KEITH PRODUCTS, Inc.

Air Conditioning System for Learjet 60

Section	Component
21-50-00	Air Conditioning System
21-50-01	Electrical
21-50-02	Plumbing
21-50-03	Compressor/Drive Motor
21-50-04	Condenser
21-50-05	Forward Evaporator
21-50-06	Aft Evaporator
21-50-07	Air Distribution

Maintenance Manual
with
Illustrated Parts Catalog

Document Number CR-66-100-1M
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Prepared By:	P. Baba
Approved By:	M. A. Krause
Approved By:	J. T. Doell

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JUN 29 2010

LIST OF REVISIONS

Rev.	Date	Description	By	Approved
NC	1/14/98	Initial release	MJR	MJR
A	5/1/98	Minor corrections	LH	MJR
B	1/7/00	Updated time intervals for Inspection/Check Added overhaul time for compressor drive motor, and added intervals for FWD and AFT evaporator blowers.	PB	HA
C	1/3/01	Updated Maintenance Manuals Title pg, Table of Contents pg, and List of Revisions Page Added pages Record of Revisions, List of Service Bulletins, & List of Effective pages Modified footers & document titles to correlate w/ Maintenance Manuel standards 21-50-00 Sect. 1, Pg 1 was the pilot, now the pilots was the Crew, now the crew, was fig. 1 now system layout, was co-pilot now co-pilot's and was Wemac now wemac Sect. 2, Pg 2, para 2 deleted sentence "contains an evap……" also sentence "switch mounted on evap…." Sect. 2, Pg 601 (Action) was 21-50-06 pg 201, now 1-50-01 pg 102 Added system layout pictorial pg 3 21-50-01 Sect. 1, Pg 1 was Interface Control Box, now interface control box and was two (2), now two Sect. 2, Pg 1 (Table) sect. General in Flight, Comp Drive was off, now on Sect. 3A(4), Pg 101 was page 2, now page 1 Sect. 3A(5), Pg 101 was Power, Distribution Equipment, Bay, now power, distribution, equipment, bay Sect. 3A(7), Pg 101 was Ref 21-50-02, fig 1, item 17, now Ref 21-50-03, fig 1001, item 16 Sect. 3, Pg 102 (Note) was trouble shooting, now troubleshooting Sect. was 21-50-10, now 21-50-01, was fig. 10, now system electrical schematic fig. 1001, pg 103 21-50-02 Sect. 1, Pg 1 was polyol ester, now polyolester	JMS	HA

LIST OF REVISIONS (Continued)

Sect. 2, Pg 201 sealant was ES49000-3, now ES49000-1
Sect. 3, Pg 201 was Hose Swaging Instruction, now hose swaging instruction
Sect. B, Pg 202 was fig. 1 now fig. 1001,sht. 1 & was with polyol ester, now with polyolester
Sect. C, Pg 202 was one (1), now one hour
Sect. A, (Note) was polyol ester, now polyolester
Sect. A, (1) was and fitting, now and fittings
Section was 21-52-30 pictorial, now 21-50-02
IPC was fig. 40, now fig. 1001 and added title clarification
Modified P/L Added I/n 28-31 and updated other parts WAS ES48149-4, ES40158-4, ES40150-2, ES49001-1, ES26104-1, ES49001-3
Pictorial was fig. 30 pg 1,now fig. 1001, sht 1 and modified I/N's according to P/L 21-50-03
Sect. 1, Pg 1 was fig. 1, now fig. 1001(sht. 1-5)
Sect. 3, Pg 101 was Comp/Cond, now Compressor/Condenser also revised title
Sect. 3, (Note) was trouble shooting, now troubleshooting
Sect. 3(A) Pg 201 was two (2),now two
Sect. 2 & Sect. C Pg 201 was polyol ester, now polyolester
Sect. 6 Pg 202 was five (5), now five, was one (1), now one, and was fig. 20, now fig.1001
Sect. 7 Pg 202 Labeled fig. to be fig. 201
Section was 21-51-20, now 21-50-03 also added title to chart and updated P/L WAS ES61134-2, AN503-8-8, AN502-10R18, AN4-14A
Pictorial was fig. 20 pg 2, now fig. 1001, sht. 1 and modified I/N's according to P/L 21-50-04
Sect. 1 Pg 1 was direr, now drier 21-50-05
Sect. 3 Pg 101 was trouble shooting, now troubleshooting
Sect. 3 (A) was Being Blown, Air Outlets, now

LIST OF REVISIONS (Continued)

being blown, air outlets
Sect. 3 (B) was Cooling Evap. Now cooling evap.
Sect. B (1) was close out, now closeout
(4) Modified sentence structure
(5) New sentence Info
(6) New location for sentence (5)
Sect. 2 Pg 201 was ES49000-3, now ES49000-1
Sect. 3 (5) was polyol ester, now polyolester
Section was 21-50-15, now 21-50-05 Pg 1-4 Pg #'s was 4 of 8 now fig. 1001,sht.1
Modified IPC to include I/N 31-61 except for #'s 50-56 and updated P/L WAS
66-1260-4, JBS2050-2, 66-1260-5, 66-1260-11,66-1260-10, 66-0211-16, 66-0211-17, AN3-1A and Added title to Chart 21-50-06
Sect. 3 Pg 101 (Note) was trouble shooting, now troubleshooting
Sect. 3 (A) was Being Blown, Air Outlets, now being blown, air outlets (B) was Cooling Evap., now cooling evap.
Sect. B (1) was close out, now closeout (4) modified sentence structure (5) new sentence info (6) new location for sentence (5)
Sect. 2 Pg 201 was ES49000-3, now ES49000-1
Sect. 3 (6) was polyol ester, now polyolester
Section was 21-50-15, 1of 8, now fig. 1001, (sht. 1-4)
Modified Pg 4 for only I/N 1-38
Added I/N 31-38 and updated P/L WAS
66-0251-1, 66-0251-3, 66-0251-2, MS270.39-0808, MS20365-832, AN509-10R8
Pictorial was fig. 15 pg 1, now fig. 1001,sht. 1and modified I/N's according to P/L
Section was 21-27-10, now 21-50-07 and added new fig. was 10 pg 1-5, now 1001 sht. 1-4 except for I/N 18-23
Added 21-50-07 pg 1 system description

D	5/16/01	Section 21-50-13 page 1005 I/N 28 was 35-1560-8Revised 21-50-02 page	MAX	MAK
E	1/03/02	#, was 1001, now 601 Revised 21-50-06 page #, was 202, now 101 Revised 21-50-06 page #, was 202, now 201 Added pages 2 & 3 to 21-50-00 on the Table of Contents Added pages 202 & 1002 to 21-50-02 on the Table of Contents Added pages 202 & 1002-1005 to 21-50-03 on the Table of Contents Added pages 1002-1004 to 21-50-05 on the Table of Contents Added pages 1002-1004 to 21-50-06 on the Table of Contents Added pages 2 & 1002-1004 to 21-50-07 on the Table of Contents Deleted 202 from 21-50-06 on List of Effective Pages Added brush inspection of aft evap. blower motor to 21-50-01 103 Changed pg. 103 to 104 on section 21-50-01 Added service bulletins to List Of Service Bulletins	BCS	MAK
F	1/28/02	Added Rev F to Record of Revision Added SB166 to List of Service Bulletins Revised List of Effective Pages Revised Figure 1001 (SHT 2) of Section 21-50-03 Added I/N 17 Belt Guard to top figure Revised Figure 1001 (SHT 5) of Section 21-50-03 Added I/N 17 and added –2 to 66-0500-1 Revised I/N 1 WAS 66-0550-1	TLW	MAK
G	7/30/02	Added Appendix A. Added reference- 4. Torque requirements for all fittings are included in Appendix A. –to section 21-50-02, pg. 202	DRC	MAK
H	1/21/05	Added SB195 to **List of Service Bulletins.**	MRR	MAK
J	5/18/06	Section 21-50-06 page 1003 Updated current changes to I/N 36 & I/N 35 Reason: Facilitate MFG per ER3122	CDW	MAK

K	6/29/10	Updated Headers to current configuration. The following was done on Section 21-50-03 Edited part B, step 3 on pg. 201 WAS Replace brushes per Overhaul Manual TR-656... NOW Replace brushes per Manual TR-712... Added part D. Fan shroud Replacement to pg. 202 Edited the following on pg. 1002. Added 4X to I/N's 28, 29, 31 and 32. Edited the following on pg. 1003. Added 3x to I/N's 10 and 11. Deleted I/N 34 and added I/N 21 on pg. 1004. Edited the following part numbers on parts list on pg. 1005. Edited I/N 7 WAS ES10501-9 NOW ES39255-1. Edited Qty I/N 10 and 11 WAS 4 NOW 3. Edited Qty I/N 14 WAS 2 NOW REF. Deleted I/N 19 WAS 35-0560-3 Qty 1. Added I/N 19 JBS13015-4. Edited I/N 21 WAS JBS15015-4 NOW JBS15015-2. Edited Qty I/N 28 WAS 1 NOW 7. Edited Qty I/N 29 WAS 16 NOW 17. Edited Qty I/N 36 WAS 1 NOW 6. Edited Qty I/N 37 WAS 13 NOW 8. Edited Qty I/N 38 WAS 4 NOW 2. Edited Qty I/N 39 WAS 1 NOW 6. Added I/N 42 thru 48. Edited the following on Section 21-50-07. Pictorially updated views on pages 1001 and 1002. Edited the following on page 1004 part list Edited Qty I/N 6 WAS 2 NOW 1. Edited Qty I/N 7 WAS 1 NOW 12. Edited Qty I/N 8 WAS 3 NOW 120. Edited Qty I/N 10 WAS 4 NOW 60. Edited Qty I/N 12 WAS 1 NOW 12. Deleted I/N 38 WAS MS21044N08 Qty 2. Updated purpose on Introduction page. Reason: Product Improvement Per Proj. 29017 and Service Difficulty per ER4134.	LEO	TCN MARR RELEASE DATE JUN 29 2010

RECORD OF REVISIONS

REV. NO.	ISSUE DATE	DATE INSERTED	BY	REV. NO.	ISSUE DATE	DATE INSERTED	BY
ORIG.	1/14/1998						
A	5/1/98						
B	1/7/2000						
C	1/3/2001						
D	5/16/2001						
E	1/3/2002						
F	1/28/2002						
G	7/30/2002						
H	1/21/2005						
J	5/18/2006						
K	6/29/2010						

LIST OF SERVICE BULLETINS

SERVICE BULLETIN NO.	DATE	SUBJECT	REVISION NO.	DATE INCORPORATED
SB180	2/22/01	Fwd Blower	A	
SB174	8/4/01	Belt Guard	NC	
SB160	12/7/00	Access Panel	A	
SB166	10/8/01	Belt Guard	A	
SB195	12/22/04	Bonding Jumper	C	

LIST OF EFFECTIVE PAGES

CHAPTER SECTION SUBJECT	PAGE	DATE
Title	1	June 29, 2010
List of Revisions	1	January 3, 2001
	2	January 3, 2001
	3	January 3, 2001
	4	May 18, 2006
	5	June 29, 2010
Record of Revisions	1	June 29, 2010
List of Service Bulletins	1	January 21, 2005
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21-50-00 A/C System Description	1	January 3, 2001
	2	January 3, 2001
System Layout	3	January 3, 2001
	4	January 3, 2001
Inspection Intervals	601	January 3, 2002
21-50-01 Electrical Desc. And Oper.	1	January 3, 2001
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21-50-02 Plumbing Desc. And Oper.	1	January 3, 2001
Maintenance Practices	201	January 3, 2001
	202	July 30, 2001
Inspection	601	January 3, 2002
Illustrated Parts	1001	January 3, 2001
	1002	January 3, 2001

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Troubleshooting	101	January 3, 2001
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21-50-04 Condenser Assembly	1	January 3, 2001
Description and Operation		
Troubleshooting	101	January 15, 1998
Maintenance Practices	201	January 15, 1998
21-50-05 Fwd Evaporator Assembly	1	January 15, 1998
Description and Operation		
Troubleshooting	101	January 3, 2001
	102	June 29, 2010
Maintenance Practices	201	January 3, 2001
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	1002	January 3, 2001
	1003	January 3, 2001
	1004	January 3, 2001
	1005	June 29, 2010
21-50-06 Aft Evaporator Assembly	1	January 3, 2001
Description and Operation		
Troubleshooting	101	January 3, 2002
Maintenance Practices	201	January 3, 2002
Illustrated Parts	1001	January 3, 2001

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CHAPTER SECTION SUBJECT	PAGE	DATE
	1002	January 3, 2001
	1003	May 18, 2006
	1004	January 3, 2001
21-50-07 Air Distribution Assembly Description and Operation	1	January 3, 2001
21-50-07 Air Distribution Assembly Description and Operation Cont.	2	January 3, 2001
Illustrated Parts	1001	June 29, 2010
	1002	June 29, 2010
	1003	January 3, 2001
	1004	June 29, 2010
Appendix A	1	July 30, 2002

Keith Products Inc.

Learjet 60 Maintenance Manual/Illustrated with Parts Catalog
CR-66-100-1M

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INTRODUCTION

1. PURPOSE

The purpose of this Maintenance Manual is to provide detailed instructions for the troubleshooting, checking, and maintenance of the Keith Products, Inc., air conditioning system for the Learjet Model 60 aircraft. This manual is only to be used as reference for incorporation into the aircraft manufacturer's manual.

2. SCOPE

The scope of this 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 Catalog (IPC) covering the breakdown of each major component of the air conditioning system is included in this manual.

3. ARRANGEMENT

This maintenance manual is arranged in accordance with Air Transport Association (ATA Specification 100) and includes an Illustrated Parts Catalog.

4. GLOSSARY

Nonstandard abbreviations and symbols used in this maintenance manual are described below:

Abbreviations:

A/C	- Air Conditioning
A/R	- As Required
Assy	- Assembly
Comm. Avail.	- Commercially Available
Evap	- Evaporator
FWD	- Forward
Gnd	- Ground
GPU	- Ground Power Unit
IPC	- Illustrated Parts Catalog
STC	- Supplemental Type Certificate
SW	- Switch
VDC	- Volts Direct Current

AIR CONDITIONING SYSTEM

SYSTEM DESCRIPTION

1. GENERAL

The air conditioning system for the Learjet Model 60 aircraft consists of a refrigerant R134a vapor cycle cooling system. This system allows the pilots to control cooling for a comfortable aircraft cabin on the ground and in flight. System layout shows a general arrangement of the air conditioning system.

This switch panel located on the co-pilot's lower instrument panel contains the cooling system ON/OFF/FAN switch, the crew fan speed switch, and the cabin fan speed switch.

2. REFRIGERATION SYSTEM

The refrigeration or air conditioning system, as designed and manufactured by Keith Products for the Learjet Model 60 aircraft, is a vapor cycle type cooling system using refrigerant R134a. The system is electrically operated using the aircraft 28 VDC electrical system and is operable in all normal flight modes. Air conditioning may be operated with ground external power or the aircraft electrical system with both generators providing 28 VDC.

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

The compressor and condenser assemblies are mounted in the tailcone. The compressor drive motor also has a fan that provides airflow for the condenser. The motor and compressor are mounted on a beam. The motor turns at approximately 7,500 RPM. The compressor is belt driven from the motor shaft. The compressor takes low-pressure refrigerant gas and compresses it to a higher pressure and temperature. Condenser cooling air passes over the compressor and drive motor to provide cooling airflow for those components prior to passing through the condenser coil to remove heat from the refrigerant system. After passing through the condenser coil, the air is exhausted to the outside through an exhaust plenum with outlets located on the bottom of the aircraft.

An evaporator unit is located below the co-pilot's floor. It provides cooling airflow for the cockpit and the cabin overhead wemac outlets. It is of a design where in the cabin air is drawn into the blower, located beneath the pilot's seat, which sends air across the evaporator coil and delivers the conditioned air to an overhead outlet duct. 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. The evaporator is equipped with a thermal expansion valve that regulates the amount of refrigerant entering the coil to provide the optimum cooling effect. The evaporator blower can be operated in the “FAN” position to recirculate cabin air without cooling. The blower is operated from an independent and variable fan speed control potentiometer mounted on the A/C switch panel.

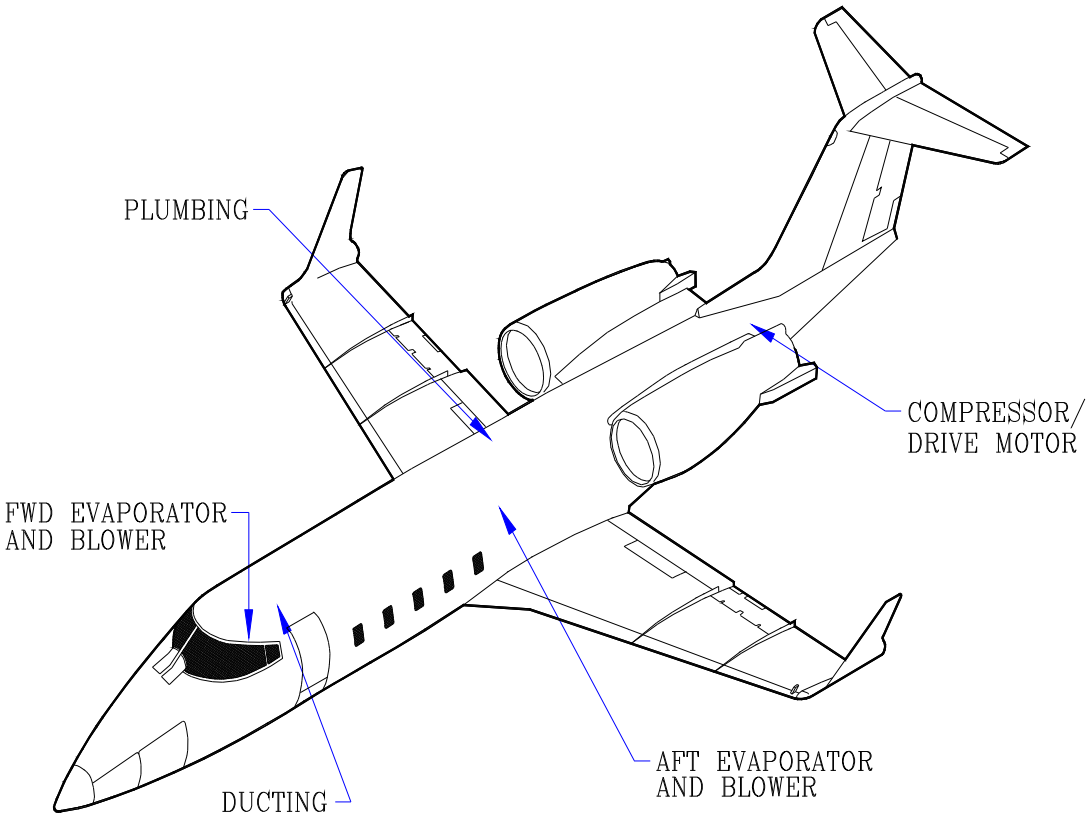
An additional evaporator/blower unit is installed just forward of the AFT pressure bulkhead. The blower provides flood duct cooling to the AFT cabin. This recirculating system continues to dry and cool the air each time it passes through the evaporator. Moisture removed from the air by the cold coil (condensate) is collected within the evaporator housing and is drained overboard. The evaporator is equipped with a thermal expansion valve that regulates the amount of refrigerant entering the coil to provide the optimum cooling effect. The evaporator blower can be operated in the “FAN” position to recirculate cabin air without cooling. The blower is operated from an independent and variable fan speed control potentiometer mounted on the switch panel.

The plumbing that connects the compressor, condenser and the evaporators, 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 compressor in the tailcone. They are sized differently to avoid incorrect cross connecting when gaining access to the plumbing for system recharging.

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, located on the compressor discharge port that activates in the event of an over-pressure. This switch will open at approximately 350 PSIG and will interrupt power to the compressor control circuit. This in turn will de-energize the compressor motor relay and remove power to the compressor motor. The refrigerant system pressure will then drop. The switch will also interrupt power to the compressor control circuit under low pressure conditions. The second overpressure safety device is a fuse plug that 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.

The electrical system allows operation of the air conditioning system from either aircraft power with both generators on-line or from an active GPU prior to engine start. System safety features include electrical interlocking and load shedding. In flight or on ground, the air conditioning system can be operated from the aircraft electrical system only with both generators on line. Loss of either generator will automatically shed the air conditioning system electrical loads except for the minimal loads of the evaporator

fans. Also, the air conditioning system is inhibited when either START-OFF-GEN switch is selected to START.



SYSTEM LAYOUT

AIR CONDITIONING SYSTEM

INSPECTION/CHECK

1. GENERAL

Listed below are the recommended inspection intervals for maintenance critical items associated with the air conditioning system. Proper and timely inspections will keep the air conditioning system operating at its peak efficiency.

2. INSPECTION INTERVALS

ITEM	INSPECT FOR	INTERVAL	ACTION
Air Conditioning System Components	Dirt, damage	On condition or every 600 hours.	Clean or replace component as necessary.
Compressor Belt	Tension wear	Within five hours of installing new belt, then every 600-hour aircraft inspections.	Tension or replace as necessary (see 21-50-03, page 201.)
Sight Glass	Proper refrigerant level	When problem is suspected.	Discharge/charge as necessary per TR-134.
Evaporator and Condenser Coils	Dirt	At 600-hour aircraft inspections.	Clean as necessary.
Refrigerant Hoses	Chafing wear	At 1200-hour aircraft inspections.	Repair as necessary per 21-50-02, page 201.
Compressor Drive Motor	Brush wear	At 1200 motor hours.	Inspect/replace per 21-50-03, page 201.
	Overhaul	Every 2000 motor hours.	
FWD Evaporator Blower	Overhaul	Every 1000 motor hours.	Return to Keith Products for overhaul.
AFT Evaporator Blower	Brush wear	At 750 motor hours.	Inspect as necessary per 21-50-01, page 103.
	Overhaul	Every 1500 motor hours.	

ELECTRICAL

DESCRIPTION AND OPERATION

1. GENERAL

The air conditioning system consists of one high energy compressor drive/condenser fan motor and two evaporator blowers (1 FWD and 1 AFT). The air conditioning system is operated by a mode switch with “COOL-OFF-FAN” positions. Airflow for the evaporators is controlled by a variable potentiometer for fan speed. The system incorporates a binary pressure switch to sense an over pressure or under pressure condition in the system.

The air conditioning system is controlled by an interface control box which monitors generator and GPU inputs to ensure operation or shedding of the system if a fault exists.

This section of the maintenance manual describes the electrical system and presents electrical troubleshooting procedures.

2. LOAD SHED DESCRIPTION

The system incorporates a logic interface control box that enables the system to operate or be shed under various conditions. The table below shows operation under various conditions.

CONDITIONS	EVAP FANS	COMP DRIVE
Gnd Power Cart/On	On	On
Gnd Power Cart Connected/Off	On	Off
Battery Only	On	Off
One Generator on Gnd	On	Off
Both Generators on Gnd	On	On
Refrigerant Over/Under-Pressure	On	Off
One Generator in Flight	On	Off
Both Generators in Flight	On	On
Either START-OFF-GEN Switch in START position	Off	Off

AIR CONDITIONING SYSTEM OPERATIVE CONFIGURATIONS

TABLE 1

ELECTRICAL

TROUBLESHOOTING

1. GENERAL

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

35-TOOLS AND EQUIPMENT

DESIGNATION	REF. NO.	QTY.	REMARKS
Service Pressure Gauge	Comm. Avail.	1	None
Multimeter	Comm. Avail.	1	None
28 VDC Source	N/A	A/R	None

35-ELECTRICAL TROUBLESHOOTING PROCEDURES

NOTE: Always attach a service gauge set to system prior to beginning troubleshooting to ensure proper refrigerant charge is present.

CAUTION: Do not operate air conditioning system with condenser air inlet or outlet blocked.

A. Air Condition Selected, Compressor Drive/Condenser Fan Motor Does Not Turn:

1. Connect service pressure gauge to service ports located near compressor/drive motor enclosure assembly.
2. Connect and activate ground power to aircraft.
3. Select air conditioning system to “COOL”.
4. Check that load shed start conditions in the Description and Operation paragraph are met. Reference 21-50-01, page 1.
5. Check the 175A current limiter located in the existing power distribution panel in the AFT equipment bay. Replace if necessary.
6. Check for power at input and output of the compressor relay. If power is present at input and output, proceed to step 8. If power is present only at input, proceed to step 7.
7. Check for power at the leads of the pressure switch. If power is present at the input of the switch and not the output, disconnect leads to the switch and check continuity of pressure switch (reference 21-50-103 IPC figure 1001, item 16). If no continuity and gauge set reads adequate pressure, replace pressure switch. Switch can be removed without discharge of refrigerant. Back switch off in a counter-clockwise direction.

Re-install in reverse order. Lubricate O-ring in switch per 21-50-02, page 202.

8. Check for power at motor. If power is present, proceed to step 9. If power is not present and load shed conditions of step 4 are met, check power on the interface control box at connector Pin 4. If power is present, system problem exists in load shed system start unit. If power is not present, check 5-amp CB and mode switch.
9. Fault is isolated to compressor drive/condenser fan motor. Unit should be replaced.
10. Select air conditioning OFF, remove electrical power, disconnect service gauge when troubleshooting is complete.

EVAPORATOR BLOWERS

1. GENERAL

The following procedures are used for troubleshooting the blowers.

CAUTION: Do not operate air conditioning system with condenser air inlet or outlet blocked.

2. TOOLS AND EQUIPMENT

DESIGNATION	REF. NO.	QTY.	REMARKS
Multimeter	Comm. Avail.	1	None
28 VDC Source	N/A	A/R	None

3. BLOWER TROUBLESHOOTING PROCEDURES

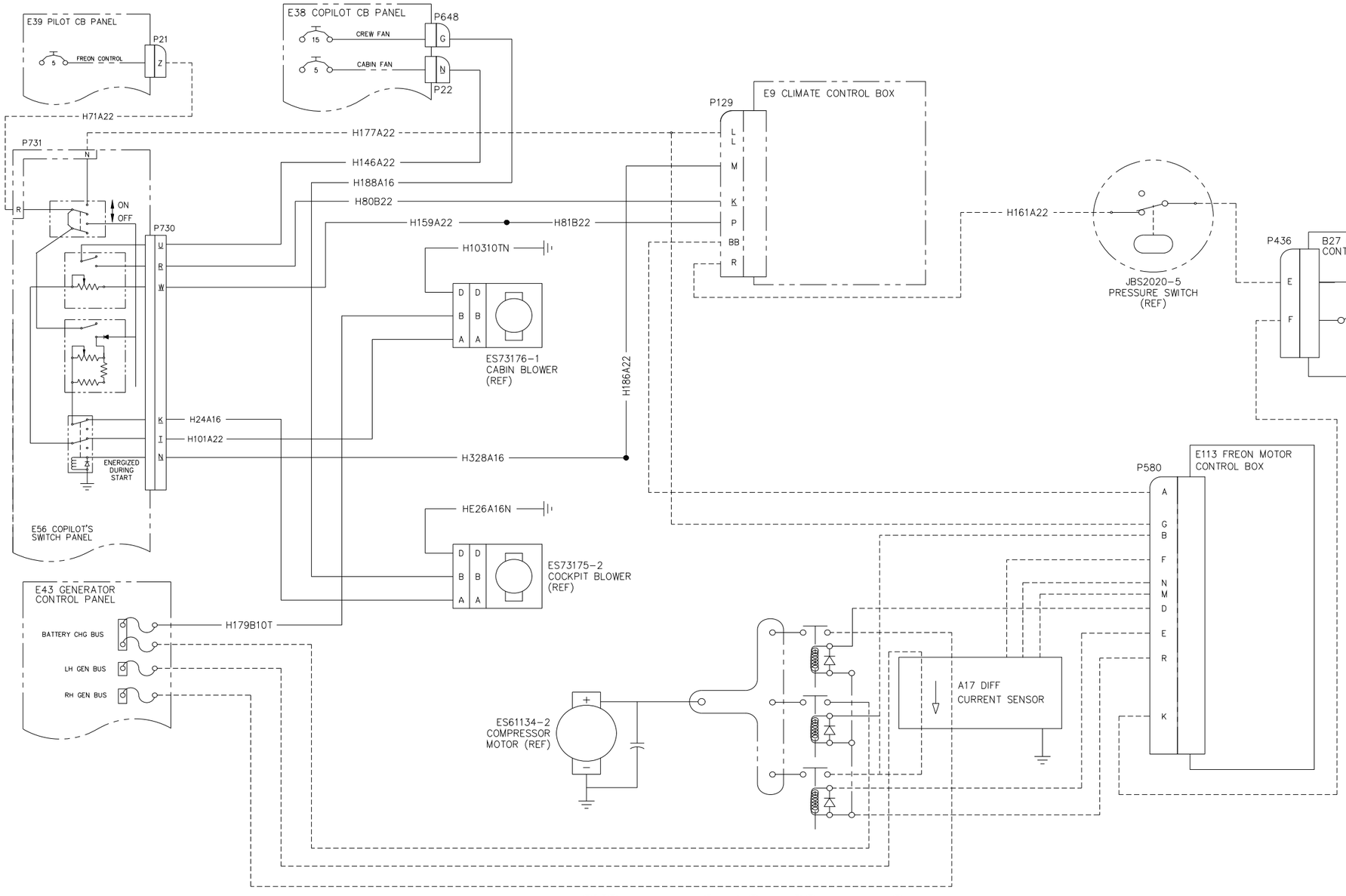
With the air conditioning system operating, observe if any of the following conditions occur as described in Table 1:

NOTE: Always attach a service gauge set to system prior to beginning troubleshooting to ensure proper refrigerant charge is present.

TROUBLE	PROBABLE CAUSE	CORRECTION
1. Blower will not run.	Loss of power to blower motor.	Check for 28 VDC at Pin B.
2. Blower will not run.	Defective potentiometer or signal wire.	Check for variable voltage at Pin A.
3. Power at connector but blower still doesn't run.	Defective blower motor.	Replace blower assembly.

COMPRESSOR/CONDENSER TROUBLESHOOTING TABLE

4. AFT EVAPORATOR BLOWER MOTOR INSPECTION:
    1. Remove aft blower motor from aircraft.
    2. Remove brush cover from motor.
    3. Inspect brushes for wear. Measure length of brushes.
    4. Return motor to Keith Products for brush replacement if brush length is less than .70 inches.



SYSTEM ELECTRICAL SCHEMATIC
FIGURE 101

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 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 polyolester oils. Two service valves are located near the compressor/drive motor enclosure assembly. They are sized differently to avoid incorrect cross-connection when servicing the system. A receiver/drier is located downstream of the condenser and is installed on the condenser flange to remove moisture from the liquid refrigerant. A binary pressure switch monitors the refrigerant gas pressure. This switch will open at a compressor discharge over pressure of 350 psi and under pressure conditions of 30 psi. This will interrupt the power to the compressor drive motor control circuit and stop the compressor.

This section of the maintenance manual discusses checks and maintenance practices used for the plumbing portion of the air conditioning system.

PLUMBING

MAINTENANCE PRACTICES

1. GENERAL

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

CAUTION: Do not operate air conditioning system with condenser air inlet or outlet blocked.

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
Polyolester Oil	Comm. Avail.	A/R	Viscosity ISO 68
Sealant	ES49000-1 Available from Keith Products	A/R	None

3. PLUMBING MAINTENANCE PROCEDURES

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 instructions 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 an 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. IPC Fig. 1001 Sht. 1) over the tube “O” end of the fitting.
2. Lubricate O-ring with polyolester oil or sealant prior to assembly.
3. Apply sealant to all fitting mating surfaces prior to assembly.
4. Torque requirements for all fittings are included in Appendix A.

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 for a period of time greater than one hour.

PLUMBING

INSPECTION/CHECK

1. GENERAL

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

35-TOOLS AND EQUIPMENT

DESIGNATION	REF. NO.	QTY.	REMARKS
Electronic R134a Refrigerant Leak Detector	Comm. Avail.	1	None

35-PLUMBING CHECK PROCEDURES

A. Plumbing Installation Preventive Maintenance Check:

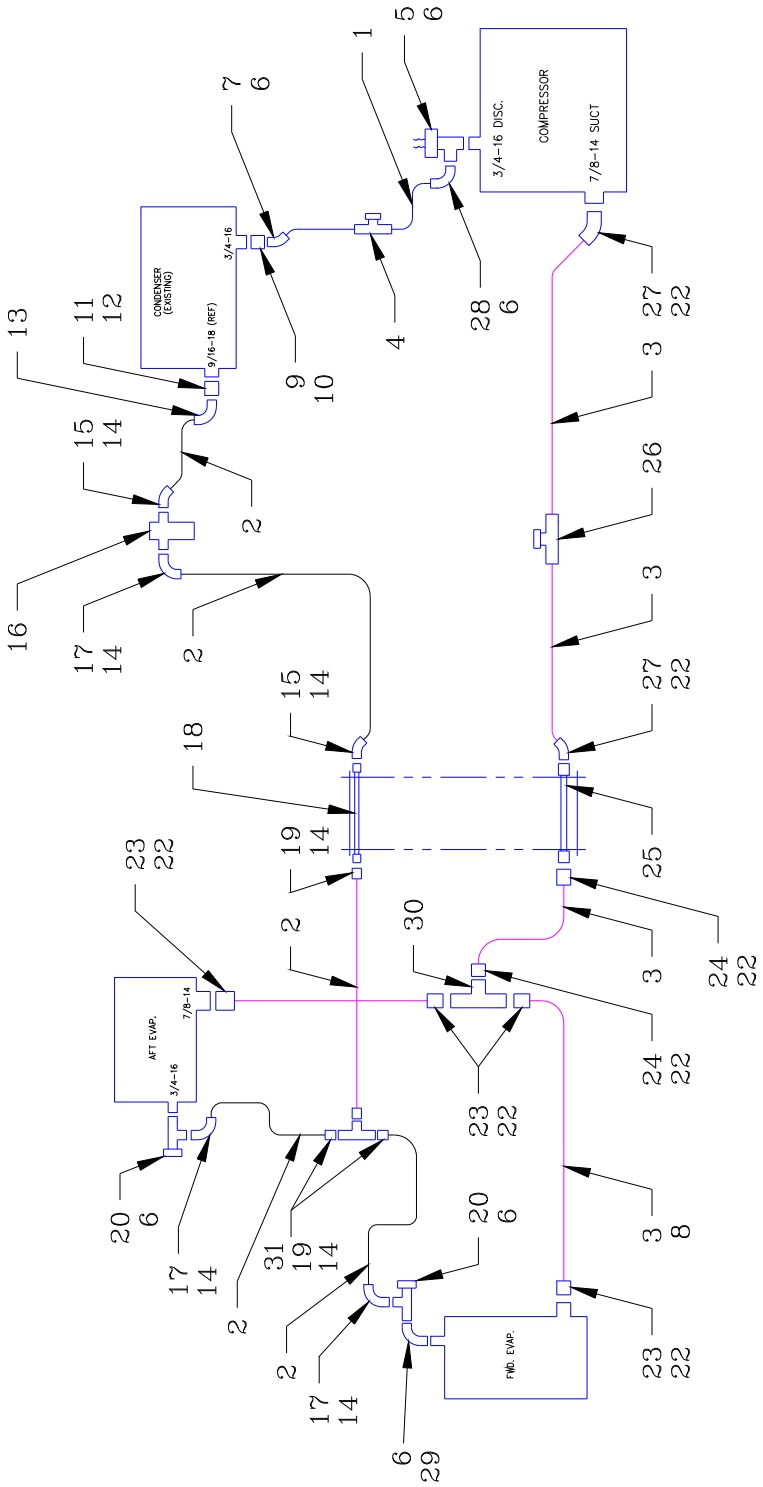
CAUTION: Do not operate air conditioning system with condenser air inlet or outlet blocked.

NOTE: All O-rings should be lubricated with polyolester oil or sealant applied to all fitting mating surfaces 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 fittings 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 near the compressor.
2. Check that the gauges are reading the proper static pressure. Both gauges should read approximately 55 psig @ standard temperature (59^{o}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 IPC.



PLUMBING INST'L – CABIN COOLING REFRIGERATION
FIGURE 1001 (SHT.1)

MODEL 60
ILLUSTRATED PARTS CATALOG

FIG	ITEM	PART NUMBER	NOMENCLATURE	EFF CODE	UNITS PER ASSY
1001		66-0800-1	Plumbing Instl		
		66-0250	Fwd Evaporator Assy		(Fig 15)
		66-0260	Aft Evaporator Assy		(Fig 15)
		JBS222-1	Compressor Assy		(Fig 20)
	1	ES48149-2	Hose		(Ref)
	2	ES48149-1	Hose		(Ref)
	3	ES48149-3	Hose		(Ref)
	4	ES40158-2	Splicer w/R134a SV		1
	5	JBS2020-5	Pressure Switch		(Fig 20)
	6	ES49011-2	O-Ring		3
	7	ES40150-2	Fitting		2
	8	ES02162-3	Tube		(Ref)
	9	JBS6009-2	Fitting		1
	10	MS28775-114	Fitting		1
	11	AN919-12D	Fitting		1
	12	MS28775-111	O-Ring		1
	13	ES40148-8	Fitting		1
	14	ES49011-1	O-Ring		9
	15	ES40150-1	Fitting		2
	16	ES43030-2	Receiver/Drier		1
	17	ES40151-1	Fitting		3
	18	66-0850-1	Tube Assy, Discharge		1
	19	ES40149-1	Fitting		4
	20	ES26105-1	Expansion Valve		1
	21	ES26104-1	Expansion Valve		1
	22	ES49011-3	O-Ring		7
	23	ES40149-3	Fitting		4
	24	ES40149-7	Fitting		2
	25	66-0850-2	Tube Assy, Suction		1
	26	ES40158-4	Splicer w/R-134a SV		1
	27	ES40150-7	Fitting		2
	28	ES40151-2	Fitting		1
	29	ES41062-2	Adapter		1
	30	ES41061-2	Adapter		1
	31	ES41061-1	Adapter		3

PLUMBING INST'L – CABIN COOLING REFRIGERATION
FIGURE 1001 (SHT. 2)

COMPRESSOR ASSEMBLY

DESCRIPTION AND OPERATION

1. GENERAL

The following assembly is located in the tailcone. The compressor is mounted on a beam assembly which also includes the compressor drive motor. The drive motor via a multi V flat belt, turns the compressor which compresses the refrigerant gas for condensing at ambient temperatures. A binary pressure switch mounted on the compressor monitors the refrigerant gas pressure. This switch will open at a compressor discharge over-pressure of 350 psi and under-pressure conditions of 30 psi. This will interrupt the signal to the interface control box and stop the compressor drive motor.

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 Catalog is included in Figure 1001Sht. 1-5.

COMPRESSOR ASSEMBLY

TROUBLESHOOTING

1. GENERAL

The following procedures are used for troubleshooting the compressor assembly.

CAUTION: Do not operate air conditioning system with condenser air inlet or outlet blocked.

2. TOOLS AND EQUIPMENT

DESIGNATION	REF. NO.	QTY.	REMARKS
Service Pressure Gauge	Comm. Avail.	1	None
28 VDC Source	N/A	A/R	None

3. COMPRESSOR/CONDENSER TROUBLESHOOTING PROCEDURES

With the air conditioning system operating, observe if any of the following conditions occur as described in Table 1.

NOTE: Always attach a service gauge set to system prior to beginning troubleshooting to ensure 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 compressor.
3. High compressor discharge pressure.	a) Condenser air exhaust restricted. b) Refrigerant overcharge.	a) Inspect exhaust flow path. b) Discharge refrigerant until only occasional bubbles are present in sight glass.
4. Rough running.	Internal compressor problem.	Replace compressor.

COMPRESSOR/CONDENSER TROUBLESHOOTING
TABLE 1

COMPRESSOR ASSEMBLY

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 Gauge	Comm. Avail.	1	None
Oil Dipstick	Make from metal wire.	1	See figure 201
Coil Cleaner	Comm. Avail.	A/R	Non-acid based
Polyolester Oil	Comm. Avail.	A/R	Viscosity ISO 68

3. COMPRESSOR ASSEMBLY MAINTENANCE PROCEDURES

A. Compressor Drive Belt Adjustment:

1. Adjust belt for moderate tension and then rotate large pulley through two revolutions.
2. Tension belt to deflect 0.16 inch with a 2-3 lb. force applied at midspan location.
3. Rotate belt two revolutions, retention as required.

B. Compressor Drive Motor Brush Inspection:

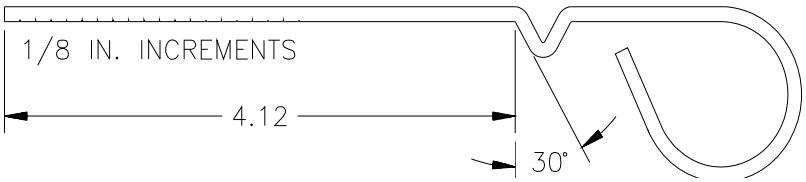
1. Remove anti-drive end bell from motor.
2. Inspect brushes for wear. Measure brush length along the longest side of angled face.
3. Replace brushes per Manual TR-712 if brushes are shorter than 1.00 in. New brush length is 1.250 in. Shortest useable length is 0.880 in.

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. Use only polyolester oil viscosity grade ISO 68.

1. Operate air conditioning system for 10 minutes. This will collect as much oil as possible in the compressor.

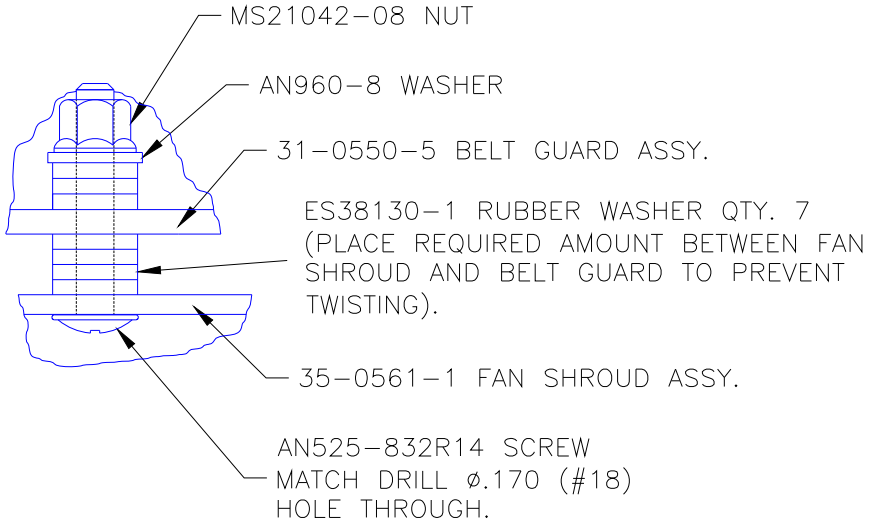
2. Evacuate air conditioning system and remove compressor from aircraft.
3. Place compressor on table such that the oil fill plug is up.
4. Remove oil fill plug.
5. Insert dipstick into oil fill port.
6. Check that the oil level is five fluid ounces (at the 5th increment). Add or subtract oil in one fluid ounce increments until five fluid ounces is obtained.
7. Clean oil fill port area and install oil fill plug. Torque plug to 6-9 ft-lbs.

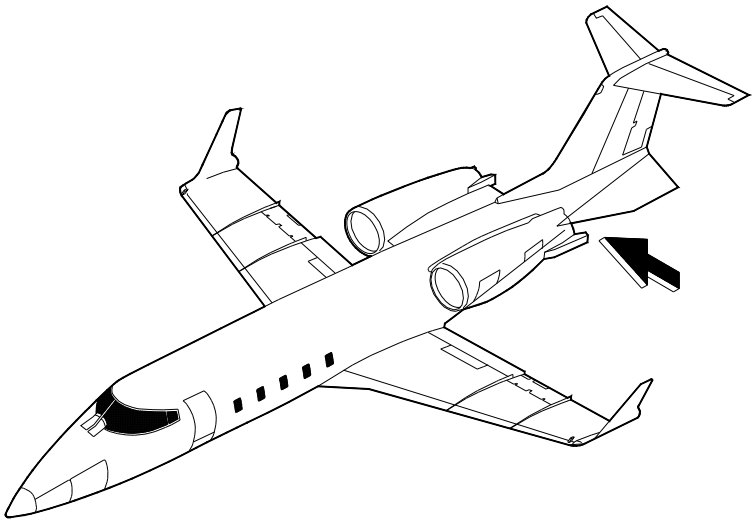


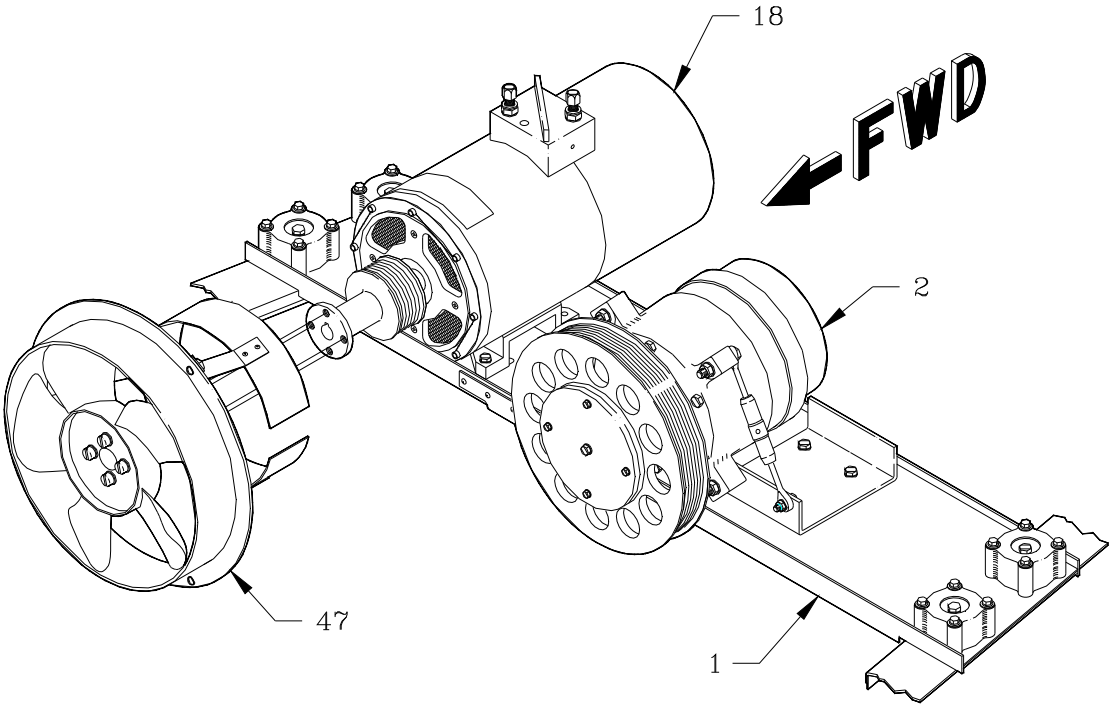
FABRICATED DIPSTICK
Figure 201

D. Fan shroud replacement:

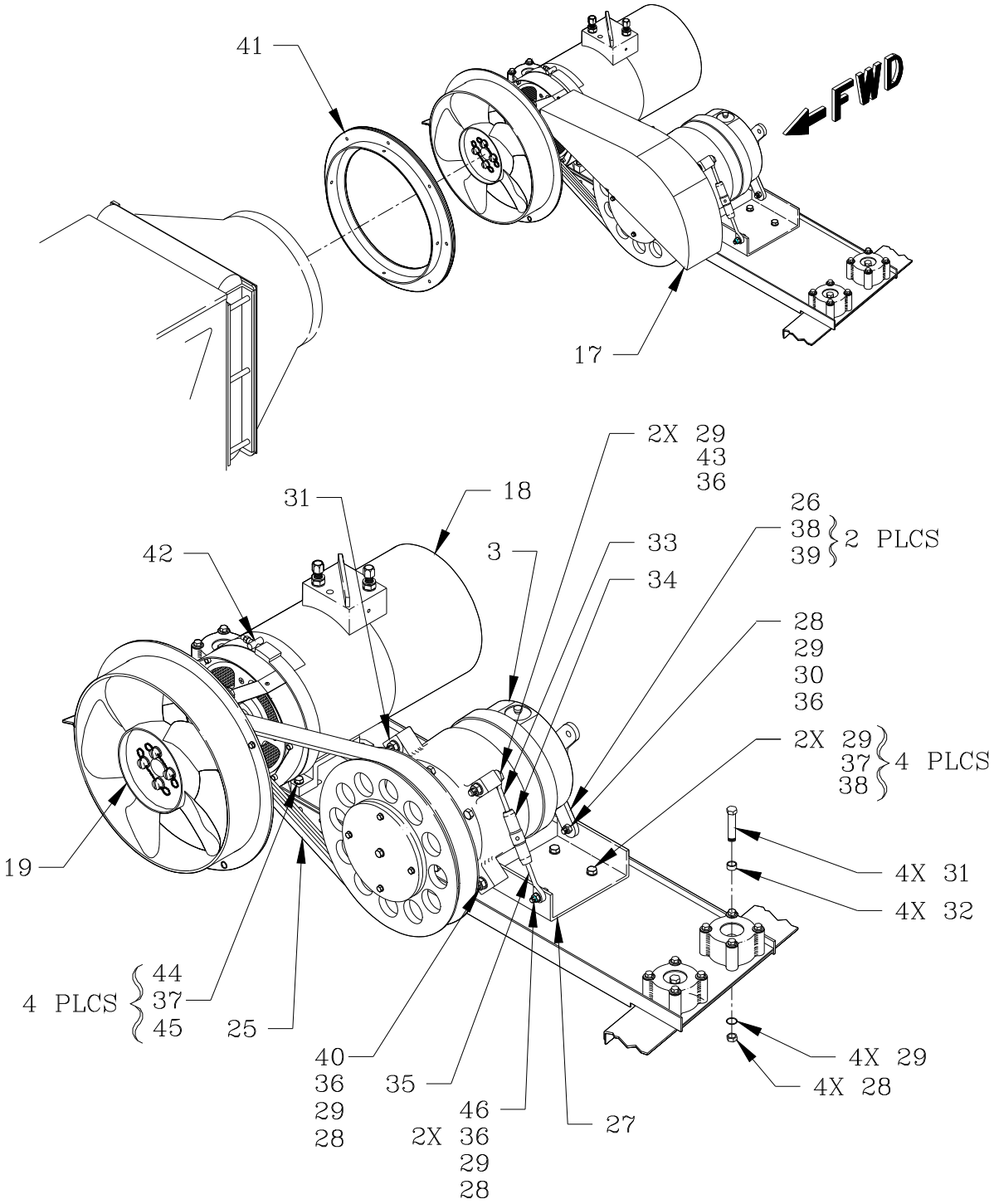
1. Remove hardware attached from fan shroud assembly to belt guard and retain hardware.
2. Loosen the clamp around the fan shroud assembly.
3. Install new fan shroud assembly in reverse order. The compressor assembly must be in the belt tightened position before match drilling the new hole location from belt guard to fan shroud assembly.



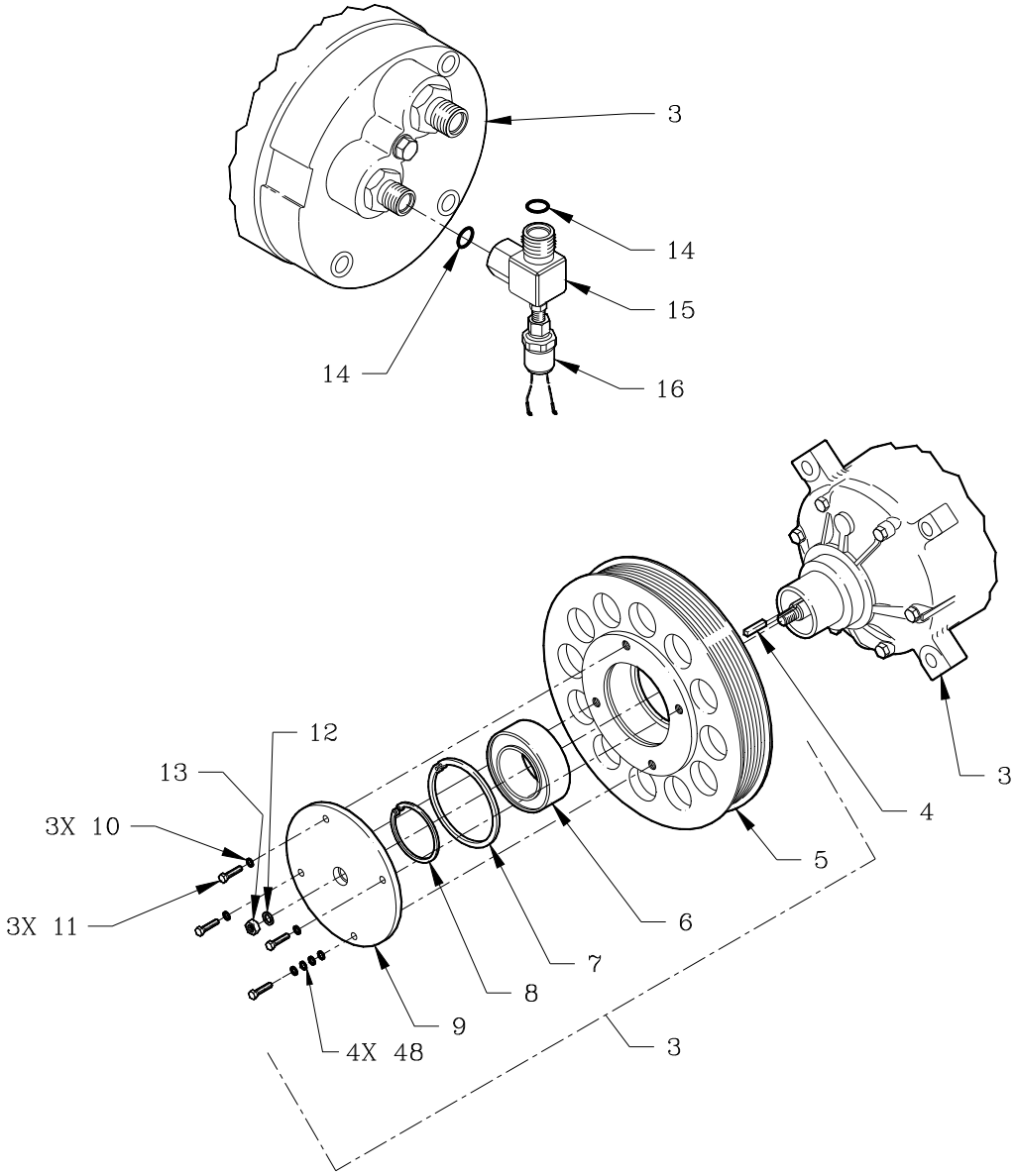




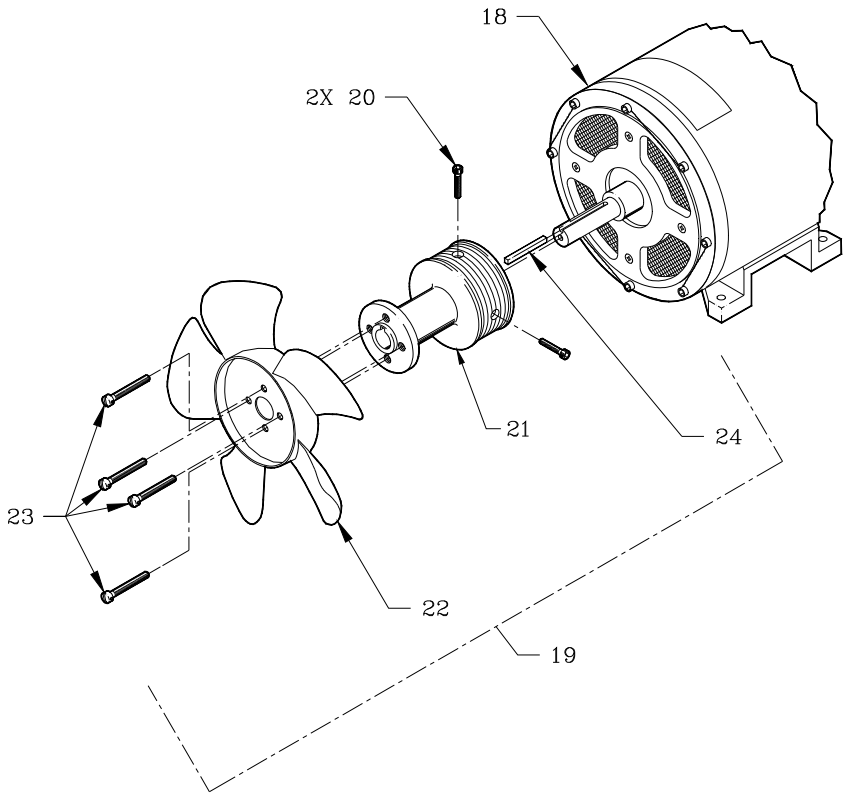
COMPRESSOR & MOTOR INST' L – CABIN COOLING REFRIGERATION
FIGURE 1001 (SHT. 1)



COMPRESSOR & MOTOR INST'L – CABIN COOLING REFRIGERATION
FIGURE 1001 (SHT. 2)



COMPRESSOR & MOTOR INST'L – CABIN COOLING REFRIGERATION
FIGURE 1001 (SHT. 3)



COMPRESSOR & MOTOR INST'L – CABIN COOLING REFRIGERATION
FIGURE 1001 (SHT. 4)

MODEL 60 ILLUSTRATED PARTS CATALOG

FIG	ITEM	PART NUMBER	NOMENCLATURE	EFF CODE	UNITS PER ASSY
1001		66-0500-1, -2	Pallet Beam Assy & Comp. Inst'l		
	1	66-0550-3	Pallet Beam Assy		1
	2	JBS222-1	Compressor Assy		1
	3	JBS223-1	Compressor		1
	4	ES20091-1	Key		1
	5	JBS14001-10	Pulley		1
	6	ES20146-4	Bearing		1
	7	ES39255-1	Retaining Ring		1
	8	ES10306-3	Retaining Ring		1
	9	JBS14001-8	Pulley End Plate		1
	10	AN960-10L	Washer		3
	11	AN3H-4A	Bolt		3
	12	AN960-616	Washer		1
	13	ES34126-1	Shaft Nut		1
	14	ES49011-2	O-Ring		REF
	15	ES49024-1	Manifold Fitting		1
	16	JBS2020-5	Pressure Switch		1
	17	31-0550-5	Belt Guard Assy		1
	18	ES61134-3	Motor, Compressor Drive		1
	19	JBS13015-4	Fan Blade Assembly		1
	20	ES31030-1	Screw		2
	21	JBS15015-2	Pulley		1
	22	ES73068-1	Fan		1
	23	AN503-8-8	Screw		4
	24	JBS80-1	Key		1
	25	ES20040-6	Belt		1
	26	35-1560-9	Bracket		1
	27	35-1560-12	Support		1
	28	MS21042-4	Nut		7
	29	AN960-416	Washer		17
	30	AN4-5A	Bolt		1
	31	AN4-16A	Bolt		5
	32	NAS43HT4-14	Spacer		4
	33	MS21254-5LS	Eye End, LH Thread		1
	34	MS21251-A5S	Turnbuckle		1
	35	MS21254-5RS	Eye End, RH Thread		1
	36	AN960-416L	Washer		6
	37	AN4-7A	Bolt		8
	38	ES39112-4	Bolt		6
	39	ES38128-4	Washer		2
	40	AN4-13A	Bolt		1
	41	66-0350-1	Shroud Assy		1

FIG	ITEM	PART NUMBER	NOMENCLATURE	EFF CODE	UNITS PER ASSY
	42	MS21920-47	Clamp		1
	43	AN4-21A	Bolt		1
	44	AN970-4	Washer		4
	45	MS35335-33	Lock Washer		4
	46	AN4-6A	Bolt		1
	47	35-0561-1	Fan Shroud Assembly		1
	48	AN970-3	Washer		4

FIGURE 1001 (SHT. 5)

CONDENSER ASSEMBLY

DESCRIPTION AND OPERATION

1. GENERAL

The condenser assembly is located in the tailcone and is attached to the condenser exhaust plenum. It consists of a condenser coil unit, shroud, 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 compressor drive motor includes a fan that draws in cool (ambient) air from an air inlet and supplies air to the condenser coil where the refrigerant gas can be condensed to a liquid. The air is then exhausted overboard through the exhaust plenum and exits at 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.

CONDENSER ASSEMBLY

TROUBLESHOOTING

1. GENERAL

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

2. TOOLS AND EQUIPMENT

DESIGNATION	REF. NO.	QTY.	REMARKS
Service Pressure Gauge	Comm. Avail.	1	None
28 VDC Source	N/A	A/R	None

3. CONDENSER TROUBLESHOOTING PROCEDURES

CAUTION: Do not operate air conditioning system with condenser air inlet or outlet blocked.

NOTE: Always attach a service gauge set to system prior to beginning troubleshooting to ensure proper refrigerant charge is present.

TROUBLE	PROBABLE CAUSE	CORRECTION
Low air flow across condenser coil.	Dirty condenser coil. Missing fan blades. Bent fins.	Clean condenser coil. Straighten fins.

CONDENSER TROUBLESHOOTING

TABLE 1

CONDENSER ASSEMBLY

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
Polyolester Oil	Comm. Avail.	A/R	Viscosity ISO 68
Vacuum Cleaner	Comm. Avail.	1	None
Coil Cleaner	Comm. Avail.	A/R	Non-acid based
Fin Tool	Comm. Avail.	1	None

3. CONDENSER ASSEMBLY MAINTENANCE PROCEDURES

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. Straighten bent cooling fins:

1. Carefully comb fins with fin comb tool until straight.

FWD EVAPORATOR ASSEMBLY

DESCRIPTION AND OPERATION

1. GENERAL

The FWD evaporator assembly for the Learjet 60 is located under the co-pilot's floor and provides cooling airflow to the flight crew through an overhead duct. The evaporator assembly includes an evaporator coil, expansion valve and air outlet ducting.

This section of the maintenance manual discusses troubleshooting and maintenance practices used for the FWD evaporator assembly portion of the air conditioning system.

FWD EVAPORATOR ASSEMBLY

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
28 VDC Source	N/A	A/R	None

3. EVAPORATOR TROUBLESHOOTING PROCEDURES

CAUTION: Do not operate air conditioning system with condenser air inlet or outlet blocked.

NOTE: Always attach a service gauge set to system prior to beginning troubleshooting to ensure proper refrigerant charge is present.

A. Water is being blown from air outlets:

1. Operate GPU 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 downhill 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 closeout assembly.
2. Operate GPU and apply 28 VDC electrical power.
3. Select air conditioning system to ON.
4. Check evaporator for proper cooling. If cooling is 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/drier. If bubbles are present, add refrigerant till sight glass just clears.
5. Check for blockage in condenser coil; inspect coil fins, cleaning and straightening as necessary; and check expansion valve inlet screen for debris.

6. If system is correctly charged, replace expansion valve per Maintenance Practices procedure.

FWD EVAPORATOR ASSEMBLY

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
Polyolester Oil	Comm. Avail.	A/R	Viscosity ISO 68
Vacuum Cleaner	Comm. Avail.	1	None
Coil Cleaner	Comm. Avail.	A/R	Non-acid based

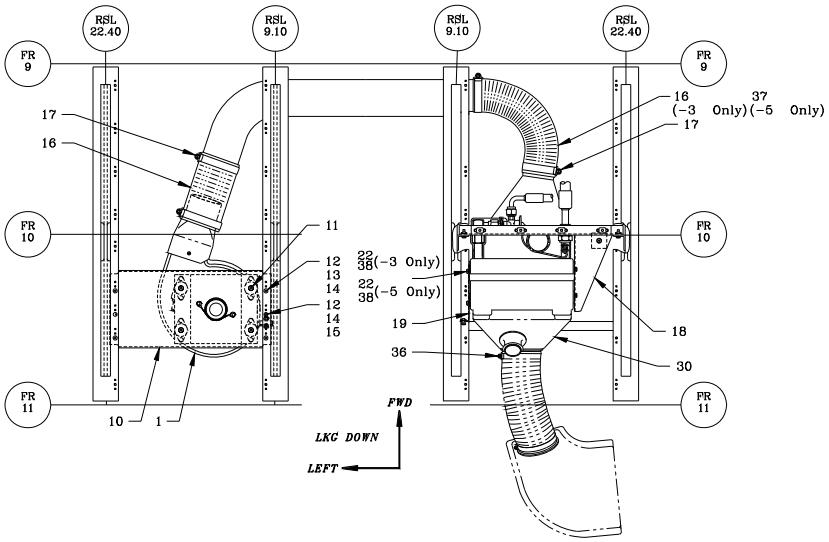
4. EVAPORATOR MAINTENANCE PROCEDURES

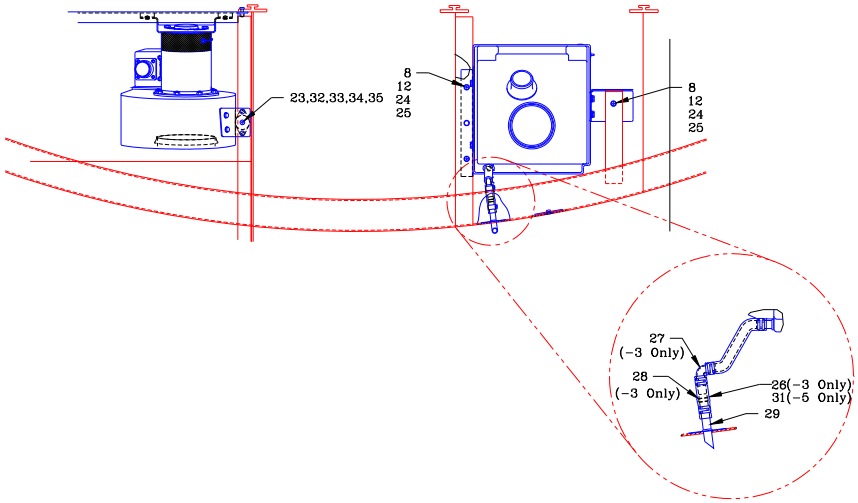
A. Expansion Valve Replacement:

1. Discharge system in accordance with recovery equipment's 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 polyolester 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, and locate it at the 3 or 9 o'clock position on the tube. Insulate the bulb thoroughly with insulation.

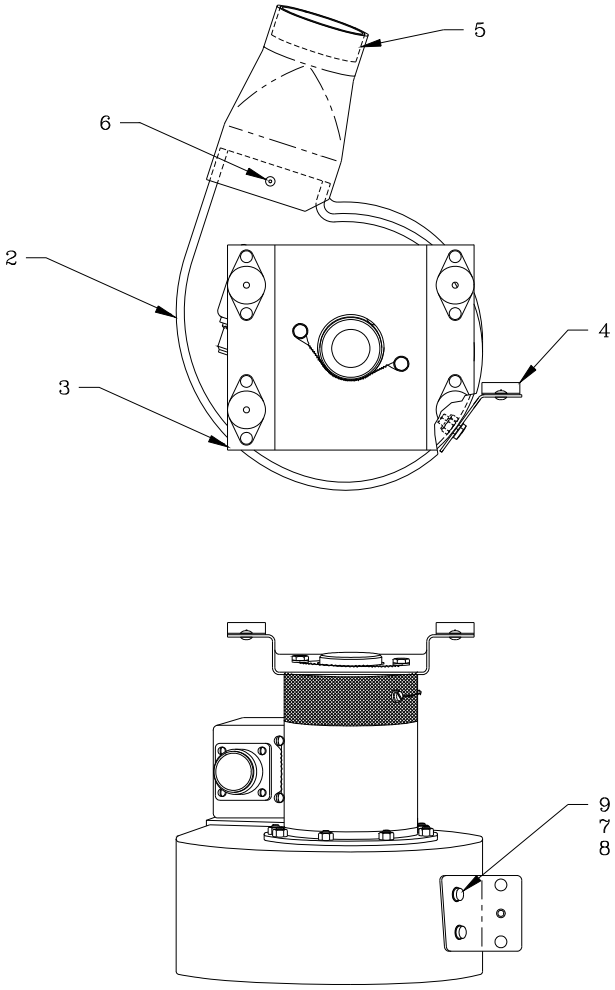
Evaporator Coil Cleaning Procedure:

1. Use vacuum cleaner to remove large debris from the coil face.
2. Spray coil cleaner on coil face. Wash off with water.

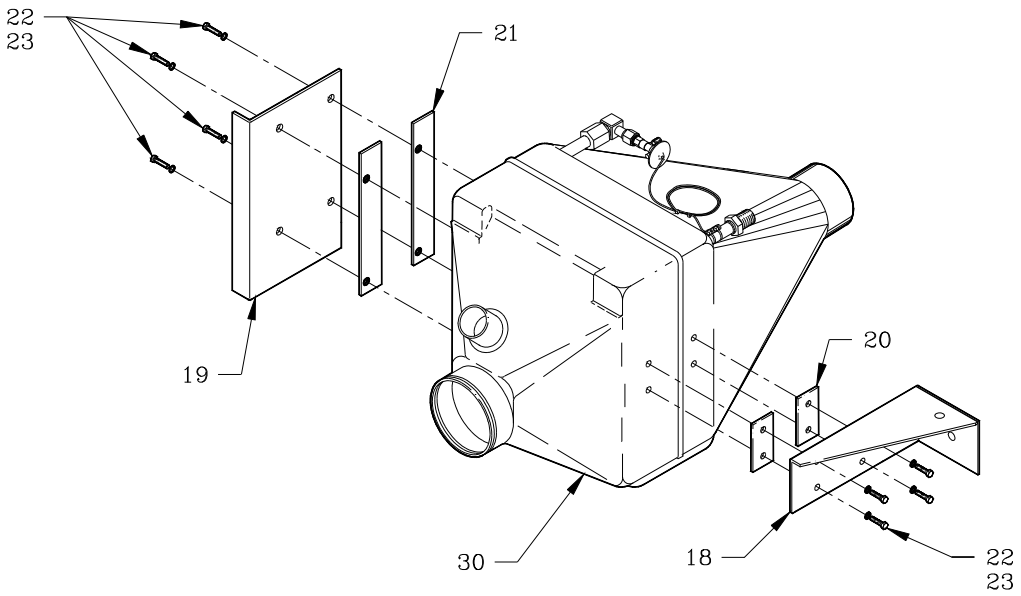




COOLING SYSTEM INST' L – CABIN REFRIGERATION
FIGURE 1001 (SHT. 1)



COOLING SYSTEM INST' L – CABIN REFRIGERATION
FIGURE 1001 (SHT. 2)



COOLING SYSTEM INST' L – CABIN REFRIGERATION
FIGURE 1001 (SHT. 3)

MODEL 60
ILLUSTRATED PARTS CATALOG

FIG	ITEM	PART NUMBER	NOMENCLATURE	EFF CODE	UNITS PER ASSY
1001		66-0200-1	Fwd Evaporator/Blower Instl		
	1	66-0251-4	Fwd Blower Assy		1
	2	ES73175-2	Blower Assy		1
	3	66-0251-6	Bracket Assy		1
	4	66-0251-5	Clip Assy		1
	5	66-1251-2	Adapter		1
	6	ES31100-2	Rivet		2
	7	MS27039-0808	Screw		2
	8	AN960-8	Washer		2
	9	MS21044N08	Nut		2
	10	66-1200-3	Bracket		1
	11	AN509-10R8	Screw		5
	12	MS21071L08	Nutplate		6
	13	AN525-10R16	Screw		4
	14	MS20426AD3-3.5	Rivet		16
	15	MS24694S-5	Screw		7
	16	ES70009-1	Flexduct		2
	17	ES30042-3	Clamp		4
	18	66-1200-1	Bracket		1
	19	66-1200-2	Bracket		1
	20	66-1250-2	Support		2
	21	66-1250-3	Support		2
	22	AN3-4A	Bolt		8
	23	AN970-3	Washer		8
	24	MS27039-0807	Screw		5
	25	NAS1097AD3-3	Rivet		22
	26	ES48012-2	Tubing		2
	27	ES41040-1	Elbow 90^{o}		2
	28	ES30001-2	Clamp		4
	29	JBS558-1	Drain, Evap		1
	30	66-0250-1	Fwd Evaporator Assy		1
	31	66-1200-9	Drain Tubing		1
	32	ES32066-2	Isolation Grommet		1
	33	NAS43DD3-36	Spacer		1
	34	MS20365-1032	Self Locking Nut		1
	35	AN525-10R16	Screw		1
	36	ES30042-5	Clamp		1
	37	66-1200-8	Flex Duct		1
	38	AN960-10	Washer		8

AFT EVAPORATOR ASSEMBLY

DESCRIPTION AND OPERATION

1. GENERAL

This section of the maintenance manual discusses troubleshooting and maintenance practices used for the AFT evaporator assembly portion of the air conditioning system.

AFT EVAPORATOR ASSEMBLY

TROUBLESHOOTING

1. GENERAL

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

2. TOOLS AND EQUIPMENT

DESIGNATION	REF. NO.	QTY.	REMARKS
Service Pressure Gauge	Comm. Avail.	1	None
28 VDC Source	N/A	A/R	None

3. EVAPORATOR TROUBLESHOOTING PROCEDURES

CAUTION: Do not operate air conditioning system with condenser air inlet or outlet blocked.

NOTE: Always attach a service gauge set to system prior to beginning troubleshooting to ensure proper refrigerant charge is present.

A. Water is being blown from air outlets:

1. Operate GPU 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 closeout assembly.
2. Operate GPU and apply 28 VDC electrical power.
3. Select air conditioning system to ON.
4. Check evaporator for proper cooling. If cooling is 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. Check for blockage in condenser coil; inspect coil fins, cleaning and straightening as necessary. Check expansion valve inlet screen for debris.

6. If system is correctly charged, replace expansion valve per Maintenance Practices procedure.

AFT EVAPORATOR ASSEMBLY

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
Polyolester Oil	Comm. Avail.	A/R	Viscosity ISO 68
Vacuum Cleaner	Comm. Avail.	1	None
Coil Cleaner	Comm. Avail.	A/R	Non-acid based

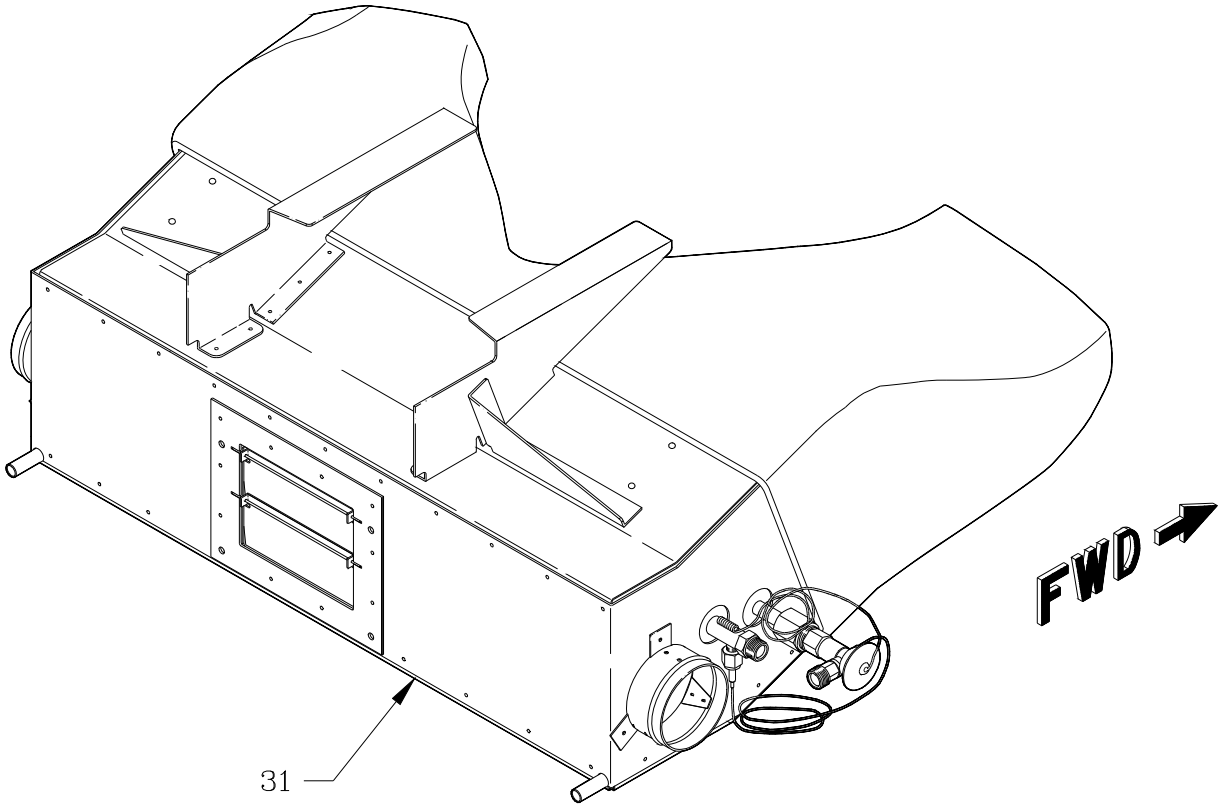
3. EVAPORATOR MAINTENANCE PROCEDURES

A. Expansion Valve Replacement:

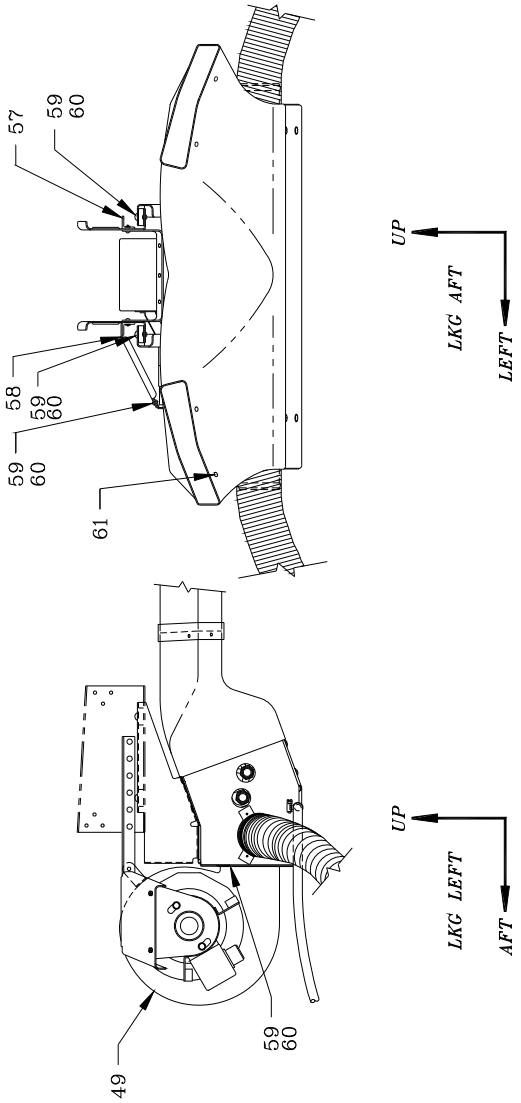
1. Discharge system in accordance with recovery equipment's instructions.
2. Disconnect liquid line from inlet of expansion valve, and cap. Remove the thermal sense bulb from its clamp located on the suction tube of the evaporator and carefully remove insulation covering bulb.
3. Disconnect expansion valve sense line from tube assembly.
4. Disconnect the fitting that connects the valve to the coil and plug coil fitting.
5. Install new expansion valve and O-rings in the reverse order.
6. Lubricate O-ring with polyolester oil or apply sealant to fitting mating surfaces prior to assembly.
7. Install the thermal sense bulb such that it makes contact with the suction tube along its entire length, and locate it at the 3 or 9 o'clock position on the tube. Insulate the bulb thoroughly with insulation.

B. Evaporator Coil Cleaning Procedure:

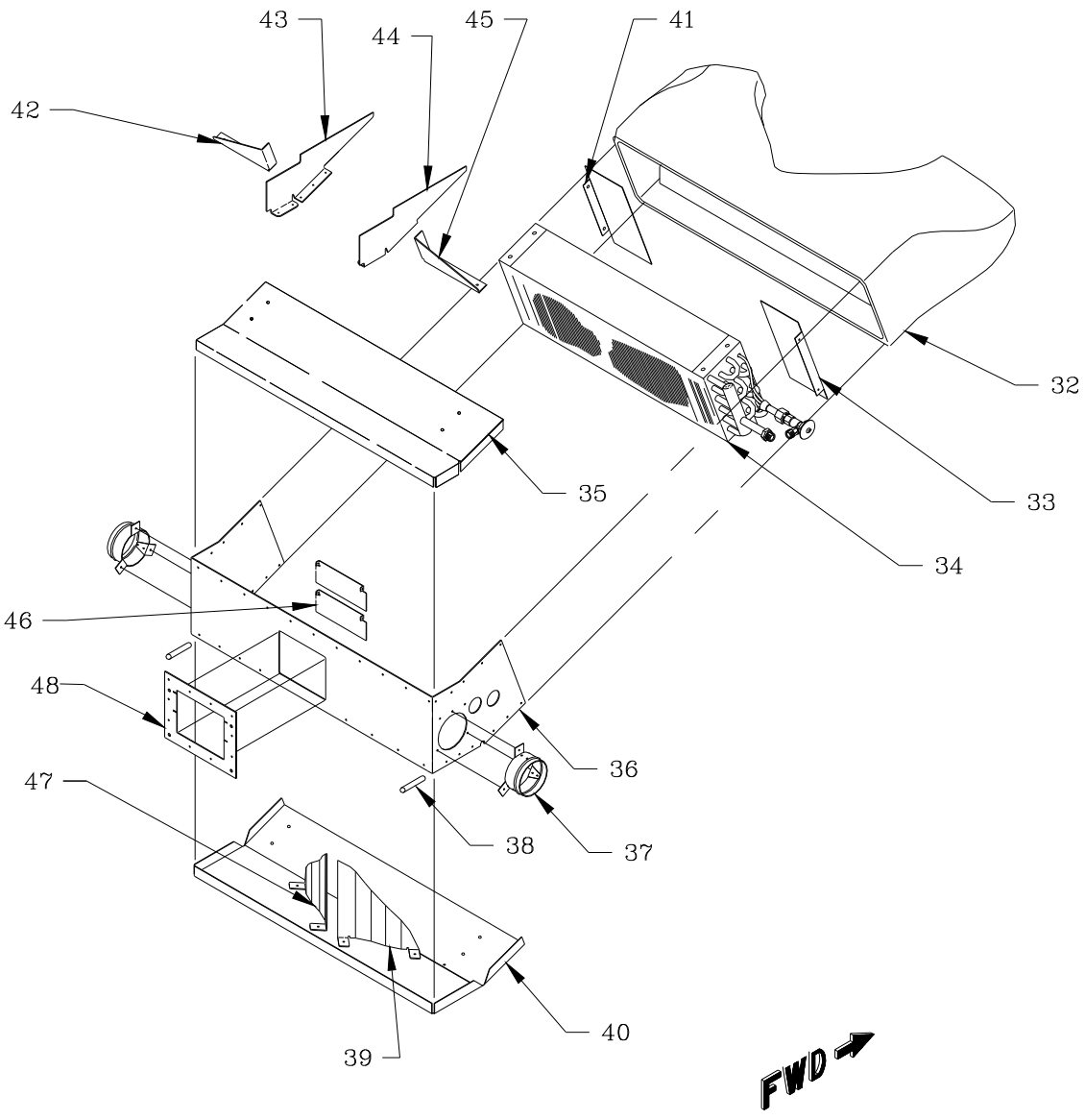
1. Use vacuum cleaner to remove large debris from the coil face.
2. Spray coil cleaner on coil face. Wash off with water.



COOLING SYSTEM INSTL – CABIN
REFRIGERATION
FIGURE 1001 (SHT. 1)



COOLING SYSTEM INSTL – CABIN REFRIGERATION
FIGURE 1001 (SHT. 2)



COOLING SYSTEM INSTL – CABIN
REFRIGERATION
FIGURE 1001 (SHT. 3)

MODEL 60
ILLUSTRATED PARTS CATALOG

FIG	ITEM	PART NUMBER	NOMENCLATURE	EFF CODE	UNITS PER ASSY
1001		66-0210-1	Aft. Evaporator/Blower Assy		
	31	66-0260-1	Aft Evaporator Assy		1
	32	ES76001-1	Distributor		1
	33	66-1260-5	Side Closeout		1
	34	JBS2050-4	Evaporator Coil		1
	35	66-1260-12	Top Plate		1
	36	66-1260-14	Closeout		1
	37	66-0260-10	Collar Assy		2
	38	66-1260-24	Drain Tube		2
	39	66-1260-7	Baffle		1
	40	66-1260-13	Bottom Plate		1
	41	66-1260-29	Screen Retrainer		1
	42	66-1260-27	Bracket		1
	43	66-1260-10	Rail, LH		1
	44	66-1260-11	Rail, RH		1
	45	66-1260-26	Bracket		1
	46	66-1260-19	Door		2
	47	66-1260-6	Baffle		1
	48	66-1260-20	Spacer		1
	49	66-0261-1	Aft Blower Assy		1
	57	66-0211-16	Bracket Assy		1
	58	66-0211-17	Hanger Assy		1
	59	AN3-4A	Bolt		10
	60	AN960-10	Washer		10
	61	AN525-832R6	Screw		4

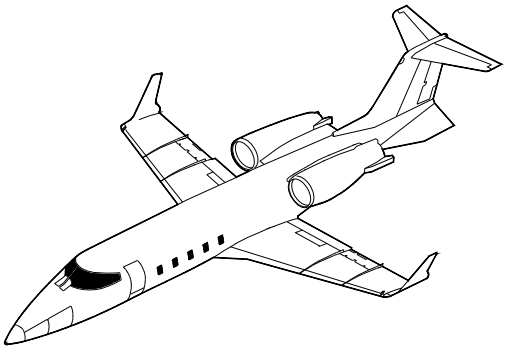
COOLING SYSTEM INSTL – CABIN
REFRIGERATION
FIGURE 1001 (SHT. 4)

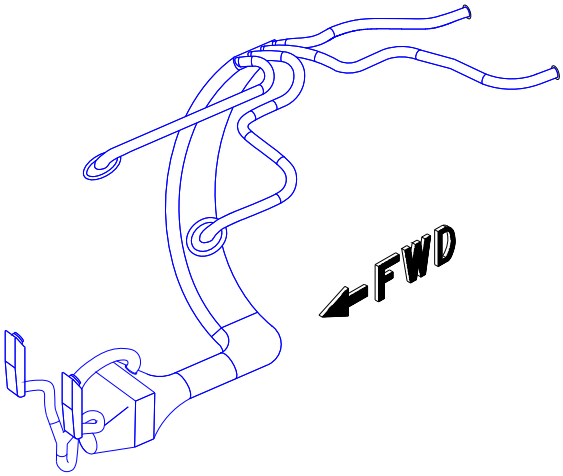
AIR DISTRIBUTION ASSEMBLY

DESCRIPTION AND OPERATION

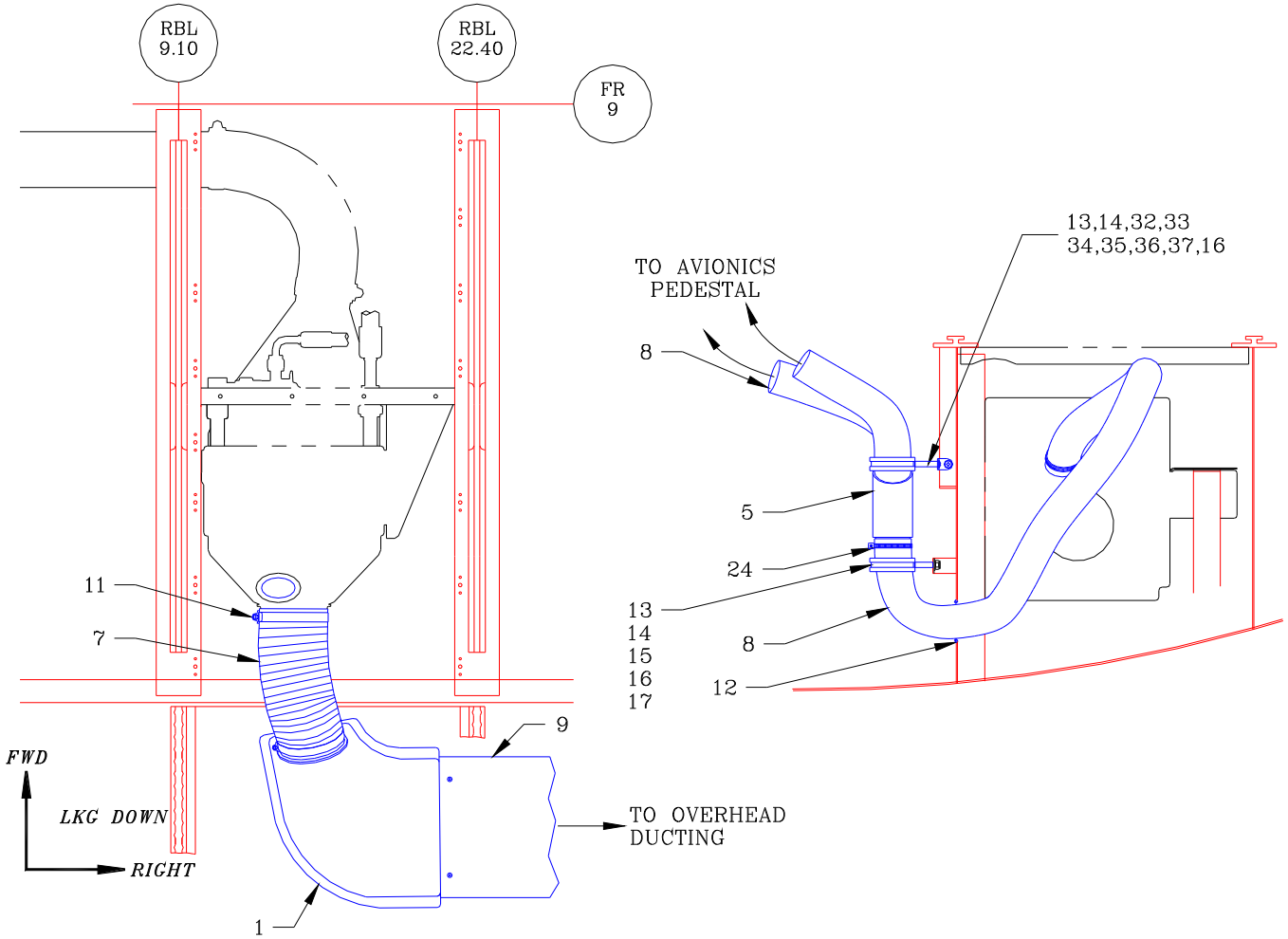
1. GENERAL

The air distribution system delivers air from the forward evaporator to the cockpit and the forward cabin. The cockpit has four air outlets, two overhead outlets and two on the control panel. The two overhead outlets are existing hardware and the Keith Products system connects to them via flex hoses and attaching hardware. Two more outlets are located on the control panel. The flight crew can control air flow through these two outlets. Air to the forward cockpit is also delivered from the forward evaporator. Hard ducts are installed along the inside right side of the aircraft, just aft of the copilot seat, connecting to the existing overhead hardware in the forward cabin.

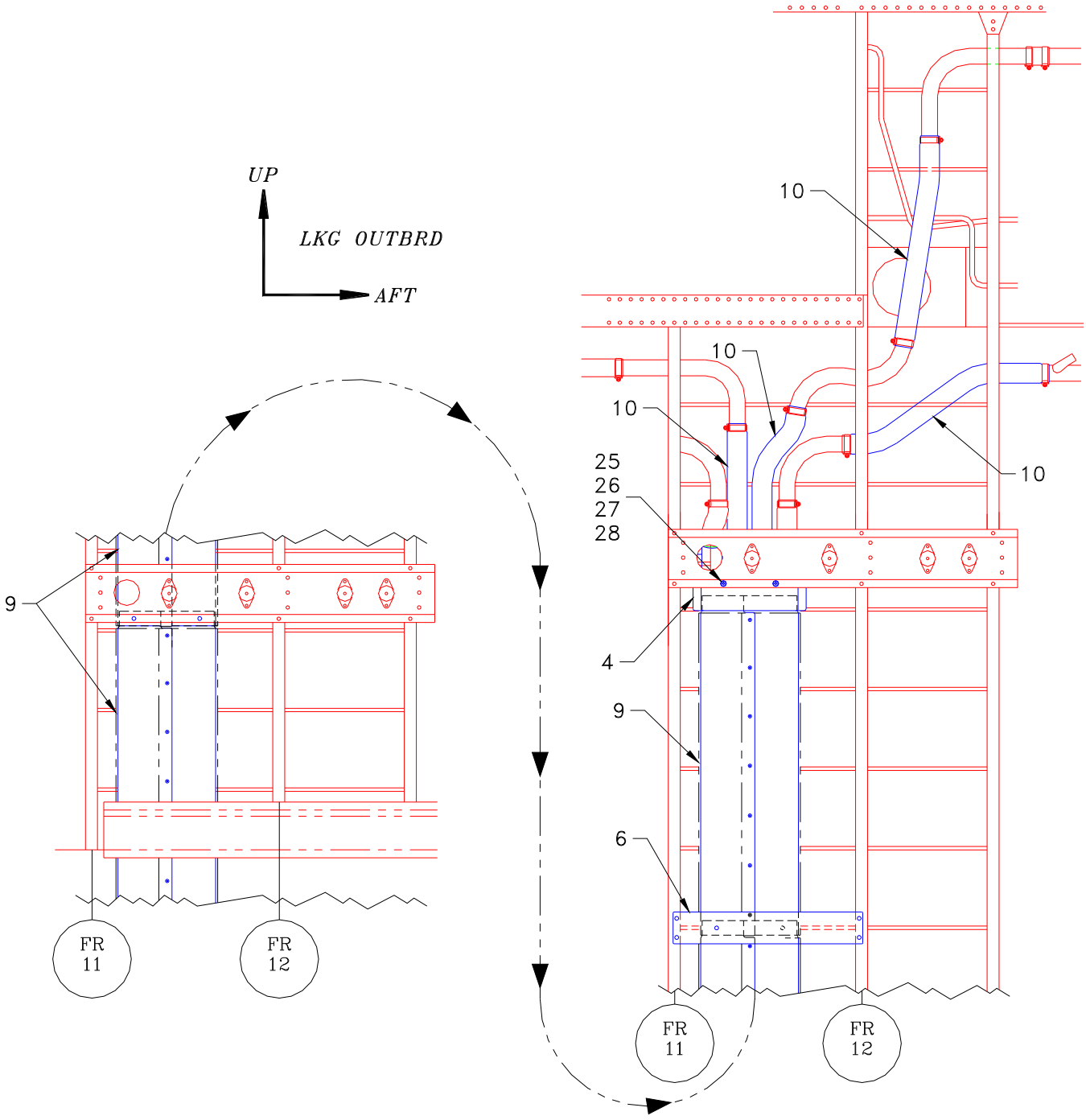




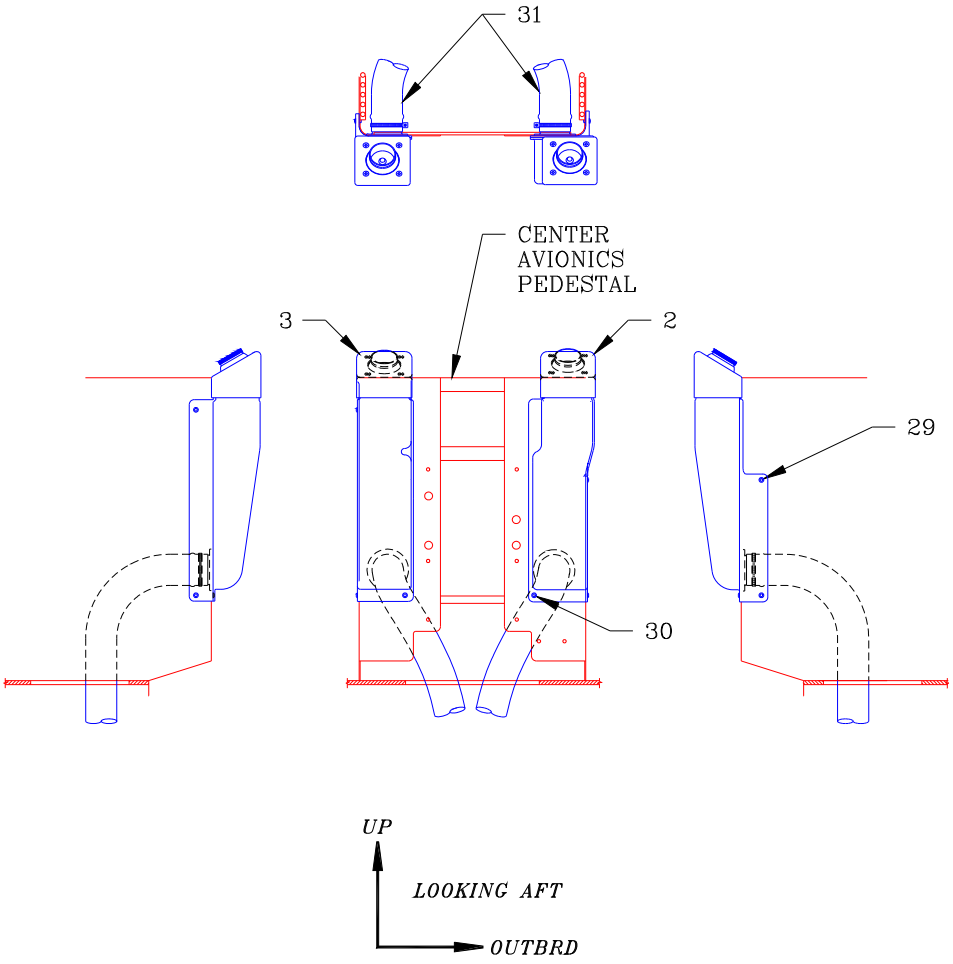
COOLING SYSTEM INST'L- DISTRIBUTION



COOLING SYSTEM INST'L - DISTRIBUTION
FIGURE 1001 (SHT. 1)



COOLING SYSTEM INST'L – DISTRIBUTION
FIGURE 1001 (SHT. 2)



COOLING SYSTEM INST'L – DISTRIBUTION
FIGURE 1001 (SHT. 3)

MODEL 60
ILLUSTRATED PARTS CATALOG

FIG	ITEM	PART NUMBER	NOMENCLATURE	EFF CODE	UNITS PER ASSY
1001		66-0600-1	Ducting Installation		
	1	66-0650-6	Transition Duct Assy		1
	2	66-0650-8	Duct Assy		1
	3	66-0650-9	Duct Assy		1
	4	66-0650-3	Distributor Duct		1
	5	66-0650-2	Y-Duct Assy		1
	6	66-1650-8	Strap		1
	7	ES70009-2	Flexduct (IN.)		12
	8	ES70009-4	Flexduct (IN.)		120
	9	66-0650-1	Duct Assy		3
	10	ES70009-11	Flexduct (IN.)		60
	11	ES30042-5	Clamp		2
	12	MS21266-1N	Grommet, Strip (IN.)		12
	13	MS21919WDG28	Clamp		2
	14	AN960-8	Washer		2
	15	NAS43DD3-48	Spacer		1
	16	MS21044N08	Nut		2
	17	AN525-832R20	Screw		1
	24	ES30015-2	Cable Tie		12
	25	MS35338-42	Lock Washer		2
	26	AN960-8L	Washer		2
	27	AN525-832R9	Screw		2
	28	MS27130-A14	Rivnut		2
	29	ES31101DS4-4	Rivet		4
	30	ES31101DS4-6	Rivet		2
	31	ES06022-1	Tape, Insu. Foam (IN.)		360
	32	NAS43DD3-64	Spacer		1
	33	AN743-12	Bracket		1
	34	AN525-832R26	Screw		1
	35	AN525-10R10	Screw		1
	36	AN960-10L	Washer		1
	37	MS20365-1032	Nut		1

AIR DISTRIBUTION
FIGURE 1001 (SHT. 4)

Appendix A

TO INSTALLER OF KEITH PRODUCTS AIR CONDITIONING SYSTEM

BEFORE YOU BEGIN YOUR INSTALLATION

Find the provided BILL OF MATERIAL (BOM) and check to ensure that all materials indicated, and the quantities indicated, are in the kit you just received.
Note that this BOM has the SERIAL NUMBER that KEITH PRODUCTS has assigned and the SYSTEM PART NUMBER of air-conditioning system on it.

Find the copies of the installation drawings and review them to get the full understanding of how the kit is to be installed. If questions should arise try to resolve them before proceeding with the installation.

If a SWAGE KIT or BUBBLE KIT has been provided as a loaner tool read the instructions enclosed in the kit to ensure that you know how to use the tool properly.

REQUIRED TOOLS

Crimper model 3700-H (Recommended brand ATCO)

DIE #3606-RB
For hose ES48149-1 & fittings ES40149 (-1), ES40150 (-1) & ES40151 (-1)
***Recommended torque 11-13 ft/lbs**
DIE #3608-RB
For hose ES48149-2 & fittings ES40148 (-8), ES40150 (-2), ES40151 (-2)
***Recommended torque 15-20 ft/lbs**
DIE #3610-RB
For hose ES48149-3 & fittings ES40149 (-3 &-7), ES40150 (-7)
***Recommended torque 21-27 ft/lbs**
DIE #3612-RB

Sealant (Ref #ES49000-1) is to be applied to all fittings and mating surface.
Note…. The part number of sealant is included in BOM, but not necessarily found on the plumbing schematic.

If a disconnection of the fitting is to occur, ensure that sealant is applied before reconnecting.

DURING THE INSTALLATION

If errors are found in the copies of the installation drawings and are confirmed by KEITH, please mark the areas of concern with the necessary corrections for future reference.

WHEN YOU FINISH YOUR INSTALLATION

When making the appropriate entries in the aircraft log book please note the Serial Number and Part Number in the entry.

Save all contents of the Data Pack that was provided with the kit. The paperwork should include the General Service Manual for Vapor Cycle air-conditioning, the copies of installation drawings, BOM, STC, FMS, Weight and Balance Sheet. It is imperative that this Data Pack be given to the Owner/Operator for future referencing purpose.