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**INSTRUCTIONS FOR CONTINUED AIRWORTHINESS
BELL HELICOPTER 206 A/B
AIR CONDITIONING SYSTEM (TH-67)**



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

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RECORD OF REVISIONS

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1	03/04/05	Page II-1- Added data for evap blower motor change and correct dual fwd evap arm. ES61142-1 motor weighs .75 lbs more than ES61060-2 motor. Pg. 5- added Fasco motor to list. Revised pgs 17 and 18 to include both the ES61060-2 (Panasonic motor) and the ES61142-1 motor (Fasco)	N/A Prepared by JAD
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Air Comm Corporation / Keith Products Bell 206 A/B (TH-67) Air Conditioner Modification Description

Drawing 206EC-203

This air conditioner system consists of components from both the Air Comm Corporation (ACC) FAA-STC approved system (SH2750NM), and those of the existing Keith Products FAA-STC approve system (SH1504NM).

The ACC system components which are required by this modification, are part of the 206EC-201 system, and includes the Compressor, Condenser, and Aft Evaporator Blower installations. These components are connected to the existing Keith Products Forward & Aft Evaporators, and the Electrical and Plumbing systems to complete the air conditioner system.

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 Bell 206 A/B (TH-67) 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 Bell Helicopter models 206 A/B (TH-67) that are equipped with the Air Comm Corporation kit number 206EC-203 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, with metric conversions in parentheses as needed.

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 Bell model 206 (TH-67) 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 **SH2750NM**

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 iii), and on the List of Effective Pages (page iv) 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 (main cabin), one condenser, and a compressor driven by the tail rotor drive shaft just forward of the aft engine compartment fire wall. 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 Blower mode.

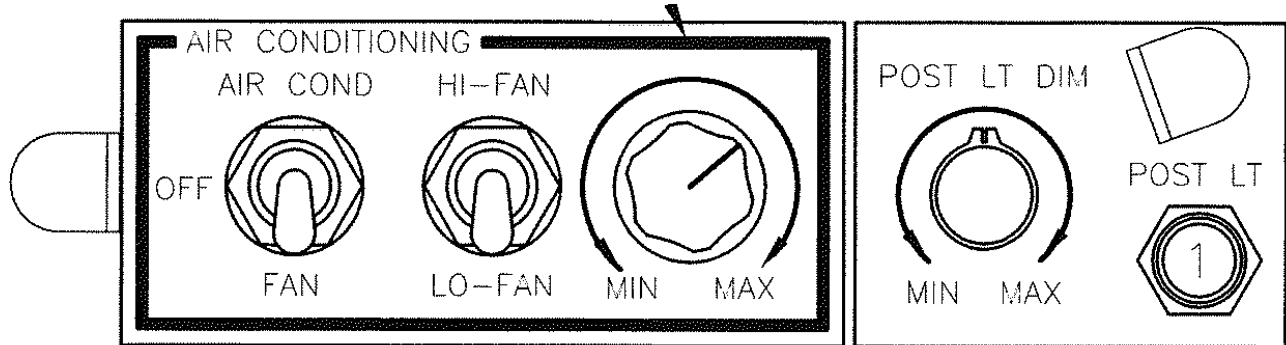
In the A/C mode, conditioned air is provided by the forward and aft evaporators to the cockpit and main cabin areas respectively.

In the Blower 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 defog 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 panel between the pilot's and co-pilot's seats. This panel consists of the A/C-OFF-FAN switch, Hi/Lo Fan switch, for the control of the Fwd & Aft evaporator blower fan speeds, and a temperature control knob, post lighting and a 1 Amp circuit breaker.



COCKPIT A/C CONTROL PANEL

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

The compressor is mounted to the surface of the engine drain pan, in the aft aircraft left portion of the engine compartment. It is driven by a V-belt and a pulley which is mounted to the tail rotor drive shaft. Access to the compressor is provided by engine 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.

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 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 temperature control knob located on the A/C control panel.

The refrigerant plumbing for this system installation incorporates insert O-ring fittings:

1. **INSERT O-RING FITTINGS:** These fittings have formed ends that along with an O-ring create a seal. Caution: when assembling these fittings care should be taken not to damage the O-ring (i.e. nicking, splitting, or crushing, etc.). Black O-rings must not be used on these fittings. (See page 32 for torquing procedures).

The system is also equipped with a Binary switch. 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).

The switch operating pressures are: Low Pressure Function:
Cut-out at 28 ± 2.8 psig ($1.9691 \pm .1969$ kg/cm)
Cut-in at 29 ± 4.3 psig ($2.0394 \pm .3024$ kg/cm)
High Pressure Function:
Cut-out at 384 ± 30 psig (27.004 ± 2.1097 kg/cm)
Cut-in at 298 ± 43 psig (20.323 ± 3.0239 kg/cm)

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 illustrated schematically in Figure 1.

Liquid refrigerant is contained in the receiver-drier under pressure from the compressor. The receiver-drier also filters the refrigerant through a material know 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 kg/cm), 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.

15. Refrigeration Cycle Schematic

(PLEASE NOTE: This illustration is provided as a reference only and may not match the actual installation)

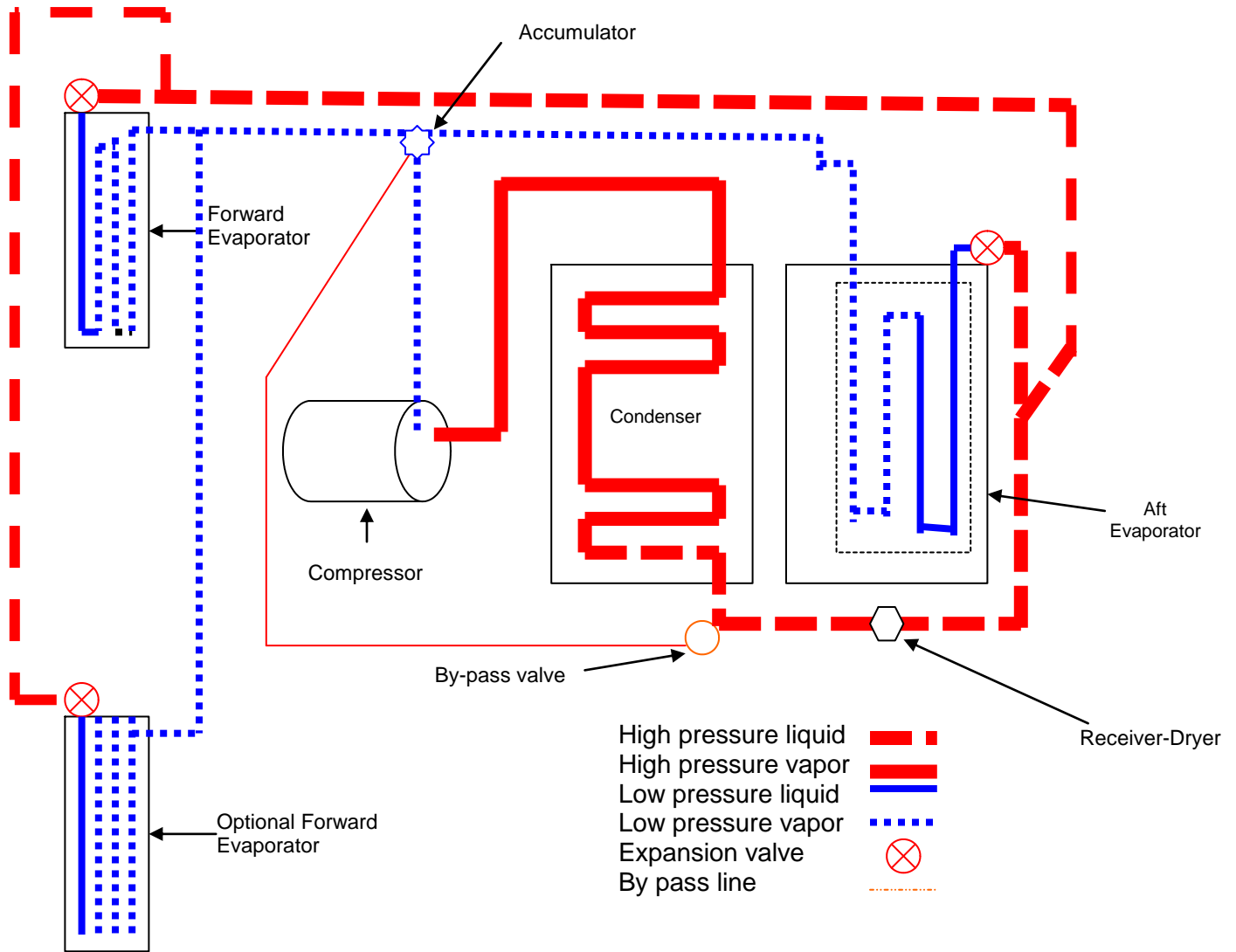


Figure 1: Refrigeration Cycle Illustration

CHAPTER 2

AIRWORTHINESS LIMITATION SECTION

The Airworthiness Limitations section is FAA approved 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

CHAPTER 3 INSPECTIONS

1. INSPECTION REQUIREMENTS

PERIODIC INSPECTIONS

(Hours are aircraft time)

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 ES61060-2	X		X	Check for operation in Hi and Lo settings
Compressor Drive Belt 7255	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
Compressor Assembly. S-3008EC-6	X	X	X	Check for operation, security of attaching hardware, and signs of oil or refrigerant leaks.
Compressor Mount S-3005EC-1	X		X	Check mount for cracks, and security of the attaching hardware.
Aft Evaporator Foam Insulation	X			Check for security and signs of deterioration, replace as necessary
Plumbing and Fittings	X		X	Check for security and signs of oil or refrigerant leaks
Compressor drive pulley S-3520EC-1	X		X	Check for security of attaching hardware.
Blower Electrical Connectors	X			Visually inspect condenser & evaporator blower motor connectors for signs of overheating

2. INSPECTION PROCEDURES.**NOTE**

Refer to "Chapter 4 Location and Access" to locate all components for inspection.

Inspection of the FWD and AFT evaporator blower motors**CAUTION**

Fans are designed to operate with the resistance of the entire ducting system. Operation of the evaporator fans with any part of the distribution system removed may cause permanent damage to the fan motor.

WARNING

Fans may take up to 10 seconds to start after the switch is turned on. Keep hands away from fan whenever switch is in "Fan" or "A/C" positions.

- a. At the Cockpit's Air Conditioner Control Panel place the AIR COND switch in the FAN position and verify that:
 1. both the fwd and aft fans are activated and operating – Place blower switches to "low" and "high" to verify blowers increase and decrease speed accordingly.
 2. the condenser fan is non-operational.
 3. the compressor clutch is disengaged.
- b. Place the AIR COND switch in the OFF position and verify that:
 1. both the fwd and aft fans deactivate
 2. the compressor clutch remains disengaged.

Inspection of the air conditioner condenser**NOTE**

This inspection may be performed with the air conditioner charged with refrigerant or it may be performed with no refrigerant in the system. In the case where there is no refrigerant in the system or the system is low on refrigerant or in the case where the ambient temperature is low, the binary switch will need to be jumpered. The temporary installation of a jumper wire across the terminals of the binary switch will do no harm even if it was not necessary.

CAUTION

THE TEMPORARY JUMPER **MUST** BE REMOVED AFTER THIS INSPECTION IS COMPLETED.

- c. Visually inspect condenser air inlet for any obstructions or debris. Airflow in this area is critical for air conditioner operation.
- d. Install a jumper between the contacts of the binary switch if required.

- e. Connect 28V ground power to the aircraft and place the A/C mode switch in the "A/C" position and verify that:
 - 1. Condenser scoop opens.
 - 2. Condenser fan is activated and operating. This fan should pull air into the aircraft through the open scoop and exit at the screen below the condenser.
 - 3. Compressor clutch is engaged. Verify compressor clutch engagement by visually observing the clutch plate clamp to the compressor rotor or an audible click when the switch is moved to "on".
- f. Place the A/C mode switch into the Off position and verify that:
 - 1. The condenser fan is deactivated.
 - 2. The condenser scoop closes.
- g. Ensure that the jumper wire is removed from the binary switch

CAUTION

This procedure requires the temporary installation of a jumper wire across the terminals of the binary switch. This wire **MUST** be removed after this inspection is accomplished.

- h. Visually inspect condenser air inlet for any obstructions or debris. Airflow in this area is critical for air conditioner operation.
- i. Install a jumper between the contacts of the binary switch.
- j. Connect 28V ground power to the aircraft and place the A/C mode switch in the "A/C" position and verify that:
 - 1. Condenser fan is activated and operating. This fan should pull air into the aircraft through the condenser assy.
 - 2. Compressor clutch is engaged.
- k. Disconnect one of the electrical leads from the binary switch, remove jumper wire and:
 - 1. Reconnect the electrical lead removed from the binary switch.
- l. Place the A/C mode switch into the Off position and verify that:
 - 1. The condenser fan is deactivated.

Inspection of compressor drive belt

- m. Remove transmission cowling to gain access to compressor drive belt and visually inspect the A/C compressor drive belt for the following:
 - 1. Any signs of excessive wear.
 - 2. Any signs of glazing.
 - 3. Any cracks or missing pieces.
 - 4. Any exposed fibers.
- n. Verify proper belt tension as shown in the illustration shown in Figure 2 below.

The proper belt tension is achieved using the following procedures:

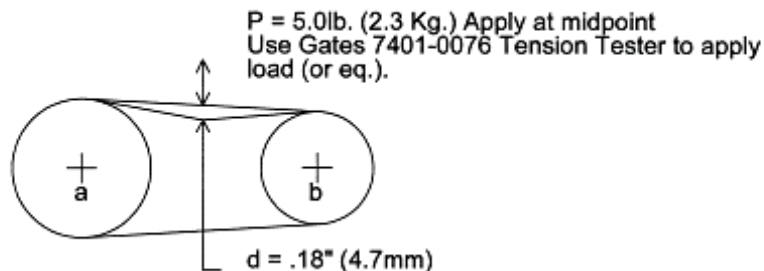


Figure 2: Belt Tension Inspection

Inspection of air conditioner placards and markings.

- o. Check all air conditioner placards and markings for security and legibility.

Inspection of air conditioner compressor assembly

NOTE:

The air conditioning system must be serviced with refrigerant to perform this inspection

- p. Connect 28V ground power to the aircraft and place the A/C mode switch in the "A/C" position and verify:
 1. Compressor clutch is engaged.
- q. Place air conditioner switch to the OFF position and verify:
 1. Compressor clutch is disengaged.
- r. Visually inspect the compressor assembly for the following:
 1. Security of all attaching hardware.
 2. Signs of refrigerant or oil leaks.
 3. Signs of excessive belt slippage or excessive heat.

Inspection of Air Conditioner compressor mount Assy.

- s. Visually inspect compressor mount for any signs of the following:
 1. Any cracks.
 2. Security of attaching hardware.
 3. Elongation of component mounting holes.
 4. Any loose rivets.

Inspection of Air Conditioner Refrigerant Plumbing

- t. Visually inspect plumbing and fittings for any signs of the following:
 1. Refrigerant gas or oil leaks.
 2. Chaffing or excessive corrosion.
 3. Security of attaching hardware.

Inspection of Compressor Drive system

- a. Cut the safety wire on the belt tensioning link assembly jam nuts and adjust the tensioning link assembly to loosen the compressor drive belt.
- b. Check S-3520 drive pulley for play relative to the tail rotor drive shaft, both in the direction of rotation as well as for lateral movement relative to the shaft, and inspect area around the base of the drive ring at the shaft for any buildup of metal dust/powder residue.
- c. If there is any detectable looseness, and/or if there is significant metal dust/powder residue present, refer to Section 8 for removal instructions to allow removal and further inspection to determine if the pulley or drive ring need to be replaced.
- d. If there is no detectable looseness, and no significant metal dust/powder residue present, re-tension the belt per Section 8.
- e. Check security and condition of all related fasteners.

I. Inspection of Blower Electrical Connectors

1. Locate the electrical connectors that power the evaporator and condenser blowers. The connectors are at the interface between the blower harness and the aircraft harness and identified by their white plastic housing.

Note:

For 206EC-203 AC kits the evaporator blowers have an additional connector to inspect located several inches away from the harness connector.

2. De-mate each connector and inspect both mates for signs of overheating (discoloration or plastic deformation).
3. 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. See Chapter 7 Standard Practices, section 14 for important connector replacement information.

3. COMPONENT OVERHAUL / REPLACEMENT SCHEDULE

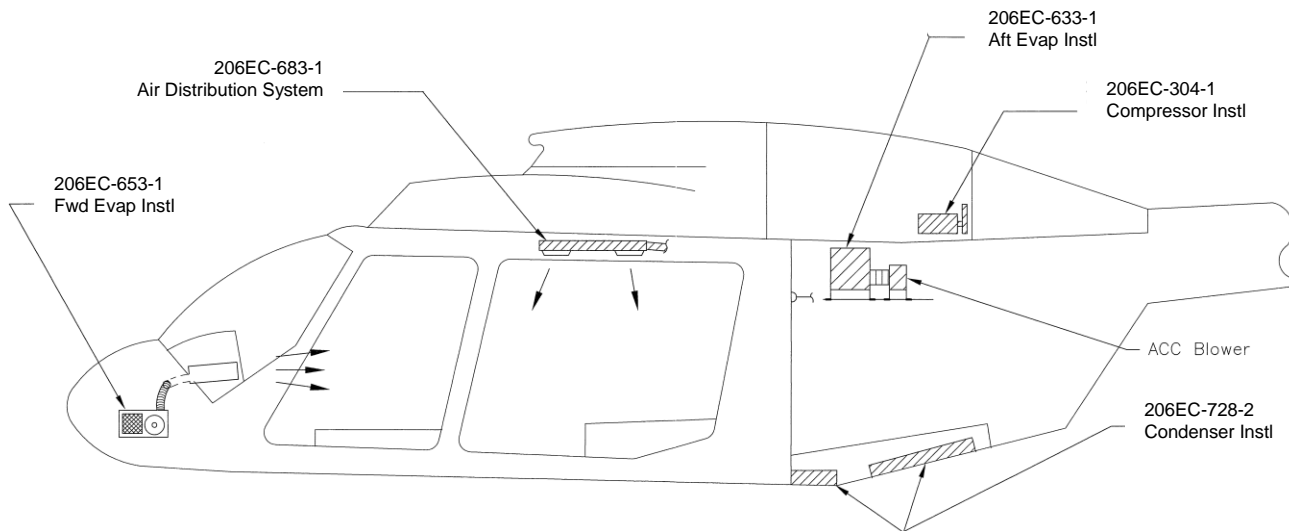
Description	Part Number	Overhaul / Replacement Hours
Condenser & Forward / Aft Evaporator Blower Motor & Fan replacement	ES61136-1 (Condenser Motor) ES61064-1 (Fwd. Evaporator Motor) ES61142-1 (Aft. Evaporator Motor)	The blower manufacturer recommended TBO is 500 hrs. At the discretion of the operator 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.

CHAPTER 4

LOCATION AND ACCESS

1. LOCATION OF AIR CONDITIONER FEATURES

Nomenclature	Description of Location
Air Conditioner Circuit Breaker & Relay Panel	Located on the avionics shelf aircraft right forward of the baggage compartment, A/C control & fan CB located on center console (VFR) and overhead (IFR).
Air Conditioner Control Panel	The air conditioner control panel is located in the existing overhead circuit breaker / switch panel.
Forward (Cockpit) Evaporator	The forward evaporator(s) is mounted to the right hand side of the center pedestal forward of the instrument panel in the chin bubble.
Forward Evaporator Blower Assemblies	The forward evaporator blower assemblies are integral to the Forward Evaporator(s) Assembly. (See Forward "Cockpit Evaporator above)
Aft (Main Cabin) Evaporator	Is located behind the "hat shelf" aft of the main cabin seats.
Condenser Assembly	The condenser is located under the baggage compartment floor, and aft of the rear cross tube assemble.
Compressor	The compressor is mounted to the aft L/H section of the engine compartment drain pan.
Refrigerant Plumbing	The refrigerant plumbing is routed from the compressor, to the area below the baggage 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 and the cabin headliner.
Servicing Ports	The Service Ports for this system are located behind the baggage compartment closeout in the aft upper aircraft left corner of the baggage compartment.



SIDE VIEW

Figure 3: Layout of Bell TH-67 (NTH) Air Conditioning System

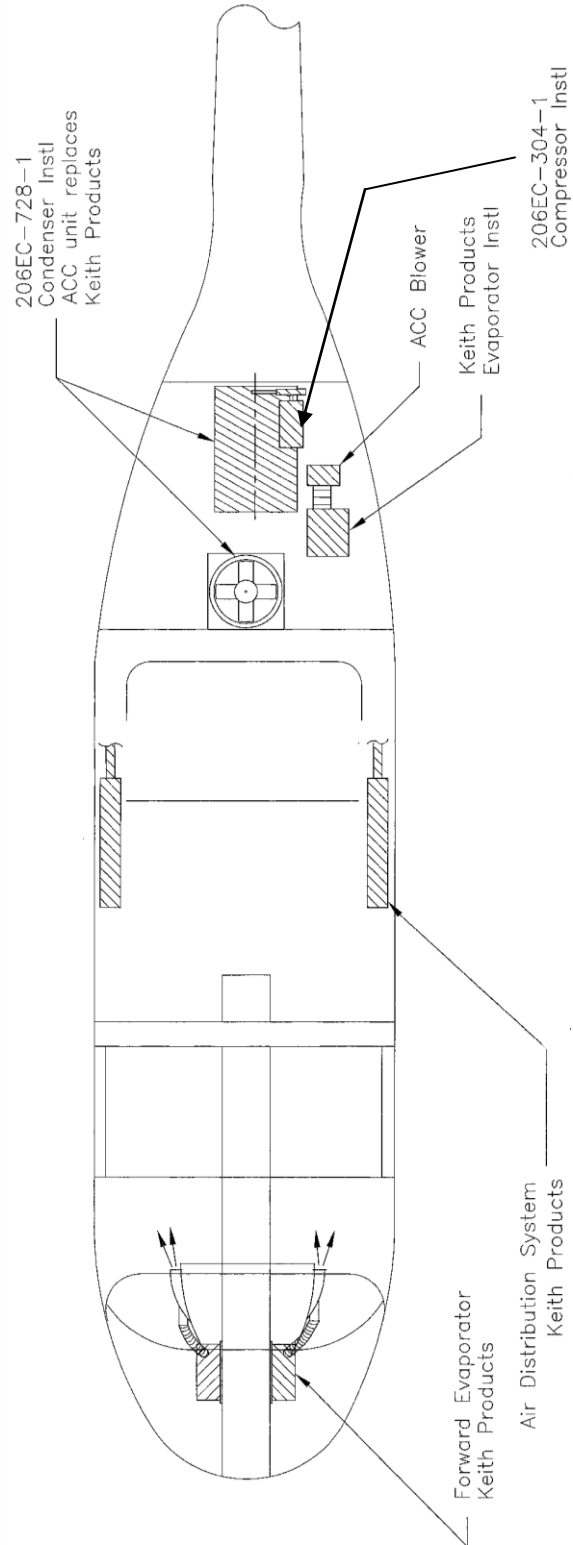


Figure 4: Top View – Model 206 (TH-67) Fuselage

2. Compressor Installation (View Looking Down)

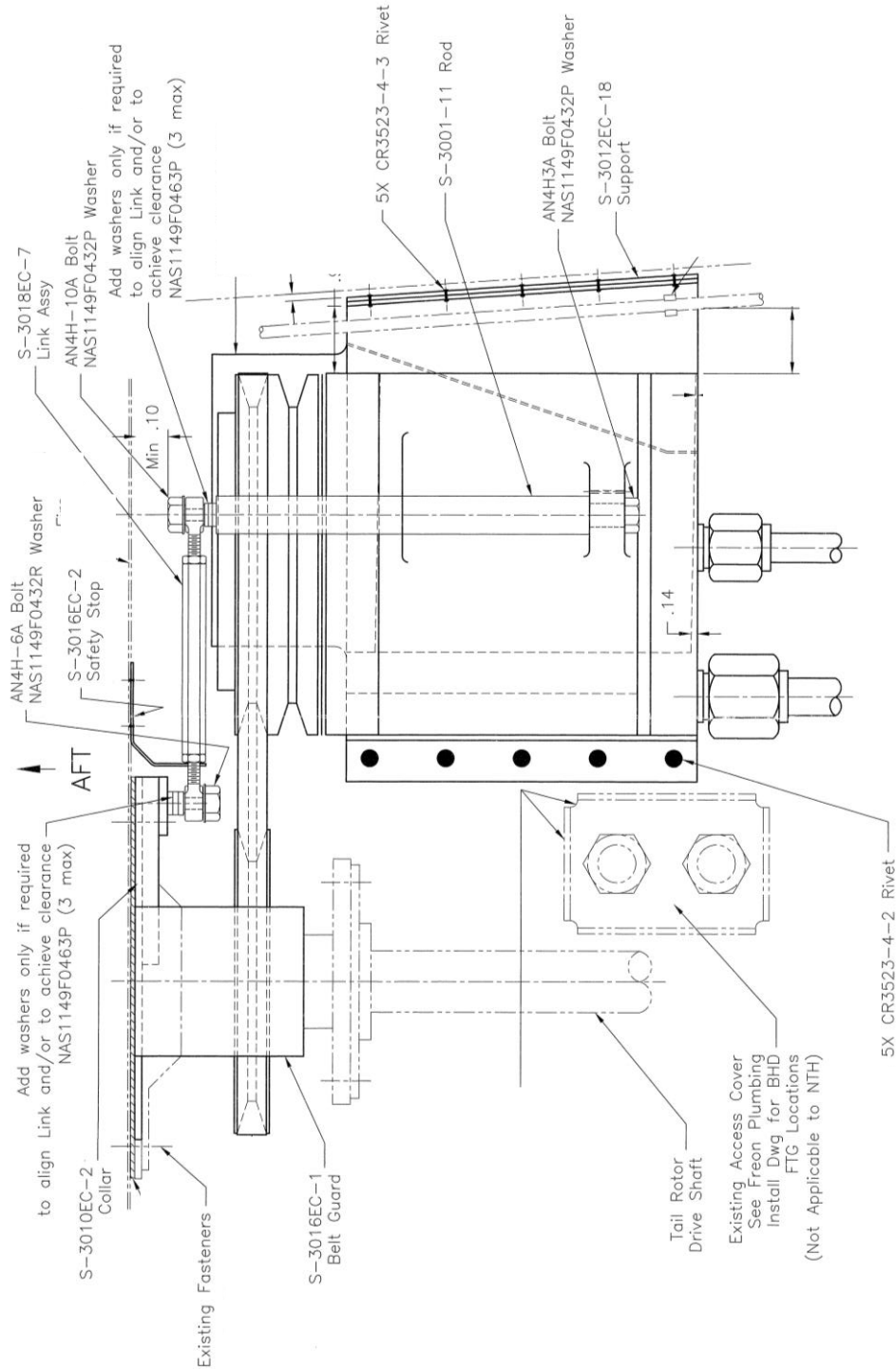


Figure 5: Compressor Installation (down)

3. Compressor Installation (View looking in from aircraft left)

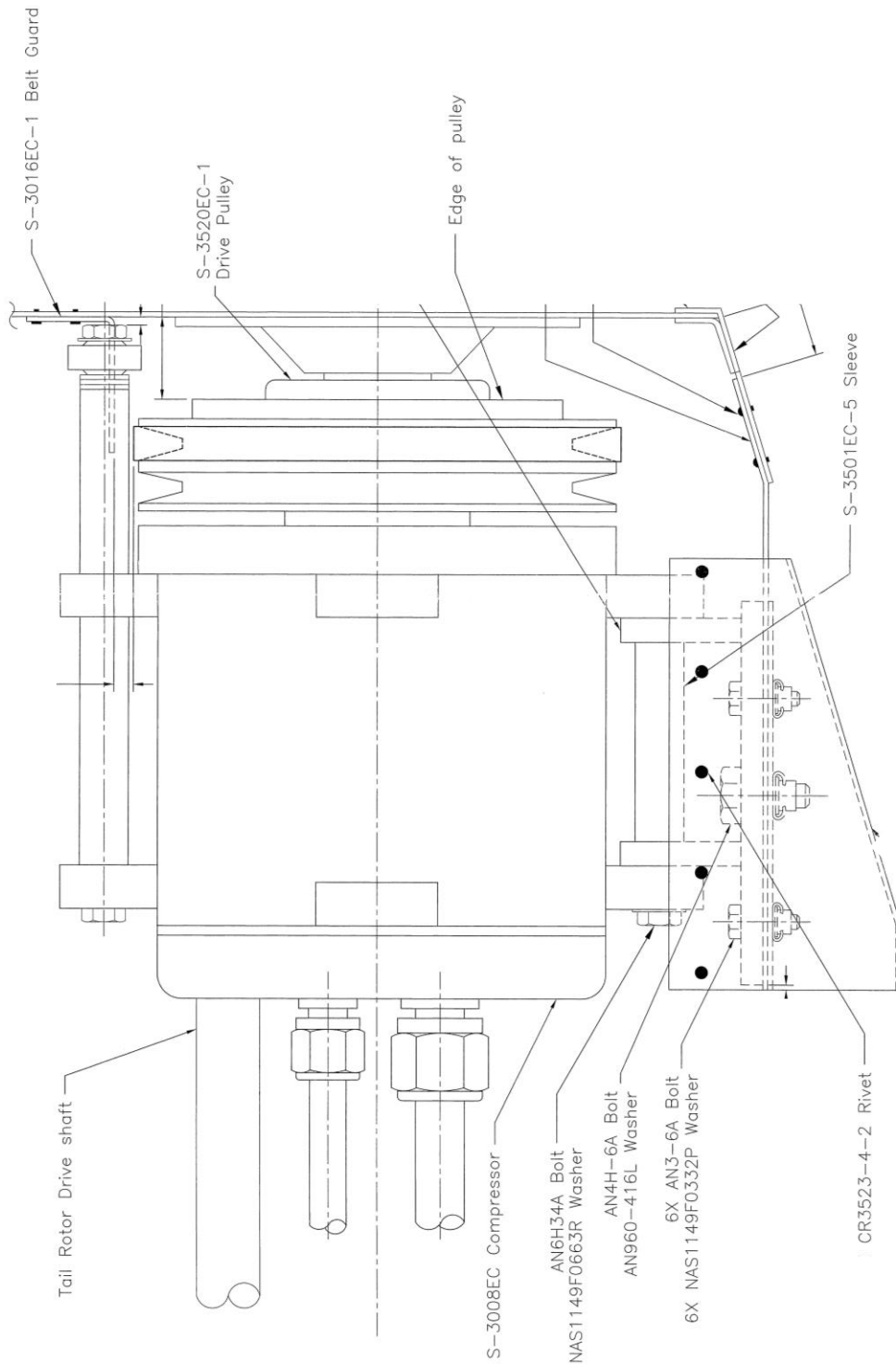


Figure 6: Compressor Installation (Aircraft Left)

4. Aft Evaporator & Aft Evaporator Blower Assemble Installation (view looking down).

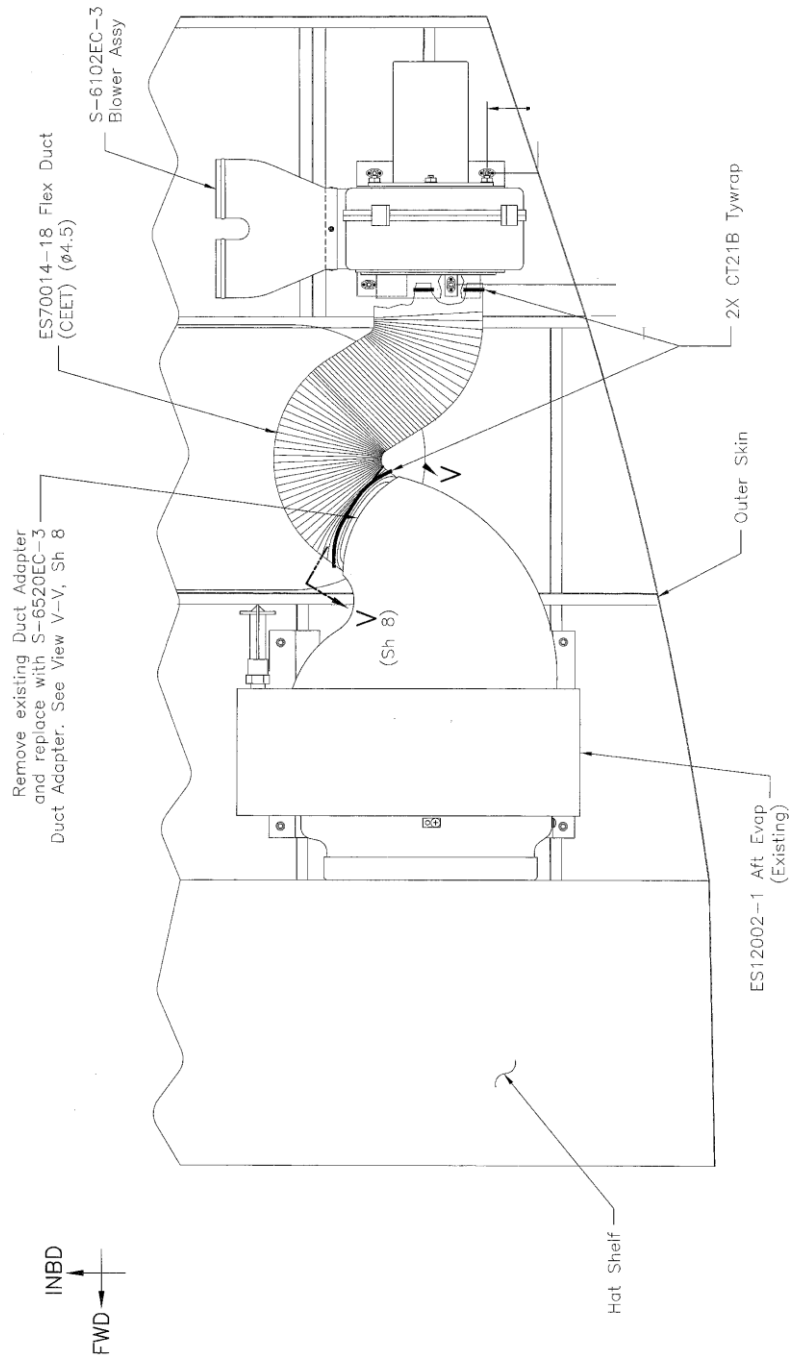


Figure 7: Aft Evaporator & Aft Evaporator Blower Assemble Installation (down)

5. Condenser Scoop Assembly Installation (view looking in aircraft left)

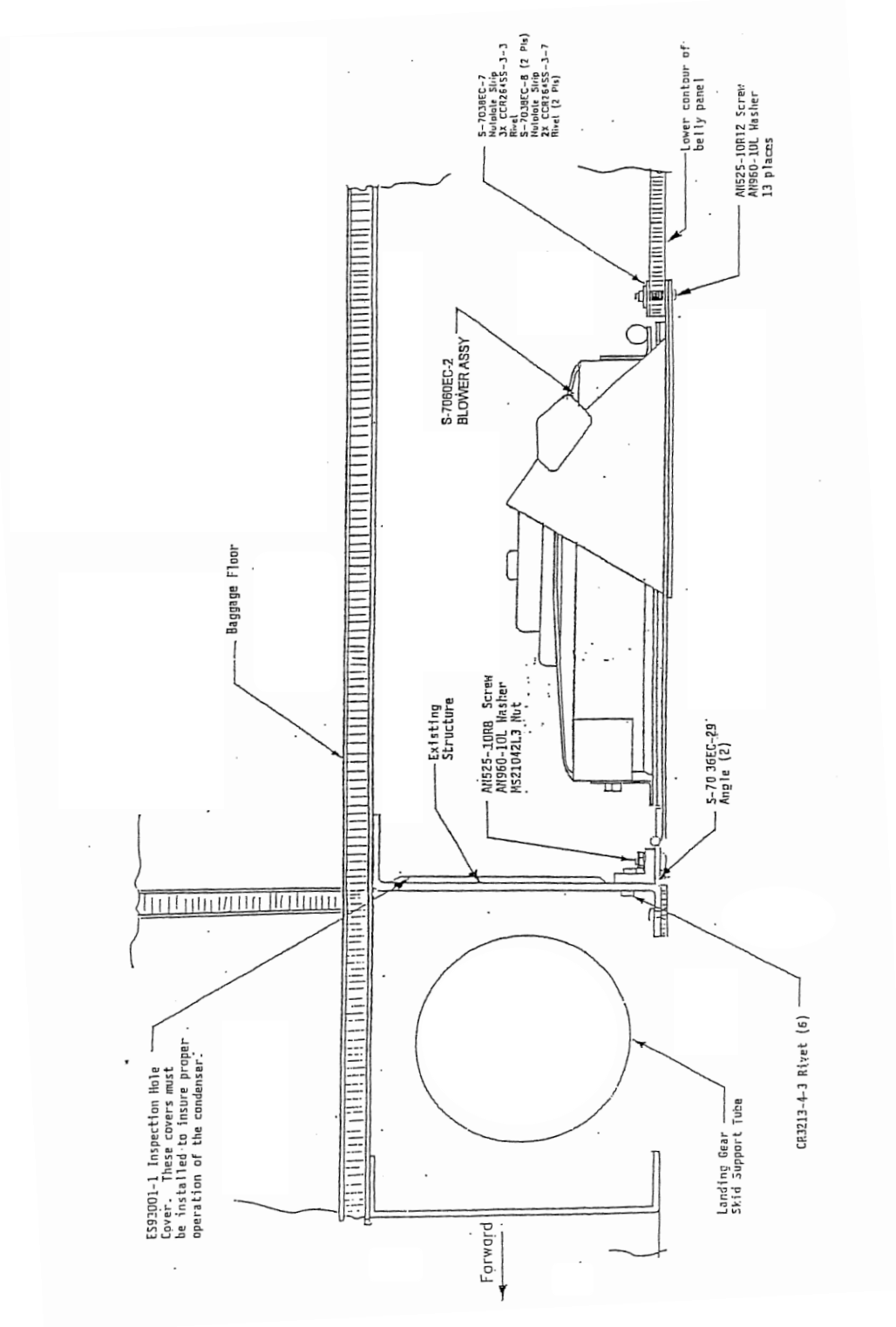


Figure 8: Condenser Scoop Assembly

6. Condenser Installation (view looking in from aircraft left)

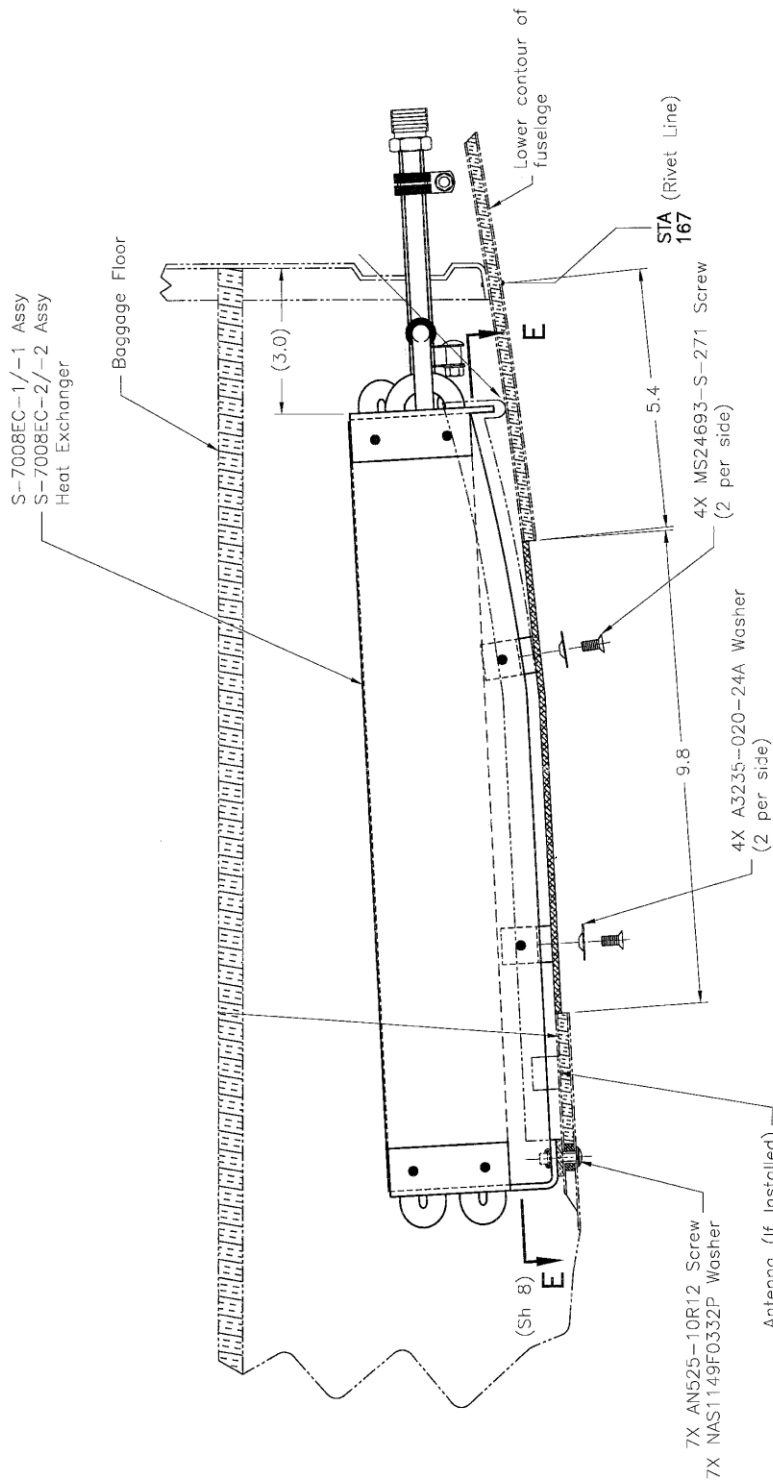


Figure 9: Condenser Installation (aircraft left)

7. Relay Panel & Circuit Breaker Installation

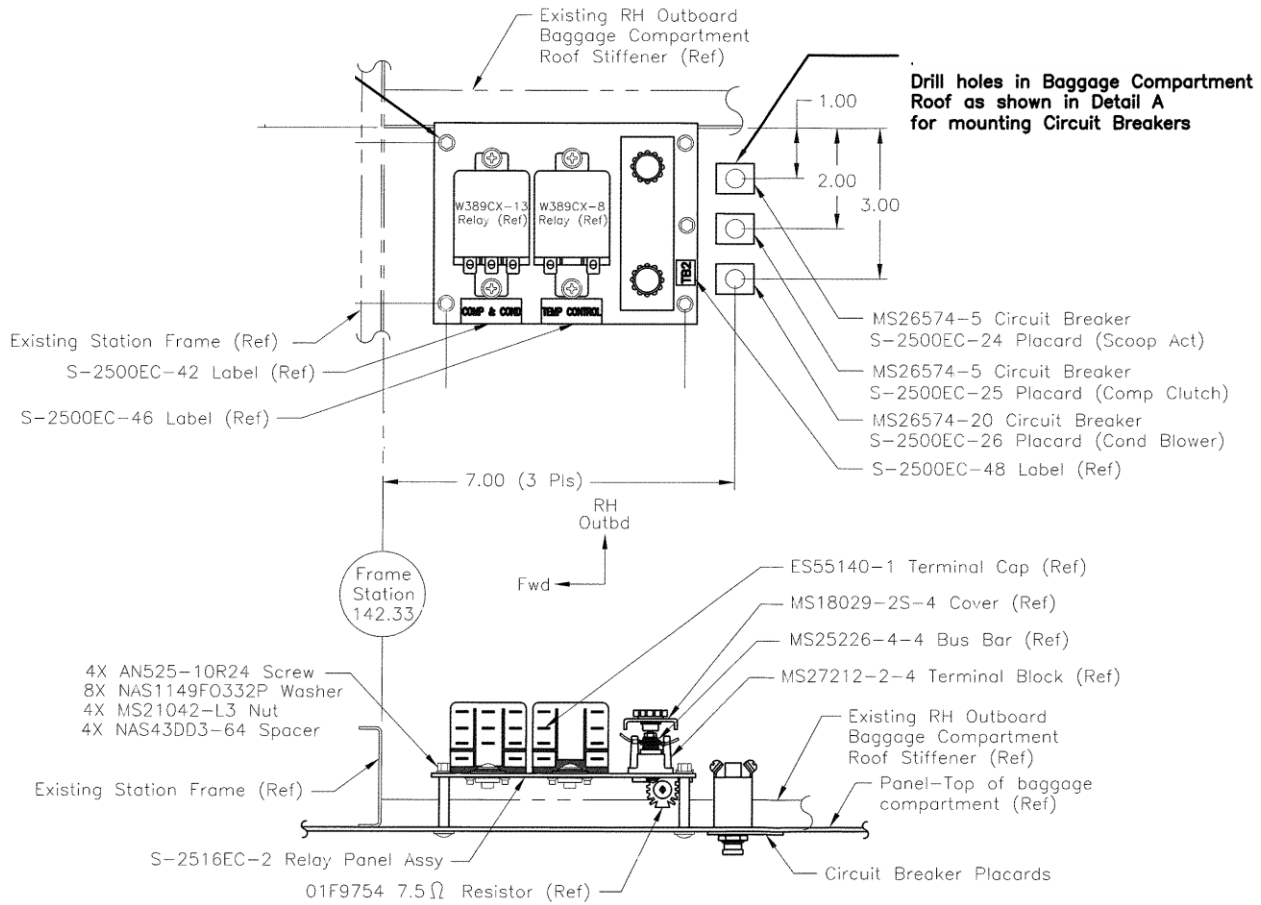


Figure 10: Relay & Circuit Breaker Panel Installation

8. Cockpit Mounted Control Panel / Center Console View

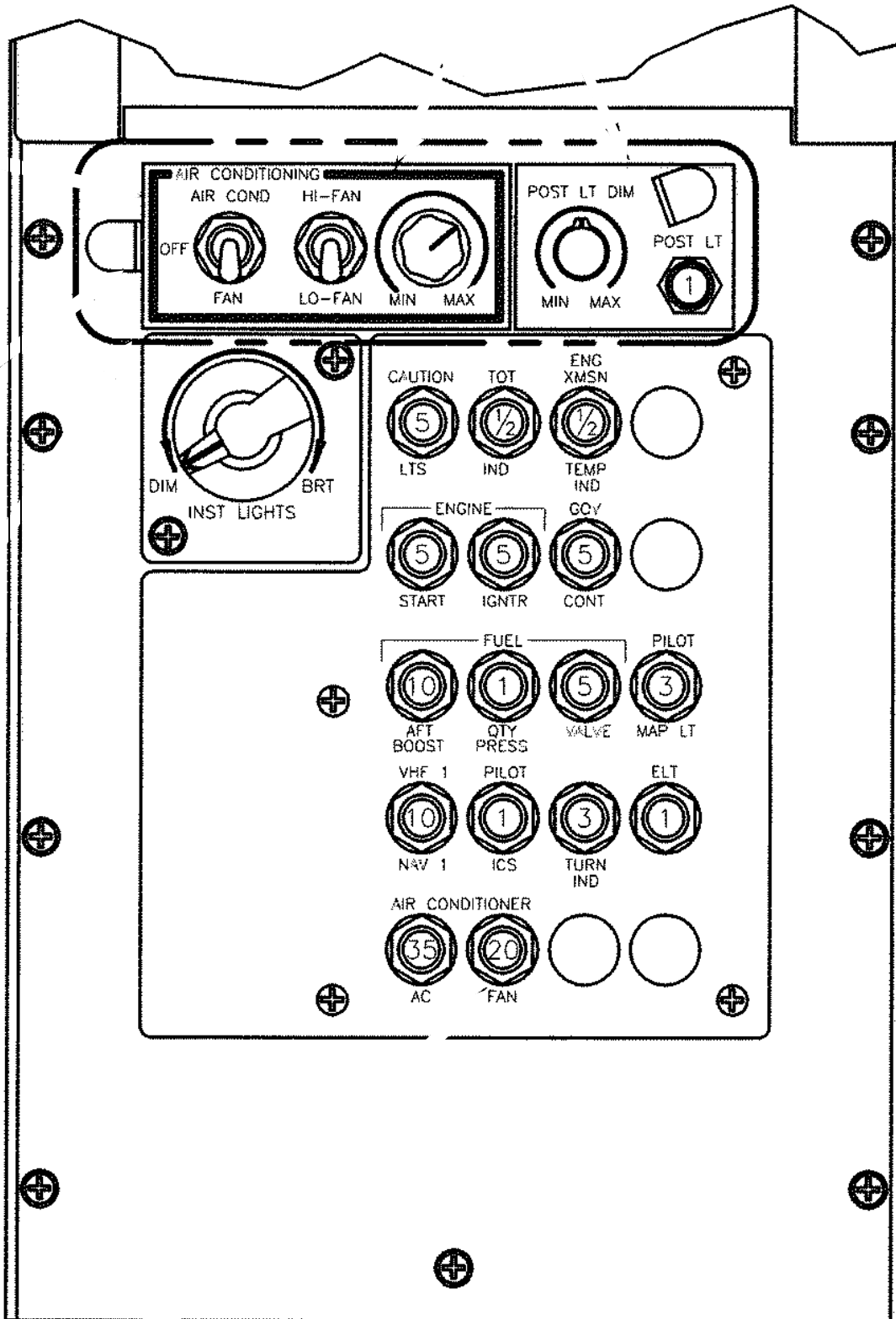


Figure 11: Cockpit Control Panel

9. Forward Evaporator Installation (view looking in from aircraft right)

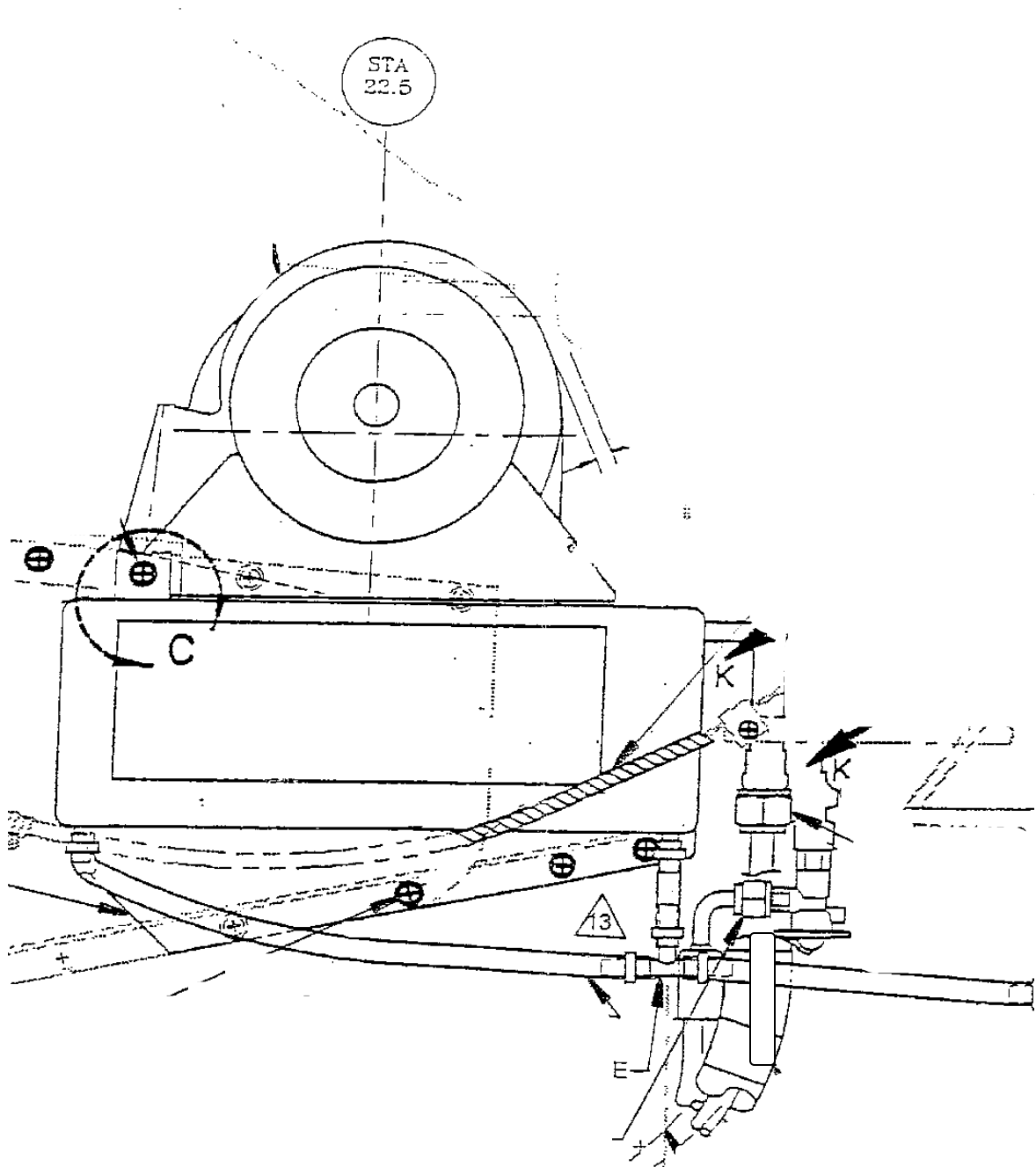


Figure 12: Forward Evaporator

10. Refrigerant Plumbing

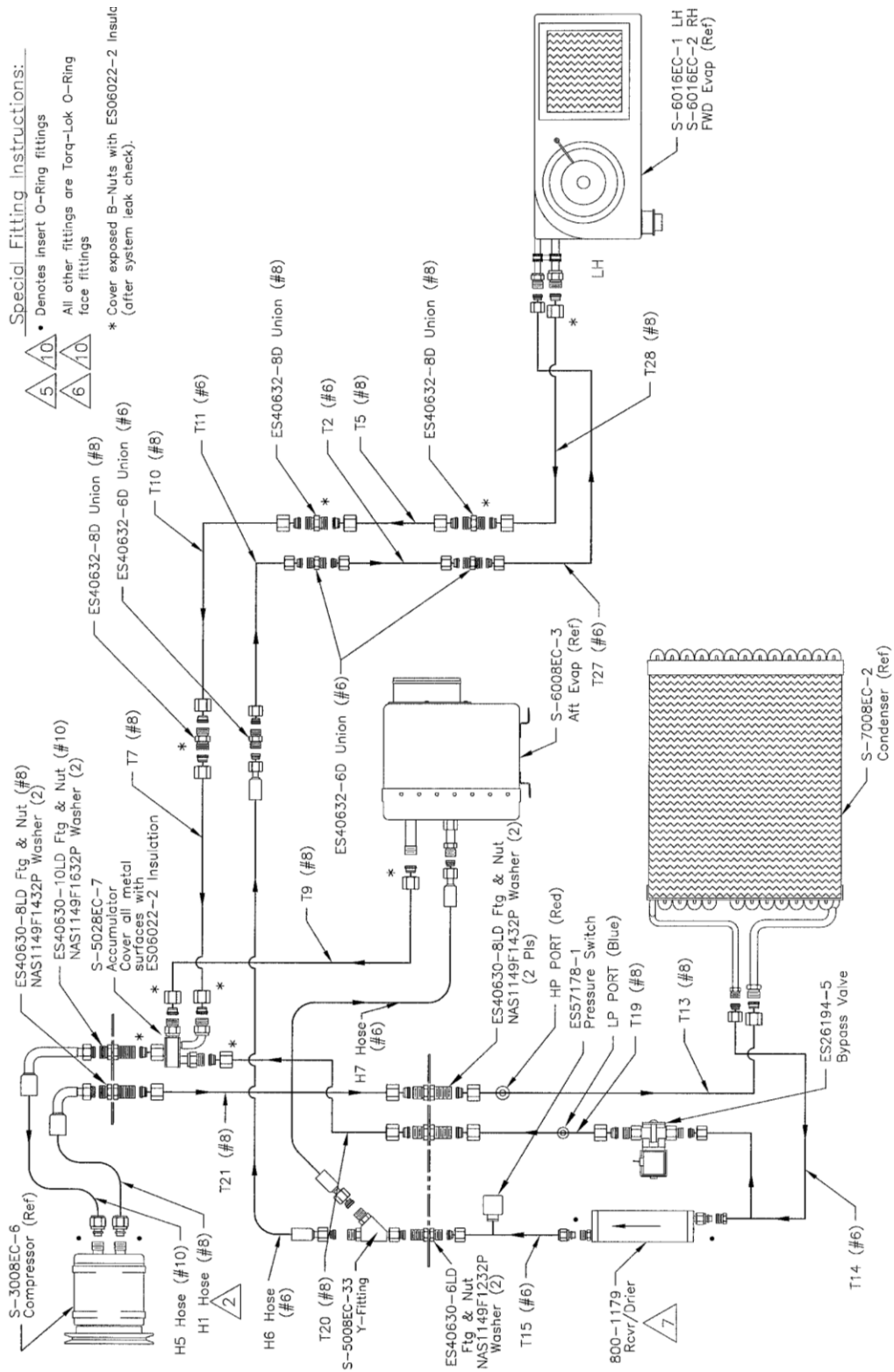
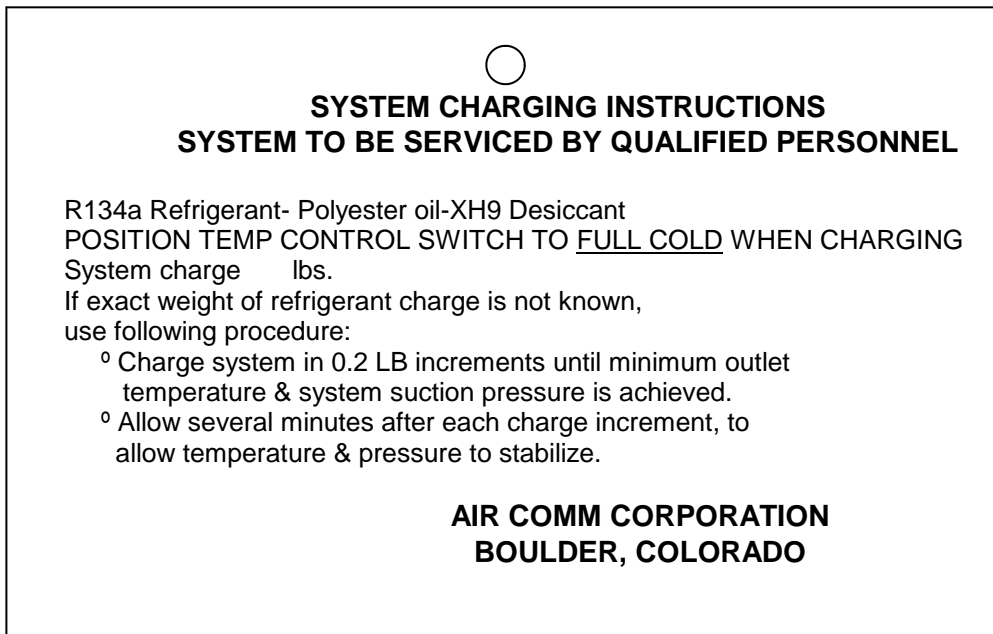


Figure13: Plumbing

CHAPTER 5 PLACARDS AND MARKINGS

1. PLACARD AND MARKING INFORMATION

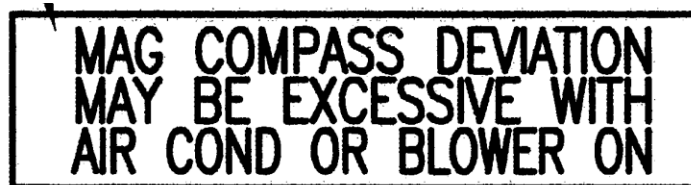
System Charging Instruction Placard
(Mounted adjacent to the air conditioner service ports on the R/H side of the baggage compartment, aft of the baggage compartment door).



NOTE

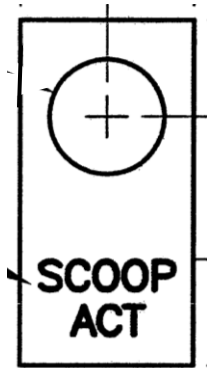
Newer systems do not include the "BOULDER, COLORADO" annotation on the System Charging Instructions Placard, and may refer to ULTRA PAG as well as POE oil.

Compass Deviation Placard (Located on top of compass support bracket)

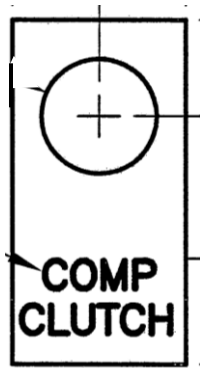


S-2500EC-4 Placard

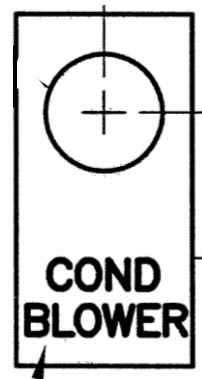
Circuit Breaker Placards (Located on the top panel of the baggage compartment)



S-2500EC-24 Placard



S-2500EC-25 Placard



S-2500EC-26 Placard

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, and 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 section.
- 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 Kg/Cm) 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.

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 2.6 lbs. (1.2 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	
206 (TH67) Air Conditioner Single Forward Evaporator	2.6 lbs.	1.2 kg.	8.0 fl. oz.	238 ml.

3. SYSTEM LEAK CHECK

Identification and elimination of system fitting leaks is extremely important to ensure 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 kg/cm) or R134a 50 psi (3.5 kg/cm) 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 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.

4. SUGGESTED EQUIPMENT FOR SERVICING

- A. Recovery / Recycling / Recharging Station
(Example: Snap-on Model ACT 3340, Robinair Model 34700, or equivalent).
- B. Electronic Leak Detector (R134a compatible)
(Example: Micro-Tech III, Robinair, Snap-on, or equivalent).
- C. Manifold and gauge set (R134a compatible)
(Example: Robinair, Snap-on, or equivalent).

5. CONSUMABLE MATERIALS

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

B. Lubricant

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.

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

C. 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-rings for the Insert fittings that are GREEN in color.

6. SUGGESTED SPARES LIST

<u>Item</u>	<u>Part Number</u>
Blower Motor – Fwd. Evaporator	ES61064-1
Blower Motor – Aft. Evaporator	ES61142-1
Blower Motor – Condenser	ES61136-1
Compressor Assembly	S-3008EC-6
Compressor Drive Belt	7255
Receiver / Drier Bottle	800-1179
Binary Switch	ES57178-1
By-pass Valve	ES26194-5
Condenser Blower replacement	ES73186-1
Relay – Temperature Control	W389CX-8
Relay – Compressor & Condenser	W389CX-13
HSN O-rings; Insert type (Green)	
<u>Size</u>	
#6 O-ring	AIR 440-840
#8 O-ring	AIR 440-841
#10 O-ring	AIR 440-842
HSN O-rings; TORQ LOK® (Black)	
#6 O-ring	2-012-N1173
#8 O-ring	2-014-N1173
#10 O-ring	2-016-N1173

Note: See Appendix B for Forward & Aft Evaporator Replacement information.

CHAPTER 7

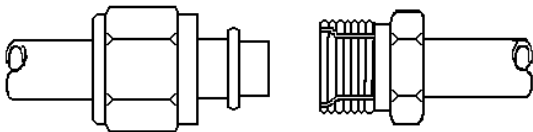
STANDARD PRACTICES INFORMATION

1. General Information

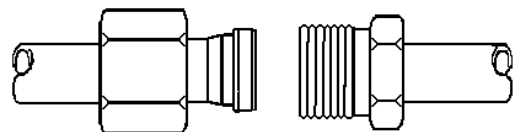
- a. Refer to Airbus Model AS350 Maintenance Manual for general removal and installation procedures associated with basic aircraft equipment and components.
- b. It may be necessary to evacuate (discharge) refrigerant from the system to remove or replace certain components. Instructions for servicing are found in Chapter 6.
- c. All openings and ports in components, hoses, and tubes disconnected or removed to facilitate removal and replacement procedures must be capped or plugged to prevent contamination.
- d. Retain all parts and attaching hardware for reassembly, unless otherwise noted.

2. Fitting Torque 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 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 without the O-ring being pinched.

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

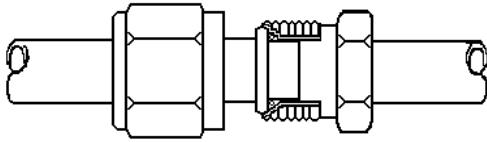
Tightening specifications

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

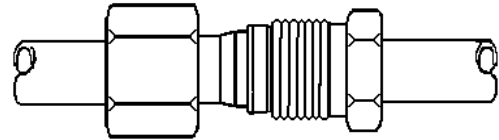
Insert O-Ring Fittings (regardless of size): Hand tighten, then turn an additional 60 deg. (one flat on the nut).

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.

(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.

3. 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 (13) thirteen AN525-10R12 Screws that attach the S-7060EC-2 Blower 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 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 be removed and replaced as required.

REPLACEMENT

- A. Locate the new blower assembly on the scoop frame. Torque the blower attaching bolts to 50 to 70 inch lbs (5.7-8.0 Nm) and safety using .032 safety wire.
- B. Reconnect the electrical connector(s). For kits prior to 2015 that use the Molex style connector refer to section 15 of this chapter for installation information.

- C. Reinstall the (13) thirteen AN525-10R12 Screws that secure the S-7060EC-2 Blower assembly to the lower contour of the belly panel.
- D. 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.

4. Removal, Replacement & Adjustment Of Compressor Drive Belt

REMOVAL

- A. It is necessary to access the engine compartment to remove, replace, or adjust the Compressor Drive Belt.
- B. Cut safety wire on the Compressor Belt Tensioning Link and the Belt Tensioning link Jam Nuts, and loosen the respective Jam Nut(s).
- C. Before attempting to adjust the drive belt tension, ensure that the compressor mounting / attaching bolts have been loosened, to allow free movement of the compressor body on the compressor mount.
- D. Remove the Compressor Drive Pulley in accordance with the instructions given in paragraph; Removal, Installation / Replacement of Compressor Drive Pulley of this manual.
- E. Adjust the Belt Tension Link to loosen the belt, and remove belt from the compressor & drive pulley.

REPLACEMENT

- A. Install the drive belt on the compressor & drive pulleys.
- B. Replace the Compressor Drive Pulley in accordance with the instructions given in paragraph 4. Removal, Installation / Replacement of Compressor Drive Pulley of this manual.
- C. Adjust belt tension (See Adjustment below).
- D. Tighten the Belt Tensioning Link Jam Nuts and re-safety using .032 safety wire.
- E. Re-torque the Compressor Mounting / Attaching bolts to 80 to 100 inch lbs. (9.04 – 11.30 Nm).

NOTE

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

ADJUSTMENT**NOTE**

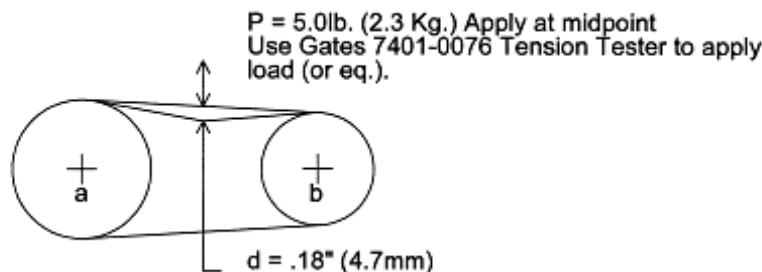
Proper belt tension is important to ensure a long belt service life and to avoid excessive loads on the compressor, and bearing assemblies.

- A. The correct belt tension for the 7255 belt is 52 lbs. (23.3 kg.) 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 .18" (4.7 mm) belt deflection when 5 lbs (2.3 kg.) of force is applied at the midpoint of the belt:

The proper belt tension is achieved using the following procedures:

**NOTE**

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

5. 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 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.

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.

- 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.

INSTALLATION / REPLACEMENT

- A. Locate the compressor on the mount. 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 fittings per the procedure in Section 2, pg 32.
- C. Re-install the belt tension link 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 35
- E. Service with R134a refrigerant per **Error! Reference source not found.** 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. Add ½ oz. to the total measured to account for unrecoverable oil in the old compressor. This total is what is needed in the new compressor. New compressors come from Air Comm charged with 8 oz. (240 cc) 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 for illustration:

Evacuating the system recovers 1.5 oz. of oil. Draining the old compressor recovered 2.0 oz. of oil. Adding 0.5 oz. of residual unrecoverable oil in the compressor gives 2.5 oz. The new receiver/drier requires an additional 1.5 oz., plus 1.5 oz. lost when the refrigerant was evacuated from the system. So the total oil needed in the replacement compressor for this case is $1.5 + 2.0 + .5 + 1.5 = 5.5$ oz. Since the new compressor comes with 8 oz. of oil, remove the oil fill plug and pour out 2.5 oz. of oil. Torque compressor oil fill cap to 132-216 in-lb.

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.

6. Removal, Installation / Replacement of Compressor Drive Pulley

REMOVAL

- A. See Removal, Replacement & Adjustment of Compressor Drive Belt (Page 34) prior to the removal of the air conditioner tailrotor driveshaft compressor drive pulley.

See Removal, Installation / Replacement of Compressor Assembly (Page 35) prior to the removal of the air conditioner tailrotor driveshaft compressor drive pulley.

- B. Remove the (4) four tailrotor driveshaft coupling retaining bolts forward of the compressor drive pulley installation.

CAUTION

Ensure that the driveshaft assembly is supported prior to the removal of the retaining bolts to prevent damage to the driveshaft, and the driveshaft coupling.

- C. Remove the two (2) AN174-6A Bolts that retain the S-3520EC-1 Drive Pulley to the driveshaft coupling assembly.
- D. Remove the four (4) remaining AN174-7A Bolts from each end of the Drive shaft assembly.
- E. Remove the driveshaft assembly from the aircraft, and remove the AN380-3-3 Cotter Key and AN320-6 Nut & S-3014EC-10 Plug from the S-3014EC-1 Bolt assembly. The S-3520EC-1 Drive Pulley can now be removed from the driveshaft assembly.

CAUTION

As the driveshaft will need to be held during the removal of the Compressor Drive Pulley, care should be taken not to damage the driveshaft, or other drive train components.

INSTALLATION / REPLACEMENT

- A. Install the Compressor Drive Pulley S-3520EC-1 on the Tail Rotor Driveshaft, Reinstall the S-3014EC-1 Bolt assy., S-3014EC-10 Plug and AN320-6 Nut, and torque to 40 – 60 inch lbs. Replace the AN380-3-3 Cotter Key.

CAUTION

As the driveshaft will need to be held during the installation of the Compressor Drive Pulley, care should be taken not to damage the driveshaft, or other drive train components.

NOTE

It will be necessary to reinstall the compressor drive belt prior to the re-assembly of the tailrotor driveshaft assembly.

- B. Reinstall the driveshaft assembly in the reverse order of its removal, torquing the attaching hardware 50 to 70 inch lbs.

7. 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 6 Servicing.

CAUTION

Refrigerant servicing should be performed by qualified personnel only!

- B. Disconnect the ducting that attaches the forward evaporator to the forward blower outlets.
- C. Disconnect the electrical connector (or splices) from the forward evaporator assembly.
- D. Disconnect drain line from bottom of evaporator housing.
- E. Disconnect refrigerant lines attaching to the expansion valve, and evaporator coil assembly.

CAUTION

Always use a backup wrench when removing or installing refrigerant line fittings.

NOTE

Cap all refrigerant lines to prevent possible contamination and refrigerant oil loss from the system.

- F. Remove (4) four AN525-10R8 Screws from the Evaporator Support Bracket and remove Evaporator assembly from aircraft.

INSTALLATION / REPLACEMENT

- A. Install the forward evaporator assembly in the reverse order of its removal. Torque the refrigerant line connections per the procedure on pg 32.

CAUTION

Always use a backup wrench when removing or installing refrigerant line fittings.

- B. Recharge the refrigerant per the servicing instructions in Chapter 6.

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.

8. Removal, Installation / Replacement Of Aft Evaporator Assembly

REMOVAL

- A. Remove the access panel on the roof of the baggage compartment.
- B. Cut the ty-wraps that connect the CAT Ducting between the Aft Evaporator Assembly, and the Aft Evaporator Blower Assembly.
- C. Disconnect the drain line from the bottom of the Aft Evaporator Assembly.
- D. 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.
- E. 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 backup wrench when removing or installing refrigerant line fittings.

- F. Disconnect the wiring to freeze switch, and Temperature Probes on the Aft Evaporator at the electrical connectors located on the Aft Evaporator Assembly.
- G. Remove MS27039-1-06 Screws, MS21042L3 Nuts (4 Pls.), and NAS1149F0332P Washers (8 Pls.), that penetrate the baggage compartment roof into the bottom of the Aft Evaporator Assembly, and remove the Evaporator from the aircraft.

INSTALLATION / REPLACEMENT

- A. Reinstall the evaporator and mounting hardware.
- B. Reconnect air inlet and outlet ducts to evaporator.
- C. Reconnect electrical connectors.
- D. Reconnect suction and pressure hoses to evaporator.
- E. Recharge the refrigerant per the service instructions in Chapter 6.

CAUTION

Refrigerant servicing should be performed by qualified personnel only!

CAUTION

Always use a backup wrench when removing or installing refrigerant line fittings.

9. Removal, Installation / Replacement of Condenser Assembly

REMOVAL

- A. It is necessary to remove the Condenser Scoop Assembly S-7060EC-2 prior to removing the Condenser Assembly. See Page 48 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!

CAUTION

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

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.

- C. Remove the aft baggage compartment closeout panel, to access the refrigerant plumbing.
- D. Disconnect the Condenser Assembly from the refrigerant lines that attach to the condenser assembly.

CAUTION

Always use a backup wrench when removing or installing refrigerant line fittings.

- E. Remove the Seven AN525-10R12 Screws that attach the Condenser to the belly of the aircraft, and remove the Condenser Assembly by sliding it forward and out through the opening provide by the removal of the Condenser Scoop Assembly.

INSTALLATION / REPLACEMENT

- A. Locate the condenser assembly in its mounting location. Torque all attaching hardware to 50 – 70 inch lbs (5.7-8.0 Nm), and replace all O-rings.
- B. Attach the refrigerant lines and torque per the procedure on pg 32.
- C. Recharge the refrigerant per the servicing instructions in Chapter 6.

CAUTION

Refrigerant servicing should be performed by qualified personnel only!

CAUTION

Always use a backup wrench when removing or installing refrigerant line fittings.

NOTE

There should be no air leakage other than inlet and outlet, Seal all other openings, including those around the Condenser Refrigerant tubes

10. Removal, Installation / Replacement Of Receiver Drier Bottle

REMOVAL

- A. Remove the aft baggage compartment closeout panel, to access refrigerant plumbing.
- 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 backup 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.

INSTALLATION / REPLACEMENT

- A. Locate the receiver drier bottle in the holding clamp. Using new o-rings secure the refrigerant lines to the bottle. Torque the fittings per the procedure on pg 32.
- B. Tighten the holding clamp.

NOTE

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

- C. Recharge the refrigerant per the servicing instructions in Chapter 6 Servicing.

CAUTION

Refrigerant servicing should be performed by qualified personnel only!

CAUTION

Always use a backup wrench when removing or installing refrigerant line fittings.

11. Removal, Installation / Replacement Of Binary Switch

REMOVAL

- A. Remove the aft baggage compartment closeout panel, to access refrigerant plumbing.
- B. Disconnect electrical connectors from bottom of binary switch.
- C. Unscrew switch from Schrader valve located on outlet tube from the receiver drier bottle.
- D. 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.

NOTE

Not necessary to discharge system.

INSTALLATION / REPLACEMENT

- A. Place switch as appropriate and install screw in Schrader valve located on outlet tube from receiver drier bottle.
- B. Reconnect electrical connectors on bottom of binary switch.
- C. Install aft baggage compartment closeout panel.

12. Removal, Installation/ Replacement of By-Pass Valve Assembly

REMOVAL

- A. Remove the aft baggage compartment closeout panel, to access refrigerant plumbing.
- 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 safety wire and mounting screws that attach the valve coil assembly to the support bracket.
- 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 backup wrench when removing or installing refrigerant line fittings.

- F. Remove the by-pass valve.

INSTALLATION / REPLACEMENT

- A. Place by-pass valve in appropriate location.
- B. Reconnect the refrigerant lines to both sides of the bypass valve assembly and replace all O-rings. See pg 32 for fitting torqueing procedure.
- C. Reconnect the electrical connectors to the by-pass valve assembly.
- D. Install the safety wire and mounting screws that attach the valve coil assembly to the support bracket.
- E. Recharge the refrigerant per the servicing instructions on Page 27, steps A through I.

CAUTION

Refrigerant servicing should be performed by qualified personnel only!

- F. Reinstall the aft baggage compartment closeout panel.

13. Removal, Installation / Replacement of Aft Evaporator Blower

REMOVAL

CAUTION

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

- A. Remove the access panel on the roof of the baggage compartment.
- B. Remove the four MS27039-1-6 Screws, and four NAS1149F0332P Washers that attach the blower motor to the top of the baggage compartment ceiling.
- C. Remove CAT ducting from the inlet, and outlet adapters on the Aft Evaporator Blower Assembly.
- D. Disconnect electrical connection to the Aft Evaporator Blower Assembly.
- E. Remove Blower Assembly from aircraft.

INSTALLATION / REPLACEMENT

- A. Place blower assembly in appropriate location.
- B. Reconnect electrical connections to the Aft Evaporator Assembly.
- C. Secure the CAT ducting to the inlet, and outlet adapters on the Aft Evaporator Blower Assembly using two 78F509 Tywraps, and one CT11B Tywrap.
- D. Install four MS27039-1-6 screws and four NAS 1149F0332P washers that attach the blower motor to the top of the baggage compartment ceiling.
- E. Install the access panel on the roof of the baggage compartment.

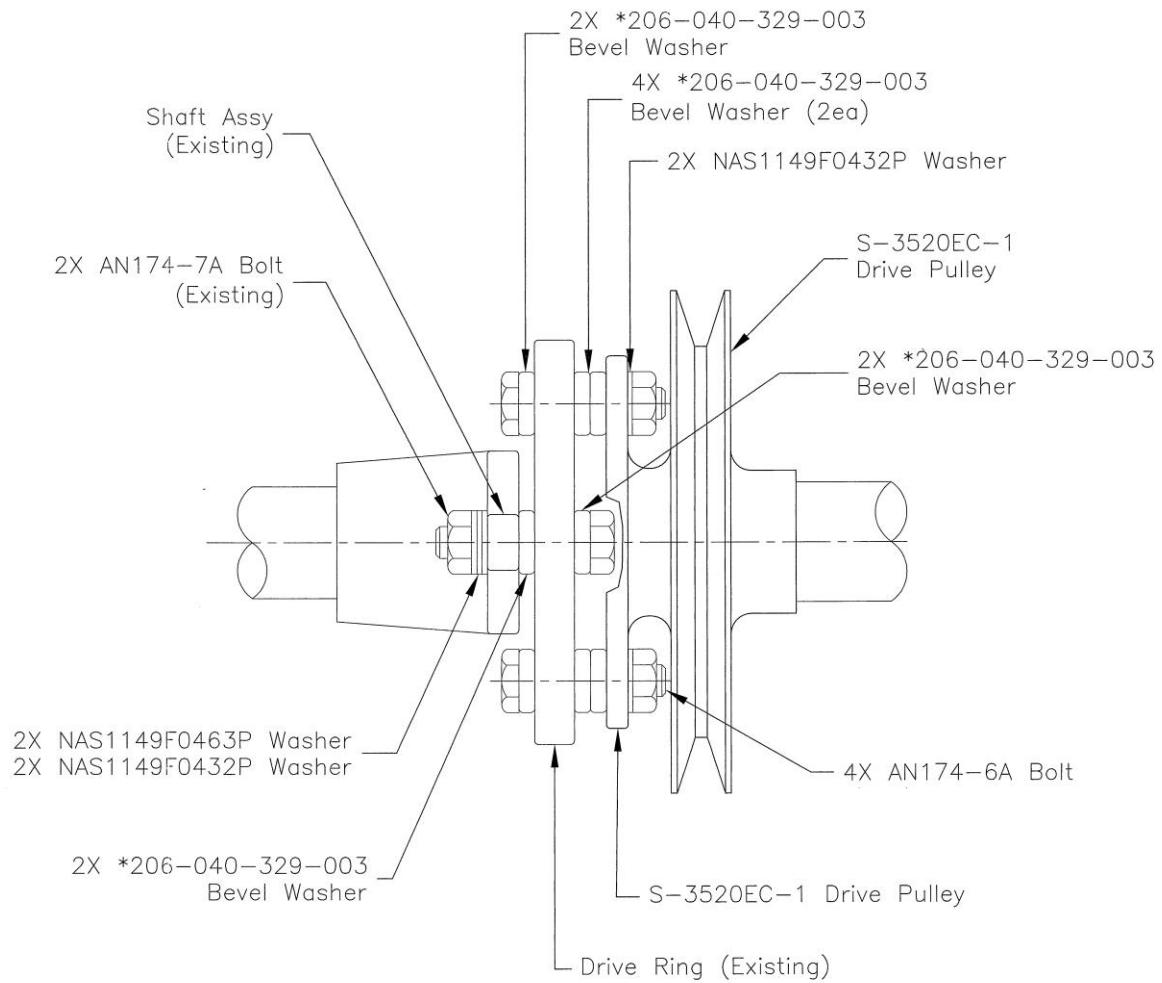


Figure 3: Compressor Drive Pulley Installation (Washer Stack-up detail) – looking inboard from Aircraft Left

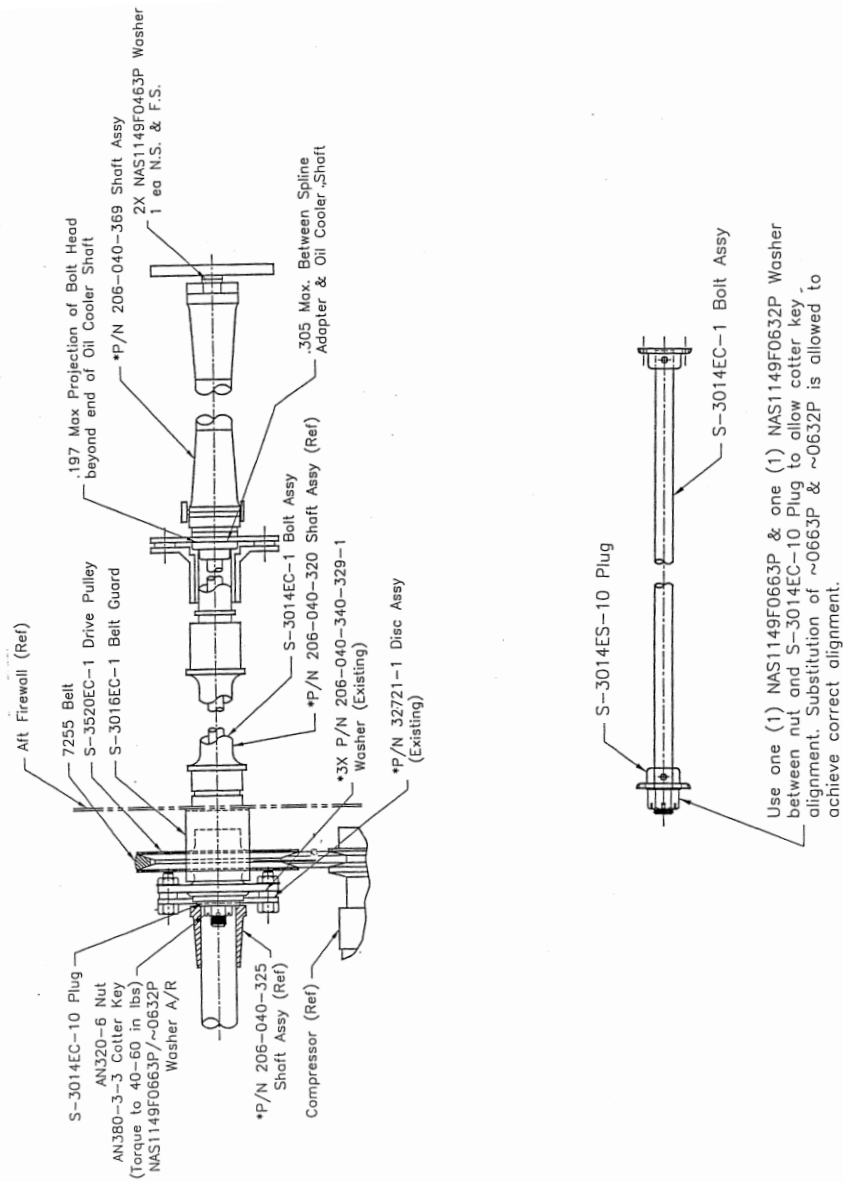


Figure 4: Compressor Drive Pulley Installation

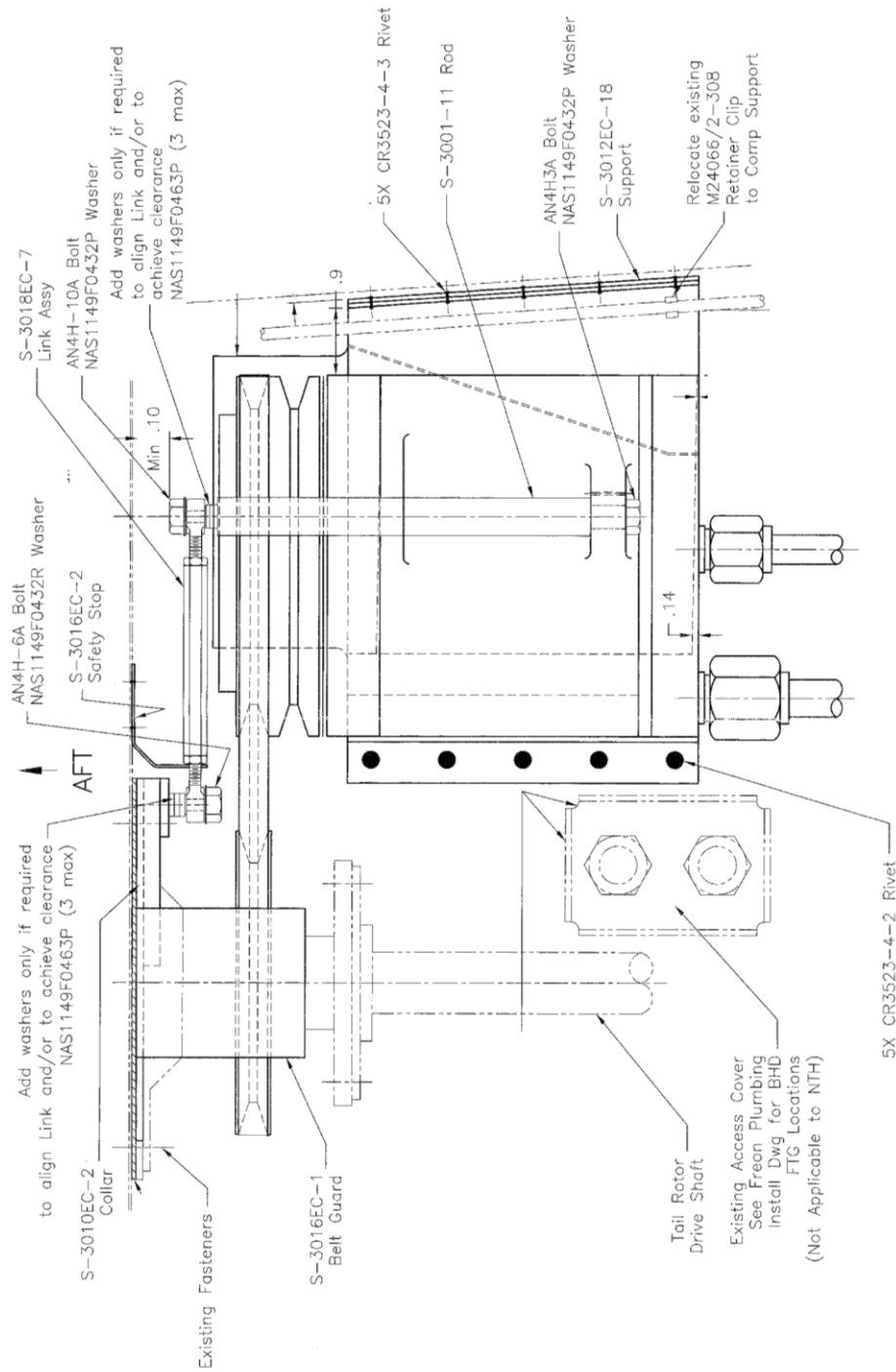


Figure 5: Driveshaft and Compressor Installation – View Looking Down

14. Removal, Installation / Replacement Of The Condenser Scoop Assembly

REMOVAL

CAUTION

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

- A. Remove the (13) AN525-10R12 Screws that attach the S-7060EC-2 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 (6) AN525-10R6 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 S-7060EC-2 Condenser Scoop Assembly from the aircraft.

INSTALLATION / REPLACEMENT

- A. Place the condenser scoop assembly in the appropriate location and support it until completely installed.
- B. Connect Molex connector that attaches the power wires from the condenser scoop assembly to the aircraft wiring.
- C. Install the 6 AN525-10R6 screws that attach the forward hinge support plate to the aircraft belly panel.
- D. Install the 13 AN525-10R12 screws that attach the S-7060EC-2 condenser scoop assembly to the lower contour of the belly panel.
- E. Reconnect the battery and/or external power.

NOTE

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.

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.

15. 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 for kits prior to 2015 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.

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 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 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 (bypassing refrigerant) the valve will need replacement, as shown in chapter 6. 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 6.
	g. Condenser Scoop Door & Scoop Door Actuator	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 6.
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.

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).

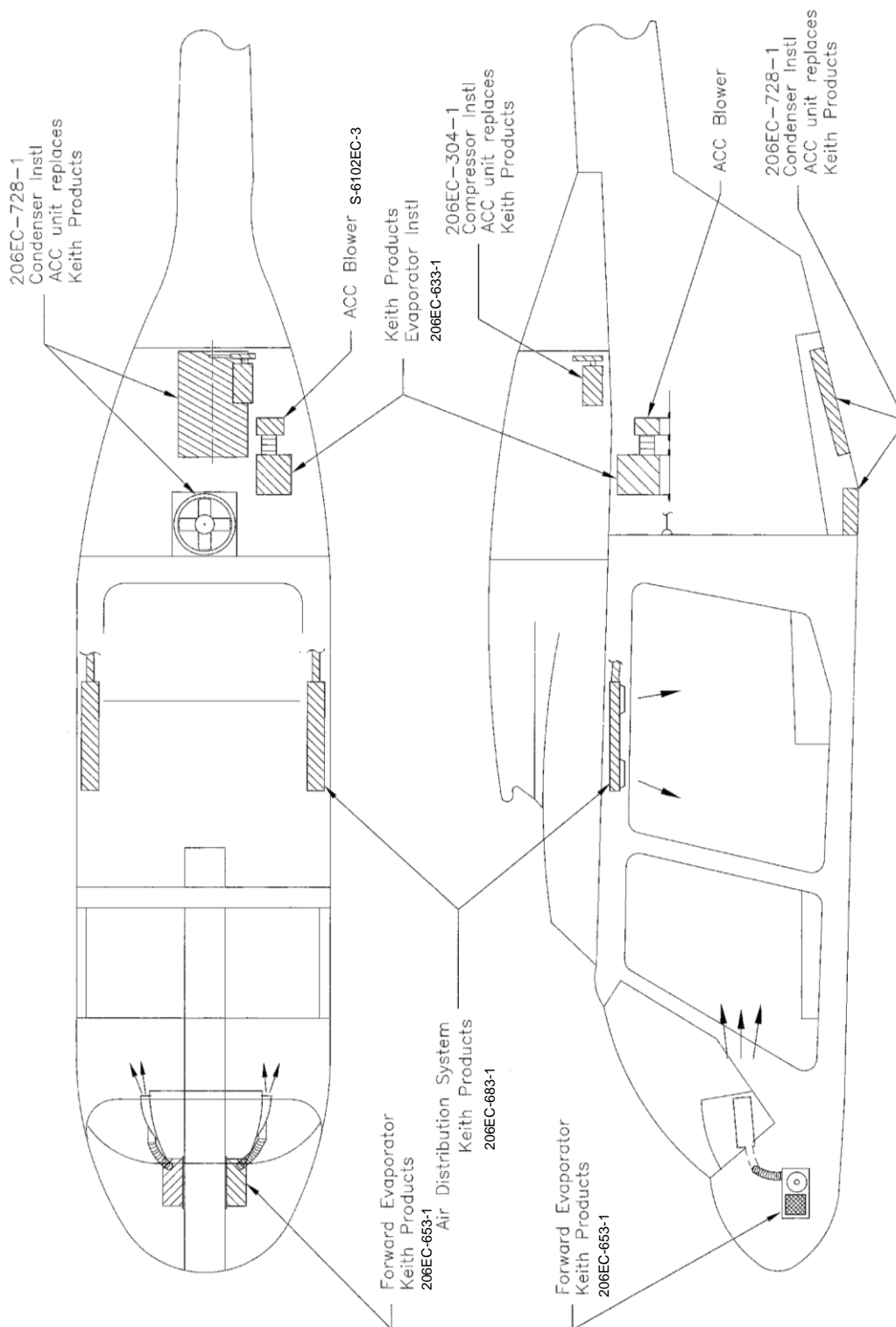
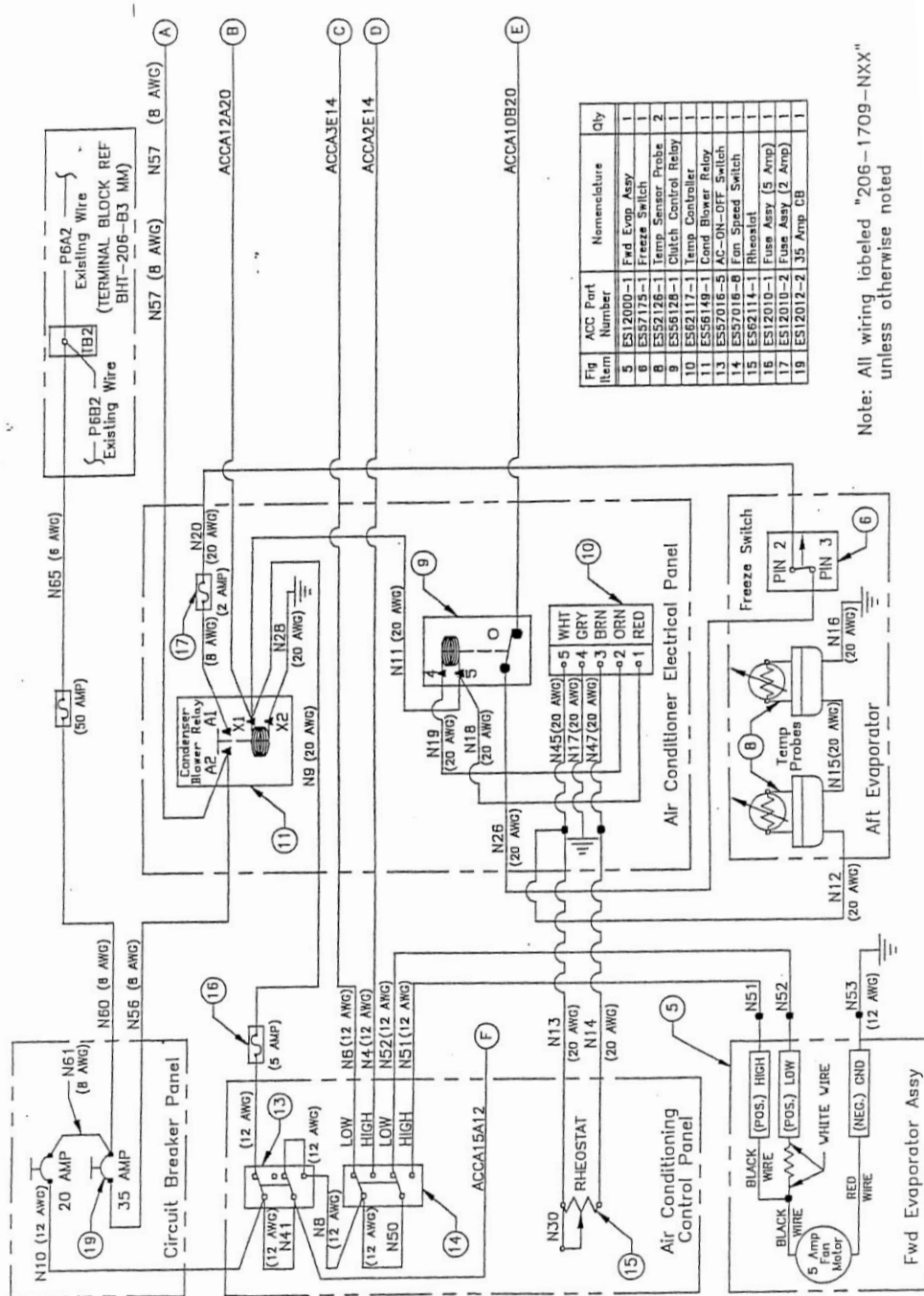


Figure 6: General Arrangement – Air Conditioning System Installation.



Note: All wiring labeled "206-1709-NXX" unless otherwise noted

Figure 7: Air Conditioning System Electrical Schematic (-1 VFR Installation)

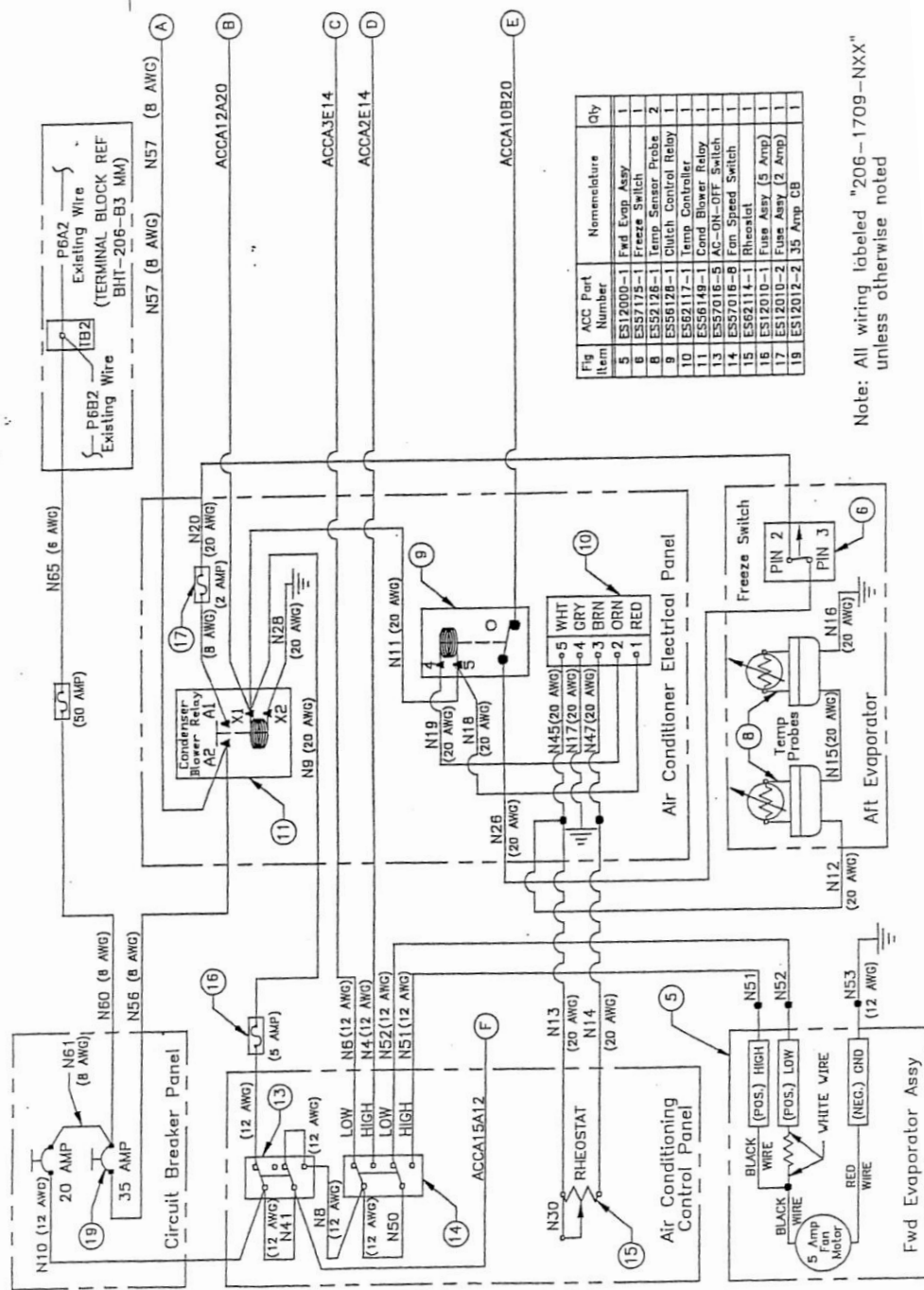
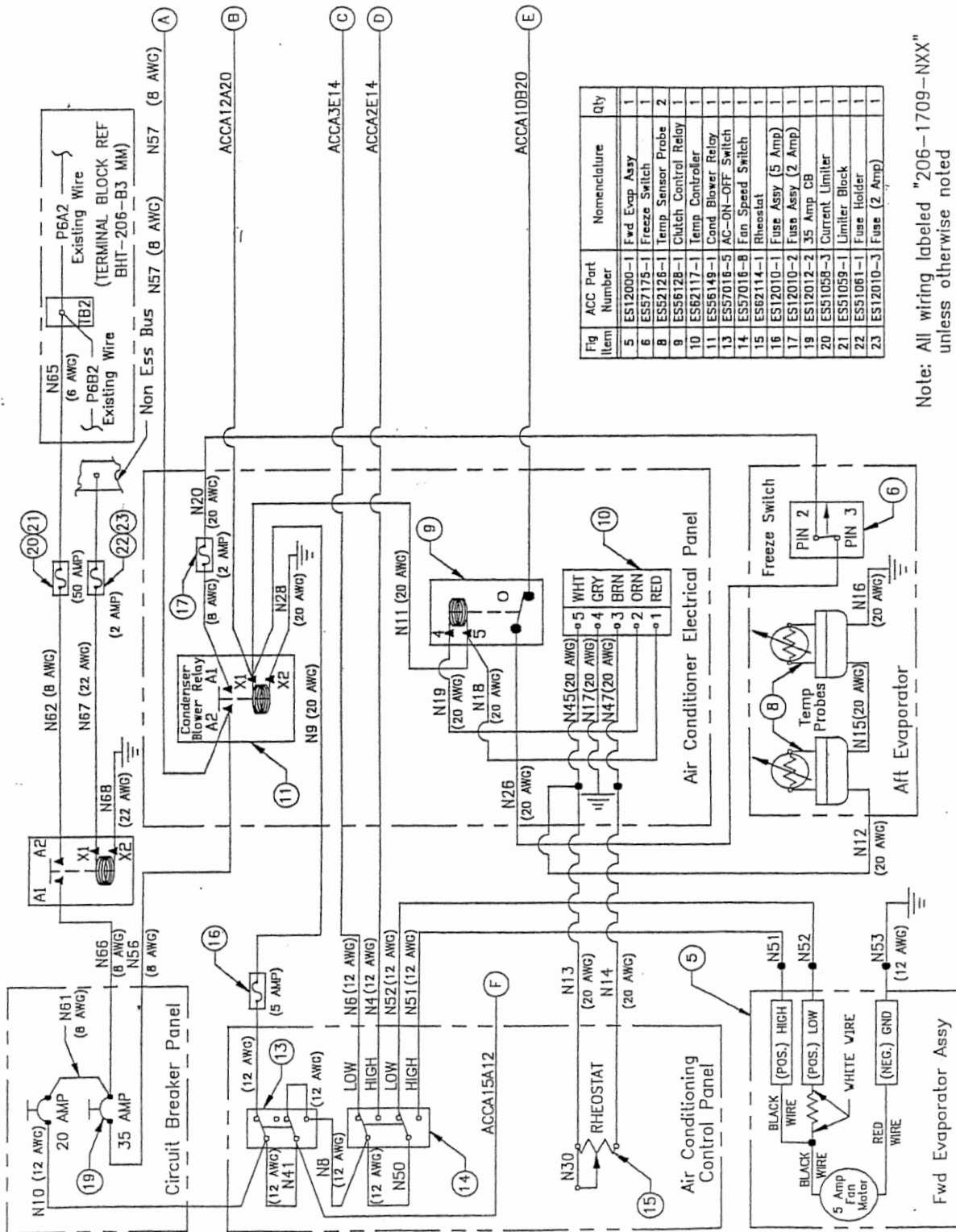


Figure 8: Air Conditioning System Electrical Schematic (-1 VFR Installation Continued)



Note: All wiring labeled "206-1709-XXX" unless otherwise noted

Figure 9: Air Conditioning System Electrical Schematic (-1 IFR Installation)

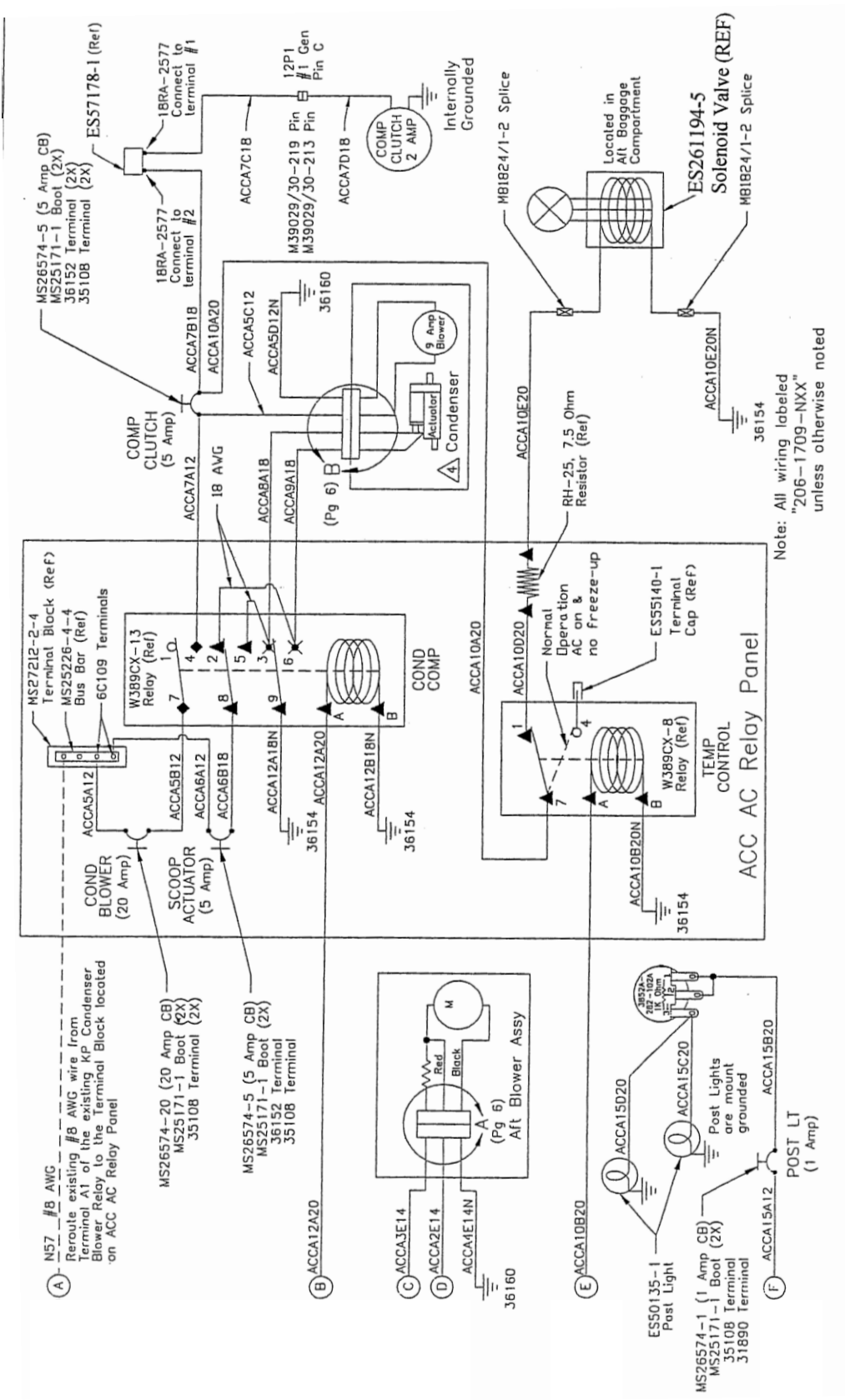


Figure 10: Air Conditioning System Electrical Schematic (-1 IFR Installation Continued)

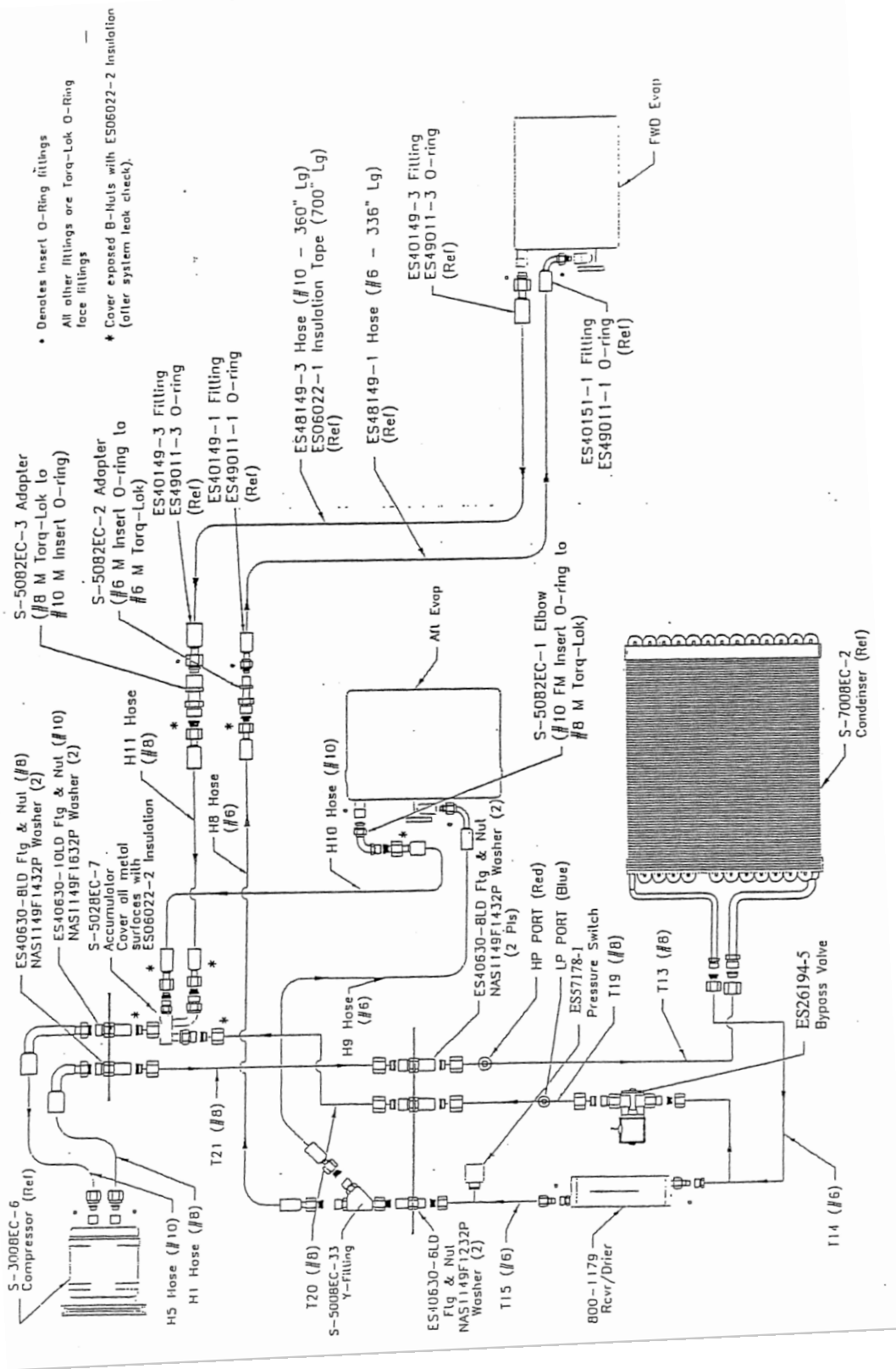


Figure 11: Refrigerant Plumbing Schematic

APPENDIX A**Weight and Balance Information**

Weight breakdown – Bell 206 A/ B (TH67) Air Conditioner System:

Item	Wt. (lbs)	Arm (in)	M (in-lb.)
Total 206-203 with Single Forward Evaporator	89.41	128.8	11514

APPENDIX B

**Service Kits
For the replacement of the
Forward & Aft Evaporator Assemblies**

Service Kit: (see Service kits, SK206EC-653-10, SK206EC-653-11, and SK206EC-633-2)