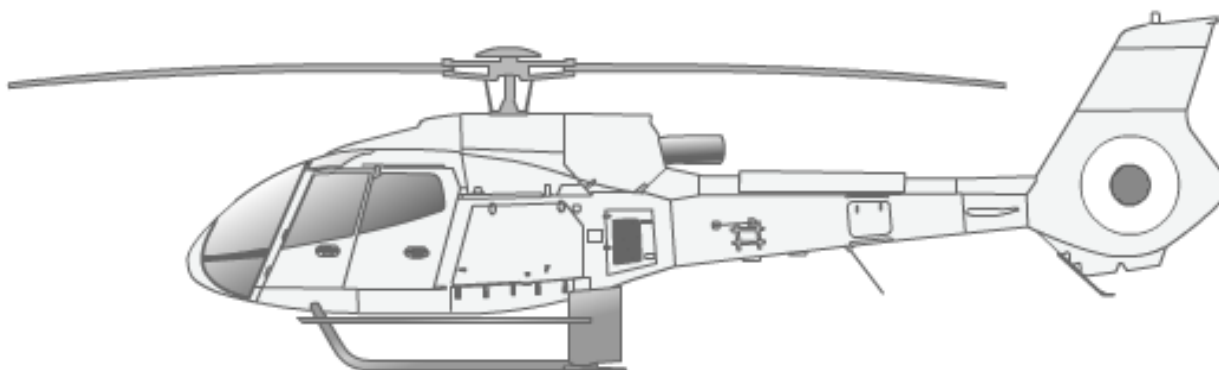


AIR COMM CORPORATION
1575 W. 124th Ave, Suite 210
WESTMINSTER, CO. 80234
PHONE: 303-440-4075 FAX: 303-440-6355
INFO@AIRCOMMCORP.COM

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS
AIRBUS EC130B
AIR CONDITIONING SYSTEM



**THIS HANDBOOK INCLUDES THE MAINTENANCE INFORMATION
REQUIRED TO BE AVAILABLE BY FAR PART 27**

RESTRICTED DISCLOSURE NOTICE

THIS PUBLICATION IS THE PROPRIETARY INTELLECTUAL PROPERTY OF AIR COMM CORPORATION AND IS DELIVERED TO THE RECIPIENT WITH THE EXPRESS CONDITION THAT IT AND THE INFORMATION CONTAINED HEREIN ARE NOT TO BE USED, DISCLOSED OR REPRODUCED IN PART OR IN WHOLE, FOR ANY PURPOSE WITHOUT THE EXPRESS WRITTEN CONSENT OF AIR COMM CORPORATION. NO RIGHT IS GRANTED TO THE RECIPIENT TO DISCLOSE OR SO USE ANY INFORMATION CONTAINED IN THIS DOCUMENT OUTSIDE THE PURPOSE FOR WHICH IT WAS DELIVERED. THESE RESTRICTIONS DO NOT OPERATE TO NULLIFY OR LIMIT ANY RIGHTS GRANTED BY CONTRACT.

AIR CONDITIONER SERVICE MANUAL EC130-200M-1

RECORD OF REVISIONS

Revision	Date	Description	Affected Pages	Revised by	Approved/ Date
1	12/12/05	Addition of EC130-202 installation details	--	GP	--
2	11/30/06	Addition of EC130-690-1 auxiliary ventilation info.	--	GP	--
3	04/30/07	Added ES61064-2 motor to suggested spares	--	GP	--
4	01/25/08	Changed obsolete ES57008-1 to ES57010-1	--	RM	--
5	8/21/2009	Changed obsolete ES35130-2 to ES35130-3 and added strut protection clamps. Changed obsolete ES57010-1 to new ES57178-1	--	RM	--
6	2/19/2015	<p>Minor re-formatting throughout document including page numbering.</p> <p>Pg 1: Chapter 1 was Chapter 0, & all subsequent chapters incremented by 1.</p> <p>Pg 3: updated ACC address</p> <p>Pg 6: updated binary pres. switch operating pressures.</p> <p>Pg 9,10: added sec 2.0 Electrical connector inspection requirements</p> <p>Pg 15. Added torque info to view</p> <p>Pg 21 thru 30: updated & added images</p> <p>Pg 31: corrected service port callout location</p> <p>Pg 32: oil charge vol. was 7.5 fl. oz.</p> <p>Pg 33,34: updated lubrication information</p> <p>Pg 37: updated fitting torquing requirements</p> <p>Pg 38 thru 51: re-arranged sections 2 thru 14, added sec. 10. All sections of Chapter 7 extensively revised for additional info, corrections, clarifications</p> <p>Pg 58: removed aux. vent system WT. info, not applicable</p> <p>Removed Appendix B: Airbus controlled information</p>		<p>Prepared By:</p> <p><u>J Byrnes</u> <u>02/19/2015</u> Date</p> <hr/> <p>ACC Approval:</p> <p><u>M Dame</u> <u>03/10/2015</u> Signature Date</p> <hr/> <p>FAA Acceptance</p> <p>N/A – Meets Minor Change Agreement MR-100-134</p> <p>_____ <u>02/19/2015</u> Signature Date</p>	
7	6/20/2019	<p>Pg 55: Updated Figure 8-3</p> <p>Pg 56: Updated Figure 8-4</p>		<p>Prepared By:</p> <p><u>C Posvic</u> <u>06/20/2019</u> Date</p> <hr/> <p>ACC Approval:</p> <p><u>M Krauss</u> <u>7-2-19</u> Signature Date</p> <hr/> <p>FAA Acceptance</p> <p>N/A – Meets Minor Change Agreement MR-100-134</p> <p>_____ <u>06/20/2019</u> Signature Date</p>	

AIR CONDITIONER SERVICE MANUAL EC130-200M-1

LIST OF EFFECTIVE PAGES

LIST OF EFFECTIVE PAGES

<u>Title</u>	<u>Page(s)</u>	<u>Revision No.</u>
Record of Revisions	iii to iv	9
List of Effective Pages	v	9
Table of Contents	v to vii	9
Chapter 1 Introduction	1 to 7	9
Chapter 2 Airworthiness Limitation Section	8	9
Chapter 3 Inspections	9-10	9
Chapter 4 Location and Access	11-29	9
Chapter 5 Placards and Markings	30	9
Chapter 6 Servicing	31-36	9
Chapter 7 Standard Practices	37-50	9
Chapter 8 Troubleshooting	51-56	9
Appendix A Weight & Balance Information	57	9

AIR CONDITIONER SERVICE MANUAL EC130-200M-1

Table of Contents

CHAPTER 1	1
INTRODUCTION	1
1. SCOPE.....	1
2. PURPOSE.....	1
3. ARRANGEMENT.....	1
4. APPLICABILITY.....	1
5. DEFINITIONS.....	1
6. ABBREVIATIONS.....	2
7. PRECAUTIONS.....	3
8. UNITS OF MEASUREMENT.....	3
9. INFORMATION ESSENTIAL TO THE CONTINUED AIRWORTHINESS OF THE A/C.....	3
10. REFERENCE DOCUMENTS.....	3
11. DISTRIBUTION.....	3
12. CHANGES TO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS.....	4
13. AIR CONDITIONER FEATURES.....	4
14. DESCRIPTION OF THE VAPOR CYCLE AIR CONDITIONER AND ITS INSTALLATION.....	6
CHAPTER 2	8
AIRWORTHINESS LIMITATION SECTION	8
1. AIRWORTHINESS LIMITATIONS.....	8
CHAPTER 3	9
INSPECTIONS	9
1. INSPECTION REQUIREMENTS.....	9
2. INSPECTION OF BLOWER ELECTRICAL CONNECTORS.....	9
3. COMPONENT OVERHAUL / REPLACEMENT SCHEDULE.....	10
CHAPTER 4	11
LOCATION AND ACCESS	11
1. LOCATION OF AIR CONDITIONER FEATURES.....	11
2. LAYOUT OF AIR CONDITIONER SYSTEM.....	12
3. LAYOUT OF AIR CONDITIONER SYSTEM.....	13
4. LAYOUT OF AIR CONDITIONER SYSTEM.....	14
5. COMPRESSOR INSTALLATION.....	15

AIR CONDITIONER SERVICE MANUAL EC130-200M-1

6.	FORWARD EVAPORATOR INSTALLATION	16
7.	AFT EVAPORATOR INSTALLATION, EC130-200-1,-2	17
8.	AFT EVAPORATOR INSTALLATION, EC130-202-1,-2	18
9.	CONDENSER SCOOP ASSEMBLY INSTALLATION, EC130-200-1,-2	19
10.	CONDENSER SCOOP ASSEMBLY INSTALLATION, EC130-200-1,-2	20
11.	CONDENSER INSTALLATION, EC130-202-1 (-2 Right side install opposite)	21
12.	CONDENSER INSTALLATION, EC130-202-1(-2 Right side install opposite)	22
13.	CONDENSER INSTALLATION, EC130-202-1 (-2 Right side install opposite)	23
14.	RELAY PANEL & CIRCUIT BREAKER ASSEMBLY, EC130-200-1,-2 INSTALL	24
15.	RELAY PANEL & CIRCUIT BREAKER ASSEMBLY, EC130-202-1,-2 INSTALL	25
16.	VENTILATION KIT, EC130-202-1,-2 INSTALLATION	26
17.	REFRIGERANT PLUMBING SCHEMATIC, EC130-200-1,-2	27
18.	REFRIGERANT PLUMBING SCHEMATIC, EC130-202-1 thru -4	28
19.	REFRIGERANT PLUMBING SCHEMATIC, EC130-202-5 thru -8	29
CHAPTER 5.....		30
PLACARDS AND MARKINGS		30
1.	PLACARD AND MARKING INFORMATION	30
CHAPTER 6.....		31
SERVICING		31
1.	SAFETY PRECAUTIONS.....	31
2.	SERVICING INFORMATION	31
3.	LUBRICATION INFORMATION	33
4.	SYSTEM LEAK CHECK	34
5.	SUGGESTED EQUIPMENT FOR SERVICING	35
6.	CONSUMABLE MATERIALS.....	35
7.	SUGGESTED SPARES LIST.....	36
CHAPTER 7.....		37
STANDARD PRACTICES INFORMATION.....		37
1.	FITTING TORQUING PROCEDURES.....	37
2.	REMOVAL, REPLACEMENT & ADJUSTMENT OF COMPRESSOR DRIVE BELT.....	38
3.	REMOVAL, INSTALLATION / REPLACEMENT OF COMPRESSOR ASSEMBLY	39
4.	REMOVAL, INSTALLATION / REPLACEMENT OF FORWARD EVAPORATOR ASSEMBLY	41

AIR CONDITIONER SERVICE MANUAL EC130-200M-1

5.	REMOVAL, INSTALLATION / REPLACEMENT OF AFT EVAPORATOR ASSEMBLY.....	42
6.	REMOVAL, INSTALLATION / REPLACEMENT OF AFT EVAPORATOR BLOWER MOTOR.....	43
7.	REMOVAL, INSTALLATION OF THE CONDENSER SCOOP ASSEMBLY, EC130-200 KITS	44
8.	REMOVAL, INSTALLATION OF THE CONDENSER ASSEMBLY, EC130-200 KITS	45
9.	REMOVAL & REPLACEMENT OF CONDENSER BLOWER FAN ASSEMBLY	46
10.	REMOVAL, INSTALLATION OF THE CONDENSER ASSEMBLY, EC130-202 KITS	47
11.	REMOVAL & REPLACEMENT OF CONDENSER BLOWER FAN ASSEMBLY, EC130-202 KITS..	47
12.	REMOVAL, INSTALLATION / REPLACEMENT OF RECEIVER DRIER BOTTLE	49
13.	REMOVAL, INSTALLATION / REPLACEMENT OF BINARY PRESSURE SWITCH.....	50
14.	REMOVAL, INSTALLATION/ REPLACEMENT OF BY-PASS VALVE ASSEMBLY	50
CHAPTER 8.....		52
TROUBLESHOOTING		52
1. SYSTEM TROUBLESHOOTING		52
APPENDIX A.....		58
Weight and Balance Information		58

CHAPTER 1 INTRODUCTION

1. SCOPE

The scope of this manual encompasses the scheduled and unscheduled maintenance procedures for the continued airworthiness of the Air Comm Corporation air conditioning system installed in the Airbus EC130B series helicopter.

2. PURPOSE

The purpose of this manual is to provide the aircraft mechanic in the field the necessary information to maintain the air conditioning system.

3. ARRANGEMENT

This manual is arranged by chapters which are broken down into paragraphs and subparagraphs. All of the chapters and paragraphs are listed in the front of this manual in the Table of Contents and are further identified by their individual page number.

4. APPLICABILITY

This manual is applicable to Airbus Helicopter models EC130B that are equipped with the Air Comm Corporation kit number EC130-200 & EC130-202 air conditioner system.

5. DEFINITIONS

The following terms are provided to give a ready reference to the meaning of some of the words contained within this manual. These definitions may differ from those given by a standard dictionary.

Ambient air temperature: The temperature of the air surrounding a person or object.

Charging station: An air conditioning system service unit which is capable of evacuating and charging an air conditioner.

Condensation: The process of changing a vapor into a liquid.

Desiccant: A material used in the receiver/drier bottle, designed to absorb moisture from the refrigerant.

Heat load: The amount of heat which the air conditioner is required to remove from the aircraft cabin.

Inches of mercury: A measurement of pressure, normally used for pressures below atmospheric, one inch of mercury is equal to approximately one-half pound per square inch.

Pressure, ambient: The pressure of the air surrounding a body, normally measured in Pounds Per Square inch, or PSIG.

Refrigerant: A fluid which is used in an air conditioning system to absorb heat from the cabin and carry it outside the helicopter where it can be transferred to the outside air.

Relative humidity: The ratio of the amount of water vapor in the air to the amount of water vapor required to saturate the air at the existing temperature.

Thermostat: An air conditioning control which senses the temperature of the evaporator coil and causes the system to cycle or by-pass to maintain the proper temperature of cooling air.

Vacuum: A negative pressure, or pressure below atmospheric; it is usually expressed in inches of mercury.

Vapor: The gaseous state of a material.

6. ABBREVIATIONS

InHg:	Inches of Mercury
Lbs:	Pounds
oz:	Ounces
Psig:	Pounds Per Square Inch (gauge)
gr:	Grams
kg:	Kilograms
Kg/cm:	Kilograms Per Centimeter
ml:	Milliliters
mm:	Millimeters
Nm:	Newton-meters

7. PRECAUTIONS

The following precautions are found throughout this manual, and will vary depending on the seriousness of the Hazard or Condition:

WARNING: May be a maintenance procedure, practice, condition, etc., which could result in personal injury or loss of life.

CAUTION: May be a maintenance procedure, practice, condition, etc., which could result in damage or destruction of equipment.

NOTE: May be a maintenance procedure, practice, condition, etc., or a statement which needs to be highlighted.

8. UNITS OF MEASUREMENT

All measurements contained within this manual are generally given in the United States standard measurement, followed by the metric conversion in parentheses.

9. INFORMATION ESSENTIAL TO THE CONTINUED AIRWORTHINESS OF THE A/C

This manual provides information which is required for operation and maintenance of the Air Comm air conditioning system installed in the Airbus model EC130B series helicopter. After completion of the air conditioner installation this document must be placed with the appropriate existing aircraft documents.

10. REFERENCE DOCUMENTS

The approval basis of the system covered by this ICA is Supplemental Type Certificate **SR00543DE**

11. DISTRIBUTION

This document is to be placed with the aircraft maintenance records at the time of system installation.

Changes will be made to this document in response to "Safety of Flight", and or "Non-safety of Flight" issues. Any changes will result in a revision to this document. Revisions shall be noted in the Record of Revisions (page i), and on the List of Revisions (page ii) of this manual.

In addition to the revision of the manual, those changes categorized as "Safety of Flight" shall have a Service Bulletin issued to the operator providing the necessary information to comply with, and or to correct, the "Safety of Flight" issue.

Replacement, and or revised copies of this manual may be obtained by contacting:

Air Comm Corporation Service Department
1575 W. 124th Ave, Ste 210.
Westminster CO, 80234
Phone No. 303-440-4075 Fax No. 303-440-6355
info@aircommcorp.com

12. CHANGES TO INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

Changes made to a line or paragraph of this document will be indicated by a vertical bar in the right-hand margin, while a complete page change will be indicated by a vertical bar next to the page number.

(Example: Any change will appear with a vertical bar next to that change).—————→ |

13. AIR CONDITIONER FEATURES

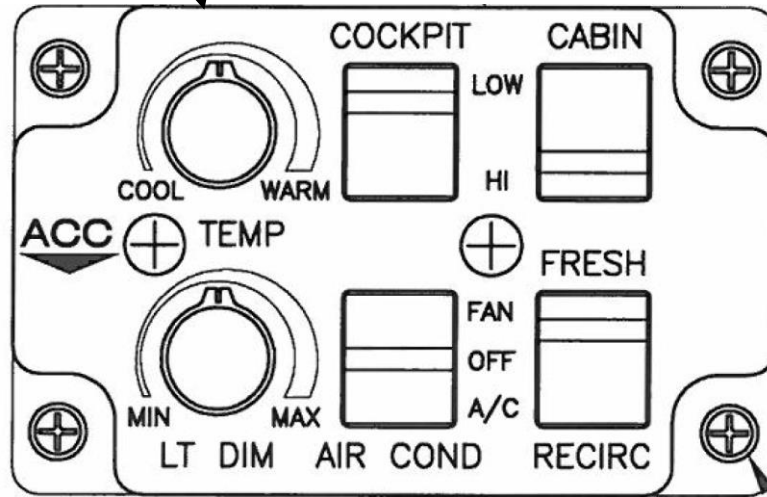
The vapor cycle air conditioner features one forward mounted evaporator (cockpit), one aft mounted evaporator assembly (behind main cabin), one condenser, and a compressor driven by the tail rotor drive shaft just aft of the aft main transmission aircraft left. These components combine to provide “conditioned air” through the existing air distribution system when the engines are operating during both ground and flight operations.

This system can be operated in either the Air Condition (A/C), or Fan mode. In the A/C mode, conditioned air is provided by the forward and aft evaporators to the cockpit and main cabin areas respectively. In the Fan mode, the evaporator blowers are used to circulate cabin air, while the compressor clutch remains disengaged. When using the cabin heater it is acceptable to operate the air conditioner if desired, to assist in defogging the cabin windows.

The air conditioning system is connected electrically to the aircraft’s DC Power Panel 28 VDC Bus.

The control panel for the air conditioner system is located on the existing overhead switch panel just forward of the pilot’s and co-pilot’s seats. This panel consists of the A/C & Fan switch, two switches, for the control of the Cockpit & Cabin evaporator blower fan speeds, a “FRESH” / “RECIRC” switch which opens and closes an air inlet box located just forward of the aft evaporator, a Temperature control rheostat knob, and panel light dimmer rheostat knob.

Forward Evaporator optional



COCKPIT A/C CONTROL PANEL

The Fan motors feature dual speed operation (Hi or Lo), and this feature can be used in both the air conditioner or fan modes.

The compressor is mounted to the surface of the Main Gearbox (MGB) Coupling Case, in the aft aircraft center portion of the transmission compartment. It is driven by a Ploy V-belt and a pulley which is mounted to the main drive shaft. Access to the compressor is provided by transmission compartment access doors. Airflow through the condenser heat exchanger is provided by one 28-volt DC high performance blower, and is enhanced by means of a retractable scoop door providing ram air in forward flight. (Condenser is mounted in the L/H side baggage compartment when the EC130-202 kit is installed).

The aft evaporator is equipped with a Freeze Switch. The Freeze Switch probe is located in the core of the evaporator heat exchanger. This unit performs two functions; 1. It acts to prevent coil freeze-up by limiting the minimum coil temperature to 32° F (0° C), and 2. It acts in conjunction with the cabin air temperature control system, by controlling the bypass of refrigerant through the evaporator coil in response to adjustment of the thermostat Switch located on the overhead control panel assy. between the pilot and co-pilots seats.

The system is also equipped with a binary pressure switch, which is located on the air conditioner discharge line. This switch is designed to protect the system against over-pressure situations, or under-pressure in the event of refrigerant loss from the system. The switch also prevents the system from operating in low ambient temperatures below 50° F (10° C).

AIR CONDITIONER SERVICE MANUAL EC130-200M-1

The switch operating pressures are:

Low Pressure Function:

Open at 28 ± 2.8 psig (2.0 ± 0.2 Kg/Cm)

Close at 30 ± 4.3 psig (2.1 ± 0.3 Kg/Cm)

High Pressure Function:

Open at 384 ± 30 psig (28.0 ± 2.0 Kg/Cm)

Close at 298 ± 43 psig (20.9 ± 2.0 Kg/Cm)

An optional Auxiliary Ventilation system may be installed to provide forced air ventilation to the existing overhead air outlets during forward flight. This optional ventilation system is operated manually by the means of a push / pull cable assembly mounted in the upper center area of the aft bulkhead.

14. **DESCRIPTION OF THE VAPOR CYCLE AIR CONDITIONER AND ITS INSTALLATION**

This section contains a general overview of a Vapor-cycle air conditioning system and how it functions. This type of system operates in a closed loop, in which the refrigerant absorbs heat from the cabin, and rejects it into the outside air. The refrigerant then returns to the cabin to repeat the cycle. The operation of the system is described below and depicted schematically in Figure 1.1 below.

Liquid refrigerant is contained in the receiver-drier under pressure from the compressor. The receiver-drier also filters the refrigerant through a material known as desiccant. The desiccant ensures that the fluid leaving this component is free of any water or other contaminants.

The low pressure (suction) line from the compressor is attached to the evaporator lines and causes the refrigerant to be pulled out of the receiver-drier and through the expansion valves. The expansion valves serve as a controlled spray orifice, to spray the correct amount of refrigerant into the evaporator.

This regulation of refrigerant allows the liquid to absorb the heat from the cabin air, and transform it to a vapor state just prior to its exiting the evaporator assembly.

The low-pressure vapor is then drawn into the compressor where its pressure is raised to approximately 200 psi (14.06 kgcm), and its temperature to around 200° F (93.3° C). This high pressure / high temperature vapor then travels to the condenser, (a heat exchanger cooled by a flow of outside air). Heat is extracted from the refrigerant, and as it cools it condenses back into a liquid and flows into the receiver-dryer, ready to repeat the cycle.

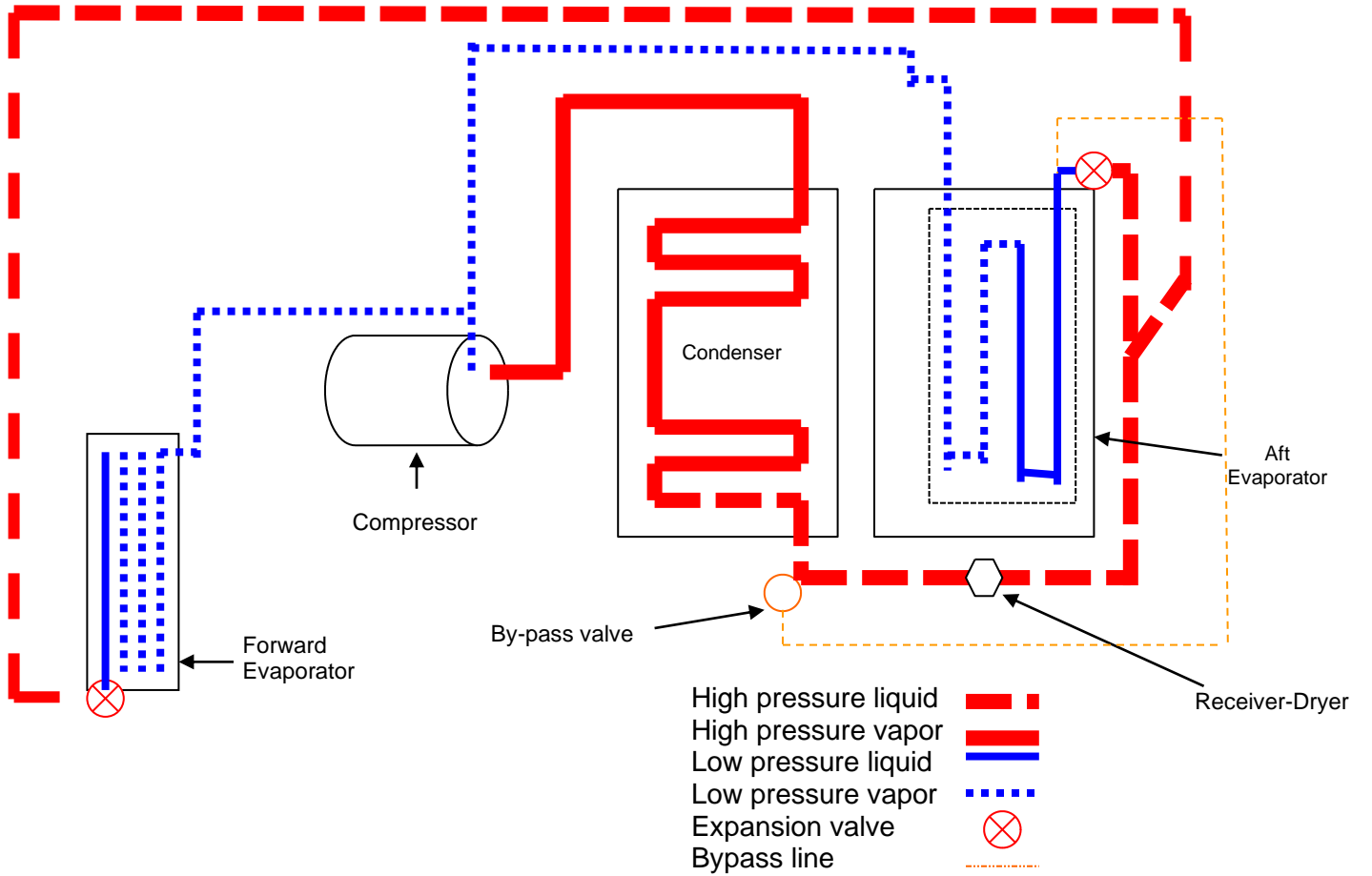


Fig 1.1 Refrigeration Cycle Functional Schematic

**CHAPTER 2
AIRWORTHINESS LIMITATION SECTION**

1. AIRWORTHINESS LIMITATIONS

“No airworthiness limitations associated with this type design change”

**CHAPTER 3
INSPECTIONS**

1. INSPECTION REQUIREMENTS

PERIODIC INSPECTIONS

Item	Annual	Every 25 Hours of Operation	Every 100 Hours of Operation	Special Inspection Information
Evaporator Blower Hi/Lo Operation	X		X	Check for operation
Condenser Blower Motor, Scoop Door Actuator	X		X	Check for operation
Forward & Aft Evaporator Blower motor	X		X	Check for operation in Hi and Lo settings
Compressor Drive Belt	X	X	X	Check belt tension, and for signs of excessive wear (example: Glazing, Cracks, and exposed fibers)
Air Conditioner Placards & Markings (see chapter 4)	X		X	Check for security and legibility
Air Conditioner Compressor Assembly.	X	X	X	Check for operation, security of attaching hardware, including strut protection clamps and signs of oil or refrigerant leaks. Check for minimum of 0.4" clearance between the compressor pulley and the transmission support strut.
Air Conditioner Compressor Mount	X		X	Check mount for cracks, and security of the attaching hardware.
Plumbing and Fittings	X		X	Check for security and signs of oil or refrigerant leaks
Air Conditioner Compressor drive pulley (mounted to tail rotor drive shaft)	X		X	Check for security of attaching hardware.
Blower Electrical connectors	X			Visually inspect for signs of overheating. See sec. 2.0 below for details.

2. INSPECTION OF BLOWER ELECTRICAL CONNECTORS

a) Locate the electrical connectors that power the aft evaporator and condenser blowers. See figures 4-6 through 4-13. The connectors are at the interface between the blower harness and the aircraft harness and identified by their white plastic housing. Note that the evaporator blowers have an additional connector to inspect located several inches away from the harness connector.

AIR CONDITIONER SERVICE MANUAL EC130-200M-1

NOTE: Aft evaporators supplied in late 2014 and newer use a gray plastic Deutsch connector and are not part of this inspection requirement.

b) De-mate each connector and inspect both mates for signs of overheating (discoloration or plastic deformation). If any signs of overheating of the housing are present the system must be rendered inoperative, and the connector housing and contacts replaced before further operation. Contact ACC service dept. for replacement parts if necessary.

c) Installation & replacement of the wire harness electrical connectors for the evaporator and condenser blowers.

To avoid potentially serious overheating issues the Molex style connectors (identified by their white plastic housing) installed on the aircraft harness for connecting to the evaporator and condenser blowers must be installed per ACC procedure PPP23 and only using the appropriate terminal crimp tool. This document is available on the ACC website www.aircommcorp.com/customer-support/service-manuals/.

3. COMPONENT OVERHAUL / REPLACEMENT SCHEDULE

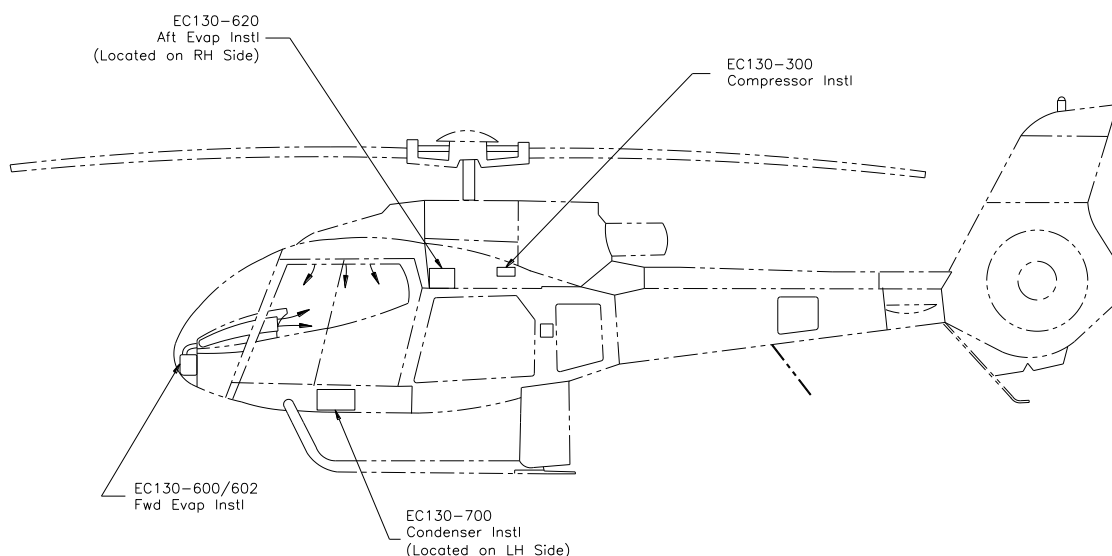
Instl	Fwd Evap Motor P/N	Aft Evap Motor P/N	Condenser Blower Motor/Impeller Assy P/N	Overhaul / Replacement Hours
EC130-200	ES61060-2	ES61060-2	ES73186-5 (Blower Assy)	On Condition
EC130-202	S-6164EC-3	ES61142-1	-	On Condition
	-	-	ES73151-11 (ALT: ES73131-1 (New) or ES73131-2 (Overhauled))	The blower manufacturer recommends TBO at 500 hrs. At the discretion of the operator it is acceptable to operate the blower until failure. A blower failure will result in a reduction in cooling, but no safety of flight issues are involved.

AIR CONDITIONER SERVICE MANUAL EC130-200M-1

CHAPTER 4 LOCATION AND ACCESS

1. LOCATION OF AIR CONDITIONER FEATURES

Nomenclature	Description of Location
Air Conditioner Control Panel	The air conditioner control panel is located in the existing center overhead panel between the pilot & co-pilot seats.
Optional Forward (Cockpit) Evaporator	The forward evaporator is mounted to the center pedestal forward of the instrument panel in the chin bubble area.
Forward Evaporator Blower Assemblies	The forward evaporator blower assemblies are integral to the Forward Evaporator Assembly. (See Forward Evaporator above)
Aft (Main Cabin) Evaporator	Is located on aircraft right, just aft of the main cabin area, and to the right side of the Main Rotor Transmission.
Condenser Assembly (EC130-200 Installation only)	The condenser assembly is located on the aircraft belly below the passenger compartment.
Condenser Assembly (EC130-202 Installation only)	The condenser assembly is located on the L/H side of the aircraft in the baggage compartment.
Compressor	The compressor is mounted to the main gearbox (MGB) coupling case.
Refrigerant Plumbing	The refrigerant plumbing is routed from the compressor to the area below the passenger compartment, and forward to the nose area. (As the refrigerant plumbing connects the Compressor, Condenser, and Evaporators, it may at times be necessary to access these components through several panels.
Servicing Ports	The Service Ports for this system are located in the transmission compartment on aircraft.

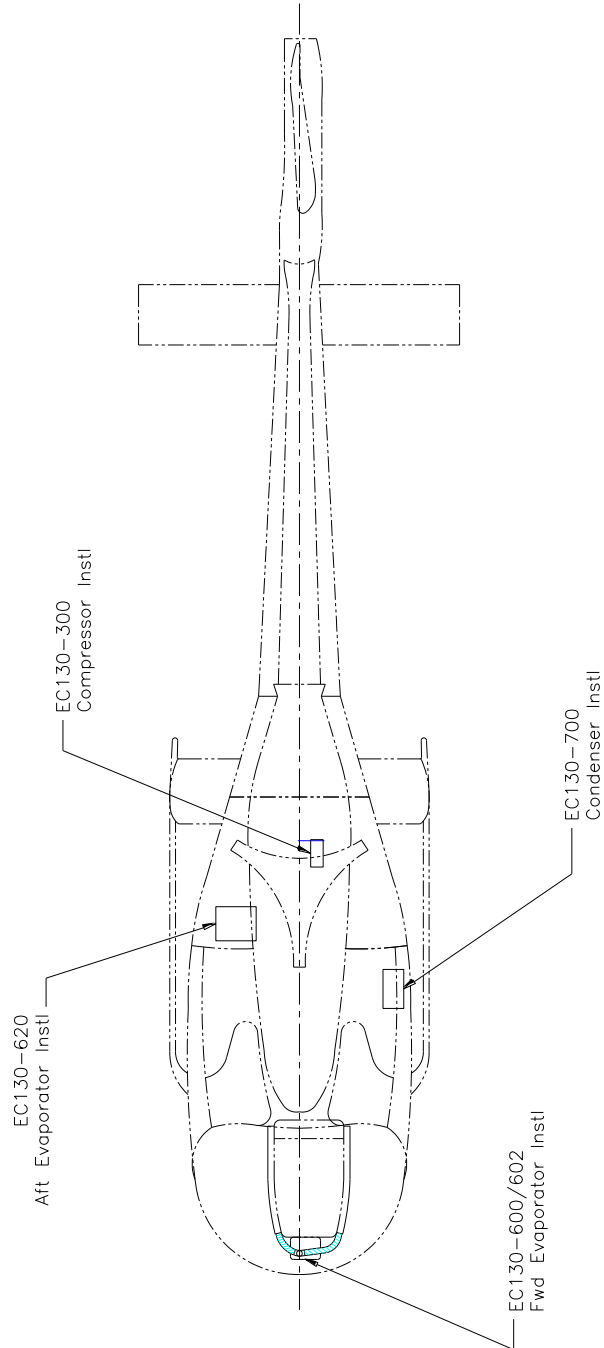


SIDE VIEW

Fig. 4-1 Layout of Airbus EC130B Air Conditioning System
EC130-200-1 & -2 Installation

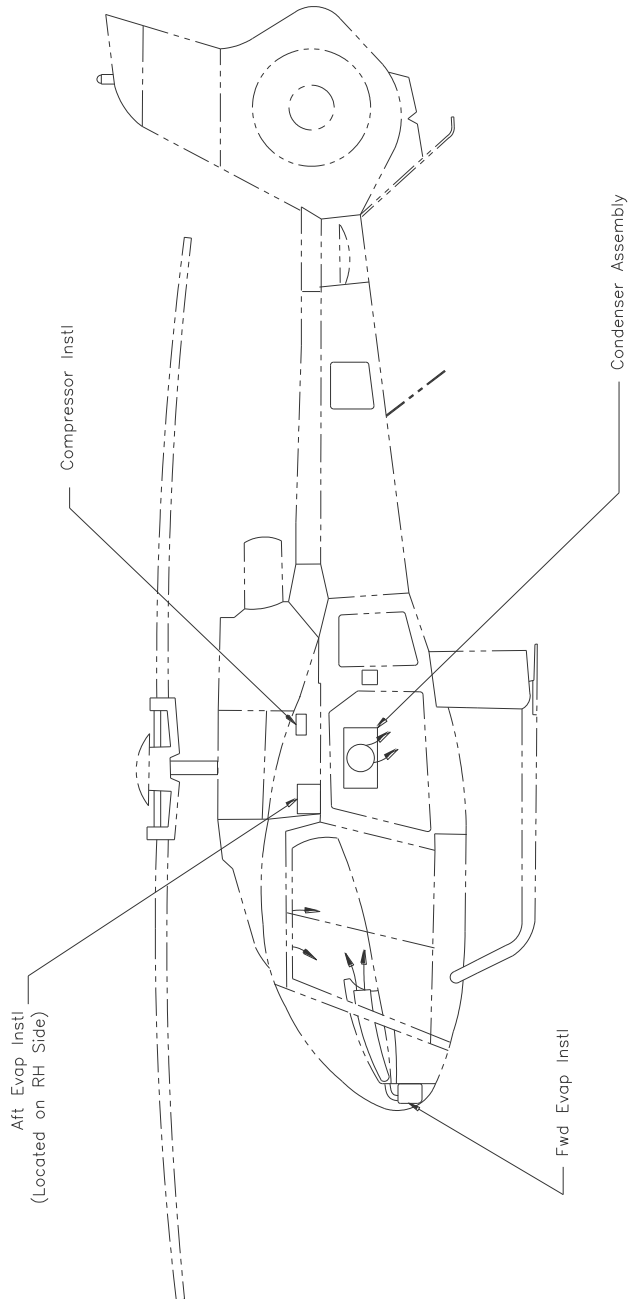
2. LAYOUT OF AIR CONDITIONER SYSTEM

Fig. 4-2 Top View - Model EC130B Fuselage, EC130-200-1 & -2 Install



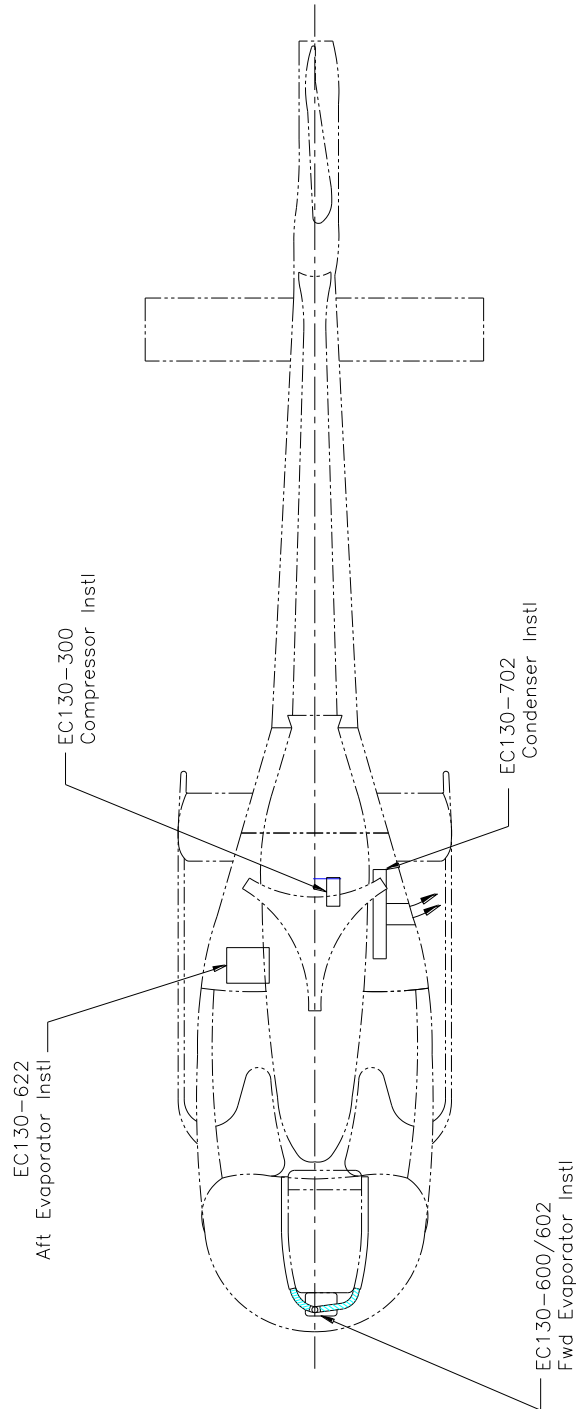
3. LAYOUT OF AIR CONDITIONER SYSTEM

Fig. 4-3 Side View - Model EC130B Fuselage- Baggage area Condenser Installation- EC130-202-1 (Shown), -2 Install (opposite)



4. LAYOUT OF AIR CONDITIONER SYSTEM

Fig. 4-4 Top View - Model EC130B Fuselage. Baggage area Condenser Installation EC130-202-1 (Shown), EC130-202-2 Installation (condenser located opposite side).



5. COMPRESSOR INSTALLATION

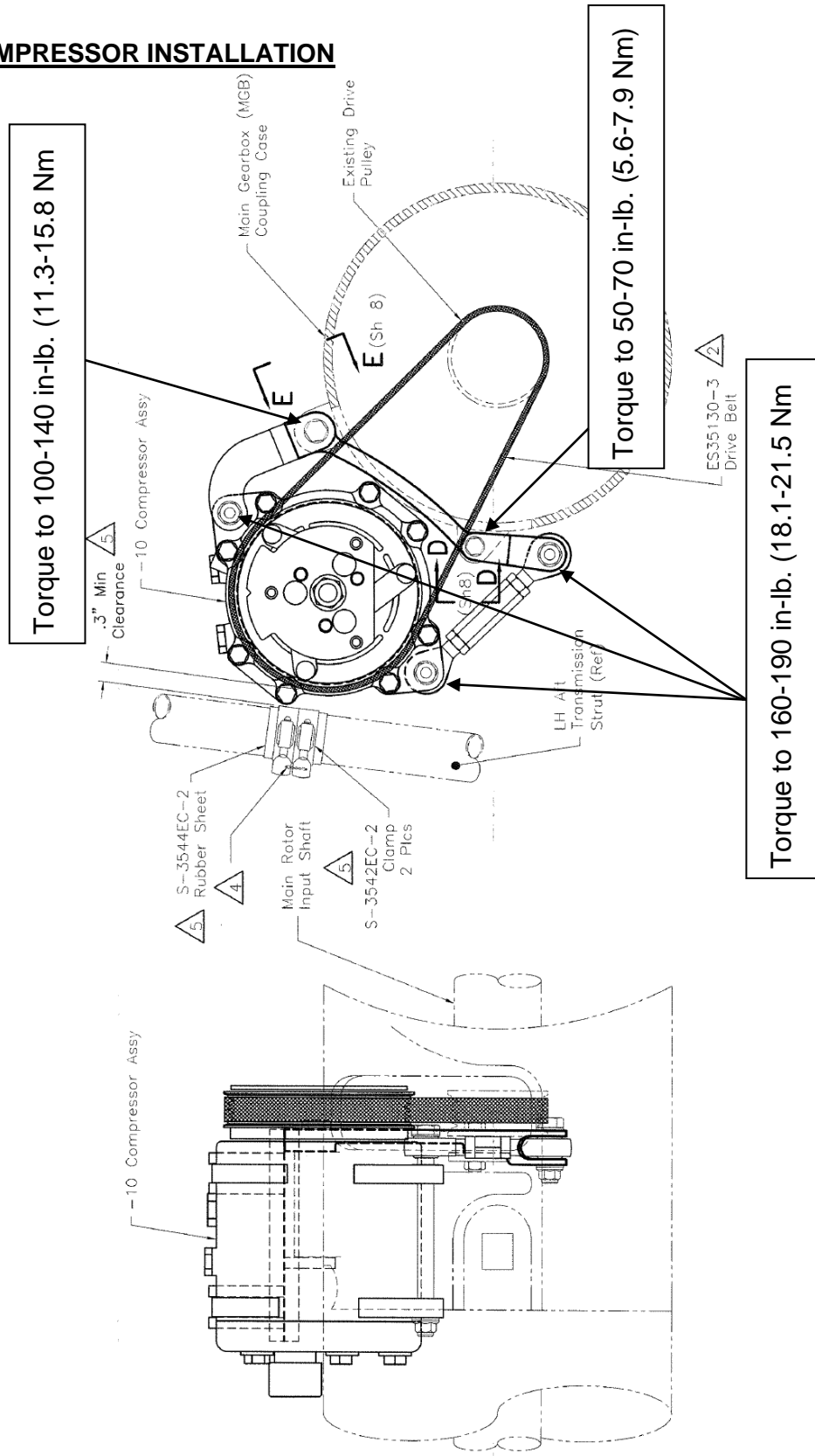
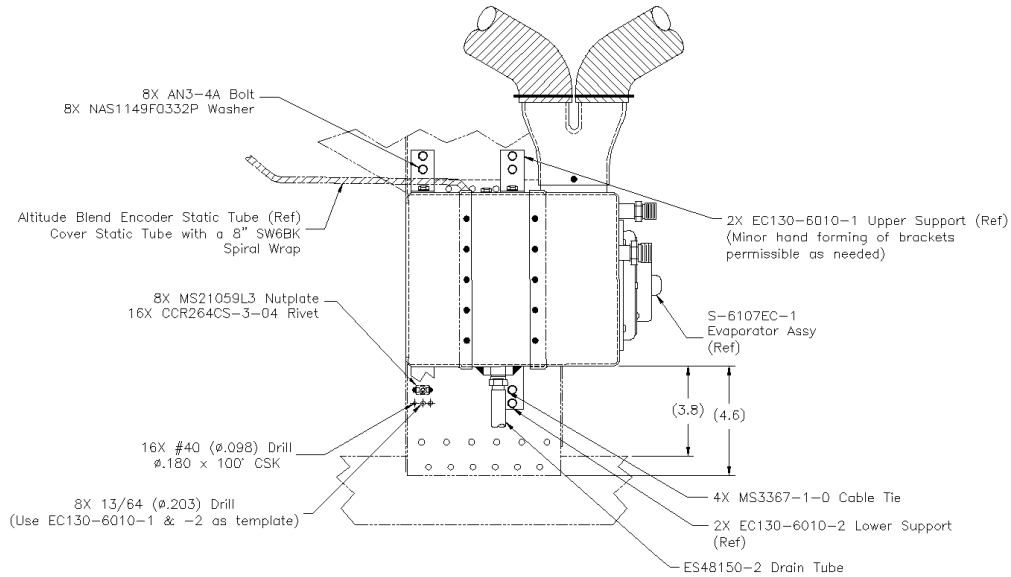
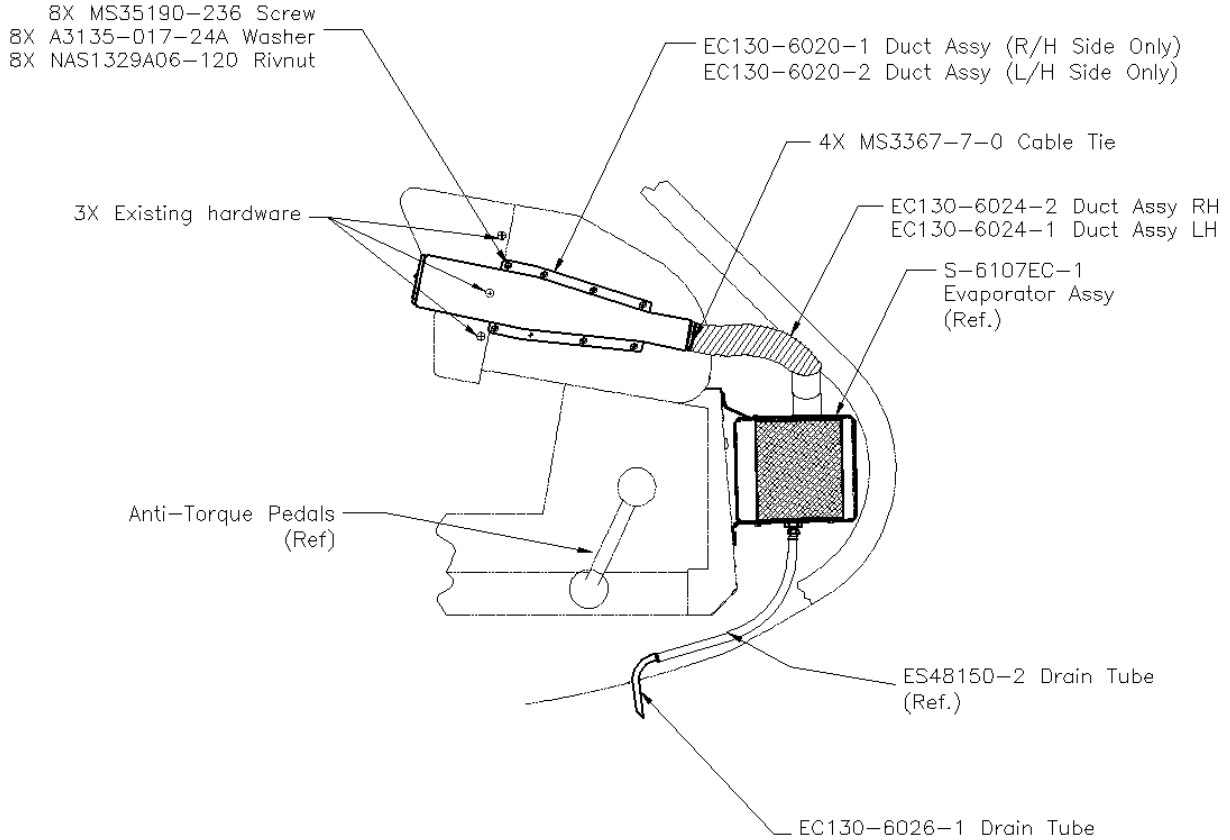


Fig 4-5 View Looking Inboard from Left side and Forward

6. FORWARD EVAPORATOR INSTALLATION

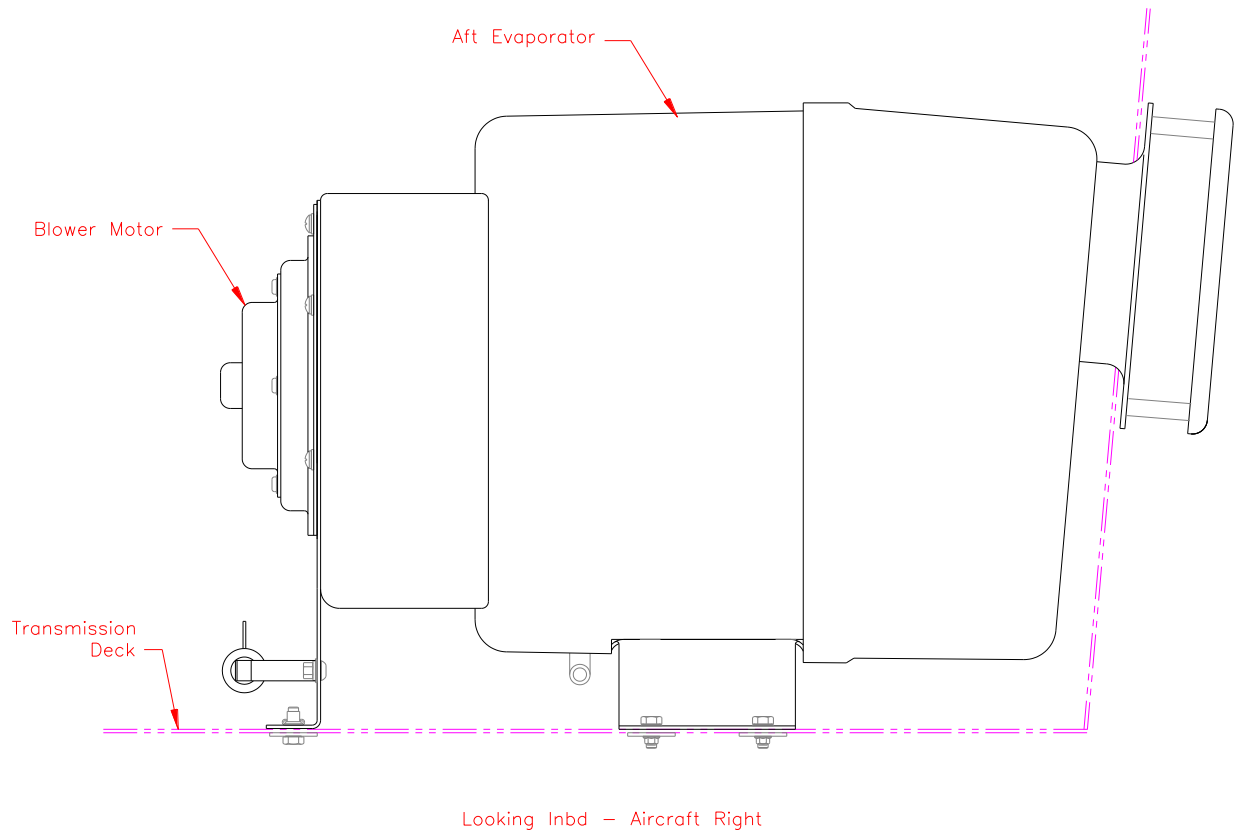
Fig 4-6 View looking Inboard Aircraft Right & Aft



(View looking Aft)

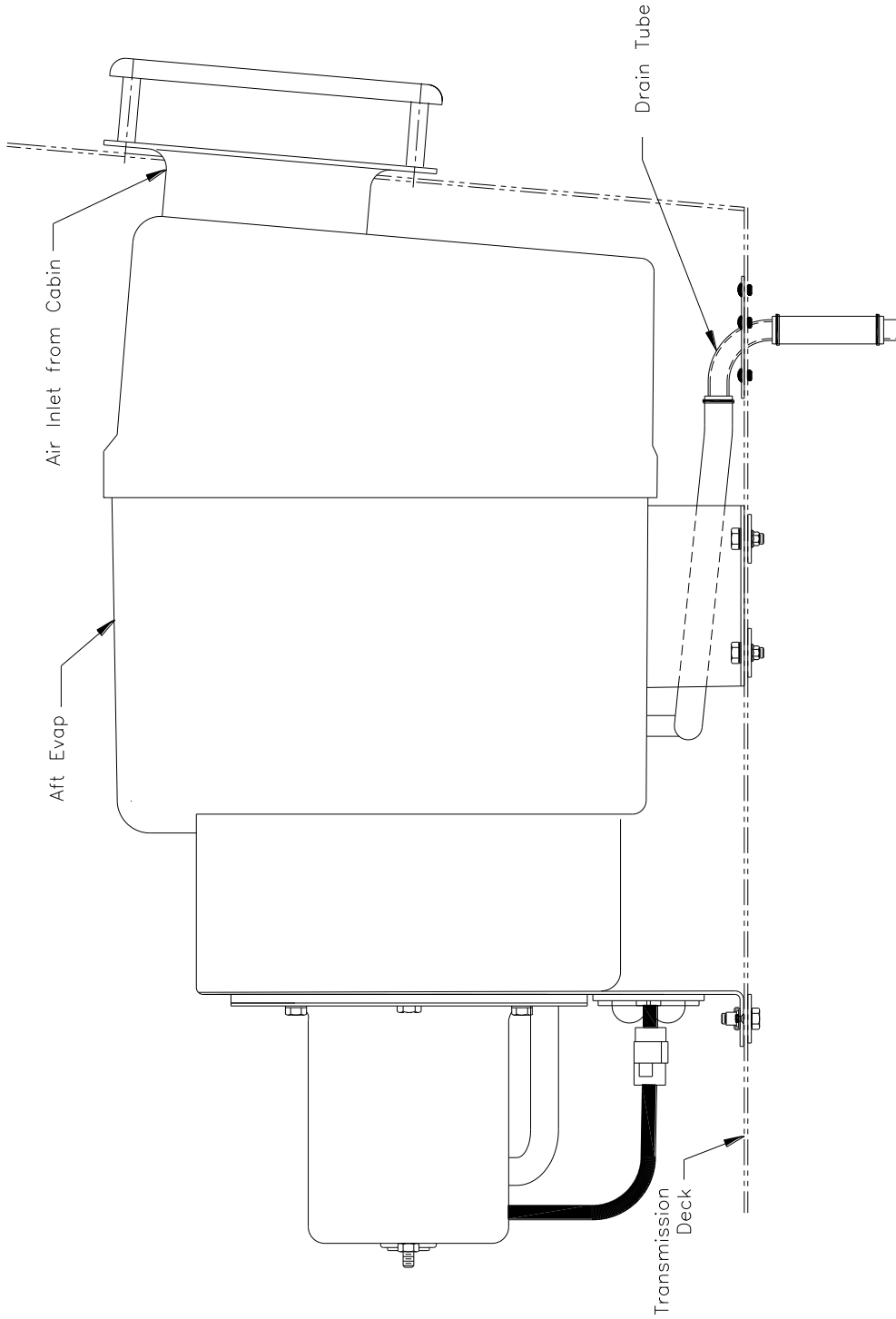
7. AFT EVAPORATOR INSTALLATION, EC130-200-1,-2

Fig 4-7 View looking inboard



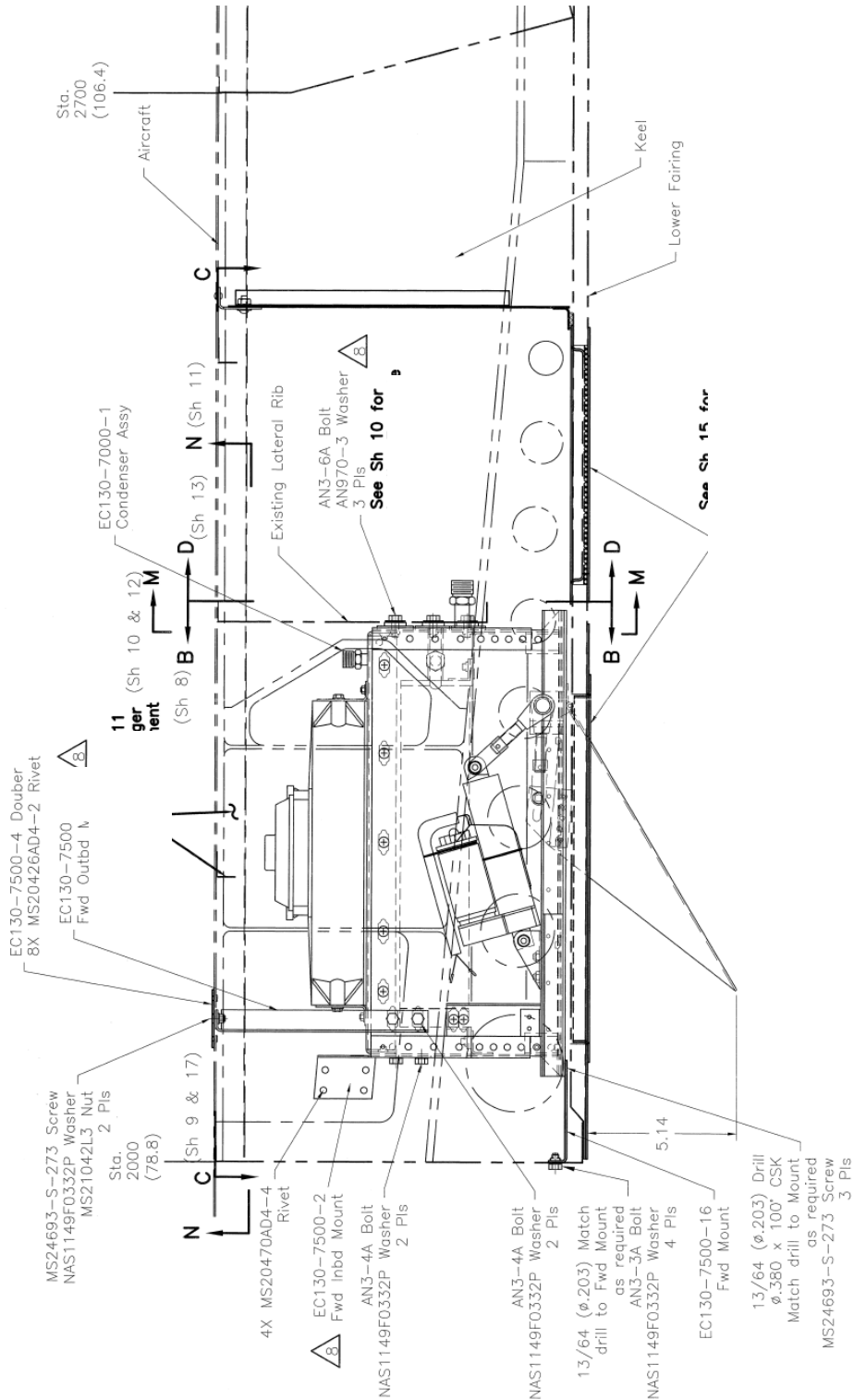
8. AFT EVAPORATOR INSTALLATION, EC130-202-1,-2

Fig 4-8 View looking inboard



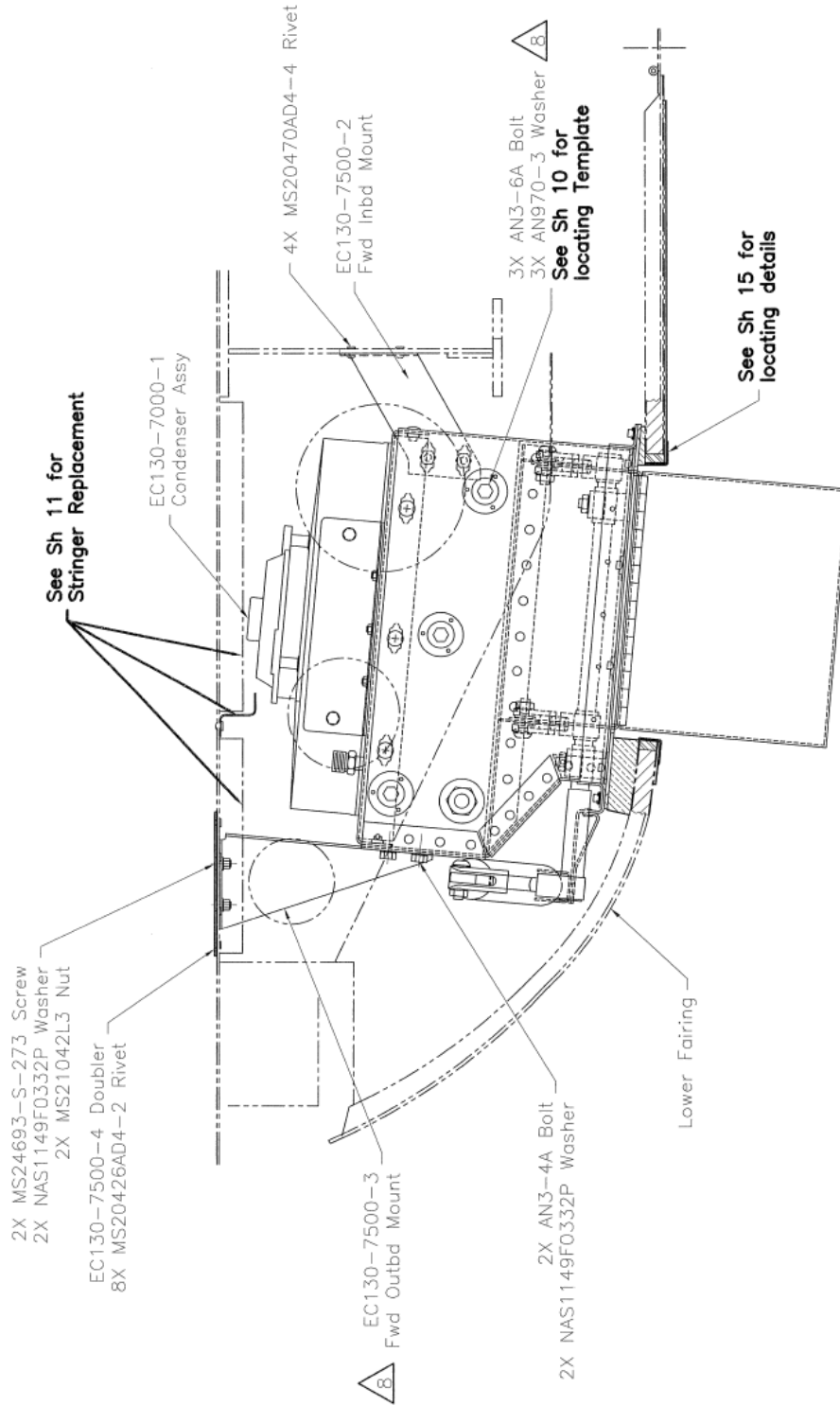
9. CONDENSER SCOOP ASSEMBLY INSTALLATION, EC130-200-1,-2

Fig 4-9 View Looking Inboard from Left side



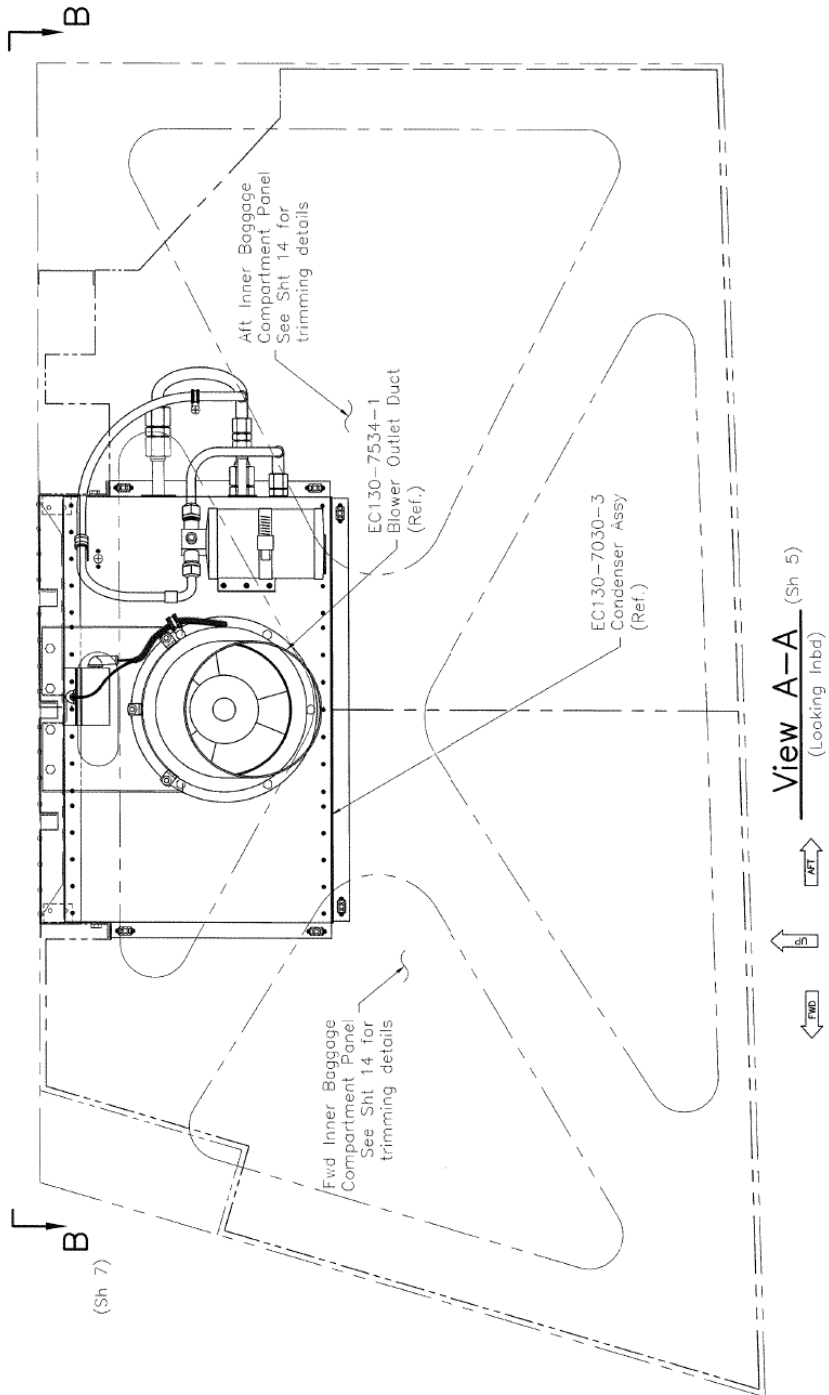
10. CONDENSER SCOOP ASSEMBLY INSTALLATION, EC130-200-1,-2

Fig 4-10 View Looking forward



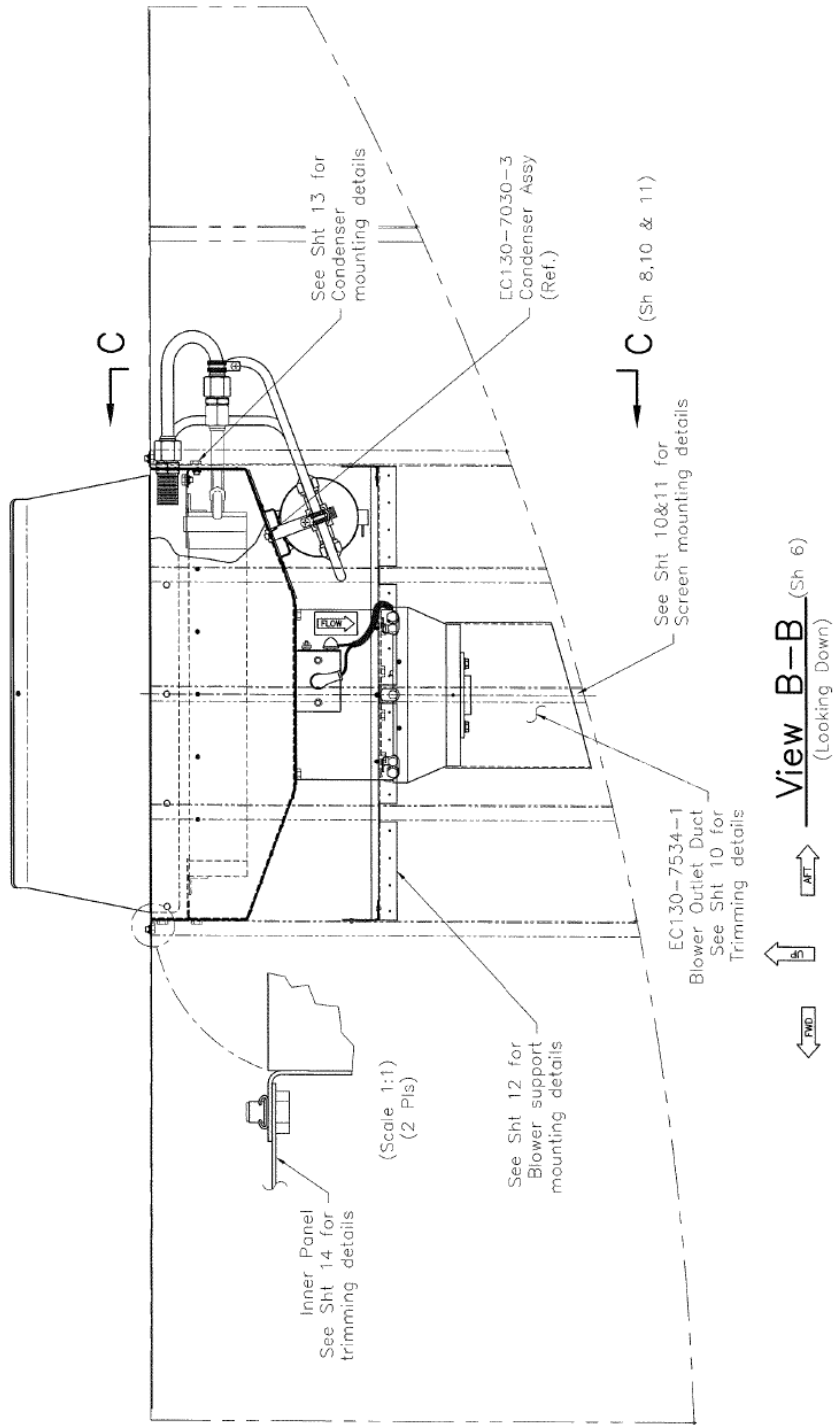
11. CONDENSER INSTALLATION, EC130-202-1 (-2 Right side install opposite)

Fig 4-11 View Looking Inboard



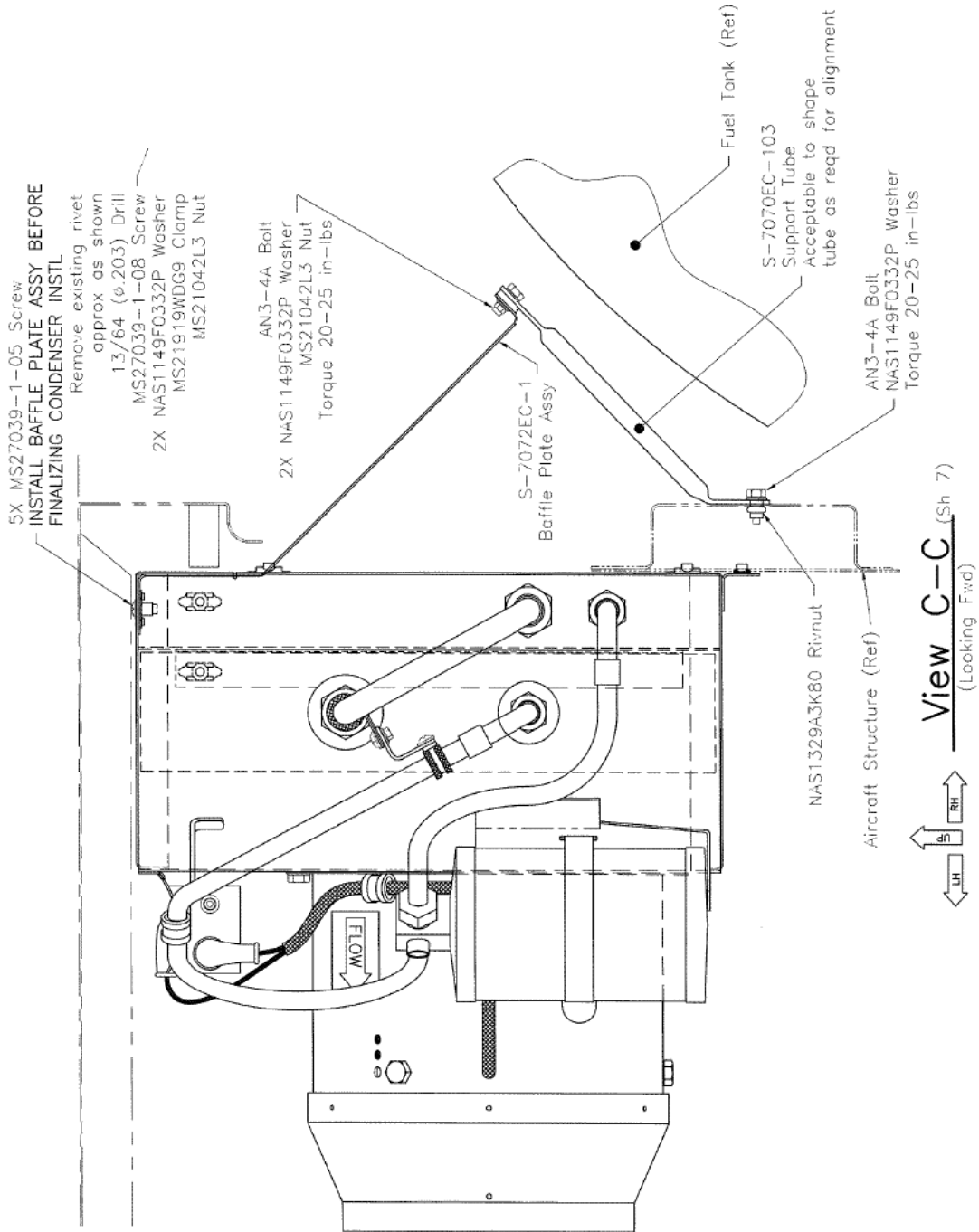
12. CONDENSER INSTALLATION, EC130-202-1(-2 Right side install opposite)

Fig 4-12 View Looking down



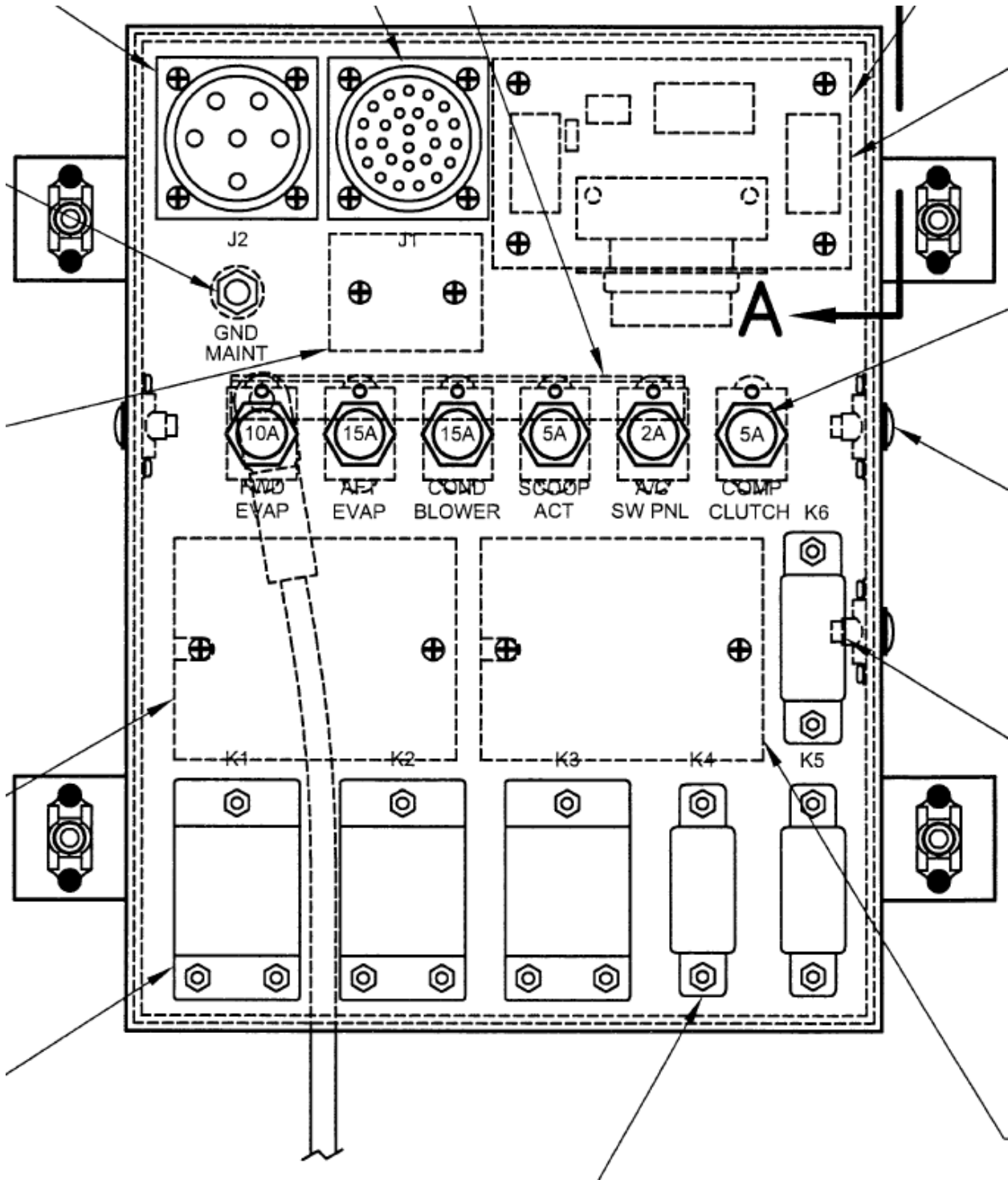
13. CONDENSER INSTALLATION, EC130-202-1 (-2 Right side install opposite)

Fig 4-13 View Looking Forward



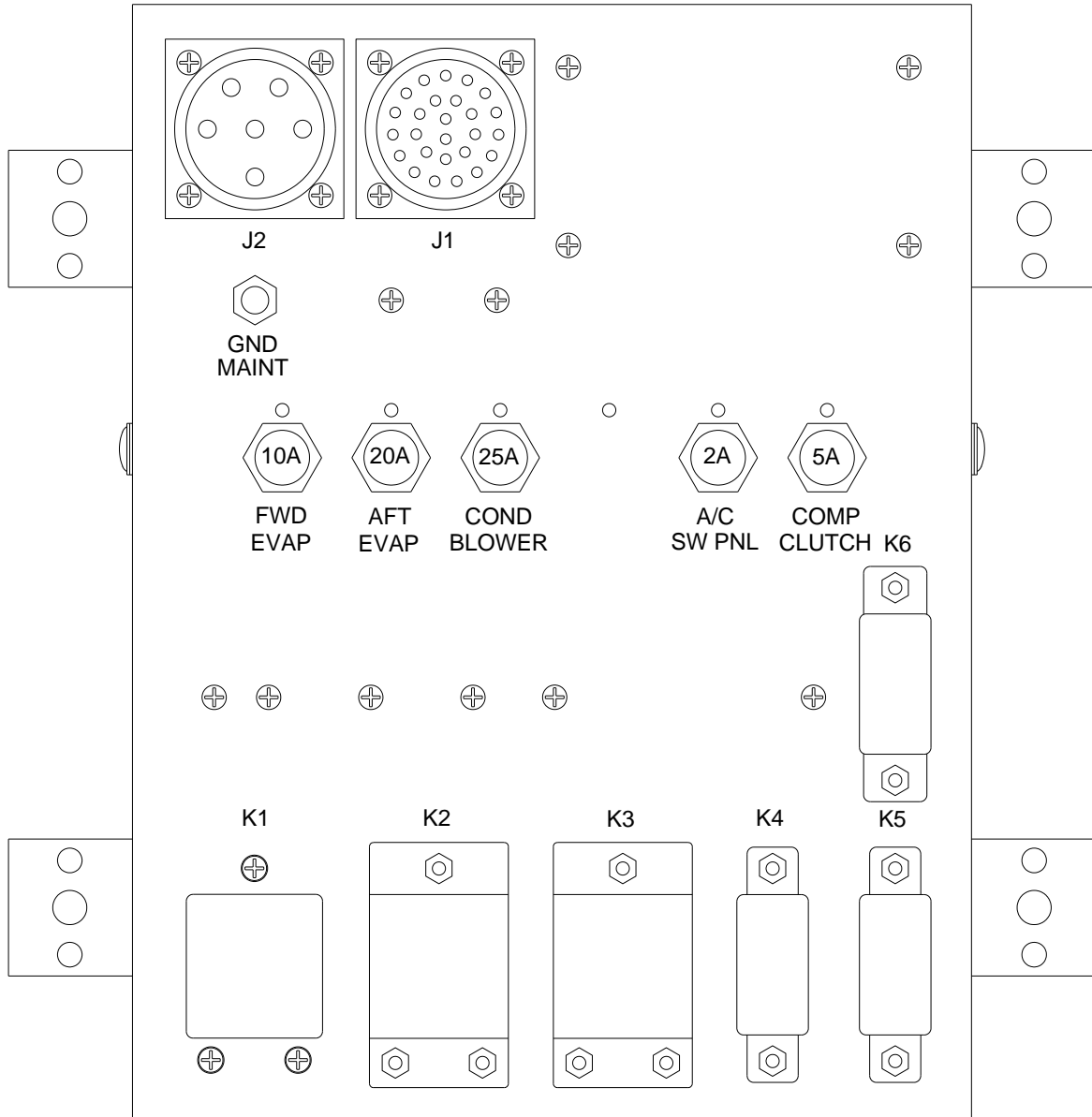
14. RELAY PANEL & CIRCUIT BREAKER ASSEMBLY, EC130-200-1,-2 INSTALL

Fig 4-14 View Looking inside RH equipment bay



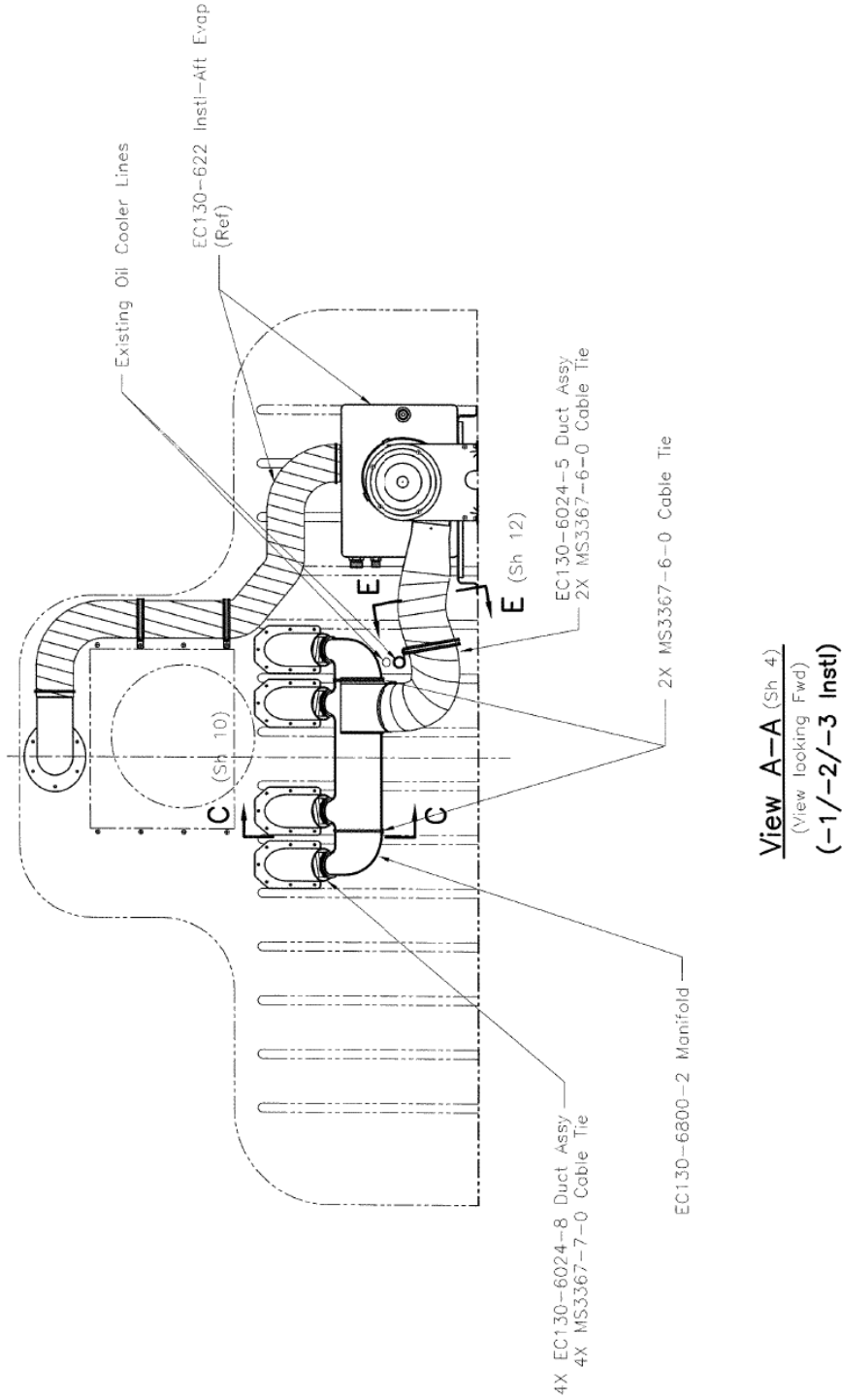
15. RELAY PANEL & CIRCUIT BREAKER ASSEMBLY, EC130-202-1,-2 INSTALL

Fig 4-15 View Looking inside RH equipment bay



16. VENTILATION KIT, EC130-202-1,-2 INSTALLATION

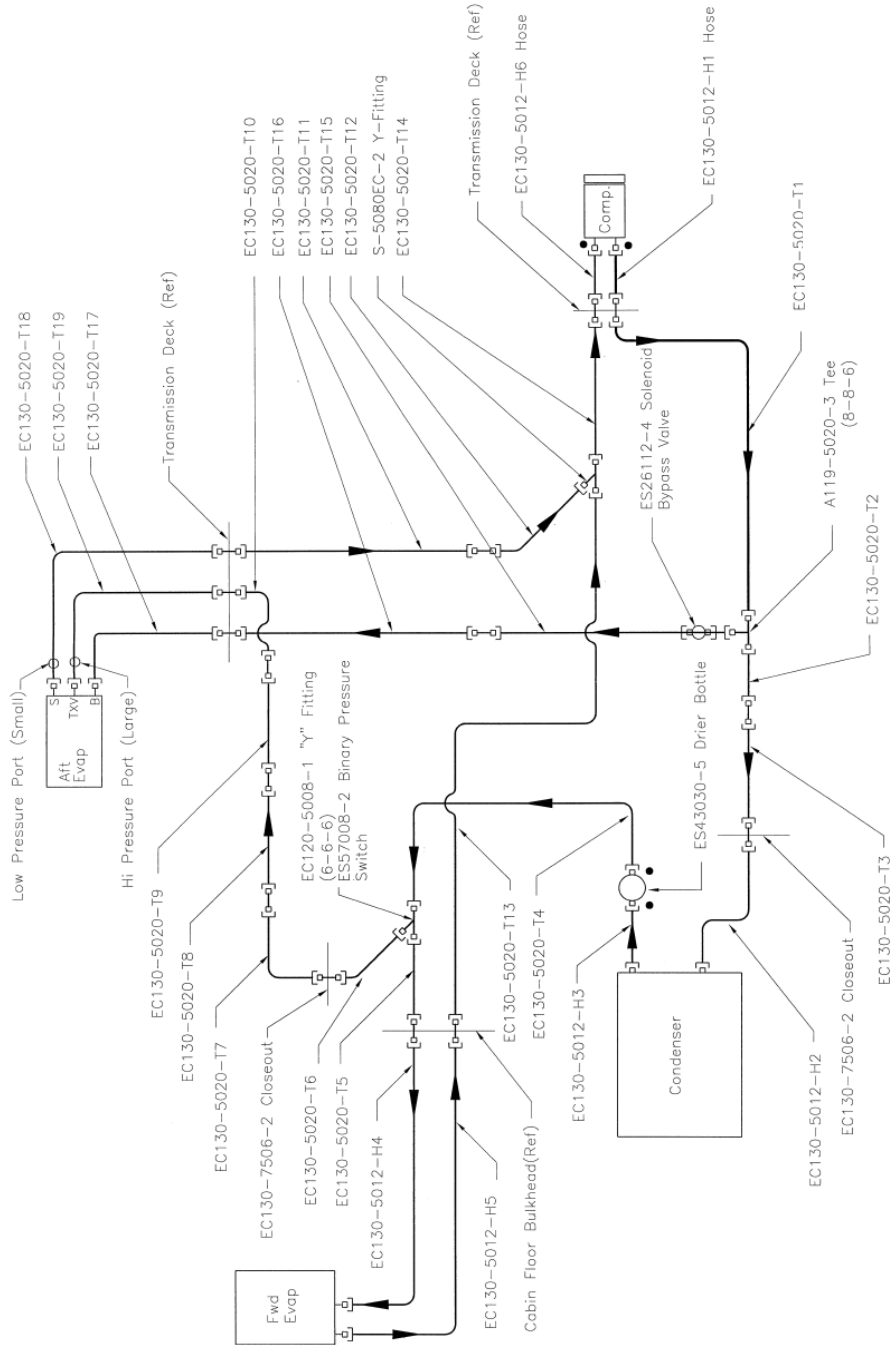
Fig 4-16 View Looking Forward, Transmission Deck



View A-A (Sh 4)
(View looking Fwd)
(-1/-2/-3 Instl)

17. REFRIGERANT PLUMBING SCHEMATIC, EC130-200-1,-2

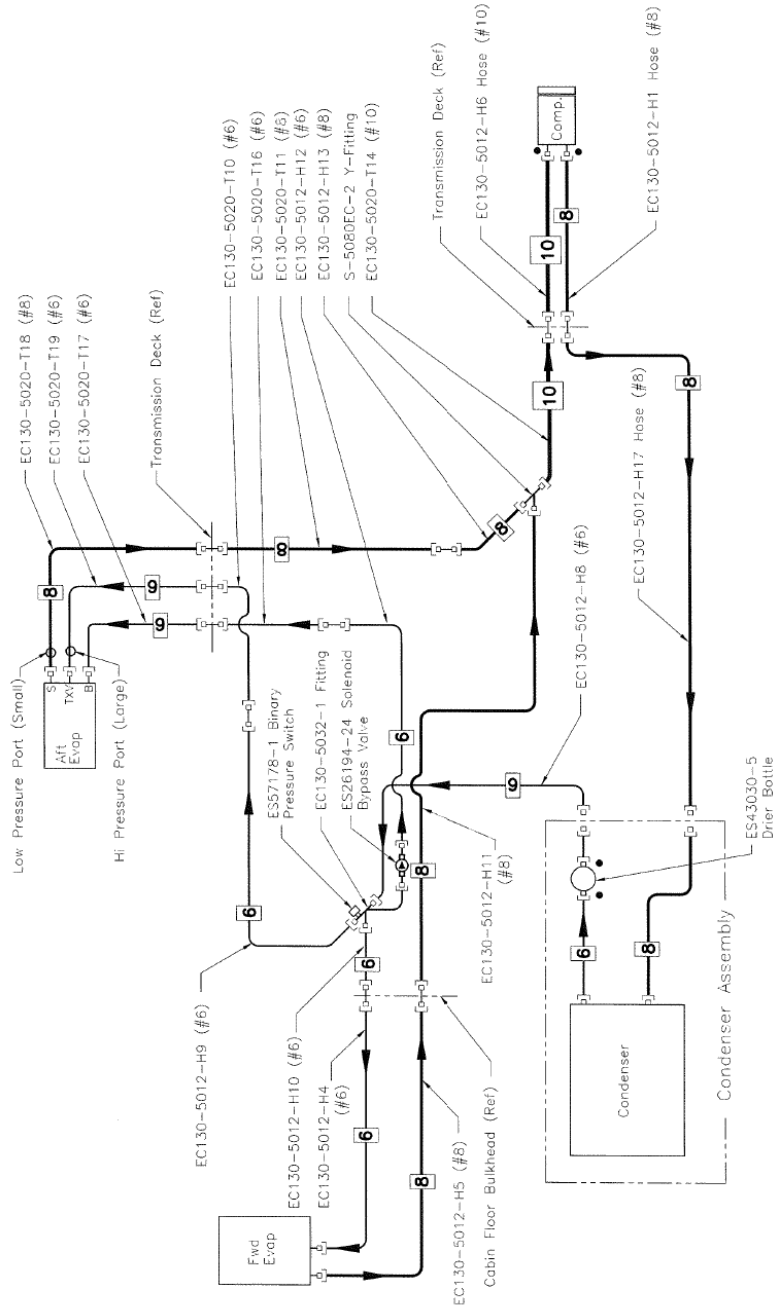
Fig 4-17 Plumbing Schematic, EC130-200-1,-2



Installation

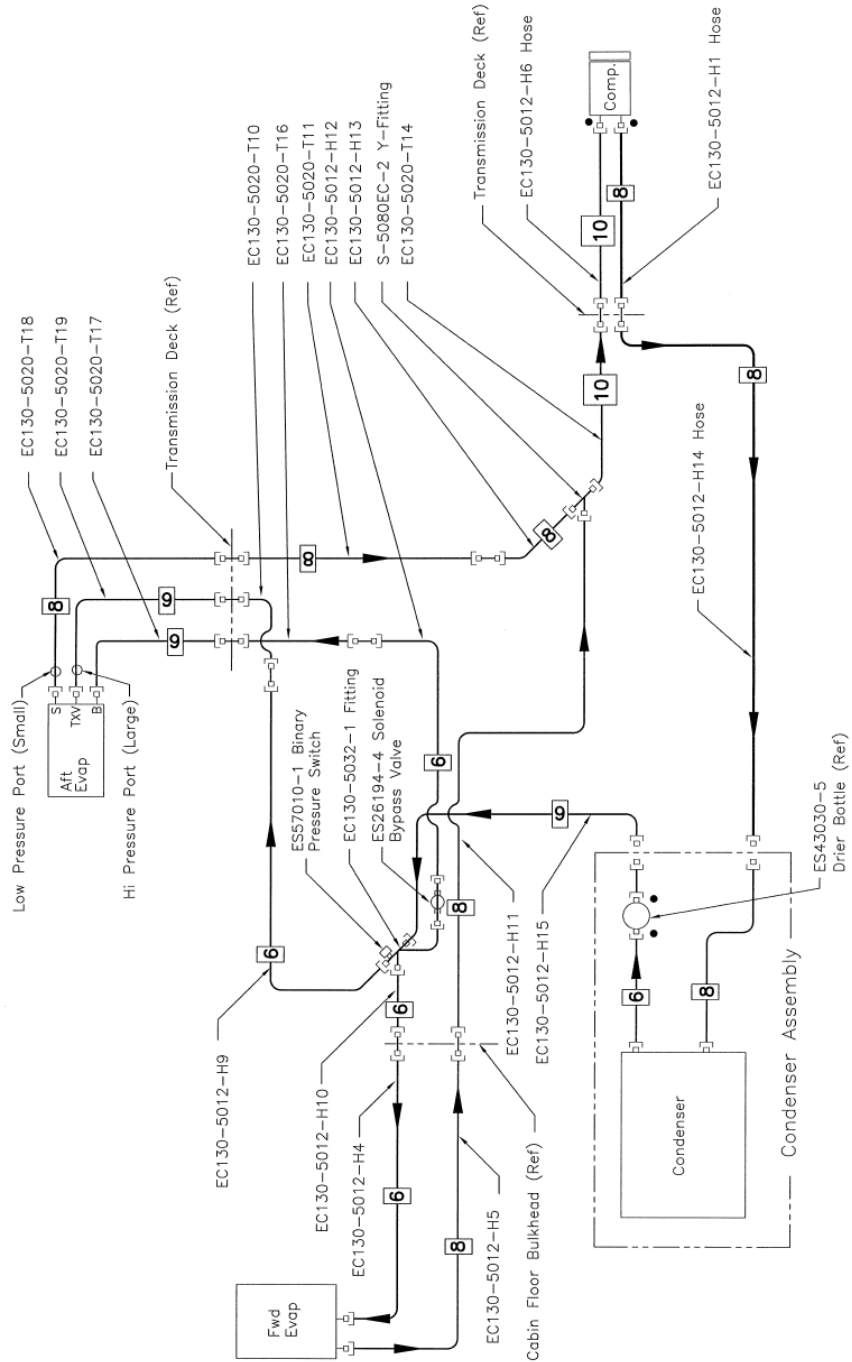
18. REFRIGERANT PLUMBING SCHEMATIC, EC130-202-1 thru -4

Fig 4-18 Plumbing Schematic, EC130-202-1 thru -4



19. REFRIGERANT PLUMBING SCHEMATIC, EC130-202-5 thru -8

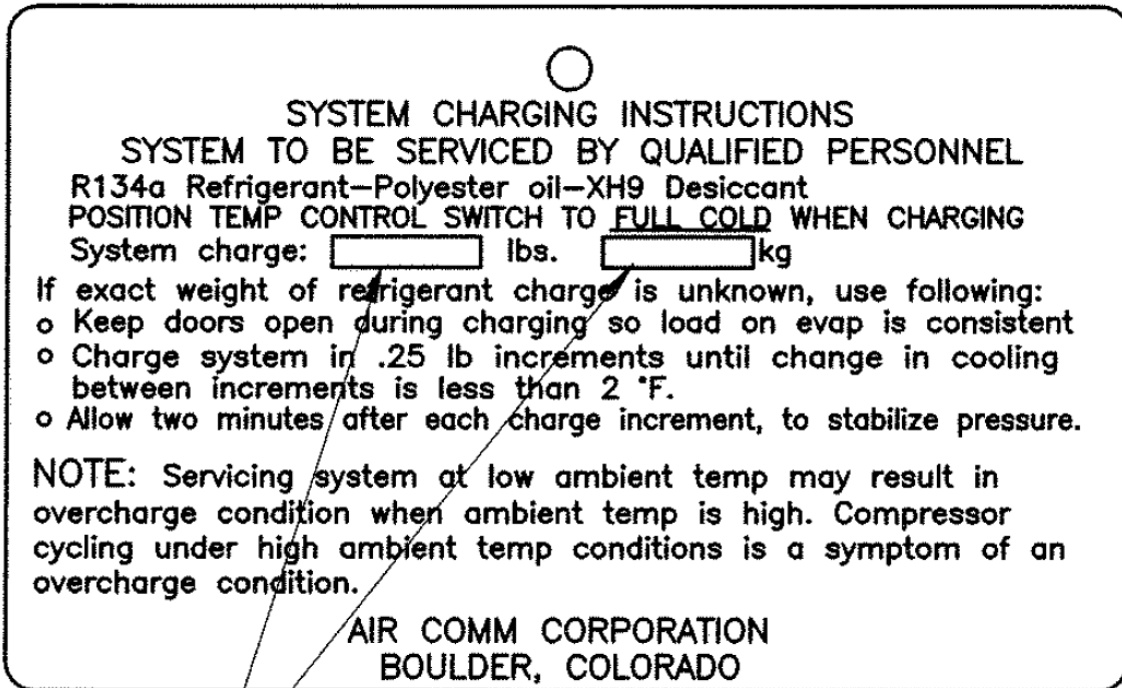
Fig 4-19 Plumbing Schematic, EC130-202-5 thru -8



CHAPTER 5
PLACARDS AND MARKINGS

1. PLACARD AND MARKING INFORMATION

System Charging Instruction Placard



2.4

1.1

NOTE: Newer placards do not include "Boulder, Colorado" and may include the use of Ultra PAG oil.

CHAPTER 6 SERVICING

1. SAFETY PRECAUTIONS

CAUTION

Refrigeration servicing should be performed by qualified personnel only!

The refrigerant used in the air conditioning system is the environmentally safe HFC R134a. This refrigerant is non-explosive, non-flammable, non-corrosive, has practically no odor, and is heavier than air. Although R134a is classified as a safe refrigerant, certain precautions must be observed to protect the parts involved, and the person working on the system.

Liquid R134a at normal atmospheric pressure and temperature evaporates so quickly that it tends to freeze anything that it contacts. Care must be taken to prevent any refrigerant from coming into contact with the skin or eyes.

WARNING

Always wear safety goggles when servicing any part of the refrigerant system. Should any liquid refrigerant contact the skin or eyes, seek medical attention immediately even if the irritation ceases.

WARNING

Never weld, use a flame-type leak detector, blow torch, solder, steam clean, bake on aircraft finish, or use excess amounts of heat on, or in the immediate area of refrigerant supply tank.

2. SERVICING INFORMATION

- A. This system should be serviced by QUALIFIED PERSONNEL ONLY!
- B. A list of suggested servicing equipment is provided in section 5 below.
- C. Connect the service manifold and vacuum pump to the service ports located on the Aft Evaporator assembly on the right side of the transmission deck.
- D. Turn on the vacuum pump and open both valves to evacuate the system. When the pressure drops to 29.40 InHg (1.9 KgCm) moisture vaporizes and is drawn out of the system by the vacuum pump. Complete removal of moisture is important to prevent blockage of the expansion valves with ice. Leak check the system as described later in this chapter.

NOTE

Due to the drop in atmospheric pressure with an increase in altitude, the normal vacuum reading will drop approximately 1" InHg (1 KgCm) for each 1000 ft. (304.8 m) of altitude.

AIR CONDITIONER SERVICE MANUAL EC130-200M-1

- E. After the system has been evacuated, turn off both manifold valves, and then turn the vacuum pump off. Allow a minimum of one hour to check for vacuum leaks (if the system will not hold a vacuum, the system has a fitting leak). It may be necessary to charge the system with one or two lbs (.45 to .86 Kg.) of refrigerant and conduct a leak check survey using an electronic leak detector.

CAUTION

IT IS MANDATORY THAT THE SYSTEM BE LEAK FREE TO ENSURE TROUBLE FREE OPERATION. CONTINUOUS OPERATION OF THE SYSTEM WITH INSUFFICIENT CHARGE WILL RESULT IN REDUCED COMPRESSOR LIFE.

- F. After the system is proven to be leak free, the system should be evacuated for a minimum of ½ hour before being charged with HFC R134a.
- G. Charging the system with 2.4 lbs. (1.1 Kg.) of R134a refrigerant is the most accurate method of charging. This should be accomplished using the suggested servicing equipment called out in this chapter.
- H. If a charging station is unavailable, the following procedure should be followed. Add an initial refrigerant charge of 2.0 lbs (0.9 Kg.) then continue to add refrigerant until the evaporator outlet air temperature and system suction pressures reach a minimum. When adding the refrigerant after the initial charge, it should be done in increments of 0.2 lbs (.09 Kg.) and two minutes allowed to elapse before adding each additional 0.2 lbs. (.09 Kg.) refrigerant charge. The optimum charge occurs when evaporator outlet temperatures are at their lowest. Any additional refrigerant will cause the outlet air temperature to increase and system performance to be degraded.

WARNING

If the system is to be charged by operating the compressor it must be charged through the Lo (Blue fitting) pressure (suction) port ONLY!
Do not open the Hi (Red fitting) pressure (discharge) valve while the system is operating!

- I. Test run the system after charging, to confirm the system is working properly.

CAUTION

When reclaiming refrigerant, be sure to note any oil that is removed from the system, and replace the lost oil before or during re-servicing. Reduced compressor life will result if the total system oil charge is not maintained.

SYSTEM REFRIGERANT & OIL CHARGE

System Description	Refrigerant Charge		Oil Charge	
EC130 Air Conditioner system	2.4 lbs.	1.1 kg.	8.0 fl oz.	238 ml.

3. LUBRICATION INFORMATION

The total system oil charge is 8.0 fl oz. (238 ml.) of Double End Capped Polyalkylene Glycol (DEC PAG). The oil is initially contained within the compressor as shipped from the factory, so no additional oil is required when installing a new system.

If oil is spilled during installation / maintenance or is lost due to a leak in the system, it is necessary to approximate the amount of lost oil and add this amount to the system. This oil, if required, should be added to the compressor discharge line prior to system charging.

This system may be serviced with either Polyolester (POE) or Double End Capped Polyalkylene Glycol (DEC PAG). Polyalkylene Glycol is preferred due to its superior lubricating properties and improved compressor service life. There are several types of PAG available. Only the “Double End Capped” type is permissible in Air Comm Corporation air conditioning systems. Double End Capped PAG oil is available from Air Comm Corporation in 8-ounce bottles (P/N ES94006-13). Mixing of POE and PAG is acceptable. Disregard previous statements to the contrary. They referenced PAG oil that was not “Double End Capped”. Current versions of compressors are designed to be operated using PAG oil. Testing by Air Comm Corporation has shown that “Double End Capped” PAG is compatible with POE and can therefore be mixed. “Double End Capped” is a reference to the chemical structure of the molecule and not to the container.

Do not use Mineral oil in this system with R134a refrigerant. Do not use any refrigerant oil other than Double End Capped Polyalkylene Glycol (also known as “ULTRA PAG”) or Polyolester (also POE).

DEC PAG and POE oils are hygroscopic so they will absorb moisture if left open. Keep containers tightly capped when not in use and keep all system components capped while servicing system.

The quantity of lubrication in the system is critical. If too little lubrication is in the system, the compressor life may be reduced. No other component in the A/C system requires lubrication. Too much lubricant in the system will retard heat transfer in the evaporator and condenser coils and reduce the cooling capacity of the system.

The following chart may be used to calculate the amount of oil to be added in case a component is being replaced with a new part.

Component	Oil Amount
Compressor	See Instructions
Evaporator	1.0 oz. per evaporator
Condenser	1.5 oz.
Receiver Drier	1.5 oz.
Hose - Vapor	1.0 oz. per 10 foot
Hose – Liquid	1.0 oz. per 20 foot

NOTE

Maintaining the correct amount of refrigerant and refrigerant oil in the system is critical for ensuring the long life of the compressor.

The Service Ports for this system are located in the upper aft right-hand corner of the baggage compartment.

CAUTION

This system is serviced with either Polyester Based Refrigerant Oil (POE) or Double end capped Polyalkylene oil (DEC PAG, aka Ultra PAG). The use of Mineral Oil or Polyalkylene (PAG) in this system will cause damage to the air conditioner compressor and expansion valves.

4. **SYSTEM LEAK CHECK**

Identification and elimination of system fitting leaks is extremely important to ensure trouble-free operation of this system.

A system which contains a partial charge of refrigerant can be leak tested with the aid of an electronic leak detector and be recharged without evacuating the system.

A new or empty system can be pressurized with nitrogen 70-80 psi (5.1-5.6 kgcm) or R134a 50 psi (3.5 kgcm) to conduct a leak survey. **DO NOT USE COMPRESSED AIR.** Compressed air will introduce moisture into the system, which will degrade the operation of the system.

The preferred method is to use an electronic leak detector in conjunction with a small charge of R134a refrigerant. All checks done in this manner should be conducted with the air conditioner off. Since the refrigerant is heavier than air, leaks are most likely to be detected on the underside of hoses and fittings. Refrigerant will collect in low areas and provide erroneous leak detection. A stream of compressed air from a nozzle may be useful in clearing the area just prior to conducting a leak test.

If the nitrogen method is used, it will be necessary to mix together a water and mild soap solution. Each fitting or suspected leak area should be brushed with this soap solution and watched for evidence of bubbles formed by the escaping nitrogen.

If a leak is detected at an O-ring fitting check to ensure proper torque has been applied to the fitting. If the system continues to leak, reclaim the system of refrigerant, and install a new O-ring. **NOTE:** be sure that the O-ring is Lubricated with refrigerant oil prior to its installation.

A small amount of leakage (approximately one ounce per year) past the compressor shaft seal is normal. Most leak detectors are sensitive enough to show a leak of this magnitude.

5. **SUGGESTED EQUIPMENT FOR SERVICING**

Recovery / Recycling / Recharging Station

(Example: Snap-on Model ACT 3340, Robinair Model 34700, or equivalent).

Electronic Leak Detector (R134a compatible)

(Example: Micro-Tech III, Robinair, Snap-on, or equivalent).

Manifold and gauge set (R134a compatible)

(Example: Robinair, Snap-on, or equivalent).

6. **CONSUMABLE MATERIALS**

Refrigerant:

This system is to be charged with Dupont, or equivalent HFC R134a refrigerant only.

Lubricant:

This system may be serviced with either Polyolester (POE) or Double End Capped Polyalkylene Glycol (DEC PAG). DEC PAG is preferred. **(Do not use Mineral Oil in this system).**

O-rings:

As this system is charged with R134a refrigerant, it must be fitted with Highly Saturated Nitrile (HSN) O-rings. This system incorporates HSN O-ring for the Insert fittings that are GREEN in color, and HSN O-rings for the TORQ LOK® fittings that are Black in color.

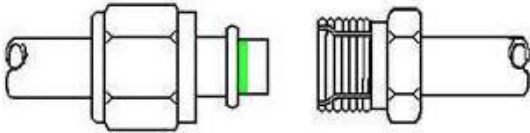
7. SUGGESTED SPARES LIST

<u>Item</u>	<u>Part Number</u>
Blower Motor – Forward Evaporator	ES61060-2
Blower Motor – Aft Evaporator (EC130-200 Installation only)	ES61060-2
Blower Motor – Forward Evaporator	S-6164EC-3
Blower Motor – Aft Evaporator (EC130-202 Installation only)	ES61142-1
Compressor Assembly	S-3036EC-1
Compressor Drive Belt	ES35130-3
Receiver / Drier Bottle	ES43030-5
Binary Switch	ES57178-1
By-pass Valve	ES26194-24
Condenser Blower replacement (EC130-200 Installation only)	ES73186-5
Condenser Blower replacement (New)	ES73131-1
Condenser Blower replacement (Overhauled)	ES73131-2
Condenser Blower replacement (EC130-202 Installation only)	ES73151-11
HSN O-rings; Insert type (Green)	
<u>Size</u>	
#6 O-ring	ES44010-2
#8 O-ring	ES44010-3
#10 O-ring	ES44010-4
HSN O-rings; TORQ LOK® Type (Black)	
<u>Size</u>	
#6 O-ring	ES44012-2
#8 O-ring	ES44012-3
#10 O-ring	ES44012-4

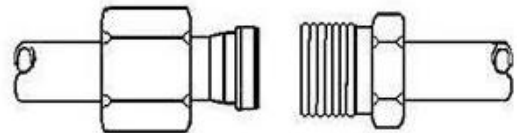
CHAPTER 7
STANDARD PRACTICES INFORMATION

1. **FITTING TORQUING PROCEDURES**

INSERT O-RING FITTINGS



TORQ LOK® FITTINGS



Apply a thin coating of refrigerant oil to O-ring and Female side of fitting. Confirm there is no damage (nicks, dirt, etc.) on fittings.

Slide B-nut back away from the end of the tube to expose the O-ring as the fittings are mated together.

Take caution not to pinch the O-ring during assembly.

Engage the male end into the female fitting being careful to maintain alignment.

Ensure that the male flange seats fully against the female fitting without the O-ring being pinched.

It is important to hold the fitting together while sliding the B-nut forward and engaging the threads.

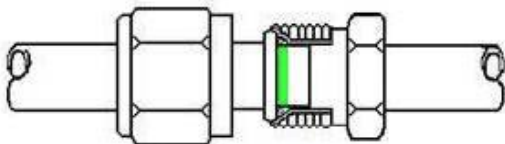
Tightening specifications

CAUTION: ALWAYS USE BACK UP WRENCH. EXCESSIVE TORQUE WILL DAMAGE THE JOINT, COMPROMISING THE INTEGRITY OF THE SEAL.

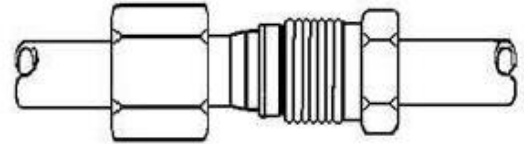
Insert O-Ring Fittings (regardless of size): Hand tighten, then turn an additional 60 deg. (one flat on the nut).

TORQ LOK® fittings (regardless of size): Hand tighten, then turn an additional 30 deg.

INSERT O-RING FITTINGS



TORQ LOK® FITTINGS



Once the system is charged, check each fitting with an electronic leak detector. A “bubble” check is inadequate for identifying small leaks. (An electronic leak detector is the only

reliable method of checking for refrigerant leaks). Once the fittings have been checked and are found to be free of leaks, torque seal as appropriate.

2. REMOVAL, REPLACEMENT & ADJUSTMENT OF COMPRESSOR DRIVE BELT

REMOVAL

- A. It is necessary to access the transmission compartment to remove, replace, or adjust the Compressor Drive Belt.
- B. Remove the safety wire from the Compressor Belt Tensioning Link jam nuts and loosen them. See Fig. 4-5, sh 15.
- C. Before attempting to remove the drive belt tension, ensure that the compressor mounting / attaching bolts have been loosened to allow free rotational movement of the compressor body on the compressor mount.
- D. Remove the Main Gearbox Engine Coupling per Airbus maintenance instructions to expose the compressor drive pulley.
- E. Adjust the Belt Tension Link to loosen the belt, and remove the belt from the compressor & drive pulley.

REPLACEMENT

- A. With the Main Gearbox Engine Coupling removed (per Airbus maintenance instructions) install the drive belt on the compressor pulley & drive pulley.
- B. Adjust belt tension (See Adjustment below).
- C. Tighten the compressor belt tensioning link jam nuts and re-safety using .032 safety wire.
- D. Re-torque the compressor mounting / attaching bolts / nuts per the torque notes in Fig. 4-5.

NOTE

The locking nuts are to be maintained and replaced per the guidelines in NASM33588

- E. Re-install the Main Gearbox Engine Coupling per Airbus maintenance instructions.

NOTE

Care should be taken to ensure that the new belt is not damaged (nicked or cut) during installation.

CAUTION

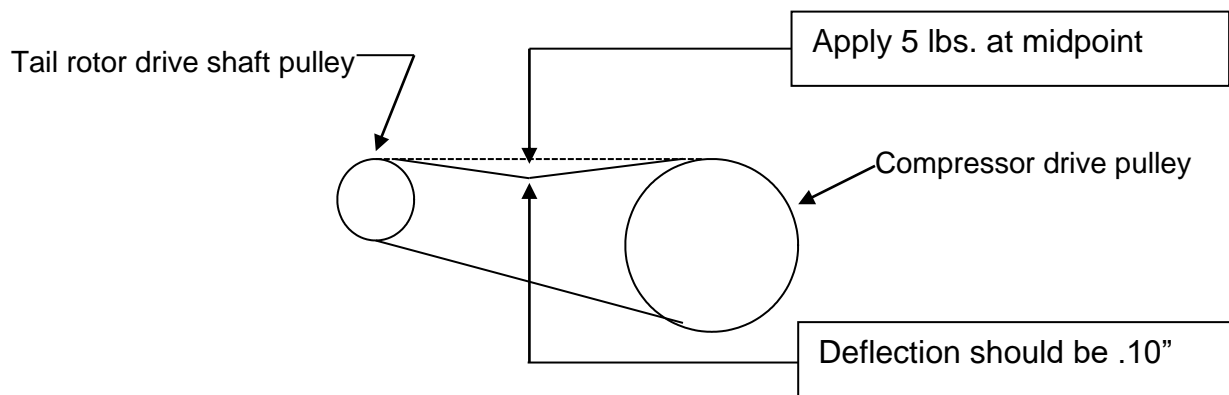
A minimum of 0.4" clearance must be maintained between the compressor pulley and the transmission support tube to prevent damage to the aircraft.

ADJUSTMENT

NOTE

Proper belt tension is important to ensure a long belt service life and to avoid excessive loads on the compressor and bearing assemblies.

- A. The correct belt tension for the belt is 5 lbs. This can be achieved with the aid of a belt tensioning tool (Kent-Moore® BT-33-73F Belt Tension Gauge or Equivalent). (This is the preferred method of obtaining proper belt tensioning).
- B. An alternate method is to observe a .10" belt deflection when 5 lbs of force is applied at the belt midpoint of the span between the pulleys.



NOTE

The belt tension should be checked and re-adjusted if necessary after the first two hours of operation for a newly installed belt.

3. REMOVAL, INSTALLATION / REPLACEMENT OF COMPRESSOR ASSEMBLY

REMOVAL

- A. Remove the drive belt per Section 2 (above).
- B. Discharge the refrigerant per Chapter 6 SERVICING of this manual.

CAUTION

Refrigeration servicing should be performed by qualified personnel only!

- C. Disconnect the refrigerant hoses from the suction and discharge ports located on the aft end of the compressor housing.
- D. Remove the attaching hardware from the top of the belt tensioning link and the compressor mount assembly. Remove the mounting bolt that attaches the compressor body to the top of the compressor mount and remove the compressor assembly.

CAUTION

It is recommended that removing the compressor attachment hardware is a two person operation due to the weight and position of the compressor.

INSTALLATION / REPLACEMENT

- A. Calculating and measuring the lubricant in the new compressor:
The amount of oil in the replacement compressor needs to be adjusted to match the amount of oil in the old compressor. To properly calculate the amount of oil required in the replacement compressor, it is necessary to pour the oil out of the old compressor into a clean container. Drain the oil out of the fill plug hole and then pour oil out of the suction and discharge ports while rotating the center shaft clockwise. Measure the total amount of oil removed from the old compressor. Note that the compressor (new or old) retains .5 oz. of unrecoverable oil even after completely draining. This total is what is needed to be in the new compressor. New compressors come from Air Comm charged with 8.0 oz. of oil. This should be adjusted according to the amount of oil recovered from the old compressor and any other components being replaced. The receiver drier should always be replaced when the compressor is replaced or when the system has been open for an appreciable time, which accounts for another 1.5 oz. of oil that should be added.

Below is an example of a compressor (and receiver drier) replacement oil calculation for illustration:

Evacuating the system recovers 1.5 oz. of oil. Draining the old compressor recovered 2.0 oz. of oil. The new receiver/drier requires an additional 1.5 oz. so the total oil needed in the replacement compressor for this case is $1.5 + 2.0 + 1.5 = 5.0$ oz, plus the .5 oz of unrecoverable oil for a total of 5.5 oz. Since the new compressor comes with 8.0 oz. of oil, remove the oil fill plug and pour out 2.5 oz. of oil.

- B. Install the attaching hardware into the top of the belt tensioning link and the compressor mount assembly. Install the mounting bolt that attaches the compressor body to the top of the compressor mount and position the compressor assembly. Do not torque the fasteners at this time.
- C. Adjust the belt tension per the procedure shown on Page 39.
- D. Torque all compressor mount fasteners per the notes in Fig 4-5.

NOTE

The locking nuts are to be maintained and replaced per the guidelines in NASM33588

- E. Safety wire the tension link jam nuts using .032 safety wire.
- F. Replace the O-rings on the refrigerant hoses and re-connect the hoses to the compressor housing. Torque the #10 hose fitting to 50 – 55 inch lbs (5.7-6.3 Nm). and torque the #8 hose fitting to 40 – 45 inch lbs (4.6-5.1 Nm).
- G. Recharge the refrigerant per the servicing instructions pg 31 thru 34, Chapter 6, sections 2 thru 4.

CAUTION

Refrigeration servicing should be performed by qualified personnel only!

NOTE

An electronic leak detector should be used any time a component is replaced or the system has been opened, to ensure trouble free operation of the air conditioner system.

4. REMOVAL, INSTALLATION / REPLACEMENT OF FORWARD EVAPORATOR ASSEMBLY

REMOVAL

- A. It will be necessary to evacuate (discharge) the refrigerant from the system to remove or replace the forward evaporator assembly. Instructions for servicing of the system are found in Chapter 5 Servicing.

CAUTION

Refrigerant servicing should be performed by qualified personnel only!

- B. Remove attaching hardware (AN3-5A Bolts) (4) four places in mounting brackets on aft of evaporator assembly.
- C. Disconnect the ducting that attaches the forward evaporator to the forward blower outlets.
- D. Disconnect the electrical connector from the forward evaporator assembly.
- E. Disconnect drain line from bottom of evaporator housing.
- F. Disconnect refrigerant plumbing from fittings and hoses located under the evaporator assembly area.

CAUTION

Always use a back-up wrench when removing, or installing refrigerant line fittings.

INSTALLATION / REPLACEMENT

- A. Locate the forward evaporator assembly per figure 4-6, pg 16. Install attaching hardware (AN3-5A Bolts) (4) four places in mounting brackets on aft of evaporator assembly.
- B. Attach the refrigerant hoses located under the evaporator assembly area. Replace the fittings o-rings and torque the refrigerant lines per section 1 p.37.

CAUTION

Always use a back-up wrench when removing, or installing refrigerant line fittings.

- C. Connect the drain line to the bottom of the evaporator housing.
- D. Connect the ducting that attaches the forward evaporator to the forward blower outlets.
- E. Recharge the refrigerant per the servicing instructions on pg 31 thru 34, sections 2 thru 4.

CAUTION

Refrigerant servicing should be performed by qualified personnel only!

NOTE

An electronic leak detector should be used any time a component is replaced or the system has been opened to ensure trouble free operation of the air conditioner system.

5. REMOVAL, INSTALLATION / REPLACEMENT OF AFT EVAPORATOR ASSEMBLY

REMOVAL

- A. Open the right hand transmission cowling.
- B. Remove the (6) six AN3-3A bolts that retain the Aft Evaporator to the cabin roof.
- C. It will be necessary to evacuate (discharge) the refrigerant from the system to remove or replace the aft evaporator assembly. Instructions for servicing of the system are found in Chapter 6 Servicing.
- D. Disconnect the refrigerant lines at the fittings to the evaporator housing.

CAUTION

Refrigerant servicing should be performed by qualified personnel only!

CAUTION

Always use a back-up wrench when removing or installing refrigerant line fittings.

- E. Disconnect wiring to the Temperature control module on the Aft Evaporator assembly by disconnecting the Molex connector.

INSTALLATION / REPLACEMENT

- A. Locate the aft evaporator assembly in the aircraft per figure 4-17, p17 (EC130-200 kit) or per figure 4-18, p18 (EC130-202 kit).
- B. Install the six AN3-3A screws to secure the evaporator to the cabin roof.
- C. Connect the refrigerant lines and recharge the refrigerant per the service instructions on pg 31 thru 34, Sections 2 thru 4.

CAUTION

Refrigerant servicing should be performed by qualified personnel only!

CAUTION

Always use a back-up wrench when removing or installing refrigerant line fittings.

6. REMOVAL, INSTALLATION / REPLACEMENT OF AFT EVAPORATOR BLOWER MOTOR

REMOVAL

CAUTION

It is recommended that the battery and external power be disconnected before starting work.

- A. Access the aft evaporator on the aircraft right transmission deck area.
- B. Remove the AN525-10R8 Screws, and AN960-10L Washers that attach the blower motor to the Aft Evaporator housing.
- C. Disconnect electrical connection to the Aft Evaporator Blower Assembly.
- D. Remove Blower Assembly from aircraft.

INSTALLATION / REPLACEMENT

- A. Locate the Aft Evaporator Blower Assembly into the aft evaporator.
- B. Install the AN525-10R8 screws and AN960-10L washers to secure the motor.
- C. Re-make the electrical connection between the blower and the evaporator.

7. REMOVAL, INSTALLATION OF THE CONDENSER SCOOP ASSEMBLY, EC130-200 KITS

REMOVAL

CAUTION

It is recommended that the battery and external power be disconnected before starting work.

- A. Remove the AN3-3A bolts that attach the EC130-7002-1 Condenser Scoop Assembly to the lower contour of the belly panel. This will allow the Condenser Scoop Assembly to pivot on the forward hinged support plate.

CAUTION

Be sure to support this assembly when removing the attaching hardware to prevent damage to the Condenser Scoop Assembly, or the aircraft.

- B. Remove the AN525-10R Screws that attach the forward hinge support plate to the aircraft belly panel.
- C. Disconnect the Molex Connector that attaches the power wires from the Condenser Scoop Assembly to the aircraft wiring, and remove the EC130-7002-1 Condenser Scoop Assembly from the aircraft.

INSTALLATION / REPLACEMENT

- A. Locate the condenser scoop assembly per figures 4-9 p.19 and 4-10 p.20
- B. Install the AN525-10R Screws that attach the forward hinge support plate to the aircraft belly panel. This will allow the Condenser Scoop Assembly to pivot on the forward hinged support plate.
- C. Connect the Molex Connector that attaches the power wires from the Condenser Scoop Assembly to the aircraft wiring.
- D. Install the AN3-3A bolts that attach the EC130-7002-1 Condenser Scoop Assembly to the lower contour of the belly panel.
- E. Re-apply battery power.

NOTE

AIR CONDITIONER SERVICE MANUAL EC130-200M-1

Perform a maintenance operational check of the Condenser Scoop Assembly on completion of the installation to ensure that there is no rubbing or binding of the Scoop Door.

NOTE

The Condenser Scoop Door is rigged at the factory with a .20 to .40 \pm .10 inch gap between the Scoop Door and the Scoop Plate assemblies with the Scoop Door in the full up position.

CAUTION

Do not attempt to disassemble or readjust the Scoop Door, as altering the rigging may damage the Scoop Door Bellcrank, or Scoop Door Actuator.

8. **REMOVAL, INSTALLATION OF THE CONDENSER ASSEMBLY, EC130-200 KITS**

REMOVAL

- A. Refer to figures 4-9 Pg.19 and 4-20 Pg.20. It is necessary to remove the Condenser Scoop Assembly EC130-7002-1 prior to removing the Condenser Assembly. See previous section 7 for the removal and installation of the Condenser Scoop Assembly.
- B. It will be necessary to evacuate (discharge) the refrigerant from the system to remove or replace the condenser assemblies. Instructions for servicing of the system are found in Chapter 6 SERVICING.

CAUTION

Refrigerant servicing should be performed by qualified personnel only!

- C. Disconnect the refrigerant lines from the Condenser Assembly.

CAUTION

Always use a back-up wrench when removing or installing the refrigerant line fittings.

- D. Remove the Condenser.

INSTALLATION / REPLACEMENT

- A. Install the condenser assembly per figures 4-19 p.19 and 4-20 p.20. Torque all attaching hardware to 50 – 70 inch lbs (5.7-8.0 Nm) and replace all O-rings.
- B. Recharge the refrigerant per the servicing instructions on pg 31 thru 34, Chapter 6, Sections 2 thru 4.

CAUTION

Refrigerant servicing should be performed by qualified personnel only!

CAUTION

Always use a back-up wrench when removing or installing refrigerant line fittings.

NOTE

There should be no air leakage paths other than through the inlet and outlet. Seal all other openings including those around the condenser refrigerant tubes.

9. **REMOVAL & REPLACEMENT OF CONDENSER BLOWER FAN ASSEMBLY, EC130-200 KITS**

REMOVAL

CAUTION

It is recommended that the battery and external power be disconnected before starting work.

- A. Remove the belly panel from the lower left hand side of the aircraft to gain access to the condenser & blower assembly.

CAUTION

Be sure to support the blower assembly when removing the attaching hardware to prevent damage to the condenser housing, blower assembly, or the aircraft.

- B. Remove safety wire that secures the (4) AN3H-3A bolts (2) two on each side that attach the ES73186-1 Blower motor & Fan assembly to the condenser scoop assembly and remove bolts.
- C. Disconnect the ES73186-1 Blower motor & Fan assembly at the Molex connector.
- D. Once the mounting bolts have been removed the blower can now be removed.

REPLACEMENT

- A. Install the new blower assembly, torquing the blower attaching bolts to 50 to 70 inch lbs (5.7-8.0 Nm) and safety using .032 safety wire.
- B. Reconnect the Molex connector.
- C. Apply power and operate the air conditioner by moving the control switch into the A/C position several times to ensure there is no binding of the scoop and for proper operation of the Blower motor & Fan assembly.
- D. Reinstall lower left hand belly panel to aircraft.

10. REMOVAL, INSTALLATION OF THE CONDENSER ASSEMBLY, EC130-202 KITS

REMOVAL

- A. Remove attaching hardware securing forward inner baggage compartment panel to condenser assembly. Remove baggage compartment panel.
- B. Disconnect refrigerant plumbing from condenser fittings once refrigerant is evacuated. Always use a back-up wrench.
- C. Remove attaching hardware securing blower support mount to condenser vane axial blower assembly.
- D. Remove lower attaching hardware securing baffle plate assembly support tube to aircraft structure.
- E. While supporting condenser assembly, remove attaching hardware securing condenser hangar brackets on each side of condenser to existing horizontal support.
- F. Remove condenser assembly.

REPLACEMENT

- A. Position condenser and secure with attaching hardware to hangar brackets on each side of condenser to existing horizontal support.
- B. Install lower attaching hardware securing baffle plate assembly support tube to aircraft structure. Torque support tube bolt to 20-25 in-lbs (2.25-2.82 Nm)
- C. Secure blower support mount to condenser vane axial blower assembly with attaching hardware.
- D. Replace all O-rings before connecting refrigerant plumbing to condenser fittings using a back-up wrench. Torque refrigerant line connections per section 1, p.37.
- E. Install forward inner baggage compartment panel to condenser assembly.
- F. Service air conditioning system with refrigerant per Chapter 6.

11. REMOVAL & REPLACEMENT OF CONDENSER BLOWER FAN ASSEMBLY, EC130-202 KITS

REMOVAL

CAUTION

It is recommended that the battery and external power be disconnected before starting work.

- A. Access the condenser & blower assembly through the left side baggage door.

CAUTION

Be sure to support the blower assembly when removing the attaching hardware to prevent damage to the condenser housing, blower assembly, or the aircraft.

- B. Remove safety wire that secures the (6) AN3H-3A bolts (2) two on each side that attach the EC130-7536-1 Blower motor & Fan assembly to the condenser scoop

- C. assembly, and remove bolts.
- D. Disconnect the ES73131-1 (or -2) or ES73151-11 Blower motor & Fan assembly from the electrical connector.
- E. Cut the safety wire attached to the three (3) motor mounting bolts on the EC130-7536-1 Vane Axial Blower, Remove the motor mounting bolts and spacers holding the ES73131 or ES73151-11 Motor & fan assembly to the blower housing.

CAUTION

Be sure to support the blower fan & Motor assembly prior to removing the mounting bolts, this will prevent any damage to the stator vanes in-side the blower housing.

CAUTION

Do not attempt to remove the fan blade assembly from the motor. The fan blade is threaded to the motor armature shaft, and damage will occur if proper tooling is not available.

- F. Once the mounting bolts have been removed, the blower can be removed and replaced as required.

REPLACEMENT

- A. Locate the new blower on the condenser. Use the torque chart below for the re-installation of the blower mounting bolts. Torque each bolt in succession around the blower housing until all three torque's have been achieved.

Torque Chart

Blower Part Number	Torque Blower Mounting Bolts as Follows		
	1 st Torque	2 nd Torque	3 rd Torque
EC130-7536-1 (motor ES73131 or ES73151-11)	30 in/lbs.	45 in/lbs.	60 in/lbs

- B. Reconnect the electrical connector.
- C. Apply power and operate the Air conditioner by placing the control switch in the A/C position several times to ensure there is no binding and for proper operation of the Blower motor & Fan assembly.
- D. Secure the left-hand baggage compartment door.

12. REMOVAL, INSTALLATION / REPLACEMENT OF RECEIVER DRIER BOTTLE

REMOVAL

- A. Access the refrigerant plumbing to Receiver Drier Bottle. For the EC130-200 kits the bottle is located near the condenser assembly. For the EC130-202 kits the bottle is mounted to the side of the condenser assembly.
- B. It will be necessary to evacuate (discharge) the refrigerant from the system to remove or replace the receiver drier bottle. Instructions for servicing of the system are found in Chapter 6 SERVICING.

CAUTION

Refrigerant servicing should be performed by qualified personnel only!

- C. Disconnect refrigerant lines from both sides of the receiver drier connection fittings.

CAUTION

Always use a back-up wrench when removing or installing refrigerant line fittings.

- D. Loosen the retaining clamp holding the receiver drier bottle to the support bracket.
- E. Remove the receiver drier bottle. Temporarily cap the exposed ends of the refrigerant lines to minimize the exposure to contaminants and moisture.

INSTALLATION / REPLACEMENT

- A. Lubricate new o-rings with refrigerant oil and install onto cleaned tube ends. Install the bottle and torque the tube ends and mounting clamp.

NOTE

Never reuse a receiver drier bottle, and keep new receiver drier bottles capped until just prior to their installation.

- B. Recharge the refrigerant per the servicing instructions on pg 31 thru 37, Section 6.

CAUTION

Refrigerant servicing should be performed by qualified personnel only!

CAUTION

Always use a back-up wrench when removing or installing refrigerant line fittings.

13. REMOVAL, INSTALLATION / REPLACEMENT OF BINARY PRESSURE SWITCH

REMOVAL

- A. Access the Binary Pressure Switch located downstream from the condenser assembly (refer to the plumbing schematics Fig 4-17 thru -19). The switch will be located on a machined Y-fitting mounted to the forward bulkhead of the fuel tank bay. It is not necessary to discharge the refrigerant for this servicing operation.
- B. Disconnect the electrical connectors from the binary pressure switch.
- C. Unscrew the switch from the Schrader valve on the Y fitting.

NOTE

Use the flats provided on the top of the switch body to rotate the switch. Do not attempt to tighten or loosen the pressure switch by hand.

INSTALLATION / REPLACEMENT

- A. Wrap a small amount of thread sealant Teflon tape (or pipe dope) onto the threads of the Schrader port on the Y fitting. Install the binary pressure switch and tighten.
- B. Install the electrical connector onto the switch.

14. REMOVAL, INSTALLATION/ REPLACEMENT OF BY-PASS VALVE ASSEMBLY

REMOVAL

- A. Access the By-pass Valve (refer to the plumbing schematics Fig 4-17 thru -19). The valve will be located on the forward bulkhead of the fuel tank bay, adjacent to the binary pressure switch.
- B. It will be necessary to evacuate (discharge) the refrigerant from the system to remove or replace the by-pass valve. Instructions for servicing of the system are found in Chapter 6 SERVICING.

CAUTION

Refrigerant servicing should be performed by qualified personnel only!

- C. Remove the safety wire and mounting screws that attaches the support bracket to the valve coil assembly.
- D. Disconnect the electrical connector to the by-pass valve assembly.
- E. Disconnect the refrigerant lines from both sides of the by-pass valve assembly.

CAUTION

Always use a back-up wrench when removing or installing refrigerant line fittings.

- F. Remove the by-pass valve from the support bracket.

INSTALLATION / REPLACEMENT

- A. Lubricate new o-rings with refrigerant oil and install onto cleaned tube ends. Install the by-pass valve and torque the tube ends and support bracket fasteners.
- B. Mate the electrical connector to the harness.
- C. Charge the system with refrigerant per instructions in Chapter 6.

CAUTION

Refrigerant servicing should be performed by qualified personnel only!

**CHAPTER 8
TROUBLESHOOTING**

1. SYSTEM TROUBLESHOOTING

Prior to troubleshooting a defective system, it is advisable to conduct a visual inspection for general condition, and obvious signs of damage or failure.

The following matrix lists the easiest checks, and the most likely problems.

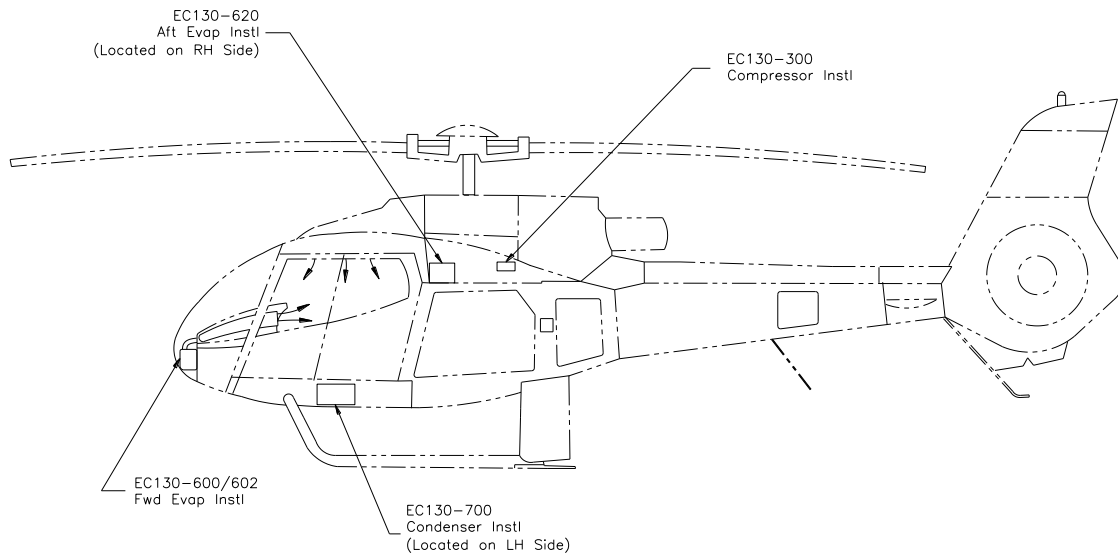
Problem	Probable Cause	Solution
System not Cooling (Evaporator blowers still operating)	a. System is low or empty of refrigerant.	a. Evacuate the system, determine the origin of the refrigerant leak, and re-charge the system as prescribed in chapter 6.
	b. Moisture, or air in the system.	b. Evacuate the system, Replace the receiver / drier, and place the system under a vacuum for a minimum of 30 minutes before recharging the system. ¹
	c. Compressor	c. If the compressor has failed, it must be replaced, as shown in chapter 7. ¹
	d. Compressor drive belt	d. If the compressor drive belt has failed it will need to be replaced. Replace and adjust compressor drive belt as shown in chapter 7. ¹
	e. By-pass valve	e. Check to ensure the temperature control knob on the A/C control panel in the cockpit is in the full cold position, and the temperature control circuit breaker has not tripped. If the valve remains open (by-passing refrigerant) the valve will need replacement, as shown in chapter 7. ¹
	f. Condenser blower motor / fan assembly.	f. Check to ensure the condenser blower motor / fan assembly are receiving power, and the circuit breakers have not tripped. If the blowers still do not function, they may have failed internally and must be replaced as shown in chapter 7.
	g. Condenser Scoop Door & Scoop Door Actuator (EC130-200 Installation only)	g. Check to ensure the condenser scoop door is fully extended when the air conditioner is running. If the scoop door is closed or not fully extended the scoop actuator circuit breaker may have tripped, or the scoop door actuator may have failed, and must be replace as shown in chapter 7.
	System not cooling (Evaporator blowers not operating)	h. Air conditioner control circuit breaker tripped.

AIR CONDITIONER SERVICE MANUAL EC130-200M-1

Problem	Probable Cause	Solution
System not cooling (Evaporator blowers not operating)	i. Forward or Aft evaporator blower circuit breaker tripped.	i. Reset circuit breaker. If breaker will not reset, check for short in circuit.
System not cooling (Evaporator blowers not operating)	j. Forward and aft evaporator blower motor(s)	j. Check for power to the motor(s), and for the free movement of the blower wheel. If the motor shaft does not turn smoothly the motor must be replaced, as shown in chapter 7. ¹
Loss of cooling limited to one evaporator.	k. Expansion valve malfunction.	k. If cooling is lost in only one of the evaporators, and the blowers continue to function, it is most likely a blockage at the expansion valve orifice. This is most often caused by dirt in the system forming a blockage as the refrigerant passes through the valve. Evacuating the system and changing the receiver drier should cure this problem. If the above actions do not resolve the problem, the evaporator assembly should be returned to Air Comm Corporation for repair. ¹
External moisture (Condensate) in the area of forward / aft evaporator	l. Leak in evaporator, or evaporator drainage system.	l. If water is noted in the area near the evaporators. This is normally caused by a loose, cracked, plugged, or disconnected drain line. NOTE The drain line consists of a tube which extends from the lower surface of the evaporators through the outer contour of the helicopter.

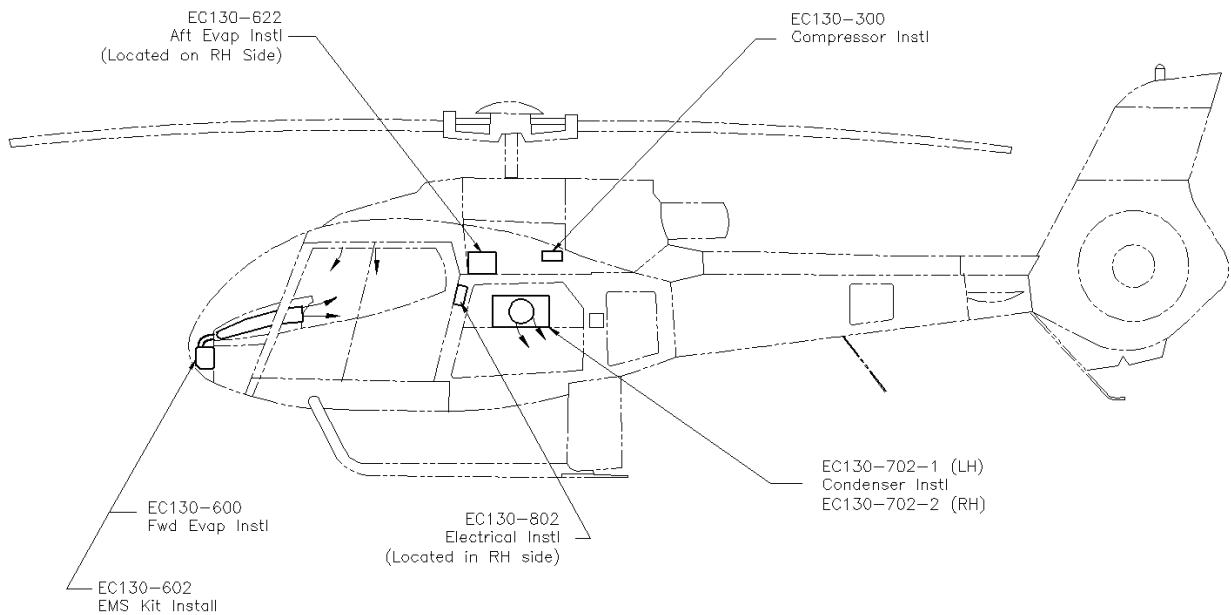
(1) Contact Air Comm Corporation Service Department for current pricing and availability of replacement components and parts.

Figure 8-1 General Arrangement – Air Conditioning System Installation.



SIDE VIEW

**Fig. 8-1 Layout of Airbus EC130B Air Conditioning System
EC130-200-1,-2 Installation**



SIDE VIEW

**Fig. 8-2 Layout of Airbus EC130B Air Conditioning System
EC130-202-1,-2 Installation**

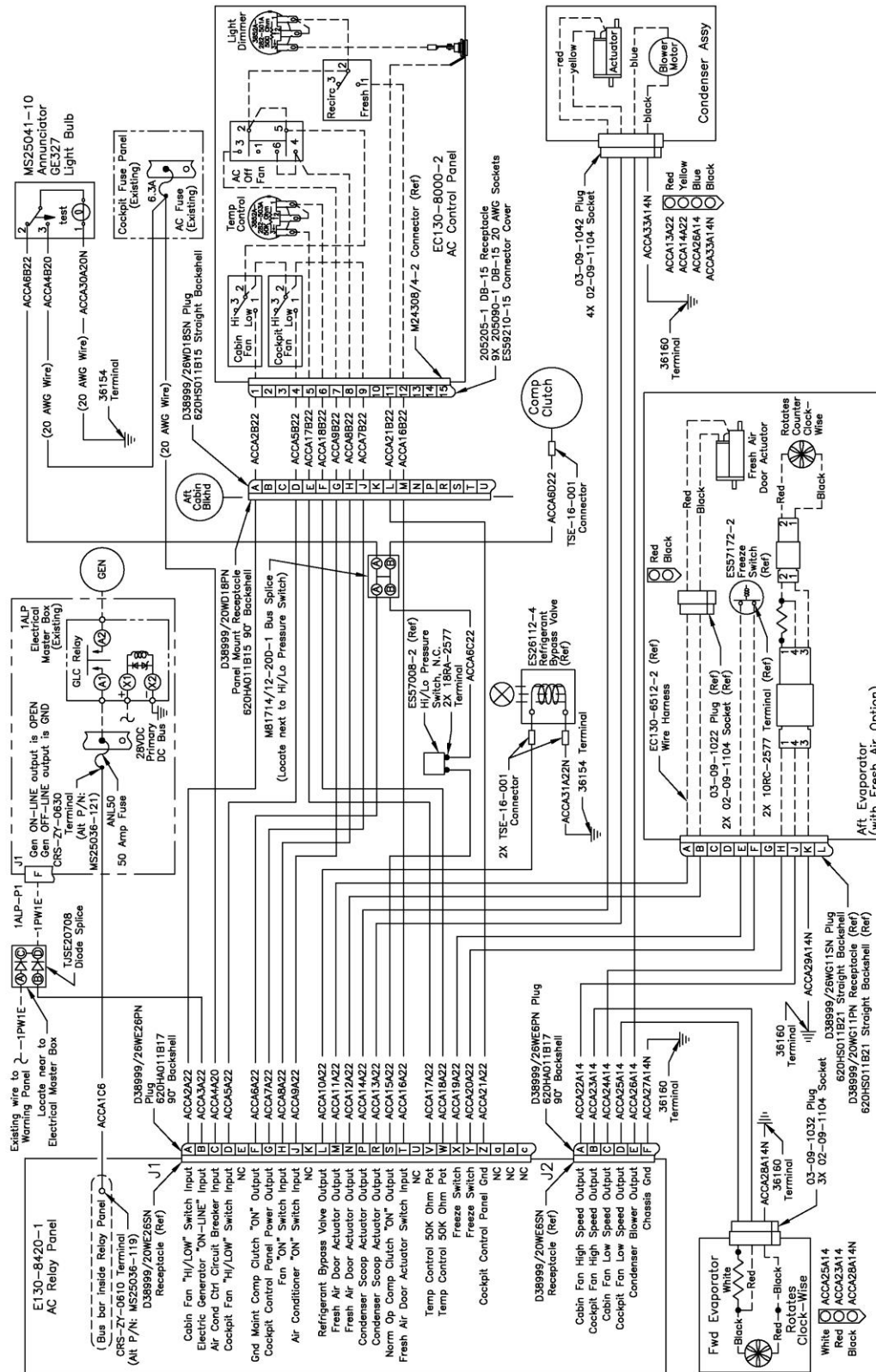


Figure 8-3 Air Conditioning System Electrical Schematic (EC130-200 Installation only)

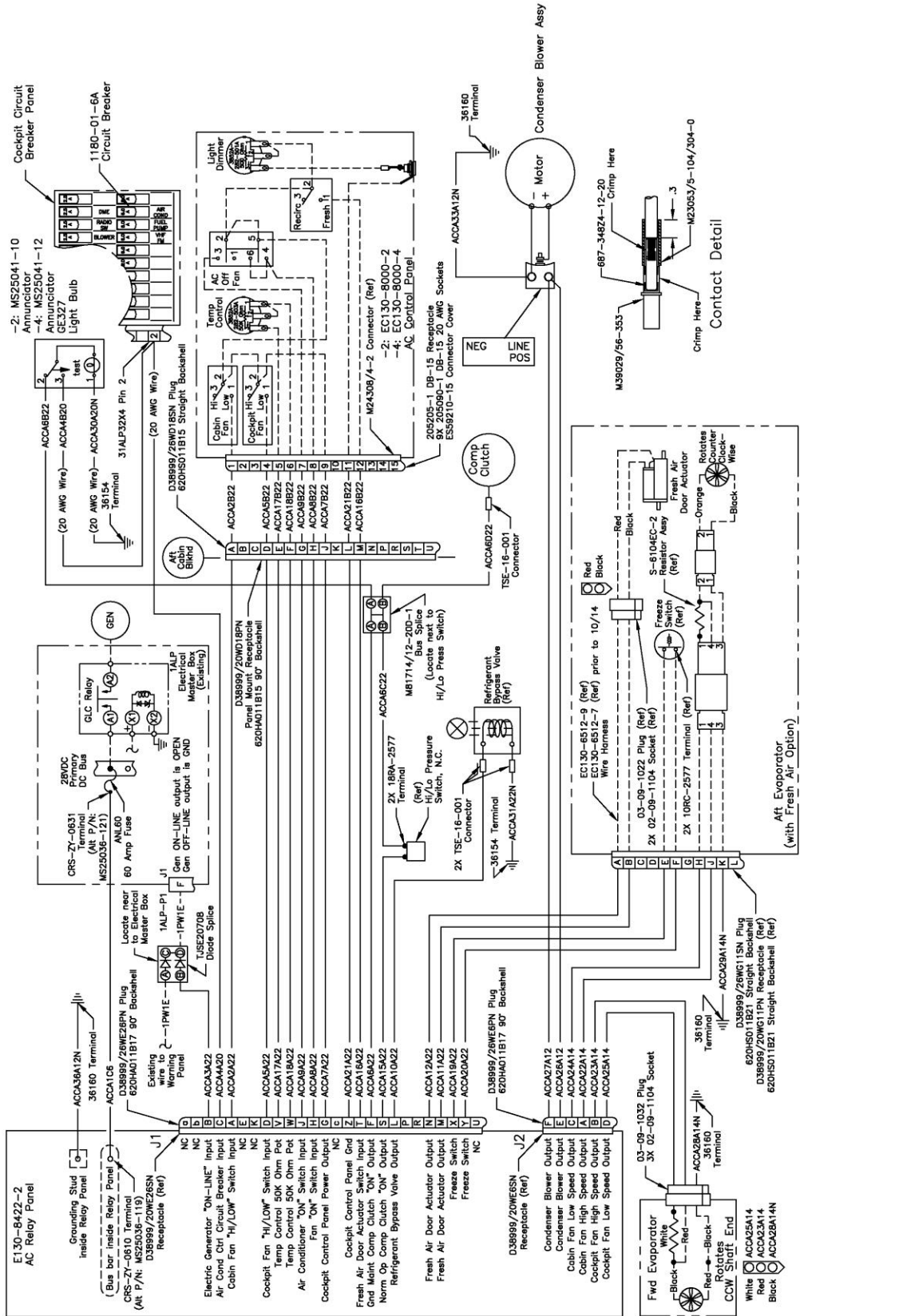


Figure 8-4 Air Conditioning System Electrical Schematic (EC130-202 Installation only)

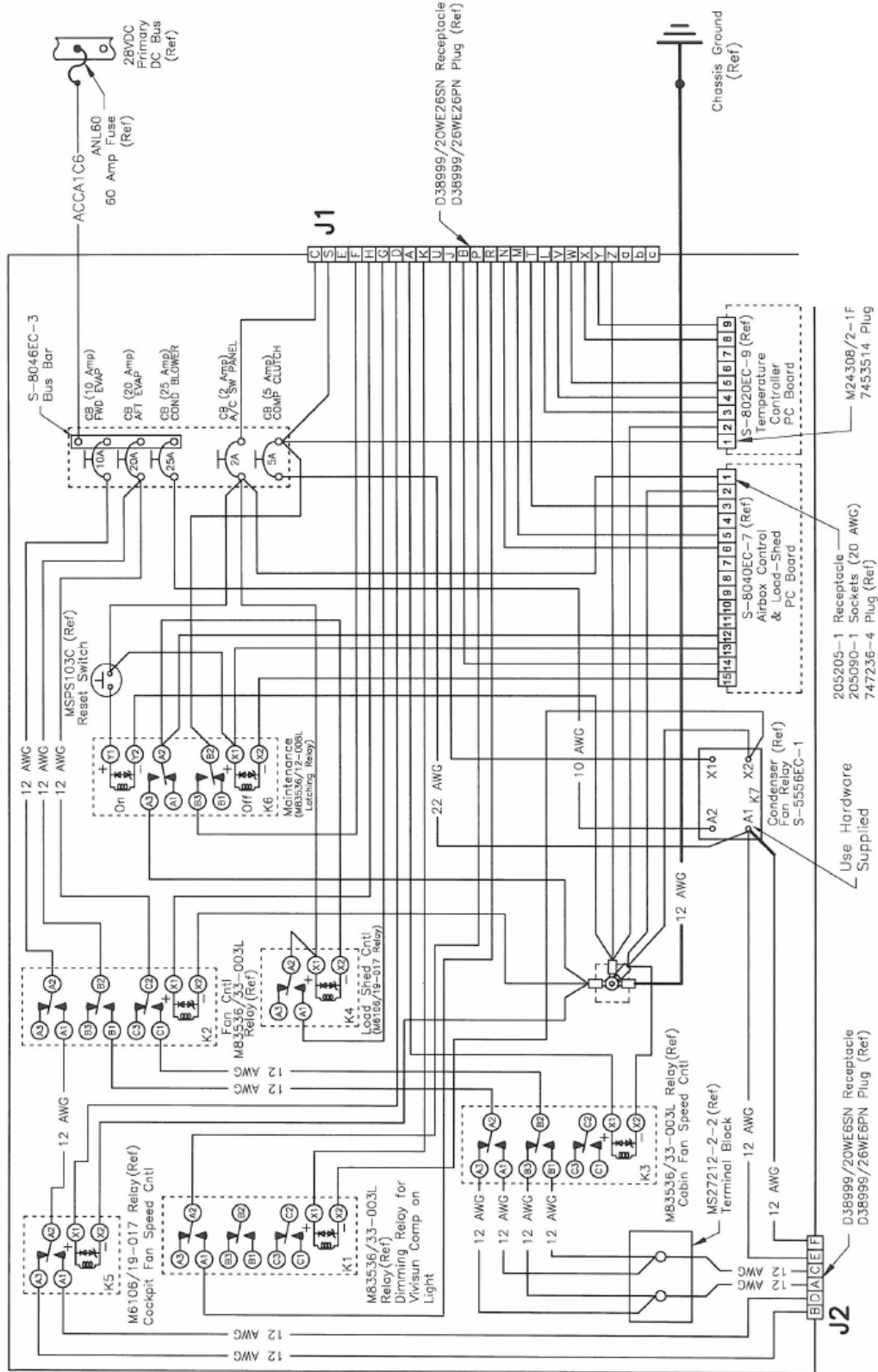


Figure 8-5 Air Conditioning System Relay Box Schematic

AIR CONDITIONER SERVICE MANUAL EC130-200M-1

APPENDIX A

Weight and Balance Information

Weight breakdown – Airbus EC130B Air Conditioner System:
Ref. Dwg. EC130-200 (Belly mounted condenser)

Item	Wt. (lbs)	X-Arm (in)	X-M (in-lb.)	Y-Arm (in)	Y-M (in-lb)
Total EC130B with Single Forward & Aft Evaporator (with fresh air option)	88.40	99.01	8,752	-3.30	-292
Total EC130B with Single Forward & Aft Evaporator (without fresh air option)	86.40	98.50	8,510	-2.83	-244

Weight breakdown – Airbus EC130B Air Conditioner System:
Ref. Dwg. EC130-202 (L/H Baggage compartment condenser)

Item	Wt. (lbs)	X-Arm (in)	X-M (in-lb.)	Y-Arm (in)	Y-M (in-lb)
Total EC130B with Single Forward & Aft Evaporator (with fresh air option)	83.34	105.08	8,786	-1.22	-102.02
Total EC130B with Single Forward & Aft Evaporator (without fresh air option)	81.34	105.42	8,547	-.66	54.02