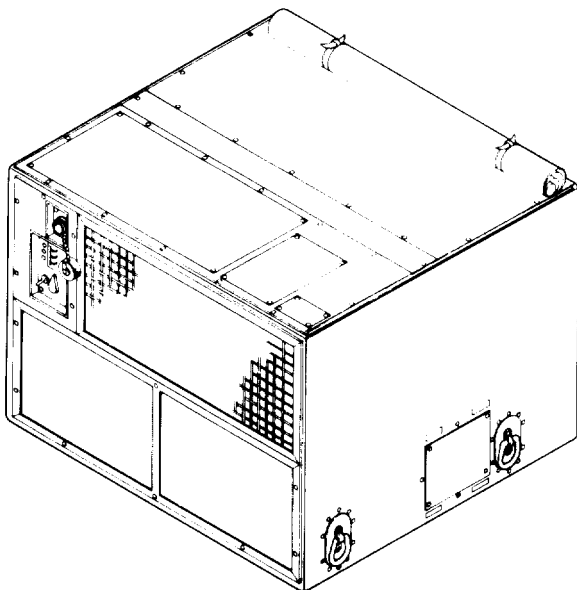


**TECHNICAL MANUAL
OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT
AND GENERAL SUPPORT MAINTENANCE MANUAL**

**AIR CONDITIONER, HORIZONTAL COMPACT
36,000 BTU/HR, COOLING
31,000 BTU/HR, HEATING
208 VOLT, 3 PHASE, 50/60 HERTZ
MODEL CH40-5/ 6-08
4120-01-122-0628**



CHAPTER 1	INTRODUCTION
CHAPTER 2	OPERATING INSTRUCTIONS
CHAPTER 3	OPERATOR'S MAINTENANCE INSTRUCTIONS
CHAPTER 4	ORGANIZATIONAL MAINTENANCE INSTRUCTIONS
CHAPTER 5	DIRECT SUPPORT MAINTENANCE INSTRUCTIONS
APPENDIX A	REFERENCES
APPENDIX B	MAINTENANCE ALLOCATION CHART
APPENDIX C	COMPONENTS OF END ITEM LIST
APPENDIX D	EXPENDABLE SUPPLIES AND MATERIALS LIST
APPENDIX E	WIRE LIST & DIAGRAMS
	GLOSSARY
	ALPHABETICAL INDEX

**HEADQUARTERS, DEPARTMENT OF THE ARMY
10 APRIL 1985**

CHANGE
NO. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON D.C., 1 JULY 1992

Operator's, Organizational, Direct Support
and General Support Maintenance Manual

**AIR CONDITIONER, HORIZONTAL COMPACT
36,000 BTU/HR, COOLING
31,000 BTU/HR, HEATING
208 VOLT, 3 PHASE, 50/60 HERTZ
MODEL CH40-5/6-08
4120-01-122-0628**

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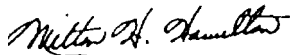
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General, United States Army
Chief of Staff

Official:



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DEPARTMENT OF THE ARMY
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Operator's, Organizational, Direct Support and General Support Maintenance Manual

AIR CONDITIONER, HORIZONTAL COMPACT
36,000 BTU/HR, COOLING
31,000 BTU/HR, HEATING
208 VOLT, 3 PHASE, 50/60 HERTZ
MODEL CH40-5/6-08
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Operator's, Organizational, Direct Support
and General Support Maintenance Manual

AIR CONDITIONER, HORIZONTAL COMPACT
36,000 BTU/HR, COOLING
31,000 BTU/HR, HEATING
208 VOLT, 3 PHASE, 50/60 HERTZ
MODEL CH40-5/6-08
4120-01-122-0628

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CHANGE }
No. 2 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 20 January 1988

Operator's, Organizational, Direct Support
and General Support Maintenance Manual

AIR CONDITIONER, HORIZONTAL COMPACT
36,000 BTU/HR, COOLING
31,000 BTU/HR, HEATING
208 VOLT, 3 PHASE, 50/60 HERTZ
MODEL CH40-5/6-08
4120-01-122-0628

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Official:

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CHANGE }
No. 1 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 27 March 1987

Operator's, Organizational, Direct Support
and General Support Maintenance Manual

AIR CONDITIONER, HORIZONTAL COMPACT
36,000 BTU/HR, COOLING
31,000 BTU/HR, HEATING
208 VOLT, 3 PHASE, 50/60 HERTZ
MODEL CH40-5/6-08
4120-01-122-0628

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TECHNICAL MANUAL

NO. TM 5-4120-376-14

HEADQUARTERS
 DEPARTMENT OF THE ARMY
 WASHINGTON, D.C., 10 April 1985

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

AIR CONDITIONER, HORIZONTAL COMPACT
 36,000 BTU/HR, COOLING
 31,000 BTU/HR, HEATING
 208 VOLT, 3 PHASE, 50/60 HERTZ
 MODEL CH40-5/6-08
 4120-01-122-0628

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistake or if you know of away to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publication sand Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U S. Army Troop Support Command, ATTN: AMSTR-MCTS, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished directly to you.

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WARNINGS

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F (38°C).

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200°F (649°C) creates phosgene gas.

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

Refrigerant R-22 is contained in the refrigerant system under high pressure. Extreme care must be exercised to prevent refrigerant from coming in contact with exposed skin 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.

Polyurethane foam insulation breaks down to form toxic gases when heated to brazing temperatures.

Acetone and methyl-ethyl ketone (MEK) are flammable and their vapors are explosive. Prolonged or repeated inhalation of fumes on contact with the skin can be toxic. Use in a well ventilated area, wear gloves and keep away from sparks or flames.

Do not use compressed air for cleaning purposes except where reduced to less than 30 psi (2.11 kg/cm²) and then only with effective chip guarding and personal protective equipment.

Be careful when working with high voltage. Failure to comply can result in serious injury or death.

Do not wire connectors J1 and J12 for use at the same time, or apply power source to connectors J1 and J12 at the same time. You could have an unknown HOT connector, radio interference, or you could place two separate power supplies in opposition to each other.

Allow heater to cool before touching heaters. They can cause severe burns.

Use compressed air at 30 psi (1.36 kg) or less. Hold compressed air nozzle at least six to eight inches away from mist eliminator.

WARNINGS (Cont)

Do not use steam to clean the coil. Hot steam will splash and cause burns. The high heat could cause high system pressure.

Wear safety glasses when cleaning coil.

Use compressed air at 30 psi (1.36 kg) or less. Hold compressed air nozzle at least six to eight inches away from coil.

Allow heaters to cool before attempting removal or test of heater thermostat.

Make sure the power supply is off at the source before disconnecting the power supply line.

Dry nitrogen is always used to purge the refrigeration system during brazing or debrazing of connections to prevent internal oxidation scaling.

You must clean the entire refrigeration system after a burnout has occurred, since contaminants will have been carried to many corners and restrictions in the piping and fittings. These contaminants will soon be mixed with new refrigerant gas and compressor oil to cause repeated burnouts. To clean the system thoroughly, act as follows:

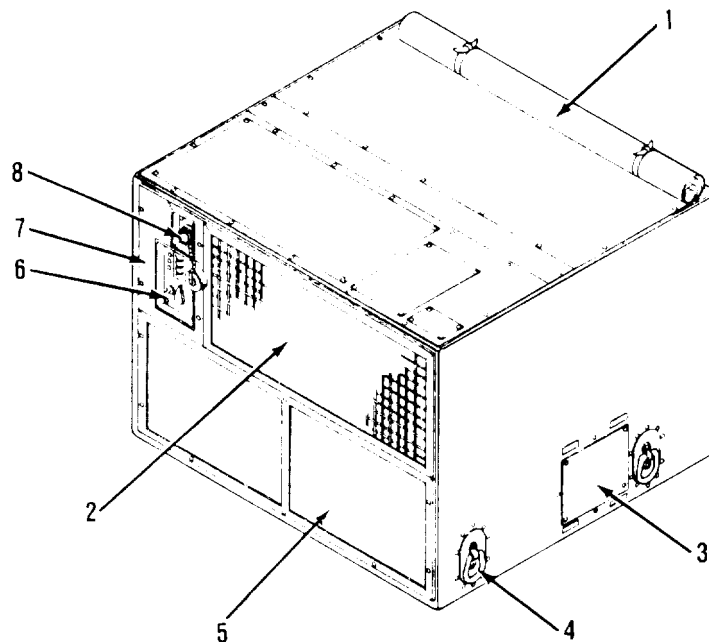
CHAPTER 1

INTRODUCTION

1-1. INTRODUCTION. The purpose of this manual is to acquaint you with the Air Conditioner Model CH 40-5/6-08. This is done by giving you a physical and functional description of those major equipment parts that you are likely to come in contact with. Complete instructions are covered in detail for Operation and Maintenance for this unit.

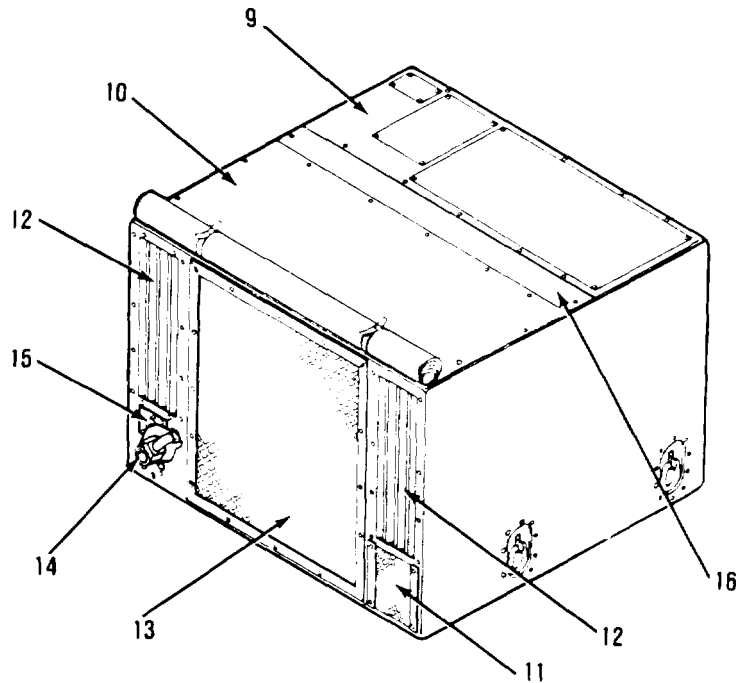
SECTION I. GENERAL INFORMATION

1. Fabric cover
2. Front louver (evaporator discharge)
3. Access cover (service valves)
4. Lifting ring and clip
5. Front louver (evaporator inlet)
6. Control module assembly
7. Junction box
8. Input power receptacle (J-1)



FRONT VIEW

9. Front cover
10. Rear cover
11. Ventilation guard
12. Condenser discharge louver
13. Condenser coil guard
14. Sight indicator
15. Auxiliary input power receptacle (J-12)
16. Center cover



REAR VIEW

1-2. SCOPE.

a. Type of Manual: Operator, Organizational, Direct Support, and General Support Maintenance.

b. Model Number and Equipment Name: CH40-5/6-08, Air Conditioner: 36,000 BTU/HR. Cooling Horizontal, Compact, 208 Volt, 3 Phase, 50/60 Cycle, AC.

c. Purpose of Equipment: The air conditioner produces cool or heated air for electronic equipment, and the comfort of operating personnel.

1-3. MAINTENANCE FORMS AND RECORDS. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750. The Army Maintenance Management System (TAMMS).

1-4. DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE. Refer to TM 750-244-3, Procedures for Destruction of Equipment to Prevent Enemy Use, for information about destruction.

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs). 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 do not like about your equipment. Let us know why you do not like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 Quality Deficiency Report. Mail it directly to Commander, U.S. Army Troop Support Command, ATTN: AMSTR-Q/X, 4300 Goodfellow Blvd., St. Louis, MO 63120.

1-6. NOMENCLATURE CROSS REFERENCE LIST. (Not required)

1-7. LIST OF ABBREVIATIONS. Not required. All abbreviations explained when used.

SECTION II. EQUIPMENT DESCRIPTION

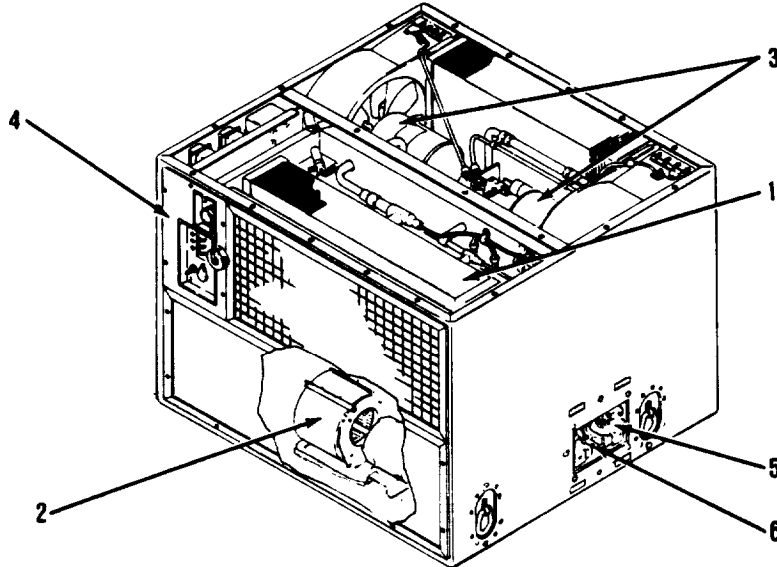
1-8. PURPOSE OF AIR CONDITIONER. The air conditioner is used primarily in van type enclosures. The unit provides filtered, cooled air, and heated air as required, to maintain the service conditions necessary for the efficient operation of electronic equipment in the vans. The air conditioner also provides for the comfort of operating personnel housed within the van.

1-9. CAPABILITIES AND FEATURES.

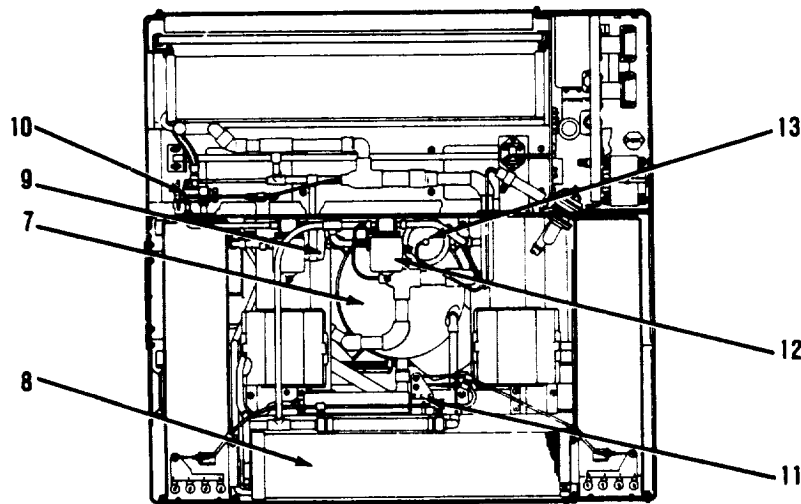
- a. Furnishes 36,000 BTU/HR for cooling.
- b. Furnishes 31,200 BTU/HR for heating.
- c. Furnishes fresh air.
- d. Furnishes air circulation.
- e. Base mounted and air cooled.
- f. Electric motor driven and designed for continuous operation Under varying loads.

1-10. LOCATION AND DESCRIPTION OF MAJOR INTERNAL COMPONENTS.

1. Evaporator coil - heat exchanger.
2. Evaporator fan assembly - blower fan for the conditioned air.
3. Condenser fan assembly - blower fans for the condenser air.
4. Junction box - electric relays & controls.
5. Service valves - allows access to the refrigerant.
6. Pressure switches - safety devices to prevent damage.



7. Compressor - electric motor, hermetically sealed with oil.
8. Condenser coil - heat exchanger.
9. Dehydrator (dryer filter) - used to remove moisture from refrigerant
10. Expansion valve - refrigerant control.
11. Condenser louver actuator - opens condenser discharge louvers.
12. Equalizing solenoid valve - equalizes internal pressure.
13. Pressure regulator valve - controlling valve during by-pass mode.



1-11. IDENTIFICATION. The air conditioner has one identification plate located on the front panel. It provides the air conditioner nomenclature, national stock number, part number, contract number, serial number and weight.

U.S. Army Troop Support and Aviation Material Readiness Command		
Air Conditioner; Horizontal Compact 36,000 BTU/Hr., 208 Volt, Three Phase 50/60 Hertz		
NSN — 4120-01-122-0628		
PART NO. — 13216E6310		
MFD. BY — Unifab Industries, Inc.		
CONTRACT NO. — DAAJ09-81-C-1627		
DATE:		
SERIAL NO.	WT.	LB.

1-12. EQUIPMENT DATA.

GENERAL

Description _____	Air Conditioner, Horizontal, Compact
Manufacturer _____	Unifab Industries, Inc.
Model _____	CH40-5/6-08
National Stock Number _____	4120-01-122-0628

DIMENSIONS AND WEIGHT

Length _____	38 1/16 in. (0.96 m)
Width _____	35 3/16 in. (0.88 m)
Height _____	27 1/8 in. (0.68 m)
Weight _____	434 lbs (196.38 kg)
Max power requirement _____	13.5 KW

SPECIFICATIONS

Capacity _____	36,000 BTU/HR
Volts _____	208
Hertz _____	50/60
Phase _____	3

SECTION III. TECHNICAL PRINCIPLES OF OPERATION

CAUTION

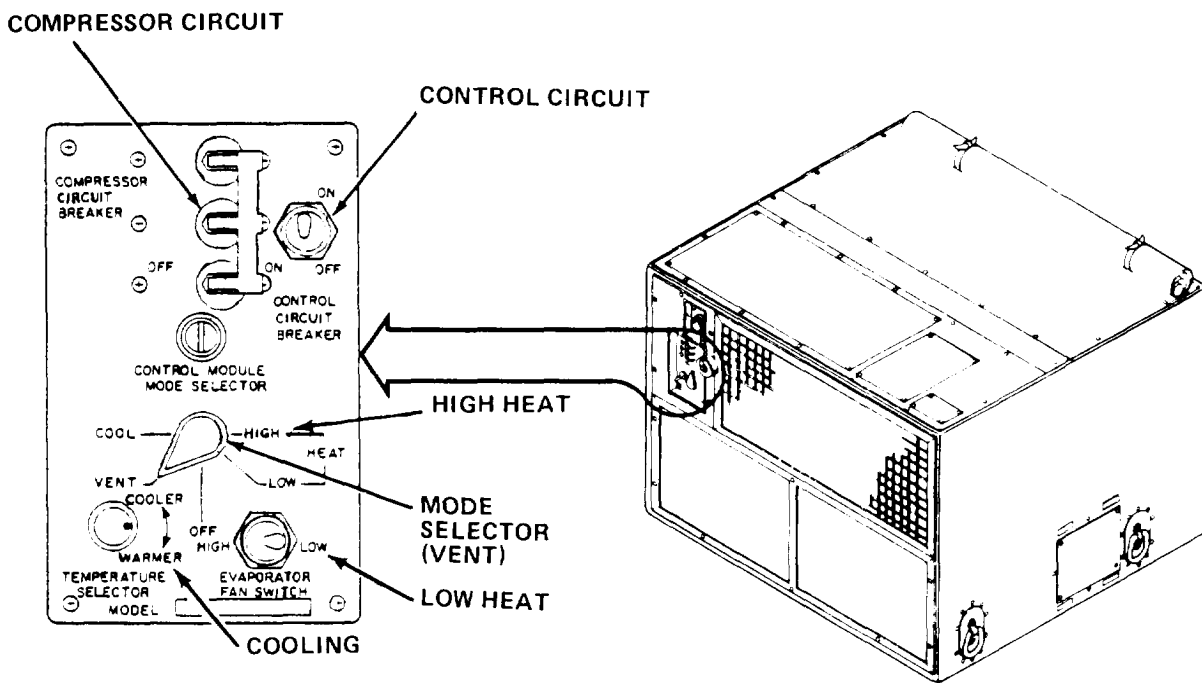
Assure that crankcase heater is on 6 hours prior to operation in a cooling mode.

CAUTION

Before turning on any of the air conditioner's operating controls, make sure that the fabric cover is rolled up and secured, and that evaporator intake and discharge louvers are fully open.

1-13. GENERAL. The air conditioner is a horizontal, compact, electric motor driven unit that provides 36,000 BTU/HR for cooling and 31,200 BTU/HR for heating. Once started, it operates automatically due to the relationship of the components, controls and instruments.

1-14. VENTILATION. Ventilation is provided in the VENT position by energizing the fan motor which forces air out of the evaporator discharge louver. The amount of out door air used for ventilation is determined by the position of the fresh air damper.



1-15. COOLING. With the mode selector in the COOL position the fan motors and the compressor are energized. All of the fan motors and the compressor run continuously. The temperature selector controls the amount of cooling.

1-16. LOW HEAT. With the mode selector in the LOW HEAT position the fan motor and heaters are energized. The evaporator fan motor runs continuously. The temperature selector controls the amount of heat. Place evaporator fan switch in the HIGH or LOW position as required.

1-17. HIGH HEAT. With the mode selector in the HIGH HEAT position, the fan motor and heaters are energized. The evaporator fan motor runs continuously. The temperature selector controls the amount of heat.

CHAPTER 2

OPERATING INSTRUCTIONS

INTRODUCTION. This chapter contains a functional description of the major components of the air conditioner. It explains how to operate the air conditioner.

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

2-1. OPERATOR'S CONTROLS. This section describes, locates and illustrates the various controls and provides the operator sufficient information to ensure proper operation of this air conditioner. The location and function of controls and instruments are illustrated as shown on the Control Module. Other information and illustrations are provided to ensure proper operation of the air conditioners.

a. Control Circuit Breaker. The control circuit breaker is a safety device which provides overcurrent protection for the control circuit of the unit. The control circuit breaker is not a control switch to be used for operating the unit. This breaker should always be maintained in the ON position. If the breaker trips to the OFF position, an electrical defect in the control circuit is indicated and corrective action should be taken. Manually resetting the circuit breaker to ON restores electrical continuity.

b. Compressor Circuit Breaker. The compressor circuit breaker is a safety device which provides overcurrent protection for the compressor. The compressor circuit breaker is not a control switch to be used for operating the unit. This breaker should always be kept in the ON position. If the breaker trips to the OFF position, a defective compressor or related defective electrical components, or faulty wiring, is indicated. Inadequate input power voltage will also cause the circuit breaker to trip. The unit control circuit is also connected to auxiliary contacts on the compressor circuit breaker. When this circuit breaker trips to OFF, it disconnects the control circuit allowing the time delay relay to reset and the refrigerant system pressures to equalize. Manually resetting the compressor circuit breaker to ON restores electrical continuity.

c. Temperature Selector Switch. The temperature selector switch is a thermostatic switch which responds to temperature variations from 60°F in the maximum cooler position to 90°F (15.6°C to 32.2°C) in maximum warmer position. The best preliminary adjustment of the temperature selector is midway between the cooler and warmer positions, corresponding to approximately 75°F (24°C). A ten minute period should be allowed between adjustments of the temperature selector for the full effect of the adjustment to be realized. Once the desired temperature of the air conditioner space is obtained, no further adjustment is required for either cooling or heating modes of operation.

d. Mode Selector Switch. The mode selector switch is an electrical switch that can be manually positioned to select the desired operational mode of the air conditioner. The five positions of the mode selector are:

(1) Off. The off mode position is used to stop operation. All major electrical components are isolate from electrical power except the compressor crankcase heater, which is thermostatically controlled as long as input power is connected to the unit.

(2) Vent. In the vent mode position, the evaporator motor operates and the fans circulate filtered air. Ventilation air will be drawn into the unit through the fresh air filter and vent duct if the damper door in the vent duct is open. Some cooling effect will occur if the ventilation air is cold. Ventilation air flow is controlled by opening and closing the damper door with the vent adjusting knob.

(3) Cool. In the cool mode position, the refrigerant cycle begins, and the unit will cool. Ventilation air will be drawn into the unit if the vent damper door is open.

(4) Low Heat. In the low heat mode, the evaporator fan motor operates continuously and three of the six heater elements are activated. The three heater elements cycle on and off under thermostatic control of the temperature selector switch. This mode will produce half of the unit's heating capability. Ventilation air will be drawn into the unit if the vent damper door is open.

(5) High Heat. In the high heat mode, the evaporator fan motor operates continuously and all six of the heater elements are activated, but only three of the heater elements will cycle on and off under thermostatic control of the temperature selector switch. This mode will produce maximum heating capability of the unit. Ventilation air will be drawn into the unit if the vent damper door is open.

e. Evaporator Fan Speed Switch. The evaporator fan speed switch has two positions, "low" and "high". The positions are manually selected to control the evaporator fan speed in all operating modes. Normally the "low" speed should be selected as it is quieter and requires less electrical power; however, the "high" speed position has three advantages over "low" which may dictate its selection:

(1) Maximum cooling capacity can only be achieved in "high".

(2) The increased flow of evaporator air improves air distribution in the conditioned space.

(3) Twice as much ventilation air is drawn into the unit in "high".

f. Ventilation Knob. The ventilation knob controls the flow of ventilation air into the unit. The knob is connected by the damper cable to a damper located in the vent duct. The knob controls the flow of ventilation air by adjusting the position of the damper from full closed to full open. Turning the knob to the right closes the damper, turning the knob to the left opens the damper. When ventilation air enters the air conditioned space a like flow of air must exhaust from the space to prevent a pressure buildup. Cracks in the space may be sufficient; but if a large flow of ventilation air is desired, some positive means of air exhaust should be provided.

g. Return Air Louver. The return air louver is finger-adjustable from full open to full closed. Normally the louver shutter tab adjustment is kept at 45 position, which is essentially the same as a full open return air louver. If the return air louver is closed, return air will still

manage to flow through it; but at a reduced rate with high pressure drop. The increase in pressure drop will cause additional ventilation air to be drawn into the unit.

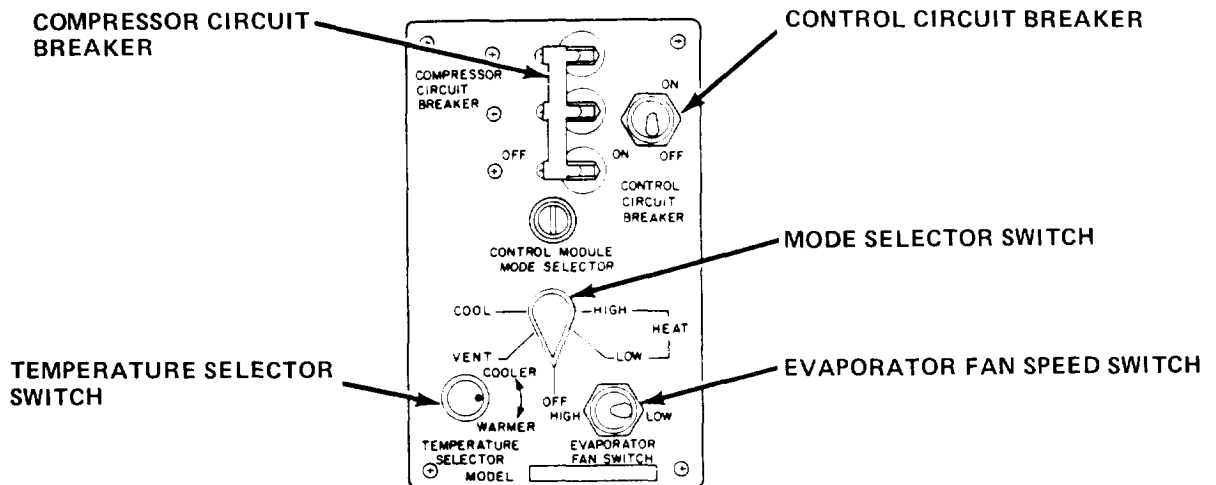
h. Outlet Air Louver. The outlet air louver is finger-adjustable in both horizontal and vertical planes. This adjustment on an individual blade basis allows maximum control over the direction of outlet air. The best distribution pattern for outlet air is left to the operator's judgment; but blades should not be adjusted beyond 45°, as evaporator air flow will be impeded.

i. Input Power Receptacle J1. This is the main power input receptacle for a suitable electrical power cable.

j. Auxiliary Receptacle J12. This is an extra receptacle for optional use of electrical power cable.

k. Sight Indicator. This a view glass showing condition of FREON.

l. Fabric Cover. This covers the condenser and should always be rolled and tied before operation.



WARNING

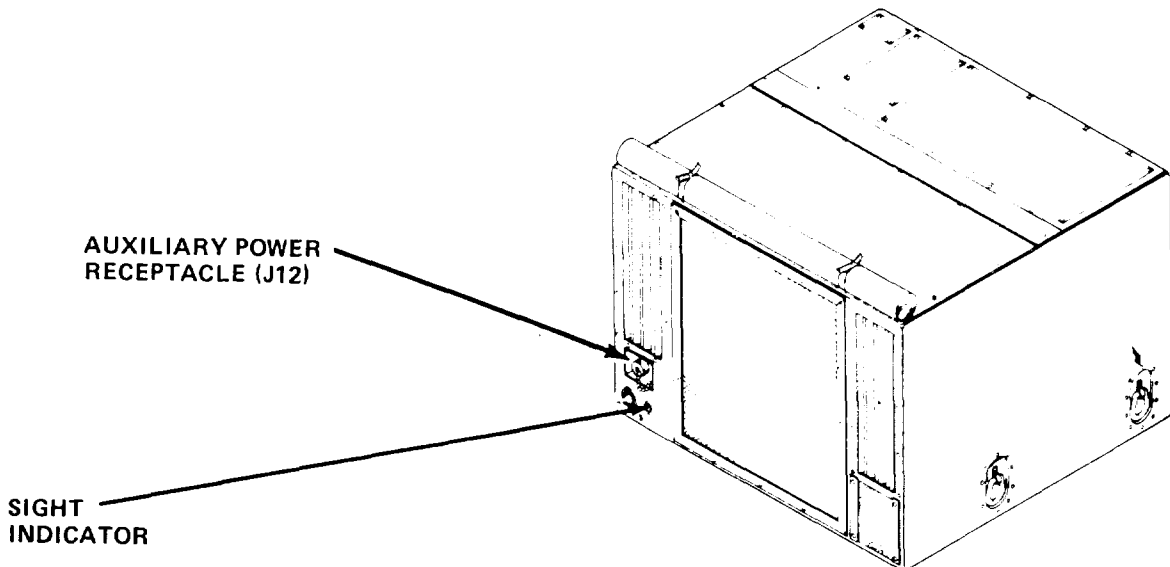
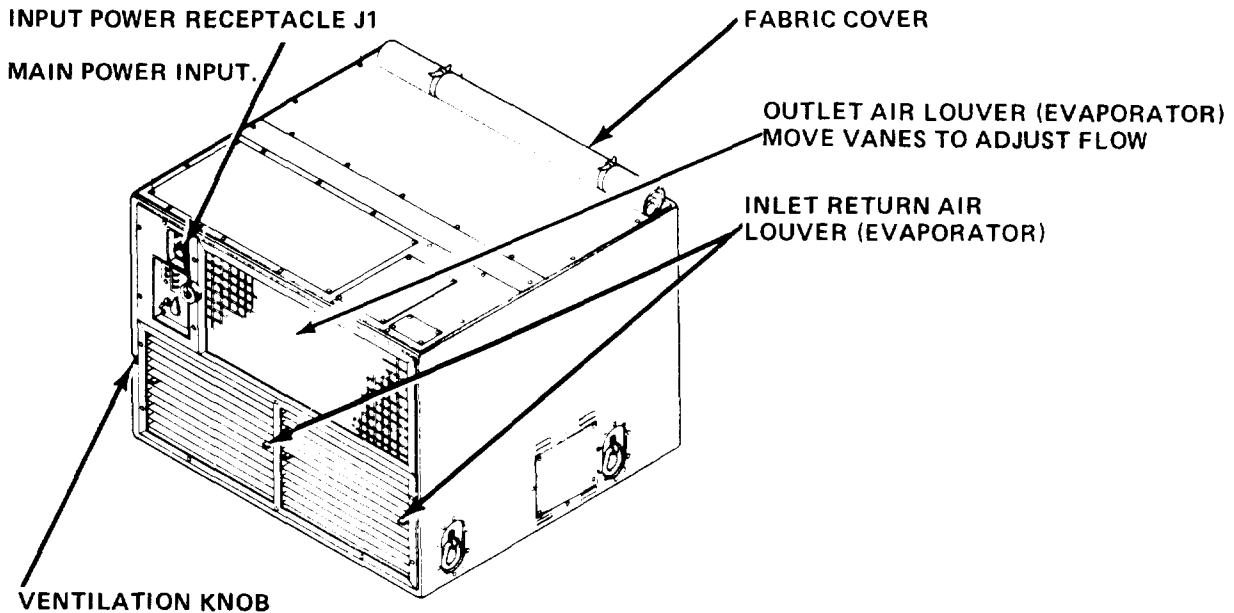
Do not wire connectors J1 and J12 for use at the same time, or apply power source to connectors J1 and J12 at the same time. You could have an unknown HOT connector, radio interference, or you could place two separate power supplies in opposition to each other.

CAUTION

Before turning on any of the air conditioning controls, make sure that the fabric cover is rolled up and secured, and that evaporator intake and discharge louvers are fully opened.

CAUTION

Assure that crankcase heater is on 6 hours prior to operation in a cooling mode.



SECTION II. PREVENTIVE MAINTENANCE CHECKS AND SERVICESCAUTION

While the air conditioner is running, if any defect develops that you think will damage the air conditioner, stop it at once.

2-2. GENERAL. Preventive Maintenance Checks and Services (PMCS) are essential to the efficient operation of the air conditioner and to prevent possible damage that might occur through neglect or failure to observe warning symptoms in a timely manner. Checks and services performed by operators are limited to those functions which are described in Table 2-1.

a. Before you operate: Always keep in mind the WARNINGS located on the inside front cover. Perform your interval (B) before PMCS.

b. While you operate: Always keep in mind the WARNINGS located on the inside front cover. Perform your interval (D) during PMCS.

c. After you operate: Be sure to perform your interval (A) after PMCS.

d. If Your Equipment Fails to Operate: Troubleshoot with proper equipment. Record any defects on DA Form 2404 (Equipment Inspection and Maintenance Work Sheet) (See DA PAM 738-750 for instructions).

2-3. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS). This paragraph contains a tabulated listing of preventive maintenance services which must be performed by the operator. The item numbers are listed in the order to be performed.

NOTE

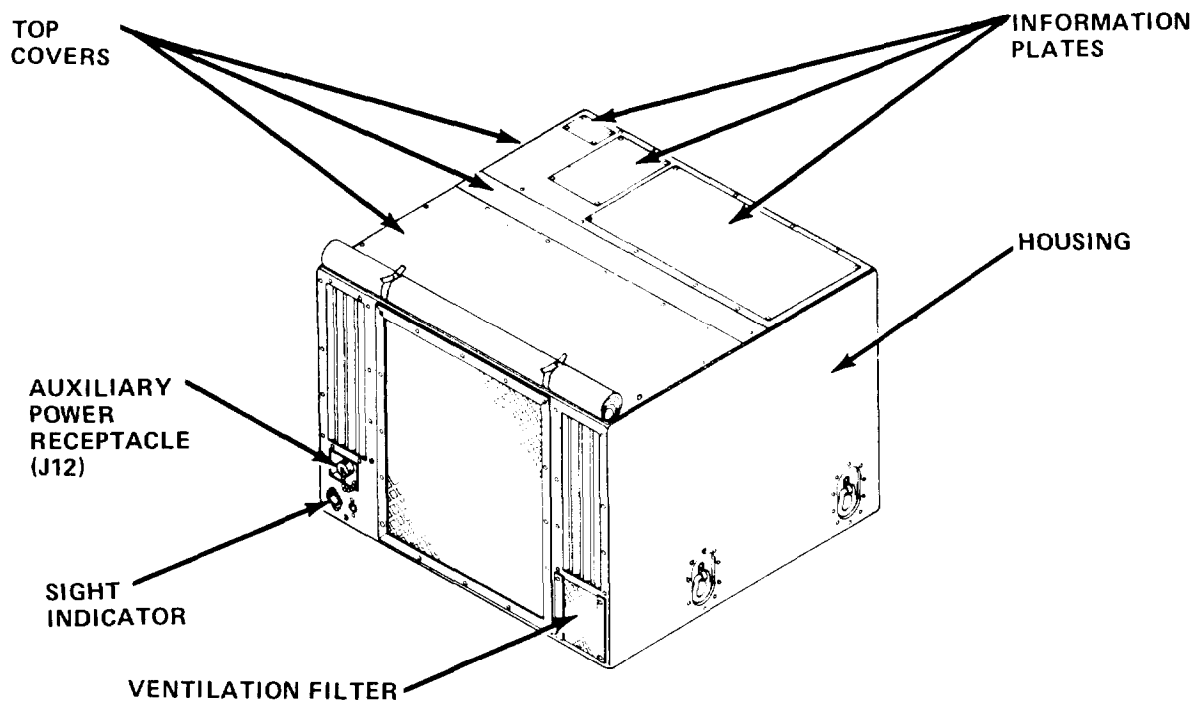
If the equipment must be kept in continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

2-4. DAILY PREVENTIVE MAINTENANCE SERVICES. This paragraph contains a tabulated listing of preventive maintenance services which must be performed by the operator. The item numbers are listed consecutively and indicate the sequence of minimum requirements. Refer to table 2-1 for the daily preventive maintenance services.

Table 2-1. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (Cont)

B-Before Operation D-During Operation A-After Operation

ITEM NO.	INTERVAL			ITEM TO BE INSPECTED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A			
6	●			Housing	Check for damage.	
7	●			Covers	Check for damage.	
8	●		●	Ventilation filter	Check for dirt and obstruction.	[f dirty or obstructed notify Organizational Maintenance.
9				Sight indicator	Check to see that sight indicator is clear of bubbles and center dot green.	If sight indicator has bubbles or yellow color notify Direct Support Maintenance.
10		●		Noise or vibration	Listen for any unusual noise or vibration.	If excessive noise or vibration exists notify Organizational Maintenance.
11	●			Auxiliary power receptacle (J-12)	Check for any loose connections or mounting.	



SECTION III. OPERATION UNDER USUAL CONDITIONS

2-5. ASSEMBLY AND PREPARATION FOR USE. This air conditioner comes fully assembled, ready to be installed.

WARNING

Be careful when working with high voltage. Failure to comply can result in serious injury or death.

2-6. INITIAL ADJUSTMENTS.

- a. Install in location.
- b. Connect power.
- c. Perform Preventive Maintenance Checks and Services, Table 2-1.

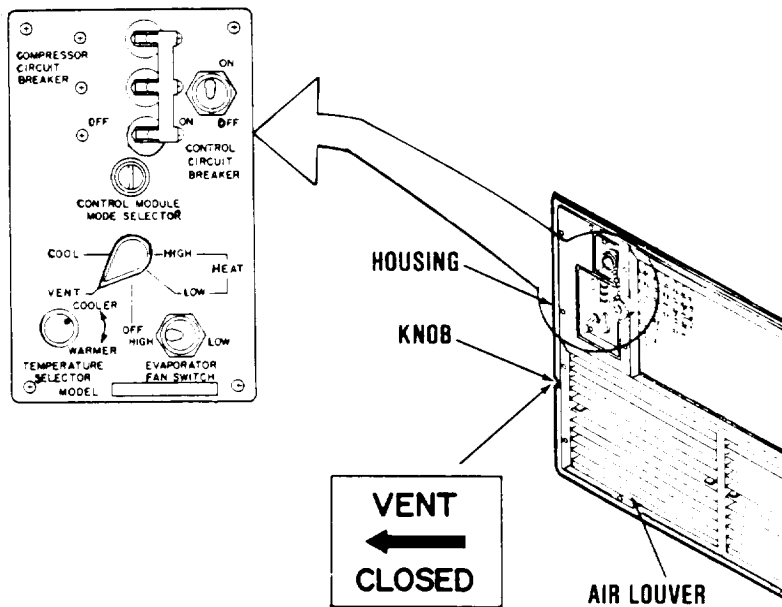
2-7. STARTING AND OPERATING PROCEDURE. This section gives instructions on starting and stopping the air conditioner, and detailed operating instructions. Since nearly every condition presents a different problem, the operator may have to vary the given procedure to fit the condition.

CAUTION

Before turning on any of the air conditioner's operating controls, make sure that the fabric cover is rolled up and secured, and that evaporator intake and discharge louvers are fully open.

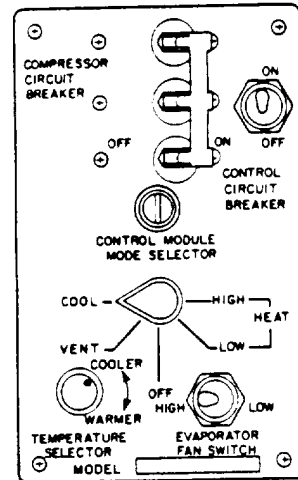
a. Ventilation Mode

- (1) Turn control circuit breaker ON.
- (2) Turn mode selector switch to VENT position.
- (3) Adjust fresh air inlet vent control to admit fresh air as required.



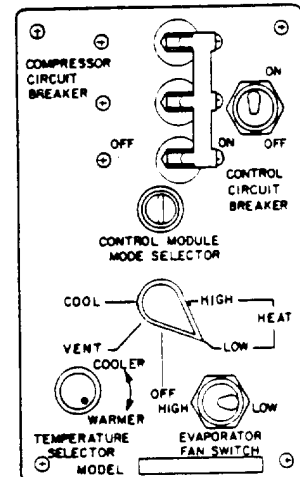
b. Cooling Mode

- (1) Turn control circuit breaker ON.
- (2) Set temperature selector for required temperature.
- (3) Set evaporator fan speed to HIGH or LOW as required.
- (4) Turn compressor circuit breaker ON.
- (5) Turn mode selector switch to COOL.



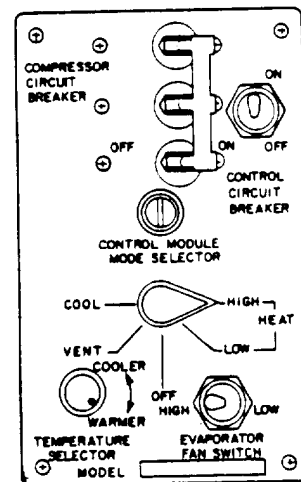
c. Low Heat Mode

- (1) Turn control circuit breaker ON.
- (2) Set temperature selector for required temperature.
- (3) Set evaporator fan speed to HIGH or LOW as required.
- (4) Turn compressor circuit breaker ON.
- (5) Turn mode selector switch to LOW HEAT.



d. High Heat Mode

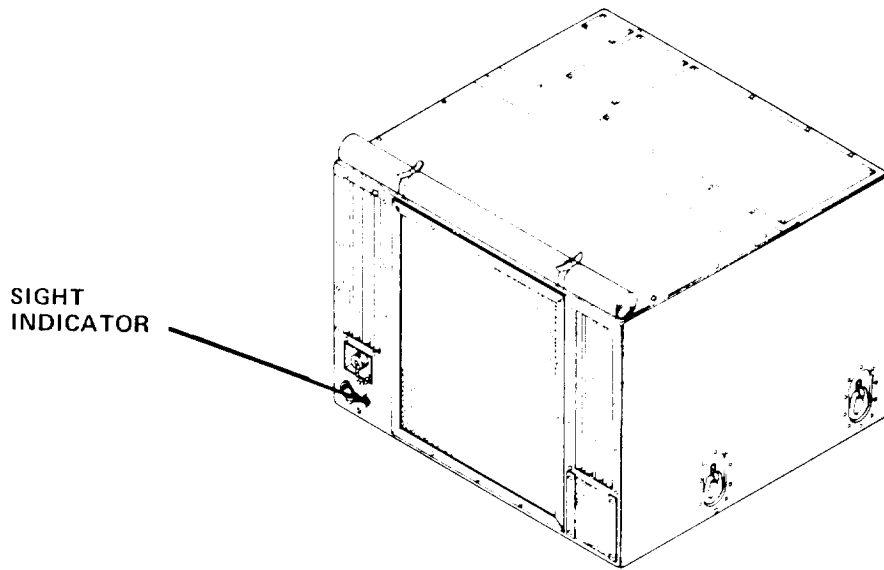
- (1) Turn control circuit breaker ON.
- (2) Set temperature selector for required temperature.
- (3) Set evaporator fan speed to HIGH or LOW as required.
- (4) Turn compressor circuit breaker ON.
- (5) Turn mode selector switch to HIGH HEAT.



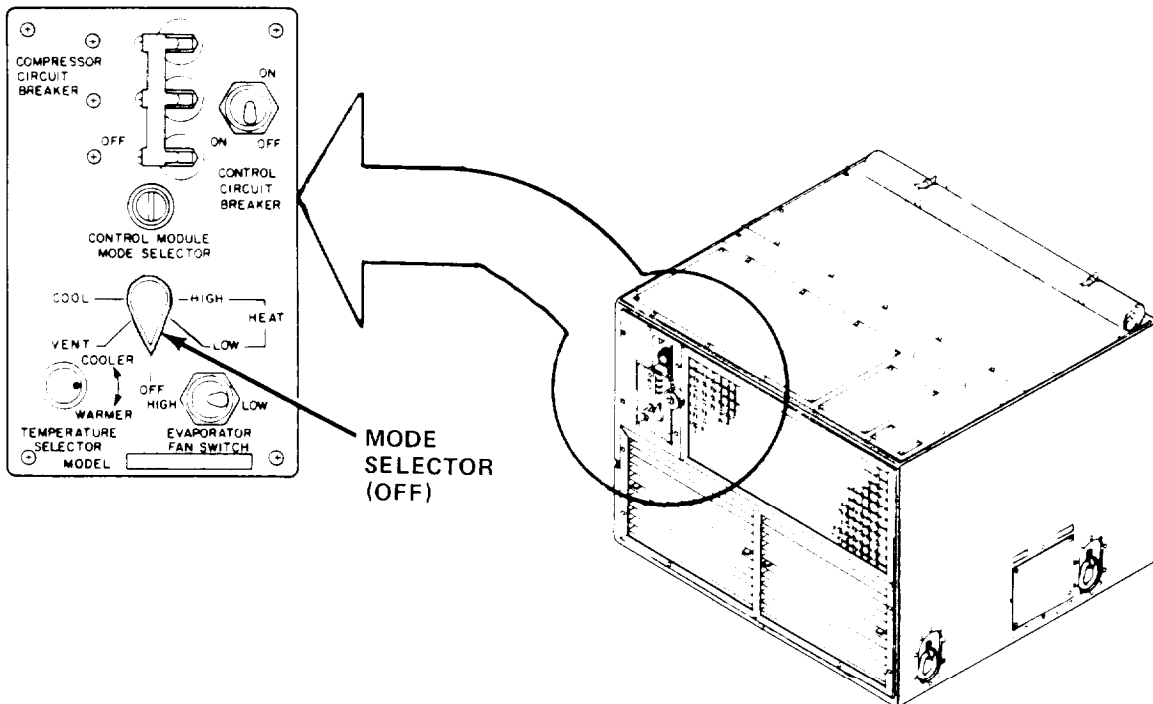
e. Sight Indicator. Allow 15 minutes operation to ensure unit has stabilized, then check sight indicator for bubbles. If sight indicator has bubbles or is yellow, see Troubleshooting Procedures in Chapter 3.

CAUTION

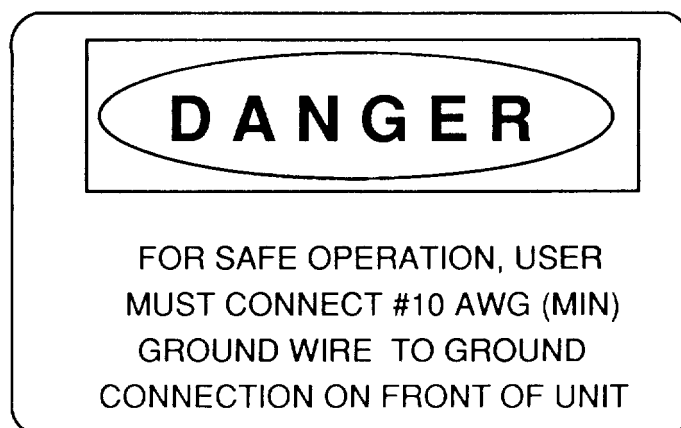
Check sight indicator for green color indicating unit is free of moisture. A change in color indicates unit needs servicing.



f. Shutdown. Turn mode selector switch to OFF position.



2-8. OPERATIONAL INSTRUCTION WARNING PLATE.

SECTION IV. OPERATION UNDER UNUSUAL CONDITIONS.

2-9. OPERATION IN EXTREME COLD.

CAUTION

Do not disturb wiring unless absolutely necessary. Cold temperature makes wires and insulation very brittle and easily broken.

- a. Keep entire unit free of snow and ice.
- b. Cover unit when not in use.

2-10. OPERATION IN EXTREME HEAT.

NOTE

Unit Preventive Maintenance Checks and Services (PMCS) should be performed at daily intervals.

a. General. The air conditioner is designed to operate in temperatures up to 120°F (49°C). Extra care should be taken to minimize the cooling load when operating in extreme high temperatures.

b. Protection.

(1) Check all openings in the enclosure, especially doors and windows, to be sure they are tightly closed. Limit in and out traffic if possible.

(2) When appropriate, use shades or awnings to shut out direct rays of the sun.

(3) When possible, limit the use of electric lights and other heat producing equipment.

(4) Limit the amount of hot, outside air introduced through the fresh air damper to that essential for ventilation.

NOTE

Weatherstripping, the installation of storm doors, and windows, if appropriate, and insulation of surfaces exposed to the outside is recommended when operating in extremely high temperatures for extended periods.

c. Cleaning.

(1) Clean outside grilles, coils, filters, and mist eliminator more frequently.

2-11. OPERATION IN DUSTY OR SANDY CONDITIONS.

NOTE

Unit Preventive Maintenance Checks and Services (PMCS) should be performed at daily intervals.

a. General. Dusty and sandy conditions can seriously reduce the efficiency of the air conditioner by clogging the air filter, mist eliminator, and coils. This will cause a restriction in the volume of airflow. Accumulation of dust or sand in the condenser coil and/or in the compressor compartment may cause overheating of the refrigeration system. Dust or sand may also clog the condensate trap and water drain lines.

CAUTION

Never operate the air conditioner without having the air filters in place.

b. Protection.

- (1) Shield the air conditioner from dust as much as possible.
- (2) Take advantage of any natural barriers which offer protection.
- (3) Limit the amount of dusty or sandy outside air introduced through the fresh air damper.
- (4) Roll down and secure the fabric cover on the back of the cabinet during periods of shutdown.

c. Cleaning.

- (1) Keep the air conditioner as clean as possible.
- (2) Pay particular attention to the outside grilles, condenser, filters, mist eliminator, louvers, and electrical components.
- (3) In extreme conditions, daily cleaning of condenser, filters, and outside grilles may be necessary.

2-12. OPERATION UNDER RAINY OR HUMID CONDITIONS.

CAUTION

Make sure power is disconnected from air conditioner before touching any wiring or other electrical parts.

- a. Keep unit clean and dry.
- b. Cover unit when not in use.
- c. Remove cover during dry periods and allow unit to dry.

2-13. OPERATION IN SALT WATER AREAS.

CAUTION

Disconnect power source before washing air conditioner.

- a. Rinse with clean water and dry as much of unit as possible to prevent corrosion.
- b. Cover unit when not in use.

2-14. OPERATION IN HIGH ALTITUDES.

- a. The operating efficiency of the unit will be reduced at higher altitudes.
- b. The unit is designed to operate in altitude up to 5000 feet.

CHAPTER 3

OPERATOR'S MAINTENANCE INSTRUCTIONS

INTRODUCTION. This chapter contains all the necessary maintenance instruction to keep your air conditioner in good repair.

SECTION I. LUBRICATION INSTRUCTIONS

3-1. LUBRICATION. The unit is fully lubricated by the manufacturer and requires no additional lubrication.

SECTION II. TROUBLESHOOTING PROCEDURES

3-2. TROUBLESHOOTING.

a. Table 3-1 provides information useful in diagnosing and correcting malfunctions which you may find during the operation or maintenance of the unit or its components. Perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

Table 3-1. OPERATOR/CREW TROUBLESHOOTING

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

WARNING

Be careful when working with high voltage. Failure to comply can result in serious injury or death.

1. AIR CONDITIONER FAILS TO OPERATE IN ANY MODE.

Step 1. Check to see if main power cord is plugged in.

Connect power cord to a source supplying 208 VAC, 3 phase, 50/60 Hertz power.

Step 2. Check to see that power supply circuit breaker is in the ON position.

Place circuit breaker in the ON position.

Step 3. Check to see if mode selector (1) is in the VENT position.

Place mode selector in VENT position.

Step 4. Check to see if control circuit breaker (2) is in the ON position.

Place control circuit breaker in the ON position.

Step 5. Check to see if compressor circuit breaker (3) is in ON position.

Place compressor circuit breaker in the ON position.

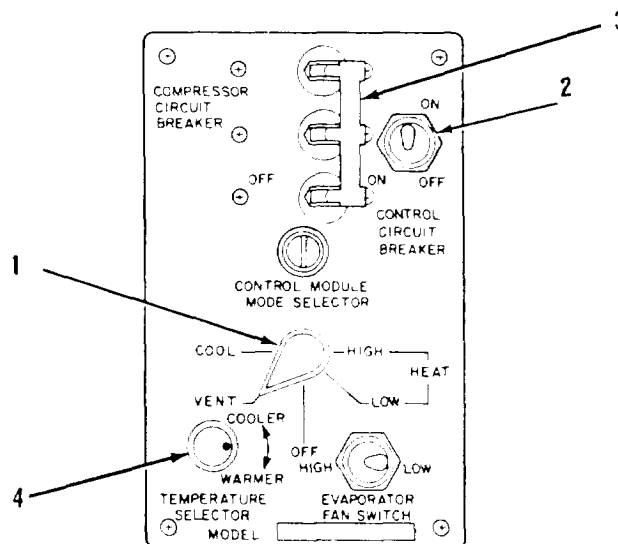


Table 3-1. OPERATOR/CREW TROUBLESHOOTING (Cont)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

2. INSUFFICIENT COOLING.

Step 1. Check to see if mode selector (1) is in COOL position.

Place mode selector in COOL position.

Step 2. Check to see if control circuit breaker (2) is in the ON position.

Place control circuit breaker in the ON position.

Step 3. Check to see if compressor circuit breaker (3) is in the ON position.

Place compressor circuit breaker in the ON position.

Step 4. Check to see if the temperature selector (4) is in the COOLER position.

Place temperature selector in COOLER position.

Step 5. Check to see air filter (5) is not obstructed.

Notify Organizational Maintenance.

Step 6. Inspect sight indicator (6) for bubbles or yellow color.

Notify Direct Support Maintenance.

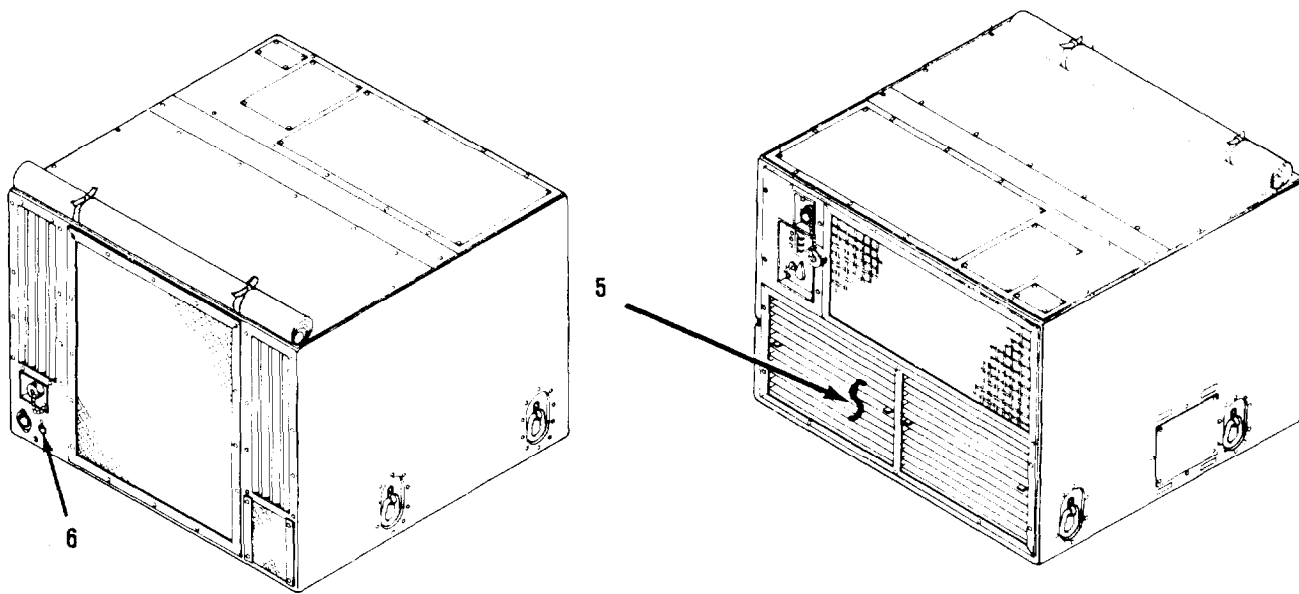


Table 3-1. OPERATOR/CREW TROUBLESHOOTING (Cont)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

3. INSUFFICIENT HEATING. (LOW HEAT)

Step 1. Check to see if mode selector (1) is in LOW HEAT position.

Place mode selector in LOW HEAT position.

Step 2. Check to see if control circuit breaker (2) is in the ON position.

Place control circuit breaker in the ON position.

Step 3. Check to see if compressor circuit breaker (3) is in the ON position.

Place compressor circuit breaker in the ON position.

Step 4. Check to see if temperature selector (4) is in the WARMER position.

Place temperature selector in the WARMER position.

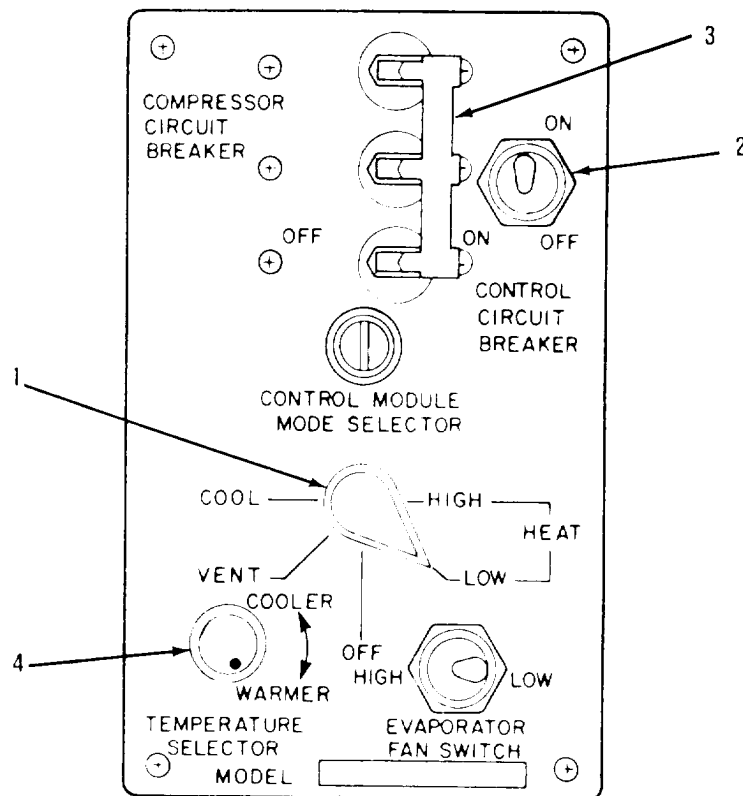


Table 3-1. OPERATOR/CREW TROUBLESHOOTING (Cont)

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

4. INSUFFICIENT HEATING (HIGH HEAT).

Step 1. Check to see if mode selector (1) is in HIGH HEAT position.

Place mode selector in HIGH HEAT position.

Step 2. Check to see if control circuit breaker (2) is in the ON position.

Place control circuit breaker in the ON position.

Step 3. Check to see if compressor circuit breaker (3) is in the ON position.

Place the compressor circuit breaker in the ON position.

Step 4. Check to see if temperature selector (4) is in the WARMER position.

Place temperature selector in the WARMER position.

SECTION III. OPERATOR MAINTENANCE PROCEDURES

3-3. MAINTENANCE PROCEDURES.

a. This section contains maintenance procedures for the operator of the air conditioner. Operator maintenance is limited to inspection, service and adjustment procedures that can be accomplished without the aid of servicing tools. Any indications of need for servicing resulting from inspection are to be reported to organizational or direct support maintenance.

b. The normal standard equipment condition to start a maintenance task is: air conditioner stopped and control switch OFF.

3-4. TOP COVERS AND FRONT LOUVERS/Inspection, Service, Adjustment

This task covers:

- a. Inspection
 - b. Service
 - c. Adjustment
-

INITIAL SETUP

Disconnect Power

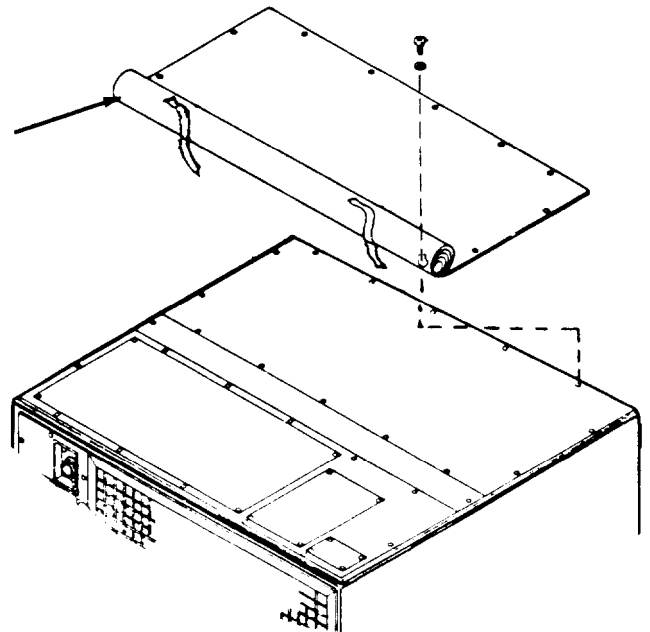
Use a cloth dampened with dry cleaning solvent (Table D-1, Item 3)

LOCATION/ITEM

FABRIC COVER

Inspect:

1. Inspect Fabric Cover (1) for damage.
2. If damaged notify Organizational Maintenance.



WARNING

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F (38°C).

Service:

1. Brush off loose dirt or foreign matter from Fabric Cover (1).
2. Wipe cover with a cloth dampened with dry cleaning solvent (Table D-1, Item 3).

3-4. TOP COVERS AND FRONT LOUVERS/Inspection, Service, Adjustment (Cont)

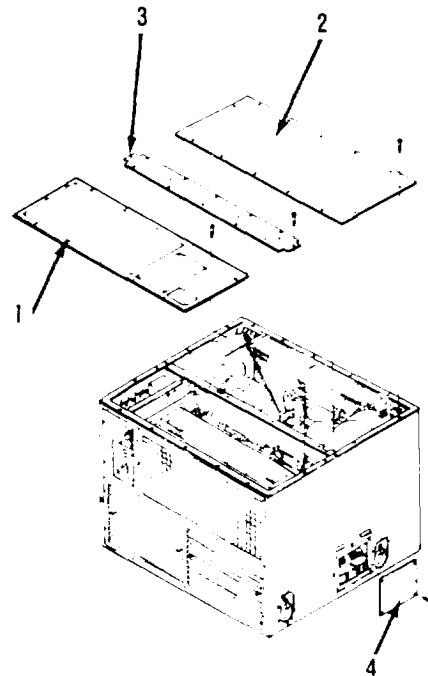
LOCATION/ITEM

METAL COVERS

Inspect:

1. Inspect Front Cover (1) Rear Cover (2) Center Cover (3) and Access Cover (Charging Valve Box) (4) for damage.

2. If damaged notify Organizational Maintenance.



WARNING

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F (38°C).

Service:

1. Brush off loose dirt or foreign matter from Front Cover (1) Rear Cover (2) Center Cover (3) and Access Cover (4).

2. Wipe covers with cloth dampened with dry cleaning solvent (Table D-1, Item 3).

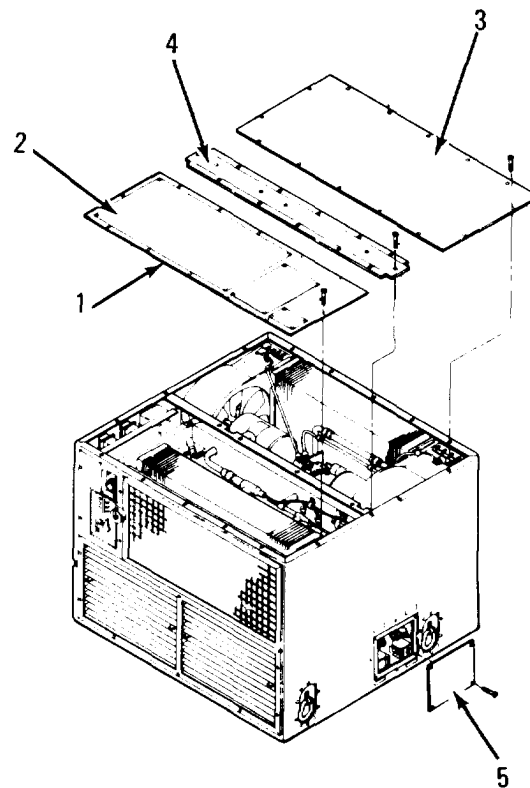
3-4. TOP COVERS AND FRONT LOUVERS/Inspection, Service, Adjustment (Cont)

LOCATION/ITEM

GASKETS, COVER

Inspect:

1. Inspect gaskets (1) on Front Cover (2) Rear Cover (3) Center Cover (4) and Access Cover (5).
2. If damaged notify Organizational Maintenance.



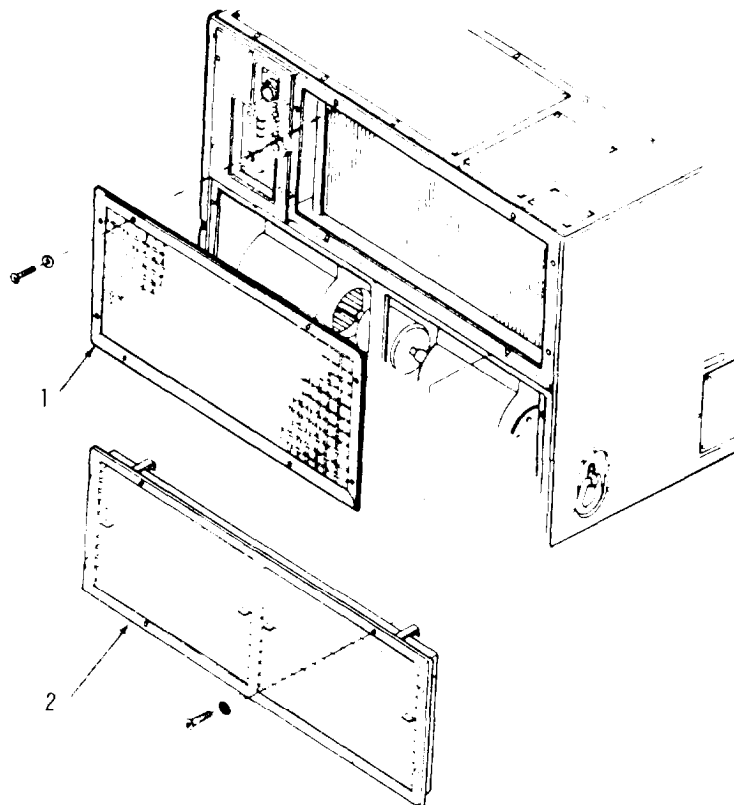
3-4. TOP COVERS AND FRONT LOUVERS/Inspection, service, Adjustment (Cont)

LOCATION/ITEM

LOUVERS, FRONT (GRILLES)

Inspect:

1. Inspect Evaporator Discharge Louver (1) and Evaporator Inlet Louver (2) for damage.
2. If damaged notify Organizational Maintenance.



WARNING

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F (38°C).

Service:

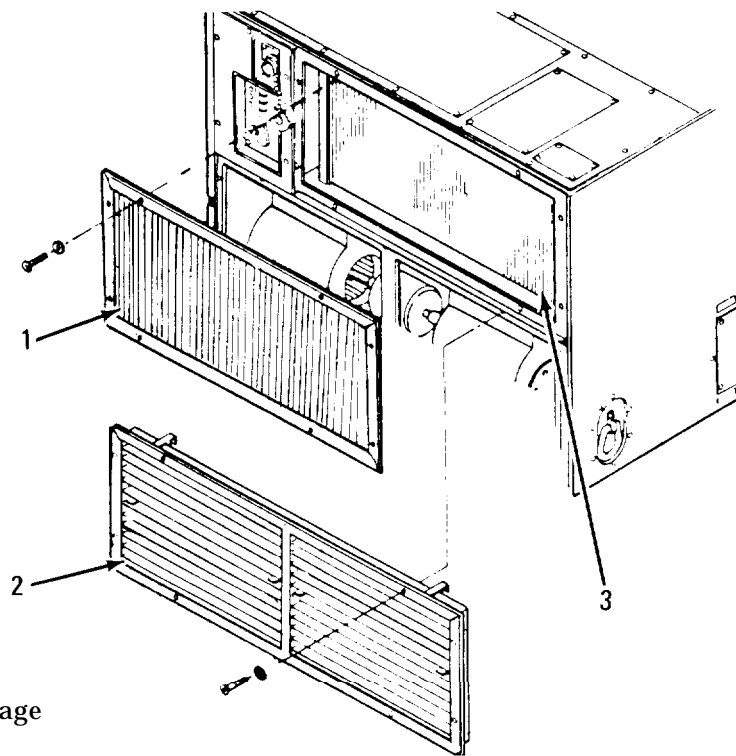
1. Brush off loose dirt or foreign matter from Evaporator Discharge Louver (1) and Evaporator Inlet Louver (2).
2. Wipe louvers with a cloth dampened with dry cleaning solvent (Table D-1, Item 3).

3-4. TOP COVERS AND FRONT LOUVERS/Inspection, Service, Adjustment (Cont)

LOCATION/ITEM

Adjust:

1. Turn Evaporator Discharge Louver (1) blades to direct air.
2. Move Evaporator Inlet Louver (2) tabs by hand up to open and down to close.

Inspect:

1. Inspect Filter (3) for damage in dirt.
2. If damaged or dirty notify Organizational Maintenance.

3-5. CONDENSER GUARD, COVERS, VENTILATION AIR FILTER AND LIFTING RINGS/Inspect, Service

This task covers:

- a. Inspection
 - b. Service
-

INITIAL SETUP

Disconnect Power

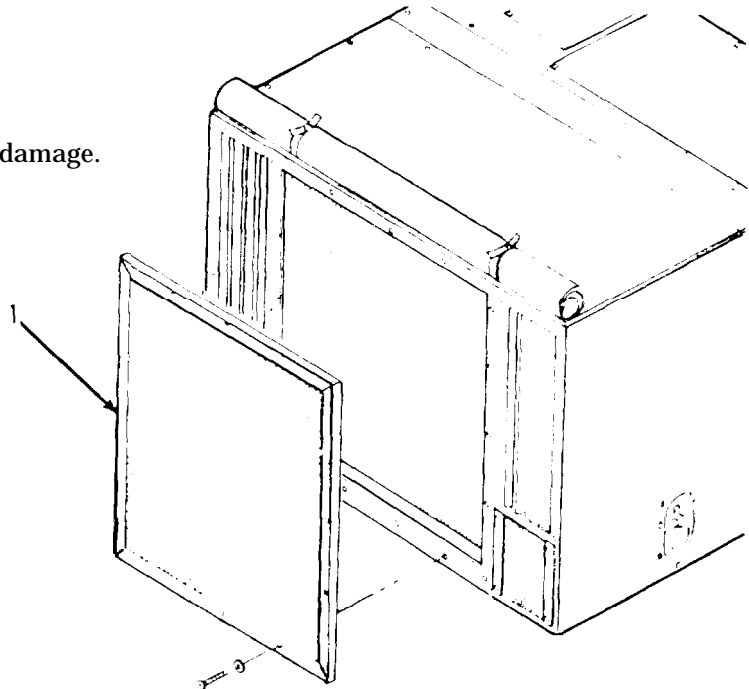
Use a cloth dampened with dry cleaning solvent (Table D-1, Item 3)

LOCATION/ITEM

CONDENSER COIL GUARD

Inspect:

1. Inspect Condenser Coil Guard (1) for damage.
2. If damaged notify Organizational Maintenance.



WARNING

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F (38°C).

3-5. CONDENSER GUARD, COVERS, VENTILATION AIR FILTER AND LIFTING RINGS/Inspect, Service (Cont)

LOCATION/ITEM

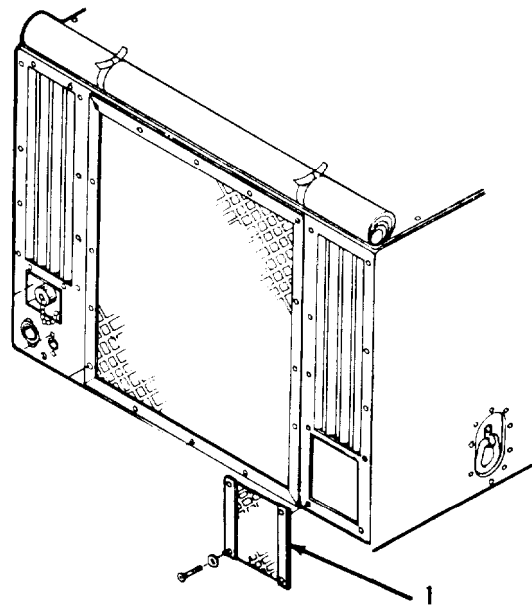
Service:

1. Brush off loose dirt or foreign matter from Condenser Coil Guard (1).
2. Wipe Condenser Guard (1) with a cloth dampened with dry cleaning solvent (Table D-1, Item 3).

VENTILATION GUARD

Inspect:

1. Inspect Ventilation Guard (1) for damage.
2. If damaged notify Organizational Maintenance.



WARNING

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F (38°C).

Service:

1. Brush off loose dirt or foreign matter from Ventilation Guard (1).
2. Wipe guard with cloth dampened with dry cleaning solvent (Table D-1, Item 3).

3-6. PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR, CHARGING VALVES
AND RELATED TUBING/Inspect

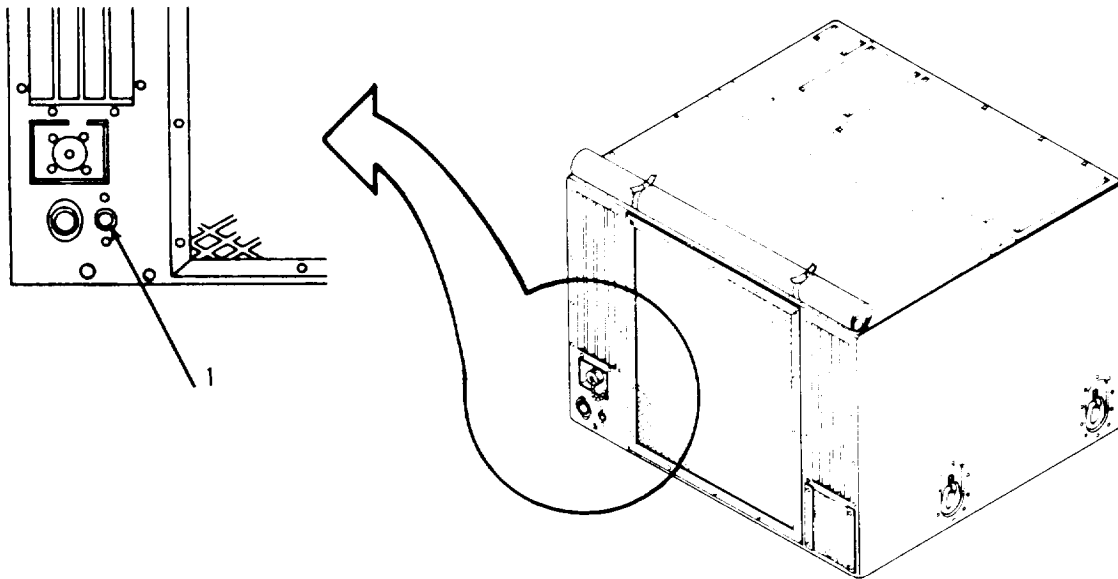
This task covers:
Inspection

LOCATION/ITEM

SIGHT INDICATOR

Inspect:

1. Inspect Sight Indicator (1) for damage.
2. If damaged notify Direct Support Maintenance.
3. Connect Power and Operate Unit. See paragraph 2-6, page 2-8.
4. Inspect Sight Indicator for bubbles or yellow color.
5. If bubbles or yellow color exist notify Direct Support Maintenance.



CHAPTER 4

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

INTRODUCTION. This chapter contains the necessary maintenance instructions to keep your air conditioner in good repair.

SECTION I. REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

4-1. COMMON TOOLS AND EQUIPMENT. For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

4-2. SPECIAL TOOLS, TM DE, AND SUPPORT EQUIPMENT. There are no special tools, TMDE, or support equipment required for this air conditioner.

4-3. REPAIR PARTS. Repair parts are listed and illustrated in Repair Parts and Special Tools List, TM5-4120-376-24P Covering Organizational Maintenance for this equipment.

SECTION II. SERVICE UPON RECEIPT

4-4. UNLOADING THE EQUIPMENT. When unloading the air conditioner, support the unit weight by the base platform.

4-5. UNPACKING THE EQUIPMENT.

CAUTION

So that the unit is protected, it should be left crated until moved to the location where it is to be installed.

a. General. To uncrate the unit, remove the bands from the top panel and lift off the top. Remove sides in a similar manner. The unit is then ready for inspection. Remove bolt from bottom of unit securing wood skid to air conditioner.

b. Depreservation. Prepare the air conditioner for inspection and operation as outlined on DA Form 2258 (Depreservation Guide for Vehicles and Equipment).

4-6. INSPECTING AND SERVICING EQUIPMENT.

CAUTION

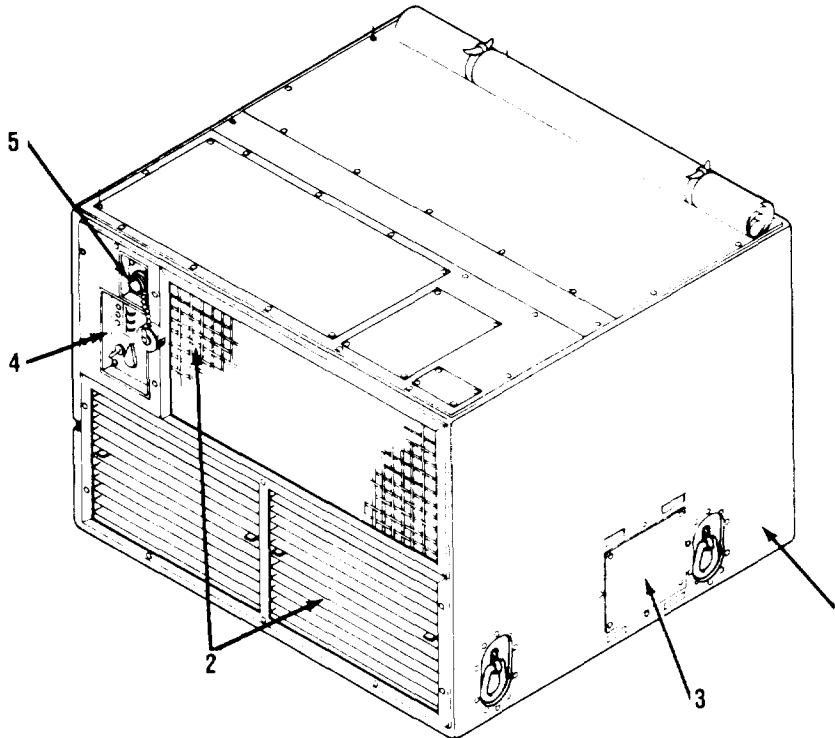
Do not remove tags from equipment until the instructions have been followed. Failure to follow these instructions can result in serious damage to the equipment.

a. Inspect the entire air conditioning unit, including motors, fans, controls etc., to be certain that all parts have been received and without damage. Report any deficiencies to the proper maintenance level.

b. Check for visible or audible leaks. If leaks exist notify Direct Support Maintenance.

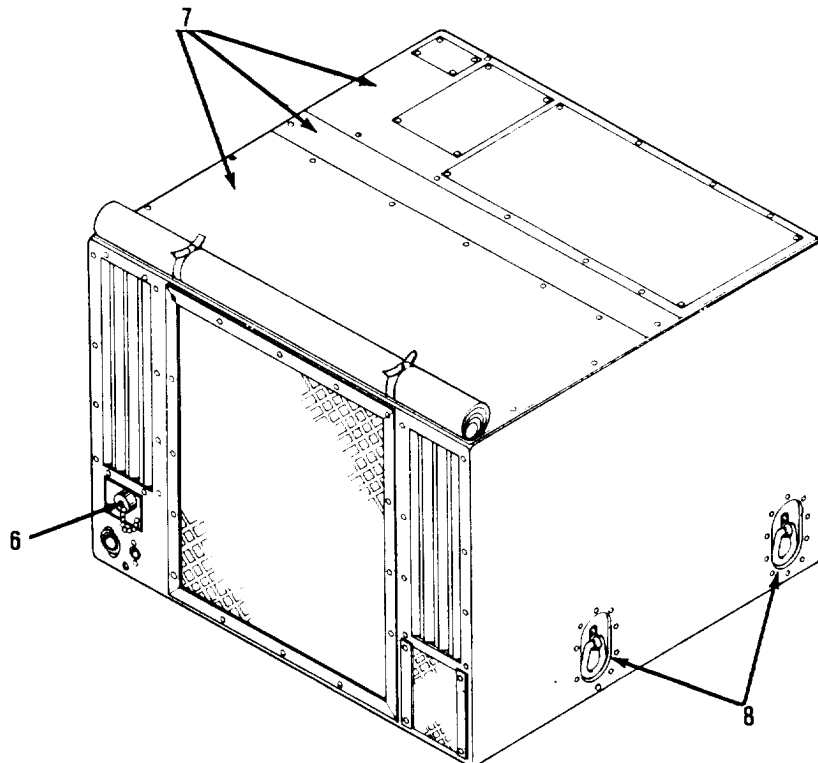
4-7. SERVICE UPON RECEIPT CHECKLIST.

LOCATION	ITEM	ACTION
1. Exterior	Housing (1) and Louvers (2)	a. Inspect for signs of rough handling and damage. b. Service or reject any component if damage prevents the air conditioner from working properly.
2. Right Side	Access Cover (3) (charging valve box)	a. Inspect access cover for damage. b. Repair or replace access cover.
3. Front	Control Module Assembly (4)	a. Check for broken or damaged knob. Insure that switches and circuit breakers move freely from position to position. b. Repair any component that is found to be malfunctioning.
4. Front	Input Power Connector (J-1) (5)	a. Inspect input power connector (J-1) for damage. b. Repair or replace input power connector (J-1).



4-7. SERVICE UPON RECEIPT CHECK LIST (Cont).

LOCATION	ITEM	ACTION
5. Rear	Input Power Connector (J-12)(6)	a. Inspect input power connector (J-12) for damage. b. Repair or replace input power connector (J-12).
6. Top	Covers (7)	a. Inspect for signs of rough handling and damage. b. Service or reject any component if damage prevents air conditioner from working properly. c. Clean filter.
7. Sides	Lifting Rings (8)	a. Inspect for signs of rough handling and damage. b. Service or reject any component if damage prevents air conditioner from working properly.



4-8. INSTALLATION INSTRUCTIONS.

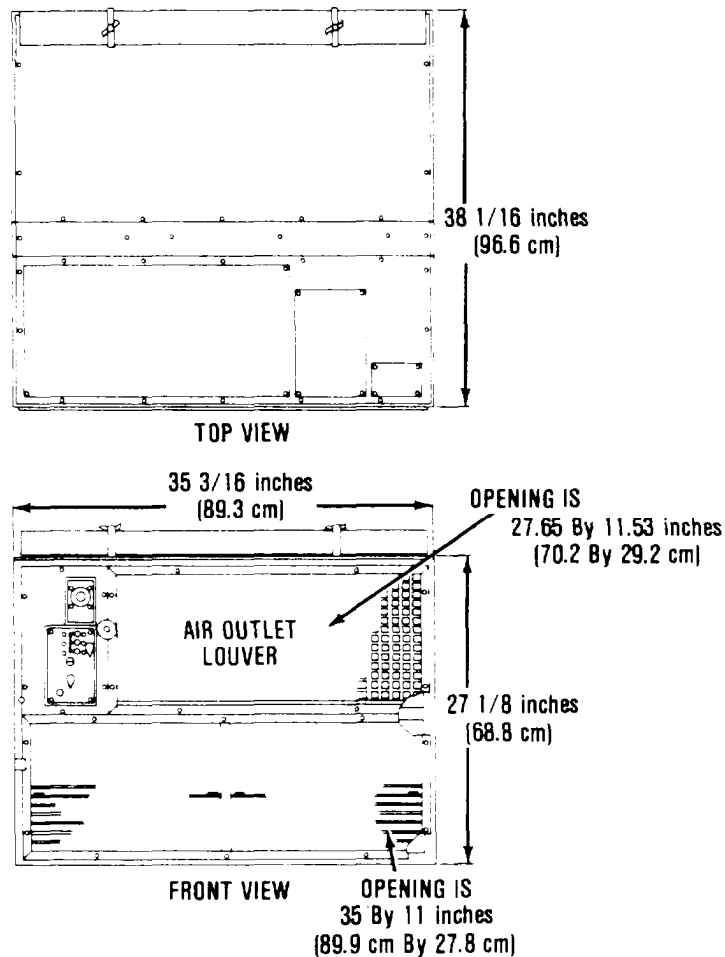
WARNING

Do not wire connectors J-1 and J-12 for use at the same time, or apply power source to connectors J-1 and J-12 at the same time. You could have an unknown HOT connector, radio interference, or you could place two separate power supplies in opposition to each other.

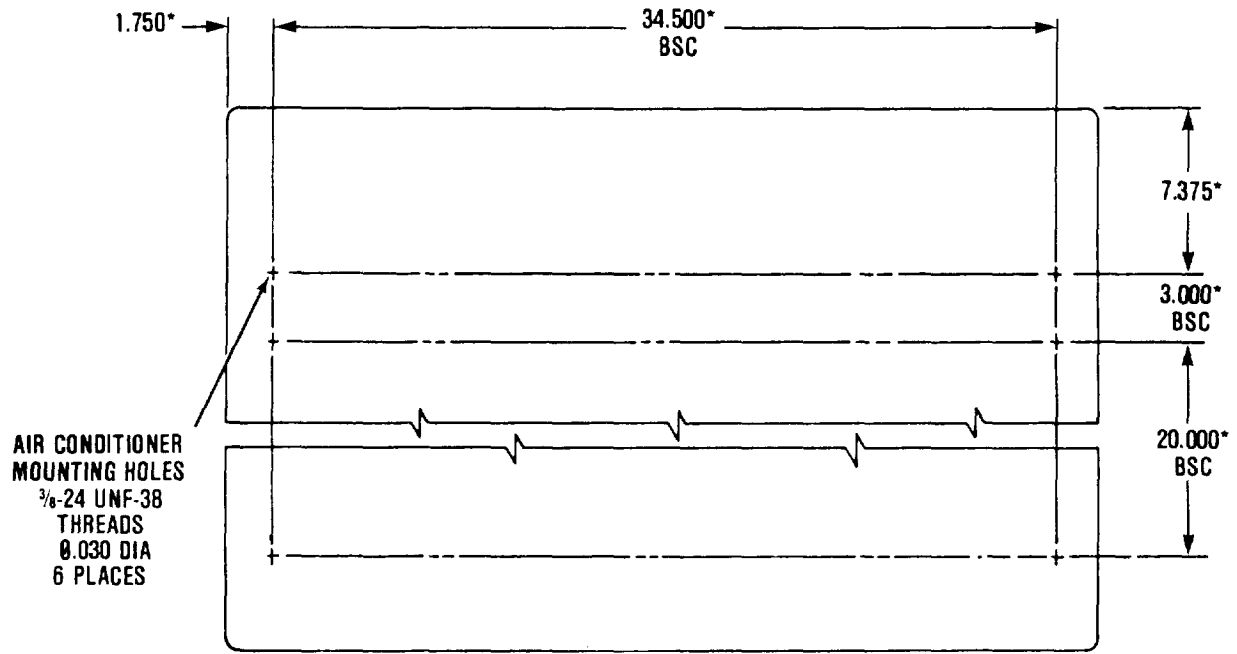
WARNING

The air conditioner must be grounded prior to operation. Connect one end of a number 10 AWG (American Wire Gauge) copper wire ground lead to an underground metallic water piping system or a driven metal ground rod or buried metal plate. Connect the other end of the ground lead to the grounding bolt on the upper left front corner of the unit.

- a. The unit may be supported by, or suspended from, any convenient part of the van or trailer capable of withstanding a concentrated load of approximately 435 pounds (197 kg.).
- b. If the unit is to be mounted near a wall or partition, allow clearance to permit maintenance.

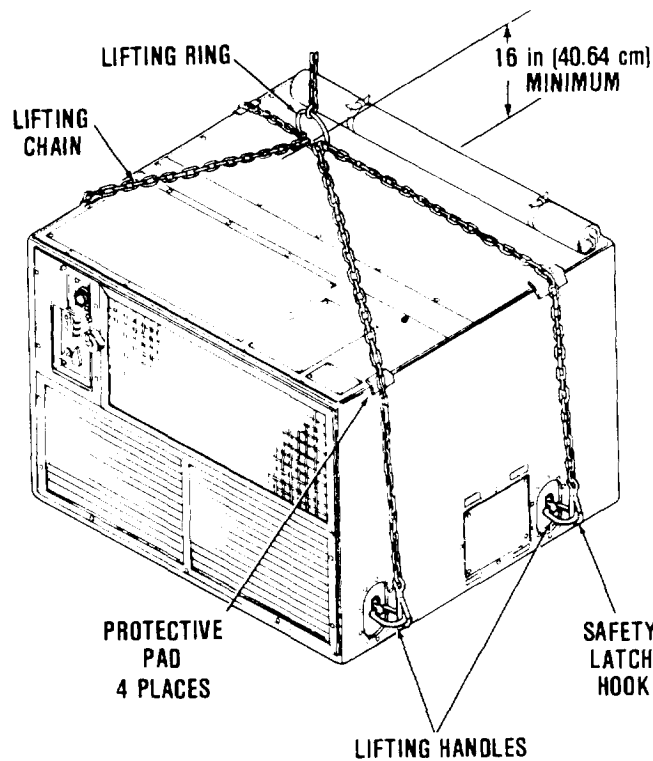


c. Use the base plan below for dimensions in selecting a suitable location or in constructing an installation base.

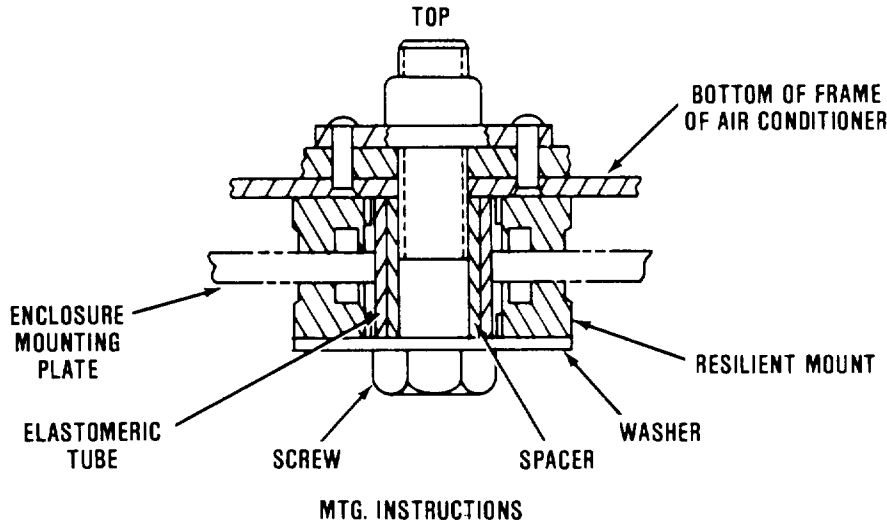


INSTALLATION INSTRUCTIONS

d. Lift unit by lifting rings.



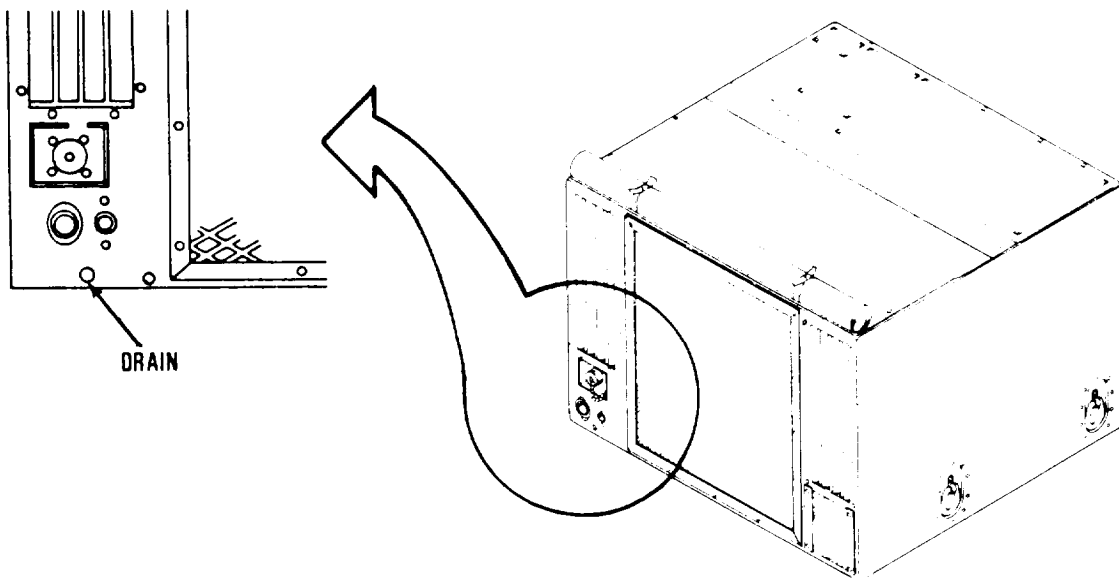
e. Use mounting hardware supplied in the overpack kit (Appendix C, Items 11 thru 15).



f. Be sure the mode selector on the control module is in the OFF position and connect a 208 volt, 50/60 cycle, 3 phase power to the input power connector (J-1) at the top left front corner of the unit.

g. The new unit should not require servicing, as it is shipped completely assembled and ready to operate when power is applied. However, if any defects have been found during the inspection of the equipment they should be corrected as necessary before the unit is placed into operation.

h. Connect a 3/16 inch threaded pipe to the drain connections on the bottom right rear of the unit to remove condensate water. Extend piping or hose to deposit water in a suitable location or container.



SECTION III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4-9. GENERAL. Preventive Maintenance Checks and Services (PMCS, Table 4-1) are to be completed to ensure the air conditioner is ready to use at all times. These checks and services help you find and repair defects before the air conditioner is damaged or fails.

CAUTION

While the air conditioner is running, if any defect develops that you think will damage the air conditioner, stop it at once.

a. Item numbers in the first column of Table 4-1 are the order in which inspections are to be done. Column two "Interval" lists when to do them.

b. Record all defects on DA Form 2404 (Equipment Inspection and Maintenance Work Sheet) as soon as possible.

c. All deficiencies and shortcomings shall be recorded together with the corrective action taken on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) at the earliest opportunity.

d. If your equipment fails to operate, troubleshoot with proper equipment. Report any deficiencies using proper forms (See DA PAM 738-750).

4-10. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS). This paragraph contains a tabulated listing of Preventive Maintenance Services which must be performed by the operator. The item numbers are listed in the order to be performed.

WARNING

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100 F (38°C).

WARNING

Do not use compressed air for cleaning purposes except where reduced to less than 30 psi (2.11 km/cm²) and then only with effective chip guarding and personal protective equipment.

NOTE

If the equipment must be kept in continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

Table 4-1. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

M-Monthly

Q-Quarterly

S-Semiannually

ITEM NO.	INTERVAL			ITEM TO BE INSPECTED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
	M	Q	S			
1		●		Front Louver (1) (Evaporator Inlet)	Check for dirt and obstructions or damage.	If damaged replace front louver (evaporator inlet) in accordance with paragraph 4-13, page 4-31.
2		●		Front Louver (2) (Evaporator Discharge)	Check for dirt and obstructions or damage.	If damaged replace front louver (evaporator discharge) in accordance with paragraph 4-13, page 4-31.
3		●		Control Module (3)	Check for proper operation or damage.	If damaged repair or replace control module in accordance with paragraph 4-22, page 4-120.
4		●		Input Power (4) Receptacle (J-1)	Check for any loose connections or damage.	If damaged repair or replace input power receptacle (J-1) in accordance with paragraph 4-23, page 4-122.

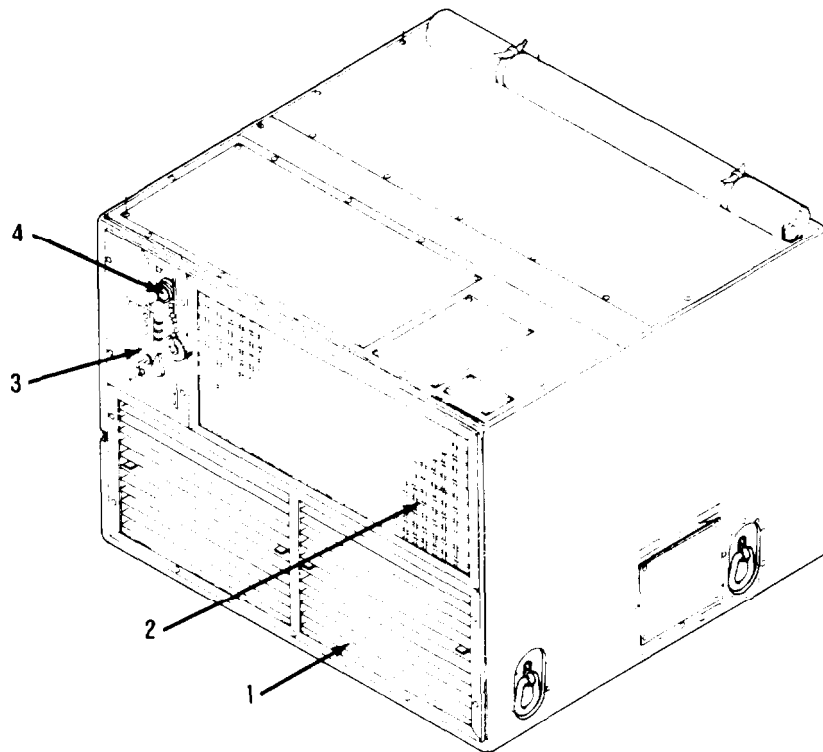


Table 4-1. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (Cont)

ITEM NO.	INTERVAL			ITEM TO BE INSPECTED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
	M	Q	S			
NOTE						
Check after air conditioner has been running (cool mode) for 15 minutes.						
5	●			Sight Indicator (5)	Check to see that sight indicator is clear of bubbles and center dot green.	If sight indicator has bubbles or center dot is yellow notify Direct Support Maintenance.
6	●			Fresh Air Filter (6)	Check for dirt or damage.	Replace fresh air filter in accordance with paragraph 4-13, page 4-33.
7		●		Auxiliary Power (7) Receptacle (J-12)	Check for any loose connections or damage.	If damaged repair or replace auxiliary power receptacle (J-12) in accordance with paragraph 4-23, page 4-134.
8		●		Condenser Coil Guard (8)	Check for dirt or damage.	If damaged replace condenser veil guard in accordance with paragraph 4-14, page 4-34.

Table 4-1. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (Cont)

M-Monthly

Q-Quarterly

S-Semiannually

ITEM NO.	INTERVAL			ITEM TO BE INSPECTED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
	M	Q	S			
9			●	Fresh Air Damper and Actuator (9)	Check for freedom of movement or damage.	Adjust or replace fresh air damper and actuator in accordance with paragraph 4-18, page 4-72.
NOTE						
Covers and gaskets should seal against air leaking in.						
10			●	Covers (10)	Check for damage.	If damaged repair or replace covers in accordance with paragraph 4-13, page 4-27.
11			●	Information Plates (11)	Check for damage.	If damaged replace information plates in accordance with paragraph 4-13, page 4-29.
12			●	Housing (12)	Check for damage.	If damaged notify General Support.

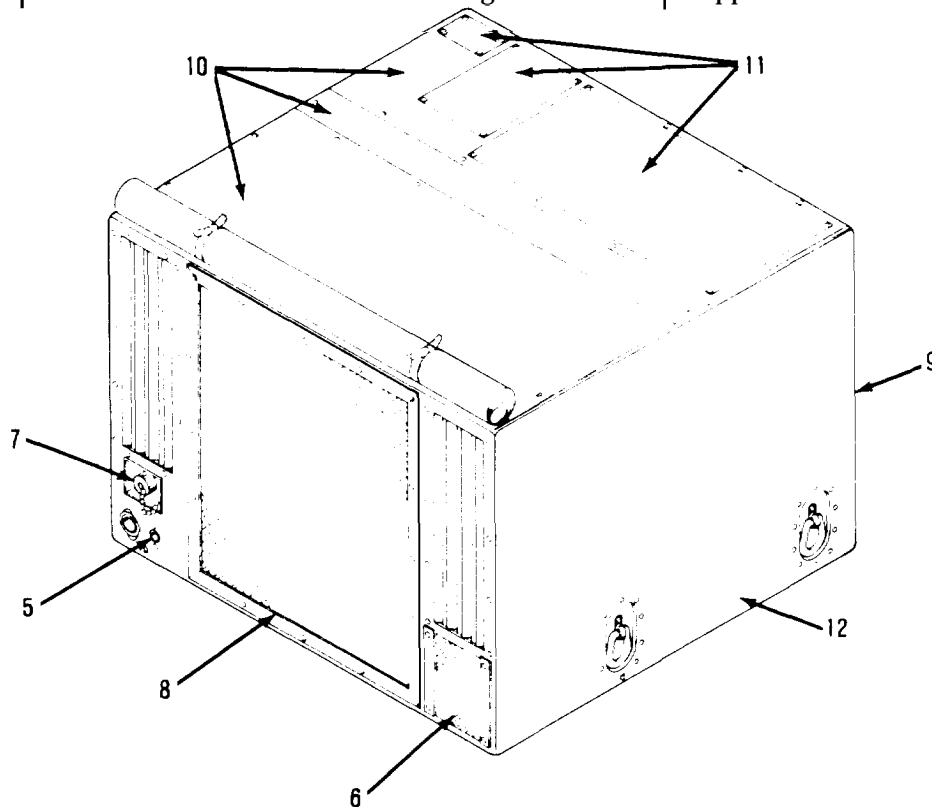


Table 4-1. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (Cont)

M-Monthly

Q-Quarterly

S-Semiannually

ITEM NO.	INTERVAL			ITEM TO BE INSPECTED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILAVBLE IF:
	M	Q	S			
13		●		Evaporator Fan Motor and Impellers (13)	Check for security of attachment, bent or broken blades.	If damaged repair or replace evaporator fan motor and impellers in accordance with paragraph 4-17, page 4-66.
14		●		Condenser Fan Motors and Impellers (14)	Check for security of attachment, bent or broken blades.	If damaged repair or replace condenser fan motors and impellers in accordance with paragraph 4-15, page 4-39.
15		●		Mist Eliminator (15)	Inspect for dirt or damage.	If damaged replace mist eliminator in accordance with paragraph 4-21, page 4-87.

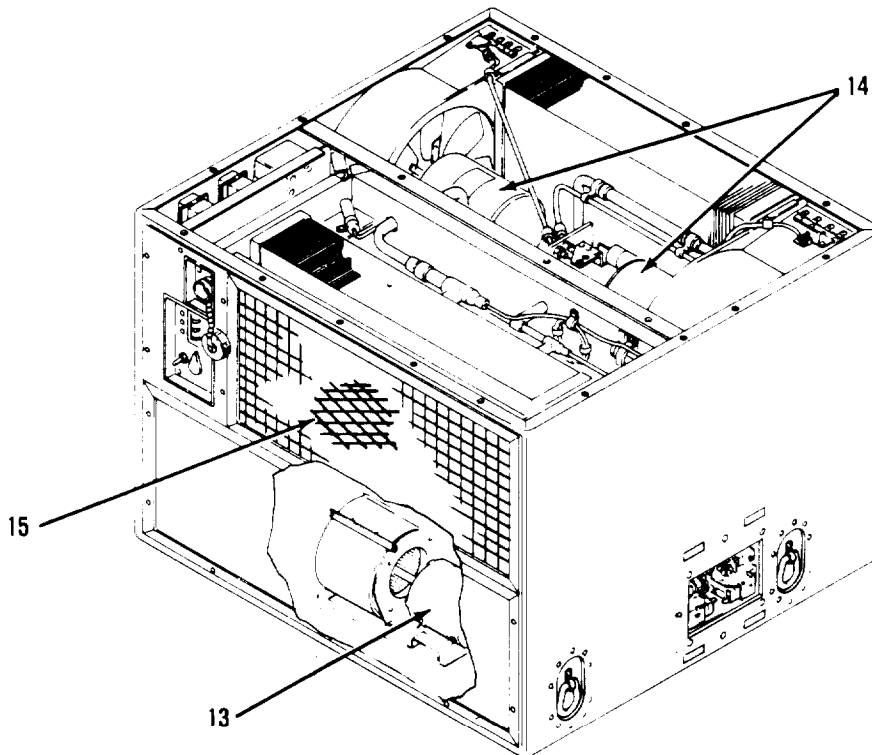


Table 4-1. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (Cont)

M-Monthly

Q-Quarterly

S-Semiannually

ITEM NO.	INTERVAL			ITEM TO BE INSPECTED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
	M	Q	S			
<u>WARNING</u>						
Allow heater to cool before touching heaters. They can cause severe burns.						
16	●			Heater Elements	Inspect for defective or damaged heaters.	If damaged replace heater elements in accordance with paragraph 4-24, page 4-139.
17		●		Evaporator Coil	Inspect evaporator coil for cleanliness. Check for visible and audible leaks.	If leak exist notify Direct Support Maintenance.
18		●		Condenser Coil	Inspect condenser coil for cleanliness. Check for visible and audible leaks.	If leak exist notify Direct Support Maintenance.

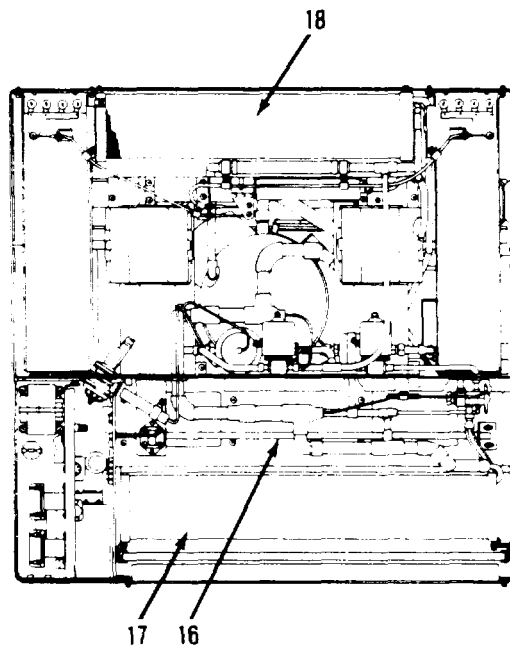


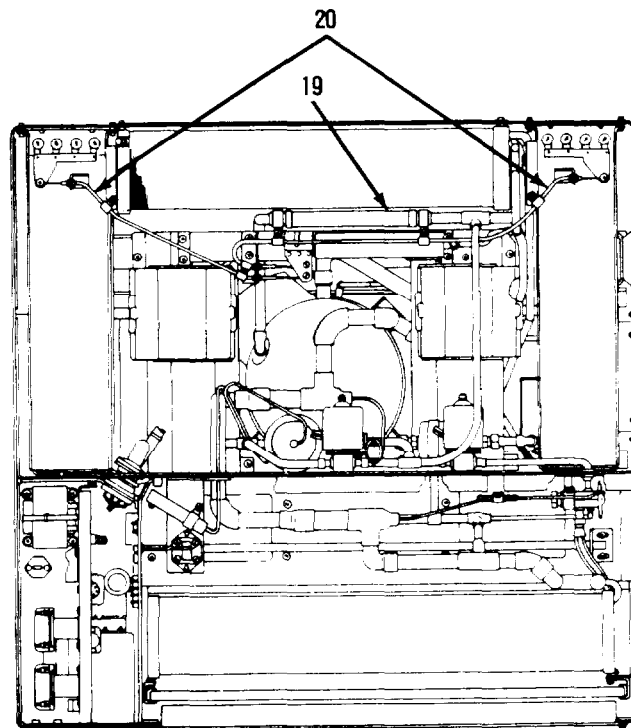
Table 4-1. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) (Cont)

M-Monthly

Q-Quarterly

S-Semiannually

ITEM NO.	INTERVAL			ITEM TO BE INSPECTED	PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
	M	Q	S			
19		●		Actuating Cylinder Cable	Inspect for freedom of movement or damage.	If damaged notify Direct Support Maintenance.
20		●		Condenser Discharge Louver Linkage Cable	Inspect for freedom of movement or damage.	Adjust, repair or replace condenser discharge louver linkage in accordance with paragraph 4-25, page 4-151.
21	●			Refrigeration Components	Check for visible and audible leaks.	If leaks exist notify Direct Support Maintenance.



SECTION IV. TROUBLESHOOTING PROCEDURES

4-11. TROUBLESHOOTING.

a. Table 4-2 contains troubleshooting information for locating and correcting most of the problems which are the responsibility of organizational maintenance. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine probable causes and corrective actions to take. Perform the test/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

c. Only those functions within the scope of organizational maintenance are listed.

Table 4-2. ORGANIZATIONAL MAINTENANCE TROUBLESHOOTING

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

1. AIR CONDITIONER FAILS TO OPERATE IN ANY MODE.

WARNING

Be careful when working with high voltage. Failure to comply can result in serious injury or death.

Step 1. Check to see if main power cord is plugged in.

Connect power cable to a source supplying 208VAC, three phase, 60 Hz. power.

Step 2. Check to see if main power supply circuit breaker is in the ON position.

Place circuit breaker in the ON position.

Table 4-2. ORGANIZATIONAL MAINTENANCE TROUBLESHOOTING (Cont)

MALFUNCTION

TEST OR INSPECTION

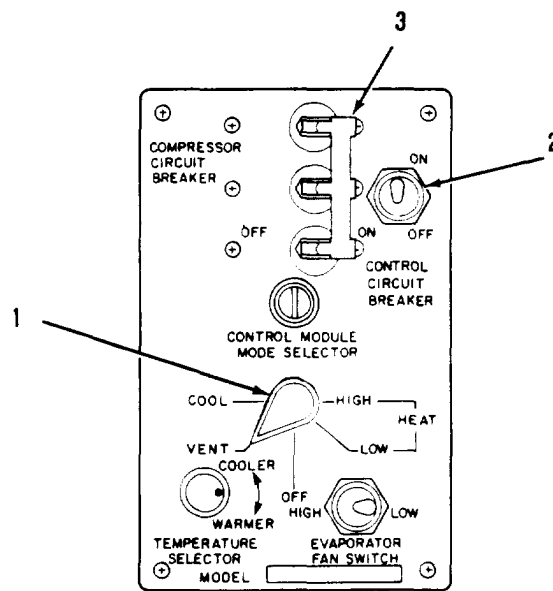
CORRECTIVE ACTION

Step 3. Check to see if mode selector (1) is in the VENT position.

Place mode selector in the VENT position.

If the air conditioner will not operate check for a defective switch in accordance with paragraph 4-22, page 4-101.

Replace defective mode selector switch in accordance with paragraph 4-22, page 4-104.



Step 4. Check to see if control circuit breaker (2) is in the ON position.

Place control circuit breaker in the ON position.

If the air conditioner will not operate, check for a defective circuit breaker in accordance with paragraph 4-22, page 4-100.

Replace defective circuit breaker in accordance with paragraph 4-22, page 4-105.

Table 4-2. ORGANIZATIONAL MAINTENANCE TROUBLESHOOTING (Cont)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

Step 5. Check to see if compressor circuit breaker (3) is in the ON position.

Place compressor circuit breaker in the ON position.

If the air conditioner will not operate in the COOL position, check for defective compressor circuit breaker in accordance with paragraph 4-22, page 4-100.

Replace defective compressor circuit breaker in accordance with paragraph 4-22, page 4-105.

Step 6. Check for loose electrical connections.

Tighten electrical connections.

Step 7. Check for defective wiring in accordance with paragraph 4-22, page 4-102.

Replace defective wiring. Use identical wire. Consult Appendix E and solder (Table D-1, Item 12) all terminals and connectors in accordance with paragraph 4-22, page 4-102.

2. COMPRESSOR FAILS TO START

COOLING MODE

Step 1. Check to see that mode selector switch (1) is in COOL position.

Place mode selector switch in COOL position.

If the air conditioner will not operate, check for a defective mode selector switch in accordance with paragraph 4-22, page 4-101.

Replace defective mode selector switch in accordance with paragraph 4-22, page 4-104.

Table 4-2. ORGANIZATIONAL MAINTENANCE TROUBLESHOOTING (Cont)

MALFUNCTION

TEST OR INSPECTION

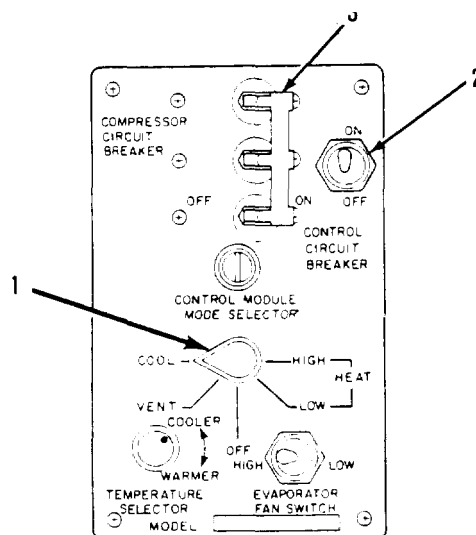
CORRECTIVE ACTION

Step 2. Check to see if control circuit breaker (2) is in the ON position.

Place control circuit breaker in the ON position.

If the air conditioner will not operate in the COOL position, check for a defective control circuit breaker in accordance with paragraph 4-22, page 4-100.

Replace defective control circuit breaker in accordance with paragraph 4-22, page 4-105.



WARNING

Be careful when working with high voltage. Failure to comply can result in serious injury or death.

Step 3. Check to see if compressor circuit breaker (3) is in the ON position.

Place compressor circuit breaker in the ON position.

If the air conditioner will not operate in the COOL position, check for defective compressor circuit breaker in accordance with paragraph 4-22, page 4-100.

Replace defective compressor circuit breaker in accordance with paragraph 4-22, page 4-105.

Table 4-2. ORGANIZATIONAL MAINTENANCE TROUBLESHOOTING (Cont)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

Step 4. Remove eight screws (4) securing access cover (charging box) to housing.

Remove access cover (5).

Check to see if low and high pressure switches (6) contacts are open.

Push reset button on the low and high pressure switches. If compressor does not start after a short delay, stop air conditioner. Notify Direct Support Maintenance.

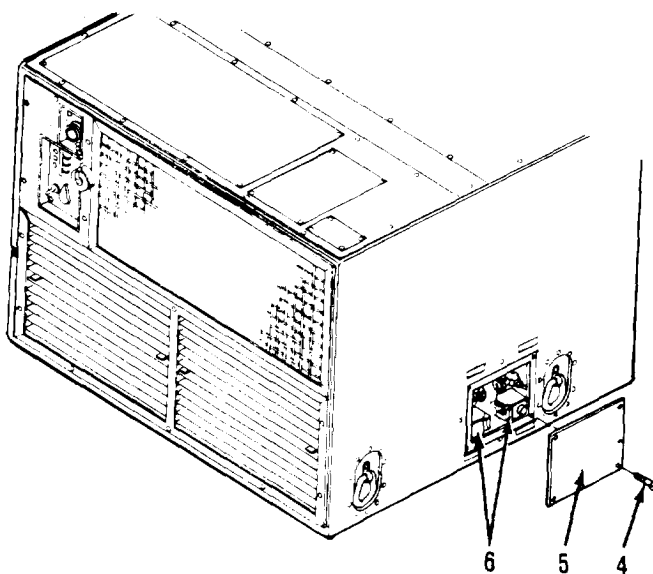


Table 4-2. ORGANIZATIONAL MAINTENANCE TROUBLESHOOTING (Cont)

MALFUNCTION

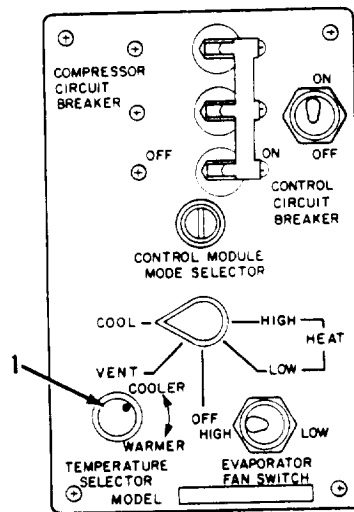
TEST OR INSPECTION

CORRECTIVE ACTION

3. INSUFFICIENT COOLING

Step 1. Check to see that thermostat (temperature control) (1) is in the COOLER position.

Place thermostat in COOLER position. Replace defective thermostat in accordance with paragraph 4-22, page 4-104.



Step 2. Check for correct operation of evaporator fan assembly (2).

Replace or repair damaged evaporator fan assembly in accordance with paragraph 4-17, page 4-68.

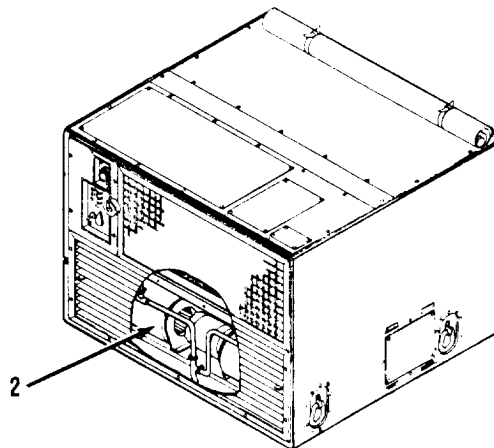


Table 4-2. ORGANIZATIONAL MAINTENANCE TROUBLESHOOTING (Cont)

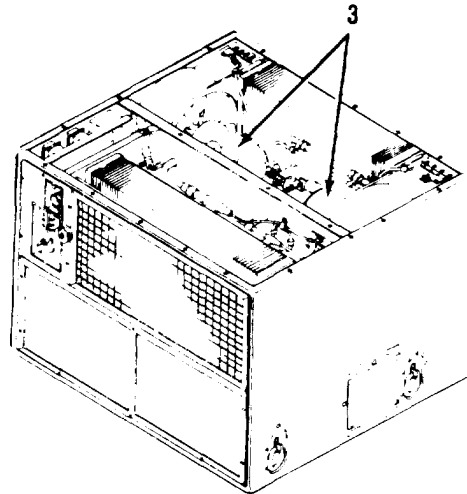
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

Step 3. Check for correct operation of condenser fan assembly (3).

Replace or repair damaged condenser fan assembly in accordance with paragraph 4-15, page 4-45.



Step 4. Remove ten screws (4) and ten lock washers (5) securing front louver (evaporator inlet) (6) to housing.

Remove front louver (evaporator inlet).

Check to see if air filter (7) is not obstructed.

Remove, repair or clean air filters in accordance with paragraph 4-13, page 4-32.

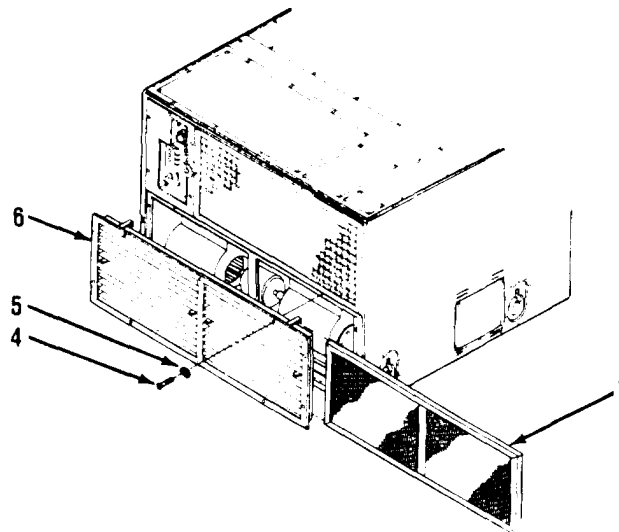


Table 4-2. ORGANIZATIONAL MAINTENANCE TROUBLESHOOTING (Cont)

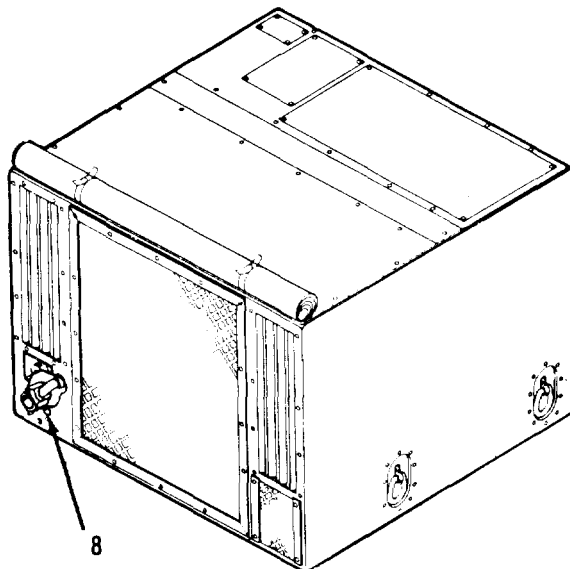
MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

Step 5. Inspect sight indicator (8) for bubbles or yellow dot in center.

Notify Direct Support Maintenance.



Step 6. Remove eight screws (9) securing access cover (charging box) to housing.

Remove access cover (10).

Check for correct suction and discharge pressures in accordance with Table 5-2.

Notify Direct Support Maintenance.

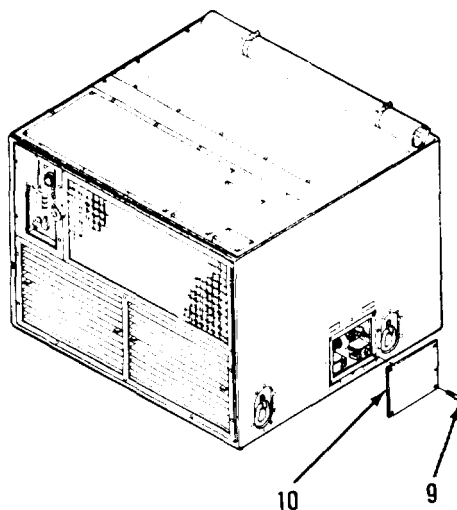


Table 4-2. ORGANIZATIONAL MAINTENANCE TROUBLESHOOTING (Cont)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

4. INSUFFICIENT HEATING (LOW HEAT)

Step 1. Check to see if mode selector switch (1) is in LOW HEAT position.

Place mode selector switch in LOW HEAT position.

If the air conditioner will not operate, check for a defective mode selector switch in accordance with paragraph 4-22, page 4-101.

Replace defective mode selector switch in accordance with paragraph 4-22, page 4-104.

Step 2. Check to see if control circuit breaker (2) is in the ON position.

Place control circuit breaker in the ON position.

If the air conditioner will not operate in the LOW HEAT mode position, check for a defective control circuit breaker in accordance with paragraph 4-22, page 4-100.

Replace defective control circuit breaker in accordance with paragraph 4-22, page 4-105.

Step 3. Check to see if temperature selector (3) is in the WARMER position.

Place temperature selector in the WARMER position.

Replace defective temperature selector in accordance with paragraph 4-22, page 4-104.

Step 4. Check to see if compressor circuit breaker (4) is in the ON position.

Place compressor circuit breaker in the ON position.

If the air conditioner will not operate, in the COOL position check for defective compressor circuit breaker in accordance with paragraph 4-22, page 4-100.

Replace defective compressor circuit breaker in accordance with paragraph 4-22, page 4-105.

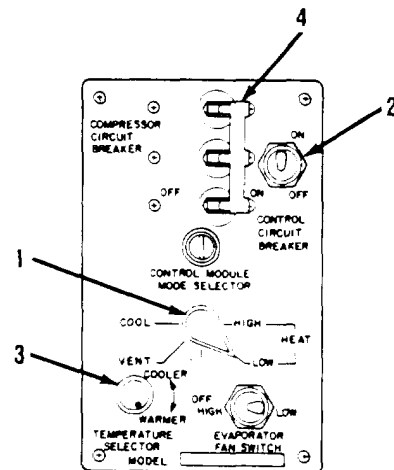


Table 4-2. ORGANIZATIONAL MAINTENANCE TROUBLESHOOTING (Cont)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

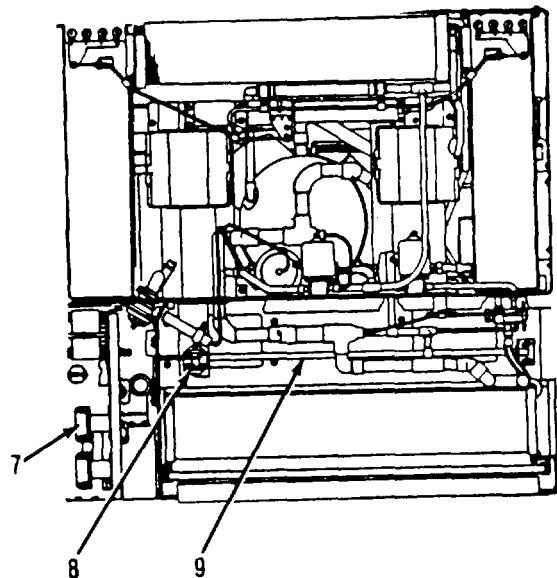
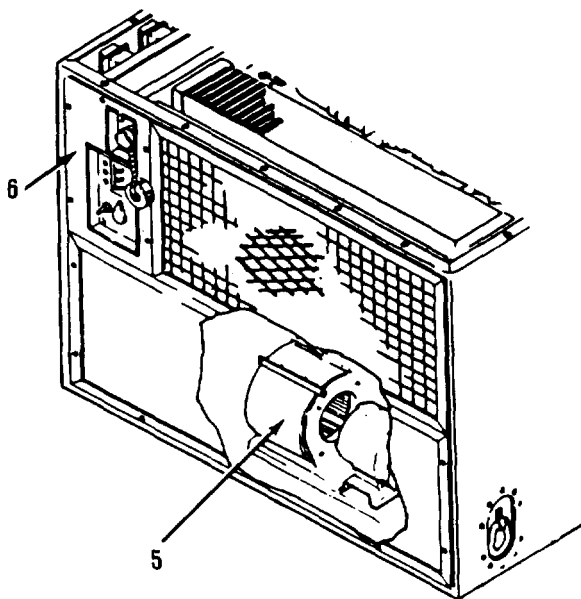
Step 5. Check for correct operation of evaporator fan assembly (5).

Replace or repair damaged evaporator fan assembly in accordance with paragraph 4-17, page 4-68.

Step 6. Check for defective low heat relay (K-2).

Remove Junction Box (6) in accordance with paragraph 4-22, page 4-107.

Replace defective low heat relay (K-2) in accordance with paragraph 4-22, page 4-117.



Step 7. Check for defective thermostatic switch (heater) in accordance with paragraph 4-24, page 4-143.

Step 8. Check for defective heater element in accordance with paragraph 4-24, page 4-138.

Step 9. Check for defective wiring in accordance with paragraph 4-22, page 4-102.

Replace defective wiring. Use identical wire. Consult Appendix E and solder (Table D-1, Item 12) all terminals connectors in accordance with paragraph 4-22, page 4-102.

Table 4-2. ORGANIZATIONAL MAINTENANCE TROUBLESHOOTING (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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5. INSUFFICIENT HEATING (HIGH HEAT).

Step 1. Check to see if mode selector switch (1) is in HIGH HEAT position.

Place control mode selector switch in HIGH HEAT position.

If the air conditioner will not operate, check for a defective switch in accordance with paragraph 4-22, page 4-101.

Replace defective mode selector switch in accordance with paragraph 4-22, page 4-104.

Step 2. Check to see if control circuit breaker (2) is in the ON position.

Place control circuit breaker in the ON position.

If the air conditioner will not operate in the HIGH HEAT position, check for a defective control circuit breaker in accordance with paragraph 4-22, page 4-100.

Replace defective control circuit breaker in accordance with paragraph 4-22, page 4-105.

Step 3. Check to see if temperature selector (3) is in the WARMER position.

Place temperature selector in the WARMER position.

Replace defective temperature selector in accordance with paragraph 4-22, page 4-104.

Step 4. Check to see if compressor circuit breaker (4) is in the ON position.

Place compressor circuit breaker in the ON position.

If the air conditioner will not operate in the COOL position, check for defective compressor circuit breaker in accordance with paragraph 4-22, page 4-100.

Replace defective compressor circuit breaker.

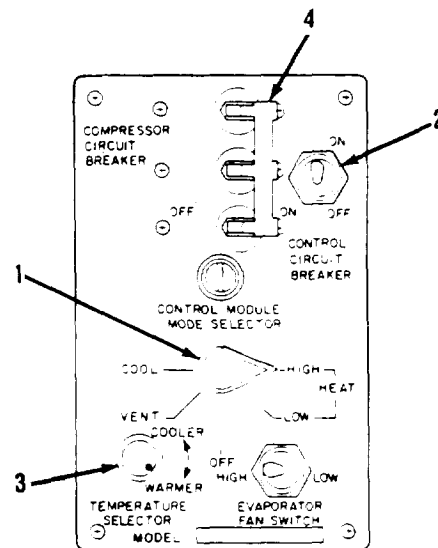


Table 4-2. ORGANIZATIONAL MAINTENANCE TROUBLESHOOTING (Cont)

MALFUNCTION

TEST OR INSPECTION

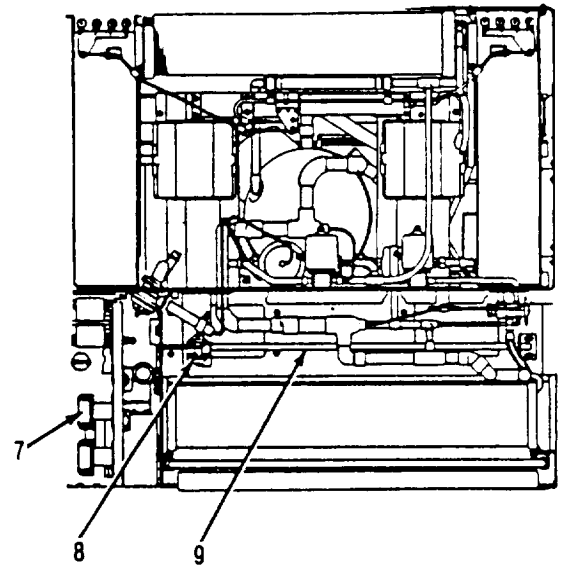
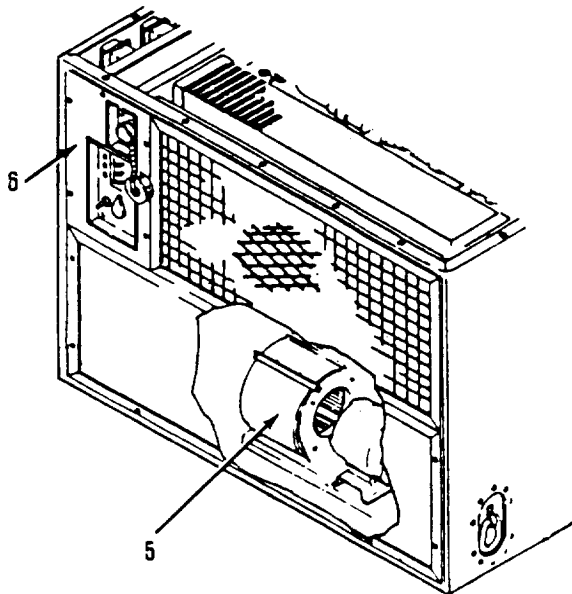
CORRECTIVE ACTION

Step 5. Check for correct operation of evaporator fan assembly (5) in accordance with paragraph 4-17, page 4-65.

Step 6. Check for defective high heat relay (K-2).

Remove Junction Box (6) in accordance with paragraph 4-22, page 4-107.

Replace defective high heat relay (K-2) in accordance with paragraph 4-22, Page 4-117.



Step 7. Check for defective heater cutout switch in accordance with paragraph 4-24, page 4-143.

Step 8. Check for defective heater element(s) (6) in accordance with paragraph 4-24, page 4-138.

Step 9. Check for defective wiring in accordance with paragraph 4-22, page 4-102.

Replace defective wiring. Use identical wire. Consult Appendix E and solder (Table D-1, Item 12) all terminals connectors in accordance with paragraph 4-22, page 4-102.

SECTION V. MAINTENANCE PROCEDURES

4-12. GENERAL INSTRUCTIONS. This section contains organizational maintenance procedures as authorized by the Maintenance Allocation Chart (MAC) and SOURCE, MAINTENANCE and RECOVERABILITY (SMR) coded items. Maintenance instructions shall reference or contain all procedures required for care and handling of the air conditioner.

If personnel is not listed, it means one person can do the task.

4-13. TOP COVERS, AND FRONT LOUVERS/Inspect, Service, Replace

This Task covers:

- a. Inspect
- b. Service
- c. Remove
- d. Replace
- e. Installation

INITIAL SETUP

Disconnect Power

Tools

TOOL KIT (SC 5180-90-CL-N18)

Adhesive (Table D-1, Item 2)

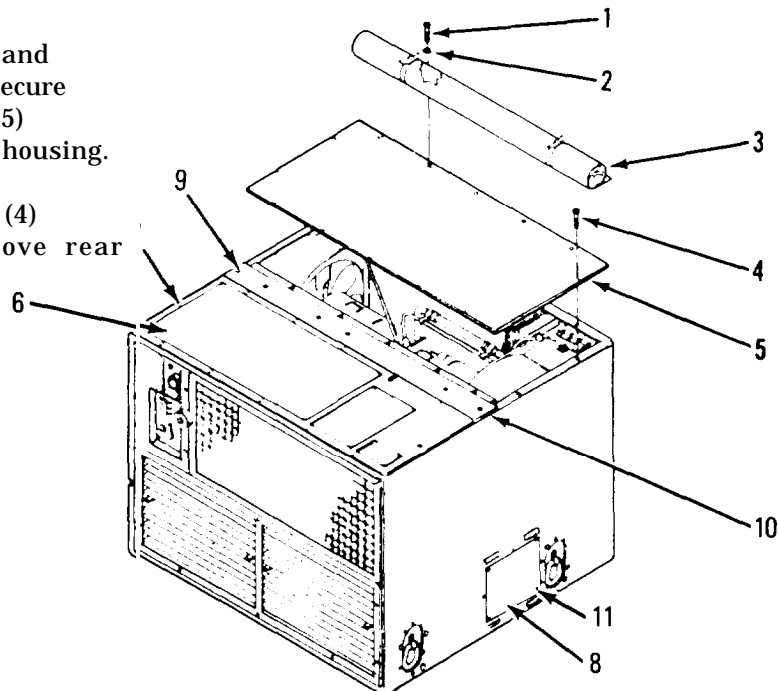
LOCATION/ITEM

FABRIC COVERS/METAL COVERS

Removal:

1. Remove three screws (1) and three lock washers (2) which secure fabric cover (3) to rear cover (5) and remove fabric cover from housing.

2. Remove fourteen screws (4) from rear cover (5) and remove rear cover from housing.



4-13. TOP COVERS, AND FRONT LOUVERS/Inspect, Service, Replace (Cont)

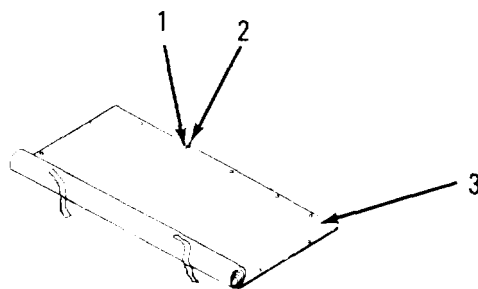
LOCATION/ITEM

Removal:

3. Remove fourteen screws (7) from front cover (6) and remove front cover from housing.
4. Remove seven screws (9) from center cover (10) and remove center cover from housing.
5. Remove eight screws (11) from access cover (8) and remove access cover from housing.

Repair:

Replace damaged snap buttons (1) and grommets (2) on fabric cover (3).

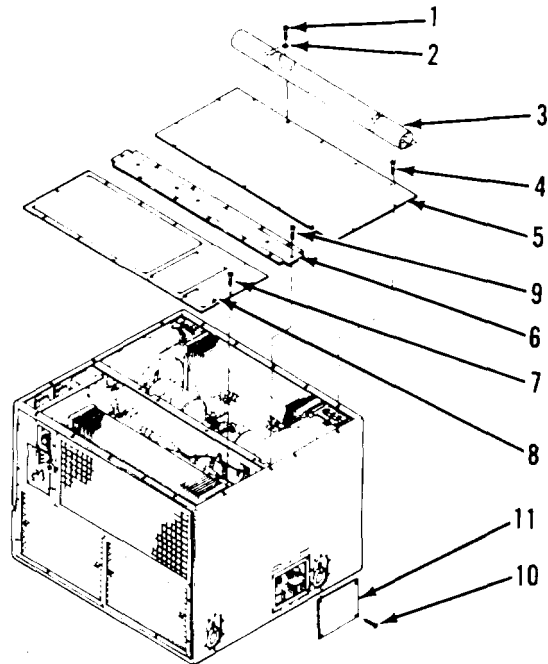
**Replace:**

1. Replace damaged gasket material, and insulation material and secure gaskets and insulation in material with adhesive (Table D-1, Item 2) to front cover (6) rear cover (5) center cover (7) and access cover (8).
2. Replace damaged rivnuts on center cover (7).

4-13. TOP COVERS, AND FRONT LOUVERS/Inspect, Service, Replace (Cont)

LOCATION/ITEM

Installation:



3. Align access cover (11) with holes in housing and secure access cover to housing with eight screws (10).

4. Align center cover (6) with holes in housing and secure center cover to housing with seven screws (9).

5. Align front cover (8) with holes in center cover and housing and secure with fourteen screws (7).

6. Align rear cover (5) with holes in center cover to housing and secure with fourteen screws (4).

7. Align fabric cover (3) with holes in housing and secure fabric cover to housing with three screws (1) and three lock washers (2).

4-13. TOP COVERS, AND FRONT LOUVERS/Inspect, Service, Replace (Cont)

LOCATION/ITEM

INFORMATION PLATES

Inspect:

Inspect information plates (8) for damage or missing from housing.

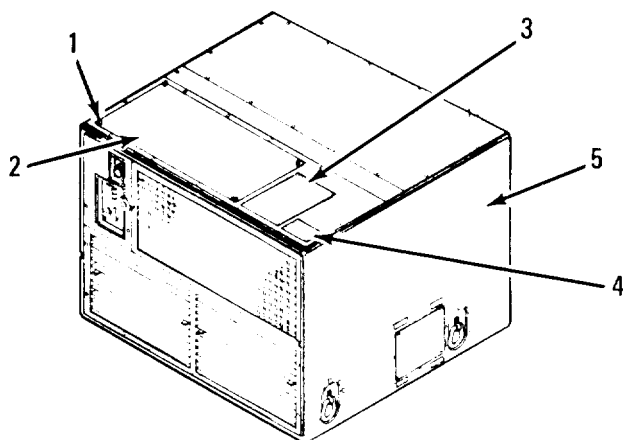
Service:

Wipe plates with a cloth dampened with dry cleaning solvent (Table D-1, Item 3).

Replace:

1. Remove four screws (1) from wiring diagram (2) identification plate (3) name plate(4) from housing (5).

2. Install new name plate (4) identification plate (3) and wiring diagram (2) securing with four screws (1) to housing (5).



4-13. TOP COVERS, AND FRONT LOUVERS/Inspect, Service, Replace (Cont)

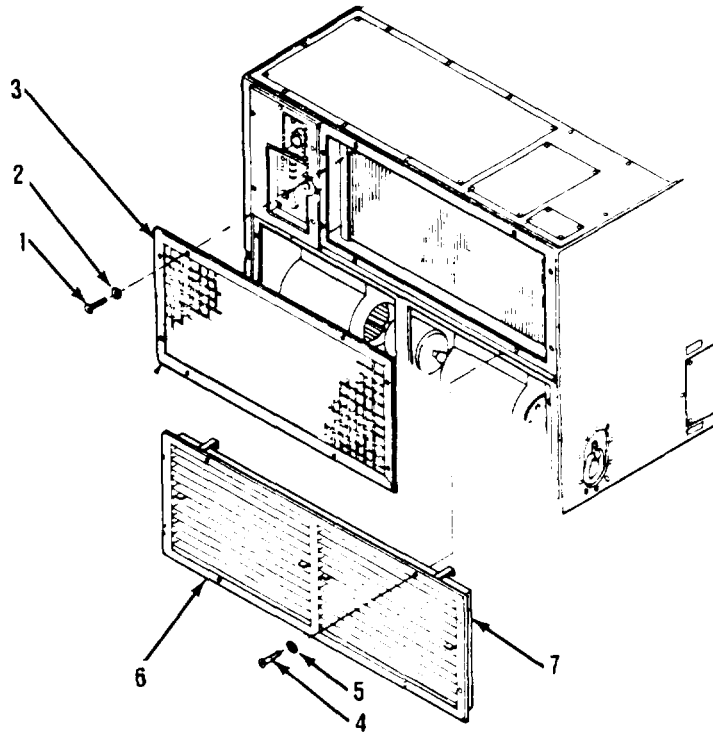
LOCATION/ITEM

LOUVERS (EVAPORATOR DISHCARGE)

Removal:

1. Remove eight screws (1) and eight lock washers (2) from front louver (evaporator discharge) (3) and remove discharge louver from housing.

2. Remove ten screws (4) and ten lock washers (5) from front inlet louver (evaporator inlet) (6) and remove inlet louver and air conditioner filter (7) from housing.



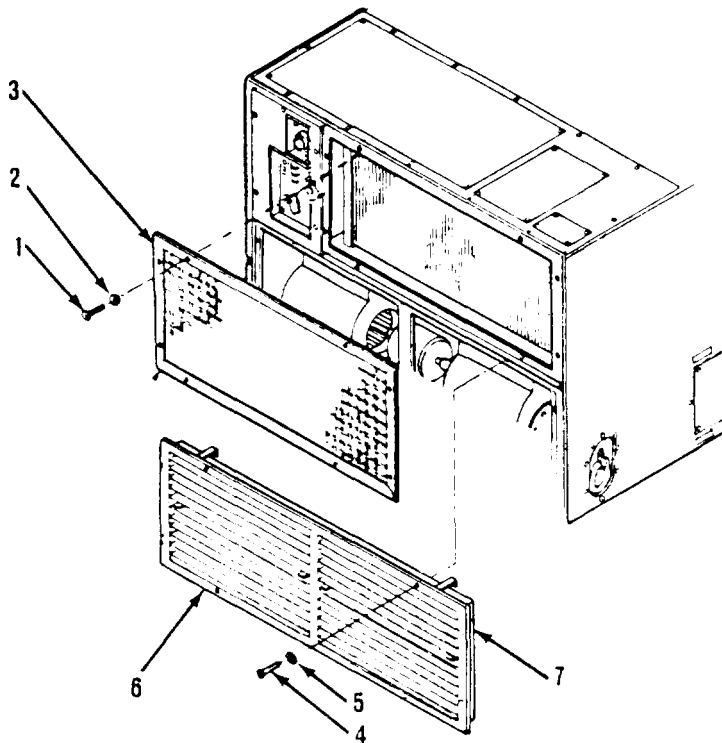
4-13. TOP COVERS, AND FRONT LOUVERS/Inspect, Service, Replace (Cont)

LOCATION/ITEM

Installation:

3. Align front louver (evaporator inlet) (6) and air conditioner filter (7) with holes in housing and secure with ten screws (4) and ten lock washers (5) to housing.

4. Align front louver (evaporator discharge) (3) with holes in housing and secure with eight screws (1) and eight lock washers (2) to housing.



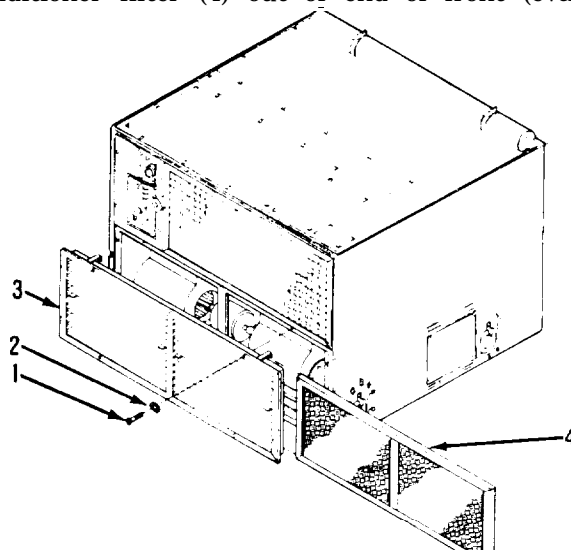
4-13. TOP COVERS, AND FRONT LOUVERS/Inspect, Service, Replace (Cont)

LOCATION/ITEM

AIR CONDITIONER FILTER

Removal:

1. Remove ten screws (1) ten lock washers (2) front louver (evaporator inlet) (3) and conditioner filter from housing.
2. Slide air conditioner filter (4) out of end of front (evaporator inlet) louver.



Service:

WARNING

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F (38°C).

NOTE

The air filter consists of a shredded aluminum foil maze held between screens in an aluminum channel frame. The filter can be cleaned and re-used repeatedly. Airflow markings (arrows) printed on the frame make it easy to replace the filter in the correct position every time.

1. Immerse the filter in soap solution or dry cleaning solvent (Table D-1, Item 3) and stir until dirt is removed using a soft brush if necessary to loosen caked-on-dirt.
2. Rinse in clean water or dry cleaning solvent.

4-13. TOP COVERS, AND FRONT LOUVERS/Inspect, Service, Replace (Cont)

LOCATION/ITEM

Service:

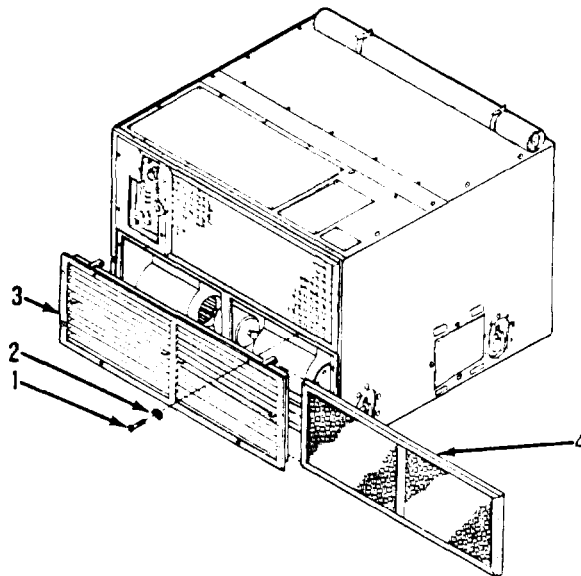
3. Hold filter horizontal and tap each edge on bench or floor to ensure all water is removed.
4. Apply a very light coat of SAE oil (Table D-1, Item 9) on air inlet side of air filter. Drain filter for eight hours.
5. Wipe off excess oil.

Installation:

NOTE

Air flow arrows on filter point inward toward fan intake.

1. Slide air conditioning filter (4) into end of front louver (evaporator inlet) (3).
2. Align front louver (evaporator inlet) (3) and air conditioner filter with holes in housing and secure ten screws (1) and ten lock washers (2) to housing.



4-14. CONDENSER GUARD, COVERS, VENTILATION AIR FILTER AND LIFTING RINGS/Inspect, Service, Repair, Replace

This Task covers:

- a. Inspect
 - b. Service
 - c. Repair
 - d. Replace
 - e. Removal
 - f. Installation
-

INITIAL SETUP

Disconnect Power

TOOL KIT (SC 5180-90-CL-N18)

Dry Cleaning Solvent (Table D-1, Item 3)

LOCATION/ITEM

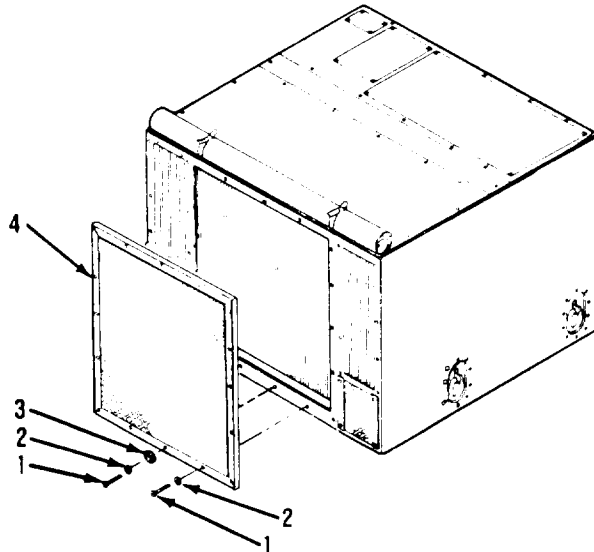
CONDENSER GUARD

Removal:

Remove seventeen screws (1) seventeen lock washers (2) one snap fastener (3) and condenser coil guard (4) from housing.

Installation:

Align condenser coil guard (4) with holes in housing and secure with seventeen screws (1), seventeen lock washers (2) and one snap fastener (3) to housing.



4-14. CONDENSER GUARD, COVERS, VENTILATION AIR FILTER AND LIFTING RINGS/Inspect, Service, Repair, Replace (Cont)

LOCATION/ITEM

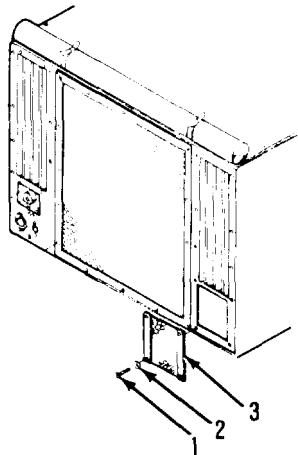
VENTILATION GUARD

Removal:

Remove four screws (1) and four lock washers (2) and ventilation guard (3) from housing.

Installation:

Align ventilation guard (3) with holes in housing and secure with four screws (1) and four lock washers (2) to housing.

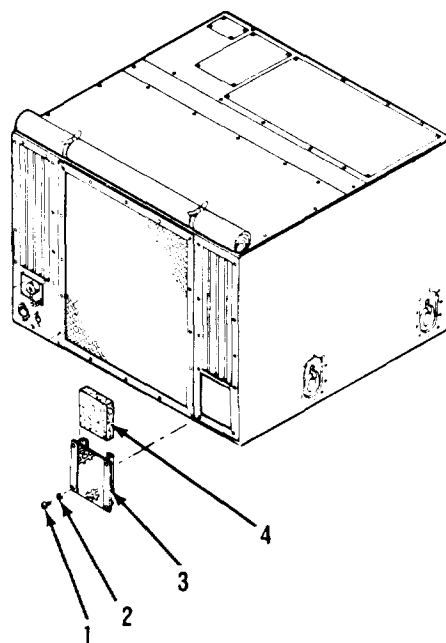


VENTILATION AIR FILTER

Removal:

1. Remove four screws (1) and four lock washers (2) and ventilation guard (3) from housing.

2. Pull air filter (4) out of ventilation guard.



4-14. CONDENSER GUARD, COVERS, VENTILATION AIR FILTER AND LIFTING RINGS/Inspect, Service, Repair, Replace (Cont)

LOCATION/ITEM

Service:

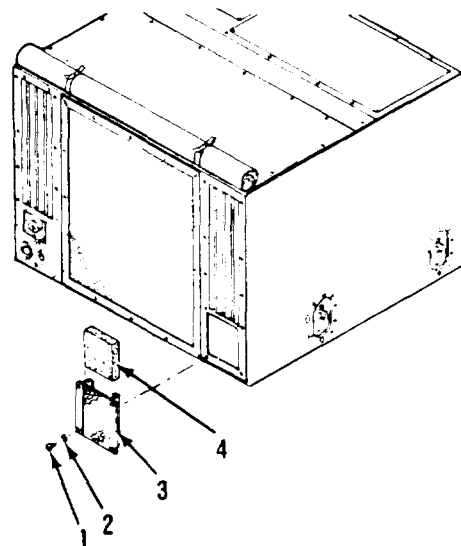
WARNING

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F (38°C).

1. Immerse the ventilation air filter in soap solution or dry cleaning solvent (Table D-1, Item 3) and stir until dirt is removed using a soft brush if necessary to loosen caked-on dirt.
2. Rinse in clean water or dry cleaning solvent.
3. Hold ventilation air filter horizontal and tap each edge on bench or floor to ensure all water is removed.

Installation:

1. Install ventilation air filter (4) in ventilation guard (3).
2. Align ventilation guard (3) with holes in housing and secure ventilation guard with four screws (1) and four lock washers (2) to housing.



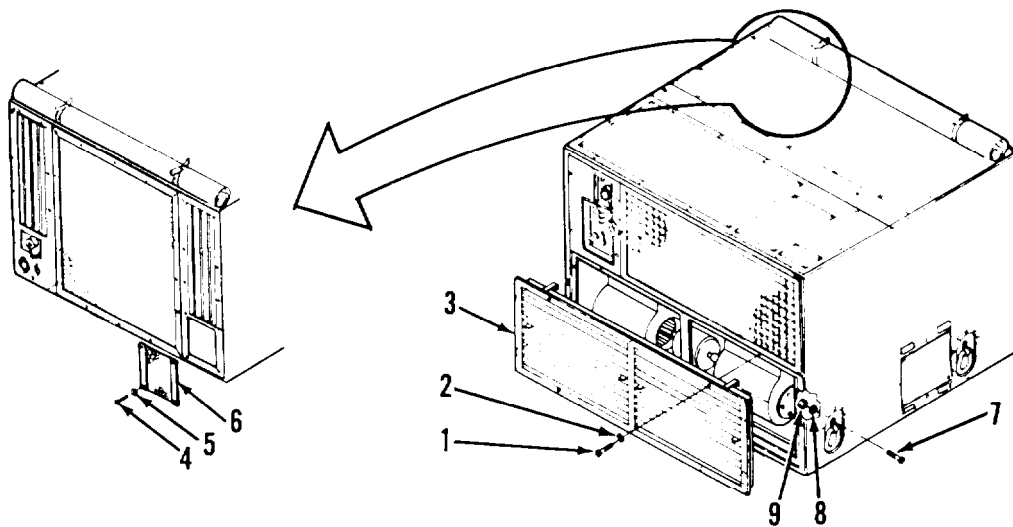
4-14. CONDENSER GUARD, COVERS, VENTILATION AIR FILTER AND LIFTING RINGS/Inspect, Service, Repair, Replace (Cont)

LOCATION/ITEM

LIFTING RING AND CLIP (Front and Left Rear)

Removal:

1. Remove ten screws (1) ten lock washers (2) and front louver (evaporator inlet) (3) from housing.
2. Remove four screws (4) four lock washers (5) and ventilation guard (6) from housing.
3. Remove three bolts (7) three lock washers (8) and three flat nuts (9) and lifting rings and clips (10) from housing.



4-14. CONDENSER GUARD, COVERS, VENTILATION AIR FILTER AND LIFTING RINGS/Inspect, Service, Repair, Replace (Cont)

LOCATION/ITEM

Inspection:

Inspect for damage and replace if damaged.

Installation:

1. Align lifting ring and clips (10) with holes in housing and secure lifting ring and clips to housing with three bolts (7) three lock washers (8) and three flat nuts (9).
2. Align ventilation guard (6) with holes in housing and secure ventilation guard to housing with four screws (4) and four lock washers (5) to housing.
3. Align front louver (evaporator inlet) (3) with holes in housing and secure with ten screws (1) and ten lock washers (2) to housing.

4-15. CONDENSER FANS, AND SUPPORT ASSEMBLIES/Inspect, Service, Replace

This Task covers:

- a. Removal
 - b. Inspect
 - c. Service
 - d. Installation
-

INITIAL SETUP

Disconnect Power

Tools

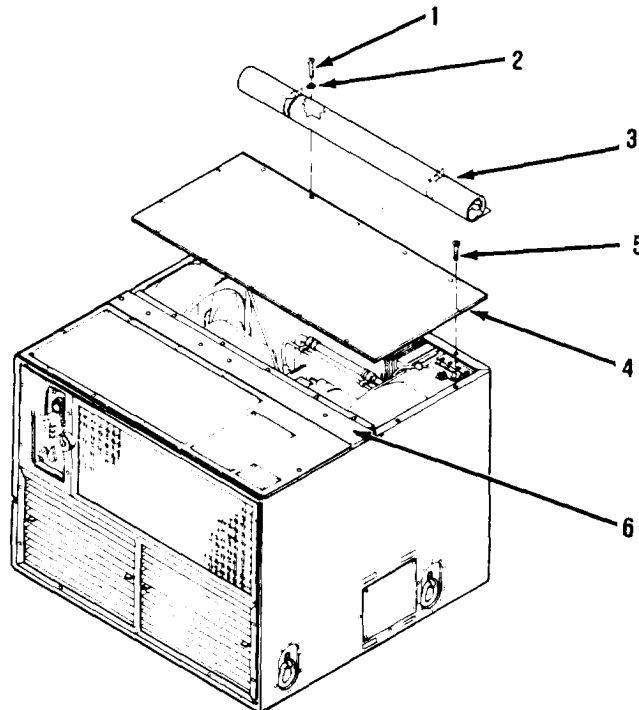
TOOL KIT (SC 5180-90-CL-N18)

Dry Cleaning Solvent (Table D-1, Item 3)

LOCATION/ITEM

AXIAL IMPELLER FANS/MOTOR SUPPORTS**Removal:**

1. Remove three screws (1) three lock washers (2) from fabric cover (3) and remove fabric cover from housing.
2. Remove fourteen screws (5) and rear cover (4) from housing.



4-15. CONDENSER FANS, AND SUPPORT ASSEMBLIES/Inspect, Service, Replace (Cont)

LOCATION/ITEM

Removal:

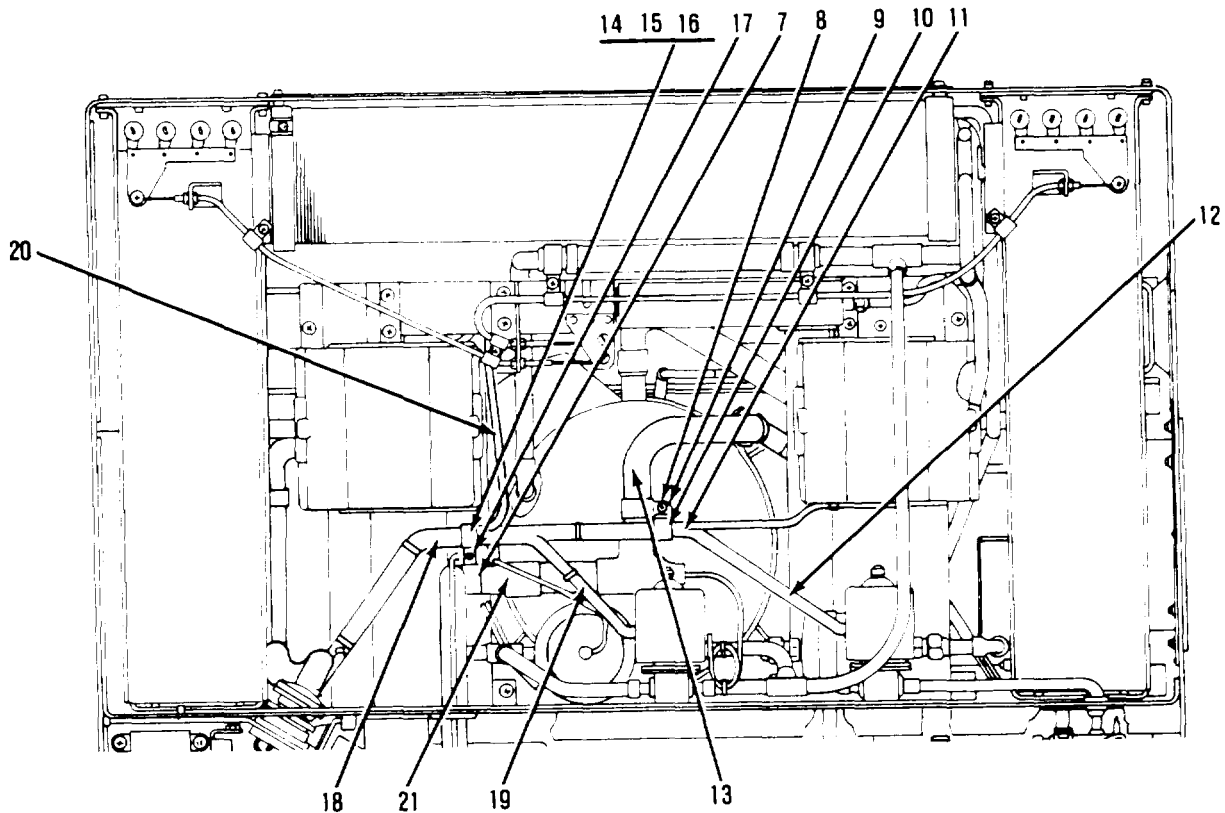
CAUTION

Be careful to avoid damaging fans during removal.

3. Remove one screw (7) one lock washer (8) one flat nut (9) and two clamps (10). These clamps secure the right condenser fan motor wiring assembly (11) and solenoid valve (L-2) wiring assembly (12) to suction line (13).

4. Remove one screw (14) one lock washer (15) one flat nut (16) and two clamps (17). These clamps secure the wiring assembly (18) solenoid valve (L-1) wiring assembly (19) and left condenser fan motor wiring assembly (20) to the suction line (21).

5. Cut wire ties (22) from suction line (21).



4-15. CONDENSER FANS, AND SUPPORT ASSEMBLIES/Inspect, Service, Replace (Cont)

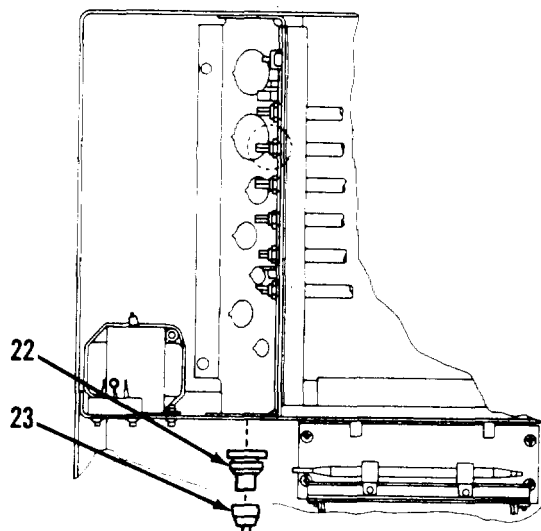
LOCATION/ITEM

Removal:

6. Disconnect electrical connectors P-4 (22) and P-5 (23) from the bulkhead.

7. Remove four screws (24) four lock washers (25) and left condenser fan motor assembly (26) from condenser fan support (27).

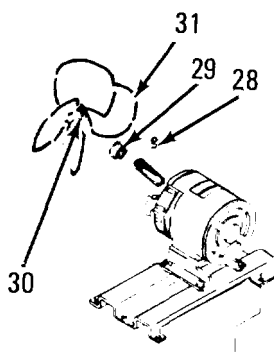
8. Loosen set screw (28) on left collar (29), and set screw (30) on left impeller (31).



NOTE

Note the position and number of impeller blades on left and right sides condenser fan assembly on removal, and be sure to replace it in the same position.

9. Slide left impeller (31) and left collar (29) off motor shaft.



4-15. CONDENSER FANS, AND SUPPORT ASSEMBLIES/Inspect, Service, Replace (Cont)

LOCATION/ITEM

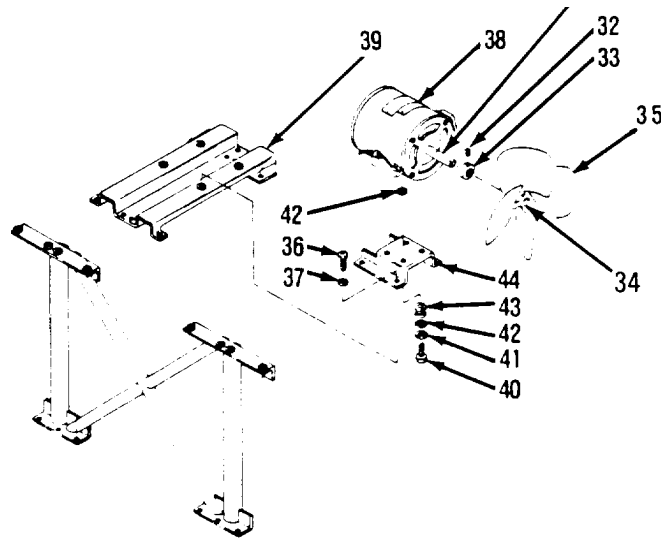
Removal:

10. Loosen set screw (32) on right collar (33) and set screw (34) on right impeller (35) and slide right impeller and right collar off motor shaft (45) and leaving impeller in condenser fan housing (38).

11. Remove four screws (36) and four lock washers (37) and right condenser fan motor assembly (38) from condenser fan support (39) and remove right condenser fan motor.

12. Remove right impeller (35) from condenser fan housing (38).

13. Remove four bolts (40) four lock washers (41) eight flat washers (42) and four bushings (43) securing condenser motor (38) to condenser fan support (44).



4-15. CONDENSER FANS, AND SUPPORT ASSEMBLIES/Inspect, Service, Replace (Cont)

LOCATION/ITEM

MOTOR SUPPORTS

Removal:

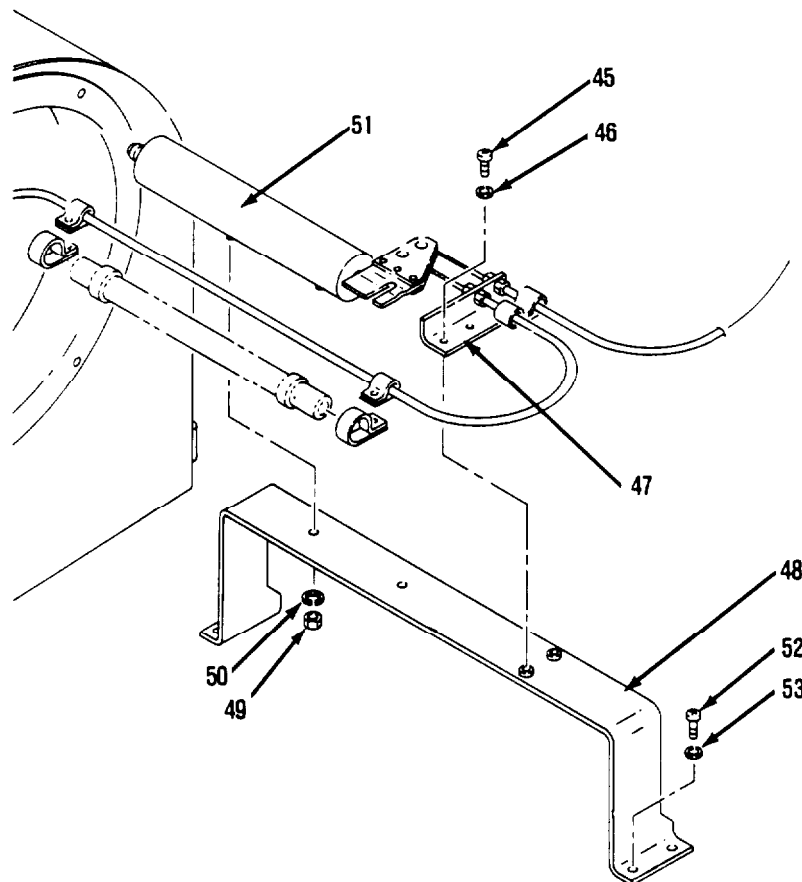
14. Remove two screws (45) and two lock washers (46) from control cable mounting bracket (47) and actuator cylinder mounting bracket (48).

NOTE

Tie actuator cylinder to vibration eliminator.

15. Remove two flat nuts (49) and two lock washers (50) from actuator cylinder (51) and actuator cylinder mounting bracket (48).

16. Remove four screws (52) and four lock washers (53) from actuator cylinder mounting bracket (48) and remove from condenser fan supports (54).



4-15. CONDENSER FANS, AND SUPPORT ASSEMBLIES/Inspect, Service, Replace (Cont)

LOCATION/ITEM

Removal:

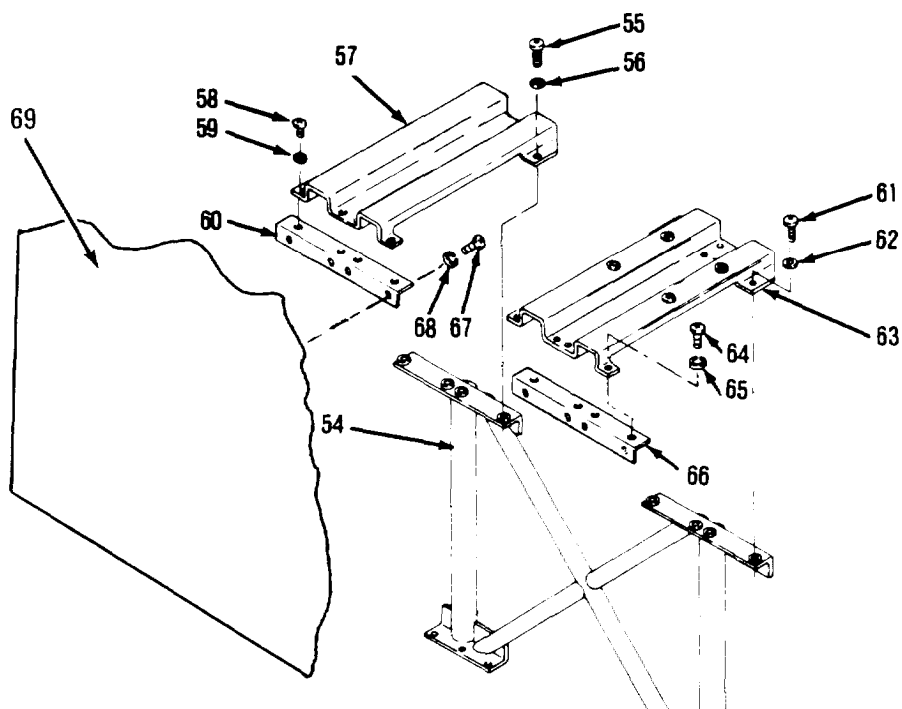
17. Remove three screws (55) and three lock washes (56) from left condenser fan motor support (57) and remove left condenser fan motor support from motor support (54).

18. Remove four screws (58) and four lock washers (59) from left condenser fan motor support (57) and condenser fan motor support (60) on bulkhead (69).

19. Remove three screws (61) and three lock washers (62) from right condenser fan motor support (63) and remove right condenser fan motor support (54).

20. Remove four screws (64) and four lock washers (65) from right condenser fan motor support (63) and condenser fan motor support (66) on bulkhead (69).

21. Remove eight screws (67) and eight lock washers (68) securing condenser fan motor supports (bulkhead) (60) (66) to bulkhead remove condenser fan motor supports from bulkhead (69).



4-15. CONDENSER FANS, AND SUPPORT ASSEMBLIES/Inspect, Service, Replace (Cont)

LOCATION/ITEM

Inspection:

Inspect axial impeller fans for damage and replace if necessary.

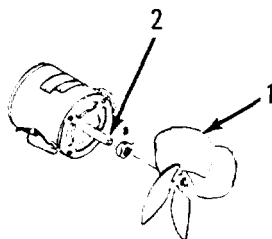
Service:**WARNING**

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F (38°C).

1. Brush off loose dirt or foreign matter from axial impeller fans.
2. Wipe axial impeller fans with a cloth dampened with dry cleaning solvent (Table D-1, Item 3).

Replace:

Place two axial impeller fans (1) onto motor shafts (2).



4-15. CONDENSER FANS, AND SUPPORT ASSEMBLIES/Inspect, Service, Replace (Cont)

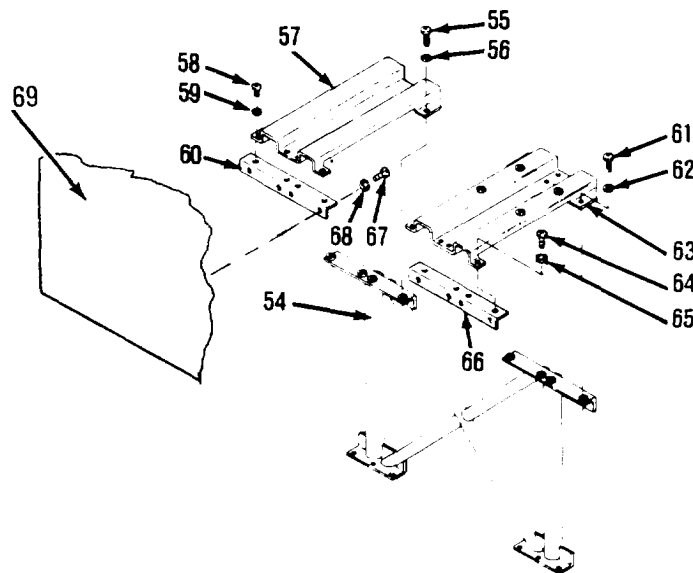
LOCATION/ITEM

Installation:

CAUTION

Do not hammer the impeller onto motor shaft. If difficulty is encountered, dress out rough spots in the shaft with a fine file or abrasive cloth. Apply coating of light oil to ease assembly.

1. Align and secure condenser fan motor supports (60)(66) with holes in bulkhead (69) with eight screws (67) and eight lock washers (68).
2. Align and secure right condenser fan motor support (63) with holes in condenser fan motor support (66) on bulkhead (69) with four screws (4) and four lock washers (65).
3. Align and secure condenser fan motor support (63) to condenser fan motor support (54) with three screws (61) and three lock washers (62).
4. Align and secure left condenser fan motor support (57) with holes in condenser fan motor support 54) condenser fan motor support (60) on bulkhead with four screws (58) and four washers (59).
5. Align and secure left condenser fan motor support (57) to condenser fan motor support (54) with three screws (55) and three lock washers (56).



4-15. CONDENSER FANS, AND SUPPORT ASSEMBLIES/Inspect, Service, Replace (Cont)

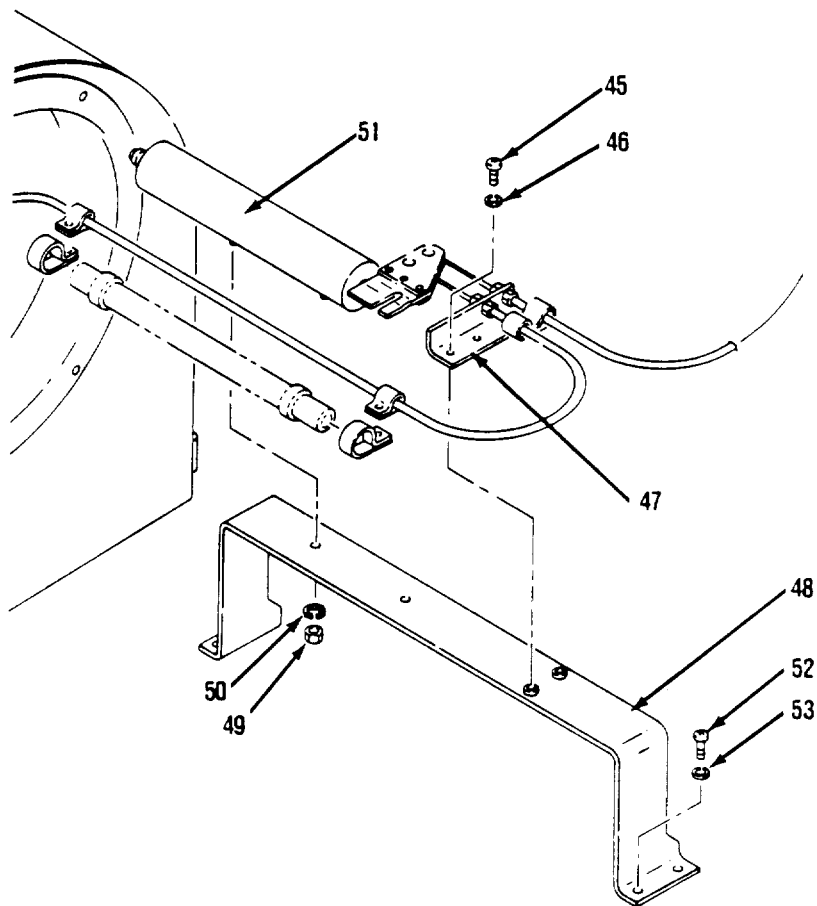
LOCATION/ITEM

Installation:

6. Align and secure actuator cylinder mounting bracket (48) with holes in condenser fan support (54) with four screws (52) and four lock washers (53).

7. Align and secure actuator cylinder (51) with holes in actuator cylinder mounting bracket (48) with two flat nuts (49) and two lock washers (50).

8. Align and secure control cable mounting bracket (47) with holes in actuator cylinder mounting bracket (48) with two screws (45) and two lock washers (46).



4-15. CONDENSER FANS, AND SUPPORT ASSEMBLIES/Inspect, Service, Replace (Cont)

LOCATION/ITEM

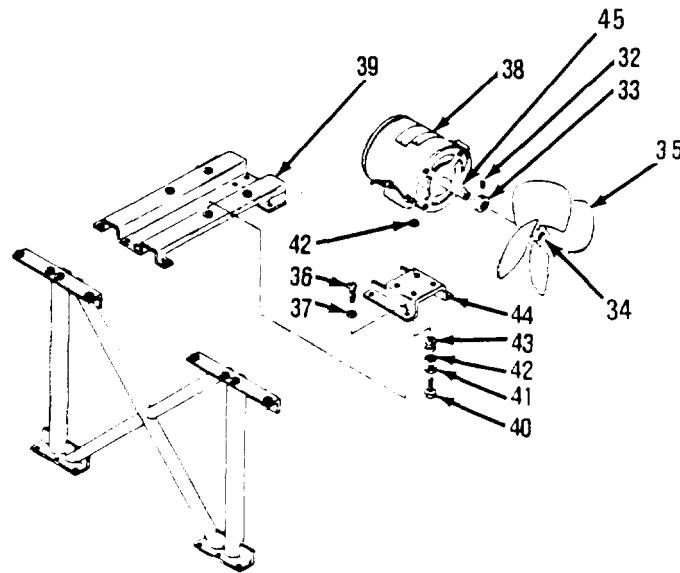
Installation:

9. Align and secure right condenser fan motor (38) with holes in condenser fan motor mounting bracket (44) with four bolts (40) four lock washers (41) eight flat washers (42) and four bushings (43).

10. Place right impeller (4-blades) (35) into right condenser fan housing.

11. Align and secure right condenser fan motor (38) with holes in condenser fan support (39) with four screws (36) and four lock washers (37) on shaft.

12. Slide and tighten right collar (33) with set screw (32) and right impeller (35) with set screw (34) on motor shaft (45).



4-15. CONDENSER FANS, AND SUPPORT ASSEMBLIES/Inspect, Service, Replace (Cont)

LOCATION/ITEM

Installation:

13. Slide left collar (29) and left impeller on motor shaft.

NOTE

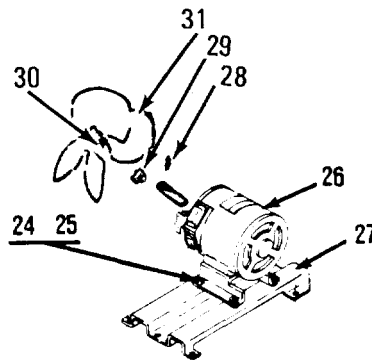
Note the position and number of impeller blades (5) on left side condenser fan assembly for assembly, and be sure to replace it in the same position.

14. Tighten set screw (28) on left collar (29) and set screw (30) on left impeller (31).

15. Align left condenser fan motor assembly (26) with left condenser fan motor support (27) and secure with four screws (24) and four lock washers (25).

CAUTION

Center impellers in fan housing and spin/shafts to be sure no parts are rubbing.



4-15. CONDENSER FANS, AND SUPPORT ASSEMBLIES/Inspect, Service, Replace (Cont)

LOCATION/ITEM

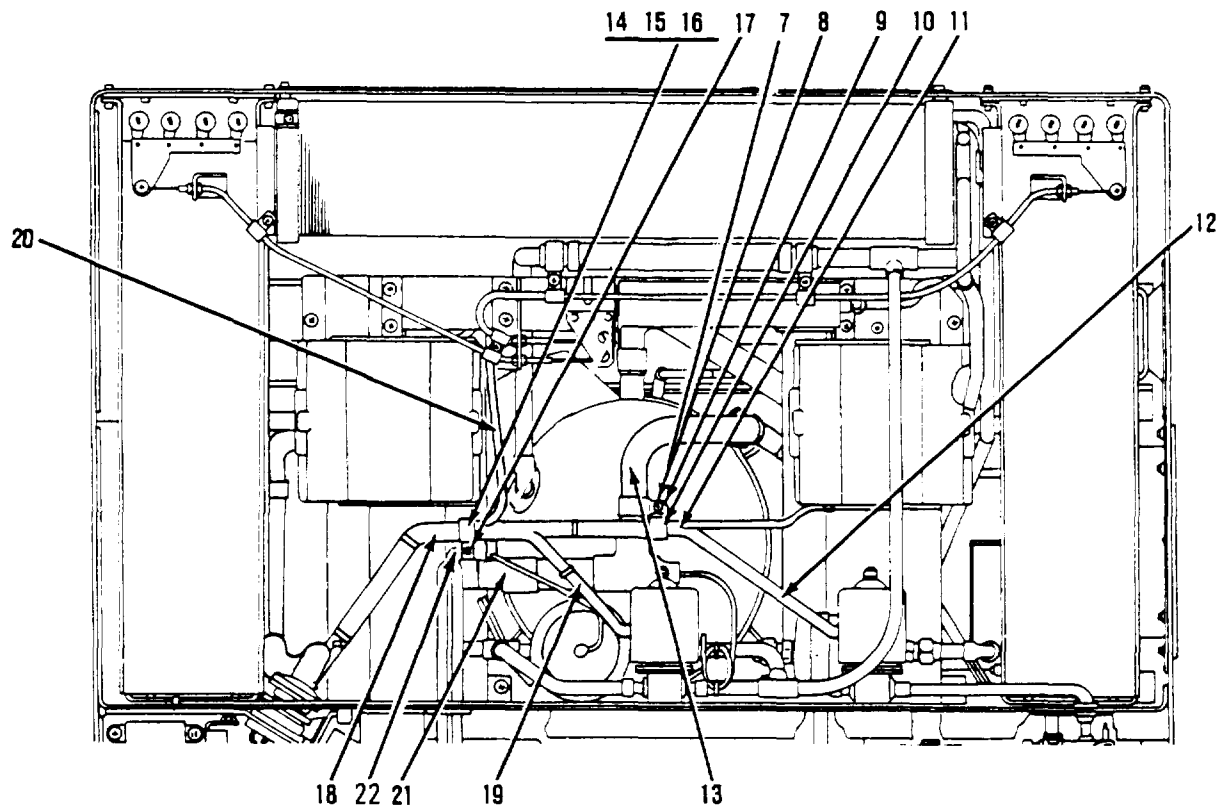
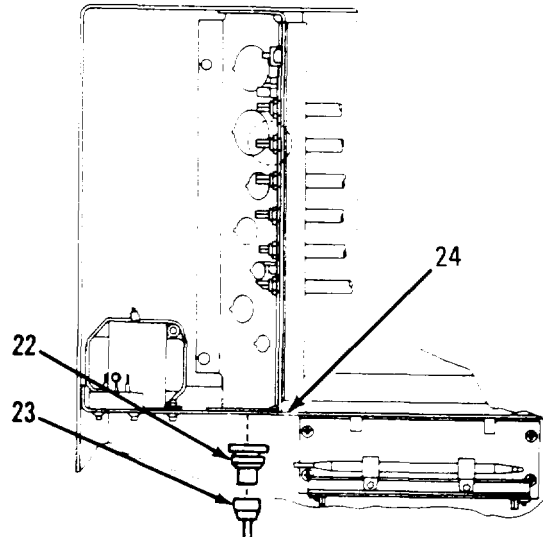
Installation:

16. Connect electrical connector P-4 (22) and P-5 (23) to bulkhead (24).

17. Tie wire ties (22) to prevent damaging of wiring harness to suction line (21).

18. Secure two clamps (17), left condenser fan motor wiring assembly (18) and solenoid valve (L-2) wiring assembly (19) to the suction line (21) with one screw (14) one lock washer (15) and one flat nut (16).

19. Secure two clamps (10) wiring assembly with one screw (7) one lock washer (8) and one flat nut (9).

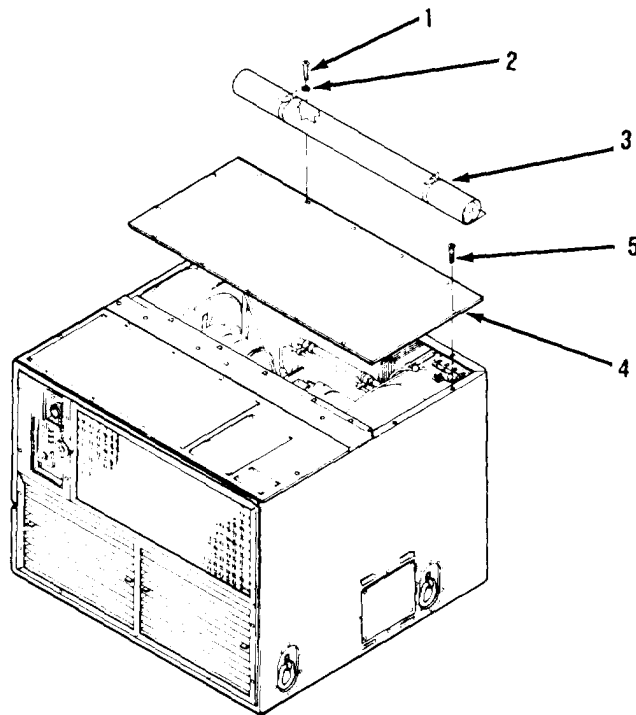


4-15. CONDENSER FANS, AND SUPPORT ASSEMBLIES/Inspect, Service, Replace (Cont)

LOCATION/ITEM

Installation:

20. Align rear cover (4) with holes in housing and secure with fourteen screws (5).
21. Align fabric cover (3) with holes in housing and secure with three screws (1) and three lock washers (2).



4-16. CONDENSER FAN MOTOR/Inspect, Service, Test, Replace

This Task covers:

- a. Removal
- b. Inspect
- c. Service
- d. Test
- e. Replace
- f. Installation

INITIAL SETUP

Disconnect Power

Tools

TOOL KIT (SC 5180-90-CL-N18)

NOTE

Replace maintenance function is done by removal/installation maintenance tasks.

LOCATION/ITEM

CONDENSER, FAN MOTOR

NOTE

Preliminary procedure: Condenser Fans, and Support Assemblies REMOVAL in paragraph 4-15, page 4-39.

Inspect:

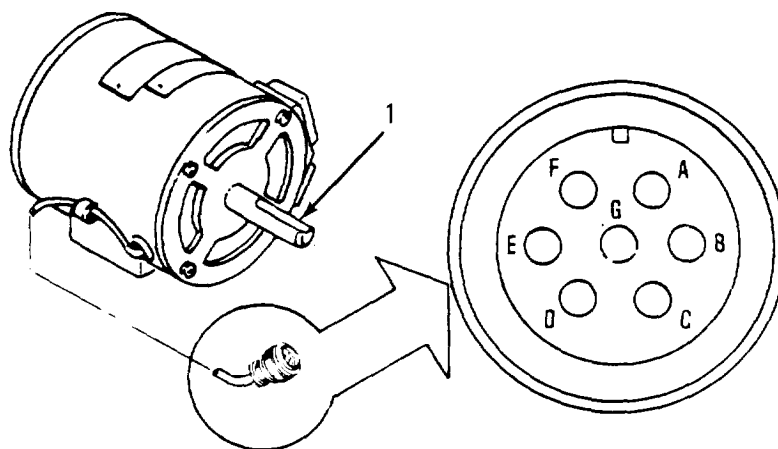
1. Spin rotor shaft (1) and listen for bearing noise indicating rough operation.
2. If roughness exists when turning the shaft slowly backward and forward by hand, replace bearings.
3. Grip the rotor shaft (1) and attempt to pull it in and out checking for end play.
4. If end play exists, replace load springs and shims.

4-16. CONDENSER FAN MOTOR/Inspect, Service, Test, Replace (Cont)

LOCATION/ITEM

Test:

1. Using an ohmmeter or other continuity testing device, check that no continuity exist between all pins and the electrical connector P-4 or P-5.
2. If continuity requirements are not met, replace connector P-4 or P-5.
3. Using an ohmmeter or other continuity testing device, check continuity between connector pins A-B, A-C, and B-C, and between E-F, E-D, and F-D. Continuity should be indicated.
4. If continuity requirements are not met, repair or replace motor.
5. Using an ohmmeter or other continuity testing device, check that no continuity exists between pins A, B, C, D, E, and F and the motor housing (stator).
6. Using an ohmmeter or other continuity testing device, check that continuity does exist between pin G and the motor housing (stator).
7. If continuity requirements are not met, repair or replace motor.
8. Using an ohmmeter or other continuity testing device, check continuity between all terminals on thermal overload (high speed) with white wires.
9. Using an ohmmeter or other continuity testing device, check continuity between all terminals on thermal overload (low speed) with black wires.
10. If continuity requirements are not met, replace thermal overload.



4-16. CONDENSER FAN MOTOR/Inspect, Service, Test, Replace (Cont)

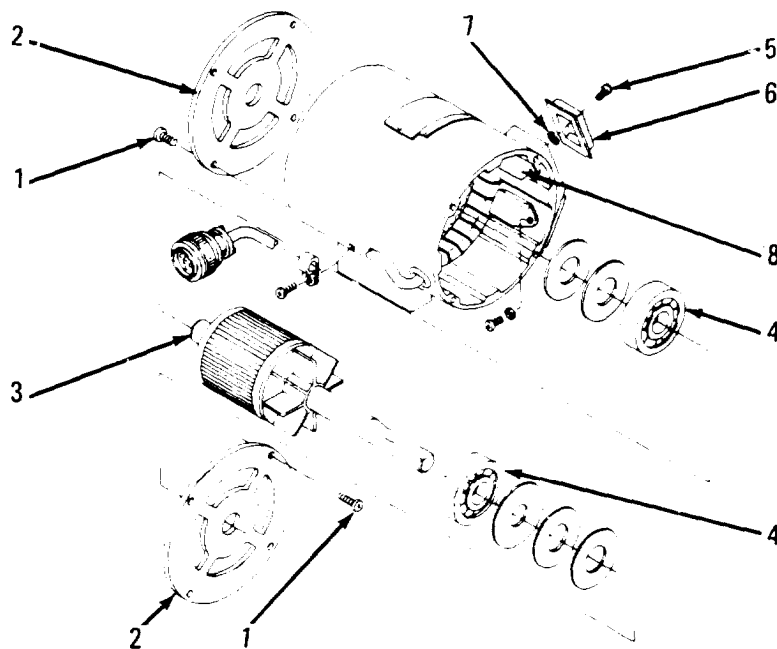
LOCATION/ITEM

Repair:

CAUTION

Keep load spring, shims and washers in their proper relationships at disassembly, they will be needed at assembly.

1. Remove eight screws (1) and end plates (2) from motor.
2. Withdraw the rotor (3) from the stator.
3. Using an arbor press or equivalent, press the bearings (4) off of the end rotor, being careful to avoid cocking.
4. Blow loose dirt from cavities and windings.
5. Remove four screws (5) securing thermal overload cover (6) to condenser motor housing.
6. Remove thermal overload cover and retaining spring (7).
7. Pull thermal overload (8) out and away from condenser motor housing, to gain access to terminals.
8. Unsolder terminals in accordance with Appendix E.
9. Remove and replace thermal overload.



4-16. CONDENSER FAN MOTOR/Inspect, Service, Test, Replace (Cont)

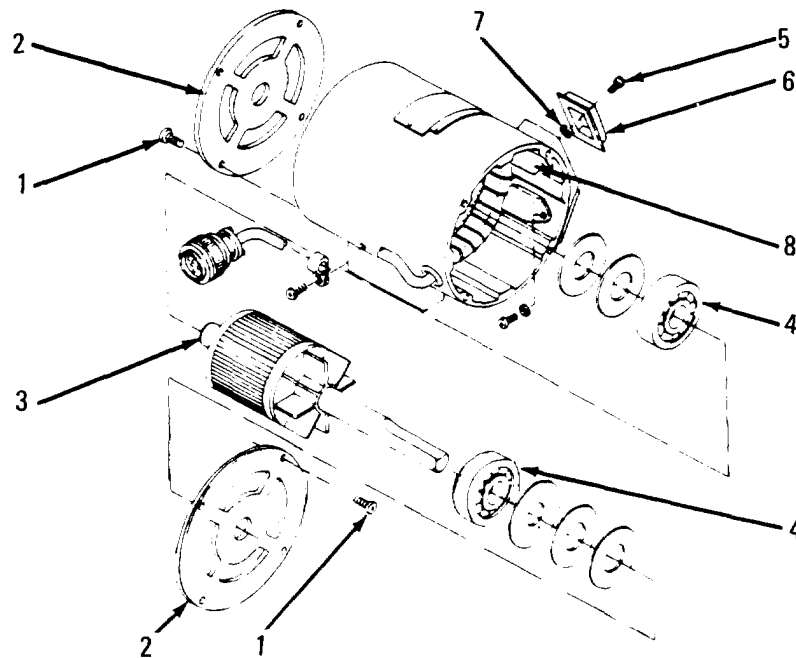
LOCATION/ITEM

Repair:

10. Solder terminals on thermal overload (8) in accordance with Appendix E.
11. Slide thermal overload into condenser fan motor housing.
12. Align retaining spring (7) and thermal overload cover (6) with holes in condenser fan motor housing.
13. Secure terminal overload cover to condenser fan motor housing with four screws (5).
14. Using an arbor press or equivalent, press the bearings (4) onto the end of the rotor, being careful to avoid cocking the bearings.
15. Insert the rotor (3) into the stator.
16. Secure the end plates (2) to the stator with eight screws (1) tighten uniformly in increments.

NOTE

Follow on maintenance: Do the Installation Task, page 4-58.



4-16. CONDENSER FAN MOTOR/Inspect, Service, Test, Replace (Cont)

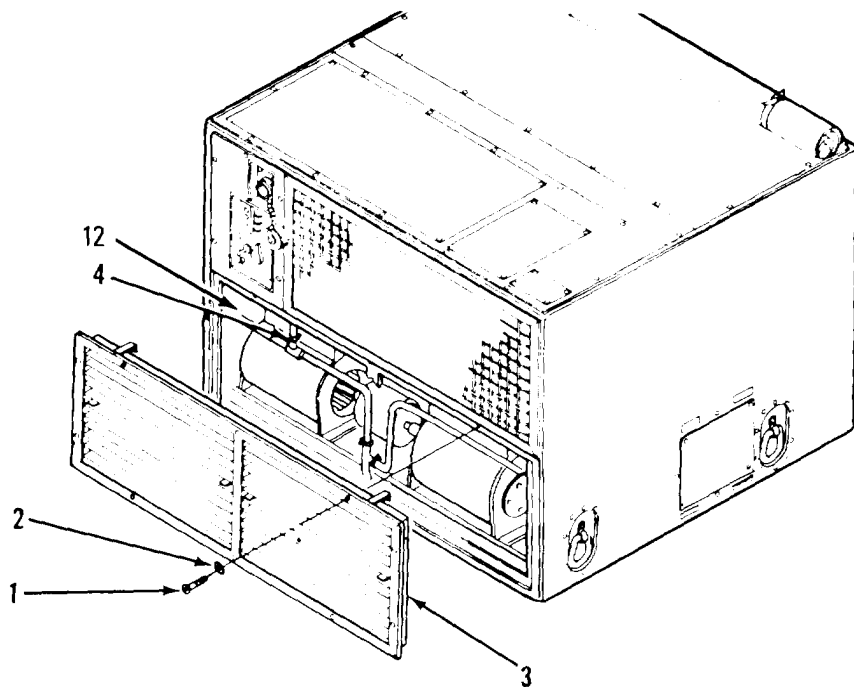
LOCATION/ITEM

CONDENSATE DRAIN ASSEMBLY

Removal:

1. Remove ten screws (1) and ten lock washers (2) from front louver (3) to housing and remove front louver (evaporator inlet).

2. Loosen four clamps (4) from condensate drain hoses (7) and one clamp (5) from condensate drain hose (10) and remove hose (10) from evaporator drain pan (12).

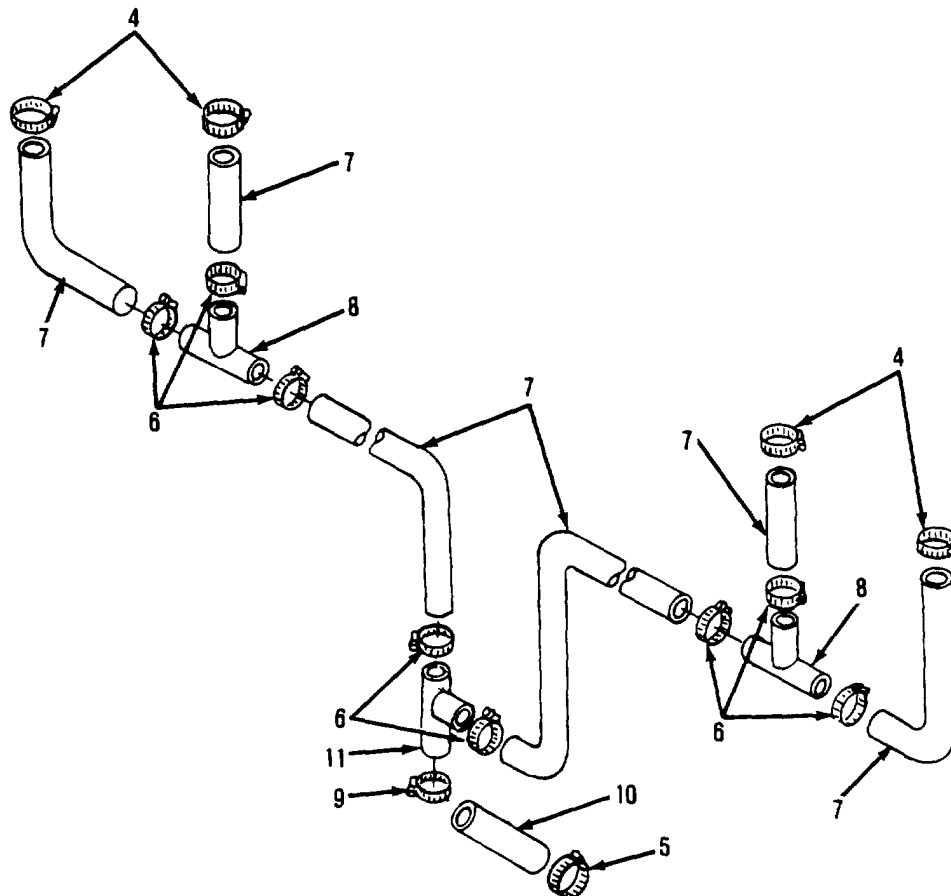


4-16. CONDENSER FAN MOTOR/Inspect, Service, Test, Replace (Cont)

LOCATION/ITEM

Removal:

3. Loosen eight clamps (6) from condensate drain hoses (7) tees (8) and remove drain hoses from tees (8).
4. Loosen one clamp (9) from condensate drain hose (10) and remove hose from tee (11).



4-16. CONDENSER FAN MOTOR/Inspect, Service, Test, Replace (Cont)

LOCATION/ITEM

Inspection:

Inspect for damage, blockage or leaks and replace if damaged.

Service:

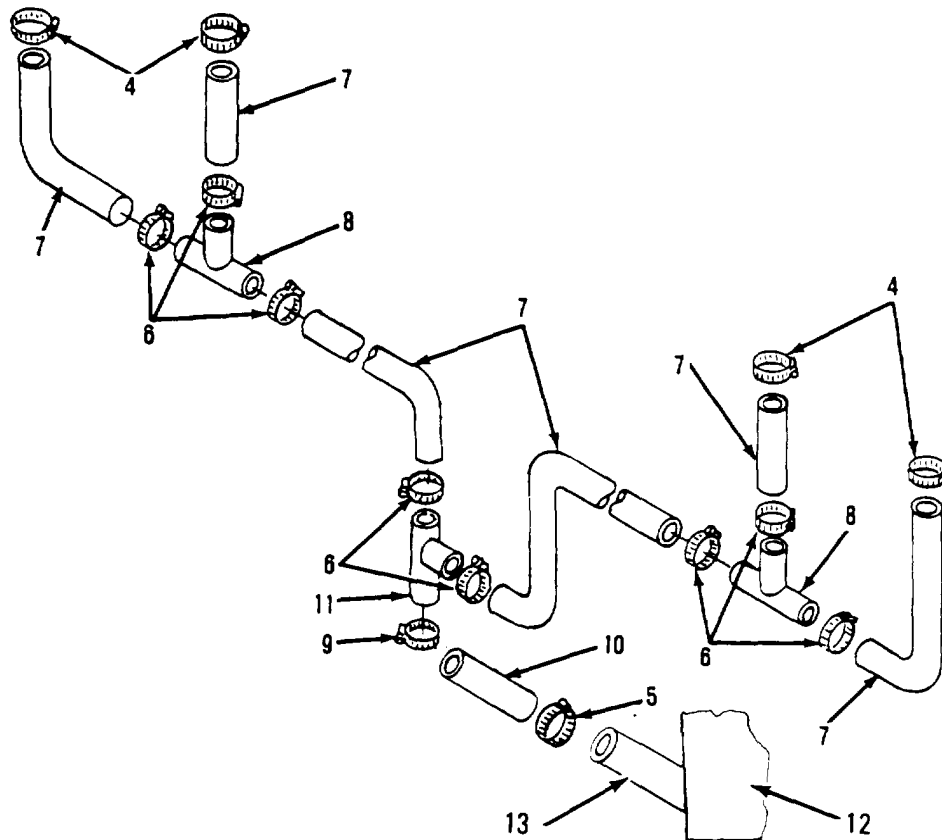
CAUTION

Use compressed air at 30 psi (1.36 Kg/CM2) or less. Hold compressed air nozzle at least 6 to 8 inches away.

Using compressed air, blow thru housing drain tube (13) from evaporator side.

Installation:

1. Align and secure condensate drain hose (10) to tee (11) with one clamp (9).
2. Align and secure six condensate drain hoses (7) to two tees (8) with eight clamps (6).
3. Align and secure condensate drain hose (10) to evaporator drain pan (12) with one clamp (5) and four clamps (4) to condensate drain hoses (7).

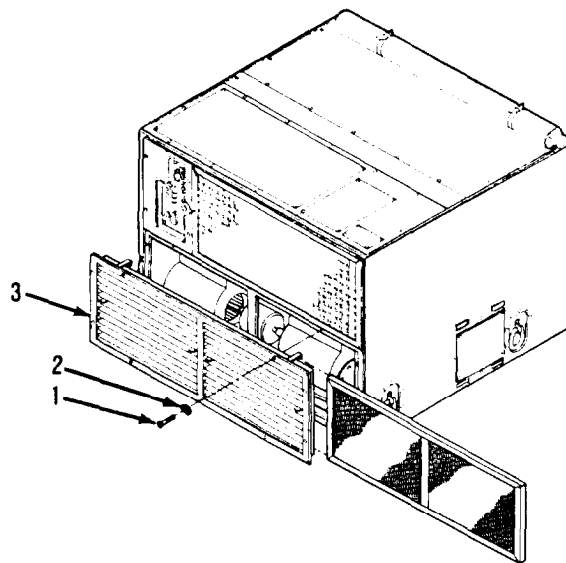


4-16. CONDENSER FAN MOTOR/Inspect, Service, Test, Replace (Cont)

LOCATION/ITEM

Installation:

4. Align front louver (evaporator inlet) (3) with holes in housing and secure with ten screws (1) and ten lock washers (2).



4-17. EVAPORATOR FAN MOTOR AND HOUSING ASSEMBLY/Inspect, Service, Test, Repair, Replace

This Task covers:

- a. Removal
 - b. Inspection
 - c. Service
 - d. Test
 - e. Repair
 - f. Replace
 - g. Installation
-

INITIAL SETUP

Disconnect Power

Tools

TOOL KIT (SC 5180-90-CL-N18)

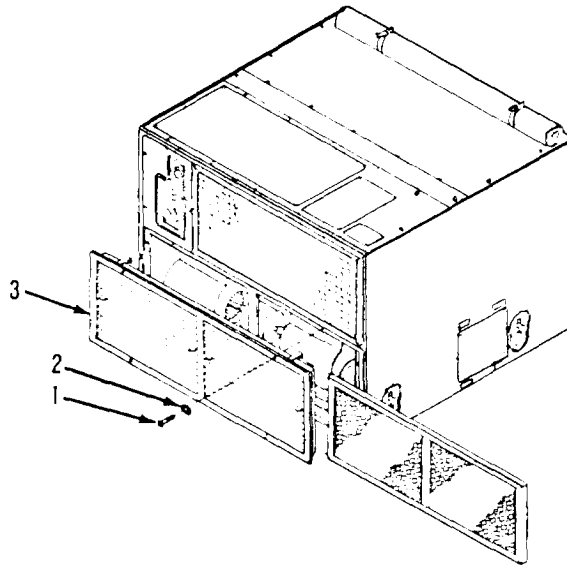
Dry Cleaning Solvent (Table D-1, Item 3)

LOCATION/ITEM

HOUSING AND MOUNTING BASE ASSEMBLIES/EVAPORATOR MOTOR/IMPELLER

Removal:

1. Remove ten screws (1) and ten lock washers (2) from front louver (evaporator inlet) (3) to housing and remove front louver (evaporator inlet) from housing.
2. Remove condensate drain in accordance with paragraph 4-16, page 4-56.



4-17. EVAPORATOR FAN MOTOR AND HOUSING ASSEMBLY/Inspect, Service, Test, Repair, Replace (Cont)

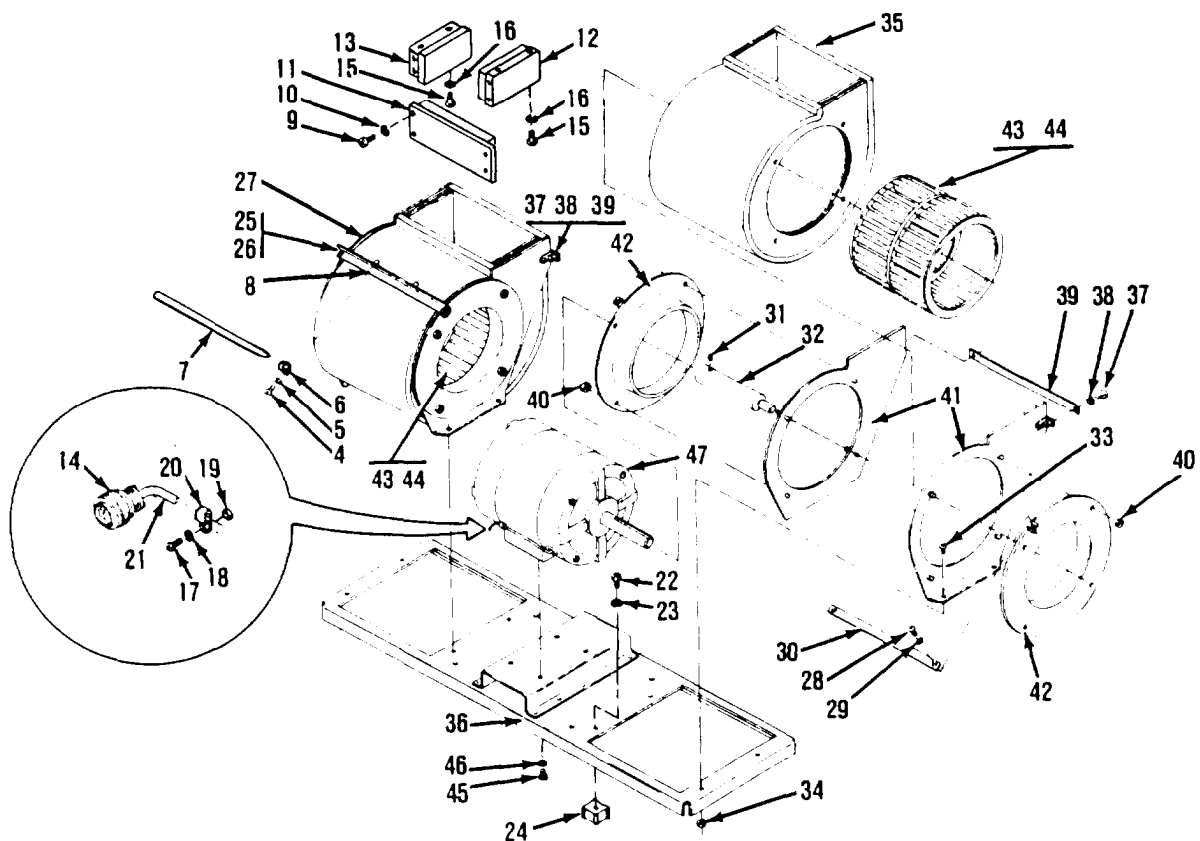
LOCATION/ITEM

HOUSING AND MOUNTING BASE ASSEMBLIES

Removal:

3. Remove two screws (4) two lock washers (5) and two clamps (6) securing thermostat sensor bulb (7) to evaporator fan strap (8).

4. Remove eight screws (9) eight lock washers (10) four screws (15) and four lock washers (16) from front brackets (11) inner brackets (12) outer brackets (13) and remove brackets from evaporator assembly.



4-17. EVAPORATOR FAN MOTOR AND HOUSING ASSEMBLY/Inspect, Service, Test, Repair, Replace (Cont)

LOCATION/ITEM

Removal:

5. Remove two screws (17) two lock washers (18) two flat nuts (19) and two clamps (20) securing evaporator fan motor wiring harness (21) to housing.
6. Disconnect electrical connector (P-3) (14).
7. Remove four bolts (22) four lock washers (23) evaporator fan motor and housing assembly (48) from resilient mounts (24).
8. Remove two screws (25) two flat washers (26) and fan strap (thermostat bulb mount) (8) from left evaporator fan housing (27).
9. Remove two screws (28) two flat washers (29) and fan strap (30) from right evaporator fan housing (35).
10. Loosen two set screws (31) securing motor extension shafts (32) to motor shaft (48).
11. Remove eight screws (33) eight lock nuts (34) and fan housings (27)(35) from evaporator fan and motor base (36).
12. Remove four screws (37) four flat washers (38) and fan straps (39) from evaporator fan housings (27)(35).
13. Remove sixteen lock nuts (40) four flanges (41) and four inlet rings (42) from evaporator fan housings (27)(35).

4-17. EVAPORATOR FAN MOTOR AND HOUSING ASSEMBLY/Inspect, Service, Test, Repair, Replace (Cont)

LOCATION/ITEM

EVAPORATOR MOTOR/IMPELLER

Removal:

NOTE

Right and left impellers are not the same.

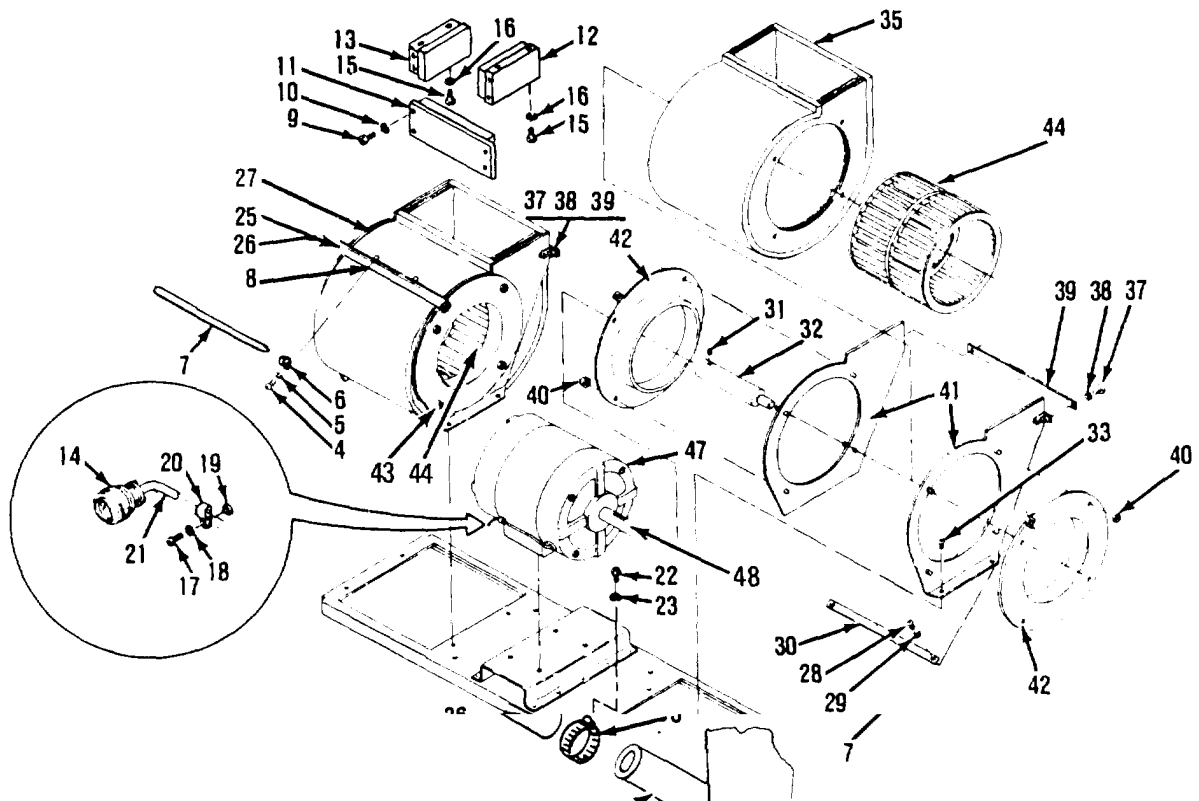
14. Tag and remove two impellers (44) from evaporator fan housings (27)(35).

15. Loosen set screws (43) on impellers (44) and remove two extension shafts (32).

16. Remove four bolts (45) four lock washers (46) and evaporator fan motor (47) from evaporator fan motor base (36).

NOTE

Note position of evaporator fan motor on removal.



4-17. EVAPORATOR FAN MOTOR AND HOUSING ASSEMBLY/Inspect, Service, Test, Repair, Replace (Cont)

LOCATION/ITEM

Inspection:

1. Inspect strap, evaporator fan housing, inlet ring and flange for damage and replace if damaged.
2. Spin the rotor and listen for bearing noise indicating rough operation.
3. If roughness exists, when turning the shaft backward and forward by hand, replace bearings.
4. Grip the rotor shaft and attempt to pull it in and out checking for end play.
5. If end play exists, replace load springs and shims.
6. Inspect impeller for damage and replace if necessary.

Service:

WARNING

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contactt. Do not use near open flame or excessive heat. Flash point of solvent is 100°F (38°C).

1. Brush off loose dirt or foreign matter from impeller.
2. Wipe impeller with a cloth dampened with dry cleaning solvent (Table D-1, Item 3).

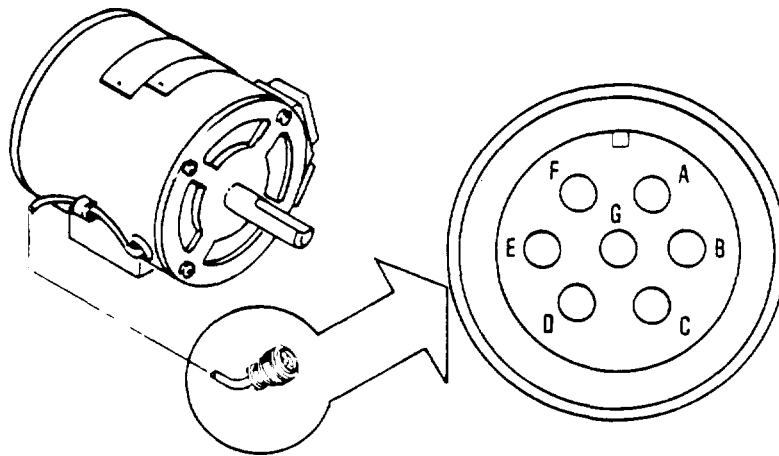
4-17. EVAPORATOR FAN MOTOR AND HOUSING ASSEMBLY/Inspect, Service, Test, Repair, Replace (Cont)

LOCATION/ITEM

EVAPORATOR MOTOR

Test:

1. Using an ohmmeter or other continuity testing device check that no continuity exist between all pins and the electrical connector P-3.
2. If continuity requirements are not met, replace connector P-3.
3. Using an ohmmeter or other continuity testing device, check continuity between connector pins A-B, A-C and B-C, and between D-E, D-F and E-F.
4. If continuity requirements are not met repair or replace evaporator motor.
5. Using an ohmmeter or other continuity testing device, check that continuity exists between pins A, B, C, D, E, and F and the motor housing (stator).
6. Using an ohmmeter or other continuity testing device, check that continuity does exist between pin G and the motor housing (stator).
7. If continuity requirements are not met, repair or replace evaporator motor.
8. Using an ohmmeter or other continuity testing device, check continuity between all terminals on thermal overload (high speed with blue/white wires).
9. Using an ohmmeter or other continuity testing device, check continuity between all terminals on thermal overload (low speed with green/white wires).
10. If continuity requirements are not met, replace thermal overload.

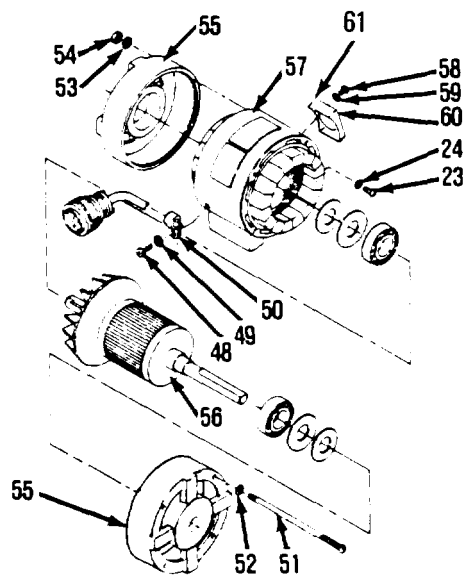


4-17. EVAPORATOR FAN MOTOR AND HOUSING ASSEMBLY/Inspect, Service, Test, Repair, Replace (Cont)

LOCATION/ITEM

Repair:

1. Remove one screw (48) one star washer (49) and one clamp (50) from evaporator fan motor housing (57).
2. Remove four screws (51), four flat washers (52) four star washers (53) and four lock nuts (54) from end plates (55).
3. Lightly tap long end of motor shaft with rubber hammer to remove rotor (56) from motor housing (57).
4. Remove four screws (58) and four star washers (59) securing thermal overload (60) to motor housing (57).
5. Pull thermal overload and mounting block (61) away from evaporator motor end plate (55) to gain access to terminals.
6. Unsolder terminals in accordance with Appendix E.
7. Remove and replace thermal overload.



4-17. EVAPORATOR FAN MOTOR AND HOUSING ASSEMBLY/Inspect, Service, Test, Repair, Replace (Cont)

LOCATION/ITEM

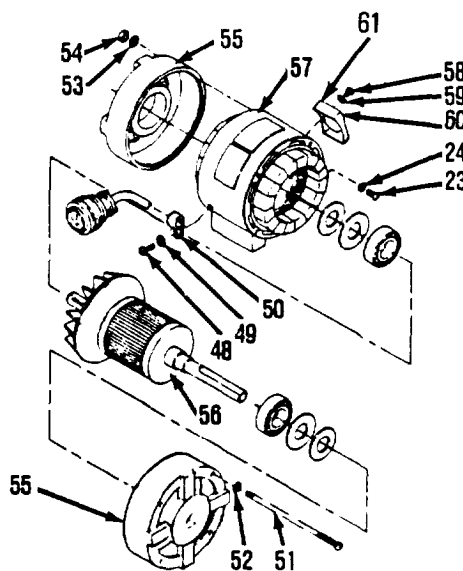
Repair:

8. Solder terminals on thermal overload (60) in accordance with Appendix E.
9. Cement thermal overload (60) to block.
10. Align thermal overload (60) and mounting block (61) with holes in end plate.
11. Secure thermal overload and mounting block to end plate with four screws (58) and four star washers (59).
12. Insert rotor (56) into motor housing (57).
13. Align end plate (55) with holes in motor housing (57).

NOTE

Ensure that drain holes in end plates and housing are at bottom of motor.

14. Tap end plate lightly with rubber hammer to seat bearing into end plate.
15. Secure end plates (56) to motor housing (57) with four screws (51) four flat washers (52) four star washers (53) and four lock nuts (54).
16. Align, secure and clamp to motor housing (57) with one star washer (49) and one screw (48).



4-17. EVAPORATOR FAN MOTOR AND HOUSING ASSEMBLY/Inspect, Service, Test, Repair, Replace (Cont)

LOCATION/ITEM

HOUSING AND MOUNTING BASE ASSEMBLY/MOTOR/IMPELLER

Installation:

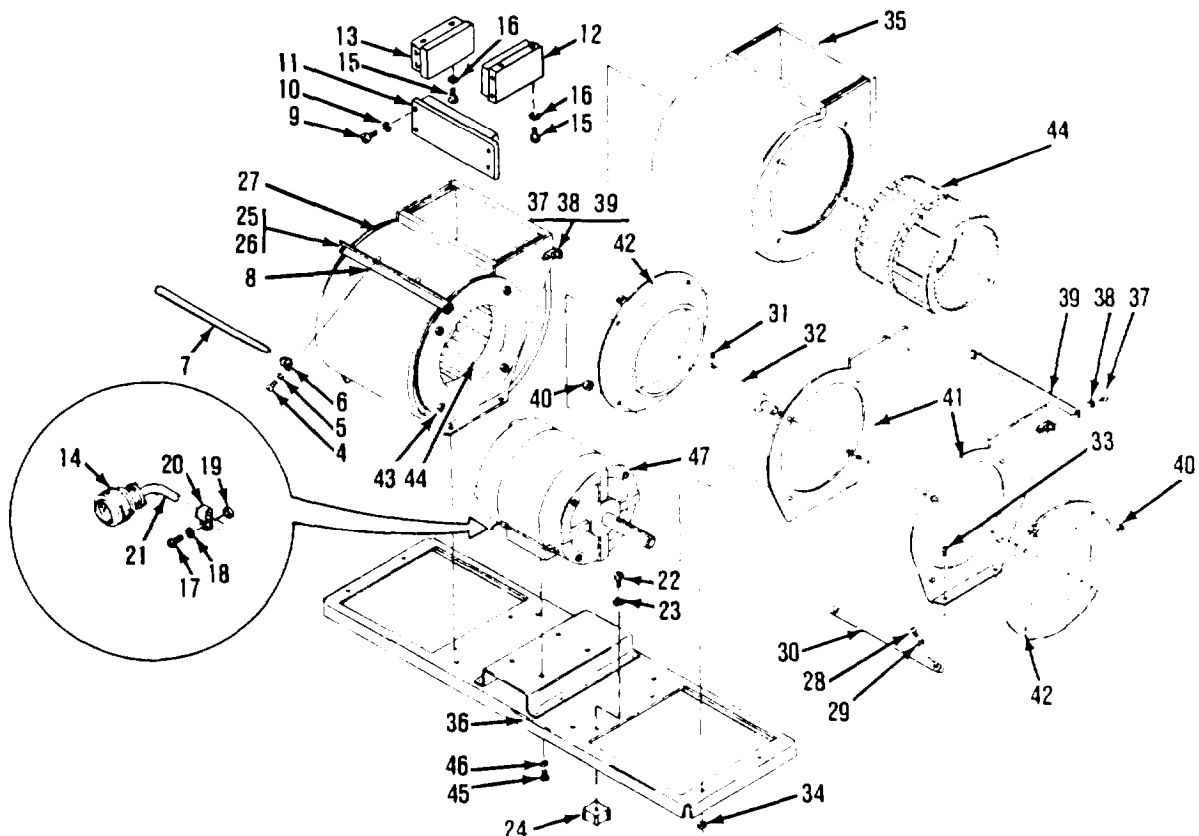
CAUTION

Do not hammer the impeller onto motor shaft. If difficulty is encountered, dress out rough spots in the shaft with a fine file, or abrasive cloth. Apply coating of light oil to ease assembly.

NOTE

Replace maintenance function is accomplished by Removal/Installation Tasks.

1. Align and secure evaporator fan motor (47) with holes in evaporator fan motor base (36) with four lock washers (46) and four bolts (45).
2. Slide impellers (44) onto extension shafts (32) and secure with set screws (43).



4-17. EVAPORATOR FAN MOTOR AND HOUSING ASSEMBLY/Inspect, Service, Test, Repair, Replace (Cont)

LOCATION/ITEM

Installation:**NOTE**

Ensure that impellers marked upon removal are installed in housing assemblies to be used same position as removal.

3. Align four flanges (41) and four inlet rings (42) with holes in evaporator fan housing (35) and secure with sixteen lock nuts (40).

4. Align fan straps (39) with holes in evaporator fan housings (27)(35) and secure with four flat washers (38) and four screws (37).

5. Align evaporator fan housings (27)(35) with holes in evaporator motor base (36) and secure with eight screws (33) and eight lock nuts (34).

6. Tighten set screws (31) on extension shafts (32) to motor shafts (49).

7. Align fan strap (30) with holes in right evaporator fan housing (35) and secure with two screws (28) and two flat washers (29).

8. Align fan strap (temperature selector bulb mount) (8) with holes in left evaporator fan housing (27) and secure fan strap (8) with two screws (25) and two flat washers (26).

CAUTION

Center impeller in fan housing and spin shafts to be sure no parts are rubbing.

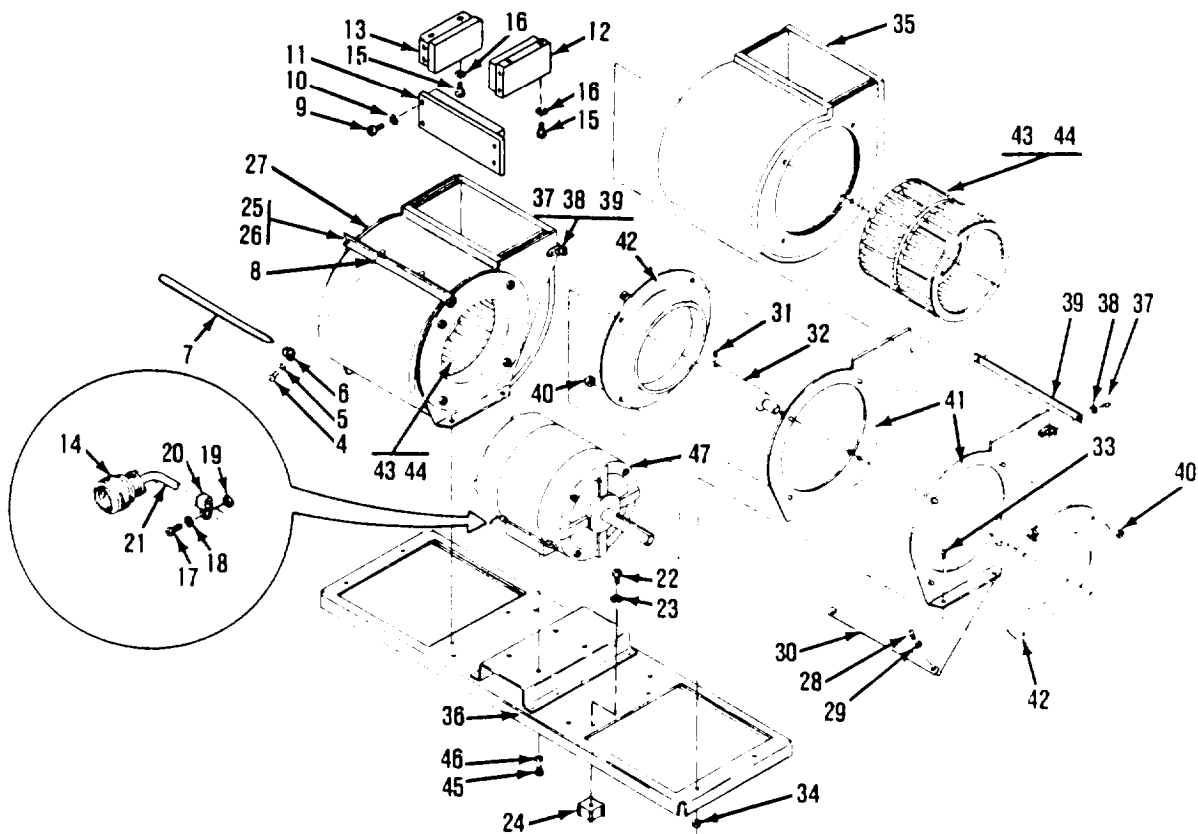
9. Align evaporator housing assembly (48) with four resilient mounts (24) and secure with four bolts (22) and four lock washers (23).

4-17. EVAPORATOR FAN MOTOR AND HOUSING ASSEMBLY/Inspect, Service, Test, Repair, Replace (Cont)

LOCATION/ITEM

Installation:

10. Connect electrical connector P-3 (14).
11. Align and install two clamps (20) around wiring harness (21) with holes in housing and secure with two screws (17) two lock washers (18) and two flat nuts (19).
12. Align outer brackets (13) inner bracket (12) front brackets (11) and align front brackets (11) with holes in inner brackets (12) and outer brackets (13) with holes in evaporator assembly pan.
13. Secure brackets to evaporator assembly pan with four screws (15) four lock washers (16) eight screws (9) and eight lock washers (10).



4-17. EVAPORATOR FAN MOTOR AND HOUSING ASSEMBLY/Inspect, Service, Test, Repair, Replace (Cont)

LOCATION/ITEM

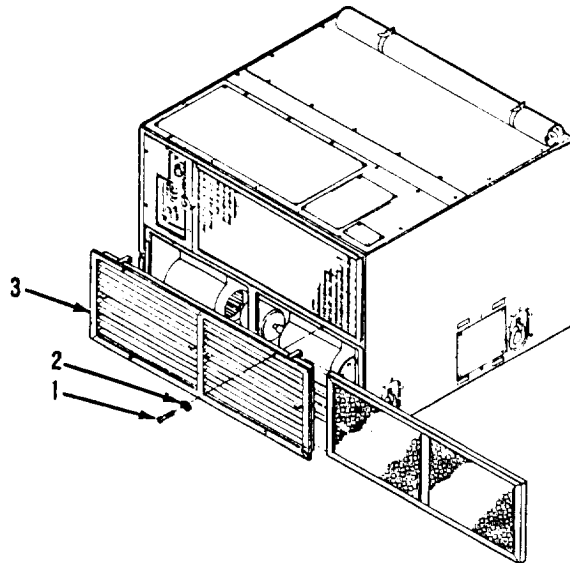
Installation:

14. Install two clamps (6) around temperature selector sensor bulb (7) and align two clamps with holes in evaporator (7) fan strap (8).

15. Secure temperature selector sensor bulb (7) and two clamps (6) with two screws (4) and two lock washers (5).

16. Install condensate drain in accordance with paragraph 4-16, page 4-56.

17. Align front louver (evaporator inlet) (3) with holes in housing and secure with ten screws (1) and ten lock washers (2).



4-18. VENTILATION DAMPER AND ACTUATOR/Inspect, Service, Replace

This Task covers:

- a. Removal
 - b. Inspection
 - c. Service
 - d. Replace
 - e. Installation
-

INITIAL SETUP

Disconnect Power

Tools

TOOL KIT (SC 5180-90-CL-N18)

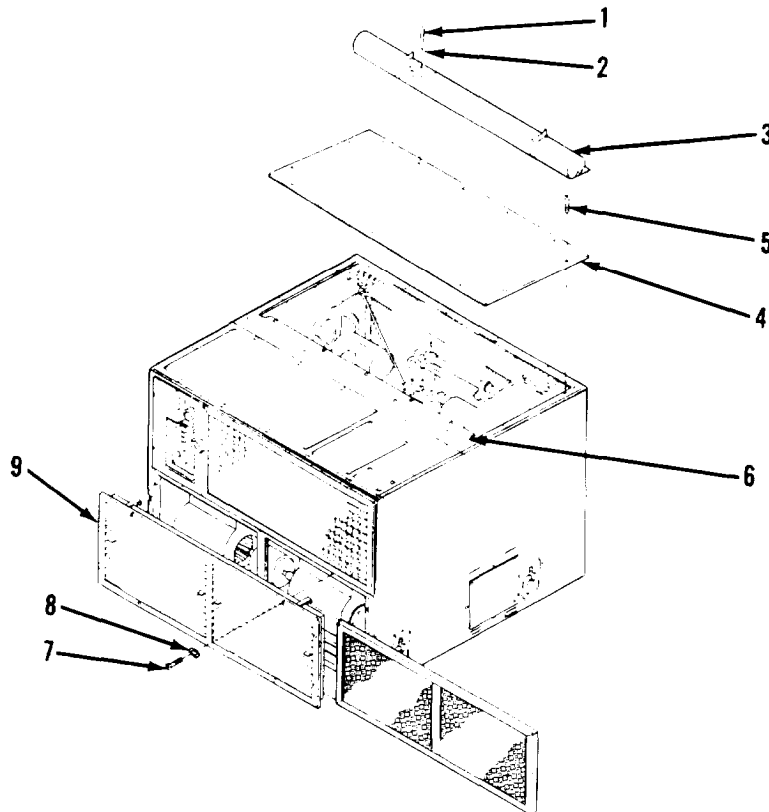
Dry Cleaning Solvent (Table D-1, Item 3)

Grease (Table D-1, Item 17)

LOCATION/ITEM

Removal:

1. Remove three screws (1) and three lock washers (2) and fabric cover (3) to rear cover (4) from housing and fabric cover.
2. Remove fourteen screws (5) from rear cover (4) and center cover (6) from housing.

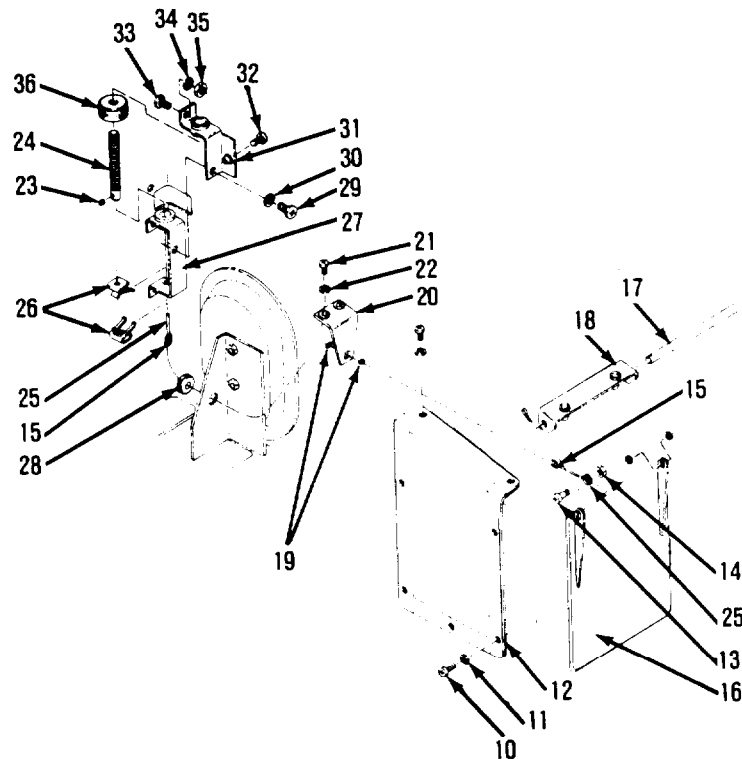


4-18. VENTILATION DAMPER AND ACTUATOR/Inspect, Service, Replace (Cont)

LOCATION/ITEM

Removal:

3. Remove ten screws (7) ten lock washers (8) and front louver (evaporator inlet) (9) from housing.
4. Remove condenser fan motor assembly in accordance with paragraph 4-16, page 4-54.
5. Remove seven screws (10) seven lock washers (11) securing cover (12) to unit.
6. Remove one screw (13) one lock nut (14) door cable (15) from damper door (16).
7. Slide door shaft (17) out of door bracket (18) and remove damper door (16).



4-18. VENTILATION DAMPER AND ACTUATOR/Inspect, Service, Replace (Cont)

LOCATION/ITEM

Removal:

8. Remove two speed nuts (19) two screws (21) two lock washers (22) and damper door cable housing bracket (20).
9. Loosen set screw (23) from damper actuator (24) and pull inner damper door cable (25) from damper door cable housing (15).
10. Remove two speed nuts (26) from the bottom of damper door actuator bracket (27) and remove damper door cable housing and remove bottom grommet (28) from unit.
11. Remove one screw (29) one lock washer (30) and one screw (32) from top damper door actuator bracket (31).
12. Remove one screw (33) one lock washer (34) and one flat nut (35) from top damper door actuator bracket (31).
13. Slide damper door actuator bracket (31) off damper door actuator (24).
14. Remove bottom damper door actuator bracket (27).
15. Remove knob (36) from damper door actuator (24) and from unit.

Inspection:

Inspect for damage and replace if necessary.

Service:

WARNING

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F (38°C).

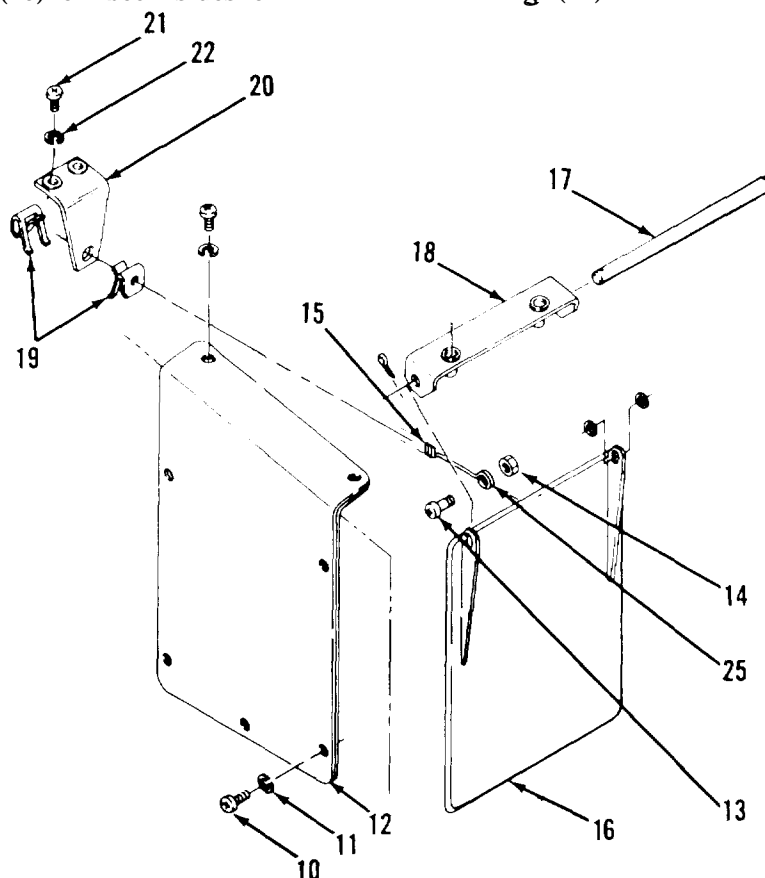
1. Brush off loose dirt or foreign matter.
2. Wipe damper door with a cloth dampened with dry cleaning solvent (Table D-1, Item 3).
3. Apply a thin layer of grease (Table D-1, Item 17) to the inner cable.

4-18. VENTILATION DAMPER AND ACTUATOR/Inspect, Service, Replace (Cont)

LOCATION/ITEM

Installation:

1. Align door (16) and door shaft (17) with door bracket (18).
2. Slide door shaft into door (16).
3. Secure door control cable (25) to door (16) with one screw (13) and one lock nut (14).
4. Align damper cover (12) with holes in unit.
5. Secure damper cover to housing with seven lock washers (11) and seven screws (10).
6. Align door cable bracket (20) with housing.
7. Secure damper door cable bracket (20) to housing with two screws (21), two lock washers (22).
8. Align damper door cable (15) with holes in unit and door cable housing bracket (18).
9. Install speed nuts (19) on both sides of door cable housing (15).

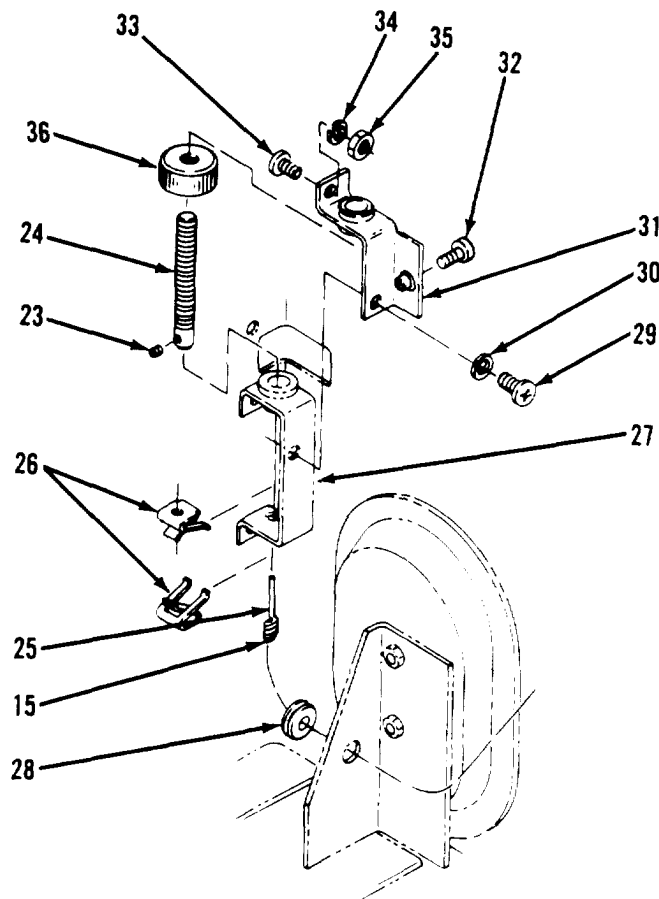


4-18. VENTILATION DAMPER AND ACTUATOR/Inspect, Service, Replace (Cont)

LOCATION/ITEM

Installation:

10. Install grommet (28) in unit and slide door cable into groin met.
11. Align door actuator (24) damper door actuator bracket (27) and damper door adjustment knob (36) with unit.
12. Secure door actuator (24) and damper door actuator bracket with one screw (33) one lock washer (34) and flat nut (35).
13. Secure door actuator and damper door actuator bracket with one screw (29) and one lock washer (30).
14. Secure door actuator and damper door actuator bracket with one screw (32).
15. Install two speed nuts (26) on both sides of damper door actuator mounting bracket.
16. Slide damper door control cable (15) into door actuator (24).
17. Secure damper door cable to damper door actuator with one set screw (23).

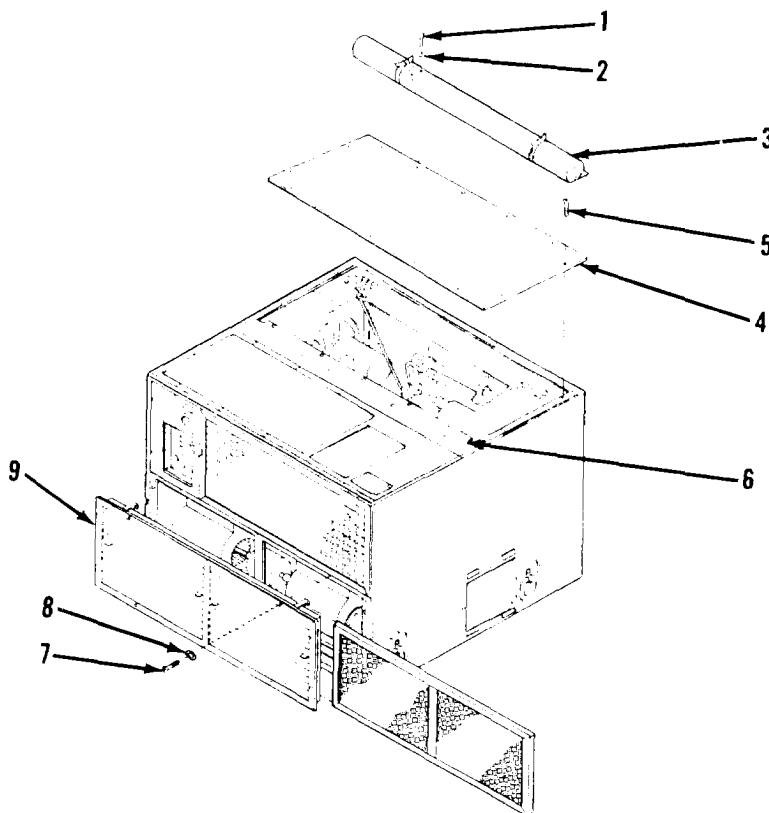


4-18. VENTILATION DAMPER AND ACTUATOR/Inspect, Service, Replace (Cont)

LOCATION/ITEM

Installation:

18. Align front louver (evaporator inlet) (9) with holes in unit and secure housing with ten screws (7) and ten lock washers (8).
19. Install condenser fan motor housing in accordance with paragraph 4-16, page 4-58.
20. Align rear cover (4) with holes in center cover (6) and secure to unit with fourteen screws (5) to unit.
21. Align fabric cover (3) with holes in housing and secure with three screws (1) and three lock washers (2).



**4-19. PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR, CHARGING VALVES
AND RELATED TUBING/Inspect, Test**

This Task covers:

- a. Remove
 - b. Inspect
 - c. Test
-

INITIAL SETUP

Disconnect Power

Tools

TOOL KIT (SC 5180-90-CL-N18)

MULTIMETER

General Safety Instructions

Turn air conditioner OFF before performing maintenance

LOCATION/ITEM

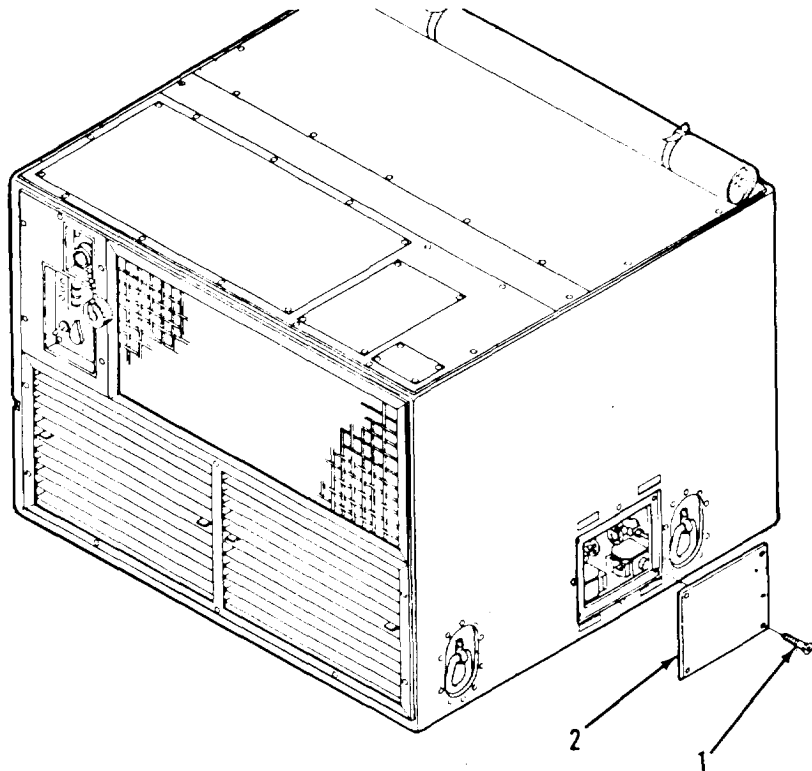
PRESSURE SWITCHES

Removal:

Remove eight screws (1) and access cover (2) from housing.

Inspection:

- 1. Inspect for damage.
- 2. If damaged notify Direct Support Maintenance.

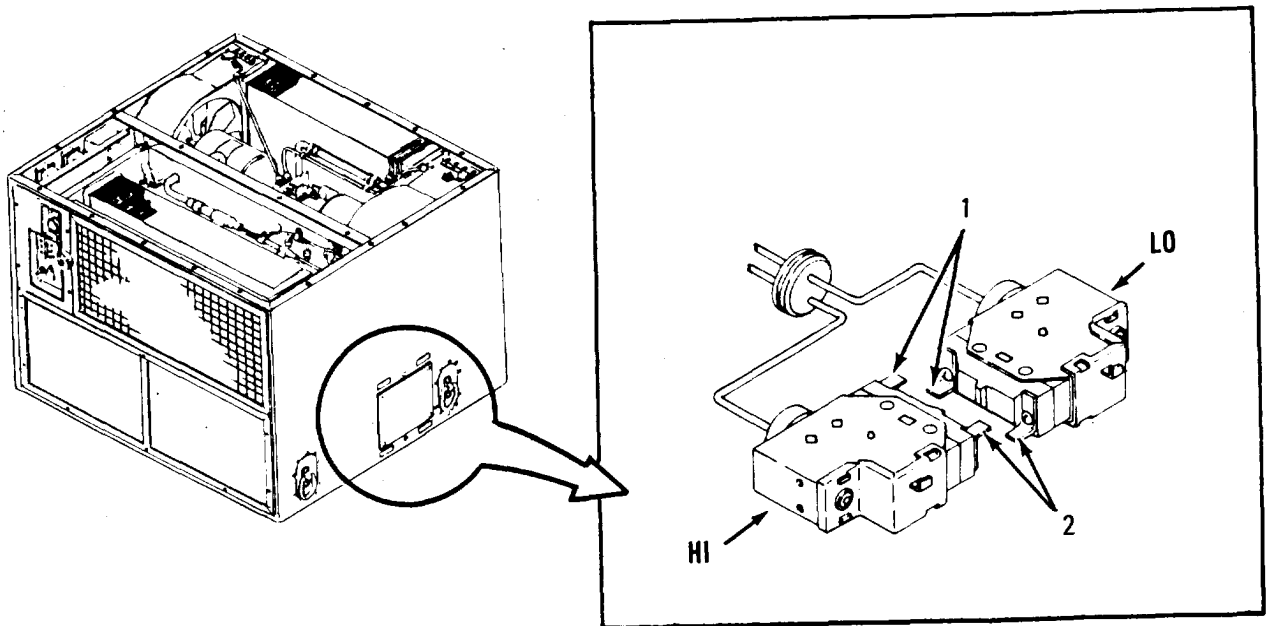


4-19. PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR, CHARGING VALVES AND RELATED TUBING/Inspect, Test (Cont)

LOCATION/ITEM

Test:

1. Using a multimeter or other continuity testing device, check for continuity between terminals (1) and (2).
2. If continuity does not exist high pressure switch is defective.
3. If defective notify Direct Support Maintenance.

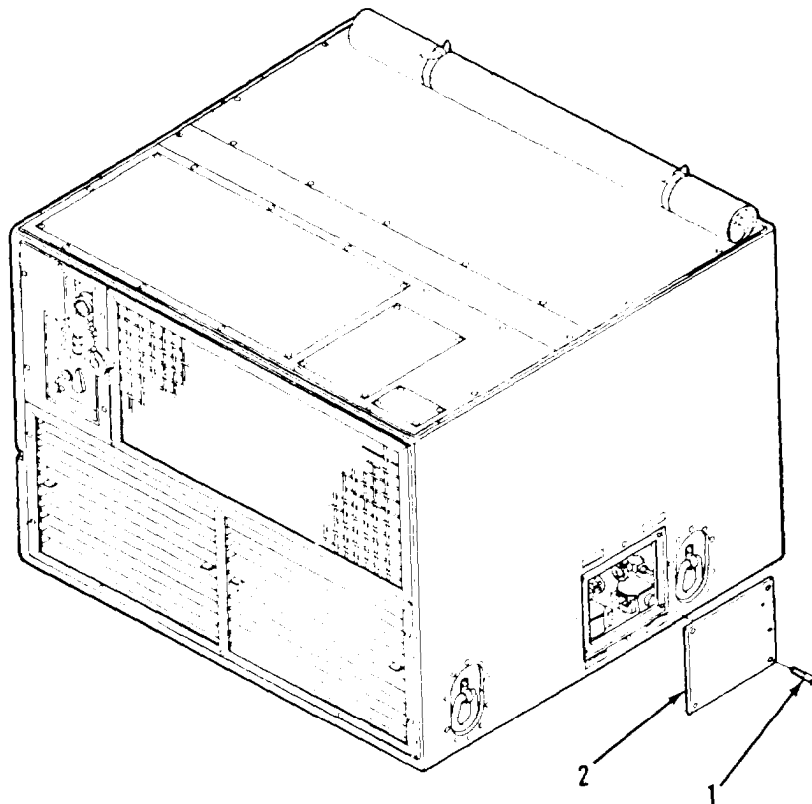


**4-19. PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR, CHARGING VALVES
AND RELATED TUBING/Inspect, Test (Cont)**

LOCATION/ITEM

Installation:

Align access cover (2) with holes in housing and secure with eight screws (1).



4-20. COMPRESSOR, ACCUMULATOR, AND RELATED PARTS/Inspect, Test

This Task covers:

- a. Removal
 - b. Inspect
 - c. Test
 - d. Installation
-

INITIAL SETUP

Disconnect Power

Tools

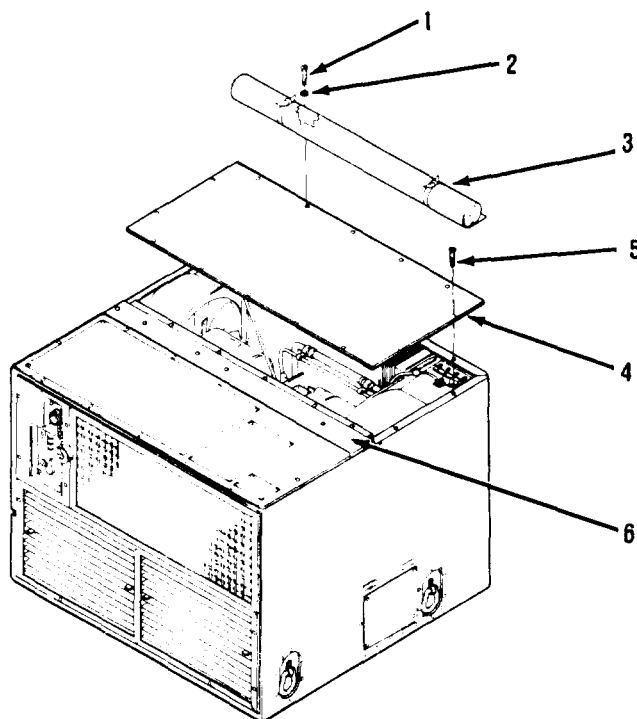
TOOL KIT (SC 5180-90-CL-N18)

OHMMETER

LOCATION/ITEM

COMPRESSOR**Removal:**

1. Remove three screws (1) three lock washers (2) and fabric cover (4) from housing.
2. Remove fourteen screws (5) and rear cover (4) from housing.



4-20. COMPRESSOR, ACCUMULATOR, AND RELATED PARTS/Inspect, Test (Cont)

LOCATION/ITEM

Removal:

3. Remove condenser fans and support assemblies in accordance with paragraph 4-15, page 4-39.

Inspection:

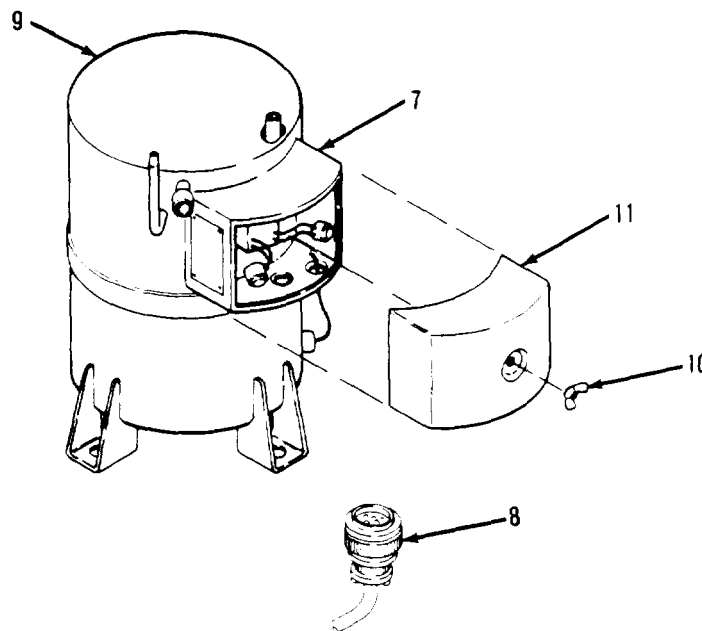
1. Inspect for damage.
2. If damaged notify Direct Support Maintenance.

Test:

CAUTION

Compressor schematic is deceptive. Red, white and black wires are yellow wires striped with red, white and black respectively.

1. Disconnect plug P-7 (8), from the electrical junction box (7) on the compressor (9).
2. Remove wing nut (10) securing compressor junction box cover (11) to compressor.
3. Remove compressor junction box cover (11).



4-20. COMPRESSOR, ACCUMULATOR, AND RELATED PARTS/Inspect, Test (Cont)

LOCATION/ITEM

MOTOR, COMPRESSOR

Test:

1. Use an ohmmeter or other continuity testing device, check continuity between connector pins A-B, A-C and B-C. Continuity should not be indicated.
2. Using an ohmmeter or other continuity testing device, check continuity between compressor housing and connector pins A, B and C. Continuity should not be indicated.
3. If continuity requirements are not met, notify Direct Support.

Thermal Overload Compressor

1. Using an ohmmeter or other continuity testing device, check continuity between thermal overload pins. Continuity should be indicated.
2. Using an ohmmeter or other continuity testing device, check continuity between thermal overload and compressor housing. Continuity should not be indicated.
3. If continuity requirements are not met, notify Direct Support.

Crankcase Heater

1. Using an ohmmeter or other continuity testing device, check continuity between connector pins. Continuity should be indicated.
2. Using an ohmmeter or other continuity testing device, check continuity between compressor housing and connector pins. Continuity should be indicated.
3. If continuity requirements are not met, notify Direct Support.

Thermal Overload Crankcase Heater

1. Using an ohmmeter or other continuity testing device, check continuity between connector pins. Continuity should be indicated.
2. Using an ohmmeter or other continuity testing device, check continuity between compressor housing and connector pins. Continuity should not be indicated.
3. If continuity requirements are not met, notify Direct Support. Check for the lack of continuity between the two thermal overload (crankcase heater). Replace thermal overload (crankcase heater) that does not meet continuity requirements.
4. Check system pressures in accordance with (Table 5-2).

4-20. COMPRESSOR, ACCUMULATOR, AND RELATED PARTS/Inspect, Test (Cont)

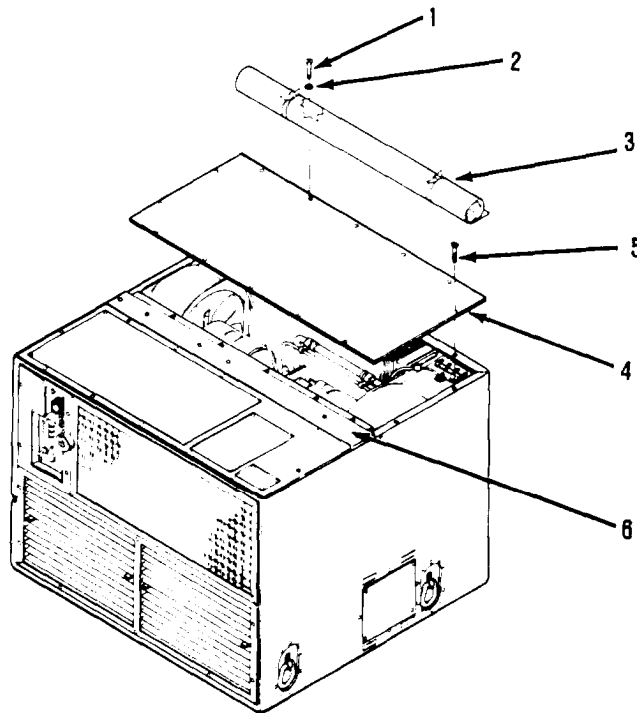
LOCATION/ITEM

Test:

5. If suction pressure is high and discharge pressure is low, notify Direct Support Maintenance.

Installation:

1. Install condenser fans, support assemblies in accordance with paragraph 4-15, page 4-46.
2. Align rear cover(4) with holes (6) and housing and secure with fourteen screws(5).
3. Align fabric cover(3) with holes in housing and secure with three screws (1) and three lock washers (2).



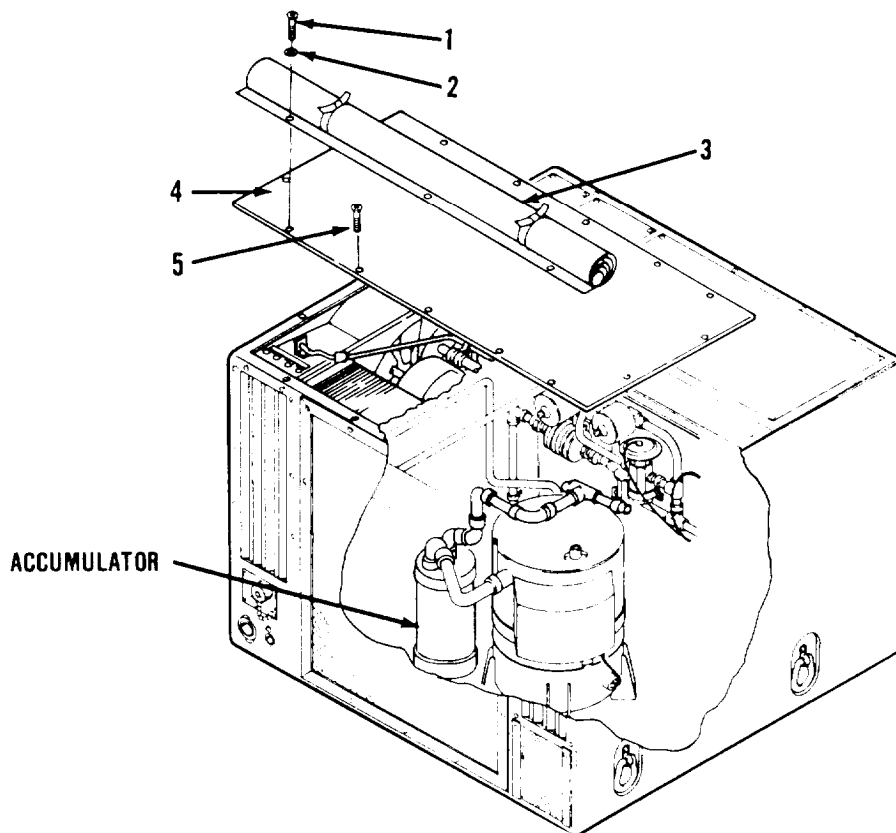
4-20. COMPRESSOR, ACCUMULATOR, AND RELATED PARTS/Inspect, Test (Cont)

LOCATION/ITEM

ACCUMULATOR

Removal:

1. Remove three screws (1) three lock washers (2) and fabric cover (3) to rear cover (4) from housing.
2. Remove fourteen screws (5) and rear cover (4) from housing.
3. Remove condenser fans and support assemblies in accordance with paragraph 4-15, page 4-43.



4-20. COMPRESSOR, ACCUMULATOR, AND RELATED PARTS/Inspect, Test (Cont)

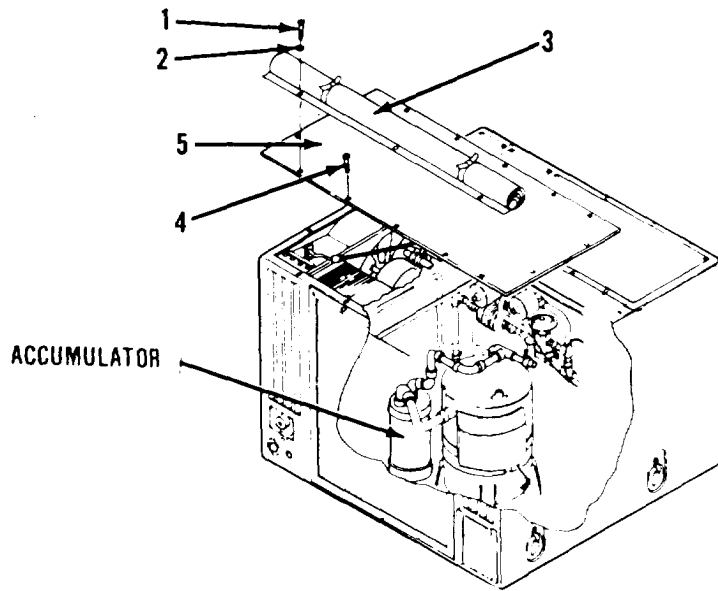
LOCATION/ITEM

Inspect:

1. Inspect for damage.
2. If damaged notify Direct Support Maintenance.

Installation:

1. Install condenser fans and support assemblies in accordance with paragraph 4-15, page 4-46.
2. Align rear cover (4) with holes in housing and secure with fourteen screws (5).
3. Align fabric cover (3) with holes in housing and secure with three screws (1) and three lock washers (2).



**4-21. EVAPORATOR AND CONDENSER COILS AND RELATED COMPARTMENT
PARTS/Service, Replace**

This Task covers:

- a. Removal
 - b. Service
 - c. Replace
 - d. Installation
-

INITIAL SETUP

Disconnect Power

Tools

TOOL KIT (SC 5180-90-CL-N18)

Dry Cleaning Solvent (Table D-1, Item 3)

General Safety Instructions

Turn air conditioner OFF before performing maintenance

LOCATION/ITEM

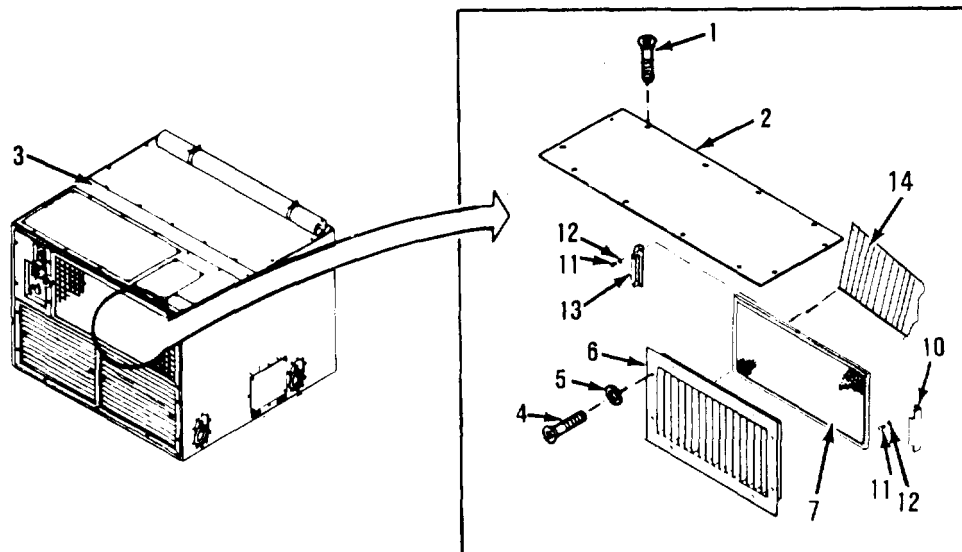
NOTE

Replace maintenance function is done by removal/installation maintenance tasks.

MIST ELIMINATOR

Removal:

1. Remove fourteen screws (1) and front cover (2) from housing.
2. Remove eight screws (4) eight lock washers (5) and front louver (evaporator discharge) (6) from housing.



**4-21. EVAPORATOR AND CONDENSER COILS AND RELATED COMPARTMENT
PARTS/Service, Replace (Cont)**

LOCATION/ITEM

Removal:

3. Lift mist eliminator (7) out of brackets (10)(13).
4. Remove two screws (8) and two lock washers (9) and right mist eliminator mounting bracket (10) from evaporator coil (14).
5. Remove two screws (11) and two lock washers (12) and left mist eliminator mounting bracket (13) from evaporator coil (14).

Inspection:

1. Inspect mist eliminator (7) for tears, cracks, bends.
2. Replace if damaged.
3. Inspect brackets (10)(13) for damage.
4. Replace if damaged.

**4-21. EVAPORATOR AND CONDENSER COILS AND RELATED COMPARTMENT
PARTS/Service, Replace (Cont)**

LOCATION/ITEM

Service:**WARNING**

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F (38°C).

WARNING

Use compressed air at 30 psi (1.36 kg) or less. Hold compressed air nozzle at least six to eight inches away from mist eliminator.

1. Clean mist eliminator with warm soapy water or dry cleaning solvent (Table D-1, Item 3).
2. Dry thoroughly with low pressure compressed air.

Installation:

1. Align right mist eliminator mounting bracket (10) with holes in evaporator coil (14) and secure with two screws (8) and two lock washers (9).
2. Align left mist eliminator mounting bracket (13) with holes in evaporator coil (14) and secure with two screws (11) and two lock washers (12).

NOTE

Arrow on mist eliminator must point outward.

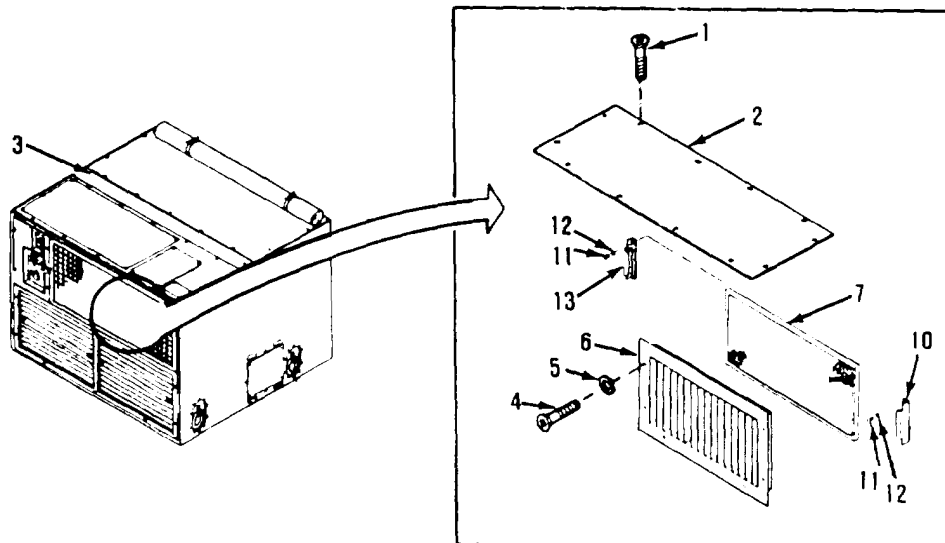
3. Slide mist eliminator (7) out of mist eliminator mounting brackets (10)(13).
4. Align front louver (evaporator discharge) (6) with holes in housing and secure with eight screws (4) and eight lock washers (5).

**4-21. EVAPORATOR AND CONDENSER COILS AND RELATED COMPARTMENT
PARTS/Service, Replace (Cont)**

LOCATION/ITEM

Installation:

5. Align front cover (2) with holes in center cover and housing and secure with fourteen screws (1).



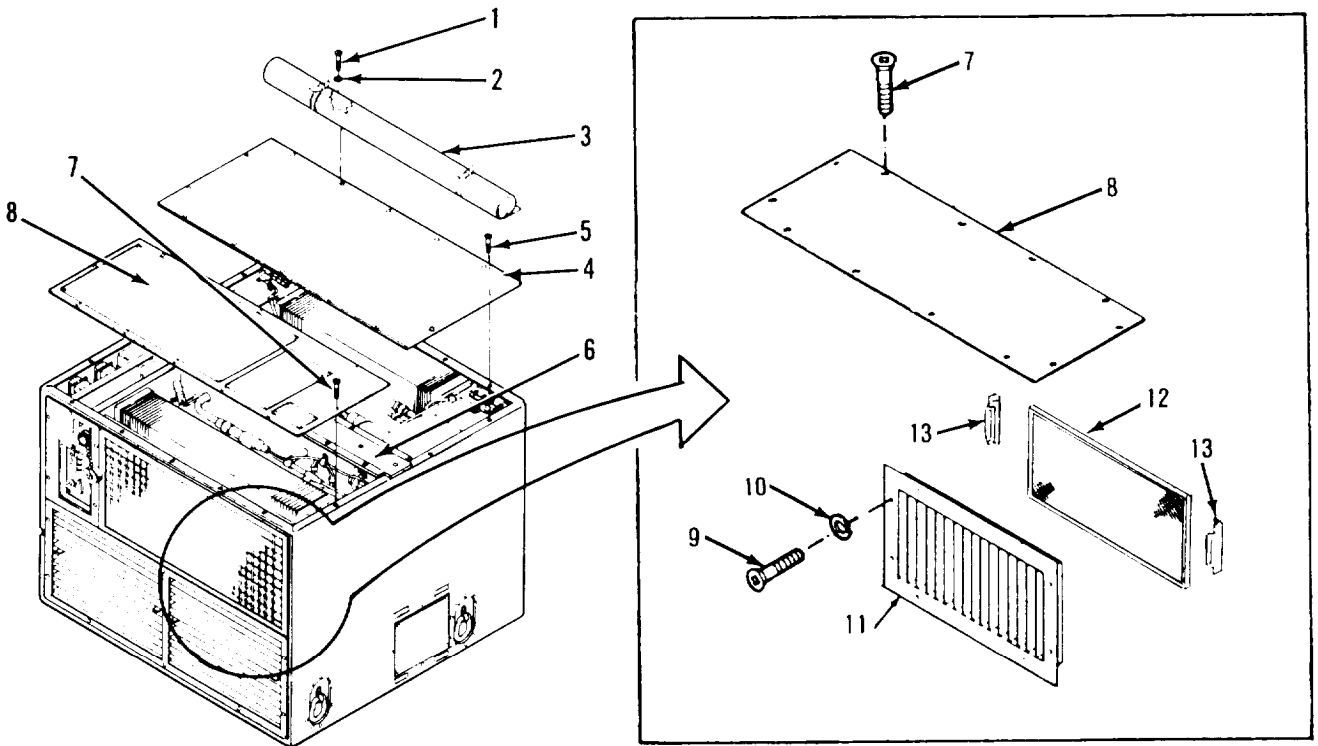
**4-21. EVAPORATOR AND CONDENSER COILS AND RELATED COMPARTMENT
PARTS/Service, Replace (Cont)**

LOCATION/ITEM

COILS

Removal:

1. Remove three screws (1) three lock washers (2) and fabric cover (3) from housing.
2. Remove fourteen screws (5) and rear cover from housing.



**4-21. EVAPORATOR AND CONDENSER COILS AND RELATED COMPARTMENT
PARTS/Service, Replace (Cont)**

LOCATION/ITEM

Removal:

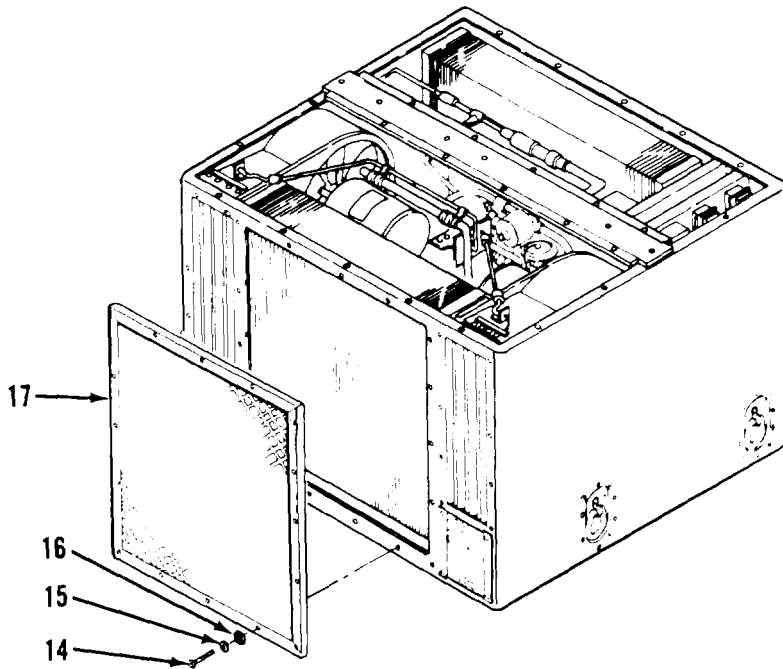
3. Remove fourteen screws (7) and front cover (8) from housing.

FRONT LOUVER (EVAPORATOR DISCHARGE)

4. Remove eight screws (9) and eight lock washers (10) and front louver (evaporator discharge) (11) from housing.

5. Lift mist eliminator (12) out of mounting brackets (13).

6. Remove seventeen screws (14), seventeen lock washers (15) and one snap fastener (16) and condenser coil guard (17) from housing.



**4-21. EVAPORATOR AND CONDENSER COILS AND RELATED COMPARTMENT
PARTS/Service, Replace (Cont)**

LOCATION/ITEM

Service:**WARNING**

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F (38°C).

WARNING

Do not use steam to clean the coil. Hot steam will splash and cause burns. The high heat could cause high system pressure.

WARNING

Wear safety glasses when cleaning coil.

WARNING

Use compressed air at 30 psi (1.36 kg) or less. Hold compressed air nozzle at least six to eight inches away from coil.

NOTE

Always use compressed air in direction of air flow marked on coils.

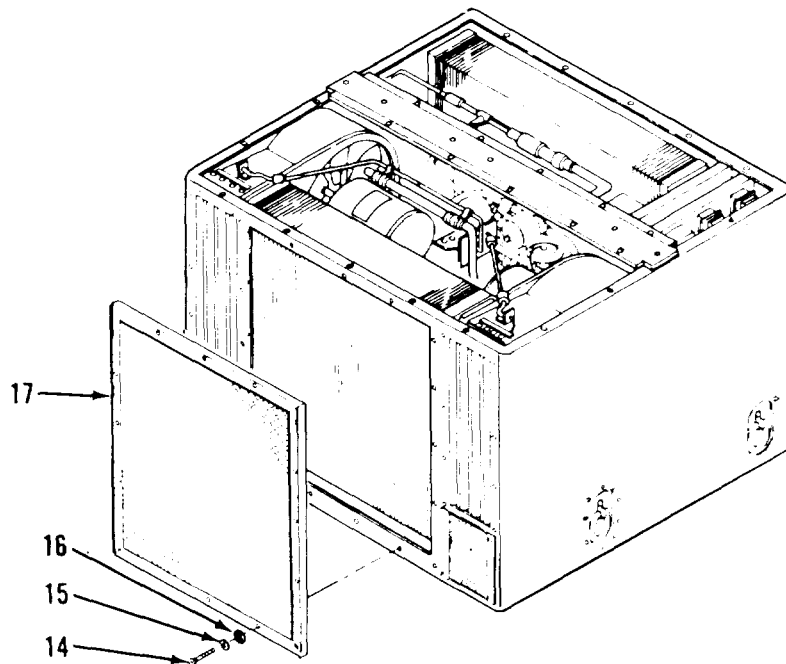
1. Clean the front and back surfaces using a soft bristle brush.
2. Use a vacuum cleaner and compressed air if necessary to clean the area between the fins.

**4-21. EVAPORATOR AND CONDENSER COILS AND RELATED COMPARTMENT
PARTS/Service, Replace (Cont)**

LOCATION/ITEM

Installation:

1. Align condenser coil guard (17) with holes in housing and secure with seventeen screws (14) and seventeen lock washers (15) one snap fastener (16).



2. Slide mist eliminator (12) down into mounting brackets (13).
3. Align front louver (evaporator discharge) (11) with holes in housing and secure front louver (evaporator discharge) to housing with eight screws (9) and eight lock washers (10).
4. Align front cover (8) with holes in center cover and housing and secure with fourteen screws (7).

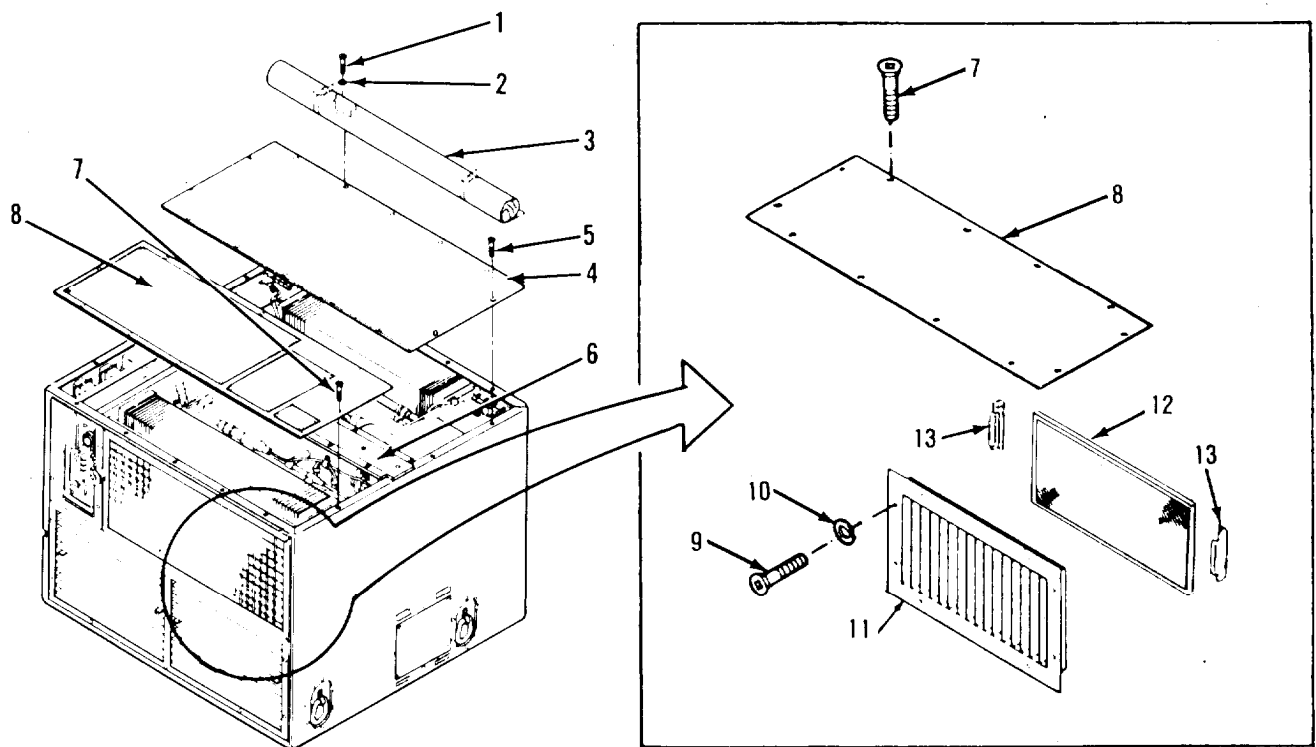
**4-21. EVAPORATOR AND CONDENSER COILS AND RELATED COMPARTMENT
PARTS/Service, Replace (Cont)**

LOCATION/ITEM

Installation:

5. Align rear cover (4) with holes in center cover and housing and secure with fourteen screws (5).

6. Align fabric cover(3) with holes in housing and secure with three screws (1) and three lock washers (2).



4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace

This Task covers:

- a. Removal
 - b. Inspection
 - c. Test
 - d. Replace
 - e. Installation
-

NOTE

Replace maintenance function is done by removal/installation maintenance tasks.

INITIAL SETUP

Disconnect Power

Tools

TOOL KIT (SC 5180-90-CL-N18)

Troubleshooting Reference

Malfunction 1 Step 3

Disconnect Power

LOCATION/ITEM

CONTROL MODULE

Removal:

1. Remove ten screws (1) and ten lock washers (2) and front louver (evaporator inlet) (3) from housing.

CAUTION

Avoid kinking temperature selector cap line when removing.

2. Remove plastic tie wrap from cap line.

3. Remove two screws (4) two lock washers (5) and two clamps (6) securing thermostat sensor bulb (7) to left evaporator fan housing assembly (8).

4. Remove thermostat sensor bulb from left evaporator fan housing assembly.

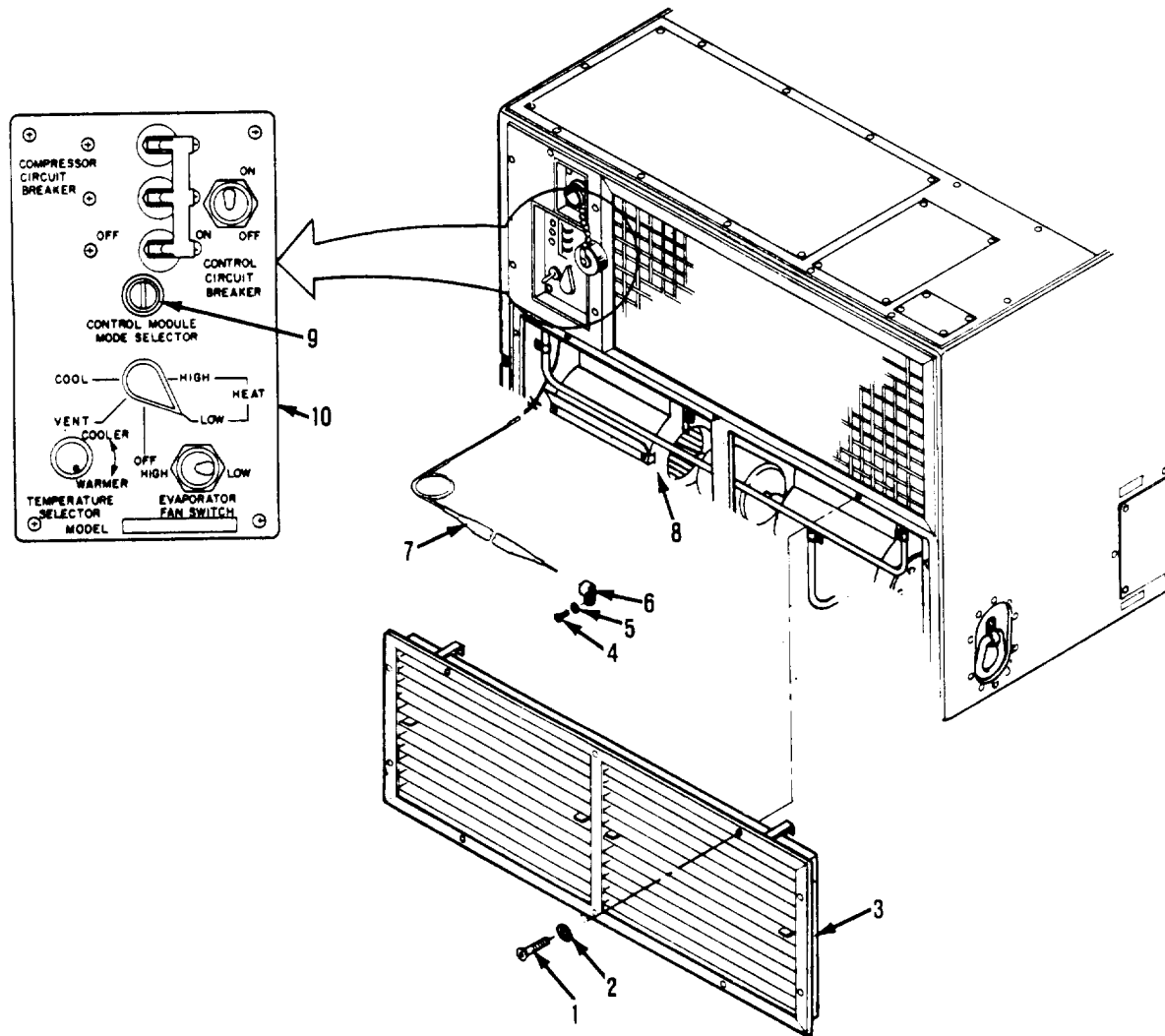
5. Loosen connector knob (9) securing control module (10) to junction box.

6. Remove control module and thermostat sensor bulb.

4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Removal:



Circuit Breaker (CB2) (Control)

1. Remove four screws (11) securing control module cover (12) to control module mounting frame (13).
2. Remove control module cover.

4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Removal:

3. Remove two screws (14) securing wires to terminals on circuit breaker (CB2) (15).
4. Tag and remove wires from terminals on circuit breaker.
5. Remove retaining nut (16) and washer (17) securing circuit breaker to control module mounting plate.
6. Remove circuit breaker (CB2).

Circuit Breaker (CB1) (Compressor)

1. Remove pin (18) and two spacers (19) from circuit breaker arm.
2. Tag and remove wires from terminals on circuit breaker.
3. Remove six screws (21) and six flat washers (22) securing circuit breaker to control module mounting plate (23).
4. Remove circuit breaker (CB1).

Evaporator Fan Speed Switch (S-2)

1. Tag and remove wires from terminals on evaporator fan speed switch (S-2).
2. Remove retaining nut (25) and washer (26) securing evaporator fan speed switch (S-2) (24) to control module mounting plate.
3. Remove evaporator fan speed switch (S-2).

Mode Selector Switch (S-1)

1. Loosen two set screws (27) on mode selector knob (28).
2. Remove mode selector knob.
3. Tag and remove wires from terminals on mode selector switch (S-1) (29).
4. Remove one retaining nut (30) and one lock washer (31) securing mode selector switch to control module mounting plate.
5. Remove mode selector (S-1).

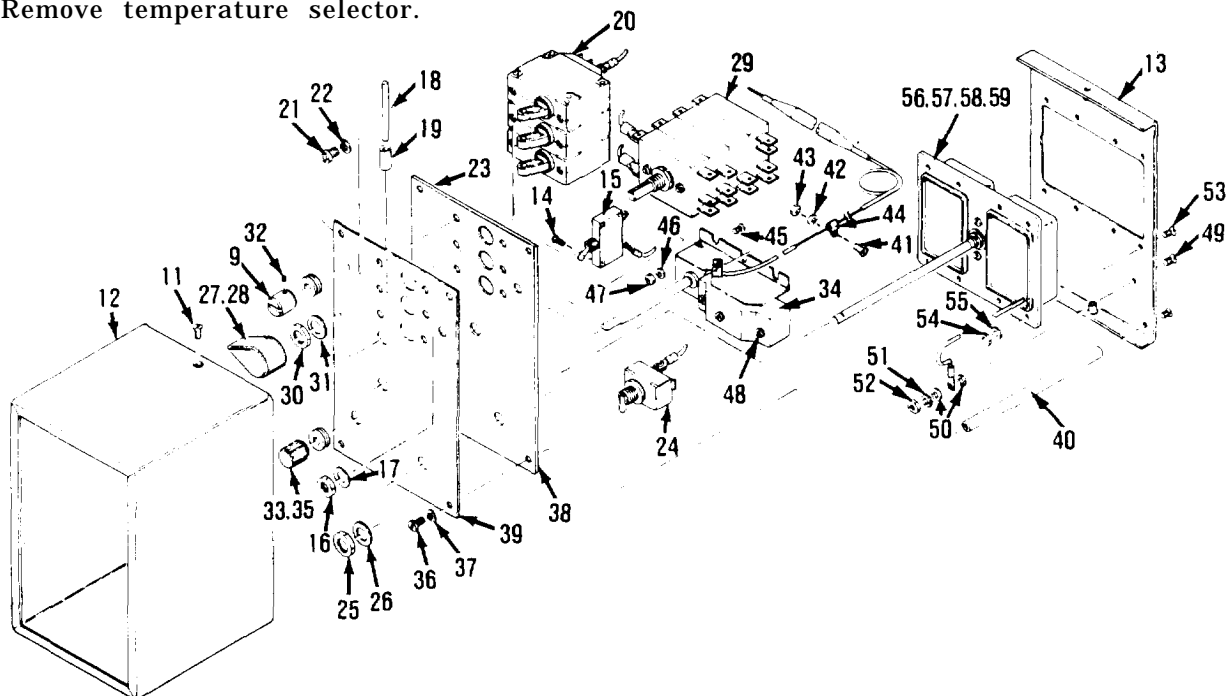
4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Removal:

Temperature Selector (S-3)

1. Loosen two set screws (32) on control module knob (9).
2. Remove control module knob.
3. Loosen set screw (33) on temperature selector knob (35).
4. Remove temperature selector knob.
5. Remove eight screws (36) and eight flat washers (37) securing control module mounting plate (38) and control module designation plate (39) to four posts (40).
6. Remove control module mounting plate and control module designation plate.
7. Remove one screw (41) one flat washer (42) one lock nut (43) and one clamp (44) securing sensor bulb to control module mounting frame.
8. Remove three screws (45) three flat washers (46) and three lock nuts (47) securing temperature selector (S-3) (34) to control module mounting frame.
9. Remove two screws (48) securing terminals to thermostat (S-3).
10. Tag and remove wires from terminals.
11. Remove temperature selector.



4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cent)

LOCATION/ITEM

Removal:

Connector With Leads

1. Remove one screw (49) two flat washers (50) one lock washer (51) and one flat nut (52) securing ground terminal (E-2) to control module frame (13).
2. Tag and remove wires from terminals.
3. Remove eight screws (53) and eight nuts (54) and eight washers (55) securing connector with leads (56) to control module mounting plate.
4. Remove connector with leads.
5. Remove two screws (57) and two lock nuts (58) securing control module mounting post (59) to connector (J-2) (56).
6. Remove control module mounting post.

Inspection:

1. Inspect control module, circuit (CB-2), (CB-1), Evaporator Fan Speed Switch (S-2), Mode Selector (S-1), Temperature Selector (S-3), connector with leads for cracking, breaks and scratching.
2. Repair or replace if damaged.

Test:

Circuit Breaker (CB2)

1. Use a multimeter and test between the two terminals with the circuit breaker in the ON position.
2. If continuity does not exist the circuit breaker is defective.
3. Replace defective circuit breaker.

Circuit Breaker (CB1)

1. Use a multimeter and test between terminals C1-C2, B1-B2, A1-A2 and No-C with the circuit breaker in the ON position.
2. If continuity does not exist in any of the four test positions the circuit breaker is defective.
3. Replace defective circuit breaker.

4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Test:Evaporator Fan Speed Switch (S-2)

1. Place evaporator fan speed (S-2) in LOW position.
2. Use a multimeter and test between terminals 1 and 3.
3. If continuity does not exist in any of the four test positions the circuit breaker is defective.
4. Replace defective evaporator fan.
5. Place evaporator fan speed (S-2) in HIGH position.
6. Use a multimeter and test between terminals 1 and 2.
7. If continuity does not exist in any of the four test positions the circuit breaker is defective.
8. Replace defective evaporator fan.

Mode Selector Switch (S-1)

1. Use a multimeter and test between terminals.
2. If continuity does not exist in any of the test positions, the mode selector switch is defective.
3. Replace defective mode selector.

Temperature Selector (S-3)

1. Place thermostat (S-3) sensor bulb in ambient temperature of 85 to 100°F (30 to 40°C).
2. Place the thermostat (S-3) in COOLER position.
3. Using a multimeter check for continuity between terminals 1 and 3.
4. If continuity does not exist the temperature selector is defective.
5. Replace defective temperature selector (S-3).
6. Place thermostat (S-3) sensor bulb in a container of cold H₂O, 40 to 65°F (5 to 18°C).
7. Place the temperature selector (S-3) in WARMER.

4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Test:

8. Using a multimeter check for continuity between terminals 2 and 3.
9. If continuity does not exist the temperature selector is defective.
10. Replace defective temperature selector (S-3).

Connector With Leads

1. Using a multimeter test for continuity between connector pins and terminations in accordance with wiring diagram Appendix E.
2. If continuity does not exist connector with leads defective.
3. Repair or replace defective connector with leads.

Installation:

Connector With Leads

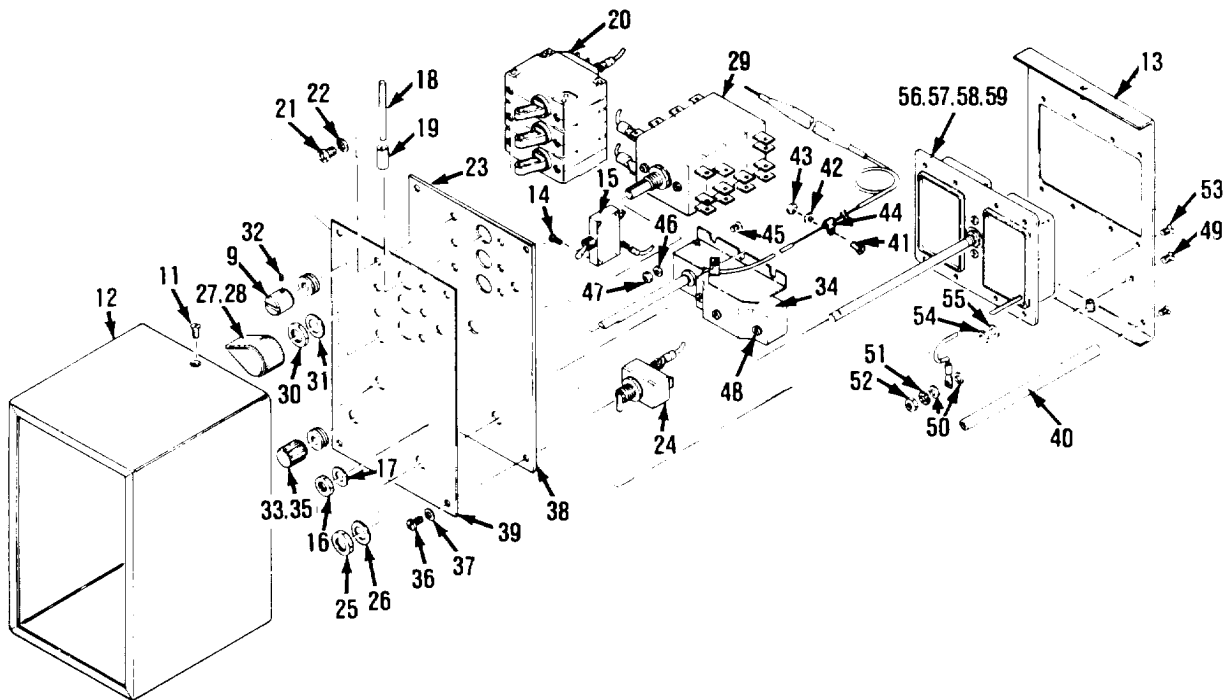
1. Align connector module mounting post (59) with holes in connector (56).
2. Secure connector module mounting post and connector J-2 with two screws (57) and two lock nuts (58).
3. Align connector with holes in control module mounting frame.
4. Secure above with eight screws (53) eight lock washers (55) and eight nuts (54).
5. Attach wires to appropriate terminals.
6. Align control mounting plate (38) and control module designation plate (39) with four posts (40).

4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Installation:

7. Secure control module mounting plate and control module designation plate to four posts with eight screws (36) and eight flat washers (37).
8. Align ground terminal wire with hole in mounting plate.
9. Secure ground terminal to mounting plate with one screw (49) two flat washers (50) one lock washer (51) and one flat nut (52).



4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Installation:

Temperature Selector (S-3)

1. Align temperature selector (S-3) (34) with holes in control module mounting frame (13).
2. Secure temperature selector (S-3) to control module mounting frame with three screws (45) three flat washers (46) and three lock nuts (47).
3. Attach wires to appropriate terminals.
4. Align temperature selector sensor bulb cap line and one clamp (44) with hole in control module mounting frame.
5. Secure temperature selector sensor bulb cap line and one clamp to control module mounting frame with one screw (41) one flat washer (42) and one lock washer (43).
6. Attach temperature selector knob (35) to temperature selector (S-3).
7. Secure temperature selector knob to temperature selector by tightening set screw (33).

Mode Selector (S-1)

1. Align mode selector (29) with holes in control module mounting plate.
2. Secure mode selector to control module mounting plate with one lock washer (31) and one retaining nut (32).
3. Attach wires to appropriate terminals in accordance with Appendix E and remove tags.
4. Attach mode selector knob (28) to mode selector.
5. Secure mode selector knob to mode selector with two set screws (27).

Evaporator Fan Speed (S-2)

NOTE

When installing (S-2) adjust lock nut so that outer nut is flush with shaft threads.

1. Align evaporator fan speed (S-2) (24) with holes in control module mounting plate.
2. Secure evaporator fan speed to control module mounting plate with one lock washer (26) and one retaining nut (25).

4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Installation:

3. Attach wires to appropriate terminals and remove tags.

Circuit Breaker (CB1) (Compressor)

1. Align circuit breaker (CB1) (20) with holes in control module mounting plate.
2. Secure circuit breaker to control module mounting plate with six flat washers (22) and six screws (21).
3. Attach wires to appropriate terminals and remove tags.

Circuit Breaker (CB2) (Control)

1. Align circuit breaker (CB2) (15) with holes in control module mounting plate.
2. Secure circuit breaker to control module mounting plate with one lock washer (17) and one retaining nut (16).
3. Attach wires to appropriate terminals and remove tags.
4. Align control module cover (12) with holes control module mounting frame.
5. Secure control module cover to control module mounting frame with four screws (11).

Control Module

1. Slide thermostat sensor bulb (7) thru junction box to left evaporator fan housing (8).
2. Secure thermostat sensor bulb to left evaporator fan housing with two clamps (6) two lock washers (5) and two screws (4).
3. Slide control module into junction box (10).
4. Secure control module (5) to junction box with knob (9).

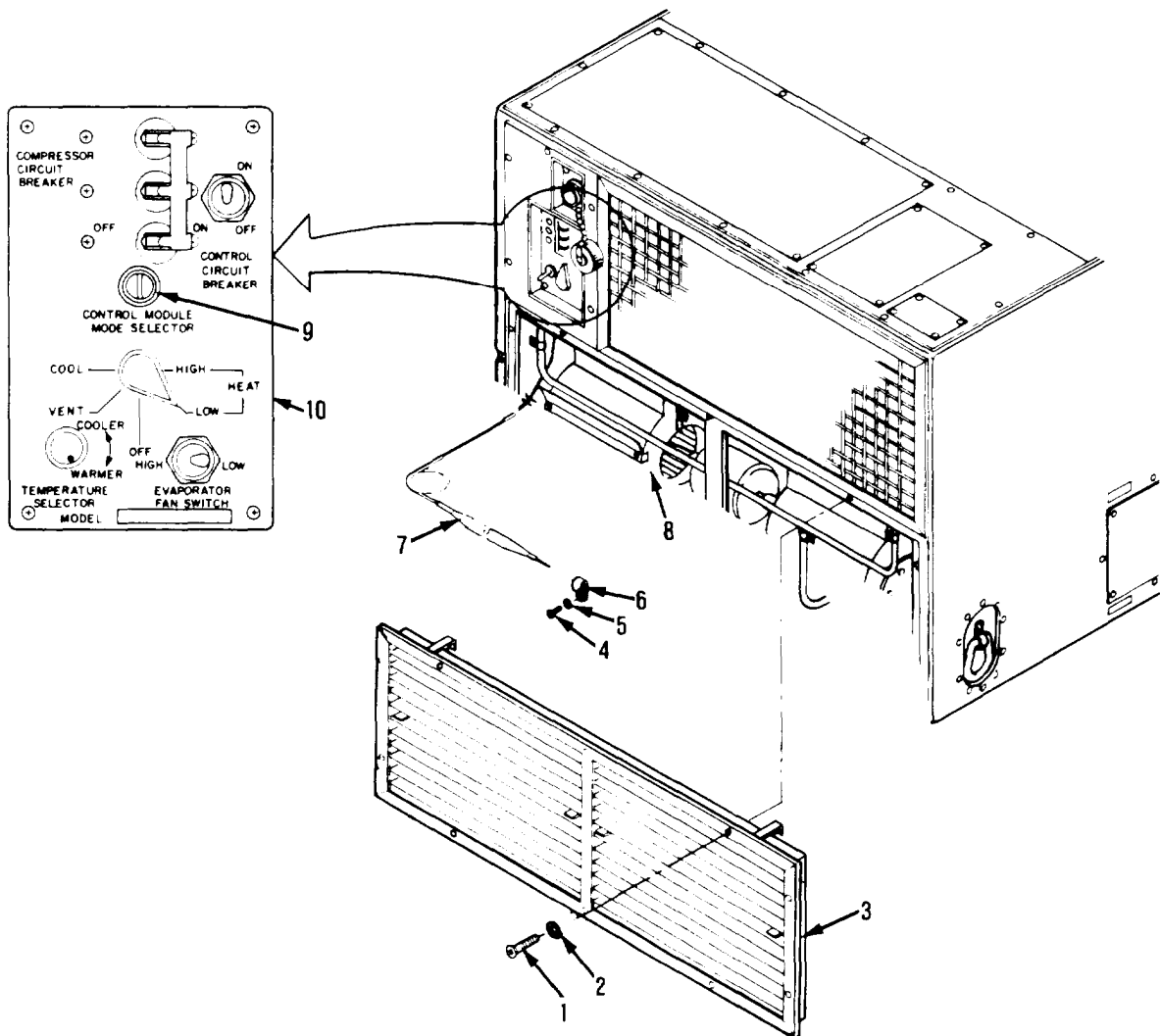
4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Installation:

Front Louver (Evaporator Inlet)

Align front louver (evaporator inlet) (3) with holes in housing and secure front louver (evaporator inlet) and air conditioner filter to housing with ten screws (1) and ten lock washers (2).



4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

JUNCTION BOX

Removal:

1. Remove three screws (1) and three lock washers (2) and fabric cover (3) from housing.
2. Remove fourteen screws (5) and rear cover (4) from housing.
3. Remove fourteen screws (7) and front cover (8) from housing.
4. Remove seven screws (9) and center cover from housing.
5. Remove ten screws (10) and ten lock washers (11) and front louver (evaporator inlet) (12) from housing.

Control Module

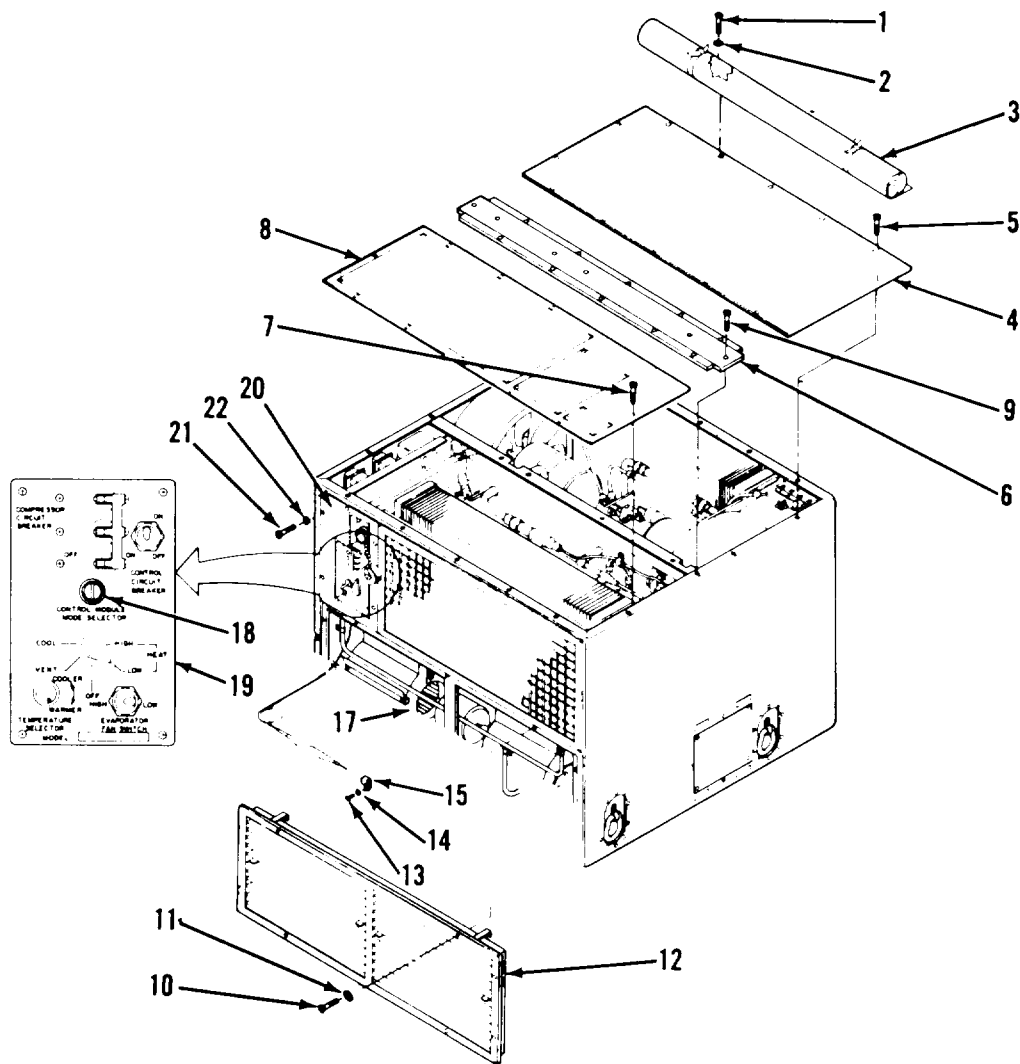
1. Remove two screws (13) two lock washers (14) and two clamps (15) securing thermostat sensor bulb (16) to left evaporator fan housing assembly (17).
2. Remove thermostat sensor bulb (7) from left evaporator fan housing assembly (17).

4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Removal:

3. Loosen knob (18) securing control module (19) to junction box (20).
4. Remove thermostat sensor bulb (7) from evaporator fan housing assembly (17).



4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

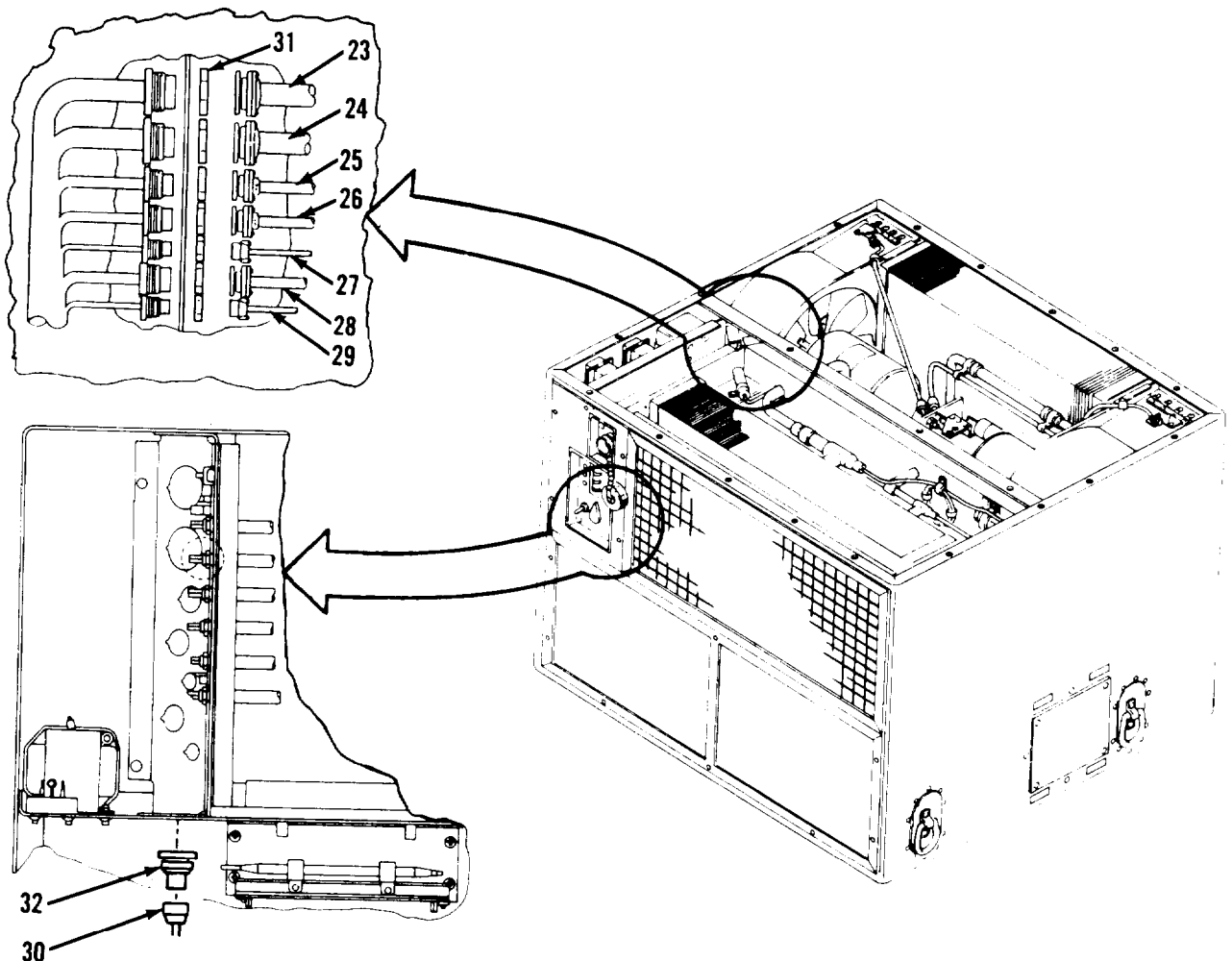
Removal:

Junction Box

CAUTION

Be careful when removing junction box not to damage plastic relay covers.

1. Remove six screws (21) and six lock washers (22) securing junction box (20) to housing.
2. Pull junction box (20) out to allow access to connectors.
3. Disconnect junction box wire harness connectors P-n (23), P-7 (24), P-4 (25), P-5 (26), P-10 (27), P-9 (28), P-8 (29) and P-3 (30).
4. Remove retaining nuts (31) securing electrical connectors J-11, J-7, J-4, J-5, J-10, J-9, J-8 and retaining nut (32) on J-3, to bulkhead.



4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/hspect, Test, Replace (Cont)

LOCATION/ITEM

Removal:

5. Tag and remove wiring from TB-4 (33) TB-2 (34) and ground E-3 (35).

6. Remove one screw (36) and one washer (37) securing one clamp (38) and wire harness to housing.

7. Remove clamp (38) and junction box.

Terminal Board TB3

1. Remove two screws (39) two flat washers (40) and two lock nuts (41) securing terminal board TB3 (42) and marker strip (43) to junction box.

2. Tag and remove wires from terminals.

3. Remove terminal board TB3.

Terminal Board TB1

1. Remove four screws (44) four flat washers (45) and four lock nuts (46) securing terminal board TB1 (47) and marker strip (48) to junction box.

2. Tag and remove wires from terminals.

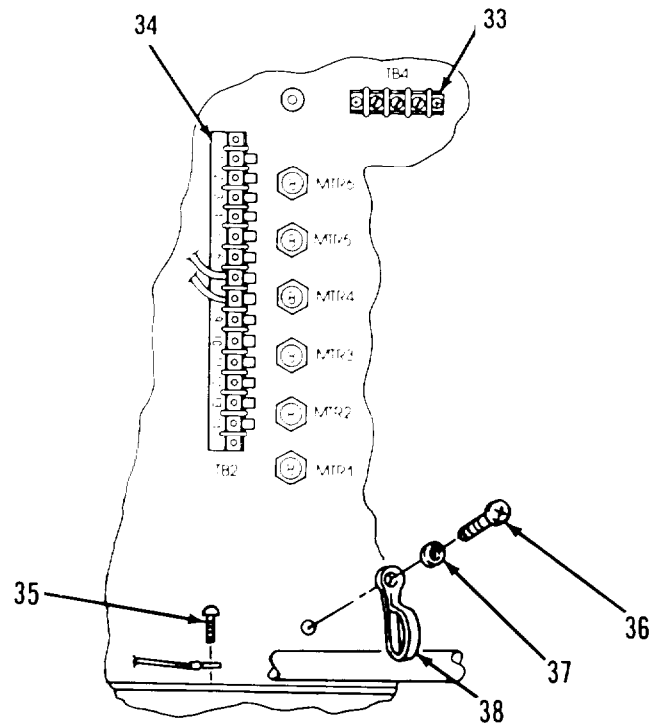
3. Remove terminal board TB1.

Relay K3

1. Remove four screws (49) four flat washers (50) and four lock nuts (51) securing relay K3 (52) to junction box.

2. Tag and remove wires from terminals.

3. Remove relay K-3.



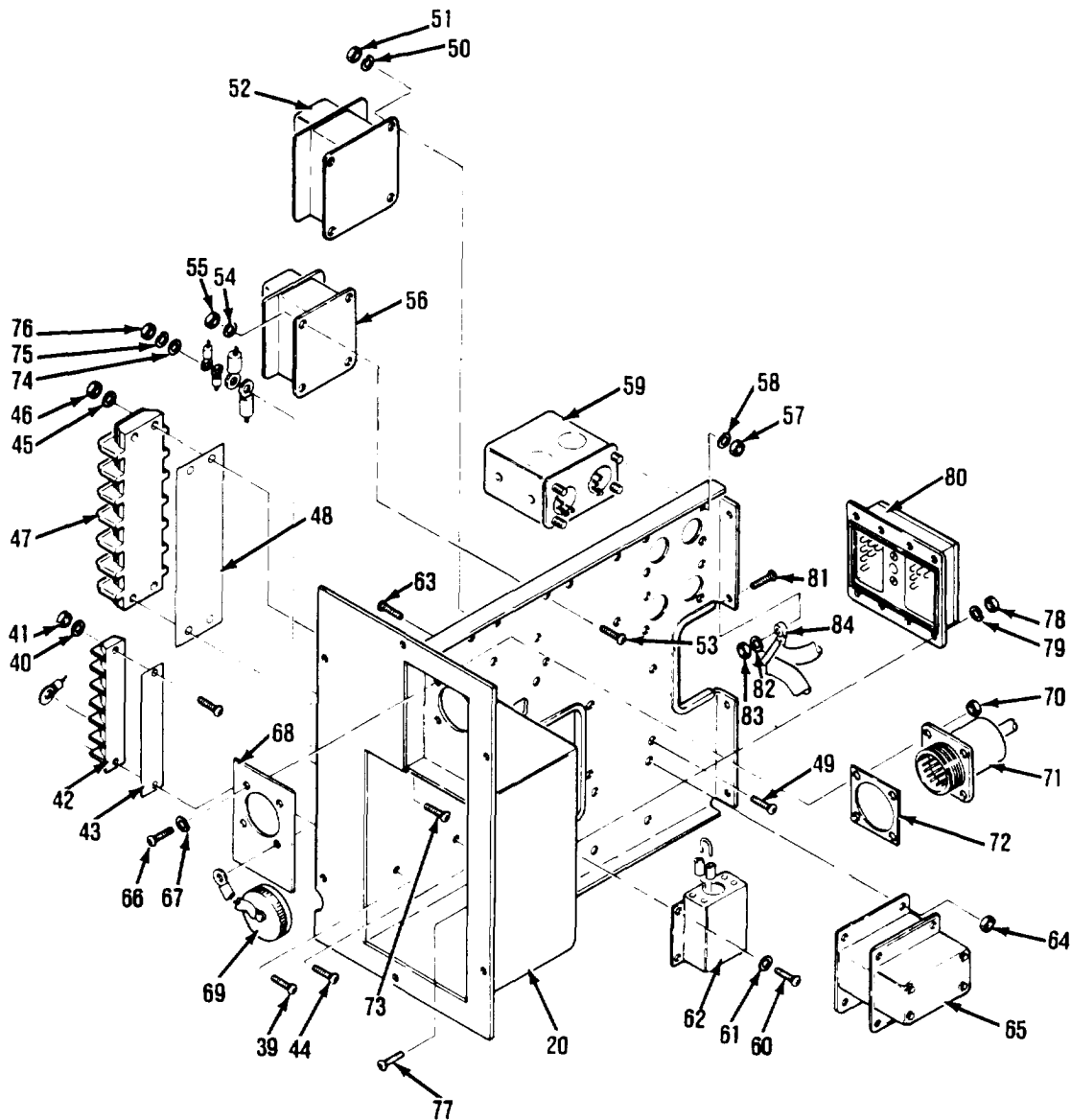
4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Removal:

Relays K2, K7 and K9

1. Remove twelve screws (53) twelve flat washers (54) and twelve lock nuts (55) securing relays K2, K7 and K9 (56) to junction box.
2. Tag and remove wires from terminals.
3. Remove relays K-2, K-7, and K-9.



4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Removal:

Relay K4 and Relay K5 Assembly

1. Remove three lock nuts (57) and three flat washers (58) securing relay (59) K4 and KS assembly to junction box.
2. Remove relay K4 and relay KS assemblies.
3. Unsolder wires from terminals connecting relay K4 to relay K5 and tag wires.
4. Unsolder wires from terminals connecting relays to wire harness and tag wires.

Relay K1

1. Remove four screws (60) and four flat washers (61) securing relay K1 (62) to junction box.
2. Tag and remove wires from terminals.
3. Remove relay K1.

Relay K8

1. Remove four screws (63) and four lock nuts (64) securing relay K8 (65) to junction box.
2. Tag and remove wires from terminals.
3. Remove relay K8.

Connector With Leads J-1

1. Remove four screws (66) four flat washers (67) identification tag (68) connector cover (69) and four lock nuts (70) securing wiring harness (71) and gasket (72) to junction box.
2. Tag and remove wires from terminals.
3. Remove wiring harness.

Connector With Leads J-2

1. Remove one screw (73) one flat washer (74) one lock washer (75) and one nut (76) securing ground wires to junction box.
2. Tag and remove wires.

4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Removal:

3. Remove eight screws (77) eight flat washers (78) and eight lock nuts (79) securing wiring harnesses (80) to junction box.
4. Remove one screw (81) one flat washer (82) one nut (83) and one clamp (84) securing wire harness to junction box.
5. Tag and remove wires from terminals.
6. Remove wiring harness.

Test:**Relay K2**

1. Apply external 28 VDC to terminals X1 and X2; positive to X1 and negative to X2.
2. Using an ohmmeter or other continuity testing device, check continuity between terminals A1-A2, B1-B2 and C1-C2.
3. If continuity does not exist relay is defective.
4. Replace defective relay.

Relay K3

1. Apply external 28 VDC to terminals X1 and X2; positive to X1 and negative to X2.
2. Using an ohmmeter or other continuity testing device, check continuity between terminals A1-A2, B1-B2 and C1-C2.
3. If continuity does not exist relay is defective.
4. Replace defective relay.

Relay K7

1. Apply external 28 VDC to terminals X1 and X2; positive to X1 and negative to X2.
2. Using an ohmmeter or other continuity testing device, check continuity between terminals A1-A2, B1-B2 and C1-C2.
3. If continuity does not exist relay is defective.
4. Replace defective relay.

4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Test:

Relay K9

1. Apply external 28 VDC to terminals X1 and X2; positive to X1 and negative to X2.
2. Using an ohmmeter or other continuity testing device, check continuity between terminals A1-A2, B1-B2 and C1-C2.
3. If continuity does not exist relay is defective.
4. Replace defective relay.

Relay K4 and Relay K5 Assembly

1. Apply external 28 VDC to terminals 1 and 11.
2. Using an ohmmeter check for continuity across terminals 4 and 14; 7 and 17; 10 and 20.
3. If continuity is not found between each of the three sets of terminals, relay is defective.
4. Replace defective relay.

Relay K 1

1. Apply external 28 VDC to terminals 2 and 5; positive to 2 and negative terminal 5.
2. Using an ohmmeter check for 28 VDC across terminals 2 and 3 within 30 seconds + or -3 seconds of energizing the coil.
3. If 28 VDC is not found after 30 seconds + 3 seconds relay is defective.
4. Replace defective relay.

Installation:

Connector With Leads J-2

1. Align wiring harness (80) with holes in junction box (20).
2. Secure wiring harness to junction box with eight screws (77) eight flat washers (78) and eight lock washers (79).
3. Align wiring harness (80) and one clamp (84) with hole in junction box.
4. Secure clamp with one screw (81) one flat washer (82) and one nut (83).

4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Installation:

5. Align wiring harness ground with hole in junction box.
6. Secure ground with one screw (73) one flat washer (74) one lock washer (75) and one nut (76).
7. Attach wires to appropriate terminals in accordance with Appendix E and remove tags.

Connector With Leads J-1

1. Align wiring harness connector (71) and gasket (72) with holes in junction box.
2. Secure wiring harness to junction box with four screws (66) four flat washers (67) identification tag (68) connector cover and four lock nuts (70).
3. Attach wires to appropriate terminals in accordance with Appendix E and remove tags.

Relay K8

1. Align relay K8 (65) with holes in junction box.
2. Secure relay K8 to junction box with four screws (63) and four lock nuts (64).
3. Attach wires to appropriate terminals in accordance with Appendix E and remove tags.

Relay K1

1. Align relay K1 (62) with holes in junction box.
2. Secure relay K1 to junction box with four screws (60) and four flat washers (61).
3. Attach wires to appropriate terminals in accordance with Appendix E and remove tags.

Relay (K5)

Attach wires to appropriate terminals in accordance with Appendix E and remove tags.

4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Installation:**Replay K4 and Relay K5 Assy**

1. Align relay K4 and relay K5 assembly with holes in junction box.
2. Secure relay K4 and relay K5 with three lock nuts (57) and three flat washers (58).
3. Attach wires to appropriate terminals in accordance with Appendix E and remove tags.

Relay K2, K7 and K9

1. Align relays K2, K7 and K9 (56) with holes in junction box.
2. Secure relays K2, K7 and K9 to junction box with twelve screws (53) twelve flat washers (54) and twelve lock nuts (55).
3. Attach wires to appropriate terminals in accordance with Appendix E and remove tags.

Relay K3

1. Align relay K3 (52) with holes in junction box.
2. Secure relay K3 to junction box with four screws (49) four flat washers (50) and four lock nuts (51).
3. Attach wires to appropriate terminals in accordance with Appendix E and remove tags.

Terminal Board TB1

1. Align terminal board TB1 (47) and marker strip (48) with holes in junction box.
2. Secure terminal board TB1 with four screws (44) four flat washers (45) and four lock nuts (46).
3. Attach wires to appropriate terminals in accordance with Appendix E and remove tags.

Terminal Board TB3

1. Align terminal board TB3 (42) and marker strip (43) with holes in junction box.
2. Secure terminal board TB3 with four screws (39) four flat washers (40) and four lock nuts (41).
3. Attach wires to appropriate terminals in accordance with Appendix E and remove tags.

4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Installation:

Junction Box

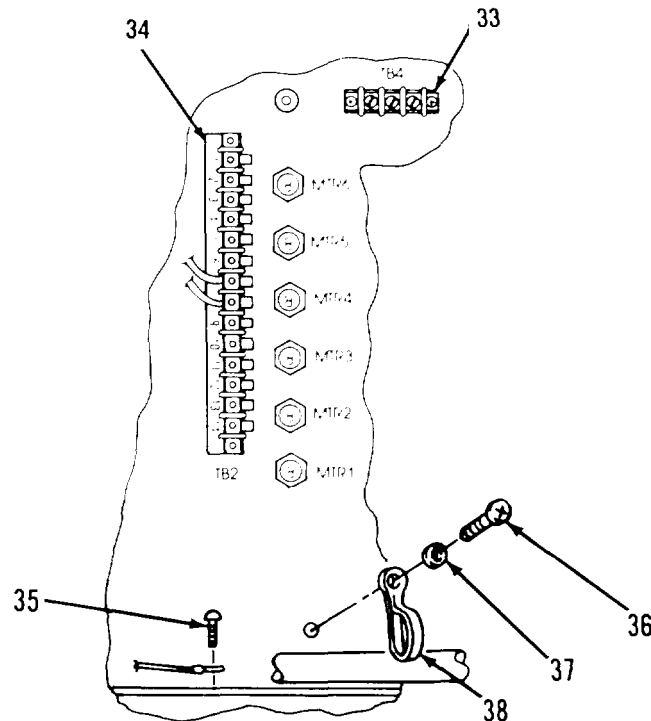
CAUTION

Be careful when installing junction box not to damage plastic relay covers.

1. Attach wires to appropriate terminals on TB-4, TB-2 and ground E-3 in accordance with Appendix E and remove tags.

2. Align one clamp (38) and wire harness with holes in housing.

3. Secure harness and clamp with one screw (36) and one washer (37).



4. Align electrical connectors J-11, J-7, J-4, J-5, J-10, J-9, J-8 and J-3 with holes in bulkhead.

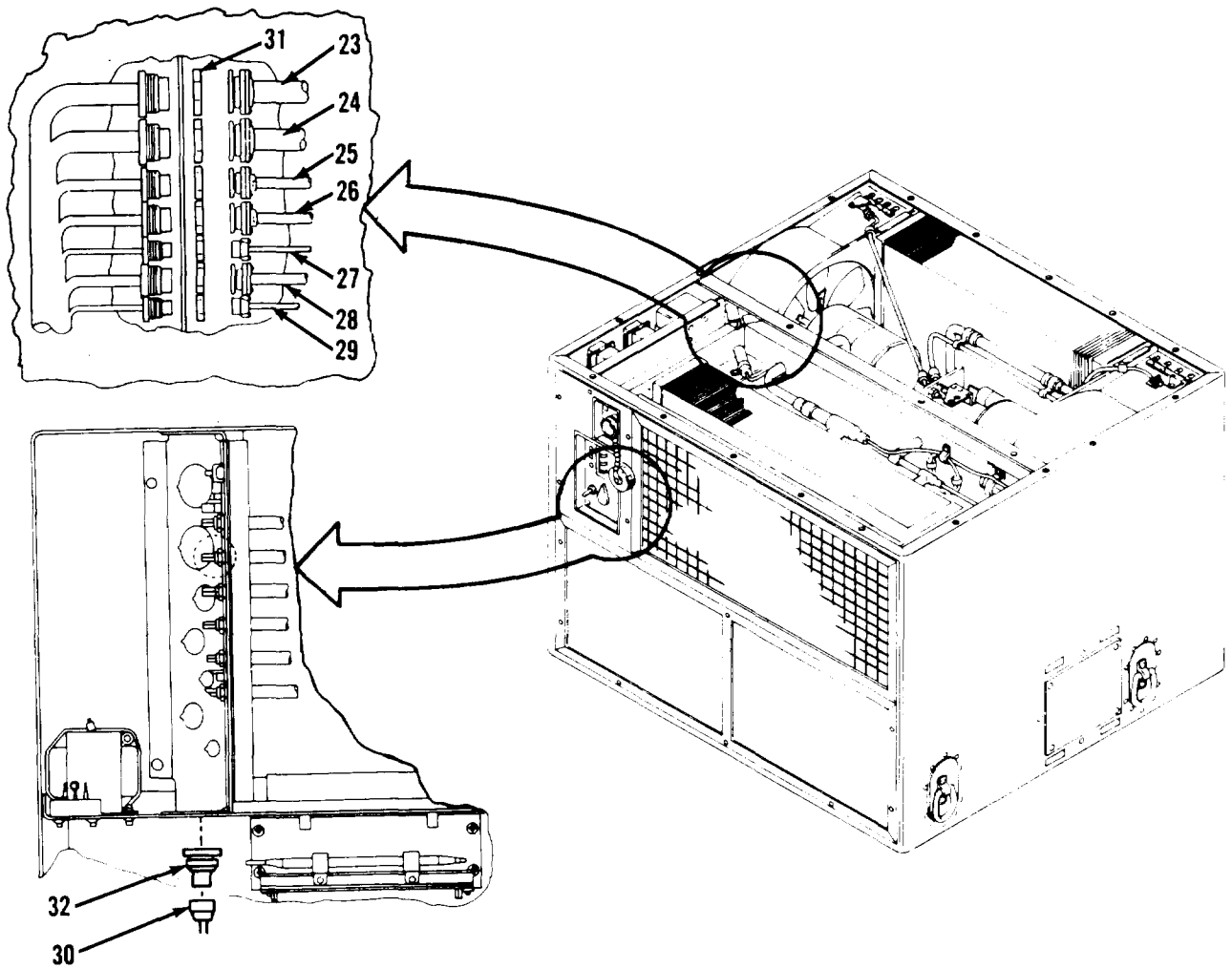
5. Secure above with retaining nuts (31) and (32).

4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Installation:

6. Connect electrical connectors P-n (23), P-7 (24), P-4 (25), P-5 (26), P-10 (27), P-9 (28), P-8 (29) and P-3 (30) with holes in bulkhead.
7. Align junction box (20) with holes in housing.
8. Secure junction box to housing with six screws (21) and six lock washers (22).



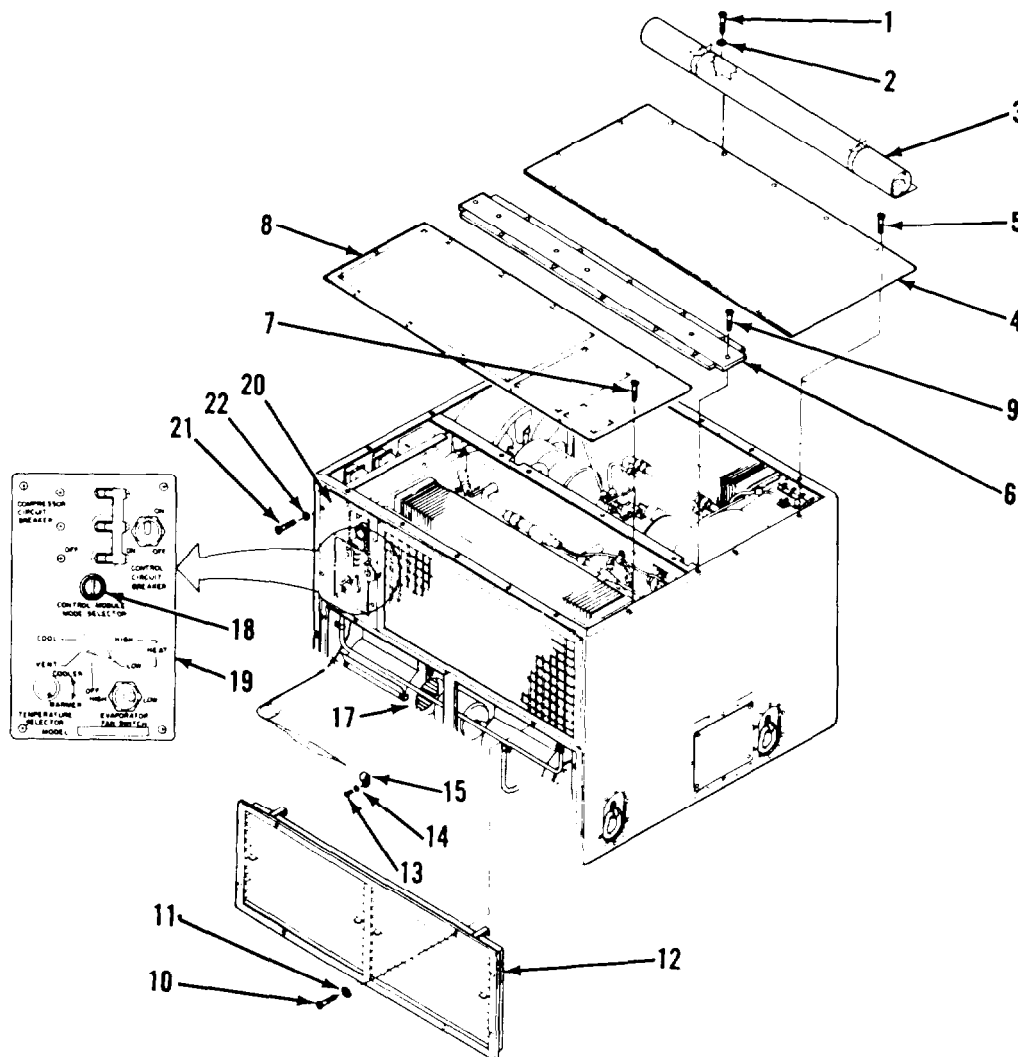
4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Installation:

Control Module

1. Slide thermostat sensor bulb (16) thru junction box to left evaporator fan housing (17).
2. Secure thermostat sensor bulb to left evaporator fan housing with two clamps (15) two lock washers (14) and two screws (13).
3. Slide control module (19) into junction box.
4. Secure control module to junction box with knob (18).



4-22. JUNCTION BOX AND CONTROL MODULE ASSEMBLY/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Installation:**Front Louver**

1. Align front louver (12) with holes in housing and secure with ten screws (10) and ten lock washers (11).
2. Align center cover (6) with holes in housing and secure with seven screws (9).
3. Align front cover (8) with holes in center cover and housing and secure with fourteen screws (7).
4. Align rear cover (4) with holes in center cover and housing and secure with fourteen screws (5).
5. Align fabric cover (3) with holes in housing and secure with three screws (1) and three lock washers (2).

4-23. AMBIENT THERMOSTAT AUXILIARY POWER INLET/Inspect, Test, Repair, Replace

This Task covers:

- a. Removal
 - b. Inspection
 - c. Test
 - d. Repair
 - e. Replace
 - f. Installation
-

INITIAL SETUP

Disconnect Power
Test Equipment
MULTIMETER

Tools
TOOL KIT (SC 5180-90-CL-N18)

General Safety Instructions
Turn air conditioner OFF before performing maintenance

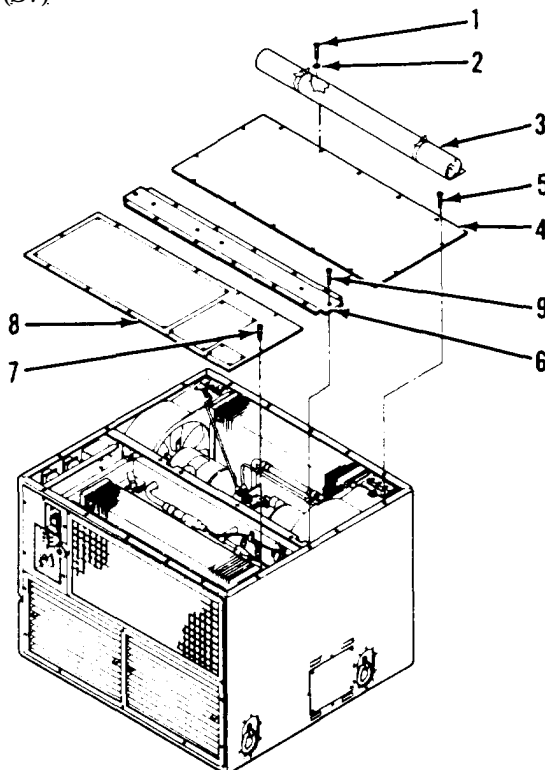
LOCATION/ITEM

AMBIENT THERMOSTAT SWITCH ASSY (S7)

Removal:

1. Remove three screws (1) and three lock washers (2) and fabric cover (3) from housing.

2. Remove fourteen screws (5) and rear cover (4) from housing.

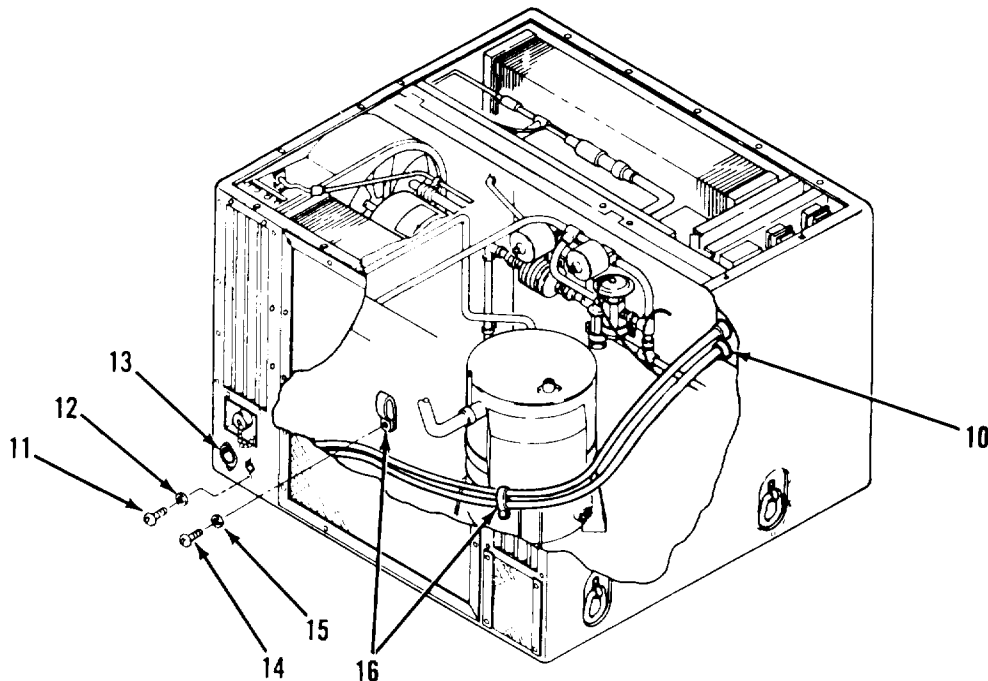


4-23. AMBIENT THERMOSTAT AUXILIARY POWER INLET/Inspect, Test, Repair, Replace (Cont)

LOCATION/ITEM

Removal:

3. Remove fourteen screws (7) and front cover (8) from housing.
4. Remove seven screws (9) and center cover from housing.
5. Remove condenser fans and support assembly in accordance with paragraph 4-15, page 4-39.
6. Disconnect electrical connector (P-9) (10).
7. Remove two lock washers (11) and two screws (12) securing ambient thermostat switch assembly (S-7) (13) to housing.
8. Remove two screws (14) two lock washers (15) and two clamps (16) from housing.



**4-23. AMBIENT THERMOSTAT AUXILIARY POWER INLET/Inspect, Test, Repair, Replace
(Cont)**

LOCATION/ITEM

Removal:

9. Remove plastic tie wraps.
10. Remove ambient thermostat switch assembly (S-7).

Inspect:

1. Inspect for damage.
2. Repair or replace if damaged.

Test:

1. Using an ohmmeter or other continuity tester, check continuity of red and black wires. Continuity should be indicated up to 100°F.
2. If continuity is not indicated replace ambient thermostat switch assembly (S-7).
3. Tape the bulk of a thermometer or junction of a thermocouple to the body of the ambient thermostat switch assembly (S-7) and leave the continuity tester connected to the red and black wires.
4. Gradually apply heat, and observe both the thermometer and continuity tester.
5. Continuity should drop out at 100 + 4°F (38°C).
6. While still continuing to watch the thermometer and the continuity tester, let the ambient thermostat switch assembly (S-7) cool.
7. Continuity should be re-established at 100 +/- 4°F (38°C).
8. If the ambient thermostat switch assembly (S-7) thermostat does not meet temperature and continuity requirements, replace ambient thermostat switch assembly (S-7).

Installation:

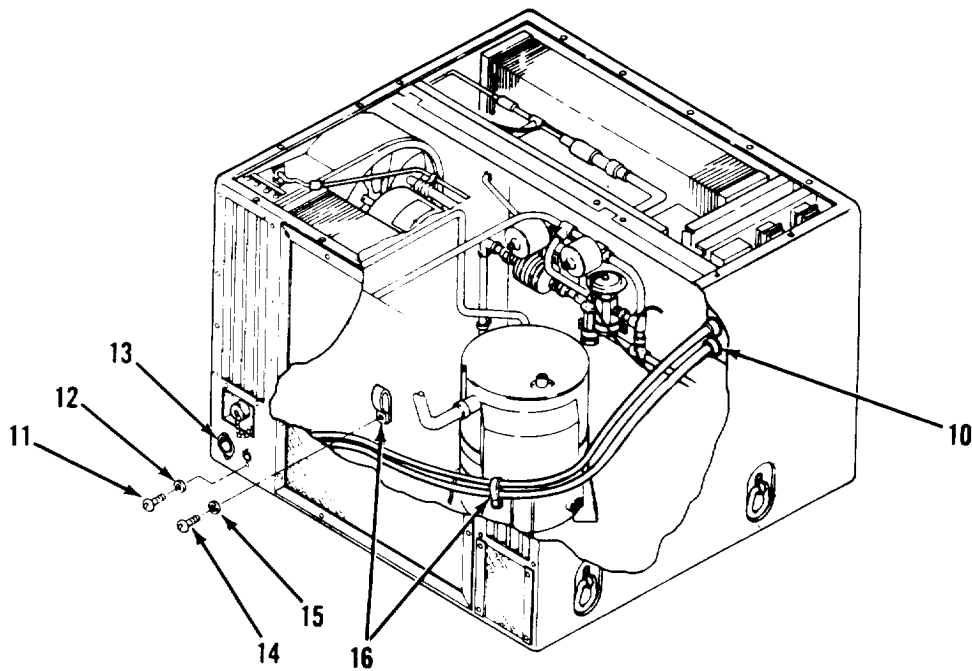
1. Align ambient thermostat switch assembly (S-7) (13) with holes in housing and secure with two screws (12) and two lock washers (11).

4-23. AMBIENT THERMOSTAT AUXILIARY POWER INLET/Inspect, Test, Repair, Replace (Cont)

LOCATION/ITEM

Installation:

2. Connect electrical connector (P-9) (10).
3. Secure thermostat switch assembly (S-7) with two screws (14) two lock washers (15) and two clamps (16).



4. Replace condenser fans, motors assembly in accordance with paragraph 4-15, page 4-46.
5. Align center cover (6) with holes in housing and secure with seven screws (9).
6. Align front cover (8) with holes in center cover and housing and secure with fourteen screws (7).

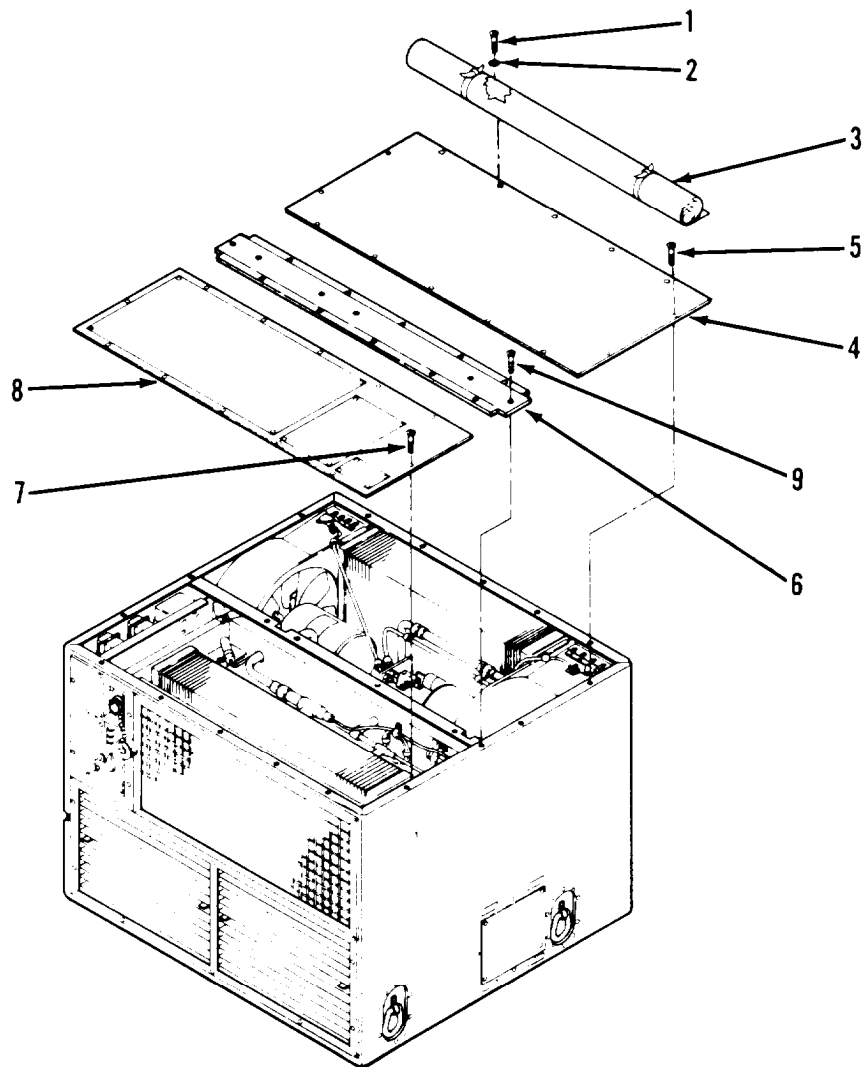
**4-23. AMBIENT THERMOSTAT AUXILIARY POWER INLET/Inspect, Test, Repair, Replace
(Cont)**

LOCATION/ITEM

Installation:

7. Align rear cover (4) with holes in center cover and housing and secure with fourteen screws (5).

8. Align fabric cover (3) with holes in housing and secure with three screws (1) and three lock washers (2).



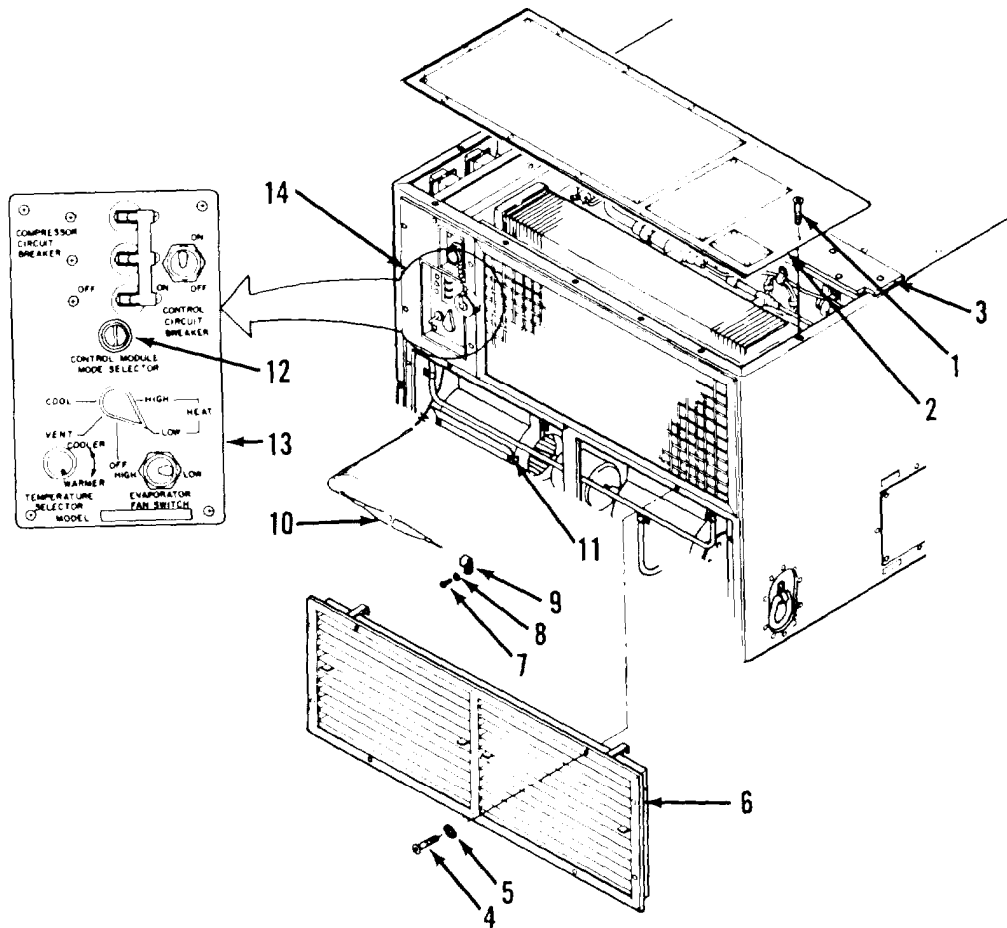
4.23. AMBIENT THERMOSTAT AUXILIARY POWER INLET/Inspect, Test, Repair, Replace (Cont)

LOCATION/ITEM

INLET POWER CONNECTOR ASSY

Removal:

1. Remove fourteen screws (1) and front cover (2) from housing.

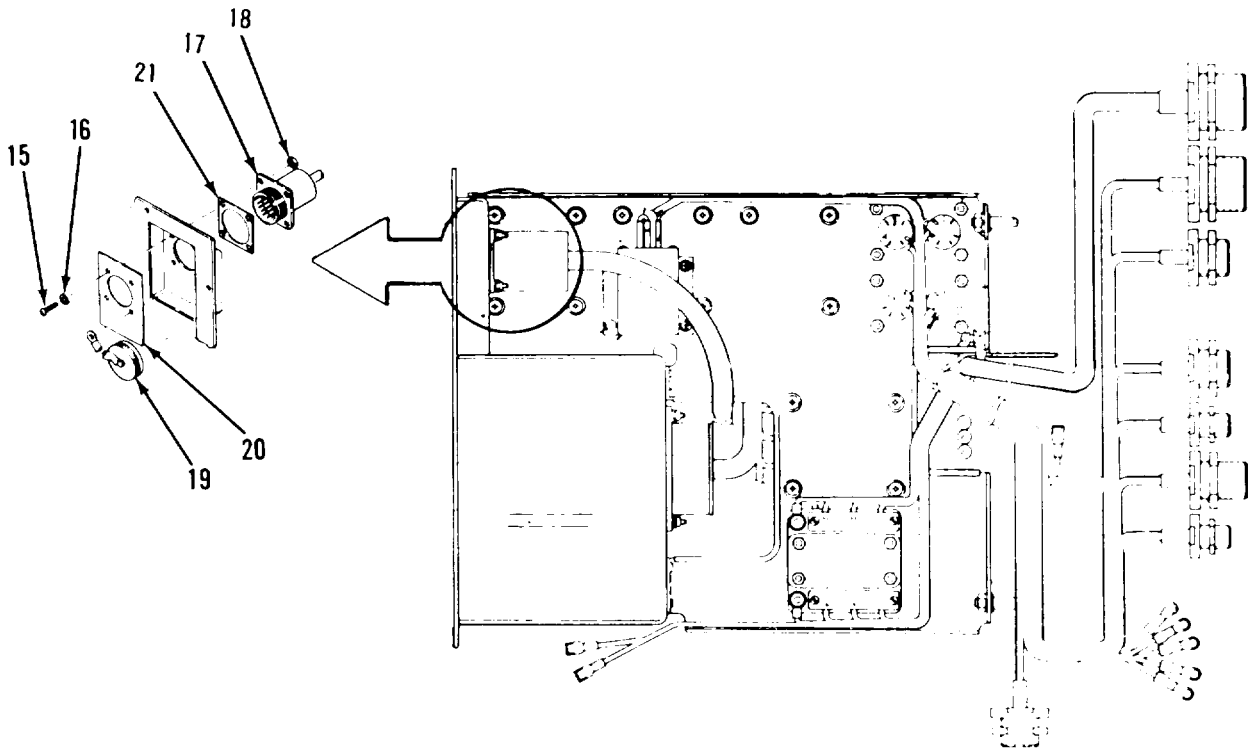


**4-23. AMBIENT THERMOSTAT AUXILIARY POWER INLET/Inspect, Test, Repair, Replace
(Cont)**

LOCATION/ITEM

Removal:

2. Remove eight screws (4) and eight lock washers (5) and front louver (evaporator discharge) (6) from housing.
3. Remove two screws (7) two lock washers (8) and two clamps (9) and thermostat sensor bulb (10) from left evaporator fan housing assembly (11).
4. Loosen connector knob (12) securing control module (13) from junction box (14).
5. Remove junction box in accordance with paragraph 4-22, page 4-109.
6. Remove four screws (15) four flat washers (16) and four lock nuts (17) securing inlet power wiring harness (J-1) (18) to junction box.
7. Remove connector cover (19) plate (20) and gasket (21).



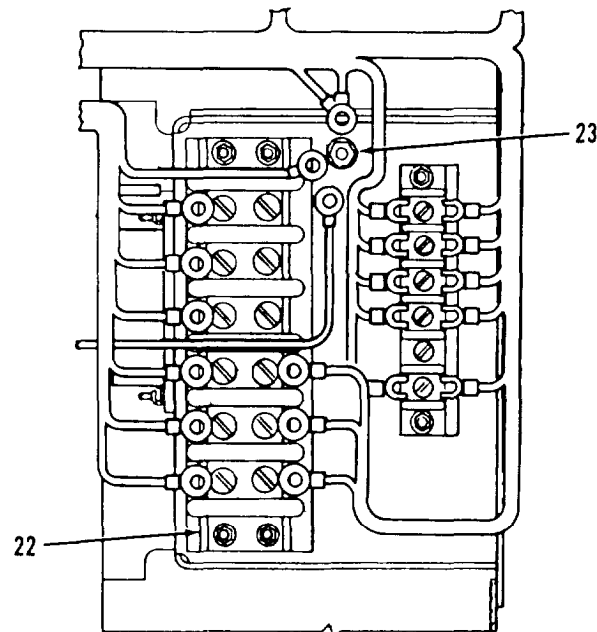
4-23. AMBIENT THERMOSTAT AUXILIARY POWER INLET/Inspect, Test, Repair, Replace (Cont)

LOCATION/ITEM

Removal:

8. Tag and remove wires from terminal board (22) and ground screw (23).

9. Remove inlet connector assy (J-1).



Inspection:

1. Inspect for damage.
2. Repair or replace if damaged.

Repair:

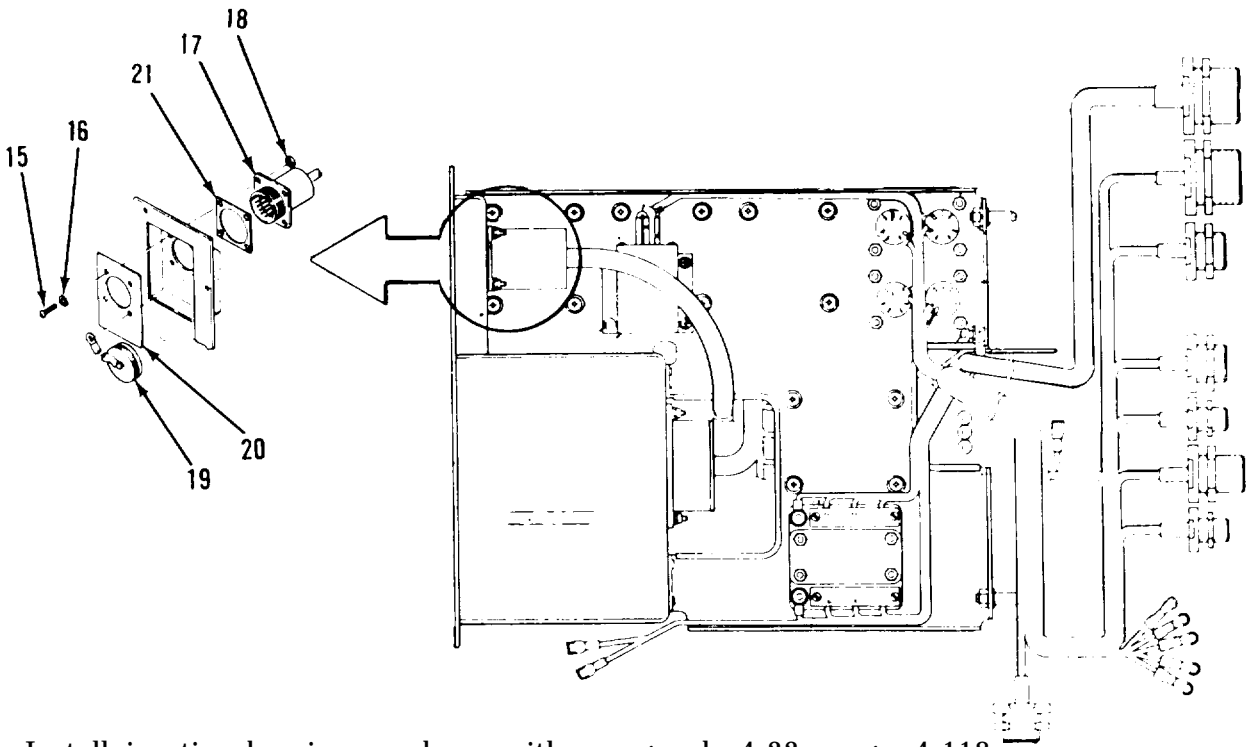
1. To repair broken or cut wires that are otherwise sound, the mating ends can be stripped and spliced.
2. A commercial butt splice can be crimped onto the ends to join them, or a wire splice can be made.
3. A wire splice is made by stripping one 1 1/4 inches of insulation from the wire ends, holding the ends parallel and facing opposite directions, then twisting each end around the other wire at least three turns.
4. Solder and apply heat-shrink tubing.

4-23. AMBIENT THERMOSTAT AUXILIARY POWER INLET/inspect, Test, Repair, Replace (Cont)

LOCATION/ITEM

Installation:

1. Attach wires to appropriate terminals on terminal board (22) and on ground screw (23) in accordance with Appendix E and remove tags.
2. Align inlet power connector assembly (J-1) (18) gasket (21) plate (20) and connector cover (19) with holes in junction box (14).
3. Secure inlet power connector assembly (J-1), gasket and cover to junction box with four screws (15) four flat washers (16) and four lock nuts (17).



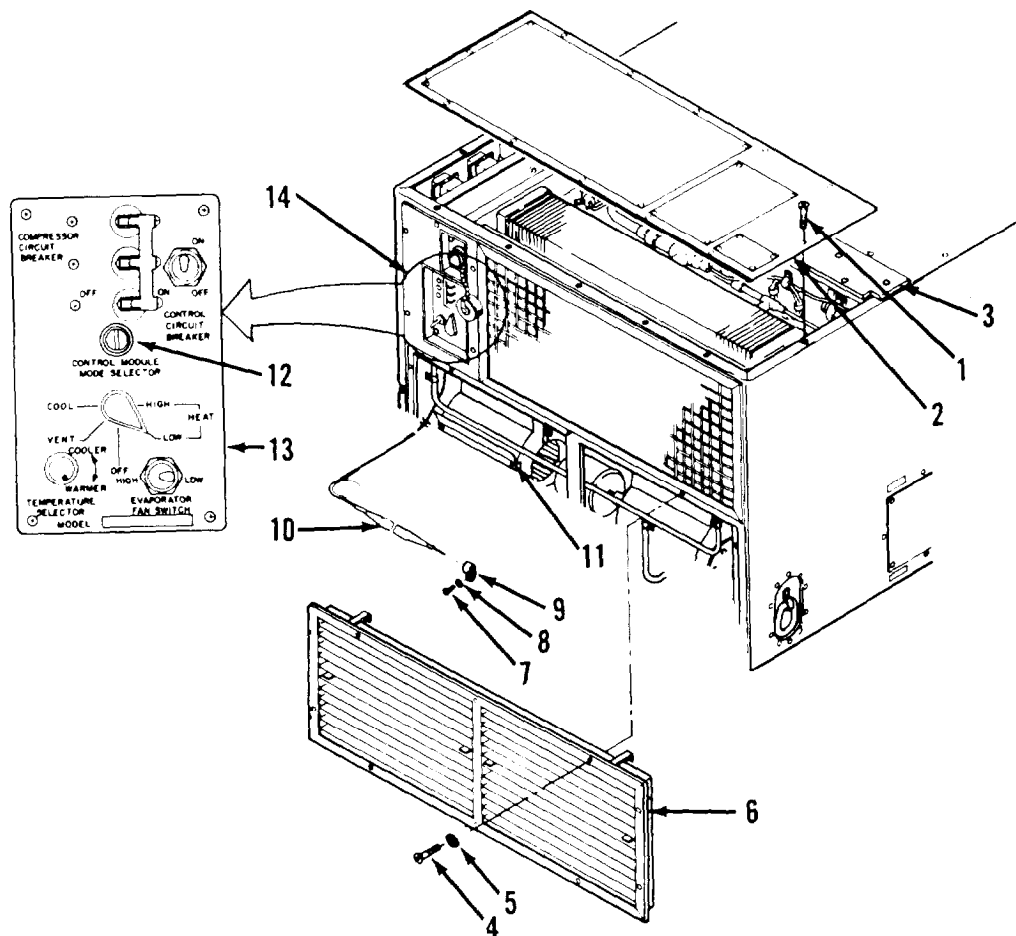
4. Install junction box in accordance with paragraph 4-22, page 4-118.
5. Slide temperature selector sensor bulb (10) thru junction box (14) to left evaporator fan housing assembly (11).

4-23. AMBIENT THERMOSTAT AUXILIARY POWER INLET/Inspect, Test, Repair, Replace (Cont)

LOCATION/ITEM

Installation:

6. Secure temperature selector sensor bulb to left evaporator fan housing with two clamps (9) two lock washers (8) and two screws (7).
7. Slide control module into junction box.
8. Secure control module to junction box with knob (12).
9. Align front louver (evaporator discharge) and secure with eight screws (4) and eight lock washers (5).
10. Align front cover (2) with holes in center cover (3) and housing and secure with fourteen screws (1).



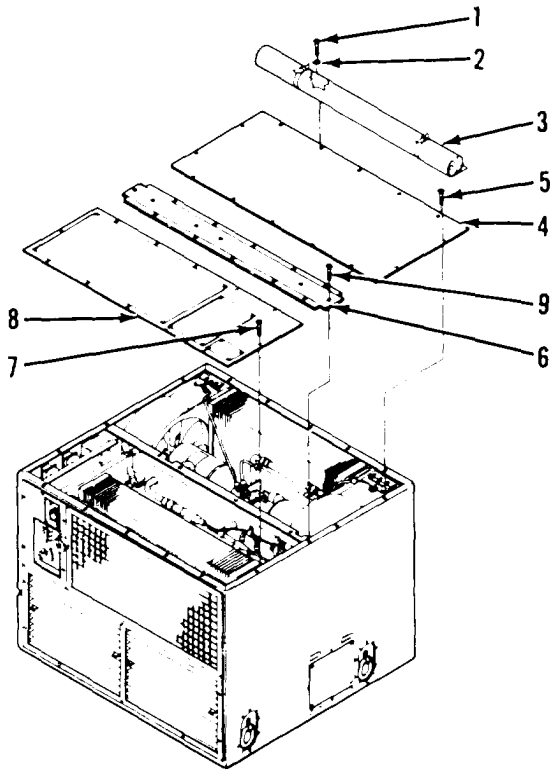
**4-23. AMBIENT THERMOSTAT AUXILIARY POWER INLET/Inspect, Test, Repair, Replace
(Cont)**

LOCATION/ITEM

AUXILIARY POWER CONNECTOR

Removal:

1. Remove three screws (1) and three leek washers (2) and fabric cover (3) and housing.
2. Remove fourteen screws (5) and rear cover (4) from housing.

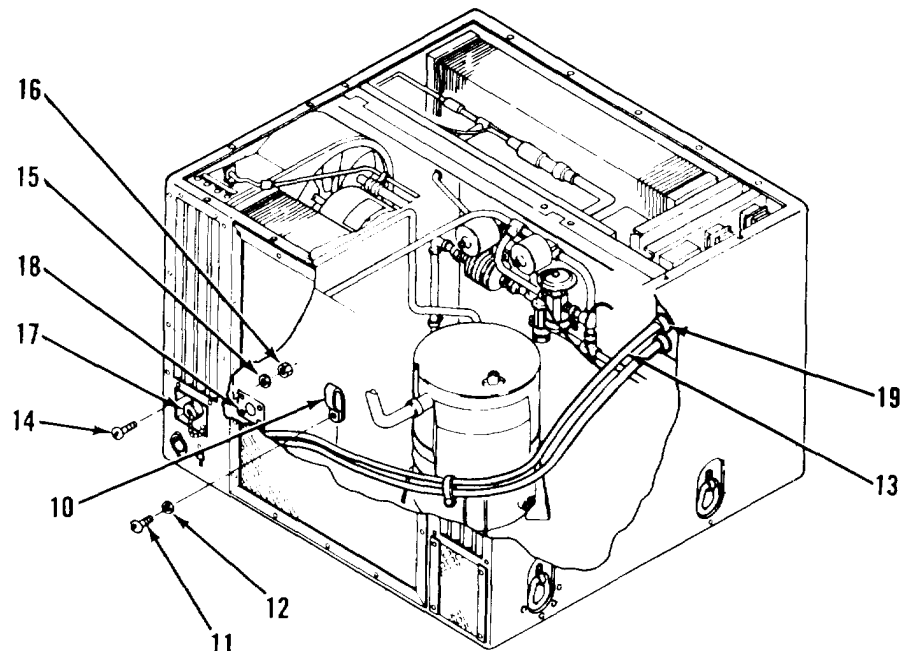


**4-23. AMIBENT THERMOSTAT AUXILIARY POWER INLET/Inspect, Test, Repair, Replace
(Cont)**

LOCATION/ITEM

Removal:

3. Remove fourteen screws (7) and front cover (8) from housing.
4. Remove seven screws (9) and center cover (6) from housing.
5. Remove condenser fans, motor and support assembly in accordance with paragraph 4-15, page 4-43.
6. Remove two clamps (10) two screws (11) and two lock washers (12) and auxiliary inlet power connector assembly (13) from housing.
7. Remove four screws (14) four flat washers (15) and four lock nuts (16) and inlet power connector assembly, dust cover (17) and gasket (18) from housing.
8. Disconnect connector (J-12) (19) from bulkhead.
9. Remove inlet power connector assembly (J-12).



**4-23. AMBIENT THERMOSTAT AUXILIARY POWER INLET/Inspect, Test, Repair, Replace
(Cont)**

LOCATION/ITEM

Inspection:

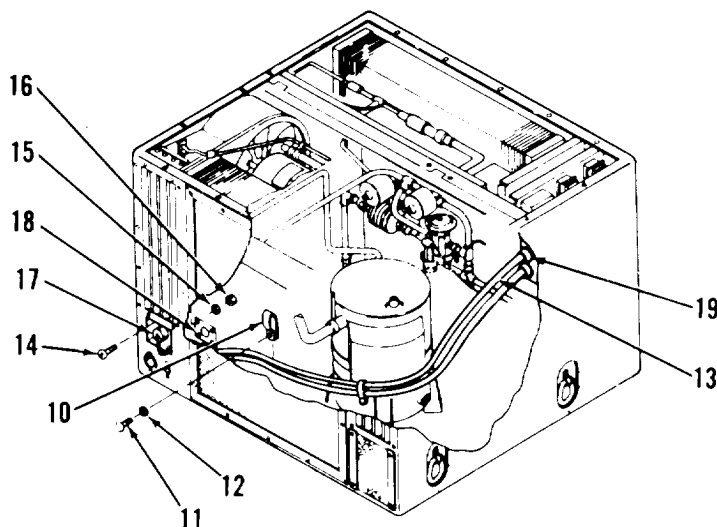
1. Inspect for damage.
2. Repair or replace if damaged.

Repair:

1. Remove damaged section of wire.
2. Strip insulation 1-1/4 inches off both ends of damaged wire.
3. Insert new section of wire, stripped 1-1/4 inches on both ends.
4. Twist wires together on both ends.
5. Solder and insulate.

Installation:

1. Align auxiliary inlet power connector assembly (J-12) (13) with gasket (18) dust cover (17) and holes in housing.
2. Secure above with four screws (14) four flat washers (15) and four lock nuts (16).
3. Secure auxiliary inlet power connector assembly (J-12) to housing with two clamps (10) two screws (11) and two lock washers (12).
4. Attach connector (J-12) (19) to bulkhead.

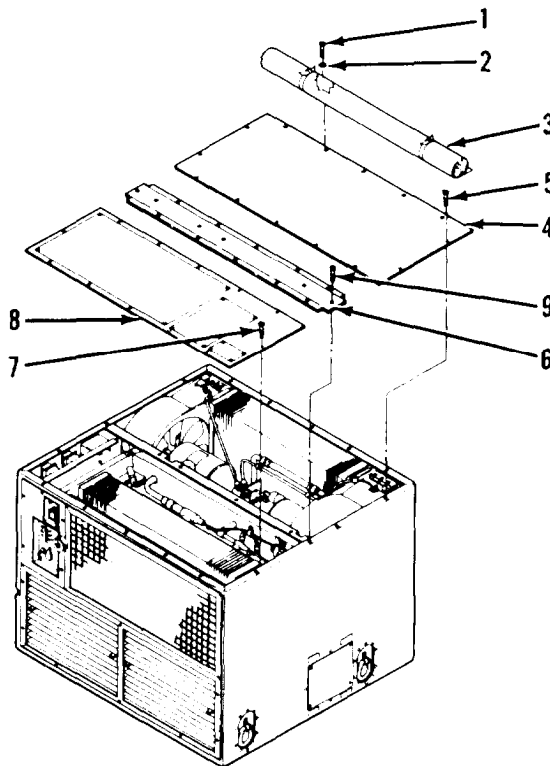


4-23. AMBIENT THERMOSTAT AUXILIARY POWER INLET/Inspect, Test, Repair, Replace (Cont)

LOCATION/ITEM

Installation:

5. Replace condenser fans, motors and support assembly in accordance with paragraph 4-15, page 4-46.
6. Align center cover (6) with holes in housing and secure center cover to housing with seven screws (9).
7. Align front cover (8) with holes in center cover and housing and secure with fourteen screws (7).
8. Align rear cover (4) with holes in center cover and housing and secure with fourteen screws (5).
9. Align fabric cover (3) with holes in housing and secure fabric cover to housing with three screws (1) and three lock washers (2).



4-24. HEATER, TRANSFORMER, RECTIFIER AND RELATED PARTS/Inspect, Test, Replace

This Task covers:

- a. Removal
- b. Inspection
- c. Test
- d. Replace
- e. Installation

INITIAL SETUP

Disconnect Power

Test Equipment

MULTIMETER

Tools

TOOL KIT (SC 5180-90-CL-N18)

Troubleshooting Reference

Malfunction 4 Step 8

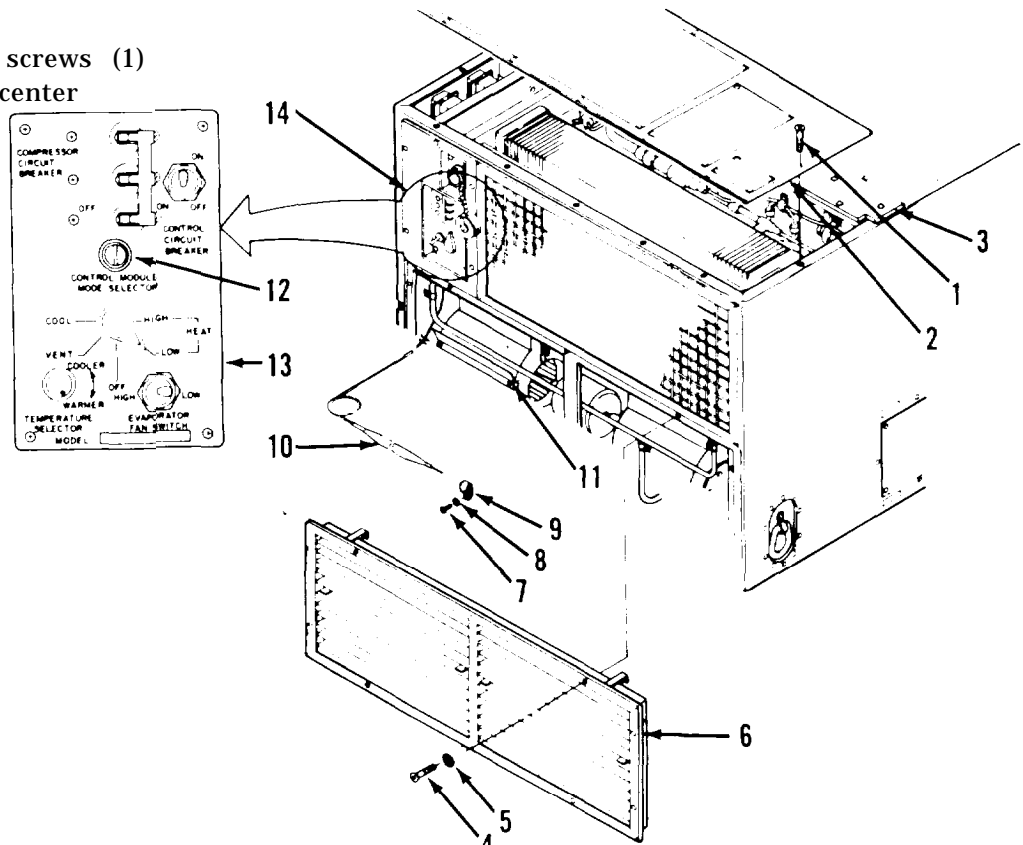
Malfunction 5 Step 8

LOCATION/ITEM

HEATER ELEMENT

Removal:

1. Remove fourteen screws (1) and front cover (2) to center cover (3) from housing.



**4-24. HEATER, TRANSFORMER, RECTIFIER AND RELATED PARTS/Inspect, Test, Replace
(Cont)**

LOCATION/ITEM

Removal:

2. Remove ten screws (4) and ten lock washers (5) and front louver (evaporator inlet) (6) from housing. Remove front louver (evaporator inlet).
3. Remove two screws (7) two lock washers (8) and two clamps (9) and temperature selector sensor bulb (10) from left evaporator fan housing assembly (11).
4. Loosen connector knob (12) and control module (13) from junction box (14). Remove control module and thermostat sensor bulb from evaporator fan housing assembly.
5. Remove junction box in accordance with paragraph 4-22, page 4-107.

WARNING

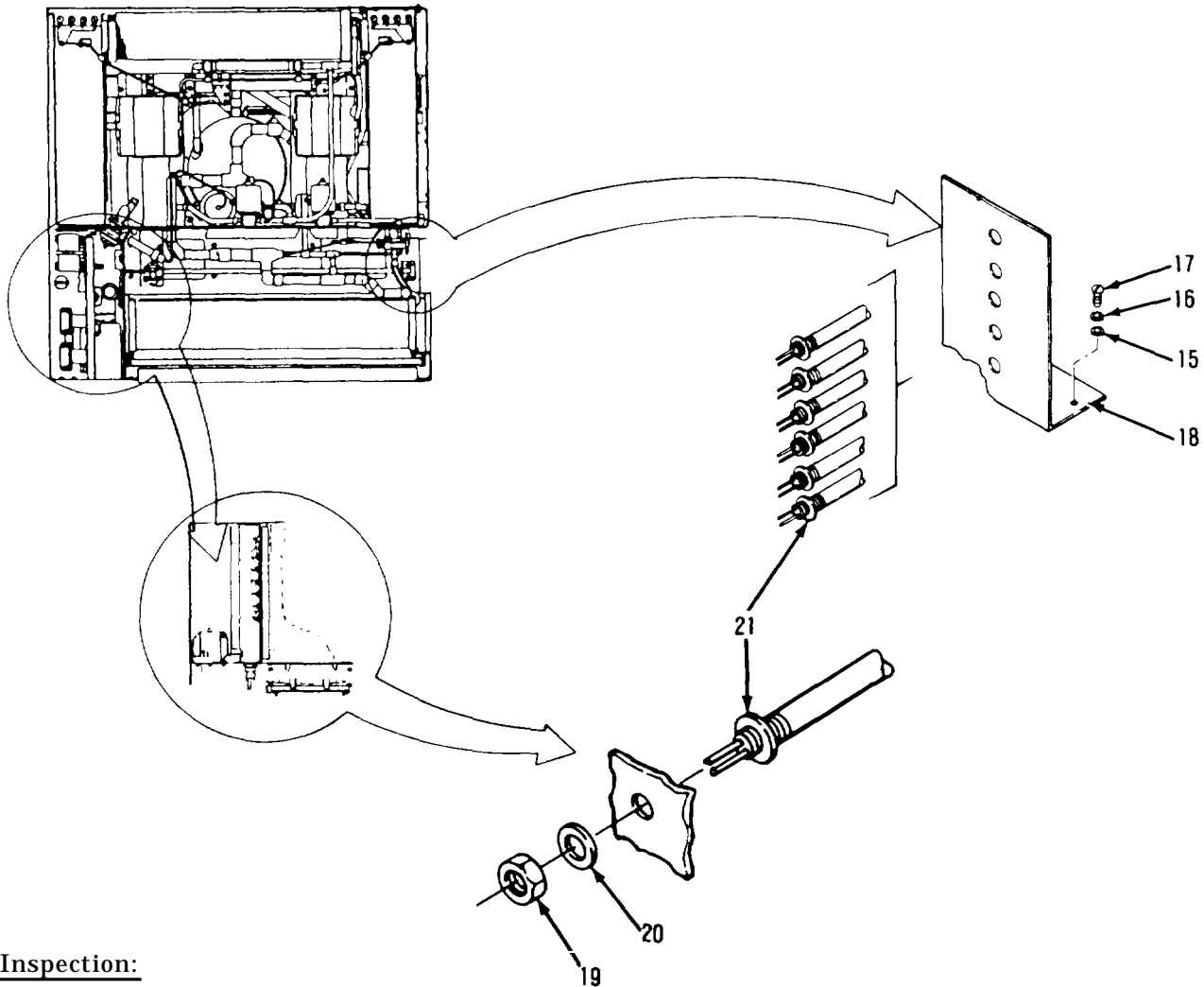
Refrigerant R-22 is contained in the refrigerant system under high pressure. Extreme care must be exercised to prevent refrigerant from coming in contact with exposed skin and eyes. Provide adequate ventilation when discharging the system in a confined area. All refrigerant gas must be discharged from system before performing any removal procedures of refrigerant components.

6. Remove two flat washers (15) two lock washers (16) two screws (17) and heater element mounting bracket (18) from housing.
7. Tag and remove heater wires from terminal board.
8. Remove one nut (19) and one lock washer (20) and heater element (21) from housing.

4-24. HEATER, TRANSFORMER, RECTIFIER AND RELATED PARTS/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Removal:



Inspection:

1. Inspect heater element for damage and repair or replace if damaged.
2. Inspect heater element mounting bracket for damage and repair or replace if damaged.

Test:

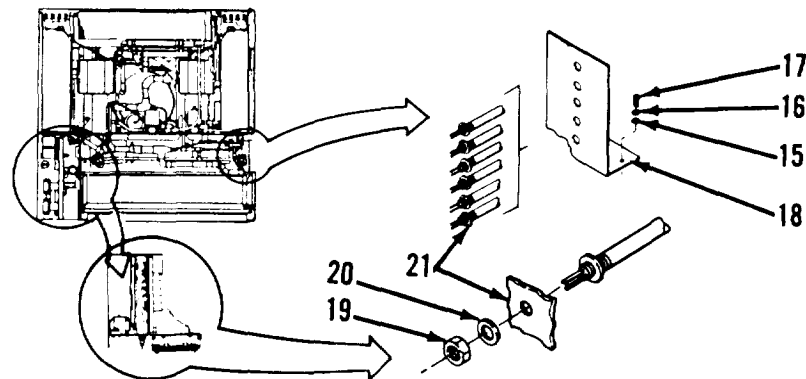
1. Using a multimeter or other continuity tester, check continuity of each heater element.
2. Replace elements that do not indicate continuity.

4-24. HEATER, TRANSFORMER, RECTIFIER AND RELATED PARTS/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Installation:

1. Attach heater element wires to appropriate terminal on terminal board in accordance with Appendix E and remove tags.
2. Align heater element (21) with hole in housing and secure with one lock washer (20) and one nut (19).
3. Slide heater element mounting bracket (18) on to heater elements.
4. Align heater element mounting bracket with holes in housing and secure with two flat washers (15) two lock washers (16) and two screws (17).
5. Install junction box in accordance with paragraph 4-22, page 4-118.
6. Slide thermostat sensor bulb (10) thru junction box (14) to left evaporator fan housing (11).
7. Secure thermostat sensor bulb to left evaporator fan housing with two clamps (9) two lock washers (8) and two screws (7).
8. Slide control module into junction box.
9. Secure control module to junction box with knob (12).
10. Align front louver (evaporator inlet) (6) with housing and secure with ten screws (4) and ten lock washers (5).

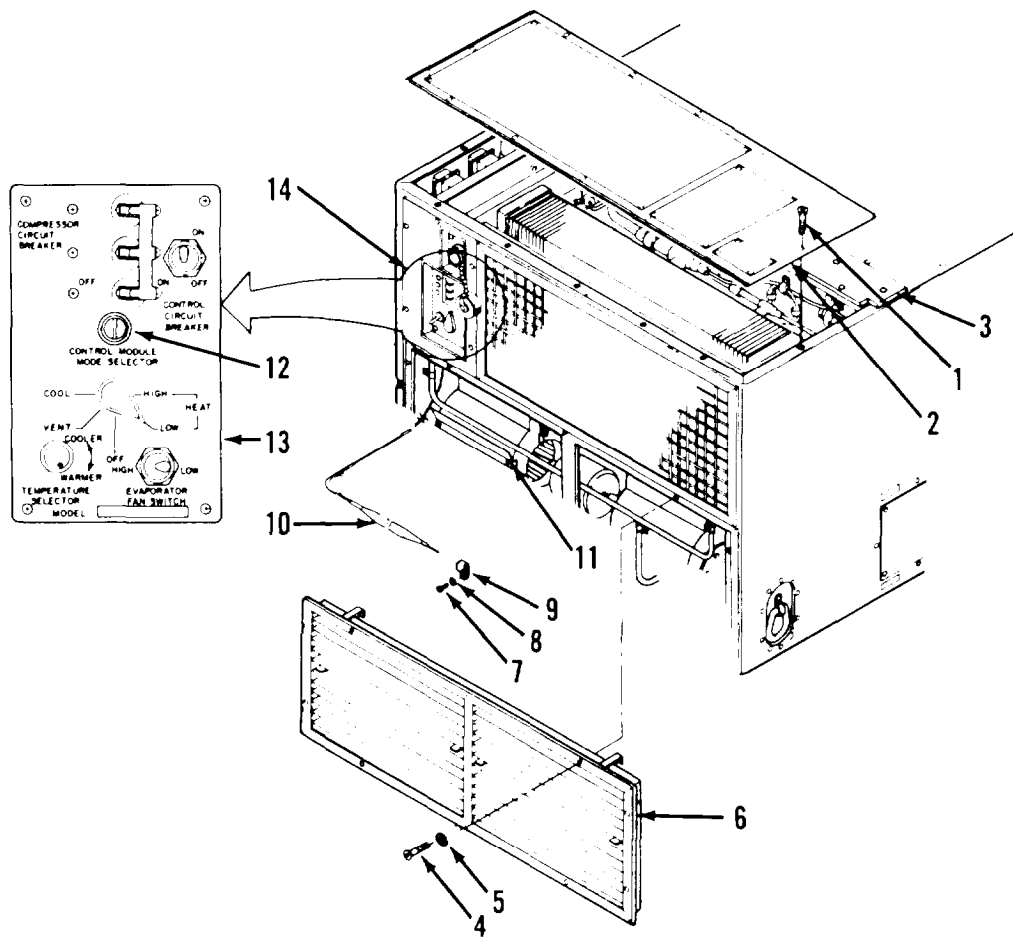


**4-24. HEATER, TRANSFORMER, RECTIFIER AND RELATED PARTS/Inspect, Test, Replace
(Cont)**

LOCATION/ITEM

Installation:

11. Align front cover (2) with holes in center cover and housing and secure housing with fourteen screws (1).



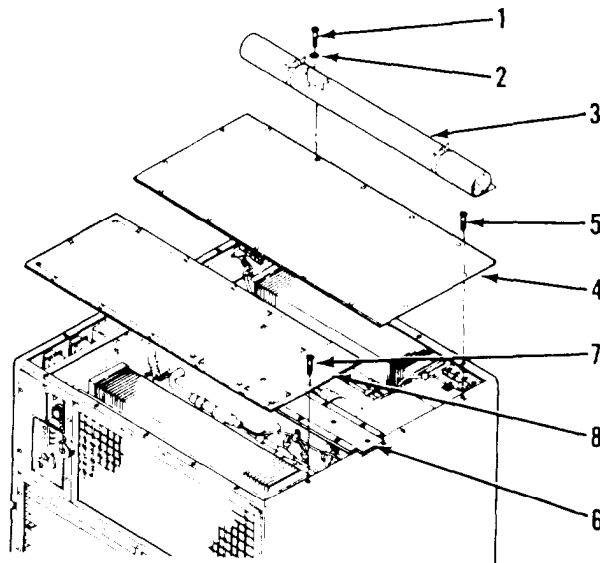
**4-24. HEATER, TRANSFORMER, RECTIFIER AND RELATED PARTS/Inspect, Test, Replace
(Cont)**

LOCATION/ITEM

THERMOSTATIC SWITCH

Removal:

1. Remove three screws (1) and three lock washers (2) and fabric cover (3) from housing.
2. Remove fourteen screws (5) and rear cover (4) from housing.



**4-24. HEATER, TRANSFORMER, RECTIFIER AND RELATED PARTS/Inspect, Test, Replace
(Cont)**

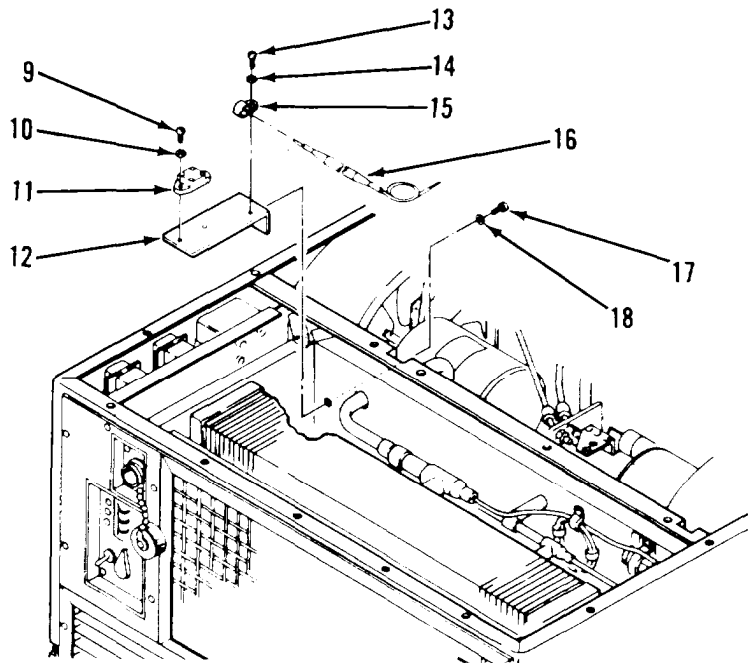
LOCATION/ITEM

Removal:

WARNING

Allow heaters to cool before attempting removal or test of heater thermostat.

3. Remove fourteen screws (7) and front cover (8) to center cover from housing.
4. Remove two screws (9) and two lock washers (10) securing thermostatic switch (11) to mounting bracket (12).
5. Tag and remove wires from thermostatic switch.
6. Remove thermostatic switch (heater).
7. Remove one screw (13) one lock washer (14) and one clamp (15) and sensor bulb (16) from heater thermostatic mounting bracket.
8. Remove three screws (17) and three lock washers (18) and mounting bracket (12) from housing.



4-24. HEATER, TRANSFORMER, RECTIFIER AND RELATED PARTS/Inspect, Test, Replace (Cont)

LOCATION/ITEM

THERMOSTATIC SWITCH (HEATER) and MOUNTING BRACKET

Inspect:

1. Inspect for damage.
2. Repair or replace if damaged.

Test:

1. Using a multimeter check continuity of the wire leads attached to terminals 1 and 2, of the heater thermostat. Continuity is not indicated if thermostatic switch (heater) is defective.
2. Replace defective thermostatic (heater).
3. Tape the bulb of a thermometer or junction of a thermocouple to the body of the heater thermostat, and leave the continuity tester connected to terminals one and two. Gradually apply heat, and observe both the thermometer and the continuity tester. Continuity should drop out at $194 + 9^{\circ}\text{F}$ ($90 + 5^{\circ}\text{C}$). While still continuing to watch the thermometer and the continuity tester, let the heater thermostat cool. Continuity should be re-established at $142 + 17^{\circ}\text{F}$ ($61 + 9^{\circ}\text{C}$).
4. Repeat step 1 with the meter connected to terminal 3 and 4.
5. If the heater thermostat does not meet temperature and continuity requirements, it is defective.
6. Replace defective thermostatic switch (heater).

Installation:

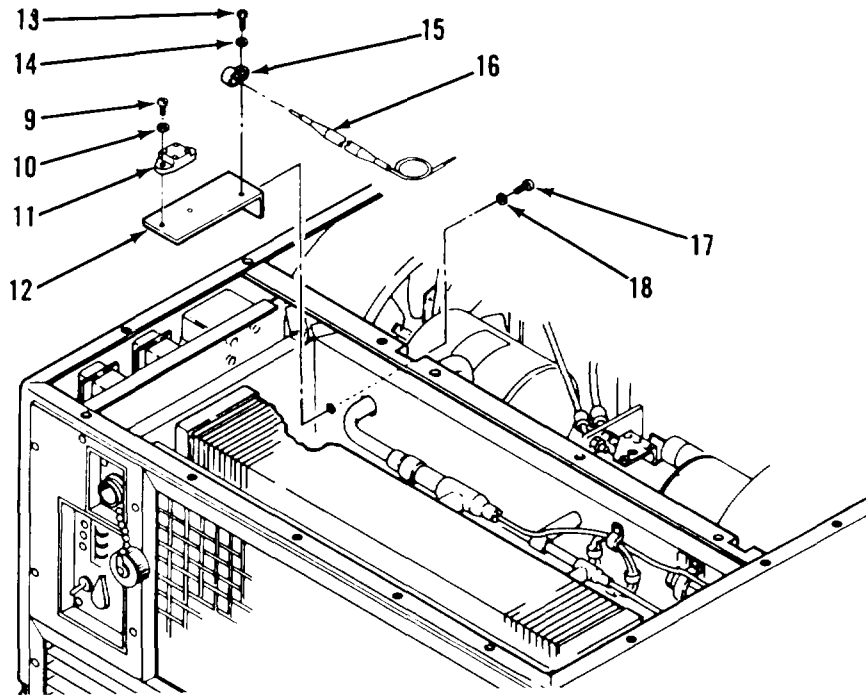
1. Align heater thermostatic mounting bracket (12) with holes in housing and secure with three screws (17) and three lock washers (18).
2. Align sensor bulb (16) and one clamp (15) with holes in mounting bracket (12) and secure with one screw (13) and one lock washer (14).
3. Attach wire to appropriate terminals on thermostat in accordance with Appendix E and remove tags.

4-24. HEATER, TRANSFORMER, RECTIFIER AND RELATED PARTS/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Installation:

4. Align thermostat with holes in housing and secure with two screws (9) and two lock washers (10).



5. Align front cover (8) with holes in center cover (6) and housing and secure with fourteen screws (9).

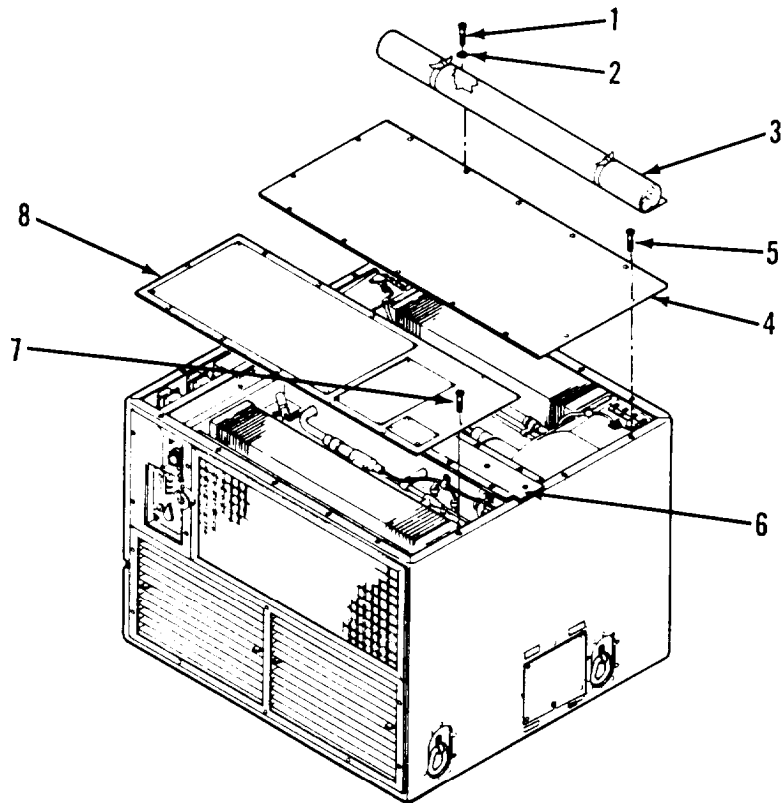
6. Align rear cover (4) with holes in center cover and housing and secure with fourteen screws (5).

**4-24. HEATER, TRANSFORMER, RECTIFIER AND RELATED PARTS/Inspect, Test, Replace
(Cont)**

LOCATION/ITEM

Installation:

7. Align fabric cover (3) with holes in housing and secure with three screws (1) and three lock washers (2).



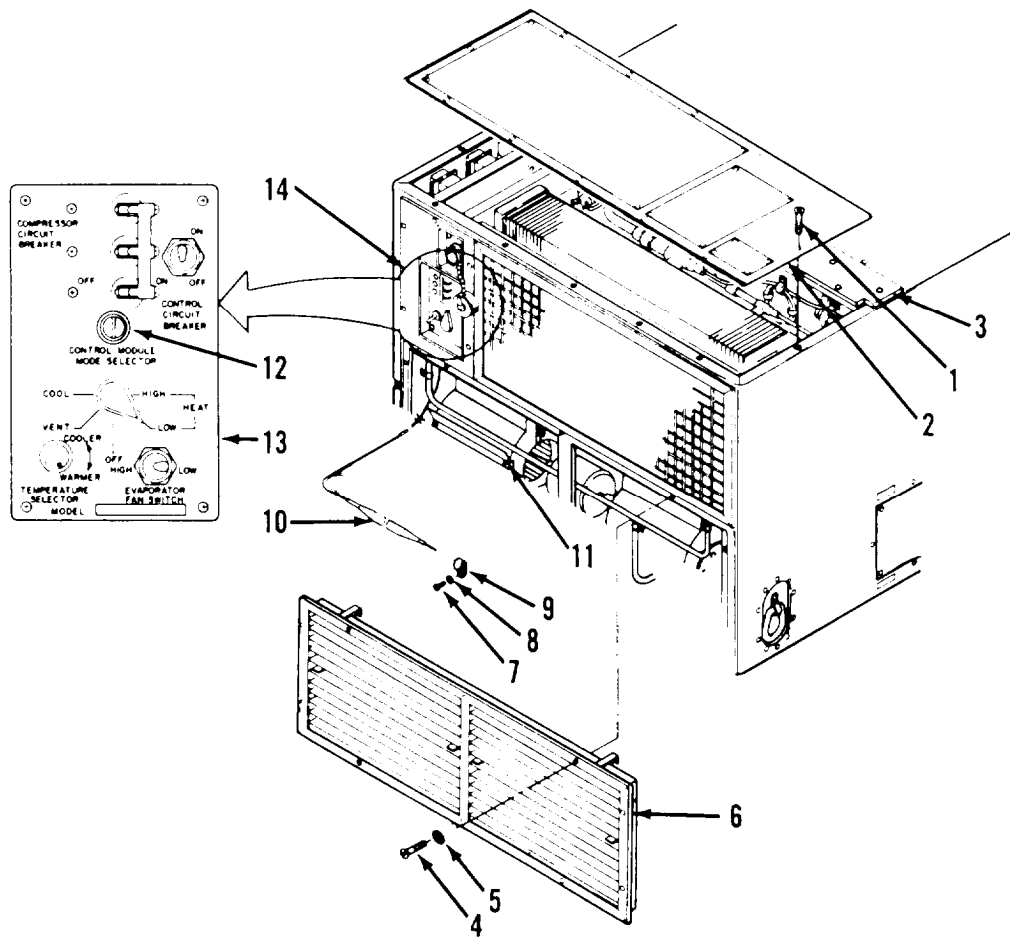
**4-24. HEATER, TRANSFORMER, RECTIFIER AND RELATED PARTS/Inspect, Test, Replace
(Cont)**

LOCATION/ITEM

RECTIFIER/TRANSFORMER/CAPACITORS

Removal:

1. Remove fourteen screws (1) and front cover (2) from housing.



4-24. HEATER, TRANSFORMER, RECTIFIER AND RELATED PARTS/Inspect, Test, Replace
(Cont)

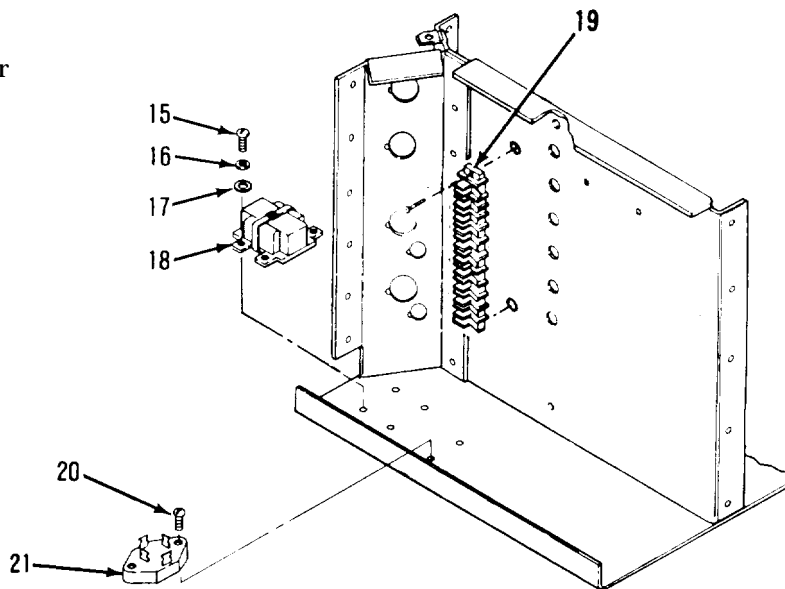
LOCATION/ITEM

Removal:

2. Remove ten screws (4) and ten lock washers (5) securing front louver (evaporator inlet) (6) to housing.
3. Remove two screws (7) two lock washers (8) and two clamps (9) and temperature selector sensor bulb (10) from left evaporator fan housing assembly (11).
4. Loosen connector knob (12) securing control module (13) to junction box (14).
5. Remove control module and thermostat sensor bulb from evaporator fan housing assembly.
6. Remove junction box in accordance with paragraph 4-22, page 4-107.

Rectifier/Transformer

1. Remove four screws (15) four lock washers (16) and four flat washers (17) securing transformer (18) to housing.
2. Tag and remove transformer wires from terminal board (19).
3. Remove two screws (20) securing rectifier (21) to housing.
4. Tag and remove rectifier/wires from terminal board.
5. Remove transformer and rectifier assembly.
6. Tag and unsolder the leads at the transformer.
7. Remove rectifier.



**4-24. HEATER, TRANSFORMER, RECTIFIER AND RELATED PARTS/Inspect, Test, Replace
(Cont)**

LOCATION/ITEM

Inspection:

Rectifier/Transformer/Capacitor (C1)(C2)

1. Inspect for damage, cracks, scorches and/or missing.
2. Replace if damaged.

Test:

Rectifier

1. Apply external 28-30 VAC to rectifier terminal 1 and 3.
2. Output at terminal 4 and 2 should be 26-30 VDC.
3. Terminal 4 is negative.
4. Terminal 2 is positive.
5. If above requirements are not met, rectifier is defective.
6. Replace defective rectifier.

Transformer

1. Check for continuity across the primary winding and then across the secondary winding. If either winding is open, replace the transformer.
2. Check for shorts between one terminal and transformer case and also between one primary terminal and one secondary terminal using multimeter on high ohms setting. Replace transformer if a short is indicated.

Capacitors (C-1) and (C-2)

1. Unsolder leads on capacitor and tag wires.
2. Apply external 28 VAC to the capacitor to charge the capacitor.
3. Using a multimeter or other continuity testing device, check for continuity on the capacitor.
4. No continuity indicates a defective capacitor. Complete continuity indicates a defective capacitor. A short spike returning to 0 indicates a good capacitor.

4-24. HEATER, TRANSFORMER, RECTIFIER AND RELATED PARTS/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Test:

5. Replace defective capacitor.

Installation:

Capacitors (C-1) and (C-2)

1. Slip heat shrink tubing over capacitor wires.
2. Solder capacitor wires to appropriate terminals on rectifier.

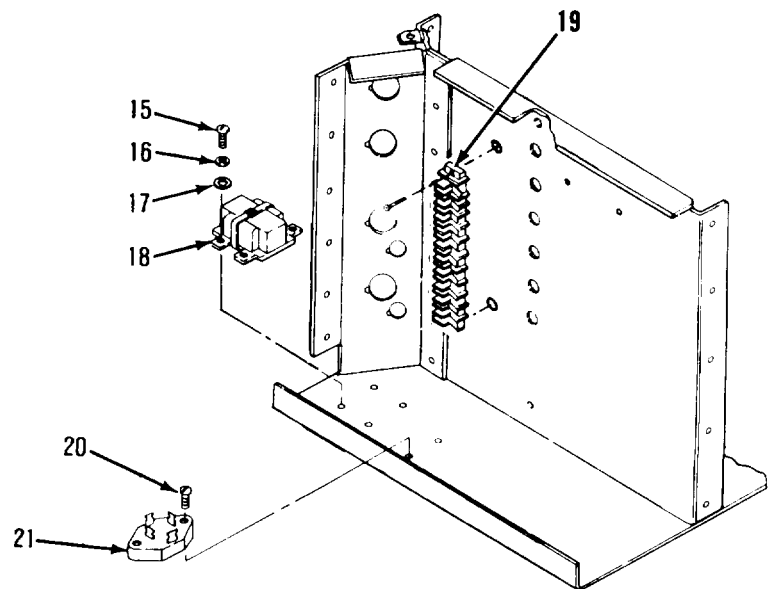
Transformer

1. Solder wires to appropriate terminals on transformer (18) in accordance with Appendix E and remove tags.

2. Attach wires to appropriate terminals on terminal board (19) in accordance with Appendix E and remove tags.

3. Align transformer (20) with housing.

4. Secure transformer to housing with four screws (15), four lock washers (16) and four flat washers (17).



Rectifier

1. Solder wires to transformer (18) in accordance with Appendix E and remove tags.

2. Attach wires to terminal board (19) at appropriate terminals.

3. Align rectifier (21) with housing.

4. Secure rectifier to housing with two screws (20).

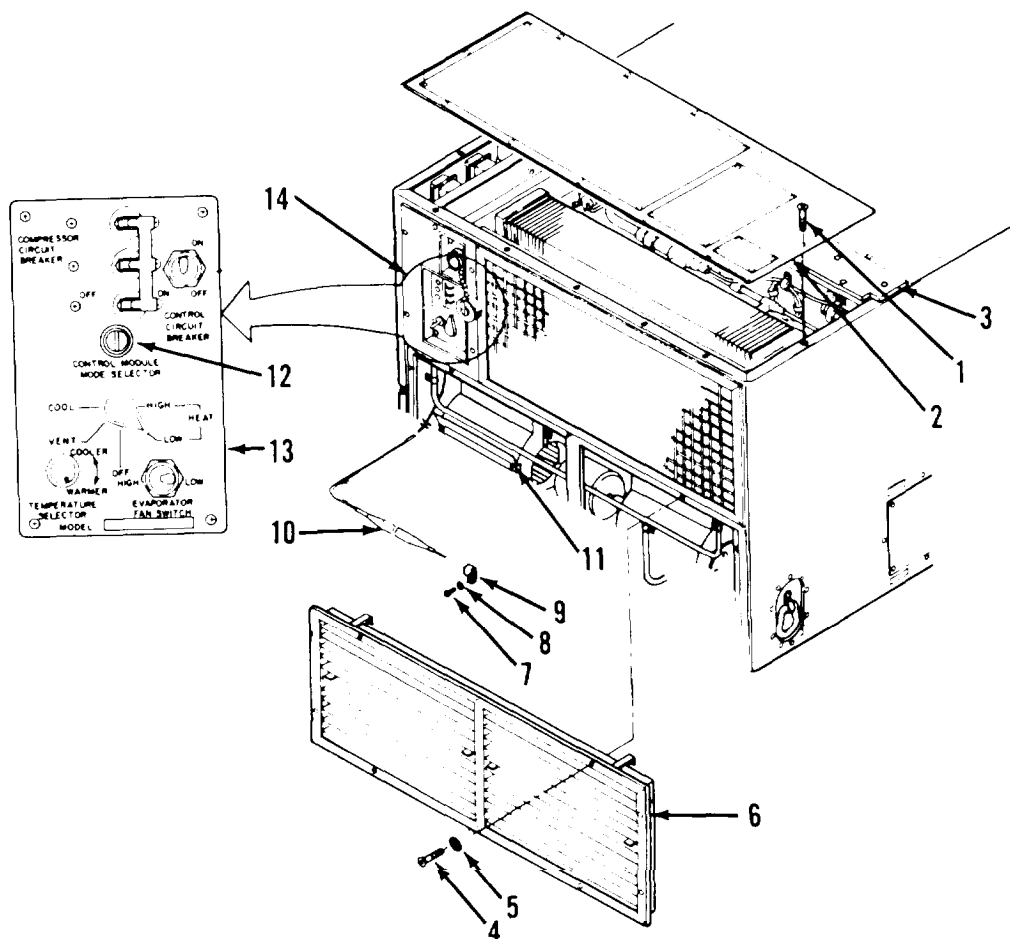
5. Install junction box in accordance with paragraph 4-22, page 4-118.

4-24. HEATER, TRANSFORMER, RECTIFIER AND RELATED PARTS/Inspect, Test, Replace (Cont)

LOCATION/ITEM

Installation:

6. Slide thermostat sensor bulb (10) thru junction box (14) to left evaporator fan housing (11).
7. Secure thermostat sensor bulb to left evaporator fan housing with two clamps (9) two lock washers (8) and two screws (7).
8. Slide control module (13) into junction box.
9. Secure control module to junction box with knob (12).
10. Align front louver (evaporator inlet) (6) with holes in housing and secure with ten screws (4) and ten lock washers (5).
11. Align front cover (2) with holes in center cover (3) and housing and secure with fourteen screws (1).



Removal:

Capacitor (C-1) and (C-2)

Unsolder leads from capacitor in accordance with Appendix E and tag wires.

4-25. LOUVER AND CONDENSER FAN HOUSING ASSY/Inspect, Service, Adjust, Repair, Replace

This Task covers:

- a. Removal
 - b. Inspection
 - c. Service
 - d. Adjustment
 - e. Repair
 - f. Installation
-

INITIAL SETUP

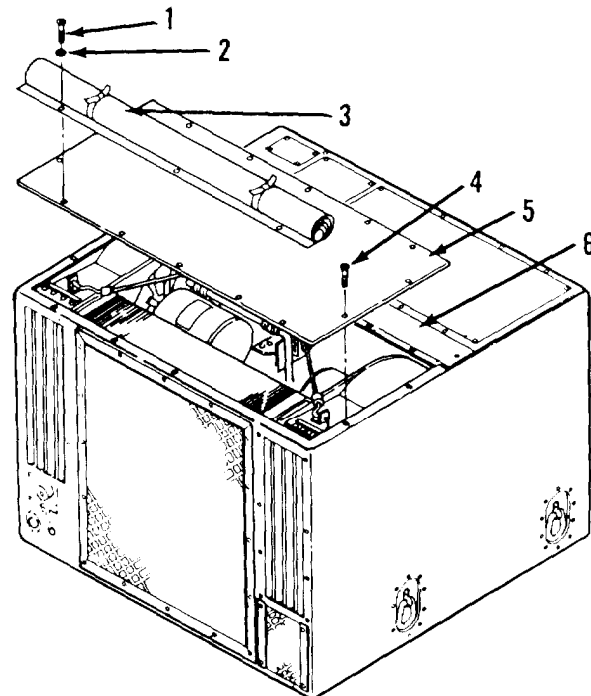
Disconnect Power
 Test Equipment
 MULTIMETER

Tools
 TOOL KIT (SC 5180-90-CL-N18)

LOCATION/ITEM

Removal:

1. Remove three screws (1) and three lock washers (2) and fabric cover (3) from housing.
2. Remove fourteen screws (4) and rear cover (5) from housing.



4-25. LOUVER AND CONDENSER FAN HOUSING ASSY/Inspect, Service, Adjust, Repair, Replace (Cont)

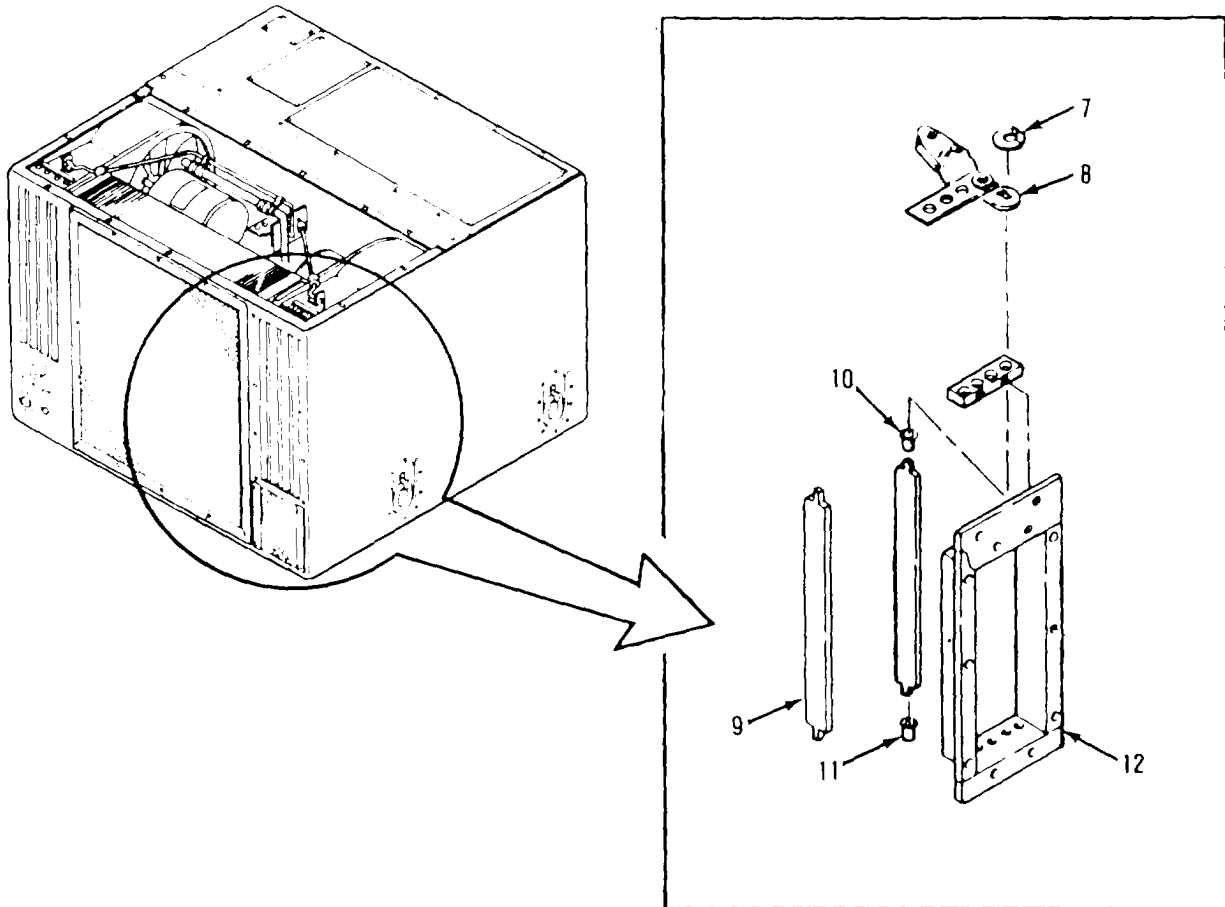
LOCATION/ITEM

Removal:

NOTE

Individual louver blades are flexible enough for removal.

3. Remove four push-pull nuts (7) and connecting link (8) from four louver blades (9).
4. Set connecting link (8) aside.
5. Bend louver blade (9) to remove from bearing (10).
6. Remove blade (9) and bearing (11) from louver frame (12).



4-25. LOUVER AND CONDENSER FAN HOUSING ASSY/Inspect, service, Adjust, Repair, Replace (Cont)

LOCATION/ITEM

Inspection:

Inspect for bends, cracks or weather damage, replace if damaged.

Service:

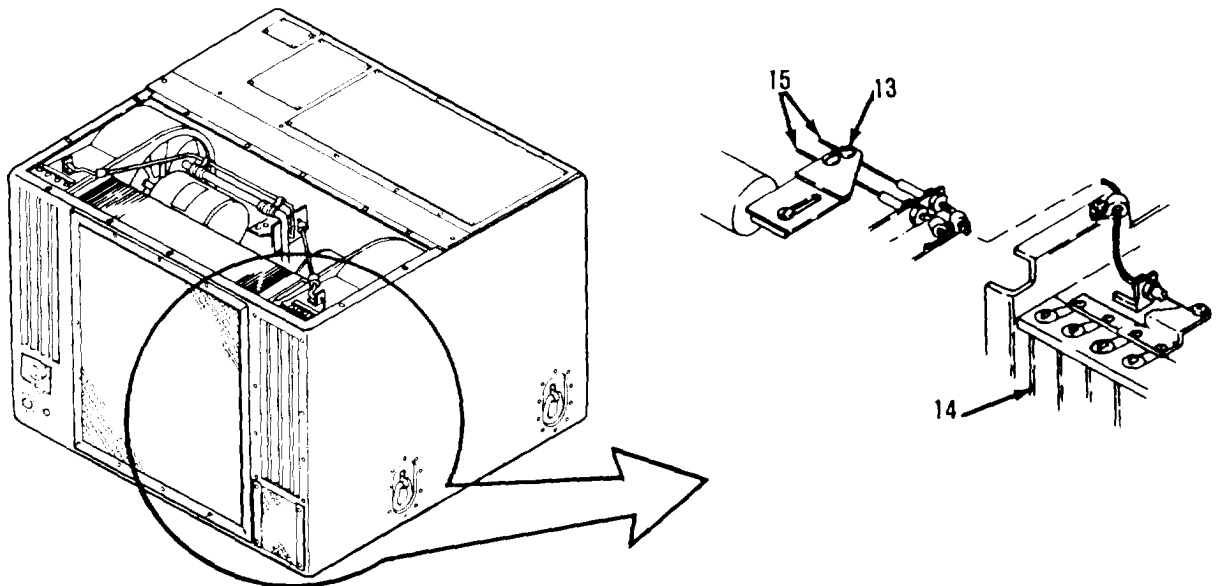
WARNING

Dry cleaning solvent, P-D-680 or P-S-661, used to clean parts is potentially dangerous to personnel and property. Avoid repeated and prolonged skin contact. Do not use near open flame or excessive heat. Flash point of solvent is 100°F (38°C).

Wipe consenser louver with cloth dampened with dry cleaning solvent (Table D-1, Item 3).

Adjust:

1. Turn off air conditioner and wait four hours or until air conditioner is uniformly at ambient temperature or head pressure is below 150 psig (10.516 kg/cm 2).
2. Loosen mechanical post screw (13).
3. Close condenser louvers (14).
4. Pull control cables (15) tight and tighten mechanical post screw (13).



4-25. LOUVER AND CONDENSER FAN HOUSING ASSY/Inspect, Service, Adjust, Repair, Replace (Cont)

LOCATION/ITEM

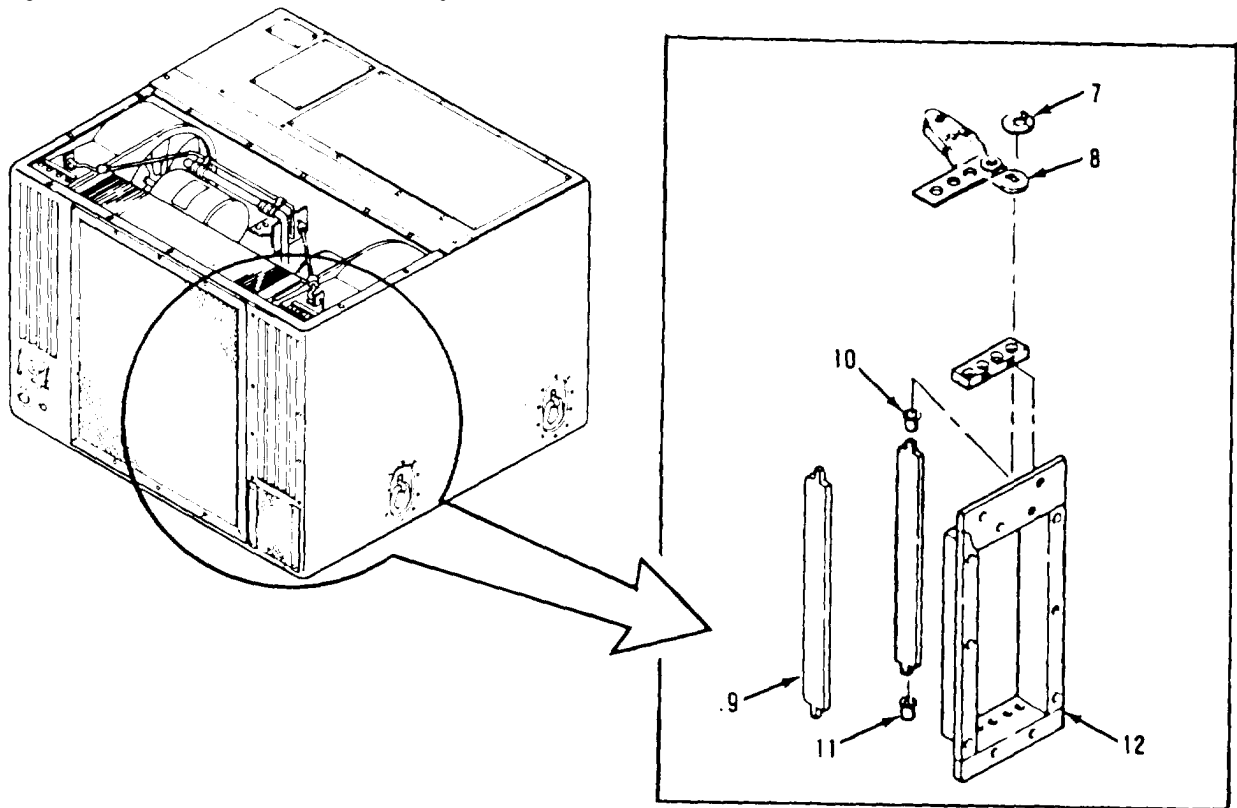
Repair:

1. Replace damaged gasket material and secure gaskets with adhesive in accordance with paragraph (Table D-1, Item 2).

2. Straighten any bent louvers.

Installation:

1. Install bearing (11) in bottom of condenser louver frame (12).
2. Install bearing (10) in top of condenser louver frame.
3. Bend new blade in same manner as removal.
4. Align connecting link (8) with louver blades (9).
5. Secure connecting link to louver blades with four push-on nuts (7).
6. Adjust condenser louver assembly as described above.



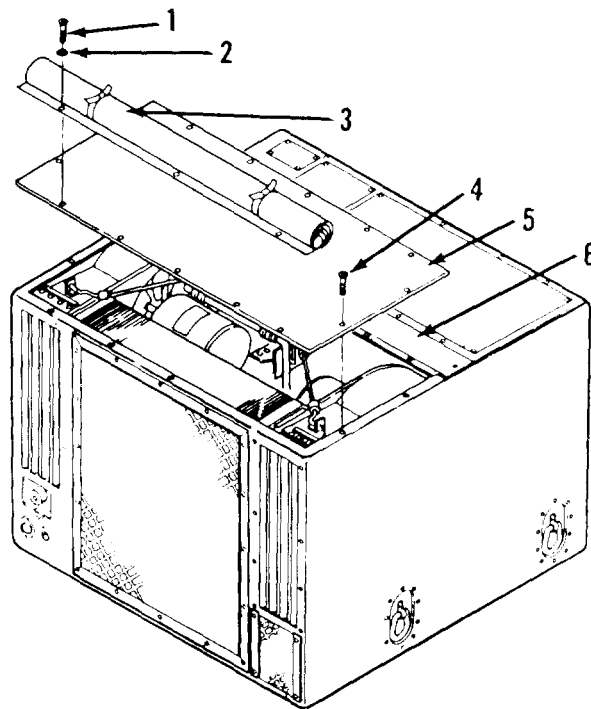
4-25. LOUVER AND CONDENSER FAN HOUSING ASSY/Inspect, Service, Adjust, Repair, Replace (Cont)

LOCATION/ITEM

Installation:

7. Align rear cover (5) with holes in center cover (6) and housing and secure rear cover in center cover and housing with fourteen screws (4).

8. Align fabric cover (3) with holes in housing and secure with three screws (1) and three lock washers (2).



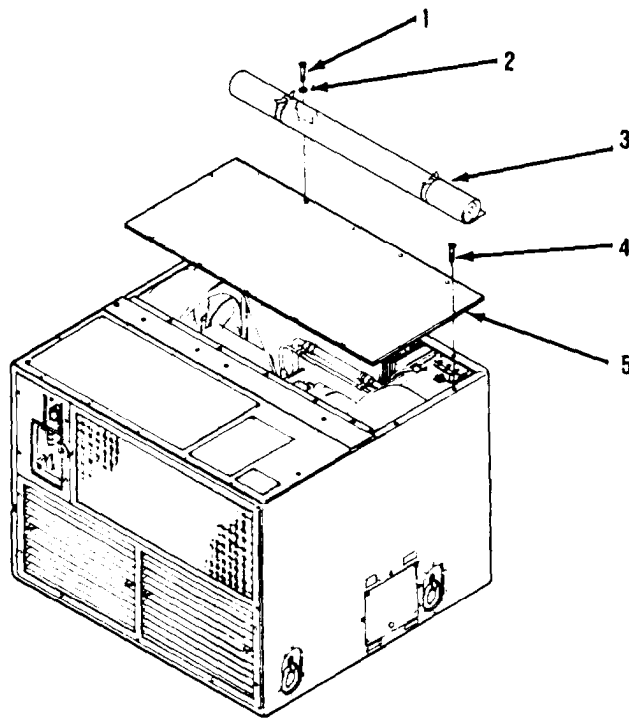
4-25. LOUVER AND CONDENSER FAN HOUSING ASSY/Inspect, Service, Adjust, Repair, Replace (Cont)

LOCATION/ITEM

FAN HOUSING

Removal:

1. Remove three screws (1) and three lock washers and fabric cover (2) from housing.
2. Remove fourteen screws (4) and rear cover (5) from housing.

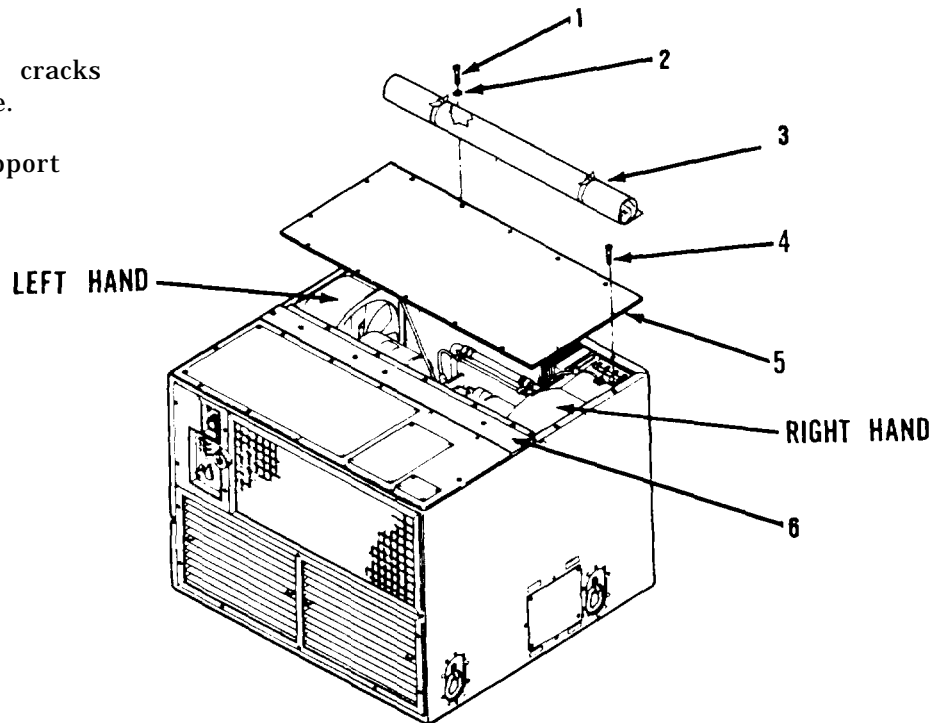


4-25. LOUVER AND CONDENSER FAN HOUSING ASSY/Inspect, Service, Adjust, Repair, Replace (Cont)

LOCATION/ITEM

Inspection:

1. Inspect for bends, cracks and/or weather damage.
2. Notify Direct Support Maintenance.



Installation:

1. Align rear cover (5) with holes in center cover (6) and housing and secure with fourteen screws (4).
2. Align fabric cover (3) with holes in housing and secure with three screws (1) and three lock washers (2).

4-26. HOUSING ASSEMBLY/Repair, Replace

This Task covers:

- a. Repair
 - b. Replace
-

INITIAL SETUP

Disconnect Power

Tools

Tool Kit Refrigeration (SC 5180-90-CL-N18)

LOCATION/ITEM

HOUSING ASSY

Repair:

1. Inspect the housing assembly for dents, gouges, cuts or tears, broken welds, and major deformation. Remove panels as necessary to determine whether internal components such as coils, wiring, piping or other components or sub-assemblies have been damaged. If damage is apparent, leak-test all parts of refrigerant system and make an operating check of controls and functional components. If the unit is functionally ok, repair the housing.

2. Straighten dents by using a sheet-metal hammer and back-up dolly, using care to avoid stretching the metal more than necessary. Fill gouges with body putty, fiberglass-epoxy filler or weld. Weld cuts or tears. Sand paint to a feather edge around the repair, and paint as directed in TM-43-0139.

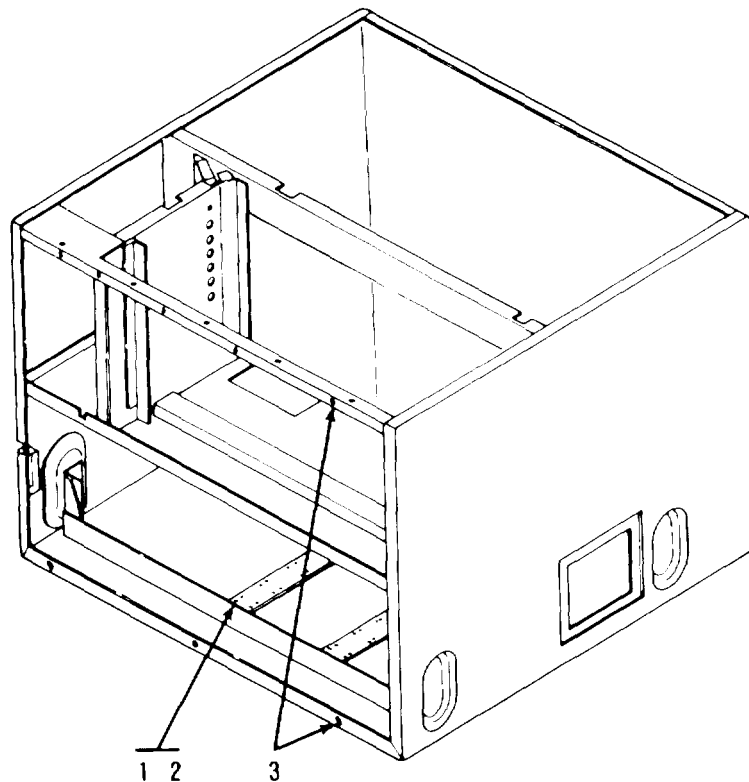
3. Inspect for damaged plate nuts and rivnuts.

4-26. HOUSING ASSEMBLY/Repair, Replace (Cont)

LOCATION/ITEM

Replace:

1. Drill out rivets (1) and remove plate nut (2).
2. Align new plate nuts (2) and new rivnuts (3) with holes in housing and insert with hammer.

**WARNING**

Acetone and methyl-ethyl ketone (MEK) are flammable and their vapors are explosive. Prolonged or repeated inhalation of fumes on contact with the skin can be toxic. Use in a well ventilated area, wear gloves and keep away from sparks or flame.

3. Scrape and pull off as much of the damaged insulation and gaskets as possible.
4. Soften the remaining insulation and adhesive with acetone (Table D-1, Item 1) or methyl-ethyl ketone (MEK) (Table D-1, Item 7).

4-26. HOUSING ASSEMBLY/Repair, Replace (Cont)

LOCATION/ITEM

Installation:

5. Clean up metal surface with a cloth moistened in acetone (Table D-1, Item 1) or methyl-ethyl ketone (MEK) (Table D-1, Item 7).
6. Cut a sheet of the proper insulating material to correct shape.
7. Coat the attaching side with adhesive (Table D-1, Item 2) using paint brush to ensure complete coverage.
8. Coat the metal with adhesive (Table D-1, Item 2) to which the insulation is to be attached.
9. Let both surfaces air-dry until the adhesive becomes tacky but will not stick to the fingers.
10. Starting at one corner or at a narrow edge, carefully bring the insulation in to full contact with the metal.
11. Press into firm contact all over.

4-26. HOUSING ASSEMBLY/Repair, Replace (Cont)

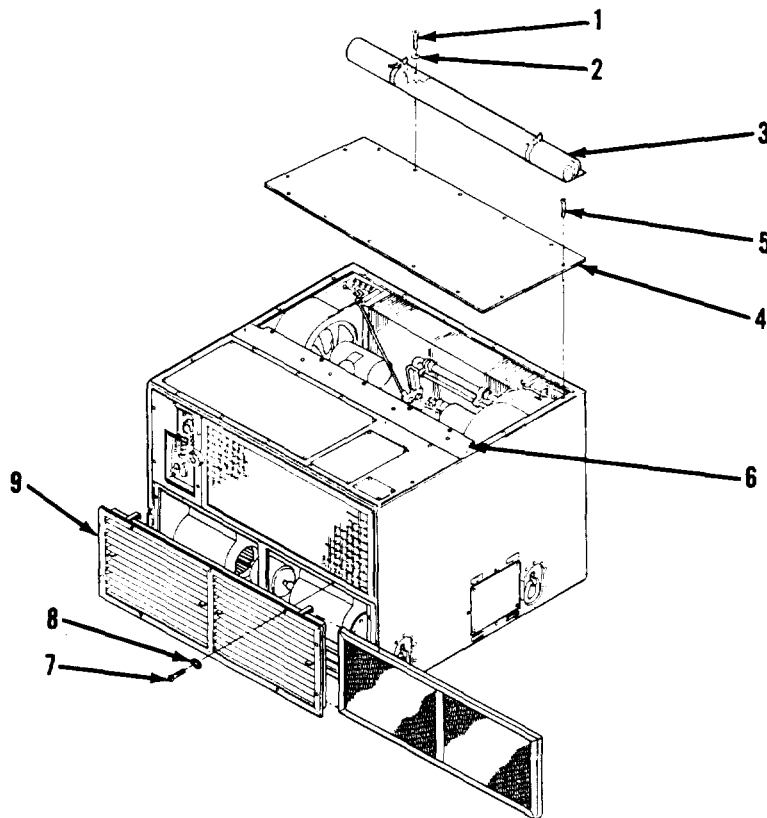
LOCATION/ITEM

CONDENSER FAN HOUSING

Removal:

Left Side

1. Remove three screws (1) and three lock washers (2) and fabric cover (3) to rear cover (4) from housing.
2. Remove fourteen screws (5) and rear cover (4) from housing.



4-26. HOUSING ASSEMBLY/Repair, Replace (Cont)

LOCATION/ITEM

Removal:

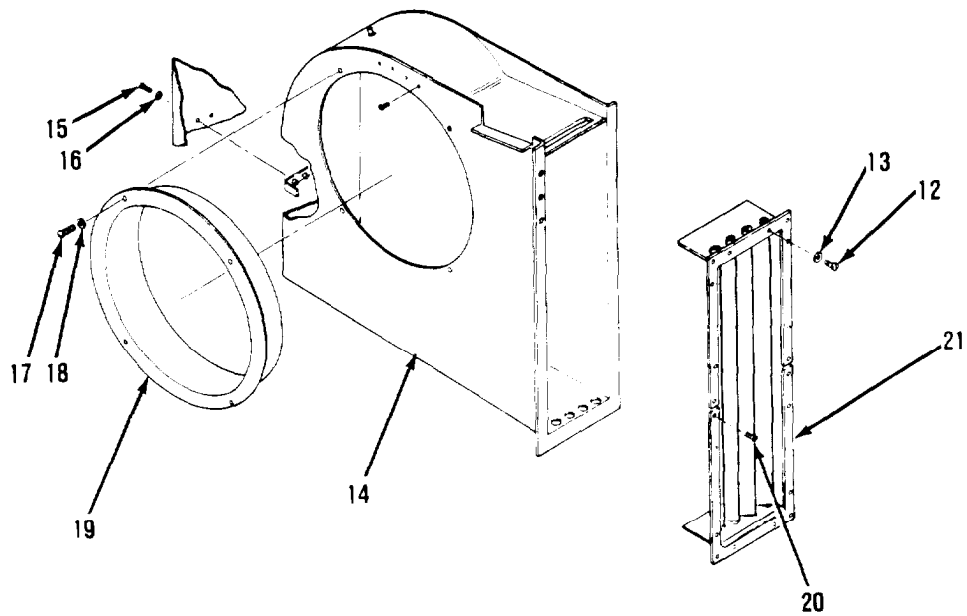
3. Remove ten screws (7) and ten lock washers (8) and front louver (evaporator inlet) (9) from housing.
4. Remove condenser louver cable actuator in accordance with paragraph 5-18, page 5-26.
5. Remove control cable assembly in accordance with paragraph 5-18, page 5-24.
6. Remove condenser fans, motors and support assemblies in accordance with paragraph 4-15, page 4-39.
7. Remove condenser fan and motor support ("X") in accordance with paragraph 5-17, page 5-21.
8. Remove eighteen screws (10) and condenser coil guard (11) from housing.
9. Remove condenser coil in accordance with paragraph 5-23, page 5-73.

4-26. HOUSING ASSEMBLY/Repair, Replace (Cont)

LOCATION/ITEM

Removal:

10. Remove thirteen screws (12) and thirteen lock washers (13) and condenser fan housing assembly (left) (14) from housing.
11. Remove two screws (15) and two lock washers (16) and condenser fan housing assembly (14) from bulkhead.
12. Remove four screws (17) and four flat washers (18) and inlet ring (venturi) (19) from condenser fan housing (14).
13. Remove four screws (20) and louver assembly (21) from condenser fan housing (14).



4-26. HOUSING ASSEMBLY/Repair, Replace (Cont)

LOCATION/ITEM

Installation:

1. Align condenser louver assembly (21) with holes in condenser fan housing and secure with four screws (20).

2. Align inlet ring (venturi) (19) with holes in condenser fan housing and secure with four screws (17) and four flat washers (18).

3. Align condenser fan housing assembly with holes in bulkhead and housing and secure with two screws (15) and two lock washers (16).

4. Secure condenser fan housing assembly with thirteen screws (12) and thirteen lock washers (13).

5. Install condenser coil in accordance with paragraph 5-23, page 5-76.

6. Install condenser fan motor support in accordance with paragraph 5-17, page 5-22.

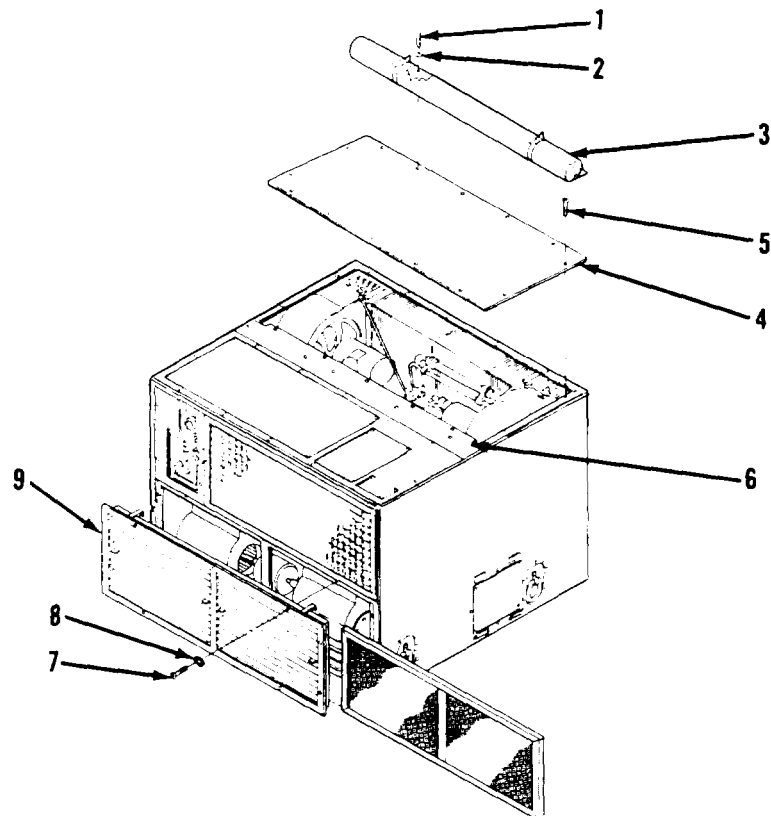
7. Install condenser fans, and support assemblies in accordance with paragraph 4-15, page 4-46.

8. Install condenser louver cable actuator in accordance with paragraph 5-18, page 5-29.

9. Align condenser coil guard (11) with holes in housing and secure condenser coil guard to housing with eighteen screws (10).

10. Align front louver (evaporator inlet) (9) with holes in housing and secure with ten screws (7) and ten lock washers (8).

11. Align rear cover (6) with holes in center cover and housing and secure rear cover in center cover and housing with fourteen screws (5).



4-26. HOUSING ASSEMBLY/Repair, Replace (Cont)

LOCATION/ITEM

Installation:

12. Align fabric cover (3) with holes in housing and secure with three screws (1) and three lock washers (2).

CONDENSER FAN HOUSING

Removal:

Right Side

1. Remove three screws (1) and three lock washers (2) and fabric cover (3) to rear cover (4) and housing.

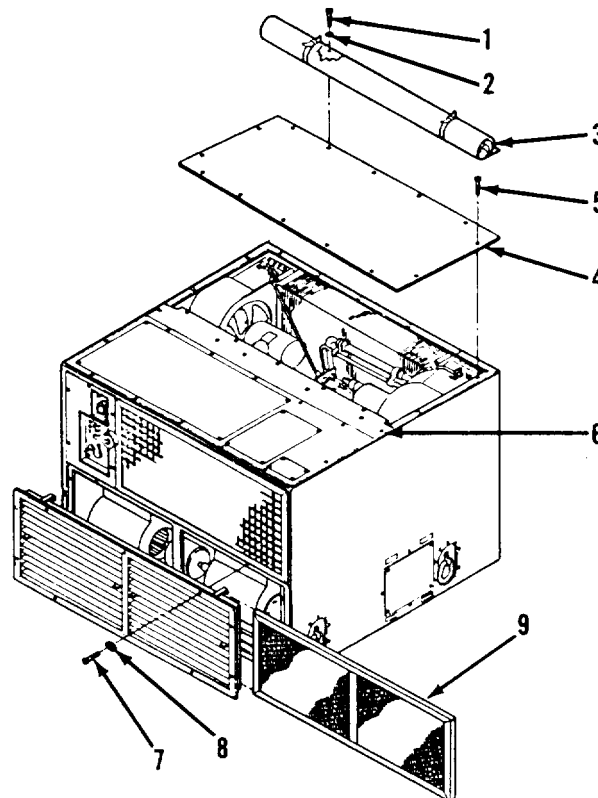
2. Remove fourteen screws (5) and rear cover (4) from housing.

3. Remove condenser louver cable actuator in accordance with paragraph 5-18, page 5-24.

4. Remove control cable assembly in accordance with paragraph 5-18, page 5-24.

5. Remove ten screws (7) and ten lock washers (8) and front louver (evaporator inlet) (9) from housing.

6. Remove condenser fans, motors and support assemblies in accordance with paragraph 4-15, page 4-39.

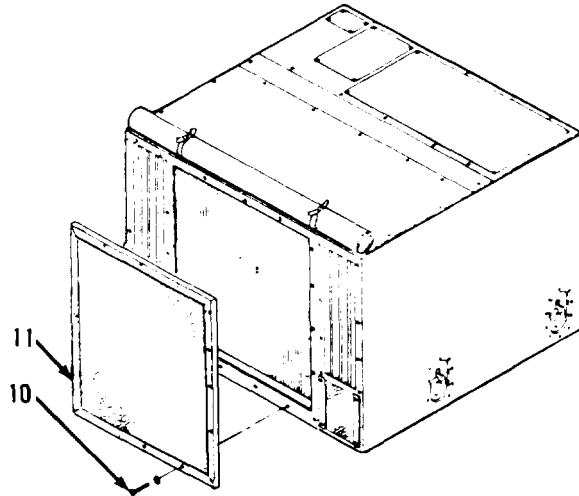


4-26. HOUSING ASSEMBLY/Repair, Replace (Cont)

LOCATION/ITEM

Removal:

7. Remove condenser fan motor support in accordance with paragraph 4-15, page 4-39.
8. Remove eighteen screws (10) and condenser coil guard (11) from housing.
9. Remove condenser coil in accordance with paragraph 5-23, page 5-73.
10. Remove accumulator in accordance with paragraph 5-22, page 5-69.
11. Remove evaporator fan motor and housing assembly in accordance with paragraph 4-17, page 4-60.
12. Remove receiver in accordance with paragraph 5-21, page 5-54.



4-26. HOUSING ASSEMBLY/Repair, Replace (Cont)

LOCATION/ITEM

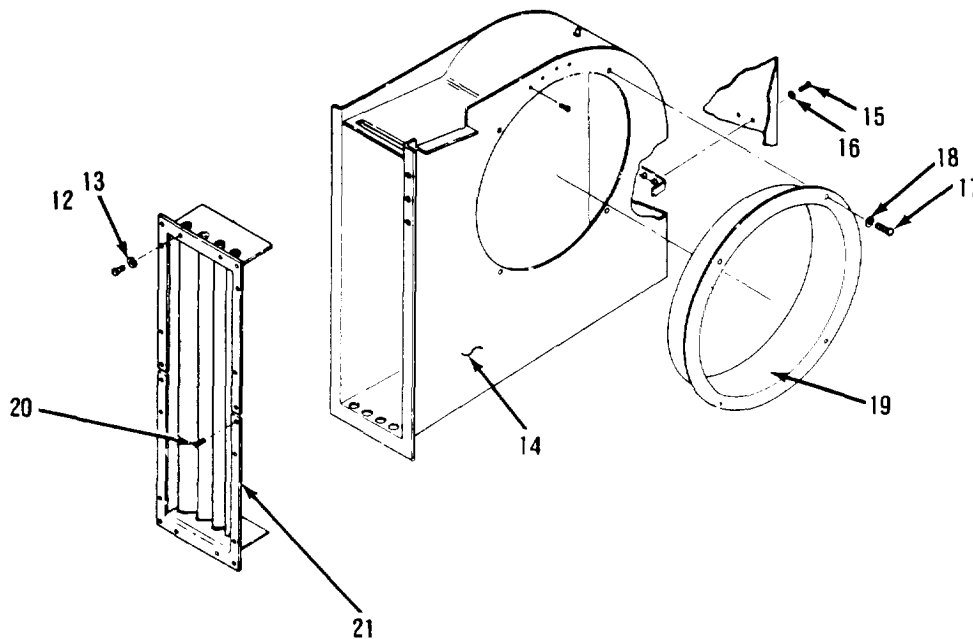
Removal:

13. Remove thirteen screws (12) and thirteen lock washers (13) and condenser fan housing assembly (left) (14) from housing.

14. Remove two screws (15) and two lock washers (16) and condenser fan housing assembly from bulkhead.

15. Remove four screws (17) and four flat washers (18) and inlet ring (venturi) (19) from condenser fan housing (14).

16. Remove four screws (20) and louver assembly (21) from condenser fan housing (14).

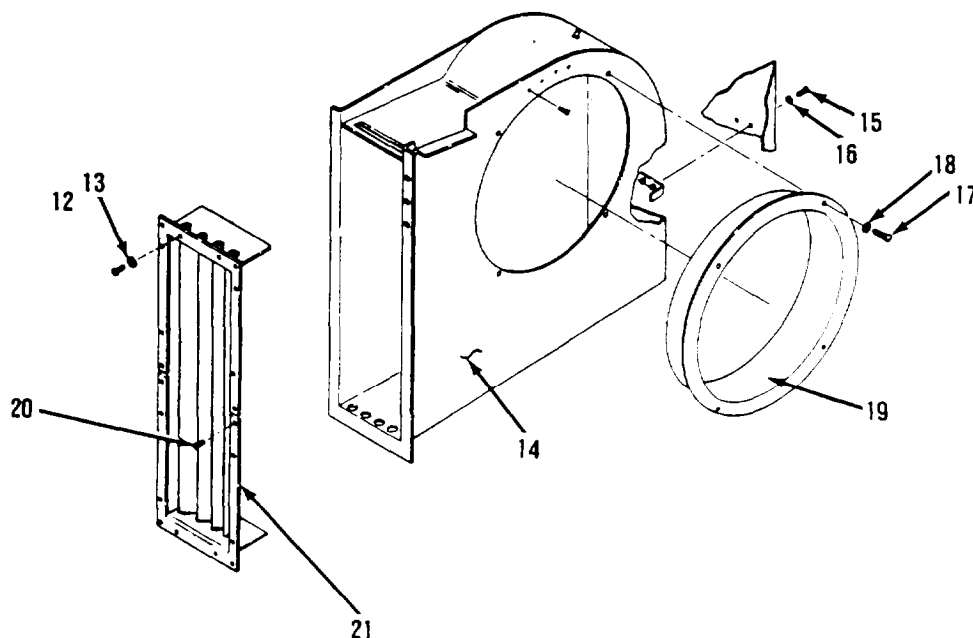


4-26. HOUSING ASSEMBLY/Repair, Replace (Cont)

LOCATION/ITEM

Installation:

1. Align louver assembly (21) with holes in condenser fan housing and secure louver assembly to condenser fan housing with four screws (20).
2. Align inlet ring (venturi) (19) with holes in condenser fan housing and secure with four screws (17) and four flat washers (18).
3. Align condenser fan housing assembly with holes in bulkhead and housing and secure condenser fan housing assembly to bulkhead with two screws (15) and two lock washers (16).
4. Secure condenser fan housing assembly to housing with thirteen screws (12) and thirteen lock washers (13).



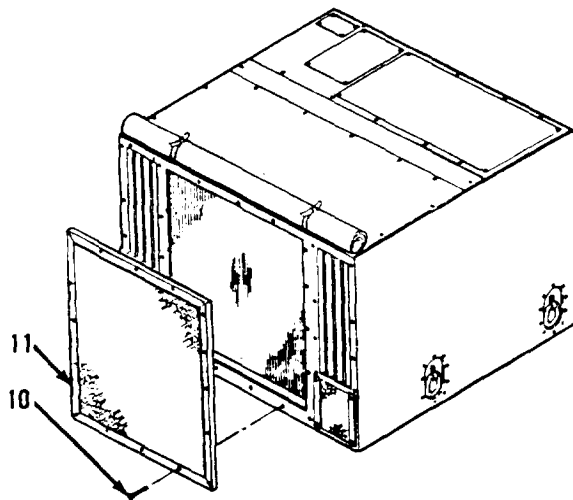
5. Replace receiver in accordance with paragraph 5-21, page 5-57.
6. Replace accumulator in accordance with paragraph 5-22, page 5-71.

4-26. HOUSING ASSEMBLY/Repair, Replace (Cont)

LOCATION/ITEM

Installation:

7. Replace evaporator fan motor and housing assembly in accordance with paragraph 4-17, page 4-68.
8. Replace condensate drain assembly in accordance with paragraph 4-16, page 4-58.
9. Replace condenser coil in accordance with paragraph 5-23, page 5-75.
10. Align condenser coil guard(n) with holes in housing and secure condenser coil guard to housing with eighteen screws.
11. Install condenser fan motor support in accordance with paragraph 5-17, page 5-22.
12. Install condenser fans and motor support assembly in accordance with paragraph 5-17, page 5-22.
13. Install condenser louver cable actuator in accordance with paragraph 5-18, page 5-29.

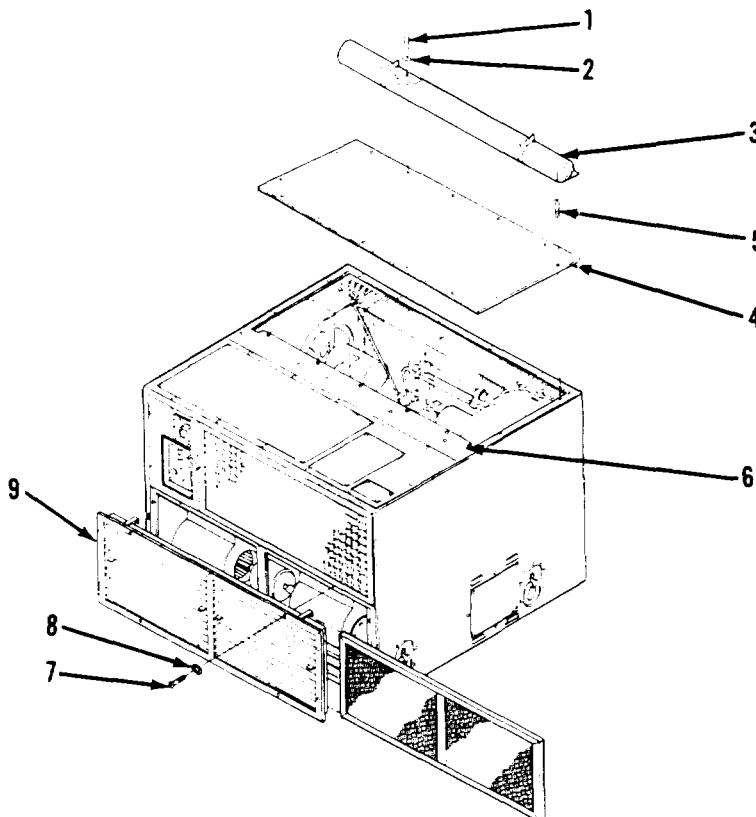


4-26. HOUSING ASSEMBLY/Repair, Replace (Cont)

LOCATION/ITEM

Installation:

14. Install control cable assembly in accordance with paragraph 5-18, page 5-24.
15. Align front louver (evaporator inlet) (9) with holes in housing and secure front louver (evaporator inlet) to housing with ten screws (7) and ten lock washers (8).
16. Align rear cover (4) with holes in center cover (6) and housing and secure rear cover in center cover and housing with fourteen screws (5).
17. Align fabric cover (3) with holes in housing and secure fabric cover to housing with three screws (1) and three lock washers (2).



SECTION VI. PREPARATION FOR STORAGE OR SHIPMENT**4-27. PREPARATION FOR STORAGE.****WARNING**

Make sure the power supply is off at the source before disconnecting the power supply line.

The air conditioner is prepared for storage or movement by performing the following:

- a. Turn off electrical power supply to air conditioner and disconnect power cable from unit.
- b. Prepare the air conditioner assembly for storage in accordance with TM-740-90-1.

4-28. SHIPMENT.**CAUTION**

Keep unit vertical.

- a. Short Distance Movement. Lift unit at base with a forklift or carry unit to new worksight using lifting rings on the sides of unit.
- b. Long Distance Movement. Crate the air conditioner, providing adequate protection for panels and control box. Refer to TM 38-250 for crating information. Provide suitable blocking and tie downs to prevent unit from shifting during transfer.

CHAPTER 5**DIRECT SUPPORT MAINTENANCE INSTRUCTIONS**

INTRODUCTION. This chapter is for the use of Direct Support Maintenance personnel. It contains a section on troubleshooting and maintenance procedures. In Appendix F is a refrigerant flow diagram that is included to assist maintenance of refrigerant components.

SECTION I. REPAIR PARTS, SPECIAL TOOLS, TMDE AND SUPPORT EQUIPMENT

5-1. COMMON TOOLS AND EQUIPMENT. For authorized common tools and equipment refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

5-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT. No special tools, TM DE, or support equipment are required for this air conditioner.

5-3. REPAIR PARTS. Repair parts are listed and illustrated in TM5-4120-376-24P.

SECTION II. TROUBLESHOOTING**5-4. TROUBLESHOOTING**

a. Table 5-1 contains troubleshooting information for locating and correcting most of the operating troubles which are the responsibility of Direct Support Maintenance. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine probable causes and corrective actions to take. Perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

c. Only those functions within the scope of Direct Support Maintenance are listed. For troubleshooting procedures within the scope of operator/crew maintenance, refer to Table 3-1 and Organization Maintenance refer to Table 4-1.

5-5. SYMPTOM INDEX. Locate the malfunction which is the same, or most nearly the same, as the trouble you are having with the air conditioner. The Symptom Index lists the first page of troubleshooting information for that malfunction. Follow the steps one by one, and perform the corrective actions listed.

Malfunction Number	Description	Page
1	Insufficient cooling	5-3
2	Compressor fails to start	5-5
3	Compressor starts but stops at once "short cycles"	5-7
4	Compressor runs but does not cool	5-8

Table 5-1. DIRECT SUPPORT MAINTENANCE TROUBLESHOOTING

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

1. INSUFFICIENT COOLING

Step 1. Check sight indicator for bubbles or yellow color. If bubbles or yellow color exist, leak check system in accordance with paragraph 5-11, page 5-13.

Repair or replace sight indicator in accordance with paragraph 5-21, page 5-58.

Step 2. Feel dehydrator (filter-drier) (6) to see whether it is cold to the touch or is frosted or sweating. Cold discharge indicates obstruction.

Replace dehydrator (filter-drier) in accordance with paragraph 5-20, page 5-48.

Step 3. Check solenoid valve (L-1) (7) for proper operation. Test solenoid valve (L-1) in accordance with paragraph 5-19, page 5-38.

Replace solenoid valve (L-1) in accordance with paragraph 5-19, page 5-40.

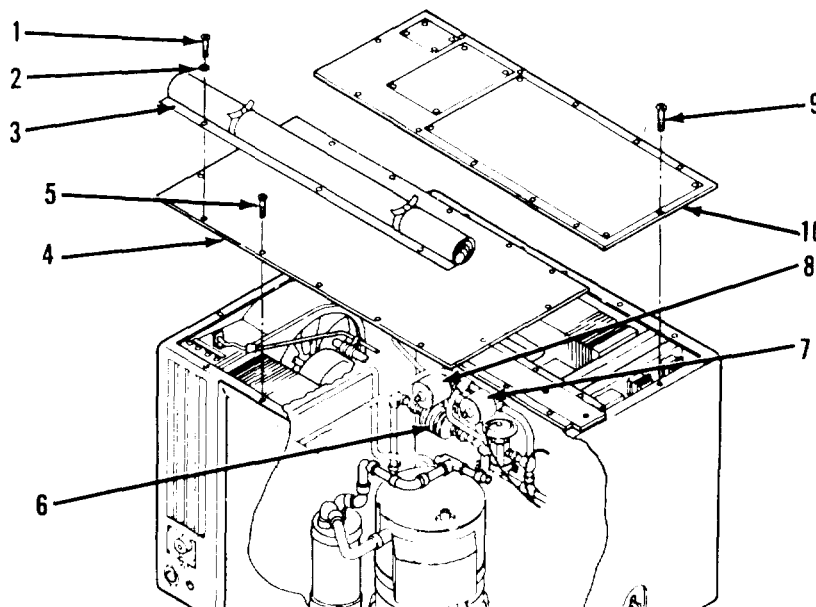


Table 5-1. DIRECT SUPPORT MAINTENANCE TROUBLESHOOTING (Cont)

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
	Step 4.	Check solenoid valve (L-2) (8) for proper operation. Test solenoid valve (L-2) in accordance with paragraph 5-19, page 5-38. Replace solenoid valve (L-2) in accordance with paragraph 5-19, page 5-40.
	Step 5.	Remove fourteen screws (9) securing front cover (10) to housing. a. Remove front cover. b. Check thermostatic expansion valve (11) for proper operation. Test thermostatic expansion valve in accordance with paragraph 5-19, page 5-38. c. Replace thermostatic expansion valve in accordance with paragraph 5-19, page 5-40.

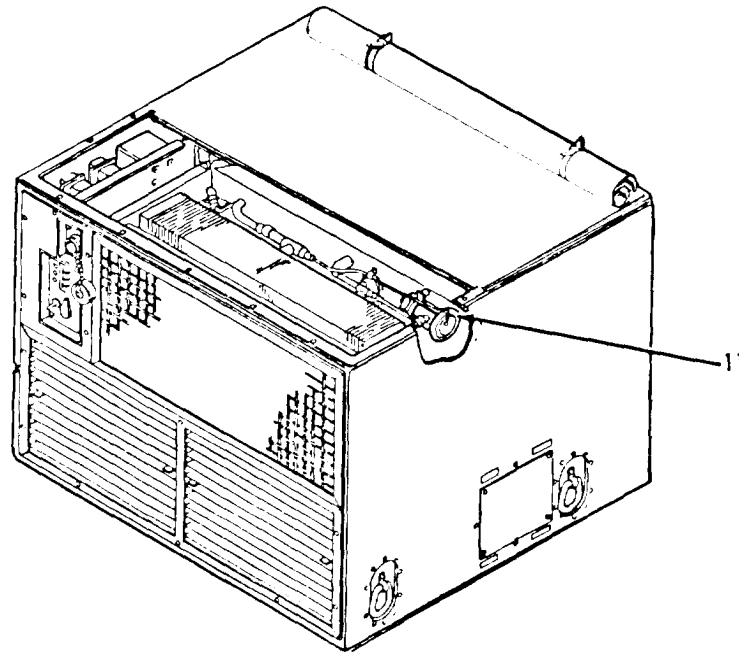


Table 5-1. DIRECT SUPPORT MAINTENANCE TROUBLESHOOTING (Cont)

MALFUNCTION

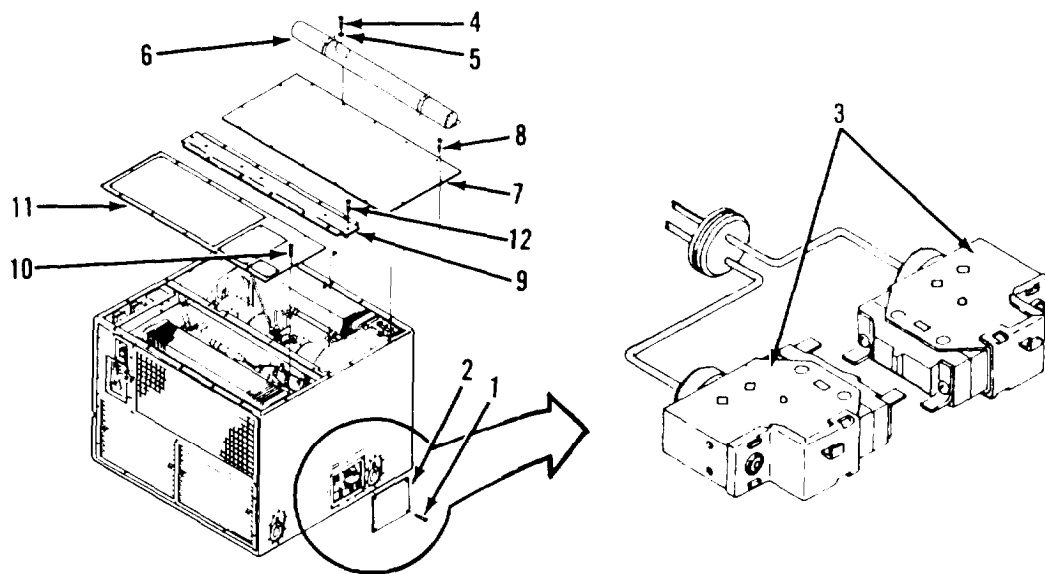
TEST OR INSPECTION

CORRECTIVE ACTION

2. COMPRESSOR FAILS TO START

Step 1. Remove access cover (2).

- a. Check high and low pressure reset buttons on pressure switches (3).
- b. Test pressure switches in accordance with paragraph 5-21, page 5-49.
- c. Replace defective pressure switches in accordance with paragraph 5-21, page 5-58.



Step 2. Remove fabric cover (6) in accordance with paragraph 4-13, page 4-26.

Table 5-1. DIRECT SUPPORT MAINTENANCE TROUBLESHOOTING (Cont)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

Step 3. Disconnect electrical connector J-7 (13) from compressor.

- a. Using an ohmmeter or continuity tester, test compressor receptacle pin A-B, A-C, B-C, and D-E.
- b. Continuity should be indicated.
- c. Test points A, B, C to compressor casing or common ground.
- d. No continuity should be indicated.
 - (1) Replace compressor that does not meet continuity requirements.
 - (2) Replace compressor in accordance with paragraph 5-22, page 5-67.

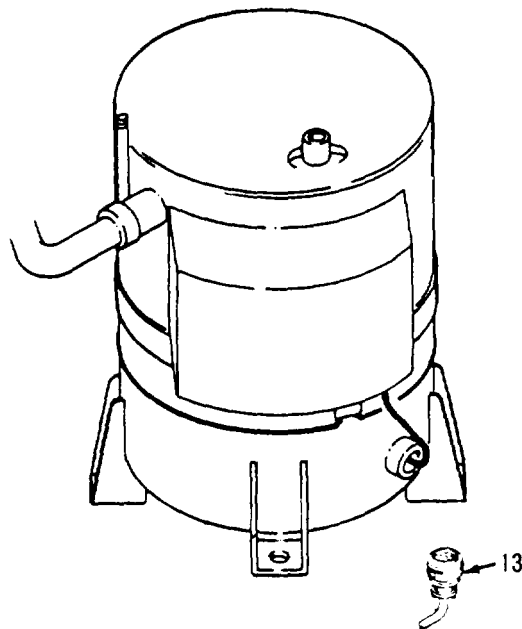


Table 5-1. DIRECT SUPPORT MAINTENANCE TROUBLESHOOTING (Cont)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

3. COMPRESSOR STARTS BUT STOPS AT ONCE—"SHORT CYCLES"

Step 1. Check compressor for excessive amp draw causing it to overheat.

Repair or replace compressor in accordance with paragraph 5-22, page 5-67.

Step 2. Remove access cover (2) to housing.

Connect manifold gauges to suction and discharge service valves. Check system pressures as indicated in accordance with Table 5-2.

(1) If pressures are too low, leak check in accordance with paragraph 5-11, page 5-13.

(2) If pressures are too high, bleed off refrigerant to pressure in accordance with Table 5-2.

Step 3. Check compressor circuit breaker for proper action in accordance with paragraph 5-22, page 5-64.

Replace compressor circuit breaker in accordance with paragraph 4-22, page 4-105.

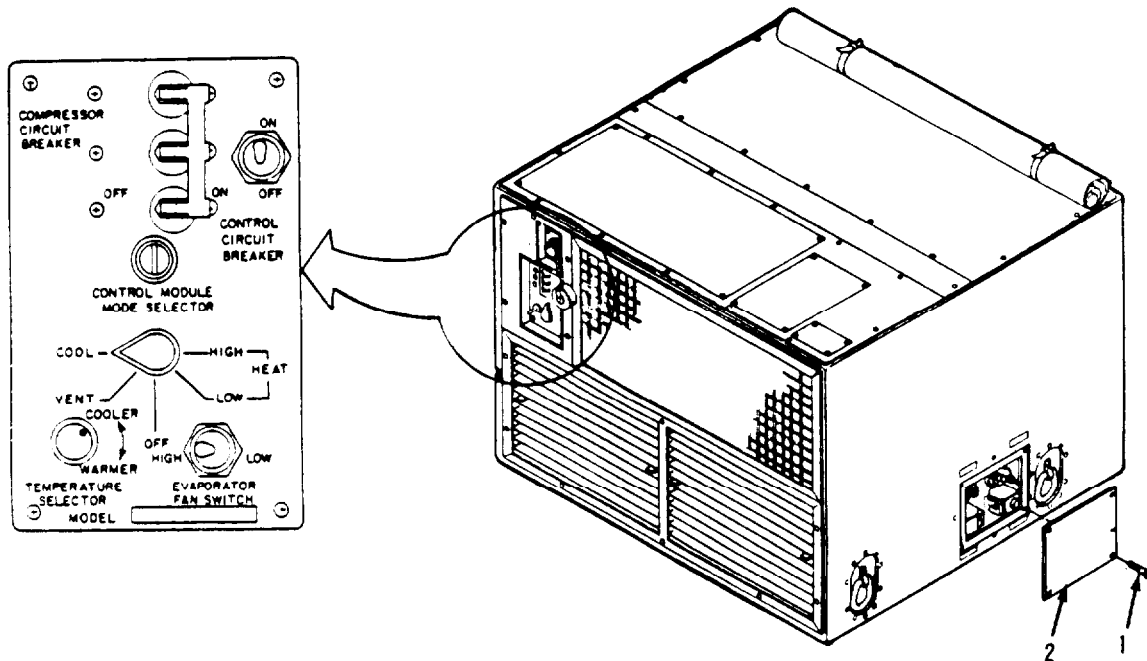


Table 5-1. DIRECT SUPPORT MAINTENANCE TROUBLESHOOTING (Cont)

MALFUNCTION

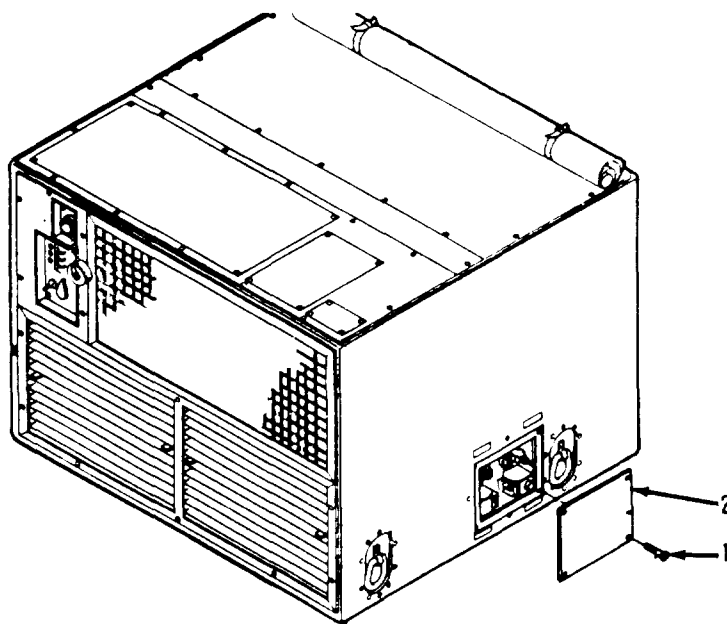
TEST OR INSPECTION

CORRECTIVE ACTION

4. COMPRESSOR RUNS BUT DOES NOT COOL

Step 1. Check sight indicator for bubbles or yellow color.

- a. If bubbles or yellow exist, check system for leaks in accordance with paragraph 5-11, page 5-13.
- b. Replace sight indicator in accordance with paragraph 5-21, page 5-58.



- c. Remove eight screws (1) and access cover (2).
- d. Install manifold gauges in accordance with paragraph 5-8, page 5-10.
- e. Check system pressure in accordance with Table 5-2.

If pressure is low, check for leaks in accordance with paragraph 5-11, page 5-13.

Table 5-1. DIRECT SUPPORT MAINTENANCE TROUBLESHOOTING (Cont)

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION
<p>Step 2. Check compressor for damaged valves, bleed off refrigerant to pressures in accordance with Table 5-2.</p> <p>a. Test compressor in accordance with paragraph 5-22, page 5-64.</p> <p>b. Replace compressor in accordance with paragraph 5-22, page 5-67.</p>

Table 5-2. NORMAL TEMPERATURE-PRESSURE RELATIONSHIPS

95°F (36°C) dry bulb return air to unit					
Outdoor ambient temperature	50F 10C	75F 24C	100F 38C	110F 4.35C	125F 52C
GAUGE PRESSURES					
Suction (psig)	58-65	58-70	60-75	62-72	65-75
(Kg/Cm ² ,	4.1-4.6	4.1-4.9	4.2-5.3	4.4-5.1	4.6-5.3
Discharge (psig)	120-155	170-205	250-290	300-390	370-410
(Kg/Cm ² ,	8.4-10.9	11.9-14.4	17.6-20.4	21.1-2.4	26.0-28.8

NOTE

Dry bulb temperatures are measured with an ordinary thermometer.

SECTION III. REFRIGERATION SYSTEM SERVICES

5-6. INSTRUCTION. This section contains all the necessary instructions to perform refrigeration system services. For your convenience, an index of this section follows.

5-7. REFRIGERATION SYSTEM SERVICES.

INDEX

	Paragraph	Page
Charging the System	5-13	5-15
System Discharge	5-8	5-10
Replacing Tubing or Refrigerant Components	5-9	5-11
Brazing	5-10	5-12
Leak Checking	5-11	5-13
System Evacuation	5-12	5-14
Pressure Testing	5-14	5-18

5-8. SYSTEM DISCHARGE.

WARNING

Refrigerant R-22 is contained in the refrigerant system under high pressure. Extreme care must be exercised to prevent refrigerant from coming in contact with exposed skin 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.

- a. Access Cover. Remove eight screws and access cover.

CAUTION

Rapid discharge will cause oil to be blown out of the system.

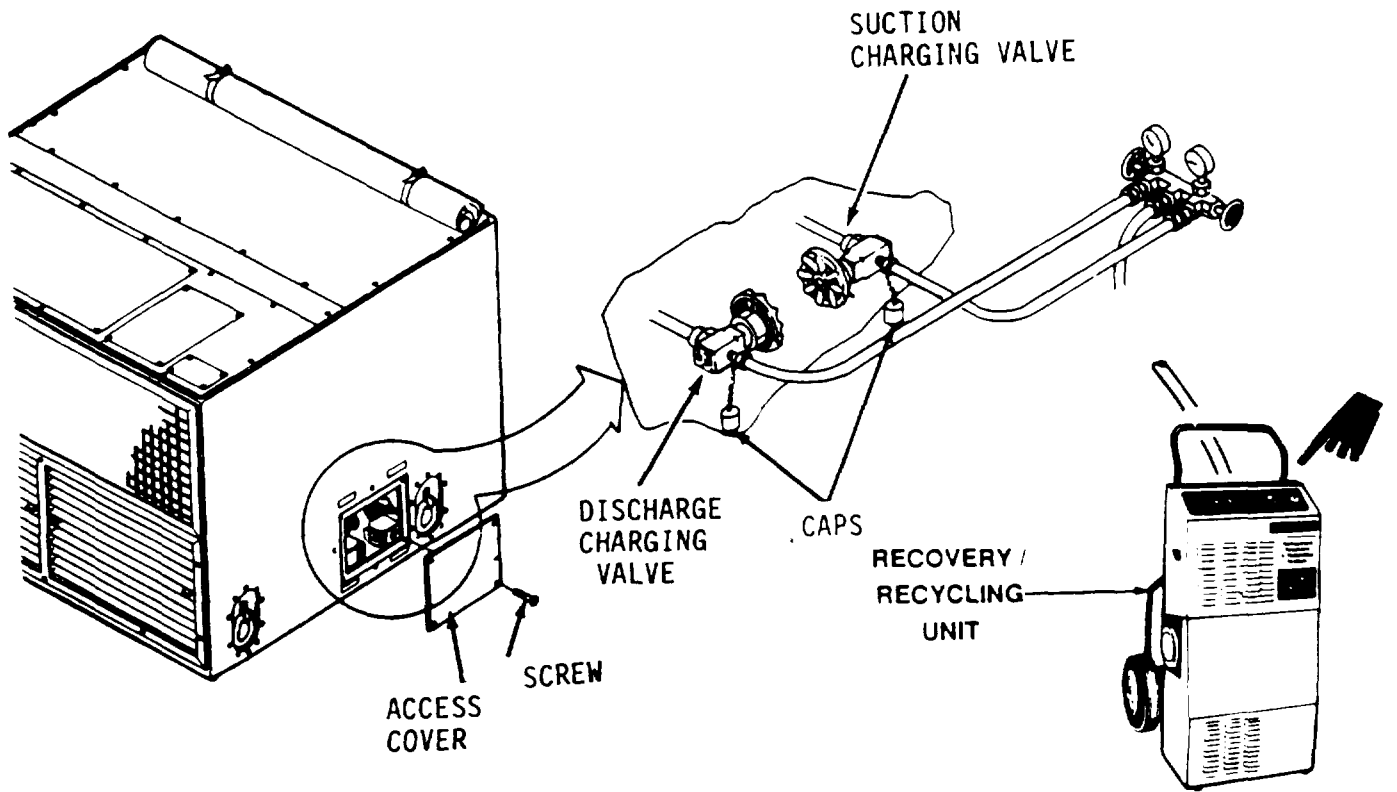
NOTE

In accordance with Environmental Protection Agency regulations refrigerants cannot be discharged into the atmosphere. A refrigerant recovery & recycling unit must be used whenever discharging the refrigerant system.

Operation of the recovery/recycling unit must be by AUTHORIZED PERSONNEL ONLY

- b. Service Valves.

- (1) Remove caps from discharge and suction service valves.
- (2) Install gauges to service valves.
- (3) Connect and operate a recovery/recycling unit in accordance with the manufacturer's instructions.



5-9. REPLACING TUBING or REFRIGERANT COMPONENTS.**WARNING**

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200°F (649°C) creates phosgene gas.

WARNING

Dry nitrogen is always used to purge the refrigeration system during brazing or debrazing of connections to prevent internal oxidation scaling.

NOTE

A careful analysis of any trouble should first be made to determine if replacement is necessary. The cause of failure must be determined before replacement is made.

a. System Discharge. Discharge system in accordance with paragraph 5-8, page 5-10.

b. Debrazing Joints.

(1) Connect a cylinder of dry nitrogen (Table D-1, Item 8) to the gauge port of the suction service valve. Open the cylinder shutoff valve and the suction service valve slightly and completely open the discharge service valve to purge the system of refrigerant gas. Use 1-2 cfm (0.1 to 1.02 M3/minute).

(2) Debraise those joints which must be removed in order to replace the tubing, fitting, or refrigerant component that is defective.

c. Cutting Copper Tubing.

(1) Use a tubing cutter.

(2) Cut tubing square and remove all burrs from inside and outside with a sharp fine file. Hold tubing so filings will drop away from tube opening.

d. Brazing. Braze joints in accordance with paragraph 5-10, page 5-13.

e. Leak Check. Leak check in accordance with paragraph 5-11, page 5-13.

f. System Evacuation. Evacuate system in accordance with paragraph 5-12, page 5-14.

g. Charging System. Charge system in accordance with paragraph 5-13, page 5-15 through 5-17.

h. Pressure Test. Pressure test in accordance with paragraph 5-14, page 5-18 through 5-19.

5-10. BRAZING.

WARNING

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200°F (649°C) creates phosgene gas.

a. Preparation for Brazing.

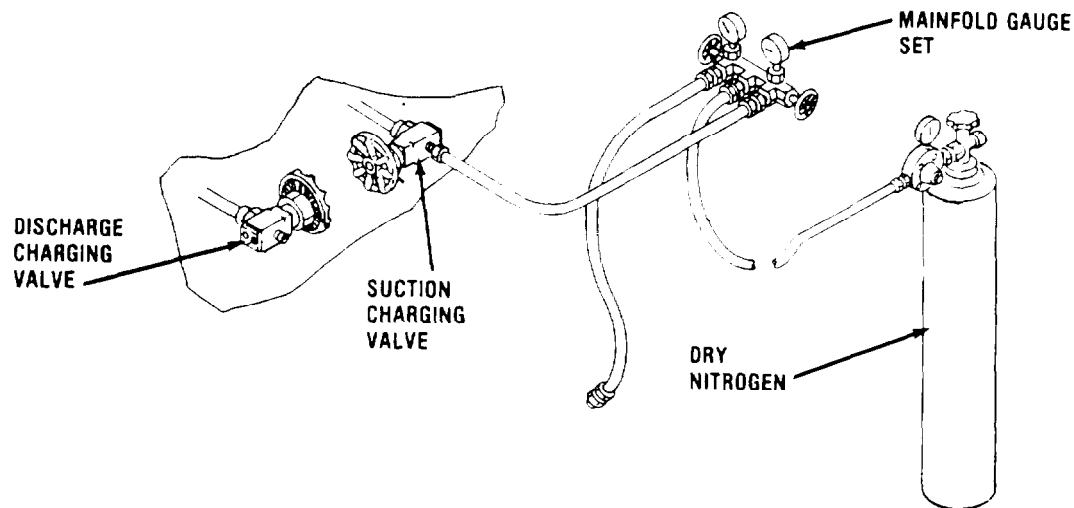
(1) Cut tubing using a tube cutter.

(2) If not perfectly round, size the end of the tube with a sizing tool.

(3) Clean the ends of the tubing with crocus cloth or wire brush. Do not under any circumstances use sandpaper, emery cloth or steel wool for this purpose.

(4) Flux female end (larger end) of tubing.

(5) Slip tubing into fitting until it seats properly.



b. Brazing.

- (1) Heat evenly to recommended temperature. Keep the torch moving constantly in a “figure-eight” motion.
- (2) Apply silver brazing alloy to the heated parts. Do not heat (melt) the silver brazing alloy with the torch.
- (3) Cool the joint.
- (4) Clean the joint, using warm water and a brush.
- (5) Be sure all flux has been removed.

5-11. LEAK CHECKING.**CAUTION**

Rapid discharge will cause oil to be blown out of the compressor.

NOTE

The electronic leak detector is sensitive to the presence of refrigerant gas (Table D-1, Item 11) in the atmosphere. When refrigerant gas is present in the atmosphere of the work area, false indications can result. Use in a well ventilated but draft-free area.

a. Connect a manifold gauge to the suction service valve on the unit and a cylinder of refrigerant (Table D-1, Item 11). Open both service valves and the cylinder shutoff valve. Let refrigerant flow into the system until the pressure gauge indicates 50 psig (3.5 kg/cm²). Close cylinder shutoff valve and suction service valve and disconnect the refrigerant cylinder.

b. Connect a cylinder of dry nitrogen (Table D-1, Item 8) to the suction service valve. Open the nitrogen cylinder shutoff valve and the suction service valve and pressurize the system to 350 psig (22 kg/cm²). Close both valves and test for leaks using an electronic leak detector or the soap bubble method as described below:

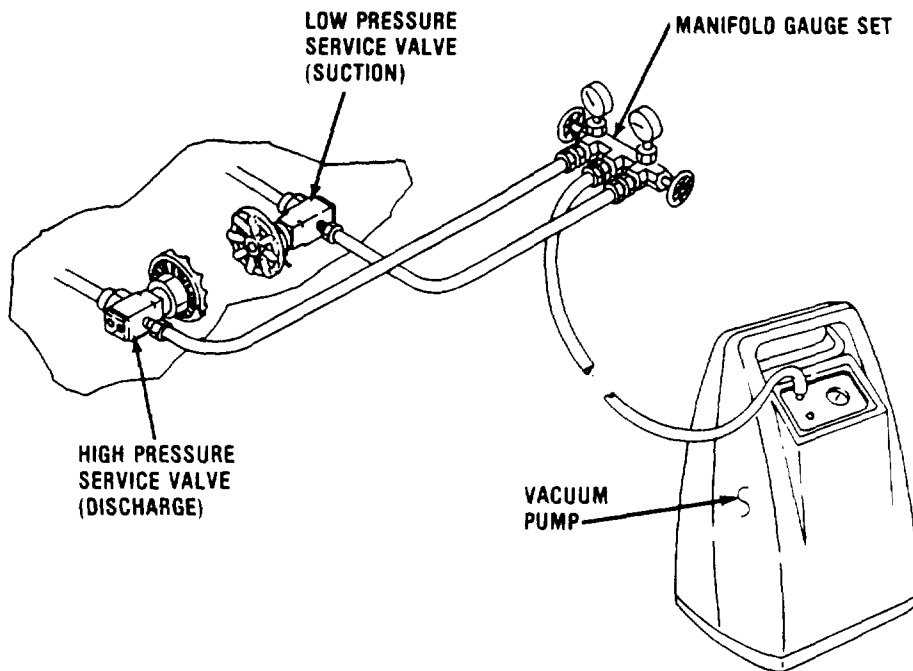
(1) Electronic Leak Detector. Turn the electronic unit on and slowly pass the probe around all points of the refrigeration system at which a leak could exist. Depending upon the type of detector used, leak will be indicated by an audible signal, a light, or by meter deflection.

(2) Soap Solution. Brush soap solution on all possible points of leakage and watch for bubbles. Follow a definite sequence to avoid missing any joints that should be tested. Wipe the solution from all joints and mark any point at which a leak is found.

(3) Discharge the system after leak checking by connecting a hose to the suction service valve and cracking the valve open slightly to slowly discharge the gas. If leaks were detected, repair them and retest in accordance with paragraph 5-11. If the system is tight, double evacuate and charge the system in accordance with paragraphs 5-12 and 5-13.

5-12. SYSTEM EVACUATION. Connects manifold gauge set to the suction and discharge service valves and a hose to a vacuum pump. Start the pump and open both service valves and open manifold gauge set valves. Operate the vacuum pump until pressure in the system is reduced to 500 microns. Close manifold gauge set valve and turn the vacuum pump off. Let the unit stand in this condition for at least one hour. If the system holds the vacuum, charge unit in accordance with paragraph 5-13. If the 500 microns vacuum cannot be held for one hour, break the vacuum repeat the leak checking procedure in accordance with paragraph 5-11. If 500 micron vacuum cannot be achieved, one or more of the following reasons may account for the problem.

- a. Presence Of Water Vapor In The System. Continued pumping will correct this condition.
- b. Leaks In The Refrigeration System. Break the vacuum and retest for leaks in accordance with paragraph 5-11.
- c. Internal Leakage Of Vacuum Pump. Test the pump by connecting a vacuum gauge directly to the vacuum pump intake and continue to pump. If pump still fails to reach 500 microns, the pump is faulty.



5-13. CHARGING THE SYSTEM.

WARNING

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

CAUTION

Do not attempt to charge liquid refrigerant into the suction line. The compressor would be damaged.

CAUTION

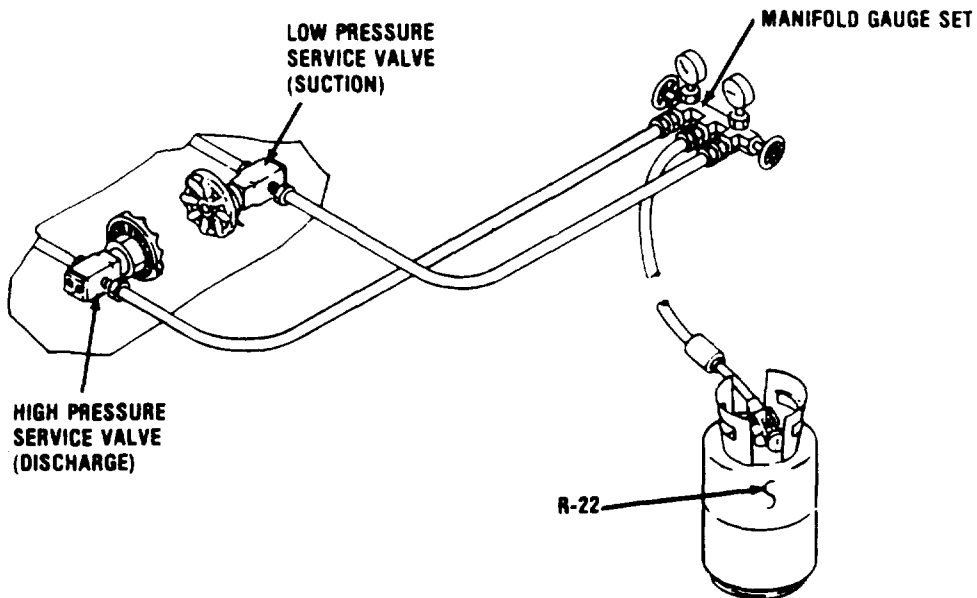
If knocking or pounding is heard when starting the air conditioner, shut down at once and release some refrigerant before attempting another start.

NOTE

Two kinds of refrigerant cylinders are used in general. One is equipped with a single shutoff valve, and must be inverted when charging liquid refrigerant. The other is equipped with a vapor valve and a liquid valve, which makes it possible to charge with either liquid or vapor when the cylinder is upright.

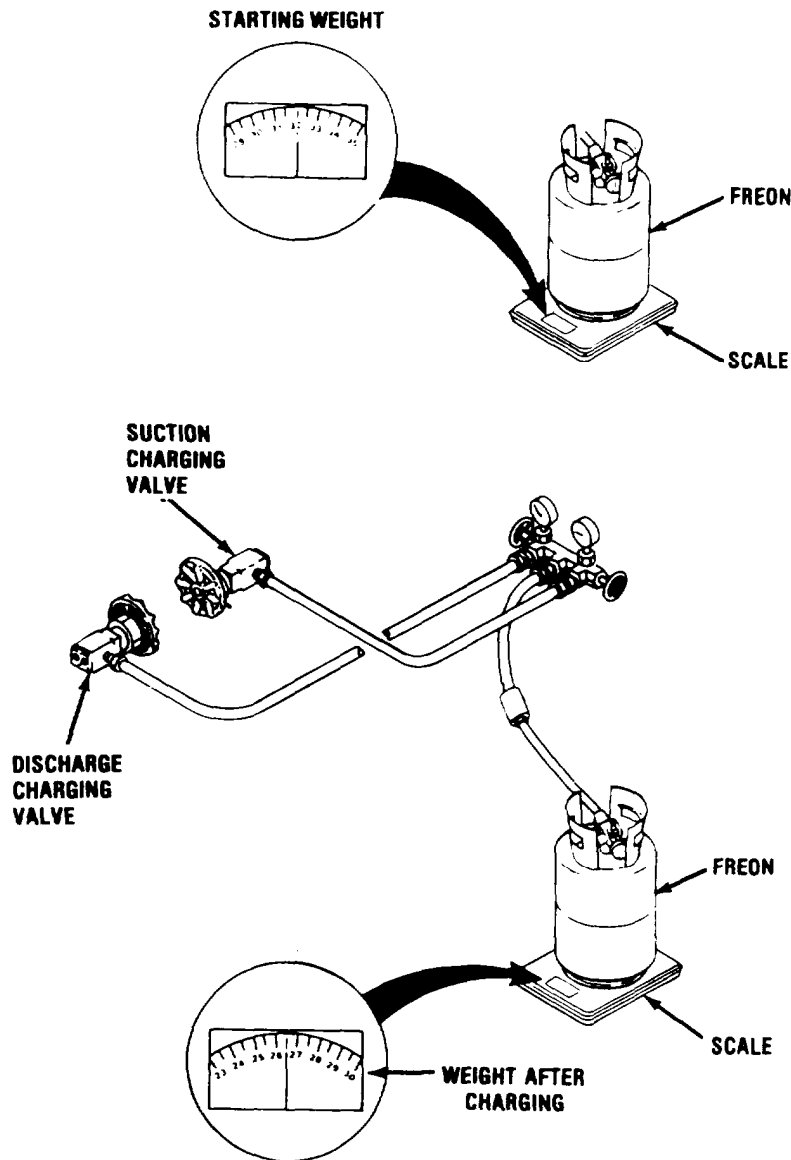
Whenever available, use recycled refrigerant for charging the refrigeration system.

- a. When charging the system use a manifold gauge set similar to that shown below. Connect a manifold gauge and a cylinder of refrigerant R-22 (Table D-1, Item 11) loosely to the service valves and open the cylinder shutoff valve for a few seconds to purge the line of air. Tighten the service valves connection.



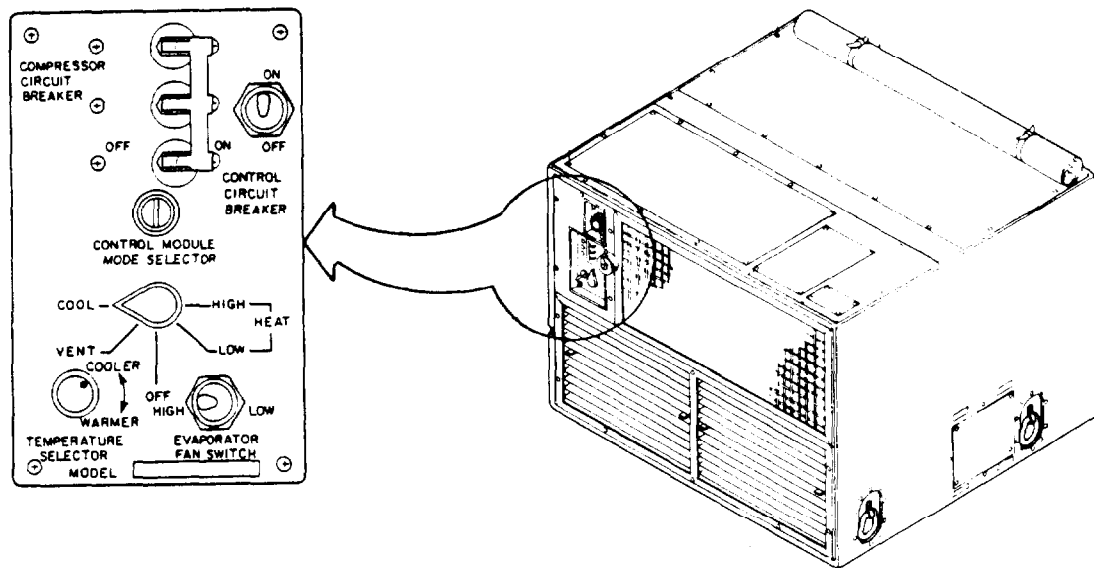
- b. Place the refrigerant cylinder on a scale of sufficient capacity.
- c. Weigh the cylinder and record the weight.

d. Open the suction service valve and slightly open the cylinder vapor shutoff valve. Gas refrigerant will be sucked into the refrigeration system rapidly at first, then more slowly as pressures begins to equalize. When pressure have equalized or 11 pounds of refrigerant gas has flowed into the refrigerant system, close the suction service valve and the cylinder shutoff valve.



e. Check operation and top of refrigerant as necessary, in the following manner:

(1) With power connected to the air conditioner, turn the mode selector switch to COOL and the temperature selector to the maximum COOLER position. Let the air conditioner operate for 15 minutes in this mode, then observe the sight indicator while the air conditioner is running. If bubbles or milky appearance appears, top off the refrigerant charge as follows:



(2) With the air conditioner compressor operating, open the suction service valve and the cylinder shutoff valve to charge refrigerant gas. Continue to observe the sight indicator until sight indicator is clear of bubbles. Freon may be heated by placing the cylinder in a container of warm water to ease charging procedure.

(3) When the liquid in the sight indicator is clear of bubbles, add additional 6-8 ounces (168-264 g) of refrigerant. Close the suction service valve and the cylinder shutoff valve.

(4) Disconnect the manifold gauge assembly and the refrigerant cylinder pressure-test the air conditioner in accordance with paragraph 5-14, page 5-18.

5-14. PRESSURE TESTING. Pressure testing the refrigeration system is an important diagnostic procedure which you should perform whenever the system has been newly recharged after replacement of a component or when the air conditioner is operating inefficiently. Pressure testing is accomplished by connecting individual pressure gauges or a refrigeration manifold gauge to the suction and discharge service valves. Compare readings to Table 5-2.

a. Set Up. Prepare the air conditioner for pressure-testing as stated below.

(1) Make sure that the fresh air damper is completely closed and that the evaporator louver (inlet) and evaporator (discharge) are fully open.

(2) Hang an accurate thermometer directly in front of the evaporator louver (inlet) to record dry bulb return air temperature to the unit.

(3) Hang an accurate thermometer directly in front of the condenser coil guard, making sure that the thermometer is shaded from direct sun light, to record "outdoor ambient temperature".

(4) Connect a refrigeration service manifold gauge to the suction and discharge service valves, purging the manifold of any air trapped in the lines.

(5) If indoor ambient temperature is too low, provide a space heater to raise the dry bulb return air temperature to 80°F (27°C).

b. Procedure. Perform the pressure test in the following manner:

(1) Turn the mode selector to COOL, and the temperature selector to maximum COOLER.

(2) Slowly open the suction and discharge service valves to which pressure gauges have been connected.

(3) Let the air conditioner operate for at least 15 minutes in the cooling mode, so that all parts of the system are stabilized.

(4) Record the temperatures indicated by both thermometers and the pressures indicated by both pressure gauges.

(5) Compare the readings obtained from pressure testing with the normal ranges shown in Table 5-2.

c. Analysis of Discrepancies. If actual pressure-temperature relationships differ from those shown in Table 5-2, consider the following reasons, and take appropriate action.

(1) If pressures are too low: Check leaks in accordance with paragraph 5-11. Repair and recharge the system in accordance with paragraph 5-13 and repeat the pressure test paragraph 5-14.

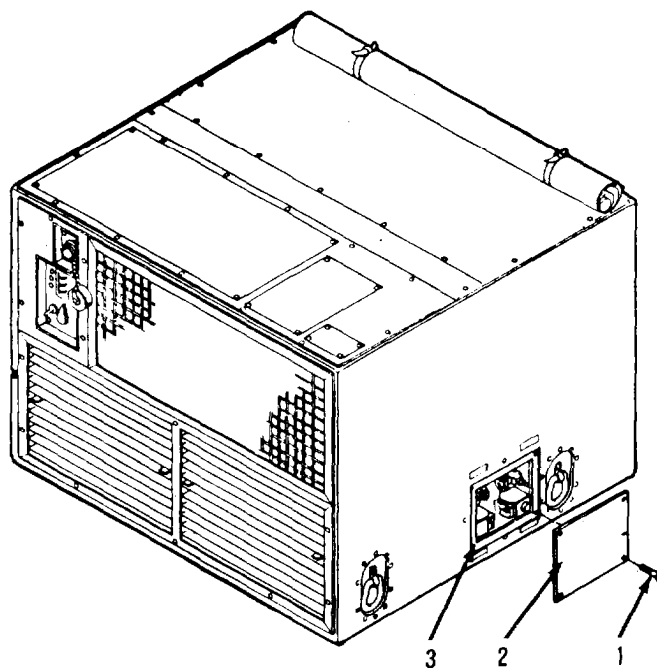
(2) If pressures are too high: Close the suction service valve, remove the pressure gauge, and bleed off the appropriate amount of refrigerant in accordance with Table 5-2. Repeat the pressure test 5-14.

(3) If discharge pressure is extremely high and suction pressure is extremely low, blockage may exist in the refrigeration system. Troubleshoot, correct the trouble, recharge if necessary, and repeat the pressure test 5-14.

d. Completion.

- (1) Close suction and discharge service valves.
- (2) Remove refrigeration servicing manifold gauges.
- (3) Secure service valve caps (3) to service valves.

e. Access Cover. Replace covers.



SECTION IV. MAINTENANCE PROCEDURES

5-15. GENERAL INSTRUCTIONS. Most maintenance instructions in this section will list resources required, personnel required and equipment condition for the start of the procedure.

NOTE

Resources required are not listed unless they apply to the procedure.

Personnel required are listed only if the task requires more than one person.

The normal standard equipment condition to start a maintenance task turn OFF air conditioner and disconnect main power source. Equipment condition is not listed unless some other condition is required except Disconnect Power.

5-16. DIRECT SUPPORT MAINTENANCE PROCEDURES.

INDEX

	Paragraph	Page
Charging Valves, Pressure Switches, Liquid Receiver, Sight Indicator, Pressure Relief Valves	5-21	5-49
Compressor, Accumulator and Related Parts	5-22	5-62
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Condenser Louver Actuator and Control Assy	5-18	5-24
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5-17. CONDENSER FAN SUPPORT ("X") ASSYS/Replace

This Task covers:

- a. Removal
- b. Replace
- c. Installation

INITIAL SETUP

NOTE

Replace maintenance function is done by Removal/Installation Maintenance Tasks.

Disconnect Power

Tools

TOOL KIT (SC 5180-90-CL-N18)

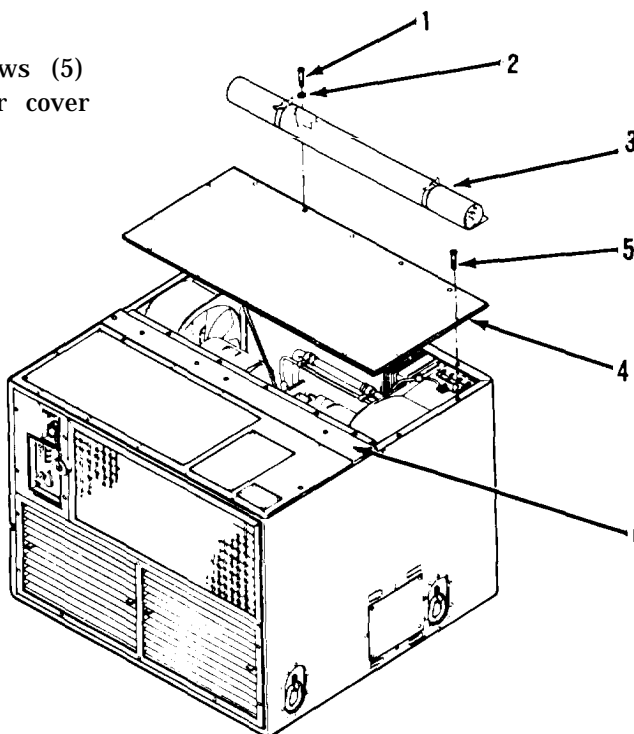
LOCATION/ITEM

MOTOR SUPPORTS

Removal:

1. Remove three screws (1) and three lock washers (2) and fabric cover (3) to rear cover (4) from housing.

2. Remove fourteen screws (5) and rear cover (4) to center cover (6) from housing.



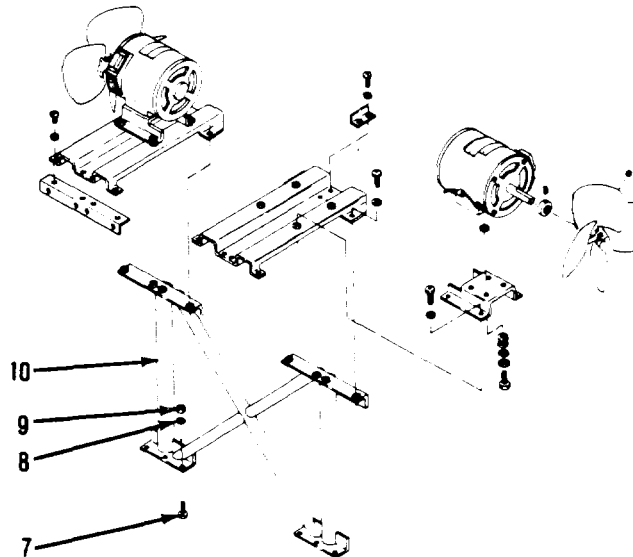
5-17. CONDENSER FAN SUPPORT ("X") ASSYS/Replace (Cont)

LOCATION/ITEM

Removal:

3. Remove condenser fans, motors and support assemblies in accordance with paragraph 4-15, page 4-39.

4. Remove six screws (7), six lock washers (8) and six flat nuts (9) and condenser fan support (10) from housing.



Installation:

1. Align condenser fan motor support (10) with holes in housing and secure to housing with six screws (7), six lock washers (8) and six flat nuts (9).

2. Install condenser fans and motor support assemblies in accordance with paragraph 4-15, page 4-46.

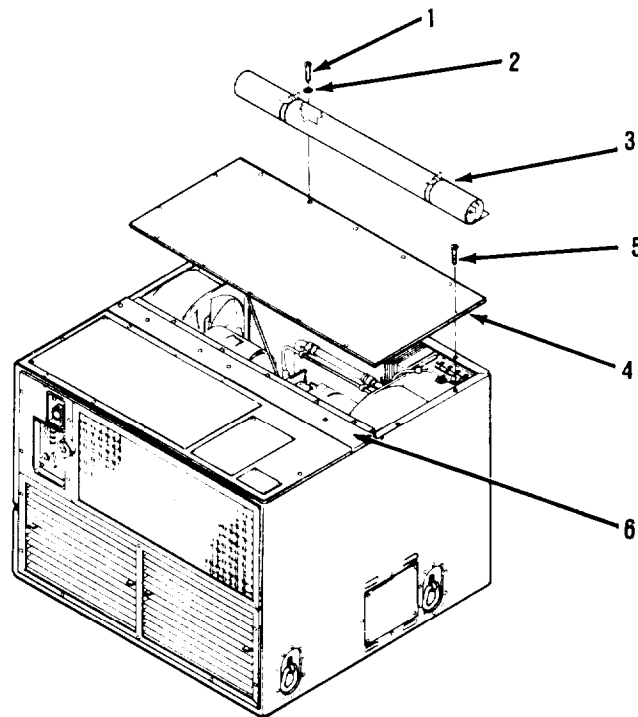
5-17. CONDENSER FAN SUPPORT ("X") ASSYS/Replace (Cont)

LOCATION/ITEM

Installation:

3. Align rear cover (4) with holes in center cover (6) and housing and secure with fourteen screws (5).

4. Align fabric cover (3) with holes in housing and secure three screws (1) and three lock washers (2).



5-18. CONDENSER LOUVER ACTUATOR AND CONTROL ASSY/Service, Adjust, Replace

This Task covers:

- a. Removal
 - b. Service
 - c. Adjustment
 - d. Replace
 - e. Installation
-

INITIAL SETUP

NOTE

Replace maintenance function is done by Removal/Installation Maintenance Tasks.

Disconnect Power

Tools

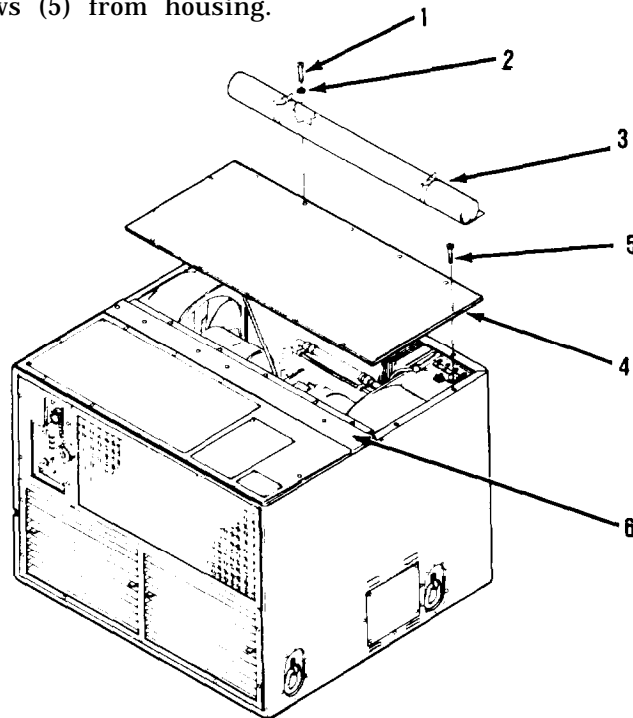
TOOL KIT (SC 5180-90-CL-N18)

LOCATION/ITEM

LOUVER CONTROL CABLES/CABLE ACTUATOR

Removal:

1. Remove three screws (1) and three lock washers (2) and fabric cover (3) from rear cover (4) from housing.
2. Remove fourteen screws (5) from housing.



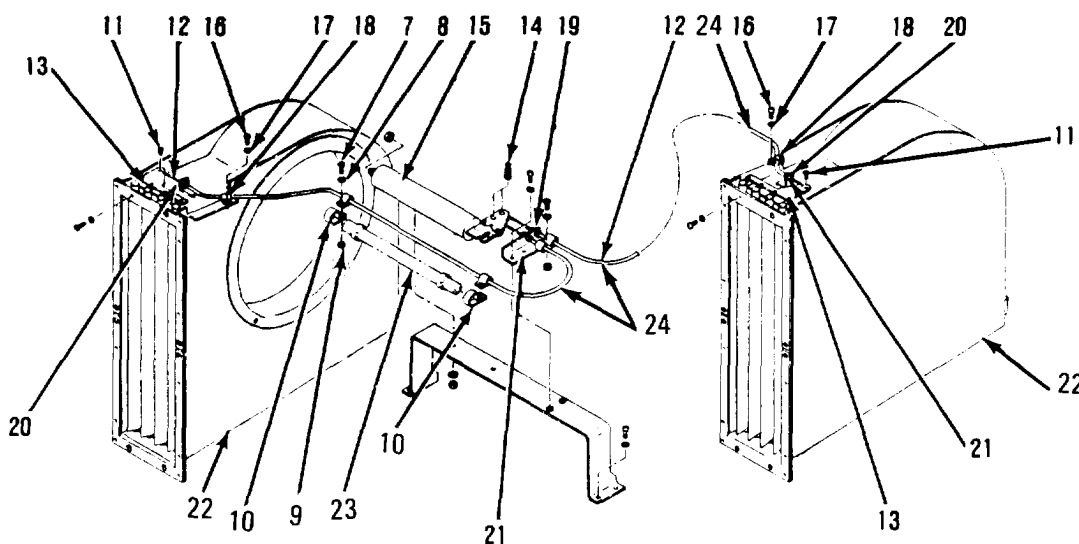
5-18. CONDENSER LOUVER ACTUATOR AND CONTROL ASSY/Service, Adjust, Replace (Cont)

LOCATION/ITEM

LOUVER CONTROL CABLES

Removal:

3. Remove two screws (7) two lock washers (8) two flat nuts (9) two clamps (10) and housing (24) from discharge line (23).
4. Remove two screws (11) securing cable (12) to fan louver connecting links (13).
5. Loosen screws (14) securing cable housing (24) to actuator cylinder (15).
6. Slide cables (inner) (12) out of cable housings (24).
7. Remove two screws (16) two lock washers (17) and two clamps (18) cable housing (24) from condenser fan louver housing assemblies.
8. Remove two speed nuts (19) from condenser cable housing mounting bracket (21).
9. Remove two speed nuts (20) and cable housing (24) to condenser fan housing (22).



**5-18. CONDENSER LOUVER ACTUATOR AND CONTROL ASSY/Service, Adjust, Replace
(Cont)**

LOCATION/ITEM

CABLE ACTUATOR

Removal:

WARNING

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200°F (649°C) creates phosgene gas.

WARNING

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

NOTE

Leak check fittings.

NOTE

Always perform inspections, adjustments and test before removing refrigerant components.

10. Discharge system in accordance with paragraph 5-8, page 5-10.
11. Remove flare nut (7) cable actuator (10).
12. Remove two flat nuts (8) and two lock washers (9) and condenser cable actuator (10) from actuator mounting bracket (11).

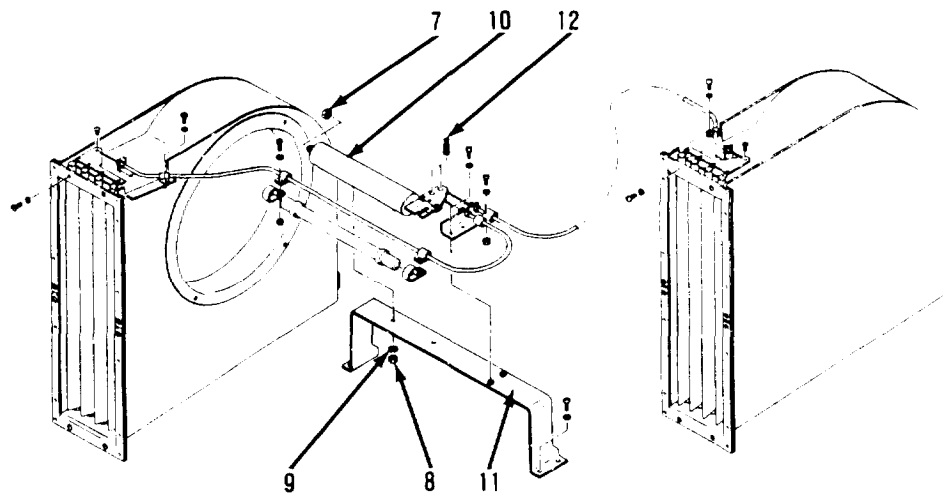
5-18. CONDENSER LOUVER ACTUATOR AND CONTROL ASSY/Service, Adjust, Replace (Cont)

LOCATION/ITEM

CABLE ACTUATOR

Removal:

13. Loosen two screws (12) and remove cable actuator (10).



LOUVER CONTROL CABLES

Service:

- Apply a thin layer of grease (Table D-1, Item 17) to control cables.

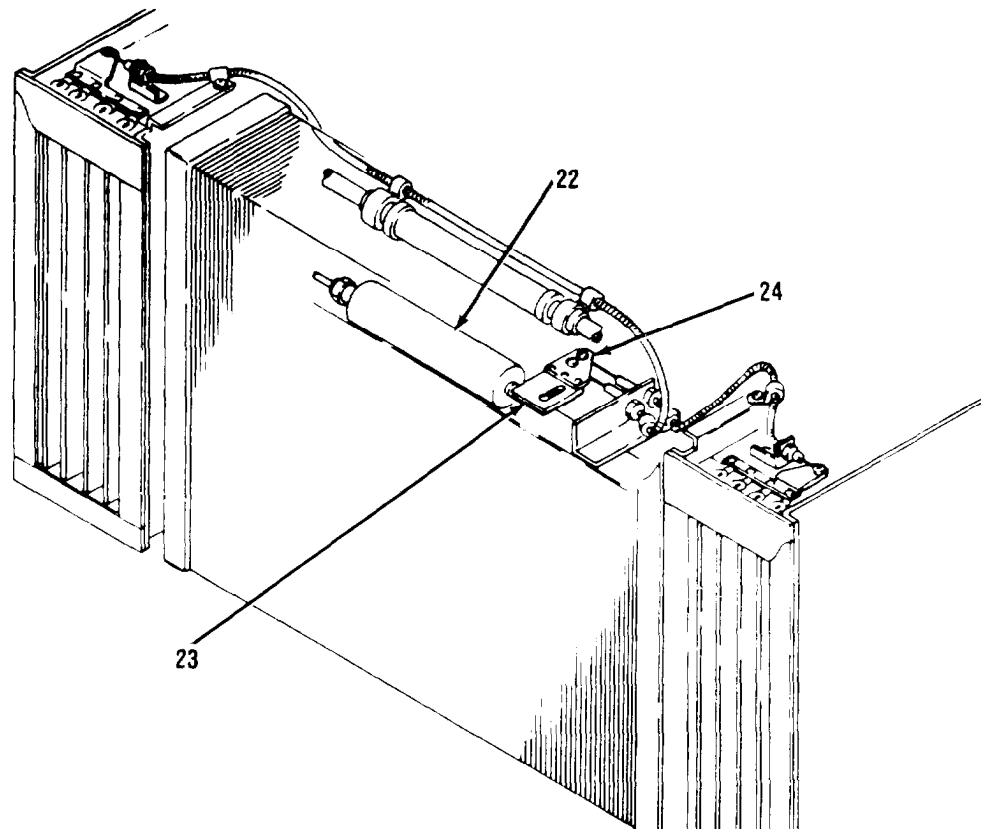
**5-18. CONDENSER LOUVER ACTUATOR AND CONTROL ASSY/Service, Adjust, Replace
(Cont)**

LOCATION/ITEM

LOUVER CONTROL CABLES

Adjustment:

1. Close louver blades.
2. Extend cable actuator (22) until there is 1/4 inches of space between inner edge of bracket (23) and the face of the cable actuator (22).
3. Tighten screws (24) on bracket (23).



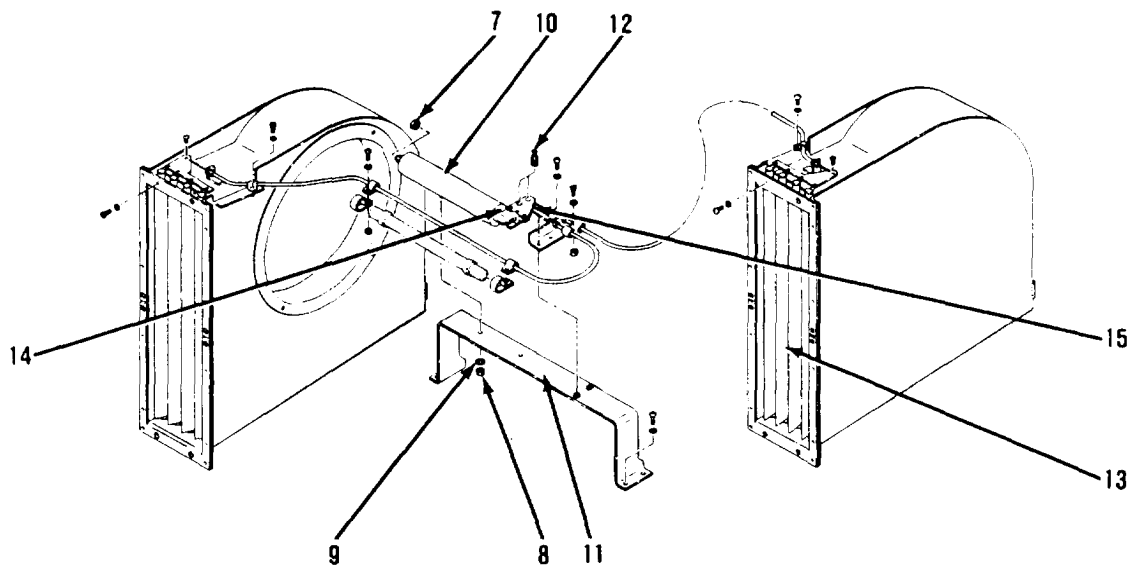
5-18. CONDENSER LOUVER ACTUATOR AND CONTROL ASSY/Service, Adjust, Replace (Cont)

LOCATION/ITEM

LOUVER CONTROL ACTUATOR

Installation:

1. Align cable actuator (10) with holes in mounting bracket (11) and secure with two flat nuts (8) and two lock washers (9).
2. Align cable actuator and secure flare nut (7).
3. Test, evacuate and charge in accordance with paragraph 5-8 through 5-14, page 5-10 through 5-19.
4. Close louver blades (13).
5. Extend condenser cable actuator rod (14) until there is 1/4 inch of space between inner edge of mounting bracket (15) and the face of the cable actuator (10).
6. Tighten screws (12).



**5-18. CONDENSER LOUVER ACTUATOR AND CONTROL ASSY/Service, Adjust, Replace
(Cont)**

LOCATION/ITEM

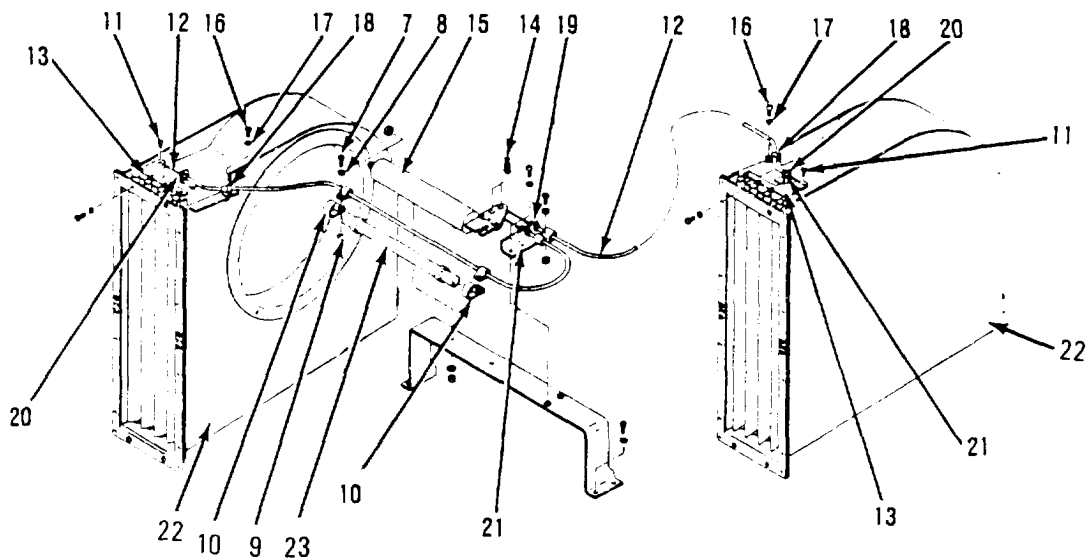
LOUVER CONTROL CABLES

Installation:

NOTE

The longer control cable assembly should be installed on the right side.

1. Align cable housings (12) with control cable housing mounting bracket (21) and secure with four speed nuts (20).
2. Install two speed nuts (20) around control cable housing (12).
3. Align control cable housings (12) with condenser fan housings (22) and secure with two speed nuts (20).
4. Align cable housing (12) with condenser fan housings and secure with two clamps (18) two screws (16) and two lock washers (17).



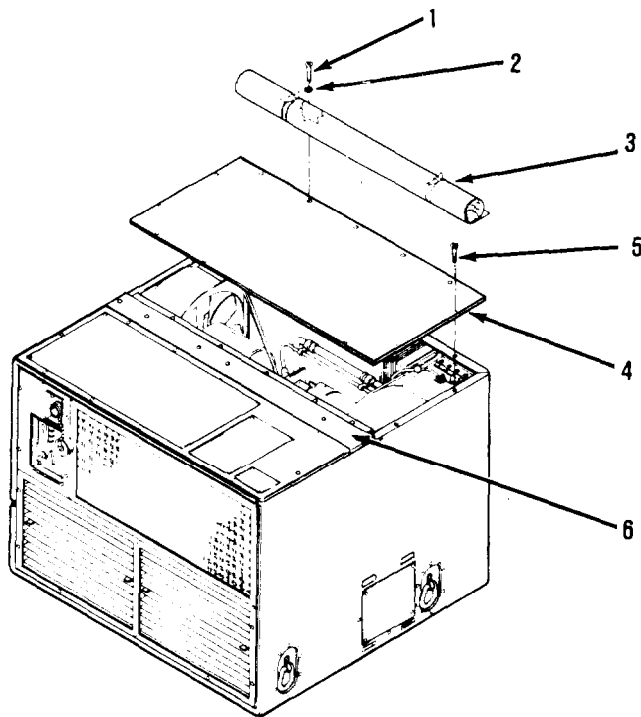
**5-18. CONDENSER LOUVER ACTUATOR AND CONTROL ASSY/Service, Adjust, Replace
(Cont)**

LOCATION/ITEM

LOUVER CONTROL CABLES

Installation:

5. Align cables (12) with connecting links (13) and secure with two screws (11).
6. Align cable housing (13) with discharge line (23) and secure with two clamps (10) two screws (7) two lock washers (8) and two flat nuts (9).
7. Align control cables (12) with mounting bracket (19) and secure with two screws (14).
8. Adjust louver control cable in accordance with paragraph 4-25, page 4-153.
9. Align rear cover (4) with holes in center cover (6) and housing and secure with fourteen screws (5).
10. Align fabric cover (3) with holes in housing and secure with three screws (1) and three lock washers (2).



5-19. REFRIGERANT VALVES AND RELATED TUBING/Test, Repair, Replace

This Task covers:

- a. Removal
- b. Inspect
- c. Test
- d. Repair
- e. Replace
- f. Installation

INITIAL SETUP

NOTE

Replace maintenance function is done by Removal/Installation Maintenance Tasks.

NOTE

All maintenance functions for tubing and fittings are covered by Brazing and Debrazing discussed in paragraphs 5-9 and 5-10.

Disconnect Power

Tools

TOOL KIT (SC 5180-90-CL-N18)

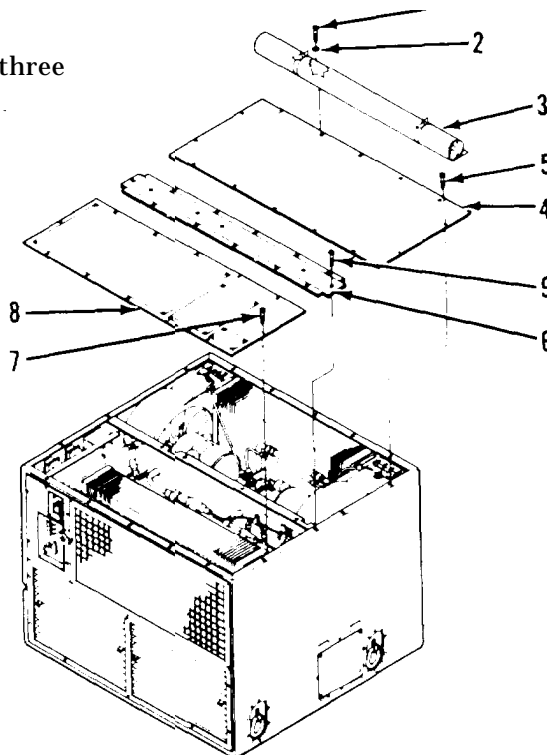
LOCATION/ITEM

EXPANSION VALVES/QUENCH VALVE/SOLENOID VALVES/PRESSURE REGULATING VALVE

Removal:

1. Remove three screws (1) and three lock washers (2) and fabric cover (3) to rear cover (4) from housing.

2. Remove fourteen screws (5) and rear cover from housing.



5-19. REFRIGERANT VALVES AND RELATED TUBING/Test, Repair, Replace (Cont)

LOCATION/ITEM

Removal:

3. Remove fourteen screws (7) and front cover (8) from housing.
4. Remove seven screws (9) and center cover (6) from housing.

WARNING

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200°F (649°C) creates phosgene gas.

WARNING

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

WARNING

Refrigerant R-22 is contained in the refrigerant system under high pressure. Extreme care must be exercised to prevent refrigerant from coming in contact with exposed skin 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.

CAUTION

Maintain a 1-2 cpm (0.1-0.2 M³/Min) flow of dry nitrogen through the refrigeration system to prevent oxidation and scaling when brazing or debrazing components.

NOTE

Always perform inspections and test before removing refrigerant components. The Expansion Valve and Quench Valve are hermetically sealed and cannot be repaired. Pressure Relief Valve is factory set and is not field adjustable.

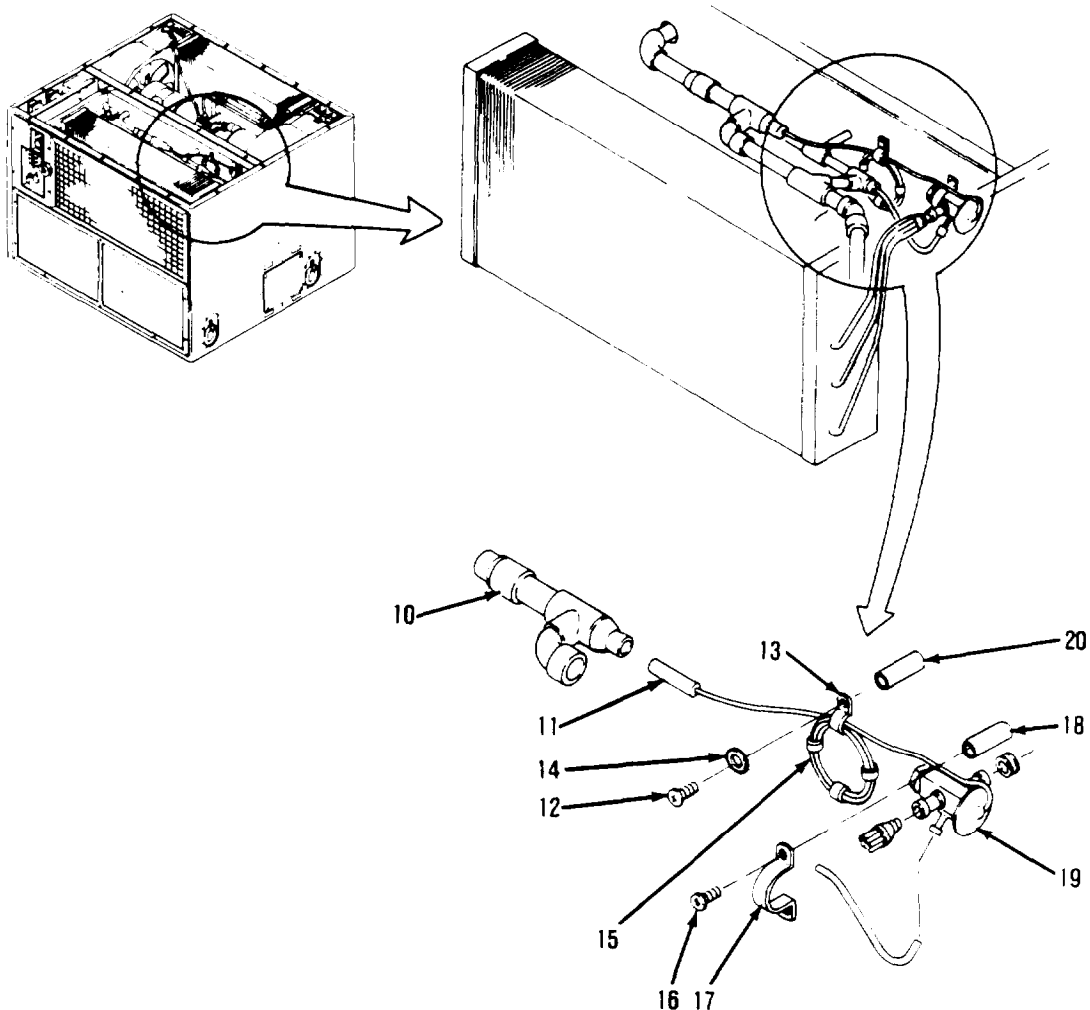
5-19. REFRIGERANT VALVES AND RELATED TUBING/Test, Repair, Replace (Cont)

LOCATION/ITEM

EXPANSION VALVE (THERMAL)

Removal:

5. Discharge the system in accordance with paragraph 5-8, page 5-10.
6. Remove mastic (Table D-1, Item 20) from bulb well (10).
7. Remove sensor bulb (11) from bulb well (10).
8. Remove one screw (12) one clamp (13) one lock washer (14) and one spacer (20) securing cap line (15) to bulkhead.
9. Remove one screw (16) one clamp (17) and one spacer post (18) securing expansion valve (19) to bulkhead.
10. Debraze expansion valve in accordance with paragraph 5-9, page 5-11.



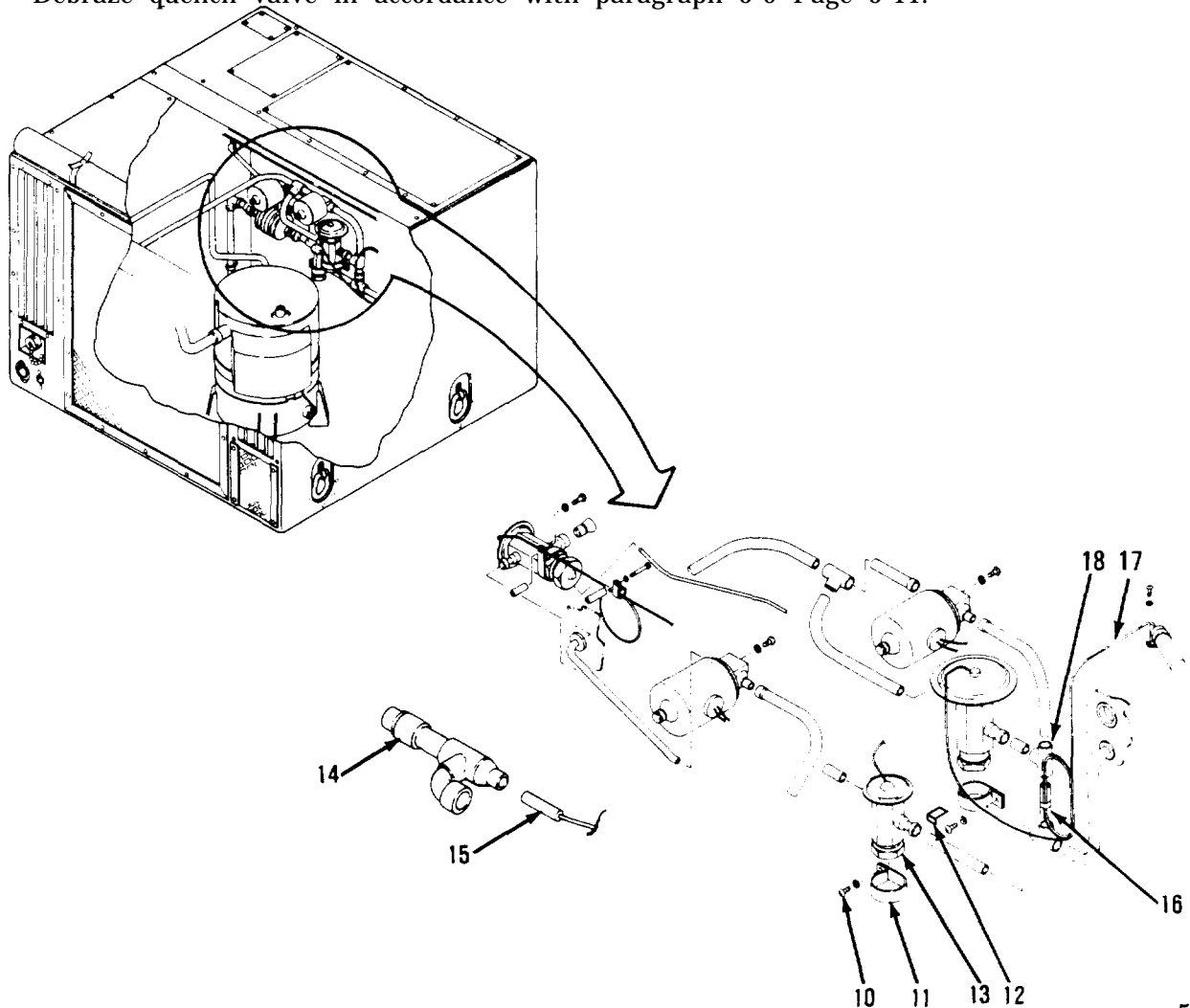
5-19. REFRIGERANT VALVES AND RELATED TUBING/Test, Repair, Replace (Cont)

LOCATION/ITEM

Removal:**NOTE**

Always perform inspections, adjustments and test before removing refrigerant components. The thermal expansion valve is hermetically sealed and cannot be repaired.

11. Discharge the system in accordance with paragraph 5-8, page 5-10.
12. Remove one screw (10) one clamp (11) and one spacer post (12) securing quench valve (13) to bulkhead.
13. Remove thermal mastic (Table D-1, Item 20) from bulb well (14).
14. Remove sensor bulb (15) from bulb well.
15. Debraze quench valve in accordance with paragraph 5-9 Page 5-11.



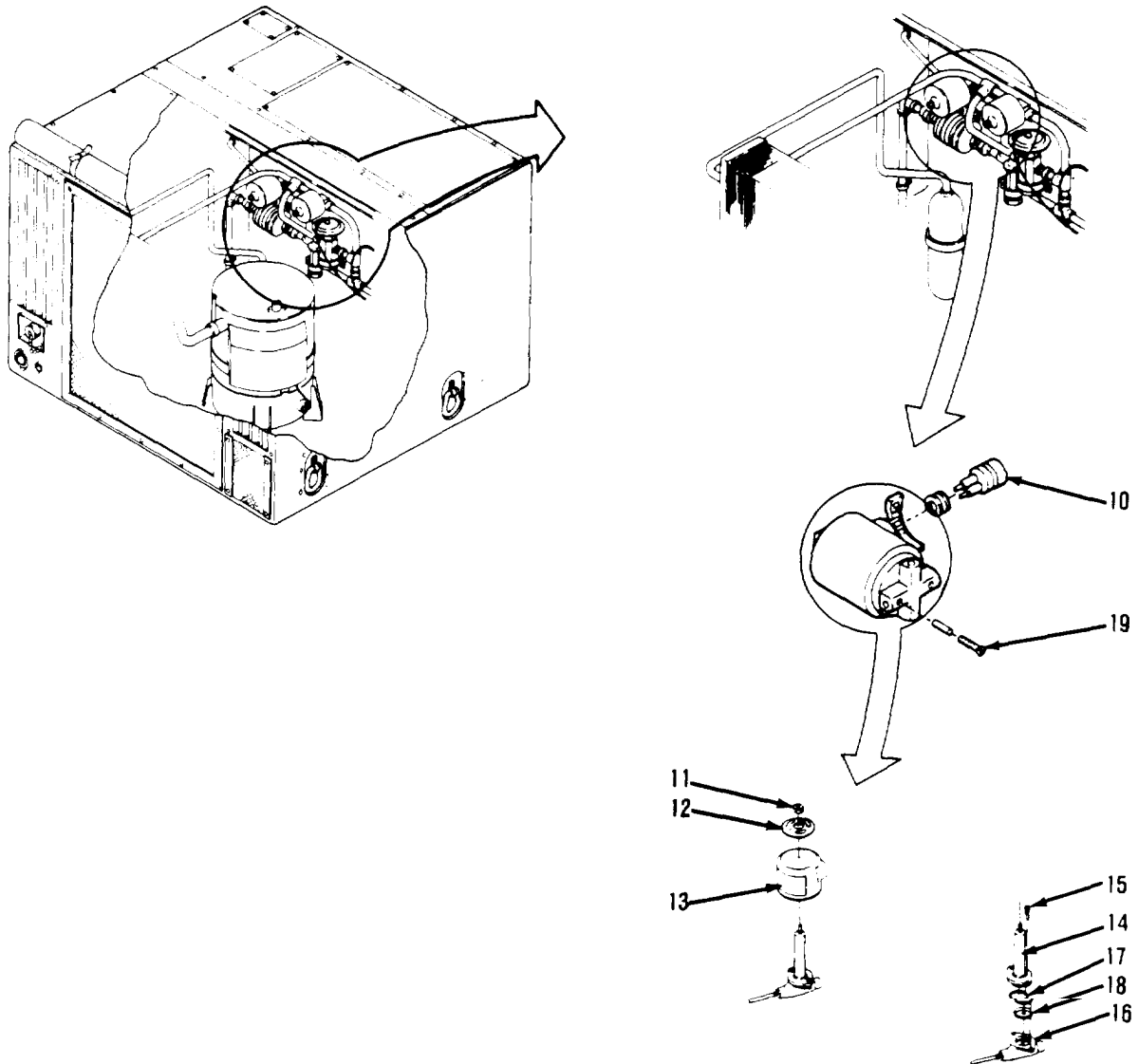
5-19. REFRIGERANT VALVES AND RELATED TUBING/Test, Repair, Replace (Cont)

LOCATION/ITEM

SOLENOID VALVE (L-1) (L-2)

Removal:

1. Discharge the system in accordance with paragraph 5-8, page 5-10.
2. Disconnect solenoid valve electrical connector P-8 (10).
3. Remove retaining nut (11) nameplate (12) and lift coil (13) from plunger assembly (14).
4. Remove two screws (15) securing plunger assembly (14) to solenoid valve base (16).
5. Remove plunger assembly (14) O-ring (17) and diaphragm (18).
6. Remove two screws (19) securing valve base (16) to bulkhead.



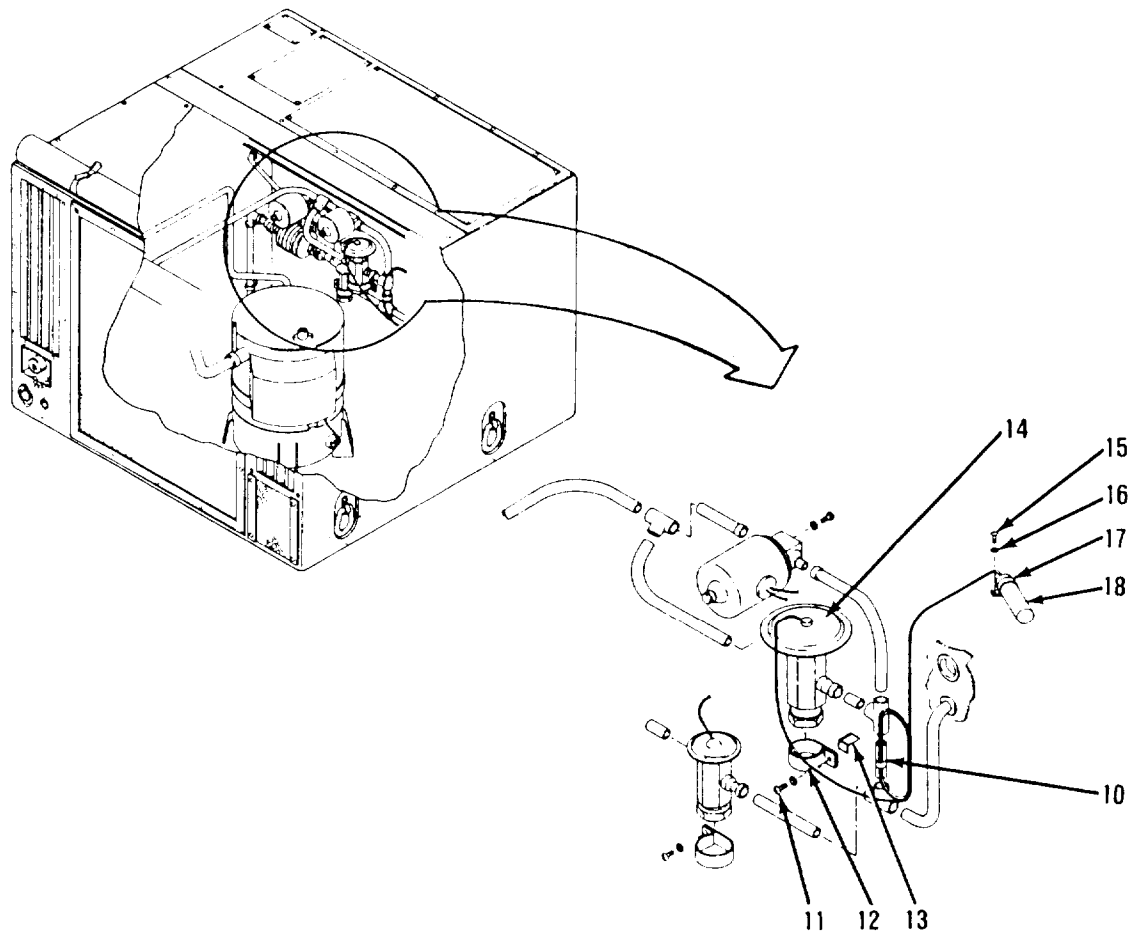
5-19. REFRIGERANT VALVES AND RELATED TUBING/Test, Repair, Replace (Cont)

LOCATION/ITEM

PRESSURE REGULATING VALVE

Removal:

1. Remove cable strap (10) securing sensor bulb (18) to suction line (19).
2. Remove one screw (11) and one clamp (12) and one spacer post (13) securing pressure valve (14) to bulkhead.
3. Debraze pressure valve in accordance with paragraph 5-9, page 5-11.
4. Remove one screw (15) one lock washer (16) and one clamp (17) and remove sensor bulb (18).



5-19. REFRIGERANT VALVES AND RELATED TUBING/Test, Repair, Replace (Cont)

LOCATION/ITEM

EXPANSION VALVE (THERMAL) /QUENCH VALVE

Test:

CAUTION

Do not let liquid refrigerant flood back into the compressor any longer than 1-2 seconds. The expansion valve will be wide open during the following procedure. Excessive flood-back of liquid refrigerant will damage the compressor.

NOTE

Testing expansion valve is to be done while air conditioner is operating and supplying cooling air.

1. Connect power.
2. With the air conditioner in off position, let the suction line warm up to ambient temperature.
3. Place sensing bulb in a container of ice water or crushed ice (32°F or 0°C).
4. Start the air conditioner by setting the mode selector at COOL, and the temperature selector at maximum COOLER. Remove the sensing bulb from the ice water, and hold it in one hand to warm it while feeling the suction line. If the suction line temperature drops, the valve is operating properly. Stop the air conditioner at once, and reinstall the sensing bulb. If the temperature of the suction line does not drop, stop the air conditioner and replace the expansion valve and quench valve.

SOLENOID VALVE (L-1) (L-2)

Test:

1. Apply external 24-28 VDC to the connector pins A and B of electrical connector P-8.
2. Listen for a sharp click which indicates that the solenoid valve plunger is working properly.
3. If the solenoid valve plunger fails to work properly the solenoid valve coil is defective, replace defective solenoid valve coil.

5-19. REFRIGERANT VALVES AND RELATED TUBING/Test, Repair, Replace (Cont)

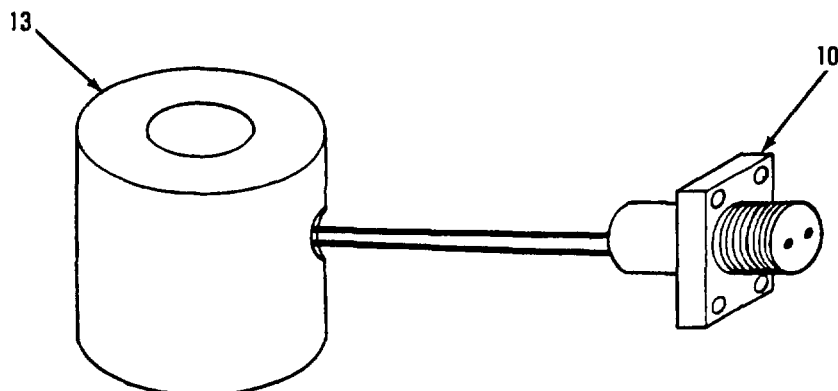
LOCATION/ITEM

PRESSURE REGULATING VALVE**Test:**

Install gauges and operate unit in cooling mode. Turn thermostat (Temperature Selector Switch) to warmer. Check that the liquid line solenoid (L-1) is closed. The unit will stop cooling but continue to operate. Watch the suction gauge. If the compressor pulls the suction pressure down to the factory setting (35 psig +/- 5 psig) the valve is operating normally. If the pressure falls below this value, the valve is defective and must be replaced. The pressure regulator valve is factory set and can not be adjusted or repaired.

SOLENOID VALVE (L-1) (L-2)**Repair:**

1. Tag and unsolder wires from electrical connector P-8 (10).
2. Remove adapter from coil (13).
3. Replace defective coil (13) and install adapter.
4. Solder wires on new coil (13) to electrical connector P-8 (10) in accordance with Appendix E and remove tags.



5-19. REFRIGERANT VALVES AND RELATED TUBING/Test, Repair, Replace (Cont)

LOCATION/ITEM

EXPANSION VALVE/QUENCH VALVE/SOLENOID VALVE/PRESSURE REGULATING VALVE

Installation:

WARNING

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

WARNING

Refrigerant R-22 is contained in the refrigerant system under high pressure. Extreme care must be exercised to prevent refrigerant from coming in contact with exposed skin 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.

CAUTION

Maintain a 1-2 cpm (0.1-0.2 M³/Min) flow of dry nitrogen through the refrigeration system to prevent oxidation and scaling when brazing or debrazing components.

NOTE

Wrap valve with wet cloth to prevent overheating valve during soldering.

1. Align sensor bulb (18) and one clamp (17) with sensor bulb mounting bracket and secure with one screw (15) and one lock washer (16).
2. Braze in accordance with paragraph 5-10, page 5-12.
3. Install one clamp (12) around pressure regulating valve (14) and align with spacer post (13) on hole in bulkhead and secure one screw (11).
4. Secure sensor bulb (18) to suction line (19) with cable strap (10).
5. Test, evacuate and charge system in accordance with paragraphs 5-8 through 5-14, pages 5-10 through 5-19.

SOLENOID VALVE (L-1) (L-2)

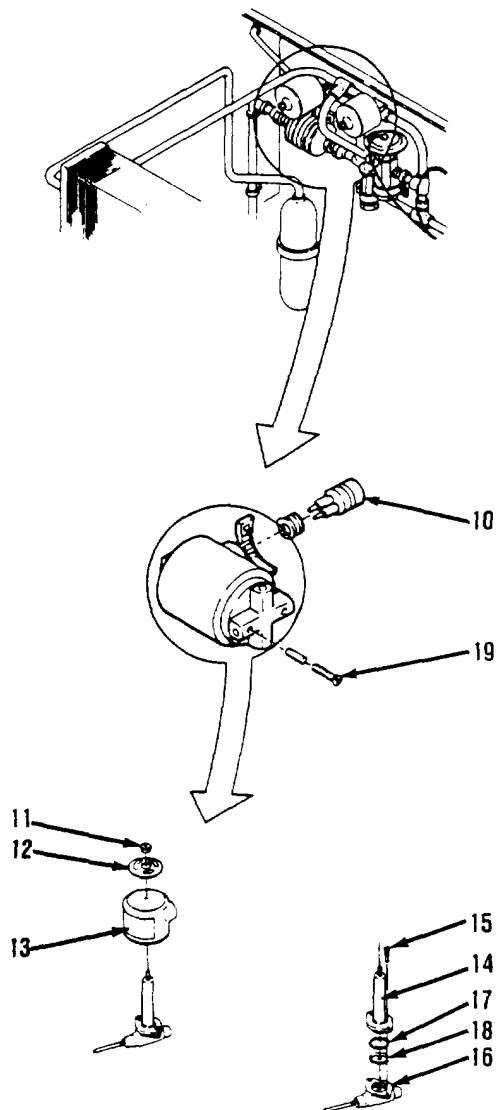
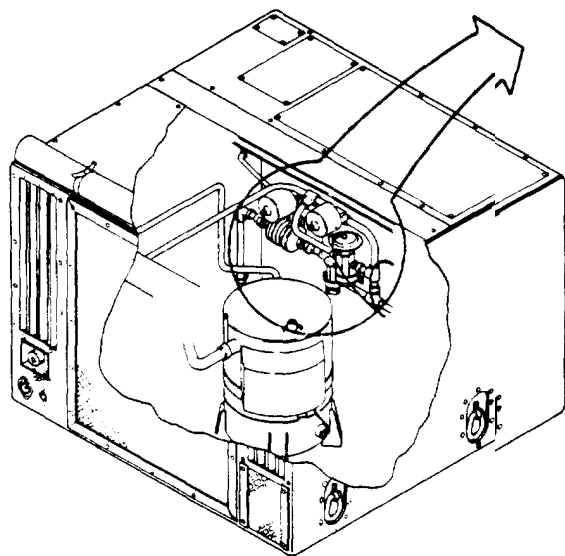
6. Braze in accordance with paragraph 5-10, page 5-12.
7. Secure solenoid valve base (20) to bulkhead with two screws (19).

5-19. REFRIGERANT VALVES AND RELATED TUBING/Test, Repair, Replace (Cont)

LOCATION/ITEM

Installation:

8. Install O-ring (17) in groove in plunger assembly (14) and place diaphragm (18) in recess of base (16) with the seat facing upwards.
9. Secure plunger assembly (14) to valve base (16) with two screws (15).
10. Install coil (13) nameplate (12) and retaining nut (11) to plunger assembly and tighten nut (11).
11. Connect electrical connector P-8 (10).
12. Test, evacuate and charge system in accordance with paragraphs 5-8 through 5-14, pages 5-10 through 5-19.

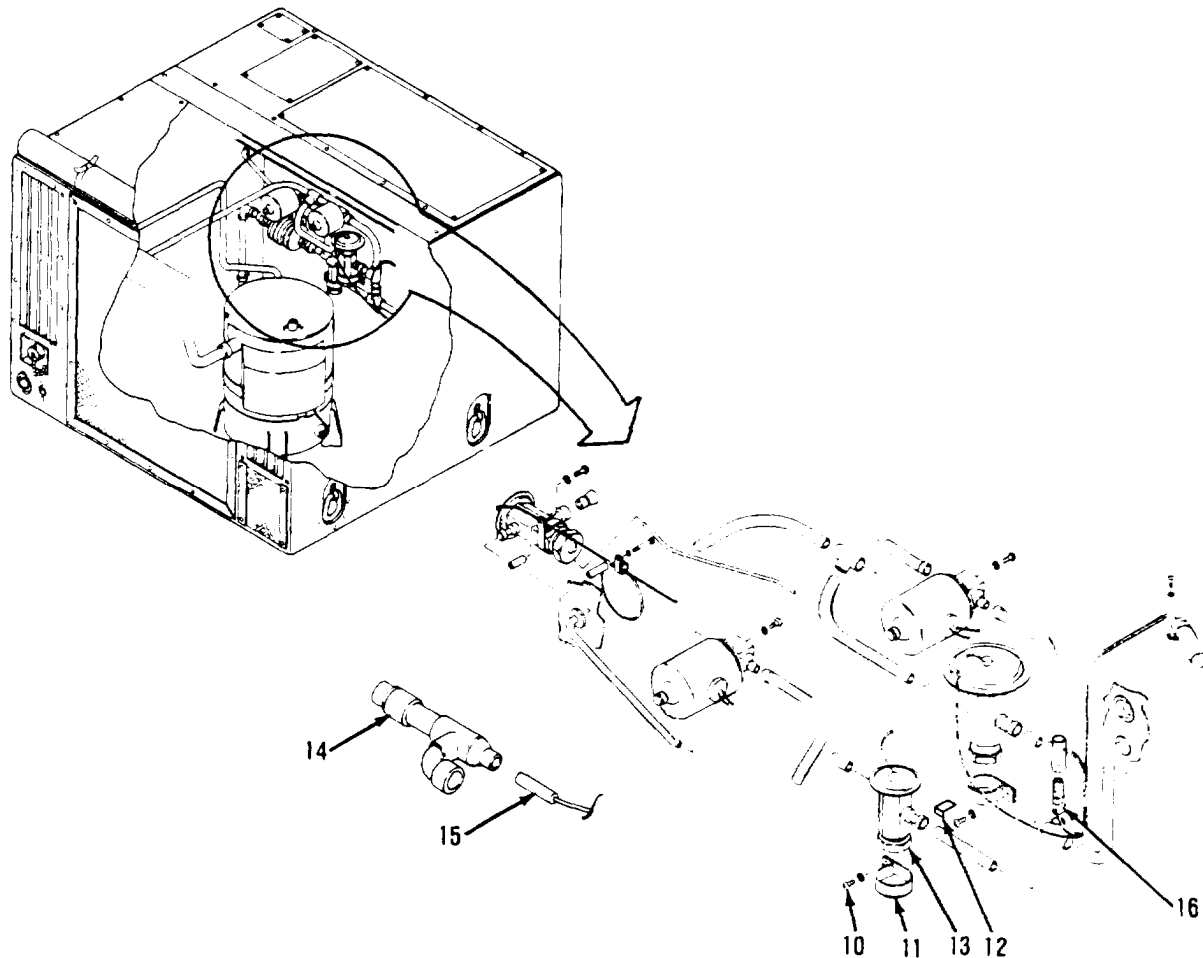


5-19. REFRIGERANT VALVES AND RELATED TUBING/Test, Repair, Replace (Cont)

LOCATION/ITEM

Installation:

13. Braze valve (quench) in accordance with paragraph 5-10, page 5-12.
14. Align one clamp (11) quench valve (13) spacer post (12) with hole in bulkhead and secure thermal expansion valve and spacer post to bulkhead with one screw (10).
15. Insert approximately one ounce of thermal mastic (Table D-1, Item 20) in bulb well.
16. Move thermal expansion valve sensor bulb (15) back and forth to distribute thermal mastic (Table D-1, Item 20) equally.
17. Set bulb (15) one inch beyond open end.
18. Test, evacuate and charge system in accordance with paragraphs 5-8 through 5-14, pages 5-10 through 5-19.



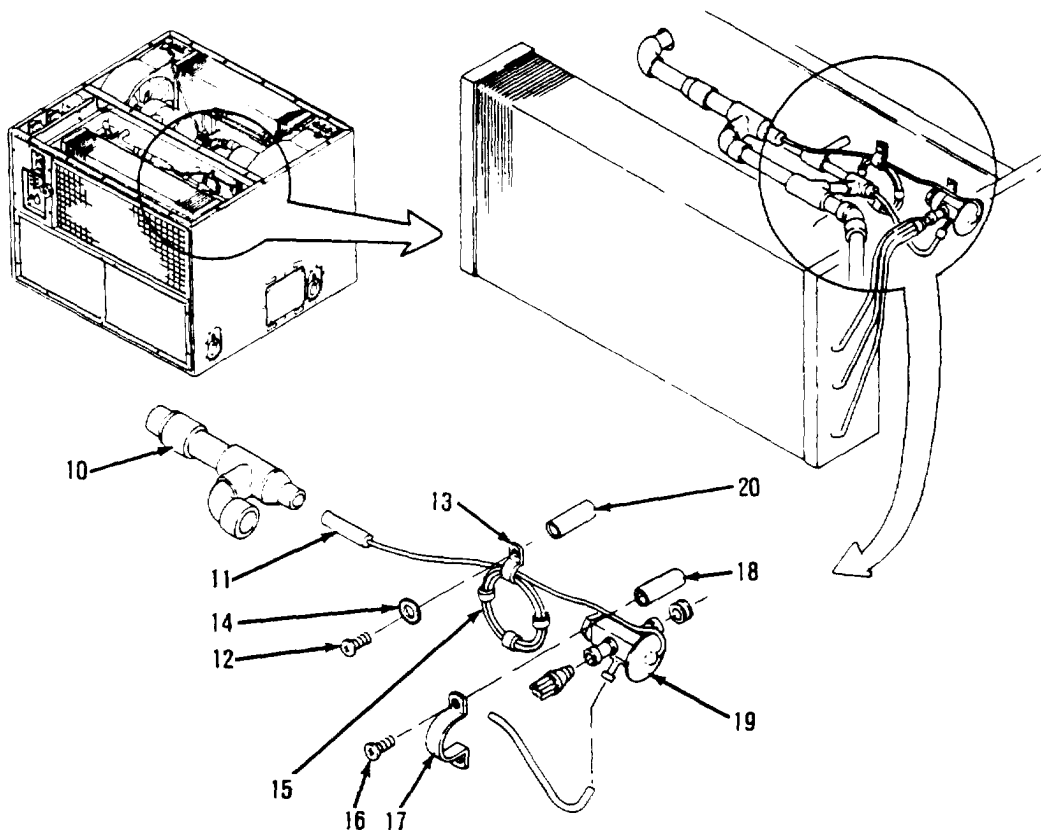
5-19. REFRIGERANT VALVES AND RELATED TUBING/Test, Repair, Replace (Cont)

LOCATION/ITEM

EXPANSION VALVE (THERMAL)

Installation:

19. Braze in accordance with paragraph 5-10, pages 5-12 and 5-13.
20. Install one clamp (17) around expansion valve (19).
21. Align one clamp (17) thermal expansion valve (19) and one spacer post (18) with hole in bulkhead and secure with one screw (16).



5-19. REFRIGERANT VALVES AND RELATED TUBING/Test, Repair, Replace (Cont)

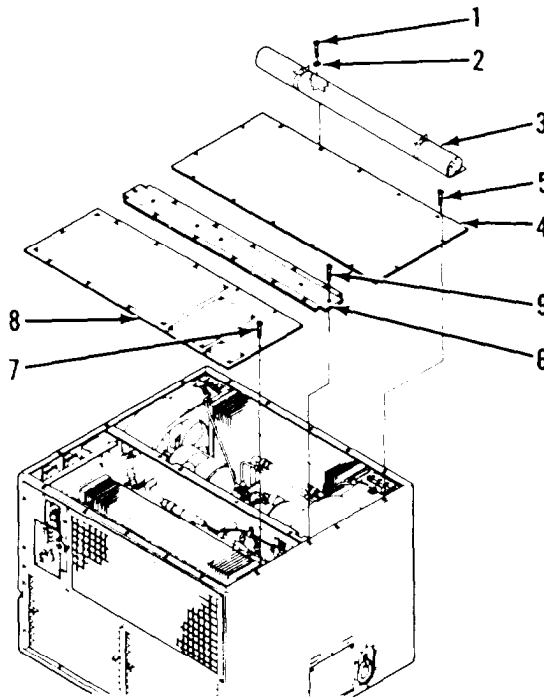
LOCATION/ITEM

Installation:

- 22. Install one clamp (13) around cap line (15) align with hole in bulkhead and secure one screw (12) one washer (14) and one spacer (20).
- 23. Insert approximately one ounce of thermal mastic (Table D-1, Item 20) in bulb well.
- 24. Move expansion valve sensor bulb (11) back and forth to distribute mastic (Table D-1, Item 20) equally.
- 25. Set bulb (11) one inch beyond open end.
- 26. Test, evacuate and charge in accordance with paragraphs 5-8 through 5-14, pages 5-10 through 5-19.

EXPANSION VALVE (THERMAL/QUENCH VALVE/SOLENOID VALVE/PRESSURE REGULATING VALVE)

- 27. Align center cover (6) with holes in housing and secure center cover to housing with seven screws (9).



5-19. REFRIGERANT VALVES AND RELATED TUBING/Test, Repair, Replace (Cont)

LOCATION/ITEM

Installation:

28. Align front cover (8) with holes in center cover and housing and secure with fourteen screws (7).

29. Align rear cover (4) with holes in center cover and housing and secure with fourteen screws (5).

30. Align fabric cover (3) with holes in housing and secure with three screws (1) and three lock washers (2).

5-20. DEHYDRATOR (FILTER-DRIER) AND RELATED TUBING/Replace

This Task covers:

- a. Removal
 - b. Replace
 - c. Installation
-

INITIAL SETUP

NOTE

Replace maintenance function is done by Removal/Installation Maintenance Tasks.

NOTE

All maintenance functions for tubing and fittings are covered by Brazing and Debrazing discussed in paragraphs 5-9 and 5-10.

Disconnect Power

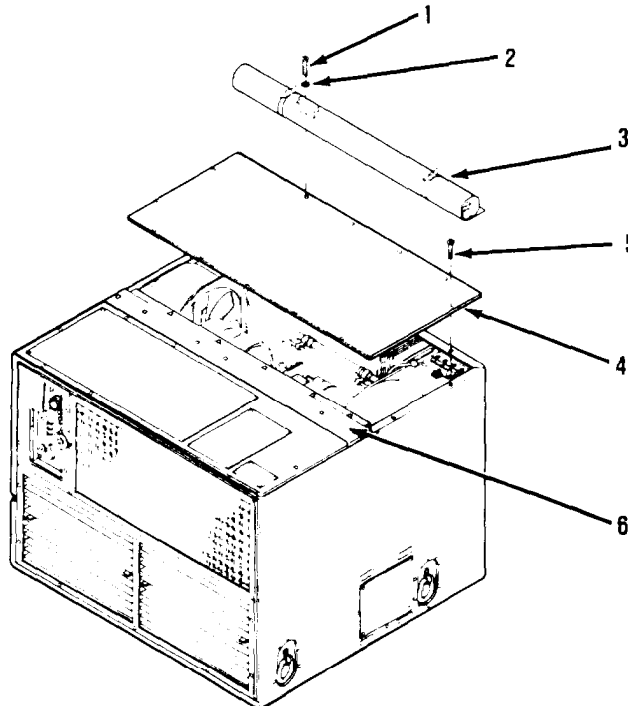
Tools

TOOL KIT (SC 5180-90-CL-N18)

LOCATION/ITEM

Removal:

1. Remove three screws (1) and three lock washers (2) and fabric cover (3) from housing.
2. Remove fourteen screws (5) securing rear cover (4) from housing.



5-20. DEHYDRATOR (FILTER-DRIER) AND RELATED TUBING/Replace (Cont)

LOCATION/ITEM

Removal:

WARNING

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200 F (649°C) creates phosgene gas.

WARNING

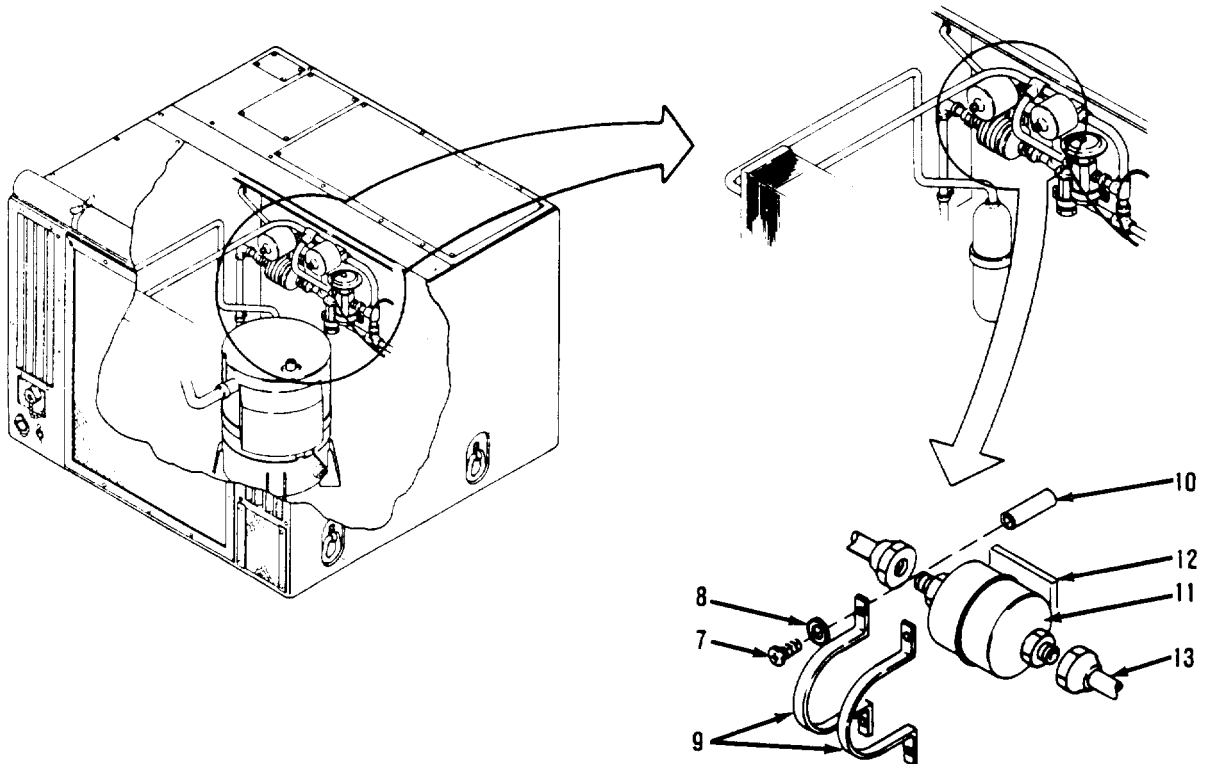
Avoid contact with refrigerant acid. Burns could result from contact with refrigerant.

CAUTION

Maintain a 1-2 cpm (0.1-0.2 M³/Min) flow of dry nitrogen through the refrigeration system to prevent oxidation and scaling when brazing or debrazing components.

NOTE

Leak check fittings. Always perform inspections, adjustments and test before removing refrigerant components.



5-20. DEHYDRATOR (FILTER-DRIER) AND RELATED TUBING/Replace (Cont)

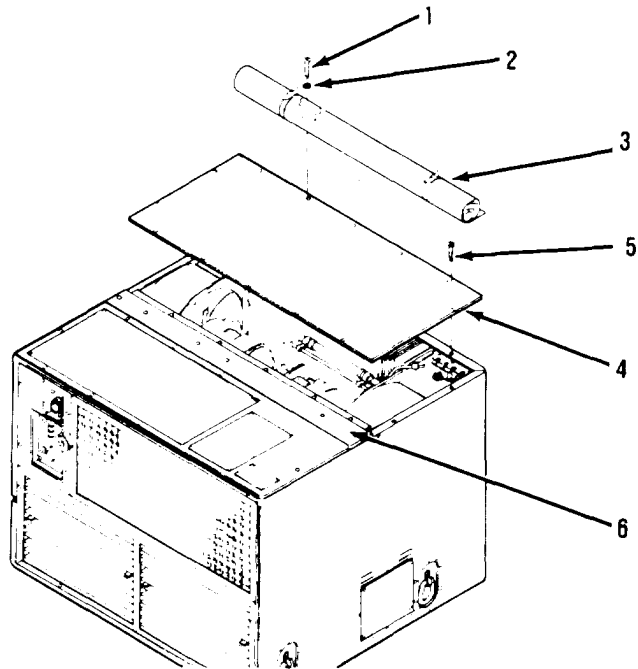
LOCATION/ITEM

Removal:

3. Discharge the system in accordance with paragraph 5-8, page 5-10.
4. Remove four screws (7) four lock washers (8) two clamps (9) and four spacer posts (10) securing dehydrator (11) and dehydrator mounting bracket (12) to bulkhead.
5. Unscrew the tubing flare nuts (13) from both ends of the dehydrator (11) and remove from unit.

Installation:

1. Connect the tubing flare nuts (13) to both ends of the dehydrator (11).
2. Align dehydrator (11) dehydrator mounting bracket (12) four spacer posts (10) and two clamps (9) with holes in bulkhead and secure with four screws (7) and four lock washers (8).
3. Test, evacuate and charge system in accordance with paragraphs 5-8 through 5-14, pages 5-10 through 5-19.
4. Align rear cover (4) with holes in center cover (6) and housing and secure with fourteen screws (5).



5-21. CHARGING VALVES, PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR, PRESSURE RELIEF VALVES/Replae

This Task covers:

- a. Removal
 - b. Replace
 - c. Installation
-

INITIAL SETUP

NOTE

Replace maintenance function is done by Removal/Installation Maintenance Tasks.

NOTE

All maintenance functions for tubing and fittings are covered by Brazing and Debrazing discussed in paragraphs 5-9 and 5-10.

Disconnect Power

Tools

TOOL KIT (SC 5180-90-CL-N18)

LOCATION/ITEM

CHARGING VALVES/PRESSURE SWITCHES/SIGHT INDICATOR/PRESSURE RELIEF VALVES

Removal:

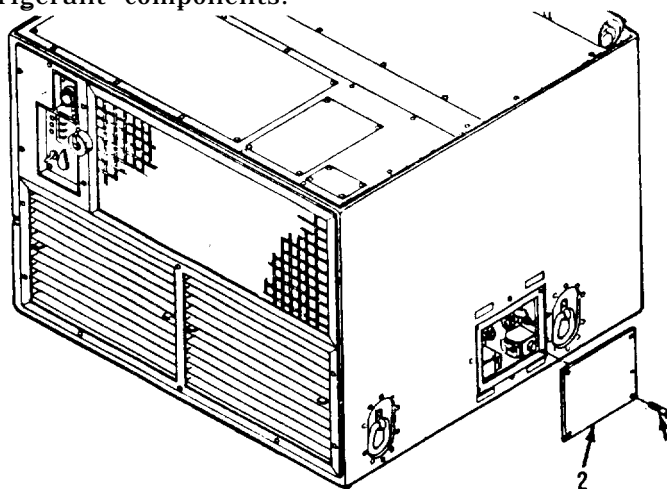
1. Remove eight screws (1) and access cover (2) to valve charging box from housing.

WARNING

Purge system with dry nitrogen prior to soldering" Refrigerant heated to 1200° F (649°C) creates phosegene gas.

NOTE

Leak check fittings. Always perform inspections, adjustments and test before removing refrigerant components.



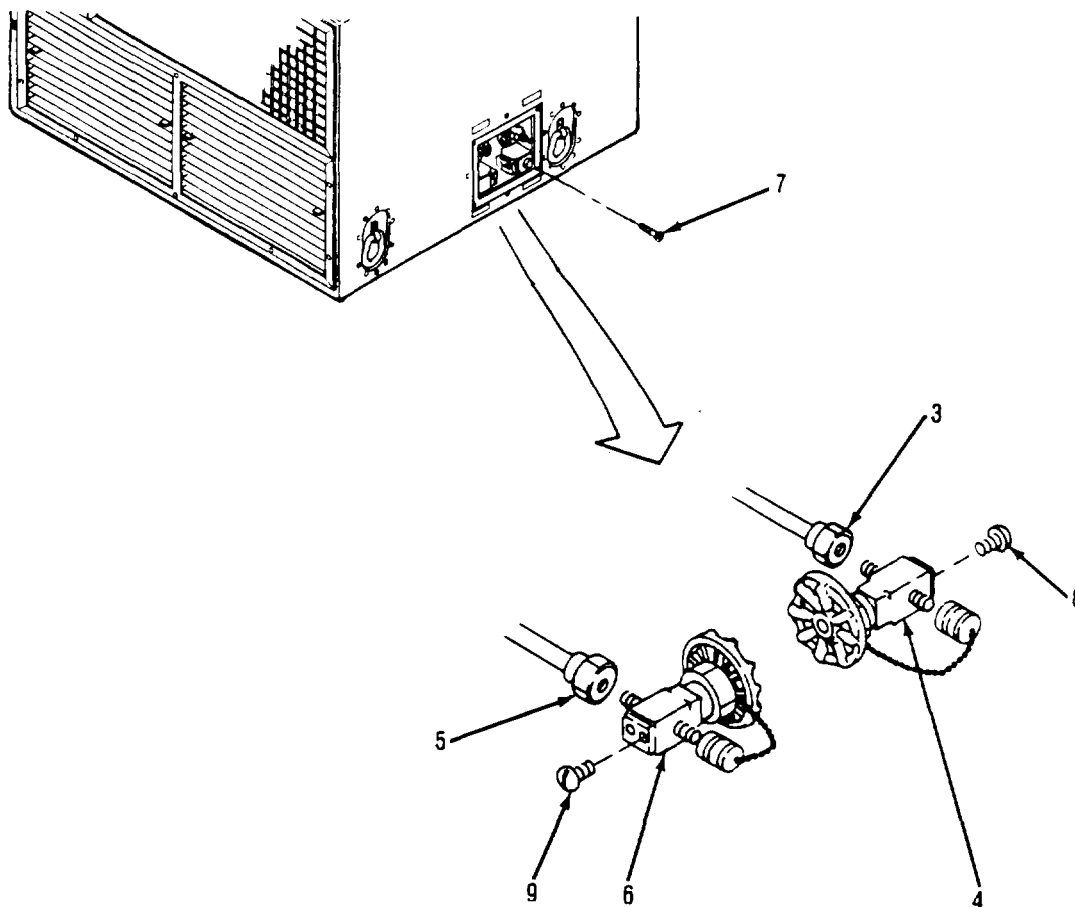
5-21. CHARGING VALVES, PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR, PRESSURE RELIEF VALVES/Replace (Cont)

LOCATION/ITEM

CHARGING VALVES

Removal:

2. Discharge system in accordance with paragraph 5-8, page 5-10.
3. Remove one flare nut (3) from suction charging valve (4).
4. Remove one flare nut (5) from discharge charging valve (6).
5. Remove four screws (7) securing charging valve box to housing.
6. Slide charging valve box out of housing to allow access to charging valve mounting screws.
7. Remove two screws (8) and suction charging valve (4) to charging valve box.
8. Remove two screws (9) and discharge charging valve (6) from charging valve box.



5-21. CHARGING VALVES, PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR, PRESSURE RELIEF VALVES/Replace (Cont)

LOCATION/ITEM

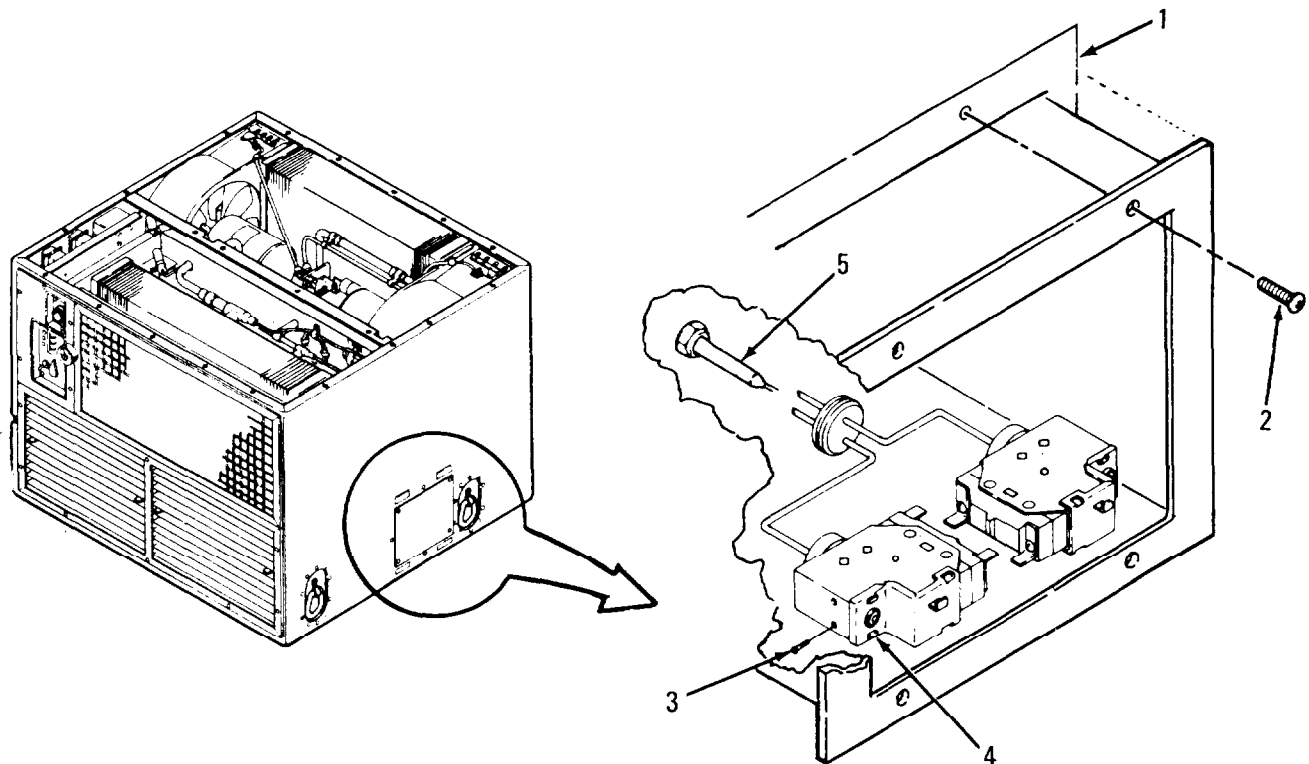
Removal:

NOTE

Leak check fittings. Always perform inspections, adjustments and test before removing refrigerant components.

PRESSURE SWITCHES (HIGH AND LOW)

9. Remove four screws (2) and charging valve box (1) from housing.
10. Slide charging valve box (1) out of housing to allow access to high pressure switch mounting screws.
11. Remove two screws (3) and pressure switch (4) from charging valve box (1).
12. Disconnect sampling tubing by loosening flare nut (5) on high pressure switch lines.
13. Tag and remove wires from terminals.
14. Remove pressure switch.



5-21. CHARGING VALVES, PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR, PRESSURE RELIEF VALVES/Replace (Cont)

LOCATION/ITEM

Removal:

SIGHT INDICATOR

WARNING

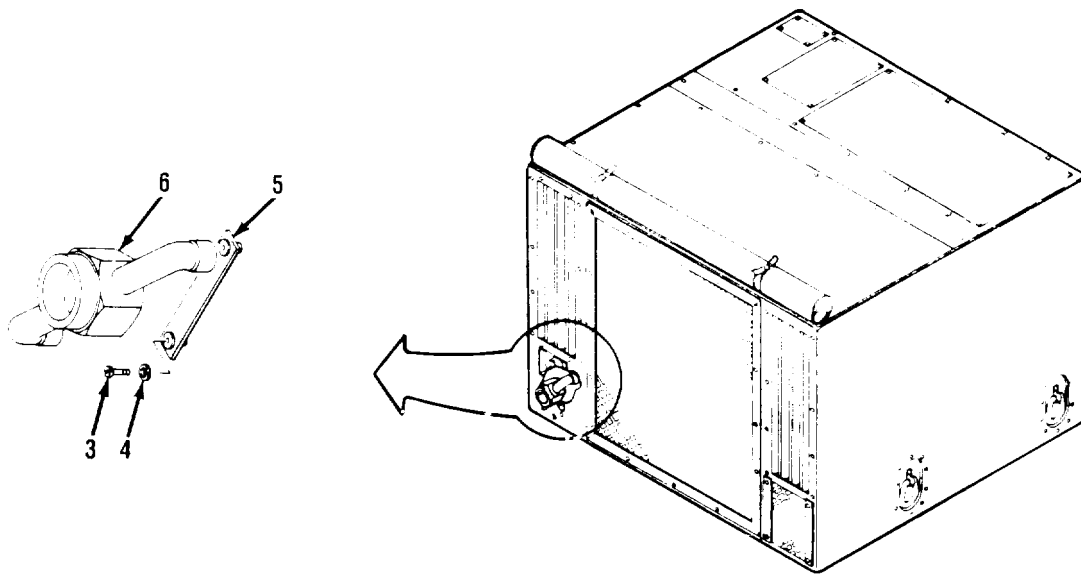
Avoid contact with refrigerant acid. Burns could result from contact with refrigerant.

CAUTION

Maintain a 1-2 cpm (0.1-0.2 M³Min) flow of dry nitrogen through the refrigeration system to prevent oxidation and scaling when brazing or debrazing components.

15. Remove two screws (3) two lock washers (4) and one clamp (5) securing sight indicator (6) to housing.

16. Debraze in accordance with paragraph 5-10, pages 5-12 and 5-13.



5-21. CHARGING VALVES, PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR, PRESSURE RELIEF VALVES/Replace (Cont)

LOCATION/ITEM

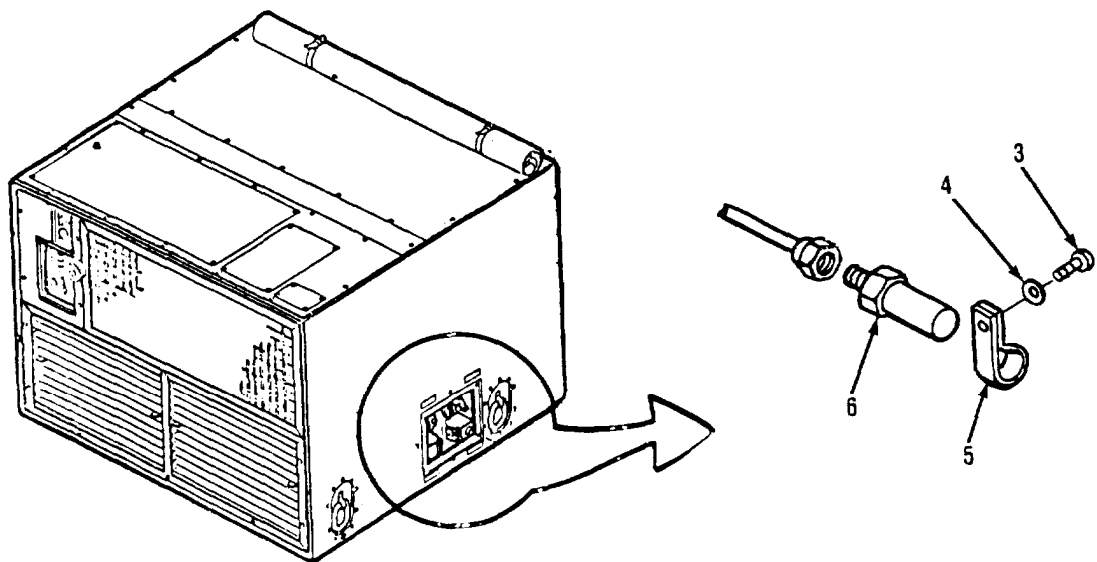
Removal:

PRESSURE RELIEF VALVE

CAUTION

Use back-up wrench to prevent damage to refrigeration system fittings.

1. Remove charging valves and pressure switches (steps 1-14).
2. Remove one screw (3) one lock washer (4) and one clamp (5) securing pressure relief valve (6) from bulkhead.
3. Unscrew and remove pressure relief valve (6).



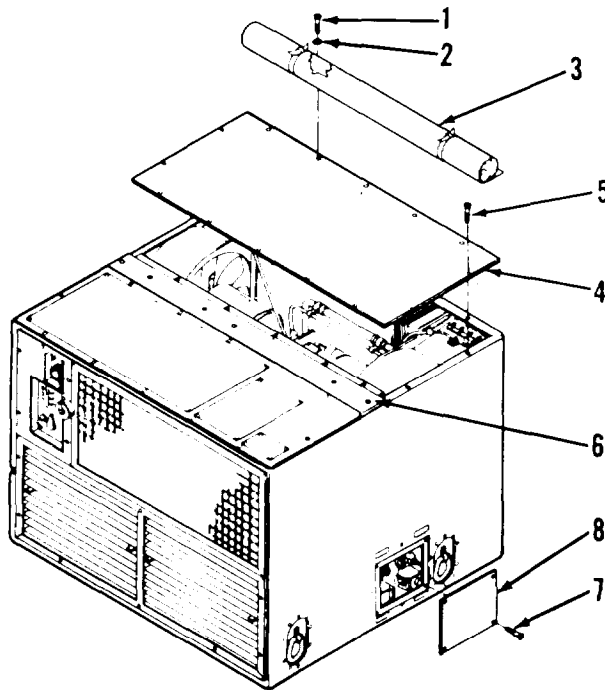
5-21. CHARGING VALVES, PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR, PRESSURE RELIEF VALVES/Replace (Cont)

LOCATION/ITEM

Removal:

RECEIVER

1. Remove three screws (1) and three lock washers (2) and fabric cover (3) from housing.
2. Remove fourteen screws (5) and rear cover (4) from housing.



**5-21. CHARGING VALVES, PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR,
PRESSURE RELIEF VALVES/Replace (Cont)**

LOCATION/ITEM

Removal:

3. Remove condenser fans, and support assemblies in accordance with paragraph 5-17, page 5-21.
4. Remove eight screws (7) and access cover (8) from housing.
5. Remove charging valves, pressure switches in accordance with page 5-50, steps 1-14.

WARNING

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200°F (649°C) creates phosgene gas.

WARNING

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

CAUTION

Maintain a 1-2 cpm (0.1–0.2 M³/Min) flow of dry nitrogen through the refrigerant ion system to prevent oxidation and scaling when brazing or debrazing components.

NOTE

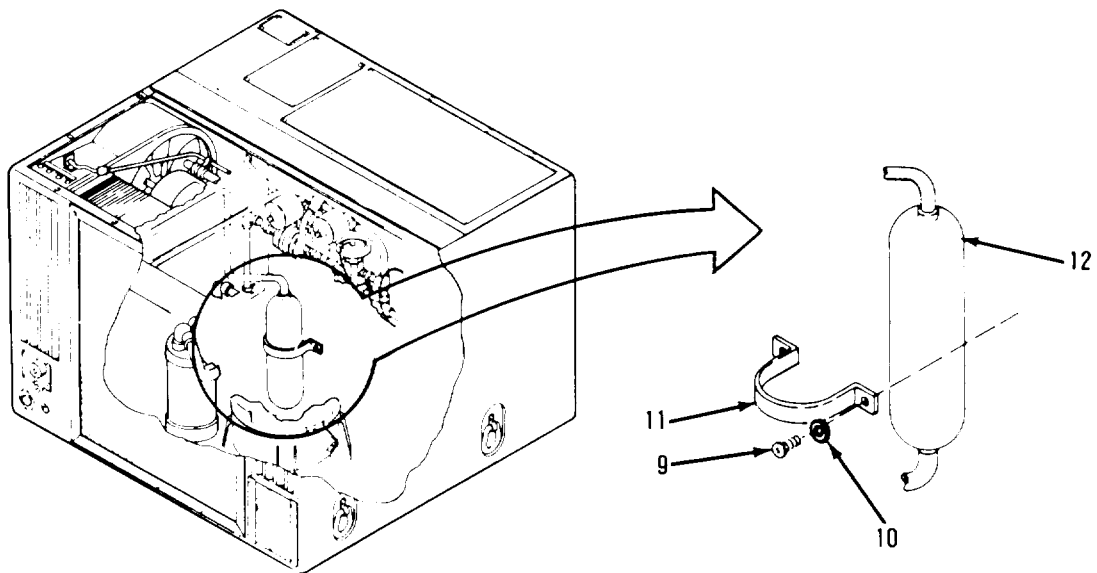
Leak check fittings. Always perform inspections, adjustments and test before removing.

5-21. CHARGING VALVES, PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR, PRESSURE RELIEF VALVES/Replace (Cont)

LOCATION/ITEM

Removal:

6. Remove two screws (9) two lock washers (10) and one clamp (11) securing receiver (12) to bulkhead.
7. Debraze in accordance with paragraph 5-9, page 5-11.
8. Remove receiver (12).



**5-21. CHARGING VALVES, PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR,
PRESSURE RELIEF VALVES/Replace (Cont)**

LOCATION/ITEM

RECEIVER

Installation:**CAUTION**

Maintain a 1-2 cpm (0.1-0.2 M³/Min) flow of dry nitrogen through the refrigeration system to prevent oxidation and scaling when brazing or debrazing components.

1. Braze in accordance with paragraph 5-10, pages 5-12 and 5-13.
2. Align receiver (12) and one clamp (11) with holes in bulkhead and secure to bulkhead with two screws (9) and two lock washers (10).

5-21. CHARGING VALVES, PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR, PRESSURE RELIEF VALVES/Replace (Cont)

LOCATION/ITEM

SIGHT INDICATOR

Installation:

CAUTION

Maintain a 1-2 cpm (0.1-0.2 M³ Min) flow of dry nitrogen through the refrigeration system to prevent oxidation and scaling when brazing or debrazing components.

1. Braze in accordance with paragraph 5-10, page 5-12 and 5-13.
2. Align sight indicator (6) and one clamp (5) with holes in housing and secure two screws (3) and two lock washers (4).

HIGH PRESSURE SWITCHES

CAUTION

Assure sampling tubing is reinstalled in proper location to prevent damaging.

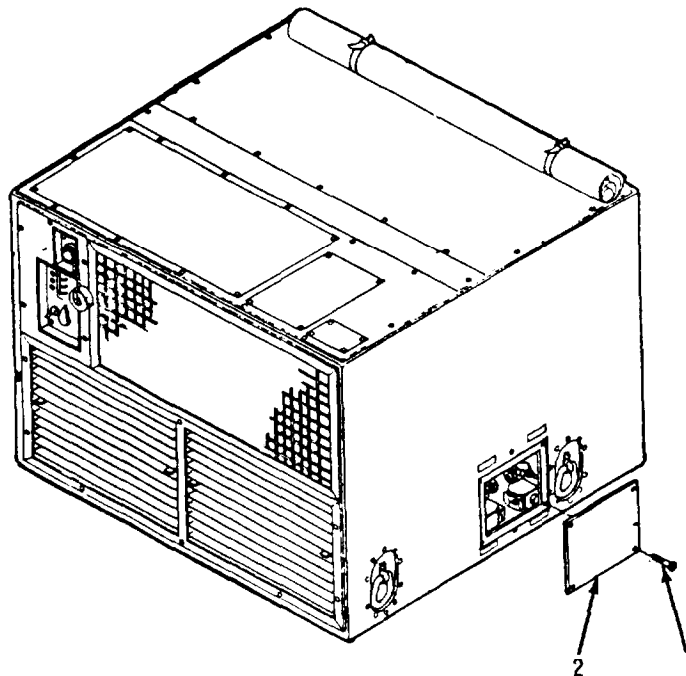
3. Attach wires to appropriate terminals in accordance with Appendix E and remove tags.
4. Connect sampling tubing flare nut (6) and tighten.
5. Align pressure switches (5) with charging valve box (1) and secure with two screws (4).
6. Align charging valve box (5) with housing and secure charging valve box to housing with four screws (3).

5-21. CHARGING VALVES, PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR, PRESSURE RELIEF VALVES/Replace (Cont)

LOCATION/ITEM

Installation:

7. Align suction charging valve (4) with charging valve box and secure with two screws (8).
8. Align discharge charging valve (6) with charging valve box and secure with two screws (9).
9. Align charging valve box with housing and secure with four screws (7).
10. Connect one flare nut (3) to suction charging valve (4).
11. Connect one flare nut (5) to discharge charging valve (6).
12. Test, evacuate and charge system in accordance with paragraphs 5-8 through 5-14, pages 5-10 through 5-19.
13. Align access cover (2) with holes in housing and secure eight screws (1).



5-21. CHARGING VALVES, PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR, PRESSURE RELIEF VALVES/Replace (Cont)

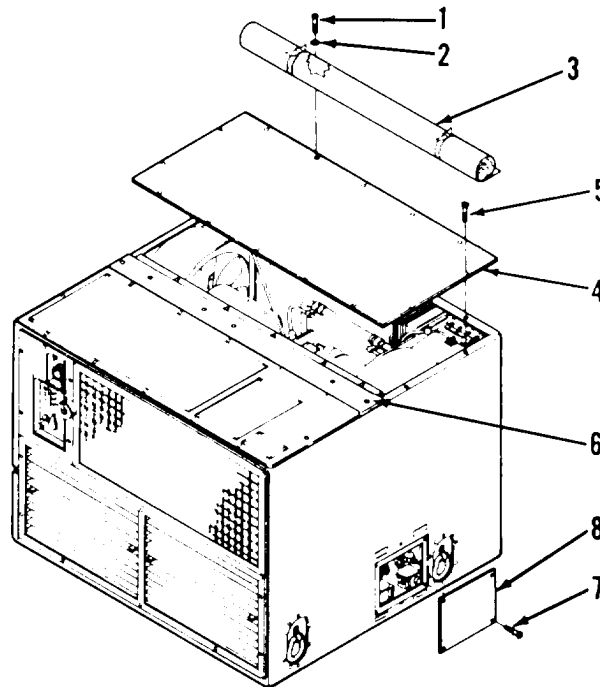
LOCATION/ITEM

Installation:

14. Install condenser fans, motors, and support assemblies in accordance with paragraph 4-15, page 4-46.

15. Align rear cover (4) with holes in center cover (6) and housing and secure rear cover in center cover and housing with fourteen screws (5).

16. Align fabric cover (3) with holes in housing and secure with three screws (1) and three lock washers (2).



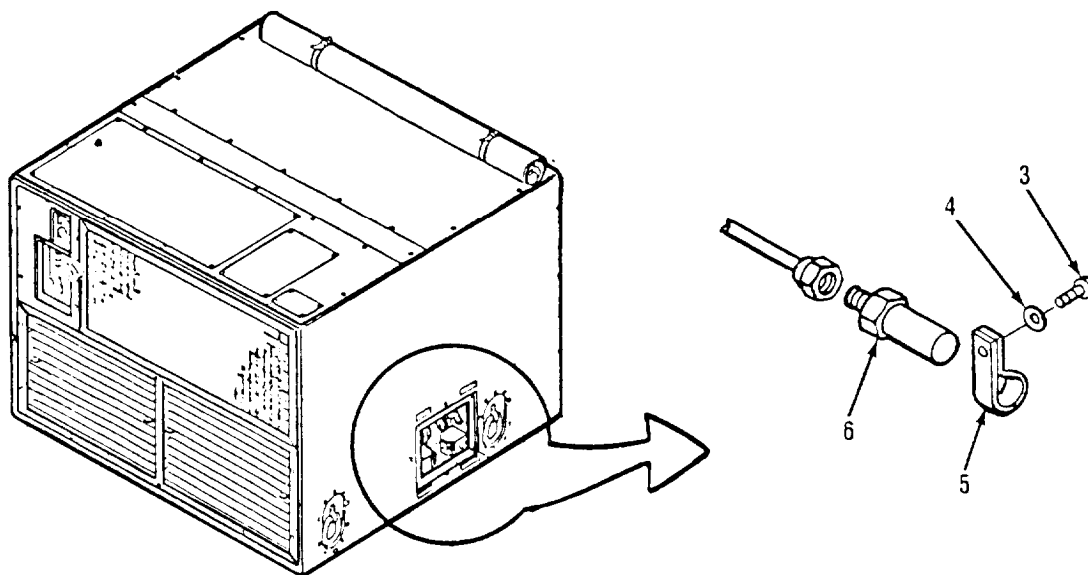
**5-21. CHARGING VALVES, PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR,
PRESSURE RELIEF VALVES/Replace (Cont)**

LOCATION/ITEM

Installation:**PRESSURE RELIEF VALVE****NOTE**

Use a back-up wrench on the fitting to prevent damage when tightening the valve.

1. Wrap thread seal tape (Table E-1, Item 19) around the threads of the pressure relief valve.
2. Screw the pressure relief valve (6) to the refrigeration system fitting.
3. Align pressure relief valve and one clamp (5) with hole in bulkhead and secure with one lock washer (4) and one screw (3).
4. Test, evacuate and charge system in accordance with paragraphs 5-8 through 5-14, pages 5-10 through 5-19.



5-22. COMPRESSOR, ACCUMULATOR AND RELATED PARTS/Replace

This Task covers:

- a. Removal
 - b. Replace
 - c. Installation
-

INITIAL SETUP

NOTE

All maintenance functions for tubing and fittings are covered by Brazing and Debrazing discussed in paragraphs 5-9 and 5-10.

Disconnect Power

Tools

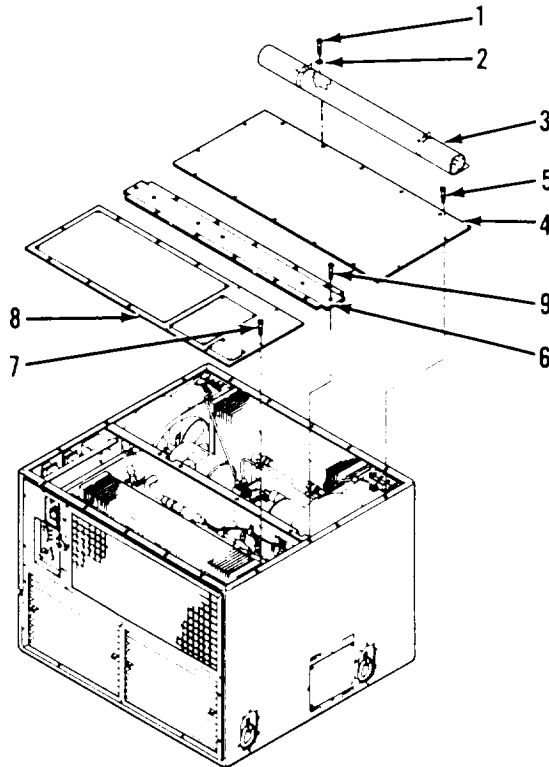
TOOL KIT (SC 5180-90-CL-N18)

LOCATION/ITEM

COMPRESSOR

Removal:

1. Remove three screws (1) and three lock washers (3) and fabric cover (3) from housing.
2. Remove fourteen screws (5) and rear cover (4) from housing.



5-22. COMPRESSOR, ACCUMULATOR AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Removal:

3. Remove fourteen screws (7) and front cover (8) from housing.
4. Remove seven screws (9) and center cover (6) from housing.
5. Remove louver cable actuator in accordance with paragraph 5-18, page 5-24.
6. Remove condenser fans, motors, and support assemblies in accordance with paragraph 4-15, page 4-39.
7. Remove condenser motor support in accordance with paragraph 5-17, page 5-21.

WARNING

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200° F (649° C) creates phosgene gas.

WARNING

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

CAUTION

Maintain a 1-2 cpm (0.1-0.2 M³ Min) flow of dry nitrogen through the refrigeration system to prevent oxidation and scaling when brazing or debrazing components.

NOTE

Leak check fittings. Always perform inspections, adjustments and test before removing refrigerant components.

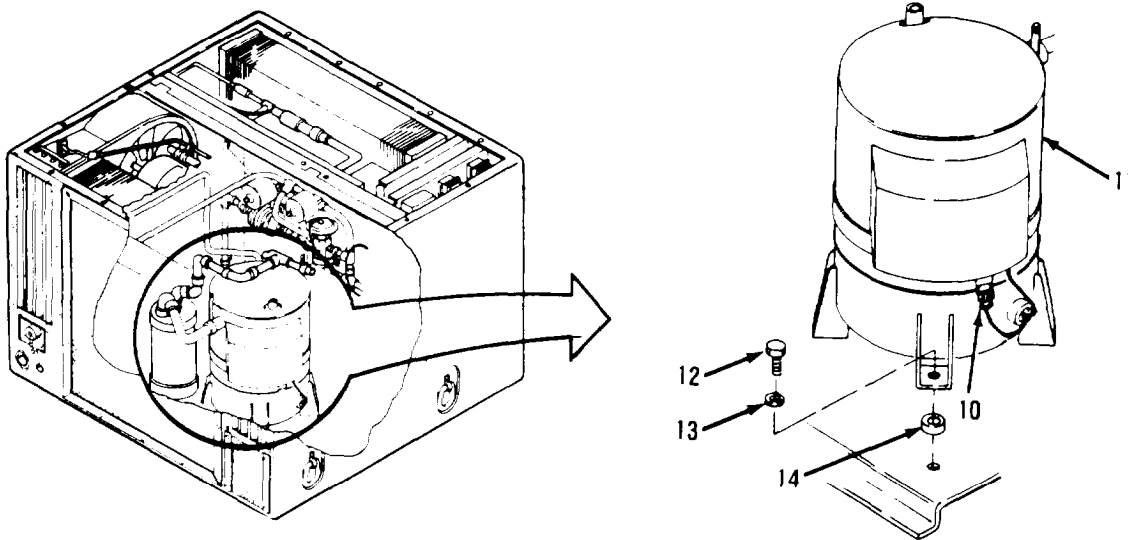
8. Disconnect electrical connector P-7 (10) from compressor (11).
9. Discharge system in accordance with paragraph 5-8, page 5-10.
10. Deb raze compressor in accordance with paragraph 5-9, page 5-11.
11. Remove four bolts (12) and four lock washers (13) and compressor from housing.

5-22. COMPRESSOR, ACCUMULATOR AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Removal:

12. Remove four compressor mounting bushings (14).



Test:

Motor Burnout. Burnout of a compressor motor is indicated by lack of continuity of the motor windings and the condition of compressor oil, which must be determined after the compressor has been removed from the refrigeration system. Causes of compressor motor burnout include the following:

1. Low line voltage, which causes motor winding to overheat. Before burning out completely, the overheated windings cause chemical breakdown of the refrigerant and the oil to form sludge and other system contaminants.
2. Loss of refrigerant. An inadequate charge of refrigerant gas in the system reduces the amount of cooling gas within the compressor, resulting in gradual overheating of the motor and failure of the winding.

5-22. COMPRESSOR, ACCUMULATOR AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Test:

3. High head pressure. High head pressures can be caused by clogged or dirty condenser coils or screens, or by an inoperative condenser fan. High head pressure requires the compressor to work harder, creating additional heat which ultimately can result in motor burnout. Poor ventilation around the condenser, and extremely high ambient temperature can also cause motor failures.

4. Moisture in system. Leakage of air into the refrigeration system starts a chain reaction which can result in motor burnout. Air contains oxygen and moisture which combine with refrigerant gas to form hydrochloric and hydrofluoric acids. These combine with compressor oil to form an acid sludge which is carried throughout the system, and which attacks the motor winding, causing short circuits and burnout.

Diagnosing Motor Burnout. It is important to diagnose the type of compressor failure for two reasons. Simple failure, without motor burnout, does not require the extensive cleaning of the entire refrigeration system that a major failure requires. Also, motor burnout indicates other problems that have contributed to the failure, and these problems must be corrected or avoided to prevent repetition of the burnout. After removal of a bad compressor from the refrigeration system, remove all external tubing and tip the compressor toward the discharge port to drain a small quantity of oil into a clear glass container. If the oil is clean and clear, and does not have an acrid smell, the compressor did not fail because of motor burnout. If the oil is black, contains sludge and has an acrid odor, the compressor failed because of motor burnout, and the refrigeration system must be cleaned to prevent residual contaminants from causing repeated burnouts when the compressor is replaced.

Cleaning Out the Refrigeration System After Burnout.**WARNING**

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200° F (649°C) creates phosgene gas.

WARNING

You must clean the entire refrigeration system after a burnout has occurred, since contaminants will have been carried to many corners and restrictions in the piping and fittings. These contaminants will soon be mixed with new refrigerant gas and compressor oil to cause repeated burnouts. To clean the system thoroughly, act as follows:

NOTE

An unused filter-drier or other suitable medium may be used as the filter.

5-22. COMPRESSOR, ACCUMULATOR AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Test:

1. Remove the filter-drier (dehydrator) in accordance with paragraph 5-20, page 5-46 and blow down each leg of the refrigeration system. To do this, connect a cylinder of dry nitrogen (Table E-1, Item 8) to each filter-drier connection, in turn, and open the cylinder shutoff valve for at least 30 seconds at 50 psig (3.5 kg cm²) pressure.
2. Connect the two filter-drier fittings with a jumper locally manufactured from refrigerant tubing and fittings, and install a pump, reservoir and filter in place of the compressor.
3. Disassemble expansion valve and quench valve and temporarily remove the valve cages. Re-install shell of power assembly, using a gasket between power assembly and body to prevent leakage. Tag and retain valve cages for use at reassembly.
4. Disassemble solenoid valve in accordance with paragraph 5-19, page 5-36.
5. Fill reservoir with fluorocarbon refrigerant, (Table E-1, Item 10) and start the pump. Continue filling the reservoir with refrigerant, until it begins to pour out of the return line. Continue flushing for at least 15 minutes.
6. Reverse the pump connections, replace the filter with a new filtering medium, and back-flush the system for an additional 15 minutes.
7. Remove the pump, reservoir, filter and filter-drier jumper. Place an empty container below the compressor connection, and connect a cylinder of dry nitrogen (Table E-1, Item 8) to each filter-drier connection in turn. Blow down each leg of the system at 50 psig (3.5 kg/cm²), for at least 30 seconds.
8. Disassemble both expansion valves and re-install the valve cages. Install new gaskets, and assemble the valves, making sure that projections in valve cages fit in notches in valve bodies.
9. Disconnect the dry nitrogen cylinder, and immediately install a new filter-drier, making sure that the direction of flow arrow points up. Cap or plug compressor connections if compressor is not to be installed immediately.

Installation:

WARNING

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200°F (649°C) creates phosgene gas.

5-22. COMPRESSOR, ACCUMULATOR AND RELATED PARTS/Replace (Cont)

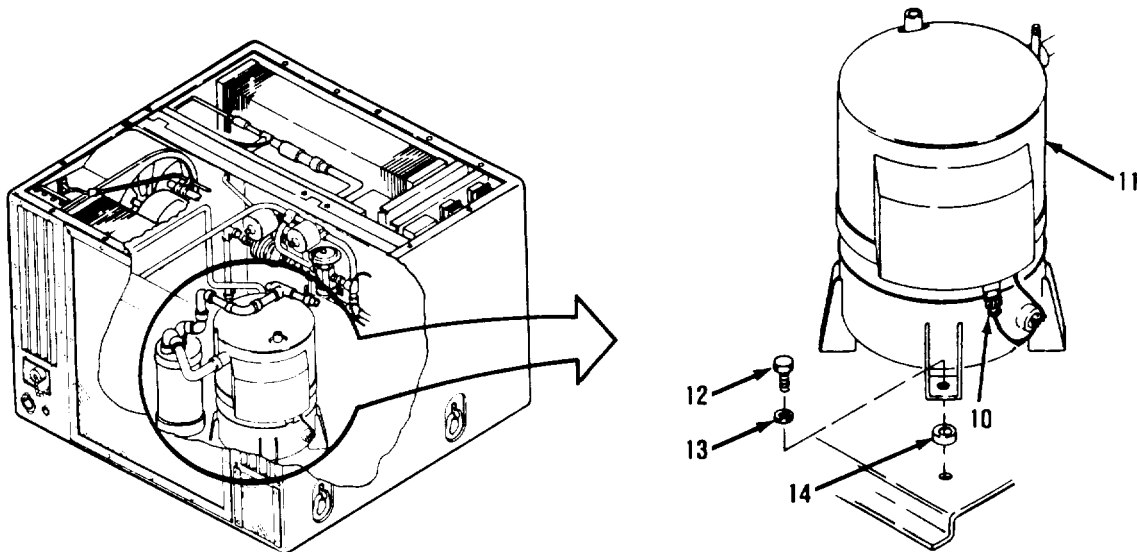
LOCATION/ITEM

Installation:

CAUTION

Maintain a 1-2 cpm (0.1-0.2 M³ Min) flow of dry nitrogen through the refrigeration system to prevent oxidation and scaling when brazing or debrazing components.

1. Align compressor (11) and compressor mounting bushing (14) with housing and secure compressor and compressor mounting bushing to housing with four bolts (12) and four lock washers (13).
2. Braze in accordance with paragraph 5-10, page 5-12.
3. Test, evacuate and charge system in accordance with paragraphs 5-8 through 5-14, pages 5-10 through 5-19.
4. Connect electrical connector P-7 (10) to compressor.



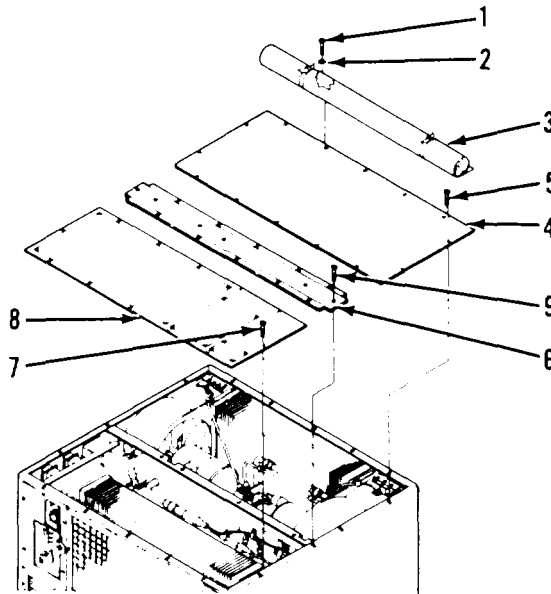
5. Install condenser fans, and support assemblies in accordance with paragraph 4-15, page 4-46.

5-22. COMPRESSOR, ACCUMULATOR AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Installation:

6. Install condenser motor support ("X") in accordance with paragraph 5-17, page 5-22.
7. Install condenser louver cable actuator in accordance with paragraph 5-18, page 5-29.
8. Align center cover(6) with holes inhousing and secure center cover to housing with seven screws (9).
9. Align front cover (8) with holes in center cover and housing and secure with fourteen screws (7).
10. Align rear cover (4) with holes in center cover and housing and secure rear cover in center cover and housing with fourteen screws (5).
11. Align fabric cover (3) with holes in housing and secure fabric cover to housing with three screws (1) and three lock washers (2).



5-22. COMPRESSOR, ACCUMULATOR AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

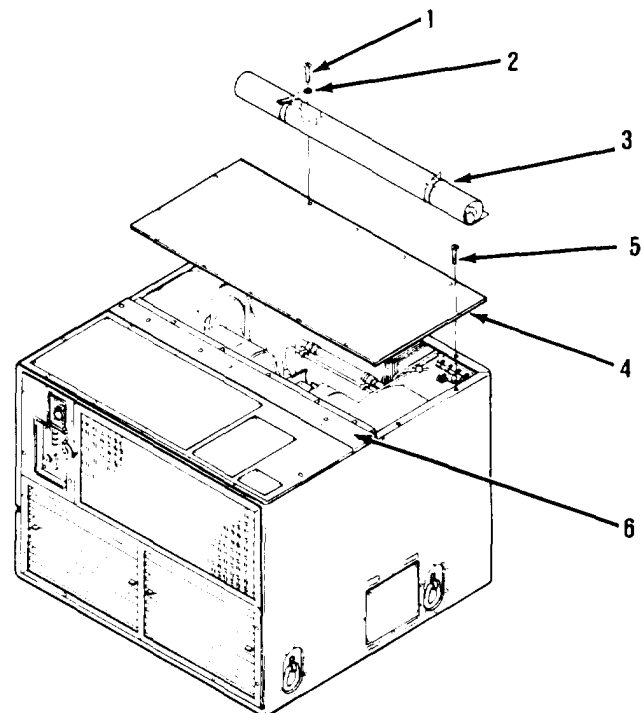
ACCUMULATORRemoval:

1. Remove three screws (1) three lock washers (2) and fabric cover (3) to rear cover (4) from housing.

2. Remove fourteen screws (5) and rear cover to center cover (6) from housing.

3. Remove condenser louver cable actuator in accordance with paragraph 5-18, page 5-24.

4. Remove condenser fans, motors and support assemblies in accordance with paragraph 4-15, page 4-39.

**WARNING**

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200° F (649°C) creates phosgene gas.

WARNING

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

CAUTION

Maintain a 1-2 cpm (0.1-0.2 M³ Min) flow of dry nitrogen through the refrigeration system to prevent oxidation and scaling when brazing or debrazing components.

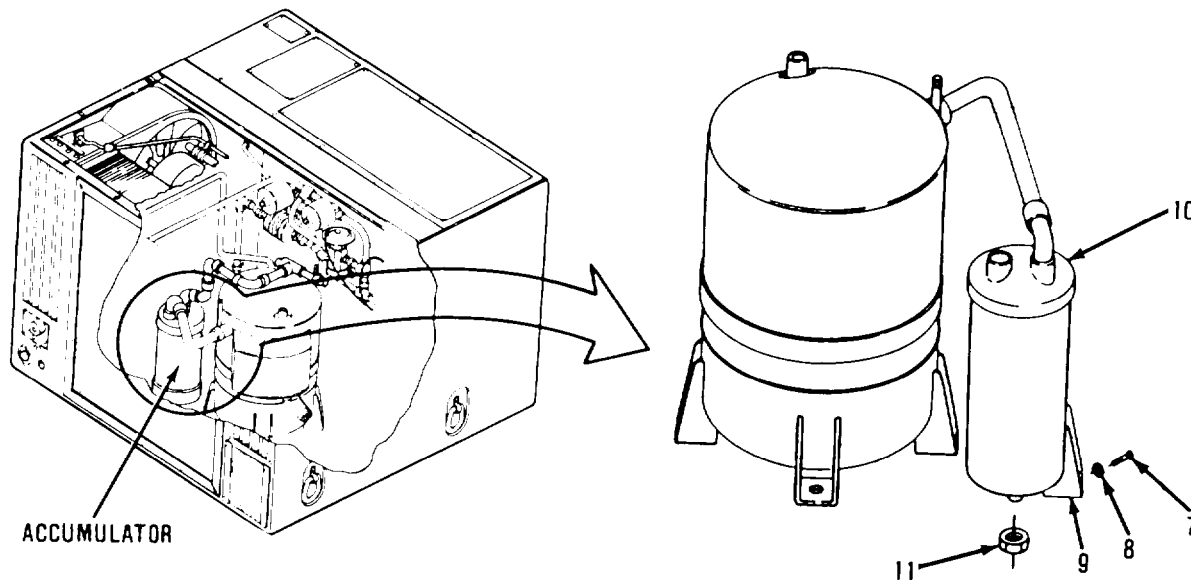
5-22. COMPRESSOR, ACCUMULATOR AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Removal:

NOTE

Leak check fittings. Always perform inspections, adjustments and test before removing refrigerant components.



5. Discharge system in accordance with paragraph 5-8, page 5-10.
6. Debraze in accordance with paragraph 5-9, page 5-11.
7. Remove two screws (7) and two lock washers (8) securing accumulator mounting bracket (9) to housing.
8. Remove accumulator (10) and accumulator mounting bracket (9).

5-22. COMPRESSOR, ACCUMULATOR AND RELATED PARTS/Replace (Cont)

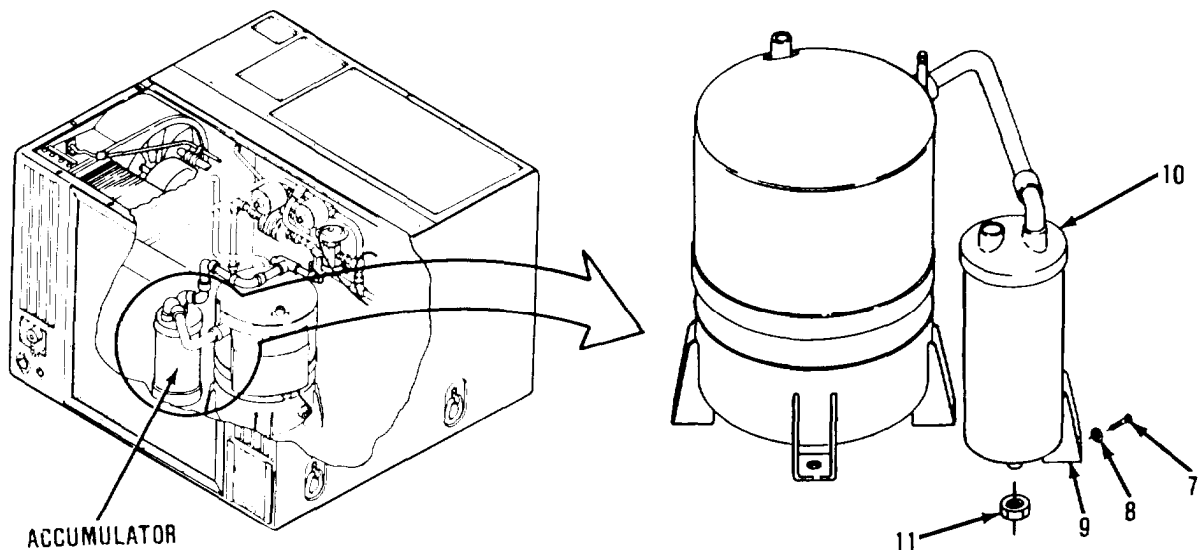
LOCATION/ITEM

Removal:

9. Remove one lock nut (11) and accumulator (10) from mounting bracket.

Installation:

1. Align accumulator (10) with hole in accumulator mounting bracket (9) and secure with one lock nut (11).
2. Align accumulator and accumulator mounting bracket with hole in housing and secure with two screws (7) and two lock washers (8).
3. Braze in accordance with paragraph 5-10, page 5-12.
4. Test, evacuate and charge in accordance with paragraphs 5-8 through 5-14, pages 5-10 through 5-19.

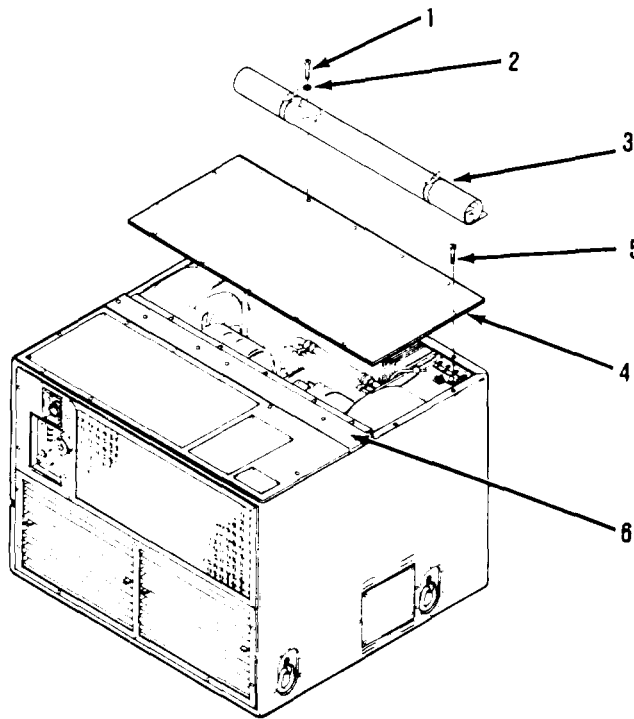


5-22. COMPRESSOR, ACCUMULATOR AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Installation:

5. Install condenser motor support ("X") in accordance with paragraph 5-17, page 5-22.
6. Install condenser fans, and support assemblies in accordance with paragraph 4-15, page 4-40.
7. Install condenser louver cable actuator in accordance with paragraph 5-18, page 5-29.
8. Align rear cover (4) with holes in center cover (6) and housing and secure with fourteen screws (5).
10. Align fabric cover (3) with holes in housing and secure with three screws (1) and three lock washers (2).



5-23. EVAPORATOR, CONDENSER COILS AND RELATED PARTS/Replace

This Task covers:

- a. Removal
 - b. Replace
 - c. Installation
-

INITIAL SETUP

NOTE

All maintenance functions for tubing and fittings are covered by Brazing and Debrazing discussed in paragraphs 5-9 and 5-10.

Disconnect Power

Tools

TOOL KIT (SC 5180-90-CL-N18)

LOCATION/ITEM

COILS

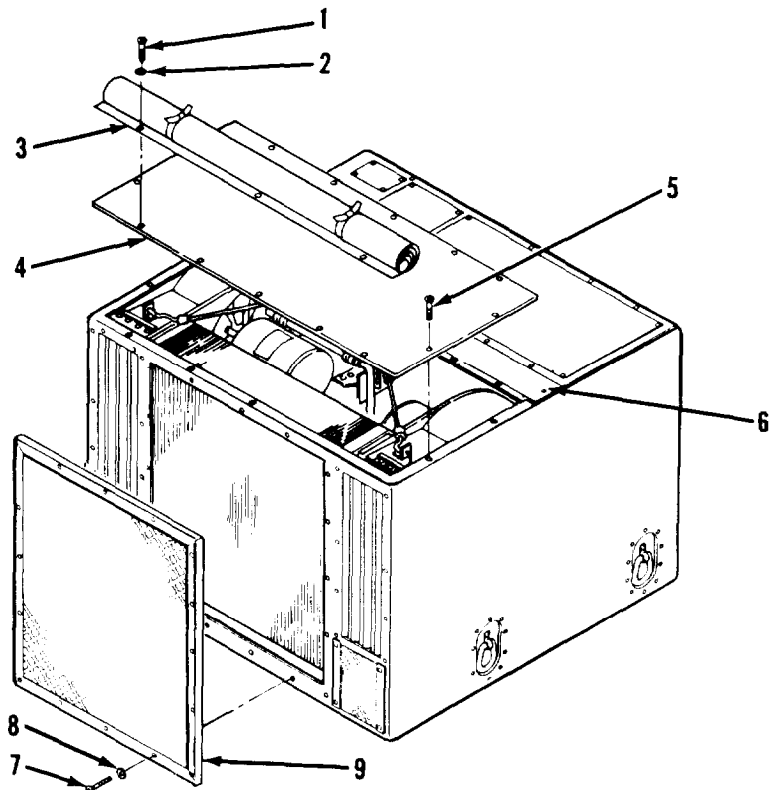
Removal:

Condenser

1. Remove three screws (1) three lock washers (2) and fabric cover (3) to rear cover (4) from housing.

2. Remove fourteen screws (5) and rear cover (4) from housing.

3. Remove seventeen screws (7) seventeen lock washers (8) and one snap fastener (9) and condenser coil guard (10) from housing.



5-23. EVAPORATOR, CONDENSER COILS AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Removal:

4. Remove condenser louver cable actuator in accordance with paragraph 5-18, page 5-24.
5. Remove condenser fans, and support assemblies in accordance with paragraph 4-15, page 4-39.
6. Remove condenser fan support in accordance with paragraph 5-17, page 5-21.

WARNING

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200° F (649°C) creates phosgene gas.

WARNING

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

CAUTION

Maintain a 1-2 cpm (0.1-0.2 M³ Min) flow of dry nitrogen through the refrigeration system to prevent oxidation and scaling when brazing or debrazing components.

NOTE

Leak check fittings. Always perform inspections, adjustments and test before removing refrigerant components.

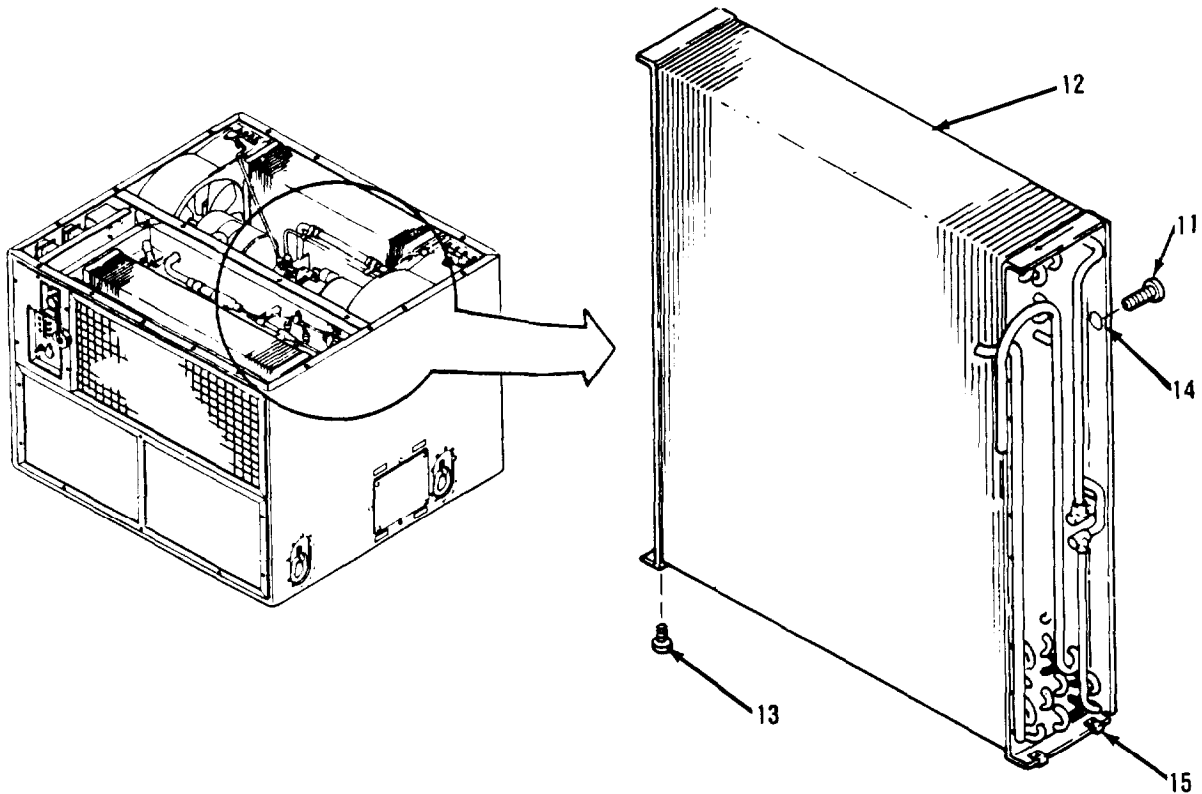
7. Discharge system in accordance with paragraph 5-8, page 5-10.
8. Debraze in accordance with paragraph 5-9, page 5-11.
9. Remove twelve screws (11) securing condenser coil (12) to housing.

5-23. EVAPORATOR, CONDENSER COILS AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Removal:

10. Remove four screws (13) and condenser (12) coil from bottom of housing.

**Replace:**

1. Drill out damaged blind rivnut (14).
2. Install blind rivnut (14).
3. Remove sheet spring nut (15).
4. Install sheet spring nut (15).

5-23. EVAPORATOR, CONDENSER COILS AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Installation:

Condenser Coil

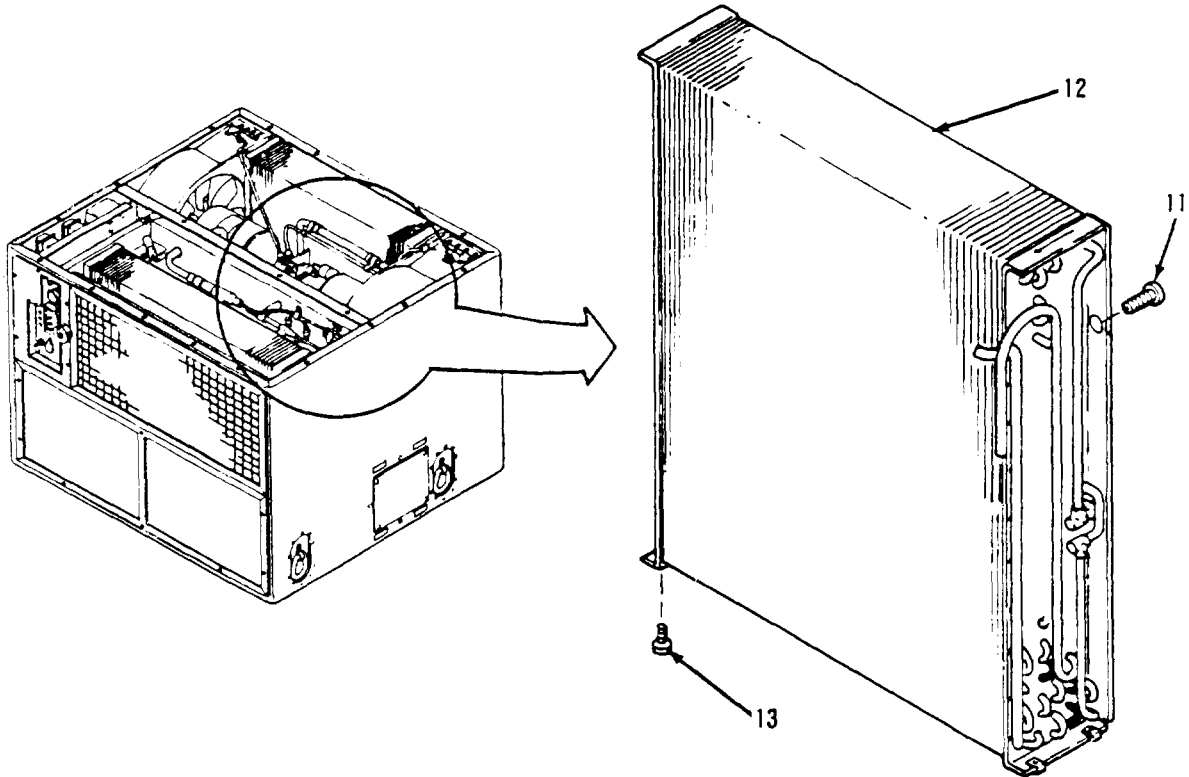
WARNING

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200°F (649°C) creates phosgene gas.

CAUTION

Maintain a 1-2 cpm (0.1-0.2 M³ Min) flow of dry nitrogen through the refrigeration system to prevent oxidation and scaling when brazing or debrazing components.

1. Align condenser coil (12) with housing and secure twelve screws (11) and four screws (13).
2. Braze in accordance with paragraph 5-10, page 5-12.

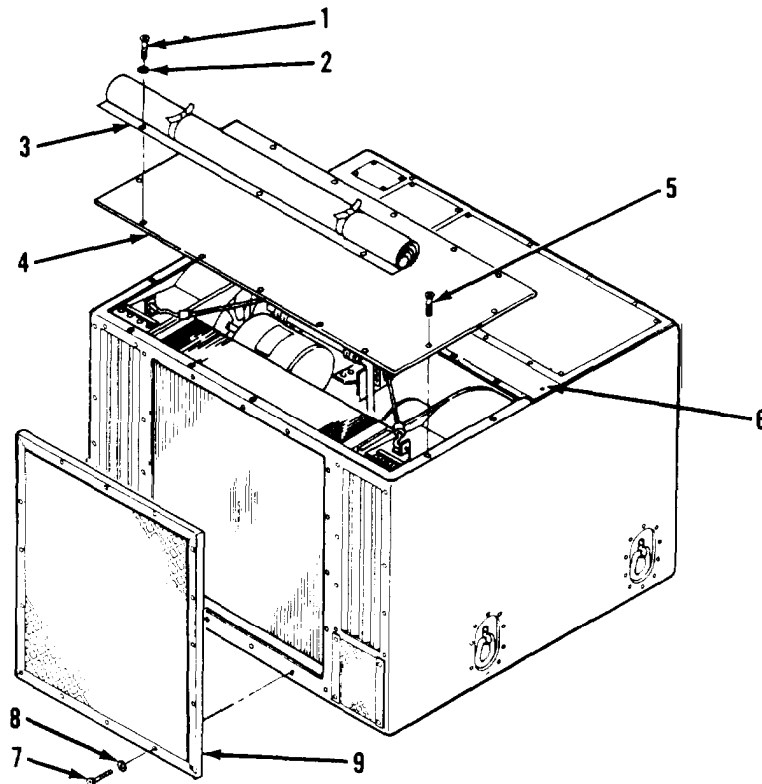


5-23. EVAPORATOR, CONDENSER COILS AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Installation:

3. Test, evacuate and charge system in accordance with paragraphs 5-8 through 5-14, pages 5-10 through 5-19.
4. Install condenser fan support in accordance with paragraph 5-17, page 5-22.
5. Install condenser fans, motors and support assemblies in accordance with paragraph 4-15, page 4-46.
6. Replace condenser louver cable actuator in accordance with paragraph 5-18, page 5-29.
7. Align condenser coil guard (10) with holes in housing and secure with seventeen screws (7) seventeen lock washers (8) and one snap fastener (9).
8. Align rear cover (4) withholds in center cover and housing and secure with fourteen screws(5).
9. Align fabric cover (3) with holes in housing and secure with three screws (1) and three lock washers (2).



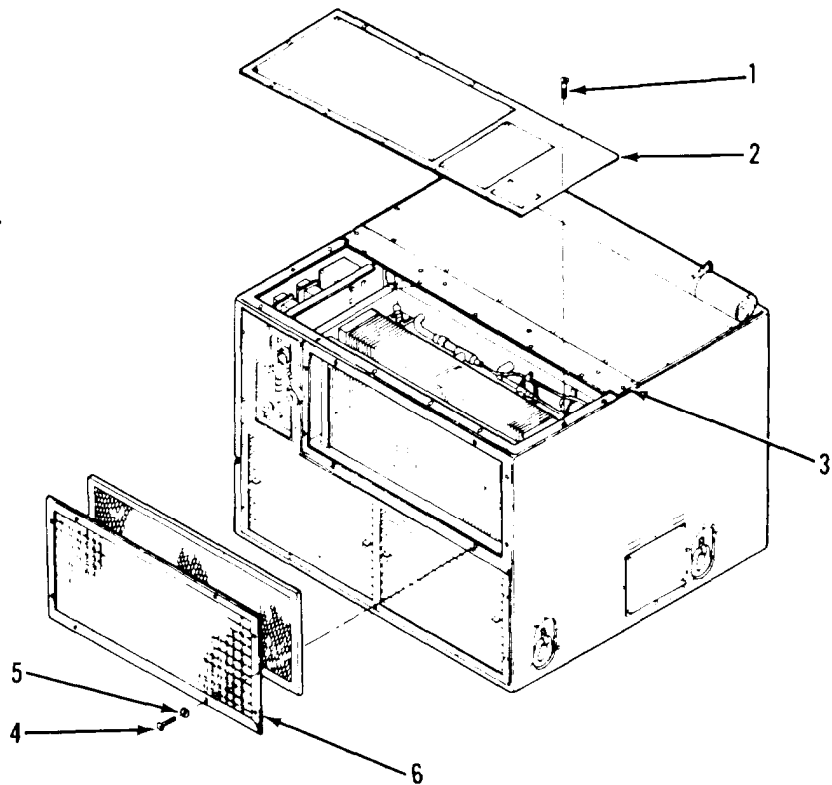
5-23. EVAPORATOR, CONDENSER COILS AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

EVAPORATOR

Removal:

1. Remove fourteen screws (1) and front cover (2) to center cover (3) from housing.
2. Remove ten screws (4) and ten lock washers (5) and front louver (evaporator discharge) (6) from housing.
3. Lift mist eliminator out of mist eliminator mounting brackets.
4. Remove thermostat expansion valve in accordance with paragraph 5-19, page 5-32.



5-23. EVAPORATOR, CONDENSER COILS AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Removal:**WARNING**

Purge system with dry nitrogen prior to soldering. Refrigerant heated to 1200°F (649°C) creates phosgene gas.

WARNING

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

WARNING

Refrigerant R-22 is contained in the refrigerant system under high pressure. Extreme care must be exercised to prevent refrigerant from coming in contact with exposed skin 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.

WARNING

Polyurethane foam insulation breaks down to form toxic gases when heated to brazing temperatures.

CAUTION

Maintain a 1-2 cpm (0.1-0.2M³ Min) flow of dry nitrogen through the refrigeration system to prevent oxidation and scaling when brazing or debrazing components.

NOTE

Leak check fittings. Always perform inspections, adjustments and test before removing refrigerant components.

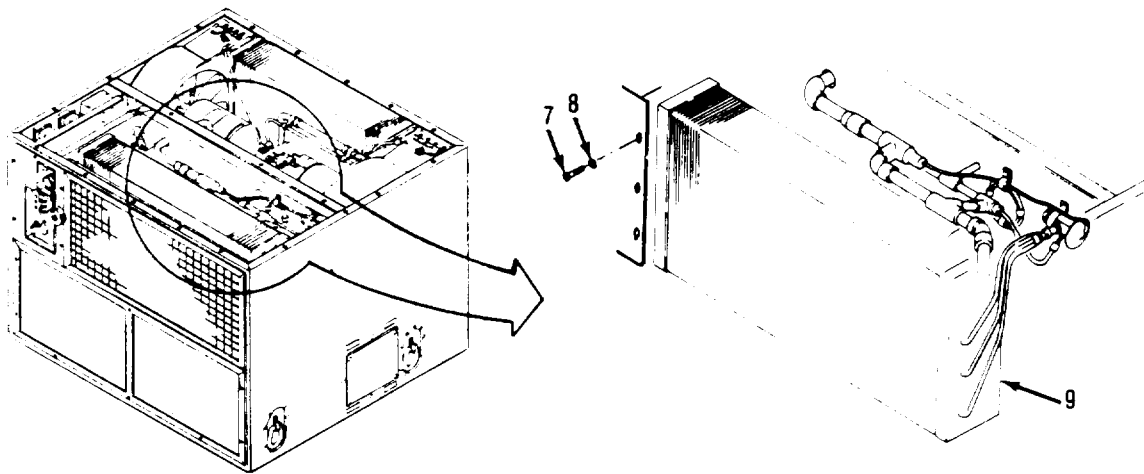
5. Discharge system in accordance with paragraph 5-8, page 5-10.
6. Remove six screws (7) and six lock washers (8) securing evaporator coil (9) to mounting brackets.

5-23. EVAPORATOR, CONDENSER COILS AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Removal:

7. Debraze in accordance with paragraph 5-9, page 5-11.
8. Remove evaporator coil.



5-23. EVAPORATOR, CONDENSER COILS AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Replace:

1. Drill out damaged blind rivnut.
2. Install blind rivnut.

EVAPORATOR COIL

Installation:

WARNING

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

WARNING

Refrigerant R-22 is contained in the refrigerant system under high pressure. Extreme care must be exercised to prevent refrigerant from coming in contact with exposed skin 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.

CAUTION

Maintain a 1-2 cpm (0.1-0.2 M³ Min) flow of dry nitrogen through the refrigeration system to prevent oxidation and scaling when brazing or debrazing components.

1. Align evaporator coil (9) with housing and secure evaporator coil to housing with six screws (7) and eight lock washers (8).
2. Braze in accordance with paragraph 5-10, page 5-12.
3. Test, evacuate and charge system in accordance with paragraphs 5-8 through 5-14, page 5-10 through 5-19.
4. Install expansion valve in accordance with paragraph 5-19, page 5-40.

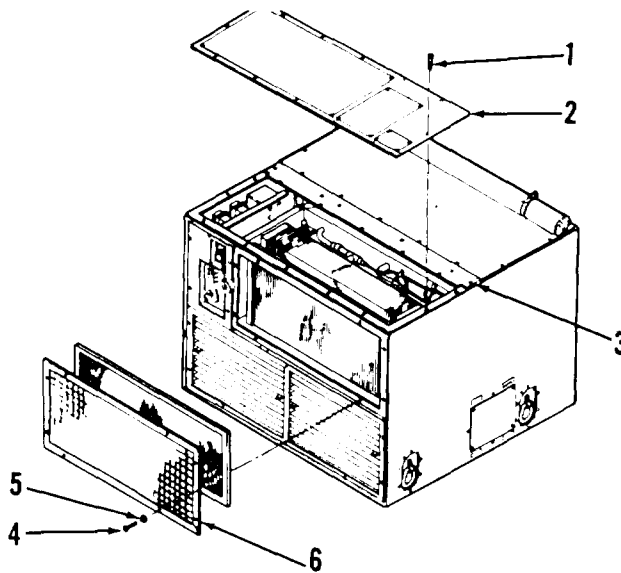
5-23. EVAPORATOR, CONDENSER COILS AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Installation:

5. Align front louver (evaporator discharge) (6) with holes in housing and secure with ten screws (4) and ten lock washers (5).

6. Align front cover (2) with holes in center cover and housing and secure front cover to center cover and housing with fourteen screws (1).



5-23. EVAPORATOR, CONDENSER COILS AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Installation:

Insulation

1. Cut a sheet of the proper insulating material to correct shape.
2. Coat the attaching side with adhesive (Table D-1, Item 2) using a paint brush to ensure complete coverage.
3. Coat the metal with adhesive (Table D-1, Item 2) to which the insulation is to be attached.
4. Let both surfaces air-dry until the adhesive becomes tacky but will not stick to the fingers.
5. Starting at one corner or at a narrow edge, carefully bring the insulation into full contact with the metal.
6. Press into firm contact all over.

Evaporator Fan Motor and Housing Assembly

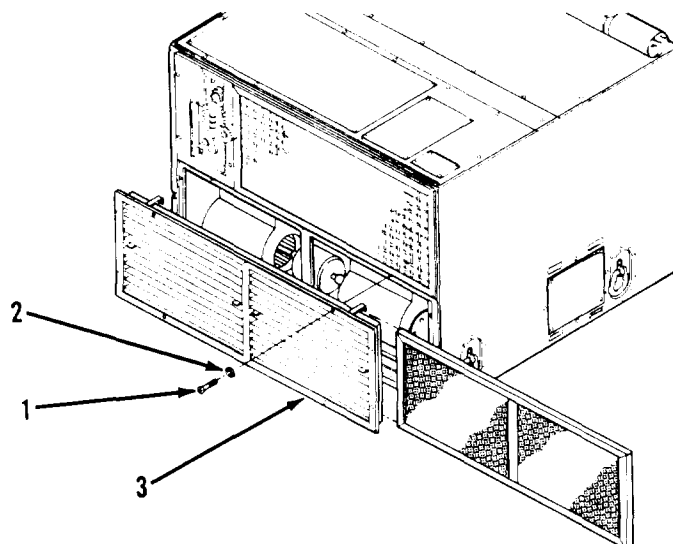
Install evaporator fan motor and housing assembly in accordance paragraph 4-17, page 4-68.

Condensate Drain Assembly

Install condensate drain assembly in accordance with paragraph 4-16, page 4-58.

Front Louver (Evaporator Inlet)

1. Align front louver (evaporator inlet) (3) with holes in housing.
2. Secure front louver (evaporator inlet) to housing with ten screws (1) and ten lock washers (2).



5-23. EVAPORATOR, CONDENSER COILS AND RELATED PARTS/Replace (Cont)

LOCATION/ITEM

Removal:

Evaporator Compartment Insulation (Upper Section)

WARNING

Acetone and methyl-ethyl ketone (MEK) are flammable and their vapors are explosive. Prolonged or repeated inhalation of fumes on contact with the skin can be toxic. Use in a well ventilated area, wear gloves and keep away from sparks or flame.

1. Scrape and pull off as much of the damaged insulation as possible.
2. Soften the remaining insulation and adhesive with acetone (Table D-1, Item 1) or methyl-ethyl ketone (MEK) (Table D-1, Item 7).
3. Repeat the softening and scraping process as required.
4. Clean up metal surface with a cloth moistened in acetone (Table D-1, Item 1) or methyl-ethyl ketone (MEK) (Table D-1, Item 7).

Inspection:

Evaporator Compartment Insulation (Upper Section)

1. Inspect insulation for areas of looseness or separation from the metal panel, and for missing areas.
2. Replace damaged or missing insulation.

Service:

Evaporator Compartment Insulation (Upper Section)

1. Brush off loose dirt or foreign matter.
2. Wipe insulation with a cloth moistened with warm soapy water.
3. Rinse with water.
4. Dry thoroughly.

APPENDIX A

REFERENCES

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- | | |
|--|--|
| <p>A-1. FIRE PROTECTION</p> <p>TB 5-4200-200-10</p> | <p>Hand Portable Fire Extinguishers approved for Army Users.</p> |
| <p>A-2. PAINTING</p> <p>TM 43-0139</p> | <p>Painting Instructions for Field Use.</p> |
| <p>A-3. MAINTENANCE</p> <p>DA PAM 738-750</p> <p>TM 5-764</p> <p>TM 5-4120-376-24P</p> | <p>The Army Maintenance Management System (TAMMS)</p> <p>Electric Motor and Generator Repair</p> <p>Organizational, Direct Support and General Support Maintenance Repair Parts and Special Tools List for Air Conditioner, Horizontal, Compact.</p> |
| <p>A-4. SHIPMENT AND STORAGE</p> <p>TM 740-90-1</p> | <p>Administrative Storage of Equipment.</p> |
| <p>A-5. DESTRUCTION OF ARMY EQUIPMENT</p> <p>TM 750-244-3</p> | <p>Procedures for Destruction of Equipment to Prevent Enemy Use.</p> |

APPENDIX B**MAINTENANCE ALLOCATION CHART (MAC)**

SECTION I. INTRODUCTION**B-1. GENERAL.**

a. This Section provides a general explanation of all maintenance and repair functions authorized at various maintenance categories.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall responsibility for the performance of maintenance function on the identified end item or component will be consistent with the capabilities of the designated maintenance categories.

c. Section III lists the tools and equipment required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS. Maintenance functions will be limited to and defined as follows:

a. **Inspect.** To determine serviceability of an item by comparing its physical mechanical, or electrical characteristics with established standards through examination.

b. **Test.** To verify serviceability by measuring the mechanical 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 (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. **Adjust.** To maintain within prescribed limits, by grinding 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 equipments used in precision measurement. Consists of comparison 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.

h. **Replace.** To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the 3d position code of the SMR code.

i. Repair. The application of maintenance services.

(1) Including fault location/troubleshooting.

(2) Removal/installation, and disassembly/assembly.

(3) procedures and maintenance actions.

(4) To identify troubles and restore serviceability to an item correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component 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 publications (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 material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc) considered in classifying Army equipment/components.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

a. Services. Inspect, test, service, adjust, align, calibrate, and/or replace.

b. Fault Locate/Troubleshoot. 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).

c. Disassemble/assemble-encompasses the step-by-step taking apart (or breakdown) of a spare/functional group coded item to the level of its least componency identified as maintenance significant (i.e., assigned an SMR code) for the category of maintenance under consideration.

d. Actions. Welding, grinding, riveting, straightening, facing, remachinery, and/or resurfacing.

(1) 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. End item group number shall be "00".

(2) Column (2), Component/Assembly. Column contains the names of components, assemblies, sub-assemblies, and modules for which maintenance is authorized.

(3) Column (3), Maintenance Functions. 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).

(4) Column (4), Maintenance Level. This column is made up of sub-columns for each category of maintenance. Work time figures are listed in these subcolumns for the lowest level of maintenance authorized to perform the function listed in Column 3. These figures indicate

the average active time required to perform the maintenance functional the indicated category of maintenance under typical field operating conditons.

- C Operator or crew
- O Organizational Maintenance
- F Direct Support Maintenance
- H General Support Maintenance
- D Depot Maintenance

e. Column(5), Tools and Equipment. Column 5 specifies, by code those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

f. Column (6), Remarks. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

B-4. EXPLANATION OF COLUMNS IN SECTION III.

a. Column (1), Reference Code. The tool and test equipment reference code correlates with a maintenance function on the identified end item or component.

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/NATO Stock Number. The National or NATO stock number of the tool or test equipment.

e. Column (5), Tool Number. The manufacturer's part 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 MAC, Section II.

SECTION II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level			H
			C	O	F	
01	TOP COVERS, AND FRONT LOUVERS					
	Fabric Covers	Inspect	.10			
		Service	.10			
		Repair			.10	
		Replace			.20	
	Metal Covers	Inspect	.10			
		Service	.10			
		Replace			.20	
	Information Plates	Inspect			.10	
		Service			.10	
		Replace			.25	
	Front Louvers (Grilles)	Inspect	.10			
Service		.10				
Adjust		.10				
Replace				.20		
Filter, Air Conditioning	Inspect	.10				
	Service			.40		
	Replace			.20		
02	CONDENSER GUARD, COVERS, VENTILATION AIR FILTER AND LIFTING RINGS					
	Condenser Guard	Inspect	.10			
		Service	.10			
		Replace			.20	
	Ventilation Guard	Inspect	.10			
		Service	.10			
		Replace			.15	
	Ventilation Air Filter	Inspect	.10			
		Service			.35	
		Replace			.30	
	Lifting Ring & Clip (Front & Left Rear)	Inspect			.10	
		Replace			1.0	

SECTION II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level			
			C	O	F	H
03	CONDENSER FANS AND SUPPORT ASSEMBLIES					
	Axial Impeller Fans	Inspect Service Replace		.10 .15 2.0		
	Motor Supports	Replace			3.0	
04	CONDENSER FAN MOTOR	Inspect Test Repair Replace		.10 1.0 4.0 2.0		
	Condensate Drain Assembly	Inspect Service Replace		.20 .15 1.0		
	EVAPORATOR FAN MOTOR AND HOUSING ASSEMBLY					
05	Housing& Mounting Base Assemblies	Inspect Replace		.10 2.0		
	Evaporator Motor	Inspect Test Repair Replace		.10 1.0 4.0 1.5		
	Impeller	Inspect Service Replace		.10 .15 2.0		
06	VENTILATION DAMPER AND ACTUATOR	Inspect Service Replace		.10 .20 1.0		

SECTION II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level			
			C	O	F	H
07	CONDENSER LOUVER ACTUATOR & CONTROL ASSEMBLY					
	Louver Control Cables	Service Adjust Replace			.25 .35 .50	
	Cable Actuator	Replace			8.0	
08	REFRIGERANT VALVES AND RELATED TUBING					
	Expansion Valves	Inspect Test Replace			.15 .50 4.0	
	Quench Valve	Test Replace			.50 4.0	
	Solenoid Valve	Test Repair Replace			.25 1.0 4.0	
	Pressure Regulating Valve	Test Replace			.50 4.0	
	Tubing & Fittings	Inspect Replace			.10 4.0	
09	DEHYDRATOR AND RELATED TUBING					
	Dehydrator	Replace			4.0	
	Tumbing & Fittings	Replace			4.0	

SECTION II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level			
			C	O	F	H
10	PRESSURE SWITCHES, LIQUID RECEIVER, SIGHT INDICATOR, CHARGING VALVES AND RELATED TUBING					
	Charging Valves	Replace			4.0	
	Pressure Switches	Inspect Test Replace		.10 .25		4.0
	Sight Indicator	Replace			12.0	
	Pressure Relief Valve	Replace			4.0	
	Receiver	Replace			12.0	
	Tumbing & Fittings	Replace			4.0	
11	COMPRESSOR, ACCUMULATOR AND RELATED PARTS					
	Compressor	Inspect Test Replace		.10	.15 12.0	
	Accumulator	Inspect Replace		.10	12.0	
12	EVAPORATOR & CON- DENSER COILS AND RELATED COMPARTMENT PARTS					
	Mist Eliminator	Inspect Service Replace		.10 .50 .10		
	Coils	Inspect Service Replace		.10 .15	8.0	
	Tubing & Fittings	Replace			4.0	

SECTION II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level				
			C	O	F	H	
13	JUNCTION BOX AND CONTROL MODULE ASSY						
	Control Module	Inspect Test Replace		.10 .50 1.0			
	Junction Box	Inspect Test Replace		.10 .30 1.0			
	14	AMBIENT THERMOSTAT, AUXILIARY POWER INLET AND CONDENSATE DRAIN ASSEMBLY					
		Ambient Thermostat Switch Assembly	Inspect Test Replace		.10 .50 8.0		
		Inlet Power Connector Assy	Inspect Repair Replace		.10 8.0 8.0		
Auxiliary Power Connector Assy		Inspect Repair Replace		.10 8.0 8.0			
15	HEATER, TRANS- FORMER, RECTIFIER AND RELATED PARTS						
	Heater Element	Inspect Test Replace		.10 .25 1.0			
	Thermostatic Switch	Inspect Test Replace		.10 .25 .50			

SECTION II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Level					
			C	O	F	H		
15 (cont)	HEATER, TRANS- FORMER, RECTIFIER AND RELATED PARTS							
	Rectifier	Inspect Test Replace		.10 .25 .50				
	Transformer	Inspect Test Replace		.10 .50 1.0				
	Capacitors	Inspect Test Replace		.10 .25 .25				
	16	LOUVER & CONDENSER FAN HOUSING ASSY						
		Louver Assy	Inspect Service Adjust Repair Replace		.15 .25 .50 .50 1.0			
		Fan Housing	Inspect Replace		.10 2.0			
		17	HOUSING ASSEMBLY					
			Unit Housing	Repair Replace		1.0 24.0		
Condenser Fan Housing	Repair			2.0				

SECTION III. MAINTENANCE ALLOCATION CHART

(1) Reference	(2) Maintenance Level	(3) Nomenclature	(4) National/NATO Stock Number	(5) Tool Number
		No special tools and test equipment required. Standard tools and test equipment in the following kits are adequate to accomplish the maintenance functions- listed in Section II:		
		Tool kit service, refrigeration Unit (SC 5 180-90-CL-N18)	5180-00-596-1474	
		Soldering Gun Kit	3439-00-930-1638	
	F H	Recovering and Recycling Unit, Refrigerant	4130-01-338-2707	17500B (07295)

SECTION IV. REMARKS

MAINTENANCE ALLOCATION CHART

Reference Code

Remarks

No Supplemental instructions or explanatory remarks are required for the maintenance functions listed in Section II. All functions are sufficiently defined in Section I. Active time listed for maintenance task functions are with the air conditioner in off-equipment position.

APPENDIX C**COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS****Section I. INTRODUCTION**

C-1. SCOPE. This appendix lists components of end item and basic issue items for the air conditioner to help you inventory items required for safe and efficient operation.

C-2. GENERAL. The Components of End Item and Basic Issue Items Lists are divided into the following sections:

a. Section II. Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but 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 assist you in identifying the items.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the air conditioner in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the air conditioner during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of the end item.

C-3. EXPLANATION OF COLUMNS. The following provides an explanation of columns found in the tabular listings.

a. Column (1) - Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.

b. Column (2) - National Stock Number. Indicates the National Stock Number assigned to the item and will be used for requisitioning purposes.

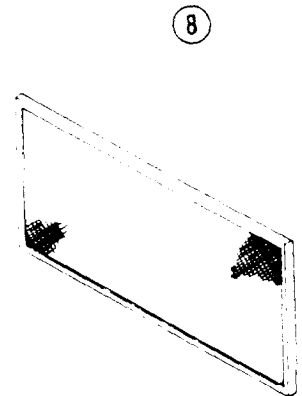
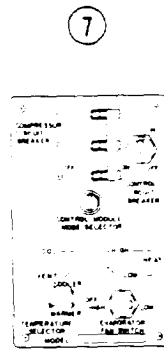
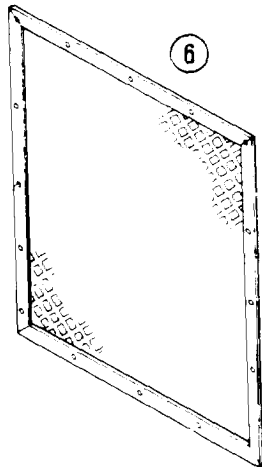
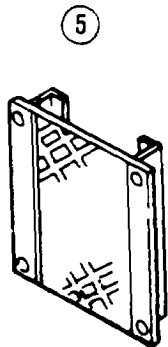
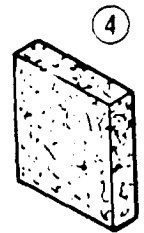
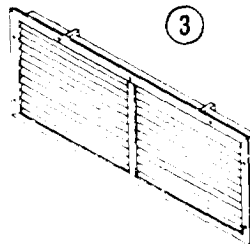
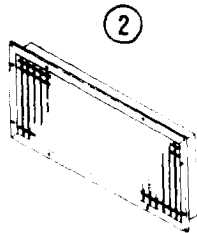
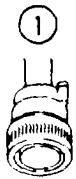
c. Column (3) - Description. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

d. Column (4) - Unit of Measure (U/M). Indicates the measure used in performing the actual operation/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (es, in, pr).

e. Column (5) - Quantity required (QTY/REQ). Indicates the quantity of the item authorized to be used with/on the equipment.

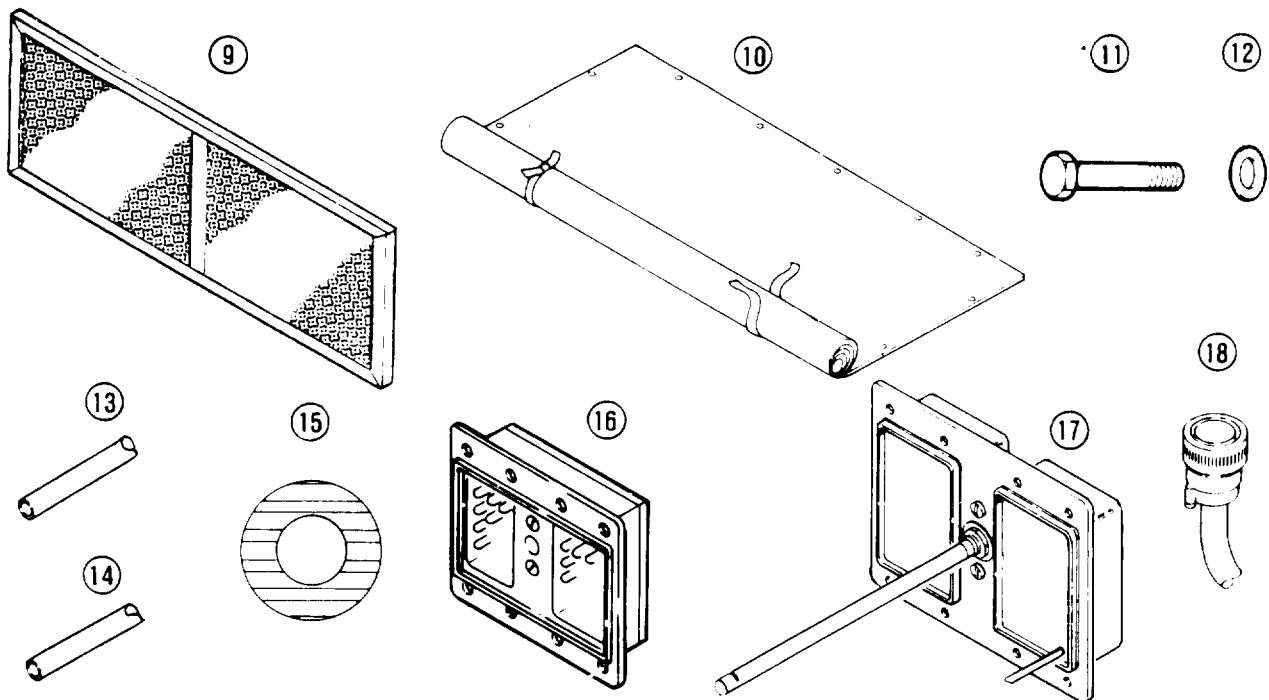
COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

Illus. Number	National Stock Number	Description FSCM & Part No.	U/M	QTY Req.
1.		Connector, Plug, Electrical (96906) MS3100R-18-11P	EA	1
2.		Discharge, Louver, Metal (97403) 13216E6318	EA	1
3.		Inlet, Louver with Filter Clips (97403) 13216E6080	EA	1
4.		Guard, Ventilation (97403) 13216E6316	EA	1
5.		Filter, Ventilation (97403) 13216E6088-3	EA	1
6.		Guard, Condenser (97403) 13216E6315	EA	1
7.		Control, Module Assembly (97403) 13219E9877	EA	1
8.		Mist, Eliminator (97403) 13219E1032	EA	1



COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS (Cont)

Illus. Number	National Stock Number	Description FSCM & Part No.	U/M	QTY Req.
9.		Filter, Air Conditioner (97403) 13216E6292-1	EA	1
10.		Cover, Fabric (97403) 13216E6361	EA	1
11.		Screw, Cap Hex Head (96906) MS90726-65	EA	6
12.		Washer (97403) 13216E6138-2	EA	6
13.		Spacer (97403) 13216E6152	EA	6
14.		Tube, Elastomeric (97403) 13216E6153	EA	6
15.		Mount, Resilient (97403) 13216E6137	EA	12
16.		Connector, Receptacle (97403) 13216E6177	EA	1
17.		Connector, Plug, Electrical (97403) 13216E6209-1	EA	1
18.		Connector, Plug, Electrical (96906) MS3106R24-22S	EA	1



APPENDIX D
EXPENDABLE SUPPLIES AND MATERIALS LIST

Section 1. INTRODUCTION

D-1. SCOPE. This appendix lists expendable supplies and materials you will need to operate and maintain the air conditioner. These items are authorized to you by CTA 50-970, expendable items (except Medical, Class V, Repair Parts and Heraldic Items).

D-2. EXPLANATION OF COLUMNS.

a. Column (1), Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, Table D-1, Item 5").

b. Column (2), Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew

O - Organizational 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 request or requisition the item.

d. Column (4), Description. Indicates the Federal item name and, if required a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturers (FSCM) in parentheses followed by the part number.

e. Column (5), Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pt). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

Table D-1. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	O		ACETONE	PT
2	O	8040-00-664-4318	ADHESIVE TYPE MM-A-1617 TYPE II	PT
3	O		DRY CLEANING SOLUTION (PD-680)	PT
4	F		FIBERGLASS CLOTH	ROLL
5	O	4130-00-860-0042	FILTER-KOTE	PT
6	O		INSULATING TAPE	ROLL
7	O		METHYL-ETHYL-KETONE (MEK)	PT
8	F		NITROGEN (DRY)	CYL
9	F		OIL (MIL SPEC 0-2104)	PT
10	F		REFRIGERANT (R11)	CYL
11	F		REFRIGERANT (R22)	CYL
12	F		SOLDER ALLOYS (60 22 SWG)	ROLL
13	F		SOLDER SILVER (.062 DIA)	ROLL
14	F		SOLDERING PASTE (1.707)	CAN
15	F		SILVER SOLDER FLUX (6.507)	CAN
16	F		PLUMBERS ABRASIVE CLOTH	ROLL
17	O		GREASE (GAA)	TUBE
18	O		RTV 108	TUBE
19	F		THREAD SEAL TAPE (MIL-T-27730A)	ROLL
20	F		THERMAL MASTIC B13216E6210	GL

APPENDIX E

WIRE LIST AND DIAGRAMS

E-1. REFRIGERANT SYSTEM DIAGRAM. The refrigerant system diagram for the air conditioner is shown in figure E-1.

Find No.	Part No.	Qty	Nomenclature
1	D13215E6309-1	1	Compressor, 208V, 3 Phase, 60 HZ
2	C13216E6167	1	Hose Assembly, Metal
3A	D13216E6284	1	Coil, Condenser
3B	Pt. of Find No. 3A	1	Subcooler
4	D13216E6330	1	Cylinder Assy, Actuating, Linear
5	D13216E6355	1	Receiver, Liquid Refrigerant
6	C13214E3969	1	Indicator, Sight Liquid
7	C13216E5918-2	1	Dehydrator, Desiccant, Refrig.
8	C13216E6172-3	1	Solenoid Valve, with Leads (L1)
9	C13216E6160-3	1	Valve, Expansion (Primary)
10	C13216E6345	1	Restrictor, Fluid Flow
11	D13216E6283	1	Coil, Evaporator
12	C13216E6344	2	Bulb Well
13	C13216E6174-2	1	Valve, Expansion (Quench)
14	C13216E6172-4	1	Solenoid Valve, with Leads (L2)
15	C13216E6362-1	1	Regulator, Fluid Pressure
16	B13211E8369	1	Valve, Pressure Relief
17	C13219E9499-1	2	Valve, Service
18	C13216E6215-3	1	Switch, Pressure (High)
19	C13218E7546	1	Accumulator

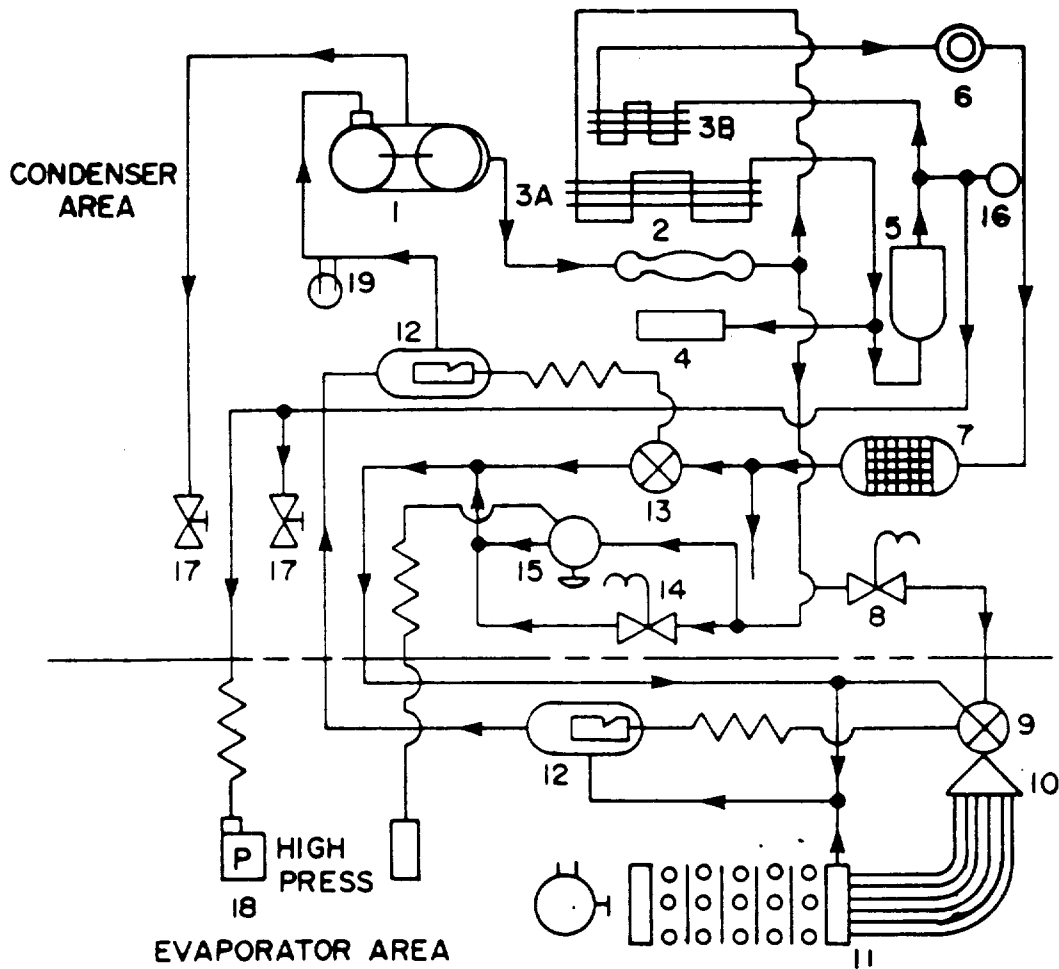


Figure E-1. Refrigerant System Diagram

E-2. WIRE LIST.

FROM		TO				
Wire I.D. #	Terminal Type	Term. No.	Terminal Type	Term. No.	Length (inches)	Wire Size
WIRING HARNESS - 13219E9873						
1	MS25036-112	K9-C1	MS25036-112	K2-C1	13	12
2	MS25036-112	K9-C1	MS25036-157	TB1-3	17	10
3	MS25036-112	K9-B1	MS25036-112	K2-B1	12-1/2	12
4	MS25036-112	K9-B1	MS25036-112	TB1-2	15	10
5	MS25036-112	K9-A1	MS25036-112	K2-A1	9-1/2	12
6	MS25036-112	K9-A1	MS25036-112	TB1-1	13	10
7	MS25036-112	K9-C2	13216E6191-3	TB2-3	44-3/4	12
8	MS25036-112	K9-B2	13216E6191-3	TB2-2	44-3/4	12
9	MS25036-112	K9-A2	13216E6191-3	TB2-1	44-3/4	12
10	MS25036-112	K2-A2	13216E6191-3	TB2-4	39-1/2	12
11	MS25036-112	K2-B2	13216E6191-3	TB2-5	39-1/2	12
12	MS25036-112	K2-C2	13216E6191-3	TB2-6	39-1/2	12
13	MS25036-149	K9-X2	MS25036-149	K2-X2	9-1/2	20
14	MS25036-149	K2-X2	13216E6191-1	TB2-7	41	20
15	MS25036-149	K9-X1	13216E6177	JB2-13	13-3/4	20
16	MS25036-149	K2-X1	13216E6177	JB2-5	10	20
17	MS25036-112	K2-A1	MS25036-112	K7-A1	12-1/4	12
18	MS25036-112	K2-B1	MS25036-112	K7-B1	13-1/4	12
19	MS25036-112	K2-C1	MS25036-1121	K7-C1	14-1/4	12
20	MS25036-108	K7-A1	MS25036-108	K8-A1	17-1/2	16
21	MS25036-108	K7-B1	MS25036-1081	K8-B1	18-1/2	16
22	MS25036-108	K7-C1	MS25036-108	K8-C1	19-1/2	16
23	MS25036-103	K8-A2	13216E6193-2	J3-D	31-1/2	20
24	MS25036-103	K8-B2	13216E6193-2	J3-E	32-1/2	20
25	MS25036-103	K8-C2	13216E6193-2	J3-F	32-1/2	20
26	MS25036-108	K7-A2	13216E6193-2	J3-A	24-1/4	16
27	MS25036-108	K7-B2	13216E6193-2	J3-B	24-3/4	16
28	MS25036-108	K7-C2	13216E6193-2	J3-C	25-1/4	16
29	MS25036-149	K7-X1	13216E6177	J2A-1	15-3/4	20
30	MS25036-149	K7-X2	MS25036-149	K8-X2	19-1/2	20
31	MS25036-108	K7-X2	13216E6193-1	J8-B	32-1/2	20
32	MS25036-149	K7-X2	MS25036-149	K3-X2	10-3/4	20
33	MS25036-149	K8-X1	13216E6177	J2A-4	10	20
34	MS25036-149	K8-X2	13216E6191-1	TB2-8	33-3/4	20
35	MS25036-149	K8-X2	13216E6458	K5-11	14	20
36	MS25036-108	K8-A1	13216E6458	K4-3	13	16
37	MS25036-108	K8-B1	13216E6458	K4-6	13-1/2	16
38	MS25036-108	K8-C1	13216E6458	K4-9	14	16
39	MS25036-112	K3-A2	13216E6193-6	J7-D	41-3/4	10
40	MS25036-112	K3-B2	13216E6193-6	J7-E	42-1/2	10
41	MS25036-112	K3-C2	13216E6193-6	J7-F	43-1/4	10
42	MS25036-149	K3-X2	13216E6193-6	J10-B	29-1/4	20

E-2. WIRE LIST (Cont).

Wire I.D. #	FROM		TO		Length (inches)	Wire Size
	Terminal Type	Term. No.	Terminal Type	Term. No.		
WIRING HARNESS-13219E9873						
43	MS25036-149	K3-X2	MS25036-103	E3	25	20
44	MS25036-149	K3-X1	13216E6193-1	J10-A	34-1/4	20
45	MS25036-149	K3-X1		K1-3	25-1/2	20
46	MS25036-112	K3-A1	13216E6177	J2A-11	15-3/4	10
47	MS25036-112	K3-B1	13216E6177	J2A-13	13	10
48	MS25036-112	K3-C1	13216E6177	J2A-15	11	10
49	13216E6458	K4-1	13216E6193-4	J9-C	30-1/2	20
50	13216E6458	K4-4	13216E6193-2	J4-A	36-1/2	16
51	13216E6458	K4-7	13216E6193-2	J4-B	36-1/2	16
52	13216E6458	K4-10	13216E6993-2	J4-C	36-1/2	16
53	13216E6458	K4-14	13216E6193-2	J5-A	33-1/2	16
54	13216E6458	K4-17	13216E6193-2	J5-C	33-1/2	16
55	13216E6458	K4-20	13216E6193-2	J5-B	33-1/2	16
56	13216E6458	K5-1	13216E6193-4	J9-A	28-1/2	20
57	13216E6193-1	J8-A	13216E6177	J2B-4	35-1/2	20
58	13216E6193-4	J9-B	MS25036-149	TB3-5	38-1/2	20
59	13216E6191-1	TB2-12	MS25036-149	TB3-4	40	20
60	13216E6191-1	TB2-11	MS25036-149	TB4-2	18-1/2	20
61	13216E6191-1	TB2-10	13216E6177	J2B-15	39	20
62	13216E6458	K5-4	13216E6193-2	J4-D	34-1/2	20
63	13216E6458	K5-7	13216E6193-2	J4-E	34-1/2	20
64	13216E6458	K5-10	13216E6193-2	J4-F	34-1/2	20
65	13216E6458	K5-14	13216E6193-2	J5-D	31-1/2	20
66	13216E6458	K5-17	13216E6193-2	J5-F	31-1/2	20
67	13216E6458	K5-20	13216E6193-2	J5-E	31-1/2	20
68	13216E6193-6	J7-B	MS25036-149	TB3-5	48-1/2	20
69	13216E6193-6	J7-A	MS25036-149	TB3-6	50	20
70	13216E6193-6	J7-G	MS25036-103	K9-B1	50-1/4	20
71	13216E6193-6	J7-H	MS25036-103	K9-A1	49-3/4	20
72	13216E6193-2	J4-G	MS25036-108	E3	14	16
73	13216E6193-2	J5-G	MS25036-1082	E3	14	16
74	13216E6193-2	J3-G	MS25036-108	E1	29-1/2	16
75	MS25036-156	TB3-1	MS25036-112	E1	8-1/2	10
76	MS25036-108	K8-B1	13216E6177-2	J2B-14	7-1/2	16
77	MS25036-115	E1	MS25036-115	TB4-1	50-1/2	8
83	MS25036-157	TB1-3	13216E6177	J2A-16	29	10
84	13216E6177	J2A-17	MS25036-157	TB1-2	28	10
85	13216E6177	J2A-20	MS25036-1572	TB1-1	27	10
86	13216E6177	J2B-10	MS25036-149	TB3-4	17	20
87	13216E6177	J2B-3	MS25036-149	TB3-5	16-1/2	20
88	13216E6177	J2B-11	MS25036-153	TB3-3	17-1/2	16
89	13216E6182-3	K1-1	MS25036-149	TB3-6	32-1/2	20

E-2. WIRE LIST (Cont).

FROM		TO		Length (inches)	Wire Size	
Wire I.D. #	Terminal Type	Term. No.	Terminal Type			Term. No.
WIRING HARNESS - 13219E9873						
91	13216E6482-3	K1-5	MS25036-149	TB3-3	34	20
92	13216E6458	K4-11	13216E6458	K5-11	6	20
93	13216E6458	K-13	13216E6458	K5-3	6	16
94	13216E6458	K4-16	13216E6458	K5-6	6	16
95	13216E6458	K4-19	13216E6458	K 5-9	6	16
96	MS25036-112	E 3	MS25036-156	TB3-1	40	12
CABLE ASSEMBLY COMPRESSOR - 13216E6461						
1	MS3106R24-11P	P7-A	MS3106R24-11S	P6-A	37	20
2	MS3106R24-11P	P7-B	13216E6191-1	SH-1	84	20
3	MS3106R24-11P	P7-D	MS3106R24-11S	P6-D	37	10
4	MS3106R24-11P	P7-E	MS3106R24-11S	P6-E	37	10
5	MS3106R24-11P	P7-F	MS3106R24-11S	P6-F	37	10
6	MS3106R24-11P	P7-G	MS3106R24-11S	P6-G	37	20
7	MS3106R24-11P	P7-H	MS3106R24-11S	P6-H	37	20
8	13216E6191-1	S5-2	MS3106R24-11S	P6-B	57	20
CABLE ASSEMBLY POWER INPUT AUXILIARY-13216E6464						
1	MS3100R24-22P	J12-A	MS3100R24-10S	P11-A	61	8
2	MS3100R24-22P	J12-B	MS3100R24-10S	P11-B	61	8
3	MS3100R24-22P	J12-C	MS3100R24-10S	P11-C	61	8
4	MS3100R24-22P	J12-D	MS3100R24-10S	P11-D	61	8
WIRING HARNESS TRANSFORMER AND RECTIFIER-13220E5283						
1	13220E6838	R1	13220E6191-1	TB2-10	14-1/2	20
2	13216E6214	T1-5	13216E6191-1	TB2-11	14-1/2	20
3	13216E6191-1	CR1-2	13216E6191-1	TB2-12	20-3/4	20
4	13216E6214	T1-7	13216E6223	CR1-1	10-1/4	20
5	13216E6214	T1-8	13216E6223	CR1-3	10-1/4	20
6	MS25036-149	E 3	13216E6191-1	CR1-4	7	20
CONNECTOR WITH LEADS-13219E9879						
1	13216E6209-3	P2A-1	MS5036-1061	S2-A1	8	16
2	13216E6209-3	P2A-16	13216E6191-3	CB1-C1	5-1/4	10
3	13216E6209-3	P2A-11	13216E6191-3	CB1-A2	6	14
4	13216E6209-3	P2A-4	MS25036-101	S2-A3	8-1/4	10
5	13216E6209-3	P2A-13	13216E6191-3	CB1-B2	4-1/2	10
6	13216E6209-3	P2A-15	13216E6191-3	CB1-C2	4	10

E-2. WIRE LIST (Cont).

FROM		TO				
Wire I.D. #	Terminal Type	Term. No.	Terminal Type	Term. No.	Length (inches)	Wire Size
CONNECTOR WITH LEADS - 13219E9879						
7	13216E6209-3	P2A-20	13216E6191-3	CB1-A1	6	10
8	13216E6209-3	P2A-17	13216E6191-3	CB1-B1	5-3/4	10
9	13216E6209-3	P2B-3	13216E6191-3	S1-1D	6	20
10	13216E6209-3	P2B-4	13216E6191-3	S1-1B	6-1/4	20
11	13216E6209-3	P2B-15	13216E6191-3	S1-1A	6-1/2	20
12	13216E6209-3	P2B-10	13216E6191-3	S1-21	8-1/4	20
13	13216E6201	S1-21	13216E6191-3	S1-42	2-1/2	20
14	13216E6209-3	P2B-10	MS25036-149	S3-1	5	20
15	13216E6209-3	P2B-11	MS25036-153	E2	6	16
16	13216E6209-3	P2B-13	13216E6191-3	S1-4A	4-1/2	20
17	13216E6209-3	P2B-14	MS25036-1013	CB2-1	7	20
18	13216E6209-3	P2B-15	13216E6192-3	CB1-NO	5	20
CONNECTOR WITH LEADS - 13216E6465						
1	MS3100R24-22P	J1-A	MS25036-116	TB1-1	16	8
2	MS3100R24-22P	J1-B	MS25036-116	TB1-2	16	8
3	MS3100R24-22P	J1-C	MS25036-116	TB1-3	16	8
4	MS3100R24-22P	J1-D	MS25036-116	TB4-2	22-1/2	8
LEAD ELECTRICAL - 13216E6467						
1	13216E6182-3	K1-1	13216E6182-3	K1-2	3	20
2	13216E6191-2	S1-2C	MS25036-106	S2-A2	7	16
3	13216E6191-1	S1-12	MS25036-149	S3-2	8	20
4	13216E6191-1	S1-11	MS25036-149	S3-1	8-1/2	20
5	MS25036-156	TB3-3	MS25036-156	TB3-1	3	12
8	13216E6192	CB1-C	MS25036-101	CB2-2	6	20
CONNECTOR WITH LEADS - 13216E6466						
1	13216E6193-7	J11-A	MS25036-116	TB1-4	37	8
2	13216E6193-7	J11-B	MS25036-116	TB1-5	37	8
3	13216E6193-7	J11-C	MS25036-116	TB1-6	37	8
4	13216E6193-7	J11-D	MS25036-115	TB4-3	37	8
SWITCH THERMOSTATIC WITH CONNECTOR - 13216E6462						
1	13216E6462	S7-3	MS3106R16-10P	P9-A	66	
2	13216E6462	S7-1	MS3106R16-10P	P9-B	66	
3	13216E6462	S7-2	MS3106R16-10P	P9-C	66	

E-2. WIRE LIST (Cont).

FROM		TO			Length (inches)	Wire Size
Wire I.D. #	Terminal Type	Term. No.	Terminal Type	Term. No.		
SOLENOID VALVE WITH LEADS - 13216E6172						
1	13216E6158	L2-1	13216E6173	P10-A	36	
2	13216E6158	L2-2	13216E6173	P10-B	36	

GLOSSARY

COMPRESSOR	- Compresses low pressure refrigerant vapor from the evaporator into high pressure, high temperature vapor.
CONDENSER	- Cools the hot, high pressure refrigerant gas causing it to condense into high pressure liquid refrigerant.
CRANKCASE HEATER	- Prevents migration of liquid refrigerant into the compressor in cold weather.
EVAPORATOR	- Cools and dehumidify air before it enters the room.
FILTER-DRYER	- Removes any traces of moisture from the refrigerant system.
HIGH PRESSURE CUTOUT	- Interrupts power to the compressor when the refrigerant system pressure becomes too high.
LIQUID LINE SOLENOID	- Opens or closes the liquid refrigerant line from the condenser coil to the evaporator coil expansion valve.
LOW PRESSURE CUTOUT	- Interrupts power to the compressor when the refrigerant system pressure becomes too low.
LIQUID THERMAL EXPANSION VALVE	- Meter liquid refrigerant into the evaporator coil distributor.
RECEIVER	- A reservoir for liquid refrigerant which tends to stabilize operation of the refrigeration system.
SERVICE VALVES	- Valves for suction and discharge when air conditioner refrigerant is being tested and-serviced.
SIGHT INDICATOR	- A diagnostic tool to observe refrigerant flow and refrigerant level.

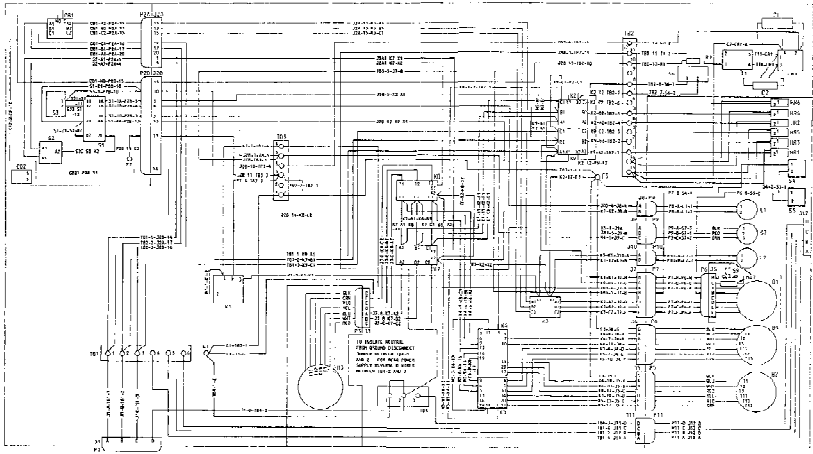
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32	020000000 2	CONNECTOR, RETACT
33	020000000 3	CONNECTOR, RETACT
34	020000000 4	CONNECTOR, RETACT
35	020000000 5	CONNECTOR, RETACT
36	020000000 6	CONNECTOR, RETACT
37	020000000 7	CONNECTOR, RETACT
38	020000000 8	CONNECTOR, RETACT
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96	020000000 66	CONNECTOR, RETACT
97	020000000 67	CONNECTOR, RETACT
98	020000000 68	CONNECTOR, RETACT
99	020000000 69	CONNECTOR, RETACT
100	020000000 70	CONNECTOR, RETACT

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

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Brigadier General, United States Army
The Adjutant General

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THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

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TM 5-4120-376-14

PUBLICATION DATE

10 Apr 85

PUBLICATION TITLE

AIR CONDITIONER, HORIZONTAL, COMPACT
NSN 4120-01-122-0628

BE EXACT. PIN-POINT WHERE IT IS

PAGE NO

6

PARA-GRAPH

2-1
a

FIGURE NO

TABLE NO

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

In line 6 of paragraph 2-1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders.

81

4-3

Callout 16 on figure 4-3 is pointing at a bolt. In key to figure 4-3, item 16 is called a shim - Please correct one or the other.

125

line 20

I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered, so the NSN is wrong. Please give me a good NSN

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

JOHN DOE, PFC (268) 317-7111

SIGN HERE

JOHN DOE

DA FORM 2028-2
1 JUL 79

PREVIOUS EDITIONS ARE OBSOLETE.
DRSTSM Overprint 1, 1 Nov 80

PS--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT. FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER

TM 5-4120-376-14

PUBLICATION DATE

10 Apr 85

PUBLICATION TITLE

AIR CONDITIONER, HORIZONTAL, COMPACT
NSN 4120-01-122-0628

BE EXACT. PIN-POINT WHERE IT IS

PAGE NO

PARA-GRAPH

FIGURE NO

TABLE NO

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

TEAR ALONG PERFORATED LINE

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

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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 = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
 1 decigram = 10 centigrams = 1.54 grains
 1 gram = 10 decigrams = .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

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
 1 deciliter = 10 centiliters = 3.38 fl. ounces
 1 liter = 10 deciliters = 33.81 fl. ounces
 1 dekaliter = 10 liters = 2.64 gallons
 1 hectoliter = 10 dekaliters = 26.42 gallons
 1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	To	Multiply by	To change	To	Multiply by
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C
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PIN: 057943-005