Keith Products, Inc.
Environmental Control System for Bell 206B, L3, L4

Section	Component
21-00-00	System Description
21-40-01	Heater
21-50-01	Electrical
21-50-02	Plumbing
21-50-03	Compressor Assy.
21-50-04	Condenser Assy.
21-50-05	FWD Evaporator
21-50-06	AFT Evaporator

Maintenance Manual
With
Illustrated Parts List

Document No. 206-0102-1SM

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APR 26 2010

RECORD OF REVISION

REV	DATE	DESCRIPTION	BY	APPV
NC	01/03/95	Initial Release		
1	03/07/97		RH	CSH
A	03/17/05	Updated Record of Revisions with new format. Added SB196 to List of Service Bulletins. Added pressure switch JBS2020-9 to section 21-50-01 pg. 1001 and 1004 and added note to page 1004. Also added pressure switch JBS2020-9 to section 21-50-02 pages 1001 and 1002 and added Note 1 to page 1002. Reason: Service Difficulty Per ER2406.	LEO	MAK
B	08/04/06	Revised section 21-50-03 pg 1002 I/N 13a WAS ES20033-29 NOW ES20033-27 Reason: Service Difficulty per ER3280	CDW	MAK
C	04/26/07	Deleted page 1 Record of Temporary Revisions. Revised Following on Page 1002 of Section 21-50-01: I/N 5 WAS JBS276-1 FWD Evap Fan NOW ES61060-2 Motor. Revised Following on Page 1002 of Section 21-50-05: I/N 15 WAS JBS276-1 NOW ES61060-2 Reason: Product Improvement per ER3497	AJ	MAK
D	04/26/10	Revised I/N 11 on page 1002 section 21-50-05 WAS JBS862-4 NOW JBS862-6. Reason: Drafting Error per ER4122	HEB	

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LIST OF SERVICE BULLETINS

SERVICE BULLETIN NO.	DATE	SUBJECT	REVISION NO.	DATE INCORP.
SB196	3/17/05	Pressure Switch Replacement	NC	3/17/05

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INTRODUCTION

1. PURPOSE

The purpose of this Maintenance Manual is to provide detailed instructions for the troubleshooting, checking and maintaining of the Keith Products, Inc. environmental control system for the Bell Model 206B, L3, or L4 helicopter. This Maintenance Manul covers both the heating and air conditioning systems. Your helicopter may have only one of these systems installed.

2. SCOPE

The scope of the service and maintenance manual provides the maintenance technician with detailed information covering:

- Overall system level description and theory of operation.
- Component level description and theory of operation.
- Component checking and troubleshooting procedures.
- Maintenance practices to keep the environmental control system operating at its maximum efficiency.
- The identification of special equipment to accomplish the specific tasks.
- An Illustrated Parts List (IPL) covering the breakdown of each major component of the air conditioning system, including part number and relevant illustrations.

3. ARRANGEMENT

This Maintenance Manual is arranged in accordance with Air Transport Association (ATA) Specification 100 and includes an Illustrated Parts List.

4. GLOSSARY

Nonstandard abbreviations and symbols used in the Maintenance Manual are described below.

Abbreviations:

A/R	-	As Required
Assy	-	Assembly
Comm. Avail.	-	Commercially Available
ECS	-	Environmental Control System
Evap	-	Evaporator
FWD	-	Forward
Gnd	-	Ground
GPU	-	Ground Power Unit
IPL	-	Illustrated Parts List
SW	-	Switch
VDC	-	Volts Direct Current

ENVIRONMENTAL CONTROL SYSTEM - SYSTEM DESCRIPTION

1. GENERAL

The environmental control system for the Bell 206 helicopter consists of a cabin ventilation/ engine bleed air heating system and a refrigerant R134a vapor cycle cooling system. This system allows the pilot to control both heating and cooling for a comfortable aircraft cabin. Figure 1 shows a general arrangement of the environmental control system.

The pilot's overhead control panel contains the bleed air heat OFF/MAX control valve. The instrument panel contains the cooling system ON/OFF switch, the fan OFF/LOW/HIGH switch, and a cabin cooling rheostat. The heating and cooling systems can be used simultaneously for cabin de-fogging.

2. HEATING SYSTEM

The heating system consists of a bleed air heater that is integrated into the aft evaporator distribution ducting and is pneumatically controlled. Bleed air from the engine is mixed with cabin air, as drawn through the aft evaporator distribution ducting. The heater assembly is located above the baggage compartment . A control valve on the pilot's overhead console controls the amount of heat delivered to the cabin.

3. COOLING SYSTEM

The cooling or air conditioning system, as designed and manufactured by Keith Products for the Bell 206 helicopter, is a vapor cycle type cooling system using refrigerant R134a. The electrical portion of the system is operated using the aircraft 28 VDC electrical system and is operable in all normal flight modes. Air conditioning may be operated with the engine operating and the aircraft electrical system providing 28 vDC to the main buss.

The major components of the system are the compressor, condenser assembly with blower, and two evaporator/cabin blower units. Refrigerant plumbing and electrical systems connect the major component to provide a closed loop system.

The compressor is mounted in the engine compartment and is driven by the tail rotor drive shaft accessory pulley via a "V" type belt. The compressor takes low pressure refrigerant gas and compresses it to a higher pressure and temperature.

The condenser is located in above the baggage compartment area and includes a condenser coil and blower. The condenser cooling air (ambient air) is drawn in through a cutout in the fuselage skin on the left side of the aircraft and passes through the condenser coil to remove heat from the system. After passing through the condenser coil, the air is exhausted to the outside through an exhaust duct also located on the left side of the aircraft.

Two evaporator/blower units are located within the helicopter interior. The aft evaporator, located aft of the rear passenger's seat, provides cooling airflow for the cabin area of the interior. The forward evaporator is located forward of the instrument panel and provides cooling airflow to the flight crew through two panel mounted air outlets. Both evaporators are of a design wherein the cabin air is drawn into the evaporator coil and the fan then delivers the conditioned air to the cabin. This recirculating system continues to dry and cool the air each time it passes through the evaporator. Moisture removed from the air by the cold coil (condensate) is collected within the evaporator housing and is forced overboard. Each evaporator is equipped with a thermal expansion valve which regulates the amount of refrigerant entering the coil to provide optimum cooling effect. The evaporator blowers can be operated in the "FAN" position to recirculate cabin air without cooling. Both blowers are operated from the same fan speed control.

The plumbing which connects the compressor, condenser and the evaporator consists of rubber based hoses with a nylon barrier. The fittings are permanently swaged onto the hoses. All fittings are "o-ring" type connections with sealant on the fitting mating surfaces to prevent refrigerant leaks. Two R134a service valves are located near the condenser in the area above the baggage compartment. They are sized differently to avoid incorrect cross-connecting when gaining access to the plumbing for system recharging.

Temperature control is accomplished through a rheostat to set desired cooling air temperature. Two temperature sensors, wired in series and located in the aft evaporator inlet, provides the input signal to the temperature controller. The temperature controller cycles the compressor clutch, as necessary, to achieve the selected cabin temperature. System safety features include an evaporator freeze switch that inhibits the compressor clutch when the evaporator air outlet temperature is cold enough to form condensate ice build up.

The entire air conditioning refrigerant loop is protected against over pressure conditions by two separate safety devices. The first device is a binary high/low pressure switch that activates in the event of an overpressure and is located in the plumbing system above the baggage compartment. This switch will open at approximately 350 PSIG and will interrupt power to the compressor clutch at which point the system pressures will drop. The switch will also interrupt power to the compressor clutch under low pressure conditions. The second overpressure safety device is a fuse plug which will vent the system refrigerant safely overboard in the event of a system pressure in excess of 425 PSIG. It is located on the receiver/drier.

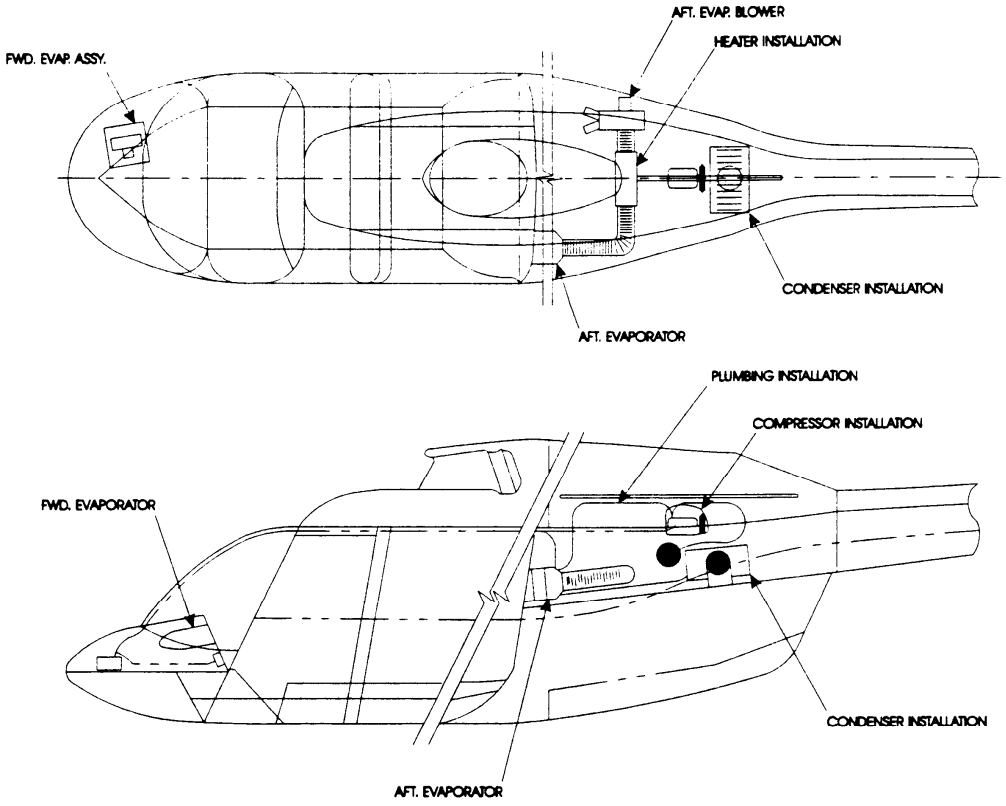


Figure 1. Environmental Control System General Arrangement

HEATER ASSEMBLY

DESCRIPTION & OPERATION

1. GENERAL

The heating system consists of a bleed air heater assembly that is integrated into the aft evaporator air distribution system and is pneumatically controlled. The heater assembly with flow reeulator is located above the baggage compartment and just behind the passenger compartment. A knob on the pilot's overhead console controls the control valve that regulates bleed air flow through the flow regulator. A duct overheat light, located on the lower right hand instrument panel (or incorporated in the annunciator panel), illuminates in the event of a duct overtemp.

Bleed air from the engine flowing thru a restrictor is supplied to the regulator valve. The regulator valve poppet is held closed by the spring. A very small flow of air passes through an orifice in the regulator valve to the dome covering the regulator valve diaphragm. As long as the spring tension in the pilot valve is low, dome pressure passes out the vent.

When spring tension is increased in the pilot valve, which is done manually by turning the control knob of the valve, pressure builds in the regulator valve dome proportional to that spring force and the diaphragm forces the poppet valve open. Bleed air flows through the regulator seat and forces the diaphragm to close the regulator. Therefore, air pressure to the ejector nozzle is proportional to the pilot valve spring tension. Bleed air flow through the nozzle increases with increasing pressure and more heat is supplied to the cabin.

This section of the maintenance manual describes the heating system and presents heating system troubleshooting and maintenance practices procedures. An Illustrated Parts List is included in Figure 1.

TROUBLESHOOTING

1. GENERAL

The following procedures are used for troubleshooting the bleed air heater system and the duct over temperature indication.

2. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Shop Air Source		A/R	None
28vdc Source		A/R	None

3. HEATING TROUBLESHOOTING PROCEDURES (REF. IPL Fig. 1)

A. Bleed air heating system.

SYMPTOM	POSSIBLE PROBLEM	CORRECTIVE ACTION
1. No bleed air to regulator valve.	a. Loose or ruptured bleed air line.	1. Check for loose fittings. 2. Replace lines.
2. No bleed air flow thru regulator valve.	a. No air to pilot valve.	1. Check lines and fittings to pilot valve.
	b. Orifice in regulator plugged.	1. Replace regulator.
	c. Diaphragm ruptured.	1. Replace regulator.
	d. Seal damaged or dirt in valve.	1. Test pilot valve by covering vent with finger. If this causes regulator to open replace pilot valve. NOTE: Engine may be run or shop air line may be connected to regulator inlet.

SYMPTOM	POSSIBLE PROBLEM	CORRECTIVE ACTION
3. Insufficient heater flow.	a. Flow restrictors installed backwards. (B model only).	Check to see that long taper is downstream from engine
	b. Pilot valve faulty.	Test pilot valve by covering vent with finger. If heater flow increases replace pilot valve.
4. Regulator will not shut off.	a. Dirt in regulator seat.	Remove regulator valve, lower cover only, and clean chamber, poppet, spring and seat in accordance with "Maintenance Practices" instructions.
	b. Line to pilot valve plugged or damaged.	Disconnect valve at regulator valve. If regulator valve closes check line for blocking if regulator valve fails to close, replace regulator valve.
	c. Pilot valve faulty.	Disconnect at pilot valve if regulator closes, replace pilot valve.

B. Duct Over Temp Indication

NOTE: Certain operating conditions may require operation of the fan to prevent inadvertent "DUCT OVER TEMP" light indication.

SYMPTOM	POSSIBLE PROBLEM	CORRECTIVE ACTION
Duct over temp light ON.	a. Defective switch.	Replace switch
	b. Blockage in duct.	Clean duct.
	c. Passenger air outlets closed.	Open outlets.

MAINTENANCE PRACTICES

1. GENERAL

The following procedures are used to perform typical maintenance on the bleed air heater.

2. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Shop Air Source		A/R	None

3. HEATER MAINTENANCE PROCEDURES (REF. IPL Fig. 1)

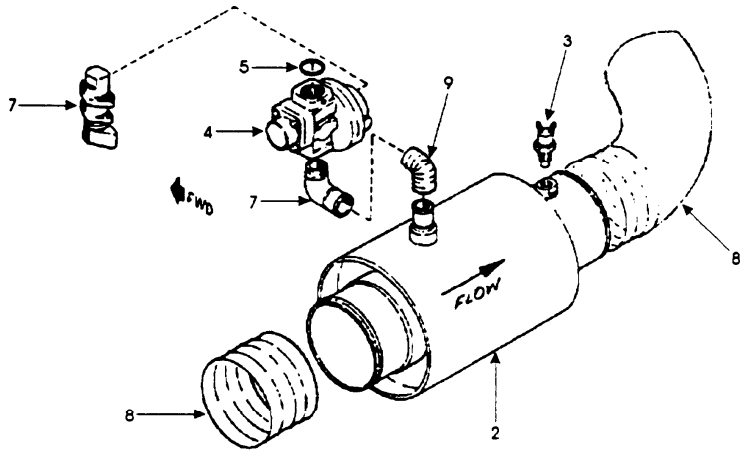
A. Ejector Nozzle Cleaning
   1. Remove silencer assembly.
   2. Backflush nozzle inside the silencer assembly by applying shop air to outlet ring.

B. Flow Regulator Cleaning/Disassembly

NOTE: It is recommended that the regulator valve not be disassembled unless discrepant operation is noted. This may be caused by contamination when operating in a dusty or salty environment where engine compressor washing is employed. Where washing is employed, it is further recommended that the bleed lines be disconnected at the engine before performing the work.

NOTE: Disassembly of the upper half of the valve may result in damage to the diaphragm. In the event the flow regulator becomes inoperative, field service is limited to cleaning and or replacement of the parts described below.

1. Remove safety wire and screws - LOWER HALF ONLY.
2. Remove snap ring retainer plate and retainer plate o-ring.
3. Remove poppet retainer and inspect Bal Seal, for deterioration, replace as required.
4. Remove lower cap exposing spring, poppet and cap o-ring. Clean all parts.
5. Reassemble dry in reverse order of disassembly.
6. Operate valve and observe proper operation.
7. Safety wire screws.



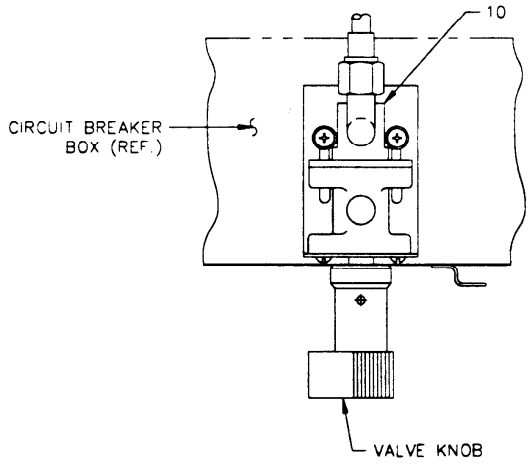


Figure 1. Heater Assembly

FIG.	ITEM	PART NUMBER	NOMENCLATURE	EFFECT	UNITS PER ASSY
1	1	206-0801-1	Heater Installation	L3, L4	RF
	1	206-0802-2	Heater Installation	B	RF
	2	206-0851-6	Silencer Assy		1
	3	ES52127-1	Temp. Sensor		1
	4	ES26053-1	Valve		1
	5	ES49002-18	O-Ring, M83248/1-910		1
	6	AN842-16D	Elbow		1
	7	ES26051-1	Valve		1
	8	ES70011-6	Duct (4.0 Dia. length A/R)		1
	9	ES70012-1	Duct, Extreme Temp.		1
	-	ES49002-5	O-Ring, M83248/1-908 All Connections in Engine Compartment.		3
	-	ES49002-14	O-Ring, M83248/1-903, (Particle Separator Plug)		1
	10	ES26051-1	Valve		1

Heater System
IPL Figure 1

ELECTRICAL

DESCRIPTION AND OPERATION

1. GENERAL

The heating system is pneumatically controlled except for the duct overheat indication. The air conditioning system consists of one vane axial condenser fan, one centrifugal evaporator blower for each evaporator assembly, and a temperature controller with rheostat. The system is controlled by a mode switch with Air Conditioning Off and Fan Only position. The evaporator fan has a high and low position switch. The system incorporates a binary pressure switch to sense an over pressure or under pressure condition in the system. A freeze switch that measures the aft evaporator air outlet temperature cycles the compressor clutch to off to prevent ice forming on the coil.

Two temperature sensors, wired in series and located in the aft evaporator inlet, provide cabin temperature information to the temperature controller. A rheostat also provides input to the controller. The controller takes these signals and cycles the compressor clutch as necessary to provide the desired cabin temperature.

The system is protected by a 30 amp fan breaker and a 35 amp air cond breaker.

This section of the maintenance manual describes the electrical system and presents electrical troubleshooting and adjustment/test procedures. An Illustrated Parts List is included in Figure 1.

TROUBLESHOOTING

1. GENERAL

The following procedures are used for troubleshooting the electrical system and the electrical interfaces with the other assemblies of the air conditioning system.

2. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Service Pressure Gauge	Comm. Avail.	1	None
Multi-meter	Comm. Avail.	1	None
28vdc Source		A/R	None

3. ELECTRICAL TROUBLESHOOTING PROCEDURES (REF. IPL Fig. 1)

NOTE: Always attach a service gauge set to system prior to beginning trouble shooting to insure proper refrigerant charge is present.

A. Cooling Problems.

The following tables outline electrical system problems and solutions for no cooling, reduced cooling, or unwanted cooling.

SYMPTOMS	COMPONENT	FAILURE MODE	ADDITIONAL TESTS
No Cooling and: 1. Clutch does not engage, and 2. Condenser Blower Motor does not operate.	"AIR COND." CIRCUIT BREAKER	OPEN	
	AIR COND. SWITCH	"AIR COND." pole OPEN	
	FUSE ON A/C SWITCH "A.C." POLE	OPEN	
No Cooling and: 1. Cooling Control Rheostat set on "MAX"	COOLING RHEOSTAT	OPEN	
	Evap. Temp. Probe(s)	OPEN	Total resistance should be: 8670 ohms @ 60°F, 4952 ohms @ 80°F.
	TEMP. CONTROLLER	SHORT (#2 PIN)	See Temp Controller check procedure
No Cooling and: 1. Clutch does not engage	Clutch Relay	OPEN (Output)	
	Evap. Freeze Switch	OPEN (or out of adjustment)	Should close at 36°F
	Pressure Switch - High Limit	OPEN	Should be closed at 350 ± 30 psig at compressor discharge
	Pressure Switch -Low Limit	OPEN	Should be closed at 22 ± 7 psig
	Clutch Dropping Resistor	OPEN	
	Clutch Coil	OPEN	Replace compressor.
	Clutch Fuse	OPEN	

SYMPTOMS	COMPONENT	FAILURE MODE	ADDITIONAL TESTS
No Cooling and: 1. "AIR COND" CIRCUIT BREAKER OPENS	Condenser Blower Motor	SHORT	
No Cooling and: 1. No Airflow, and 2. No Motors OPERATING, and 3. Clutch disengaged	"FAN" CIRCUIT BREAKER	OPEN	
No Cooling and: 1. Clutch does not engage.	CLUTCH COIL	SHORT	
No Cooling and: 1. No airflow from FWD or AFT evap, and 2. FAN SWITCH ON "HI", and 3. A.C. switch on "ON" or "FAN", and 4. "FAN" circuit breaker opens	FWD or AFT EVAPORATOR FAN MOTOR	SHORT	See Evap Fan Check.
No Cooling and: 1. No airflow from fwd or aft evaporator fan	FWD or AFT EVAPORATOR FAN MOTOR	OPEN	See Evap fan Check.
No Cooling and: 1. Fuse on "AIR COND" pole of A.C. switch is blown	Condenser Blower Motor Relay	SHORT	
	Clutch Relay	SHORT	

SYMPTOMS	COMPONENT	FAILURE MODE	ADDITIONAL TESTS
No Cooling: 1. Condenser Blower Motor does not operate	Condenser Blower Relay	OPEN (input)	
		OPEN (output)	
	Condenser Blower Motor	OPEN	
Reduced Cooling and Air Flow: 1. System operational	Freeze Switch	Setting	Adjust "Freeze Switch" Setting
Excessive Cooling and: 1. Cooling Control Rheostat Inoperative	Cooling Rheostat	SHORT	
	Evap. Temp. Probe(s)	SHORT	
	Temp. Controller	OPEN (#2 PIN)	See "Temp Controller" Check Procedure
	Clutch Relay	OPEN (input)	
		SHORT (output)	
Unwanted Cooling and: 1. Air Cond. switch on "OFF" or "FAN"	Air Cond. Switch	SHORT ("AIR COND" POLE)	

B. Air Flow Problems.

The following tables outline electrical system problems and solutions for no air flow or excessive air flow.

SYMPTOMS	COMPONENT	FAILURE MODE	ADDITIONAL TESTS
No Airflow and: 1. No cooling, and 2. Both Evap. Fans Inoperative.	Air Condition Switch	FAN" POLE OPEN	
No Airflow from FWD or AFT Evap and: 1. No cooling, and 2. "FAN" Circuit Breaker open, and 3. Fan switch on "HI" setting	FWD or AFT Evap. Fan Motor	SHORT	See Evap Fan Check.
No Airflow from FWD or AFT Evap Fan and: 1. Reduced cooling	FWD or AFT Evap. Fan Motor	OPEN	See Evap Fan Check.
No Airflow and: 1. No cooling, and 2. No motors or clutch operating	"FAN" Circuit Breaker	OPEN	
No Airflow on "LO" Fan Switch setting	Fan Switch	OPEN ("LO" POLE)	
No Airflow on "HI" Fan Switch setting	Fan Switch	OPEN ("HI" POLE)	
No Airflow from FWD or AFT Evap on "LO" Fan Setting)	Fan "Low speed" or "Dropping" Resistor on FWD or AFT Evap.	OPEN	See Evap Fan Check.
Excessive Airflow from both evaps on "LO" Fan Setting	Fan Switch	SHORT ("HI" POLE)	
Unwanted Airflow from both Evap. Fans and: 1. Air Cond. Switch is on "OFF"	Air Cond. Switch	SHORT ("FAN POLE")	
Condenser Blower Motor Operates and: 1. Clutch is engaged, and 2. Air Cond. Switch is on "OFF" or "FAN"	Condenser Blower Motor Relay	SHORT (Output)	

ADJUSTMENT /TEST

1. GENERAL

The following procedures are used for testing and checking the electrical system and the electrical interfaces with the other assemblies of the cooling or air conditioning system.

2. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Service Pressure Gauge	Comm. Avail.	1	None
Multi-meter	Comm. Avail.	1	None
28vdc Source		A/R	None

3. ELECTRICAL TEST PROCEDURES (REF. IPL Fig. 1)

Listed below are tests or checks that can be accomplished to help resolve the troubleshooting symptoms listed on page 101.

A. Air Condition Selected, Compressor Clutch Will Not Engage.
   1. Connect service pressure gauge to service ports located behind the baggage compartment bulkhead.
   2. Connect ground power to aircraft .
   3. Check that the AIR COND and FAN C/B's are closed.
   3. Select air conditioning system to ON.
   4. Check that minimum static system pressure is greater than 50 psig.
   5. Check for power at clutch coil. If present, check that ground wire is securely attached.
   6. If clutch still will not work properly, check clutch coil air gap per 21-50-03, page 201.
   7. If no power is present at clutch coil, check for power at both sides of pressure switch. If power is present on relay side of switch (with static pressure ≥ 50psig), replace switch.
   8. If no power is present at pressure switch, check for power at relay (item 9).

B. FWD Evaporator Blower will not operate in high or low speed.
   1. Connect ground power to aircraft.
   2. Select air conditioning system to ON.
   3. Check if power and ground present at fan wire splices and GND terminal strip. If power and ground are present, blower motor (Ref. 21-50-05 IPL Fig.1, item 15) has failed.
   4. Select air conditioning OFF, remove electrical power.
   5. Remove blower assy from aircraft. Remove the four screws attaching the motor to the housing. Using a 1/8 allen wrench remove blower wheel (use extreme care not to bend blower wheel). Cut power wires at splice and remove Gnd wire from GND terminal. Install new motor in reverse order.

C. FWD Evaporator Blower will not operate in the low speed setting.
   1. Connect ground power to aircraft.
   2. Select air conditioning system to ON.
   3. Check if power is present at wire 206-1709-N52 (at splice). If power is present, the low speed resistor (Ref. 21-50-05 IPL Fig. 1, item 16) has failed.
   4. Select air conditioning OFF, remove electrical power.
   5. Remove blower assembly and using a #21 drill remove the two rivets securing the resistor. Cut the wires at the splice and remove GND wire from GND terminal. Install new resistor in reverse order.

D. AFT Evaporator Blower will not operate in high or low speed.
   1. Connect ground power to aircraft.
   2. Select air conditioning system to ON.
   3. Check if power and ground present at fan wire splices and GND terminal strip. If power and ground are present, blower motor (Ref. 21-50-06 IPL Fig.2, item 50) has failed.
   4. Select air conditioning OFF, remove electrical power.
   5. Remove blower assy from aircraft.

E. AFT Evaporator Blower will not operate in the low speed setting.
   1. Connect ground power to aircraft.
   2. Select air conditioning system to ON.
   3. Check if power is present at wire 206-1709-N6 (at electrical panel). If power is present, the low speed (dropping) resistor (Ref. item 12) has failed.
   4. Select air conditioning OFF, remove electrical power.
   5. Remove resistor located in electrical panel. Install new resistor in reverse order.

F. Condenser Blower will not operate.
   1. Connect ground power to aircraft.
   2. Select air conditioning system to ON.
   3. Check if power is present at wire 206-1709-N57 (at electrical panel). If power is present, the fan motor (Ref.21-50-04 IPL Fig. 1, item 4) has failed.
   4. Select air conditioning OFF, remove electrical power.
   5. Remove blower assembly. Remove the power wire at the blower terminal and remove GND wire from GND terminal. Install new blower in reverse order.

G. Temperature Controller Check Procedure

   Note: The following procedure allows the checking of the operation of the temperature controller while leaving it installed and wired in the aircraft.

   1. Conduct an ohm meter check of the cooling control rheostat mounted on the ECS control panel and of the temperature sensors located in the evaporator air inlet lip. The following chart gives the correct resistance values for the conditions shown. The temperature probes are wired in series and the resistance reading is made across both sensors.

COMPONENT	CONDITION	RESISTANCE (OHMS)
RHEOSTAT	"MIN" SETTING	1500
	"MAX" SETTING	0
TEMP. SENSORS	60°F EVAP. INLET AIR	8670
	80°F EVAP. INLET AIR	4952

Note: To check the trip point temperature of the controller, the temperature of the air entering the evaporator must be between 60°F and 70°F.

2. Attach the voltmeter (+) lead to either end terminal of the 206-1709-N19 wire and the ground lead to aircraft structure.

3. Place a thermometer in the evaporator air inlet.

4. Set the fan switch on "LO" and the air conditioner switch on "AIR COND."

5. Rotate the cooling control from "MIN" to "MAX". The voltage reading should jump from zero to battery voltage during the rotation.

6. Rotate the control fan from "MAX" to "MIN" and the voltage should drop from battery voltage back to zero.

7. The position of the rheostat know at which the voltage jumps will vary with the evaporator inlet air temperature. See the following chart for trip points.

AIR TEMPERATURE	RHEOSTAT SETTING
70°F	"MIN"
60°F	"MAX"

H. Freeze Switch Adjustment

Note: The normal setting for this application is to align the scribe line on the cam with the scribe line on the case. However, under certain extreme climatic conditions the freeze switch may not function, thus continuing to allow the compressor to run. Build up of ice on the evaporator coil fins can result and reduce air flow and cooling.

1. Adjust cam CCW to increase the temperature set point. Approximately 8° of angular cam rotation (CCW) will increase the temperature set point 1°F higher.
2. The chart below illustrates the temperature ranges for the freeze switch. The switch is originally set to the NORMAL setting.

DIAL POSITION	TERMINAL #2 COMMON			
	TERM 2-1 BREAK AT	TERM 2-1 MAKE AT	TERM 2-3 BREAK AT	TERM 2-3 MAKE AT
COLD	20°F	12°F	12°F	20°F
NORMAL	38°F	30°F	30°F	38°F
WARM	56°F	48°F	48°F	56°F

Switch: 1. Snap-acting S.P.D.T.
2. #2 Terminal is common.
3. #3 Terminal makes on temperature rise.
4. #1 Terminal breaks on temperature rise.

Dial Range: Coldest out to warmest in; 12°F to 60°F

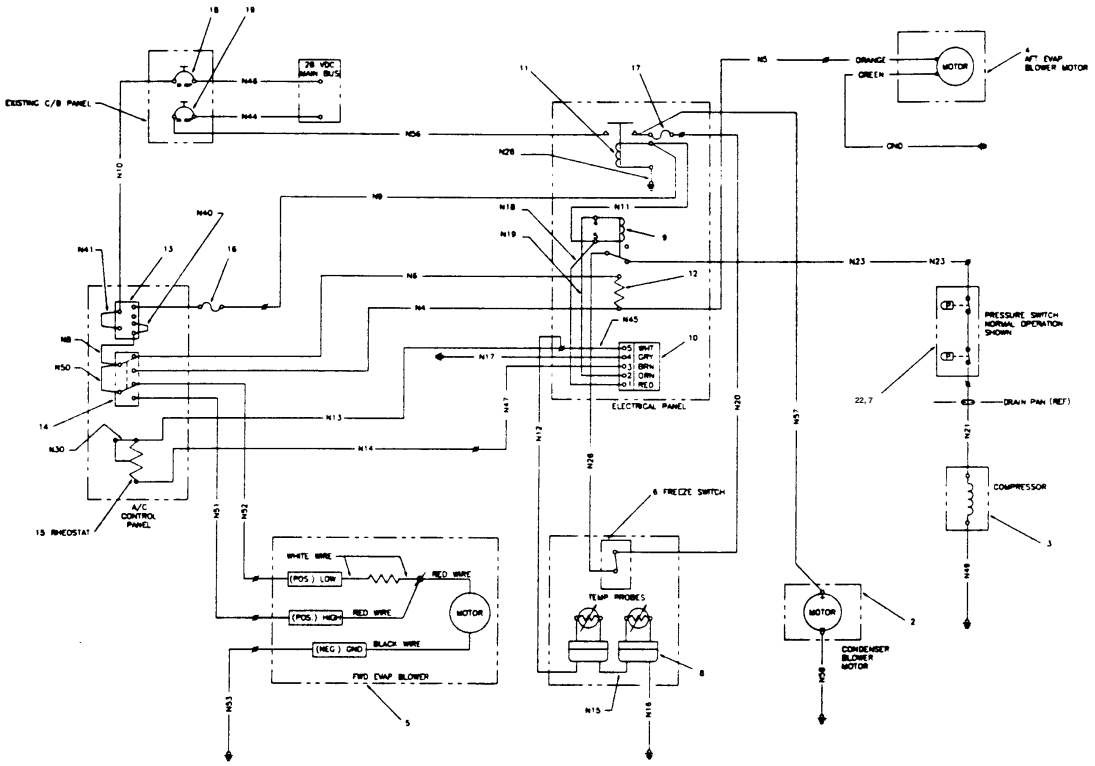


Figure 1. Electrical System
(Sheet 1)

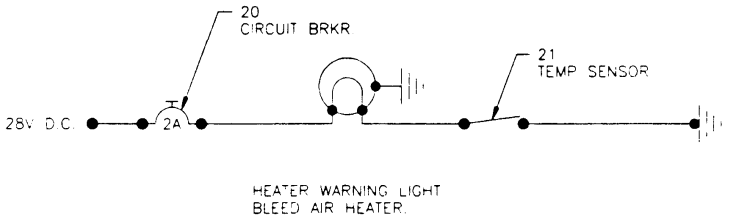


Figure 1. Electrical System
(Sheet 2)

FIG.	ITEM	PART NUMBER	NOMENCLATURE	EFFECT	UNITS PER ASSY
1	1	206-0700-3,-4	Electrical Installation		RF
	2	ES73127-2	Condenser Blower Motor		1 ref
	3	JBS220-1	Compressor		1 ref
	4	ES73103-2	AFT Evap Fan		1 ref
	5	ES61060-2	Motor		1 ref
	6	JBS60-2	Freeze Switch		1 ref
	7	JBS2020-5	Pressure Switch	Note 1	1 ref
	8	ES52126-1	Temp Sensor Probes		2 ref
	9	ES56128-1	Relay, Clutch		1
	10	ES62117-1	Temp. Controller		1
	11	ES56149-1	Relay, Cond Blower		1
	12	ES63014-7	Resistor, Aft Evap Fan Dropping		1
	13	ES57016-5	Switch, AC ON - OFF		1
	14	ES57016-8	Switch, Fan Speed		1

Air Conditioning System - Electrical System
IPL FIGURE 1

FIG. ITEM	PART NUMBER	NOMENCLATURE	EFFECT	UNITS PER ASSY
15	ES62114-1	Rheostat		1
16	JBS79-8	Fuse Assy		1
17	JBS79-6	Fuse Assy		1
18	JBS75-8	Circuit Breaker - 30A, "FAN"		1
19	JBS75-28	Circuit Breaker - 35A, "A/C"		1
20	JBS75-1	Circuit Breaker - 2A, "Duct Overheat"		1
21	ES52127-1	Duct Ovht Sensor		1
22	JBS2020-9	Pressure switch	Note 1	1 ref

Note 1: JBS2020-9 supersedes JBS2020-5.

Air Conditioning System - Electrical System
IPL FIGURE 1

PLUMBING

DESCRIPTION AND OPERATION

1. GENERAL

The plumbing system consists of a flexible nylon lined refrigerant hose with permanent swaged on fittings. All connections are tube O-ring type connections with sealant on the fitting mating surfaces to ensure leak free operation. Hose, O-ring material, and sealant are specially designed to work with refrigerant R134a and polyol ester oils. Two service valves are located near the condenser, in the area above the baggage compartment. They are sized differently to avoid incorrect cross-connecting when gaining access to the plumbing for system recharging. A receiver/drier is installed downstream of the condenser to remove moisture from the liquid refrigerant.

This section of the maintenance manual discusses checks and maintenance practices used for the plumbing portion of the air conditioning system. An Illustrated Parts List is included in Figure 1.

MAINTENANCE PRACTICES

1. GENERAL

The following procedures are used to perform typical maintenance on the air conditioning system plumbing.

2. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
R134a Compatible Hose Swaging Kit	Available from Keith Products	1	None
Sharp Knife	Comm. Avail.	1	None
Impact Wrench	Comm. Avail.	1	None
Polyol Ester Oil	Comm. Avail.	A/R	Viscosity Grade 68
Sealant	ES49000-1	A/R	None

3. PLUMBING MAINTENANCE PROCEDURES (REF. IPL Fig. 1)

A. Hose or Fitting Replacement

NOTE: If it is found that a hose or fitting has a leak, it will be necessary to replace the entire hose assembly. Follow the Hose Swaging Instruction below:

1. Hose should only be cut with a sharp knife. (**Note:** Use of serrated blades or saws to cut hose will leave particles that can contaminate system.)
2. Insert the proper size die in the swaging tool.
3. Insert fitting in swaging tool so that it is centered in the die and hand tighten.
4. Insert hose in fitting until it bottoms (**Note:** Indicating hole is in base of fitting).
5. Using impact wrench, tighten nut until die housings contact. (**Note:** It is important to keep hose pushed into fitting while swaging).
6. Reverse impact and back off nut until housing contacts rubber stops.

B. Connection to Components - O-Ring Replacement
   1. Place the appropriate o-ring (REF. IPL Fig. 1) over the tube "O" end of the fitting.
   2. Lubricate o-ring with polyol ester oil prior to assembly.
   3. Apply sealant to all fitting mating surfaces prior to assembly.

C. Receiver/Drier Replacement
   1. Replace receiver/drier whenever the compressor is replaced or when the air conditioning system plumbing is left open to the atmosphere.

INSPECTION/CHECK

1. GENERAL

The following procedures are used for checking and inspecting the air conditioning system plumbing.

2. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Electronic R134a Refrigerant Leak Detector	Comm. Avail.	1	None

3. PLUMBING CHECK PROCEDURES (REF. IPL Fig. 1)

A Plumbing Installation Preventive Maintenance Check

NOTE: All O-rings should be lubricated with polyol ester oil or sealant applied to all fittings before assembly.

1. Check that all hoses are properly supported and do not chafe. Check that all clamps remain secure and that the hose and fitting are well supported at connections with fixed units such as evaporator, condenser etc. to prevent fatigue cracking in tubing headers or fittings.

B. Plumbing System Refrigerant Leak Check

1. Connect service pressure gauge set to service ports, located behind the baggage compartment bulkhead.
2. Check that the gauges are reading the proper static pressure. Both gauges should read approximately 55 psig @ standard temperature (59°F) with a properly charged system when the system is not operating.
3. Using leak detector, check entire plumbing system including hose fittings and coil assemblies for leaks. There shall be no leaks. Repair or replace leaking component per the appropriate maintenance manual section and its IPL.

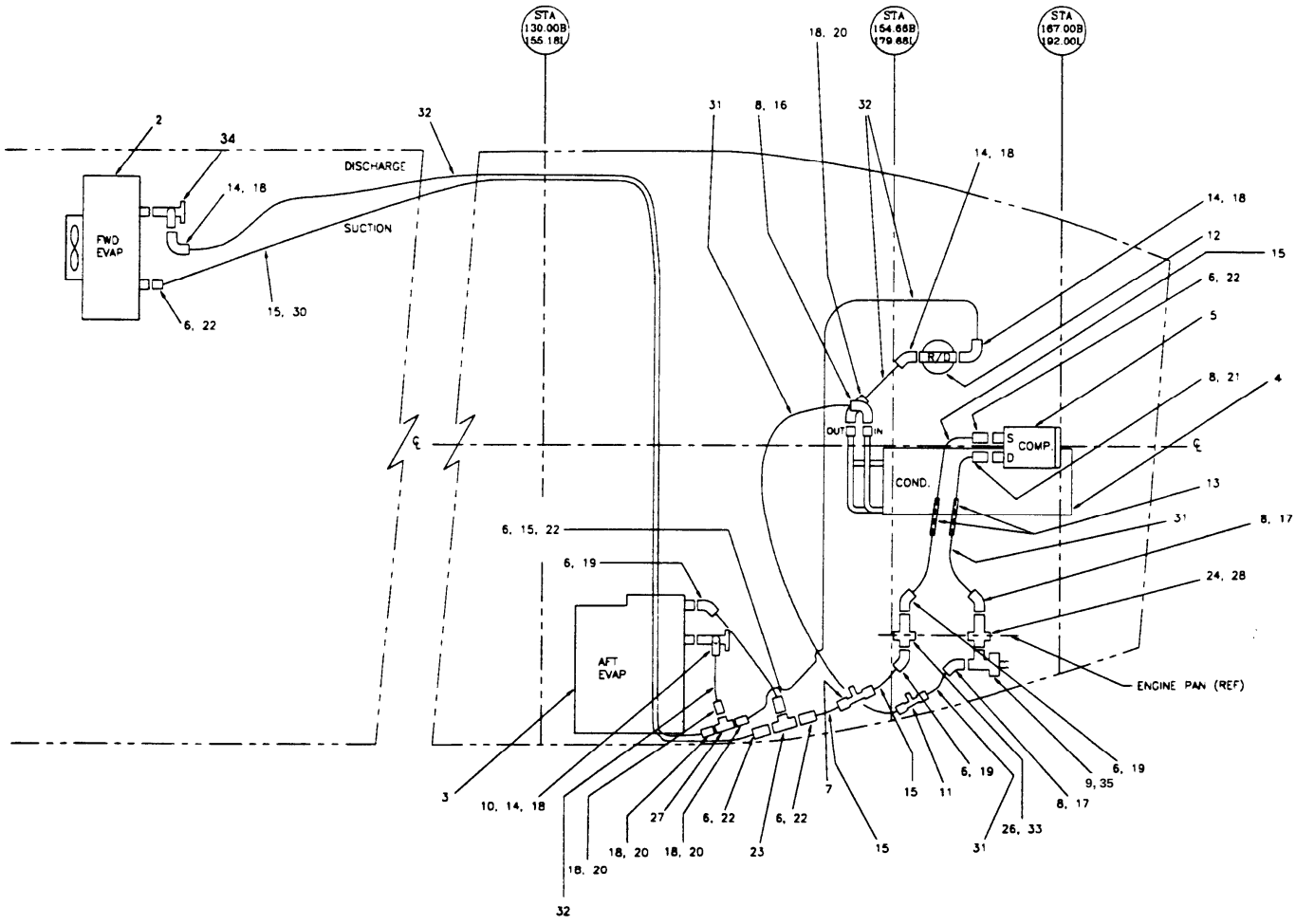


Figure 1. Plumbing System

FIG. ITEM	PART NUMBER	NOMECLATURE	EFFECT	UNITS PER ASSY.
1 1	206-0752	Plumbing Installation		RF
2	JBS2003-3	FWD Evaporator		1 ref
3	JBS2005-2	AFT Evaporator		1 ref
4	206-1351-2	Condenser		1 ref
5	JBS220-1	Compressor		1 ref
6	ES49011-3	O-ring		8
7	ES40158-3	Service Valve		1
8	ES49011-2	O-ring		5
9	JBS2020-5	Pressure Switch	Note 1	1
10	ES26104-2	Expansion Valve		1 ref
11	ES40158-2	Service Valve		1
12	ES43030-2	Receiver/Drier		1
13	ES02126-2	Fire Sleeve		42 in
14	ES40151-1	90° Fitting		4
15	ES48149-3	Hose		360 in
16	ES40151-2	90° Fitting		1
17	ES40150-2	45° Fitting		2
18	ES49011-1	O-ring		8
19	ES40150-3	45° Fitting		3
20	ES40149-1	Fitting		4
21	ES40149-2	Fitting		1
22	ES40149-3	Fitting		5
23	ES41061-2	Tee Fitting		1
24	JBS915-1	Bulkhead Fitting		1
26	JBS915-2	Bulkhead Fitting		1
27	ES41061-1	Tee Fitting		1
28	AN924-8D	Nut		1
30	ES06022-1	Insulation Tape		700 in
31	ES48149-2	Hose		60 in
32	ES48149-1	Hose		336 in
33	AN924-10D	Nut		1
34	ES26104-1	Expansion Valve		1 ref
35	JBS2020-9	Pressure Switch	Note 1	1

Note 1: JBS2020-9 supersedes JBS2020-5.

Air Conditioning System – Plumbing Systems
IPL FIGURE 1

COMPRESSOR ASSEMBLY

DESCRIPTION AND OPERATION

1. GENERAL

The compressor assembly is driven from the tail rotor drive shaft and is mounted in the engine compartment. The unit consists of a compressor, compressor mount and support hardware. The compressor is driven via a single V flat belt, and compresses the refrigerant gas at which it will condense at ambient temperatures. This gas is directed to the condenser where its heat is removed by air flow from the condenser fan. A binary pressure switch monitors the refrigerant gas pressure. This switch will open at a condenser over pressure of 350 psi and under pressured conditions of 30 psi. This will interrupt the power to the compressor clutch and stop the compressor.

This section of the maintenance manual discusses troubleshooting and maintenance practices used for the compressor assembly portion of the air conditioning system. An Illustrated Parts List is included in Figure 1.

TROUBLESHOOTING

1. GENERAL

The following procedures are used for troubleshooting the compressor assembly.

2. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Service Pressure Gauge	Comm. Avail.	1	None
28vdc Source		A/R	None

3. COMPRESSOR TROUBLESHOOTING PROCEDURES (REF. IPL Fig. 1)

With the air conditioning system operating, do any of the following conditions occur:

NOTE: Always attach a service gauge set to system prior to being trouble shooting to insure proper refrigerant charge is present.

Trouble	Probable Cause	Correction
1. Unusually high suction pressure with low discharge pressure.	Internal problem with compressor body.	Replace compressor.
2. Unusually low suction and discharge pressure.	System or Compressor Leak.	Repair leak or replace leaking component.
3. Clutch disengagement "chattering", intermittent or inoperative.	(a) Improper clutch air gap. (b) Defective clutch coil.	(a) Remove compressor and adjust air gap. (b) Remove compressor and replace clutch coil.
4. Rough running.	Internal compressor problem.	Replace compressor.

Trouble	Probable Cause	Correction
5. Unusual noise, clutch engaged.	(a) Improper clutch air gap.	(a) Remove compressor and adjust air gap.
	(b) Defective clutch coil.	(b) Remove compressor and replace clutch coil.
	(c) Worn bearing.	(c) Replace compressor

MAINTENANCE PRACTICES

1. GENERAL

The following procedures are used to perform typical maintenance on the compressor assembly.

2. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Feeler Gage	Comm. Avail.	1	None
Oil Dipstick	Make from metal wire.	1	See Fig. 201.
Polyol Ester Oil	Comm. Avail	A/R	Viscosity Grade 68
Anti-Seize Compound	MIL-A-907	A/R	None

3. COMPRESSOR MAINTENANCE PROCEDURES (REF. IPL Fig. 1)

A. Compressor Drive Belt Removal , Installation and Adjustment
   1. Loosen the two compressor pivot bolts (15). Loosen nut (29) and nut (17) securing the adjusting support.
   2. Remove the short shaft assembly from between the free-wheeling output shaft and adapter pulley (12).
   3. Loosen the four bolts (24) securing the compressor mount (4) to pallet, remove the two forward bolts and slide compressor (2) forward.
   4. Remove old belt and install new belt (13).
   5. Slide compressor mount (4) aft and align the adapter (12) and clutch (2) pulleys. Replace the two forward bolts (24).
   6. Tighten bolts (24) securing compressor mount.
   7. Tighten nut (29) to tension belt. To tension belt:
      a. Adjust nut for moderate belt tension.
      b. Rotate tail rotor drive shaft through 2 revolutions.
      c. Tension belt to deflect 0.08 inch with a 2.4 - 3.2 lb. force applied at midspan location.
      d. Rotate belt 2 revolutions, retention as required to obtain proper deflection.

8. Tighten nut (17) securing the adjusting support.
9. Install short shaft assembly per installation procedure (Ref. page 204). Torque attach bolts to 70 in-lbs.
10. Retension belt after running helicopter 5 to 10 hours.

B. Clutch Air Gap Check
   1. Measure clutch air gap with feeler gauge.
   2. Clutch air gap should be 0.016 - 0.031 in. (0.4 - 0.8 mm).
   3. If gap is not even around clutch, remove compressor from aircraft and gently pry up on the faceplate on low spots or tap down on high spots.
   4. If overall gap is out of specification, remove compressor from aircraft and remove faceplate and change shims until gap is within specification. Air gap is controlled by the shims.

C. Compressor Oil Level Check

NOTE: It is not necessary to check the compressor oil level during routine maintenance. It only needs to be checked when a system component is replaced or when incorrect oil level is suspected.

1. Operate air conditioning system for 10 minutes. This will collect as much oil as possible in the compressor.
2. Discharge air conditioning system and remove compressor from aircraft.
3. Place compressor on table such that the oil fill plug is up.
4. Remove oil fill plug.
5. Insert dipstick into oil fill port.
6. Check that the oil level is 5 fluid ounces (at the 5th increment). Add or subtract oil in 1 fluid ounce increments until 5 fluid ounces is obtained.
7. Clean oil fill port area and install oil fill plug. Torque plug to 6 - 9 ft-lbs.

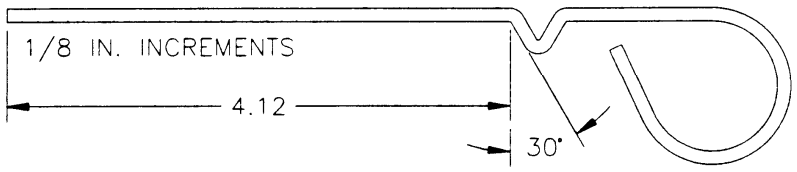


Figure 201. Make Dipstick as Shown Above.

D. Compressor Pulley Installation (206B, 206L3 ONLY)

1. Install the MS28775-211 o-ring (6) on the fwd. end of the oil cooler fan shaft assy by coating the o-ring with anti-seize compound per MIL-A-907 and sliding over the splines into the recessed area on the aft side of the splines.

2. Coat the inside of the JBS15005-2 (12) pulley between the threads and the counterbore with anti-seize compound. Also, coat the matching area of the shaft with anti-seize compound.

3. Install the JBS15005-2 pulley (12) on the oil cooler fan shaft. Install wrench 206-1435-3 on Bell Thomas Coupling, P/N 206-040-328-3 splined adapter, using existing hardware. Using spanner wrench (Snap-On P/N APS363 or equal), hold pulley in place. Slide Thomas Coupling with wrench installed, over shaft and torque to 200 to 300 in/lb. Place wrench, P/N 206-1435-3, with aircraft's tools.

4. Install JBS15005-1 splined internal ring (10) over the shaft and align holes to match holes of pulley. Position the ring until holes align. Pulley may be adjusted slightly to achieve alignment, maintaining 200 to 300 in - lbs. torque.

5. Install (4) NAS1351-3H6 (25) screws in the JBS15005-1 ring and torque 50 to 70 in - lbs. Safety wire the four screws with MS20995C32, Single Wire Method in accordance with MS33540.

E. Compressor Pulley Installation (206L4 ONLY)

1. Install the MS28775-211 o-ring (6) on the fwd. end of the oil cooler fan shaft assy by coating the o-ring with anti-seize compound per MIL-A-907 and sliding over the splines into the recessed area on the aft side of the splines.

2. Coat the inside of the JBS15005-2 (12) pulley between the threads and the counterbore with anti-seize compound. Also, coat the matching area of the shaft with anti-seize compound.

3. Install the JBS15005-2 pulley (12) on the oil cooler fan shaft. Install wrench 206-1435-2 on Bell Thomas Coupling, P/N 206-040-373-101 splined adapter, using existing hardware. Using spanner wrench (Snap-On P/N APS363 or equal), hold pulley in place. Slide Thomas Coupling with wrench installed, over shaft and torque to 200 to 300 in/lb. Place wrench, P/N 206-1435-2, with aircraft's tools.

4. Install JBS15005-1 splined internal ring (10) over the shaft and align holes to match holes of pulley. Position the ring until holes align. Pulley may be adjusted slightly to achieve alignment, maintaining 200 to 300 in - lbs. torque.

5. Install (4) NAS1351-3H6 (25) screws in the JBS15005-1 ring and torque 50 to 70 in - lbs. Safety wire the four screws with MS20995C41, Single Wire Method in accordance with MS33540.

F. Disc Pack, Shaft Adapter or FWD Shaft Installation (206B, 206L3 ONLY) (Ref. Fig. 202)

1. On a bench, assemble the Bell adapter, P/N 206-040-328-3, to the disc pack P/N 32721-1 with existing Bell bolt, P/N AN174-7A and existing AN960-416L washer (under bolt head) installed in the adapter. Position disc pack on the bolts with one existing 206-040-329 washer per bolt between the disc pack and adapter.

   NOTE: The radius edge of the washer must be mated against the disc pack. See Fig. 202.

2. After the disc pack is in place, add (1) existing 206-040-329 washer on each bolt under the existing Bell nut, with the radius edge facing the disc pack. Insure that the bolts are installed as described with the bolt head on the adapter side of the assembly, then torque nuts per manufacturers specifications.

3. Slide the assembled disc pack and adapter onto the oil cooler fan shaft, Bell P/N 206-040-320-103.

4. Attach the forward shaft assy, P/N 206-040-325, to the disc pack/adapter assy near the pulley with existing hardware oriented and installed as shown in Fig. 202. Insure that radius edge of washers mate against disc pack.

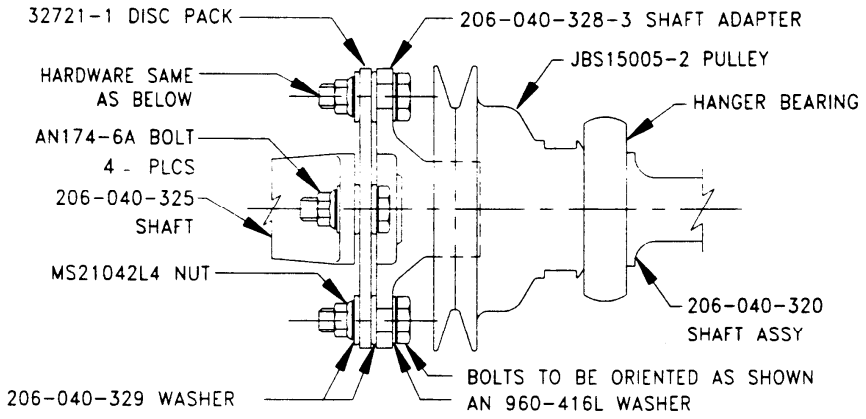


Figure 202. Pulley / Disc Pack Installation
(206B, 206L3 ONLY)

G. Disc Pack, Shaft Adapter or FWD Shaft Installation (206L4 ONLY) (Ref. Fig. 203)

1. On the bench, assemble the Bell adapter, P/N 206-040-373-101, to the disc pack P/N 406-040-340-101 with existing Bell bolt, P/N 20-065-05008 and JBS15005-3 washer (under bolt head with countersink facing the head) installed in the adapter. Note that the JBS15005-3 washer is olive drab in color. Position disc pack on the bolts with one JBS15005-3 washer per bolt between the disc pack and adapter.

   NOTE: The radius edge of the washer must be mated against the disc pack. See Fig. 203.

2. After the disc pack is in place, add (1) JBS15005-3 washer on each bolt under the existing Bell nut, P/N EWSN26M-5, with the radius edge facing the disc pack. Insure that the bolts are installed as described with the bolt head on the adapter side of the assembly, then torque nuts 150 to 180 in - lbs. A minimum of .5280 in. must be maintained between pulley and adapter.

3. Slide the assembled disc pack and adapter onto the oil cooler fan shaft, Bell P/N 206-040-320-103.

4. Attach the forward shaft assy, P/N 406-040-315-111, to the disc pack/adapter assy near the pulley with existing hardware oriented and installed as shown in Fig. 203. Insure that radius edge of washers mate against disc pack.

5. Measure the gap between the fwd face of the pulley and the aft flange of P/N 206-040-373-101 adapter. If the gap is .5280 or greater then proceed to Item 1.60. If the gap is less than .5280 then remove the Bell washer (1 each bolt) P/N 214-040-611-003 between the Bell disc pack, P/N 406-040-340-101 and the aft end of the shaft, P/N 406-040-315-111, and replace with JBS15005-3 washer (olive drab in color). The radius edge of the washer must face the disc pack). Measure the gap again. If it is .5280 or greater then proceed to Step 6.

6. If the measured gap is still less than .5280 then replace Bell washers P/N 214-040-611-003 (2 each bolt) between the disc pack (located at sta 165.969 near the engine) and the adapter on the fwd end of Bell shaft assy P/N 406-040-315-111 with the olive drab JBS15005-3 washers (1 each bolt). The radius edge of the washer must face the disc pack.

   NOTE: The existing washers, Bell P/N 214-040-611-003, between the disc pack and the output shaft adapter may then be replaced with the olive drab JBS15005-3 washers if needed to achieve the proper gap, but do not replace more washers than is necessary to achieve the correct gap or slightly more. The radius edge of the JBS15005-3 washer will always face the disc pack.

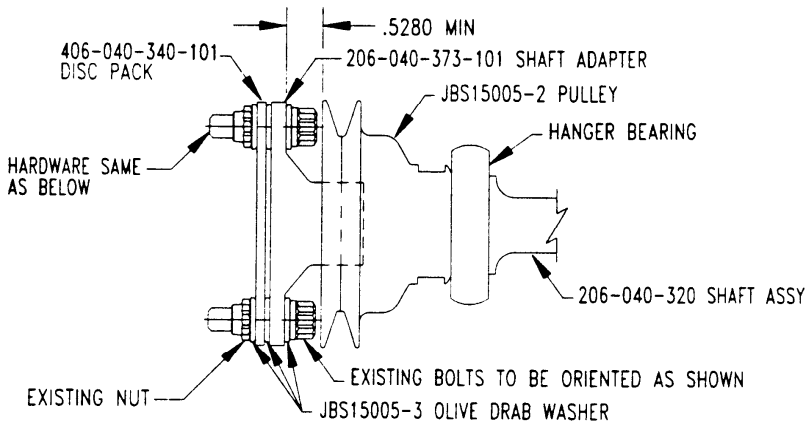


Figure 203. Pulley / Disc Pack Installation
(206L4 ONLY)

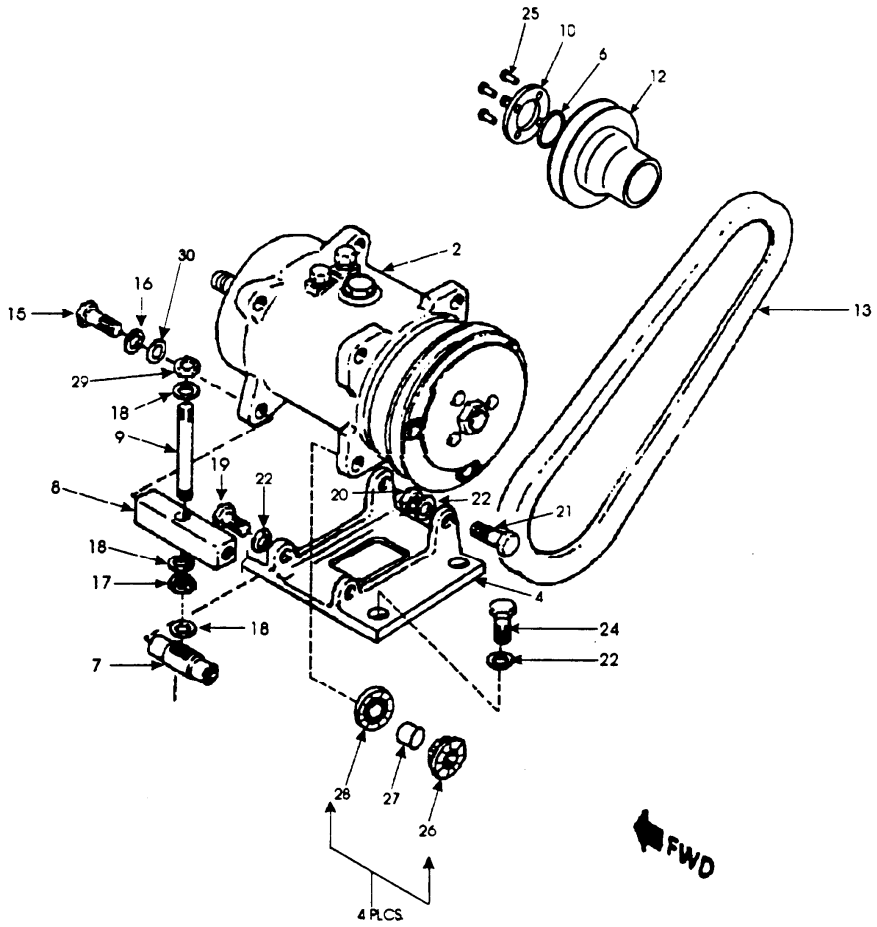


Figure 1. Compressor Assembly/Instl

FIG. ITEM	PART NUMBER	NOMENCLATURE	EFFECT	UNITS PER ASSY
1 1	206-0408	Compressor Installation		RF
2	JBS220-1	Compressor Assy		1
4	JBS823-1	Compressor Mount		1
6	MS28775-211	O-ring		1
7	JBS806-5	Adj. Support		1
8	JBS806-4	Adj. Bracket		1
9	JBS59-7	Stud		1
10	JBS15005-1	Spline Internal Ring		1
12	JBS15005-2	Adapter Pulley		1
13a	ES20033-27	Belt	B model	1
13b	ES20033-34	Belt	L3, L4	1
15	AN4-13A	Bolt		2
16	AN935-416	Lock Washer		2
17	AN315-5R	Nut		1
18	AN960-516	Washer		3
19	AN4-6A	Bolt		2
20	MS21042-4	Nut		2
21	AN4-15A	Bolt		2
22	AN960-416	Washer		8
24	AN4-11A	Bolt		4
25	NAS1351-3H6	Screw		4
26	JBS364-2	Bushing		4
27	JBS197-6	Spacer		4
28	ES32066-2	Bushing		4
29	MS21042-5	Nut		1
30	214-1410-1	Washer		8
-	206-1435-2	Spanner Wrench	L4	1
-	206-1435-3	Spanner Wrench	B, L3	1

Air Conditioning System-Compressor Assembly/Instl
IPL FIGURE 1

CONDENSER ASSEMBLY

DESCRIPTION AND OPERATION

1. GENERAL

The condenser assembly is located above the baggage compartment. It consists of a condenser coil unit, shroud, fan and receiver/drier . The condenser condenses the refrigerant gas to a liquid. This liquid is collected by the receiver/ drier where moisture is removed. The blower supplies cool (ambient) air to the condenser coil where the refrigerant gas can be condensed to a liquid. The air is then exhausted overboard through an exhaust duct located on the bottom of the aircraft.

This section of the maintenance manual discusses troubleshooting and maintenance practices used for the condenser assembly portion of the air conditioning system. An Illustrated Parts List is included in Figure 1.

TROUBLESHOOTING

1. GENERAL

The following procedures are used for troubleshooting the condenser assembly portion of the air conditioning system.

For troubleshooting of the condenser blower, an electrical procedure is conducted per 21-50-01, page 101.

2. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Service Pressure Gauge	Comm. Avail.	1	None
28vdc Source		A/R	None

3. CONDENSER TROUBLESHOOTING PROCEDURES (REF. IPL Fig. 1)

NOTE: Always attach a service gauge set to system prior to being trouble shooting to insure proper refrigerant charge is present.

	Trouble	Probable Cause	Correction
1.	Low air flow across condenser coil.	Dirty condenser coil.	Clean condenser coil.

MAINTENANCE PRACTICES

1. GENERAL

The following procedures are used to perform typical maintenance on the condenser assembly.

2. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Polyol Ester Oil	Comm. Avail.	A/R	Viscosity Grade 68
Vacuum Cleaner	Comm. Avail.	1	None
Coil Cleaner	Comm. Avail.	A/R	Non-acid based

3. CONDENSER ASSEMBLY MAINTENANCE PROCEDURES (REF. IPL Fig. 1)

A. Condenser Coil Cleaning Procedure
   1. Use vacuum cleaner to remove large debris from upstream and downstream coil faces.
   2. Spray coil cleaner on both coil faces. Wash off with water.
   3. Allow coil to dry thoroughly prior to additional maintenance.

B. Condenser Fan Overhaul
   The condenser fan can be overhauled with the replacement of the brushes and bearings. These items plus instructions to overhaul the fan are included in the overhaul kit (item 6).

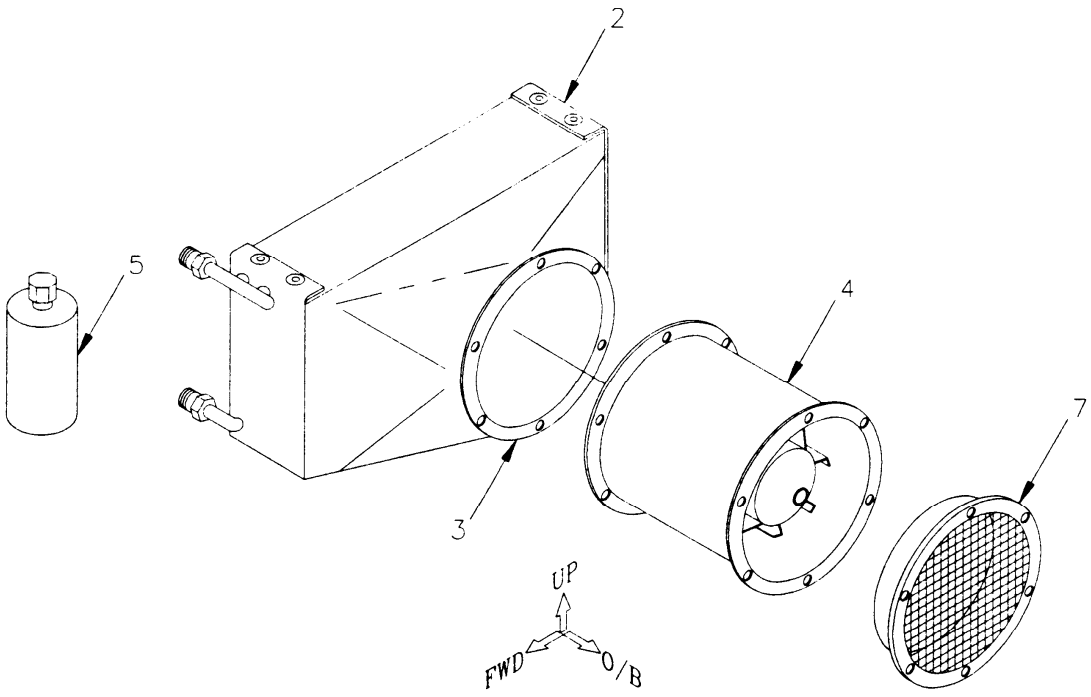


Figure 1. Condenser Assembly

FIG.	ITEM	PART NUMBER	NOMENCLATURE	EFFECT	UNITS PER ASSY
1	1	206-0302-6	Condenser Installation	B	RF
	1	206-0302-7	Condenser Installation	L3, L4	RF
	2	206-1351-2	Coil Assy		1
	3	206-1362-1	Shroud		1
	4	ES73127-2	Fan, Vaneaxial		1
	6	ES73127-20	Fan Overhaul Kit		1
	5	ES43030-2	Receiver/Drier		1
	7	206-0358-2	Adapter Collar		1

Air Conditioning System - Condenser Assembly
IPL FIGURE 1

FWD EVAPORATOR ASSEMBLY

DESCRIPTION AND OPERATION

1. GENERAL

The FWD evaporator assembly for the Bell 206 helicopter is located under the instrument panel on the right hand side with an air outlet on each side of the instrument panel. The evaporator assembly for includes an evaporator coil, blower with motor, expansion valve and air outlet ducting.

This section of the maintenance manual discusses troubleshooting and maintenance practices used for the evaporator assembly portion of the air conditioning system. Additional troubleshooting and testing procedures for the evaporator blower is contained in 21-50-01, pages 101 and 501. An Illustrated Parts List is included in Figure 1.

TROUBLESHOOTING

1. GENERAL

The following procedures are used for troubleshooting the fwd evaporator assembly portion of the air conditioning system.

2. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Service Pressure Gauge	Comm. Avail.	1	None
28vdc Source		A/R	None

3. EVAPORATOR TROUBLESHOOTING PROCEDURES (REF. IPL Fig. 1)

NOTE: Always attach a service gauge set to system prior to being trouble shooting to insure proper refrigerant charge is present.

A. Water is Being Blown from Air Outlets.
   1. Operate engine and apply 28 vdc electrical power.
   2. Select air conditioning system to ON.
   3. Check evaporator drain for condensate runoff.
   4. If no runoff, clear drain of blockage or verify that routing is in a down hill orientation.
   5. Select air conditioning OFF, remove electrical power.

B. No Cooling at Evaporator.
   1. Connect service pressure gauge to service ports located near compressor in engine compartment.
   2. Operate engine and apply 28 vdc electrical power.
   3. Select air conditioning system to ON.
   4. Check evaporator for proper cooling. If cooling not sufficient, check refrigerant level to ensure that system is correctly charged, this can be confirmed by a clear sight glass (no bubbles) on the top of the receiver dryer. If bubbles are present, add refrigerant till sight glass just clears.
   5. If system is correctly charged, replace expansion valve per Maintenance Practices procedure.

MAINTENANCE PRACTICES

1. GENERAL

The following procedures are used to perform typical maintenance on the evaporator assembly.

2. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Sealant	ES49000-1	A/R	None
Polyol Ester Oil	Comm. Avail.	A/R	Viscosity Grade 68
Vacuum Cleaner	Comm. Avail.	1	None
Coil Cleaner	Comm. Avail.	A/R	Non-acid based

3. EVAPORATOR MAINTENANCE PROCEDURES (REF. IPL Fig. 1)

A. Expansion Valve Replacement
1. Discharge system in accordance with recovery equipments instructions.
2. Disconnect liquid line from inlet of expansion valve, and cap. Remove the thermal sense bulb from its clamp located on the suction tube of the evaporator and carefully remove insulation covering bulb.
3. Disconnect the fitting that connects the valve to the coil and plug coil fitting.
4. Install new expansion valve and o-ring in the reverse order.
5. Lubricate o-ring with polyol ester oil or apply sealant to fitting mating surfaces prior to assembly.
6. Install the thermal sense bulb such that it makes contact with the suction tube along its entire length. Insulate the bulb thoroughly with insulation.

B. Evaporator Coil Cleaning Procedure
1. Use vacuum cleaner to remove large debris from upstream and downstream coil faces.
2. Spray coil cleaner on both coil faces. Wash off with water.
3. Allow coil to dry thoroughly prior to additional maintenance.

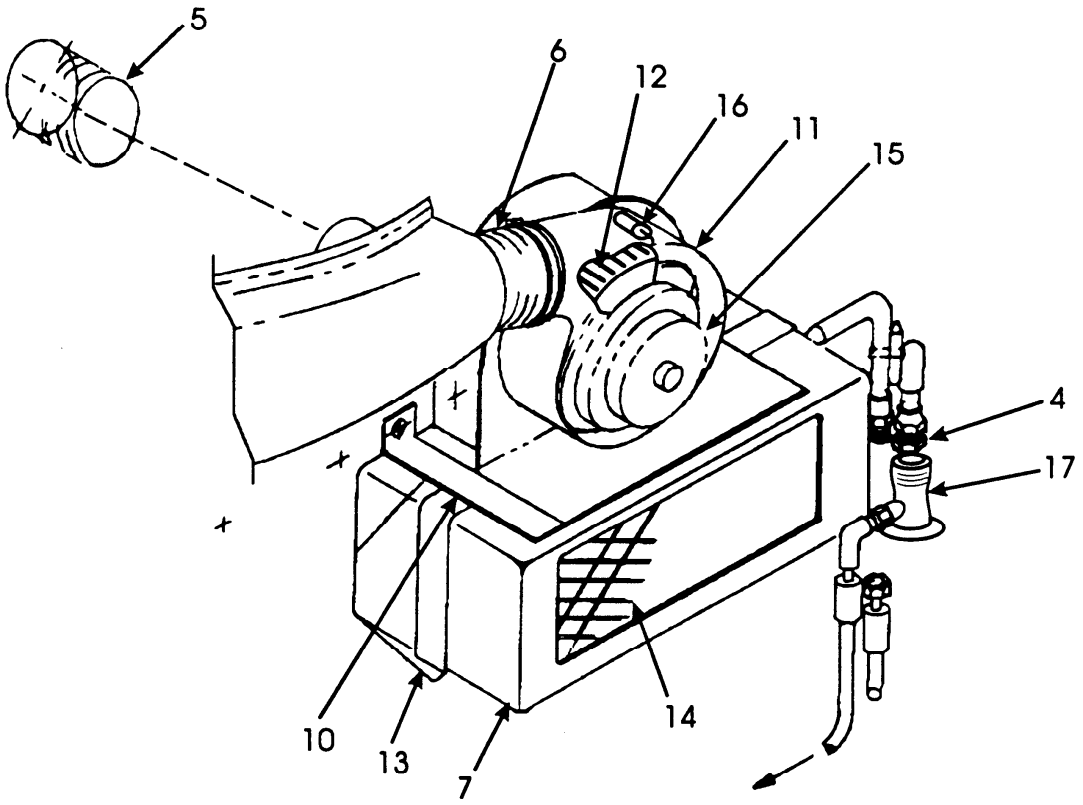


Figure 1. FWD Evaporator Assembly

FIG.	ITEM	PART NUMBER	NOMENCLATURE	EFFECT	UNITS PER ASSY
1	1	206-0208-1	FWD Evaporator Installation		RF
	4	ES49011-1	O-ring		1
	5	ES70009-3	Flexduct		1
	6	ES70009-2	Flexduct		1
	7	JBS2003-3	Evaporator Assy		1
	11	JBS862-6	Blower Housing		1
	16	JBS240-2	Low Speed Resistor		1
	12	ES73088-10	Blower Wheel		1
	13	ES49006-1	Drain		1
	14	JBS157-2	Coil Assembly		1
	15	ES61060-2	Motor		1
	17	ES26104-1	Expansion Valve		1

Air Conditioning System -FWD Evaporator Assy
IPL FIGURE 1

AFT EVAPORATOR ASSEMBLY

DESCRIPTION AND OPERATION

1. GENERAL

The aft evaporator assembly is located above the baggage compartment area and behind the rear passenger's seat. It consists of an evaporator, expansion valve, blower assembly and duuting The blower supplies conditioned air to the cabin. The evaporator coil cools and dehumidifies the air to be distributed by the blower and ducting.

This section of the maintenance manual discusses troubleshooting used for the aft evaporator assembly portion of the air conditioning system. An Illustrated Parts List is included in Figures 1 and 2.

TROUBLESHOOTING

1. GENERAL

The following procedure is used for troubleshooting the aft evaporator assembly. For additional troubleshooting procedures involving the electrical aspects of the evaporator blower, see 21-50-01, page 101.

2. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Service Pressure Gauge	Comm. Avail.	1	None
28vdc Source		A/R	None

3. EVAPORATOR TROUBLESHOOTING PROCEDURE (Ref. IPL Fig. 1 & 2)

A. Water is Being Blown from Air Outlets.
   1. Operate engine and apply 28 vdc electrical power.
   2. Select air conditioning system to ON.
   3. Check evaporator drain for condensate runoff.
   4. If no runoff, clear drain of blockage or verify that routing is in a down hill orientation.
   5. Select air conditioning OFF, remove electrical power.

B. No Cooling at Evaporator.
   1. Connect service pressure gauge to service ports located near compressor in engine compartment.
   2. Operate engine and apply 28 vdc electrical power.
   3. Select air conditioning system to ON.
   4. Check evaporator for proper cooling. If cooling not sufficient, check refrigerant level to ensure that system is correctly charged, this can be confirmed by a clear sight glass (no bubbles) on the top of the receiver dryer. If bubbles are present, add refrigerant till sight glass just clears.
   5. If system is correctly charged, replace expansion valve per Maintenance Practices procedure.

MAINTENANCE PRACTICES

1. GENERAL

The following procedures are used to perform typical maintenance on the aft evaporator assembly.

2. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Sealant	ES49000-1	A/R	None
Polyol Esyer Oil	Comm. Avail.	A/R	Viscosity Grade 68
Vacuum Cleaner	Comm. Avail.	1	None
Coil Cleaner	Comm. Avail.	A/R	Non-acid based

3. EVAPORATOR MAINTENANCE PROCEDURES (REF. IPL Fig. 1)

A. Expansion Valve Replacement
   1. Discharge system in accordance with recovery equipments instructions.
   2. Disconnect liquid line from inlet of expansion valve, and cap. Remove the thermal sense bulb from its clamp located on the suction tube of the evaporator and carefully remove insulation covering bulb.
   3. Disconnect the fitting that connects the valve to the coil and plug coil fitting.
   4. Install new expansion valve and o-ring in the reverse order.
   5. Lubricate o-ring with polyol ester oil or apply sealant to fitting mating surfaces prior to assembly.
   6. Install the thermal sense bulb such that it makes contact with the suction tube along its entire length. Insulate the bulb thoroughly with insulation.

B. Evaporator Coil Cleaning Procedure
   1. Use vacuum cleaner to remove large debris from upstream and downstream coil faces.
   2. Spray coil cleaner on both coil faces. Wash off with water.
   3. Allow coil to dry thoroughly prior to additional maintenance.

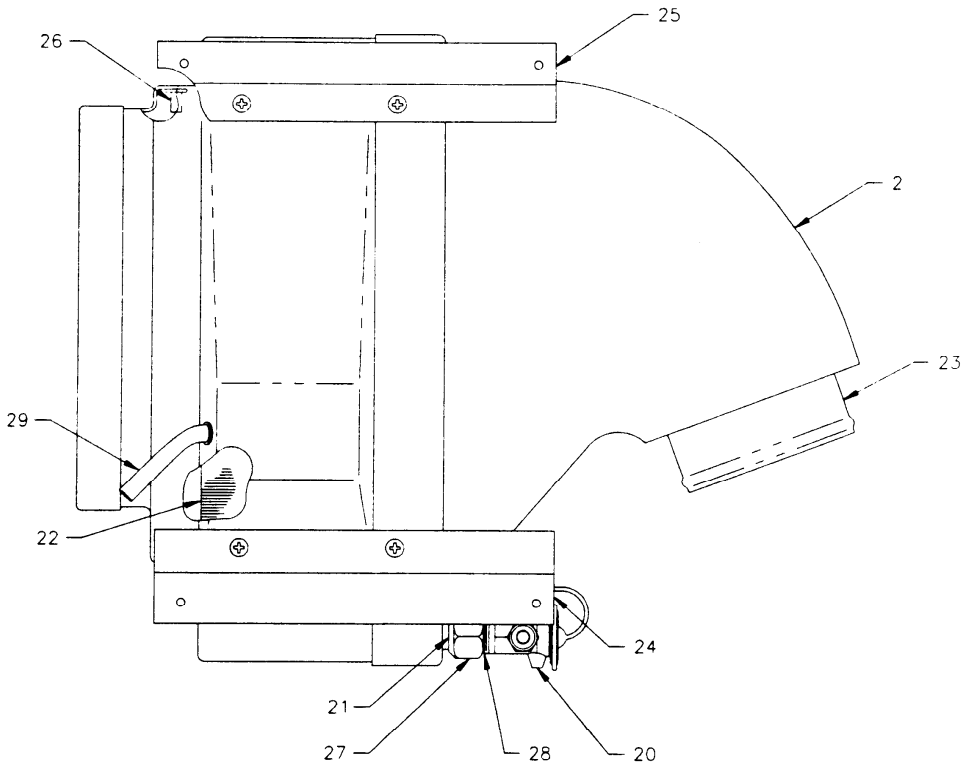


Figure 1. Aft Evaporator Assembly

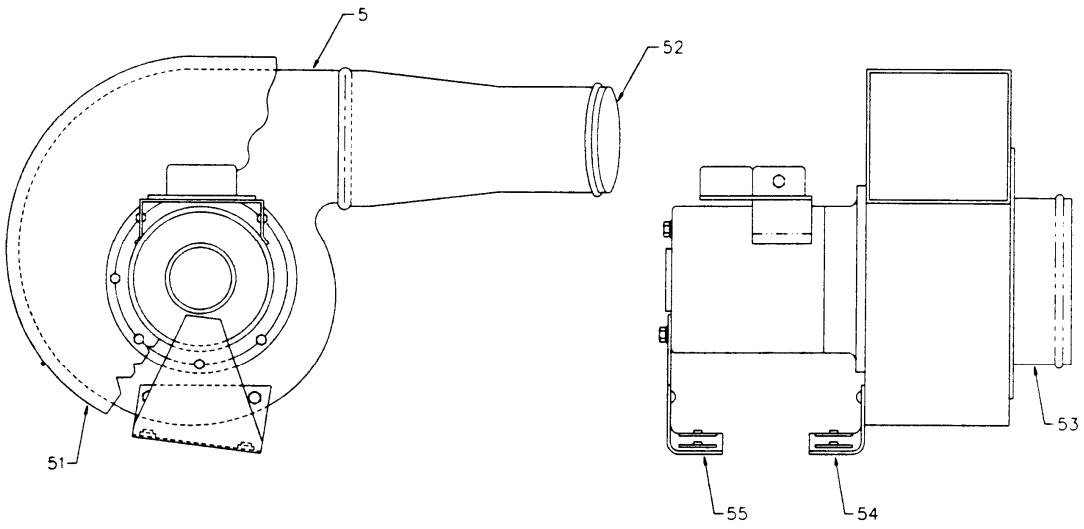


Figure 2. Aft Evaporator Blower Assembly

FIG. ITEM	PART NUMBER	NOMENCLATURE	EFFECT	UNITS PER ASSY
1 1	206-0208-1	AFT Evaporator Installation		RF
2	JBS2005-2	Evaporator Assy		1
20	ES26104-2	Expansion Valve		1
21	JBS60-2	Thermostat (Freeze sw)		1
22	JBS2006-2	Coil		1
23	JBS2007-1	Rear Cover		1
24	JBS2008-2	Bracket		1
25	JBS2008-1	Bracket		1
26	ES52126-1	Temp Sensor Probe		2
27	ES49011-2	O-ring		1
28	ES02163-2	Insulation		36 sq in
29	ES48012-1	Drain Tube		96 in

Air Conditioning System - AFT Evaporator Assembly
IPL FIGURE 1

FIG. ITEM	PART NUMBER	NOMENCLATURE	EFFECT	UNITS PER ASSY
2				
5	206-0259-1	Blower Assy		1
50	ES73103-2	Blower		1
51	JBS363-1	Insulation		1
52	206-1259-1	Collar Adapter "Y"		1
53	206-1258-1	Collar Assy		1
54	206-0257-2	Bracket Assy		1
55	206-0257-3	Bracket Assy		1

Air Conditioning System - AFT Evaporator Blower Assembly
IPL FIGURE 2