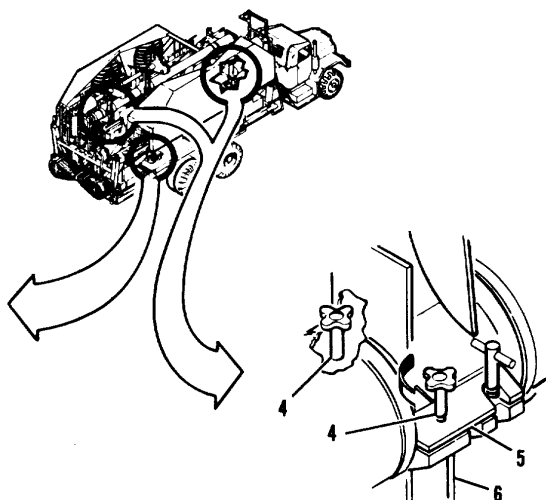
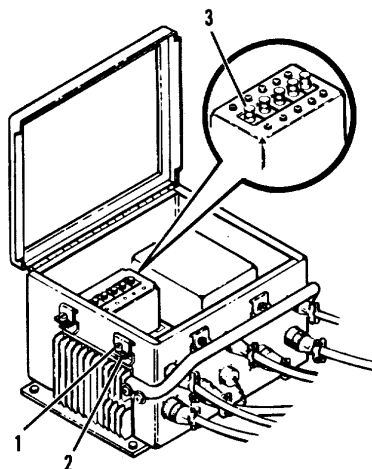
Installation

INITIAL SETUPTools

Refrig Unit Svce Tool Kit
 5180-00-596-1474
 3/8 in. flat tip scar
 9/16 in. comb. wr
 feeler gage
 9/16 in. skt
 10 in. skt wr hdl
 Grs gun, 4910-00-754-0654
 Torque wr, 5120-00-247-2540
 Torque wr adapter, 5120-00-867-5518
 Skt, adapter, 5120-00-240-8702
 Endless loop sling (two)

Materials/Parts

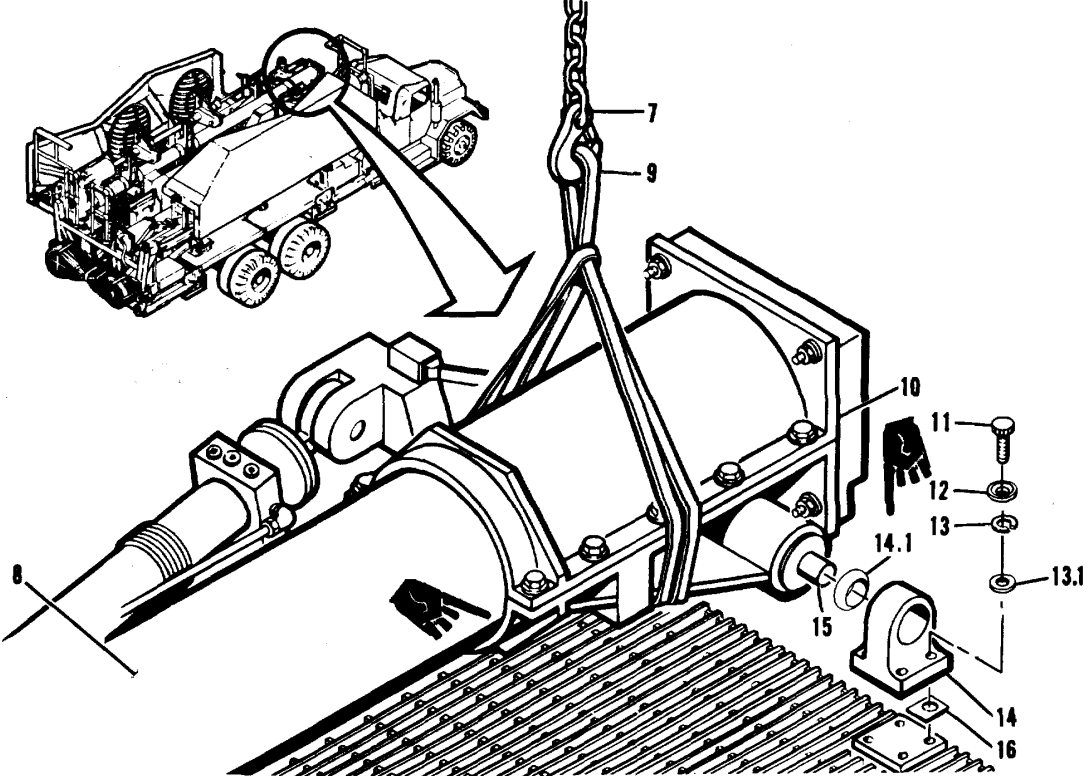
Shop cloth, (two) (appx B, item 17)
 Grease (appx B, item 2)
 Bearing unit housing
 Rope, 20 foot (appx B, item 16)

STEP**PROCEDURE****REMOVAL**

1. Loosen six screws (1), release latches (2), open cover, and pull all circuit breakers (3) to outer (off) position.
2. Lower antenna protective cover on the side of vehicle that requires housing replacement (TM 11-5985-368-12&P, para 2-15).
3. Unscrew two handknobs (4) from upper mast clamp (5) and mast support clamp (6).

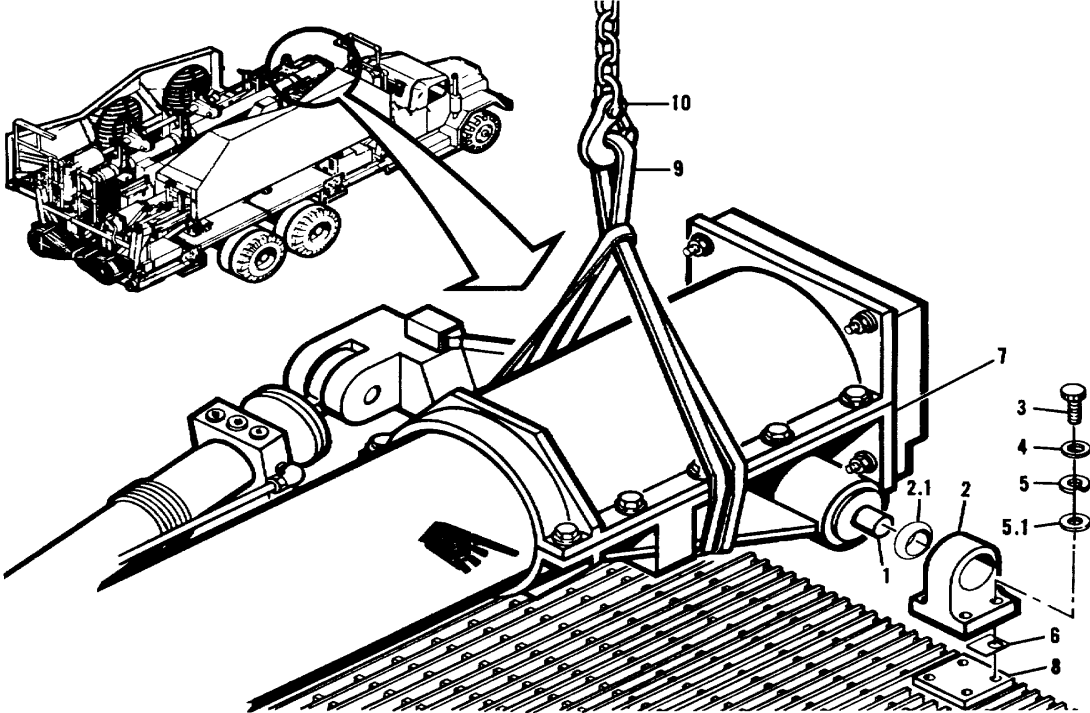
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

n. BEARING HOUSING REPLACEMENT - Continued

STEP	PROCEDURE
	 4. Position wrecker so that wrecker hook (7) is over base of mast (8). 5. Install sling (9) around lower mast clamp (10). 6. Attach sling (9) to wrecker hook (7) and take up slack in sling. 7. Remove four bolts (11), countersunk washers (12), lockwashers (13), and flat washers (13.1) from bearing housing (14). CAUTION Use care not to damage cylinder support when raising mast clamp. 8. Raise the mast clamp (10) slightly so that the bearing housing (14) just lifts from frame of vehicle. 9. Remove bearing housing (14) and ring (14.1) from pivot bar (15) of lower mast clamp (10). If installed, remove spacer(s) (16) from support frame.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

n. BEARING HOUSING REPLACEMENT - Continued

STEP	PROCEDURE
	 INSTALLATION 1. Wipe tip of lower mast clamp pivot bar (1) and inner surfaces of bearing housing (2) with cloth. 2. Apply a small amount of grease around tip of lower mast clamp pivot bar (1) and install bearing housing (2) and ring (2.1) on pivot bar (1). 3. Start four bolts (3), countersunk washers (4), lockwashers (5), and flat washers (5.1) through bearing housing (2) and into frame (6). NOTE Position countersunk washers with countersunk side up.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

n. BEARING HOUSING REPLACEMENT - Continued

STEP	PROCEDURE
	4. Slowly lower mast base clamp (7) so full weight is on frame (8). Check to see if there are any gaps between frame (8) and bearing housing (2). If there are any gaps greater than .020 inch, remove bolt(s) (3), lift mast base clamp (7) and use spacer(s) (6) as required to fill gaps. Trim off any excess portion of spacer(s) that may stick out between support frame (8) and bearing housing (2). Install bolt(s) (3). 5. Tighten bolts (3) to between 67 and 70 ft-lbs torque. NOTE When using the torque wrench adapter, connect it at a right angle to the torque wrench to prevent a change in the torque value from occurring 7. Tighten two handknobs (11) in upper mast clamp (12) and mast support clamp (13). 8. Lubricate mast clamp bearings on the side of vehicle you are working on (see LUBRICATION INSTRUCTIONS in TM 11-5985-368-12&P). 9. Raise and stow antenna protective cover (see applicable portions of paragraph entitled Mast Stowage in TM 11-5985-368-12&P). 10. Push all circuit breakers (14) to the inner (on) position, close cover, fasten latches (15), and tighten six screws (16) in latches.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**o. REPLACE AIR TANKS****This task covers:****Removal****Installation****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit

3/4 in. comb. wr

1 5/8 in. comb. wr

7/8 in. comb. wr

7/16 in. comb. wr

9/16 in. comb. wr

3/8 in. flat tip scar

1-1/16 in. skt

Skt wr hdl

7/16 in. skt

9/16 in. skt

1-1/4 in. comb. wr

1-1/16 in. comb. wr

Tools (Continued)

Wrecker truck M819A1

Flat-bed truck

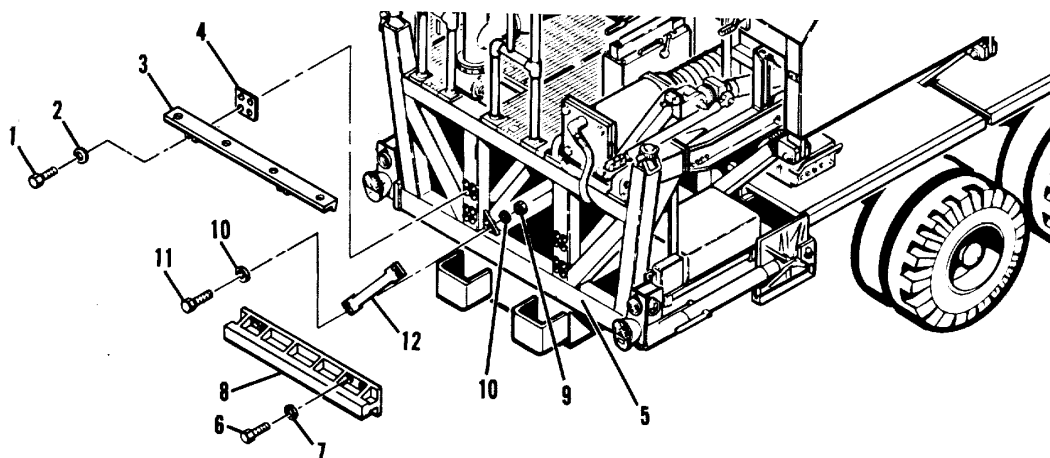
Endless loop sling ENI-62X96IN (two)

Materials/Parts

20-ft rope (four) (ap px B. item 16)

Thread sealing compound (appx B. item 21)

Ship cloths (appx B. item 17)

STEP**PROCEDURE****REMOVAL**

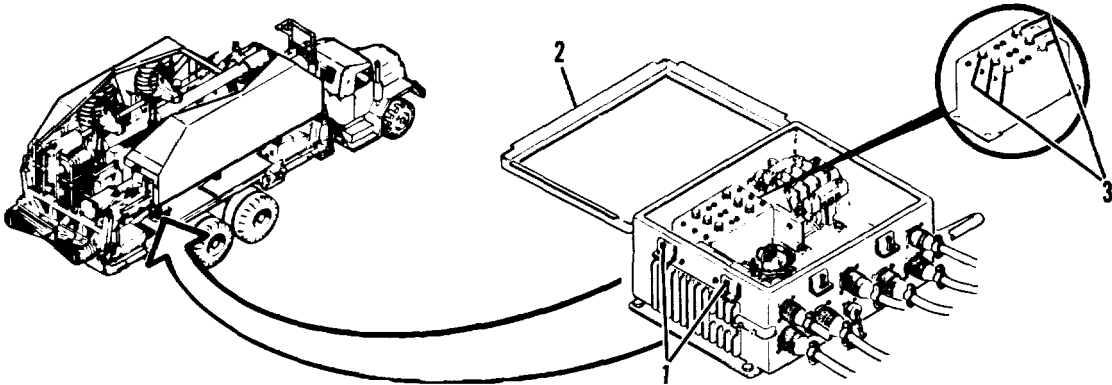
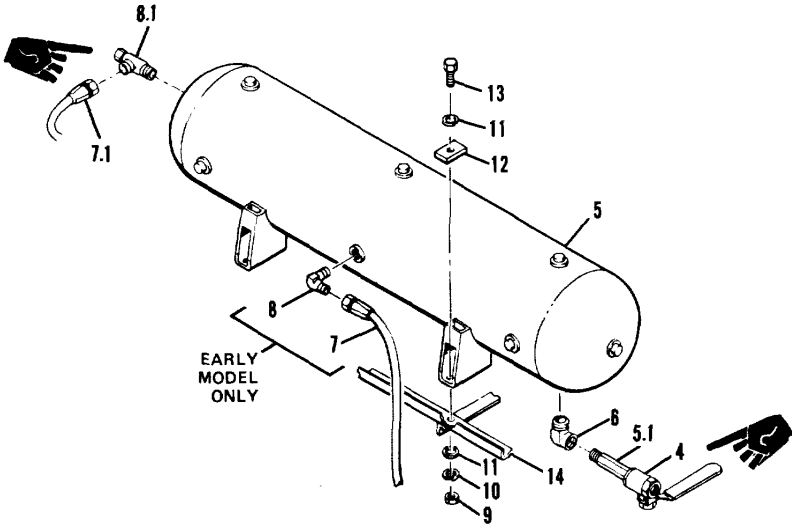
1. Remove cable rack from rear of mast group (TM 9-1430-603-24).
2. Remove eight screws (1) and flatwashers (2), and remove top cable support (3) and shims (4) from support frame (5). Count shims for reference in reassembly.
3. Remove eight screws (6) and flatwashers (7), and remove bottom cable support (8) from support frame (5).
4. Remove four nuts (9), eight flatwashers (10), and four bolts (11); and remove diagonal support tube (12) from support frame (5).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**o. REPLACE AIR TANKS - Continued**

STEP	PROCEDURE
	NOTE Remove only those cable clamp brackets that obstruct movement of air tank mounting feet of air tank is slid on angle brackets during removal. 5. As required, remove two nuts (13), two lockwashers (14), four flatwashers (15), and two screws (16); and remove cable clamp bracket (17) from angle bracket (18) with cable (19) attached.

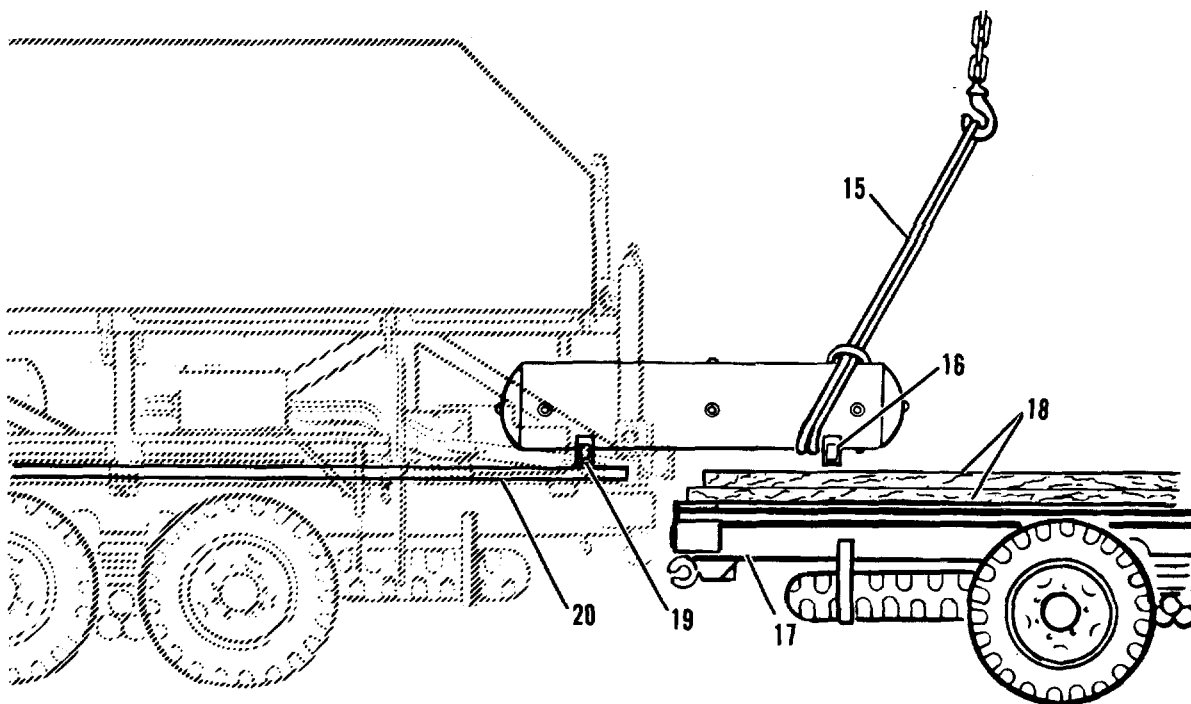
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

o. REPLACE AIR TANKS - Continued

STEP	PROCEDURE
	
6. 7.	Loosen screw in each of six latches (1), release latches, and open cover (2). Pull all circuit breaker reset buttons (3) to outer (off) position.
8. 8.1 9. 10.	 Open ball valve (or petcock if early model) (4) at bottom of rear air tank (5) and vent all air from air tank. NOTE Early models have a petcock installed instead of the nipple pipe and ball valve. Remove nipple pipe (5.1) (with ball valve (4) installed) from elbow (6). Remove elbow (6) from air tank (5). On air tank to be removed, disconnect hose assembly (7 or 7.1) from elbow (8) or tee (8.1) and remove elbow or tee as applicable.

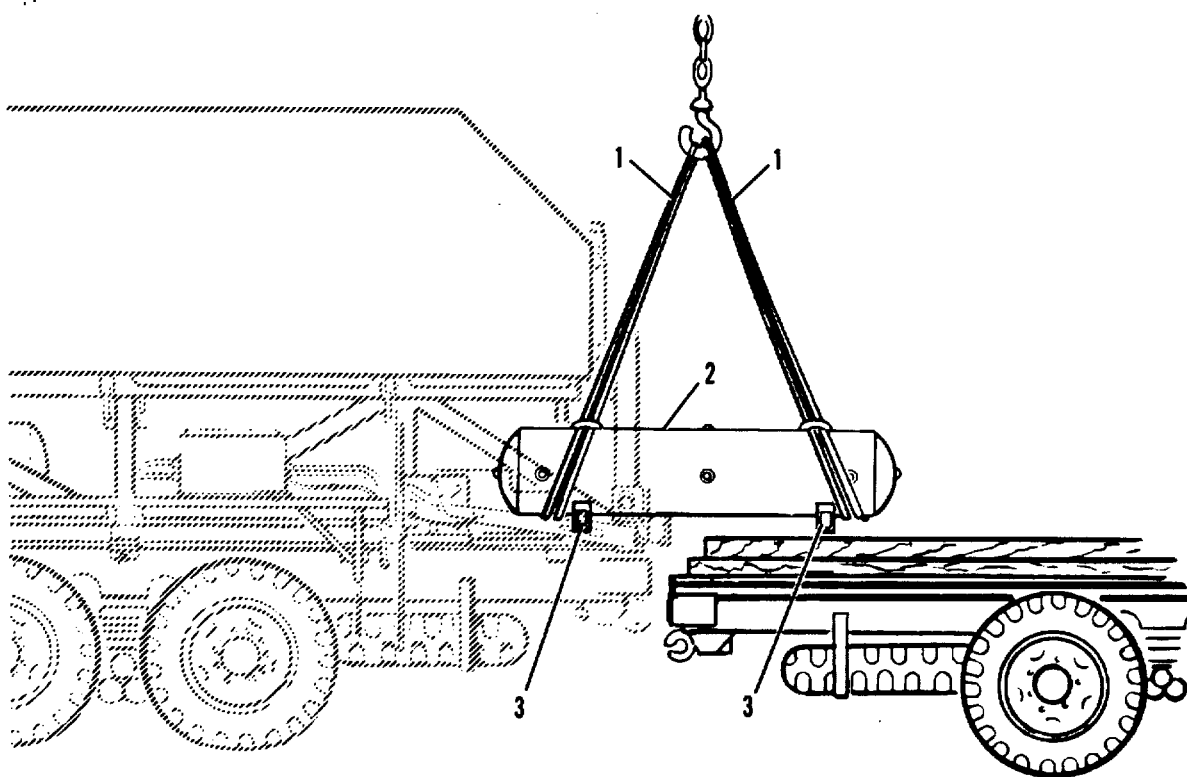
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**o. REPLACE AIR TANKS - Continued**

STEP	PROCEDURE
11.	Remove four nuts (9), four lockwashers (10), eight flatwashers (11), four flatwashers (12), and four screws (13) securing air tank (5) to angle bracket (14).
12.	Connect a sling (15) to air tank in a choker configuration, with sling just to the inside of the rear feet (16) as shown. Connect sling to wrecker hook. Take up slack in sling.
13.	Back a flatbed truck (17) up against rear of mast group. Check to see that bed of truck is about level with air tank when it is mounted in the mast group. If necessary, lay boards (18) on bed of flatbed truck.
14.	Carefully lift and pull air tank out of mast group until rear feet (16) are over flatbed truck (17) and front feet (19) are resting on mast group angle brackets (20). Lower wrecker boom. Remove sling (15) from air tank.



3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**o. REPLACE AIR TANKS - Continued****STEP****PROCEDURE**

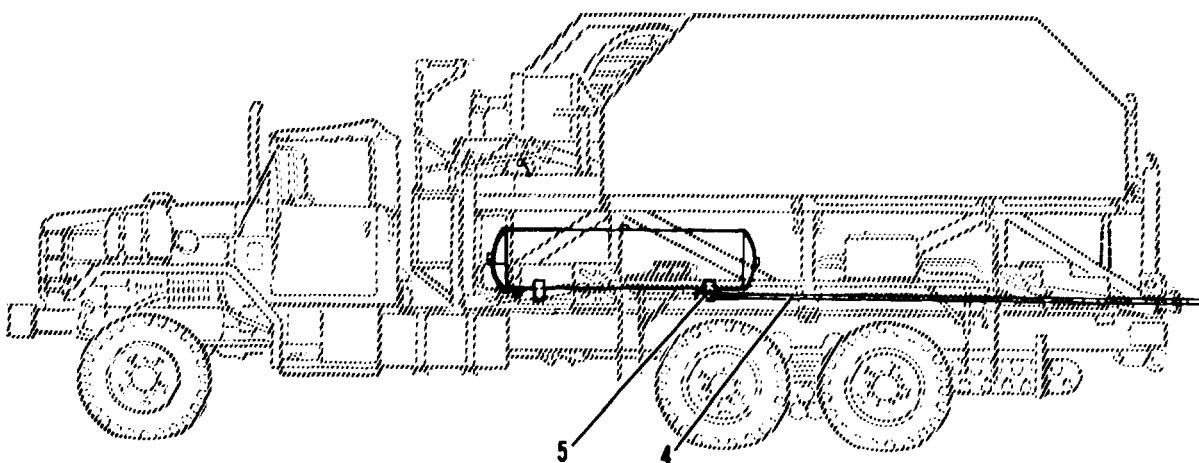
15. Connect two slings (1) to air tank (2) in a choker configuration with slings just to the outside of the mounting feet (3) as shown.
16. Slowly lift air tank (2) and remove from mast group. Carefully place tank on flatbed truck, or on the ground.
17. Remove slings from air tank and wrecker.



3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

o. REPLACE AIR TANKS - Continued

STEP	PROCEDURE
NOTE Steps 18 to 20 apply only if removing forward air tank.	
18.	Repeat steps 5 to 11 for forward air tank.
19.	Tie two guide ropes (4) to rear feet (5) of air tank. Pass ropes through center of support frame. Pull on guide ropes (4) and slide air tank to rear of mast group. Remove guide ropes.
20.	Repeat steps 12 to 17 and remove forward air tank.

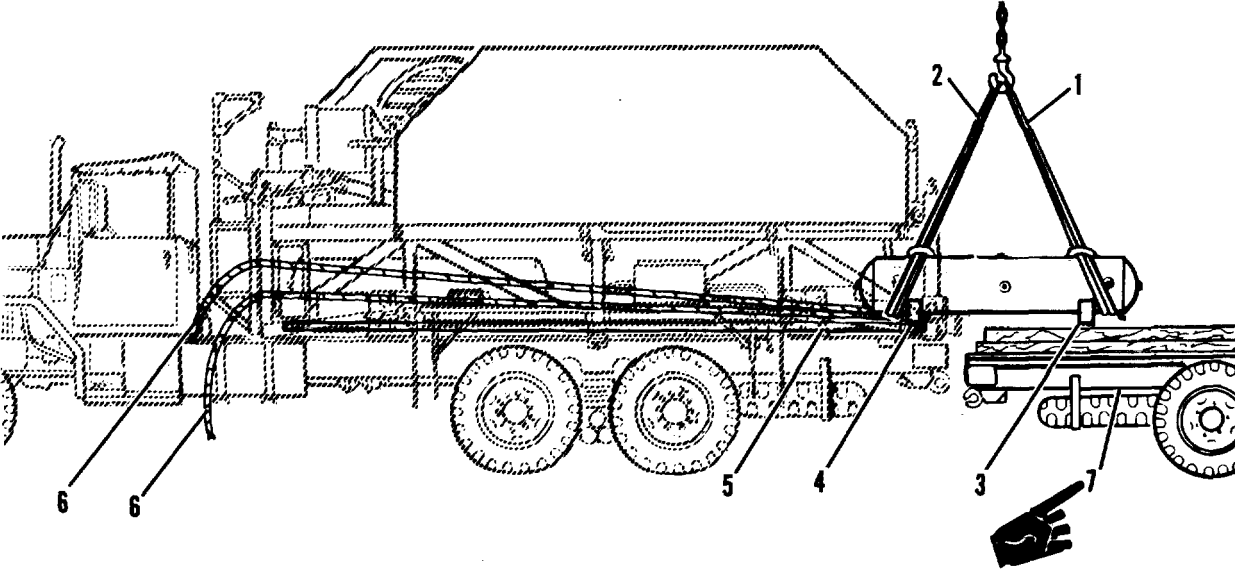


3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**o. REPLACE AIR TANKS - Continued**

STEP	PROCEDURE
	INSTALLATION NOTE Make sure air tanks are oriented correctly during installation. The petcock hole of the forward air tank is at the front end of the tank, and the petcock hole of the rear air tank is at the rear end of the tank. 1. Connect two slings (1 and 2) to air tank in a choker configuration, with slings just to the outside of the mounting feet (3 and 4) as shown. 2. Carefully lift air tank, and position so that front mounting feet (4) are over angle brackets (5) and rear mounting feet (3) are over flatbed truck (7). 3. Lower air tank. Disconnect the sling (2) from the front of the air tank, and from the wrecker hook. 4. Slide air tank into the mast group using remaining sling (1). Lower air tank when the rear mounting feet (3) are positioned over angle brackets (5). 5. Move flatbed truck from the rear of the mast group. 6. Remove sling from the air tank and wrecker hook. NOTE If replacing rear air tank only, align tank mounting feet with holes in angle brackets and proceed to step 10. 7. Tie two guide ropes (6) to front feet (4) of air tank. Pass both guide ropes (6) through center of support frame to the front of the mast group, with one rope exiting to each side of the support frame. <u>CAUTION</u> Do not slide tank too far forward. If you do, the front mounting feet will fall off end of angle brackets. 8. Pull on guide ropes (6) and push tank from the rear to slide tank forward on angle brackets. Align air tank mounting feet (3 and 4) with holes in angle brackets (5). 9. Remove guide ropes (6) from air tank.

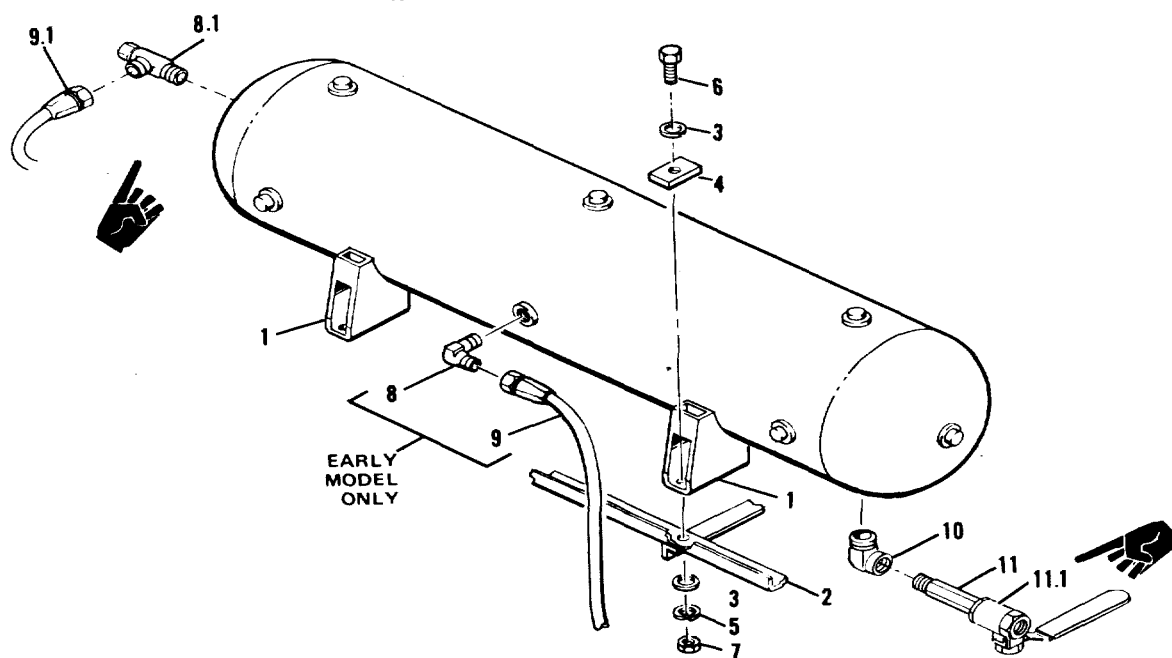
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

o. REPLACE AIR TANKS - Continued

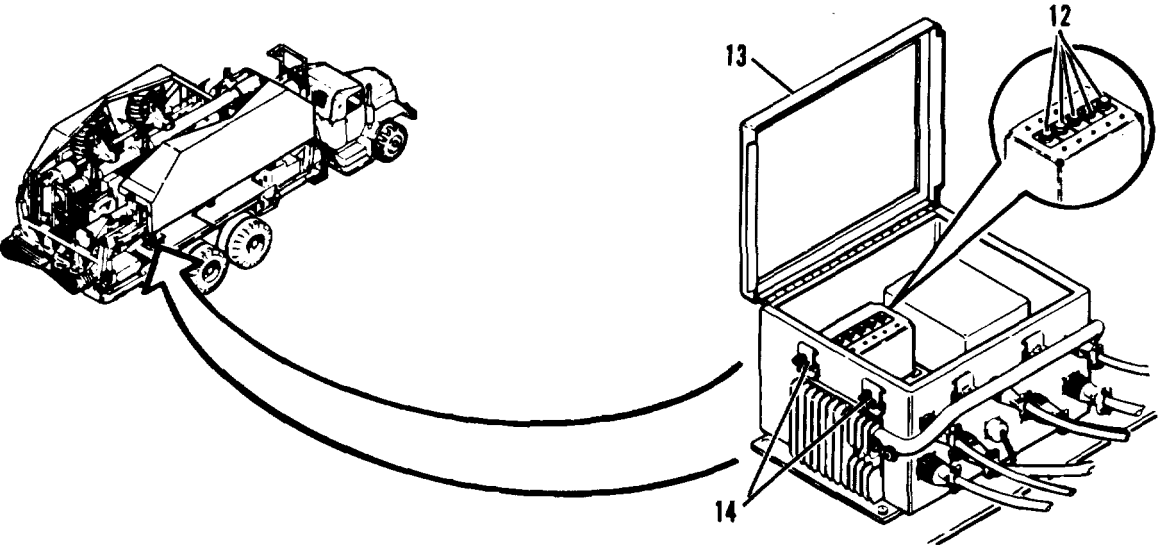
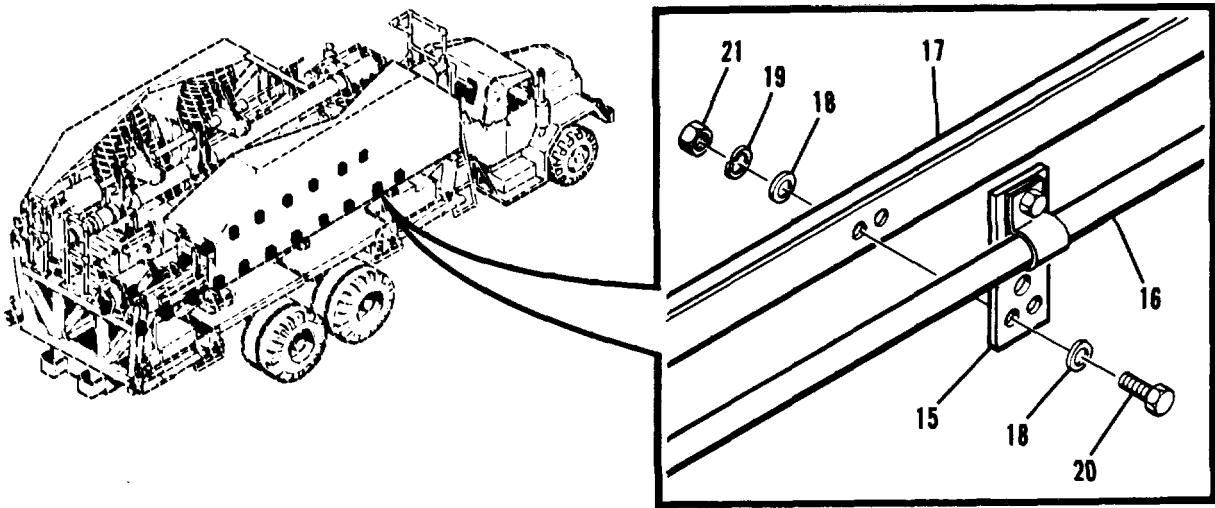
STEP	PROCEDURE
	 The diagram illustrates the removal of an air tank from a truck chassis. A hand is shown pulling a pin (3) from a bracket (4) that holds the air tank (5). The air tank is being lifted by a chain (1) and shackle (2). Two hoses (6) are shown connected to the tank. A hand is also shown pointing to the bracket (4).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**o. REPLACE AIR TANKS - Continued**

STEP	PROCEDURE
10.	Secure air tank mounting feet (1) to angle brackets (2) with eight flatwashers (3), four flatwashers (4), four lockwashers (5), four screws (6), and four nuts (7).
11.	Wipe threads of elbow (8) or tee (8.1) clean. Apply sealing compound only to the male threads of elbow or tee which screw into tank. Install elbow (8) to port side of tank, or install tee (8.1) to end port of tank, as applicable. Point elbow toward nearest pneumatic components assembly.
12.	Connect pneumatic hose (9 or 9.1) to elbow (8) or tee (8.1) as applicable.
13.	Wipe threads of elbow (10) clean. Apply sealing compound to male threads of elbow (10) and install elbow to bottom of tank.
13.1	Wipe threads of nipple pipe (11) clean. Apply sealing compound to male threads of nipple pipe and install nipple pipe (with ball valve (11.1) installed) on elbow (10), (if early model install petcock on elbow). Close ball valve or petcock (11.1) as applicable.



3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**o. REPLACE AIR TANKS - Continued**

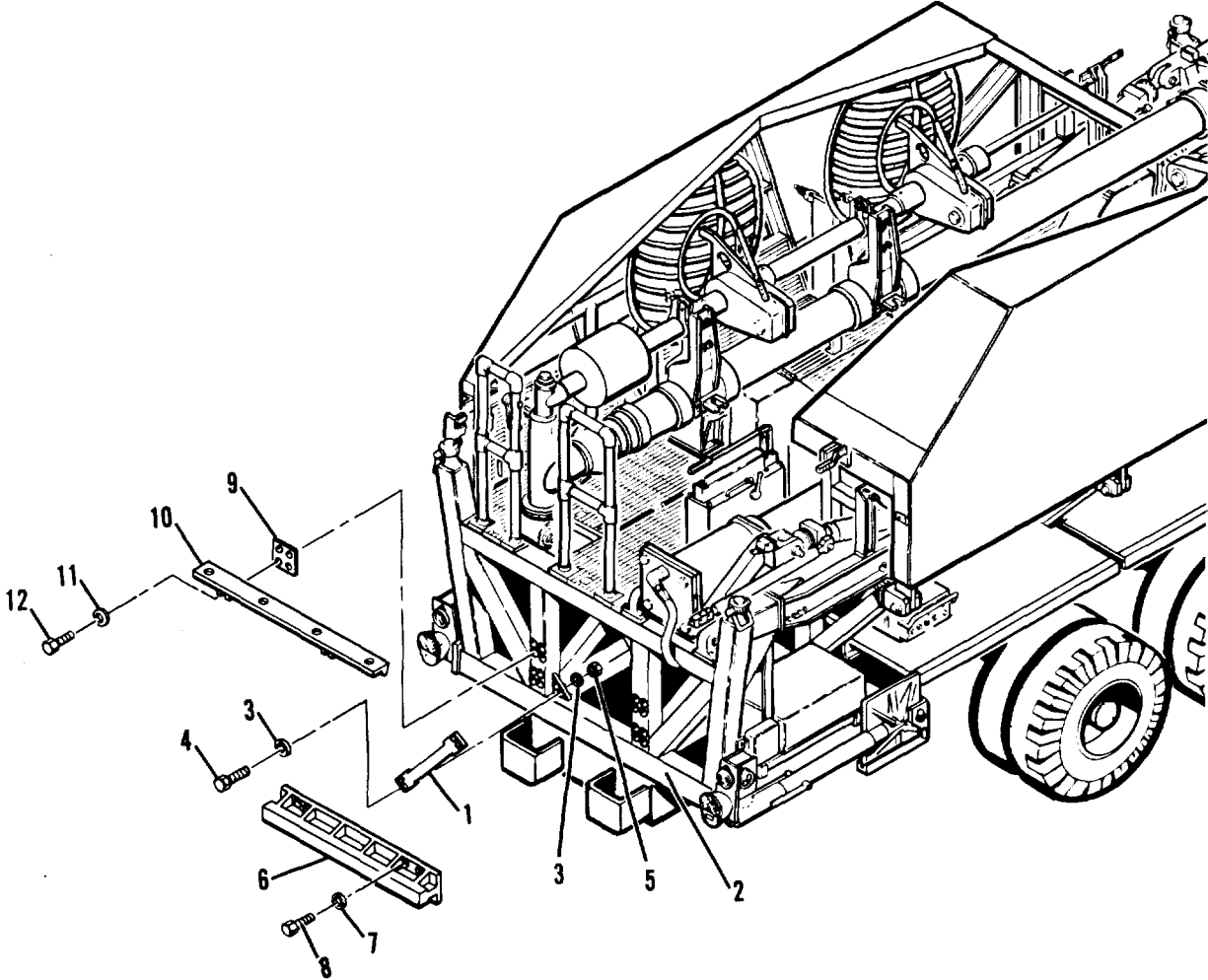
STEP	PROCEDURE
14.	Push all circuit breaker reset buttons (12) down. Close distribution box cover (13). Tighten six screws to secure latches (14). 
15.	Position cable clamp brackets (15) with cables (16) to angle brackets (17) and secure with four flat washers (18), two lockwashers (19), two screws (20) and two nuts (21) each. 

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**o. REPLACE AIR TANKS Continued**

STEP	PROCEDURE
16.	NOTE Diagonal support tube is match drilled to support frame. Do not interchange diagonal support tube with a different support frame.
	Position diagonal support tube (1) to support frame (2) and secure with eight flat washers (3), four bolts (4), and four nuts (5).
	Position bottom cable support (6) to support frame (2) and secure with eight flat washers (7) and screws (8). Do not tighten screws (8).
	Position shims (9) and top cable support (10) to support frame (2) and secure with eight flat washers (11) and screws (12). Do not tighten screws (12).
17.	NOTE Use some number of shim' of when removed to ensure correct assembly.
	Install cable rack to rear of mast group (see TM 9-1430-603-24). Tighten screws (8 and 12).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

o. REPLACE AIR TANKS - Continued

STEP	PROCEDURE
	

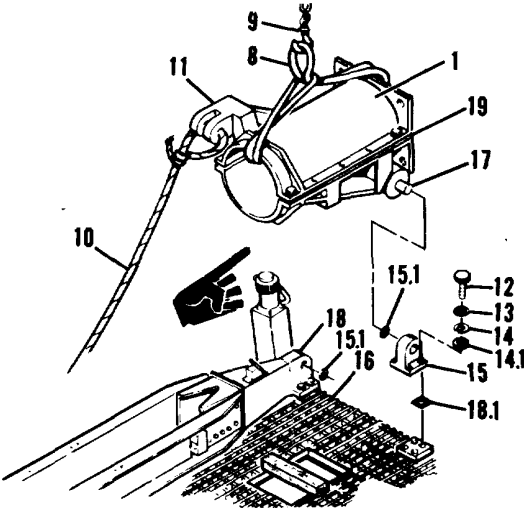
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

p. MAST BASE CLAMP Continued

STEP	PROCEDURE
This task covers:	
Removal	Replacement Installation
INITIAL SETUP <u>Tools</u> Refrig Unit Svce Tool Kit, 15/16 in. comb. wr 9/16 in. comb. wr 1/2 in. comb. wr 1/2 in. skt 7/16 in. skt 11/16 in. skt 12 point Skt wr hdl Skt wr ext Feeler gage Wrecker truck M819A1 Torque wr, 0-150 ft-lbs Adapter, torque, 9/16 in. Adapter skt, 3/8 in.	
	Equipment Condition <u>Para</u> <u>Condition Description</u> 2-17 Mast removed 2-12 Linear actuating cylinder removed <u>Materials/Parts</u> Shop cloths (appx B. item 17) Grease, GAA (appx B. item 2) Mast Clamp
STEP	PROCEDURE
1.	REMOVAL NOTE Upper section of the mast base clamp was removed when mast was removed (see para 2-17). Be sure that a 2x4x12 in. block of wood (20), cut in the shape of a wedge, has been inserted under the center support (21) of the mast clamp. Position upper section (1) of mast base clamp to lower section (2). Install at four corners (3), four bolts (4), four recessed washers (5), four flatwashers (6) and nuts (7). The diagram illustrates the assembly of the mast base clamp. It shows two main sections, (1) and (2), being joined at four corners (3). Four bolts (4) are used to secure the assembly, with four recessed washers (5) placed under the bolts. Four flatwashers (6) and four nuts (7) are also shown. A wooden block (20), cut into a wedge shape, is placed under the center support (21) of the mast clamp. Hand icons indicate the placement of the bolts and washers.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

p. MAST BASE CLAMP - Continued

STEP	PROCEDURE
	 The diagram illustrates the mast base clamp assembly. It shows a main clamp body (1) with various internal components and attachment points. A sling (8) is shown passing through the upper section (1). A wrecker hook (9) is attached to the sling. A rope (10) is attached to a clevis (11). The assembly is shown being lifted from a support frame (16) by a bearing housing (15). Various bolts (12), washers (13, 14, 14.1), and spacers (18.1) are shown being removed or installed. The diagram also shows the clamp being positioned on 4x4 wood blocks (19) and being supported by a plate end (19). 3. Position two blocks of wood (4x4x24) by side of truck. Set them in parallel approximately 12 inches apart. 4. Install sling (8) through upper section (1) of mast base clamp. 5. Attach sling (8) to wrecker hook (9) and take up slack in sling. 6. Attach a 20-foot rope (10) to mast clamp clevis (11) for use as a guide line. 7. Remove four bolts (12), countersunk washers (13), lockwashers (14), and flat washers (14.1) from bearing housing (15). 8. Raise mast base clamp slightly so that bearing housing (15) clears support frame (16). 9. Remove bearing housing (15) and ring (15.1) from pivot bar (17) in lower mast base clamp. If installed, remove spacer(s) (18.1) from support frame (16). 10. Lift mast base clamp free from second bearing housing (18) and away from support frame (16). Remove ring (15.1). 11. Use guide line (10) to keep mast base clamp from swinging. 12. Set mast base clamp on 4x4 wood blocks so sling (8) is between blocks. 13. Using two technicians, stand mast base clamp on plate end (19). 14. Remove sling (8) from upper section (1) of mast base clamp and from wrecker hook (9).

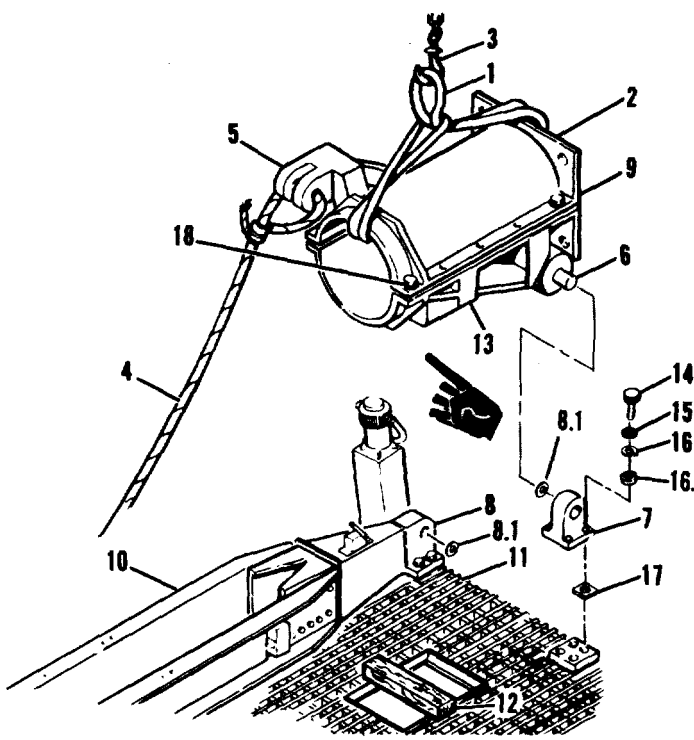
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3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**p. MAST BASE CLAMP Continued**

STEP	PROCEDURE
	REPLACEMENT Replace a faulty mast base clamp with a new, matching set. INSTALLATION NOTE The two halves of the mast base clamp, upper and lower sections, are manufactured as a matching set. The two sections are bolted together before shipping and must remain bolted together for the initial installation on the support frame.
	1. Deleted 2. Deleted

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

p. MAST BASE CLAMP Continued

STEP	PROCEDURE
	 The diagram illustrates the assembly of a mast base clamp. It shows a large, curved metal clamp (2) being positioned over a support frame (10). A 20-foot rope (4) is attached to a clevis (5) on the clamp and used as a guide line. A wrecker hook (3) is attached to a sling (1) that passes through the upper section of the clamp. The clamp is being lowered into a cylinder support (10) which contains a pivot bar (6) and bearing housings (7 and 8). Various components are labeled with numbers: 1 (sling), 2 (clamp), 3 (wrecker hook), 4 (rope), 5 (clevis), 6 (pivot bar), 7 (bearing housing), 8 (bearing housing), 8.1 (rings), 9 (clamp), 10 (cylinder support), 11 (support frame), 12 (wood blocks), 13 (hand), 14 (nut), 15 (washer), 16 (washer), 16.1 (washer), 17 (nut), and 18 (rope). 3. Install sling (1) through upper section (2) of mast clamp. 4. Attach sling (1) to wrecker hook (3) and take up slack in sling. 5. Attach a 20-foot rope (4) to mast clamp clevis (5) for use as a guide line. 6. Using two technicians, lay mast clamp down on 4x4 wood blocks. 7. Wipe both ends of pivot bar (6) and inner surfaces of bearing housings (7 and 8) with clean shop cloth. Install rings (8.1) on both ends of pivot bar (6). 8. Apply GAA grease to inner surface of bearing housings (7 and 8). 9. Lift mast clamp (9) and position pivot bar into the outboard bearing housing (8) located in cylinder support (10). Use guide line (4) to keep mast clamp from swinging. 10. Slip bearing housing (7) on to the pivot bar (6). 11. Lower mast clamp (9) so bearing housing (7) is approximately 1/4 in. from support frame (11) and holes are alined with bearing housing.

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**p. MAST BASE CLAMP - Continued**

STEP

PROCEDURE

CAUTION

Be sure that wood block (12) is positioned under the center support (13).

12. Start four bolts (14), countersunk washers (15), lockwashers (16), and flatwashers (16.1) through bearing housing (7) and into support frame (11).

NOTE

Position countersunk washers with countersunk side up.

13. Lower mast clamp (9) so full weight is on support frame. Check to see if there are any gaps between support frame (11) and bearing housing (7). If there are any gaps greater than .0015 inch, remove bolt(s) (14) lift mast base clamp and use spacer(s) (17) as required to fill gaps. Trim off any excess portion of spacer(s) that may stick out between support frame (11) and bearing housing (7). Install bolt(s) (14).

NOTE

Do not final-torque bolts (14) at this time, The mast clamp may need to be repositioned when mast is installed, When you do final-torque bolts (14), tighten them to between 67 and 70 ft-lbs torque.

NOTE

When using the torque wrench adapter, connect it at a right angle to the torque wrench to prevent a change in the torque value from occurring.

14. Remove sling (1) and guide line (4).
15. Remove upper section (2) of mast clamp (9) by removing four bolts, four flatwashers, four recessed washers, and four nuts (18).
16. Install linear actuating cylinder (see para 2-12).
17. Deleted.
18. Install mast (see para 2-17).

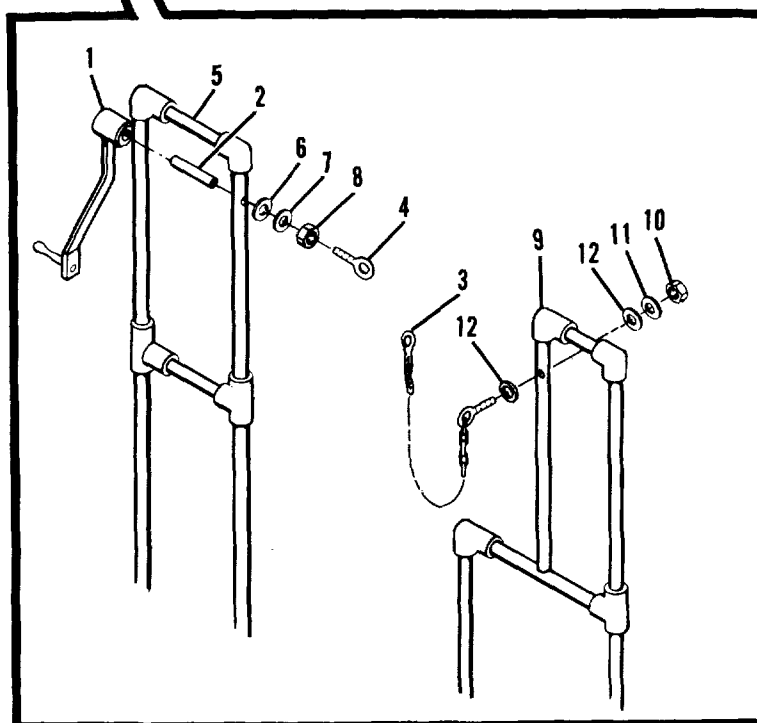
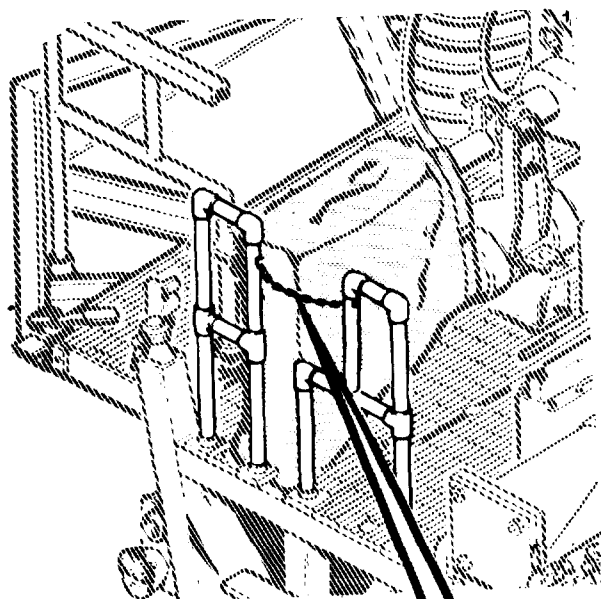
3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued		
q. CHAIN ASSEMBLY		
This task covers:	Removal	Replacement Installation
<u>INITIAL SETUP</u> <u>Tools</u> Refrig Unit Svce Tool Kit 1/2 in. comb. wr Pinch bar <u>Materials/Parts</u> Chain assembly		
STEP	PROCEDURE	
	REMOVAL 1. Remove handle (1) from stowage shaft (2). 2. Unhook snaphook of chain assembly (3) from eyebolt (4). 3. Remove eyebolt (4) from handrail (5) by removing stowage shaft (2), flatwasher (6), lockwasher (7), and nut (8). 4. Remove chain assembly (3) from handrail (9) by removing nut (10), lockwasher (11), and two flatwashers (12). REPLACEMENT Replace faulty part with a new part. INSTALLATION NOTE Position chain assembly so that eye of eyebolt faces outboard. 1. Install chain assembly (3), two flatwashers (12), lockwasher (11), and nut (10) on handrail (9). 2. Install eyebolt (4), flatwasher (6), lockwasher (7), nut (8) and stowage shaft (2) on handrail (5). 3. Hook chain assembly (3) to eyebolt (4). 4. Install handle (1) on stowage shaft (2).	

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

q. CHAIN ASSEMBLY - Continued

STEP

PROCEDURE



3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**r. LOCK BRACKET**

This task covers:
Removal

Replacement

Installation

INITIAL SETUPTools

Refrig Unit Svce Tool Kit

1/2 in. comb. wr

1/2 in. skt

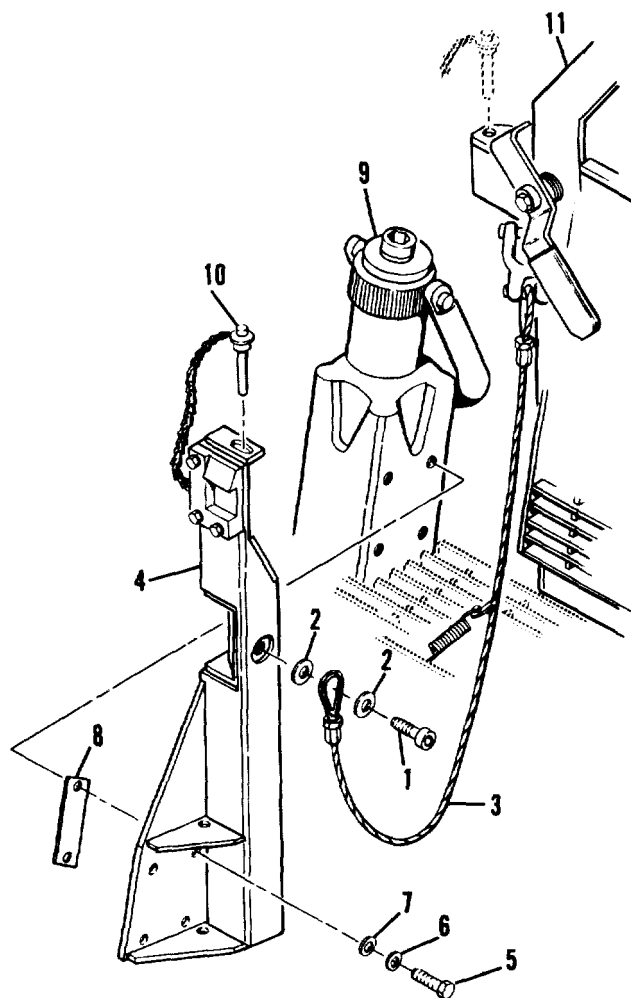
Skt wr hdl

5/16 in. skt head screw key

Materials/Parts

Sealing compound (appx B, item 21)

Lock bracket

STEP**PROCEDURE**

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**r. LOCK BRACKET - continued****STEP****PROCEDURE****REMOVAL**

1. Lower antenna protective cover part way (see applicable portions of Mast Deployment procedure in TM 11-5985-368-12&P).
2. Remove shoulder screw (1) and two flat washers (2) securing cable (3) to lock bracket (4).

WARNING

Do not walk on cover when one of the wire rope assemblies is disconnected.

3. Remove four screws (5), lockwashers (6), and flat washers (7) securing lock bracket (4) and, if installed, spacer(s) (8) to support frame (9). Remove lock bracket (4).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

1. Position lock bracket (4) and, if installed, spacer(s) (8) to support frame (9). Secure with four flat washers (7), lockwashers (6), and screws (5).
2. Check that quick release pin (10) properly engages and secures antenna protective cover (11) to lock bracket (4). If not, remove lock bracket (4) and readjust (install or remove) spacer (s) (8) as required. Reinstall lock bracket.
3. Apply sealing compound to threads of shoulder screw (1). Secure cable (3) to lock bracket (4) with two flat washers (2) and shoulder screw (1).
4. Lower antenna protective cover and check tension on all three cables (3). If cables are not tensioned evenly loosen screws (5) and move lock bracket (4) as required. Recheck cable (3) tension. If tension is still not correct adjust other two cables (See installation procedures in paragraph 3-7c Antenna Protective Cover).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**s. ANTENNA PROTECTIVE COVER HYDRAULIC CYLINDER**

This task covers:

Removal

Replacement

Installation

INITIAL SETUP**Tools**

Refrig Unit Svce Tool Kit,

5180-00-596-1474

1/2 in. skt

3/4 in. rcht wr

11/16 in. rcht wr

Pocket knife

1-1/8 in. comb. wr

Liquid measure

Materials/Parts

Preformed packings (TM 11-5985-368-34P)

Hydraulic fluid (appx B, item 5)

GAA grease (appx B, item 2)

STEP**PROCEDURE****REMOVAL**

1. Lower antenna protective cover to the down position and place directional control valve handle to HOLD. See TM 11-5985-368-12&P.

NOTE

Place a drip pan under cylinder and cap hose assemblies immediately to avoid serious leakage and loss of hydraulic fluid. Wipe up spilled hydraulic fluid right away - it can damage the paint on your mast group.

2. If replacing curbside front or roadside rear cylinder (1), tag and disconnect two hose assemblies (2) from elbows (3). If replacing roadside front or curbside rear cylinder (4), tag and disconnect four hose assemblies (5) from tees (6).

NOTE

You only need remove one retaining ring from each pin to drive pin out.

NOTE

It may be necessary to loosen screws securing walkway grate and slide grate away from cylinder to provide space for driving out pins.

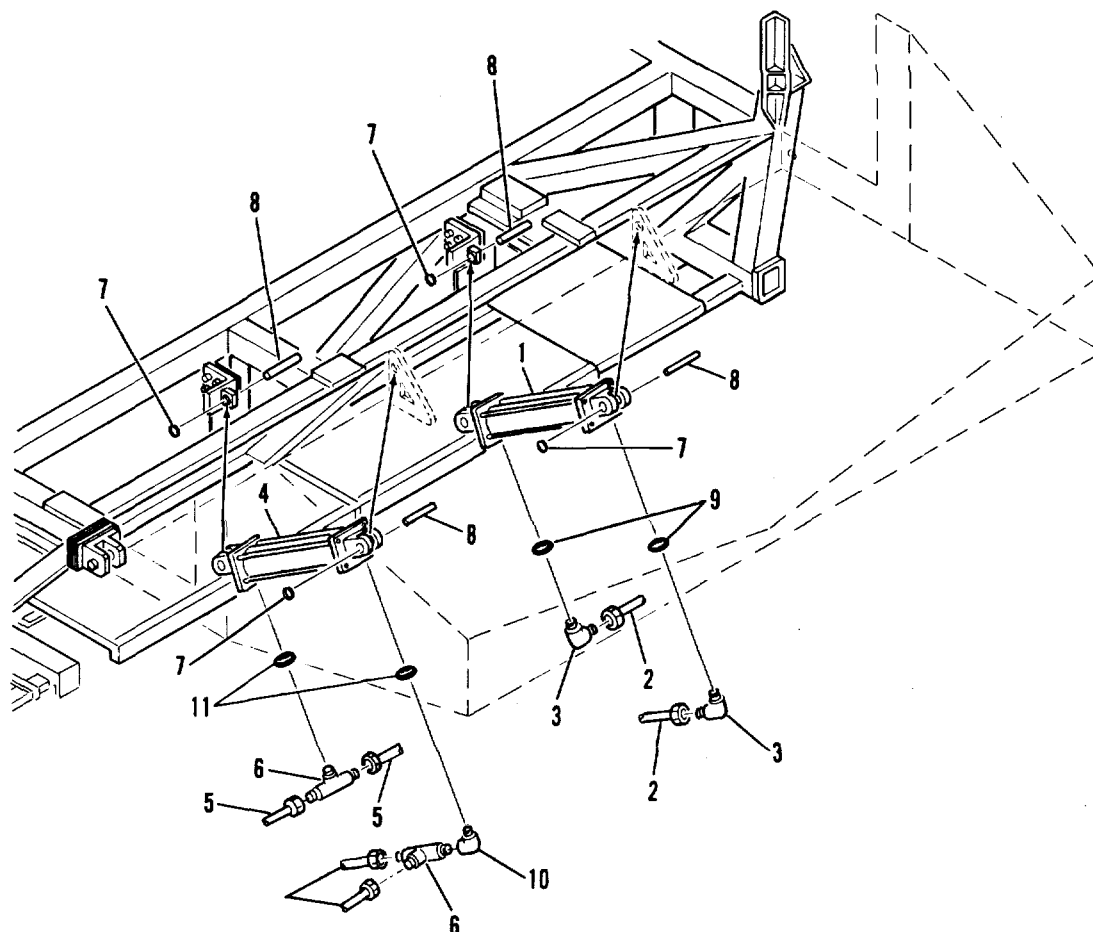
3. Remove two retaining rings (7) and drive out two pins (8) securing cylinder (1 or 4). Remove cylinder (1 or 4).
4. If replacing curbside front or roadside rear cylinder, remove two elbows (3) and preformed packings (9) from cylinder (1). If replacing curbside rear or roadside front cylinder, remove two tees (6), elbow (10), and preformed packings (11) from cylinder (4).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

s. ANTENNA PROTECTIVE COVER HYDRAULIC CYLINDER - Continued

STEP

PROCEDURE



3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued**s. ANTENNA PROTECTIVE COVER HYDRAULIC CYLINDER - Continued****STEP****PROCEDURE****INSTALLATION****NOTE**

Coat preformed packings with clean hydraulic fluid before installing.

1. If replacing curbside front or roadside rear cylinder (1), install two preformed packings (2) and elbows (3) to cylinder (1); orient as shown. If replacing roadside front or curbside rear cylinder (4), install preformed packing (5) and elbow (6) to clevis (7) end of cylinder. Install tee (8) to elbow (6); orient as shown. Install preformed packing (9) and tee (10) to cylinder; orient as shown.
2. Position cylinder (1 or 4) to bracket (11) on frame. Install pin (12) and secure with retaining ring (13).
3. Position clevis (7) end of cylinder (4 or 1) to pivot point on antenna protective cover. Install pin (14) and secure with retaining ring (13).
4. If replacing curbside front or roadside rear cylinder, uncap two hoses (15) and connect hoses (15) to elbows (3). If replacing curbside rear or road-side front cylinder, uncap four hoses (16) and connect hoses (16) to tees (8 and 10).

NOTE

Connect hoses quickly after uncapping them to avoid spilling and losing hydraulic fluid. Wipe up spilled hydraulic fluid right away - it can damage the paint on your most group.

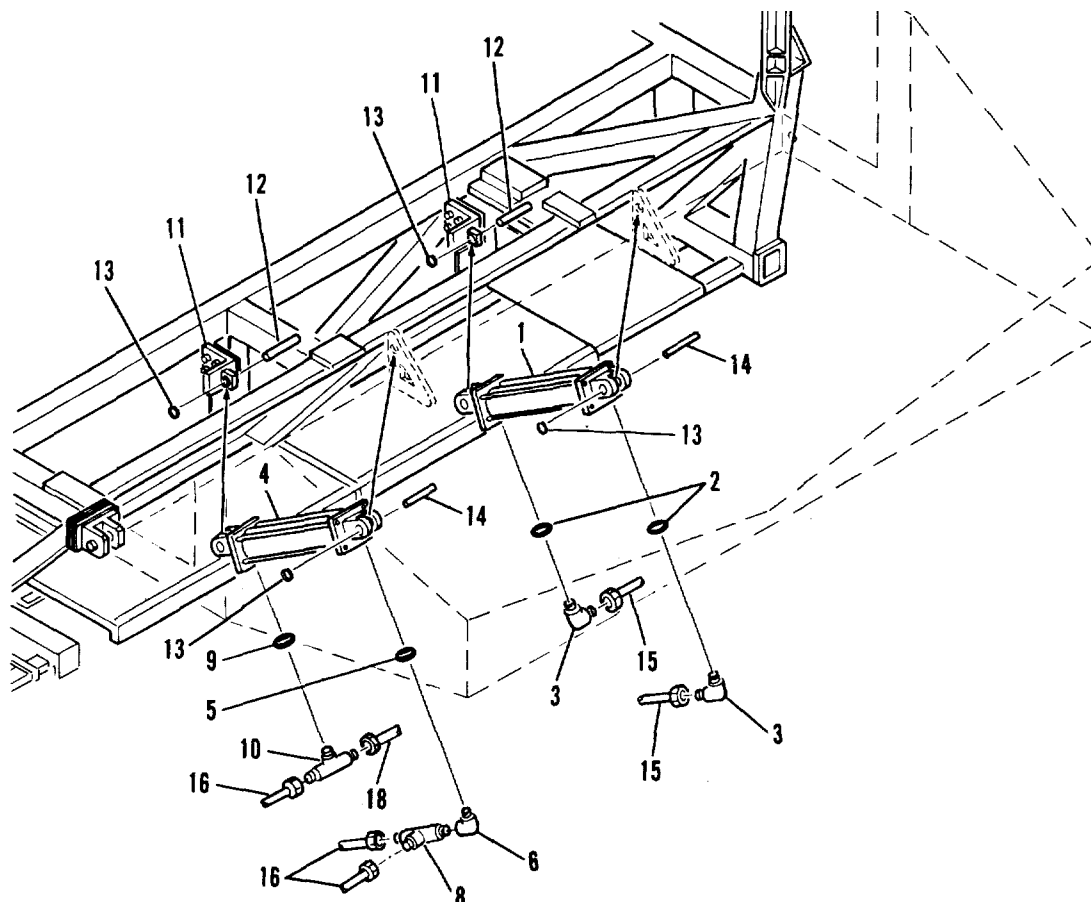
5. Raise antenna protective cover. With antenna protective cover in the up position, check hydraulic fluid level in antenna protective cover pump (TM 11-5985-368-12&P). Add fluid if required (TM 11-5985-368-12&P).
6. Operate the antenna protective cover several times to check for hydraulic fluid leaks at the replaced cylinder, to eliminate air bubbles from the system, and to check for binding at the cylinder pivot points. With cover in up position, recheck fluid level and add fluid if required.
7. Grease antenna protective cover pivot points at replaced cylinder (Lube Order, TM 11-5985-368-12&P).

3-7. SUPPORT FRAME MAINTENANCE INSTRUCTIONS - Continued

s. ANTENNA PROTECTIVE COVER HYDRAULIC CYLINDER - Continued

STEP

PROCEDURE



3-8. REPAIR OF MAST

This task covers:

Removal

Replacement

Installation

INITIAL SETUPTools

Refrig Unit Svce Tool Kit

1/2 in. skt

Skt wr hdl, 11 in.

3/16 in. skt hd scr key

9/16 in. skt hd scr key

3/4 in. comb. wr

9/16 in. comb. wr

No. 2 xtip scdr

Skt wr hdl, 18 in.

1/2 in. skt hd scr key

Slip-Joint plr

3/8 in. skt hd scr key

Torque wrench, 0-150 ft-lbs

Torque wrench, 0-600 in.-lbs

Brush, paint

Strap wrench

Seal compressor, 5078213

1-3/16 in. skt

Rubber mallet

Deleted

Deleted

Personnel Required

Utilities Equipment Repairer, (three)

Materials/Parts

Cleaning solvent (appx B, item 1)

Shop cloth (appx B, item 17)

10 W lubricating oil (appx B, item 30)

Sealing compound (appx B, item 21)

Sealing compound (appx B, item 25)

Seals (must be replaced)

Seal expanders

Backup flat washers

Orifice bolts

Restraining brackets

Mast guides I

Cover and attaching hardware

Pipe plug

Cable retainers and attaching hardware

Antitroque plate, antitorque key

and attaching hardware

Strap, tiedown (appx B, item 22)

Freon TF (aerosol can) (appx B,
item 23)Grease, Aircraft Instrument (appx B,
item 26)**STEP****PROCEDURE****DISASSEMBLY****NOTE**

Disassembly of mast requires a stable work platform, Mast must be securely positioned on platform, Ends of mast must overhang platform.

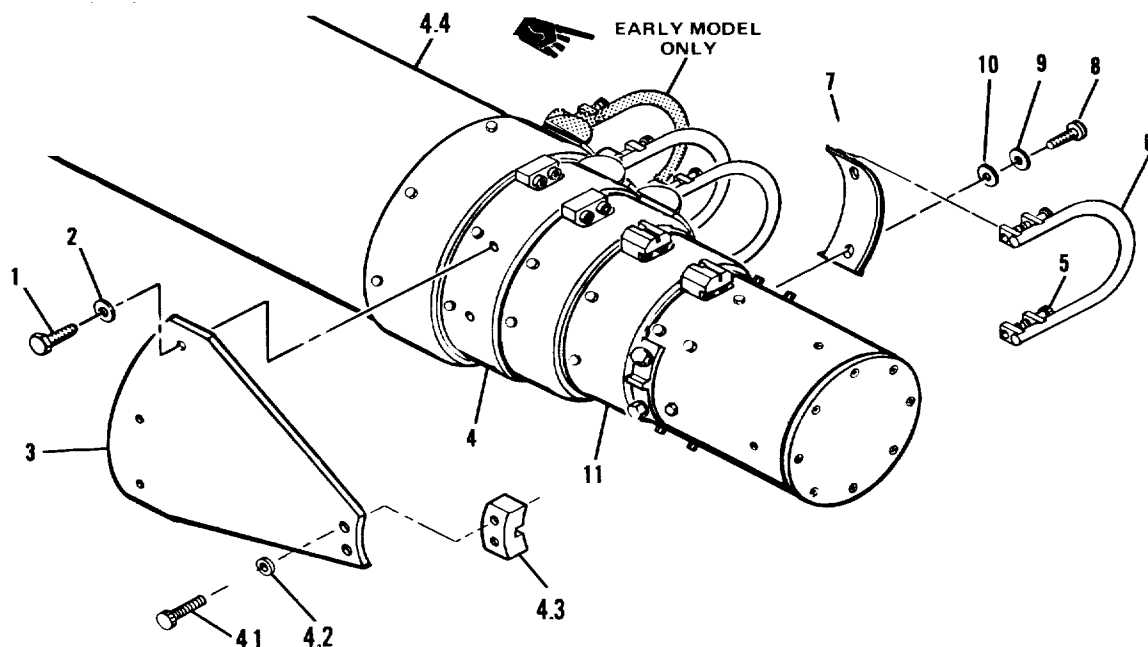
3-8. REPAIR OF MAST - Continued**STEP****PROCEDURE**

1. If there is a cable securing mast sections together, remove cable.
2. Remove three bolts (1) and flatwashers (2) securing antitorque plate (3) to mast section number 2 (4). Remove antitorque plate (3).
- 2.1 If needed, remove two screws (4.1), flatwashers (4.2), and keyway plate (4.3) from antitorque plate (3).

NOTE

Early model mast groups have four cable retainers (6) and brackets (1) on mast (4.4). Later model mast groups have three cable retainers and brackets on mast.

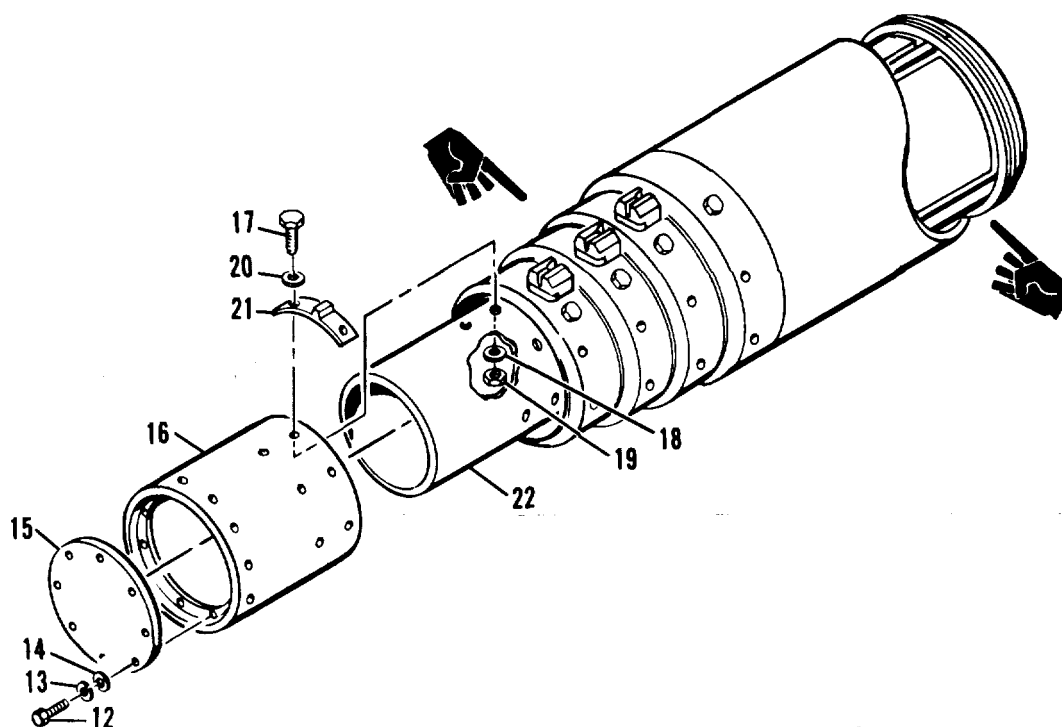
3. If needed, pull captive screws (5) and remove cable retainers (6) from cable retainer brackets (7).
4. Remove two bolts (8), lockwashers (9), and flatwashers (10) securing cable retainer bracket (7) to mast section number 4 collar (11).
5. Repeat step 4 for mast sections number 1, 2, and 3.
6. Remove eight screws (12), lockwashers (13), and flatwashers (14) securing cover (15) to adapter collar (16). Remove cover (15).



3-8. REPAIR OF MAST - Continued

STEP

PROCEDURE



7. Remove 15 bolts (17), flat washers (18), and locknuts (19) securing adapter collar (16), two washers (20), and antitorque key (21) to top of mast section number 5 (22). Remove adapter collar and antitorque key.

NOTE

Adapter collar must be removed to disassemble the mast. But .., adapter collar and mast section number 5 are a matched set. Do not try to replace the adapter collar with a new one.

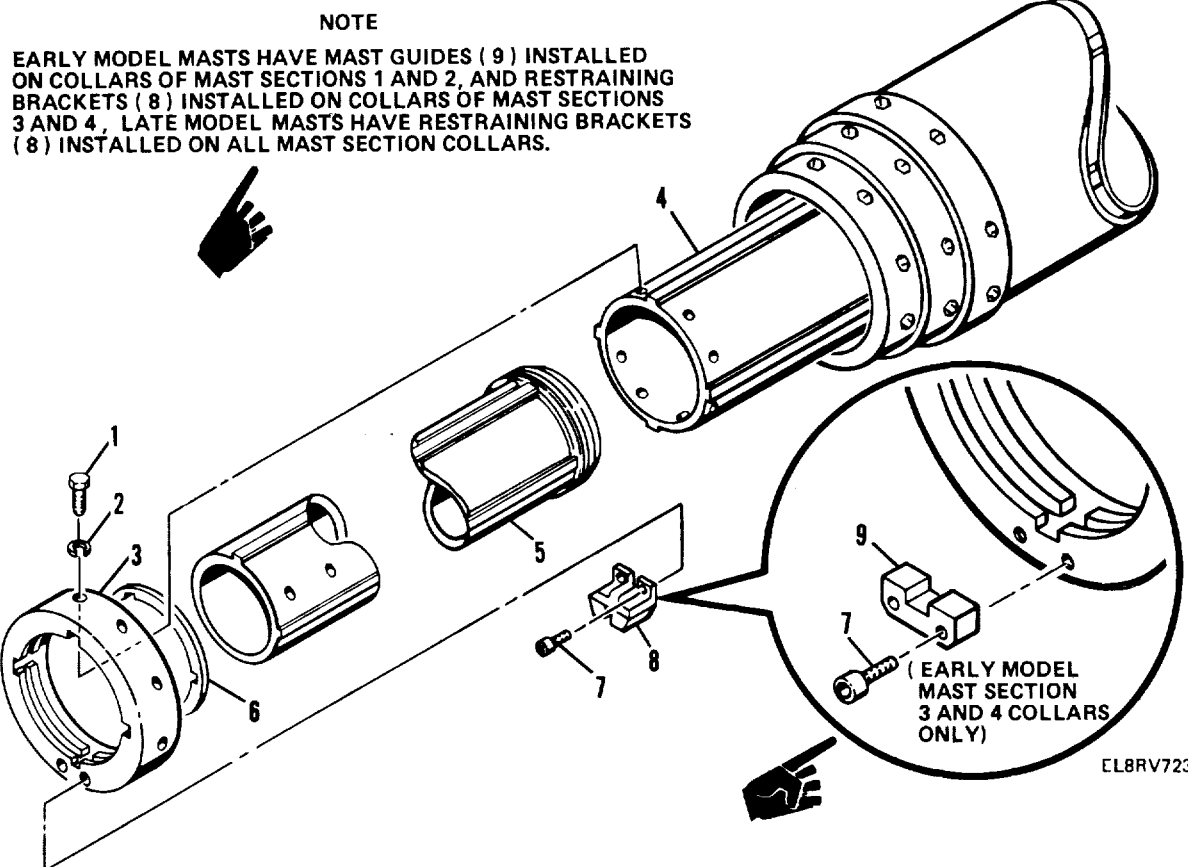
NOTE

Early model masts will look slightly different than as shown in this procedure.

3-8. REPAIR OF MAST - Continued

STEP

PROCEDURE



8. Remove eight collar bolts (1) and lockwashers (2) securing collar (3) to mast section number 4 (4).

CAUTION

Do not damage seal expanders at end of mast section.

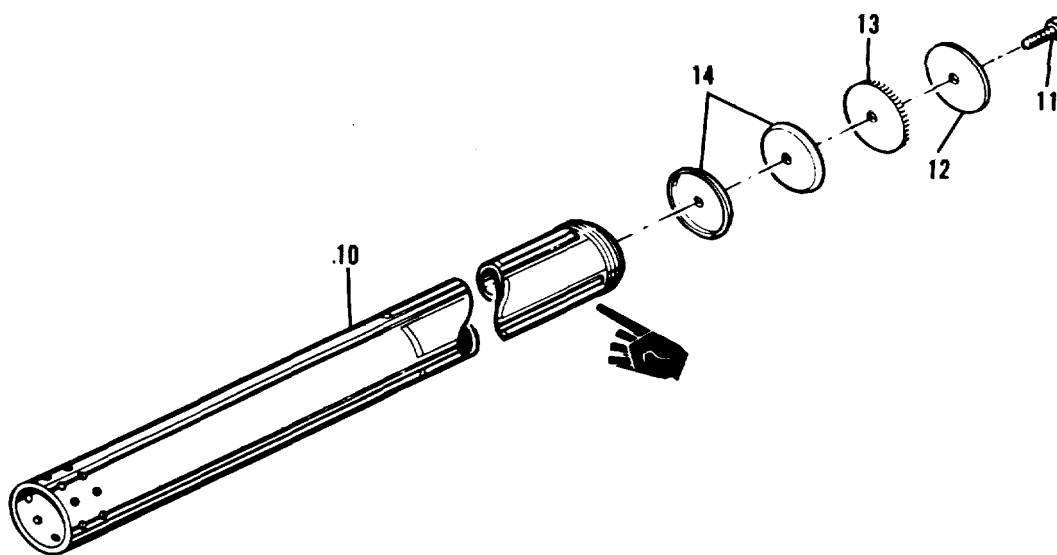
9. Use three personnel and pull mast section 5 (5) from the mast. The base of mast section number 5 should pull collar (3) off mast section number 4 (4). Do not let mast section number 4 extend more than 4 feet when pulling mast section number 5.

NOTE

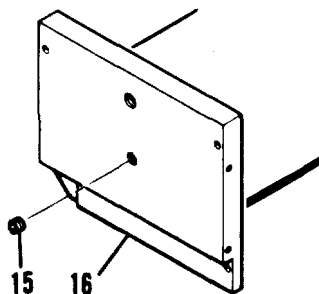
If collar (3) does not break loose, tap collar with rubber mallet.

3-8. REPAIR OF MAST - Continued**STEP****PROCEDURE**

10. Slide collar (3) off mast section number 5. Separate mast section inner bumper (6) from collar (3). Set mast section down on a platform so that ends of mast section extend beyond edges of platform.
11. Remove two screws (7) securing restraining bracket (8) to collar (3) of mast section number 4 (4).
12. Repeat steps 8 through 11 for mast sections number 1, 2, and 3.



13. Hold mast section number 5 (10) with a strap wrench. Remove orifice bolt (11) securing backup flat washer (12), seal expander (13), and two leather seals (14) to mast section.
14. Remove backup flat washer (12), seal expander (13), and two leather seals (14) from mast section.
15. Repeat steps 13 and 14 for mast sections numbers 1, 2, 3, and 4.



16. Remove plug (15) from base of mast section number 1 (16).

3-8. REPAIR OF MAST - Continued**STEP****PROCEDURE****CLEANING****NOTE**

Use shop cloths and cleaning solvent to wipe clean mast.

1. Wipe clean all outside surfaces of mast sections.
2. Wipe clean all orifice bolts, backup flat washers, and collars.

WARNING

The edges of the seal expanders are sharp. Take care not to cut yourself.

3. Very carefully clean the seal expanders. Do not bend any tabs around the edges of seal expanders. If any seal expander is damaged all the seal expanders must be replaced.
4. Clean inside the mast sections. Here's how:

NOTE

Clean smallest mast section first.

- a. Assemble cleaning brush (1) to rammer-staff section (2).
- b. Fold shop cloths (3) lengthwise three times. Wrap folded shop cloths (3) around cleaning brush (1) to obtain desired thickness to clean inside of mast section. Wrap unfolded shop cloths (4) as required around bundle (5) of folded shop cloths. Secure bundle (5) of shop cloths with two tie wraps (6). Cut off loose ends of tie wraps (6).
- c. Using aerosol can of solvent, spray solvent through orifice hole at bottom of mast. This will loosen any sludge and dirt at the hard-to-reach bottom of the mast.

WARNING

Adequate ventilation should be provided while using TRICLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

3-8. REPAIR OF MAST - Continued**STEP****PROCEDURE****CAUTION**

Do not scratch inside surface of mask. Make sure cleaning brush is completely covered with shop clothes.

- d. Assemble remaining four rammer-staff sections (2).

NOTE

Solvent evaporates quickly.

- e. Soak bundle (5) of shop cloths in cleaning solvent.

CAUTION

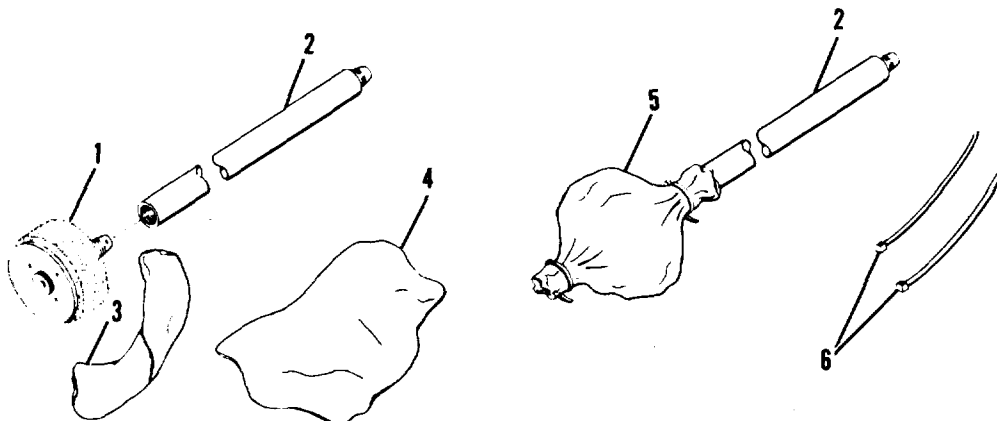
Rotate rammer-staff clockwise only. If you rotate it counterclockwise you can unscrew cleaning brush from rammer-staff.

- f. Put bundle (5) into mast section and push it forward all the way. Rotate and work rammer-staff back and forth until inside of mast section is clean. To determine if mast section is clean, add or substitute clean rags to bundle and push bundle down mast section. Rags must come out clean.

NOTE

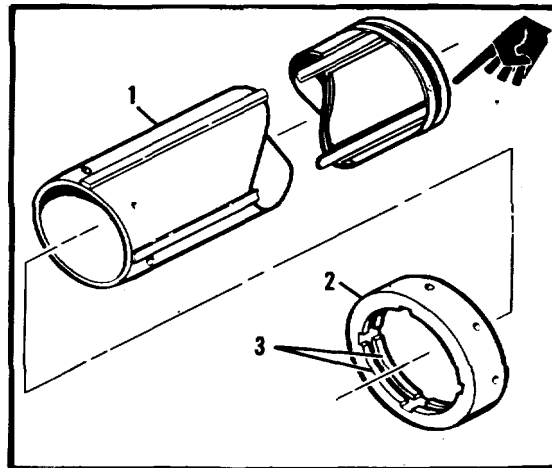
A small amount of residue at the bottom of the mast is almost impossible to clean and is acceptable.

- g. Repeat steps b to f to clean remaining mast sections, just add more shop cloths to bundle (5).
- h. Disassemble shop cloth bundle, brush, and rammer-staff.



3-8. REPAIR OF MAST - Continued**STEP****PROCEDURE****INSPECTION AND REPAIR****a. Inspection**

1. Examine all mast sections (1) and collars (2) for damage. If any mast section or collar is damaged, the entire mast assembly must be replaced.



2. Deleted.
3. Examine all seal expanders. If any seal expander is cracked, damaged or has a missing tab, replace all seal expanders.

b. Repair

Repair of the mast assembly is limited to replacing (based on inspection) the following items:

seals (must be replaced)
 seal expanders
 backup flat washers
 orifice bolts
 restraining brackets
 mast guides (early model masts)
 deleted

cover and attaching hardware
 pipe plug
 cable retainers and attaching
 hardware
 antitorque plate, antitorque
 key, and attaching hardware

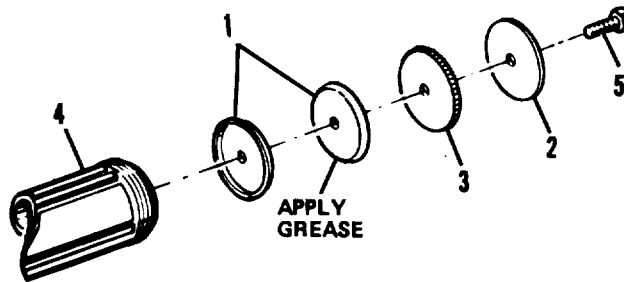
If any mast section or collar is damaged, or if any bearing strip (3) is missing, the entire mast assembly must be replaced. Tag damaged mast assembly for further repairs at the depot level.

If mast is disassembled, replace all mast seals.

3-8. REPAIR OF MAST - Continued**STEP****PROCEDURE****ASSEMBLY****NOTE**

Seals must be lubricated to prevent them from becoming dry and brittle.

1. Apply a thin coat of GM grease to new seals (1) where two seals touch. Join seals together, then apply 10 W lubricating oil to outer edge of mast section number 2 seals.
2. Position backup flat washer (2), seal expander (3), and two new seals (1) other down.



3. Use a strap wrench to hold mast section (4) and install orifice bolt (5). Torque orifice bolt (5) to 245 - 295 in.-lbs.

WARNING

Mast section number 1 must be firmly secured. If it is allowed to move while assembling mast sections, someone could be hurt.

NOTE

If you have a seal compressor to aid assembly of mat sections, go to step 8. Otherwise, assemble sections by hand in accordance with steps 4 through 7.

4. Apply a thin even coat of GAA grease around the inside of the top of mast section number 1 (6).
5. Get three soldiers to lift end of mast section number 2 (7) and rest it on the bottom of the inside lip of mast section number 1 (6).

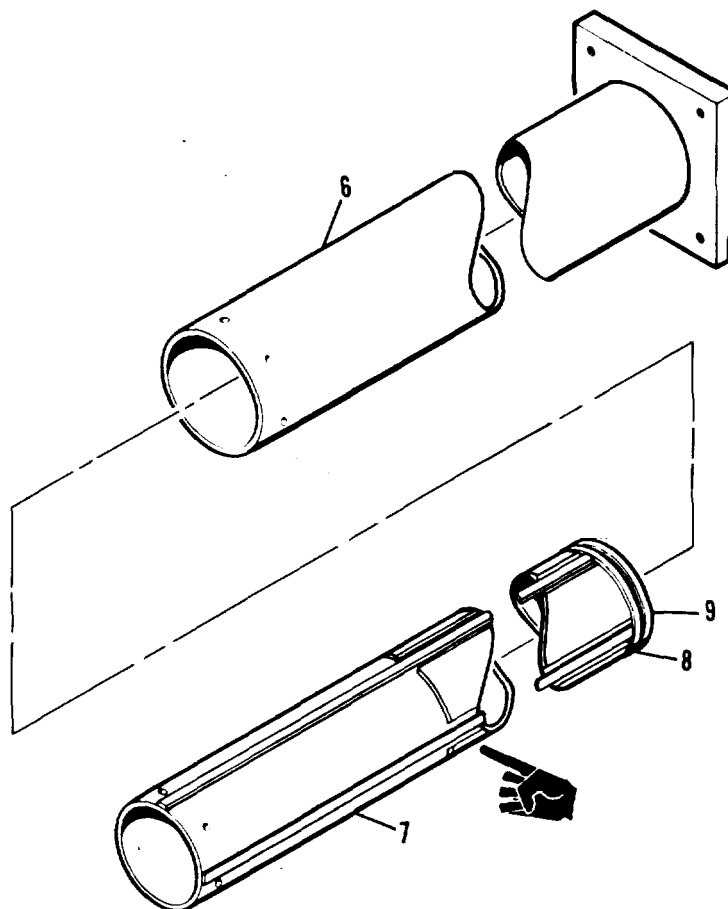
3-8. REPAIR OF MAST - Continued**STEP****PROCEDURE****WARNING**

Take care not to crush or pinch fingers when inserting one mast section into another.

NOTE

If during assembly seal expander is damaged, disassemble mast section and replace seal expander.

6. One soldier must work the seals (8) and seal expander (9) of section number 2 (7) into section number 1 (6) while the other two soldiers slowly raise section number 2 (7) to horizontal position.
7. Slide section number 2 (7) into section number 1 (6) when both seals (8) and seal expander (9) have been inserted into section number 1 (6).



3-8. REPAIR OF MAST - Continued

STEP

PROCEDURE

WARNING

Mast section number 1 must be firmly secured. If it is allowed to move while assembling mast section, someone could be hurt.

NOTE

Perform steps 8 to 12 below only if you intend to use seal compressor to aid assembly of mast sections.

8. Apply a thin even coat of GAA grease around the inside of the top of mast section number 1 (1) to a depth of about 2 inches. Also coat mast seals (2) with GAA grease.

WARNING

Edges of seal compressor are sharp. Use care not to get cut.

9. Slide seal compressor (3) over end of mast section number 2 (t) so almost all of seals (2) are covered by seal compressor (3). Leave about 1/8 inch of seal sticking out from seal compressor.

NOTE

There are dimples at one end of seal compressor. The dimpled end of seal compressor should be at the seal end of the mast section.

CAUTION

Do not overtighten socket head screw on seal compressor. Seals and seal expander may be damaged, and mast section will not slide through seal compressor.

10. Tighten socket head screw (5) on seal compressor (3) just enough so seals (2) and seal expander (6) are flattened. Do not over tighten socket head screw (5).
11. Lift mast section number 2 (4) and position it for insertion into mast section number 1 (1).

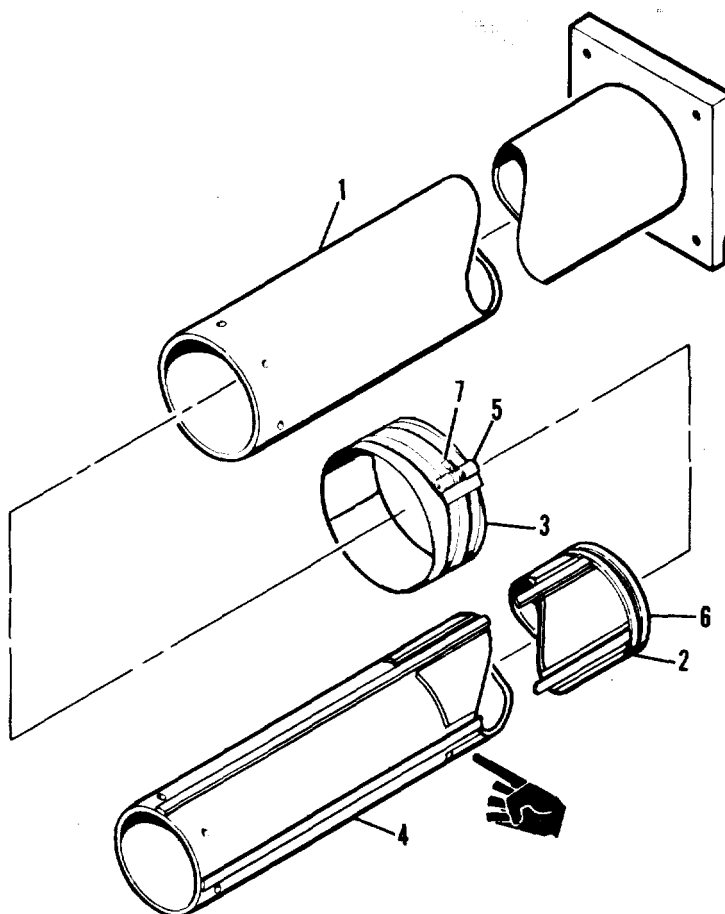
3-8. REPAIR OF MAST - Continued**STEP****PROCEDURE****NOTE**

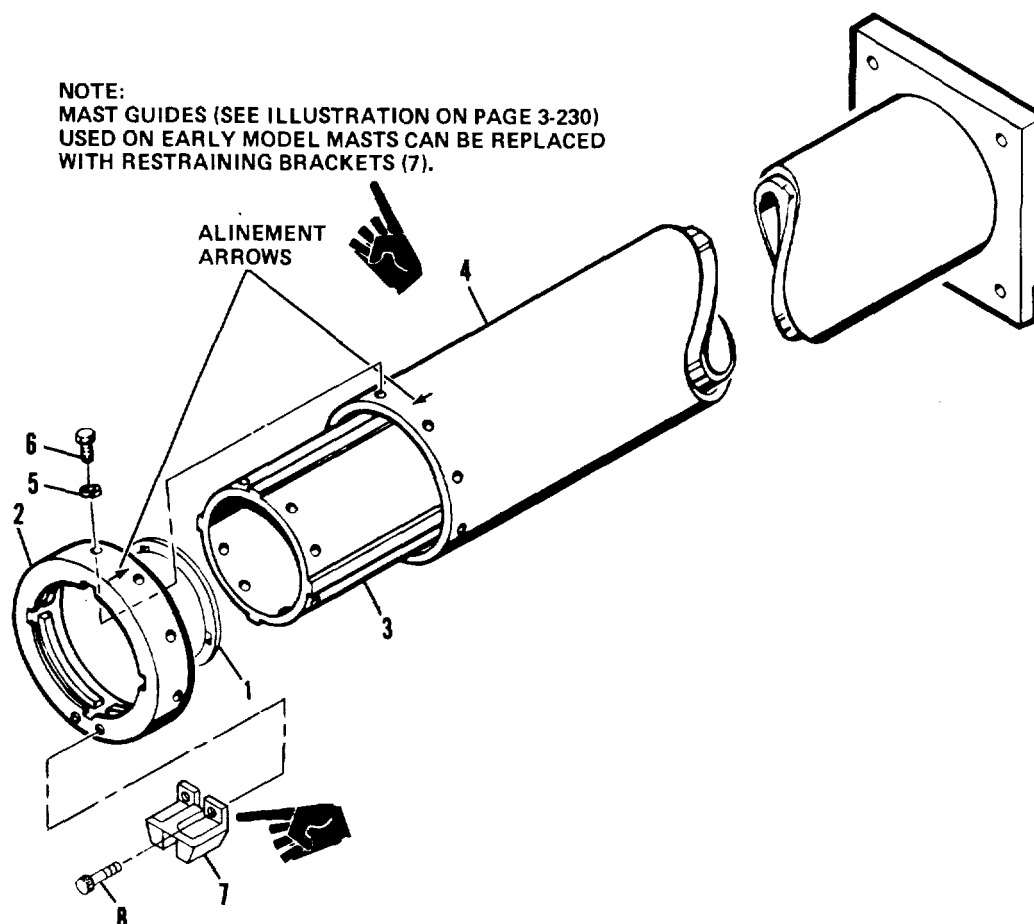
Look through collar bolt holes in mast section number 1 to make sure seal is not rolled over when mast section number 2 is inserted. If seal has rolled over remove mast section and try again.

12. Carefully work seals (2) and seal expander (6) of mast section number 2 (4) through seal compressor (3) and into mast section number 1 (1). Use care not to damage seal expander or seals. Flip lever (7) on seal compressor (3) and remove seal compressor. Slide section number 2 (4) completely into section number 1 (1).

NOTE

If seal expander is damaged during assembly, disassemble most section and replace seal expander,



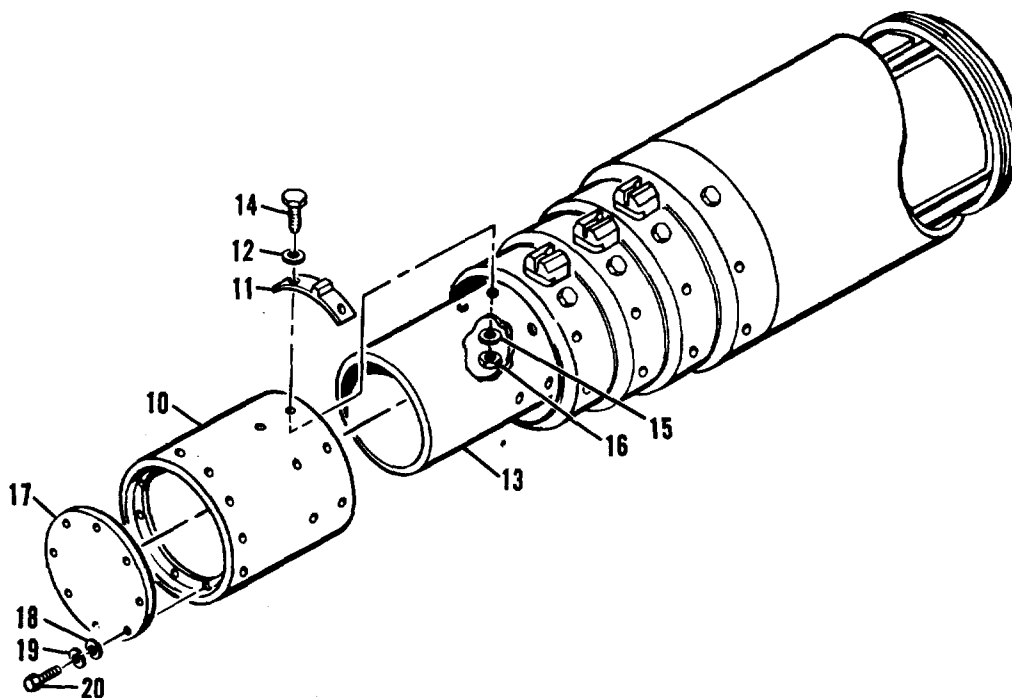
3-8. REPAIR OF MAST - Continued**STEP****PROCEDURE**

ELIRV731

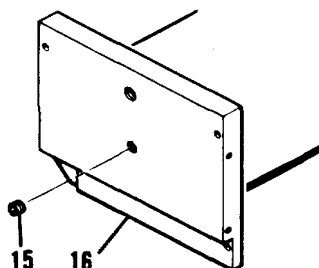
13. Position mast section inner bumper (1) in mast section number 1 collar (2). Slide mast section number 1 collar (2) over mast section number 2 (3) and position collar on section number 1 (4), so alignment arrows on collar and mast section number 1 are aligned.
14. Secure collar (2) to mast section number 1 (4) with eight lockwashers (5) and bolts (6).
15. Position restraining bracket (7) to collar (2) of mast section number 1 (4). Install two screws (8) to secure restraining bracket, but do not tighten screws (8).
16. Slide mast section number 2 (3) out all the way. This will properly position restraining bracket (7) on section number 1 collar (2).
17. Tighten screws (8) to 130 in. lbs. Slide mast section number 2 (3) into mast section number 1 (4).

3-8. REPAIR OF MAST - Continued**STEP****PROCEDURE**

18. Repeat steps 1 through 17 for all remaining mast sections.



19. Position adapter collar (10), antitorque key (11), and two washers (12) to top of mast section number 5 (13). Secure adapter collar with 15 bolts (14), flatwashers (15), and locknuts (16), using two longest bolts to secure washers (12) and antitorque key (11).
20. Position cover (17) to adapter collar (10). Secure cover with eight flatwashers (18), lockwashers (19), and screws (20).



21. Coat threads of pipe plug (21) with sealing compound (appx B, item 21). Install plug in hole in base of mast (22).

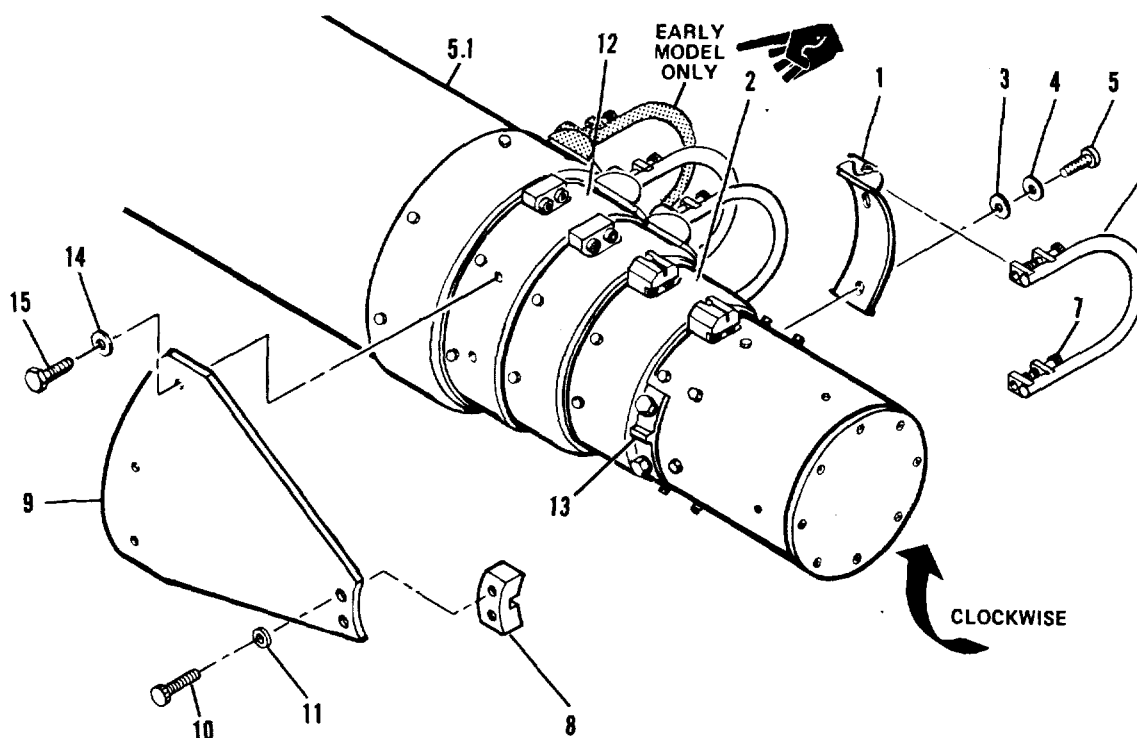
3-8. REPAIR OF MAST - Continued**STEP****PROCEDURE**

22. Position cable retainer bracket (1) to mast section number 4 collar (2). Secure with two flat washers (3), lockwashers (4), and bolts (5).
23. Repeat step 22 for mast sections number 1, 2, and 3.

NOTE

Early model mast groups have four cable retainers (6) and brackets (1) on mast (5.1). Later mast groups have three cable retainers and brackets on mast.

24. Pull out captive screws (7) and position cable retainers (6) to cable retainer brackets (1). Release captive screws (7) to secure cable retainers (6).
25. If disassembled, position keyway plate (8) to antitorque plate (9). Coat threads of two bolts (10) with sealing compound (appx B, item 25) and secure keyway plate to antitorque plate with two bolts (10), and flat-washers (11). Tighten bolts (10) to 40 to 43 ft-lbs torque.
26. Position antitorque plate (9) to mast section number 2 collar (12). Slot in keyway (8) must engage key plate (13). Secure plate (9) with three flatwashers (14) and bolts (15). Rotate plate (9) as far clockwise as possible and tighten bolts (15) to 108 to 112 ft-lbs torque.



3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS

- You will find procedures for repairing all major parts of the distribution box in this paragraph.
- If a part is found to be faulty during troubleshooting, you will be referred directly to the repair procedure.
- If a part is found to be faulty during inspection, refer to the List of Tasks, below. It will tell you the location of the repair procedure for the part.
- Turn to the referenced procedure and check the INITIAL SETUP for information needed to begin the repair.
- Note that the Equipment Condition entry in INITIAL SETUP tells you what parts must have been removed before you can begin the actual repair.

OVERVIEW

To repair the distribution box you must:

- Remove parts to gain access to the faulty part.
- Remove the faulty part.
- Replace the faulty part with a new part.
- Install the new part.
- Reinstall parts removed to gain access.
- Test the distribution box to verify successful repair (see para 3-18).

NOTE

To avoid unnecessary replacement of a good wiring harness or before starting a difficult replacement task, make certain you have found the part causing the malfunction. Complete the troubleshooting procedure and make any other voltage or continuity checks on the distribution box in order to isolate the faulty part. If you are in doubt about the malfunction, confirm it, by doing a distribution box post-maintenance test.

NOTE

Remove and reinstall cable clamps as necessary to gain access to required items.

LIST OF TASKS

Maintenance (repair) of -	Paragraph No. (3-9)
Circuit breakers CB1 thru CB6	i
Compressor connector J3	d
Control connector J5	f
Diode rectifier CR1	j
Diodes CR2 and CR3	m
Distribution box cover	a
Engine interlock connector J6	o
Hydraulic connector J7	9
Limit switches connector J2	c
Pneumatic connector J8	h
Wire harness	n
24 Vdc connector J4	e
115 Vac connector J1	b
+24 Vdc battery control relay K2	1
+90 Vdc pump motor relay K1	k

NOTE

Early model distribution boxes have five circuit breakers and a relay cover over K1. In later models another circuit breaker, CB6, has been added and the circuit breaker bracket and wiring harness changed. In addition, the relay cover and attaching hardware has been deleted. If you have an early model (CB1 through CB5 only) and are replacing a circuit breaker, circuit breaker bracket or the wiring harness, upgrade your distribution box by replacing the following items: circuit breakers CB1 through CB5, circuit breaker bracket, and wiring harness WI. Install CB6, a new identification plate (indicating J.3747A/G), a new warning label on the inside of the distribution box behind relay K1, and remove relay K1 cover.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**a. DISTRIBUTION BOX COVER - Continued**

This task covers:

Removal

Replacement

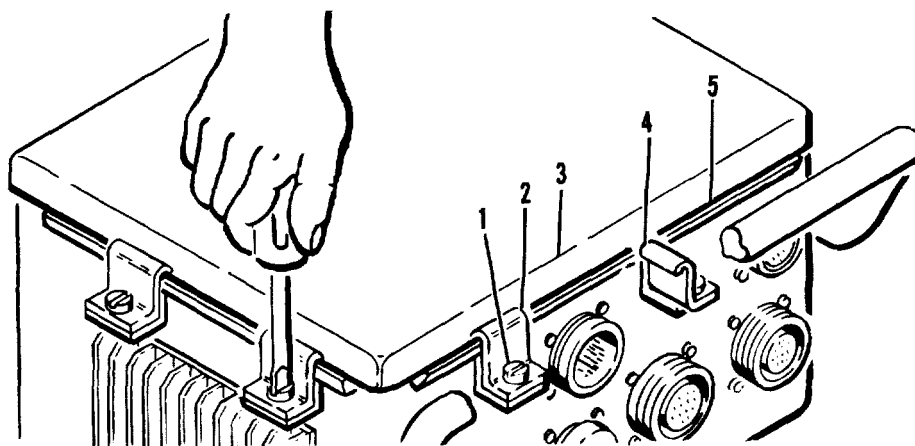
Installation

INITIAL SETUPTools

Refrig Unit Svce Tool Kit,

5180-00-596-1474

3/8 in. flat tip scdr

STEP**PROCEDURE****REMOVAL**

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued	
a. DISTRIBUTION BOX COVER - Continued	
STEP	PROCEDURE
1.	Loosen six captive screws (1) in six retaining latches (2).
2.	Push latches (4) up and away from lip (5) of distribution box cover (3).
NOTE To free latches (2) after they have been loosened sufficiently, press down on cover (3). This is necessary because the cover springs open as the screws are loosened.	
3.	Swing cover (3) open.
INSTALLATION	
1.	Swing cover (3) closed.
2.	Press down on cover (3) while positioning six latches (4) over lip (5) of cover.
3.	Tighten captive screws (1).

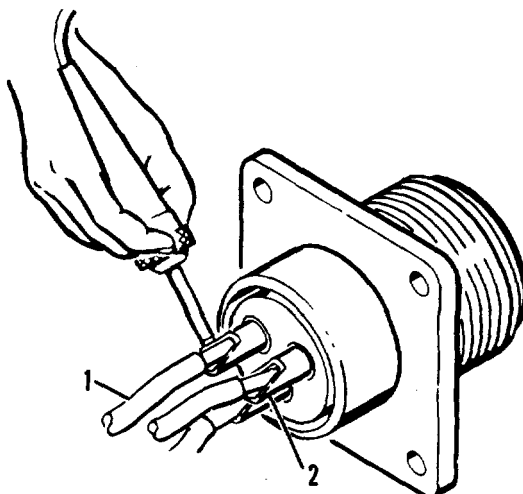
3-9. DITRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued			
b. 115 VAC CONNECTOR J1			
This task covers:			
Removal	Replacemen t	Installation	Test
<u>INITIAL SETUP</u>			
<u>Tools</u> Refrig Unit Svce Tool Kit, 5180-00-596-1474 lg rd nose plr No. 1 xtip scdr pocket knife sldr and desldr set, 3439-00-460-7198 diag ctg plr, 5110-00-965-0974 skt wr hdl, 5120-00-221-7957 1/4 in. skt, 520-00-236-2264 skt wr ext, 5120-00-243-1686 heat gun, 4940-00-363-3225		<u>Equipment</u> Condition Para 3-9a <u>Condition Description</u> Cover removed Wire ties removed as necessary <u>Materials/Parts</u> heat shrink sleeving (appx B, items 6, 7, 8, 9, 10, 11, or 12) solder (appx B, item 19) connector	
STEP		PROCEDURE	
REMOVAL			
1. Split sleeving lengthwise and remove sleeving from three connector pins.			

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**b. 115 VAC CONNECTOR J1 - Continued****This task covers:****Removal****Replacement****Installation****STEP****PROCEDURE**

2. Tag each wire removed with following information for installation:

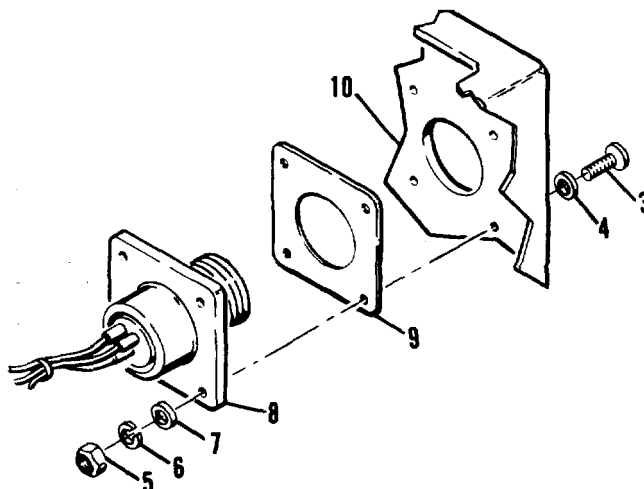
<u>Wire Number</u>	<u>J1 Pin Connection</u>
1	A
2	B
3	C

3. Unsolder and remove three wires (1) from connector pins (2).



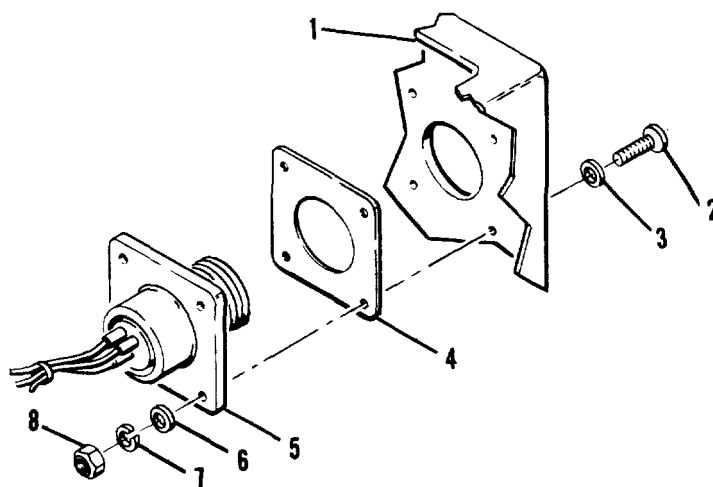
4. Remove four screws (3), flat washers (4), nuts (5), lockwashers (6), and flat washers (7).

5. Remove connector J1 (8) and rubber gasket (9) from distribution box (10).



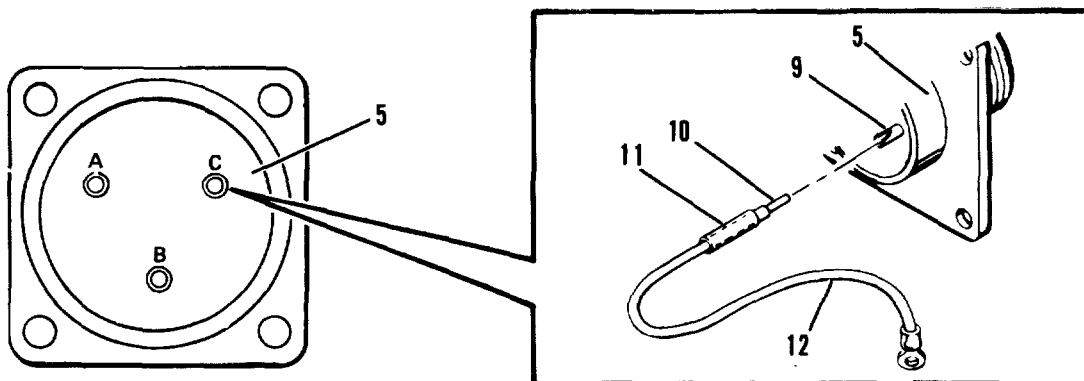
3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**b. 115 VAC CONNECTOR J1 - Continued****STEP****PROCEDURE****REPLACEMENT**

Replace faulty part with a new part.

INSTALLATION**NOTE**

Install connector with keyway up.

1. Install four screws (2) and flat washers (3) through distribution box (1), rubber gasket (4), and connector (5).
2. Install connector with four flat washers (6), lock washers (7), and hex nuts (8) .



3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**b. 115 VAC CONNECTOR J1 - Continued**

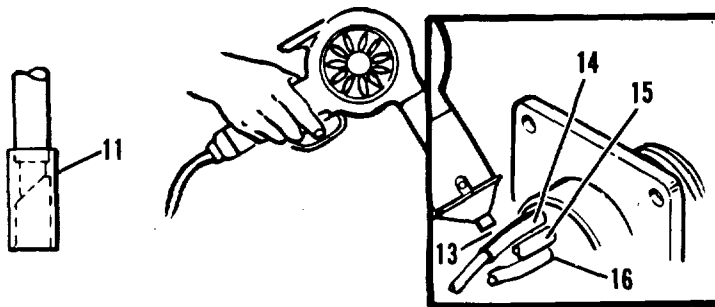
STEP	PROCEDURE

3.	Prepare and tin ends of three wires (10) and pins (9) on connector (5).
4.	Cut three pieces of heat shrink sleeving (11), each 1/2 in. long.
5.	Slide heat shrink sleeving (11) over wires (12).

NOTE**Keep soldering iron tip clean.**

6.	Solder three white wires to three connections in order shown below.

<u>Wire Number</u>	<u>J1 Pin Connection</u>
2	B
1	A
3	C



7.	Slide heat shrink sleeving (11) over newly soldered connections (14, 15 and 16).
8.	Use heat gun (13) to shrink heat shrink sleeving on connections.
9.	Install wire ties.

TEST

Test distribution box (para 3-18) to verify repair.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**c. LIMIT SWITCHES CONNECTOR J2****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,

5180-00-596-1474

lg rd nose plr

No. 1 xtip scdr

pocket knife

sldr and desldr set,

3439-00-460-7198

diag ctg plr, 5110-00-965-0974

skt wr hdl, 5120-00-221-2957

1/4 in. skt, 5120-00-236-2264

heat gun, 4940-00-363-3225

Equipment

Condition

Para

3-9a

- - -

Condition Description

Cover removed

Wire ties removed as
necessaryMaterials/Partsheat shrink sleeving (appx B, items
6, 7, 8, 9, 10, 11, or 12)

solder (appx B, item 19)

connector

STEP**PROCEDURE****REMOVAL**

1. Split heat shrink sleeving lengthwise and remove from ten connector pins.

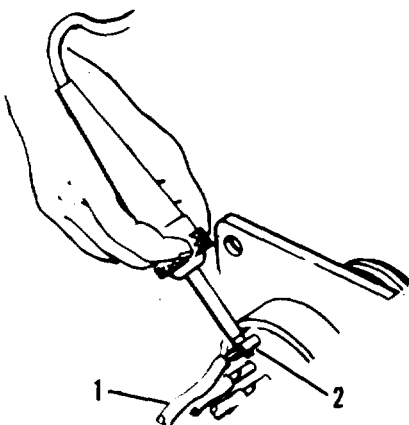
3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**c. LIMIT SWITCHES CONNECTOR J2 - Continued**

STEP	PROCEDURE

2. Tag each wire removed with following information for installation:

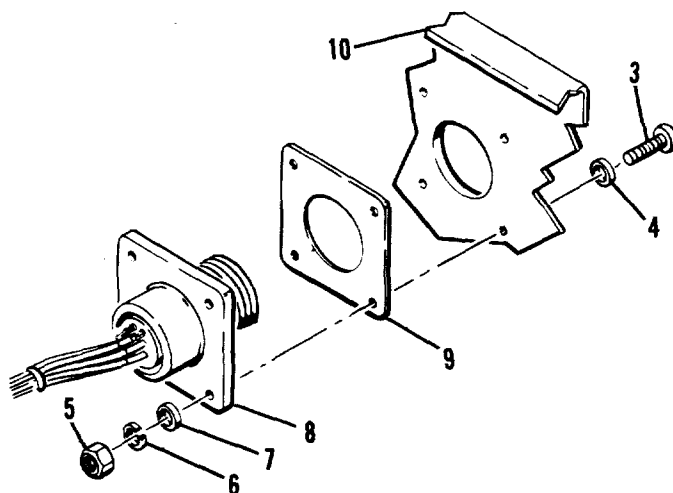
<u>Wire Number</u>	<u>J2 Pin Connection</u>	<u>Wire Number</u>	<u>J2 Pin Connection</u>
4	D	10	K
5	E	11	L
6	F	12	M
7	G	57	M
8	H	13	N
46	H	58	N
9	I		

3. Unsolder and remove 13 wires (1) from connector pins (2).



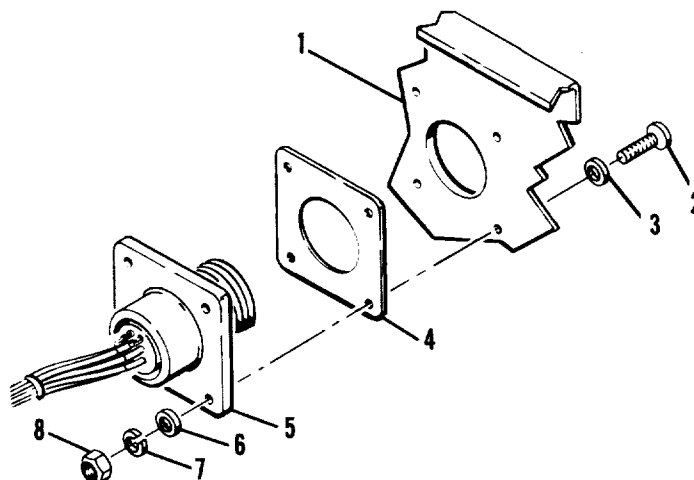
4. Remove four screws (3), flat washers (4), nuts (5), lockwashers (6), and flat washers (7).

5. Remove connector (8) and rubber gasket (9) from distribution box (10).



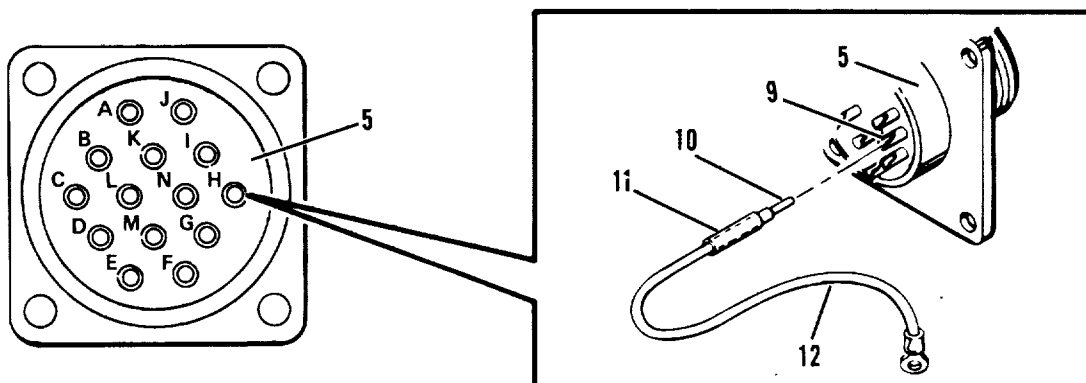
3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**c. LIMIT SWITCHES CONNECTOR J2 - Continued****STEP****PROCEDURE****REPLACEMENT**

Replace faulty part with a new part.

INSTALLATION**NOTE**

Install connector with keyway up.

1. Install four screws (2) and flat washers (3) through distribution box (1), rubber gasket (4), and connector (5).
2. Install connector (5) with four flat washers (6), lockwashers (7), and hex nuts (8).



3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**c. LIMIT SWITCHES CONNECTOR J2 - Continued**

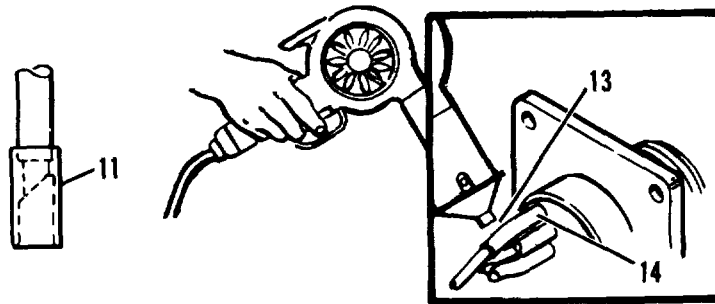
STEP	PROCEDURE

3.	Prepare and tin ends of 13 wires (10) and ten pins (9) on connector (5).
4.	Cut ten pieces of heat shrink sleeving (11), each 1/2 in. long.
5.	Slide heat shrink sleeving (11) over wires (12).

NOTE**Keep soldering iron tip clean.**

6.	Solder 13 wires to ten connections in order shown below:

<u>Wire Number</u>	<u>J2 Pin Connection</u>	<u>Wire Number</u>	<u>J2 Pin Connection</u>
5	E	11	L
6	F	13 & 58	N
4	D	8 & 46	H
12 & 57	M	10	K
7	G	9	I



7.	Slide heat shrink sleeving (11) over ten newly soldered connections (14).
8.	Use heat gun (13) to shrink heat shrink sleeving on connections.
9.	Install wire ties.

TEST

Test distribution box (para 3-18) to verify repair.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**d. COMPRESSOR CONNECTOR J3****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,

5180-00-596-1474

lg rd nose plr

No. 1 xtip scdr

pocket knife

sldr and desldr set,

3439-00-460-7198

diag ctg plr, 5110-00-965-0974

skt wr hdl, 5120-00-221-7957

1/4 in. skt, 5120-00-236-2264

skt wr ext, 5120-00-243-1686

heat gun, 4940-00-363-3225

EquipmentConditionPara

3-9a

- - -

Condition Description

Cover removed

Wire ties removed as
necessaryMaterials/Parts

heat shrink sleeving (appx B, items

6, 7, 8, 9, 10, 11, or 12)

solder (appx B, item 19)

connector

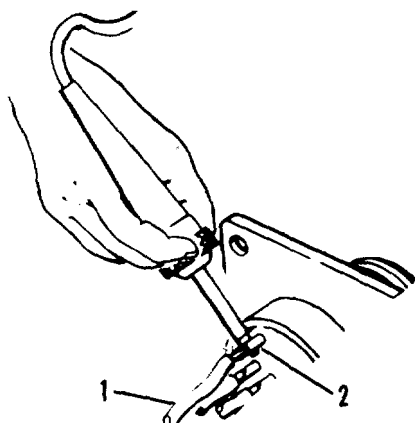
STEP**PROCEDURE****REMOVAL**

1. Split heat shrink sleeving lengthwise and remove from seven connector pins.

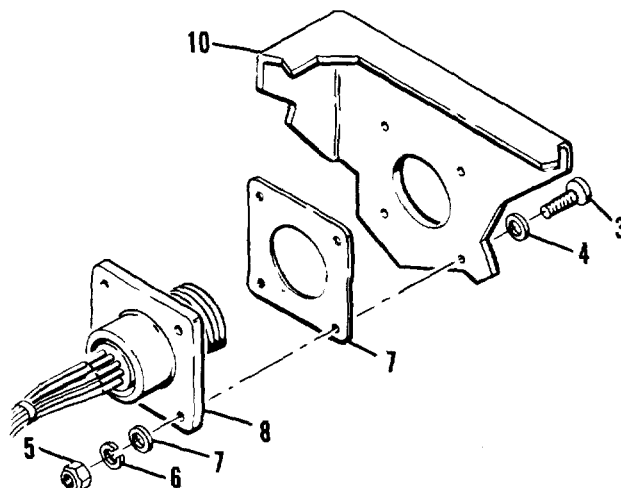
3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**d. COMPRESSOR CONNECTOR J3 - Continued****STEP****PROCEDURE**

2. Tag each wire removed with following information for installation:

<u>Wire Number</u>	<u>J2 Pin Connection</u>	<u>Wire Number</u>	<u>J2 Pin Connection</u>
14	A	18	E
15	B	19	F
16	C	20	G
17	D		

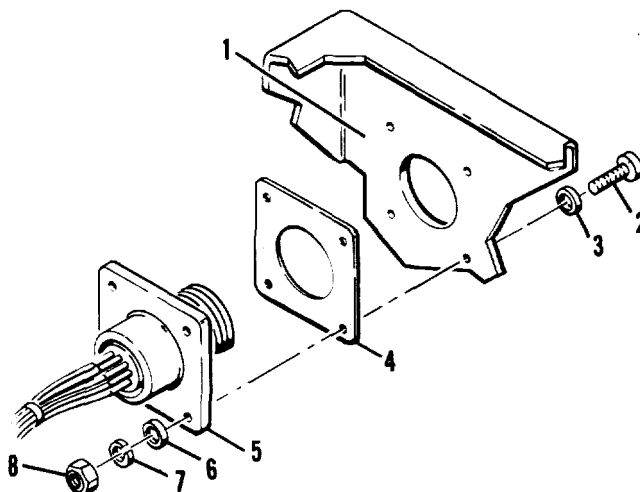


3. Unsolder and remove seven wires (1) from connector pins (2).
4. Remove four screws (3), flat washers (4), nuts (5), lockwashers (6), and flat washers (7).
5. Remove connector (8) and rubber gasket (9) from distribution box (10).

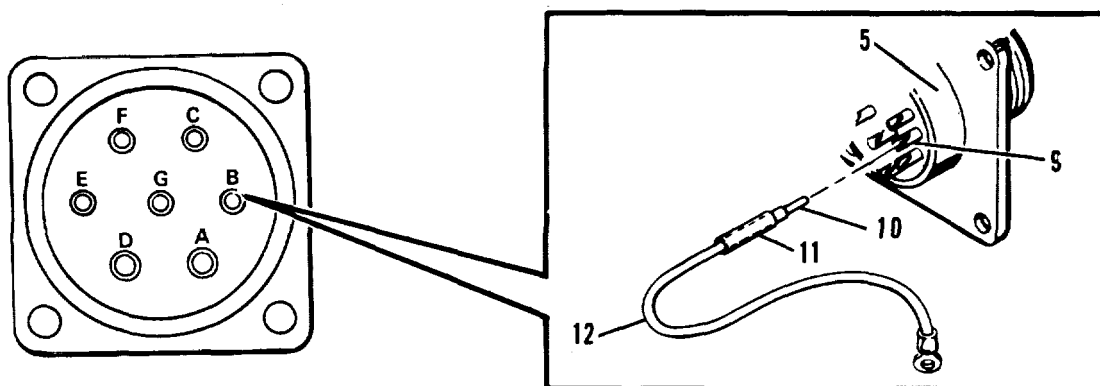


3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**d. COMPRESSOR CONNECTOR J3 - Continued****STEP****PROCEDURE****REPLACEMENT**

Replace faulty part with a new part.

INSTALLATION

1. Install four screws (2) and flat washers (3) through distribution box (1), rubber gasket (4), and connector (5).
2. Install connector (5) with four flat washers (6), lockwashers (7), and hex nuts (8).



3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**d. COMPRESSOR CONNECTOR J3 - Continued****STEP****PROCEDURE**

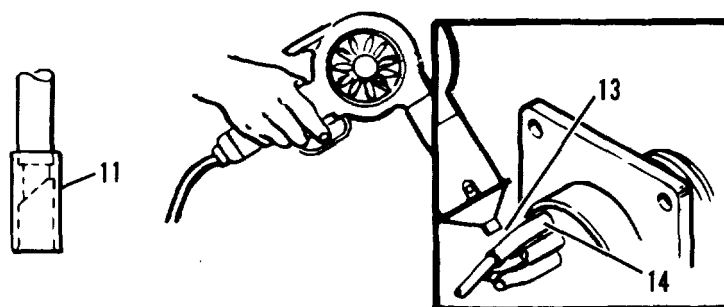
3. Prepare and tin ends of seven wires (10) and seven pins (9) on connector (5).
4. Cut seven pieces of heat shrink sleeving (11), each 1/2 in. long.
5. Slide heat shrink sleeving (11) over wires (12).

NOTE

Keep soldering iron tip clean.

6. Solder seven wires to seven connections in order shown below:

<u>Wire Number</u>	<u>J3 Pin Connection</u>
17	D
14	A
18	E
20	G
15	B
19	F
16	C



7. Slide heat shrink sleeving (11) over seven newly soldered connections (14).
8. Use heat gun (13) to shrink heat shrink sleeving on connections.
9. Install wire ties.

TEST

Test distribution box (para 3-18) to verify repair.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**e. 24 VDC CONNECTOR J4****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
 5180-00-596-1474
 lg rd nose plr
 No. 1 xtip scdr
 pocket knife
 sldr and desldr set,
 3439-00-460-7198
 diag ctg plr, 5110-00-965-0974
 skt wr hdl, 5120-00-221-7957
 1/4 in. skt, 5120-00-236-2264
 skt wr ext, 5120-00-243-1686
 heat gun, 4940-00-363-3225

Equipment
ConditionPara

3-10a

- - -

Condition Description

Cover removed

Wire ties removed as
necessaryMaterials/Parts

heat shrink sleeving (appx B, items
 6, 7, 8, 9, 10, 11, or 12)
 solder (appx B, item 19)
 connector

STEP**PROCEDURE****REMOVAL**

1. Split heat shrink sleeving lengthwise and remove from two connector pins.

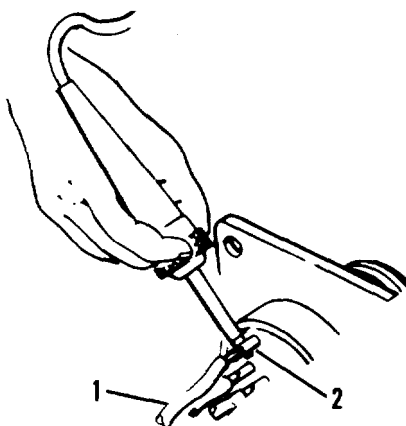
3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**e. 24 VDC CONNECTOR J4 - Continued**

STEP	PROCEDURE

2. Tag each wire removed with following information for installation:

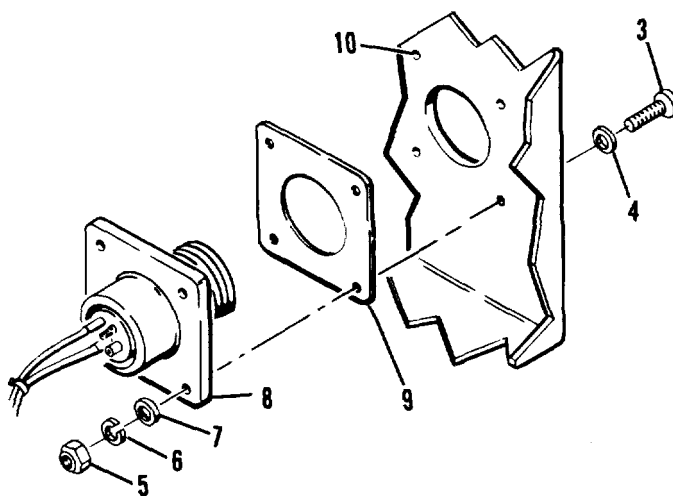
<u>Wire Number</u>	<u>J2 Pin Connection</u>
21	A
22	C

3. Unsolder and remove two wires (1) from connector pins (2).



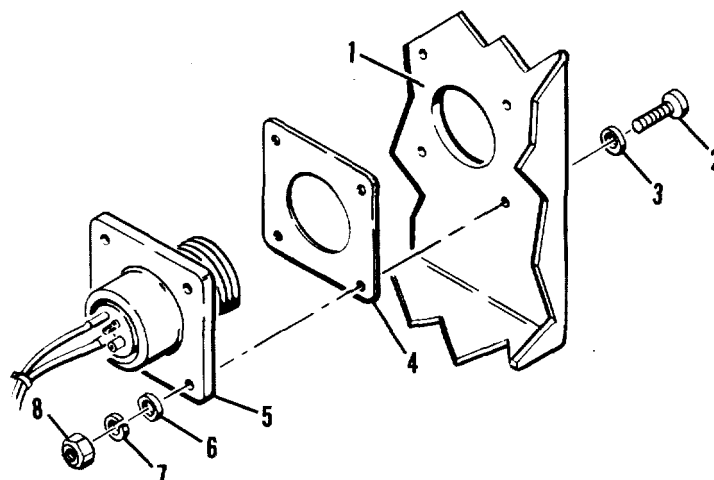
4. Remove four screws (3), flat washers (4), nuts (5), lockwashers (6), and flat washers (7).

5. Remove connector (8) and rubber gasket (9) from distribution box (10).



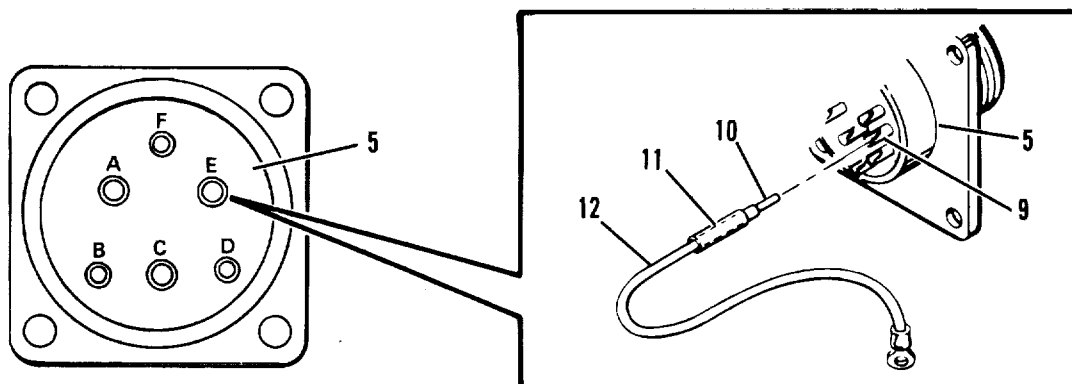
3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**e. 24 VDC CONNECTOR J4 - Continued****STEP****PROCEDURE****REPLACEMENT**

Replace faulty part with a new part.

INSTALLATION**NOTE**

Install connector with keyway up.

1. Install four screws (2) and flat washers (3) through distribution box (1), rubber gasket (4), and connector (5).
2. Install connector (5) with four flat washers (6), lockwashers (7), and hex nuts (8).



3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**e. 24 VDC CONNECTOR J4 - Continued****STEP****PROCEDURE**

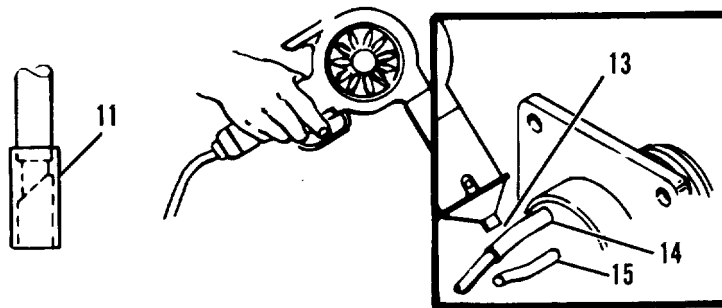
3. Prepare and tin ends of two wires (10) and six pins (9) on connector (5).
4. Cut two pieces of heat shrink sleeving (11) 1/2 in. long.
5. Slide heat shrink sleeving (11) over wires (12).

NOTE

Keep soldering iron tip clean.

6. Solder two wires to two connections in order shown below:

<u>Wire Number</u>	<u>J4 Pin Connection</u>
22	C
21	A



7. Slide heat shrink sleeving (11) over newly soldered connections (14) and (15).
8. Use heat gun (13) to shrink heat shrink sleeving on connections.
9. Install wire ties.

TEST

Test distribution box (para 3-18) to verify repair.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**f. CONTROL CONNECTOR J5****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
 5180-00-596-1474
 5/16 in. comb. wr
 In rd nose plr
 No. 1 xtip scdr
 pocket knife
 sldr and desldr set,
 3439-00-460-7198
 diag ctg plr, 5110-00-965-0974
 heat gun, 4940-00-363-3225

Equipment
Condition

Para
 3-9a
 - - -
 necessary

Condition Description

Cover removed
 Wire ties removed as
 necessary

Materials/Parts

heat shrink sleeving (appx B, items
 6, 7, 8, 9, 10, 11, or 12)
 solder (appx B, item 19)
 connector

STEP**PROCEDURE****REMOVAL**

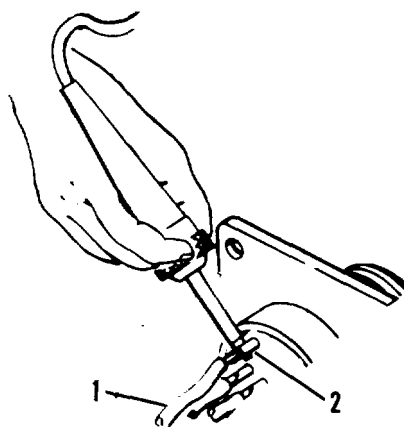
1. Split heat shrink sleeving lengthwise and remove from 18 connector pins.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**f. CONTROL CONNECTOR J5 - Continued****STEP****PROCEDURE**

2. Tag each wire removed with following information for installation:

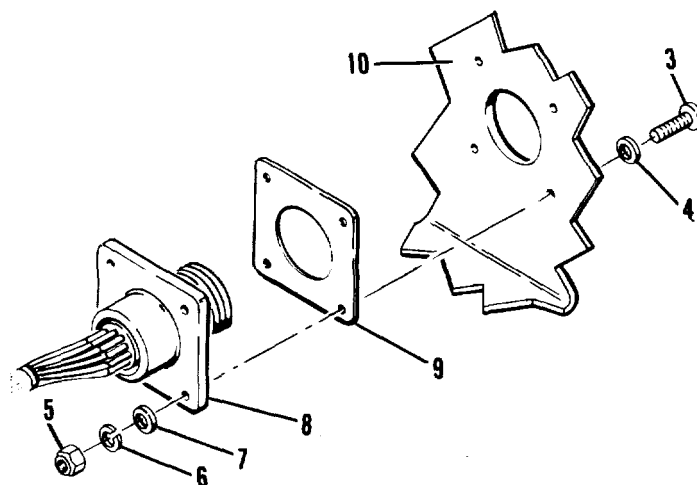
<u>Wire Number</u>	<u>J5 Pin Connection</u>	<u>Wire Number</u>	<u>J5 Pin Connection</u>	<u>Wire Number</u>	<u>J5 Pin Connection</u>
23	D	26	I	32	N
12	E	60	H	33	P
24	F	23 & 28	J	4	Q
59	G	29	K	34	R
25	H	30	L	35 & 7	S
15	H	31	M	6	T

3. Unsolder and remove 20 wires (1) from connector pins (2).



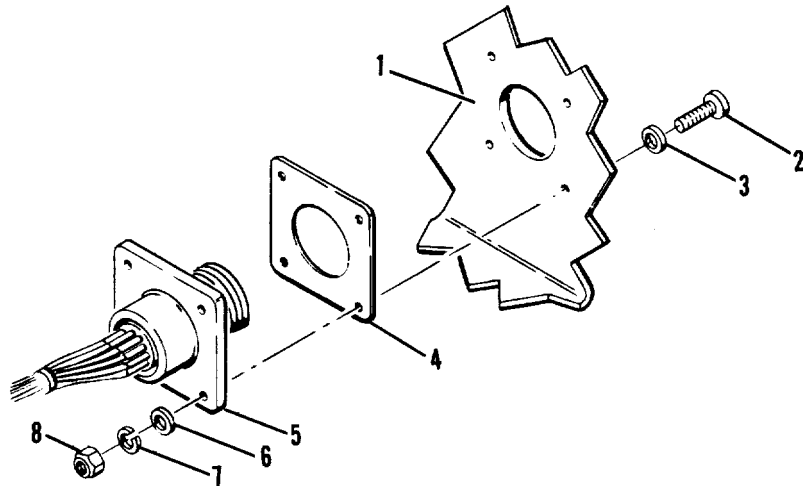
4. Remove four screws (3), flat washers (4), nuts (5), lockwashers (6), and flat washers (7).

5. Remove connector (8) and rubber gasket (9) from distribution box (10).



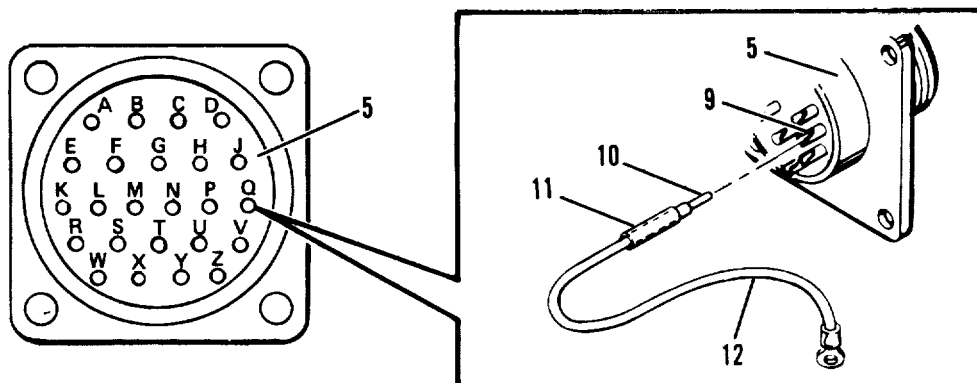
3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**f. CONTROL CONNECTOR J5 - Continued****STEP****PROCEDURE****REPLACEMENT**

Replace faulty part with a new part.

INSTALLATION**NOTE**

Install connector with keyway up.

1. Install four screws (2) and flat washers (3) through distribution box (1), rubber gasket (4), and connector (5).
2. Install connector with four flat washers (6), lockwashers (7) and hex nuts (8).



3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**f. CONTROL CONNECTOR J5 - Continued****STEP****PROCEDURE**

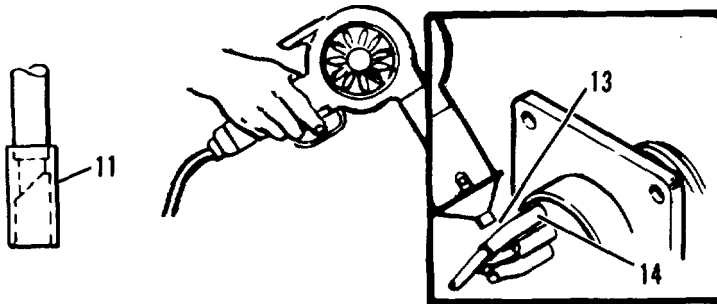
3. Prepare and tin ends of 20 wires (10) and 18 pins (9) on connector (5).
4. Cut 18 pieces of heat shrink sleeving (11), each 1/2 in. long.
5. Slide heat shrink sleeving (11) over wires (12).

NOTE

Keep soldering iron tip clean.

6. Solder 20 wires to 18 connections in order shown below:

<u>Wire Number</u>	<u>J5 Pin Connection</u>	<u>Wire Number</u>	<u>J5 Pin Connection</u>
34	R	25	E
35 & 7	S	15	F
6	T	26	G
29	K	60	H
30	L	23 & 28	J
31	M	23	A
32	N	12	B
33	P	24	C
4	Q	59	D



7. Slide heat shrink sleeving (11) over 18 newly soldered connections (14).
8. Use heat gun (13) to shrink heat shrink sleeving on connections.
9. Install wire ties.

TEST

Test distribution box (para 3-18) to verify repair.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**g. HYDRAULIC CONNECTOR J7****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,

5180-00-596-1474

5/16 in. comb. wr

lg rd nose plr

No. 1 xtip scdr

pocket knife

sldr and desldr set,

3439-00-460-7198

diag ctg plr, 5110-00-965-0974

heat gun, 4940-00-363-3225

Equipment

Condition

Para

3-9a

- - -

necessary

Condition Description

Cover removed

Wire ties removed as
necessaryMaterials/Partsheat shrink sleeving (appx B, items
6, 7, 8, 9, 10, 11, or 12)

solder (appx B, item 19)

connector

STEP**PROCEDURE****REMOVAL**

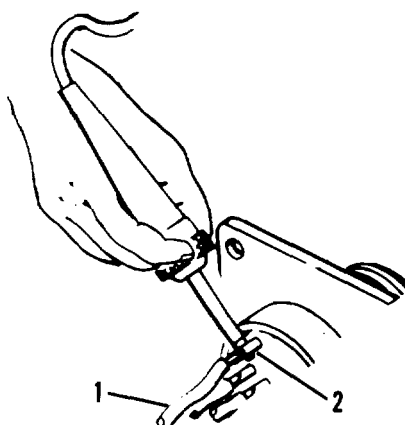
1. Split heat shrink sleeving lengthwise and remove from nine connector pins.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**g. HYDRAULIC CONNECTOR J7 - Continued****STEP****PROCEDURE**

2. Tag each wire removed with following information for installation:

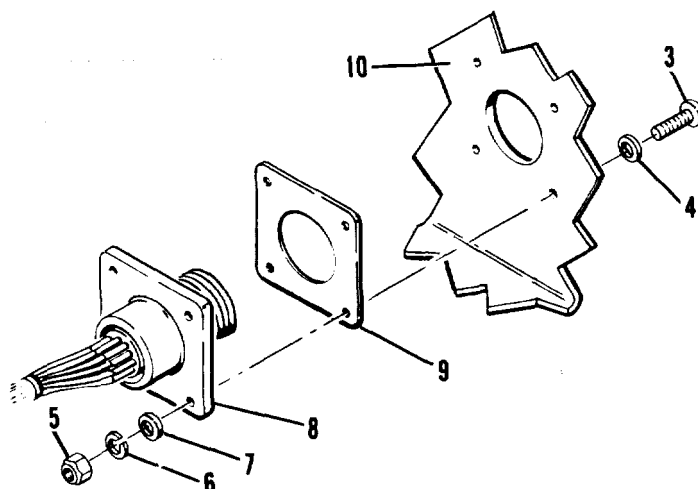
<u>Wire Number</u>	<u>J5 Pin Connection</u>	<u>Wire Number</u>	<u>J5 Pin Connection</u>
36	A	40	E
37	B	41	F
38	C	42	G
39	D	5	H
		35	I

3. Unsolder and remove nine wires (1) from connector pins (2).



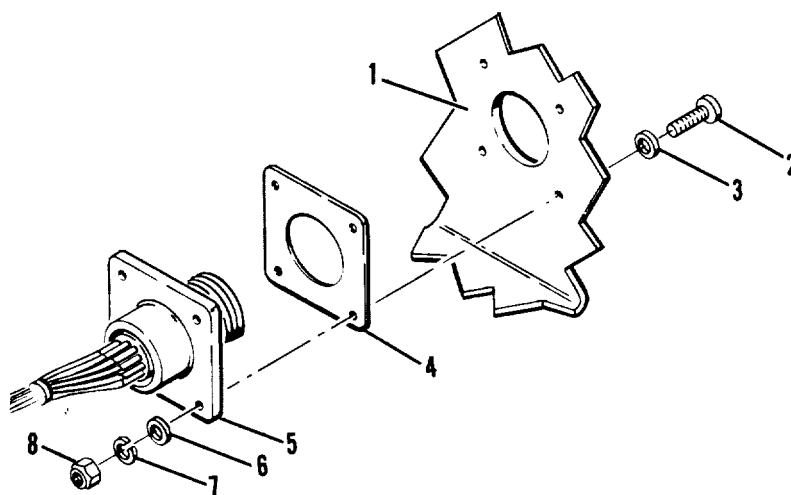
4. Remove four screws (3), flat washers (4), nuts (5), lockwashers (6), and flat washers (7).

5. Remove connector (8) and rubber gasket (9) from distribution box (10).



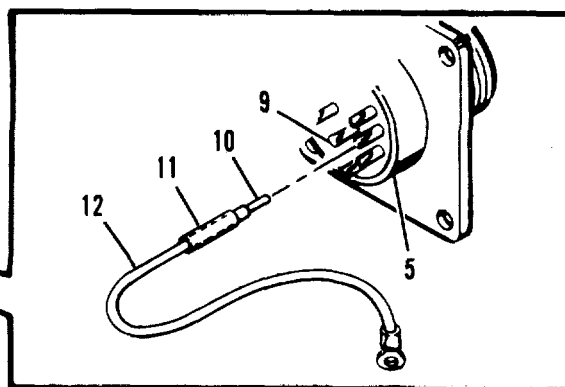
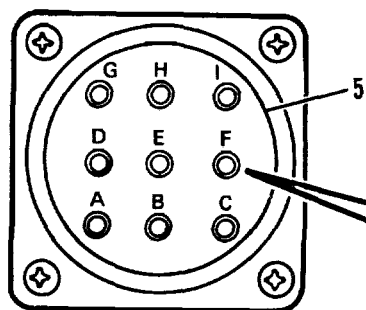
3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**g. HYDRAULIC CONNECTOR J7 - Continued****STEP****PROCEDURE****REPLACEMENT**

Replace faulty part with a new part.

INSTALLATION**NOTE**

Install connector with keyway up.

1. Install four screws (2) and flat washers (3) through distribution box (1), rubber gasket (4), and connector (5).
2. Install connector with four flat washers (6), lockwashers (7), and hex nuts (8).



3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**g. HYDRAULIC CONNECTOR J7 - Continued****STEP****PROCEDURE**

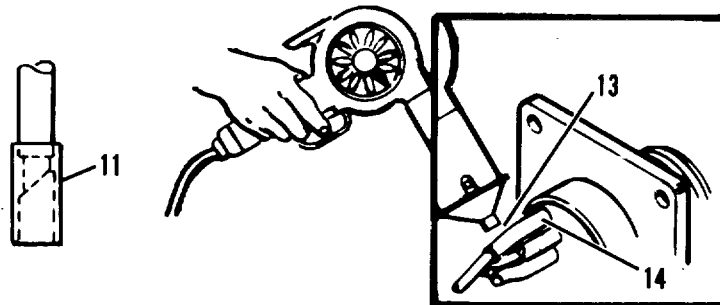
3. Prepare and tin nine wires (12) and pins (9) on connector (5).
4. Cut nine pieces of heat shrink sleeving (11), each 1/2 in. long.
5. Slide heat shrink sleeving (11) over wires (12).

NOTE

Keep soldering iron tip clean.

6. Solder nine wires to nine connections in order shown below:

<u>Wire Number</u>	<u>J7 Pin Connection</u>	<u>Wire Number</u>	<u>J7 Pin Connection</u>
35	I	39	D
5	H	38	C
42	G	37	B
41	F	36	A
39	E		



7. Slide heat shrink sleeving (11) over nine newly soldered connections (14).
8. Use heat gun (13) to shrink heat shrink sleeving on connections.
9. Install wire ties.

TEST

Test distribution box (para 3-18) to verify repair.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**h. PNEUMATIC CONNECTOR J8****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,

5180-00-596-1474

lg rd nose plr

No. 1 xtip scdr

pocket knife

sldr and desldr set,

3439-00-460-7198

diag ctg plr, 5110-00-965-0974

skt wr hdl, 5120-00-221-7957

1/4 in. skt, 5120-00-236-2264

skt wr ext, 5120-00-243-1686

heat gun, 4940-00-363-3225

EquipmentConditionPara

3-9a

- - -

Condition Description

Cover removed

Wire ties removed as
necessaryMaterials/Parts

heat shrink sleeving (appx B, items

6, 7, 8, 9, 10, 11, or 12)

solder (appx B, item 19)

connector

STEP**PROCEDURE****REMOVAL**

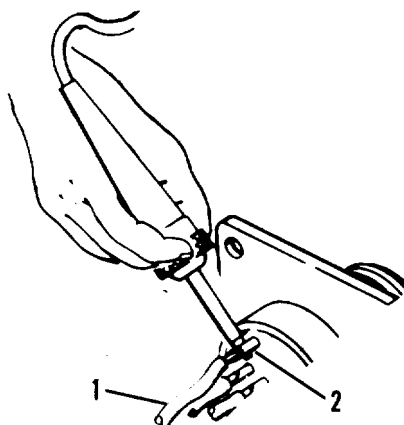
1. Split heat shrink sleeving lengthwise and remove from 11 connector pins.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**h. PNEUMATIC CONNECTOR J8****This task covers:****Removal****Replacement****Installation****Test**

2. Tag each wire removed with following information for installation:

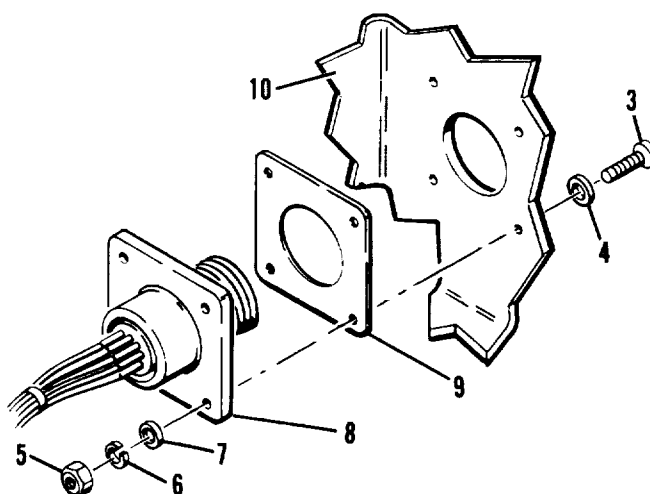
<u>Wire Number</u>	<u>J8 Pin Connection</u>	<u>Wire Number</u>	<u>J8 Pin Connection</u>
29	A	44	J
13	B	45	K
43	C	34	L
62	E	45 & 46	M
24	H	25	N
9	I		

3. Unsolder and remove 12 wires (1) from connector pins (2).



4. Remove four screws (3), flat washers (4), nuts (5), lockwashers (6), and flat washers (7).

5. Remove connector (8) and rubber gasket (9) from distribution box (10).



3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued

h. PNEUMATIC CONNECTOR J8

This task covers:

Removal

Replacement

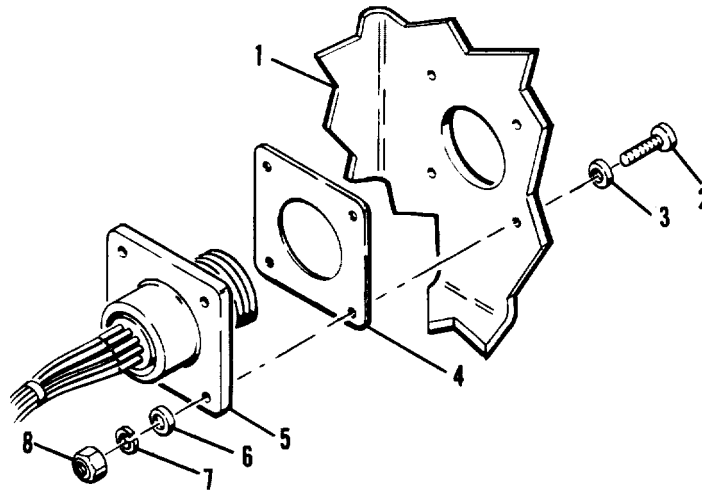
Installation

Test

REPLACEMENT

Replace faulty part with a new part.

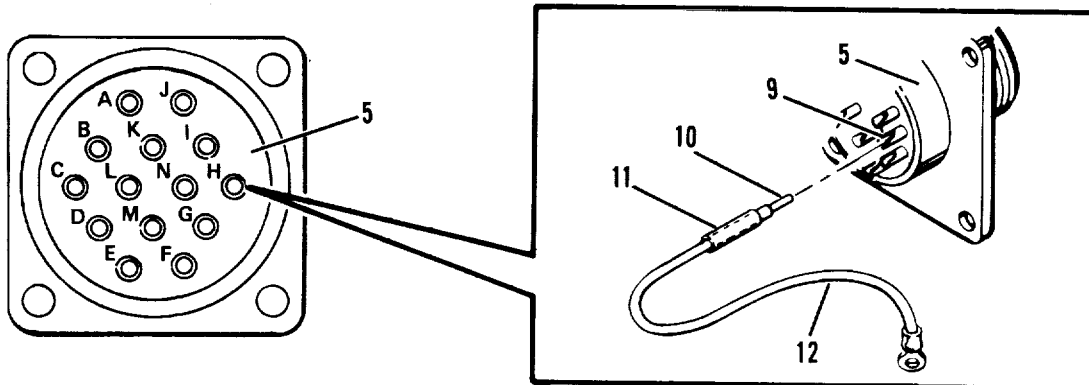
INSTALLATION



NOTE

Install connector with keyway up.

1. Install four screws (2) and flat washers (3) through distribution box (1), rubber gasket (4), and connector (5).
2. Install connector with four flat washers (6), lockwashers (7), and hex nuts (8).



3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**h. PNEUMATIC CONNECTOR J8****This task covers:****Removal****Replacement****Installation****Test**

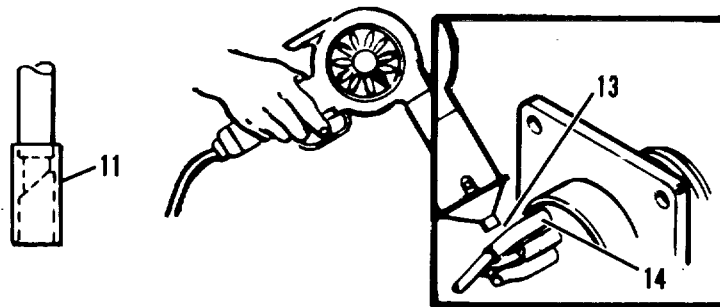
3. Prepare and tin ends of 12 wires (10) and 11 pins (9) on connector (5).
4. Cut 11 pieces of heat shrink sleeving (11), each 1/2 in. long.
5. Slide heat shrink sleeving (11) over wires (12).

NOTE

Keep soldering iron tip clean.

6. Solder 12 wires to 11 connections in order shown below:

<u>Wire Number</u>	<u>J8 Pin Connection</u>	<u>Wire Number</u>	<u>J8 Pin Connection</u>
62	E	13	B
45 & 46	M	45	K
43	C	9	I
34	L	29	A
25	N	44	J
24	H		



7. Slide heat shrink sleeving (1) over 10 newly soldered connections (14).
8. Use heat gun (13) to shrink heat shrink sleeving on connections.
9. Install wire ties.

TEST

Test distribution box (para 3-18) to verify repair.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**i. CIRCUIT BREAKERS CB1 THRU CB6****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP****Tools**

Refrig Unit Svce Tool Kit,

No. 2 xtip scdr

No. 1 xtip scdr

No. 1 xtip scdr

Lg rd nose plr

Screw starter

Equipment**Condition**Para

3-9a

3-9j

Condition Description

Cover removed

Covered removed

Materials/Parts

circuit breaker CB1 or CB2, 10A

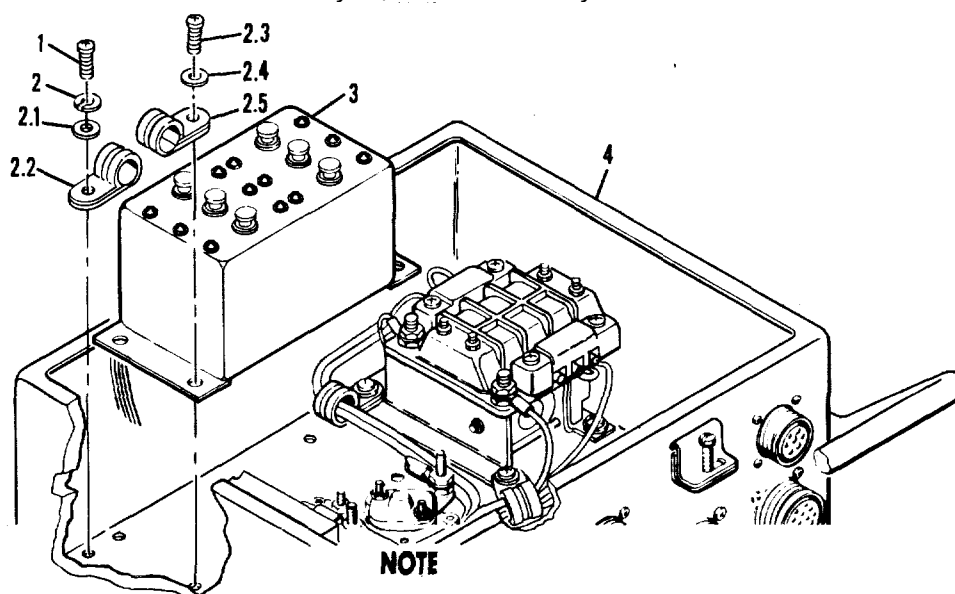
circuit breaker CB3 or CB4, 35A

circuit breaker CB5, 50A

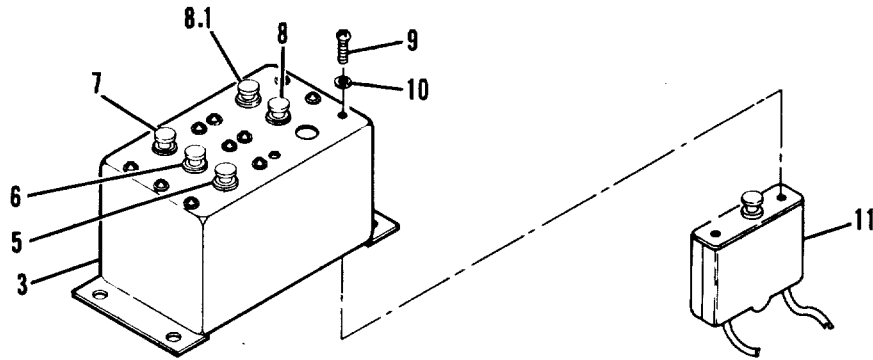
circuit breaker CB6, 5A

STEP**PROCEDURE****REMOVAL**

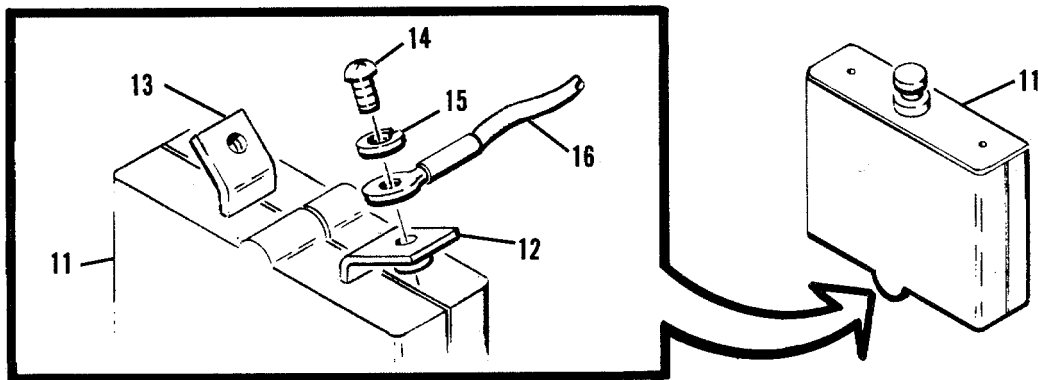
If you have an early model distribution box (CB1 through CB5 only) and are replacing a circuit breaker or a circuit breaker bracket, upgrade your distribution box by replacing the following items: circuit breaker CB1 through CB5, circuit breaker bracket, and wiring harness WI. Install CB6, a new identification plate (indicating J.3747A/G), a new warning label on the inside of the distribution box behind relay KI, and remove relay K1 cover.



1. If installed, remove screw (1), lockwasher (2), flatwasher (2.1), and cable clamp (2.2).
- 1.1 Remove four screws (2.3), flatwashers (2.4) and if installed cable clamp (2.5).
2. Remove bracket (3) from distribution box (4).

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**i. CIRCUIT BREAKERS CBI THRU CB6 - Continued****This task covers:****Removal****Replacement****Installation****Test**

3. Remove circuit breakers CB1 thru CB6 as follows:
- Remove from bracket (3) all screws (9) and flatwashers (10) for all circuit breakers. Circuit breaker CB6 (11) is shown as an example.
 - Remove circuit breakers (5), (6), (7), (8), (8.1), and (11).



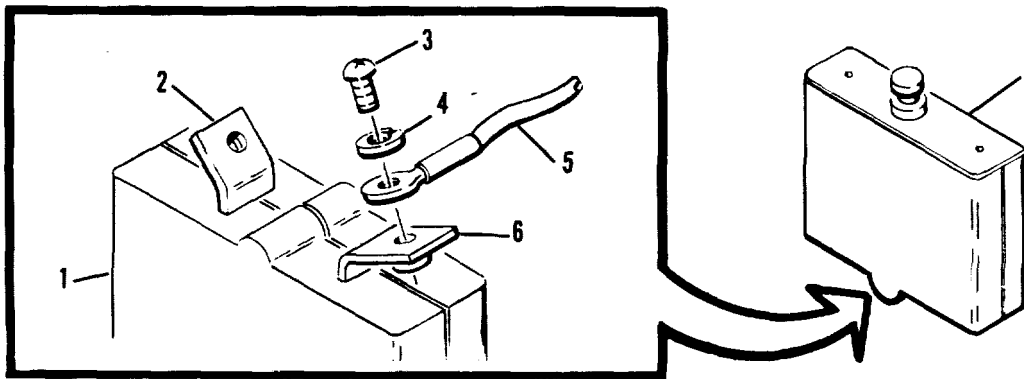
4. Remove screws (14) and lockwashers (15) from two terminals (12 and 13), and remove wires (16) of circuit breaker to be removed.

NOTE

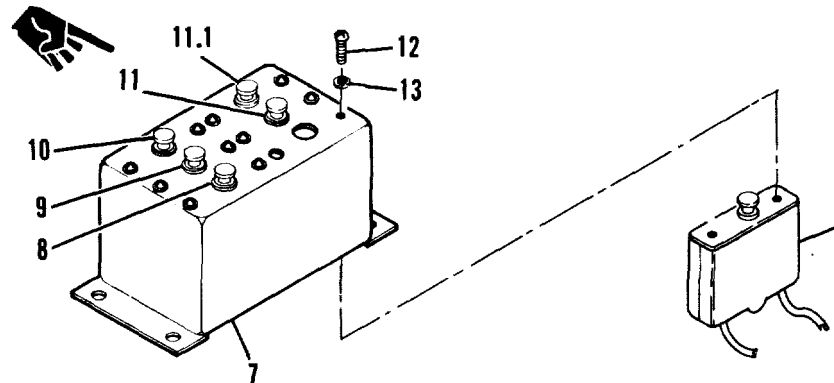
Tag wire to identify for installation if wire numbers are not showing.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**i. CIRCUIT BREAKERS CBI THRU CB6 - Continued****This task covers:****Removal****Replacement****Installation****Test****REPLACEMENT**

Replace faulty part with a new part.

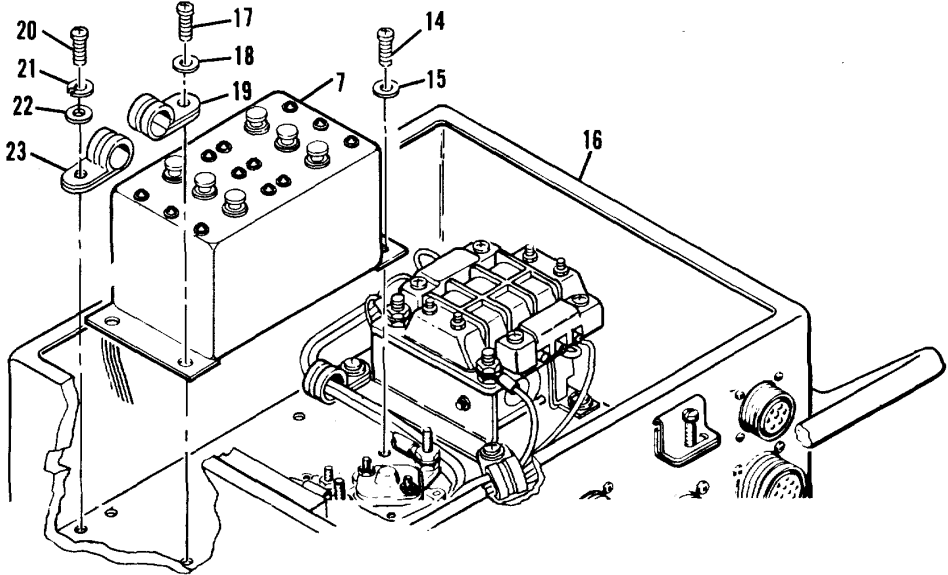
INSTALLATION

1. Install wires (5) at two terminals (2 and 6) on the circuit breaker (1) being installed.
2. Install one screw (3) and lockwasher (4) on each terminal. See following table for wire numbers that connect to terminal 1 (6) and terminal 2 (2) of each circuit breaker.



3. Install circuit breakers CB1 thru CB6 in bracket (7). Install screws (12) and flatwashers (13) for each circuit breaker (8), (9), (10), (11), (11.1), and (1). Circuit breaker CB6 (1) is shown as an example.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**i. CIRCUIT BREAKERS CB1 THRU CB6 - Continued**

STEP	PROCEDURE		
	<u>CIRCUIT BREAKER</u> CB1 (10) CB2 (9) CB3 (8) CB4 (11.1) CB5 (11) CB6 (1)	<u>CONNECTIONS</u> 1 (6) 2 (2) 1 (6) 2 (2) 1 (6) 2 (2) 1 (6) 2 (2) 1 (6) 2 (2) 1 (6) 2 (2)	<u>WIRE NOS.</u> 49 61 1 and 50 26 49 and 51 14 50 47, 36 and 62 21 and 51 52 64 16
			
4.	Install bracket (7) into distribution box (16).		
5.	Install three screws (14) and flatwashers (15).		
6.	Install screw (17), flatwasher (18), and cable clamp (19).		
7.	Install screw (20), lockwasher (21), flatwasher (22), and cable clamp (23).		
	TEST Test distribution box (see para 3-18) to verify repair.		

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**j. DIODE RECTIFIER CR1****This task covers:****Removal****Replacement****Installation****INITIAL SETUP****Tools**

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 2 xtip scdr
No. 1 xtip scdr
rcht wr (non-reversible)
7/16 in. comb. wr
11/16 in. comb. wr
lg rd nose plr
heatsink pliers, 3439-00-145-6377
sldr and desldr set, 3439-00-460-7198
skt wr hdl, 5120-00-221-57
11/32 in. skt, 5120-242-3352
skt wr ext, 5120-00-243-1686

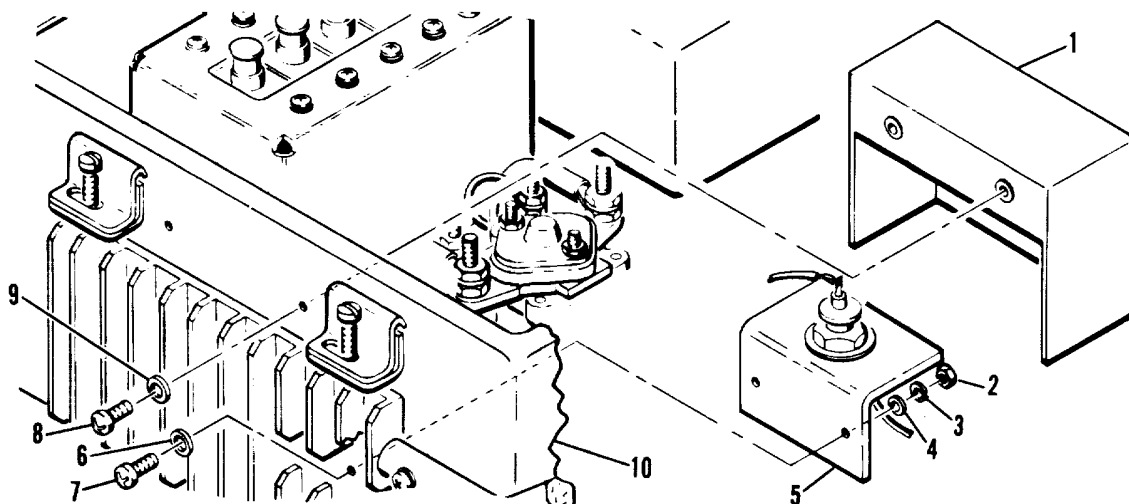
Equipment
Condition

Para
3-9a

Condition Description
Cover removed

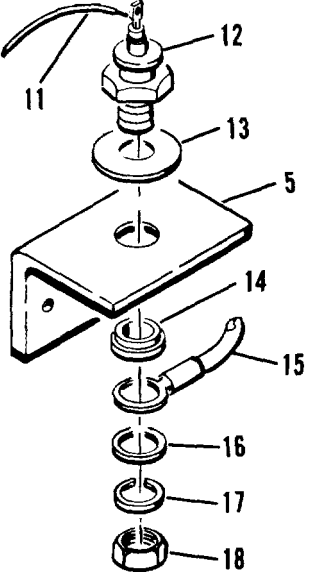
Materials/Parts

solder (appx B, item 19)
heat sink compound (appx B, item 4)
shop cloths (appx B, item 17)
diode rectifier

STEP**PROCEDURE****REMOVAL**

1. Remove two screws (8) and flatwashers (9).
2. Remove cover (1) from distribution box (10).

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**j. DIODE RECTIFIER CR1-Continued**

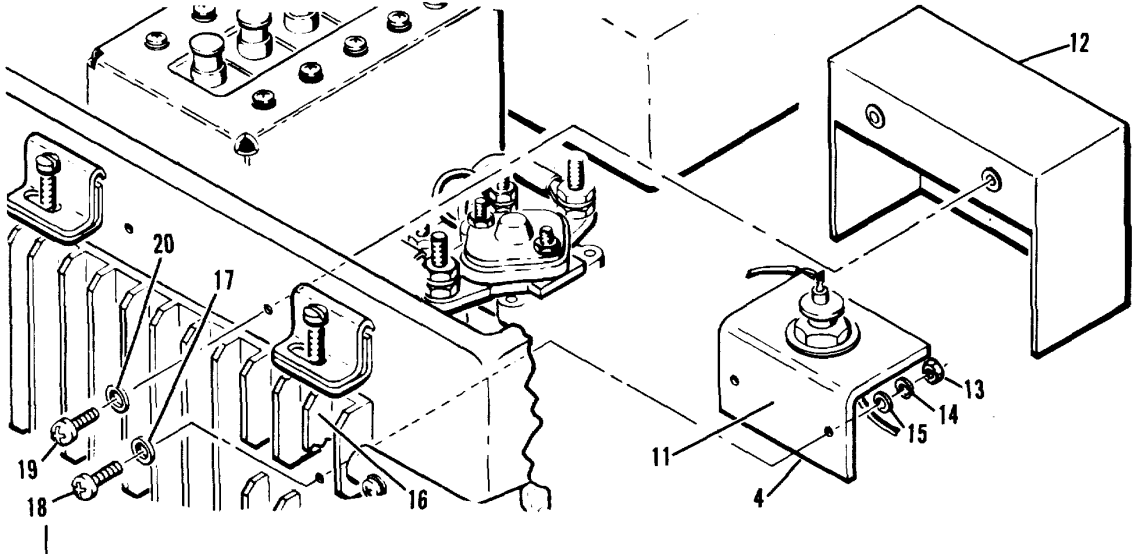
STEP	PROCEDURE
3.	Remove two screws (7), flatwashers (6), hex nuts (2), lockwashers (3), and flatwashers (4).
4.	Extend rectifier bracket (5) from distribution box (10) to gain access to wire connections. 
5.	Unsolder wire no. 47 (11) from diode (12).
6.	Remove hex nut (18), lockwasher (17), flatwasher (16), eyelet with wire no. 48 (15), and two insulator washers (13 and 14).
7.	Remove diode (12).
	REPLACEMENT Replace faulty part with a new part.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued

j. DIODE RECTIFIER CR1 - Continued

STEP	PROCEDURE
	INSTALLATION LATER MODEL CAUTION Be sure that the diodes are installed correctly by verifying that the measured resistance from the anode to the cathode of each diode is at least 100 times greater than the measured resistance in the reverse direction. For example: with the ohmmeter in the 2K ohm range, if the resistance from the anode to the cathode is greater than 1K ohm and the resistance in the reverse direction is less than 10 ohms, the diode is installed correctly. 1. Install diode CR1 and insulator washers (3) in rectifier bracket (4). Apply heat sink compound to mounting surface of diode. 2. Install insulator washer (6) so that the smaller edge (5) is inside the mounting hole and flush with the rectifier bracket (4). 3. Install eyelet of wire no. 48 (7), flatwasher (8), and lockwasher (9); and tighten with hex nut (10). 4. Connect heat sink to diode terminal (2). 5. Insert wire no. 47 (1) in eyelet of diode terminal (2) and solder. In later models route wire up through grommet in rectifier bracket (4).

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**j. DIODE RECTIFIER CR1-Continued**

STEP	PROCEDURE
	 6. Wipe mounting surface (11) clean with a shop cloth and apply heat sink compound on clean mounting surface (11) of diode bracket. 7. Install diode bracket (4) on heat sink (16) with two screws (18) and flatwashers (17). Secure with two flatwashers (15), lockwashers (14), and nuts (13). 8. Install protective cover (12) over diode and secure with two screws (19) and flatwashers (20). TEST Test distribution box (para 3-18) to verify repair.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**k. +90 VDC PUMP MOTOR CONTROL RELAY K1****This task covers:****Removal****Replacement****Installation****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
 7/32 in. flat tip scdr
 Lg rd nose plr
 No. 2 xtip scdr
 No. 1 xtip scdr
 Skt wr hdl Relay
 Skt wr ext
 3/8 in. skt
 11/32 in. skt
 No. 2, 8 in., xtip scdr
 Screw starter

Equipment

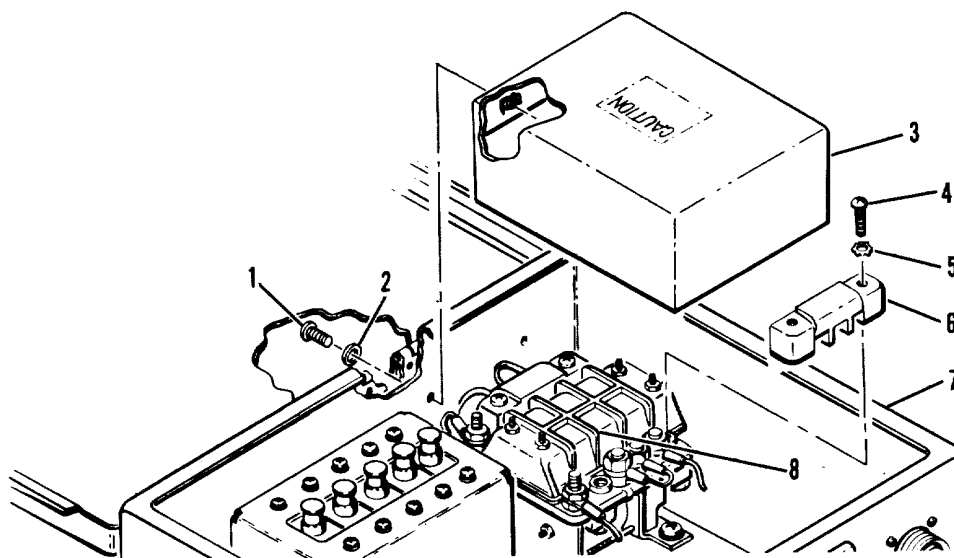
Condition

Para

3-9a

Condition Description

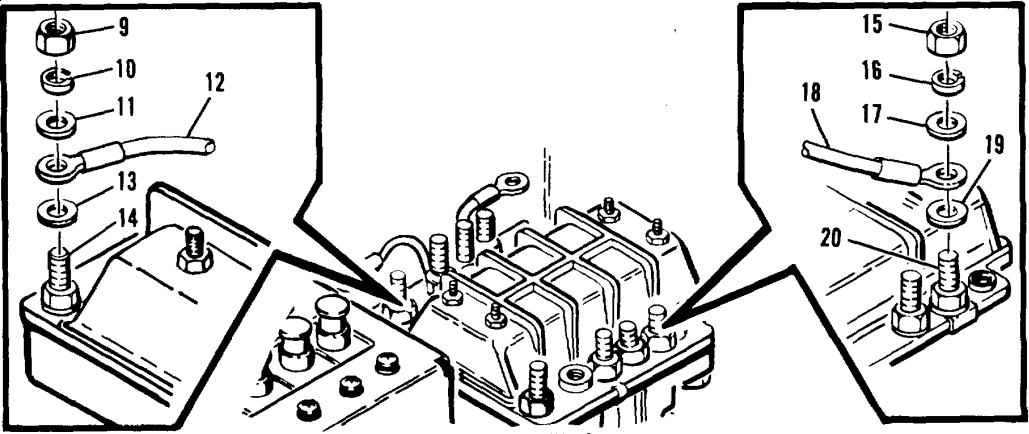
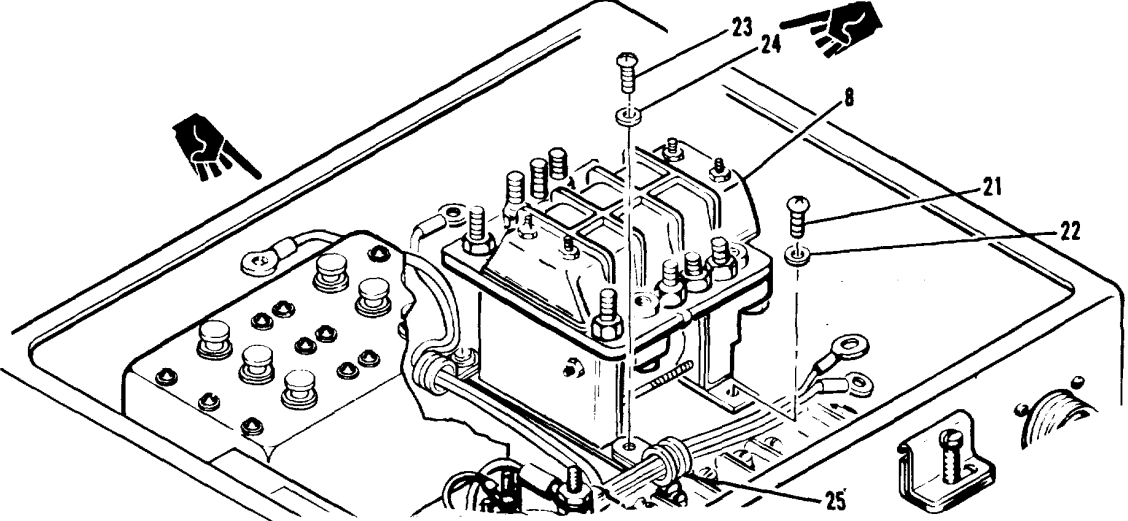
Cover removed

Materials/Parts**STEP****PROCEDURE****REMOVAL**

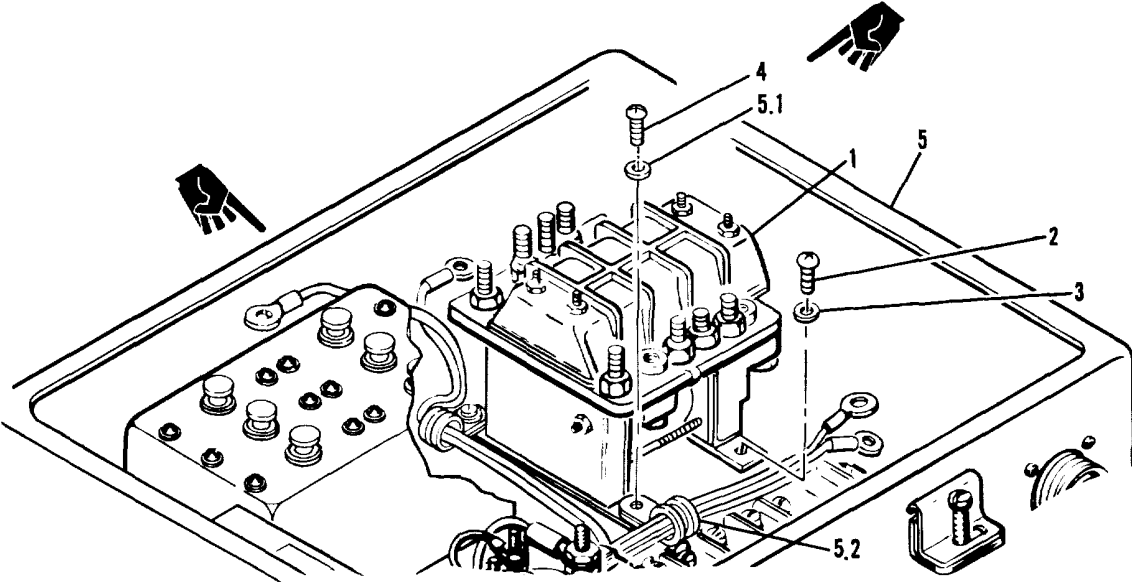
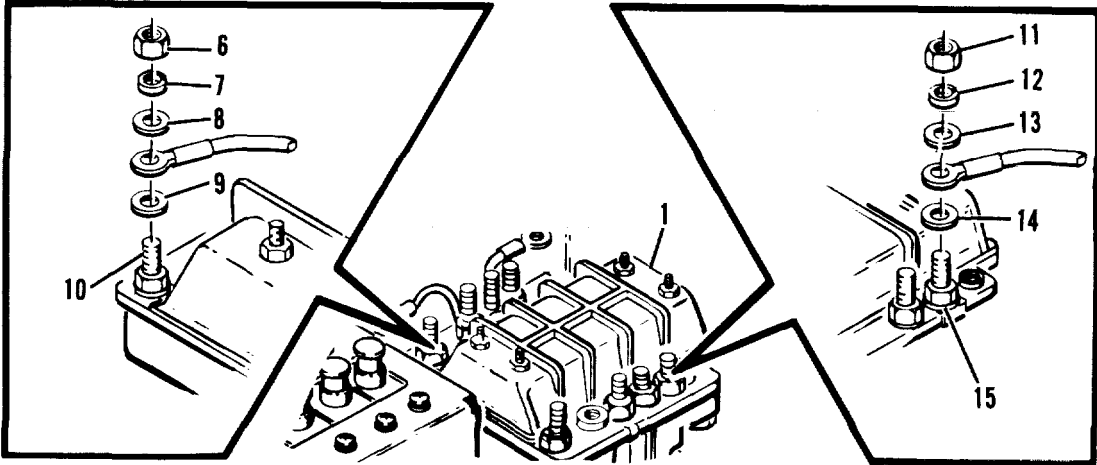
1. Remove two screws (1) and flatwashers (2) from cover (3), if installed.
2. Remove cover (3) from distribution box (7), if installed.
3. Remove two screws (4) and star washers (5) from each of two terminal protective covers (6).
4. Remove two terminal protective covers (6) from relay (8).

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued

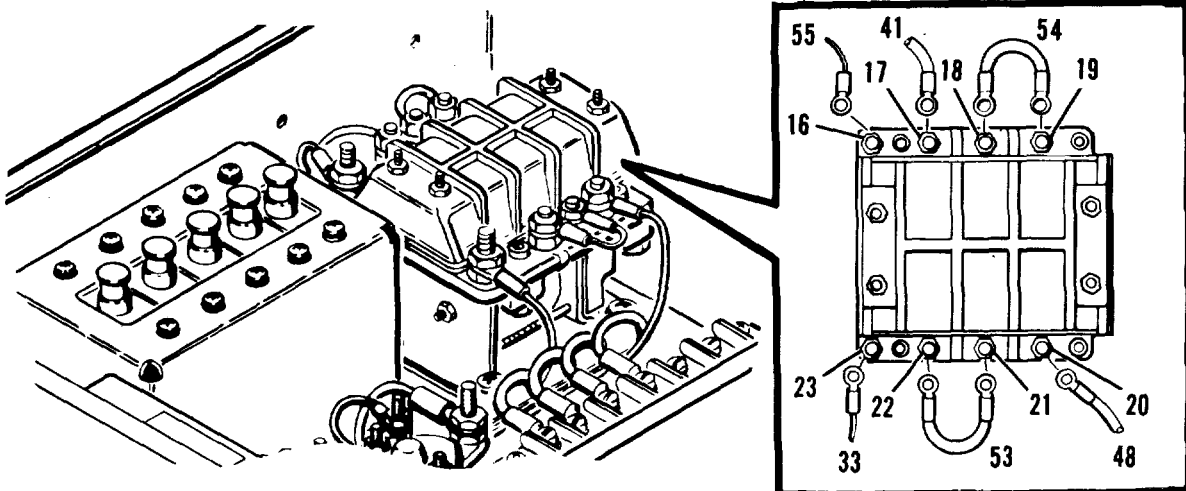
k. +90 VDC PUMP MOTOR CONTROL RELAY K1 - Continued

STEP	PROCEDURE
	 5. Remove two hex nuts (9), lockwashers (10), and flatwashers (11) from smaller terminal posts (14). 6. Remove wires (12) from two smaller terminal posts (14). Leave flatwashers (13) on terminal posts. 7. Remove six hex nuts (15), lockwashers (16), and flatwashers (17) from larger terminal posts (20). 8. Remove wires (18) from six larger terminal posts (20). Leave flatwashers (19) on terminal posts.  9. Remove two screws (21) and flatwashers (22). 9.1 Remove two screws (23), flatwashers (24), and if installed cable clamps (25). 10. Remove relay (8) from distribution box.

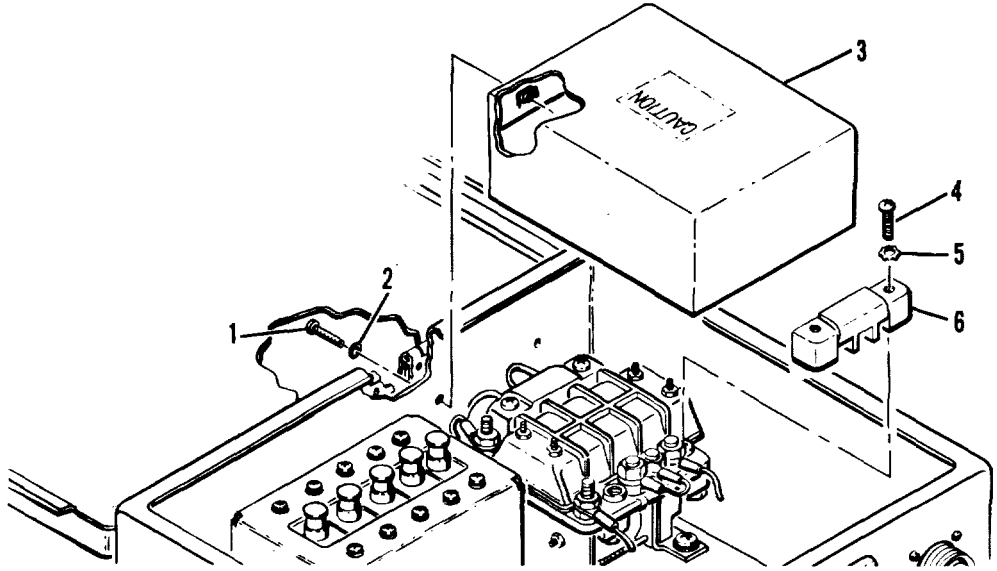
3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**k. +90 VDC PUMP MOTOR CONTROL RELAY K1**

STEP	PROCEDURE
	REPLACEMENT Replace faulty part with a new part. INSTALLATION  1. Position relay (1) in distribution box (5). 2. Install two screws (2) and flatwashers (3). 2.1 Install two screws (4), flatwashers (5.1), and if removed cable clamps (5.2). 

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**k. +90 VDC PUMP MOTOR CONTROL RELAY K1**

STEP	PROCEDURE																											
3.	Install one thin flatwasher (14) on each of six larger terminal posts (15).																											
4.	Install one thin flatwasher (9) on each of two smaller terminal posts (10).																											
																												
5.	Connect wires to eight terminal posts (16 through 23) on relay K1 as follows:																											
	<table><tr><th><u>CALL OUT</u></th><th><u>K1 PIN NUMBER</u></th><th><u>WIRE NUMBER</u></th></tr><tr><td>16</td><td>X1</td><td>55</td></tr><tr><td>17</td><td>A2</td><td>41</td></tr><tr><td>18</td><td>B2</td><td>54</td></tr><tr><td>19</td><td>C2</td><td>54</td></tr><tr><td>20</td><td>C1</td><td>48</td></tr><tr><td>21</td><td>B1</td><td>53</td></tr><tr><td>22</td><td>A1</td><td>53</td></tr><tr><td>23</td><td>X2</td><td>33</td></tr></table>	<u>CALL OUT</u>	<u>K1 PIN NUMBER</u>	<u>WIRE NUMBER</u>	16	X1	55	17	A2	41	18	B2	54	19	C2	54	20	C1	48	21	B1	53	22	A1	53	23	X2	33
<u>CALL OUT</u>	<u>K1 PIN NUMBER</u>	<u>WIRE NUMBER</u>																										
16	X1	55																										
17	A2	41																										
18	B2	54																										
19	C2	54																										
20	C1	48																										
21	B1	53																										
22	A1	53																										
23	X2	33																										
6.	Install six flatwashers (13), lockwashers (12), and nuts (11).																											
7.	Install two flatwashers (8), lockwashers (7), and nuts (6).																											

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**k. +90 VDC PUMP MOTOR CONTROL RELAY K1**

STEP	PROCEDURE
	 7.1 Bend terminal lugs on K1 down to a 90 degree angle if relay cover (3) is to be installed. 8. Install two terminal protective covers (6), and secure with two screws (4), and star washers (5). 9. Install relay cover (3), and secure with two screws (1) and flatwashers (2) if removed. TEST Test distribution box (see para 3-18) to verify repair.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**I. +24 VDC BATTERY CONTROL RELAY K2****This task covers:****Removal****Replacement****Installation****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit

5180-00-596-1474

No. 2 xtip scdr

skt wr hdl, 5120-00-221-7952

2 in. skt wr ext, 5120-00-227-8105

5/16 in. skt, 5120-00-235-5878

3/8 in. skt, 5120-00-242-3352

Equipment

Condition

Para

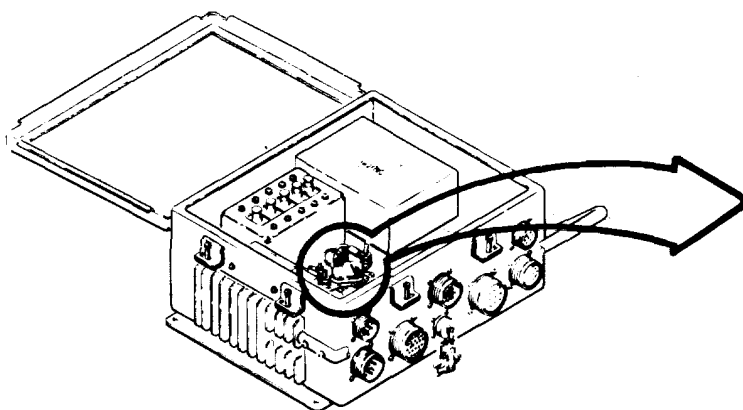
3-9a

Condition Description

Cover removed

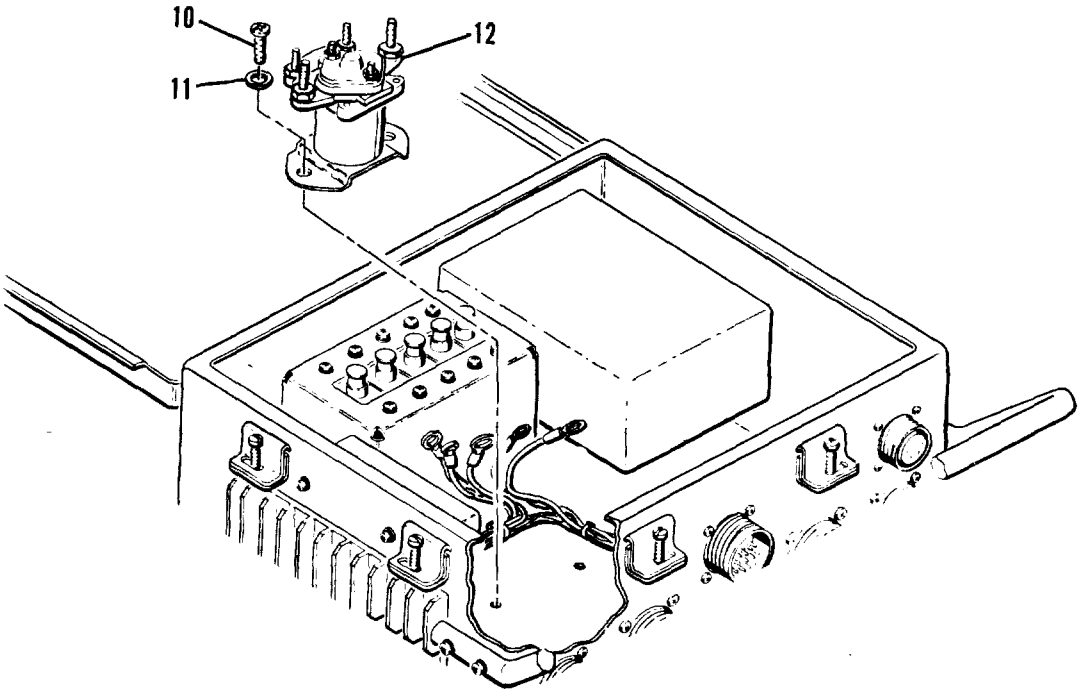
Materials/Parts

relay

STEP**PROCEDURE****REMOVAL**

1. Remove hex nuts (4), lockwashers (5), and flat washers (6) from two larger terminal posts (7) on relay (8).
2. Remove wires 39 and 52 from terminal posts (7).

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**I. +24 VDC BATTERY CONTROL RELAY K2**

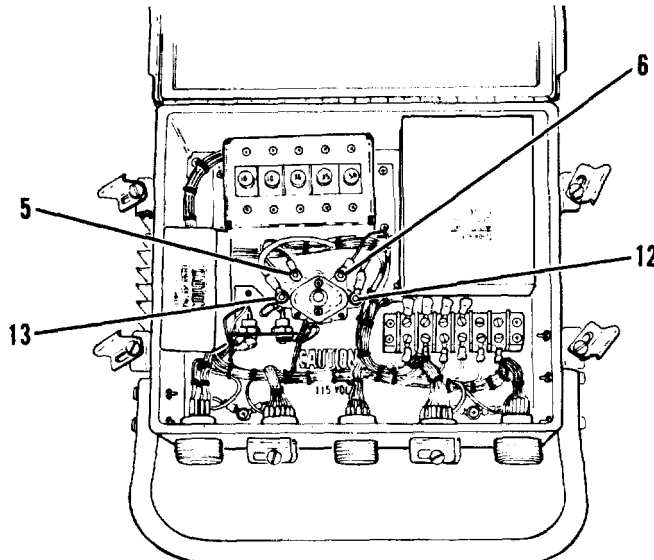
STEP	PROCEDURE
3.	Remove hex nuts (1), lockwashers (2), and flat washers (3) from two smaller terminal posts (9) on relay (8).
4.	Remove wires 32, and 55 and 56 from terminal posts (9).
5.	
	6.
	REPLACEMENT Replace faulty part with a new part.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued

I. +24 VDC BATTERY CONTROL RELAY K2

STEP	PROCEDURE
	INSTALLATION 1. Position relay (4) in distribution box (1). 2. Install two flat washers (3) and screws (2). 3. Install four thin flat washers (11) on terminal posts (5, 6, 12 and 13).

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**I. +24 VDC BATTERY CONTROL RELAY K2**

STEP	PROCEDURE															
4.	Connect five wires (10) to four terminal posts as follows: <table><tr><th>CALL OUT</th><th>K2 PIN NUMBER</th><th>WIRE NUMBER</th></tr><tr><td>13</td><td>A1</td><td>52</td></tr><tr><td>5</td><td>X1</td><td>55 & 56</td></tr><tr><td>6</td><td>X2</td><td>32</td></tr><tr><td>12</td><td>A2</td><td>39</td></tr></table> 	CALL OUT	K2 PIN NUMBER	WIRE NUMBER	13	A1	52	5	X1	55 & 56	6	X2	32	12	A2	39
CALL OUT	K2 PIN NUMBER	WIRE NUMBER														
13	A1	52														
5	X1	55 & 56														
6	X2	32														
12	A2	39														
5.	Install two flatwashers (9), lockwashers (8), and nuts (7) on two smaller terminals (5 and 6).															
6.	Install two flatwashers (9), lockwashers (8), and nuts (7) on two larger terminals (12 and 13).															
	TEST Test distribution box (para 3-18) to verify repair.															

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**m. DIODES CR2 AND CR3****This task covers:****Removal****Replacement****Installation****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,

7/16 in. comb. wr

11/16 in. comb. wr

Lg rd nose plr

Sldr and desldr set

Heatsink pliers

Diag ctg plr

Equipment

Condition

Para

3-9a

Condition Description

Cover removed

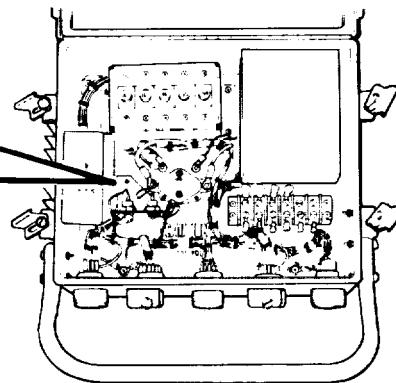
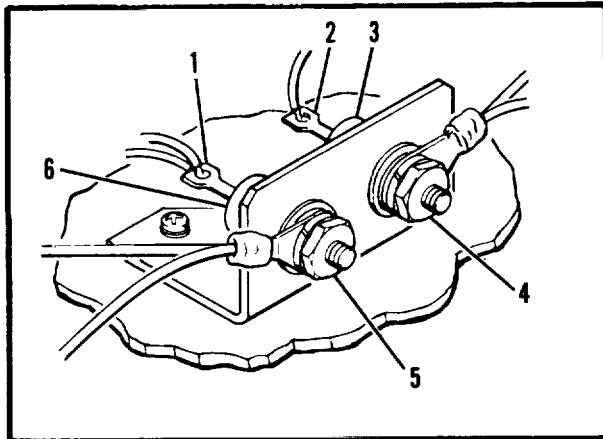
Strap, tiedown removed

as necessary

Materials/Parts

Semiconductor diode

Lead-tin solder (appx B, item 19)

STEP**PROCEDURE****REMOVAL****CAUTION**

To prevent burning wires during the soldering task, move or disconnect, as required, any wires that may contact the soldering iron.

1. Unsolder wires 64 (16 if early model) and 60 from anode (1) of diode (6).
2. Unsolder wire 61 from anode (2) of diode (3).

3.9. DISTRIBUTION BOX MAINTENANCE Continued**m. DIODES CR2 AND CR3 Continued**

STEP	PROCEDURE
3. 4. 5. 6.	To remove wires from cathodes, remove nut (7), lockwasher (8), two wires (9 and 10), flatwasher (11), and shoulder insulator washer (12). Remove wires 8 and 63 from cathode (5). Remove wires 28 and 63 from cathode (4). Remove diodes (6 and 3) and thin insulator washer (14) from mounting bracket (13).
	REPLACEMENT Replace faulty part with a new part.
1. 2. 3. 4. 5. 6. 7.	INSTALLATION Place insulator washer (14) on diode (15). Insert diode (15) into diode mounting bracket (13). Install shoulder insulator washer (12), flatwasher (11), two wires (9 and 10), lockwasher (8), and nut (7). Connect heat sink to terminal (16) of diode being soldered. Solder wires 64 (16 if early model) and 60 to anode (1). Solder wire 61 to anode (2). Install tiedown straps.

3.9. DISTRIBUTION BOX MAINTENANCE Continued	
m. DIODES CR2 AND CR3 Continued	
STEP	PROCEDURE
	CAUTION Be sure that the diodes are installed correctly by verifying that the measured resistance from the anode to the cathode of each diode is at least 100 times greater than the measured resistance in the reverse direction, For example: With the ohmmeter in the 2K ohm range, if the resistance from the anode to the cathode is greater than 1K ohm and the resistance in the reverse direction is less than 10 ohms, the diode is Installed correctly. NOTE Reconnect any wires that were disconnected to prevent damage to them during the soldering task. TEST Test distribution box (para 3-18) to verify repair.

3.9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS Continued**n. WIRE HARNESS****This task covers:****Removal****Replacement****Installation**INITIAL SETUPTools

Refrig Unit Svce Tool Kit

Lg rd nose plr

5/16 in. comb. wr

7/16 in. comb. wr

11/16 in. comb. wr

Pocket knife

3/8 in. flat tip scdr

No. 1 xtip scdr

No. 2 xtip scdr

Sldr and desldr set

Skt wr hdl

1/4 in. skt

Diag ctg plr

Heat gun

Equipment

Condition

Para

3-9a

3-9j

3-9i

Condition Description

Cover removed

Diode CR1 removed

Circuit breakers removed

Materials/Parts

Heat shrink sleeving (appx B, items

6, 7, 8, 9, 10, 11, or 12)

Solder (appx B, item 19)

Wire harness

Deleted

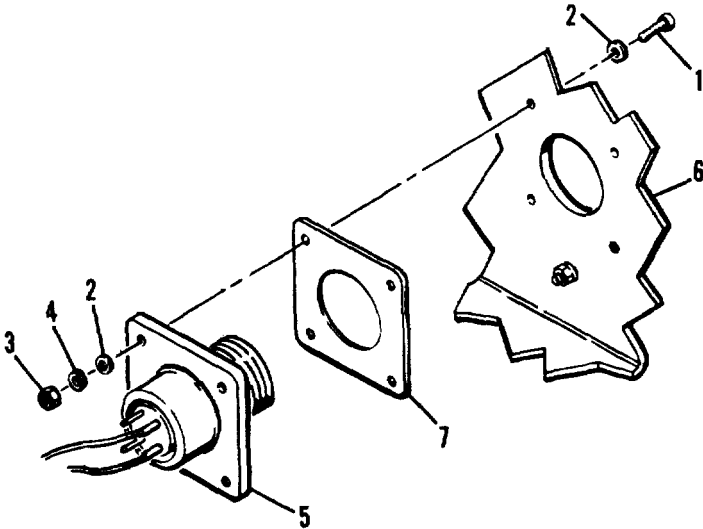
STEP**PROCEDURE****REMOVAL****NOTE**

As you remove each cover or wire eyelet from the components, replace all washers, nuts and screws on the terminals so the hardware will not be lost.

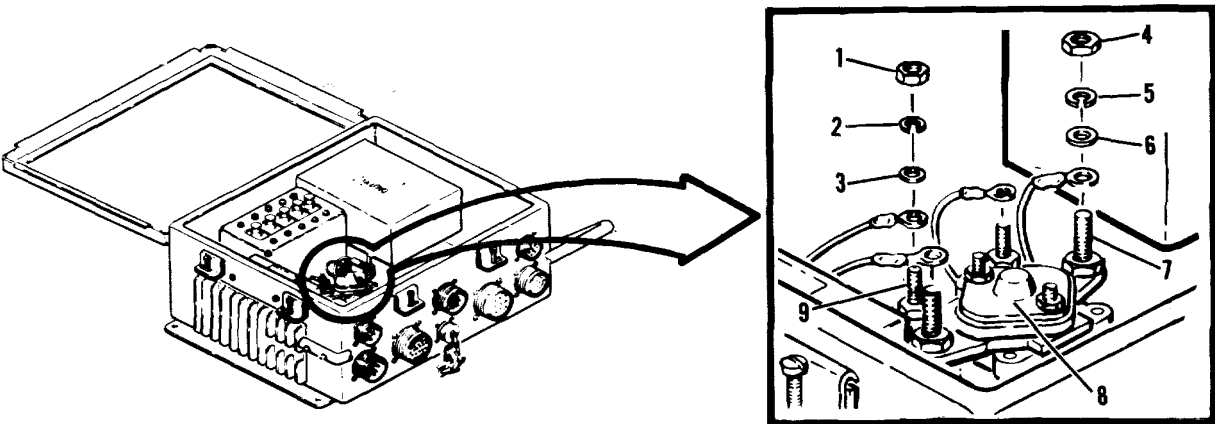
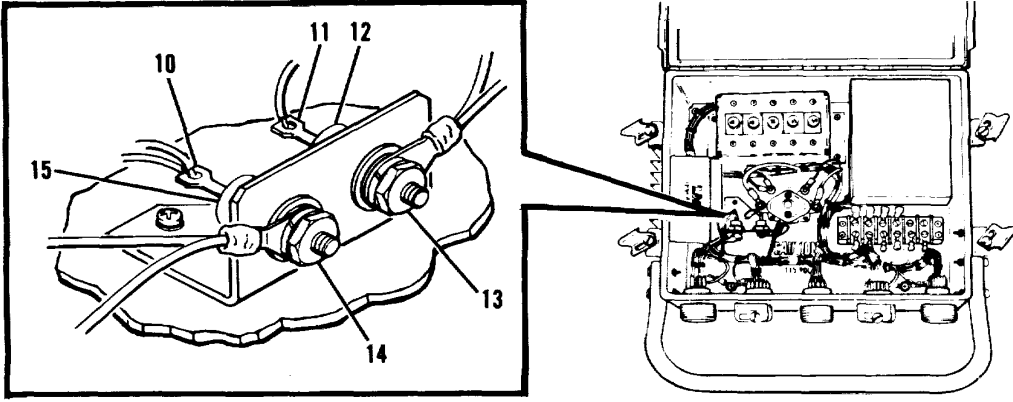
NOTE

If you have an early model distribution box (CB1 through CBS only) and are replacing a wiring harness, upgrade your distribution box by replacing the following items: circuit breakers CB1 through CBS, circuit breaker bracket, and wiring harness W1. Install CB6, a new identification plate (indicating J.3747A/G), a new warning label on the inside of the distribution box behind relay K1, and remove relay K1 cover.

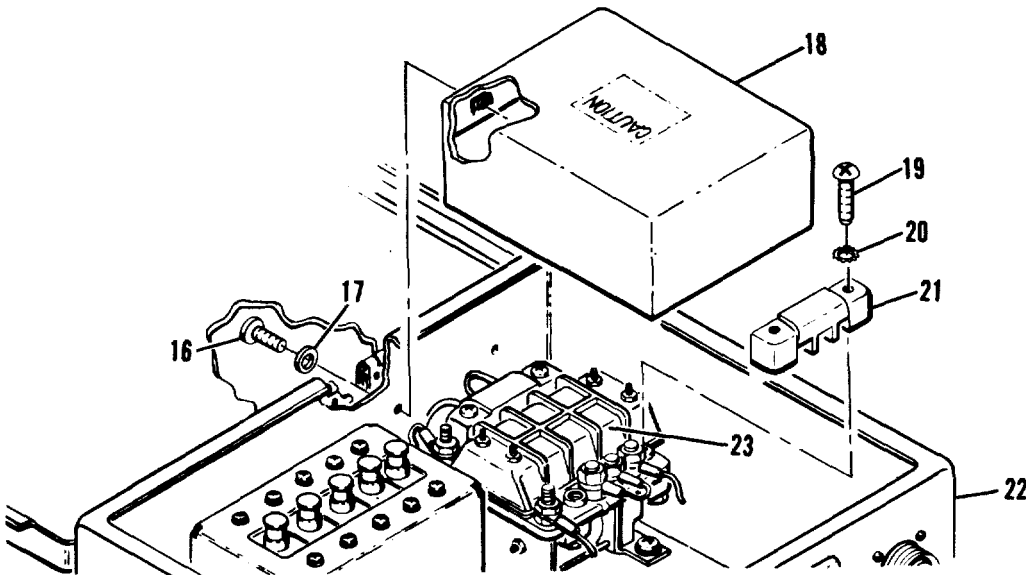
3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**n. WIRE HARNESS - Continued**

STEP	PROCEDURE
1.	 Separate connectors J1 through J8 from the distribution box: NOTE Connectors J1 through J8 are all attached to the distribution box in a similar manner. Steps a and b below are typical for all distribution box connectors. a. Remove four screws (1), eight flatwashers (2), four nuts (3), and four lockwashers (4), securing connector (5) to distribution box (6). b. Separate connector (5) and rubber gasket (7) from distribution box (8).

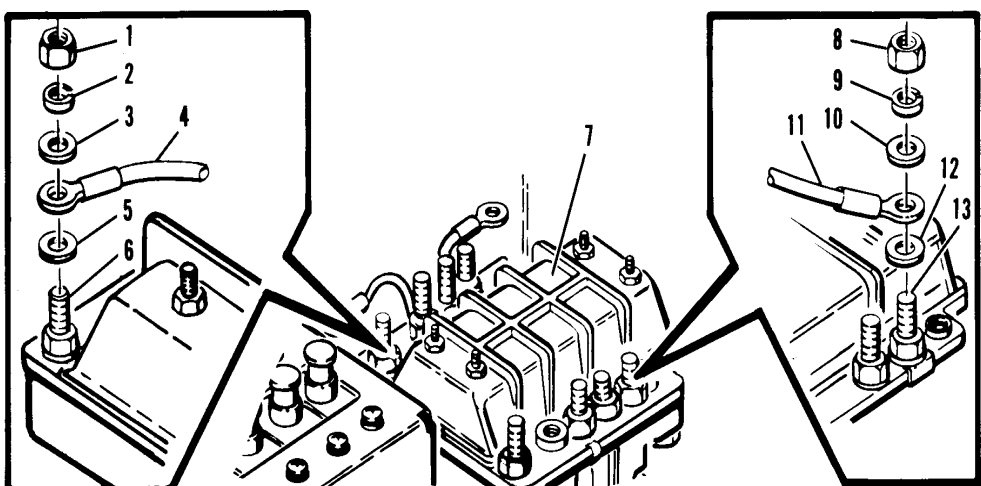
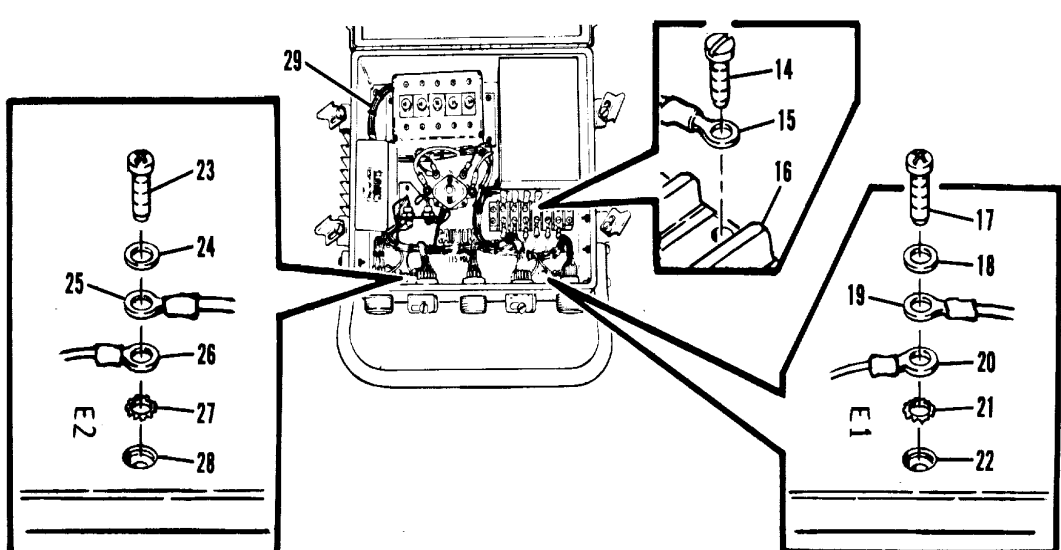
3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**n. WIRE HARNESS - Continued**

STEP	PROCEDURE
	 2. Remove two hex nuts (4), lockwashers (5), and flatwashers (6) from larger two terminal posts (7) of relay (8). 3. Remove wires from terminal posts (7). 4. Remove two hex nuts (1), lockwashers (2), and flatwashers (3) from smaller two terminal posts (9) of relay (8). 5. Remove wires from terminal posts (9).
	 6. Unsolder wires 64 (16 if early model) and 60 from anode (10) of diode (15). 7. Unsolder wire 61 from anode (11) of diode (12).

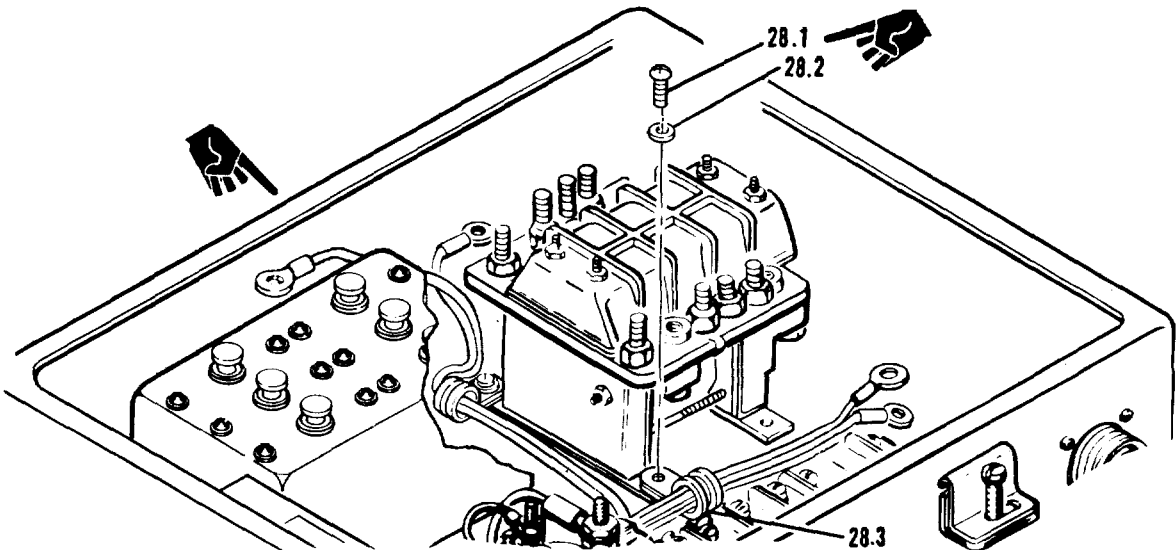
3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**n. WIRE HARNESS - Continued**

STEP	PROCEDURE
	CAUTION To prevent burning wires during the soldering task, move or disconnect, as required, any wires that may contact the soldering iron. 8. Remove nut and lockwasher from cathode end (13 and 14) of each diode. 9. Remove wires 8 and 63 from diode (15). Reinstall nut and lockwasher. 10. Remove wires 28 and 63 from diode (12). Reinstall nut and lockwasher.
	 11. On early models only, remove two screws (16) and flatwashers (17) from cover (18). 12. On early models only, remove cover (18) from distribution box (22). 13. Remove two screws (19) and star washers (20) from each of two terminal protective covers (21). 14. Remove two terminal protective covers (21) from relay (23).

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**n. WIRE HARNESS - Continued**

STEP	PROCEDURE
	 15. Remove two hex nuts (1), lockwashers (2), and flatwashers (3) from smaller terminal posts (6) of relay (7). 16. Remove wires (4) and flatwashers (5) from terminal posts (6). 17. Remove six hex nuts (8), lockwashers (9), and flatwashers (10) from larger terminal posts (13). 18. Remove wires (11) and flatwashers (12) from terminal posts (13).
	

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**n. WIRE HARNESS - Continued**

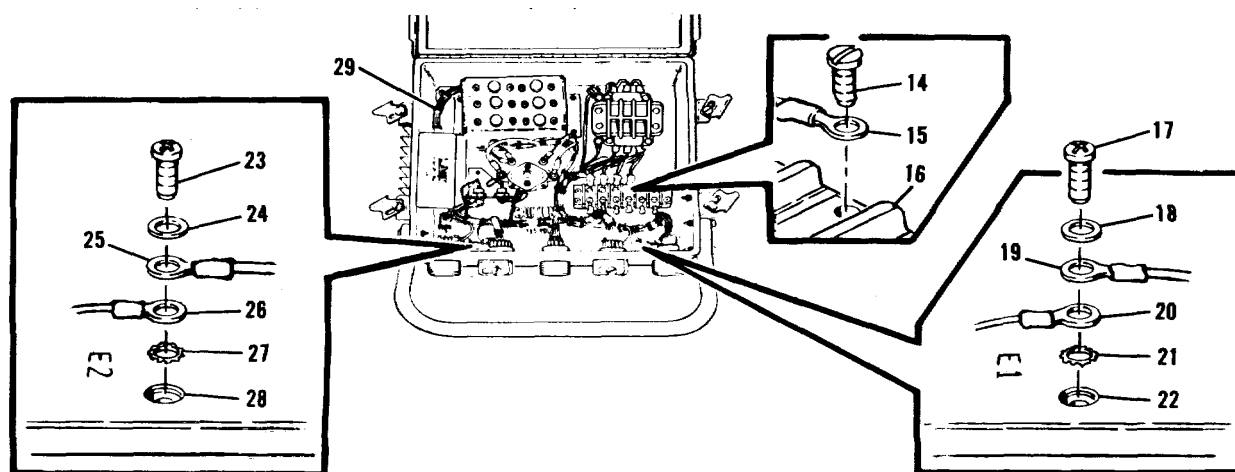
STEP	PROCEDURE
19. Remove 10 screws (14) and 15 wires (15) from terminal board (16). 20. Remove screw (17), lockwasher (21), and flatwasher (18) from terminal (22). 21. Remove wire 37 (20) and wire 20 (19). 22. Remove screw (23), lockwasher (27), and flatwasher (24) from terminal (28). 23. Remove wire 30 (26) and wire 2 (25). 23.1 Remove two screws (28.1), flatwashers (28.2), and if installed cable clamps * (28.3).	
	

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**n. WIRE HARNESS - Continued**

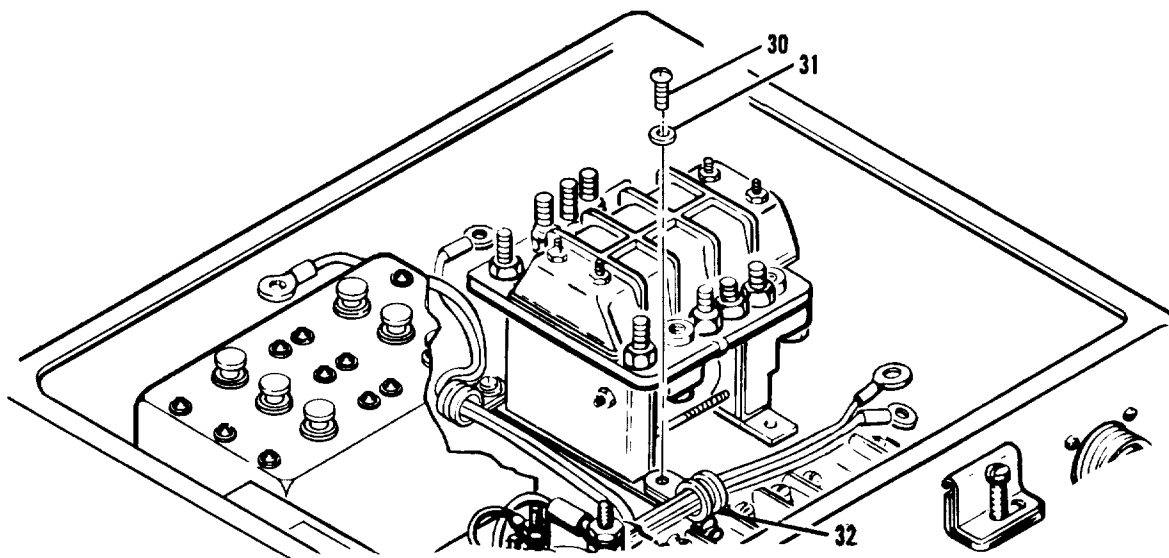
STEP	PROCEDURE
24.	Remove wire harness (29) from distribution box. REPLACEMENT Replace faulty part with a new part.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**n. WIRE HARNESS - Continued**

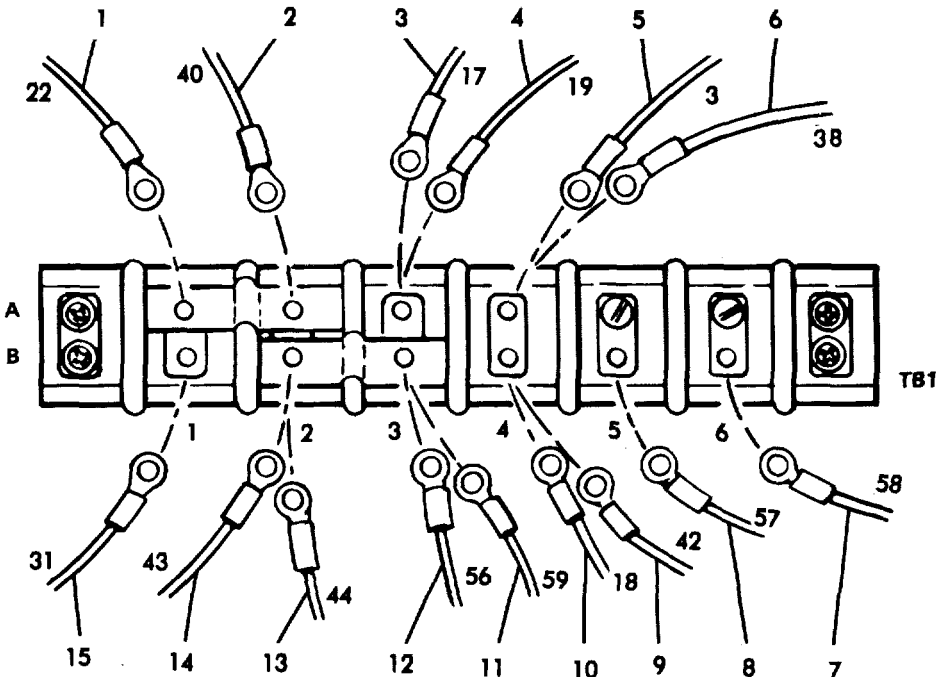
STEP	PROCEDURE
	INSTALLATION 1. Install wire harness (29) in distribution box so wires are flush with bottom. 2. Connect wires 30 (26) and 2 (25) to terminal (28) with screw (23), lockwasher (27), and flatwasher (24). 3. Connect wires 37 (20) and 20 (19) to terminal (22) with screw (17), lockwasher (21), and flatwasher (18).



- 3.1 Install two screws (30), flatwashers (31) and cable clamps (32).



3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**n. WIRE HARNESS - Continued**

STEP	PROCEDURE																																	
4.	Connect wires to terminal board (16) as follows:  <table><tr><th>CALL OUT</th><th>WIRE NO.</th><th>TB1 CONNECTION</th></tr><tr><td>1</td><td>22</td><td>A1</td></tr><tr><td>2</td><td>40</td><td>A2</td></tr><tr><td>3 and 4</td><td>17 and 19</td><td>A3</td></tr><tr><td>5 and 6</td><td>3 and 38</td><td>A4</td></tr><tr><td>7</td><td>58</td><td>B6</td></tr><tr><td>8</td><td>57</td><td>B5</td></tr><tr><td>9 and 10</td><td>42 and 18</td><td>B4</td></tr><tr><td>11 and 12</td><td>59 and 56</td><td>B3</td></tr><tr><td>13 and 14</td><td>44 and 43</td><td>B2</td></tr><tr><td>15</td><td>31</td><td>B1</td></tr></table>	CALL OUT	WIRE NO.	TB1 CONNECTION	1	22	A1	2	40	A2	3 and 4	17 and 19	A3	5 and 6	3 and 38	A4	7	58	B6	8	57	B5	9 and 10	42 and 18	B4	11 and 12	59 and 56	B3	13 and 14	44 and 43	B2	15	31	B1
CALL OUT	WIRE NO.	TB1 CONNECTION																																
1	22	A1																																
2	40	A2																																
3 and 4	17 and 19	A3																																
5 and 6	3 and 38	A4																																
7	58	B6																																
8	57	B5																																
9 and 10	42 and 18	B4																																
11 and 12	59 and 56	B3																																
13 and 14	44 and 43	B2																																
15	31	B1																																
5.	Connect wires to diodes CR2 and CR3 as follows: <u>CAUTION</u> When soldering wires to the anode of the diode, connect a heat sink to the anode to prevent damaging the diode.																																	

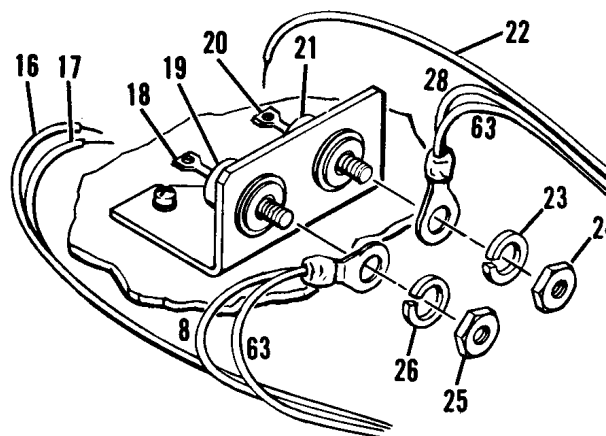
3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**n. WIRE HARNESS - Continued****STEP****PROCEDURE**

a. Remove nut (25) and lockwasher (26) from diode (19). Install wires 8 and 63 and install lockwasher and nut.

b. Remove nut (24) and lockwasher (23) from diode (21). Install wires 28 and 63 and install lockwasher and nut.

c. Connect and solder wire 61 (22) to anode (20) of diode (21).

d. Connect and solder wires 64 and 60 (16 and 17) to anode (18) of diode (19).



Connect wires to relay (41) as follows:

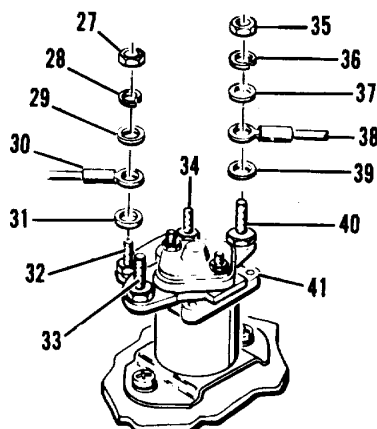
a. Install two thin flatwashers (31) on smaller terminal posts (32 and 34).

b. Install two thin flatwashers (39) on larger terminal posts (33 and 40).

c. Connect wires 55 and 56 (30) to terminal (32) and wire no. 32 to terminal (34).

d. Install two flatwashers (29), lockwashers (28), and nuts (27) on two smaller terminals (32 and 34).

e. Connect wire 52 to terminal (33) and wire 39 (38) to terminal (40).



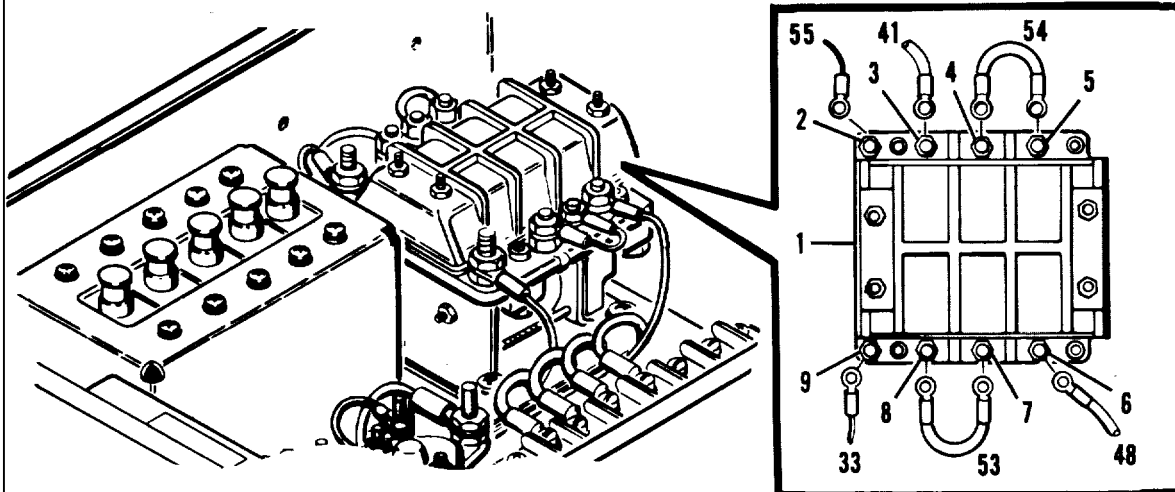
f. Install two flatwasher (37), lockwashers (36), and nuts (35) on two larger terminals (33 and 40).

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued

n. WIRE HARNESS - Continued

STEP

PROCEDURE

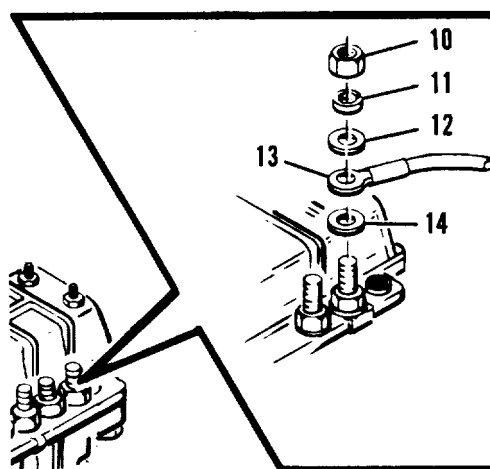


7. Install thin flatwashers (14) on eight terminal posts (2 thru 9) of relay (1).

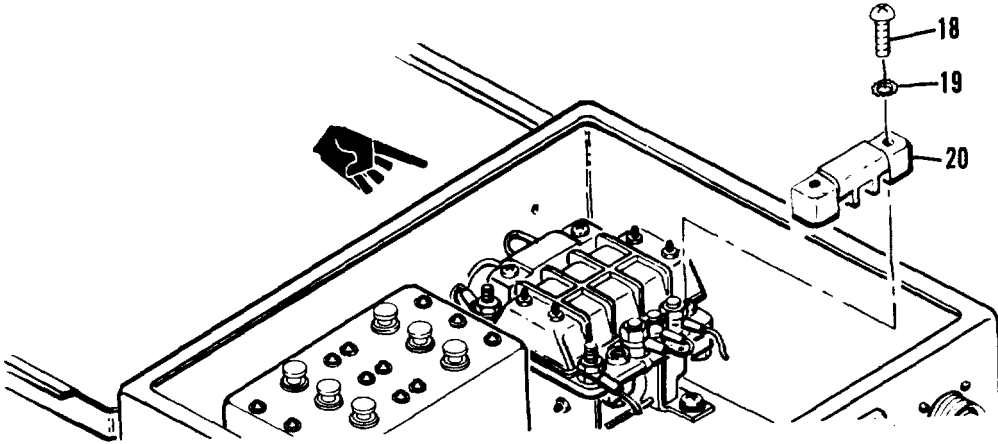
8. Connect wires (13) to relay (1) as follows:

CALL OUT	RELAY PIN NUMBER	WIRE NUMBER
2	XI	55
3	A2	41
4	B2	54
5	C2	54
6	C1	48
7	B1	53
8	A1	53
9	X2	33

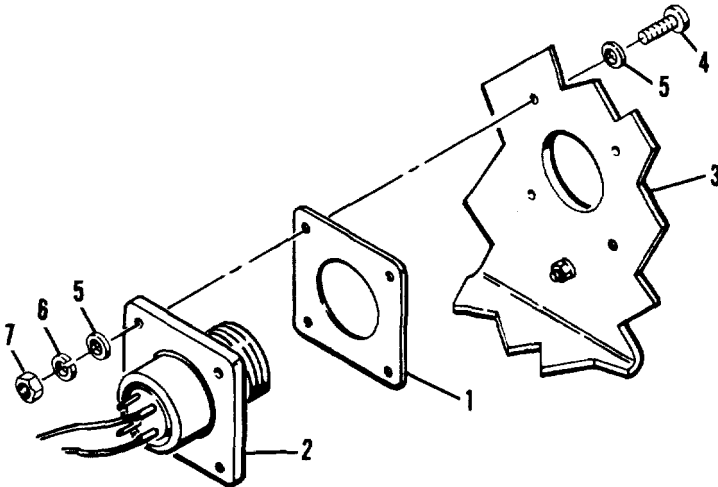
9. Install eight flatwashers (12), lockwashers (11), and hex nuts (10).



3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**n. WIRE HARNESS - Continued**

STEP	PROCEDURE
	 10. Install two covers (20) with two screws (18) and star washers (19). 11. Deleted. 12. Install diode (see para 3-9j). 13. Install circuit breakers and CB bracket (see para 3-9i).

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**n. WIRE HARNESS - Continued**

STEP	PROCEDURE
14.	Install wire harness connectors J1 through J8 to distribution box: NOTE Connectors J1 through J8 are all secured to distribution box in a similar manner. Step a and b below are for a typical connector. - Position rubber gasket (1) and connector (2) to distribution box (3). Make sure key on connector is on top. - Secure connector (2) and rubber gasket (1) to distribution box (3) with four screws (4), eight flatwashers (5), four lockwashers (6), and four nuts (7).  TEST Test distribution box (para 3-18) to verify repair.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**o. ENGINE INTERLOCK CONNECTOR J6****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5120-00-596-1474
Lg rd nose plr
No. 1 xtip scdr
Pocket knife
Sldr and desldr set,
3439-00-40-7198
Diag ctg plr, 5110-00-965-0974
Skt wr hdl, 5120-00-221-7952
1/4 in. skt, 5120-00-236-2264
Skt wr ext, 5120-00-243-1686
Heat gun HG-501

EquipmentConditionPara

3-9a

Condition Description

Cover removed

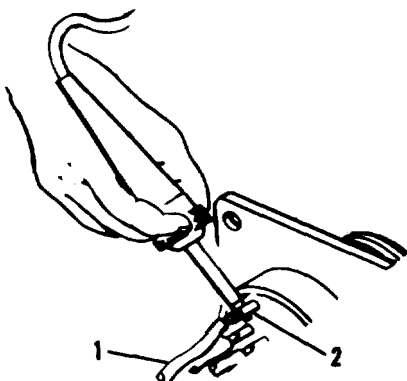
Wire ties removed as
necessaryMaterials/Parts

Heat shrink sleeving (appx B, items
6, 7, 8, 9, 10, 11, or 12)
Solder (appx B, item 19)
Connector
Wire ties

STEP**PROCEDURE****REMOVAL**

1. Split heat shrink sleeve lengthwise and remove from 2 connector pins.
2. Tag each wire removed with following information for installation:

Wire	J6 Pin
<u>Number</u>	<u>Connection</u>
11	A
10	B



Unsolder and remove two wires (1)
from connector pins (2).

3.

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**o. ENGINE INTERLOCK CONNECTOR J6 - Continued**

STEP	PROCEDURE
4.	Remove four screws (1), eight flat washers (2), four lockwashers (3), and four nuts (4) securing connector (5) and rubber gasket (6) to distribution box (7). Remove connector (5) and rubber gasket (6).
5.	Remove screw (8), two flat washers (9), lockwasher (10), and nut (11) securing cover (12) to distribution box (7). Remove cover (12).
REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Position cover (12) to distribution box (7) and secure with screw (8), two flat washers (9), lockwasher (10), and nut (11). NOTE Install connector with keyway up. 2. Position connector (5) and rubber gasket (6) to distribution box (7) and secure with four screws (1), eight flat washers (2), four lockwashers (3), and four nuts (4).	

3-9. DISTRIBUTION BOX MAINTENANCE INSTRUCTIONS - Continued**o. ENGINE INTERLOCK CONNECTOR J6 - Continued**

STEP	PROCEDURE						
3. 4. 5.	Prepare and tin ends of two wires and pins on connector (5). Cut two pieces of heat shrink sleeving (13) 1/2 in. long. Slide heat shrink sleeving (13) over wires (14).						
	NOTE Keep soldering Iron tip clean.						
6.	Solder two wires to two connections as follows: <table border="1"> <thead> <tr> <th>Wire Number</th><th>J4 Pin Connection</th></tr> </thead> <tbody> <tr> <td>11</td><td>A</td></tr> <tr> <td>10</td><td>B</td></tr> </tbody> </table>	Wire Number	J4 Pin Connection	11	A	10	B
Wire Number	J4 Pin Connection						
11	A						
10	B						
7. 8. 9.	Slide heat shrink sleeving (13) over soldered connections (15). Use heat gun to shrink heat shrink sleeving on connections. Install tiedown straps.						
	TEST Test distribution box (para 3-18) to verify repair.						

3-10. PCA MAINTENANCE INSTRUCTIONS

- You will find procedures for repairing all major parts of the PCA in this paragraph.
- If a part is found to be faulty during troubleshooting, you will be referred directly to the repair procedure.
- If a part is found to be faulty during inspection, refer to the List of Tasks, below. It will tell you the location of the repair procedure for the part.
- Turn to the referenced procedure and check the INITIAL SETUP for information needed to begin the repair.
- Note that the Equipment Condition entry in INITIAL SETUP tells you what parts must have been removed before you can begin the actual repair.
- When required, you will be referred to test and adjustment procedures.

OVERVIEW

To repair the PCA, you must:

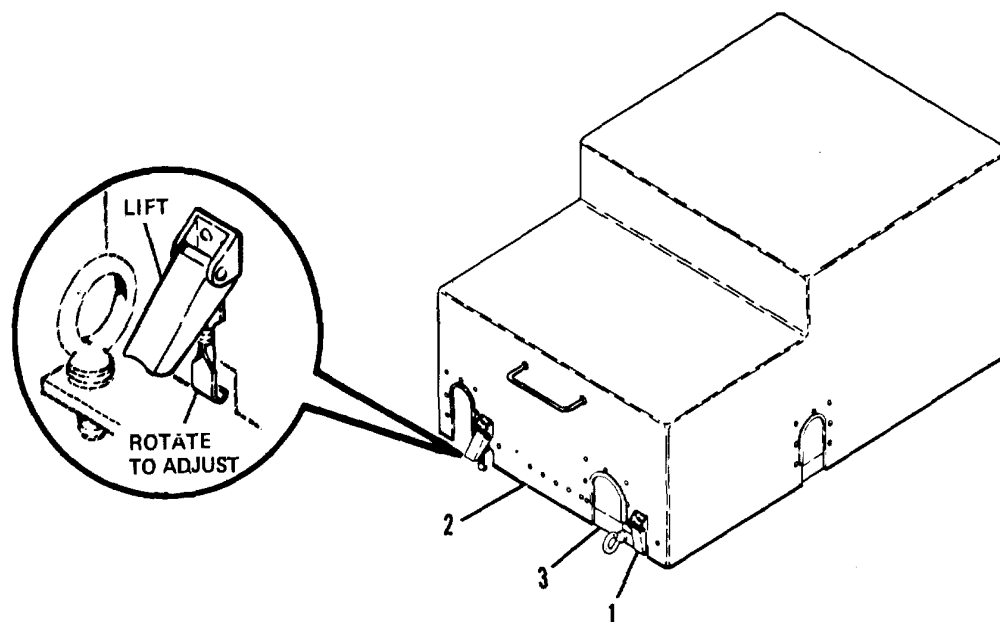
- Remove parts to gain access to the faulty part.
- Remove the faulty part.
- Replace the faulty part with a new part.
- Install the new part.
- Reinstall parts removed to gain access.
- Test the PCA to verify successful repair (see para 3-19).
- Adjust settings of parts, if settings are not correct (see para 3-23).

NOTE

Remove and reinstall cable clamps as necessary to gain access to require items.

Apply sealing compound (appx b, Item 25) to threads of all MS51958-65 and MS24693C274 screws prior to installation.

LIST OF TASKS	
Maintenance (repair) of -	Para No (3-10)
air filter element	g
air pressure regulator	s
capacitor C1	i
check valves	o
compressor A1	e
compressor A5	c
compressor motor brushes	b
connector J1	y
connector J2	z
line air filter	x
heater switch S6	p
manifold heater HR1	u
manifold heater thermostat S5	t
manifold-to-mast line adapter	r
PCA cover	a
pressure gages	j
pressure switch S1	f
pressure switch S2 or S3	k
pressure switch S4	d
rectifier CR1	w
relay K1	v
safety relief valve	q
resilient mounts	ab
solenoid valve A2 (extend)	n
solenoid valve A3 (retract)	m
solenoid valve A4 (safety)	l
transformer T1	h
wire harness	aa

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**a. PCA COVER****This task covers:****Removal****Replacement****Installation****INITIAL SETUP** - None**STEP****PROCEDURE**

Release four catches (1) and remove cover (2) from base (3).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

Position cover (2) on base (3) and secure with four catches (1).

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**b. COMPRESSOR MOTOR BRUSHES****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP** - NoneTools

Refrig Unit Svce Tool Kit;
 5180-00-596-1474
 1/4 in. flat tip scdr
 3/8 in. comb. wr

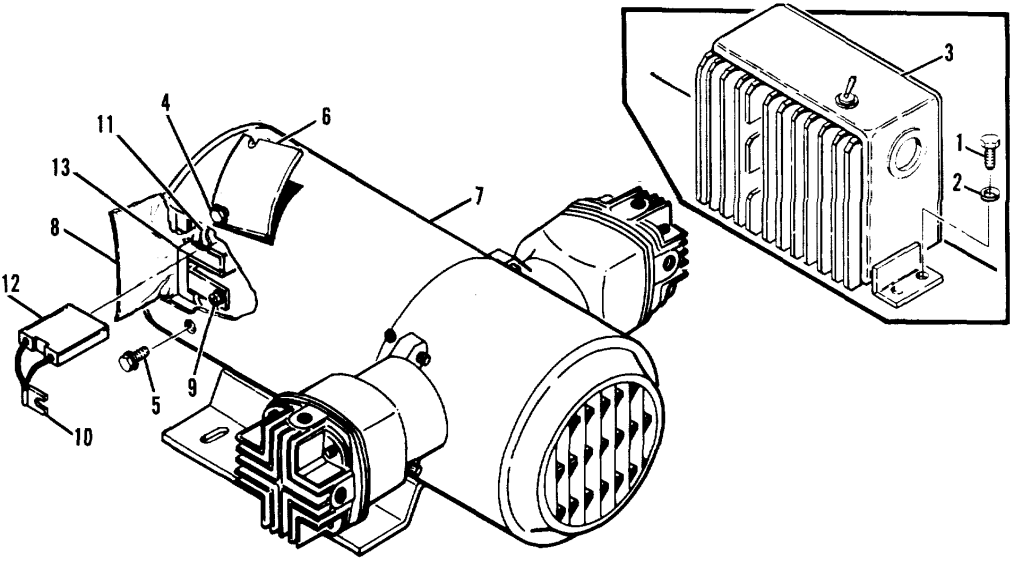
Equipment
 Condition

Para
 3-10a

Condition Description
 PCA cover removed

Materials/Parts

brush (two)

STEP	PROCEDURE
	REMOVAL  NOTE This procedure applies for both brushes. Replace both brushes at the same time. If brushes in compressor A1 are to be replaced, perform step 1 to obtain access. If not, begin with step 2. 1. Remove four bolts (1) and flat washers (2) and move junction box (3) aside. 2. Loosen screw (4), remove screw (5), and swing cover (6) away from opening in motor (7).

3-10. PCA MAINTENANCE INSTRUCTIONS-Continued	
b. COMPRESSOR MOTOR BRUSHES-Continued	
STEP	PROCEDURE
3.	Fold insulating paper (8) outward.
4.	Loosen screw (9) and remove terminal (10) from behind screw.
5.	Slip clip (11) off end of brush (12).
6.	Pull brush (12) out of brush holder (13).
	REPLACEMENT
	Replace faulty part with a new part.
	INSTALLATION
1.	Insert brush (12) into brush holder (13).
2.	Slip clip (11) over end of brush (12).
3.	Insert terminal (10) under head of screw (9) and tighten screw.
4.	Fold insulating paper (8) into opening in motor (7).
5.	Swing cover (6) into position over opening in motor (7) and secure with two screws (4 and 5).
6.	If junction box (3) was moved aside, set into place and secure with four washers (2) and bolts (1).
	TEST
	Test PCA (para 3-19) to verify repair.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**c. COMPRESSOR A5****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP** - NoneTools

Refrig Unit Svce Tool Kit,

5180-00-596-1474

9/16 in. comb. wr

3/4 in. comb. wr

5/8 in. comb. wr

7/16 in. comb. wr

1/2 in. comb. wr

No. 2 xtip scdr

Materials/Parts

Thread sealing compound (appx B, item 21)

Compressor

EquipmentConditionPara

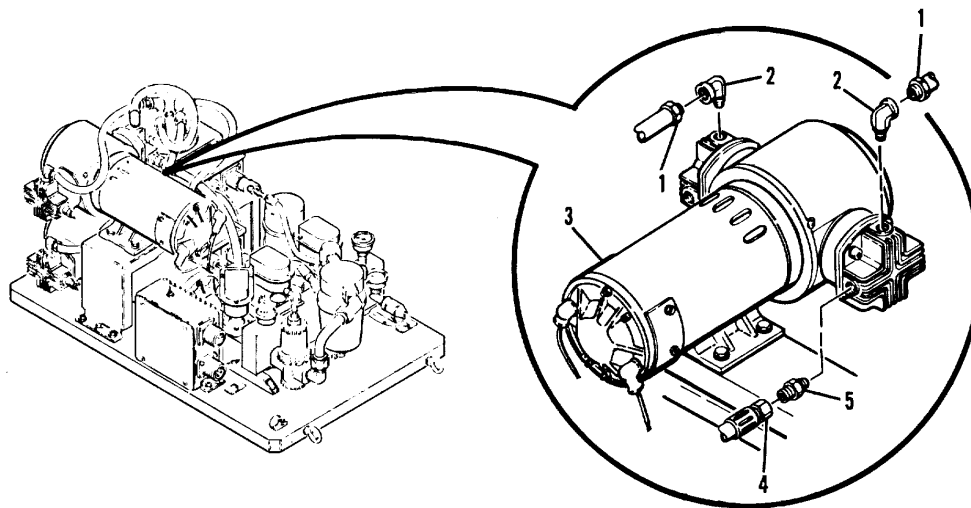
3-10a

Condition Description

PCA cover removed

Troubleshooting Reference (table 3-3)

Malfunction 1, step 1

STEP**PROCEDURE****REMOVAL**

1. Disconnect two adapters (1) from elbows (2).
2. Remove two elbows (2) from compressor (3).
3. Disconnect adapter (4) from adapter (5).
4. Remove adapter (5) from compressor (3).

3-10. PCA MAINTENANCE INSTRUCTIONS-Continued**c. COMPRESSOR A5-Continued**

STEP	PROCEDURE
	5. Slip two boots (6) back along wires (7). 6. Remove two nuts (8) and disconnect two wires (7) from terminals (9). 7. Remove four screws (10), lockwashers (11), and flat washers (12); and remove compressor (3) from bracket (13). REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Position compressor (3) on bracket (13) and secure with four flat washers (12), lockwashers (11), and screws (10). 2. Connect two wires (7) to terminals (9) (wire 25 to POS, wire 27 to NEG) and secure with two nuts (8). 3. Slip two boots (6) over terminals (9).

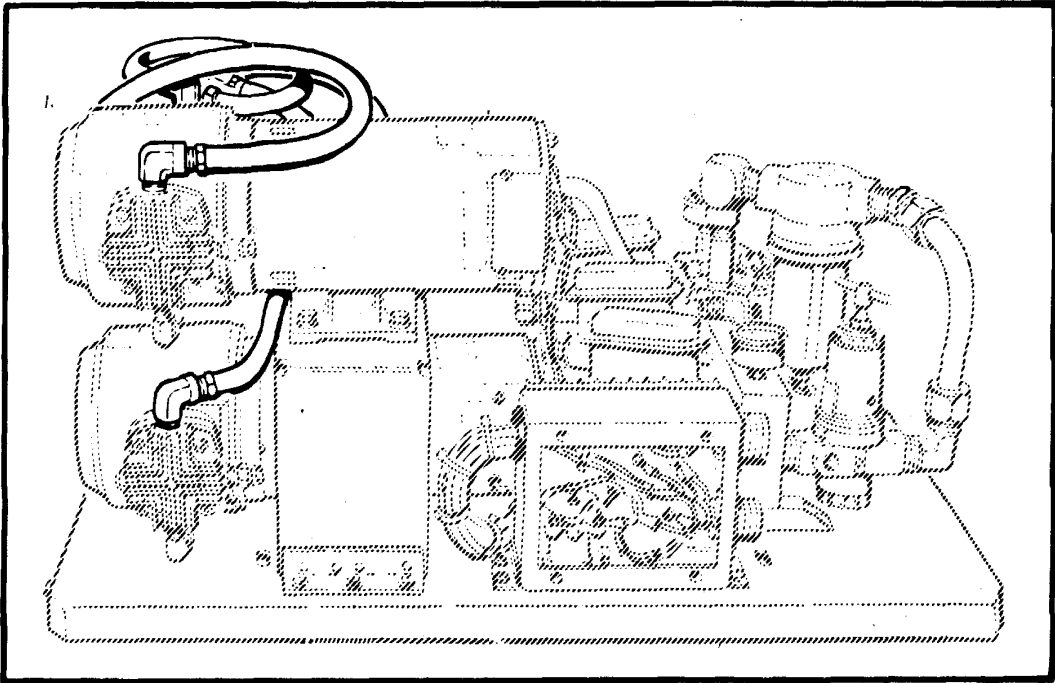
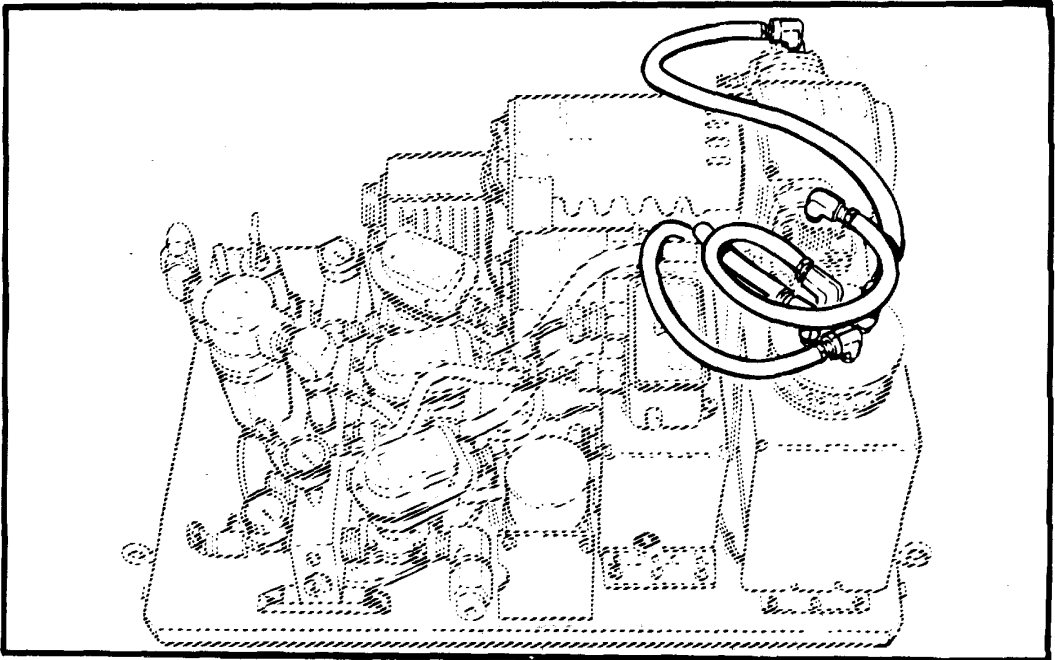
3-10. PCA MAINTENANCE INSTRUCTIONS-Continued

c. COMPRESSOR A5-Continued

STEP	PROCEDURE
	4. Apply a light coat of thread sealing compound on tapered threads of adapters (1). 5. Install adapter (1) in port in compressor (2). NOTE When installing pneumatic line adapters and elbows, do not overtighten. 6. Connect adapter (3) to adapter (1). 7. Apply a light coat of thread sealing compound on external threads of two elbows (4), and install elbows in ports in compressor (2). 8. Connect two adapters (5) to elbows (4). NOTE See figure on next page for proper arrangement of compressor input hoses. TEST Test PCA (para 3-19) to verify repair.

3-10. PCA MAINTENANCE INSTRUCTIONS-Continued

c. COMPRESSOR A5-Continued

STEP	PROCEDURE
	 1. 

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**d. PRESSURE SWITCH S4****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474

5/8 in. comb. wr

7/16 in. comb. wr

3/8 in. flat tip scdr

1/4 in. flat tip scdr

No. 3 xtip scdr

1-1/4 in. comb. wr, 5120-00-228-9517

EquipmentCondition

Para
3-10a

Condition Description

PCA cover removed

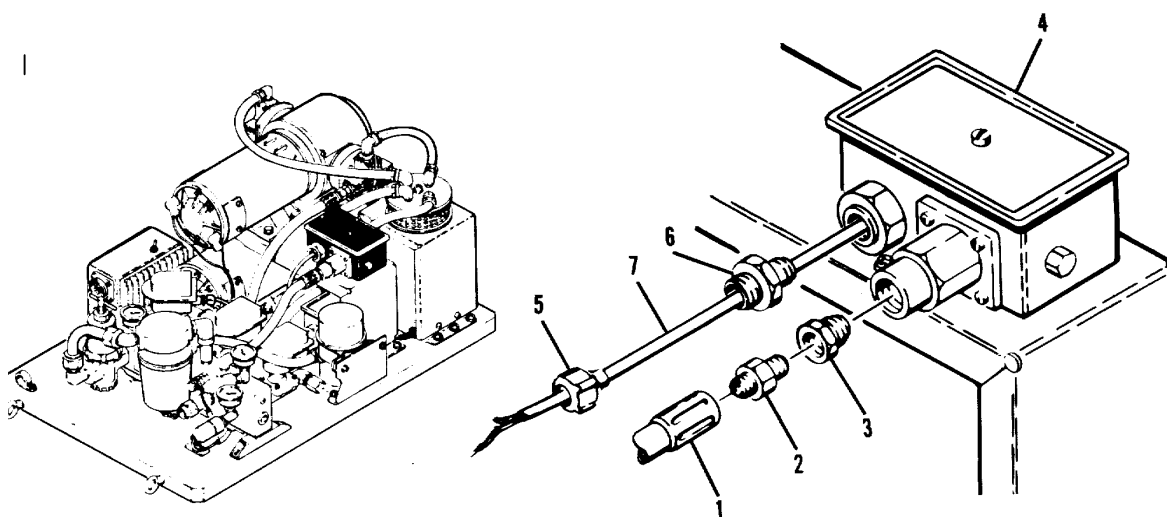
Troubleshooting Reference (table 3-3)
malfunction 1, step 2

Materials/Parts

pressure switch

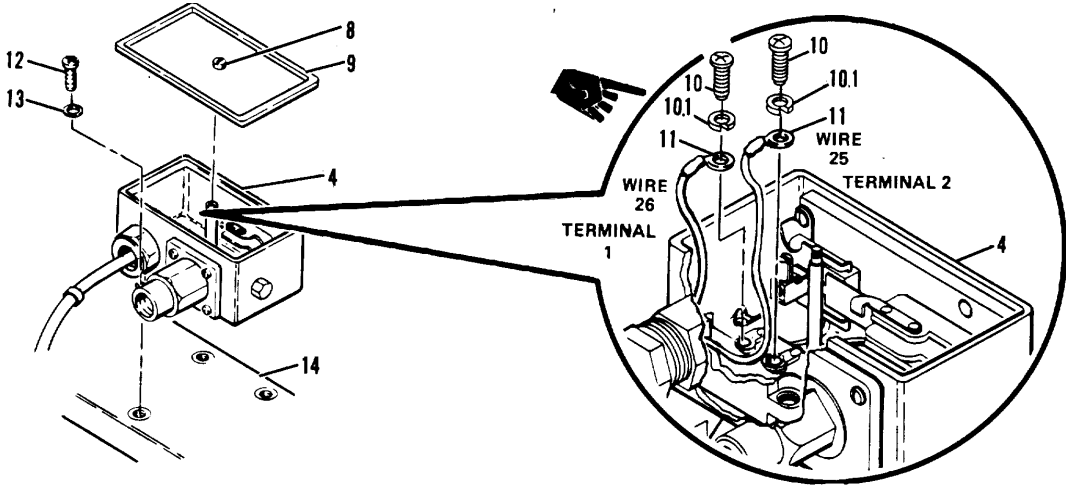
silicone adhesive (appx B, item 18)

thread sealing compound (appx B, item 21)

STEP**PROCEDURE****REMOVAL**

1. Disconnect adapter (1) from adapter (2).
2. Remove adapter (2) from bushing (3).
3. Remove bushing (3) from switch (4).
4. Loosen bushing (5), unscrew adapter (6) while holding cable (7), to prevent twisting, and slide bushing and adapter back along cable.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**d. PRESSURE SWITCH S4 - Continued**

STEP	PROCEDURE
	 5. Release captive screw (8) and remove cover (9) and attached gasket. 6. Remove two screws (10) and lockwashers (10.1), disconnect two wires (11), and pull wires out of switch (4). 7. Remove three screws (12) and flat washers (13), and remove switch (4) from bracket (14). REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Position switch (4) on bracket (14) and secure with three flat washers (13) and screws (12). 2. Insert two wires (11) through bushing (5) and adapter (6), and into port in switch (4). 3. Connect two wires (11) to terminals in switch (4) (wire 26 to terminal 1, and wire 25 to terminal 2) and secure with two lockwashers (10.1) and screws (10). 4. Install cover (9) along with gasket and secure with captive screw (8).

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

d. PRESSURE SWITCH S4 - Continued

STEP	PROCEDURE
	NOTE Hold cable (1) while installing adapter (2) and bushing (3) to prevent cable from twisting. 5. Install adapter (2) in port in switch (4). 6. Install bushing (3) on adapter (2). 7. Apply a light coating of thread sealing compound on external threads of bushing (5) and install bushing in port in switch (4). 8. Install adapter (6) on bushing (5). 9. Connect adapter (7) to adapter (6). TEST Test PCA (para 3-19) to verify repair.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**e. COMPRESSOR A1****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP****Tools**

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 3 xtip scdr

**Equipment
Condition****Para**

3-10a

3-10c

3-10d

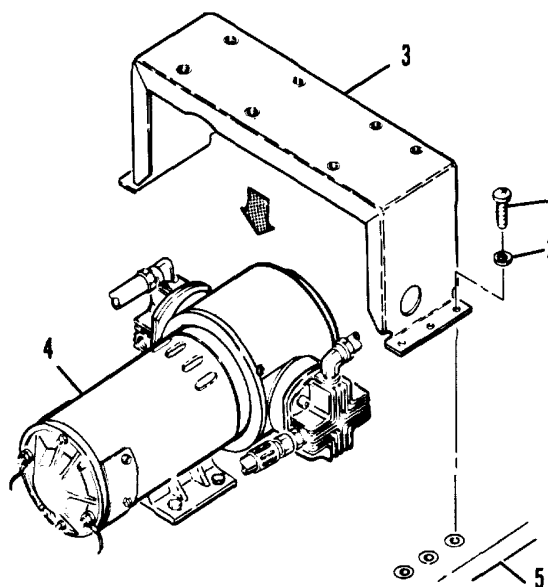
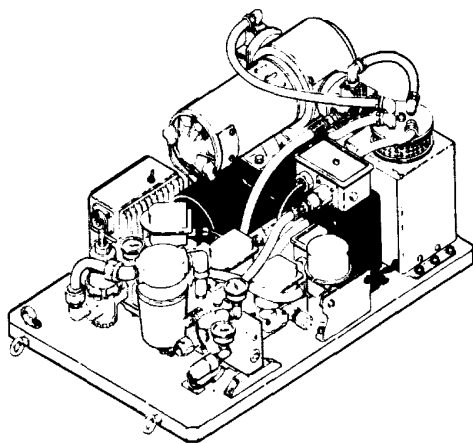
Condition Description

PCA cover removed

Compressor A5 removed

Pressure switch S4
removed**Materials/Parts**
compressor

Troubleshooting Reference (table 3-3)
malfunction 2, step 1

STEP**PROCEDURE****REMOVAL**

1. Remove six screws (1) and flat washers (2), and remove bracket (3).
2. Perform REMOVAL steps 1 through 7 of paragraph 3-10c (removal of compressor A5), except remove compressor A1 (4) from base (5).

REPLACEMENT

Replace faulty part with a new part.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**e. COMPRESSOR A1 - Continued**

STEP	PROCEDURE
	INSTALLATION 1. Perform INSTALLATION steps 1 through 8 of paragraph 3-10c (installation of compressor A5), except for the following: a. Install compressor A1 (4) on base (5). b. Connect wire 22 to POS; connect wire 23 to NEG. 2. Install bracket (3) and secure to base (5) with six flat washers (2) and screws (1). TEST Test PCA (para 3-19) to verify repair.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**f. PRESSURE SWITCH S1****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 3 xtip scdr

EquipmentConditionPara

3-10a

3-10c

Condition Description

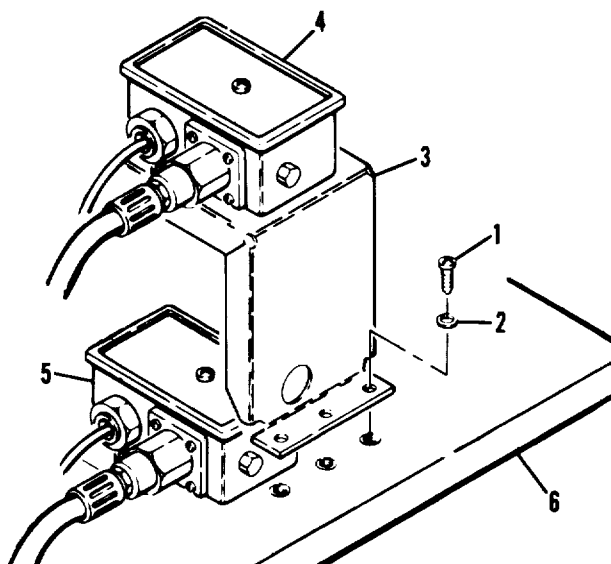
PCA cover removed

Compressor A5 removed

Materials/Parts

switch

Troubleshooting Reference (table 3-3)
malfunction 2, step 1

STEP**PROCEDURE****REMOVAL**

1. Remove six screws (1) and flat washers (2), and move bracket (3) and attached switch S4 (4) aside for access to switch S1 (5).
2. Perform REMOVAL steps 1 through 7 of paragraph 3-10d (removal of pressure switch S4), except remove switch S1 (5) from base (6).

REPLACEMENT

Replace faulty part with a new part.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**f. PRESSURE SWITCH S1 - Continued**

STEP	PROCEDURE
	INSTALLATION 1. Perform INSTALLATION steps 1 through 9 of paragraph 3-10d (installation of pressure switch S4), except connect wire 1 (brown) to terminal 1 and wire 1 (black) to terminal 2, and install switch S1 (5) on base (6). 2. Install bracket (3) with attached switch S4 (4) and secure to base (5) with six flat washers (2) and screws (1). TEST Test PCA (para 3-19) to verify repair.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**g. AIR FILTER ELEMENT****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 3 xtip scdr

Equipment

Condition

Para

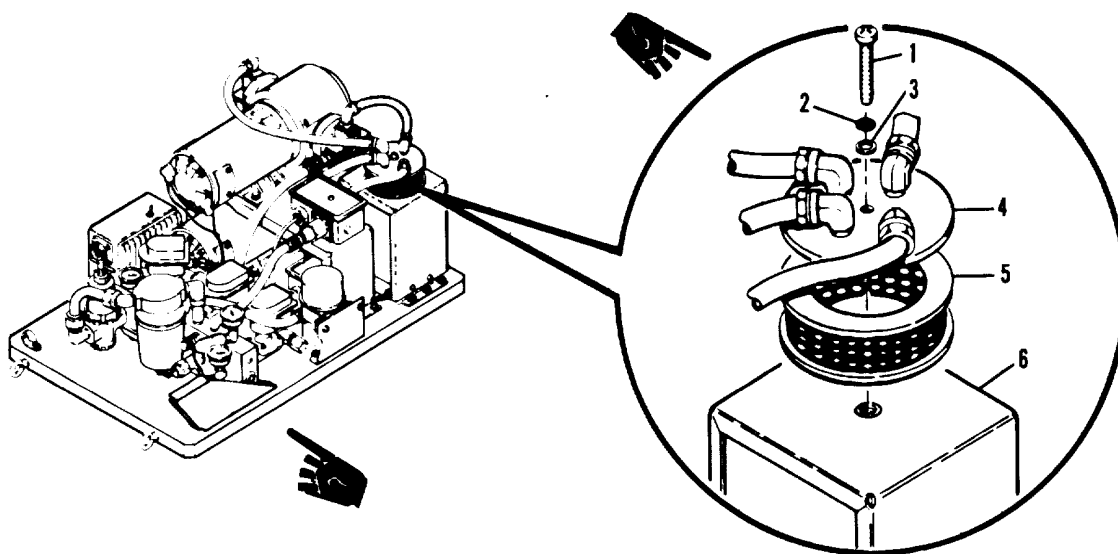
3-10a

Condition Description

PCA cover removed

Materials/Parts

Filter element

STEP**PROCEDURE****REMOVAL**

1. Remove screw (1), lockwasher (2) and flat washer (3).
2. Lift plate (4) and remove filter element (5) from cover (6).

REPLACEMENT

Replace faulty part with a new part.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**g. AIR FILTER ELEMENT - Continued**

STEP	PROCEDURE
	INSTALLATION
	1. Lift plate (4) away from cover (6), slide filter element (5) between plate and cover, and position filter element in groove in bottom of plate.
	2. Secure plate (4) to cover (6) with flat washer (3), lockwasher (2), and screw (1).

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**h. TRANSFORMER T1****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
3/8 in. comb. wr
7/16 in. comb. wr
No. 3 xtip scdr
No. 2 xtip scdr (16 in. blade)

Materials/Parts
transformer

Equipment
Condition

Para

3-10a

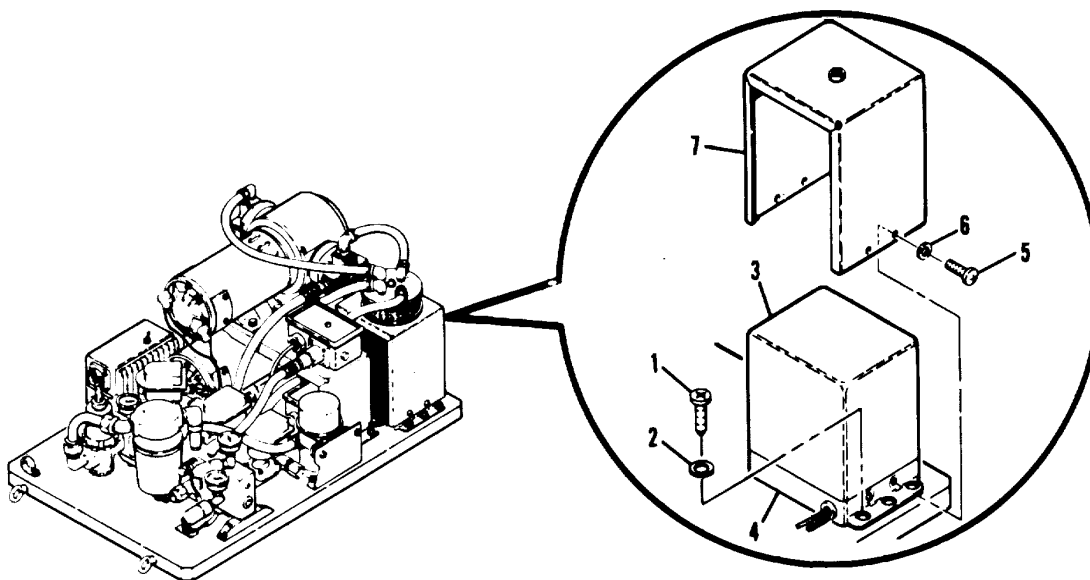
3-10g

Condition Description

PCA cover removed

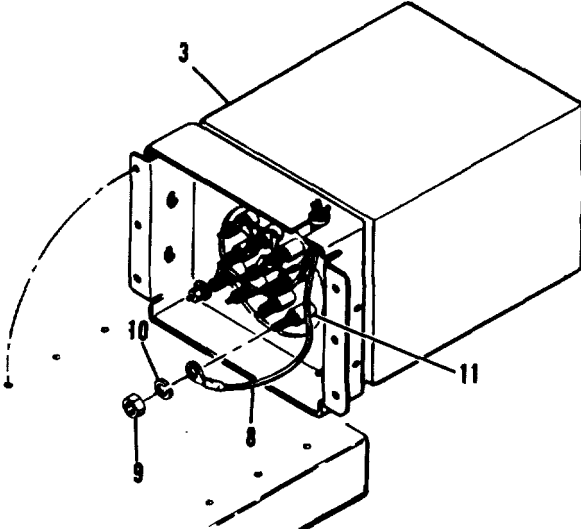
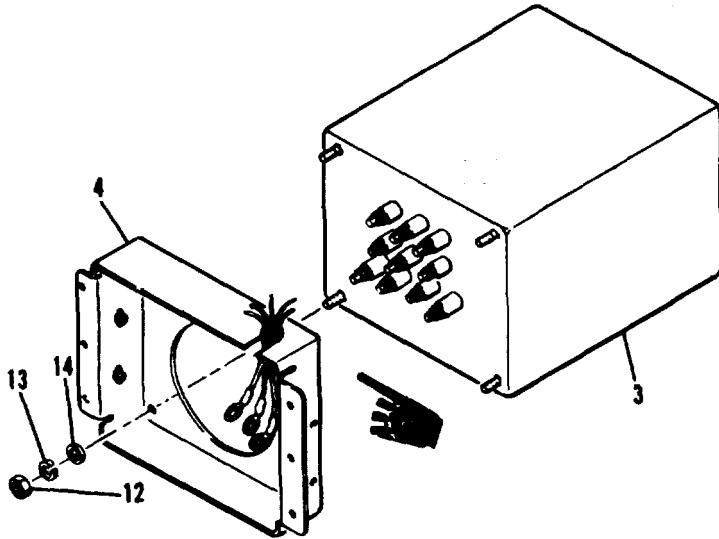
Air filter element
removed

Troubleshooting Reference (table 3-3)
malfunction 1, step 4,5,and 6

STEP**PROCEDURE****REMOVAL**

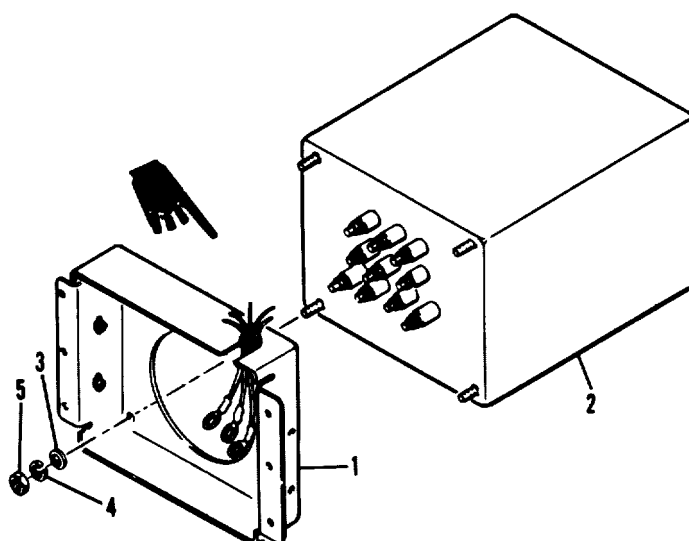
1. Remove six screws (1) and flat washers (2), and move transformer (3) and attached bracket (4), aside for access to screws (5).
2. Remove four screws (5) and flat washers (6), and remove cover (7).

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**h. TRANSFORMER T1 - Continued**

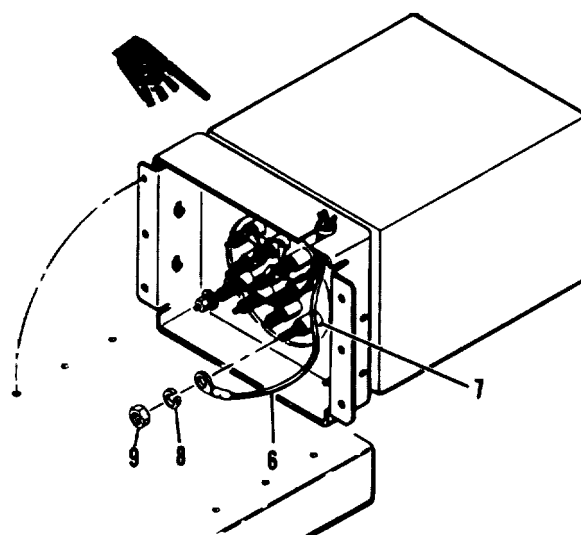
STEP	PROCEDURE
	 3. Turn transformer (3) on its side for access to wires (8). 4. Remove five nuts (9) and lockwashers (10), and disconnect six wires (8) from terminals (11). Tag wires for reconnection.  5. Remove four nuts (12), lockwashers (13), and flat washers (14); and remove bracket (4) from transformer (3).

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**h. TRANSFORMER T1 - Continued****STEP****PROCEDURE****REPLACEMENT**

Replace faulty part with a new part.

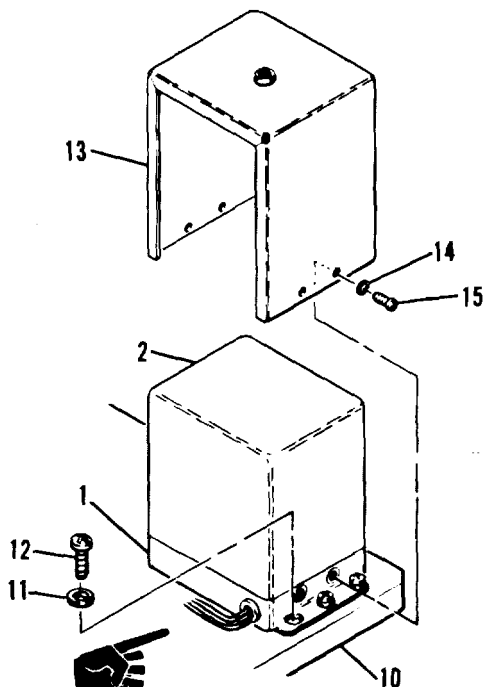
INSTALLATION

1. Attach bracket (1) to transformer (2) with four flat washers (3), lockwashers (4), and nuts (5).
2. Place transformer on its side for connection of wires (6).



3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

h. TRANSFORMER T1 - Continued

STEP	PROCEDURE																				
3.	Connect six wires (6) to terminals (7) as listed below, and secure with five lockwashers (8) and nuts (9). <table><tr><td><u>connect</u></td><td>wire 16</td><td><u>to</u></td><td>terminal C</td></tr><tr><td></td><td>wire 19, 37</td><td></td><td>terminal 125</td></tr><tr><td></td><td>wire 31</td><td></td><td>terminal 1</td></tr><tr><td></td><td>wire 32</td><td></td><td>terminal 6</td></tr><tr><td></td><td>wire 33</td><td></td><td>(jumper terminal 3 to terminal 4)</td></tr></table>	<u>connect</u>	wire 16	<u>to</u>	terminal C		wire 19, 37		terminal 125		wire 31		terminal 1		wire 32		terminal 6		wire 33		(jumper terminal 3 to terminal 4)
<u>connect</u>	wire 16	<u>to</u>	terminal C																		
	wire 19, 37		terminal 125																		
	wire 31		terminal 1																		
	wire 32		terminal 6																		
	wire 33		(jumper terminal 3 to terminal 4)																		
																					
4.	Position cover (13) on bracket (1) and secure with four flatwashers (14) and screws (15).																				
5.	Position transformer (2) and bracket (1) on base (10) and secure with five flatwashers (11) and screws (12).																				
	NOTE Ensure wires are routed at 90 degree angle from transformer assembly to avoid chafing of wires against other parts. TEST Test PCA (see para 3-19) to verify repair.																				

3-10. PCA - Continued**i. CAPACITOR C1****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 2 xtip scdr
3/8 in. comb. wr
1/4 in. flat tip scdr

Materials/Parts

Capacitor

Equipment
Condition

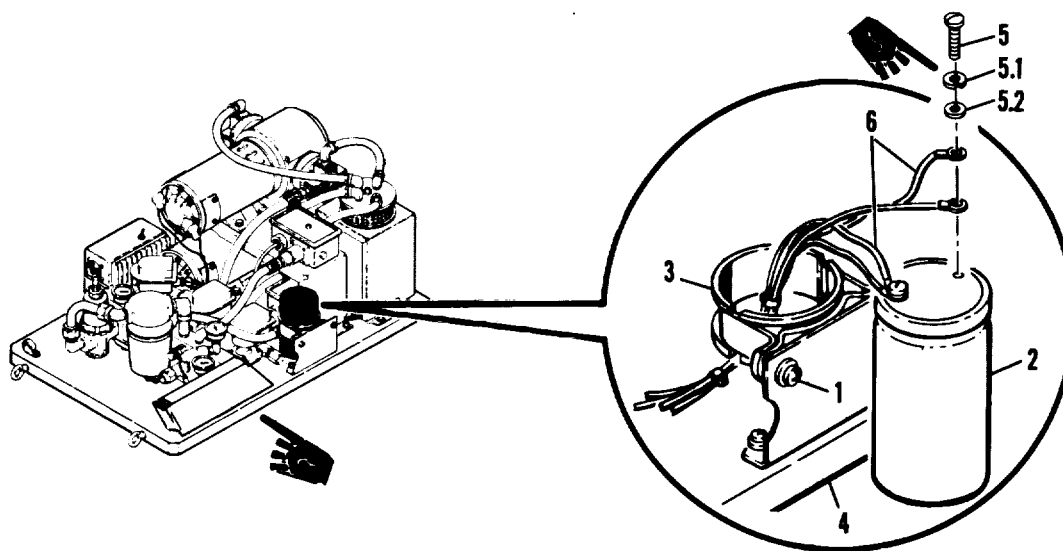
Para

3-10a

Condition Description

PCA cover removed

Troubleshooting Reference (table 3-3)
Malfunction 1, step 8

STEP**PROCEDURE****REMOVAL**

Capacitor C1 stores a moderate electrical charge. To avoid electrical shock, short capacitor terminals together using a screwdriver with a plastic handle before doing maintenance procedures.

1. Loosen two screws (1).
2. Lift capacitor (2) out of retaining strap (3), turn it upside down, and stand it next to base (4).
3. Remove two screws (5), lockwashers (5.1), and flatwashers (5.2); and disconnect four wires (6).
4. Remove capacitor (2).

3.10. PCA MAINTENANCE INSTRUCTIONS - Continued**i. CAPACITOR C1 - Continued**

STEP	PROCEDURE								
	REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Turn capacitor (2) upside down and stand it next to base (4). 2. Feed four wires (6) up through retaining strap (3), connect wires as listed below, and secure with two screws (5), lockwashers (5.1), and flat washers (5.2). <table><tr><td><u>connect:</u></td><td>wires 26 and 28</td><td><u>to:</u></td><td>positive terminal</td></tr><tr><td></td><td>wires 27 and 29</td><td></td><td>negative terminal</td></tr></table> 3. Turn capacitor (2) right side up and slip it into retaining strap (3). 4. Tighten two screws (1) to secure capacitor (2) in retaining strap (3) with approximately 1/2 inch clearance between terminals and base (4). TEST Test PCA (para 3-19) to verify repair.	<u>connect:</u>	wires 26 and 28	<u>to:</u>	positive terminal		wires 27 and 29		negative terminal
<u>connect:</u>	wires 26 and 28	<u>to:</u>	positive terminal						
	wires 27 and 29		negative terminal						

3-10. PCA - Continued

j. PRESSURE GAGES

This task covers:

Removal

Replacement

Installation

Test

INITIAL SETUP

Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
7/16 in. comb. wr

Equipment
Condition

Para
3-10a

Condition Description
PCA cover removed

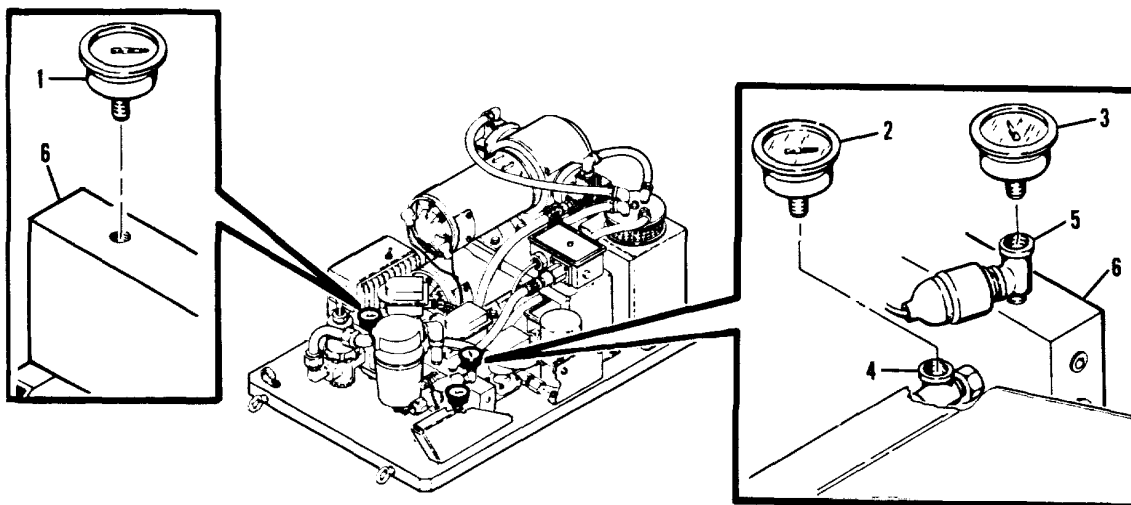
Materials/Parts

Gage
Thread sealing compound (appx B, item 21)

STEP

PROCEDURE

REMOVAL



NOTE

Use the following procedure to replace either of the three gages (1, 2, or 3).

Carefully unscrew and remove faulty gage.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**j. PRESSURE GAGES - Continued**

STEP	PROCEDURE
1.	REPLACEMENT
	Replace faulty part with a new part.
	INSTALLATION
	Coat threads of gage with thread sealing compound.
	Carefully screw gage into tee (4 or 5) or manifold (6), as applicable.
2.	TEST
	Test PCA (para 3-19) to verify repair.

3-10. PCA - Continued**k. PRESSURE SWITCH S2 OR S3****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
1/4 flat tip scdr
1/2 in. comb. wr
pocket knife
Heat gun HG-501
Diag ctg plr, 5110-00-965-0974

Equipment
Condition

Para
3-10a

Condition Description
PCA cover removed

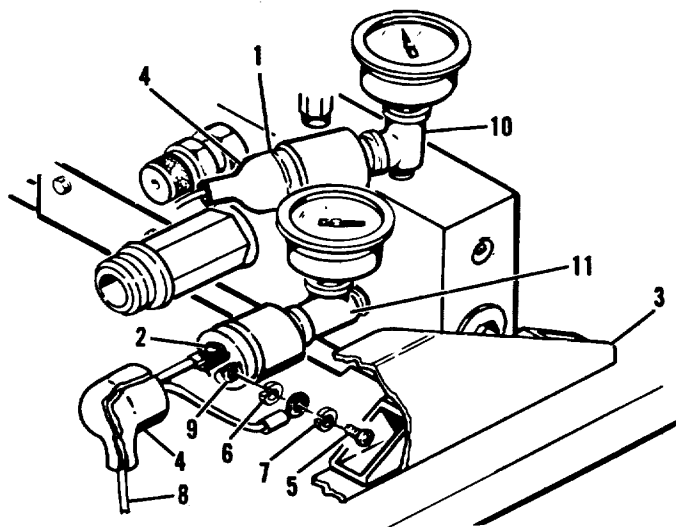
Troubleshooting Reference (table 3-3)
Malfunction 3, step 3 (S2)
Malfunction 4, step 3 (S3)

Materials/PartsSwitch

Heat shrink sleeving (appx B, items
6, 7, 8, 9, 10, 11, or 12)

Insulation sleeve (see RPSTL)

Thread sealing compound (appx B, item 21)

STEP**PROCEDURE****REMOVAL****NOTE**

Use the following procedure to replace either switch S2 (1) or S3 (2). It may be necessary to remove bracket (3).

1. Carefully split and remove insulating sleeve (4) from switch S2 (1) or S3 (2), as applicable.
2. Remove three screws (5) and lockwashers (6 and 7) and disconnect three wires (8) from terminals (9).

3-10. PCA MAINTENANCE INSTRUCTIONS-Continued			
k. PRESSURE SWITCH S2 OR S3-Continued			
STEP	PROCEDURE		
3.	Unscrew and remove switch (1 or 2) from tee fitting (10 or 11).		
	REPLACEMENT		
	Replace faulty part with a new part.		
	INSTALLATION		
1.	Screw switch (1 or 2) into tee fitting (10 or 11).		
2.	Slip a new insulating sleeve (3) over ends of three wires (8).		
3.	Connect three wires (8) to terminals (9) as stated below, and secure wires with three lockwashers (6 and 7) and screws (4).		
	switch S2 (1)	<u>connect:</u>	wire 6 to NC wire 13 to C wire 14 to NO
	switch S3 (2)	<u>connect:</u>	wire 12 to NC wire 11 to C wire 7 to NO
4.	Slip insulating sleeve (4) over switch (1 or 2) and apply heat to shrink sleeve.		
	TEST		
	Test PCA (para 3-19) to verify repair.		

3-10. PCA MAINTENANCE INSTRUCTIONS- Continued**I. SOLENOID VALVE A4 (SAFETY VALVE)**

This task covers:

Removal

Replacement

Installation

Test

INITIAL SETUPToolsRefrig Unit Svce Tool Kit,
5180-00-596-1474

5/8 in. comb. wr

7/16 in. comb. wr

9/16 in. comb. wr

1 in. comb. wr

pocket knife

lg rd nose plr

No. 2 xtip scdr

Skt Wr Set, 5120-00-089-3663

7/16 in. nut driver

diag ctg plr, 5110-00-965-0974

sldr and desldr set, 3439-00-460-7198

1-1/4 in. comb. wr, 5120-00-228-9517

1-5/16 in. comb. wr, 5120-00-228-9518

1/3-8 in. comb. wr, 5120-00-227-8833

3/4 in. internal pipe wr,

5120-00-288-8776

heat gun, 4940-00-363-3225

Personnel RequiredUtilities Equipment Repairer,
MOS 52C10 (two)EquipmentConditionPara

3-10a

3-10o

Condition Description

PCA cover removed

Check valves removed

Materials/Partsthread sealing compound (appx B,
item 21)heat shrink sleeving (appx B, items
6, 7, 8, 9, 10, 11; or 12)

silicone adhesive (appx B, item 18)

pneumatic grease (appx B, item 3)

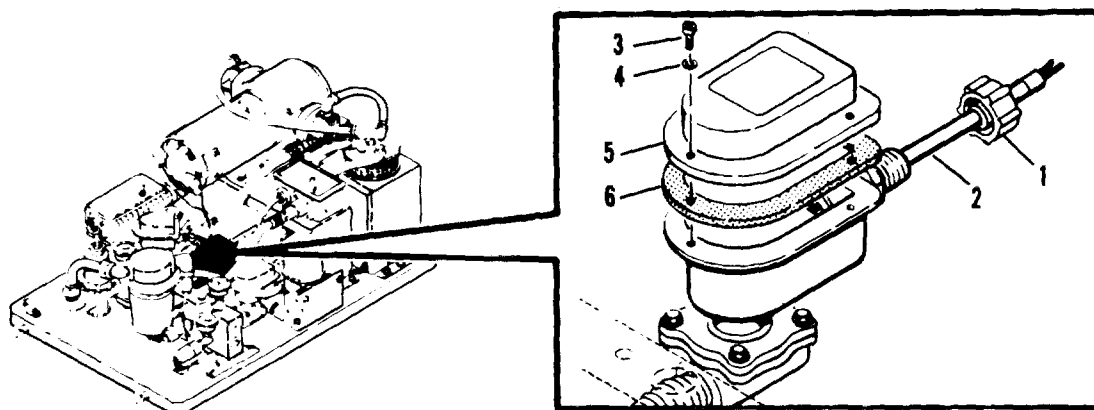
solder (appx B, item 19)

shop cloths (appx B, item 17)

solenoid valve

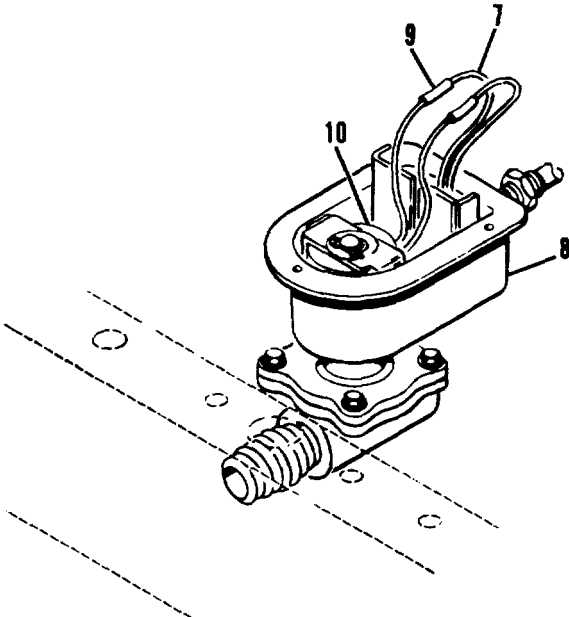
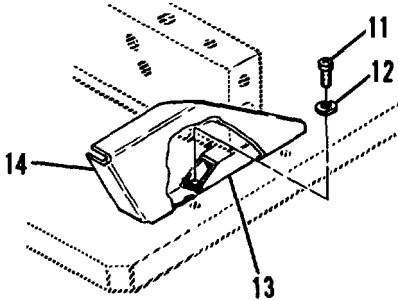
Troubleshooting Reference (table 3-3)

malfunction 5, steps 8 and 14

STEP**PROCEDURE****REMOVAL**

1. Unscrew bushing (1) and slide bushing back on cable (2).
2. Remove three screws (3) and lock washers (4), and remove cover (5) and gasket (6).

3-10. PCA MAINTENANCE INSTRUCTIONS-Continued**I. SOLENOID VALVE A4 (SAFETY VALVE)-Continued**

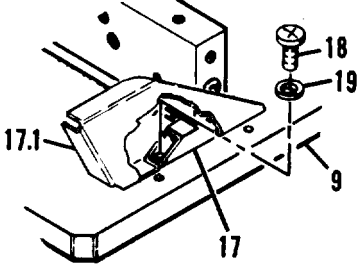
STEP	PROCEDURE
	 3. Lift two wires (7) out of housing (8) to access soldered connections. 4. Carefully cut and remove two heat shrink sleeves (9) from wires (7). 5. Unsolder and disconnect two wires (7) from leads of valve coil (10) and pull wires out of housing (8).  6. Remove four screws (11) and flatwashers (12) from two brackets (13) and bracket (14). Three of the four screws may secure cable clamps (see para 3-10aa step 9).

3-10. PCA MAINTENANCE INSTRUCTIONS-Continued

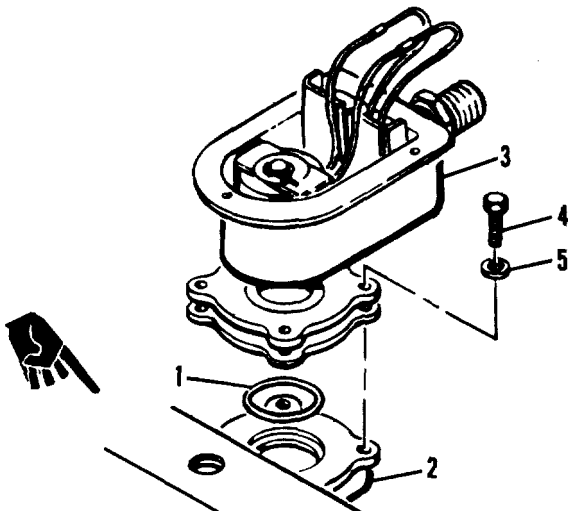
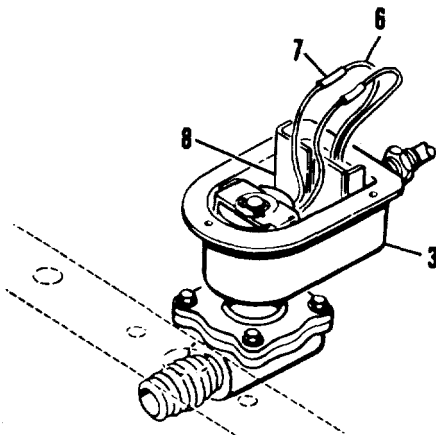
I. SOLENOID VALVE A4 (SAFETY VALVE)-Continued

STEP	PROCEDURE
7.	Remove four screws (1) and lockwashers (2), hold diaphragm (3) on underside of housing (4) to prevent diaphragm and internal parts from falling out, and remove valve housing (4) and packing (5) from valve body (6). BOTTOM VIEW MANIFOLD CUTOUT COVER CERAMIC CAP BASE SHOP CLOTH CAUTION Lift manifold straight up for first 2 inches off base to avoid breaking ceramic caps.

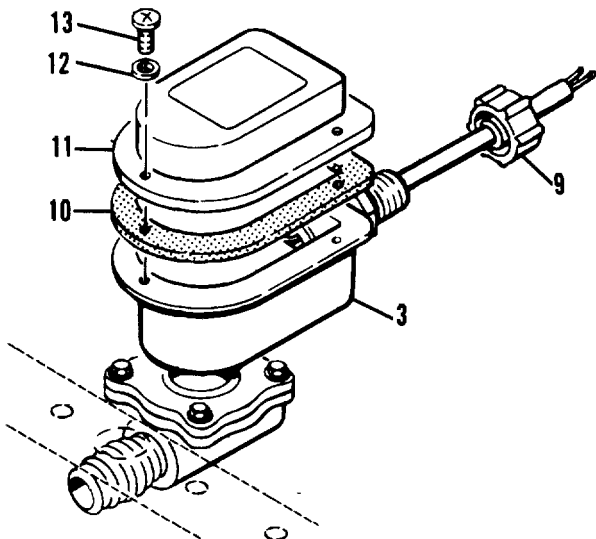
3-10. PCA MAINTENANCE INSTRUCTIONS-Continued**I. SOLENOID VALVE A4 (SAFETY VALVE)-Continued**

STEP	PROCEDURE
8.	Lift manifold (7) and stand on end, on a clean shop cloth (to prevent damage to base or wires beneath manifold), with end nearest to junction box (8) on base (9).
9.	Unscrew tube nuts (10 and 11), rotate valve (12) to free tube assembly (13), and remove tube assembly.
	NOTE If nipple (14) comes out of manifold (7) and remains in valve body (6) during step 10, use 3/4 in. internal pipe wrench to remove nipple (14) from valve body (6).
10.	Unscrew and remove valve body (6). REPLACEMENT Replace faulty part with a new part. INSTALLATION
1.	Clean any chips or residue from nipple (14) with a clean cloth. Apply a light coating of thread sealing compound to tapered threads of nipple (14) and screw nipple and valve body (6) into port in manifold (7) (if nipple came out with faulty valve).
2.	Install tube assembly (13) between elbow (15) and adapter (16), rotate valve (12) until end of elbow is parallel to end of tube nut (11), and tighten tube nuts (10 and 11).
	 CAUTION When lowering manifold to base, align ceramic cops with cutout in base to avoid breaking cops.
3.	Remove shop cloth, lower manifold (7) onto base (9), and secure two brackets (17), and bracket (17.1) to base with four screws (18) and flatwashers (19). Three of the four screws may secure cable clamps (see para 3-10aa step 34).

3-10. PCA MAINTENANCE INSTRUCTIONS-Continued**I. SOLENOID VALVE A4 (SAFETY VALVE) · Continued**

STEP	PROCEDURE
	
4.	Coat packing (1) with pneumatic grease and place packing in valve body (2).
5.	Install valve housing (3) on valve body (2) and secure with four lockwashers (4) and screws (5).
	
6.	Insert two wires (6) into port in valve housing (3).
7.	Slip a 1-inch piece of heat shrink sleeving (7) over end of each of two wires (6).
8.	Solder brown wire to one lead of coil (8) and black wire to other lead.
9.	Slip heat shrink sleeving (7) over soldered connections, apply heat to sleeving in order to shrink it tight around connection, and tuck wires (6) into valve housing (3).

3-10. PCA MAINTENANCE INSTRUCTIONS-Continued**I. SOLENOID VALVE A4 (SAFETY VALVE)-Continued**

STEP	PROCEDURE
	 10. Install bushing (9) on valve housing (3). 11. Install gasket (10) and cover (11) and secure with three lockwashers (12) and screws (13). NOTE Go to INSTALLATION and TEST of check valves (para 3-10o) for instructions for completion of this task.

3-10. PCA MAINTENANCE INSTRUCTIONS-Continued**m. SOLENOID VALVE S3 (RETRACT VALVE)**

This task covers:

Removal

Replacement

Installation

Test

INITIAL SETUPToolsRefrig Unit Svce Tool Kit,
5180-00-596-1474

5/8 in. comb. wr

7/16 in. comb. wr

9/16 in. comb. wr

1 in. comb. wr

pocket knife

lg rd nose plr

No. 2 xtip scdr

sldr and desldr set, 3439-00-460-7198

diag ctg plr, 5110-00-965-0974

1-1/2 in. comb. wr, 5120-00-203-4804

1-3/8 in. comb. wr, 5120-00-277-8833

3/4 in. internal pipe wr,
5120-00-228-8776

heat gun, 4940-00-363-3225

Equipment

Condition

Para

3-10a

Condition Description

PCA cover removed

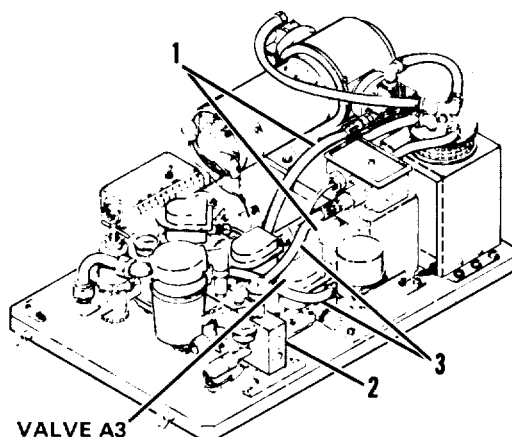
Materials/Partsthread sealing compound (appx B,
item 21)heat shrink sleeving (appx B, items
6, 7, 8, 9, 10, 11, or 12)

pneumatic grease (appx B, item 3)

solder (appx B, item 19)

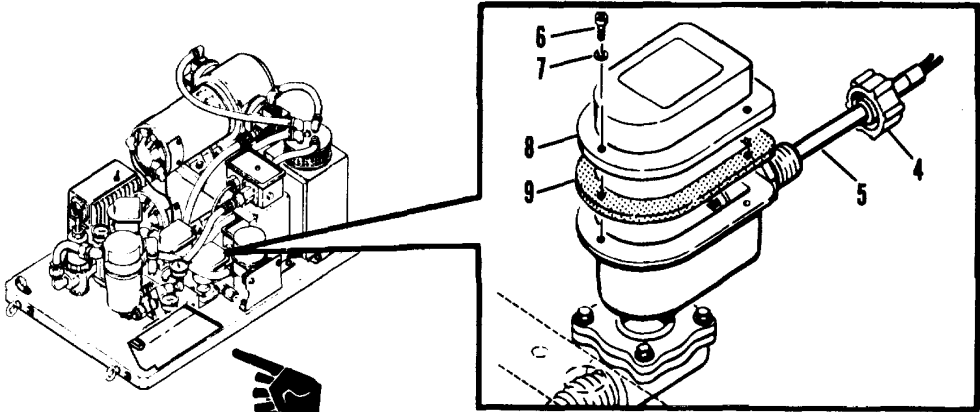
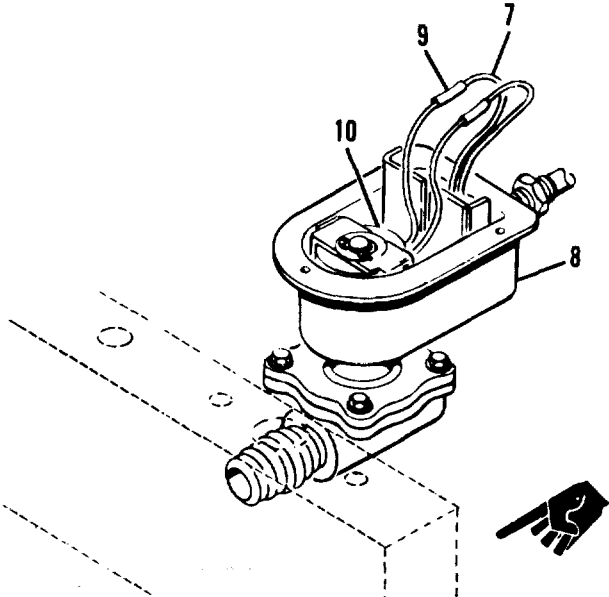
shop cloth (appx B, item 17)

solenoid valve

Troubleshooting Reference (table 3-3)
malfunction 6, steps 1 and 7**STEP****PROCEDURE****REMOVAL**

1. Disconnect two compressor output hoses (1) at end nearest manifold (2).
2. Disconnect two compressor pressure switch hoses (3) at end nearest manifold (2).
3. Fold hoses back to clear equipment mounted on manifold (2).

3-10. PCA MAINTENANCE INSTRUCTIONS Continued**m. SOLENOID VALVE A3 (RETRACT VALVE) · Continued**

STEP	PROCEDURE
	 4. Unscrew nut bushing (4) and slide bushing back on cable (5). 5. Remove three screws (6) and lockwashers (7), and remove cover (8) and gasket (9).  6. Lift two wires (10) out of housing (11) to access soldered connections. 7. Carefully split and remove two heat shrink sleeves (12) from wires (10). 8. Unsolder and disconnect two wires (10) from leads of valve coil (13) and pull wires out of housing (11).

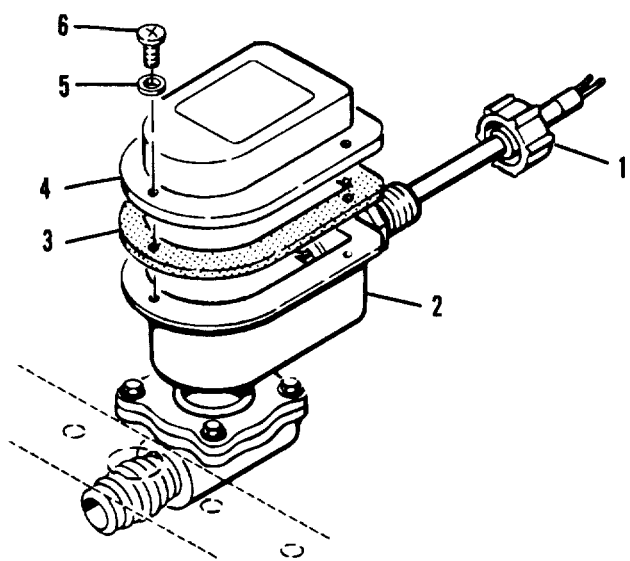
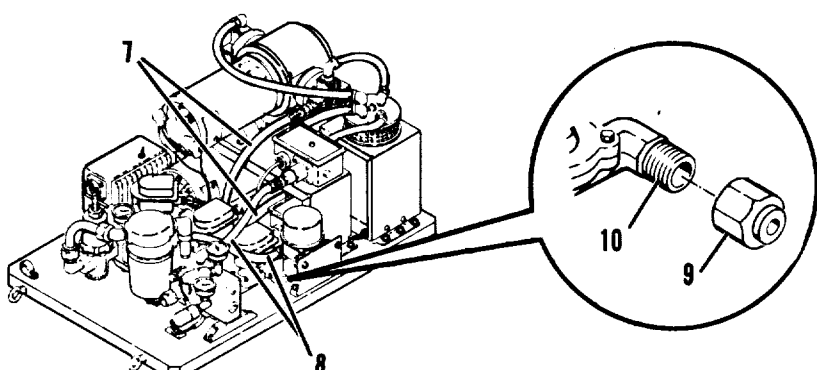
3-10. PCA MAINTENANCE INSTRUCTIONS-Continued**m. SOLENOID VALVE A3 (RETRACT VALVE)-Continued**

STEP	PROCEDURE
	NOTE In following step, hold diaphragm on underside of housing against housing to prevent diaphragm and internal parts from falling out. 9. Remove four screws (1) and lockwashers (2), and remove housing (3) and packing (4) from body (5). 10. Unscrew and remove restrictor (6) from elbow (7). 11. Unscrew and remove body (5) and attached elbow (7). NOTE If nipple (8) comes out of manifold (9) and remains in valve, use 3/4 in. internal pipe wrench to remove nipple from valve. 12. Unscrew and remove elbow (7) from body (5). REPLACEMENT Replace faulty part with a new part.

3-10. PCA MAINTENANCE INSTRUCTIONS · Continued**m. SOLENOID VALVE A3 (RETRACT VALVE) · Continued**

STEP	PROCEDURE
	INSTALLATION 1. Clean any chips or residue from nipple (8) with a clean cloth. Apply a light coating of thread sealing compound to tapered threads of nipple (8) and elbow (7); screw elbow into body (5) and screw nipple and body into port in manifold (9) (if nipple came out with faulty valve). 2. Apply a light coat of pneumatic grease on packing (4) and place packing in body (5). 3. Hold diaphragm in housing (3), install housing on body (5), and secure with four lockwashers (2) and screws (1). The diagram illustrates the assembly of the Solenoid Valve A3. It shows a cross-section of the valve body (5) with a diaphragm (4) being installed into the housing (3). Two wires (10) are shown entering the housing (3) through a port. A heat shrink sleeve (11) is shown being applied to the wires. A hand is shown pointing to the valve assembly. The diagram also shows the valve being installed into a manifold (9) using a nipple (8) and elbow (7). The valve is secured with four lockwashers (2) and screws (1). 4. Insert two wires (10) into port in housing (3). 5. Slip a 1-inch piece of heat shrink sleeving (11) over end of each of two wires (10). 6. Solder wire 3 (brown) to either lead of coil (12) and wire 3 (black) to other lead. 7. Slip heat shrink sleeving (11) over soldered connections and apply heat to sleeving in order to shrink it tight around connection. 8. Tuck wires (10) into housing (3).

3-10. PCA MAINTENANCE INSTRUCTIONS · Continued**m. SOLENOID VALVE A3 (RETRACT VALVE) · Continued**

STEP	PROCEDURE
	 A detailed line drawing of the Solenoid Valve A3 assembly. The valve housing (2) is shown with a gasket (3) and cover (4) being secured with lockwashers (5) and screws (6). A wire port (1) is shown being installed into the housing. The valve is mounted on a base plate with various ports and hoses.
9.	Install bushing (1) in wire port in housing (2).
	 A line drawing of the PCA assembly with various components labeled. A callout circle shows a close-up of a restrictor (9) being installed on an elbow (10). The main drawing shows the PCA with various hoses and components labeled 1 through 8.
10.	Position gasket (3) and cover (4) on housing (2), and secure with three lockwashers (5) and screws (6).
11.	Connect two pressure switch hoses (7) and two compressor outlet hoses (8).
12.	Install restrictor (9) on elbow (10).
	TEST Test PCA (para 3-19) to verify repair.

3-10. PCA MAINTENANCE INSTRUCTIONS-Continued**n. SOLENOID VALVE A2 (EXTEND VALVE)**

This task covers:

Removal

Replacement

Installation

Test

INITIAL SETUPTools

Refrig Unit Svce Tool Kit,

5180-00-596-1474

5/8 in. comb. wr

7/16 in. comb. wr

9/16 in. comb. wr

1 in. comb. wr

pocket knife

lg rd nose pliers

No. 2 xtip scdr

Skt Wr Set, 5120-00-089-3663

7/16 in. nut driver

diag cutting plr, 5110-00-965-0974

sldr and desldr set, 3439-00-460-7198

1-1/4 in. comb. wr, 5120-00-228-9157

1-3/8 in. comb. wr, 5120-00-227-8833

3/4 in. internal pipe wr,

5120-00-288-8776

heat gun, 4940-00-363-3225

Equipment

Condition

Para Condition Description

3-10a PCA cover removed

Materials/Parts

thread sealing compound (appx B, item 21)

heat shrink sleeving (appx B, items 6, 7, 8, 9, 10, 11, or 12)

silicone adhesive (appx B, item 18)

pneumatic grease (appx B, item 3)

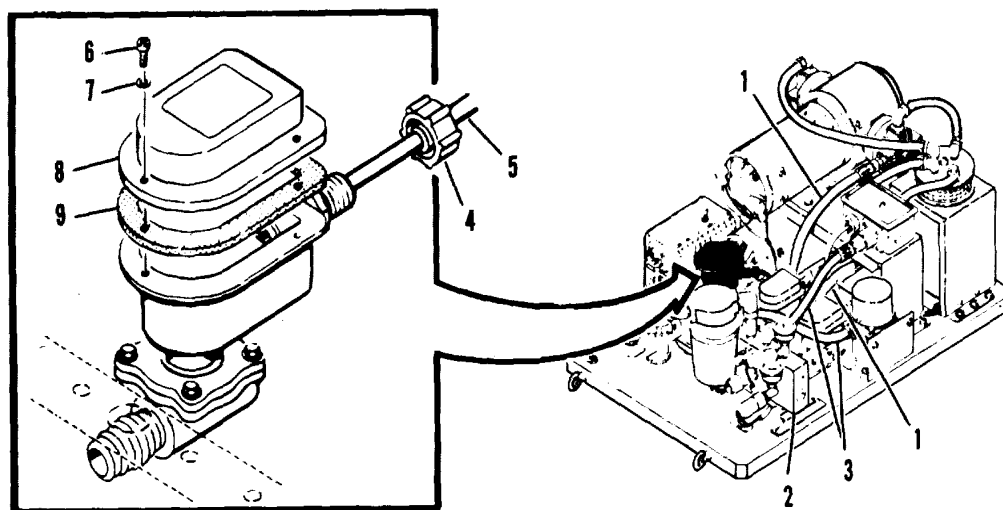
shop cloth (appx B, item 17)

solder (appx B, item 19)

solenoid valve

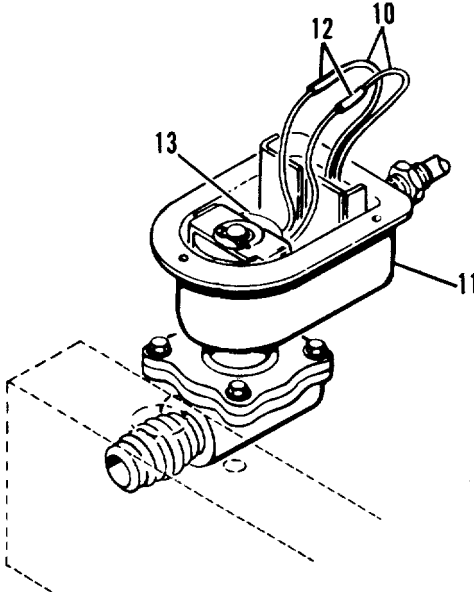
Troubleshooting Reference (table 3-3)

malfunction, 5, step 7

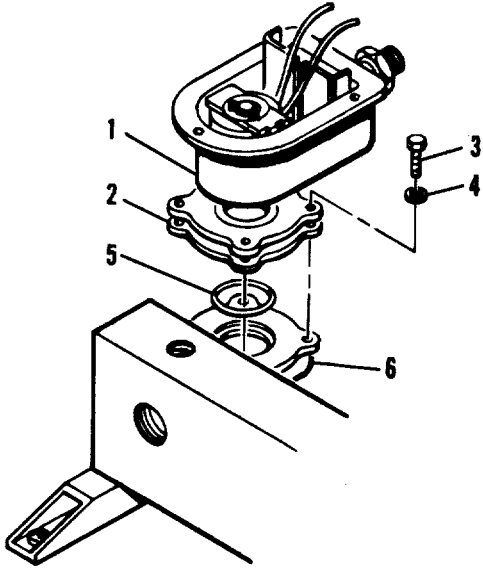
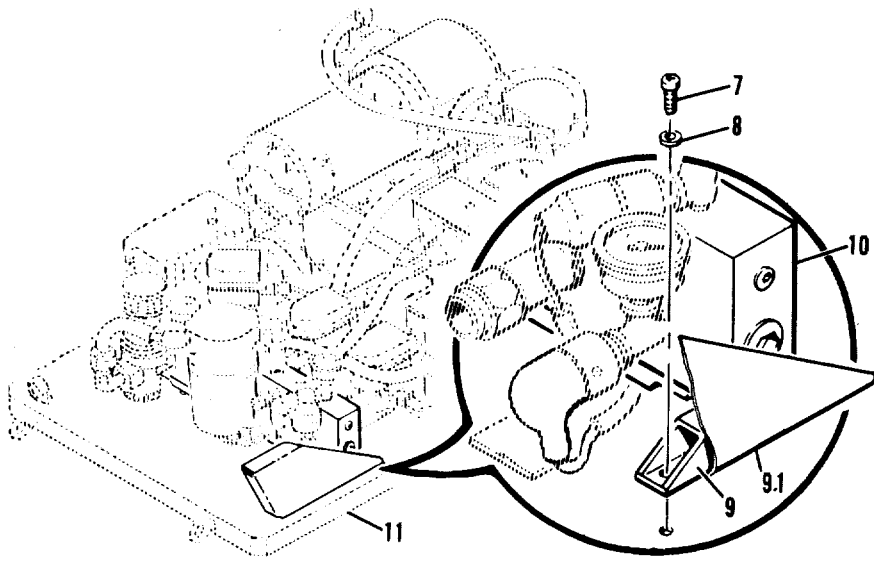
STEP**PROCEDURE****REMOVAL**

1. Disconnect two compressor output hoses (1) at end nearest manifold (2).
2. Disconnect two compressor pressure switch hoses (3) at end nearest manifold (2).

3-10. PCA MAINTENANCE INSTRUCTIONS-Continued**n. SOLENOID VALVE A2 (EXTEND VALVE)-Continued**

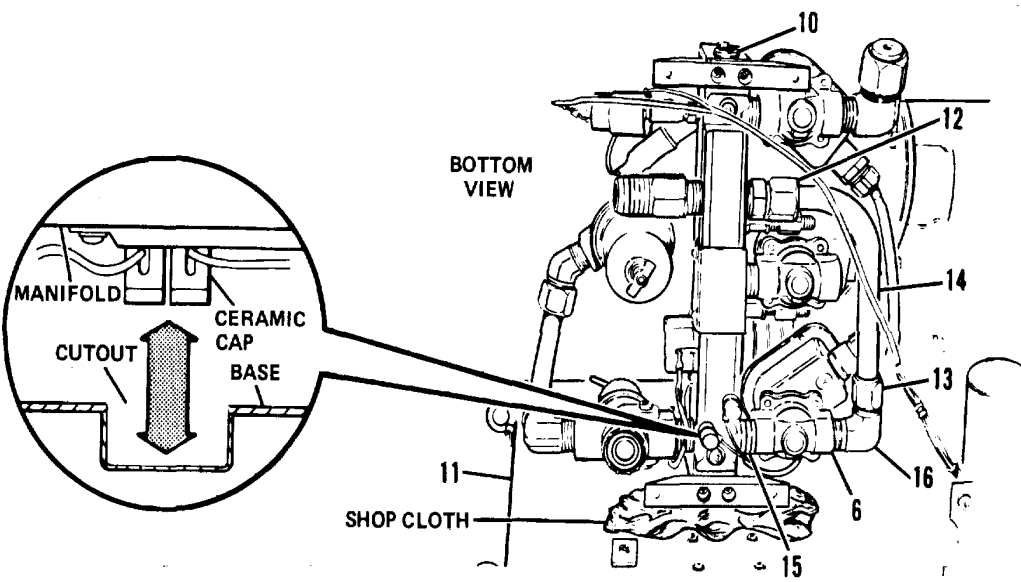
STEP	PROCEDURE
3.	Fold hoses back to clear equipment mounted on manifold (2).
4.	Unscrew bushing (4) and slide back on cable (5).
5.	Remove three screws (6) and lockwashers (7), and remove cover (8) and gasket (9). 
6.	Lift two wires (10) out of housing (11) to access soldered connections.
7.	Carefully split and remove two heat shrink sleeves (12) from wires (10).
8.	Unsolder and disconnect two wires (10) from leads of valve coil (13) and pull wires out of housing.

3-10. PCA MAINTENANCE INSTRUCTIONS-Continued**n. SOLENOID VALVE A2 (EXTEND VALVE)-Continued**

STEP	PROCEDURE
	 NOTE When removing housing (1), hold diaphragm (2) against bottom of housing to prevent diaphragm and internal parts from falling out of housing.
9.	Remove four screws (3) and lockwashers (4), and remove housing (1) and packing (5) from body (6). 
10.	Remove four screws (7) and flatwashers (8) securing two manifold brackets (9) and bracket (9). Three of the four screws may secure cable clamps (see para 3-10aa step 9).

3-10. PCA MAINTENANCE INSTRUCTIONS · Continued

n. SOLENOID VALVE A2 (EXTEND VALVE) · Continued

STEP	PROCEDURE
	 CAUTION • Lift manifold straight up for first two inches off base to avoid breaking ceramic caps on heating element terminals. • Place clean shop cloth between manifold and base to avoid cutting insulation on wires and scratching base. 11. Lift manifold (10) and stand on end on base (11). 12. Loosen tube nut (12) and completely unscrew tube nut (13). 13. Rotate body (6) counterclockwise to release end of tube assembly (14), then swing end of tube assembly away from body (6). NOTE If nipple (15) comes out of manifold (10) with body (6), use 3/4 in. internal pipe wrench to remove nipple from body. If nipple remains in manifold, do not remove it. 14. Unscrew and remove body (6), with attached elbow (16), from manifold (10). 15. Remove elbow (16) from body (6).

3.10. PCA MAINTENANCE INSTRUCTIONS-Continued**n. SOLENOID VALVE A2 (EXTEND VALVE)-Continued**

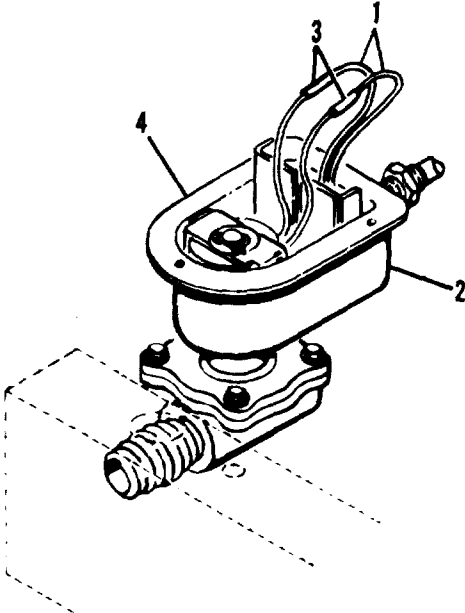
STEP	PROCEDURE
	REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Clean any chips or residue from nipple (1) with a clean cloth. Apply a light coating of thread sealing compound on tapered threads of nipple (1) and elbow (2). 2. Install elbow (2) in body (3). 3. Install nipple (1) and body (3) on manifold (4) (if nipple came out during removal). 4. Swing end of tube assembly (5) into position to connect to elbow (2), rotate body (3) clockwise to aline end of tube with mating surface of elbow, and tighten tube nuts (6 and 7).

3-10. PCA MAINTINANCE INSTRUCTIONS -Continued

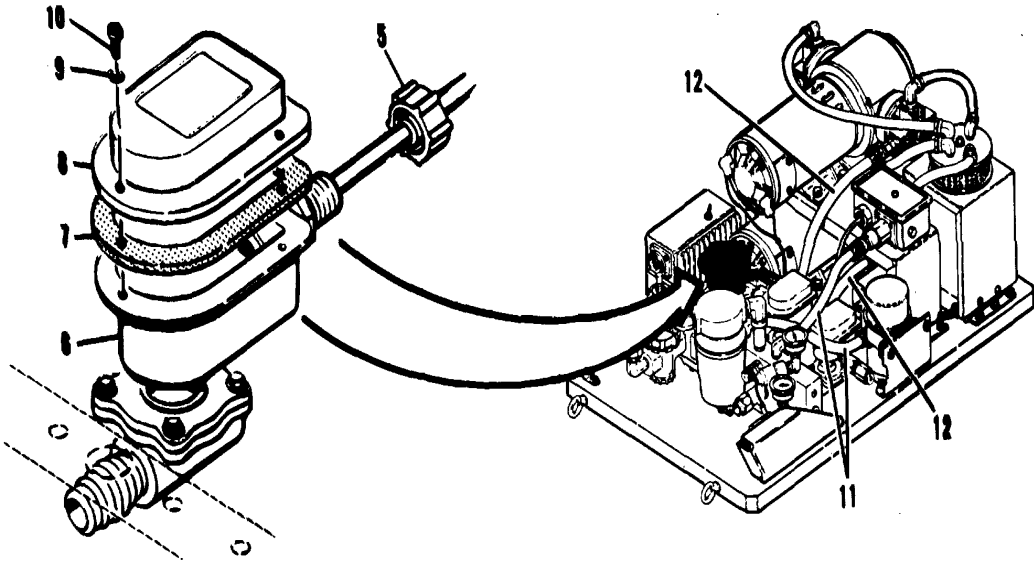
n. SOLENOID VALVE A2 (EXTEND VALVE)-Continued

STEP	PROCEDURE
	CAUTION When lowering manifold to base, be certain to aline ceramic caps with cutout in vase to prevent damaging ceramic caps. 5. Remove shop cloths from beneath manifold (4), carefully lower manifold onto base (8), and secure two brackets (9), and bracket (9.1) to base with four flatwashers (10) and screws (11). Three of the four screws may secure cable clamps (see para 3-10aa step 34). 6. Apply a light coating of pneumatic grease on packing (12) and place packing in body (3). NOTE When installing housing on body, hold diaphragm against bottom of housing to prevent diaphragm and internal parts from falling out of housing. 7. Install housing (13) and diaphragm (13.1) on body (3) and secure with four flatwashers (14) and screws (15).

3-10. PCA MAINTENANCE INSTRUCTIONS-Continued**n. SOLENOID VALVE A2 (EXTEND VALVE) Continued**

STEP	PROCEDURE
	 8. Insert two wires (1) into port in valve housing (2). 9. Slip a 1-inch piece of heat shrink sleeving (3) over end of each of two wires (1). 10. Solder wire 2 (brown) to either lead of coil (4) and wire 2 (black) to other lead. 11. Slip heat shrink sleeving (3) over soldered connections and apply heat to sleeving in order to shrink it tight around connection. 12. Tuck wires (1) into valve housing (2).

3-10. PCA MAINTENANCE INSTRUCTIONS-Continued**n. SOLNEOID VALVE A2 (EXTEND VALVE)-Continued**

STEP	PROCEDURE
	 13. Install bushing (5) in wire port in valve housing (6). 14. Position gasket (7) and cover (8) on valve housing (6) and secure with three lockwashers (9) and screws (10). 15. Install two pressure switch hoses (11) and two compressor outlet hoses (12). TEST Test PCA (para 3-19) to verify repair.

3-10. PCA MAINTENANCE INSTRUCTIONS- Continued**o. CHECK VALVES**

This task covers:

Removal

Replacement

Installation

Test

INITIAL SETUPTools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
3/4 in. comb. wr
7/16 in. comb. wr
5/8 in. comb. wr

Equipment

Condition

Para

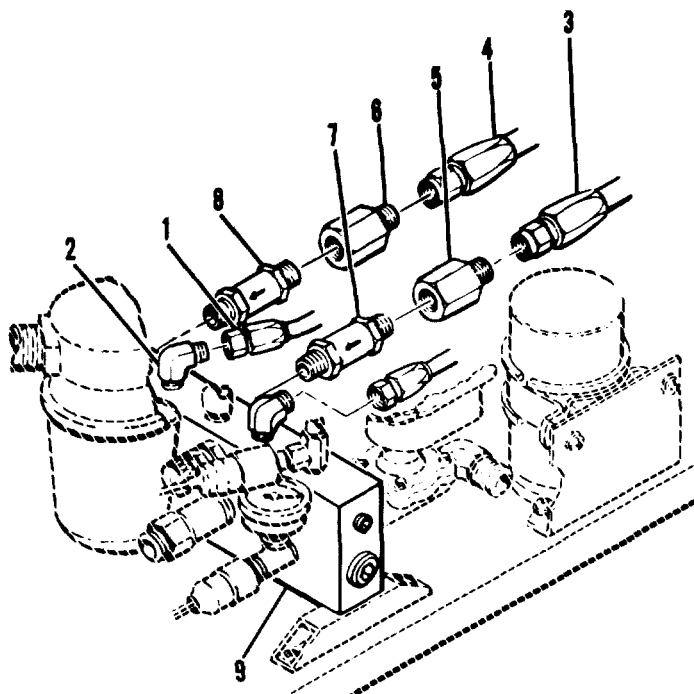
3-10a

Condition Description

PCA cover removed

Materials/Parts

thread sealing compound (appx B, item 21)
check valve

STEP**PROCEDURE****REMOVAL****NOTE**

You may use this procedure to replace either check valve or both check valves.

1. Disconnect compressor control switch hose (1) from elbow (2).
2. Disconnect compressor output hose (3 or 4) from adapter (5 or 6).

3-10. PCA MAINTENANCE INSTRUCTIONS	
o. CHECK VALVES-Continued	
STEP	PROCEDURE
3.	Unscrew and remove adapter (5 or 6) from check valve (7 or 8).
4.	Unscrew and remove check valve (7 or 8) from manifold (9).
	REPLACEMENT
	Replace faulty part with a new part.
	INSTALLATION
	NOTE
	Install valve (7 or 8) with arrow pointing toward manifold (9).
1.	Apply a light coat of thread sealing compound on threads on both ends of valve (7 or 8) and install valve in manifold (9).
2.	Install adapter (5 or 6) on valve (7 or 8).
3.	Connect hoses (1 and 3 or 4).
	TEST
	Test PCA (para 3-19) to verify repair.

3-10. PCA MAINTENANCE INSTRUCTIONS**p. LINE AIR FILTER****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP****Tools**

Refrig Unit Svce Tool Kit,
 3/4 in. comb. wr
 7/16 in. comb. wr
 1/2 in. comb. wr
 1-1/8 in. comb. wr
 1-1/4 in. comb. wr
 1-3/8 in. comb. wr

Equipment**Condition****Para**

3-10a

Condition Description

PCA cover removed

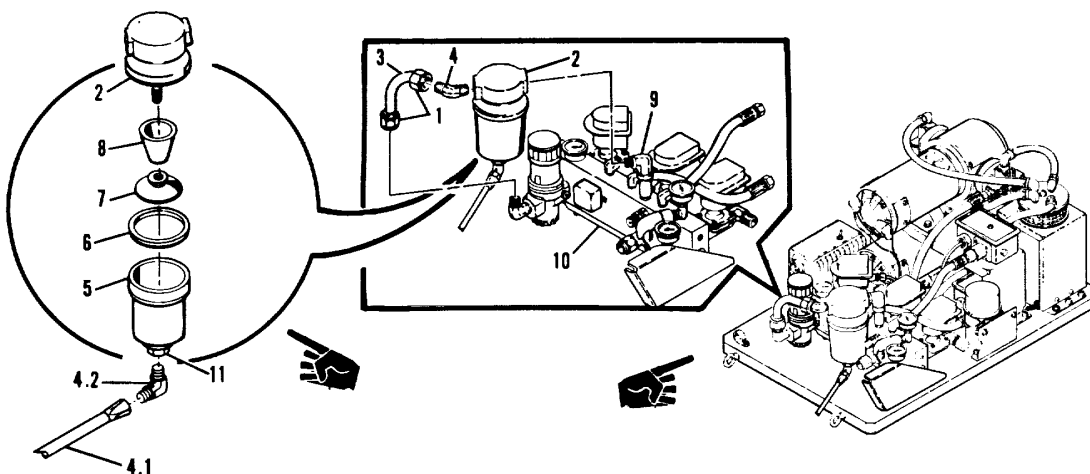
Materials/Parts

Thread sealing compound (appx B, item 21)

Pneumatic grease (appx B, item 3)

Shop cloth (appx B, item 17)

Air filter

STEP**PROCEDURE****REMOVAL**

1. Unscrew two nuts (1), swing body (2) away from tube assembly (3), and remove tube assembly.
2. Unscrew and remove elbow (4) from body (2).

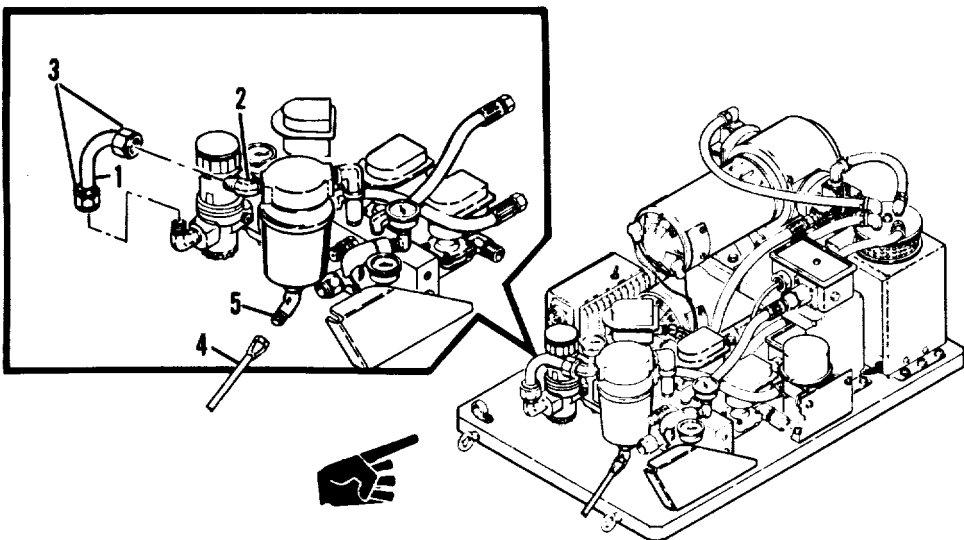
NOTE

On early models a petcock is installed instead of the automatic drain line. If you do not have an automatic drain line installed, proceed to step 3.

- 2.1 Remove automatic drain line (4.1) from elbow (4.2).
3. Manually unscrew and remove bowl (5) and seal (6) from body (2).

3-10. PCA MAINTENANCE INSTRUCTIONS	
p. LINE AIR FILTER-Continued	
STEP	PROCEDURE
3.1	Remove elbow (4.2) from bowl (5), if installed.
	WARNING
	Edges of baffle are sharp. Use caution when removing baffle to avoid getting cut.
4.	Using a shop cloth to protect hand, unscrew and remove baffle (7) and filter element (8) from body (2).
5.	Rotate body (2) to unscrew, and remove body from elbow (9).
	REPLACEMENT
	Replace faulty part with a new part.
	INSTALLATION
1.	Apply a light coating of thread sealing compound to threads of elbow (9) and screw body (2) onto elbow (9), with arrow on body pointing away from manifold (10).
	WARNING
	Edges of baffle are sharp. Use caution when installing baffle to avoid getting cut.
2.	Using a shop cloth to protect hand, install filter element (8) and baffle (7) into body (2).
	CAUTION
	Fitting (11) Is plastic. Use care when installing elbow (4.2) to avoid breaking fitting.
2.1	If removed, clean male threads of elbow (4.2). Apply sealing compound only to the male threads which screw into bowl (5) and reinstall elbow into bottom of bowl.
3.	Apply a light coat of pneumatic grease on seal (6) and place seal on shoulder of bowl (5).
4.	Install bowl (5) on body (2) and tighten bowl until seal contacts body.
5.	Apply a light coating of thread sealing compound to tapered threads of elbow (4) and screw elbow into port in body (2).

3-10. PCA MAINTENANCE INSTRUCTIONS**p. LINE AIR FILTER-Continued**

STEP	PROCEDURE
	NOTE Mating ends of tube assembly (1) and elbow (2) must be parallel to ensure tight seal. Do not overtighten nuts (3). 6. Install tube assembly (1) and secure with two nuts (3). 7. If removed reinstall automatic drain line (4) on elbow (5). TEST Test PCA (see para 3-19) to verify repair. 

3-10. PCA MAINTENANCE INSTRUCTIONS**q. SAFETY RELIEF VALVE****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP****Tools**

Refrig Unit Svce Tool Kit

11/16 in. comb. wr

Equipment

Condition

Para

3-10a

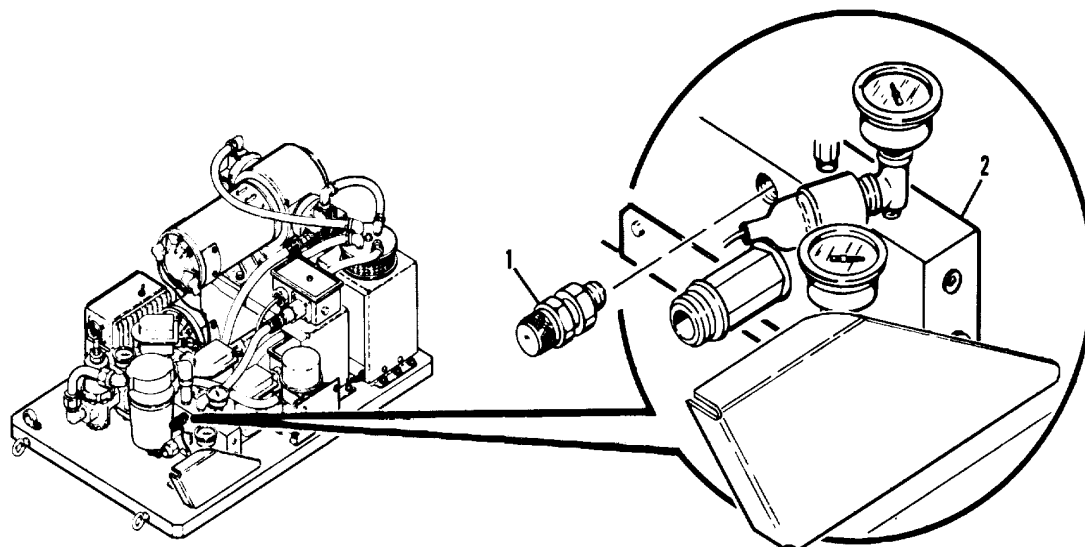
Condition Description

PCA cover removed

Materials/Parts

Thread sealing compound (appx B, item 21)

Valve

STEP**PROCEDURE****REMOVAL**

3-10. PCA MAINTENANCE INSTRUCTIONS	
q. SAFETY RELIEF VALVE-Continued	
STEP	PROCEDURE
	Unscrew and remove valve (1) from manifold (2). REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Apply a thin coat of thread sealing compound to threads of valve (1). 2. Screw valve (1) into port in manifold (2). 3. Adjust safety relief valve (para 3-23f). TEST Test PCA (para 3-19) to verify repair.

3-10. PCA MAINTENANCE INSTRUCTIONS**r. MANIFOLD-TO-MAST LINE ADAPTER****This task covers:****Removal****Replacement****Installation****INITIAL SETUP****Tools**

Refrig Unit Svce Tool Kit,
 5/8 in. comb. wr
 7/16 in. comb. wr
 9/16 in. comb. wr
 No. 2 xtip scdr
 1-1/8 in. comb. wr

Equipment**Condition****Para**

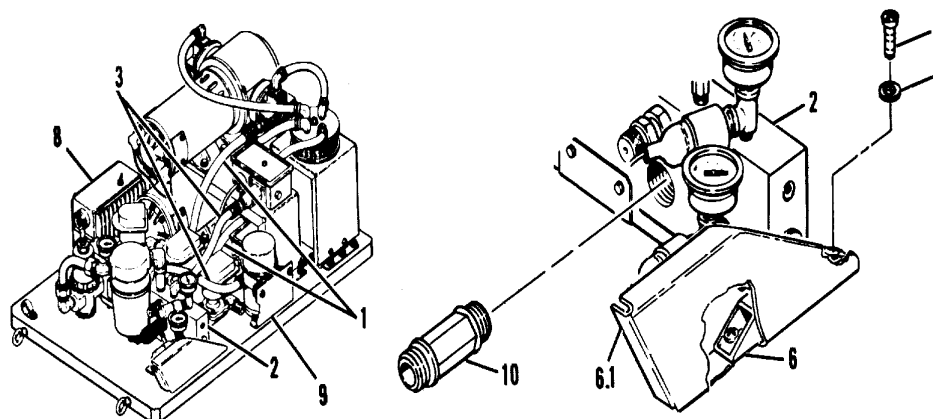
3-10a

Condition Description

PCA cover removed

Materials/Parts

Thread sealing compound (appx B,
 item 21)
 Adapter

STEP**PROCEDURE****REMOVAL**

1. Disconnect two compressor output hoses (1) at end nearest manifold (2).
2. Disconnect two compressor pressure switch hoses (3) at end nearest manifold (2).
3. Fold hoses back to clear equipment mounted on manifold (2).
4. Remove four screws (4) and flatwashers (5) securing two brackets (6), and bracket (6.1). Three of the four screws may secure cable clamps (see para 3-10aa step 9.)

CAUTION

Lift manifold straight up for first 2 inches off base to avoid breaking ceramic caps. Place shop cloth beneath manifold to prevent damage to base.

3-10. PCA MAINTENANCE INSTRUCTIONS

r. MANIFOLD-TO-MAST LINE ADAPTER-Continued

STEP	PROCEDURE
	5. Lift manifold (2) and stand on end, with end nearest to junction box (7) on base (8). 6. Unscrew and remove adapter (9) from manifold (2). REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Clean any chips or residue from adapter with a clean cloth. Apply a thin coat of thread sealing compound on threads of adapter (9) and install adapter on manifold (2). CAUTION When lowering manifold to base, aline ceramic caps with cutout in base to avoid breaking cap 2. Carefully lower manifold (2) onto base (8) and secure two brackets (6) and bracket (6.1) to base with four flatwashers (5) and screws (4). Three of the four screws may secure cable clamps (see para 3-10aa step 34). 3. Connect two compressor pressure switch hoses (3). 4. Connect two compressor output hoses (1).

3-10. PCA MAINTENANCE INSTRUCTIONS**s. AIR PRESSURE REGULATOR****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit

3/4 in. comb. wr

1/4 in. skt hd scr key

1-1/4 in. comb. wr

3/4 in. internal pipe wr

Equipment

Condition

Para

3-10a

Condition Description

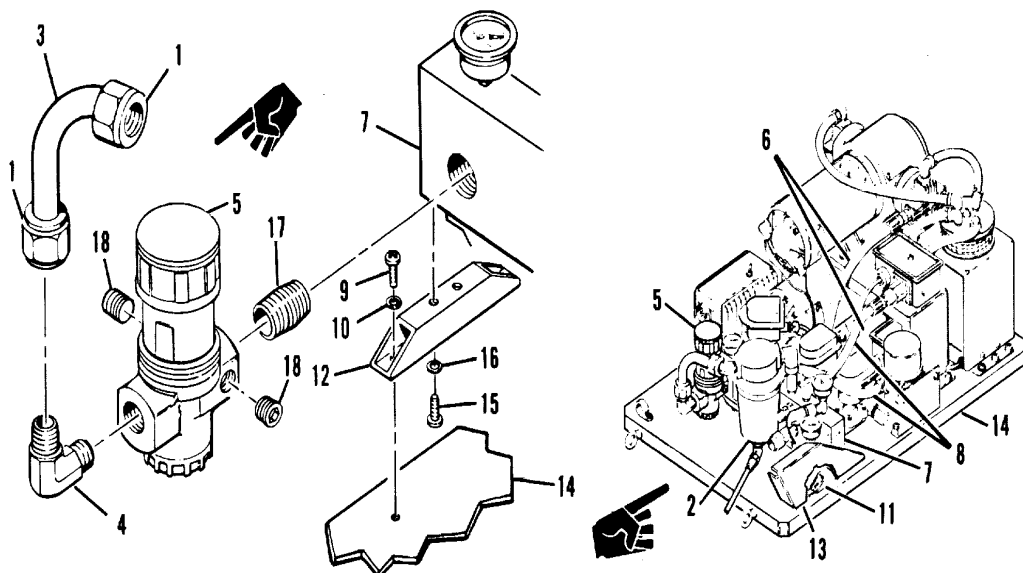
PCA cover removed

Materials/Parts

Thread sealing compound (appx B, item 21)

Shop cloth (appx B, item 17)

Regulator

STEP**PROCEDURE****REMOVAL**

3-10. PCA MAINTENANCE INSTRUCTIONS-Continued	
s. AIR PRESSURE REGULATOR-Continued	
STEP	PROCEDURE
1.	Unscrew two tube nuts (1), swing filter (2) aside to free tube assembly (3), and remove tube assembly.
2.	Unscrew and remove elbow (4) from regulator (5).
3.	Disconnect two compressor output hoses (6) at end nearest to manifold (7).
4.	Disconnect two pressure switch hoses (8) at end nearest to manifold (7).
5.	Remove four screws (9) and flatwashers (10) that secure two brackets (11 and 12) and bracket (13) to base (14). Three of the four screws may secure cable clamps (see para 3-10aa step 9).
	CAUTION
	When lifting manifold, lift straight up to prevent damaging ceramic caps on bottom of manifold.
6.	Lift manifold (7) as required, remove two screws (15) and flatwashers (16), and remove bracket (12). Place a shop cloth between manifold and base (14) to protect base.
7.	Unscrew regulator (5) from nipple (17).
8.	If nipple (17) comes out with regulator (5), use 3/4 in. internal pipe wrench to remove nipple from regulator.
9.	Remove two pipe plugs (18) from regulator (5).
	REPLACEMENT
	Replace faulty part with a new part.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**s. AIR PRESSURE REGULATOR - Continued**

STEP	PROCEDURE
	CAUTION When lowering manifold to base, align ceramic caps on bottom of manifold with cutout in base to prevent damaging caps. INSTALLATION 1. Clean any chips or residue from nipple (16) with a clean shop cloth. 1.1 Install two pipe plugs (17) into regulator (9). 2. Apply a light coating of thread sealing compound to threads of nipple (16), and screw nipple and regulator (9) into place in port in manifold (1), with arrow on regulator pointing to manifold. 3. Attach bracket (4) to manifold (1) with two flatwashers (15) and screws (18). 4. Remove shop cloth, carefully lower manifold (1) to base (2) and secure two brackets (3, 4) and bracket (4.1) to base with four screws (6) and flat-washers (5). Three of the four screws may secure cable clamps; if so, see para 3-10aa step 34. 5. Apply a light coating of thread sealing compound to tapered threads of elbow (7) and screw elbow into port in regulator (9).

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued	
s. AIR PRESSURE REGULATOR - Continued	
STEP	PROCEDURE
NOTE Mating ends of tube assembly and elbow must be alined to ensure tight seal. 6. Install tube assembly (10), swing filter (11) to aline tube assembly (10) and elbow (7), and tighten two tube nuts (12). 7. Connect two pressure switch hoses (13). 8. Connect two compressor output hoses (14). TEST Test PCA (para 3-19) to verify repair.	

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**t. MANIFOLD HEATER THERMOSTAT S5****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 1 xtip scdr
No. 2 xtip scdr
pocket knife
Sldr and desldr set, 3439-00-460-7198
Heat gun, 4940-00-363-3225

EquipmentConditionPara

3-10a

Condition Description

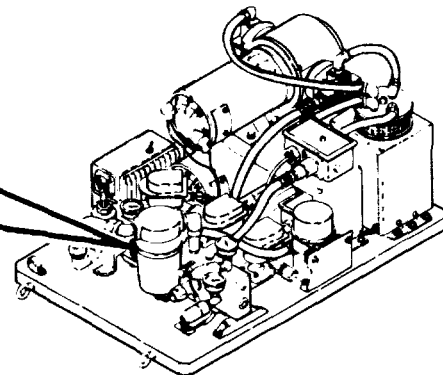
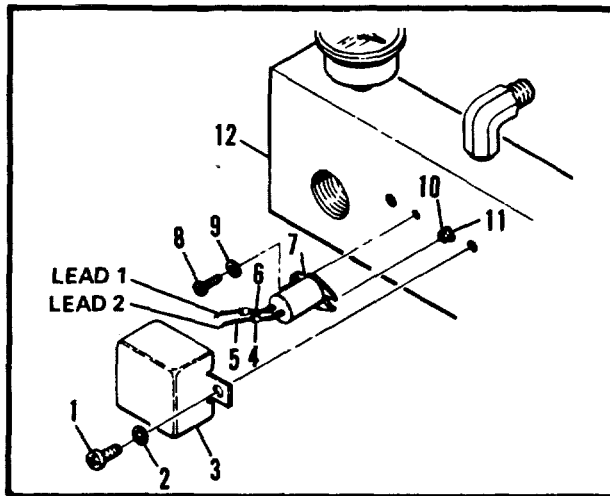
PCA cover removed

Troubleshooting Reference

Malfunction 7

Materials/Parts

Heat shrink sleeving (appx B, items
6, 7, 8, 9, 10, 11, or 12)
Solder (appx B, item 19)
Thermostat

STEP**PROCEDURE****REMOVAL**

1. Remove two screws (1) and flat washers (2). and remove cover (3).
2. Carefully split and remove two heat shrink sleeves (4).
3. Unsolder two wires (5) from leads (6) of thermostat (7).
4. Remove screw (8) and flat washers (9), loosen screw (10) one quarter turn, and remove thermostat (7) from manifold (12).

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued	
t. MANIFOLD HEATER THERMOSTAT SS - Continued	
STEP	PROCEDURE
	REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Position thermostat (7) on manifold (12) with slot in thermostat between washer (11) and manifold (12), secure with flatwasher (9) and screw (8), and tighten screw (10). 2. Slip a ½ inch length of heat shrink sleeve (4) over end of each of two wires (5) and solder wires to leads (6) of thermostat (7). Solder wire 35 to lead 2 and wire 36 to lead 1. 3. Slip heat shrink sleeves (4) over soldered connections, and apply heat to and shrink sleeves. 4. Position cover (3) over thermostat (7) and secure to manifold (12) with two flatwashers (2) and screws (1). TEST Test PCA (para 3-19) to verify repair.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**u. MANIFOLD HEARING ELEMENT HR1****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit

9/16 in. comb. wr

3/8 in. comb. wr

5/8 in. comb. wr

No. 2 xtip scdr

5/16 in. comb. wr

Equipment

Condition

Para

3-10a

Condition Description

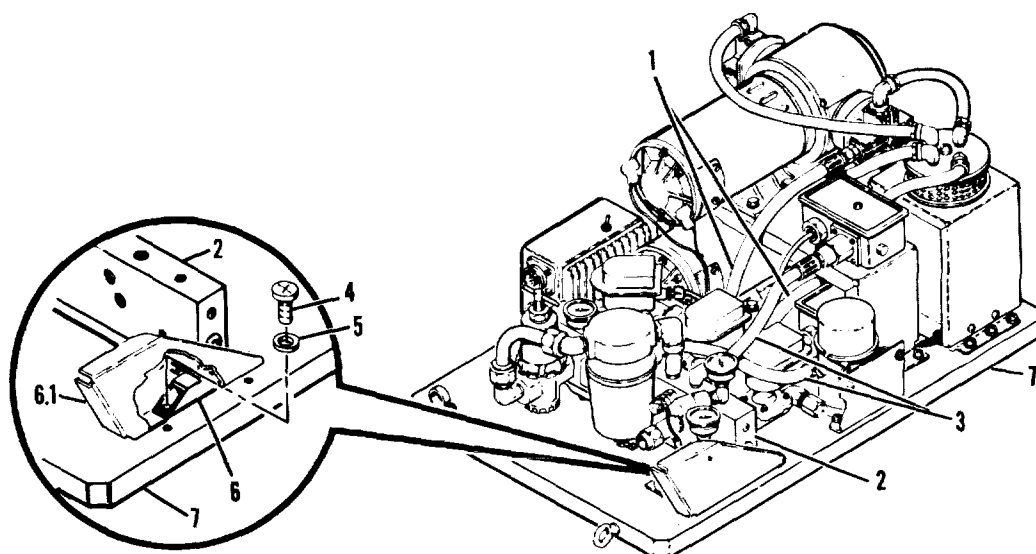
PCA cover removed

Materials/Parts

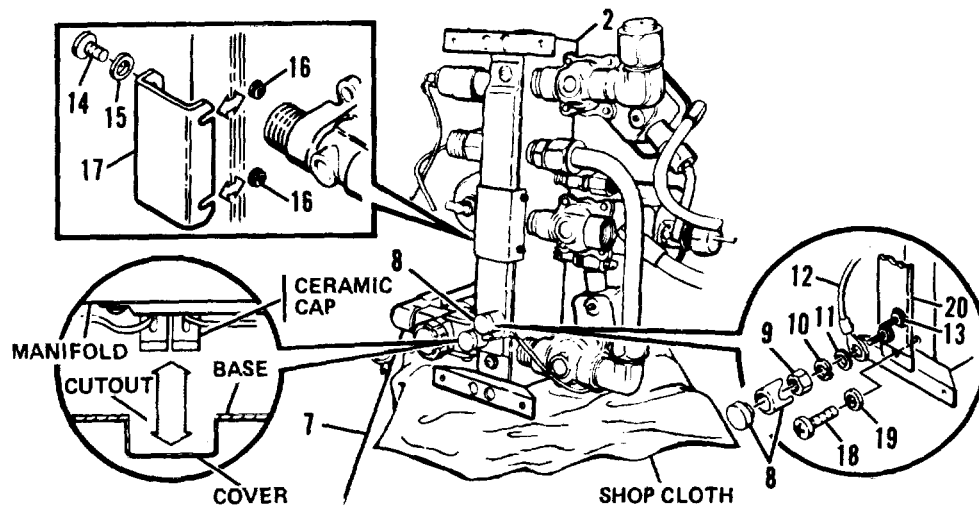
Shop cloths (appx B, item 17)

Heat sink compound (appx B, item 4)

Heating element

STEP**PROCEDURE****REMOVAL**

1. Disconnect two compressor output hoses (1) at end nearest manifold (2).
2. Disconnect two compressor pressure switch hoses (3) at end nearest manifold (2).
3. Fold hoses back to clear equipment mounted on manifold (2).
4. Remove four screws (4) and flatwashers (5) from two brackets (6) and bracket (6.1). Three of the four screws may secure cable clamps (see para 3-10aa step 9).

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**u. MANIFOLD HEATING ELEMENT HR1 - Continued****STEP****PROCEDURE****CAUTION**

Lift manifold straight up for first 2 inches off base to avoid breaking ceramic caps.

5. Lift manifold (2) and stand on end on a clean shop cloth (to prevent damage to base (7) and any wires beneath manifold).
6. Unscrew and remove two ceramic caps (8), nuts (9), lockwashers (10), and flatwashers (11); and disconnect two wires (12) from terminals (13).
7. Remove two screws (14) and flatwashers (15), loosen two screws (16), and remove bracket (17).
8. Remove four screws (18) and flatwashers (19), and remove heating element (20).

CLEANING

Using a clean shop cloth, wipe heat sink compound from bottom surface of manifold (2).

REPLACEMENT

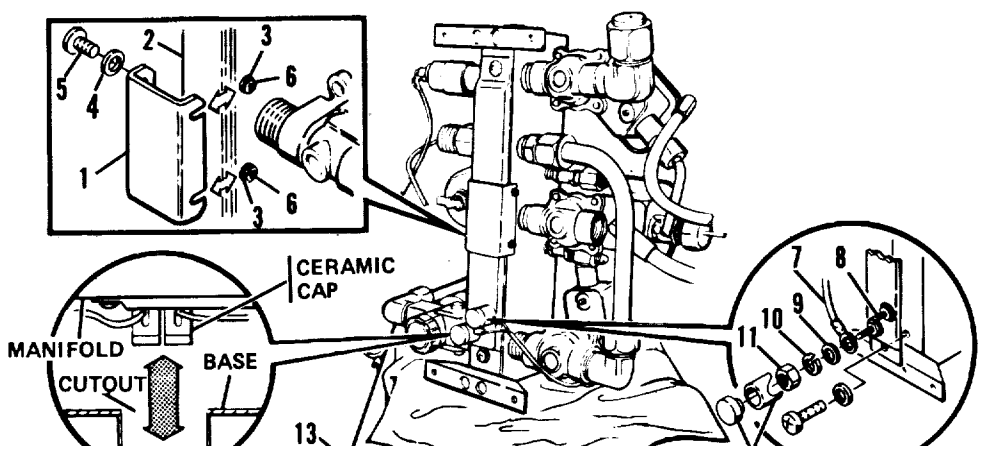
Replace faulty part with a new part.

INSTALLATION

1. Apply a coating of heat sink compound on bottom surface of manifold (2).
2. Position heating element (20) on manifold (2) and secure with two flatwashers (19) and screws (18).

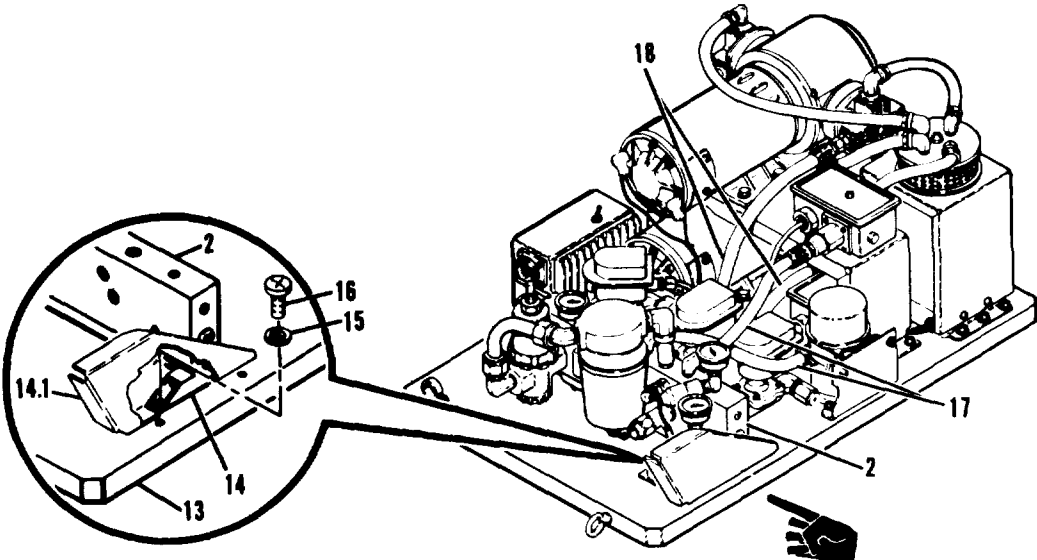
3.10. PCA MAINTENANCE INSTRUCTIONS - Continued

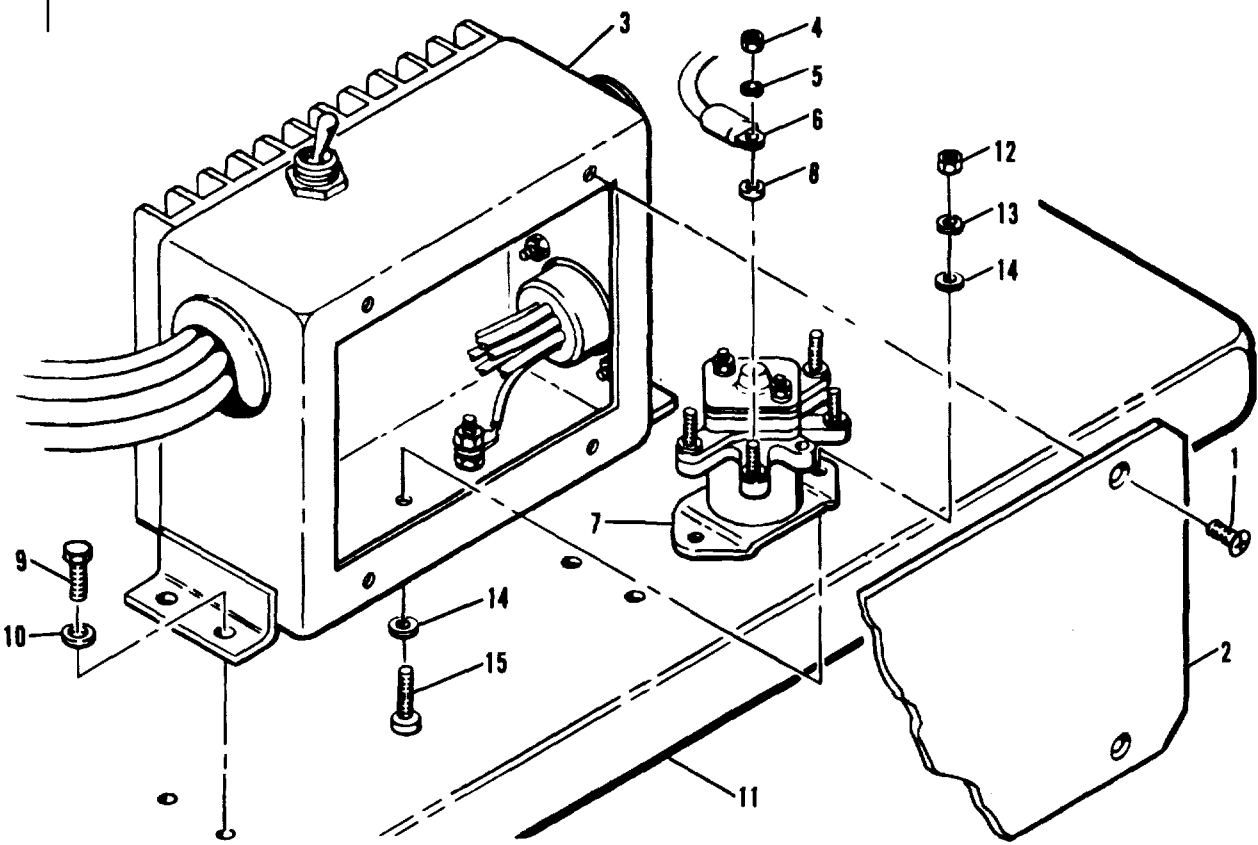
u. MANIFOLD HEATING ELEMENT HR1 - Continued

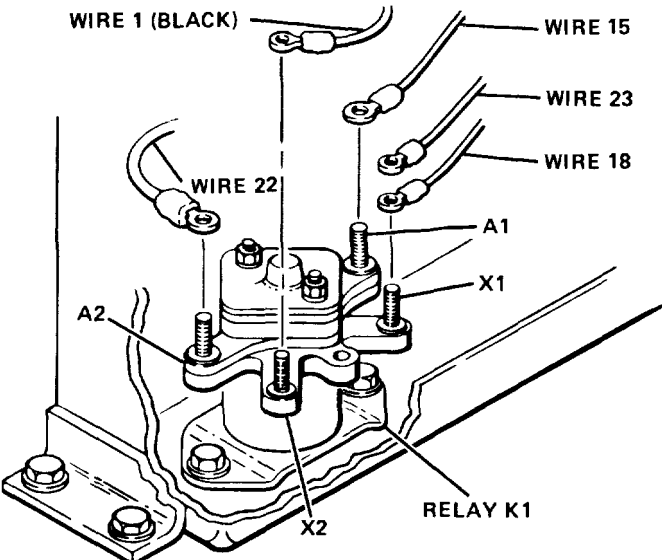
STEP	PROCEDURE
	 3. Using clean shop cloth, wipe off excess heat sink compound. 4. Slide bracket (1) onto manifold (2) so two slots are between manifold and flatwashers (3). 4.1 Install two flatwashers (4) and screws (5) to secure bracket (1) to opposite side of manifold (2). Tighten two screws (6). 5. Connect wires 34 and 35 (7) to terminals (8), either wire to either terminal, and secure with two flatwashers (9), lockwashers (10), nuts (11), and caps (12). CAUTION When lowering manifold to base, align ceramic caps with cutout in base to prevent breaking caps. 6. Remove shop cloth and carefully lower manifold (2) to base (13). 7. Secure two brackets (14) and bracket (14.1) to base (13) with four flatwashers (15) and screws (16). Three of the four screws may secure cable clamps (see para 3-10aa step 34). 8. Connect two pressure switch hoses (17). 9. Connect two compressor output hoses (18).

3-10. PCA MAINTENANCE INSUCTIONS - Continued

u. MANIFOLD HEATING ELEMENT HR1 - Continued

STEP	PROCEDURE
	

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued				
v. RELAY K1				
This task covers:				
Removal	Replacement	Installation	Test	
<u>INITIAL SETUP</u>				
<u>Tools</u> Refrig Unit Svce Tool Kit, 5180-00-596-1474 3/8 in. comb. wr 5/16 in. comb. wr No. 2 xtip scdr		Equipment Condition <u>Para</u> 3-10a	<u>Condition Description</u> PCA cover removed	
<u>Materials/Parts</u> relay		<u>Troubleshooting Reference</u> malfunction 2, step 5		
STEP	PROCEDURE			
	REMOVAL			
				
1.	Remove four screws (1), and remove cover (2) from junction box (3).			
2.	Remove four nuts (4) and lockwashers (5), disconnect five wires (6) from relay (7), and remove four flat washers (8).			

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued	
v. RELAY K1 - Continued	
STEP	PROCEDURE
3. 4. REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. 2. 3.	Remove four bolts (9) and flat washers (10) that secure junction box (3) to base (11). Remove two nuts (12), two lockwashers (13), four flat washers (14), and two screws (15); and remove relay (7). REPLACEMENT Replace faulty part with a new part. INSTALLATION Position relay (7) in Junction box (3) and secure with two screws (15), four flat washers (14), two lockwashers (13), and two nuts (12). Position junction box (3) on base (11) and secure with four flat washers (10) and bolts (9). Install four flat washers (8) on terminals of relay (7), connect five wires (6) as shown below, and secure wires with four lockwashers (5) and nuts (4). 
4. TEST	Position cover (2) on junction box (3), and secure with four screws (1). TEST Test PCA (para 3-19) to verify repair.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**w. RECTIFIER CR1****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
3/8 in. comb. wr
No. 2 xtip scdr
lg rd nose plr

Equipment
Condition

Para

3-10a

Condition Description

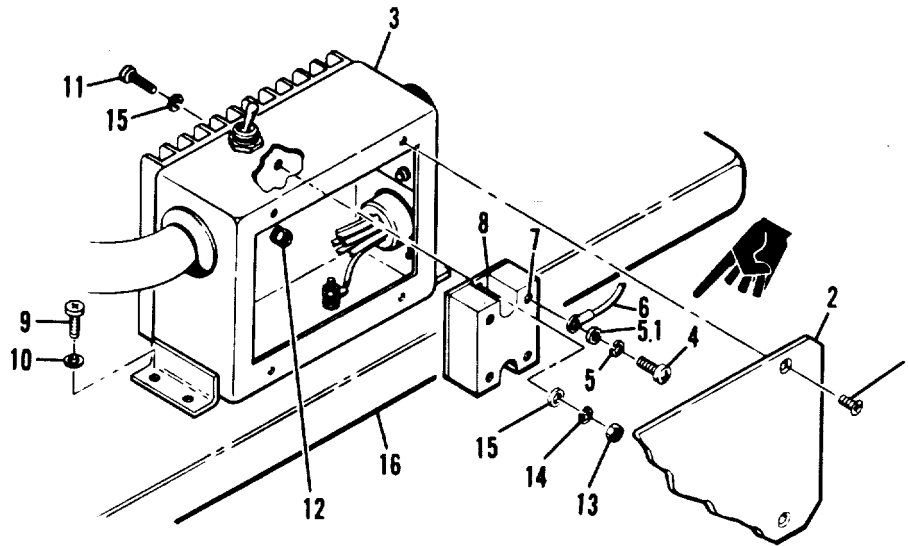
PCA cover removed

Troubleshooting Reference

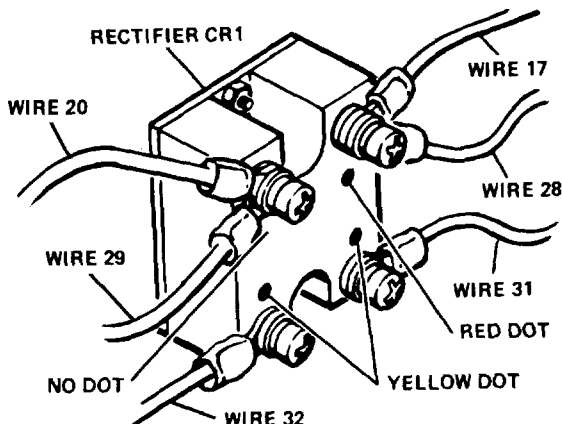
Malfunction 1, step 7

Materials/Parts

Shop cloth (appx B, item 17)
Heat sink compound (appx B, item 4)
Rectifier

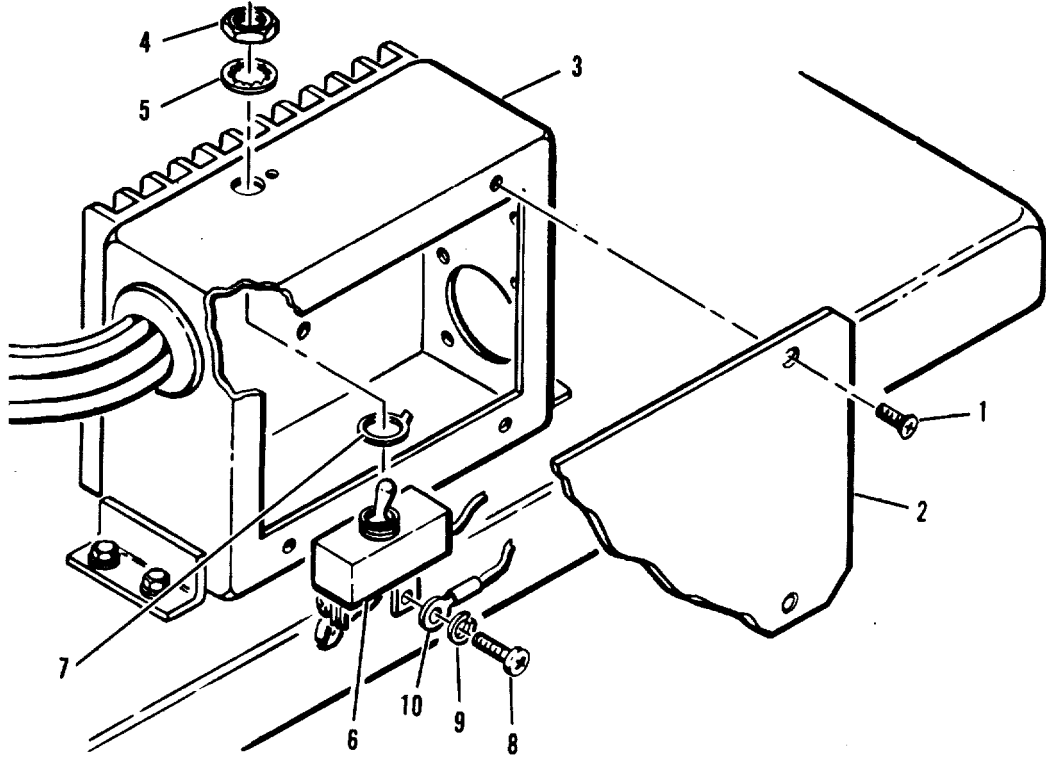
STEP**PROCEDURE****REMOVAL**

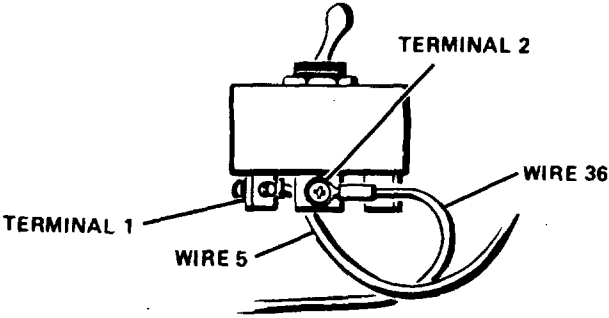
1. Remove four screws (1), and remove cover (2) from junction box (3).
2. Remove four screws (4), lockwashers (5), and flat washers (5.1) that secure six wires (6) to terminals (7) of rectifier (8), and disconnect wires.

3-10.	PCA MAINTENANCE INSTRUCTIONS - Continued
w.	RECTIFIER CR1 - Continued
STEP	PROCEDURE
3. 4. CLEANING Use a clean shop cloth to wipe heat sink compound from inner surface of junction box (3) in area where faulty rectifier was mounted. REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. 2. 3.	Remove four bolts (9) and flat washers (10), and move junction box (3) as required for access to screws (11). Using long round nose pliers, loosen nut (12) and remove nut (13), lockwasher (14), two flat washers (15), and screw (11). Slip rectifier (8) off nut (12) and rectifier. CLEANING Use a clean shop cloth to wipe heat sink compound from inner surface of junction box (3) in area where faulty rectifier was mounted. REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Apply a light coating of heat sink compound on mounting surface of rectifier (8). 2. Carefully place rectifier in mounting position on inner surface of junction box (3) with mounting slot between lockwashers and nut (12), and, using long round nose pliers to hold nut, secure with flat washer (15), two screws (11), two lockwashers (14), and nut (12). Tighten nut (12), then wipe off excess heat sink compound with shop cloth. 3. Connect six wires (6) to terminals (7) of rectifier (8), as shown below, and secure with four lockwashers (5), flat washers (5.1), and screws (4).
	 The diagram illustrates the wiring connections for Rectifier CR1. It shows a perspective view of the rectifier with six wires connected to its terminals. The connections are as follows: WIRE 20 is connected to the top-left terminal; WIRE 17 is connected to the top-right terminal; WIRE 28 is connected to the middle-right terminal; WIRE 29 is connected to the bottom-left terminal; WIRE 31 is connected to the bottom-right terminal; and WIRE 32 is connected to the middle-left terminal. A 'RED DOT' is marked on the middle-right terminal, and a 'YELLOW DOT' is marked on the bottom-right terminal. A 'NO DOT' label points to the bottom-left terminal. The rectifier is labeled 'RECTIFIER CR1'.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**w. RECTIFIER CRI - Continued**

STEP	PROCEDURE
	The diagram illustrates the assembly of a junction box (1) onto a base (2). The junction box is shown with its internal components, including a terminal block and wiring. It is secured to the base with four flat washers (3) and bolts (4). A cover (5) is then placed over the junction box and secured with four screws (6). 4. Position junction box (1) on base (2) and secure with four flat washers (3) and bolts (4). 5. Position cover (5) on junction box (1) and secure with four screws (6). TEST Test PCA (para 3-19) to verify repair.

3-10. PCA MAINTENANCE INSTRUCTIONS Continued				
x. HEATER SWITCH S6				
This task covers:				
Removal	Replacement	Installation	Test	
INITIAL SETUP Tools Refrig Unit Svce Tool Kit, 5180-00-596-1474 9/16 in. comb. wr ¼ in. flat tip scdr No. 2 xtip scdr Equipment Condition Para 3-10a Condition Description PCA cover removed Materials/Parts switch				
STEP	PROCEDURE			
	REMOVAL 			

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued	
x. HEATER SWITCH S6 -Continued	
STEP	PROCEDURE
1.	Remove four screws (1), and remove cover (2) from junction box (3).
2.	Remove nut (4) and internal tooth lockwasher (5) and remove switch (6) and tab washer (7) from Junction box (3).
3.	Remove two screws (8) and lockwashers (9) that attach two wires (10) to terminals of switch (6) and disconnect wires.
	REPLACEMENT Replace faulty part with a new part.
	INSTALLATION
1.	Connect two wires (10), as shown below, and secure with two lockwashers (9) and screws (8).
2.	Install tab washer (7) and switch (6) in junction box (3), and secure with internal tooth lockwasher (5) and nut (4).
	
3.	Position cover (2) on Junction box (3), and secure with four screws (1).

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**y. CONNECTOR J1****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,

5180-00-596-1474

No. 1 xtip scdr

Pocket knife

Skt wr set, 5120-00-081-2305

Sldr/desldr set, 3439-00-460-7198

Heat gun HG-501

Materials/Parts

Heat shrink sleeving (appx B, item 7)

Solder (appx B, item 19)

Connector

Deleted

EquipmentConditionPara

3-10a

3-10w

Condition Description

PCA cover removed

Rectifier CR1 removed

Troubleshooting ReferenceMalfunctionStep

2

4

3

3

4

3

5

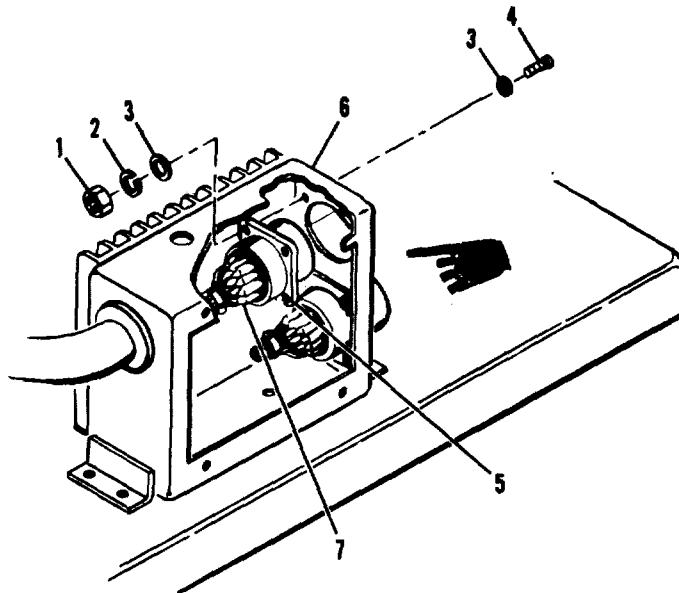
3

5

9

6

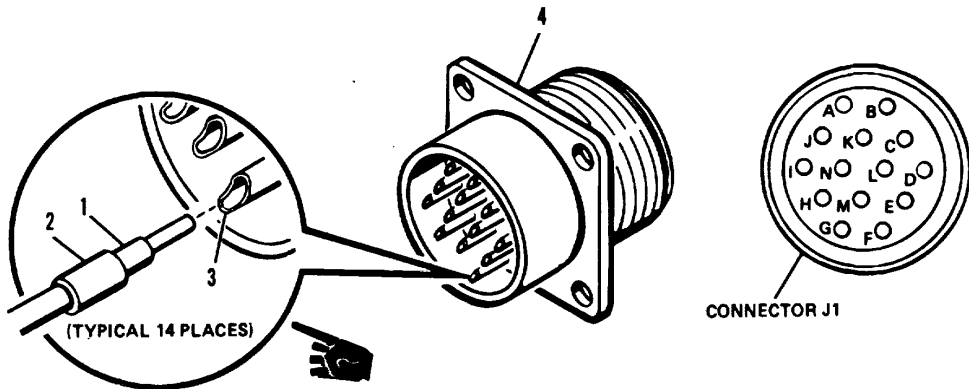
3

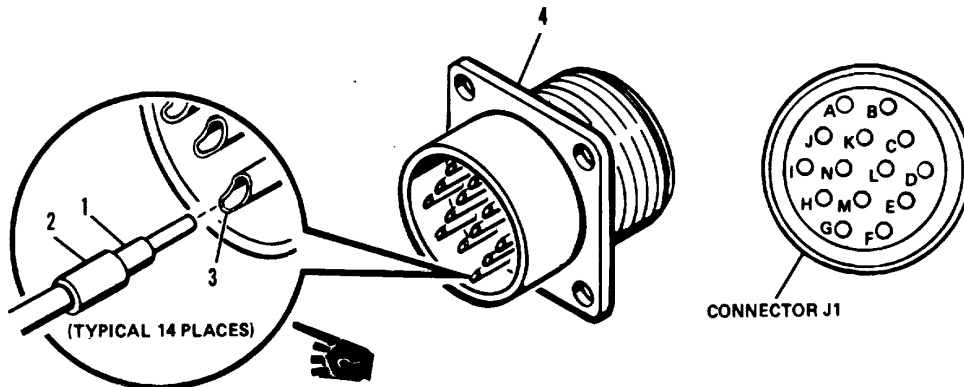
STEP**PROCEDURE****REMOVAL**

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**y. CONNECTOR J1 - Continued**

STEP	PROCEDURE
1. 2. 3.	Remove four nuts (1), four lockwashers (2), eight flat washers (3), and four screws (4) that secure connector (5) to junction box (6). Carefully pull connector (5) away from junction box (6) to gain access to soldered connections of wires (7) at rear of connector. Disconnect each of 14 wires (7) as follows: a. Carefully split and remove heat shrink sleeve (8). WARNING Improperly reconnected wires can cause physical injury. Carefully tag all wires before disconnecting them. b. Unsolder and disconnect wire (7) from pin (9). Remove connector (5).
4.	REPLACEMENT Replace faulty part with a new part. INSTALLATION
1.	Deleted.
2.	Cut 14 pieces of heat shrink sleeve (8), each approximately 3/4 inch long. The diagram illustrates the disconnection process. On the left, a circular inset labeled '(TYPICAL 14 PLACES)' shows a wire (7) with a heat shrink sleeve (8) being removed from a pin (9). In the center, a perspective view of connector (5) shows its internal pins (9). On the right, a top-down view of 'CONNECTOR J1' shows 14 pins arranged in a circle, labeled with letters: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**y. CONNECTOR J1 - Continued**

STEP	PROCEDURE																																				
3.	Connect each of 14 wires (1) as follows: a. Slip a piece of heat shrink sleeve (2) over end of wire. b. Refer to list, below, and to wire tags attached during removal for wire connections. <table><tr><td><u>Connect wire:</u></td><td><u>to pin:</u></td><td><u>Connect wire:</u></td><td><u>to pin:</u></td></tr><tr><td>1 (brown)</td><td>A</td><td>4 (brown)</td><td>H</td></tr><tr><td>2 brown)</td><td>B</td><td>9 (brown)</td><td>I</td></tr><tr><td>2 (black)</td><td>C</td><td>9 (black)</td><td>J</td></tr><tr><td>4 (black)</td><td>C</td><td>11 (white)</td><td>K</td></tr><tr><td>None</td><td>D</td><td>12 (white)</td><td>L</td></tr><tr><td>5 (white)</td><td>E</td><td>13 (white)</td><td>M</td></tr><tr><td>6 (white)</td><td>F</td><td>14 (white)</td><td>N</td></tr><tr><td>7 (white)</td><td></td><td></td><td></td></tr></table> c. Insert wire (1) into base of pin (3) and solder wire to pin. Allow to cool. d. Slip heat shrink sleeve (2) over pin and soldered connection.	<u>Connect wire:</u>	<u>to pin:</u>	<u>Connect wire:</u>	<u>to pin:</u>	1 (brown)	A	4 (brown)	H	2 brown)	B	9 (brown)	I	2 (black)	C	9 (black)	J	4 (black)	C	11 (white)	K	None	D	12 (white)	L	5 (white)	E	13 (white)	M	6 (white)	F	14 (white)	N	7 (white)			
<u>Connect wire:</u>	<u>to pin:</u>	<u>Connect wire:</u>	<u>to pin:</u>																																		
1 (brown)	A	4 (brown)	H																																		
2 brown)	B	9 (brown)	I																																		
2 (black)	C	9 (black)	J																																		
4 (black)	C	11 (white)	K																																		
None	D	12 (white)	L																																		
5 (white)	E	13 (white)	M																																		
6 (white)	F	14 (white)	N																																		
7 (white)																																					
																																					



3-10. PCA MAINTENANCE INSTRUCTIONS - Continue**y. CONNECTOR J1 - Continued**

STEP	PROCEDURE
4. 5.	When all wires are connected, apply heat to shrink sleeves over pins and soldered connections. Position connector (4) on Junction box (5), and secure with eight flat washers (6), four screws (7), four lockwashers (8), and four nuts (9). TEST Test PCA (para 3-19) to verify repair.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**z. CONNECTOR J2****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 1 xtip scdr
Pocket knife
Skt wr set, 5120-00-081-2305
Sldr/desldr set, 3439-00-460-7198
Heat gun HG-501

Equipment
ConditionPara

3-10a

3-10w

Condition Description

PCA cover removed

Rectifier CR1 removed

Troubleshooting Reference

Malfunction 1, step 9

Malfunction 2, step 4

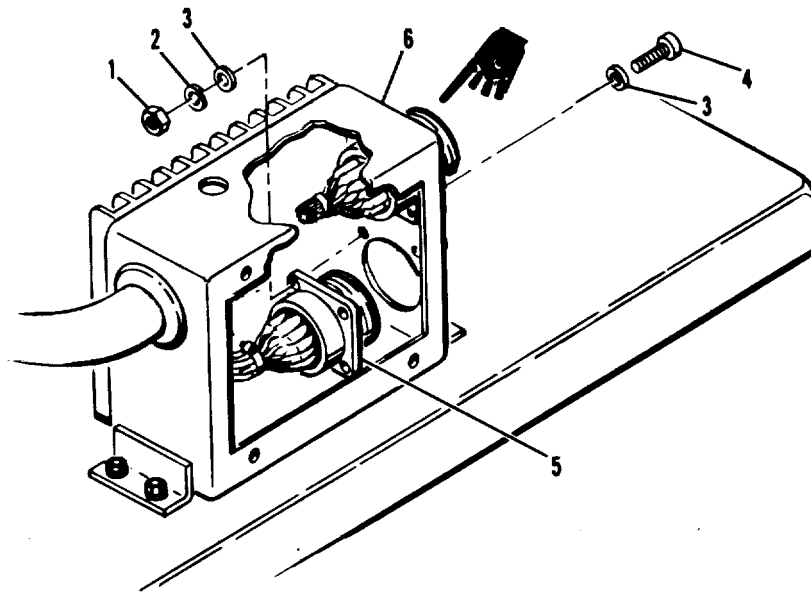
Materials/Parts

Heat shrink sleeving (appx B, item 7)

Solder (appx B, item 19)

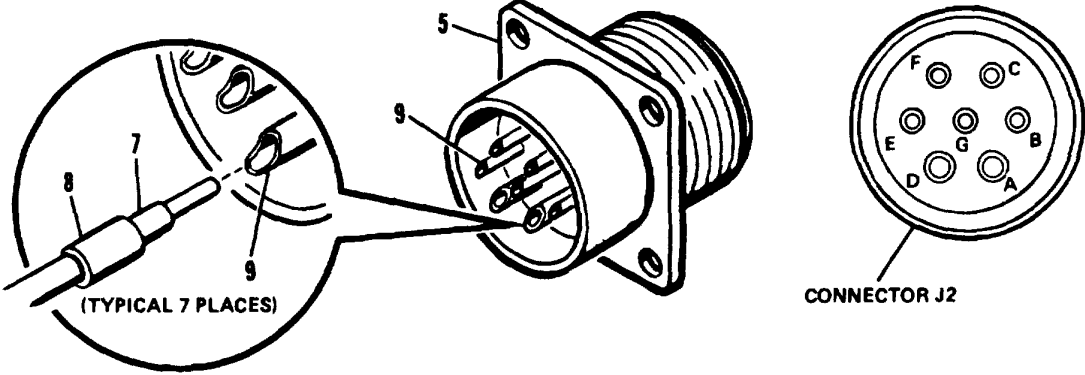
Receptacle

Deleted

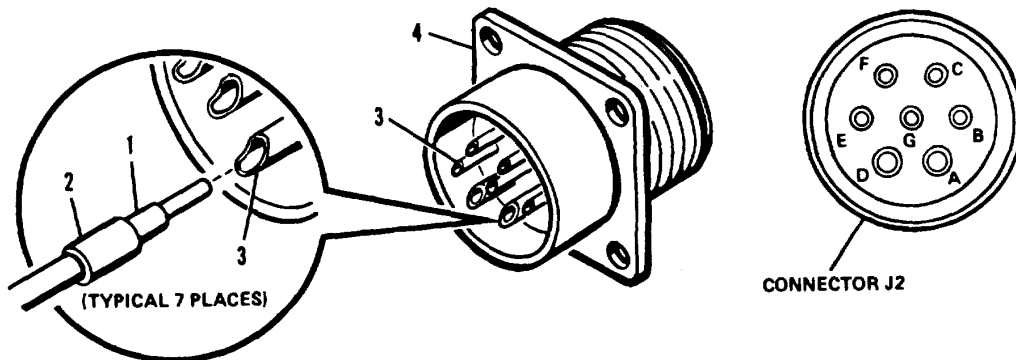
STEP**PROCEDURE****REMOVAL**

1.

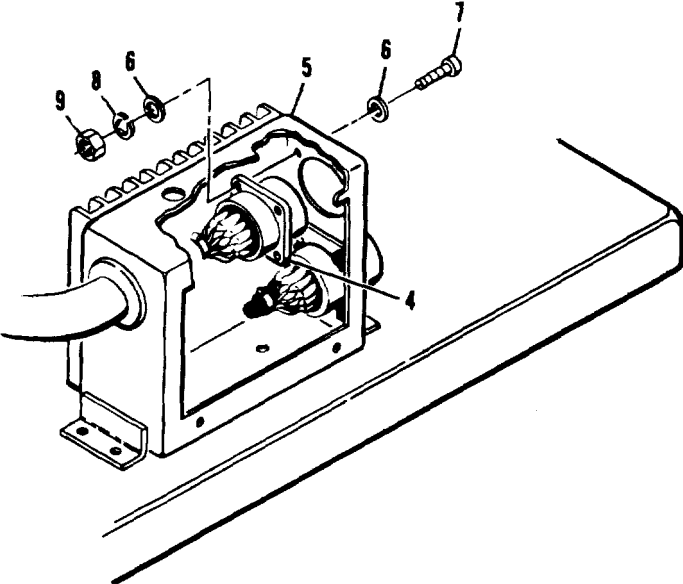
Remove four nuts (1), four lockwashers (2), eight flat washers (3), and four screws (4) that secure connector (5) to junction box (6).

3-10.	PCA MAINTENANCE INSTRUCTIONS - Continued
z.	CONNECTOR J2 - Continued
STEP	PROCEDURE
2.	Carefully pull connector (5) away from Junction box (6) to gain access to soldered connections of wires (7).  3. Disconnect each of seven wires (7) as follows: - Carefully split and remove heat shrink sleeve (8). WARNING Improperly reconnected wires can cause physical injury. Carefully tag all wires before disconnecting them. - Unsolder and disconnect wire (7) from pin (9). 4. Remove connector (5). REPLACEMENT Replace faulty part with a new part. INSTALLATION - Deleted. - Cut eight pieces of heat shrink sleeve (8), each approximately 3/4 inch long.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**z. CONNECTOR J2 - Continued**

STEP	PROCEDURE																				
3.	Connect each of seven wires (1) as follows: a. Slip a piece of heat sink sleeve (2) over end of wire (1). b. Refer to list, below, and to wire tags attached during removal for wire connections. <table><tr><td><u>Connect wire:</u></td><td><u>to pin:</u></td><td><u>Connect wire:</u></td><td><u>to pin:</u></td></tr><tr><td>15</td><td>A</td><td>19</td><td>E</td></tr><tr><td>16</td><td>B</td><td>34</td><td>E</td></tr><tr><td>17</td><td>C</td><td>20</td><td>F</td></tr><tr><td>18</td><td>D</td><td>21</td><td>G</td></tr></table> c. Insert wire (1) into base of pin (3) and solder wire to pin. Allow to cool. d. Slip heat shrink sleeve (2) over soldered connection.	<u>Connect wire:</u>	<u>to pin:</u>	<u>Connect wire:</u>	<u>to pin:</u>	15	A	19	E	16	B	34	E	17	C	20	F	18	D	21	G
<u>Connect wire:</u>	<u>to pin:</u>	<u>Connect wire:</u>	<u>to pin:</u>																		
15	A	19	E																		
16	B	34	E																		
17	C	20	F																		
18	D	21	G																		
4.	When all wires are connected, apply heat to shrink sleeves over pins and soldered connections. 																				

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**z. CONNECTOR J2 - Continued**

STEP	PROCEDURE
5.	Position connector (4) on Junction box (5) and secure with eight flat washers (6), four screws (7), four lockwashers (8), and four nuts (9). TEST Test PCA (para 3-19) to verify repair.  The diagram is an exploded view showing the assembly of connector (4) onto junction box (5). The junction box is mounted on a rectangular base plate. Connector (4) is a cylindrical component with a cable attached to its side. Eight flat washers (6) are shown being positioned around the base of the connector. Four screws (7) are shown being inserted through the top of the junction box into the base plate. Four lockwashers (8) and four nuts (9) are shown being positioned around the base of the connector to secure it to the junction box.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**aa. WIRE HARNESS****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 1 xtip scdr
No. 2 xtip scdr
No. 3 xtip scdr
¼ in. comb. wr
3/8 in. comb. wr
5/8 in. comb. wr
7/16 in. comb. wr
9/16 in. comb. wr
1 in. comb. wr
pocket knife
lg rd nose plr
skt wr set,
5120-00-081-2305
No. 2 xtip scdr (16 in. blade)
diag ctg plr, 5110-00-965-0974

Materials/Parts

heat shrink sleeving (appx B, items
6, 7, 8, 9, 10, 11, or 12)
solder (appx B, item 19)
heat sink compound (appx B, item 4)
wire harness
insulation sleeve (see RPSTL)
tiedown strap (six)

sldr and desldr set, 3430-00-460-7198
heat gun, 4940-00-363-3225
1-¼ in. comb. wr
1-3/8 in. comb. wr
1-5/16 in. comb. wr
1-½ in. comb. wr

Equipment
Condition

<u>Para</u>	<u>Condition Description</u>
3-10a	PCA cover removed

Troubleshooting Reference (table 3-3)

Malfunction 1, step 9
Malfunction 2, step 5
Malfunction 3, step 3
Malfunction 4, step 3
Malfunction 5, step 13
Malfunction 6, step 7

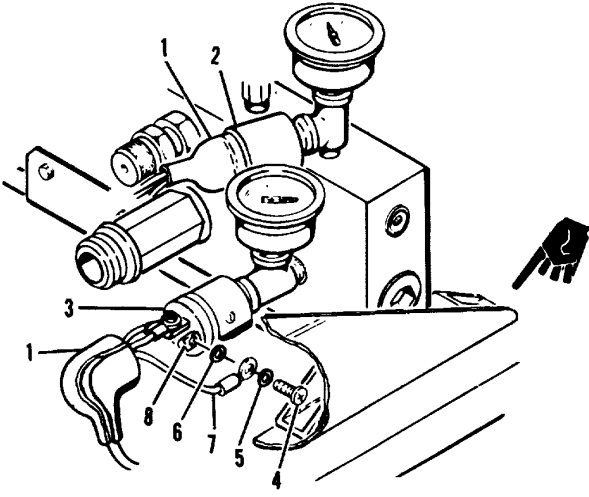
STEP**PROCEDURE****REMOVAL****WARNING**

Mast group equipment may move in an unexpected manner if you do not connect wire harness wires correctly. Such movement may cause injury or death.

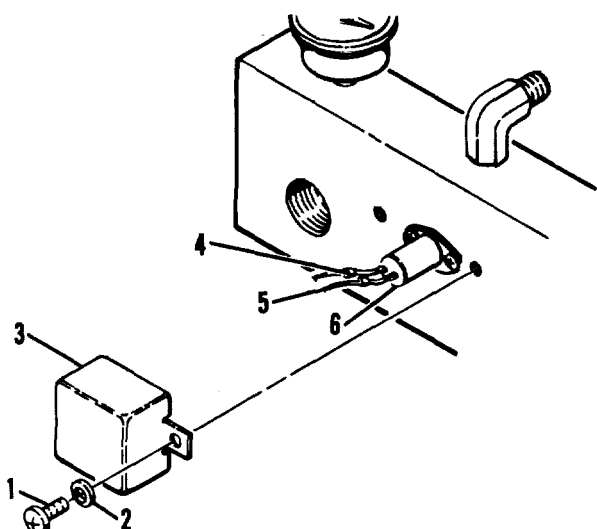
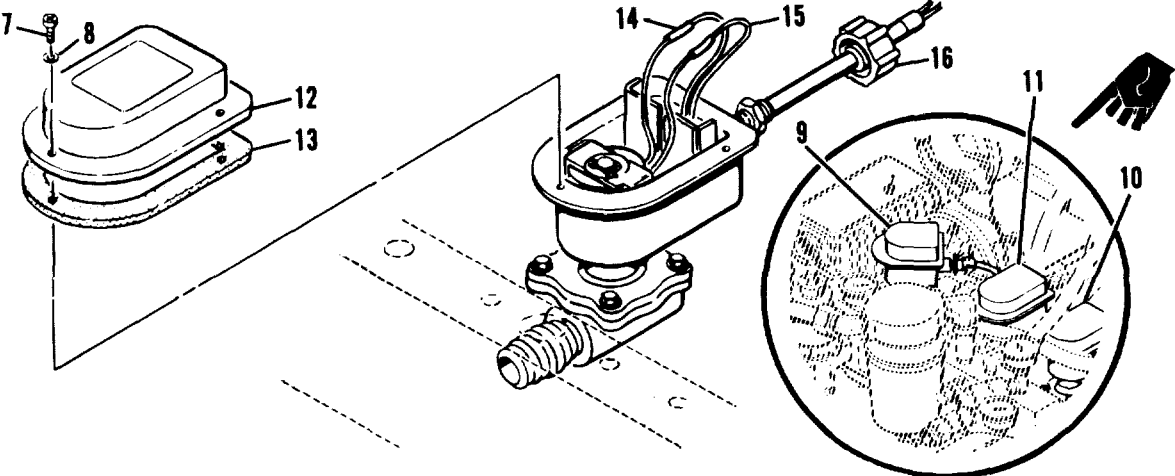
NOTE

Since you will need to disconnect and then connect many wires during replacement, do not replace a wire harness unless you are certain it is faulty.

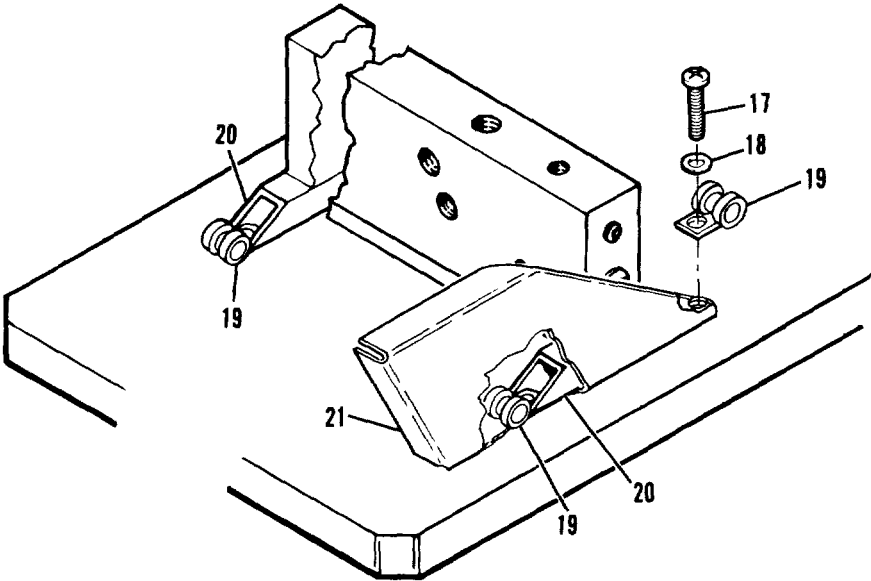
3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**aa. WIRE HARNESS - Continued**

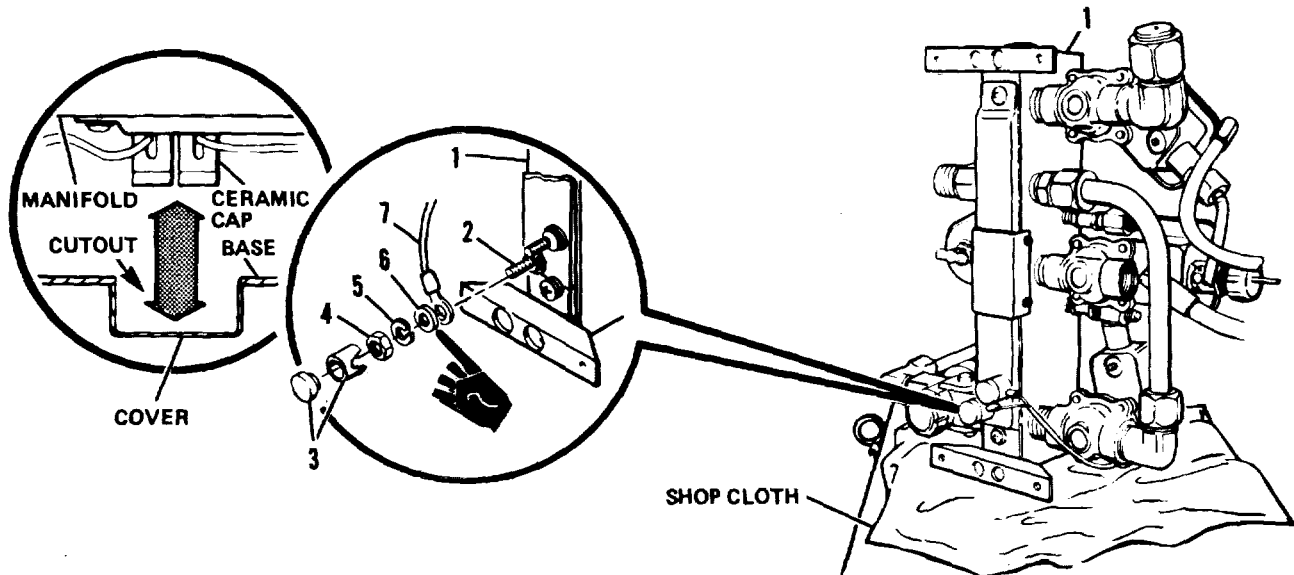
STEP	PROCEDURE
	NOTE When troubleshooting has indicated that the wire harness is faulty do a PCA test (para 3.19) to verify that fault is present. Refer to the PCA schematic diagram (FO-7) and the Wire List (Appx D), and check continuity of harness wires. Make certain that the wire harness connections are clean and securely made. Replace the wire harness only if an open or shorted wire is found. 
1.	Carefully split and remove insulating sleeving (1) from switch S2 (2) and switch S3 (3). NOTE Throughout this removal procedure, loosely reinstall screws and other hardware removed after disconnecting wire harness lead wires. 2. Remove three screws (4) and lockwashers (5 and 6) from switches (2 and 3) and disconnect three wires (7) from terminals (8) of each switch.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**aa. WIRE HARNESS - Continued**

STEP	PROCEDURE
	
3.	Remove two screws (1) and flat washers (2), and remove cover (3).
4.	Remove heat shrink sleeving (4) from two wires (5) and unsolder wires from terminals of thermostat (6).
	
5.	Remove three screws (7) and lockwashers (8) each from solenoid valves A2 (9), A3 (10), and A4 (11) and remove cover (12) and gasket (13) from each solenoid valve.
6.	Carefully split and remove heat shrink sleeving (14) from six wires (15).

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**aa. WIRE HARNESS - Continued**

STEP	PROCEDURE
7. 8.	Unsolder two wires (15) each from solenoid valves (9, 10, and 11). Unscrew and remove strain relief bushing (16) from each solenoid valve (9, 10, and 11); and remove strain relief bushings from harness wires. 
9.	Remove four screws (17), flatwashers (18), and if installed three cable clamps (19) from two brackets (20) and bracket (21).

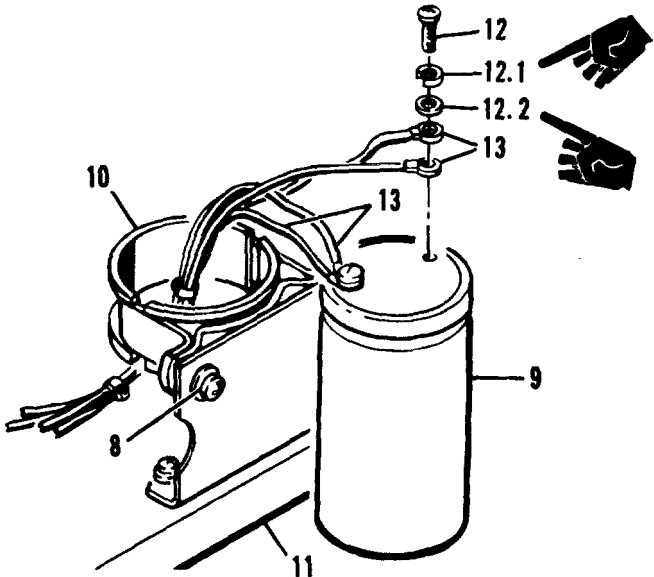
3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**aa. WIRE HARNESS - Continued****STEP****PROCEDURE****CAUTION**

When lifting manifold, lift straight up for first 2 inches to avoid damaging ceramic caps on terminals beneath manifold.

Place a clean shop cloth between upended manifold and base to avoid damaging insulation on wires or scratching base.

10. Lift manifold (1) and stand on end for access to terminals (2) beneath manifold.
11. Unscrew and remove two caps (3), nuts (4), lockwashers (5) and flatwashers (6); and disconnect two wires (7) from terminals (2).
12. Remove manifold (1) from PCA and place manifold on a clean surface away from PCA.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**aa. WIRE HARNESS - Continued**

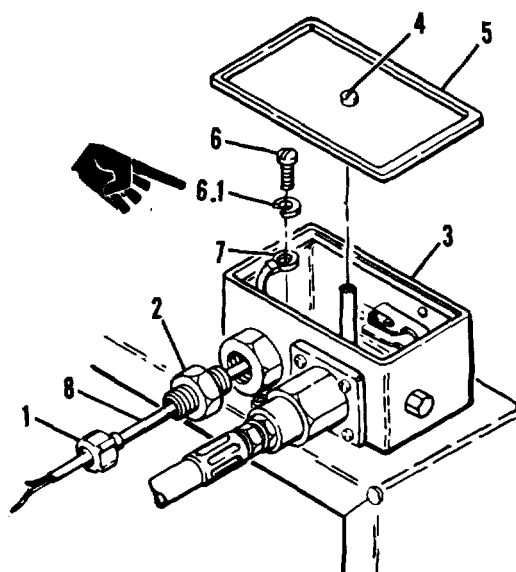
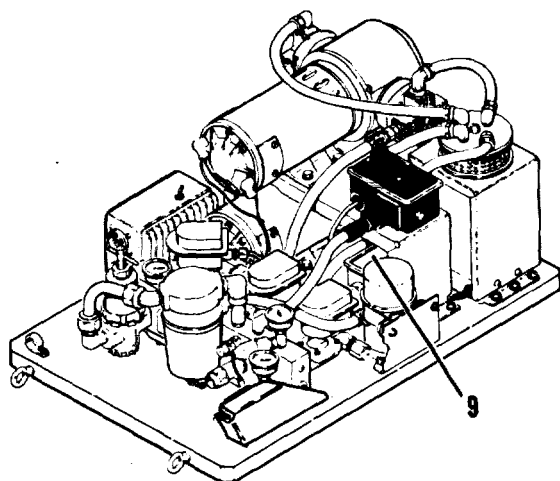
STEP	PROCEDURE
	 13. Loosen two screws (8) to free capacitor (9) from retaining strap (10). 14. Lift capacitor (9) out of retaining strap (10), turn capacitor upside down, and stand it next to base (11). 15. Remove two screws (12), two lockwashers (12.1), and two flat washers (12.2) and disconnect four wires (13).

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

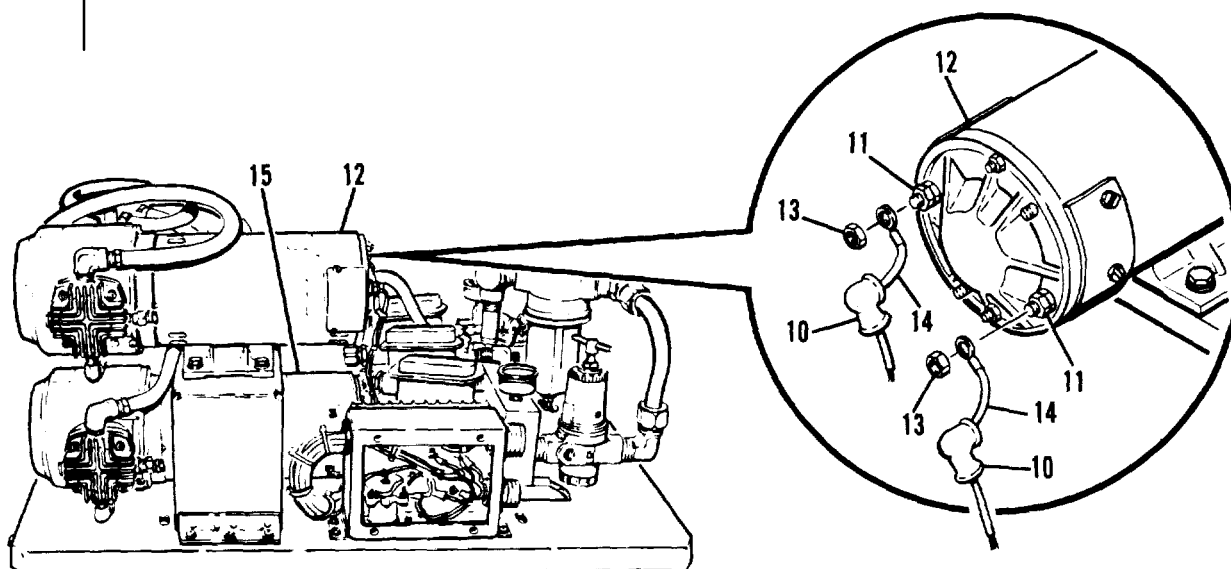
aa. WIRE HARNESS - Continued

STEP

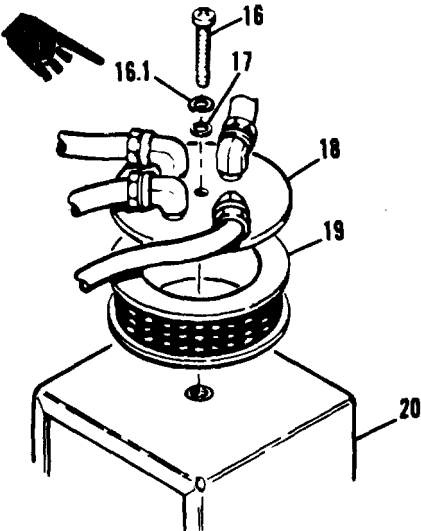
PROCEDURE



16. Unscrew strain relief bushing (1) from adapter (2) and then unscrew adapter from switch S4 (3).
17. Release captive screw (4) and remove cover (5) with attached gasket.
18. Remove two screws (6), and two lockwashers (6.1), and pull two wires (7) out of port in switch (3).
19. Remove adapter (2) and strain relief bushing (1) from wire harness (8).
20. Repeat steps 16 through 19 at switch S1 (9)

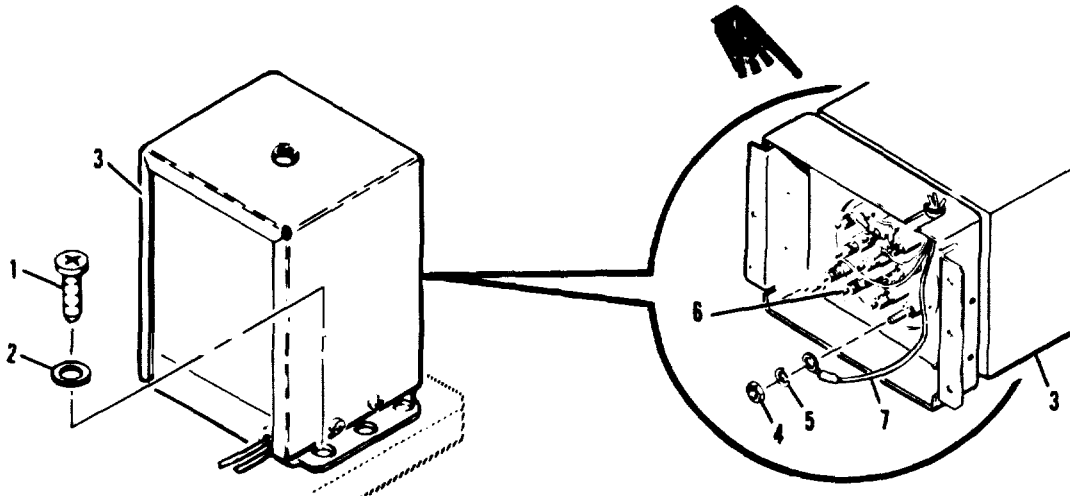
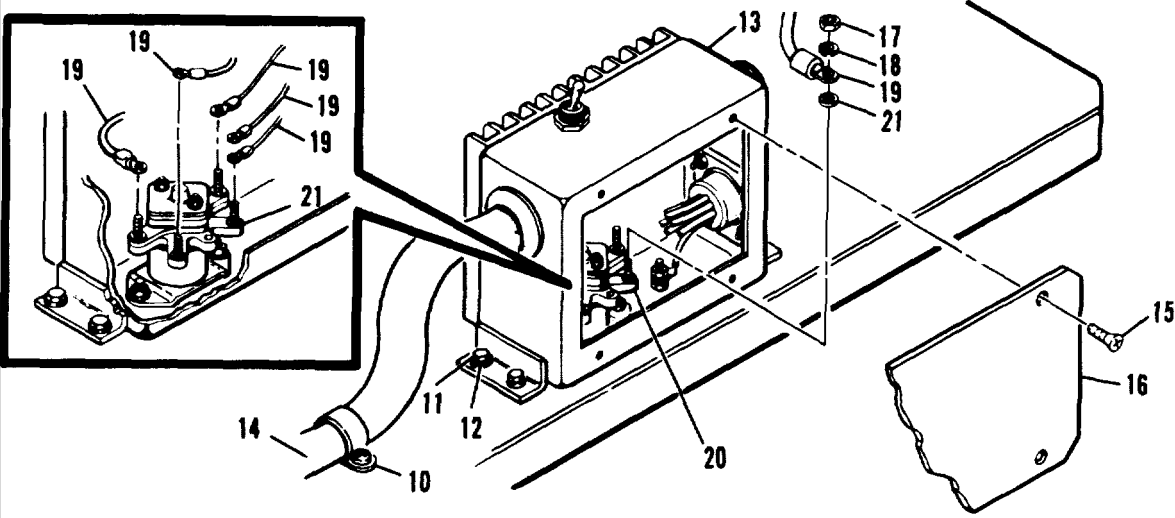


3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**aa. WIRE HARNESS - Continued**

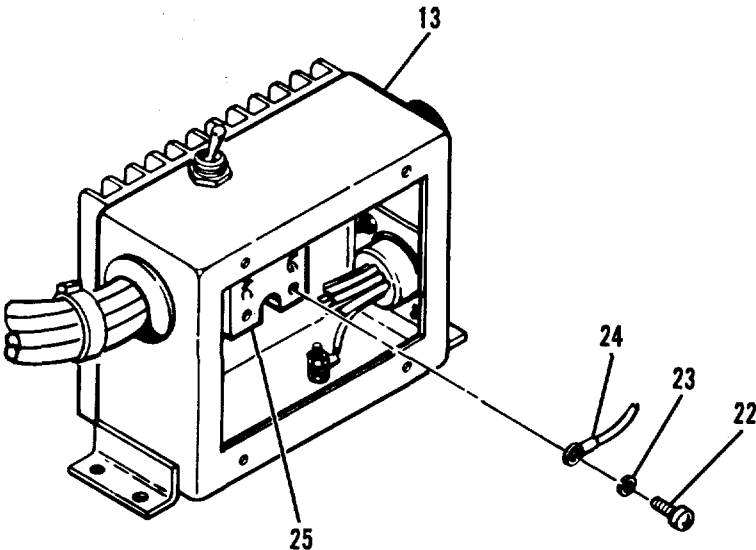
STEP	PROCEDURE
21.	Slip insulation sleeve (10) off each of two terminals (11) of compressor A5 (12).
22.	Remove two nuts (13) and disconnect two wires (14) from terminals (11).
23.	Pull insulation sleeve (10) off each of two wires (14).
24.	Repeat steps 21 through 23 at compressor A1 (15)
25.	
	Remove screw (16), lockwasher (16.1), and flat washer (17).
	Lift plate (18) and remove filter element (19) from cover (20).

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

aa. WIRE HARNESS - Continued

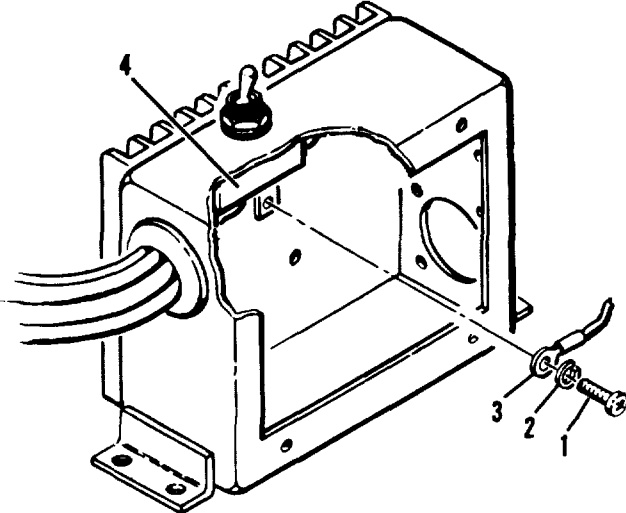
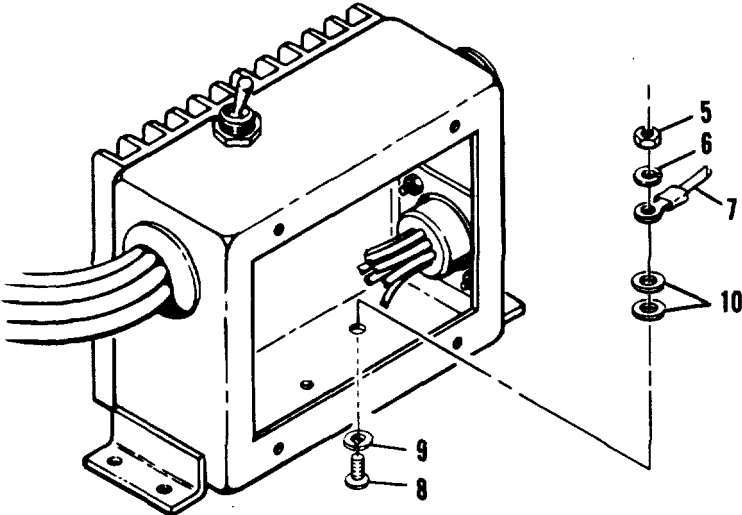
STEP	PROCEDURE
	 27. Remove six screws (1) and flat washers (2). 28. Turn transformer (3) on its side for disconnection of harness leads. 29. Remove six nuts (4) and flat washers (5) from terminals (6), and disconnect six wires (7). 30. Deleted. 

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**aa. WIRE HARNESS - Continued**

STEP	PROCEDURE
31.	If used on your PCA, cut wire harness tiedown straps (10).
32.	Remove four bolts (11) and flat washers (12), and remove junction box (13) and attached wire harness (14) to work bench.
33.	Remove four screws (15) from cover (16) and remove cover.
34.	Remove four nuts (17) and lockwashers (18), disconnect five wires (19) from terminals of relay (20), and remove four flat washers (21).
35.	 Remove four screws (22) and lockwashers (23) and disconnect five wires (24) from terminals of rectifier CR1 (25).

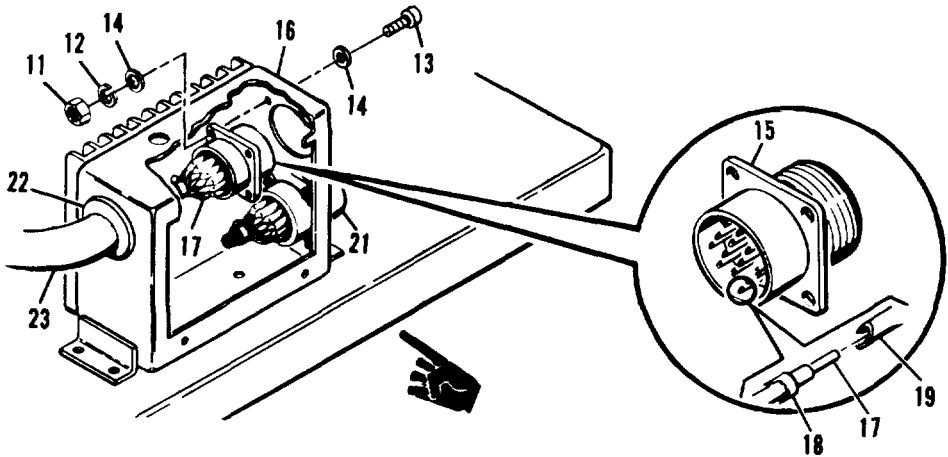
3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

aa. WIRE HARNESS - Continued

STEP	PROCEDURE
	
36.	Remove two screws (1) and lockwashers (2), and disconnect two wires (3) from terminals of switch S6 (4). 

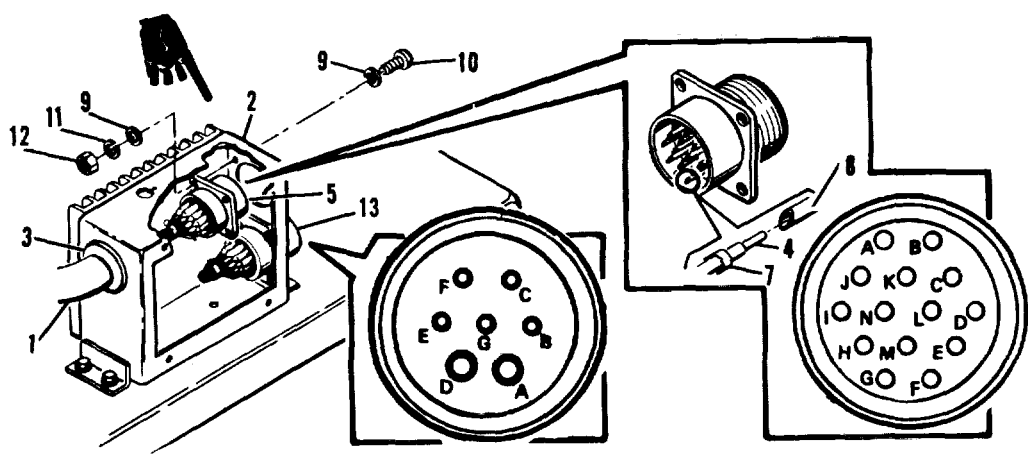
3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

aa. WIRE HARNESS - Continued

STEP	PROCEDURE
	 38. Remove four nuts (11), four lockwashers (12), four screws (13), and eight flat washers (14). 39. Carefully pull connector J1 (15) away from junction box (16) to gain access to soldered connections of wires (17) at rear of connector. 40. Disconnect each of 14 wires (17) as follows: - Carefully remove heat shrink sleeve (18). - Unsolder and disconnect wire (17) from pin (19). 41. Remove connector (15). 42. Repeat steps 38 through 41 at connector J2 (21), except that only seven wires need to be unsoldered and disconnected. 43. Pull ends of wires in junction box (16) out through grommet (22), and remove wire harness (23). REPLACEMENT Replace faulty part with a new part.

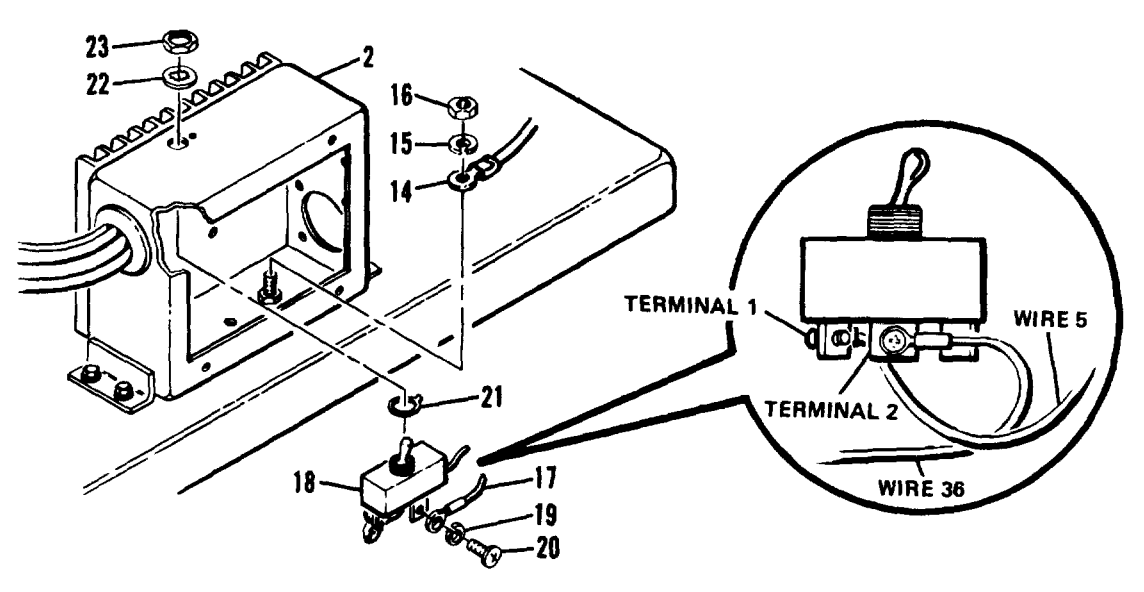
3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

aa. WIRE HARNESS - Continued

STEP	PROCEDURE																																								
	INSTALLATION  Most group equipment may move in an unexpected manner if you do not connect wire harness wires correctly. Such movement may cause Injury or death. - Place wire harness (1) and junction box (2) on workbench and feed the ends of wires listed in step 4 below through grommet (3) and into junction box. - Deleted. - Slip a 1/2 inch length of heat shrink sleeve (7) over end of each wire (4). - Solder wires (4) to pins (8) as listed. <table><tr><th>Wire</th><th>Pin</th><th>Wire</th><th>Pin</th><th>Wire</th><th>Pin</th><th>Wire</th><th>Pin</th></tr><tr><td>1 BRN</td><td>A</td><td>5 WHT</td><td>E</td><td>9 BRN</td><td>I</td><td>13 WHT</td><td>M</td></tr><tr><td>2 BRN</td><td>B</td><td>6 WHT</td><td>F</td><td>9 BLK</td><td>J</td><td>14 WHT</td><td>N</td></tr><tr><td>3 BRN</td><td>C</td><td>7 WHT</td><td>G</td><td>11 WHT</td><td>K</td><td></td><td></td></tr><tr><td>4 BRN</td><td>C</td><td>4 BRN</td><td>H</td><td>12 WHT</td><td>L</td><td></td><td></td></tr></table> - Slip heat shrink sleeves (7) over soldered connections and apply heat to make sleeve shrink. - Position connector (5) on junction box (2) and secure with eight flat washers (9), four screws (10), four lockwashers (11), and four nuts (12).	Wire	Pin	Wire	Pin	Wire	Pin	Wire	Pin	1 BRN	A	5 WHT	E	9 BRN	I	13 WHT	M	2 BRN	B	6 WHT	F	9 BLK	J	14 WHT	N	3 BRN	C	7 WHT	G	11 WHT	K			4 BRN	C	4 BRN	H	12 WHT	L		
Wire	Pin	Wire	Pin	Wire	Pin	Wire	Pin																																		
1 BRN	A	5 WHT	E	9 BRN	I	13 WHT	M																																		
2 BRN	B	6 WHT	F	9 BLK	J	14 WHT	N																																		
3 BRN	C	7 WHT	G	11 WHT	K																																				
4 BRN	C	4 BRN	H	12 WHT	L																																				

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

aa. WIRE HARNESS - Continued

STEP	PROCEDURE																								
7.	Repeat steps 2 through 6 connector J2 (13) except feed seven wires through lower cutout in Junction box and connect wires to pins listed. <table><tr><td>Wire</td><td>Pin</td><td>Wire</td><td>Pin</td><td>Wire</td><td>Pin</td><td>Wire</td><td>Pin</td></tr><tr><td>15</td><td>A</td><td>17</td><td>C</td><td>19</td><td>E</td><td>20</td><td>F</td></tr><tr><td>16</td><td>B</td><td>18</td><td>D</td><td>34</td><td>E</td><td>21</td><td>G</td></tr></table> 	Wire	Pin	Wire	Pin	Wire	Pin	Wire	Pin	15	A	17	C	19	E	20	F	16	B	18	D	34	E	21	G
Wire	Pin	Wire	Pin	Wire	Pin	Wire	Pin																		
15	A	17	C	19	E	20	F																		
16	B	18	D	34	E	21	G																		
8.	Install ground wire 21 (14), lockwasher (15), and nut (16).																								
9.	Connect two wires (17) to switch S6 (18), wire 5 to terminal 1 and wire 36 to terminal 2, and secure with two lockwashers (19) and screws (20).																								
10.	Place tab washer (21) on switch (18), position switch inside Junction box (2) with tab of washer in hole in Junction box, and secure switch with internal tooth lockwasher (22) and nut (23).																								

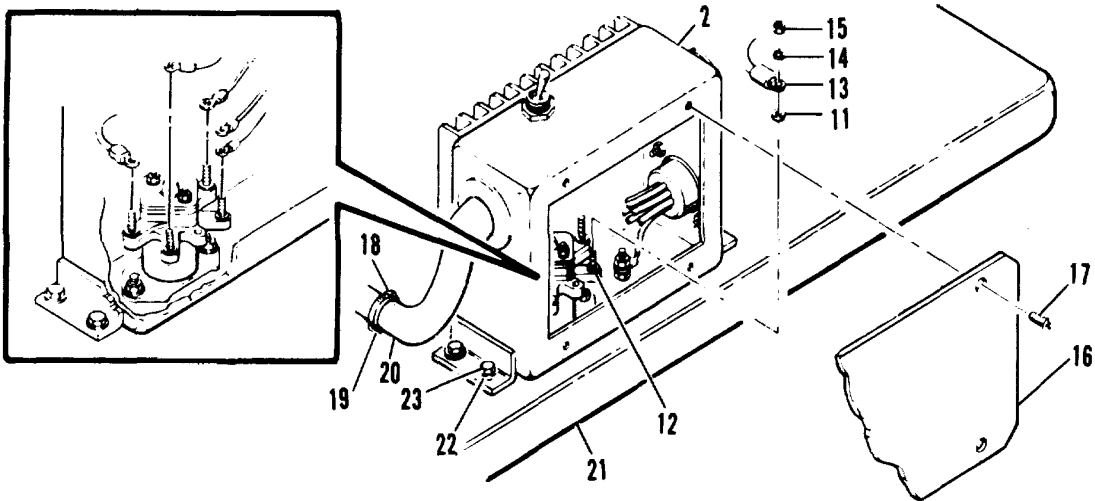
3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

aa. WIRE HARNESS - Continued

STEP	PROCEDURE																
11.	Apply a light coating of heat sink compound to back surface of rectifier CR1 (1) and position rectifier on back wall of junction box (2) with slot of rectifier between flatwasher (3) and back wall.																
12.	Install two flat washers (4), screw (5), lockwasher (6), and nut (7). Using long round nose pliers to hold nuts securing rectifier (1), tighten both screws.																
13.	Connect six wires (8) to rectifier (1) as listed, and secure with four lockwashers (9) and screws (10).																
	<table><tr><th>Wire</th><th>Terminal</th><th>Wire</th><th>Terminal</th></tr><tr><td>17</td><td>+ (red dot)</td><td>31</td><td>AC (yellow dot)</td></tr><tr><td>28</td><td>+ (red dot)</td><td>20</td><td>- (minus) (no dot)</td></tr><tr><td>32</td><td>AC (yellow dot)</td><td>29</td><td>- (minus) (no dot)</td></tr></table>	Wire	Terminal	Wire	Terminal	17	+ (red dot)	31	AC (yellow dot)	28	+ (red dot)	20	- (minus) (no dot)	32	AC (yellow dot)	29	- (minus) (no dot)
Wire	Terminal	Wire	Terminal														
17	+ (red dot)	31	AC (yellow dot)														
28	+ (red dot)	20	- (minus) (no dot)														
32	AC (yellow dot)	29	- (minus) (no dot)														

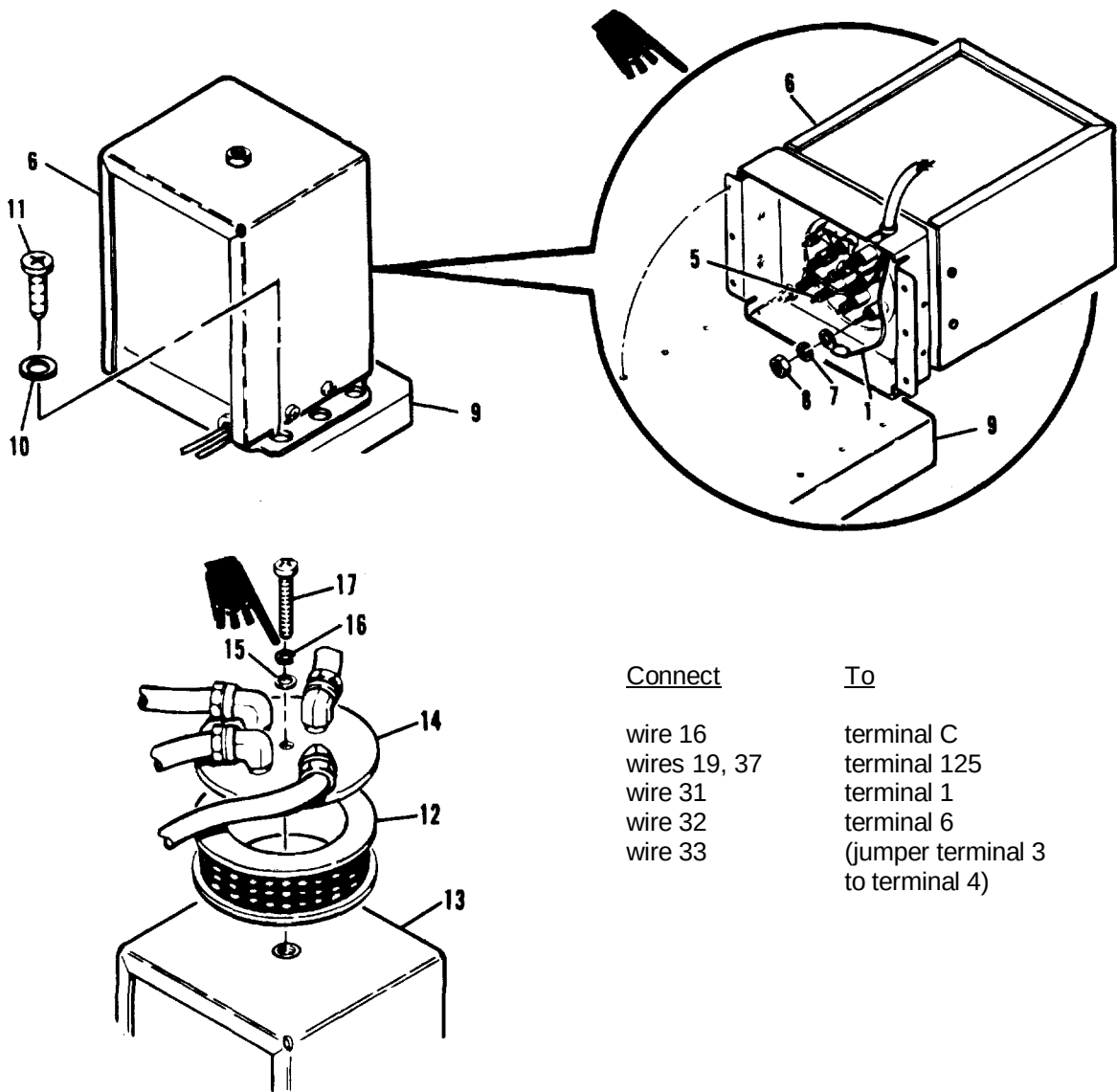
3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

aa. WIRE HARNESS - Continued

STEP	PROCEDURE												
													
14.	Place one flat washer (11) on each of four terminals (12), connect five wires (13) as listed, and secure wires with four lockwashers (14) and nuts (15). <table><tr><th>Wire</th><th>Terminal</th><th>Wire</th><th>Terminal</th></tr><tr><td>15</td><td>A1</td><td>23</td><td>X1</td></tr><tr><td>22</td><td>A2</td><td>1</td><td>X2</td></tr></table>	Wire	Terminal	Wire	Terminal	15	A1	23	X1	22	A2	1	X2
Wire	Terminal	Wire	Terminal										
15	A1	23	X1										
22	A2	1	X2										
15.	Position cover (16) on junction box (2) and secure with four screws (17).												
16.	Thread a new tiedown strap (18) through each of six strap bases (19).												
17.	Position junction box (2) and wire harness (20) on PCA, and secure junction box to base (21), with four flat washers (22) and bolts (23).												
18.	Using six tiedown straps (18) secure wire harness (20) to base (21).												

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

aa. WIRE HARNESS - Continued

STEP	PROCEDURE												
	 <table> <thead> <tr> <th><u>Connect</u></th><th><u>To</u></th></tr> </thead> <tbody> <tr> <td>wire 16</td><td>terminal C</td></tr> <tr> <td>wires 19, 37</td><td>terminal 125</td></tr> <tr> <td>wire 31</td><td>terminal 1</td></tr> <tr> <td>wire 32</td><td>terminal 6</td></tr> <tr> <td>wire 33</td><td>(jumper terminal 3 to terminal 4)</td></tr> </tbody> </table>	<u>Connect</u>	<u>To</u>	wire 16	terminal C	wires 19, 37	terminal 125	wire 31	terminal 1	wire 32	terminal 6	wire 33	(jumper terminal 3 to terminal 4)
<u>Connect</u>	<u>To</u>												
wire 16	terminal C												
wires 19, 37	terminal 125												
wire 31	terminal 1												
wire 32	terminal 6												
wire 33	(jumper terminal 3 to terminal 4)												
19.	Deleted.												
20.	Deleted.												
21.	Connect six wires (1) to terminals (5) of transformer T1 (6) as listed, and secure with flat washers (7) and nuts (8).												
22.	Position transformer (6) on base (9) and secure with six flat washers (10) and screws (11).												

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

aa. WIRE HARNESS - Continued

STEP	PROCEDURE
	NOTE Ensure wires are routed at a 90 degree angle from transformer assembly to avoid chafing of wires against other parts. 23. Position filter element (12) on cover (13), place plate (14) over filter element, center groove in plate on filter element, and secure plate with flatwasher (15), lockwasher (16), and screw (17). 24. Slip one insulation sleeve (18) over end of each of wires 22, 23, 25, and 27 (19), connect wires to compressors A1 (20) and A5 (21), as listed below, and secure wires with four nuts (22), and slip electrical cable nipples over terminals (23). COMPRESSOR A1 (20) wire 22 to POS wire 23 to NEG COMPRESSOR A5 (21) wire 25 to POS wire 27 to NEG

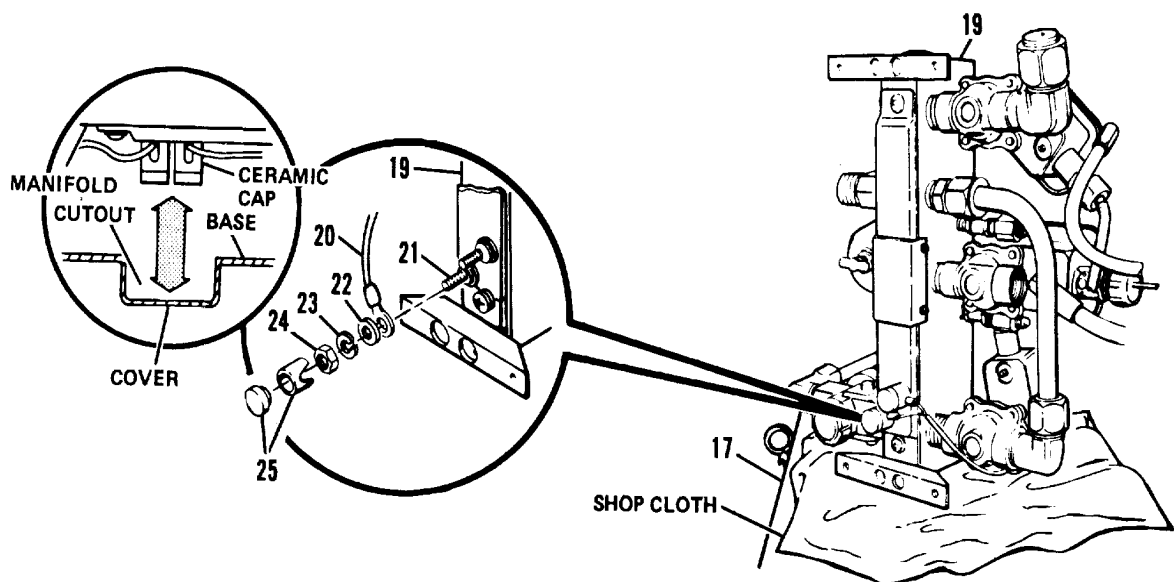
3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

aa. WIRE HARNESS - Continued

STEP	PROCEDURE
	25. Feed two wires (1) through strain relief bushing (2) and adapter (3), and then into port in switch S4 (4). 26. Connect two wires (5), wire 26 to terminal 1 (6) and wire 25 to terminal 2 (7), and secure with two screws (8), and two lockwashers (8.1). 27. Position cover (9), with attached gasket, on switch (4) and secure with captive screw (10). 28. Repeat steps 24 through 26 to connect wires to switch S1 (11). Connect wire 1 BRN to terminal 1 and wire 1 BLK to terminal 2.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

aa. WIRE HARNESS - Continued

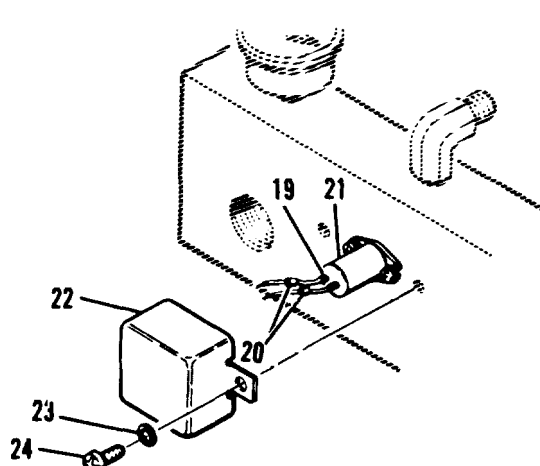
STEP	PROCEDURE								
29.	Stand capacitor C1 (12) next to bracket (13) with terminal end up.								
30.	Feed wires 26, 27, 28, and 29 (14) up through retaining strap (15), connect four wires (14) as listed, and secure wires with two screws (16), two lock-washers (16.1) and two flatwashers (16.2).								
	<table><tr><td><u>Wire</u></td><td><u>Terminal</u></td><td><u>Wire</u></td><td><u>Terminal</u></td></tr><tr><td>6 & 28</td><td>Positive</td><td>27 & 29</td><td>Negative</td></tr></table>	<u>Wire</u>	<u>Terminal</u>	<u>Wire</u>	<u>Terminal</u>	6 & 28	Positive	27 & 29	Negative
<u>Wire</u>	<u>Terminal</u>	<u>Wire</u>	<u>Terminal</u>						
6 & 28	Positive	27 & 29	Negative						
31.	Turn capacitor (12) right side up, (terminals down) and slip it into retaining strap (15) with approximately 1/2 inch clearance between terminals and base (17) and tighten two screws (18).								
	 CAUTION Place a clean shop cloth between manifold and base to avoid damaging Insulation on wires beneath manifold or scratching base.								
32.	Position manifold (19) on end on base (17), as shown above.								
33.	Connect wires 34 and 35 (20) to terminals (21), either wire to either terminal, and secure with two flat washers (22), lockwashers (23), nuts (24), and caps (25).								

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

aa. WIRE HARNESS - Continued

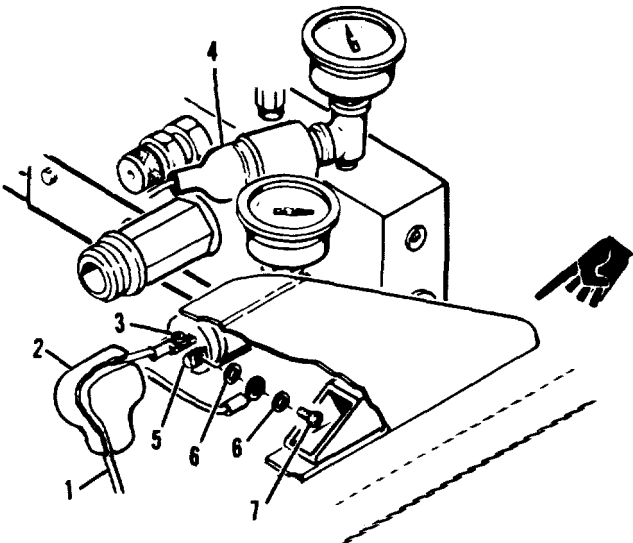
STEP	PROCEDURE
	CAUTION When lowering manifold to base, aline ceramic caps with cutout in base to prevent breaking caps. 34. Carefully lower manifold (1) into position on base (2) and secure two brackets (3) and bracket (3.1) to base with four screws (5), flatwashers (4), and if removed, three cable clamps (4.1).

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**aa. WIRE HARNESS - Continued**

STEP	PROCEDURE												
35.	Slip strain relief bushing (6) and adapter (7) over wire harness lead (8) and insert two wires (9) into port in valve (10).												
36.	Slip a one inch length of heat shrink sleeving (11) over end of each of two wires (9), and solder wire 2 (black) and wire 2 (brown) to two wires of coil (12), either wire to either wire.												
37.	Slip heat shrink sleeving (11) over soldered connections and apply heat to make sleeving shrink.												
38.	Install gasket (13) and cover (14) on valve (10) and secure with three flat washers (15) and screws (16).												
39.	Install adapter (7) and strain relief bushing (6) on port in valve (10).												
40.	Repeat steps 36 through 39 at valve (17) and valve (18), except connect wires as listed.												
	<table><tr><td><u>Valve</u></td><td><u>Wire</u></td><td><u>Coil</u></td><td><u>Valve</u></td><td><u>Wire</u></td><td><u>Coil</u></td></tr><tr><td>(17)</td><td>9 (brown) 9 (brown)</td><td>either wire either wire</td><td>(18)</td><td>4 (brown) 4 (black)</td><td>either wire either wire</td></tr></table>	<u>Valve</u>	<u>Wire</u>	<u>Coil</u>	<u>Valve</u>	<u>Wire</u>	<u>Coil</u>	(17)	9 (brown) 9 (brown)	either wire either wire	(18)	4 (brown) 4 (black)	either wire either wire
<u>Valve</u>	<u>Wire</u>	<u>Coil</u>	<u>Valve</u>	<u>Wire</u>	<u>Coil</u>								
(17)	9 (brown) 9 (brown)	either wire either wire	(18)	4 (brown) 4 (black)	either wire either wire								
													
41.	Slip two pieces of heat shrink sleeving (20) over wires (19), sold er wires (19) (wires 35 and wire 36) to two terminals of thermostat S5 (21), (either wire to either wire), and apply heat to make sleeving shrink over soldered connection.												
42.	Position cover (22) over thermostat (21) and secure with two flat washers (23) and screws (24).												

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

aa. WIRE HARNESS - Continued

STEP	PROCEDURE																
	 43. Feed three wires (1) through smaller end of insulating sleeve (2), and connect wires to terminals of switch S3 (3) as listed. <table> <thead> <tr> <th><u>Wire</u></th><th><u>Terminal</u></th></tr> </thead> <tbody> <tr> <td>7</td><td>NO</td></tr> <tr> <td>11</td><td>C</td></tr> <tr> <td>12</td><td>NC</td></tr> </tbody> </table> 44. Connect wires (1) to terminals (5) with two lockwashers (6) and screw (7). 45. Slip insulating sleeve (2) over switch (3) and apply heat to shrink. 46. Repeat steps 43 and 44 at switch S2 (4), except connect wires as listed. <table> <thead> <tr> <th><u>Wire</u></th><th><u>Terminal</u></th></tr> </thead> <tbody> <tr> <td>6</td><td>NC</td></tr> <tr> <td>13</td><td>c</td></tr> <tr> <td>14</td><td>NO</td></tr> </tbody> </table>	<u>Wire</u>	<u>Terminal</u>	7	NO	11	C	12	NC	<u>Wire</u>	<u>Terminal</u>	6	NC	13	c	14	NO
<u>Wire</u>	<u>Terminal</u>																
7	NO																
11	C																
12	NC																
<u>Wire</u>	<u>Terminal</u>																
6	NC																
13	c																
14	NO																

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued	
aa. WIRE HARNESS - Continued	
STEP	PROCEDURE
	TEST Test PCA (para 3-19) to verify repair.

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued**ab. RESILIENT MOUNTS**

This task covers:

Removal

Replacement

Installation

INITIAL SETUPToolsRefrig Unit Svce Tool Kit,
5180-00-596-1474

3/8 in. comb. wr

No. 1 & No. 2 xtip scdr

No. 2 offset tip scdr

No. 2 xtip scdr blade

Equipment

Condition

Para

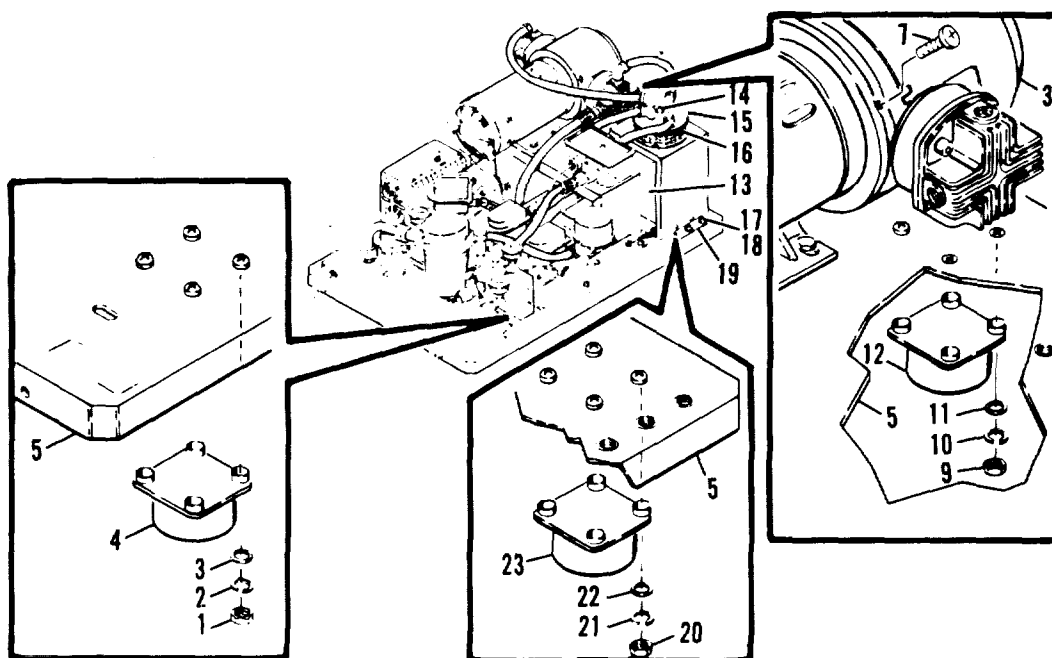
3-10a

Condition Description

PCA cover removed

Materials/Parts

resilient mount

STEP**PROCEDURE****REMOVAL**

1.

Removal of mounts at manifold end of PCA:

Remove four nuts (1), lockwashers (2), and flat washers (3); and remove mount (4) from base (5).

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued	
ab. RESILIENT MOUNTS - Continued	
STEP	PROCEDURE
2.	Removal of resilient mount beneath compressor A1 (6):
	a. Loosen four screws (7) and remove cover (8) from compressor (6).
	b. Remove four nuts (9), lockwashers (10), and flat washers (11); and remove mount (12).
3.	Removal of resilient mount beneath transformer T1 (13):
	a. Remove screw (14), swing plate (15) aside, and remove filter element (16).
	b. Remove six screws (17) and flat washers (18), and move transformer (13) and bracket (19) aside.
	c. Remove four nuts (20), lockwashers (21), and flat washers (22); and remove mount (23).
	REPLACEMENT
	Replace faulty part with a new part.
	INSTALLATION
1.	<u>Installation of resilient mounts at manifold end of PCA:</u>
	Position mount (4) on underside of base (5) and secure with four flat washers (3), lockwashers (2), and nuts (1).
2.	<u>Installation of resilient mount beneath compressor A1 (6):</u>
	a. Position mount (12) on underside of base (5) and secure with four flat washers (11), lockwashers (10), and nuts (9).
	b. Position cover (8) on compressor (6) and tighten four screws (7).

3-10. PCA MAINTENANCE INSTRUCTIONS - Continued

ab. RESILIENT MOUNTS - Continued

STEP	PROCEDURE
3.	Installation of resilient mount beneath transformer (1) - Position mount (2) on underside of base (3) and secure with four flat washers (4), lockwashers (5), and nuts (6). - Position transformer (1) and attached bracket (7) on base (3) and secure with six flat washers (8) and screws (9). - Position filter element (10) on bracket (7), install plate (11) on filter element, and secure plate with screw (12).

3-11. HCA MAINTENANCE INSTRUCTIONS

- You will find procedures for repairing all major parts of the hydraulic component assembly in this paragraph.
- If a part is found to be faulty during troubleshooting, you will be referred directly to the repair procedure.
- If a part is found to be faulty during inspection, refer to the List of Tasks below. It will tell you the location of the repair procedure for the part.
- Turn to the referenced procedure and check the INITIAL SETUP for information needed to begin the repair.
- Note that the Equipment Condition entry in INITIAL SETUP tells you what parts must have been removed before you can begin the actual repair.

OVERVIEW

To repair the HCA you must:

- Remove parts to gain access to the faulty part.
- Remove the faulty part.
- Replace the faulty part with a new part.
- Install the new part.
- Reinstall parts removed to gain access.
- Test the HCA to verify successful repair (para 3-21).

NOTES

To avoid unnecessary replacement of a good pump motor or before starting a difficult replacement task, make certain you have found the part causing the malfunction. Complete the troubleshooting procedure and make any other voltage or continuity checks on the HCA in order to isolate the faulty part. If you are in doubt about the malfunctions, do an HCA post-maintenance test to confirm it.

Upon removing any hydraulic tubing or fixtures or connectors, protect the threads by covering them with masking tape or available protective caps.

To prevent leaks, replace removed preformed packings and gaskets with new ones.

LIST OF TASKS	
Maintenance (repair) task	Para No. (3-11)
Cable assembly W2	i
Cable assembly W3	g
Cable assembly W4	h
Cable assembly W5	j
HCA cover	a
Heater	m
Hydraulic fluid	b
Inline oil filter	d
Junction box and cover	f
Junction box terminal boards TB1 and TB2	1
Oil pressure gage	c
Oil tank	n
Wiring harness W1	k
24 Vdc pump motor	o
4-way valve and subplate	e
90 Vdc pump motor	p

3-10. HCA MAINTENANCE INSTRUCTIONS - Continued**a. HCA COVER**

This task covers:
Removal

Installation

INITIAL SETUP

STEP	PROCEDURE
	REMOVAL The diagram illustrates the removal of the HCA cover. It shows a rectangular cover (2) being lifted from a base (3). Four catches (1) are located at the corners of the base. A circular inset provides a detailed view of a catch (1) being lifted and rotated to adjust. Release four catches (1) and remove cover (2) from base (3). INSTALLATION Position cover (2) on base (3) and secure with four catches (1).

3-10. HCA MAINTENANCE INSTRUCTIONS - Continued**B. HYDRAULIC FLUID**

This task covers:

Removal

Replacement

Installation

INITIAL SETUPTools

Refrig Unit Svce Tool Kit,

5180-00-596-1474

1/4 in. skt hd scr key

8 qt. liquid measure

Equipment

Condition

Para

3-11a

Condition Description

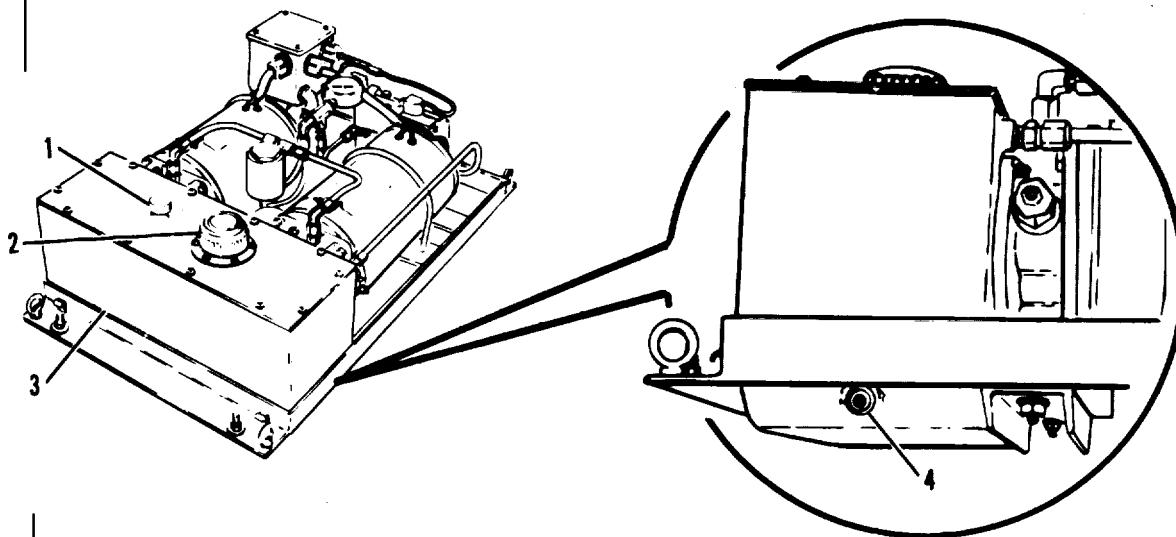
HCA cover removed

Materials/Parts

Hydraulic fluid, 9150-00-223-4134

(appx B, item 5)

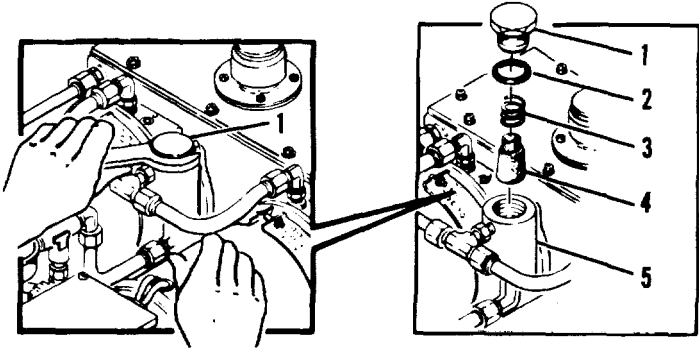
Shop cloths (appx B, item 17)

STEP**PROCEDURE****REMOVAL**

Open drain plug (4) and empty contents of oil tank (3) into a container.

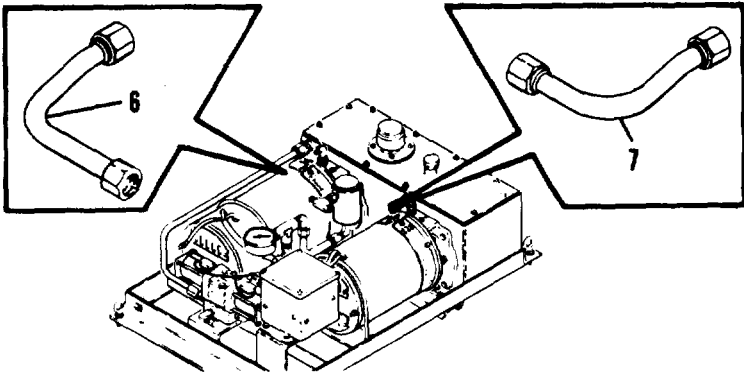
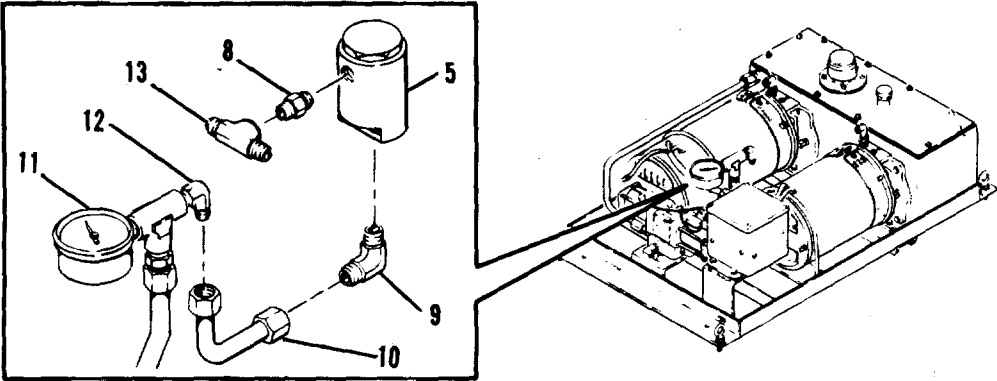
REPLACEMENT

Replace contaminated hydraulic oil with new oil.

3-10. HCA MAINTENANCE INSTRUCTIONS - Continued			
d. INLINE OIL PRESSURE FILTER			
This task covers:			
Removal	Replacement	Installation	Test
<u>INITIAL SETUP</u> <u>Tools</u> Refrig Unit Svce Tool Kit, 5180-00-596-1474 5/8 in. rcht wr 9/16 in. rcht wr 11/16 in. rcht wr 3/4 in. rcht wr 1-1/2 in. comb. wr <u>Equipment Condition</u> <u>Para</u> 3-11a <u>Condition Description</u> HCA cover removed <u>Materials/Parts</u> inline oil filter preformed packing shop cloths (appx B, item 17) thread sealing compound (appx B, item 21)			
STEP	PROCEDURE		
	REMOVAL NOTE Complete steps 1 and 2 to remove Inner filter element. Complete steps 3 and 4 to remove tubing between filter and pump motors. Complete steps 3 through 8 to remove entire inline oil filter.  1. Remove locknut (1), packing (2) and spring (3). 2. Remove inner filter element (4) from inline oil filter (5) for cleaning or replacement.		

3-10. HCA MAINTENANCE INSTRUCTIONS - Continued

d. INLINE OIL FILTER - Continued

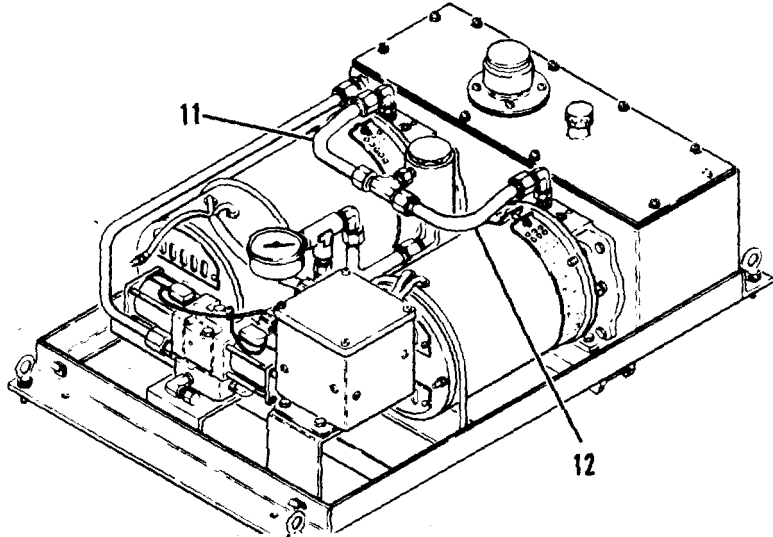
STEP	PROCEDURE
	A technical diagram showing a pump motor assembly. Two callout boxes are present. The left callout shows a curved tube labeled '6' being disconnected from the pump. The right callout shows a curved tube labeled '7' being disconnected from the pump. The main diagram shows the pump motor with various fittings and connections.
3.	Remove tube (6) to 90 Vdc pump motor.
4.	Remove tube (7) to 24 Vdc pump motor.
	A technical diagram showing the removal of an inline oil filter assembly. A callout box on the left shows a pressure gage (11) connected to a tee (12). A tee (13) is connected to an adapter (8), which is connected to an elbow (9). An 'L' shaped tube (10) is connected to the elbow (9) and the filter (5). The main diagram shows the pump motor assembly with the filter (5) and its connections.
5.	Disconnect and remove "L" shaped tube (10) from between filter (5) and pressure gage (11). Support tube (10) during removal at elbows (9) and (12) on either end.
6.	Remove filter (5).
7.	Remove tee (13), adapter (8) and elbow (9) from filter.
	REPLACEMENT a. Replace filter element with a cleaned or new filter element. b. Replace faulty inline oil filter with new inline oil filter.

3-10. HCA MAINTENANCE INSTRUCTIONS - Continued

d. INLINE OIL FILTER - Continued

STEP	PROCEDURE
	INSTALLATION NOTE Complete steps 1 and 2 to install inner filter element. Complete steps 3 through 8 to install entire inline oil filter. Complete steps 7 and 8 to install tubing between filter and pump motors. 1. Install cleaned or new inner filter element (4). 2. Install spring (3), new packing (2) and locknut (1) at top of filter (5) and tighten locknut. 3. Apply thread sealing compound to threads of adapter (10).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**d. INLINE OIL FILTER - Continued**

STEP	PROCEDURE
4. 5. 6. 7.	Install adapter (10) in the connector (9) and in filter (5). NOTE Apply thread sealing compound to threads of elbow (6) that are being inserted into the filter. Install elbow (6) in filter (5). Install "L" shaped tube (7) to elbow (6). Support tube, while tightening, with 9/16-inch ratchet wrench at elbow (6). Install filter in HCA by connecting tube (7) to elbow (8).
	
8. 9.	Install tube (11) to 90 Vdc pump motor. Install tube (12) to 24 Vdc pump motor. TEST Test hydraulic assembly (para 3-20) to verify that malfunction has been corrected.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**e. 4-WAY VALVE AND SUBPLATE**

This task covers:

Removal

Replacement

Installation

INITIAL SETUPTools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
11/16 in. comb. wr
1/2 in. skt
skt wr hdl
1/2 in. comb. wr
9/16 in. comb. wr
5/8 in. comb. wr

Equipment

Condition

Para

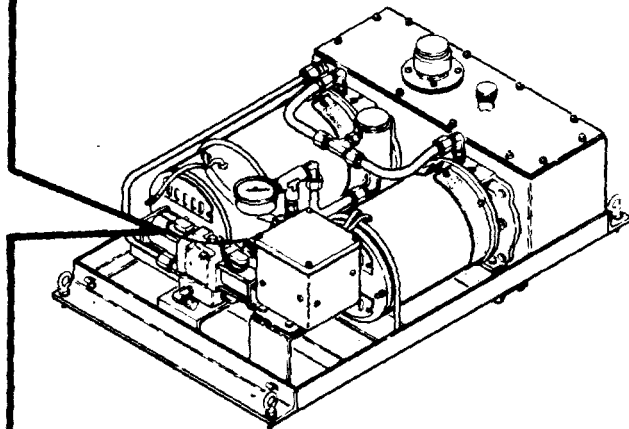
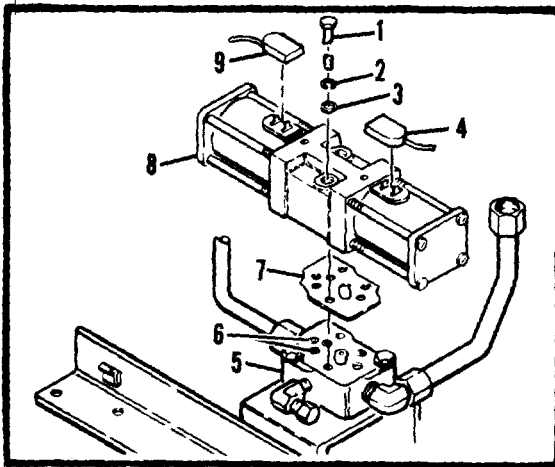
3-11a

Condition Description

HCA cover removed

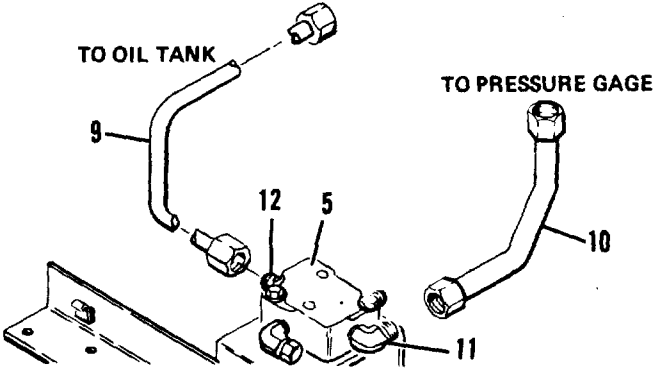
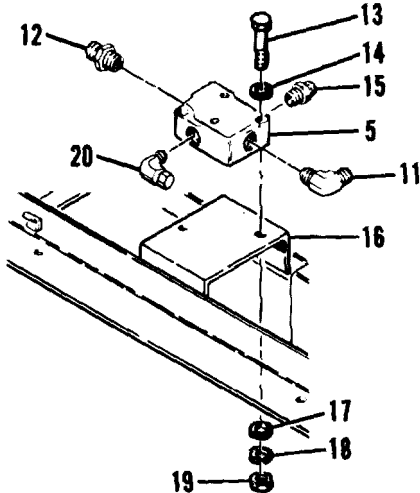
Materials/Parts

thread sealing compound (appx B,
item 21)
shop cloths (appx B, item 17)
preformed packings
4-way valve/subplate

STEP**PROCEDURE****REMOVAL**

1. Disconnect plugs A4P1 (9) and A4P2 (4) from top of 4-way valve (8).
2. Remove two cap screws (1), lockwashers (2) and flat washers (3).
3. Lift 4-way valve (8) off of subplate (5). Remove gasket (7). Be careful to note position of packing (6).

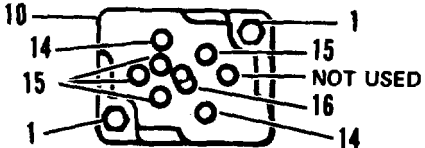
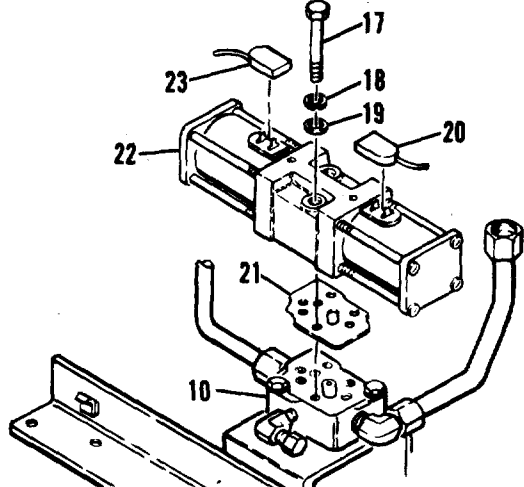
3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**e. 4-WAY VALVE AND SUBPLATE - Continued**

STEP	PROCEDURE
	
4.	Disconnect tube (9) which connects between adapter (12) on subplate (5) and oil tank.
5.	Remove tube (10) which connects between elbow (11) on subplate and pressure gage.
	
6.	Loosen two elbows (11) and (20) and two adapters (12) and (15) from subplate (5).
7.	Remove two cap screws (13), flat washers (14), hex nuts (19), lockwashers (18) and flat washers (17).
8.	Remove subplate (5) from mounting bracket (16).
9.	Remove two elbows (11) and (20) and two adapters (12) and (15) from subplate (5).
	REPLACEMENT
	Replace faulty part with a new part.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**e. 4-WAY VALVE AND SUBPLATE - Continued**

STEP	PROCEDURE
	1. Apply thread sealing compound to the threads of the two adapters and two elbows. 2. Install two elbows (4) and (9) and two adapters (3) and (11) in subplate (10). 3. Install subplate (10) on mounting bracket (5). 4. Install two cap screws (1) and washers (2) through subplate (10) and mounting bracket (5). Install flat washers (6), lockwashers (7) and nuts (8). 5. Connect long tube (12) which connects between adapter (11) and oil tank. 6. Install tube (13) which connects between elbow (4) and pressure gage.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**e. 4-WAY VALVE AND SUBPLATE - Continued**

STEP	PROCEDURE
7.	Install gasket (21). 
8.	Install new packings on subplate (10) as follows: - Install four small (11/32 in. OD) packing (15). A fifth small packing must be installed on the NOT USED port. - Install large (11/16 in. OD) packing (16). Mold round packing (16) to fit elongated hole. 
9.	Install 4-way valve (22) on subplate (10) so that fluid holes line up with holes in subplate.
10.	Install two cap screws (17), with lockwashers (18) and flat washers (19), through 4-way valve (22) and holes (14) in subplate (10).
11.	Connect plugs A4P1 (23) and A4P2 (20) to top of 4-way valve (22) and press firmly so they are flush with connectors.
	TEST Test hydraulic assembly (para 3-20) to verify that malfunction has been corrected.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**f. JUNCTION BOX AND COVER**

This task covers:

Removal

Replacement

Installation

Test

INITIAL SET-UPTools

Refrig Unit Svce Tool Kit
(5180-00-596-1474)
1/2 in. skt wr
1/4 in. flat tip scdr
1/2 in. comb. wr

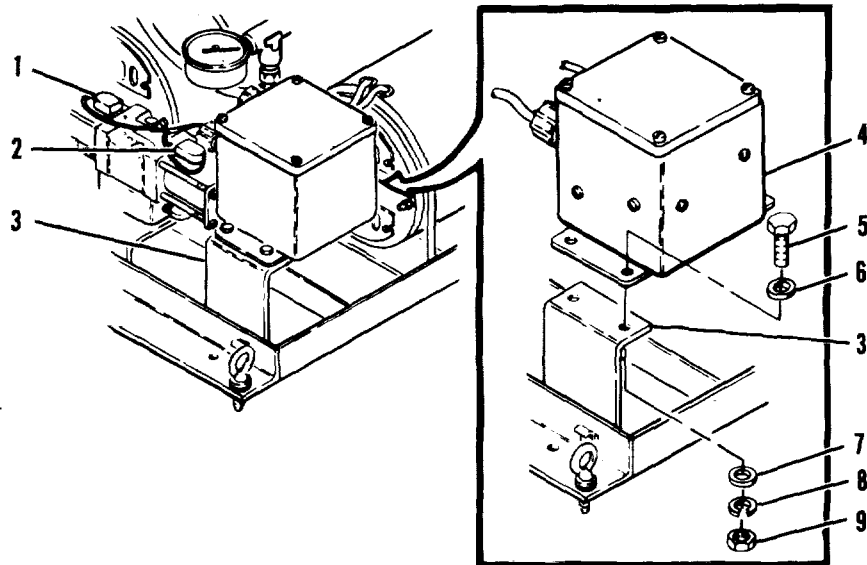
Equipment
Condition

Para
3-11a

Condition Description
HCA cover removed

Materials/Parts

Junction box'

STEP**PROCEDURE****REMOVAL**

1. Remove two cap screws (5) and flat washers (6) with hex nuts (9), lockwashers (8) and flat washers (7). Remove junction box (4) from mounting bracket (3). (Use 1/2-inch comb. wrench if needed to keep hex nuts from turning.)
2. Disconnect electrical plugs A4P1 (1) and A4P2 (2) from top of 4-way valve. Tag each cable connector to identify for Installation.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**f. JUNCTION BOX AND COVER - Continued**

STEP	PROCEDURE														
	REMOVAL OF COVER 3. Loosen four captive screws (11) in cover (10) of junction box (4). 4. Remove junction box cover (10). REPLACEMENT Replace faulty part with a new part. To replace a junction box, remove and install two terminal boards, and disconnect and connect cable assemblies and wiring harness as follows: NOTE Install connectors in reverse order. <table> <thead> <tr> <th><u>Instruction</u></th><th><u>Paragraph</u></th></tr> </thead> <tbody> <tr> <td>Cable assembly W3</td><td>3-11g</td></tr> <tr> <td>Cable assembly W4</td><td>3-11h</td></tr> <tr> <td>Cable assembly W2</td><td>3-11i</td></tr> <tr> <td>Cable assembly W5</td><td>3-11j</td></tr> <tr> <td>Wiring harness W1</td><td>3-11k</td></tr> <tr> <td>Junction box terminal boards TB1 and TB2</td><td>3-11l</td></tr> </tbody> </table>	<u>Instruction</u>	<u>Paragraph</u>	Cable assembly W3	3-11g	Cable assembly W4	3-11h	Cable assembly W2	3-11i	Cable assembly W5	3-11j	Wiring harness W1	3-11k	Junction box terminal boards TB1 and TB2	3-11l
<u>Instruction</u>	<u>Paragraph</u>														
Cable assembly W3	3-11g														
Cable assembly W4	3-11h														
Cable assembly W2	3-11i														
Cable assembly W5	3-11j														
Wiring harness W1	3-11k														
Junction box terminal boards TB1 and TB2	3-11l														

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued

f. JUNCTION BOX AND COVER - Continued

STEP	PROCEDURE
	INSTALLATION NOTE Complete step 1 to install cover on junction box. Complete steps 2 and 3 to install junction box on mounting bracket in hydraulic assembly. 1. Install junction box cover (1) on junction box (3). Tighten the four captive screws (2).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued	
f. JUNCTION BOX AND COVER - Continued	
STEP	PROCEDURE
2.	Install two cap screws (7) with flat washers (8) through junction box and mounting bracket (6) and tighten cap screws with flat washers (9), lockwashers (10) and hex nuts (11).
3.	Install electrical plugs A4P1 (4) and A4P2 (5) to the top of 4-way valve. Be sure to install plugs according to tag information attached to each cable connector. TEST Test hydraulic assembly (para 3-20) to verify that malfunction has been corrected.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**g. CABLE ASSEMBLY W3**

This task covers:

Removal

Replacement

Installation

Test

INITIAL SET-UPTools

Refrig Unit Svce Tool Kit
(5180-00-596-1474)
1/4 in. Flat tip scdr.
slip-joint plr
No. 2 xtip scdr
3/8 in. comb. wr
3/8 in. skt
skt wr hdl extension
lg rd nose plr

Equipment
Condition

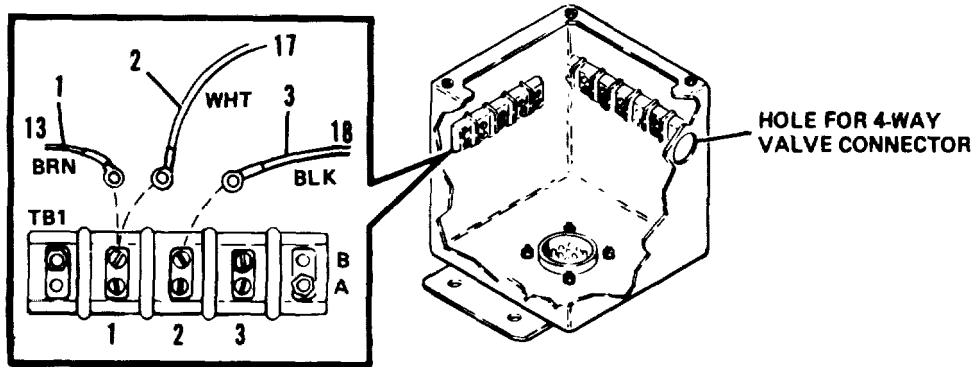
Para
3-11a
3-11f

Condition Description

HCA cover removed
Junction box and cover
removed

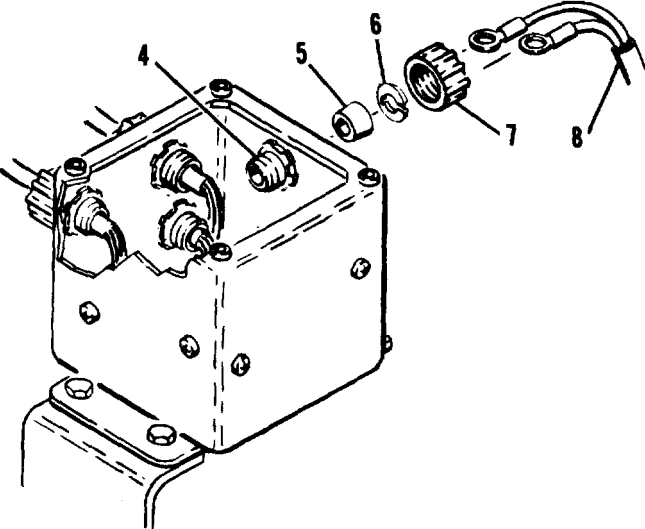
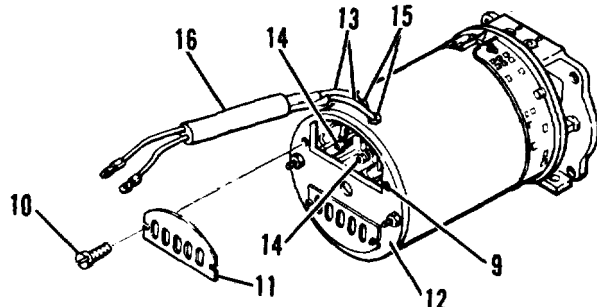
Materials/Parts

Cable assembly W3

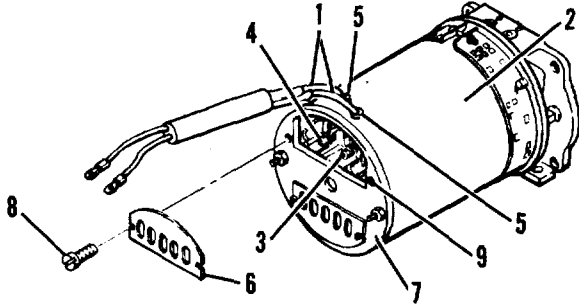
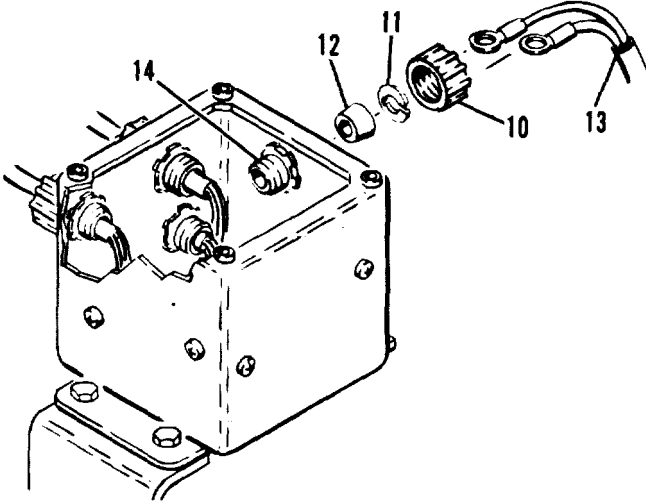
STEP**PROCEDURE****REMOVAL**

1. Remove TB1 from junction box (para 3-11I TB1 removal steps 1 and 2).
2. Disconnect white wire (2), wire no. 17, from TB1 connection B1.
3. Disconnect black wire (3), wire no. 18, from TB1 connection B2.
4. Reinstall both screws and make sure that brown wire (1), wire no. 13, is reconnected at TB1-B1.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**g. CABLE ASSEMBLY W3 - Continued**

STEP	PROCEDURE
	
5.	Unscrew conduit locknut (7) from 24 Vdc pump motor connector (4) on junction box.
6.	Slide the yellow plastic bushing (6) and black rubber bushing (5) out of connector (4).
7.	Pull two cable wires (8) out of 24 Vdc motor connector (4).
	
8.	Loosen screw (9) and remove screw (10) securing top inspection plate (11) to 24 Vdc pump motor base plate (12). Remove top inspection plate (11).
9.	Remove two terminal mounting nuts, lockwashers, and flat washers securing two cable assembly W3 leads (13) to terminals (14). Disconnect leads (13) from terminals (14).
10.	Pull cable assembly W3 leads (13) with rubber grommets (15) out of 24 Vdc pump motor. Remove cable assembly W3 (16).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**g. CABLE ASSEMBLY W3 - Continued**

STEP	PROCEDURE
	REPLACEMENT Replace faulty part with a new part.  INSTALLATION 1. Thread two cable assembly W3 leads (1) through holes in top of 24 Vdc pump motor (2). 2. Position white lead to terminal (3) and position black lead to terminal (4). Install two flat washers, lockwashers, and terminal mounting nuts to secure leads (1) to terminals (3 and 4). 3. Install grommets (5) into holes in top of 24 Vdc pump motor (2). 4. Position top inspection plate (6) to 24 Vdc pump motor base plate (7) and secure with two screws (8 and 9). 

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**g. CABLE ASSEMBLY W3 - Continued**

STEP	PROCEDURE
5. 6. 7. 8.	Slide conduit locknut (10), yellow plastic bushing (11) and black rubber bushing (12) over cable assembly W3 (13). Thread black and white wires of cable assembly W3 (13) through connector(14). Press black rubber bushing (12) into connector and place yellow plastic bushing (11) behind it. Install conduit locknut (10) finger tight on connector (14).
	9. Install black wire (15), wire no. 18, to TB1 connection B2. 10. Install white wire (16), wire no. 17, to TB1 connection B1. Ensure that brown wire (17), wire no. 13, remains connected at TB1-B1. 11. Install TB1 in junction box (para 3-111 TB1 installation steps 3 and 4). Adjust wire lengths inside junction box as required. 12. Handtighten conduit locknut (10). 13. Set junction box cover on junction box and tighten the four captive screws. 14. Install junction box to HCA. TEST Test HCA (para 3-20) to verify repair.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**h. CABLE ASSEMBLY W4**

This task covers:

Removal

Replacement

Installation

Test

INITIAL SET-UPTools

Refrig Unit Svce Tool Kit
(5180-00-596-1474)
1/4 in. Flat tip scdr.
slip-joint plr
No. 2 xtip scdr
3/8 in. comb. wr
3/8 in. skt
skt wr hdl extension
lg rd nose plr
7/16 in. comb. Wr

Equipment

Condition

Para

Condition Description

3-11a

HCA cover removed

3-11f

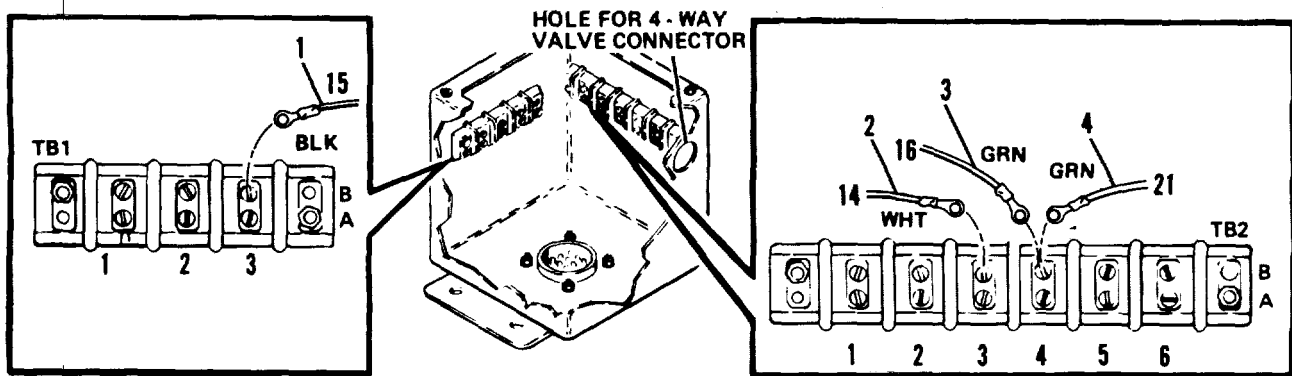
Junction box cover removed

3-11e

4-way valve removed

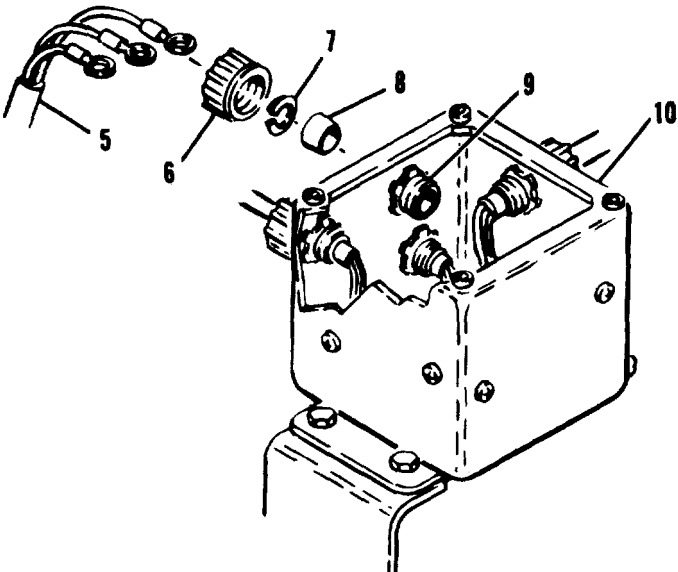
Materials/Parts

Cable assembly W4

STEP**PROCEDURE****REMOVAL**

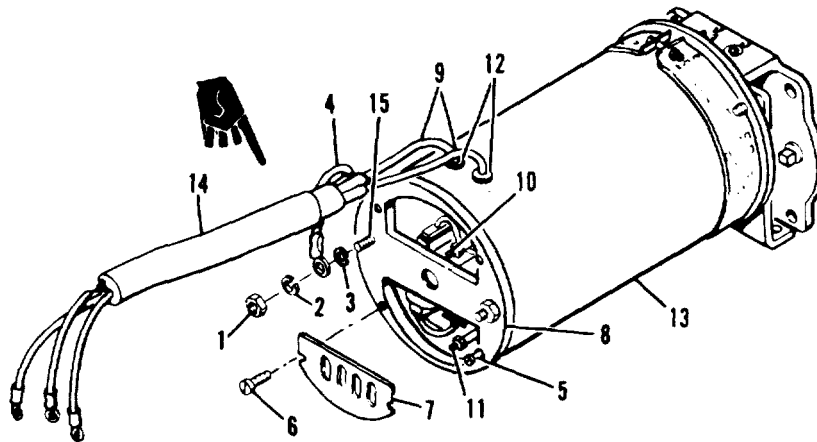
1. Remove TB1 and TB2 from junction box (para 3-11l steps 1 and 2, and 5 and 6).
2. Disconnect black wire (1), wire no. 15, from TB1 connection B3.
3. Disconnect white wire (2), wire no. 14, from TB2 connection B3.
4. Disconnect green wire (3), wire no. 16, from TB2 connection B4.
5. Reinstall three screws. Make sure that other green wire (4), wire no. 21, is reconnected at TB2-B4.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**h. CABLE ASSEMBLY W4 - Continued**

STEP	PROCEDURE
	 6. Unscrew conduit locknut (6) from 90 Vdc pump motor connector (9) on junction box (10). 7. Slide the yellow plastic bushing (7) and black rubber bushing (8) out of connector (9) and over cable (5). 8. Pull three cable wires (5) out of 90 Vdc motor connector (9). 9. Replace rubber bushing (8), plastic bushing (7), and locknut (6) on connector (9).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**h. CABLE ASSEMBLY W4 - Continued**

STEP	PROCEDURE
10.	Remove nut (1), lockwashers (2 and 3) and green lead (4).
11.	Loosen two screws (5) and remove two screws (6) securing top and bottom inspection plates (7) to 90 Vdc pump motor base plate (8). Remove top and bottom inspection plates (7).
12.	Remove two terminal mounting nuts, lockwashers, and flat washers securing two cable assembly W4 leads (9) to terminals (10 and 11). Disconnect leads (9) from terminals (10 and 11).
13.	Pull cable assembly W4 leads (9), along with rubber grommets (12) out of 90 Vdc pump motor (13). Remove cable assembly W4 (14).



Change 13-446

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued	
h. CABLE ASSEMBLY W4 - Continued	
STEP	PROCEDURE
	REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Thread two cable assembly W4 leads (9) through holes in top of 90 Vdc pump motor (13). 2. Position white lead to terminal (11) and position black lead to terminal (10). Install two flat washers, lockwashers, and terminal mounting nuts to secure leads (9) to terminals (10 and 11). 3. Install grommets (12) into holes in top of 90 Vdc pump motor (13). 4. Position top and bottom inspection plates (7) to 90 Vdc pump motor base plate (8) and secure with two screws (5 and 6). 5. Position green lead (4) to motor bolt (15) and secure with lockwashers (3 and 2) and nut (1).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**h. CABLE ASSEMBLY W4 - Continued**

STEP	PROCEDURE
	6. Slide conduit locknut (1), yellow plastic bushing (2) and rubber bushing (3) over cable assembly W4 (4). 7. Thread black, white and green wires of cable assembly W4 (4) through connector (5). 8. Press black rubber bushing (3) into connector (5) and place yellow plastic bushing (2) behind it. 9. Install conduit locknut (1) finger tight on connector (5).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**h. CABLE ASSEMBLY W4 - Continued**

STEP	PROCEDURE
10.	Install black wire (6), wire no. 15, to TB1 connection B3.
11.	Install white wire (7), wire no. 14, to TB2 connection B3.
12.	Install green wire (8), wire no. 16, to TB2 connection B4. Be sure that second green wire (9), wire no. 21, remains connected at TB2-B4.
13.	Install TB1 and TB2 in junction box (para 3-111 steps 3 and 4, and 8 and 9). Adjust wire lengths inside junction box as required.
14.	Handtighten conduit locknut (1).
15.	Set junction box cover on junction box and tighten the four captive screws.
16.	Install 4-way valve.
	TEST
	Test HCA (para 3-20) to verify repair.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**i. CABLE ASSEMBLY W2**

This task covers:

Removal

Replacement

Installation

Test

INITIAL SET-UPToolsRefrig Unit Svce Tool Kit
(5180-00-596-1474)

skt wr hdl

1/4 in. flat tip scdr

slip-joint plr

3/8 in. skt

No. 2 xtip scdr

Equipment

Condition

Para

3-11a

3-11f

3-11b

Condition Description

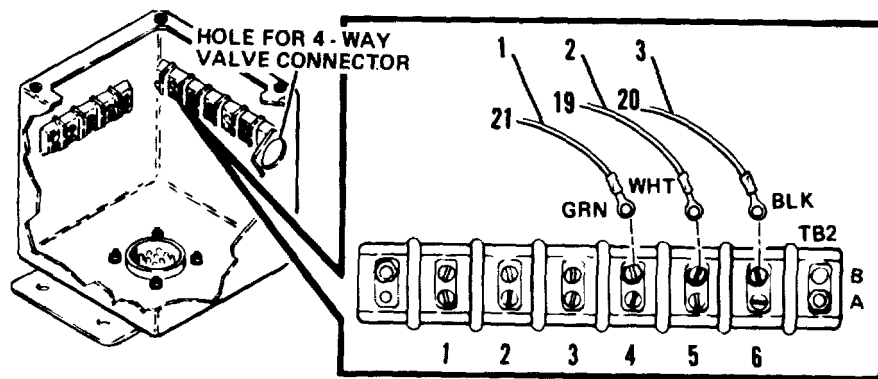
HCA cover removed

Junction box cover removed

Hydraulic fluid drained

Materials/Parts

Cable assembly W2

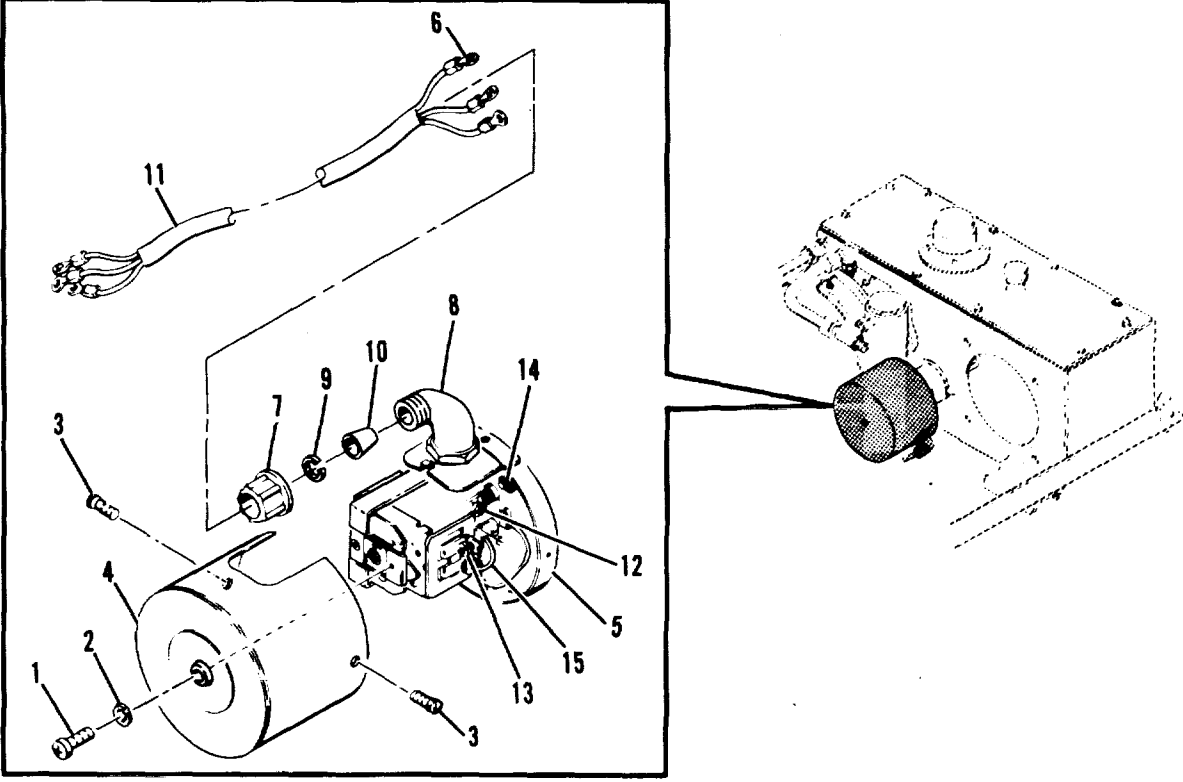
STEP**PROCEDURE****REMOVAL**

1. Remove TB2 from junction box (para 3-11I TB2 removal steps 5 and 6).
2. Disconnect black wire (3), wire no. 20, from TB2 connection B6.
3. Disconnect white wire (2), wire no. 19, from TB2 connection B5.
4. Disconnect green wire (1), wire no. 21, from TB2 connection B4.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**i. CABLE ASSEMBLY W2 - Continued**

STEP	PROCEDURE
	5. Unscrew conduit locknut (6) from heater connector (elbow) (8) on Junction box (9). 6. Slide the yellow plastic bushing (5) and black rubber bushing (4) out of connector (8) and over cable (7). 7. Pull three cable wires (7) out of heater connector (8). NOTE Be sure hydraulic fluid is drained before tipping hydraulic component assembly on its side. 8. Set hydraulic component assembly on its side so bottom can be seen.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**i. CABLE ASSEMBLY W2 - Continued**

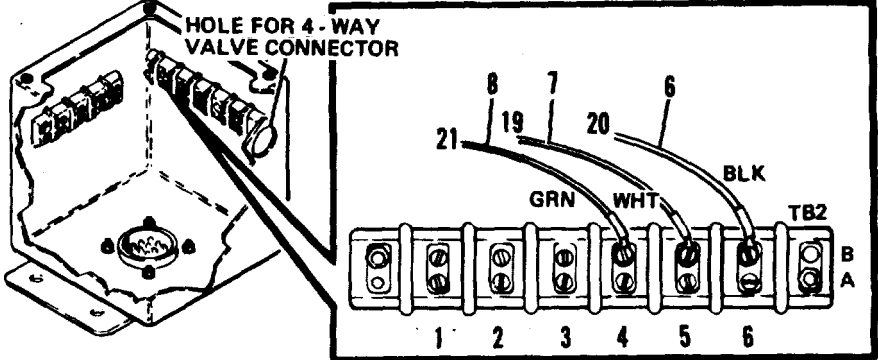
STEP	PROCEDURE
	NOTE Two models of the heater are used on the HCA and the method for attaching the cover (4) differs for each model. One model uses screw (1) and lockwasher (2). The other model uses two screws (3). 9. Either remove screw (1) and lockwashers (2), or remove two screws (3) (depending upon which model heater you have) securing cover (4) to heater (5) and remove cover (4). 10. Remove one brass screw, one silver screw, and one nut and washer securing three cable assembly W2 leads (6) to heater. Remove leads (6) from heater. 11. Unscrew conduit locknut (7) from heater connector (8) on heater (5). 12. Slide the yellow plastic bushing (9) and black rubber bushing (10) out of connector (8) and over cable assembly W2 (11).
	

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued	
i. CABLE ASSEMBLY W2 - Continued	
STEP	PROCEDURE
13.	Pull three cable wires (6) through heater connector (8). REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Slide conduit locknut (7), yellow plastic bushing (9), and rubber bushing (10) over cable assembly W2 (11). 2. Thread three cable assembly W2 leads (6) through heater connector (8). 3. Press black rubber bushing (10) into connector (8) and place yellow plastic bushing (9) behind it. 4. Install conduit locknut (7) finger tight on connector (8). 5. Connect three leads (6) to terminals at the heater's base as follows: a. White-19 to silver terminal (12) of heater element. b. Black-20 to brass terminal (13) of thermostat. c. Green-21 to GND terminal (14) (marked GND). NOTES Numbers after the wire colors -19, -20 and 21 are the identifying wire numbers printed on each wire. A bare wire (15) connects the brass terminal of the thermostat to the silver terminal of the heater element. 6. Install heater cover (4) with either two screws (3) in side of cover (4) or with screw (1) and washer (2) in end of cover, depending on type of heater.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**i. CABLE ASSEMBLY W2 - Continued**

STEP	PROCEDURE
	7. Slide conduit locknut (1), yellow plastic bushing (2) and rubber bushing (3) over cable assembly W2 (4). 8. Thread leads of cable assembly W2 (4) through heater connector (5). 9. Press black rubber bushing (3) into connector (5) and place yellow plastic bushing (2) behind it. 10. Install conduit locknut (1) finger tight on connector (5).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**i. CABLE ASSEMBLY W2 - Continued**

STEP	PROCEDURE
	 The diagram shows a perspective view of a cable assembly box on the left and a detailed terminal block connection diagram on the right. The terminal block has six positions labeled 1 through 6. Wires are connected as follows: Wire 6 (BLK) to position 6 (B6), Wire 7 (WHT) to position 5 (B5), and Wire 8 (GRN) to position 4 (B4). The terminal block is also labeled TB2, B, and A. A label 'HOLE FOR 4-WAY VALVE CONNECTOR' points to a hole in the box. A conduit locknut is shown at position 5. 11. Install black wire (6), wire no. 20, to TB2 connection B6. 12. Install white wire (7), wire no. 19, to TB2 connection B5. 13. Install green wire (8), wire no. 21, to TB2 connection B4 and do not tighten. 14. Handtighten conduit locknut (5). 15. Install 90 Vdc pump motor connector and cable per installation instructions in paragraph 3-11h. TEST Test HCA (para 3-20) to verify repair.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**j. CABLE ASSEMBLY W5**

This task covers:

Removal

Replacement

Installation

Test

INITIAL SET-UPToolsRefrig Unit Svce Tool Kit
(5180-00-596-1474)

1/4 in. flat tip scdr

slip-joint plr

No. 2 xtip scdr

3/8 in. comb. wr

Equipment

Condition

Para

3-11a

Condition Description

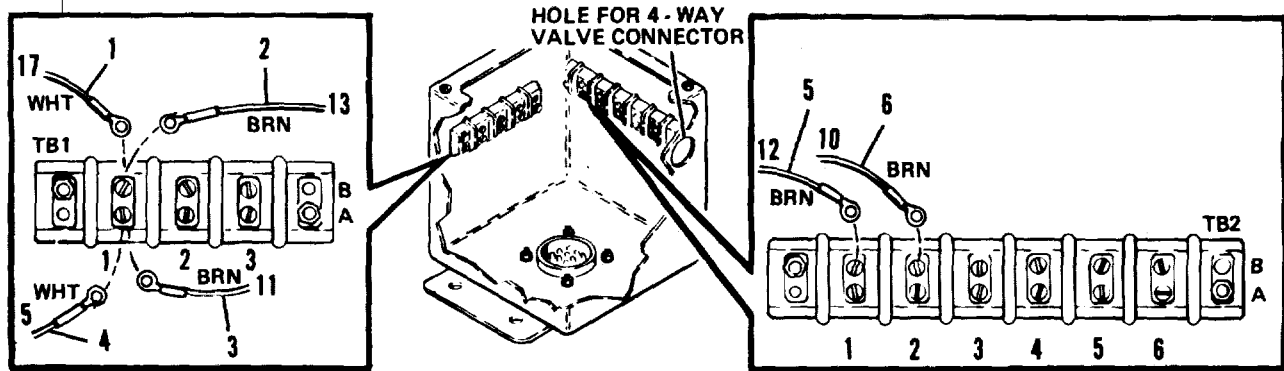
HCA cover removed

3-11f

Junction box cover removed

Materials/Parts

Cable assembly W5

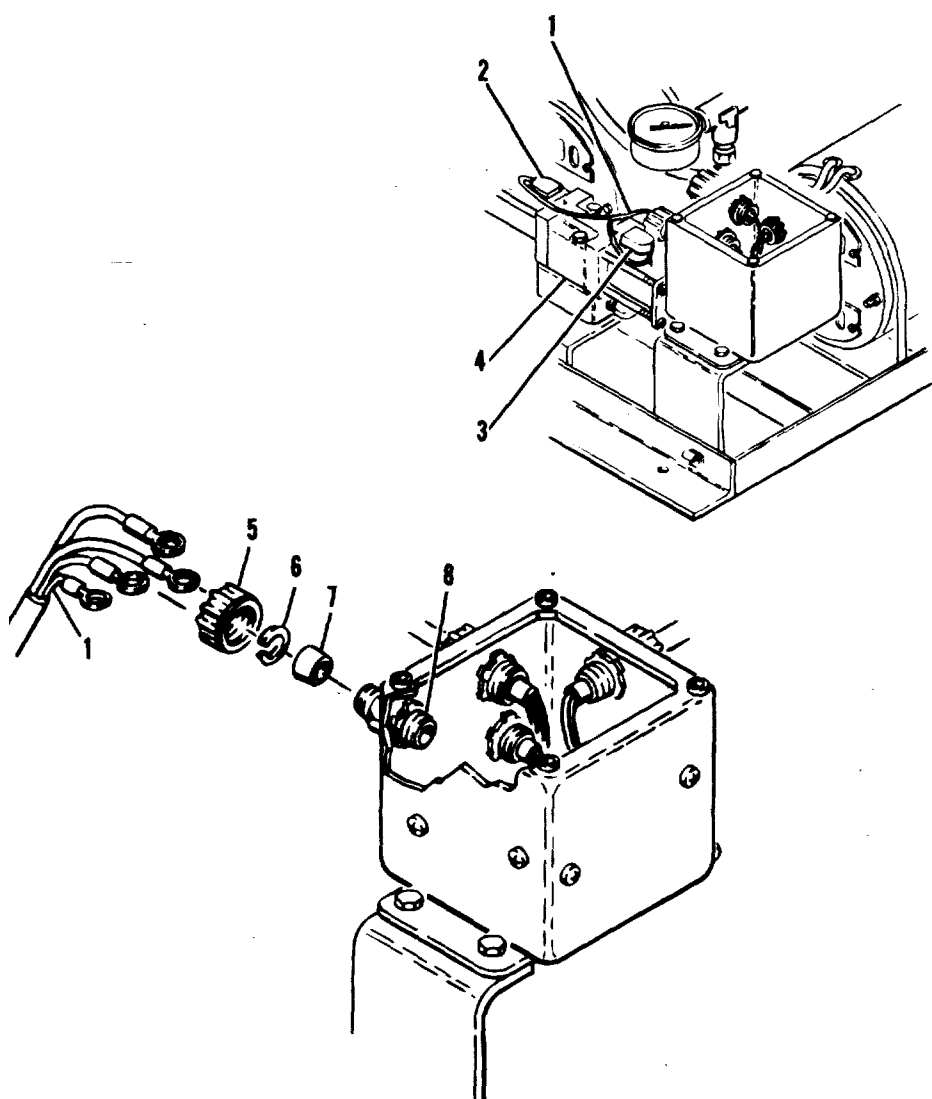
STEP**PROCEDURE****REMOVAL**

1. Remove TB2 and TB1 from junction box (para 3-111 TB2 removal steps 5 and 6 and TB1 removal steps 1 and 2).
2. Disconnect brown wire (5), wire no. 12, from TB2 connection B1.
3. Disconnect brown wire (6), wire no. 10, from TB2 connection B2.
4. Disconnect brown wire (2), wire no. 13, from TB1 connection B1. Make sure white wire (1), wire no. 17, is reconnected with the screw at TB1-B1.
5. Disconnect brown wire (3), wire no. 11, from TB1 connection A1. Make sure white wire (4), wire no. 5 is reconnected with the screw at TB1-A1.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**j. CABLE ASSEMBLY W5 - Continued**

STEP	PROCEDURE
	6. Unscrew conduit locknut (8) from the 4-way valve connector (11) on junction box (12). 7. Slide the yellow plastic bushing (9) and black rubber bushing (10) out of connector and over cable (7). 8. Pull cable assembly W5 (7) out of 4-way valve connector (11). 9. Disconnect cable assembly WS (7) electrical plugs A4P1 (13) and A4P2 (14) from top of 4-way valve (15). Tag plugs to aid installation. Remove cable assembly W5 (7). REPLACEMENT Replace faulty part with a new part.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**j. CABLE ASSEMBLY W5 - Continued**

STEP	PROCEDURE
1.	INSTALLATION Connect cable assembly W5 (1) electrical plugs A4P1 (2) and A4P2 (3) to top of 4-way valve(4).  2. Slide conduit locknut (5), yellow plastic bushing (6) and rubber bushing (7) over cable assembly W5 (1). 3. Thread four brown wires of cable assembly W5 (1) through 4-way valve connector (8). 4. Press black rubber bushing (7) into connector (8) and place yellow plastic bushing (6) behind it. 5. Install conduit locknut (5) finger tight on connector (8).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**j. CABLE ASSEMBLY W5 - Continued**

STEP	PROCEDURE
	6. Install brown wire (11), wire no. 11, and white wire (12), wire no. 5, to TB1 connection A1. Adjust wire length, inside junction box, of brown wire (11) as required. 7. Install brown wire (10), wire no. 13, and white wire (9), wire no. 17, to TB1 connection B1. Adjust wire length, inside junction box, of brown wire (10) as required. 8. Install brown wire (13), wire no. 12, to TB2 connection B1. 9. Install brown wire (14), wire no. 10, to TB2 connection B2. 10. Install TB1 and TB2 in junction box (para 3-11I TB1 installation steps 3 and 4 and TB2 installation steps 8 and 9). 11. Tighten conduit locknut (5). 12. Set junction box cover on junction box and tighten the four captive screws. TEST Test HCA (para 3-20) to verify that malfunction has been corrected.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued

k. WIRING HARNESS W1

This task covers:

Removal

Replacement

Installation

Test

INITIAL SET-UP

Tools

Refrig Unit Svce Tool Kit
(5180-00-596-1474)

1/4 in. flat tip scdr

5/16 in. Skt wr

skt ext

skt wr hdl

No. 2 xtip scdr

Equipment

Condition

Para

3-11a

3-11f

Condition Description

HCA cover removed

Junction box and cover
removed

Materials/Parts

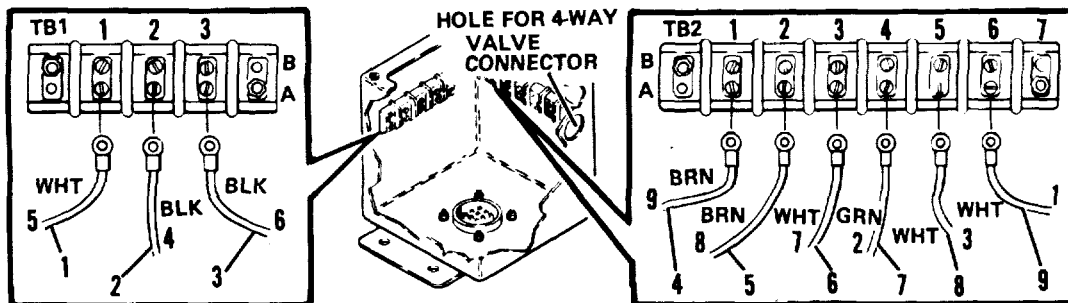
Wiring harness W1

STEP

PROCEDURE

REMOVAL

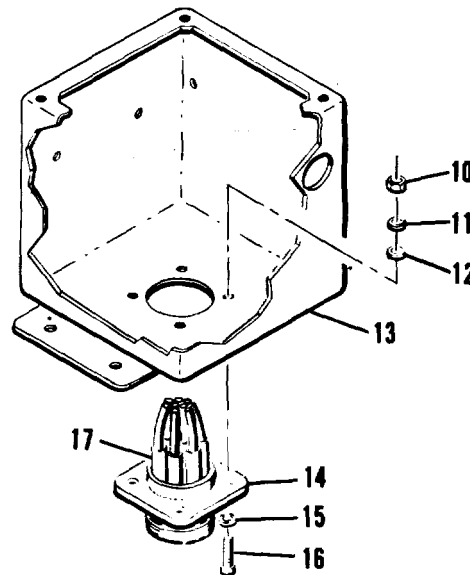
1. Remove TB1 and TB2 from junction box (para 3-11l, TB1 removal steps 1 and 2 and TB2 removal steps 5 and 6).



3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**k. WIRING HARNESS W1 - Continued****STEP****PROCEDURE**

2. Remove nine screws securing nine wiring harness W1 leads (1 to 9) to bottom terminals (A terminals) of TB1 and TB2 as follows:

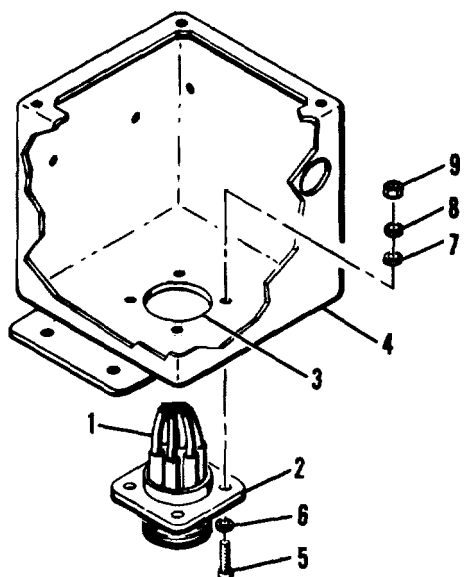
<u>Terminal</u>	<u>Wire No.</u>	<u>Connected To</u>	<u>Wire Color</u>
TB1-A1	5 (1)	J1-E	White
TB1-A2	4 (2)	J1D	Black
TB1-A3	6 (3)	J1-F	Black
TB2-A1	9 (4)	J1-I	Brown
TB2-A2	8 (5)	J1-H	Brown
TB2-A3	7 (6)	J1-G	White
TB2-A4	2 (7)	J1-B	Green
TB2-A5	3 (8)	J1-C	White
TB2-A6	1 (9)	J1-A	Black



3. Remove four screws (16) and flat washers (15) with nuts (10), lockwashers (11) and flat washers (12).
4. Remove wiring harness W1 (14) from junction box (13).

REPLACEMENT

Replace faulty part with a new part.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**k. WIRING HARNESS W1 - Continued****STEP****PROCEDURE****INSTALLATION**

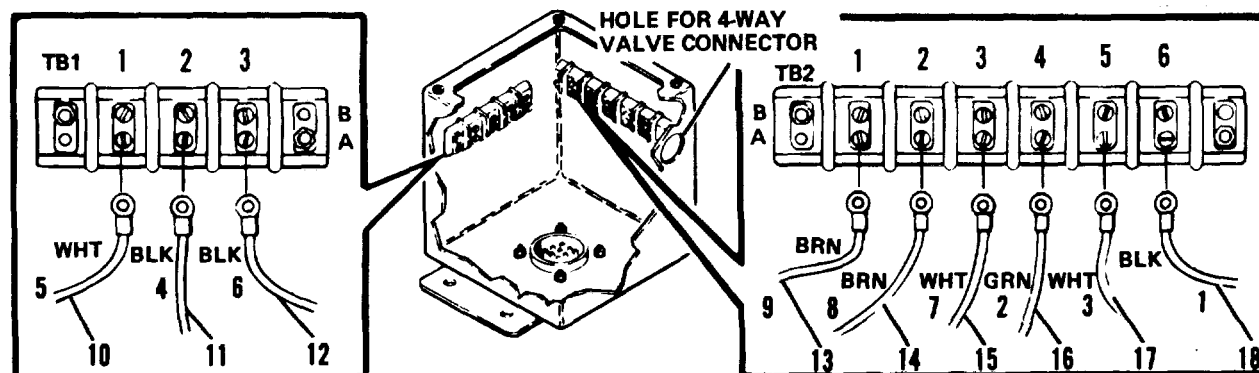
1. Thread wires (1) of wiring harness W1 (2) through connector hole (3) in bottom of junction box (4).
2. Install four screws (5) and flat washers (6) with flat washers (7), lock-washers (8) and nuts (9).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued

k. WIRING HARNESS W1 - Continued

STEP

PROCEDURE



3. Position nine wiring harness W1 leads (10 to 18) to bottom terminals (A terminals) of TB1 and TB2 and secure with nine screws:

<u>Terminal</u>	<u>Wire No.</u>	<u>Connected To</u>	<u>Wire Color</u>
<u>TB1</u>			
A1	5 (10)	J1-E	White
A2	4 (11)	J1-D	Black
A3	6 (12)	J1-F	Black
<u>TB2</u>			
A1	9 (13)	J1-I	Brown
A2	8 (14)	J1-H	Brown
A3	7 (15)	J1-G	White
A4	2 (16)	J1-B	Green
A5	3 (17)	J1-C	White
A6	1 (18)	J1-A	Black

4. Install TB1 and TB2 in junction box (para 3-111 TB1 installation steps 3 and 4 and TB2 installation steps 8, 9 and 10).

TEST

Test HCA (para 3-20) to verify repair.

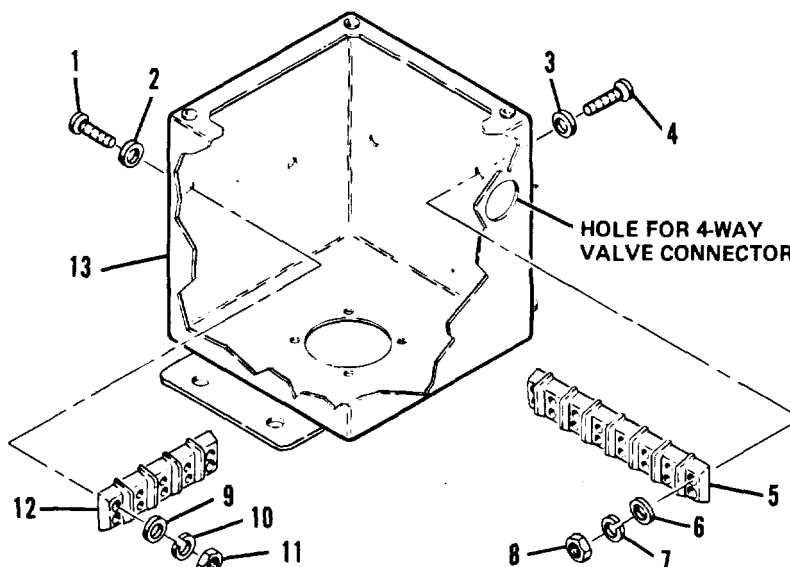
3-11. HCA MAINTENANCE INSTRUCTIONS - Continued			
I. JUNCTION BOX TERMINAL BOARDS TB1 AND TB2			
This task covers:			
Removal	Replacement	Installation	Test
<u>INITIAL SETUP</u>			
<u>Tools</u> Refrig Unit Svce Tool Kit, 5180-00-596-1474 No. 2 xtip scdr 1/4 in. flat tip scdr 3/8 in. comb. wr		<u>Equipment</u> Condition <u>Para</u> <u>Condition Description</u> 3-11a HCA cover removed 3-11f Junction box and cover removed	
<u>Materials/Parts</u> Terminal boards TB1 and TB2			
STEP		PROCEDURE	
REMOVAL			
NOTE			
The following removal procedure contains instructions to remove both terminal boards. However, the instructions are written so that each terminal board can be replaced individually.			
<u>Removal of TB1</u>			
1. Remove two mounting screws (1), flat wash ers (2) with nuts (11), lockwashers (10) and flat washers (9). (If nut (11) turns, hold with 3/8-inch combina- tion wrench.)			
2. Remove TB1 (12) from junction box (13).			
3. Remove following wires from B terminals of TB1 which are connected between TB1 and unit connectors. Tag each wire with terminal board information to identify the wires when reconnecting.			
NOTE			
Numbers after the wire colors, black.18, brown-13, etc., are the identifying wire numbers printed on each wire.			
a. Black-15 from TB1-B3		c. White-17 from TB1-B1	
b. Black-18 from TB1-B2		d. Brown-13 from TB1-B1	

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued

I. JUNCTION BOX TERMINAL BOARDS TB1 AND TB2 - Continued

STEP

PROCEDURE



4. Remove following wires from A terminals of TB1:

a. White-5 from TB1-A1	c. Black-4 from TB1-A2
b. Brown-11 from TB1-A1	d. Black-6 from TB1-A3

Removal of TB2

5. Remove two mounting screws (4) and flat washers (3) with nuts (8), lock-washers (7) and flat washers (6). If nut (8) turns, hold with 3/8 in. combination wrench.
6. Remove TB2 (5) from junction box (13).
7. Remove following wires from B terminals of TB2 which are connected between TB2 and unit connectors. Tag each wire with terminal board information to identify the wires when reconnecting.

NOTE

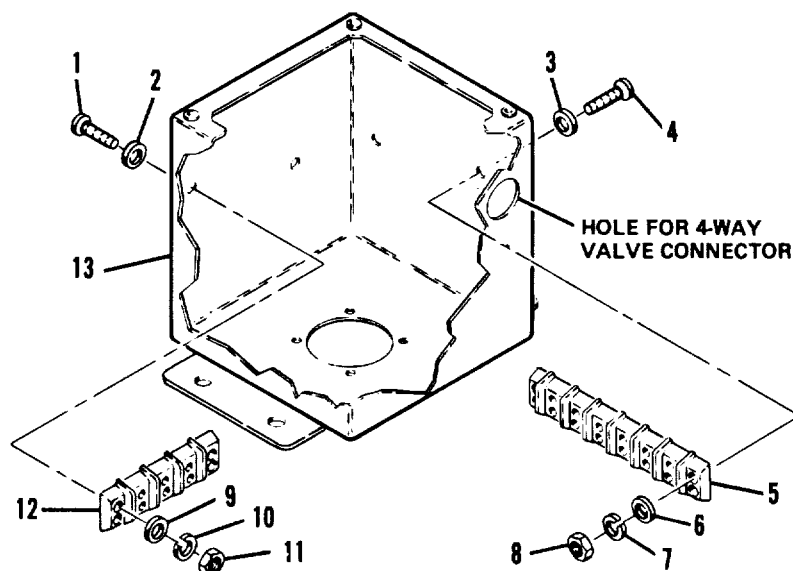
Numbers after the wire colors, black-20, brown-12, etc., are the identifying wire numbers printed on each wire.

a. Brown-12 from TB2-B1	e. Green-21 from TB2-B4
b. Brown-10 from TB2-B2	f. White-19 from TB2-B5
c. White-14 from TB2-B3	g. Black-20 from TB2-B6
d. Green-16 from TB2-B4	

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**I. JUNCTION BOX TERMINAL BOARDS TB1 AND TB2 - Continued****STEP****PROCEDURE**

8. Remove following wires from A terminals of TB2 (1) which are connected between TB2 and J1:

- a. Brown-9 from TB2-A1
- b. Brown-8 from TB2-A2
- c. White-7 from TB2-A3
- d. Green-2 from TB2-A4
- e. White-3 from TB2-A5
- f. Black-1 from TB2-A6

**REPLACEMENT**

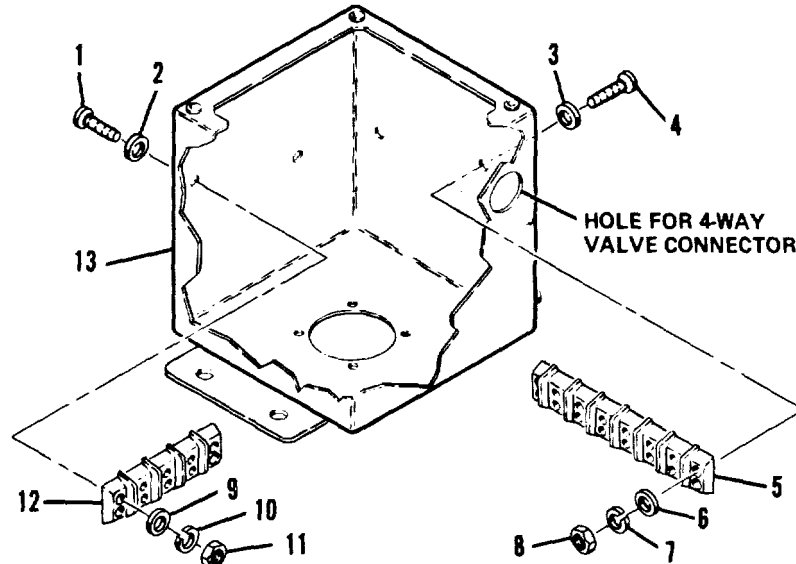
Replace faulty part with a new part.

INSTALLATION**NOTE**

The following installation procedure contains instructions to install both terminal boards. However, the instructions are written so that each terminal board can be replaced individually.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**I. JUNCTION BOX TERMINAL BOARDS TB1 AND TB2 - Continued**

STEP	PROCEDURE
	<u>Installation of TB1</u>
1.	Connect following wires, coming from connector J1, to the bottom or A terminals of TB1 (2): a. White-5 to TB1-A1 b. Brown-11 to TB1-A1 c. Black-4 to TB1-A2 d. Black-6 to TB1-A3
	NOTE
	Numbers after the wire colors, white-5, black-6, etc., are the identifying wire numbers printed on each wire.
2.	Connect following wires, coming from unit connectors in the junction box, to the top or B terminals of TB1 (2): a. White-17 to TB1-B1 b. Brown-13 to T1-B1 c. Black-18 to TB1-B2 d. Black-15 to TB1-B3
3.	Install TB1 (2) in junction box (3) on the side across from the side with three connectors in it.
	NOTE
	If connector J1 is also to be installed, it must be installed before either terminal board. Refer to installation procedure for connector J1 in paragraph 3-11k.
4.	Install two mounting screws (4) and flat washers (5) through side of junction box (3) and TB1 (2) with flat washers (6), lockwashers (7) and hex nuts (8).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**I. JUNCTION BOX TERMINAL BOARDS TB1 AND TB2 - Continued****STEP****PROCEDURE****NOTE**

If TB1 is the only terminal board to be replaced, complete the following step including the test procedure to verify the installation.

5. Set junction box cover on junction box and tighten the four captive screws

Installation of TB2

6. Connect following wires, coming from connector J1, to the bottom or A terminals of TB2 (1):
 - a. Brown-9 to TB2-A1
 - b. Brown-8 to TB2-A2
 - c. White-7 to TB2-A3
 - d. Green-2 to TB2-A4
 - e. White-3 to TB2-A5
 - f. Black-1 to TB2-A6

NOTE

Numbers after the wire colors, brown-8, green-2, etc., are the identifying wire numbers printed on each wire.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**I. JUNCTION BOX TERMINAL BOARDS TB1 AND TB2 - Continued**

STEP	PROCEDURE
7.	Connect following wires, coming from unit connectors in the junction box, to the top or B terminals of TB2 (1): a. Brown-12 to TB2-B1 b. Brown-10 to TB2-B2 c. White-14 to TB2-B3 d. Green-16 to TB2-B4 e. Green-21 to TB2-B4 f. White-19 to TB2-B5 g. Black-20 to TB2-B6
8.	Install TB2 (1) in junction box (2) on the side across from the side with one connector in it.
NOTE If connector J1 is also to be installed, it must be installed before either terminal board. Refer to installation procedure for connector J1 in paragraph 3-11k.	
9.	Loosely install two mounting screws (3) and flat washers (4) through side of junction box (2) and TB2 (1) with flat washers (5), lockwashers (6) and hex nuts (7).
10.	Set junction box cover on junction box and tighten the four captive screws.
TEST	
Test HCA (para 3-20) to verify that malfunction has been corrected.	

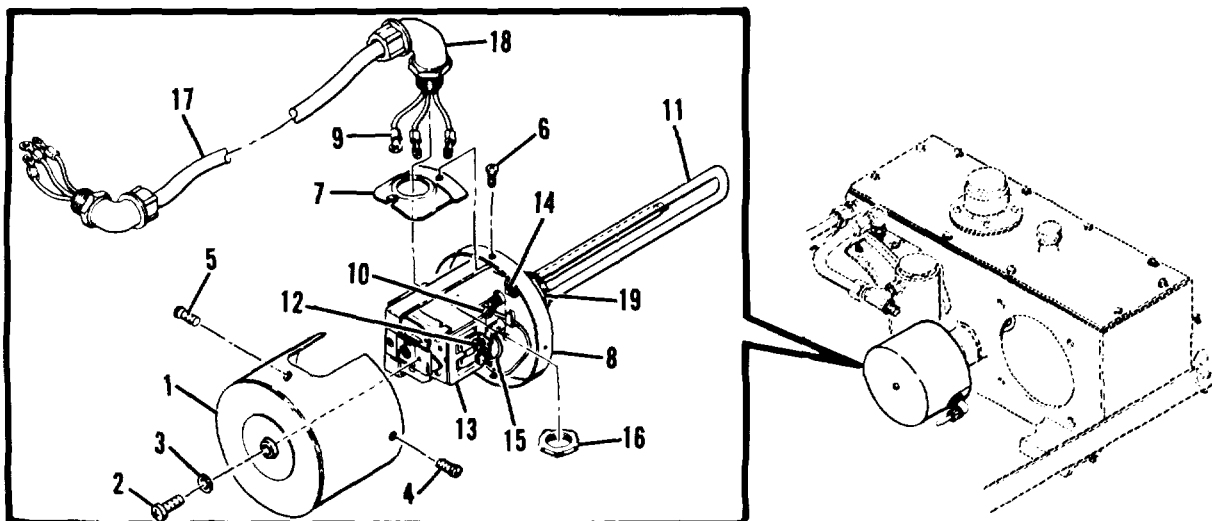
3-11. HCA MAINTENANCE INSTRUCTIONS - Continued			
m. HEATER			
This task covers:			
Removal	Replacement	Installation	Test
<u>INITIAL SETUP</u>			
<u>Tools</u> Refrig Unit Svce Tool Kit, 5180-00-596-1474 1/4 in. flat tip scdr No. 2 xtip scdr 3/8 in. comb. wr Slipjoint plr 1-1/2 in. comb. wr 5120-00-203-4804		<u>Equipment</u> Condition Para _____ <u>Condition Description</u> 3-11a Cover removed 3-11b Hydraulic oil removed <u>Materials/Parts</u> thread sealing compound (appx B, item 21) heater element	
STEP		PROCEDURE	
REMOVAL		NOTE Two models of the heater are used on the HCA and the method for attaching the cover (1) differs for each model. One model uses screw (2) and lockwasher (3). The other model uses two screws (4 and 5). Inspect your unit before removing the cover to determine which model is used and then use the right procedure in step 1 for removing the cover. 1. Remove heater cover (1) with procedure that applies, below: a. Remove screw (2), lockwasher (3) and cover (1). b. Remove two screws (4 and 5) and cover (1). 2. Set HCA on its side for access to bottom. 3. Remove screw (6) to free cable mounting plate (7) from heater (8).	

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued

m. HEATER - Continued

STEP

PROCEDURE



4. Remove three wires (9) at heater's base as follows:
 - a. White-19 from silver terminal (10) of heater element (11).
 - b. Black-20 from brass terminal (12) of thermostat (13).
 - c. Green-21 from GRD terminal (14).

NOTE

Numbers after the wire colores -19, -20 and -21 are the identifying wire numbers printed on each wire.

A bare wire (15) connects the brass terminal of the thermostat (13) to the silver terminal of the heater element (11).

5. Remove locknut (16) heater cable (17) and plug (18).

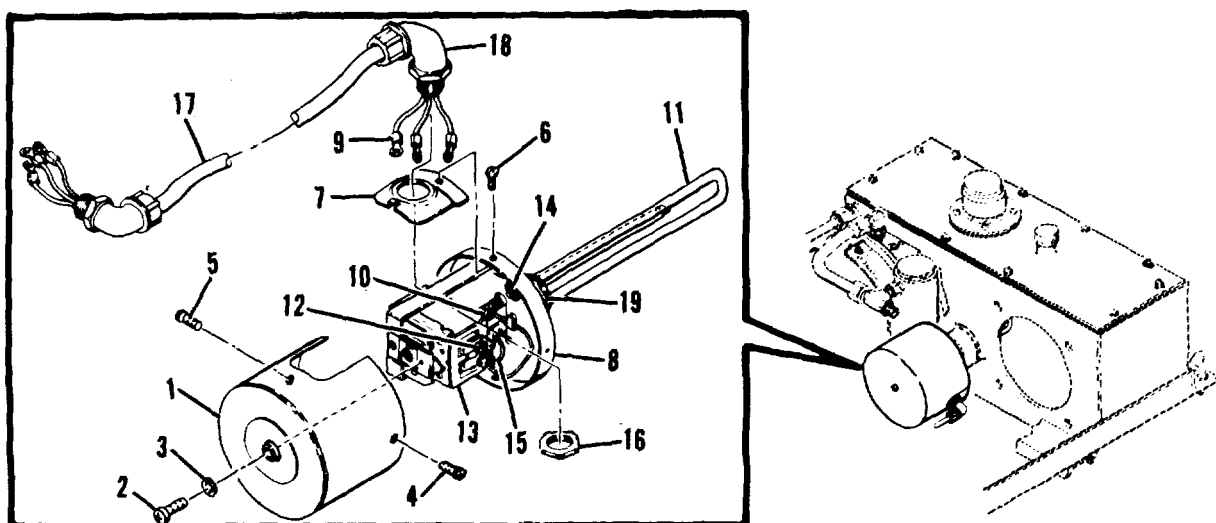
CAUTION

Before completing step 6 be sure the oil tank has been drained of all oil.

6. Remove heater from oil tank using nut (19).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**m. HEATER - Continued****STEP****PROCEDURE****REPLACEMENT**

Replace faulty part with a new part.

**INSTALLATION**

1. Before installing replacement heater in oil tank, remove heater cover (1) by either removing two screws (4 and 5) from side of cover (1) or removing screw (2) and washer (3) from end of cover, depending on type of heater.
2. Apply a light coat of thread sealing compound on threads (19) of heater (8).
3. Install heater in oil tank.
4. Install screw (6) and cable mounting plate (7) under edge of heater (8).
5. Install plug (18), three wires (9) (black, white and green) of heater cable (17), and locknut (16).
6. Adjust heater so final position places plug (18) under 24 Vdc pump motor, but not in contact with it.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued	
m. HEATER - Continued	
STEP	PROCEDURE
7.	Connect three wires (9) to terminals at the heater's base as follows: a. White-19 to silver terminal (10) of heater element (11). b. Black-20 to brass terminal (12) of thermostat (13). c. Green-21 to GRD terminal (14) (marked GRD). NOTE A bare wire (15) connects the bran terminal of the thermostat (13) to the silver terminal of the heater element (11).
8.	Install heater cover (1) with either two screws (4 and 5) in side of cover (1) or with screw (2) and washer (3) in end of cover, depending on type of heater.
9.	Fill oil tank with hydraulic fluid per paragraph 3-11b.
	TEST Test HCA (para 3-20) to verify repair.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued

n. Oil Tank

This task covers:

Removal

Replacement

Installation

Test

INITIAL SETUP

Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474

Pinch bar

5/8 in. comb. wr

Materials/Parts

oil tank

Equipment

Condition

Para

Condition Description

3-11a

Cover removed

3-11b

Hydraulic oil removed

3-11c

Pressure gage removed

3-11d

Filter removed

3-11m

Heater removed

3-11o

24 Vdc pump motor removed

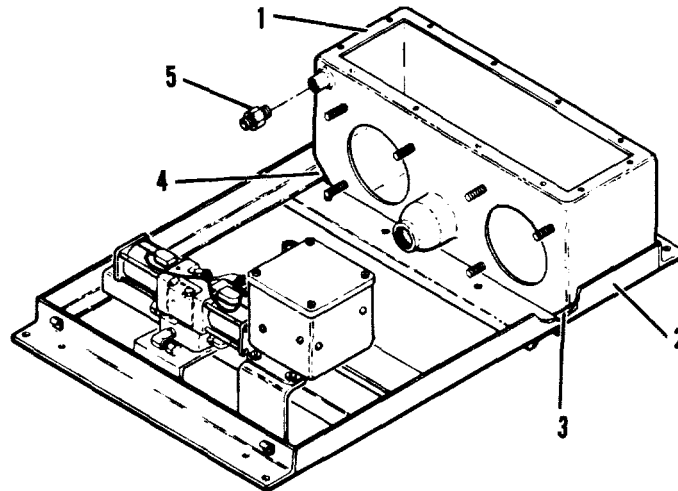
3-11p

90 Vdc pump motor removed

STEP

PROCEDURE

REMOVAL



3-11. HCA MAINTENANCE INSTRUCTIONS - Continued	
n. Oil Tank - Continued	
STEP	PROCEDURE
1.	Remove adapter (5) from oil tank (1).
CAUTION Do not bend oil tank when removing	
2.	Remove oil tank (1). Work oil tank back and forth to loosen it. If it is too tight to be removed easily, work a pry bar between frame (2) and corner (3) of tank. Also pry at point (4) if necessary.
REPLACEMENT Replace faulty part with a new part. INSTALLATION	
1.	Install oil tank (1) on HCA mounting frame (2) and press firmly into place. Be sure that tank is fully seated.
2.	Install adapter (5) on oil tank (1).
3.	Install heater (para 3-11m).
4.	Install 24 Vdc pump motor (para 3-11o).
5.	Install 90 Vdc pump motor (para 3-11p).
6.	Install oil pressure gage (para 3-11c).
7.	Fill oil tank with hydraulic fluid (para 3-11b).
8.	Install hydraulic assembly cover (para 3-11a).
TEST Test HCA (para 3-20) to verify repair.	

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**o. 24 VDC PUMP MOTOR****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474

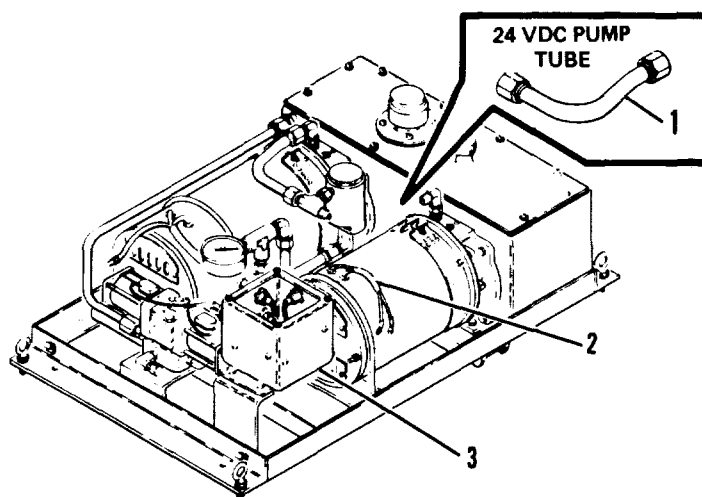
1/2 in. comb. wr
1/2 in. skt
7/16 in. comb. wr
3/8 in. comb. wr
1/4 in. flat tip scdr
pinch bar
lg rd nose plr
flashlight
No. 2 xtip scdr
slipjoint plr
9/16 in. skt
skt hd scr key set
skt wr hdl
5/8 in. comb. wr
9/16 in. comb. wr
7/16 in. skt
11/16 in. comb. wr
3/8 in. skt
11/32 in. comb. wr

EquipmentConditionParaCondition Description

3-11a HCA cover removed
3-11b Hydraulic oil removed
3-11f Junction box and cover removed

Materials/Parts

Thread sealing compound (appx B,
item 21)
24 Vdc pump motor
Oil tank gasket
Pump motor gaskets

STEP**PROCEDURE****REMOVAL**

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**o. 24 VDC PUMP MOTOR - Continued**

STEP	PROCEDURE
1.	Disconnect and remove two 24 Vdc motor wires (2) from Junction box (3) (para 3-11g, removal procedure steps 1 thru 8). Tag each wire with terminal information to identify the wires when reconnecting.
2.	Remove 24 Vdc pump tube (1).
3.	Remove two nuts (15), lockwashers (14) and flat washers (13) from U bolt (4). Tilt hydraulic assembly to gain access to nuts.
4.	Remove U bolt (4) from 24 Vdc pump motor (12).
5.	Remove 12 mounting screws (7) and flat washers (8) on oil tank cover (9).
6.	Remove cover (9) and gasket (10) from oil tank (11).
7.	Remove elbow (5) and adapter (6) from 24 Vdc pump motor (12).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued

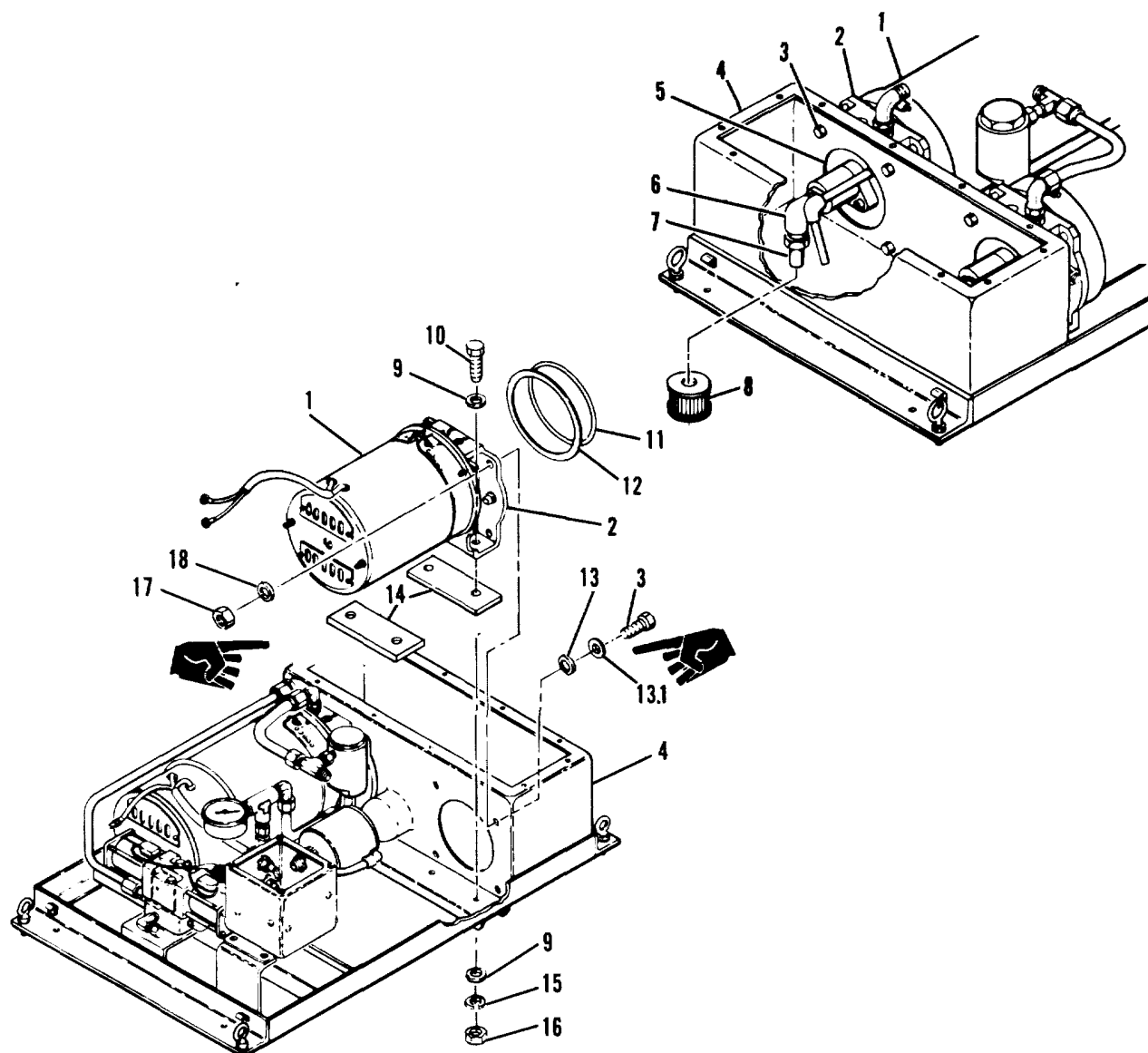
o. 24 VDC PUMP MOTOR - Continued

STEP

PROCEDURE

NOTE

To lift 24 Vdc pump motor (1) through 5 in. diameter hole (5) and from oil tank (4), filter (8) must be removed from oil pump filter assembly (6).

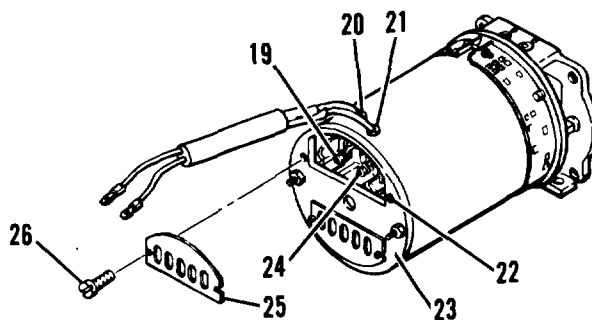


8. Pull filter (8) down to slide it off fitting (7).
9. Remove bottom two nuts (17) and flat washers (18) from two cap screws (3) and seal washers (13) mounted on oil tank (4).
10. Remove two screws (10), four flat washers (9), two nuts (16), and lock-washers (15) securing 24 Vdc pump motor (1) and (if installed) plate spacer (14).
11. Remove top two nuts (17), flat washers (18), cap screws (3), washers (13), and preformed packings (13.1) securing pump motor (1) to oil tank (4).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**o. 24 VDC PUMP MOTOR - Continued****STEP****PROCEDURE****NOTE**

When removing the 24 Vdc pump motor, check position of two gaskets (11 and 12) on pump housing (2).

12. Remove 24 Vdc pump motor (1) from oil tank (4). Turn and tilt oil pump filter assembly as required to remove from oil tank (4).

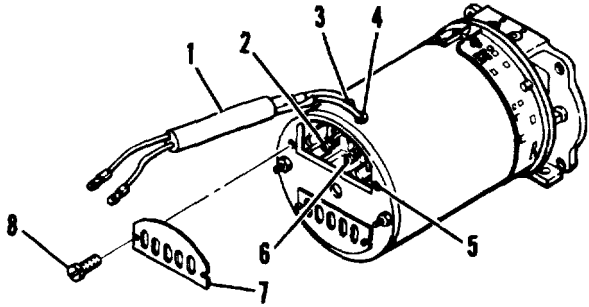


13. Remove top inspection plate (25) from motor base plate (23) as follows:
- Loosen screw (22) in top inspection plate.
 - Remove screw (26) from top inspection plate, and then remove top plate (25). Reinstall screw (26).
14. Remove two terminal mounting nuts at terminals (19) and (24) inside base of motor (23).
15. Disconnect white wire at terminal (24) and black wire at terminal (19).
16. Pull white and black wires with rubber grommets (20) and (21) out of the motor. Tag white wire for right grommet (21) and black wire for left grommet (20).
17. Reinstall terminal mounting nuts (19) and (24) to prevent loss of these items.

REPLACEMENT

Replace faulty part with a new part.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**o. 24 VDC PUMP MOTOR - Continued**

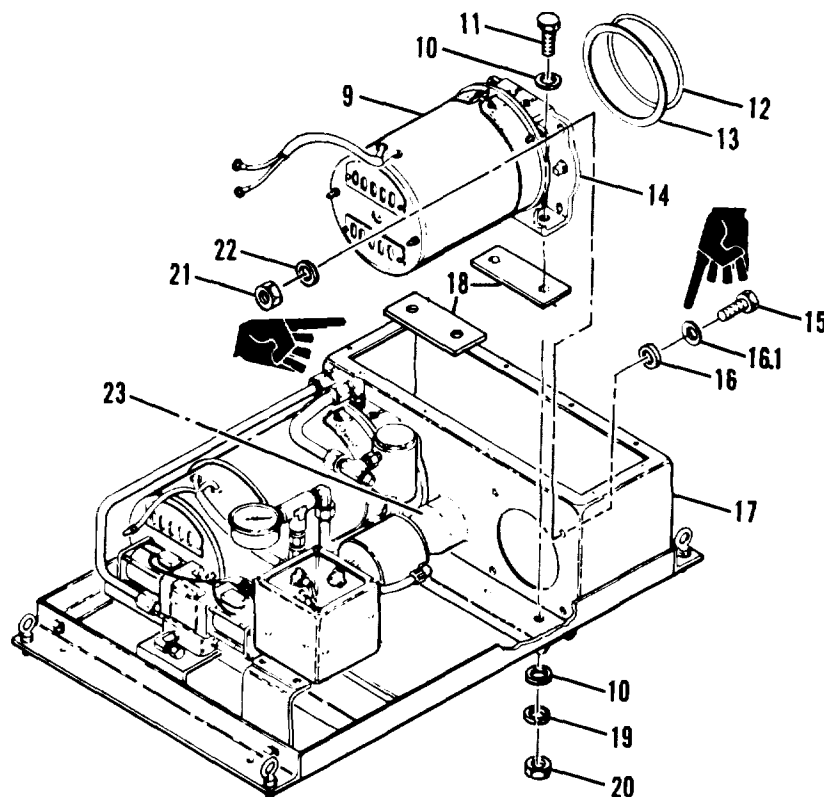
STEP	PROCEDURE
INSTALLATION NOTE If cable (1) (black and white wires) must be installed in the motor as part of this installation procedure, it is preferred that it be installed prior to mounting pump motor on the HCA.  1. Insert white wire of cable (1) through right grommet (4) and insert black wire through left grommet (3). 2. Install wires and rubber grommets in cable holes on motor top. 3. Connect white wire to terminal (6) and black wire to terminal (2) with washers and nuts. 4. Install top inspection plate (7) with screws (5 and 8). 5. Install and seat new gaskets (12 and 13) in pump housing (14). Install flat, inner paper gasket (13) first. Then, install gasket (12) on top of inner gasket (13). NOTE Before you install the pump motor, remove the filter from the oil pump filter assembly (step 8 of removal procedure). 6. Install 24 Vdc pump motor (9) on oil tank (17). If coupling (23) on oil tank interferes with 24 Vdc pump motor (9), install plate spacers (18) underneath pump housing (14) and pump motor (9). 7. Coat preformed packings (16.1) with clean hydraulic fluid. Install top two screws (15), washers (16), and preformed packings (16.1) from inside oil tank.	

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued

o. 24 VDC PUMP MOTOR - Continued

STEP

PROCEDURE



8. Install flat washers (22) and nuts (21) finger tight so pump housing (14) is set snug to mounting wall of oil tank (17).
9. Install two screws (11), four flat washers (10) two lockwashers (19) and nuts (20).
10. Coat preformed packings (16.1) with clean hydraulic fluid. Loosely install bottom two screws (15), washers (16), preformed packings (16.1), flat washers (22), and nuts (21).

CAUTION

When tightening four nuts (21), hold screws (15) from inside oil tank AND PREVENT THEM FROM TURNING. If screws (15) are allowed to rotate, preformed packings may be damaged and cause oil leakage.

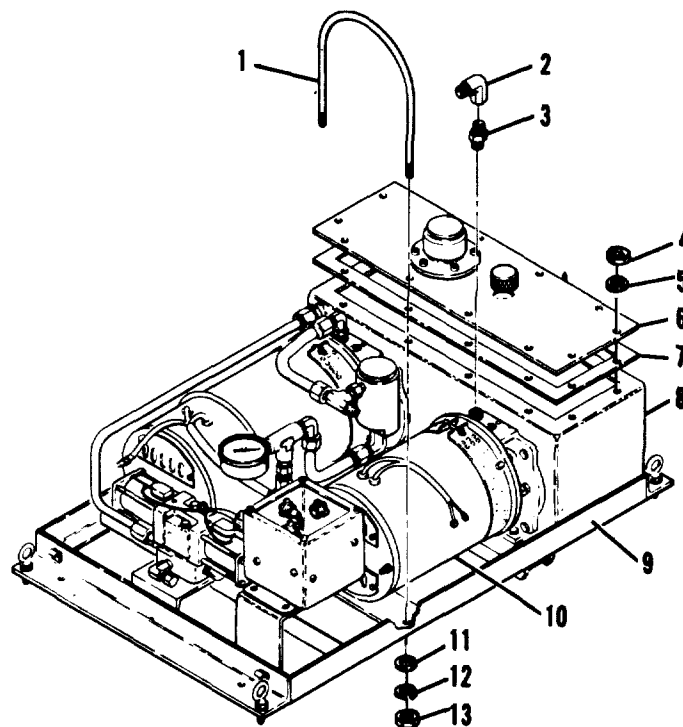
11. Tighten four nuts (21).
12. Install filter removed in step 5.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued

o. 24 VDC PUMP MOTOR - Continued

STEP

PROCEDURE

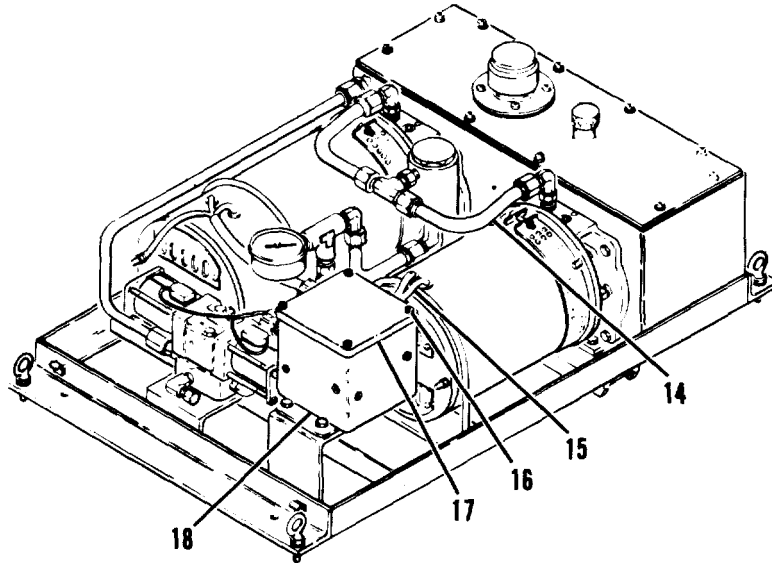


13. Install oil tank cover (6) and new gasket (7) on oil tank (8).

NOTE

Do not overtighten screws (4). Overtightening causes the gasket to push out on the sides.

14. Install and tighten 12 mounting screws (4) and flat washers (5).
15. Install U bolt (1). Tilt HCA frame (9) to gain access to threaded ends of U bolt.
16. Install two flat washers (11), lockwashers (12) and nuts (13).
17. Treat threads of adapter (3) with thread sealing compound and install adapter (3) on elbow (2) and on 24 Vdc pump motor (10).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**o. 24 VDC PUMP MOTOR - Continued****STEP****PROCEDURE**

18. Remove conduit locknut and bushings from 24 Vdc junction box connector. Install two 24 Vdc pump motor wires of cable (15) into junction box (18) using procedure in paragraph 3-11g, installation procedure steps 3 thru 10.
19. Install junction box cover (17) on junction box (18) and tighten four captive screws (16).
20. Install 24 Vdc pump motor tube (14).
21. Fill oil tank with hydraulic fluid (para 3-IIb).

TEST

Test hydraulic assembly (para 3-20) to verify repair.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**p. 90 VDC PUMP MOTOR****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
11/16 in. comb. wr
1/2 in. comb. wr
1/2 in. skt
7/16 in. skt
7/16 in. comb. wr
3/8 in. comb. wr
1/4 in. flat tip scdr
No. 2 xtip scdr
Slipjoint plr
lg rd nose plr
9/16 in. skt
skt hd scr key set
skt wr hdl
5/8 in. comb. wr
9/16 in. comb. wr
Flashlight
3/8 in. skt
11/32 in. comb. wr

EquipmentConditionParaCondition Description

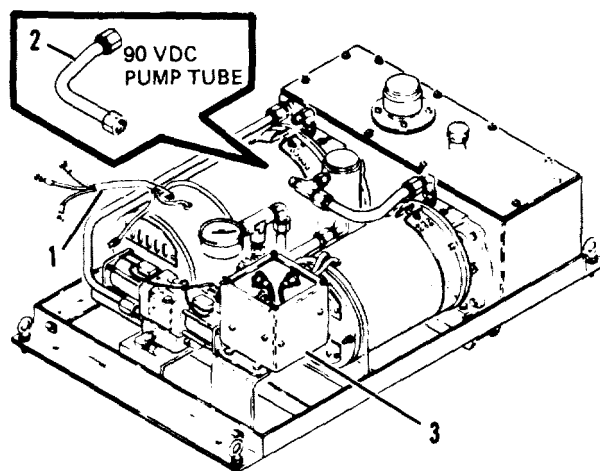
3-11a HCA cover removed
3-11b Hydraulic oil removed
3-11f Cover of junction box removed

Materials/Parts

thread sealing compound (appx B, item 21)
90 Vdc pump motor
oil tank gasket
pump motor gaskets

STEP**PROCEDURE****REMOVAL**

1. Disconnect and remove three 90 Vdc motor wires (1) from junction box (3), (para 3-12h removal procedure step 1 thru 9). Tag each wire with terminal information to identify the wires when reconnecting.
2. Remove 90 Vdc pump tube (2).

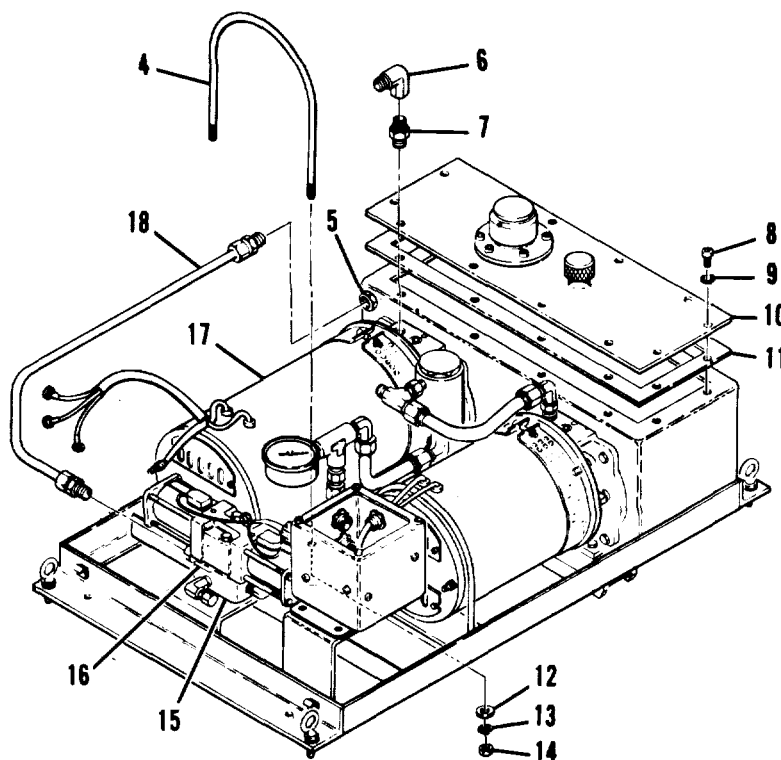


3-11. HCA MAINTENANCE INSTRUCTIONS - Continued

p. 90 VDC PUMP MOTOR - Continued

STEP

PROCEDURE



3. Remove 4-way valve (16) (para 3-lie, removal procedure steps 1 thru 3).
4. Remove long tube (18) which connects between subplate (15) and oil tank (5).
5. Remove two nuts (14), lockwashers (13) and flat washers (12) from U bolt (4). Tilt HCA to gain access to nuts.
6. Remove U bolt (4) from 90 Vdc pump motor (17).
7. Remove 12 mounting screws (8) and flat washers (9) on oil tank cover (10),
8. Remove cover (10) and gasket (11).
9. Remove elbow (6) and adapter (7) from 90 Vdc pump motor (17).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued

p. 90 VDC PUMP MOTOR - Continued

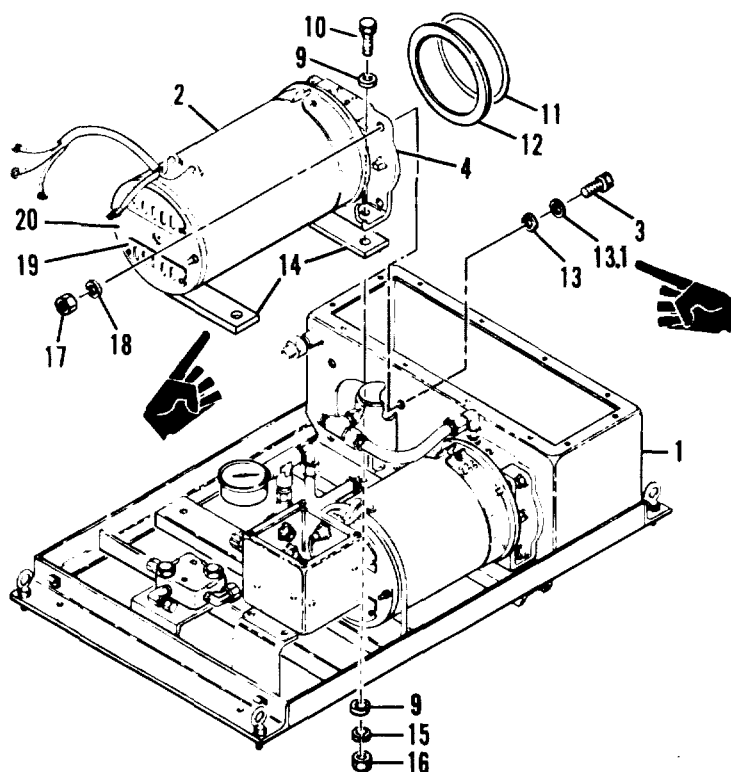
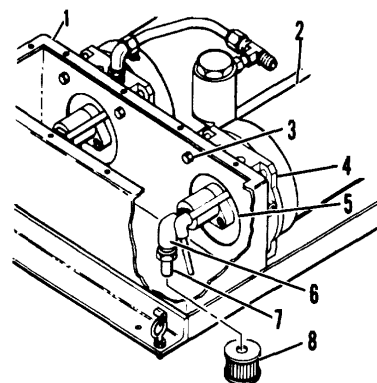
STEP

PROCEDURE

NOTE

To lift 90 Vdc pump motor (2) through 5 in. diameter hole (5) and from oil tank (1), filter (8) must be removed from oil pump filter assembly (6).

10. Pull filter (8) down to slide it off fitting (7).



11. Remove bottom two nuts (17), flat washers (18), cap screws (3), washers (13), and preformed packings (13.1) securing pump motor (1) to oil tank (4).
12. Remove two screws (10), four flat washers (9), two nuts (16), and lock-washers (15) securing 24 Vdc pump motor (2) and (if installed) plate spacers (14).
13. Remove top two nuts (17), flat washers (18), cap screws (3), washers (13), and preformed packings (13.1) securing pump motor (1) to oil tank (4).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued

p. 90 VDC PUMP MOTOR - Continued

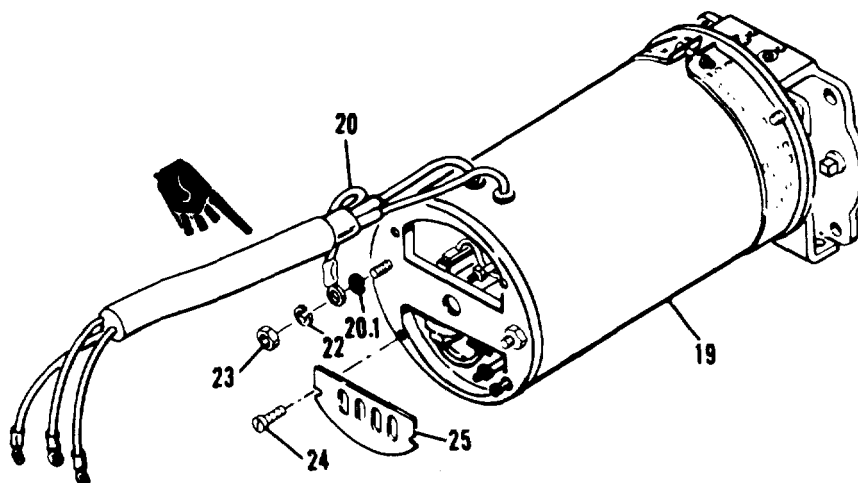
STEP

PROCEDURE

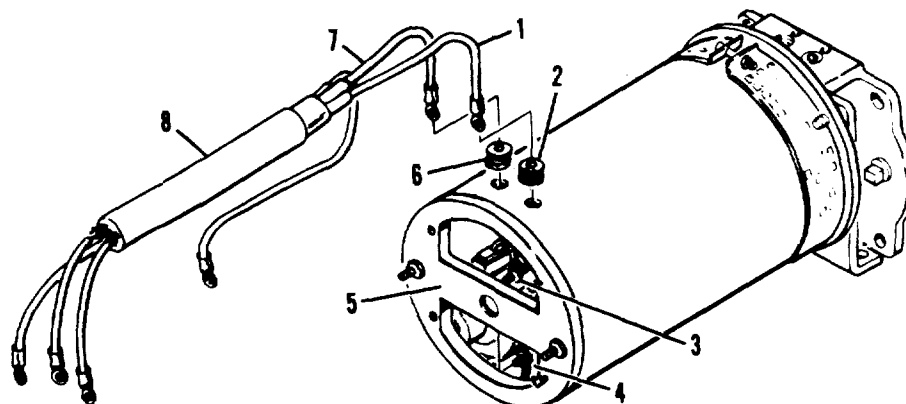
NOTE

When removing the 90 Vdc pump motor, check position of two gaskets (11 and 12) on pump housing (4).

14. Remove 90 Vdc pump motor (2) from oil tank (1). Turn and tilt oil pump filter assembly as required to remove from oil tank (1).



15. Remove nut (23), washer (22), green wire (20) and lockwasher (20.1). Replace washer and nut.
16. Remove two inspection plates (25) from motor base plate (19) as follows:
- Loosen two screws (21) in top and bottom inspection plates (25).
 - Remove two screws (24) from top and bottom inspection plates, and then remove both plates (25). Reinstall screws (24).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**p. 90 VDC PUMP MOTOR - Continued****STEP****PROCEDURE**

17. Remove two terminal mounting nuts at terminals (3) and (4) inside base of the motor (5).
18. Disconnect white wire (1) at terminal (4) and black wire (7) at terminal (3).
19. Pull white and black wires with rubber grommets (2) and (6) out of the motor. Tag white wire for right grommet (2) and black wire for left grommet (6).
20. Reinstall mounting nuts to terminals (3) and (4) to prevent loss.

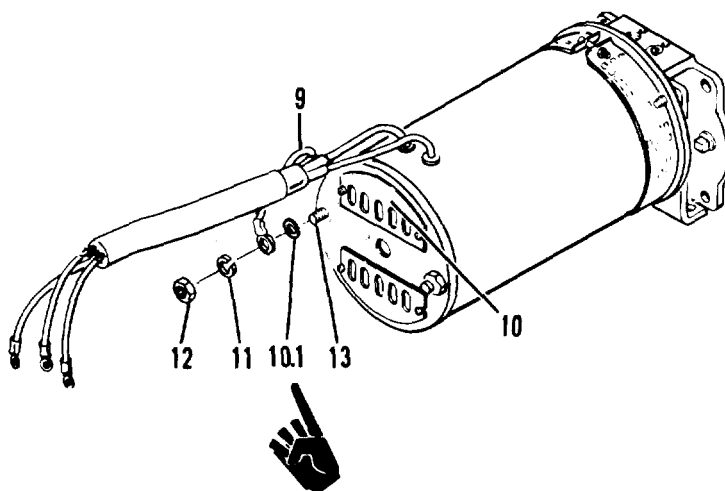
REPLACEMENT

Replace faulty part with a new part.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**p. 90 VDC PUMP MOTOR - Continued****STEP****PROCEDURE****INSTALLATION****NOTE**

If cable (8) (black, white and green wires) must be installed in the motor as part of this Installation procedure, it is best to install it before mounting the pump motor on the HCA.

1. Insert white wire (1) of cable (8) through right grommet (2) and insert black wire (7) through left grommet (6).
2. Install wires and rubber grommets in cable holes on motor top.
3. Connect white wire (1) to terminal (4) and black wire (7) to terminal (3).



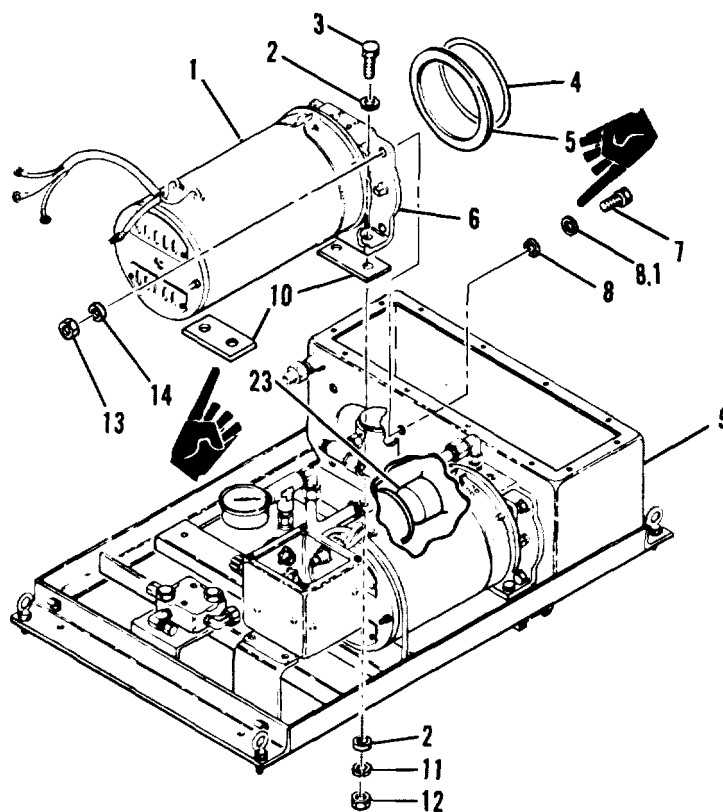
4. Install top and bottom inspection plates (10).
5. Install lockwasher (10.1) and green wire (9) over motor bolt (13).
6. Install washer (11) and nut (12) and tighten.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued

p. 90 VDC PUMP MOTOR - Continued

STEP

PROCEDURE



7. Install and seat new gaskets (4 and 5) in pump housing (6). Install flat, inner paper gasket (5) first. Then install gasket (4) on top of inner gasket (5).
8. Remove the filter from the oil pump filter assembly (step 10 of removal procedure). Install 90 Vdc pump motor assembly (1) on oil tank (9). If coupling (23) on oil tank interferes with 90 Vdc pump motor (1), install plate spacers (10) underneath pump housing (6) and pump motor (1).
9. Coat preformed packings (8.1) with clean hydraulic fluid. Install top two screws (7), washers (8), and preformed packings (8.1) from inside oil tank.
10. Install flat washers (14) and nuts (13) finger tight so pump housing (6) is set snug to mounting wall of oil tank (9).
11. Install two screws (3), four flat washers (2), two lockwashers (11) and two hex nuts (12) securing 90 Vdc pump motor assembly and (if installed) spacer(s) (10).
12. Coat preformed packings (8.1) with clean hydraulic fluid. Loosely install bottom two screws (7), washers (8), and preformed packings (8.1) from inside oil tank.

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued

p. 90 VDC PUMP MOTOR - Continued

STEP

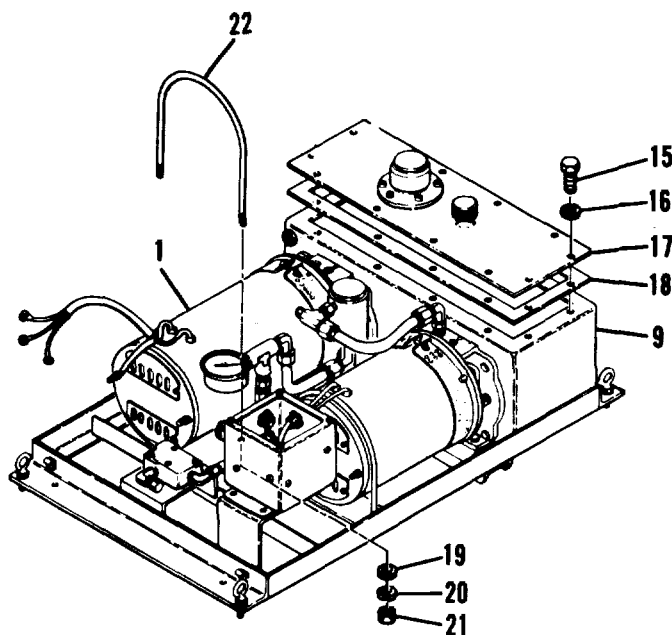
PROCEDURE

CAUTION

When tightening four nuts (13), hold screws (7) inside oil tank AND PREVENT THEM FROM TURNING. If screws (7) are allowed to rotate, preformed packings may be damaged and cause oil leakage,

13. Tighten four nuts (13) and tighten two nuts (12).

14. Install filter removed in step 8.



15. Install oil tank cover (17) and new gasket (18) on oil tank (9).

16. Install twelve mounting screws (15) and flat washers (16).

NOTE

Do not overtighten screws (15). Overtightening causes the gasket to push out on the sides.

17. Install U bolt (22). Tilt HCA to gain access to threaded ends of U bolt.

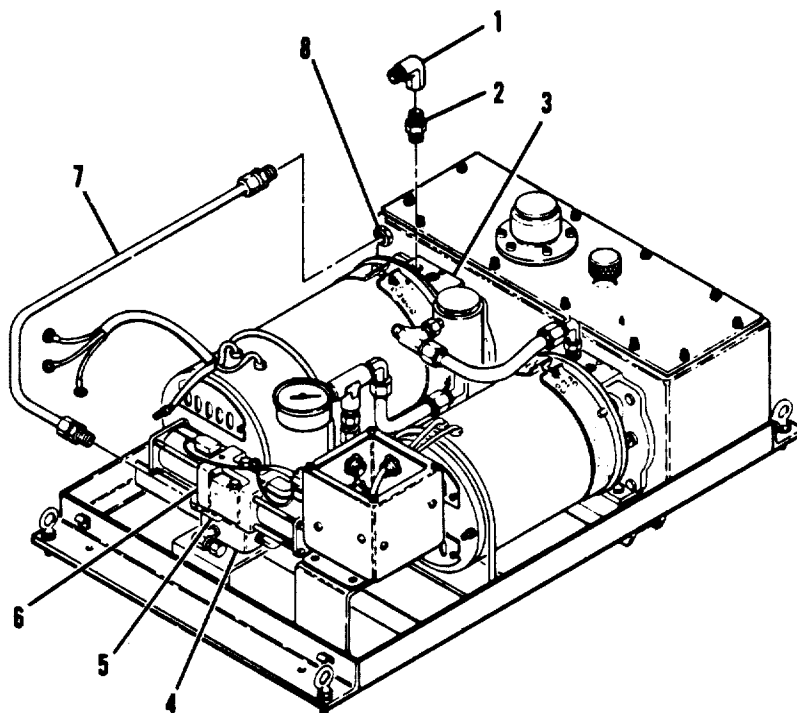
18. Install two flat washers (19), lockwashers (20) and nuts (21).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued

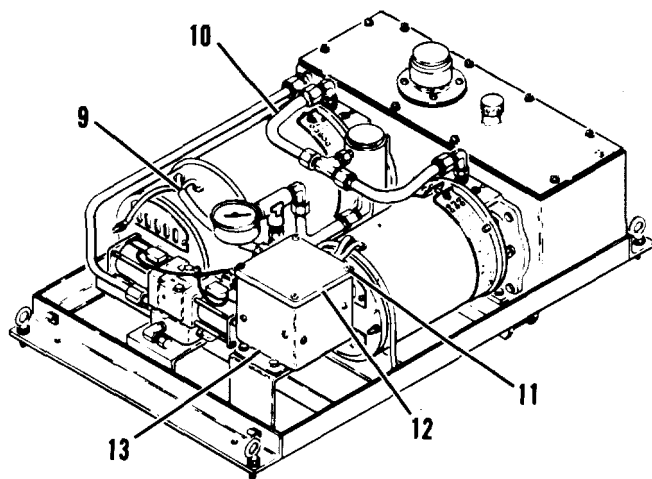
p. 90 VDC PUMP MOTOR - Continued

STEP

PROCEDURE



19. Treat threads of adapter (2) with thread sealing compound and install adapter (2) on elbow (1) and pump housing (3).
20. Install long tube (7) which connects between subplate (4) and oil tank adapter (8).
21. Install 4-way valve (6) on subplate (4) with new packings (5) (para 3-11e installation procedure steps 6 thru 9).

3-11. HCA MAINTENANCE INSTRUCTIONS - Continued**p. 90 Vdc PUMP MOTOR - Continued****STEP****PROCEDURE**

22. Remove conduit locknut and bushings from 90 Vdc junction box (13) connector. Install three 90 Vdc pump motor wires of cable (9) into junction box (13) (para 3-11h, installation procedure steps 3 thru 11).
23. Install junction box cover (12) on junction box (13) and tighten the four captive screws (11).
24. Install 90 Vdc pump motor tube (10).
25. Fill oil tank with hydraulic fluid (para 3-11b).
26. Install HCA cover.

TEST

Test hydraulic assembly (para 3-20) to verify repair.

3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS

- You will find procedures for repairing all major parts of the Mast Control in this paragraph.
- If a part is found to be faulty during troubleshooting, you will be referred directly to the repair procedure.
- If a part is found to be faulty during inspection, refer to the List of Tasks below. It will tell you the location of the repair procedure for the part.
- Turn to the referenced procedure and check the INITIAL SETUP for information needed to begin the repair.
- Note that the Equipment Condition entry in INITIAL SETUP tells you what parts must have been removed before you can begin the actual repair.

OVERVIEW

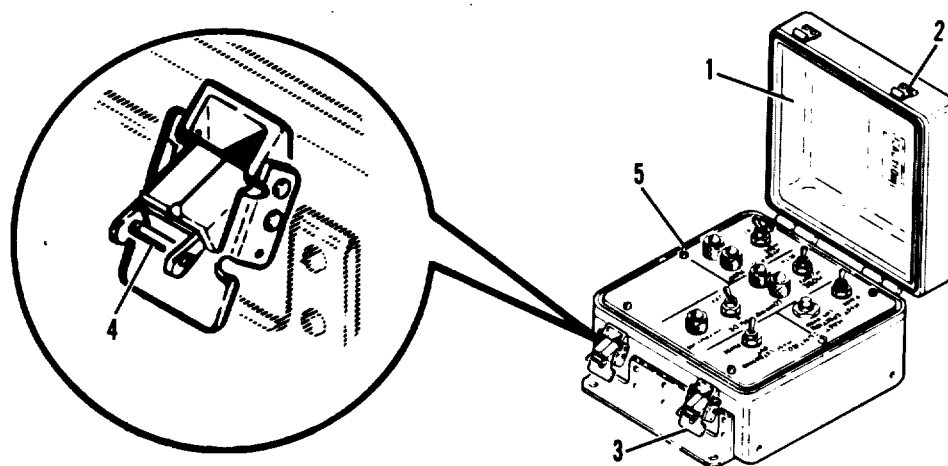
To repair the Mast Control you must:

- Remove parts to gain access to the faulty part.
- Remove the faulty part.
- Replace the faulty part with a new part.
- Install the new part.
- Reinstall parts removed to gain access.
- Test the Mast Control to verify successful repair (para 3-21).

NOTE

To avoid unnecessary replacement of a good wiring harness or before starting a difficult replacement task, make certain you have found the part causing the malfunction. Complete the troubleshooting procedure and make any other voltage or continuity checks on the mast control in order to isolate the faulty part. If you are in doubt about the malfunction, confirm it, by doing a mast control post-maintenance test.

LIST OF TASKS	
Maintenance (repair) tasks	Para No. (3-12)
Compressor mode AC/AUTO-DC-BOTH switch S4	f
Connector J1	g
Dc mode ON-OFF switch S5	e
Front panel	b
Hydraulic pump mode AC-DC switch S6	e
Indicator lights DS1 thru DS5	i
LIM OVRD switch S2	d
Mast control cover	a
Mast erection RAISE-OFF-LOWER switch S1	c
Mast extension OUT-PAUSE-IN switch S3	e
Relay K1	h
Wire harness and indicator lights DS1 thru DS5	i

3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS**a. MAST CONTROL COVER****This task covers:****Removal****Installation****INITIAL SETUP****STEP****PROCEDURE****REMOVAL**

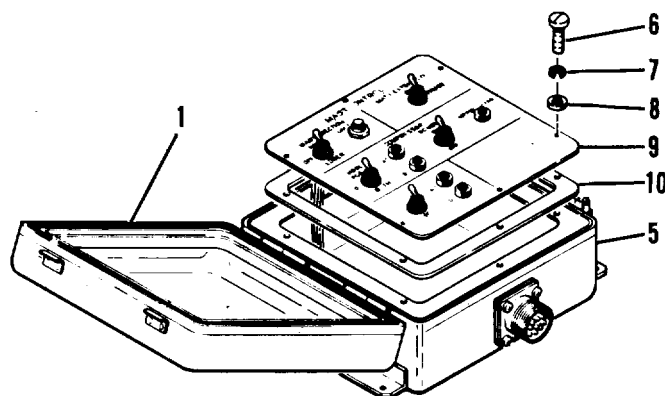
Lift and release two latches (3) on mast control case (5) and swing cover (1) open.

INSTALLATION

1. Close cover (1) of mast control case (5).
2. Secure holding ring (4) over hook (2) on cover and press down on latch (3).

3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued**b. FRONT PANEL****This task covers:****Removal****Installation****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 2 xtip scdr

STEP**PROCEDURE****REMOVAL**

1. Remove six screws (6), lockwashers (7) and flat washers (8).
2. Lift front panel (9) free of rubber gasket (10) and mast control case (5). Do not remove rubber gasket (10) unless it is to be replaced.

INSTALLATION

1. Set front panel (9) on rubber gasket (10) on mast control case (5).
2. Install six screws (6), lockwashers (7) and flat washers (8).

3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued**c. MAST ERECTION RAIS-OFF-LOWER SWITCH S1****This task covers:****Removal****Installation****INITIAL SETUP****Tools**

Refrig Unit Svce Tool Kit,
5180-00-596-1474
9/16 in. comb. wr
1/4 in. flat tip scdr
diag ctg plr
5110-00-985-0974

Materials/Parts

wire ties (appx B, item 22)
toggle switch S1, 5035860-1

Equipment
Condition

Para

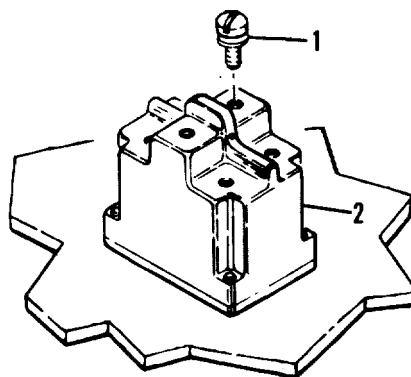
3-12a

3-12b

Condition Description

Mast control cover
removed

Front panel removed
Wire ties removed as
necessary

STEP**PROCEDURE****REMOVAL**

1. Remove six screws with self contained lockwashers (1) from back of switch S1 (2).

CAUTION

To prevent damage to equipment, be careful not to cut wire harness when removing wire ties.

2. Tag wires (see INSTALLATION), and remove the nine wires from six terminals.

3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued**d. LIM OVRD SWITCH S2****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
3/4 in. comb. wr
pocket knife
Diag ctg plr,
5110-00-965-0794
Heat gun
Sldr and desldr set,
3439-00-460-7198

Equipment
ConditionPara

3-12a

3-12b

Condition DescriptionMast control cover
removed

Front panel removed

Tiedown straps removed
as necessaryMaterials/Parts

Insulation sleeving (appx B, item 7)
Solder (appx B, item 19)
Tiedown straps (appx B, item 22)
Pushbutton switch S2, M8805-99-015

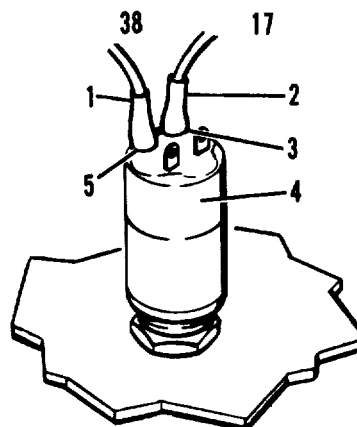
STEP**PROCEDURE****REMOVAL****CAUTION**

To prevent damage to equipment, be careful not to cut wire harness when removing tiedown straps or heat shrink sleeving.

NOTE

There are no connections to pins 1 and 2 of the switch,

1. Remove heat shrink sleeving (1 and 2) from pin 3 (3) and pin 4 (5) of switch S2 (4).
2. Unsolder and remove wire no. 17 from pin 3 (3) and wire no. 38 from pin 4 (5).



3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued**e. MAST EXTENSION OUT-PAUSE-IN SWITCH S3, DC MODE ON-OFF SWITCH S5 AND
HYDRAULIC PUMP MODE AC-DC SWITCH S6****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP****Tools**

Refrig Unit Svce Tool Kit,
5180-00-596-1474
9/16 in. comb. wr
1/4 in. flat tip scdr
Diag ctg plr,
5110-00-965-0974

**Equipment
Condition****Para**

3-12a

Condition Description

Mast control cover
removed

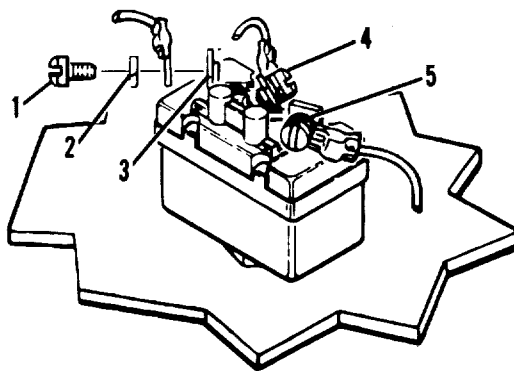
3-12b

Front panel removed

Tiedown straps removed
as necessary

Material s/Parts

Tiedown straps (appx B, item 22)
Toggle switch S3, MS25306-212
Toggle switch S5 and S6, MS25306-232
MS25306-232

STEP**PROCEDURE****REMOVAL****NOTE**

Switches S3, S5 and S6 are the same type of switch and their removal procedures are similar. Therefore, the removal of these three switches is combined. Complete those steps of the procedure that are needed to remove the required switch.

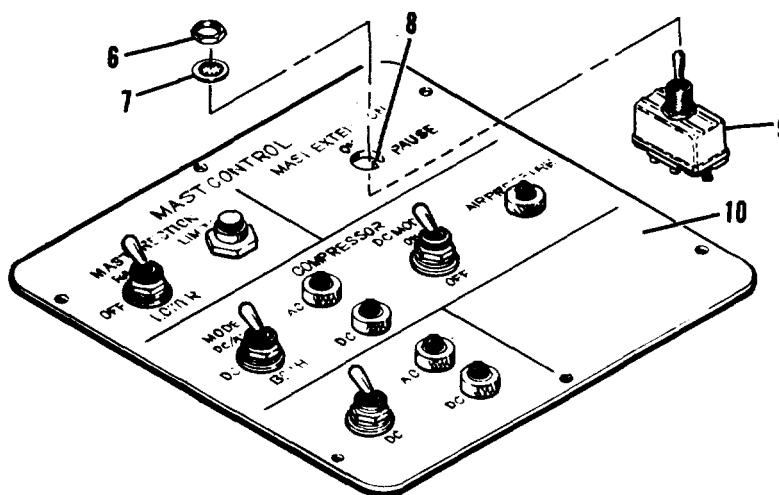
1. Remove three screws (1) and lockwashers (2) from three switch terminals 1, 2 and 3 (3, 4 and 5) of switch to be removed. Identify wires for installation.

3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued**e. MAST EXTENSION OUT-PAUSE-IN SWITCH S3, DC MODE ON-OFF SWITCH AND HYDRAULIC PUMP MODE AC-DC SWITCH S6 - Continued****STEP****PROCEDURE**

2. Remove retaining nut and lockwasher from switch to be removed.
3. Remove switch from front panel.

REPLACEMENT

Replace faulty part with a new part.

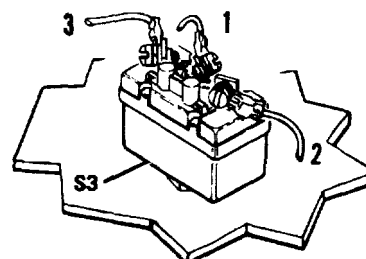
INSTALLATION

1. Discard locking ring supplied with new switch. Install switch (9), either S3, S5 or S6, in front panel (10). Switches are keyed (8) and can only be installed in one direction.
2. Install lockwasher (7) and retaining nut (6).

3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued**e. MAST EXTENSION OUT-PAUSE-IN SWITCH S3, DC MODE ON-OFF SWITCH S5 AND
HYDRAULIC PUMP MODE AC-DC SWITCH S6 - Continued****STEP****PROCEDURE**

3. Connect three wires on switch S3 as follows:

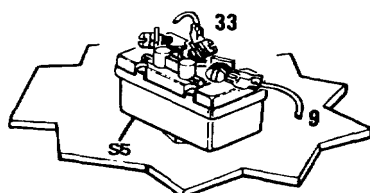
Wire no. 3 to terminal 1
 Wire no. 1 to terminal 2
 Wire no. 2 to terminal 3



- 4.

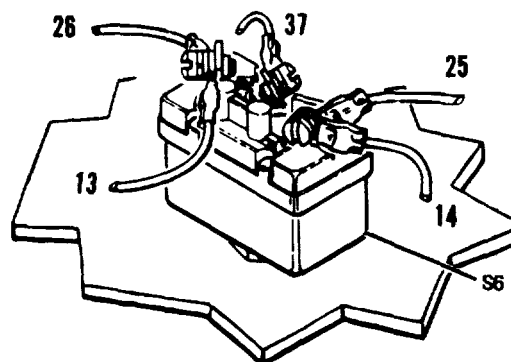
Connect two wires on switch S5 as follows:

Wire no. 33 to terminal 2
 Wire no. 9 to terminal 3



5. Connect five wires on switch S6 as follows:

<u>Wire Number</u>	<u>Terminal</u>
13	1
26	1
37	2
14	3
25	3



6. Reinstall tiedown straps as necessary.

TEST

Test mast control (para 3-21) to verify repair.

3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued**f. COMPRESSOR MODE AC/AUTO-DC-BOTH SWITCH S4****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
 5180-00-596-1474
 9/16 in. comb. wr
 1/4 in. flat tip scdr
 diag ctg plr
 5110-00-965-0974

Equipment
 Condition

Para

3-12a

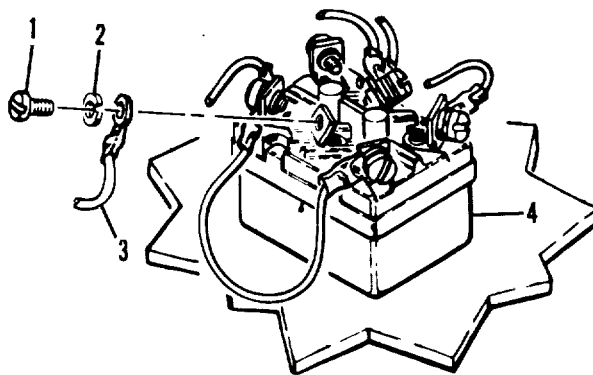
Condition DescriptionMast control cover
removed

3-12b

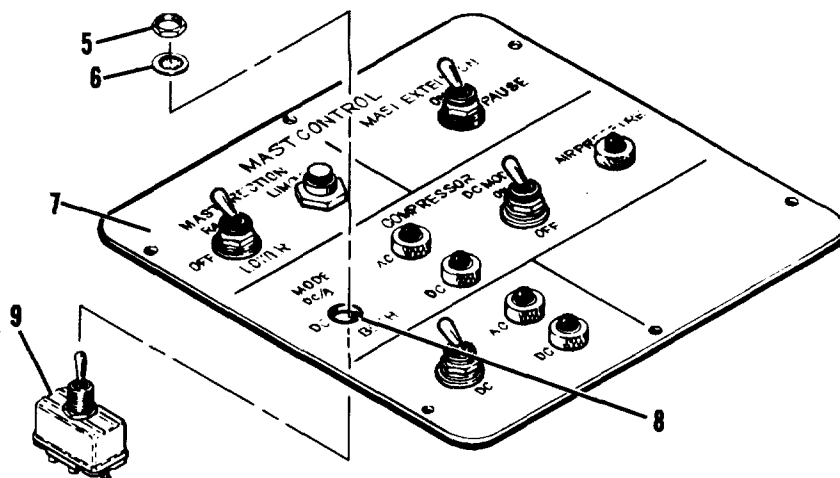
Front panel removed
Wire ties removed as
necessary

Materials/Parts

wire ties (appx B, item 22)
 toggle switch S4, MS25307-212

STEP**PROCEDURE****REMOVAL**

1. Remove five screws (1) and lockwashers (2) from switch S4 (4).
2. Remove seven wires (3) from five terminals and tag wires for installation.

3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued**f. COMPRESSOR MODE AC/AUTO-DC-BOTH SWITCH S4 - Continued****STEP****PROCEDURE**

3. Remove retaining nut (5) and lockwasher (6).
4. Remove switch S4 (9) from front panel (7).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

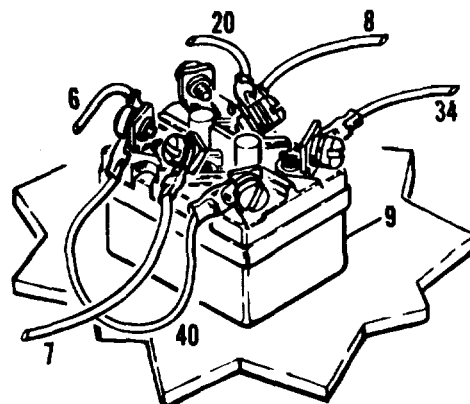
1. Discard locking ring supplied with new switch. Install switch S4 (9) in front panel (7). Switch is keyed (8) and can only be installed in one direction.
2. Install lockwasher (6) and retaining nut (5).
3. Connect seven wires to five terminals on switch S4 (9) as follows:

<u>Wire Number</u>	<u>Terminals</u>
40 & 6	1
7	2
40	3
NC	4
20 & 8	5
34	6

4. Install tiedown straps as necessary.

TEST

Test mast control (para 3-21) to verify repair.



3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued

g. CONNECTOR J1

This task covers:

Removal

Replacement

Installation

Test

INITIAL SETUPTools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
5/16 in. comb. wr
lg rd nose plr
No. 1 xtip scdr
pocket knife
Sldr and desldr set,
3439-00-460-7198
Diag ctg plr,
5110-00-965-0974
Heat gun

Equipment
ConditionPara

3-12a

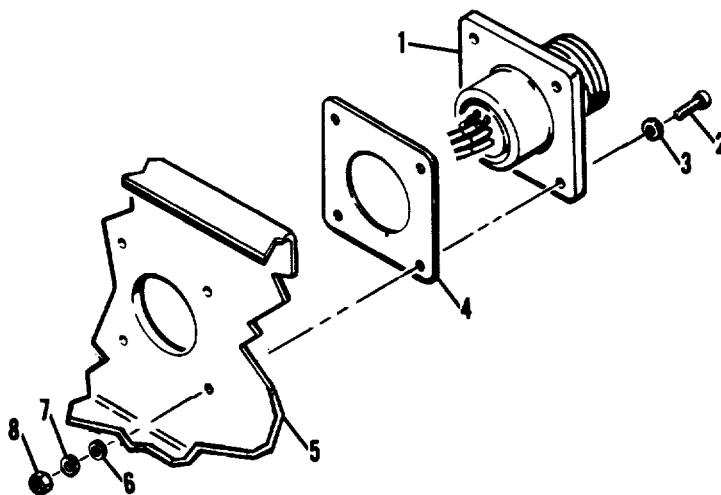
3-12b

Condition DescriptionMast control cover
removed

Front panel removed

Tiedown straps removed
as necessaryMaterials/Parts

Insulation sleeving (appx B, item 7)
Solder (appx B, item 19)
Tiedown straps (appx B, item 22)
Elec receptacle connector J1
MS3102R24-28P

STEP**PROCEDURE****REMOVAL**

1. Remove four screws (2), flat washers (3), hex nuts (8), lockwashers (7) and flat washers (6),
2. Remove connector J1 (1) and rubber gasket (4) from mast control (5).

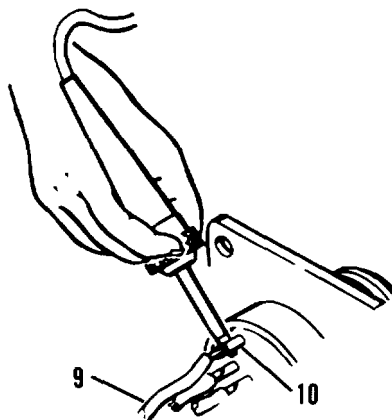
3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued**g. CONNECTOR J1 - Continued****STEP****PROCEDURE****CAUTION**

To prevent damage to equipment, be careful not to cut wire harness when removing wire ties or heat shrink sleeving.

3. Remove heat shrink sleeving from 18 connector pins.
4. Split heat shrink sleeving lengthwise and remove.
5. Tag each wire removed with following information for installation.

<u>Wire Number</u>	<u>J1 Pin Connection</u>	<u>Wire Number</u>	<u>J1 Pin Connection</u>
1	A	10	K
2	B	22	K
3	C	11	L
4	D	12	M
19	D	13	N
5	E	14	P
6	F	15	Q
7	G	16	R
8	H	17	S
9	J	18	T

4. Unsolder and remove 20 wires (9) from J1 connector pins (10).

**REPLACEMENT**

Replace faulty part with a new part.

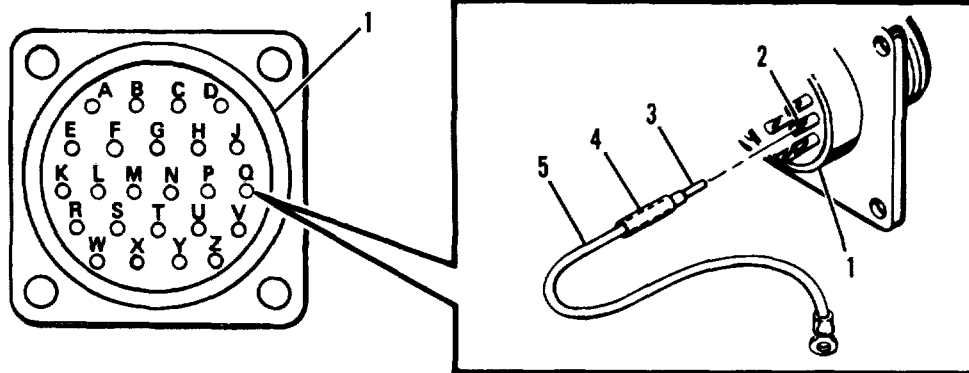
3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued

g. CONNECTOR J1 - Continued

STEP

PROCEDURE

INSTALLATION

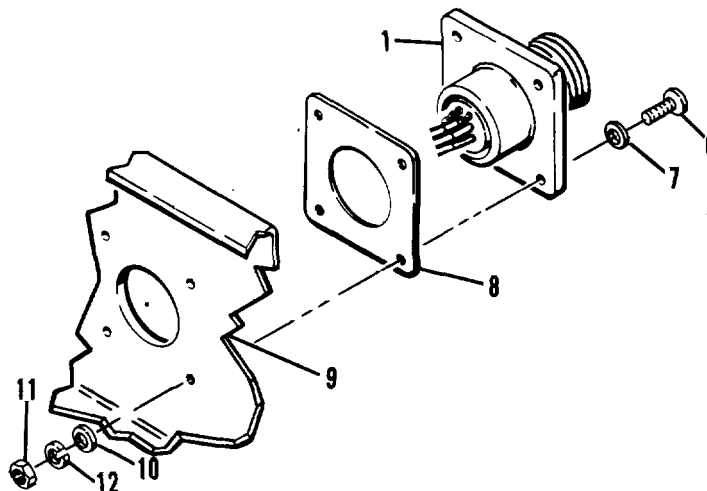


NOTE

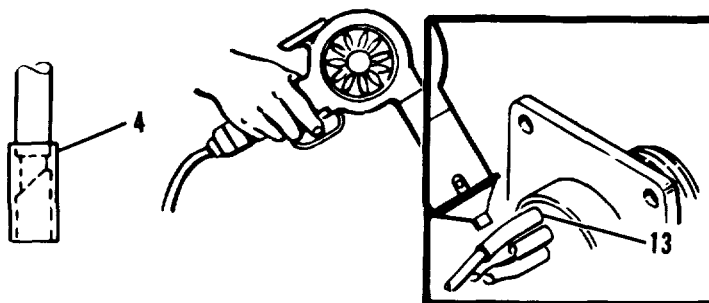
Keep soldering iron tip clean.

1. Prepare and tin ends of 20 wires (3) and 18 pins (2) on connector J1 (1).
2. Cut 18 pieces of heat shrink sleeving (4) 1/2 in. long.
3. Slide heat shrink sleeving (4) over wires (5).
4. Solder 20 wires to 18 connections in order shown below.

<u>Wire Number</u>	<u>J1 Pin Connection</u>	<u>Wire Number</u>	<u>J1 Pin Connection</u>
16	R	5	E
17	S	6	F
18	T	7	G
10 & 22	K	8	H
11	L	9	J
12	M	1	A
13	N	2	B
14	P	3	C
15	Q	4 & 19	D

3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued**g. CONNECTOR J1 - Continued****STEP****PROCEDURE**

5. Install four screws (6) and flat washers (7) through connector (1), rubber gasket (8) and mast control (9).
6. Install connector with four flat washers (10), lockwashers (12) and hex nuts (11).



7. Slide heat shrink sleeving (4) over 18 newly soldered connections (13).
8. Apply heat to shrink the heat shrink sleeving on connections.
9. Reinstall wire ties.

TEST

Test Mast Control (para 3-21) to verify repair.

3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS. - Continued**h. RELAY K1****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
 5180-00-596-1474
 5/16 in. comb. wr
 lg rd nose plr
 Pocket knife
 sldr and desldr set
 3439-00-460-7198
 diag ctg plr
 5110-00-965-0974
 heat gun

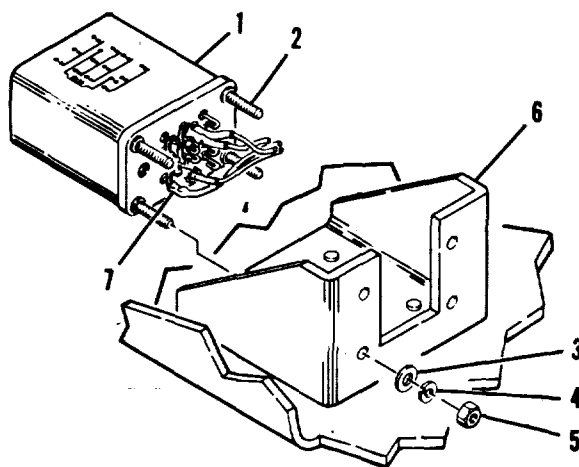
Equipment
ConditionPara

3-12a

3-12b

Condition DescriptionMast control cover
removedFront panel removed
Wire ties removed as
necessaryMaterials/Parts

wire ties (appx B, item 22)
 insulation sleeving (ap px B, item 7)
 solder (appx B, item 19)
 relay K1 M5757-15-001

STEP**PROCEDURE****REMOVAL**

1. Remove four hex nuts (5), lockwashers (4) and flat washers (3) from four mounting screws (2) and relay K1 (1).
2. Remove relay K1 (1) from mounting bracket (6).

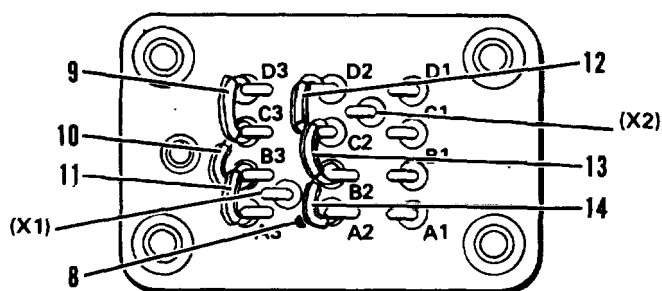
3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued**h. RELAY K1 - Continued****STEP****PROCEDURE****CAUTION**

To prevent damage to equipment, be careful not to cut the wires when removing the heat shrink sleeving.

3. Remove heat shrink sleeving from four relay pins.
4. Split heat shrink sleeving lengthwise and remove.
5. Unsolder and remove four wires (7) from relay pin D2, X2, A3 and X1.
6. Tag each wire is for installation as follows (if wires are not marked): D2 wire no. 33, X2 wire no. 34, A3 wire no. 10 and X1 wire no. 4.

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

1. Set relay case on end so red dot (8) is towards you.
2. Connect and solder jumper wires between following pins of relay K1:
D3 to C3 (9); C3 to B3 (10); B3 to A3 (11)
D2 to C2 (12); C2 to B2 (13); B2 to A2 (14)
3. Cut four pieces of heat shrink sleeving 1/2 in. long.
4. Slide heat shrink sleeving over four wires.

3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued

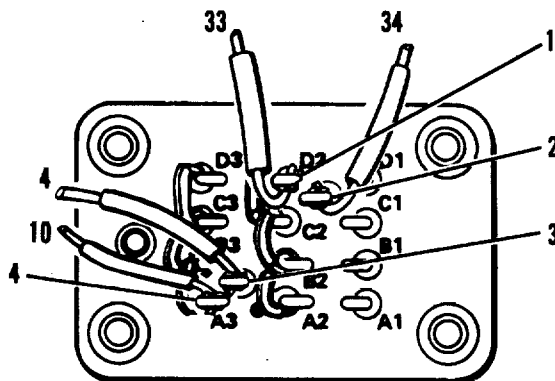
h. RELAY K1 - Continued

STEP

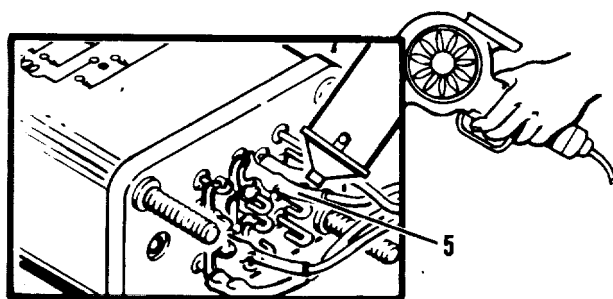
PROCEDURE

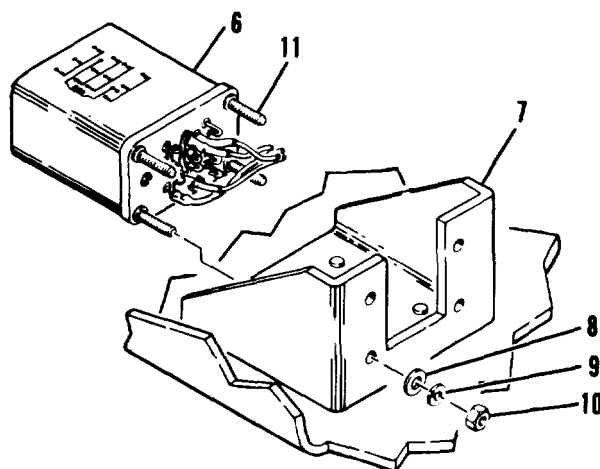
5. Solder four wires to relay K1 in order shown below:

Wire No.	K1 Pin Connection
10	A3 (4)
4	X1 (3)
34	X2 (2)
33	D2 (1)



6. Slide heat shrink sleeving (5) over newly soldered connections.
7. Apply heat to shrink heat shrink sleeving on connections.



3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued**h. RELAY K1 - Continued****STEP****PROCEDURE**

8. Install relay K1 (6) in relay mounting bracket (7).
9. Install four flat washers (8), lockwashers (9) and hex nuts (10) on mounting screws (11).
10. Replace wire ties as needed.
11. Replace front panel (para 3-12b).

TEST

Test Mast Control (para 3-21) to verify repair.

3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued**i. WIRE HARNESS AND INDICATOR LIGHTS DS1 THRU DS5****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP****Tools**

Refrig Unit Svce Tool Kit,
 5180-00-596-1474
 5/16 in. comb. wr
 9/16 in. comb. wr
 No. 1 xtip scdr
 Lg rd nose plr
 Pocket knife
 Sldr and desldr set,
 3439-00-460-7198
 Diag ctg plr,
 5110-00-965-0974
 Heat gun HG-501

Materials/Parts

Insulation sleeving (appx B, item 7)
 Solder (appx B, item 19)
 Wire ties (appx B, item 22)
 Wire harness

**Equipment
Condition****Para****Condition Description**

3-12a

Mast control cover
removed

3-12b

Front panel removed

3-12c

Switch S1 wiring removed
(steps 1 & 2)

3-12d

Switch S2 wiring removed
(steps 1 & 2)

3-12e

Switches S3, S5 and S6
wiring removed (steps
1 - 4)

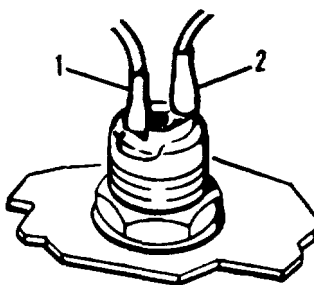
3-12f

Switch S4 wiring removed
(steps 1 & 2)

3-12g

Connector J1 separated
from mast control
(steps 1 & 2)

3-12h

Relay K1 wiring removed
(steps 3 - 5)
Wire ties remov ed as
necessary**STEP****PROCEDURE****REMOVAL****CAUTION**

To prevent damage to equipment, be careful not to cut wire harness when remov-
 ing wire ties or heat shrink sleeving.

3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued

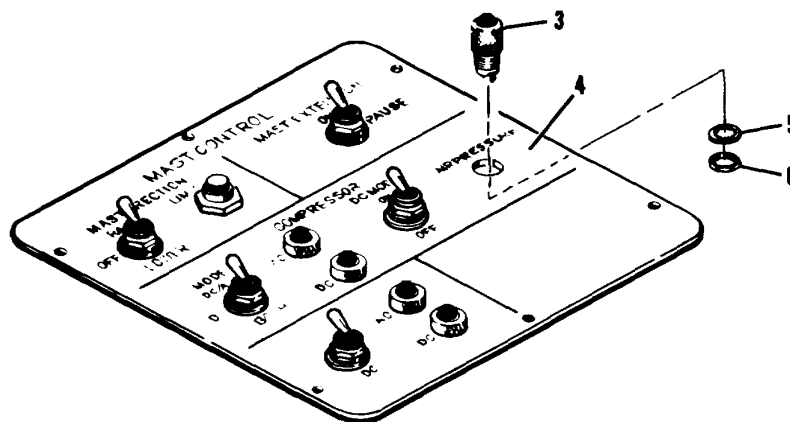
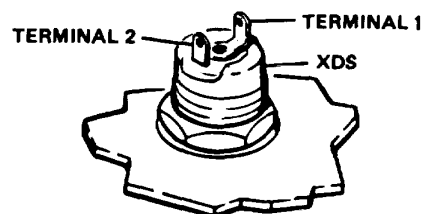
i. WIRE HARNESS AND INDICATOR LIGHTS DS1 THRU DS5 - Continued

STEP

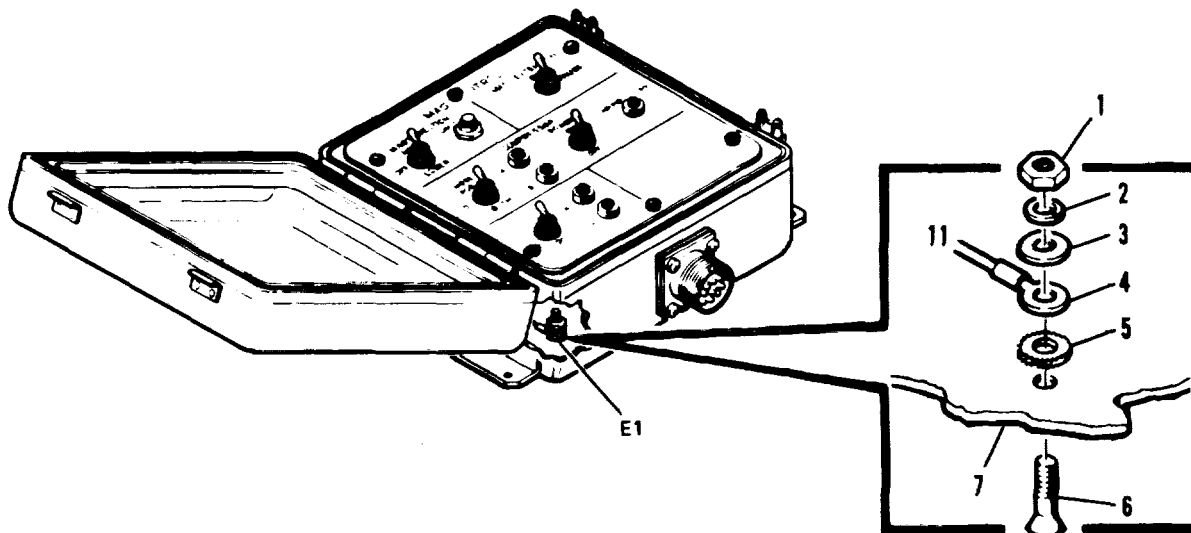
PROCEDURE

1. Remove heat shrink sleeving (1 and 2) from two pins on indicator to be removed.
2. Unsolder and remove wires from each pin.
3. Identify each wire for installation as follows:

<u>Indicator</u>	<u>Terminal</u>	<u>Wire Number</u>
DS1	1	19
	2	20
DS2	1	12 and 21
	2	22
DS3	1	5
	2	21 and 23
DS4	1	23 and 24
	2	25
DS5	1	26
	2	24



4. Remove retaining nut (6) and lockwasher (5) from indicator to be removed.
5. Remove indicator (3) from front panel (4).

3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued**i. WIRE HARNESS AND INDICATOR LIGHTS DS1 THRU DS5 - Continued****STEP****PROCEDURE**

6. Remove nut (1), lockwasher (2) and flat washer (3) from screw (6) E1 terminal.
7. Remove wire no. 11 (4) and star washer (5) from E1 terminal.
8. Remove wire harness from mast control.

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

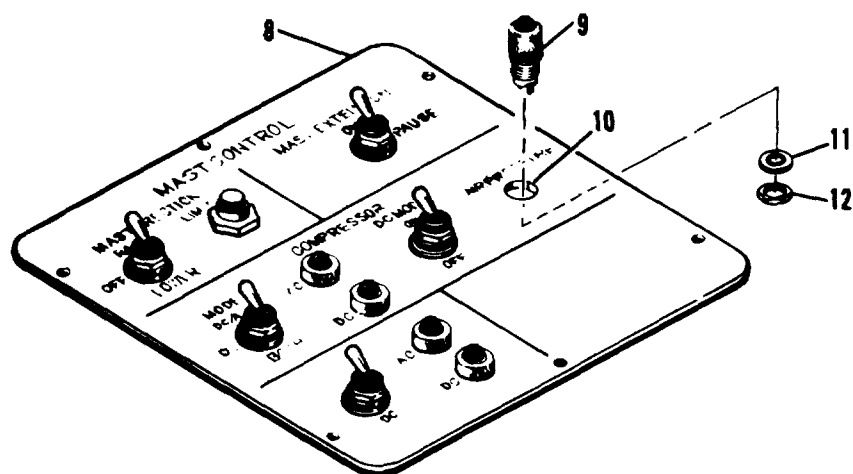
1. Install replacement wire harness in mast control unit.
2. Install screw (6) (E1 terminal) in mast control base (7).
3. Install star washer (5), wire no. 11 (4), flat washer (3), lockwasher (2), and hex nut (1); and tighten.
4. Install relay K1 (para 3-12h, installation steps 3 - 7).

3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued

i. WIRE HARNESS AND INDICATOR LIGHTS DS1 THRU DS5 - Continued

STEP

PROCEDURE

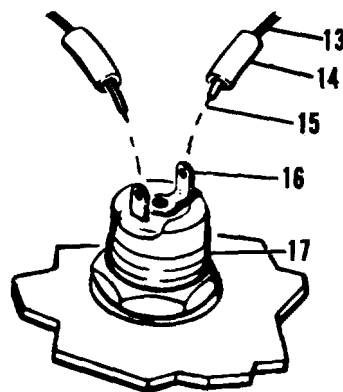


5. Install DS1 through DS5 as follows:
 - a. Install indicator (9) in front panel (8). Indicator is keyed (10) and can only be installed in one direction.
 - b. Install lockwasher (11) and retaining nut (12).
6. Connect and solder wires to five indicators as follows:

NOTE

If wires to DS1 DS5 need to be prepared for soldering, cut and tin wires as described below. Keep soldering iron tip clean.

- a. Prepare and tin ends (15) of 13 wires to the wire harness and 10 terminals (16) of five indicator lights (17).
- b. Cut 10 pieces of heat shrink sleeving (14) 1/2 in. long.
- c. Slide heat shrink sleeving (14) over wire (13). Note in next step that some connections have two wires.

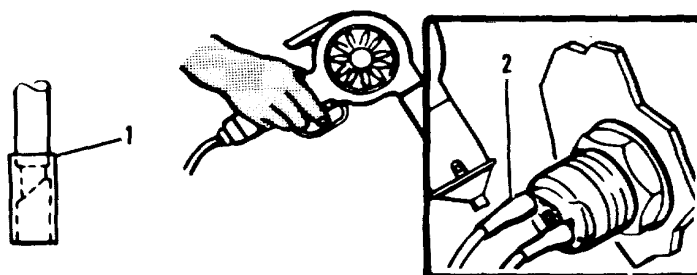
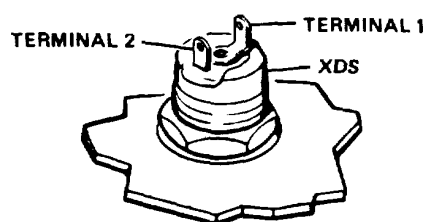


3-12. MAST CONTROL MAINTENANCE INSTRUCTIONS - Continued**i. WIRE HARNESS AND INDICATOR LIGHTS DS1 THRU DS5 - Continued**

STEP	PROCEDURE

17. Solder 13 wires to 10 terminals as shown below:

<u>Indicator</u>	<u>Terminal</u>	<u>Wire Number</u>
DS1	1	19
2	20	
DS2	1	12 and 21
2	22	
DS3	1	5
2	21 and 23	
DS4	1	23 and 24
2	25	
DS5	1	26
2	24	



8. Slide heat shrink sleeving (1) over 10 soldered connections (2).
 9. Apply heat to shrink heat shrink sleeving on connections.
 10. Install and solder two wires to switch S2 (para 3-12d, installation steps 4 - 7).
 11. Install nine wires to switch S1 (para 3-12c, installation step 3).
 12. Install wires to switches S3, S5 and S6 (para 3-12e, installation steps 3 - 5).
 13. Install wires to switch S4 (para 3-12f, installation step 3).
 14. Install front panel (para 3-12b).

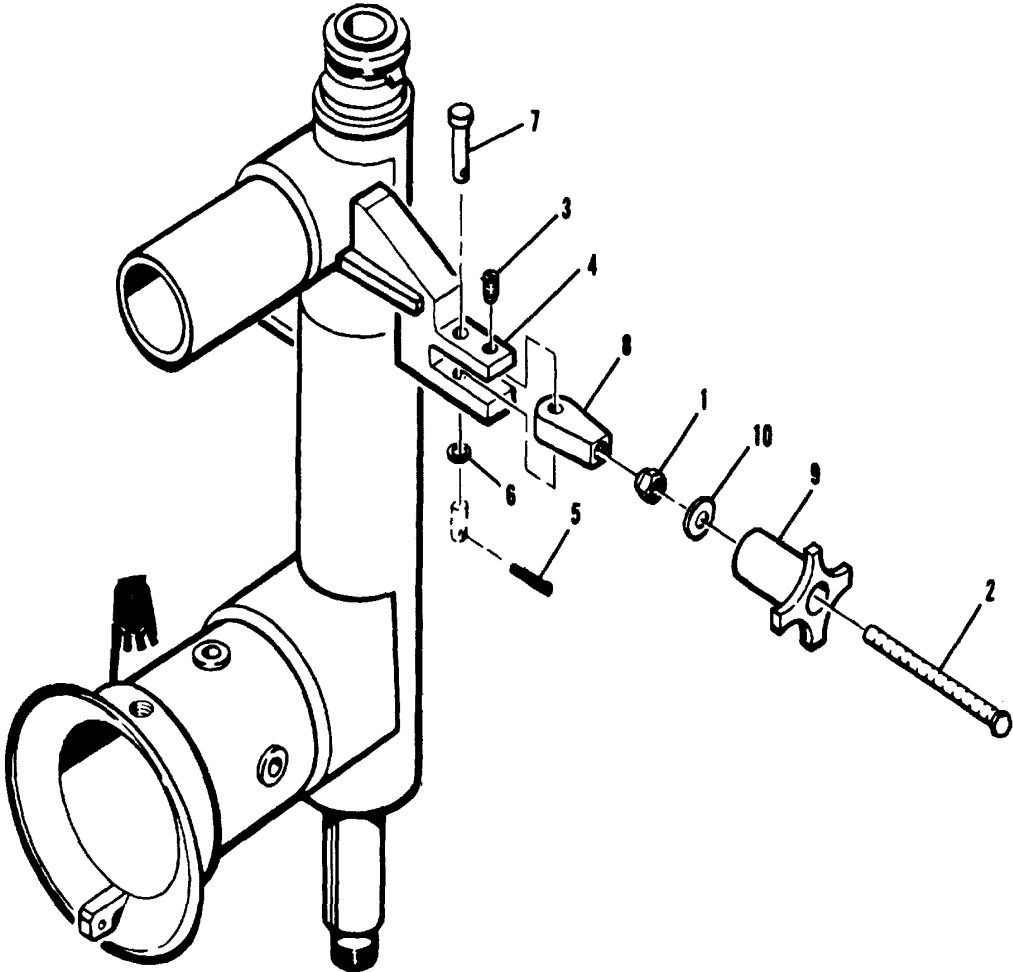
TEST

Test mast control (para 3-21) to verify repair.

3-13. ANTENNA POSITIONER MAINTENANCE - Continued

STEP	PROCEDURE
	DISASSEMBLY NOTE Limit disassembly to that required to replace a damaged part. 1. Remove bolt (1), plastic washer (2), lockwasher (3), and flat washer (4) securing torque arm (5) of gear assembly (6) to antenna positioner (7). 2. Straighten bent tabs of key washer (8). Remove nut (9) and key washer (8) securing gear assembly (6) to shaft (10). 3. Loosen four setscrews (11). 4. Remove gear assembly (6), flat washers (12), and key (13) from antenna positioner.

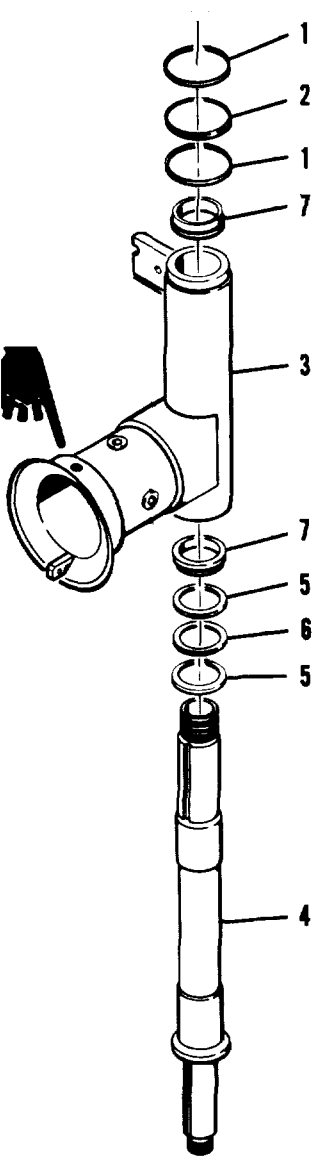
3-13. ANTENNA POSITIONER MAINTENANCE - Continued

STEP	PROCEDURE
	 5. Loosen jamnut (1) on machine bolt (2). 6. Remove plunger (3) from bracket (4). 7. Remove cotter pin (5), flat washer (6) and pin (7) securing swivel eye (8) (with handle (9) attached) to bracket (4). 8. Remove swivel eye (8), jamnut (1) and washer (10) from machine bolt (2). 9. Separate machine bolt (2) from handle (9).

3-13. ANTENNA POSITIONER MAINTENANCE - Continued

STEP	PROCEDURE
	10. Straighten bent tabs of key washer (12). Remove two nuts (11), key washer (12), and flatwasher (13) securing upper support (14) to lower support (15). 11. Remove upper support (14). Remove key (16) from shaft (17). 12. Remove nut (18) and setscrew (19) from lower support (15).

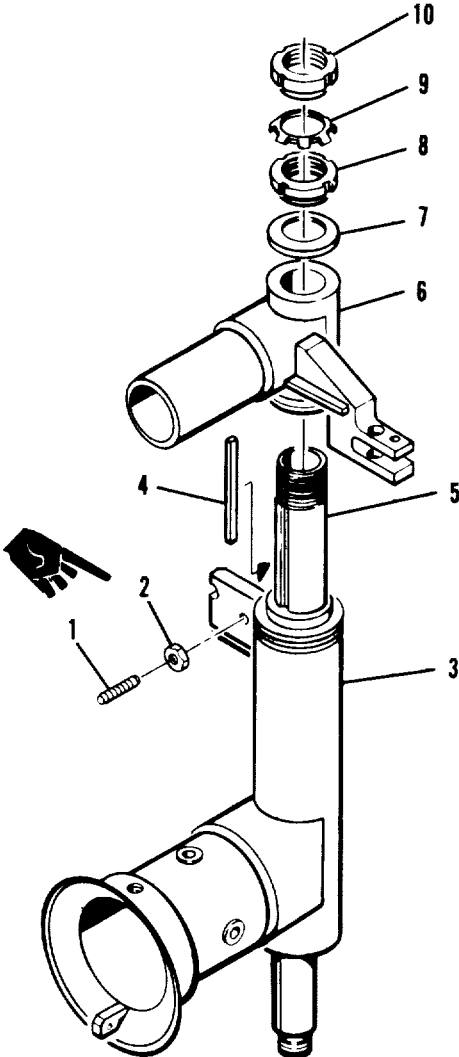
3-13. ANTENNA POSITIONER MAINTENANCE - Continued

STEP	PROCEDURE
13.	Remove two flatwashers (1) and thrust washer (2) from top of lower support, (3).
14.	Remove shaft (4) from lower support (3).
15.	Remove two flatwashers (5) and thrust washer (6) from bottom of lower support (3).
16.	Using two small flat tip screwdrivers, lift edges of wiper rings (7) and remove wiper rings (7) from lower support (3). 

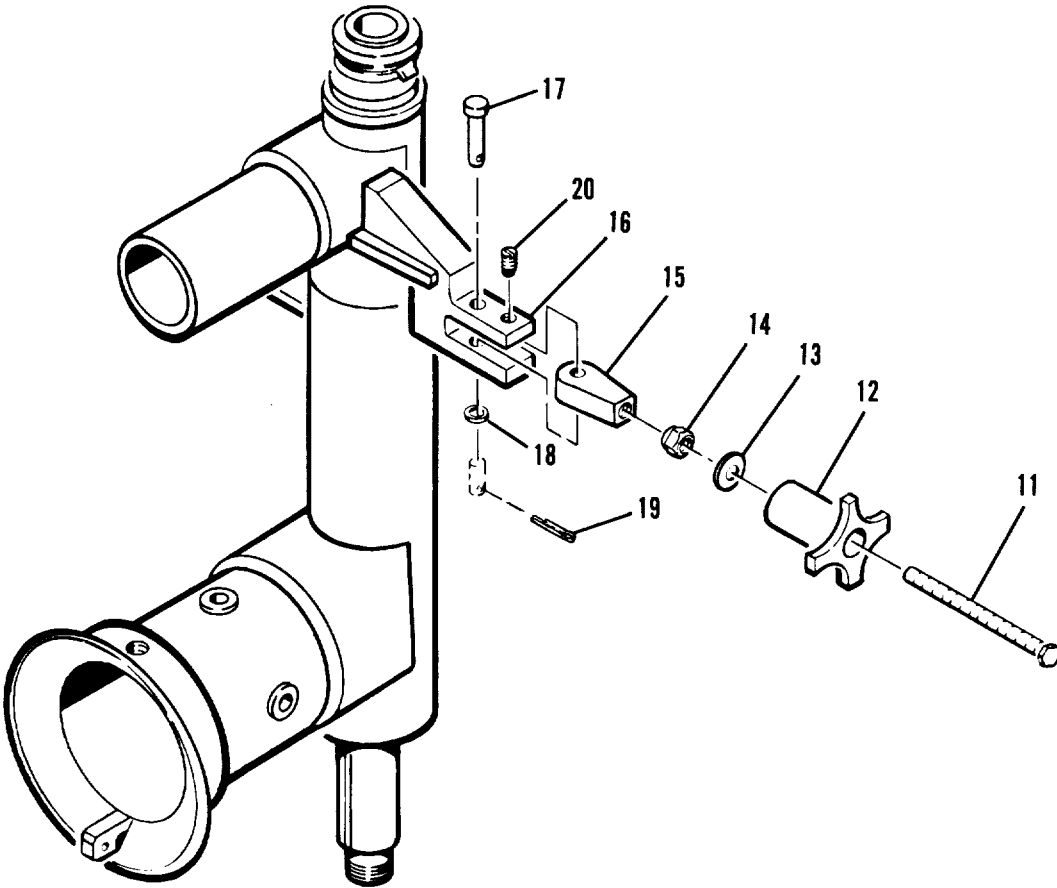
3-13. ANTENNA POSITIONER MAINTENANCE - Continued

STEP	PROCEDURE
	REPLACEMENT Replace faulty part with a spare part. ASSEMBLY 1. Install two wiper rings (7) in lower support (3). 2. Position two flatwashers (5) and thrust washer (6) to bottom of lower support (3). NOTE Check end of shaft for the number "8228" before installing shaft. If your shaft does not have "8228" stamped on the end, get a new (high strength) shaft with the number on the end. 3. Install shaft (4) in lower support (3). 4. Position two flatwashers (1) and thrust washer (2) to top of lower support (3).

3-13. ANTENNA POSITIONER MAINTENANCE - Continued

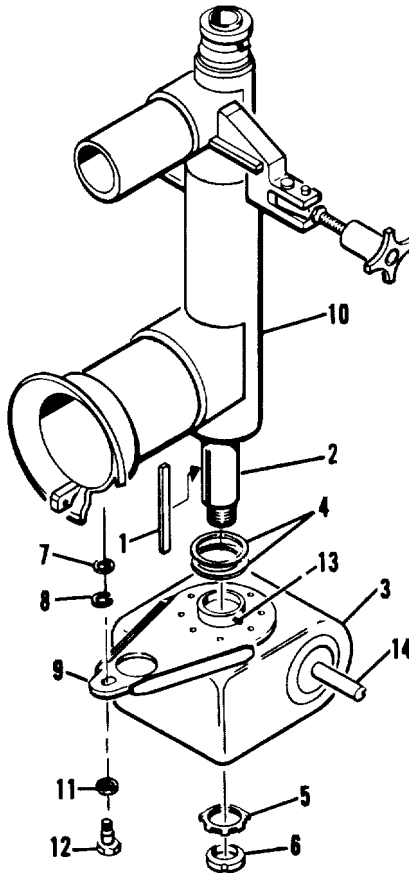
STEP	PROCEDURE
5.	Install setscrew (1) and nut (2) to lower support (3).
6.	Install key (4) in slot in shaft (5).
 The diagram shows an exploded view of the antenna positioner assembly. At the bottom is the lower support (3), a vertical cylindrical component. Above it is the upper support (6), another vertical cylindrical component. A shaft (5) passes through the center of both supports. A key (4) is shown being inserted into a slot in the shaft. A setscrew (1) and a nut (2) are shown being installed on the lower support. A flatwasher (7) is shown being placed on top of the upper support. A nut (8) is shown being installed on the shaft above the flatwasher. A tab washer (9) is shown being placed on top of the nut. A tab washer (10) is shown being placed on top of the tab washer. A hand icon points to the setscrew (1).	
7.	Position upper support (6) on lower support (3). Position flatwasher (7) on top of upper support (6).
8.	Install nut (8) on shaft (5) and torque to 45-55 ft-lbs, then loosen and retorque to 30-34 ft-lbs.
8.1	Install tab washer (9) and bend tabs of washer (9) to secure nut (8).

3-13. ANTENNA POSITIONER MAINTENANCE - Continued

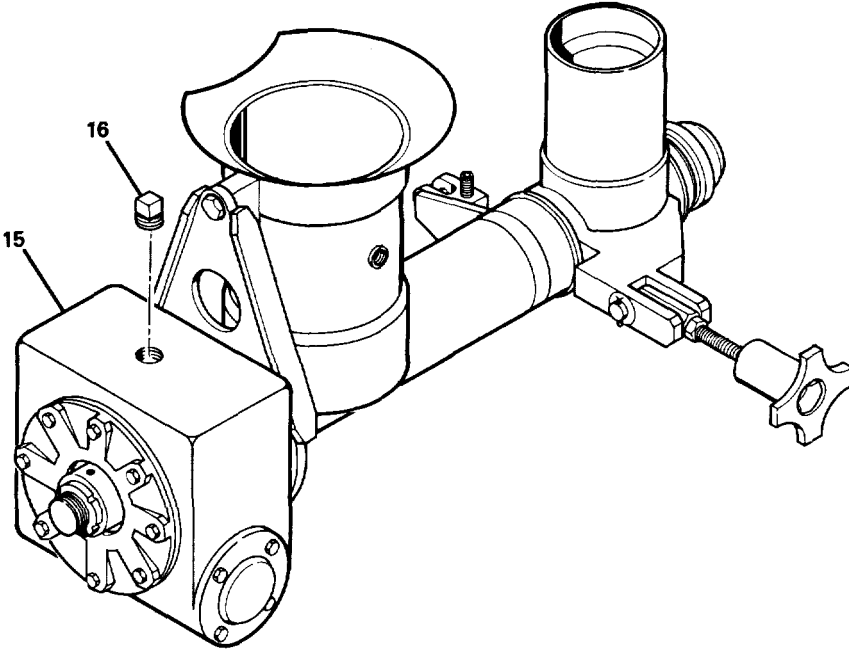
STEP	PROCEDURE
9.	Install nut (10) and torque to 45-55 ft-lbs. Bend tabs of washer (9) to secure nut (10).
	
10.	Screw machine bolt (11) into handle (12).
11.	Install washer (13) and jam nut (14) on machine bolt (11).
12.	Coat internal threads of swivel eye (15) with sealing compound (appx B. item 25). Install machine bolt (11) (with handle attached) in swivel eye (15).
13.	Position swivel eye (15) in bracket (16). Secure with pin (17), flatwasher (18), and new cotter pin (19).
14.	Install plunger (20) in bracket (16).
15.	Tighten jam nut (14) on machine bolt (11) against swivel eye (15).

3-13. ANTENNA POSITIONER MAINTENANCE - Continued

STEP	PROCEDURE
16.	Install key (1) on shaft (2). Apply grease to exposed surfaces of shaft (2) and to holes in gear assembly (3) through which shaft (2) is going to be installed. Position gear assembly (3) to antenna positioner.
17.	Position two flat washers (4) and gear assembly (3) to shaft (2), and secure with key washer (5) and nut (6). Torque nut (6) to 91-108 ft-lbs.
18.	Apply sealing compound (appx B, item 25.1) to threads of bolt (12). Position flat washer (7) and lockwasher (8) between torque arm (9) and lower support (10), and secure with plastic washer (11) and bolt (12). Torque bolt (12) to 45-55 ft-lbs.
19.	Check to see that there is at least .09 inch clearance between the torque arm (9) and the lower support (10). If not, remove gearbox (3) and add flat washers (4) to obtain .09 inch clearance. Re-torque nut (6) and bolt (12).
20.	Tighten four set screws (13). Bend tabs of key washer (5) to secure nut (6).

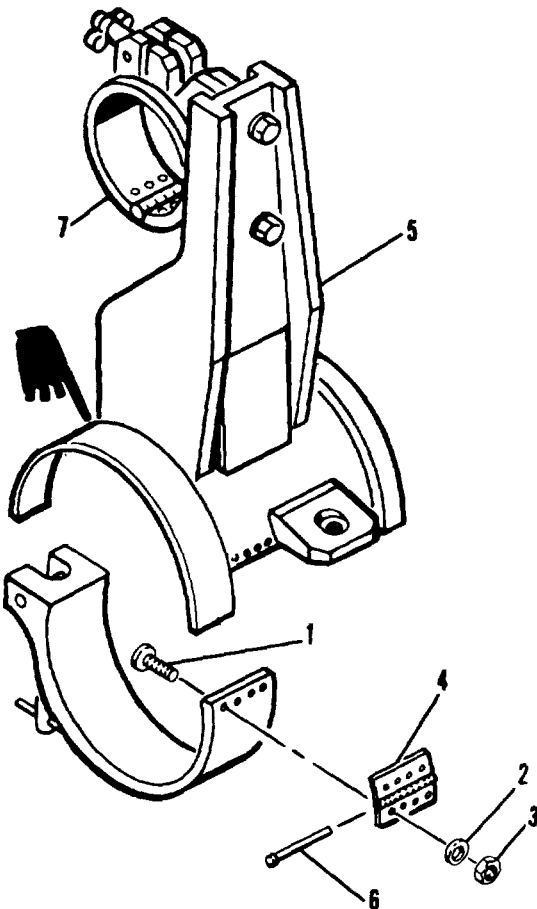


3-13. ANTENNA POSITIONER MAINTENANCE - Continued

STEP	PROCEDURE
21.	Coat shaft (14) with solid film lubricant. <u>CAUTION</u> Lubricating oil must be added to a new gear assembly. <u>NOTE</u> Early model gear assemblies (15) have two plugs (16). Remove plug depicted below.
22.	If gear assembly (15) was replaced, set antenna positioner on its side (as shown) and remove plug (16). Fill assembly with gear lubricating oil (approximately 3 quarts) but leave a small air space in gear assembly to accommodate oil expansion from temperature changes. Apply a light coating of thread sealing compound (appx B, item 21) to threads of plug (16) and install plug in gear assembly (15). 

3-14. MAST CLAMP	
This task covers:	
Removal	Replacement Installation
<u>INITIAL SETUP</u> <u>Tools</u> Refrig Unit Svce Tool Kit, 5180-00-596-1474 1/4 in. flat tip scdr 1/4 in. end wr <u>Materials/Parts</u> hinge butt	
STEP	PROCEDURE
1.	REMOVAL Remove eight screws (1), flat washers (2), and nuts (3) securing hinge butt (4) from mast clamp (5). 2. If needed, remove the pin (6) from hinge butt (4). Separate hinge butt halves.
2.	
	REPLACEMENT Replace hinge butt that shows binding, cracks, bends or deformation.
	INSTALLATION 1. If removed, install pin (6) securing hinge butt (4) halves together. 2. Position hinge butt (4) to mast clamp and secure with eight screws (1), flat washers (2), and nuts (3).
	NOTE Hinge butt (7) at upper end of mast clamp is repaired in the same way. The only difference is that six screws (instead of eight) are used to secure hinge halves to clamp.

3-14. MAST CLAMP

STEP	PROCEDURE
	

3-15. REPAIR OF MAST COVERS

This task covers:
Repair

INITIAL SETUPTools

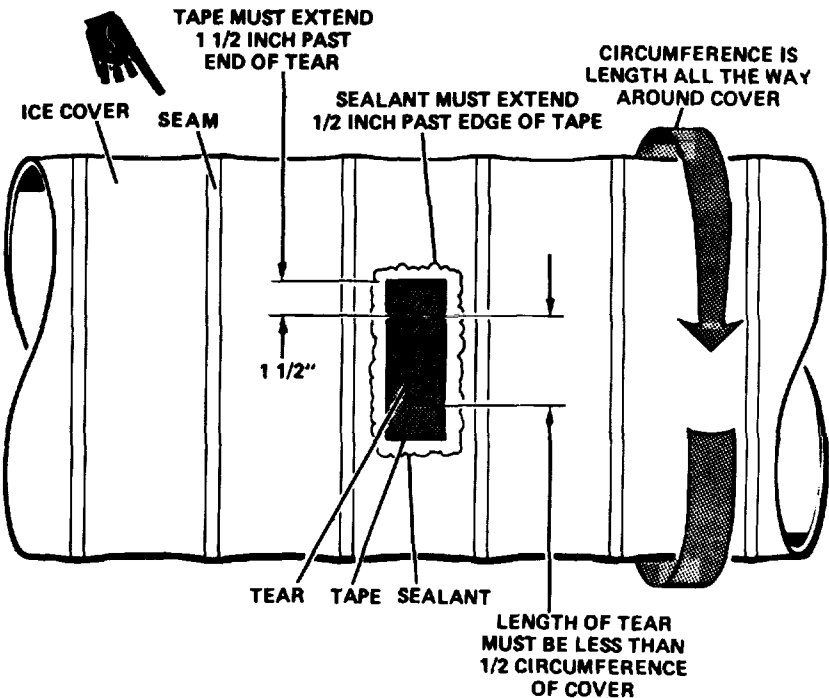
Refrig Unit Svce Tool Kit,
 5180-00-596-1474
 Pocket knife
 Measuring tape

Materials/Parts

Shop cloth (appx B, item 17)
 Cleaning solvent (appx B, item 1)
 Plastic tape (appx B, item 15)
 Silicone sealant (appx B, item 18)

STEP	PROCEDURE
	REPAIR 1. Examine mast cover. A rip or tear can be repaired if: • Tear does not cross a seam. • Tear is not larger than one-half the circumference of the mast cover. 2. Clean area to be repaired with cleaning solvent and wipe dry. 3. Apply tape over the tear. Tape must extend 1-1/2 inches past end of tear. 4. Apply a 1/4 inch thick layer of silicone rubber adhesive sealant over tape. Sealant must extend 1/2 inch past edge of tape. Allow sealant to dry for 24 hours.

3-15. REPAIR OF MAST COVERS - Continued

STEP	PROCEDURE
	 ICE COVER SEAM TAPE MUST EXTEND 1 1/2 INCH PAST END OF TEAR SEALANT MUST EXTEND 1/2 INCH PAST EDGE OF TAPE CIRCUMFERENCE IS LENGTH ALL THE WAY AROUND COVER 1 1/2" TEAR TAPE SEALANT LENGTH OF TEAR MUST BE LESS THAN 1/2 CIRCUMFERENCE OF COVER

SECTION IV. TEST

LIST OF TASKS	
Task	Paragraph No.
Test of:	
Distribution box	3-18
HCA	3-20
Mast	3-17
Mast control	3-21
PCA	3-19
Support frame	3-16

3-16. SUPPORT FRAME POST MAINTENANCE TESTS

- These tests verify that the repair mode has restored the equipment to operational condition.
- Go to INITIAL SETUP for information needed to prepare for the tests.
- The tests prove that the interconnect box or the vertical interlock switch is operational.

OVERVIEW

- The procedures in this section tell you how to test the equipment for proper operation after you have completed repair.
- Where possible, you will apply operating power to the equipment and operate it as if it were actually installed in a mast group.
- Where it is necessary to adjust a replacement part or assembly to set its operating point or operating range, references are provided to the applicable procedure in the adjustment section.

3-16. SUPPORT FRAME POST-MAINTENANCE TESTS**INITIAL SETUP**Test Equipment

Multimeter AN/URM-105,
6625-00-581-2036

STEP	PROCEDURE
1.	Test Interconnect Box as follows: - Test for continuity (less than 0.5 ohm) between J1-C and J2-C. If no continuity, box is faulty. - Test for continuity (less than 0.5 ohm) between J1-D and J2-D. If no continuity, box is faulty. - Test for continuity (less than 0.5 ohm) between J2-A and J3-A. If no continuity, box is faulty. - Test for continuity (less than 0.5 ohm) between J2-B and J3-B. If no continuity, box is faulty.

3-17. MAST POST MAINTENANCE TESTS**This task covers:
Test****INITIAL SETUP**Tools

Refrig Svce Unit Tool Kit,
5180-00-596-1474
1/2 in. skt hd scr key
1-1/8 in. skt
9/16 in. skt hd scr key
Prybar
15/16 in. skt
15/16 in. comb. wr
9/16 in. skt
9/16 in. comb. wr
Torque wr, 5120-00-247-2540
Rubber mallet, 5120-00-293-3399
Ladder, 5440-00-227-1596
Air supply of at least 50 psi
Machinist level, 5210-00-241-3613
Strap wr, 5120-00-133-3060
1-5/16 in. comb. wr, 5120-00-228-9518
1-1/2 in. comb. wr, 5120-00-203-4804
Interval timer, 6645-00-632-7789
Drift pin, 5120-00-242-0764
Wrecker truck M819A1
5-ton truck

Personnel Required

Utilities Equipment Repairer,
MOS 52C10 (three)
Wrecker Operator

EquipmentCondition

<u>Para</u>	<u>Condition Description</u>
2-17	Mast removed
3-8	Mast repaired

Materials/Parts

20 ft. rope (twelve) (appx B, item 16)
Sealing compound (appx B, item 21)
Wood blocks

Maintenance Kit - General Support

Mast support plate assembly
Air supply regulator
Mast base clamp
Webbing strap (two)
Maintenance hose assembly
Endless loop sling (two)

STEP**PROCEDURE**

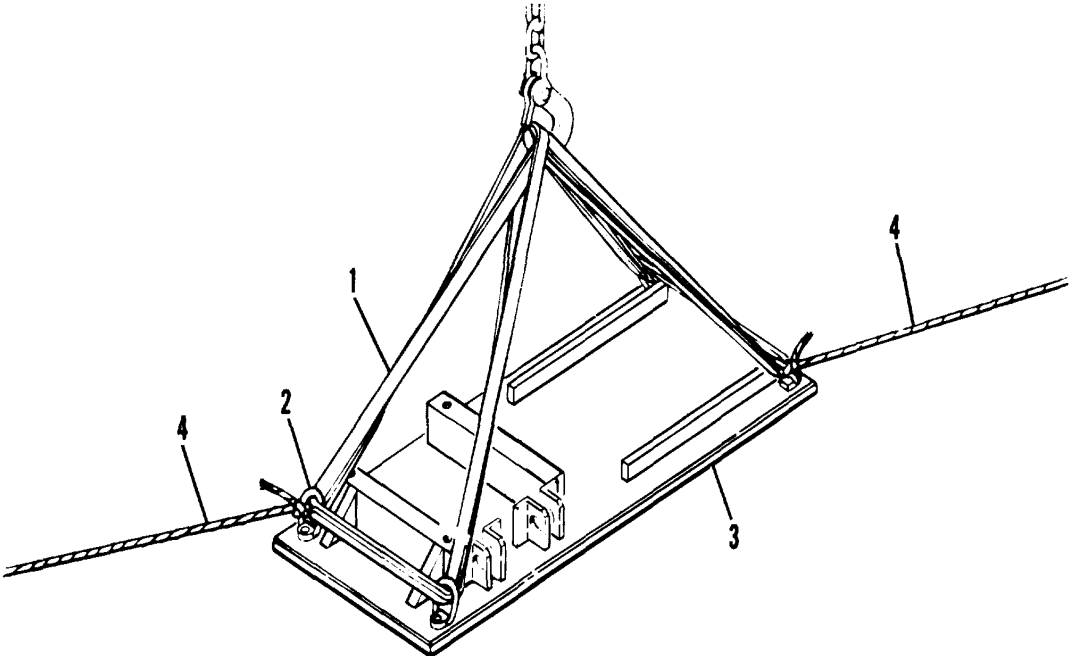
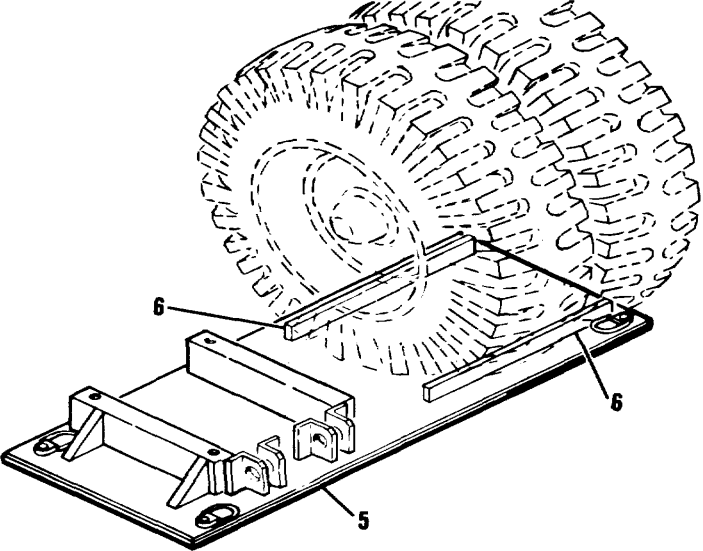
1. Thread two slings (1) through hoist eyes (2) at corners of mast support plate (3) (one sling at each end of plate).
2. Tie two guide ropes (4) to mast support plate (3), one guide rope at each end of plate.
3. Connect ends of slings to wrecker truck hoo k. Carefully lift mast support plate (3). Move plate to test site and lower plate to desired position.

WARNING

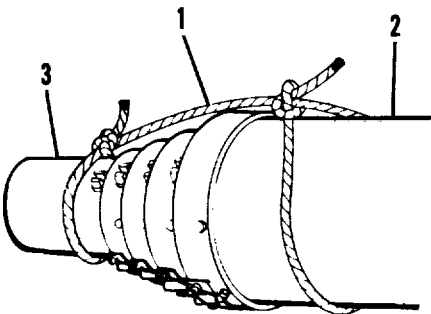
Test site must be on solid ground. It is unsafe to test mast on soft or mushy ground. Do not test mast in winds above 15 mph. Make sure mast support plate is level.

4. Remove slings (1) from wrecker hook. Remove slings (1) and guide ropes (4) from mast support plate (3).

3-17. MAST POST MAINTENANCE TEST - Continued

STEP	PROCEDURE
	 5. Drive a 5-ton truck over mast support plate (5) so both rear wheels on one side of truck are positioned between stiffening ribs (6) on plate (5). The weight of the truck will anchor plate on the ground. Check to see that plate is level, reposition if required. 

3-17. MAST POST MAINTENANCE TEST - Continued

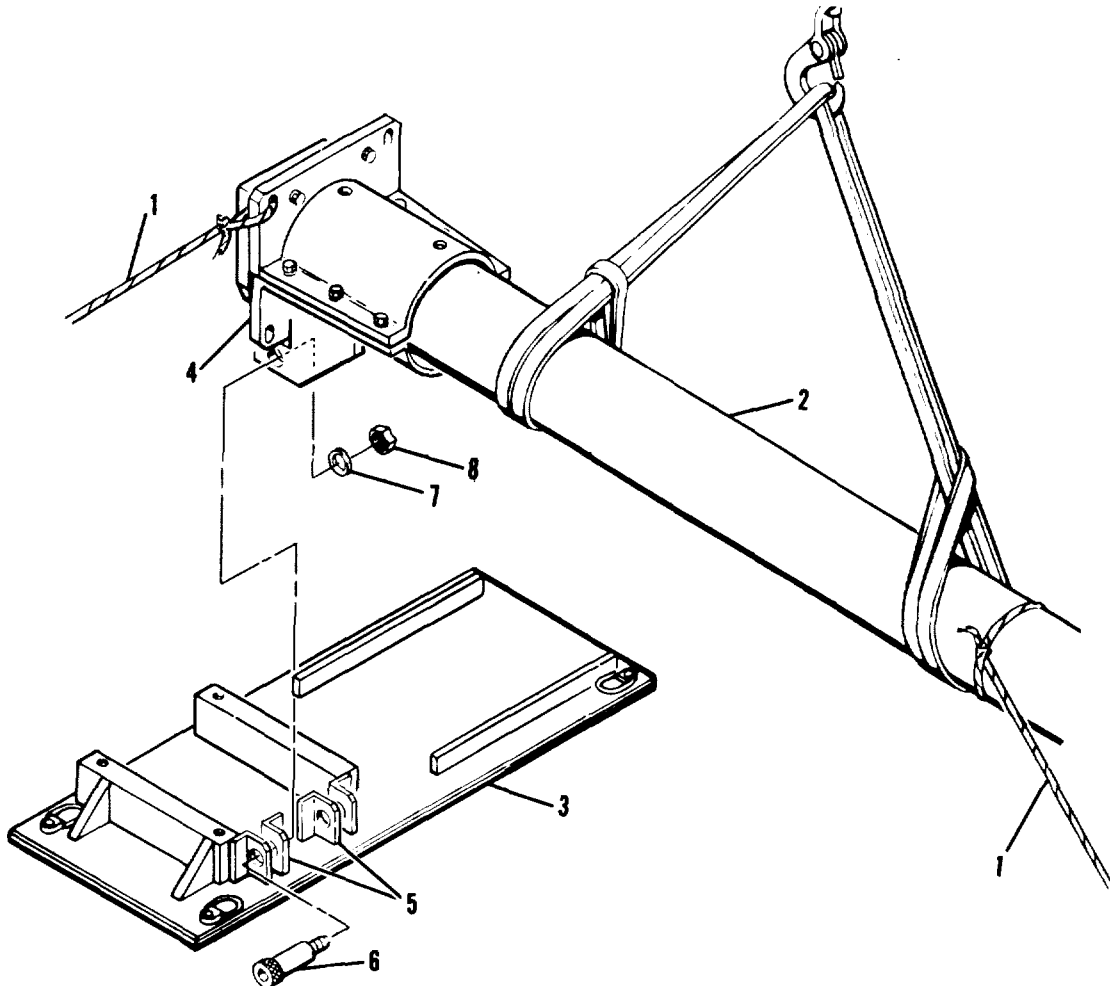
STEP	PROCEDURE
6.	Tie a rope (1) between mast sections one (2) and five (3) to prevent mast sections from sliding out as mast is lifted.  The diagram shows a side view of a mast assembly with several sections. A rope, labeled '1', is tied in a loop around two sections. One end of the rope is labeled '2' and the other end is labeled '3', indicating it connects two different mast sections.
7.	Connect two slings (4) to mast, one at each end, in a choker configuration. Each sling should be about two feet from end on mast. Connect slings to wrecker hook. Carefully lift mast about 2 or 3 feet off the ground. NOTE You may have to seat hinged mast base clamp and half mast base clamp on mast with a rubber mallet.
8.	Position hinged mast base clamp (5) to mast and secure with two screws (6) and flat washers (7). One screw (6) is shorter than the other. Use short screw on side of mast base plate (8) that has cut-out.
9.	Position half mast base clamp (9) to mast and secure with two screws (10), four flat washers (11), two lockwashers (12), and two nuts (13).
10.	Slide shims (14) as required between half mast base clamp (9) and hinged mast base clamp (5) to fill gaps between clamps (5 and 9). Shims must slide into gaps; do not force them.
11.	Secure hinged mast base clamp (5) to half mast base clamp (9) with six screws (15), 12 flat washers (16), six lockwashers (17), and six nuts (18). Torque screws to 96-104 ft-lbs.

3-17. MAST POST MAINTENANCE TEST - Continued

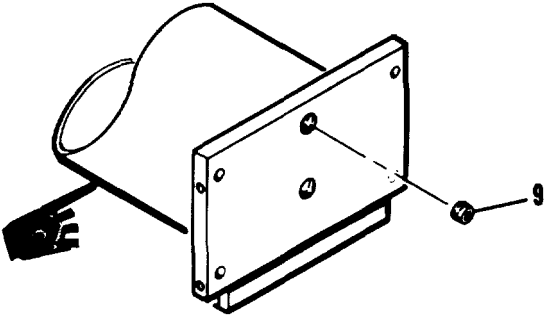
STEP	PROCEDURE
	The diagram illustrates the assembly of a mast post. The central component is the mast post (4). At the top, a bracket (9) is positioned to be secured with bolts (11, 12, 13) and a nut (15) with a washer (16). A plate (14) is also shown. On the left, a bracket (8) is shown with bolts (6, 7, 10, 11). At the bottom, a bracket (5) is shown with bolts (16, 17, 18). A chain is attached to the top of the mast post.

3-17. MAST POST MAINTENANCE TEST - Continued

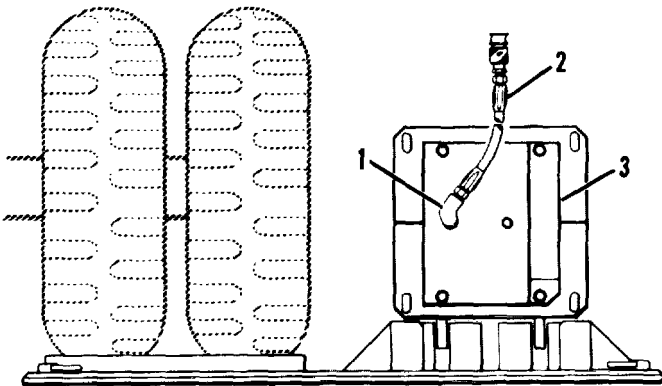
STEP	PROCEDURE
12.	Tie two guide ropes (1) one at each end, to mast (2).
13.	Using a strap wrench, rotate mast (2) as required to aline hinged mast base clamp (4) with mast support plate brackets (5). Because of the choker configuration of the slings, you may have to lower the mast first before you can rotate it.
14.	Carefully position mast over mast support plate (3). Lower mast so that holes in hinged mast base clamp (4) are alined with ho les in mast support plate brackets (5).
15.	Secure hinged mast base clamp (4) to mast support plate brackets (5) with two shoulder socket-head screws (6), flat washers (7), and nuts (8).



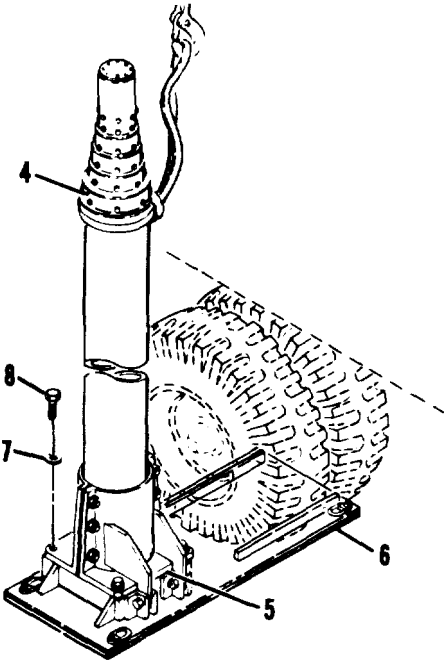
3-17. MAST POST MAINTENANCE TEST - Continued

STEP	PROCEDURE
16.	Deleted.
17.	Lower mast to ground and set on wood blocks. Remove slings and guide ropes from mast. 
18.	Remove plug (9) at base of mast.

3-17. MAST POST MAINTENANCE TEST - Continued

STEP	PROCEDURE
19.	Coat threads of elbow (1) on hose assembly (2) with sealing compound. Install elbow (1) to base of mast (3). Position elbow (1) on hose assembly (2) up and slightly inboard as shown. <u>CAUTION</u> Elbow on hose assembly must be positioned correctly to prevent hose from being pinched and damaged as mast is raised to vertical position. 
20.	Connect a sling to top of mast under mast section number one collar (4) in a choker configuration. Connect sling to wrecker hook. Untie and remove rope securing mast sections one and five together.
21.	Tie four 20-ft ropes together to make a rope approximately 80 feet in length. Make one more 80-ft long rope. Tie the two 80-ft long ropes securely to the top of the mast at mast section number five. Space the ropes evenly so there will be even pull on the mast should you need to use the ropes to bring the mast down. Coil the ropes neatly to avoid snarling as the mast is extended. <u>CAUTION</u> Make sure wrecker hook is directly over mast as mast is raised to vertical. If hook is not directly over mast you will put stress on mast base hinge clamp.
22.	Carefully raise mast to vertical position with wrecker.
23.	Secure mast base clamps (5) to mast support plate (6) with four flat washers (7), and screws (8).

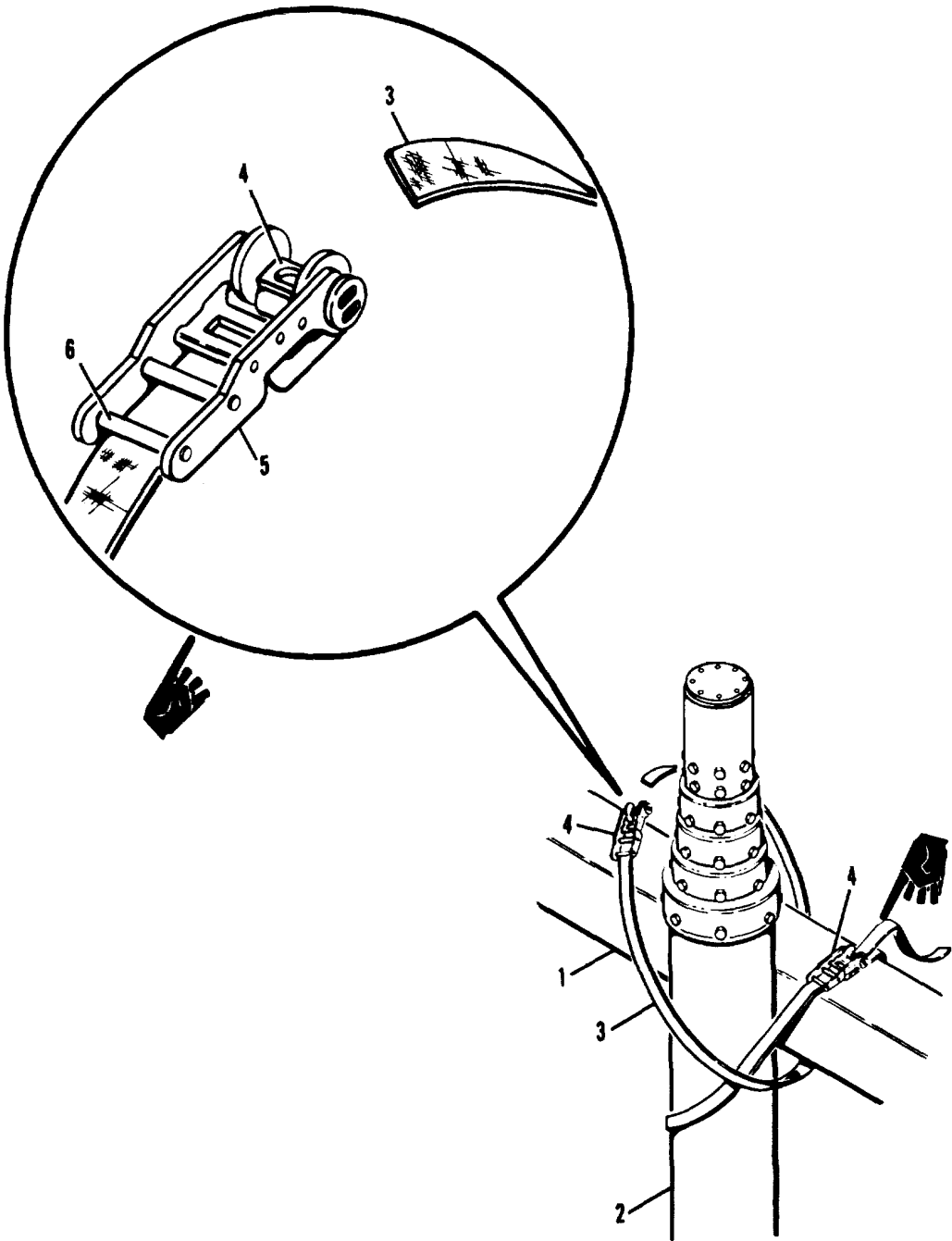
3-17. MAST POST MAINTENANCE TEST - Continued

STEP	PROCEDURE
24.	NOTE It may be necessary to move entire mast with a pry bar to get holes in most base clamps alined with holes in mast support plate. Disconnect sling from mast and wrecker. Lower wrecker boom. 

3-17. MAST POST MAINTENANCE TEST - Continued

STEP	PROCEDURE
25.	Position a wrecker boom (1) or other suitable object near the top of mast section number one (2).
	NOTE Position straps as high up on mast section number one as possible. You will probably need a ladder.
26.	Position two strap assemblies (3) around mast and wrecker boom. Thread free ends of strap assemblies (3) through slots in shafts (4) of buckles (5). Pull straps (3) through shafts (4) to take up slack.
27.	Operate buckle handles (6) back and forth to apply tension to straps (3).
	WARNING A minimum of two wraps of strap must be wound on buckle shaft to prevent strap from slipping.
28.	Check that straps are not twisted and secure mast upper support (5) to wrecker boom (1) (or other suitable object) tightly.
29.	Deleted.
30.	Deleted.

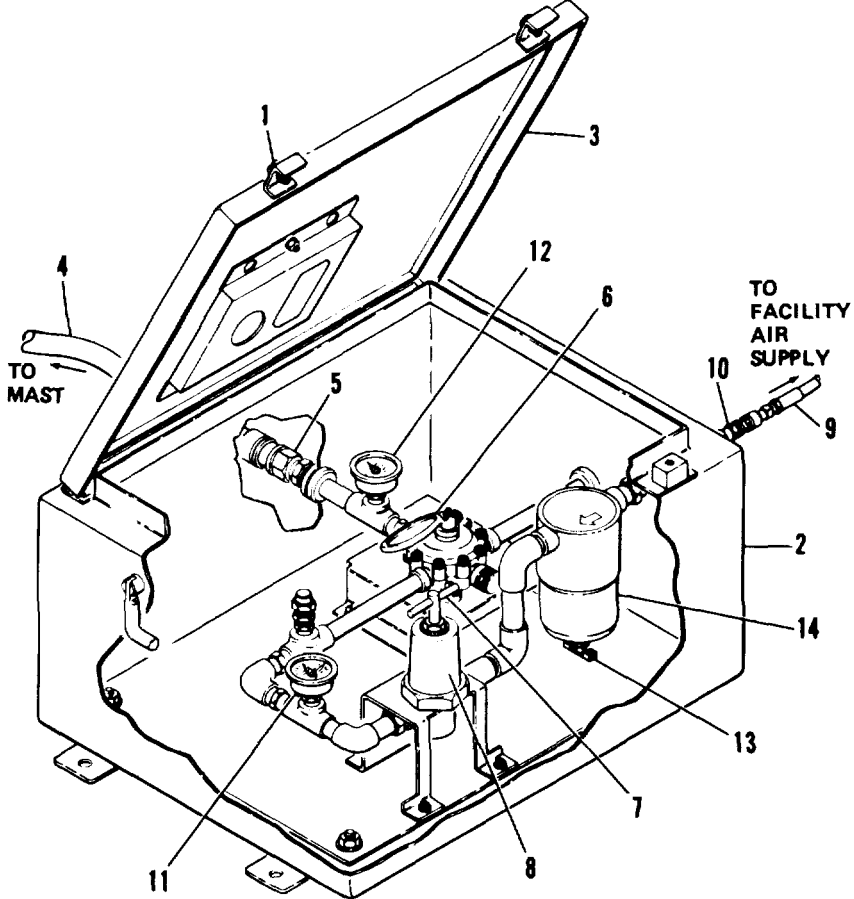
3-17. MAST POST MAINTENANCE TEST - Continued

STEP	PROCEDURE
	 The diagram illustrates the procedure for a mast post maintenance test. It features a main view of a mast post assembly and a circular callout providing a detailed view of a specific component. Main View: Shows a vertical mast post (1) with a cylindrical section (2) at the top. A cable (3) is attached to the side of the mast post. A hand is shown holding a tool (4) to adjust the cable. Another hand is shown holding a tool (5) to adjust the cable. A third hand is shown holding a tool (6) to adjust the cable. Callout View: A circular callout provides a detailed view of the cable adjustment mechanism. It shows a cable (3) passing through a bracket (4) and being secured by a nut (5). A hand is shown holding a tool (6) to adjust the nut.

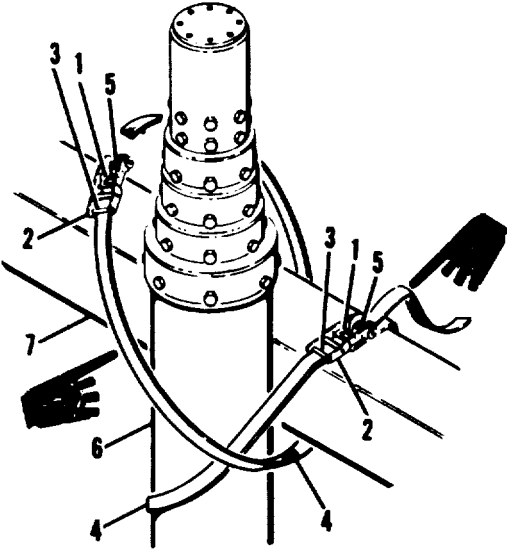
3-17. MAST POST MAINTENANCE TEST - Continued

STEP	PROCEDURE
31.	Loosen two screws (1) and open air supply regulator (2) cover (3).
32.	Connect mast pneumatic hose (4) to air supply regulator (2) AIR OUT coupling (5).
33.	Make sure directional control valve handle (6) is in PAUSE position. Turn air pressure regulating valve handle (7) counterclockwise all the way to close valve (8).
34.	Connect facility air supply line (9) to air supply regulator (2) AIR IN coupling (10). Check to see that air pressure gage (11) indicates zero psi.
WARNING Do not continue operations if air pressure gage (11) indicates more than zero psi. Either air pressure regulator valve is not completely closed, or air is leaking past air pressure regulator valve.	
35.	Place directional control valve handle (6) to OUT position.
<u>CAUTION</u> Do not extend mast too rapidly. Mast sections and collars could be damaged.	
36.	Gradually turn air pressure regulator valve handle (7) clockwise to open valve and begin extending mast. Continue gradually opening valve until mast is fully extended.
37.	After mast is fully extended, check air pressure gage (12). Turn air pressure regulator valve handle (7) clockwise and increase the mast pressure to 5 psi over pressure required to extend mast, as indicated on air pressure gage (12). Record the time and pressure indicated on air pressure gage (12). Place directional control valve handle (6) to PAUSE position. Turn air pressure regulating valve handle (7) counterclockwise all the way to close valve (8).
38.	After 1 hour check and record air pressure indicated on gage (12). Subtract second air pressure reading from the first air pressure reading. This figure will tell you how much air pressure has escaped from the mast. If the mast has lost more than 10 psi (figure greater than 10 psi) the mast has failed the test.

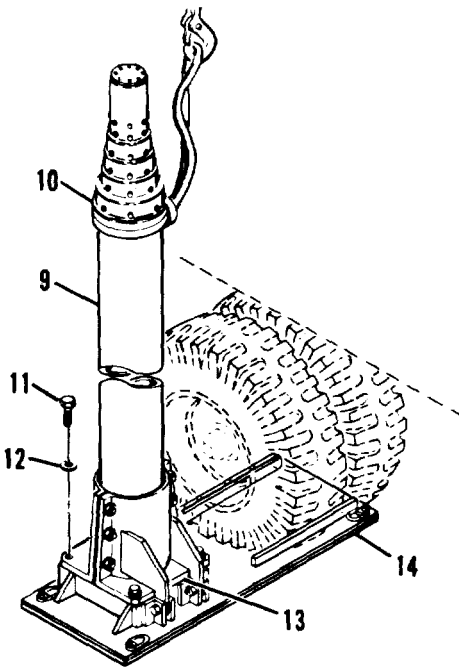
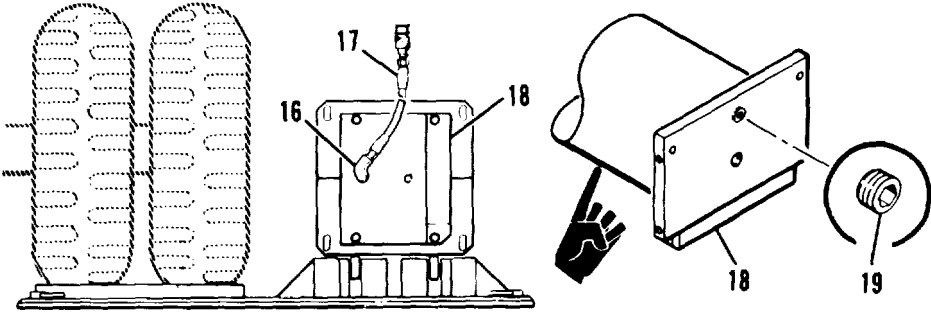
3-17. MAST POST MAINTENANCE TEST - Continued

STEP	PROCEDURE
	WARNING Wear eye protection when retracting mast. Dust and dirt can be blown into your eyes as air is exhausted out of the mast. 39. Gradually place directional control valve handle (6) to IN position and retract the mast. If mast will not retract, use the three ropes tied to the top of the mast and pull the mast down. 40. Open petcock (13) at bottom of air filter (14). Hold a shop cloth under filter to soak up any water that may drain from petcock (13). Close petcock when filter has been completely drained. 41. Disconnect facility air supply line (9) from air supply regulator AIR IN coupling (10). Disconnect pneumatic hose (4) from air supply regulator AIR OUT coupling (5). 

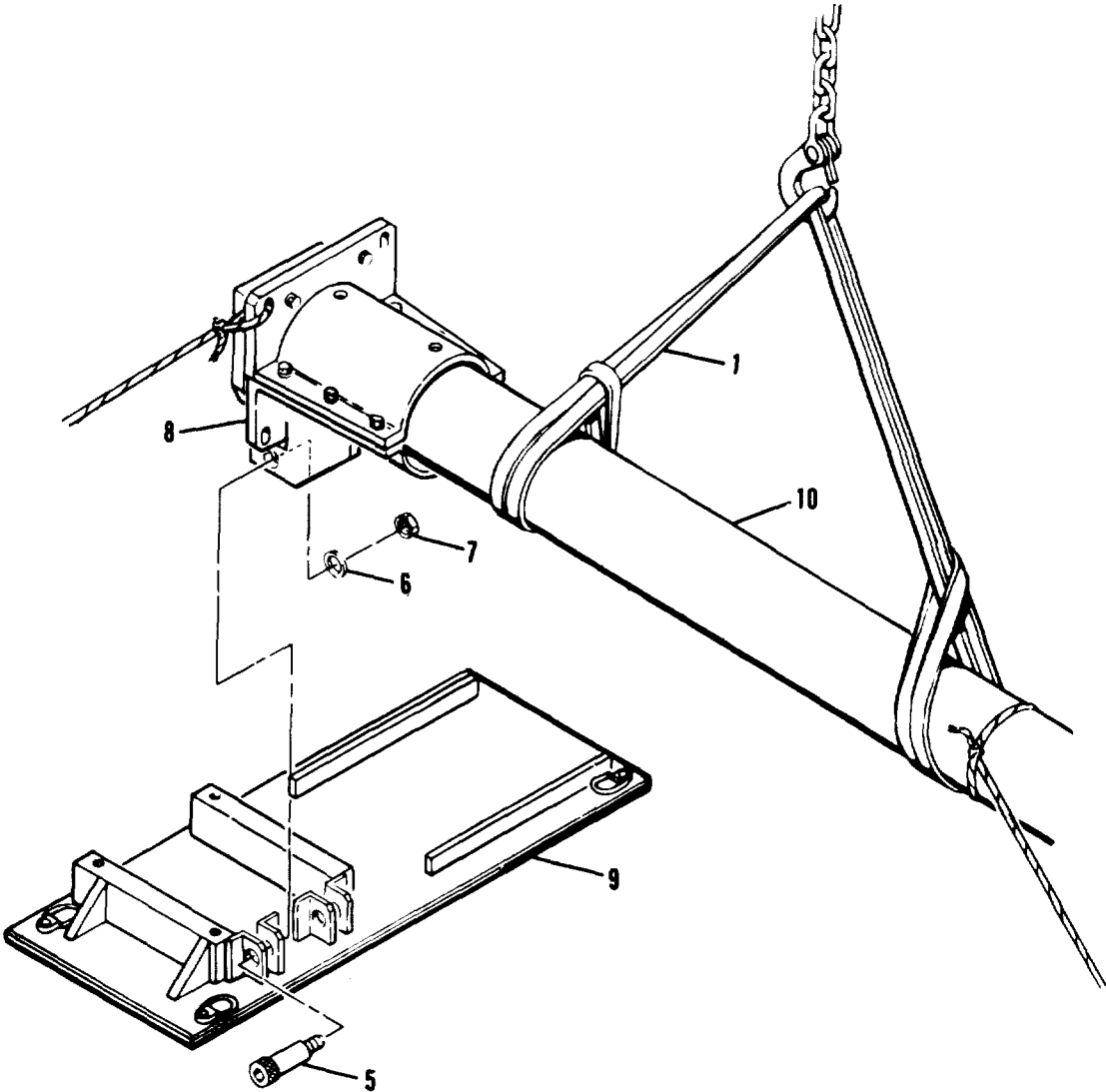
3-17. MAST POST MAINTENANCE TEST - Continued

STEP	PROCEDURE
42.	Deleted.
43.	Depress release levers (1) on both buckles (2) and rotate handles (3) over center as far as they will go to release straps (4).
44.	Pull straps (4) through shafts (5) on buckles (2) and remove straps (4) from mast (6) and wrecker boom (7). 
45.	Connect a sling to mast section number one (9) in a choker configuration. Slide sling up against mast section number one collar (10).
46.	Connect sling to wrecker hook. Take up slack in sling.
47.	Remove four screws (11), and flat washers (12) securing mast base clamps (13) to test plate (14).
48.	Deleted.

3-17. MAST POST MAINTENANCE TEST - Continued

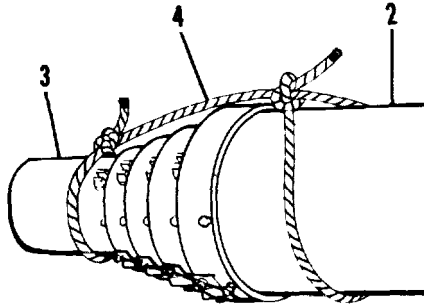
STEP	PROCEDURE
	<u>CAUTION</u> Make sure wrecker hook is directly over mast as mast is lowered to horizontal position. If hook is not directly over mast, you will put stress on mast base hinge clamp. 49. Lower mast to horizontal position with wrecker so that mast rests on wood blocks on the ground. It may be necessary to push mast by hand to start it downwards.  50. Remove elbow (16) and hose assembly (17) from base of mast (18). Coat threads of plug (19) with sealing compound and install plug (19) to base of mast (18). 

3-17. MAST POST MAINTENANCE TEST - Continued

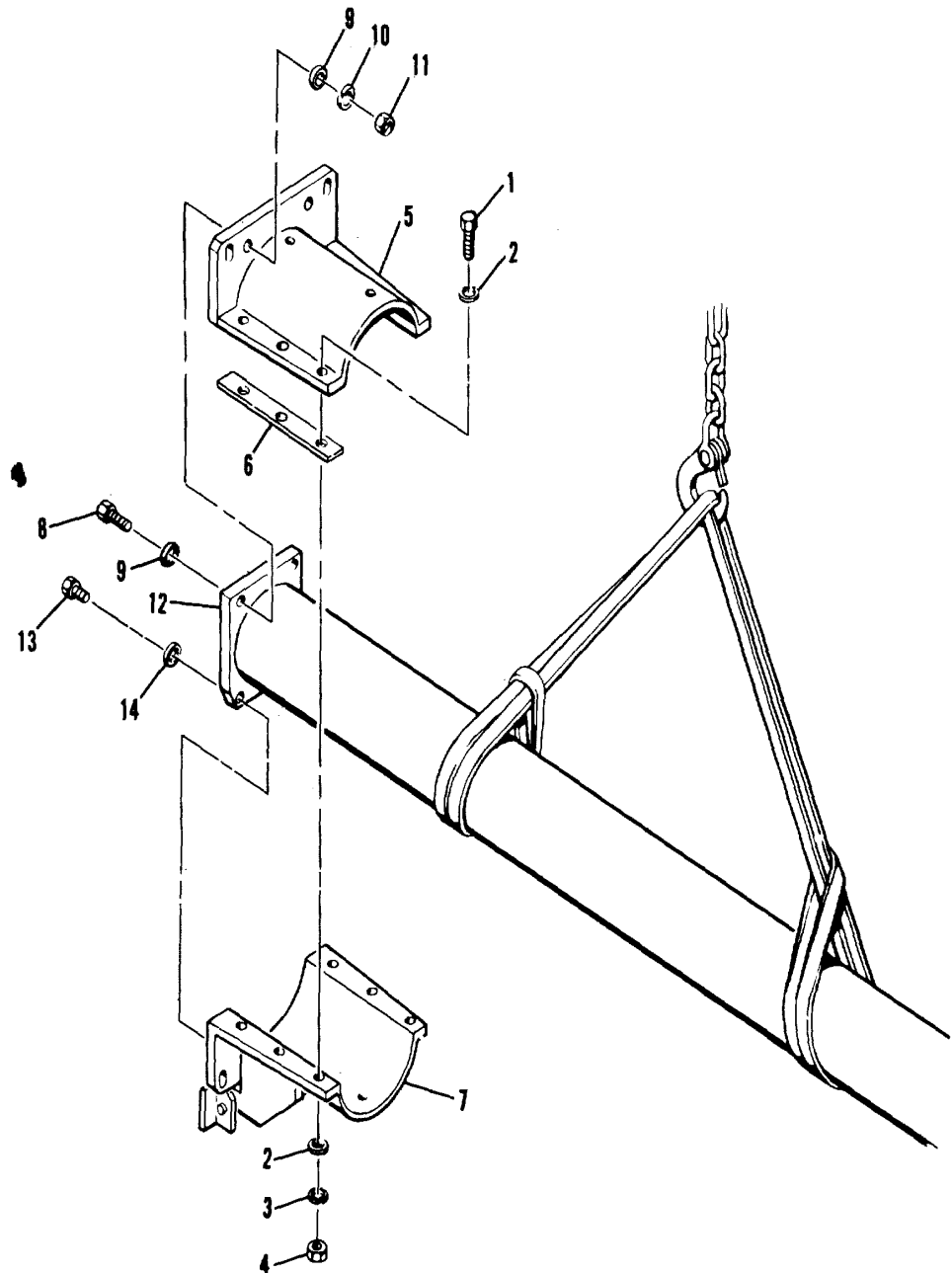
STEP	PROCEDURE
51.	Remove sling from top of mast. Untie and remove three 80-ft ropes from the top of the mast. Connect two slings (1) to mast, one at each end, in a choker configuration. Each sling should be about two feet from end of mast. Connect slings to wrecker boom. Tie two guide ropes, one at each end, to mast.  The diagram is an exploded view of a mast assembly. It shows a central cylindrical mast (10) with various components being attached. At the top left, a bracket (8) is shown with bolts (6) and washers (7) being installed. A cable (1) is shown passing through the bracket. At the bottom left, a base plate (9) is shown with a pin (5) being inserted into a hole. A cable (1) is also shown passing through the base plate. On the right side, a cable (1) is shown passing through a choker hitch on the mast (10). The mast (10) is shown with two cables (1) attached to it, one at each end, in a choker configuration. The mast (10) is also shown with two guide ropes (1) attached to it, one at each end, in a choker configuration.

3-17. MAST POST MAINTENANCE TEST - Continued

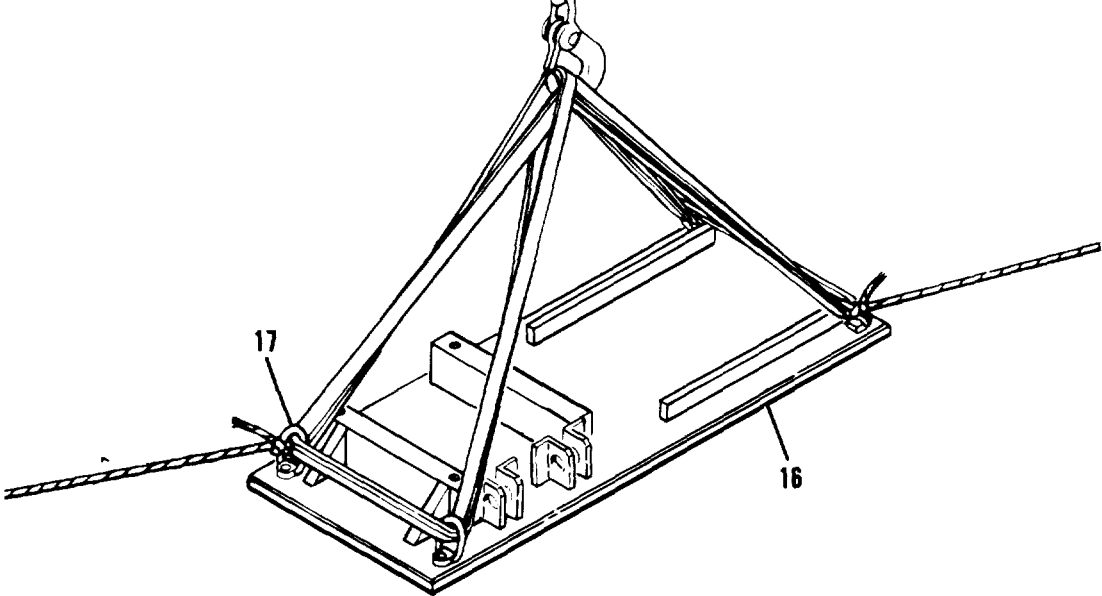
STEP	PROCEDURE
52.	Tie mast sections one (2) and five (3) together with a rope (4) to prevent mast sections from sliding out as mast is lifted.
53.	Raise wrecker boom and take up slack in slings.
54.	Remove two shoulder socket-head screws (5), flat washers (6), and nuts (7) securing hinged mast base clamp (8) to mast support plate (9). If shoulder socket-head screws (5) are hard to remove, tap them lightly with a brass drift pin:
55.	Carefully lift mast (10) off mast support plate (9). Leave mast suspended about two or three feet off the ground.



3-17. MAST POST MAINTENANCE TEST - Continued

STEP	PROCEDURE
	 The diagram is an exploded view of a mast post assembly. It shows a central horizontal mast post with a chain and shackle at the top right. Various brackets and hardware are shown in their relative positions for assembly. Numbered callouts identify the following parts: 1: Bolt 2: Washer 3: Bolt 4: Bolt 5: Bracket 6: Plate 7: Bracket 8: Bolt 9: Bolt 10: Bolt 11: Bolt 12: Bolt 13: Bolt 14: Bolt

3-17. MAST POST MAINTENANCE TEST - Continued

STEP	PROCEDURE
56.	Remove six screws (1), twelve flat washers (2), six lockwashers (3), and six nuts (4) securing mast base clamp half (5) and shims (6) to hinged mast base clamp (7).
57.	Remove two screws (8), four flat washers (9), two lockwashers (10), and two nuts (11) securing mast base clamp half (5) to mast base plate (12). Remove mast base clamp half.
58.	Remove two screws (13) and flat washers (14) securing hinged mast base clamp (15) to mast base plate (12).
	59. Place wood blocks under mast as required. Carefully lower mast to ground. Remove slings from wrecker hook. Remove slings and guide ropes from mast.
60.	Drive truck off mast support plate (16).
61.	Thread two slings through hoist eyes (17) at corners of mast support plate (16) (one sling at each end of plate).
62.	Tie two guide ropes to mast support plate (16) one guide rope at each end of plate.
63.	Connect ends of slings to wrecker truck hook. Carefully lift mast support plate (16). Move plate to stowage site and lower plate.
64.	Remove slings from wrecker hook. Remove slings and guide ropes from mast support plate.
	

3-18. DISTRIBUTION BOX POST-MAINTENANCE TEST

- This test verifies that the repair you made in the maintenance instructions (para 3-9) restored the equipment to operational condition.
- You will be directed to this test by a reference in the maintenance instructions (para 3-9).
- Go to INITIAL SETUP for information needed to prepare for the test.

OVERVIEW

- The Interface Coupling Device (ICD) is used to connect electrical activating power to the distribution box relays K1 and K2.
- The ICD panel provides controls that enable you to operate and test the distribution box relays as they are actually used when the distribution box is installed in the Mast Group.
- Point-to-point test and inspection procedures are provided to verify that defective diodes, wires, and connectors have been repaired.
- The test proves that the distribution box is operational.

Change 3 3-539

3-18. DISTRIBUTION BOX POST-MAINTENANCE TEST . Continued**INITIAL SETUP**Test Equipment

Multimeter AN/URM-105

6625-00-581-5036

24 Vdc Power Supply, 6130-00-148-1796

Interface Coupling Device, 5035604-1

Equipment
ConditionPara

3-9a

Condition DescriptionDistribution Box cover
removed

4-5

ICD cover removed

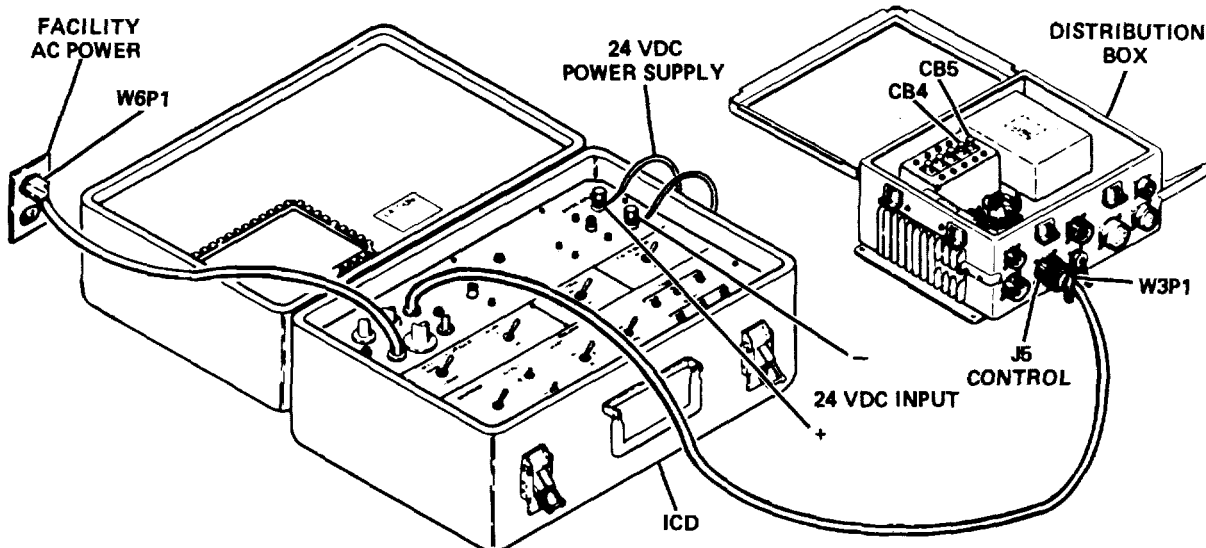
Tools

Refrig Unit Svce Tool Kit,

5180-00-596-1474

3/8 in. flat tip scdr

5120-00-278-1280

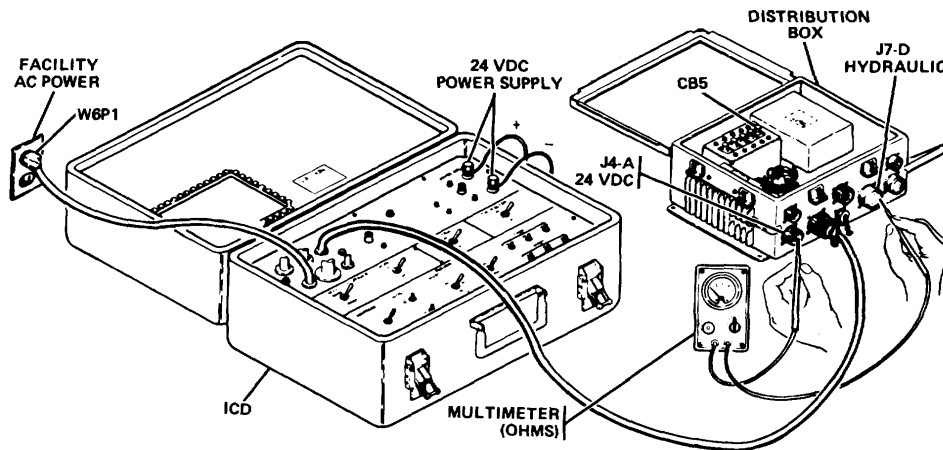
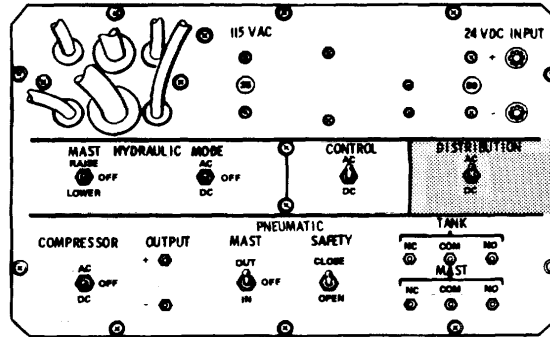
STEP**PROCEDURE****A. PREPARATION**

1. Connect DISTR connector W3 P1 from ICD to CONTROL connector J5 of distribution box.
2. Connect 115 VAC connector W6 P1 to maintenance facility 115 Vac power receptacle
3. Set reset buttons on circuit breakers CB4 and CB5 to inner (on) position.
4. Connect +24 Vdc power supply to 24VDC INPUT positive (+) and negative (-) terminal lugs.
5. Set DISTRIBUTION AC-DC switch S4 on ICD panel to DC.

3-18. DISTRIBUTION BOX POST-MAINTENANCE TEST- Continued

STEP

PROCEDURE

**B. BATTERY RELAY K2 TEST**

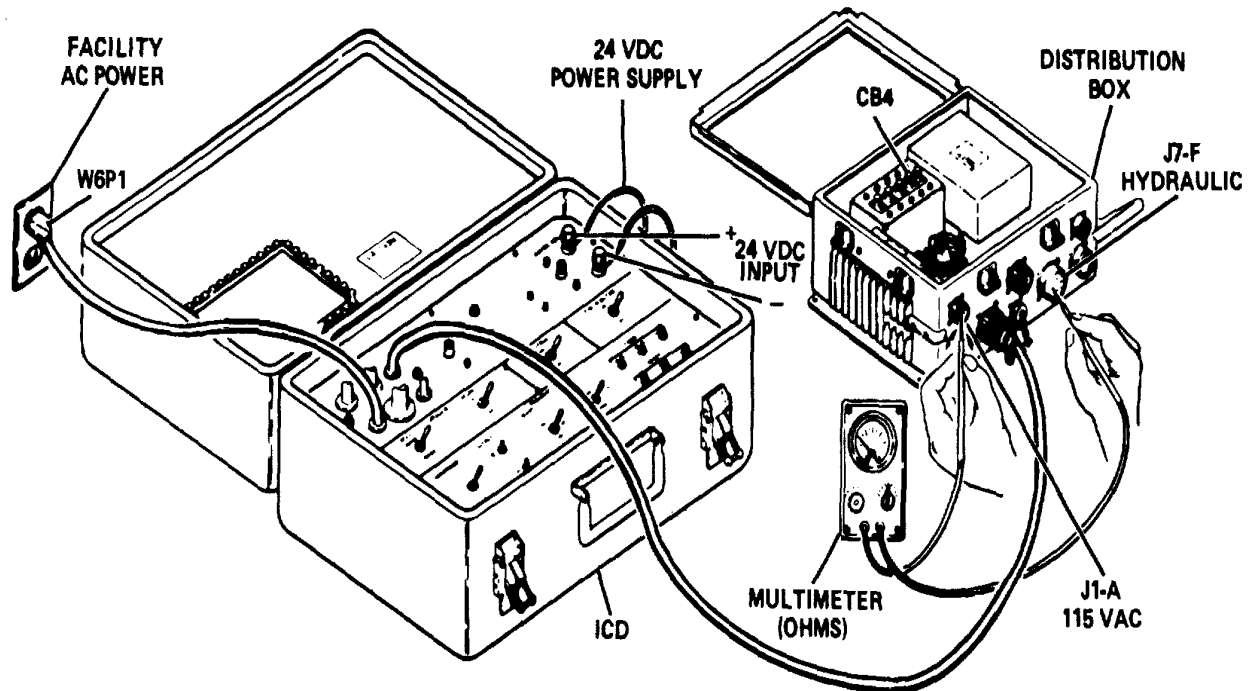
1. Test continuity between +24 VDC connector J4-A and HYDRAULIC connector J7-D on distribution box.
2. If there is no continuity, check to see that reset buttons on circuit breakers CB5 are at inner (on) position, then test continuity again.
3. If there is no continuity, troubleshoot relay K2, circuit breaker CB5 and wire harness (para 3-2).

Change 3 3-541

3-18. DISTRIBUTION BOX POST-MAINTENANCE TEST · Continued

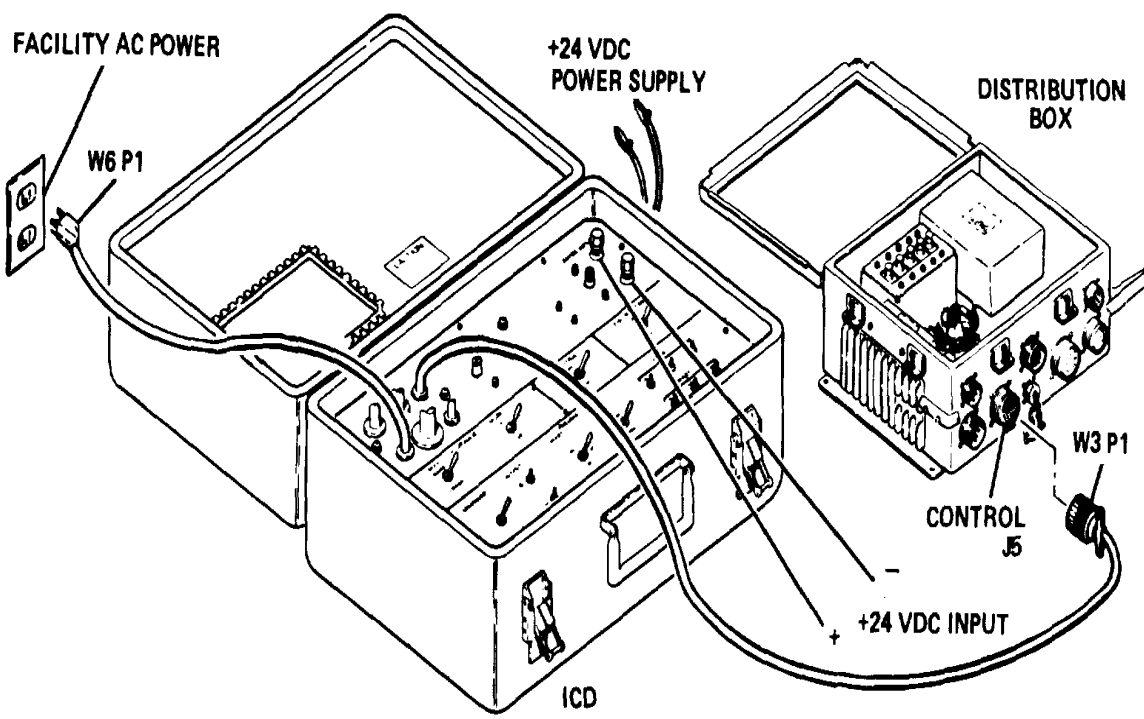
STEP

PROCEDURE

**C. RECTIFIER CR1 AND RELAY K1 TEST**

1. Set DISTRIBUTION switch S4 on ICD panel to AC.
2. Test continuity between 115 VAC connector J1-A and HYDRAULIC connector J7-F on distribution box. Continuity is tested by reversing leads of multimeter between J1-A and J7-F. Multimeter readings should be low in one direction, at least 100 times greater in reverse direction.
3. If there is no reading on ohmmeter, check to see that reset buttons on circuit breaker CB4 are at inner (on) position, then test continuity again.
4. If there is no continuity, troubleshoot rectifier CR1, circuit breaker CB4, relay K1 and wire harness (para 3-2).

3-18. DISTRIBUTION BOX POST - MAINTENANCE TEST Continued

STEP	PROCEDURE
	 D. SHUTDOWN 1. Turn off 24 Vdc power supply. 2. Disconnect 24 Vdc power supply from maintenance facility 115 Vac power receptacle. 3. Disconnect 24 Vdc power supply from 24VDC INPUT positive (+) and negative (-) terminal lugs. 4. Disconnect 115 VAC connector W6 P1 from maintenance facility 115 Vac power receptacle. 5. Disconnect DISTR connector W3 P1 to CONTROL connector J5 of distribution box.

3-18. DISTRIBUTION BOX POST-MAINTENANCE TEST - Continued

STEP	PROCEDURE
3.1	E. POINT-TO-POINT TESTS The diagram consists of two parts. The top part is a perspective view of the open distribution box. It shows six circuit breakers labeled CB1 through CB6 at the top. Below them are components labeled K2, CR1, CR2, CR3, E2, and E1. A 'RESET BUTTON' is indicated on the right side, with a hand icon pointing to it. A 'CAUTION 115 VOL' label is visible in the center. The bottom part is a top-down view of the distribution box cover. It shows eight terminals labeled J1, J4, J5, J2, J6, J7, J3, and J8. J1 and J4 are on the left, J5 and J2 are in the middle, J6 and J7 are on the right, and J3 and J8 are on the far right. Various labels like '115 VAC', '115 VDC', 'CONTR', 'ENGINE INTER', 'HYDRAUL', 'PNEUMATIC', and 'PRESSOR' are also present. 1. Push reset buttons on distribution box circuit breakers CB1, CB2, CB3, and on later models CB6 to inner (on) position. 2. Using multimeter, check for continuity between grounding terminal E1 inside distribution box and J7-B, and between E1 and J3-G. 3. Check for continuity between E2 and J1-B, and between E2 and J5-L.

3-18. DISTRIBUTION BOX POST-MAINTENANCE TEST Continued

STEP	PROCEDURE																																																																								
4.	Check resistance of diode CR2 with multimeter positive lead at anode and negative lead at cathode. Reverse leads and repeat. First check must be low, second 100 times greater. (Refer to para 3-9 for location of diode anode and cathode.)																																																																								
5.	Check resistance of diode CR3 with multimeter positive lead at anode and negative lead at cathode. Reverse leads and repeat. First check must be low, second 100 times greater. (Refer to para 3-9 for location of diode anode and cathode.)																																																																								
6.	Check for continuity between the points listed in the table below. <table><tr><td>FROM</td><td>TO</td><td>FROM</td><td>TO</td><td>FROM</td><td>TO</td></tr><tr><td>J1-C</td><td>J7-G</td><td>J2-K</td><td>J6-B</td><td>J5-R</td><td>J8-L</td></tr><tr><td>J1-C</td><td>J3-E</td><td>J2-L</td><td>J6-A</td><td>J5-E</td><td>J8-N</td></tr><tr><td>J1-C</td><td>J7-C</td><td>J2-N</td><td>J8-B</td><td>J5-K</td><td>J8-A</td></tr><tr><td>J5-M</td><td>J4-C</td><td>J2-E</td><td>J7-H</td><td>J5-F</td><td>J3-B</td></tr><tr><td>J5-M</td><td>J7-E</td><td>J2-D</td><td>J5-Q</td><td>J1-A</td><td>J8-E</td></tr><tr><td>J5-M</td><td>J5-D</td><td>J2-F</td><td>J5-I</td><td>J1-A</td><td>J7-A</td></tr><tr><td>J5-M</td><td>J8-C</td><td>J2-M</td><td>J5-B</td><td>J5-F</td><td>J3-B</td></tr><tr><td>J5-M</td><td>J8-J</td><td>J2-G</td><td>J5-S</td><td>J1-A</td><td>J8-E</td></tr><tr><td>J3-C</td><td>J5-H</td><td>J2-G</td><td>J7-I</td><td>J1-A</td><td>J7-A</td></tr><tr><td>J2-I</td><td>J8-I</td><td>J5-C</td><td>J8-H</td><td>J4-A</td><td>J3-A</td></tr><tr><td></td><td></td><td></td><td></td><td>J1-A</td><td>J5-G</td></tr></table>	FROM	TO	FROM	TO	FROM	TO	J1-C	J7-G	J2-K	J6-B	J5-R	J8-L	J1-C	J3-E	J2-L	J6-A	J5-E	J8-N	J1-C	J7-C	J2-N	J8-B	J5-K	J8-A	J5-M	J4-C	J2-E	J7-H	J5-F	J3-B	J5-M	J7-E	J2-D	J5-Q	J1-A	J8-E	J5-M	J5-D	J2-F	J5-I	J1-A	J7-A	J5-M	J8-C	J2-M	J5-B	J5-F	J3-B	J5-M	J8-J	J2-G	J5-S	J1-A	J8-E	J3-C	J5-H	J2-G	J7-I	J1-A	J7-A	J2-I	J8-I	J5-C	J8-H	J4-A	J3-A					J1-A	J5-G
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J3-C	J5-H	J2-G	J7-I	J1-A	J7-A																																																																				
J2-I	J8-I	J5-C	J8-H	J4-A	J3-A																																																																				
				J1-A	J5-G																																																																				
7.	Close cover of distribution box, engage six latches, and tighten captive screw in each latch.																																																																								

3-19. PCA POST-MAINTENANCE TESTS

- This test verifies that the repair you made (para 3-10) has restored the equipment to operational condition.
- You will be directed to the test by a reference in the maintenance instructions (para 3-10).
- Go to INITIAL SETUP for information needed to prepare for the test.
- Go to adjustments (para 3-23), when directed in the test.

OVERVIEW

- The Interface Coupling Device (ICD) is used to connect electrical operating power to the PCA.
- The ICD panel provides controls and test points that enable you to operate and test the PCA as if it were actually installed in the Mast Group.
- Successful completion of the test verifies that the PCA is operational.
- The procedures refer you to adjustments (para 3-23) if operation is not within required limits.

3-19. PCA POST-MAINTENANCE TESTS

INITIAL SETUP

Test Equipment

24 VDC Power Supply, 6130-00-148-1796
Interface Coupling Device 5035604-1
Multimeter AN/URM-105,
6625-00-581-2036

Equipment

Condition

Para
3-10a

Condition Description

PCA cover removed

Tools

Refrig Unit Svce Tool Kit.
5180-00-596-1474
7/8 in. comb. wr
3/4 in. comb. wr
1-1/2 in. comb. wr

Materials/Parts

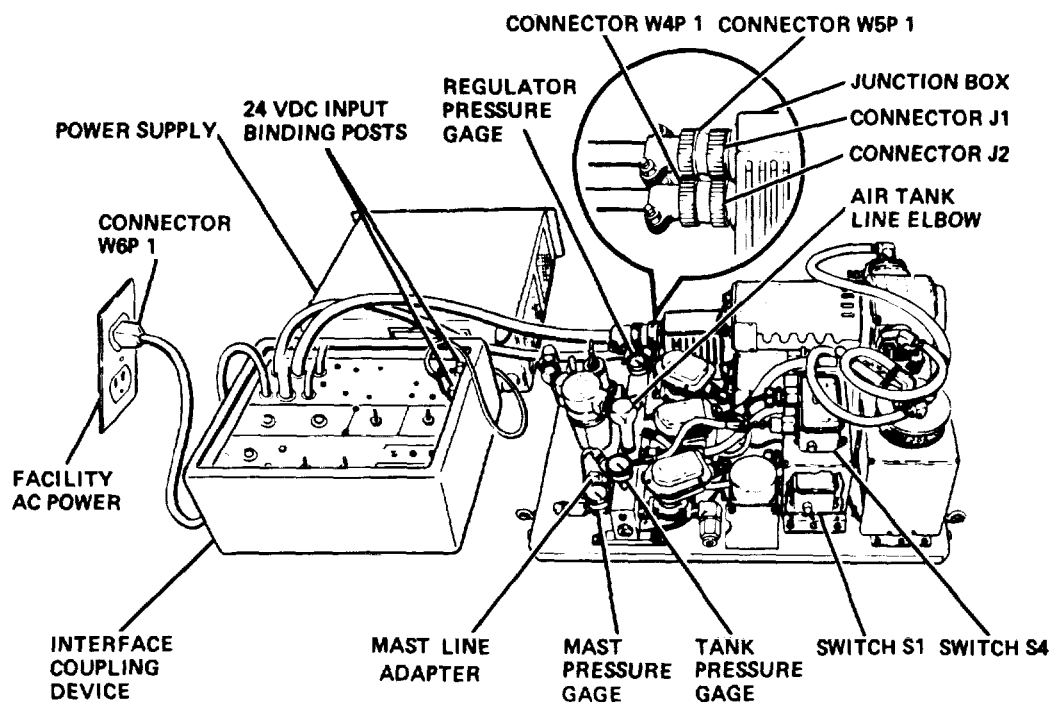
Pipe cap (appx B, item 14)

Pipe cap (appx B, item 29)

STEP

PROCEDURE

A. PREPARATION

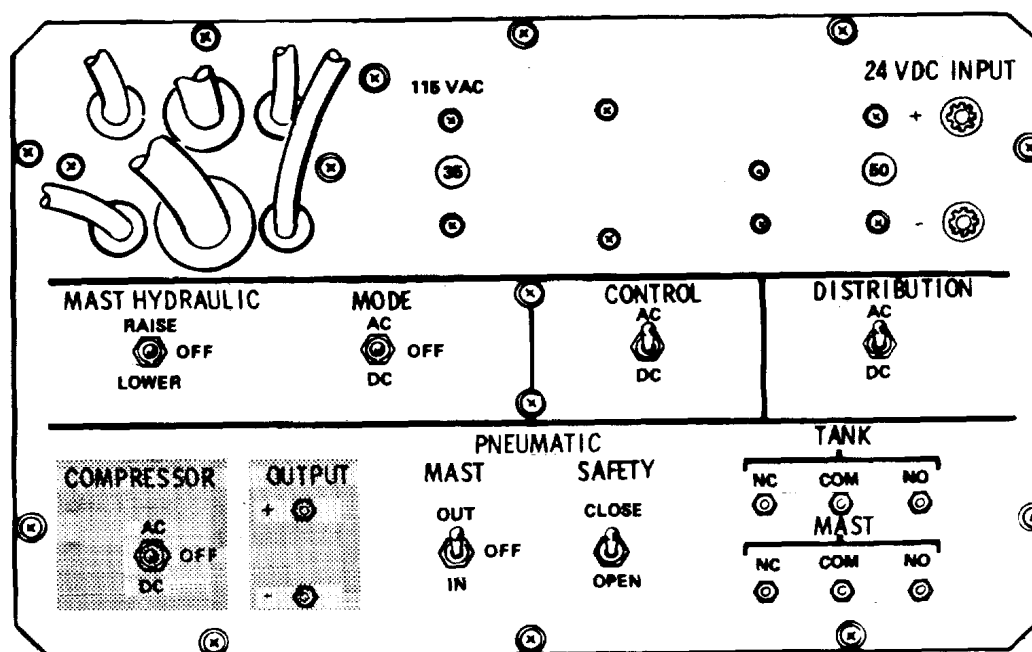


1. Install pipe cap to air tank line elbow.
2. Install pipe cap to mast line adapter.
3. Connect connector W4P1 from ICD panel to connector J2 on junction box, W5P1 - to J1, and W6P1 to maintenance facility 115 Vac power receptacle.

3-19. PCA POST-MAINTENANCE TESTS - Continued

STEP

PROCEDURE

B. GAGE CHECK

Verify that pressure gages indicate zero. If any gage does not, replace gage (para 3-10j).

C. TRANSFORMER T1 AND RECTIFIER CR1

1. Set COMPRESSOR switch to AC.
2. Measure dc voltage between OUTPUT + jack and - jack.
3. If voltage is not +22.5 to +27.5 Vdc, troubleshoot transformer and rectifier (para 3-3).

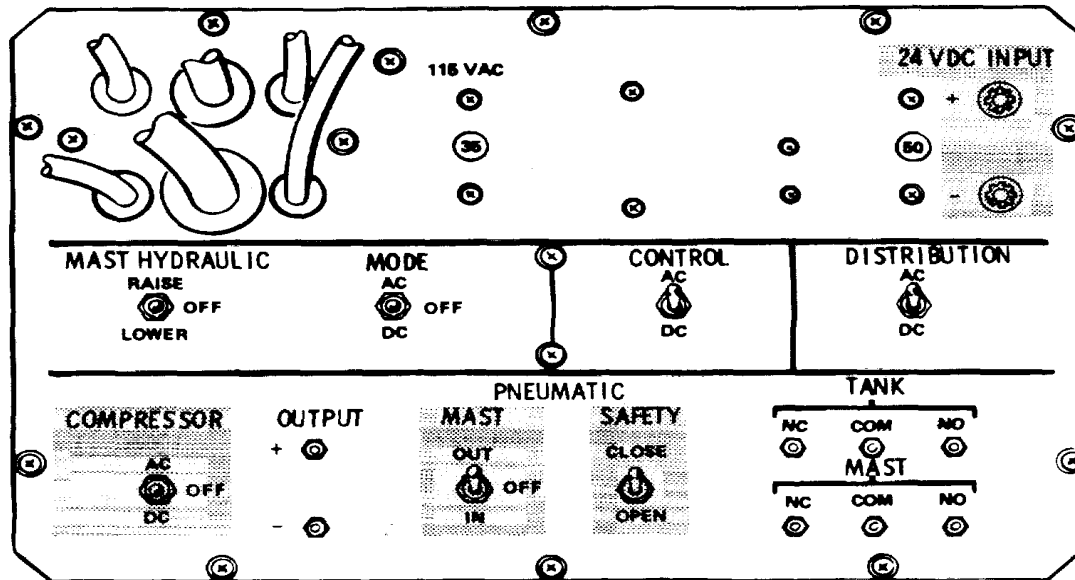
D. AC COMPRESSOR AND TANK PRESSURE SWITCH S4

Verify that TANK PRESSURE gage shows pressure increasing to 90-95 psig. If not, adjust tank pressure switch S4 (para 3-23a).

3-19. PCA POST-MAINTENANCE TESTS - Continued

STEP

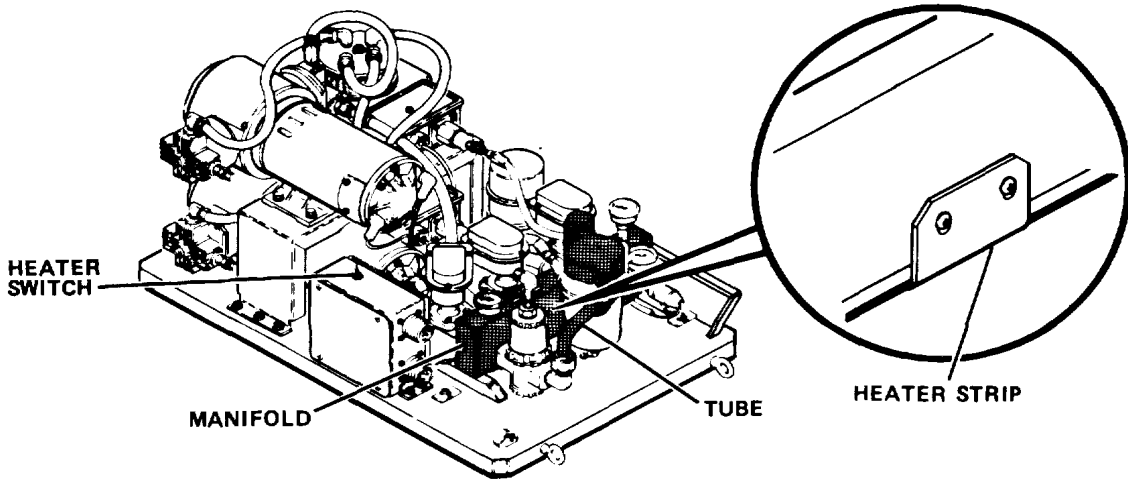
PROCEDURE



E. DC COMPRESSOR, SAFETY VALVE, AND TANK PRESSURE SWITCH S1

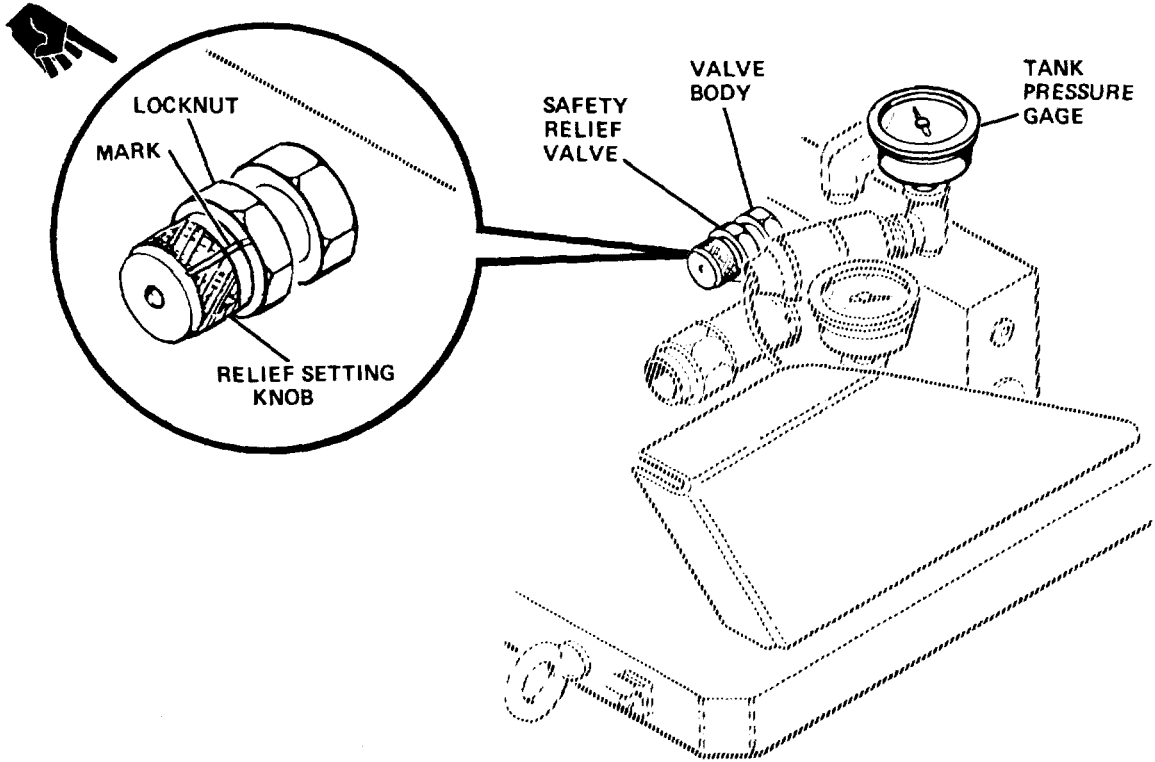
1. Set COMPRESSOR switch to OFF.
2. Connect 24 Vdc power supply to 24 VDC INPUT + binding post and - binding post.
3. Set SAFETY switch to CLOSE.
4. Set COMPRESSOR switch to DC.
5. Set MAST switch to OUT. Verify that TANK PRESSURE gage shows pressure increasing to 90-95 psig. If pressure is out of this range, adjust tank pressure switch S1 (para 3-23b).

3-19. PCA POST-MAINTENANCE TESTS - Continued

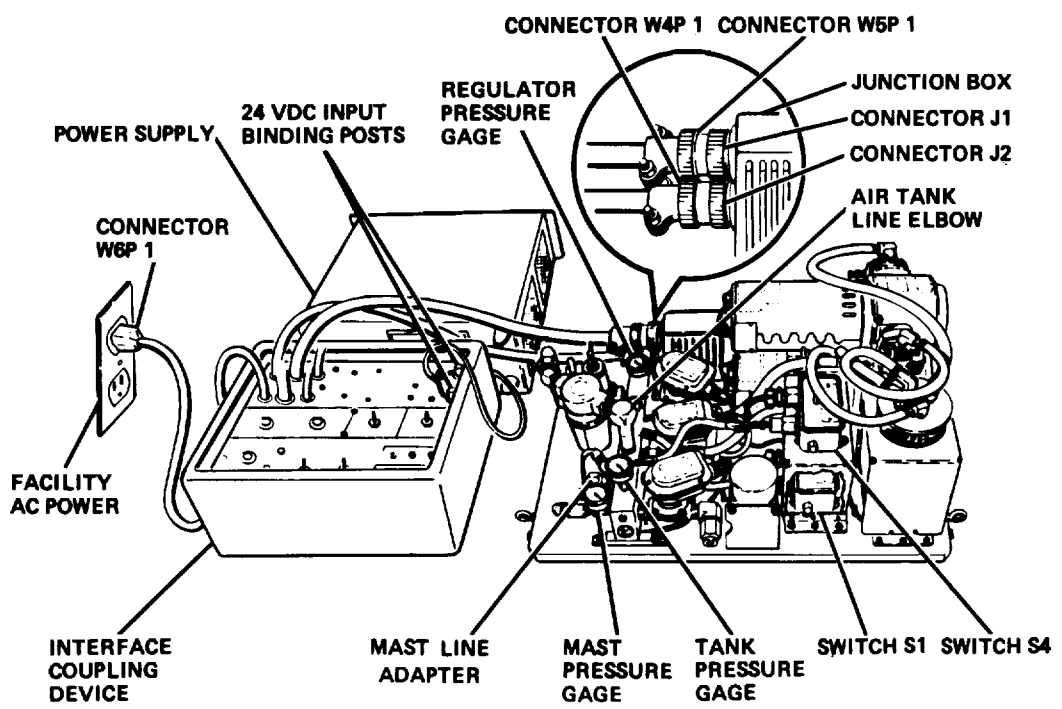
STEP	PROCEDURE
1.	E.1 PCA HEATER
	Turn PCA heater switch to ON.
	WARNING Use care when checking PCA heater. Heater strip can get very hot and you can get burned.
	2. Cautiously feel metal tubes attached to manifold. Start away from the manifold and work towards it until you can determine the heater is working (tube feels warm).
3.	Turn PCA heater switch to OFF.
 The diagram illustrates the PCA heater assembly. It shows a manifold with several tubes attached. A heater switch is located on the left side of the manifold. A tube is shown extending from the manifold. A circular inset provides a close-up view of the heater strip, which is a metal strip with two screws, mounted on a surface.	

3-19. PCA POST-MAINTENANCE TESTS - Continued	
STEP	PROCEDURE
	F. ANTI - JOG SWITCH S3 1. Verify that continuity is not present between MAST test jacks NC and COM. Continue monitoring test jacks during next step. NOTE In following step, set MAST switch briefly to OUT, to OFF, to IN, then to OFF to be able to observe pressure passing through 0.10 psig range. 2. While observing MAST PRESSURE gage, set MAST switch to IN. Verify that circuit between test jacks is closed (continuous) when pressure indication on gage drops to 10 to 0 psig. If not, adjust antijog pressure switch S3 (para 3 - 23d). G. TANK PRESSURE INDICATOR SWITCH S2 1. Set SAFETY switch to OPEN. 2. Verify that continuity is <u>not</u> present (open circuit) between TANK test jacks NO and COM. Continue monitoring test jacks during next step. 3. Set SAFETY switch to CLOSE. Verify that circuit between test jacks closes (becomes continuous) when pressure indicated on TANK PRESSURE gage rises to 80-85 psig. If not, adjust tank pressure indicator switch S2 (para 3-23c). G.1 AIR PRESSURE REGULATOR 1. Set SAFETY switch to CLOSE. 2. Set MAST switch to OUT. 3. Set COMPRESSOR switch to AC. 4. Check both PCA pressure gages. Pressure gages should indicate about 35 psig. If they do not, adjust maximum air pressure (para 3-23e).

3-19. PCA POST-MAINTENANCE TESTS - Continued

STEP	PROCEDURE
	G.2 SAFETY RELIEF VALVE  The diagram illustrates the adjustment of the safety relief valve. A hand icon points to a circular callout showing a close-up of the valve's locknut, a mark, and the relief setting knob. The main diagram shows the valve body, the safety relief valve, and the tank pressure gage mounted on a tank. 1. Verify that TANK PRESSURE gage indicates 90-95 psig. 1.1 Loosen locknut. 2. Place a mark with colored pencil or white paint on safety relief valve body and on relief setting knob. This will indicate current setting. 3. Slowly turn relief setting knob counterclockwise (counting each full rotation) until valve opens and relieves pressure. If valve does not open, replace safety relief valve (para 3-10a) and repeat steps 1 through 3. 4. If valve opens, turn relief setting knob clockwise to original setting marked in step 2. Tighten locknut.

3.19. PCA POST-MAINTENANCE TESTS- Continued

STEP	PROCEDURE
	 H. SHUTDOWN 1. Set COMPRESSOR switch to OFF. 2. Set MAST switch to OUT. 3. Set SAFETY switch to OPEN. 4. Disconnect 24 Vdc from 24 VDC INPUT binding posts. 5. Disconnect connector W6P1 from facility ac power. 6. Disconnect connector W5P1 from receptacle J1. 7. Disconnect connector W4P1 from receptacle J2. 8. Remove pipe caps from air tank line elbow and mast line adapter. 9. Deleted. 10. Deleted.

3-20. HCA POST-MAINTENANCE TEST

- This test verifies that the repair you made in the maintenance instructions (para 3-11) restored the equipment to operational condition.
- You will be directed to this test by a reference in the maintenance instructions (para 3-11).
- Go to INITIAL SETUP for information needed to prepare for the test.

OVERVIEW

- The Interface Coupling Device (ICD) is used to connect electrical operating power to the HCA.
- The ICD panel provides controls and test points that enable you to operate and test the HCA as if it were actually installed in the Mast Group.
- The test proves that the HCA is operational.

3-20. HCA POST-MAINTENANCE TEST - Continued

INITIAL SETUP

Test Equipment

24 Vdc Power Supply,
6130-00-148-1796
Interface Coupling Device,
5035604-1

Equipment Condition

Para

3-11a

3-11b

Condition Description

HCA cover removed

Hydraulic tank filled

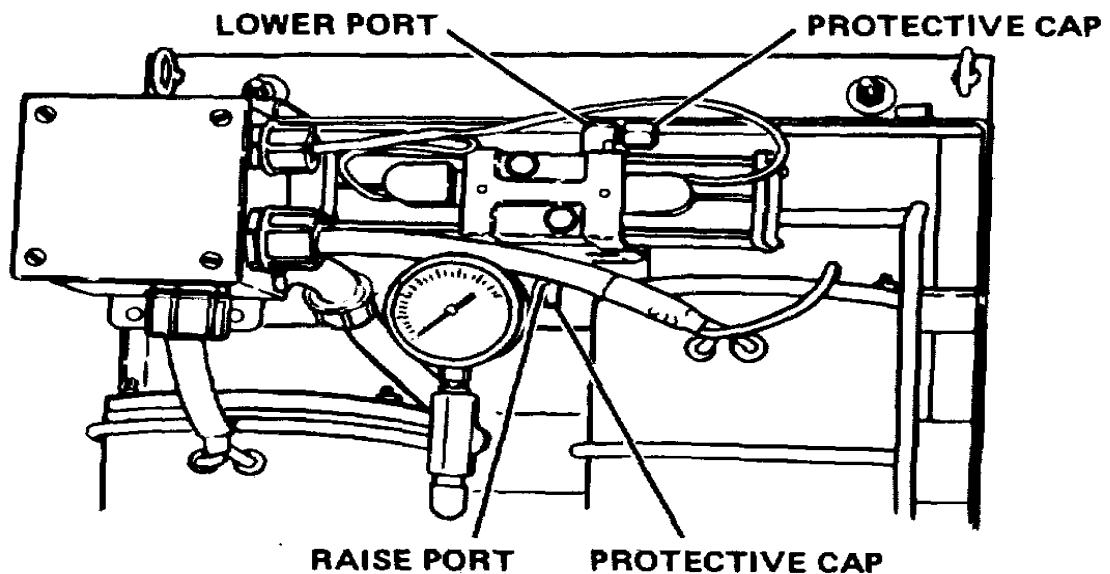
Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
9/16 in. comb. wr

Materials/Parts

protective plugs (appx B,
items 13, 14)
shop cloths (appx B, item 17)

STEP PROCEDURE



A. PREPARATION

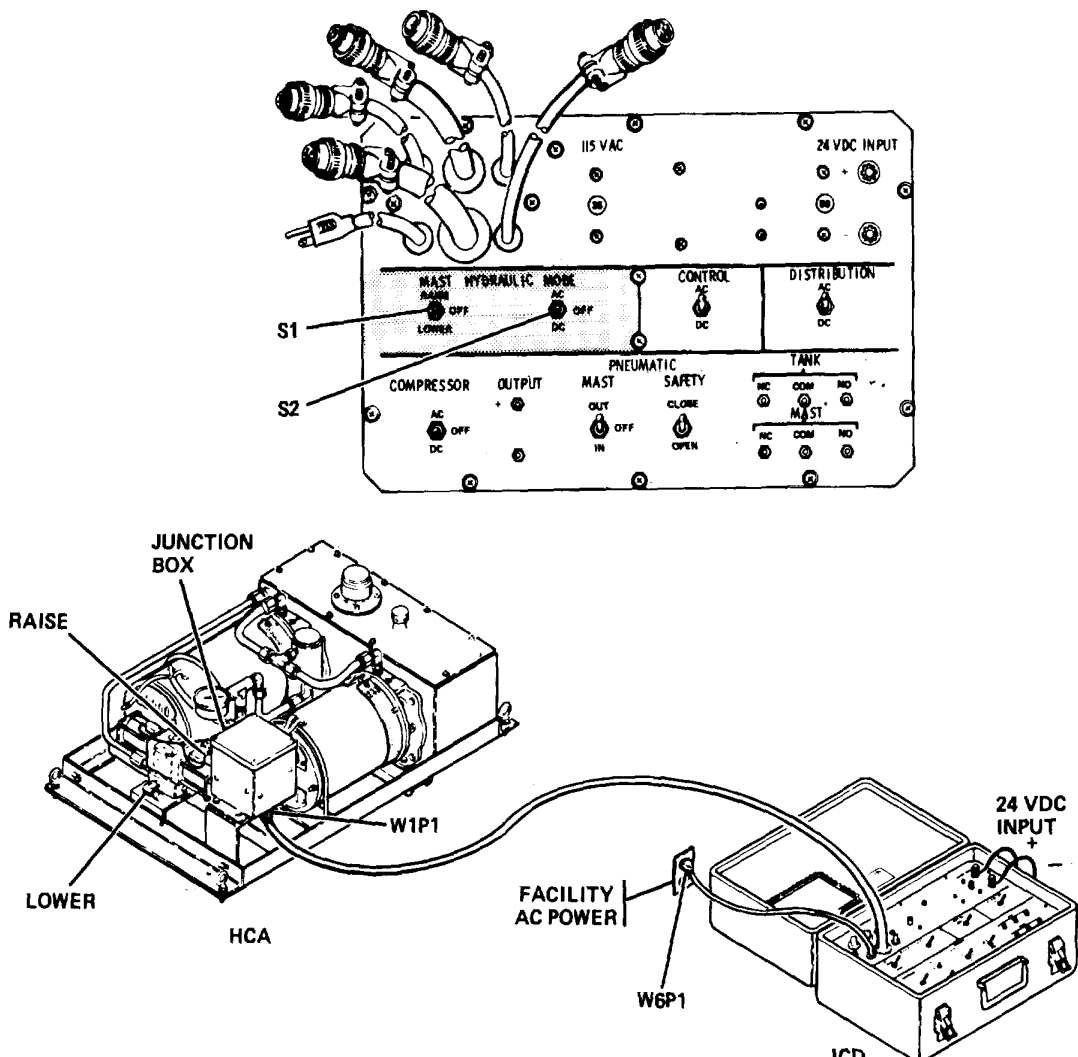
AT HCA 4-WAY VALVE:

1. Remove protective caps on lower and raise ports of 4-way valve.
2. Install cap fittings on lower and raise ports.

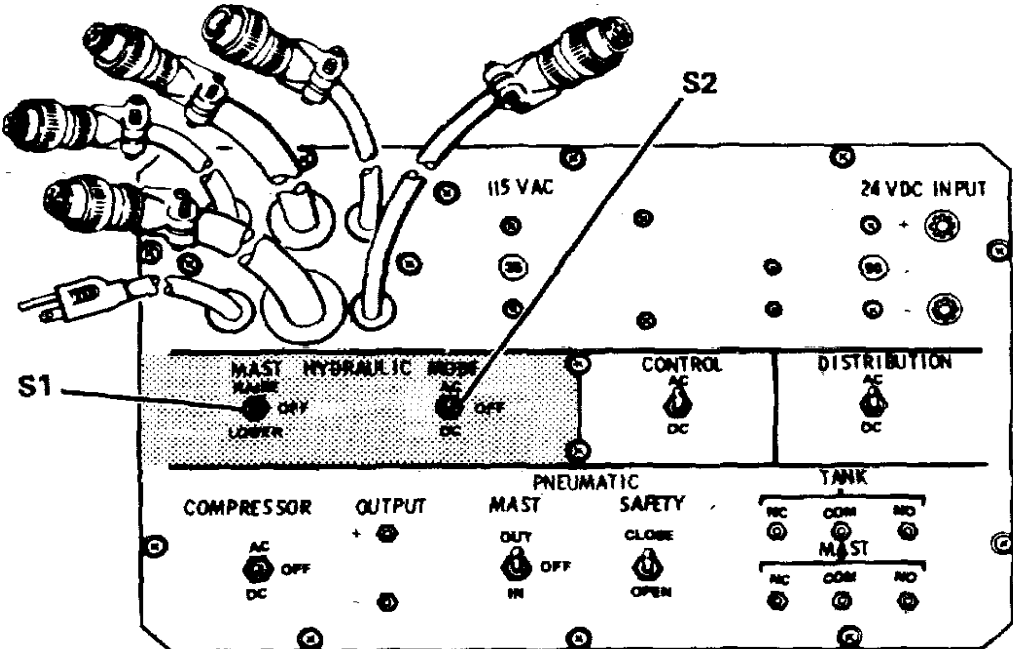
AT ICD PANEL:

1. Set HYDRAULIC MAST RAISE-OFF-LOWER switch S1 to OFF.
2. Set HYDRAULIC MODE AC-OFF-DC switch S2 to OFF.

3-20. HCA POST MAINTENANCE TESTS - Continued

STEP	PROCEDURE
	 The diagram shows the HCA control panel with various connectors and switches. The top section has a 115 VAC input and a 24 VDC INPUT. Below these are sections for MAST HYDRAULIC INODE, CONTROL, and DISTRIBUTION. The bottom section includes switches for COMPRESSOR, OUTPUT, MAST, PNEUMATIC SAFETY, and TANK. A separate diagram shows the HCA unit with a JUNCTION BOX, RAISE, LOWER, and W1P1 connector. A cable connects W1P1 to the ICD power supply, which also has a 24 VDC INPUT and a FACILITY AC POWER connection point with a W6P1 connector.
3. 4. 5. B. TEST 1.	Connect HYDR (hydraulic) connector W1 P1 to J1 on junction box of HCA. Connect 115 VAC connector W6 P1 to maintenance facility ac power. Connect 24 Vdc power supply to 24 VDC INPUT positive (+) and negative (-) terminal lugs. B. TEST Connect 24 Vdc power supply to maintenance facility ac power.

3-20. HCA POST-MAINTENANCE TEST - Continued

STEP	PROCEDURE
2.	Set HYDRAULIC MAST switch S1 on ICD to RAISE.  CAUTION The 90 Vdc hydraulic pump motor must be primed to make sure there is fluid in the pump before a load is applied. Operating the pump under a load and without fluid could damage the seals or other parts. 3. To prime pump motor, momentarily set HYDRAULIC MODE switch S2 on ICD to AC then turn it to OFF. Repeat this AC-OFF action until a pressure shows on HCA pressure gage. NOTE A pressure registering on the gage is an Indication that the pump motor is primed. 4. Set HYDRAULIC MODE switch S2 to AC while watching pressure gage. Verify that pressure gage registers at least 1800 psi then set HYDRAULIC MODE switch OFF. The pressure indication verifies that 90 Vdc pump motor is operational.

3-20. HCA POST-MAINTENANCE TEST - Continued	
STEP	PROCEDURE
5.	Set HYDRAULIC MAST switch S1 on ICD to LOWER. CAUTION The 24 Vdc hydraulic pump motor must be primed to make sure there is fluid in the pump before a load is applied. Operating the pump under a load and without fluid could damage the seals or other parts.
6.	To prime pump motor, momentarily set HYDRAULIC MODE switch S2 on ICD to DC then turn it to OFF. Repeat this DC-OFF action until a pressure shows on HCA pressure gage. NOTE A pressure registering on the gage is an indication that the pump motor is primed.
7.	Set HYDRAULIC MODE switch S2 to DC while watching pressure gage. Verify that pressure gage registers at least 1800 psi then set HYDRAULIC MODE switch OFF. The pressure indication verifies that 24 VDC pump motor is operational. C. SHUTDOWN
1.	Turn off 24 Vdc power supply.
2.	Disconnect 24 Vdc power supply from maintenance facility 115 Vac power receptacle.
3.	Disconnect 24 Vdc power supply from 24 VDC INPUT positive (+) and negative (-) terminal lugs.
4.	Disconnect 115 Vac connector W6 P1 from maintenance facility 115 Vac power receptacle.
5.	Disconnect HYDR connector W1 P1 from J1 on junction box of HCA.
6.	Empty contents of oil tank (para 3-11b).
7.	Disconnect cap fittings on lower and raise ports of 4-way valve.
8.	Install protective caps on lower and raise ports.
9.	Wipe up hydraulic fluid spills from HCA.

3-21. MAST CONTROL POST-MAINTENANCE TEST

- This test verifies that the repair you made in the maintenance instructions (para 3-12) restored the equipment to operational condition.
- You will be directed to this test by a reference in the maintenance instructions (para 3-12).
- Go to INITIAL SETUP for information needed to prepare for the test.

OVERVIEW

- The Interface Coupling Device (ICD) is used to connect electrical operating power to the mast control.
- The ICD panel provides controls and test points that enable you to operate and test the mast control as if it were actually installed in the Mast Group.
- The test proves that the mast control is operational.

3-21. MAST CONTROL POST-MAINTENANCE TEST**INITIAL SETUP**Test Equipment

Interface Coupling Device, 5035604-1
 Multimeter, AN/URM-105
 6625-00-581-2036
 24 Vdc Power Supply, 6130-00-148-1796

Equipment Condition

Para
 3-12a

Condition Description

Mast Control cover
 removed
 ICD cover removed

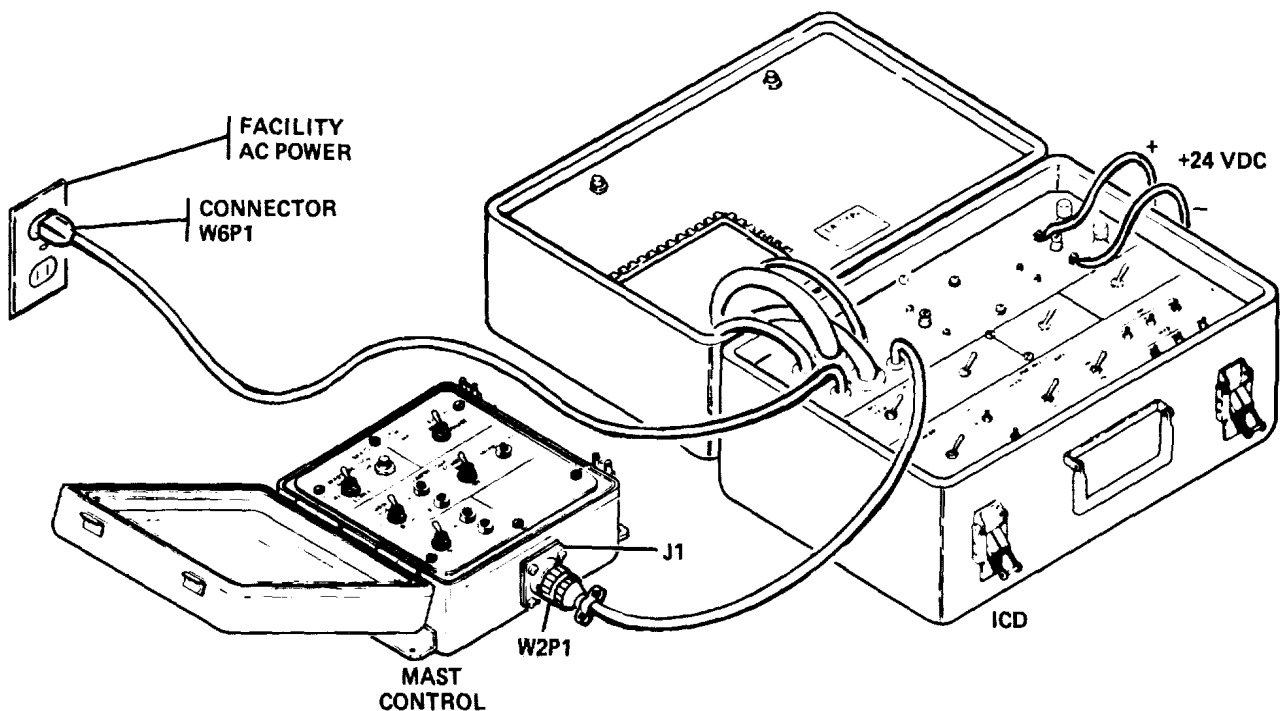
4-5

Tools

Refrig Unit Svce Tool Kit,
 5180-00-596-1474
 3/8 in. flat tip scdr

Elec. jumper, 6625-00-400-8731

STEP	PROCEDURE

**A. PREPARATION**

- 1.. Connect CONT (control) connector W2 P1 from ICD to J1 of mast control
- 2.. Connect 115 VAC connector W6 P1 to maintenance facility 115 Vac power receptacle

3-21. MAST CONTROL POST-MAINTENANCE TEST - Continued

STEP	PROCEDURE
	AT ICD PANEL: - Set HYDRAULIC MAST RAISE-OFF-LOWER switch (9) to OFF. - Set HYDRAULIC MODE AC-OFF-DC switch (8) to OFF. - Set CONTROL AC-DC switch (4) to DC. - Set DISTRIBUTION AC-DC switch (3) to DC. - Set PNEUMATIC COMPRESSOR AC-OFF-DC switch (7) to OFF. - Set PNEUMATIC OUT-OFF-IN switch (6) to OFF. - Set PNEUMATIC SAFETY CLOSE-OPEN switch (5) to OPEN. - Connect 24 Vdc power supply to 24VDC INPUT (1) positive (+) and negative (-) terminal lugs. Check to see that 24 VDC INPUT 50 amp circuit breaker (2) is pressed in. - Connect 115 Vac connector on 24 Vdc power supply to maintenance facility 115 Vac power receptacle. Turn power supply on. Check to see that 115 VAC 35 amp circuit breaker (10) is pressed in. NOTE The AIR PRESSURE indicator lights when power is applied to the test setup.

3-21. MAST CONTROL POST-MAINTENANCE TEST - Continued**STEP PROCEDURE**

: AT MAST CONTROL PANEL

1. Set COMPRESSOR DC MODE ON-OFF switch to OFF.
2. Set COMPRESSOR MODE AC/AUTO-DC-BOTH switch to DC.

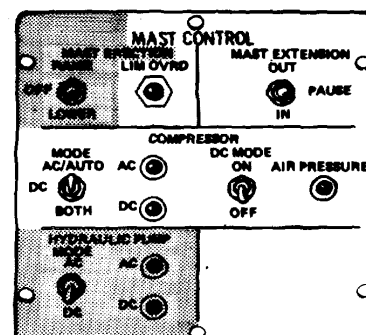
B. TEST

TEST HYDRAULIC PUMP MODE INDICATORS:

1. Set HYDRAULIC PUMP MODE AC-DC switch to AC.
2. Press and hold MAST ERECTION RAISE-OFF-LOWER switch to RAISE.
3. Verify that AC MODE indicator lights.
4. Press and hold MAST ERECTION switch to LOWER.
5. Verify that AC MODE indicator lights.
6. Set HYDRAULIC PUMP MODE AC-DC switch to DC.
7. Press and hold MAST ERECTION RAISE-OFF-LOWER switch to RAISE.
8. Verify that DC MODE indicator lights.
9. Press and hold MAST ERECTION switch to LOWER.
10. Verify that DC MODE indicator lights.

TEST COMPRESSOR MODE INDICATORS:

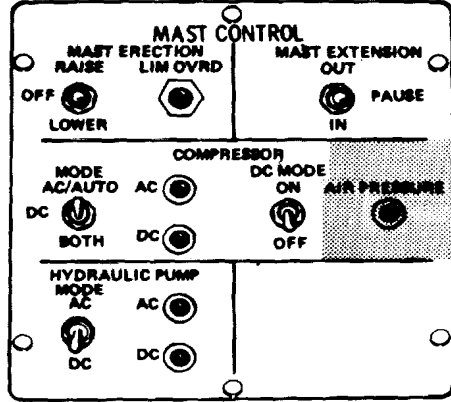
1. Set COMPRESSOR DC MODE ON-OFF switch on mast control to ON.
2. Verify that COMPRESSOR DC MODE indicator lights.



3-21. MAST CONTROL POST-MAINTENANCE TEST - Continued

STEP	PROCEDURE
	3. Set CONTROL AC-DC switch on ICD to AC. 4. Set COMPRESSOR MODE AC/AUTO-DC-BOTH switch to AC/AUTO. 5. Verify that COMPRESSOR DC MODE indicator on mast control is off 6. Verify that COMPRESSOR AC MODE indicator is now on. 7. Set COMPRESSOR MODE AC/BOTH-DC-BOTH switch to DC. 8. Set COMPRESSOR DC MODE ON-OFF switch to OFF. 9. Set CONTROL AC-DC switch on ICD to DC.

3-21. MAST CONTROL POST-MAINTENANCE TEST - Continued

STEP	PROCEDURE
	TEST AIR PRESSURE INDICATOR: Verify that AIR PRESSURE indicator lights when power is applied to test setup.  The diagram shows a rectangular control panel with several sections. At the top, it is labeled 'MAST CONTROL'. Below this, there are two main columns of controls. The left column includes a 'MAST ERECTION' section with 'RAISE' and 'LOWER' buttons, and a 'LIMIT OVRD' (override) button. The right column includes a 'MAST EXTENSION' section with 'OUT' and 'IN' buttons, and a 'PAUSE' button. Below these, there is a 'COMPRESSOR' section with 'MODE' (AC/AUTO, DC, BOTH) and 'DC MODE' (ON, OFF) buttons. At the bottom, there is a 'HYDRAULIC PUMP' section with 'MODE' (AC, DC) buttons. On the far right, there is a shaded rectangular area labeled 'AIR PRESSURE' which contains a single indicator light. The entire panel is surrounded by a border with small circles at the corners, possibly representing mounting holes. C. SHUTDOWN 1. Turn off 24 Vdc power supply and disconnect 115 Vac connector from maintenance facility 115 Vac power receptacle. 2. Disconnect 24VDC INPUT positive (+) and negative (-) from ICD terminal lugs. 3. Remove 115 VAC connector W6 P1 of ICD from maintenance facility 115 Vac power receptacle. 4. Disconnect CONT (control) connector W2 P1 of ICD from connector J1 of mast control.

SECTION V. ADJUSTMENTS

3-22. SUMMARY

- These adjustment procedures tell you how to set PCA components to actuate at a specific point during operation or within a specific range of operation.
- You will be referenced to these procedures when required by PCA test (para 3-19).
- You will use the same test equipment as that used during PCA test, connected as described in paragraph 3-19.
- Where indicated, you will be setting actuation points while air pressure rises to or falls from specific values. You will use switches on the ICD to raise and lower air pressure, and will monitor continuity with a multimeter to tell you when the component actuates.

3-23. PCA

INITIAL SETUP

Test Equipment

Multimeter AN/URM-105,
6625-00-581-2036
24Vdc Power Supply,
6130-00-148-1796
Interface Coupling Device,
5035604-1

Tools

Refrig Svce Unit Tool Kit,
5180-00-596-1474
7/32 in. flat tip scdr
5/8 in. comb. wr
skt hd scr key set
9/16 in. skt
skt wr hdl
11/16 in. comb. wr

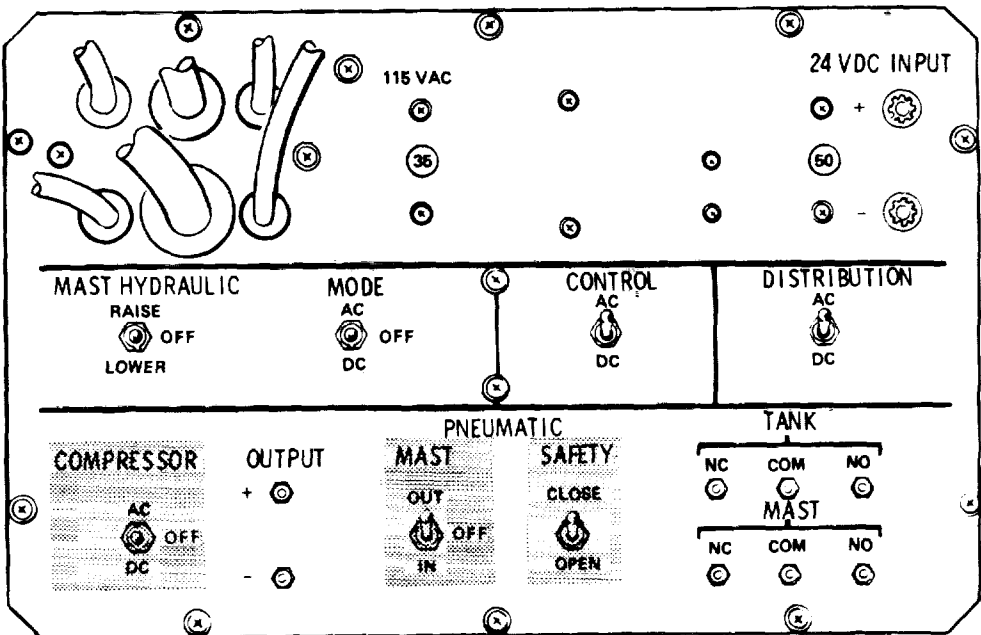
Test (Cont.)

3/4 in. comb wr
1/16 in. hex hd. scr key
1-5/16 in. comb wr,
5120-00-228-9518
1-1/2 in. comb wr,
5120-00-203-4804
1/2 in. pipe cap,
4730-00-625-2212
1 in. pipe cap,
4730-00-994-0829
Elec jumper, 6625-00-400-8731

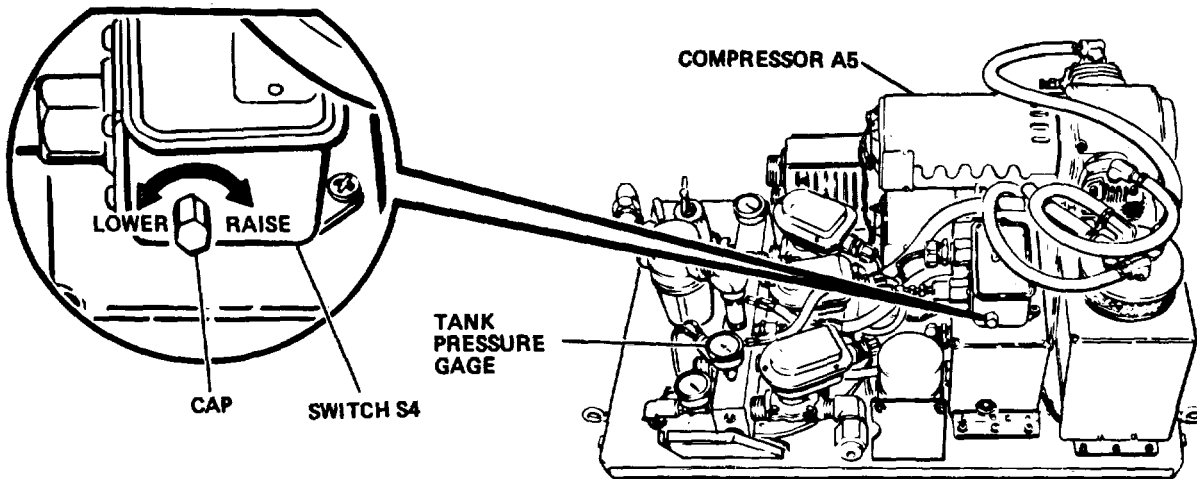
Equipment Condition

<u>Para</u>	<u>Condition Description</u>
3-10a	PCA cover removed
3-19	Test Equipment connected

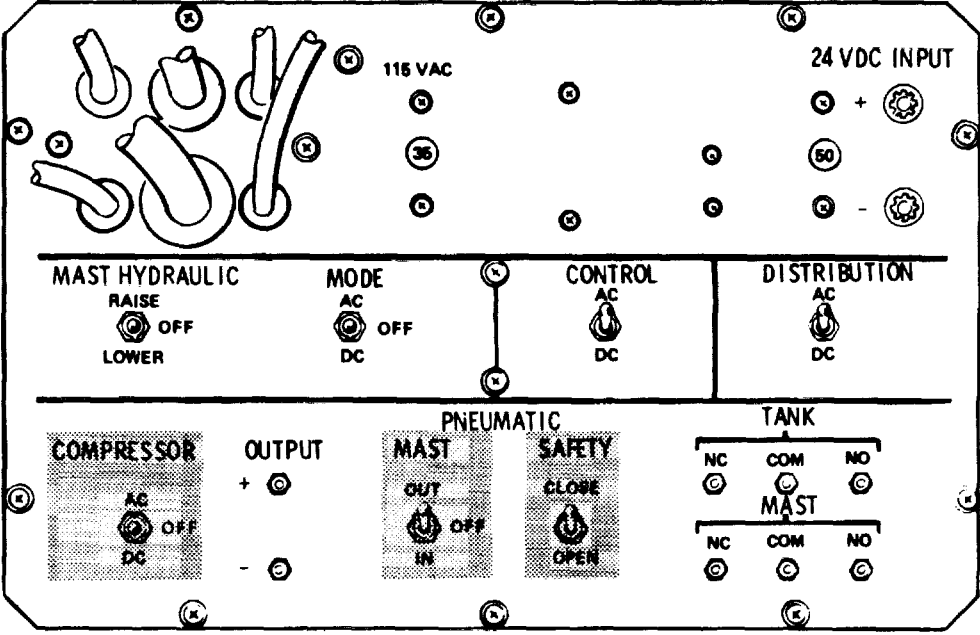
3-23. PCA - Continued

STEP	PROCEDURE
	A. ADJUSTMENT OF SHUTOFF POINT FOR AC COMPRESSOR AS  1. Set SAFETY switch to CLOSE. 2. Set MAST switch to OFF. 3. Set COMPRESSOR switch to AC and wait for pressure on TANK PRESSURE gage to stop rising.

3-23. PCA - Continued

STEP	PROCEDURE
	 The diagram shows a mechanical unit with a compressor labeled 'COMPRESSOR A5' and a 'TANK PRESSURE GAGE'. A callout provides a detailed view of 'SWITCH S4', which has an adjusting screw with a 'CAP' and a scale with 'LOWER' and 'RAISE' directions. An arrow points from the callout to the switch on the main unit.
4.	Set SAFETY switch to OPEN. When pressure on TANK PRESSURE gage drops below 80 psig, set SAFETY switch to CLOSE. Verify that compressor A5 has started and pressure indication on gage is rising. Note pressure when compressor A5 stops running. • If compressor A5 does not start or stops running below 95 psig, remove cap on end of switch S4 and turn adjusting screw clockwise to raise shutoff point to 95 psig. • If compressor A5 stops running above 95 psig, turn adjusting screw on end of switch S4 counterclockwise to lower shutoff point to 95 psig.
5.	Repeat step 4, and readjust if necessary.
6.	Reinstall cap over adjusting screw.
7.	Set COMPRESSOR switch to OFF.
8.	Set SAFETY switch to OPEN.

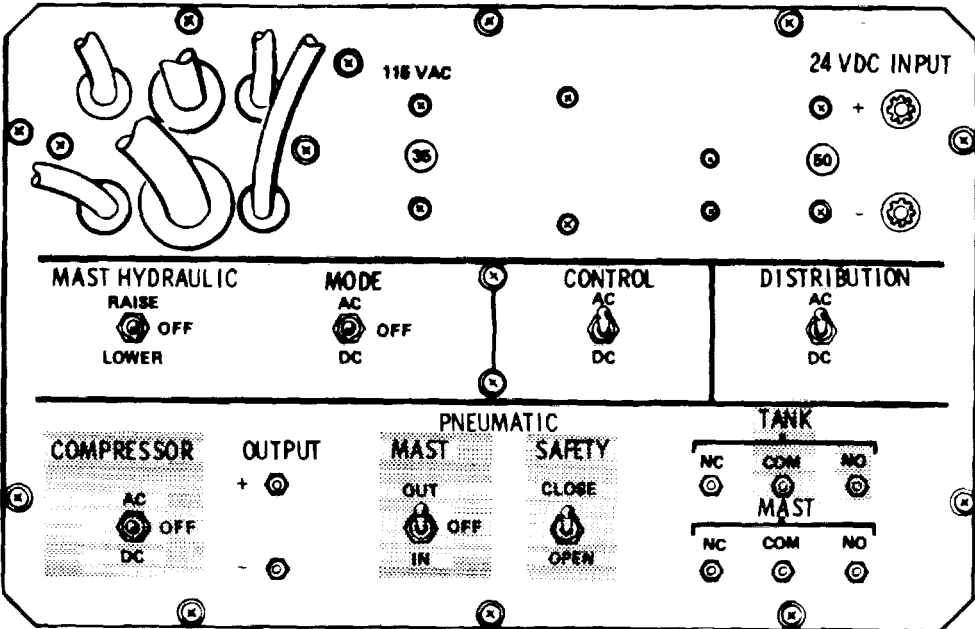
3-23. PCA - Continued

STEP	PROCEDURE
	B. ADJUSTMENT OF SHUTOFF POINT FOR DC COMPRESSOR AI  1. Set SAFETY switch to CLOSE. 2. Set MAST switch to OFF. 3. Set COMPRESSOR switch to DC and wait for pressure on TANK PRESSURE gage to stop rising.

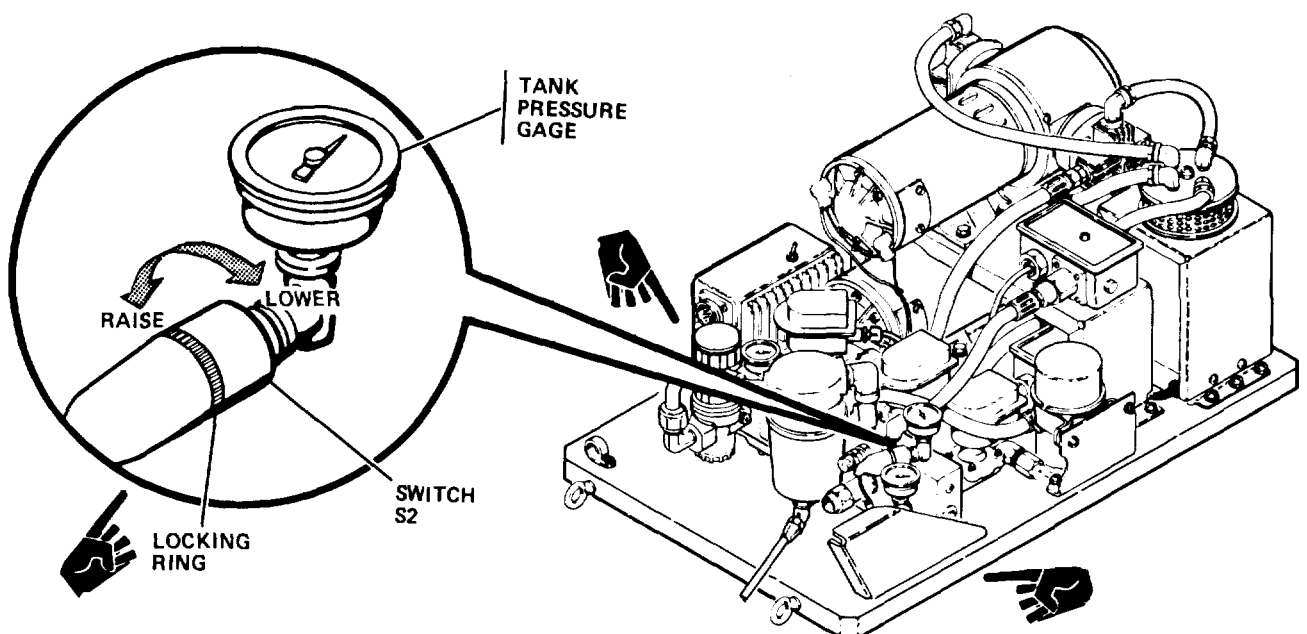
3-23. PCA - Continued

STEP	PROCEDURE
	The diagram illustrates the PCA unit with labels for COMPRESSOR A1, TANK PRESSURE GAGE, and a detailed view of SWITCH S1. The detailed view shows the switch S1 with a BRACKET, a CAP, and labels for LOWER and RAISE positions. 4. Set SAFETY switch to OPEN. When pressure on TANK PRESSURE gage drops below 80 psig, set SAFETY switch to CLOSE. Verify that compressor A1 has started and pressure indication on gage is rising. Note pressure when compressor A1 stops running. • If compressor A1 stops running below 95 psig, remove cap on end of switch S1 and turn adjusting screw on clockwise to raise shutoff point to 95 psig. • If compressor A1 stops running above 95 psig, turn adjusting screw on end of switch S1 counterclockwise to lower shutoff point to 95 psig. 5. Repeat step 4, and readjust if necessary. 6. Reinstall cap over adjusting screw. 7. Set COMPRESSOR switch to OFF. 8. Set SAFETY switch to OPEN.

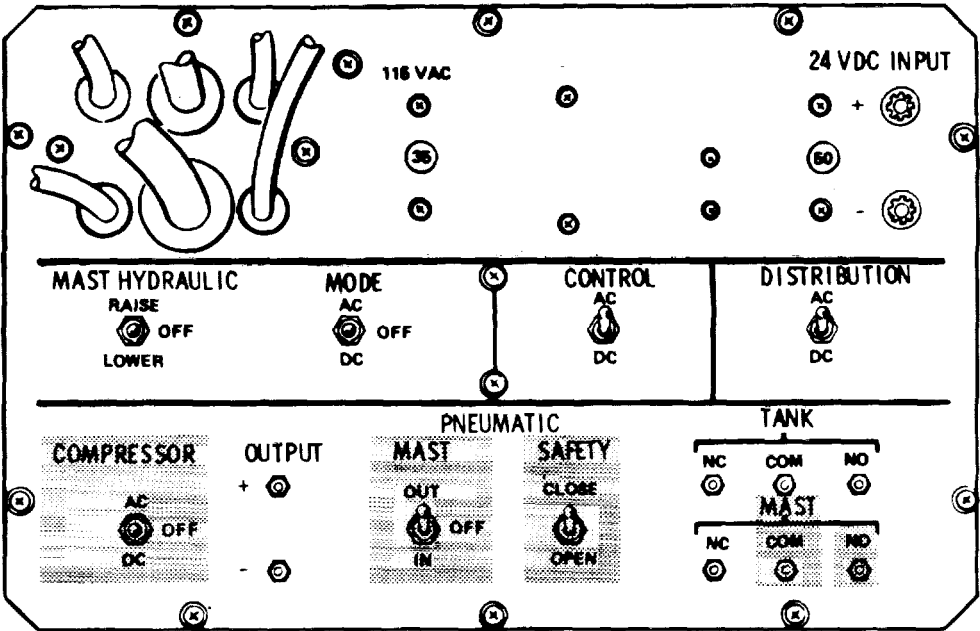
3-23. PCA - Continued

STEP	PROCEDURE
	C. ADJUSTMENT OF ACTUATION POINT OF AIR PRESSURE INDICATION SWITCH S2  1. Set SAFETY switch to CLOSE. 2. Set MAST switch to OUT. 3. Loosen locking ring on switch S2 (on early models loosen setscrew on side of switch S2). 4. Set COMPRESSOR switch to AC. NOTE To lower and raise tank pressure while adjusting air pressure indication switch, set S2 MAST switch, momentarily to IN or OUT as required. 5. While monitoring continuity with multimeter connected between TANK NO and COMM test jacks, rotate switch S2 as required to obtain continuity (switch closure) as pressure at TANK PRESSURE gage rises to 80-85 psig. Rotate switch S2 as follows to change actuation point: • clockwise to lower point (on early models to raise point). • counterclockwise to raise point (on early models to lower point). 6. When setting is correctly adjusted, tighten locking ring or setscrew, as applicable on switch S2.

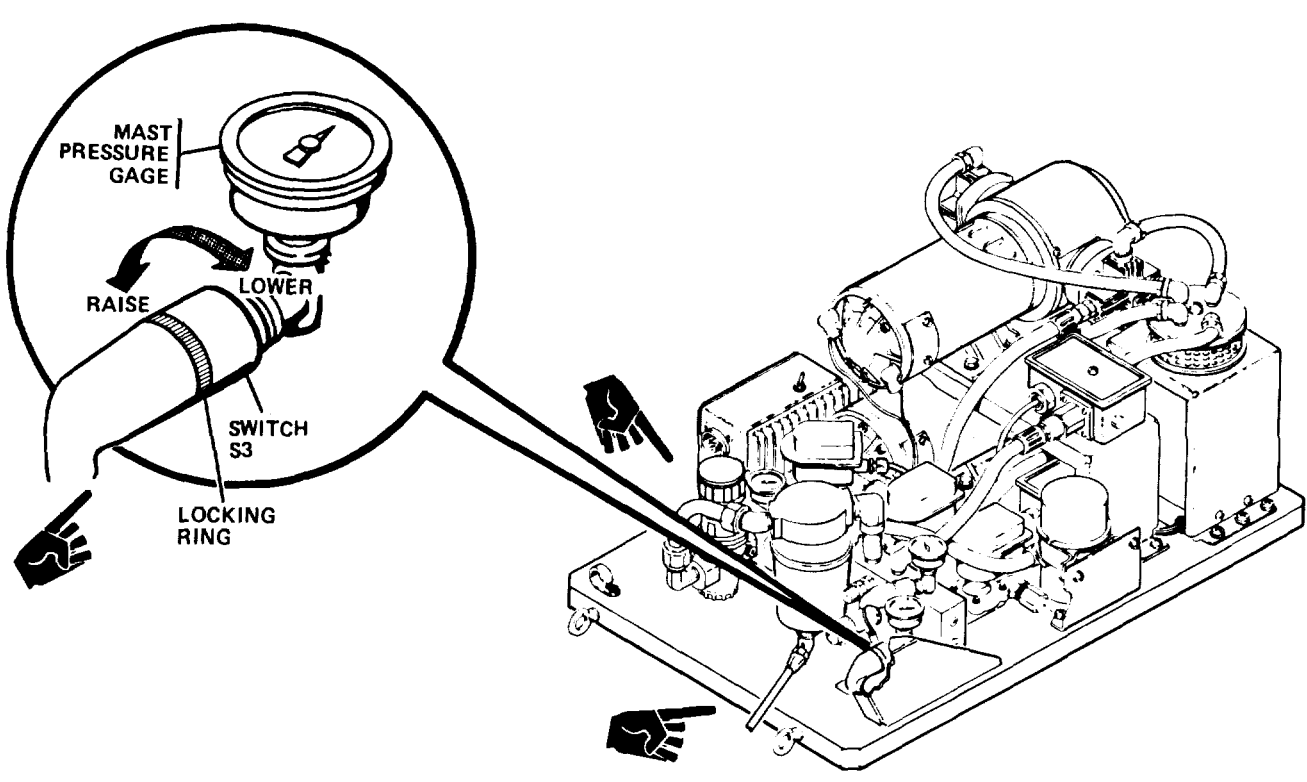
3-23. PCA - Continued

STEP	PROCEDURE
	 7. Repeat steps 4 and 5 to verify proper adjustment of switch S2. 8. Set COMPRESSOR switch to OFF. 9. Set SAFETY switch to OPEN.

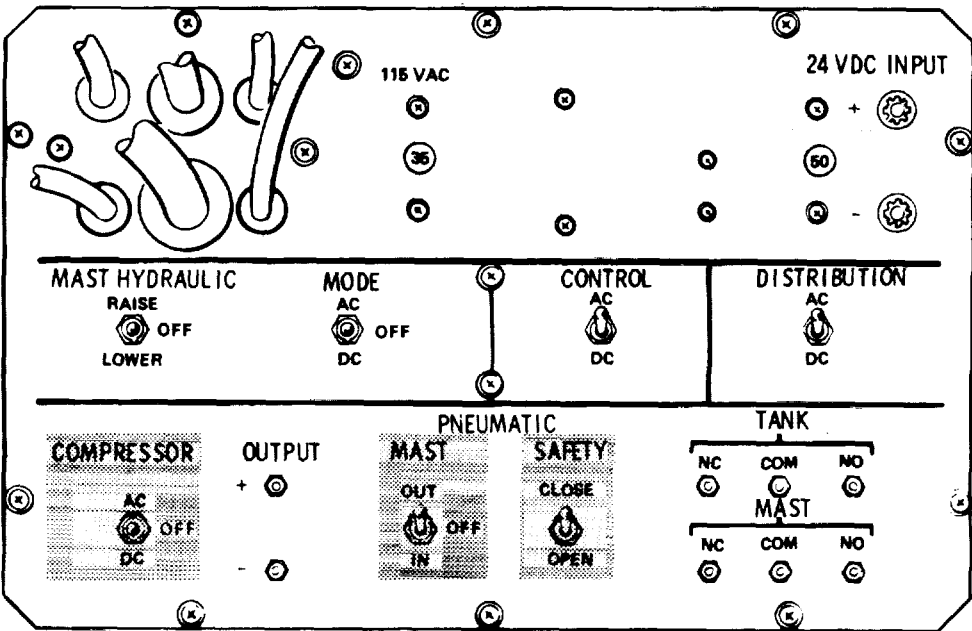
3-23. PCA - Continued

STEP	PROCEDURE
	D. ADJUSTMENT OF ACTUATION POINT OF ANTI-JOG SWITCH S3.  1. Set SAFETY switch to CLOSE. 2. Set MAST switch to OUT. 3. Loosen locking ring on switch S3 (on early models loosen setscrew on side of switch S3). 4. Set COMPRESSOR switch to AC. 5. While monitoring continuity with multimeter connected between MAST NO and COMM test jacks, rotate switch S3 as required to obtain no continuity (switch open) as pressure at MAST PRESSURE gage decreases within 3-10 psig range. Rotate switch S3 as follows to change actuation point: • clockwise to lower point (on early models to raise point). • counterclockwise to raise point (on early models on lower point). NOTE To lower pressure at MAST PRESSURE gage, set MAST switch to OFF and use manual control knob on solenoid valve A3 to slowly release pressure. To increase pressure, set MAST switch to OUT. 6. When setting is correctly adjusted, tighten locking ring or setscrew, as applicable on switch S3.

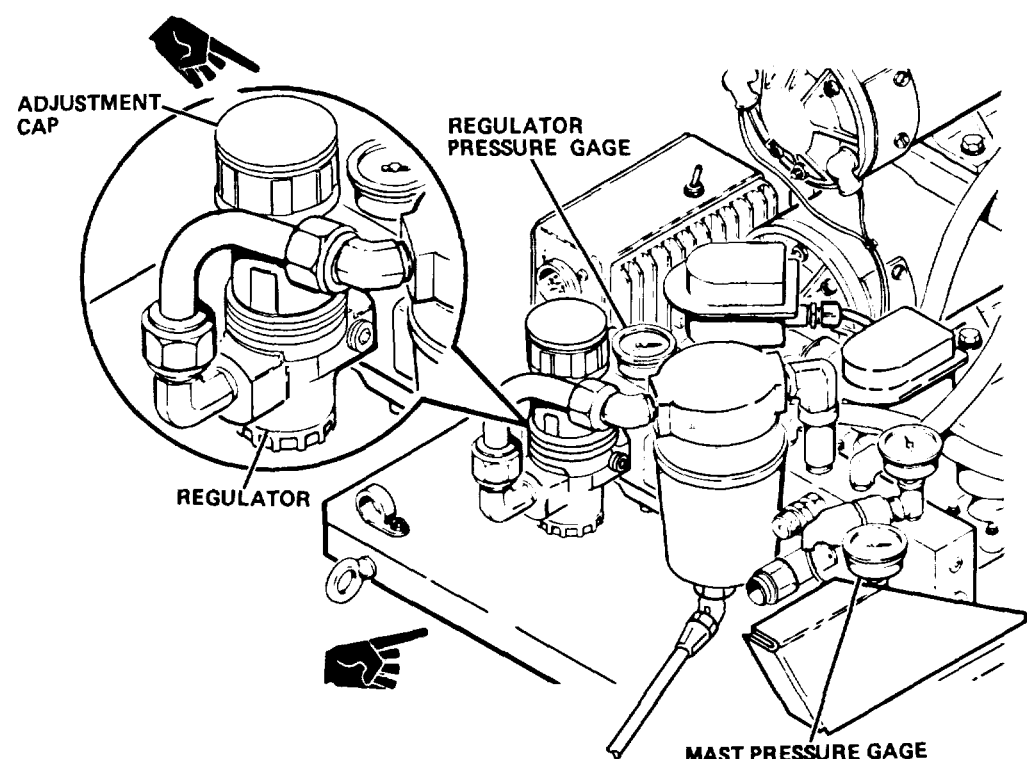
3-23. PCA - Continued

STEP	PROCEDURE
	
7.	Repeat steps 4 and 5 to verify proper adjustment of switch S3.
8.	Set COMPRESSOR switch to OFF.
9.	Set SAFETY switch to OPEN.

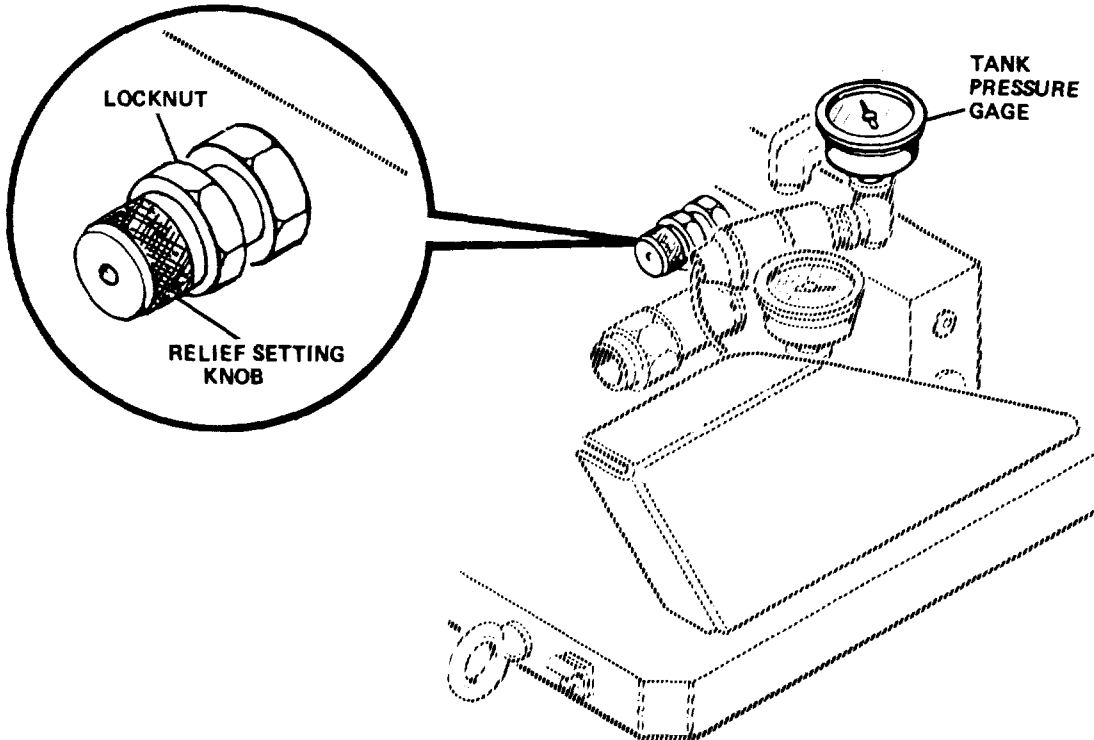
3-23. PCA - Continued

STEP	PROCEDURE
	E. ADJUSTMENT OF MAXIMUM MAST AIR PRESSURE  1. Set SAFETY switch to CLOSE. 2. Set MAST switch to OUT. 3. Set COMPRESSOR switch to AC. NOTE On early models a T-handle and locking nut are installed Instead of the adjustment cap. 4. Pull up on air pressure regulator adjustment cap (or on early models loosen locking nut). 5. Observe pressure indication on REGULATOR PRESSURE and MAST PRESSURE gages, and adjust regulator as follows to obtain a 35 psig indication on both gages: • To increase pressure indications turn regulator adjustment cap or T-handle as applicable, clockwise. • To decrease pressure indications turn regulator adjustment cap or T-handle as applicable, fully counterclockwise. Then increase pressure indications.

3-23. PCA - Continued

STEP	PROCEDURE
	 The diagram illustrates the air pressure regulator assembly. A circular inset provides a close-up view of the regulator, showing the adjustment cap and the regulator body. A hand icon points to the adjustment cap. The main diagram shows the regulator connected to the air pressure system, with a regulator pressure gage and a mast pressure gage. A hand icon points to the regulator body.
6.	Set MAST switch to IN.
7.	When indication on mast pressure gage drops below 25 psig, set MAST switch to OUT and verify that both gages return to 35 psig. If not, repeat steps 5 through 7.
8.	Press air pressure regulator adjustment cap down (or tighten locking nut on early models).
9.	Set COMPRESSOR switch to OFF.
10.	Set SAFETY switch to OPEN.

3-23. PCA - Continued

STEP	PROCEDURE
	F. ADJUSTMENT OF SAFETY RELIEF VALVE  The diagram illustrates the adjustment of the safety relief valve. A circular inset provides a detailed view of the 'RELIEF SETTING KNOB' and the 'LOCKNUT' on the valve. The main diagram shows the 'TANK PRESSURE GAGE' mounted on a tank, with various hoses and valves connected to it. 1. Set SAFETY switch to CLOSE. 2. Set MAST switch to OFF. 3. Set COMPRESSOR switch to AC. 4. Wait until pressure rises to between 90 to 95 psi as indicated by tank pressure gage. 5. Loosen locknut. 6. Rotate relief setting knob counterclockwise until you hear air escaping. 7. Rotate relief setting knob clockwise two complete turns. 8. Tighten locknut.

CHAPTER 4
AUXILIARY EQUIPMENT MAINTENANCE
FOR
INTERFACE COUPLING DEVICE

SECTION I. INTRODUCTION

4-1. SCOPE

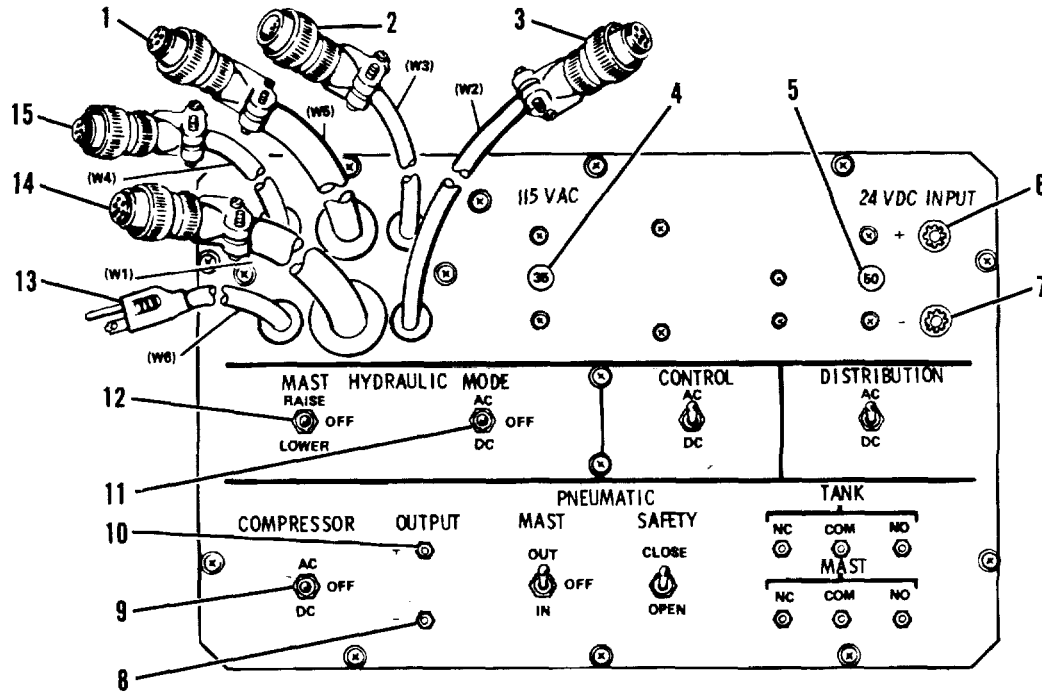
This chapter provides instructions for use and maintenance of the Interface Coupling Device (ICD)

4-2. PURPOSE OF EQUIPMENT

- Provides power and controls for off-equipment testing of the following:
 - mast control
 - pneumatic components assembly (PCA)
 - hydraulic components assembly (HCA)
 - distribution box

SECTION II. DESCRIPTION AND OPERATION

4-3. OPERATOR CONTROLS AND INDICATORS



CIRCUIT BREAKERS AND INTERCONNECTIONS

- a. 115 VAC circuit breaker (4). Protects against overloads in 115 Vac supply. Rated at 35A.
- b. 24 VDC INPUT circuit breaker (5). Protects against overloads in 24 Vdc supply. Rated at 50A.
- c. 24 VDC INPUT binding posts (6) and (7). Provides connections for applying 24 Vdc to ICD.
 - + -- Connection for positive lead (6)
 - -- Connection for negative lead (7)
- d. Cable assembly W1 (14). Provides connector P1 for interconnections to Hydraulic Components Assembly (HCA) under test.
- e. Cable assembly W2 (3). Provides connector P1 for interconnections to Mast Control under test.
- f. Cable assembly W3 (2). Provides connector P1 for interconnections to Distribution Box under test.

- g. Cable assemblies W4, W5 (15) and (1). Each provide a connector P1 for interconnections to Pneumatic Components Assembly (PCA) under test.
- h. Cable assembly W6 (13). Provides three-prong connector P1 for interconnections between ICD and 115 Vac supply.

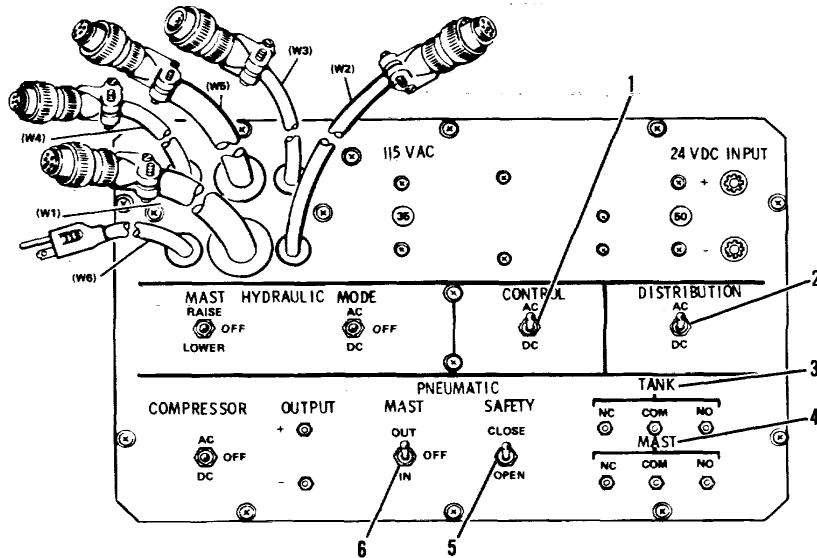
HYDRAULIC CONTROLS FOR TESTING HCA

- i. MODE switch (11). Three-position switch that selects power source for HCA testing.
 - AC -- Applies 115 Vac to drive 90 Vdc hydraulic pump
 - OFF -- Removes all drive to hydraulic pumps
 - DC -- Applies 24 Vdc to drive 24 Vdc hydraulic pump
- j. MAST switch (12). Three-position switch that applies 24 Vdc to select flow direction in 4-way valve.
 - RAISE -- Selects 4-way valve port for raising mast
 - OFF -- Places all ports of 4-way valve in common and unpressurized
 - LOWER -- Selects 4-way valve port for lowering mast

PNEUMATIC CONTROLS FOR TESTING PCA

- k. COMPRESSOR switch (9). Three-position switch that selects power source for compressor testing.
 - AC -- Applies 115 Vac to drive 24 Vdc Compressor
 - OFF -- Removes all drive to compressors
 - DC -- Applies 24 Vdc to drive 24 Vdc Compressor
- l. OUTPUT tip jacks (8) and (10). Provides monitoring test points for rectified 24 Vdc.
 - + -- Connects to positive side of rectified voltage (10)
 - -- Connects to negative side of rectified voltage (8)

PNEUMATIC CONTROLS FOR TESTING PCA - Continued



- m. PNEUMATIC MAST switch (6). Three-position switch that controls pressurization of mast
 - OUT -- Opens valve that extends mast
 - OFF -- Neither extends nor retracts mast; traps pressure in mast
 - IN -- Opens valve that retracts mast
- n. PNEUMATIC SAFETY switch (5). Two-position switch that controls valve used to prevent mast pressurization under adverse conditions.
 - CLOSE -- Permits mast to pressurize
 - OPEN -- Vents pressure from mast
- o. TANK tip jacks (3). Three test points used for continuity-test monitoring of tank pressure switch.
 - NC -- Normally closed contacts make contact with tank depressurized
 - COM -- Common point used for reference
 - NO -- Normally open contacts make contact with tank pressurized
- p. MAST tip jacks (4). Three test points used for continuity test monitoring of mast pressure switch.
 - NC -- Normally closed contacts make contact with mast depressurized
 - COM -- Common point used for reference
 - NO -- Normally open contacts make contact with mast pressurized

CONTROL SWITCH FOR TESTING MAST CONTROL

- q. CONTROL switch (1). Two-position switch that controls 24 Vdc to relay

AC -- Applies 24 Vdc for availability to energize relay and prevent Compressor A1 operation

DC -- Removes 24 Vdc to keep relay de-energized to permit selection of Compressor A1 operation

DISTRIBUTION SWITCH FOR TESTING DISTRIBUTION BOX

- r. DISTRIBUTION switch (2). Two-position switch that controls relays which, in turn, apply source power.

AC -- Energizes relay that selects 115 Vac for source power

DC -- Energizes relay that selects 24 Vdc for source power

4-4. PRINCIPLES OF OPERATION

The ICD is a special-purpose test aid that is enclosed in a man-portable, self-contained case. All test cables are stowed in the hinged cover of the case. A lid in the hinged cover provides access to the cables. Opening the hinged cover exposes a panel that contains all operator controls.

The ICD routes source power and provides controls for individually testing major assemblies after repair or upon receipt. Assemblies tested are:

Hydraulic Components Assembly

Pneumatic Components Assembly

Distribution Box

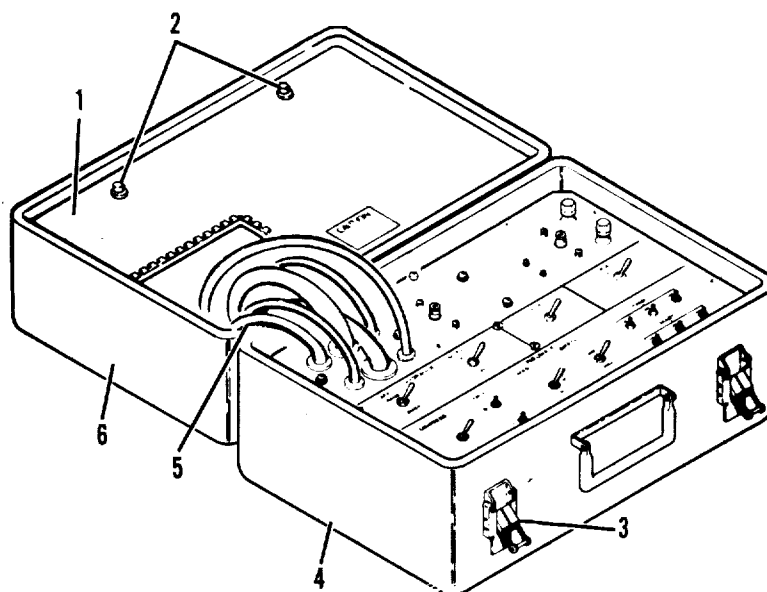
Mast Control

Two circuit breakers protect the source power against overloads. A diode rectifier converts the 115 Vac source power to dc before its application to the hydraulic components assembly. Another diode prevents accidentally polarity-reversed 24 Vdc source power from being switched to equipment-under-test.

Operator control is through the positioning of toggle switches. Each switch position causes a particular reaction in the equipment-under-test. An integral relay provides a high-current, switchable path of the 24 Vdc source power to the hydraulic components assembly.

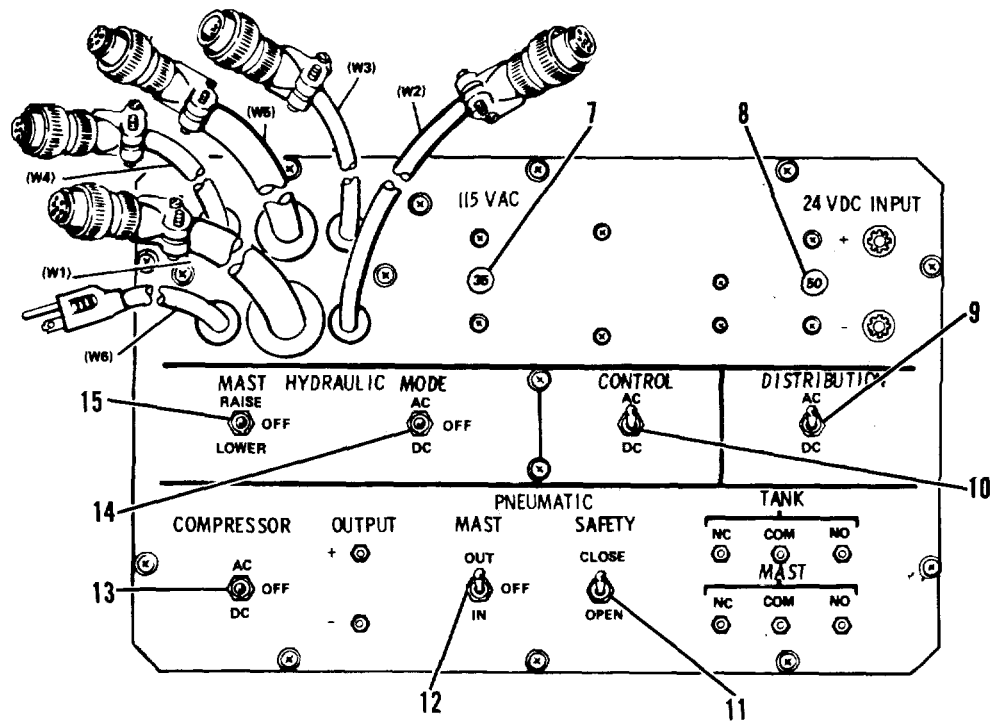
Test points enable operator monitoring of the pneumatic components assembly. The actual voltage of the rectified dc can be measured. The presence or absence of pressure in the tank and mast lines can also be determined.

4-5. PREPARATION FOR USE



REMOVING COVER

- a. Release two catch clamps (3) holding hinged cover (6) closed to case (4).
- b. Open hinged cover (6).
- c. Press two pushbutton fasteners (2) to release lid (1) from hinged cover (6), exposing six stowed cables (5).
- d. Remove six cables (5) from stowed position.



INITIAL SWITCH SETTINGS

e. HYDRAULIC

- (1) MAST switch (15) to OFF.
- (2) MODE switch (14) to OFF.

f. PNEUMATIC

- (1) COMPRESSOR switch (13) to OFF.
- (2) MAST switch (12) to OFF.
- (3) SAFETY switch (11) to OPEN.

g. DISTRIBUTION switch (9) to DC.

h. CONTROL switch (10) to DC.

i. 24 VDC INPUT (8) and 115 VAC (7) circuit breakers pressed in (not tripped).

4-5. PREPARATION FOR USE - Continued

INPUT POWER CONNECTIONS

WARNING

Make connections to equipment-under-test before performing following steps. Faulty wiring could cause serious Injury if connections are made with power applied.

CAUTION

Make sure contacts of unused cable connectors are not shorted by tools and other metal objects in the work area. Make sure plastic connector covers are installed on all unused cable connectors.

NOTE

Connect the 24 Vdc input only if you are going to use the ICD to perform a post-maintenance test on an assembly. The 24 Vdc Input is not required to perform maintenance on the ICD.

- j. Connect wire lead from 24 VDC INPUT + binding post to + output terminal of 24 Vdc power supply.
- k. Connect wire lead from 24 VDC INPUT - binding post to output terminal of 24 Vdc power supply.
- l. Connect 115 VAC connector W6P1 to 115 Vac power receptacle.
- m. Apply ac and dc power.

4-6. SHUTDOWN

REMOVAL OF POWER

- a. If controllable, turn-off ac and dc power at sources.
- b. Disconnect connector W6P1 from 115 Vac power receptacle.
- c. Disconnect wire lead from + output terminal of 24 Vdc power supply and 24 VDC INPUT + binding post of ICD.
- d. Disconnect wire lead from - output terminal of 24 Vdc power supply and 24 VDC INPUT - binding post of ICD.

Section III. ICD GENERAL SUPPORT MAINTENANCE

OVERVIEW

This section contains complete maintenance information for the ICD. This includes troubleshooting, maintenance instructions, and test procedure. Table 4-1 contains the complete troubleshooting information for isolating ICD malfunctions to replaceable parts.

Unless otherwise indicated in the INITIAL SETUP, each general support maintenance task has a personnel requirement of one Utilities Equipment Repairman.

4-7. ICD TROUBLESHOOTING

- Read Failure Symptom recorded on tag attached to faulty ICD.
- Refer to Symptom Index and find applicable MALFUNCTION entry.
- Refer to INITIAL SETUP for preparation.
- Refer to the RPSTL, TM 11-5985-368-34P, for identification of special tools.
- Turn to referenced MALFUNCTION in table 4-1 and troubleshoot as directed.

SYMPTOM INDEX	
<u>SYMPTOM</u>	<u>MALFUNCTION NO.</u> <u>(Table 4-1)</u>
Failed to test distribution box	1
Failed to test HCA pump motor with ac power	7
Failed to test HCA pump motor with dc power	8
Failed to test mast control	2
Failed to test mast extension or retraction function of PCA	5
Failed to test mast raising or lowering function of HCA	9
Failed to test safety valve of PCA	6
Failed to test PCA compressor with ac power	3
Failed to test PCA compressor with dc power	4

NOTE

Refer to the ICD schematic diagram (FO.8) and the Wire List (appx D), and check continuity of harness wires. Make certain the wire harness connections are clean and secure. Replace wire harness only if an open or shorted wire is found.

INITIAL SETUPTest Equipment

Multimeter , AN/URM-105
6625-00-581-2036

Equipment
Condition

ParaCondition Description

4-5

Cover removed

4-5

Initial switch settings
selected

4-8a

Panel removed

Tools

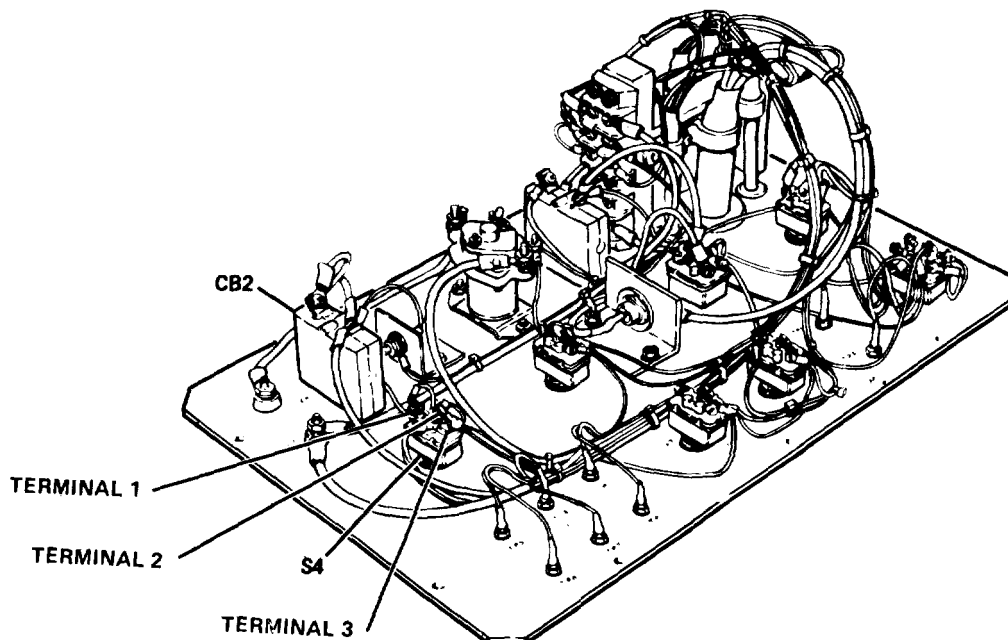
Refrig Unit Svce Tool Kit,
5180-00-596-1474
5/16 in. comb. wr
No. 1 xtip scdr

TABLE 4-1. TROUBLESHOOTING
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

1. FAILED TO TEST DISTRIBUTION BOX



Step 1. Measure continuity between two terminals of 24 VDC INPUT circuit breaker CB2. Be sure that plunger on circuit breaker CB2 is down (closed).

- If continuity is present, go to step 2.
- If there is no continuity, circuit breaker CB2 is defective. Replace CB2 (para 4-8e).

Step 2. Measure continuity between terminals 1 and 2 of DISTRIBUTION switch S4. Be sure that switch S2 is in the DC position.

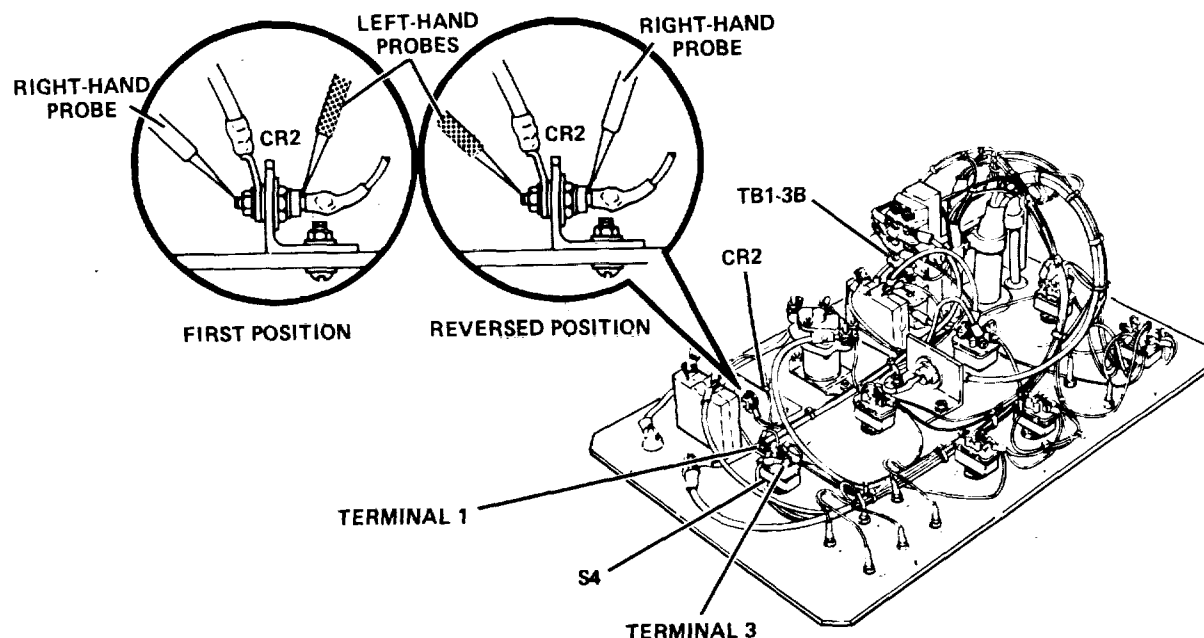
- If continuity is present, go to step 3.
- If there is no continuity, switch S4 is defective. Replace S4 (para 4-8g).

TABLE 4-1. TROUBLESHOOTING Continued
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

1. FAILED TO TEST DISTRIBUTION BOX - Continued



Step 3. Measure continuity across semiconductor diode CR2. Check resistance on 2 kohm range across diode CR2 in first position; then reverse leads and check resistance in reverse position across diode.

CR2 is good if the ratio between the two ohmmeter readings is 100:1 or greater. For example: if leads in first position read approximately 10 ohms, the leads in the reverse position should read at least 1000 ohms.

- If the ratio between the two ohmmeter readings is not greater than 100:1, replace diode CR2 (para 4-8c)
- If CR2 is good, go to step 4.

Step 4. Set DISTRIBUTION switch S4 to AC.

TABLE 4-1. TROUBLESHOOTING Continued
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

1. FAILED TO TEST DISTRIBUTION BOX - Continued

Step 5. Measure continuity between terminals 2 and 3 of DISTRIBUTION switch S4.

- If continuity is present, go to step 6.
- If there is no continuity, switch S4 is defective. Replace S4 (para 4-8g).

Step 6. Measure continuity between following points:

One Probe

Other Probe

Pin N of connector W3P1

Terminal 1 of S4

Pin P of connector W3P1

Terminal 3 of S4

Pin M of connector W3P1

Terminal 3B of TB1

- If continuity is present each time, wire harness is defective. Refer to paragraph 4-8p.
- If there is no continuity any one time, cable assembly W3 is defective. Replace W3 (para 4-81).

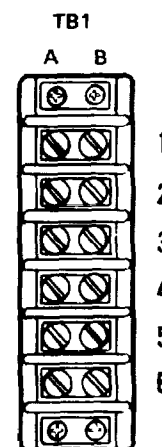
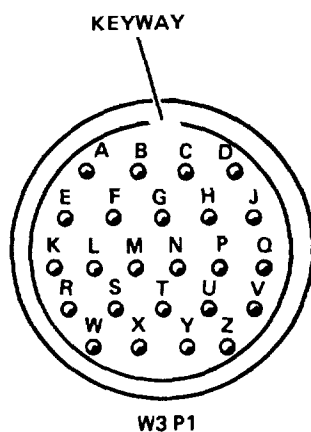
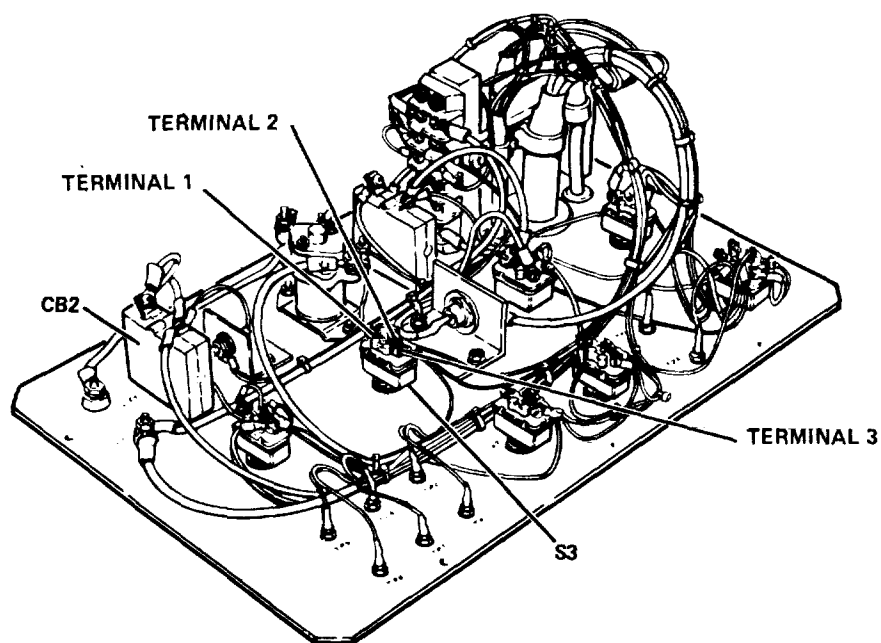


TABLE 4-1. TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****2. FAILED TO TEST MAST CONTROL**

Step 1. Measure continuity between the two terminals of 24 VDC INPUT circuit breaker CB2. Be sure that plunger on circuit breaker CB2 is down.

- If continuity is present, go to step 2.
- If there is no continuity, circuit breaker CB2 is defective. Replace CB2 (para 4-8e).

Step 2. Measure continuity between terminals 2 and 3 of CONTROL switch S3. Be sure that switch S3 is in the AC position.

- If continuity is present, go to step 4.
- If there is no continuity, switch S3 is defective. Replace S3 (para 4-8g).

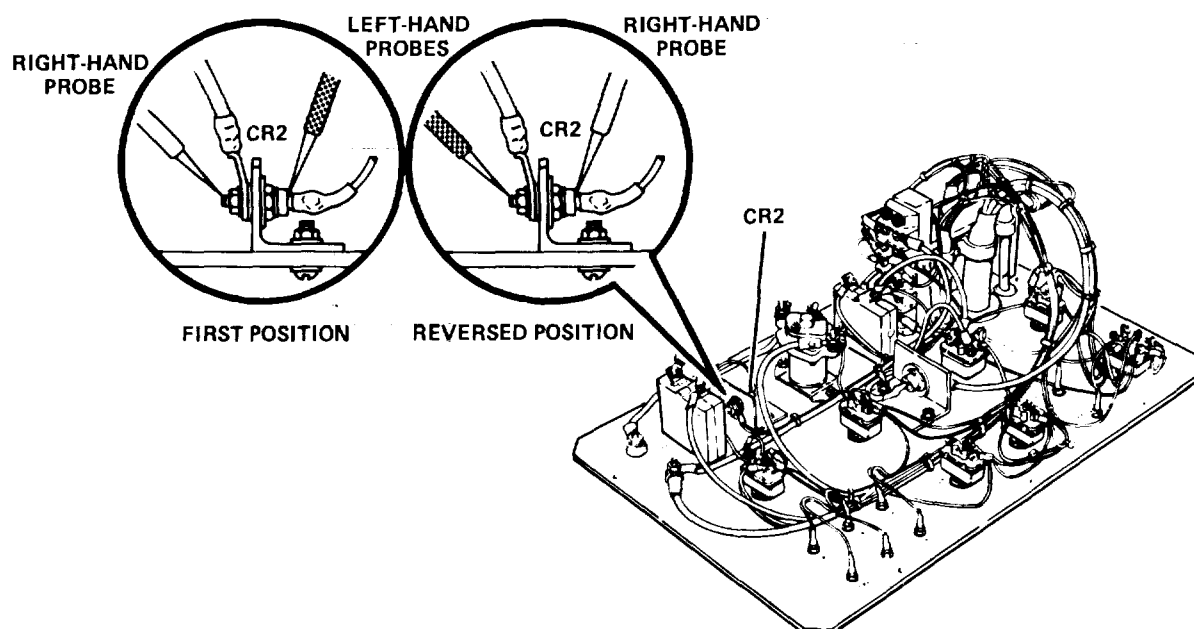
TABLE 4-1. TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

2. FAILED TO TEST MAST CONTROL - Continued

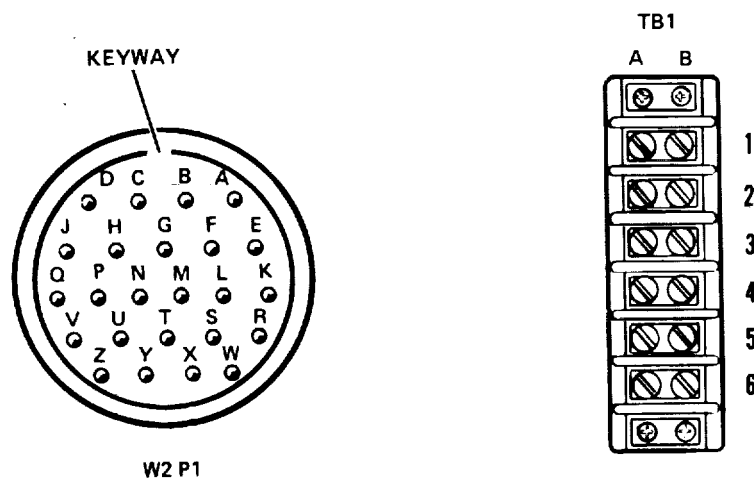


Step 3.

Measure continuity across semiconductor diode CR2. Check resistance on 2 kohm range across diode CR2 in first position; then reverse leads and check resistance in reverse position across diode.

CR2 is good if the ratio between the two ohmmeter readings is 100:1 or greater. For example: if leads in first position read approximately 10 ohms, the leads in the reverse position should read at least 1000 ohms.

- If the ratio between the two ohmmeter readings is not greater than 100:1, replace diode CR2 (para 4-8c)
- If CR2 is good, go to step 4.

TABLE 4-1. TROUBLESHOOTING Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTIVE ACTION****2. FAILED TO TEST MAST CONTROL - Continued**

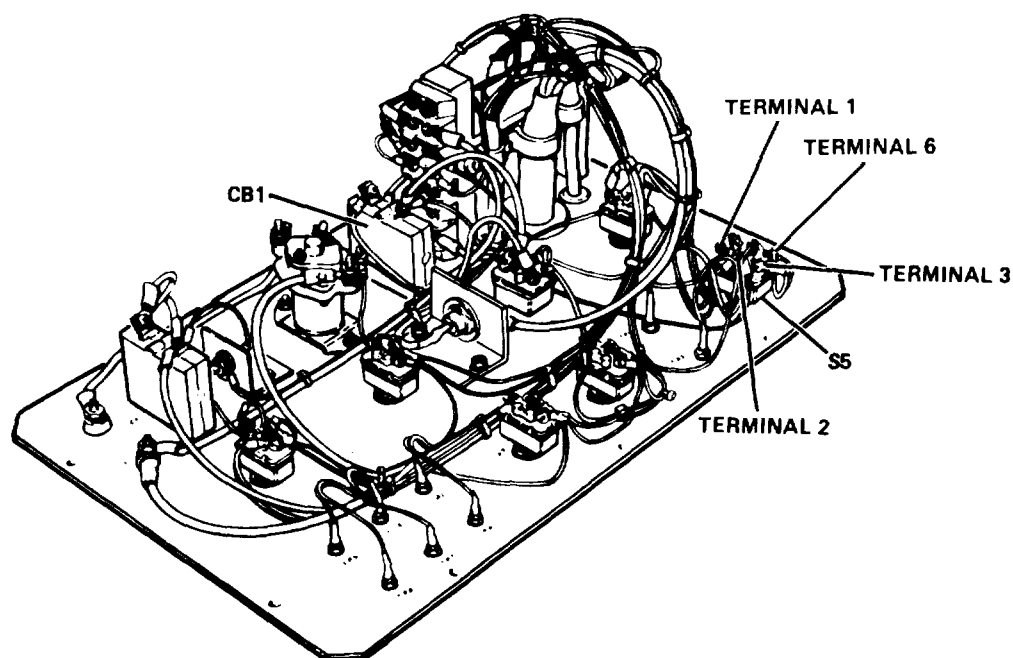
Step 4. Measure continuity between following points:

One Probe to connectorOther Probe to terminal

Pin D of W2P1
 Pin M of W2P1
 Pin H of W2P1
 Pin J of W2P1

3A of TB1
 3A of TB1
 3 of S3
 5 of S5

- If continuity is present each time, wire harness is defective. Refer to paragraph 4-8p.
- If there is no continuity any one time, cable assembly W3 is defective. Replace W2 (para 4-8k).

TAKE 4-1. TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTION ACTION****3. FAILED TO TEST PCA COMPRESSOR WITH AC POWER**

- Step 1. Measure continuity between the two terminals of 115 VAC circuit breaker CB1. Be sure that CB1 reset button is pushed in.
- * If continuity is present, go to step 2.
 - * If there is no continuity, circuit breaker CB1 is defective. Replace CB1 (para 4-8d).
- Step 2. Measure continuity between terminals 2 and 3 of PNEUMATIC COMPRESSOR switch S5. Be sure S5 is in AC position.
- * If continuity is not present, switch S5 is defective. Replace S5 (para 4-8h).
 - * If there is continuity, go to step 3.

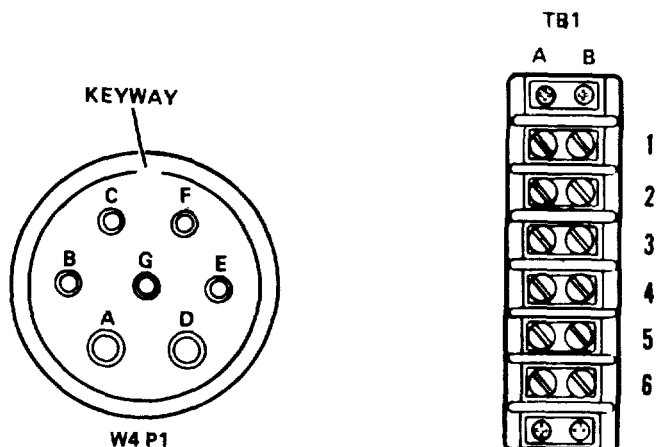
TABLE 4.1. TROUBLESHOOTING -Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTION ACTION

3. FAILED TO TEST PCA COMPRESSOR WITH AC POWER - Continued



Step 3. Measure continuity between following points:

NOTE

If insulation on connector prevents you from making contact with probe on back of TP1-8, use the test point on the front panel .

One Probe on connector

Pin B of W4P1
Pin E of W4P1
Pin G of W4P1
Pin C of W4P1
Pin F of W4P1

Other Probe

Terminal 3 of S5
Terminal 6A of TB1
Any unpainted point on chassis
TP1 (PNEUMATIC OUTPUT)
TP2 (PNEUMATIC OUTPUT)

* If continuity is present each time, go to step 4.

* If there is no continuity any one time, cable assembly W4 is defective. Replace W4 (para 4-8m).

TABLE 4-1. TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTION ACTION****3. FAILED TO TEST PCA COMPRESSOR WITH AC POWER - Continued**

Step 4. Measure continuity between following points:

One Probe on connectorOther Probe

Pin F of W5P1

TP3 (PNEUMATIC TANK NC)

Pin M of W5P1

TP4 (PNEUMATIC TANK COM)

Pin L of W5P1

TP6 (PNEUMATIC MAST NC)

Pin K of W5P1

TP7 (PNEUMATIC MAST COM)

* If continuity is present each time, go to step 5.

* If there is no continuity any one time, cable assembly W5 is defective. Replace W5 (para 4-8n).

Step 5. Measure continuity between following points:

One Probe on connectorOther Probe

Pin HOT of W6P1

Terminal 1 of CB1

Pin NEUT of W6P1

Terminal 6A of TB1

Pin GND of W6P1

Any unpainted point on chassis

* If continuity is present each time, wire harness is defective. Refer to paragraph 4-8p.

* If there is no continuity any one time, cable assembly W6 is defective. Replace W6 (para 4-8o).

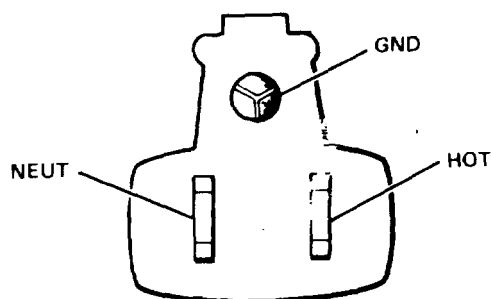


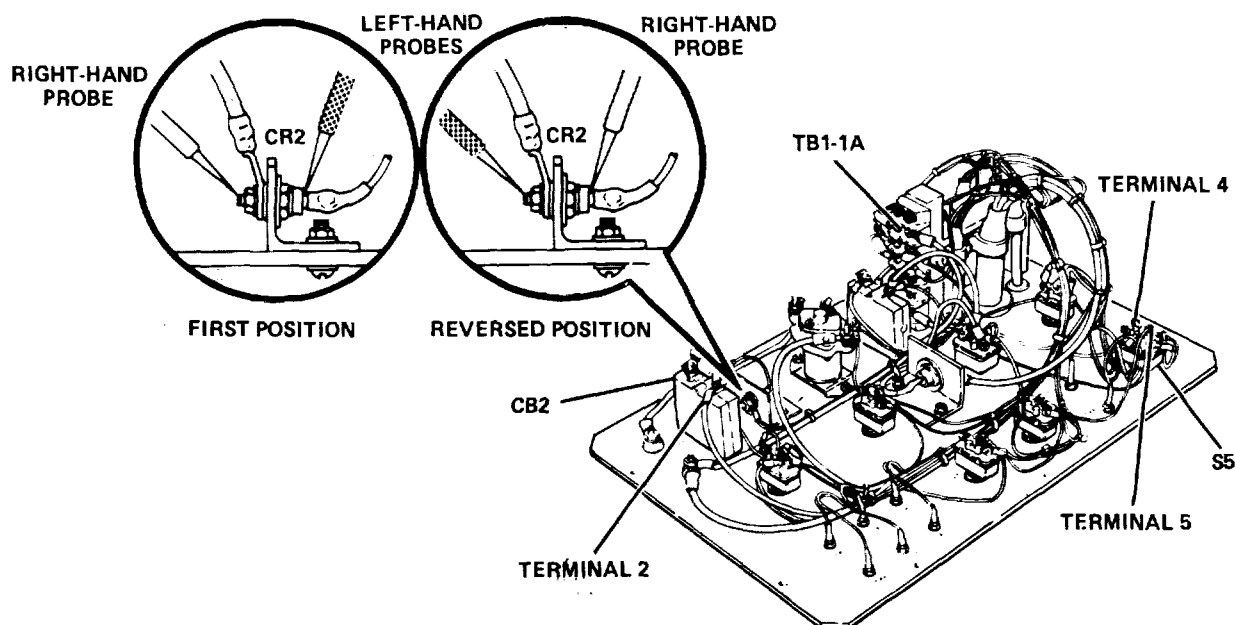
TABLE 4-1. TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTION ACTION

4. FAILED TO TEST PCA COMPRESSOR WITH DC POWER



Step 1. Measure continuity between terminals 1 and 2 of 24 VDC INPUT circuit breaker CB2. Be sure that CB2 reset button is pushed in.

* If continuity is present, go to step 2.

* If there is no continuity, circuit breaker CB2 is defective. Replace CB2 (para 4-8e).

Step 2. Set PNEUMATIC COMPRESSOR switch S5 to DC.

Step 3. Measure continuity between terminals 4 and 5 of PNEUMATIC COMPRESSOR switch S5.

* If continuity is present, go to step 4.

* If there is no continuity, switch S5 is defective. Replace S5 (para 4-8h).

TABLE 4-1. TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTION ACTION****4. FAILED TO TEST PCA COMPRESSOR WITH DC POWER - Continued**

Step 4. Measure continuity across semiconductor diode CR2. Check resistance on 2 kohm range across diode CR2 in first position; then reverse leads and check resistance in reverse position across diode.

CR2 is good if the ratio between the two ohmmeter readings is 100:1 or greater. For example: if leads in first position read approximately 10 ohms, the leads in the reverse position should read at least 1000 ohms.

* If the ratio between the two ohmmeter readings is not greater than 100:1, replace diode CR2 (para 4-8c)

* If CR2 is good, go to step 5.

Step 5. Measure continuity between following points:

One Probe on connectorOther Probe

Pin A of W4P1

Terminal 2 of CB2

Pin D of W4P1

Terminal 1A of TB1

* If continuity is present each time, go to step 6.

* If there is no continuity any one time, cable assembly W4 is defective. Replace W4 (para 4-8m).

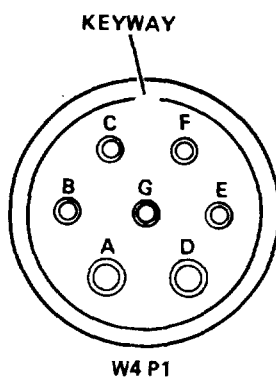


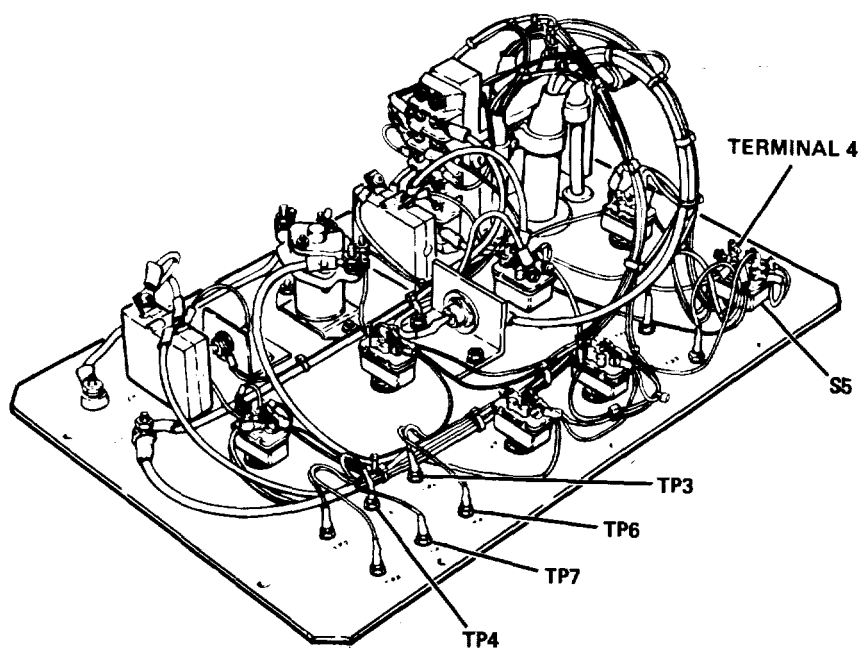
TABLE 4-1. TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTION ACTION

4. FAILED TO TEST PCA COMPRESSOR WITH DC POWER - Continued



Step 6. Measure continuity between following points:

One Probe to connectorOther Probe

Pin A of W5P1
 Pin F of W5P1
 Pin M of W5P1
 Pin L of W5P1
 Pin K of W5P1

Terminal 4 of S5
 TP3 (PNEUMATIC TANK NC)
 TP4 (PNEUMATIC TANK COM)
 TP6 (PNEUMATIC MAST NC)
 TP7 (PNEUMATIC MAST COM)

* If continuity is present each time, wire harness is defective.
 Refer to paragraph 4-8p.

* If there is no continuity any one time, cable W5 is defective.
 Replace W5 (para 4-8n).

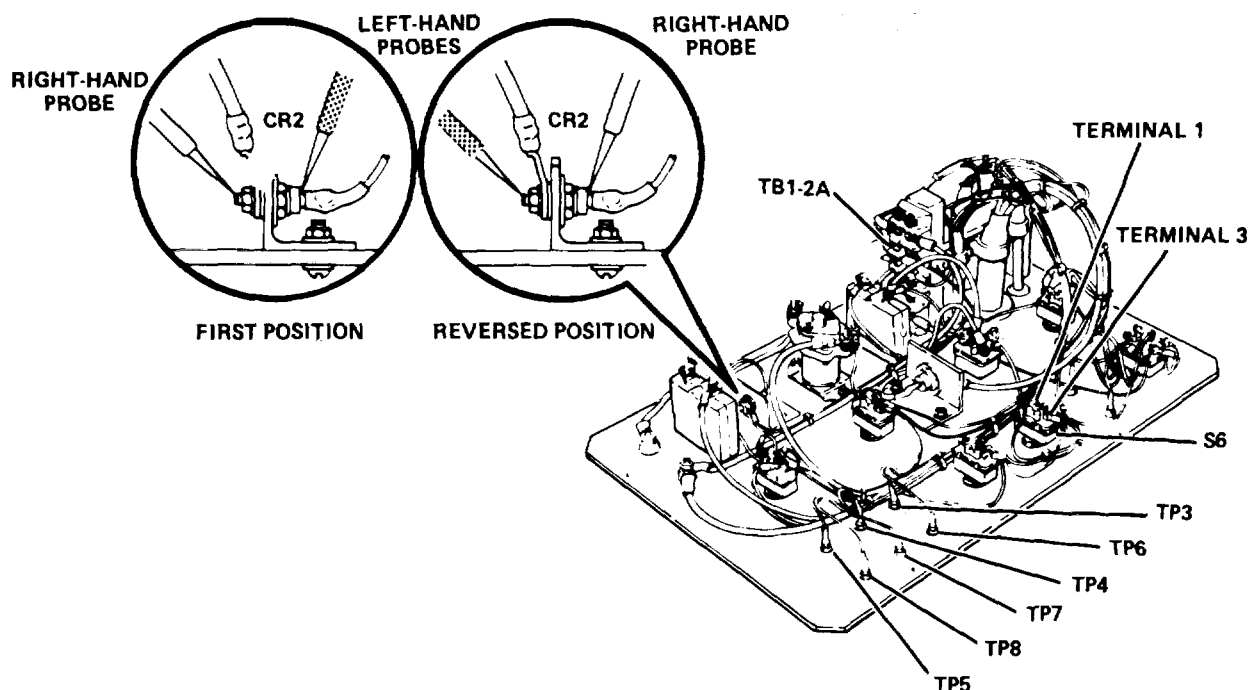
TABLE 4-1. TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTION ACTION

5. FAILED TO TEST MAST EXTENSION OR RETRACTION FUNCTION OF PCA



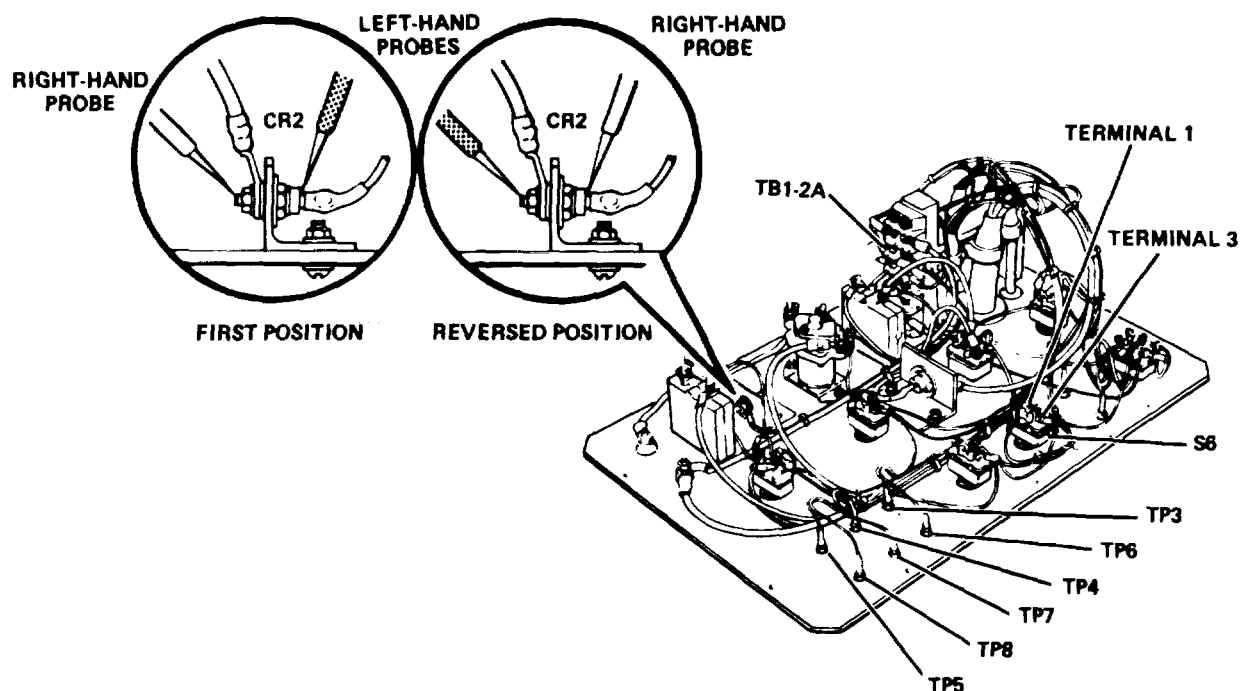
Step 1. Measure continuity between the two terminals of 24 VDC INPUT circuit breaker CB2. Be sure that plunger on CB2 is down.

- * If continuity is present, go to step 2.
- * If there is no continuity, circuit breaker CB2 is defective. Replace CB2 (para 4-8e).

Step 2. Measure continuity across semiconductor diode CR2. Check resistance on 2 kohm range across diode CR2 in first position; then reverse leads and check resistance in reverse position across diode.

CR2 is good if the ratio between the two ohmmeter readings is 100:1 or greater. For example: if leads in first position read approximately 10 ohms, the leads in the reverse position should read at least 1000 ohms.

- * If the ratio between the two ohmmeter readings is not greater than 100:1, replace diode CR2 (para 4-8c)
- * If CR2 is good, go to step 3.

TABE 4-1. TROUBLESHOOTING - Continued
MALFUNCTION
TEST OR INSPECTION
CORRECTION ACTION
5. FAILED TO TEST MAST EXTENSION OR RETRACTION FUNCTION OF PCA - Continued


Step 3. Set PNEUMATIC MAST switch S6 to OUT.

Step 4. Measure continuity between terminals 2 and 3 of PNEUMATIC MAST switch S6.

* If continuity is present, go to step 5.

* If there is no continuity, switch S6 is defective. Replace S6 (para 4-8g).

Step 5. Set PNEUMATIC MAST switch S6 to IN.

Step 6. Measure continuity between terminals 1 and 2 of PNEUMATIC MAST switch S6.

* If continuity is present, go to step 7.

* If there is no continuity, switch S6 is defective. Replace S6 (para 4-8g).

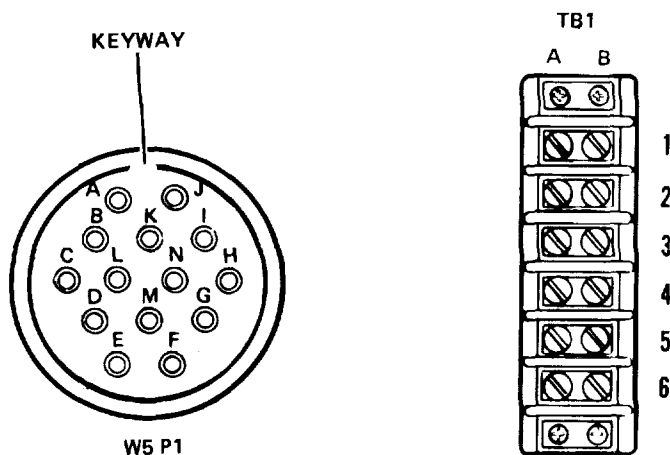
TABLE 4-1. TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTION ACTION

5. FAILED TO TEST MAST EXTENSION OR RETRACTION FUNCTION OF PCA - Continued



Step 7. Measure continuity between following points:

One Probe to connector

Pin C of W5P1
 Pin B of W5P1
 Pin H of W5P1
 Pin F of W5P1
 Pin M of W5P1
 Pin N of W5P1
 Pin L of W5P1
 Pin K of W5P1
 Pin G of W5P1

Other Probe

Terminal 2A of TB1
 Terminal 3 of S6
 Terminal 1 of S6
 TP3 (PNEUMATIC TANK NC)
 TP4 (PNEUMATIC TANK COM)
 TP5 (PNEUMATIC TANK NO)
 TP6 (PNEUMATIC MAST NC)
 TP7 (PNEUMATIC MAST COM)
 TP8 (PNEUMATIC MAST NO)

* If continuity is present each time, wire harness is defective.
 Refer to paragraph 4-8p.

* If there is no continuity any one time, cable assembly W5 is defective. Replace W5 (para 4-8n).

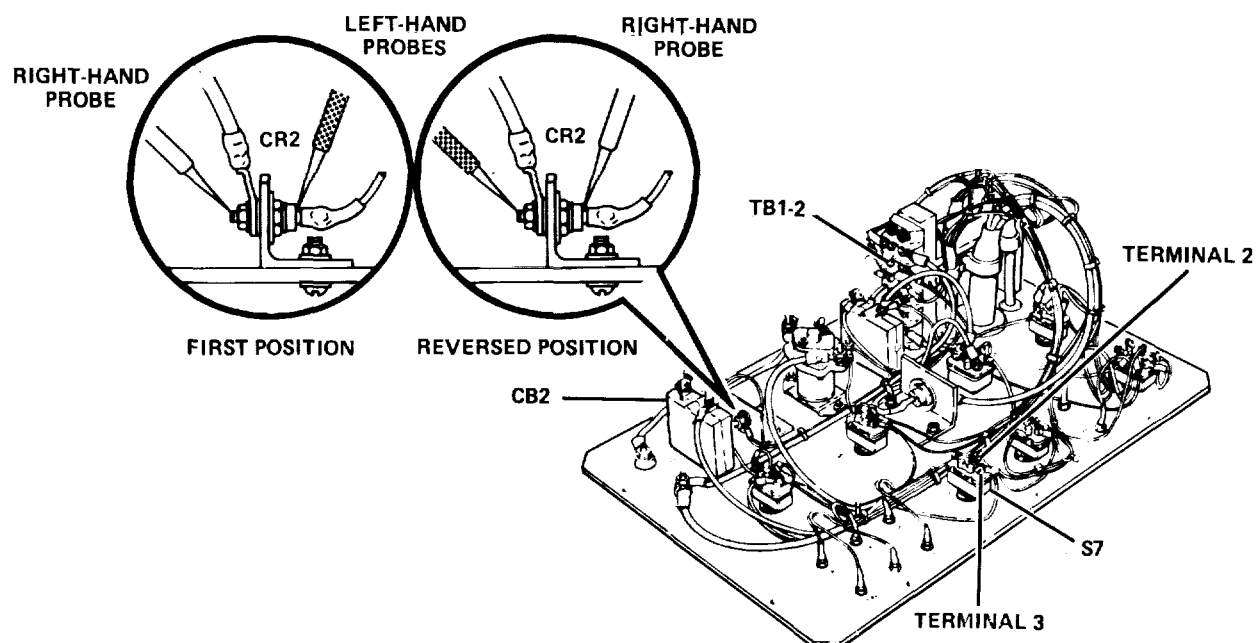
TABLE 4-1. TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTION ACTION

6. FAILED TO TEST SAFETY VALVE OF PCA



Step 1. Measure continuity between both terminals of 24 VOC INPUT circuit breaker CB2. Be sure that plunger on CB2 is down when measuring.

* If continuity is present, go to step 2.

* If there is no continuity, circuit breaker CB2 is defective. Replace CB2 (para 4-8e).

Step 2. Set PNEUMATIC SAFETY switch S7 to CLOSE.

Step 3. Measure continuity between terminals 2 and 3 of PNEUMATIC SAFETY switch S7.

* If continuity is present, go to step 4.

* If there is no continuity, switch S7 is defective. Replace S7 (para 4-8g).

TABLE 4-1. TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTION ACTION

6. FAILED TO TEST SAFETY VALVE OF PCA - Continued

Step 4. Measure continuity across semiconductor diode CR2. Check resistance on 2 kohm range across diode CR2 in first position; then reverse leads and check resistance in reverse position across diode.

CR2 is good if the ratio between the two ohmmeter readings is 100:1 or greater. For example: if leads in first position read approximately 10 ohms, the leads in the reverse position should read at least 1000 ohms.

* If the ratio between the two ohmmeter readings is not greater than 100:1, replace diode CR2 (para 4-8c)

* If CR2 is good, go to step 5.

Step 5. Measure continuity between following points:

One Probe on connectorOther Probe

Pin J of W5P1

Terminal 2 of TB1

Pin I of W5P1

Terminal 3 of S7

* If continuity is present each time, wire harness is defective. Refer to paragraph 4-8p.

* If there is no continuity any one time, cable assembly W5 is defective. Replace W5 (para 4-8n).

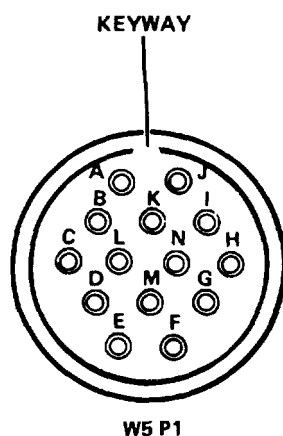


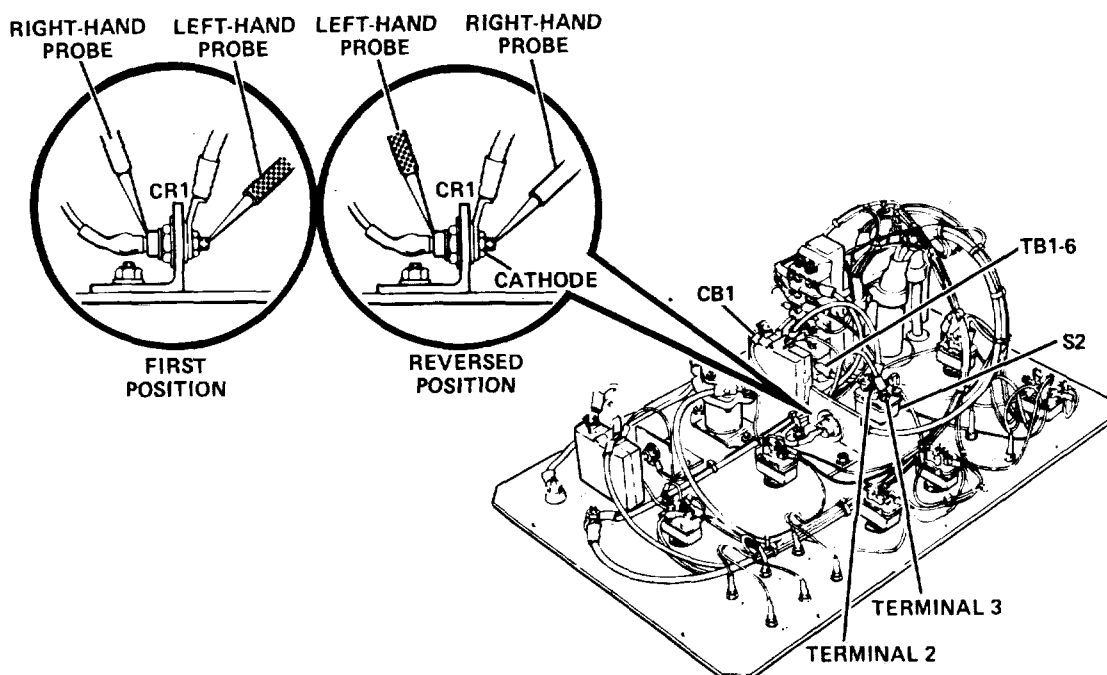
TABLE 4-1. TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTION ACTION

7. FAILED TO TEST HCA PUMP MOTOR WITH AC POWER



Step 1. Measure continuity between the two terminals of 115 VAC circuit breaker CB1. Be sure that plunger on CB1 is down when measuring.

* If continuity is present, go to step 2.

* If there is no continuity, circuit breaker CB1 is defective. Replace CB1 (para 4-8d).

Step 2. Set HYDRAULIC MODE switch S2 to AC.

Step 3. Measure continuity between terminals 2 and 3 of HYDRAULIC MODE switch S2.

* If continuity is present, go to step 4.

* If there is no continuity, switch S2 is defective. Replace S2 (para 4-8h).

TABLE 4-1. TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTION ACTION

7. FAILED TO TEST HCA PUMP MOTOR WITH AC POWER - Continued

Step 4. Check continuity across diode rectifier CR1. Check resistance across diode CR1 in first position; then reverse leads and check resistance in reverse position across diode. Use 2 kohm range.

CR2 is good if the ratio between the two ohmmeter readings is 100:1 or greater. For example: if leads in first position read approximately 10 ohms, the leads in the reverse position should read at least 1000 ohms.

* If the ratio between the two ohmmeter readings is not greater than 100:1, replace diode CR2 (para 4-8c).

* If CR2 is good, go to step 5.

Step 5. Measure continuity between following points:

One Probe on connectorOther Probe

Pin F of W1P1

Cathode of diode CR1 (at red wire)

Pin G of W1P1

Terminal 6 of TB1

Pin B of W1P1

Any point on chassis

* If continuity is present each time, go to step 6.

* If there is no continuity any one time, cable assembly W1 defective. Replace W1 (para 4-8j).

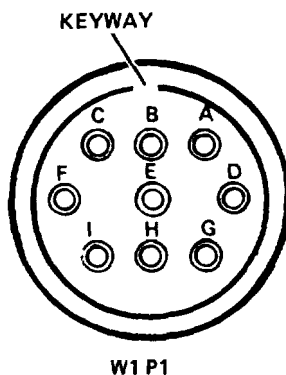


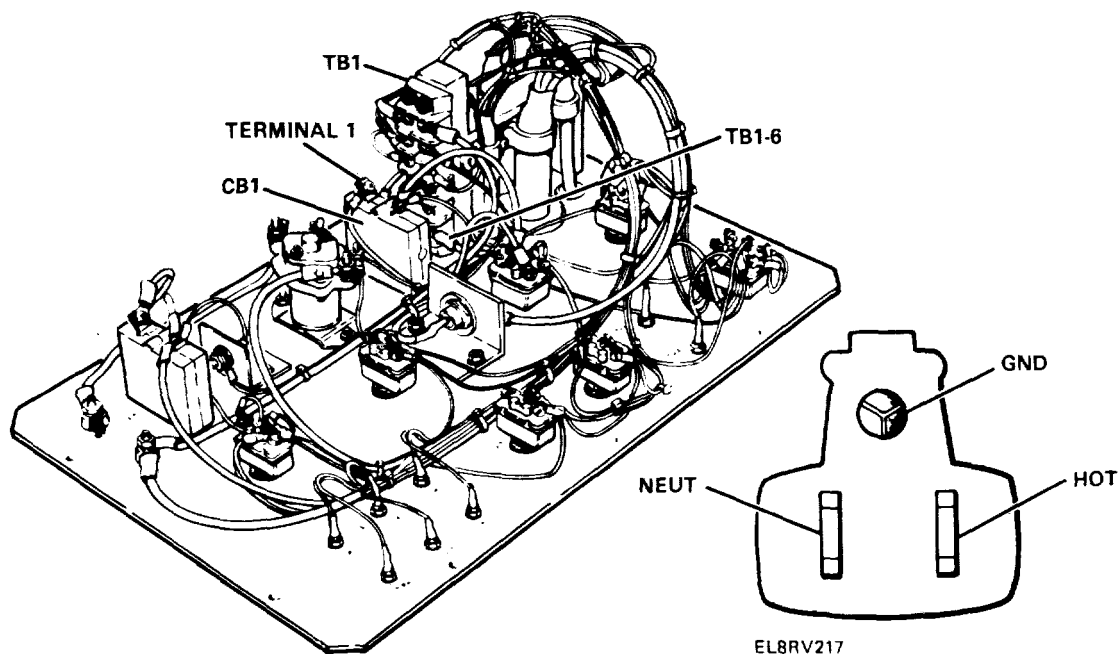
TABLE 4-1. TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTION ACTION

7. FAILED TO TEST HCA PUMP MOTOR WITH AC POWER - Continued



Step 6. Measure continuity between following points:

One Probe on connector

Pin HOT of W6P1
Pin NEUT of W6P1
Pin GND of W6P1

Other Probe

Terminal 1 of CB1
Terminal 6 of TB1
Any unpainted point on chassis

* If continuity is present each time, wire harness is defective.
Refer to paragraph 4-8p.

* If there is no continuity any one time, cable assembly W6
defective. Replace W6 (para 4-8o).

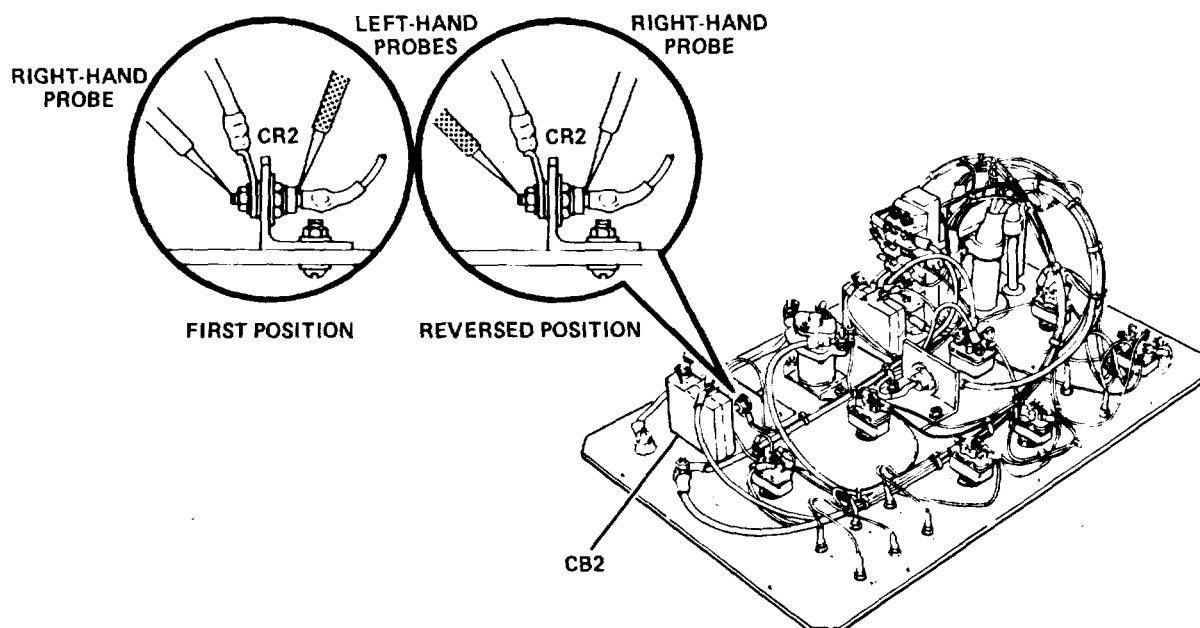
TABLE 4-1. TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTION ACTION

8. FAILED TO TEST HCA PUMP MOTOR WITH DC POWER



Step 1. Measure continuity between the two terminals of 24 VDC INPUT circuit breaker CB2.

* If continuity is present, go to step 2.

* If there is no continuity, circuit breaker CB2 defective.
Replace CB2 (para 4-8e).

Step 2. Measure continuity across semiconductor diode CR2. Check resistance on 2 kohm range across diode CR2 in first position; then reverse leads and check resistance in reverse position across diode.

CR2 is good if the ratio between the two ohmmeter readings is 100:1 or greater. For example: if leads in first position read approximately 10 ohms, the leads in the reverse position should read at least 1000 ohms.

* If the ratio between the two ohmmeter readings is not greater than 100:1, replace diode CR2 (para 4-8c)

* If CR2 is good, go to step 3.

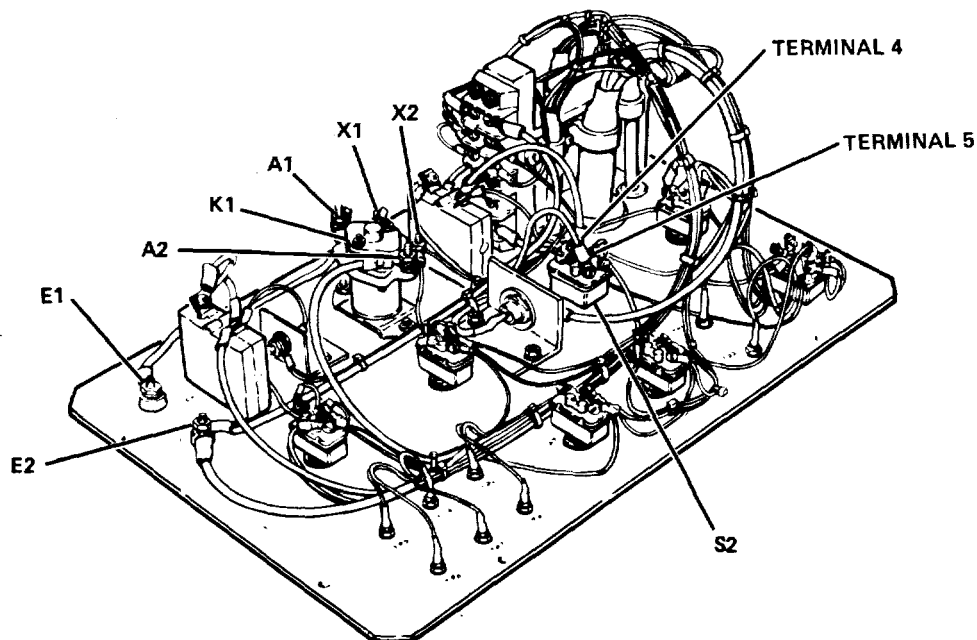
TABLE 4-1. TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTION ACTION

8. FAILED TO TEST HCA PUMP MOTOR WITH DC POWER - Continued



Step 3. Set HYDRAULIC MODE switch S2 to DC.

Step 4. Measure continuity between terminals 4 and 5 of HYDRAULIC MODE switch S2.

* If continuity is present, go to step 5.

* If there is no continuity, switch S2 is defective. Replace S2 (para 4-8h).

TABLE 41. TROUBLESHOOTING - Continued		
MALFUNCTION	TEST OR INSPECTION	CORRECTION ACTION
8. FAILED TO REST HCA PUMP MOTOR WITH DC POWER - Continued		
Step 5.	Deleted. Go to step 6.	
Step 6.	Measure continuity between following points:	
	<u>One Probe</u>	<u>Other Probe</u>
	24 VDC INPUT - binding post E2	Terminal X1 of K1
	24 VDC INPUT + binding post E1	Terminal A1 of K1
	* If continuity is present each time, go to step 7.	
	* If there is no continuity any one time, wire harness is defective. Refer to para 4-8p.	
Step 7.	Measure continuity, using 2 kohm range, between 24 VDC INPUT + binding post E1 and terminal X2 of relay K1; then reverse test leads and repeat measurement.	
	* If one reading is on-scale and other reading is off-scale, go to step 8.	
	* If both readings are off-scale, wire harness is defective. Refer to para 4-8p.	

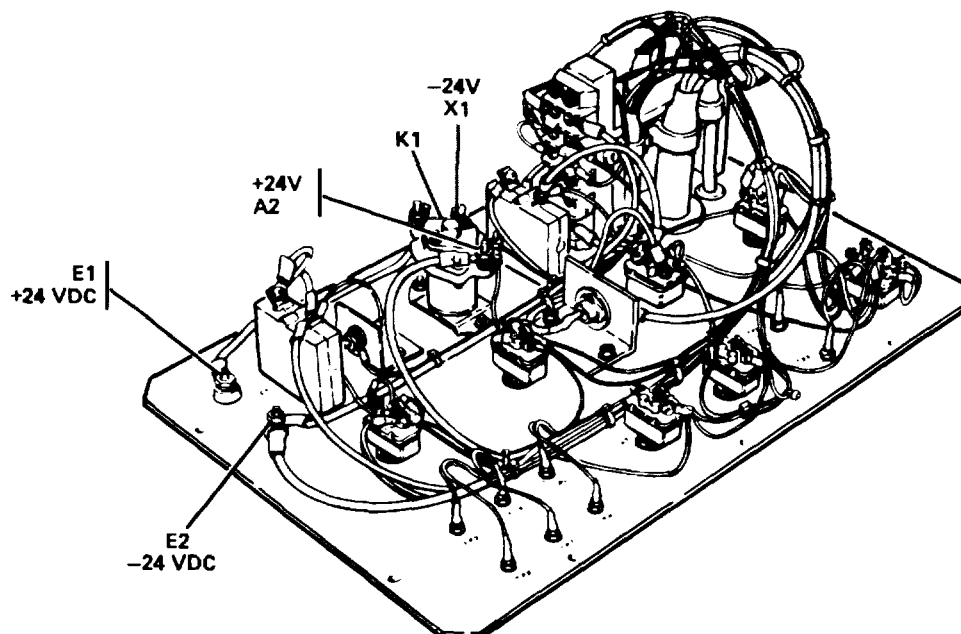
TABLE 4-1. TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTION ACTION

8. FAILED TO TEST HCA PUMP MOTOR WITH DC POWER - Continued



Step 8. Apply 24 Vdc power to binding posts E1 and E2. Connect the positive lead to E1 and the negative lead to E2.

Step 9. Measure $+24 \pm 2$ Vdc between terminals A2 and terminal X1 of relay K1.

* If voltage is present, cable assembly W1 is defective. Remove power. Replace W1 (para 4-8j).

* If there is no voltage, relay K1 is defective. Remove power. Replace K1 (para 4-8i).

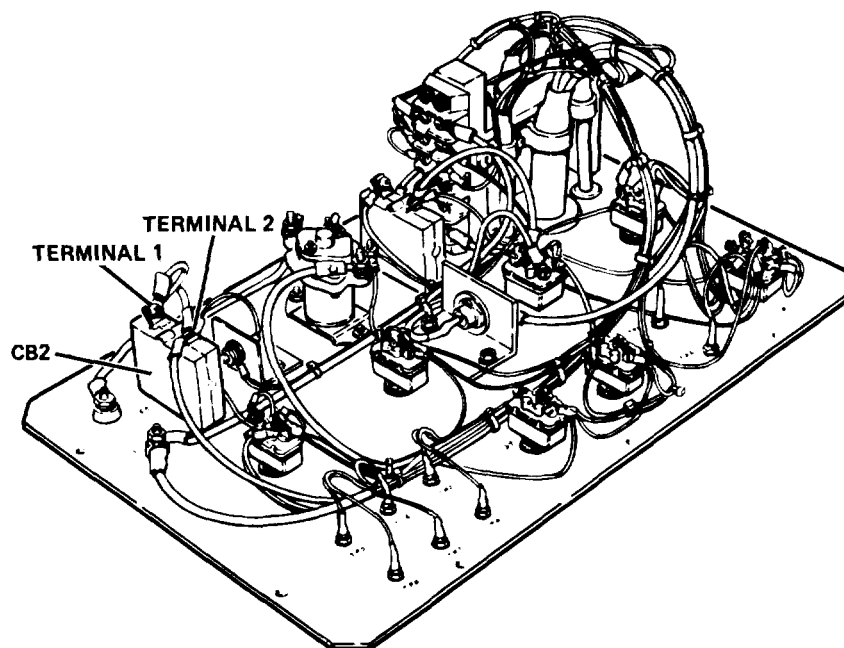
TABLE 4-1. TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTION ACTION

9. FAILED TO TEST MAST RAISING OR LOWERING FUNCTION OF HCA



Step 1. Measure continuity between the two terminals of 24 VDC INPUT circuit breaker CB2.

* If continuity is present, go to step 2.

* If there is no continuity, circuit breaker CB2 is defective.
Replace CB2 (para 4-8e).

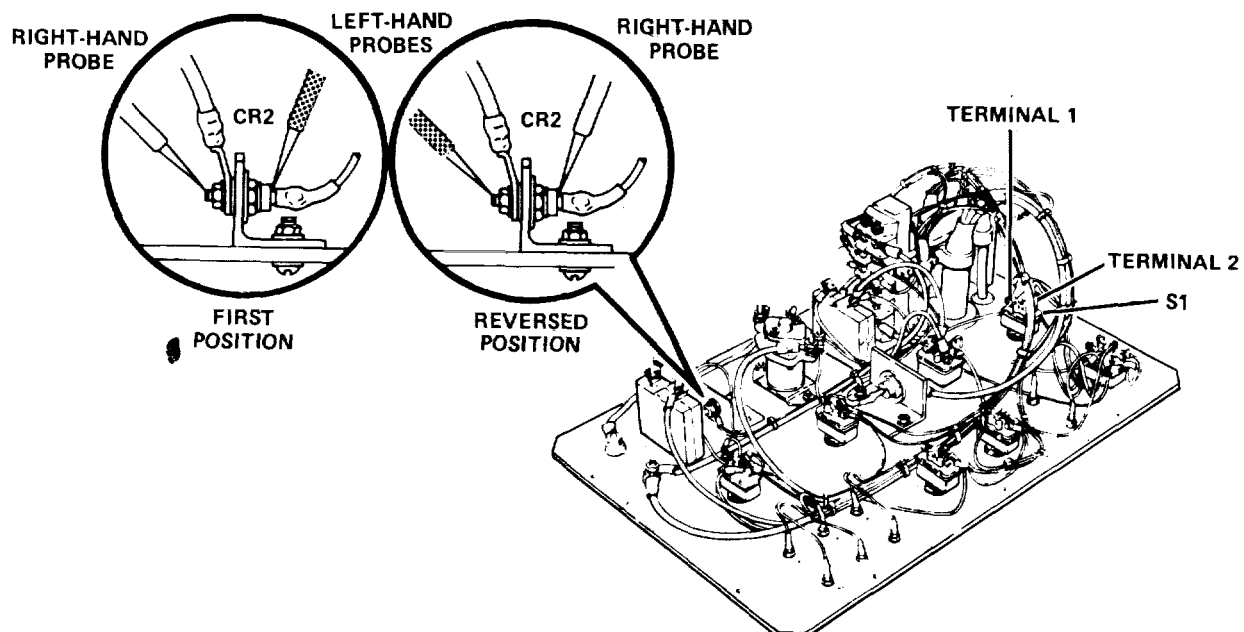
TABLE 4-1. TROUBLESHOOTING - Continued

MALFUNCTION

TEST OR INSPECTION

CORRECTION ACTION

9. FAILED TO TEST MAST RAISING OR LOWERING FUNCTIONS OF HCA - Continued

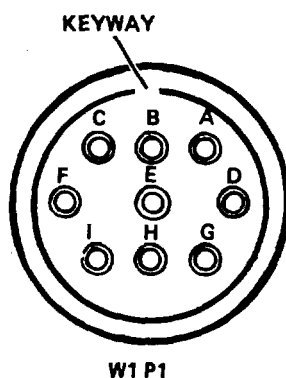


Step 2. Measure continuity across semiconductor diode CR2. Check resistance on 2 kohm range across diode CR2 in first position; then reverse leads and check resistance in reverse position across diode.

CR2 is good if the ratio between the two ohmmeter readings is 100:1 or greater. For example: if leads in first position read approximately 10 ohms, the leads in the reverse position should read at least 1000 ohms.

* If the ratio between the two ohmmeter readings is not greater than 100:1, replace diode CR2 (para 4-8c)

* If CR2 is good, go to step 3.

TABLE 4-1. TROUBLESHOOTING - Continued**MALFUNCTION****TEST OR INSPECTION****CORRECTION ACTION****9. FAILED TO TEST MAST RAISING OR LOWERING FUNCTIONS OF HCA - Continued**

Step 3. Set HYDRAULIC MAST switch S1 to RAISE.

Step 4. Measure continuity between terminals 2 and 3 of HYDRAULIC MAST switch S1.

* If continuity is present, go to step 5.

* If there is no continuity, replace switch S1 (para 4-8g).

Step 5. Set HYDRAULIC MAST switch S1 to LOWER.

Step 6. Measure continuity between terminals 1 and 2 of HYDRAULIC MAST switch S1.

* If continuity is present, go to step 7.

* If there is no continuity, replace switch S1 (para 4-8g).

Step 7. Measure continuity between following points:

One Probe on connector

Other Probe

Pin H of W1P1

Terminal 3 of S1

Pin I of W1P1

Terminal 1 of S1

* If continuity is present, wire harness is defective. Refer to paragraph 4-8p.

* If there is no continuity, replace cable assembly W1 (para 4-8j).

4-8. ICD MAINTENANCE INSTRUCTIONS

- * Procedures for repairing all major parts of the ICD are in this paragraph.
- * If a part is found to be faulty during troubleshooting, you will be referred directly to the repair procedure.
- * The List of Tasks below will tell you the location of the repair procedure for faulty parts.
- * The INITIAL SETUP will give you information needed to begin the repair.
 - * Refer to TM 11-5985-368-34P, for identification of repair parts and special tools.
 - * Refer to Appendix B for identification of expendable materials.
- * Note that the Equipment Condition entry in INITIAL SETUP tells you what parts must have been removed before you can begin the actual repair.

OVERVIEW

To repair the ICD you must:

- * Remove parts to gain access to the faulty part.
- * Remove the faulty part.
- * Replace the faulty part with a new part.
- * Install the new part.
- * Reinstall parts removed to gain access.
- * Test the ICD to verify successful repair (para 4-9).

LIST OF TASKS	
Maintenance (repair) task	Para No. (4-8)
Binding post E1	p
Binding post E2	j
Cable assembly W1 and binding post E2	j
Cable assembly W2	k
Cable assembly W3	l
Cable assembly W4 and terminal lug E5	m
Cable assembly W5	n
Cable assembly W6	o
Cable support bracket	f
Circuit breaker CB1	d
Circuit breaker CB2	e
Diode CR1	b
Diode CR2	c
Double pole toggle switches	g
Front panel	a
Relay K1	i
Single pole toggle switches	g
Terminal board TB1 and cable support bracket	f
Terminal lug E5	m
Wiring harness and binding post E1	p

NOTE

Terminal lugs E3 and E4 have been deleted, therefore these reference designators do not appear in the maintenance instructions.

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

a. FRONT PANEL

This task covers:

Removal

Installation

INITIAL PANEL

Tools

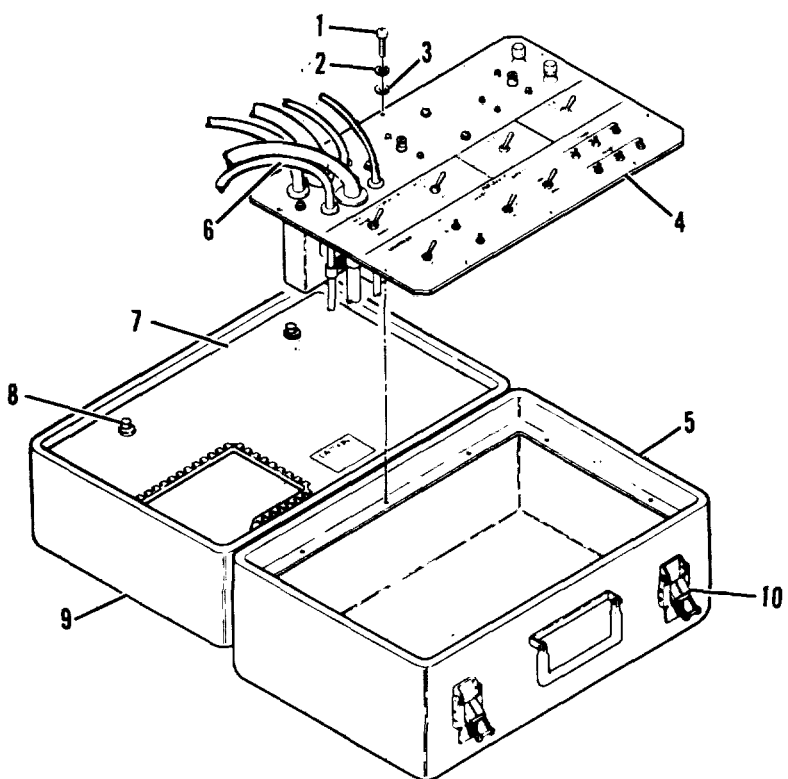
Refrig Unit Svce Tool Kit,
5180-00-596-1474

Equipment Condition

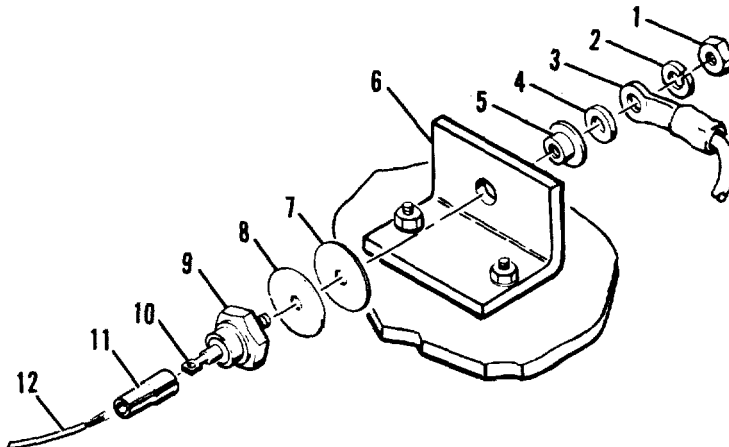
Para
4-5

Condition Description

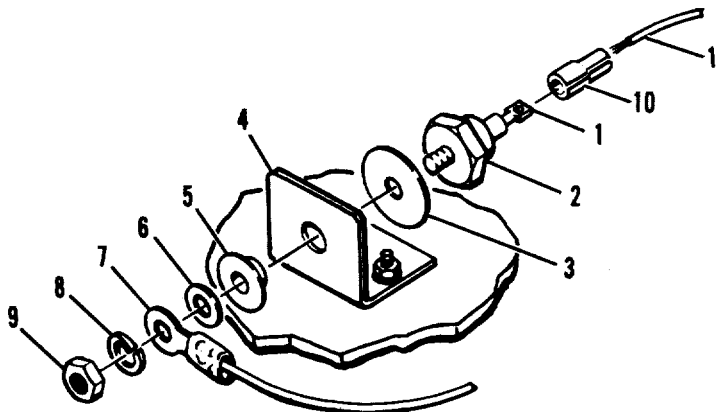
Cover removed to access controls

STEP	PROCEDURE
REMOVAL	NOTE The front panel is removed so you can get to the components and wiring under the panel.  The diagram shows an exploded view of a control panel assembly. At the top is a rectangular control panel (4) with various knobs, switches, and indicator lights. Below it is a mounting plate (3) with several screws (1, 2) and a bundle of wires (6) connected to it. The panel is shown being removed from a metal chassis (5). The chassis has a front panel (9) and a rear panel (8). A handle (10) is attached to the front panel. A screw (7) is shown being removed from the chassis. A small rectangular component is shown being removed from the chassis.

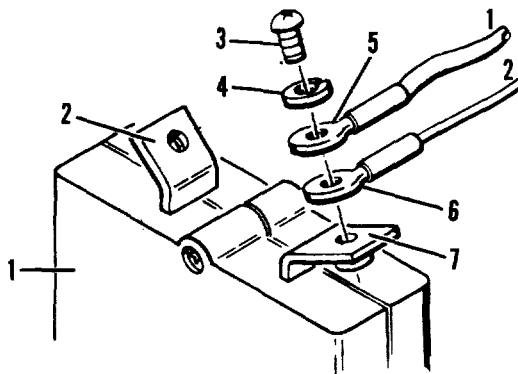
4-8. ICD MAINTENANCE INSTRUCTIONS Continued	
a. FRONT PANEL Continued	
STEP	PROCEDURE
1.	Remove ten retaining screws (1) on outer edge with flat washers (2), and lockwashers (3) from front panel (4).
2.	Remove front panel (4) by pulling straight away from case (5).
	INSTALLATION
1.	Place front panel (4) in case (5) with cables (6) protruding upwards to hinged side of case
2.	Fasten panel (4) to case (5) using ten retaining screws (1) with flat washers (2) and lockwashers (3).
3.	Coil and stow cables in hinged cover (7) and engage two pushbutton fasteners (8).
4.	Close cover (9) and fasten clamps (10).

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued			
b. DIODE CRI			
This task covers:			
Removal	Replacement	Installation	Test
INITIAL SETUP			
<u>Tools</u> Refrig Unit Svce Tool Kit, 5180-00-596-1474 11/32 in. comb. wr 7/16 in. comb. wr 11/16 in. comb. wr No. 2 xtip scdr lg rd nose plr heat gun sldr and desldr set plier type heat sink diag ctg plr		<u>Equipment Condition</u> Para 4-5 4-8a <u>Materials/Parts</u> solder (appx B, item 19) insulation sleeving (appx B, item 7) heat sink compound (appx B, item 4) diode rectifier JAN 1N1188	
<u>Condition Description</u> Cover removed to access controls Front panel removed			
STEP	PROCEDURE		
	REMOVAL		
1.	Remove heat shrink sleeving (11) from white wire no. 6 (12) at CR1 anode (10). Cut sleeving lengthwise and remove.		
2.	Unsolder white wire no. 6 (12) from CR1 anode (10).		
3.	Remove hex nut (1), lockwasher (2), eyelet with red wire (3), flat washer (4), and a shoulder insulator (5).		
4.	Remove diode rectifier CR1 (9) and two thin insulator washers (7 and 8) from mounting bracket (6).		
			

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued	
b. DIODE CR1 - Continued	
STEP	PROCEDURE
	REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Place two insulator washers (7 and 8) on diode (9) <u>CAUTION</u> Insulator washers (7 and 8) are both required when installing diode CR1 otherwise, the diode may be damaged 2. Insert diode (9) into diode mounting bracket (6). 3. Install shoulder insulator (5), flat washer (4), eyelet with red wire (3), lockwasher (2) and nut (1) and tighten nut. <u>CAUTION</u> Upon completion of step 3, be sure that CR1 is installed correctly by checking for a short between the anode (10) and ground (mounting bracket) (6); and between the nut (1) of CR1 and ground (6). An open or infinite resistance indicates CR1 is correctly mounted. 4. Slide 1/2 in. piece of heat shrink sleeving over wire no. 6. 5. Connect plyer type heat sink to CR1 anode (10). 6. Solder wire no. 6 (12) to CR1 anode (10). 7. Slide heat shrink sleeving over solder connection on CR1 and apply heat to shrink the sleeving. NOTE If the diode mounting bracket is replaced, be sure to apply heat sink compound to the mounting surface. The bracket is mounted with two screws, two flat washers on each screw, and one lockwasher and nut for each screw. TEST Test ICD (para 4-9) to verify repair.

4-8. CD MAINTENANCE INSTRUCTIONS - Continued									
c. DIODE CR2									
This task covers:									
Removal	Replacement	Installation	Test						
INITIAL SETUP									
<u>Tools</u> Refrig Unit Svce Tool Kit, 5180-00-596-1474 3/16 in. comb. wr 7/16 in. comb. wr 11/16 in. comb. wr No. 1 xtip scdr pocket knife lg rd nose plr sldr and desldr set heat gun plier type heat sink diag ctg plr		<u>Equipment Condition</u> <table><tr><th>Para</th><th>Condition Description</th></tr><tr><td>4-5</td><td>Cover removed to access controls</td></tr><tr><td>4-8a</td><td>Front panel removed</td></tr></table> <u>Materials/Parts</u> solder (appx B, item 19) insulation sleeving (appx B, item 7) heat sink compound (appx B, item 4) semiconductor diode JAN 1N3768		Para	Condition Description	4-5	Cover removed to access controls	4-8a	Front panel removed
Para	Condition Description								
4-5	Cover removed to access controls								
4-8a	Front panel removed								
STEP	PROCEDURE								
	REMOVAL								
1.	Remove heat shrink sleeving (10) from black wire no. 5 (11) at CR2 anode (1). Cut sleeving lengthwise and remove.								
2.	Unsolder wire no. 5 from CR2 anode (1).								
									
3.	Remove hex nut (9), lockwasher (8), eyelet with wire no. 8 (7), flat washer (6), and shoulder insulator (5).								
4.	Remove diode CR2 (2) and insulator washer (3) from mounting bracket (4).								
5.	Remove mounting bracket, if necessary, by removing two nuts, screws, lock washers, and two flat washers on each screw.								

4-8. ICD MAINTENANCE INSTRUCTIONS Continued	
c. DIODE CR2 Continued	
STEP	PROCEDURE
	REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Place insulator washer (3) on diode (2). 2. Insert diode (2) into diode mounting bracket (4). 3. Install shoulder insulator washer (5), flat washer (6), eyelet with white wire no. 8 (7), lockwasher (8), and nut (9); and tighten nut. <u>CAUTION</u> Upon completion of step 3, be sure that CR2 is installed correctly by checking for a short between the diode anode (1) and ground, mounting bracket (4), and between nut (9) of CR2 and ground. An open or infinite resistance indicates CR2 is correctly mounted 4. Slide 1/2 in. piece of heat shrink sleeving over black wire no. 5. 5. Connect heat sink-to CR2 anode (1). 6. Solder wire no. 5 to diode CR2 anode (1). 7. Slide heat shrink sleeving over solder connection on CR2 and apply heat to shrink the sleeving. <u>NOTE</u> If the diode mounting bracket is replaced, be sure to apply heat sink compound to the mounting surface. The bracket is mounted with two screws, two flat washers on each screw, and one lockwasher and nut for each screw TEST Test ICD (pare 4-9) to verify repair.

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued			
d. CIRCUIT BREAKER CB1			
This task covers:			
Removal	Replacement	Installation	Test
<u>INITIAL SETUP</u>			
<u>Tools</u> Refrig Unit Svce Tool Kit, 5180-00-596-1474 No. 1 xtip scdr No. 2 xtip scdr		<u>Equipment Condition</u> <u>Para</u> 4-5 4-8a	<u>Condition Description</u> Cover removed to access controls Front panel removed
<u>Materials/Parts</u> circuit breaker CB1 MS24571-35			
STEP	PROCEDURE		
	REMOVAL		
			
1.	Remove one screw (3) and lockwasher (4) from each terminal (2 and 7) of CB1 (1).		
	NOTE		
	Tag wires to identify for installation if wire number is not showing.		
2.	Remove wires no. 1 and 2 (5 and 6) from terminal 2 (7) and black wire of cable W6 from terminal 1 (2).		

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

d. CIRCUIT BREAKER CB1 - Continued

STEP	PROCEDURE
3.	Remove two screws (8) and two flat washers (9) and remove CB1 (1) from panel (10). REPLACEMENT Replace faulty part with a new part. INSTALLATION - Position circuit breaker CB1 (1) into panel (10). - Install two flat washers (9) and screws (8) to secure circuit breaker. - Install black wire of cable W6 on terminal 1 (2) and install wires no. 1 and 2 (5 and 6) on terminal 2 (7) with a screw (3) and lock washer (4) at each terminal (2 and 7). TEST Test ICD (para 4-9) to verify repair.

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**e. CIRCUIT BREAKER CB2 - Continued****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 1 xtip scdr
No. 2 xtip scdr

Equipment
Condition

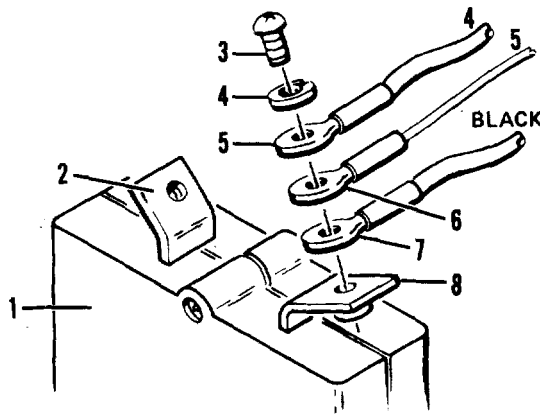
Para
4-5

Condition Description

Cover removed to access
controls

Materials/Parts

circuit breaker CB2 MS24571-50

STEP**PROCEDURE****REMOVAL**

1. Remove one screw (3) and lockwasher (4) from each terminal (2 and 8) of CB2 (1).

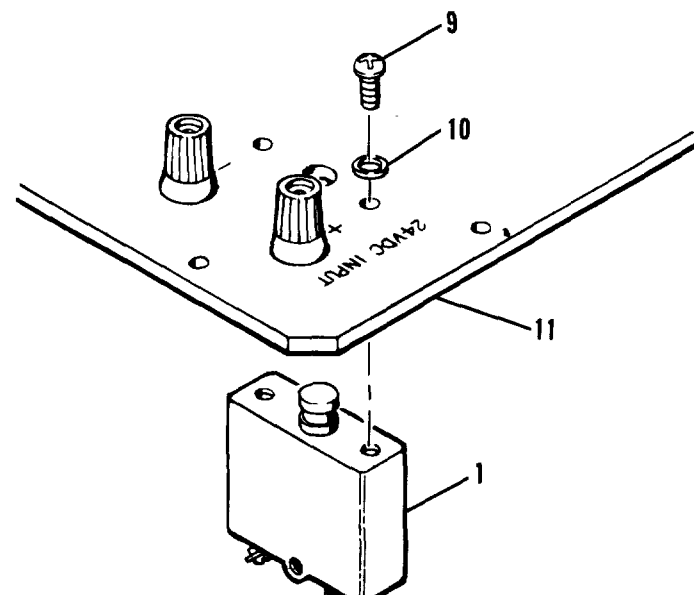
NOTE

Tag wires to identify for installation if wire number is not showing.

2. Remove wires no. 4 and 5 (5 and 6) and black wire to cable W4 (7) from terminal 2 (8) and wire no. 3 from terminal 1 (2).

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

e. CIRCUIT BREAKER CB2 - Continued

STEP	PROCEDURE
	
3.	Remove two screws (9) and two lockwashers (10) and remove CB2 (1) from panel (11).
	REPLACEMENT Replace faulty part with a new part.
	INSTALLATION
1.	Position circuit breaker CB1 (1) into panel (11).
2.	Install two flat washers (10) and screws (9) to secure circuit breaker.
3.	Install wire no. 3 to terminal 1 (2) and install wires no. 4 and 5 (5 and 6) and black wire of cable W4 (7) on terminal 2 (8) with one screw (3) and lock washer (4) at each terminal (2 and 8).
	TEST Test ICD (para 4-9) to verify repair.

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

f. TERMINAL BOARD TB1 AND CABLE SUPPORT BRACKET

This task covers:

Removal

Replacement

Installation

Test

INITIAL SETUP

Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 2 xtip scdr
1/4 in. flat tip scdr

Equipment

Condition

Para

4-5

4-8a

Condition Description

Cover removed to access
controls

Front panel removed

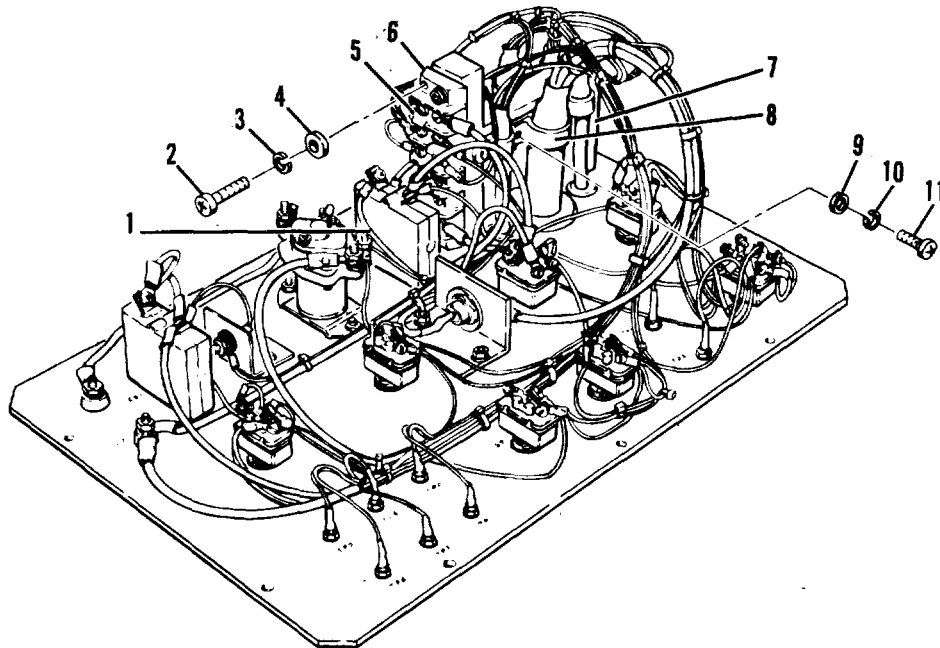
Materials/Parts

terminal board TB1
cable support bracket

STEP

PROCEDURE

REMOVAL



4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**f. TERMINAL BOARD TB1 AND CABLE SUPPORT BRACKET - Continued****STEP****PROCEDURE****NOTE**

It is not necessary to remove TB1 before removing the cable support bracket.

1. Remove the following wires from terminal board TB1 (6):

NOTE

To remove wires at TB1-6A and TB1-6B, move CB1 (1) (para 4-8d). Do not disconnect wires from CB1.

TB1 Terminal

1A

2A

3A

6A

1B

2B

3B

6B

Wire

Brown from W4

Green and white/black from W5

Orange and black from W2

Yellow from W4 and white from W6

White no. 7 from E2

White no. 6 from K1

Black from W3

Yellow from W1

Also remove shorting straps (5).

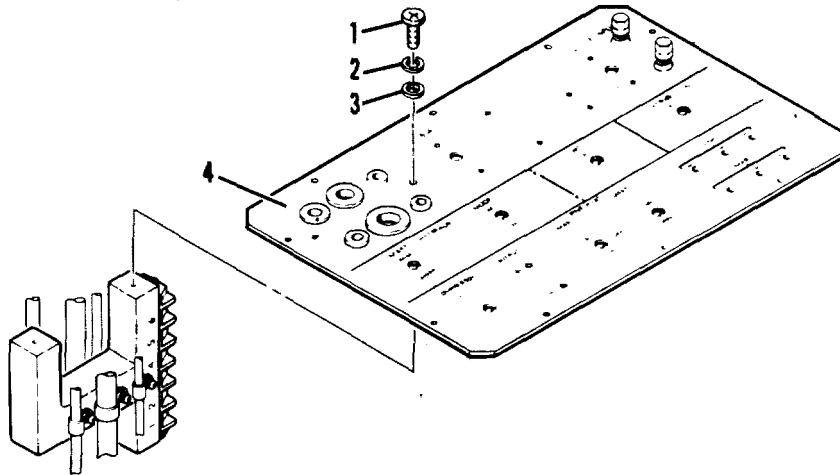
2. Remove four screws (2), lockwashers (3) and flat washers (4) securing TB1 to cable support bracket (7).
3. Remove TB1 (6). If cable support bracket (7) is also to be removed, go to step 5.
Cable Support Bracket Removal
4. Remove four screws (2), lockwashers (3), and flat washers (4); and remove TB1 (6).
5. Remove six screws (11), lockwashers (10), and flat washers (9); and remove six loop clamps (8).

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

f. TERMINAL BOARD TB1 AND CABLE SUPPORT BRACKET - Continued

STEP

PROCEDURE

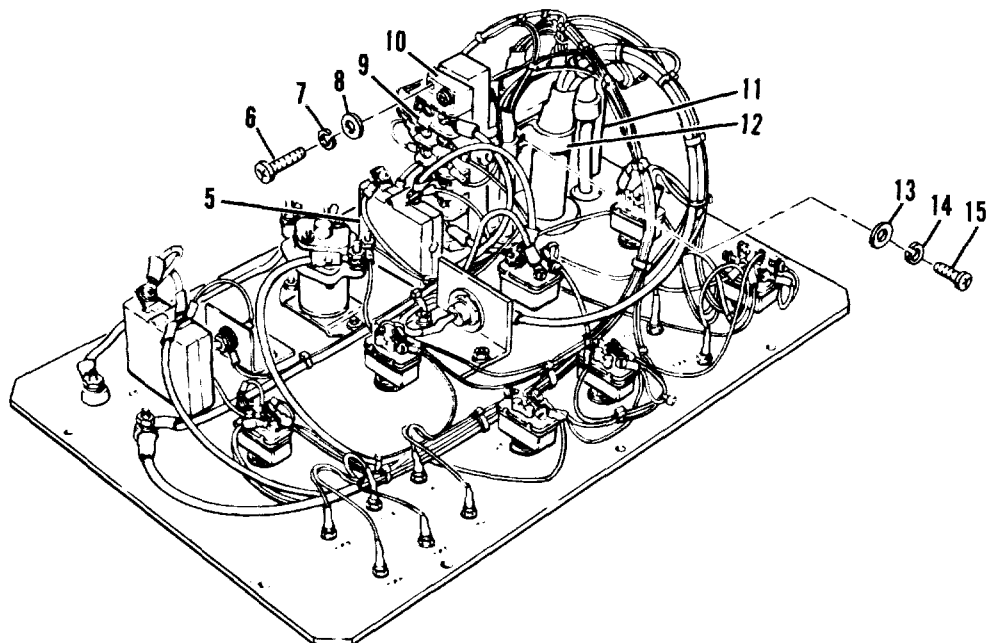


6. On front panel (4), remove two screws (1), lockwashers (2), and flat washers (3).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION



4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**f. TERMINAL BOARD TB1 AND CABLE SUPPORT BRACKET - Continued****STEP****PROCEDURE****NOTE**

Each installation procedure is complete in itself for TB1 and for the cable support bracket. Therefore, to install the cable support bracket, it is not necessary to do the TB1 installation procedure first and then do the cable support bracket installation procedure.

TB1 Installation

1. Install TB1 (10) on cable support bracket (11) with four screws (6), lock washers (7), and flat washers (8).
2. Install wires on TB1 (10) as follows:

TB1 Terminal

1A
2A
3A
6A

1B
2B
3B
6B

Wire

Brown from W4
Green and white/black from W5
Orange and black from W2
Yellow from W4 and white from W6

White no. 7 from E2
White no. 6 from K1
Black from W3
Yellow from W1

NOTE

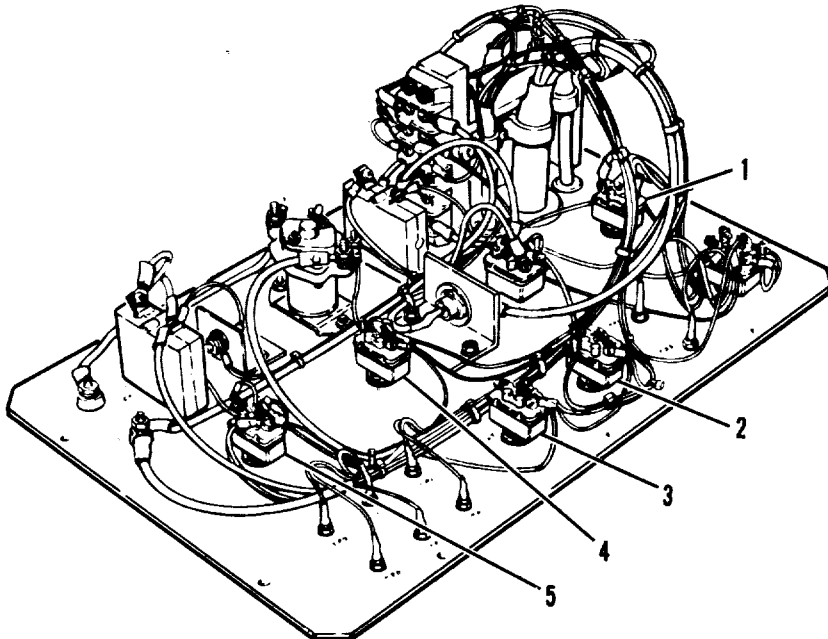
To install wires at TB1-6A and TB1-6B, it may be necessary to move CB1 (5).

Cable Support Bracket Installation

3. Install two screws (1), lockwashers (2) and flat washers (3) through front panel (4) and secure cable support bracket (11) to back of front panel.
4. Install six loop clamps (12) with six screws (15), lockwashers (14) and flat washers (13).
5. Install TB1 (10) with four screws (6), lockwashers (7) and flat washers (8). Be sure that shorting straps (9) are connected between TB1-A1 and TB1-A2, and between TB1-B2 and TB1-B3.

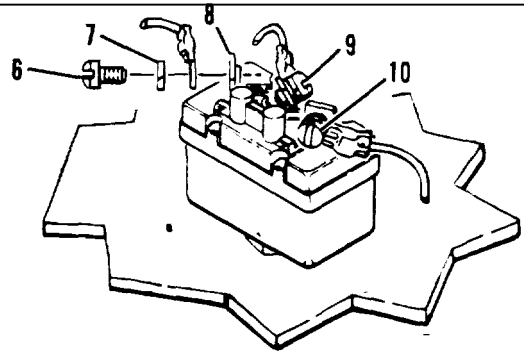
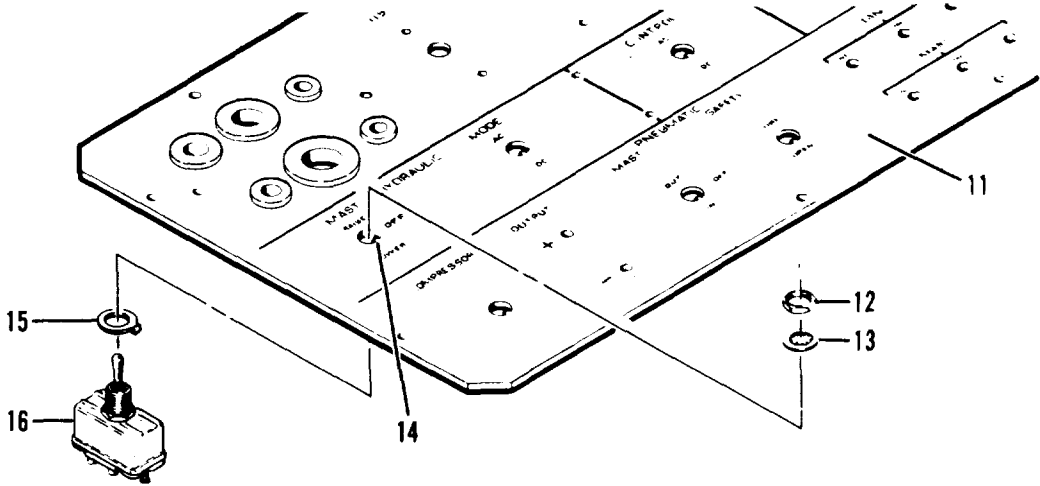
TEST

Test ICD (para 4-9) to verify repair.

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued				
g. SINGLE POLE TOGGLE SWITCHES				
This task covers:				
Removal	Replacement	Installation	Test	
INITIAL SETUP				
<u>Tools</u> Refrig Unit Svc Tool Kit, 5180-00-596-1474 9/16 in. comb. wr 1/4 in. flat tip scdr		Equipment Condition <u>Para</u> 4-5 4-8a	Condition Description Cover removed to access controls Front panel removed	
<u>Materials/Parts</u> toggle switch S1, S6, MS25306-212				
STEP	PROCEDURE			
REMOVAL				
	NOTE Switches S1 (1), S3 (4), S4 (5), S6 (2) and S7 (3) are the same type of switch and their removal procedures ore similar. Therefore, the removal of these five switches is combined.			

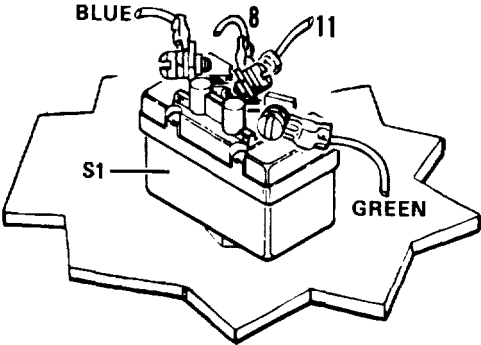
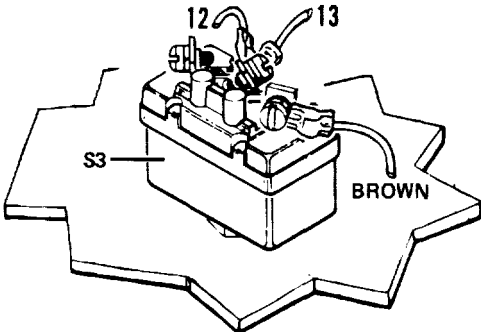
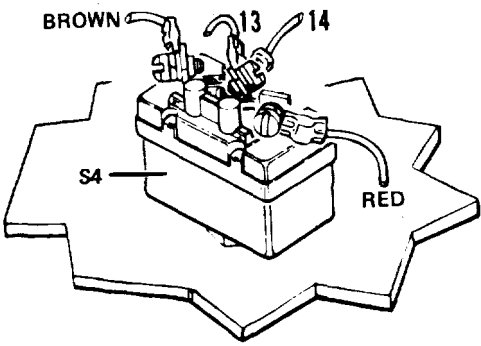
4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

g. SINGLE POLE TOGGLE SWITCHES - Continued

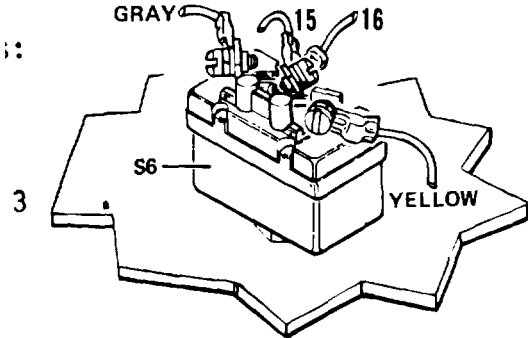
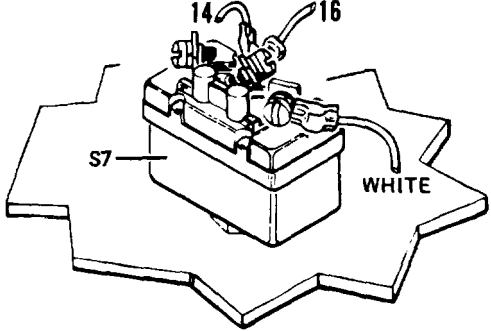
STEP	PROCEDURE
1. 2. 3.	Remove three screws (6) and lockwashers (7) from three switch terminals 1, 2 and 3 (8, 9 and 10) of switch to be removed. Identify wires for installation. Remove retaining nut (12) and lock washer (13) from switch to be removed. Remove switch with keying washer (15) from front panel (11).  REPLACEMENT Replace faulty part with a new part. INSTALLATION  1. Install keying washer (15) on switch (16). 2. Install switch, either S1; S3, S4, S6 or S7; in front panel (11). Switches are keyed (14) and can only be installed one direction. 3. Install lock washer (13) and retaining nut (12).

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

g. SINGLE POLE TOGGLE SWITCHES - Continued

STEP	PROCEDURE
4.	Connect four wires on switch S1 as follows: - Blue wire from cable W1 to terminal 1 - Wire no. 8 to terminal 2 - Wire no. 11 to terminal 2 - Green wire from cable W1 to terminal 3. 
5.	Connect three wires on switch S3 as follows: - Wire no. 13 to terminal 2 - Wire no. 12 to terminal 2 - Brown wire from cable W2 to terminal 3 
6.	Connect four wires on switch S4 as follows: - Brown wire from cable W3 to terminal 1 - Wire no. 13 to terminal 2 - Wire no. 14 to terminal 2 - Red wire from cable W3 to terminal 3 

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**g. SINGLE POLE TOGGLE SWITCHES - Continued**

STEP	PROCEDURE
7.	Connect four wires on switch S6 as follows: Gray wire from cable W5 to terminal 1 Wire no. 15 to terminal 2 Wire no. 16 to terminal 2 Yellow wire from cable W5 to terminal 3 
8.	Connect three wires on switch S7 as follows: Wire no. 14 to terminal 2 Wire no. 16 to terminal 2 White wire from cable W5 to terminal 3.  TEST Test ICD (para 4-9) to verify repair.

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**h. DOUBLE POLE TOGGLE SWITCHES****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
9/16 in. comb. wr
1/4 in. comb. wr

EquipmentConditionPara

4-5

Condition Description

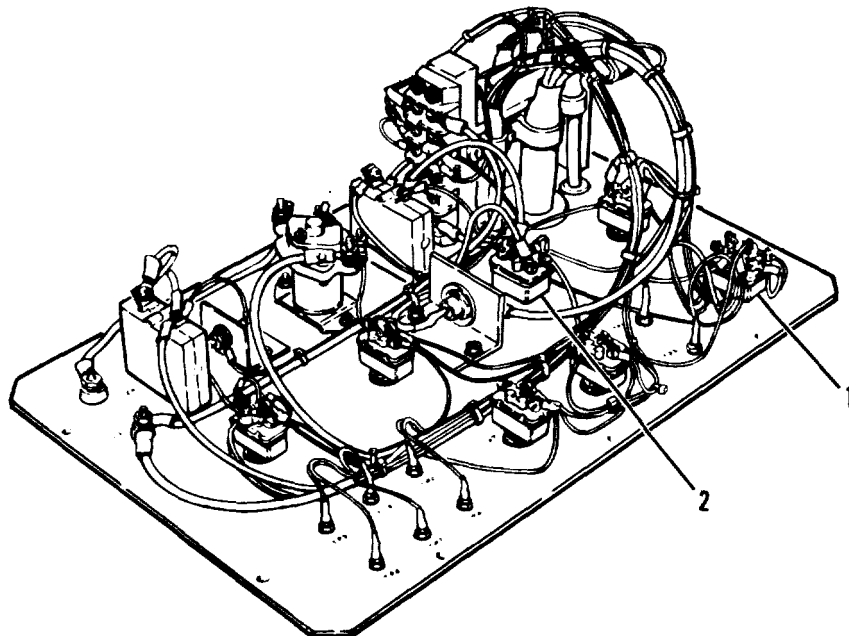
Cover removed to access
controls

4-8a

Front panel removed

Materials/Parts

toggle switch S2, S5 MS25307-212

STEP**PROCEDURE****REMOVAL****NOTE**

Since switches S5 (1) and S2 (2) are the same type of switch, their removal procedures are similar and are combined into one procedure.

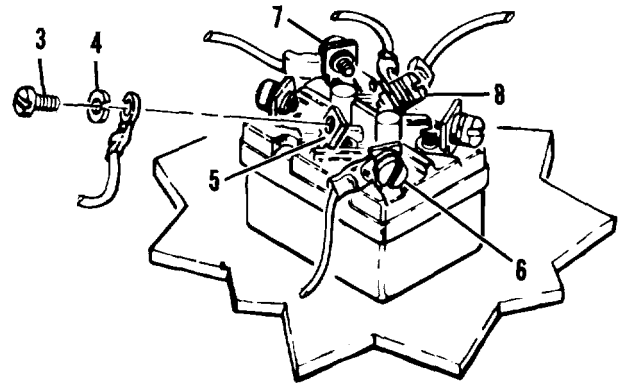
4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

h. DOUBLE POLE TOGGLE SWITCHES - Continued

STEP

PROCEDURE

1. Remove four screws (3) and lock-washers (4) from four switch terminals 2, 3, 4 and 5 (5, 6, 7 and 8) of switch to be removed. Identify wires for installation.

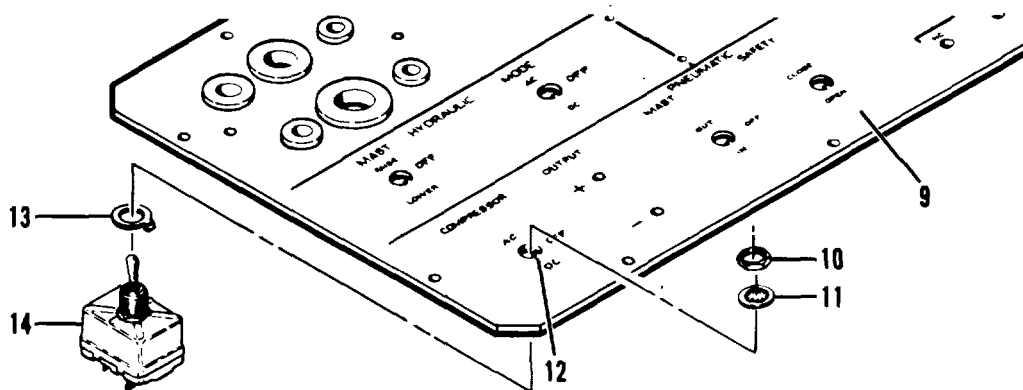


2. Remove retaining nut (10) and star washer (11) from switch to be removed.
3. Remove switch (14) with keying washer (13) from front panel (9).

REPLACEMENT

Replace faulty part with a new part.

INSTALLATION

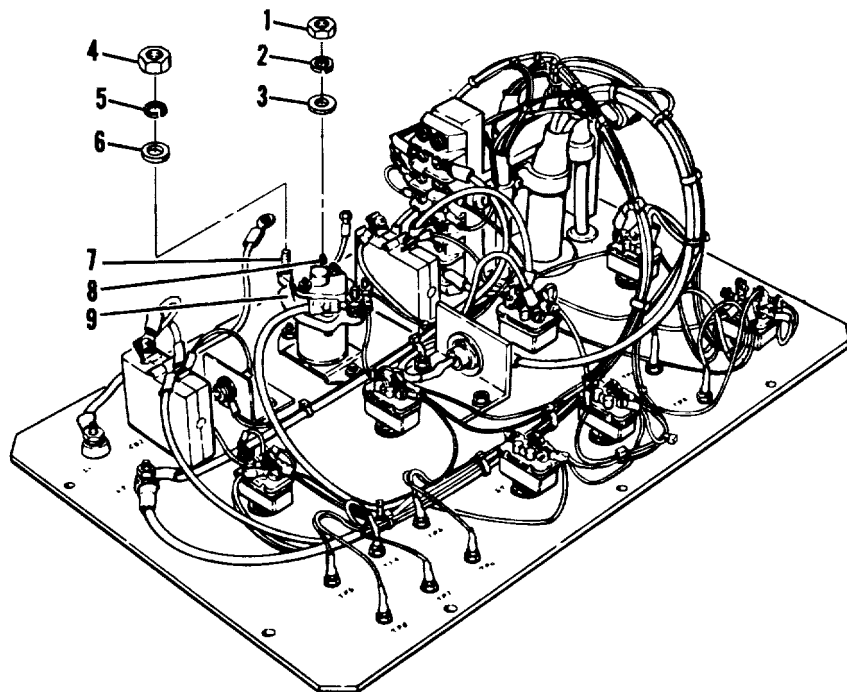


1. Install keying washer (13) on switch (14).
2. Install switch S5 (1) or S2 (2) in front panel (9). Switches are keyed (12) and can only be installed in one direction.
3. Install lock washer (11) and retaining nut (10).

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

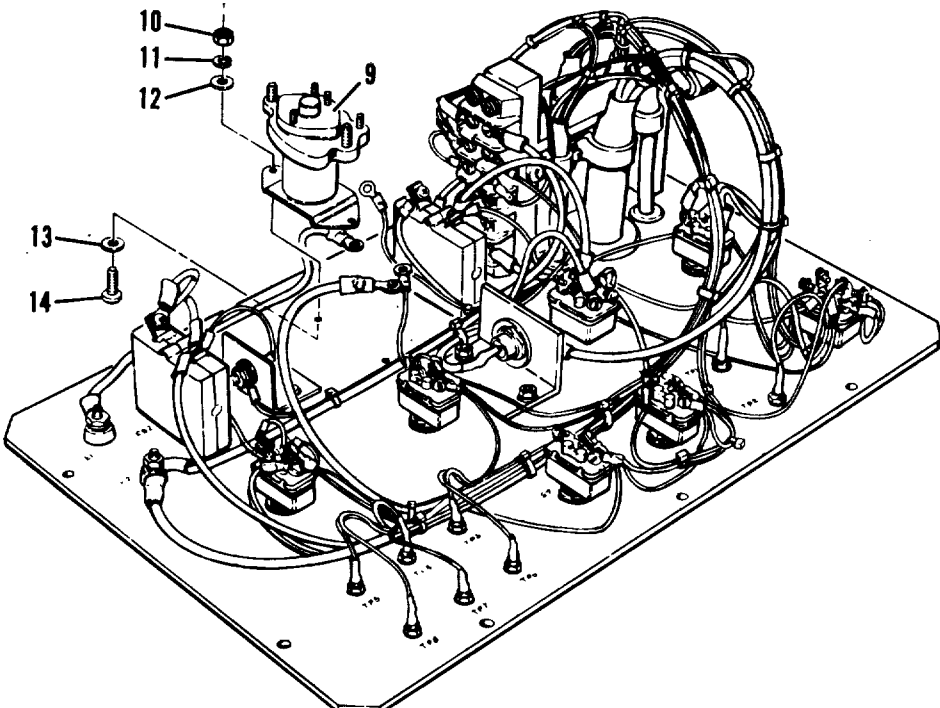
h. DOUBLE POLE TOGGLE SWITCHES - Continued

STEP	PROCEDURE
4.	A perspective view of a double pole toggle switch labeled S2. It is mounted on a star-shaped base. Five wires are connected to the terminals: wire 1 (black) to terminal 2, wire 6 (white) to terminal 3, wire 10 (white) to terminal 4, and wires 11 and 12 (white) to terminal 5. Connect five wires on switch S2 as follows: - Black wire no. 1 to terminal 2. - White wire no. 6 to terminal 3. - White wire no. 10 to terminal 4. - White wires no. 11 and no. 12 to terminal 5. A perspective view of a double pole toggle switch labeled S5. It is mounted on a star-shaped base. Six wires are connected to the terminals: wire 2 (black) and a white/green wire to terminal 2, a red wire to terminal 3, an orange wire to terminal 4, and wire 15 (white) and a red wire to terminal 5.
5.	Connect six wires on switch S5 as follows: - Black wire no. 2 and white/green wire from W5 to terminal 2. - Red wire from W4 to terminal 3. - Orange wire from W5 to terminal 4. - White wire no. 15 and red wire from W2 to terminal 5. TEST Test ICD (para 4-9) to verify repair.

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued			
i. RELAY K1			
This task covers:			
Removal	Replacement	Installation	Test
<u>INITIAL SETUP</u>			
Tools Refrig Unit Svce Tool Kit, 5180-00-596-1474 3/8 in. comb. wr 5/16 in. comb. wr No. 2 xtip scdr		Equipment Condition <u>Para</u> 4-5 4-8a	<u>Condition Description</u> Cover removed to access controls Front panel removed
<u>Materials/Parts</u> relay K1 MS24166D1			
STEP	PROCEDURE		
REMOVAL			

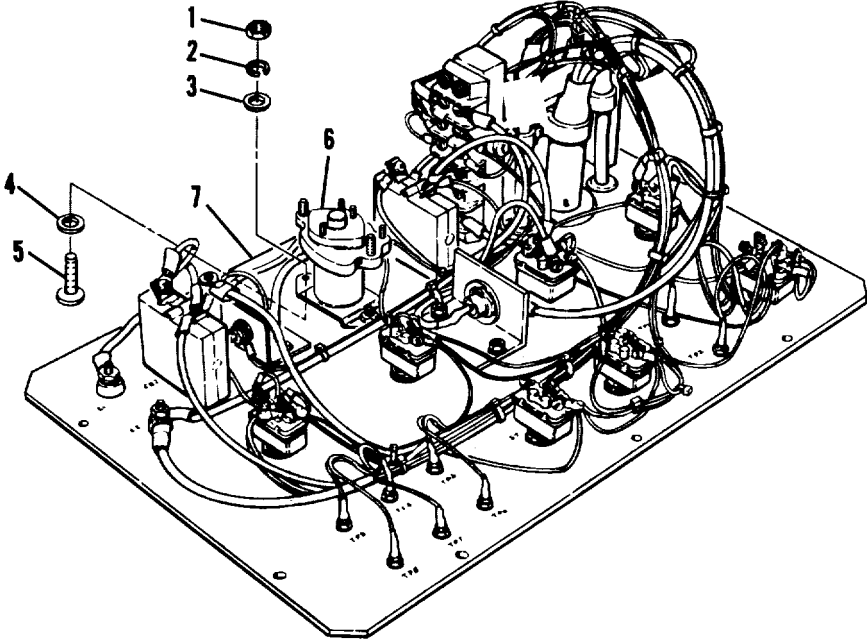
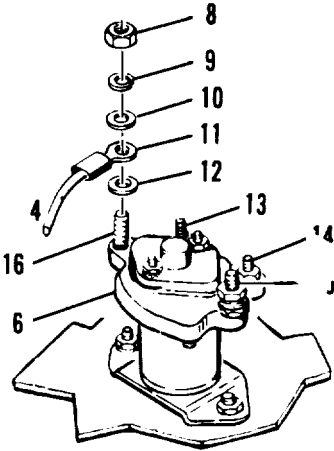
4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

i. RELAY K1- Continued

STEP	PROCEDURE
1. 2. 3. 4.	Remove hex nuts (1), lockwashers (2), and flat washers (3) from smaller two terminal posts (8) on relay K1 (9). Remove wire no. 9 and wire no. 10 from two terminal posts (8). Remove hex nuts (4), lockwashers (5) and flat washers (6) from larger two terminal posts (7) on relay K1 (9). Remove wire no. 4 and black wire (from W1) from the two terminal posts (7). 
5. 6. REPLACEMENT Replace faulty part with a new part.	

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

i. RELAY K1- Continued

STEP	PROCEDURE
	INSTALLATION  1. Install relay K1 (6) on ICD front panel (7) with two screws (5), flat washers (3 and 4), lockwashers (2), and nuts (1).  2. Install four thin flat washers (12) on terminal posts (13, 14, 15 and 16).

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**i. RELAY K1 - Continued**

STEP	PROCEDURE										
3.	Connect four wires (11) to four terminal posts as follows: <table> <tr> <td><u>K1 Pin No.</u></td><td><u>Wire</u></td></tr> <tr> <td>X1 (13)</td><td>No. 9</td></tr> <tr> <td>X2 (14)</td><td>No. 10</td></tr> <tr> <td>A2 (15)</td><td>Black from W1</td></tr> <tr> <td>A1 (16)</td><td>No. 4</td></tr> </table>	<u>K1 Pin No.</u>	<u>Wire</u>	X1 (13)	No. 9	X2 (14)	No. 10	A2 (15)	Black from W1	A1 (16)	No. 4
<u>K1 Pin No.</u>	<u>Wire</u>										
X1 (13)	No. 9										
X2 (14)	No. 10										
A2 (15)	Black from W1										
A1 (16)	No. 4										
4.	Install flat washers (10), lockwashers (9), and nuts (8) on two smaller terminals (13 and 14) and two larger terminals (15 and 16). TEST Test ICD (para 4-9) to verify repair.										

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

j. CABLE ASSEMBLY W1 AND BINDING POST E2

This task covers:

Removal

Replacement

Installation

Test

INITIAL SETUP

Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
7/16 in. comb. wr
3/8 in. comb. wr
11/16 in. comb. wr
No. 2 xtip scdr
1/4 in. flat tip scdr
diag ctg plr
5110-00-240-6209

Equipment
Condition

Para

4-5

Condition Description

Cover removed to access
controls

4-8a

Front panel removed

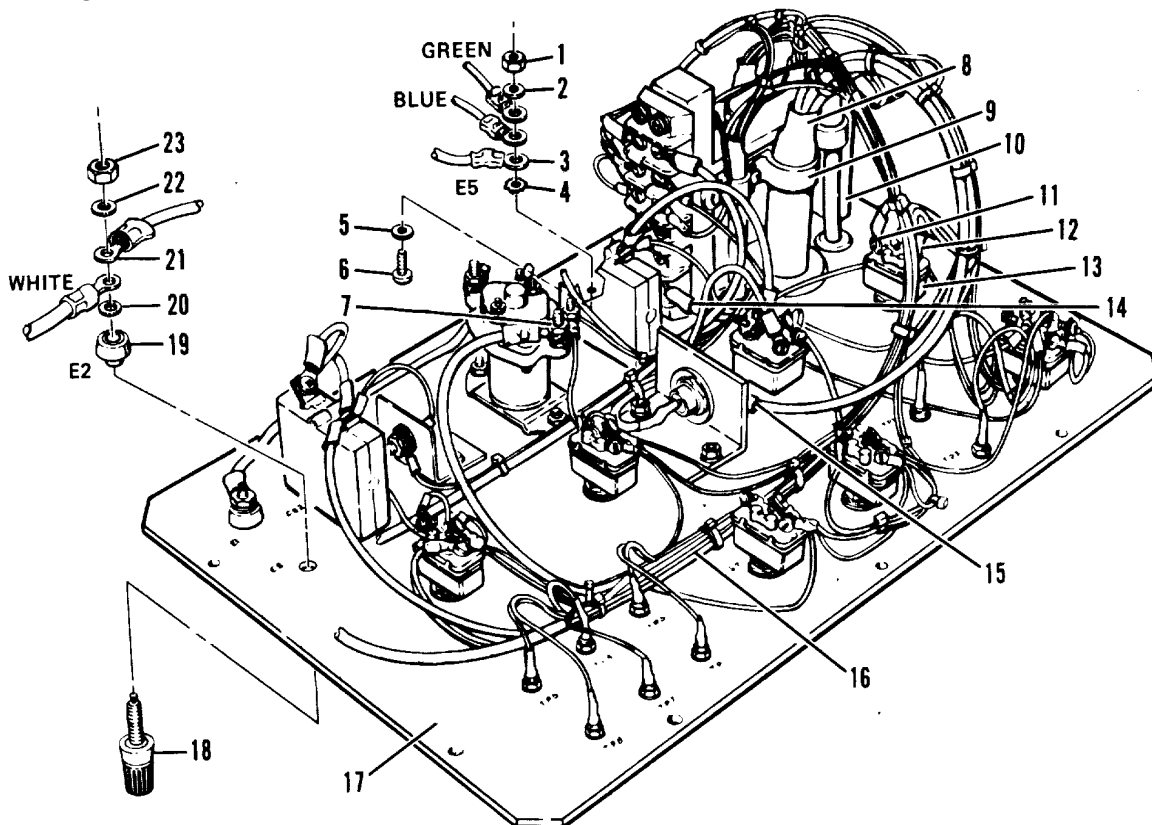
Materials/Parts

wire ties (appx B, item 22)
cable assembly W1

STEP

PROCEDURE

REMOVAL

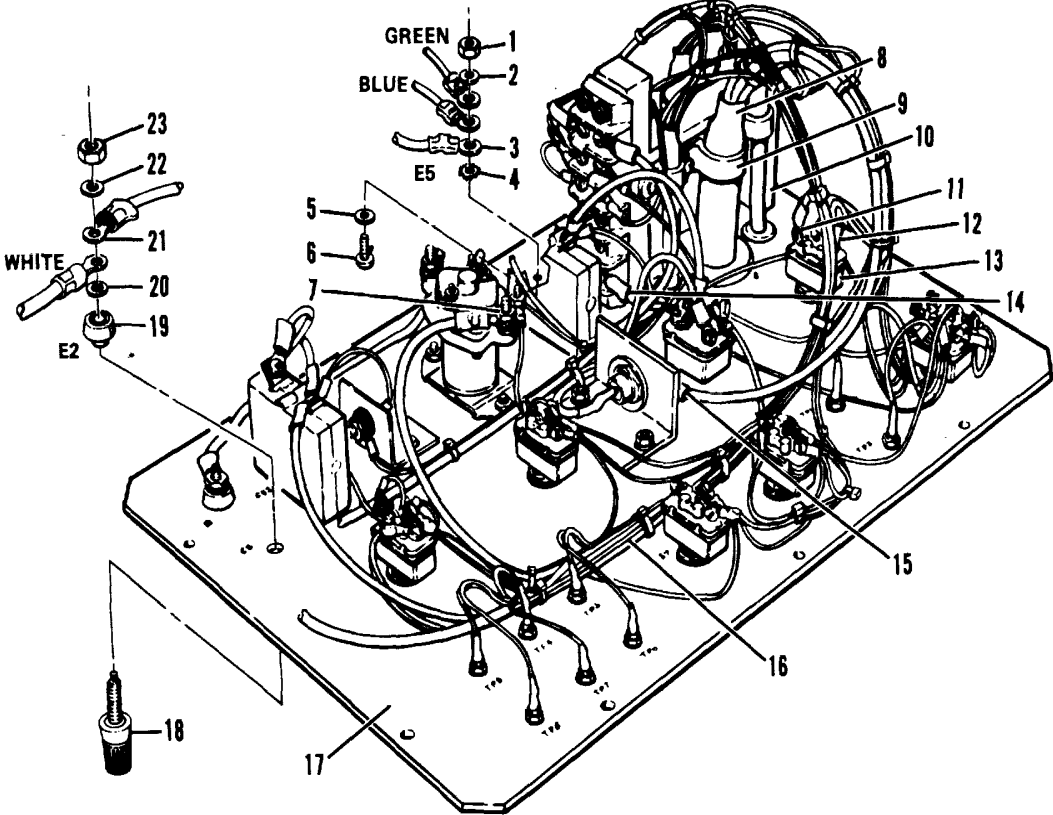


4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**j. CABLE ASSEMBLY W1 AND BINDING POST E2 - Continued**

STEP	PROCEDURE
	<u>CAUTION</u> To prevent damage to equipment, be careful not to cut cables or wire harness when removing wire ties. 1. Remove wire ties from wire bundles as required to free seven wires in cable W1 (8). 2. At terminal lug E5 remove following: a. Remove hex nut (1), flat washer (2) and blue and green wires as required. b. Remove orange wire (3), then reinstall flat washer (2) and hex nut (1) to prevent loss of screw (6), flat washer (5), and star washer (4). 3. Remove blue wire from terminal 1 (11) of switch S1 (12) and green wire from terminal 3 (13). 4. Remove yellow wire from TB1-6B (14). It may be necessary to remove CB1 (para 4-8d) for access to screw at TB1-6B. 5. Remove red wire from CR1 (15) (para 4-8b). 6. At binding post E2 remove: a. Hex nut (23), flat washer (22) and white wire if necessary. b. Brown wire (21), then reinstall flat washer (22) and hex nut (23) to prevent loss of star washer (20), insulator (19), and binding post (18). 7. Remove black wire from terminal A2 of K1 (7) (para 4-8i). 8. Remove loop clamp (9) from cable support bracket (10). 9. Pull cable W1 (8) through rubber grommet. REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Insert seven wires of W1 cable assembly (8) through rubber grommet. Insert one wire at a time beginning with longest wire. 2. Slide loop clamp (9) over cable assembly (8). 3. Position wires so brown, black, red and yellow wires lay on back of front panel (17), and parallel to cable harness (16).

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

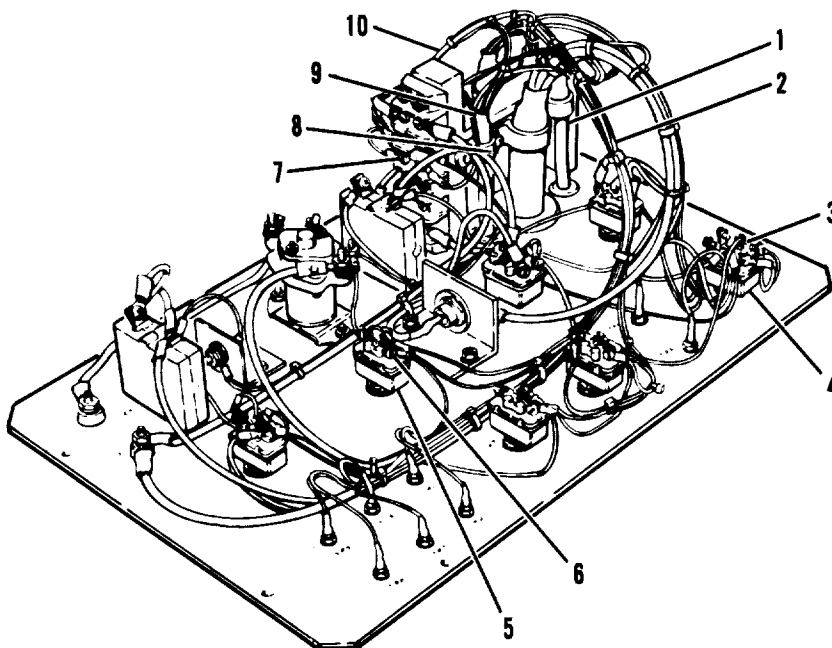
j. CABLE ASSEMBLY W1 AND BINDING POST E2 - Continued

STEP	PROCEDURE
	 4. Connect black wire to terminal A2 of K1 (7) (para 4-8i). 5. Connect brown wire to binding post E2 as follows: - Slide black insulator (19) and star washer (20) over binding post (18). Insulator (19) must be flush with back of front panel (17). - Install brown wire (21), white wire no. 7, flat washer (22) and hex nut (23). 6. Connect red wire to CR1 (15) (para 4-8b). 7. Connect yellow wire to TB1-6B (14). 8. Replace CB1 (para 4-8d). 9. Connect blue wire to terminal 1 (11) of switch S1 (12) and green wire to terminal 3 (13). 10. Bundle brown, black, red, yellow, green, and blue wires of cable W1 into wire harness (16) and use wire ties as necessary.

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

j. CABLE ASSEMBLY W1 AND BINDING POST E2 - Continued

STEP	PROCEDURE
11.	Connect orange wire to terminal lug E5 as follows:
a.	Install screw (6) and flat washer (5) through front panel (17).
b.	Install star washer (4), orange wire (3) from cable W1, blue and green wires, flat washer (2) and hex nut (1).
12.	Tie orange wire into available wire harness using wire ties as necessary.
13.	Fasten loop clamp (9) to cable support bracket (10) with screw, flat washer and lock washer .
	TEST
	Test ICD (para 4-9) to verify repair.

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued			
k. CABLE ASSEMBLY W2			
This task covers:			
Removal	Replacement	Installation	Test
<u>INITIAL SETUP</u>			
<u>Tools</u> Refrig Unit Svce Tool Kit, 5180-00-596-1474 No. 2 xtip scdr 1/4 in. flat tip scdr diaq ctg plr, 5110-00-240-6209		Equipment Condition <u>Para</u> 4-5 4-8a	<u>Condition Description</u> Cover removed to access controls Front panel removed
<u>Materials/Parts</u> wire ties (appx B, item 22) cable assembly W2			
STEP	PROCEDURE		
REMOVAL			

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued	
k. CABLE ASSEMBLY W2 - Continued	
STEP	PROCEDURE
	<u>CAUTION</u> To prevent damage to equipment, be careful not to cut cables or wire harness when removing wire ties. 1. Remove wire ties as required from wire harnesses (2 and 10) to free four wires in cable W2 (9). 2. Remove orange and black wires from TB1-3A (7). 3. Remove brown wire from terminal 3 (6) of switch S3 (5). 4. Remove red wire from terminal 5 (3) of switch S5 (4). 5. Remove loop clamp (8) from cable support bracket (1). 6. Pull cable W2 (9) through rubber grommet. REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Insert four wires of cable W2 (9) through rubber grommet. Insert one wire at a time beginning with longest wire. 2. Slide loop clamp (8) over cable W2 (9). 3. Connect red wire to terminal 5 (3) of switch S5 (4). 4. Connect brown wire to terminal 3 (6) of switch S3 (5). 5. Connect orange and black wires to TB1-3A (7). 6. Bundle red and brown wires into wire harness (2) and bundle black and orange wires into wire harness (10). Secure wires into wire harnesses with wire ties. 7. Fasten loop clamp (8) to cable support bracket (1) with screw, flat washer and lock washer , TEST Test ICD (para 4-9) to verify repair.

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**I. CABLE ASSEMBLY W3****This task covers:****Removal****Replacement****Installation****Test****INITIAL SETUP**Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 2 xtip scdr
1/4 in. flat tip scdr
diag ctg plr, 5110-00-240-6209

Equipment
Condition

Para

4-5

Condition Description

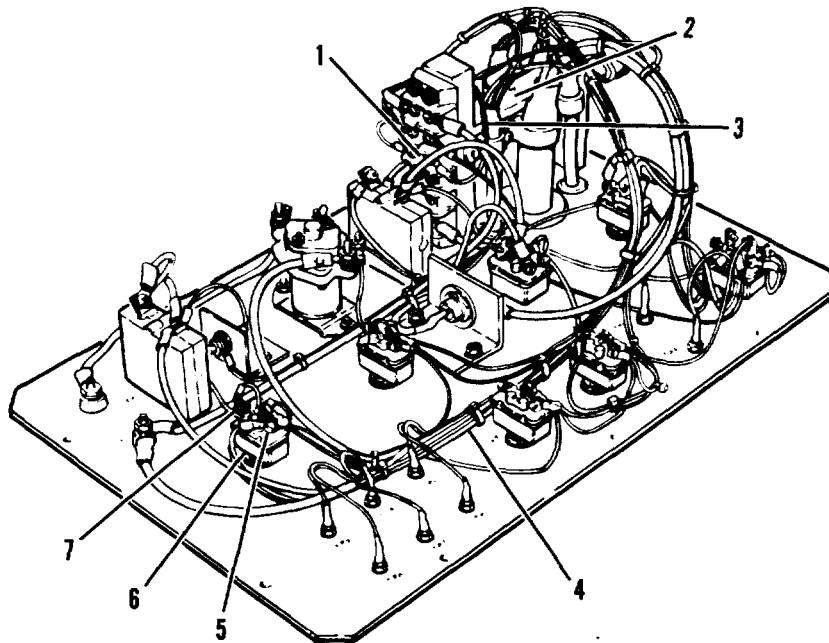
Cover removed to access
controls

4-8a

Front panel removed

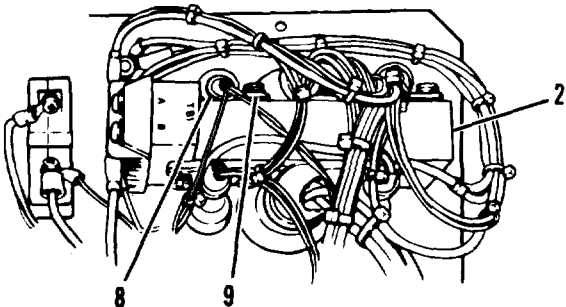
Materials/Parts

wire ties (appx B, item 22)
cable assembly W3

STEP**PROCEDURE****REMOVAL****CAUTION**

To prevent damage to equipment, be careful not to cut cables or wire harness when removing wire ties.

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**I. CABLE ASSEMBLY W3 - Continued**

STEP	PROCEDURE
1. Remove wire ties from wire harnesses (3 and 4) as required to free three wires in cable W3 (8). 2. Remove black wire from TB1-3B (1). 3. Remove brown wire from terminal 1 (7) of switch S4 (6) and red wire from terminal 3 (5). 4. Remove loop clamp (9) from cable support bracket (2). 5. Pull cable W3 (8) through rubber grommet.	 The diagram shows a cable assembly W3 (8) being pulled through a rubber grommet (9) in a cable support bracket (2). The cable has multiple wires, some of which are bundled into wire harnesses (3 and 4). The diagram is a line drawing showing the physical arrangement of the cable, bracket, and grommet.
	REPLACEMENT Replace faulty part with a new part.
	INSTALLATION 1. Insert three wires of cable W3 (8) through rubber grommet. Insert one wire at a time beginning with longest wire. 2. Slide loop clamp (9) over cable assembly (8). 3. Connect brown wire to terminal 1 (7) of switch S4 (6) and red wire to terminal 3 (5). 4. Connect black wire to TB1-3B (1). 5. Bundle red and brown wires into wire harness (4) and bundle black wire into wire harness (3). Secure wires in wire harnesses with wire ties. 6. Fasten loop clamp (9) to cable support bracket (2) with screw, flat washer, and lock washer.
	TEST Test ICD (para 4-9) to verify repair.

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

m. CABLE ASSEMBLY W4 and TERMINAL LUG E5

This task covers:

Removal

Replacement

Installation

Test

INITIAL SETUPTools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
No. 2 xtip scdr
3/8 in. comb. wr
5/16 in. comb. wr
1/4 in. flat tip scdr
pocket knife
heat gun
sldr and desldr set
diag cut plr

Equipment

Condition

Para

4-5

4-8a

Condition DescriptionCover removed to access
controls

Front panel removed

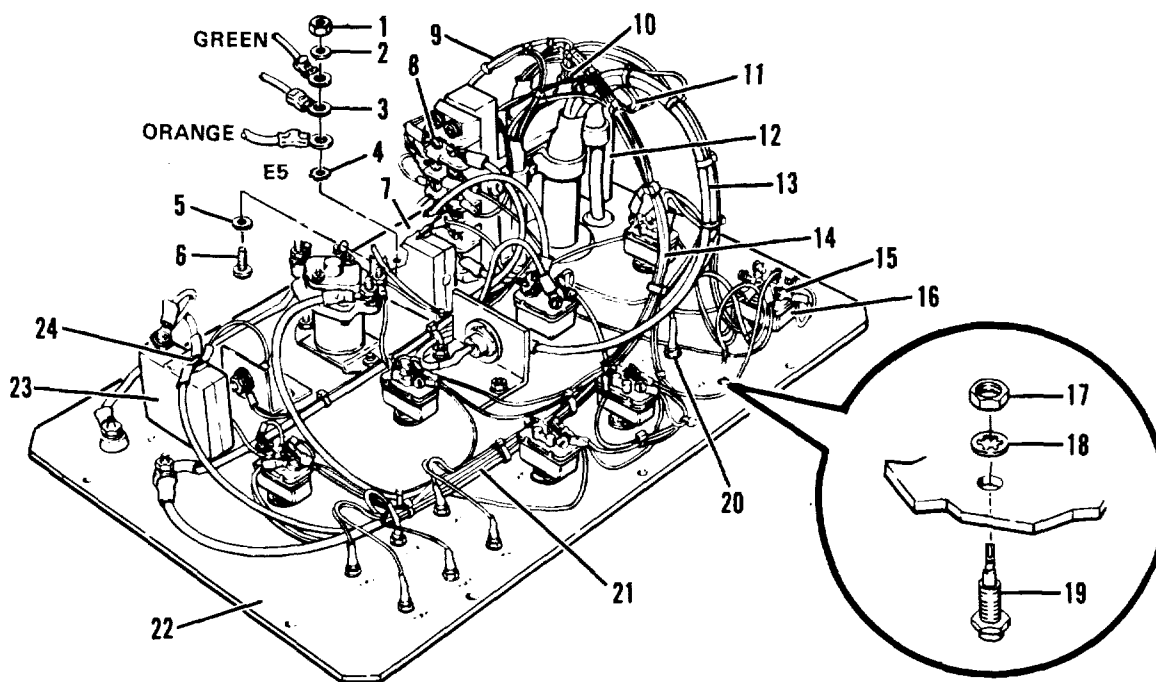
Materials/Parts

wire ties (appx B, item 22)
insulation sleeving (appx B, item 7)
solder (appx B, item 19)
cable assembly W4

STEP

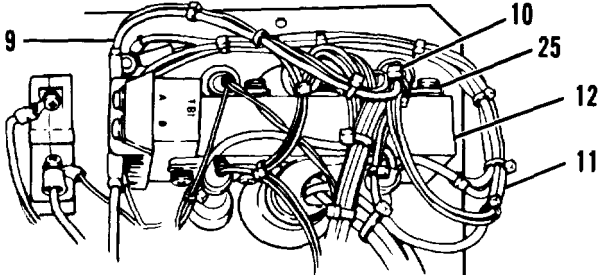
PROCEDURE

REMOVAL



4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

m. CABLE ASSEMBLY W4 AND TERMINAL LUG E5 - Continued

STEP	PROCEDURE
	CAUTION To prevent damage to equipment, be careful not to cut cables or wire harness when removing wire ties or heat shrink sleeving. 1. Remove wire ties, as required, from wire bundles (9, 11, 13, 14 and 21) to free seven wires in cable W4 (10). 2. At terminal lug E5: a. Remove hex nut (1), flat washer (2), blue wire (3) and orange and green wires. b. Reconnect orange and green wires, flat washer (2), and hex nut (1) to E5 to prevent loss of star washer (4), flat washer (5), and screw (6). 3. Remove yellow wire from TB1-6A (7). It may be necessary to remove CB1 (para 4-8d) to access screw at TB1-6A. 4. Remove brown wire from TB1-1A (8). 5. Remove red wire from terminal 3 (15) of switch S5 (16). 6. To remove cable assembly W4: remove heat shrink sleeving from wire at TP1 (20) and TP2 (19). Unsolder orange wire from TP1 and green wire from TP2. 7. To remove a damaged tip jack TP1 or TP2: a. Remove heat shrink sleeving from the wire at damaged tip jack , either TP1 (20) or TP2 (19). b. Unsolder wire from the damaged tip jack, either the orange wire from TP1 or green wire from TP2. c. Remove nut (17) and flat washer (18) securing tip jack (19) to front panel (22). 8. Remove large black wire from CB2 (23) terminal 2 (24) (para 4-8e). (Black wire labeled no. 5 remains connected to CB2.) 9. Remove loop clamp (25) from cable support bracket (12). 

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**m. CABLE ASSEMBLY W4 AND TERMINAL LUG E5 - Continued**

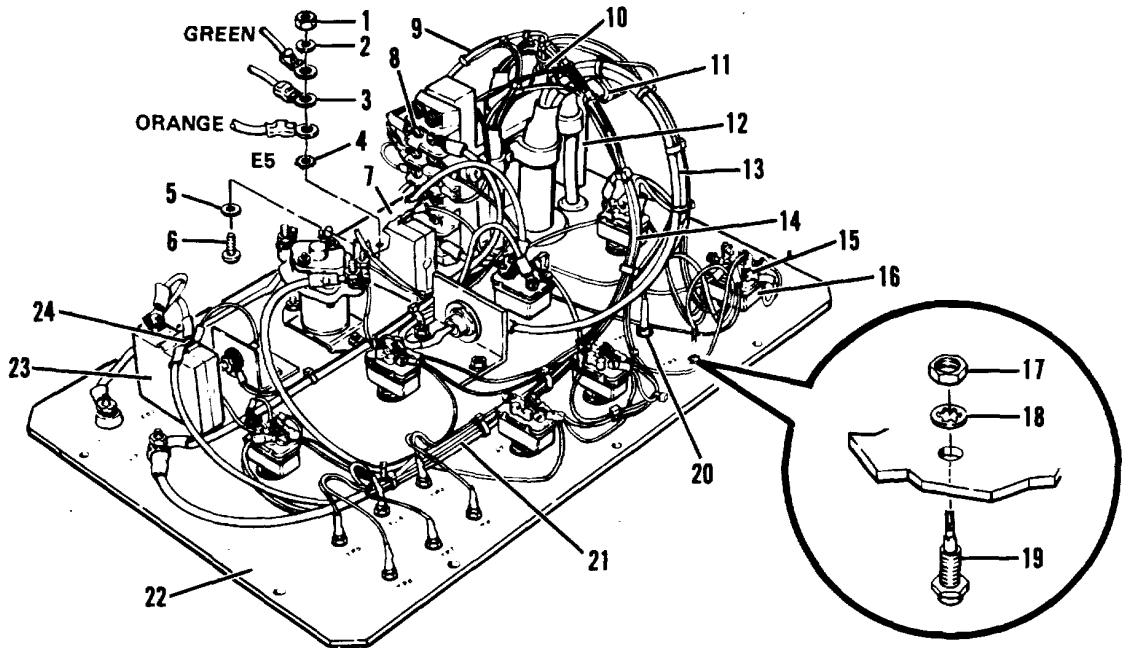
STEP	PROCEDURE
10.	Pull cable W4 (10) through rubber grommet. REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Insert seven wires of cable W4 (10) through rubber grommet. Insert one wire at a time beginning with longest wire. 2. Slide loop clamp over cable W4 (10). 3. Position wires of cable so brown wire follows wire bundle (9), blue and yellow wires lay around behind cable support bracket (12) and follow wire bundle (11), green and orange wires follow wire bundle (13), red wire follows wire bundle (14), and black wire follows wire bundles (14 and 21). 4. Connect black wire to CB2 (23) terminal 2 (24) (para 4-8e).

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**m. CABLE ASSEMBLY W4 AND TERMINAL LUG E5 - Continued**

STEP	PROCEDURE
5.	To install orange and green wire of cable assembly W4: a. Prepare and tin orange and green wire. NOTE Keep tip of soldering iron clean. b. Cut two pieces of heat shrink sleeving 1/2 in. long and slide it over orange and green wires. c. Solder orange wire to TP1 (20) and solder green wire to TP2 (19). d. Slide heat shrink sleeving over newly soldered connections and apply heat to shrink sleeving.
6.	To install a damaged tip jack either TP1 or TP2: a. Install tip jack (19), star washer (18), and nut (17). b. Prepare and tin orange or green wire. NOTE Keep tip of soldering iron clean. c. Cut a piece of heat shrink sleeving 1/2 in. long and slide it over either orange or green wire. d. Solder orange wire to TP1 (20) or solder green wire to TP2 (19). e. Slide heat shrink sleeving over newly soldered connection and apply heat to shrink sleeving.
7.	Connect red wire to terminal 3 (16) of switch S5 (15).
8.	Connect brown wire to TB1-1A (8).
9.	Connect yellow wire to TB1-6A (7). Replace CB1 if removed for access.
10.	Connect blue wire to terminal lug E5 as follows: a. Install screw (6) and flat washer (5) through front panel (22). b. Install star washer (4), blue wire (3) from cable W1, orange and green wires, flat washer (2), and hex nut (1).

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

m. CABLE ASSEMBLY W4 AND TERMINAL LUG E5 - Continued

STEP	PROCEDURE
	 11. Tie yellow and blue wires into wire bundle (11). 12. Tie brown wire into wire bundle (9). 13. Tie orange and green wires into wire bundle (13). 14. Tie black and red wires into wire bundle (14) so red wire stops at S5 (15) and black wire continues in wire bundle (21). 15. Fasten loop clamp to cable support bracket (12) with screw, lockwasher , and flat washer. TEST Test ICD (para 4-9) to verify repair.

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**n. CABLE ASSEMBLY WS**

This task covers:

Removal

Replacement

Installation

Test

INITIAL SETUPTools

Refrig Unit Svce Tool Kit,

5180-00-596-1474

No. 2 xtip scdr

1/4 in. flat tip scdr

heat gun

sldr and desldr set

diag ctg plr, 5110-00-240-6209

Equipment

Condition

Para

4-5

4-8a

Condition DescriptionCover removed to access
controls

Front panel removed

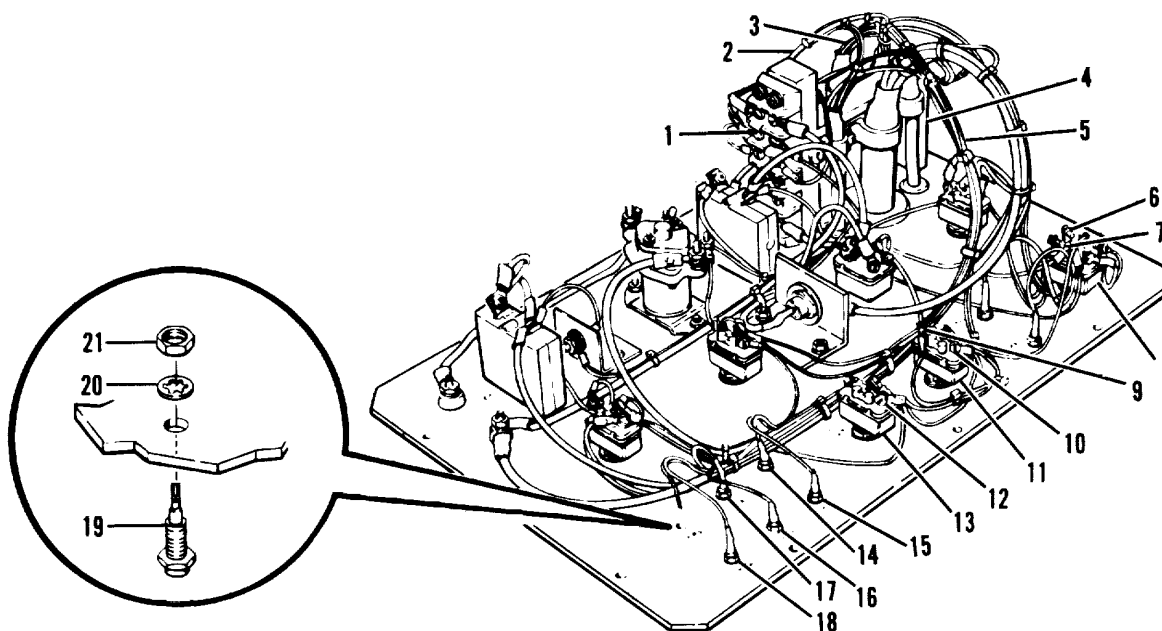
Materials/Parts

wire ties (appx B, item 22)

insulation sleeving (appx B, item 7)

solder (appx B, item 19)

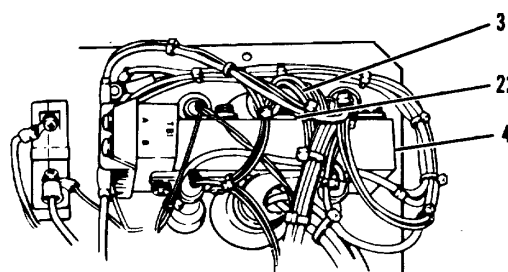
cable assembly W5

STEP**PROCEDURE****REMOVAL****CAUTION**

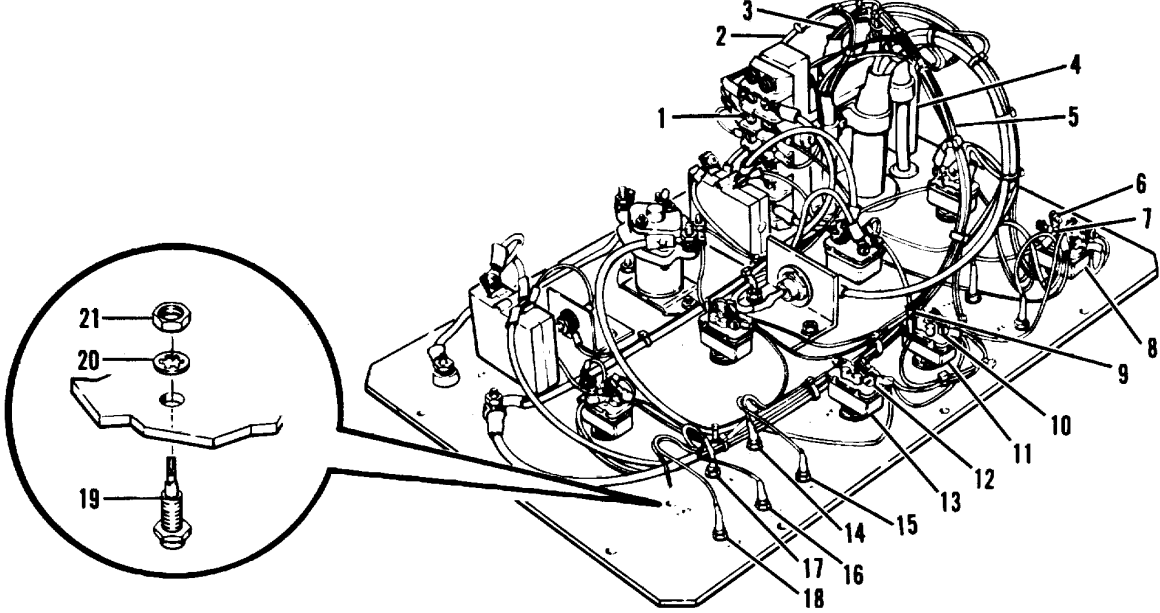
To prevent damage to equipment, be careful not to cut cables or wire harness when removing wire ties or heat shrink sleeving

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**n. CABLE ASSEMBLY WS - Continued**

STEP	PROCEDURE
1.	Remove wire ties as required from wire bundles (2 and 5) to free 13 wires in cable W5 (3).
2.	Remove green and white/black wires from TB1-2A (1).
3.	Remove orange wire from terminal 4 (6) of switch S5 (8) and white/green wire from terminal 2 (7).
4.	Remove grey wire from terminal 1 (9) of switch S6 (11) and yellow wire from terminal 3 (10).
5.	Remove white wire from terminal 3 (12) of switch S7 (13).
6.	To remove cable assembly W5: remove heat shrink sleeving from wires at TP3(14), TP6 (15), TP7 (16), TP4 (17), TP8 (18), and TP5 (19).
(	
7.	Unsolder six wires from six test points TP3 thru TP8.
8.	To remove a damaged tip jack TP3 through TP8:
	a. Remove heat shrink sleeving from wire at damaged tip jack either TP3. (14), TP6 (15), TP7 (16), TP4 (17), TP8 (18), or TP5 (19).
	b. Unsolder wire from the damaged tip jack
	c. Remove nut (21), star washer (20) and tip jack (19).
9.	Remove loop clamp (22) from cable support bracket (4).
10.	Pull cable W5 (3) through rubber grommet.
	REPLACEMENT
	Replace faulty part with a new part.
	INSTALLATION
1.	Insert thirteen wires of cable W5 (3) through rubber grommet. Insert one wire at a time beginning with longest wire.
2.	Slide loop clamp (22) over cable W5 (3).



4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**n. CABLE ASSEMBLY WS - Continued**

STEP	PROCEDURE																					
	 3. Position wires of cable so green and white/black wires follow wire bundle (2) and remaining eleven wires are in wire bundle (5). 4. To install six wires of cable W5 to six tip jacks, TP3 thru TP8: a. Tin six wires for soldering to six test points TP3 thru TP8. b. Cut six pieces of heat shrink sleeving 1/2 in. long and slide over wires. c. Solder six wires to test points TP3 through TP8 as follows: <table><thead><tr><th>TEST POINT</th><th>WIRE COLOR</th><th>INDEX NO.</th></tr></thead><tbody><tr><td>3</td><td>Blue</td><td>(14)</td></tr><tr><td>4</td><td>White/Orange</td><td>(17)</td></tr><tr><td>5</td><td>White/Yellow</td><td>(19)</td></tr><tr><td>6</td><td>White/Red</td><td>(15)</td></tr><tr><td>7</td><td>White/Brown</td><td>(16)</td></tr><tr><td>8</td><td>Violet</td><td>(18)</td></tr></tbody></table> d. Slide heat shrink sleeving over newly soldered connections and apply heat to shrink sleeving.	TEST POINT	WIRE COLOR	INDEX NO.	3	Blue	(14)	4	White/Orange	(17)	5	White/Yellow	(19)	6	White/Red	(15)	7	White/Brown	(16)	8	Violet	(18)
TEST POINT	WIRE COLOR	INDEX NO.																				
3	Blue	(14)																				
4	White/Orange	(17)																				
5	White/Yellow	(19)																				
6	White/Red	(15)																				
7	White/Brown	(16)																				
8	Violet	(18)																				

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

n. CABLE ASSEMBLY WS - Continued

STEP	PROCEDURE
5.	To install one of damaged tip Jacks, TP3 through TP8: a. Install tip jack (19), star washer (20) and nut (21). b. Prepare and tin wire for replaced tip jack. c. Cut a piece of heat shrink sleeving 1/2 in. long and slide over wire. d. Solder wire to test point. e. Slide heat shrink sleeving over newly soldered connection and apply heat to shrink sleeving.
6.	Connect white wire to terminal 3 (12) of switch S7 (13).
7.	Connect grey wire to terminal 1 (9) of switch S6 (11) and yellow wire to terminal 3 (10).
8.	Connect orange wire to terminal 4 (6) of switch S5 (8) and white/green wire to terminal 2 (7).
9.	Connect green and white/black wires to TB1-2A (1).
10.	Tie green and white/black wires into wire bundle (2).
11.	Tie remaining wires into wire bundle (5).
12.	Fasten loop clamp to cable support bracket (4) with screw, lockwasher , and flat washer .
	TEST
	Test ICD (para 4-9) to verify repair.

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**o. CABLE ASSEMBLY W6**

This task covers:

Removal

Replacement

Installation

Test

INITIAL SETUPTools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
3/8 in. comb. wr
No. 2 xtip scdr
1/4 in. flat tip scdr
diag ctg plr
5110-00-240-6209

EquipmentConditionPara

4-5

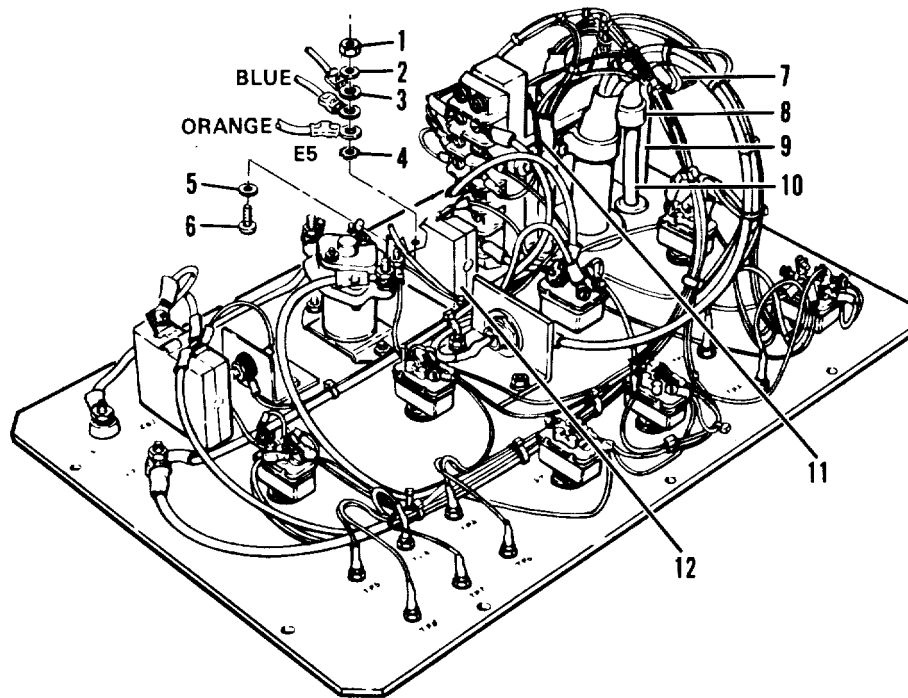
4-8a

Condition DescriptionCover removed to access
controls

Front panel removed

Materials/Parts

wire ties (appx B, item 22)
cable assembly W6

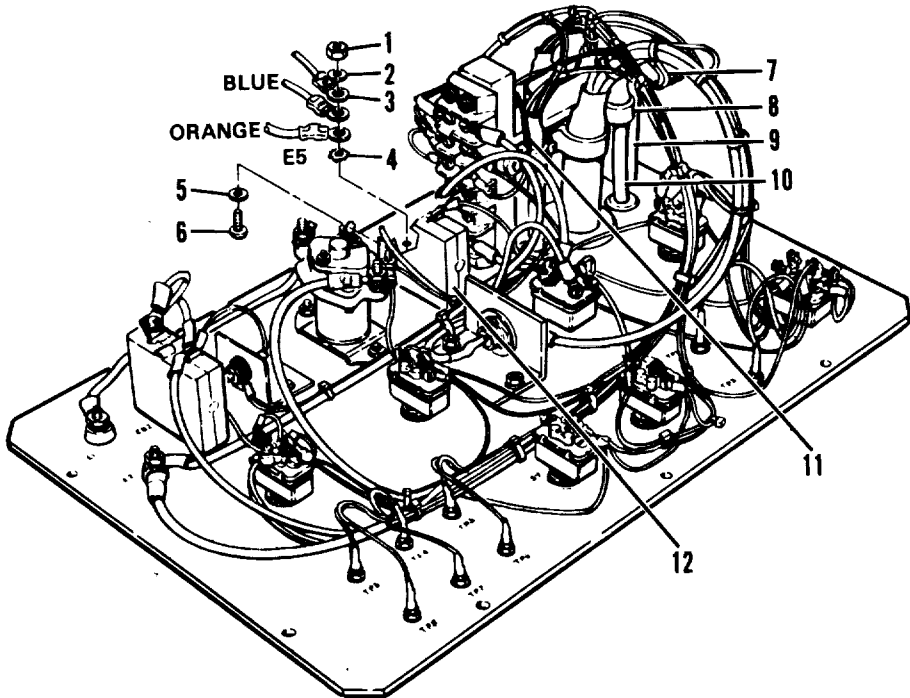
STEP PROCEDURE**REMOVAL**

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**o. CABLE ASSEMBLY W6 - Continued**

STEP	PROCEDURE
	CAUTION To prevent damage to equipment, be careful not to cut cables or wire harness when removing wire ties. 1. Remove wire ties from wire bundles (7 and 11) to free three wires in W6 (10). 2. At terminal lug E5: a. Remove hex nut (1), flat washer (2) and blue and orange wire as required. b. Remove green wire (3) then reinstall flat washer (2) and hex nut (1) to prevent loss of screw (6), flat washer (5), and star washer (4). 3. Remove white wire from TB1-6A (14). It may be necessary to remove CB1 to - access screw at TB16A (para 4-8d). 4. Remove black wire from terminal 1 (13) of CB1 (12) (para 4-8d). 5. Remove loop clamp (8) from cable support bracket (9). 6. Pull cable W6 (10) through rubber grommet. REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Insert three wires of W6 cable assembly (10) through rubber grommet. Insert one wire at a time beginning with longest wire. 2. Slide loop clamp (8) over cable assembly (10). 3. Connect white wire to TB1-6A (14). Remove CB1 if removed for access. 4. Connect black wire to terminal 1 (13) of CB1 (12) (para 4-8d).

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

o. CABLE ASSEMBLY W6 - Continued

STEP	PROCEDURE
	 5. Connect green wire to terminal lug E5 as follows: - Install screw (6) and flat washer (5) through front panel. - Install star washer (4), green wire (3) from cable W6 (10) blue and range wires, flat washer (2), and hex nut (1). 6. Tie green and white wires into bundle (7). 7. Tie black wire from CB1 (12) into wire bundle (11). 8. Fasten loop clamp (8) to cable support bracket (9) with screw, lockwasher, and flat washer. TEST Test ICD (para 4-9) to verify repair.

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

p. WIRING HARNESS AND BINDING POST E1

This task covers:

Removal

Replacement

Installation

Test

INITIAL SETUPTools

Refrig Unit Svce Tool Kit,
 5180-00-596-1474
 5/16 in. comb. wr
 11/32 in. comb. wr
 3/8 in. comb. wr
 1/4 in. flat tip scdr
 No. 1 xtip scdr
 pocket knife
 sldr and desldr set
 diag ctg plr
 heat gun
 plier type heat sink

EquipmentConditionPara

4-5

4-8a

Condition Description

Cover removed to access controls

Front panel removed

Materials/Parts

insulation sleeving (appx B, item 7)

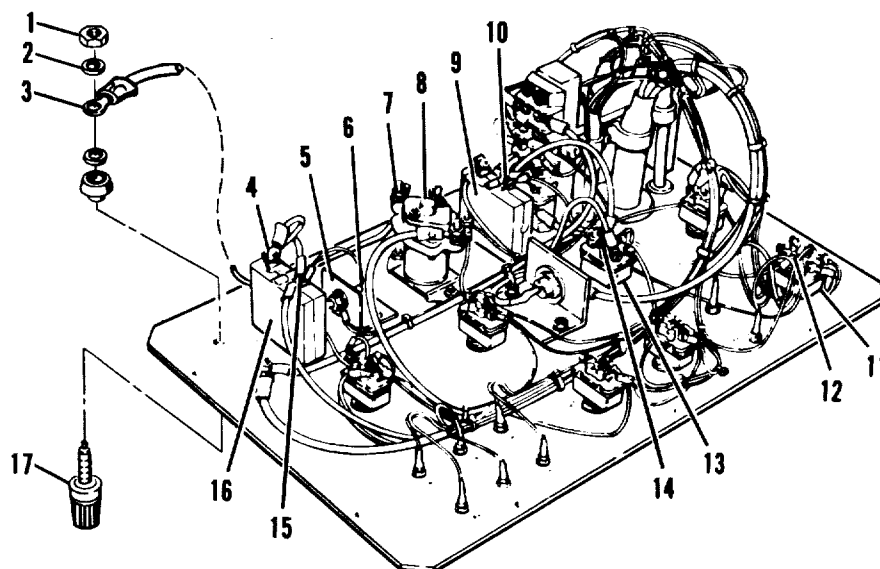
solder (appx B, item 19)

wire ties (appx B, item 22)

wire harness

STEP**PROCEDURE****REMOVAL****CAUTION**

Replace only those wires that are broken, damaged, or open in the wire harness. Make point-to-point continuity check of a suspected wire to make sure it is faulty before replacing.



4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**p. WIRING HARNESS AND BINDING POST E1****STEP****PROCEDURE****CAUTION**

To prevent damage to equipment, be careful not to cut cables or wire harness when removing wire ties.

NOTE

This procedure provides information for replacement of those wires not part of cable assemblies. There are 16 wires in the ICD wiring harness that are not part of the six cable assemblies. The wires are identified in table 4-2 by wire numbers, wire colors and point-to-point connections.

As you remove each wire terminal lug from the components, replace all washers, nuts, and screws on the terminals so the hardware will not be lost.

1. Remove required wires of wiring harness as follows:
 - a. Wire no. 1:
 - (1) Remove screw and washer from CB1 (9) terminal 2 (10).
 - (2) Remove screw and washer from S2 (13) terminal 2 (14).
 - b. Wire no. 2:
 - (1) Remove screw and washer from CB1 (9) terminal 2 (10).
 - (2) Remove screw and washer from S5 (11) terminal 2 (12).
 - c. Wire no. 3:
 - (1) Remove nut (1) flat washer (2), and white wire no. 3 (3) from binding post EI (17).
 - (2) Remove screw and washer from CB2 (16) terminal 1 (4).
 - d. Wire no. 4:
 - (1) Remove screw and washer from CB2 (16) terminal 2 (15).
 - (2) Remove nut, lockwasher and flat washer from K1 (8) terminal AI (7) (para 4-8i).
 - e. Wire no. 5:
 - (1) Remove screw and washer from CB2 (16) terminal 2 (15).
 - (2) Remove wire no. 5 from CR2 (5) anode (6) (para 4-8c).

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

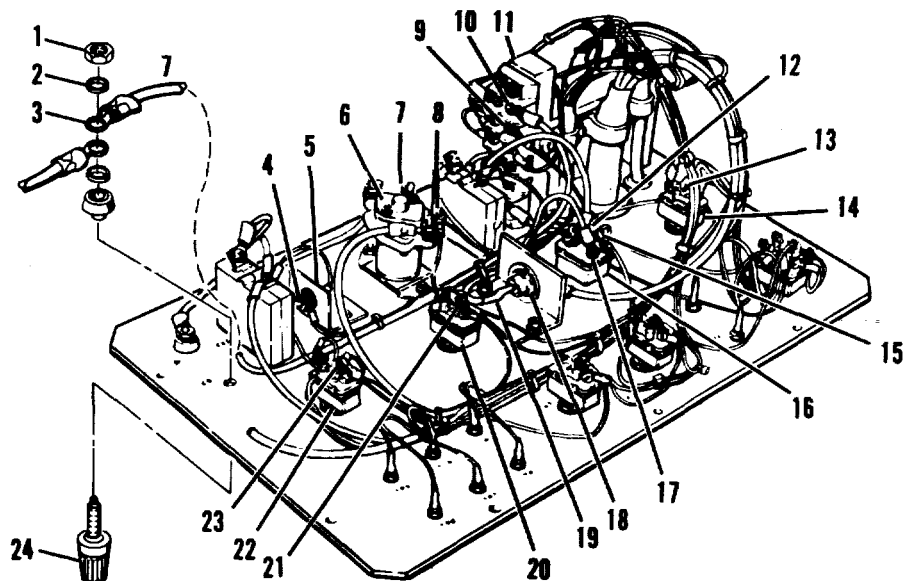
p. WIRING HARNESS AND BINDING POST E1

STEP

PROCEDURE

Table 4-2. Wiring harness connections

Wire No.	Wire Color	Connections From	To
1	Black	CB1 terminal 2	S2 terminal 2
2	Black	CB1 terminal 2	S5 terminal 2
3	White	CB2 terminal 1	E1 +24 Vdc
4	White	CB2 terminal 2	K1 terminal A1
5	Black	CB2 terminal 2	•CR2 anode
6	White	CR1 anode	S2 terminal 3
7	White	E2 -24 Vdc	TB1 terminal 1B
8	White	CR2 cathode	S1 terminal 2
9	White	K1 terminal X1	TB1 terminal 2B
10	White	K1 terminal X2	S2 terminal 4
11	White	S2 terminal 5	S1 terminal 2
12	White	S2 terminal 5	S3 terminal 2
13	White	S3 terminal 2	S4 terminal 2
14	White	S4 terminal 2	S7 terminal 2
15	White	S6 terminal 2	S5 terminal 2
16	White	S7 terminal 2	S6 terminal 2

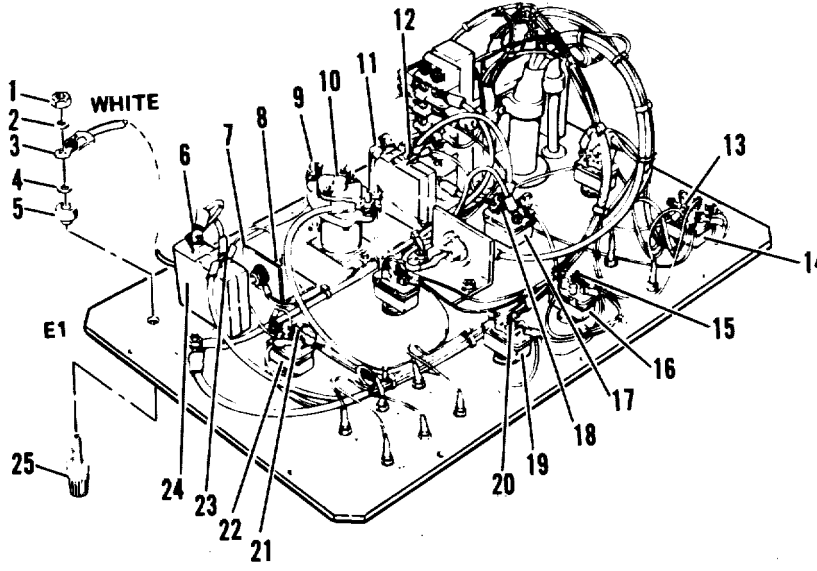


4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**p. WIRING HARNESS AND BINDING POST E1**

STEP	PROCEDURE
1. Cont.	Remove required wires of wiring harness as follows: f. Wire no. 6: (1) Remove wire no. 6 from CR1 (18) anode (19) (para 4-8b). (2) Remove screw and washer from S2 (16) terminal 3 (17). g. Wire no. 7: (1) Remove nut (1), flat washer (2) and white wire no. 7 (3) from E2 (24). (2) Remove screw from TB1 (11) terminal 1B (10). h. Wire no. 8: (1) Remove hex nut lockwasher and wire no. 8 from CR2 (5) cathode (4) (para 4-8cl). (2) Remove screw and washer from S1 (14) terminal 2 (13). i. Wire no. 9: (1) Remove nut, lockwasher and flat washer from K1 (6) terminal X1 (7) (para 4-8i). (2) Remove screw from TB1 (11) terminal 2B (9). j. Wire no. 10: (1) Remove nut, lockwasher, and flat washer from K1 (6) terminal X2 (8) (para 4-8i). (2) Remove screw and washer from S2 (16) terminal 4 (12). k. Wire no. 11: (1) Remove screw and washer from S2 (16) terminal 5 (15). (2) Remove screw and washer from S1 (14) terminal 2 (13). 1. Wire no. 12: (1) Remove screw and washer from S2 (16) terminal 5 (15). (2) Remove screw and washer from S3 (20) terminal 2 (21). m. Wire no. 13: (1) Remove screw and washer from S3 (20) terminal 2 (21). (2) Remove screw and washer from S4 (22) terminal 2 (23).

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

p. WIRING HARNESS AND BINDING POST E1

STEP	PROCEDURE
1. Cont.	Remove required wires of wiring harness as follows:  n. Wire no. 14: 21 (1) Remove screw and washer from S4 (22) terminal 1 2 (21). (2) Remove screw and washer from S7 (19) terminal 2 (20). o. Wire no. 15: (1) Remove screw and washer from S6 (16) terminal 2 (15). (2) Remove screw and washer from S5 (14) terminal 2 (13). p. Wire no. 16: (1) Remove screw and washer from S7 (19) terminal 2 (20). (2) Remove screw and washer from S6 (16) terminal 2 (15). 2. To remove complete wiring harness, if required, remove cable assemblies as follows: - W1 (para 4-8j). - W2 (para 4-8k). - W3 (para 4-8l). - W4 (para 4-8m). - W5 (para 4-8n). - W6 (para 4-8o).

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**p. WIRING HARNESS AND BINDING POST E1 - Continued**

STEP	PROCEDURE						
	REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Install cable assemblies removed in removal procedure: <table border="0"> <tr> <td>a. W1 (para 4-8j).</td> <td>d. W4 (para 4-8m).</td> </tr> <tr> <td>b. W2 (para 4-8k).</td> <td>e. W5 (para 4-8n).</td> </tr> <tr> <td>c. W3 (para 4-8l).</td> <td>f. W6 (para 4-8o).</td> </tr> </table> 2. Install wires removed in removal procedure. (Refer to table 4-3 for wire and terminal lug sizes.) a. Install wire no. 1: (1) With screw and washer on CB1 (11) terminal 2 (12). (2) With screw and washer on S2 (17) terminal 2 (18). b. Install wire no. 2: (1) With screw and washer on CB1 (11) terminal 2 (12). (2) With screw and washer on S5 (14) terminal 2 (13). c. Install wire no. 3: (1) With screw and washer on CB2 (24) terminal 1 (6). (2) Insert red binding post (25) through hole in front panel marked with a (+). (3) Slide red insulator (5) and star washer (20) over binding post. (4) Install white wire no. 3 (3), flat washer (2) and nut (1). d. Install wire no. 4: (1) With screw and washer on CB2 (24) terminal 2 (23). (2) With nut, lockwasher and flat washer on K1 (10) terminal A1 (9) (para 4-8i). e. Install wire no. 5: (1) With screw and washer on CB2 (24) terminal 2 (23). (2) Install wire no. 5 on CR2 (7) anode (8) (para 4-8c).	a. W1 (para 4-8j).	d. W4 (para 4-8m).	b. W2 (para 4-8k).	e. W5 (para 4-8n).	c. W3 (para 4-8l).	f. W6 (para 4-8o).
a. W1 (para 4-8j).	d. W4 (para 4-8m).						
b. W2 (para 4-8k).	e. W5 (para 4-8n).						
c. W3 (para 4-8l).	f. W6 (para 4-8o).						

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued

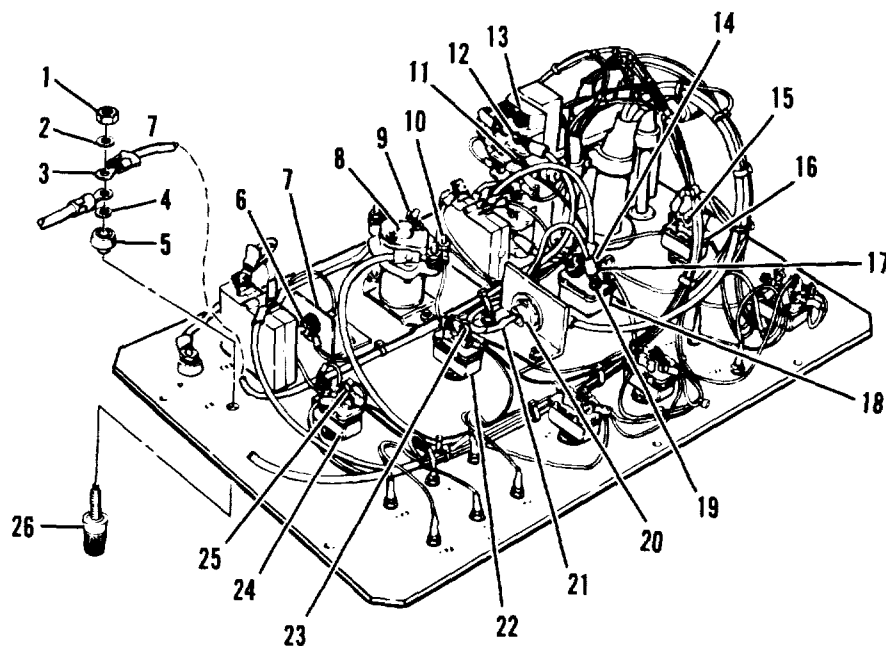
p. WIRING HARNESS AND BINDING POST E1 - Continued

STEP

PROCEDURE

Table 4-3. Wiring harness replacement wires and terminal lugs

Wire No.	Wire Color	Wire Size (AWG)	Terminal Lug Size
1	Black	10	No. 10
2	Black	16	No. 8
3	White	10	No. 10
4	White	10	No. 10
5	Black	20	NQ. 6
6	White	10	No. 10
7	White	10	No. 10
8	White	20	No. 6
9	White	20	No. 6
10	White	20	No. 6
11	White	20	No. 6
12	White	20	No. 6
13	White	20	No. 6
14	White	20	No. 6
15	White	20	No. 6
16	White	20	No. 6



4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**p. WIRING HARNESS AND BINDING POST E1 - Continued**

STEP	PROCEDURE
2. Cont .	Install wires removed in removal procedure. (Refer to table 4-3 for wire and terminal lug sizes.) f. Install wire no. 6: (1) With screw and washer on S2 (18) terminal 3 (19). (2) Install wire no. 6 on CR1 (20) anode (21) (para 4-8b). g. Install wire no. 7: (1) With screw on TB1 (13) terminal 1B (12). (2) Insert black binding post (26) through hole in front panel marked with a (-). (3) Slide black insulator (5) and star washer (4) over binding post. (4) Install white wire no. 7 (3), flat washer (2) and nut (1). h. Install wire no. 8: (1) With screw and washer on S1 (16) terminal 2 (15). (2) Install wire no. 8 on CR2' (7) cathode (6) (para 4-8c). i. Install wire no. 9: (1) With nut, lockwasher and flat washer on K1 (8) terminal X1 (9) (para 4-8i). (2) With screw on TB1 (13) terminal 2B (11). j. Install wire no. 10: (1) With nut, lockwasher and flat washer on K1 (8) terminal X2 (10) (para 4-8i). (2) With screw and washer on S2 (18) terminal 4 (14). k. Install wire no. 11: (1) With screw and washer on S2 (18) terminal 5 (17). (2) With screw and washer on S1 (16) terminal 2 (15). l. Install wire no. 12: (1) With screw and washer on S2 (18) terminal 5 (17). (2) With screw and washer on S3 (22) terminal 2 (23). m. Install wire no. 13: (1) With screw and washer on S3 (22) terminal 2 (23). (2) With screw and washer on S4 (24) terminal 2 (25).

4-8. ICD MAINTENANCE INSTRUCTIONS - Continued**p. WIRING HARNESS AND BINDING POST E1 - Continued**

STEP	PROCEDURE
2. Cont.	n. Install wire no. 14: (1) With screw and washer on S4 (7) terminal 2 (8). (2) With screw and washer on S7 (6) terminal 2 (5). o. Install wire no. 15: (1) With screw and washer on S6 (4) terminal 2 (3). (2) With screw and washer on S5 (2) terminal 2 (1). p. Install wire no. 16: (1) With screw and washer on S7 (6) terminal 2 (5). (2) With screw and washer on S6 (4) terminal 2 (3). TEST Test ICD (para 4-9) to verify repair.

4-9. ICD POST-MAINTENANCE TEST

- This test verifies that the repair you made in the maintenance instructions (para 4-8) restored the equipment to operational condition.
- You will be directed to this test by a reference in the maintenance instructions (para 4-8).
- Go to INITIAL SETUP for information needed to prepare for the test.

OVERVIEW

- The 115 Vac and 24 Vdc power are applied to the ICD.
- Application of ac and dc power to the ICD causes diodes and a relay to operate. The following checks at selected test points verify the operation of the diodes and relay.
- The test proves that the ICD is operational.

4-9. ICD POST MAINTENANCE TEST - Continued

INITIAL SETUP

Tools

Refrig Unit Svce Tool Kit,
5180-00-596-1474
3/8 in. flat tip scdr

Equipment

Condition

Para

4-5

Condition Description

ICD

Multimeter AN/URM-105

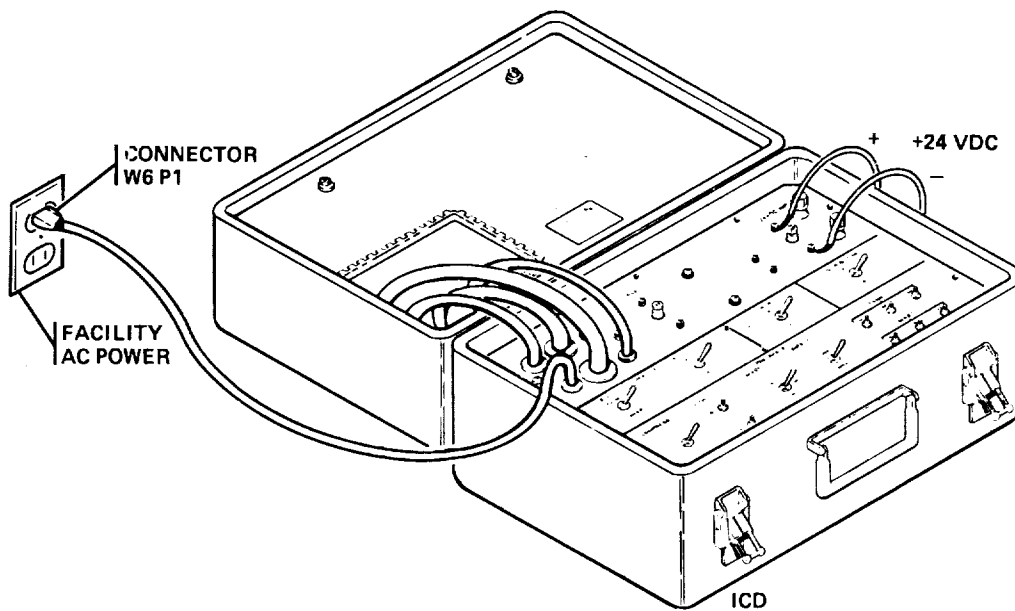
6625-00-581-5036

24 Vdc Power Supply, 6130-00-148-1796

STEP

PROCEDURE

REMOVAL



1. Connect 115 VAC connector W6 P1 to 115 Vac power receptacle.
2. Connect 24 Vdc power supply to 24 Vdc INP UT positive (+) and negative (-) terminal lugs.

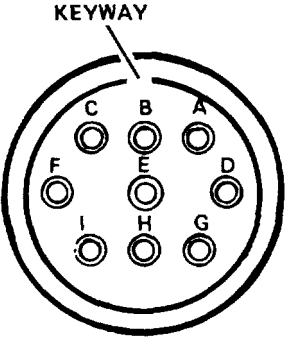
4-9. ICD POST-MAINTENANCE TEST - Continued

STEP	PROCEDURE
	3. Set HYDRAULIC MAST RAISE-OFF-LOWER switch (8) to RAISE. 4. Set HYDRAULIC MODE AC-OFF-DC switch (7) to DC. 5. Set CONTROL AC-DC switch (3) to AC. 6. Set DISTRIBUTION AC-DC switch (2) to DC. 7. Set PNEUMATIC COMPRESSOR AC-OFF-DC switch (6) to DC. 8. Set PNEUMATIC MAST OUT-OFF-IN switch (5) to IN. 9. Set PNEUMATIC SAFETY CLOSE-OPEN switch (4) to CLOSE. 10. Be sure that 24 VDC INPUT 50 amp circuit breaker (1) is pressed in. 11. Turn 24 Vdc power supply on. Check to see that 115 VAC 35 amp circuit breaker (9) is pressed in.

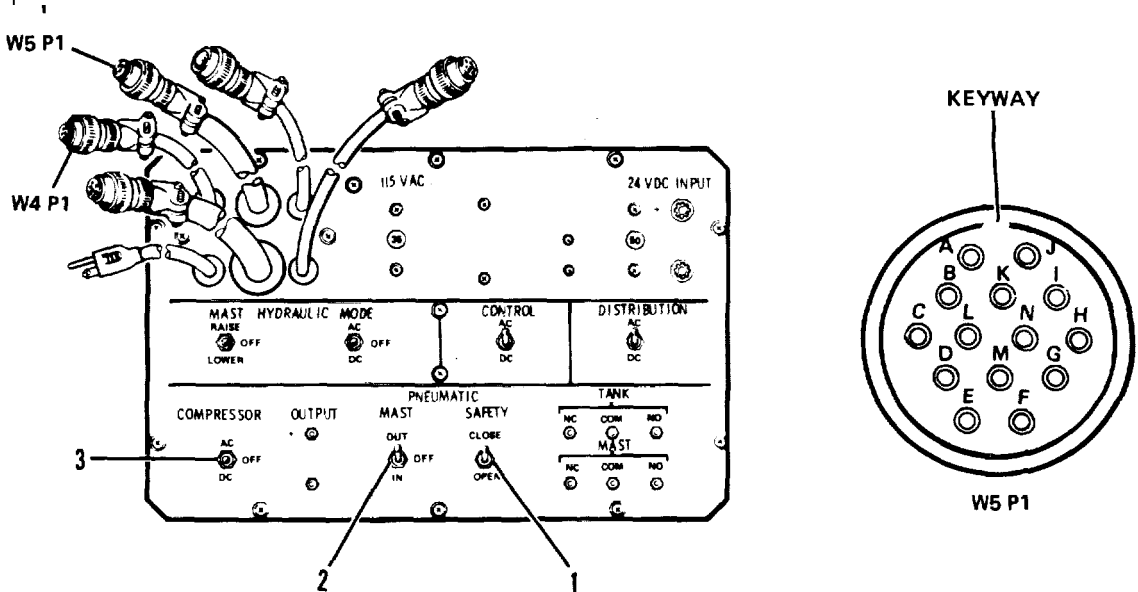
4-9. ICD POST MAINTENANCE TEST - Continued

STEP	PROCEDURE												
	W3 P1 W1 P1 W2 P1 W3 P1 115 VAC 24 VDC INPUT MAST HYDRAULIC MODE CONTROL DISTRIBUTION RAISE OFF AC OFF AC AC LOWER DC OFF DC 3 4 COMPRESSOR OUTPUT PNEUMATIC SAFETY TANK AC OFF MAST OUT OFF CLOBE MAST DC DC IN OPEN NC COM NO NC COM NO 12. Measure voltages shown below with multimeter at P1 end of cable assembly W3 between connector pins indicated: <table><thead><tr><th><u>VOLTAGE MEASURED</u></th><th><u>POSITIVE LEAD AT:</u></th><th><u>NEGATIVE LEAD AT:</u></th><th><u>CONDITIONS</u></th></tr></thead><tbody><tr><td>24 Vdc</td><td>Pin N</td><td>Pin M</td><td>DISTRIBUTION switch (1) in DC</td></tr><tr><td>24 Vdc</td><td>Pin p</td><td>Pin M</td><td>DISTRIBUTION switch (1) in AC</td></tr></tbody></table> W2 P1	<u>VOLTAGE MEASURED</u>	<u>POSITIVE LEAD AT:</u>	<u>NEGATIVE LEAD AT:</u>	<u>CONDITIONS</u>	24 Vdc	Pin N	Pin M	DISTRIBUTION switch (1) in DC	24 Vdc	Pin p	Pin M	DISTRIBUTION switch (1) in AC
<u>VOLTAGE MEASURED</u>	<u>POSITIVE LEAD AT:</u>	<u>NEGATIVE LEAD AT:</u>	<u>CONDITIONS</u>										
24 Vdc	Pin N	Pin M	DISTRIBUTION switch (1) in DC										
24 Vdc	Pin p	Pin M	DISTRIBUTION switch (1) in AC										

4-9. ICD POST MAINTENANCE TEST - Continued

STEP	PROCEDURE			
13.	Measure voltages shown below with multimeter at P1 end of cable assembly W2 between connector sockets indicated.			
	<u>VOLTAGE MEASURED</u>	<u>POSITIVE LEAD AT:</u>	<u>NEGATIVE LEAD AT:</u>	<u>CONDITIONS</u>
	24 Vdc	Socket H	Socket D	Control switch (2) in AC
	24 Vdc	Socket E	Socket M	None
	24 Vdc	Socket J	Socket M	None
	24 Vdc	Socket R	Socket M	None
14.	Measure voltages shown below with multimeter at P1 end of cable assembly W1 between connector sockets indicated.			
	 W1 P1			
	<u>VOLTAGE MEASURED</u>	<u>POSITIVE LEAD AT:</u>	<u>NEGATIVE LEAD AT:</u>	<u>CONDITIONS</u>
	24 Vdc	Socket H	Socket E	HYDRAULIC MAST switch (3) in RAISE
	24 Vdc	Socket I	Socket E	HYDRAULIC MAST switch (3) in LOWER
	24 Vdc	Socket D	Socket E	HYDRAULIC MODE switch (4) in DC (K1 energizes)
	90 Vdc	Socket F	Socket G	HYDRAULIC MODE switch (4) in AC

4-9. ICD POST MAINTENANCE TEST - Continued

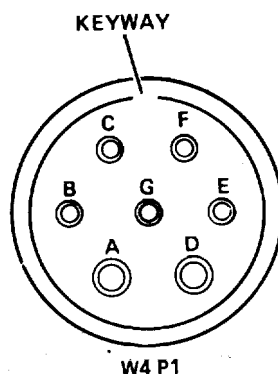
STEP	PROCEDURE																				
	 15. Measure voltages shown below with multimeter at P1 end of cable assembly W5 between connector sockets indicated. <table><thead><tr><th><u>VOLTAGE MEASURED</u></th><th><u>POSITIVE LEAD AT:</u></th><th><u>NEGATIVE LEAD AT:</u></th><th><u>CONDITIONS</u></th></tr></thead><tbody><tr><td>24 Vdc</td><td>Socket I</td><td>Socket J</td><td>PNEUMATIC SAFETY switch (1) in CLOSE</td></tr><tr><td>24 Vdc</td><td>Socket H</td><td>Socket C</td><td>PNEUMATIC MAST switch (2) in IN</td></tr><tr><td>24 Vdc</td><td>Socket B</td><td>Socket C</td><td>PNEUMATIC MAST switch (2) in OUT</td></tr><tr><td>24 Vdc</td><td>Socket A</td><td>Socket C</td><td>PNEUMATIC COMPRESSOR switch (3) in DC</td></tr></tbody></table>	<u>VOLTAGE MEASURED</u>	<u>POSITIVE LEAD AT:</u>	<u>NEGATIVE LEAD AT:</u>	<u>CONDITIONS</u>	24 Vdc	Socket I	Socket J	PNEUMATIC SAFETY switch (1) in CLOSE	24 Vdc	Socket H	Socket C	PNEUMATIC MAST switch (2) in IN	24 Vdc	Socket B	Socket C	PNEUMATIC MAST switch (2) in OUT	24 Vdc	Socket A	Socket C	PNEUMATIC COMPRESSOR switch (3) in DC
<u>VOLTAGE MEASURED</u>	<u>POSITIVE LEAD AT:</u>	<u>NEGATIVE LEAD AT:</u>	<u>CONDITIONS</u>																		
24 Vdc	Socket I	Socket J	PNEUMATIC SAFETY switch (1) in CLOSE																		
24 Vdc	Socket H	Socket C	PNEUMATIC MAST switch (2) in IN																		
24 Vdc	Socket B	Socket C	PNEUMATIC MAST switch (2) in OUT																		
24 Vdc	Socket A	Socket C	PNEUMATIC COMPRESSOR switch (3) in DC																		

4-9. ICD MAINTENANCE INSTRUCTIONS - Continued

STEP

PROCEDURE

16. Measure voltages shown below with multimeter at P1 end of cable assembly W4 between connector sockets indicated.

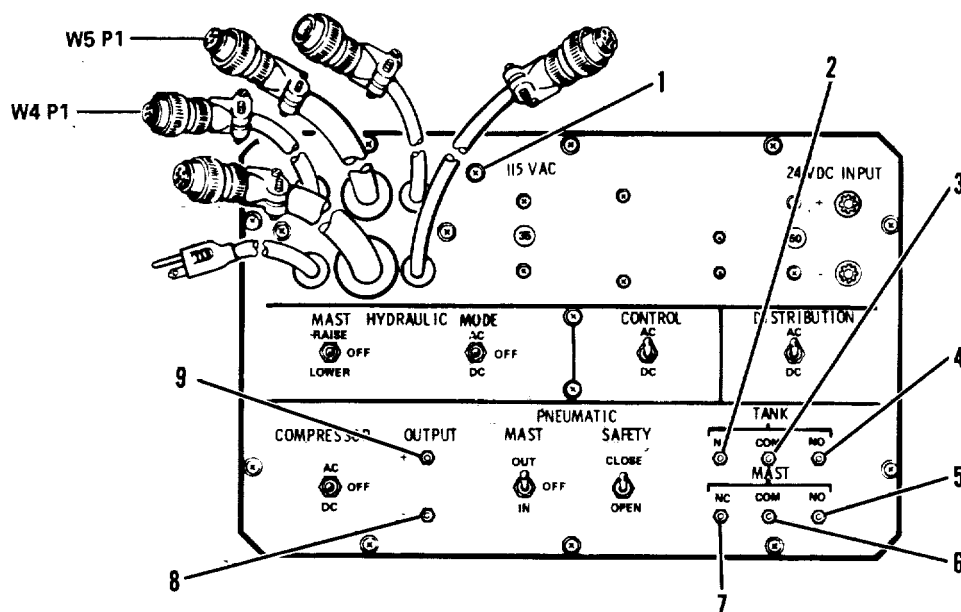


<u>VOLTAGE MEASURED</u>	<u>POSITIVE LEAD AT:</u>	<u>NEGATIVE LEAD AT:</u>	<u>CONDITIONS</u>
115 VAC	Socket B	Socket E	PNEUMATIC COMPRESSOR switch (3) in AC
115 VAC	Socket E W5 P1	Socket E W4 P1	Check voltage between and W4 P1-E
24 Vdc	Socket A	Socket D	None

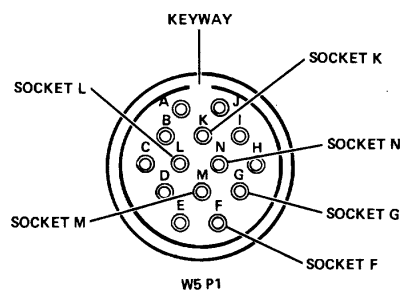
4-9. ICD POST MAINTENANCE TEST - Continued

STEP

PROCEDURE



17. Make following continuity checks at P1 end of cable assembly W5 and ICD test points.

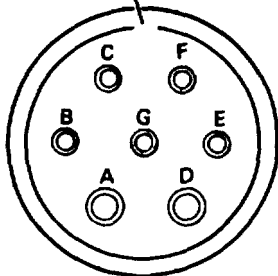
W5 SOCKET

- a. W5 P1-5
- b. W5 P1-M
- c. W5 P1-N
- d. W5 P1-L
- e. W5 P1-K
- f. W5P1-g

ICD TEST POINT

- TP3 TANK NC (2)
- TP4 TANK COM (3)
- TP5 TANK NO (4)
- TP6 MAST NC (7)
- TP7 MAST COM (6)
- TP8 MAST NO (5)

4-9. ICD POST MAINTENANCE TEST - Continued

STEP	PROCEDURE								
18.	Make following continuity checks at P1 end of cable assembly W4 and ICD test points. <table border="0"> <thead> <tr> <th><u>W4 SOCKET NUMBER</u></th><th><u>ICE TEST POINT</u></th></tr> </thead> <tbody> <tr> <td>a. W4 PI-C</td><td>TP1 + OUTPUT (9)</td></tr> <tr> <td>b. W4 P1-F</td><td>TP2 - OUTPUT (8)</td></tr> <tr> <td>c. W4 P1-G</td><td>Ground (Terminal Lug E5) (1)</td></tr> </tbody> </table> KEYWAY  W4 P1	<u>W4 SOCKET NUMBER</u>	<u>ICE TEST POINT</u>	a. W4 PI-C	TP1 + OUTPUT (9)	b. W4 P1-F	TP2 - OUTPUT (8)	c. W4 P1-G	Ground (Terminal Lug E5) (1)
<u>W4 SOCKET NUMBER</u>	<u>ICE TEST POINT</u>								
a. W4 PI-C	TP1 + OUTPUT (9)								
b. W4 P1-F	TP2 - OUTPUT (8)								
c. W4 P1-G	Ground (Terminal Lug E5) (1)								
19.	Shutdown ICD as follows: - Pull plunger of both circuit breakers out or to off position. - Complete removal of power and securing after use in paragraph 4-6.								

CHAPTER 5
AUXILIARY EQUIPMENT MAINTENANCE
FOR
AIR SUPPLY REGULATOR

SECTION I. INTRODUCTION

5-1. SCOPE

This chapter provides instructions for maintenance of the air supply regulator.

5-2. PURPOSE OF EQUIPMENT

The air supply regulator provides filtered, regulated and monitored air to the mast during the mast post-maintenance test procedure (pare 3-17).

NOTE

Check maintenance records and replace air supply regulator filter element (see paragraph 5-5) annually.

SECTION II. DESCRIPTION AND OPERATION**5-3. OPERATOR'S CONTROL AND INDICATORS****AIR SUPPLY REGULATOR**

- a. Latches (1). Secure air supply regulator cover in the closed position.
- b. Outlet air pressure gage (2). Indicates air pressure going to the mast.
- c. Directional control valve handle (3). Controls the flow of air through the directional control valve.

AIR OUT - Allows flow of air to mast.

AIR IN - Allows flow of air to exhaust port.

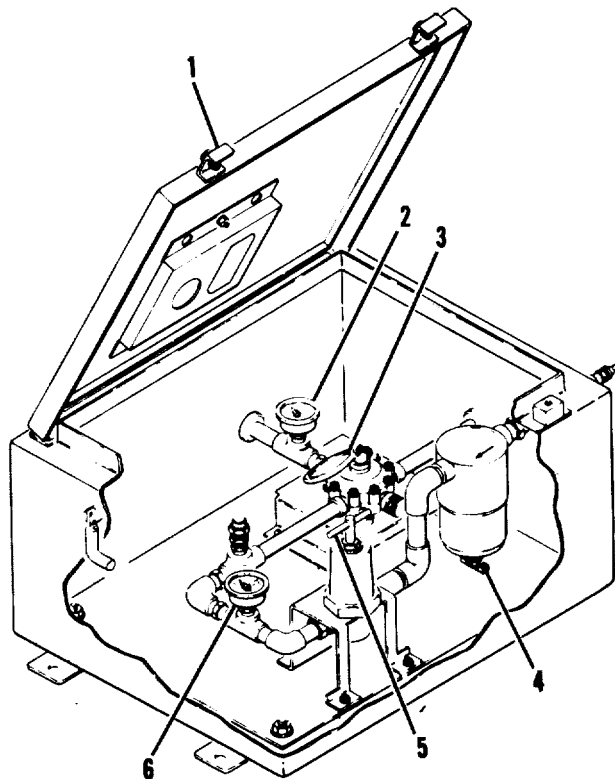
PAUSE - Prevents flow of air through directional control valve.

- d. Air filter petcock (4). Allows water to be drained from air filter.
- e. Air pressure regulator valve tee handle (5). Controls air pressure to mast:.

Turning handle clockwise increases air pressure.

Turning handle counterclockwise decreases air pressure.

- f. Inlet air pressure gage (6). Indicates air pressure in line between directional control valve and air pressure regulator.



5.4. PRINCIPLES OF OPERATION

The air supply regulator is a special purpose test aid housed in a portable enclosure. It consists of the following components:

- Inlet dial indicating pressure gage
- Directional control valve
- Air filter
- Air pressure regulator valve
- Outlet dial indicating pressure gage
- Safety relief valve

Various pipe plumbing connects the components into an assembly.

A facility air hose is connected to the AIR IN port. The air is filtered and the air pressure is regulated by the air pressure regulator valve. A safety relief valve protects the assembly and the operator from excessive air pressure. The directional control valve allows you to control the flow of air. Two pressure gages allow you to read air pressure. For use of the air supply regulator see paragraph 3-17.

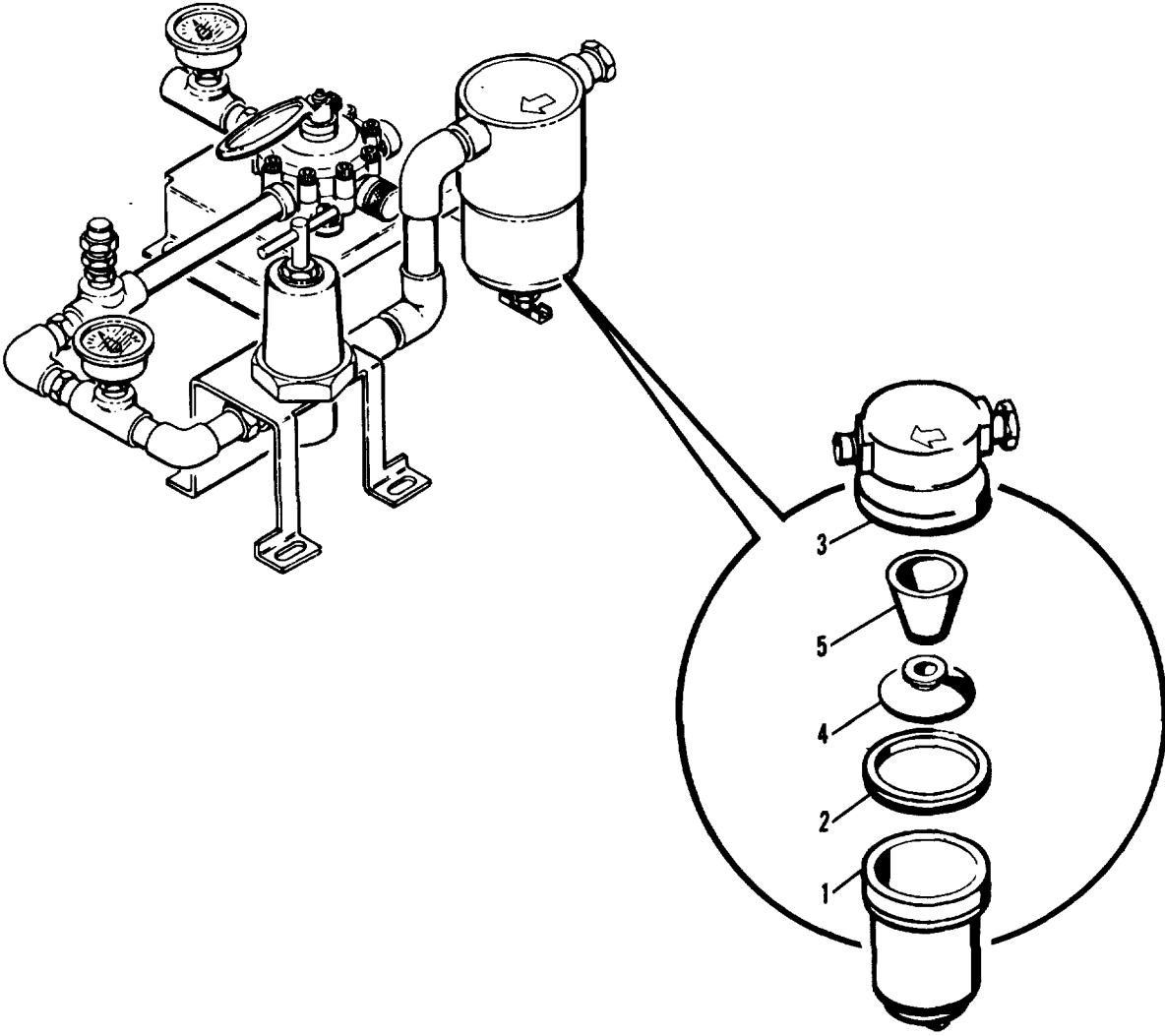
Section III. AIR SUPPLY REGULATOR GENERAL SUPPORT MAINTENANCE

OVERVIEW

- Procedures for repairing all major parts of the air supply regulator are in this section
- Paragraph 5-5 tells you how to replace the air supply regulator air filter element, which must be done annually
- Paragraph 5-6 tells you how to repair the air supply regulator
- Paragraph 5-7 tells you how to adjust the safety relief valve
- The INITIAL SETUP at the beginning of each paragraph and subparagraph will give you information needed to begin the task
 - Refer to the RPSTL, TM 11-5985-368-34P for identification of repair parts and special tools
 - Refer to appendix B for identification of expendable materials
 - Note that the Equipment Condition entry in the INITIAL SETUP tells you what parts have been removed before you can begin the task
 - Unless otherwise indicated in the INITIAL SETUP, each general support maintenance task has a personnel requirement of one Utilities Equipment Repairman.

5-5. AIR SUPPLY FILTER ELEMENT REPLACEMENT		
This task covers:		
Removal	Replacement	
<u>INITIAL SETUP</u>		
<u>Materials/Parts</u>	<u>Equipment</u>	
Pneumatic grease (appx b, item 3)	Condition	
Shop cloth (appx B, item 17)	<u>Para</u>	<u>Condition Description</u>
Antiseize compound (appx B, item 24)	5-6a	Air supply regulator components removed from enclosure
STEP	PROCEDURE	
1. 2.	REMOVAL	
	Turn assembly upside down. Manually unscrew and remove bowl (1) and preformed packing (2).	
	Using a shop cloth, wipe bowl (1) and body (3) clean.	
	WARNING	
	Edges of baffle are sharp. Use caution when unscrewing baffle to avoid getting cut	
3.	Using a shop cloth to protect hand, unscrew and remove baffle (4) and filter element (5) from body (3).	
	REPLACEMENT	
	WARNING	
	Edges of baffle are sharp. Use caution when hand tightening baffle to avoid getting cut.	
	1. Position filter element (5) in body (3) and secure with baffle (4). Using a shop cloth to protect hand, tighten baffle (4).	

5-5. AIR SUPPLY FILTER ELEMENT REPLACEMENT

STEP	PROCEDURE
2. 3.	Coat preformed packing (2) with pneumatic grease. Install preformed packing (2) in groove in filter bowl (1). Apply antiseize compound to threads of filter bowl (1). Position bowl (1) to body (3) and handtighten to secure.  The diagram illustrates the air supply filter assembly. On the left, a larger mechanical assembly is shown, featuring a central vertical component with a handle, two pressure gauges, and various pipes and valves. A line from a cylindrical filter bowl in this assembly points to a circular inset on the right. This inset provides a detailed view of the filter bowl assembly, showing five numbered components: 1. The filter bowl, which is a cylindrical container. 2. A preformed packing ring that fits into a groove on the top of the bowl. 3. The filter body, which is a larger cylindrical component with a flange. 4. A small O-ring or seal. 5. A conical filter element that fits into the top of the bowl. The components are shown in a disassembled state to illustrate their relationship.

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS

- You will find procedures for repairing all major parts of the air supply regulator in this paragraph.
- If a part is found to be faulty during inspection, refer to the List of Tasks, below. It will tell you the location of the repair procedure for the part.
- Turn to the referenced procedure and check the INITIAL SETUP for information needed to begin the repair.
- Note that the Equipment Condition entry in INITIAL SETUP tells you what parts must have been removed before you can begin the actual repair.
- When required, you will be referred to adjustment procedures.

OVERVIEW

To repair the air supply regulator, you must:

- Remove parts to gain access to the faulty part.
- Remove the faulty part.
- Replace the faulty part with a new part.
- Install the new part.
- Reinstall parts removed to gain access.
- Adjust settings of parts, if so directed.

LIST OF TASKS

Maintenance (repair) of -	Para No. (5-6)
air filter	e
air pressure regulator valve	f
air supply regulator components	a
bail handle	l
coupling half	k
directional control valve	j
directional control valve bracket	c
inlet dial indicating pressure gage	g
mounting panel	b
outlet dial indicating pressure gage	h
regulator bracket	d
safety relief valve	i

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued**a. AIR SUPPLY REGULATOR COMPONENTS**

This task covers:

Removal

Installation

INITIAL SETUPToolsRefrig Unit Svce Tool Kit
(5180-00-596-1474)

3/8 in. flat tip scdr

pipe wr (two)

15/16 in. comb. wr

No. 2 xtip scdr

1-1/4 in. comb. wr

1-3/8 in. comb. wr

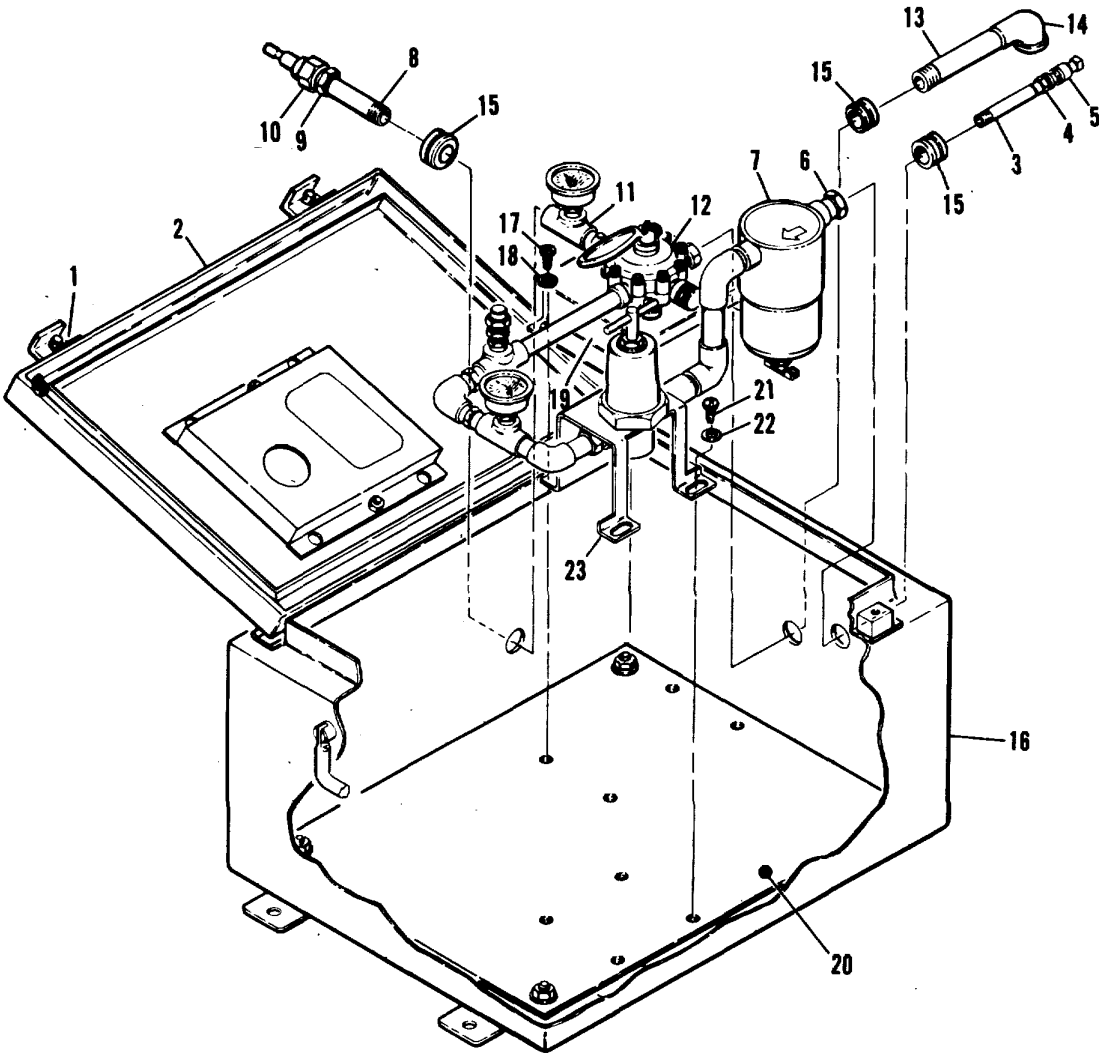
Materials/Parts

Sealing compound

STEP	PROCEDURE
	REMOVAL 1. Loosen two screws (1) and open air supply regulator cover (2). 2. At the AIR IN port, remove the pipe nipple (3), with pipe reducer (4) and filler adapter (5) attached, from pipe bushing (6) on air filter (7). 3. At the AIR OUT port, remove the pipe nipple (8) with pipe bushing (9) and coupling half (10) attached, from the pipe tee (11) at the OUT port of the directional control valve (12). 4. At the exhaust port, remove the pipe nipple (13) with elbow (14) attached, from the exhaust port of the directional control valve (12). 5. Remove three grommets (15) from the air supply regulator enclosure (16). 6. Remove four screws (17) and flat washers (18) securing valve bracket (19) to mounting panel (20). 7. Remove four screws (21) and flat washers (22) securing regulator bracket (23) to mounting panel (20). 8. Lift the air supply regulator components with plumbing attached out of the enclosure (16).

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued

a. AIR SUPPLY REGULATOR COMPONENTS

STEP	PROCEDURE
	 The diagram is an exploded view of an air supply regulator assembly. It shows the following components and their assembly relationships: 1: Mounting bracket on the left side of the main housing. 2: The main rectangular housing of the regulator. 3, 4, 5: A three-piece air line assembly (pipe, elbow, and nut) that connects to the top of the regulator. 6, 7: A vertical air filter canister mounted on top of the regulator. 8, 9, 10: A horizontal air line assembly (nut, pipe, and elbow) that connects to the side of the regulator. 11: A pressure gauge mounted on the side of the regulator. 12: The main body of the air supply regulator. 13, 14: A horizontal air line assembly (pipe, elbow, and nut) that connects to the top of the regulator. 15: Multiple O-rings and seals used at various connection points. 16: The base plate or mounting flange of the regulator. 17, 18: Small adjustment screws or pins on the top of the regulator. 19: A vertical air line connecting the filter canister to the regulator body. 20: A horizontal air line connecting the regulator body to the base plate. 21, 22: Small O-rings or seals at the base of the regulator. 23: A vertical air line connecting the regulator body to the base plate.

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued**a. AIR SUPPLY REGULATOR COMPONENTS - Continued**

STEP	PROCEDURE
	INSTALLATION 1. Position air supply regulator components, with plumbing attached, inside enclosure (16). 2. Install four flat washers (22) and screws (21) securing regulator bracket (23) to mounting panel (20). 3. Install four flat washers (18) and screws (17) securing valve bracket (19) to mounting panel (20). 4. Position three grommets (15) into air supply regulator enclosure (16). 5. Wipe clean and apply sealing compound to threads of pipe nipple (13). 6. Thread pipe nipple (13) with elbow (14) attached through grommet (15). Install pipe nipple (13) to exhaust port of directional control valve (12). Make certain elbow (14) points downward. 7. Wipe clean and apply sealing compound to threads of pipe nipple (8). 8. Thread pipe nipple (8) with pipe bushing (9) and coupling half (10) attached through grommet (15) at the AIR OUT port. Install pipe nipple (8) to the pipe tee (11) at the OUT port of the directional control valve (12). 9. Wipe clean and apply sealing compound to threads of pipe nipple (3). 10. Thread pipe nipple (3), with pipe reducer (4) and filler adapter (5) attached, through grommet (15) at AIR IN port. Install pipe nipple (3) to pipe bushing (6) on air filter (7). 11. Close air supply regulator cover (2) and tighten two screws (1) to secure.

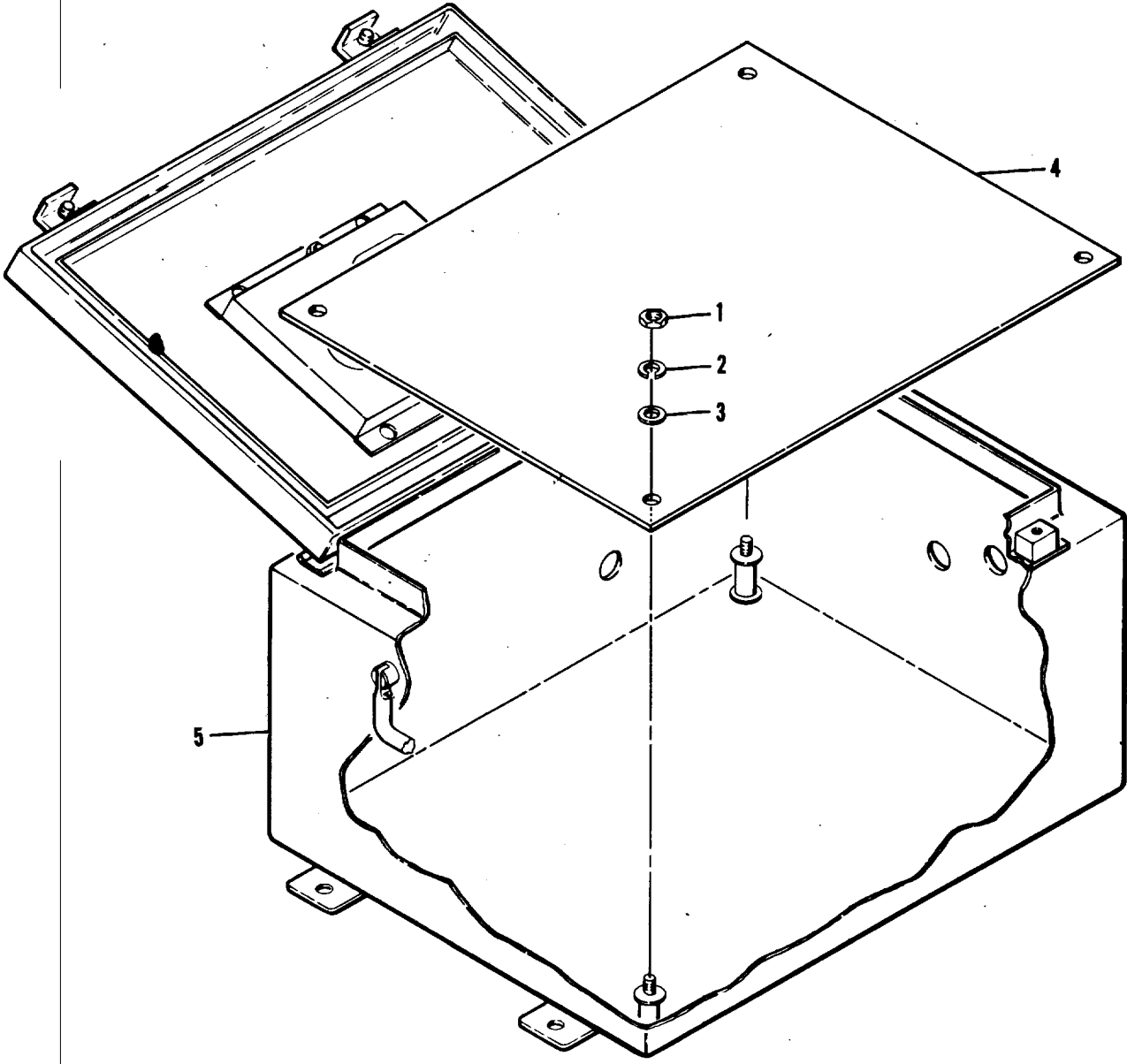
5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued

a. AIR SUPPLY REGULATOR COMPONENTS - Continued

STEP	PROCEDURE
1	An exploded view diagram of an air supply regulator assembly. The main body (16) is shown with a top cover (2) and a base plate (20). Various components are numbered: 1 (cover hinge), 2 (top cover), 3 (nut), 4 (washer), 5 (nut), 6 (flange), 7 (cylinder), 8 (pin), 9 (nut), 10 (washer), 11 (valve), 12 (valve), 13 (pipe), 14 (elbow), 15 (nut), 16 (main body), 17 (pin), 18 (pin), 19 (pin), 20 (base plate), 21 (pin), 22 (pin), 23 (pin).

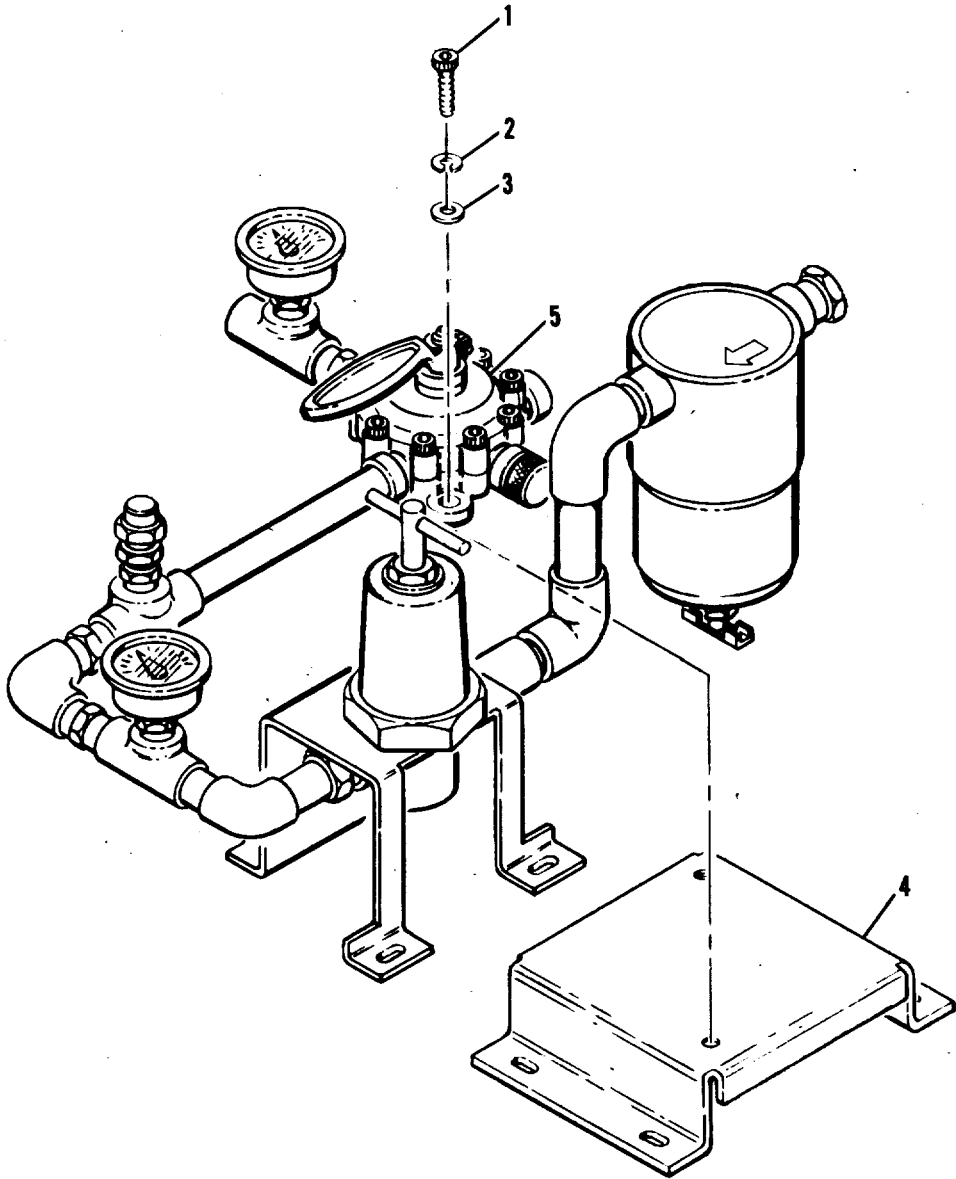
5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued	
b. MOUNTING PANEL	
This task covers:	
Removal	Replacement Installation
<u>INITIAL SETUP</u>	
<u>Tools</u> Refrig Unit Svce Tool Kit (5180-00-596-1474) 9/16 skt skt wr hdl	Equipment Condition <u>Para</u> 5-6a
	<u>Condition Description</u> Air supply regulator components removed from enclosure
STEP	PROCEDURE
	REMOVAL Remove four nuts (1), lockwashers (2), and flat washers (3) securing mounting panel (4) to air supply regulator enclosure (5). Remove mounting panel (4). REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Position mounting panel (4) inside air supply regulator enclosure (5). 2. Install four flat washers (3), lockwashers (2), and nuts (1) securing mounting panel (4) to enclosure (5).

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued**b. MOUNTING PANEL - Continued**

STEP	PROCEDURE
	 The diagram is an exploded view showing the assembly of a mounting panel. It features a main rectangular panel (4) and a smaller internal panel. Three screws (1, 2, 3) are shown being inserted into the main panel. A vertical pin or bolt is shown passing through the main panel and the internal panel. A bracket (5) is shown attached to the side of the main panel. The diagram uses dashed lines to indicate the alignment and assembly path of the components.

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued	
c. DIRECTIONAL CONTROL VALVE BRACKET	
This task covers:	
Removal	Replacement Installation
<u>INITIAL SETUP</u> <u>Tools</u> Refrig Unit Svce Tool Kit (5180-00-596-1474) 5/8 comb. wr Equipment Condition <u>Para</u> 5-6a <u>Condition Description</u> Air supply regulator components removed from enclosure	
STEP	PROCEDURE
	REMOVAL Remove two screws (1), lockwashers (2), and flat washers (3) securing directional control valve bracket (4) to directional control valve (5). Remove valve bracket (4). REPLACEMENT Replace faulty part with a new, part. INSTALLATION Position directional control valve bracket (4) to directional control valve (5) and secure with two flat washers (3), lockwashers (2), and screws (1).

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued**c. DIRECTIONAL CONTROL VALVE BRACKET-Continued**

STEP	PROCEDURE
	

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued

d. REGULATOR BRACKET-Continued

This task covers:

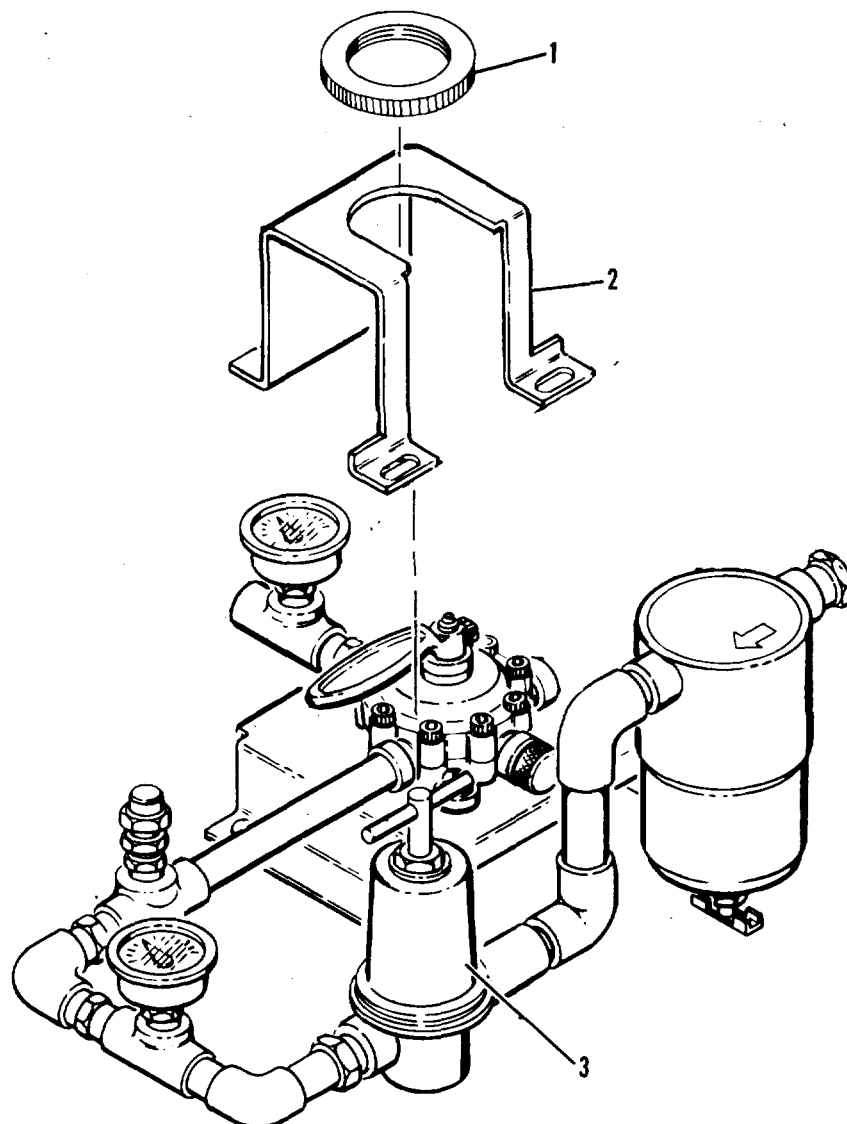
Removal

Replacement

Installation

STEP

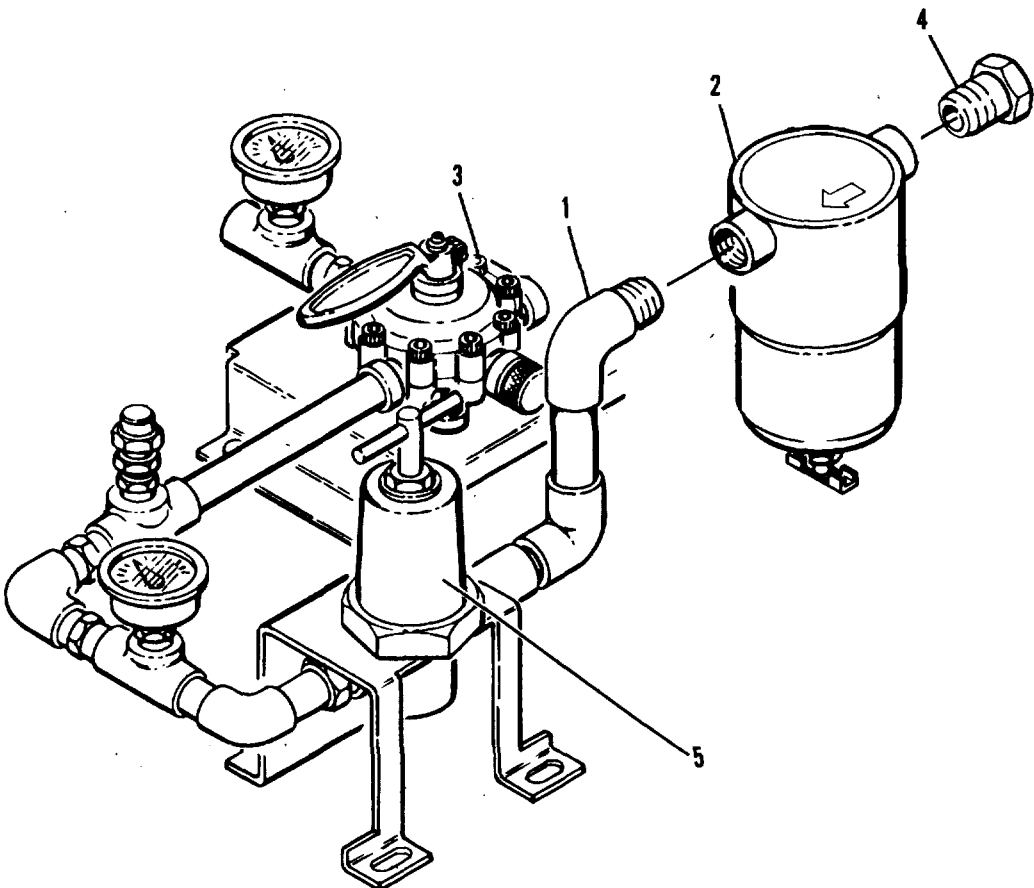
PROCEDURE



5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued				
e. AIR FILTER				
This task covers:		Removal	Replacement	Installation
<u>INITIAL SETUP</u>				
<u>Tools</u>		<u>Equipment Condition</u>		<u>Condition Description</u>
Refrig Unit Svce Tool Kit (5180-00-596-1474)		<u>Para</u> 5-6a		Air supply regulator components removed from enclosure
1-3/8 in. comb wr.				
1-5/16 in. comb wr.				
1-1/8 in. comb wr.				
<u>Materials/Parts</u>				
Sealing compound (appx B, item 21)				
Shop cloth (appx B, item 17)				
STEP	PROCEDURE			
	REMOVAL			
1.	Rotate elbow (1) slightly outboard to provide access space so that air filter (2) will not hit directional control valve (3) when it is being removed.			
2.	Remove air filter (2) from pipe elbow (1).			
3.	Remove pipe bushing (4) from air filter (2).			
	REPLACEMENT			
	Replace faulty part with a new part.			
	INSTALLATION			
1.	Wipe clean and apply sealing compound to male threads of pipe bushing (4).			
2.	Install pipe bushing (4) into air filter (2).			
3.	Install air filter (2) to pipe elbow (1). Make certain arrow on top of air filter is pointing towards air pressure regulator valve (5).			
4.	Rotate elbow (1) inboard to original position.			

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued

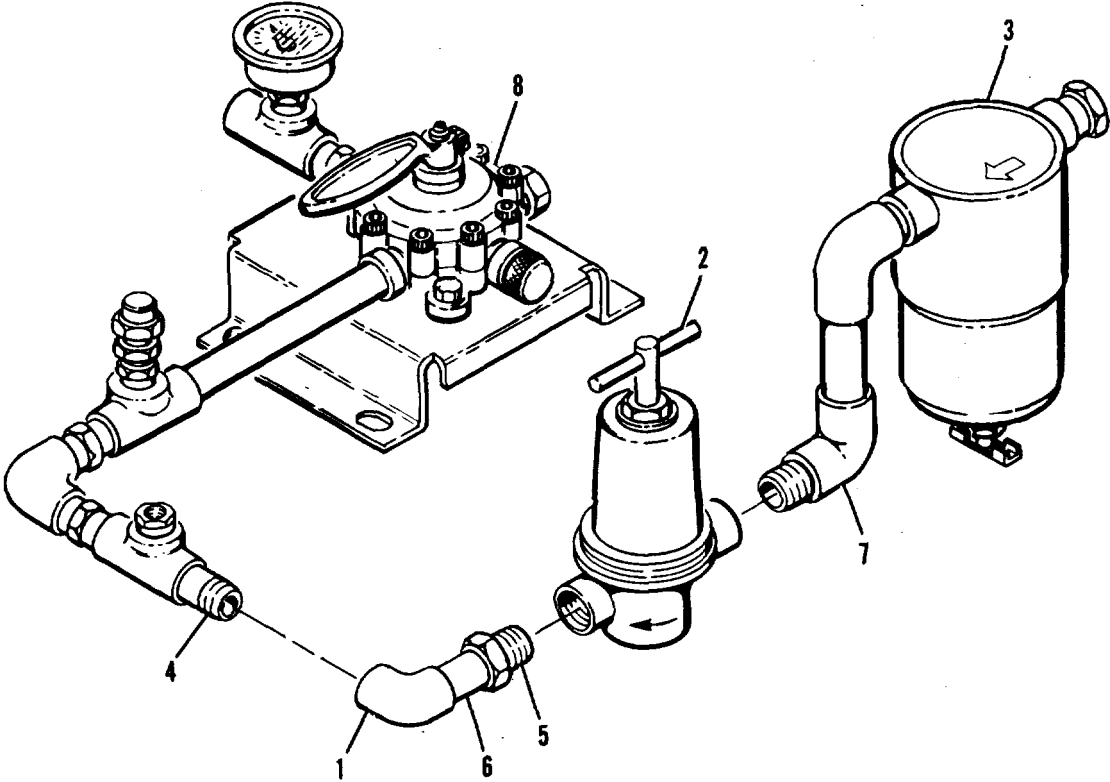
e. AIR FILTER-Continued

STEP	PROCEDURE
	 The diagram illustrates the assembly of an air filter onto an air supply regulator. The regulator, located on the left, features two pressure gauges, a handwheel for manual operation, and several connection ports. A curved pipe, labeled '1', is shown connecting one of the regulator's ports to the side of a cylindrical air filter, labeled '2'. The air filter has a cap, labeled '4', which is shown being removed from its top. A bracket, labeled '5', is positioned to support the regulator assembly. Arrows on the air filter indicate the flow direction of the air.

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued					
f. AIR PRESSURE REGULATOR VALVE					
This task covers:					
Removal	Replacement	Installation			
<u>INITIAL SETUP</u> <table> <tr> <td> <u>Tools</u> Refrig Unit Svce Tool Kit (5180-00-596-1474) 1-3/8 in. comb wr. 1-5/16 in. comb wr. 1-1/8 in. comb wr. <u>Materials/Parts</u> Sealing compound Shop cloth </td><td> Equipment Condition <u>Para</u> 5-6a 5-6g 5-6d </td><td> <u>Condition Description</u> Air supply regulator components removed from enclosure Inlet dial indicating pressure bracket Regulator bracket removed </td></tr> </table>			<u>Tools</u> Refrig Unit Svce Tool Kit (5180-00-596-1474) 1-3/8 in. comb wr. 1-5/16 in. comb wr. 1-1/8 in. comb wr. <u>Materials/Parts</u> Sealing compound Shop cloth	Equipment Condition <u>Para</u> 5-6a 5-6g 5-6d	<u>Condition Description</u> Air supply regulator components removed from enclosure Inlet dial indicating pressure bracket Regulator bracket removed
<u>Tools</u> Refrig Unit Svce Tool Kit (5180-00-596-1474) 1-3/8 in. comb wr. 1-5/16 in. comb wr. 1-1/8 in. comb wr. <u>Materials/Parts</u> Sealing compound Shop cloth	Equipment Condition <u>Para</u> 5-6a 5-6g 5-6d	<u>Condition Description</u> Air supply regulator components removed from enclosure Inlet dial indicating pressure bracket Regulator bracket removed			
STEP	PROCEDURE				
1.	REMOVAL				
	Remove pipe elbow (1) with air pressure regulator valve (2), air filter (3), and associated plumbing attached, from pipe nipple (4) (rotate entire assembly so that elbow (1) unscrews from pipe nipple (4)).				
	Remove pipe bushing (5), with pipe nipple (6) and pipe elbow (1) attached, from air pressure regulator valve (2).				
	Remove air pressure regulator valve (2) from pipe elbow (7).				
	REPLACEMENT				
	Replace faulty part with a new part.				
	INSTALLATION				
	Wipe clean and apply sealing compound to threads of pipe elbow (7).				
	Install air pressure regulator valve (2) to pipe elbow (7). Make certain arrows on air pressure regulator valve point toward bushing.(5).				
	Wipe clean and apply sealing compound to male threads of pipe bushing (5).				
	Install pipe bushing (5), with pipe nipple (6) and pipe elbow (1) attached, to air pressure regulator valve (2).				

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued

f. AIR PRESSURE REGULATOR VALVE-Continued

STEP	PROCEDURE
	 5. Wipe clean and apply sealing compound to threads of pipe nipple (4). 6. Install pipe elbow (1), with air pressure regulator valve (2), air filter (3), and associated plumbing attached, to pipe nipple (4). Position entire assembly so that it is parallel to plumbing coming from directional control valve (8).

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued

g. INLET DIAL INDICATING PRESSURE GAGE

This task covers:

Removal

Replacement

INITIAL SETUP

Tools

Refrig Unit Svce Tool Kit
(5180-00-596-1474)
7/16 in. comb. wr
3/4 in. comb. wr

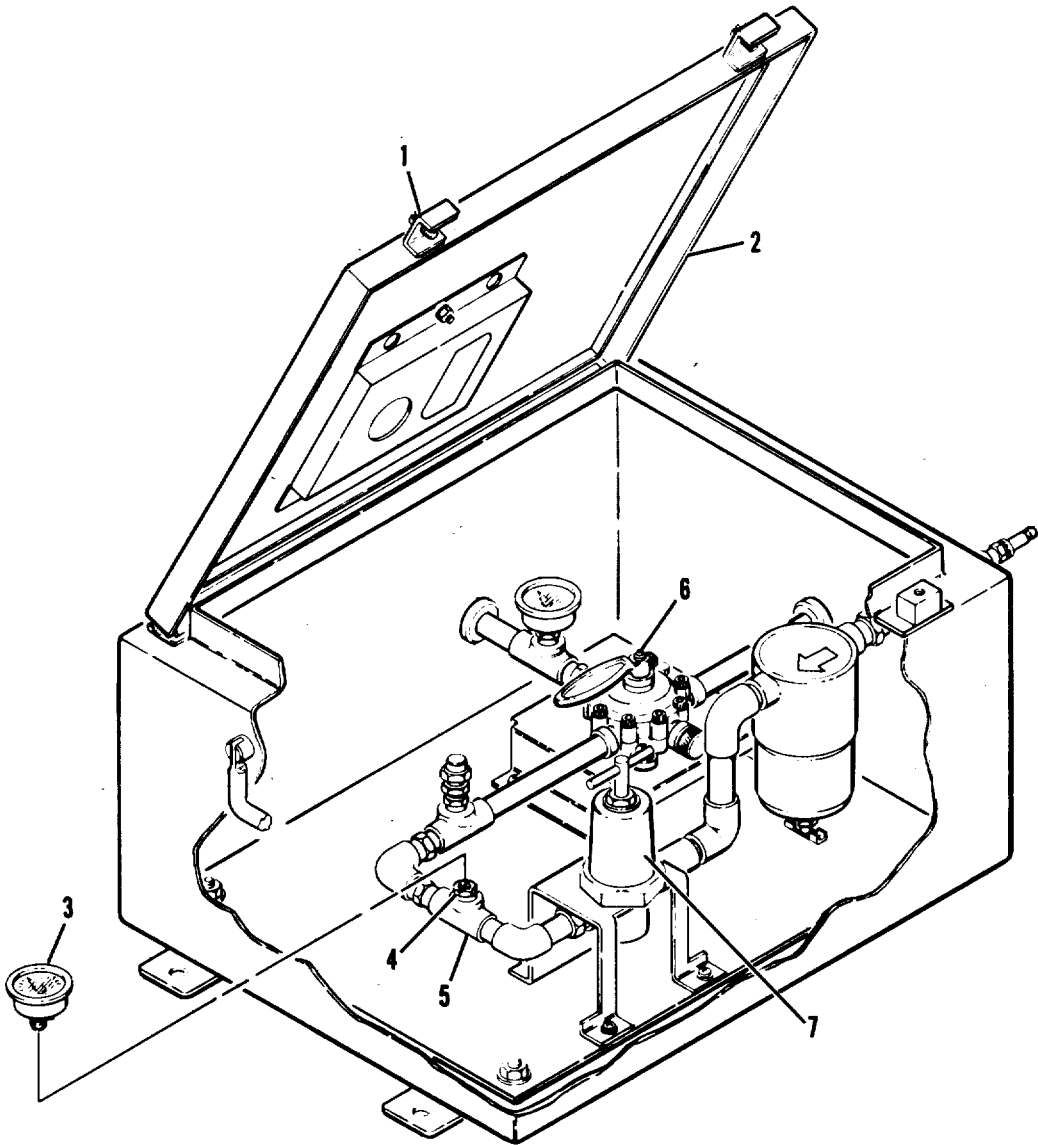
Materials/Parts

Sealing compound (appx B, item 21)
Shop cloth (appx B, item 17)

STEP	PROCEDURE
	REMOVAL 1. Loosen two screws (1) and open air supply regulator cover (2). 2. Remove inlet dial indicating pressure gage (3) from the pipe bushing (4) in the pipe tee (5) between the directional control valve (6) and the air pressure regulator valve (7). REPLACEMENT Replace faulty part with a new part. INSTALLATION 1. Wipe clean and apply sealing compound to threads of inlet dial indicating pressure gage (3). 2. Install inlet dial indicating pressure gage to pipe bushing (4) in the pipe tee (5) between the directional control valve (6) and the air pressure regulator valve (7). 3. Close air supply regulator cover (2) and tighten two screws (1) to secure.

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued

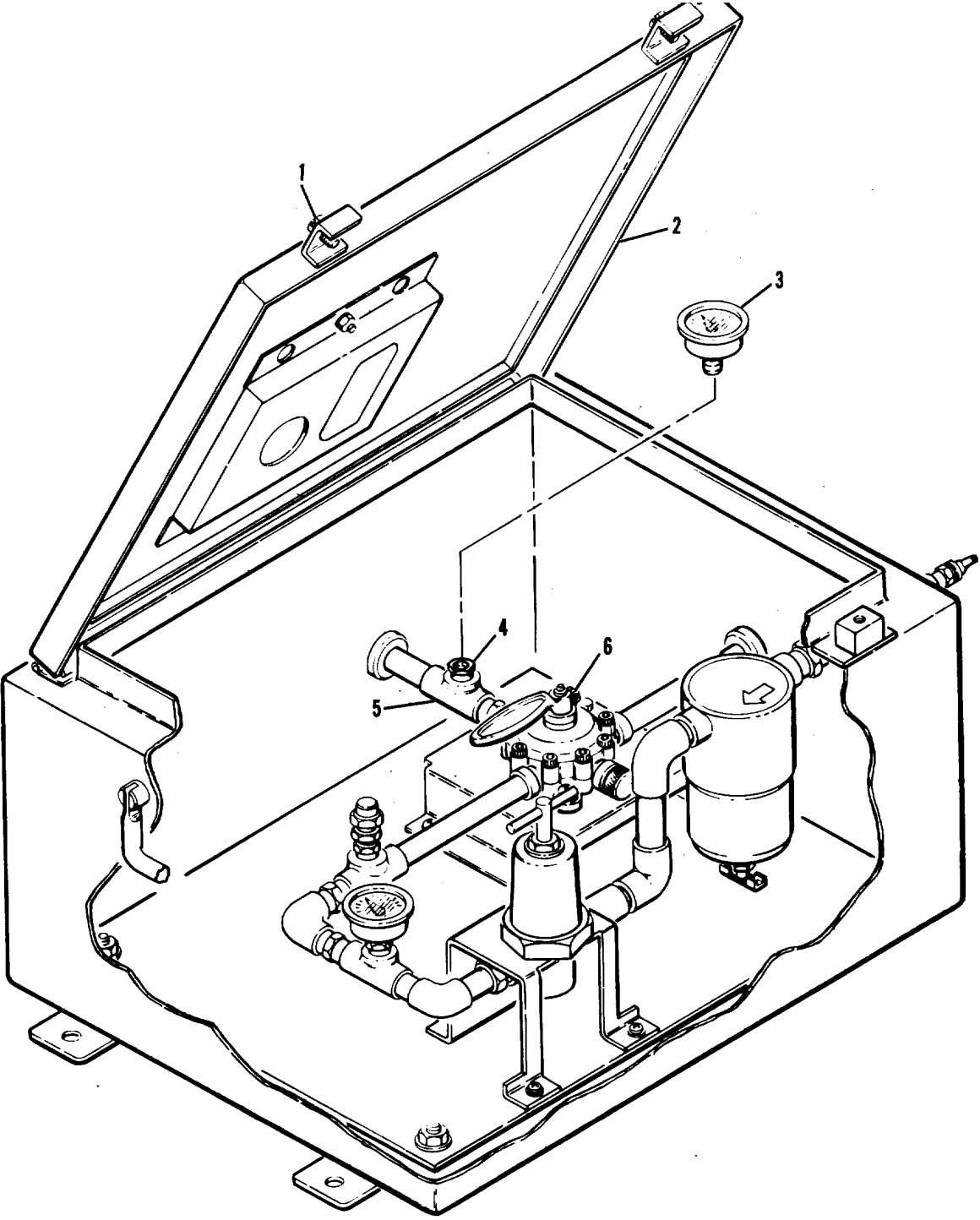
g. INLET DIAL INDICATING PRESSURE GAGE-Continued

STEP	PROCEDURE
	 The diagram is an exploded view of an air supply regulator assembly. It shows the following components and their assembly points: 1: A small pin or screw located at the top hinge of the lid. 2: The lid of the assembly, shown in an open position. 3: An inlet dial indicating pressure gage, shown separately with a leader line pointing to its installation point on the left side of the main body. 4: A small fitting or connector on the left side of the main body. 5: A larger fitting or connector on the left side of the main body, below component 4. 6: A central valve or regulator component mounted on top of the main body. 7: A cylindrical component, likely a filter or accumulator, mounted on the right side of the main body.

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued	
h. OUTLET DIAL INDICATING PRESSURE GAGE	
This task covers:	
Removal	Replacement Installation
<u>INITIAL SETUP</u> <u>Tools</u> Refrig Unit Svce Tool Kit (5180-00-596-1474) 7/16 in. comb. wr 3/4 in. comb. wr <u>Materials/Parts</u> Sealing compound (appx B, item 21) Shop cloth (appx B, item 17)	
STEP	PROCEDURE
	REMOVAL - Loosen two screws (1) and open air supply regulator cover (2). - Remove outlet dial indicating pressure gage (3) from the pipe bushing (4) in the pipe tee (5) at the OUT PORT of the directional control valve (6). REPLACEMENT Replace faulty part with a new part. INSTALLATION - Wipe clean and apply sealing compound to threads of inlet dial indicating pressure gage (3). - Install outlet dial indicating pressure gage to pipe bushing (4) in the pipe tee (5) at the OUT PORT of the directional control valve (6). - Close air supply regulator cover (2) and tighten two screws (1) to secure.

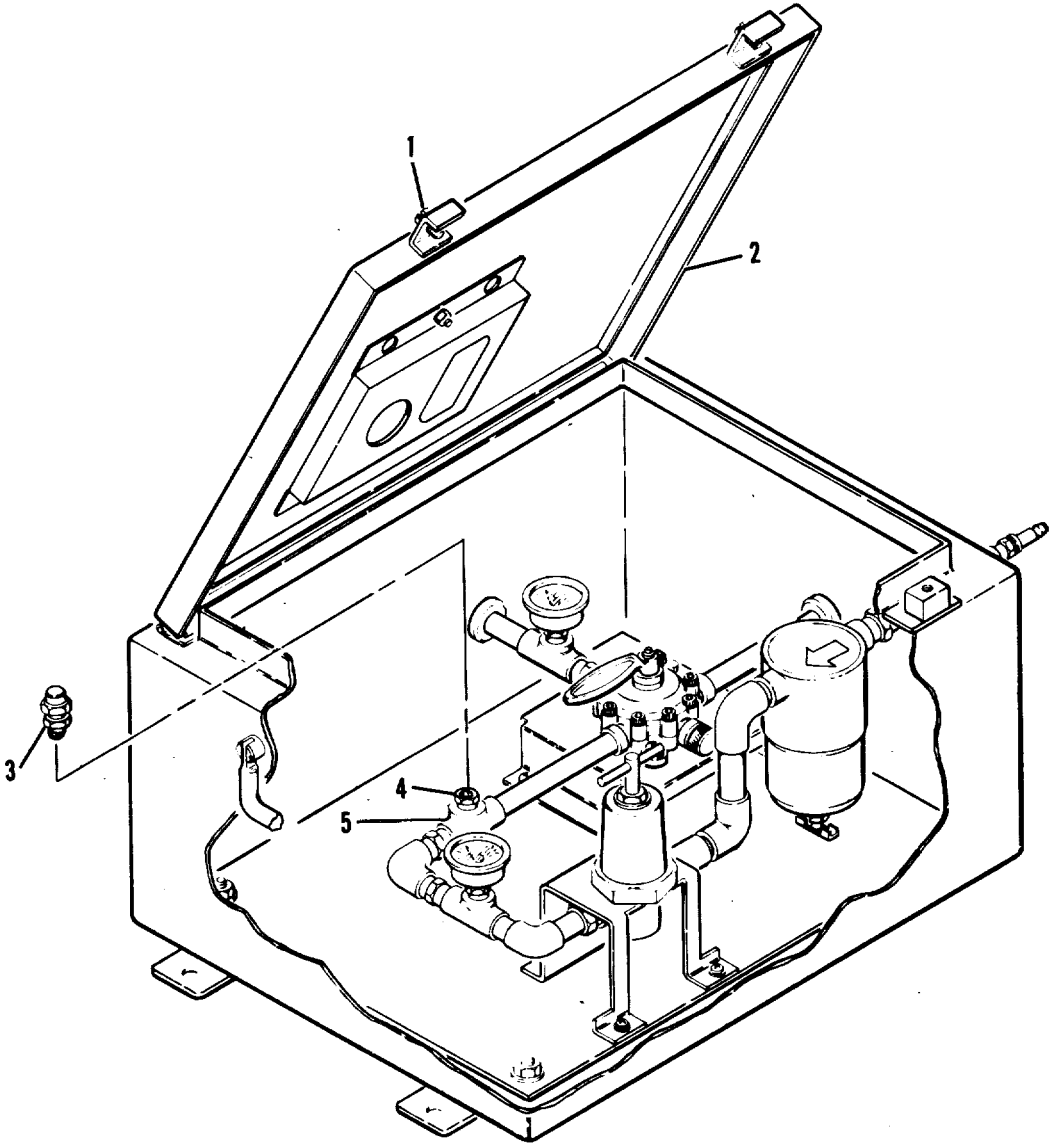
5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued

h. OUTLET DIAL INDICATING PRESSURE GAGE-Continued

STEP	PROCEDURE
	 The diagram is an exploded view of an air supply regulator assembly housed within a rectangular metal enclosure. The enclosure's lid is shown open, hinged at the top. Inside, the regulator assembly is mounted on a base plate. Key components are labeled with numbers: 1 points to a hinge pin on the lid; 2 points to the lid's hinge mechanism; 3 points to a small circular gage or indicator mounted on the right side of the enclosure; 4 points to a horizontal pipe or valve on the left; 5 points to a vertical pipe or valve in the center; and 6 points to the main regulator body with various adjustment knobs and connections. A larger cylindrical component, possibly a filter or separator, is also visible on the right side of the assembly.

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued	
i. SAFETY RELIEF VALVE	
This task covers:	
Removal	Replacement Installation
<u>INITIAL SETUP</u> <u>Tools</u> Refrig Unit Svce Tool Kit (5180-00-596-1474) 11/16 in. comb. wr 3/4 in. comb. wr <u>Materials/Parts</u> Sealing compound (appx B, item 21) Shop cloth (appx B, item 17)	
STEP	PROCEDURE
1.	REMOVAL
	Loosen two screws (1) and open air supply regulator cover (2).
2.	Remove safety relief valve (3) from pipe bushing (4) in pipe tee (5).
1.	REPLACEMENT
	Replace faulty part with a new part.
1.	INSTALLATION
	Wipe clean and apply sealing compound to threads of safety relief valve (3).
2.	Install safety relief valve (3) to pipe bushing (4) in pipe tee (5).
3.	Adjust safety relief valve (para 5-7).
4.	Close air supply regulator cover (2) and tighten two screws (1) to secure.

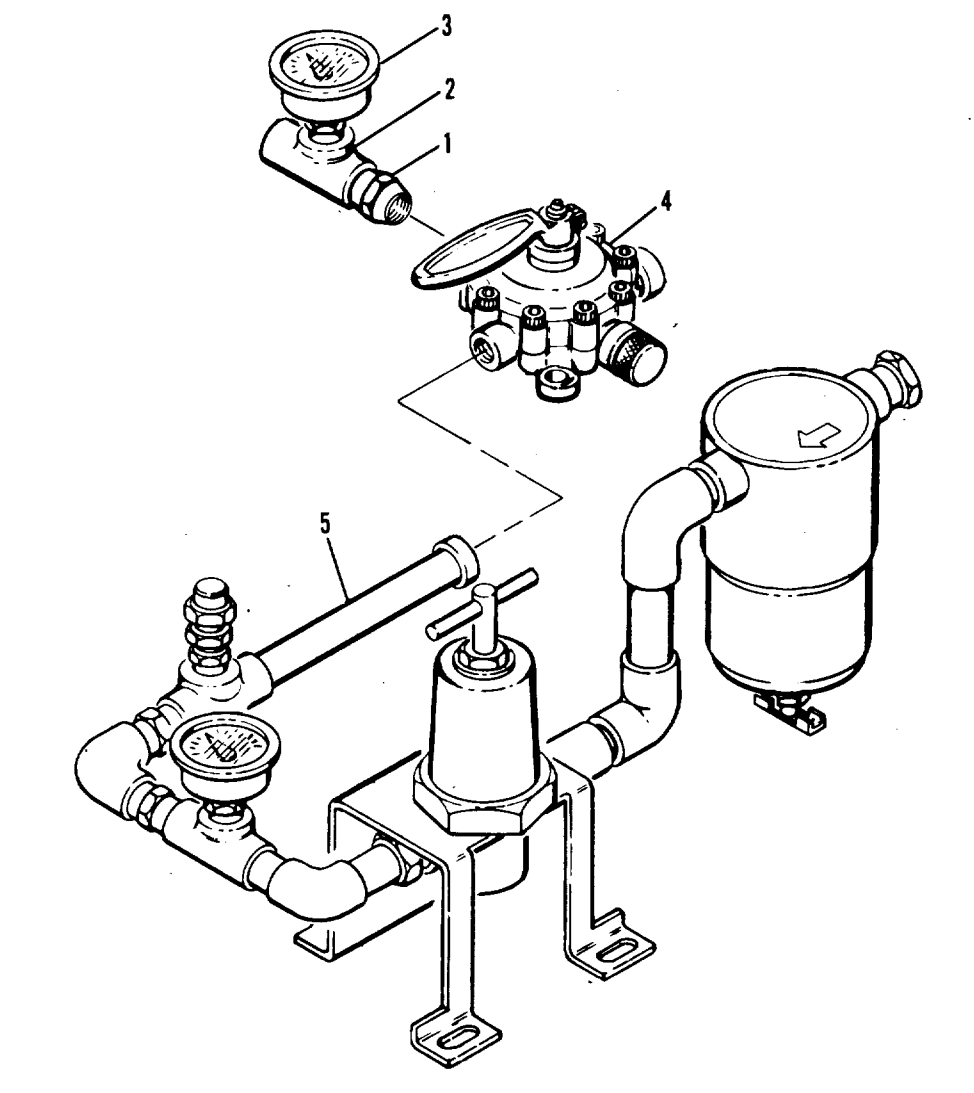
5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued**i. SAFETY RELIEF VALVE-Continued**

STEP	PROCEDURE
	 The diagram is an exploded view of an air supply regulator assembly. It shows a main rectangular housing with a hinged lid. The lid is shown open, revealing the internal components. The components are numbered as follows: 1 points to a small pin or screw on the lid hinge; 2 points to the lid itself; 3 points to a small cylindrical component, likely a safety relief valve, shown in an exploded position to the left of the main housing; 4 points to a small cylindrical component, likely a pressure gauge, shown in an exploded position above the main regulator body; and 5 points to the main regulator body, which includes a pressure gauge, a valve handle, and various connecting pipes and fittings. The entire assembly is shown in a perspective view, highlighting its three-dimensional structure.

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued	
j. DIRECTIONAL CONTROL VALVE	
This task covers:	
Removal	Replacement Installation
<u>INITIAL SETUP</u>	
<u>Tools</u> Refrig Unit Svce Tool Kit (5180-00-596-1474) pipe wr. 3/4 in. comb wr.	Equipment Condition <u>Para</u> 5-6a
<u>Materials/Parts</u> Sealing compound (appx B, item 21) Shop cloth (appx B, item 17)	5-6c
	<u>Condition Description</u> Air supply regulator components removed from enclosure Directional control valve bracket removed from valve
STEP	PROCEDURE
	REMOVAL
1.	Remove pipe nipple (1) (with pipe tee (2) and pressure gage (3) attached) from directional control valve (4).
2.	Remove directional control valve (4) from pipe nipple (5).
	REPLACEMENT
	Replace faulty part with a new part.
	INSTALLATION
1.	Wipe clean and apply sealing compound to threads of pipe nipple (5).
2.	Install directional control valve (4) to pipe nipple (5). Position valve (4) so the word "PAUSE" will be towards the AIR OUT port when the air regulator supply components are installed in the enclosure.
3.	Wipe clean and apply sealing compound to threads of pipe nipple (1).
4.	Install pipe nipple (1) (with pipe tee (2) and pressure-gage (3) attached) to directional control valve (4).

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued

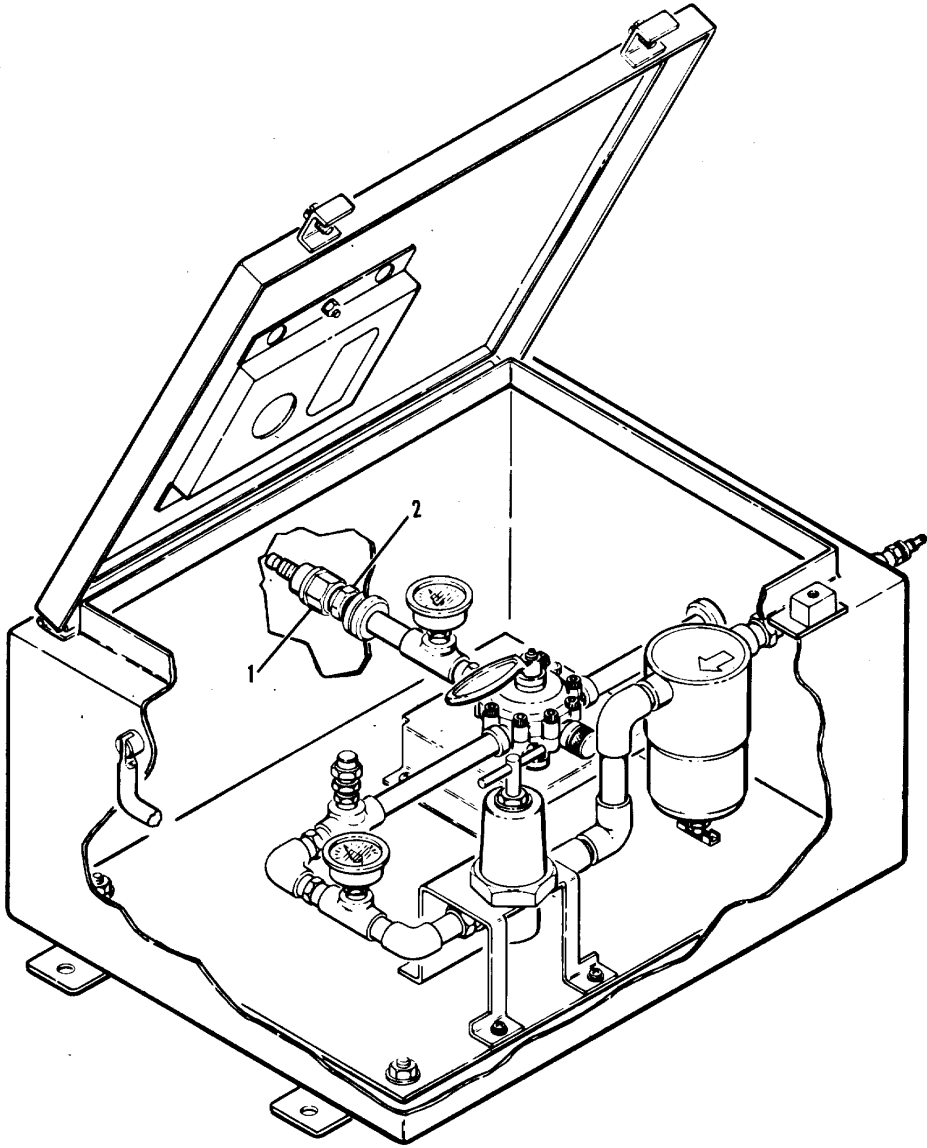
j. DIRECTIONAL CONTROL VALVE-Continued

STEP	PROCEDURE
	 The diagram illustrates the assembly of a hydraulic system. At the top, a sub-assembly is shown with numbered callouts: 1 points to a fitting on a pipe, 2 points to a pressure gauge, and 3 points to the gauge's face. This sub-assembly is being connected to a larger manifold (4) which has multiple ports. Below, the main system is shown, including a pump (5) mounted on a base, a pressure gauge, and a reservoir. A dashed line indicates the connection point between the manifold (4) and the pump assembly (5).

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued		
k. COUPLING HALF		
This task covers:		
Removal	Replacement	Installation
<u>INITIAL SETUP</u> <u>Tools</u> Refrig Unit Svce Tool Kit (5180-00-596-1474) 1-3/8 in. comb. wr 1-1/8 in. comb. wr <u>Materials/Parts</u> Sealing compound (appx B, item 21) Shop cloth (appx B, item 17)		
STEP	PROCEDURE	
	REMOVAL Remove coupling half (1) from pipe bushing (2).	
	REPLACEMENT Replace faulty part with a new part.	
	INSTALLATION 1. Wipe clean and apply sealing compound to threads of pipe bushing (2). 2. Install coupling half (1) to pipe bushing (2).	

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued

k. COUPLING HALF-Continued

STEP	PROCEDURE
	

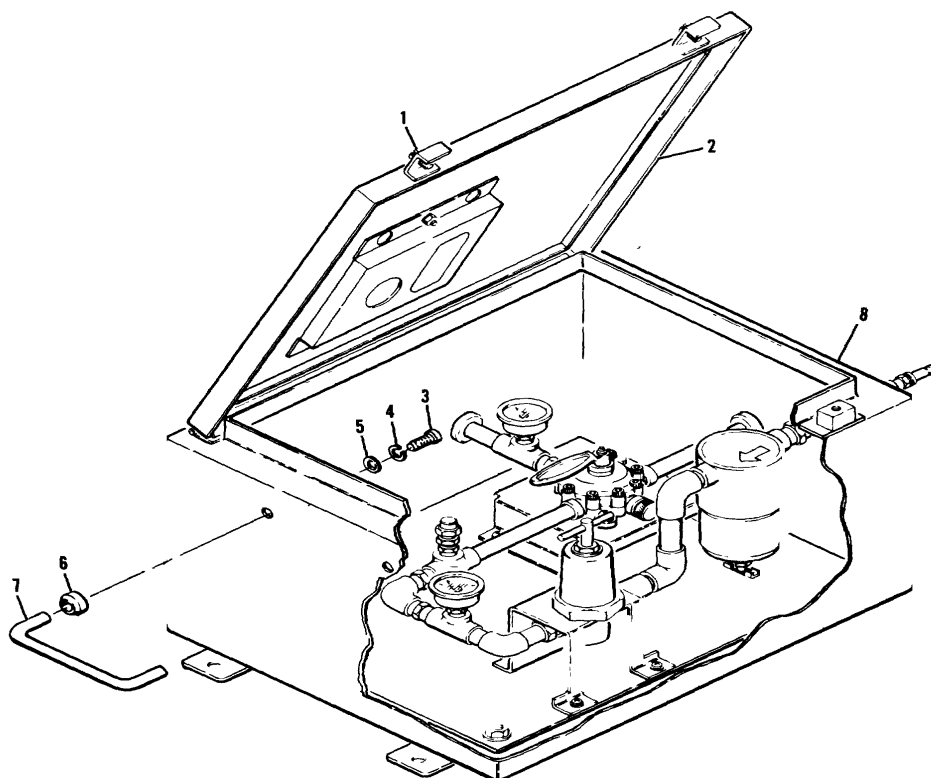
5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS-Continued	
I. BAIL HANDLE	
This task covers:	
Removal	Replacement Installation
<u>INITIAL SETUP</u> <u>Tools</u> Refrig Unit Svce Tool Kit (5180-00-596-1474) No. 2 xtip scdr	
STEP	PROCEDURE
	REMOVAL
	1. Loosen two screws (1) and open air supply regulator cover (2).
	2. Remove two screws (3), lockwashers (4), and flat washers (5) securing two recessed washers (6) and bail handle (7) to air supply regulator enclosure(8).
	REPLACEMENT
	Replace faulty part with a new part.
	INSTALLATION
	1. Position bail handle (7) and two recessed washers (6) to air supply regulator enclosure (8), and secure with two flat washers (5), lockwashers (4), and screws (3).
	2. Close air supply regulator cover (2) and tighten two screws (1) to secure.

5-6. AIR SUPPLY REGULATOR MAINTENANCE INSTRUCTIONS - Continued

I. BAIL HANDLE - Continued

STEP

PROCEDURE



5-7. ADJUSTMENT OF SAFETY RELIEF VALVE

This task covers:
Adjustment

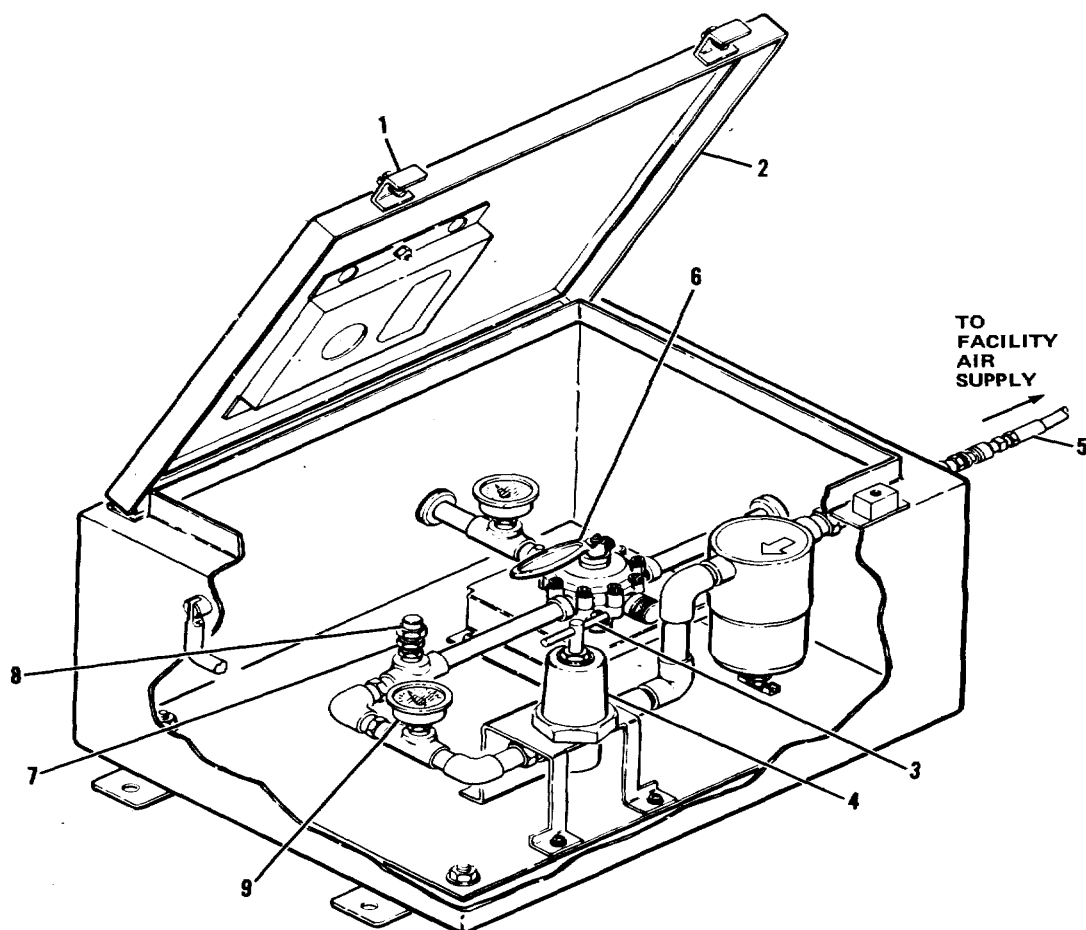
INITIAL SETUPTools

Refrig Unit Svce Tool Kit
 (5180-00-596-1474)
 3/8 in. flat tip scdr
 11/16 in. comb. wr

STEP	PROCEDURE
	ADJUSTMENT 1. Loosen two screws (1) and open air supply regulator cover (2). 2. Turn tee handle (3) on air pressure regulator valve (4) counterclockwise until regulator is fully closed. 3. Connect facility air supply line (5) to AIR IN coupling. 4. Place directional control valve handle (6) to P AUSE. 5. Loosen locknut (7) on safety relief valve. 6. Turn cap (8) on safety relief valve clockwise as far as it will go. 7. Slowly turn tee handle (3) on air pressure regulator valve (4) clockwise until air inlet pressure gage (9) indicates 45 psi. 8. Slowly turn cap (8) on safety relief valve counterclockwise until a slight hissing sound is heard. This will set the pressure of the safety relief valve at 45 psi. 9. Turn tee handle (3) on air pressure regulator valve (4) clockwise until air inlet gage (9) indicates 50 psi. 10. Check to see that air is escaping from safety relief valve. You should hear a hissing sound as air is vented out of the safety relief valve. NOTE Air should begin escaping at about 36 psi.

5-7. ADJUSTMENT OF SAFETY RELIEF VALVE - Continued**STEP****PROCEDURE**

11. Tighten locknut (7) on safety relief valve.
12. Turn tee handle (3) on air pressure regulator valve (4) counterclockwise all the way to close valve.
13. Disconnect facility air supply line (5) from AIR IN coupling.
14. Close air supply regulator cover (2) and tighten two screws (1) to secure.



APPENDIX A

REFERENCES

A-1. PUBLICATIONS INDEXES

The following index should be consulted frequently for latest changes or revisions of references given in this appendix and for new publications relating to the material covered in this manual.

Consolidated Index of Army Publications and Blank Forms DA Pam 310-1

A-2. FORMS AND RECORDS

The following forms and records pertain to this material.

Recommended Change to Equipment Technical Manuals DA Form 2028-2

Report of Discrepancy SF 364

A-3. OTHER PUBLICATIONS

The following publications contain information pertinent to this material and associated equipment.

a. General.

The Army Maintenance Management System (TAMMS) DAPM 738-750

b. Maintenance.

Administrative Storage Requirements TM 740-90-1

Army Shipping Documents AR 725-5

Packaging Data Sheet PDS

Service Bulletin: Painting and Preserving Supplies

Available for Field Use SB 11-573

A-3. OTHER PUBLICATIONS - Continued

- c. Safety.
Artificial Respiration FM 21-11
- d. Related Publications.

Direct Support and General Support
Maintenance Repair Parts and Special Tools
List (Including Depot Maintenance Repair
Parts and Special Tools) for Mast Group,
Hydraulic-Pneumatic OA-9054(V)4/G
(NSN 5985-01-129-1794) TM 11-5985-368-34P

Operator's and Organizational Maintenance Manual,
Including Repair Parts and Special Tools List;
Mast Group, Hydraulic-Pneumatic OA-9054(V)4/G
(NSN 5985-01-129-1794) TM 11-5985-368-12&P

Operator's Manual, Truck, 5-Ton, 6X6 (Diesel) TM 9-2320-260-10

Operator's Manual, Truck, 5-Ton, 6X6 M939 Series
(Diesel) TM 9-2320-272-10

Organizational Maintenance Manual for Truck, Chassis:
5-Ton, 6X6, M809 W/W (NSN 2320-00-050-8841),
M810 W/W (2320-00-051-0585) WO/W (2320-00-051-0586),
M811 W/W (2320-00-051-8985) WO/W (2320-00-050-8986),
M811A1 W/W (2320-00-050-8989), M811A2 WO/W
(2320-00-050-9005), M812 W/W (2320-00-050-9011),
M812A1 W/W (2320-00-050-9040); Truck, Cargo: M813
W/W (2320-00-050-8890) WO/W (2320-00-050-8902), M814 W/W
(2320-00-050-8987) WO/W (2320-00-050-8933); Truck,
Cargo: Dropside, M813A1 W/W (2320-00-050-8905) WO/W
(2320-00-050-8913); Truck, Bolster: M815 W/W (2320-00-
050-8927); Truck, Wrecker: Medium, M816 W/W (2320-00-
051-0489); Truck, Dump: M817 W/W (2320-00-051-0589)
WO/W (2320-00-050-8970); Truck, Tractor:
M818 W/W (2320-00-050-8978) WO/W (2320-00-050-8984);
Truck, Tractor, Wrecker: M819 W/W (2320-00-050-9004);
Truck, Van: Expansible, M820 WO/W (2320-00-050-9006),
M820A1 WO/W (2320-00-050-9007) M820A2 WO/W (2320-00-
050-9010); Truck, Stake: Bridge Transporting, M821
W/W (2320-00-050-9015) TM 9-2320-260-20

A-3. OTHER PUBLICATIONS - Continued

Direct Support and General Support
Maintenance Manual Repair Parts and Special
Tools List for Truck, Chassis: 5-Ton, 6X6
M939, M940, M941, M942, M943, M944, M945;
Truck, Cargo: Dropside, 5-Ton, 6X6, M923, M925;
Truck, Cargo: 5-Ton, 6X6, M924, M926;
Truck, Cargo, Long Wheel Base, 5-Ton,
6X6, M927, M928;
Truck, Wrecker: 5-Ton, 6X6, M936;
Truck, Dump: 5-Ton, 6X6, M929, M930;
Truck, Tractor: 5-Ton, 6X6, M931, M932 TM 9-2320-272-34P-1
-2

Direct Support and General Support
Maintenance Manual, Truck, 5-Ton, 6X6, M939
Series (Diesel) TM 9-2320-272-34-2

Organizational Maintenance Manual,
Truck, 5-Ton, 6X6, M939 Series (Diesel) TM 9-2320-272-20-1

APPENDIX B**EXPENDABLE SUPPLIES AND MATERIALS LIST****B-1. SCOPE**

This appendix lists expendable supplies and materials you will need to operate and maintain the Mast Group, Hydraulic-Pneumatic OA-9054(V)4/G. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

B-2. EXPLANATION OF COLUMNS

The columns in this list are explained below.

- a. Column 1 - Item number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., 'Use cleaning compound, item 5, App. D').
- b. Column 2 - Level. This column identifies the lowest level of maintenance that requires the listed item.
- c. Column 3 - National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.
- d. Column 4 - Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parenthesis followed by the part number.
- e. Column 5 - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

(1)	(2)	(3)	(4)	(5)
ITEM NUMBER	LEVEL	NATIONAL STOCK NUMBER	DESCRIPTION	U/M
1	H	6850-00-984-5853	Cleaning Solvent, Trichlorotrifluoroethane (81349) MIL-C-81302	oz
2	H	9150-00-190-0904	Grease, GAA (81349) MIL-G-10424	lb
3	H	9150-01-018-8960	Grease, Pneumatic (81349) MIL-G-4343	lb
4	H	6850-00-927-9461	Heat Sink Compound, Silicone (71984), 340	Tu
5	H	9150-00-265-9408	Hydraulic Fluid (81349) MIL-H-5606	gal
6	H	5970-00-812-2974	Insulation Sleeving, Electrical, Heat Shrinkable, 0.093 in. id (81349) MIL-I-23053/5-103-0	ft
7	H	5970-00-812-2969	Insulation Sleeving, Electrical Heat Shrinkable, 0.125 in. id (813495) MIL-I-23053/5/5-104-O	ft
8	H	5970-00-954-1622	Insulation Sleeving, Electrical, Heat Shrinkable, 0.187 in. id (81349) MIL-I-23053/5/5-105-0	ft
9	H	5970-00-815-1295	Insulation Sleeving, Electrical, Heat Shrinkable, 0.250 in. id (81349) MIL-I-23053/5/5-106-0	ft
10	H	5970-00-954-1624	Insulation Sleeving, Electrical Heat Shrinkable, 0.375 in. id (813495) MIL-I-23053/5/5-107-0	ft
11	H	5970-00-812-2967	Insulation Sleeving, Electrical, Heat Shrinkable, 0.500 in. id (81349) MIL-I-23053/5/5-108-0	ft
12	H	5970-00-914-3118	Insulation Sleeving, Electrical, Heat Shrinkable, 0.750 in. id (81349) MIL-I-23053/5/5-109-0	ft
13	F	4730-00-540-1525	Cap, Pipe, 3/8", 37° Flared (96906) MS51532-B6	ea
14	F	4730-00-625-2212	Cap, Pipe, 1/2", 37° Flared (96906) MS51532-B8	ea
15	H	7310-00-916-9659	Tape, Pressure, Plastic (81349) MIL-T-22085 4 in.	in
16	F	4020-00-289-8613	Rope, Fibrous 1/4 in. dia (83148) TR605	ft
17	F	8245-00-267-3015	Shop Cloth, Cotton (831348) CCCC 440	ea
18	H	8040-00-945-7978	Silicone Adhesive (RTV) (71984) 3145 RTV	oz

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
19	H	3439-00-555-4629	Solder, Lead-tin, 60/40, (81348) Federal Specification QQ-S-571SN60WRMAP3	in
20	H	9150-00-834-5608	Solid Film Lubricant (81349) MIL-L-23398, Type 2	oz
21	F,H	8030-01-105-3322	Thread Sealing Compound (05972) PST 59231	ml
22	H	5975-00-482-3954	Strap, Tiedown (tie-wraps, wire ties) (96906) MS3367-5-9	ea
23	H	6850-00-105-3084	Freon TF (aerosol can) cleaning fluid (81349) MIL-C-81302	16 oz can
24	H	5815-00-015-1295	Antisieze Compound (84180)	oz
25	F,H	8030-00-844-3821	Sealing Compound (81349) MIL-S-22473 Grade A	cc
25.1	H	8030-00-081-2336	Sealing Compound (81349) MIL-S-22473 Grade AV	cc
25.2	H	8030-00-823-7917	Sealing Compound (81349) MIL-S-22473 Grade C	cc
25.3	F	8030-00-081-2326	Sealing Compound (81349) MIL-S-22473 Grade H	cc
26	H	9150-00-935-4017	Grease, Aircraft-instrument (81349) MIL-G-23827	oz
27	F,H	5975-00-727-5153	Strap, Tiedown (tie-wraps) (96906) MS3367-4-9	ea
28	F	4730-01-108-7746	Plug, Pipe, 3/8", 370 Flared (96906) MS51518B6S	ea
29	H	4730-00-994-0829	Cap, Pipe, 1", 370 Flared (96906) MS51532-B16	ea
30	H	9150-00-186-6668	Engine Oil Lubricant, (81349) MIL-L-2104, Grade 10	qt
31	H		Lubricating oil, gear, 5 gal (19135) SHC 630	co
32	H	8030-00-889-3534	Tape, Antiseize (81349) MIL-T-27730	ea

APPENDIX C

TORQUE LIMITS

Table C-1 lists torque values for installing screws in tapped holes, installing standard nuts on screws and bolts, and for installing shear nuts on screws and bolts. These nominal torque values are to be used where specific torque values are not given in the maintenance procedures.

Table C-1. Torque Values

Thread Size (Tapped Holes, Standard Nuts)	Torque (In. Lb)	Thread Size (Shear Nuts)	Torque (In. Lb)
6-32	10-16	6-32	6-10
8-32	18-27	8-32	10-13
10-24	25-40	10-24	12-15
10-32	25-40	10-32	12-15
1/4-20	70-100	1/4-20	30-40
1/4-28	70-100	1/4-28	30-40
5/16-18	140-200	5/16-18	60-85
5/16-24	140-200	5/16-24	60-85
3/8-16	190-350	3/8-16	95-110
3/8-24	190-350	3/8-24	95-110
1/2-13	480-690	1/2-13	270-300
1/2-20	480-690	1/2-20	270-300
5/8-11	990-1170	5/8-11	590/700
5/8-18	1100-1300	5/8-18	660-780

APPENDIX D**WIRE LISTS**

This appendix provides a wire list for the mast group major electrical components and support equipment. The index below is to help you locate the wire list for a particular component.

Distribution box	D-3
Hydraulics.....	D-21
Mast control	D-27
Pneumatic components assembly	D-37
Interface coupling device	D-51

APPLICATION		REVISIONS																			
NEXT ASSY	USED ON	REV	DESCRIPTION	DATE	APPROVED																
5035397			SSG-WD RELEASED & CONTROLLED	80/06/19	<i>[Signature]</i>																
		A	REVISED PER ECN 44431 SER NO: 001 SUP <i>[Signature]</i> 80/09/26	81/01/15	<i>[Signature]</i>																
		B	REVISED PER ECN 47291 EFF: SERNO 001 + UP 81/17/23 <i>[Signature]</i>	81/08/07	<i>[Signature]</i>																
		C	REVISED PER ECN 50160 EFF: SERNO 001 + UP 82/06/29 <i>[Signature]</i>	23 Aug 82	<i>[Signature]</i>																

-1 AS SHOWN

FOR REVISION STATUS OF EACH SHEET SEE NOTE ONE

REV	C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	

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UNLESS OTHERWISE SPECIFIED, DIMENSIONS AND TOLERANCES ARE IN INCHES / MILLIMETERS AND PER ANGLES: THIS IS BEFORE SURFACE COATING TOLERANCES ONE PLACE (FRACTION) TWO PLACE (FRACTION) THREE PLACE (FRACTION) FOUR PLACE (FRACTION) SURFACE FINISH ☒ DO NOT SCALE DRAWING COPY	GOVERNMENT CONTRACT NO. DAAK21-79-C-0085 PREP <i>[Signature]</i> DATE <i>[Signature]</i> CHK <i>[Signature]</i> 80-6-19 APPD <i>[Signature]</i> APPD <i>[Signature]</i>	U S ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND SIGNALS WARFARE LABORATORY WIRE LIST DISTRIBUTION BOX (50 & 80FT SYS) SIZE A FSCM NO. 57958 DWG NO. 5035430 SCALE NONE

MFR CODE IDENT 07397

SHEET 1 OF 17

NOTES: UNLESS OTHERWISE SPECIFIED;

1. THIS IS A COMPUTER OUTPUT REPORT. ALL SHEETS ARE ISSUED AT THE SAME REVISION LETTER AND AT THE REVISION LETTER OF SHEET ONE
2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT NUMBER AND ASSEMBLY DESIGNATION
3. REFER TO PARTS LIST ~~C5073088-1~~ FOR WIRE TYPE INFORMATION NOTED BY ITEM NUMBERS ON THIS WIRE LIST
4. REF SCHEMATIC DIAGRAM 5035494-1
5. LENGTH OF WIRE TO BE DETERMINED AT ASSEMBLY
6. WIRING PROCEDURE PER MIL-STD-454, REQ 20, SOLDER PER MIL-STD-454, REQ 5
7. IDENTIFICATION OF WIRE PER MIL-STD-681, SYSTEM IV

U S ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND SIGNALS WARFARE LABORATORY			
DRAWN <i>Jm Kelli</i>	SIZE A	FSCM NO. 57958	DWG NO. 5035430
ISSUED <i>80/66/19</i>	SCALE —	REV- C	SHEET 2

COMPONENT J3

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
+24VDC (BATT)			J3 - A	14	CB3 - 2	999	92		STR			12 AWG WHT
115VAC (H)			J3 - B	15	J5 - F	999	91		STR			16 AWG WHT
+24VDC (SUPPLY)			J3 - C	16	CR2 - ANOD	999	90		STR			22 AWG WHT*
+24VDC (SUPPLY)			J3 - C	16	CB6 - 2	999	90		STR			22 AWG WHT**
-24VDC (BATT)			J3 - D	17	TB1 - A3	999	92		STR			12 AWG WHT
115V (N)			J3 - E	18	TB1 - B4	999	91		STR			16 AWG WHT
-24VDC (SUPPLY)			J3 - F	19	TB1 - A3	999	90		STR			22 AWG WHT
GND			J3 - G	20	E1	999	91		STR			16 AWG WHT
* EARLY MODEL ONLY												
** LATER MODEL ONLY												

KEY: TST – TWISTED SHIELDED TRIPPLE TT – TWISTED TRIPPLE COAX – COAXIAL SOL – SOLID
TSP – TWISTED SHIELDED PAIR TP – TWISTED PAIR SHLD – SHIELDED STR – STRANDED
WW – WIRE WRAP

CONTRACT NO.: _____

WIRE LIST **5035430**

CODE IDENT **57958** **SHEET** **5** **REV** **C**

COMPONENT J5

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
+24VDC (BATT)			J5 - A	23	J5 - J	999	90		STR			22 AWG WHT
OUT VALVE	12	J2 - M	J5 - B									
IN VALVE			J5 - C	24	J8 - H	999	90		STR			22 AWG WHT
-24VDC (SUPPLY)			J5 - D	59	T81 - B3	999	90		STR			22 AWG WHT
AIR PRESS IND			J5 - E	25	J8 - N	999	90		STR			22 AWG WHT
115VAC (H)	15	J3 - B	J5 - F									
115VAC (H)			J5 - G	26	C82 - Z	999	91		STR			16 AWG WHT
+24VDC (SUPPLY)			J5 - H	60	CR2 - ANOD	999	90		STR			22 AWG WHT
+24VDC (BATT)	23	J5 - A	J5 - J	28	CR3 - CATH	999	90		STR			22 AWG WHT
DC COMP CONTROL			J5 - K	29	J8 - A	999	90		STR			22 AWG WHT
GND			J5 - L	30	E2	999	91		STR			16 AWG WHT
-24VDC (BATT)			J5 - M	31	T81 - B1	999	90		STR			22 AWG WHT
PUMP CONTROL BAT			J5 - N	32	K2 - X2	999	90		STR			22 AWG WHT
PUMP CONTROL AC			J5 - P	33	K1 - X2	999	90		STR			22 AWG WHT
100D LIMIT SW RA	4	J2 - D	J5 - Q									
R/L CONTROL			J5 - R	34	J8 - L	999	90		STR			22 AWG WHT
15D LIMIT OVRD	7	J2 - G	J5 - S	35	J7 - I	999	90		STR			22 AWG WHT
15D LIMIT LOWER	6	J2 - F	J5 - T									
			J5 - U									NC
KEY: TST - TWISTED SHIELDED TRIPLE TSP - TWISTED SHIELDED PAIR						WIRE LIST 5035430						
TT - TWISTED TRIPLE TP - TWISTED PAIR						COAX - COAXIAL SHLD - SHIELDED						
						SOL - SOLID STR - STRANDED WW - WIRE WRAP						
CONTRACT NO.:						CODE IDENT		57958		SHEET 7		REV C

D-11

COMPONENT **J7**

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
HEATER (H)			J7 - A	36	CB4 - 2	999	92		STR			12 AWG WHT
GND			J7 - B	37	E1	999	92		STR			12 AWG WHT
115VAC (N)			J7 - C	38	TB1 - A4	999	92		STR			12 AWG WHT
+24VDC HYD PUMP			J7 - D	39	K2 - A2	999	93		STR			10 AWG WHT
-24VDC HYD PUMP			J7 - E	40	TB1 - A2	999	93		STR			10 AWG WHT
+90VDC HYD PUMP			J7 - F	41	K1 - A2	999	92		STR			12 AWG WHT
-90VDC HYD PUMP			J7 - G	42	TB1 - B4	999	92		STR			12 AWG WHT
100D LIMIT SW R	5	J2 - E	J7 - H									
15D LIMIT OVRD	35	J5 - S	J7 - I									
KEY: TST - TWISTED SHIELDED TRIPLE TSP - TWISTED SHIELDED PAIR						WIRE LIST						
TT - TWISTED TRIPLE TP - TWISTED PAIR						5035430						
COAX - COAXIAL SHLD - SHIELDED						CODE IDENT						
SOL - SOLID STR - STRANDED WW - WIRE WRAP						57958 SHEET 10 REV C						
CONTRACT NO.:												

COMPONENT **J8**

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
DC COMP CONTROL	29	J5 - K	J8 - A									
OUT VALVE	13	J2 - N	J8 - B									
-24VDC (BATT)			J8 - C	43	TB1 - B2	999	90		STR			22 AWG WHT
			J8 - D									NC
HEATER (H)			J8 - E	62	CB4 - 2	999	91		STR			16 AWG WHT
			J8 - F									NC
			J8 - G									NC
IN VALVE	24	J5 - C	J8 - H									
OD LIMIT SW SV	9	J2 - I	J8 - I									
-24VDC (BATT)			J8 - J	44	TB1 - B2	999	90		STR			22 AWG WHT
+24VDC (BATT)			J8 - K	45	J8 - H	999	90		STR			22 AWG WHT
R/L CONTROL	34	J5 - R	J8 - L									
+24VDC (BATT)	45	J8 - K	J8 - M	46	J2 - H	999	90		STR			22 AWG WHT
AIR PRESS IND	25	J5 - E	J8 - N									
KEY: TST - TWISTED SHIELDED TRIPLE TT - TWISTED TRIPLE COAX - COAXIAL SOL - SOLID						WIRE LIST						
TSP - TWISTED SHIELDED PAIR TP - TWISTED PAIR SHLD - SHIELDED STR - STRANDED						5035430						
WW - WIRE WRAP						CODE IDENT						
CONTRACT NO.:						57958						
						SHEET 11 REV C						

COMPONENT												CR1-3	
SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS	
	WIRE NO.	LOCATION											
HEATER (H)			CR1 -ANOD	47	CB4 - 2	999	92		STR			12 AWG WHT	
DIODE OUT +			CR1 - CATH	48	K1 - C1	999	92		STR			12 AWG WHT	
+24VDC (SUPPLY)	16	J3 - C	CR2 -ANOD									.	
+24VDC (SUPPLY)	16	J3 - C	CB6 - 2									..	
+24VDC (SUPPLY)			CR2 -ANOD	64	CB6 - 1	999	90		STR			..	
+24VDC (SUPPLY)	60	J5 - H	CR2 -ANOD										
+24VDC (BATT)			CR2 -CATH	63	CR3 - CATH	999	90		STR			22 AWG WHT	
OD LIMIT SW +24V	8	J2 - H	CR2 -CATH										
+24VDC (BATT)	61	CB1 - 2	CR3 -ANOD										
+24VDC (BATT)	28	J5 - J	CR3 -CATH										
+24VDC (BATT)	63	CR2 -CATH	CR3 -CATH										
* EARLY MODEL ONLY													
** LATER MODEL ONLY													
KEY: TST - TWISTED SHIELDED TRIPPLE TT - TWISTED TRIPPLE COAX - COAXIAL SOL - SOLID TSP - TWISTED SHIELDED PAIR TP - TWISTED PAIR SHLD - SHIELDED STR - STRANDED WW - WIRE WRAP													
CONTRACT NO.:						WIRE LIST			5035430				
						CODE IDENT			57958		SHEET 12		REV C

COMPONENT **C81-5**

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
+24VDC (BATT)			C81 - 1	49	C83 - 1	999	92		STR			12 AWG WHT
+24VDC (BATT)			C81 - 2	61	CR3 -ANOD	999	90		STR			22 AWG WHT
+24VDC (BATT)	28	J5 - J	C81 - 2									
+24VDC (BATT)	46	J8 - M	C81 - 2									
115VAC (H)	1	J1 - A	C82 - 1	50	C84 - 1	999	92		STR			12 AWG WHT
115VAC (H)	26	J5 - G	C82 - 2									
+24VDC (BATT)	49	C81 - 1	C83 - 1	51	C85 - 1	999	92		STR			12 AWG WHT
+24VDC (BATT)	14	J3 - A	C83 - 2									
115VAC (H)	50	C82 - 1	C84 - 1									
ANODE (A)	47	CR1 -ANOD	C84 - 2									
HEATER(H)	36	J7 - A	C84 - 2									
HEATER(H)	62	J8 - E	C84 - 2									
+24VDC (BATT)	21	J4 - A	C85 - 1									
+24VDC (BATT)	51	C83 - 1	C85 - 1									
+24VDC CB			C85 - 2	52	K2 - A1	999	93		STR			10 AWG WHT
KEY: TST - TWISTED SHIELDED TRIPLE TSP - TWISTED SHIELDED PAIR						WIRE LIST						
TT - TWISTED TRIPLE TP - TWISTED PAIR						5035430						
COAX - COAXIAL SHLD - SHIELDED						CODE IDENT						
SOL - SOLID STR - STRANDED WW - WIRE WRAP						57958 SHEET 13 REV C						
CONTRACT NO.:												

[illegible]

COMPONENT													K1-K2
SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS	
	WIRE NO.	LOCATION											
+90VDC HYD PUMP			K1 - A1	53	K1 - B1	999	92		STR			12 AWG WHT	
+90VDC HYD PUMP	41	J7 - F	K1 - A2										
+90VDC HYD PUMP	53	K1 - A1	K1 - B1										
+90VDC HYD PUMP			K1 - B2	54	K1 - C2	999	92		STR			12 AWG WHT	
+90VDC HYD PUMP	48	CR1 -CATH	K1 - C1										
+90VDC HYD PUMP	54	K1 - B2	K1 - C2										
-24VDC (BATT)			K1 - X1	55	K2 - X1	999	90		STR			22 AWG WHT	
PUMP CONTROL AC	33	J5 - P	K1 - X2										
+24VDC CB	52	C85 - 2	K2 - A1										
+24VDC HYD PUMP	39	J7 - D	K2 - A2										
	55	K1 - X1	K2 - X1	56	TB1 - B3	999	90		STR			22 AWG WHT	
PUMP CONTROL BAT	32	J5 - N	K2 - X2										
KEY: TST - TWISTED SHIELDED TRIPLE TSP - TWISTED SHIELDED PAIR						WIRE LIST							
TT - TWISTED TRIPLE TP - TWISTED PAIR						5035430							
COAX - COAXIAL SHLD - SHIELDED						CODE IDENT							
SOL - SOLID STR - STRANDED WW - WIRE WRAP						57958							
CONTRACT NO.:						SHEET							
						14							
						REV C							

COMPONENT **T81**

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
+24VDC (BATT)	22	J4 - C	T81 - A1									
-24VDC (BATT)	40	J7 - E	T81 - A2									
-24VDC (BATT)	17	J3 - D	T81 - A3									
-24VDC (BATT)	19	J3 - F	T81 - A3									
NEUTRAL	3	J1 - C	T81 - A4									
NEUTRAL	38	J7 - C	T81 - A4									
			T81 - A5									NC
			T81 - A6									NC
-24VDC (BATT)	31	J5 - M	T81 - B1									
-24VDC (BATT)	43	J8 - C	T81 - B2									
-24VDC (BATT)	44	J8 - J	T81 - B2									
-24VDC (BATT)	59	J5 - D	T81 - B3									
-24VDC (BATT)	56	K2 - X1	T81 - B3									
NEUTRAL	18	J3 - E	T81 - B4									
NEUTRAL	42	J7 - G	T81 - B4									
VERTICLE SW	57	J2 - M	T81 - B5									
VERTICLE SW	58	J2 - N	T81 - B6									
KEY: TST - TWISTED SHIELDED TRIPLE TSP - TWISTED SHIELDED PAIR						WIRE LIST						
TT - TWISTED TRIPLE TP - TWISTED PAIR						5035430						
COAX - COAXIAL SHLD - SHIELDED						CODE IDENT						
SOL - SOLID STR - STRANDED WW - WIRE WRAP						57958 SHEET 15 REV C						
CONTRACT NO.												

NM WL-5035430 REV-C DISTRIBUTION BOX (50480 FT)

WIRE HARNESS SUMMARY
DATA 08/13/82
PAGE 1

ITEM#	KEY	QTY	WIRE NUMBERS													
90	STR	34	4	5	6	7	8	9	10	11	12	13	16	19	23	24
			25	28	29	31	32	33	34	35	43	44	45	46	55	56
			57	58	59	60	61	63								
91	STR	6	15	18	20	26	30	62								
92	STR	17	1	2	3	14	17	36	37	38	41	42	47	48	49	50
			51	53	54											
93	STR	5	21	22	39	40	52									

57958
REV-C5035430
SH 17

REV	A	-	A	A	-															
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

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OR MAINTENANCE OPERATION.

UNLESS OTHERWISE SPECIFIED: DIMENSIONS AND TOLERANCES ARE IN INCHES / MILLIMETERS PER ANSI Y14.5 SURFACE COATING TOLERANCES PLACE HRS TYPE PLACE I HRS FURNISH ANGLE S THIRD ANGLE PROJECTION USE MICROINCH MICROINCH DO NOT SCALE DRAWING COPY	GOVERNMENT CONTRACT NO. DA AK 21-79-C-0085		U S ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND SIGNALS WARFARE LABORATORY	
	PREP <i>Kiki Kelly</i>	DATE <i>10-17-23</i>		
	CNK <i>S Knick</i>	APPRO <i>P.D. Daniels</i>		
	APPRO			
MFR CODE IDENT 07397		SIZE A	FSCM NO. 57958	DWG NO. 5035548
		SCALE NONE	SHEET 1 OF 5	

NOTES - UNLESS OTHERWISE SPECIFIED;

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT NUMBER AND ASSEMBLY DESIGNATION
2. REFER TO PL 5035395-1 FOR WIRE TYPE INFORMATION NOTED BY ITEM NUMBERS ON THIS WIRE LIST
3. REF SCHEMATIC DIAGRAM 5035547 - 1
4. LENGTH OF WIRE TO BE DETERMINED AT ASSEMBLY
5. WIRING PROCEDURE PER MIL-STD-454, REQT 20, SOLDER PER MIL-STD-454, REQT 5
6. PREWIRED COMPONENT
7. WIRE NUMBERS FOR REFERENCE

U S ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND SIGNALS WARFARE LABORATORY			
SIZE	FSCM NO.	DWG NO.	
A	57958	5035548	
DRAWN <i>John Keely</i>		ISSUED <i>Editha</i> 91-01-30	
SCALE —		SHEET 2	

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
115V AC			J1 A	1	TB2 6A	000	098		STR			14 AWG BLK
GND			J1 B	2	TB2 4A	555	101		STR			12 AWG GRN
115V AC			J1 C	3	TB2 5A	999	105		STR			12 AWG WHT
+24V DC			J1 D	4	TB1 2A	000	103		STR			10 AWG BLG
-24V DC			J1 E	5	TB1 1A	999	102		STR			10 AWG WHT
+90V DC			J1 F	6	TB1 3A	000	103		STR			10 AWG BLK
-90V DC			J1 G	7	TB2 3A	999	097		STR			14 AWG WHT
+24V DC			J1 H	8	TB2 2A	111	099		STR			14 AWG BRN
+24V DC			J1 I	9	TB2 1A	111	099		STR			14 AWG BRN
RAISE SOL A+			P1 RND	10	TB2 2B	111			STR	6		18 AWG BRN
RAISE SOL A-			P1 SQR	11	TB1 1B	111			STR	6		18 AWG BRN
LWR SOL B+			P2 RND	12	TB2 1B	111			STR	6		18 AWG BRN
LWR SOL B-			P2 SQR	13	TB1 1B	111			STR	6		18 AWG BRN
90V DC MTR -			A1 1	14	TB2 3B	999	095		STR			12 AWG WHT
90V DC MTR+			A1 2	15	TB1 3B	000	095		STR			12 AWG BLK
GND			A1 3	16	TB2 4B	555	095		STR			12 AWG GRN
KEY: TST - TWISTED SHIELDED TRIPLE COAX - COAXIAL WW - WIRE WRAP						WIRE LIST						
TSP - TWISTED SHIELDED PAIR SHLD - SHIELDED						5035548						
TT - TWISTED TRIPLE SOL - SOLID						CODE IDENT						
TP - TWISTED PAIR STR - STRANDED						57958						
										SHEET		REV
										3		4

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
24V DC MTR -			A2 1	17	TB1 1B	999	094		STR			10 AWG WHT
24V DC MTR +			A2 2	18	TB1 2B	000	094		STR			10 AWG BLK
115V AC NEUT			A3 1	19	TB2 5B	999	096		STR			16 AWG WHT
115V AC			A3 2	20	TB2 6B	000	096		STR			16 AWG BLK
GROUND			A3 3	21	TB2 4B	555	096		STR			16 AWG GRN
-24V	5	J1 E	TB1 1A									
RAISE SOL A-	11	P1 SQR	TB1 1B									
LWR SOL B-	13	P2 SQR	TB1 1B									
24V MOTOR -	17	A2 1	TB1 1B									
+24V	4	J1 D	TB1 2A									
24V MOTOR-	18	A2 2	TB1 2B									
+90V	6	J1 F	TB1 3A									
90V MOTOR+	15	A1 2	TB1 3B									
+24V	9	J1 I	TB2 1A									
RAISE SOL A+	10	P1 RND	TB2 2B									
+24V	8	J1 H	TB2 2A									
LWR SOL B+	12	P2 RND	TB2 1B									
-90V	7	J1 G	TB2 3A									
KEY: TST - TWISTED SHIELDED TRIPLE COAX - COAXIAL WW - WIRE WRAP						WIRE LIST						
TSP - TWISTED SHIELDED PAIR SHLD - SHIELDED						5035548						
TT - TWISTED TRIPLE SOL - SOLID						CODE IDENT						
TP - TWISTED PAIR STR - STRANDED						57958						
											SHEET	REV
											4	A

COMPONENT													
SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS	
	WIRE NO.	LOCATION											
90V METER -	14	A1 1	TB2 3B										
GND	2	J1 B	TB2 4A										
90V METER GND	16	A1 3	TB2 4B										
GND	21	A3 3	TB2 4B										
115V AC NEUT	3	J1 C	TB2 5A										
115V AC	1	J1 A	TB2 6A										
115V AC	20	A3 2	TB2 6B										
115V AC NEUT	19	A3 1	TB2 5B										

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	REV	DESCRIPTION	DATE	APPROVED
5035398			~~ASG-WD RELEASED & CONTROLLED~~	80/06/23	[Signature]
A			REVISED PER ECN 50635 EFF: SER NO 001 +UP <i>JMP Kelly</i> 8207/6	82 Aug 4	[Signature]

-1 AS SHOWN
FOR REVISION STATUS OF EACH SHEET SEE NOTE ONE

REV	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
A																						

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UNLESS OTHERWISE SPECIFIED: DIMENSIONS AND TOLERANCES ARE IN INCHES / MILLIMETERS AND PER ANSI Y14.5 BEFORE SURFACE COATING		GOVERNMENT CONTRACT NO. DAAK21-79-C-0085		U.S. ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND SIGNALS WARFARE LABORATORY	
TOLERANCES HOLE .015 FILL .015 THREE PLACE .0005 ANGLE 2	THIRD ANGLE PROJECTION USC	PREP <i>Kelly</i>	DATE 82-72		
		CHEK <i>JMP Kelly</i>	82-20		
		APPD <i>G King</i>	80-6-21		
		SIZE	FSCM NO.	DWG NO.	
		A	57958	5035432	
SURFACE FINISH ✓ MICROINCHES MICROMETERS		SCALE NONE		SHEET 1 OF 10	
DO NOT SCALE DRAWING COPY		MFR CODE IDENT 07397			

NOTES: UNLESS OTHERWISE SPECIFIED;

1. THIS IS A COMPUTER OUTPUT REPORT. ALL SHEETS ARE ISSUED AT THE SAME REVISION LETTER AND AT THE REVISION LETTER OF SHEET ONE
2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT NUMBER AND ASSEMBLY DESIGNATION
3. REFER TO PARTS LIST C5078089-1 FOR WIRE TYPE INFORMATION NOTED BY ITEM NUMBERS ON THIS WIRE LIST
4. REF SCHEMATIC DIAGRAM 5035431-1
5. LENGTH OF WIRE TO BE DETERMINED AT ASSEMBLY
6. WIRING PROCEDURE PER MIL-STD-454, REQ 20, SOLDER PER MIL-STD-454, REQ 5
7. IDENTIFICATION OF WIRE PER MIL-STD-681, SYSTEM IV
8. JUMPER WIRE NOT PART OF HARNESS. REFER TO PARTS LIST 5035398-1 FOR WIRE TYPE INFORMATION NOTED BY ITEM NUMBERS ON THIS WIRE LIST

U S ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND SIGNALS WARFARE LABORATORY			
DRAWN <i>J M Phillips</i>	SIZE A	FSCM NO. 57958	DWG NO. 5035432
ISSUED <i>896/23</i>	SCALE -	REV - A	SHEET 2

COMPONENT J1

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
ME PAUSE			J1 - A	1	S3 - 2	999	50		STR			22 AWG WHT
ME OUT			J1 - B	2	S3 - 3	999	50		STR			22 AWG WHT
ME IN			J1 - C	3	S3 - 1	999	50		STR			22 AWG WHT
-24VDC (SUPPLY)			J1 - D	4	K1 - X1	999	50		STR			22 AWG WHT
-24VDC (SUPPLY)			J1 - D	19	XDS1 - 1	999	50		STR			22 AWG WHT
TANK PRESSURE SW			J1 - E	5	XDS3 - 1	999	50		STR			22 AWG WHT
COMP TRANSFORMER			J1 - F	6	S4 - 1	999	51		STR			16 AWG WHT
115VAC (HOT)			J1 - G	7	S4 - 2	999	51		STR			16 AWG WHT
+24VDC (SUPPLY)			J1 - H	8	S4 - 5	999	50		STR			22 AWG WHT
+24VDC (BATT)			J1 - J	9	S5 - 3	999	50		STR			22 AWG WHT
PRESSURE SWITCH			J1 - K	10	K1 - A3	999	50		STR			22 AWG WHT
PRESSURE SWITCH			J1 - K	22	XDS2 - 2	999	50		STR			22 AWG WHT
GND			J1 - L	11	E1	999	51		STR			16 AWG WHT
-24VDC (BATT)			J1 - M	12	XDS2 - 1	999	50		STR			22 AWG WHT
BATT HYD PUMP CT			J1 - N	13	S6 - 1	999	50		STR			22 AWG WHT
AC HYD PUMP CONT			J1 - P	14	S6 - 3	999	50		STR			22 AWG WHT
1000 LIMIT SW			J1 - Q	15	S1 - 6	999	50		STR			22 AWG WHT
ANTI JOG			J1 - R	16	S1 - 2	999	50		STR			22 AWG WHT
LOWER VALVE			J1 - S	17	S2 - 3	999	50		STR			22 AWG WHT
KEY: TST - TWISTED SHIELDED TRIPLE TSP - TWISTED SHIELDED PAIR						WIRE LIST 5035432						
TT - TWISTED TRIPLE TP - TWISTED PAIR						COAX - COAXIAL SHLD - SHIELDED						
						SOL - SOLID STR - STRANDED WW - WIRE WRAP						
CONTRACT NO.						CODE IDENT 57958 SHEET 3 REV A						

COMPONENT DS1-5

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
-24VDC (SUPPLY)	19	J1 - D	XDS1 - 1									
+24VDC (SUPPLY)			XDS1 - 2	20	S4 - 5	999	50		STR			22 AWG WHT
-24VDC (BATT)	12	J1 - M	XDS2 - 1	21	XDS3 - 2	999	50		STR			22 AWG WHT
PRESSURE SWITCH	22	J1 - K	XDS2 - 2									
TANK PRESSURE SW	5	J1 - E	XDS3 - 1									
-24VDC (BATT)	21	XDS2 - 1	XDS3 - 2	23	XDS4 - 1	999	50		STR			22 AWG WHT
-24VDC (BATT)	23	XDS3 - 2	XDS4 - 1	24	XDS5 - 2	999	50		STR			22 AWG WHT
AC HYD PUMP CONT			XDS4 - 2	25	S6 - 3	999	50		STR			22 AWG WHT
BATT HYD PUMP CT			XDS5 - 1	26	S6 - 1	999	50		STR			22 AWG WHT
-24VDC (BATT)	24	XDS4 - 1	XDS5 - 2									
KEY: TST - TWISTED SHIELDED TRIPLE TSP - TWISTED SHIELDED PAIR						WIRE LIST						
TT - TWISTED TRIPLE TP - TWISTED PAIR						5035432						
COAX - COAXIAL SHLD - SHIELDED						CODE IDENT						
SOL - SOLID STR - STRANDED WW - WIRE WRAP						57958 SHEET 5 REV A						
CONTRACT NO.:												

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
			K1 - A1									NC
DC MODE			K1 - A2	27	K1 - B2	999	60		SOL	8		22 AWG SOLID
PRESSURE SWITCH	10	J1 - K	K1 - A3	28	K1 - B3	999	60		SOL	8		22 AWG SOLID
			K1 - B1									NC
DC MODE	27	K1 - A2	K1 - B2	29	K1 - C2	999	60		SOL	8		22 AWG SOLID
PRESSURE SWITCH	28	K1 - A3	K1 - B3	30	K1 - C3	999	60		SOL	8		22 AWG SOLID
			K1 - C1									NC
DC MODE	29	K1 - B2	K1 - C2	31	K1 - D2	999	60		SOL	8		22 AWG SOLID
PRESSURE SWITCH	30	K1 - B3	K1 - C3	32	K1 - D3	999	60		SOL	8		22 AWG SOLID
			K1 - D1									NC
DC MODE	31	K1 - C2	K1 - D2	33	S5 - 2	999	50		STR			22 AWG WHT
PRESSURE SWITCH	32	K1 - C3	K1 - D3									
-24VDC (SUPPLY)	4	J1 - D	K1 - X1									
MODE BOTH			K1 - X2	34	S4 - 6	999	50		STR			22 AWG WHT
KEY: TST - TWISTED SHIELDED TRIPLE TT - TWISTED TRIPLE COAX - COAXIAL SOL - SOLID						WIRE LIST						
TSP - TWISTED SHIELDED PAIR TP - TWISTED PAIR SHLD - SHIELDED STR - STRANDED						5035432						
CONTRACT NO.						CODE IDENT						
						57958 SHEET 6 REV A						

COMPONENT S1-S3

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
ME RAISE			S1 - 1	35	S1 - 3	999	50		STR			22 AWG WHT
ANTI JOG	16	J1 - R	S1 - 2	36	S1 - 5	999	50		STR			22 AWG WHT
ME RAISE	35	S1 - 1	S1 - 3	37	S6 - 2	999	50		STR			22 AWG WHT
15D LIMIT SW	18	J1 - T	S1 - 4	38	S2 - 4	999	50		STR			22 AWG WHT
ANTI JOG	36	S1 - 2	S1 - 5									
100D LIMIT SW	15	J1 - Q	S1 - 6									
			S2 - 1									NC
			S2 - 2									NC
LOWER VALVE	17	J1 - S	S2 - 3									
15D LIMIT SW	38	S1 - 4	S2 - 4									
ME IN	3	J1 - C	S3 - 1									
ME PAUSE	1	J1 - A	S3 - 2									
ME OUT	2	J1 - B	S3 - 3									
KEY: TST - TWISTED SHIELDED TRIPLE TT - TWISTED TRIPLE COAX - COAXIAL SOL - SOLID						WIRE LIST 5035432						
TSP - TWISTED SHIELDED PAIR TP - TWISTED PAIR SHLD - SHIELDED STR - STRANDED						CODE IDENT 57958 SHEET 7 REV A						
CONTRACT NO.:												

COMPONENT S4-S6

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
COMP TRANSFORMER	6	J1 - F	S4 - 1	40	S4 - 3	999	51	4	STR			16 AWG WHT
115VAC (HOT)	7	J1 - G	S4 - 2									
COMP TRANSFORMER	40	S4 - 1	S4 - 3									
			S4 - 4									NC
+24VDC (SUPPLY)	8	J1 - H	S4 - 5									
+24VDC (SUPPLY)	20	XDS1 - 2	S4 - 5									
MODE BOTH	34	K1 - X2	S4 - 6									
			S5 - 1									NC
DC MODE	33	K1 - D2	S5 - 2									
+24VDC (BATT)	9	J1 - J	S5 - 3									
BATT HYD PUMP CT	13	J1 - N	S6 - 1									
BATT HYD PUMP CT	26	XDS5 - 1	S6 - 1									
ME RAISE	37	S1 - 3	S6 - 2									
AC HYD PUMP CONT	14	J1 - P	S6 - 3									
AC HYD PUMP CONT	25	XDS4 - 2	S6 - 3									
KEY: TST - TWISTED SHIELDED TRIPLE TSP - TWISTED SHIELDED PAIR						WIRE LIST						
TT - TWISTED TRIPLE TP - TWISTED PAIR						5035432						
COAX - COAXIAL SHLD - SHIELDED						CODE IDENT						
SOL - SOLID STR - STRANDED WW - WIRE WRAP						57958						
CONTRACT NO.:						SHEET						
						8						
						REV A						

MM WL-5035432 REV-A CONTROL, MAST ELEVATOR

WIRE HARNESS SUMMARY
DATA 08/03/82
PAGE 1

ITEM#	KEY	QTY	WIRE NUMBERS													
50	STR	29	1	2	3	4	5	8	9	10	12	13	14	15	16	17
			18	19	20	21	22	23	24	25	26	33	34	35	36	37
			38													
51	STR	4	6	7	11	40										
60	SOL	6	27	28	29	30	31	32								

57958
REV-A

5035432
SM 10

REV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					
SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22					
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UNLESS OTHERWISE SPECIFIED: DIMENSIONS AND TOLERANCES ARE IN INCHES - FRACTIONS AND DECIMALS ARE NOT TO BE ROUNDED UP OR DOWN UNTIL AFTER THE SURFACE COATING. TOLERANCES: ALL PLACES ± 0.125 THREE PLACES ± 0.015 TWO PLACES ± 0.010 ANGLES ± 0.005 1.00000 ± 0.0005 0.00000 ± 0.0001 INCHES MILLIMETERS DO NOT SCALE DRAWING COPY														GOVERNMENT CONTRACT NO. DAAK21-79-C-0085 PREP <i>K Kelly</i> DATE <i>8-6-79</i> CHK <i>Tom G. Phillips</i> <i>8-6-79</i> APP <i>A. K. King</i> <i>8-6-79</i> APPD					U S ARMY ELECTRONIC RESEARCH AND DEVELOPMENT SIGNALS WARFARE WIRE LIST PNEUMATIC COMPONENTS (50 & 80FT SY) SIZE FSCM NO. DWG NO. A 57958 50 SCALE NONE								
MFR CODE IDENT 07397																											

OOH (R & C)

NOTES: UNLESS OTHERWISE SPECIFIED;

1. THIS IS A COMPUTER OUTPUT REPORT. ALL SHEETS ARE ISSUED AT THE SAME REVISION LETTER AND AT THE REVISION LETTER OF SHEET ONE
2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT NUMBER AND ASSEMBLY DESIGNATION
3. REFER TO PARTS LIST C5078086-1 FOR WIRE TYPE INFORMATION NOTED BY ITEM NUMBERS ON THIS WIRE LIST
4. REF SCHEMATIC DIAGRAM 5035492-1
5. LENGTH OF WIRE TO BE DETERMINED AT ASSEMBLY
6. WIRING PROCEDURE PER MIL-STD-454, REQ 20, SOLDER PER MIL-STD-454, REQ 5
7. IDENTIFICATION OF WIRE PER MIL-STD-681, SYSTEM IV
8. SLEEVE AND STOW UNUSED CONDUCTORS.

U S ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND SIGNALS WARFARE LABORATORY			
SIZE	FSCM NO.	DWG NO.	
A	57958	5035449	
DRAWN <i>Jon Phillips</i>		ISSUED <i>00/06/19</i>	
SCALE —		SHEET 2	

COMPONENT J1

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
COMP CONT RELAY			J1 - A	1	S1 - 1	111	139		STR	8	1	20 AWG BRN
OUT (+24VDC)			J1 - B	2	A2 - +	111	139		STR	8	2	20 AWG BRN
-24VDC (BATT)			J1 - C	2	A2 - -	000	139		STR	8	2	20 AWG BLK
-24VDC (BATT)			J1 - C	4	A3 - -	000	139		STR	8	3	20 AWG BLK
			J1 - D									NC
HEATER SW			J1 - E	5	S6 - 1	999	141		STR			16 AWG WHT
J1-F			J1 - F	6	S2 - NC	999	140		STR			22 AWG WHT
MAST PRESSURE			J1 - G	7	S3 - NO	999	140		STR			22 AWG WHT
IN (+24VDC)			J1 - H	4	A3 - +	111	139		STR	8	3	20 AWG BRN
SAFETY (+24VDC)			J1 - I	9	A4 - +	111	139		STR	8	4	20 AWG BRN
-24VDC (BATT)			J1 - J	9	A4 - -	000	139		STR	8	4	20 AWG BLK
+24VDC (BATT)			J1 - K	11	S3 - COM	999	140		STR			22 AWG WHT
MAST ERECT CONT			J1 - L	12	S3 - NC	999	140		STR			22 AWG WHT
+24VDC (BATT)			J1 - M	13	S2 - COM	999	140		STR			22 AWG WHT
PRESS IND			J1 - N	14	S2 - NO	999	140		STR			22 AWG WHT
KEY: TST - TWISTED SHIELDED TRIPLE TSP - TWISTED SHIELDED PAIR						TT - TWISTED TRIPLE TP - TWISTED PAIR		COAX - COAXIAL SHLD - SHIELDED		SOL - SOLID STR - STRANDED WW - WIRE WRAP		
CONTRACT NO:						WIRE LIST 5035449						
						CODE IDENT		57958		SHEET 3		REV 0

COMPONENT J2

[illegible]

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
COMPRESSOR			A1 - +	22	K1 - A2	999	142		STR			12 AWG WHT
-24VDC (BATT)			A1 - -	23	K1 - X1	999	142		STR			12 AWG WHT
OUT (+24VDC)	2	J1 - B	A2 - +									
-24VDC (BATT)	2	J1 - C	A2 - -									
IN (+24VDC)	4	J1 - H	A3 - +									
-24VDC (BATT)	4	J1 - C	A3 - -									
SAFETY (+24VDC)	9	J1 - I	A4 - +									
-24VDC (BATT)	9	J1 - J	A4 - -									
PRESSURE SW			A5 - +	25	S4 - 2	999	142		STR			12 AWG WHT
COMPRESSOR -	27	C1 - -	A5 - -									
KEY: TST - TWISTED SHIELDED TRIPLE TT - TWISTED TRIPLE COAX - COAXIAL SOL - SOLID						WIRE LIST						
TSP - TWISTED SHIELDED PAIR TP - TWISTED PAIR SHLD - SHIELDED STR - STRANDED						5035449						
CONTRACT NO						CODE IDENT		57958	SHEET		5	REV D

COMPONENT C1

[illegible]

COMPONENT	CR1
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[illegible]

COMPONENT HR1

[illegible]

COMPONENT K1

[illegible]

COMPONENT S1-S4

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
COMP CNT RELAY	1	J1 - A	S1 - 1									
PRESS SW			S1 - 2	1	K1 - X2	000	139		STR	8	1	20 AWG BLK
+24VDC (BATT)	13	J1 - M	S2 - COM									
PRESS IND	14	J1 - N	S2 - NO									
J1-F	6	J1 - F	S2 - NC									
+24VDC (BATT)	11	J1 - K	S3 - COM									
MAST ERECT CONT	12	J1 - L	S3 - NC									
MAST PRESSURE	7	J1 - G	S3 - NO									
+24VDC (SUP OUT)	26	C1 - +	S4 - 1									
PRESSURE SW	25	A5 - +	S4 - 2									
KEY: TST - TWISTED SHIELDED TRIPLE TT - TWISTED TRIPLE COAX - COAXIAL SOL - SOLID						WIRE LIST						
TSP - TWISTED SHIELDED PAIR TP - TWISTED PAIR SHLD - SHIELDED STR - STRANDED						5035449						
CONTRACT NO:						CODE IDENT		57958	SHEET	10	REV	D

D-47

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
115VAC (HCT)	16	J2 - B	T1 - C									
AC OUT			T1 - 1		CR1 - AC1	999	142		STR			12 AWG WHT
			T1 - 2									NC
T1 3-4			T1 - 3		T1 - 4	999	142		STR			12 AWG WHT
T1 3-4	33	T1 - 3	T1 - 4									
			T1 - 5									NC
AC OUT			T1 - 6		CR1 - AC2	999	142		STR			12 AWG WHT
			T1 - 105									NC
			T1 - 115									NC
115VAC (NEUT)	19	J2 - E	T1 - 125									
115VAC (NEUT)	34	HR1 - 2	T1 - 125									
KEY: TST - TWISTED SHIELDED TRIPLE TT - TWISTED TRIPLE COAX - COAXIAL SOL - SOLID						WIRE LIST						
TSP - TWISTED SHIELDED PAIR TP - TWISTED PAIR SHLD - SHIELDED STR - STRANDED						5035449						
CONTRACT NO.:						CODE IDENT						
						57958 SHEET 12 REV 0						

D-49

MN XL-5075449 REV D, 50 G 80 FT SYSTEM

WIRE HARNESS SUMMARY
DATA 10/28/82
PAGE 1

ITEM#	KEY	QTY	WIRE NUMBERS									

139	STR	8	1	1	2	2	4	4	9	9

140	STR	8	6	7	11	12	13	14	17	20

141	STR	7	5	16	19	21	34	35	36

142	STR	12	15	18	22	23	25	26	27	28	29	31	32	33

57958 5035449
REV-D SH 14

APPLICATION		REVISIONS			
NEXT ASSY	USED ON	REV	DESCRIPTION	DATE	APPROVED
5035604			SSG-WD RELEASED & CONTROLLED	8-10-88	<i>H. K. Kirtner</i>
		A	REVISED PER ECN 50126 EFF: ALL <i>Thick Kelly 82-412</i>	82 June 23	<i>D. Wall</i>

-1 AS SHOWN

REV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
A																					

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UNLESS OTHERWISE SPECIFIED: DIMENSIONS AND TOLERANCES ARE IN INCHES / MILLIMETERS AND PER ANSI Y14.5 BEFORE SURFACE COATING TOLERANCES: ONE PLACE (X) IS —  TWO PLACE (XX) IS —  THREE PLACE (XXX) IS —  ANGLES & SURFACES —  SURFACE FINISH —  DO NOT SCALE DRAWING COPY		GOVERNMENT CONTRACT NO. DAAK21-79-C-0085 PREP <i>H. K. Kirtner</i> DATE <i>8-9-80</i> CND <i>R. P. Smith</i> <i>8-10-80</i> APPR <i>G. King</i> <i>8-10-80</i>	U S ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND SIGNALS WARFARE LABORATORY WIRE LIST- INTERFACE COUPLING DEVICE SIZE FSCM NO. DWG NO. A 57958 5035606 SCALE <i>NONE</i> SHEET 1 OF 12

00H 

NOTES-UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN, FOR COMPLETE DESIGNATION
PREFIX WITH UNIT NUMBER AND ASSEMBLY DESIGNATION
2. REFER TO PL 5035604-1 FOR WIRE TYPE INFORMATION NOTED BY ITEM NUMBERS
ON THIS WIRE LIST
3. REF SCHEMATIC DIAGRAM 5035605-1
4. LENGTH OF WIRE TO BE DETERMINED AT ASSEMBLY
5. WIRING PROCEDURE PER MIL-STD-454, REQ T 20, SOLDER PER MIL-STD-454, REQ T 5
6. IDENTIFICATION OF WIRE PER MIL-STD-681, SYSTEM IV
7. W1 THRU W6 ARE PRE-ASSEMBLED CABLES

U S ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND SIGNALS WARFARE LABORATORY			
RELEASED & CONTROLLED DRAWN		SIZE A	FSCM NO. 57958
DOCUMENT ISSUED 21-10-08		DWG NO. 5035606	
SCALE —		SHEET 2	

COMPONENT W1, W2

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
			WIPI-A				12			7		NC
GND			-B		E5	ORN						
			-C									NC
+24VDC PUMP			-D		K1-AZ	BLK						
24VDC RTN			-E		E2	BRN						
+90VDC PUMP			-F		CRI-CATH	RED						
115VAC NEUT			-G		TB1-6B	YEL						
HYD MAST RAISE			-H		S1-3	GRN						
HYD MAST LOWER			WIPI-I		S1-1	BLU	12			7		
			W2PI-A				13			7		NC
			-B									NC
			-C									NC
24VDC RTN			-D		TB1-3A	BLK	13					
LAMP			-E	17	W2PI-R	WHT	109					22AWG
			-F				13					NC
			-G									NC
CONTROL AC			-H		S3-3	ORN						
24VDC IN		W2PI-R	W2PI-J		S5-5	RED	13			7		
KEY: TST - TWISTED SHIELDED TRIPLE COAX - COAXIAL WW - WIRE WRAP						WIRE LIST 5035606						
TSP - TWISTED SHIELDED PAIR SHLD - SHIELDED						CODE IDENT 57958			SHEET 3		REV A	
TT - TWISTED TRIPLE SOL - SOLID												
TP - TWISTED PAIR STR - STRANDED												

COMPONENT W2 CONT'D

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
			W2P1-K				13			7		NC
			-L									NC
24VDC RTN			-M		TBI-3A	ORN						
			-N									NC
			-P									
			-Q				13					NC
LAMP		W2P1-E	-R	18	W2P1-J	WHT	109					ZZAWG
			-S				13					NC
			-T									
			-U									
			-V									
			-W									
			-X									
			-Y									
			W2P1-Z				13			7		NC
KEY: TST - TWISTED SHIELDED TRIPLE COAX - COAXIAL WW - WIRE WRAP TSP - TWISTED SHIELDED PAIR SHLD - SHIELDED TT - TWISTED TRIPLE SOL - SOLID TP - TWISTED PAIR STR - STRANDED												
WIRE LIST						5035606						
CODE IDENT						57958		SHEET 4		REV A		

COMPONENT *N3*

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
			W3PI-A				19			7		NC
			-B									
			-C									
			-D									
			-E									
			-F									
			-G									
			-H									
			-J									
			-K									
			-L									NC
24VDC RTN.			-M		TBI-3B	BLK						
DISTR DC			-N		S4-1	BRN						
DISTR AC			-P		S4-3	RED						
			-Q									NC
			-R									
			-S									
			-T									
			W3PI-U				19			7		NC
KEY: TST - TWISTED SHIELDED TRIPLE COAX - COAXIAL WW - WIRE WRAP						WIRE LIST 5035606						
TSP - TWISTED SHIELDED PAIR SHLD - SHIELDED						CODE IDENT 57958						
TT - TWISTED TRIPLE SOL - SOLID						SHEET 5						
TP - TWISTED PAIR STR - STRANDED						REV						

COMPONENT W3 CONT'D, W4

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
			W3PI-V				19			7		NC
			-W									
			-X									
			-Y									
			W3PI-Z				19			7		NC
24VDC IN			W4PI-A		CB2-2	BLK	10			7		
COMPRESSOR AC			-B		S5-3	RED						
OUTPUT (+)			-C		TP1	ORN						
24VDC RTN			-D		TBI-1A	BRN						
115VAC NEUT			-E		TBI-6A	YEL						
OUTPUT (-)			-F		TP2	GRN						
GND			W4PI-G		ES	BLU	10			7		
KEY: TST - TWISTED SHIELDED TRIPLE COAX - COAXIAL WW - WIRE WRAP						WIRE LIST 5035606						
TSP - TWISTED SHIELDED PAIR SHLD - SHIELDED						CODE IDENT 57958						
TT - TWISTED TRIPLE SOL - SOLID						SHEET 6						
TP - TWISTED PAIR STR - STRANDED						REV						

COMPONENT W5, W6

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
COMPRESSOR DC			W5P1-A		S5-4	ORN	11			7		
PNEU MAST OUT			-B		S6-3	YEL						
24 VDC RTN			-C		TB1-2A	GRN						
			-D									NC
HEATER			-E		S5-2	WHT GRN						
TANK PRESS SW NC			-F		TP3	BLU						
MAST PRESS SW NO			-G		TP8	VIO						
PNEU MAST IN			-H		S6-1	GRY						
PNEU SAFETY CLUSE			-I		S7-3	WHT						
24 VDC RTN			-J		TB1-2A	WHT BLK						
MAST PRESS SW COM			-K		TP7	WHT GRN						
MAST PRESS SW NC			-L		TP6	WHT RED						
TANK PRESS SW COM			-M		TP4	WHT GRN						
TANK PRESS SW NO			W5P1-N		TP5	WHT YEL	11			7		
115 VAC HOT			W6-HOT		CB1-1	BLK	14			7		
115 VAC GND			W6-GND		ES	GRN	14			7		
115 VAC NEUT			W6-NEUT		TB1-6A	WHT	14			7		
KEY: TST - TWISTED SHIELDED TRIPLE COAX - COAXIAL WW - WIRE WRAP						WIRE LIST 5035606						
TSP - TWISTED SHIELDED PAIR SHLD - SHIELDED						CODE IDENT 57958						
TT - TWISTED TRIPLE SOL - SOLID						SHEET 7						
TP - TWISTED PAIR STR - STRANDED						REV A						

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
		W6-HOT	CB1-1									
115 VAC HOT			CB1-2	1	52-2	BLK	107		STR			10 AWG
115 VAC HOT			CB1-2	2	55-2	BLK	105		STR			16 AWG
24 VDC IN			CB2-1	3	E1	WHT	108		STR			10 AWG
24 VDC IN		W4P1-A	CB2-2	4	K1-A1	WHT	108		STR			10 AWG
24 VDC IN			CB2-2	5	E3	BLK	103		STR			20 AWG
HYD MODE AC			CRI-ANODE	6	52-3	WHT	108		STR			10 AWG
		WIPI-F	CRI-CATH									
	3	CB2-1	E1									
24 VDC RTN		WIPI-E	E2	7	TB1-1B	BLK	107		STR			10 AWG
	5	CB2-2	E3									
24 VDC IN			E4	8	S1-2	WHT	104		STR			20 AWG
		WIPI-B	E5									
		W4P1-G	E5									
		W6-GND	E5									
KEY: TST - TWISTED SHIELDED TRIPLE COAX - COAXIAL WW - WIRE WRAP TSP - TWISTED SHIELDED PAIR SHLD - SHIELDED TT - TWISTED TRIPLE SOL - SOLID TP - TWISTED PAIR STR - STRANDED												
						WIRE LIST 5035606						
						CODE IDENT 57958		SHEET 8		REV		

COMPONENT K1, S1-53

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
	4	CB2-2	K1-A1									
		WIPI-D	K1-A2									
24VDC RTN			K1-X1	9	TB1-2B	WHT	104		STR			20 AWG
HYD MODE DC			K1-X2	10	S2-4	WHT	104		STR			20 AWG
		WIPI-I	S1-1									
HYD MAST	8	E4	S1-2	11	S2-5	WHT	104		STR			20 AWG
		WIPI-H	S1-3									
			S2-1									NC
	1	CB1-2	S2-2									
	6	CRI-ANODE	S2-3									
	10	K1-X2	S2-4									
CONTROL	11	S1-2	S2-5	12	S3-2	WHT	104		STR			20 AWG
			S2-6									NC
			S3-1									NC
DISTR	12	S2-5	S3-2	13	S4-2	WHT	104		STR			20 AWG
		W2PI-H	S3-3									

KEY: TST - TWISTED SHIELDED TRIPLE TSP - TWISTED SHIELDED PAIR TT - TWISTED TRIPLE TP - TWISTED PAIR						COAX - COAXIAL WW - WIRE WRAP SHLD - SHIELDED SOL - SOLID STR - STRANDED						WIRE LIST 5035606		
												CODE IDENT 57958	SHEET 9	REV

COMPONENT 54-57

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
		W3P1-N	54-1									
24VDC IN	13	S3-2	54-2	14	57-2	WHT	104		STR			20AWG
		W3P1-P	54-3									
		W5P1-E	55-2									
			55-1									NC
	2	C81-2	55-2									
		W4P1-B	55-3									
		W5P1-A	55-4									
24VDC IN		W3P1-J	55-5	15	56-2	WHT	104		STR			20AWG
			55-6									NC
		W5P1-H	56-1									
24VDC IN	15	55-5	56-2	16	57-2	WHT	104		STR			20AWG
		W5P1-B	56-3									
			57-1									NC
	14	54-2	57-2									
	16	56-2	57-2									
		W5P1-I	57-3									
KEY: TST - TWISTED SHIELDED TRIPLE COAX - COAXIAL WW - WIRE WRAP						WIRE LIST 5035606						
TSP - TWISTED SHIELDED PAIR SHLD - SHIELDED						CODE IDENT 57958			SHEET 10		REV A	
TT - TWISTED TRIPLE SOL - SOLID												
TP - TWISTED PAIR STR - STRANDED												

SIGNAL NAME	CALL BACKS		FROM	WIRE NO.	TO	COLOR	ITEM NO.	LEVEL	KEY	NOTE	GROUP	REMARKS
	WIRE NO.	LOCATION										
		W4PI-D	TB1-1A									
	7	E2	-1B									
		WSP1-C	-2A									
		WSP1-J	-2A									
	9	K1-X1	-2B									
		W2PI-D	-3A									
		W2PI-M	-3A									
		W3PI-M	-3B									
			-4A									NC
			-4B									NC
			-5A									NC
			-5B									NC
		W4PI-E	-6A									
		W6-NEUT	-6A									
		WIPI-G	TB1-6B									
KEY: TST - TWISTED SHIELDED TRIPLE COAX - COAXIAL WW - WIRE WRAP						WIRE LIST 5035606						
TSP - TWISTED SHIELDED PAIR SHLD - SHIELDED						CODE IDENT 57958						
TT - TWISTED TRIPLE SOL - SOLID						SHEET 11						
TP - TWISTED PAIR STR - STRANDED						REV						

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GLOSSARY

SECTION I. ABBREVIATIONS

ac	Alternating current
adj	adjust
amp	Amperage
appx	Appendix
attn	Attention
BII	Basic issue items
BOI	Basis of issue
CB1	Circuit breaker one (two, three, etc.)
comb	combination
CR1	Diode rectifier one (two, three, etc.)
CRG	Communications relay group
ctg	cutting
dc	Direct current
desldr	desolder
diag	diagonal
DISREP	Discrepancy in shipment report
DMWR	Depot maintenance work requirement
dr	drive
ea	Each
ECS	Engagement control station
eg	For example
EIR	Equipment improvement recommendations
ext	extension
F	Fahrenheit
fig	Figure
Fltr	Filter
F01	Fold out one (two, three, etc.)
FSCM	Federal supply code for manufacturer
gal	gallons

HCA	Hydraulic components assembly
Hd	Head
hdl	handle
ICC	Information and coordination central
ICD	Interface coupling device
ie	that is
Illus	Illustration
in	Inch
lb	Pound
lg	long
MAC	Maintenance allocation chart
Mach	Machine
mph	miles per hour
NIIN	National identification number
NSN	National stock number
Ovrd	Override
PCA	Pneumatic components assembly
plr	pliers
P/N	Part number -
psi	Pound-force per square inch
Qty rqr ..	Quantity required
rcht	ratchet
rd	round
refrig	refrigeration
ROD	Report of discrepancy
RPSTL	Repair parts and special tools list
S1	switch one (two, three, etc.)
scdr	screwdriver
scr	screw
skt	socket
sldr	solder
SMR	Source, maintainability, recoverability
svce	service

TAMMS The army maintenance management system
 TB1 Terminal board one (two, three, etc.)
 TMDE Test, measurement and diagnostic equipment
 U/M Unit of measure
 UUT Unit under test
 Vdc Volt direct current
 wr wrench
 xtip cross tip

SECTION II. DEFINITION OF UNUSUAL TERMS

Roadside - The left side of the vehicle as viewed from the rear.
 Curbside - The right side of the vehicle as viewed from the rear.
 Class I leak - Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
 Class II leak- Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.
 Class III leak- Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

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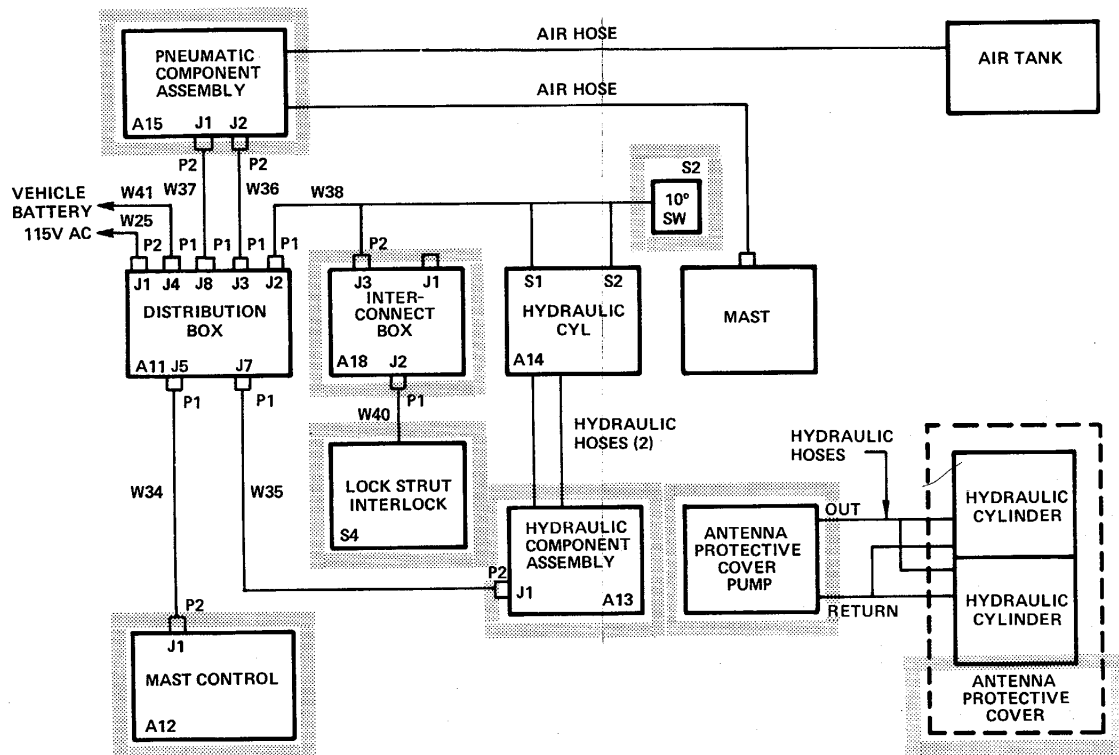
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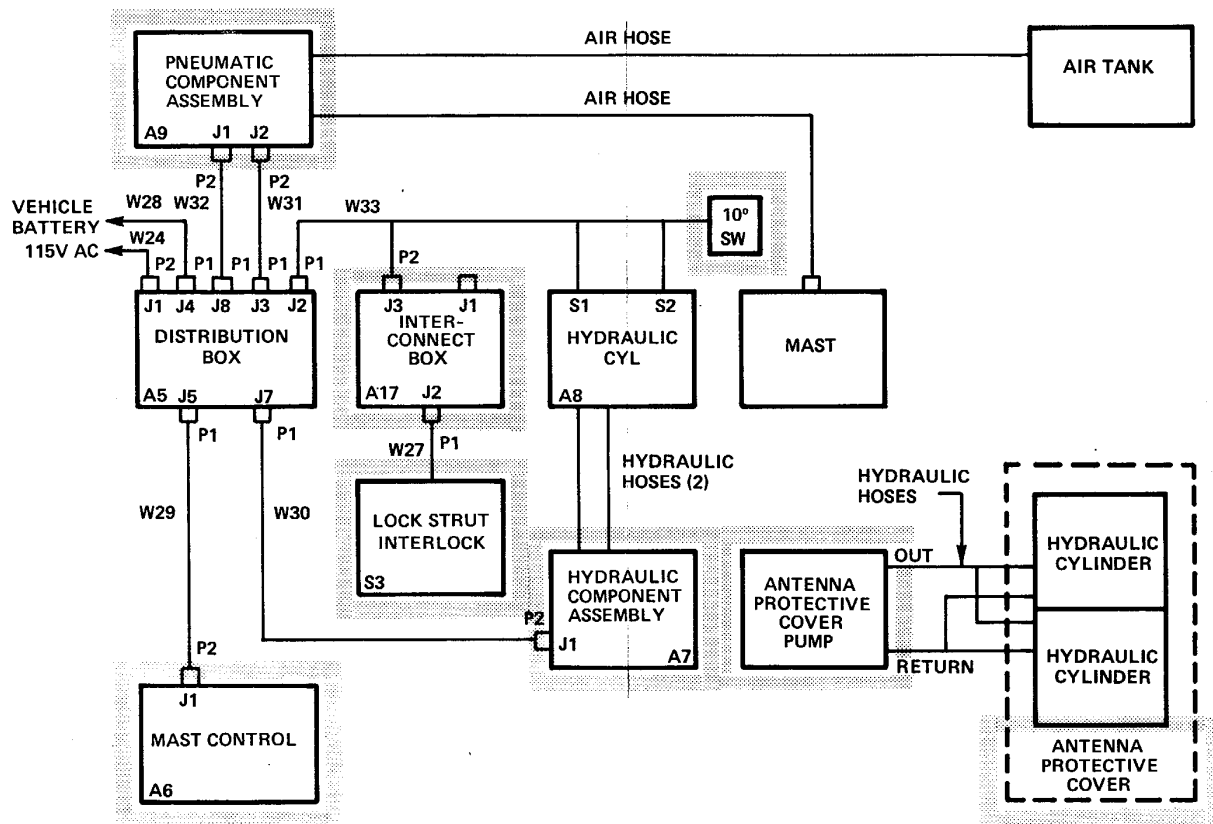
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Distribution:

To be distributed in accordance with special list.

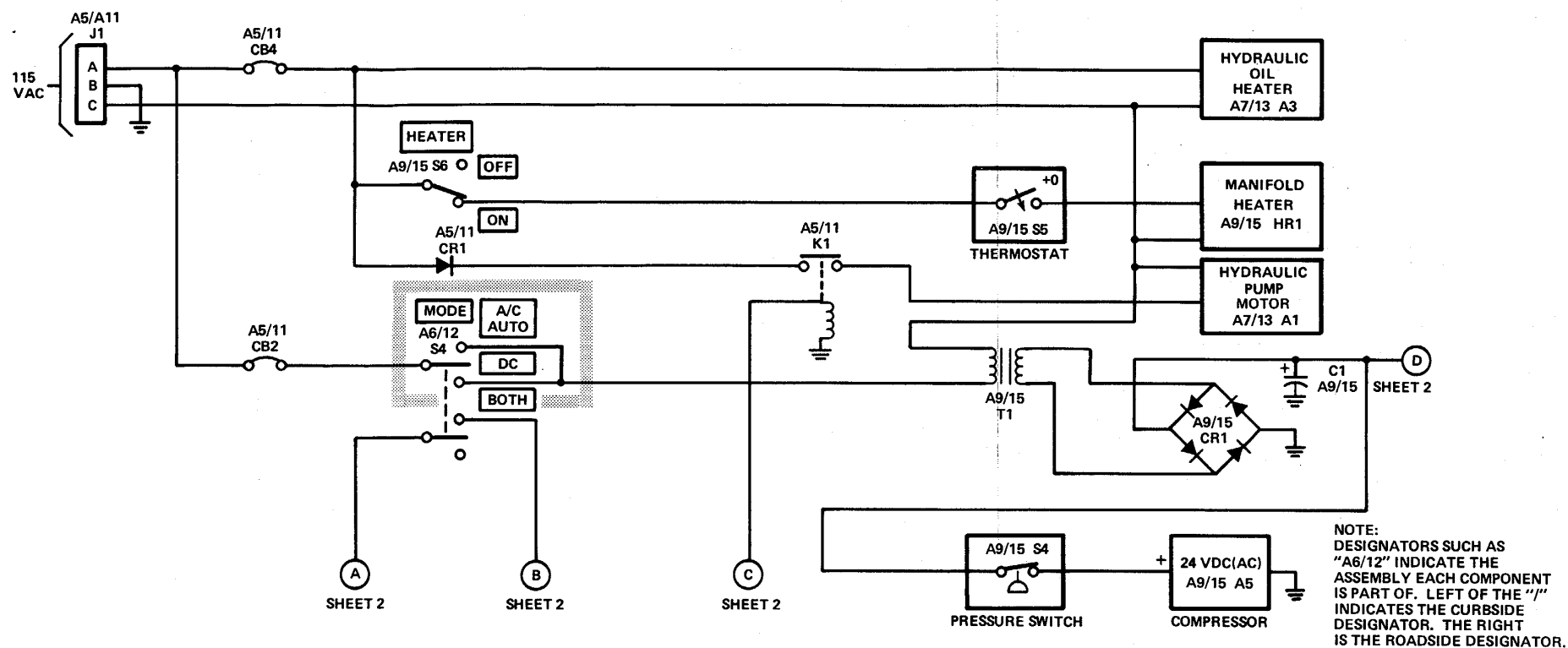


FO-1. Mast Group-Curbside, Cabling Diagram

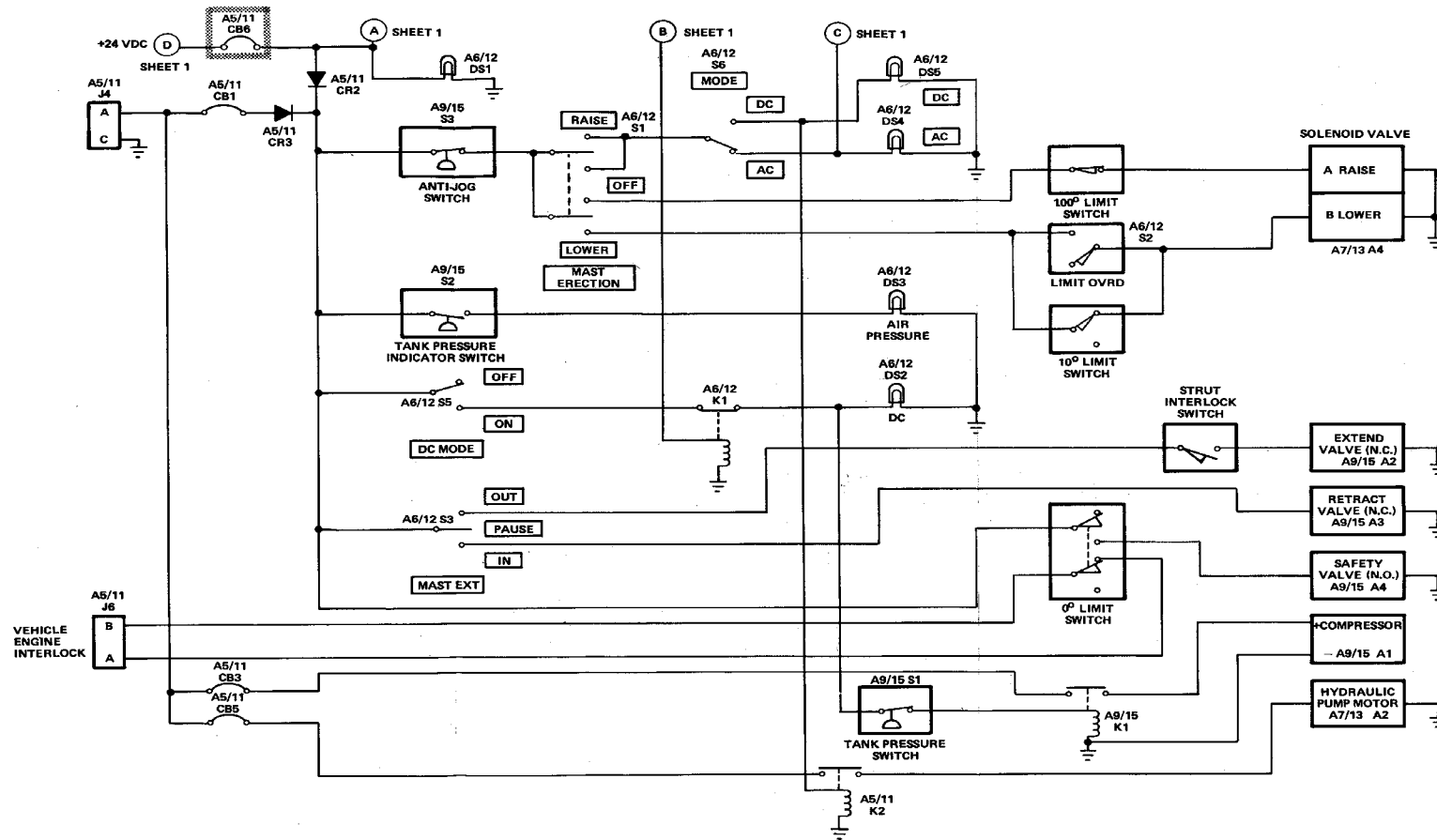


FO-2. Mast Group-Roadside, Cabling Diagram

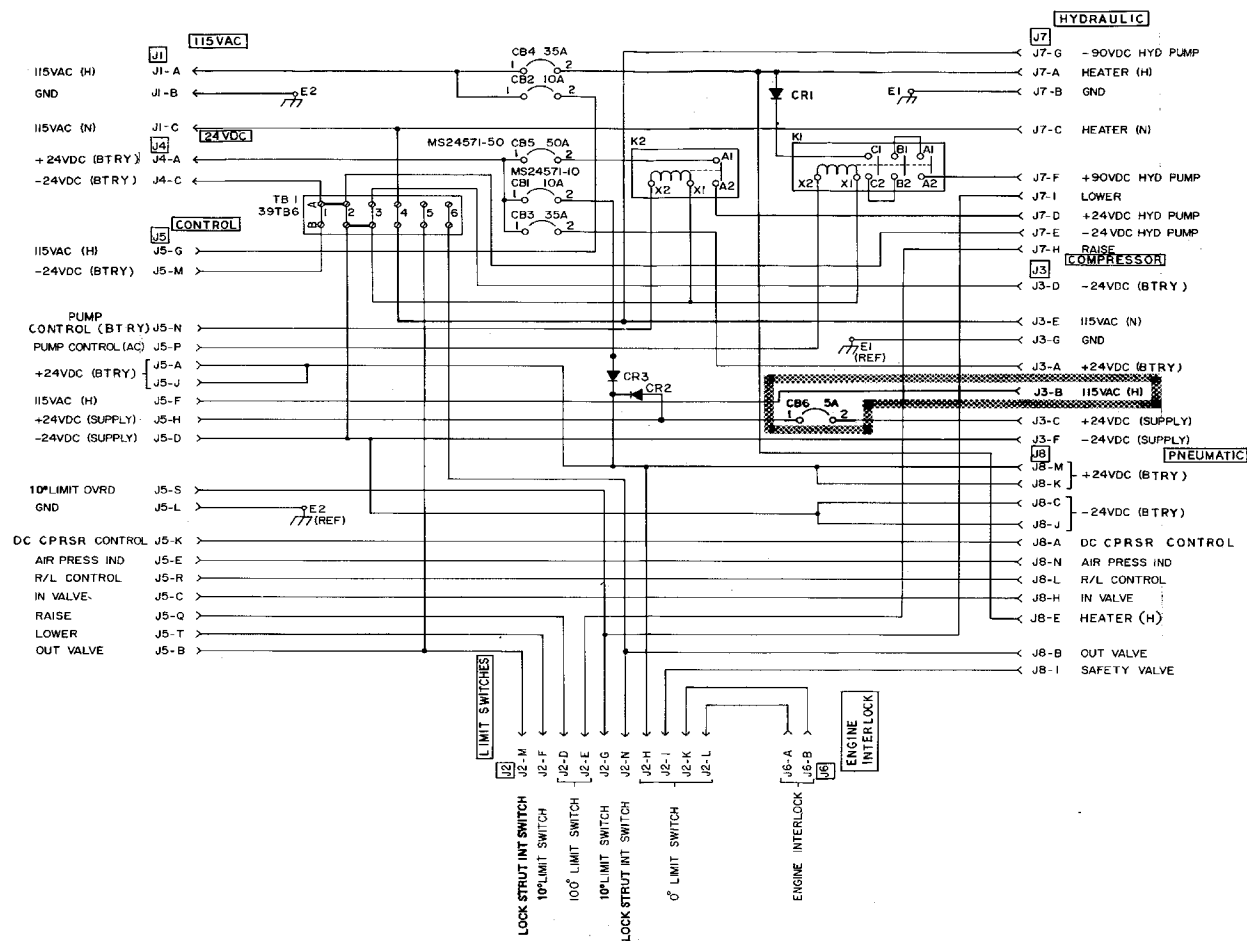
Change 2



FO-3. Mast Group-Electrical, Schematic/Functional Diagram



FO-3. Mast Group-Electrical, Schematic/Functional Diagram



NOTES: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN: FOR COMPLETE DESIGNATION PREFIX WITH UNIT NO. AND ASSEMBLY DESIGNATIONS.

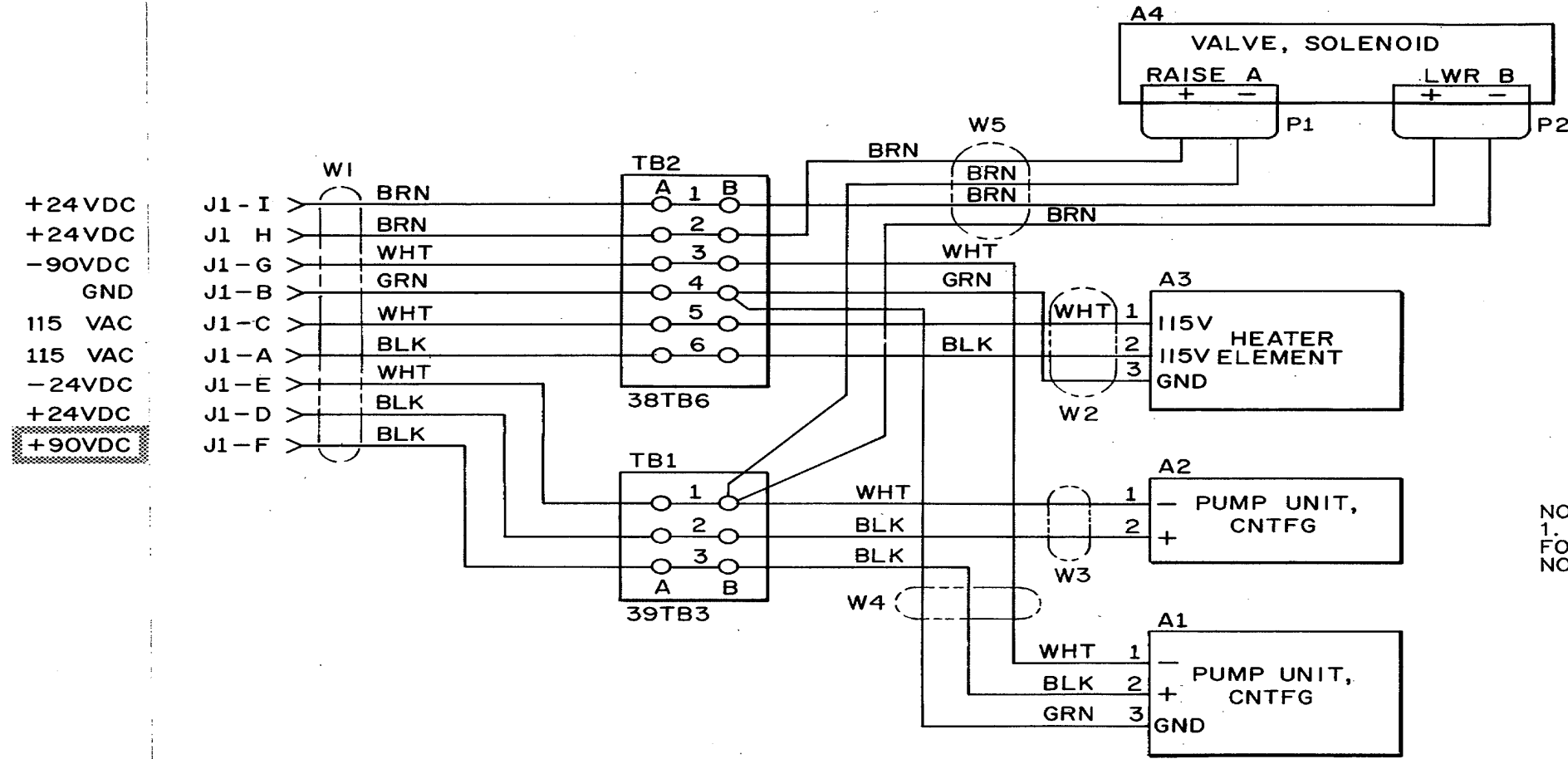
2. UNUSED CONNECTOR PINS NOT SHOWN.

3. CB6 INSTALLED IN LATER MODELS ONLY.

HIGHEST REFERENCE DESIGNATIONS
CR 3 J8 J3
E 5 K2
REFERENCE DESIGNATIONS NOT USED
E3.4.5

FO-4. Distribution Box, Schematic Diagram

Change 4

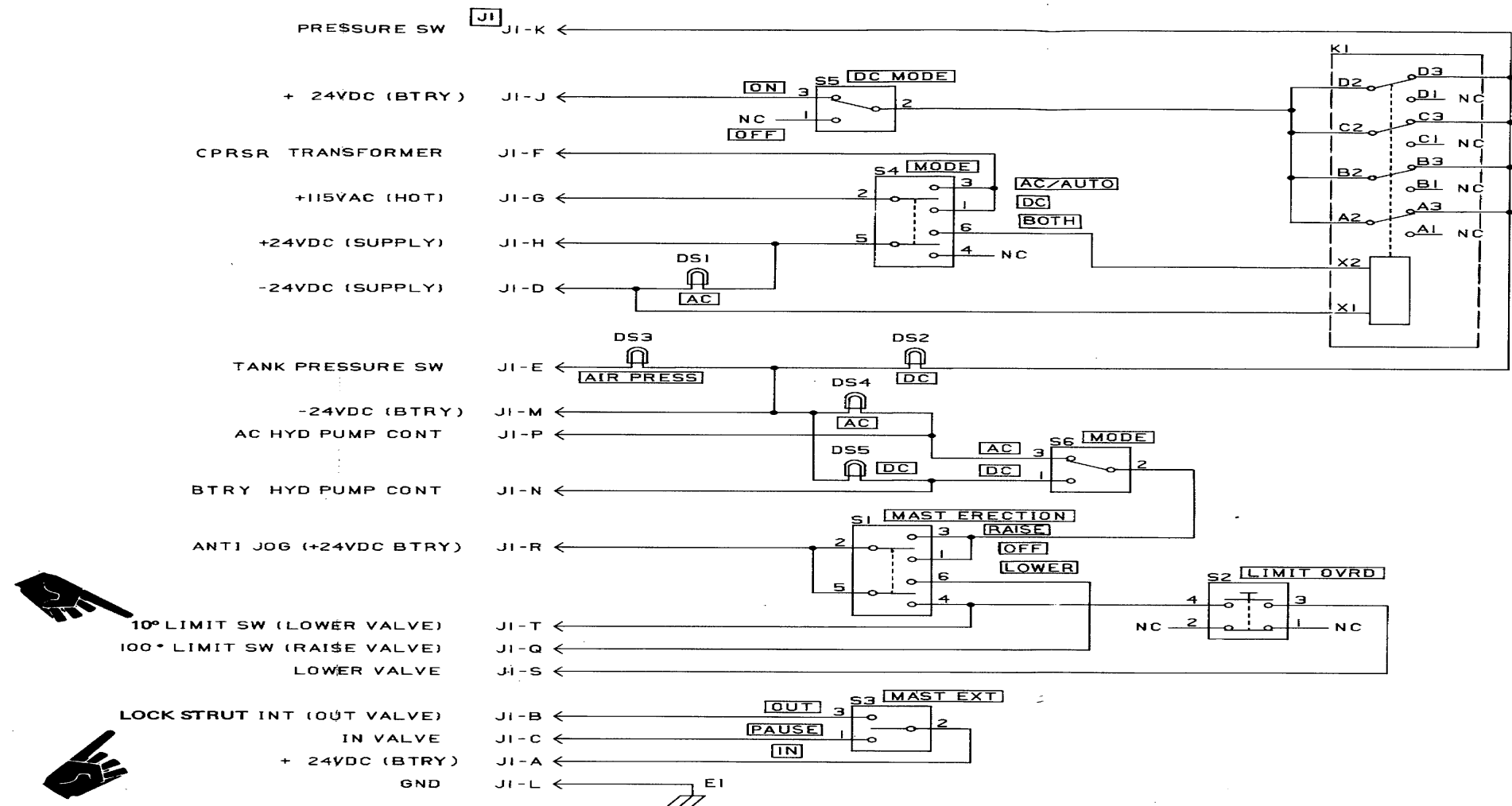


NOTES: UNLESS OTHERWISE SPECIFIED;
1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN:
FOR COMPLETE DESIGNATION PREFIX WITH UNIT
NO. AND ASSEMBLY DESIGNATION.

HIGHEST REFERENCE DESIGNATION		
J1	A 4	TB2

FO-5. HYDRAULIC COMPONENT ASSEMBLY, ELECTRICAL SCHEMATIC DIAGRAM

CHANGE 5

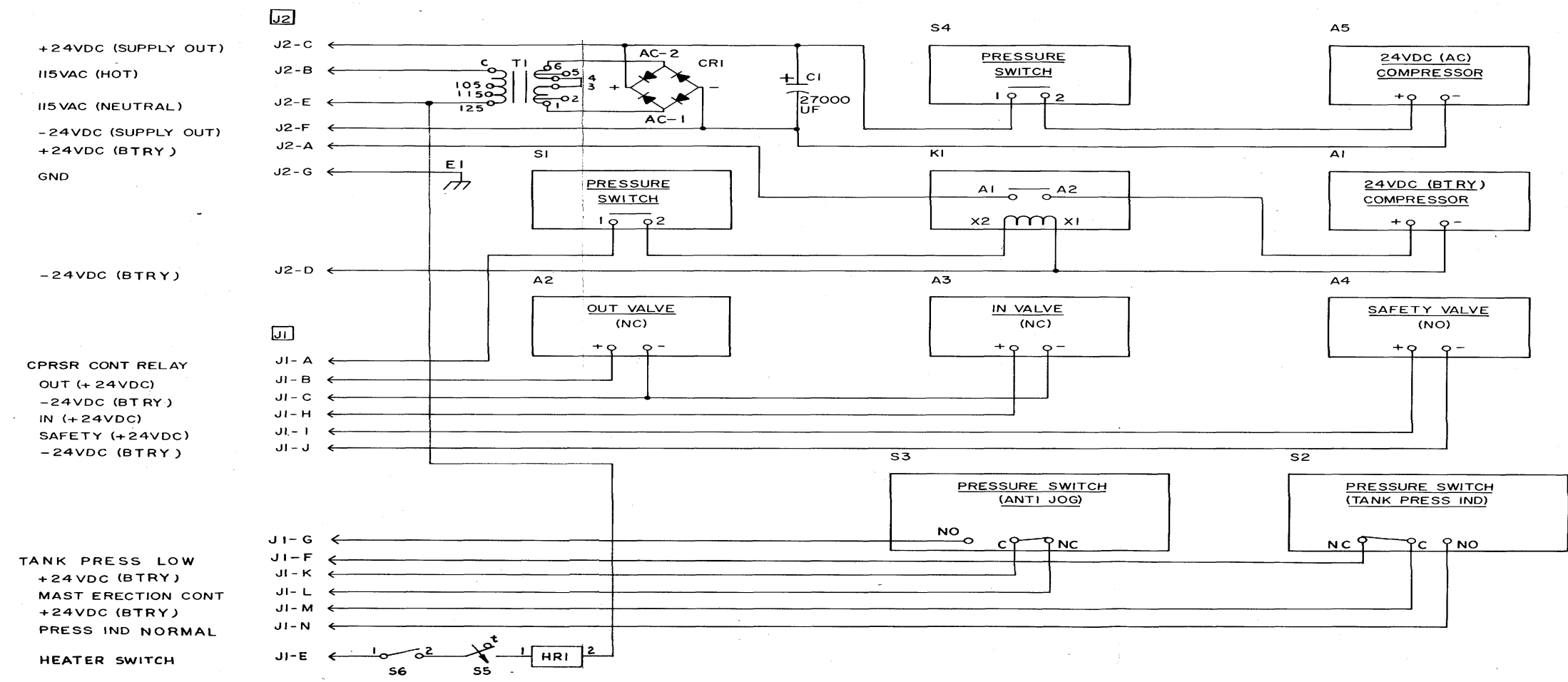


FO-MAST CONTROL, SCHEMATIC DIAGRAM

CHANGE 2

- NOTES: UNLESS OTHERWISE SPECIFIED:
1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION PREFIX WITH UNIT NO AND ASSEMBLY DESIGNATIONS.
 2. [] INDICATES EQUIPMENT MARKING.
 3. NC INDICATES NO CONNECTION.
 4. ALL LAMPS DS1 THRU DS5 ARE MS25237-387
 5. UNUSED CONNECTOR PINS NOT SHOWN

HIGHEST REFERENCE DESIGNATIONS			
J1	S6	K1	DS5
E1			
REFERENCE DESIGNATIONS NOT USED			

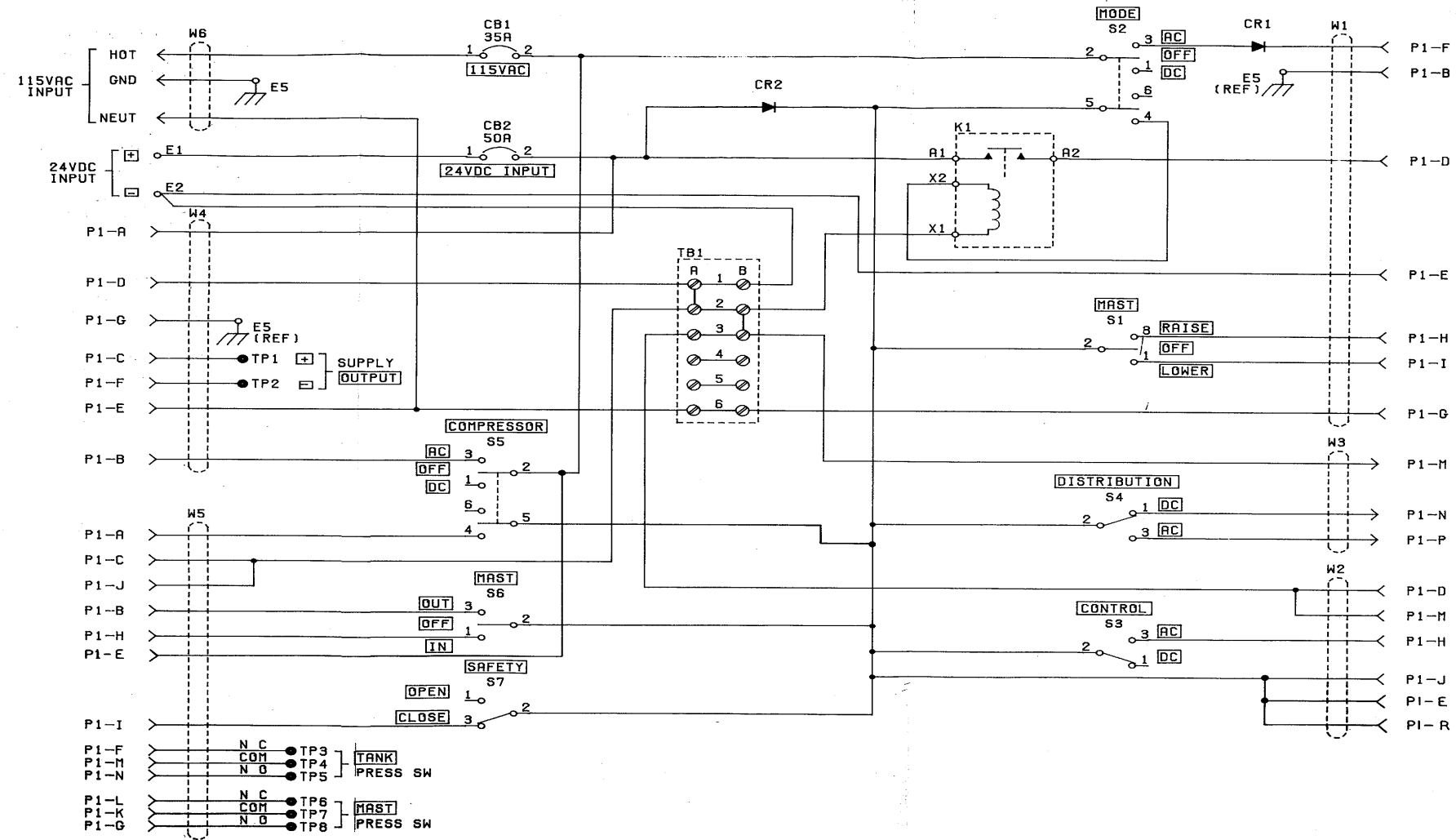


- NOTES: UNLESS OTHERWISE SPECIFIED;
1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN: FOR COMPLETE DESIGNATION PREFIX WITH UNIT NO. AND ASSEMBLY DESIGNATIONS.
 2. UNUSED CONNECTOR PINS NOT SHOWN.

HIGHEST REFERENCE DESIGNATIONS		
A5	K1	CR1
C1	T1	S4
J2	E1	
REFERENCE DESIGNATIONS NOT USED		

FO-7. PNEUMATIC COMPONENT ASSEMBLY, ELECTRICAL SCHEMATIC DIAGRAM

CHANGE 2

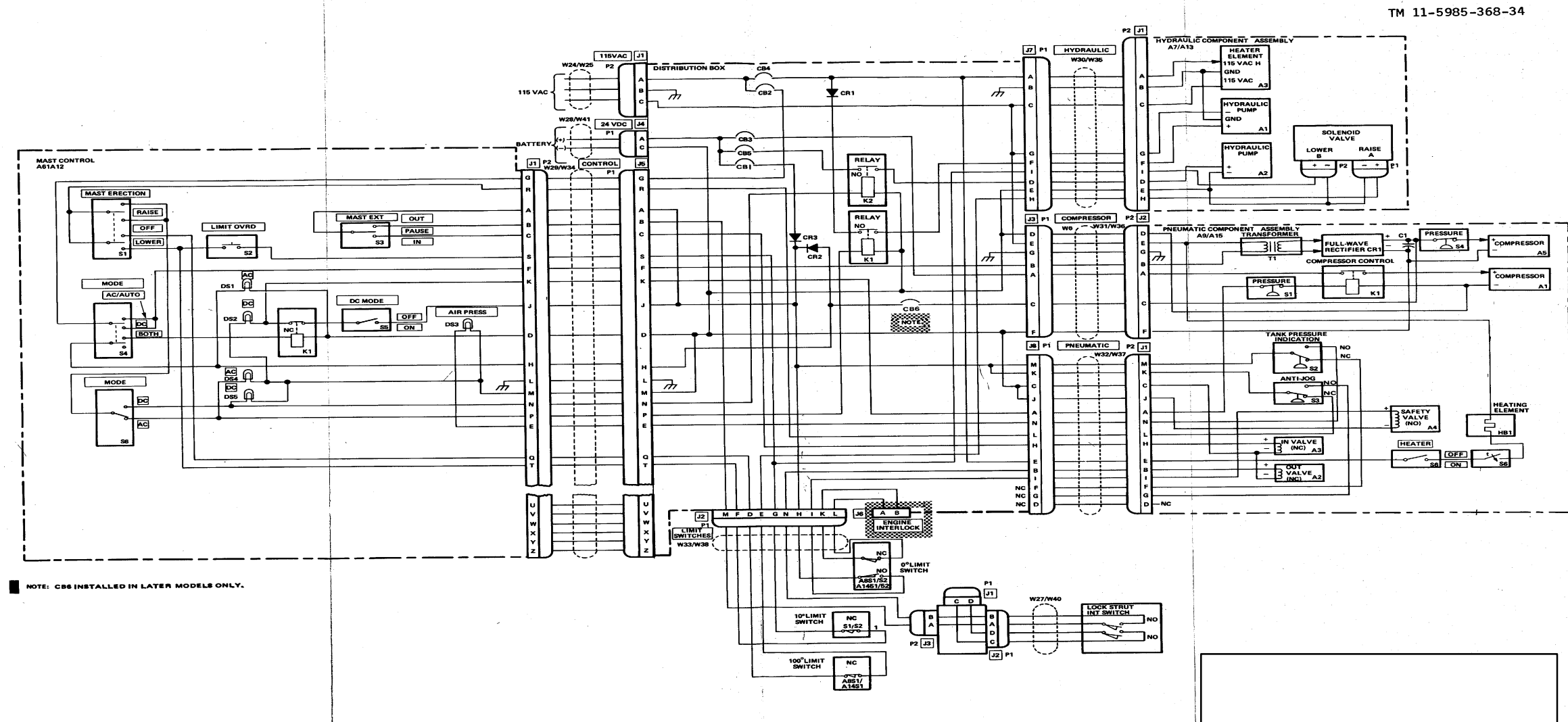


NOTES: UNLESS OTHERWISE SPECIFIED:
1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION PREFIX WITH UNIT NO AND ASSEMBLY DESIGNATIONS
2. N C INDICATES NORMALLY CLOSED
N O INDICATES NORMALLY OPENED
3. [] INDICATES EQUIPMENT MARKED

HIGHEST REFERENCE DESIGNATIONS			
CB2	CR2	TB1	K1
S7	W6	P1	E5
REFERENCE DESIGNATIONS NOT USED			
E3, E4			

FO-8. INTERFACE CONTROL DEVICE, SCHEMATIC DIAGRAM

CHANGE 2



FO-9. MAST GROUP, SCHEMATIC DIAGRAM

CHANGE 5

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN...JOT DOWN THE
DOPE ABOUT IT ON THIS FORM.
CAREFULLY TEAR IT OUT, FOLD IT
AND DROP IT IN THE MAIL.

SOMETHING WRONG WITH PUBLICATION

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER

PUBLICATION DATE

PUBLICATION TITLE

BE EXACT PIN-POINT WHERE IT IS

PAGE
NO.

PARA-
GRAPH

FIGURE
NO.

TABLE
NO.

IN THIS SPACE, TELL WHAT IS WRONG
AND WHAT SHOULD BE DONE ABOUT IT.

TEAR ALONG PERFORATED LINE

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER

SIGN HERE

DA FORM 2028-2
1 JUL 79

PREVIOUS EDITIONS
ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR
RECOMMENDATION MAKE A CARBON COPY OF THIS
AND GIVE IT TO YOUR HEADQUARTERS.

CONVERSION TO/FROM METRIC MEASURES

SYMBOL GIVEN → MULTIPLY BY → TO OBTAIN
← FROM METRIC

LENGTH

in	inches	25.4*	millimeters	mm
ft	feet	30.48*	centimeters	cm
yd	yards	0.9144*	meters	m
mi	miles (statute)	1.609	kilometers	km
nmi	miles (nautical)	1.852*	kilometers	km
Å	micron	1.0*	micrometers	µm
	angstrom	0.1*	nanometers	nm

AREA

cmil	circular mils	0.0005067	sq millimeters	mm ²
in ²	square inches	6.452	sq centimeters	cm ²
ft ²	square feet	0.09290	sq meters	m ²
yd ²	square yards	0.8361	sq meters	m ²
mi ²	sq miles (statute)	2.590	sq kilometers	km ²
	acres	0.4047	hectares (10 ⁴ m ²)	ha

VOLUME

fl oz	fluid ounces (US)	29.57	cubic cm (milliliters)	cm ³ or ml
gal	gallons (US liq)	3.785	liters	l
gal	gallons (Canada)	4.546	liters	l
in ³	cubic inches	16.39	cu centimeters	cm ³
ft ³	cubic feet	0.02832	cubic meters	m ³
yd ³	cubic yards	0.7646	cubic meters	m ³
bbl	barrels (US petro)	0.1590	cubic meters	m ³
	acre feet	1233.5	cubic meters	m ³

SPEED

ft/min	feet per minute	5.080*	millimeters per second	mm/s
mi/h	miles per hour	0.4470	meters per sec	m/s
km/h	kilometers per hr	0.2778	meters per sec	m/s
kn	knots	0.5144	meters per sec	m/s

MASS

oz	ounces (avdp)	28.35	grams	g
lb	pounds (avdp)	0.4536	kilograms	kg
ton	short tons (2000 lbs)	0.9072	metric tons (1000kg)	t

DENSITY

lb/ft ³	pounds per cubic foot	16.02	kilograms per cubic meter	kg/m ³

SYMBOL TO OBTAIN ← DIVIDE BY ← GIVEN
Conversion FROM Metric Measures

SYMBOL GIVEN → TO METRIC →
MULTIPLY BY → TO OBTAIN
← FROM METRIC

FORCE

oz _f	ounces-force	0.2780	newtons	N
lb _f	pounds-force	4.448	newtons	N
kg _f	kilograms-force	9.807	newtons	N
dyn	dynes	10 ⁻⁵ *	newtons	N

WORK, ENERGY - POWER

ft-lb _f	foot pounds-force	1.356	joules	J
cal	calorie (thermochem)	4.184*	joules	J
Btu	British thermal units (Intl)	1055	joules	J
hp	horsepower (elec)	746*	watts	W
ft-lb _f /s	foot pounds-force per second	1.356	watts	W
Btu/h	British thermal units per hour (Intl)	0.2931	watts	W

PRESSURE

lb _f /in ²	pounds-force/inch ²	6.895	kilopascals	kPa
lb _f /ft ²	pounds-force/foot ²	47.88	pascals	Pa
kg _f /m ²	kilograms-force/meter ²	9.807	pascals	Pa
mb	millibars	100.0*	pascals	Pa
mmHg	millimeters of Hg	133.3	pascals	Pa
inH ₂ O	inches of water (39°F)	0.2491	kilopascals	kPa
ftH ₂ O	feet of water	2.989	kilopascal	kPa

LIGHT

fc	footcandles	10.76	lux	lx
fL	footlamberts	3.426	candelas per sq meter	cd/m ²

SYMBOL TO OBTAIN ← DIVIDE BY ← GIVEN
Conversion FROM Metric Measures

TEMPERATURE

Symbol	Given	Compute by	To Obtain	Symbol
°F	° Fahrenheit	(°F - 32) · 5/9	° Celsius	°C
°C	° Celsius	°C · 9/5 + 32	° Fahrenheit	°F

*Indicates exact value 5 omit when rounding

