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INSTRUCTIONS FOR CONTINUED AIRWORTHINESS
BELL HELICOPTER 429
AIR CONDITIONING SYSTEM

Revision 13 **December 5, 2018**

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RECORD OF REVISIONS

Rev	Date	Description of Change	Approval
0	4/27/2009	Original Issue	N/A Prepared by RM
1	9/8/2009	Inspection and Provision kit	N/A Prepared by RM
2	10/28/2009	Single fwd & aft evaporator configuration	N/A Prepared by GP
3	9/21/2010	New fwd & aft evaporator motor part numbers	N/A Prepared by MS
4	3/21/2011	Aft evaporator drain design change.	N/A Prepared by KP
5	8/15/2013	Minor ICA change to clarify refrigerant oil requirements, updated revisions history page, added specific installation / replacement instructions, and updated formatting and corrected typographical errors (revision bars were omitted for formatting and typographical or spelling and grammar updates).	Prepared By: Karen G. Blecha (KGB) 8/28/2013 Signature Date ACC Approval: /S/ Mike J. Knap 9/6/13 Signature Date FAA Acceptance (Major Change): N/A – Meets Minor Change Agreement MR-100-134 8/28/2013 Signature Date
6	9/16/2013	Updated to include design change to upgrade condenser blower. Add new configurations throughout. Added weight and balance information.	Prepared By: Karen G. Blecha (KGB) 9/16/2013 Signature Date ACC Approval: /S/ M. J. Knap 9/19/13 Signature Date FAA Acceptance (Major Change): /S/ J. E. Cox 11/6/13 Signature Date
7	12/3/2014	Pg 28,29: corrected p/n in label, Pg 22 thru 29: added kit p/n's, Pg 58-64: re-titled figures for clarity.	Prepared By: J Byrnes 12/3/2014 Signature Date ACC Approval: MJK 12/10/2014 Signature Date FAA Acceptance (Major Change): /S/ J.E. Cox 1/14/2015 Signature Date

8	2/26/2015	Pg 59: added wire ga. info specific to the relay panel for -204 & -206 kits.	Prepared By: J Byrnes 2/26/2015 Signature Date ACC Approval: Keith P 4/3/2015 Signature Date FAA Acceptance (Major Change): N/A – Meets Minor Change Agreement MR-100-134 6/28/2013 Signature Date
9	7/15/2015	Pg 8: added tolerances onto the inspection period & added blower connector inspection Pg 11: Added Section I for connector inspection Pg 35-41: Added info for charging at cold temps, purging, & updated lubrication info for Ultra PAG oil. Created new sub-section no. Pg 46: Updated fitting torque requirements Pg 62: Updated Fig 28 title Pg 66: Updated Fig 32 title Pg 67: Added Fig 33 Pg 68: Updated Fig 34 title Pg 69: Added Fig 35	Prepared By: J Byrnes 7/15/2015 Signature Date Service: K. Moore 7/22/2015 Signature Date ACC Approval: K. Pharris 7/22/2015 Signature Date FAA Acceptance : N/A – Meets Minor Change Agreement MR-100-134 Rev NC 6/28/2013 Signature Date
10	4/20/2017	Pg 8: Added inspection for condenser blower fasteners Pg 11: Added inspection steps for condenser blower fasteners Pg 14, 28, 29, 30, 31, 46: Updated part numbers for S-6061EC-3 and S-6085EC-3 Pg 24, 25, 26, 27: Updated part numbers for 429EC-7004-2 and 429EC-7006-2 ***Not approved for use**	Prepared By: C. Posvic 4/20/2017 Signature Date ACC Approval: K. Moore 5/1/2017 Signature Date FAA Acceptance : Not Approved Signature Date

11	5/23/2017	Page 8: Added references to inspection procedure sections to table Page 57: Added additional instructions for removing/replacing condenser blower assembly to account for added locking mechanisms.	Prepared By: C. Posvic 5/23/2017 Signature Date ACC Approval: L. Bokas 5/25/2017 Signature Date FAA Acceptance : Not Approved Signature Date
12	6/12/2017	Page 57: Updated instructions for installing safety wire/cable.	Prepared By: C. Posvic 6/12/2017 Signature Date ACC Approval: L. Bokas 6/16/2017 Signature Date FAA Acceptance : Not Approved Signature Date
13	12/5/2018	Page 69: Updated Fig. 33 schematic to correct revision. Page 71: Updated Fig. 35 schematic to correct revision. See ECO 18-679 for description of change	Prepared By: R. Dodrill 12/5/2018 Signature Date ACC Approval: 1-11-19 Signature Date FAA Acceptance: N/A – Meets Minor Change Agreement MR-100-134 Rev NC 6/28/2013 Signature Date

LIST OF EFFECTIVE PAGES

LIST OF REVISIONS

Revision 0 (Original Issue) ..... April 27, 2009
Revision 1 (Inspection or Provisions kit) ..... September 8, 2009
Revision 2 (Single fwd. & aft evaporator configuration) ..... October 28, 2009
Revision 3 (New fwd & aft evaporator motor part numbers) ..... September 21, 2010
Revision 4 (Aft Evap Drain Design Change) ..... March 21, 2011
Revision 5 (Lubrication Information Update and reformat) ..... August 28, 2013
Revision 6 (Upgraded Condenser Blower)..... September 16, 2013
Revision 7 (General updates & format changes)……..……December 3, 2014
Revision 8 (Ref. Relay panel wire updates)……..…….February 26, 2015
Revision 9 (General updates) ……July 15, 2015
Revision 10 (Condenser blower locking mechanism changes)……...April 20, 2017
Revision 11 (Condenser blower locking mechanism changes)……...May 23, 2017
Revision 12 (Condenser blower locking mechanism changes)……..June 12, 2017
Revision 13 (General updates)… ……...December 5, 2018

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TABLE OF CONTENTS

CHAPTER 1
INTRODUCTION

1. Scope
The scope of this manual encompasses scheduled and unscheduled maintenance procedures for continued airworthiness of Air Comm Corporation air conditioning system installed in Bell 429 series helicopter.

2. Purpose
The purpose of this manual is to provide aircraft field mechanic 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 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 model 429 equipped with Air Comm Corporation kit number 429EC-200, 429EC-202, 429EC-204, and 429EC-206 air conditioner system.

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

A. Ambient air temperature: Temperature of the air surrounding a person or object.
B. Charging station: An air conditioning system service unit which is capable of evacuating and charging an air conditioner.
C. Cold: The absence of heat.
D. Condensation: The process of changing a gaseous phase into a liquid.
E. Desiccant: Material used in a receiver/drier bottle, designed to absorb moisture from refrigerant.
F. Evaporate: To change from a liquid into a vapor.
G. Heat load: The amount of heat which the air conditioner is required to remove from the aircraft cabin.
H. 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.
I. Pressure, ambient: The pressure of the air surrounding a body, normally measured in pounds per square inch, or PSIG.
J. 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.
K. 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.
L. 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.

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

N. Vapor: The gas formed by boiling or evaporating a liquid. A gas at a temperature below its critical temperature.

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 Measure

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

9. Information Essential to Continued Airworthiness

This manual provides information which is required for operation and maintenance of the Air Comm air conditioning system installed in Bell model 429 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 SR00693DE.

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 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 and on the List of Revisions 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 or to correct the safety-of-flight issue.

Replacement or revised copies of this manual can 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
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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. 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 or two forward mounted evaporator(s) (cockpit), one or two aft mounted evaporator(s) (main cabin), one condenser and one compressor belt-driven by the transmission 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.

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

The A/C system is connected electrically to the aircraft’s DC Power Panel 28 VDC Bus.

The control panel for the A/C system is located in the aft section of the existing center console between the pilot’s and copilot’s seats. This panel consists of the A/C & Fan Switch, two potentiometers (for the control of cockpit and cabin evaporator blower speed) and a temperature control rheostat.

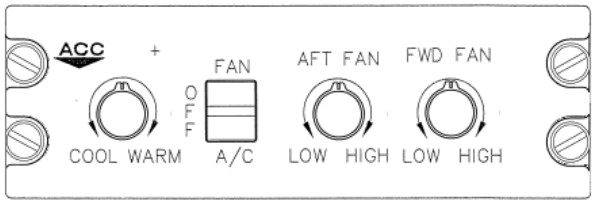


Figure 1: Cockpit A/C Control Panel

The blower motors feature variable fan speed. This feature can be used in both the fan and air conditioner modes.

The compressor is mounted to the surface of the main rotor gear box and is driven by a Poly V-Belt and a pulley which is mounted to the transmission drive quill. Access to the compressor is provided by the transmission compartment access doors.

Airflow through the condenser heat exchanger is provided by one 28 volt DC high performance blower, and is enhanced by means of a large cut out in the transmission cowling providing ram air in forward flight.

The right side aft evaporator is equipped with a Freeze Switch. The Freeze Switch probe is located in the core of the evaporator heat exchanger. This unit performs two functions; 1. It acts to prevent coil freeze-up by limiting the minimum coil temperature to 32º F (0º C), and 2. It acts in conjunction with the cabin air temperature control system, by controlling the bypass of refrigerant through the evaporator coil in response to adjustment of the thermostat switch located on the left hand lower section of the instrument panel.

Each evaporator has an overboard drain to remove condensate from the system. The forward evaporator(s) are drained overboard directly underneath each, through the bottom nose skin. See Figure 16 and Figure 17. The aft evaporator drain(s) run from each evaporator through bulkhead fittings in the transmission deck into flexible tubing through the overhead and left door post. They continue under the floor along the left keel beam then aft through check valves and out the left bottom skin. See Figure 29 and Figure 30.

The refrigerant plumbing for this system installation incorporates insert O-Ring and TORQ LOK® fittings:

A. 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.). These fittings are signified by a green band placed around the outside diameter of the hose or tube they are utilized on. **Black O-Rings must not be used on these fittings**. (See Chapter 7 for torqueing procedures).

B. TORQ LOK® FITTINGS: These fittings have two flat mating surfaces 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.). **Green O-Rings must not be used on these fittings.** (See Chapter 7 for torqueing 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 50º F (10º C).

The switch operating pressures are:

Low Pressure Function:
Cut-out at 28 ± 2.8psi (2.0 ± .2 Kg/cm²)
Cut-in at 29 ± 4.3 psi (2.1 ± .3 Kg/cm²)

High Pressure Function:
Cut-out at 384 ± 30psig (28.0 ± 2.0 Kg/cm²)
Cut-in at 298 ± 43psig (20.9 ± 2.0 Kg/cm²)

14. Description of Vapor Cycle Air Conditioner and 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 (See Figure 2).

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 liquid refrigerant 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 psig (14.06 kg/cm) and its temperature to around 200º F (93.3º C). This high pressure/high temperature vapor then travels to the condenser (a heat exchanger cooled by a flow of outside air). Heat is extracted from the refrigerant, and as it cools it condenses back into a liquid and flows into the receiver-dryer, ready to repeat the cycle.

15. Refrigeration Cycle Illustration

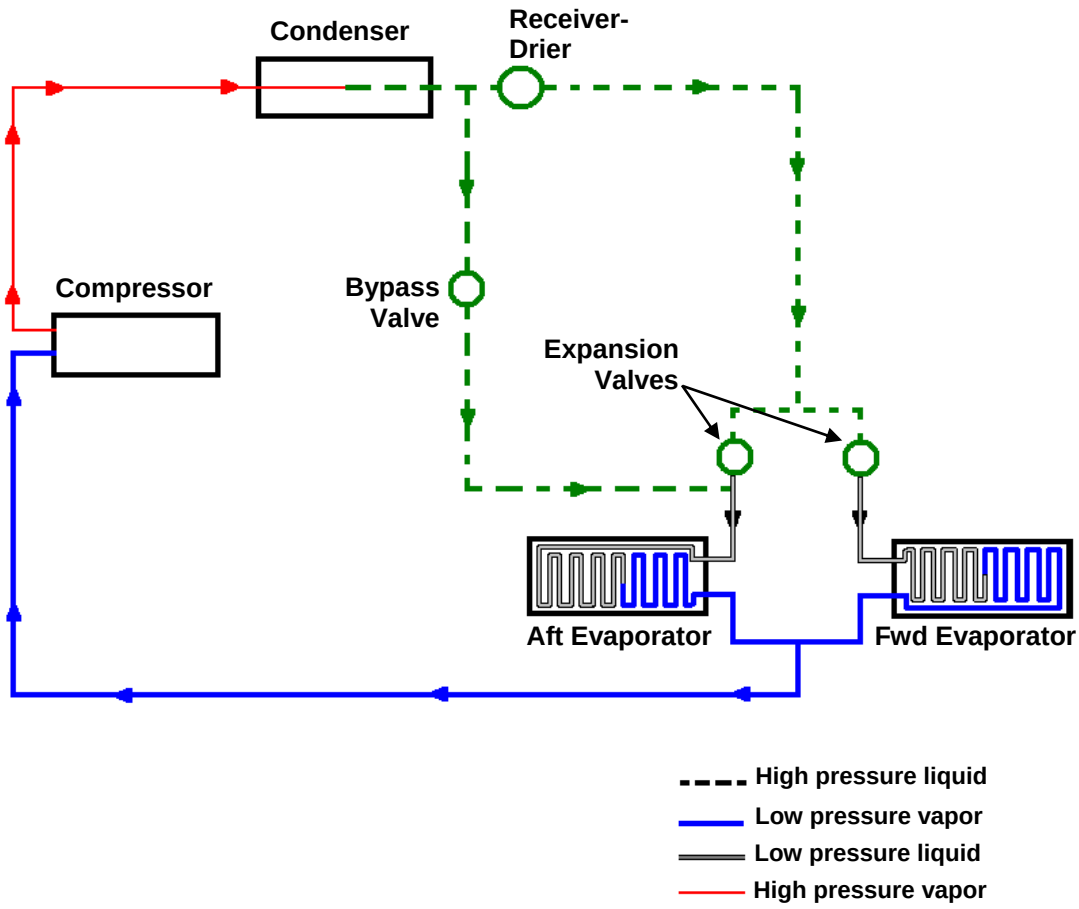


Figure 2: Refrigeration Cycle Illustration

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

CHAPTER 2
AIRWORTHINESS LIMITATION SECTION

1. Airworthiness Limitations

The Airworthiness limitations section is FAA approved and specifies inspections and other maintenance required under Sections 43.16 and 91.403 of Federal Aviation Regulations unless an alternative program has been FAA approved.

No airworthiness limitations associated with this type design change.

ACO Approval Date

CHAPTER 3
INSPECTIONS AND OVERHAUL

1. Inspection Requirements

PERIODIC INSPECTIONS
(Hours are aircraft time)

NOTE

The 429EC-250 provisions kit does not require periodic inspection until the 429EC-200, 429EC-202, 429EC-204, or 429EC-206 Air Conditioner kit has been installed.

Item	Annual	Every 200 +/- 20 Hours of Operation	Special inspection instructions. (Paragraph)
Fwd Evaporator Blower	X		Check for operation throughout entire range of speed for blower operation. **(A)**
Aft Evaporator Blower	X		Check for operation throughout entire range of speed for blower operation. **(A)**
Condenser Blower Motor and Fan Assembly	X		Check for operation. **(B)**
Compressor Drive Belt	X	X	Check for signs of excessive wear (Example: Glazing, Cracks and Exposed Fibers). **(C)**
Air Conditioner Placards and Markings	X		Check for security and legibility. **(D)**
Compressor Assembly	X	X	Check for operation, security of attaching hardware and signs of refrigerant or oil leaks. **(E)**
Compressor Mount	X	X	Check for cracks and security of attaching hardware. **(F)**
Plumbing and Fittings	X	X	Check for security and signs of oil or refrigerant leaks. **(G)**
Air Conditioner Compressor Drive Pulley	X	X	Check for security of attaching hardware. **(H)**
Blower Electrical Connectors	X		Visually inspect the condenser and evaporator blower connectors for signs of overheating. **(I)**
Blower Fasteners		X	Visually inspect the condenser blower fan fasteners for secured locking mechanisms. **(J, K)**

2. Inspection Procedures

NOTE

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

A. 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 wheels or blades whenever switch is in "Fan" or "A/C" positions.

At the Cockpit's A/C Control Panel place the AIR COND switch in the FAN position and verify:

1) That both the fwd and aft fans are activated and operating. Rotate speed control knobs to verify blowers increase and decrease speed accordingly.
2) That the condenser fan is non-operational.
3) That the compressor clutch is disengaged and the “AIR COND FAIL” message is not illuminated on the ADIU display.

Place the AIR COND switch in the OFF position and verify:

1) That both the fwd and aft fans deactivate.
2) That the compressor clutch remains disengaged and the “AIR COND FAIL” message is not illuminated on the ADIU display.

B. Inspection of the 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

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.

1) Visually inspect condenser air inlet for any obstructions or debris. Airflow in

this area is critical for air conditioner operation.

2) Disconnect electrical leads from the binary switch and install a jumper between the leads.
3) Connect 28V ground power to the aircraft and place the A/C mode switch in the "A/C" position and verify:
    a. Condenser fan is activated and operating. This fan should pull air into the aircraft through the condenser assembly.
    b. Compressor clutch is engaged and the "AC COMP FAIL" message is not illuminated on the ADIU display.
    c. Disconnect one of the electrical leads from the binary switch, remove jumper wire and verify that the "AC COMP FAIL" message is illuminated on the ADIU display.
4) Reconnect the electrical leads removed from the binary switch.
5) Place the A/C mode switch into the Off position and verify:
    a. The condenser fan deactivates.
    b. The compressor clutch disengages and all blowers deactivate.

C. Inspection of the Drive Belt:

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

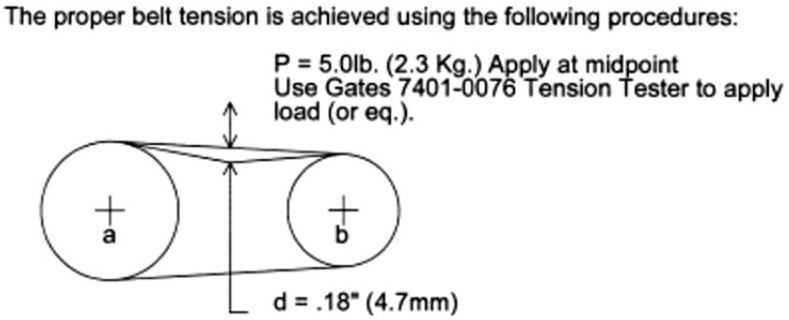


Figure 3: Belt Tension Inspection

D. Inspection of Placards And Markings:

1) Check all air conditioner placards and markings for security and legibility.

E. Inspection of Compressor Assembly:

NOTE:

The air conditioning system must be serviced with refrigerant to perform

this inspection.

1) Connect 28V ground power to the aircraft and place the A/C mode switch in the “A/C” position and verify that the Compressor clutch is engaged and the “AC COMP FAIL” message is not illuminated on the ADIU display.
2) Place air conditioner switch to the OFF position and verify that the Compressor clutch is disengaged and the “AC COMP FAIL” message is not illuminated on the ADIU display.
3) Visually inspect the compressor assembly for the following.
    a. Security of all attaching hardware.
    b. Signs of refrigerant or oil leaks.
    c. Signs of excessive belt slippage or excessive heat.

F. Inspection of Compressor Mount Assembly:

1) Visually inspect compressor mount of any signs of the following:
    a. Any cracks.
    b. Security of attaching hardware.
    c. Elongation of component mounting holes.

G. Inspection of A/C Refrigerant Plumbing:

1) Visually inspect for any signs of the following:
    a. Refrigerant gas leaks.
    b. Refrigerant oil leaks.
    c. Chaffing or excessive corrosion.
    d. Security of attaching hardware.

H. Inspection of Compressor Drive Quill (Part of the 429 aircraft type design):

1) Inspect security of attaching hardware.

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.
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.

J. Inspection of Blower Fasteners (429EC-200/202 air conditioning systems)

1) Locate the three fasteners connecting the condenser blower motor to the condenser blower fan. Verify the locking cable or wire is taut and properly secured. The locking cable or wire must be secured to the fasteners as shown in Figure 4.

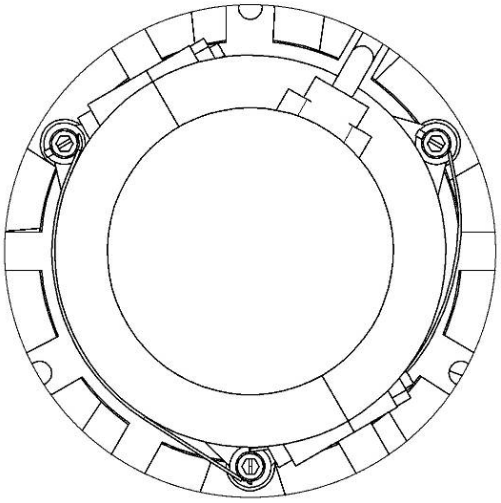


Figure 4: Condenser blower motor locking cable/wire

2) Locate the four fasteners connecting the condenser blower fan to the condenser blower assembly. Verify the locking cable or wire is taut and properly secured. The locking cable or wire must be secured to the fasteners as shown in Figure 5.

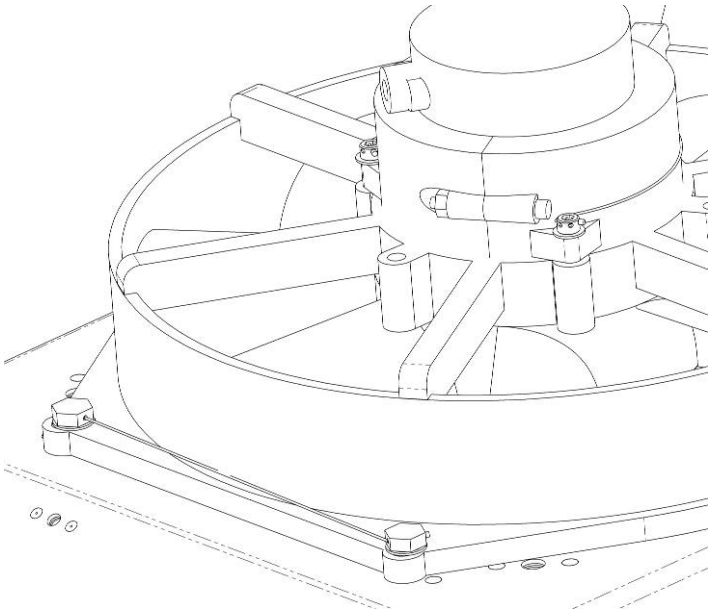


Figure 5: Condenser blower locking cable/wire

K. Inspection of Blower Fasteners (429EC-204/206 air conditioning systems)

1) Locate the three fasteners connecting the condenser blower motor

cover to the condenser blower motor. Verify the locking cable or wire is taut and properly secured. The locking cable or wire must be secured to the fasteners as shown in Figure 6.

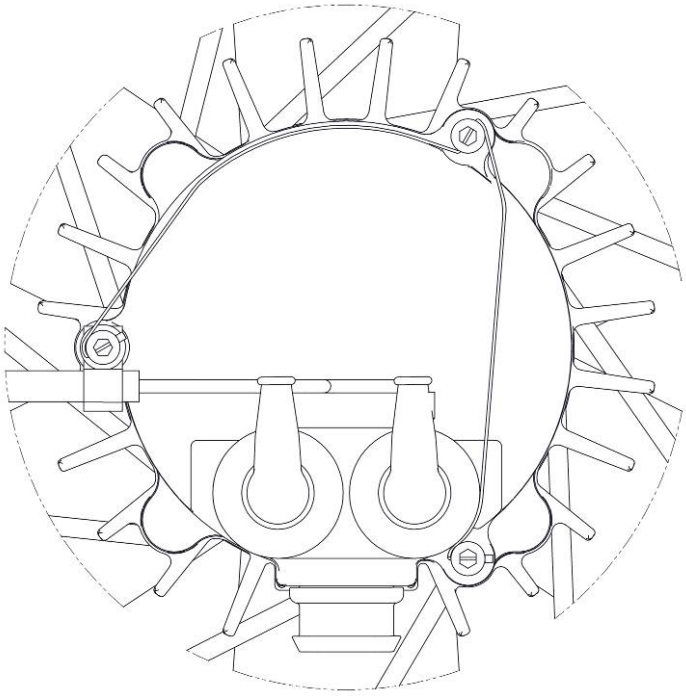


Figure 6: Condenser blower cover locking cable/wire

2) Locate the ring covering the four fasteners connecting the condenser blower motor to the condenser blower fan. Verify the ring does not show signs of wear and the fasteners do not show signs of backing out.
3) Locate the four fasteners connecting the condenser blower fan to the condenser blower assembly. Verify the anti-rotation rings are secure over the heads of the fasteners and the snap rings are secured. See Figure 7 for a depiction of the fastener and anti-rotation ring as assembled.

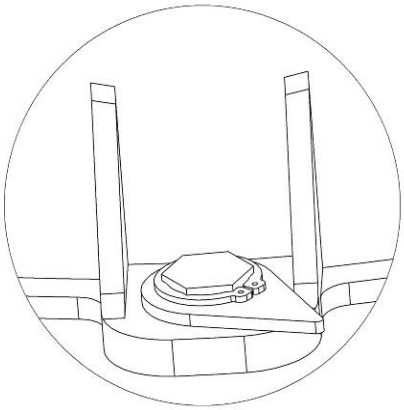


Figure 7: Condenser blower fastener assembled

3. Component Overhaul / Replacement Schedule

Part Number	Description	Recommended replacement
S-6029EC-11 (LH) S-6029EC-12 (RH)	Forward Evaporator Blower Motor Assy	Every five years or 1500 hours. Acceptable to operate motor until failure as it poses no safety of flight risks.
429EC-6302-11 (LH) 429EC-6302-12 (RH)	Aft Evaporator Blower Motor Assy	Every five years or 1500 hours. Acceptable to operate motor until failure as it poses no safety of flight risks.
S-6063EC-3 S6085EC-3 (optional)	Condenser Blower Assy	Every five years or 1500 hours. Acceptable to operate motor until failure as it poses no safety of flight risks.
ES35429-1	Compressor Drive Belt	Every 1000 hours or as condition dictates.
S-3038EC-1	Compressor	Every 1000 hours. Acceptable to operate compressor until failure as it poses no safety of flight issues.

CHAPTER 4
LOCATION AND ACCESS

1. Location of Air Conditioner Components

Nomenclature	Description of Location
Control Panel	In the existing center console panel between the pilots and co-pilots seats.
Forward (Flight Deck) Evaporators	Mounted on either side of the center pedestal below the instrument panel in the chin bubble area.
Aft (Main Cabin) Evaporators	Forward of the main rotor transmission on the transmission deck.
Condenser Assembly	Forward of the main rotor transmission between the two aft (cabin) evaporators on the transmission deck.
Compressor Assembly	Mounted to the forward right hand side of the main rotor transmission and is driven off the transmission quill.
Refrigerant Plumbing	Routed from the compressor, to the condenser and all the other components. (As the refrigerant plumbing connects the compressor, condenser and evaporators, it may be necessary to remove several panels to gain access to its components).
Servicing Ports	On the right hand side of the transmission deck forward of the main rotor transmission.

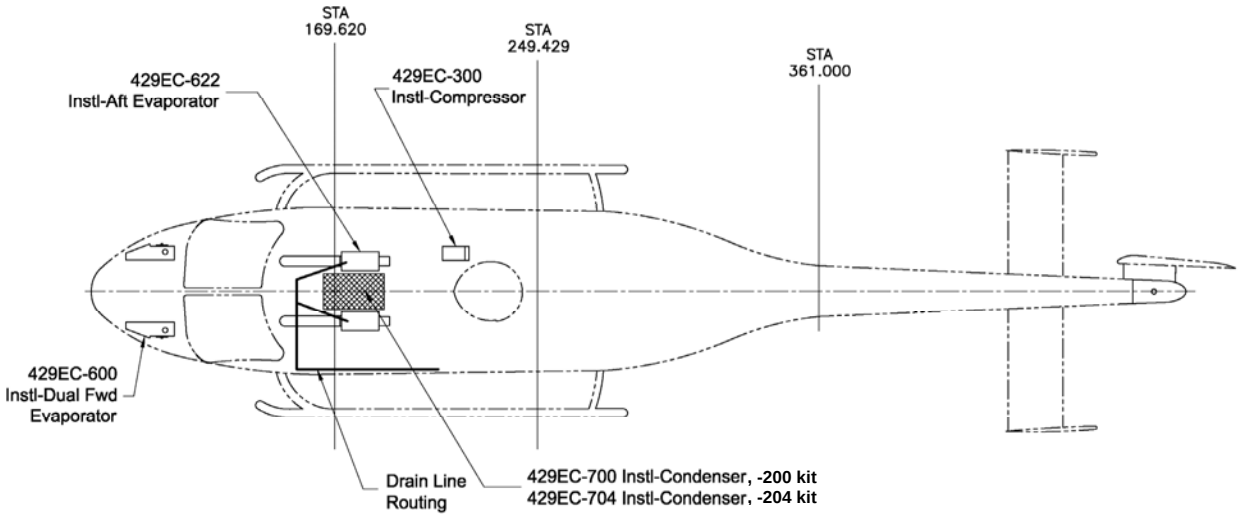


Figure 8: Layout of Air Conditioner Features, Dual Evaporators (Top View)

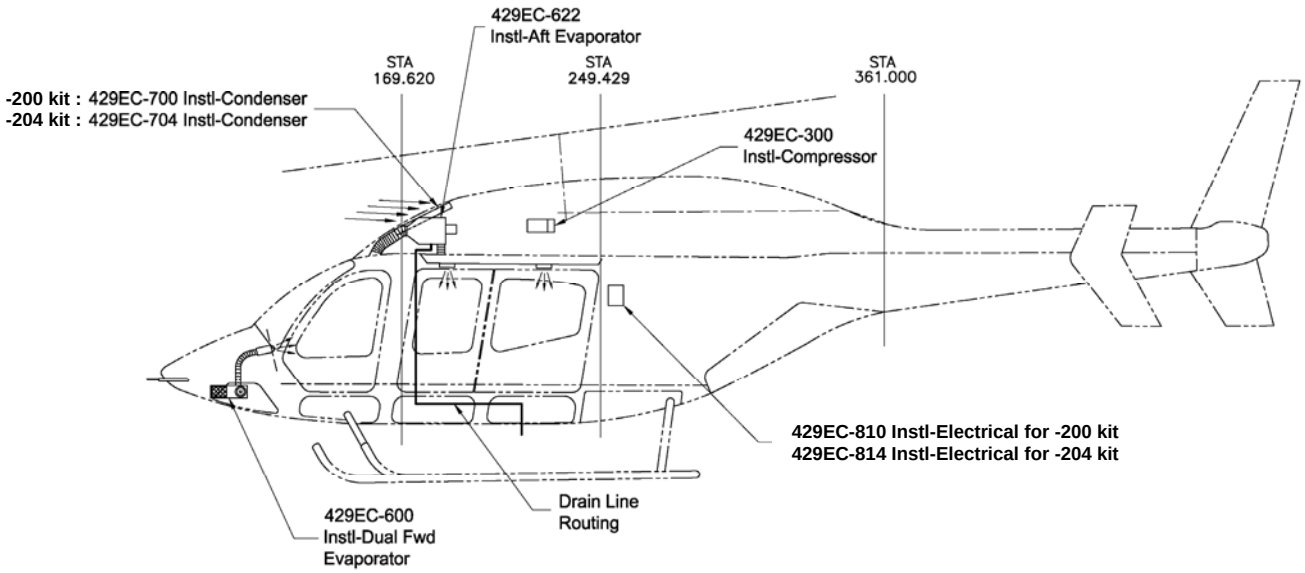


Figure 9: Layout of Air Conditioner Features, Dual Evaporators (Side View)

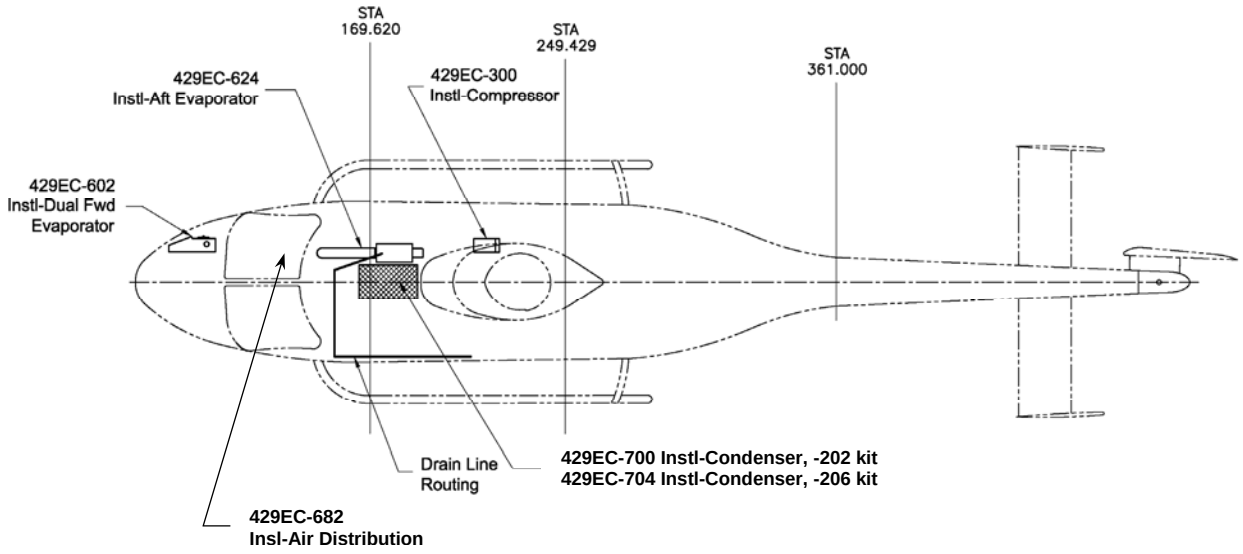


Figure 10: Layout of Air Conditioner Features, Single Evaporator (Top View)

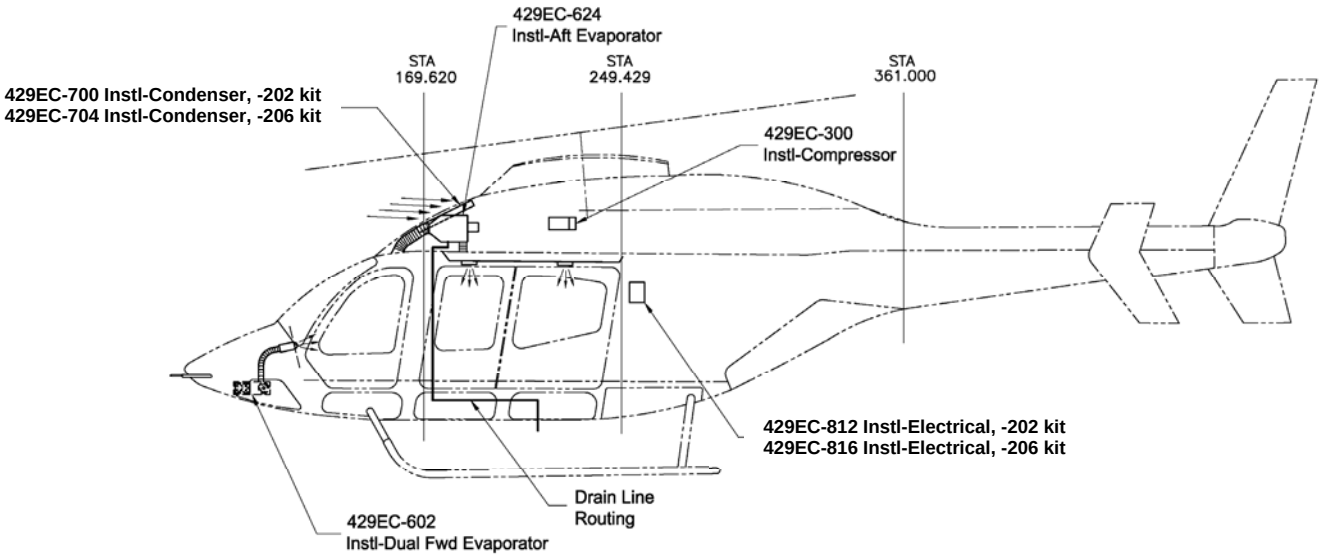
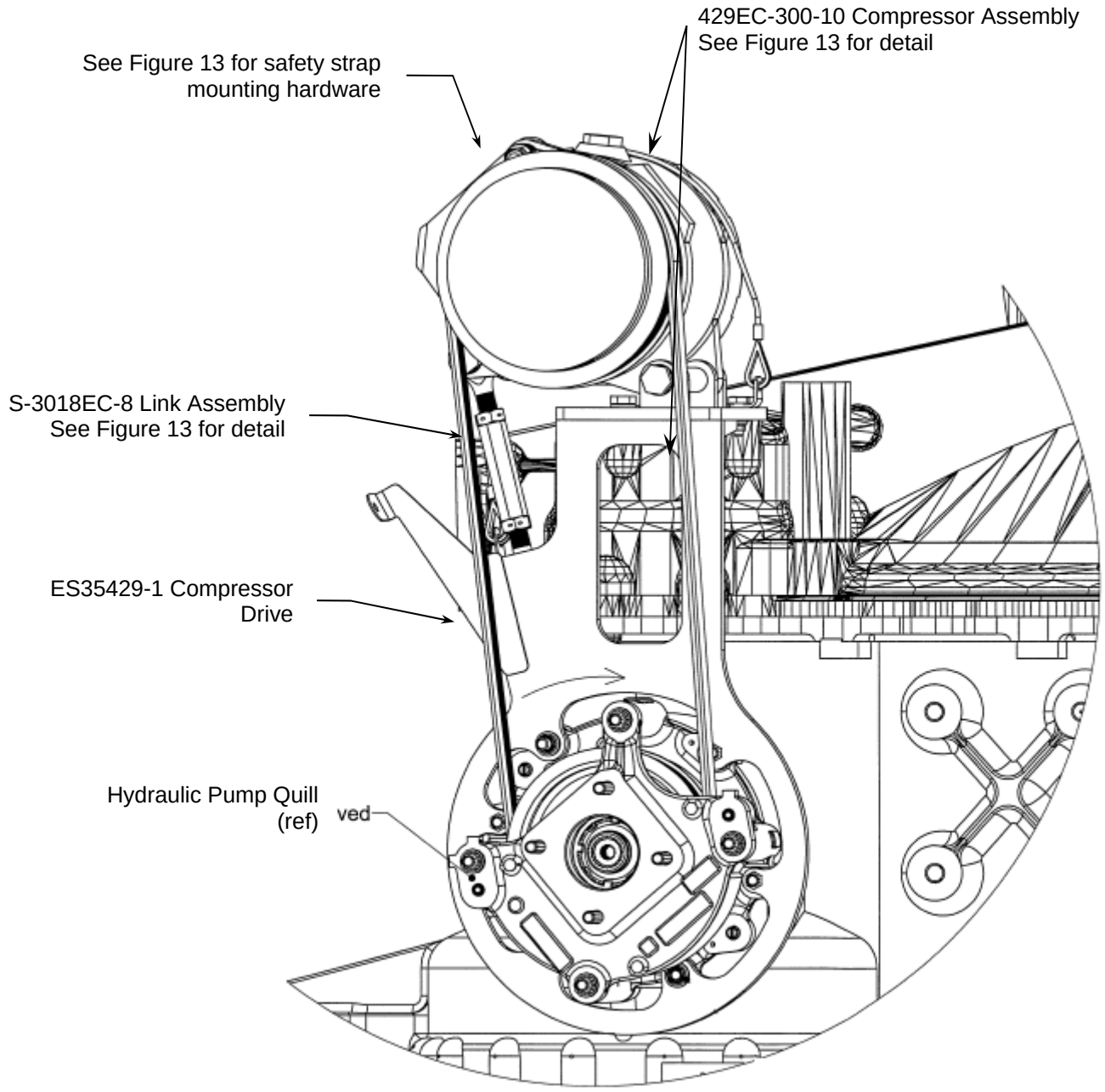
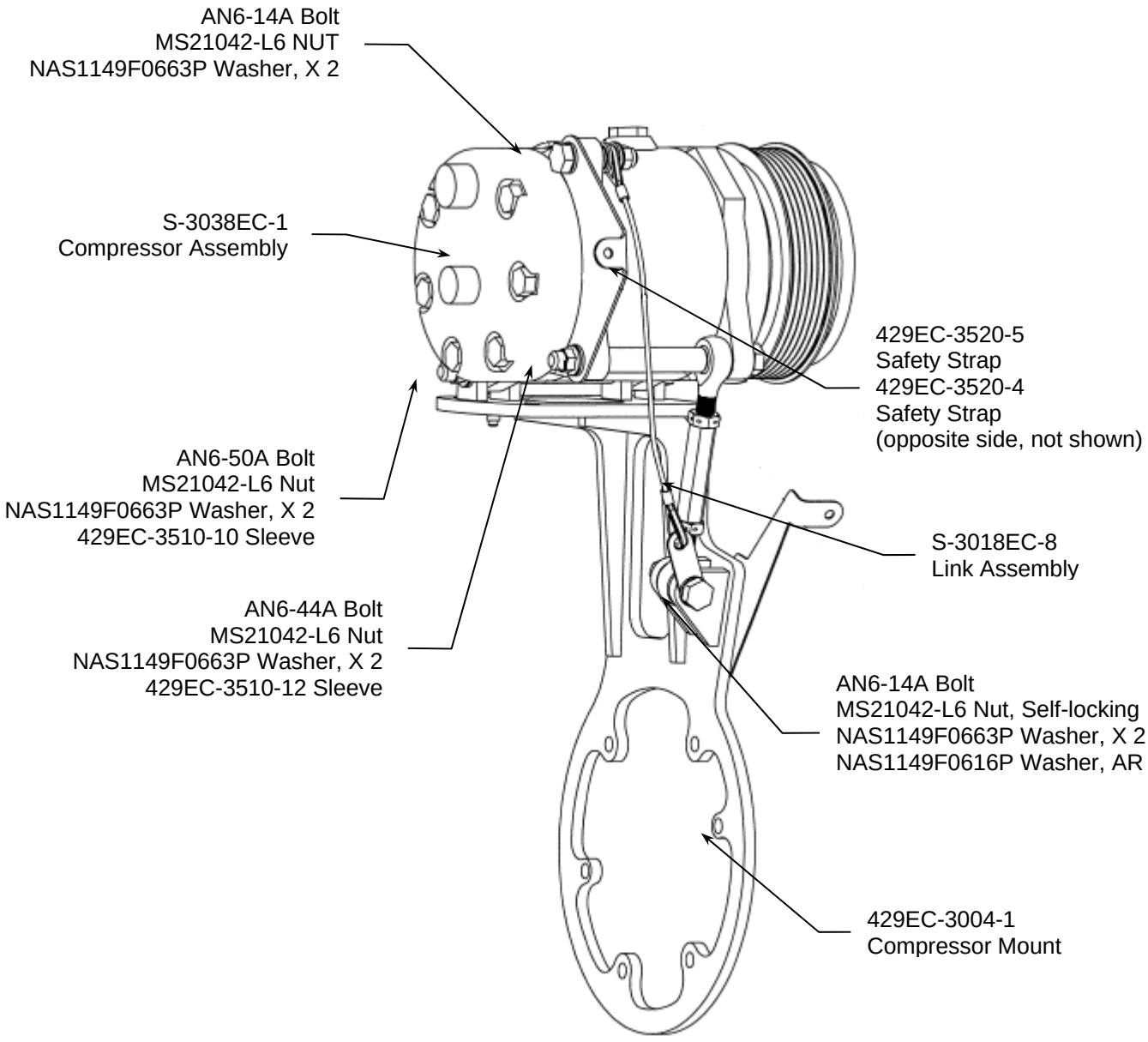


Figure 11: Layout of Air Conditioner Features, Single Evaporator (Side View)



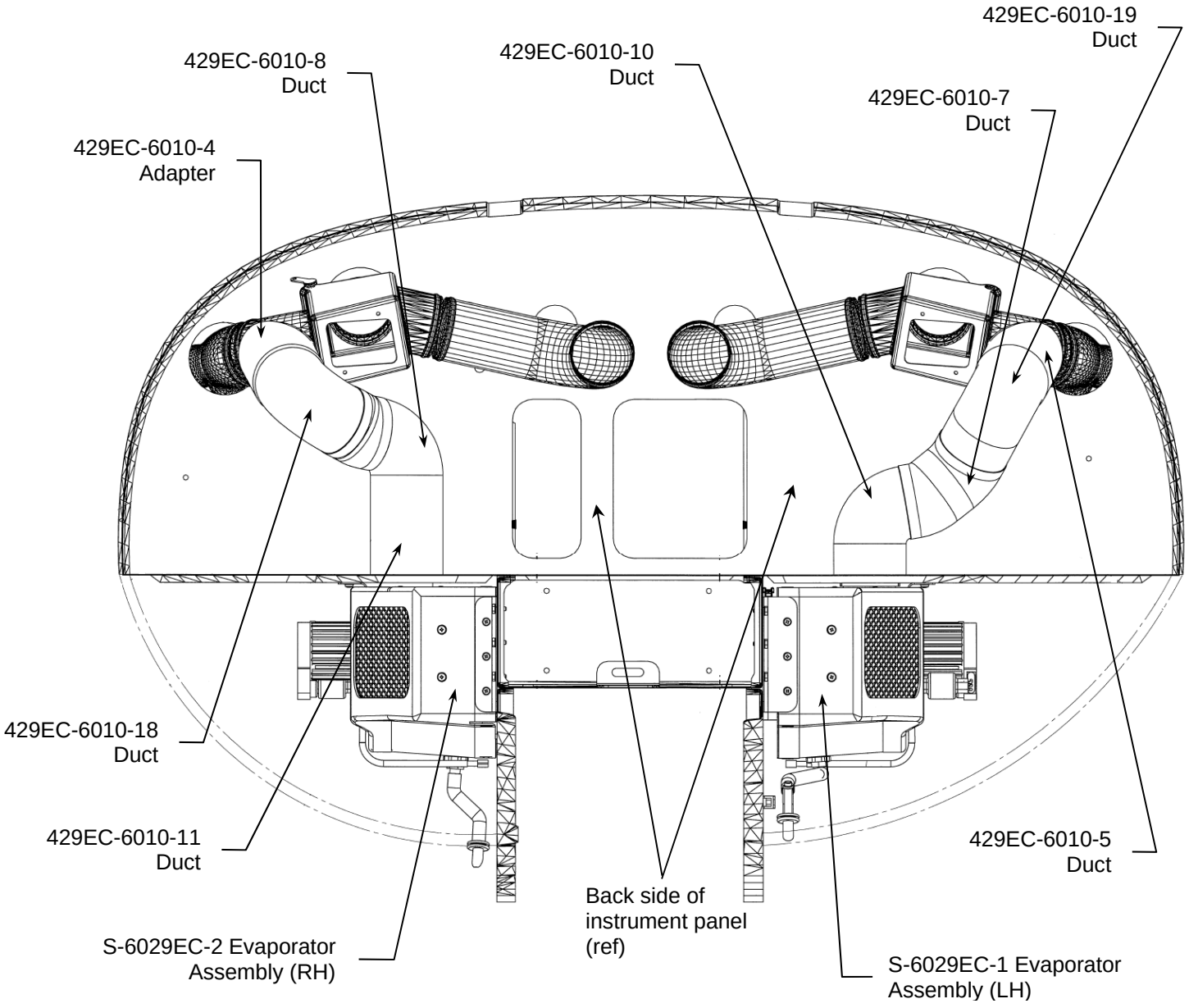
View Looking Aft R/H side
(Hydraulic Pump and Quill Assy removed for clarity)

Figure 12: 429EC-300 Compressor Installation



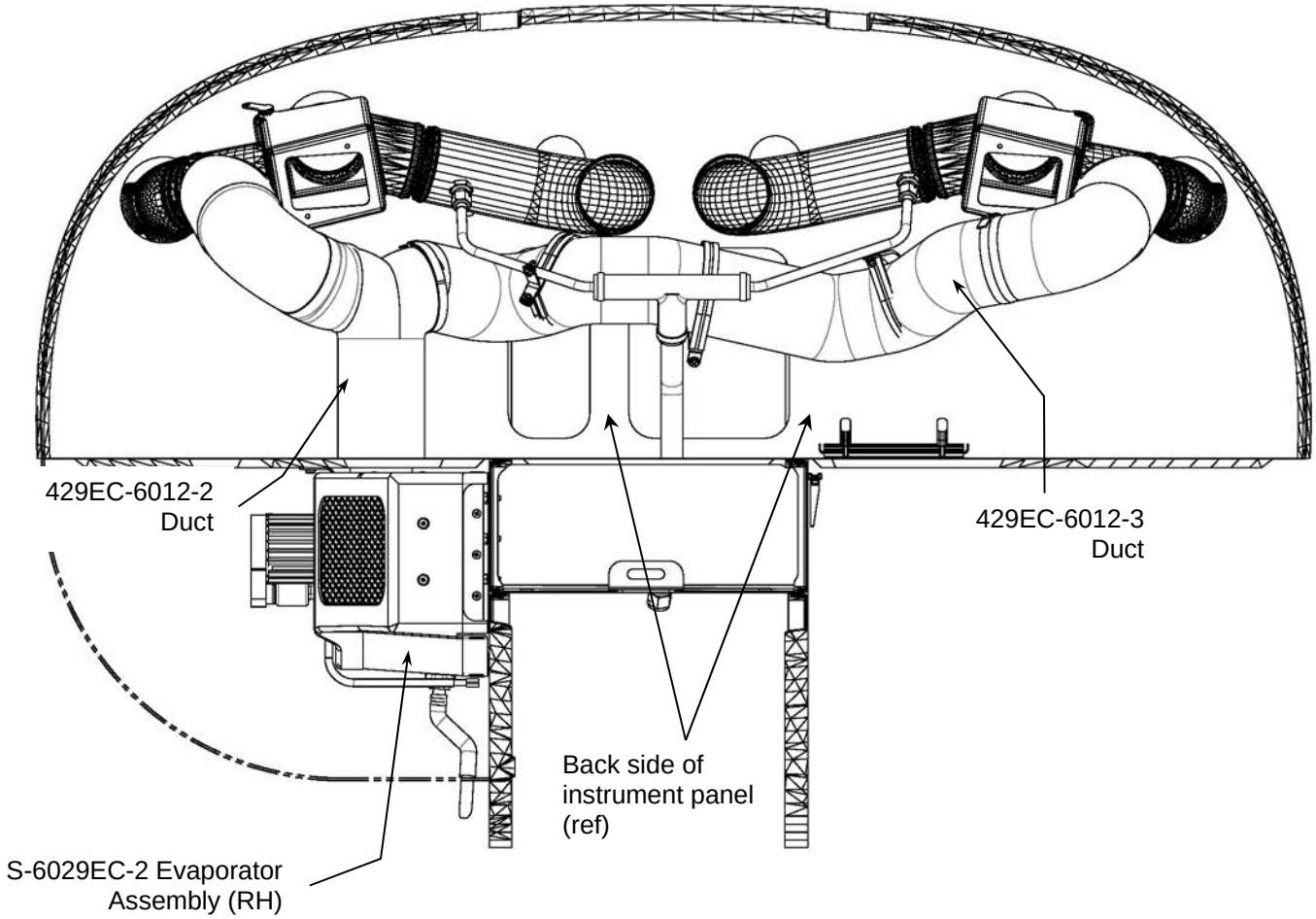
Detail View

Figure 13: 429EC-300 Compressor Assembly



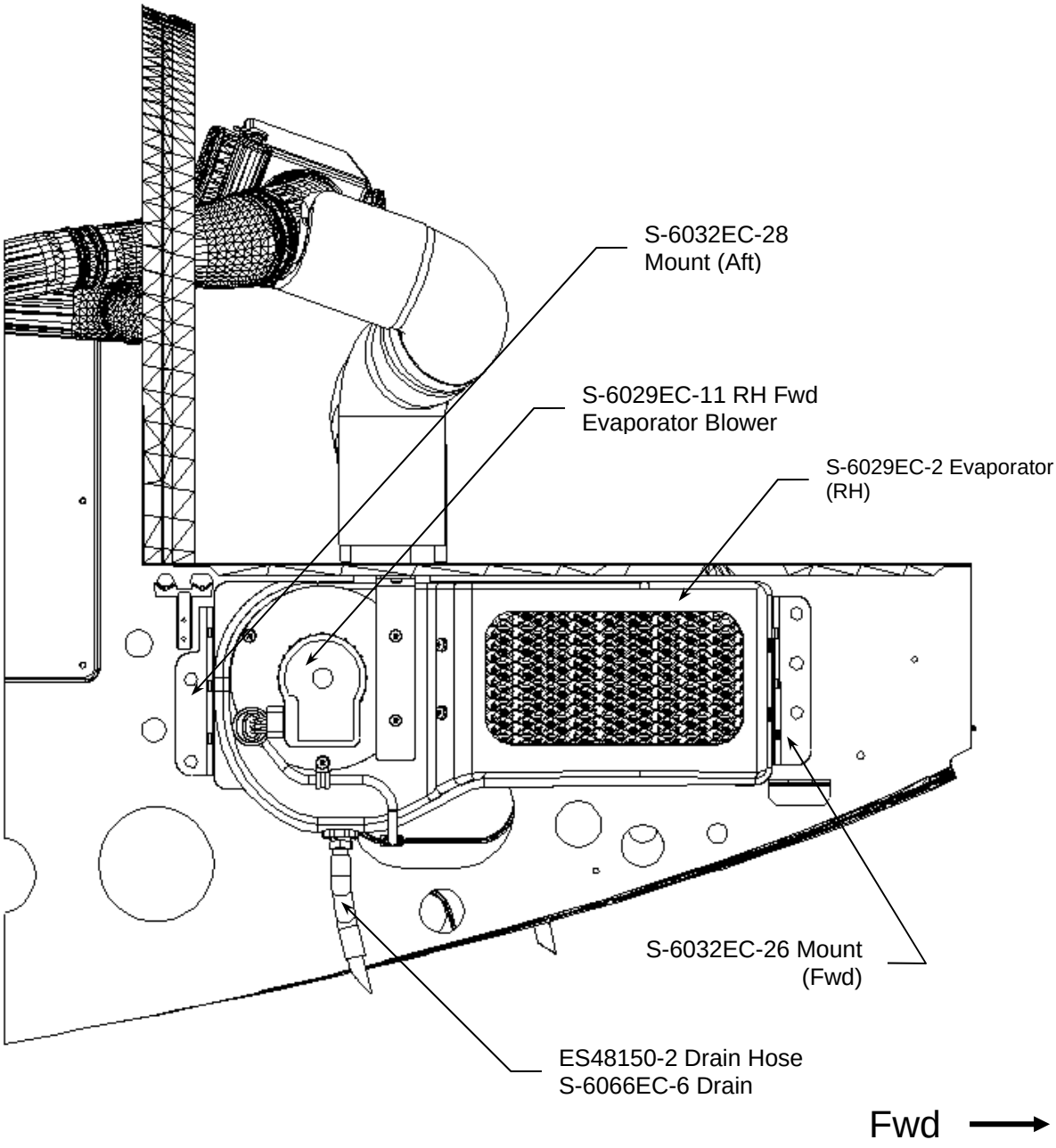
View Looking Aft from Front of Aircraft
(Aircraft structure removed for clarity)
See Figure 16 and Figure 17 for detail

Figure 14: 429EC-600 Dual Fwd Evaporator Installation



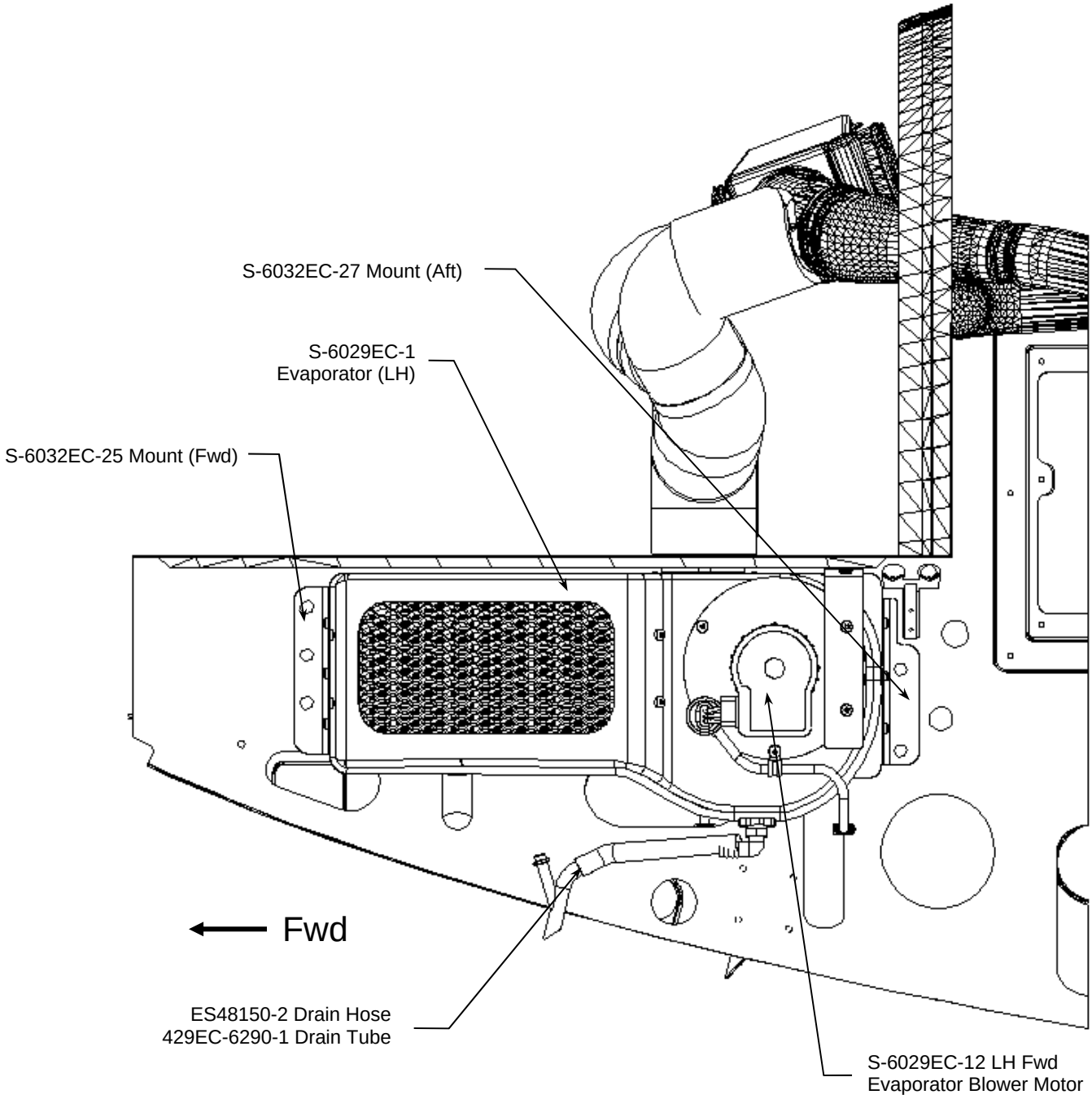
View Looking Aft from Front of Aircraft
(Aircraft structure removed for clarity)

Figure 15: 429EC-602 Single Fwd Evaporator Installation



View Looking Inboard from Aircraft Right
(Aircraft structure removed for clarity)
(Single Fwd Evaporator Configuration)

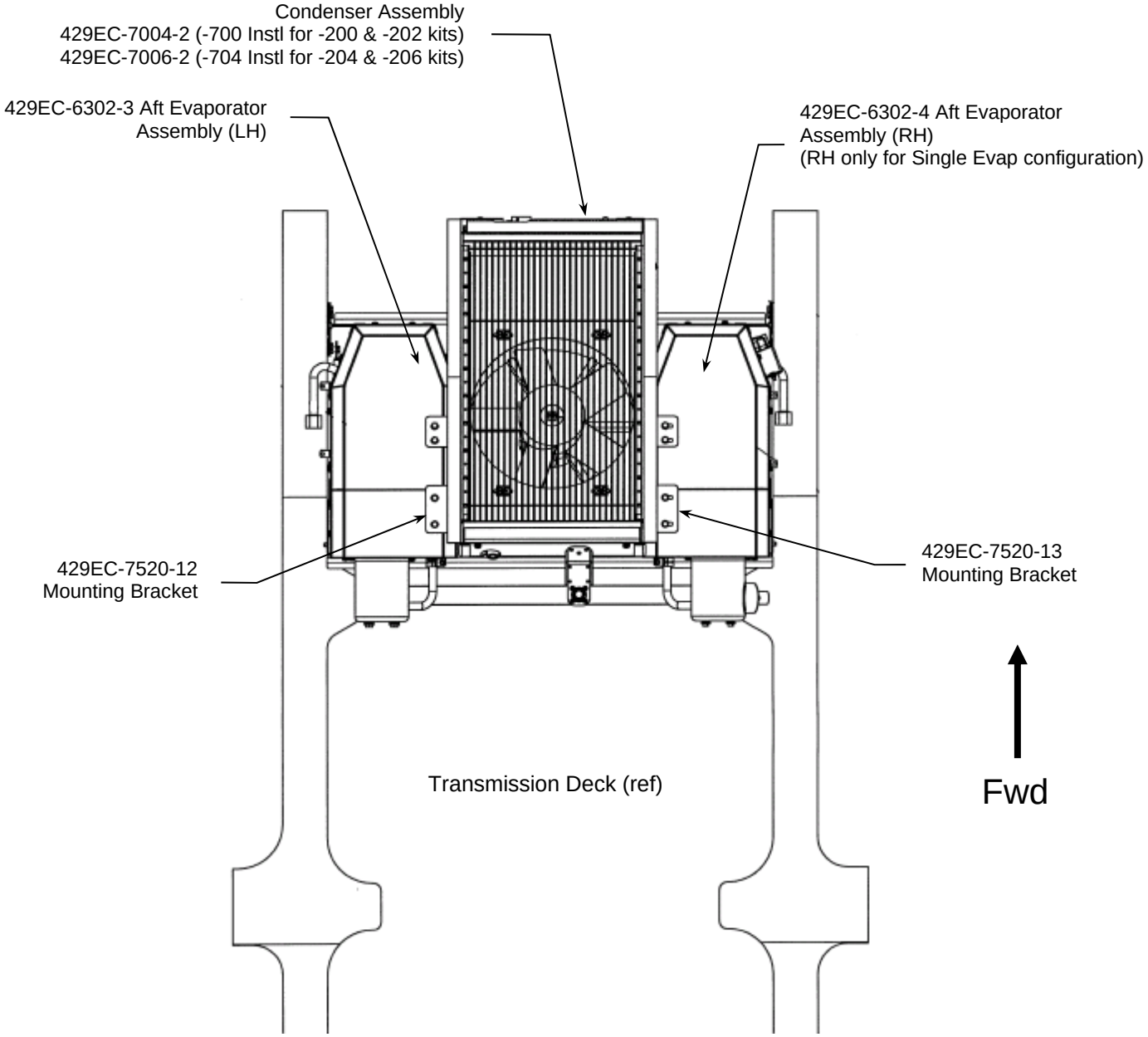
Figure 16: 429EC-600 and 429EC-602 RH Fwd Evaporator Installation



View Looking Inboard from Aircraft Left
(Aircraft structure removed for clarity)

Figure 17: 429EC-600 LH Fwd Evaporator Installation

(429EC-602 version would look the same except without the evaporator showing)



View Looking Down
(Transmission removed for clarity)

Figure 18: 429EC-622 Aft Evaporator and 429EC-700 / 429EC-704 Condenser Installation

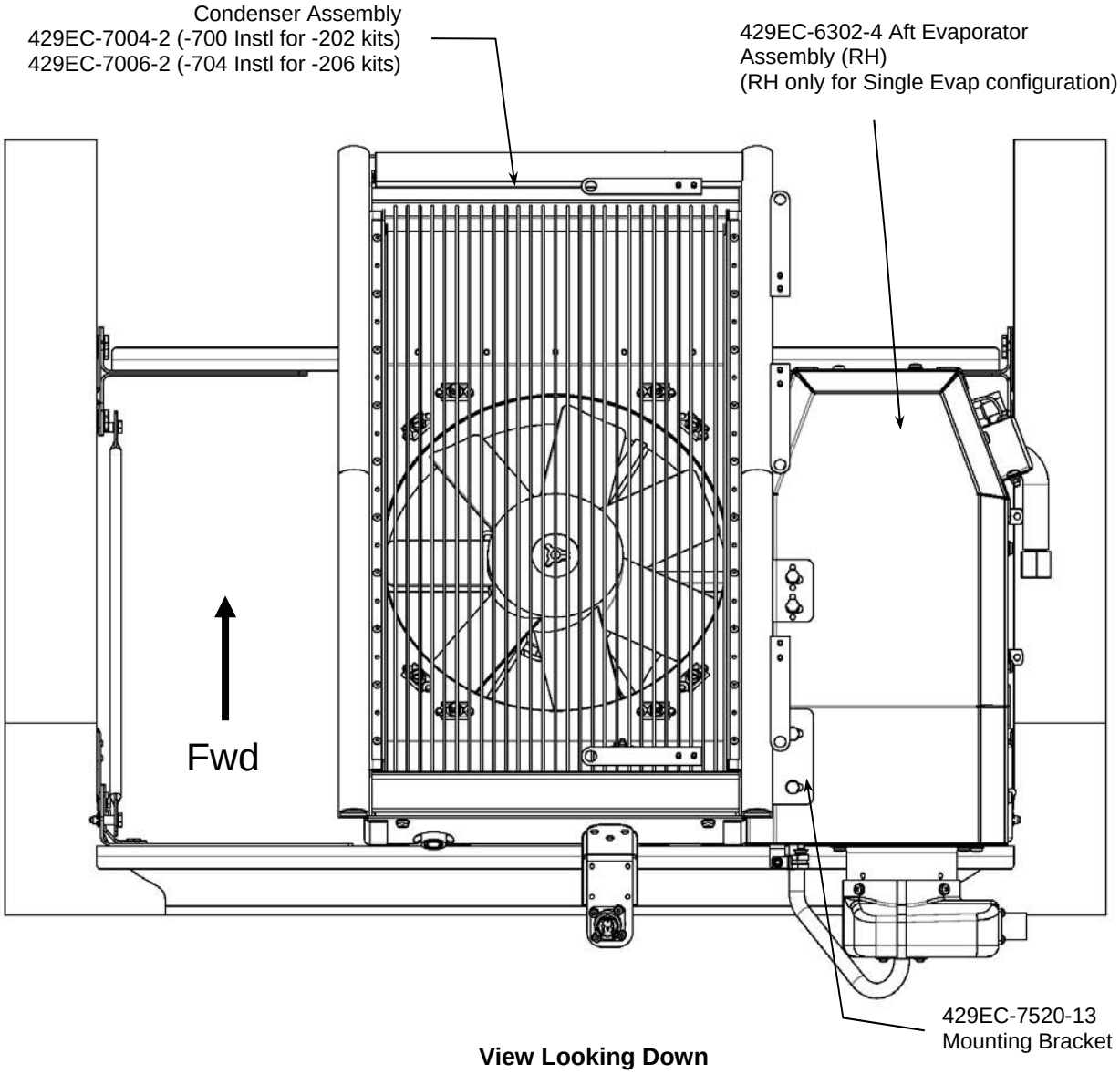


Figure 19: 429EC-624 Single Aft Evaporator and 429EC-700 and 429EC-704 Condenser Installation (-202, -206 kits)

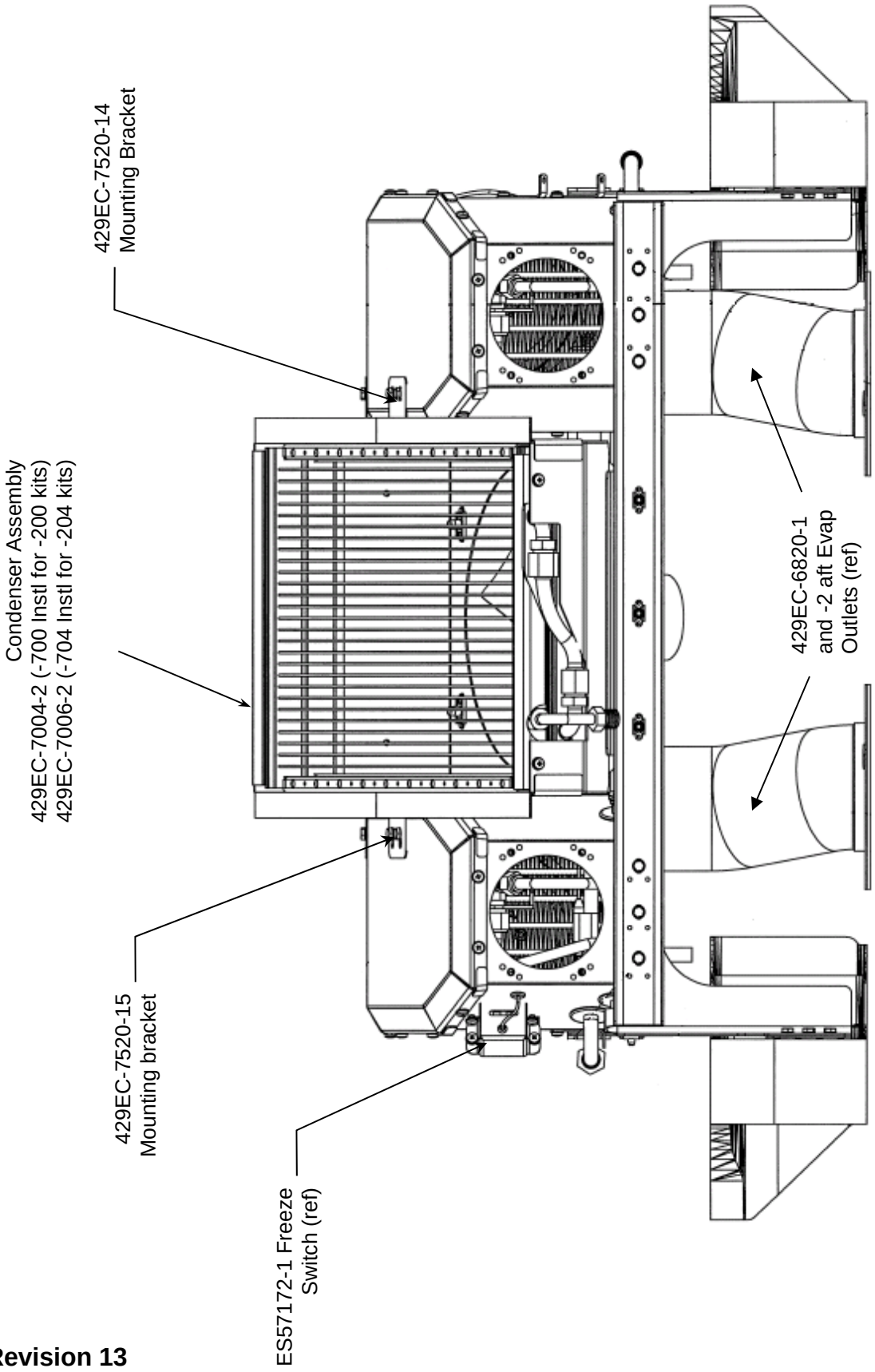


Figure 20: 429EC-622 Aft Evaporator and 429EC-700 and 429EC-704 Condenser Installation (-200, -204 kits)

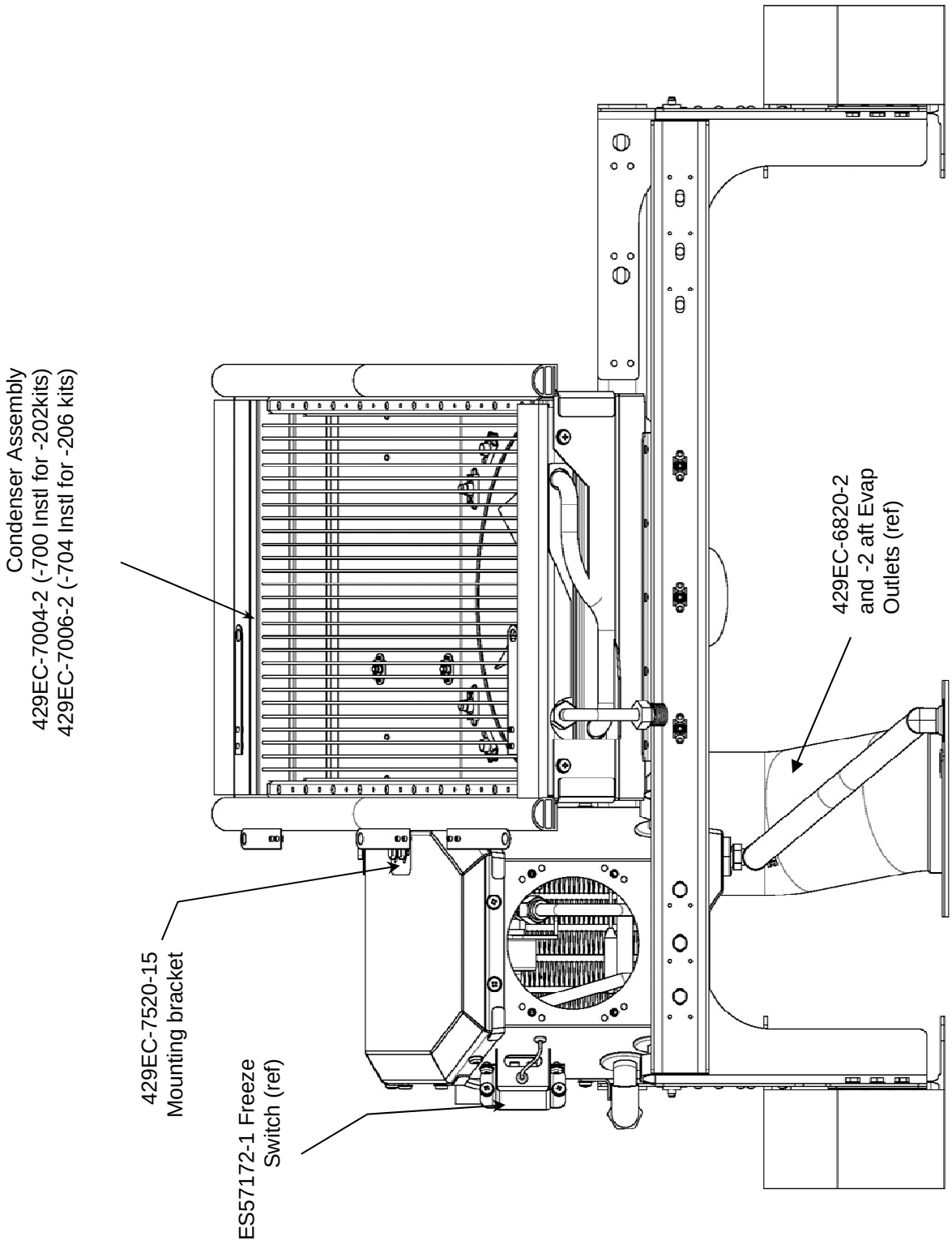
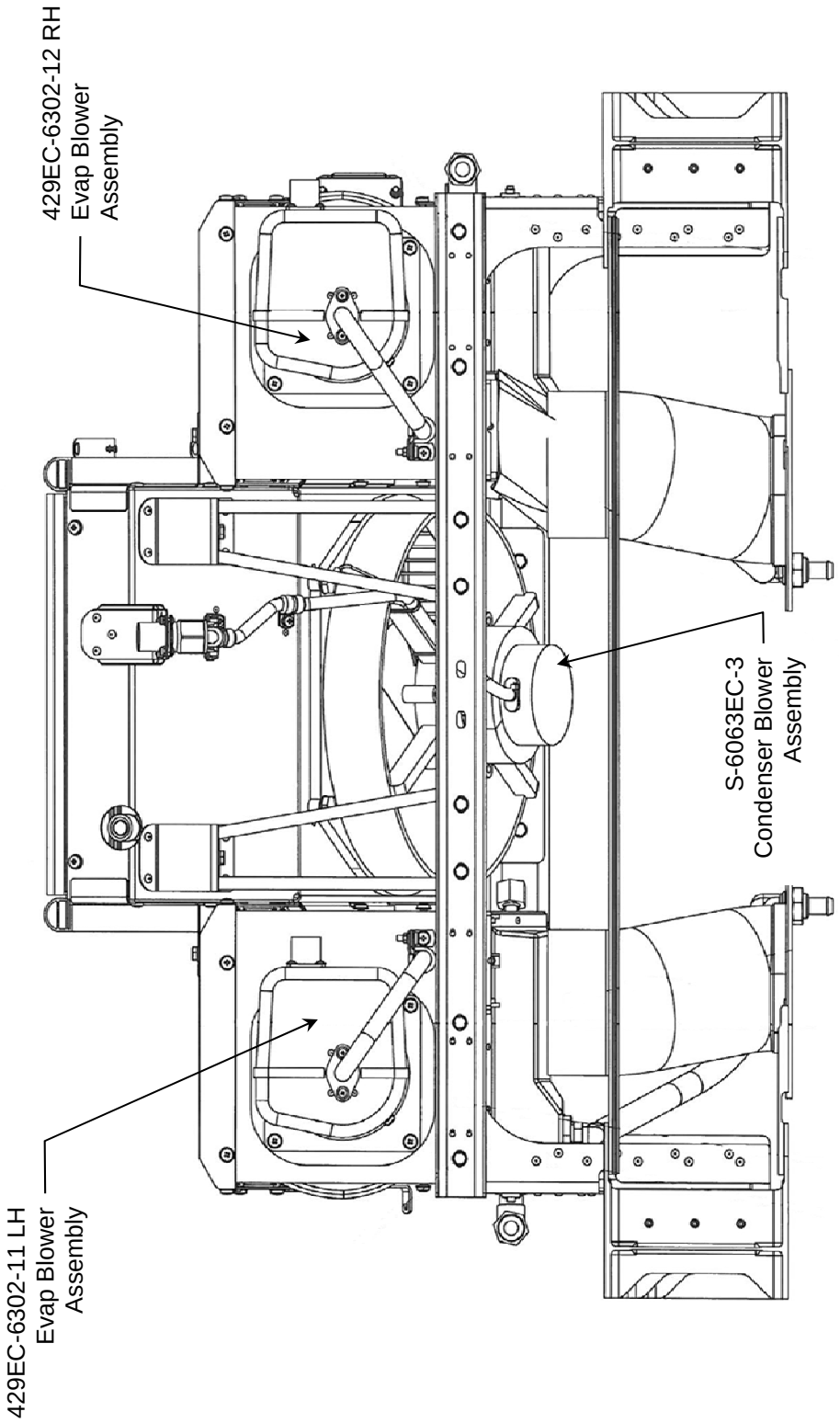
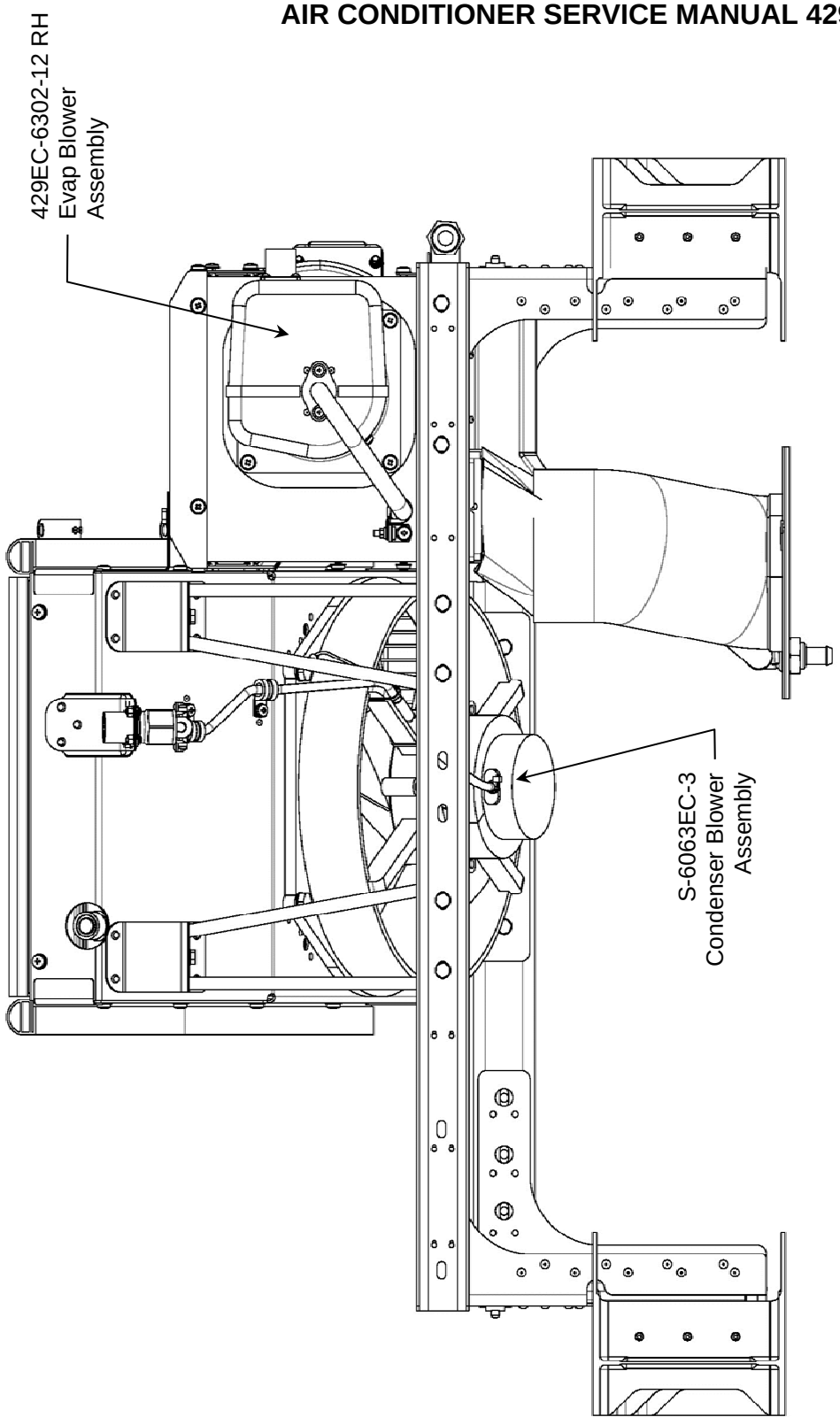


Figure 21: 429EC-624 Single Aft Evaporator and 429EC-700 / 429EC-704 Condenser Installation (-202, -206 kits)



(Transmission removed for clarity)

Figure 22: 429EC-622 Aft Evaporator and 429EC-700 Condenser Installation , -200 kit
View Looking Forward



(Transmission removed for clarity)

Figure 23: 429EC-624 Aft Evaporator and 429EC-700 Condenser Installation, -202 kit
View Looking Forward

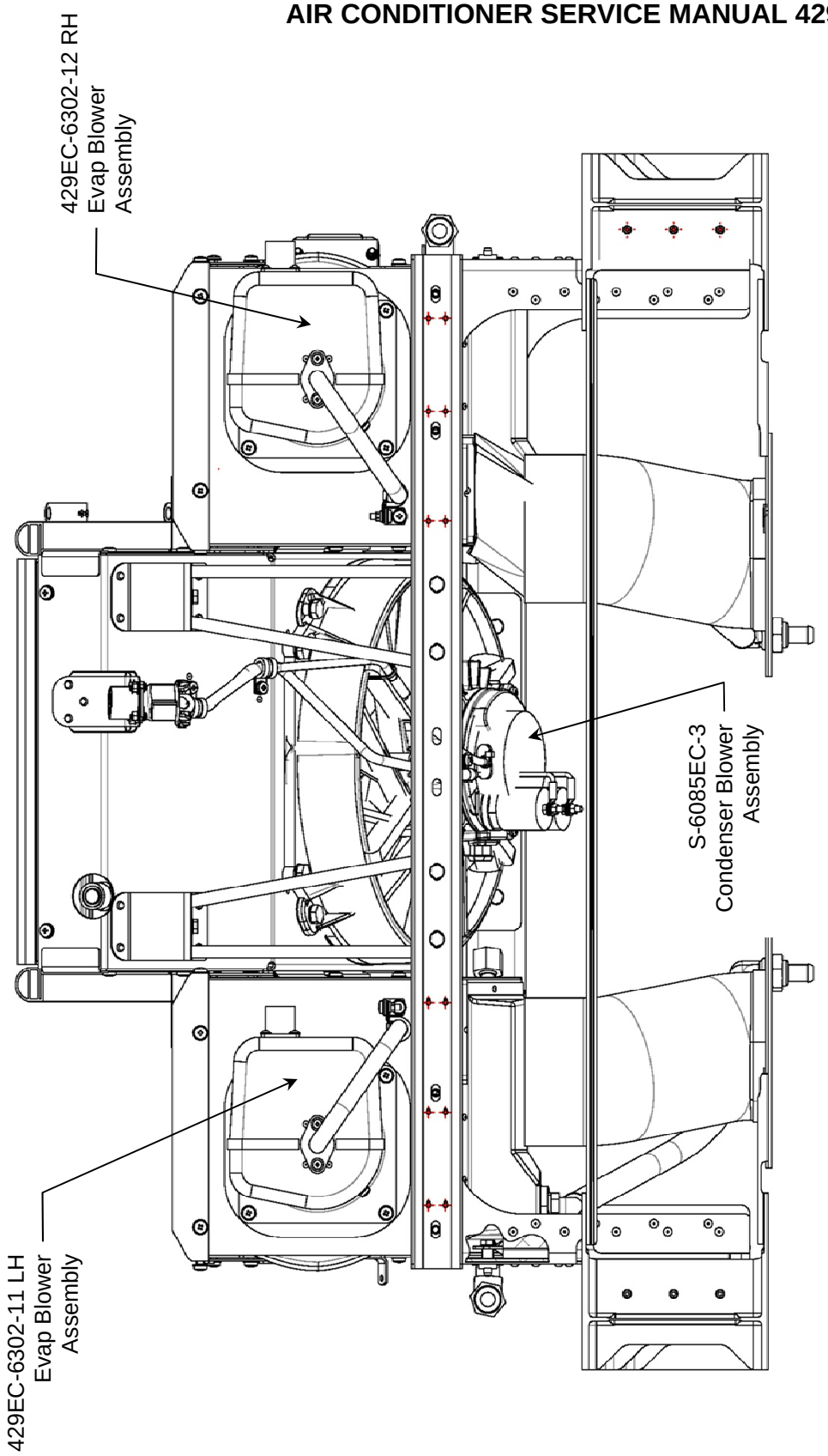


Figure 24: 429EC-622 Aft Evaporator and -704 Condenser Installation, -204 kit
View Looking Forward
(Transmission removed for clarity)

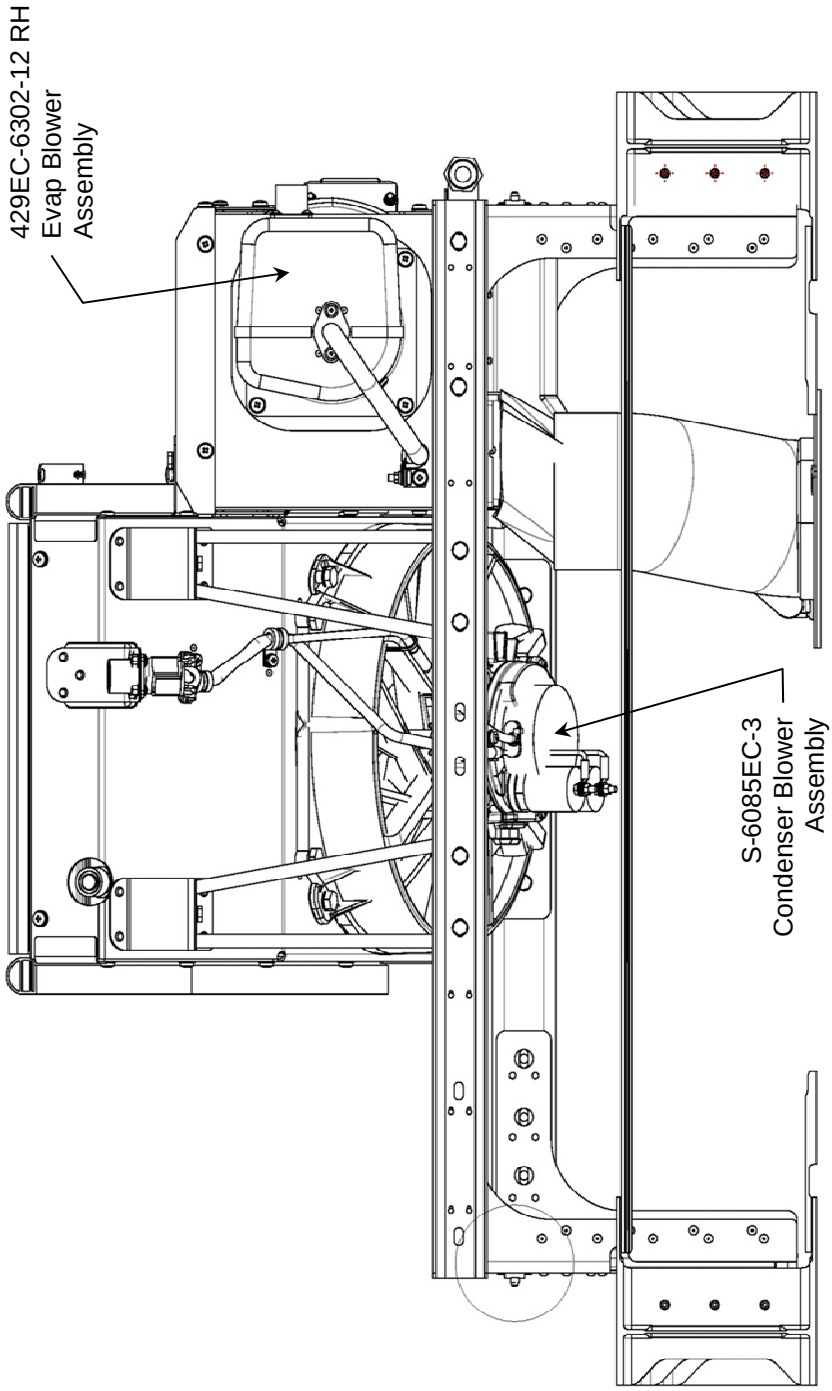
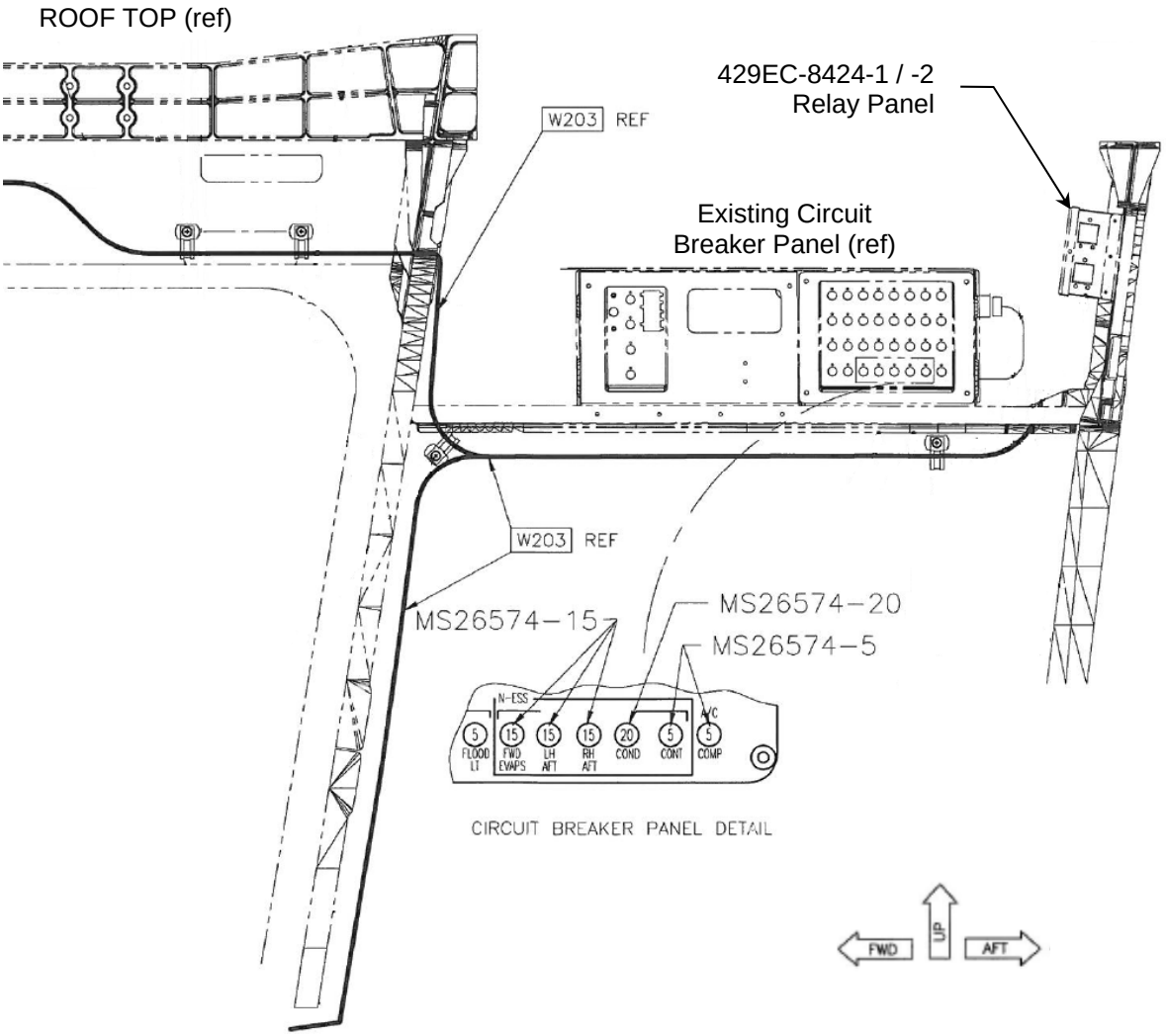
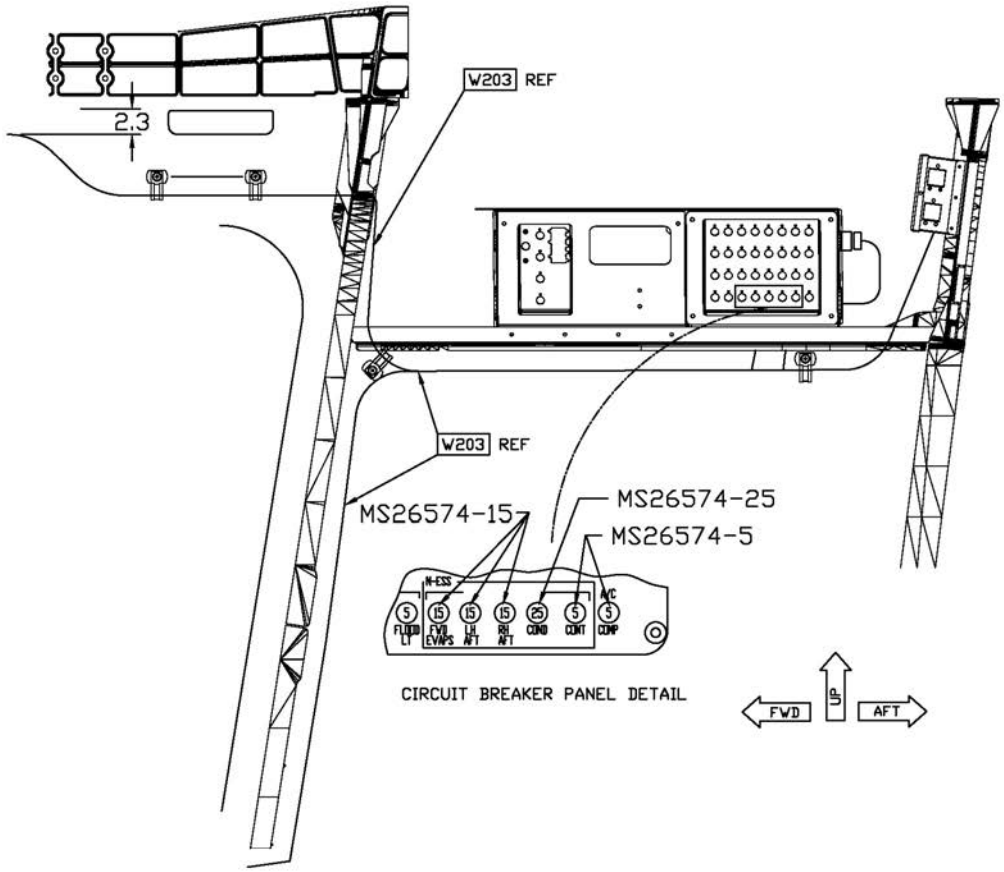


Figure 25: 429EC-624 Aft Evaporator and 429EC-704 Condenser Installation, -206 kit
View Looking Forward
(Transmission removed for clarity)



View Looking Outboard RH Side

Figure 26: -700 Relay Panel and Circuit Breaker for -200 and -202 Installation



View Looking Outboard RH Side

Figure 27: -704 Relay Panel and Circuit Breaker Installation

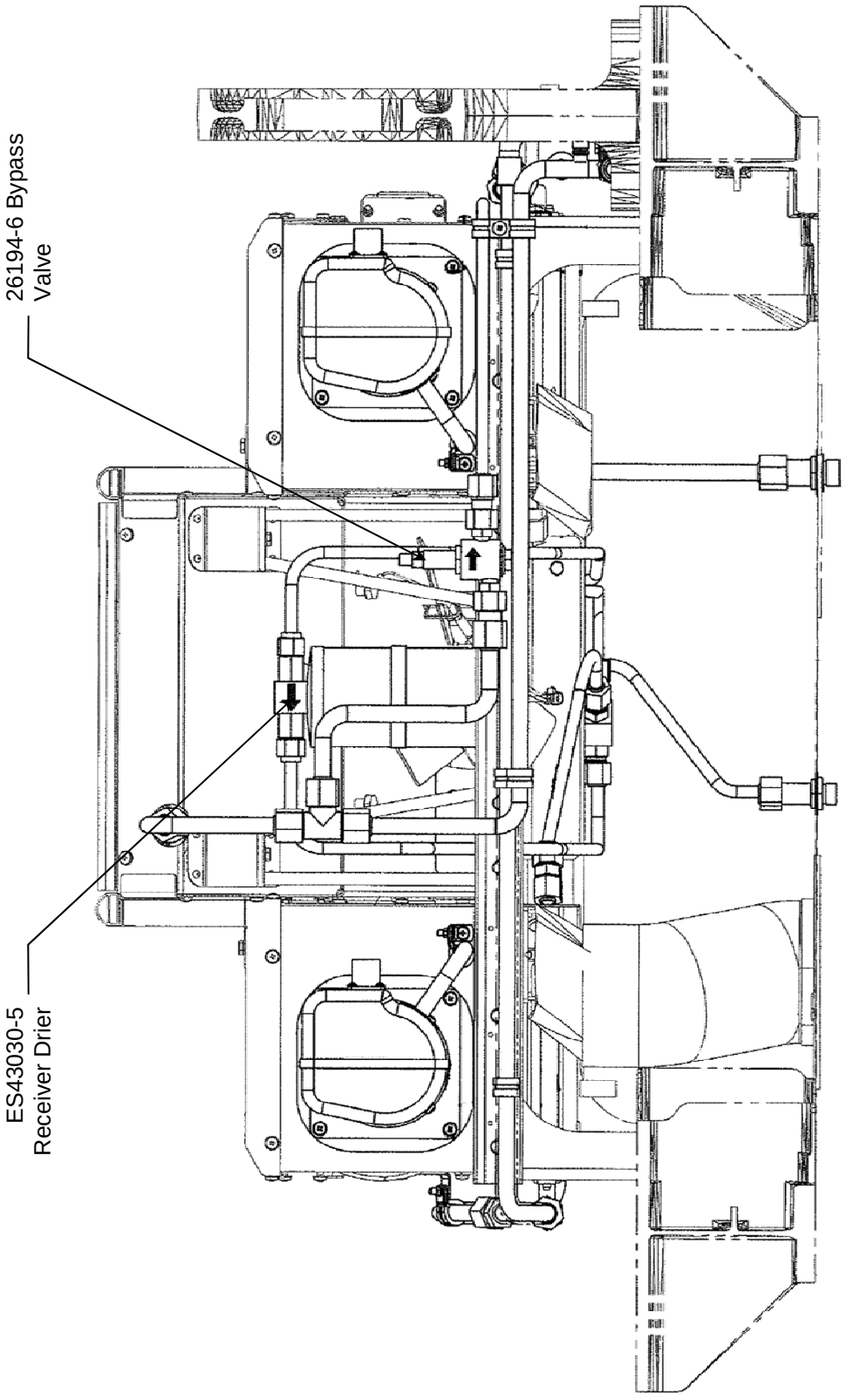


Figure 28: Receiver Drier and Bypass Valve Installation Detail View Looking Forward
(Transmission removed for clarity)

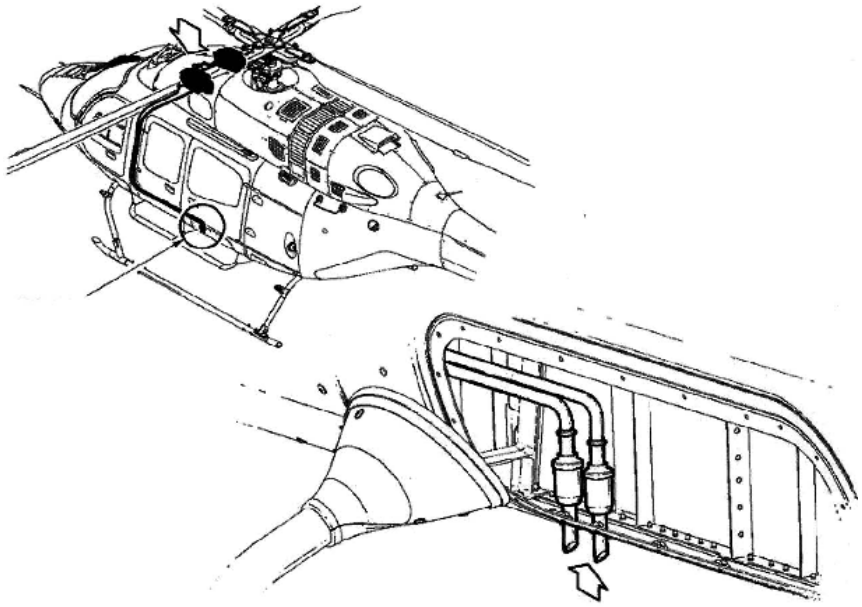


Figure 29: Aft Evaporator Drain Line Routing, Dual Evaporators

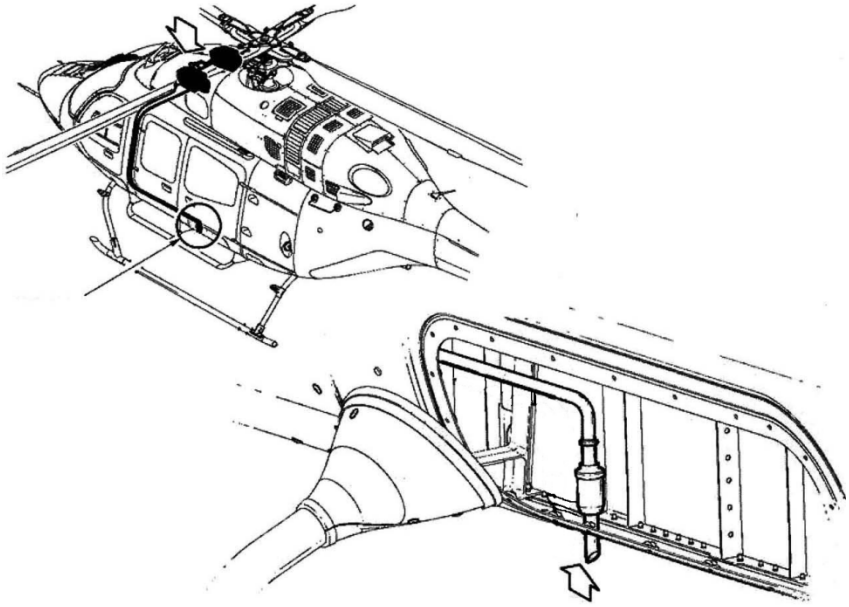


Figure 30: Aft Evaporator Drain Line Routing, Single Evaporators

CHAPTER 5
PLACARDS AND MARKINGS

1. Placard and Marking Information

All placards and markings associated with the installation of the air conditioner system are part of the type design of this helicopter. Please refer to the Bell Helicopter Instructions for Continued Airworthiness Manual for placards and markings information.

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CHAPTER 6
SERVICING

1. Safety Precautions

CAUTION

Refrigeration servicing should be performed by qualified personnel only. Check all local and federal regulations before servicing any refrigerant system or storage device.

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. However, certain precautions must me observed to ensure the safety of the equipment and any personnel servicing this system.

HFC R134A is stored in a liquid state. It will rapidly evaporate or sublimate when exposed to normal temperature and atmospheric pressure. This rapid evaporation can causes a severe drop in temperature. If liquid refrigerant comes in contact with the skin or eyes it may cause severe frostbite or blindness. Care must be taken to prevent liquid refrigerant from contacting the skin or the eyes.

WARNING

Safety glasses must be worn at all times when servicing the air conditioning system. Should any liquid refrigerant come in contact with the skin or eyes seek medical attention immediately even if the irritation ceases.

WARNING

To avoid a potential explosion NEVER weld, solder, steam clean, use a flame type leak detector, blow torch, bake on aircraft finish, or use excessive heat on, or in the immediate area of refrigerant lines or supply tanks while they are closed to the atmosphere.

WARNING

Refrigerant servicing must be performed in a well-ventilated area to minimize inhalation of the refrigeration gas.

2. Servicing Information

CAUTION

Refrigeration servicing should be performed by qualified personnel only.

NOTE

A list of suggested servicing equipment is provided later in this chapter.

2.1 Servicing Procedure using a Service Cart

A. Connect the servicing manifold to the servicing ports located on the forward R/H side of the transmission deck. BLUE for low pressure or “Suction” and RED for high pressure or “Discharge.”

B. After the quick disconnect fittings have been attached to the servicing ports, tighten the knobs on the back of the fittings to engage the Schrader valves located inside the charging ports.

NOTE

The Schrader valves inside the charging ports MUST be engaged to allow servicing of the air conditioner system.

C. Connect the YELLOW line in the center of the manifold to the vacuum pump. Turn the vacuum pump on and open both valves on the charging manifold. Decreasing the pressure in the closed system to -29.40 InHg causes the moisture in the system to vaporize allowing it to be drawn out by the vacuum pump. Removal of all moisture is crucial to the operation of the A/C system. Any moisture left in the system will be turned into ice causing undesired operation or blockage of one or more expansion valve. Allow the vacuum pump to draw against the system for a minimum of ONE HOUR.

NOTE

Due to a drop in atmospheric pressure with an increase in altitude, the normal vacuum reading will drop 1" (1 kg/cm) for each 1000 ft of altitude gained e.g., Sea Lever Reading = 10 InHg, reading at 1000 feet above sea level = 9 InHg.

D. After the system has been evacuated, turn both valves on the manifold assembly to the "OFF" position and switch the vacuum pump off. Allow the system to hold the vacuum for a minimum of ONE hour to check for vacuum leaks. If the system will not hold the vacuum, the system may have a fitting leak. It may be necessary to charge the system with one to two pounds of refrigerant and conduct a leak check using an electronic leak detector.

CAUTION

To ensure trouble free operation the system must be leak free.

E. After the leak check has been performed evacuate the system for a minimum of ½ hour before charging per the levels below:

429 air conditioning system with dual Fwd evaporators, 2.7 lbs (1.2247 Kg) of refrigerant.
429 air conditioning system with single Fwd evaporator, 2.5 lbs (1.1340 Kg) of refrigerant.

NOTE

Static charging is the most accurate and safest way to charge an air conditioning system. To accomplish this all 2.7 Lbs. of refrigerant must be charged into the system without the compressor engaged or the system operating. If the system must be serviced with the compressor running, servicing must be performed through LO (BLUE) side only! Please make sure that the HIGH (RED) side valve stays closed during this procedure and any time the system is operating. Never Charge through the Discharge or "HIGH" (RED) side of the system while the compressor is running as this may cause severe damage to the compressor Assy.

CAUTION

Operating the air conditioning system with a low refrigerant charge may cause severe damage to the compressor assembly.

F. After charging, perform a test run to ensure proper function of the Air Conditioning System.

2.2 Servicing Procedure without using a Service Cart

A. The following tools & materials will be required:
1. R134a Manifold Gauge Set
2. 3 pound bottle of R134a
3. Refrigerant Scale to weigh the refrigerant bottle
4. Vacuum Pump capable of maintaining 29in Hg of mercury at sea level
5. Ultra PAG oil

B. Charging procedure:
Note that the following steps 1 through 7 are to be accomplished while the aircraft and air conditioning system are "OFF".

1. Connect the servicing lines from the manifold gauges to the servicing ports located on the forward R/H side of the transmission deck. The BLUE port is for low pressure (suction) and the RED port is for high pressure (discharge).

2. After the quick disconnect fittings have been connected to the servicing ports, tighten the knobs on the back of the fittings to engage the Schrader valves located inside the charging ports. If the knobs are not properly tightened, the Schrader valve inside of the ports will not engage.

3. To ensure there is no air or moisture in the system, use the Manifold Gauges and Vacuum Pump to pull the system down on a vacuum continuously for a minimum of 1 hour. To perform this, connect the YELLOW line in the center of the manifold to the vacuum pump. Turn the Vacuum pump on and open both valves on the charging manifold until the pressure has decreased to 29.40 in Hg.

4. After 1 hour of vacuuming and while the vacuum pump is still working, close both valves on the manifold gauge set and watch the High and Low pressure gauges to ensure the system pressures remain constant or "vacuumed." If the system does not hold a vacuum it has a leak.

5. Once the system has been proven to be "Leak Free," disconnect the vacuum pump and connect the refrigerant bottle to the manifold gauge set.

6. Purge the line between the refrigerant bottle and manifold gauge by opening the knob on the refrigerant bottle. Then, loosen the line at the manifold slightly to allow the refrigerant to push the air out. This will verify that there is no air in the line.

7. Charge the system by opening the low side and high side valves which will allow

the initial charge of 2.0 pounds to be added. This can be measured and tracked by placing the bottle on a scale.

Note that the following step 8 is to be accomplished while the aircraft is running at 100% and the air conditioning system is "ON". Ensure that the High side (RED) is closed at all times while system is operating.)

8. Add the remainder of the required charge in 0.2 lb. increments by opening the low side (BLUE) slightly to allow the refrigerant to be drawn in. Allow two minutes to elapse between each addition of refrigerant. The amount entering the system can be verified by monitoring the scale as the refrigerant is added. Note that the compressor can be damaged if an excessive amount is added. Charge the system as listed below:

   429 air conditioning system with dual Fwd evaporators, 2.7 lbs (1.2247 Kg) of refrigerant.
   429 air conditioning system with single Fwd evaporator, 2.5 lbs (1.1340 Kg) of refrigerant.

WARNING

If charging is to be accomplished with the compressor engaged it must be accomplished through the LO (BLUE) side only. **Never Charge through the Discharge or "HIGH" (RED) side of the system while the compressor is running. This may cause severe damage to the servicing equipment and may cause personal injury or death**. Care should be taken to ensure the HIGH (RED) side valve stays closed during this procedure and any time the system is operating.

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. Maintaining a proper oil and refrigerant charge is critical to the life of the compressor assembly. Excessive system oil charge will reduce cooling performance.

2.3 Ambient Temperature effects on servicing

Running the system when the ambient temperature is below 80 ^{O}F will present unusual (low) suction and discharge pressures on system gauges. An overcharge condition is likely if the process described in section 2.1 is followed when the ambient temperature is below 80 ^{O}F. Running the air conditioning system when the outside air temperature is appreciably colder than the normal design operating temperatures may result in damage to the compressor. The following guidelines will provide means to mitigate the chances of system damage.

The following assumes that the system is either a freshly installed system or a previously operated system with a newly installed compressor.

Ambient temperature above 80^{O}F:

If the system was charged by refrigerant weight utilizing a charging station and the compressor has not been rotated since the oil and refrigerant were added, then manually rotate the compressor shaft clockwise a minimum of 10 full revolutions prior to running the compressor. A socket or wrench applied to the shaft nut is the recommended method. Always rotate clockwise to insure against loosening the compressor shaft nut.

If the system was charged per section 2.2 of this Chapter then disregard manual rotation.

Operate system normally, check for evaporator fan operation on both high and low speed settings. Insure that condenser fans are operating and airflow direction is correct.

Ambient temperature between 60 ^{O}F and 80 ^{O}F:

At these ambient temperatures system charging is to be accomplished by refrigerant weight. The method discussed in section 2.2 is not applicable at these condenser inlet temperatures. It is recommended that the aircraft heater be used during air conditioner system testing in order to provide a heat load to the evaporators.

Manually rotate the compressor shaft clockwise a minimum of 10 full revolutions prior to running of compressor. A socket or wrench applied to the shaft nut is recommended method. Always rotate clockwise to insure against loosening the compressor shaft nut.

Normal suction and discharge pressures are not expected under these conditions and the evaporators may be cold enough to cause the freeze switch to activate and the bypass valve to open and close in a cyclic pattern.

Even though the bypass valve may be cycling this test may be conducted for sufficient time to thoroughly check for condenser blower and fan operation. Check for evaporator fan operation on both high and low speed settings. Insure that the condenser fan is operating and the airflow direction is correct. Low side pressure may be observed to be higher than expected when the bypass valve is open.

Ambient Temperatures between 60 ^{O}F and 32 ^{O}F:

At these ambient temperatures system charging is to be accomplished by refrigerant weight. The method discussed in section 2.2 is not allowed at these condenser inlet temperatures. It is required that the aircraft heater, or another means of elevating the evaporator inlet air, be used during air conditioner system testing in order to provide a heat load to the evaporators.

It is recommended that the aircraft be warmed in a heated hangar immediately prior to running the air conditioner test. Upon removing the aircraft from the heated environment the test should be started within ten minutes or as soon as practical.

Manually rotate the compressor shaft clockwise a minimum of 10 full revolutions prior to running of compressor. A socket or wrench applied to the shaft nut is recommended method. Always rotate clockwise to insure against loosening the compressor shaft nut.

Normal suction and discharge pressures are not expected under these conditions and the evaporators may be cold enough to cause the freeze switch to activate and the bypass valve to open and close in a cyclic pattern.

At these ambient temperatures this test should not be conducted for more than 15 minutes. Testing the evaporator fan operation using the vent position prior to rolling out of the hangar and prior to running the air conditioner system is recommended. Check for evaporator fan operation on both high and low speed settings. Insure that condenser fan is operating and the airflow direction is correct.

Ambient Temperature less than 32 ^{O}F:

There is no safe way to operate the air conditioning compressor with ambient temperatures below 32 ^{O}F. Much of the system can be tested for proper operation even though the compressor cannot be run.

Charge the system by refrigerant weight only.

Manually rotate the compressor shaft clockwise a minimum of 10 full revolutions. A socket or wrench applied to the shaft nut is recommended method. Always rotate clockwise to insure against loosening the compressor shaft nut.

Temporarily disconnect the wire energizing the compressor clutch.

Run the aircraft and turn the switch to air conditioning. Check the condenser fan for operation and correct direction of airflow. Check evaporator fans for airflow on both high and low settings.

2.4 Purging procedure

If the system has become contaminated or if the amount of oil in the system is unknown, the following purge steps will prep the system for charging.

1. Remove all refrigerant from the system and discard. Ensure the charging station is cleaned afterwards from the contaminated oil and refrigerant.

2. Disconnect all tubing and hoses from the system components.

3. Purge all hoses and tubes using solvents specifically made for air conditioning systems such as Four Seasons Dura II A/C flush solvent (Isopropyl alcohol or Denatured alcohol are acceptable substitutes). A/C flushing equipment available from sources such as hecatinc.com is also recommended.

4. (This step does not need to be completed if the compressor is being replaced)

Remove the compressor from the aircraft, remove the drain plug and let the compressor drain. Rotate the compressor and allow it to drain again. Repeat this process until the compressor no longer has fluid inside. Do not use solvent to clean the compressor. This will damage and possibly destroy the compressor. Add 8.0 ounces of Ultra PAG oil to the compressor (see section 3.0 below) and ensure the O-ring on the drain plug is undamaged and retighten.

5. Purge the evaporators using air conditioner solvent (or equivalent i.e. Isopropyl alcohol, Denatured alcohol). Flush the evaporator in the same direction as refrigerant flow. The solvent should enter from the expansion valve side and exit on the discharge side until the solvent runs out clean.

6. Purge the condenser using air conditioner solvent (or equivalent i.e. Isopropyl alcohol, Denatured alcohol).

7. Flush the bypass valve with air conditioner solvent. Do not use pressure to force solvent through the valve.

8. Replace the receiver drier bottle. THIS IS CRITICAL AND MUST BE PERFORMED.

9. Reconnect all components. Replace O-rings as needed.

10. Reconnect the compressor hose and place the system on a constant vacuum for 1 hour minimum.

11. Service the system with fresh R134a refrigerant and run an operational check out.

3. Lubrication Information

SYSTEM DESCRIPTION	REFRIGERANT CHARGE		OIL CHARGE	
429 air conditioning system with dual fwd evaporators	2.7 lbs	1.2247 Kg	8.0 oz.	237 ml
429 air conditioning system with single fwd evaporator	2.5 lbs	1.1340 Kg	8.0 oz	237 ml

CAUTION

This system may be serviced with either Polyolester (POE) or Double End Capped Polyalkylene Glycol (DEC PAG, also known as Ultra PAG) oil. Polyalkylene Glycol oil 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 oil charge is continuously circulated by the refrigerant during the operation of the system. A quantity of oil is trapped by the compressor, as well as by other parts 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

Compressor Replacement – 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. (237 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 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.
>
> The total system oil charge is 8.0 fl. oz. (237 ml.) of Refrigerant Oil. The compressor is charged with 8.0 fl. oz. of oil at the factory.

NOTE

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

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.

4. System Leak Check

A. It is important to identify and eliminate refrigerant leaks at system connections to ensure trouble free operation of the air conditioning system.

A new or empty system can be pressurized with R134a at 50 psi (3.5 kgcm) to conduct a leak survey. Do not pressurize the system with 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. In some cases, leaking refrigerant gas may collect in low areas of the aircraft 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.

B. 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 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: Sun (Snap-on) Kool Kare QTech III, Robinair Model 34788, or equivalent)
Note: new equipment should meet SAE standard J2788

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

A. Refrigerant: This system is to be charged with Dupont (or equivalent) HFC R134a refrigerant.

Lubricant: Lubricant: Ultra PAG refrigerant oil. See Lubrication information, pg. 39.

B. O-Rings: This system utilizes the refrigerant HFC R134a. Consequently, the system must also utilize Highly Saturated Nitrile (HSN O-Rings) the insert O-Ring fittings (as previously described in this manual) require the use of Green HSN O-Rings while the TORQ LOK® Fittings (As previously described in this manual) require the use of the Black HSN O-Rings.

C. Loctite thread sealer 554 (or equivalent).

D. Torque-Seal Anti Sabotage Lacquer.

7. Suggested Spares List

ITEM	PART NUMBER
Binary Pressure Switch	ES57178-1
Drive Belt, Compressor	ES35429-1
Bypass Valve	ES26194-6
Receiver Drier Bottle	ES43030-5
Compressor Assembly	S-3038EC-1
Condenser Blower, pre-July 2015 Condenser Blower, July 2015 & newer	S-6063EC-3 S-6085EC-3
Blower Motor Assembly (LH Fwd Evaporator)	S-6029EC-11
Blower Motor Assembly (RH Fwd Evaporator)	S-6029EC-12
Blower Motor Assembly (LH Aft Evaporator)	429EC-6302-11
Blower Motor Assembly (RH Aft Evaporator)	429EC-6302-12

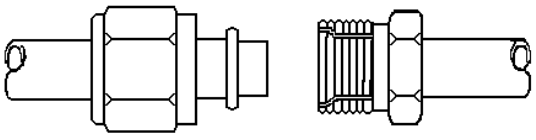
HSN O-Rings; Insert Type (Green)	
# 6 O-Ring	ES44010-2
# 8 O-Ring	ES44010-3
# 10 O-Ring	ES44010-4
HSN O-Rings; TORQ LOK® Type (Black)	
#6 O-Ring	ES44012-2
#8 O-Ring	ES44012-3
#10 O-Ring	ES44012-4

CHAPTER 7

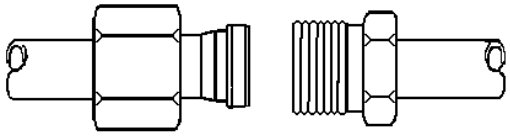
STANDARD PRACTICES AND INFORMATION

1. Fitting Torque Procedures and Values

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. Tighten the B-nut by hand and then torque as follows:

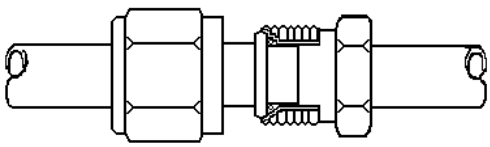
Tightening specifications
CAUTION: ALWAYS USE BACK UP WRENCH. EXCESSIVE TORQUE WILL DAMAGE THE JOINT, COMPROMISING THE INTEGRITY OF THE SEAL.

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

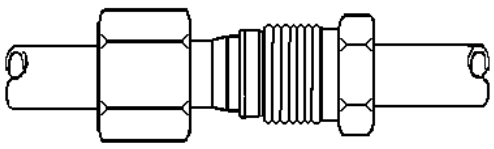
TORQ-LOK ® fittings (regardless of size): Hand tighten, then turn an additional 30 deg.

DO NOT OVER TORQUE
ALWAYS USE BACK UP WRENCH

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.

2. Removal and Replacement of Forward Evaporator Blower Motor Assembly

Removal

CAUTION

It is recommended that battery and external power be disconnected before starting work. Care should also be taken to protect the chin bubble area from scratches while performing this task using a foam sheet or other protective measure.

A. Disconnect Molex connector located on motor controller from aircraft wiring.

CAUTION

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

B. Remove and retain six (6) screws from blower motor base (five (5) size 12 and one (1) size 8 screws).

C. Remove blower motor assembly from evaporator housing.

Installation/Replacement

CAUTION

It is recommended that battery and external power be disconnected before starting work. Care should also be taken to protect the chin bubble area from scratches while performing this task using a foam sheet or other protective measure.

A. Install new blower motor assembly in the appropriate location.

B. Ensure the blower motor assembly is supported while installing attachment hardware.

C. Reinstall six (6) mounting screws to the blower motor base.

D. Reconnect Molex connector located on motor controller to aircraft wiring.

E. After re-applying power, perform an operational check by switching the air conditioning control switch to the “BLOWER” position and operating the forward evaporator blower fan through its entire range of speed to ensure motor does not bind, chafe, or drag.

3. Removal and Replacement of Forward Evaporator Assembly

Removal

A. It will be necessary to discharge (evacuate) refrigerant from the system to remove or replace the forward evaporator assembly. Instructions on servicing and evacuating this system can be found in Chapter 6 of this manual.

CAUTION

Refrigerant servicing should be performed by qualified personnel only.

CAUTION

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

B. Remove the panel located on the underside of the aircraft nose to gain access to the fwd evaporator plumbing.

CAUTION

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

C. Disconnect the aircraft plumbing from the forward evaporator assembly and cap to prevent oil leakage.

D. Disconnect all ducting attached to forward evaporator blower outlet.

E. Disconnect drain hoses from bottom of evaporator assembly.

F. Disconnect evaporator assembly from aircraft wiring at the existing Molex connector located on the evaporator motor controller.

G. Remove attaching hardware from the forward evaporator assembly located on the forward and aft side of evaporator.

CAUTION

Be sure to support the evaporator assembly during removal to prevent damage to the aircraft or evaporator assembly.

H. Once attaching hardware has been removed the evaporator may be removed from the aircraft.

Installation/Replacement

CAUTION

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

CAUTION

Refrigerant servicing should be performed by qualified personnel only.

A. Install evaporator assembly in the appropriate location.

B. Ensure the evaporator assembly is supported while installing attachment hardware.

C. Reinstall attachment hardware to attach the forward evaporator assembly on to the forward and aft side of the evaporator.

D. Reconnect Molex connector located on evaporator motor controller.

E. Reconnect the drain hoses to the bottom of the evaporator assembly.

F. Reconnect all ducting attaching the forward evaporator blower outlet.

CAUTION

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

G. Reconnect the aircraft plumbing to the forward evaporator assembly.

H. Replace all O-Rings before connecting refrigerant plumbing to evaporator fittings using a back-up wrench. Torque 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.

I. Reinstall the panel on the underside of the aircraft nose.

J. Service air conditioning in accordance with Chapter 6 of this manual.

4. Removal, Replacement and Adjustment of Compressor Drive Belt

Removal

A. It is necessary to access the upper transmission compartment to remove, replace, or adjust the compressor drive belt.

B. Cut safety wire on the compressor belt tensioning link and jam nuts, and loosen the respective jam nut(s).

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

D. Adjust belt tension by turning the barrel portion of the tension link until enough slack has been achieved to pull the belt off of the compressor pulley.

E. Gain access to the lower drive pulley in accordance with BELL service manual to remove belt from the hydraulic pump quill pulley.

Installation/Replacement

A. Install the drive belt on the compressor pulley and hydraulic pump quill pulley.

CAUTION

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

B. Adjust belt tension (See adjustment below).

C. Tighten the belt tensioning link jam nuts and safety wire using .032 safety wire.

D. Torque the compressor mounting bolts to 160 to 190 inch lbs. (18.08 – 21.47 Nm).

Adjustment

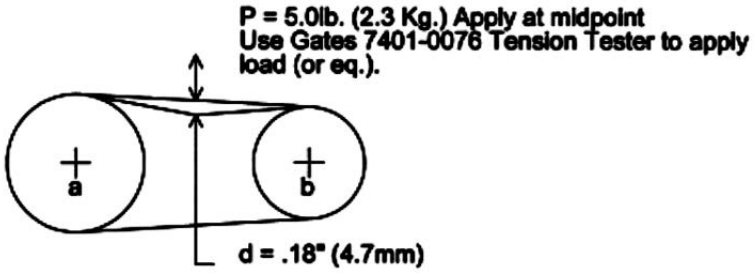
NOTE

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 is achieved when the belt deflects .18” when a 5lb load is applied as shown below. This can be achieved with the aid of a belt tensioning tool (Gates 7401-0076 Belt Tension Gauge or equivalent). This is the preferred method of obtaining proper belt tensioning.

B. An alternate method is to observe a .10” belt deflection when 5 lbs of force is applied at the midpoint of the belt.

The proper belt tension is achieved using the following procedures:



NOTE

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

5. Removal and Replacement of Compressor Assembly

Removal

A. It is necessary to access the upper transmission compartment to remove, replace, the compressor assembly.

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

C. 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

Refrigerant servicing should be performed by qualified personnel only.

D. Disconnect the refrigerant hoses from the suction and discharge ports located on the aft top of the compressor housing.

E. Remove attaching hardware for safety straps.

F. Remove the attaching hardware from the top of the belt tensioning link and the compressor mount assembly.

CAUTION

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

G. Remove the mounting bolt that attach the compressor body to the top of the compressor mount, and remove compressor assembly.

Installation/Replacement

A. Install the compressor assembly in the appropriate location.

B. Ensure the compressor assembly is supported while installing attachment hardware.

C. Reinstall the attaching hardware to the top of the belt tensioning link and the compressor mount.

D. Torque attaching hardware to 160 to 190 inch lbs. (18.08 – 21.47 Nm). Reinstall the attaching hardware for the safety straps.

E. 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).

F. Install the belt tension bolt and attaching hardware to the compressor, and torque to 160 to 190 inch lbs. (18.08 – 21.47 Nm).

G. Adjust the belt adjustment per the procedure shown on page 41.

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.

H. Recharge the refrigerant per the servicing instructions in Chapter 6 of this manual.

I. Reinstall all cowlings removed to access the compressor assembly.

6. Removal and Replacement of Aft Evaporator Assembly

Removal

CAUTION

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

A. It is necessary to access the upper transmission compartment to remove, replace, the aft evaporator assembly.

CAUTION

Refrigerant servicing should be performed by qualified personnel only.

B. It will be necessary to evacuate (discharge) the refrigerant from the system to remove and replace the aft evaporator assemblies. Instructions for servicing of the system are found in Chapter 6 servicing of this manual.

C. Disconnect blower outlet ducting from the evaporator assembly.

CAUTION

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

D. Disconnect the aircraft plumbing from the evaporator assembly and cap to prevent oil leakage.

E. Disconnect evaporator blower from existing aircraft wiring at connector located on aft portion of the aft evaporator assembly.

F. Remove and retain the attaching hardware located at the top and bottom of evaporator assembly and remove from aircraft.

Installation/Replacement

A. Install the evaporator assembly in the appropriate location.

B. Reinstall the attaching hardware at the top and the bottom of the evaporator assembly.

C. Reconnect the evaporator blower to the existing aircraft wiring at connector located on the aft portion of the aft evaporator assembly.

CAUTION

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

D. Reconnect aircraft plumbing for the evaporator assembly.

G. Replace all O-Rings before connecting refrigerant plumbing to evaporator fittings using a back-up wrench. Torque 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.

E. Reconnect the blower outlet ducting from the evaporator assembly.

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.

F. Service air conditioner in accordance with Chapter 6 of this manual.

G. Install any cowlings removed to gain access to the aft evaporator assemblies.

7. Removal and Replacement of Condenser Assembly

Removal

A. It is necessary to access the upper transmission compartment to remove, replace, the condenser assembly.

B. It will be necessary to evacuate (discharge) the refrigerant from the system to remove and replace the condenser assembly. Instructions for servicing of the system are found in Chapter 6 servicing of this manual.

CAUTION

Refrigerant servicing should be performed by qualified personnel only.

C. Disconnect the condenser blower assembly from the aircraft wiring at the existing connector.

D. Disconnect the aircraft plumbing from the condenser assembly and cap to prevent oil leakage.

E. Remove and retain the attaching hardware located on top and bottom of the condenser assembly and remove from the aircraft.

Installation/Replacement

A. Install the condenser assembly in the appropriate location.

B. Reinstall the attaching hardware on top and the bottom of the condenser assembly.

CAUTION

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

C. Reconnect the aircraft plumbing to the condenser assembly.

D. Replace all O-Rings before connecting refrigerant plumbing to evaporator fittings using a back-up wrench. Torque 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.

E. Reconnect the condenser blower assembly to the aircraft wiring at the existing connector.

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.

F. Service air conditioner in accordance with Chapter 6 of this manual.

G. Install any cowlings removed to gain access to the condenser assembly.

8. Removal and Replacement of Condenser Blower Assembly

Removal

A. It is necessary to access the upper transmission compartment and remove the condenser assembly to remove, replace, the condenser blower assembly. (See condenser assembly removal instructions in Paragraph 7 of this Chapter.

B. Remove and retain the attaching hardware and remove the condenser blower assembly from the condenser assembly. Discard any used locking cable or locking wire.

Installation/Replacement

A. Install the condenser blower assembly onto the condenser assembly.

B. For 429EC-200/202 air conditioning systems: reinstall the attaching hardware to attach the condenser blower assembly to the condenser assembly. Attach AS3510-0224K locking cable or MS20995C32 locking wire to fasteners as shown in Figure 5, installing per the double-twist method specified in AC 43.13-1B Chapter 7 Section 7.

C. For 429EC-204/206 air conditioning systems: reinstall the attaching hardware to attach the condenser blower assembly to the condenser assembly. Torque each bolt to 100-140 in-lbs. Place one anti-rotation retainer over top of each bolt head, orienting anti-rotation retainer full counterclockwise, as shown in Figure 7. Attach one snap ring to each bolt.

D. Reinstall the condenser assembly in accordance with Paragraph 7 of this Chapter.

9. Removal and Replacement of Receiver Drier

Removal

A. It is necessary to access the upper transmission compartment to remove, replace, the receiver drier.

B. It will be necessary to evacuate (discharge) the refrigerant from the system to remove and replace the receiver drier. Instructions for servicing of the system are found in Chapter 6 servicing of this manual.

CAUTION

Refrigerant servicing should be performed by qualified personnel only.

CAUTION

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

C. Disconnect the refrigerant lines from the receiver drier bottle and cap to prevent oil leakage.

D. Loosen, remove and retain the clamp(s) holding the receiver drier bottle.

E. After the retaining clamps and plumbing lines have been removed the receiver drier bottle may be removed from the aircraft.

Installation/Replacement

A. Install the receiver drier in the appropriate location.

B. Reinstall and tighten retaining clamps and plumbing lines to the receiver drier bottle.

CAUTION

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

C. Reconnect the refrigerant lines to the receiver drier bottle.

D. Replace all O-Rings before connecting refrigerant plumbing to evaporator fittings using a back-up wrench. Torque refrigerant line connections to 30–35 inch-lbs (3.4-4.0 Nm) for the #6 fitting.

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.

E. Service air conditioner in accordance with Chapter 6 of this manual.

F. Install any cowlings removed to gain access to the receiver drier.

10. Removal and Replacement of Bypass Valve

Removal

A. It is necessary to access the upper transmission compartment to remove, replace, the bypass valve.

B. It will be necessary to evacuate (discharge) the refrigerant from the system to remove and replace the bypass valve. Instructions for servicing of the system are found in Chapter 6 servicing of this manual.

CAUTION

Refrigerant servicing should be performed by qualified personnel only.

C. Disconnect the refrigerant lines from the bypass valve and cap to prevent oil leakage.

D. Remove and retain the two (2) screws on the bottom of the valve holding it in place.

E. De-pin the two (2) electrical splices connecting the bypass valve into the aircraft wiring.

F. Remove the bypass valve from the aircraft.

Installation/Replacement

A. Install the bypass valve in the appropriate location.

B. Re-pin the two (2) electrical splices connecting the bypass valve to the aircraft wiring.

C. Reinstall the two (2) screws on the bottom of the valve to hold it in place.

CAUTION

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

D. Reconnect the refrigerant lines to the bypass valve.

G. Replace all O-Rings before connecting refrigerant plumbing to evaporator fittings using a back-up wrench. Torque 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.

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.

E. Service air conditioner in accordance with Chapter 6 of this manual.

F. Install any cowlings removed to gain access to the bypass valve.

11. Removal and Replacement of Binary Switch

Removal

A. It is necessary to access the upper transmission compartment to remove, replace, the binary switch.

B. Disconnect electrical connectors from top of binary 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.

C. Unscrew switch from Schrader valve located on outlet tube from the compressor assembly.

D. Remove binary switch.

Installation/Replacement

A. Install the binary switch in the appropriate location.

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.

B. Screw the binary switch from the Schrader valve located on the outlet tube from the compressor assembly.

C. Reconnect the electrical connectors from the top of the binary switch.

D. Install any cowlings removed to gain access to the binary switch.

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	Corrective Action
System not Cooling (Evaporator blowers still operating)	System is low or empty of refrigerant	Evacuate the system, determine the origin of the refrigerant leak if applicable, and re-charge the system.
	Moisture or air in the system	Evacuate the system, replace the receiver drier, and place the system under a vacuum for a minimum of 30 minutes before recharging the system.
	Compressor	If the compressor has failed, it must be replaced.
	Compressor drive belt	If the compressor drive belt has failed it will need to be replaced and adjusted.
	By-pass valve	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.
	Condenser blower motor / fan assembly	Check to insure the condenser blower motor/fan assembly are receiving power, and the circuit breaker has not tripped; if the blowers still do not function, they may have failed internally and must be replaced.
	Condenser Blockage	Check to insure the condenser fins are clear and free of any blockage. This will cause higher than normal discharge pressure in the system.
System not cooling (Evaporator blowers not operating)	Air conditioner control circuit breaker tripped	Reset circuit breaker; if breaker will not reset, check for short in circuit.
	Forward or Aft evaporator blower circuit breaker tripped	Reset circuit breaker; if breaker will not reset, check for short in circuit.

Problem	Probable Cause	Corrective Action
System not cooling (Evaporator blowers not operating)	Forward and aft evaporator blower motor(s)	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
Loss of cooling limited to one evaporator	Expansion valve malfunction	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 must be replaced.
External moisture (Condensate) in the area of forward / aft evaporator	Leak in evaporator, or evaporator drainage system	Water noted in the area near the evaporator is normally caused by a loose, cracked, plugged, or disconnected drain line. To test, pour water into the face of the evaporator checking for proper drainage and note any leaks. **NOTE** The drain line consists of a tube which extends from the lower surface of the evaporators through the outer contour of the helicopter.
	The suction or low side of the evaporator refrigerant plumbing may be cold and will condense moisture.	Cover line with a layer of insulating cork tape.

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

2. System Schematics

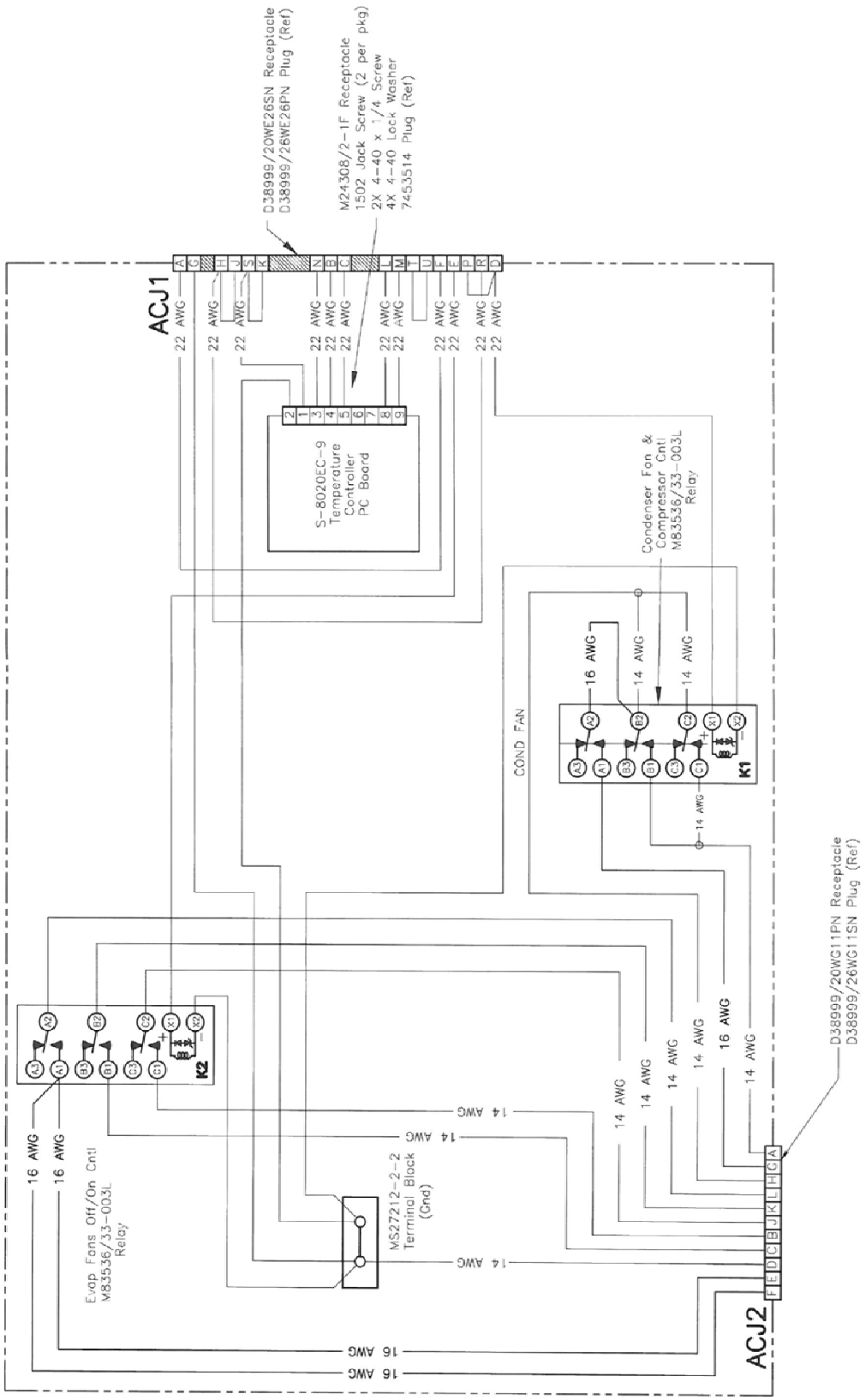


Figure 27: 429EC-8424-1 Relay Panel (Pre 2011)
Applies to 429EC-200 & -202 kits (S-6027EC Fwd Evap)

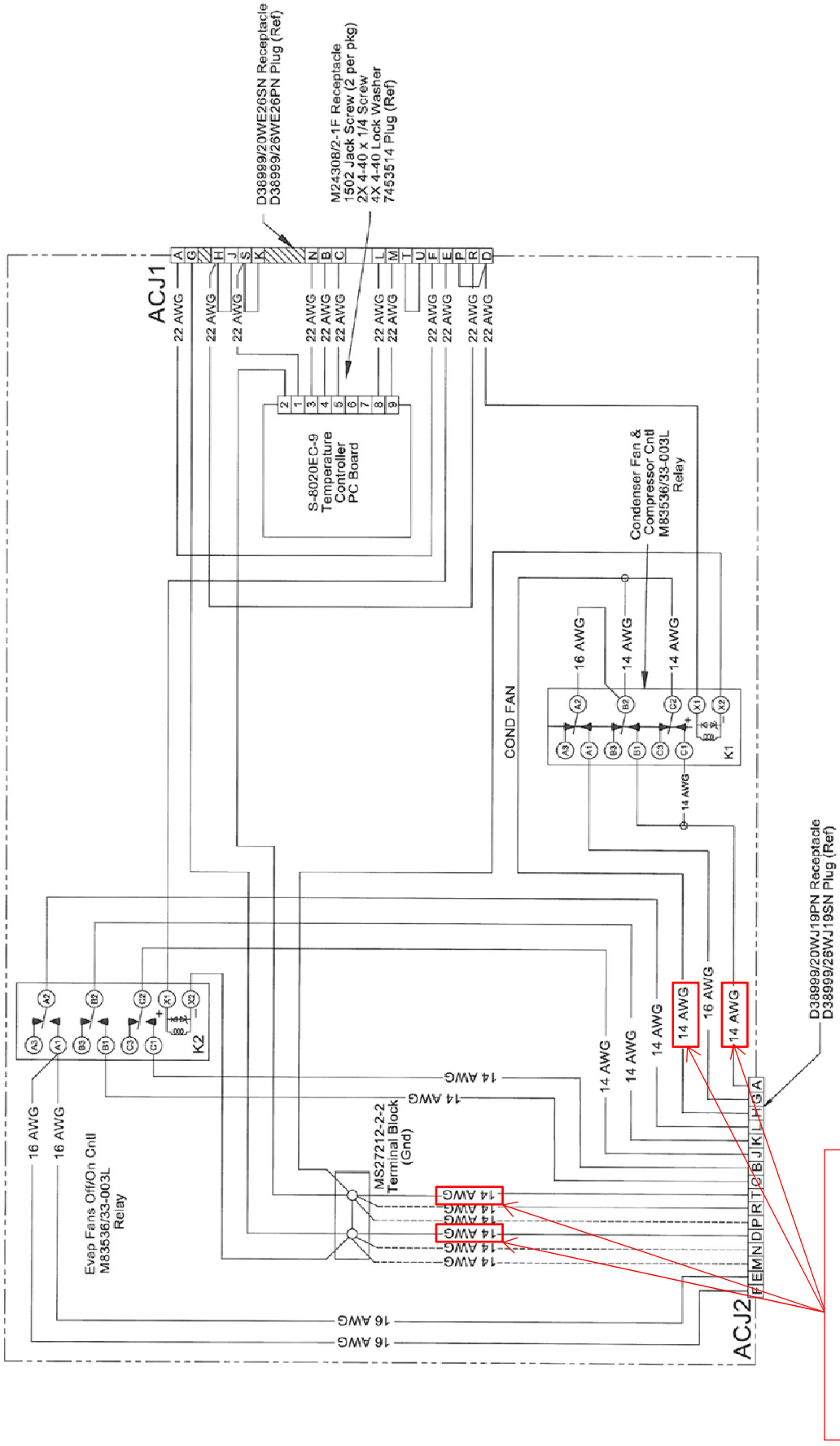


Figure 28: 429EC-8424-2 Relay Panel
Applies to 429EC-200,-202,-204,-206 kits (S-6029EC Fwd Evap)

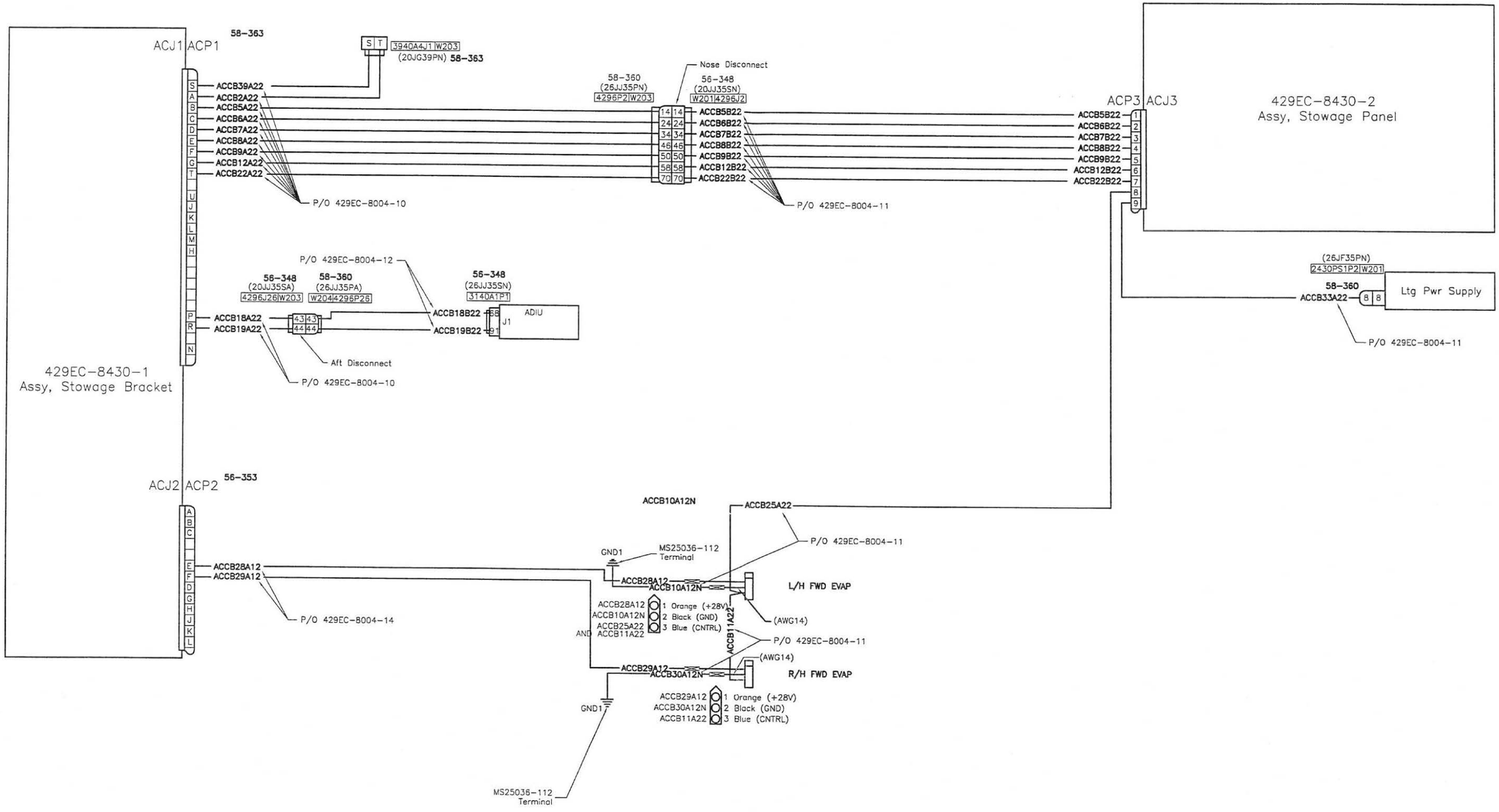


Figure 29: Provisions Schematic, Pre 2011 429EC-200 kits (Dual Fwd/Aft Evaporators with S-6027EC Fwd Evap)

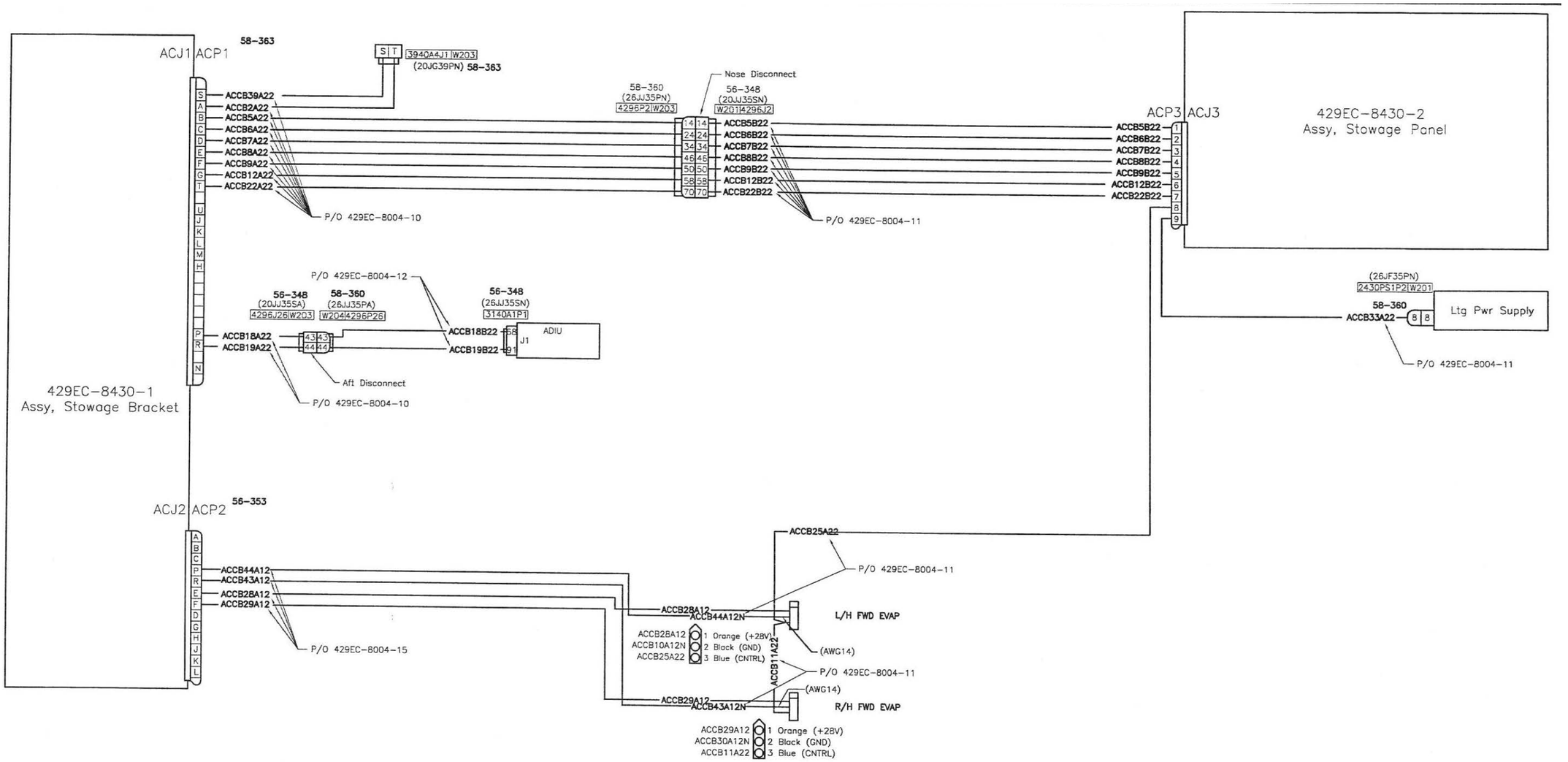


Figure 30: Provisions Schematic, 2011 & newer 429EC-200, -204 kits (Dual Fwd/Aft Evaporators with S-6029EC Fwd Evap)

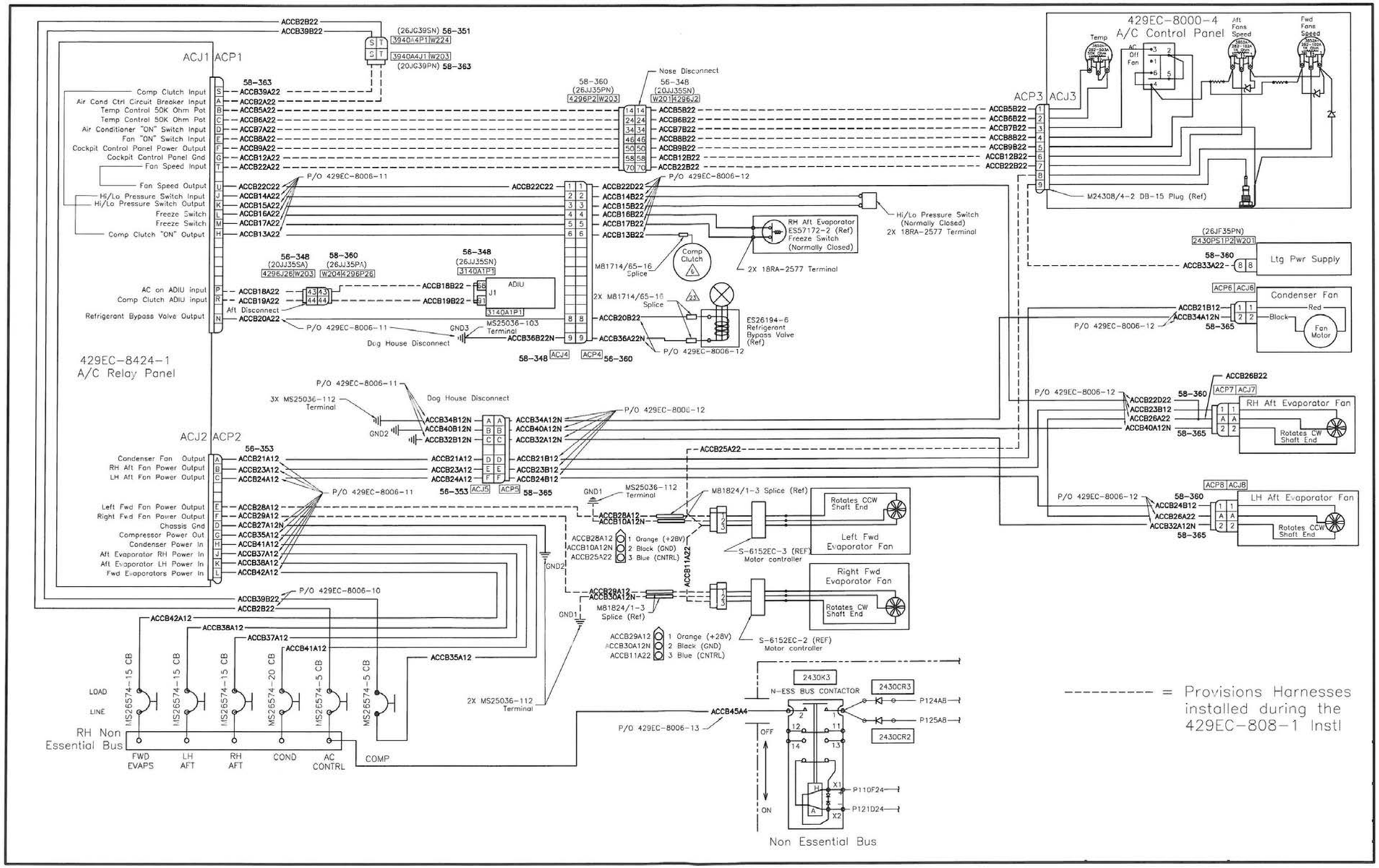


Figure 31: Component Schematic, Pre 2011 429EC-200 kits (Dual Fwd/Aft Evaporators with S-6027EC Fwd Evap)

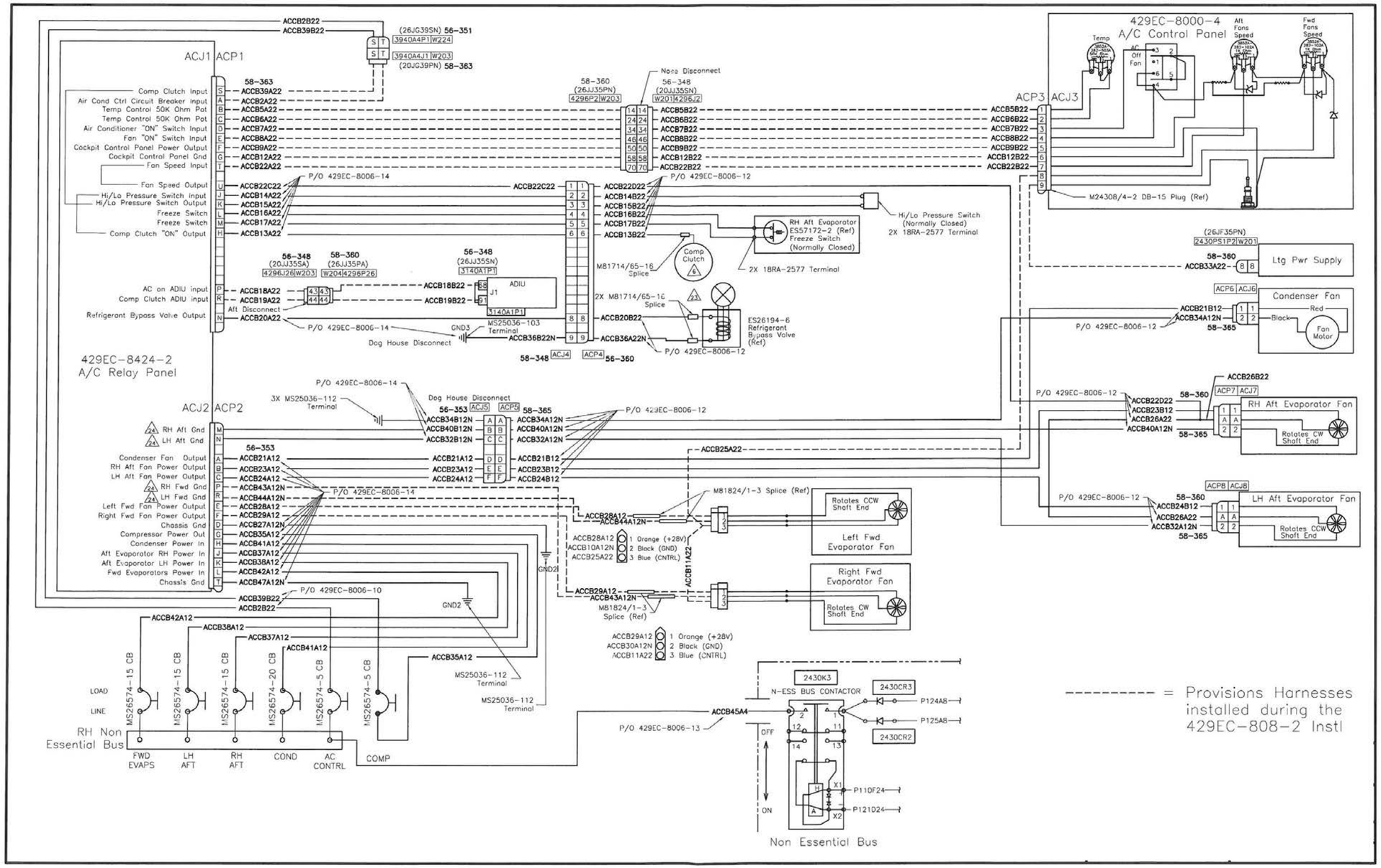


Figure 32: Component Schematic, 2011 – July 2015 429EC-200 kits
(Dual Fwd/Aft Evaporators with S-6029EC Fwd Evap)

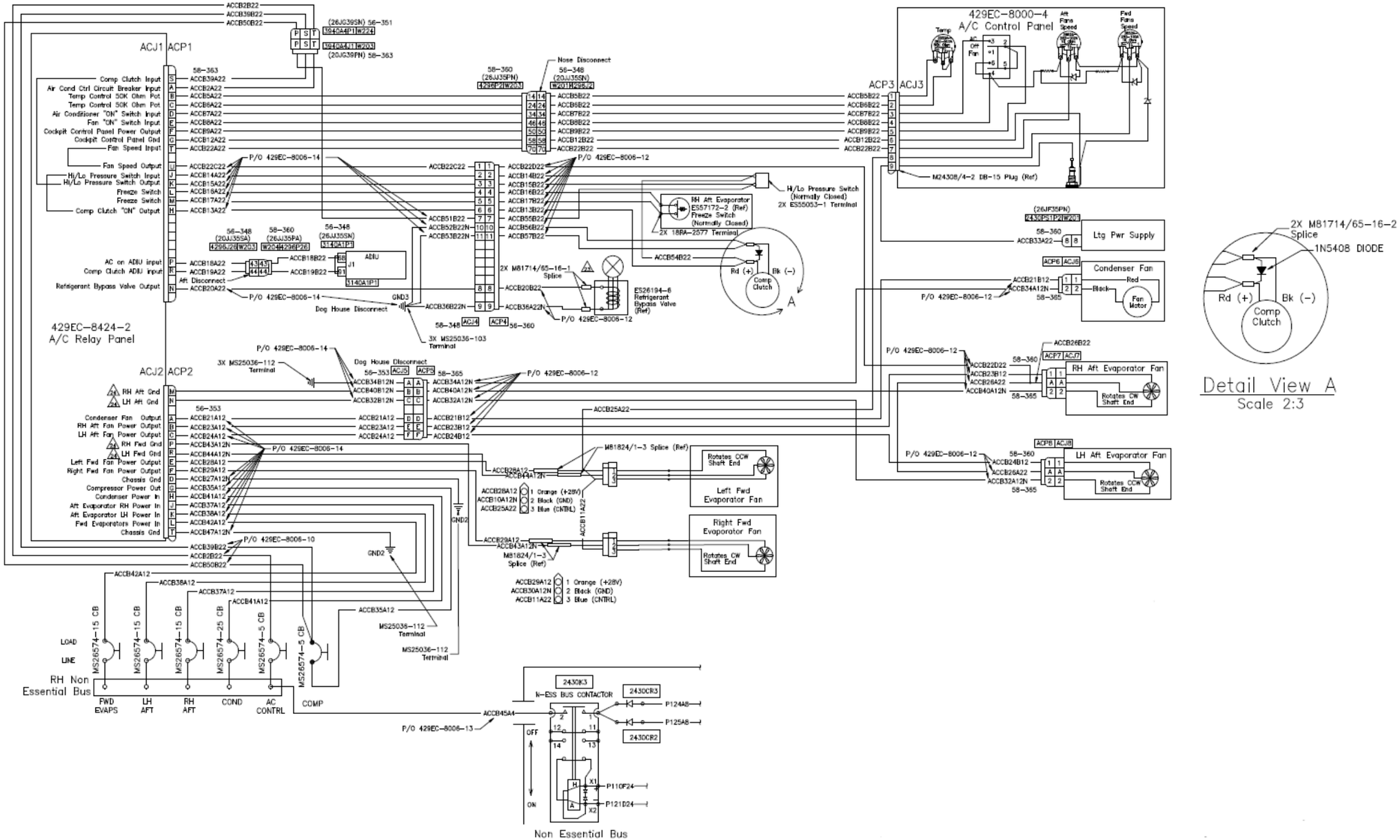


Figure 33: Component Schematic, July 2015 & newer 429EC-204 kits
(Dual Fwd/Aft Evaporators with S-6029EC Fwd Evap)

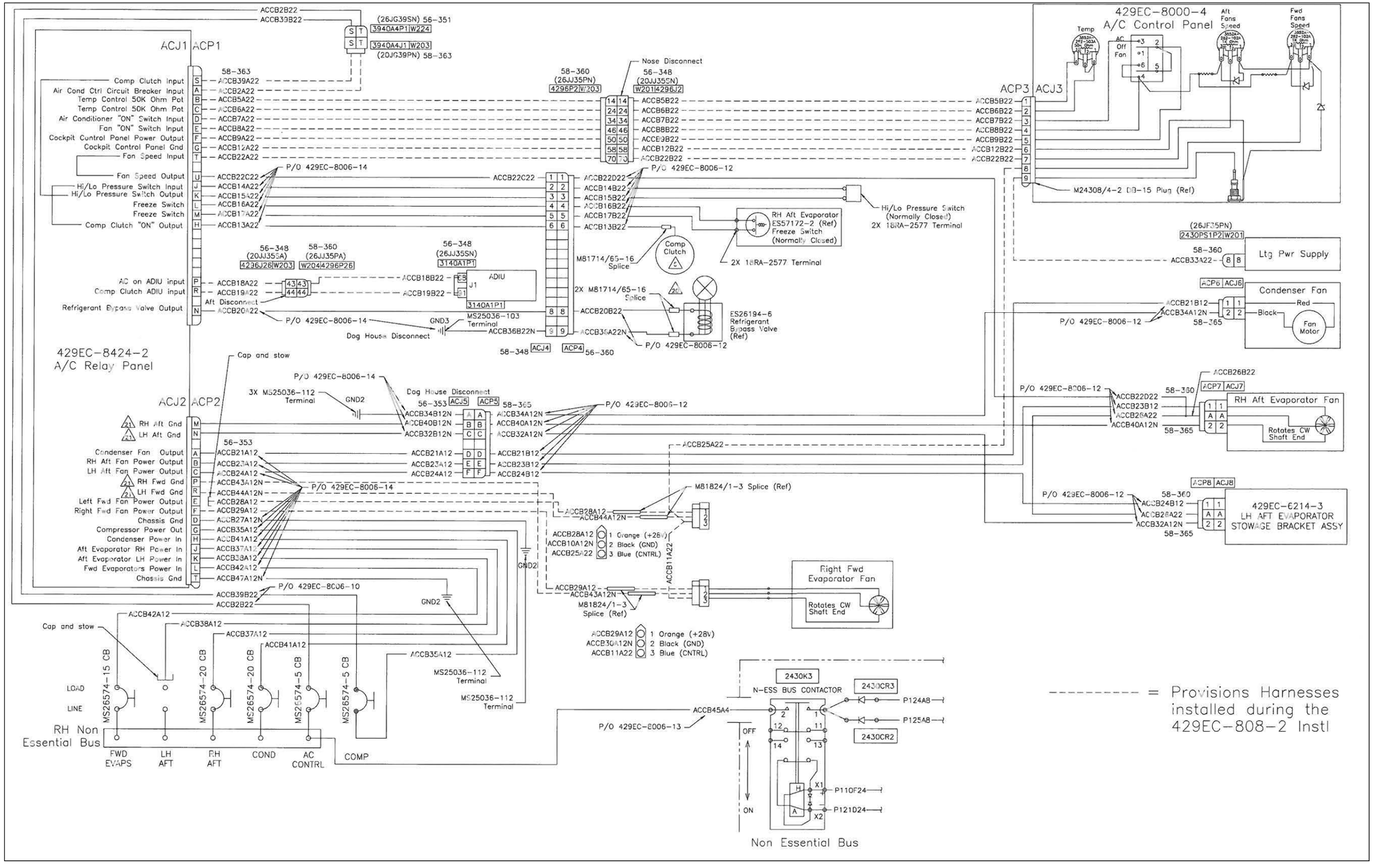


Figure 34: Component Schematic, 2011 – July 2015 429EC-202 kits (Single Fwd/Aft Evaporators with S-6029EC Fwd Evap)

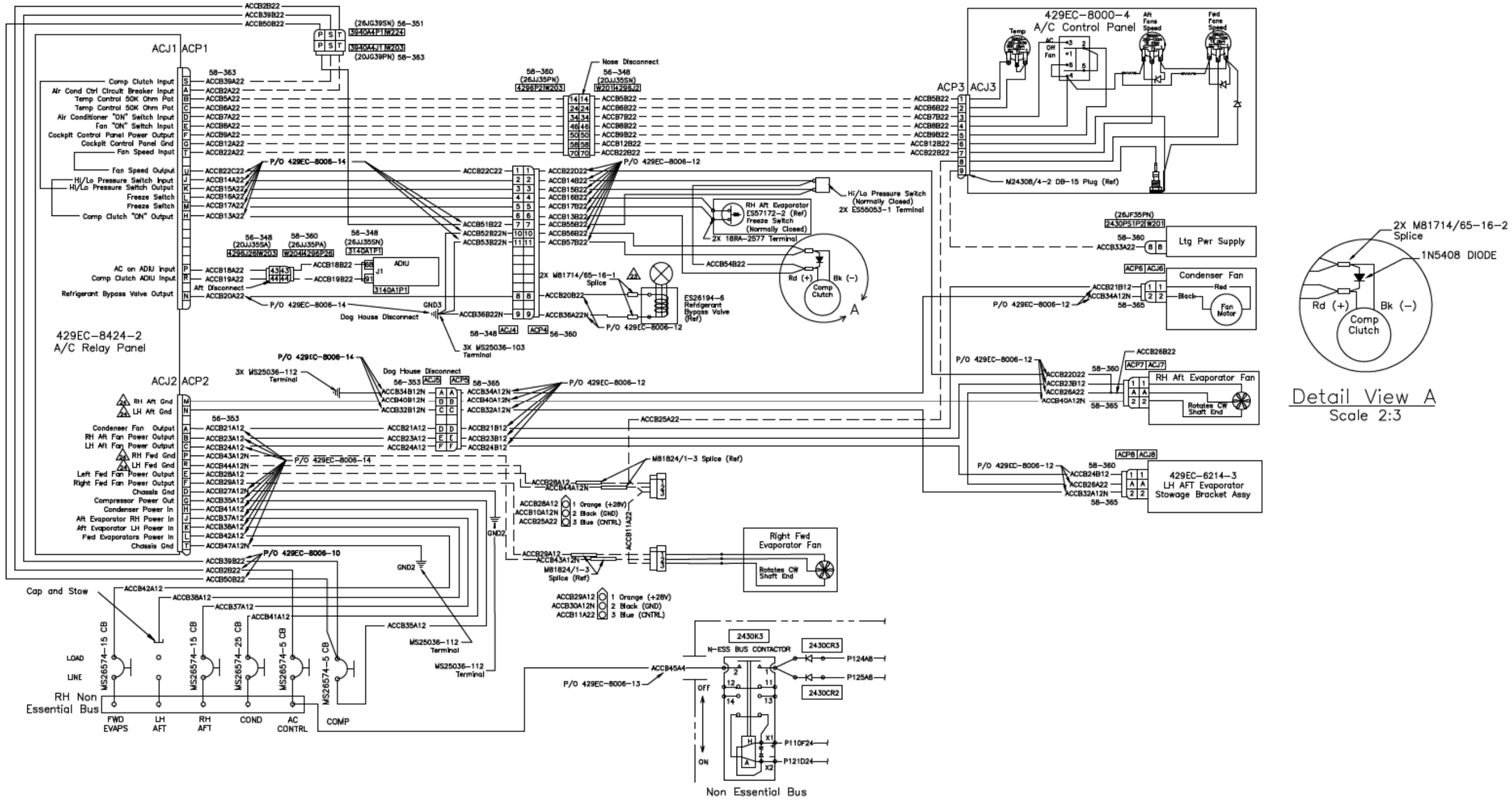


Figure 35: Component Schematic, July 2015 & newer 429EC-206 kits (Single Fwd/Aft Evaporators with S-6029EC Fwd Evap)

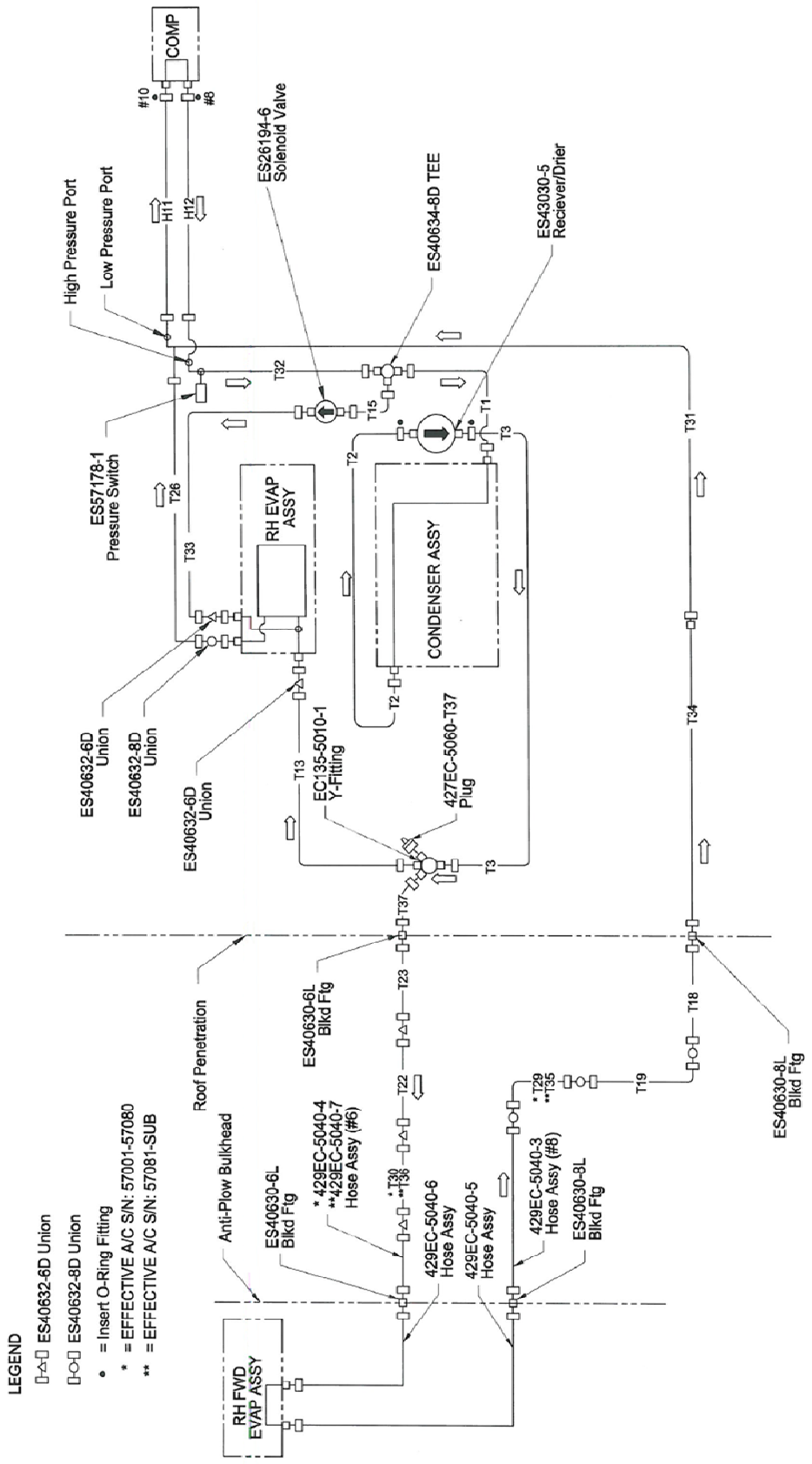


Figure 36: Refrigerant Plumbing Schematic – Single Evaporator Installation

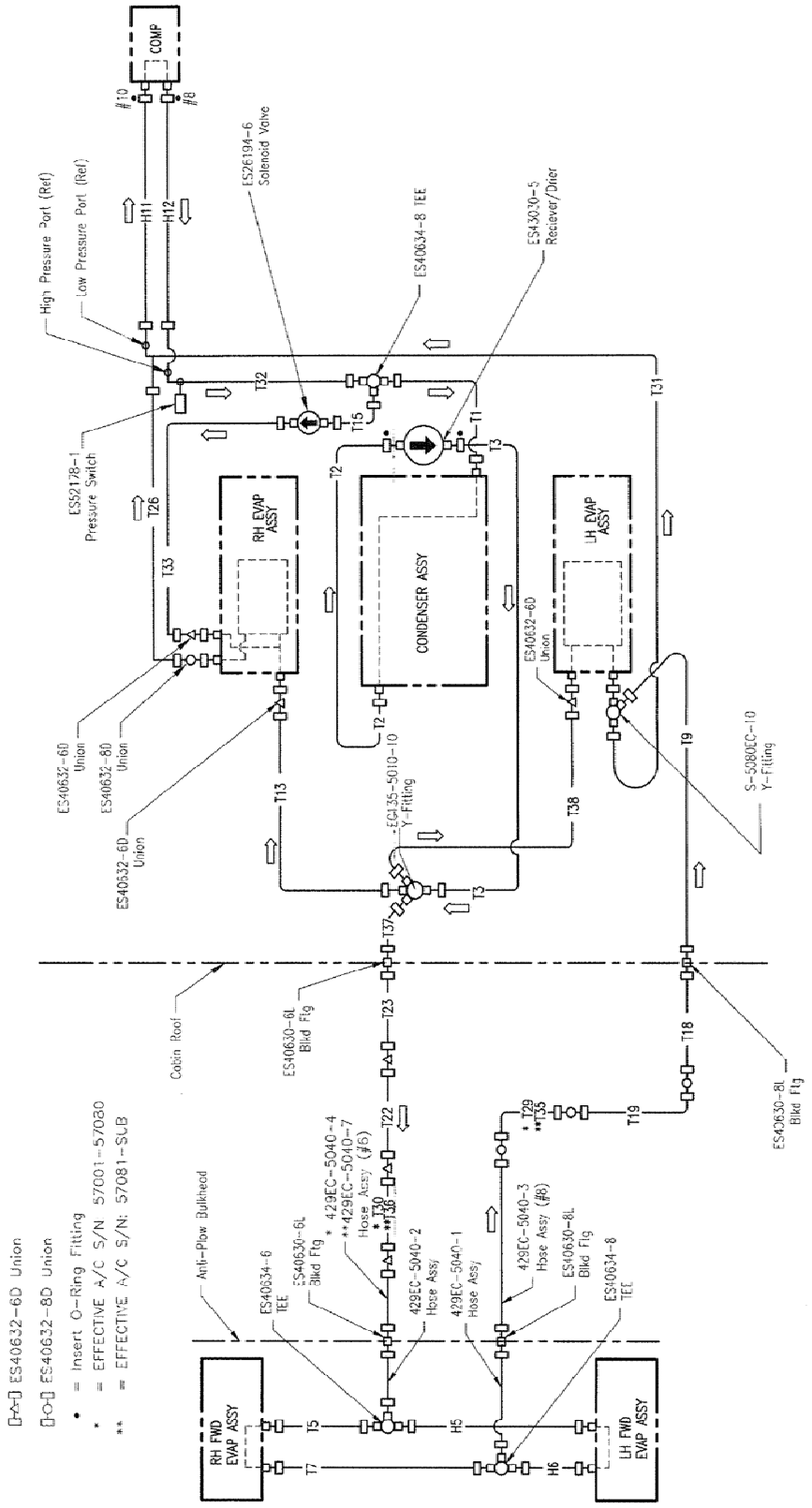


Figure 37: Refrigerant Plumbing Schematic – Dual Evaporator Installation

APPENDIX A
WEIGHT AND BALANCE INFORMATION

Weight Breakdown – Bell 429 Series Air Conditioner System Drawing 429EC-200, Dual Forward & Aft Evaporators

Item	Dwg. No.	Weight (lb)	X-Arm (in)	*Y-Arm (in)	X-M (in-lb)	Y-M (in-lb)
Dual Fwd Evaporator Instl	429EC-600					
Evaporator Assembly		20.53	97.3	0.0	1998	0
Installation Hardware Kit		1.78	100.7	0.0	179	0
Aft Evaporator Instl	429EC-622					
Evaporator Assembly		28.17	185.5	0.1	5224	4
Installation Hardware Kit		1.63	194.2	-0.6	317	-1
Condenser Instl	429EC-700					
Condenser Assembly		21.35	180.8	0.0	3861	0
Installation Hardware Kit		3.73	284.8	0.0	1062	0
Electrical System Instl	429EC-810					
Relay Panel		1.33	283.8	-10.9	377	-15
Switch Panel		0.27	159.1	3.0	42	1
Installation Hardware Kit		0.39	176.5	0.8	69	0
Plumbing Instl	429EC-500	7.84	166.8	-3.0	1308	-24
Compressor Instl	429EC-300					
Compressor Mount Assembly		19.31	223.5	-11.8	4317	-228
Installation Hardware Kit		0.37	219.4	-10.2	80	-4
R134a Refrigerant		2.70	166.8	-3.0	450	-8
Air Distribution Instl	429EC-680	3.91	182.5	1.0	714	4
Total (English Units)		113.30	176.5	-2.4	19998	-271
Total (Metric Units)		51.39	4483.4	-60.7	230402	-3121

*negative value indicates left of center

Weight Breakdown – Bell 429 Series Air Conditioner System
Drawing 429EC-202, Single Fwd/Aft Evaporators

Item	Dwg. No.	Weight (lb)	X-Arm (in)	*Y-Arm (in)	X-M (in-lb)	Y-M (in-lb)
RH Fwd Evaporator Instl	429EC-602-1					
Evaporator Assembly		10.20	97.3	9.4	993	96
Installation Hardware Kit		0.89	100.7	9.4	89	8
RH Aft Evaporator Instl	429EC-624-1					
Evaporator Assembly		14.90	185.5	11.3	2762	169
Installation Hardware Kit		0.82	194.2	11.3	158	9
Condenser Instl	429EC-700-1					
Condenser Assembly		21.35	180.8	0.0	3861	0
Installation Hardware Kit		3.73	284.8	0.0	1062	0
Electrical System Instl	429EC-812-1					
Relay Panel		1.33	283.8	-10.9	377	-15
Switch Panel		0.27	159.1	3.0	42	1
Installation Hardware Kit		0.39	176.5	0.8	69	0
Plumbing Instl	429EC-502-1	6.85	166.8	-3.0	1142	-21
Compressor Instl	429EC-300-1					
Compressor Mount Assembly		19.31	223.5	-11.8	4317	-228
Installation Hardware Kit		0.37	219.4	-10.2	80	-4
R134a Refrigerant		2.20	166.8	-3.0	367	-7
Air Distribution Instl	429EC-682-1	1.96	182.5	1.0	357	2
Total (English Units)		84.54	185.4	0.1	15677	12
Total (Metric Units)		38.35	4710.2	3.5	180617	133

*negative value indicates left of center

Weight Breakdown – Bell 429 Series Air Conditioner System
Drawing 429EC-204, Dual Forward & Aft Evaporators

Weight Breakdown - Bell 429 Series Air Conditioner System

Drawing 429EC-204-1, Dual Forward Evaps

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Item	Dwg. No.	Weight (lb)	X-Arm (in)	Y-Arm (in)	X-M (in-lb)	Y-M (in-lb)
Dual Fwd Evaporator Instl	429EC-600-1					
Evaporator Assembly		20.53	97.3	0.0	1998	0
Installation Hardware Kit		1.78	100.7	0.0	179	0
Aft Evaporator Instl	429EC-622-1					
Evaporator Assembly		28.17	185.5	0.1	5224	4
Installation Hardware Kit		1.63	194.2	-0.6	317	-1
Condenser Instl	429EC-704-1					
Condenser Assembly		24.00	180.8	0.0	4339	0
Installation Hardware Kit		3.73	284.8	0.0	1062	0
Electrical System Instl	429EC-814-1					
Relay Panel		1.33	283.8	-10.9	377	-15
Switch Panel		0.27	159.1	3.0	42	1
Installation Hardware Kit		0.39	176.5	0.8	69	0
Plumbing Instl	429EC-500-1	7.84	166.8	-3.0	1308	-24
Compressor Instl	429EC-300-1					
Compressor Mount Assembly		19.31	223.5	-11.8	4317	-228
Installation Hardware Kit		0.37	219.4	-10.2	80	-4
R134a Refrigerant		2.70	166.8	-3.0	450	-8
Air Distribution Instl	429EC-680-1	3.91	182.5	1.0	714	4
Total (English Units)		115.94	176.6	-2.3	20476	-271
Total (Metric Units)		52.59	4485.9	-59.3	235915	-3121

*negative value indicates left of center

Weight Breakdown – Bell 429 Series Air Conditioner System
Drawing 429EC-206, Single Fwd/Aft Evaporators

Weight Breakdown - Bell 429 Series Air Conditioner System

Drawing 429EC-206-1, Single Fwd/Aft Evap System

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Item	Dwg. No.	Weight (lb)	X-Arm (in)	Y-Arm (in)	X-M (in-lb)	Y-M (in-lb)
RH Fwd Evaporator Instl	429EC-602-1					
Evaporator Assembly		10.20	97.3	9.4	993	96
Installation Hardware Kit		0.89	100.7	9.4	89	8
RH Aft Evaporator Instl	429EC-624-1					
Evaporator Assembly		14.90	185.5	11.3	2762	169
Installation Hardware Kit		0.82	194.2	11.3	158	9
Condenser Instl	429EC-704-1					
Condenser Assembly		24.00	180.8	0.0	4339	0
Installation Hardware Kit		3.73	284.8	0.0	1062	0
Electrical System Instl	429EC-816-1					
Relay Panel		1.33	283.8	-10.9	377	-15
Switch Panel		0.27	159.1	3.0	42	1
Installation Hardware Kit		0.39	176.5	0.8	69	0
Single Fwd-Aft Evap Plumbing Install	429EC-502-1	6.85	166.8	-3.0	1142	-21
Compressor Instl	429EC-300-1					
Compressor Mount Assembly		19.31	223.5	-11.8	4317	-228
Installation Hardware Kit		0.37	219.4	-10.2	80	-4
R134a Refrigerant		2.20	166.8	-3.0	367	-7
Single RH Aft Air Distribution Install	429EC-682-1	1.96	182.5	1.0	357	2
Total (English Units)		87.18	185.3	0.1	16155	12
Total (Metric Units)		39.55	4706.6	3.4	186130	133

*negative value indicates left of center