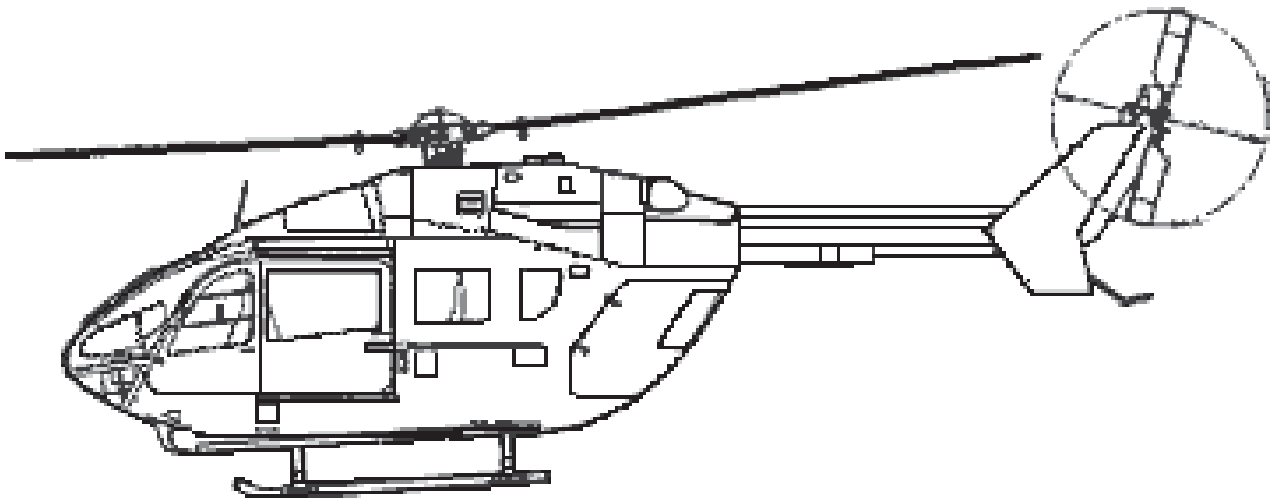
AIR COMM CORPORATION
1575 WEST 124TH AVENUE
WESTMINSTER, CO 80234

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS
EUROCOPTER
MBB-BK117-C1 & MBB-BK117-C2 (EC145)
AIR CONDITIONING SYSTEM



Revision 16 9 July, 2019

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RECORD OF REVISIONS

Rev	Date	Description of Change	Approval
1	10-5-2006	Aft Evaporator Motor part number change	N/A Prepared by GP
2	11-14-2006	Condenser mounting change & aft evap. TBO change	N/A Prepared by GP
3	5-29-2007	New forward evaporator blower motor added.	N/A Prepared by GP
4	6-22-2007	New Hi/Lo pressure switch & condenser blower motors. Weight & Balance revised.	N/A Prepared by GP
5	10-16-2007	EC135-8000-1 Control Panel Assy. Changed to EC135-8000-3 Control Panel Assy.	N/A Prepared by RM
6	12-19-2007	Added 3rd blower configuration to aft evaporator.	N/A Prepared by GP
7	3-6-2008	Added noise filters to electrical schematic	N/A Prepared by GP
8	6-11-2008	Added alternate hi/lo pressure switch	N/A Prepared by GP
9	4-10-2009	Added part callout for Aft Evaporator Blower	N/A Prepared by RM
10	9-11-2009	Added EC145-205 configuration to distinguish between civilian and military configuration, and changed aft evaporator blower part number callout.	N/A Prepared by RM
11	10-21-2011	Added Note to Figure 3-5 for clarification. Added current O-Ring part numbers and corrected motor part number on Page 5-5.	N/A Prepared by RM
12	7-17-2013	Minor ICA change to correct bolt callouts on page 11 Compressor Installation drawing. Updated part numbers in Chapter 5. Added new Record of Revisions sign off sheet.	Prepared By: Karen G. Blecha (KGB) 7/24/2013 Signature Date ACC Approval: /S/ Mike Knap 7/24/13 Signature Date FAA Acceptance (Major Change): N/A – Meets Minor Change Agreement MR-100-134 7/24/2013 Signature Date
13	2/27/2014	Minor ICA change to update address, clarify replacement schedule of compressor, clarify wording of condenser blower replacement schedule. Revised to make all pages current revision level. When any pages are updated, the entire document will be revised.	Prepared By: Karen G. Blecha (KGB) 2/27/2014 Signature Date ACC Approval: /S/ Mike Knap 3/3/14 Signature Date FAA Acceptance (Major Change): N/A – Meets Minor Change Agreement MR-100-134 2/27/2014 Signature Date

14	6/21/2017	Minor ICA change to add the EC145-205 configuration to Weight and Balance information in Appendix A	Prepared By: Cory Posvic 6/21/2017 Signature Date ACC Approval: /S/ Jonathan Buczkowski 6/27/17 Signature Date FAA Acceptance (Major Change): N/A – Meets Minor Change Agreement MR-100-134 2/27/2014 Signature Date
15	7/9/19	Minor ICA change to Pages 21 & 22: Revised oil type to include Ultra PAG. Reference ECO 19-288.	Prepared By: Rick Longcrier 7/9/2019 Signature Date ACC Approval: /S/ Mitch Krauss 8/1/19 Signature Date FAA Acceptance (Major Change): N/A – Meets Minor Change Agreement MR-100-134 2/27/2014 Signature Date
16	2/19/20	Updated references to EC145-704 condenser to use EC145-705 condenser. Added new configuration to Weight and Balance. Updated address. Reference ECO 20-040. **FAA ACTION** **DENVER AIRCRAFT CERTIFICATION OFFICE** **Further Comments:** CPN response allows for ACO signature based on minor nature of change to the ICA FAA Safety Engineer Signature / Date: 1 Apr 2020	Prepared By: Cory Posvic 2/19/2020 Signature Date ACC Approval: M. Krauss 2-25-2020 Signature Date FAA Acceptance (Major Change): Digitally signed by MATTHEW A BRYANT Date: 2020.04.01 12:54:11 -06'00' Signature Date

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CHAPTER 0
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 Eurocopter MBB-BK117-C1 & MBB-BK117-C2 (EC145) 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 sub-paragraphs. 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 Eurocopter Helicopter models MBB-BK117-C1 & MBB-BK117-C2 (EC145) that are equipped with the Air Comm Corporation kit number EC145-200, EC145-202, EC145-203, & EC145-205 air conditioner systems.

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.

Cold: The absence of heat.

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.

Evaporate: To change from a liquid into a vapor.

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.

CHAPTER 0
INTRODUCTION (continued)

5. DEFINITIONS (continued)

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
Kgcm:	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.

CHAPTER 0
INTRODUCTION (continued)

8. UNITS OF MEASUREMENT

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

9. INFORMATION ESSENTIAL TO THE CONTINUED AIRWORTHINESS OF THE AIR CONDITIONER.

This manual provides information which is required for operation and maintenance of the Air Comm air conditioning system installed in the Eurocopter model MBB-BK117-C1 & MBB-BK117-C2 (EC145) 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 **SR00601DE**.

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.

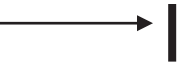
In addition to the revision of the manual, those changes categorized as “Safety of Flight” shall have a Service Bulletin issued to the operator providing the necessary information to comply with, and or to correct, the “Safety of Flight” issue.

Replacement, and or revised copies of this manual maybe purchased by contacting:

Air Comm Corporation Service Department
1575 W 124th Avenue
Westminster, CO 80234
Phone No. 303-440-4075 Fax No. 303-440-6355

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 two forward (optional single forward evaporator) mounted evaporator (cockpit), one aft mounted evaporator assembly (above the main cabin), one condenser, and a compressor driven by a belt just aft of the aft main transmission. These components combine to provide “conditioned air” through sections of the existing air distribution system when the engines are operating during both ground and flight operations.

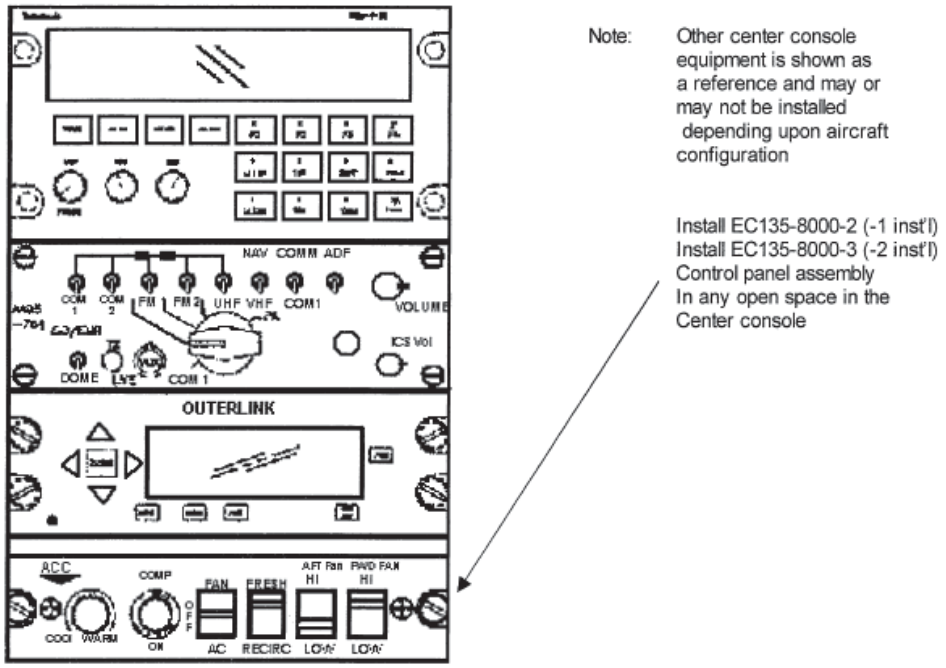
CHAPTER 0
INTRODUCTION (continued)

13. AIR CONDITIONER FEATURES (continued)

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 center console between 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 above the main cabin overhead air outlets, a Temperature control rheostat knob, and compressor on annunciator.



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 Rotor Gear Box, 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 rotor break disk flange portion of the drive shaft. Access to the compressor is provided by transmission compartment access doors.

One condenser mounted aft of the engine compartment (aircraft left). Airflow through the condenser heat exchanger is provided by two 28 volt DC high performance blowers.

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 32º F (0º 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 control panel assy. between the pilot and co-pilots seats.

CHAPTER 0
INTRODUCTION (continued)

13. AIR CONDITIONER FEATURES (continued)

The system is also equipped with a Binary 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 50º F (10º C).

The switch operating pressures are:

Low Pressure Function: (P/N ES57178-1)
Cut-out at 30 psig
Cut-in at 50 psig

High Pressure Function: (P/N ES57178-1)
Cut-out at 335 psig
Cut-in at 280 psig

Low Pressure Function: (Alt. P/N ES57179-1)
Cut-out at 30 psig
Cut-in at 50 psig

High Pressure Function: (Alt. P/N ES57179-1)
Cut-out at 427 psig
Cut-in at 341 psig

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.

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 insures 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.

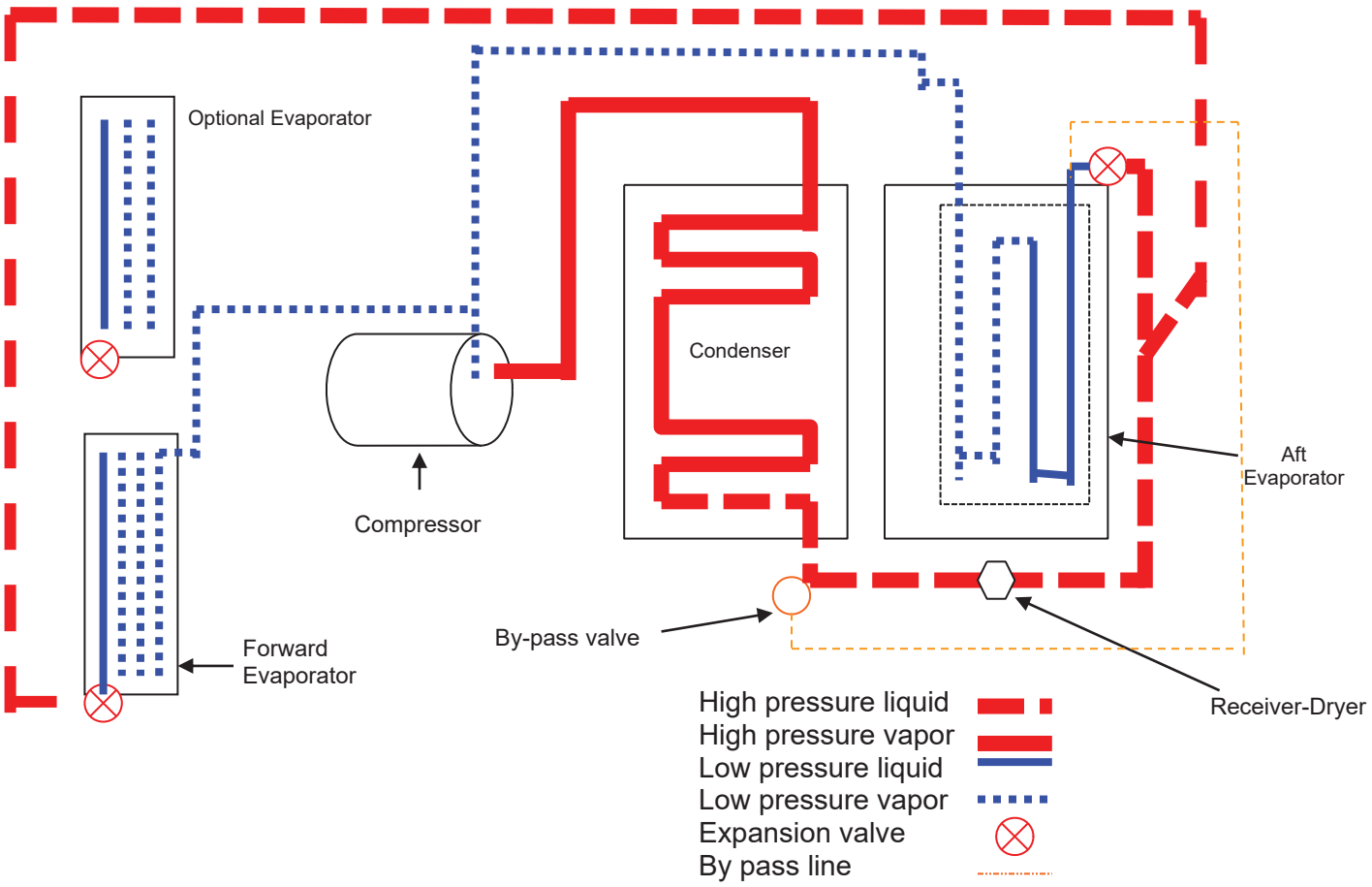
CHAPTER 0
INTRODUCTION (continued)

14. DESCRIPTION OF THE VAPOR CYCLE AIR CONDITIONER AND ITS INSTALLATION (continued)

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 200º F (93.3º 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.

Refrigeration Cycle Illustration



CHAPTER 1
AIRWORTHINESS LIMITATION SECTION

The Airworthiness Limitations section is FAA approve and specifies maintenance required under paragraph 43.16 and 91.403 of the Federal Aviation Regulations unless an alternate program has been FAA approved.

1. Airworthiness Limitations

“No airworthiness limitations associated with this type design change”

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CHAPTER 2
INSPECTIONS

1. INSPECTION REQUIREMENTS

PERIODIC INSPECTIONS
(Hours are aircraft time)

Item	Annual	Every **300** Hours of Operation	Special Inspection Information
Fwd Evaporator Blower(s)	X	X	Check for Operation in High, and Low settings
Condenser Blower Motor(s) & Fan blade assy.	X	X	Check for operation
Aft Evaporator Blower motor	X	X	Check for operation in High, and Low settings
Compressor Drive Belt	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		Check for security and legibility
Air Conditioner Compressor Assembly.	X	X	Check for operation, security of attaching hardware, and signs of oil or refrigerant leaks.
Air Conditioner Compressor Mount	X	X	Check mount for cracks, and security of the attaching hardware.
Plumbing and Fittings	X		Check for security and signs of oil or refrigerant leaks
Air Conditioner Compressor drive pulley	X	X	Check for security of attaching hardware.

2. COMPONENT OVERHAUL / REPLACEMENT SCHEDULE

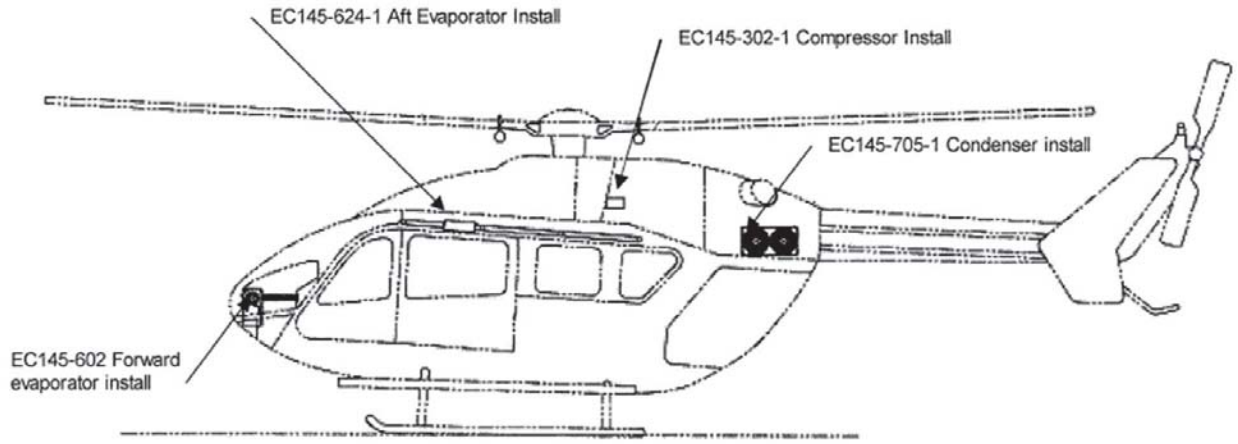
(Hours are aircraft time)

Description	Part Number	Overhaul / Replacement Hours
Forward Blower Motor	ES61064-1 (Fwd. Evaporator Motor)	The replacement of this item is 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.
Aft Evaporator Blower Motor & Fan replacement	S-6222EC-2 (Aft Evaporator Motor)	The replacement of this item is 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.
Condenser (Standard) EC145-702	ES73186-4 (Condenser Motor / Blower Assy.)	The recommended replacement schedule for this item is every five (5) years or 3000 airframe hours, however, it is acceptable to operate on an "on condition" basis.
Condenser (High Output) EC145-705	ES73192-2 (Condenser Motor / Blower Assy.)	The recommended replacement schedule for this item is every five (5) years or 3000 airframe hours, however, it is acceptable to operate on an "on condition" basis.
Compressor	EC145-3006-1 (Compressor Assy.)	The recommended replacement schedule for this item is every five (5) years or 3000 airframe hours, however, it is acceptable to operate on an "on condition" basis.

CHAPTER 3
LOCATION AND ACCESS

1. LOCATION OF AIR CONDITIONER FEATURES

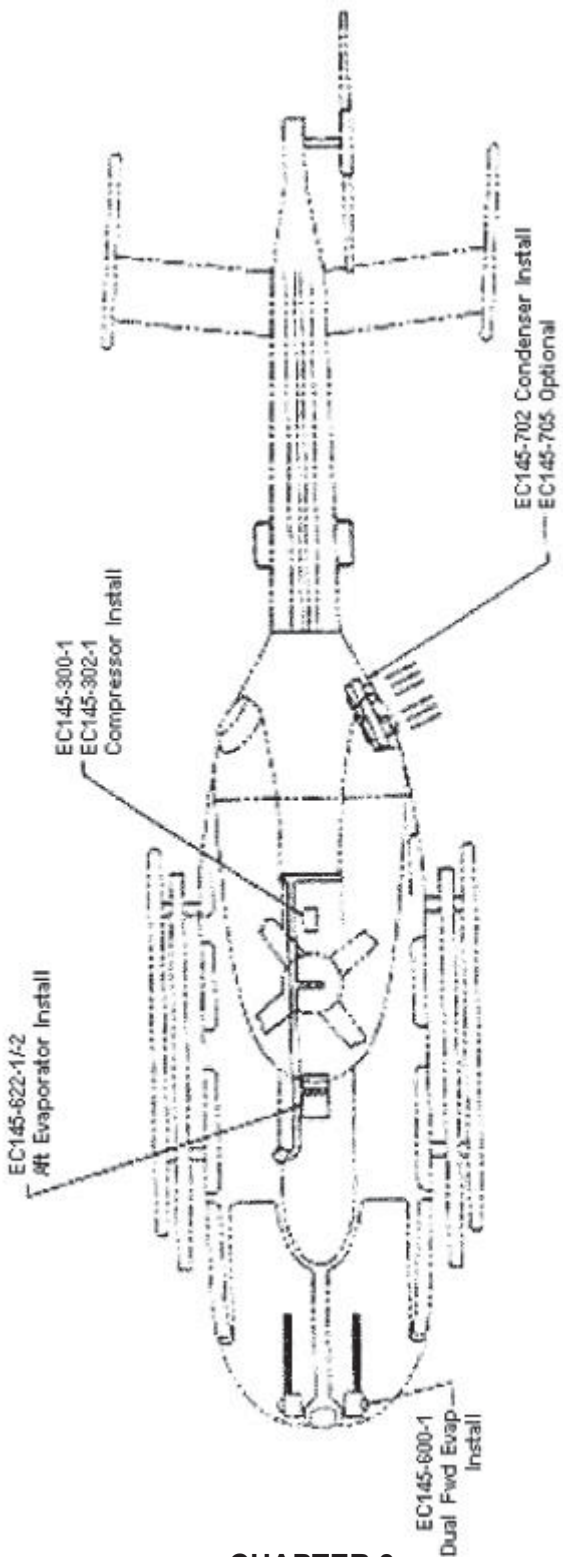
Nomenclature	Description of Location
Air Conditioner Control Panel	The air conditioner control panel is located in the existing center console panel between the pilot & co-pilot seats.
Forward (Cockpit) Evaporators	The forward evaporators are mounted to the center pedestal forward of the instrument panel in the chin bubble area.
Forward Evaporator Blower Assemblies	The forward evaporator blower assemblies are integral to the Forward Evaporator Assembly. (See Forward “Cockpit Evaporator above)
Aft (Main Cabin) Evaporator	Is located on aircraft center line above the main cabin headliner.
Condenser Assembly	The condenser assembly is located on the left hand side of the aircraft, just aft of the engine compartment.
Compressor	The compressor is mounted to the aft of the main gearbox 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 behind the aft left hand interior panel next to the "calm shell" doors.



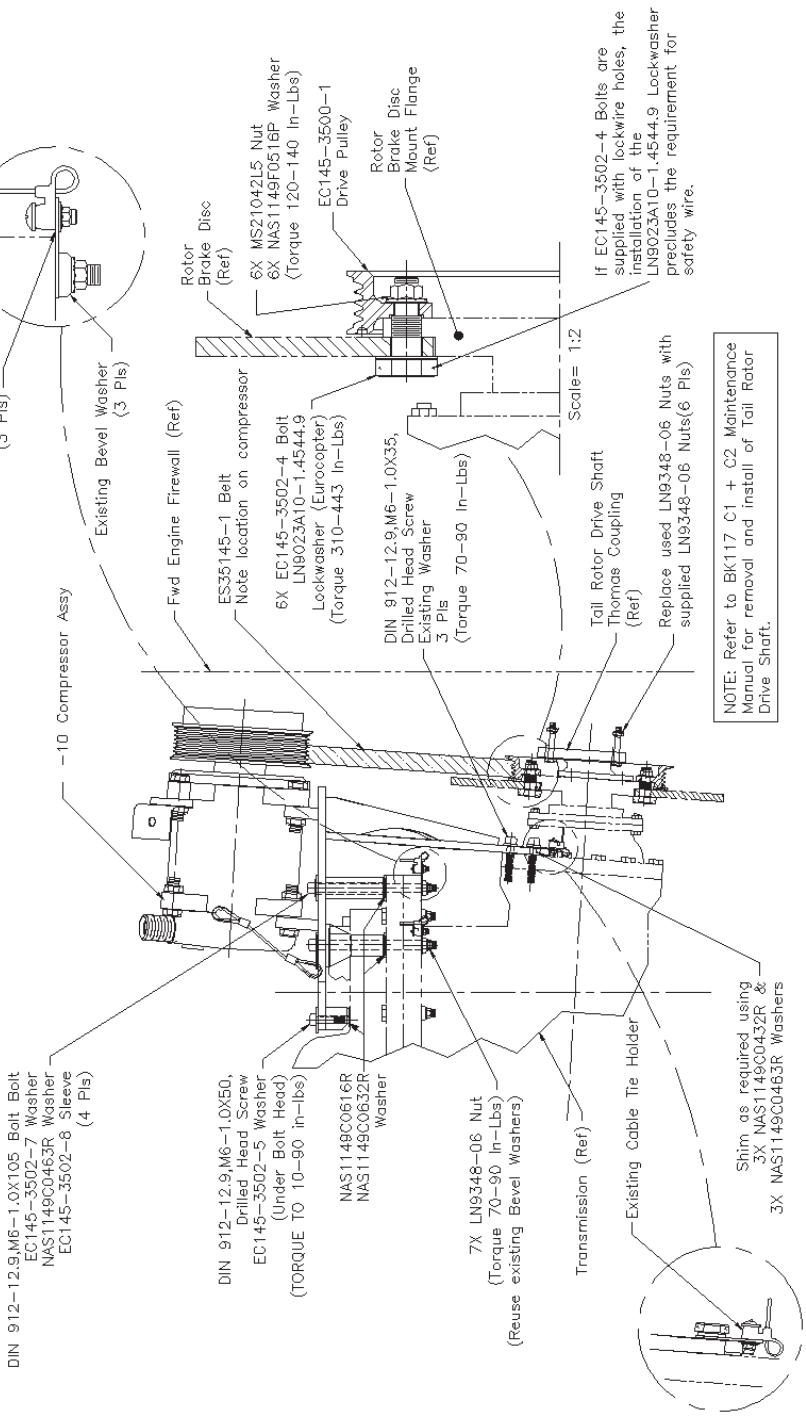
SIDE VIEW

Fig. 3-1 Layout of Eurocopter EC145 Air Conditioning System

Fig. 3-2 Top View - Model EC145 Fuselage

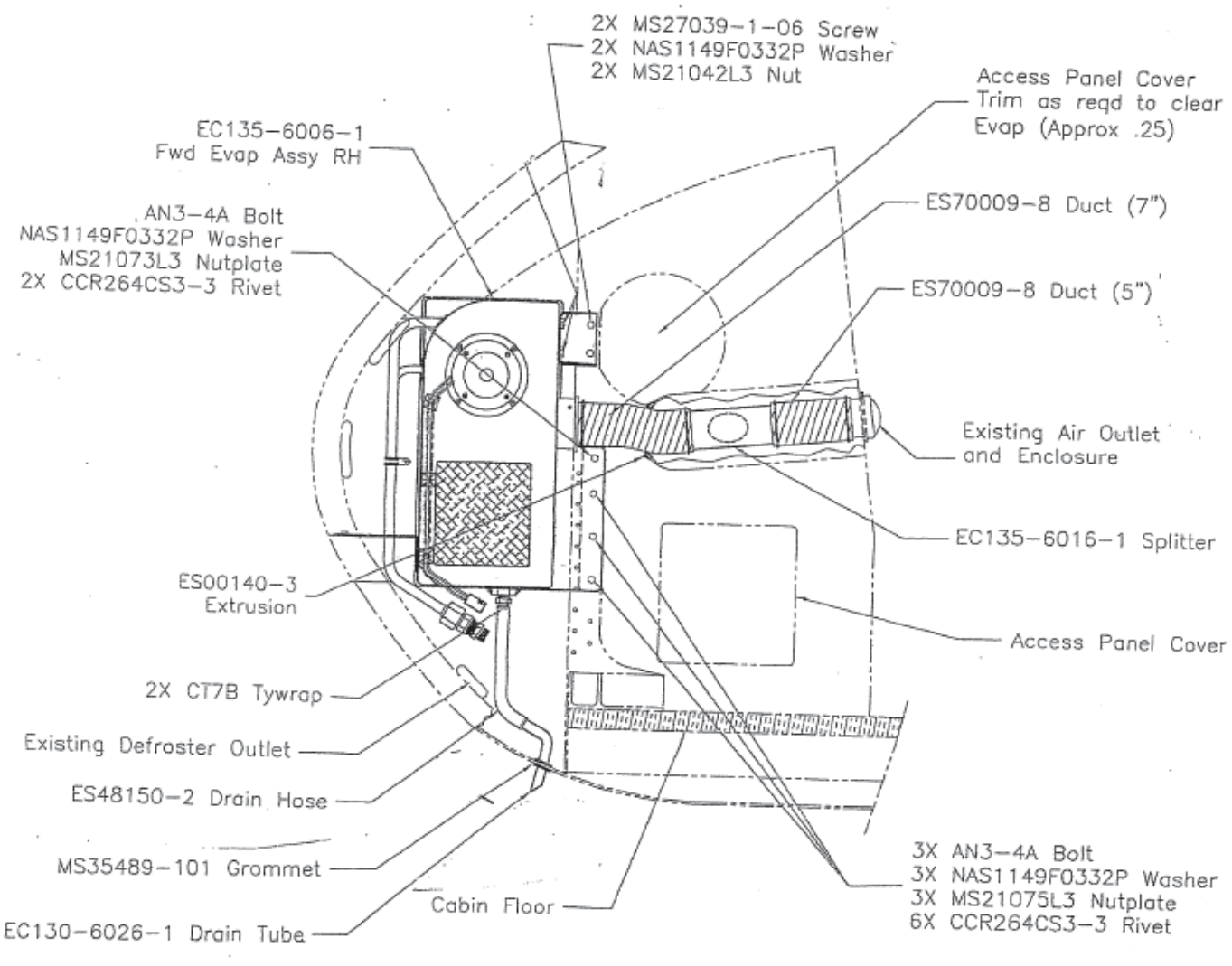


2. Compressor Installation (View Looking Inboard aircraft left) Fig 3-3



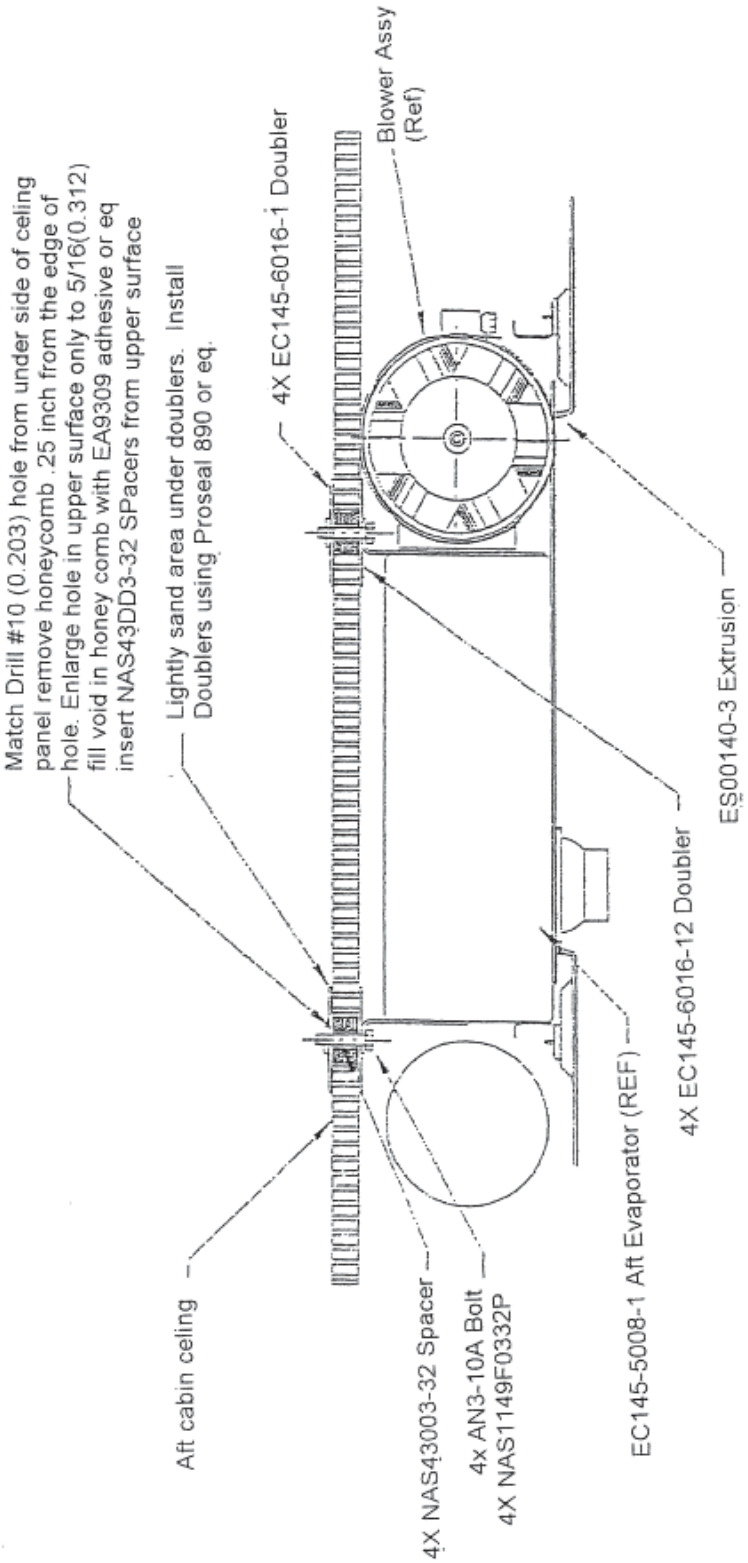
CHAPTER 3
LOCATION AND ACCESS (continued)

3. Forward Evaporator Installation (View looking Inboard Aircraft Left) Fig 3-4



CHAPTER 3
LOCATION AND ACCESS (continued)

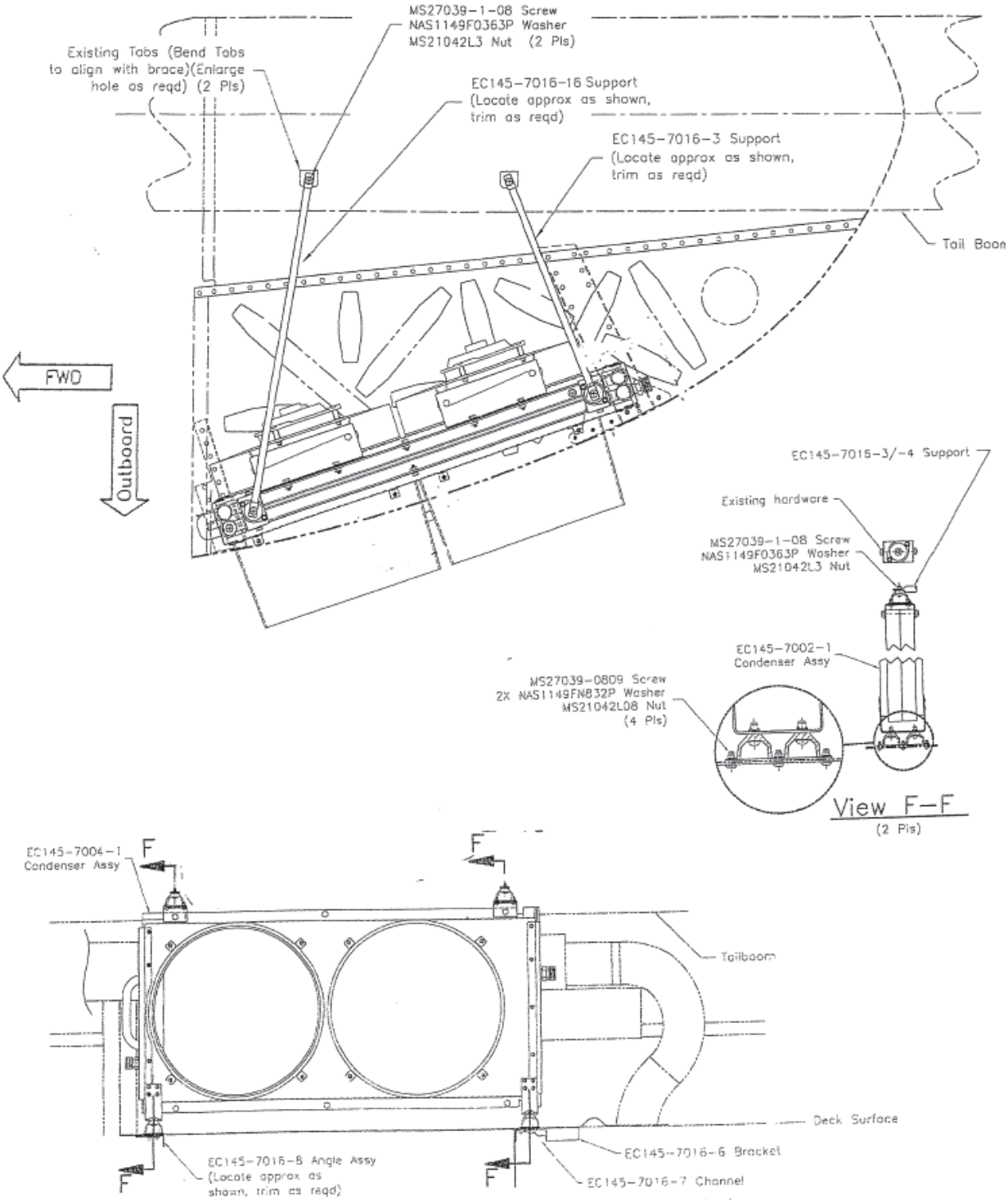
4. Aft Evaporator & Aft Evaporator Blower Assembly Installation (view looking inboard). Fig 3-5



NOTE: When reinstalling the Blower Duct Clamps, ensure the bottom side of the duct clamp fits into the bottom side groove.
It is acceptable to protect existing adjacent wire bundles as necessary to avoid chafing damage.

CHAPTER 3
LOCATION AND ACCESS (continued)

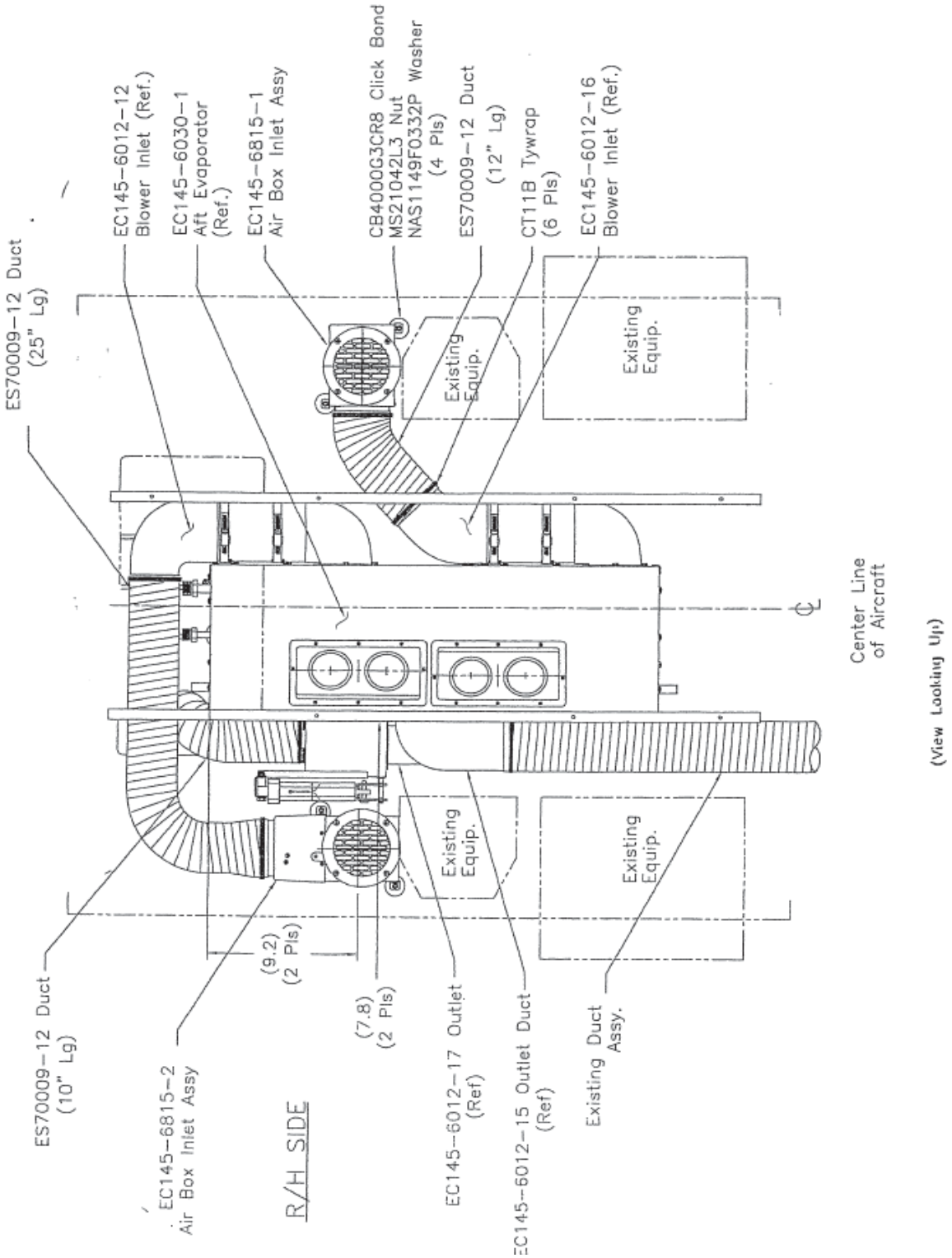
5. Condenser Assembly Installation (view looking down, Inboard, & Forward). Fig 3-6



Condenser Instl -- Looking Inbd

CHAPTER 3
LOCATION AND ACCESS (continued)

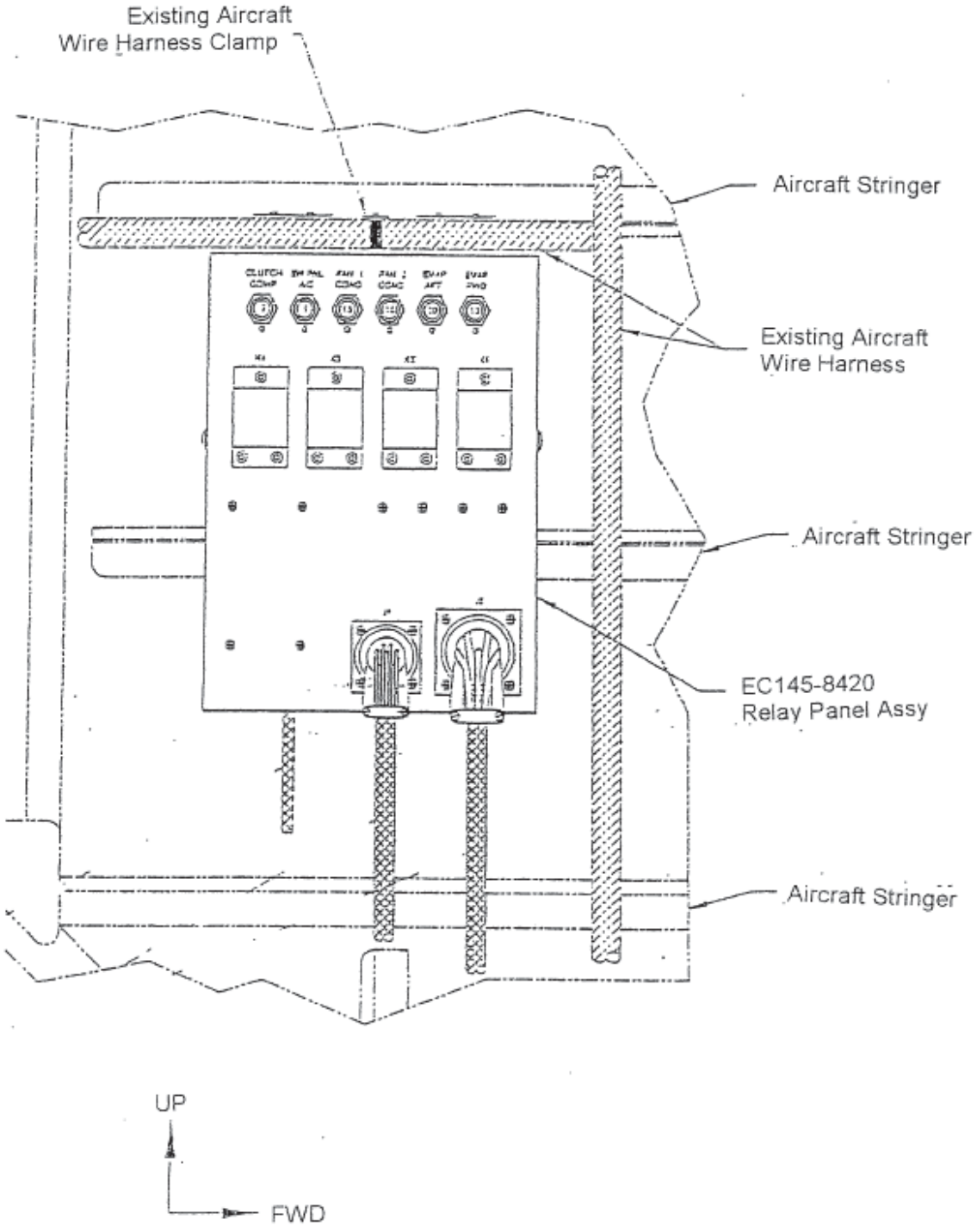
6. Cabin Headliner / Air Distribution. Fig 3-7



(Kit S/N 001 thru 014)

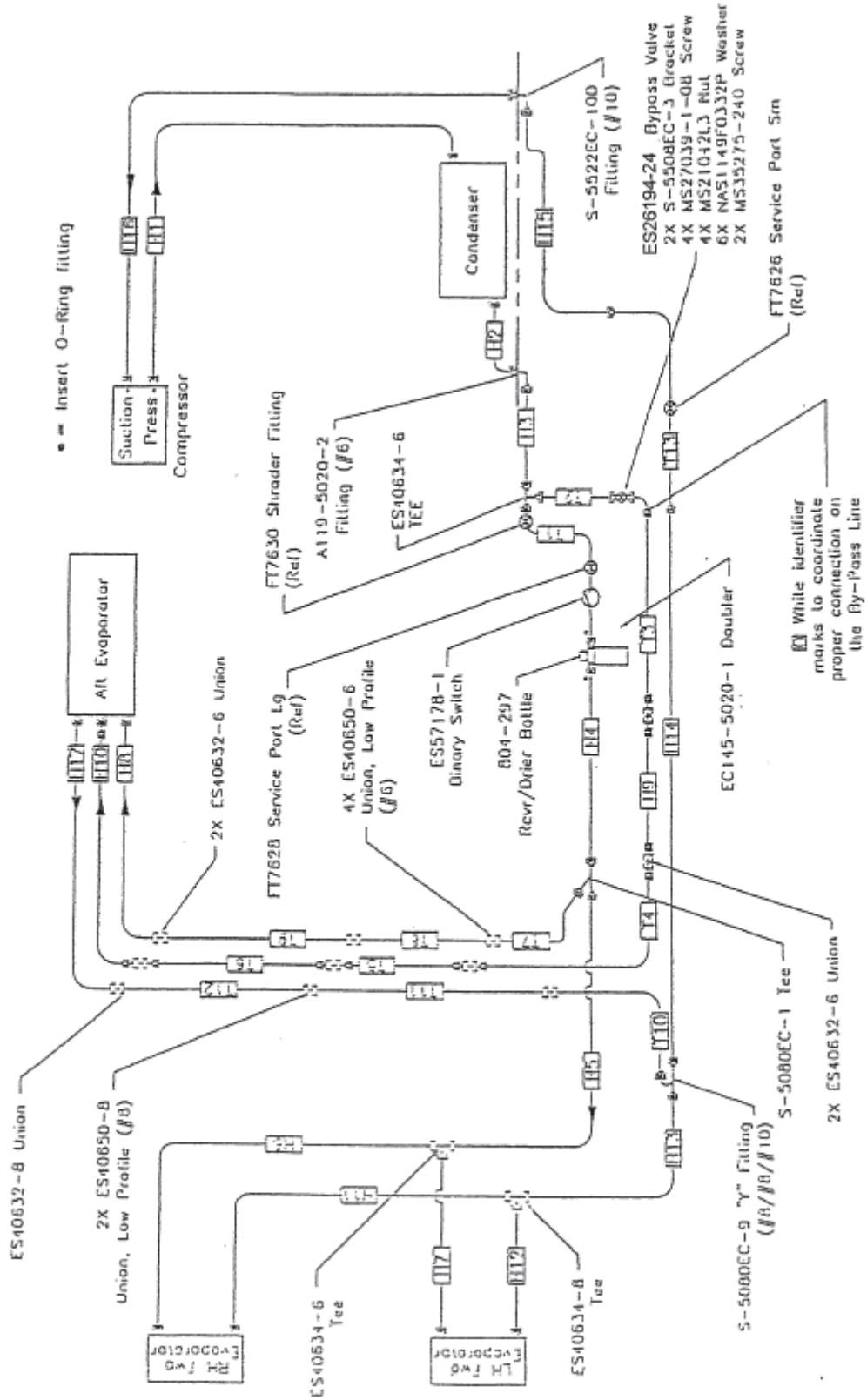
CHAPTER 3
LOCATION AND ACCESS (continued)

7. Relay Panel & Circuit Breaker Assembly Fig 3-8



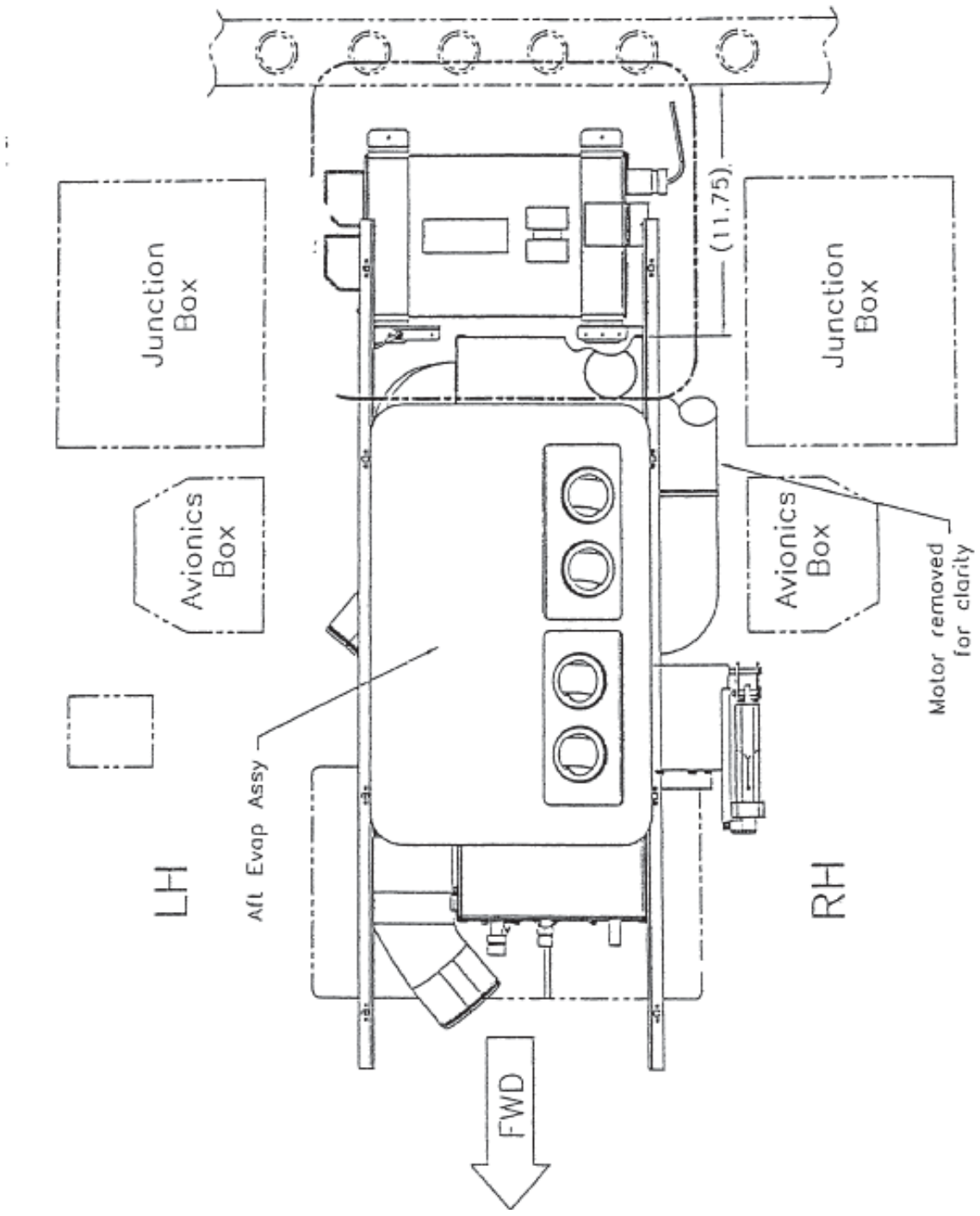
CHAPTER 3
LOCATION AND ACCESS (continued)

8. Refrigerant Plumbing Schematic Fig 3-9



CHAPTER 3
LOCATIONS AND ACCESS

9. Aft Evaporator Installation Fig 3-10



Aft Evaporator with 3rd Blower Motor Configuration
(S/N 015 and Subsequent

CHAPTER 4
PLACARDS AND MARKINGS

1. PLACARD AND MARKING INFORMATION

System Charging Instruction Placard

SYSTEM CHARGING INSTRUCTIONS
SYSTEM TO BE SERVICED BY QUALIFIED PERSONNEL

R134a Refrigerant- Polyester oil-XH9 Desiccant
System charge 4.5 lbs
If exact weight of refrigerant charge is not known,
use following procedure:
- º Charge system in .25 LB increments until minimum outlet temperature & system suction pressure is achieved.
- º Allow several minutes after each charge increment, to allow temperature & pressure to stabilize.

NOTE: Refrigerant over charge or operation of the AC during low Ambient temperature may cause tail rotor pedal feedback.

AIR COMM CORPORATION
BOULDER, COLORADO

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CHAPTER 5
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, especially the 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 later in this chapter (Page 5-4, Paragraph 5).

C. Connect the service manifold and vacuum pump to the service ports located in the upper aft right hand corner of the baggage compartment.

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.

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.

CHAPTER 5
SERVICING (continued)

2. SERVICING INFORMATION (Continued)

CAUTION

IT IS MANDATORY THAT THE SYSTEM BE LEAK FREE TO INSURE 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 4.5 lbs. (2.04 Kg.) Single forward evaporator 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!!
Never 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	
EC145 Air Conditioner system Single fwd Evaporator	4.3 lbs.	1.95 kg.	7.5 fl oz.	222.7 ml.
EC145 Air Conditioner system Dual fwd Evaporator	4.5 lbs.	2.04 kg.	7.5 fl oz.	222.7 ml.

3. LUBRICATION INFORMATION

The total system oil charge is 7.5 fl oz. (227.7 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.

CHAPTER 5
SERVICING (continued)

3. LUBRICATION INFORMATION (continued)

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)).

Containers of DEC PAG or POE will absorb moisture if left open (hygroscopic). 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.

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.

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CHAPTER 5
SERVICING (continued)

4. SYSTEM LEAK CHECK

Identification and elimination of system fitting leaks is extremely important to insure a 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 insure 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 is to be serviced with R134a compatible Polyester Refrigerant Oil.
(Do *not* use Polyalkylene glycol (PAG), or Mineral Oil in this system).

CHAPTER 5
SERVICING (continued)

6. CONSUMABLE MATERIALS (continued)

O-rings:

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

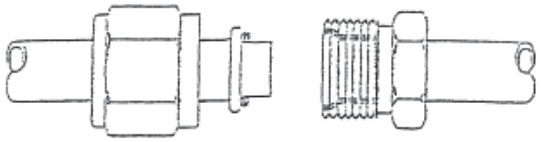
7. SUGGESTED SPARES LIST

Item	Part Number
Blower Motor – Aft Evaporator	S-6222EC-2 S-6220EC-1 (ALT)
Blower Motor – Forward Evaporator	ES61064-1
Compressor Assembly	EC145-3006-1
Compressor Drive Belt	ES35145-1
Receiver / Drier Bottle	ES43030-6
Binary Switch	ES57178-1
By-pass Valve	ES26194-24
Condenser Blower replacement (Standard)	ES73186-4
Condenser Blower replacement (High output)	ES73192-3
HSN O-rings; Insert type (Green)	
Size	
#6 O-ring	ES44010-2 (WAS 440-840)
#8 O-ring	ES44010-3 (WAS 440-841)
#10 O-ring	ES44010-4 (WAS 440-842)
HSN O-rings; Torq-Lok Type (Black)	
Size	
#6 O-ring	ES44012-2 (WAS 2-012-N1173)
#8 O-ring	ES44012-3 (WAS 2-014-N1173)
#10 O-ring	ES44012-4 (WAS 2-016-N1173)

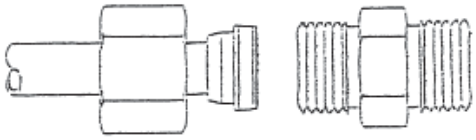
CHAPTER 6
STANDARD PRACTICES INFORMATION

1. FITTING TORQUING PROCEDURES AND TORQUE VALUES

INSERT O-RING FITTINGS



TORK-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 so you can see the O-ring as you slide the fitting together.

Be careful not to pinch O-ring during assembly.

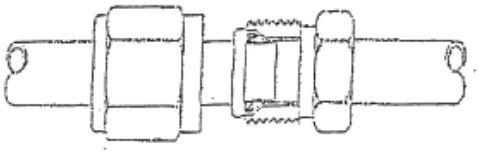
Engage the male end into the female fitting being careful to maintain alignment.

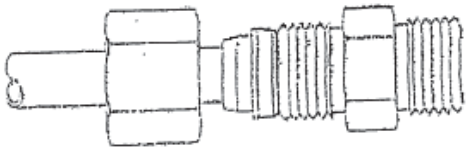
The male flange should seat fully against the female fitting with out the O-ring being pinched.

It is important to hold the fitting together while sliding the B-nut forward and engaging the threads. Tighten the B-nut by hand and then torque as follows.

6 Fittings: 30 – 35 in/lbs. (3.4-4.0 Nm)
8 Fittings: 40 – 45 in/lbs. (4.6-5.1 Nm) DO NOT OVER TORQUE!
#10 Fittings: 50 – 55 in/lbs. (5.7-6.3 Nm)

ALWAYS USE BACK UP WRENCH





Once the system is charged, check each fitting with an electronic leak detector.
(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.

CHAPTER 6
STANDARD PRACTICES INFORMATION (continued)

2. REMOVAL & REPLACEMENT OF CONDENSER BLOWER MOTOR & FAN ASSEMBLY.

REMOVAL

CAUTION

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

A. Remove the cowling aft of the engine compartment on the 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 ES73186-4 Blower motor & Fan assembly to the condenser assembly, and remove bolts.

C. Disconnect the ES73186-4 Blower motor & Fan assembly at the Molex connector.

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

REPLACEMENT

A. Install the new blower assembly in the reverse order of its removal, 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 placing the control switch in the A/C position several times to insure there is no binding and for proper operation of the Blower motor & Fan assembly.

D. Reinstall the cowling to the upper left hand side of the aircraft.

3. REMOVAL, REPLACEMENT & ADJUSTMENT OF COMPRESSOR DRIVE BELT

REMOVAL

A. It is necessary to access the upper transmission compartment to remove, replace, or adjust the Compressor Drive Belt.

B. Cut safety wire on the Compressor Belt Tensioning Link and the Compressor housing & Jam Nuts, and loosen the respective Jam Nut(s).

C. Before attempting to adjust the drive belt tension, insure that the compressor mounting / attaching bolts have been loosened, to allow free movement of the compressor body on the compressor mount.

D. After loosening the belt tension remove the compressor attaching bolts from around the base of the compressor body.

CHAPTER 6
STANDARD PRACTICES INFORMATION (continued)

3. REMOVAL, REPLACEMENT & ADJUSTMENT OF COMPRESSOR DRIVE BELT (continued)

E. Loosen the belt and remove belt from the compressor & drive pulley from the compressor housing.

REPLACEMENT

A. Install the drive belt on the compressor pulley & drive pulley.

B. Adjust belt tension (See Adjustment below).

C. Tighten the Belt Tensioning Link Jam Nuts and re-safety using .032 safety wire.

D. Re-torque the Compressor Mounting / Attaching bolts to 80 to 100 inch lbs. (9.04 – 11.30 Nm).

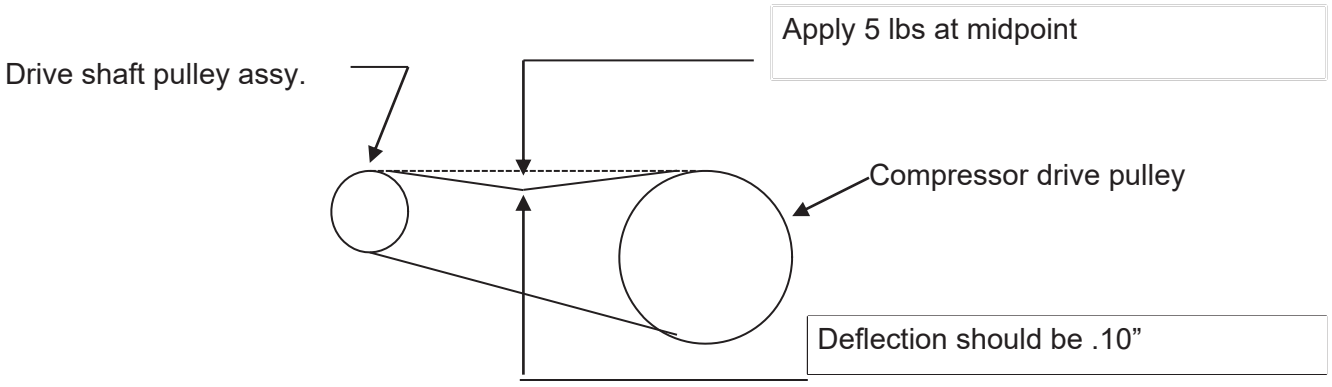
NOTE
Care should be taken to insure that the new belt is not damaged (nicked or cut) during installation.

ADJUSTMENT

NOTE
Proper belt tension is important to insure 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 (**Gates 7401-0076 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 midpoint of the belt.



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

4. REMOVAL, INSTALLATION / REPLACEMENT OF COMPRESSOR ASSEMBLY.

REMOVAL

A. See Removal, Replacement, & Adjustment of Compressor Drive Belt prior to the removal of the air conditioner compressor assembly.

B. It will be necessary to evacuate (discharge) the refrigerant from the system to remove and replace the air conditioner compressor. Instructions for servicing of the system are found in Chapter 5 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 top 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 attach the compressor body to the top of the compressor mount, and remove compressor assembly.

CAUTION

Before removing the compressor attaching hardware it is necessary to seek assistance in supporting the compressor, due to the weight and position of this component. Failure to do so may result in damage to the aircraft.

INSTALLATION / REPLACEMENT

A. Install the compressor assembly in the reverse order of its removal. Torque attaching hardware to 80 to 100 inch lbs (9.04 – 11.30 Nm).

B. 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).

C. Re-install the belt tension bolt attaching hardware to the compressor, and torque to 95 – 110 inch lbs (10.9-12.6 Nm).

D. Adjust the belt adjustment per the procedure shown on Page 6-3

E. Recharge the refrigerant per the servicing instructions on Page 5-1, steps A through I.

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 insure trouble free operation of the air conditioner system.

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CHAPTER 6
STANDARD PRACTICES INFORMATION (continued)

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CHAPTER 6
STANDARD PRACTICES INFORMATION (continued)

5. 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 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. Install the forward evaporator assembly in the reverse order of its removal. Torque the refrigerant line connections to 30 – 35 inch lbs (3.4-4.0 Nm) for the #6 fitting, and 40 – 45 inch lbs (4.6-5.1 Nm) for the #8 fitting, and replace all O-rings.

CAUTION

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

B. Recharge the refrigerant per the servicing instructions on Page 5-1, steps A through I

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 insure trouble free operation of the air conditioner system.

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CHAPTER 6
STANDARD PRACTICES INFORMATION (continued)

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CHAPTER 6
STANDARD PRACTICES INFORMATION (continued)

6. REMOVAL, INSTALLATION / REPLACEMENT OF AFT EVAPORATOR ASSEMBLY.

REMOVAL

A. Remove the overhead ceiling panel above the main cabin area to access the aft evaporator assembly.

B. Remove the (4) four AN3-10A bolts that retain the Aft Evaporator to the support bracket.

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 5 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 Temperature control module on the Aft Evaporator assembly by disconnecting the Molex connector.
F. Slide Evaporator Assembly forward and down to remove the assembly from the aircraft.

INSTALLATION / REPLACEMENT

A. Install the aft evaporator assembly in the reverse order of its removal.

B. Recharge the refrigerant per the service instructions on Page 5-1, steps A through I.

CAUTION
Refrigerant servicing should be performed by qualified personnel only!

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

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CHAPTER 6
STANDARD PRACTICES INFORMATION (continued)

7. REMOVAL, INSTALLATION / REPLACEMENT OF CONDENSER ASSEMBLIY.

REMOVAL

A. 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 5 Servicing.

CAUTION
Refrigerant servicing should be performed by qualified personnel only!

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

B. Disconnect the Condenser Assembly electrical connector from condenser blower fan assemblies.

C. Disconnect the Condenser Assembly from the refrigerant lines that attach to the condenser assembly.

D. Remove condenser retaining hardware from condenser base attaching points.

CAUTION
Insure the Condenser assembly is properly supported prior to removal of attaching hardware, to prevent damage to the condenser assembly, or aircraft.

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

INSTALLATION / REPLACEMENT

A. Install the condenser assemblies in the reverse order of the removal. 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 Page 5-1, steps A through I.

CAUTION
Refrigerant servicing should be performed by qualified personnel only!

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

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CHAPTER 6
STANDARD PRACTICES INFORMATION (continued)

8. REMOVAL, INSTALLATION / REPLACEMENT OF RECEIVER DRIER BOTTLE.

REMOVAL

A. Access refrigerant plumbing to Receiver Drier Bottle which is located next to 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 5 Servicing.

CAUTION
Refrigerant servicing should be performed by qualified personnel only!

C. Disconnect refrigerant lines form 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, and remove drier bottle.

INSTALLATION / REPLACEMENT

A. Install the receiver drier bottle in the reverse order of its removal, and replace all O-rings.

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 Page 5-1, steps A through I.

CAUTION
Refrigerant servicing should be performed by qualified personnel only!

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

9. REMOVAL, INSTALLATION / REPLACEMENT OF BINARY SWITCH.

REMOVAL

A. Access refrigerant plumbing to Binary Switch.

B. Disconnect electrical connectors from bottom of binary switch.

B. Unscrew switch from Schrader valve located on outlet tube from the receiver drier bottle. Remove switch.

NOTE
Use the flats provided on the top of the switch body to tighten, do not attempt to tighten, or loosen the pressure switch by hand.

INSTALLATION / REPLACEMENT

A. Install the binary pressure switch in the reverse order of its removal.

CHAPTER 6
STANDARD PRACTICES INFORMATION (continued)

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

REMOVAL

A. Access refrigerant plumbing to By-pass Valve.

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 5 Servicing.

CAUTION
Refrigerant servicing should be performed by qualified personnel only!

C. Remove safety wire and mounting screws that attaches 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.

INSTALLATION / REPLACEMENT

A. Install the by-pass valve in the reverse order of the removal, and replace all O-rings, (See page 6-1 for installation data / fitting assembly procedures).

B. Recharge the refrigerant per the servicing instructions on Page 5-1, steps A through I.

CAUTION
Refrigerant servicing should be performed by qualified personnel only!

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CHAPTER 6
STANDARD PRACTICES INFORMATION (continued)

11. 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 to the aft evaporator blower assemblies requires the removal of the overhead ceiling panel in the main cabin area.

B. Remove the hardware that attaches 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. The installation of the Aft Evaporator Blower Assembly is in the reverse order of their removal.

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CHAPTER 6
STANDARD PRACTICES INFORMATION (continued)

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FOR FURTURE USE

CHAPTER 7
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 5.
	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 6. [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 6. [1]
	e. By-pass valve	e. Check to insure 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 6. [1]
	f. Condenser blower motor / fan(s) assembly.	f. Check to insure 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 6.
	g. Condenser Blockage	g. Check to insure the condenser fins are clear and free of any blockage, and this will cause higher than normal discharge pressure in the system.
System not cooling (Evaporator blowers not operating)	h. Air conditioner control circuit breaker tripped.	h. Reset circuit breaker. If breaker will not reset, check for short in circuit.
	i. Forward or Aft evaporator blower circuit breaker tripped.	i. Reset circuit breaker. If breaker will not reset, check for short in circuit.

CHAPTER 7
TROUBLESHOOTING (continued)

1. SYSTEM TROUBLESHOOTING (continued)

Problem	Probable Cause	Solution
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 6. [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.

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

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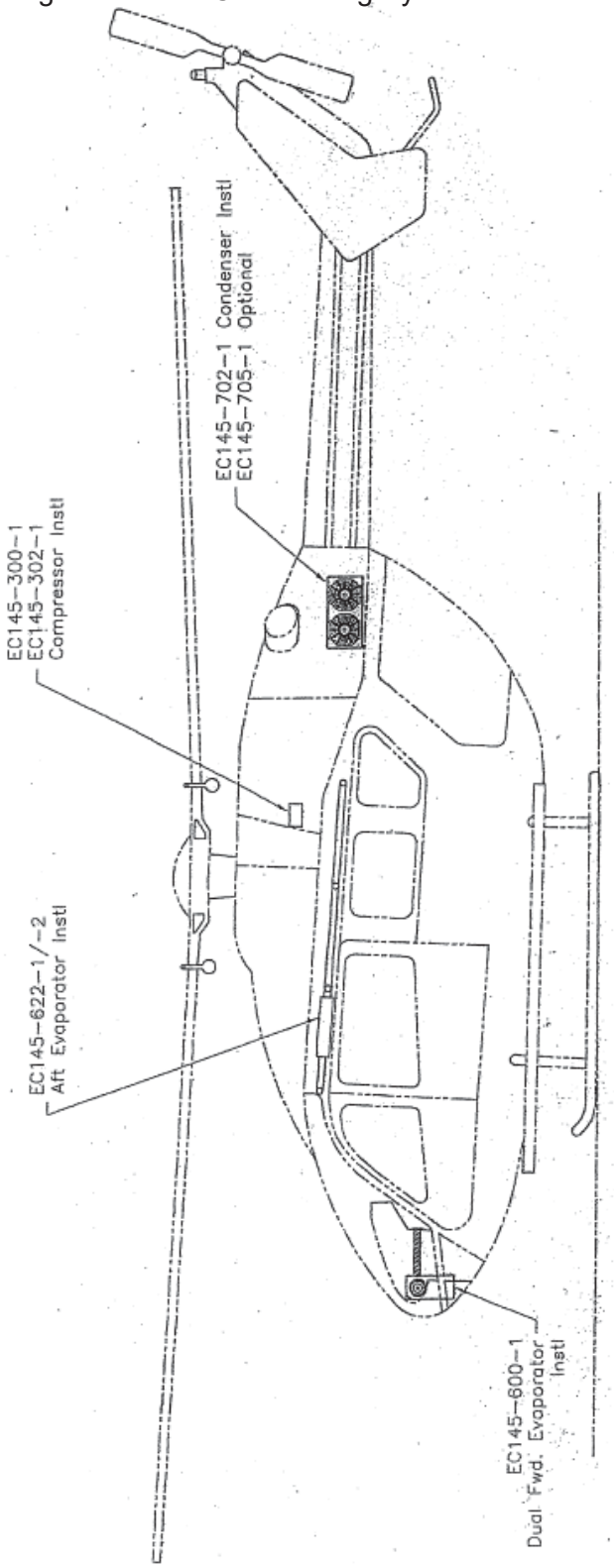
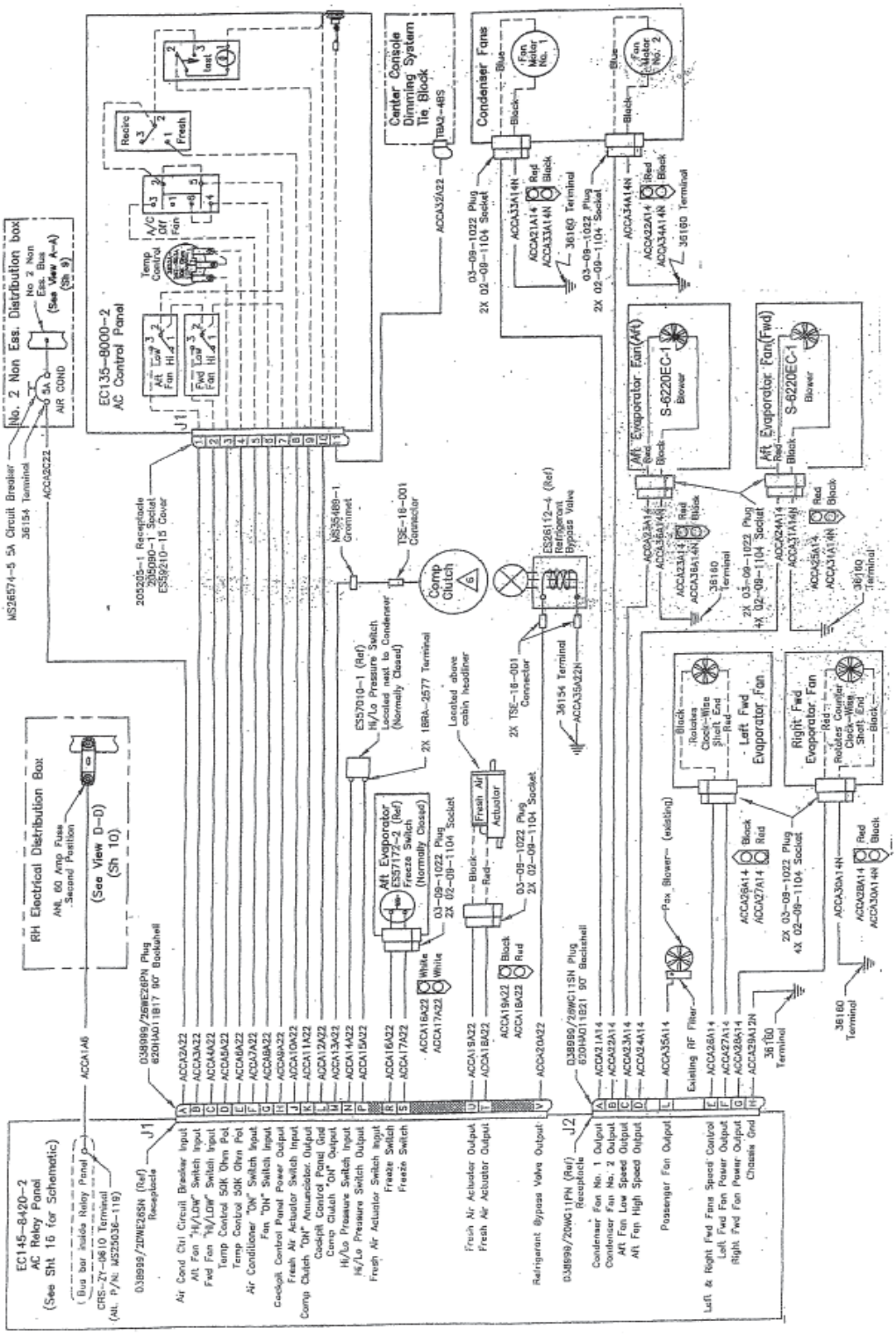
CHAPTER 7
TROUBLESHOOTING (continued)

Figure 7-1 General Arrangement – Air Conditioning System Installation.



CHAPTER 7
TROUBLESHOOTING (continued)

Figure 7-2 Air Conditioning System Electrical Schematic



(S/N 001 Thru 005)

CHAPTER 7

TROUBLESHOOTING (continued)

Figure 7-3 Air Conditioning System Electrical Schematic

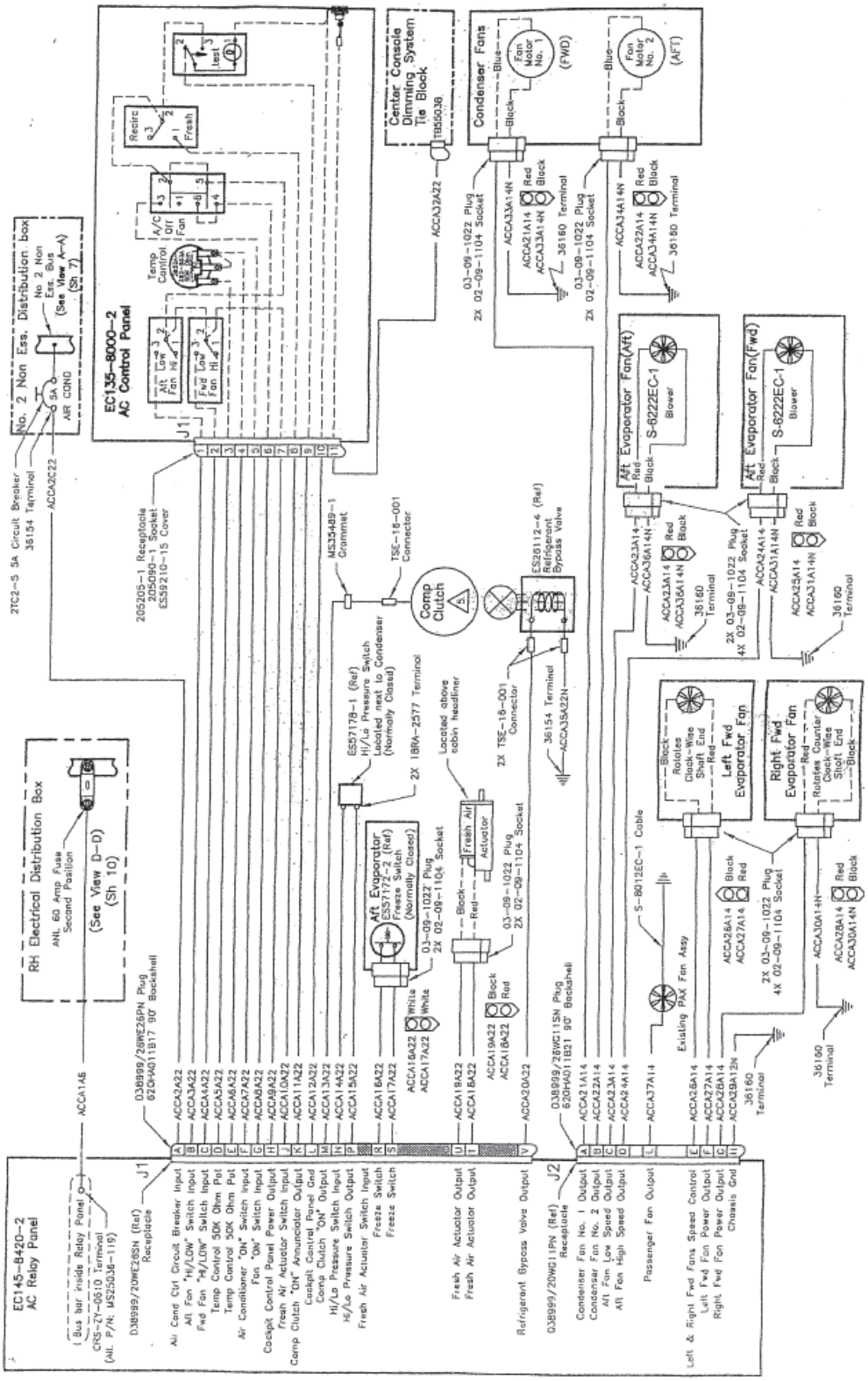
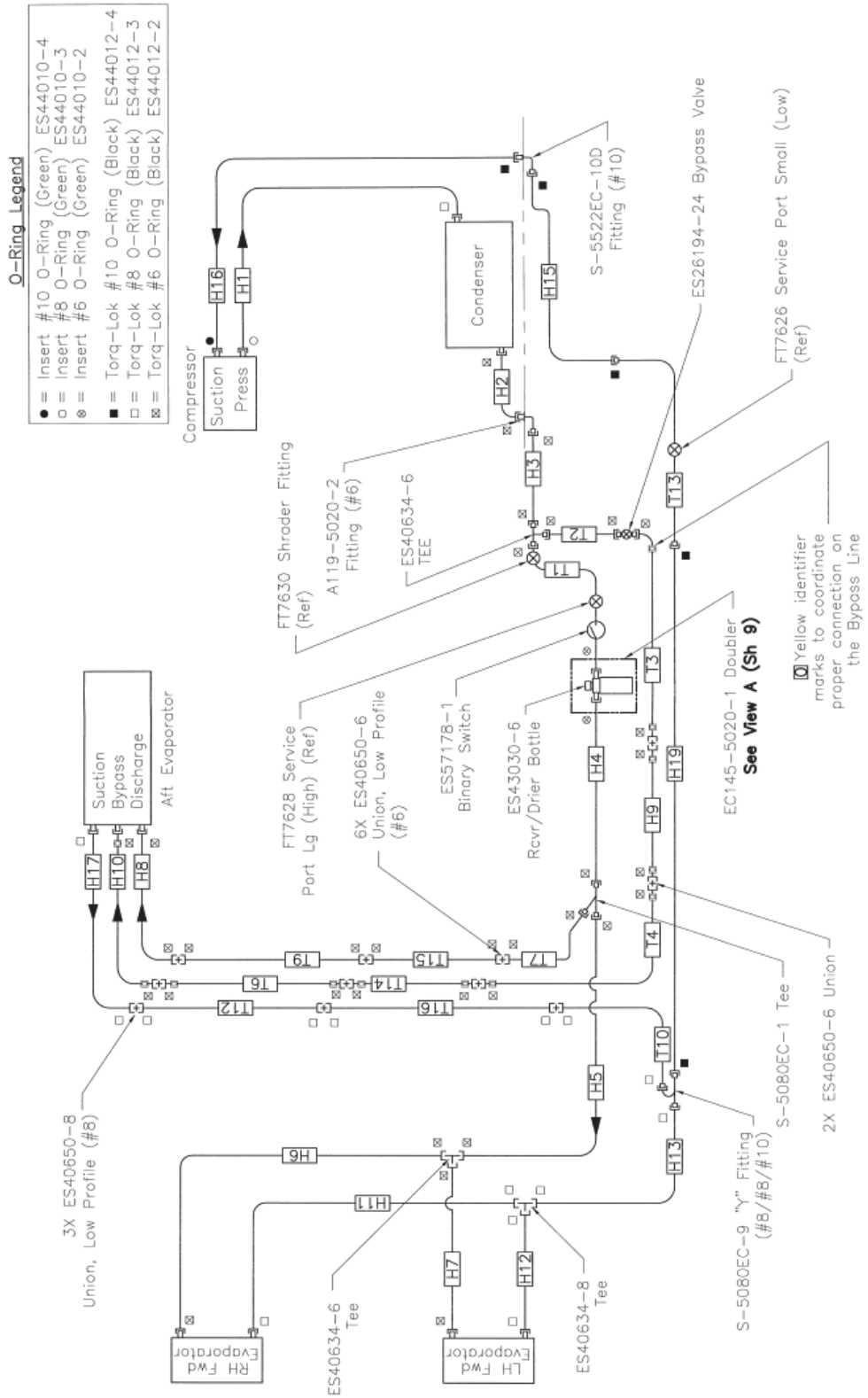
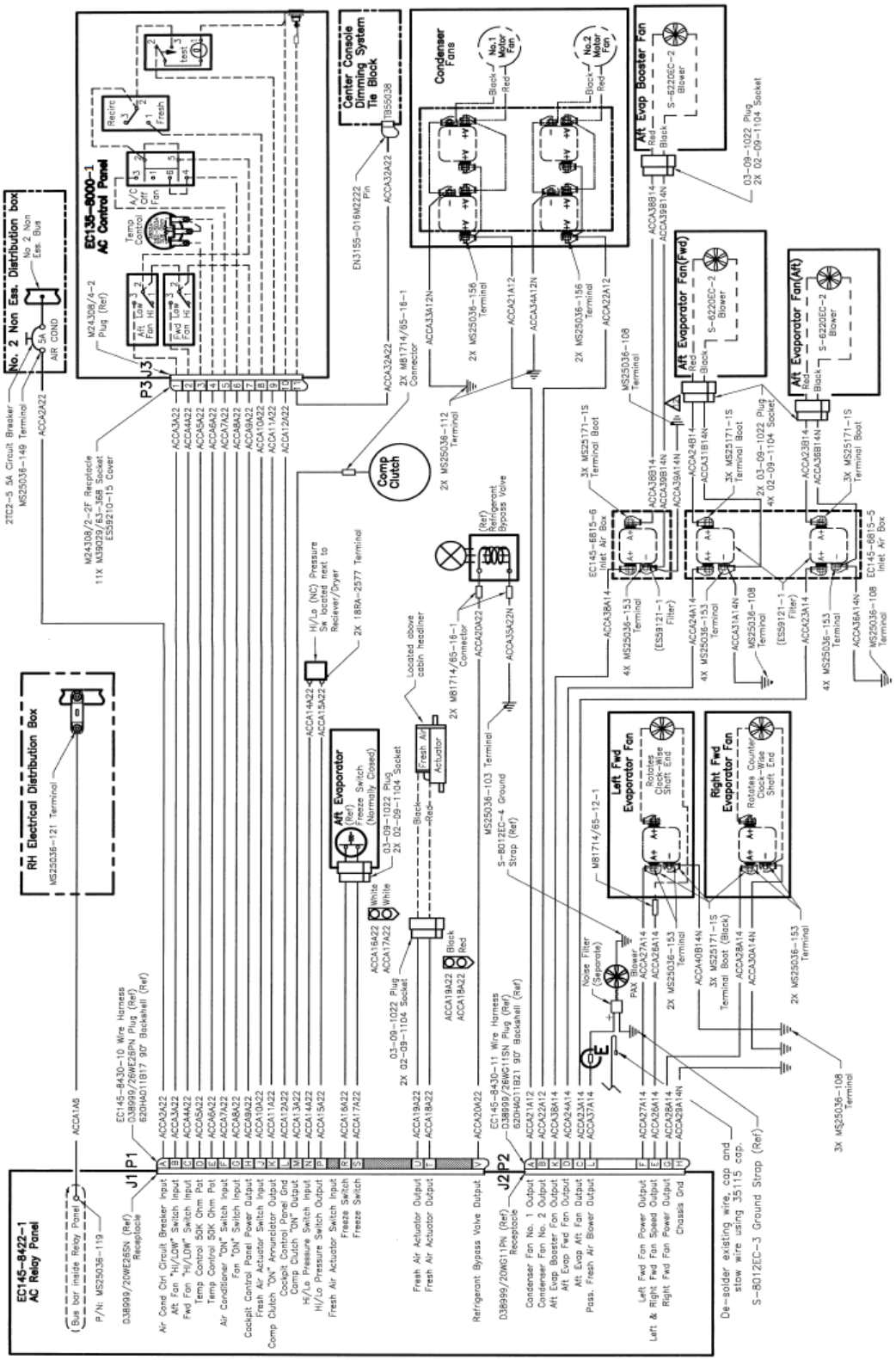


Figure 7-4 Refrigerant Plumbing Schematic



CHAPTER 7
TROUBLESHOOTING (continued)



Electrical Schematic with 3rd Aft Evaporator Blower
(S/N 015 and Subsequent)

APPENDIX A

Weight and Balance Information

Weight breakdown – Eurocopter EC145 Air Conditioner System:
Ref. Dwg. EC145-200, EC145-202, EC145-203, & EC145-205

(EC145-702 Standard Condenser)

Item	Wt. (lbs)	X-Arm (in)	X-M (in-lb.)	Y-Arm (in)	Y-M (in-lb)
Total EC145 with Dual Forward & Single Aft Evaporator (EC145-200)	113.24	161.6	18301	-5.7	-647
Total EC145 with Single Forward & Single Aft Evaporator (EC145-202)	105.24	143.8	15145	-7.6	-804

(EC145-704 High Output Condenser: High Output Blowers Only)

Item	Wt. (lbs)	X-Arm (in)	X-M (in-lb.)	Y-Arm (in)	Y-M (in-lb)
Total EC145 with Dual Forward & Single Aft Evaporator (EC145-200)	114.24	162.5	18562	-5.9	-671
Total EC145 with Single Forward & Single Aft Evaporator (EC145-202)	106.24	145.0	15406	-7.8	-828

(EC145-704 High Output Condenser: High Output Blowers, with Cowling Cutouts & Scoops)

Item	Wt. (lbs)	X-Arm (in)	X-M (in-lb.)	Y-Arm (in)	Y-M (in-lb)
Total EC145 with Dual Forward & Single Aft Evaporator (EC145-200)	114.59	162.8	18653	-5.9	-675
Total EC145 with Single Forward & Single Aft Evaporator (EC145-202)	106.59	145.4	15497	-7.8	-832

(EC145-704 High Output Condenser: High Output Blowers, with Cowling Cutouts & Scoops, and Ducting)

Item	Wt. (lbs)	X-Arm (in)	X-M (in-lb.)	Y-Arm (in)	Y-M (in-lb)
Total EC145 with Dual Forward & Single Aft Evaporator (EC145-200)	118.37	165.9	19638	-6.1	-720
Total EC145 with Single Forward & Single Aft Evaporator (EC145-202)	110.37	149.3	16482	-7.9	-877

(EC145-704 High Output Condenser: High Output Blowers, with Cowling Cutouts & Scoops, and Ducting. Third blower added to aft evaporator)

Item	Wt. (lbs)	X-Arm (in)	X-M (in-lb.)	Y-Arm (in)	Y-M (in-lb)
Total EC145 with Dual Forward & Single Aft Evaporator (EC145-203) (with blower motor filters)	123.82	164.3	20342	-6.2	-768
Total EC145 with Dual Forward & Single Aft Evaporator (EC145-205) (with blower motor filters)	130.80	163.3	21382	-6.3	-826

EC145-705 High Output Condenser

Item	Wt. (lbs)	X-Arm (in)	X-M (in-lb.)	Y-Arm (in)	Y-M (in-lb)
Total EC145 with Dual Forward & Single Aft Evaporator (EC145-205) (with blower motor filters)	131.47	163.3	21554	-6.3	-841