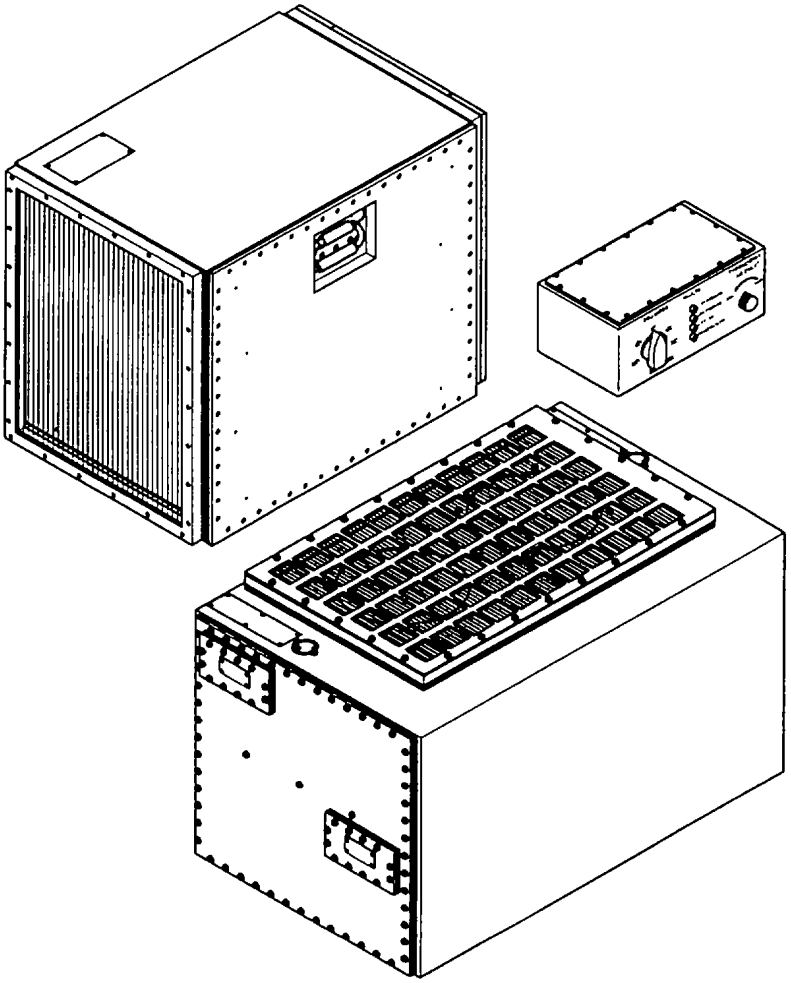
TECHNICAL MANUAL

OPERATOR'S, UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL



AIR CONDITIONER:
SPLIT PACK, 30,000 BTUH
28 VDC
(NSN: 4120-01-377-7511) (EIC: FGJ)

H E A D Q U A R T E R S , D E P A R T M E N T O F T H E A R M Y
1 5 S E P T E M B E R 1 9 9 3

CHANGE

NO. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 22 November 1995

**Operator's, Unit, Direct Support,
and General Support Maintenance Manual**

**AIR CONDITIONER: SPLIT PACK,
30,000 BTUH, 28 VDC
(NSN: 4120-01-377-7511) (EIC: FGJ)**

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

TM 9-4120-408-14, 15 September 1993, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
1-7 through 1-10	1-7 through 1-10
5-5 through 5-12	5-5 through 5-12
5-15 through 5-20	5-15 through 5-20
5-23 through 5-26	5-23 through 5-26
5-29 through 5-40	5-29 through 5-40
5-43 through 5-48	5-43 through 5-48
5-51 through 5-64	5-51 through 5-64
5-67 and 5-68	5-67 and 5-68
5-71 and 5-72	5-71 and 5-72
6-1 and 6-2	6-1 and 6-2
6-5 through 6-7/(6-8 blank)	6-5 through 6-7/(6-8 blank)
B-9 and B-10	B-9 and B-10
E-1 and E-2	E-1 and E-2

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief of Staff

Official:

YVONNE M. HARRISON
Administrative Assistant to the
Secretary of the Army
00985

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WARNING

HAZARDOUS MATERIALS

- **DANGEROUS CHEMICALS are used in this equipment. DEATH or SERIOUS INJURY may result if personnel fail to observe proper safety precautions. Great care must be exercised to prevent contact of liquid refrigerant, or refrigerant gas discharged under pressure, with any part of the body. The extremely low temperature resulting from the rapid expansion of liquid refrigerant, or refrigerant gas released under pressure, can cause sudden and irreversible tissue damage through freezing. As a minimum, all personnel must wear thermal protective gloves and a face shield or goggles when working in any situation where refrigerant contact with the skin or eyes is possible.**

- **Application of excessive heat to any component in a charged system will cause extreme pressure that may result in a rupture, possibly explosive in nature. Exposure of Refrigerant 12 or Refrigerant 134-A to an open flame or very hot surface will cause a chemical reaction in the gas to form carbonyl chloride (phosgene), a highly toxic and corrosive gas.**

- **PHOSGENE IS A LETHAL QAS. In their vapor state, Refrigerant 12 and Refrigerant 134-A are odorless vapors with no toxic characteristics.**

- **It is lighter than air and in a well ventilated area will disperse rapidly. However, in an unventilated area it presents danger as an asphyxiant, which may result in death or personal injury.**

- **Be sure the refrigerant system is fully discharged and purged and that dry nitrogen is flowing through the system at the rate of less than 1 2 cubic feet per minute (cfm) (0.028 0.057 meters^3 (m)/minute) before all brazing or debrazing operations. Failure to do so may result in the generation of phosgene which may result in death or personal injury.**

HIGH VOLTAGE

- **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 electrical 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 the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body resulting in personal injury or death.**

- **Do not operate the equipment without the grilles, guards, louvers, and covers in place and tightly secured. Personal injury may occur.**

- **DO NOT BE MISLED by the term "low voltage." Potentials as low as 50 volts may cause death under adverse conditions.**

- **Disconnect input power prior to disassembly of the air conditioner to prevent dangerous, possibly fatal electric shock.**

WARNING

SOLVENTS

- **Do not use diesel fuel, gasoline, or benzene (benzol) for cleaning. Death or personal injury may result.**
- **Acetone and methyl-ethyl ketone (MEK) solvents are flammable, and their vapors can be explosive. Do not smoke when using cleaning solvents.**
- **Repeated or prolonged skin contact or inhalation of vapors can be toxic. Use a well-ventilated area, and keep away from sparks or flame.**
- **Use goggles, gloves, and apron when appropriate. In cold weather, contact of exposed skin with cleaning solvents can cause personal injury.**
- **Clean parts in a well ventilated area. Avoid inhalation of solvent fumes and prolonged exposure of skin to cleaning solvent. Wash exposed skin thoroughly, failure to do so may result in personal injury.**
- **Dry cleaning solvent (A-A-711) used to clean parts is potentially dangerous to personnel and property.**
- **Do not use cleaning solvent near open flame or excessive heat. Flash point of solvent is 1000F to 1380F (380C to 590C). Death or personal injury may result if cleaning solvent is used near open flame or excessive heat.**
- **Wear eye protection when blowing solvent from parts. Air pressure should not exceed 30 pounds per square inch (psi) (206.7 kilopascals (kPa)). Personal injury may result if eye protection is not used.**
- **Do not use steam to clean coils. Electrical shock or death can result if power is supplied to equipment while using steam to clean coils.**
- **Do not rinse air conditioner while power is connected or equipment is in operation. Electrical shock or death can result if power is supplied to equipment while rinsing.**
- **Do not use steam, open flame, heat gun, or any other high temperature heat source to thaw an iced coil. Thaw an iced coil with a lamp bulb (75 watt maximum), hair dryer, electric fan, or by leaving the unit shut down until ice melts. Using steam, open flame, heat gun, or any other high temperature heat source to thaw an iced coil may result in the generation of phosgene which may result in death or personal injury.**
- **Compressed air used for cleaning purposes shall not exceed 30 pounds per square inch (psi) (206.7 kilopascal (kPa)). Do not direct compressed air against the skin and use goggles or full face shield, failure to do so may result in personal injury.**
- **Avoid inhaling fumes and burns from any acid formed by burnout of oil or refrigerant. Wear chemical protective mask if area is not thoroughly ventilated. Wear protective goggles or glasses to protect eyes. Wear rubber gloves to protect hands. Use care to avoid spilling compressor burnout sludge. If sludge is spilled, clean area thoroughly. Personal injury may result.**

Refer to FM 21-11 for first aid.

TECHNICAL MANUAL

NO. 9-4120-408-14

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON D.C., 15 September 1993

OPERATORS, UNIT. DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL FOR

AIR CONDITIONER:
SPLIT PACK, 30,000 BTUH
28VDC
(NSN: 4120-01-377-7511) (RIC: FGJ)

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 Aviation and Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished to you.

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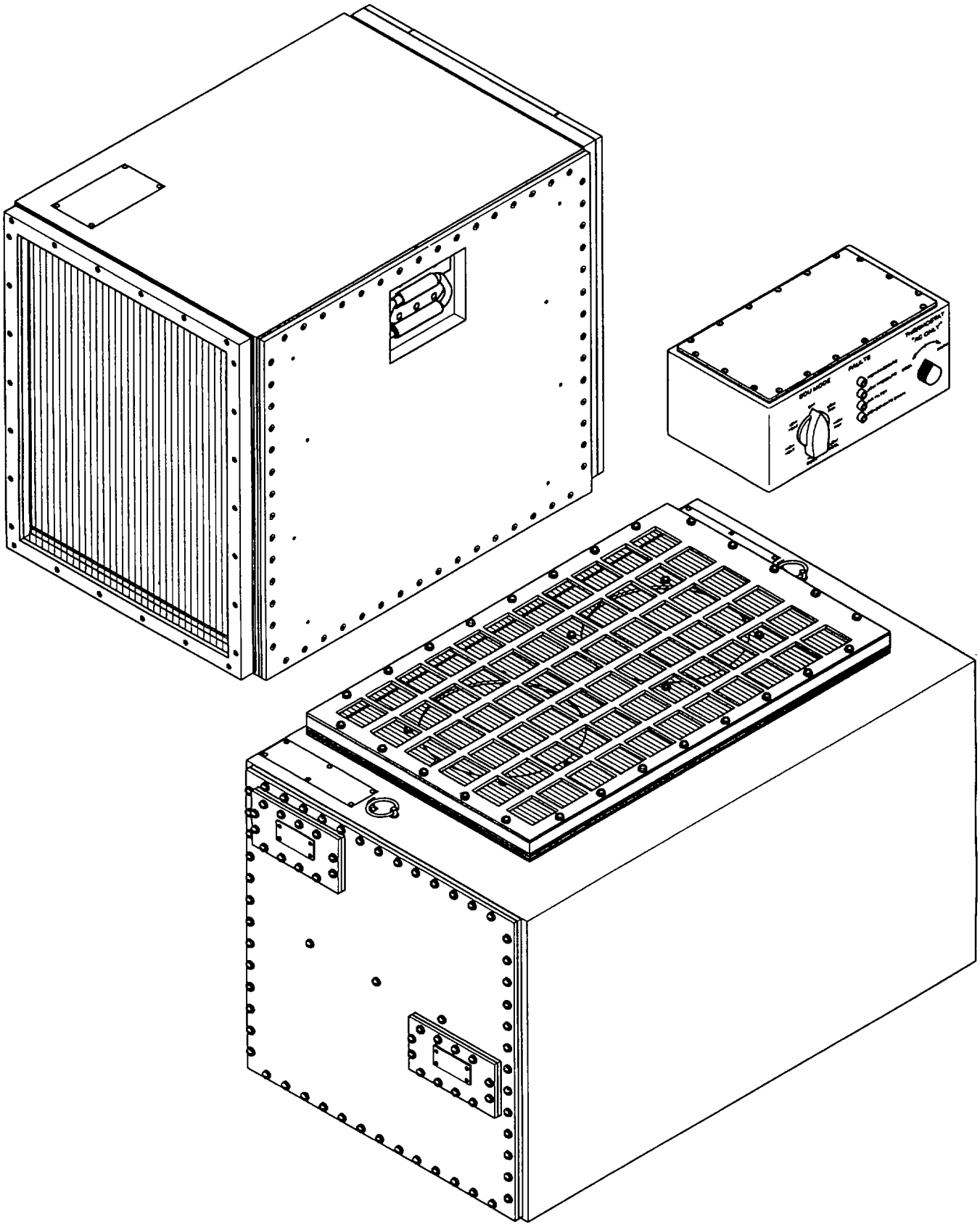


Figure 1-1. Air Conditioner: Split Pack, 30,000 BTUH, 28VDC.

CHAPTER 1

INTRODUCTION

INDEX

SECTION I. GENERAL INFORMATION

1-1. SCOPE.

a. **Type of Manual**. Operator's, Unit, Direct Support, and General Support Maintenance. This manual contains detailed instructions for operating, maintaining, and repairing the air conditioner assemblies at any of the four maintenance levels.

b. **Equipment Name and Model Number**. Air Conditioner: Split Pack, 30,000 BTUH, 28VDC (NSN: 4120-01-377-7511). The compressor is not a component of the air conditioner. The compressor is a component of the vehicle to which the air conditioner is mounted.

c. **Purpose of Equipment**. The air conditioner is used to cool the Radio Receiving Set, AN/TRQ-32 (A)V. For refrigerant and electrical interconnection information and condenser assembly, evaporator assembly, and control module assembly removal and replacement refer to applicable system technical manual. For repair part information, refer to the Repair Parts and Special Tools List (RPSTL) Manual, technical manual (TM) 9-4120-408-24P.

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 The Army Maintenance Management System (TAMMS).

1-3. CORROSION PREVENTION AND CONTROL.

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

If a corrosion problem is identified, it can be reported using Standard Form (SF) 368, Product Quality Deficiency Report. Use of key words such as "corrosion", "rust", "deterioration", or "cracking" will ensure that the information is identified as a CPC problem.

The form should be submitted to the address specified in Department of the Army (DA) pamphlet (PAM) 738-750.

1-4. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.

Destruction of Army materiel to prevent enemy use shall be in accordance with TM 750-244-3.

1-5. PREPARATION FOR STORAGE AND SHIPMENT.

Refer to Chapter 5 Section IV.

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

If your air conditioner needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on SF 368 (Product Quality Deficiency Report). Mail it to us at: Commander U.S. Army Aviation and Troop Command, ATTN: AMSAT-I-MDO 4300 Goodfellow Blvd. St. Louis, MO 63120-1798. We will send you a reply.

1-7. WARRANTY INFORMATION.

No warranty exists for the Environmental Control Unit (ECU) or it components.

1-8. QUALITY ASSURANCE (QA).

Text of each quality assurance maintenance procedure in the TM is preceded and highlighted by the addition of "(QA)."

1-9. NOMENCLATURE CROSS-REFERENCE LIST.

Table 1-1 provides a cross-reference listing of the common names to official nomenclature. Common names are used in this manual to make procedures easier to read.

Table 1-1. Nomenclature Cross-Reference Limit.

Common Name	Official Nomenclature
Air Conditioner	Air Conditioner: Split Pack, 30,000 BTUH, 28VDC
Dehydrator	Filter-Drier, Refrigerant
Environmental Control Unit (ECU)	Air Conditioner: Split Pack, 30,000 BTUH, 28VDC
Evaporator	Evaporator Assembly
Evaporator Fan Motor	Motor, Direct Current, Evaporator Fan
Fan	Fan, Vane Axial, Condenser

1-9. NOMENCLATURE CROSS-REFERENCE LIST. (Continued)

Table 1-1. Nomenclature Cross-Reference Limit. (Continued)

Common Name	Official Nomenclature
Fan Cutout Switch	Switch, Fan, Cutout
Indicator Lights	Diode Assembly, Light Emitting
Low-Pressure Switch	Switch, Low-Pressure Cutout
Mode Selector Switch	Switch, Rotary, Cam Actuated
Relay	Relay, 50 Amp
Service Valve	Tee, Swivel, Access Valve
Thermoexpansion	Valve (TEV) Valve, Thermoexpansion

1-10. LIST OF ABBREVIATIONS.

All abbreviations, acronyms, signs, and symbols used in this manual are listed in the glossary (Section I), located in the back of this manual.

1-11. GLOSSARY.

All terms used in this manual that are not defined in the Army Dictionary (AR 310-25) are defined in the glossary (Section II), located in the back of this manual.

SECTION II. EQUIPMENT DESCRIPTION

1-12. EQUIPMENT CHARACTERISTICS. CAPABILITIES. AND FEATURES.

The air conditioner is a split pack unit that provides 30,000 British Thermal Unit per Hour (BTUH) cooling capacity. The heating system of the shelter is incorporated with the control module to provide ease of operation of both heating and cooling systems. The air conditioner operates on 28 volts direct current (VDC) at 66 amperes. The system is a sealed unit and illuminates one of four warning lights on the control module should a problem occur. The air conditioner will also automatically shut itself down to prevent further damage to the air conditioner or compressor. The compressor is not a component of the air conditioner. The compressor is a component of the vehicle to which the air conditioner is mounted. Refer to applicable technical manual for compressor information.

1-13. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

Figure 1-2, figure 1-3, and figure 1-4 illustrate the major components of the air conditioner assembly. Tables 1-2, table 1-3, and table 1-4 list the major components and provide a description of each. The Item No. in Table 1-2 relates to the callouts in Figure 1-2, the Item No. in Table 1-3 relates to callouts in Figure 1-3, and the Item No. in Table 1-4 relates to callouts in Figure 1-4.

1-13. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (Continued)

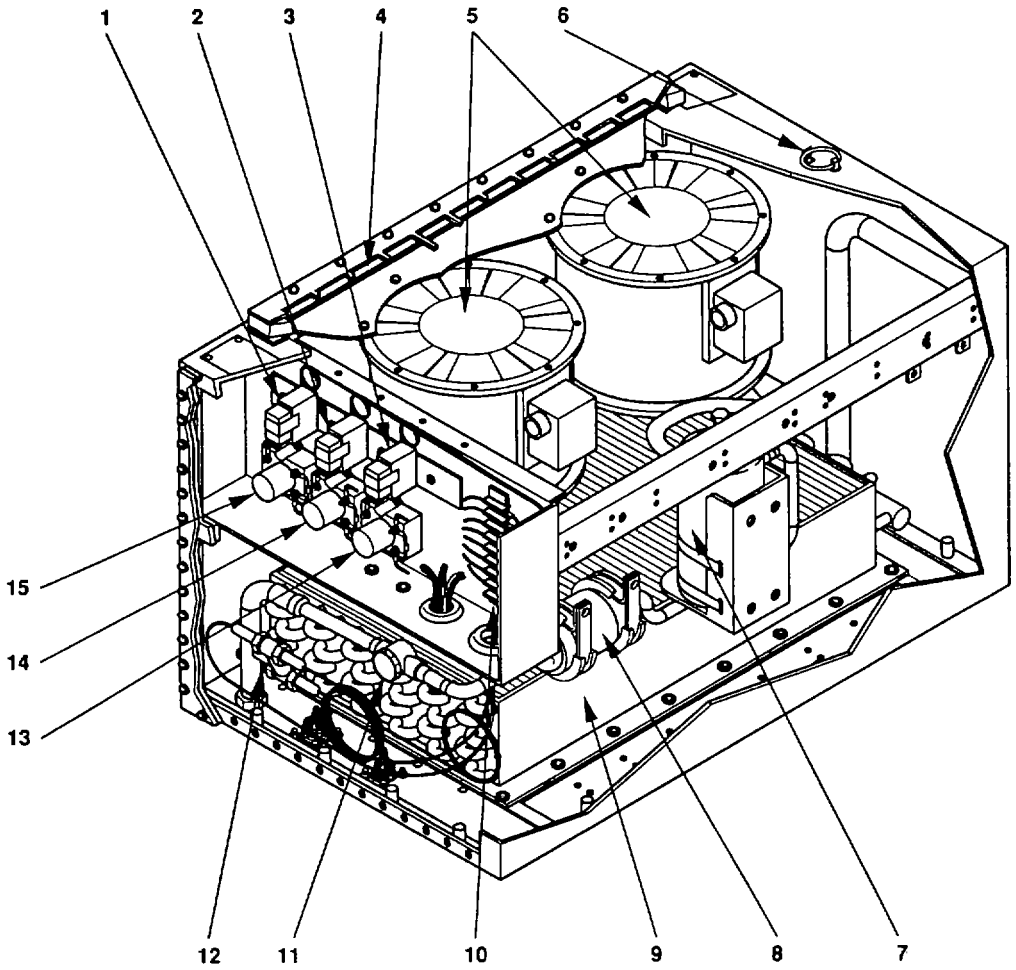


Figure 1-2. Location of Major Components, Condenser Assembly.

Table 1-2. Description of Major Components, Condenser Assembly.

Item No.	Item Name	Description
1	Switch, S6	Detects high pressure within the system. Shuts off the compressor at 275 ± 9 pounds per square inch (psi) (1,895 ± 62 kilo pascal (kPa)) and illuminates the warning indicator light in the control module.
2	Switch, S3	Turns on the curbside fan (B2) when pressure in system reaches 160 ± 3 psi (1,102 ± 21 kPa).
3	Switch, S4	Turns on the roadside fan (B3) when pressure in system reaches 190 ± 3 psi (1,309 ± 21 kPa).
4	Condenser, EMI/RFI Ventilation Panel	Dissipates and prevents electro-magnetic interference from affecting the operation of other electronic equipment located within close proximity and provides ventilation for condenser assembly.

1-13. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (Continued)

Table 1-2. Description of Major Components, Condenser Assembly.

Item No.	Item Name	Description
5	Fan Assemblies	Pulls air across the coil which aids in the transfer of heat.
6	Lifting Rings	Allows for attaching a lifting device to condenser assembly.
7	Liquid Line Receiver	Stores excess liquid refrigerant in the system.
8	Filter Dryer	Removes impurities and moisture that could be in the system.
9	Condenser Coil	Transfers heat. High pressure vapor refrigerant is changed into a high pressure liquid refrigerant and subcooled.
10	Terminal Board	Allows for ease of troubleshooting and repair.
11	Sight Glass	A brass tube with a glass window in the refrigerant line of the condenser. Shows amount of refrigerant or oil in system and indicates presence of gas bubbles and moisture in liquid line.
12	Service Valve	Spring-loaded device which permits fluid flow in one direction when a center pin is depressed and in other direction when a pressure difference exists.
13	Relay, K3	Controls evaporator blower fan.
14	Relay, K2	Controls roadside (B3) condenser fan.
15	Relay, K1	Controls curbside (B2) condenser fan.

1-13. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (Continued)

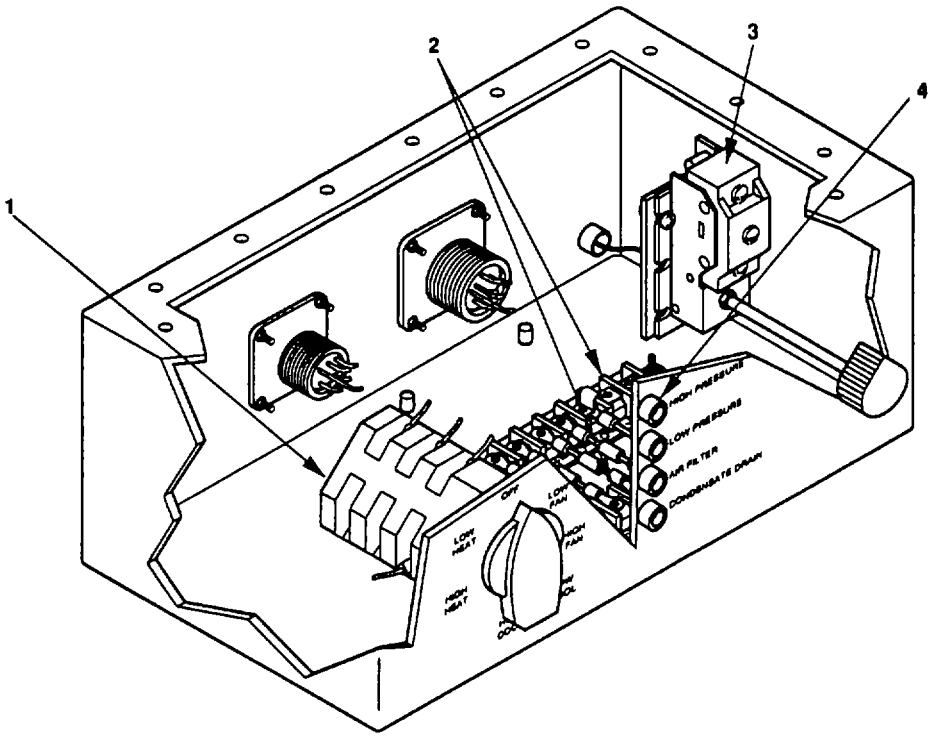


Figure 1-3. Location of Major Components, Control Module.

Table 1-3. Description of Major Components, Control Module.

Item No.	Item Name	Description and Purpose
1	Mode Selector Switch (S1)	Seven position switch that allows operator to control the air conditioner modes. The seven modes are: High Cool, Low Cool, High Fan, Low Fan, High Heat (Increases evaporator fan speed only. Does not increase heat output), Low Heat, and Off.
2	Terminal Board, Single Row	Allows for ease of troubleshooting and repair.
3	Thermostat Switch (S2)	Allows operator to control temperature of enclosure.
4	Indicator Lights	Alerts operator if a deficiency occurs. The four indicator lights are: High Pressure warning, Low Pressure warning, Air Filter warning, and Condensate Drain warning.

1-13. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (Continued)

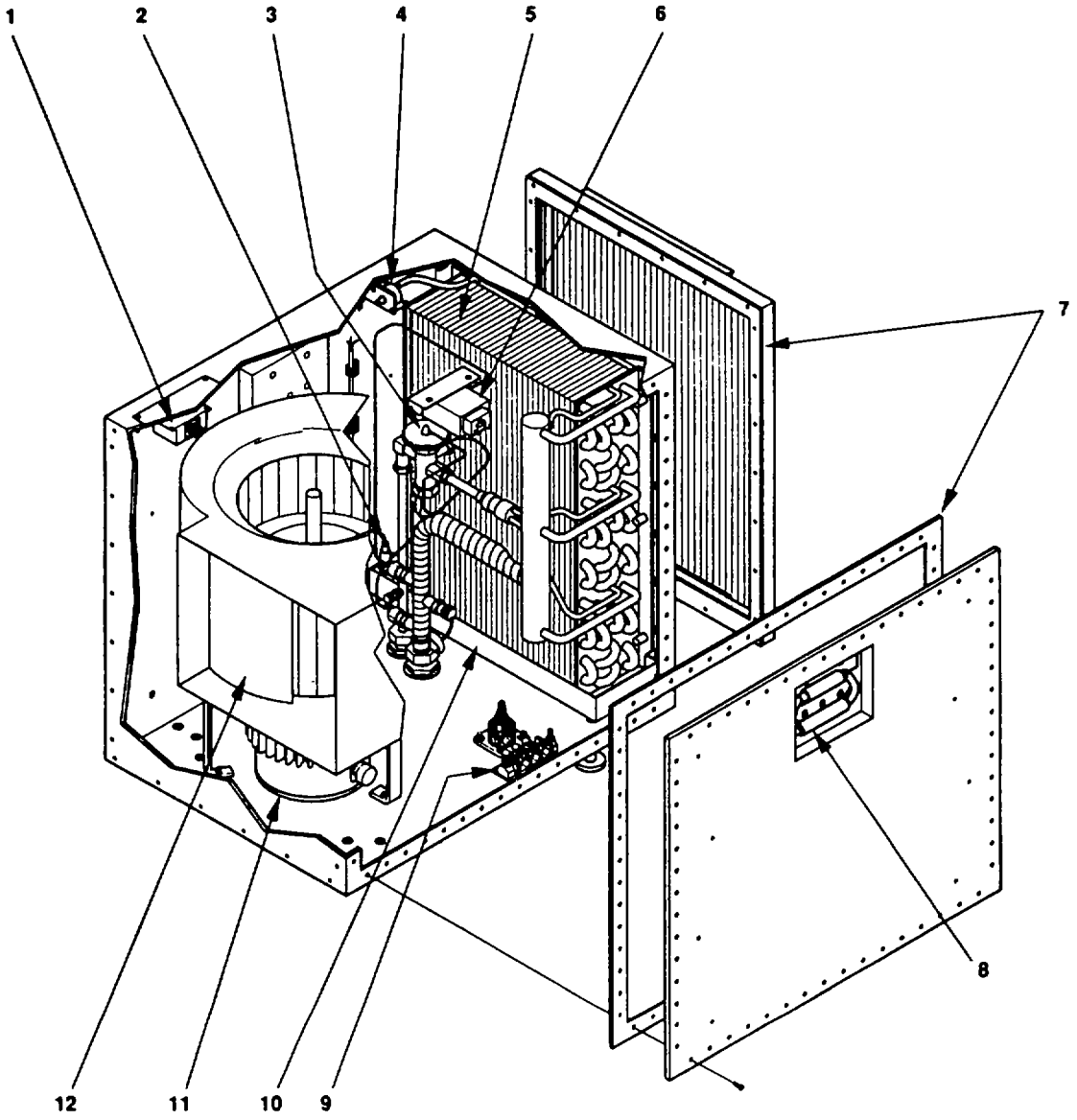


Figure 1-4. Location of Major Components, Evaporator Assembly.

Table 1-4. Description of Major Components, Evaporator Assembly.

Item No.	Item Name	Description and Purpose
1	Filter, Electronic, EMI	Filters electromagnetic interference (ELI) from wiring harness.
2	Condensate Level Warning Switch	Monitors the level of accumulated condensation in the condensate drain pan. Illuminates a control module indicator light when the level is too high.

1-13. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS. (Continued)

Table 1-4. Description of, Major Components, Evaporator Assembly (Continued).

Item No.	Item Name	Description and Purpose
3	Thermoexpansion Valve (TEV)	Meters refrigerant flow and converts hot high-pressure liquid to a cold low-pressure liquid. Controlled by refrigerant temperature and pressure in the evaporator and TEV sensing bulb. TEV opening is governed by evaporator temperature. As the evaporator warms, the TEV opens allowing a rapid flow of liquid in the evaporator, speeding up cooling. As the evaporator cools, the TEV closes restricting refrigerant flow in the evaporator, slowing down cooling.
4	Differential Pressure Switch	Monitors the cleanliness of the air filter and illuminates an indicator light on the control module when filter is dirty.
5	Evaporator Coil	Absorbs heat through the vaporization of low-pressure liquid. A low-pressure vapor is discharged from the coil.
6	Low-Pressure Cut Out Switch	Shuts off compressor and illuminates a control module indicator light when the pressure drops to 27 ± 3 psi (186 ± 21 kPa).
7	EMI Filter and EMI Gasket	Dissipates and prevents EMI from affecting the operation of other electronic equipment located within close proximity.
8	Handle	Allows two people to lift evaporator assembly.
9	Terminal Board, Single Row	Allows for ease of troubleshooting and repair.
10	Condensate Drain Pan	Collects condensation from coil and discharges through drain hole.
11	Evaporator Fan Motor	Drives Evaporator Housing Fan.
12	Evaporator Fan Housing	Draws air across evaporator coil to increase heat transfer from refrigerant.

1-14. EQUIPMENT DATA.

OPERATING TEMPERATURES

Low	-25°F (-32°C)
High	+120°F (+49°C)

PERFORMANCE

Cooling capacity	30,000 BTUH

POWER REQUIRED

Voltage	28vdc
Amperes	66
Watts, Running (Maximum)	1,848

DIMENSIONS

CONDENSER ASSEMBLY

Width	33.00 in.	(83.82 cm)
Depth	20.00 in.	(50.80 cm)
Height	22.25 in.	(56.52 cm)

Weight (Maximum) 200 lb (91 kg)

1-14. EQUIPMENT DATA. (Continued)

CONTROL MODULE		
Width	9.38 in.	(23.83 cm)
Depth	7.00 in.	(17.78 cm)
Height	5.00 in.	(12.70 cm)
EVAPORATOR ASSEMBLY		
Width	17.25 in.	(43.82 cm)
Depth	23.50 in.	(59.69 cm)
Height	23.50 in.	(45.35 cm)
Weight (maximum)	100 lb	(45.35 kg)
REFRIGERANT		
Type	R134a	
Charge	12.0 lb	(5.8 kg)

NOTE

The equipment manufacturer requires that the mineral oil lubricant be replaced with Polyol Ester Oil. A "Retro-Fit Test Kit" has been developed to provide a simple means of determining the level of mineral oil remaining in the system following change out to an ester based lubricant. Continued proper operation of the system after retrofitting requires that the mineral oil content be reduced to low levels as prescribed by the equipment manufacturer.

LUBRICATING OIL	
Type	Polyol Ester Oil (POE)
Amount	4.6 oz. (130 g)

COMPRESSOR

The compressor is a component of the vehicle to which the air conditioner is mounted, refer to TM 9-2320-280-10 for compressor equipment data.

Service valves for refrigerant recovery, evacuation, and charging are located on the compressor. Refer to TM 9-2320-280-34 for location of service valves on compressor.

EXTERNAL REFRIGERANT LINES

The external refrigerant lines are a component of the AN/TRQ-32(A)V. Refer to applicable system technical manual for equipment data on the external refrigerant lines.

EXTERNAL POWER' CABLES

The external power cables lines are a component of the AN/TRQ-32(A)V. Refer to applicable system technical manual for equipment data on the external power cables.

CIRCUIT BREAKER

The circuit breaker is a component of the AN/TRQ-32(A)V. Refer to applicable system technical manual for equipment data on the circuit breaker.

EXTERNAL CONDENSATE DRAIN LINE

The external condensate drain line is a component of the AN/TRQ-32(A)V. Refer to applicable system technical manual for equipment data on the external condensate drain line.

SECTION III. PRINCIPLES OF OPERATION

1-15. FUNCTIONAL DESCRIPTION.

a. The compressor takes cold, low pressure refrigerant gas and compresses it to a high temperature, high pressure gas. This gas flows through the metal tubing to the condenser coil and receiver. Refer to Figure 1-5 for the refrigerant schematic.

1-15. FUNCTIONAL DESCRIPTION. (Continued)

FIND NO.	PART NO.	QTY	NOMENCLATURE
1	(BY OTHERS)	1	COMPRESSOR, RECIPROCATING, BELT DRIVE
2	13230E4409	1	COIL, CONDENSER
3	13230E4427	1	PLUG, FUSIBLE
4	13230E4398	1	RECEIVER, LIQUID REFRIGERANT
5	13230E4397	1	FILTER, DRYER
6	13230E4408	1	INDICATOR, LIQUID/MOISTURE
7	13230E4393	1	VALVE, THERMOEXPANSION
8	13230E4375	1	COIL, EVAPORATOR
9	13230E4380	1	SWITCH, LOW PRESSURE
10	13230E4407-1	1	SWITCH, FAN CYCLING
11	13230E4407-1	1	SWITCH, FAN CYCLING
12	13230E4406	1	SWITCH, HIGH PRESSURE

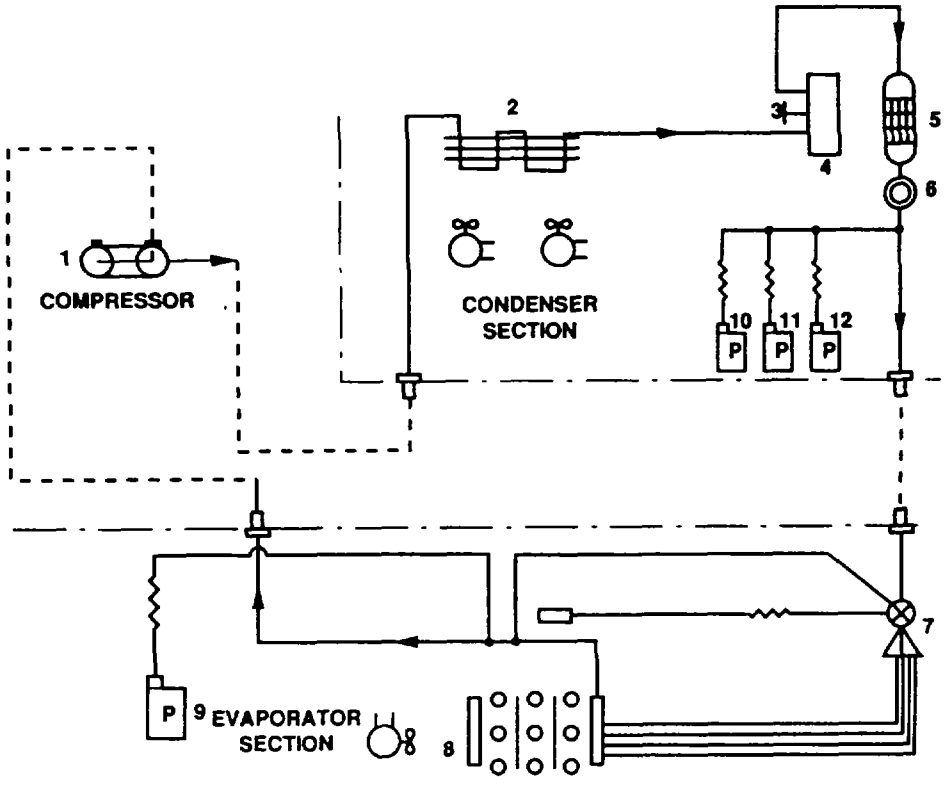


Figure 1-5. Refrigerant Schematic.

1-15. FUNCTIONAL DESCRIPTION. (Continued)

b. The condenser fan draws outside ambient air over and through the condenser coil. The high temperature, high pressure gas from the compressor is cooled by the flow of air and is changed into a high pressure liquid.

c. The receiver stores excess refrigerant in the system until it is drawn into the evaporator.

d. The dehydrator removes any moisture or contaminants that may be carried by the liquid refrigerant.

e. The liquid indicator indicates the presence of moisture and quantity of refrigerant in the system.

f. The expansion valve controls the amount of liquid refrigerant delivered to the evaporator coil. The expansion valve senses the temperature and pressure of the refrigerant as it leaves the evaporator coil. By use of a sensing bulb and “external equalizer lines the valve constantly adjusts the flow of liquid refrigerant to the evaporator coil.

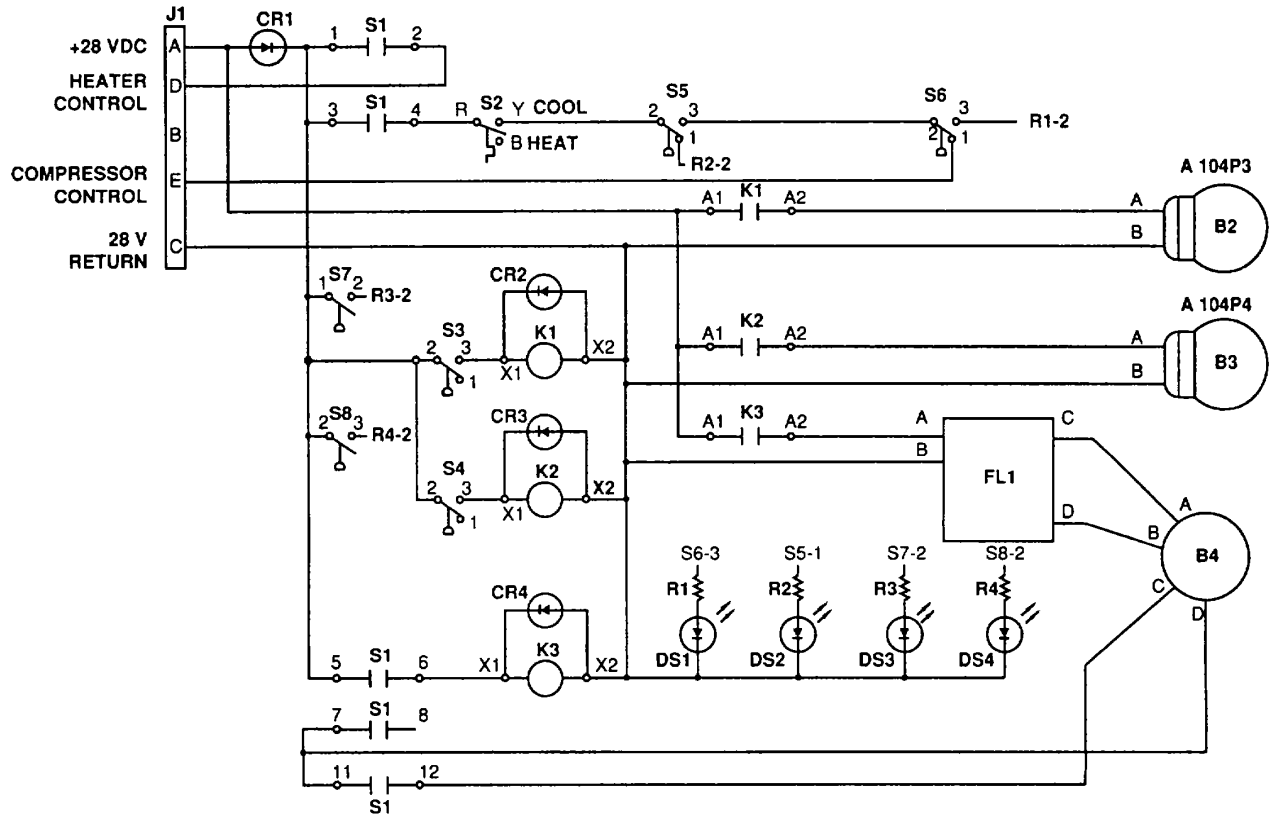
g. Liquid refrigerant, leaving the expansion valve, passes through the distributor and enters the evaporator coil. As the liquid enters the coil at a reduced pressure, the reduction in pressure and the warmer air being forced across the tubes of the coil cause the refrigerant to boil and change to a gas (vapor). Warm air from the conditioned space is circulated over and through the evaporator coil by the evaporator blower. Refrigerant absorbs heat as it converts from liquid to gas. As the air from the conditioned spaces comes in contact with the evaporator coil, heat is absorbed and the air is cooled.

h. The service valves are provided for charging and general servicing of the refrigerant system.

l. The low pressure and high pressure cut-out switches are provided to protect the unit from damage due to pressure extremes.

j. The air conditioner is powered by 28VDC, 66 amperes, and is controlled by a 7 position rotary switch. Refer to schematic diagram (Figure 1-6), system interconnection diagram (Figure 1-7), and air conditioner wiring diagrams (Figures I-1 through I-3) for details of the electrical system.

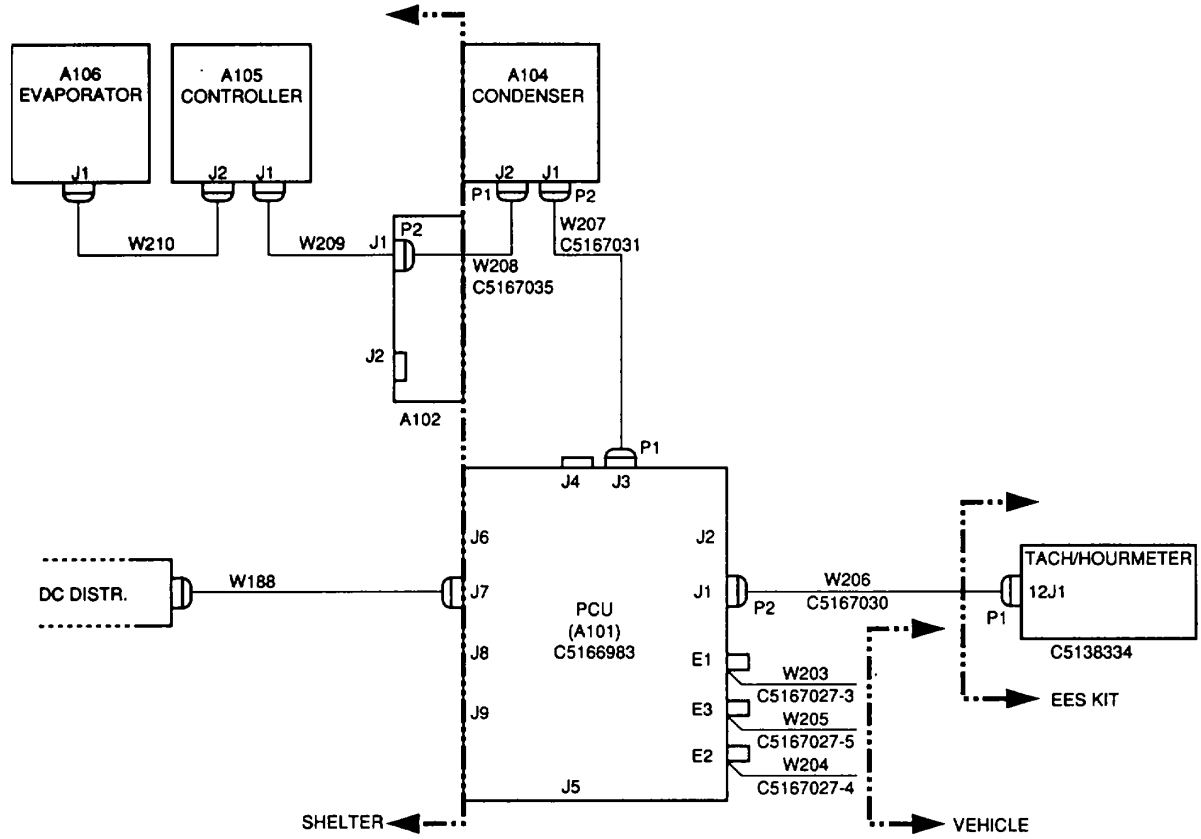
1-15. FUNCTIONAL DESCRIPTION. (Continued)



SELECTOR SWITCH POSITION	SWITCH FUNCTION	SWITCH CONTACTS CLOSED				
1	HEAT HI	1-2		5-6	7-8	
2	HEAT LO	1-2		5-6		11-12
3	OFF					
4	FAN LO			5-6		11-12
5	FAN HI			5-6	7-8	
6	COOL LO		3-4	5-6		11-12
7	COOL HI		3-4	5-6	7-8	

Figure 1-6. Electrical Schematic Diagram.

1-15. FUNCTIONAL DESCRIPTION. (Continued)



COMPRESSOR CLUTCH ELECTRICAL INTERCONNECTIONS					
FROM			TO		
WIRING HARNESS	CONNECTOR	PIN	WIRING HARNESS	CONNECTOR	PIN
A104J1	J1	E	W207	P2	E
W207	P2	E	W207	P1	E
W207	P1	E	PCU	J3	E
PCU	J3	E	PCU	J1	F
PCU	J1	F	W206	P2	F
W206	P2	F	W206	P1	F

Figure 1-7. System Interconnection Diagram.

CHAPTER 2

OPERATING INSTRUCTIONS

INDEX

SECTION I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

2-1. OPERATOR'S CONTROLS AND INDICATORS.

All operator's controls and indicators are located on the control module. Refer to Figure 2-1 and Table 2-1 below for location and description of operator's controls and indicators.

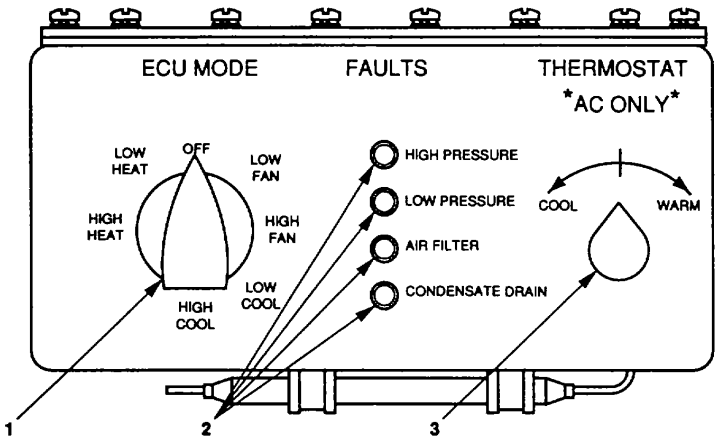


Figure 2-1. Operator's Controls and Indicators.

Table 2-1. Description of operator's Controls and Indicators.

Item Number	Description	Function
1	Mode Selector Switch	Allows operator to set mode of operation. Modes of operation are High Cool, Low Cool, High Fan, Low Fan, High Heat (Increases evaporator fan speed only. Does not increase heat output.), Low Heat, and Off.
2	Indicator Lights	Indicates problems that have occurred during operation. Lights indicate High Pressure, Low Pressure, Air Filter - restricted air flow, and Condensate Drain - clogged.
3	Thermostat Switch	Allows operator to adjust air conditioner to desired temperature within shelter during cooling mode.

SECTION II. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-2. GENERAL.

Preventive Maintenance Checks and Services (PMCS) means systematic caring, inspecting, and servicing of equipment to keep it in good condition and to prevent breakdowns. Figure 2-2 (PMCS routing diagram) and Table 2-2 (PMCS table) have been provided so you can keep your equipment in good operating condition and ready for its primary mission. As the operator, your mission is to:

a. Be sure to perform your PMCS each time you operate the equipment. Always do your PMCS in the same order, so it becomes a habit. Once you've had some practice, you'll quickly spot anything wrong.

b. Perform BEFORE PMCS immediately before operating the air conditioner. Pay attention to all WARNINGs, CAUTIONs, and NOTEs.

c. Perform DURING PMCS while operating the air conditioner. During operation means to monitor the equipment and it's related components while it is actually being operated. Pay attention to all WARNINGs, CAUTIONs, and NOTEs.

2-2. GENERAL. (Continued)

d. Perform AFTER PMCS immediately after operating the air conditioner. Pay attention to all WARNINGs, CAUTIONs, and NOTEs.

e. Perform WEEKLY PMCS once a week.

f. Use DA Form 2404 (Equipment Inspection and Maintenance Worksheet) to record any faults that you discover before, during, or after operation, unless you can fix them. You DO NOT need to record faults that you can fix.

g. Be prepared to assist unit maintenance when they service the air conditioner. Perform any other services when required by unit maintenance.

2-3. PMCS PROCEDURES.

a. Item No. Column. Numbers in this column are for reference. When completing DA Form 2404 (Equipment Inspection and Maintenance Worksheet), include the item number for the check/service indicating a fault. Item numbers also appear in the order that you must do checks and services for the intervals listed.

b. Interval Column. This column defines when you must perform the procedure in the procedure column. BEFORE procedures must be done before operating the equipment for its intended mission. DURING procedures must be done while operating the equipment for its intended mission. AFTER procedures must be done immediately after operating the equipment.

c. Location. Item to Check/Service Column. This column identifies the location and item to be checked or serviced.

d. Procedure Column. This column provides the procedure required to check or service the item listed in the Check/Service column. The procedure must be performed at the time stated in the interval column.

e. Not Fully Mission Capable If: Column. This column identifies faults that will keep your equipment from being capable of performing its primary mission. If checks or service procedures identify faults listed in this column, do not operate the equipment. Follow standard operating procedures for maintaining the equipment or reporting equipment failure.

2-4. CLEANING AGENTS.

WARNING

- DO NOT use diesel fuel, gasoline, or benzene (benzol) for cleaning.
- DO NOT SMOKE when using cleaning solvent. NEVER USE IT NEAR AN OPEN FLAME. Be sure there is a fire extinguisher nearby and use cleaning solvent only in well-ventilated places. Flash point of solvent is 1380F (600C). Failure to obey this warning may result in death or personal injury.
- Wear protective goggles or glasses to protect eyes. Wear rubber gloves to protect hands.
- USE CAUTION when using cleaning solvents. Cleaning solvents evaporate quickly and can irritate exposed skin if solvents contact skin. In cold weather, contact of exposed skin with cleaning solvents can cause frostbite.
- Failure to obey these warnings may result in death or personal injury.

CAUTION

When cleaning coils or internal components, air conditioner must be the same temperature as outside air. DO NOT point water or steam directly at any electrical connection. DO NOT point water stream directly at coil fins. DO NOT use high pressure water supply system. Damage to coils or other components may result.

NOTE

Use only those authorized cleaning solvents or agents listed in Appendix E.

a. Use a rag, Appendix E, Item 21 moist with cleaning solvent, Appendix E, Item 10 to wipe components free from dirt or mildew.

CAUTION

Keep cleaning solvents, gasoline, and lubricants away from rubber or soft plastic parts. They will deteriorate material.

b. When cleaning grease buildup or rusty places, use a cleaning solvent, then apply a thin coat of lubrication oil, Appendix E, Item 17 to affected area.

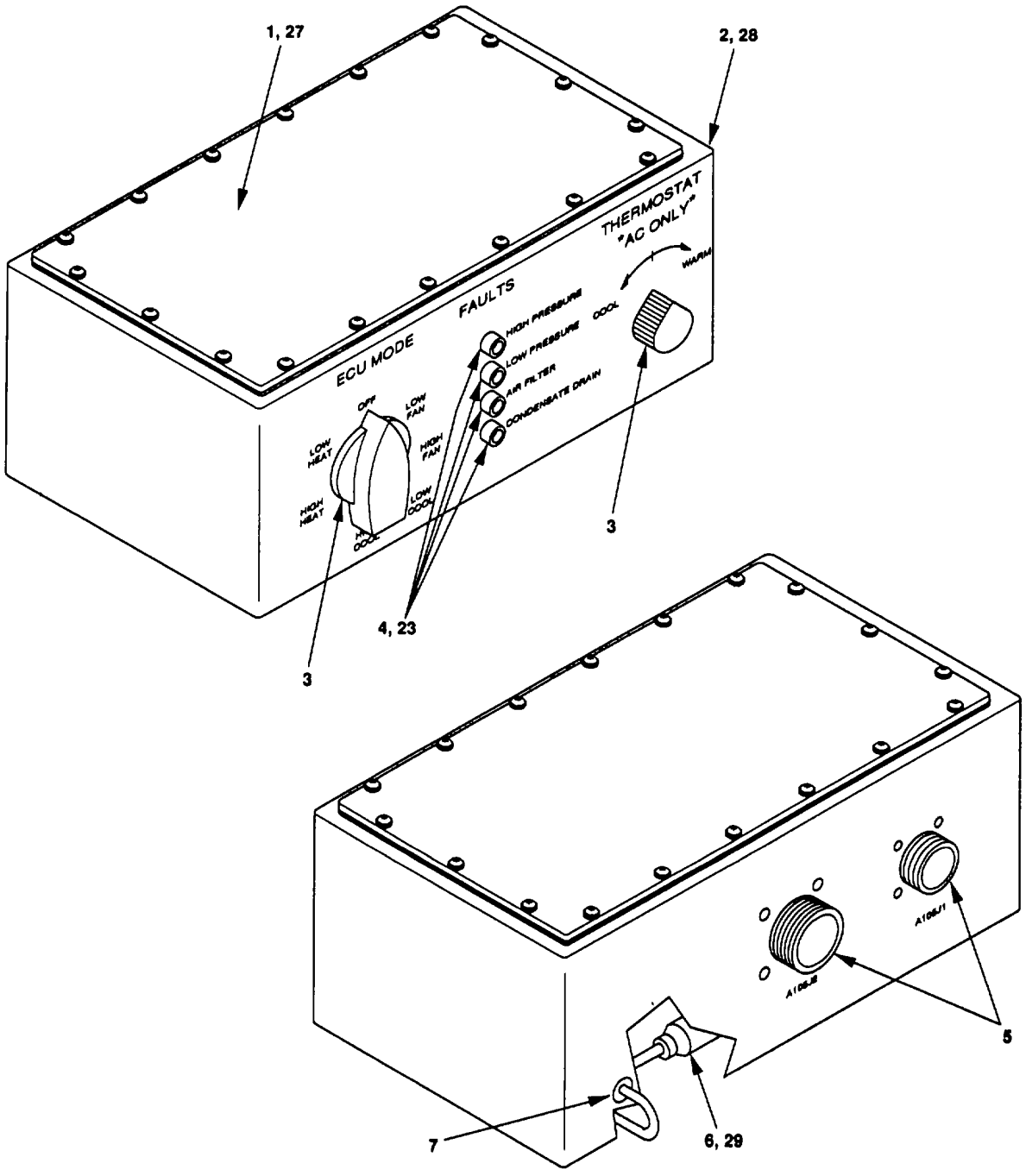


Figure 2-2. Operator's PMCS Routing Diagram (Sheet 1 of 3).

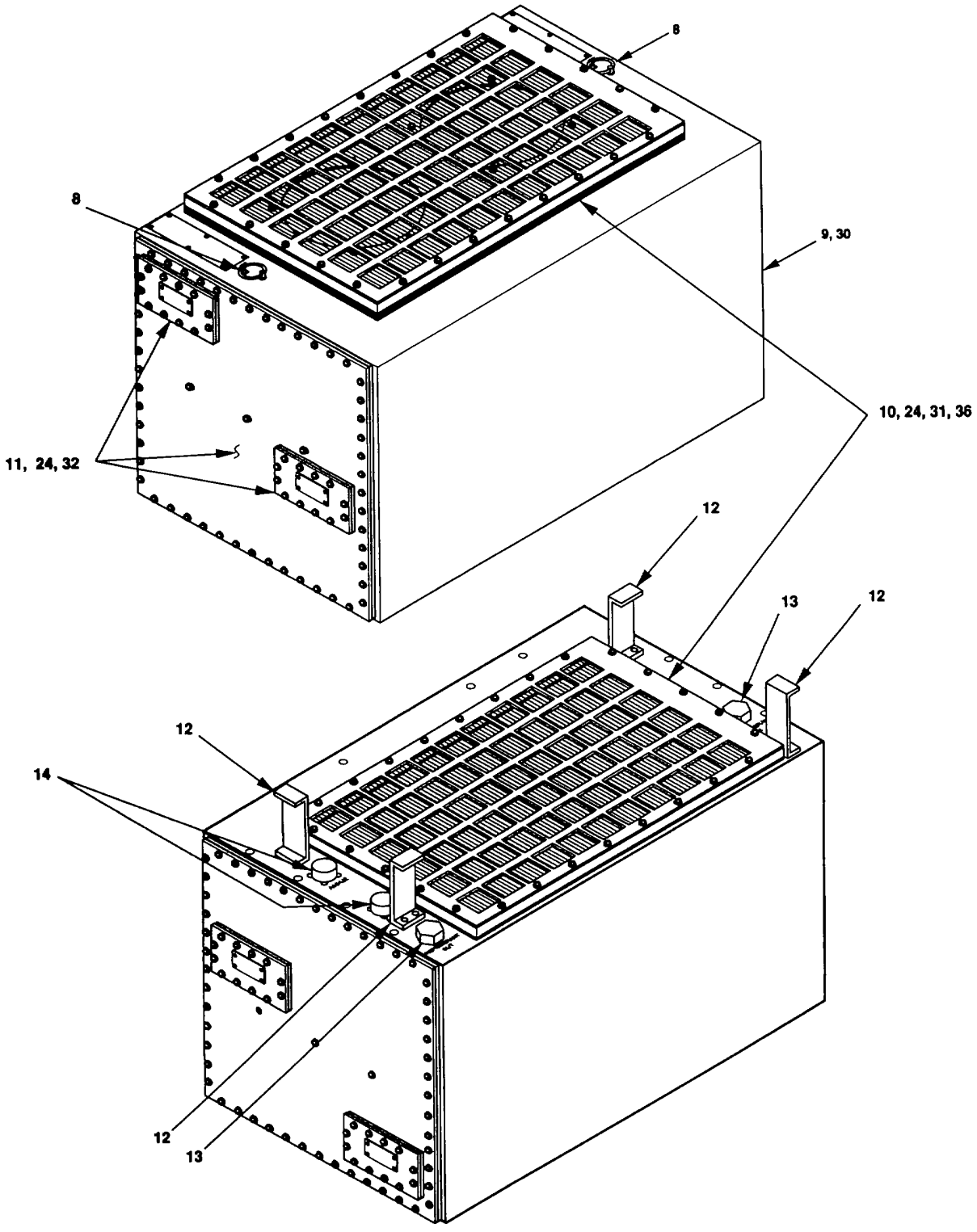


Figure 2-2. Operator's PMCS Routing Diagram (Sheet 2 of 3).

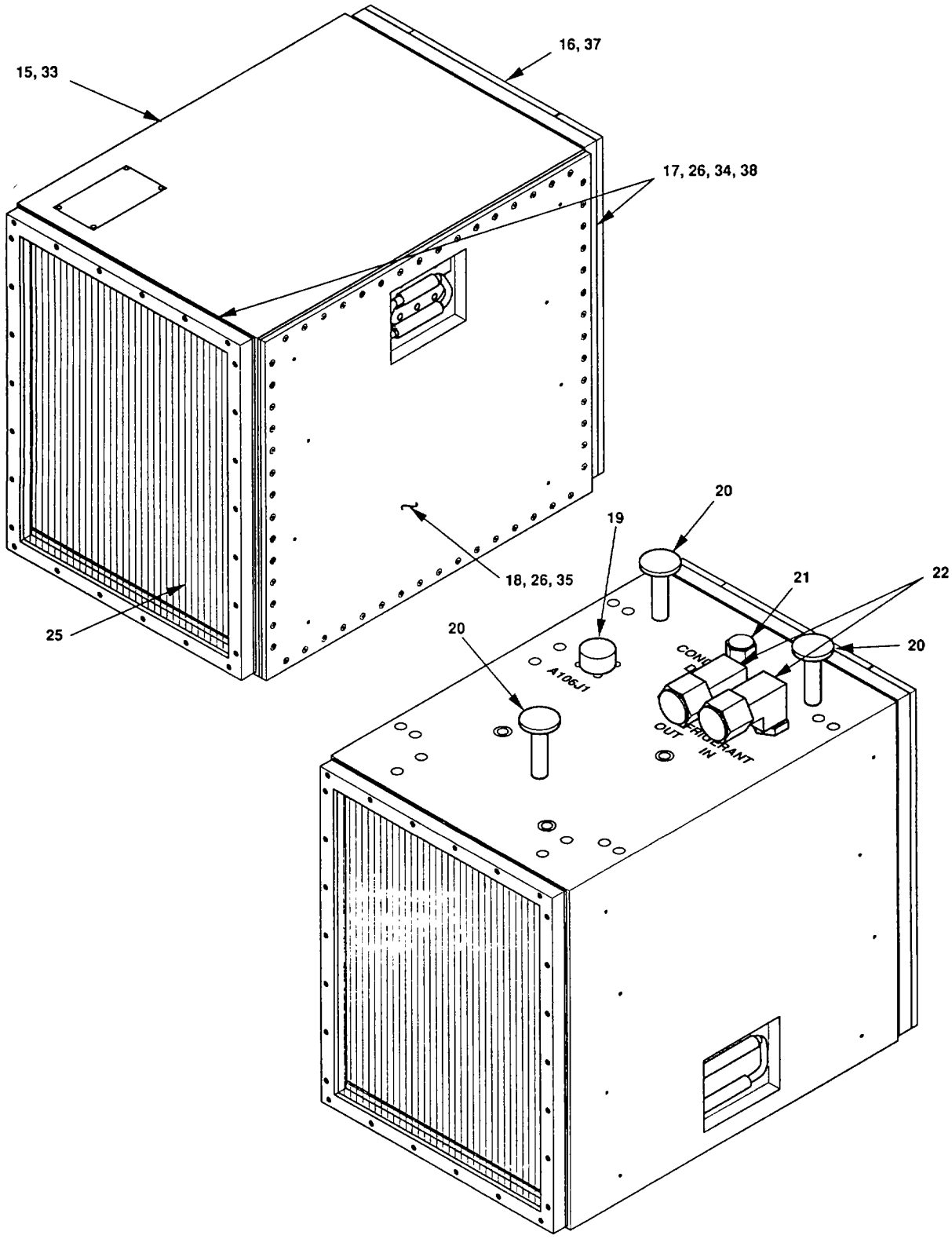


Figure 2-2. Operator's PMCS Routing Diagram (Sheet 3 of 3).

Table 2-2. Operator Preventive Maintenance Checks and Services for Air Conditioner: Split Pack, 30,000 BTUH, 28VDC

Item No	Interval	Location / Item To Be Check/Service	Procedure	Not Fully Mission Capable If:
		Control Module Assembly		
1	BEFORE	Control Panel Top Cover	Inspect top cover for damage, cracks, holes, missing or damaged EMI gasket, or missing or damaged mounting hardware.	Top cover is missing, cracked, or has holes. EMI gasket is missing or damaged. Mounting hardware is missing or damaged.
2	BEFORE	Control Module Housing	Inspect housing for dents, cracks, or holes.	Housing is cracked or has holes.
3	BEFORE	Switch Knobs	Inspect switch knobs for damage and free operation.	Switch knobs are damaged or bind.
4	BEFORE	Light Emitting Diode Assemblies	Inspect for damaged or missing assemblies.	Any diode assembly is damaged or missing.
5	BEFORE	Wiring Harness Connectors	Inspect for missing or damaged wiring harness connectors.	Damaged or missing wiring harness connectors.
		CAUTION Do not damage temperature capillary tube while performing PMCS. Equipment failure and damage may result from damaged temperature capillary tube.		
6	BEFORE	Temperature Sensor	Inspect temperature sensor for damage, cracks, or holes. Inspect for damaged or missing mounting clamps and mounting hardware.	Damaged, cracked, or missing temperature sensor. Damaged or missing mounting hardware.
7	BEFORE	Temperature Sensor Port Seal	Inspect temperature port seal for cracks, holes, or missing sealant.	Temperature sensor port seal is cracked or missing.
		Condenser Assembly		
8	BEFORE	Lifting Rings	Inspect lifting rings and spring clips for damage or missing mounting hardware.	Lifting rings are damaged or missing. Damaged or missing mounting hardware.
9	BEFORE	Condenser Housing	Inspect housing for dents, cracks, or holes.	Housing is cracked or has holes.

Table 2-2. Operator Preventive Maintenance Checks and Services for Air Conditioner: Split Pack, 30,000 BTUH, 28VDC (Continued)

Item No	Interval	Location: Item To Be Check/Service	Procedure	Not Fully Mission Capable If:
		Condenser Assembly (Cont)		
10	BEFORE	Condenser Protective Grilles and EMI/ RFI Condenser Ventilation Panel	Inspect grilles for damage or missing mounting hardware. Inspect EMI/RFI condenser ventilation panels for separation from frame, holes in filter element, and bent or damaged 'honey combs."	Grilles damaged or missing. Damaged or missing mounting hardware. Filter element has separated from frame. One or more holes exist measuring twice the size of one 'honey comb." Bent or damaged "honey combs" which restrict air flow.
11	BEFORE	Side Panel and Access Panels	Inspect side panel and access panels for damage, cracks, holes, missing or damaged EMI gasket, or missing or damaged mounting hardware.	Side panel or access panels are missing, cracked, or have holes. EMI gasket is missing or damaged.
12	BEFORE	Condenser Feet	Inspect for damaged or missing condenser feet and mounting hardware.	Condenser feet are damaged or missing. Mounting hardware is damaged or missing.
13	BEFORE	Refrigerant Line Connectors	Inspect for damaged or missing refrigerant line connectors.	Damaged or missing refrigerant line connectors.
14	BEFORE	Wiring Harness Connectors	Inspect for missing or damaged wiring harness connectors	Damaged or missing wiring harness connectors.
		Evaporator Assembly		
15	BEFORE	Evaporator Housing	Inspect housing for dents, cracks, or holes.	Housing is cracked or has holes.
16	BEFORE	Air Filter and Return Air Filter Bracket	Inspect air filter for obvious dirt and damage. Inspect for damaged or missing return air filter bracket.	Dirt, foreign objects, or damage present which will cause restricted air flow. Missing return air filter bracket.
17	BEFORE	EMI/RFI Evaporator Ventilation Panel	Inspect EMI/RFI evaporator ventilation panels for separation from frame, holes in filter element, bent or damaged "honey comb", and missing or damaged mounting hardware.	Filter element has separated from frame. One or more holes exist measuring twice the size of one "honey comb." Bent or damaged "honey combs" which restrict air flow.

Table 2-2. Operator Preventive Maintenance Checks and Services for Air Conditioner: Split Pack, 30,000 BTUH, 28VDC (Continued)

Item No	Interval	Location / Item To Be Check/Service	Procedure	Not Fully Mission Capable If:
		Evaporator Assembly (Cont)		
18	BEFORE	Evaporator Side Panel	Inspect evaporator side panel for damage, cracks, holes, missing or damaged handle, missing or damaged mounting hardware, and missing or damaged EMI gasket.	Evaporator side panel has cracks or holes. Missing or damaged handle, EMI gasket, or mounting hardware.
19	BEFORE	Wiring Harness Connector	Inspect for damaged or missing wiring harness connector.	Damaged or missing wiring harness connector.
20	BEFORE	Evaporator Feet	Inspect for damaged or missing evaporator feet.	Damaged or missing evaporator feet.
21	BEFORE	Condensate Drain	Inspect condensate drain for damage.	Damaged condensate drain.
22	BEFORE	Refrigerant Line Connectors	Inspect for damaged or missing refrigerant line connectors.	Damaged or missing refrigerant line connectors.
		Control Module Assembly		
23	DURING	Light Emitting Diode Assemblies	Check for illuminated warning light.	Any one or more of the warning lights are lit.
		Condenser Assembly		
24	DURING	Condenser Protective Grilles, EMI/RFI Ventilation Panels, Access Panels, and Side Panel Evaporator Assembly	Check for loose panels. tightened to prevent EMI problems.	Panels cannot be
25	DURING	Evaporator Assembly	Check that cool air is emitted from back of evaporator assembly when operating in High Cool or Low Cool modes.	Room temperature or warm air is emitted from the evaporator assembly.
26	DURING	Evaporator EMI/RFI Ventilation Panels and Side Panel	Check for loose panels. Check for hammering sound from the compressor in the High Mobility Multi-Wheeled Vehicle (HMMWV).	Panels cannot be tightened to prevent EMI problems. Hammering sound heard from compressor.

Table 2-2. Operator Preventive Maintenance Checks and Services for Air Conditioner: Split Pack, 30,000 BTUH, 28VDC (Continued)

Item No	Interval	Location / Item To Be Check/Service	Procedure	Not Fully Mission Capable If:
		Control Module Assembly		
27	AFTER	Control Panel Top Cover	Inspect top cover for damage, cracks, holes, missing or damaged EMI gasket, or missing or damaged mounting hardware.	Top cover is missing, cracked, or has holes. EMI gasket is missing or damaged. Mounting hardware is missing or damaged.
28	AFTER	Control Module Housing	Inspect housing for dents, cracks, or holes.	Housing is cracked or has holes.
		CAUTION		
		Do not damage temperature capillary tube while performing PMCS. Equipment failure and damage may result from damaged temperature capillary tube.		
29	AFTER	Temperature Sensor	Inspect temperature sensor for damage, cracks, or holes. Inspect for damaged or missing mounting clamps and mounting hardware.	Damaged, cracked, or missing temperature sensor. Damaged or missing mounting hardware.
		Condenser Assembly		
30	AFTER	Condenser Housing	Inspect housing for dents, cracks, or holes.	Housing is cracked or has holes.
31	AFTER	Condenser Protective Grilles and EMI/ hardware. RFI Condenser Ventilation Panels	Inspect grilles for damage or missing mounting Inspect EMI/RFI condenser ventilation panels for separation from frame, holes in filter element, and bent or damaged "honey combs."	Grilles damaged or missing. Damaged or missing mounting hardware. Filter element has separated from frame. One or more holes exist measuring twice the size of one "honey comb." Bent or damaged "honey combs" which restrict air flow.
32	AFTER	Side Panel and Access Panels	Inspect side panel and access panels for damage, cracks, holes, missing or damaged EMI gasket, or missing or damaged mounting hardware.	Side panel or access panels are missing, cracked, or have holes. EMI gasket is missing or damaged.

Table 2-2. Operator Preventive Maintenance Checks and Services for Air Conditioner: Split Pack, 30,000 BTUH, 28VDC (Continued)

Item No	Interval	Location / Item To Be Check/Service	Procedure	Not Fully Mission Capable If:
		Evaporator Assembly		
33	AFTER	Evaporator Housing	Inspect housing for dents, cracks, and holes.	Housing is cracked or has holes.
34	AFTER	EMI/RFI Evaporator Ventilation Panel	Inspect EMI/RFI evaporator ventilation panels for separation from frame, holes in filter element, bent or damaged "honey comb", and missing or damaged mounting hardware.	Filter element has separated from frame. One or more holes exist measuring twice the size of one "honey comb." Bent or damaged "honey combs" which restrict air flow.
35	AFTER	Evaporator Side Panel	Inspect evaporator side panel for damage, cracks, holes, missing or damaged mounting hardware, and missing or damaged EMI gasket.	Evaporator side panel has cracks or holes. Missing or damaged EMI gasket or mounting hardware.
		Condenser Assembly		
36	WEEKLY	EMI/RFI Condenser Ventilation Panels	Inspect EMI/RFI ventilation panels for dirt, foreign objects, or damage which will restrict air flow.	Dirt, foreign objects, or damage present which will cause restricted air flow.
		Evaporator Assembly		
37	WEEKLY	Air Filter	Inspect air filter for dirt, foreign objects, or damage which will restrict air flow.	Dirt, foreign objects, or damage present which will cause restricted air flow.
38	WEEKLY	EMI/RFI Evaporator Ventilation Panels	Inspect EMI/RFI ventilation panels for dirt, foreign objects, or damage which will restrict air flow.	Dirt, foreign objects, or damage present which will cause restricted air flow.

SECTION III. OPERATION UNDER USUAL CONDITIONS

2-5. OPERATING PROCEDURES.

a. **General operation of controls**. All controls necessary to operate the air conditioner and heater are located on the control module. When the controls are properly set, the unit will automatically control the temperature. Do not adjust controls unnecessarily. The temperature control thermostat on the control module operates like a conventional room thermostat, except that the temperature scale is not marked on the control module. The thermostat has a range of 40° F to 90° F (4° C to 32° C). A temperature sensor located on the bottom of the control module senses the temperature.

NOTE

High heat mode increases evaporator fan speed only.
High heat mode does not increase heat output.

b. **Operation in HIGH HEAT or LOW HEAT**. Position the mode selector switch to the HIGH HEAT or LOW HEAT setting.

CAUTION

For initial operation ensure condensate drain on evaporator assembly is uncapped. Failure to uncap condensate drain on evaporator assembly may result in equipment failure or damage.

c. **Operation in HIGH COOL or LOW COOL**. Position the mode selector switch to the HIGH COOL or LOW COOL setting. Adjust the thermostat switch to select desired temperature.

d. **Operation in HIGH FAN or LOW FAN.** Position the mode selector switch to the HIGH FAN or LOW FAN position. The evaporator blower will circulate air within the shelter. The evaporator blower does not exchange shelter air with outside air.

e. **Shutdown.** Position the mode selector switch to the OFF position. No other action is necessary to shut down the air conditioner.

2-6. DECALS AND INSTRUCTION PLATES.

Refer to Figures 2-3 through 2-8 for the location and text of the identification/information plates on the air conditioner.

2-6. DECALS AND INSTRUCTION PLATES. (Continued)

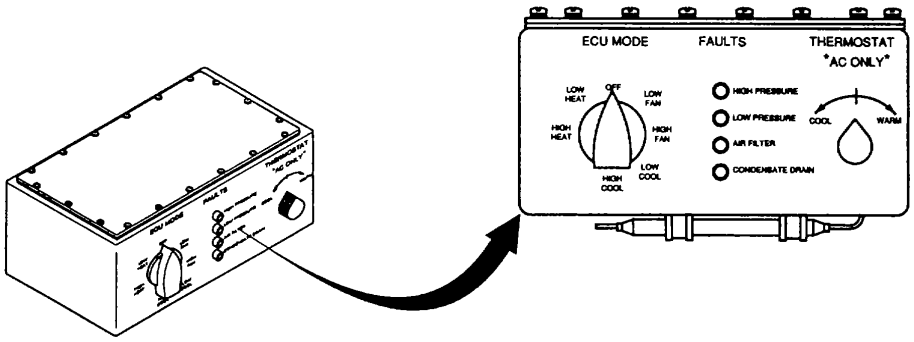


Figure 2-3. Information Plate, Control Module.

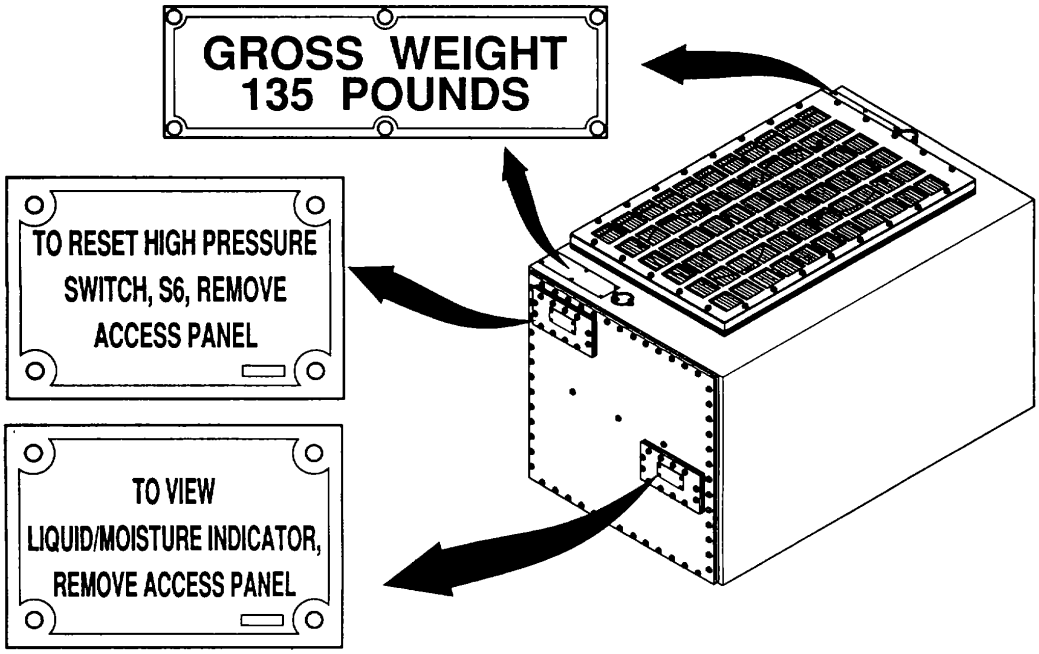


Figure 2-4. Exterior Information Plates, Condenser Assembly.

2-6. DECALS AND INSTRUCTION PLATES. (Continued)

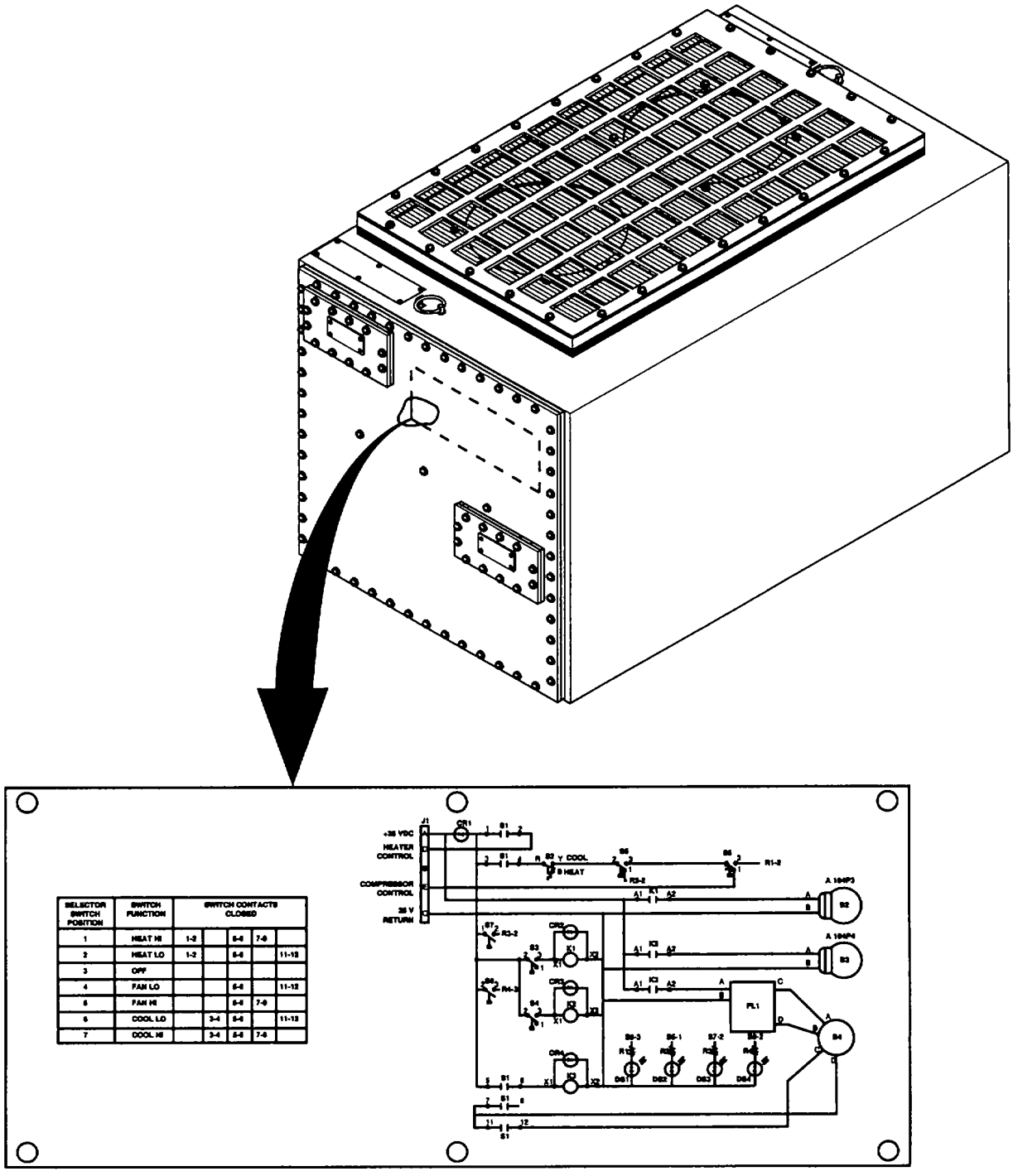
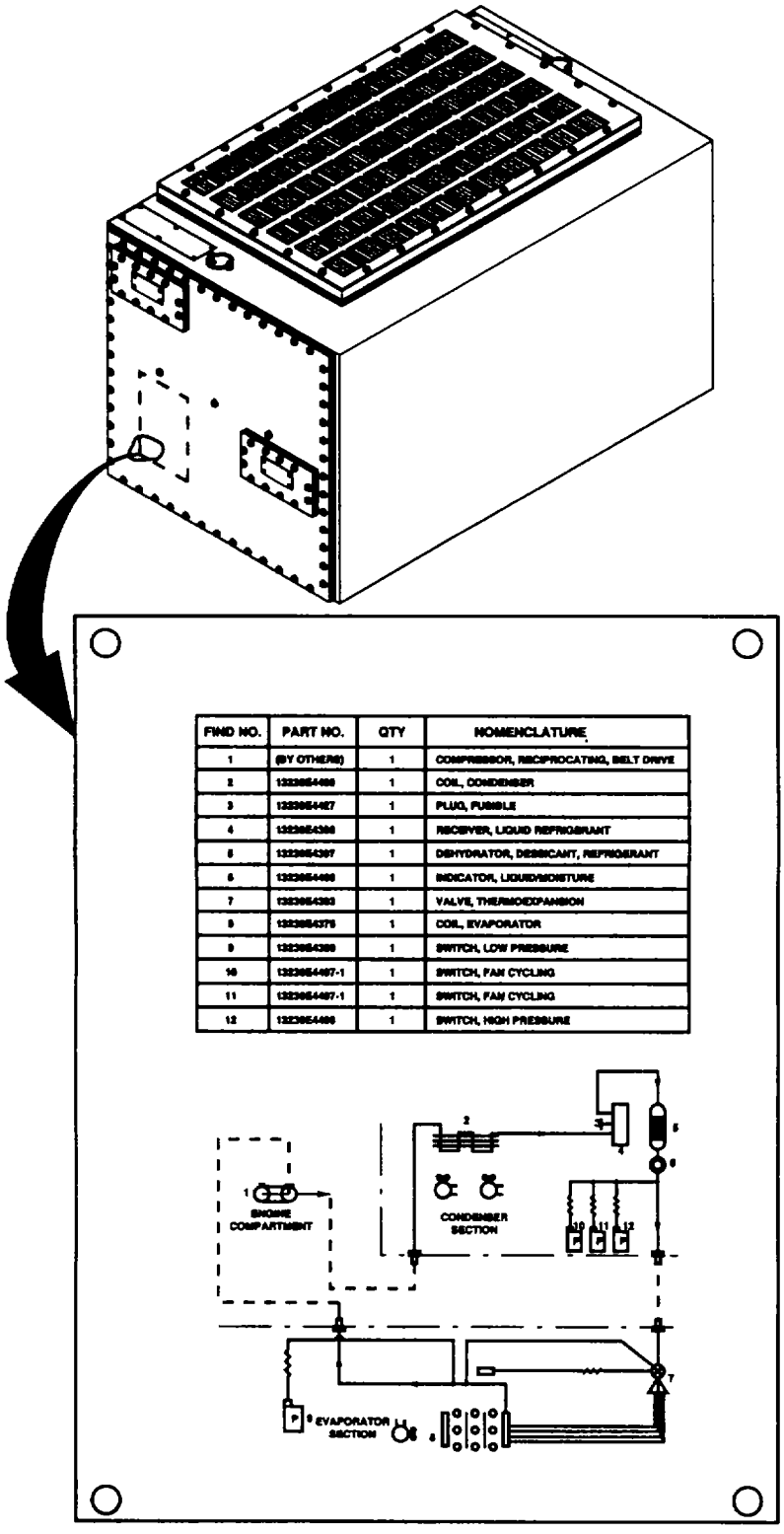


Figure 2-5. Schematic Diagram Plate.

2-6. DECALS AND INSTRUCTION PLATES. (Continued)



FIND NO.	PART NO.	QTY	NOMENCLATURE
1	(BY OTHERS)	1	COMPRESSOR, RECIPROCATING, BELT DRIVE
2	1323654466	1	COIL, CONDENSER
3	1323654467	1	PLUG, FUSIBLE
4	1323654368	1	RECEIVER, LIQUID REFRIGERANT
5	1323654367	1	DEHYDRATOR, DESSICANT, REFRIGERANT
6	1323654468	1	INDICATOR, LIQUID/MOISTURE
7	1323654383	1	VALVE, THERMOEXPANSION
8	1323654378	1	COIL, EVAPORATOR
9	1323654369	1	SWITCH, LOW PRESSURE
10	1323654467-1	1	SWITCH, FAN CYCLING
11	1323654467-1	1	SWITCH, FAN CYCLING
12	1323654469	1	SWITCH, HIGH PRESSURE

Figure 2-6. Refrigerant Fluid Diagram Plate.

2-6. DECALS AND INSTRUCTION PLATES. (Continued)

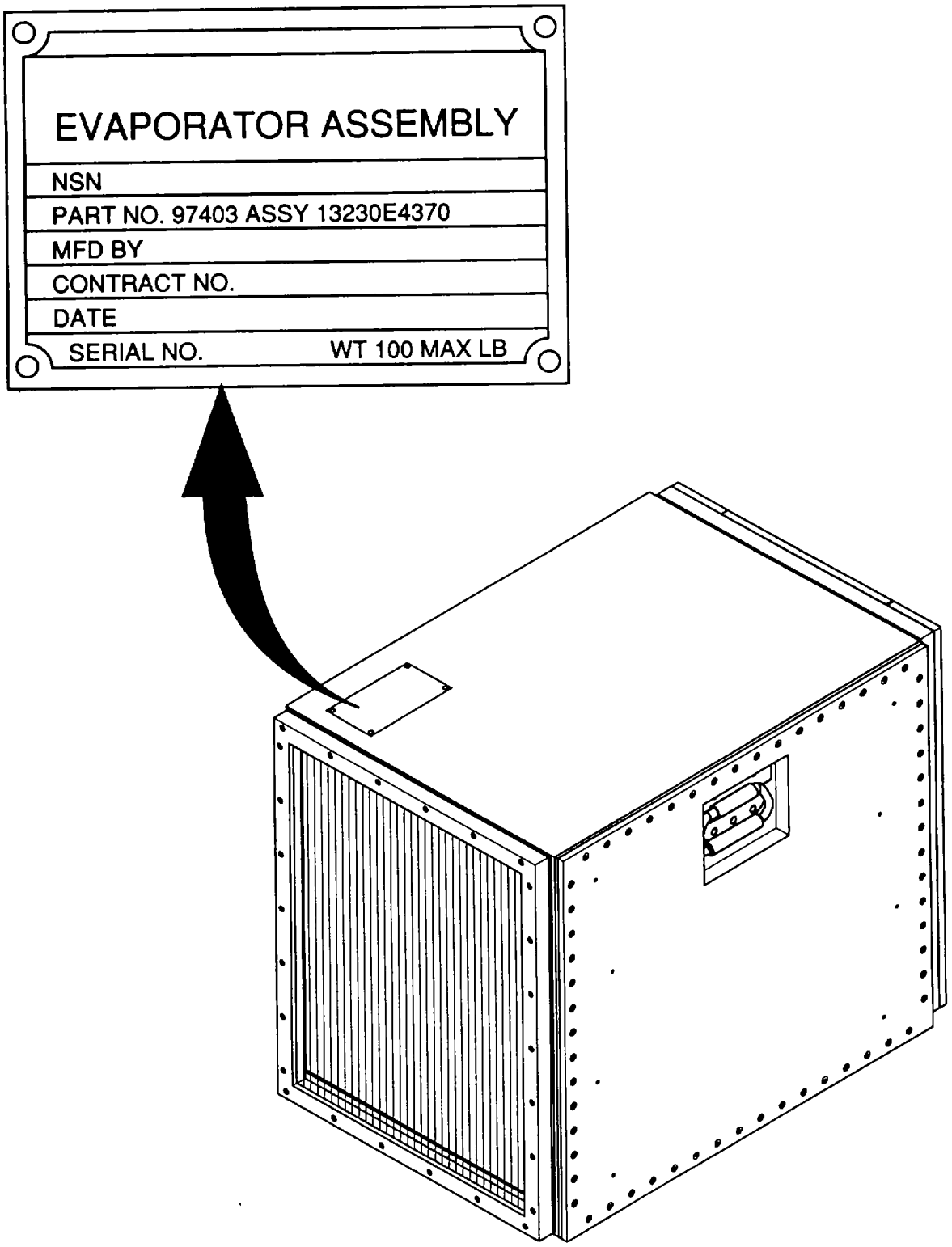


Figure 2-7. Identification Plate, Evaporator Assembly.

2-6. DECALS AND INSTRUCTION PLATES. (Continued)

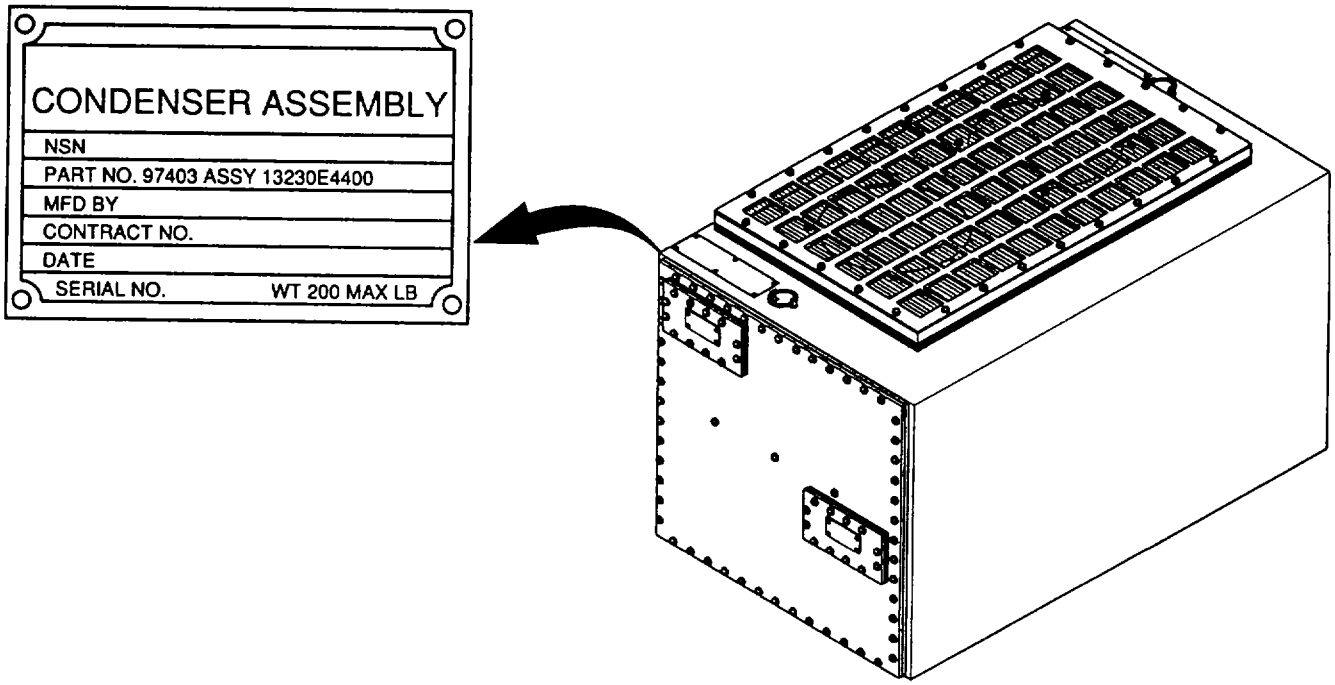


Figure 2-8. Identification Plate, Condenser Assembly.

2-7. PREPARATION FOR MOVEMENT.

Refer to paragraph 2-6, Operating Procedures, to shut down air conditioner. No other preparation is required for movement.

SECTION IV. OPERATION UNDER UNUSUAL CONDITIONS

2-8. UNUSUAL ENVIRONMENTAL/WEATHER.

The air conditioner is designed to operate normally within a wide range of climatic conditions. However, some extreme conditions require special operating and servicing procedures to prevent undue and excessive wear on the equipment. These conditions are listed in the following paragraphs, with their required special procedures.

a. Operation in Extreme Heat. When operating the air conditioner in temperatures of 120° F (49° C) or higher, extra care should be taken to minimize the cooling load. Some precautions that may be taken are:

NOTE

If operation in extremely high temperatures for extended periods of time is anticipated, it is recommended that weather stripping and door/window seals be repaired or replaced prior to deployment. If possible, insulation of the shelter should be performed.

(1) Ensure all openings in the shelter or enclosure, especially doors and windows, are tightly closed. Limit in and out traffic, if possible.

2-8. UNUSUAL ENVIRONMENTAL/WEATHER. (Continued)

(2) When possible, use shades or awnings to prevent direct sunlight from hitting the shelter or air conditioner.

(3) Limit the use of electric lights and other heat producing equipment.

(4) Limit the amount of hot, outside air introduced through shelter vents and louvers to that required for ventilation.

b. Operation in Extreme Cold. When operating the air conditioner in temperatures down to -25° F (-32° C), extra care should be taken to minimize the heating load. Some precautions that may be taken are:

NOTE

If operation in extremely low temperatures for extended periods of time is anticipated, it is recommended that weather stripping and door/window seals be repaired or replaced prior to deployment. If possible, insulation of the shelter should be performed.

(1) Ensure all openings in the enclosure, especially doors and windows are tightly closed. Limit in and out traffic, if possible.

(2) Expose shelter and air conditioner to direct sunlight if possible.

(3) Limit the amount of cold, outside air introduced through shelter vents and louvers to that required for ventilation.

WARNING

ELECTRICAL SHOCK or DEATH will result if power is supplied to equipment while rinsing. DO NOT rinse air conditioner while power is connected or equipment is in operation.

c Operation in Salt Air or Sea Spray. Salt air or sea spray may cause many of the same clogging problems as encountered when operating in a dusty or sandy environment. In addition, the nature of salt presents serious corrosion problems. More frequent PMCS and rinsing surfaces of condenser with fresh water may prevent corrosion problems (refer to paragraph d). Refer to paragraph 1-3 for reporting of corrosion problems.

d Operation in Dust storms or Sandstorms. Dusty and sandy conditions can seriously reduce the efficiency of the air conditioner by clogging the air filter and restricting the volume of airflow, resulting in high pressure problems. Accumulation of dust or sand in the condenser coil and/or in the HMMWV compartment may cause overheating of the refrigeration system. Dust or sand may also clog the condensate water drain line. When operating the air conditioner in dusty or sandy conditions, perform the following steps:

(1) Frequent cleaning or changing of the evaporator filter and all other areas of dust and sand accumulation. In extreme conditions, daily cleaning or changing of the filter may be necessary.

(2) Limit the amount of dusty or sandy outside air introduced through shelter vents and louvers to that required for ventilation.

2-8. UNUSUAL ENVIRONMENTAL/WEATHER. (Continued)

CAUTION

Severe damage may result if air conditioner is operated with a cover on the condenser assembly. Do not cover or obstruct condenser fans or air inlet during operation.

(3) Cover the condenser assembly with canvas or other available material (such as camouflage bags) during periods of shutdown.

e Operation in High Altitudes. The air conditioner is a sealed system and is not affected by a change in atmospheric pressure.

f Operation in Snow, Mud. and Other Conditions. Snow, mud, and other extreme environmental conditions will only affect the performance of the air conditioner if the flow of air through the condenser is hindered or the coil cannot transfer heat due to dirt, mud, snow, etc.

2-9. EMERGENCY PROCEDURES.

a Loss of Primary Power From HMMWV. If primary power from the HMMWV is lost or intermittent, position mode selector switch to OFF position to shutdown air conditioner. When primary power from the HMMWV is restored, refer to paragraph 2-6 and start air conditioner.

b Partial Equipment Failure. Emergency procedures to be followed when partial equipment failure occurs are provided in the following paragraphs. These paragraphs cannot list all possible partial equipment failures that may occur. If equipment failures other than those identified occur, immediately notify your supervisor.

(1) **Mode Selector Switch Failure**. Disconnect power supply cable to shut down air conditioner. Notify your supervisor.

(2) **Thermostat Switch Failure**. Monitor compartment temperature to ensure air conditioner is maintaining temperature at proper levels to continue with intended mission. If proper temperature levels are maintained, notify your supervisor and continue with mission. If proper temperature levels are not maintained, position mode selector switch to OFF position to shutdown air conditioner and notify your supervisor.

(3) **Evaporator and Condenser Fans Not Operating**. Position mode selector switch to OFF position to shutdown air conditioner and notify your supervisor.

2-10. NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) DECONTAMINATION.

The split pack air conditioner is not designed to operate in an NBC environment. Air from within the shelter is exchanged with outside air. Refer to MIL-HDBK-116, Environmental Control of Small Shelters for additional general NBC information. In addition, refer to Field Manual (FM) 3-100 (NBC Operations), FM 3-3 (NBC Contamination Avoidance), FM 3-4 (NBC Protection), and FM 3-5 (NBC Decontamination). General interim NBC decontamination procedures should be performed according to unit Standing Operating Procedures until NBC decontamination facilities are available.

2-11. ELECTRONIC COUNTERMEASURES (ECM).

The air conditioner is designed to prevent electro-magnetic interference from affecting surrounding communications and electronics equipment. In addition, the air conditioner is designed, through the use of EMI/RFI filters and EMI gaskets, to prevent an electro-magnetic signature from being emitted. Refer to FM 32-20, Electronic Warfare, for additional information.

CHAPTER 3

OPERATOR MAINTENANCE INSTRUCTIONS

INDEX

SECTION I. LUBRICATION INSTRUCTIONS

No lubrication is required.

SECTION II. REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE), AND SUPPORT EQUIPMENT

3-1. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to Modified Table of Organization and Equipment (MTOE), Common Table of Allowances (CTA) CTA 50-970, or CTA 8-100, as applicable to your unit.

3-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

Special tools, TMDE, and support equipment are listed in TM 9-4120-408-24P, Repair Parts and Special Tools List (RPSTL) for the Air Conditioner: Split Pack, 30,000 BTUH, 28VDC covering unit, direct support, and general support maintenance, or the Maintenance Allocation Chart (MAC), Appendix B of this manual.

3-3. REPAIR PARTS.

Repair parts are listed and illustrated in TM 9-4120-408-24P covering unit, direct support, and general support maintenance of this equipment.

SECTION III. OPERATOR TROUBLESHOOTING PROCEDURES

3-4. OPERATOR TROUBLESHOOTING.

The malfunction index lists malfunctions that may be observed by you as the operator. Use the malfunction index to locate faults listed in Table 3-1. Table 3-1 lists common malfunctions that you may find with your equipment. After locating the listed malfunction, perform the test/inspections and corrective actions in the order listed in Table 3-1. The malfunction index and Table 3-1 cannot list all the malfunctions that may occur, all the tests and inspections needed to find the fault, or all the corrective actions needed to correct the fault. If the equipment malfunction is not listed or actions listed do not correct the fault, notify your supervisor.

OPERATOR MALFUNCTION INDEX

Table 3-1. Operator Troubleshooting Table

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

1. Air Conditioner Fails to Start in Any Mode.
Ensure all power connections to the control module, condenser assembly, and evaporator assembly are secure. Inspect all external power cables for damage.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury .

a Disconnect, clean connectors, and reconnect all connectors or connect power from a source supplying 28 vdc.

b Notify unit maintenance.

Table 3-1. Operator Troubleshooting Table. (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

2. Insufficient Cooling.

Step 1. Ensure all doors, windows, and other openings in the shelter or enclosure are tightly closed.

Tightly close all openings.

Step 2. Check that the condenser EMI/RFI ventilation panels, fans, and coil are not obstructed or blocked. Check that evaporator EMI/RFI ventilation panels and fan assembly outlet is not blocked.

Remove obstructions from condenser and evaporator EMI/RFI ventilation panels.

Step 3. Inspect external refrigerant lines for loose connections and damage.

Report loose connection or damaged refrigerant lines to your supervisor.

Step 4. Check operation of temperature control thermostat.

a Turn thermostat switch counterclockwise to maximum COOL setting; then, if condition improves, adjust thermostat switch to desired setting.

b Notify unit maintenance.

3. Air Conditioner Stops Operating.

Ensure all power connections to the control module, condenser assembly, and evaporator assembly are secure. Inspect all external power cables for damage.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

a. Disconnect, clean connectors, and reconnect all connectors or connect power from a source supplying 28 vdc.

b. Notify unit maintenance.

4. High Pressure Warning Light on Control Module is Lit.

Inspect refrigerant out line from condenser for damage or kinks which would cause a restriction in refrigerant flow. Position mode selector switch to OFF to shutdown air conditioner and notify unit maintenance.

5. Low Pressure Warning Light on Control Module is Lit.

Inspect refrigerant out line from evaporator for damage. Turn air conditioner off and notify unit maintenance.

Table 3-1. Operator Troubleshooting Table . (Constructed)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

6. Air Filter Warning Light on Control Module is Lit.

Inspect air filter on evaporator assembly for obstructions or damage.

a Remove and service air filter (paragraph 3-5). Inspect for damage.

b Replace air filter (paragraph 3-5).

c Notify unit maintenance.

7. Condensate Drain Warning Light on Control Module is Lit.

Notify unit maintenance.

SECTION IV. OPERATOR MAINTENANCE PROCEDURES

3-5. RETURN AIR FILTER MAINTENANCE.

This task covers: **Remove** **Service** **Install**

INITIAL SETUP:

Tools
No tools are required.

Material/Parts

Drain Pan, Appendix E, Item 19

Soap, Appendix E, Item 22

Refer to TM 9-4120-408-24P for part number of item to be replaced.

Equipment Conditions
Air Conditioner shut down, paragraph 2-5.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

a. Remove. Remove filter (Figure 3-1, 1) from return air filter brackets (2).

b. Service. Clean filter tl) with warm soapy water and air dry prior to installation. If damaged, replace filter (1).

WARNING

Return air filter must be installed with protective grill facing away from evaporator assembly. Failure to do so may result in equipment damage.

c Install. Install filter (1) into return air filter brackets (2).

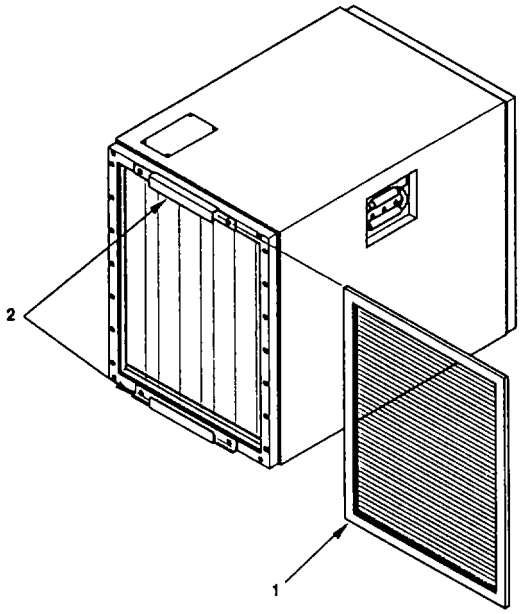


Figure 3-1. Return Air

CHAPTER 4

UNIT MAINTENANCE INSTRUCTIONS

INDEX

SECTION I. LUBRICATION INSTRUCTIONS

No lubrication is required.

SECTION II. REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

4-1. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to Modified Table of Organization and Equipment (MTOE), Common Table of Allowances (CTA) 50-970 or CTA 8-100 as applicable to your unit.

4-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

Special tools, TMDE, and support equipment are listed in TM 9-4120-408-24P, Repair Parts and Special Tools List (RPSTL) for the Air Conditioner: Split Pack, 30,000 BTUH, 28VDC covering unit, direct support, and general support maintenance, or the Maintenance Allocation Chart (MAC), Appendix B of the manual.

4-3. REPAIR PARTS.

Refer to Mandatory Replacement Parts, Appendix G. for parts that must be stocked for proper repair of the air conditioner. Repair parts are listed and illustrated in TM 9-4120-408-24P covering unit, direct support, and general support maintenance of this equipment.

SECTION III. SERVICE UPON RECEIPT

4-4. UNPACKING.

The initial unpacking will be performed by the systems integrator prior to equipment delivery.

4-5. CHECKING UNPACKED EQUIPMENT.

Initial checking of unpacked equipment will be performed by the systems integrator prior to equipment delivery. Perform Unit PMCS prior to placing air conditioner into service. Should an equipment problem arise shortly after initial operation, notify your supervisor.

4-6. PROCESSING UNPACKED EQUIPMENT.

Initial processing of unpacked equipment will be performed by the systems integrator prior to equipment delivery.

4-7. INSTALLATION.

For installation of control module assembly, refer to applicable technical manual.

SECTION IV. UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4-8. GENERAL.

Table 4-1 (Unit PMCS table) has been provided so you can keep your equipment in good operating condition and ready for its primary mission.

a. **Warnings. Cautions, and Notes**. Always observe the WARNINGS and CAUTIONS appearing in your PMCS table. Warnings and cautions appear before applicable procedures. You must observe these WARNINGS and CAUTIONS to prevent serious injury to yourself and others or to prevent your equipment from being damaged.

b. **Explanation of Table Entries**.

1. **Item No. Column**. Numbers in this column are for reference. When completing DA Form 2404 (Equipment Inspection and Maintenance Worksheet), include the item number for the check/service indicating a fault. Item numbers also appear in the order that you must do checks and services for the intervals listed.
2. **Interval Column.** This column tells you when you must do the procedure in the procedure column.
3. Item to be Checked or Serviced Column. This column describes the item to be checked or serviced.
4. **Procedure Column**. This column gives the procedure you must do to check or service the item listed in the Item to be Checked or Serviced column to know if the equipment is ready or available for its intended mission or for operation. You must do the procedure at the time stated in the interval column.
5. **Not Fully Mission Capable if**: Column. Information in this column tells you what faults will keep your equipment from being capable of performing its primary mission. If you make checks or service procedures that show faults listed in this column, do not operate the equipment. Follow standard operating procedures for maintaining the equipment or reporting equipment failure.

c **Other Table Entries**. Be sure to observe all special information and notes that appear in your table.

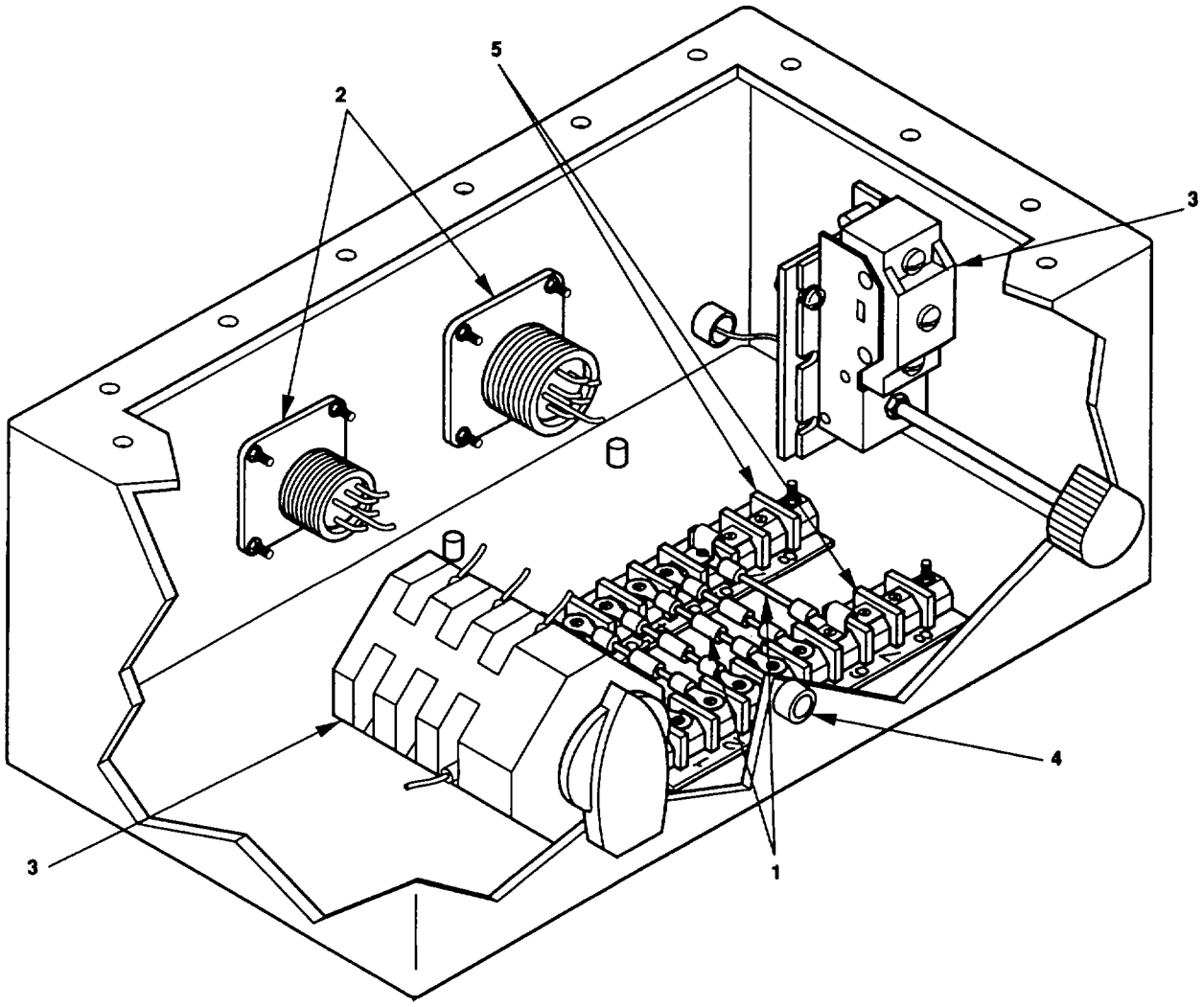


Figure 4-1. Unit PMCS Routing Diagram (Control Module Assembly).

Table 4-1. Unit Preventive Maintenance Checks and Services for Control Module Assembly.

Item No.	Interval	Item to be Checked or Serviced	Procedure	Not Fully Mission Capable if:
1	SEMI-ANNUALLY	Electrical Leads, Resistor Assemblies, and Diode Assembly	Inspect all electrical leads for burns or damage.	Electrical leads are burned or damaged.
2	SEMI-ANNUALLY	Wiring Harnesses	Inspect wiring harnesses for burned, damaged, or missing wires and connectors. Inspect for damaged or missing EMI gasket at connectors.	Wiring harnesses have burned, damaged, or missing wires or connectors. EMI gaskets are damaged or missing.

Table 4-1. Unit Preventive Maintenance Checks and Services for Control Module Assembly. (Continued)

Item No	Interval	Item To Be Checked or Serviced	Procedure	Not Fully Mission Capable If:
3	SEMI-ANNUALLY	Switches	Inspect switches for burns and damage.	Switches are damaged or burned.
4	SEMI-ANNUALLY	Light Emitting Diode Assemblies	Inspect for burned or damaged electrical leads. Inspect for cracked or damaged. damaged light. or damaged light.	Electrical leads are burned or Cracked
5	SEMI-ANNUALLY	Terminal Boards	Inspect for burned or damaged terminal boards.	Terminal boards are burned or damaged.

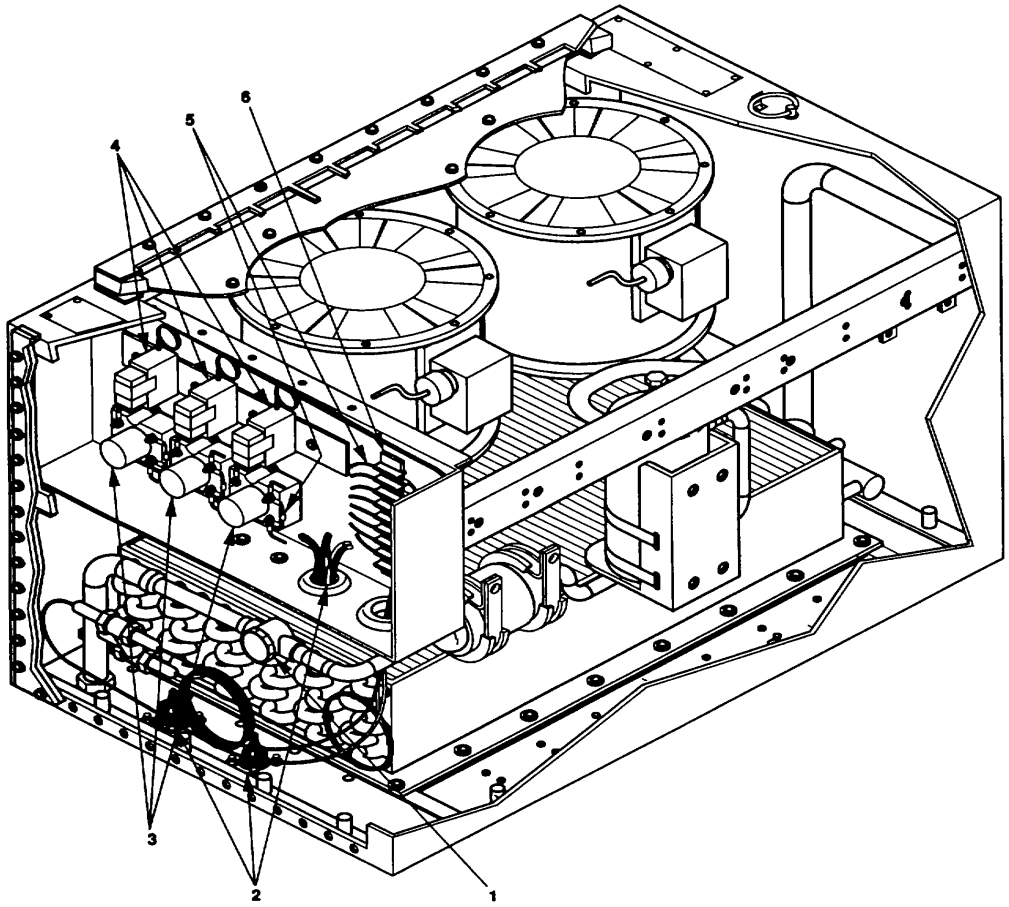


Figure 4-2. Unit PMCS Routing Diagram (Condenser Assembly).

Table 4-2. Unit Preventive Maintenance Checks and Services for Condenser Amply.

Item No	Interval	Item To Be Checked or Serviced	Procedure	Not Fully Mission Capable If:
1	MONTHLY	Liquid/Moisture Indicator	Inspect for damaged liquid moisture indicator. Check indicator color. appear during operation. Indicator color indicates wet condition.	Indicator is damaged. Bubbles
2	SEMI-ANNUALLY	Wiring Harnesses	Inspect wiring harnesses for burned, damaged, or missing wires and damaged, or missing connectors. Inspect for wires or damaged or missing EMI connectors. gasket between connectors and condenser housing.	Wiring harnesses have burned, EMI gaskets are damaged or missing.
3	SEMI-ANNUALLY	50 Amp Relays	Inspect relays for burns or damage.	Relays burned or damaged.
4	SEMI-ANNUALLY	Pressure Switches	Inspect for burned or damaged switch bodies damaged capillary tubes.	Burned or damaged and switch bodies or damaged capillary tubes.
5	SEMI-ANNUALLY	Electrical Leads and Diode Assemblies	Inspect all electrical leads for burns or damage.	Electrical leads are burned or damaged.
6	SEMI-ANNUALLY	Terminal Board	Inspect for burned or damaged terminal board.	Terminal board is burned or damaged.

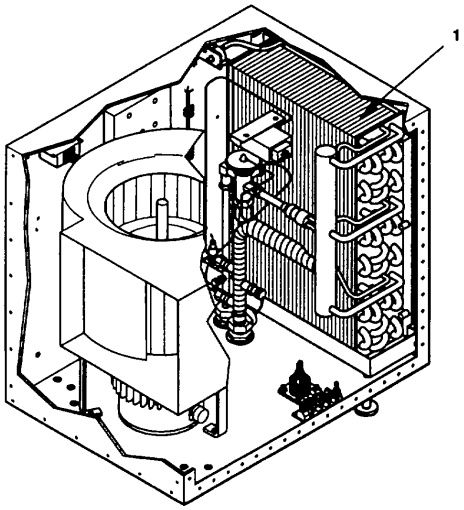


Figure 4-3. Unit PACE Routing Diagram (Evaporator Assembly).

Table 4-3. Unit Preventive Maintenance Checks and Services for Evaporator Assembly.

Item No	Interval	Item To Be Checked or Serviced	Procedure	Not Fully Mission Capable If:
1	ANNUALLY	Evaporator Coil	Inspect for cracks, holes, or damage to coil. Inspect fins for damage and Fins are damaged or presence of debris and foreign objects which restrict air flow.	Coil has cracks, holes, or damage. debris and foreign objects are present which restrict air flow.

SECTION V. UNIT TROUBLESHOOTING PROCEDURES

4-9. UNIT TROUBLESHOOTING.

The malfunction index lists malfunctions that may be observed by unit level maintenance. The malfunctions are then cross-referenced to the troubleshooting table 4-4. Table 4-4 contains information useful in diagnosing and correcting unsatisfactory air conditioner operation which may be encountered during operation or maintenance. Use the malfunction index to locate specific troubleshooting procedures contained in table 4-4. After locating the listed malfunction, perform the test/inspections and corrective actions in the order listed in table 4-4. The malfunction index and Table 4-4 cannot list all malfunctions that may occur, all test and inspections required to find the fault, or all corrective actions required to correct the fault. If the equipment malfunction is not listed or actions listed, do not correct the fault, notify your supervisor.

UNIT MALFUNCTION INDEX

Table 4-4. Unit Troubleshooting Table (Continued).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

1. Air Conditioner Fails to Operate in Any Mode.

Step 1. Ensure all power connections to the control module, condenser assembly, and evaporator assembly are secure. Inspect all external power cables for damage.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal Injury.

Disconnect, clean connectors, and reconnect all connectors or connect power from a source supplying 28 vdc.

Step 2. Check to see if DC control circuit breaker in shelter is in the ON position.

a. Reset DC circuit breaker by placing it in the OFF and then in the ON position.

b. If the air conditioner will not operate, refer to applicable technical manual and test for defective circuit breaker.

c. Replace defective circuit breaker.

Step 3. Check to see if mode selector switch (S1) on control module is in the HIGH COOL position.

a. Position mode selector switch in the HIGH COOL position.

b. If the air conditioner will not operate, test mode selector switch (S1) (paragraph 4-21).

c. Replace defective mode selector switch (S1) (paragraph 4-21).

Step 4. Refer to wiring diagrams (Figures H-1, H-2, and H-3) and inspect/test for defective wiring.

Repair or replace damaged or defective wiring as required.

2. Air Conditioner Suddenly Stops.

Step 1. Ensure all power connections to the control module, condenser assembly, and evaporator assembly are secure. Inspect all external power cables for damage.

Table 4-4. Unit Troubleeshooting Table

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

2. Air Conditioner Suddenly Stops. (Continued)

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal Injury.

Disconnect, clean connectors, and reconnect all connectors or connect power from a source supplying 28 vdc.

Step 2. Test mode selector switch (S1) (paragraph 4-21).

Replace defective mode selector switch (paragraph 4-21).

Step 3. Refer to wiring diagrams (Figure H-1, H-2, and H-3) and inspect/test wiring.

Repair or replace damaged or defective wiring as required.

3. Insufficient Cooling Capacity.

Step 1. Ensure that all doors, windows, and other openings in the shelter or enclosure are tightly closed.

Tightly close all openings.

Step 2. Ensure that the evaporator outlet is not blocked or obstructed.

Unblock or remove obstructions.

Step 3. Ensure that the condenser inlet and outlet are not obstructed.

Remove obstructions.

Step 4. Inspect for obstructions in fins of evaporator coil or damaged evaporator coil.

a. Remove obstructions and clean evaporator coil.

b. Notify direct support maintenance.

Step 5. Inspect thermostat temperature sensing bulb and capillary tube for damage and test thermostat (paragraph 4-23).

Replace damaged or defective thermostat (paragraph 4-23).

Step 6. Remove lower access panel (paragraph 4-10) and with unit operating in HIGH COOL mode, check refrigerant condition in liquid/moisture indicator.

Table 4-4. Unit Troubleshooting Table. (continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

3 Insufficient Cooling Capacity. (Continued)

WARNING

Serious damage may result to compressor if liquid enters compression chamber. It is indicated by liquid/moisture indicator showing wet condition or bubbles in the sight glass.

If liquid/moisture indicator shows wet condition or numerous bubbles appear in refrigerant, immediately turn air conditioner **OFF** and notify your direct support maintenance.

4. High Pressure Warning Light on Control Module is Lit.

Inspect refrigerant out line from condenser assembly for damage or kinks which could cause a restriction in refrigerant flow.

a. Ensure condenser inlet and outlet are not obstructed.

b. Adjust refrigerant out line to remove kinks or restrictions.

c. Remove upper access panel (paragraph 4-10) and reset high pressure cut out switch.

d. Notify direct support maintenance.

5. Low Pressure Warning Light on Control Module is Lit.

Notify direct support maintenance.

6. Air Filter Warning Light on Control Module is Lit.

Test differential pressure switch (paragraph 4-30).

a. If air filter warning light does not light, test LED assembly (paragraph 4-22).

b. Replace defective LED assembly (paragraph 4-22).

c. Notify direct support maintenance.

7. Condensate Drain Warning Light on Control Module is Lit.

Remove front (air inlet) EMI/RFI ventilation panel (paragraph 4-29) and inspect condensate drain pan for water build up.

WARNING

Wear eye protection when using compressed air. Air pressure should not exceed 30 pounds per square inch (psi) (206.7 kilopascals (kPa)). Personal injury may result if eye protection is not used.

a. Back flush condensate drain line using compressed air.

Table 4-4. Unit Troubleshooting Table. (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

7. Condensate Drain Warning Light on Control Module is Lit. (Continued)

b. Notify direct support maintenance.

8. Evaporator Fan Assembly Does Not Operate.

Step 1. Test mode selector switch (S1) (paragraph 4-21).
Replace defective mode selector switch (S1) (paragraph 4-21).
Step 2. Test 50 amp relay (K3) (paragraph 4-18).
a. Replace defective 50 amp relay (paragraph 4-18).
b. Notify direct support maintenance.

9. Condenser Vane Axial Fans Do Not Operate.

Test 50 amp relays (K1 and K2) (paragraph 4-18).
a. Replace defective or damaged 50 amp relays (paragraph 4-18).
b. Notify direct support maintenance.

10. Condenser Vane Axial Fans Both Run. but Compressor Does Not Start.

Step 1. Test thermostat (paragraph 4-23).
Replace defective thermostat (paragraph 4-23).
Step 2. Check to see if high pressure cut out switch has tripped.
a. Remove upper access panel (paragraph 4-10) and reset high pressure cut out switch.
b. If high pressure cut out switch continues to trip, check for restrictions in refrigerant line.
c. Check for obstructions to condenser air flow.
Step 3. Check to see if mode selector switch (S1) is in HIGH COOL position.
a. Position mode selector switch (S1) to HIGH COOL.
b. Notify direct support maintenance.

11. Compressor Starts Normally, but High Pressure Cut Out Switch Soon Trips.

Step 1. Check to be sure there is no restriction to air flow through condenser assembly.
Clean all obstructions from condenser inlet and outlet.
Step 2. Inspect refrigerant lines for damage or kinks which could cause a restriction in refrigerant flow.
Remove restrictions from refrigerant lines.

Table 4-4. Unit Troubleshooting Table. (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

11. Compressor Starts Normally, but High Pressure Cut Out Switch Soon Trips. (Continued)

Step 3. Test 50 amp relays (K1 and K2) (paragraph 4-18).

a. Replace damaged or defective 50 amp relays (paragraph 4-18).

b. Notify direct support maintenance.

SECTION VI. UNIT MAINTENANCE PROCEDURES

4-10. ACCESS PANEL MAINTENANCE

This task covers: **Remove** **Install**
Inspect

INITIAL SETUP:

Tools
Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Equipment Conditions
Air Conditioner shut down, paragraph 2-5.

Material/Parts
Lock Washers, Appendix G, Item 14
Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

General Safety Instructions
Do not work on equipment without following standard shop safety precautions.

a. Remove. Remove twelve screws (Figure 4-4, 1), lock washers (2), flat washers (3), and access panel (4). Discard lock washers (2).

b. Inspect.

(1) Inspect access panel (4) for cracks, holes, damage, or damaged or missing EMI gasket (5).

(2) Inspect mounting hardware for damage.

(3) Replace damaged or missing components.

c. Install.

NOTE

If access panel is to be replaced, refer to paragraph 4-12, remove data plate from damaged access panel and install on new access panel.

(1) Position access panel (4) on side panel (6).

4-10. ACCESS PANEL MAINTENANCE. (Continued)

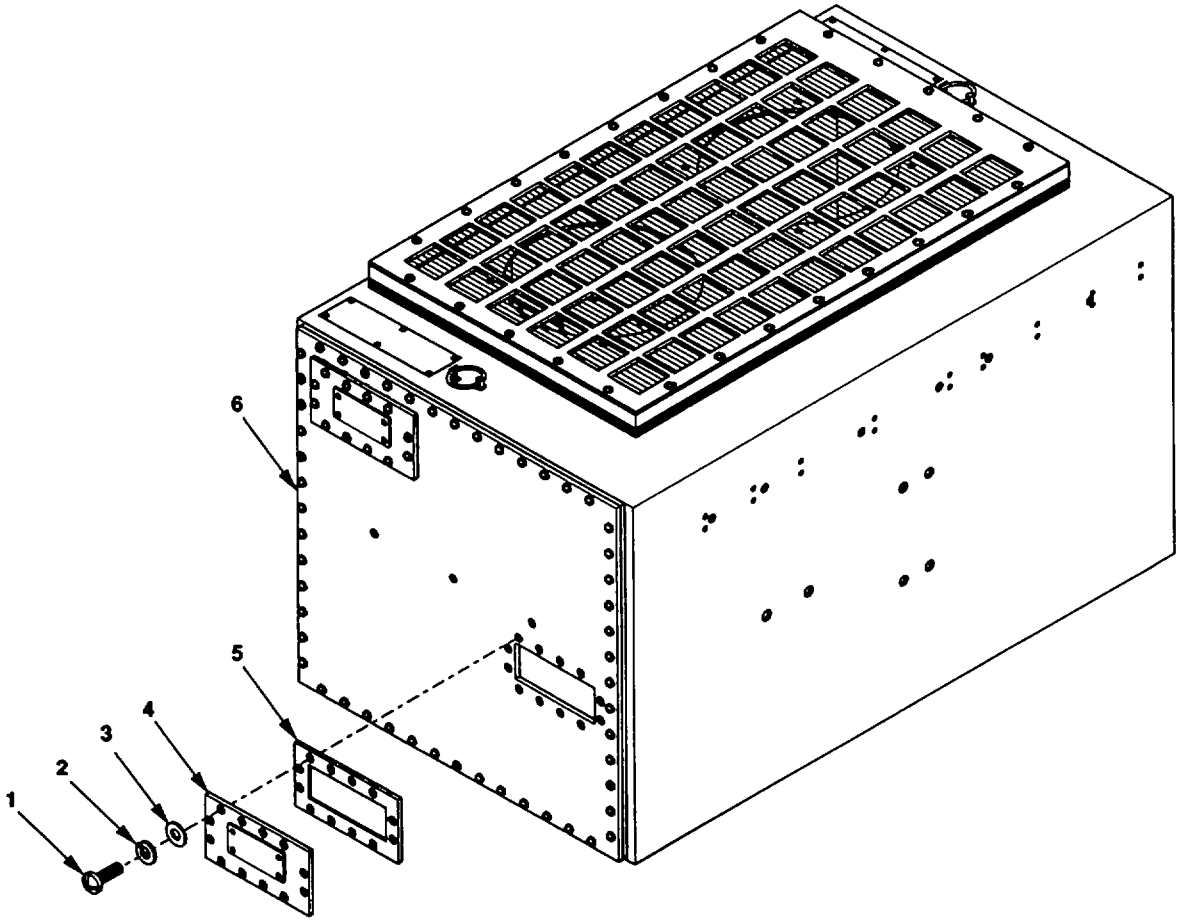


Figure 4-4. Access Panel Maintenance.

(2) Secure access panel (4) with twelve flat washers (3), new lock washers (2), and screws (1).

4-11. CONDENSER SIDE PANEL MAINTENANCE

This task covers: **Remove** **Install**
Inspect

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Material/Parts

Lock Washers, Appendix G, Item 14

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Roadside Support Bracket removed, refer to applicable system technical manual.

Access Panels removed, paragraph 4-10.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

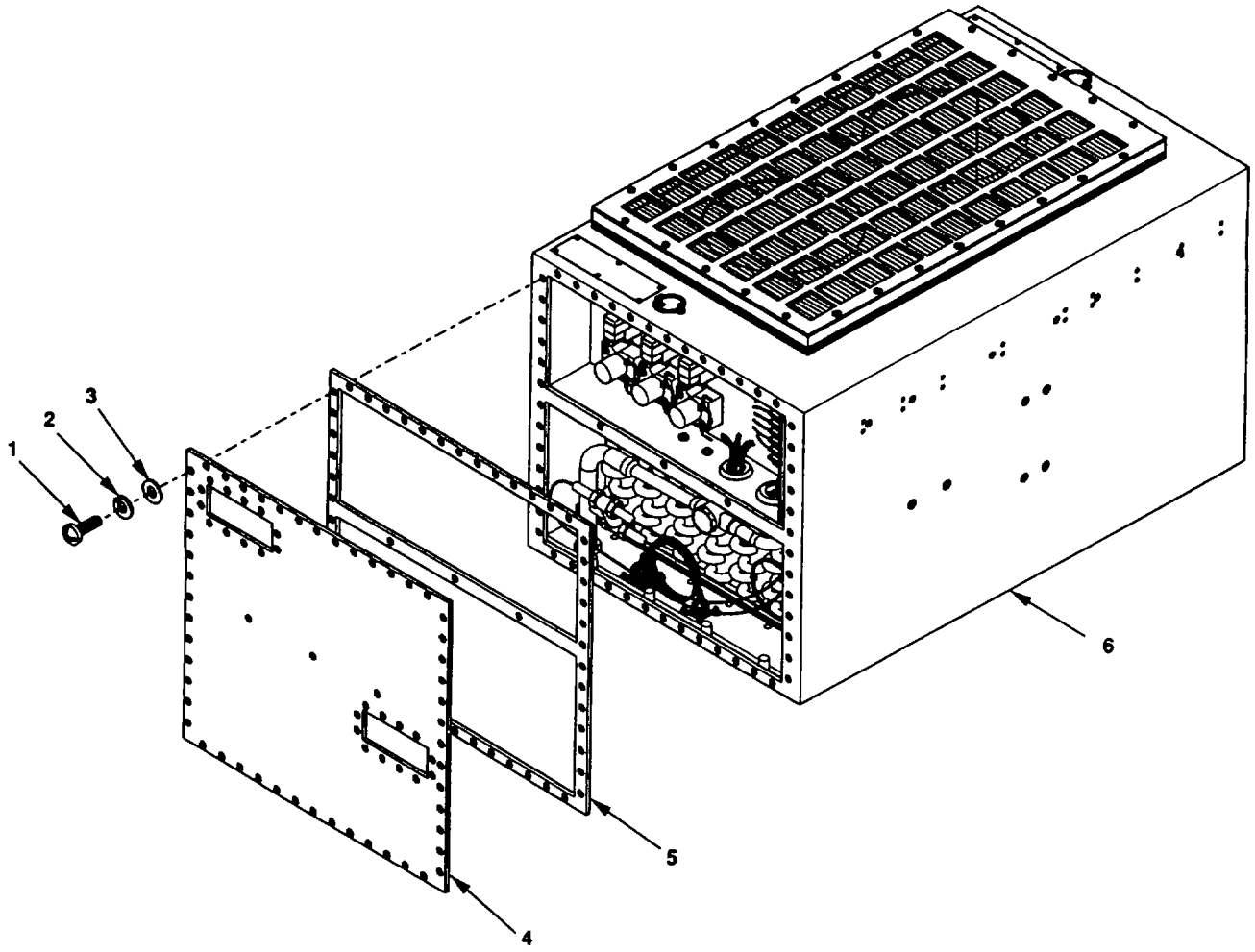


Figure 4-5. Condenser Side Panel Maintenance.

4-11. CONDENSER SIDE PANEL MAINTENANCE. (Continued)

a. Remove. Remove 55 screws (Figure 4-5, 1), lock washers (2), flat washers (3), and condenser side panel (4). Discard lock washers (2).

b. Inspect.

(1) Inspect condenser side panel (4) for cracks, holes, or damage.

(2) Inspect EMI gasket (5) for damage.

(3) Inspect mounting hardware for damage.

(4) Replace all damaged or missing components.

c. Install.

(1) Position condenser side panel (4) on condenser assembly (6) and secure with 55 flat washers (3), new lock washers (2) and screws (1).

(2) Follow on maintenance:

(a) Refer to paragraph 4-10 and install access panels.
(b) Refer to applicable system technical manual and install roadside support bracket.

4-12. DATA PLATE AND SPRING CLIP REPLACEMENT.

This task covers: **Remove** **Install**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Riveter Blind, Hand, Appendix B, Section III, Item 2

Material/Parts

Rivets, Appendix G, Item 7

Rivets, Appendix G, Item 8 (For spring clips)

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Condenser Side Panel removed, paragraph 4-11.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

NOTE

- This procedure applies to the information plate shown. The procedures for the roadside spring clip, schematic diagram plate, refrigeration fluid diagram plate, switch reset instruction plate, and liquid/moisture indicator plate are similar.

- The schematic diagram plate and refrigeration fluid diagram plate are located on the interior surface of the side panel.

a. Remove. Remove six rivets (Figure 4-6, 1) and data plate (2). Discard rivets (1).

4-12. DATA PLATE AND SPRING CLIP REPLACEMENT. (Continued)

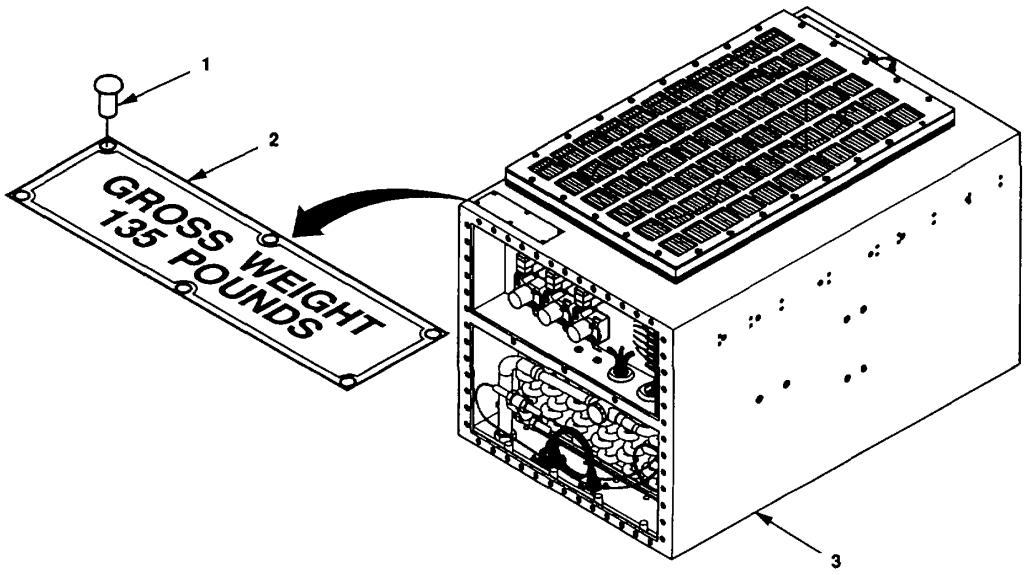


Figure 4-6. Data Plate Replacement.

b. Install.

(1) Position dataplate (2) on condenser assembly (3) and secure with six new rivets (1).

(2) Follow on maintenance: refer to paragraph 4-11 and install side panel.

4-13. ROADSIDE LIFTING RING REPLACEMENT.

This task covers: **Remove** **Install**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Material/Parts

Lock Washer, Appendix G, Item 16

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions (Continued)

Air Conditioner shut down, paragraph 2-5.

Condenser Side Panel removed, paragraph 4-11.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

a. Remove. Remove nut (Figure 4-7, 1), lock washer (2), flat washer (3), and lifting ring (4). Discard lock washer (2).

4-13. ROADSIDE LIFTING RING REPLACEMENT. (Continued)

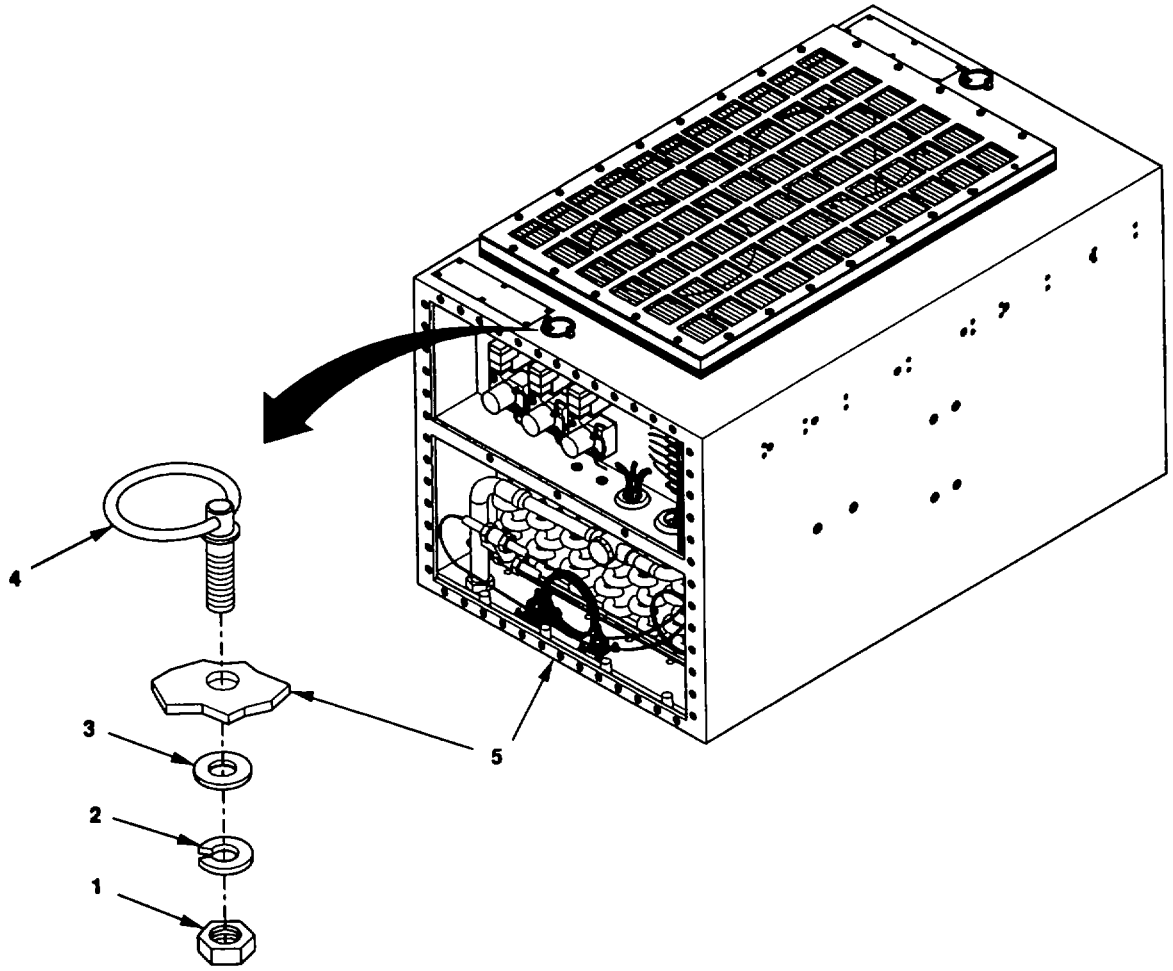


Figure 4-7. Lifting Ring Replacement.

b. Install.

(1) Install lifting ring (4) in condenser assembly (5) and secure with flat washer (3), new lock washer (2), and nut (1).

(2) Follow on maintenance: refer to paragraph 4-11 and install side panel.

4-14. CONDENSER FOOT REPLACEMENT.

This task covers: **Remove** **Install**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Material/Parts

Lock Washers, Appendix G, Item 14

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

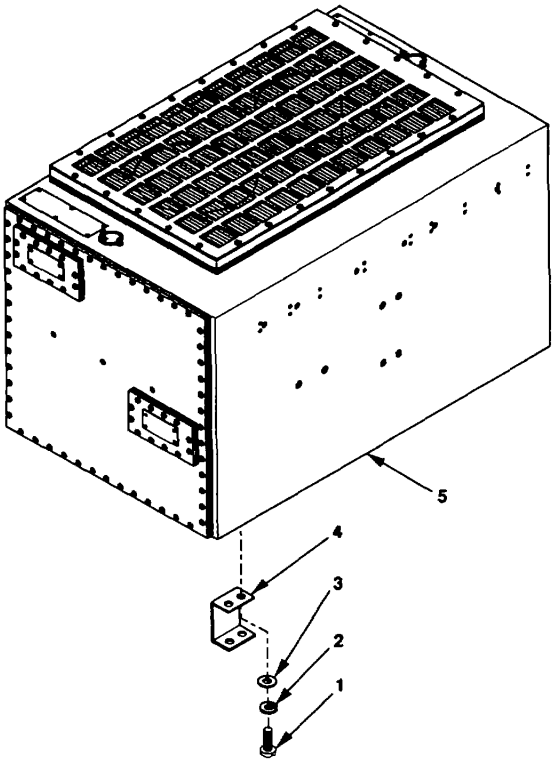


Figure 4-8. Condenser Foot Replacement.

a. **Remove**. Remove two screws (Figure 4-8, 1), lock washers (2), flat washers (3), and condenser foot (4). Discard lock washers (2).

b. **Install**. Position condenser foot (4) on condenser assembly (5) and secure with two flat washers (3), new lock washers (2), and screws (1).

4-15. UPPER CONDENSER PROTECTIVE GRILLE AND EMI/RFI VENTILATION PANEL MAINTENANCE.

This task covers: **Remove** **Inspect** **Service**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Material/Parts

Lock Washers, Appendix G, Item 14

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

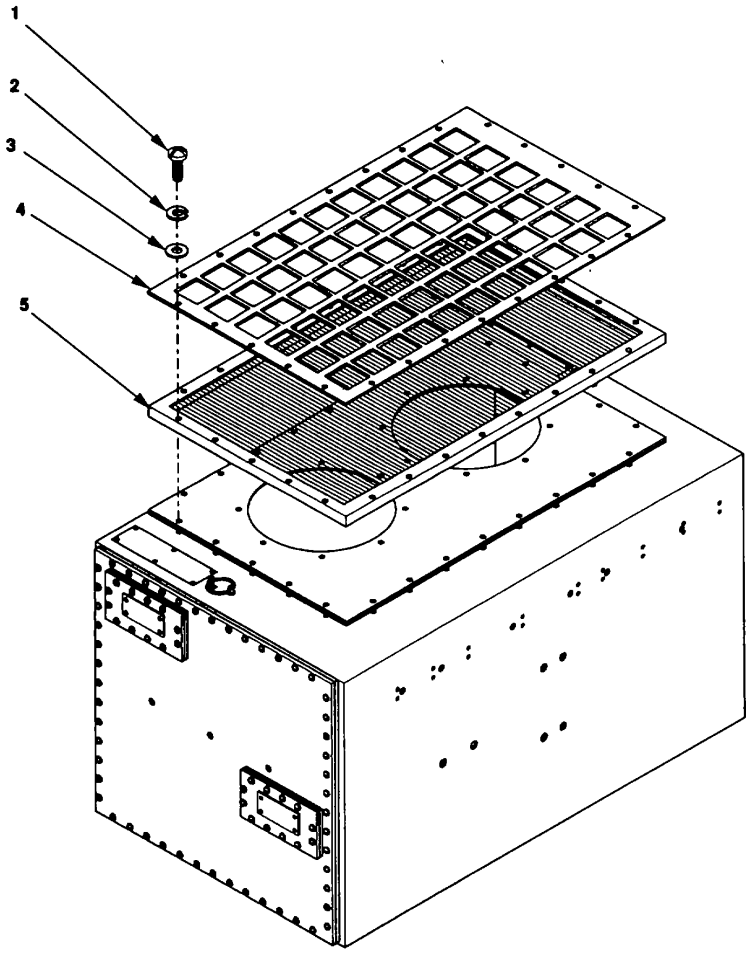


Figure 4-9. Condenser Upper Protective Grille and EMI/RFI Ventilation Panel.

4-15. UPPER CONDENSER PROTECTIVE GRILLE AND EMI/RFI VENTILATION PANEL MAINTENANCE. (Continued)

a. **Remove**. Remove 26 screws (Figure 4-9, 1), lock washers (2), flat washers (3), condenser protective grille (4), and condenser EMI/RFI ventilation panel (5). Discard lock washers (2).

b. **Inspect**.

(1) Inspect condenser protective grille (4) for cracks, holes, or damage.

(2) Inspect condenser EMI/RFI ventilation panel (5) for hole(s) equivalent to two "honey combs" or larger.

(3) Inspect condenser EMI/RFI ventilation panel (5) for bent fins. Replace if bent fins hinder heat transfer of the coil.

(4) Inspect EM/RFI ventilation panel (5) for damaged or missing EMI/RFI gasket material.

(5) Inspect all mounting hardware for damage.

(6) Replace all damaged or defective components.

c. **Service**. Rinse removed condenser upper EMI/RFI ventilation panel (5) with clean water.

d. **Install**. Install condenser EMI/RFI ventilation panel (5), condenser protective grille (4), 26 flat washers (3), new lock washers (2), and screws (1).

4-16. CONDENSER WIRING HARNESS MAINTENANCE.

This task covers: **Remove** **Repair**
Test

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Crimping Tool, Appendix B, Section III, Item 3

Heater, Gun Type, Electrical, Appendix B, Section III, Item 4

Material/Parts

Cable Clamp Electrical, Appendix E, Item 7 (A104J1)

Adapter, Cable Clamp, Appendix E, Item 1 (A104J2)

Insulation Sleeving, Appendix E, Item 13 (A104J1)

Insulation Sleeving, Appendix E, Item 12 (A104J2)

Insulation Sleeving, Appendix E, Item 15

Strap Tiedown, Appendix E, Item 26

Tags, Appendix E, Item 27

Gasket, Appendix G, Item 10 (A104J1)

Materials/Parts (Continued)

Gasket, Appendix G, Item 9 (A104J2)

Lock Washers, Appendix G, Item 12 (A104J1)

Lock Washers, Appendix G, Item 13 (A104J2)

Lock Washers, Appendix G, Item 14 (Cable Clamps)

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Condenser Side Panel removed, paragraph 4-11.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

Ensure that power has been disconnected before performing maintenance on electrical components.

NOTE

This procedure applies to wiring harness A104J1. The procedure for wiring harness A104J2 is similar.

a. Remove.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

(1) Refer to Appendix H, Figure H-2, Tables H-3 and H-4, and tag and disconnect all single wire terminations for wiring harness A104J1 (Figure 4-10, 1) and remove and discard all tiedown straps.

(2) Remove two screws (2), lock washers (3), flat washers (4), and cable clamps (5). Discard lock washers (3).

4-16. CONDENSER WIRING HARNESS MAINTENANCE. (Continued)

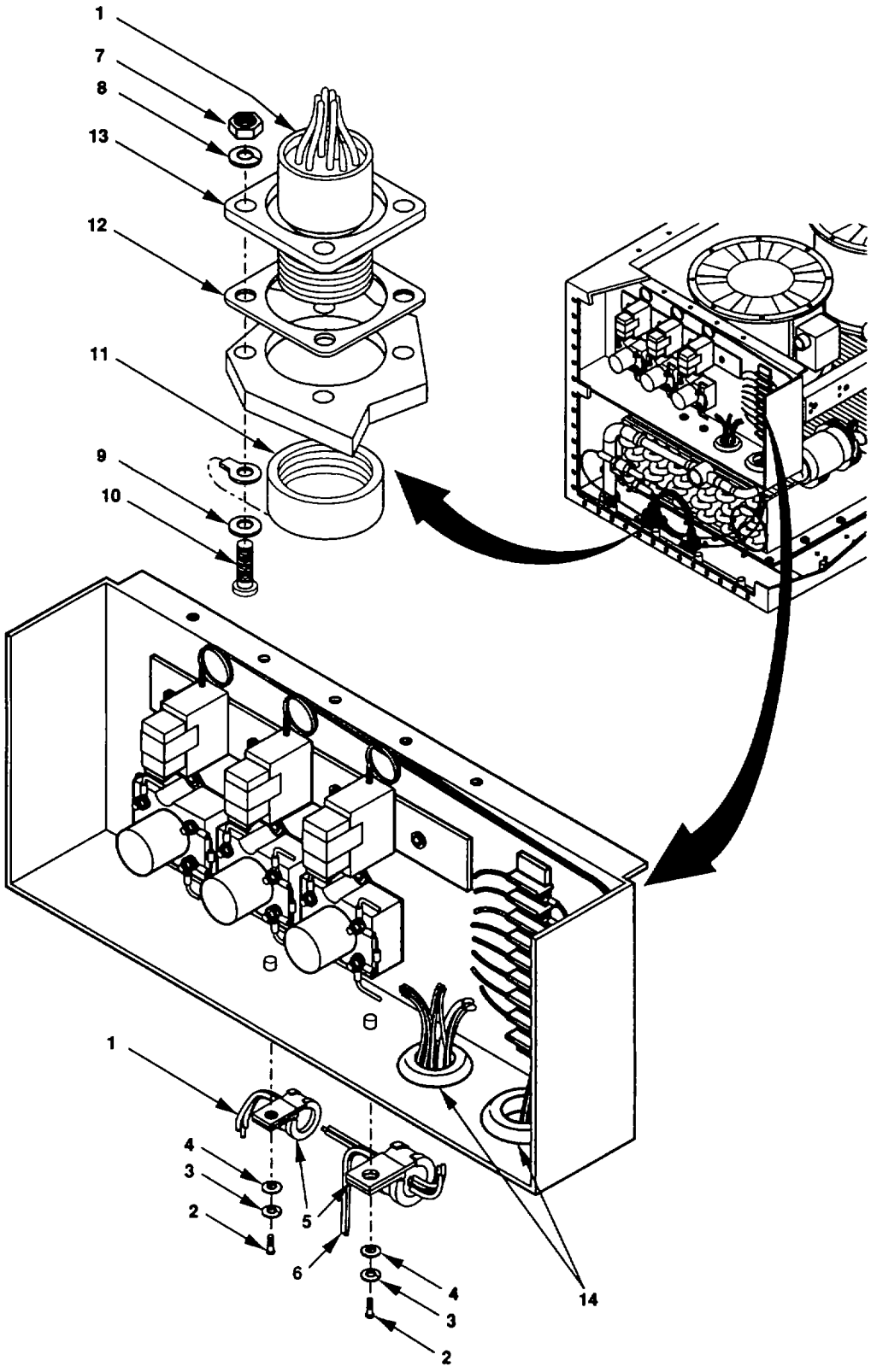


Figure 4-10. Condenser Assembly Wiring Harness Maintenance.

4-16. CONDENSER WIRING HARNESS MAINTENANCE. (Continued)

(3) Remove wiring harness A104J2 (6) from cable clamp (5).

(4) Remove four nuts (7), lock washers (8), flat washers (9), screws (10), one electrical receptacle cover (11), gasket (12), and connector (13) of wiring harness A104J1 (1). Discard lock washers (8) and gasket (12).

b. Inspect.

(1) Inspect for loose wires in connector (13).

(2) Inspect all wiring harness (1) wires for cracked insulation, damaged or missing connectors and terminals, burns, or fraying.

(3) Inspect grommets (14) for damage.

(4) Inspect all mounting hardware for damage.

c. Test. Refer to Appendix H, Figure H-2, Tables H-3 and H-4 and test continuity of each wire run for wiring harness A104J1 (1).

NOTE

Refer to Appendix F, Figure F-2 for condenser wiring harness A104J2.

d. Repair.

(1) Refer to Appendix F, Figure F-1 and repair faulty or damaged wiring harness A104J1 (1).

(2) Replace all damaged or defective components.

e. Install.

(1) Install connector (13), new gasket (12), electrical receptacle cover (11) and secure with four screws (10), flat washers (9), new lock washers (8), and nuts (7).

(2) Insert wiring harness A104J2 (6) into cable clamp (5).

NOTE

Position larger cable clamp on vehicle rear side of condenser assembly.

(3) Install two cable clamps (5) and secure with two flat washers (4), new lock washers (3), and screws (2).

(4) Refer to Appendix H, Figure H-2, Tables H-3 and H-4 and connect all single wire terminations for wiring harness A104J1 (1). Secure wiring harness A104J1 (1) with new tiedown straps approximately every three inches. Remove and discard tags.

(5) Follow on maintenance: refer to paragraph 4-11 and install side panel.

4-17. CONDENSER ELECTRICAL LEAD AND DIODE ASSEMBLIES MAINTENANCE.

This task covers:	Remove Inspect Test	Repair Install

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Crimping Tool, Appendix B, Section III, Item 3

Soldering Iron, Appendix B, Section III, Item 5

Material/Parts

Solder, Appendix E, Item 23

Tiedown Strap, Appendix E, Item 24

Tags, Appendix E, Item 27

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions (Continued)

Air Conditioner shut down, paragraph 2-5.

Condenser Side Panel removed, paragraph 4-11.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

Ensure that power has been disconnected before performing maintenance on electrical components.

NOTE

This procedure applies to electrical lead assembly from relay K1-A1 to relay K2-A2. The procedures for all other electrical lead assemblies and diode assemblies are similar.

a. Remove.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

NOTE

When removing diode assemblies note polarity.

(1) Refer to Appendix H, Figure H-2, Tables H-3 and H-4 to identify electrical lead assembly (Figure 4-11, 1) to be disconnected.

NOTE

Remove spring clip and protective cover from pressure switches as required.

(2) Remove two nuts (2), lock washers (3), flat washers (4), remove and discard tiedown straps, and tag and remove electrical lead assembly (1).

b. Inspect. Inspect electrical lead assembly (1) for cracked insulation, burns, loose or damaged terminals.

4-17. CONDENSER ELECTRICAL LEAD AND DIODE ASSEMBLIES MAINTENANCE. (Continued)

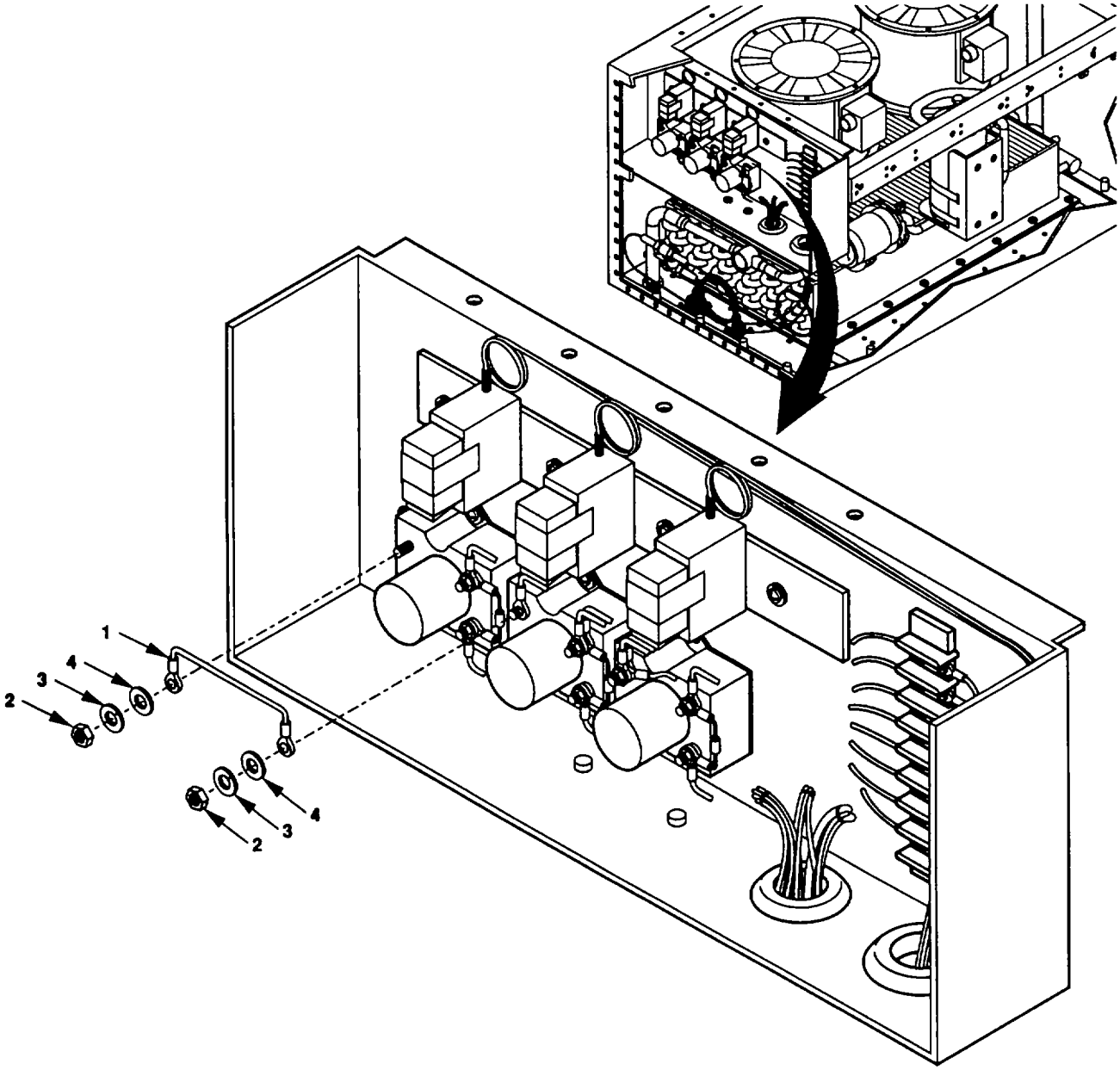


Figure 4-11. Electrical Lead Assembly Maintenance.

NOTE

Test continuity of diode assemblies in both directions. Replace diode assembly if both resistance readings are 0 ohms or infinity in both directions.

c. **Test**. Test continuity of electrical lead assembly (1).

4-17. CONDENSER ELECTRICAL LEAD AND DIODE ASSEMBLIES MAINTENANCE. (Continued)

NOTE
For repair of diode assembly refer to Appendix F, Figure F-4.

d. Repair. Refer to Appendix F, Figure F-3 and repair damaged or defective electrical lead assembly (1).

CAUTION
Refer to tags and observe polarity, noted during removal, when installing diode assembly. Failure to observe polarity may result in damage to equipment.

e. Install.

(1) Install electrical lead assembly (1) and secure with two flat washers (4), lock washers (3), and nuts (2). Secure electrical lead assembly (1) with new tiedown straps approximately every three inches, as required. Remove and discard tags.

(2) Follow on maintenance: refer to paragraph 4-11 and install side panel.

4-18. 50 AMP RELAY MAINTENANCE.

This task covers:	**Test** **Remove**	**Install**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Material/Parts

Tags, Appendix E, Item 27

Lock Washers, Appendix G, Item 14

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Side Panel removed, paragraph 4-11.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

Ensure that power has been disconnected before performing maintenance on electrical components.

a. Test.

(1) With air conditioner operating in HIGH COOL mode, paragraph 2-5, measure voltage across wire terminals X1 (Figure 4-12, 1) and X2 (2) and Al (3) and A2 (4) of relay K3 (5) for 28vdc. If either measurement is 0vdc, replace relay K3.

(2) When left condenser fan assembly is operating measure voltage across wire terminals X1 and X2 and A1 and A2 of relay K1 for 28vdc. If either measurement is 0vdc, replace relay K1.

(3) When right condenser fan assembly is operating measure voltage across wire terminals X1 and X2 and A1 and A2 of relay K2 for 28vdc. If either measurement is 0vdc, replace relay K2.

b. Remove.

(1) Shut down air conditioner.

4-18. 50 AMP RELAY MAINTENANCE. (Continued)

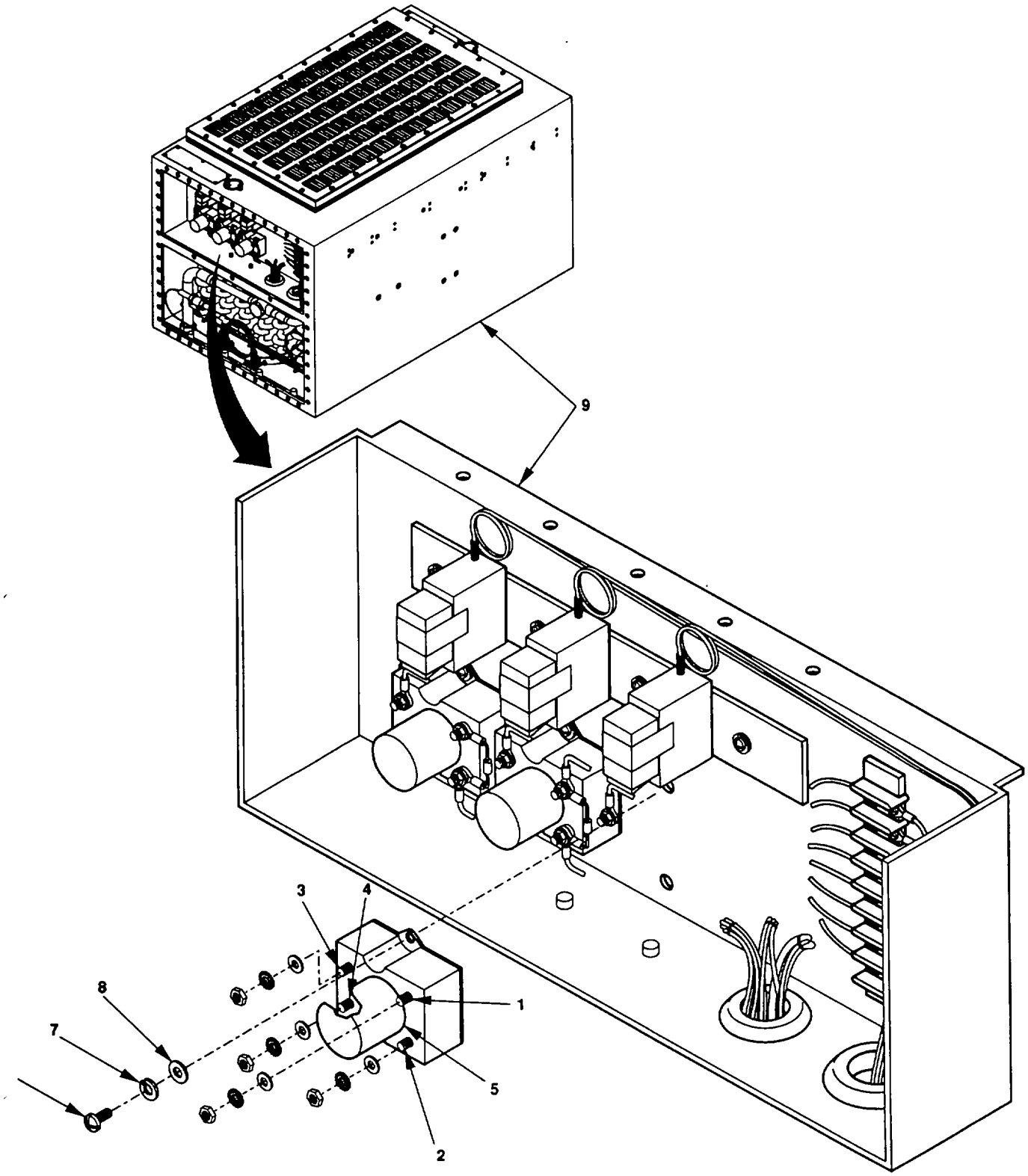


Figure 4-12. 50 Amp Relay Maintenance.

4-18. 50 AMP RELAY MAINTENANCE. (Continued)

(2) Refer to paragraph 4-17 and remove electrical lead assemblies and diode assemblies.

(3) Remove two screws (6), lock washers (7), flat washers (8), and relay K3 (5). Discard lock washers (7).

c. Install.

(1) Position relayK3 (5) in condenser assembly (9) and secure with two flat washers (8), new lock washers (7), and screws (6).

(2) Refer to paragraph 4-17 and install electrical leads and diode assemblies.

(3) Follow on maintenance: refer to paragraph 4-11 and install side panel.

4-19. CONDENSER TERMINAL BOARD MAINTENANCE

This task covers: **Remove** **Inspect** **Install**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Material/Parts

Lock Washers, Appendix G, Item 13

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Condenser Side Panel removed, paragraph 4-11.

Equipment Conditions (Continued)

Wiring Harness Electrical Leads disconnected, paragraph 4-16.

Electrical Lead Assemblies disconnected, paragraph 4-17.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

Ensure that power has been disconnected before performing maintenance on electrical components.

a. Remove. Remove two screws (Figure 4-13, 1), lock washers (2), flat washers (3), terminal board (4) and terminal board marker strip (5). Discard lock washers (2).

b. Inspect.

(1) Inspect terminal board (4) for cracks, broken or missing contacts, corroded or dirty contacts on the terminal board (4).

(2) Inspect terminal board marker strip (5) for missing markings or damage.

(3) Inspect all mounting hardware for damage.

(4) Replace all defective components.

c. Install.

(1) Position terminal board marker strip (5) and terminal board (4) in condenser assembly (6) and secure with two flat washers (3), new lock washers (2), and screws (1).

4-19. CONDENSER TERMINAL BOARD MAINTENANCE. (Continued)

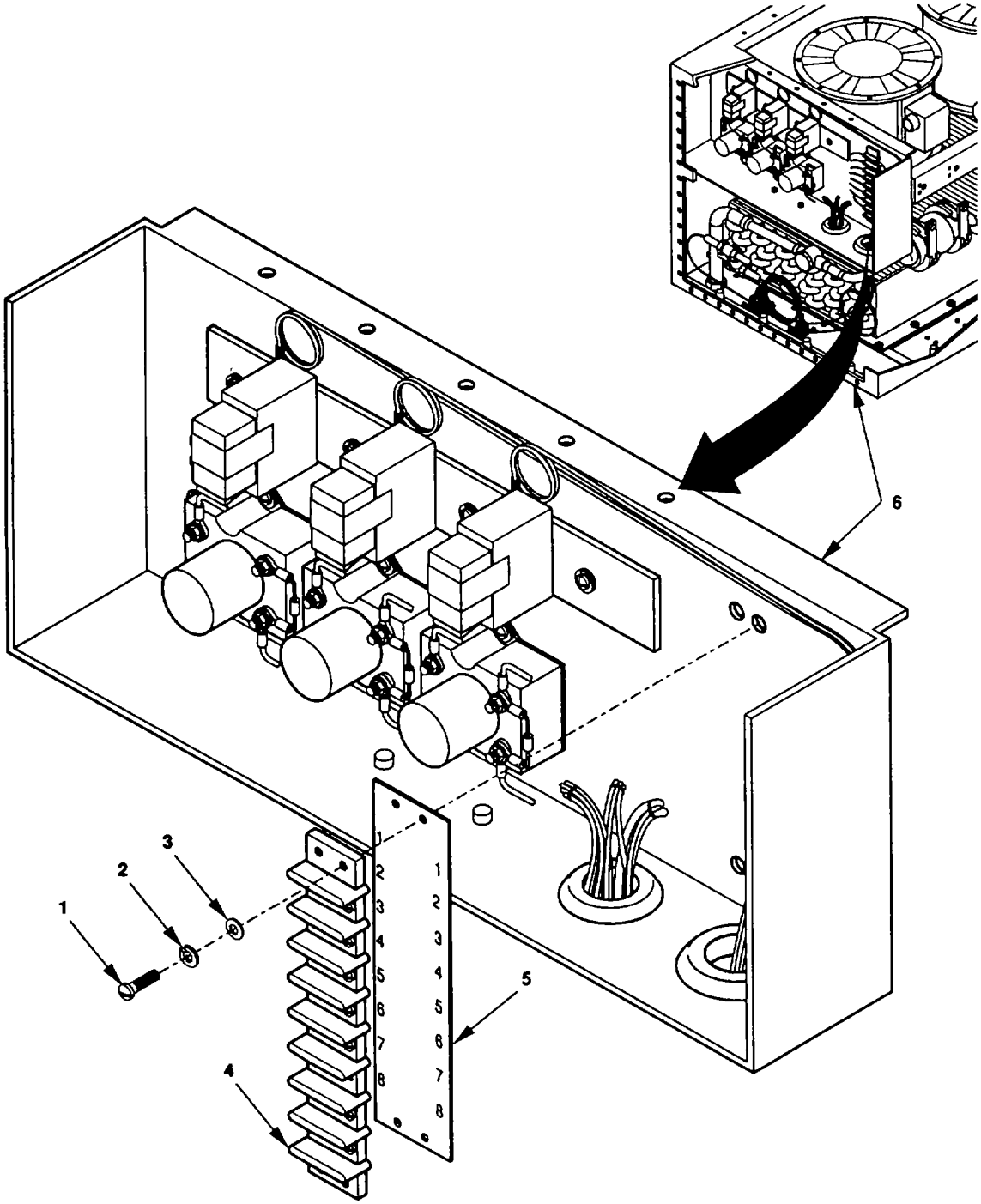


Figure 4-13. Terminal Board Maintenance.

(2) Follow on maintenance:

(a) Refer to paragraph 4-17 and connect electrical lead assemblies as required.

4-19. CONDENSER TERMINAL BOARD MAINTENANCE. (Continued)

(b) Refer to paragraph 4-16 and connect wiring harness electrical leads as required.
(c) Refer to paragraph 4-11 and install side panel.

4-20. CONTROL MODULE TOP PANEL MAINTENANCE

This task covers:	Remove Inspect	Install

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Material/Parts

Lock Washers, Appendix G, Item 14

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

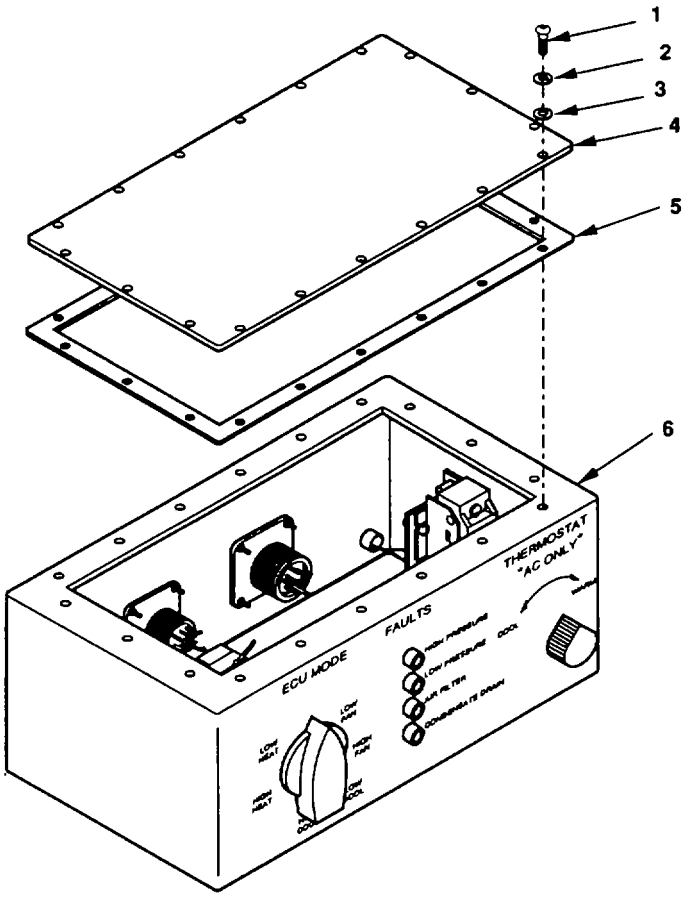


Figure 4-14. Control Module Top Panel Maintenance.

4-20. CONTROL MODULE TOP PANEL MAINTENANCE. (Continued)

a. Remove. Remove 20 screws (Figure 4-14, 1), lock washers (2), flat washers (3), and control module top panel (4). Discard lock washers (2).

b. Inspect.

1. Inspect control module top panel (4) for cracks, breaks, holes, and damaged or missing EMI/RFI gasket material (5).
2. Inspect all mounting hardware for damage.
3. Replace all defective components.

c. Install. Position control module top panel (4) on control module (6) and secure with 20 flat washers (3), new lock washers (2), and screws (1).

4-21. MODE SELECTOR SWITCH (S1) MAINTENANCE

This task covers:	**Remove** **Test**	**Inspect** **Install**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Materials/Parts

Tags, Appendix E, Item 27

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Power disconnected, refer to applicable technical manual.

Equipment Conditions (Continued)

Control Module Top Panel removed, paragraph 4-20.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

a. Remove.

(1) Remove retaining screw (Figure 4-15, 1) and selector knob (2).

(2) Remove two switch mounting screws (3) and mode selector switch (4).

(3) Tag and disconnect all electrical leads.

b. Test. Test contacts on mode selector switch (4) for closure in accordance with table 4-5.

4-21. MODE SELECTOR SWITCH (S1) MAINTENANCE. (Continued)

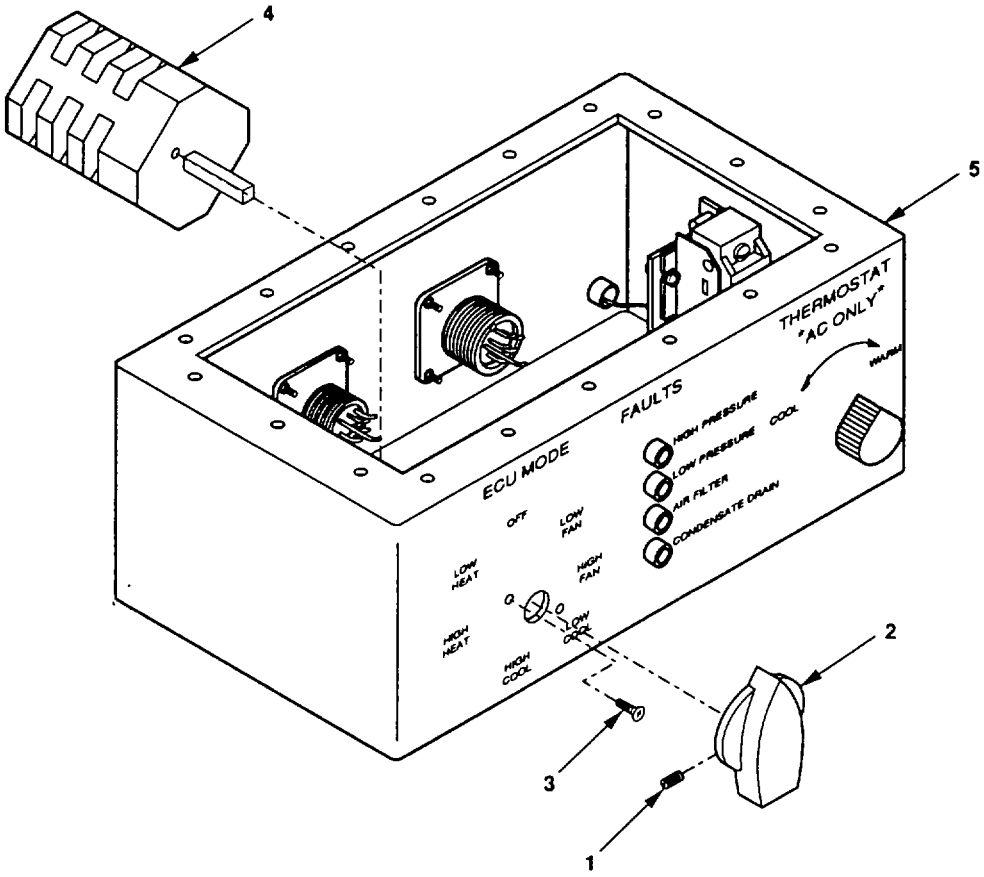


Figure 4-15. Mode Selector Switch.

Table 4-5. Mode Selector Switch (S1) Closed Contacts.

SELECTOR SWITCH (S1) POSITION	SWITCH FUNCTION	SWITCH CONTACTS CLOSED				
1	HEAT HI	1-2		5-6	7-8	
2	HEAT LO	1-2		5-6		11-12
3	OFF					
4	FAN LO			5-6		11-12
5	FAN HI			5-6	7-8	
6	COOL LO		3-4	5-6		11-12
7	COOL HI		3-4	5-6	7-8	

c. Inspect. Inspect mode selector switch (4) for cracks, corrosion, and other physical damage.

4-21. MODE SELECTOR SWITCH (S1) MAINTENANCE. (Continued)

d. Install.

(1) Refer to tags and install electrical leads on mode selector switch (4). Remove and discard tags.

(2) Position mode selector switch assembly (4) in control module housing (5) with terminal number 1 on top and secure with two screws (3).

(3) Install selector knob (2) on mode selector switch (4). Rotate shaft of mode selector switch (4) fully counterclockwise and position knob (2) pointing at the HIGH HEAT position. Secure knob (2) with retaining screw (1).

(4) Turn mode selector switch (4) to the OFF position.

(5) Follow on maintenance:

(a) Refer to applicable technical manual and connect power.
(b) Refer to paragraph 4-20 and install control module top panel.

4-22. LIGHT EMITTING DIODE (LED) ASSEMBLY MAINTENANCE

This task covers: **Remove** **Repair** **Test** **Install**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Soldering Iron, Appendix B, Section III, Item 5

Material/Parts

Insulation Sleeving, Appendix E, Item 14

Insulation Sleeving, Appendix E, Item 15

Solder, Appendix E, Item 23

Tags, Appendix E, Item 27

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Equipment Conditions (Continued)

Power disconnected, refer to applicable technical manual.

Control Module Top Panel removed, paragraph 4-20.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

4-22. LIGHT EMITTING DIODE (LED) ASSEMBLY MAINTENANCE. (Continued)

NOTE

This procedure applies to LED assembly DS4, drain indicator light. The procedures for LED assemblies DS1 through DS3 are similar.

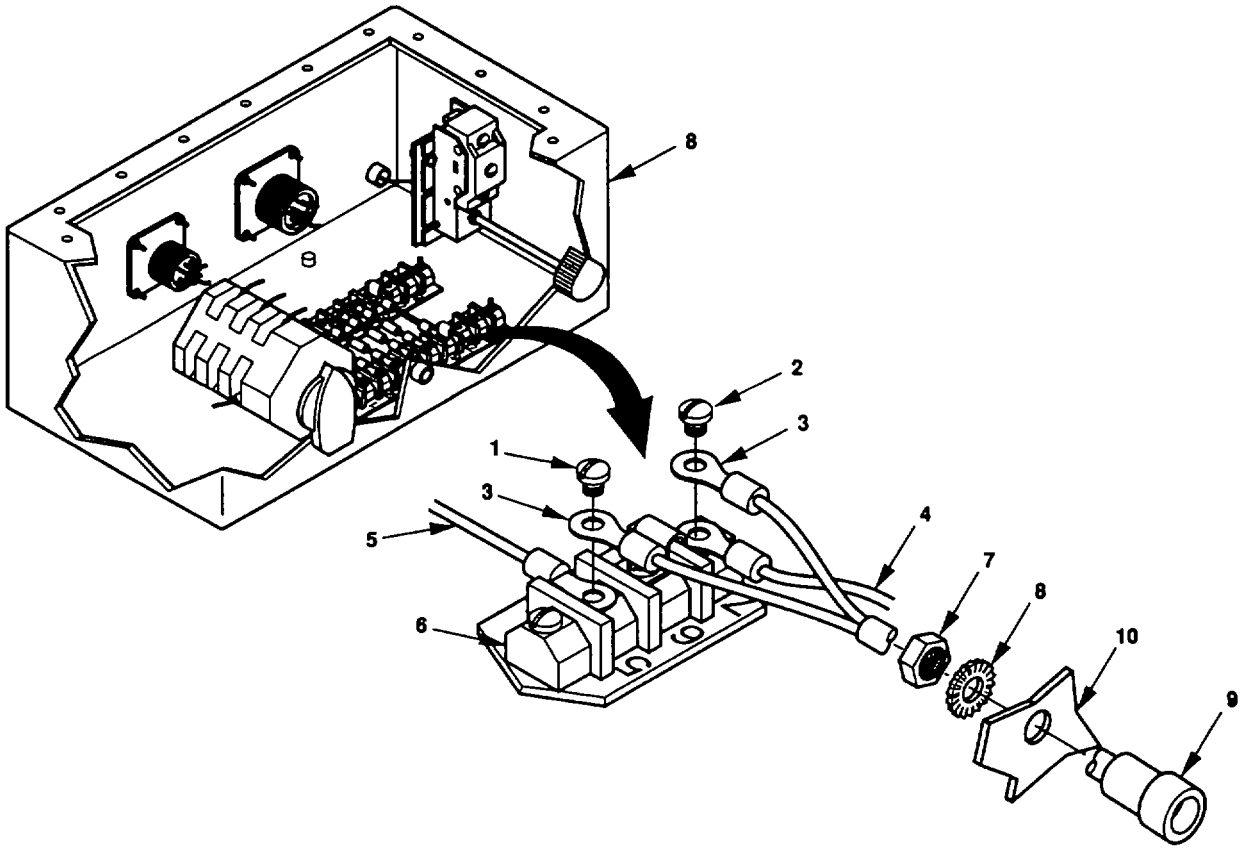


Figure 4-16. LED Assembly.

a. Remove.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

(1) Remove screw (Figure 4-16, 1) from TB2-5 and screw (2) from TB2-7.

4-22. LIGHT EMITTING DIODE (LED) ASSEMBLY MAINTENANCE. (Continued)

NOTE

- For LED assemblies DS-1 - DS-3, refer to wiring diagram H-1 to disconnect electrical leads.
- Observe polarity of LED assembly.

(2) Tag and disconnect two electrical leads (3), wiring harness lead (4), and resistor lead (5) from terminal board, TB2, (6).

(3) Remove nut (7), lock washer (8), and LED assembly (9).

b. Test. Test LED assembly (9) for continuity.

c. Repair.

(1) Inspect casing of LED assembly (9) for cracks, corrosion, and broken, missing, or loosely mounted bulb.

(2) Inspect electrical leads (3) for burns, damaged or missing terminals, and cracked or damaged insulation.

(3) Inspect mounting hardware for damage.

(4) If mounting hardware or casing of LED assembly (9) is cracked, corroded, or has a broken, missing, or loosely mounted bulb, replace LED assembly (9).

(5) If electrical leads (3) are damaged, refer to Appendix F, Figure F-5 and repair LED assembly (9).

d. Install.

(1) Install LED assembly (9) in control module housing (10) and secure with lock washer (8) and nut (7).

CAUTION

Refer to tags and observe polarity, noted during removal, when installing LED assembly. Failure to observe polarity may result in damage to equipment.

(2) Refer to tags and secure resistor lead (5), wiring harness lead (4), and electrical leads (3) to terminal board, TB2, (6) with screws (1 and 2). Remove and discard tags.

(3) Follow on maintenance:

(a) Refer to applicable technical manual and connect power.

(b) Refer to paragraph 4-20 and install control module top panel.

4-23. THERMOSTAT MAINTENANCE

This task covers: **Remove** **Inspect** **Test** **Install**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Material/Parts

Conductive RTV Silicone Caulking, Appendix E, Item 8

RFI Rotary Shaft Seal Boot, Appendix G, Item 5

Lock Washers, Appendix G, Item 11 (Thermostat)

Lock Washers, Appendix G, Item 14 (Clamps)

Refer t6 TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Power disconnected, refer to applicable technical manual.

Control Module Top Panel removed, paragraph 4-20.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

a. Remove.

(1) Loosen two set screws (Figure 4-17, 1) and remove knob (2).
(2) Remove two screws (3), lock washers (4), flat washers (5), and cushion clamps (6). Remove thermostat sensing bulb (7) from cushion clamps (6). Discard lock washers (4).

CAUTION

Use care when removing conductive RTV silicone caulking from tube in control module housing. Damage to thermostat sensor capillary tube may result.

(3) Remove conductive RTV silicone caulking from tube (8) in control module housing (9).
(4) Remove and discard RFI rotary shaft seal boot (10).

CAUTION

Use care when removing thermostat sensor from control module housing. Damage to thermostat capillary tube and sensor may result.

(5) Remove two screws (11), thermostat (12), and thermostat bracket (13).
(6) Remove EMI shaft seal locking nut (14).

4-23. THERMOSTAT MAINTENANCE. (Continued)

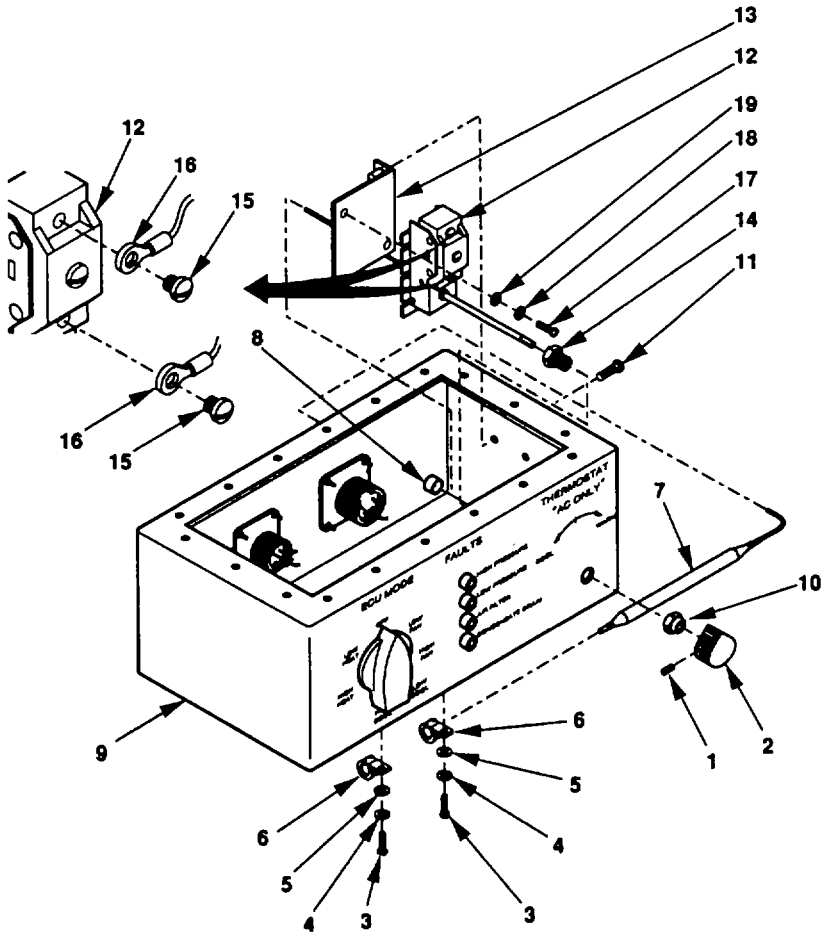


Figure 4-17. Thermostat Maintenance

(7) Remove two screws (15) and tag and disconnect two electrical leads (16).

(8) Remove two screws (17), lock washers (18), flat washers (19), and thermostat (12) from thermostat bracket (13). Discard lock washers (18).

NOTE

Prior to performing test, position thermostat with handle down.

b. Test. Rotate handle of thermostat (12) fully counterclockwise. Test continuity between upper and lower contacts. Replace faulty thermostat (12).

4-23. THERMOSTAT MAINTENANCE. (Continued)

c. Inspect.

CAUTION

Use care when handling thermostat sensor and capillary tube. Damage to thermostat sensor and capillary tube may result.

(1) Inspect thermostat (12) for damaged or crimped capillary tube.

(2) Inspect thermostat (12) for burns, cracks, and damage.

(3) Inspect thermostat bracket (13) and mounting hardware for damage.

(4) Replace all damaged or defective components.

d. Install.

(1) Position thermostat (12) on thermostat bracket (13) and secure with two flat washers (19), new lock washers (18), and screws (17).

(2) Refer to tags and connect two electrical leads (16) to thermostat (12) and secure with two screws (15). Remove and discard tags.

(3) Install EMI shaft seal locking nut (14) in control module housing (9).

CAUTION

Use care when installing thermostat sensor and capillary tube through tube in control module housing. Damage to thermostat sensor and capillary tube may result.

(4) Install thermostat (12) into control module housing (9). Insert thermostat sensing bulb (7) through tube (8).

(5) Secure thermostat bracket (13) to control module housing (9) using two screws (11).

(6) Install new RFI rotary shaft seal boot (10).

(7) Install thermostat sensing bulb (7) in two cushion clamps (6) and secure to control module housing (9) using two flat washers (5), new lock washers (4), and screws (3).

(8) Apply adhesive into tube (8).

(9) Install knob (2) on shaft of thermostat (12) and secure with two set screws (1).

(10) Follow on maintenance:

(a) Refer to applicable technical manual and connect power.

(b) Refer to paragraph 4-20 and install control module top panel.

4-24. CONTROL MODULE WIRING HARNESS MAINTENANCE.

This task covers:	Remove	Repair
	Inspect	Install
	Test	

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Crimping Tool, Terminal, Appendix B, Section III, Item 3

Material/Parts
Tiedown Strap, Appendix E, Item 26

Tags, Appendix E, Item 27

Gasket, Appendix G, Item 9 (A105J1)

Gasket, Appendix G, Item 10 (A105J2)

Lock Washers, Appendix G, Item 12 (AlO5J1)

Lock Washers, Appendix G, Item 13 (A105J2)
Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.
Power disconnected, refer to applicable technical manual.

Control Module Top Panel removed, paragraph 4-20.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

Ensure that power has been disconnected before performing maintenance on electrical components.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

NOTE

This procedure applies to wiring harness A105J2. The procedures for wiring harness A105J1 are similar.

a. Remove.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

(1) Refer to Appendix H, Figure H-1, Tables H-1 and H-2, and tag and disconnect all single wire terminations for wiring harness A105J2 (Figure 4-18, 1).

(2) Remove four nuts (2), lock washers (3), flat washers (4), screws (5), connector (6) of wiring harness A105J2 (1), and gasket (7). Discard lock washers (3) and gasket (7).

4-24. CONTROL MODULE WIRING HARNESS MAINTENANCE. (Continued)

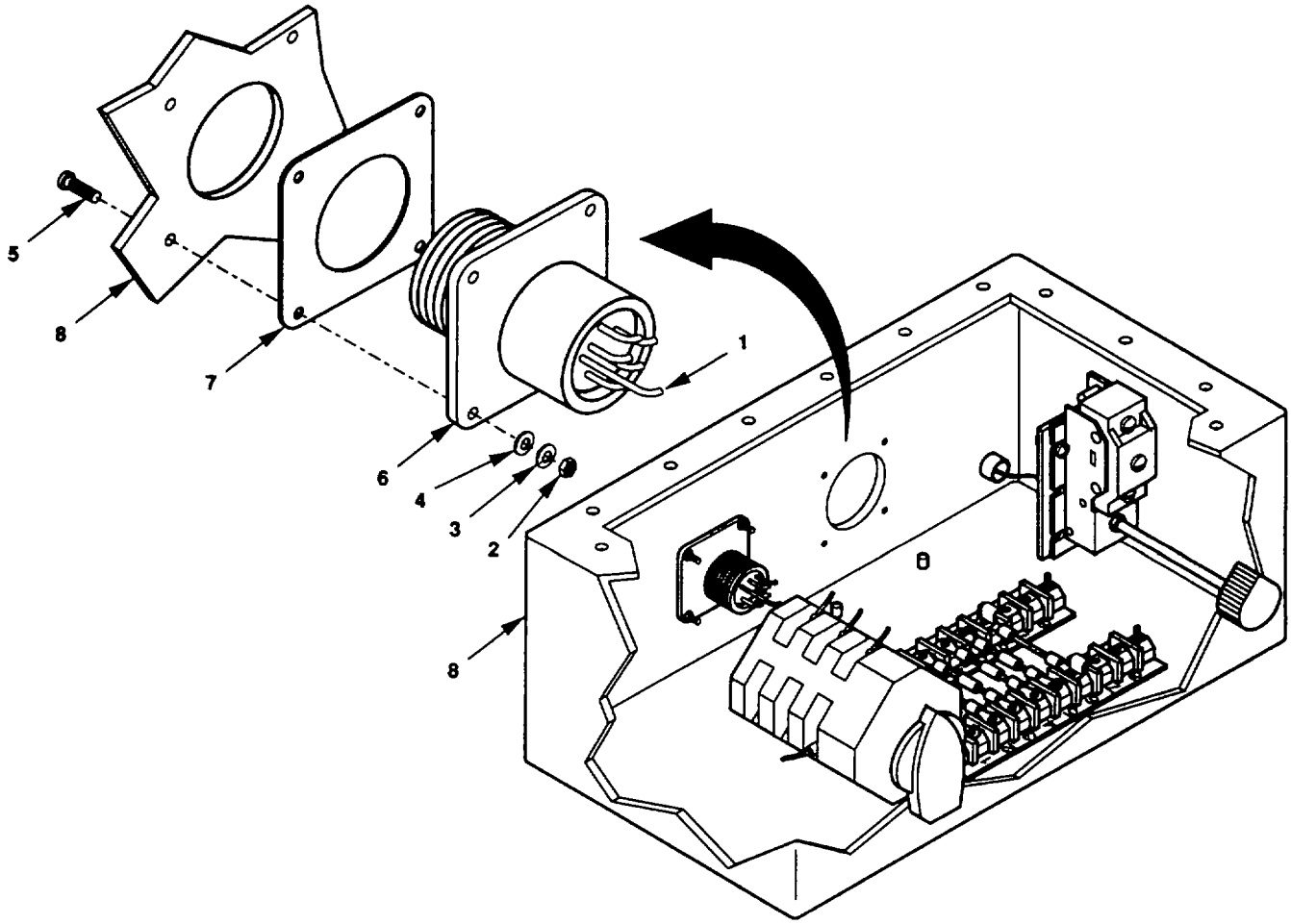


Figure 4-18. Control Module Assembly Wiring Harness Maintenance.

b. Inspect.

(1) Inspect for loose wires in connector (6).

(2) Inspect wiring harness (1) wires for cracked insulation, damaged, or missing connectors and terminals, burns, or fraying.

(3) Inspect all mounting hardware for damage.

(4) Replace all damaged or defective components.

c. Test. Refer to Appendix H, Figure H-1, Tables H-1 and H-2 and test continuity of each wire run for wiring harness A105J2 (1).

NOTE

Refer to Appendix F, Figure F-6 for control module wiring harness A105Jl.

d. Repair. Refer to Appendix F, Figure F-7 and repair faulty or damaged wiring harness A105J2 (1).

4-24. CONTROL MODULE WIRING HARNESS MAINTENANCE. (Continued)

e. Install.

(1) Install new gasket (7) and connector (6) in control module (8) and secure with four screws (5), flat washers (4), new lock washers (3), and nuts (2).

(2) Refer to Appendix H, Figure H-I, Tables H-1 and H-2 and connect all single wire terminations for wiring harness A105J2 (1). Remove and discard tags.

(3) Follow on maintenance:

(a) Refer to applicable technical manual and connect power.

(b) Refer to paragraph 4-20 and install control module top panel.

4-25. CONTROL MODULE ELECTRICAL LEAD, DIODE, AND RESISTOR ASSEMBLIES MAINTENANCE.

This task covers:	**Remove**	**Repair**
	Inspect	**Install**
	Test	

INITIAL SETUP:

Tools
Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Soldering Iron, Appendix B, Section III, Item 5

Material/Parts

Solder, Appendix E, Item 23

Tags, Appendix E, Item 27

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Power disconnected, refer to applicable technical manual.

Control Module Top Panel removed, paragraph 4-20.

Equipment Conditions (Continued)
Control Module Wiring Harnesses A105J1 and A105J2 disconnected as required, paragraph 4-24.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

Ensure that power has been disconnected before performing maintenance on electrical components.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

4-25. CONTROL MODULE ELECTRICAL LEAD, DIODE, AND RESISTOR ASSEMBLIES MAINTENANCE. (Continued)

NOTE

This procedure applies to resistor assembly from TB2-5 to TB3-5. The procedures for all other resistor, diode, and electrical lead assemblies are similar.

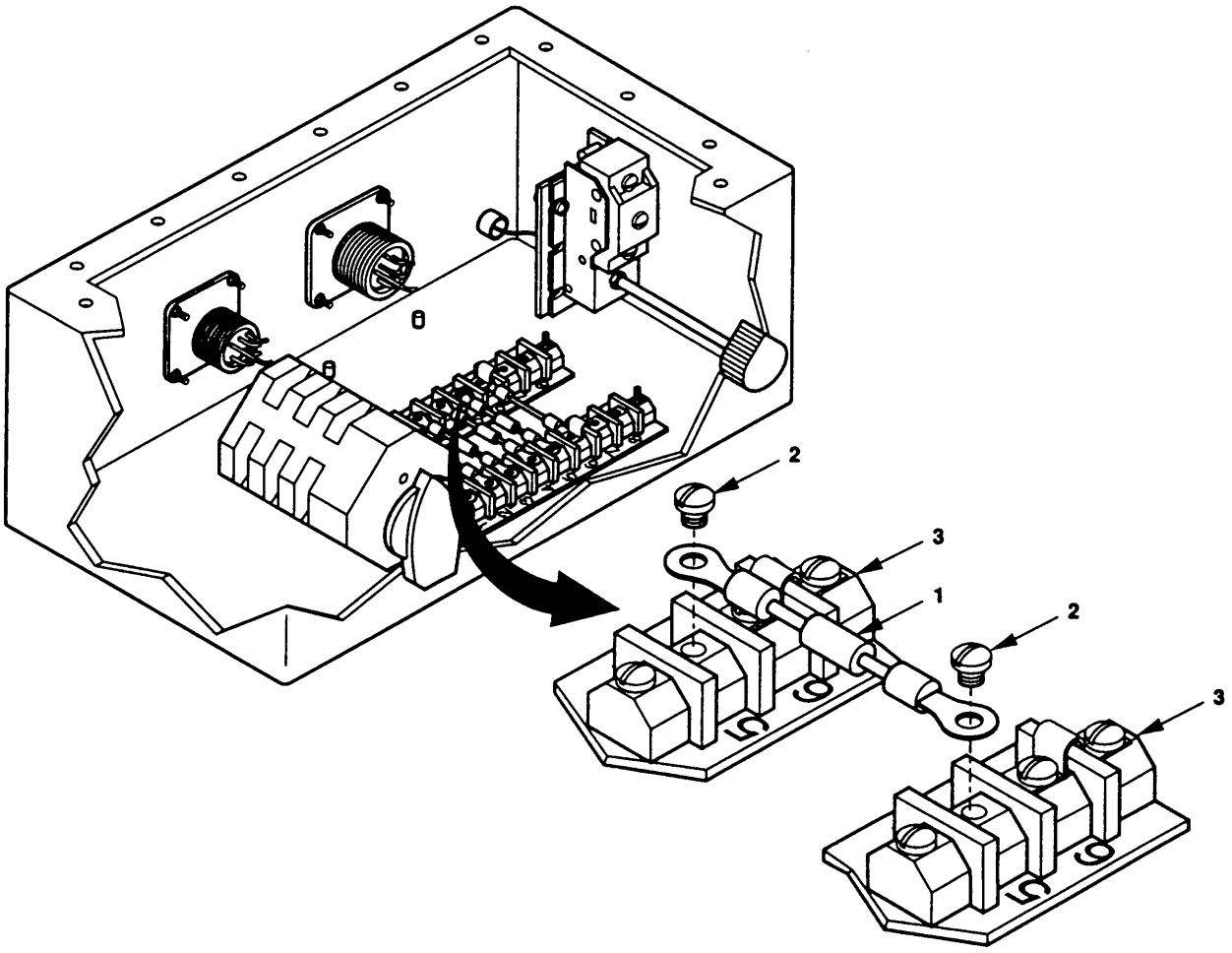


Figure 4-19. Resistor Assembly Maintenance

4-25. CONTROL MODULE ELECTRICAL LEAD, DIODE, AND RESISTOR ASSEMBLIES MAINTENANCE. (Continued)

a. Remove.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

NOTE

When removing diode assembly, note polarity.

(1) Refer to Appendix H. Figure H-1, Tables H-1 and H-2 to identify resistor assembly (Figure 4-19, 1) to be disconnected.

(2) Remove two screws (2) and tag and remove resistor assembly (1).

b. Inspect. Inspect resistor assembly (1) for cracks, burns, loose, or damaged terminals.

NOTE

- Test continuity of diode assemblies in both directions. Replace diode assembly if both resistance readings are 0 ohms or infinity in both directions.
- Test continuity of electrical lead assembly.

c. Test. Measure resistance of resistor assembly (1). If resistance is not approximately 750 ohms, replace resistor assembly (1).

NOTE

Refer to Appendix F. Figure F-3 for electrical leads and Figure F-4 for diode assembly.

d. Repair. Refer to Appendix F. Figure F-8 and repair damaged resistor assembly (1).

CAUTION

Refer to tags and observe polarity, noted during removal, when installing diode assembly. Failure to observe polarity may result in damage to equipment.

e. Install.

(1) Position resistor assembly (1) on terminal boards (3) and secure with two screws (2). Remove and discard tags.
(2) Follow on maintenance:
    (a) Refer to paragraph 4-24 and install control module wiring harnesses A105J1 and A105J2 as required.
    (b) Refer to paragraph 4-20 and install control module top panel.
    (c) Refer to applicable technical manual and connect power.

4-26. CONTROL MODULE BUS CONNECTOR AND SINGLE ROW TERMINAL BOARD MAINTENANCE

This task covers: **Remove** **Install** **Inspect**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Material/Parts

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Equipment Conditions (Continued)

Control Module Wiring Harness Electrical Leads disconnected as required, paragraph 4-24.

Control Module Electrical Lead, Diode Assembly, and Resistor Assemblies removed or disconnected, as required, paragraph 4-25.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

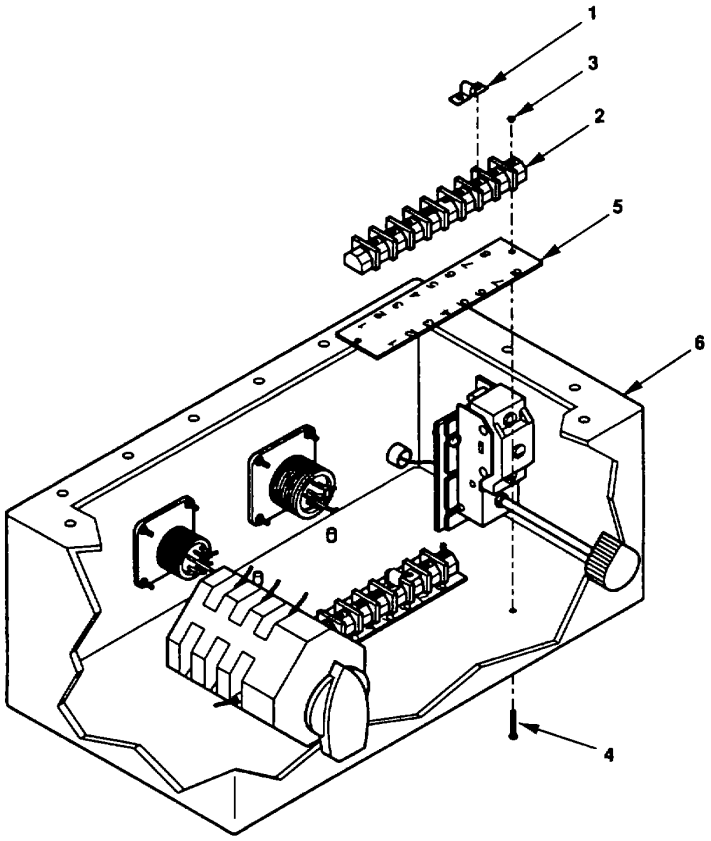


Figure 4-20. Bus Connector and Single Row Terminal Board Maintenance.

4-26. CONTROL MODULE SINGLE ROW TERMINAL BOARD MAINTENANCE. (Continued)

a. Remove.

(1) Remove bus connector (Figure 4-20, 1) from single row terminal board (2).
(2) Remove two nuts (3), screws (4), single row terminal board (2), and terminal board marker strip (5).

b. Inspect.

(1) Inspect bus connector (1) for cracks, bends, burns, or damage.
(2) Inspect single row terminal board (2) for cracks, damage, and broken, dirty, or missing contacts.
(3) Inspect terminal board marker strip (5) for damage or missing numbers.
(4) Inspect all mounting hardware for damage.
(5) Replace all damaged or defective components.

c. Install.

(1) Position terminal board marker strip (5) and single row terminal board (4)in control module housing (6) and secure with two screws (4) and nuts (3).
(2) Position bus connector (1) on single row terminal board (2).
(3) Follow on maintenance:

(a) Refer to paragraph 4-25 and connect or install control module resistor assemblies, diode assembly, and electrical lead assemblies as required.
(b) Refer to paragraph 4-24 and connect control module wiring harness electrical leads as required.

4-27. CONTROL MODULE HOUSING MAINTENANCE

This task covers:	**Remove** **Repair**	**Install**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Rivnut Installation Tool, Appendix B, Section III, Item 6

Material/Parts

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Mode Selector Switch removed, paragraph 4-21.

Equipment Conditions (Continued)

LED Assemblies removed, paragraph 4-22.

Thermostat removed, paragraph 4-23.

Control Module Wiring Harnesses removed, paragraph 4-24.

Bus Connectors and Single Row Terminal Boards removed, paragraph 4-26.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

4-27. CONTROL MODULE HOUSING MAINTENANCE. (Continued)

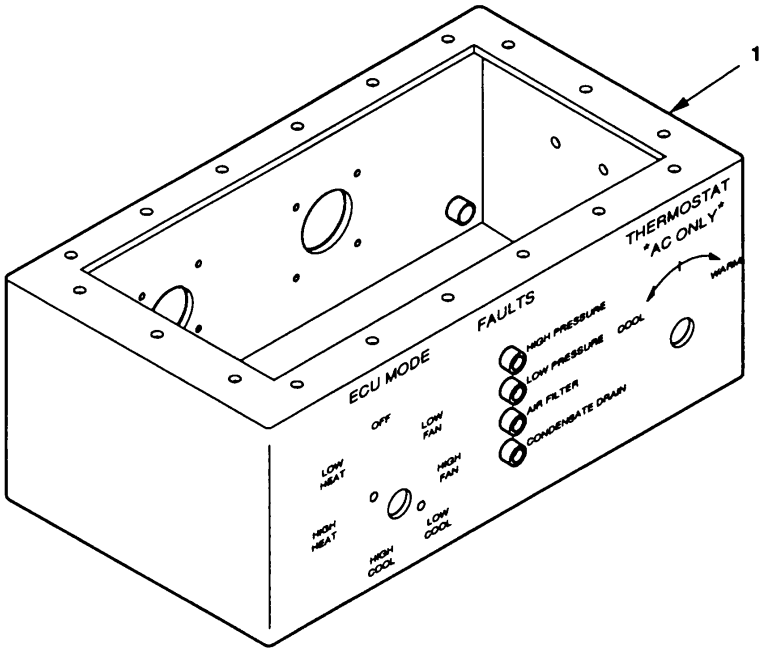


Figure 4-21. Control Module Housing Maintenance.

a. Remove. Placing the control module housing (Figure 4-21, 1) in the equipment conditions specified above will remove it from the air conditioner.

b. Repair.

(1) Inspect control module housing (1) for corrosion, cracks, bends, breaks, holes, missing blind nuts, or severe damage.

(2) Refer to TM 5-625 and TM 5-745 for sheet metal repair procedures and repair control module housing assembly (1).

(3) Replace damaged or missing blind nuts in control module housing (1).

(4) Replace control module housing (1) if damage is severe enough to prevent repair which would protect internal components from environmental damage or permit proper EMI shielding.

c. Install .

(1) Installing all the components removed as part of the equipment condition will install the control module housing (1).

(2) Follow on maintenance:

(a) Refer to paragraph 4-26 and install single row terminal boards and bus connectors.

(b) Refer to paragraph 4-24 and install control module wiring harnesses.

(c) Refer to paragraph 4-23 and install thermostat.

(d) Refer to paragraph 4-22 and install LED assemblies.

4-27. CONTROL MODULE HOUSING MAINTENANCE. (Continued)

(e) Refer to paragraph 4-21 and install mode selector switch.

INSERT SUBTITLE HERE!

This task covers: **Remove** **Install**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B. Section III, Item 1

Material/Parts

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Return Air Filter removed, paragraph 3-5.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

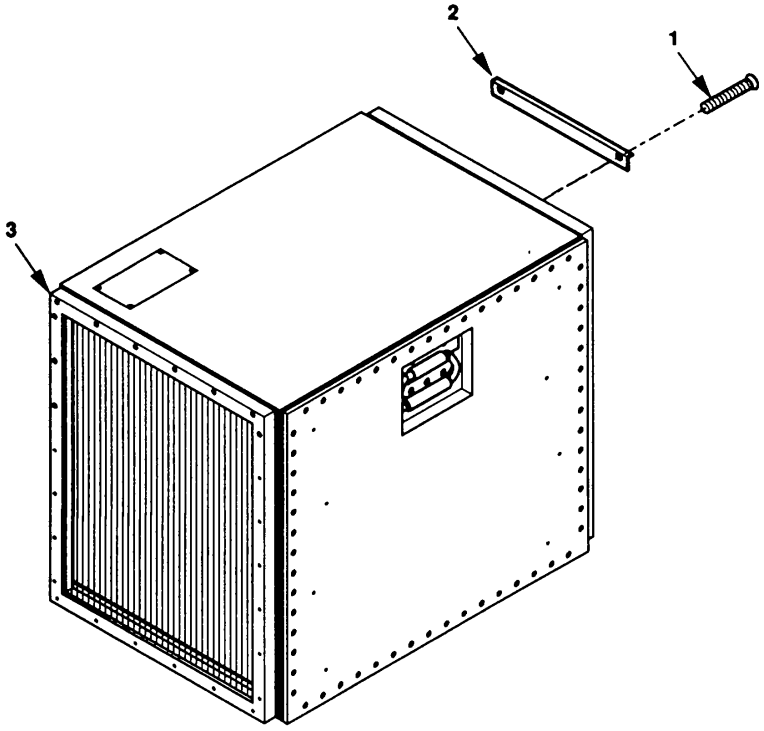


Figure 4-22. Return Air Filter Mounting Bracket Replacement.

a. Remove. Remove two screws (Figure 4-22, 1) and return air filter mounting bracket (2) -

b. Install. .
(1) Position return air filter mounting bracket (2) on evaporator assembly (3) and secure with two screws (1).
(2) Follow on maintenance: refer to paragraph 3-S and install return air filter.

4-29. FRONT (AIR INLET) EVAPORATOR EMI/RFI VENTILATION PANEL MAINTENANCE

This task covers:	Remove	Inspect
	Service	Install

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Material/Parts
Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Equipment Conditions (Continued)

Return Air Filter Mounting Brackets removed, paragraph 4-28.

General Safety Instructions
Do not work on equipment without following standard shop safety precautions.

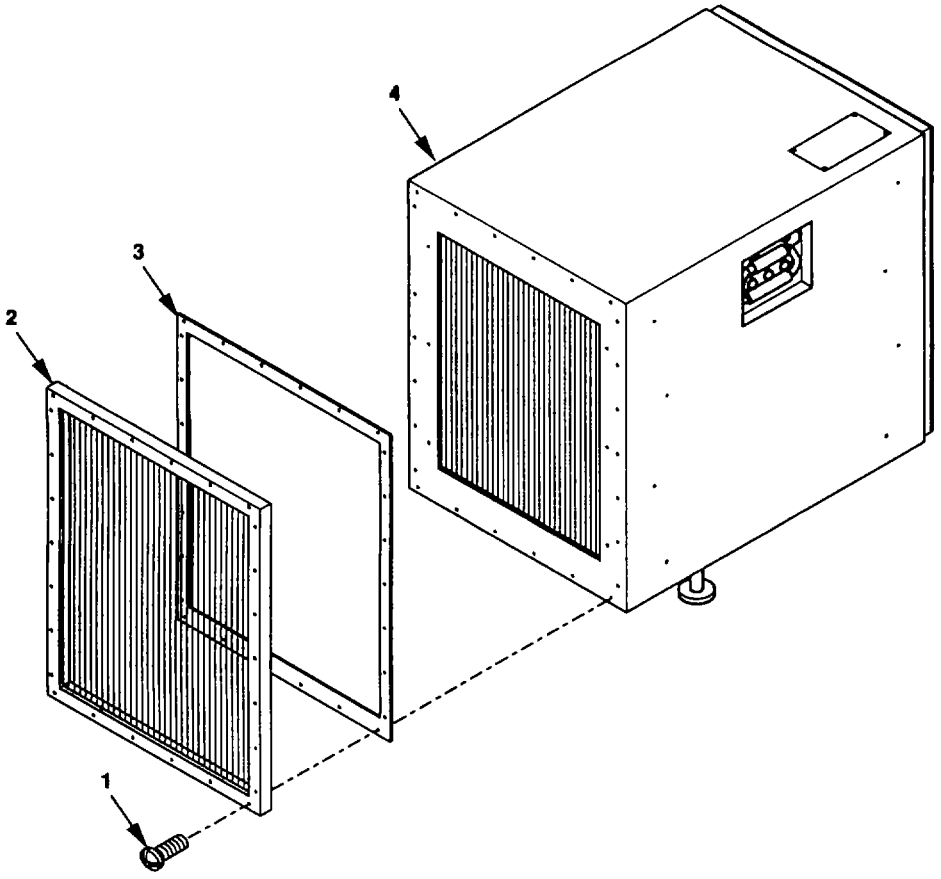


Figure 4-23. Evaporator EMI/RFI Ventilation Panels.

a. Remove. Remove 22 screws (Figure 4-23, 1) and evaporator EMI/RFI ventilation panel (2) .

b Service. Rinse EMI/RFI ventilation panel (2) with clean water.

4-29. FRONT (AIR INLET) EVAPORATOR EMI/RFI VENTILATION PANEL MAINTENANCE. (Continued)

c. Inspect.

(1) Inspect evaporator EMI/RFI ventilation panel (2) for hole(s) equivalent to two "honey combs" or larger.

(2) Inspect evaporator EMI/RFI ventilation panel (2) for deteriorated, damaged, or missing EMI gasket material (3).

(3) Inspect all mounting hardware for damage.

(4) Replace all damaged or defective components.

d. Install.

(1) Position evaporator EMI/RFI ventilation panel (2) on evaporator assembly (4) and secure with 22 screws (1).

(2) Follow on maintenance: refer to paragraph 4-28 and install air filter mounting brackets.

4-30. DIFFERENTIAL PRESSURE SWITCH TEST

This task covers: Test Only

INITIAL SETUP:

Tools
Tool Kit, Service Refrigeration Unit,
Appendix B, Section III, Item 1

Equipment Conditions
Air Conditioner running, paragraph 2-5.

Front (Air Intake) EMI/RFI Ventilation
Panel removed, paragraph 4-29.

General Safety Instructions
Do not work on equipment without following standard shop safety procedures.

a. Test. Cover filter end of tube (Figure 4-24, 1) and ensure air filter warning light (on control module) turns on. If air filter warning light does not turn on or remains on after uncovering end of tube (1) notify direct support maintenance.

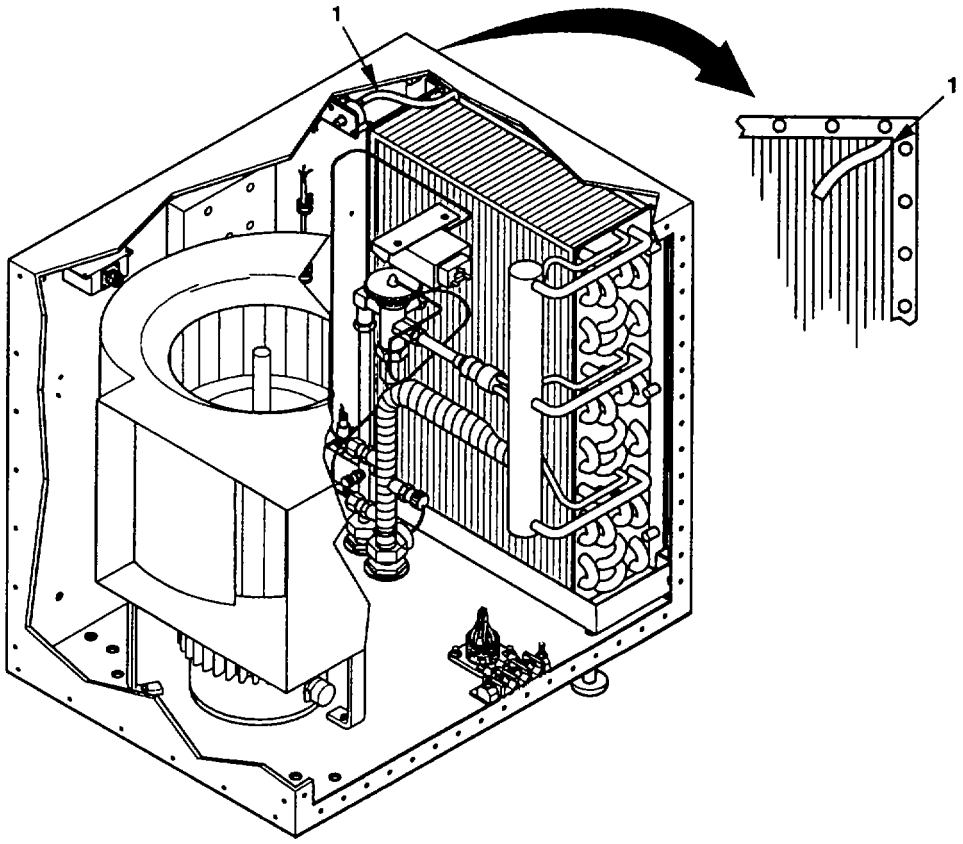


Figure 4-24. Differential Pressure Switch Maintenance.

SECTION VII. PREPARATION FOR STORAGE OR SHIPMENT

4-31. SPECIAL INSTRUCTIONS FOR ADMINISTRATIVE STORAGE.

Placement of equipment in administrative storage should be for short periods of time when a shortage of maintenance effort exists. Items should be in mission readiness within 24 hours or within the time factors as determined by the directing authority. During the storage period, appropriate maintenance records will be kept.

Before placing the equipment in administrative storage, current preventive maintenance checks and services should be completed, shortcomings and deficiencies should be corrected, and all modification work orders (MWOs) should be applied.

Storage site selection. Inside storage is preferred for items selected for administrative storage. If inside storage is not available, trucks, vans, convex containers, and other containers may be used.

Preservation procedures and marking requirements for storage and shipment are given in paragraph 5-32.

CHAPTER 5

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

INDEX

SECTION I. REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

5-1. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to Modified Table of Organization and Equipment (MTOE), Common Table of Allowances (CTA) CTA 50-970, or CTA 8-100, applicable to your unit.

5-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

Special tools, TMDE, and support equipment are listed in TM 9-4120-408-24P, Repair Parts and Special Tools List (RPSTL) for the Air Conditioner: Split Pack, 30,000 BTUH, 28VDC covering unit, direct support, and general support maintenance, or the Maintenance Allocation Chart (MAC), Appendix B of the manual.

5-3. REPAIR PARTS.

Refer to Mandatory Replacement Parts, Appendix G, for parts that must be stocked for proper repair of the air conditioner. Repair parts are listed and illustrated in TM 9-4120-408-24P covering unit, direct support, and general support maintenance of this equipment.

SECTION II. DIRECT SUPPORT TROUBLESHOOTING

5-4. TROUBLESHOOTING.

The malfunction index lists malfunctions that may be observed by you the direct support maintainer. Use the malfunction index to locate faults listed in Table 5-1. Table 5-1 lists common malfunctions that you may find with your equipment. After locating the listed malfunction, perform the test/inspections and corrective actions in the order listed in Table 5-1. The malfunction index and Table 5-1 cannot list all the malfunctions that may occur, all the tests and inspections needed to find the fault, or all the corrective actions needed to correct the fault. If the equipment malfunction is not listed or actions listed do not correct the fault, notify your supervisor.

DIRECT SUPPORT MALFUNCTION INDEX

Table 5-1. Direct Support Troubleshooting Table.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

1. High Pressure Warning Light on Control Module is Lit.

Test high pressure cut out switch (paragraph 5-10).

Replace defective high pressure cut out switch (paragraph 5-10).

2. Low Pressure Warning Light on Control Nodule Is Lit.

Step 1. Check refrigerant charge.

If refrigerant charge is low, charge system (paragraph 5-5).

Step 2. Inspect liquid line receiver for damaged or missing fusible plug (paragraph 5-13).

Replace damaged or missing fusible plug (paragraph 5-13).

Step 3. Inspect condenser assembly for leaks and damaged liquid/moisture indicator (paragraphs 5-10, 5-11, 5-12, 5-13, 5-14, and 5-15).

Replace damaged or leaking components (paragraph 5-10, 5-11, 5-12, 5-13, 5-14, and 5-15).

Step 4. Test evaporator low pressure cut out switch (paragraph 5-24).

Replace defective low pressure cut out switch (paragraph 5-24).

Step 5. Test thermoexpansion valve (TEV) (paragraph 5-26).

a. Adjust TEV (paragraph 5-26).

b. Replace defective TEV (paragraph 5-26).

Step 6. Inspect evaporator assembly for leaks or damage (paragraphs 5-24, 5-25, 5-26, and 5-27).

Replace damaged or leaking components (paragraphs 5-24, 5-25, 5-26, and 5-27).

3. Condenser Vane Axial Fans Do Not Operate.

Test condenser vane axial fan cut out switches (S3 and S4) (paragraph 5-10).

Replace defective condenser vane axial fan cut out switch (S3 or S4) (paragraph 5-10).

4. Insufficient Cooling.

Step 1. Check refrigerant charge.

If refrigerant charge is low, charge system (paragraph 5-5).

Step 2. Check for blocked air flow in condenser assembly.

Remove obstructions.

Step 3. Test thermoexpansion valve (paragraph 5-26).

Replace defective thermoexpansion valve (paragraph 5-26).

Table 5-1. Direct Support Troubleshooting Table. (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

5. Air Filter Warning Light on Control Module is Lit.

Step 1. Inspect for damaged differential pressure switch hose (paragraph 5-21).

Repair damaged differential pressure switch hose (paragraph 5-21).

Step 2. Test differential pressure switch (paragraph 5-21).

Replace defective differential pressure switch (paragraph 5-21).

Step 3. Refer to wiring diagram H-3 and inspect/test wiring.

Replace or repair damaged or defective wiring as required.

6. Condensate Drain Warning Light on Control Module is Lit.

Step 1. Test condensate level warning switch (paragraph 5-29).

Replace defective condensate level warning switch (paragraph 5-29).

Step 2. Refer to wiring diagram Figure H-3 and inspect/test wiring.

Replace or repair damaged or defective wiring as required.

7. Evaporator Fan Assembly Does Not Operate.

Step 1. Inspect evaporator fan assembly for damage (paragraph 5-18).

Replace damaged evaporator fan assembly (paragraph 5-18).

Step 2. Inspect EMI electronic filter for damage (paragraph 5-19).

Replace damaged EMI electronic filter (paragraph 5-19).

Step 3. Refer to wiring diagrams H-1, H-2, and H-3 and inspect/test wiring.

Repair or replace damaged or defective wiring as required.

8. Condenser Vane Axial Fans Do Not Operate.

Step 1. Refer to wiring diagrams Figure H-1 and H-2 and inspect/test wiring.

Replace or repair damaged or defective wiring as required.

Step 2. Test condenser vane axial fans (paragraph 5-7).

Replace defective condenser vane axial fans (paragraph 5-7).

9. Condenser Vane Axial Fans Both Run, But Compressor Does Not Start.

Step 1. Refer to TM 9-2320-280-34 and test for 28 vdc at compressor clutch.

a. Refer to TM 9-2320-280-24 and troubleshoot vehicle.

b. Refer to applicable system technical manual and troubleshoot AN/TRQ-32 (A)V.

Table 5-1. Direct Support Troubleshooting Table. (Continued)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

9. Condenser Vane Axial Fans Both Run, But Compressor Does Not Start. (Continued)

Step 2. Refer to TM 9-2320-280-34 and test compressor.

Refer to applicable technical manual and replace damaged or defective compressor.

Step 3. Refer to wiring diagrams Figures H-1, H-2, and H-3 and inspect/test wiring.

a. Ensure all connectors are securely connected.

b. Replace or repair damaged or defective wiring as required.

10. Excessively Noisy Operation.

CAUTION

If a knocking or hammering sound is heard when compressor starts, turn mode selector switch to OFF, immediately. Such noise is usually caused by liquid refrigerant in compressor which can seriously damage or destroy compressor. Notify your supervisor.

Step 1. Inspect condenser vane axial fans for damage and blade clearance (paragraph 5-7).

Replace damaged condenser vane axial fan (paragraph 5-7).

Step 2. Inspect evaporator fan assembly for damaged impeller, loose or missing mounting hardware, or damaged mounting bracket (paragraph 5-18).

Replace or repair damaged evaporator fan assembly (paragraph 5-18).

Step 3. Check all internal components of condenser assembly and evaporator assembly for looseness, vibration, and security.

a. Tighten, adjust, and secure loose components as necessary.

b. If unit is still noisy, notify your supervisor.

SECTION III. DIRECT SUPPORT MAINTENANCE PROCEDURES

5-5. REFRIGERANT SERVICE

This task covers: **Service**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B. Section III, Item 1

Recovery and Recycling Unit, Refrigerant, Appendix B. Section III, Item 7

Manifold Gage, Charging and Testing, Appendix B. Section III, Item 16

Leak Detector, Appendix B. Section III, Item 17

Materials/Parts

Tetrafluoroethane, Appendix E, Item 9

Gloves, Protectant, Appendix D, Item 1

Goggles, Industrial, Appendix D, Item 2

Mask, Gas, Appendix D, Item 3

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.
Power source disconnected.

General Safety Instructions

DEATH or SERIOUS INJURY may result if personnel fail to observe safety precautions. Use great care to avoid contact with liquid refrigerant or refrigerant gas being discharged under pressure. Sudden and irreversible tissue damage can result from freezing. wear thermal protective gloves and a face protector or goggles in any situation where skin-eye-contact is possible.

DEATH may result if personnel inhale phosgene. Phosgene (carbonyl chloride) is formed when refrigerant is broken down by heat. Prevent contact of refrigerant gas with flame or hot surfaces

5-5. REFRIGERANT SERVICE. (Continued)

Service.

WARNING

Refrigerant R134a is contained in the refrigerant system under high pressure. Extreme care must be exercised to prevent refrigerant from coming in contact with exposed "kin and eyes. Provide adequate ventilation when discharging the system in a confined area. All refrigerant gas must be discharged from system before performing any removal procedures of refrigerant components. Failure to obey this warning may result in death or serious personal injury.

WARNING

Rapid discharge will cause oil to be blown out of the system. Damage to Compressor may occur.

NOTE

- **In accordance with Environmental Protection Agency regulation. refrigerants cannot be discharged into the atmosphere. A refrigerant recovery and recycling unit must be used whenever discharging the refrigerant system.**
- **Operation of the recovery/recycling unit must be by AUTHORIZED PERSONNEL ONLY.**
- **Evacuate air conditioner prior to removal.**

a. System Discharge.

b.

(1) Remove caps from discharge and suction service valve" located on compressor. Refer to TM 9-2320-280-34 for location of compressor discharge and suction service valves.

(2) Install bar manifold gauge. to compressor service valves.

(3) Connect and operate recovery/recycling unit in accordance with the manufacturer's instructions.

5-5. REFRIGERANT SERVICE. (Continued)

b. Charging the system.

WARNING

Avoid contact with refrigerant. Burns could result from contact with refrigerant.

CAUTION

- **Do not attempt to charge liquid refrigerant into suction line. The compressor would be damaged.**
- **If knocking or pounding is heard when starting the air conditioner, shut down at once and release some refrigerant before attempting another start.**

(1) Remove caps from discharge and suction service valves located on compressor. Refer to TM 9-2320-280-34 for location of compressor discharge and suction service valves.

(2) Install bar manifold gauges to service valves.

NOTE
Use recycled refrigerant when available.

(3) Connect a cylinder of new or recycled refrigerant. Charge the system with 12 lbs of refrigerant.

5-6. LOWER CONDENSER PROTECTIVE GRILLE AND EMI/RFI VENTILATION PANEL MAINTENANCE

This task covers:	Remove	Service
	Inspect	Install

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B.

Section III, Item 1

Recovery and Recycling Unit, Refrigerant, Appendix B.

Section III, Item 7

Regulator, Nitrogen, Appendix B.

Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B.

Section II I, Item 16

Leak Detector, Appendix B, Section III, Item 17

Materials/Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item g

Flux, Appendix E, Item 11

Materials/Parts (Continued)

Nitrogen, Appendix E, Item 18

Dehydrator, Appendix G. Item 2 Lock Washers,

Appendix G. Item 14

(Dehydrator) Lock Washers, Appendix G. Item 14

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Condenser Assembly removed, refer to applicable system technical manual.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

Caution

Dehydrator mast be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Remove. 26 screws (Figure S-1, 1), lock washers (2), flat washers (3), condenser protective grille (4), and condenser EMI/RFI ventilation panel (5). Discard lock washer. (2).

b. Inspect.

(1) Inspect condenser protective grille (4) for cracks, holes, or damage.

(2) Inspect condenser EMI/RFI ventilation panel (5) for hole(-) equivalent to two honey camber or larger.

(3) Inspect condenser EMI/RFI ventilation panel (5) for bent fins. Replace if bent fins hinder heat transfer of the coil.

(4) Inspect for damaged or missing EMI/RFI gasket material on EMI/RFI ventilation panel (5).

(5) Inspect all mounting hardware for damage.

(6) Replace all damaged or defective components.

c. Service. Rinse removed lower condenser EMI/RFI ventilation panel (5) with clean water.

5-6. LOWER CONDENSER PROTECTIVE GRILLE AND EMI/RFI VENTILATION PANEL MAINTENANCE. (Continued)

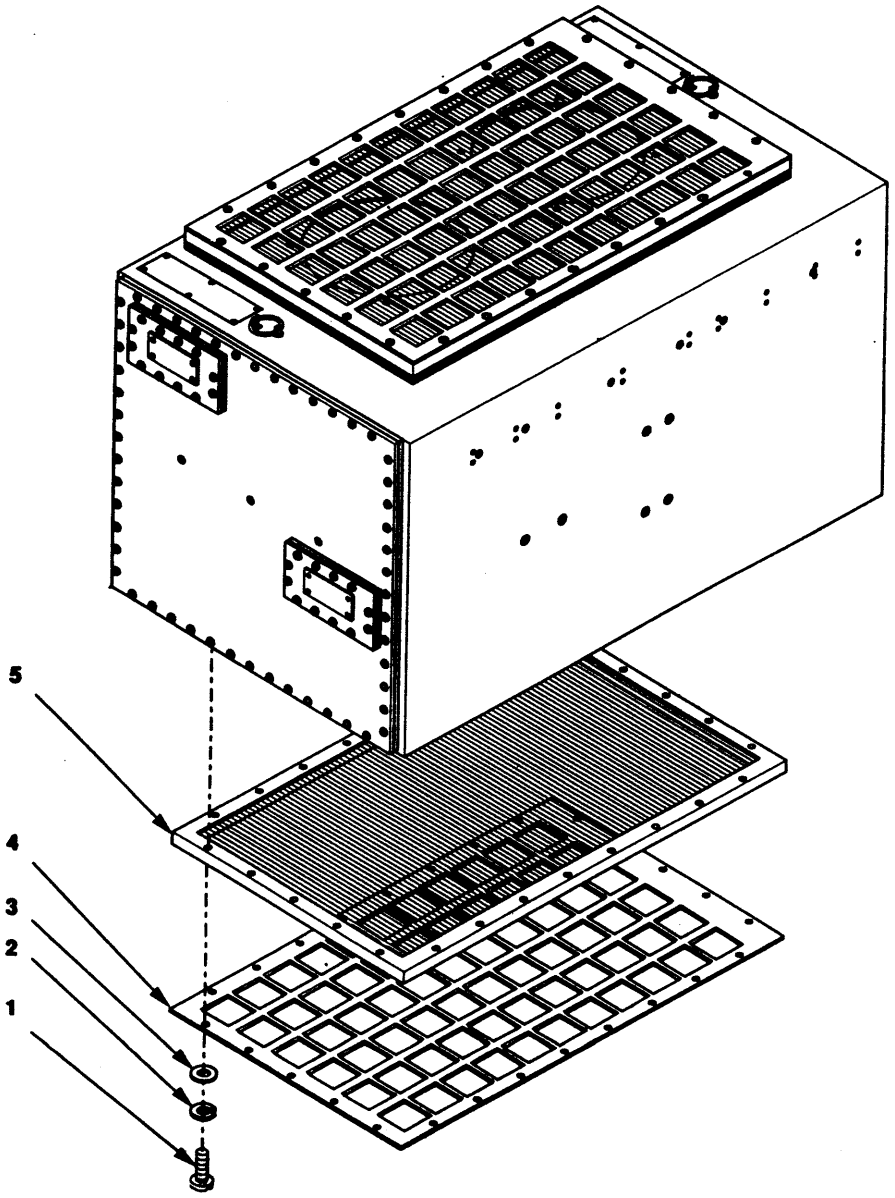


Figure 5-1. Condenser EMI/RFI Ventilation Panels.

d. Install

(1) Install lower condenser EMI/RFI ventilation panel (5), condenser protective grille (4), 26 flat washers (3), new lock washer" (2), and screws (11.

(2) Follow on maintenance:

(a) Refer to paragraph 5-14 and install new dehydrator.
(b) Refer to applicable system technical manual and install condenser assembly.

5-7. CONDENSER VANVE AXIAL FAN MAINTENANCE

This task covers:	Remove	Test
	Repair	Install

INITIAL SETUP:

Tools

Tool Kit,-Service Refrigeration Unit,

Appendix B. Section III, Item 1

Cropping Tool, Appendix B. Section III, Item 3

Recovery and Recycling Unit, Appendix B. Section III, Item 7

Power Supply, 28v, Appendix B. Section III, Item 8

Regulator, Nitrogen, Appendix B. Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B. Section III, Item 16

Leak Detector, Appendix B. Section III, Item 17

Materials/Parts

Adapter, Cable Clamp, Appendix E, Item 1

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item 9

FLUX, Appendix E, Item 11

Insulation Sleeving, Appendix E, Item 12

Insulation Sleeving, Appendix E, Item 15

Nitrogen, Appendix E, Item 18

Wire Ties, Appendix E, Item 26

Tags, Appendix E, Item 27

Dehydrator, Appendix G. Item 2

Materials/Parts (Continued)

Lock washers, Appendix G. Item 14 (Dehydrator)

Lock Washers, Appendix G. Item 14

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Personal

Two personnel are required for lifting the condenser vane axial fans from the condenser housing

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Power disconnected, refer to applicable system technical manual.

Condenser Assembly removed from shelter, refer to applicable system technical manual.

Condenser Side Panel removed, paragraph 4-11.

Upper Condenser Protective Grille and EMI/RFI Ventilation Panel removed, paragraph 4-15.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

5-7. CONDENSER VANE AXIAL FAN MAINTENANCE.. (Continued)

a. Remove .

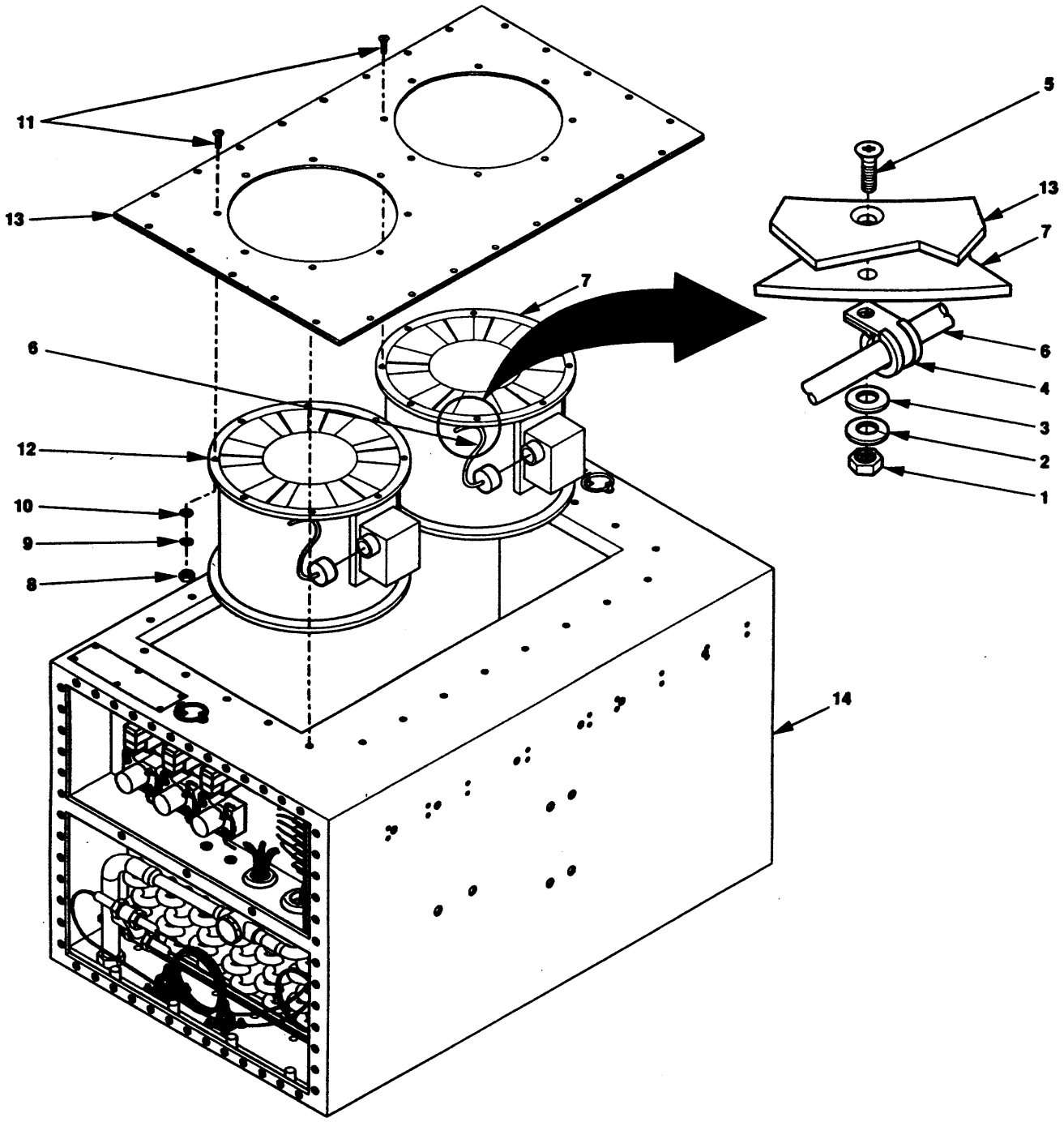


Figure 5-2. Condenser Vane Axial Fan Maintenance.

5-7. CONDENSER VANE AXIAL FAN MAINTENANCE. (Continued)

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

(1) Refer to wiring diagram H-2 and tag and disconnect condenser vane axial fan electrical leads and remove and discard wire ties.

NOTE

Steps 2 and 3 apply to both condenser vane axial fans.

(2) Remove nut (Figure 5-2, 1), lock washer (2), flat washer (3), cable clamp (4), screw (5), and wiring harness (6) from condenser vane axial fan (7). Discard lock washer (2).

(3) Remove seven nuts (8), lock washers (9), flat washers (10), screws (11) and condenser vane axial fan (12) from condenser top panel (13). Discard lock washers (9).

b. Test.

CAUTION

Electrical lead mounted on terminal board, TB1, is negative. Failure to properly hookup power supply may result in damage to equipment.

(1) Apply 28vdc to individual condenser vane axial fan assemblies (7 and 12). Condenser vane axial fans (7 and 12) should begin spinning immediately and quietly with no vibration, loud humming, wobbling or overheating.

(2) Check for voltage drop below 24vdc.

(3) Replace condenser vane axial fan (7 or 12) if it does not spin, vibrates, hums loudly, wobbles, or overheats.

c. Repair.

(1) Inspect wiring harness on condenser vane axial fans (7 and 12) for burns or damage. Refer to Appendix F. Figures F-9 and F-10 and repair condenser vane axial fan wiring harnesses as required.

(2) Check blades and housings of condenser vane axial fans (7 and 12) for cracks, bends, or breaks. Ensure housings do not touch blades and that blades spin freely.

(3) Inspect condenser top panel (13) for cracks, bends, holes, or damage.

(4) Inspect all mounting hardware for damage.

(5) Replace all damaged or defective components.

5-7. CONDENSER VANE AXIAL FAN MAINTENANCE. (Continued)

d. Install.

NOTE

Steps 1 and 2 apply to both condenser vane axial fans.

(1) Position condenser vane axial fan (12) on condenser top panel (13) and secure with seven screws (11), flat washers (10), new lock washers (9), and nuts (8).

(2) Install wiring harness (6) in cable clamp (4) and secure with screw (5), flat washer (3), new lock washer (2), and nut (1).

(3) Refer to paragraph 5-14 and install new dehydrator.

WARNING

Two personnel are required to lift top panel. Failure to obey this warning may result in personal injury.

(4) Install condenser top panel (13) into condenser housing (14).

(5) Refer to paragraph 4-15 and install upper EMI/RFI ventilation panel and protective grille.

(6) Refer to wiring diagram H-2 or tags and connect condenser vane axial fan electrical leads. Secure condenser vane axial fan wiring harnesses with new wire ties.

(7) Follow on maintenance: (a) Refer to paragraph 4-15 and install upper condenser protective grille and EMI/RFI ventilation panel.

(b) Refer to paragraph 4-11 and install condenser side panel.

(c) Refer to applicable system technical manual and install condenser assembly.

(d) Refer to applicable system technical manual and connect power.

5-8. CURBSIDE LIFTING RING REPLACEMENT.

This task covers: **Remove** **Install**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B. Section III, Item 1

Recovery and Recycling Unit, Appendix B. Section III, Item 7

Regulator, Nitrogen, Appendix B. Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B. Section III, Item 16

Leak Detector, Appendix B. Section III, Item 17

Material Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11

Materials/Parts (Continued)

Nitrogen, Appendix E, Item 18

Dehydrator, Appendix G. Item 2

Lock Washers, Appendix G. Item 14 (Dehydrator)

Lock Washers, Appendix a, Item 16 (Lifting Rang)

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Condenser Vane Axial Fans removed, paragraph 5-7.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. **Remove.** Remove nut (Figure 5-3, 1), lock washer (2), flat washer (3), and lifting ring (4). Discard lock washer (2).

b. **Install.**

(1) Install lifting ring (4) in condenser assembly (5) and secure with flat washer (3), new lock washer (2), and nut (1).

(2) Follow on maintenance:

(a) Refer to paragraph 5-14 and replace dehydrator.

(b) Refer to paragraph 5-7 and install condenser vane ax-ai-fans.

5-8. CURSIDE LIFTING RING REPLACEMENT. (CONTINUED)

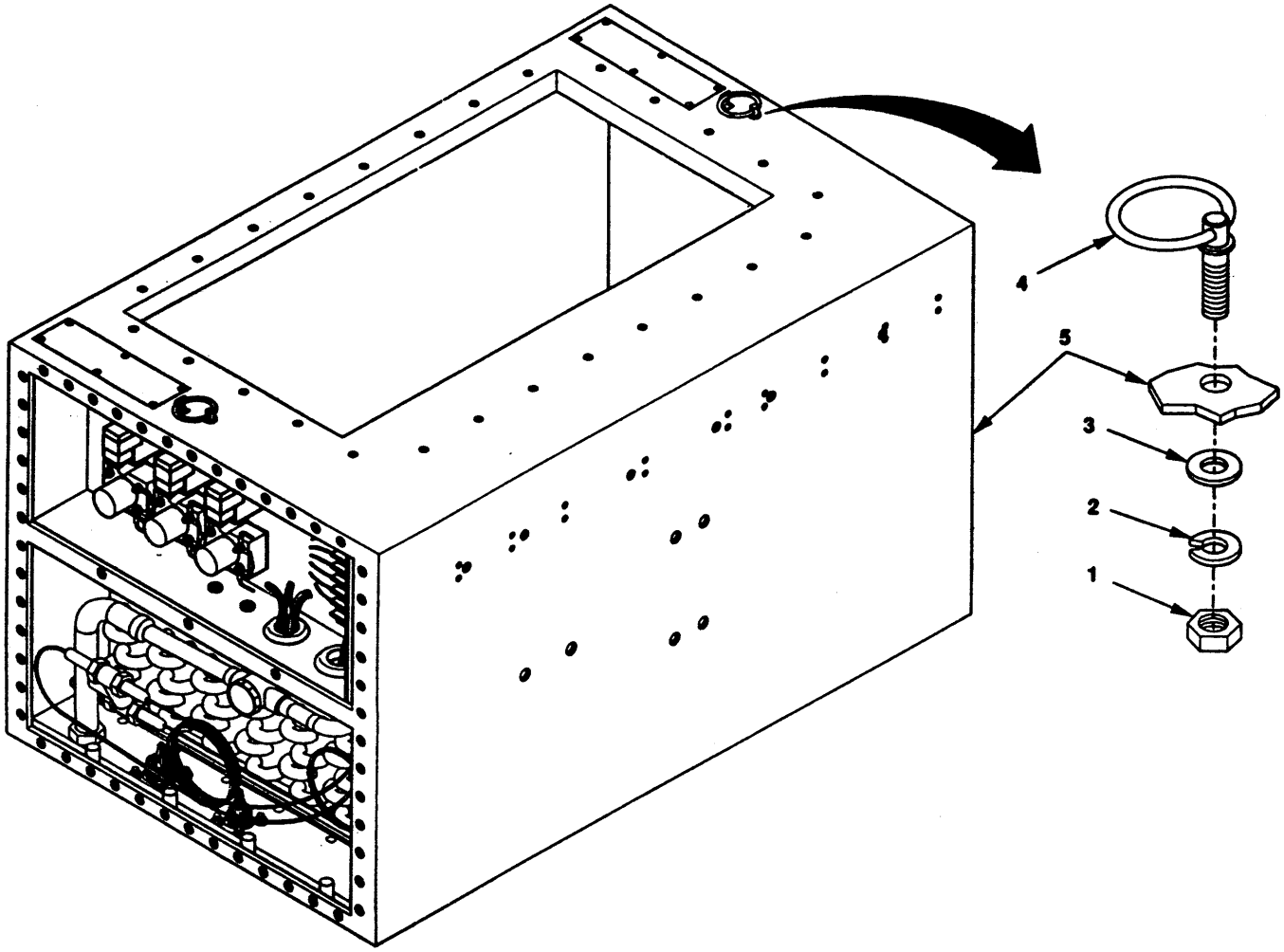


Figure 5-3. Curbside Lifting Ring Replacement

5-9. CONDENDSER DATA PLATE AND SPRING CLIP REPLACEMENT

This task covers: **Remove** **Install**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B. Section III, Item 1

Riveter Blind, Hand, Appendix B. Section III, Item 2

Recovery and Recycling Unit, Appendix B. Section III, Item 7

Regulator, Nitrogen, Appendix B. Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B. Section III, Item 16

Leak Detector, Appendix B. Section III, Item 17

Materials/Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item 9

Materials/Parts (Continued)

Flux, Appendix E, Item 11

Nitrogen, Appendix E, Item 18

Dehydrator, Appendix G. Item 2

Rivets, Appendix G. Item 7 Rivet a, Appendix G. Item 8 (Spring clips)

Lock Washers, Appendix G. Item 14 (Dehydrator).

Refer to TM 9-4120-408-24P for part numbers Of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Condenser Vane Axial Fans removed, paragraph 5-7.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey thin caution may result in equipment damage.

NOTE

This procedure applies to the data plate shown. The procedure for the spring clip and the identification plate are similar.

a. Remove. Remove six rivets (Figure 5-4, 1) and data plate (2). Discard rivet (1).

b. Install.

(1) Position data plate (2) on condenser assembly (3) and secure with six new rivets (1).

(2) Follow on maintenance:

(a) Refer to paragraph 5-14 and replace dehydrator.

(b) Refer to paragraph 5-7 and install condenser vane axial fans.

5-9. CONDENSER DATA PLATE AND SPRING CLIP REPLACEMENT. (Continued)

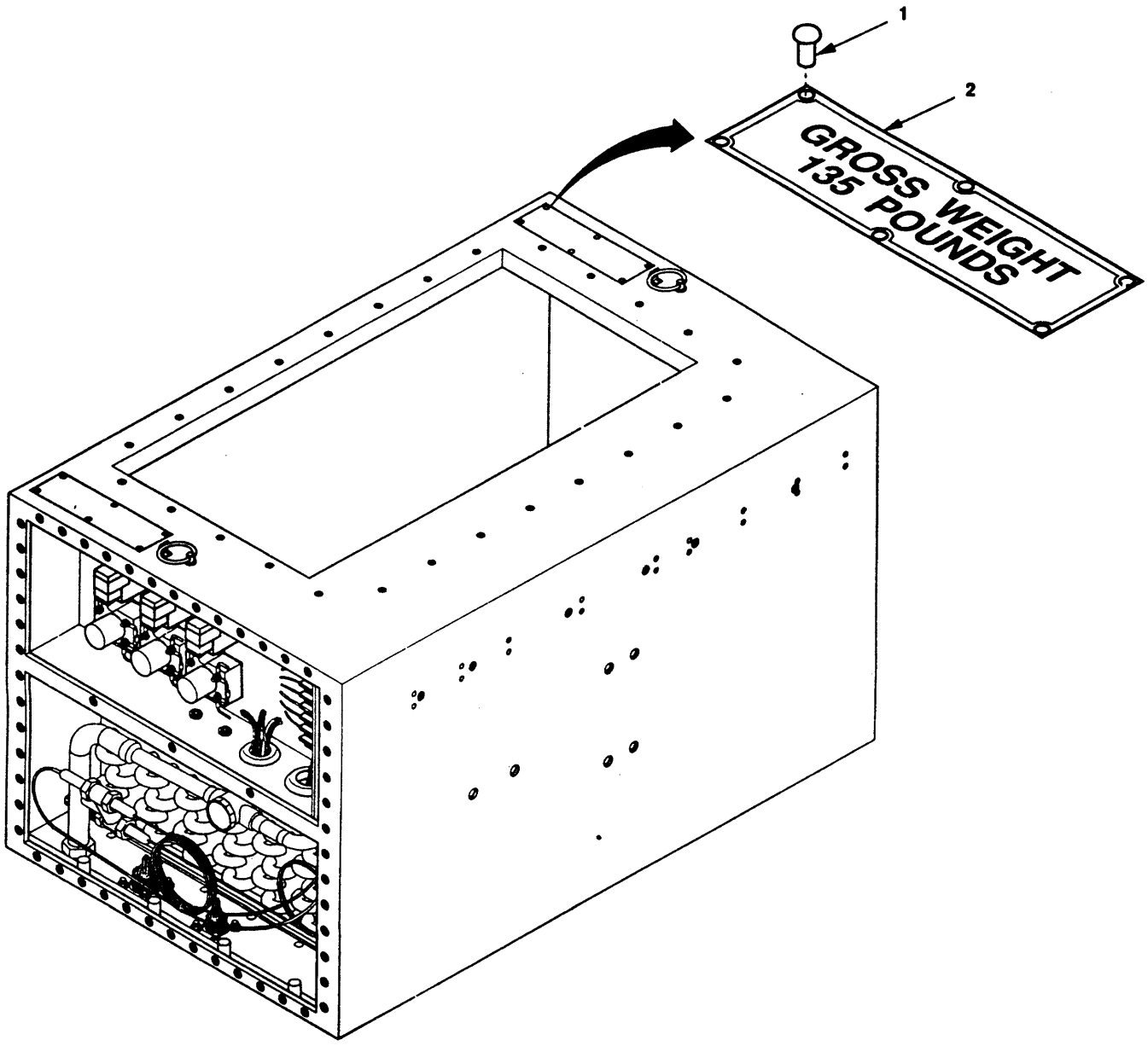


Figure 5-4. Data Plate Replacement

5-10. CONDENSER PRESSURE SWITCH MAINTENACE.

This task covers:	Inspect	Remove
	Test	Install
	Adjust	

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B. Section III, Item 1

Recovery and Recycling Unit, Appendix B. Section III, Item 7

Regulator, Nitrogen, Appendix B. Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B. Section III, Item 16

Leak Detector, Appendix B. Section III, Item 17

Materials/Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11

Nitrogen, Appendix E, Item 18

Strap, Tiedown, Appendix E, Item 24

Tags, Appendix E, Item 27

Tape, Appendix E, Item 28

Dehydrator, Appendix G. Item 2

Lock Washers, Appendix G. Item 14 (Dehydrator)

Lock Washers, Appendix G. Item 14

Materials/Parts (Continued)

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Power disconnected, refer to applicable system technical manual.

Condenser Side Panel removed, paragraph 4-11.

Condenser Wiring Harness Electrical Leads disconnected as required, paragraph 4-16.

Electrical Leads disconnected as required, paragraph 4-17.

Refrigerant removed from system, paragraph 5-5.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

Ensure that power has been disconnected before performing maintenance on electrical components.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

5-10. CONDENSER PRESSURE SWITCH MAINTENANCE. (Continued)

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

NOTE

These procedures apply to low pressure fan switch S3. The procedures for high pressure fan cut in switch S4 and high pressure cutout switch S6 are similar.

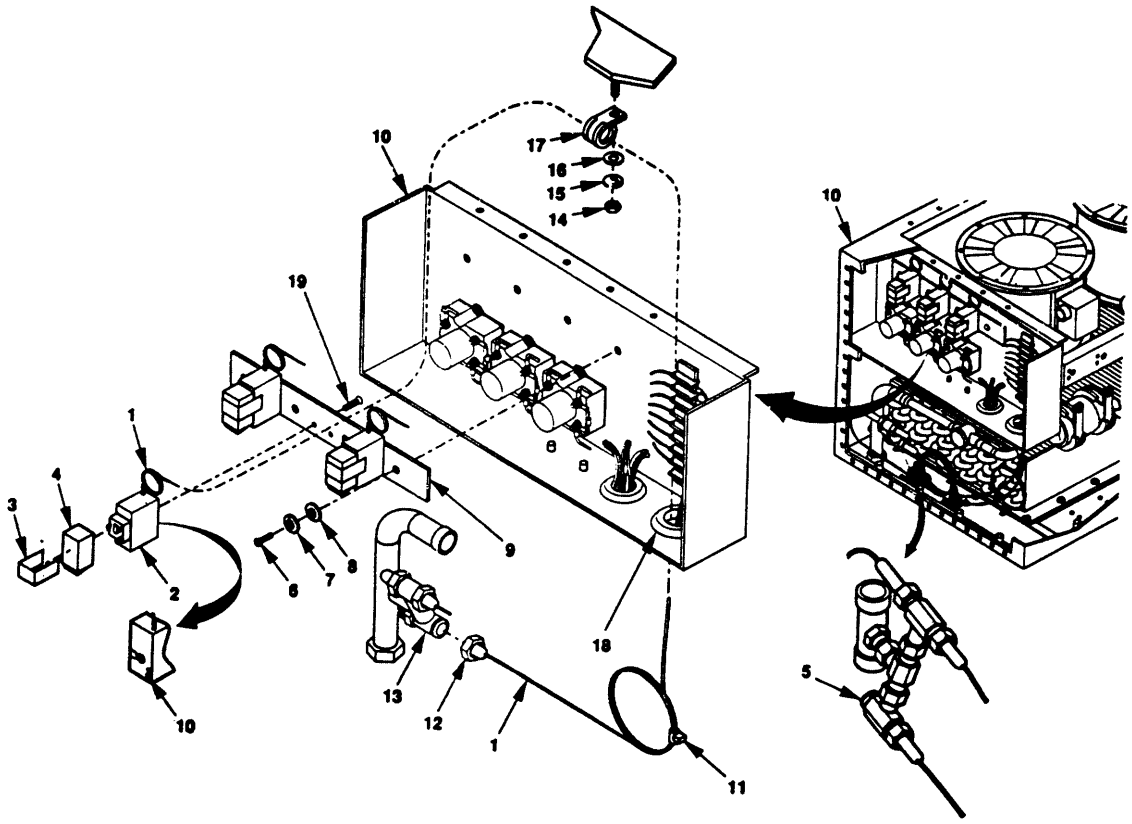


Figure 5-5. Pressure Switch Maintenance.

a. Inspect.

(1) Check capillary tube (Figure 5-5, 1) and-low pressure fan switch S3 (2) for leaks, cracks, or break. . Ensure tape on capillary tube (1) is not damaged.

5-10. CONDENSER PRESSURE SWITCH MAINTENANCE. (Continued)

NOTE
Setting for high pressure fan cut in switch S4 is 190 ± 3 psi.

(2) Ensure low pressure fan switch S3 (2) is set to 160 3 psi.

(3) Remove spring clip (3) and cover (4) and check wire connections to low pressure fan switch S3 (2). Tighten loose connections.

b. Test.

NOTE
Apply pressure as required using dry nitrogen.

(1) Install pressure gauge of manifold to gauge port (5) of condenser assembly (6).

(2) Remove spring clip (3) and cover (4) from pressure switch (2).

NOTE

- Resistance measurements on high pressure fan cut in switch S4 will be as follows:
  - At pressures below 190° ± 3° psi resistance between contacts 1 and 2 will be 0 and resistance between contacts 2 and 3 will be infinite.
  - At pressures of 190° ± 3° psi or above resistance between contacts 1 and 2 will be infinite and resistance between contacts 2 and 3 will be 0.
- Resistance measurements on high pressure cut out switch S6 (2) will be as follows:
  - At pressures up to 275° ± 9° psi resistance between contacts 1 and 2 will be 0 and resistance between contacts 2 and 3 will be infinite.
  - At pressures above 275° ± 9° psi resistance between contacts 1 and 2 will be infinite and resistance between contacts 2 and 3 will be 0.

(3) Resistance measurements on low pressure fan switch S3 (2) will be as follows:

- At pressures of 160° ± 3° psi and below resistance between contacts 1 and 2 will be infinite and resistance between contacts 2 and 3 will be 0.
- At pressures above 160° ± 3° psi resistance between contacts 1 and 2 will be 0 and resistance between contacts 2 and 3 will be infinite.

5-10. CONDENSER PRESSURE SWITCH MAINTENANCE. (Continued)

NOTE

- Pressure setting for low pressure fan switch S3 is 160° ± 3° psi.
- Pressure setting for high pressure fan cut in switch S4 is 190° ± 3° psi.

c. Adjust.

(1) Remove four screws (6), lock washers (7), and flat washers (8). Discard lock washers (7).
(2) Rotate bracket (9) and adjust low pressure fan switch S3 (2) pressure settings by rotating adjusting screw (10) on switch (2).
(3) Retest low pressure fan switch S3 (2) in accordance with b.
(4) Replace defective low pressure fan switch S3 (2) in accordance with d.
(5) Position bracket (9) in condenser assembly (10) and secure with four flat washers (8), new lock washers (7), and screws (6).

d. Remove.

WARNING

Refrigerant temperatures and pressure may cause severe personal injury. Do not disconnect switch sensors without recovering refrigerant first.

(1) Remove and discard tiedown straps (11).
(2) Remove spring clip (3) and cover (4) from pressure switch (2).
(3) Loosen flare nut (12) and disconnect capillary tube (1) from tee (13).

NOTE

- Remove three nuts, lock washers, flat washers, and cushion clamps when removing pressure switch S4.
- Remove five nuts, lock washers, flat washers, and cushion clamps when removing pressure switch S6.

(4) Remove four nuts (14), lock washers (15), flat washers (16), and cushion clamps (17). Discard lock washers (15).
(5) Pull capillary tube (1) through grommet (18).
(6) Remove four screws (6), lock washers (7), flat washers (8), and switch mounting bracket (9). Discard lock washers (7).
(7) Remove two screws (19) and low pressure fan switch S3 (2).

e. Install.

(1) Position low pressure fan switch S3 (2) on switch mounting bracket (9) and secure with two screws (19).

5-10. CONDENSER PRESSURE SWITCH MAINTENANCE. (Continued)

(2) Position switch mounting bracket (9) on condenser assembly (10) and secure with four flat washers (8), new lock washers (7), and screws (6).

NOTE

When installing tape on capillary tube, ensure tape edges overlap and no portion of capillary tube is exposed to air.

(3) Insert capillary tube (1) through grommet (18). As required replace tape on capillary tube (1) with new tape.

- Secure pressure switch S4 with three nuts, lock washers, flat washers, and cushion clamps.

- Secure pressure switch S6 with five nuts, lock washers, flat washers, and cushion clamps.

(4) Position capillary tube (1) in four cushion clamps (17) and secure to condenser housing (10) with four flat washers (16), new lock washers (15), and nuts (14).

NOTE

- When installing capillary tube on tee, ensure chain for access port cap is secured by flare nut.

- If new switch is being installed install flare nut on capillary tube and flare tube to 45°.

(5) Install capillary tube (1) on tee (13) and secure with flare nut (12).
(6) Coil excess capillary tube (1) and secure with new tiedown straps (11).
(7) Follow on maintenance: (a) Refer to paragraph 5-14 and replace dehydrator.

(b) Refer to paragraph 5-5 and charge system.

(c) Refer to paragraph 4-17 and connect electrical leads as required.

(d) Refer to paragraph 4-16 and connect wiring harness single leads as required.

(e) Refer to paragraph 4-11 and install condenser side panel removed.

5-11. SWIVEL TEE ACCESS VALVE AND FLARE TEE MAINTENANCE.

This task covers: **Removal** **Inspect** **Install**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit.
Appendix B, Section III, Item 1

Recovery and Recycling Unit, Refrigerant,
Appendix B, Section III, Item 7

Regulator, Nitrogen, Appendix B, Section III,
Item 9

Manifold Gage, Charging and Testing,
Appendix B, Section III, Item 16

Leak Detector, Appendix B, Section III,
Item 17

Materials/Parts

Brazing Alloy, Appendix E, Item 5
Brazing Alloy, Appendix E, Item 6
Tetrafluoroethane, Appendix E, Item 9

Materials/Parts (Continued)

Flux, Appendix E, Item 11
Nitrogen, Appendix E, Item 18

Dehydrator, Appendix G, Item 2

Lock Washers, Appendix G, Item 14

(Dehydrator)
Refer to TM 9-4120-408-24P for part numbers

of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Condenser Assembly removed, refer to
applicable system technical manual.

General Safety Instructions

Do not work on equipment without following
standard shop safety precautions.

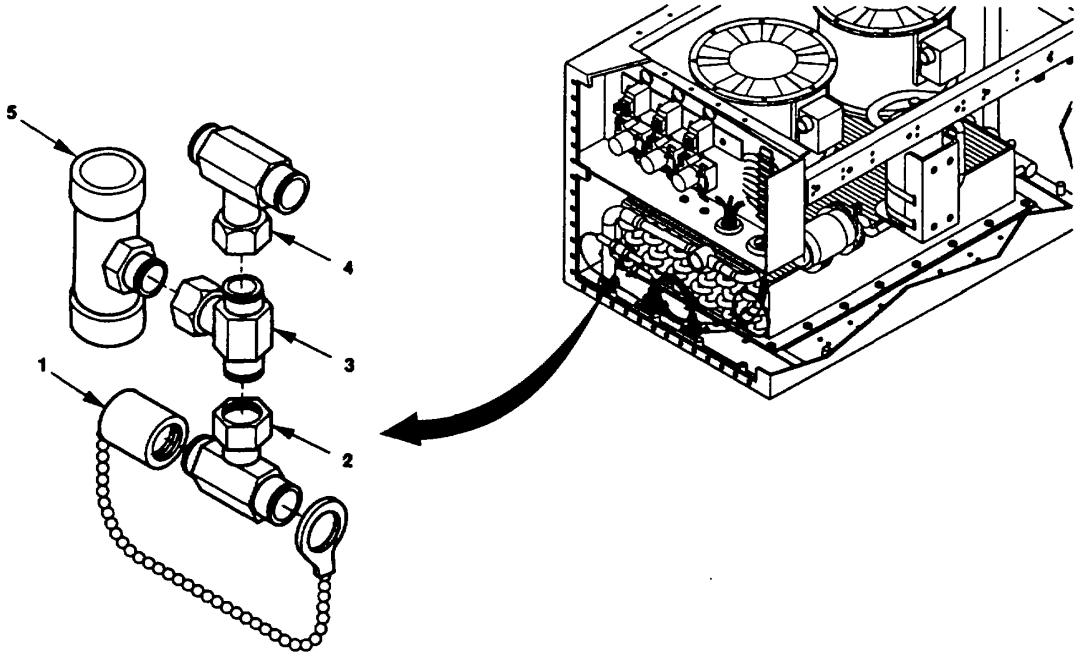


Figure 5-6. Swivel Tee Access. Valve and Flare Tee Maintenance.

5-11. SWIVEL TEE ACCESS VALVE AND FLARE TEE MAINTENANCE. (Continued)

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Remove.

(1) Remove cap and chain (Figure 5-6, 1) from swivel tee access valve (2).
(2) Remove swivel tee access valve (2) from flare tee (3).
(3) Remove two flare tees (3 and 4).

b. Inspect.

(1) Inspect all components for cracks, evidence of leaks, or damage.

(2) Replace all damaged or defective components.

c. Install.

(1) Install flare tee (3) on braze reducing tee (5).
(2) Install flare tee (4) and swivel tee access valve (2) on flare tee (3).

CAUTION

Ensure gasket is present in cap and chain prior to installation. If gasket is not present equipment damage may result.

(3) Install cap and chain (1) on swivel tee access valve (2).

(4) Follow on maintenance:

(a) Refer to paragraph 5-14 and replace dehydrator.

(b) Refer to paragraph 5-10 and connect pressure capillary tubes.

5-12. CONDENSER TUBING AND FITTINGS MAINTENANCE.

This task covers:	Inspect	Repair
	Removal	Install

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix

Nitrogen Regulator, Appendix B, Section III, Item 7

Recovery and Recycling Unit, Appendix B, Section III, Item 7

Manifold Gage, Charging and Testing, Appendix B, Section III, Item 16

Leak Detector, Appendix B, Section III, Item 17

Materials/Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11

Materials/Parts (Continued)

Nitrogen, Appendix E, Item 18
B, Section III, Item 1 Dehydrator, Appendix G, Item 2

Preformed Packing, Appendix G, Item 3

Lock washers, Appendix G, Item 14

Lock Washers, Appendix G, Item 14 (Dehydrator)

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Condenser Vane Axial Fans removed, paragraph 5-7.

Flare Tees removed, paragraph 5-11.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Inspect.

(1) Inspect all components for cracks, bends, breaks, ruptures, or open tubing or fittings.

(2) Pressurize condenser assembly (Figure 5-7, 1) to a minimum of 70 psi and inspect liquid/moisture indicator (2) for broken sight glass and leaking tubing and fittings.

b. Remove.

NOTE

The dehydrator must be replaced any time the refrigerant system is open to the atmosphere.

(1) Flow nitrogen through system.

(2) Remove damaged parts as required.

5-12. CONDENSER TUBING AND FITTINGS MAINTEANCE. (Continued)

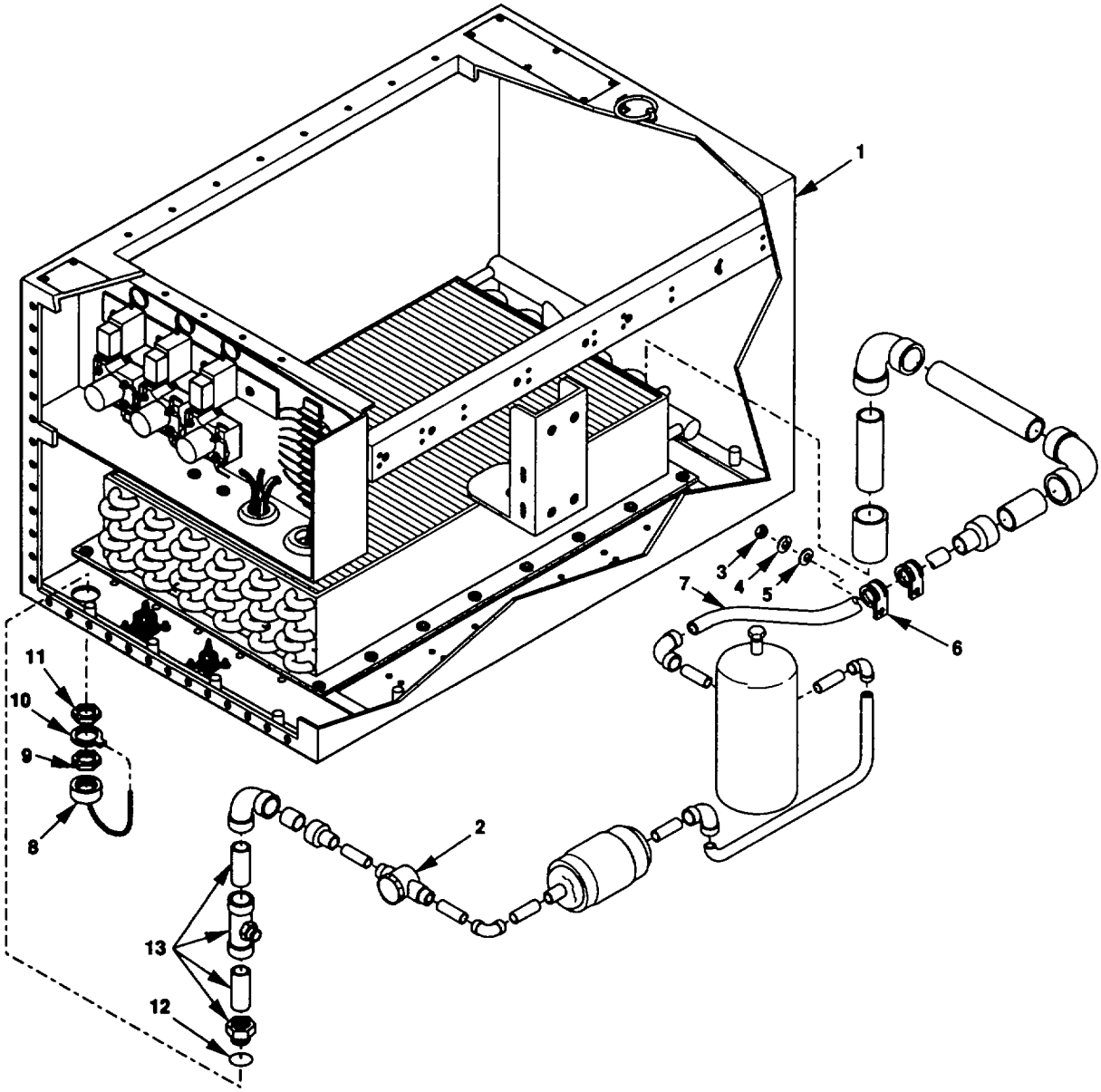


Figure 5-7. Condenser Tubing and Fittings maintenance.

CAUTION

Remove sight glass insert and preformed packing from liquid/moisture indicator prior to installing liquid/moisture indicator in condenser assembly. Failure to obey this caution will result in damage to equipment.

(3) Remove sight glass insert and preformed packing of liquid/moisture indicator (2) prior to removing liquid/moisture indicator (2).

5-12. CONDENSER TUBING AND FITTINGS MAINTENANCE. (Continued)

(4) Remove two nuts (3), lock washers (4), flat washers (5), and clamps (6), prior to removing tubing section (7). Discard lock washers (4).

(5) Disconnect cap of cap and chain (8) and remove bulkhead locking nut (9), split ring (10) and cap and chain (8), bulkhead lock nut (11), and preformed packing (12) from bulkhead braze adapter fitting and tube (13) prior to removing bulkhead braze adapter fitting and tube (13). Discard preformed packing (12).

c. Repair.

(1) Repair consists of replacing damaged components.

(2) Refer to Appendix F, Figure F-ll for repair procedures for all tubing pieces.

d. Install.

(1) Install replacement parts as required.

(2) Position new preformed packing (12) on bulkhead braze adapter fitting and tube (13). Position bulkhead braze adapter fitting and tube (13) in condenser assembly (3) and secure with bulkhead lock nut (11), split ring (10) and cap and chain (8), and locking nut (9). Install cap of cap and chain (8) on braze adapter fitting and tube (13).

(3) After installing tubing section (7), secure to condenser assembly (1) with two clamps (6), flat washers (5), new lock washers (4), and nuts (3).

CAUTION

Remove sight glass insert and preformed packing from liquid/moisture indicator prior to installing liquid/moisture indicator in condenser assembly. Failure to obey this caution will result in damage to equipment.

(4) Install liquid/moisture indicator (2), then install preformed packing and sight glass.

(5) Follow on maintenance: (a) Refer to paragraph 5-14 and replace dehydrator.

(b) Refer to paragraph 5-11 and install swivel tee access valve and flare tees.

(c) Refer to paragraph 5-7 and install condenser vane axial fans.

5-13. LIQUID LINE RECEIVER MAINTENANCE.

This task covers: **Removal** **Inspect** **Install**

INTAL SETUP

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Recovery and Recycling Unit, Refrigerant, Appendix B, Section III, Item 7

Regulator, Nitrogen, Appendix B, Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B, Section III, Item 16
Leak Detector, Appendix B, Section III, Item 17

Materials/Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11

Materials/Parts (Continued)

Nitrogen, Appendix E, Item 18

Dehydrator, Appendix G, Item 2

Lock Washers, Appendix G. Item 14 (Dehydrator)

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.
Refrigerant recovered, paragraph 5-5.

Condenser vane Axial Fans removed, paragraph 5-7.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Inspect.

(1) Inspect liquid line receiver (Figure 5-8, 1) for leaks, cracks, bends, breaks, holes, and damaged or missing fusible plug (2).

(2) Inspect all mounting hardware for damage.

(3) Replace all damaged or defective components.

b. Remove.

(1) Flow nitrogen through system.

CAUTION

Remove fusible plug prior to removing liquid line receiver. Failure to do so may result in damage to the equipment.

(2) Remove fusible plug (2) from liquid line receiver (1).

(3) Disconnect tubing (3) from liquid line receiver (1).

5-13. LIQUID LINE RECEIVER MAINTENANCE. (Continued)

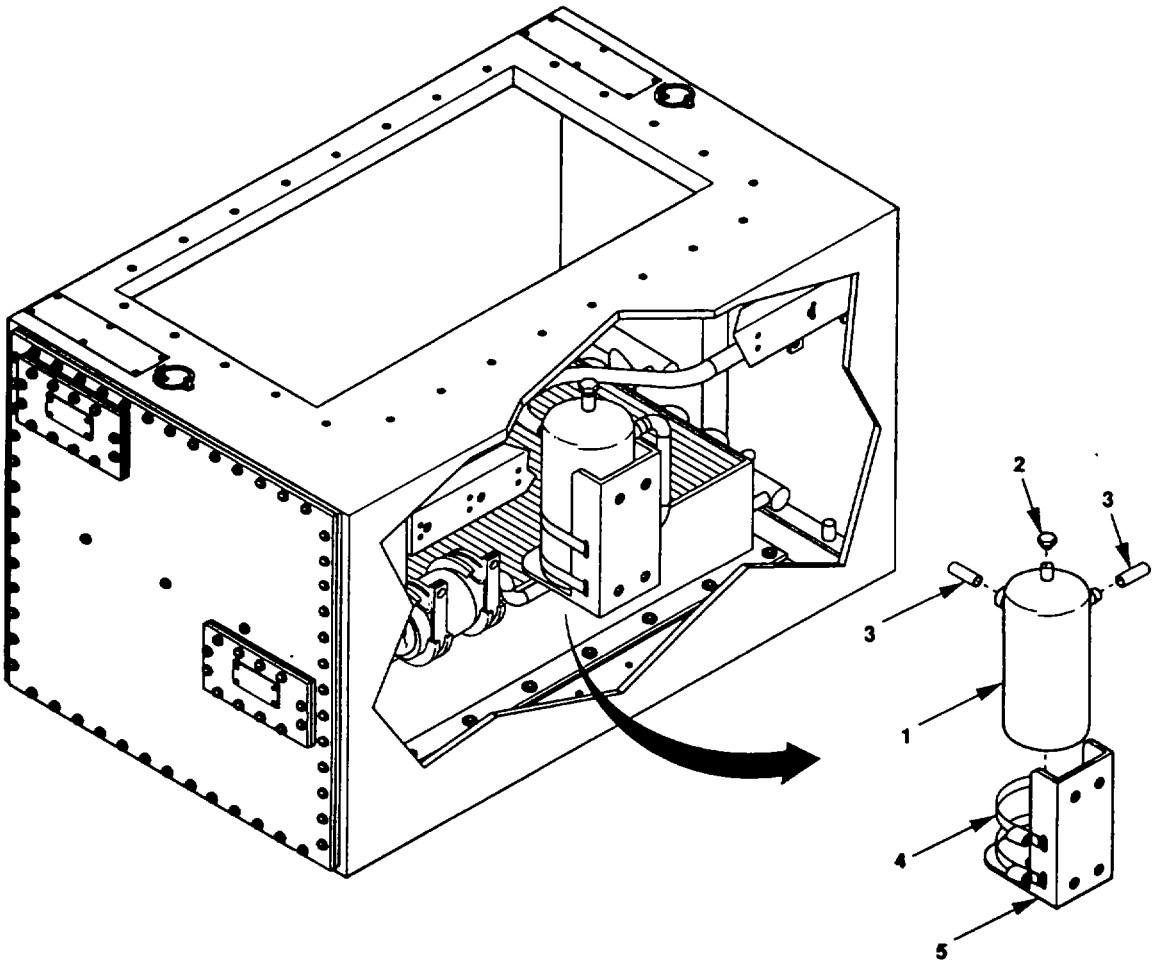


Figure 5-8. Liquid Line Receiver Replacement.

(4) Remove two retaining clamps (4) and liquid line receiver (1) from bracket (5).

c. Install.

(1) Install liquid line receiver (1) in bracket (5) and secure with two retaining clamps (4).

CAUTION

Remove fusible plug prior to installing liquid line receiver. Failure to do so may result in damage to the equipment.

(2) Connect tubing (3) to inlet and outlet ports of liquid line receiver (1).

(3) Install fusible plug (2) on liquid line receiver (1).

(4) Follow on maintenance:

(a) Refer to paragraph 5-14 and replace dehydrator.

(b) Refer to paragraph 5-7 and install condenser vane axial fans.

(c) Refer to paragraph 5-5 and charge system.

5-14. DEHYDRATOR MAINTENANCE.

This task covers: **Removal** **Inspect** **Install**

INTIAL SETUP

Tools

Tool Kit, Service Refrigeration Unit, Appendix

Recovery and Recycling Unit, Refrigerant, Appendix B, Section III, Item 7

Regulator, Nitrogen, Appendix B, Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B, Section III, Item 16

Leak Detector, Appendix B, Section III, Item 17

Materials/Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6.

Tetrafluoroethane, Appendix E, Item 9

Materials/Parts (Continued)

Flux, Appendix E, Item 11
B, Section III, Item 1 Nitrogen, Appendix E, Item 18

Lock Washers, Appendix G, Item 14

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Refrigerant recovered, paragraph 5-5.

Condenser Vane Axial Fans removed, paragraph 5-7.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Inspect.

(1) Inspect clamps (Figure 5-9, 1) and all mounting hardware for damage.
(2) Replace all damaged or defective components.

b. Remove.

(1) Flow nitrogen through system.
(2) Remove two nuts (2), lock washers (3), flat washers (4), clamps (1), and screws (5) from dehydrator (6). Discard lock washers (3).
(3) Disconnect tubing (7) from ends of dehydrator (6) and remove dehydrator (6).

5-14. DEHYDRATOR MAINTENANCE. (Continued)

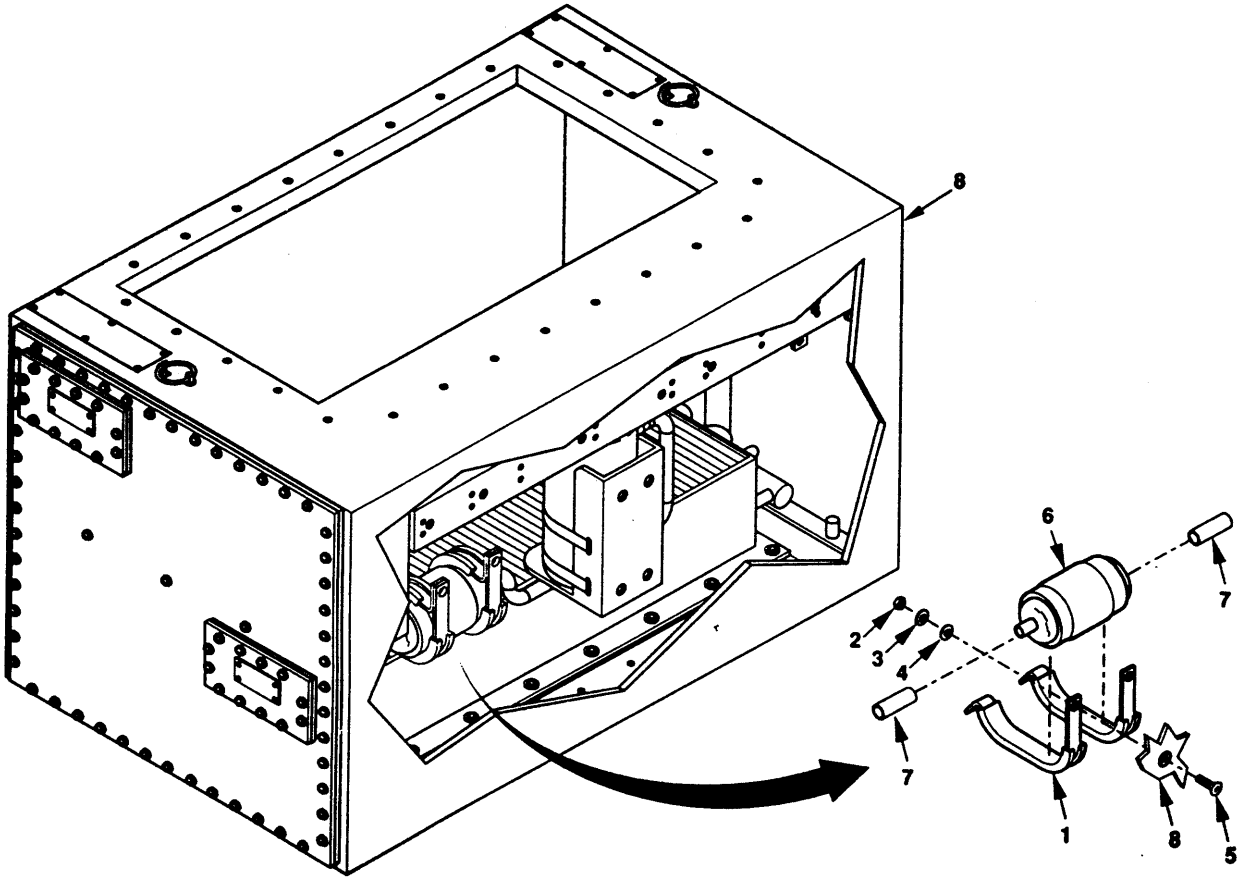


Figure 5-9. Dehydrator Replacement.

c. Install

CAUTION

Observe refrigerant flow direction when installing dehydrator. Failure to do so may result in damage to the equipment.

(1) Install dehydrator (6) in condenser housing (8) and connect tubing (7).

(2) Secure dehydrator (6) to condenser assembly (8) and secure with two screws (5), Clamps (1), flat washers (4), new lock washers (3), and nuts (2).

(3) Follow on -maintenance:

(a) Refer to paragraph 5-14 and replace dehydrator.

(b) Refer to paragraph 5-7 and install condenser vane axial fans.

(c) Refer to paragraph 5-5 and charge system.

5-15. CONDENSER COIL MAINTENANCE.

This task covers: **Removal** **Inspect** **Install**

INITIAL SETUP

Tool
Tool Kit, Service Refrigeration Unit, Appendix B. Section III, Item 1

Recovery and Recycling Unit, Refrigerant, Appendix B. Section III, Item 7

Regulator, Nitrogen, Appendix B. Section III, Item 9

Screwdriver, Cross Tip, Appendix B. Section II, Item 10

Cleaning Set, Fin, Appendix B. Section III, Item 11

Manifold Gage, Charging and Testing, Appendix B. Section III, Item 16

Leak Detector, Appendix B. Section III, Item 17

Materials/Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11

Materials/parts (Continued)

Nitrogen, Appendix E, Item 18

Dehydrator, Appendix G. Item 2

Preformed Packing, Appendix G. Item 3

Lock Washers, Appendix G. Item 14 (Dehydrator)

Lock Washers, Appendix G. Item 14

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Lower Condenser Protective Grille and EMI/ RFI Ventilation Panel removed, paragraph 5-6.

Condenser Vane Axial Fans removed, paragraph 5-7.

Tubing disconnected, paragraph 5-12.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions..

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Service.

(1) Clean debris, dirt or other obstructions from condenser coil (Figure 5-10, 1) .
(2) Using fin comb, straighten any bent fine on condenser coil (1).

b. Remove.

(1) Disconnect cap of cap and chain (2).
(2) Remove bulkhead locking nut (3), split ring (4), cap and chain (2), bulkhead locking nut (5), and preformed packing (6). Discard preformed packing (6).
(3) Remove sixteen screws (7), lock washers (8), and flat washers (9). Discard lock washers (8).

5-15. CONDENSER COIL MAINTENANCE. (Continued)

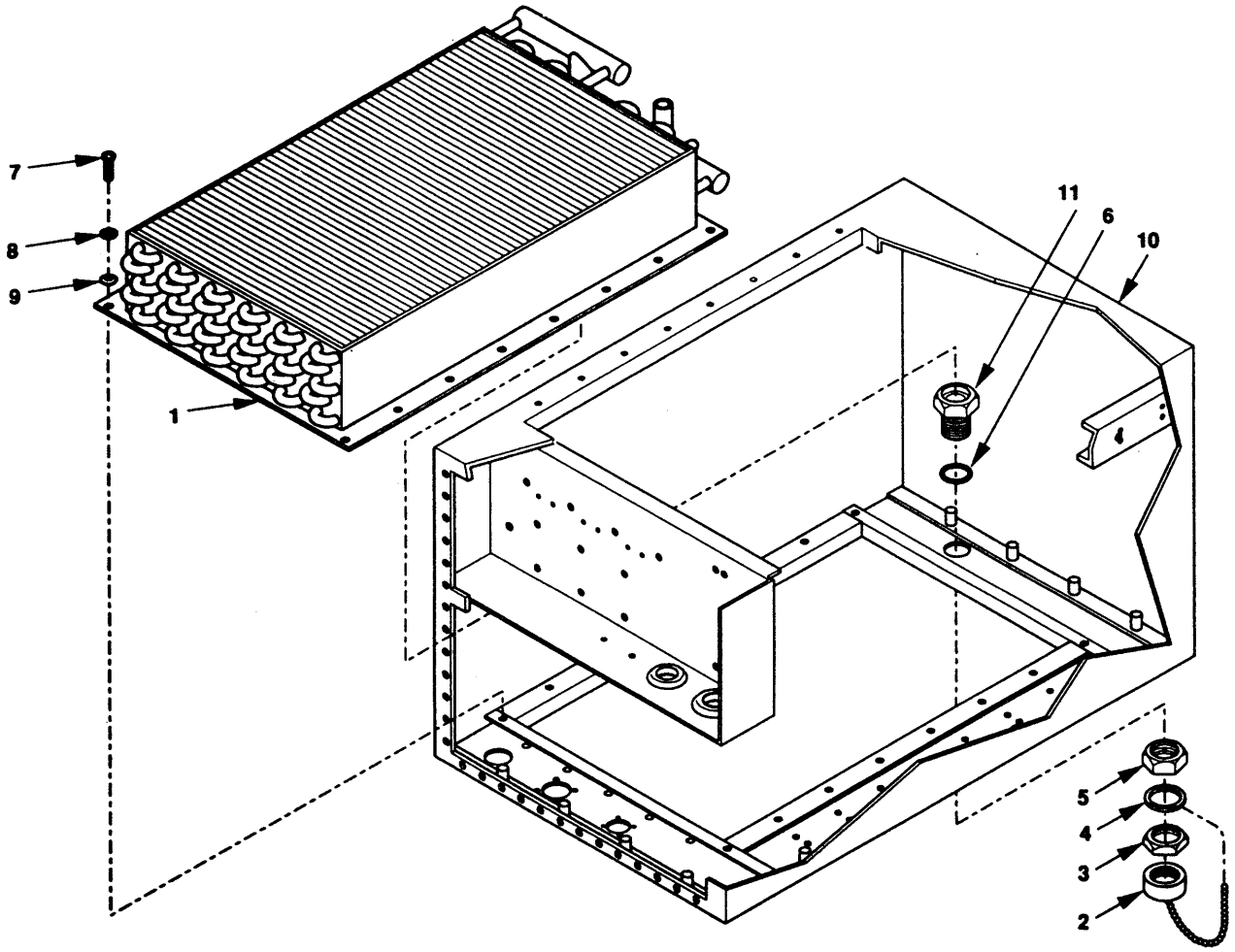


Figure 5-10. Condenser Coil Maintenance.

CAUTION

Be careful not to bend coil fins. Improper heat transfer may result from bent or broken fins which will degrade system performance.

(4) Remove condenser coil (1) from condenser housing (10).

c. Repair.

(1) Check condenser coil (1) for dirty, obstructed, bent fins, and dirty or damaged tubes.

(2) Check for holes in tubes or large holes in fins of condenser coil (1).

(3) Inspect fitting (11) for cracks, damage, or evidence of leaks. Replace damaged fitting (11).

(4) Condenser coil (1) tubing may be repaired by brazing. Any other damage requires replacement of condenser coil (1).

5-15. CONDENSER COIL MAINTENANCE. (Continued)

(5) Inspect all mounting hardware and cap and chain (2) for damage.

(6) Replace all damaged mounting hardware or cap and chain (2).

d. Install.

(1) Install new preformed packing (6) in fitting (11) and position condenser coil (1) in condenser housing (10), securing with sixteen flat washers (9), new lock washers (8), and screws (7).

(2) Install bulkhead locking nut (5) and split ring (4) on fitting (11) and secure with bulkhead locking nut (3).

(3) Install cap of cap and chain (2) on fitting (11).

NOTE

Add 3 oz (85 g) of oil if the condenser is removed from the system.

(4) Follow on maintenance:

(a) Refer to paragraph 5-14 and replace dehydrator.

(b) Refer to paragraph 5-12 and connect tubing.

(c) Refer to paragraph 5-7 and install condenser vane exit fans.

(d) Refer to paragraph 5-6 and install lower condenser EMI/RFI ventilation panel and protective grille.

5-16. REAR (AIR DISCHARGE) EVAPORATOR EMI/RFI VENTILATION PANEL MAINTENANCE.

This task covers:	**Remove**	**Inspect**
	Service	**Install**

INTIAL SETUP

Tools
Tool Kit, Service Refrigeration Unit, Appendix 8, Section III, Item 1

Recovery and Recycling Unit, Refrigerant, Appendix B. Section III, Item 7

Regulator, Nitrogen, Appendix B. Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B. Section III, Item 16

Leak Detector, Appendix B. Section III, Item 17

Materials/Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item 9

Materials/Parts (Continued)

Flux, Appendix E, Item 11

Nitrogen, Appendix E, Item 18

Dehydrator, Appendix G. Item 2

Lock Washers, Appendix G. Item 14 (Dehydrator)

Refer to TM 9-4120-408-24P for part numbers Of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-S.

Evaporator Assembly disconnected from shelter, refer to applicable system technical manual.

General Safety Instructions
Do not work on equipment without following standard shop safety precautions.

5-16. REM (AIR DISCHARGE) EVAPORATOR EMI/RFI VENTILATION PANEL MAINTENANCE. (Continued)

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

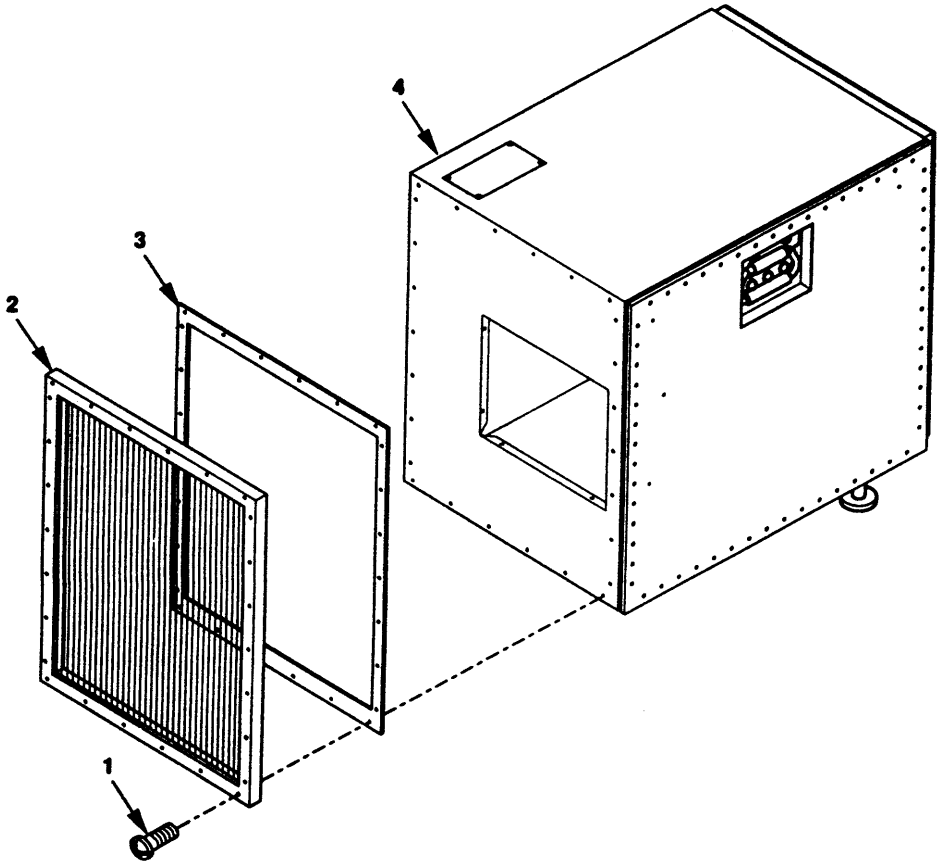


Figure 5-11. Rear (Air Discharge) Evaporator EMI/RFI Ventilation Panels.

a. **Remove**. Remove 26 screws (Figure 5-11, 1) and evaporator EMI/RFI ventilation panel (2).

b. **Service**. Rinse rear (air discharge) evaporator EMI/RFI ventilation panel with clean water.

c. **Repair.**

(1) Inspect rear (air discharge) evaporator EMI/RFI ventilation panel (2) for hole(s) equivalent to two honey combs. or larger.

(2) Inspect rear (air discharge) evaporator EMI/RFI ventilation panel (2) for deteriorated, damaged, or missing EMI gasket material (3).

(3) Inspect all mounting hardware for damage.

(4) Replace all damaged or defective components.

5-16. REAR (AIR DISCHARGE) EVAPORATOR EMI/RFI VENTILATION PANEL MAINTENANCE. (Continued)

d. Install.

(1) Position rear (air discharge) evaporator EMI/RFI ventilation panel (2) on evaporator assembly (4) and secure with 26 screw (1).

(2) Follow on maintenance:
   (a) Refer to paragraph 5-14 and replace dehydrator.
   (b) Refer to applicable technical manual and install evaporator assembly.

5-17. EVAPORATOR SIDE PANEL MAINTENANCE.

This task covers:	Removal	Install
	Inspect	

INITIAL SETUP

Tool
Tool Kit, Service Refrigeration Unit, Appendix B. Section III, Item 1

Riveter, Blind, Hand, Appendix B. Section III, Item 2

Recovery and Recycling Unit, Refrigerant Appendix B. Section III, Item 7

Regulator, Nitrogen, Appendix B. Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B. Section III, Item 16

Leak Detector, Appendix B. Section III, Item 17

Materials/Parts

Adhesive, Appendix E, Item 3

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Material-/Parts (Continued)

Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11

Nitrogen, Appendix E, Item 18

Dehydrator, Appendix G. Item 2

Rivets, Appendix G. Item 6

Lock Washers, Appendix G. Item 14 (Dehydrator)

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Evaporator Assembly removed from shelter, refer to applicable system technical manual.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Remove. Remove 60 screws (Figure 5-12, 1) and evaporator side panel (2).

b. Repair.

(1) Inspect evaporator side panel (2) for cracks, holes, bends, deteriorated or damaged EMI gasket (3), and damaged or missing bail handle (4).
(2) Inspect mounting hardware for damage.
(3) Replace all damaged or missing components.

5-17. EVAPORATOR SIDE PANEL MAINTENANCE. (Continued)

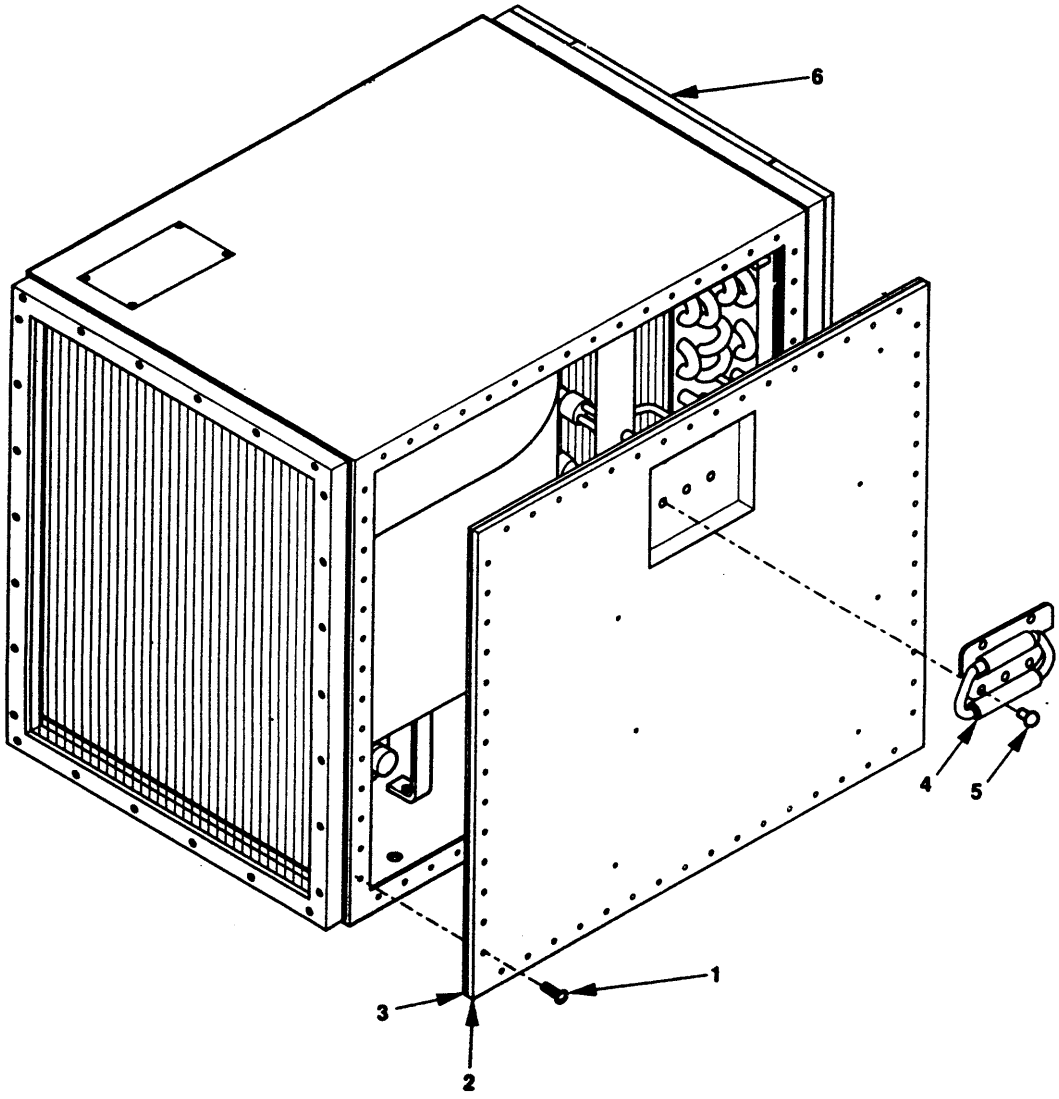


Figure 5-12. Evaporator Side Panel Maintenance.

(4) Replace damaged bail handle 14) as follows:

(a) Remove and discard insulation material from evaporator side panel (2) as required.

(b) Remove and discard five rivets (5).

(c) Position bail handle (4) on evaporator side panel (2) and secure with five new rivets (5).

(5) If insulation material is damaged, refer to Appendix F. Figure F-12, manufacture new insulation material and secure to side panel (2) with adhesive.

c. Install.

(1) Position evaporator side panel (2) on evaporator assembly (6) and secure with 60 screws (l).

(2) Follow on maintenance:

5-17. EVAPORATOR SIDE PANEL MAINTENANCE. (Continued)

(a) Refer to paragraph 5-14 and replace dehydrator.

(b) Refer to applicable system technical manual and install evaporator assembly.

(c) Refer to paragraph 5-5 and charge system.

5-18. EVAPORATOR FAN ASSEMBLY MAINTENANCE.

This task covers:	Removal	Repair
	Disassemble	Assemble
	Test	Install

INITIAL SETUP

Tools

Tool Kit, Service Refrigeration Unit, Appendix B. Section III, Item 1

Heater, Gun Type, Electrical, Appendix B. Section III, Item 4

Soldering Iron, Appendix B. Section III, Item 5

Recovery and Recycling Unit, Refrigerant, Appendix B. Section III, Item 7

Power Supply, 28v, Appendix B. Section III, Item 8

Regulator, Nitrogen, Appendix B. Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B. Section III, Item 16

Leak Detector, Appendix B. Section III, Item 17

Materials/Parts

Adhesive, Appendix E, Item 4

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Electrical Cable Clamp, Appendix E, Item 7

Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11

Insulation Sleeving, Appendix E, Item 13

Insulation Sleeving, Appendix E, Item 16

Nitrogen, Appendix E, Item 18

Materials/Parts (Continued)

Solder, Appendix E, Item 23

Tiedown Straps, Appendix E, Item 26

Tags, Appendix E, Item 27

Dehydrator, Appendix G. Item 2

Lock Washers, Appendix G. Item 14 (Fan mounting two places)

Lock Washers, Appendix G. Item 14 (Cushion Clamps)

Lock Washers, Appendix G. Item 14 (Dehydrator)

Lock Washers, Appendix G. Item 15(Bracket mounting and motor securing)

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Power disconnected, refer to applicable system technical manual.

Rear (Air Discharge) Evaporator EMI/RFI Ventilation Panel removed, paragraph 5-16.

Evaporator Side Panel removed, paragraph 5-17.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

Ensure that power has been disconnected before performing maintenance on electrical components.

5-18. EVAPORATOR FAN ASSEMBLY MAINTENANCE. (Continued)

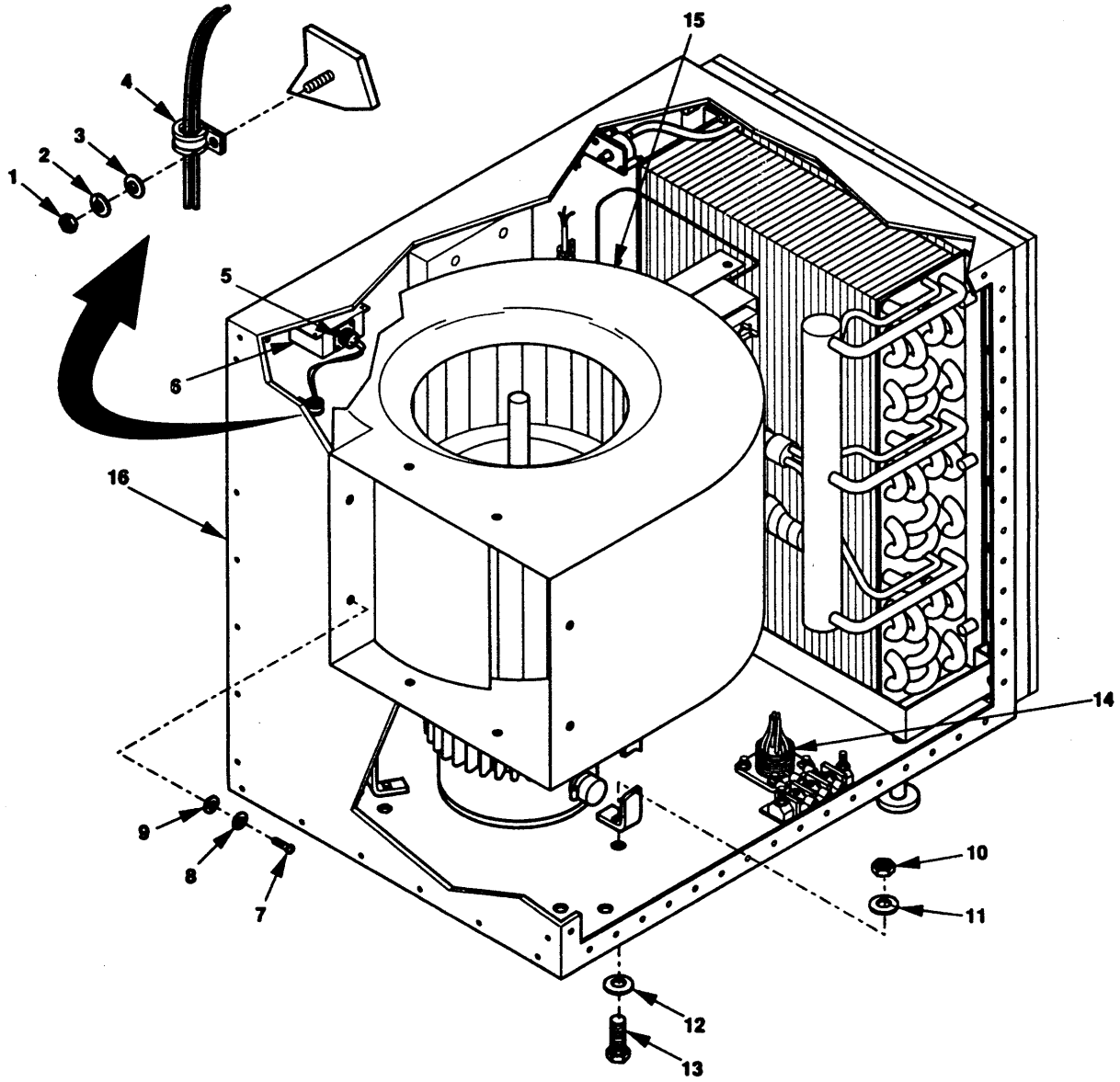


Figure 5-13. Evaporator Fan Assembly Removal.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

5-18. EVAPORATOR FAN ASSEMBLY MAINTENANCE. (Continued)

a. Remove.

(1) Remove six nuts (Figure 5-13, 1), lock washers (2), flat washers (3), and cushion clamps (4). Discard lock washers (2).
(2) Disconnect connector A106P2 (5) from EMI Electronic Filter (6).
(3) Remove eight screws (7), lock washers (8), and flat washers (9). Discard lock washers (8).

CAUTION

Do not remove evaporator fan assembly. Ensure fan assembly is stable after mounting hardware is removed. Failure to obey this caution may result in damage to wiring harness A106J1.

(4) Remove three nuts (10), lock washers (11), flat washers (12), and screws (13). Discard lock washers (11).
(5) Remove-and discard electrical cable clamp and insulation sleeving and tag -and disconnect four wires from connector A106J1 (14) at positions E, F, K, and L and remove and discard all tiedown straps.
(6) Remove evaporator fan assembly (15) from evaporator housing (16) and remove adhesive from evaporator fan assembly (15).

b. Disassemble.

(1) Loosen set screw (Figure 5-14, 1).

CAUTION

Retain bushing on motor drive shaft. Do not use bushing with a different motor. Failure to obey this caution may result in equipment damage.

(2) Remove three screws (2), lock washers (3), flat washers (4) and slide evaporator fan housing (5) from evaporator fan motor (6). Discard lock washers (3).
(3) Remove two nuts (7), lock washers (8), four flat washers (9), two screws (10), and evaporator fan motor (6) from evaporator fan mounting bracket (11). Discard lock washers (8) and remove adhesive from fan motor (6) and evaporator fan mounting bracket (11).
(4) Remove four screws (12), plate (13), and impeller (14) from evaporator fan housing (5).

c. Test.

(1) Apply 28vdc across connector A106P2 (15) jacks C and D and check for spinning drive shaft on evaporator fan motor (6). Replace evaporator fan motor (6) if drive shaft does not rotate.
(2) With 28vdc applied to connector A106P2 (15) jacks C and D, connect wires disconnected from connector A106J1 (Figure 5-13, 14) positions K and L. Spinning of drive shaft on evaporator fan motor (Figure 5-14, 6) should decrease by one half. Replace evaporator fan motor (6) if drive shaft rotation rate does not decrease.
(3) Test two wires (16) for continuity.

5-18. EVAPORTOR FAN ASSEMBLY MAINTENANCE. (Continued)

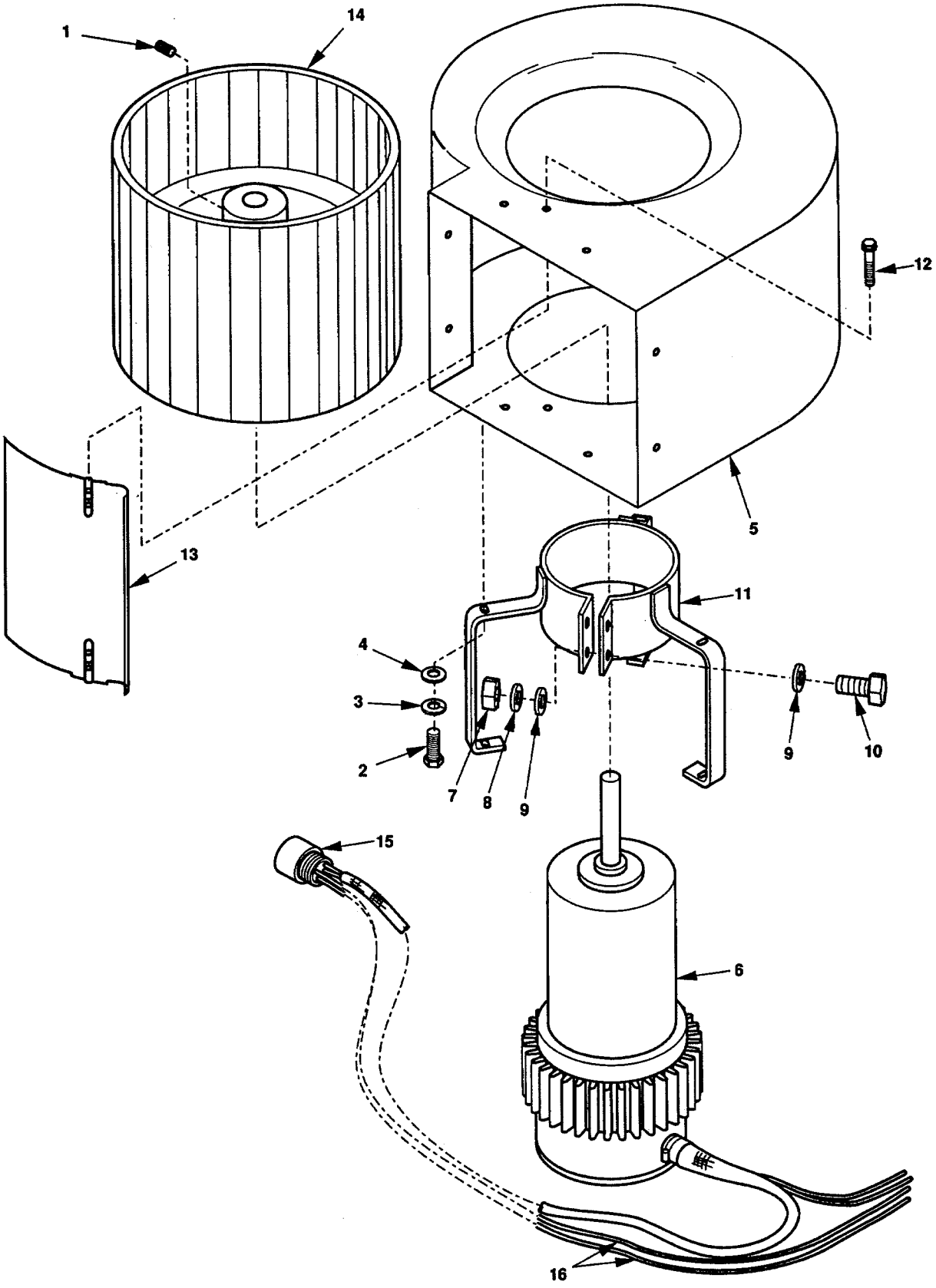


Figure 5-14. Evaporator Fan Assembly.

5-18. EVAPORATOR FAN ASSEMBLY MAINTENANCE. (Continued)

d. Repair

(1) Inspect evaporator fan housing (5) and impeller (14) for bends, breaks and other physical damage that may impair fan operation. Ensure impeller (14) rotates freely within evaporator fan housing (5) and is free of debris and dirt.

(2) Inspect evaporator fan motor (6) and evaporator fan mounting bracket (11) for cracks or damage.

(3) Inspect all mounting hardware for damage.

(4) Replace all damaged or defective components.

(5) Refer to Appendix F. Figure F-13 to repair defective wires (16).

e. Assemble.

(1) Install impeller (14) in evaporator fan housing (5).

NOTE

Short screws secure panel from inside of evaporator fan housing.

(2) Install plate (13) in evaporator fan housing (5) and secure with four screws (12).

(3) Apply adhesive to evaporator fan motor (6) mounting surface and position evaporator fan motor (6) in evaporator fan mounting bracket (11). Secure evaporator fan motor (6) with two screws (10), four flat washers (9), two new lock washers (8), and nuts (7).

CAUTION

Ensure bushing is installed on motor drive shaft. Do not use bushing from another motor. Failure to obey this caution may result in equipment damage.

(4) Slide evaporator fan motor (6) into impeller (14) and secure evaporator fan mounting bracket (11) to evaporator fan housing (5) with three flat washers (4), new lock washers (3), and -crew" (2).

CAUTION

Ensure impeller is centered between interior surfaces of fan housing and spins freely. Failure to obey this caution may result in equipment damage.

(5) Tighten set screw (1).

f. Install.

(1) Refer to tags and install wires in connector A106J1 (Figure 5-13, 14) positions E, F, R, and L.. Remove and discard tags and refer to Appendix F. Figure F-15 for installing electrical cable clamp and insulation sleeving on connector A106J1 (14).

(2) Position evaporator fan assembly (15) in evaporator housing (16) and secure with three screws (13), flat washers (12), new lock washers (11), nuts (10), eight flat washers (7), new lock washers (6), and screws (5).

5-18. EVAPORATOR FAN ASSEMBLY MAINTENANCE. (Continued)

(3) Apply adhesive around evaporator fan assembly (15) and evaporator housing (16).

(4) Connect connector A106P2 (5) to EMI Electronic Filter (6).

(5) Install new tiedown straps, located approximately every three inches, and secure wiring harness to evaporator housing (16) with six cushion clamps (4), flat washers (3), new lock washers (2), and nuts (1).

(6) Follow on maintenance
(a) Refer to paragraph 5-14 and replace dehydrator.

(b) Refer to paragraph 5-17 and install evaporator side panel.

(c) Refer to paragraph 5-16 and install rear (air discharge) evaporator EMI/RFI ventilation panel.

(d) Refer to applicable system technical manual and connect power to evaporator assembly.

5-19. EMI ELECTRONIC FILTER REPLACEMENT.

This task covers: Remove Install

INITIAL SETUP

Tools
Tool Kit, Service Refrigeration Unit, Appendix B. Section III, Item 1

Recovery and Recycling Unit, Refrigerant, Appendix B. Section III, Item 7

Regulator, Nitrogen, Appendix B. Section III, Item 9

Manifold Gage, Charging and Testing,

Appendix B. Section III, Item 16

Leak Detector, Appendix B. Section III, Item 17

Materials/Parts
Brazing Alloy, Appendix E, Item 6
Brazing Alloy, Appendix E, Item 5
Tetrafluoroethane, Appendix E, Item 9

Materials/Parts (Continued)

Flux, Appendix E, Item 11

Nitrogen, Appendix E, Item 18

Dehydrator, Appendix G. Item 2

Lock Washers, Appendix G. Item 14 (Dehydrator)

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions
Air Conditioner shut down, paragraph 2-5.

Evaporator Side Panel removed, paragraph 5-17.

General Safety Instruction.
Do not work on equipment without following standard shop safety precautions.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Remove.

(1) Disconnect connector A106P2 (Figure 5-15, 1).

(2) Remove four screws (2) and EMI electronic filter (3).

5-19. EMI ELECTRONIC FILTER REPLACEMENT. (Continued)

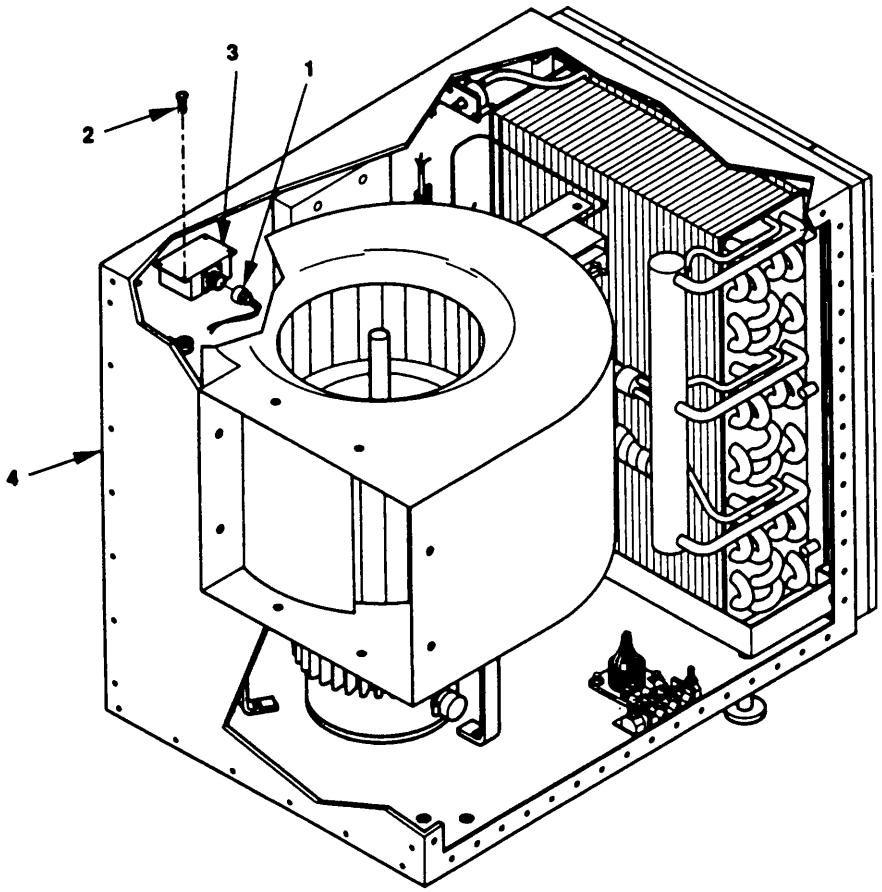


Figure 5-15. EMI Electronic Filter Replacement

b. Install

(1) Position EMI electronic filter (3) in evaporator housing (4) and secure with four screws (2).

(2) Connect connector A106P2 (1) to EMI/RFI electronic filter (3).

(3) Follow on maintenance:

(a) Refer to paragraph 5-14 and install dehydrator.

(b) Refer to paragraph 5-17 and install evaporator side panel.

5-20. EVAPORATOR ELECTRICAL LEAD MAINTENANCE.

This task covers: Inspect, Test, Remove, Repair, Install

INITIAL SETUP

Tools

Tool Kit, Service Refrigeration Unit, Appendix B. Section III, Item 1

Crimping Tool, Terminal, Appendix B. Section III, Item 2

Soldering Iron, Appendix B. Section III, Item 4

Recovery and Recycling Unit, Refrigerant, Appendix B. Section III, Item 7

Regulator, Nitrogen, Appendix B. Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B. Section III, Item 16

Leak Detector, Appendix B. Section III, Item 17

Materials/Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11

Nitrogen, Appendix E, Item 18

Solder, Appendix E, Item 23

Tiedown Straps, Appendix E, Item 25

Materials/Parts (Continued)

Tags, Appendix E, Item 27

Dehydrator, Appendix G. Item 2

Lock Washers, Appendix G. Item 14 (Dehydrator)

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Power disconnected, refer to applicable system technical manual.

Evaporator Side Panel removed, paragraph 5-17.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

Ensure that power has been disconnected before performing maintenance on electrical components.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

NOTE

This procedure applies to an electrical lead between differential pressure switch, S7, and terminal board, TB4, contact TB4-1. The procedure for the electrical lead between differential pressure switch, S7, and terminal board, TB4, contact TB4-2 is similar.

a. Inspect. Inspect electrical lead (Figure 5-16, 1) for cracks, burns, loose or damaged terminals.

5-20. EVAPORATOR ELECTRICAL LEAD MAIRTENANCE. (Continued)

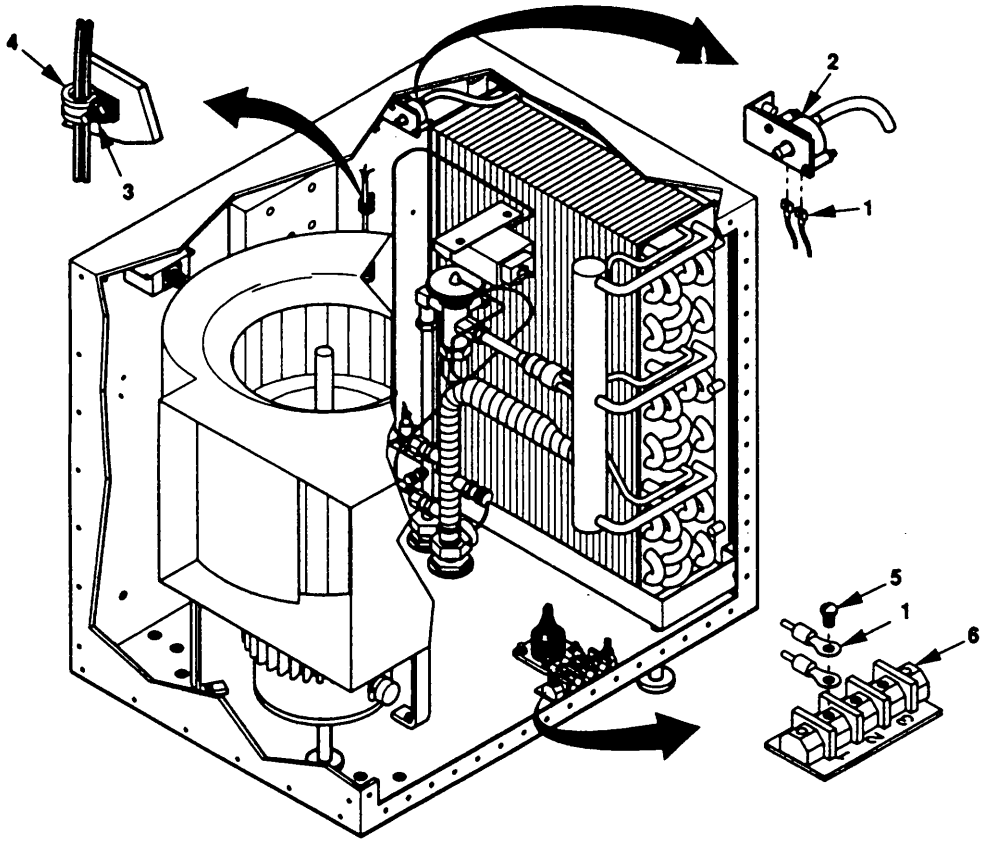


Figure 5-16. Evaporator Electrical Lead Maintenance.

b. Test. Refer to wiring diagram H-3, isolate electrical lead and test for continuity.

c. Remove.

(1) Tag and remove electrical lead (1) from differential pressure switch (2).

(2) Remove and discard tiedown straps.

(3) Loosen seven nuts (3) and remove electrical lead (1) from seven clamps (4).

(4) Remove screw (5) from terminal board, TB4, (6) on contact TB4-1, and tag and remove electrical lead (1).

d. Repair.Refer to Appendix F. Figure F-3 and repair damaged electrical lead (1).

e. Install .

(1) Position electrical lead (1) on contact TB4-1 of terminal board, TB4, (6) and secure with screw (I).

(2) Slide electrical lead assembly (1) through seven clamps (4) and secure by tightening seven nuts (3). '

(3) Install new tiedown straps every three inches.

5-20. EVAPORATOR ELECTRICAL LEAD MAINTENANCE. (Continued)

(4) Install electrical lead (1) on differential pressure switch (2).

(5) Follow on maintenance:
(a) Refer to paragraph 5-14 and replace dehydrator.
(b) Refer to paragraph 5-17 and install evaporator side panel.
(c) Refer to applicable system technical manual and connect power.

5-21. DIFFERENTIAL PRESSURE SWITCH MAINTENANCE. This task covers:

This task covers: Remove Install
Repair

INITIAL SETUP

Tools

Tool Kit, Service Refrigeration Unit, Appendix B. Section III, Item 1

Recovery and Recycling Unit, Refrigerant, Appendix B. Section III, Item 7

Regulator, Nitrogen, Appendix B. Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B. Section III, Item 16

Leak Detector, Appendix B. Section III, Item 17

Material/Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11 Nitrogen, Appendix E, Item 18

Materials/Parts (Continued)

Adjustable Hose Clamp, Appendix G. Item 1

Dehydrator, Appendix G. Item 2

Lock Washers, Appendix G. Item 12

Lock Washers, Appendix G. Item 14 (Dehydrator)

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Front (Air Inlet) EMI/RFI Ventilation Panel removed, paragraph 4-29.

Evaporator Side panel removed, paragraph 5-17. Evaporator Electrical Leads disconnected, paragraph 5-20.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Remove.

(1) Remove two screws (Figure 5-17, 1) differential pressure switch (2), and mounting bracket (3).

(2) Remove hose clamp (1) and tube (5). Discard hose clamp (a).

(3) Remove two nuts (6), lock washers (7), flat washers (8), bolts (9), and differential pressure switch (2) from mounting bracket (3).

5-21. DIFFERENTIAL PRESSURE SWITCH MAINTENANCE. (Continued)

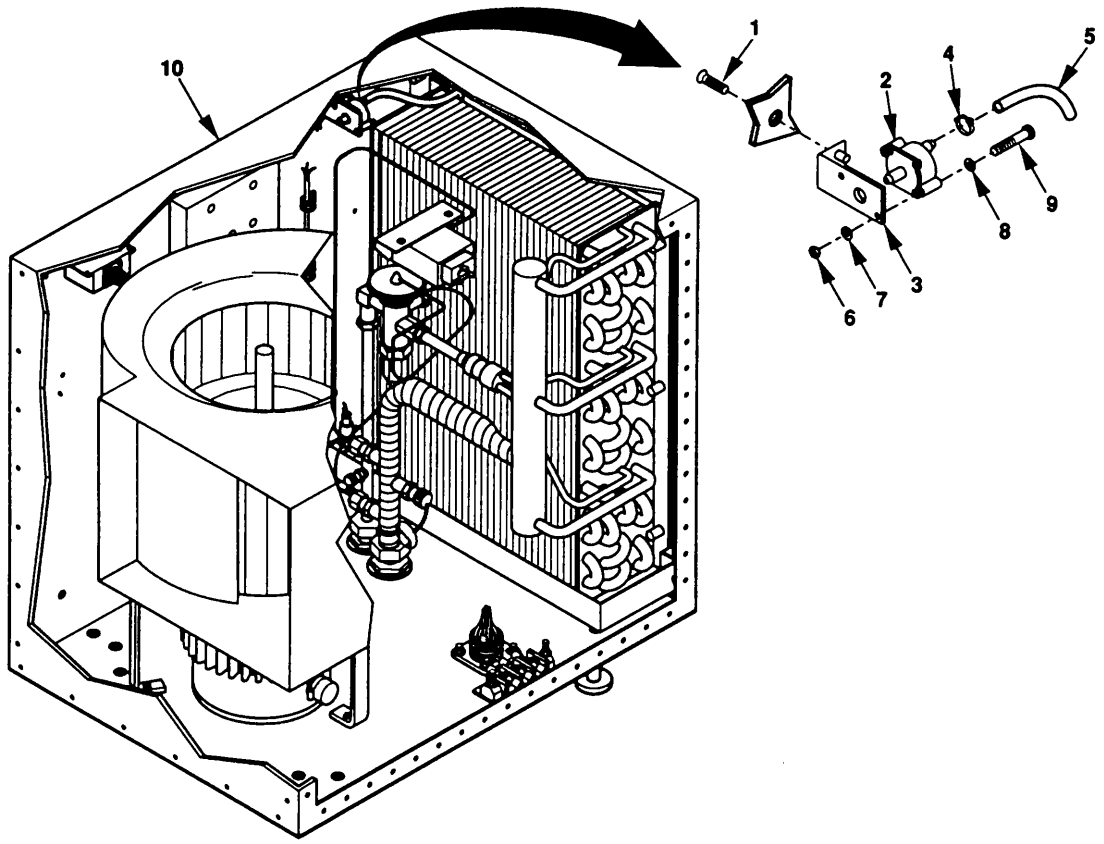


Figure 5-17. Differential Pressure Beech -Maintenance.

b. Repair.

(1) Inspect tube (5) for cracks, holes, tears, and blockages. Refer to Appendix F. Figure F-14 to repair damaged tube (5).

(2) Inspect differential pressure switch (2) and mounting bracket (3) for cracks, damage, and burned or damaged electrical contacts on differential pressure switch (2).

(3) Inspect all mounting hardware for damage.

(4) Replace all damaged or defective components.

c. Install.

(1) Position differential pressure switch (2) on mounting bracket (3) and secure with two bolts (9), flat washers (8), new lock washers (7), and nuts (6).

5-21. DIFFERENTIAL PRESSURE SWITCH MAINTENANCE. (Continued)

CAUTION

Use care when installing tube in evaporator assembly. Damage to tube or evaporator coil may result.

(2) Install tube (5) on differential pressure switch (2) and secure with new hose clamp (4).

(3) Position mounting bracket (3) in evaporator housing (10) and secure with two screws (1).

(4) Follow on maintenance:

(a) Refer to paragraph 5-14 and replace dehydrator.

(b) Refer to paragraph 5-20 and install evaporator electrical leads.

(c) Refer to paragraph 5-17 and install evaporator side panel assembly.

(d) Refer to paragraph 4-29 and install front (air inlet) EMI/RFI ventilation panel.

5-20. EVAPORATOR ELECTRICAL LEAD MAINTENANCE.

This task covers: Inspect, Test, Remove, Repair, Install

INITIAL SETUP

Tools
Tool Kit, Service Refrigeration Unit, Appendix B. Section III, Item 1

Crimping Tool, Terminal, Appendix B. Section III, Item 2

Beater, Gun Type, Electrical, Appendix B. Section III, Item 4

Recovery and Recycling Unit, Refrigerant, Appendix B. Section III, Item 7

Regulator, Nitrogen, Appendix B. Section III, Item 9

Manifold Gage, Charging and Testing (Appendix B. Section III, Item 16)

Leak Detector (Appendix B. Section III, Item 17)

Material/Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Electrical Cable Clamp, Appendix E, Item 7

Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11

Insulation Sleeving, Appendix E, Item 13

Insulation Sleeving, Appendix E, Item 16

Nitrogen, Appendix E, Item 18

Strap, Tiedown, Appendix E, Item 26

Tags, Appendix E, Item 27

Materials/Parts (Continued)

Dehydrator, Appendix G. Item 2

Gasket, Appendix G. Item 10

Lock Washers, Appendix G. Item 12 (A106J1 Connector)

Lock Washers, Appendix G. Item 14 (Cable clamps)

Lock Washers, Appendix G. Item 14(Dehydrator)

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Condition

Air Conditioner shut down, paragraph 2-5.

Power disconnected, refer to applicable system technical manual.

Evaporator Side Panel removed, paragraph 5-17.

Evaporator Fan Assembly removed, paragraph 5-18.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

Ensure that power has been disconnected before performing maintenance on electrical components.

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey thin caution may result in equipment damage.

5-22. EVAPORATOR WIIRING HARNESS, A106J1, MAINTENANCE. (Continued)

a. Remove.

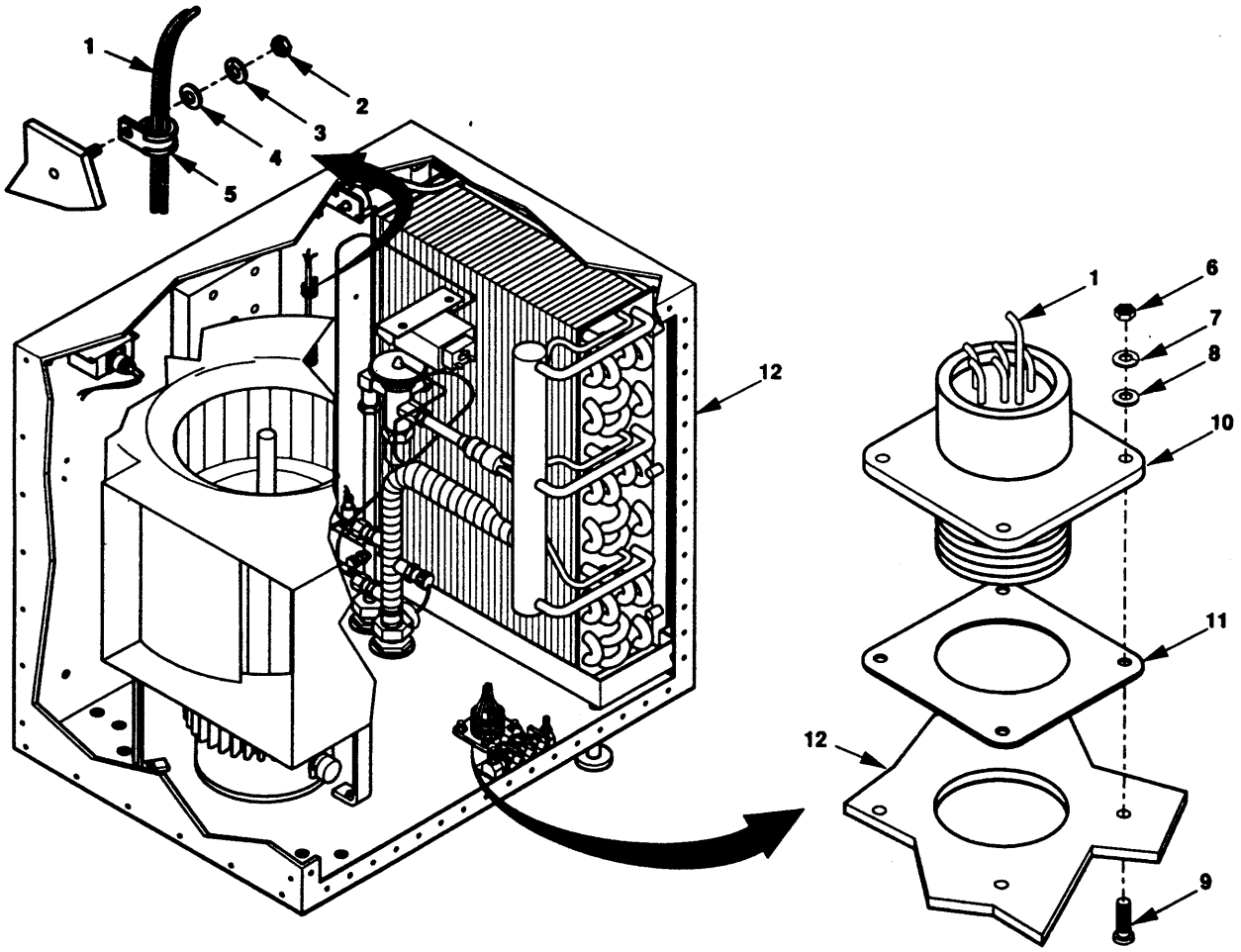


Figure 5-18. Wiring Harness A106J1 Maintenance

WARNING

Do not work on equipment with power connected. Electrocution hazard is present. Failure to obey this warning may result in death or serious personal injury.

(1) Refer to Appendix H. Figure H-3, Tables H-5 and H-6, and tag and disconnect all single wire terminations for wiring harness A106J1 (Figure 5-18, 1).

(2) Remove ten nuts (2), lock washers (3), flat washers (4), and cushion clamps (5). Remove cushion clamps (5) from wiring harness A106J1 (1) and discard lock washers (3).

5-22. EVAPORATOR HIRING HARNESS, A106J1,-MAINTENANCE. (Continued)

(3) Remove and discard all tiedown straps securing wiring harness A106J1 (1) to any electrical lead-.

(4) Remove four nuts (6), lock washers (7), flat washers (8), screws (9), connector A106J1 (10) of wiring harness A106J1 (1), and gasket (11). Discard lock washers (7) and gasket (11).

b. Inspect.

(1) Inspect for loose wires in connector A106J1 (10).

(2) Inspect all wiring harness A106J1 (1) wires for cracked insulation, damaged or missing connectors and terminals, burns, or fraying.

(3) Inspect all mounting hardware for damage.

(4) Replace all damaged or defective components.

c. Test. Refer to Appendix H. Figure H-3, Tables H-5 and H-6 and test continuity of each wire run for wiring harness A106J1 (1).

d. Repair. Refer to Appendix F. Figure F-15 and repair faulty or damaged wiring harness A106J1 (1).

e. Install.

(1) Install new gasket (11) and connector A106J1 (10) in evaporator housing (12) and secure with four screws (9), flat washers (8), new lock washers (7), and nut n (6).

(2) Secure wiring harness A106J1 (1) to electrical leads with new tiedown straps located approximately every three inches.

(3) Install ten cushion clamps (5) on wiring harness A106J1 (1) and secure them to evaporator housing (12) with ten flat washers (4), new lock washers (3), and nuts (2).

(4) Refer to Appendix H. Figure H-3, Tables H-5 and H-6 and connect all single wire terminations for wiring harness A106J1 (1). Remove and discard tags.

(5) Follow on maintenance :

(a) Refer to paragraph 5-14 and replace dehydrator.

(b) Refer to paragraph 5-18 and install evaporator fan assembly.

(c) Refer to paragraph 5-17 and install evaporator side panel.

(d) Refer to applicable system technical manual and connect power.

5-23. EVAPORATOR LOW PRESSURE SWITCH MAINTENANCE.

This task covers: Inspect, Test, Adjust, Remove, Install

INITILAL SETUP

Tools

Tool Kit, Service Refrigeration Unit, Appendix B. Section III, Item 1

Recovery and Recycling Unit, Appendix B. Section III, Item 7

Regulator, Nitrogen, Appendix B. Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B. Section III, Item 16

Leak Detector, Appendix B. Section III, Item 17

Materials/Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11

Nitrogen, Appendix E, Item 18

Materials/Parts (Continued)

Strap, Tiedown, Appendix E, Item 24

Tape, Appendix E, Item 28

Dehydrator, Appendix G. Item 2

Lock Washers, Appendix A, Item 14-. (Dehydrator)

Lock Washers, Appendix G. Item 14 (Cushion Clamps)

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment conditions

Air Conditioner shut down, paragraph 2-5.

Refrigerant recovered, paragraph 5-5.

Wiring Harness, A106J1, leads disconnected, paragraph 5-22. (For replacement only)

General safety Instructions

Do not work on equipment without following standard shop safety precautions.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Inspect.

(1) Inspect capillary tube (Figure 5-19, 1) and low pressure cut out switch S5

(2) for leaks, cracks, or breaks. Ensure tape on capillary tube (1) is not damaged.

NOTE

- Cut out setting for low pressure switch S5 is 27 ± psi (186 ± 21 kPa).
- Cut in setting for low pressure switch S5 is 60 -± 3 psi (413 ± 21 kPa).

(2) Ensure low pressure switch S5 (2) is set to a cut out pressure of 27 ± 3 psi (186 ± 21 kPa) (cut in pressure of 60 ± 3 psi (413 ± 21 kPa).

(3) Remove spring clip (3) and protective cover (4) and check wire connections to low pressure cut out switch S5 (2). Tighten loose connections.

5-23. EVAPORATOR LOW PRESSURE SWITCH MAINTENANCE. (Continued)

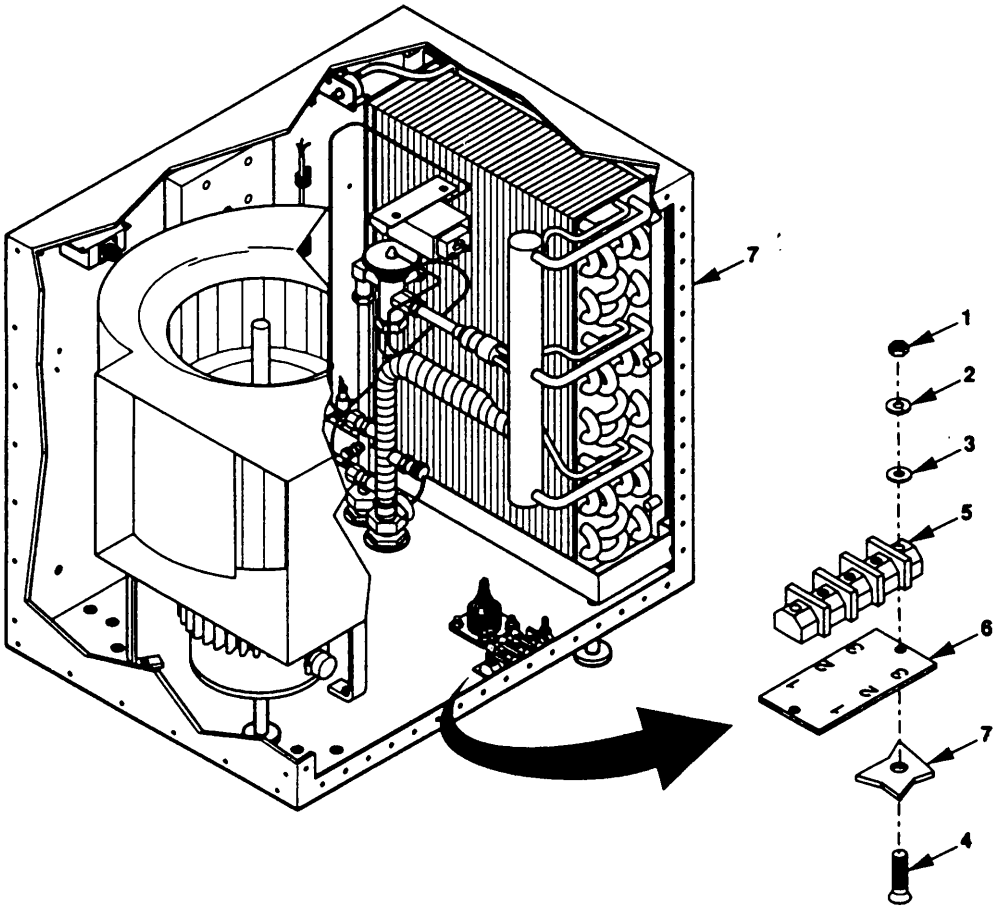


Figure 5-19. Evaporator Low Pressure Cut Out Switch Maintenance.

b. Test.

NOTE
Apply pressure a. required using dry nitrogen.

(1) Install pressure gauge of manifold to evaporator assembly (10).

(2) Resistance measurements on low pressure switch S5 (2) will be as follows:

- At pressures up to 27 ± 3 psi (186 ± 21 kPa) resistance between contacts 1 and 2 will be 0 and resistance between contacts 2 and 3 will be infinite.
- At pressures above 27 ± 3 psi (186 ± 21 kPa) resistance between contacts 1. and 2 will be infinite and. resistance between contacts 2 and 3 will be 0.

Replace defective low pressure switch SS (2).

c. Adjust.

(1) Remove nut (5), lock washer (6), flat washers (7), and cushion clamp (8). Discard lock washer (6).

(2) Remove two screws (9) and lower pressure switch S5 (2).

5-23. EVAPORATOR LOW PRESSURE SWITCH MAINTENANCE. (Continued)

(3) Adjust low pressure switch S5 (2) pressure settings by rotating adjusting screw on rear of low pressure switch S5 (2).

(4) Refer to b and retest low pressure switch S5 (2).

(5) Replace defective switch.

(6) Position low pressure switch S5 (2) in evaporator housing (10) and secure with two screws (9).

(7) Secure low pressure switch S5 (2) electrical leads with cushion clamp (8), flat washer (7), new lock washer (6), and nut (5).

d. Remove.

WARNING

Refrigerant temperatures and pressure may cause severe personal injury. Do not disconnect switch sensors without recovering refrigerant first.

(1) Remove four nuts (5), lock washers (6), flat washers (7), and cushion clamps (8). Discard lock washers (6).

(2) Remove and discard tiedown straps as required.

(3) Loosen flare nut (11) and disconnect capillary tube (1) from suction line tube assembly (12).

(4) Remove two screws (9) and low pressure switch S5 (2).

e. Install.

(1) Position low pressure switch S5 (2) in evaporator assembly (10) and secure with two screws (9).

NOTE

When installing tape on capillary tube, ensure tape edges overlap and no portion of capillary tube is exported to air.

.

(2) If new low pressure switch S5 (2) is being installed, wrap capillary tube (1) with new tape. Otherwise replace tape as required.

NOTE

If new low pressure switch S5 is being installed, install flare nut on capillary tube and flare tube 450.

(3) Install capillary tube (1) on suction line tube assembly (12) and secure with flare nut (11).

(4) Position capillary tube (1) in four cushion clamps (8) and secure with four flat washers (7), new lock washers (6), and nuts (5).

(5) Coil excess length of capillary tube (1) and secure with new tiedown straps as required.

5-23. EVAPORATOR LOW PRESSURE SWITCH MAINTENANCE. (Continued)

(6) Follow on maintenance:

(a) Refer to paragraph 5-14 and replace dehydrator.

(b) Refer to paragraph 5-22 and connect wiring harness A106J1 leads.

(c) Refer to paragraph 5-5 and charge air conditioner.

5-24. EVAPORATOR SINGLE ROW TERMINAL BOARD MAINTENANCE.

Thin task covers	Remove Inspect	Install

INITIAL SETUP

Tools

Tool Kit, Service Refrigeration Unit, Appendix B. Section III, Item 1

Recovery and Recycling Unit, Refrigerant, Appendix B. Section III, Item 7

Regulator, Nitrogen, Appendix B. Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B. Section III, Item 16

Leak Detector, Appendix B. Section III, Item 17

Materials/Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11

Nitrogen, Appendix E, Item 18

Dehydrator, Appendix G. Item 2

Materials/Parts (Continued)

Lock Washers, Appendix G. Item 13

Lock Washers, Appendix G. Item 14 (Dehydrator)

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Evaporator Side Panel removed, paragraph 5-17. Electrical Leads disconnected, paragraph 5-20.

Wiring Harness, A106J1, leads disconnected, paragraph 5-22.

Condensate Level warning Switch leads disconnected, paragraph 5-29.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey thin caution may result in equipment damage.

a. Remove. Remove two nuts (Figure 5-20, 1), lock washers (2), flat washers (3), screw" (4), single row terminal board (5), and marker strip (6). Discard lock washers (2).

b. Inspect.

(1) Inspect single row terminal board (5) for cracks, broken, missing, corroded or dirty contacts on the terminal board.

(2) Inspect all mounting hardware for damage.

5-24. EVAPORATOR SINGLE ROW TERMINAL BOARD MAINTENANCE. (Continued)

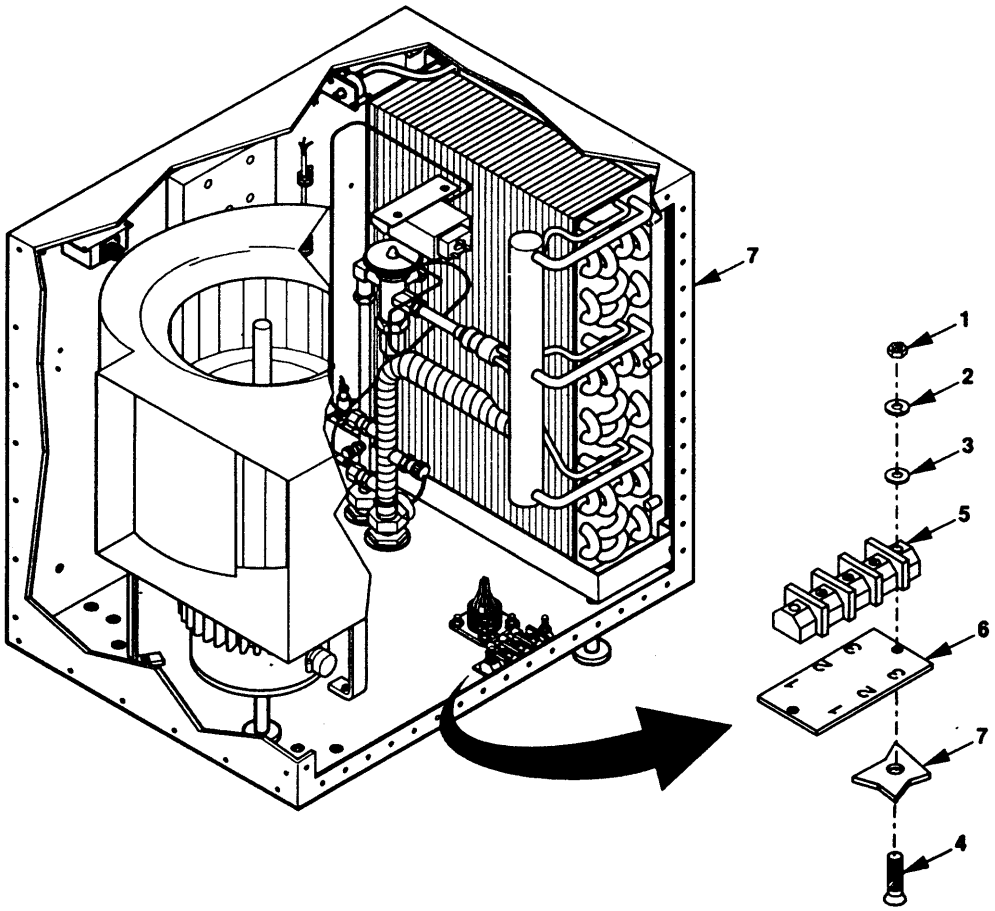


Figure 5-20. Evaporator Single Row Terminal Board Maintenance

(3) Replace all damaged or defective components.

c. Install.

(1) Position marker strip (6) and single row terminal board (5) in evaporator housing (7) and secure with two screws (4), flat washers (3), new lock washer" (2), and nuts (1).

(2) Follow on maintenance:

(a) Refer to paragraph 5-14 and replace dehydrator.

(b) Refer to paragraph 5-29 and connect condensate level warning switch electrical leads.

(c) Refer to paragraph 5-22 and connect wiring harness, A106J1, leads.

(d) Refer to paragraph 5-20 and connect electrical leads.

(e) Refer to paragraph 5-17 and install evaporator side panel.

5-25. EQUALIZER LIKE TUBE ASSEMBLY - MAINTENANCE.

This task cover: Remove, Repair, Install

INITIAL SETUP

Tools

Tool Kit, Service Refrigeration Unit, Appendix B. Section III, Item 1

Recovery and Recycling unit, Refrigerant, Appendix B. Section III, Item 7

Regulator, Nitrogen, Appendix B. Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B. Section III, Item 16

Leak Detector, Appendix B. Section III, Item 17

Materials/Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11

Materials/Parts (Continued)

Nitrogen, Appendix E, Item 18

Dehydrator, Appendix G. Item 2

Lock Washers, Appendix G. Item 14 (Dehydrator)

Refer to TM 9-4120-408-24P for part numbers Of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Refrigerant recovered, paragraph 5-5.

Evaporator Side Panel removed, paragraph 5-17.

Evaporator Fan Assembly removed, paragraph 5-18.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Remove. Loosen two flare nuts (Figure 5-21, 1) and remove equalizer line tube assembly (2).

b. Repair.

(1) Inspect equalizer line tube assembly (2) for cracks, rooted, bends. damage, or damaged flare nuts.

(2) Refer to Appendix F. Figure F-16 and repair equalizer line tube assembly (2).

c. Install.

(1) Position equalizer line tube assembly (2) in evaporator assembly (3) and using two flare nuts (1) secure it to thermoexpansion valve (4) and suction line tube assembly (5).

(2) Follow on maintenance:

(a) refer to paragraph 5-14 and replace dehydrator.

(b) Refer to paragraph 5-18 and install evaporator fan assembly.

(c) Refer to paragraph 5-17 and install evaporator side panel.

5-25. EQUALIZER LINE TUBE ASSEMBLY - MAINTENANCE. (Continued)

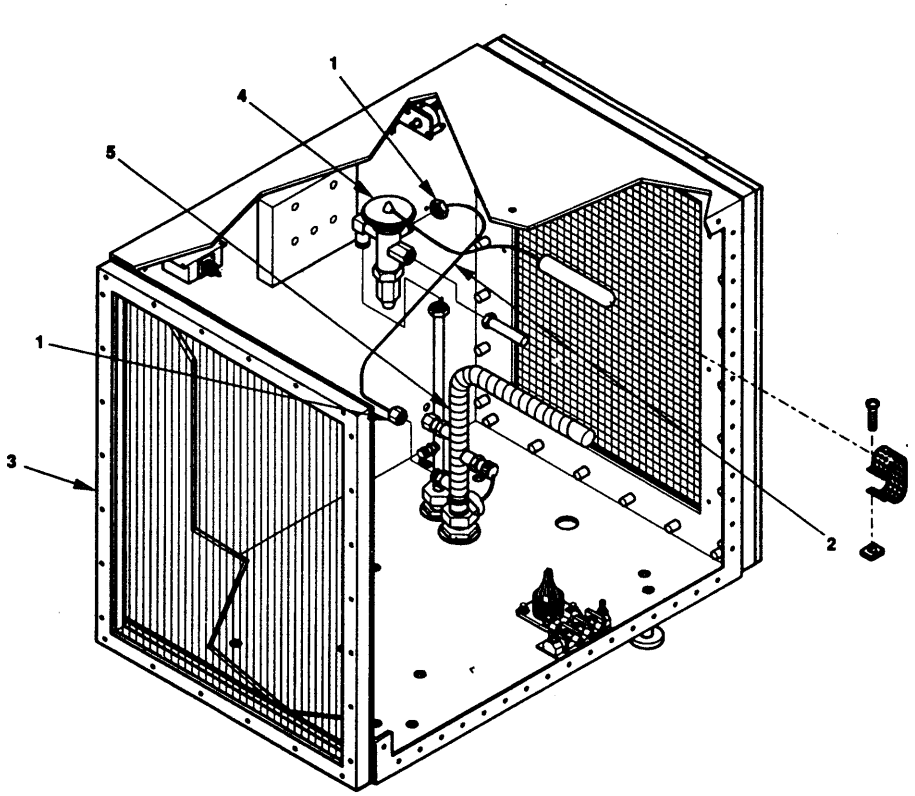


Figure 5-21. Equalizer Line Tube Assembly Maintenance.

(d) Refer to paragraph 5-5 and charge air conditioner.

5-26. THERMOEXPANSION VALVE (TEV) MAINTENANCE

This task covers: **Remove** **Install**
Test and Adjust

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1
Tape, Appendix E, Item 28
Recovery and Recycling Unit, Appendix B, Section III, Item 7
Regulator, Nitrogen, Appendix B, Section III, Item 9
Manifold Gage, Charging and Testing, Appendix B, Section III, Item 16
Leak Detector, Appendix B, Section III, Item 17

Materials/Parts

Adhesive, Appendix E, Item 3
Brazing Alloy, Appendix E, Item 5
Brazing Alloy, Appendix E, Item 6
Tetrafluoroethane, Appendix E, Item 9
Flux, Appendix E, Item 11
Nitrogen, Appendix E, Item 18
Plastic Material, Appendix E, Item 20

Materials/Parts (Continued)

Strap, Tiedown, Appendix E, Item 23
Dehydrator, Appendix G, Item 2
Lock Washers, Appendix G, Item 14 (Dehydrator)
Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.
Refrigerant recovered, paragraph 5-5.
Evaporator Fan Assembly removed, paragraph 5-18.
Equalizer Line Tube Assembly disconnected, paragraph 5-25.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Remove.

NOTE

Insulation material must be removed from suction line tube assembly prior to removal of TEV sensing bulb.

(1) Remove insulation from suction line tube assembly (Figure 5-22, 1).
(2) Remove two nuts (2), screws (3), and clamp (4) securing TEV sensing bulb (5) to side of suction line tube assembly (1). Remove and discard tiedown straps.
(3) Loosen two flare nuts (6) and remove TEV (7).

5-26. THERMOEXPANSION VALVE (TEV) MAINTENANCE. (Continued)

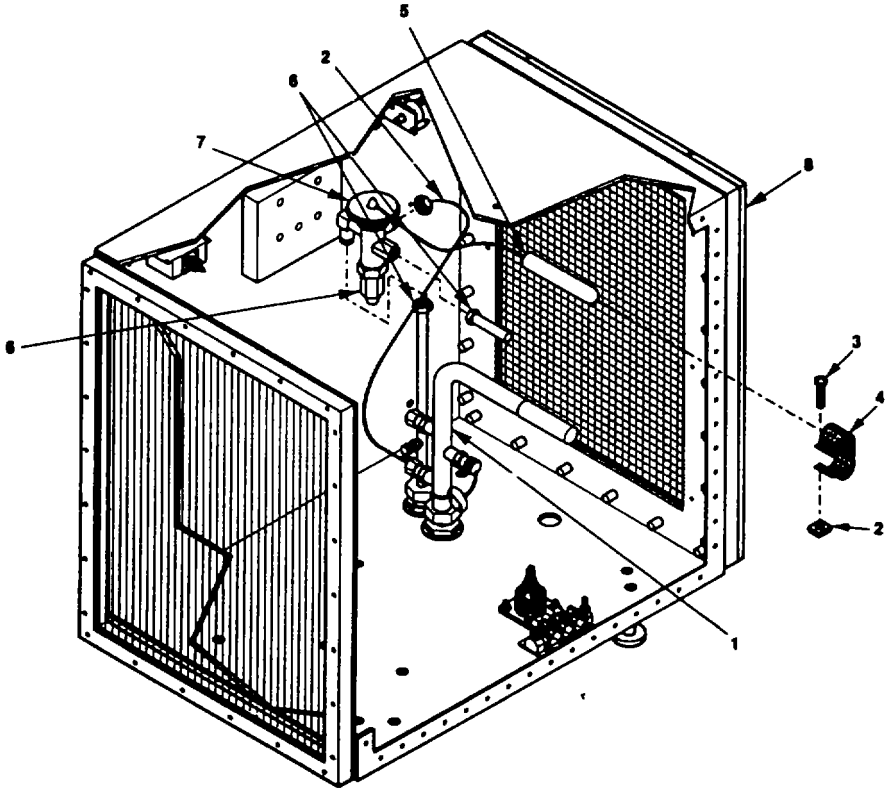


Figure 5-22. Thermoexpansion Valve Maintenance.

b. Test and Adjust.

NOTE
Refer to Figure 5-23 for thermoexpansion valve test set up.

(1) Connect bar gauge manifold, hoses, TEV, tees, nitrogen, and other components as depicted in Figure 5-23.

(2) Insert TEV temperature sensing bulb (Figure 5-23, 1) in ice.

(3) Open nitrogen cylinder (70 psi (482 kPa) minimum).

NOTE
Allow nitrogen to bleed off during entire test and adjustment.

(4) Open compound gage hand valve to adjust bleed rate psi or less below TEV outlet pressure.

(5) To Test Valve Seat: Block off bar gauge manifold center port. Pressure should not rise more than 2 psi (14 kPa). Replace defective TEV.

(6) To Check Bulb (1): Remove bulb (1) from ice and warm in hand - pressure should increase. Return bulb (1) to ice - pressure should drop. Replace defective TEV.

5-26. THERMOEXPANSION VALVE (TEV) MAINTENANCE. (Continued)

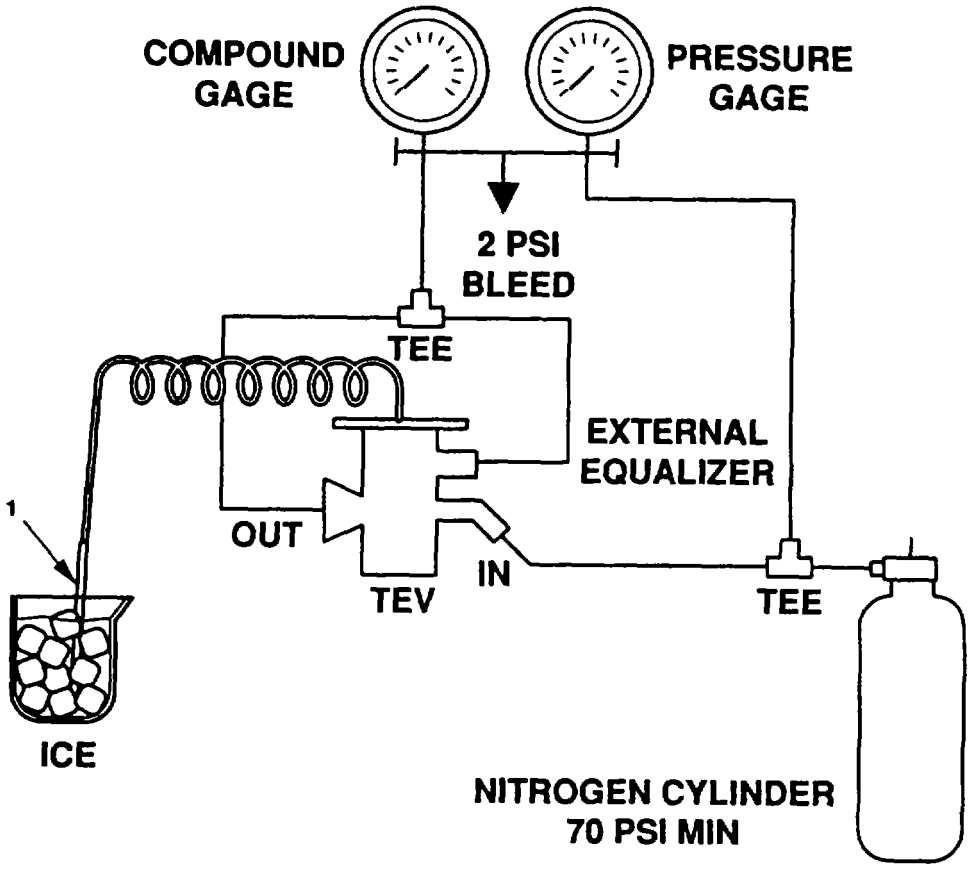


Figure 5-23. Thermoexpnasion Valve Test Setup.

(7) Adjusting Superheat: Simulating 6°:

(a) Suction line temperature = 32° (temperature sensing bulb (1) is in ice).

(b) For 6° superheat, evaporator must be 26°
26° = 25 psi (172 kPa) (R-12)

NOTE

- Turn clockwise to increase superheat.
- Turn counter-clockwise to decrease superheat.

(c) Adjust valve stem of TEV to get 25 psi (172 kPa) on compound gage. Replace TEV if 25 psi (172 kPa) can not be reached.

c. Install.

(1) Position TEV (Figure 5-22, 7) in evaporator assembly (8).

(2) Align two flare nuts (6) and secure TEV (7).

(3) Position TEV sensing bulb (5) on side of suction line tube assembly (1) and secure with clamp (4), two screws (3), and nut (2). Coil and secure capillary tube of TEV sensing bulb (5) with new tiedown straps.

5-26. THERMOEXPANSION VALVE (TEV) MAINTENANCE. (Continued)

NOTE

Seal all joints and seams of insulation with adhesive. Wrap ends of insulation twice around tightly using tape to secure. Use tape where capillary tube exits insulation to seal opening in insulation.

(4) Install new insulation around suction line tube assembly (1) and TEV sensing bulb (5) from evaporator coil to outlet connection.

(5) Follow on maintenance:

(a) Refer to paragraph 5-14 and replace dehydrator.
(b) Refer to paragraph 5-25 and connect equalizer line tube assembly
(c) Refer to paragraph 5-18 and install evaporator fan assembly.
(d) Refer to paragraph 5-5 and charge the air conditioner.

5-27. EVAPORATOR TUBING AND FITTINGS MAINTENANCE

This task covers: **Remove** **Repair** **Install**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Recovery and Recycling Unit, Refrigerant, Appendix B, Section III, Item 7

Regulator, Nitrogen, Appendix B, Section III, Item 9

Wrench, Box and Open End, Appendix B, Section III, Item 12
Wrench, Open End, Appendix B, Section III, Item 13
Manifold Gage, Charging and Testing, Appendix B, Section III, Item 16

Leak Detector, Appendix B, Section III, Item 17

Materials/Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6
Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11

Nitrogen, Appendix E, Item 18

Materials/Parts (Continued)

Strap, Tiedown, Appendix E, Item 25

Dehydrator, Appendix G, Item 2

Lock Washers, Appendix G, Item 14 (Dehydrator)

Preformed Packing, Appendix G, Item 3 (In Line) (Quantity 2)

Preformed Packing, Appendix G, Item 4 (Out Line) (Quantity 2)
Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Evaporator Side Panel removed, paragraph 5-17.

Evaporator Fan Assembly removed, paragraph 5-18.

TEV removed, paragraph 5-26.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

5-27. EVAPORATOR TUBING AND FITTINGS MAINTENANCE. (Continued)

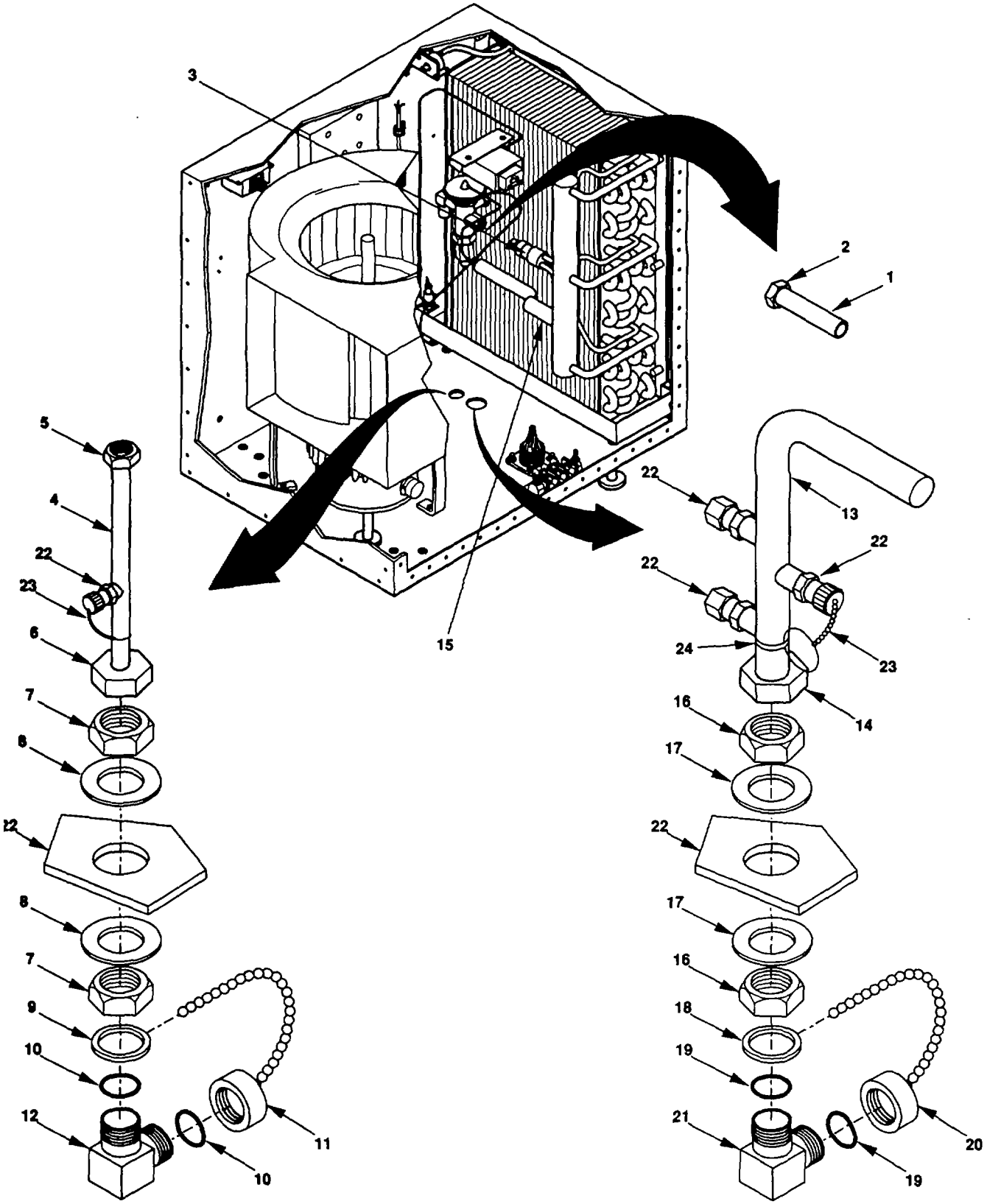


Figure 5-24. Evaporator Tubing and Fittings Maintenance.

5-27. EVAPORATOR TUBING AND FITTINGS MAINTENANCE. (Continued)

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Remove.

(1) Remove TEV outlet tubing (Figure 5-24, 1) as follows:

(a) Loosen flare nut (2).

(b) Disconnect outlet tubing (1) from evaporator coil distributor (3).

(2) Remove liquid line tube assembly (4) as follows:

(a) Loosen flare nut (5) and nut (6) and remove liquid line tube assembly (4).

(b) Remove two lock nuts (7), flat washers (8), two preformed packings (9), split ring (10) and cap chain (11) from bulkhead elbow (12). Discard preformed packing (9).

(3) Remove suction line tube assembly (13) as follows:

(a) Loosen nut (14), disconnect suction line tube assembly (13) from evaporator coil return (15), and remove suction line tube assembly (13).

(b) Remove two lock nuts (16), flat washers (17), two preformed packings (18), split ring (19) and cap chain (20) from bulkhead elbow (21).

b. Repair.

(1) Inspect TEV outlet tubing (1), liquid line tube assembly (4), and suction line tube assembly (13) for any evidence of cracks, bends, ruptures, or damaged access valves (22). Refer to Appendix F, Figure F-17 to repair TEV outlet tubing (1).

NOTE

- When replacing damaged or missing cap and chain on liquid line tube assembly the cap and chain ring is installed on the liquid line tube assembly.
- When replacing damaged cap and chain on suction line tube assembly secure cap and chain ring to suction line tube assembly with new wire tie

(2) Inspect liquid line tube assembly (4) and suction line tube assembly (13) for damaged or missing cap and chain (23).

NOTE

When replacing cap and chain assembly on suction line remove and discard tiedown strap. Use new tiedown strap to secure cap and chain assembly to suction line assembly.

(3) Replace damaged or missing cap and chain (23).

(4) Inspect all mounting hardware for damage.

5-27. EVAPORATOR TUBING AND FITTINGS MAINTENANCE. (Continued)

(5) Replace all damaged or missing components.

c. Install.

(1) Install suction line tube assembly (13) as follows:
(a) Install split ring and cap and chain (19 and 20), lock nut (16), and flat washer (17) on bulkhead elbow (21). lb) Install bulkhead elbow (21) in evaporator assembly (24) and secure with flat washer (17) and lock nut (16).

(c) Install two preformed packings (19) in bulk head elbow (21). Install cap (20) on bulk head elbow (21).
(d) Position suction line tube assembly (13) in evaporator assembly (24) connecting it to evaporator coil return (15) and securing it to bulkhead elbow (21) with nut (14).
(2) Install liquid line tube assembly (4) as follows:

(a) Install split ring and cap and chain (10 and 11), lock nut (7), and flat washer (8) on bulkhead elbow (12).

(b) Install bulkhead elbow (12) in evaporator assembly (24) and secure with flat washer (8) and lock nut (7).
(c) Install two preformed packings (10) in bulk head elbow (12). Install cap (11) on bulk head elbow (12).
(d) Position liquid line tube assembly (4) in evaporator assembly (24) securing it to bulkhead elbow (12) with nut (6).
(e) Tighten flare nut (5).

(3) Install TEV outlet tubing (1) as follows:
(a) Connect outlet tubing (1) to evaporator coil distributor (3).

(b) Secure flare nut (2).
(4) Follow on maintenance:
(a) Refer to paragraph 5-14 and replace dehydrator.
(b) Refer to paragraph 5-26 and install TEV.
(c) Refer to paragraph 5-18 and install evaporator fan assembly.

(d) Refer to paragraph 5-17 and install evaporator side panel.

5-28. EVAPORATOR COIL MAINTENANCE

This task covers:	Service Remove	Repair Install

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Recovery and Recycling Unit, Appendix B, Section III, Item 7
Regulator, Nitrogen, Appendix B, Section III, Item 9

Cleaning Set, Fin, Appendix B, Section III, Item 11

Manifold Gage, Charging and Testing, Appendix B. Section III, Item 16

Leak Detector, Appendix B, Section III, Item 17

Materials/Parts

Adhesive, Appendix E, Item 2

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11

Materials/Parts (Continued)

Nitrogen, Appendix E, Item 18

Dehydrator, Appendix G, Item 2

Lock Washers, Appendix G, Item 14 (Dehydrator)
Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Front (Air Inlet) E2I/RFI Ventilation Panel removed, paragraph 4-29.

Evaporator Fan Assembly removed, paragraph 5-18.

Differential Pressure Switch removed, paragraph 5-21.

Evaporator Tubing and Fittings removed, paragraph 5-27.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Service.

(1) Clean debris, dirt, or other obstructions from evaporator coil (Figure 5-25, 1).

(2) Using fin comb, straighten any bent fins on evaporator coil (1).

b. Remove.

(1) Remove six screws (2).

(2) Disconnect cap of cap and chain (3) and remove lock nut (4) and split ring (5).

(3) Remove insulation. material (6), between evaporator coil (1) and top of evaporator housing (7), as required.

5-28. EVAPORATOR COIL MAINTENANCE. (Continued)

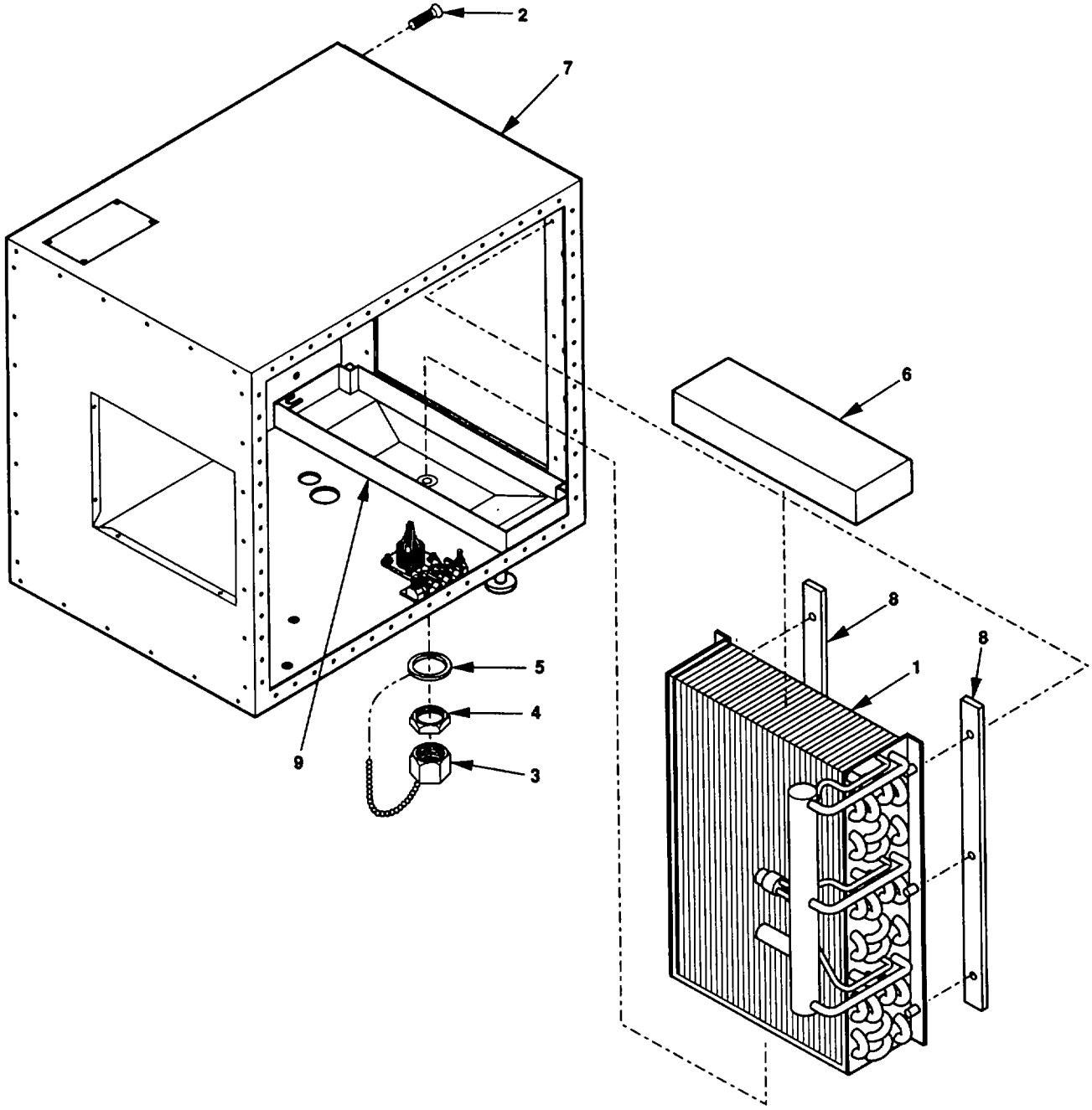


Figure 5-25. Evaporator Coil Maintenance.

c. Repair.

(1) Inspect evaporator coil (1) for dirty, obstructed, or bent fins, or damaged tubes.

(2) Check for holes in tubes or large holes in fins of evaporator coil (1).

5-28. EVAPORATOR COIL MAINTENANCE. (Continued)

(3) Inspect rubber sheets (8), on mounting surfaces of evaporator coil (1), and insulation material (6) for deterioration or damage. Refer to Appendix F, Figure F-12 and repair deteriorated or damaged rubber sheets (8) or insulation material (6).
(4) Evaporator coil (1) tubing may be repaired by brazing. Any other damage requires replacement of evaporator coil (1).
(5) Inspect all mounting hardware for damage.

(6) Replace all damaged mounting hardware.

d. Install.

(1) Position evaporator coil (1) in evaporator housing (7) and condensate drain pan (9).
(2) Apply adhesive to insulation material (6) and install insulation material (6) between evaporator coil (1) and top of evaporator housing (7).

(3) Position split ring (5) on drain tube of condensate drain pan (9) and secure with lock nut (4).
(4) Install cap of cap and chain (3) on drain tube of condensate drain pan (9).
(5) Secure evaporator coil (1) to evaporator housing (7) with six screws (2).

(6) Follow on maintenance:
  (a) Refer to paragraph 5-14 and replace dehydrator.
  (b) Refer to paragraph 5-27 and install evaporator tubing and fittings.
  (c) Refer to paragraph 5-21 and install differential pressure switch.
  (d) Refer to paragraph 5-18 and install evaporator fan assembly.

  (e) Refer to paragraph 4-29 and install front (air inlet) EMI/RFI ventilation panel.
  (f) Refer to paragraph 5-5 and charge air conditioner.

5-29. CONDENSATE LEVEL WARNING SWITCH MAINTENANCE

This task covers: **Test** **Remove** **Install**

INITIAL SETUP:

Tools
Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Recovery and Recycling Unit, Refrigerant, Appendix B, Section III, Item 7
Regulator, Nitrogen, Appendix B, Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B. Section III, Item 16

Leak Detector, Appendix B, Section III, Item 17

Materials/Parts

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11

Materials/Parts (Continued)
Nitrogen, Appendix E, Item 18

Straps, Tiedown, Appendix E, Item 25

Tags, Appendix E, Item 27
Dehydrator, Appendix G, Item 2

Lock Washers, Appendix G, Item 14 (Dehydrator)

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Evaporator Coil removed, paragraph 5-28.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Test. Test continuity at terminal board, TB4, (Figure 5-26, 1) positions 1 and 2. When condensate drain pan (2) is full, resistance should be 0. When condensate drain pan (2) is empty, resistance should be infinite. Replace defective condensate level warning switch (3).

b. Remove.

(1) Remove two screws (4) and tag and remove three electrical leads (5).
(2) Remove and discard tiedown straps from electrical leads (5).
(3) Loosen four nuts (6) and remove two electrical leads (5) from four cushion clamps (7).
(4) Loosen switch retaining nut (8) and remove condensate level warning switch (3) from condensate drain pan (2).

c. Install.

(1) Install condensate level warning switch (3) in condensate drain pan (2) and secure with retaining nut (8).
(2) Install two electrical leads (5) in four cushion clamps (7) and tighten four nuts (6).

5-29. CONDENSATE LEVEL WARNING SWITCH MAINTENANCE. (Continued)

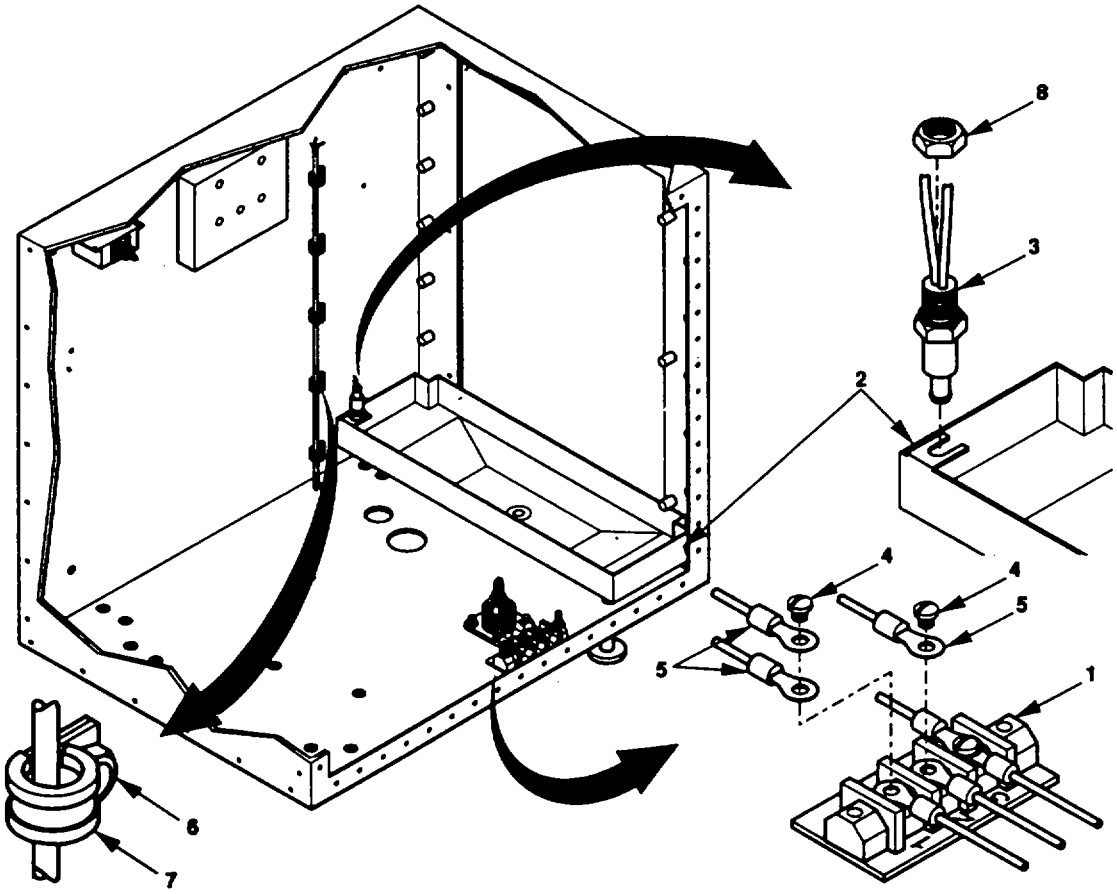


Figure 5-26. Condensate Level Warning Switch Maintenance

(3) Secure electrical leads (5) with new tiedown straps approximately three inches apart.

(4) Position electrical leads (5) on terminal board TB4, (1) and secure with two screws (4). Remove and discard tags.

(5) Follow on maintenance:

(a) Refer to paragraph 5-14 and replace dehydrator.

(b) Refer to paragraph 5-28 and install evaporator coil.

5-30. CONDENSATE DRAIN PAN MAINTENANCE

This task covers: **Remove** **Inspect** **Service** **Install**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Recovery and Recycling Unit, Appendix B, Section III, Item 7

Regulator, Nitrogen, Appendix B, Section III, Item 9

Material/Parts

Brazing Alloy, Appendix E, Item 5
Brazing Alloy, Appendix E, Item 6
Conductive Caulking, Appendix E, Item 8
Flux, Appendix E, Item 11
Nitrogen, Appendix E, Item 18
Drain Pan, Appendix E, Item 19
Rags, Appendix E, Item 21
Soap, Appendix E, Item 22

Material/Parts (Continued)

Dehydrator, Appendix G. Item 2
Lock Washers, Appendix G. Item 14 (Dehydrator)
Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Evaporator Coil removed, paragraph 5-28.

Condensate Level Warning Switch, paragraph 5-29.

General Safety Instructions

Do not work on equipment without following standard shop safety procedures.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Remove. Remove condensate drain pan (Figure 5-27, 1) from evaporator housing (2).

b. Service.

(1) Remove all conductive caulking from condensate drain pan (1) and evaporator housing (2).

WARNING

Ensure all fungus, mold, and mildew is removed from condensate drain pan. Failure to obey this warning may result in serious personal injury.

(2) Clean condensate drain pan (1) as required.

c. Inspect

(1) Inspect condensate drain pan (1) for damaged welds, missing or damaged fitting, and damaged condensate level warning switch mounting bracket.

5-30. CONDENSATE DRAIN PAN MAINTENANCE. (Continued)

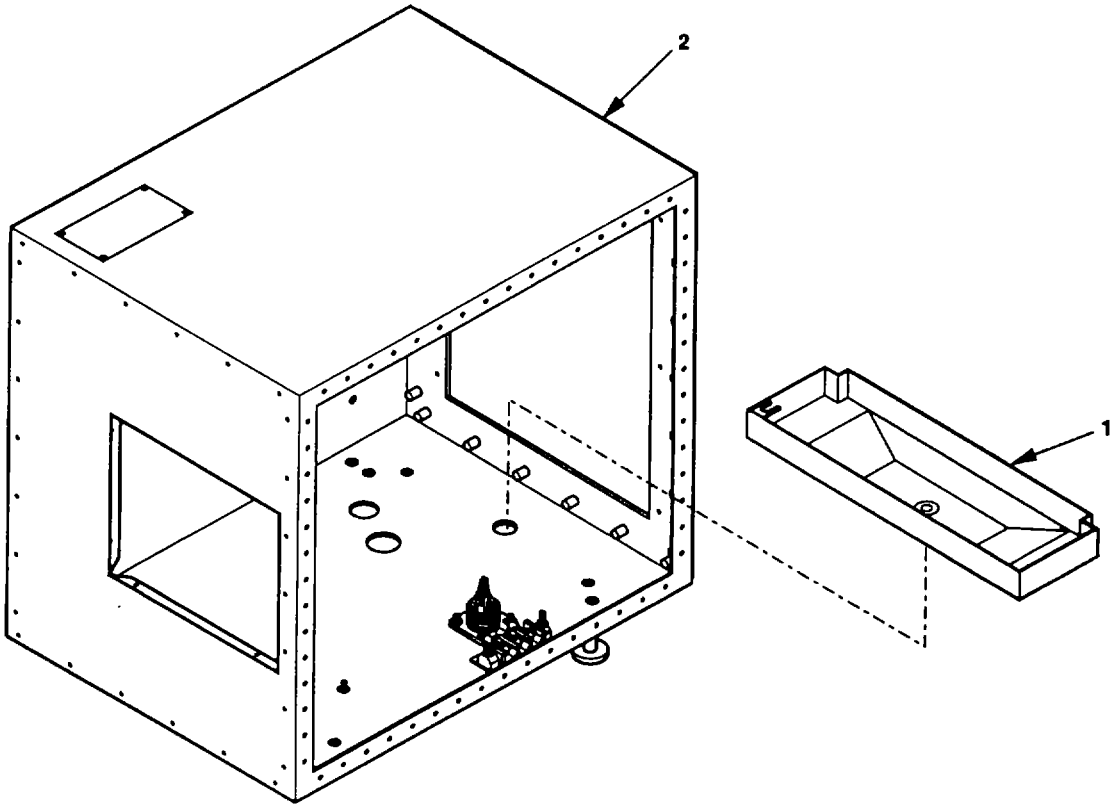


Figure 5-27. Condensate Drain Pan Maintenance.

(2) Inspect all mounting hardware for damage.

(3) Replace all damaged or defective components.

d. Install.

(1) Position condensate drain pan (1) in evaporator housing (2) and apply conductive caulking between evaporator housing (2) and condensate drain pan (1). Also, apply conductive caulking around drain fitting of condensate drain pan (1).

(2) Follow on maintenance:

(a) Refer to paragraph 5-14 and replace dehydrator.

(b) Refer to paragraph 5-29 and install condensate level warning switch.

(c) Refer to paragraph 5-28 and install evaporator coil.

SECTION IV. PREPARATION FOR STORAGE OR SHIPMENT

5-31. MARKING.

Mark the air conditioner in accordance with the standard Army procedures contained in MIL-STD-129, Marking for Shipment and Storage.

5-32. PRESERVATION PROCEDURES.

Ensure that all refrigerant has been recovered from the system and open refrigerant lines are capped securely to prevent moisture from entering the system.

Administrative storage is short term storage (1 to 45 days). It covers storage of equipment which can be readied for mission performance within 24 hours.

Intermediate storage is 46 to 180 days and requires no special handling other than protection from damage and the elements.

Long term storage and flyable storage are for indefinite periods of time and require special steps to prepare the equipment. See paragraphs 5-33.a through 5-33.c below for preparing each component of the air conditioner for long term or flyable storage.

5-33. PACKING.

a. Control Module Assembly Preservation. Place protective caps over the electrical connectors. (If original protective caps are not available, use a substitute that will prevent moisture, dirt or other foreign matter from entering the electrical connectors). Wrap the unit with two layers of heavy plastic material or barrier paper. Using banding material, strap the Control Module Assembly to the same wooden pallet or suitable skid base with either the Condenser Assembly or the Evaporator Assembly as space allows. Mark the Control Module Assembly in accordance with paragraph 5-31.

b. Condenser Assembly Preservation. Recover the refrigerant and disconnect refrigerant lines. Immediately place protective caps over the refrigerant fittings and electrical connectors. (If original protective caps are not available, use a substitute that will prevent moisture, dirt or other foreign matter from entering the vacuum of the refrigerant system or electrical connectors). Evacuate the condenser assembly. Wrap the unit with two layers of heavy plastic material or barrier paper. Using banding material, strap the Condenser to a wooden pallet or other skid base suitable for forklift blades. Mark the Condenser Assembly in accordance with paragraph 5-31.

c. Evaporator Assembly Preservation. Recover the refrigerant and disconnect refrigerant lines. Immediately place protective caps over the refrigerant fittings and electrical connectors. (If original protective caps are not available, use a substitute that will prevent moisture, dirt or other foreign matter from entering the vacuum of the refrigerant system or electrical connectors). Evacuate the Evaporator Assembly. Wrap the unit with two layers of heavy plastic material or barrier paper. Using banding material, strap the Evaporator Assembly to a wooden pallet or other skid base suitable for forklift blades. Mark the Evaporator Assembly in accordance with paragraph 5-31.

CHAPTER 6

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

INDEX

SECTION I. REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

6-1. COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to Modified Table of Organization and Equipment (MTOE), Common Table of Allowances (CTA) CTA 50-970, or CTA 8-100, as applicable to your unit.

6-2. SPECIAL TOOLS, TIDE. AND SUPPORT EQUIPMENT.

Special tools, TMDE, and support equipment are listed in TM 9-4120-408-24P, Repair Parts and Special Tools List (RPSTL) for the Air Conditioner: Split Pack, 30,000 BTUH, 28VDC covering unit, direct support, and general support maintenance, or the Maintenance Allocation Chart (MAC), Appendix B of the manual.

6-3. REPAIR PARTS.

Refer to Mandatory Replacement Parts, Appendix G, for parts that must be stocked for proper repair of the air conditioner. Repair parts are listed and illustrated in TM 9-4120-408-24P covering unit, direct support, and general support maintenance of this equipment.

SECTION II. GENERAL SUPPORT MAINTENANCE PROCEDURES

6-4. CONDENSER HOUSING MAINTENANCE

This task covers: **Remove** **Install** **Repair**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1
Riveter Blind Hand, Appendix B, Section III, Item 2
Rivnut Installation Tool, Appendix B, Section III, Item 6
Recovery and Recycling Unit, Appendix B, Section III, Item 7
Regulator, Nitrogen, Appendix B, Section III, Item 9
Sling, Appendix B, Section III, Item 14
Rivnut Installation Tool, Appendix B, Section III, Item 15
Manifold Gage, Charging and Testing, Appendix B, Section III, Item 16
Leak Detector, Appendix B, Section III, Item 17

Materials/Parts

Brazing Alloy, Appendix E, Item 5
Brazing Alloy, Appendix E, Item 6
Tetrafluoroethane, Appendix E, Item 9
Flux, Appendix E, Item 11
Nitrogen, Appendix E, Item 18
Dehydrator, Appendix G, Item 2
Lock Washers, Appendix G, Item 14 (Dehydrator)
Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Equipment Conditions (Continued)

Side Panel Assembly removed, paragraph 4-11.
Data Plates and Spring Clip removed, paragraph 4-12.
Roadside Lifting Ring removed, paragraph 4-13.
Condenser Feet removed, paragraph 4-14.
Upper Condenser Protective Grille and EMI/RFI Ventilation Panel removed, paragraph 4-15.
Wiring Harnesses removed, paragraph 4-16.
Condenser Electrical Leads and Diode Assemblies removed, paragraph 4-17.
50 Amp Relays removed, paragraph 4-18.
Condenser Terminal Board removed, paragraph 4-19.
Lower Condenser Protective Grille and EMI/RFI Ventilation Panel removed, paragraph 5-6.
Condenser vane Axial Fans removed, paragraph 5-7.
Curbside Lifting Ring removed, paragraph 5-8.
Data Plates and Spring Clip removed, paragraph 5-9.
Condenser Pressure Switches removed, paragraph 5-10.
Condenser Tubing and Fittings removed, paragraph 5-12.
Liquid Line Receiver removed, paragraph 5-13.
Dehydrator removed, paragraph 5-14.
Condenser Coil removed, paragraph 5-15.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

a. Remove. Placing the condenser housing (Figure 6-1, 1) in the equipment conditions specified above will remove it from the system.

6-4. CONDENSER HOUSING MAINTENANCE. (Continued)

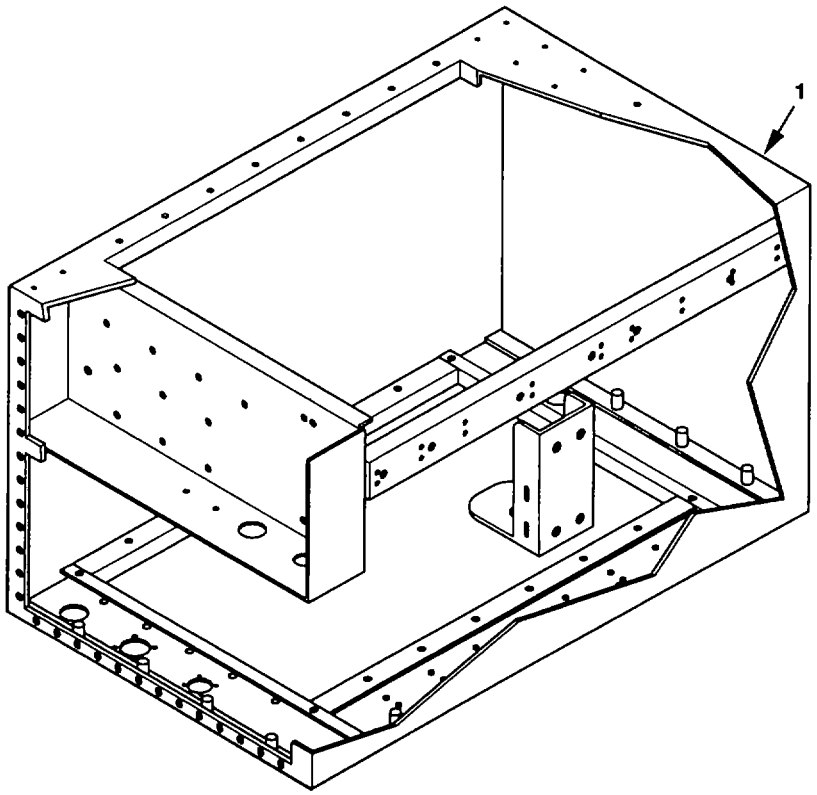


Figure 6-1. Condenser Housing.

b. Repair.

(1) Inspect condenser housing (1) for corrosion, cracks, bends, breaks, holes, severe damage, or missing rivnuts, rivets, and self clinching studs. Replace damaged or missing rivnuts, rivets, and self clinching studs,

(2) Replace or repair condenser housing (1) if it is unable to protect components from environmental damage or provide EMI shielding.

(3) Refer to TM 5-625 and TM 5-745 for sheet metal repair procedures.

c. Install. Follow on maintenance:

(1) Refer to paragraph 5-15 and install condenser coil.

(2) Refer to paragraph 5-14 and install new dehydrator.

(3) Refer to paragraph 5-13 and install liquid line receiver.

(4) Refer to paragraph 5-12 and install condenser tubing and fittings.

(5) Refer to paragraph 5-10 and install condenser pressure switches.

(6) Refer to paragraph 5-9 and install data plates and spring clip.

(7) Refer to paragraph 5-8 and install curbside lifting ring.

6-4. CONDENSER HOUSING MAINTENANCE. (Continued)

(8) Refer to paragraph 5-7 and install condenser vane axial fans.
(9) Refer to paragraph 5-6 and install lower condenser protective grille and EMI/RFI ventilation panel.

(10) Refer to paragraph 4-19 and install condenser terminal board.
(11) Refer to paragraph 4-18 and install 50 amp relays.

(12) Refer to paragraph 4-17 and install condenser electrical leads and diode assemblies.

(13) Refer to paragraph 4-16 and install wiring harnesses.

(14) Refer to paragraph 4-15 and install upper condenser protective grille and EMI/RFI ventilation panel.

(15) Refer to paragraph 4-14 and install condenser feet.
(16) Refer to paragraph 4-13 and install roadside lifting ring.
(17) Refer to paragraph 4-12 and install data plates and spring clip.
(18) Refer to paragraph 4-11 and install side panel assembly.

6-5. EVAPORATOR HOUSING MAINTENANCE

This task covers: **Remove** **Repair** **Install**

INITIAL SETUP:

Tools

Tool Kit, Service Refrigeration Unit, Appendix B, Section III, Item 1

Riveter Blind Hand, Appendix B, Section III, Item 2

Rivnut Installation Tool, Appendix B, Section III, Item 6

Recovery and Recycling Unit, Appendix B, Section III, Item 7

Regulator, Nitrogen, Appendix B, Section III, Item 9

Manifold Gage, Charging and Testing, Appendix B, Section III, Item 16
Leak Detector, Appendix B, Section III, Item 17

Materials/Parts

Adhesive, Appendix E, Item 3

Brazing Alloy, Appendix E, Item 5

Brazing Alloy, Appendix E, Item 6

Tetrafluoroethane, Appendix E, Item 9

Flux, Appendix E, Item 11

Nitrogen, Appendix E, Item 18

Dehydrator, Appendix G, Item 2

Lock Washers, Appendix G, Item 14 (Dehydrator)

Rivets, Appendix G, Item 6

Rivets, Appendix G, Item 7

Materials/Parts (Continued)

Refer to TM 9-4120-408-24P for part numbers of items to be replaced.

Equipment Conditions

Air Conditioner shut down, paragraph 2-5.

Front (Air Inlet) Evaporator EMI/RFI Ventilation Panel removed, paragraph 4-29.

Evaporator Side Panel Assembly removed, paragraph 5-17.

Evaporator Fan Assembly removed, paragraph 5-18.

EMI Electronic Filter removed, paragraph 5-19.

Evaporator Electrical Leads removed, paragraph 5-20.

Differential Pressure Switch removed, paragraph 5-21.

Evaporator Wiring Harness, A106J1, removed, paragraph 5-22.

Low Pressure Switch removed, paragraph 5-23.

Evaporator Single Row Terminal Board removed, paragraph 5-24.

Equalizer Line Tube Assembly removed, paragraph 5-25.

Condensate Drain Pan removed, paragraph 5-30.

General Safety Instructions

Do not work on equipment without following standard shop safety precautions.

CAUTION

Dehydrator must be replaced every time the air conditioner lines are exposed to the atmosphere. Failure to obey this caution may result in equipment damage.

a. Remove. Placing the evaporator housing (Figure 6-2, 1) in the equipment conditions specified above will remove it from the system.

6-5. EVAPORATOR HOUSING MAINTENANCE. (Continued)

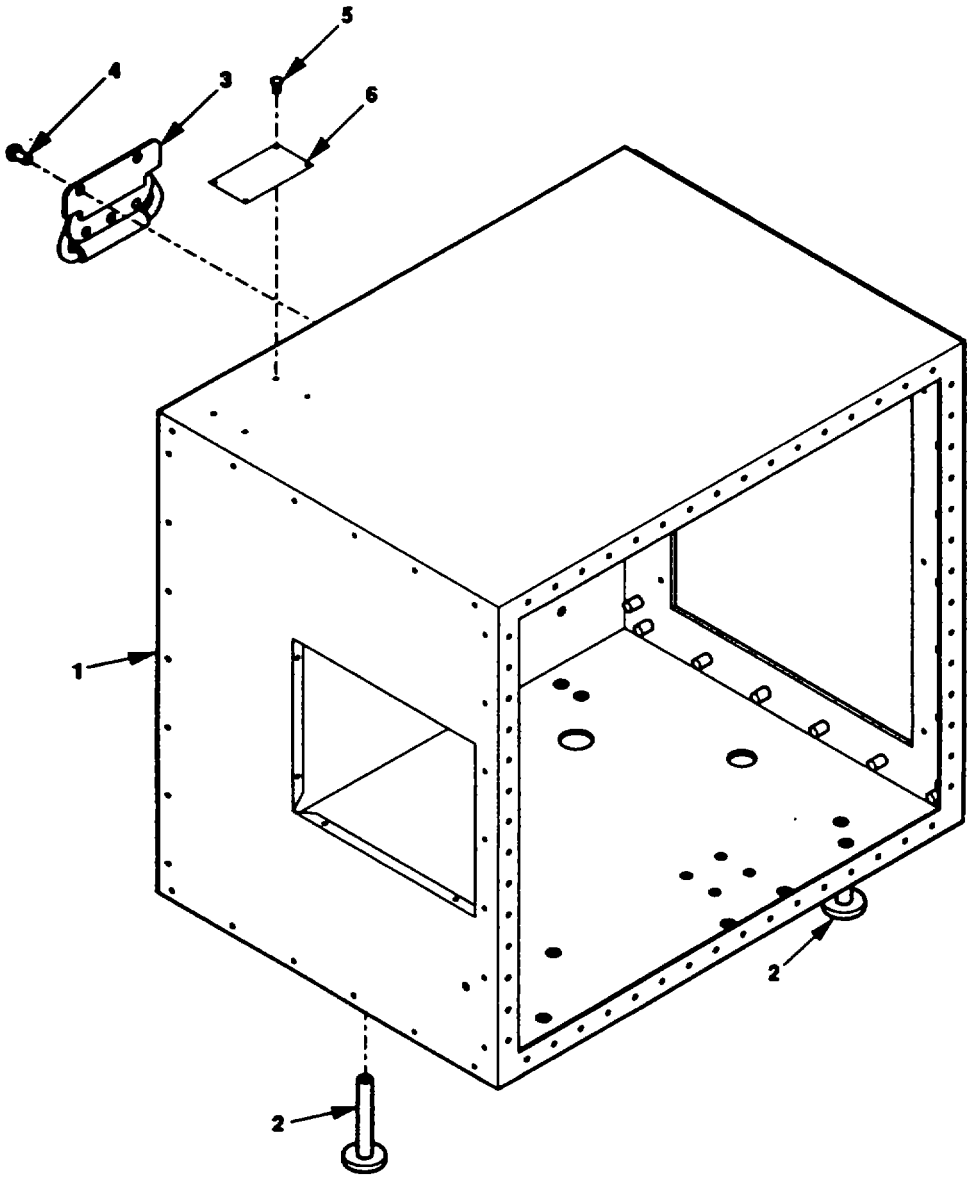


Figure 6-2. Evaporator Housing Maintenance.

b. Repair.

(1) Inspect evaporator housing (1) for corrosion, cracks, bends, breaks, holes, severe damage, or missing rivnuts, rivets, and self clinching studs.

(2) Inspect mounting feet (2) and handle (3) for damage.

(3) Replace damaged or missing mounting feet (2).

(4) Replace damaged handle (3) as follows:

(a) Remove and discard five rivets (4) and remove handle (3).

6-5. EVAPORATOR HOUSING MAINTENANCE. (Continued)

(b) Position handle (3) on evaporator housing (1) and secure with five new rivets (4).

(5) Replace damaged or missing identification plate (6) as follows:

(a) Remove and discard four rivets (5) and remove identification plate (6).

(b) Position identification plate (6) on evaporator housing (1) and secure with four new rivets (5).

(6) Replace or repair evaporator housing (1) if it is unable to protect components from environmental damage or provide EMI shielding.

(7) Refer to TM 5-625 and TM 5-745 for sheet metal repair procedures.

(8) Inspect all rubber sheets on interior of evaporator housing (1). Refer to Appendix F, Figure F-12 to repair damaged rubber sheets.

NOTE

Add 2 oz (57 g) of oil if the evaporator is removed from the system.

c. Install. Follow on maintenance:

(1) Refer to paragraph 5-14 and replace dehydrator.

(2) Refer to paragraph 5-30 and install condensate drain pan.

(3) Refer to paragraph 5-25 and install equalizer line tube assembly.

(4) Refer to paragraph 5-24 and install evaporator single row terminal board.

(5) Refer to paragraph 5-23 and install low pressure switch.

(6) Refer to paragraph 5-22 and install evaporator wiring harness, A106J1.

(7) Refer to paragraph 5-21 and install differential pressure switch.

(8) Refer to paragraph 5-20 and install evaporator electrical leads.

(9) Refer to paragraph 5-19 and install EMI electronic filter.

(10) Refer to paragraph 5-18 and install evaporator fan assembly.

(11) Refer to paragraph 5-17 and install evaporator side panel assembly.

(12) Refer to paragraph 4-29 and install front (air inlet) evaporator EMI/RFI ventilation panel.

APPENDIX A

REFERENCES

A-1. SCOPE.

This appendix lists all forms, field manuals, technical manuals, and miscellaneous publications referenced in this manual.

A-2. FORMS.

DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2404	Equipment Inspection and Maintenance Worksheet
SF 368	Product Quality Deficiency Report

A-3. FIELD MANUALS.

FM 3-3	NBC Contamination Avoidance
FM 3-4	NBC Protection
FM 3-5	NBC Decontamination
FM 3-100	NBC Operations
FM 21-11	First Aid for Soldiers
FM 32-20	Electronic Warfare

A-4. TECHNICAL MANUALS.

TM 5-625	Repairs, Sheet Metal
TM 5-745	Repairs, Sheet Metal Work
TM 9-2320-280-10	Operator's Manual for Truck, Utility
TM 9-2320-280-34	Direct Support and General Support Maintenance Manual or Truck, Utility
TM 9-4120-408-24P	Unit, Direct Support, and General Support Maintenance Repair Parts and Special Tools List
TM 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use
TM 740-90-1	Administrative Storage of Equipment

A-5. MISCELLANEOUS PUBLICATIONS.

AR 310-25	Army Dictionary
DA Pam 738-750	The Army Maintenance Management System (TAMMS)
MIL-HDBK-116	Environmental Control of Small Shelters
MIL-STD-129	Marking for Shipment and Storage
SC 5180-90-N18	DA Supply Catalog; Tool Kit, Service, Refrigeration Unit

APPENDIX B

MAINTENANCE ALLOCATION CHART (MAC)

SECTION I. INTRODUCTION

B-1. THE ARMY MAINTENANCE SYSTEM MAC.

a. **Introduction**. This introduction (Section I) provides a general explanation of all levels of maintenance and repair functions authorized at various maintenance levels under the standard Army Maintenance System concept.

b. **Maintenance Allocation Chart Section II**. The Maintenance Allocation Chart (MAC) in section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Unit - includes two subcolumns, C (operator/crew) and O (unit) maintenance

Direct support - includes an F subcolumn

General support - includes an H subcolumn

Depot - includes a D subcolumn

c. **Tools and Test Equipment Introduction**. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from section II.

d. **Supplemental Instructions Introduction**. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS.

Maintenance functions are limited to and defined as follows:

a. **Inspect**. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

b. **Test**. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. **Service.** Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. **Adjust**. To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. **Align**. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of equipment or a system.

h. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the 3d position code of the SMR code.

i. Repair. The application of maintenance services', including fault location/troubleshooting 2, removal/installation, and disassembly/assembly3 procedures, and maintenance actions4 to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publication (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurement (e.g., hour/miles) considered in classifying Army equipment/components.

B-3. EXPLANATION OF COLUMNS IN THE MAC. SECTION II.

a. Column 1. Group Number. Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3. Maintenance Function. Column 3 lists the functions to be performed on the item listed in Column 2. (For detailed explanation of these functions, see paragraph B.2.)

d. Column 4. Maintenance Level. Column 4 specifies each level of maintenance authorized to perform each function listed in Column 3, by indicating worktime required (expressed as manhours in whole hours or decimals) in the appropriate subcolumn. This work-time figure represents the active time

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[1]Services Inspect, test, service, adjust, align, calibrate, and/or replace.

[2]Fault location/troubleshooting The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or unit under test (UUT).

[3]Disassembly/assembly The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

[4]Actions Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate worktime figures are to be shown for each level. The work-time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

C ..... Operator or crew maintenance
O ..... Unit maintenance
F ..... Direct Support maintenance
L ..... Specialized Repair Activity (SRA)5
H ..... General support maintenance
D ..... Depot maintenance

e. **Column 5, Tools and Test Equipment Reference Code**. Column 5 specifies, by code, those common tool sets (not individual tools), common TMDE, and special tools, special TMDE, and special support equipment required to perform the designated function. Codes are keyed to tools and test equipment in Section III.

f. **Column 6. Remarks**. When applicable, this column contains a letter code, in alphabetic order, which is keyed to the remarks contained in Section IV.

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III.

a. **Column 1. Reference Code**. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column S.

b. **Column 2, Maintenance Level**. The lowest level of maintenance authorized to use the tool or test equipment.

c. **Column 3. Nomenclature**. Name or identification of the tool or test equipment.

d. **Column 4, National Stock Number**. The National Stock Number of the tool or test equipment.

e. **Column 5. Tool Number**. The manufacturer's part number, model number, or type number.

B-5. EXPLANATION OF COLUMNS IN REMARKS. SECTION IV .

a. **Column 1, Reference Code.** The code recorded in Column 6, Section II.

b. **Column 2. Remarks**. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

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[5]This maintenance category is not included in Section II, column (4) of the Maintenance Allocation Chart. To identify functions to this category of maintenance, enter a work time figure in the "H" column of Section II, column (4), and use an associated reference code in the Remarks column (6). Key the code to Section IV, Remarks, and explain the SRA complete repair application there. The explanatory remark(s) shall reference the specific Repair Parts and Special Tools List (RPSTL) TM which contains additional SRA criteria and the authorized spare/repair parts.

SECTION II. MAINTENANCE ALLOCATION CHART
FOR
AIR CONDITIONER: SPLIT PACK
30,000 BTUH, 28VDC

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools & Eqpt.	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
00	Air Conditioner Split Pack 30,000 BTUH 28VDC								
01	Condenser Assembly	Service			6.0			1, 7	
	Panel, Access	Inspect	0.1	0.3				1	
		Replace		0.3				1	
	Panel, Side	Inspect	0.1	0.3				1	
		Replace		0.3				1	
	Data Plates and Spring Clip	Inspect		0.1	0.1				
		Replace		0.4	7.3			1, 2, 7	
	Panel, Ventilation, EMI/RFI, Upper Service	Inspect	0.1	0.3				1	
		Replace		0.3				1	
				0.2				1	
	Panel, Ventilation, EMI/RFI, Lower Service	Inspect	0.1	0.1	6.1			1, 7	
		Replace			6.0			1, 7	
					6.2			1, 7	
		Repair			6.3			1, 7	
	Fan, Vane Axial, Condenser	Inspect			6.1			1, 7	
		Test			1.0			1, 7, 8	
		Replace			7.0			1, 7	
		Repair			8.0			1, 3, 7	A
	Wiring Harness	Inspect	0.1	0.1				1	B
		Test		0.3				1	
		Replace		3.0				1	
		Repair		3.0				1, 3, 4	
	Lead, Electrical	Inspect		0.1				1	
		Test		0.3				1	
		Replace		0.5				1	
		Repair		1.0				1, 3, 5	
	Assembly, Diode	Inspect		0.1				1	
		Test		0.3				1	
		Replace		0.5				1	
		Repair		1.0				1, 3, 5	
	Relay, 50 Amp	Test		1.0				1	
		Replace		1.0				1	

SECTION II. MAINTENANCE ALLOCATION CHART
FOR
AIR CONDITIONER: SPLIT PACK
30,000 BTUH, 28VDC (CONTINUED)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools & Eqpt.	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
	Pressure Switches	Inspect		0.1	0.3			1	C
		Test			6.0			1, 7, 9	
		Adjust			6.5			1, 7, 9	D
		Replace			6.0			1, 7, 9	
	Terminal Board, Single Row	Inspect		0.1				1	
		Replace		1.0				1	
	Tubing and Fittings	Inspect	0.1	0.1	6.5			1	C, E
		Replace			9.0			1, 7, 9	F
		Repair			9.0			1, 7, 9	F
	Receiver, Liquid Line	Inspect		0.1	1.0			1	C
		Replace			8.0			1, 7, 9	F
	Dehydrator, Filter Dryer, Refrigerant	Inspect		0.1	1.0			1	C
		Replace			8.0			1, 7, 9	F
	Coil, Condenser	Inspect		0.1	6.2			1	C
		Service			6.3			1, 11	
		Replace			9.0			1, 7, 9, 10	F
		Repair			10.0			1, 7, 9, 10	F, G
	Housing, Condenser	Inspect	0.1			6.3		1, 7, 9, 14	H
		Replace				9.5		1, 7, 9, 14	
		Repair				11.0		1, 7, 9, 14, 15	A, I
02	Control Module Assembly								
	Panel, Top	Inspect	0.1	0.3				1	
		Replace		0.3				1	
	Switch, Rotary, Cam Actuated	Inspect	0.1	0.1				1	J
		Test		1.5				1	
		Replace		1.0				1	
	Assembly, Diode, Light Emitting	Inspect	0.1	0.1				1	
		Test		0.5				1	
		Replace		1.0				1	
		Repair		1.0				1, 5	

SECTION II. MAINTENANCE ALLOCATION CHART
FOR
AIR CONDITIONER: SPLIT PACK
30,000 BTUH, 28VDC (CONTINUED)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools & Eqpt.	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
	Thermostat	Inspect	0.1	0.1				1	K
		Test		0.5				1	
		Replace		1.0				1	
	Wiring Harness	Inspect	0.1	0.1				1	B
		Test		0.5				1	
		Replace		1.0				1	
		Repair		3.0				1, 3	
	Lead,	Inspect		0.1				1	
	Electrical	Test		0.3				1	
		Replace		0.5				1	
		Repair		0.5				1, 5	
	Assembly,	Inspect		0.1				1	
	Diode	Test		0.3				1	
		Replace		0.5				1	
		Repair		0.5				1, 5	
	Assembly,	Inspect		0.1				1	
	Resistor	Test		0.3				1	
		Replace		0.5				1	
		Repair		0.5				1, 5	
	Board,	Inspect		0.1				1	
	Terminal,	Replace		1.0				1	
	Single Row								
	Housing,	Inspect	0.1	0.1				1	
	Control Module	Replace		2.0				1	
		Repair		2.0				1, 6	H, I
03	Evaporator	Service			6.0			1, 7	
	Assembly								
	Filter, Air	Inspect	0.1						
	Return	Service	0.2						
		Replace	0.1						
	Panel,	Inspect	0.1	0.1				1	
	Ventilation,	Replace		0.3				1	
	EMI/RFI, Front Service			0.4				1	
	(Air Inlet)								
	Panel,	Inspect			6.1			1, 7, 9	
	Ventilation,	Replace			6.3			1, 7, 9	
	EMI/RFI, Rear Service				6.4			1, 7, 9	
	(Air								
	Discharge)								

SECTION II. MAINTENANCE ALLOCATION CHART
FOR
AIR CONDITIONER: SPLIT PACK
30,000 BTUH, 28VDC (CONTINUED)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools & Eqpt.	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
	Panel, Side	Inspect	0.1		6.1			1, 7, 9	
		Replace			6.5			1, 7, 9	
		Repair			7.0			1, 2, 7, 9	A
	Assembly, Fan, Evaporator	Inspect			6.2			1, 7, 9	
		Test			6.4			1, 7, 8, 9	
		Replace			8.0			1, 7, 9	
		Repair			9.0			1, 7, 9	
	Filter, Electronic, EMI	Inspect			6.1			1, 7, 9	
		Replace			6.5			1, 7, 9	
	Lead, Electrical	Inspect			6.1			1, 7, 9	
		Test			6.3			1, 7, 9	
		Replace			6.5			1, 7, 9	
		Repair			6.5			1, 3, 7, 9	
	Switch, Pressure, Differential	Inspect			6.2			1, 7, 9	
		Test		0.3	1				
		Replace			6.5			1, 7, 9	
		Repair			6.5			1, 7, 9	
	Wiring Harness	Inspect			6.3			1, 7, 9	B
		Test			6.3			1, 7, 9	
		Replace			8.0			1, 7, 9	
		Repair			8.0			1, 3, 4, 7, 9	
	Switch, Low Pressure	Inspect			6.1			1, 7, 9	C
		Test			6.5			1, 7, 9	
		Adjust			6.5			1, 7, 9	
		Replace			7.0				
	Terminal Board	Inspect			6.1			1, 7, 9	
		Replace			6.5			1, 7, 9	
	Assembly, Tube, Equalizer Line	Inspect			6.1			1, 7, 9	C
		Replace			9.1			1, 7, 9	
		Repair			9.5			1, 7, 9	
	Thermo-expansion Valve	Test/Adjust			10.0			1, 7, 9	C
		Replace			9.0			1, 7, 9	

SECTION II. MAINTENANCE ALLOCATION CHART
FOR
AIR CONDITIONER: SPLIT PACK
30,000 BTUH, 28VDC (CONTINUED)

(1)	(2)	(3)	(4) Maintenance Level					(5)	(6)
			Unit		Direct Support	General Support	Depot	Tools & Eqpt.	
Group Number	Component/Assembly	Maintenance Function	C	O	F	H	D	Ref Code	Remarks Code
	Tubing and	Inspect			6.4			1, 7, 9	C, E
	Fittings	Replace			8.5			1, 7, 9, 12, 13	F
		Repair			8.0			1, 7, 9, 12, 13	F
	Coil,	Inspect		0.1	6.3			1, 7, 9	C
	Evaporator	Service			6.3			1, 7, 9, 11	
		Replace			9.0			1, 7, 9	F
		Repair			10.0			1, 7, 9	F, G
	Switch,	Test			6.2			1, 7, 9	
	Warning,	Replace			9.2			1, 7, 9	
	Condensate Level							1, 7, 9	
	Pan,	Inspect		0.1	9.3			1, 7, 9	L
	Condensate	Replace			9.3			1, 7, 9	
	Drain	Service			9.5			1, 7, 9	
		Repair			10.0			1, 7, 9	
	Housing,	Inspect				6.7		1, 7, 9	H
	Evaporator	Replace				10.5		1, 7, 9	
	Repair					11.0		1, 2, 6, 7, 9	A, I

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR AIR CONDITIONER: SPLIT PACK 30,000 BTUH, 28VDC

(1) TOOL OR TEST EQUIPMENT REF CODE	(2) MAINT LEVEL	(3) NOMENCLATURE	(4) NATIONAL/NATO STOCK NUMBER	(5) TOOL NUMBER
1	0	Tool Kit, Service, Refrigeration Unit	5180-00-597-1474	(19099) SC5180-90-CL-N18
2	0	Riveter, Blind, Hand	5120-00-017-2849	(10054) 250K
3	0	Crimping Tool, Terminal	5120-00-278-2423	(60592)CT-100
4	0	Heater, Gun Type, Electrical	4940-00-561-1002	(06690) 500A
5	0	Soldering Iron, Electric	3439-00-078-3058	(28493) 22GK
6	0	Rivnut Installation Tool		(78276) AA170
7	F	Recovery Recycling Unit, Refrigerant	4130-01-396-8928	(07295) 34400
8	F	Power Supply, 28v	6930-01-177-2515	(K1182)A8/426/12
9	F	Regulator, Nitrogen	4935-00-040-9916	(00742) 231P128058
10	F	Screwdriver, Cross Tip	5120-00-542-3438	(64067) 5120-00-542-3438
11	F	Cleaning Set, Fin	5120-01-355-6595	(17529) FCS-6
12	F	Wrench, Box and Open End	5120-00-277-8833	(93389) 1244
13	F	Wrench, Open End	5120-00-449-8141	(80204) B107.6 TY2
14	H	Sling	4910-00-944-4915	
15	H	Rivnut Installation Tool	(78276) AA184	
16	0	Manifold Gage, Charging and Testing	4130-01-396-4422	(07295) 40134A
17	0	Leak Detector	4940-01-300-8318	(64615) HI 300 TEL

SECTION IV. REMARKS
FOR
AIR CONDITIONER: SPLIT PACK
30,000 BTUH, 28VDC

(1) Reference Code	(2) Remarks
A	Repair by replacing damaged components.
B	Crew inspection consists of inspecting external portions of wiring harness connectors for damage.
C	Inspection includes leak detection.
D	This procedure applies to switches S3 and S4 only.
E	Crew inspection consists of inspecting external refrigerant line connectors for damage.
F	Repair or replace using brazing procedures. Recover refrigerant using recovery system and circulate with nitrogen. Evacuate and test for leaks when maintenance procedure has been completed. Refer to Modern Refrigeration and Air Conditioning Manual included in the Refrigeration Mechanics Tool Kit for air conditioning brazing procedures.
G	Repair consists of repairing minor damage and small holes.
H	Housing must be replaced if the internal components cannot function properly because of the damage to the case or the housing cannot be repaired to protect against EMI.
I	Refer to TM 5-625 and TM 5-745 and repair damaged sheet metal.
J	Crew inspection consists of inspecting switch knob for damage.
K	Crew inspection consists of inspecting thermostat knob and temperature sensor for damage.
L	Crew inspection consists of inspecting condensate' drain pan outlet for damage or leaks.

APPENDIX C
COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS
SECTION I. INTRODUCTION

C-1. SCOPE.

This appendix lists components of the end item and basic issue items for the air conditioner to help you inventory the items for safe and efficient operation of the equipment.

C-2. GENERAL.

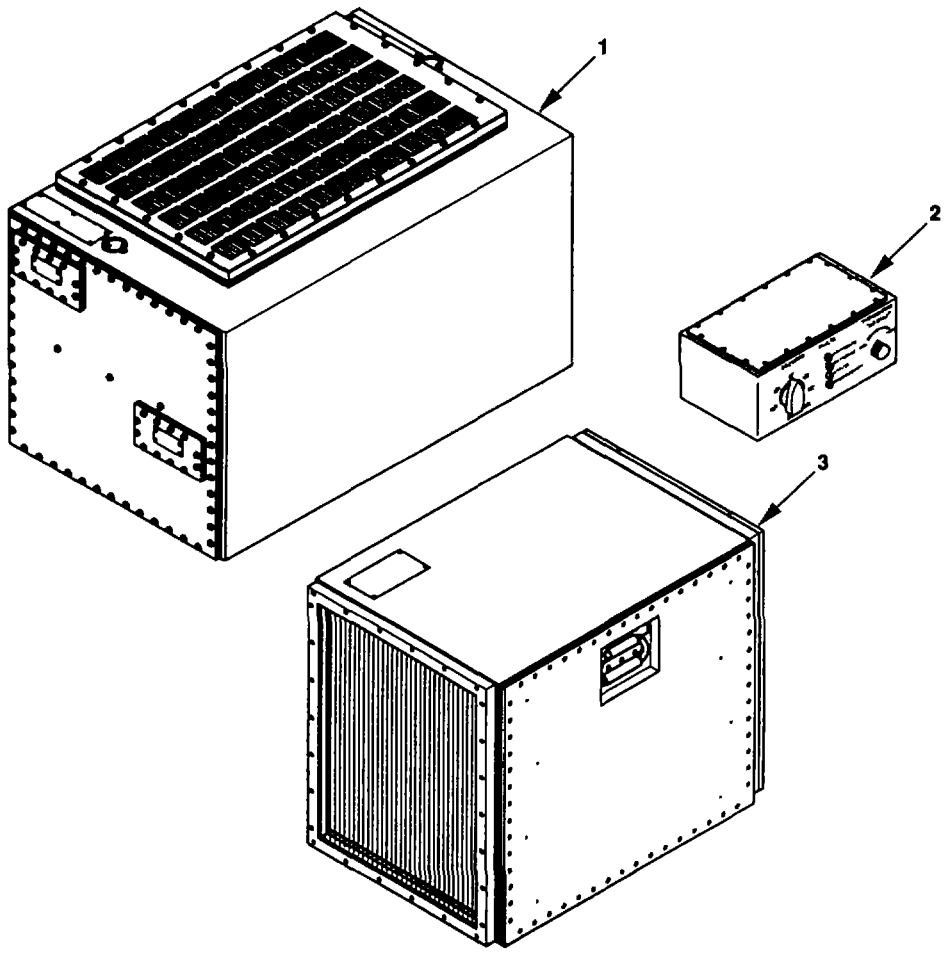
The Components of End Item (COEI) and Basic Issue Items (BII) Lists are divided into the following sections:

- **a.** **Section II. Components of End Item**. This listing is for information purposes only, and is not authority to requisition replacements. These items are part of the air conditioner, but they are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to help you find and identify the items.
- **b.** **Section III, Basic Issue Items**. These essential items are required to place the air conditioner in operation, operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the air conditioner during operation and when it is transferred between property accounts. This list is your authority to request/requisition them for replacement based on authorization of the end item by the TOE/MTOE. Illustrations are furnished to help you find and identify the items.

C-3. EXPLANATION OF COLUMNS.

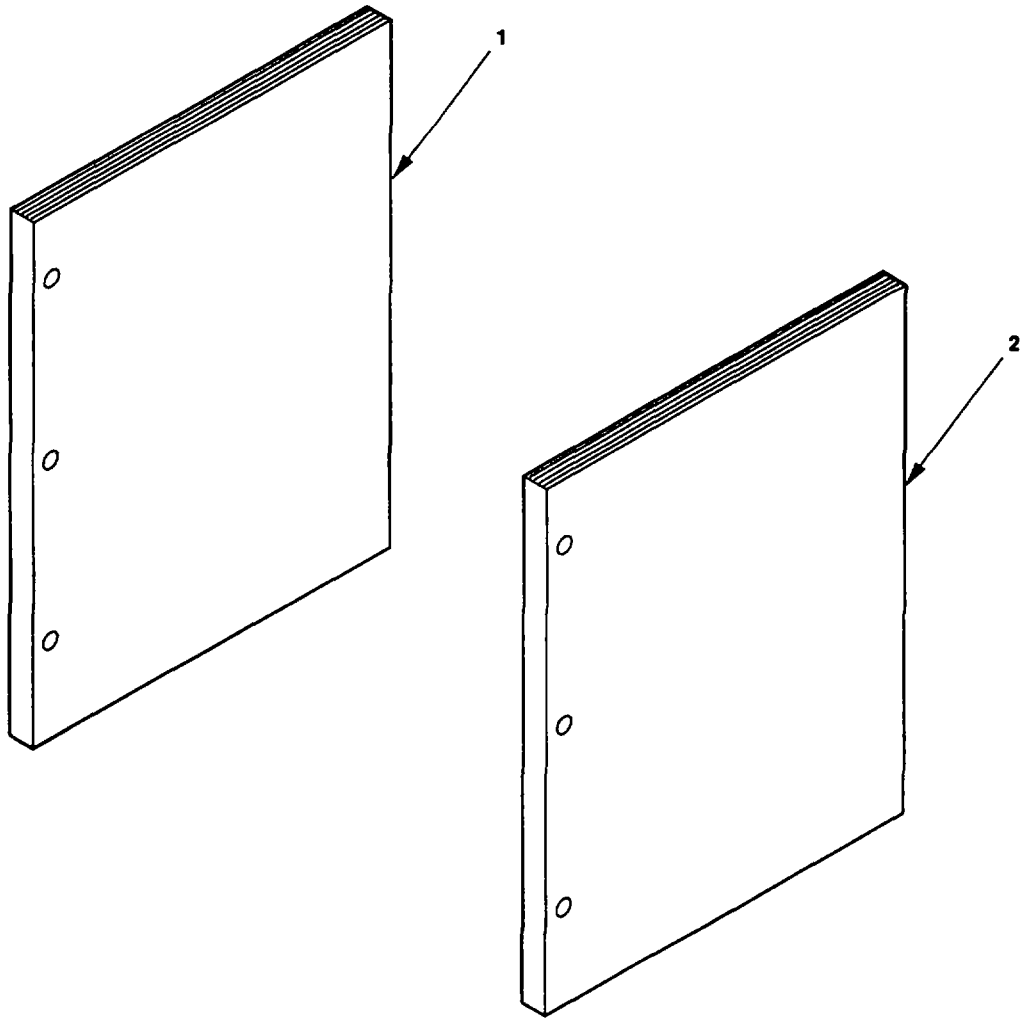
- **a.** **Column (1).** The first column, Illus Number, gives you the number of the item illustrated.
- **b.** **Column (2).** The second column, National Stock Number, identifies the stock number of the item to be used for requisitioning purposes.
- **c.** **Column (3).** The third column, Description and Usable On Code (UOC), identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The last line below the description is the Commercial and Government Entity Code (CAGEC) (in parenthesis) and the part number. If the item you need is not the same for different models of the equipment, a UOC will appear on the right side of the description column on the same line as the part number.
- **d.** **Column (4).** The fourth column, U/I (unit of issue), indicates how the item is issued for the National Stock Number shown in column two.
- **e.** **Column (5).** The fifth column, Qty Rqd, indicates the quantity required.

SECTION II. COMPONENTS OF END ITEM



(1) Illus Number	(2) National Stock Number	(3) Description CAGEC and Part Number	Usable On Code	(4) U/I	(5) Qty Rqd
1		CONDENSER ASSEMBLY (97403) 13230E4400		ea	1
2		CONTROL MODULE ASSEMBLY (97403) 13230E4420		ea	1
3		EVAPORATOR ASSEMBLY (97403) 13230E4370		ea	1

SECTION III. BASIC ISSUE ITEMS



(1) Illus Number	(2) National Stock Number	(3) Description CAGEC and Part Number Usable On Code	(4) U/I	(5) Qty Rqd
1		TM 9-4120-408-14	ea	1
2		TM 9-4120-408-24P	ea	1

APPENDIX D
ADDITIONAL AUTHORIZATION LIST
SECTION I. INTRODUCTION

D-1. SCOPE.

This appendix lists additional items you are authorized for the support of the air conditioner.

D-2. GENERAL.

This list identifies items that do not have to accompany the air conditioner and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TOE, TDA, or JTA.

D-3. EXPLANATION OF LISTING.

- **a. Column (1).** The first column, National Stock Number, identifies the stock number of the item to be used for requisitioning purposes.
- **b. Column (2).** The second column, Description and Usable On Code, identifies the Federal item name (in all capital letters) followed by a description when needed. The last line below the description is the Commercial And Government Entity Code (CAGEC) (in parenthesis) and the part number. If the item you need is not the same for different models or configuration of the equipment, a Usable On Code will appear on the right side of the description column on the same line as the part number.
- **c. Column (3).** The third column, U/I (unit of issue), indicates how the item is issued for the National Stock Number shown in column (1).
- **d. Column (4).** The fourth column, Qty Auth, indicates the quantity authorized.

SECTION II. ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION CAGEC AND PART NMBER USABLE ON CODE	(3) U/I	(4) QTY AUTH
8415-00-266-8679	GLOVES, PROTECTANT (81348) ZZ-G-381	EA	1
4240-00-816-3819	GOGGLES, INDUSTRIAL (74936) WA60-5H0746-0315	EA	1
	MASK, GAS (81348) GGG-M-131 TYPE A	EA	1

APPENDIX E

EXPENDABLE AND DURABLE ITEMS LIST

SECTION I. INTRODUCTION

E-1. SCOPE.

This appendix lists expendable and durable items that you will need to operate and maintain the air conditioner. This listing is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-790, expendable items (except medical, class V repair parts, and heraldic items).

E-2. EXPLANATION OF COLUMS.

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 item (e.g., "Rags, Appendix E, Item 3").

b. **Column (2) Level.** This column identifies the lowest level of maintenance that requires the listed item.

C ----Operator/Crew
O ----Unit Maintenance
F ---- Direct Support Maintenance
H ----General Support Maintenance

c. **Column (3) National Stock Number.** This is the National Stock Number assigned to the item; use it to 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 Commercial and Government Entity Code (CAGEC) in parentheses followed by the part number.

e. **Column (5) Unit of Measure (UIM)/Unit of Issue (U/I).** 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 as shown in the Army Master Data File (AMDF), requisition the lowest unit of issue that will satisfy your requirements.

SECTION II. EXPENDABLE AND DURABLE ITEMS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION CAGEC AND PART NUMBER	(5) U/M/ U/I
1	0	5935-01-228-1812	Adapter, Cable Clamp (81349) M85049/60-1W20	EA
2	F	8040-00-165-8614	Adhesive (81348) MMM-A-121	QT
3	F	8040-00-221-3811	Adhesive (80244) MMM-A-1617 TY2	BT
4	F		Adhesive-Sealant (97403) M4610631ATN	
5	F	3439-00-058-0094	Brazing Alloy, Silver (81348) QQ-B-654	TO

SECTION II. EXPENDABLE AND DURABLE ITEMS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION CAGEC AND PART NUMBER	(5) U/M/ U/I
6	F	3439-00-255-8954	Brazing Alloy, Silver (81348) QQB654 BCUP5	TO
7	O	5935-01-233-1241	Clamp, Cable, Electrical (81349) M85049/601W24	EA
8	O		Conductive RTV Silicone Caulking (0ONDX8) 7200152	
9	F	6830-01-380-4960	Tetrafluoroethane: with cylinder 30 lb. (Refrigerant134a) (25827) HFC134a	CY
10	O	6850-00-281-1985	Dry Cleaning Solvent (58536) AA711	GL
11	F		Flux, Brazing (81348) OF499 Type B	JR
12	O	5970-01-079-5810	Insulation Sleeving (96906) MS310906AC	EA
13	O	5970-00-397-3576	Insulation Sleeving (96906) MS310907AU	EA
14	O	5970-00-812-2974	Insulation Sleeving (81349) M23053/51030	FT
15	O	5970-00-954-1624	Insulation Sleeving (81349) M23053/51070	FT
16	F	5970-00-914-3118	Insulation Sleeving (81349) M23053/51090	FT
17	O	9150-01-387-4469	Lubricating Oil (99252) 150	DR
18	F	6830-00-292-0732	Nitrogen, Technical (81348) BBN411	CY
19	F	4910-00-387-9592	Pan, Drain, 4 Gallon (05463) 450	EA
20	F	5640-00-444-7680	Plastic Material (81349) MILP15280	FT
21	0	7920-00-205-1711	Rags, Wiping (58536) AA2522	BE
22	F	7930-00-285-4304	Soap, Scouring (58536) AA45	BX
23	O	3439-01-121-5822	Solder, Tin Alloy (81349) QQS571SN60WRAP2	
24	O	5975-00-074-2072	Strap, Tiedown, Electrical (96906) MS336719	HD
25	F	5975-00-451-5001	Strap, Tiedown, Electrical (96906) MS336739	HD
26	O	5975-00-111-3208	Strap, Tiedown, Electrical (96906) MS336759	HD

* U.S. GOVERNMENT PRINTING OFFICE' 1996 - 755-025/40003

SECTION II. EXPENDABLE AND DURABLE ITEMS LIST				
(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION CAGEC AND PART NUMBER	(5) U/M/ U/I
27	O	9905-00-537-8954	Tag, Marker (64067) 9905005378954	BD
28	F	7510-00-074-4946	Tape, Pressure Sensitive (80244) PPPT60 TY4CL1	RO

APPENDIX F

ILLUSTRATED LIST OF MANUFACTURED ITEMS

F-1. SCOPE.

This appendix includes complete instructions for making items authorized to be manufactured or fabricated at unit, direct support, and general support maintenance.

F-2. General.

A part number index in alphanumeric order is provided below for cross-referencing the part number of the item to be manufactured to the figure which covers fabrication criteria.

13230E4368	Figure F-2
13230E4369	Figure F-15
13230E4377	Figure F-3
13230E4391	Figure F-16
13230E4426	Figure F-4
13230E4428	Figure F-7
13230E4429	Figure F-6
13230E4430	Figure F-i
13230E4439	Figure F-8
13230E4440	Figure F-5
13230E4441	Figure F-10
13230E4442	Figure F-9
ASTM B-280	Figures F-11 and F-17
MIL-W-5086	Figure F-13
MIL-R-6130	Figure F-12
ZZ-T-831	Figure F-14

All bulk materials needed for manufacture of an item are listed by part number or specification number in a tabular list on the illustration.

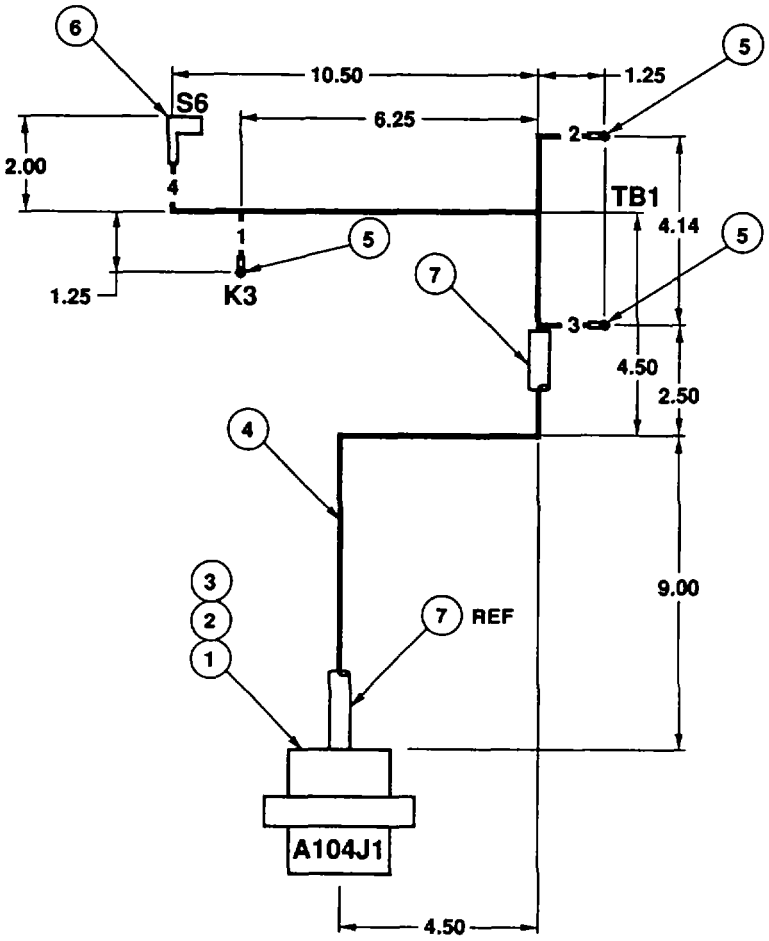


Figure F-1. Wiring Harness A104J1.

PROCEDURES:

a. Refer to Figure H-2 and determine faulty wire.

b. Remove and discard electrical cable clamp (Figure F-1, 2), insulation sleeving (3), and insulation sleeving (7) from connector (1) and wiring.

c. Remove faulty wire from wiring harness.

d. Cut wire to dimensions shown in Figure F-1.

e. Refer to table F-1 and table F-2 and assemble wire. Mark wire with from to termination designations and double headed arrow on each end of wire assembly.

f. Install wire in connector (1).

g. Install new electrical cable clamp (2), insulation sleeving (3), and insulation sleeving (7), as shown in Figure F-1, and heat shrink to a firm fit.

h. Install tiedown straps at 3.00 inch maximum intervals and at each breakout.

Table F-1. Parts List for Wiring Harness A104J1.

Find Number	Part or Identifying Number	Quantity Required	Description	NSN
1	MS3450L24-12P	1	Connector, Receptacle, Electrical, Box Mounting, Rear Release, Crimp Contact, AN Type	5935-01-048-7521
2	M85049/60-1W24	1	Cable, Clamp, Electrical	5935-01-233-1241
3	MS3109-07AU	1	Insulation Sleeving	5970-00-397-3576
4	M5086/1-12-9	AR	Wire, Electric, Copper Conductor, 600 V	6145-00-578-7521
5	MS25036-112	3	Terminal, Lug, Crimp Style	5940-00-143-4794
6	13230E4455-3	1	Terminal, Quick Disconnect, Female 90^0	
7	M23053/5-107-0	AR	Insulation Sleeving	5970-00-954-1624
8	MS3367-5-9	AR	Strap, Tiedown, Electrical	5975-00-111-3208

Table F-2. Wiring Harness A104J1 Wire Run List.

Wire Ref No.	Termination		Termination		Wire Find No.	Length (Inches)
	From	Find No.	To	Find No.		
1	A104J1-A	1	K3-A1	5	4	25.50
2	A104J1-C	1	TBl-1	5	4	21.39
3	A104J1-D	1	TB1-7	5	4	17.25
4	A104J1-E	1	S6-1	6	4	30.50

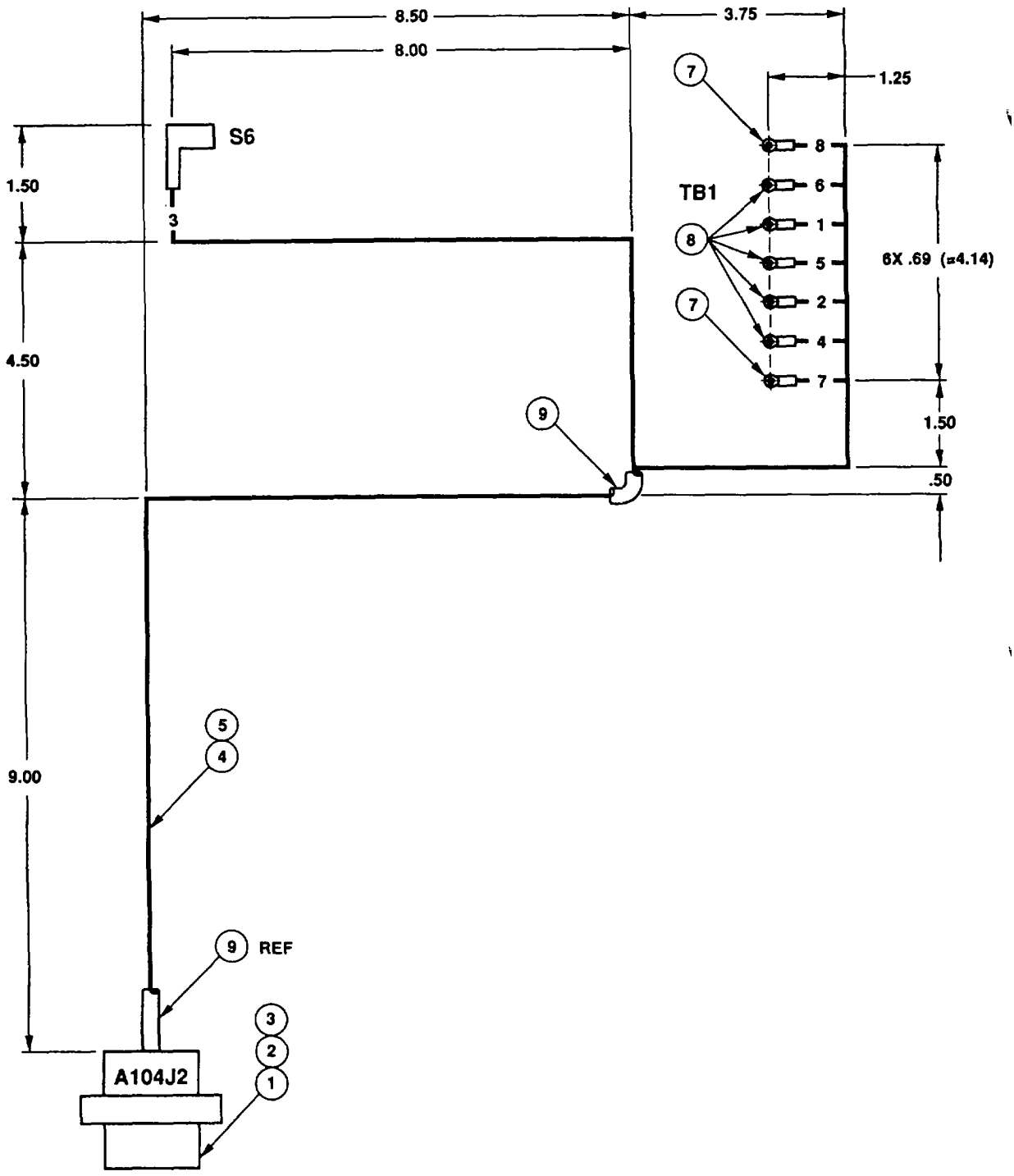


Figure F-2. Wiring Harness A10J102.

PROCEDURES:

a. Refer to Figure H-2 and determine faulty wire.

b. Remove and discard cable clamp adapter (Figure F-2, 2), insulation sleeving (3), and insulation sleeving (9) from connector (1) and wiring.

c. Remove faulty wire from wiring harness.

d. Refer to table F-4 to determine wire and cut wire to dimensions shown in Figure F-2.

e. Refer to tables F-3 and F-4 to assemble wire. Mark wire with from to termination designations and double headed arrow on each end of wire assembly.

f. Install wire in connector (1).

g. Install new cable clamp adapter (2), insulation sleeving (3), and insulation sleeving (9), as shown in figure F-2, and heat shrink to a firm fit.

h. Install tiedown straps at 3.00 inch maximum intervals and at each breakout.

Table F-3. Parts List for Wiring Harness A104J2.

Find Number	Part or Identify-ing Number	Quantity Required	Description	NSN
1	MS3450L2016S	1	Connector, Receptacle, Electrical, Box Mounting, Rear Release, Crimp Contact, AN Type	5935-01-066-0851
2	M85049/601W20	1	Adapter, Cable Clamp	5935-01-228-1812
3	MS310906AC	1	Insulation Sleeving	5970-01-079-5810
4	M5086/1129	AR	Wire, Electric, Copper Conductor, 600 V	6145-00-578-7521
5	M5086/1169	AR	Wire, Electric, Copper Conductor, 600 V	6145-00-578-6072
6	13230E44552	1	Terminal, Quick Disconnect, Female 900	
7	MS25036112	2	Terminal, Lug, Crimp Style	5940-00-143-4794
8	MS25036108	5	Terminal, Lug, Crimp Style	5940-00-143-4780
9	M23053/51070	AR	Insulation Sleeving	5970-00-954-1624
10	MS336759	AR	Strap, Tiedown, Electrical	5975-00-111-3208

Table F-4. Wiring Harness A104J2 Wire Run List.

Wire Ref No.	Termination		Termination		Wire Find No.	Length (Inches)
	From	Find No.	To	Find No.		
1	A104J2-A	1	TB1-4	8	5	23.51
2	A104J2-B	1	TB1-6	8	5	22.13
3	A104J2-C	1	S6-3	6	5	31.5
4	A104J2-D	1	TB1-7	8	5	21.44
5	A104J2-E	1	TB1-5	8	5	22.82
6	A104J2-F	1	TB1-3	8	5	24.20
7	A104J2-H	1	TB1-8	7	4	20.75
8	A104J2-I	1	TB1-2	7	4	24.89

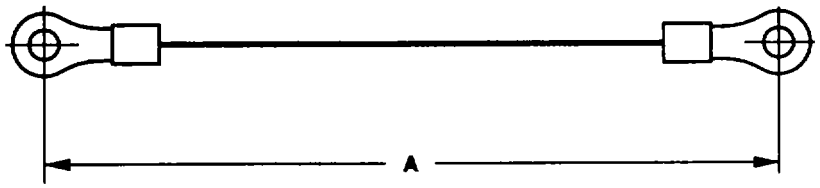


Figure F-3. Electrical Lead Assembly.

PROCEDURES:

a. Refer to tables F-5 and F-6 to determine material and wire length (Figure F-3, A) for each wire assembly.
b. Crimp and solder contacts onto wire. Mark wire with from to termination designations and double headed arrow on each end of wire assembly.

Table F-5. Parts List for Electrical Lead Assemblies.

Find Number	Part or Identifying Number	Quantity Required	Description	NSN
1	M5086/112/9	AR	Wire, Electric, Copper, 600V	6145-00-578-7521
2	M5086/1169	AR	Wire, Electric, Copper, 600V	6145-00-578-6072
3	MS25036108	6	Terminal, Lug, Crimp Style	5940-00-143-4780
4	MS25036107	15	Terminal, Lug, Crimp Style	5940-00-113-8179
5	MS25036112	8	Terminal, Lug, Crimp Style	5940-00-143-4794
6	13207E53472	5	Terminal, Quick Disconnect	5940-00-926-0085
7	13230E44563	2	Terminal, Quick Disconnect	
8	QQS571SN60WRP2	AR	Solder	3439-01-121-5822

Table F-6. Electrical Lead Assembly Wire u List.

Wire Ref No.	Termination		Termination		Wire Find No.	Length (Inches)
	From	Find No.	To	Find No.		
1	S6-2	6	TB1-5	3	14.50	2
2	S3-2	6	TB1-4	3	12.00	2
3	S3-3	6	K1-X1	4	11.00	2
4	S4-2	6	TB1-4	3	8.00	2
5	S4-3	6	K2-X1	4	11.00	2
6	KI-Al	5	K2-A1	5	5.00	1
7	K1-X2	4	K2-X2	4	5.00	2
8	K2-A1	5	K3-A1	5	5.00	1
9	K2-X2	4	K3-X2	4	5.00	2
10	K3-X1	4	TB1-6	3	10.0	2
11	K3-A1	5	TB1-3	5	8.50	1
12	K3-A2	5	TB1-8	5	7.00	1
13	K3-X2	4	TB1-2	3	10.50	2
14	TB2-6	4	TB3-6	4	2.00	2
15	S1-4	4	S2-R	3	15.00	2
16	S1-1	4	TB2-1	4	8.50	2
17	TB4-1	4	S7-1	8	40.00	2
18	TB4-2	4	S7-2	8	40.00	2

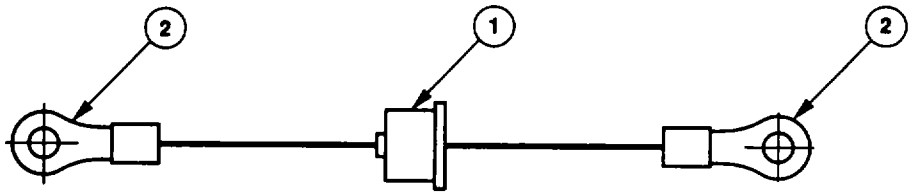


Figure F-4. Diode Assembly.

PROCEDURE:

Refer to table F-7 for materials and crimp and solder two terminals (Figure F-4, 2) on diode (1).

Table F-7. Parts List for Diode Assembly.

Find Number	Part or Identifying Number	Quantity Required	Description	NSN
1	13230E4425	1	Diode, 3 Ampere	
2	M7928/7-7	2	Terminal Lug, Crimp Style, Uninsulated	5940-01-337-3813
3	QQS571SN60WRP2	AR	Solder	3439-01-121-5822

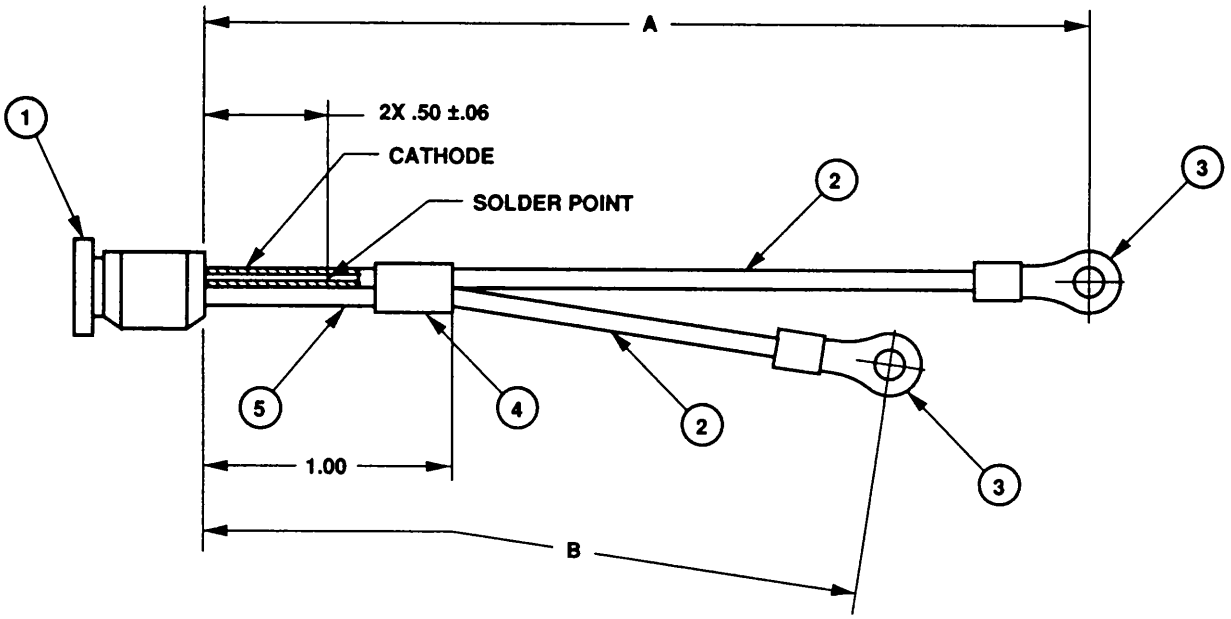


Figure F-5. LED Assembly.

PROCEDURE:

a. Identify faulty lead on LED Assembly (Figure F-5, 1).

b. Remove and discard insulation sleeving (4 and 5).

c. Disconnect faulty lead from cathode or anode.

d. Refer to tables F-8 and F-9 for material and wire lengths to manufacture leads .

NOTE

Ensure assembled LED assembly meets the dimensional requirements of Table F-9 as detailed in Figure F-5.

e. older terminal (3) to wire (2) and wire (2) to cathode or anode.

f. Install new insulation sleeving (5) over solder joint and shrink to a firm fit.

g. Install new insulation sleeving (4) over both sets of insulation sleeving (5) and shrink to a firm fit.

Table F-8. Parts List for LED Assembly.

Find Number	Part or Identifying Number	Quantity Required	Description	NSN
1	JTXM19500/52102	1	Semiconductor Device, Diode, Light Emitting	5980-01-201-4483
2	M5086/1-20-9	AR	Wire, Electrical, PVC Insulated, Nylon Jacket, Tin-Coated Copper Conductor	6145-00-578-7519
3	MS20659-101	2	Terminal, Lug, Crimp Style, Uninsulated	5940-00-113-3137
4	M23053/5-107-0	AR	Insulation Sleeving	5970-00-954-1624
5	M23053/5-103-0	AR	Insulation Sleeving	5970-00-812-2974
6	QQS571SN60WRP2	AR	Solder	3439-01-121-5822

Table F-9. LED Assembly Wire Run List

	Cathode			Anode		
	Length	Marking		Length	Marking	
Diode Designation	A (Inches)	From	To	B (Inches)	From	To
DS1	7.00	DS1-C	TB3-7	5.50	DS1-A	TB2-2
DS2	6.50	DS2-C	TB3-7	5.25	DS2-A	TB2-3
DS3	5.00	DS3-C	TB2-7	5.00	DS3-A	TB2-4
DS4	6.00	DS4-C	TB2-7	5.50	DS4-A	TB2-5

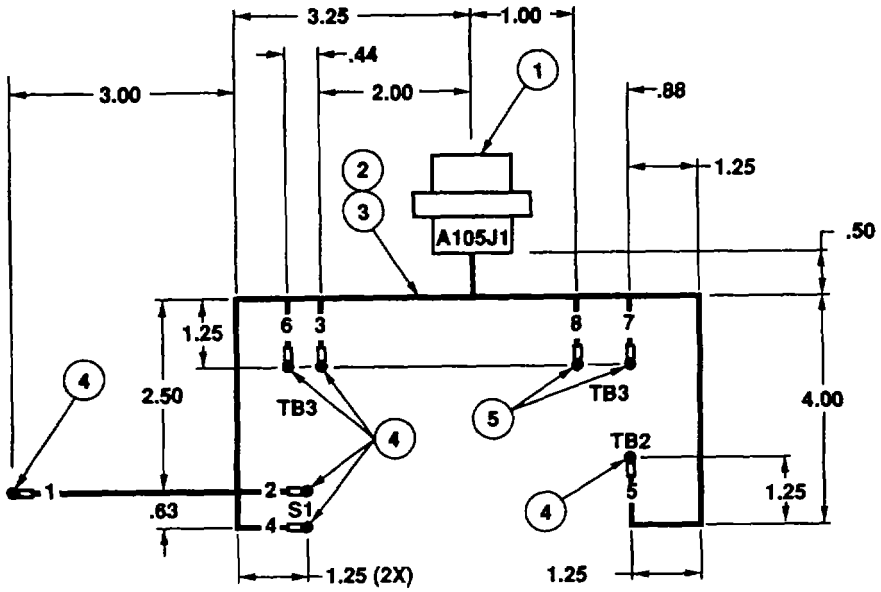


Figure F-6. Wiring Harness A105J1.

PROCEDURES:

a. Refer to Figure H-1 and determine faulty wire.

b. Remove faulty wire from wiring harness.

c. Cut wire to dimensions shown in Figure F-6.

d. Refer to tables F-10 and F-11 to assemble wire. Mark wire with from to termination designations and double headed arrow on each end of wire assembly.

e. Install wire in connector (1).

h. Install tiedown straps at 3.00 inch maximum intervals and at each breakout.

Table F-10. Parts List for Wiring Harness A105J1.

Find Number	Part or Identifying Number	Quantity Required	Description	NSN
1	MS3452W2016P	1	Connector, Receptacle, Electrical, Box Mounting, Rear Release, Crimp Contact, AN Type	5935-01-235-4011
2	M5086/1129	AR	Wire, Electric, Copper Conductor, 600 V	6145-00-578-7521
3	M5086/1169	AR	Wire, Electric, Copper Conductor, 600 V	6145-00-578-6072
4	MS25036107	6	Terminal, Lug, Crimp Style	5940-00-113-8179
5	MS25036111	2	Terminal, Lug, Crimp Style	5940-00-204-8990
6	MS336759	AR	Strap, Tiedown, Electrical	5975-00-111-3208

Table F-11. Wiring Harness A105J1 Wire Run List.

Wire Ref No.	Termination		Termination		Wire Find No.	Length (Inches)
	From	Find No.	To	Find No.		
1	A105J1-A	1	S1-5	4	3	9.25
2	A105J1-B	1	S1-6	4	3	7.50
3	A105J1-C	1	TB3-2	4	3	3.75
4	A105J1-D	1	S1-2	4	3	8.13
5	A105J1-E	1	TB2-8	4	3	10.13
6	A105J1-F	1	TB3-1	4	3	4.19
7	A105J1-H	1	TB3-8	5	2	3.63
8	A105J1-I	1	TB3-6	5	2	2.75

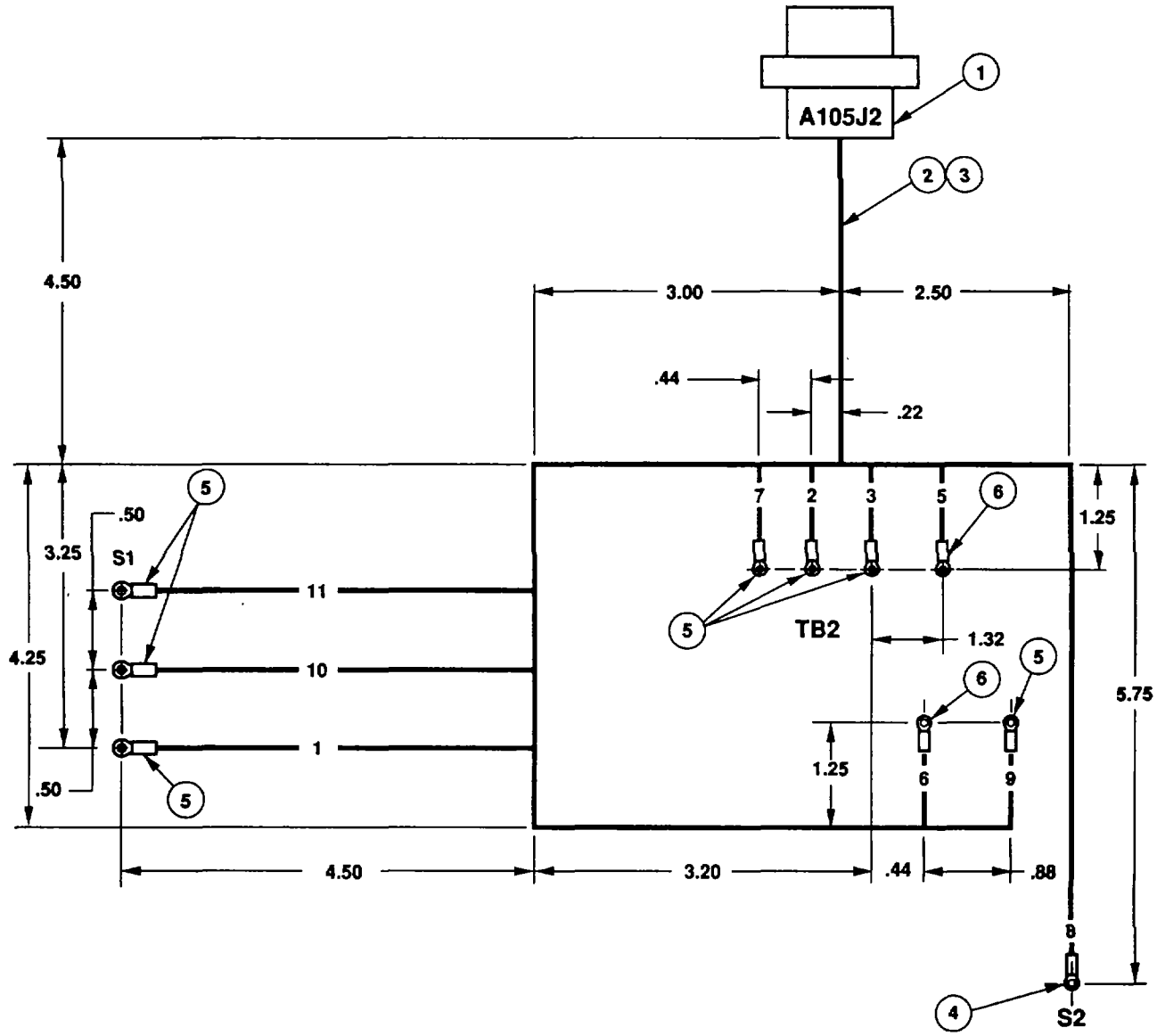


Figure F-7. Wiring Harness A105J2.

PROCEDURES:

a. Refer to Figure H-1 and determine faulty wire.

b. Remove faulty wire from wiring harness.

c. Refer to table F-13 to determine wire and cut wire to dimensions shown in Figure F-7.

d. Refer to tables F-12 and F-13 to assemble wire. Mark wire with from to termination designations and double headed arrow on each end of wire assembly.

e. Install wire in connector (1).

h. Install tiedown straps at 3.00 inch maximum intervals and at each breakout.

Table F-12. Parts List for Wiring Harness A105J2.

Find Number	Part or Identifying Number	Quantity Required	Description	NSN
1	MS3452W2420S	1	Connector, Receptacle, Electrical, Box Mounting, Rear Release, Crimp Contact, AN Type	5935-01-181-0038
2	M5086/1129	AR	Wire, Electric, Copper Conductor, 600 V	6145-00-578-7521
3	M5086/1169	AR	Wire, Electric, Copper Conductor, 600 V	6145-00-578-6072
4	MS25036153	1	Terminal, Lug, Crimp Style	5940-00-143-4774
5	MS25036107	7	Terminal, Lug, Crimp Style	5940-00-113-8179
6	MS25036111	2	Terminal, Lug, Crimp Style	5940-00-204-8990
7	MS336759	AR	Strap, Tiedown, Electrical	5975-001113-208

Table F-13. Wiring Harness A105J2 Wire Run List.

Wire Ref No.	Termination		Termination		Wire Find No.	Length (Inches)
	From	Find No.	To	Find No.		
1	A105J2-A	1	S1-3	5	3	15.25
2	A105J2-B	1	TB3-4	5	3	5.97
3	A105J2-C	1	TB3-5	5	3	5.95
5	A105J2-E	1	TB3-8	6	2	7.27
6	A105J2-F	1	TB2-6	6	2	16.64
7	A105J2-G	1	TB3-3	5	3	6.41
8	A105J2-H	1	S2-Y	4	3	12.75
9	A105J2-J	1	TB2-8	5	3	17.52
10	A105J2-K	1	S1-8	5	3	14.75
11	A105J2-L	1	S1-11	5	3	14.25

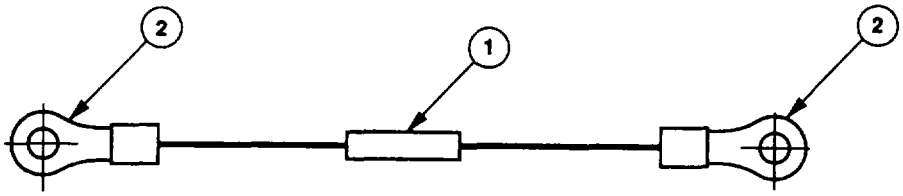


Figure F-8. Resistor Assembly.

PROCEDURES:

a. Refer to table F-14 for materials and crimp and solder two terminals (Figure F-8, 2) on resistor (1).

Table F-14. Parts List for Resistor Assembly.

Find Number	Part or Identifying Number	Quantity Required	Description	NSN
1	RCR20G751JM	1	Resistor, 750 Ohm, 1/2 Watt	5905-00-776-6479
2	M7928/73	2	Terminal Lug, Crimp Style, Uninsulated	5940-01-325-5998
3	QQS571SN60WRP2	AR	Solder	3439-01-121-5822

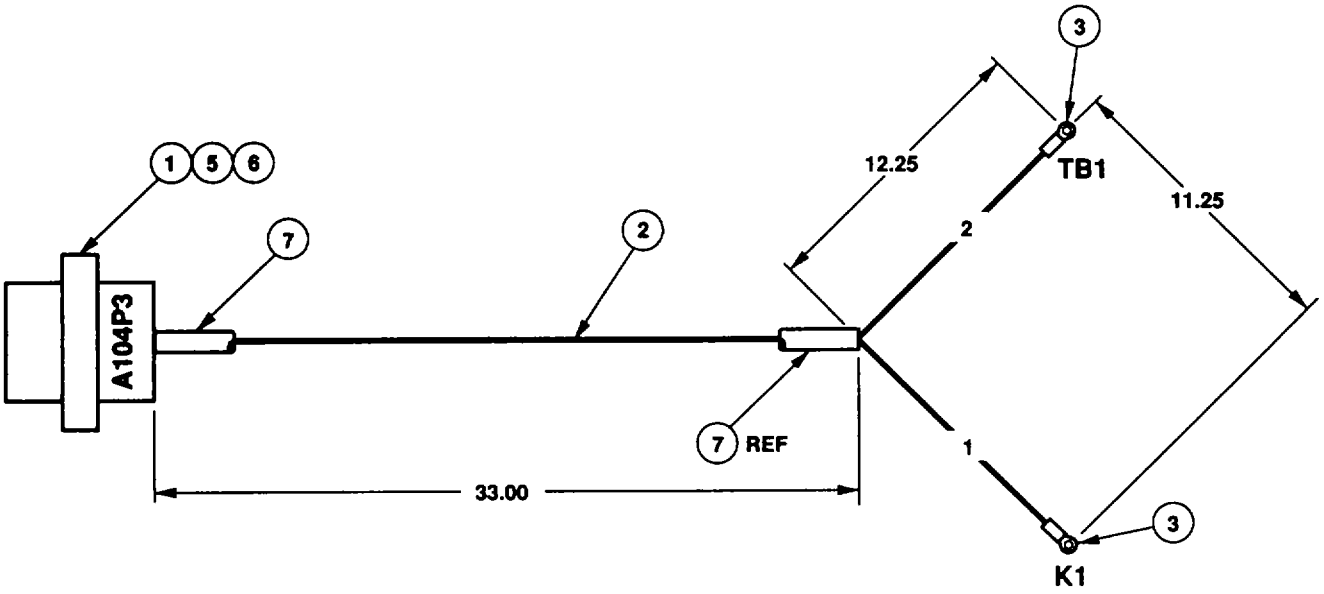


Figure F-9. Wiring Harness A104P3.

PROCEDURES:

a. Refer to Figure H-2 and determine faulty wire.

b. Remove and discard cable clamp adapter (Figure F-9, 5), insulation sleeving (6), and insulation sleeving (7) from connector (1) and wiring.

c. Remove faulty wire from wiring harness.

d. Cut wire to dimensions shown in Figure F-9.

e. Refer to tables F-14 and F-15 to assemble wire. Mark wire with from to termination designation and double headed arrow on each end of wire assembly.

f. Install wire in connector (1).

g. Install new cable clamp adapter (5), insulation sleeving (6), and insulation sleeving (7), as shown in Figure F-3, and heat shrink to a firm fit.

h. Install tiedown straps at 3.00 inch maximum intervals and at each breakout.

Table F-14. Parts List for Wiring Harness A104P3.

Find Number	Part or Identifying Number	Quantity Required	Description	NSN
1	MS3450L20-4S	1	Connector, Receptacle, Electrical, Box Mounting, Rear Release, Crimp Contact, AN Type	5935-00-185-9574
2	M5086/1-12-9	AR	Wire, Electric, Copper Conductor, 600 V	6145-00-578-7521
3	MS25036-112	2	Terminal, Lug, Crimp Style	5940-00-143-4794
4	MS3367-5-9	AR	Strap, Tiedown, Electrical	5975-00-111-3208
5	M85049/60-1W20	1	Adapter, Cable Clamp	5935-01-228-1812
6	MS3109-06AC	1	Insulation Sleeving	5970-01-079-5810
7	M23053/5-107-0	AR	Insulation Sleeving	5970-00-954-1624

Table F-15. Wiring Harness A104P3 Wire Run List.

Wire Ref No.	Termination		Termination		Wire Find No.	Length (Inches)
	From	Find No.	To	Find No.		
1	A104P3-A	1	K1-A2	3	2	44.25
2	A104P3-B	1	TBi-1	3	2	45.25

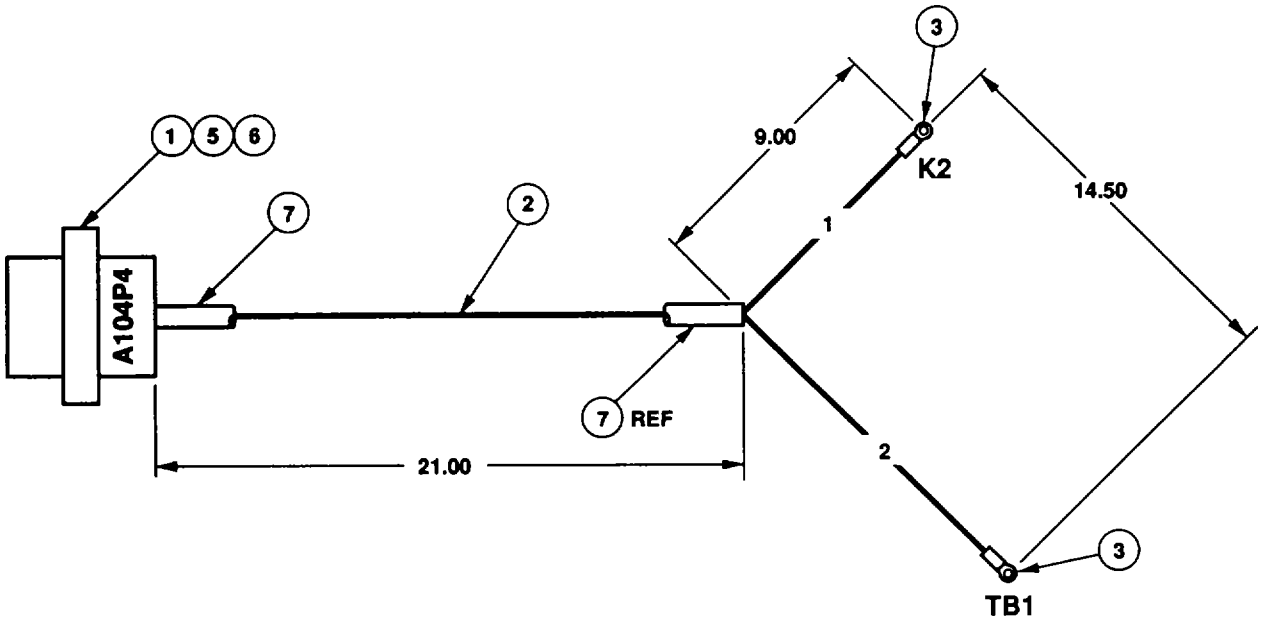


Figure F-10. Wiring Harness A104P4.

PROCEDURES:

a. Refer to Figure H-2 and determine faulty wire.

b. Remove and discard cable clamp adapter (Figure F-10, 5), insulation sleeving (6), and insulation sleeving (7) from connector (1) and wiring.

c. Remove faulty wire from wiring harness.

d. Cut wire to dimensions shown in Figure F-10.

e. Refer to tables F-16 and F-17 to assemble wire. Mark wire with from to termination designation and double headed arrow on each end of wire assembly.

f. Install wire in connector (1).

g. Install new cable clamp adapter (5), insulation sleeving (6), and insulation sleeving (7), as shown in Figure F-10, and heat shrink to a firm fit.

h. Install tiedown straps at 3.00 inch maximum intervals and at each breakout.

Table P-16. Parts List for Wiring Harness A104P4.

Find Number	Part or Identifying Number	Quantity Required	Description	NSN
1	MS3450L20-4S	1	Connector, Receptacle, Electrical, Box Mounting, Rear Release, Crimp Contact, AN Type	5935-00-185-9574
2	M5086/1-12-9	AR	Wire, Electric, Copper Conductor, 600 V	6145-00-578-7521
3	MS25036-112	2	Terminal, Lug, Crimp Style	5940-00-143-4794
4	MS3367-5-9	AR	Strap, Tiedown, Electrical	5975-00-111-3208
5	M85049/60-1W20	1	Adapter, Cable Clamp	5935-01-228-1812
6	MS3109-06AC	1	Insulation Sleeving	5970-01-079-5810
7	M23053/5-107-0	AR	Insulation Sleeving	5970-00-954-1624

Table P-17. Wiring Harness A104P4 Wire Run List.

Wire Ref No.	Termination		Termination		Wire Find No.	Length (Inches)
	From	Find No.	To	Find No.		
1	A104P4-A	1	K2-A2	3	2	30.00
2	A104P4-B	1	TBI-1	3	2	35.50

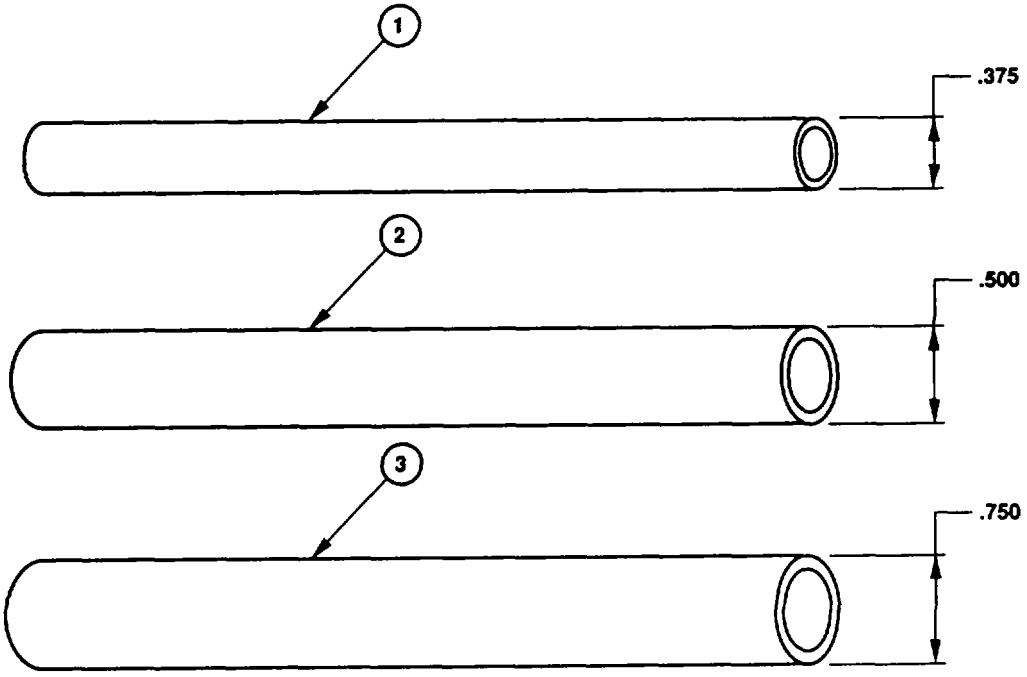


Figure F-11. Condenser Tubing.

PROCEDURE:

a. Identify proper size tubing (Figure F-11), in Table F-18.

b. Using old tubing as template cut new tubing to length and bend as required.

Table F-18. Condenser Tubing.

Find Number	Part or Identifying Number	Quantity Required	Description	NSN
1	ASTM B-280 (.375 DIA STK X .032 WALL THK)	AR	Copper Tube	
2	ASTM B-280 (.500 DIA STK X .032 WALL THK)	AR	Copper Tube	4710-01-348-2690
3	ASTM B-280 (.750 DIA STK X .035 WALL THK)	AR	Copper Tube	

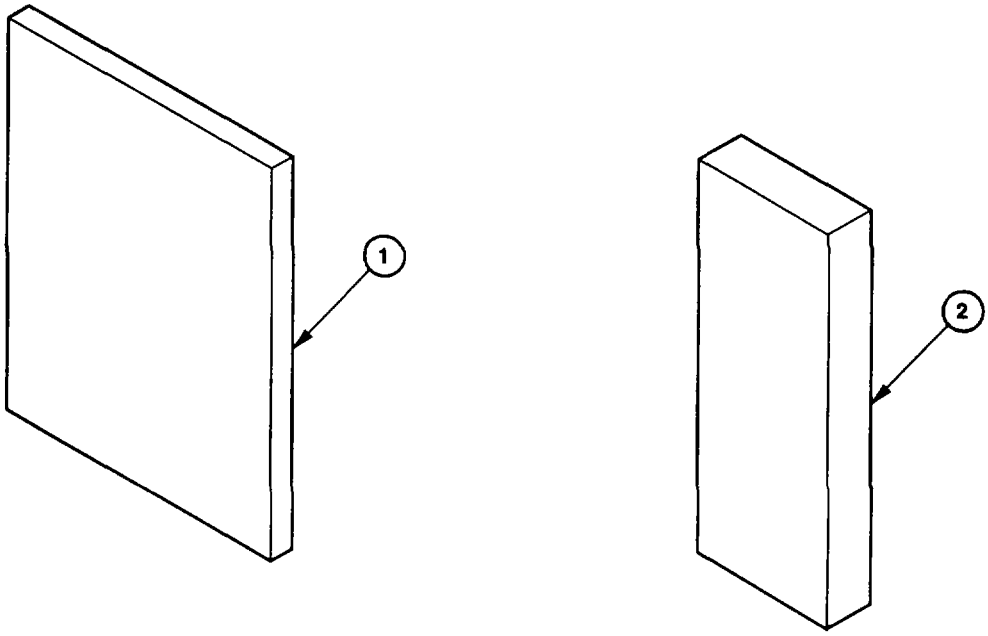


Figure P-12. Rubber Sheet.

PROCEDURE:

NOTE

- Cut size of rubber sheet to ensure butting against adjoining metal or rubber surfaces.
- All clearance holes and cutouts shall be held to a minimum size that will permit assembly of parts.
- Insulation may be slit to facilitate installation.
- Skin shall be permitted only on surfaces of insulation which are not bonded to metal.
- Use location of rivnuts on evaporator coil as template for cutting holes in insulation to be mounted on evaporator coil.

Using inner surface of evaporator housing, or mounting surface of evaporator coil, cut rubber sheet (Figure F-12) to required size.

Table F-19. Rubber Sheets.

Find Number	Part or Identifying Number	Quantity Required	Description	NSN
1	MIL-R-6130, Type II, GR A, COND MED (.250 STK)	AR	Cellular Rubber	9320-01-340-7786
2	MIL-R-6130, Type II, GR A, COND MED (1.00 STK)	2.00" W X 17.00' L	Cellular, Rubber Sheet	9320-01-339-5624

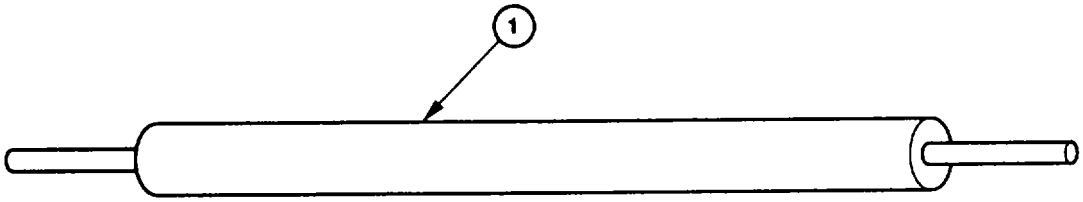


Figure F-13. Electrical Wire.

PROCEDURES:

a. Refer to table F-20 for wire and cut to 55.88 inches.

Table F-20. Electrical Wire.

Find Number	Part or Identifying Number	Quantity Required	Description	NSN
1	M5086/1-12-9	55.88"	Wire, Electrical	6145-00-578-7521

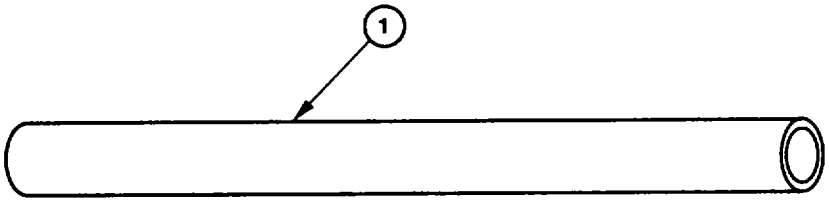


Figure F-14. Differential Pressure Switch Hose.

PROCEDURE:

Cut Differential Pressure Switch Hose (Figure F-14, 1) to length as required. Ensure cuts are square and no ragged edges are present.

Table F-21. Differential Pressure Switch Material.

Find Number	Part or Identifying Number	Quantity Required	Description	NSN
1	ZZ-T-831 Type VI, CL 6 (.188 ID)	AR	Hose, PVC	4720-00-709-0441

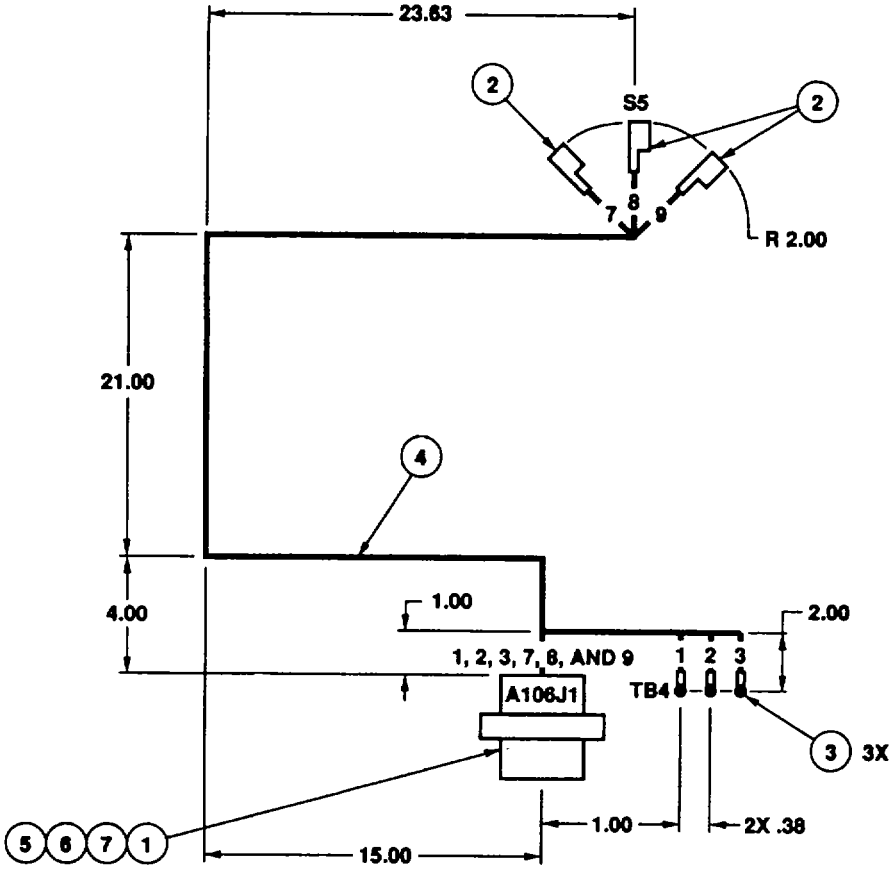


Figure F-15. Wiring Harness A106J1.

PROCEDURES:

a. Refer to Figure H-3 and determine faulty wire.

b. Remove and discard electrical cable clamp (Figure F-15, 5), insulation sleeving (6), and insulation sleeving (7) from connector (1) and wiring.

c. Remove faulty wire from wiring harness.

d. Refer to table F-23 to determine wire and cut wire to dimensions shown in Figure 15.

e. Refer to tables F-22 and F-23 to assemble wire. Mark wire with from to termination designation and double headed arrow on each end of wire assembly.

f. Install wire in connector (1).

g. Install new electrical cable clamp (5), insulation sleeving (6), and insulation sleeving (7), as shown in Figure F-15, and heat shrink to a firm fit.

h Install tiedown straps at 3.00 inch maximum intervals and at each breakout.

Table F-22. Parts List for Wiring Harness A106J1.

Find Number	Part or Identifying Number	Quantity Required	Description	NSN
1	MS3450L24-20P	1	Connector, Receptacle, Electrical, Box Mounting, Rear Release, Crimp Contact, AN Type	
2	13230E4455-2	3	Terminal, Quick Disconnect, Female 90°	
3	MS25036-112	3	Terminal, Lug, Crimp Style	5940-00-143-4794
4	M5086/1-16-9	AR	Wire, Electric, Copper Conductor, 600 V	6145-00-578-6072
5	M85049/60-1W24	1	Cable Clamp, Electrical	5935-01-233-1241
6	MS3109-07AU	1	Insulation Sleeving	5970-00-397-3576
7	M23053/5-109-0	AR	Insulation Sleeving	5970-00-111-3208
8	MS3367-5-9	AR	Strap, Tiedown, Electrical	5975-00-111-3208

Table F-23. Wiring Harness A106J1 Wire Run List.

Wire Ref No.	Termination		Termination		Wire Find No.	Length (Inches)
	From	Find No.	To	Find No.		
1	A106J1-A	1	TB4-1	3	4	4.00
2	A106J1-B	1	TB4-2	3	4	4.38
3	A106J1-C	1	TB4-3	3	4	4.76
7	A106J1-G	1	S5-1	2	4	65.63
8	A106J1-H	1	S5-2	2	4	65.63
9	A106J1-J	1	S5-3	2	4	65.63

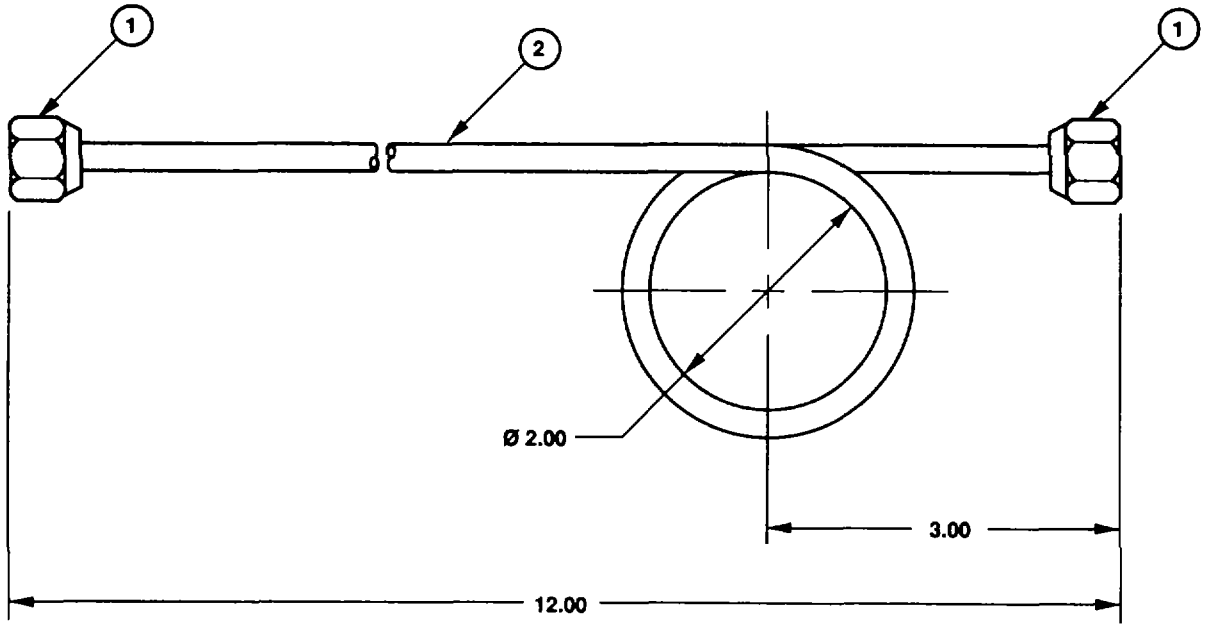


Figure P-16. Equalizer Line Tube Assembly.

PROCEDURE:

a. Cut tube (Figure F-16, 2) to length as required.

b. Install two flare nuts (1) on tube (2) and flare both ends of tube (2) 450°.

c. Bend tube (2) to dimensional requirements of Figure F-16.

Table F-24. Parts for Equalizer Line Tube Assembly.

Find Number	Part or Identifying Number	Quantity Required	Description	NSN
1	MS35872-2	2	Flare Nut	4730-00-189-2737
2	ASTM B-280 (.250 DIA STK X .030 WALL THK)	AR	Copper Tube	

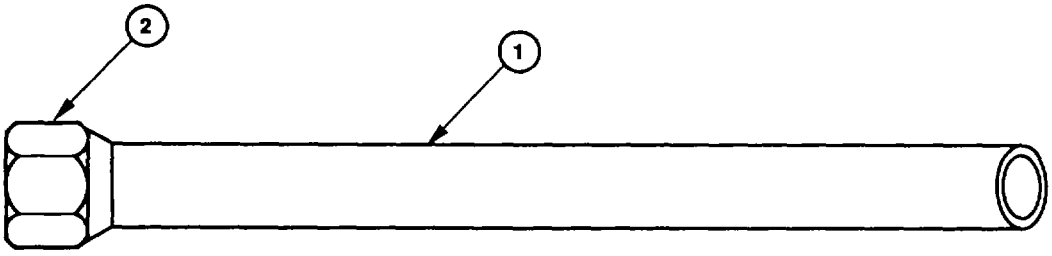


Figure F-17. TEV Outlet Tube Assembly.

PROCEDURE:

a. Cut tube (Figure F-17, 1) to length using old tube as a template.

b. Install flarenut (2) on tube (1) and flare nut end of tube (1) 450°.

Table F-25. Parts for TZV Outlet Tube Assembly.

Find Number	Part or Identifying Number	Quantity Required	Description	NSN
1	ASTM B-280 (.500 DIA X .032 WALL THK)	AR	Copper Tube	4710-01-348-2690
2	MS35872-4	1	Flare Nut	4730-00-189-2741

APPENDIX G
MANDATORY REPLACEMENT PARTS

G-1. SCOPE.

This appendix lists the parts that you must stock in order to properly repair the air conditioner.

G-2. GENERAL.

This appendix is your authority to request the items.

G-3. EXPLANATION OF ITEMS.

a. **Item Number column**. The item number column gives the item number for the replacement part. This number is for reference only.

b. **Nomenclature Column**. The nomenclature column gives the official name of the item.

c. **CAGEC and Part Number Column**. The Commercial and Government Entity Code and part number are used for requisitioning purposes.

d. **NSN**. The NSN column gives the NSN if available for the item.

Table G-1. Mandatory Replacement Parts.

(1) Item Number	(2) Nomenclature	(3) CAGEC and Part Number	(4) NSN
1	Clamp, Hose, Adjustable	(28520) 2307	
2	Filter-Drier, Refrigerant	(78462) C-084-S	4130-00-087-4760
3	Packing, Preformed	(01276) 22546-18	
4	Packing, Preformed	(01276) 22546-21	
5	RFI Rotary Shaft Seal Boot	(81349) M5423/09-14	
6	Rivet, Blind	(96906) MS20470B6-8C	
7	Rivet, Blind	(96906) MS20600AD4W2	5320-00-582-3304
8	Rivet, Blind	(96906) MS20604B3W2	5320-00-721-9075
9	Shielding Gasket, Electrical	(96906) MS90484-20-2	5999-01-006-0199
10	Shielding Gasket, Electrical	(96906) MS90484-24-2	5999-01-006-0198
11	Washer, Lock	(96906) MS35338-32	5310-00-013-1046
12	Washer, Lock	(96906) MS35338-40	5310-00-543-2410
13	Washer, Lock	(96906) MS35338-41	5310-00-045-4007
14	Washer, Lock	(96906) MS35338-43	5310-00-045-3296
15	Washer, Lock	(96906) MS35338-44	5310-00-582-5965
16	Washer, Lock	(96906) MS35338-46	5310-00-637-9541

APPENDIX H

WIRING DIAGRAMS AND WIRE RUN TABLES

This appendix contains wiring diagrams and wire run tables for each module of the Air Conditioner: Split Pack 30,000 BTUH, 28VDC. Each wiring diagram will have an associated wire run table and component reference table.

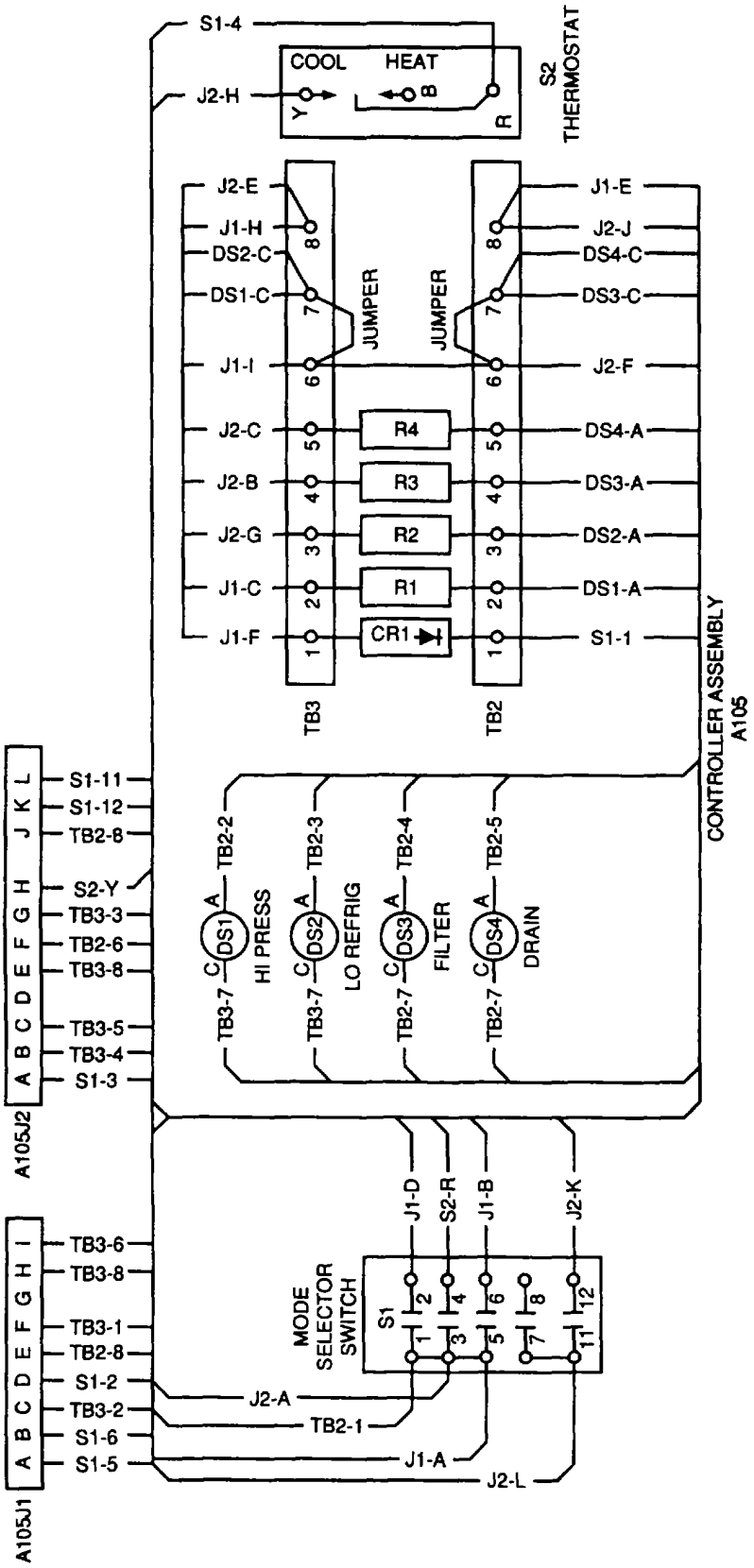


Figure H-1. Control Module Assembly Wiring Diagram.

Table H-1. Control Module Assembly Component Reference.

ELEC REF DES	PART NUMBER	DESCRIPTION
A105J1	MS3452W20-16P	CONNECTOR, CONTROLLER TO CONDENSER
A105J2	MS3452W24-20S	CONNECTOR, CONTROLLER TO EVAPORATOR
S1	13230E4423	SWITCH, ROTARY, CAM ACTUATED
DS1	13230E4440-1	INDICATOR ASSEMBLY, LED, HIGH PRESSURE
DS2	13230E4440-2	INDICATOR ASSEMBLY, LED, LOW REFRIGERANT
DS3	13230E4440-3	INDICATOR ASSEMBLY, LED, FILTER
DS4	13230E4440-4	INDICATOR ASSEMBLY, LED, DRAIN
CR1	13230E4426	DIODE ASSEMBLY
R1-4	13230E4439	RESISTOR ASSEMBLY (750 OHM)
TB2, TB3	13230E4372-2	TERMINAL BOARD, SINGLE ROW
S2	13211E8301-1	THERMOSTAT
JUMPER	TBJB	BUS CONNECTOR

Table H-2. Control Module Assembly Wire Run.

WIRE ASSY	WIRE RUN		WIRE ASSY	WIRE RUN	
	FROM	TO		FROM	TO
1	A105J1-A	S1-5	15	A105J2-H	S2-Y
2	A105J1-B	S1-6	16	A105J2-J	TB2-8
3	A105J1-C	TB3-2	17	A105J2-K	S1-8
4	A105J1-D	S1-2	18	A105J2-L	S1-11
5	A105J1-E	TB2-8	19	S1-1	TB2-1
6	A105J1-F	TB3-1	20	DS1-C	TB3-7
7	A105J1-H	TB3-8	21	DS1-A	TB2-2
8	A105J1-I	TB3-6	22	DS2-C	TB3-7
9	A105J2-A	S1-3	23	DS2-A	TB2-3
10	A105J2-B	TB3-4	24	DS3-C	TB2-7
11	A105J2-C	TB3-5	25	DS3-A	TB2-4
12	A105J2-E	TB3-8	26	DS4-C	TB2-7
13	A105J2-F	TB2-6	27	DS4-A	TB2-5
14	A105J2-G	TB3-3			

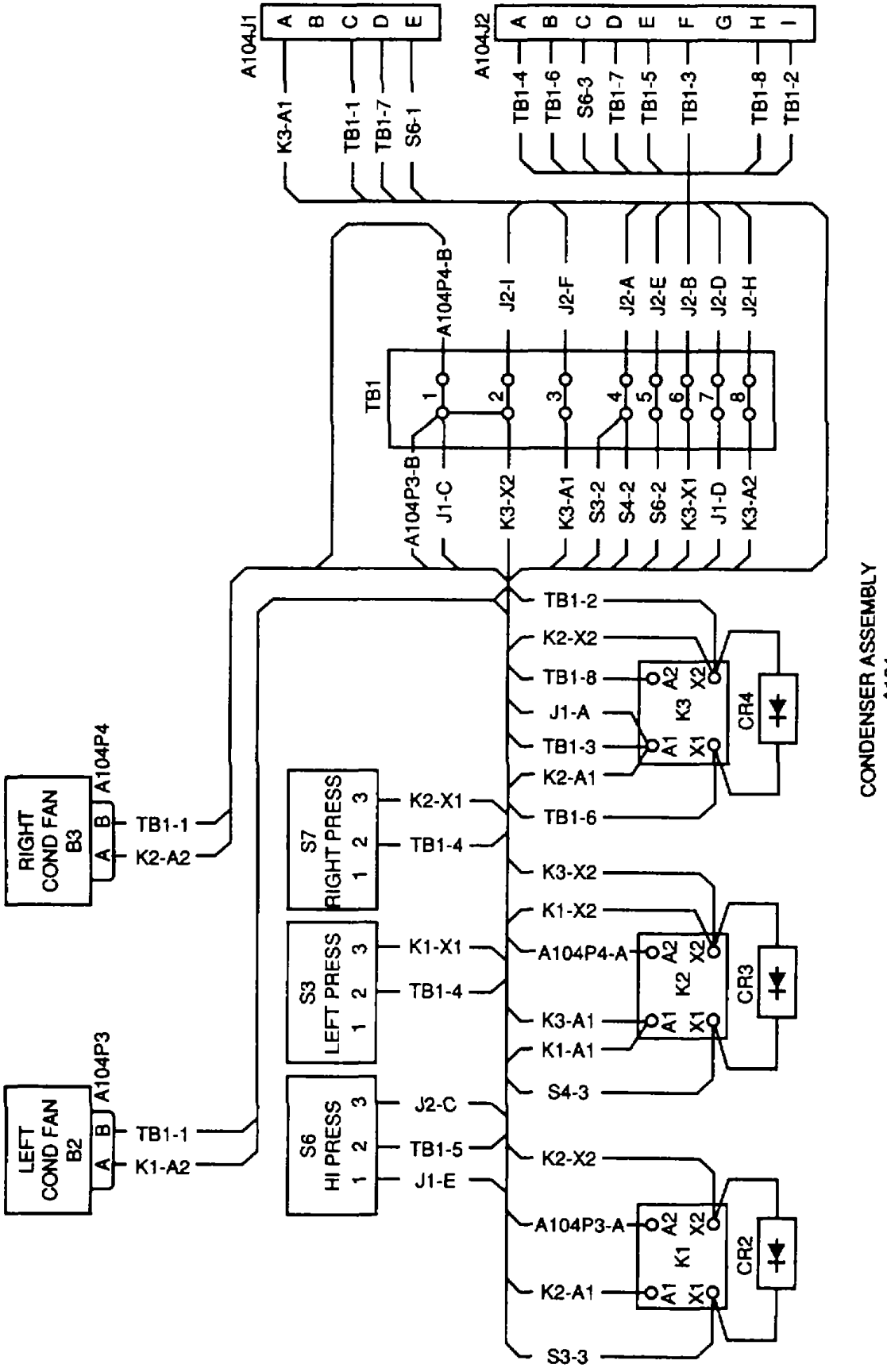


Figure H-2. Condenser Assembly Wiring Diagram.

Table H-3. Condenser Assembly Component Reference.

ELEC REF DES	PART NUMBER	DESCRIPTION
A104J1	MS3452W24-12P	CONNECTOR, CONDENSER INPUT
A104J2	MS3452W20-16S	CONNECTOR, CONDENSER TO CONTROLLER
A104P3	MS3456L20-4S	CONNECTOR, LEFT CONDENSER FAN
A104P4	MS3456L20-4S	CONNECTOR, RIGHT CONDENSER FAN
B2	13230E4404	FAN, CONDENSER, LEFT
B3	13230E4404	FAN, CONDENSER, RIGHT
CR2-4	13230E4426	DIODE ASSEMBLY
DS4	13230E4440-4	INDICATOR ASSEMBLY, LED, DRAIN
K1	MS24140D1	RELAY, CONDENSER FAN, LEFT
K2	MS24140D1	RELAY, CONDENSER FAN, RIGHT
K3	MS24140D1	RELAY, EVAPORATOR FAN
S3	13230E4407-1	SWITCH, FAN CUTOUT, LEFT
S4	13230E4407-2	SWITCH, FAN CUTOUT, RIGHT
S6	13230E4406	SWITCH, HIGH PRESSURE
TB1	72-5157	TERMINAL BOARD

Table H-4. Condenser Assembly Wire Run.

WIRE ASSY	WIRE RUN		WIRE ASSY	WIRE RUN	
	FROM	TO		FROM	TO
1	A104P3-A	K1-A2	16	A104J2-B	TB1-6
2	A104P3-B	TB1-1	17	A104J2-D	TB1-7
3	A104P4-A	K2-A2	18	A104J2-E	TB1-5
4	A104P4-B	TB1-1	19	A104J2-F	TB1-3
5	S6-1	J1-E	20	A104J2-H	TB1-8
6	S6-2	TB1-5	21	A104J2-I	TB1-2
7	S6-3	J2-C	22	K1-A1	K2-A1
8	S3-2	TB1-4	23	K1-X2	K2-X2
9	S3-3	K1-X1	24	K2-A1	K3-A1
10	S4-2	TB1-4	25	K2-X2	K3-X2
11	S4-3	K2-X1	26	K3-X1	TB1-6
12	A104J1-A	K3-A1	27	K3-A1	TB1-3
13	A104J1-C	TBl-1	28	K3-A2	TB1-8
14	A104J1-D	TB1-7	29	K3-X2	TB1-2
15	A104J2-A	TB1-4			

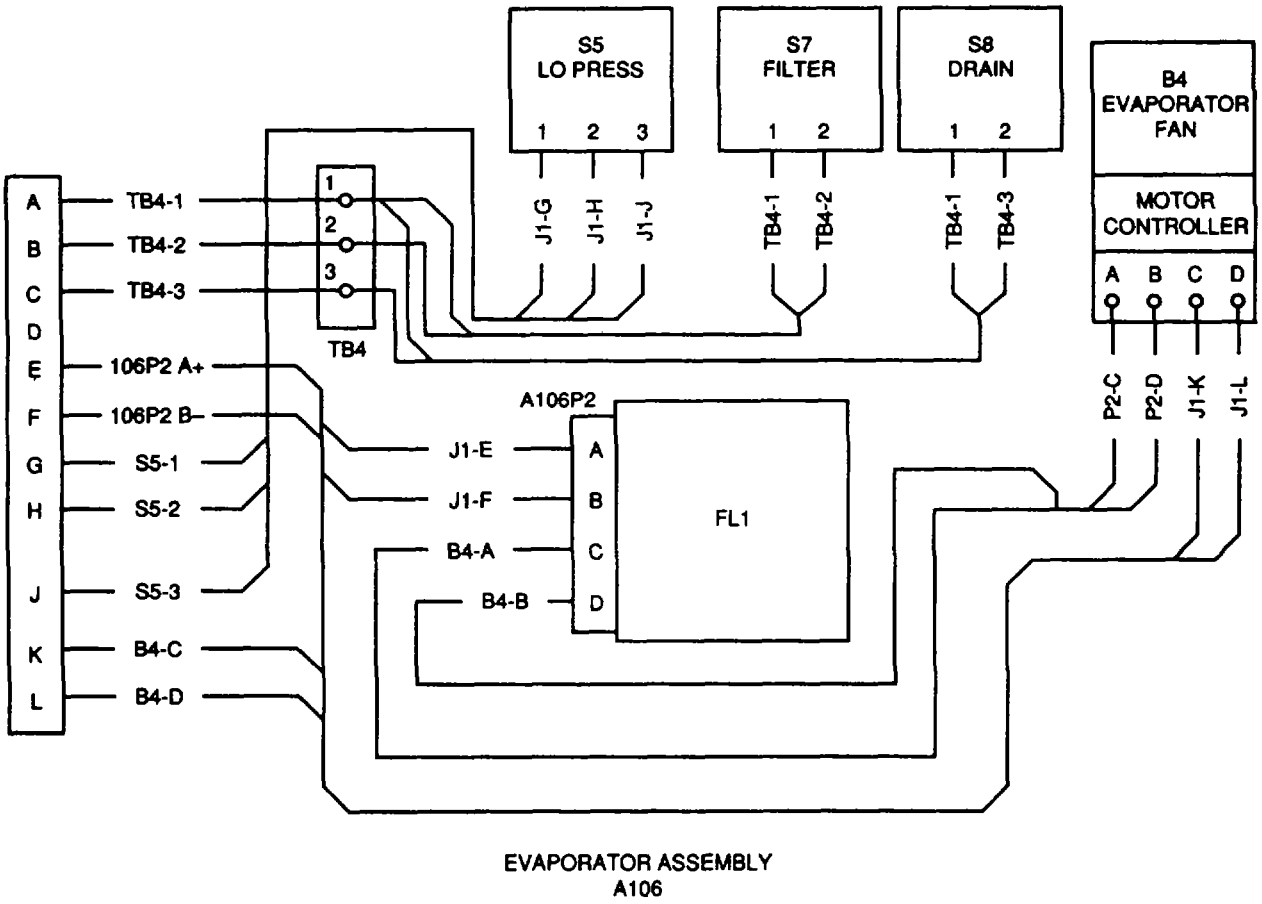


Figure H-3. Evaporator Assembly Wiring Diagram.

Table H-5. Evaporator Assembly Component Reference.

ELEC REF DES	PART NUMBER	DESCRIPTION
A106J1	MS3452W24-20P	CONNECTOR, EVAPORATOR TO CONTROLLER
A106P2	MS3452W20-4P	CONNECTOR, EMI FILTER
B4	13230E4395	MOTOR, EVAPORATOR FAN WITH CONTROLLER
FL1	13230E4396	FILTER, ELECTRONIC, EMI
S5	13230E4380	SWITCH, LOW PRESSURE
S7	13230E4379	SWITCH, DIFFERENTIAL PRESSURE, AIR FILTER
S8	13230E4378	SWITCH, LEVEL, CONDENSATE DRAIN
TB4	13230E4372-1	TERMINAL BOARD, SINGLE ROW

Table H-6. Evaporator Assembly Wire Run.

WIRE ASSY	WIRE RUN		WIRE ASSY	WIRE RUN	
	FROM	TO		FROM	TO
1	A106J1-A	TB4-1	9	A106J1-K	B4-C
2	A106J1-B	TB4-2	10	A106J1-L	B4-D
3	A106J1-C	TB4-3	11	TB4-1	S7-1
4	A106J1-E	A106P2-A	12	TB4-2	S7-2
5	A106J1-F	A106P2-B	13	TB4-1	S8-1
6	A106J1-G	S5-1	14	TB4-3	S8-2
7	A106J1-H	S5-2	15	A106P2-C	B4-A
8	A106J1-J	S5-3	16	A106P2-D	B4-B

GLOSSARY
SECTION I. ABBREVIATIONS

All abbreviations, acronyms, signs, and symbols used in the manual are listed below.

AMDF	Army Master Data File
AR	Army Regulation
ATTN	Attention
Auth	Authorized
BII	Basic Issue Item
BTUH	British Thermal Unit per Hour
BX	Box
C	Celsius
CAGEC	Commercial and Government Entity Code
CM	Centimeter
COEI	Components of End Item
CPC	Corrosion Prevention and Control
CTA	Common Table of Allowances
DA	Department of the Army
DA Pam	Department of the Army Pamphlet
DR	Drum
EA	Each
ECM	Electronic Countermeasures
ECU	Environmental Control Unit
EIR	Equipment Improvement Recommendation
EMI	Electro-Magnetic Interference
F	Fahrenheit
FM	Field Manual
FT .	Foot
GL	Gallon
ILLUS	Illustration
HMMWV	High Mobility Multi-Wheeled Vehicle
IN	Inch
JTA	Joint Table of Allowances
JR	Jar
KG	Kilogram
kPa	Kilopascal
LB	Pound(s)
MAC	Maintenance Allocation Chart
MEK .	Methyl-Ethyl Ketone
MIL-HDBK	Military Handbook
MIL-STD	Military Standard
MM	Millimeter
MS	Military Specification
MTOE	Modified Table of Organization and Equipment
MWO	Modification Work Orders
NBC	Nuclear, Biological, and Chemical
NSN	National Stock Number
PAM	Pamphlet
PMCS	Preventive Maintenance Checks and Services
PSI .	Pounds per Square Inch
QA	Quality Assurance
QT	Quart
QTY	Quantity
RFI .	Radio Frequency Interference
RPSTL	Repair Parts and Special Tools List
RQD	Required
SF	Standard Form
TAMMS	The Army Maintenance Management System
TDA	Table of Distribution and Allowances
TEV	Thermoexpansion Valve
TOE	Table of Organization and Equipment

TM .....Technical Manual
TMDE ..... Test, Measurement, and Diagnostic Equipment
U/I .....Unit of Issue
U/M ..... Unit of Measure
U.S. ..... United States
VDC .....Volts Direct Current

SECTION II. DEFINITION OF UNUSUAL TERMS

All terms used in this manual are defined in the text or listed in the Army Dictionary (AR 310-25).

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W

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THE METRIC SYSTEM AND EQUIVALENTS

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3.2808.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu in.
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Square measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. in.
1 sq. decimeter = 100 sq. centimeters = 15.5 inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 feet
1 sq. dekameter (are) = 100 sq. meters = 1.076.4 sq. ft.
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 hectometers = .386 sq. miles

Liquid Measure

1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons
1 liter = 10 deciliters = 33.81 fl. ounces
1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3 38 fl. ounces
1 metric ton = 10 quintals = 1.1 short tons

Approximate Conversion Factors

To change	To	Multiply by
inches	centimeters	2.540
feet	meters	.305
yards	meters	.914
miles	kilometers	1.609
sq. inches	sq. centimeters	6.451
sq. feet	sq. meters	.093
sq. yards	sq. meters	.836
sq. miles	sq. kilometers	2.590
acres	sq. hectometers	.405
cubic feet	cubic meters	.028
cubic yards	cubic meters	.765
fluid ounces	milliliters	29.573
pints	liters	.472
quarts	liters	.946
gallons	liters	3.785
ounces	grams	28.349
pounds	kilograms	.454
short tons	metric tons	.907
pound inches	newton-meters	.11296

To change	To	Multiply by
ounce inches	newton-meters	.0070062
centimeters	inches	.394
meters	feet	3.280
meters	yards	1.094
kilometers	miles	.621
sq. centimeters	sq. inches	.155
sq. meters	sq. yards	10.764
sq. kilometers	sq. miles	1.196
sq. hectometers	acres	2.471
cubic meters	cubic feet	35.315
milliliters	fluid ounces	.034
liters	pints	2.113
liters	quarts	1.057
grams	ounces	.035
kilograms	pounds	2.205
metric tons	short tons	1.102
pound-feet	newton-meters	1.356

Temperature (Exact)

°F Fahrenheit temperature — 5/9 (after subtracting 32) — Celsius Temperature °C

PIN: 071841-000