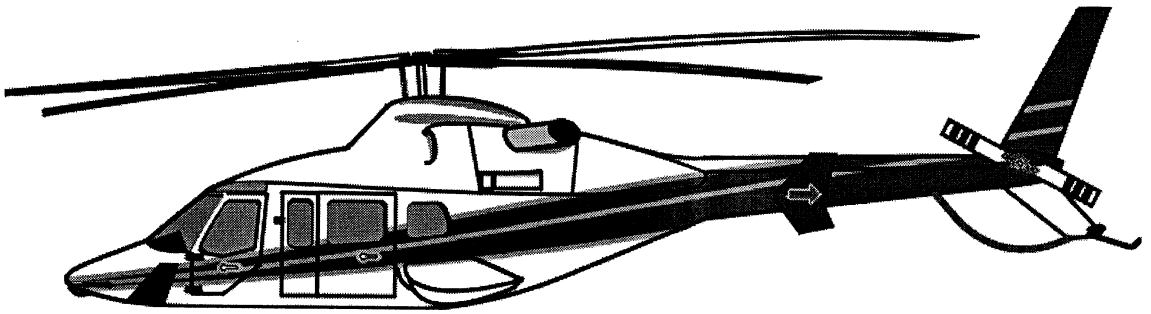
AIR CONDITIONER SERVICE MANUAL 430AC-202M

AIR COMM CORPORATION
3300 AIRPORT ROAD
BOULDER, CO. 80301

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS
BELL HELICOPTER 430
AIR CONDITIONING SYSTEM



Revision 0

10 May, 2000

RECORD OF REVISIONS

Revision Number	Issue Date	Affected Page(s)	Date Inserted	By
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LIST OF EFFECTIVE PAGES

LIST OF REVISIONS

Revision 0 (Original Issue).....May 10, 2000
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LIST OF EFFECTIVE PAGES

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These Instructions for Continued Airworthiness (ICA), except for the Airworthiness Limitation Section, have been reviewed and found to comply with the applicable requirements of Appendix A to the Federal Aviation Regulations Part 29

FAA Acceptance _____ Date 08 FEB. '01

Fort Worth Aircraft Evaluation Group

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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 for the Air Comm Corporation air conditioning system installed in the Bell 430 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 430 that are equipped with the Air Comm Corporation kit number 430AC-202 air conditioner system.

5. DEFINITIONS

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

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

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

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.

(continued)

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.

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.

Chapter 0
INTRODUCTION (continued)

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 430 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 SH5225NM

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.

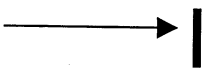
In addition to the revision of the manual, those changes categorized as "Safety of Flight" shall have a Service Bulletin issued to the operator providing the necessary information to comply with, and or to correct, the "Safety of Flight" issue.

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

Air Comm Corporation Service Department
3300 Airport Road
Boulder, CO.80301
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 one forward mounted evaporator (cockpit), one aft mounted evaporator assembly (containing two heat exchangers and two blowers) (main cabin), one condenser, and a compressor driven by the tail rotor drive shaft output quill. These components combine to provide "conditioned air" through the existing air distribution system when the engines are operating during both ground and flight operations.

(Continued)

Chapter 0
INTORDUCTION (continued)

13. AIR CONDITIONER FEATURES (continued)

This system can be operated in either the Air Condition (A/C), or Blower mode.

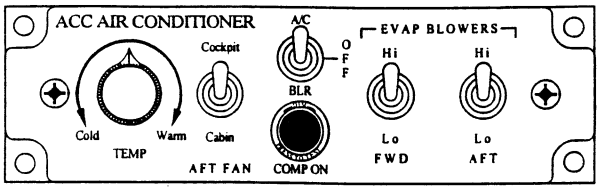
In the A/C mode, conditioned air is provided by the forward and aft evaporators to the cockpit and main cabin areas respectively.

In the Blower mode, the evaporator blowers are used to circulate cabin air, while the compressor clutch remains disengaged.

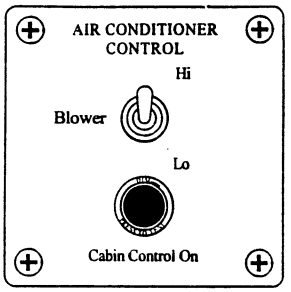
When using the cabin heater it is acceptable to operate the air conditioner if desired, to defog the cabin windows.

The air conditioning system is connected electrically to the aircraft's DC bus 1 & 2 . Should either engine fail a load shedding relay will be activated, and the air conditioner will drop off line. The load shedding relay, which is a part of the existing model 430 aircraft electrical system, and is connected to the air conditioner system at X1 of the interconnect inhibit relay. This relay is located adjacent to the ground power plug door.

The control panel for the air conditioner system is located on the center pedestal between the pilot's and co-pilot's seats. This panel consists of a temperature control knob, annunciator light (which shows on when the system is operating), the A/C & Blower switch, two switches, for the control of the Fwd & Aft evaporator blower fan speeds, and a switch to shift blower speed control to the main cabin if desired. The main cabin control panel is located just aft of the left hand main cabin door post, and operates the blower speed control for the main cabin when the pilot's control switch is in the cabin position.



COCKPIT A/C CONTROL PANEL



CABIN 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 of blower modes.

The compressor is mounted to the lower surface of the main rotor transmission. It is driven by a V-belt and a pulley which is mounted to the tail rotor transmission output quill. Access to the compressor is provided by an access panel in the headliner, and the main rotor transmission drain pan.

Airflow through the condenser heat exchanger is provided by two (2) seven inch diameter 28 volt DC high performance vane axial blowers. The airflow is provided through two cutouts in the airframe located below the baggage compartment.

The aft evaporator is equipped with a thermister & electronic temperature control unit. The thermister probe is located in the core of the evaporator heat exchanger. This unit performs two functions; 1. It acts to prevent coil freeze-up by limiting the minimum coil temperature to 32° F (0° C), and 2. It acts as a cabin air temperature control system, by controlling the bypass of refrigerant through the evaporator coil in response to adjustment of the temperature control knob. (Continued)

Chapter 0
INTRODUCTION (continued)

13. AIR CONDITIONER FEATURES (continued)

The refrigerant plumbing for this system installation incorporates two different types of 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 6-1 for torquing procedures).

2. TORQ-LOK O-RING FITTINGS: These fittings feature a face type O-ring seal. These fittings are much easier to assemble than the insert type. Again, care should be taken when assembling these fittings not to damage the O-ring. The Torq-Lok O-ring hose and tube fittings are identified by a green band adjacent to the fitting. The band color corresponds to the O-ring to be installed at that location. The green O-rings must not be used on these fittings. (See page 6-2 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 30 psig (2.1 kgcm)
Cut-in at 50 psig (3.5 kgcm)

High Pressure Function:
Cut-out at 335 psig (23.55 kgcm)
Cut-in at 280 psig (19.68 kgcm)

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 ejects 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 know 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.

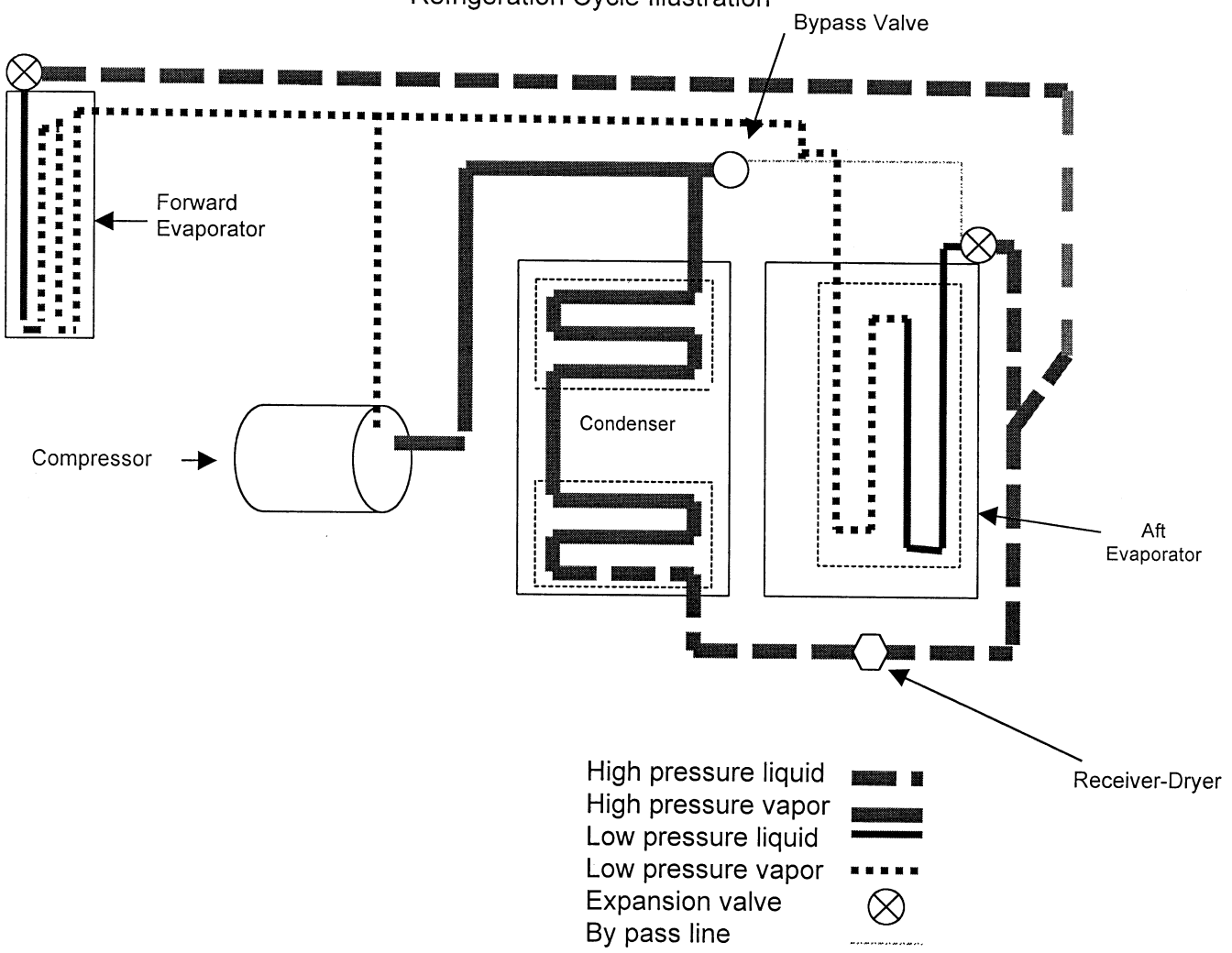
(Continued)

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 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.

Refrigeration Cycle Illustration



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CHAPTER 1
AIRWORTHINESS LIMITATION SECTION

1. Airworthiness Limitations

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CHAPTER 2
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 & Aft Evaporator Vane Axial Blower Motor & Fan Assembly. 222AC-7062-1 & ES73130-1	X		X	Check for operation and security. See Overhaul / Replacement Schedule below
Forward & Aft Evaporator Blower motor ES61060-2	X		X	Check for operation in Hi and Lo settings
Condenser Assembly. Mounting & Housing 222AC-7050-1 & -2	X		X	Check for blockage of heat exchanger fins, operation, and security
Compressor Drive Belt for Tension & Wear 7350	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. 222AC-3508-1	X	X	X	Check for operation, security of attaching hardware, and signs of oil or refrigerant leaks.
Compressor Mount 222AC-3502-1	X		X	Check mount for cracks, and security of the attaching hard -ware. Check torque of mounting nuts every 100 hrs. 100-140 inch lbs. (11.5 – 16.1 Nm)
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 222AC-3500-2	X		X	Check for security of attaching hardware. Check torque every 100 hrs. Torque to 250-290 inch lbs. (28.8 – 33.4 Nm)

2. COMPONENT OVERHAUL / REPLACEMENT SCHEDULE

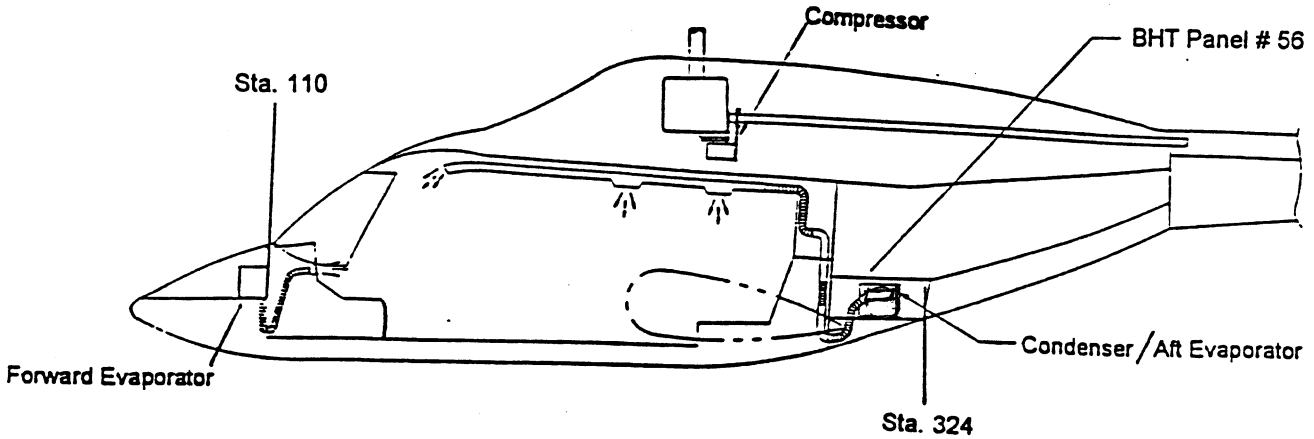
Description	Part Number	Overhaul / Replacement Hours
Condenser & Aft Evaporator Vane Axial Blower Motor & Fan replacement	222AC-7062-1 (Condenser) ES73130-1 (Aft Evaporator)	The blower manufacturer recommends TBO is 500 hrs. At the discretion of the operator it is acceptable to operate the blower until failure. A blower failure will result in a reduction in cooling, but no safety of flight issues are involved.

CHAPTER 3
LOCATION AND ACCESS

1. LOCATION OF AIR CONDITIONER FEATURES

Nomenclature	Description of Location
Air Conditioner Circuit Breaker & Relay Panel	Located forward of Sta. 324 bulkhead on the upper L/H baggage compartment wall. (see Fig. 3-1)
Air Conditioner Control Panel	The air conditioner control panel is located in the center pedestal.
Main Cabin Air Conditioner Control Panel	Is located just aft of the L/H main cabin door post.
Forward (Cockpit) Evaporator	The forward evaporator is mounted in the nose compartment, on the Sta. 110 bulkhead (Access to this component is gained by opening the nose fairing BHT #18).
Forward Evaporator Blower Assemblies	The forward evaporator blower assemblies are located in the nose compartment, on the Sta. 110 bulkhead (Access to this component is gained by opening the nose fairing BHT #18).
Aft (Main Cabin) Evaporator	Is located under the flooring in the baggage compartment. (It is necessary to remove the BHT #56 baggage floor panel to access this component).
Condenser Assembly	The condenser is located under the flooring in the baggage compartment. (It is necessary to remove the BHT #56 baggage floor panel to access this component).
Compressor	The compressor is mounted to the lower surface of the main rotor transmission housing below the tail rotor driveshaft output quill. (It is necessary to remove the aft section of the cabin headliner, and the transmission drain pan to access the compressor assembly).
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 one or all of these panels 18,36,37 & 56).
Servicing Ports	The Service Ports for this system are located in the upper aft right-hand corner of the baggage compartment.

Fig. 3-1 Layout of Bell 430 Air Conditioning System



SIDE VIEW

2. LAYOUT OF AIR CONDITIONER SYSTEM (CONTINUED).

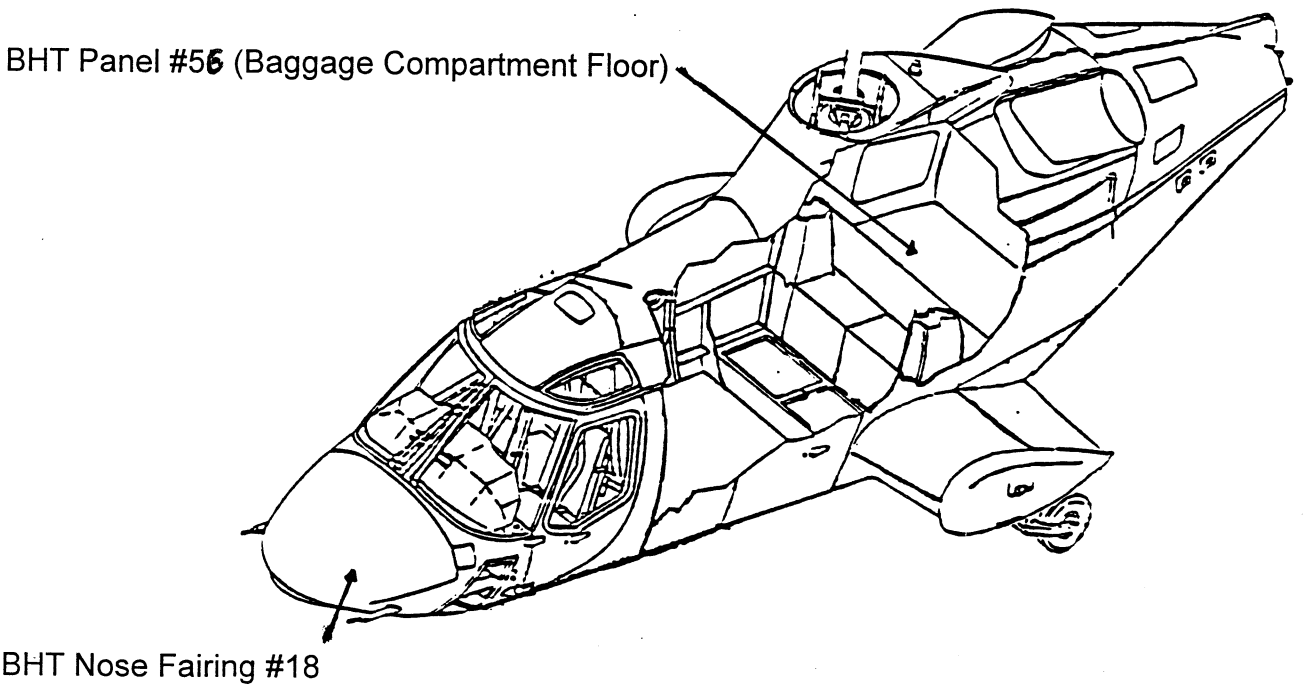
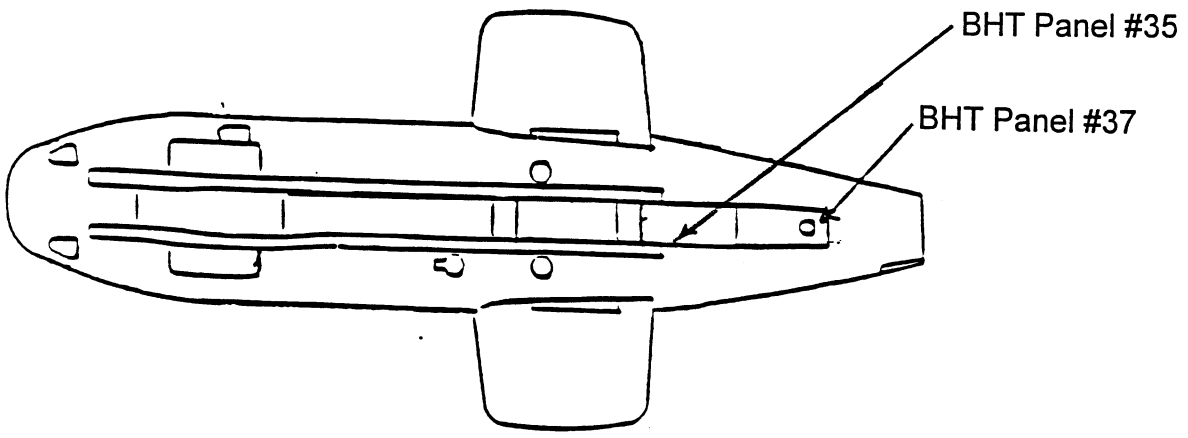


Fig. 3-2 Isometric View - Model 430 Fuselage



View Looking Up

Fig. 3-3 Plan View Showing Model 430 Panel Numbers

CHAPTER 4
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).

SYSTEM CHARGING INSTRUCTIONS
SYSTEM TO BE SERVICED BY QUALIFIED PERSONNEL

R134a Refrigerant- Polyester oil-XH9 Desiccant
POSITION TEMP CONTROL SWITCH TO FULL COLD WHEN CHARGING
System charge 5.13 lbs. (143.6 Grams)

If exact weight of refrigerant charge is not known,
use following procedure:
- Charge system in 0.2 lb (.09 Kg.) increments until minimum outlet temperature & system suction pressure is achieved.
- Allow several minutes after each charge increment, to allow temperature & pressure to stabilize.

AIR COMM CORPORATION
BOULDER, COLORADO

Compressor Placard
(Mounted on top of the compressor body)

ACC AIR COMM CORPORATION
Boulder Colorado 80301
222AC-3508-1 Compressor

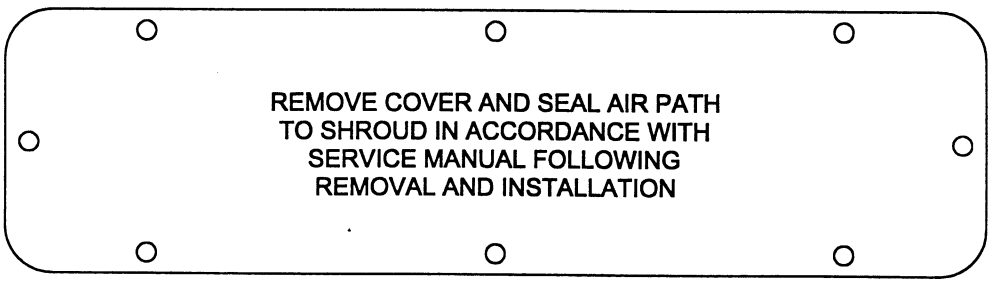
See Service Manual for Maintenance Instructions

Baggage Floor Weight Placard
(Located on lower R/H side of Baggage Compartment Door)

MAXIMUM ALLOWABLE WEIGHT 450 US LBS = 204.1 KGS

CHAPTER 4
PLACARDS AND MARKINGS (Continued)

222AC-6088-22 Panel is located one on each side of the 222AC-6088-1 Return Air Shroud located on the forward side of the baggage compartment, and Aft of the Auxiliary Fuel Tank.



222AC-6088-22 Panel Assembly

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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.

(Continued)

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 5.13 lbs. (143.6 grams) 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 3.5 lbs (1.6 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	
430 Air Conditioner	5.13 lbs.	143.6 grams	11.5 floz.	340 ml.

3. LUBRICATION INFORMATION

The total system oil charge is 11.5 floz. (340 ml.) of R134a Polyester Refrigerant Oil. The compressor is charged with 3.5 floz (103 ml.) of oil at the factory, an additional 8.0 floz. (237 ml.) of oil must be added at the time of the system installation. This oil should be added to the compressor discharge line prior to system charging.

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.

(Continued)

Chapter 5
SERVICING (continued)

3. LUBRICATION INFORMATION (continued)

The oil charge is continuously circulated by the refrigerant during the operation of the system. A quantity of oil is trapped by the compressor.

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.

Warning

This system is serviced with Polyester Based Refrigerant Oil. The use of Polyalkylene glycol (PAG), or Mineral Oil 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).

(Continued)

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 two different O-ring fittings, Tork-Lok and Insert. The HSN O-rings for the Tork-lok fittings are BLACK in color, and the HSN O-ring for the Insert fittings are GREEN in color.

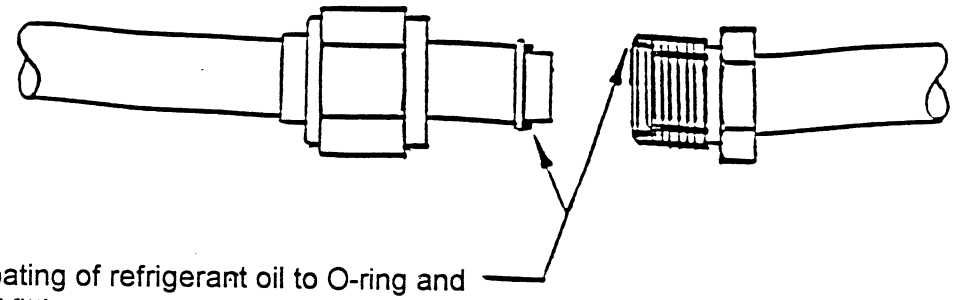
7. SUGGESTED SPARES LIST

Item	Part Number
Blower Motor – Fwd./ Aft Evaporator	ES61060-2
Compressor Assembly	222AC-3508-1
Compressor Drive Belt	7350
Receiver / Drier Bottle	804-380
Binary Switch	ES57008-2
By-pass Valve	ES26112-2
Condenser Blower replacement	222AC-7062-1
Aft Evaporator Return Air Blower Motor	ES73130-1
HSN O-rings; Insert type (Green)	
Size	
#6 O-ring	AIR 440-840
#8 O-ring	AIR 440-841
#10 O-ring	AIR 440-842
HSN O-rings; Torq-Lok Type (Black)	
Size	
#6 O-ring	2-012-N1173
#8 O-ring	2-014-N1173

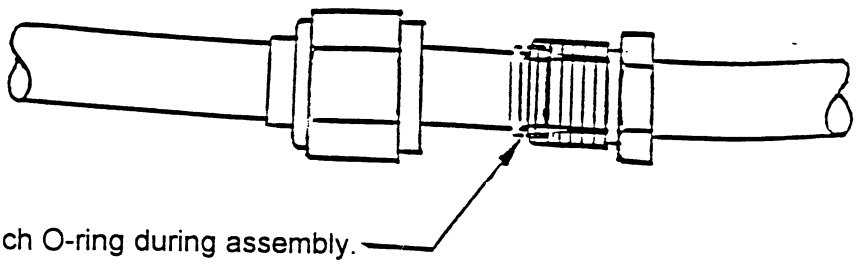
CHAPTER 6
STANDARD PRACTICES INFORMATION

1. FITTING TORQUING PROCEDURES AND TORQUE VALUES

INSERT O-RING 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.

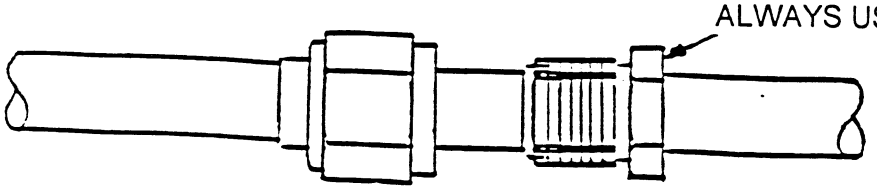
Engage the male end into the female fitting being careful to maintain alignment.

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

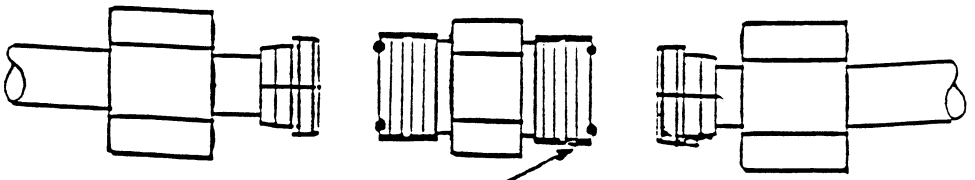


Once the system is charged, check each fitting with an electronic leak detector.
(An electronic leak detector is the only reliable method of checking for refrigerant leaks)
Once the fittings have been checked and are found to be free of leaks, torque seal as appropriate.

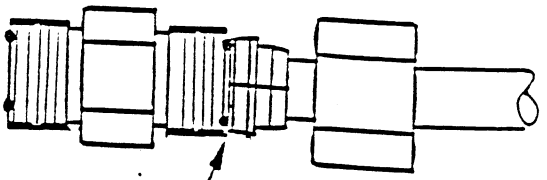
Chapter 6
STANDARD PRACTICES INFORMATION (continued)

1. FITTING TORQUING PROCEDURES AND TORQUE VALUES (continued)

TORQ-LOK O-RING FITTING



Apply a thin coating of refrigerant oil to O-ring, and
To both sides of the mating surfaces.
Confirm there is no damage (nicks, dirt, etc.) on the fitting surfaces.



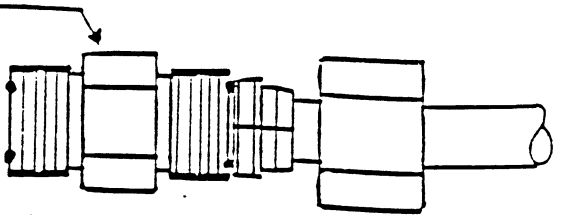
Insure that the O-ring is properly seated in the O-ring
Channel in the union or tee fitting.

Engage the male fitting up to the flat end of the tube assembly. Use caution not damage the O-ring, or allow the O-ring to slip out of place.

Hold the fittings together while sliding the B-nut forward and engaging the threads. Tighten the B-nut by hand and then torque as follows.

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

ALWAYS USE A 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.

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 baggage floor panel (BHT panel # 56) to gain access to the air conditioner condenser assembly.

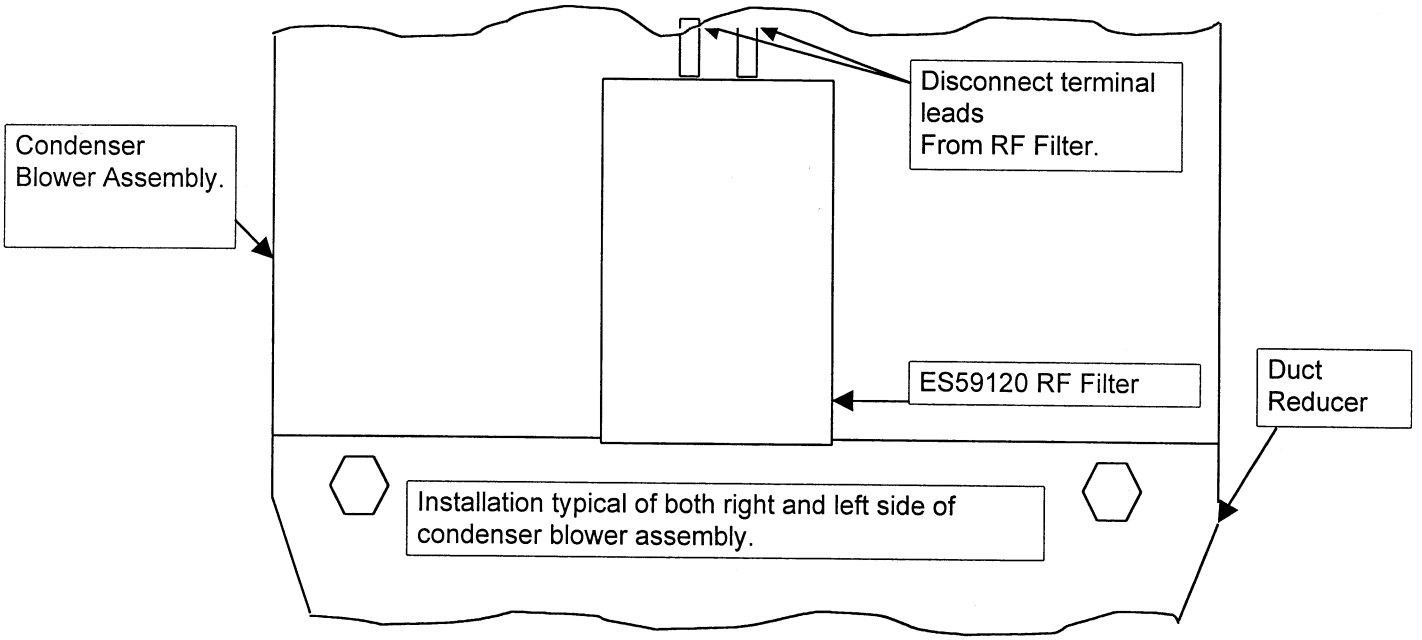
B. Remove the (3) three bolts that attach the blower housing to the duct reducer assembly.

C. Disconnect the terminal leads from the blower motors that attach to the ES59120 RF Filter. These are located on each of the condenser blower housings.

D. Remove the (6) bolts that attach the blower assembly to the condenser housing.

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.



CAUTION

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

E. 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).
B. Reconnect the terminal leads to the ES59120 RF Filter and torque to 3 to 5 inch lbs (0.3-0.5 Nm).
C. Reattach the duct reducer assembly and torque the attaching bolts to 50 to 70 inch lbs. (5.7-8.0 Nm)

Chapter 6
STANDARD PRACTICES INFORMATION (continued)

3. REMOVAL, REPLACEMENT & ADJUSTMENT OF COMPRESSOR DRIVE BELT

REMOVAL

A. It is necessary to remove the aft transmission cowling, and the transmission drain pan access cover, to gain access to the Compressor and Drive Belt, for replacement and adjustment procedures.

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, insure that the compressor mounting / attaching bolts have been loosened, to allow free movement of the compressor body on the compressor mount.

D. Remove the first tail rotor driveshaft segment in accordance with Appendix A 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 first tail rotor driveshaft segment in accordance with Appendix A of this manual.

C. Adjust belt tension (See Adjustment).

D. Torque all attaching hardware to 95 – 110 inch lbs (10.9 – 12.6 Nm).

E. Tighten the Belt Tensioning Link Jam Nuts and re-safety.

F. Reinstall the aft transmission cowling, and the transmission drain pan access cover.

NOTE

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

ADJUSTMENT

NOTE

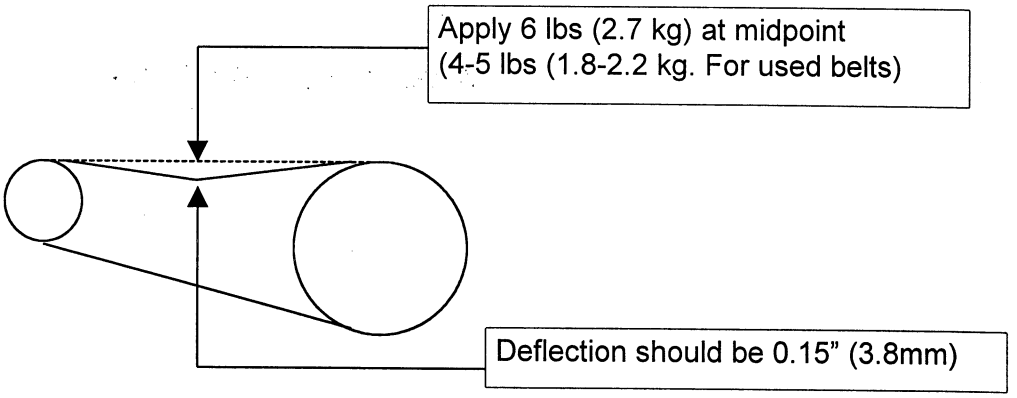
Proper belt tension is important to insure a long belt service life and to avoid excessive loads on the compressor, and bearing assemblies.

A. The correct belt tension for the 7350 belt is 68 lbs. (30.5 kg.) This can be achieved with the aid of a belt tensioning tool (this is the preferred method of obtaining proper belt tensioning).

B. An alternate method is to observe a .15" (3.8 mm) belt deflection when 6 lbs (2.7 kg.) for new belts and 4 to 5 lbs. (1.8 to 2.2 kg.) for used belts of pressure is applied to the midpoint of the belt span.

(Continued)

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



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 (Page 6-4), prior to the removal of the air conditioner compressor assembly, following Steps A-D under the Compressor Drive Belt Removal section.
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 end of the compressor housing.

D. Remove the attaching hardware from the top of the belt tensioning link and the compressor mount assembly. Remove the two mounting bolts that attach the compressor body to the bottom of the compressor mount, and remove compressor assembly.

WARNING

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 personal injury, or damage to the aircraft.

INSTALLATION / REPLACEMENT

A. Install the compressor assembly in the reverse order of its removal. Torque all attaching hardware to 95 – 110 inch lbs (10.9-12.6 Nm). Figure 6-1 & 6-2.

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 link attaching hardware to the compressor mount and torque to 95 – 110 inch lbs (10.9-12.6 Nm). Figure 6-1 & 6-2.

(Continued)

Chapter 6
STANDARD PRACTICES INFORMATION (continued)

4. REMOVAL, INSTALLATION / REPLACEMENT OF COMPRESSOR ASSEMBLY (continued)

D. Adjust the belt tension per the procedure on Page 6-4, steps A & B.

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.

5. REMOVAL, INSTALLATION / REPLACEMENT OF COMPRESSOR DRIVE PULLEY.

REMOVAL

A. See Removal, Replacement & Adjustment of Compressor Drive Belt (Page 6-4) prior to the removal of the air conditioner tail rotor driveshaft drive pulley.

B. Remove the tail rotor drive coupling in accordance with Appendix A of this manual.

C. Once the tail rotor drive adapter has been removed, the air conditioner driveshaft pulley can be removed.

INSTALLATION / REPLACEMENT

A. Install the tail rotor driveshaft, and air conditioner compressor drive pulley in the reverse order of its removal. Torque the attaching hardware to 250 – 290 inch lbs. (28.8-33.4 Nm) Figure 6-1.

B. Re-install and adjust the drive belt per the instructions given on page 6-4.

6. 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. Disconnect the refrigerant lines that attach closest to the evaporator assembly.

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

(Continued)

Chapter 6
STANDARD PRACTICES INFORMATION (continued)

6. REMOVAL, INSTALLATION / REPLACEMENT OF FORWARD EVAPORATOR ASSEMBLY (continued).

C. Disconnect the ducting that attaches the forward evaporator to the forward blower assemblies.

D. Disconnect the electrical connector from the forward evaporator assembly.

E. Remove the screws that attach the forward evaporator housing to the mounting frame assembly, and remove the evaporator assembly.

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.

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

REMOVAL

A. Remove the baggage compartment floor panel (BHT panel #56).

B. Remove the two center belly panels bellow the baggage compartment (BHT Panels #36 & 37).

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.

CAUTION
Refrigerant servicing should be performed by qualified personnel only!

D. Disconnect the refrigerant lines at the fittings to the evaporator housing.

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

E. Remove the return air duct from the forward center portion of the evaporator assembly.

F. Disconnect the blower outlet ducts from the blower adapters.

(Continued)

Chapter 6
STANDARD PRACTICES INFORMATION (continued)

7. REMOVAL, INSTALLATION / REPLACEMENT OF AFT EVAPORATOR ASSEMBLY (continued).

G. Disconnect the electrical connector from the aft evaporator assembly.

H. Remove the four (4) (two (2) each side) mounting bolts from each of the evaporator housing support brackets.

I. Remove the evaporator assembly.

INSTALLATION / REPLACEMENT

A. Install the aft evaporator assembly in the reverse order of its removal. Torque all attaching hardware 50 –70 inch lbs (5.7-8.0 Nm), and replace all O-rings.

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.

8. REMOVAL, INSTALLATION / REPLACEMENT OF CONDENSER ASSEMBLIES.

REMOVAL

A. It is necessary to remove the aft evaporator assembly in order to remove one, or both of the air conditioner condenser assemblies. See removal of the aft evaporator assembly Page 6-7 prior to the removal of the condenser assemblies.

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 5 Servicing.

CAUTION
Refrigerant servicing should be performed by qualified personnel only!

C. Disconnect the electrical connections to the condenser blower motor (See removal of condenser blower assembly Page 6-3).

D. Disconnect the refrigerant lines for the condenser assemblies.

(Continued)

Chapter 6
STANDARD PRACTICES INFORMATION (continued)

8. REMOVAL, INSTALLATION / REPLACEMENT OF CONDENSER ASSEMBLIES (continued).

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

E. Remove the three (3) top mounting bolts from the condenser assembly, and remove shims.

F. Remove the four (4) bottom mounting bolts that attach the condenser to the support brackets.

G. Remove the exhaust ducting for the condenser blower assemblies.

H. Remove the condenser assembly.

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.

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

REMOVAL

A. Remove the baggage compartment floor panel (BHT panel #56).

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.

E. Remove the receiver drier bottle.

(Continued)

Chapter 6
STANDARD PRACTICES INFORMATION (continued)

9. REMOVAL, INSTALLATION / REPLACEMENT OF RECEIVER DRIER BOTTLE (continued).

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.

10. REMOVAL, INSTALLATION / REPLACEMENT OF BINARY SWITCH.

REMOVAL

A. Remove baggage compartment floor panel (BHT panel #56).

B. Disconnect electrical connectors from bottom of binary switch.

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

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.

D. Remove switch.

INSTALLATION / REPLACEMENT

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

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

REMOVAL

A. Remove baggage compartment floor panel (BHT panel # 56).

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!

(Continued)

Chapter 6
STANDARD PRACTICES INFORMATION (continued)

11. REMOVAL, INSTALLATION / REPLACEMENT OF BY-PASS VALVE ASSEMBLY (continued).

C. Remove the mounting screw 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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12. REMOVAL, INSTALLATION / REPLACEMENT OF AFT EVAPORATOR BLOWERS

REMOVAL

A. Disconnect blower motor electrical connectors located on the aft side of the Aft Evaporator housing.

B. Remove the four (4) AN525-10R10 Screws that attach the blower motor to the Aft Evaporator housing.

C. Carefully remove the blower motor & wheel assembly from the Aft Evaporator housing.

INSTALLATION / REPLACEMENT

A. The installation of the aft evaporator blower motors is in the reverse order of their removal.

13. REMOVAL, INSTALLATION / REPLACEMENT OF AFT EVAPORATOR INLET BLOWER ASSY.

REMOVAL

A. Remove the fourteen (14) screws that secure the lid to the Aft Evaporator housing

B. Disconnect the return air ducting from forward end of the Aft Evaporator Inlet Blower Assembly by removing the six (6) attaching bolts.

C. Disconnect the terminal leads from the blower motors that attach to the ES59120 RF Filter located on the top of the blower housing.

D. Remove the six (6) AN3-10 Bolts that retain the Blower housing to the Aft Evaporator Assembly

CAUTION

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

CAUTION

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

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

INSTALLATION / 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).

(Continued)

13. REMOVAL, INSTALLATION / REPLACEMENT OF AFT EVAPORATOR INLET BLOWER ASSY. (Continued).

B. Reconnect the terminal leads to the ES59210 RF Filter and torque to 3 to 5 inch lbs (0.3 – 0.5 Nm).

C. Reattach the inlet duct assembly to the aft end of the Aft Evaporator Inlet Blower Assembly, torquing the attaching bolts 50 to 70 in lbs. (5.7 – 8.0 Nm).

14. REMOVAL, INSTALLATION / REPLACEMENT OF FORWARD EVAPORATOR BLOWERS

REMOVAL

A. Disconnect the two electrical wires from the motor to the relay which is mounted to the blower support bracket.

B. Remove the two upper and one lower AN525-10R8 screws which secure the blower mounting bracket to the support clips, which are secured to the Station 110 bulkhead.

C. The blowers can then be removed from the aircraft.

INSTALLATION / REPLACEMENT

A. Install the forward evaporator blowers in the reverse order of removal.

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Chapter 6
STANDARD PRACTICES INFORMATION (continued)

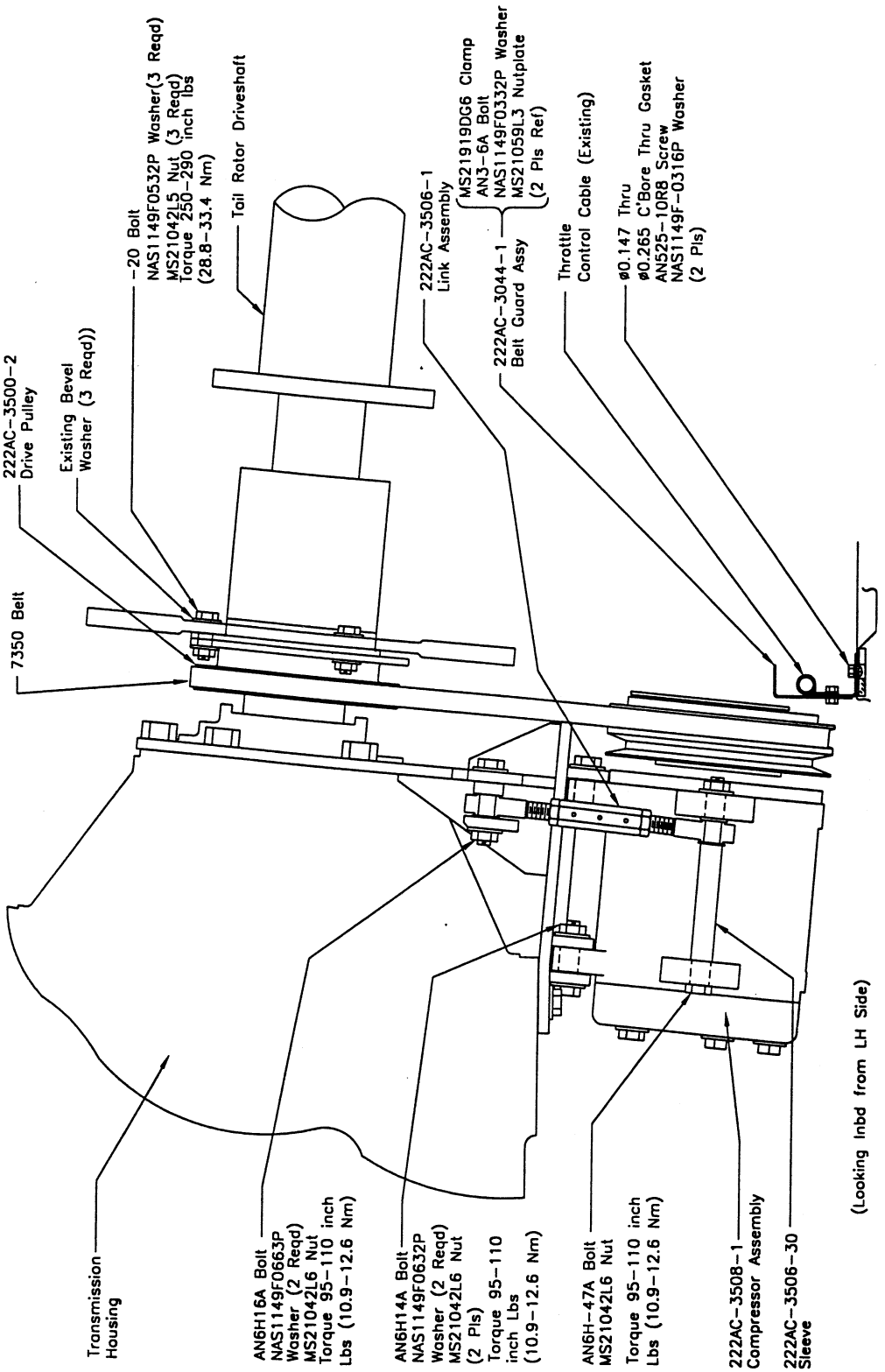

Figure 6-1 Compressor installation – looking inboard from L/H side

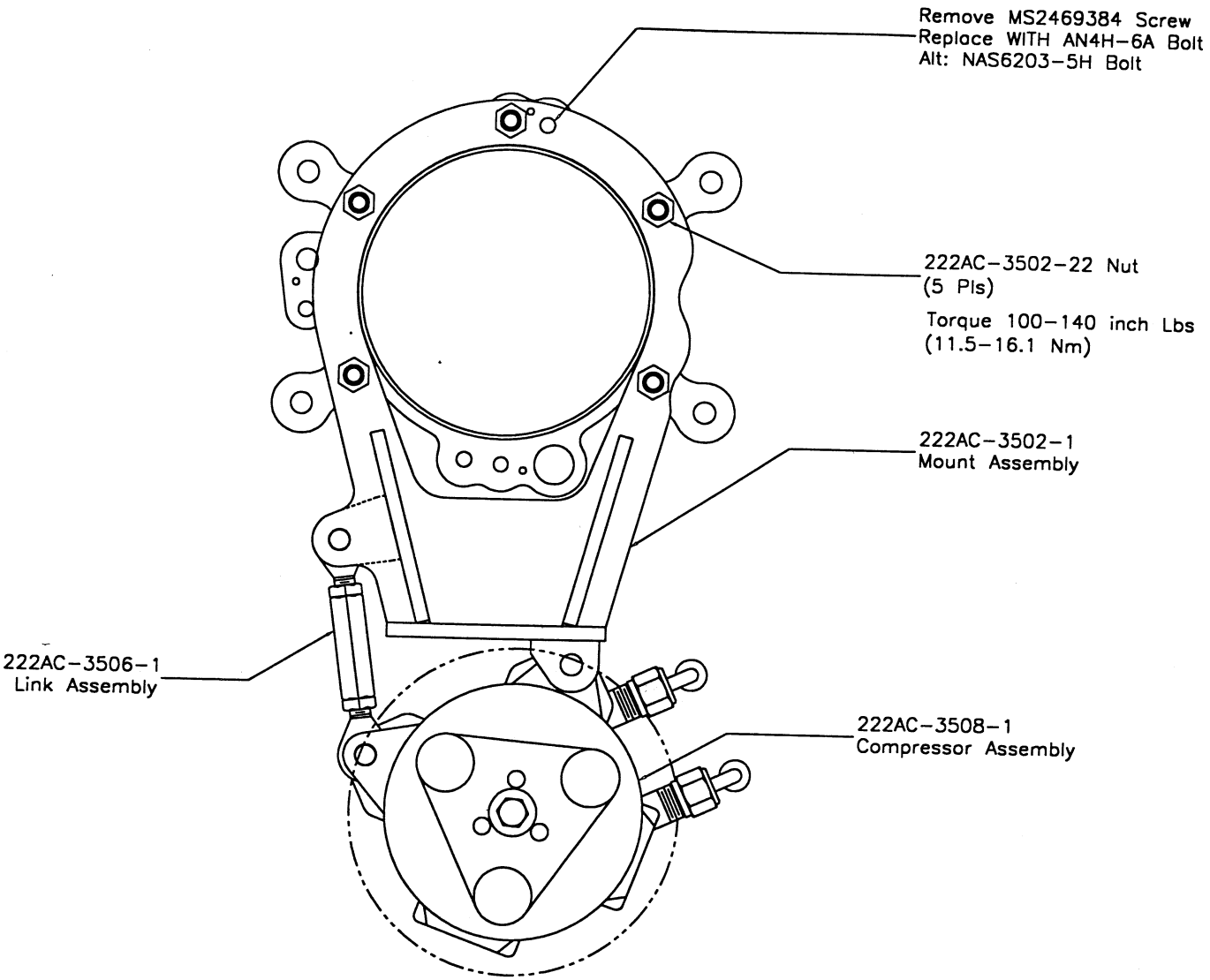

Figure 6-2 Compressor Installation – Looking Forward

CHAPTER 6
STANDARD PRACTICES INFORMATION (continued)

15. 222AC-6088-1 SHROUD AIR PATH SEALING INSTRUCTIONS.

A. Remove the eight Panel Screws from each of the 222AC-6088-22 Panels located on the forward side of the 222AC-6088-1 Shroud Assembly. (One each located on each side of the Shroud Assembly)

B. Remove the 222AC-6088-22 Panel(s) from the Shroud Assembly.

C. Apply an ample amount of RTV adhesive to any gaps that may exist between the Auxiliary Fuel Tank and the 222AC-6088-1 Shroud Assembly, and smooth as to leave the air path as unobstructed as possible. (See figure 6-3 below)

D. Replace the 222AC-6088-22 Panel, applying a small amount of RTV adhesive to the mating surface of the 222AC-6088-1 Shroud, and reinstall the eight (8) Panel Screws.

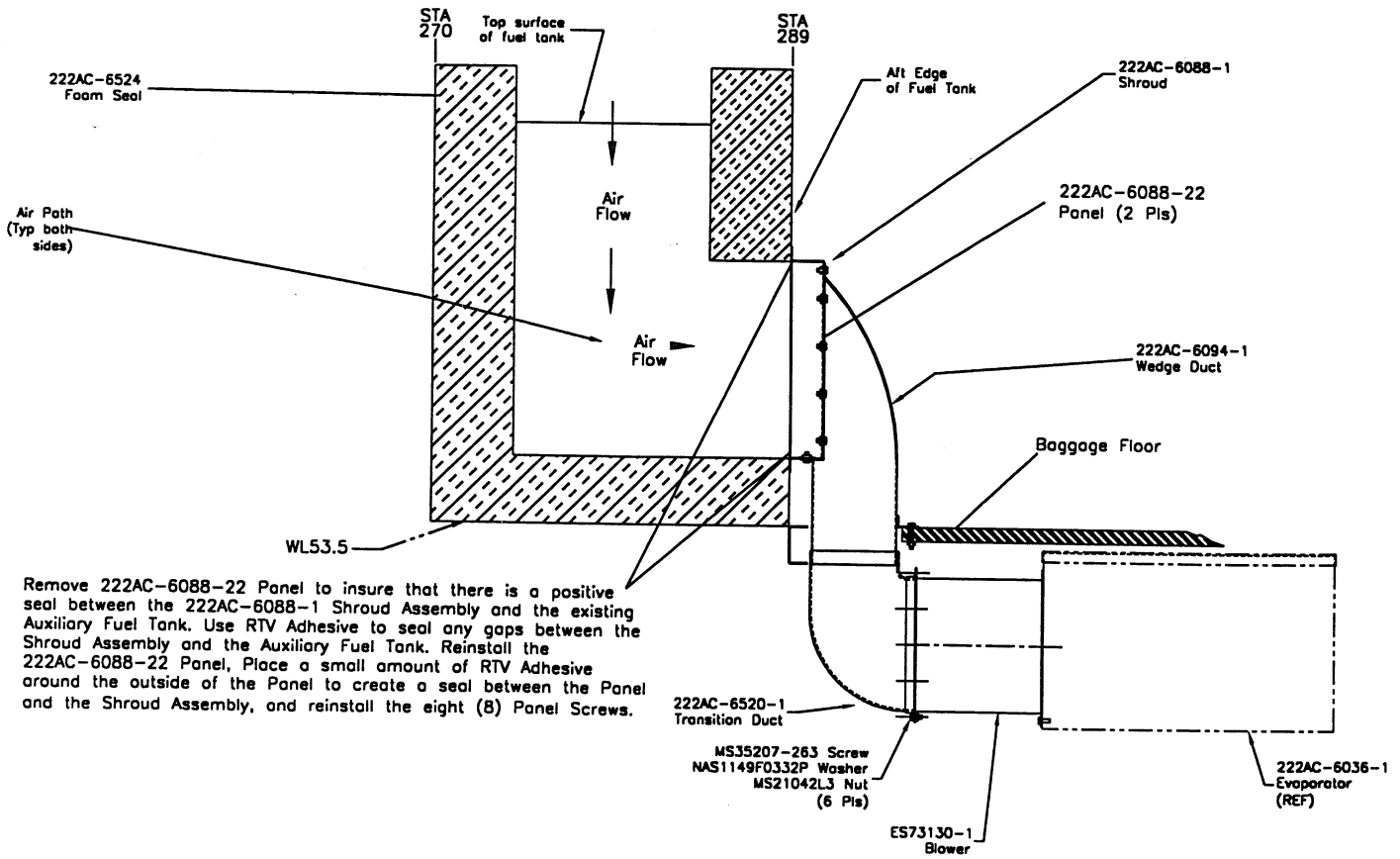

Figure 6-3 Side View of 222AC-6088-1 Shroud Installation

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(s) & fan assemblies	f. Check to insure the condenser blower motor(s) and fan assemblies 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. [1]
System not cooling (Evaporator blowers not operating)	g. Air conditioner control circuit breaker tripped.	g. Reset circuit breaker. If breaker will not reset, check for short in circuit.
	h. Forward or Aft evaporator blower circuit breaker tripped.	h. Reset circuit breaker. If breaker will not reset, check for short in circuit.

(Continued)

Chapter 7
TROUBLESHOOTING (continued)

1. SYSTEM TROUBLESHOOTING (continued)

Problem	Probable Cause	Solution
System not cooling (Evaporator blowers not operating)	i. Forward and aft evaporator blower motor(s)	i. 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.	j. Expansion valve malfunction.	j. 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	k. Leak in evaporator, or evaporator drainage system.	k. If water is noted in the area near the evaporators. This is normally caused by a loose, cracked, plugged, or disconnected drain line. **NOTE** The drain line consists of a tube which extends from the lower surface of the evaporators through the outer contour of the helicopter.

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

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Chapter 7
TROUBLESHOOTING (continued)

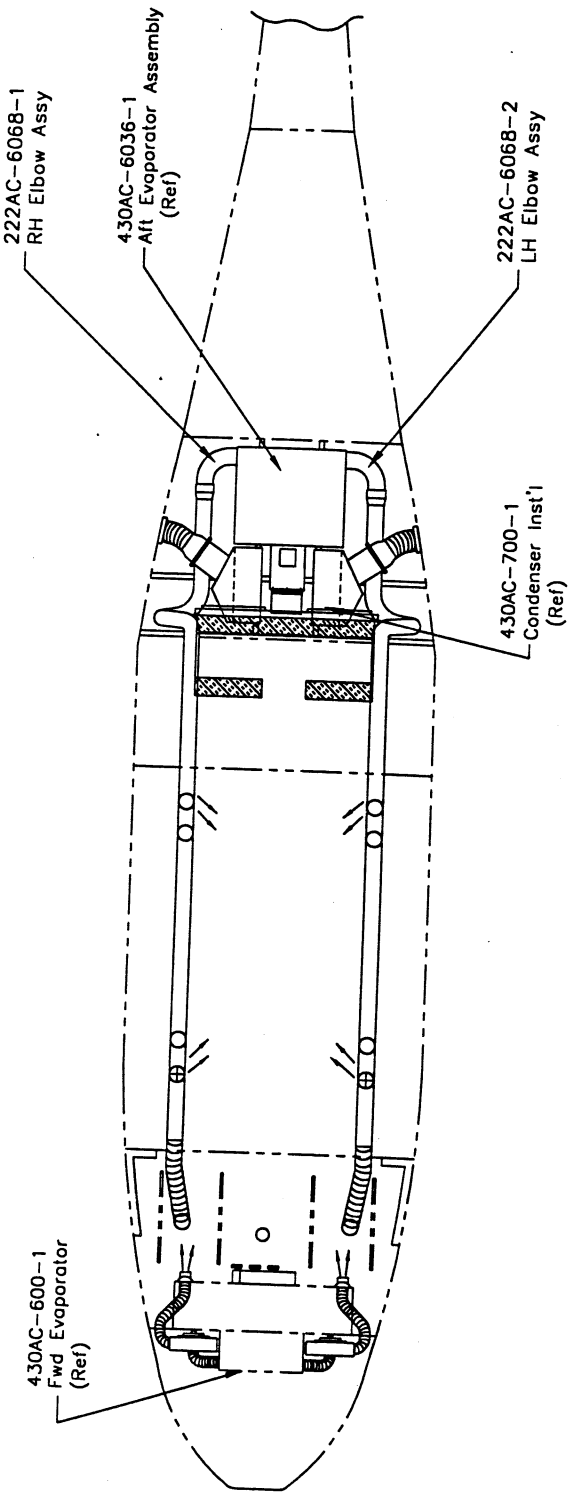


Figure 7-1 General Arrangement – Air Conditioning System Installation.

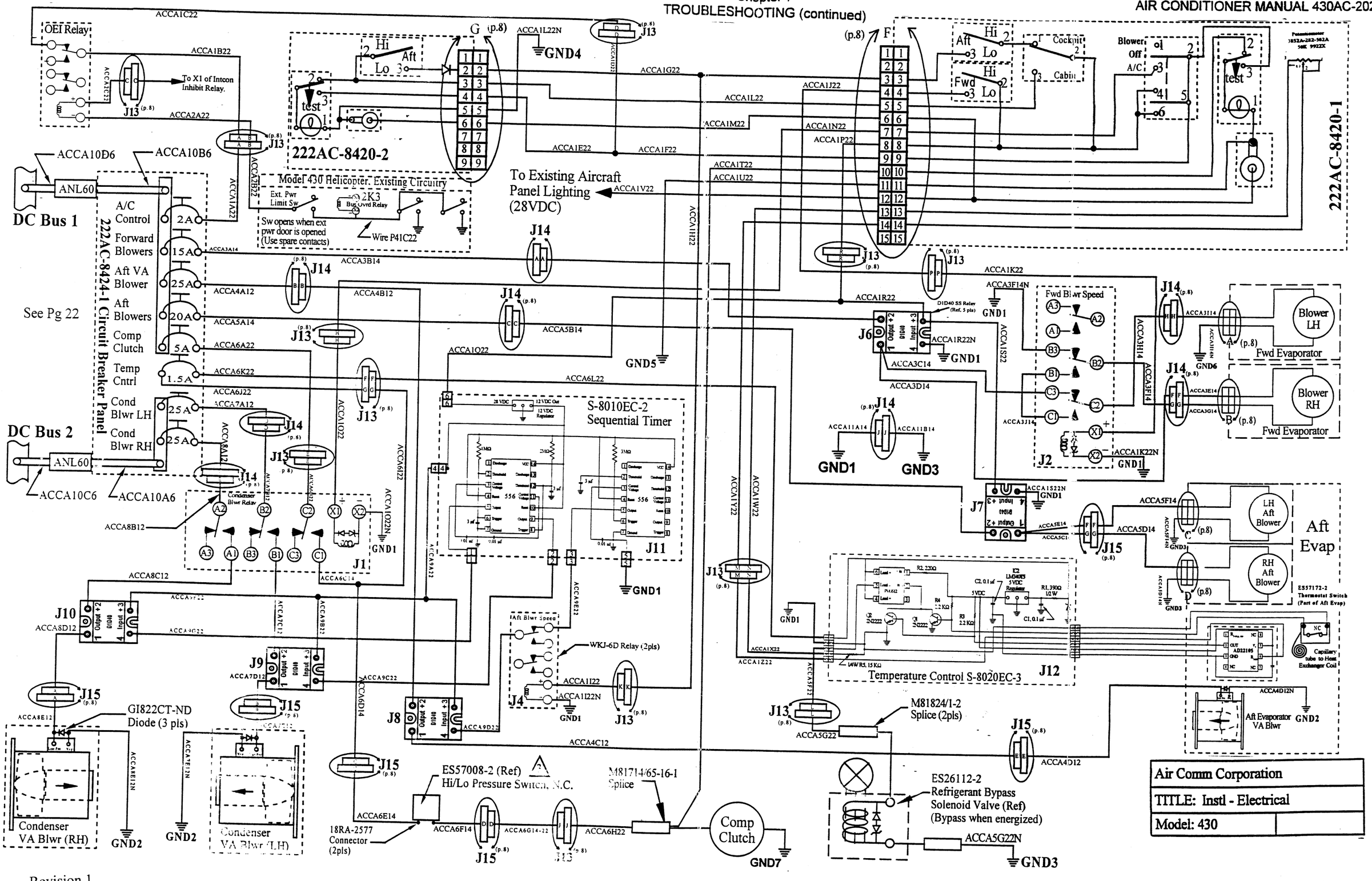
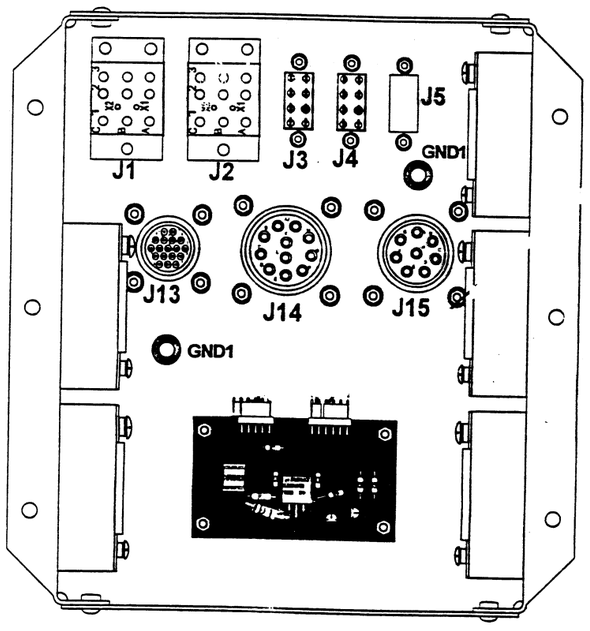
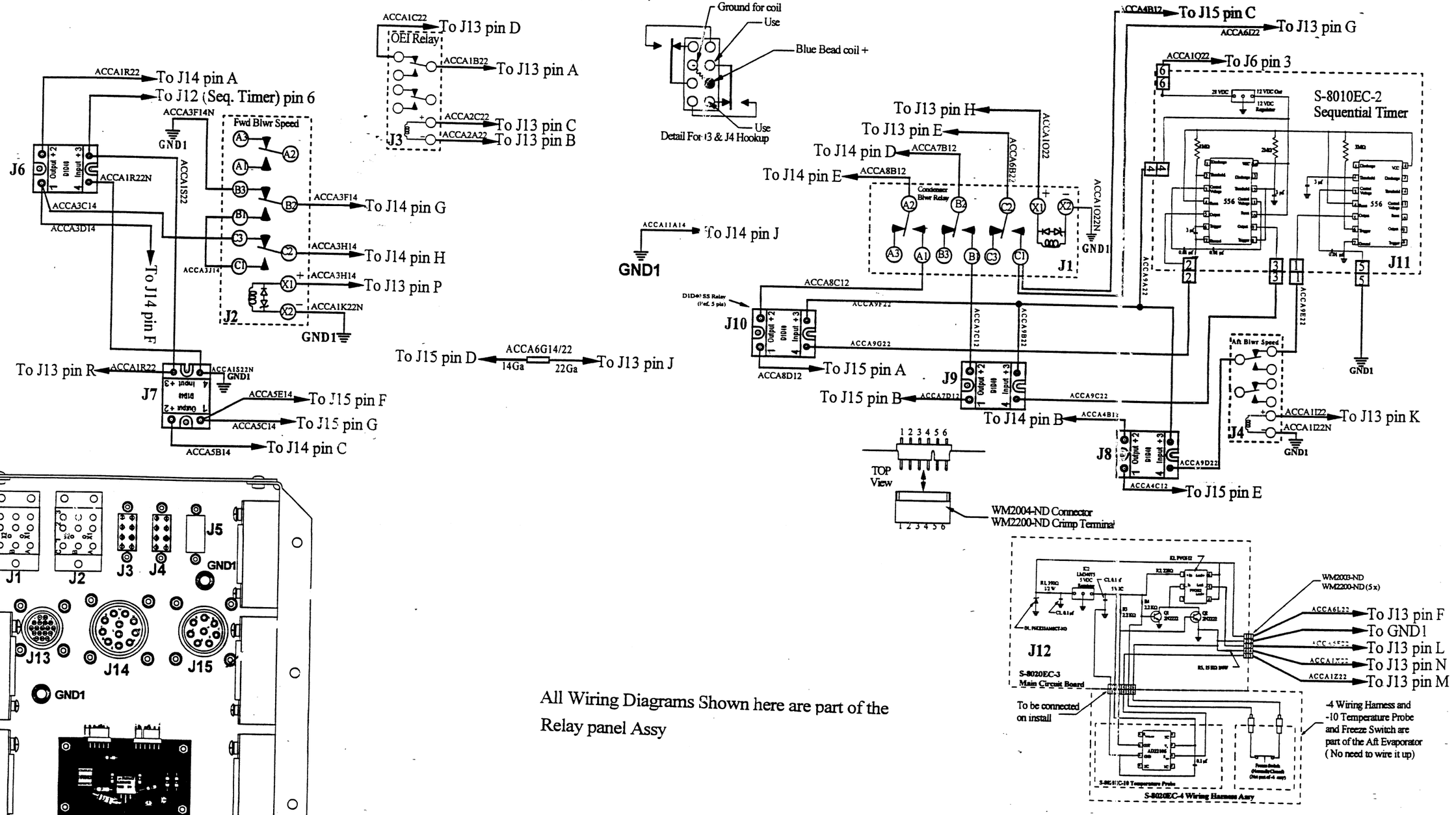


Figure 7-2 Air Conditioning System Electrical Schematic



Rear View



All Wiring Diagrams Shown here are part of the Relay panel Assy

Figure 7-3 Electrical Schematic – Relay Panel Installation / Wiring Schematic

Chapter 7
TROUBLESHOOTING (continued)

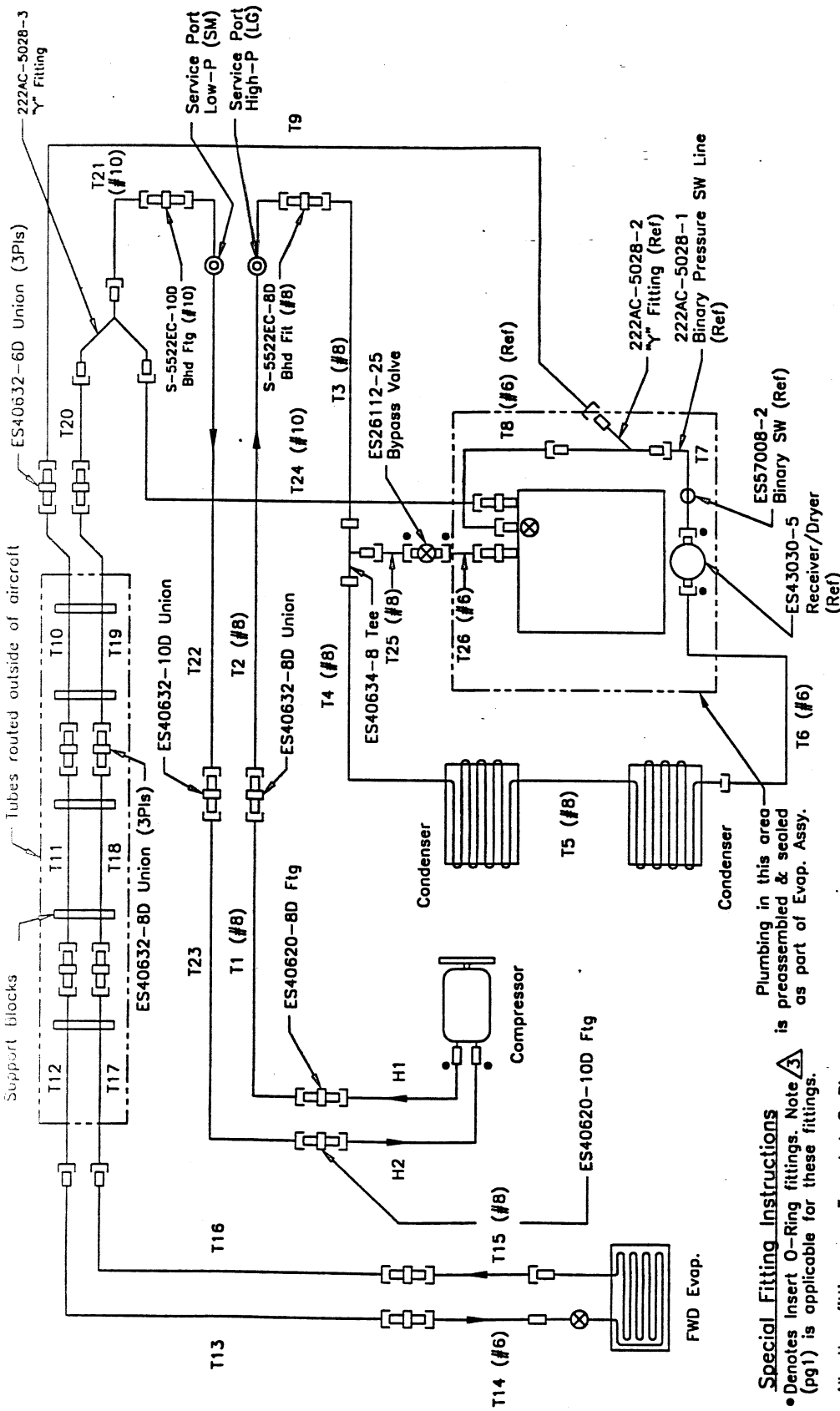


Figure 7-4 Refrigerant Plumbing Schematic

APPENDIX A

REMOVAL AND REPLACEMENT OF BELL MODEL 430 TAIL ROTOR DRIVESHAFT

A-10. TAIL ROTOR DRIVESHAFT

A. The tail rotor driveshaft is made up of four driveshaft segments, three hanger assemblies, disc assemblies and a coupling. The tail rotor driveshafts transmit power from the main transmission output adapter to the tail rotor gearbox.

A-11 REMOVAL – TAIL ROTOR DRIVESHAFT

TOOLS REQUIRED	
NUMBER	NOMENCLATURE
AN8515-1	Spanner
T103036	Holder

A. Remove the air inlet and the aft cowlings.

B. Remove the center firewall

C. Remove the forward tail rotor driveshaft segment (2, Figure A-1) and coupling (1) as follows:

a. Install a tiedown on the main and tail rotor blades.

b. Hold the aft end of the driveshaft (2) and remove the nuts (25), washers (14), beveled washers (15), and bolts (17) from the disc assembly (16).

c. Put a support on the aft end of the driveshaft.

d. Hold the forward end of the driveshaft (2) and remove the nuts (23), washers (24) and bolts (13) from the coupling (1).

e. Lift the tail rotor driveshaft segment over the hanger and pull the shaft aft and out of the driveshaft tunnel.

f. To remove the coupling (1), from the rotor brake disc (10), remove the nuts (11), washers (12), countersunk washers (8) and bolts (7). Loosely install the hardware to attach the brake disc (10) to the transmission output adapter (9).

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A-12 INSTALLATION – TAIL ROTOR DRIVESHAFT

TOOLS REQUIRED	
NUMBER	NOMENCLATURE
AN8515-1	Spanner
T103036	Holder

A. Install the forward tail rotor driveshaft segment (2, Figure A-1) and coupling (1) as follows:

a. To install the coupling (1) remove the nuts (11), washers (12), countersunk washers (8) and bolts (7) that were temporarily installed to hold the rotor brake disc (10) in place.

b. Put the forward end of the coupling (1) against the rotor brake disc (10) and align the holes of the transmission output adapter (9), rotor brake disc (10) and coupling (1).

c. Install the bolts (7), countersunk washers (8) with the countersink towards the bolt head, washers (12) and nuts (11). Torque the nuts (11) to 250 to 290 inch-pounds (28.25 to 32.77 Nm).

d. Put the forward driveshaft segment (2) into the driveshaft tunnel from the aft end.

e. Put a support on the aft end of the driveshaft.

f. Install the coupling (1) on the forward end of the forward driveshaft segment (2) with the bolts (13), washers (24) and nuts (23). Torque the nuts (23) to 250 to 290 inch pounds (28.25 to 32.77 Nm).

CAUTION

Permit only the grip (unthreaded portion) of the bolt to touch the disc assembly.

CAUTION

The bolt lengths must be equal.

CAUTION

Install the beveled washers with the rounded edges against the disc assembly.

g. Install the bolts (17), beveled washers (15), washers (14) and nuts (25). Torque the nuts (25) to 360 to 400 inch-pounds (40.67 to 45.19 Nm).

h. If you removed the disc assembly (16), install the bolts (22), beveled washers (21), washers (20) and nuts (19). Torque the nuts (19) to 360 to 400 inch-pounds (40.67 to 45.19 Nm).

i. Untie the main and tail rotor blades.

j. Make sure all the hanger nuts (34, Figure A-1) are torqued to 50 to 70 inch-pounds (5.65 to 7.91 Nm).

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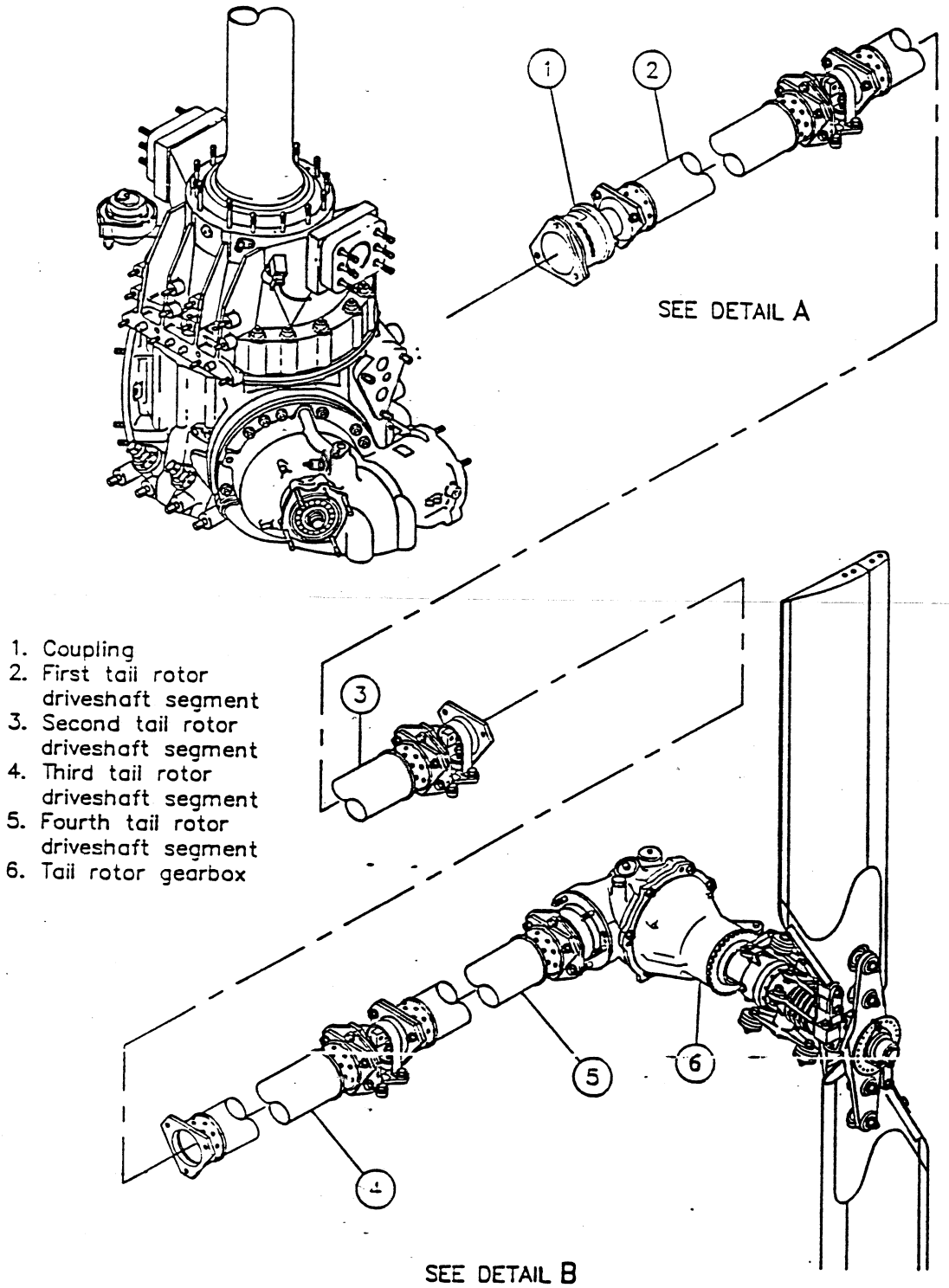
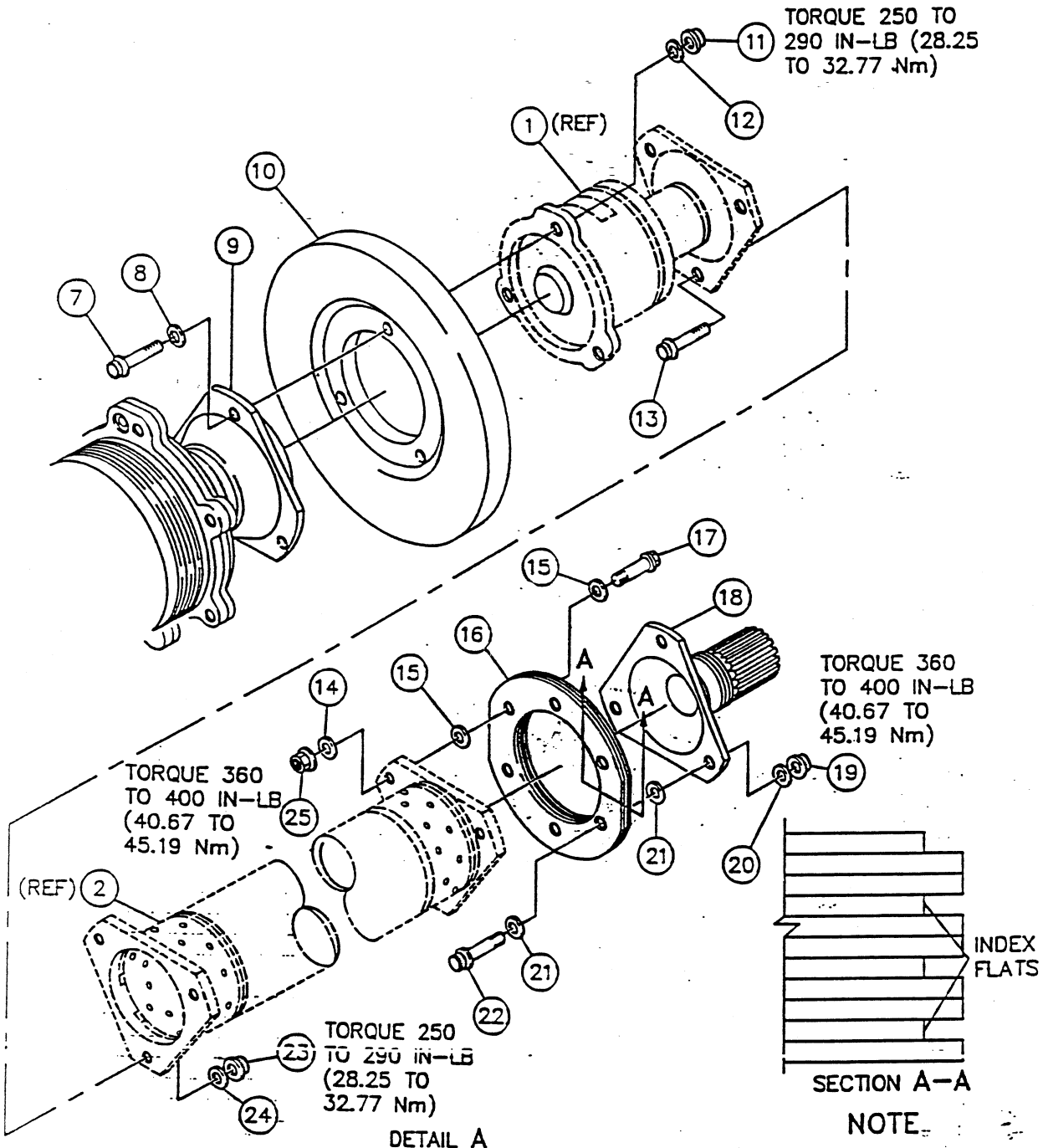


Fig. A-1, Tail Rotor Driveshaft and Coupling Installation (1 of 3)

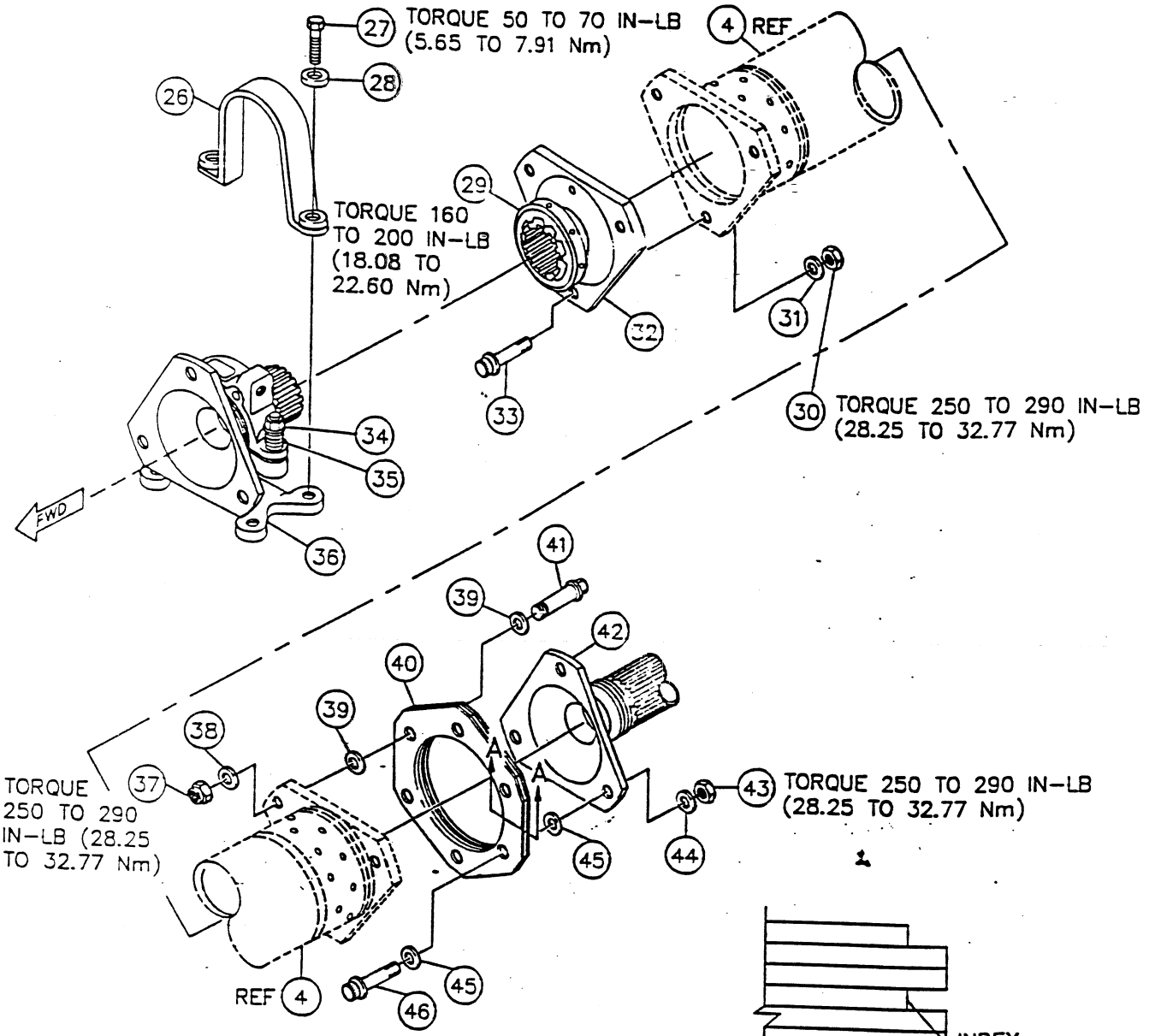


7. Bolt
8. Countersunk washer
9. Transmission output adapter
10. Brake disc
11. Nut
12. Washer
13. Bolt
14. Washer
15. Beveled washer
16. Disc assembly
17. Bolt
18. Hanger adapter
19. Nut
20. Washer
21. Beveled washer
22. Bolt
23. Nut
24. Washer
25. Nut

NOTE

The Index flats on the individual discs are alternated as illustrated on a properly stacked assembly.

Fig. A-1, Tail Rotor Driveshaft and Coupling Installation (2 of 3)



26. Strap assembly
27. Bolt
28. Washer
29. Locknut
30. Nut
31. Washer
32. Hanger adapter
33. Bolt
34. Nut
35. Spring
36. Hanger assembly
37. Nut
38. Washer
39. Beveled washer
40. Disc assembly
41. Bolt
42. Hanger adapter
43. Nut
44. Washer
45. Beveled washer
46. Bolt

NOTE

The index flats on the individual discs are alternated as illustrated on a correctly stacked assembly.

Fig. A-1, Tail Rotor Driveshaft and Coupling Installation (3 of 3)

APPENDIX B

Weight and Balance Information

Weight breakdown – Bell 430 air conditioner system:
Ref. Dwg. 430AC-202-1

Item	Wt. (lbs)	Arm (in)	M (in-lb.)
Total (430AC-202-1 Installation)	147.89	257.9	38,134

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