Air Comm Corporation

MAINTENANCE MANUAL
&
ILLUSTRATED PARTS CATALOG

REVISION U

FOR THE EUROCOPTER EC 135
ENVIRONMENTAL SYSTEM
DOCUMENT NO. CR-135-10

RECORD OF REVISIONS

PREPARED ENGR	CHECKED OTHER	APPROVED ENGR	REVISION RECORD	REV
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Document converted to current format and page references within document updated
Section 2.5 and Section 2.4 now incorporated into Section 2.3
Updated Section II Compressor Drive Belt Adjustment by adding Pulley alignment Procedures; Figure 2.3.1 on pg 116 to Section II
Added Motor dimpling Instructions to Section II
Added Soft Start configuration;
Added 4.4 Flushing procedures to Section II
Added JBS13016-3 and -5 to IPC page 7
Added ES73175-4 to IPC page 7
Added JBS13016-11 to IPC page 8
Added JBS880-1 and JBS881-1 to IPC
Document Title WAS Air Conditioning System NOW Environmental System
Updated Section I, 3.ii WAS 2 years NOW 3 years
Changed Section I, 4.1 d paragraph 4. Separated paragraph into two; Added Note.
Added Cockpit Blower statement Section II 1.3 I.
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Updated pressure test requirement; WAS 600psi NOW 200psi
Added Compressor Motor Overhaul procedure to Section II and IPC
REASON: SERVICE DIFFICULTY PER ER4022

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- *Service Bulletin / Service Letter sheet :* Added SL24005, Added SL225
- *Section I, 2. System Description :* Corrected location of blower, WAS "Pilot" , NOW "Co-Pilot"
- *Section I, 3.1 Inspection Intervals :* Removed entry for Aux Blower, edited entry for Comp drive motor
- *Section I, 4.2 System Troubleshooting :* Added conversion to °C in Note and edited Step One, WAS "evaporator(s)", NOW "evaporator"
- *Section II, 1.2.iii.b :* Corrected format of list
- *Section II, 1.3.i :* Deleted "auxiliary"
- *Section II, 1.3.iv.b :* Deleted reference to brush and bearing replacement
- *Section II, 1.3.iv.c :* Corrected step 5, WAS "repair", NOW "repair / overhaul"
- *Section II, 2.1:* Added Note regarding the return to operation of motor after an adverse pressure event.
- *Section II, 2.3.iii :* Corrected incomplete sentence
- *Section II, 2.3.1 :* Added step 12
- *Section II, 2.3.7 :* Added 135-0570-1 to list of motors eligible for maintenance
- *Section II, 2.3.3 & 2.3.8.iii:* Corrected reference, WAS "2.3.9…" NOW "2.3.iii Matrix"
- *Section III,1 :* Deleted reference to maintenance section
- *IPC Table 24 :* Corrected "Fig" and "Item" for entries 43 and 44
- *IPC Table 28 :* Added 135-0570-1 Motor Assembly

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Updated Service Bulletin Page with SB215.
Edited company name WAS Meggitt (Addison) NOW Air Comm Corp; Title Page, Introduction Page; Section I Page 101; Section II Pages 107, 110, 121, 137, 147 and 160; Section III Page 101; Illustrated Parts Catalog Page i.
Edited Inspection Intervals on table; A/C system components WAS On condition or every 800 flight hours NOW Aircraft Periodical Inspection1000 FH/3 years; Compressor Belt added "(Hour meter on compressor/condenser assembly); Evap/Condenser Coils & Refrigerant Hoses WAS (800 FH/3 years) NOW 1000 fh/ 3 years; Evap Blower WAS 800H NOW 1000FH; Sight Glass added "if installed in the receiver/dryer. Section I Page 104.

Edited the following in Section II
Edited step b WAS This can be confirmed by a clear sight glass (no bubbles) on the top of the receiver/dryer bottle. If bubbles are present, recover and recharge per Section 4.1. Page 4
Deleted Y-1, ES73175-1, ES73175-9 from table Page 107
Deleted from Table under "The vale is stuck wide open" WAS There may also be bubbles in the sight glass under this condition. Page 108.
Added "and safety wire per MS33540" to step 7. Page 115
Edited part number reference from step l WAS I/N:[66]. Page 128
Edited step l and p WAS snap ring. Page 128
Added reference to ES43030-3 (without sight glass); to viii. Page 147.
Edited figure callout and I/N on step eWAS Fig 27 I/N not shown. Page 148
Edited steps k, l, p and q WAS (Reference Figure 27; I/N: [not shown]. Page 149
Added I/N's 127, 131 and 130 to step k. Page 149.
Added item numbers to steps k, l, p and q WAS *Not Shown*. Page 149.
Added "(Reference Figure 31; I/N: [137, [118])" to step h Page 154.
Added "(Reference Figure 31; I/N [132])" to step l. Page 155.
Added I/N's 127, 131 and 130 to step k. Page 155.
Added to Section viii "(with sight glass), ES43030-3 (without sight glass). Page 159
Edited table for Sealant description WAS Sealant, ES49000-3. Page 163.
Added Pressure Switch Replacement 2.3.12. Pages 161 and 162
Added ES43030-3 to viii. Pages 137, 147, 160.
Deleted step d WAS IF THE SIGHT GLASS….INTO THE SYSTEM. Page 172.

Edited the following on IPC Section
Edited Figure 4 Title WAS EVAPORATOR BLOWER INSTALLATION. Page 4.
Edited Figure 5 Title WAS EVAPORATOR BLOWER INSTALLATION. Page 5.
Updated Figure 4 and 5 Pictorially on Pages 4 and 5.
Edited Figure 6 Title WAS EVAPORATOR BLOWER INSTALLATION. Page 6.
Deleted the following part numbers from parts list on page 7
I/N 23 WAS ES73175-2 (-3 & -10) QTY 1; ES73175-4 (-5 &-11) QTY 1
I/N 24 WAS 135-1252-4 QTY 1.
I/N 25 WAS 135-1252-6 QTY 1.
I/N 26 WAS 135-1604-2 QTY 1.
I/N 27 WAS 206-1258-1 QTY 1.
Added I/N'S 93 AND 94 to parts list on Page 10.
Edited figure callout for I/N 89 WAS 2 NOW 5. Page 9
Clarified P/N callout for I/N's 20, 21 and 22 on Figure 16 page 20 and Figure 24 page 37.
Added note for rec/dry bottle alternate. Page 22, 38 and 52.
Edited I/N 10 WAS ES10501-9 NOW ES39255-1. Page 22.
Added Figure 35. Page 52.
Added I/N's 138 thru 152 to P/L and Figure 45. Pages 52 and 57.

Edited ES49024-1 nomenclature WAS Manifold Fitting. Pages 22, 38 and 52.
Added Pictorial reference of I/N's 118 and 137 to Figure 31. Page 51.
Reason: Part Obsolete Per Project 213009 and ECR-14-194.

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- Updated IPC figure numbers due to duplication of figure names. All figures numbers from Fig. 4 onward updated.
- Updated IPC part table references to match new figure numbers. All figures numbers from Fig. 4 onward updated.
- Updated incorrect dates on List of Effective Pages.
- *Changes conducted on ECO 19-197.*

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- Updated incorrect dates on List of Effective Pages.
- Minor punctuation changes on record of revisions pages.
- *Changes conducted on ECO 19-471.*

LIST OF SERVICE BULLETINS / SERVICE LETTERS

DOC NO.	DATE	SUBJECT	REV.	DATE INCORP.
SB147	9/30/97	Vertical Duct Deviation From SIDE Mount to AFT Mount	NC	
SB200	11/29/05	Replacement and Reinforcement of Compressor and Motor Mounting Inserts	A	
SB201	11/29/05	Replacement and Reinforcement of Compressor and Motor Mounting Inserts	A	
SL24005	7/29/04	Cover Screw replacement EC135	NC	
SL25001	8/18/09	Blower Motor Replacement	A	--
SL225	5/3/12	Troubleshooting and Micro-switch Adjustment Procedure for the JBS880-3 Bleed Air Mixing Valve / Ejector	A	
SB215	7/09/13	Replacement of Motor/Compressor Mounting Bracket	NC	

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INTRODUCTION

1. PURPOSE

The purpose of this Component Maintenance Manual is to provide detailed instructions for the troubleshooting, checking and maintaining of the Air Comm Corp. air conditioning system for the Eurocopter Model EC 135 helicopter.

2. SCOPE

The scope of the component maintenance manual provides the maintenance technician with detailed information covering:

- Overall system level description and theory of operation.
- Component level description and theory of operation.
- Component checking and troubleshooting procedures.
- Maintenance practices to keep the environmental control system operating at its maximum efficiency.
- The identification of special equipment to accomplish the specific tasks.
- An Illustrated Parts Catalog (IPC) covering the breakdown of each major component of the air conditioning system, including part number and relevant illustrations.

3. GLOSSARY

Nonstandard abbreviations and symbols used in the Component Maintenance Manual are described below.

Abbreviations:

A/R	-	As Required
Comm. Avail.	-	Commercially Available
GPU	-	Ground Power Unit
IPC	-	Illustrated Parts Catalog
VDC	-	Volts Direct Current

AIR CONDITIONING SYSTEM SECTION I

1. GENERAL

The air conditioning system for the EC 135 helicopter consists of a refrigerant R134a vapor cycle cooling system. This system allows the pilot to control cooling for a comfortable aircraft cabin. Figure 1, on Page 103, shows a general arrangement of the air conditioning system.

2. SYSTEM DESCRIPTION

The refrigeration or air conditioning system, as designed and manufactured by Air Comm Corp. for the Eurocopter EC 135 helicopter, is a vapor cycle type cooling system using refrigerant R134a. The system is electrically operated using the aircraft 28 VDC electrical system and is operable in all normal flight modes. Air conditioning may be operated with ground external power or the aircraft electrical system with both generators providing 28 VDC.

The major components of the system are the Compressor/Condenser Pallet assembly with a common blower/motor, and an evaporator/blower unit. Refrigerant plumbing and electrical systems connect the major components to provide a closed loop system.

The Compressor/Condenser Pallet assembly is located aft of Frame 8, behind the left engine. The compressor drive motor includes a fan that provides airflow for the condenser. The motor, compressor, and condenser are mounted on a pallet. The motor turns at approximately 7,500 RPM. The compressor is belt driven from the motor shaft. The compressor takes low-pressure refrigerant gas and compresses it to a higher pressure and temperature. Condenser cooling air passes over the compressor and compressor drive motor to provide cooling airflow for those components prior to passing through the condenser coil to remove heat from the refrigerant system. After passing through the condenser coil, the air is exhausted to the outside through an exhaust plenum and out an exhaust outlet on the left side of the aircraft.

The evaporator/blower unit is located below the cabin floor. It provides cooling airflow for the cockpit and the cabin overhead air outlets. It is of a design where the blower, located beneath the Co-pilot's seat, which draws air across the evaporator coil and delivers the conditioned air to an overhead outlet duct, draws air through an inlet in the cabin floor. This re-circulating system continues to dry and cool the air each time it passes through the evaporator. Moisture removed from the air by the cold coil (condensate) is collected within the evaporator housing and is forced overboard. The evaporator is equipped with a thermal expansion valve, which regulates the amount of refrigerant entering the coil to provide the optimum cooling effect. The evaporator blower can be operated in the "FAN" position to re-circulate cabin air without cooling. The blower is operated from an independent variable fan speed control potentiometer mounted on the A/C switch panel.

The plumbing, which connects the compressor, condenser and the evaporators, consists of rubber-based hoses with a nylon barrier. The fittings are permanently swaged onto the hoses. All fittings are “O-ring” type connections with sealant on the fitting mating surfaces to prevent refrigerant leaks. Two R134a service valves are located near the Condenser/Pallet below the rear deck above the closeout panel. They are sized differently to avoid cross connecting when gaining access to the plumbing for system recharging.

The entire air conditioning refrigerant loop is protected against over pressure conditions by two separate safety devices. The first device is a binary high/low pressure switch, located on the compressor discharge port that activates in the event of an overpressure. This switch will open at approximately 384.0 ± 28.4 PSIG (2647.6 ± 195.8 KPa) and will interrupt power to the compressor control circuit. This in turn will de-energize the compressor motor relay and remove power to the compressor motor. The refrigerant system pressure will then drop. The switch will also interrupt power to the compressor control circuit under low-pressure conditions. The second overpressure safety device is a fuse plug, which will vent the system refrigerant safely overboard in the event of a system over temperature in excess of 217-241°F (102.7-116.1°C). It is located on the receiver/drier.

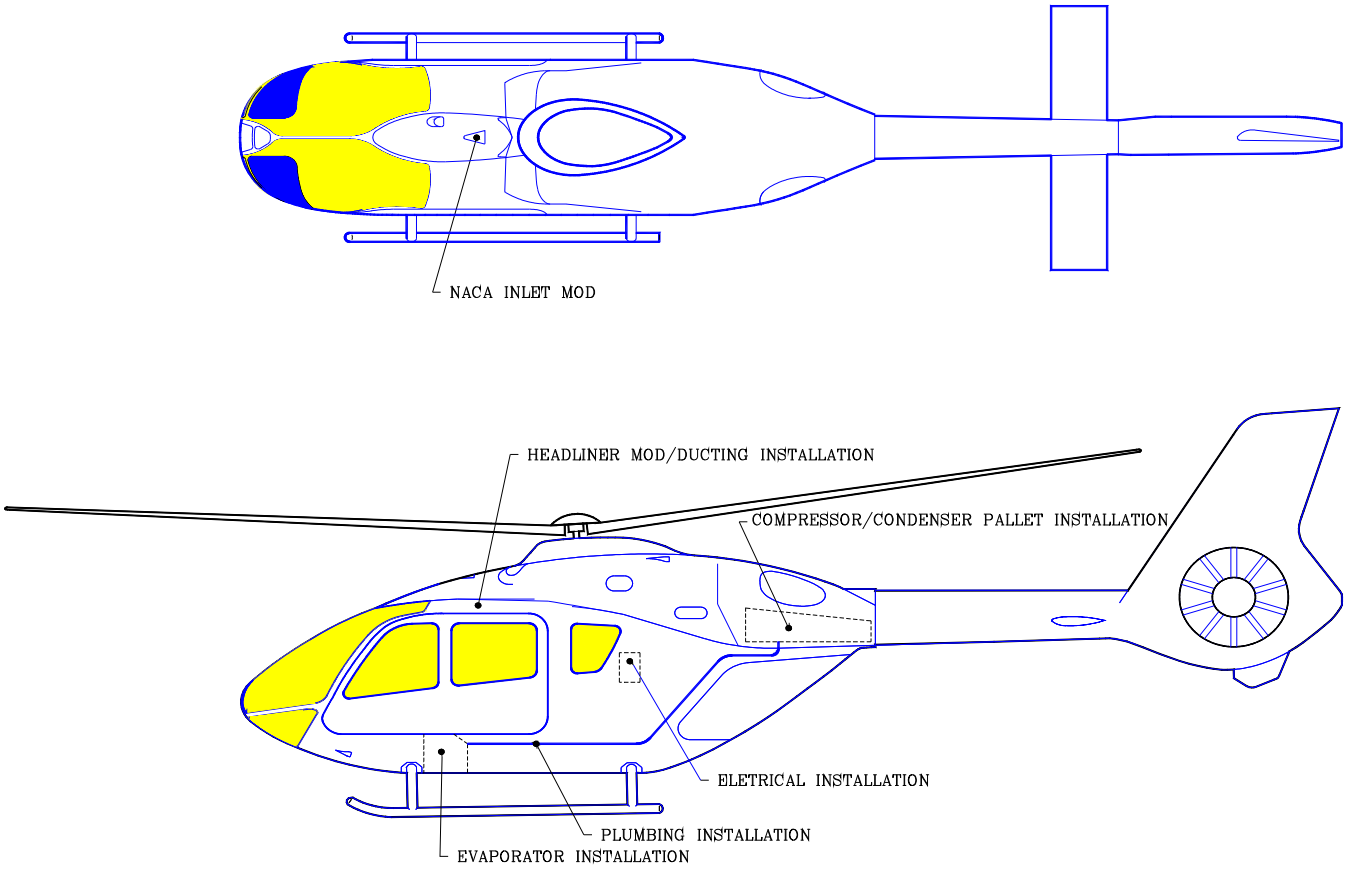

NACA INLET MOD
HEADLINER MOD/DUCTING INSTALLATION
COMPRESSOR/CONDENSER PALLET INSTALLATION
ELETRICAL INSTALLATION
PLUMBING INSTALLATION
EVAPORATOR INSTALLATION

FIGURE 1

3. INSPECTION CHECK

Listed below are the recommended inspections and inspection intervals for maintenance critical items associated with the air conditioning system. Proper and timely inspections will keep the air conditioning system operating at its peak efficiency.

3.1 INSPECTION INTERVALS

ITEM	INSPECT FOR	INTERVAL	ACTION
Air Conditioning System Components	Dirt, Damage	Aircraft Periodical Inspection (1000 FH/ 3 years)	Clean or replace component as necessary
Compressor Belt	Tension, Wear	Within five (5) hours of installing a new belt, then every 400 H (Hour meter on compressor/condenser assembly).	Tension or replace as necessary. See Section II, 2.3.1
Sight Glass (if installed on receiver dryer bottle)	Proper refrigerant level	When problem is suspected.	Discharge/charge as necessary per Section II, 4.1 through 4.3
Evaporator and condenser coils	Dirt	Aircraft Periodical Inspection (1000 FH/ 3 years)	Clean as necessary per Section II, 2.3.4
Refrigerant hoses	Chafing, wear	Aircraft Periodical Inspection (1000 FH/ 3 years)	Repair as necessary per Table 2.3.2
Compressor drive motor	Brush Inspection (See Section II, 2.3.6)	400H (Hour meter on compressor/ condenser assembly)	Inspect and replace brushes and bearings as necessary
Evaporator Blower	Brush Inspection	1000 FH TSN/TSO	Inspect and replace blower as necessary

4. AIR CONDITIONING SYSTEM TROUBLESHOOTING

4.1 GENERAL

A vapor cycle refrigeration system is dynamic in nature. It is difficult to give exact temperature drops or suction pressures and discharge pressures for trouble shooting purposes without knowing all the variables. It is recommended that you read and become familiar with this section before attempting to trouble shoot the air conditioning system. Below you will find a few examples of the dynamic nature of a refrigeration system that should help you in your trouble shooting process.

i. MEASURING TEMPERATURE DROP ACROSS THE EVAPORATOR

Trying to associate a specific temperature drop across the evaporator is dependent on many factors such as inlet air temperature, moisture content (relative humidity) and airflow. On a day with extreme humidity, up to 70% of the evaporator capacity will go towards dehumidification (Latent Heat). That only leaves 30% available to actually lower the air temperature (Sensible Heat). A mechanic encountering this scenario may assume that because he can only measure a 10°F (5.6°C) drop in temperature that the system is not operating properly. This assumption is incorrect because he is not considering the amount of work it takes to condense moisture in the air and convert it to water that pours out of the condensate drain. To further complicate the issue if you eliminate the source of this humidity by closing the cabin door, your initial temperature readings will have a smaller temperature drop than measurements taken later. This is because you are drying out the air in the cabin and the evaporator is allowed to remove more sensible heat.

ii. MEASURING SUCTION AND DISCHARGE PRESSURES

The most accurate method to start diagnosing the system is to start with checking the pressures. However you must remember that these pressures are affected by many different conditions such as outside air temperature, cabin temperature, cabin humidity and charge level. It is impossible to give an accurate head pressure at a specific temperature without knowing these other factors. These pressures can even vary during the trouble shooting process, as the system continues to run you are removing heat from the cabin and lowering the cabin temperature. This lowered heat load will result in lower suction and discharge pressures.

iii. SYSTEM DIAGNOSIS

It is important to understand the basic principles of vapor cycle air-conditioning before attempting to troubleshoot the system. The following is a brief overview.

a. Compressor

The compressor's only function is to raise the pressure of the refrigerant to a point where it can be condensed to a liquid at ambient temperature. Unfortunately, as the laws of physics tell us, we create heat in the process of compression. We now have a superheated high-pressure vapor.

b. Condenser

The condenser function is to remove the heat from the super heated vapor. As the heat is removed, the vapor will begin to condense into a liquid. Condensing occurs in accordance to a temperature / pressure ratio. *i.e. the higher the condenser air inlet temperature is, the greater the pressure required to condense, while the lower the condenser air inlet temperature is, the lower the pressure is required for condensing.* This is why on a hot day you will have higher discharge pressures than on a cool day.

c. Receiver dryer

The receiver dryer is a reservoir for liquid refrigerant. It also contains a filter screen and a desiccant material to remove particles and moisture from the refrigerant. It ensures that a filtered and dried column of liquid refrigerant is sent to the expansion valve.

d. Expansion Valve

The expansion valve is a device that meters liquid refrigerant into the inlet of the evaporator where it will be evaporated. It has an orifice with a metering pin to vary the flow of refrigerant. This pin is attached to a diaphragm that balances suction and spring pressure on one side and capillary sense bulb pressure on the other, which moves the pin in and out of the orifice.

The capillary sensing bulb contains a charge of refrigerant that is permanently sealed. This charge exerts pressure on the diaphragm to move the metering pin. Pressure is generated from the expansion or contraction of the gas charge contained in the bulb as it is warmed or cooled.

This bulb attaches to the suction line where the refrigerant exits the evaporator. It measures the temperature of this line. If there is insufficient

refrigerant flowing through the evaporator the gas will be warmer than desired (superheated). This in turn will warm the sense bulb, therefore expanding the gas within and exerting pressure on the diaphragm. The diaphragm will then move the metering pin and increase the flow of refrigerant to the evaporator. With the increased flow of refrigerant, the gas temperature exiting the evaporator will be reduced, therefore cooling the sense bulb, which lowers the pressure within and reduces the pressure exerted on the diaphragm. The diaphragm will then move the metering pin to reduce the refrigerant flow. The valve will make adjustments until a balance has been reached.

NOTE: ***One of the most common problems associated with expansion valves is a bad attachment of the sense bulb. It must make contact along its entire length and be securely attached to the metallic suction tube exiting the evaporator case. It must be thoroughly insulated with foam tape to ensure that outside air does not affect its reading.***

4.2 AIR CONDITIONING SYSTEM TROUBLESHOOTING

NOTE: Reference the air conditioning system-troubleshooting table.

This section will deal with trouble shooting the refrigeration circuit only; it will not cover the obvious, such as failed blowers or burned out drive motors.

Let's assume that an aircraft is reported to have a malfunctioning system. The report from the pilots will usually say, "poor cooling". From this you must decide where to start your investigation.

NOTE: If the OAT is below 70°F (21°C) it is much more difficult to troubleshoot because of lack of heat load.

Step One

Install gage set to the service ports. Turn on the system and allow it to stabilize for ten minutes. Observe suction and discharge pressures and temperatures across evaporator. If the evaporator does not have an adequate temperature drop or you suspect a loss of refrigerant charge, stop the system and evacuate and recharge to the prescribed weight of refrigerant R134a. With the system charged to the required weight you have now eliminated the possibility of an overcharged or undercharged system as being the cause of the problem.

Step Two

Turn the system on and allow it to stabilize for ten minutes. Check the suction and discharge pressures. A normal pressure reading for the suction side should be between 25 PSI (172.4 KPa) and 40 PSI (275.8 KPa) (remember this is

dependent on OAT and evaporator heat load). The discharge pressure should be between 150 PSI (1034.2 KPa) and 300 PSI (2068.4 KPa) (also dependent on OAT and evaporator heat load).

Let us assume that our condenser blower and evaporator blowers are functioning properly. This leaves only those components that are involved in compressing and metering the refrigerant to suspect. The suction and discharge pressures will indicate the nature of the problem.

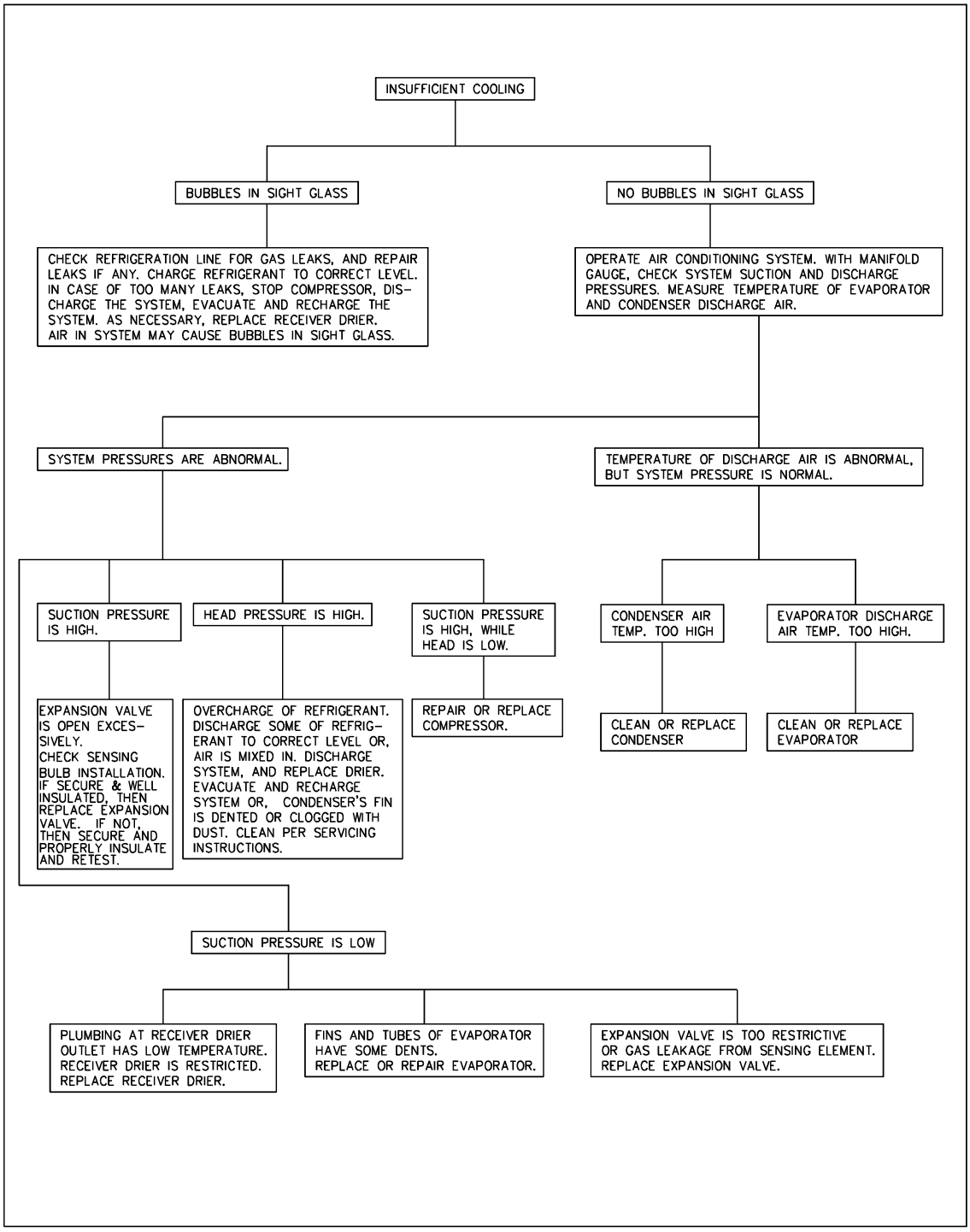
The expansion valve is the brain of the system. It controls how much liquid refrigerant is released into the evaporator coil. When this component fails it is important to understand the different ways it can fail and the associated symptoms.

The valve is stuck in mid range: This is usually associated with a contaminated system. The evaporator will have a poor temperature drop at extreme operating parameters therefore there is inadequate refrigerant flow at high heat loads and excessive refrigerant flow at low heat loads (coil flooding).

The valve is stuck wide open: This will cause excessive refrigerant to flow into the evaporator coil. The coil will become “Flooded “with liquid refrigerant. The result will be poor temperature drop because the refrigerant is not evaporating in to a vapor. Because the expansion valve is wide open the suction pressure will be higher than normal and the return line will be very cold because the liquid refrigerant is evaporating in the line instead of the evaporator. The discharge pressure will be lower than normal because there is very little pressure drop across an open expansion valve.

The valve is stuck closed: This will result in minimal refrigerant flow in to the evaporator. The coil is being starved for refrigerant. The result will be poor temperature drop because there is a lack of refrigerant available to evaporate. The suction line exiting the evaporator will be warmer than normal. The suction and discharge pressures in this scenario will not look much different from normal. The biggest clue will be a very warm suction line at the compressor.

4.3 AIR CONDITIONING SYSTEM TROUBLESHOOTING CHART



4.4 AIR CONDITIONING SYSTEM TROUBLESHOOTING TABLE

Reference Section II of this Component Maintenance Manual.

CONDITION	SERVICE PRESSURE GAUGE READING	PROBABLE CAUSE	CORRECTIVE ACTION
Insufficient Refrigerant Charge: • Insufficient cooling.	• Suction pressure: below normal. • Discharge pressure: below normal.	• Refrigerant is low or leaking a little.	• Leak test. • Repair leak. • Charge system. • Evacuate as necessary and recharge system.
Almost No Refrigerant: • No cooling action.	• Suction pressure: much below normal • Discharge pressure: much below normal.	• Serious refrigerant leak.	• Stop compressor immediately. • Leak test. • Discharge system. • Repair leak(s). • Replace receiver drier, if necessary. • Check system oil level. • Evacuate and recharge system.
Air In System: • Insufficient cooling.	• Suction pressure: above normal. • Discharge Pressure: above normal.	• Air mixed with refrigerant in system.	• Discharge system. • Replace receiver drier. • Evacuate and charge system.
Moisture In System: • After operation for a while, pressure on suction side may show vacuum pressure reading. During this condition, discharge air will be warm. As warning of this, reading shows approximately 6-psi oscillation.	• Suction pressure: below normal. • Discharge pressure: above normal.	• Drier is saturated with moisture. Moisture has frozen at expansion valve. Refrigerant flow is restricted.	• Discharge system. • Replace receiver drier (twice if necessary). • Evacuate system completely. (Repeat 30 minute evacuating three times.) • Recharge system.

CONDITION	SERVICE PRESSURE GAUGE READING	PROBABLE CAUSE	CORRECTIVE ACTION
Faulty Expansion Valve:			
• Slight cooling. Sweating or frosted expansion valve outlet.	• Suction pressure: below normal. • Discharge pressure: below normal.	• Expansion valve restricts refrigerant. • Expansion valve is clogged. • Valve is stuck closed. Thermal bulb has lost charge.	• Replace expansion valve.
• Insufficient cooling. Sweated suction line.	• Suction pressure: above normal. • Discharge pressure: above normal.	• Expansion valve allows too much refrigerant through evaporator. Sensing bulb on suction line not well insulated or properly attached to line.	• Check valve for operation. If suction side does not show a pressure decrease, replace valve. • Check security and insulation on sensing bulb.
• No cooling. Sweating or frosted suction line.	• Suction pressure: above normal. • Discharge pressure: below normal.	• Faulty expansion valve.	• Discharge system. • Replace valve. • Evacuate and replace system.
Faulty Condenser:			
• Insufficient cooling. • Suction line is very hot.	• Suction pressure: above normal. • Discharge pressure: above normal.	• Condenser air or refrigerant flow is restricted.	• Check condenser for dirt accumulation. • Check for refrigerant overcharge. • If pressure remains high in spite of all above actions taken, remove and inspect the condenser for possible oil clogging.
High Pressure Line Blocked:			
• Insufficient cooling. • Frosted high-pressure liquid line.	• Suction pressure: much below normal. • Discharge pressure: much above normal.	• Drier clogged, or restriction in high-pressure line.	• Discharge system. • Remove receiver drier and replace it. • Evacuate and charge system.

CONDITION	SERVICE PRESSURE GAUGE READING	PROBABLE CAUSE	CORRECTIVE ACTION
Faulty Compressor: • Insufficient cooling.	• Suction pressure: much below normal. • Discharge pressure: much below normal.	• Internal problem in compressor, or damaged gasket and valve.	• Discharge system. • Remove and check compressor. • Repair or replace compressor. • Check oil level. • Replace receiver drier. • Evacuate and charge system.
Too Much Oil In System: • Insufficient cooling.	• Suction pressure: above normal. • Discharge pressure: above normal.	• Too much oil circulates with refrigerant, causing the cooling capacity of the system to be reduced.	• Refer to “oil level check” for correcting oil level.

1. EVAPORATOR/BLOWER ASSEMBLY

1.1. GENERAL

The evaporator assembly is located under the cabin flooring. The evaporator assembly includes an evaporator coil, blower with motor, expansion valve and air outlet ducting.

This section of the maintenance manual discusses troubleshooting and maintenance practices used for the evaporator assembly portion of the air conditioning system. Additional troubleshooting and testing procedures for the evaporator blower is contained in Section II, 1.2. See IPC, Pages 1 through 10 for schematics and parts list.

1.2. TROUBLESHOOTING

i. GENERAL

The following procedures are used for troubleshooting the evaporator/blower assembly portion of the air conditioning system.

ii. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Service Pressure Gauge	Comm. Avail.	1	None
28 VDC Source	N/A	A/R	None

iii. EVAPORATOR TROUBLESHOOTING PROCEDURES

CAUTION: Do not operate air conditioning system with condenser air inlet or outlet blocked.

NOTE: Always attach a service gauge set to system prior to beginning troubleshooting to ensure proper refrigerant charge is present.

a. Water is being blown from Air Outlets

1. Operate GPU and apply 28 VDC electrical power.
2. Select air conditioning system to ON.
3. Check evaporator drain for condensate runoff.

4. If no runoff, clear drain of blockage or verify that routing is in a downhill orientation.

5. Check the evaporator coil for bent fins. Straighten with a fin comb if necessary.

6. Select air conditioning OFF, and remove electrical power.

b. No Cooling at Evaporator

1. Connect service pressure gauge to service ports located near compressor close out assembly.

2. Operate GPU and apply 28 VDC electrical power.

3. Select air conditioning system to ON.

4. Check evaporator for proper cooling. If cooling is not sufficient, check refrigerant level to ensure that system is correctly charged.

5. Check expansion valve bulb connection and proper orientation.

6. If system is correctly charged, replace expansion valve per Section II, 1.3, iii.

iv. BLOWER TROUBLESHOOTING PROCEDURES

REFERENCE THE BASIC AIRCRAFT WIRING DIAGRAM FOR SYSTEM SCHEMATIC.

a. Blower Inoperative

1. Check circuit breaker is in

2. Remove connector at blower and check for presence of power at Pin B and Pin A. Check for continuity to ground on Pin D.

3. If connector power and ground signals are present, replace blower.

1.3. MAINTENANCE PRACTICES

i. GENERAL

The following procedures are used to perform typical maintenance on the evaporator/blower assembly. Section II, 1.3.iv also applies to the cockpit blower in systems without air conditioning.

ii. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Sealant	ES49000-3	A/R	None
Polyolester Oil	Comm. Avail.	A/R	Viscosity ISO 68
Vacuum Cleaner	Comm. Avail.	1	None
Coil Cleaner	Comm. Avail.	A/R	Non-acid based
Plug	ES39265-2	1	Fitting Size #6
Plug	ES39265-3	2	Fitting Size #8
Plug	ES39265-4	1	Fitting Size #10
Cap	ES39263-1	1	Fitting Size #4
Cap	ES39263-2	1	Fitting Size #6
Cap	ES39263-4	1	Fitting Size #10

iii. EVAPORATOR MAINTENANCE PROCEDURES

a. Evaporator Removal/Installation

1. Refer to Aircraft Maintenance Manual. Cap evaporator assembly using P/N: ES39263-2 and ES39263-4. Plug both hose assemblies leading to evaporator assembly using P/N: ES39265-2 and ES39265-4.

b. Expansion Valve Replacement

1. Discharge system in accordance with recovery equipment's instructions.

2. Disconnect liquid line from inlet of expansion valve, and plug with P/N:ES39265-2. Remove the thermal sensing element from its clamp located on the suction tube of the evaporator and carefully remove insulation covering sensing element. Disconnect the external equalization tube that leads to suction line where refrigerant exits and cap the fitting with P/N: ES39263-1.

3. Disconnect the fitting that connects the valve to the coil and plug coil fitting using P/N: ES39265-3.

4. Install new expansion valve and O-ring in the reverse order.

5. Lubricate O-ring with Polyolester oil and apply sealant to fitting mating surfaces prior to assembly.

6. Install the thermal sensing element such that it makes contact with the suction tube along its entire length, and locate it at the 3 or 9 O'clock position on the tube. Insulate the sensing element thoroughly with insulation.

c. Evaporator Coil Cleaning Procedure

1. Use vacuum cleaner to remove large debris from the coil face.

2. Spray coil cleaner on coil face. Wash off with water.

iv. BLOWER MAINTENANCE PROCEDURES

a. Blower Removal

1. Refer to Aircraft Maintenance Manual.

b. Blower Brush Inspection

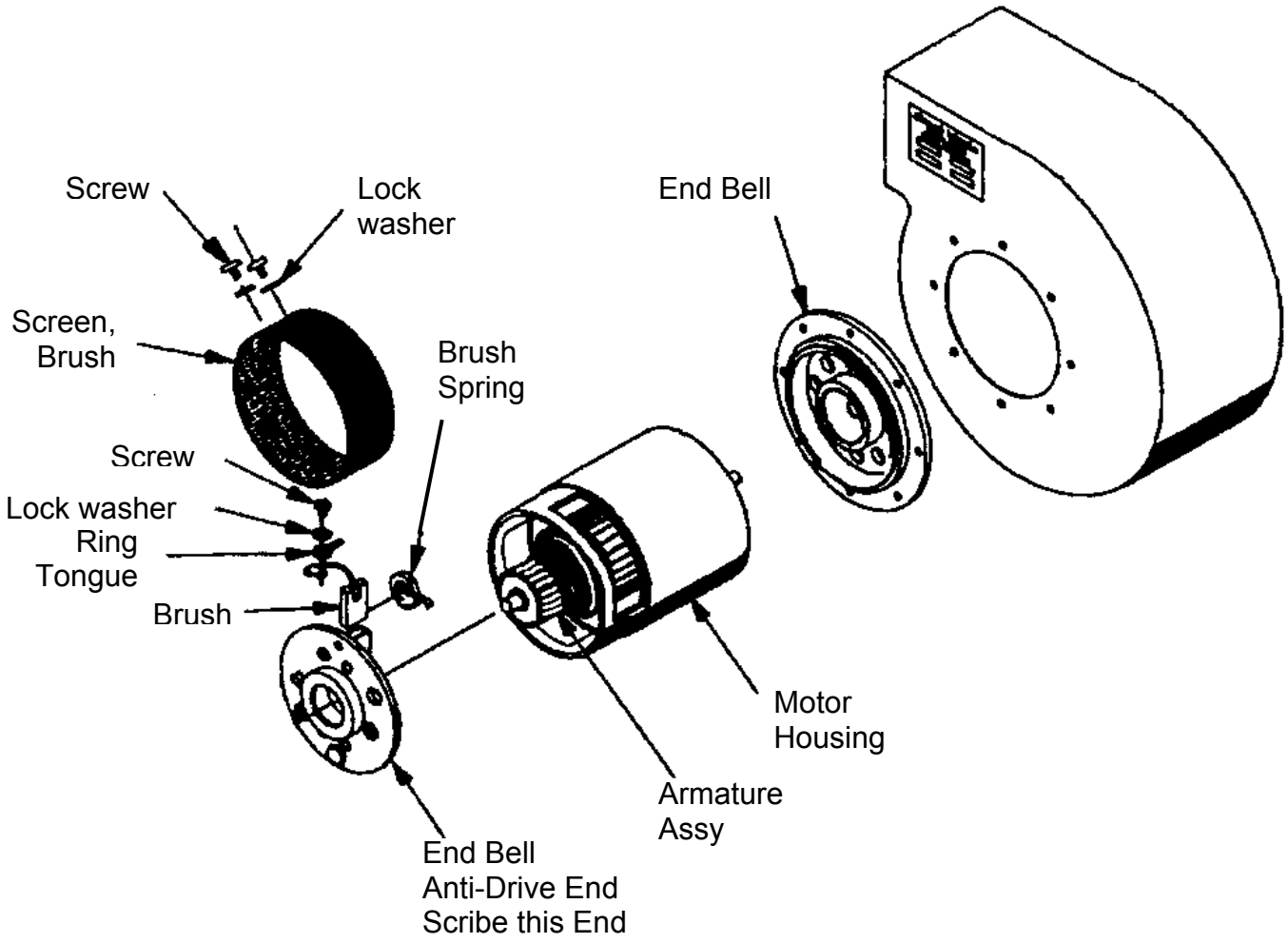
1. Remove blower in accordance with Section II 1.3, iv, a.

2. Scribe a mark on blower end bell and motor housing to ensure that end bell does not rotate.

3. Remove 2 bolts from motor end bell that attach –25 bracket (see Fig. 4 pg 4 IPC).

4. Cut safety wire and remove screws from screen band.

5. Carefully lift brush spring and slide out brush.



6. This step will allow you to extrapolate the remaining brush life. Measure the length of the shortest brush along its longest side and notate.

7. Determine the amount of time on blower by using aircraft hours since blower was installed.

.870	New Brush Length
- _____	Current Brush Length
	Brush Wear

Brush wear ÷ time in service = wear per flight hour

8. Minimum brush length is .4 in. If your brush is at or below this, return motor for overhaul.

9. If sufficient brush length is present subtract brush length from minimum brush length to determine remaining brush that is useable.

   (Brush length) -.40 = remaining brush that is useable.

10. Divide remaining brush useable length by wear per flight hour to determine how many hours of operation is left before blower needs to be overhauled.

EXAMPLE:
Assuming 800 unit hours since installation and 0.50" Brush length (measured)

STEP 1

.870 New Brush
- .500 Actual Brush Measurement
= .370 Brush Wear

STEP 2

.370 ÷ 800 = .0004625 inch per hour

STEP 3

.500 Measured Brush Length
- .400 Minimum Brush Length
.100 Remaining Useable Brush Length

STEP 4

.100 ÷ .0004625 = 216 Hours of operation remaining.

11. Notate in maintenance records of pending blower removal for overhaul.

12. Install brushes in brush housing; ensure that the brush moves freely in the housing.

13. Install screen ensuring that brush leads are positioned so they will not contact case or screen, safety screws.

14. Install item -25 bracket taking care to keep scribe lines aligned. Safety bolts.

15. Install blower per Aircraft Maintenance Manual.

c. **Blower Motor Removal**

1. Measure and document gap between blower wheel and inlet ring. See image below.

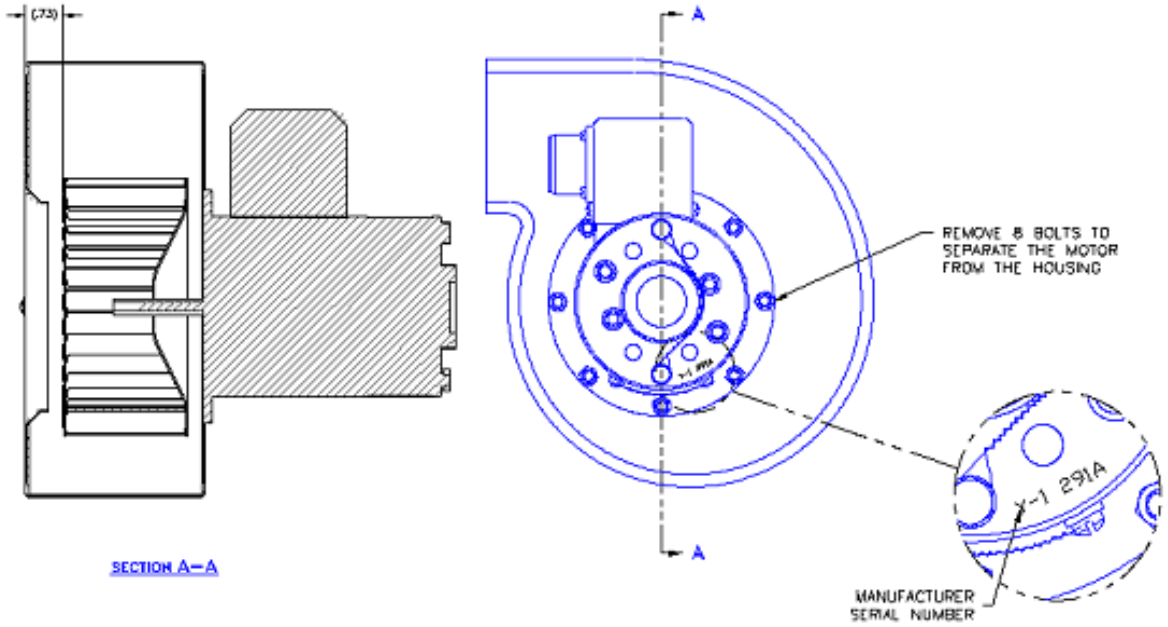
Record Gap Here _____

2. Remove and retain the inlet ring by unscrewing attaching hardware
3. Remove and retain the blower wheel.

NOTE: To access attaching hardware: Rotate blower wheel until head of setscrew is visible through recessed fin.

NOTE: Inspect the blower wheel for bent, cracked or damaged fins.

4. Remove and retain the hardware attaching the blower motor to housing as shown in figure below.
5. Remove the motor from the housing and reattach the wheel to the motor. Return to Air Comm Corp. for repair/overhaul.



MANUFACTURERS SERIAL NUMBER	BLOWER ASSEMBLY	BLOWER MOTOR AND WHEEL
Y-2	ES73175-2	ES73175-10
Y-4	ES73175-4	ES73175-11

d. Blower Motor Installation

1. Clean excess sealant from housing and inlet ring

2. Align the motor to the housing so that the connector faces in the correct direction.

3. Reattach the eight retained bolts. Torque to approximately 25 in. lbs.

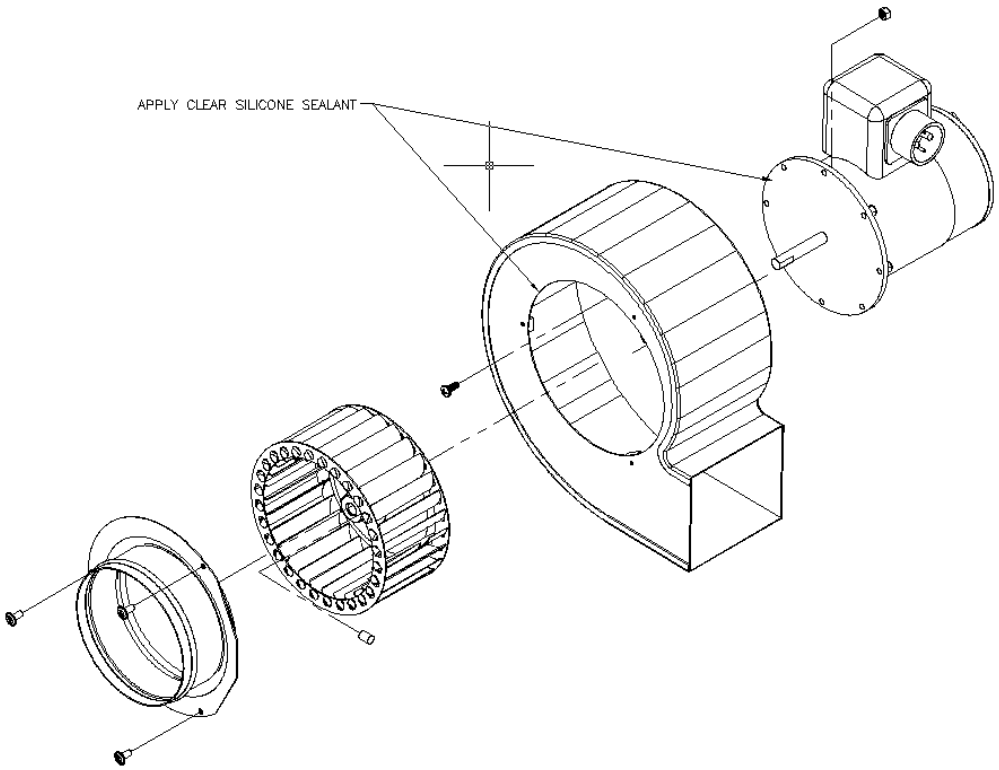
4. Reattach the blower wheel, ensuring equal space distance between the inlet ring and blower wheel documented in removal step 1. Apply Lok-tite 242 (removable) or equivalent to the blower wheel set screw and torque to approximately 30-40 in. lbs.

NOTE: Proper alignment requires temporary install of inlet ring to blower housing.

5. Apply RTV 108 silicone rubber adhesive (clear) or equivalent around mating surfaces of the inlet ring and blower housing.

6. Reattach the inlet ring and three screws.

7. Install blower per “iv” “a”.



2. COMPRESSOR/CONDENSER PALLET ASSEMBLY

The Compressor/Condenser Pallet is located on shelf aft of FR8 behind the left engine of the helicopter. The pallet consists of a compressor, motor and condenser. The motor drives both the compressor and condenser fan.

2.1. COMPRESSOR DRIVE MOTOR ASSEMBLIES

The compressor and motor assemblies are located on the pallet. The drive motor via a multi V flat belt turns the compressor, which compresses the refrigerant gas for condensing at ambient temperatures. A binary pressure switch mounted on the compressor monitors the refrigerant gas pressure. This switch will open at a compressor discharge over-pressure of 384.0 ± 28.4 PSIG (2647.6 ± 195.8 KPa) and under-pressure conditions of 30 PSI (206.8 KPa). This will interrupt the signal to the interface control box and stop the compressor drive motor.

NOTE: The compressor drive motor will return to operation when the pressure returns to the acceptable range.

This section of the maintenance manual discusses troubleshooting and maintenance practices used for the compressor assembly portion of the air conditioning system. See the IPC, Pages 11 through 56 for schematics and parts list.

2.2. COMPRESSOR/CONDENSER TROUBLESHOOTING

i. GENERAL

The following procedures are used for troubleshooting the compressor.

CAUTION: Do not operate air conditioning system with condenser air inlet or air outlet blocked.

ii. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Service Pressure Gauge	Comm. Avail.	1	None
28 VDC Source	N/A	A/R	None

Table 2.2.1: Tools and Equipment

iii. COMPRESSOR DRIVE MOTOR TROUBLESHOOTING PROCEDURES

With the system operating, observe if the following conditions occur as described in Table 2.2.2 below:

Trouble	Possible Cause	Correction
Fails to operate, no current draw.	No power supplied.	Check power source. Check for loose connections.
Operates slowly or not at all, current low.	Brushes not contacting commutator. Springs weak or brushes worn.	Replace brushes or **
	Armature damaged.	**
No rotation, high current.	Shorted field winding(s).	**
	Shorted armature winding.	**
	Armature locked.	**
	Bearing seized.	Replace bearings.
Noisy operation.	Bearings rough.	Replace bearings.
Excessive vibration	Armature out of balance.	**
	Worn bearings.	Replace bearings.
** Motor must be returned to Air Comm Corp. for inspection and repair/replacement.		

Table 2.2.2: Troubleshooting Compressor Drive Motor

iv. COMPRESSOR /CONDENSER PALLET TROUBLESHOOTING PROCEDURES

With the air conditioning system operating, observe if any of the following conditions occur as described in Table 2.2.3 below:

NOTE: Always attach a service gauge set to the system prior to beginning trouble shooting to ensure proper refrigerant charge is present.

Trouble	Probable Cause	Correction
• Unusually high suction pressure with low discharge pressure.	• Internal problem with compressor body.	• Replace compressor per Table 2.3.2.
	• Faulty expansion valve	• Replace expansion valve
• Unusually low suction and discharge pressure.	• System or compressor leak.	• Repair leak or replace compressor per Table 2.3.2.
	• Faulty expansion valve	• Check bulb location and/or replace valve as necessary
• High compressor discharge pressure.	• Condenser air exhaust restricted.	• Inspect exhaust flow path.
	• Refrigerant overcharge	• Discharge refrigerant.
• High compressor discharge pressure. (Continued)	• Excessive amount of oil	• Drain until correct.
	• Receiver/Dryer clogged	• Replace as necessary per Table 2.3.2.
	• Condenser fan damaged	• Replace as necessary per Table 2.3.2.
• Rough running.	• Damaged Belt	• Replace as necessary per Table 2.3.2.
	• Damaged fan	• Replace as necessary per Table 2.3.2.
	• Loose mounts	• Tighten bolts
	• Internal compressor problem	• Replace compressor per Table 2.3.2.
• Low airflow across condenser coil.	• Dirty condenser coil.	• Clean condenser coil per Section II, 2.3.4.
	• Bent fins.	• Straighten fins per Section II, 2.3.5
	• Missing Fan Blades.	• Replace fan assembly per Table 2.3.2.

Table 2.2.3: Troubleshooting Compressor Condenser Pallet

2.3. MAINTENANCE PRACTICES

i. GENERAL

The following procedures are used to perform typical maintenance on the Compressor/Condenser Pallet.

ii. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
12” Ruler (Rigid) or 25 cm Ruler	Comm. Avail.	1	See Fig. 2.3.1
6” Scale	Comm. Avail.	1	None
Feeler gauges	Comm. Avail.	1	None
Oil Dipstick	Make from metal wire.	1	See Fig. 2.3.2
Coil Cleaner	Comm. Avail.	A/R	Non Acid Based
Polyolester Oil	Comm. Avail.	A/R	Viscosity ISO 68
Fin Tool	Comm. Avail.	1	None
Cap	ES39263-2	1	Fitting Size #6
Cap	ES39263-3	1	Fitting Size #8
Cap	ES39263-4	1	Fitting Size #10
Plug	ES39265-2	1	Fitting Size #6
Plug	ES39265-3	1	Fitting Size #8
Plug	ES39265-4	1	Fitting Size #10

Table 2.3.1: Tools and Equipment

iii. MAINTENANCE CONFIGURATION MATRIX

The following procedures matrix is designed to assist in navigating the maintenance section of this document.

Compressor Pallet / Procedure	135-0550-1	135-0550-2	135-0550-3	135-0553-1	135-0566-1	135-0566-2
Pulley Alignment/Belt Adjustment	See Section 2.3.1					
System Oil Check	See Section 2.3.2					
Compressor Oil Check	See Section 2.3.3					
Condenser Coil Cleaning	See Section 2.3.4					
Condenser Coil Fin Maintenance	See Section 2.3.5					
Compressor Motor Brush Inspect	See Section 2.3.6					
Compressor Motor Overhaul	See Section 2.3.7					
Compressor Motor Shaft Dimpling	See Section 2.3.8					
Pressure Switch Replacement	See Section 2.3.12					
Compressor Replacement	2.3.9.i	2.3.9.i	2.3.9.i	2.3.10.i	2.3.11.i	2.3.11.i
Fan Blade Replacement	2.3.9.ii	2.3.9.ii	2.3.9.ii	2.3.10.ii	2.3.11.ii	2.3.11.ii
Spring Resistor Replacement	2.3.9.iii	2.3.9.iii	2.3.9.iii	2.3.10.iii	2.3.11.iii	2.3.11.iii

Compressor Pallet / Procedure	135-0550-1	135-0550-2	135-0550-3	135-0553-1	135-0566-1	135-0566-2
Relay Replacement	2.3.9.iv	2.3.9.iv	2.3.9.iv	2.3.10.iv	2.3.11.iv	2.3.11.iv
Compressor Motor Replacement	2.3.9.v	2.3.9.v	2.3.9.v	2.3.10.v	2.3.11.v	2.3.11.v
Drive Belt Replacement	2.3.9.vi	2.3.9.vi	2.3.9.vi	2.3.10.vi	2.3.11.vi	2.3.11.vi
Condenser Coil Replacement	2.3.9.vii	2.3.9.vii	2.3.9.vii	2.3.10.vii	2.3.11.vii	2.3.11.vii
Receiver/Drier Bottle Replacement	2.3.9.viii	2.3.9.viii	2.3.9.viii	2.3.10.viii	2.3.11.viii	2.3.11.viii
Refrigerant Hose Replacement	2.3.9.ix	2.3.9.ix	2.3.9.ix	2.3.10.ix	2.3.11.ix	2.3.11.ix

Table 2.3.2: Reference of Maintenance Procedure to Pallet Installation

COMPRESSOR PULLEY ALIGNMENT AND DRIVE BELT ADJUSTMENT

1. Loosen the cap screws under the motor.
2. Hold or clamp rigid 12” [25 cm] ruler to the face of JBS14001-10 as shown in Figure 2.3.1.
3. Referencing Figure 2.3.1; Measure dimension “C”.
4. Adjust the motor FWD/AFT so that dimension “C” is .178” ± .02” [4.52 mm ± .51 mm]. Once the two pulleys are aligned tighten the cap screws by hand.
5. Referencing Figure 2.3.1; Measure dimension “A” & “B”.
6. Check the pulley angle alignment by comparing “A” to “B”. Use the feeler gauges to measure the gaps between the rigid ruler and both sides of the JBS13015-2 Pulley. Adjust the twist in the motor until the difference between both ends is ±.02” [.51 mm].
7. Tighten the cap screws completely and safety wire per MS33540.
8. Check Dimensions A, B & C to assure that the motor did not move as the cap screws were tightened.
9. Adjust belt for moderate tension by adjusting turnbuckle and lock clips as required (Reference IPC, Figure 15). Rotate large pulley through two (2) revolutions.
10. Tension belt to deflect 0.16 in. [4.06 mm] with a 2-3 lb [0.9-1.36 kg] force applied at mid span location.
11. Rotate belt two (2) revolutions. Re-tension as required.
12. Install locking clips after belt is tensioned correctly.

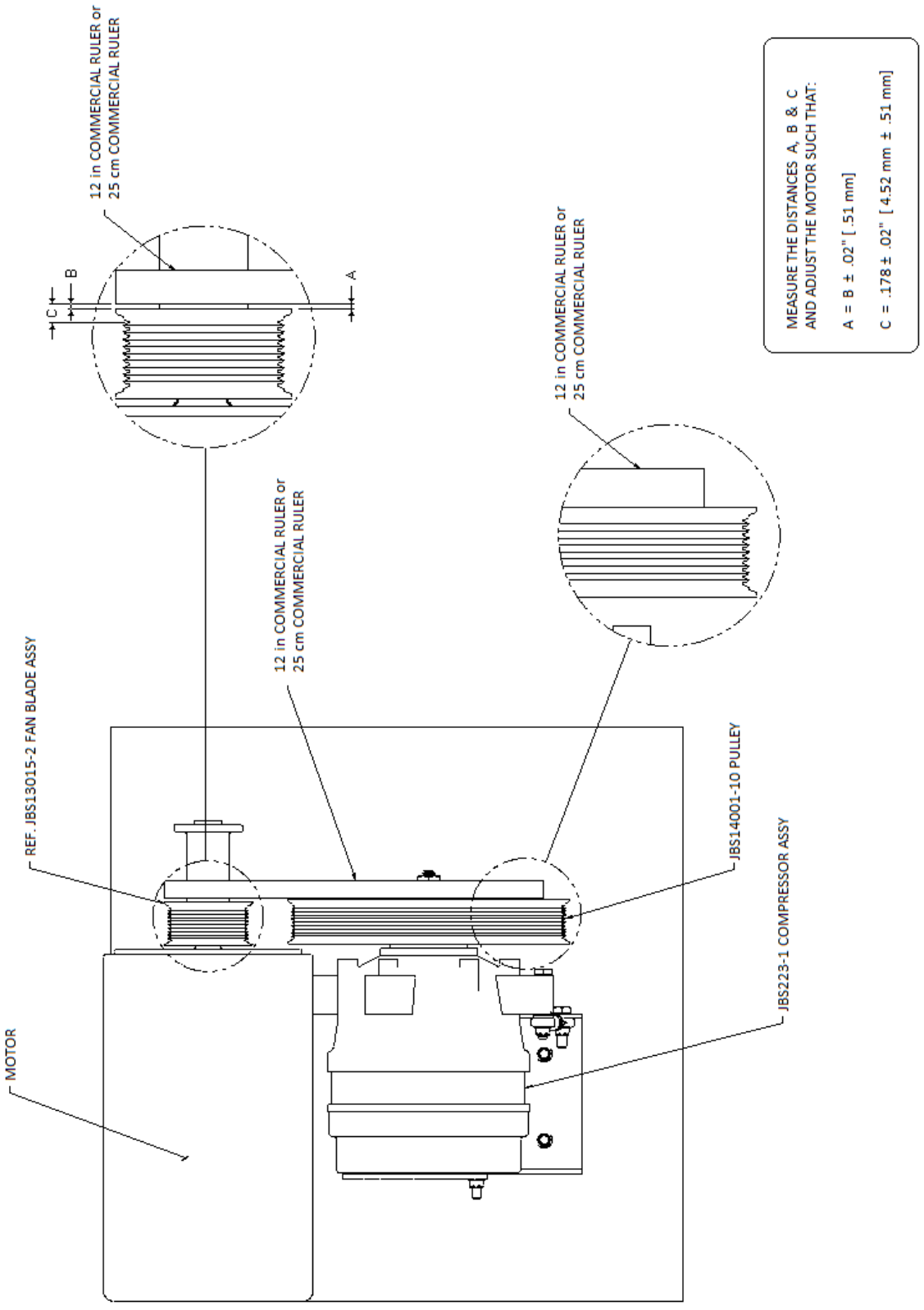

12 in COMMERCIAL RULER or
25 cm COMMERCIAL RULER
B
C
A
12 in COMMERCIAL RULER or
25 cm COMMERCIAL RULER
MEASURE THE DISTANCES A, B & C
AND ADJUST THE MOTOR SUCH THAT:
A = B ± .02" [.51 mm]
C = .178 ± .02" [4.52 mm ± .51 mm]
12 in COMMERCIAL RULER or
25 cm COMMERCIAL RULER
REF. JBS13015-2 FAN BLADE ASSY
JBS14001-10 PULLEY
JBS223-1 COMPRESSOR ASSY
MOTOR

Figure 2.3.1.

2.3.1 SYSTEM OIL CHECK

To ensure correct oil level for maintaining the system when a component is replaced, the following steps should be followed:

1. Operate air conditioning system for 10 minutes. This will collect as much oil as possible in the compressor.
2. Take note of existing oil level on the refrigerant servicing cart oil saving bottle.
3. Discharge air conditioning system of refrigerant, per procedures in Section II, 4.1.
4. Note the amount of compressor oil removed from the system during discharging. This amount of oil will have to be added back to the system during charging.
5. Evacuate the system and replace the removed oil during this process.
6. Charge the system with refrigerant per Section II, 4.3.

2.3.2 COMPRESSOR OIL CHECK

NOTE: It is only necessary to check the compressor oil level when the compressor has been removed, or when excessive oil is found to have leaked from the system, or for troubleshooting purposes. Use only Polyolester oil viscosity grade ISO 68.

If the need to check the compressor oil level arises, the following steps should be followed:

1. If installed, remove compressor per Section II, 2.3.iii Matrix.
2. Orient the compressor so the oil fill plug is at the 12 O'clock position and remove oil fill plug.
3. Insert dipstick into oil fill port. It may be necessary to insert the dipstick into the compressor at a slight angle. Ensure that the dipstick is not inserted into the compressor more than 4.7 inches [119.4 mm] as shown below.
4. Check that the oil level is eight (8) fluid ounces (at the 8^{th} increment). Add or subtract oil in one (1) fluid ounce increments until eight (8) fluid ounces is obtained.

Figure 2.3.2. Fabricated Dipstick

5. Clean oil fill port area and install oil fill plug. Torque plug to 6-9 ft-lbs (8.43-12.2 N-m)

6. Reinstall compressor in reverse order of removal.

7. Prior to charging and running the system, check and ensure that all components are properly installed and connected

2.3.3 CONDENSER COIL CLEANING PROCEDURE

1. Use vacuum cleaner to remove large debris from upstream and downstream coil faces.

2. Spray coil cleaner on both coil faces. Wash off with water.

3. Allow coil to dry thoroughly prior to additional maintenance.

2.3.4 STRAIGHTENING BENT COOLING FINS

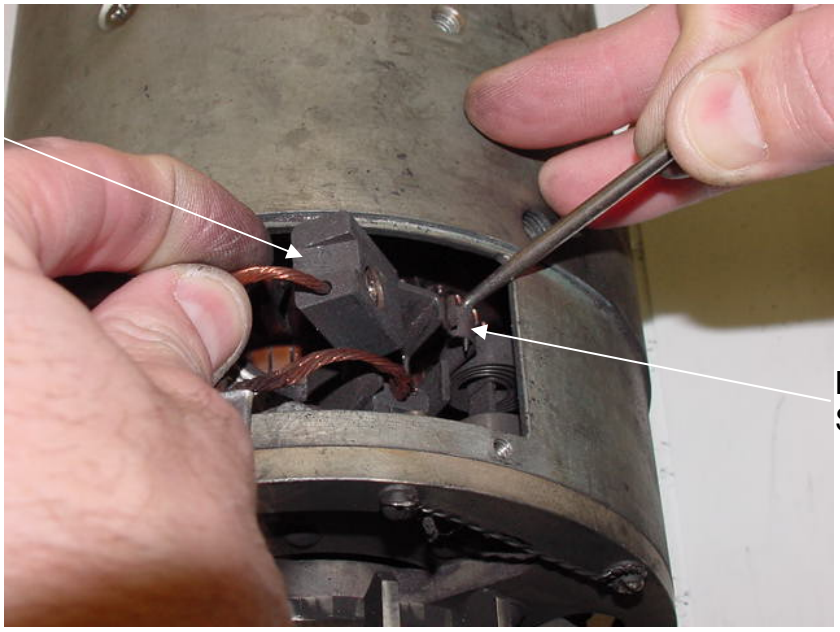
Carefully comb fins with fin comb tool until straight.

2.3.5 COMPRESSOR MOTOR BRUSH INSPECTION

1. Remove motor in accordance with Section II, 2.3, iii Matrix.
2. Cut safety wire and remove screws from motor end bell.

NOTE: Motors separated from Soft Start Assemblies will not be safety wired and will only have two (Qty 2) screws holding the bell on. Make note of these holes for reassembly.

3. Carefully lift brush spring and slide out brush. (Repeat for all four brushes).



4. This step will allow you to extrapolate the remaining brush life. Measure the length of the shortest brush along the longest side and notate.

5. Determine the amount of time on blower by using unit hour since motor was installed.

   1.250 New Brush Length
   - _____ Current Brush Length
   Brush Wear

   Brush wear ÷ time in service = wear per operating hour

6. Minimum brush length is .880 in. If your brush is at or below this return motor for overhaul.

7. If sufficient brush length is present subtract brush length from minimum brush length to determine remaining brush that is useable.

   (Brush length) -.880 = remaining brush that is useable.

8. Divide remaining brush useable length by wear per operating hour to determine how many hours of operation is left before blower needs to be overhauled.

EXAMPLE:
Assuming 800 unit hours since installation and 1.00" Brush length (measured)

STEP 1

1.250 New Brush
- 1.00 Actual Brush Measurement
= .25 Brush Wear

STEP 2

.25 ÷ 800 = .0003125 inch per hour

STEP 3

1.00 Measured Brush Length
- .880 Minimum Brush Length
.120 Remaining Useable Brush Length

STEP 4

.120 ÷ .0003125 = 384 Hours of operation remaining.

9. Notate in maintenance records of pending motor removal for overhaul.

10. Install brushes in brush housing; ensure that the brush moves freely in the housing.

11. Installed brush leads are positioned so they will contact case or housing safety screws.

12. Install motor in reverse order in Section II, 2.3.iii Matrix.

2.3.6 COMPRESSOR DRIVE MOTOR BRUSH / BEARING REPLACEMENT

This section is provided for the inspection and replacement of the bearings and brushes for P/N: ES61110-1, -2, -3 and P/N: 135-0570-1 compressor drive motors. The bearings must be replaced each time the brushes are changed. Other than the bearings and brushes there are no field serviceable parts inside the motor. If any other problems are found, as outlined in the inspection section, the motor should be returned to Air Comm Corp. for inspection and repair.

i. Cleaning

Motor should be cleaned prior to and after disassembly in order to carry out an accurate visual inspection. Any commercially available cleaning solvent is suitable.

WARNING: If solvent used is flammable, use in a well-ventilated area. Follow all instructions and warnings on label.

CAUTION: Do not immerse electrical wiring, bearings, or brushes in solvent. Use a lint free cloth moistened with solvent to clean these parts. Air pressure used for cleaning or drying parts should not exceed 30 psi.

ii. Disassembly Procedures

The numbers in brackets [ ] in the following text refer to reference designators in Figure 46 of the illustrated parts catalog. Reference designators are given in order of disassembly. Reverse order will generally be observed for reassembly. Disassembly instructions only cover replacement of bearings and brushes. For any other repairs, motor must be returned to Air Comm Corp.

1. Remove four screws [2] and washers [3] retaining the brush cover [1].

2. Remove two set screws [5] retaining fan blade [4].

3. Remove four screws [7] and washers [8] retaining brushes [6].

4. Use a scratch awl to mark clocking positions for end-bells [10] and [17] with respect to field housing [13]. Remove eight screws [11] and washers [12] retaining drive end-bell [10] on field housing assembly. Remove armature [14]. Bearing [15] and [16] will normally stay on armature shaft.

CAUTION: Take care during armature removal not to damage commutator surface or field coils.

NOTE: Remove brush debris where ever possible.

5. Use a suitable puller to remove bearings from armature shaft taking care not to damage shaft surfaces.

6. Remove retaining ring [31], shim(s) [32] and spring washer [33].

iii. Inspection

1. Visually inspect all parts for cracks, excessive wear, corrosion, stripped threads, cracked, burned, or brittle insulation or other visible defects that may affect performance.

2. Check brushes for wear and damage. Measure overall brush length along the longest face with respect to Table 2.3.4 below in this section.

3. Inspect brush holders for signs of overheating.

4. Check the surface of the commutator for signs of burning or grooves.

5. Check armature with respect to Table 2.3.4.

6. Check commutator for round.

   a. Scrap motor if commutator is out of round by more than .006 in [0.15 mm]
   b. Scrap motor if bar-to-bar on commutator surface is more than .003in [.075 mm]

iv. Assembly Procedures

Before proceeding with assembly, review illustrated parts catalog Figures 46 and 47. Numbers given in brackets [ ] throughout the assembly procedures refer to item numbers used in exploded view and associated parts list.

Prior to assembly, all parts should have required repairs completed and be free of all dirt and contaminates. Table 2.3.3 lists all expendable items which will be required during assembly.

MATERIAL	PART NUMBER	SOURCE
Lock-wire	MS20995 C25 and MS20995 C32	Commercially Available
Adhesive	Loctite #272	Loctite Corporation Newington, CT 06111
Thermalcote	Wakefield Type 120	Wakefield Manufacturing Wakefield, MA 01880

Table 2.3.3: Materials and Supplies

CAUTION: To prevent damage when pressing bearings onto armature shaft, be sure to press only against the inner race.

1. Install bearing [15] on drive end of armature [14].
2. Install bearing [16] on commutator end of armature [14].
3. Check that bearings rotate freely.

NOTE: Apply thermalcote sparingly and only to surfaces specified.

4. Sparingly coat inside surface of bearing bores of drive end bell [10] and anti-drive end bell [17] with #120 thermalcote.
5. Place drive end bell [10] on armature assembly so that bearing is fully seated in bore.

NOTE: When assembling end bells, armature assembly and field housing assembly, insure correct reassembly position of components by alignment of clocking marks made during disassembly.

6. Avoid damage to armature surfaces and position field housing assembly [13] over armature until mated with drive end bell [10].

7. Install eight screws [11], washers [12] to attach drive end bell [10] to field housing [13]. Check alignment of clocking marks.

8. Apply momentary pressure to commutator end of shaft to insure that armature and drive end bearing are fully seated in drive end bell. Install shim(s) [32] and spring washer [33]. Adjust number of shims so that stack of shims, uncompressed washer and cover are flush with to .010 below outside edge of retaining ring groove in the anti-drive end bell [17]. Compress spring washer just enough to install retaining ring (.046 to .056 inches).

9. Install new brushes [6] using screws [7] and washers [8]. Connect field coil lead to brush holders in same manner as disassembled.

10. Install fan [4] with two set screws [5] after applying Loctite 242 to threads. Gap between fan hub and anti-drive end bell should be approximately 0.1 inch.

11. Hi-pot motor assembly before connecting negative leads to ground. Test at 600 volts AC for 10 seconds. No leaking or shorts are permissible.

12. Apply 12-14 volts DC to the motor. After motor warms up, current draw should be approximately 18 amps. Cooling air is required to prevent over-heating. Run as needed to seat brushes against commutator. This may require 12 hours or more. Pull brushes periodically for inspection. Watch for signs of abnormal commutation (sparking), abnormal brush or commutator wear. A brush may be considered "seated" if 90% or more of the brush end has attained commutator contours.

13. Inspect brush shunts for proper "dress" which will allow unrestricted movement of brushes in holders. Make final inspection of lead-wire dress between brush holders and field coils.

14. Install brush cover [1] with screws [2] and flat washers [3]. Tighten screws to 20 inch-pounds. Safety wire as required.

DESCRIPTION	PART NUMBER	LIMITS
Drive end bell bearing bore	[10]	1.5754 to 1.5749 I.D.
Anti-drive end bell bearing bore	[17]	1.3786 to 1.3781 I.D.
Armature assembly Shaft drive end journal Shaft commutator end journal Shaft commutator diameter	[14]	 .6695 to 6692 O.D. .5905 to .5908 O.D. 1.820 to 2.020 O.D.
Brush lengths	ES61110-11 [6]	New length 1.250 inches, shortest useable length .880
Shaft end play		.028 to .038 by compressing wave washer.

Table 2.3.4: Measurements, Fits and Clearance

2.3.7 MOTOR SHAFT DIMPLE INSTRUCTIONS

i. GENERAL

Add second dimple on motor shaft for proper fan alignment.

ii. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
#10 drill bit	Comm. Avail.	1	None

Table 2.3.5: Tools and Equipment

iii. Motor Shaft Dimple instructions

1. Remove compressor drive motor and fan assembly. Reference Section II, 2.3.iii Matrix.
2. Dimple shaft using #10 drill bit (.190 in [4.82 mm]) at 1.245 in [31.62 mm] dim, as shown in Figure 2.3.3
3. Reinstall compressor drive motor and fan assembly. Reference Section II, 2.3.iii Matrix.

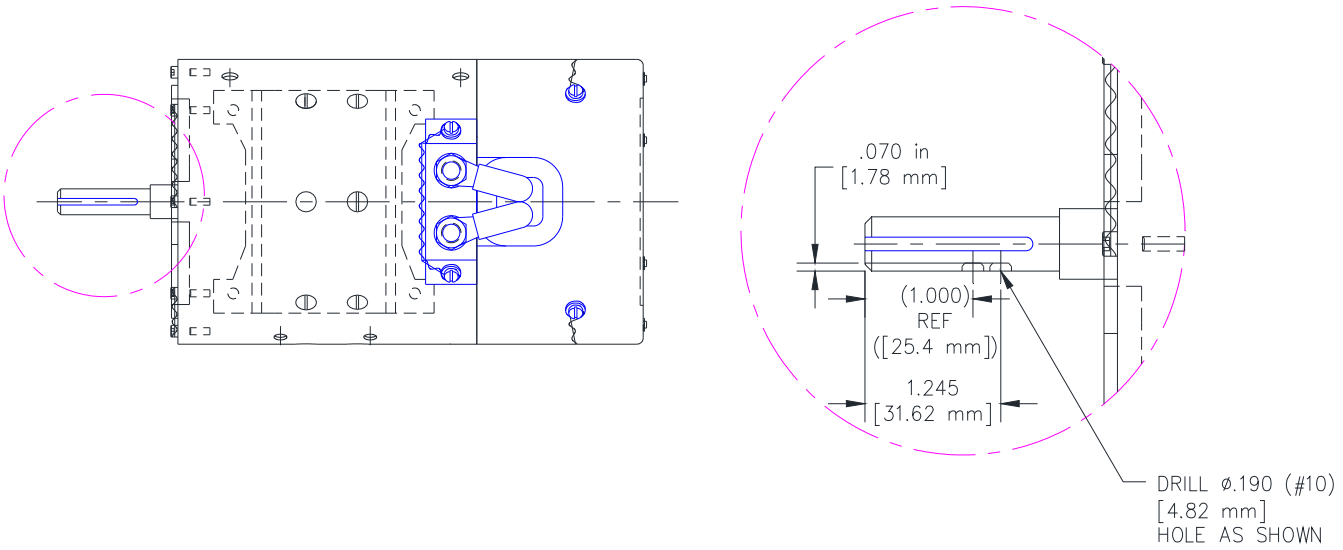


Figure 2.3.3 Motor Shaft Dimple

2.3.8 COMPONENT REPAIR/REPLACEMENT FOR 135-0550 SERIES PALLETS

In proceeding with repair/replacement, reference IPC pages 11 through 27. Numbers given in brackets [ ] throughout these procedures refer to item numbers (I/N:) used in exploded views and referenced in associated parts list.

i. Compressor Replacement (JBS222-1):

If the need to replace the compressor arises, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, Pages 11 - 27):

a. Discharge and evacuate the system per instructions in Section II, 4.1.

b. ***Optional:*** Remove the Compressor/Condenser Pallet from the helicopter. For instructions refer to the Aircraft Maintenance Manual. Plug both hose assemblies leading to pallet using plug P/N's ES39265-4 and ES39265-2 and cap both fitting under Compressor/Condenser Pallet using cap P/N's ES39263-2 and ES39263-4.

c. Remove the Compressor/Condenser Pallet covers by unscrewing screws securing them to the assembly.
(Reference Figure 11,12; I/N:[33],[34],[156])

d. Locate the compressor and disconnect both hose assemblies and plug using plug P/N's ES39265-4 and ES39265-3. If compressor is being removed for oil check then cap both fitting using cap P/N's ES39263-2 and ES39263-3.
(Reference Figure 10 and 13; I/N:[3],[46],[48])

e. Remove the pressure switch assembly from the compressor and retain for reuse.
(Reference Figure 16; I/N:[18])

f. Carefully un-tension the belt by removing the lock clips on the compressor turnbuckle and turning the turnbuckle counterclockwise. Retain turnbuckles and mounting hardware for re-use.
(Reference Figure 13,15; I/N:[77],[78],[141])

g. Once the belt is loose, remove the belt from the compressor pulley

h. Locate the three compressor mounting bolts. Remove the compressor mounting bolts, and remove the compressor from the assembly. Retain the mounting bolts for reuse.
(Reference Figure 15; I/N:[75],[95],[98])

i. Remove the compressor from the compressor bracket and retain all mounting hardware for reuse.

(Reference Figure 15; I/N:[39])

j. Carefully place the compressor assembly with the pulley attached on a flat surface.

k. Remove the pulley end plate and retain the hardware securing it to the assembly for reuse.
(Reference Figure 16; I/N:[6],[8],[9])

l. Remove the small retaining ring that secures the pulley/bearing assembly on the compressor. Retain for reuse.
(Reference Figure 16; I/N:[11])

m. With a three-leg puller carefully remove the drive pulley complete with bearing. Retain for reuse.

n. Scrap the compressor and dispose of properly.

o. Examine the bearing carefully for any damage. If it is determined that the bearing needs to be replaced go to Step “p” otherwise go to Step “s”.

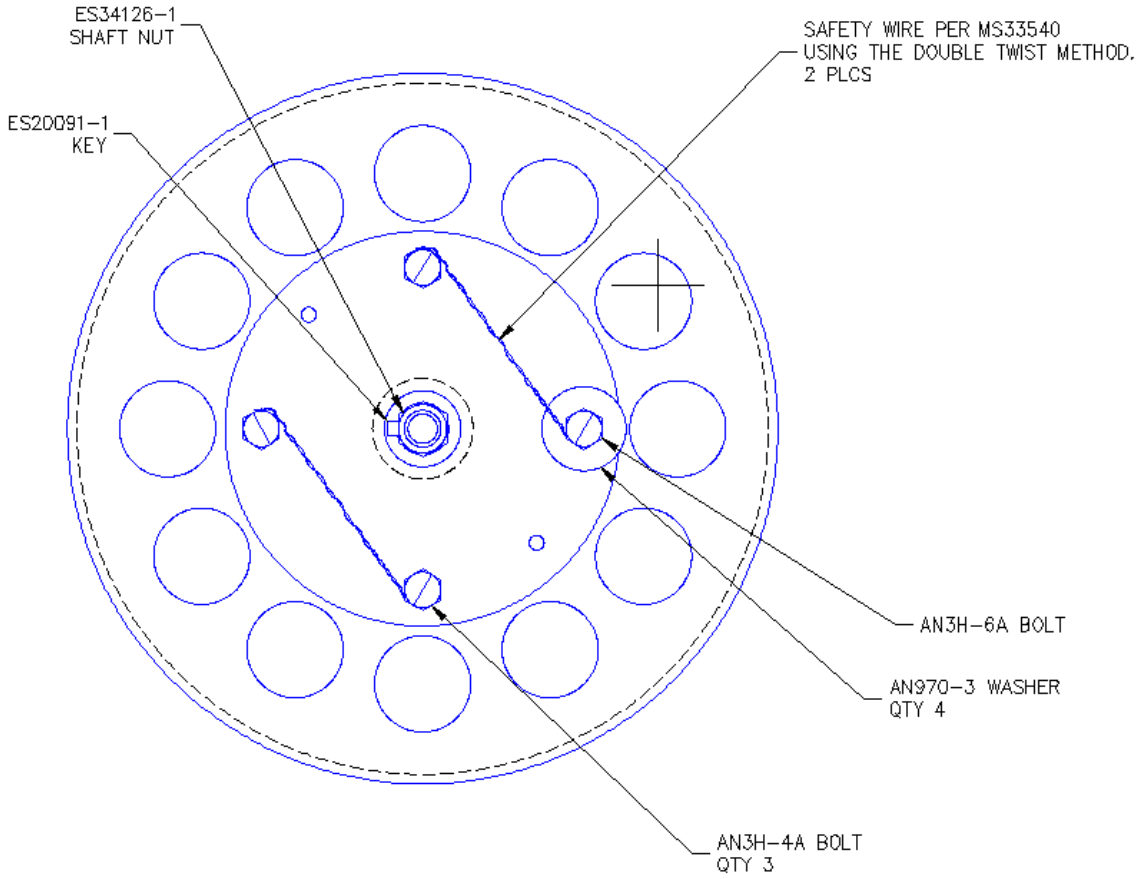
p. Remove the retaining snap ring that retains the bearing in the pulley.
(Reference Figure 16; I/N:[10])

q. With a shop press, carefully remove the bearing and dispose of properly.
(Reference Figure 16; I/N:[7])

r. Install the new bearing using a shop press on the outer race only and secure with the large snap ring.

s. Reinstall the pulley onto the new compressor using a press and reinstall the small snap ring and pulley end plate using the mounting hardware.

t. Confirm pulley balancing washers are installed opposite the keyway per figure below and safety the four bolts securing the pulley end plate to the assembly with safety wire.



Safety Wiring and Balancing of Compressor Pulley

u. Install new compressor in reverse order of removal. Tension belt per instructions given in Section II, 2.3.1, Compressor Drive Belt Adjustment.

v. *(Optional: As necessary resulting from step b.)* Install the Compressor / Condenser Pallet on the helicopter. For instructions refer to the Aircraft Maintenance Manual.

w. Prior to charging and running the system, check and ensure that all components are properly installed and connected

ii. **Comp/Cond Pallet Fan Blade Pulley Assembly Replacement (JBS13015-1):**

To remove and replace the Fan Blade Pulley assembly the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, Pages 11 - 27):

a. Remove the compressor drive motor with the Fan Blade Pulley assembly attached per Section II, 2.3.9, v, Step “a - g” and take it to a workbench.

b. Identify the location of the Fan Blade Pulley assembly on the motor shaft. *(Reference Figure 14; I/N:[16])*

c. Loosen the setscrews securing the Fan Blade Pulley assembly to the compressor-drive motor and carefully remove the assembly from the motor. *(Reference Figure 14; I/N:[168])*

d. Install the new Fan Blade Pulley assembly in reverse order of removal using a thread-locking compound (i.e. Loctite 242) to secure the setscrews and key.

e. Ensure that the assembly is tight and snug on the compressor shaft and that the setscrews are firmly secure.

f. Install the compressor drive motor and belt in reverse order of removal.

g. Tension belt per instructions given in Section II, 2.3.1, Compressor Drive Belt Adjustment

h. Prior to running the system, check and ensure that all components are properly connected.

iii. Spring Resistor Replacement (JBS912-4):

If the need to replace the spring resistor arises, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, Pages 11 - 27):

a. Disconnect electrical power supply. (If required, disconnect aircraft battery and the ground power unit).

b. Gain access to the deck below the left aircraft engine where the Compressor/Condenser Pallet is located. Remove the engine exhaust shroud if necessary.

c. Gain access to the spring resistor by removing the top cover of the pallet assembly. (If this is not possible the system will have to be evacuated and discharged and the pallet will have to be removed to workbench for easier access per instructions given in the Aircraft Maintenance Manual. Plug both hose assemblies leading to pallet using plug P/N's ES39265-4 and ES39265-2 and cap both fittings under Compressor/Condenser Pallet using cap P/N's ES39263-2 and ES39263-4).
(Reference Figure 11,12; I/N:[32],[59],[63])

d. Carefully unfasten the spring resistor by unfastening the 2 nuts securing it to the relays. Retain mounting hardware for reuse.
(Reference Figure 7,8; I/N:[40],[41],[171])

e. Reinstall new spring resistor in reverse order of removal, and ensure that there is no contact between the spring resistor and any other item on the pallet other than the two points where the spring resistor is fastened onto the relays.

f. If required, reinstall the Compressor/Condenser Pallet. Refer to the Aircraft Maintenance Manual for installation instructions.

g. Prior to running (and if required, charging) the system, check and ensure that all components are properly connected.

iv. Relay Replacement (JBS421-7):

If the need to replace the relays arises, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, Pages 11 - 27):

a. Discharge and evacuate the system per instructions in Section II, 4.1.

b. Remove the Compressor/Condenser Pallet from the helicopter. For instructions refer to the Aircraft Maintenance Manual. Plug both hose assemblies leading to pallet using plug P/N's ES39265-4 and ES39265-2 and cap both fittings under Compressor/Condenser Pallet using cap P/N's ES39263-2 and ES39263-4

c. Remove the Compressor/Condenser Pallet cover by unscrewing the fasteners securing it to the assembly.
(Reference Figure 11,12; I/N:[32],[59],[63])

d. Locate the relay assemblies on the pallet.
(Reference Figure 8; I/N:[40])

e. Identify relay contacts and the wires that go to them. Do not remove the diode on the relay assembly as a new one is on the replacement relay.

f. Unfasten the relays and retain fastening hardware for reuse.

g. Transfer the spring resistor to the new relays or combination of a new and old relay.

h. Re-install relays onto the pallet assembly. It may be necessary to attach all the wires to the relays prior to reinstalling the relays to the pallet.

i. Check all wire connections and ensure that there is no contact between the spring resistor and any other item on the pallet other than the two points where the spring resistor is fastened onto the relays.

j. Install the Compressor/Condenser Pallet on the helicopter. For instructions refer to the Aircraft Maintenance Manual.

k. Prior to charging and running the system, check and ensure that all components are properly connected.

v. Compressor Drive Motor Replacement (ES61110-3):

If the need to replace the compressor drive motor arises, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, Pages 11 - 27):

a. Discharge and evacuate the system per steps b and g in Section II, 4.1.

b. Remove the Compressor/Condenser Pallet from the helicopter. Plug both hose assemblies leading to pallet using plug P/N's ES39265-4 and ES39265-2 and cap both fittings under Compressor/Condenser Pallet using cap P/N's ES39263-2 and ES39263-4. For instructions refer to the Aircraft Maintenance Manual.

c. Remove the Compressor/Condenser Pallet cover by unscrewing screws securing it to the assembly.
(Reference Figure 11,12; I/N:[33],[34],[156])

d. Locate the compressor.

e. Carefully loosen the belt by removing the lock clips on the compressor turnbuckle and turning the turnbuckle counterclockwise. Retain turnbuckles and mounting hardware for re-use.
(Reference Figure 13,15; I/N:[77],[78],[141])

f. Once the belt is loose, remove the belt from the compressor pulley.

g. Locate the four-compressor drive motor mounting bolts. Remove the compressor drive motor mounting bolts, and carefully remove the drive motor, with the belt and fan assembly from the assembly to a work area. Retain the mounting bolts for reuse.
(Reference Figure 14; I/N:[92])

h. Identify pulley location on the drive motor shaft and the setscrews that secure it in place.
(Reference Figure 14; I/N:[16])

i. Remove and retain the pulley assembly and key by loosening the setscrews and sliding the pulley off the motor shaft.
(Reference Figure 14; I/N:[16],[168])

NOTE: Inspect the drive belt at this time for signs of wear and replace if necessary.

j. Loosely install the pulley assembly on the replacement drive motor. Refering to Section II, 2.3.1, align the motor pulley with the compressor pulley. Tighten set screw to mark shaft. Remove pulley and inspect motor shaft for mark left

by the set screw. Marks should be in bottom of the second dimple in shaft. If motor shaft does not have dimple in correct location refer to Section II, 2.3.8. Re-install pulley and belt on the new drive motor and reinstall the motor in reverse order of removal. Tension belt per instructions given in Section II, 2.3, Compressor Drive Belt Adjustment.

k. Install the Compressor/Condenser Pallet on the helicopter. For instructions refer to the Aircraft Maintenance Manual.

l. Prior to charging and running the system, check and ensure that all components are properly connected.

vi. Compressor Drive Belt Replacement (ES20040-3):

If the need to replace the compressor drive belt arises, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, Pages 11 - 27):

a. Remove the Compressor/Condenser Pallet cover by unscrewing the screws securing it to the assembly.
(Reference Figure 11,12; I/N:[33],[34],[156])

b. Locate the compressor.

c. Carefully loosen the belt by removing the lock clips on the compressor turnbuckle and turning the turnbuckle counterclockwise. Retain turnbuckles and mounting hardware for re-use.
(Reference Figure 13,15; I/N:[77],[78],[141])

d. Once the belt is loose, remove the belt from the compressor pulley

e. Carefully remove the belt by slipping it over the fan blades.

f. Scrap the belt and dispose of properly

g. Reinstall new belt in reverse order of removal. Tension belt per instructions given in Section II, 2.3.1, Compressor Drive Belt Adjustment.

vii. Condenser Coil Replacement (JBS3006-3):

If the need to replace the condenser coil arises, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, Pages 11 - 27):

a. Discharge and evacuate the system per instructions in Section II, 4.1.

b. Remove the Compressor/Condenser Pallet from the helicopter. Plug both hose assemblies leading to pallet using plug P/N's ES39265-2 and ES39265-4 and cap both fittings under Compressor/Condenser Pallet using cap P/N's ES39263-2 and ES39263-4. For instructions refer to the Aircraft Maintenance Manual.

c. Remove the Compressor/Condenser Pallet cover by unscrewing the screws securing it to the assembly.
(Reference Figure 11,12; I/N:[33],[34],[156])

d. Locate the condenser assembly.

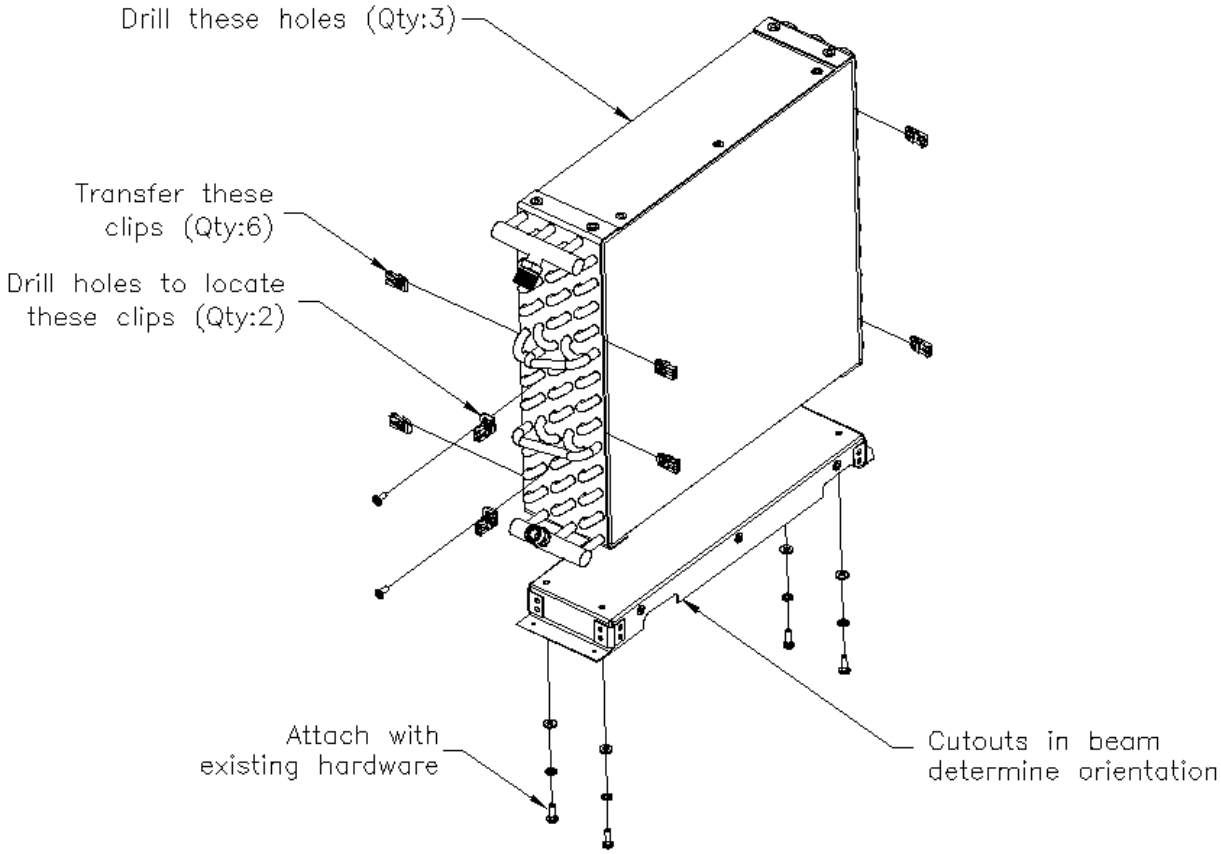
e. Remove the outlet shroud from the pallet assembly and retain all mounting hardware for reuse.
(Reference Figure 11,12; I/N:[63],[152],[63])

f. Disconnect the two hose assemblies on top of the condenser assembly and plug using plug P/N's ES39265-2 and ES39265-3.
(Reference Figure 11,12; I/N:[47],[49],[59])

g. Carefully unfasten the hardware securing the condenser coil to the pallet board.
(Reference Figure 8,13; I/N:[72],[94])

h. Remove the condenser coil from the pallet with all the mounting brackets attached.
(Reference Figure 8; I/N:[37])

i. With a measuring device mark the location of each bracket and transfer them to the new coil. Figure for reference below.



j. Pressure test the coil for leaks (200 PSI). If this is not possible, use the service cart to see if the system can hold a vacuum or use a sniffing device to see if the system has a leak at the condenser upon charging.

k. Reinstall the new coil in reverse order of removal.

l. Install the Compressor/Condenser Pallet on the helicopter. For instructions refer to the Aircraft Maintenance Manual.

m. Prior to charging and running the system, check and ensure that all components are properly connected

viii. Receiver Drier Bottle Replacement; ES43030-2 (with sight glass), ES43030-3

The receiver/drier bottle should be replaced whenever the compressor is replaced or when the air conditioning system plumbing is left open to the atmosphere for a time greater than 30 minutes. If the need to replace the receiver/drier bottle does arise, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, Pages 11 - 27):

a. Discharge and evacuate the system per instructions in Section II, 4.1.

b. Gain access to the deck behind the left aircraft engine where the Compressor/Condenser Pallet is located.

c. Locate receiver drier bottle towards the rear of the aircraft on the pallet assembly.
(Reference Figure 12; I/N:[17])

d. Disconnect electrical power supply. (If required disconnect aircraft battery and ground power unit). Disconnect and plug both hose assemblies using plug P/N: ES39265-2. Only plug plumbing connections at the receiver drier bottle end.
(Reference Figure 11,12; I/N:[47],[49])

e. Loosen the clamp securing the receiver drier bottle.
(Reference Figure 12; I/N:[25])

f. Make note of the receiver drier bottle orientation and the location of the “IN” mark.

g. Remove and discard the receiver drier bottle.

h. Install new receiver drier bottle in reverse order of removal.

i. Prior to charging and running the system, check and ensure that all components are properly connected.

ix. Refrigerant Hoses

The refrigerant hoses should be replaced when there are signs of wearing and when they have a kink or blockage. The correct hose should be identified in the IPC and a new hose assembly should be ordered from Air Comm Corp.

2.3.9 COMPONENT REPAIR/REPLACEMENT FOR 135-0553 SERIES PALLETS

In proceeding with repair/replacement, reference IPC pages 28 through 44. Numbers given in brackets [ ] throughout these procedures refer to item numbers (I/N:) used in exploded views and referenced in associated parts list.

i. Compressor Replacement (JBS222-1):

If the need to replace the compressor arises, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, pages 28 - 44):

a. Discharge and evacuate the system per instructions in Section II, 4.1.

b. *(Optional)* Remove the Compressor/Condenser Pallet from the helicopter. For instructions refer to the Aircraft Maintenance Manual. Plug both hose assemblies leading to pallet using plug P/N's ES39265-4 and ES39265-2 and cap both fitting under Compressor/Condenser Pallet using cap P/N's ES39263-2 and ES39263-4.

c. Remove the Compressor/Condenser Pallet cover by unscrewing screws securing it to the assembly.
(Reference Figure 20,22; I/N:[33],[34],[143])

d. Locate the compressor and disconnect both hose assemblies and plug using plug P/N's ES39265-4 and ES39265-3. If compressor is being removed for oil check then cap both fitting using cap P/N's ES39263-2 and ES39263-3.
(Reference Figure 21; I/N:[46],[48])

e. Disconnect the pressure switch assembly from the compressor and retain for reuse.
(Reference Figure 27; I/N:[18])

f. Carefully un-tension the belt by removing the lock clips on the compressor turnbuckle and turning the turnbuckle counterclockwise. Retain turnbuckles and mounting hardware for re-use.
(Reference Figure 21, 26; I/N:[77],[78],[141])

g. Once the belt is loose, remove the belt from the compressor pulley

h. Locate the three compressor mounting bolts. Remove the compressor mounting bolts, and remove the compressor from the assembly. Retain the mounting bolts for reuse.
(Reference Figure 26; I/N:[50],[75],[133])

i. Remove the compressor from the compressor bracket and retain all mounting hardware for reuse.

(Reference Figure 26; I/N:[39],[66])

j. Carefully place the compressor assembly with the pulley attached on a flat surface.

k. Remove the pulley end plate and retain the hardware securing it to the assembly for reuse.
(Reference Figure 27; I/N:[6],[8],[9]) deleted 176

l. Remove the small retaining ring that secures the pulley/bearing assembly on the compressor. Retain for reuse.
(Reference Figure 27; I/N:[11])

m. With a three-leg puller carefully remove the drive pulley complete with bearing. Retain for reuse.

n. Scrap the compressor and dispose of properly.

o. Examine the bearing carefully for any damage. If it is determined that the bearing needs to be replaced go to Step “p” otherwise go to Step “s”.

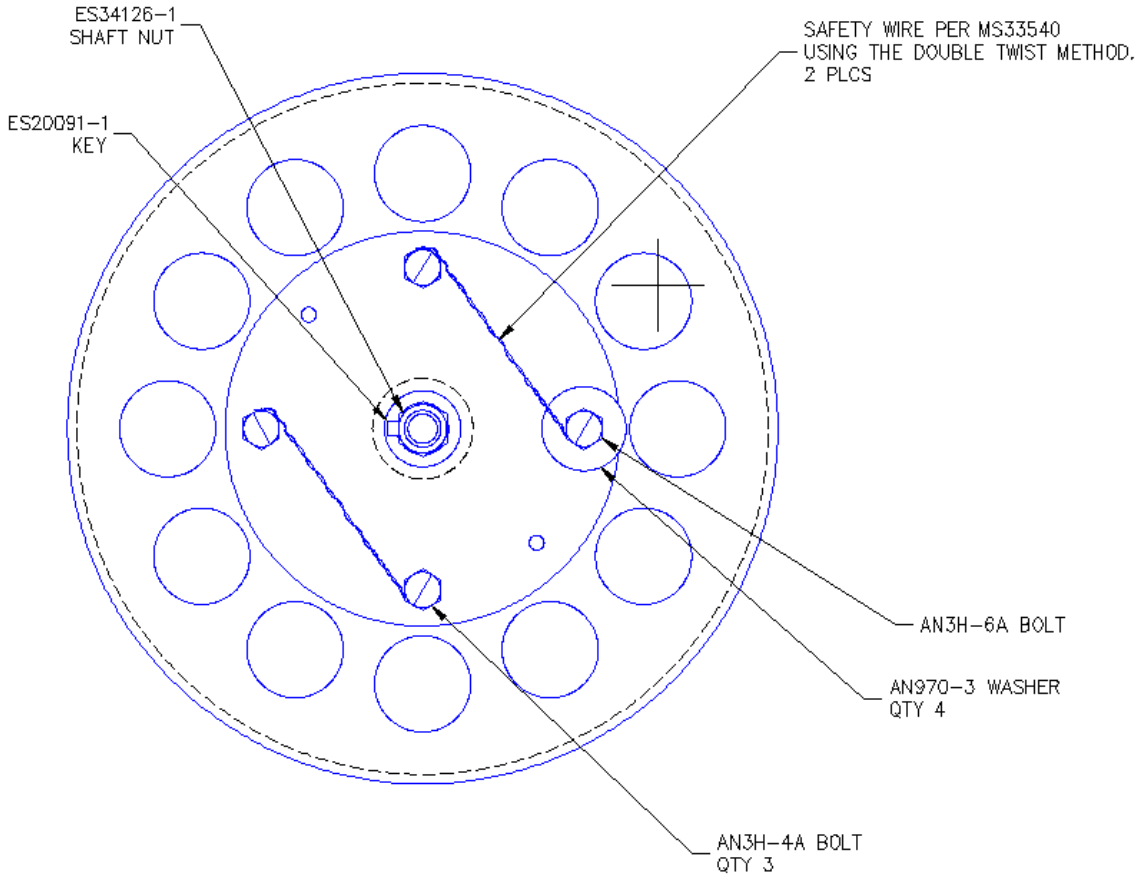
p. Remove the large retaining ring that retains the bearing in the pulley.
(Reference Figure 27; I/N:[10])

q. With a shop press, carefully remove the bearing and dispose of properly.
(Reference Figure 27; I/N:[7])

r. Install the new bearing using a shop press on the outer race only and secure with the large snap ring.

s. Reinstall the pulley onto the new compressor using a press and reinstall the small snap ring and pulley end plate.

t. Confirm pulley balancing washers are installed opposite the keyway per figure below and safety the four bolts securing the pulley end plate to the assembly with safety wire.



Safety Wiring and Balancing of Compressor Pulley

u. Install new compressor in reverse order of removal. Tension belt per instructions given in Section II, 2.3.1, Compressor Drive Belt Adjustment.

v. *(Optional: As necessary resulting from step b.)* Install the Compressor / Condenser Pallet on the helicopter. For instructions refer to the Aircraft Maintenance Manual.

w. Prior to charging and running the system, check and ensure that all components are properly installed and connected

ii. Comp/Cond Pallet Fan Blade Pulley Assembly Replacement (JBS13015-2):

To remove and replace the Fan Blade Pulley assembly the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, pages 28 - 44):

a. Remove the compressor drive motor with the Fan Blade Pulley assembly attached per Section II, Step 2.3.10, v, Step “a.” through Step “g.” and take it to a workbench.

b. Identify the location of the Fan Blade Pulley assembly on the motor shaft. *(Reference Figure 25; I/N:[16])*

c. Loosen the setscrews securing the Fan Blade Pulley assembly to the compressor-drive motor and carefully remove the assembly from the motor. *(Reference Figure 25; I/N:[168])*

d. Reinstall the new Fan Blade Pulley assembly in reverse order of removal using a thread-locking compound (i.e. Loctite 242) to secure the setscrews and key.

e. Ensure that the assembly is tight and snug on the compressor shaft and that the setscrews are firmly secure.

f. Install the compressor drive motor and belt in reverse order of removal.

g. Tension belt per instructions given in Section II, 2.3, Compressor Drive Belt Adjustment

h. Prior to running the system, check and ensure that all components are properly connected.

iii. Compressor Drive Motor Replacement (135-0570-1):

If the need to replace the compressor drive motor arises, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, pages 28 - 44):

a. Discharge and evacuate the system per steps b and g in Section II, 4.1.

b. Remove the Compressor/Condenser Pallet from the helicopter. Plug both hose assemblies leading to pallet using plug P/N's ES39265-4 and ES39265-2 and cap both fittings under Compressor/Condenser Pallet using cap P/N's ES39263-2 and ES39263-4. For instructions refer to the Aircraft Maintenance Manual.

c. Remove the Compressor/Condenser Pallet cover by unscrewing screws securing it to the assembly.
(Reference Figure 20,22; I/N:[33],[34],[143])

d. Locate the compressor.

e. Carefully loosen the belt by removing the lock clips on the compressor turnbuckle and turning the turnbuckle counterclockwise. Retain turnbuckles and mounting hardware for re-use.
(Reference Figure 33; I/N:[77],[78],[141])

f. Once the belt is loose, remove the belt from the compressor pulley.

g. Locate the four-compressor drive motor mounting bolts. Remove the compressor drive motor mounting bolts, and carefully remove the drive motor, with the belt and fan assembly from the assembly to a work area. Retain the mounting bolts for reuse.
(Reference Figure 25; I/N:[92])

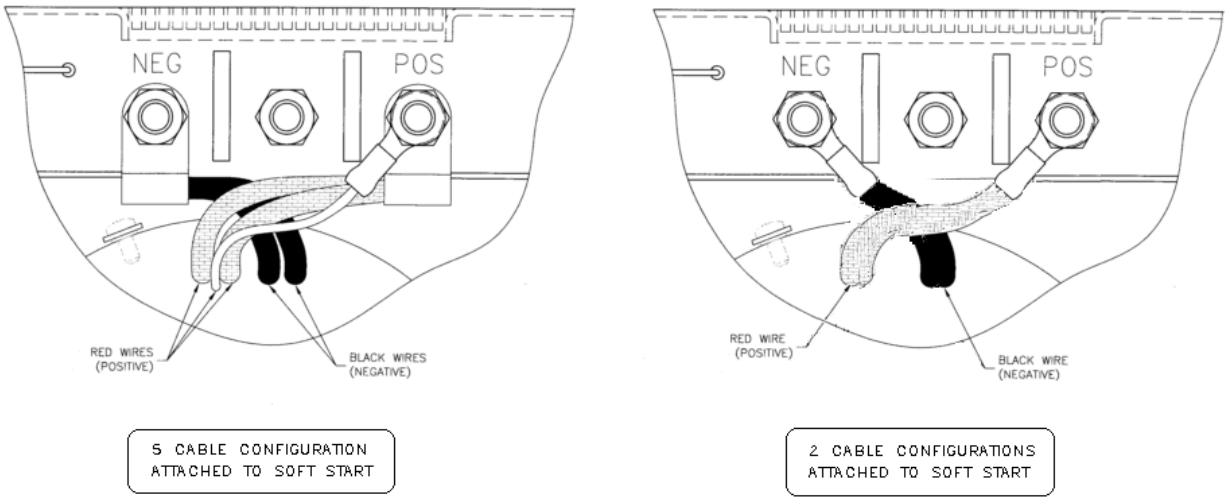
h. Identify pulley location on the drive motor shaft and the setscrews that secure it in place.
(Reference Figure 25; I/N:[16])

i. Remove and retain the pulley assembly and key by loosening the setscrews and sliding the pulley off the motor shaft.
(Reference Figure 25; I/N:[16],[168])

NOTE: Inspect the drive belt at this time for signs of wear and replace if necessary.

j. Remove the six screws attaching the cover over the soft start, and then disconnect the wires from the soft start to the motor. Remove the soft start bracket assembly with the soft start by removing the two attaching bolts from

each side of the motor and remove the MIL-S-8802 seal between the bracket and motor.
(Reference Figure 25; I/N:[184])



Soft start configurations

k. Reinstall soft start to motor by using step l in reverse order and referencing Figure 2.5.1. Apply Loctite 242 thread locker to the four bolts attaching the soft start bracket assembly to the motor. Once soft start bracket assembly is in position, seal the soft start bracket assembly around where it mates with the motor using MIL-S-8802 Type 1, Class B-1/2 sealant or equivalent.

NOTE: Torque terminal hardware to 45 in-lbs ± 5 in-lbs [5.1 N-m ± .56 N-m].

CAUTION: Motor configurations with 2 short cables should be examined carefully when reinstalling the soft start unit. Damage can occur to the soft start unit at the insulator tabs between the terminals.

l. Loosely install the pulley assembly on the replacement drive motor. Using Section II, 2.3.iii.a, align the motor pulley with the compressor pulley. Tighten set screw to mark shaft. Remove pulley and inspect motor shaft for mark left by the set screw. Marks should be in bottom of the second dimple in shaft. If motor shaft does not have dimple in correct location refer to Section II, 2.4.iii. Re-install pulley and belt on the new drive motor and reinstall the motor in reverse order of removal. Tension belt per instructions given in Section II, 2.3, Compressor Drive Belt Adjustment.

m. Install the Compressor/Condenser Pallet on the helicopter. For instructions refer to the Aircraft Maintenance Manual.

n. Prior to charging and running the system, check and ensure that all components are properly connected.

vi. Compressor Drive Belt Replacement (ES20040-3):

If the need to replace the compressor drive belt arises, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, pages 28 - 44):

a. Remove the Compressor/Condenser Pallet cover by unscrewing the screws securing it to the assembly.
(Reference Figure 20,22; I/N:[33],[34],[143])

b. Locate the compressor.

c. Carefully loosen the belt by removing the lock clips on the compressor turnbuckle and turning the turnbuckle counterclockwise. Retain turnbuckles and mounting hardware for re-use.
(Reference Figure 26; I/N:[77],[78],[141])

d. Once the belt is loose, remove the belt from the compressor pulley

e. Carefully remove the belt by slipping it over the fan blades.

f. Scrap the belt and dispose of properly

g. Reinstall new belt in reverse order of removal. Tension belt per instructions given in Section II, 2.3, Compressor Drive Belt Adjustment.

vii. Condenser Coil Replacement (JBS3006-3):

If the need to replace the condenser coil arises, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, pages 28 - 44):

a. Discharge and evacuate the system per instructions in Section II, 4.1.

b. Remove the Compressor/Condenser Pallet from the helicopter. Plug both hose assemblies leading to pallet using plug P/N's ES39265-2 and ES39265-4 and cap both fittings under Compressor/Condenser Pallet using cap P/N's ES39263-2 and ES39263-4. For instructions refer to the Aircraft Maintenance Manual.

c. Remove the Compressor/Condenser Pallet cover by unscrewing the screws securing it to the assembly.
(Reference Figure 20,22; I/N:[32],[33],[34],[143])

d. Locate the condenser assembly.

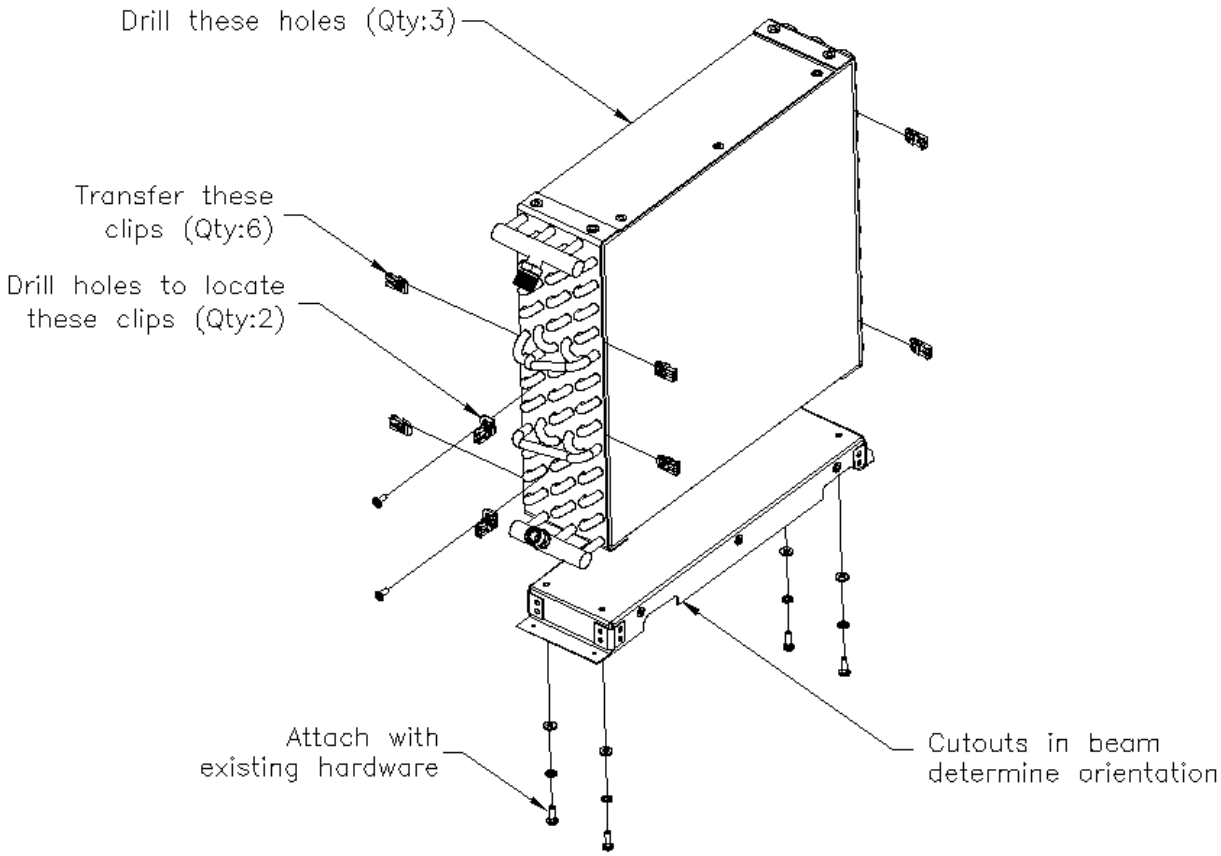
e. Remove the outlet shroud from the pallet assembly and retain all mounting hardware for reuse.
(Reference Figure 20; I/N:[63],[145],[152])

f. Disconnect the two hose assemblies on top of the condenser assembly and plug using plug P/N's ES39265-2 and ES39265-3.
(Reference Figure 20,22; I/N:[47],[49],[59])

g. Carefully unfasten the hardware securing the condenser coil to the pallet board.
(Reference Figure 21,22,23; I/N:[72],[94])

h. Remove the condenser coil from the pallet with all the mounting brackets attached.
(Reference Figure 22,23; I/N:[15],[37])

i. With a measuring device mark the location of each bracket and transfer them to the new coil. Figure for reference below.



Bracket Transfer To New Condenser Coil

j. Pressure test the coil for leaks (200 PSI). If this is not possible, use the service cart to see if the system can hold a vacuum or use a sniffing device to see if the system has a leak at the condenser upon charging.

k. Reinstall the new coil in reverse order of removal.

l. Install the Compressor/Condenser Pallet on the helicopter. For instructions refer to the Aircraft Maintenance Manual.

m. Prior to charging and running the system, check and ensure that all components are properly connected

viii. Receiver Drier Bottle Replacement; ES43030-2 (with sight glass), ES43030-3 (without sight class):

The receiver/drier bottle should be replaced whenever the compressor is replaced or when the air conditioning system plumbing is left open to the atmosphere for a time greater than 1 hour. If the need to replace the receiver/drier bottle does arise, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, pages 28 - 44):

a. Discharge and evacuate the system per instructions in Section II, 4.1.

b. Gain access to the deck behind the left aircraft engine where the Compressor/Condenser Pallet is located.

c. Locate receiver drier bottle towards the rear of the aircraft on the pallet assembly.
(Reference Figure 22; I/N:[17])

d. Disconnect electrical power supply. (If required disconnect aircraft battery and ground power unit). Disconnect and plug both hose assemblies using plug P/N: ES39265-2. Only plug plumbing connections at the receiver drier bottle end.
(Reference Figure 20,22; I/N:[47],[49])

e. Loosen the clamp securing the receiver drier bottle.
(Reference Figure 22; I/N:[25])

f. Make note of the receiver drier bottle orientation and the location of the “IN” mark.

g. Remove and discard the receiver drier bottle.

h. Install new receiver drier bottle in reverse order of removal.

i. Prior to charging and running the system, check and ensure that all components are properly connected.

ix. Refrigerant Hoses

The refrigerant hoses should be replaced when there are signs of wearing and when they have a kink or blockage. The correct hose should be identified in the IPC and a new hose assembly should be ordered from Air Comm Corp.

2.3.10 COMPONENT REPAIR/REPLACEMENT FOR 135-0566 SERIES PALLETS

In proceeding with repair/replacement, reference IPC pages 45 through 56. Numbers given in brackets [ ] throughout these procedures refer to item numbers (I/N:) used in exploded views and referenced in associated parts list.

i. Compressor Replacement (JBS222-1):

If the need to replace the compressor arises, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, pages 45 - 56):

a. Discharge and evacuate the system per instructions in Section II, 4.1.
b. *(Optional)* Remove the Compressor/Condenser Pallet from the helicopter. For instructions refer to the Aircraft Maintenance Manual. Plug both hose assemblies leading to pallet using plug P/N's ES39265-4 and ES39265-2 and cap both fitting under Compressor/Condenser Pallet using cap P/N's ES39263-2 and ES39263-4.

c. Remove the Compressor/Condenser Pallet cover by unscrewing screws securing it to the assembly.
(Reference Figure 31; I/N:[23],[24],[70 {-1 only}],[76{-2 only}])

d. Locate the compressor and disconnect both hose assemblies and plug using plug P/N's ES39265-4 and ES39265-3. If compressor is being removed for oil check then cap both fitting using cap P/N's ES39263-2 and ES39263-3.
(Reference Figure 33; I/N:[40],[41])

e. Disconnect the pressure switch assembly from the compressor and retain for reuse.
(Reference Figure 35; I/N:[9])

f. Carefully un-tension the belt by removing the lock clips on the compressor turnbuckle and turning the turnbuckle counterclockwise. Retain turnbuckles and mounting hardware for re-use.
(Reference Figure 33; I/N:[42],[45],[46])

g. Once the belt is loose, remove the belt from the compressor pulley

h. Locate the eight comp/motor bracket bolts that attach the comp/motor bracket to the pallet. Remove the comp/motor bracket bolts, and remove the comp/motor bracket with the compressor and motor attached.
(Reference Figure 33; I/N:[21],[68])

i. Remove the compressor from the comp/motor bracket and retain all mounting hardware for reuse.
(Reference Figure 33; I/N:[114],[116],[119])

j. Carefully place the compressor assembly with the pulley attached on a flat surface.

k. Remove the pulley end plate and retain the hardware securing it to the compressor assembly for reuse.
(Reference Figure 35; I/N: [144], [146], [147], [148], [149])

l. Remove the small retaining ring that secures the pulley/bearing assembly on the compressor. Retain for reuse.
(Reference Figure 35; I/N: [143])

m. With a three-leg puller carefully remove the drive pulley complete with bearing. Retain for reuse.

n. Scrap the compressor and dispose of properly.

o. Examine the bearing carefully for any damage. If it is determined that the bearing needs to be replaced go to Step “p” otherwise go to Step “s”.

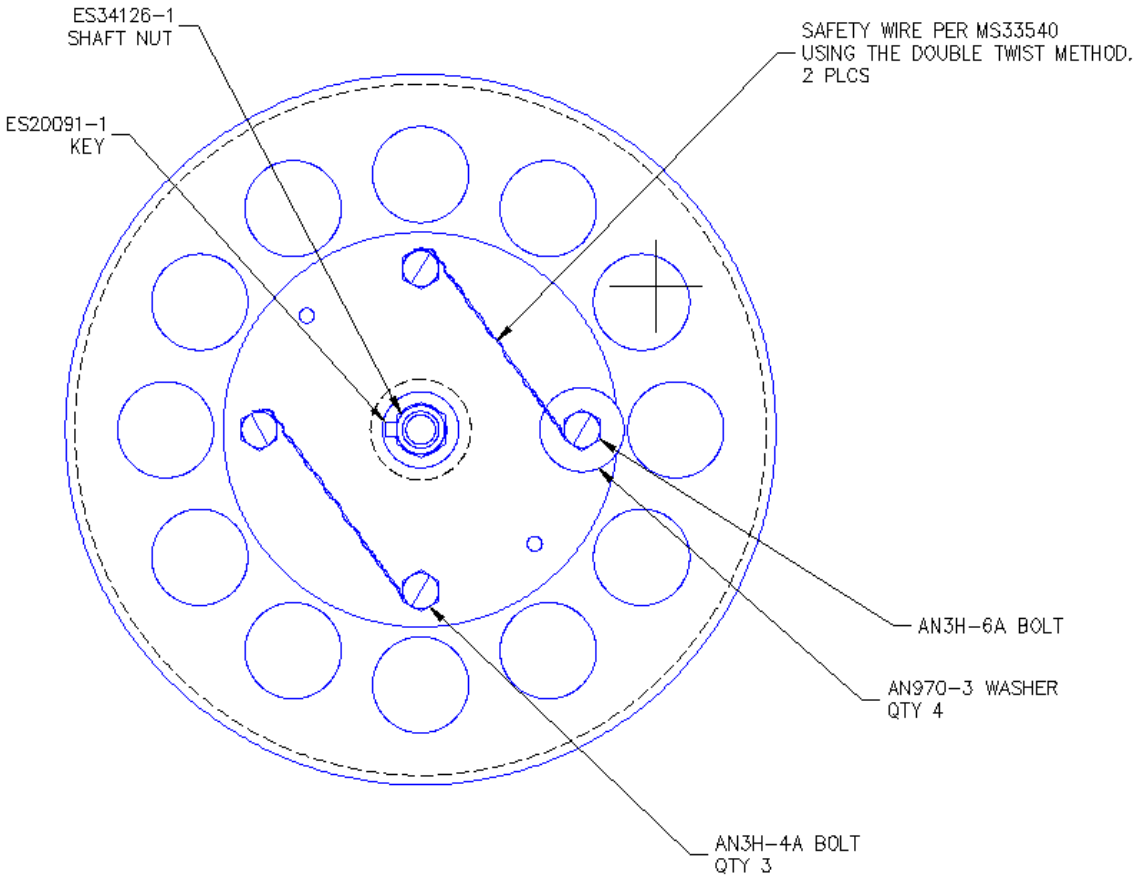
p. Remove the large retaining ring that retains the bearing in the pulley.
(Reference Figure 35; I/N: [142])

q. With a shop press, carefully remove the bearing and dispose of properly.
(Reference Figure 35; I/N: [141])

r. Install the new bearing using a shop press on the outer race only and secure with the large snap ring.

s. Reinstall the pulley onto the new compressor using a press and reinstall the small snap ring and pulley end plate.

t. Confirm pulley balancing washers are installed opposite the keyway per figure below and safety the four bolts securing the pulley end plate to the assembly with safety wire.



Safety Wiring and Balancing of Compressor Pulley

u. Install new compressor in reverse order of removal. Tension belt per instructions given in Section II, 2.3.1, Compressor Drive Belt Adjustment.

v. *(Optional: As necessary resulting from step b.)* Install the Compressor / Condenser Pallet on the helicopter. For instructions refer to the Aircraft Maintenance Manual.

w. Prior to charging and running the system, check and ensure that all components are properly installed and connected

ii. Comp/Cond Pallet Fan Blade Pulley Assembly Replacement (JBS13015-2):

To remove and replace the Fan Blade Pulley assembly the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, pages 45 - 56):

a. Remove the compressor drive motor with the Fan Blade Pulley assembly attached per Section II, 2.3.11, v, Step “a.” through Step “g.” and take it to a workbench.

b. Identify the location of the Fan Blade Pulley assembly on the motor shaft. *(Reference Figure 25; I/N:[Not Shown])*

c. Loosen the setscrews securing the Fan Blade Pulley assembly to the compressor-drive motor and carefully remove the assembly from the motor. *(Reference Figure 25; I/N:[Not Shown])*

d. Reinstall the new Fan Blade Pulley assembly in reverse order of removal using a thread-locking compound (i.e. Loctite 242) to secure the setscrews and key.

e. Ensure that the assembly is tight and snug on the compressor shaft and that the setscrews are firmly secure.

f. Install the compressor drive motor and belt in reverse order of removal.

g. Tension belt per instructions given in Section II, 2.3, Compressor Drive Belt Adjustment

h. Prior to running the system, check and ensure that all components are properly connected.

iii. Spring Resistor Replacement (JBS912-4):

If the need to replace the spring resistor arises, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, Pages 11 - 27):

a. Disconnect electrical power supply. (If required, disconnect aircraft battery and the ground power unit).

b. Gain access to the deck below the left aircraft engine where the Compressor/Condenser Pallet is located. Remove the engine exhaust shroud if necessary.

c. Gain access to the spring resistor by removing the top cover of the pallet assembly. (If this is not possible the system will have to be evacuated and discharged and the pallet will have to be removed to workbench for easier access per instructions given in the Aircraft Maintenance Manual. Plug both hose assemblies leading to pallet using plug P/N's ES39265-4 and ES39265-2 and cap both fittings under Compressor/Condenser Pallet using cap P/N's ES39263-2 and ES39263-4).
(Reference Figure 31; I/N:[22])

e. Carefully unfasten the spring resistor by unfastening the 2 nuts securing it to the relays. Retain mounting hardware for reuse.
(Reference Figure 32; I/N:[37])

e. Reinstall new spring resistor in reverse order of removal, and ensure that there is no contact between the spring resistor and any other item on the pallet other than the two points where the spring resistor is fastened onto the relays.

f. If required, reinstall the Compressor/Condenser Pallet. Refer to the Aircraft Maintenance Manual for installation instructions.

h. Prior to running (and if required, charging) the system, check and ensure that all components are properly connected.

iv. Relay Replacement (JBS421-7):

If the need to replace the relays arises, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, Pages 11 - 27):

l. Discharge and evacuate the system per instructions in Section II, 4.1.

m. Remove the Compressor/Condenser Pallet from the helicopter. For instructions refer to the Aircraft Maintenance Manual. Plug both hose assemblies leading to pallet using plug P/N's ES39265-4 and ES39265-2 and cap both fittings under Compressor/Condenser Pallet using cap P/N's ES39263-2 and ES39263-4

n. Remove the Compressor/Condenser Pallet cover by unscrewing the fasteners securing it to the assembly.
(Reference Figure 31; I/N:[22])

o. Locate the relay assemblies on the pallet.
(Reference Figure 32; I/N:[26])

p. Identify relay contacts and the wires that go to them. Do not remove the diode on the relay assembly as a new one is on the replacement relay.

q. Unfasten the relays and retain fastening hardware for reuse.

r. Transfer the spring resistor to the new relays or combination of a new and old relay.

s. Re-install relays onto the pallet assembly. It may be necessary to attach all the wires to the relays prior to reinstalling the relays to the pallet.

t. Check all wire connections and ensure that there is no contact between the spring resistor and any other item on the pallet other than the two points where the spring resistor is fastened onto the relays.

u. Install the Compressor/Condenser Pallet on the helicopter. For instructions refer to the Aircraft Maintenance Manual.

v. Prior to charging and running the system, check and ensure that all components are properly connected.

v. Compressor Drive Motor Replacement (135-0570-1):

If the need to replace the compressor drive motor arises, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, pages 45 - 56):

a. Discharge and evacuate the system per steps b and g in Section II, 4.1.

b. Remove the Compressor/Condenser Pallet from the helicopter. Plug both hose assemblies leading to pallet using plug P/N's ES39265-4 and ES39265-2 and cap both fittings under Compressor/Condenser Pallet using cap P/N's ES39263-2 and ES39263-4. For instructions refer to the Aircraft Maintenance Manual.

c. Remove the Compressor/Condenser Pallet cover by unscrewing screws securing it to the assembly.
(Reference Figure 31; I/N:[23],[24],[70 {-1 only}],[76{-2 only}])

d. Locate the compressor.

e. Carefully loosen the belt by removing the lock clips on the compressor turnbuckle and turning the turnbuckle counterclockwise. Retain turnbuckles and mounting hardware for re-use.
(Reference Figure 33; I/N:[42],[45],[46])

f. Once the belt is loose, remove the belt from the compressor pulley.

g. Locate the eight comp/motor bracket bolts that attach the comp/motor bracket to the pallet. Remove the comp/motor bracket bolts, and remove the comp/motor bracket with the compressor and motor attached.
(Reference Figure 33; I/N:[21],[68])

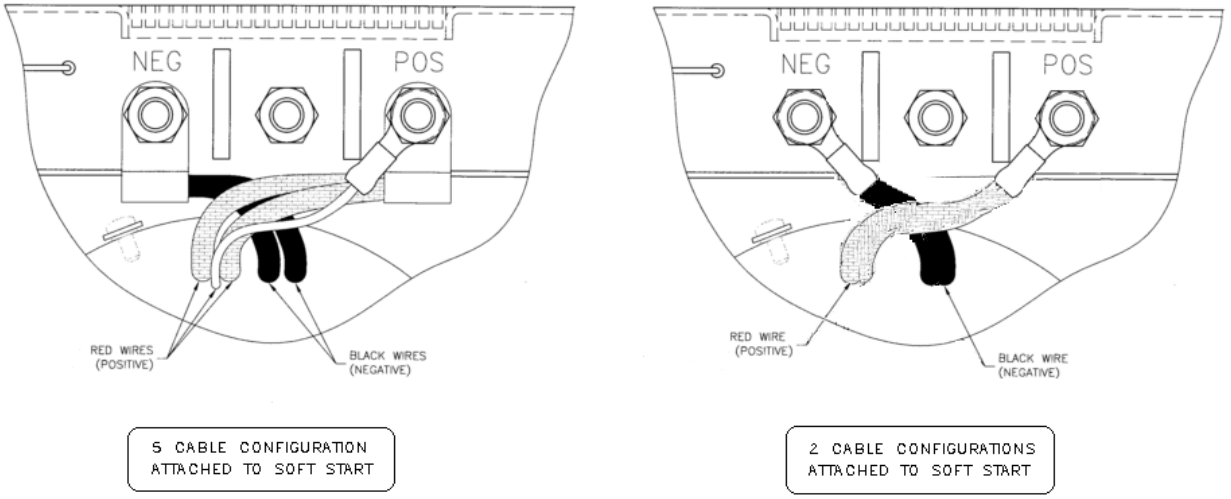
h. Locate the four-compressor drive motor mounting bolts. Remove the compressor drive motor mounting bolts, and carefully remove the drive motor, with the belt and fan assembly from the assembly to a work area. Retain the mounting bolts for reuse. *(Reference Figure 31; I/N:[137], [118])*

i. Identify pulley location on the drive motor shaft and the setscrews that secure it in place.
(Reference Figure 33; I/N:[7])

j. Remove and retain the pulley assembly and key by loosening the setscrews and sliding the pulley off the motor shaft.
(Reference Figure 33; I/N:[7],[51])

NOTE: Inspect the drive belt at this time for signs of wear and replace if necessary.

k. Remove the six screws attaching the cover over the soft start, and then disconnect the wires from the soft start to the motor. Remove the soft start bracket assembly with the soft start by removing the two attaching bolts from each side of the motor and remove the MIL-S-8802 seal between the bracket and motor.
(Reference Figure 34; I/N:[127], [135], [131], [130])



Soft start configurations

l. Reinstall soft start to motor by using step I in reverse order and referencing Figure 2.5.1. Apply Loctite 242 thread locker to the four bolts attaching the soft start bracket assembly to the motor. Once soft start bracket assembly is in position, seal the soft start bracket assembly around where it mates with the motor using MIL-S-8802 Type 1, Class B-1/2 sealant or equivalent.
(Reference Figure 31; I/N:[132])

NOTE: Torque terminal hardware to 45 in-lbs ± 5 in-lbs [5.1 N-m ± .56 N-m].

CAUTION: Motor configurations with 2 short cables should be examined carefully when reinstalling the soft start unit. Damage can occur to the soft start unit at the insulator tabs between the terminals.

m. Loosely install the pulley assembly on the replacement drive motor. Using Section II, 2.3.iii.a, align the motor pulley with the compressor pulley. Tighten set screw to mark shaft. Remove pulley and inspect motor shaft for mark left by the set screw. Marks should be in bottom of the second dimple in shaft. If motor shaft does not have dimple in correct location refer to Section II, 2.4.iii. Re-install pulley and belt on the new drive motor and reinstall the motor in reverse order of removal. Tension belt per instructions given in Section II, 2.3, Compressor Drive Belt Adjustment.

n. Install the Compressor/Condenser Pallet on the helicopter. For instructions

refer to the Aircraft Maintenance Manual.

o. Prior to charging and running the system, check and ensure that all components are properly connected.

vi. Compressor Drive Belt Replacement (ES20040-3):

If the need to replace the compressor drive belt arises, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, pages 45 - 56):

a. Remove the Compressor/Condenser Pallet cover by unscrewing the screws securing it to the assembly.
(Reference Figure 31; I/N:[23],[24],[70 {-1 only}],[76{-2 only}])

b. Locate the compressor.

c. Carefully loosen the belt by removing the lock clips on the compressor turnbuckle and turning the turnbuckle counterclockwise. Retain turnbuckles and mounting hardware for re-use.
(Reference Figure 33; I/N:[42],[45],[46])

d. Once the belt is loose, remove the belt from the compressor pulley

e. Carefully remove the belt by slipping it over the fan blades.

f. Scrap the belt and dispose of properly

g. Reinstall new belt in reverse order of removal. Tension belt per instructions given in Section II, 2.3, Compressor Drive Belt Adjustment.

vii. Condenser Coil Replacement (JBS3006-3):

If the need to replace the condenser coil arises, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, pages 45 - 56):

a. Discharge and evacuate the system per instructions in Section II, 4.1.

b. Remove the Compressor/Condenser Pallet from the helicopter. Plug both hose assemblies leading to pallet using plug P/N's ES39265-2 and ES39265-4 and cap both fittings under Compressor/Condenser Pallet using cap P/N's ES39263-2 and ES39263-4. For instructions refer to the Aircraft Maintenance Manual.

c. Remove the Compressor/Condenser Pallet cover by unscrewing the screws securing it to the assembly.
(Reference Figure 31; I/N:[23],[24],[70 {-1 only}],[76{-2 only}])

d. Locate the condenser assembly.

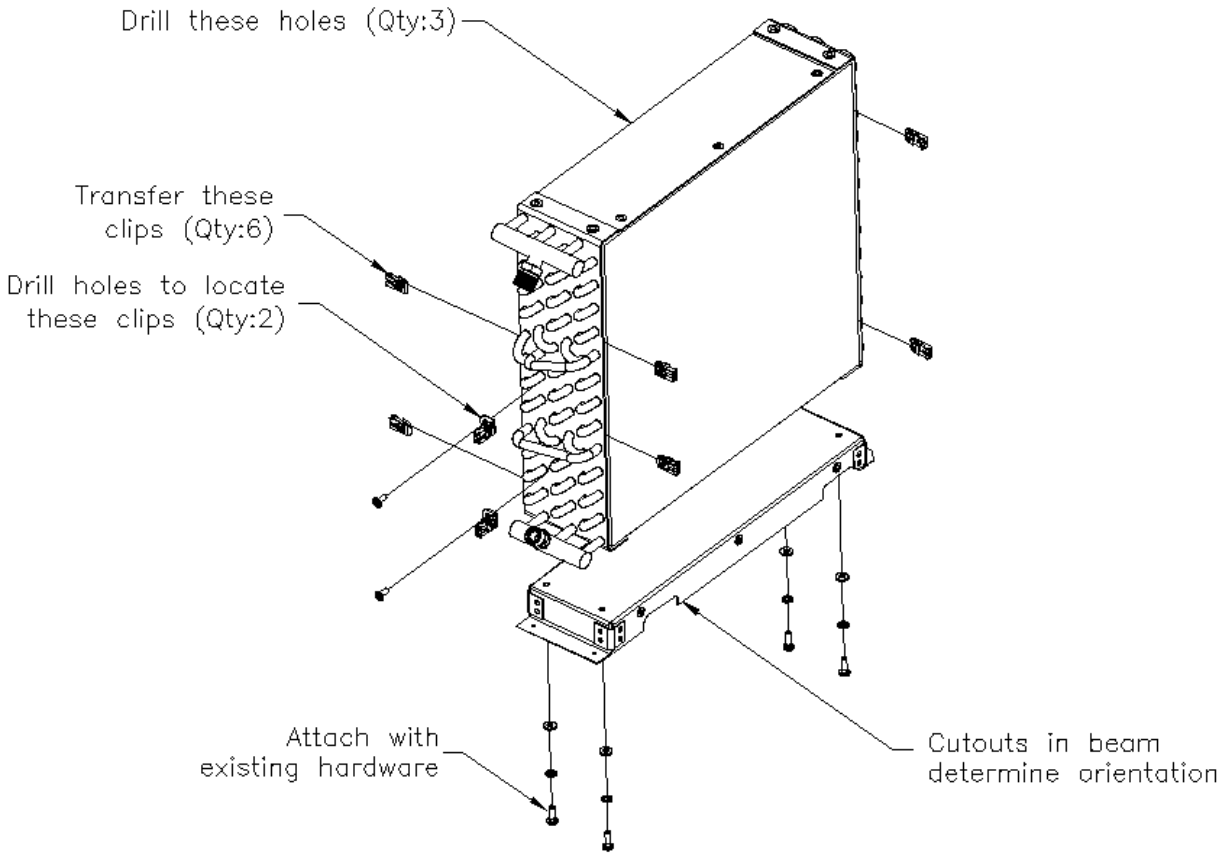
e. Remove the outlet shroud from the pallet assembly and retain all mounting hardware for reuse.
(Reference Figure 31; I/N:[65])

f. Disconnect the two hose assemblies on top of the condenser assembly and plug using plug P/N's ES39265-2 and ES39265-3.
(Reference Figure 31; I/N:[Not Shown])

g. Carefully unfasten the hardware securing the condenser coil to the pallet board.
(Reference Figure 21,22,23; I/N:[Not Shown])

h. Remove the condenser coil from the pallet with all the mounting brackets attached.
(Reference Figure 22,23; I/N:[Not Shown])

i. With a measuring device mark the location of each bracket and transfer them to the new coil. Figure for reference below.



Bracket Transfer To New Condenser Coil

j. Pressure test the coil for leaks (200 PSI). If this is not possible, use the service cart to see if the system can hold a vacuum or use a sniffing device to see if the system has a leak at the condenser upon charging.

k. Reinstall the new coil in reverse order of removal.

l. Install the Compressor/Condenser Pallet on the helicopter. For instructions refer to the Aircraft Maintenance Manual.

m. Prior to charging and running the system, check and ensure that all components are properly connected

viii. Receiver Drier Bottle Replacement; ES43030-2 (with sight glass), ES43030-3:

The receiver/drier bottle should be replaced whenever the compressor is replaced or when the air conditioning system plumbing is left open to the atmosphere for a time greater than 1 hour. If the need to replace the receiver/drier bottle does arise, the following steps should be followed (Numbers in brackets [ ] refer to item numbers (I/N:) in IPC, pages 45 - 56):

a. Discharge and evacuate the system per instructions in Section II, 4.1.

b. Gain access to the deck behind the left aircraft engine where the Compressor/Condenser Pallet is located.

c. Locate receiver drier bottle towards the rear of the aircraft on the pallet assembly.
(Reference Figure 32; I/N:[8])

d. Disconnect electrical power supply. (If required disconnect aircraft battery and ground power unit). Disconnect and plug both hose assemblies using plug P/N: ES39265-2. Only plug plumbing connections at the receiver drier bottle end.
(Reference Figure 31; I/N:[33],[39])

e. Loosen the clamp securing the receiver drier bottle.
(Reference Figure 32; I/N:[16])

f. Make note of the receiver drier bottle orientation and the location of the “IN” mark.

g. Remove and discard the receiver drier bottle.

h. Install new receiver drier bottle in reverse order of removal.

i. Prior to charging and running the system, check and ensure that all components are properly connected.

ix. Refrigerant Hoses

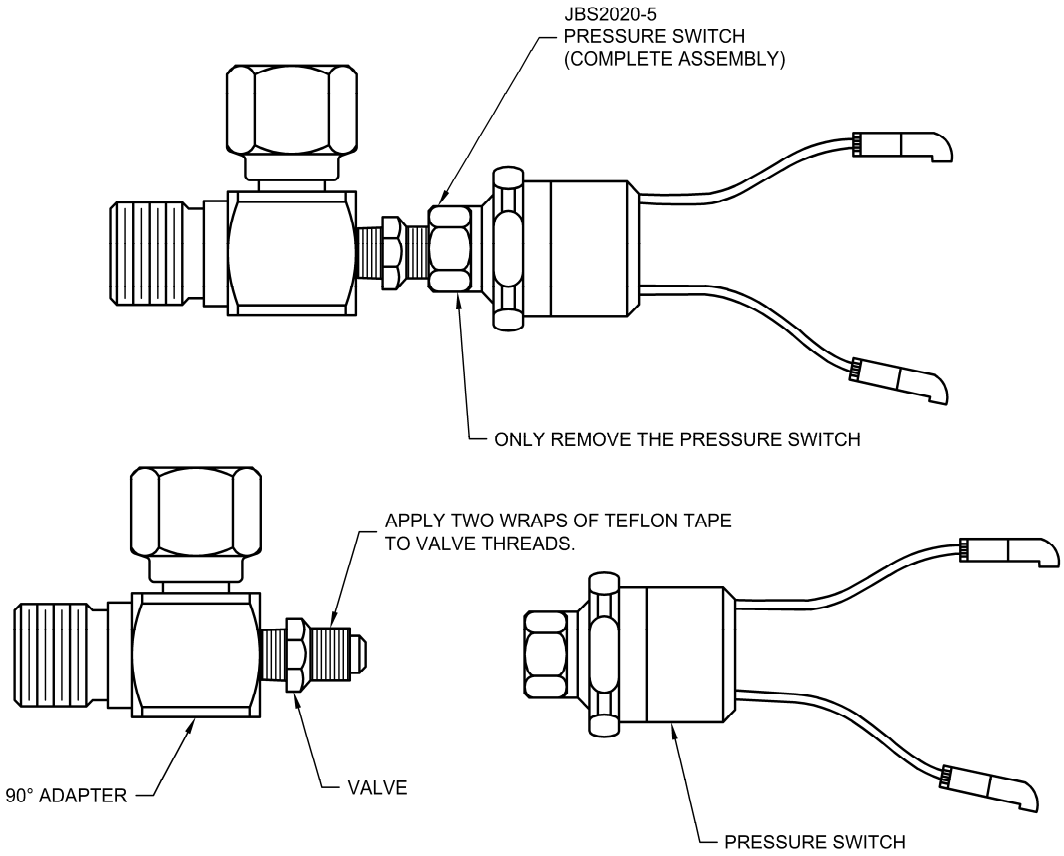
The refrigerant hoses should be replaced when there are signs of wearing and when they have a kink or blockage. The correct hose should be identified in the IPC and a new hose assembly should be ordered from Air Comm Corp.

2.3.12 Pressure Switch Replacement

i. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Pressure Switch	JBS2020-5	1	None
Cable tie	ES30015-6	6	None
Heat Shrink	JBS570-10	2	Permissible to order 6 inches of ES48060-6
Teflon Tape	Commercially Avail.	A/R	None

a. Gain access to the pressure switch. It is permissible to replace switch without removing the 90° adapter and valve per figure below. The valve will prevent the discharge of the refrigerant.



PRESSURE SWITCH REPLACEMENT

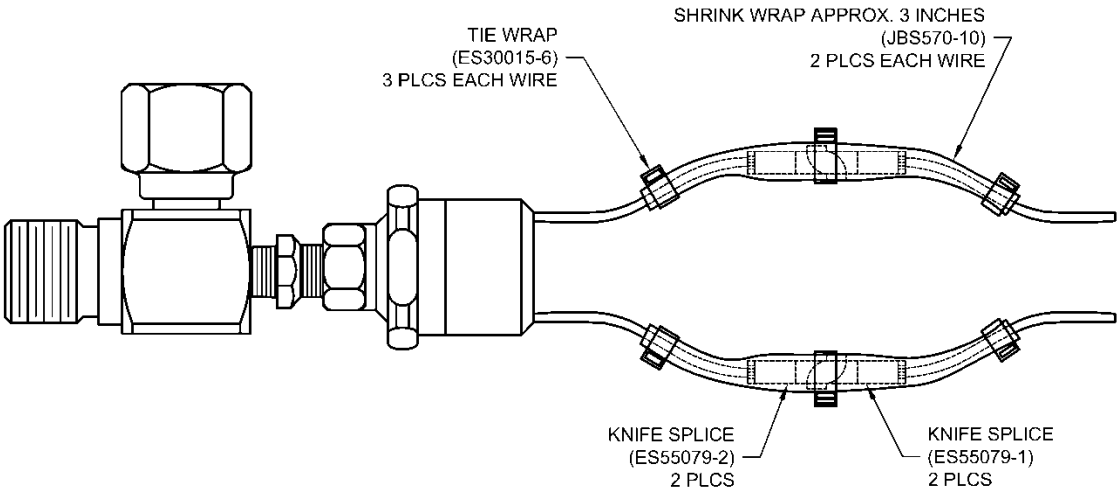
b. Disconnect the two lead wires without damaging the wires and knife splices.

c. Use a back wrench on the valve and then remove the pressure switch.

d. Apply two wraps of Teflon tape to the male fitting.

e. Install a new pressure switch JBS2020-13 until it is fully and firmly seated on the valve.

f. Reconnect the wires as shown in figure below.



PRESSURE SWITCH REPLACEMENT

g. Slide heat shrink tubing over each knife splice.

h. Cable tie tubing to wires in 3 locations for each wire as show in Figure 2.

Alternatively, the entire pressure switch JBS2020-5 may be replaced by recovering the system refrigerant, replacing the assembly and re-charging the system refrigerant.

3. PLUMBING

3.1. GENERAL

The plumbing system consists of flexible nylon lined refrigerant hoses with permanent swaged on fittings. All connections are tube O-ring type with sealant on the fitting mating surfaces to ensure leak free operation. The hose, O-ring material, and sealant are specially designed to work with refrigerant R134a and Polyolester oil. Two service valves are located in the equipment area below the Compressor/Condenser Pallet assembly. They are sized differently to avoid incorrect cross connecting when gaining access to the plumbing for system recharging. A receiver/drier is installed downstream of the condenser on the Compressor/Condenser Pallet assembly to remove moisture from the liquid refrigerant. A binary pressure switch monitors the refrigerant gas pressure. This switch will open at a condenser over pressure of 384.0 ± 28.4 PSIG (2647.6 ± 195.8 KPa) and under pressured conditions of 30 PSI (206.8 KPa). This will interrupt the power to the compressor and stop the compressor.

This section of the manual discusses checks and maintenance practices used for the plumbing portion of the air conditioning system. See IPC, Pages 63 through 65 for schematics and parts list.

3.2. MAINTENANCE PRACTICES

i. GENERAL

The following procedures are used to perform typical maintenance on the air conditioning system plumbing.

ii. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Polyolester Oil	Comm. Avail.	A/R	Viscosity Grade 68
Gasket/Thread Sealant	RT201B or RT203B	A/R	HFC Compatible

Use the following chart for plugging or capping open refrigerant hose assemblies and components according to their fitting size.

Fitting Size	Thread Size	O-ring Fitting Plug	Cap for Male Fitting
#4	7/16-20	ES39265-1	ES39263-1
#6	5/8-18	ES39265-2	ES39263-2
#8	3/4-16	ES39265-3	ES39263-3
#10	7/18-14	ES39265-4	ES39263-4

iii. PLUMBING MAINTENANCE PROCEDURES (REF. IPC Fig. 40 and Fig. 41)

a. Connection to Components - O-Ring Replacement

1. Place the appropriate o-ring over the tube "O" end of the fitting.
2. Lubricate o-ring with polyolester oil prior to assembly.
3. Apply sealant to all fitting-mating surfaces prior to assembly.

c. Recommended Standard Torque Specifications O-Ring Connections

Thread Size	Ft-Lb	N-M
5/8”	11-13	15-18
3/4"	15-20	20-27
7/8”	21-27	29-37
1 1/16”	28-33	38-45

d. Receiver/Drier Replacement

Replace receiver/drier whenever the compressor is replaced or when the air conditioning system plumbing is left open to the atmosphere for a time greater than 1 hour. For instructions on receiver/drier bottle replacement reference Table 2.3.2.

e. Refrigerant Charge

Charge and discharge air conditioning system per Section II, Step 4.1 through Step 4.3.

3.3. INSPECTION/CHECK

i. GENERAL

The following procedures are used for checking and inspecting the air conditioning system plumbing.

ii. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Electronic R134a Refrigerant Leak Detector	Comm. Avail.	1	None

iii. PLUMBING CHECK PROCEDURES

a. Plumbing Installation Preventive Maintenance Check

NOTE: All O-rings should be lubricated with Polyolester oil or sealant applied to all fittings mating surfaces before assembly.

1. Check that all hoses are properly supported and do not chafe. Check that all clamps remain secure and that the hose and fitting are well supported at connections with fixed units such as evaporator, condenser etc. to prevent fatigue cracking in tubing headers or fittings.

b. Plumbing System Refrigerant Leak Check

1. Connect service pressure gauge set to service ports, located behind the baggage compartment bulkhead.

2. Check that the gauges are reading the proper static pressure. Both gauges should read approximately 55 PSIG (379.2 KPa) at standard temperature (59°F/15°C) with a properly charged system when the system is not operating.

3. Using leak detector, check entire plumbing system including hose fittings and coil assemblies for leaks. There shall be no leaks. Repair or replace leaking component per the appropriate maintenance manual section and its IPC.

4. REFRIGERANT SERVICING

The air conditioning system uses refrigerant R134a and the compressor lubricating oil used is Polyolester Oil viscosity grade (ISO) 68. No other refrigerant or compressor oil shall be used.

Refrigerant R134a is non-explosive, non-flammable, and non-corrosive, has practically no odor, and is heavier than air. Although R134a is classified as a safe refrigerant, certain precautions must be observed to personnel and property when working with R134a refrigerant.

WARNING:

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

b. Always wear safety goggles when servicing any part of the refrigerant system to prevent refrigerant from coming into contact with the eyes.

c. To avoid explosion, never weld, use a blow torch, solder, steam clean, or use excessive amounts of heat on, or in, the immediate area of the air conditioning system, or refrigerant supply tank, full or empty, while they are closed to atmosphere.

d. The refrigerant service cart/container has a safe strength. However, if handled incorrectly, it will explode. Therefore, always follow the instruction on the label. In particular, never store it in a hot location (above 126ºF, 52ºC) or drop it.

CAUTION: Do not operate air conditioning system with condenser air outlet blocked.

CHARGING EQUIPMENT

There are many different manufacturers of charging equipment available on the market. They range in price and capabilities. EPA regulations require you to recover the refrigerant completely and not allow any to be vented to the atmosphere. Some machines only recover, while others recover and recycle the refrigerant. It is recommended that only new or recycled refrigerant be used in the system. This will ensure that your system will not be contaminated with impure refrigerant.

During the refrigerant recovery process, some oil is removed from the system with the refrigerant. This oil will be separated from the refrigerant by the recovery machine and drained to a special container. The containers are graduated in ounces or milliliters so you can view the amount of oil removed. Record the

amount of oil because the same amount of new oil will need to be added back to the system prior to charging. It is critical that only polyolester oil (POE) is used. Mixing PAG (automotive) type oils will cause contamination and system failure. It is recommended that oil only be added to the discharge side of the system prior to charging.

NOTE: If oil is added to the suction side of the system it is possible that on start up oil can be sucked into the compressor and because it is non-compressible it can damage the reed valves.

It is best to add the oil after the system has been evacuated to 29.9 in hg. This will allow the vacuum to suck the oil in to the system then add the appropriate charge through the discharge service valve only. This will ensure oil is distributed through the system prior to start up. Most charging carts have the provisions to add oil without breaking into the system.

NOTE: Ensure that there is an adequate amount of oil in the charging bottle and there no air bubbles in the standpipe.

If your cart does not have this feature you can add oil in the following manner. After recovering the refrigerant and prior to evacuation, remove the discharge fitting from the compressor and pour the required amount into the line. Reconnect the fitting to the compressor. Evacuate the system through the low side only to prevent oil from being sucked out by the vacuum pump. Add the appropriate charge through the discharge service valve only. This will ensure oil is distributed through the system prior to start up.

4.1. DISCHARGING SYSTEM

i. GENERAL

The air conditioning system refrigerant must be discharged prior to disconnecting or removing and components in the refrigerant loop. Federal law prohibits discharging refrigerant into the atmosphere. Use only an R134a compatible recycling/recovery unit when discharging the air conditioning system.

ii. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Service Pressure Gauge	Comm. Avail.	1	None
R134a Compatible Recycling/Recovery Unit	Comm. Avail.	1	None

iii. DISCHARGING PROCEDURES

a. Connect R134a compatible recycling/recovery unit to the R134a service valves on the aircraft's air conditioning system. If recovery unit does not have pressure gauges, connect service pressure to air conditioning system.

b. Operate air conditioning system for 10 minutes. This will collect as much oil as possible in the compressor.

c. Turn off the air conditioning system and take note of oil level on the refrigerant servicing cart.

d. Discharge the air conditioning system in accordance with the recovery unit's instructions.

e. Note the amount of compressor oil removed from the system during discharging. This amount of oil will have to be added back to the system during charging.

f. Remove recovery unit when discharging is complete.

4.2. EVACUATING SYSTEM

i. GENERAL

The air conditioning system must be evacuated prior to charging the system with refrigerant. Evacuating the system removes any moisture that may be in the system. Use only an R134a compatible recycling/recovery unit when evacuating the air conditioning system.

ii. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Service Pressure Gauge	Comm. Avail.	1	None
R134a Compatible Recycling/Recovery Unit	Comm. Avail.	1	None

iii. EVACUATING PROCEDURE

NOTE: If charging cart does not have provisions for adding oil to the system, it will be necessary to add oil to the system by disconnecting the compressor discharge line and pouring the required quantity of polyolester ISO 68 oil in the line prior to evacuating the system. If this method is used evacuate the system through the suction side only to prevent oil from being sucked out through the vacuum pump.

a. Connect R134a compatible recycling/recovery unit to the R134a service valves on the aircraft's air conditioning system. If recovery unit does not have pressure gauges, connect service pressure to air conditioning system.

b. Evacuate the air conditioning system in accordance with the recovery unit's instructions for a minimum of 15 minutes.

c. Once the air conditioning system has been evacuated, it is then ready for charging with new/recycled R134a refrigerant.

4.3. CHARGING SYSTEM

i. GENERAL

Use only new or recycled R134a refrigerant when charging air conditioning system. Federal law prohibits discharging refrigerant into the atmosphere. Use only R134a compatible recycling/recovery unit when charging the air conditioning system.

ii. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Service Pressure Gauge	Comm. Avail.	1	None
R134a Compatible Recycling/Recovery Unit	Comm. Avail.	1	None
Polyolester Oil	Comm. Avail	A/R	Viscosity ISO 68
R134a refrigerant	Comm. Avail	1350g	None

iv. CHARGING PROCEDURE

a. Connect R134a compatible recycling/recovery unit to the R134a service valves on the aircraft's air conditioning system.

b. Add the amount of compressor oil removed from the system during discharging. Add only polyolester oil, viscosity ISO 68.

c. Charge the air conditioning system in accordance with the recovery unit's instructions, with 1350g of new or recycled R134a refrigerant.

d. Remove recovery unit when charging is complete.

4.4 FLUSHING SYSTEM

i. GENERAL

The following procedure is used to whenever the compressor is replaced and when system contamination is suspected.

ii. TOOLS AND EQUIPMENT

Designation	Ref. No.	Qty	Remarks
Hose Coupler	JBS6020-3	1	None
Hose Coupler	JBS6020-7	1	None
Hose Coupler	JBS6020-8	1	None
Hose Jumper	JBS6009-1	1	None
Service Pressure Gauge	Comm. Avail.	1	None
R134a Compatible Recycling/Recovery Unit	Comm. Avail.	1	None
Polyolester Oil	Comm. Avail.	A/R	Viscosity ISO 68

iii. SYSTEM FLUSHING PROCEDURES

1. Connect the refrigerant recovery cart to the normal service ports.
2. Empty the refrigerant recovery cart's oil collection tube so that it begins with zero oil collected.
3. Discharge the air-conditioning system and recover the refrigerant per the refrigerant cart's instructions. Do not empty the oil collection tube.
4. Disconnect the refrigerant recover cart from the normal service ports.
5. Remove the compressor and connect JBS6020-7 and JBS6020-8 service valve couplers to suction and discharge plumbing hoses.
6. Remove the receiver/drier bottle from the aircraft and properly dispose. Attach JBS6009-1 hose coupler tool in place of the receiver/drier bottle.
7. Disconnect the expansion valve from the evaporator assembly. Attach JBS6020-3 hose coupler tool in place of the expansion valve. Use caution in handling the expansion valve by its remote bulb tubing.

8. Connect the refrigerant recovery cart to the service port couplers located where the compressor was removed to create a refrigerant loop with the refrigerant cart.

9. Evacuate the system thru the HIGH side port only per the refrigerant recovery cart's instructions for a minimum 10 minutes.

10. Charge the system thru the LOW side port only with 1.5 to 2 times a normal refrigerant charge of refrigerant. Do not add any oil to system.

11. Discharge the system thru the HIGH side port only per the refrigerant recovery cart's instructions.

12. Repeat previous three steps two additional times.

13. Disconnect the refrigerant recovery cart from the service ports.

14. Remove the compressor and drain all of the oil from the compressor into an empty graduated cylinder. It will be necessary to rotate the clutch plate several times to get as much oil as possible from the compressor.

15. Empty the refrigerant recovery cart's oil collection tube into the graduated cylinder with the drained compressor oil. Inspect the oil for debris contamination and replace compressor if necessary.

16. New compressors come serviced with 5 ounces of oil and do not require oil adjustment. If the existing removed compressor is reused or other replacement compressor for which the oil level is unknown, then completely drain the compressor and then add 5 ounces of new polyolester oil ISO grade 68 to the compressor. Torque the oil plug to 6 to 9 ft-lbs.

17. Install the compressor. Use new o-rings.

18. Inspect the expansion valves for damage and debris. Replace if any contamination is found. Use new o-rings.

19. Install a new receiver/drier bottle. Do not reuse the old bottle under any circumstance. Use new o-rings.

20. Evacuate the system per Section 4.2.

21. Add 2 ounces of new polyolester oil ISO grade 68 to the system thru the HIGH side port only.

22. Charge the system per Section 4.3.

AUXILIARY BLOWER FOR AIR CONDITIONING SYSTEM SECTION III

1. Blower Removal / Installation

For removal/installation instructions refer to the Aircraft Maintenance Manual.

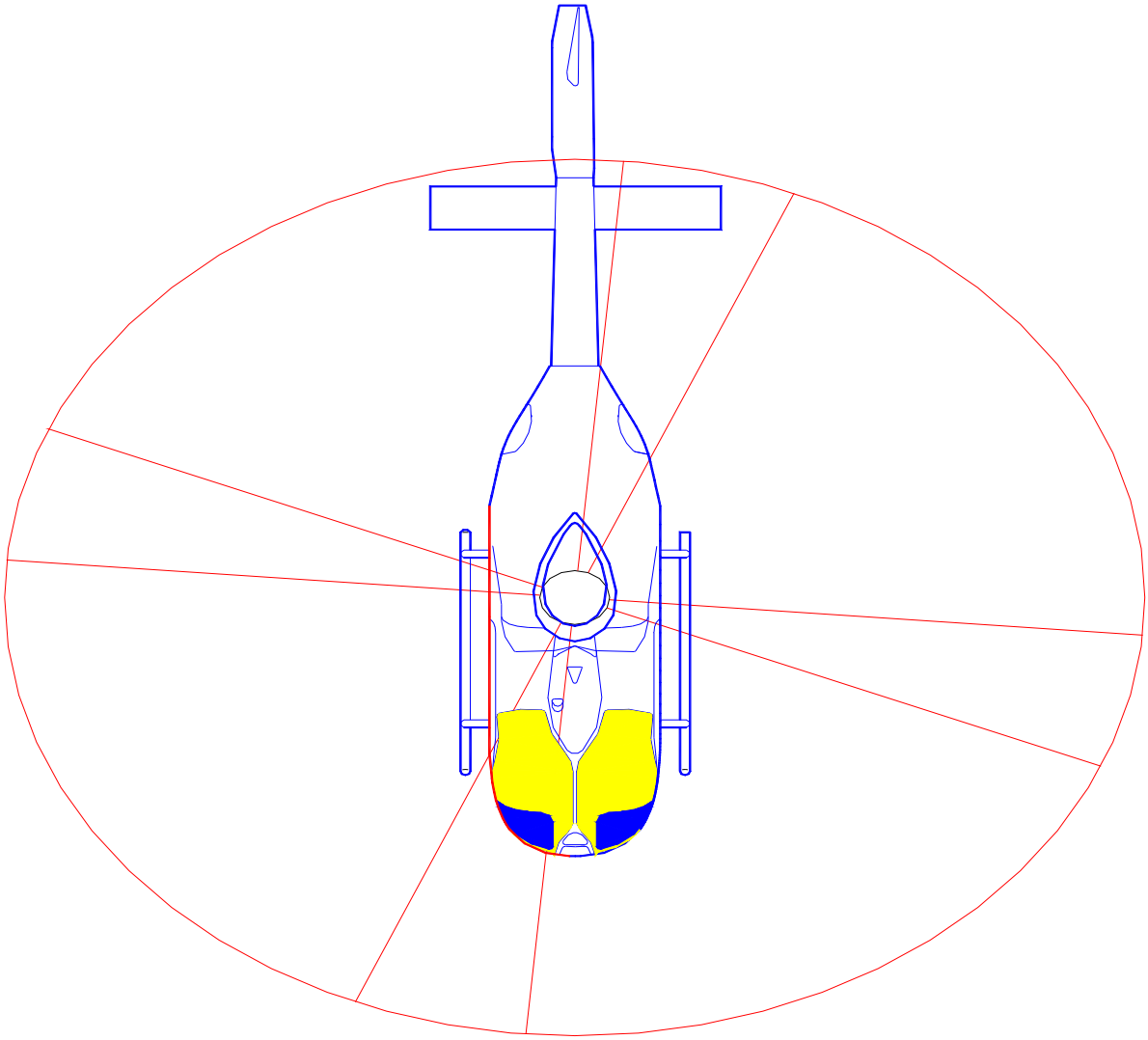
2. Duct and Hoses Removal / Installation

The ducting and plumbing system for the auxiliary blower installation should be replaced when there are signs of wearing and when the items have a kink or blockage. The correct duct or hose should be identified in the IPC and a new part should be ordered from Air Comm Corp., (Reference IPC, Pages 57 through 65). For removal/installation instructions refer to the Aircraft Maintenance Manual

ILLUSTRATED PART CATALOG

Air Comm Corp.

Air Conditioning System for EC135



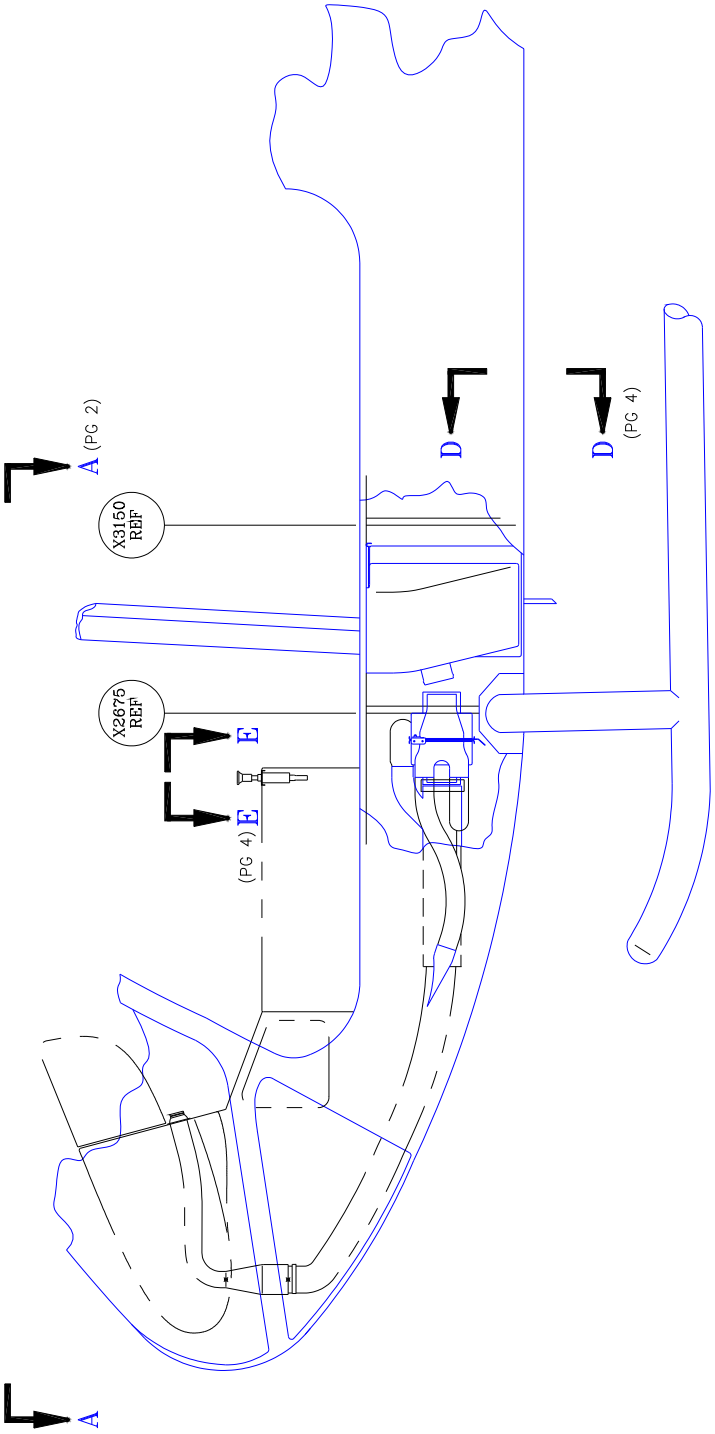


Figure 1:
135-0200-2 EVAPORATOR BLOWER INSTALLATION.

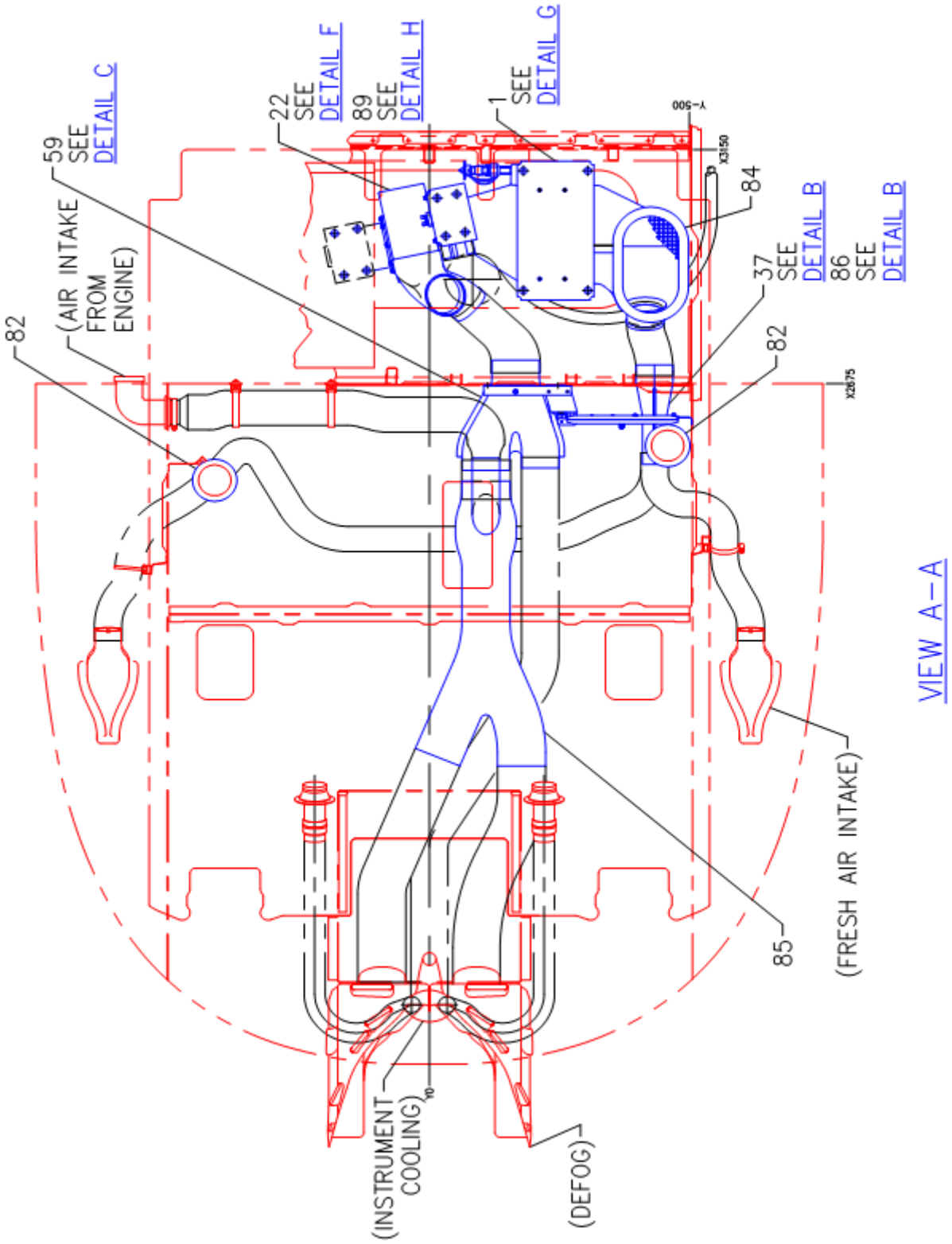


Figure 2:
135-0200-2 EVAPORATOR BLOWER INSTALLATION.

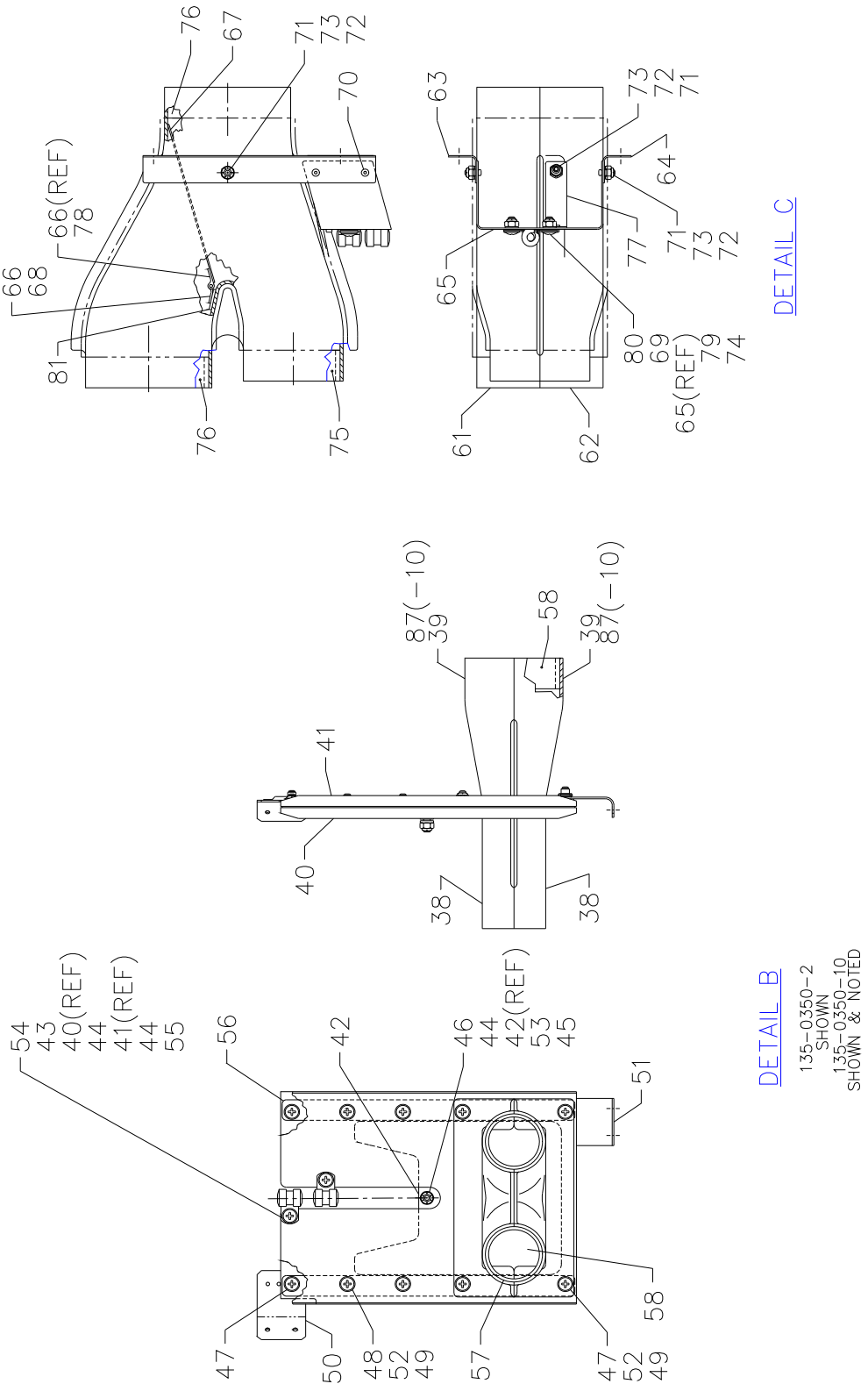


Figure 3:
135-0200-2 EVAPORATOR BLOWER INSTALLATION

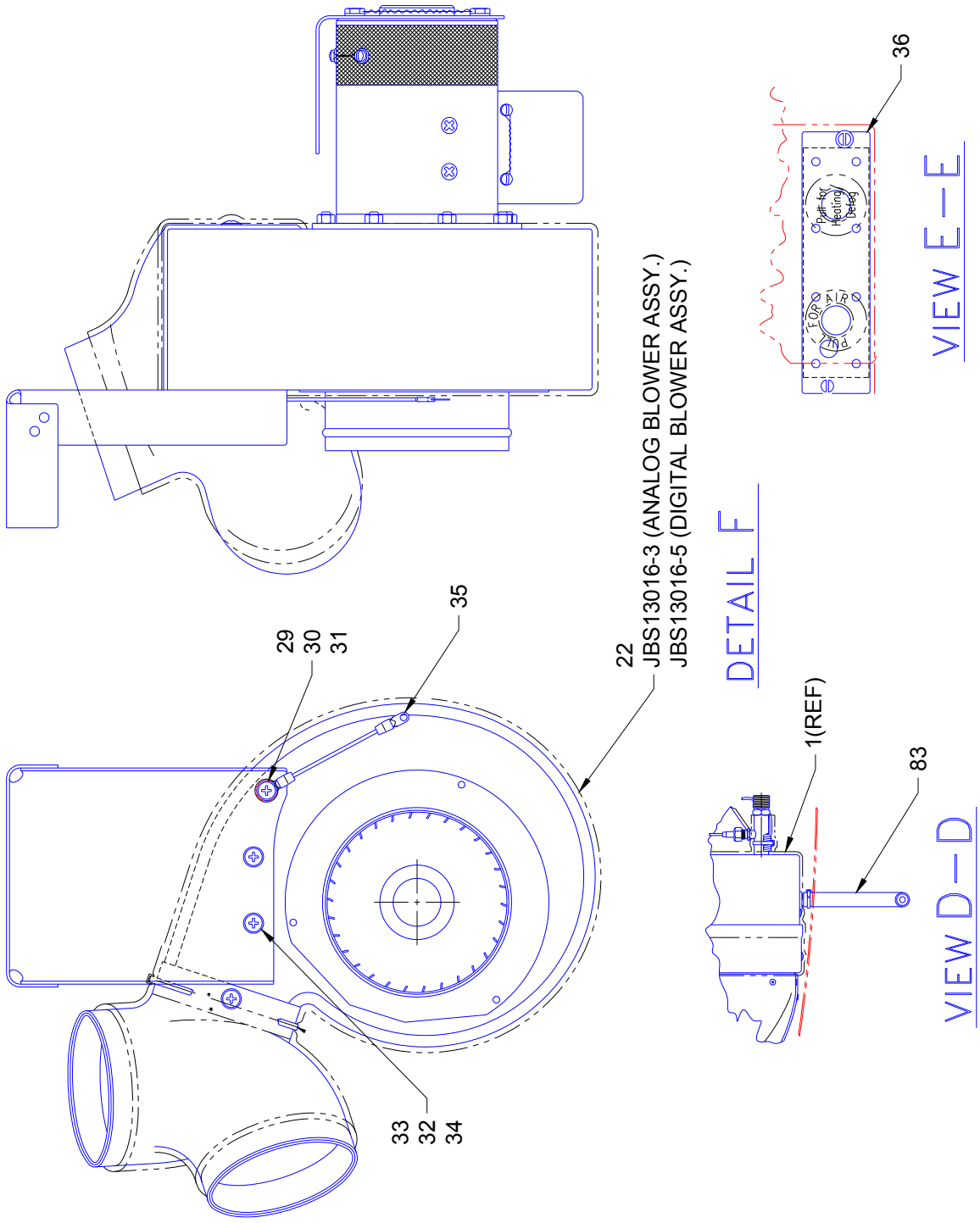


Figure 4:
135-0200-2 COCKPIT BLOWER INSTALLATION WITH AIR-CONDITION SYSTEM

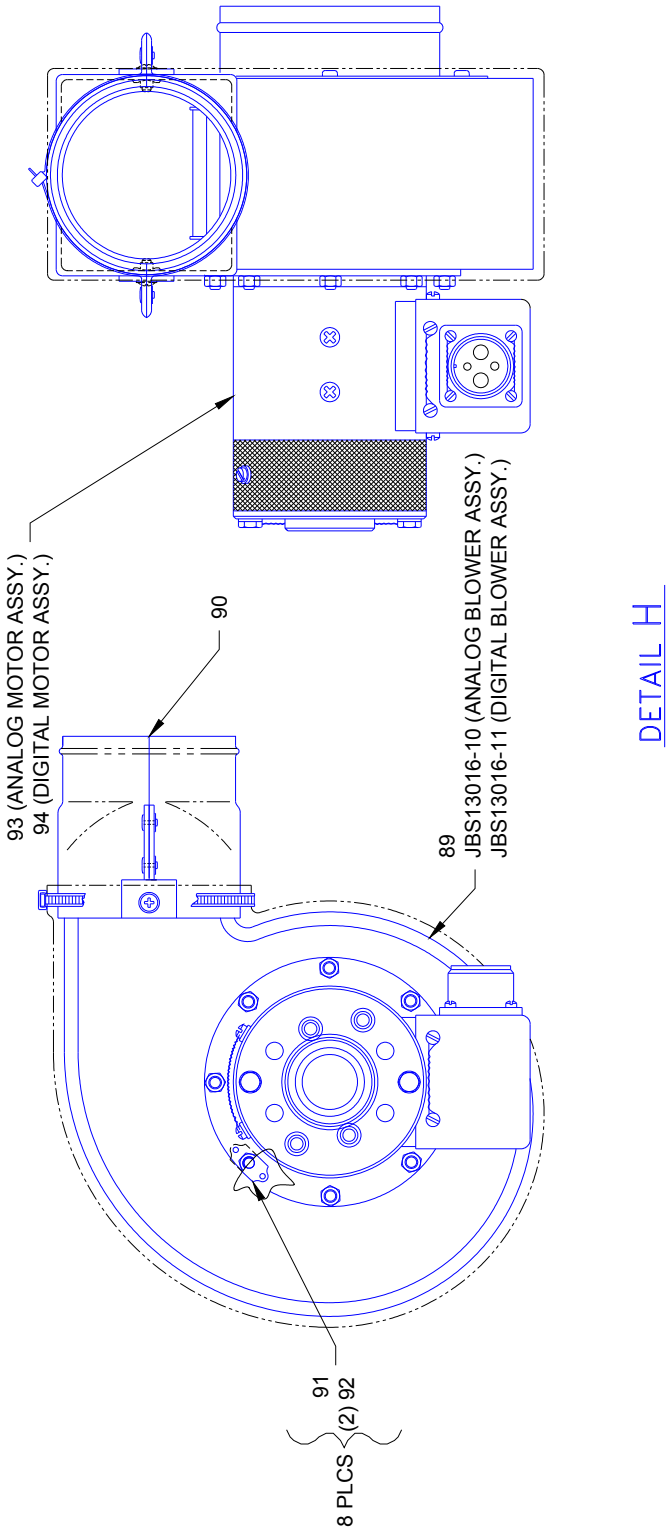


Figure 5:
COCKPIT BLOWER INSTALLATION WITHOUT AIR-CONDITIONING SYSTEM

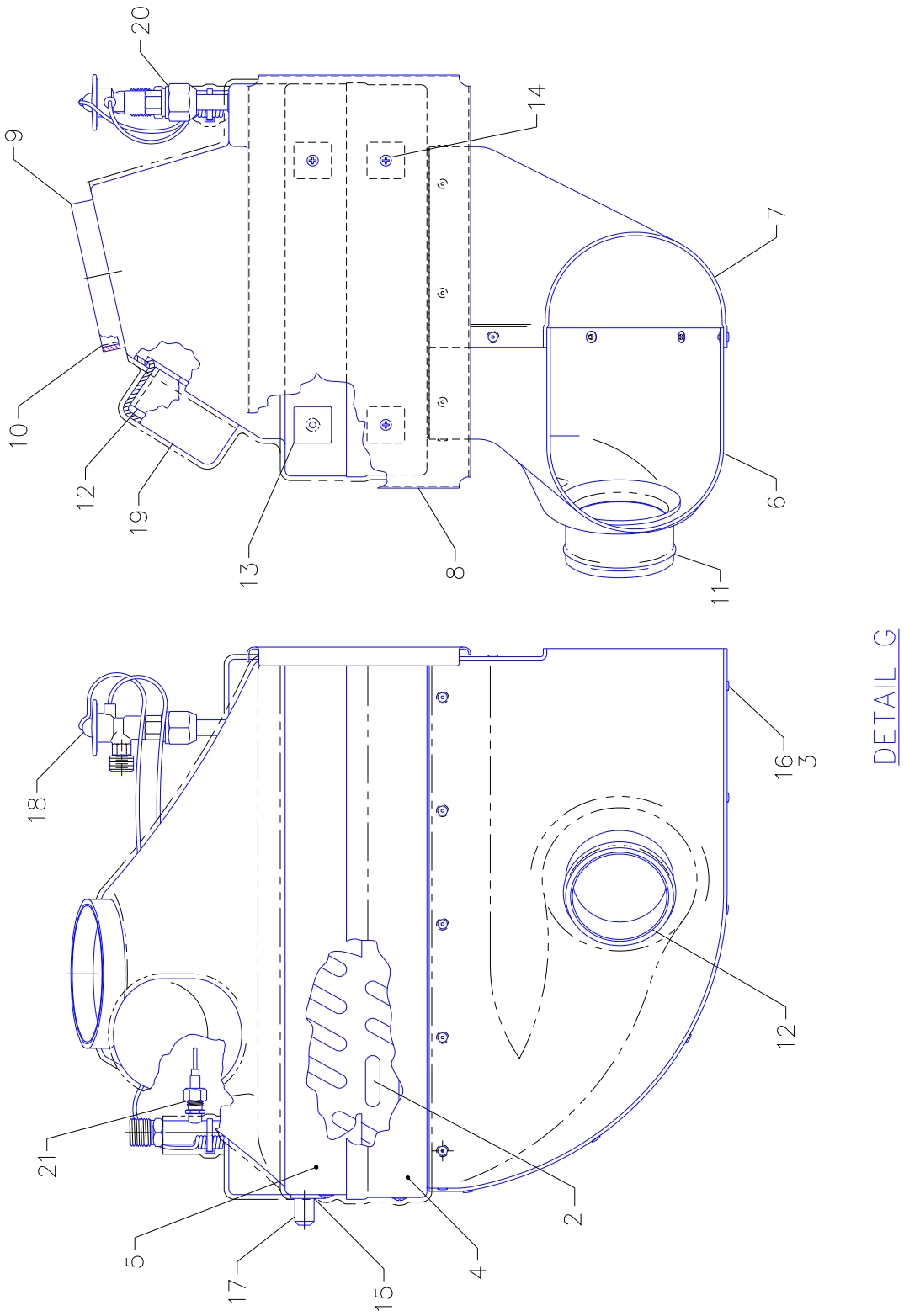


Figure 6:
135-0200-2 EVAPORATOR ASSEMBLY

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
-		135-0200-2	Sub-Kit, Evap Blower Instl	•
2	1	• 135-0250-2	Evap Assy	1
6	2	• • JBS12018-2	Coil Assy	1
6	3	• • ES31100-2	Rivet	23
6	4	• • 135-1251-12	Housing Half	1
6	5	• • 135-1251-13	Housing Half	1
6	6	• • 135-1251-14	Intake Half	1
6	7	• • 135-1251-15	Intake Half	1
6	8	• • 135-1251-16	Mounting Bracket	1
6	9	• • 135-1251-17	Collar	1
6	10	• • 135-1251-18	Support Ring	1
6	11	• • 135-1251-19	Collar	1
6	12	• • 135-1251-20	Support Ring	2
6	13	• • 135-1251-21	Spacer	4
6	14	• • AN507-832R12	Screw	4
6	15	• • AN525-832R8	Screw	4
6	16	• • AN960-4L	Washer	23
6	17	• • ES49006-4	Drain	1
6	18	• • ES26105-1	Expansion Valve	1
6	19	• • 135-1251-22	Collar	1
6	20	• • ES49011-2	O-Ring	1
6	21	• • ES49022-4	O-Ring	1
2	22	• JBS13016-3 & -5	Blower Assy, Variable Speed	1
	23	RESERVED		
	24	RESERVED		
	25	RESERVED		
	26	RESERVED		
	27	RESERVED		
-	28	RESERVED		
4	29	• • AN525-10R7	Screw	3

Table 1:
135-0200-2 EVAPORATOR BLOWER INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
4	30	• • AN960-10L	Washer	3
4	31	• • MS20365-1032	Nut	3
4	32	• • MS21059L08	Nutplate	2
4	33	• • AN525-832R7	Screw	2
4	34	• • ES31102-4	Rivet	4
4	35	• • MS25083-1BB8	Bonding Jumper	1
4	36	• 135-1601-24	Bracket Assy	1
2	37	• 135-0350-2	Air Valve Assy	1
3	38	• • 135-1350-1	Duct Half	2
3	39	• • 135-1350-2	Duct Half	2
3	40	• • 135-1350-3	Plate, Left	1
3	41	• • 135-1350-4	Plate, Right	1
3	42	• • 135-1350-5	Door	1
3	43	• • MS21919WDG3	Clamp	2
3	44	• • AN960-10	Washer	6
3	45	• • AN3-4A	Bolt	1
3	46	• • MS21042-3	Nut	1
3	47	• • AN525-832R10	Screw	5
3	48	• • AN525-832R7	Screw	5
3	49	• • MS21044N08	Nut	8
3	50	• • 135-1350-19	Bracket Assy	1
3	51	• • 135-1350-18	Angle Bracket Assy	1
3	52	• • AN960-8	Washer	8
3	53	• • AN960-10L	Washer	1
3	54	• • AN525-10R10	Screw	2
3	55	• • MS20365-1032	Nut	2
3	56	• • 135-1350-17	Spacer	2
3	57	• • 135-1350-27	Support Collar	2
3	58	• • 135-1350-26	Support Ring	1
2	59	• 135-0350-4	Air Switch Assy	1

Table 2:
135-0200-2 EVAPORATOR BLOWER INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
-	60	• • 135-0350-3	Air Switch Assy	1
3	61	• • • 135-1350-10	Duct Half	1
3	62	• • • 135-1350-11	Duct Half	1
3	63	• • • 135-1350-12	Bracket	1
3	64	• • • 135-1350-13	Bracket	1
3	65	• • • 135-1350-14	Bracket	1
3	66	• • • 135-1350-15	Hinge	1
3	67	• • • 135-1350-16	Door	1
3	68	• • • MS20426AD3-5	Rivet (CSK)	4
3	69	• • • MS21919WDG3	Clamp	2
3	70	• • • MS20470AD4-3.5	Rivet	6
3	71	• • • AN525-832R7	Screw	3
3	72	• • • AN960-8L	Washer	3
3	73	• • • MS44N08	Nut	3
3	74	• • • MS20365-1032	Nut	2
3	75	• • • 135-1350-26	Support Ring	1
3	76	• • • 135-1350-25	Support Ring	2
3	77	• • • 135-1350-33	Angle Bracket	1
3	78	• • • ES31102-1	Cherry Rivet	4
3	79	• • • AN960-10	Washer	2
3	80	• • • AN525-10R8	Screw	2
3	81	• • • 135-1350-22	Spacer	1
2	82	• 135-1601-22	Closeout	2
4	83	• 135-1200-15	Drain Assy	1
2	84	• 135-1200-14	Inlet Grill Assy	1
2	85	• 135-1605-1	Fiberglass Duct	1
2	86	• 135-0350-10	Air Switch Assy	1
3	87	• • 135-1350-35	Duct Half	2
-	88	RESERVED		
5	89	• JBS13016-10 & -11	Blower Assy	1

Table 3:
135-0200-2 EVAPORATOR BLOWER INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
5	90	• • JBS5021-3	Collar Assy	1
5	91	• • ES34135-1	Nutplate	8
5	92	• • ES31102-4	Rivet	16
5	93	• • ES73175-2 (-10)	Blower Assembly (Analog)	1
5	94	• • ES73175-4 (-11)	Blower Assembly (Digital)	1

Table 4:
135-0200-2 EVAPORATOR BLOWER INSTALLATION

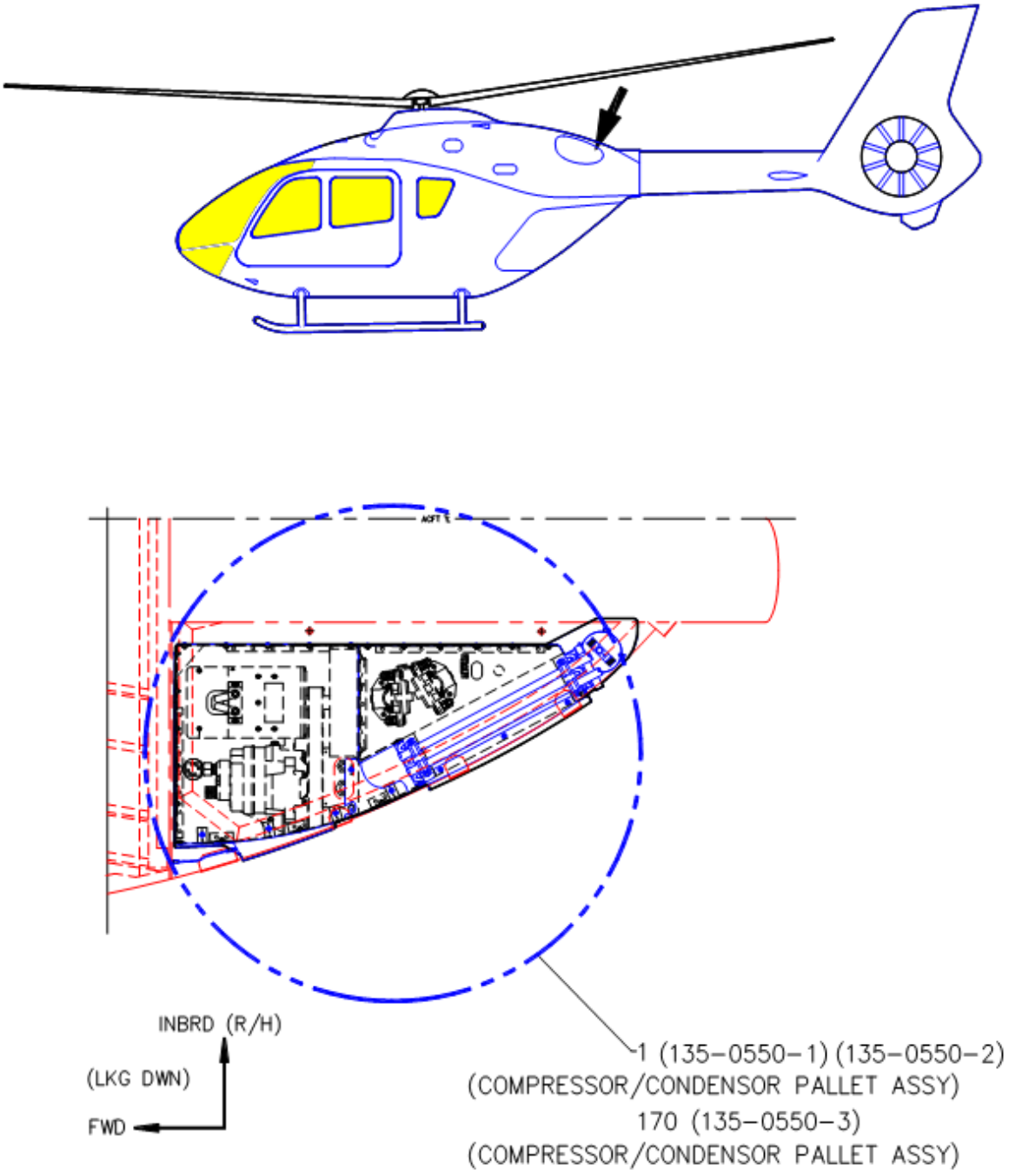


Figure 7:
135-0550 COMP/COND PALLET INSTALLATION

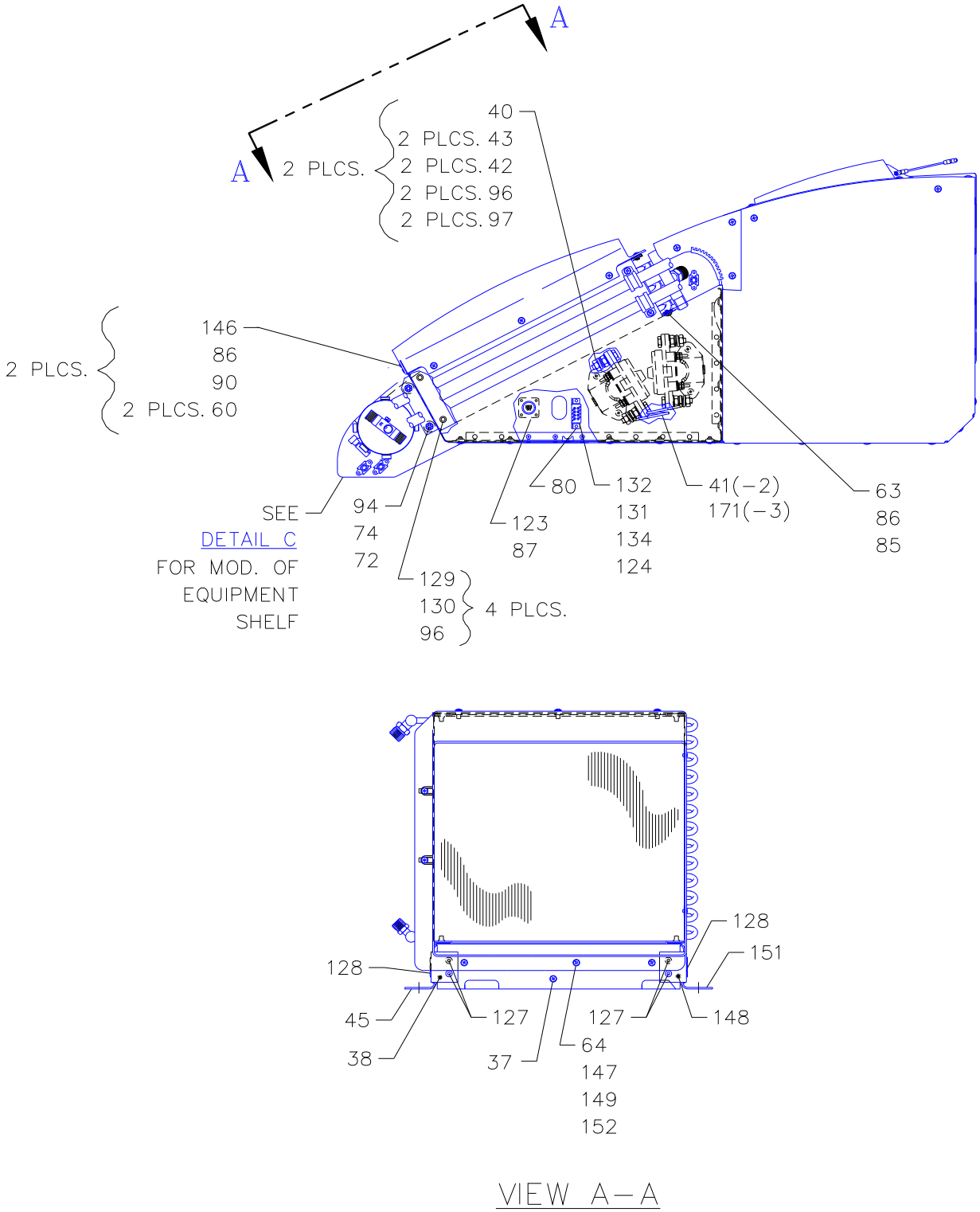
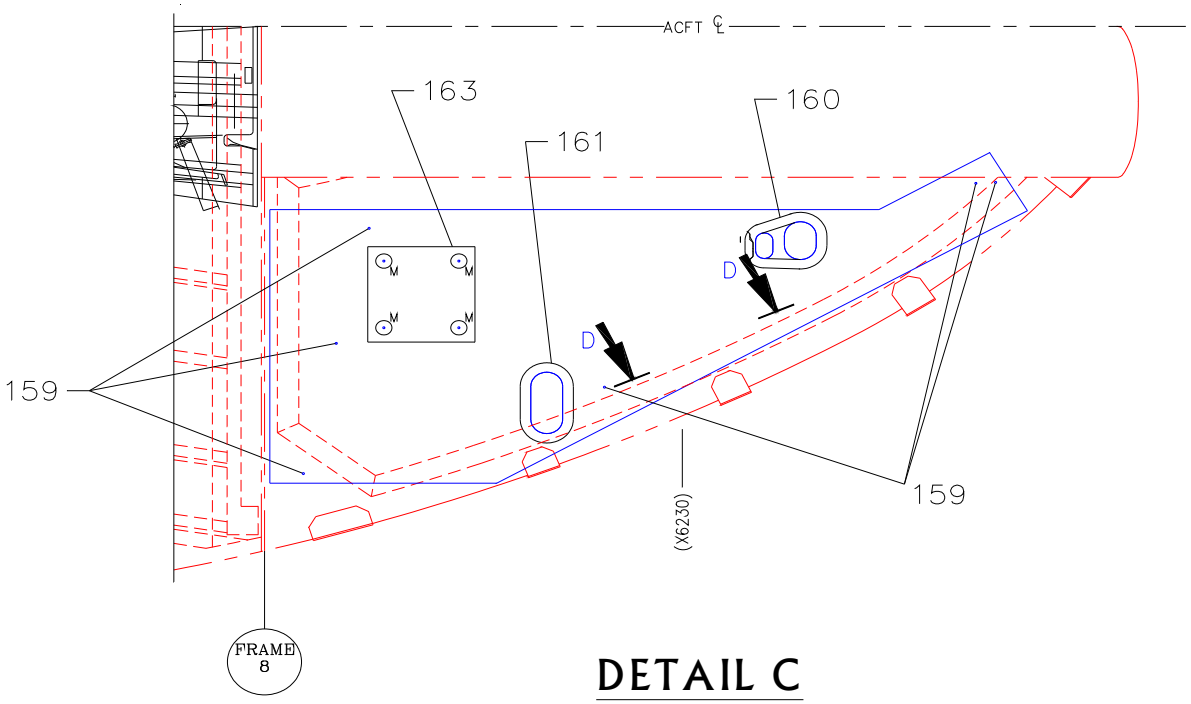
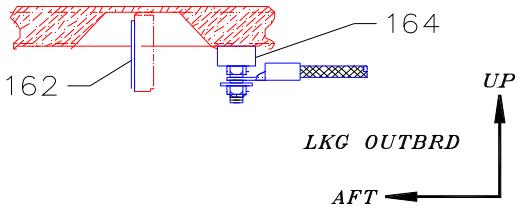


Figure 8:
135-0550 COMP/COND PALLET INSTALLATION



DETAIL C



VIEW D-D

Figure 9:
135-0550 COMP/COND PALLET INSTALLATION

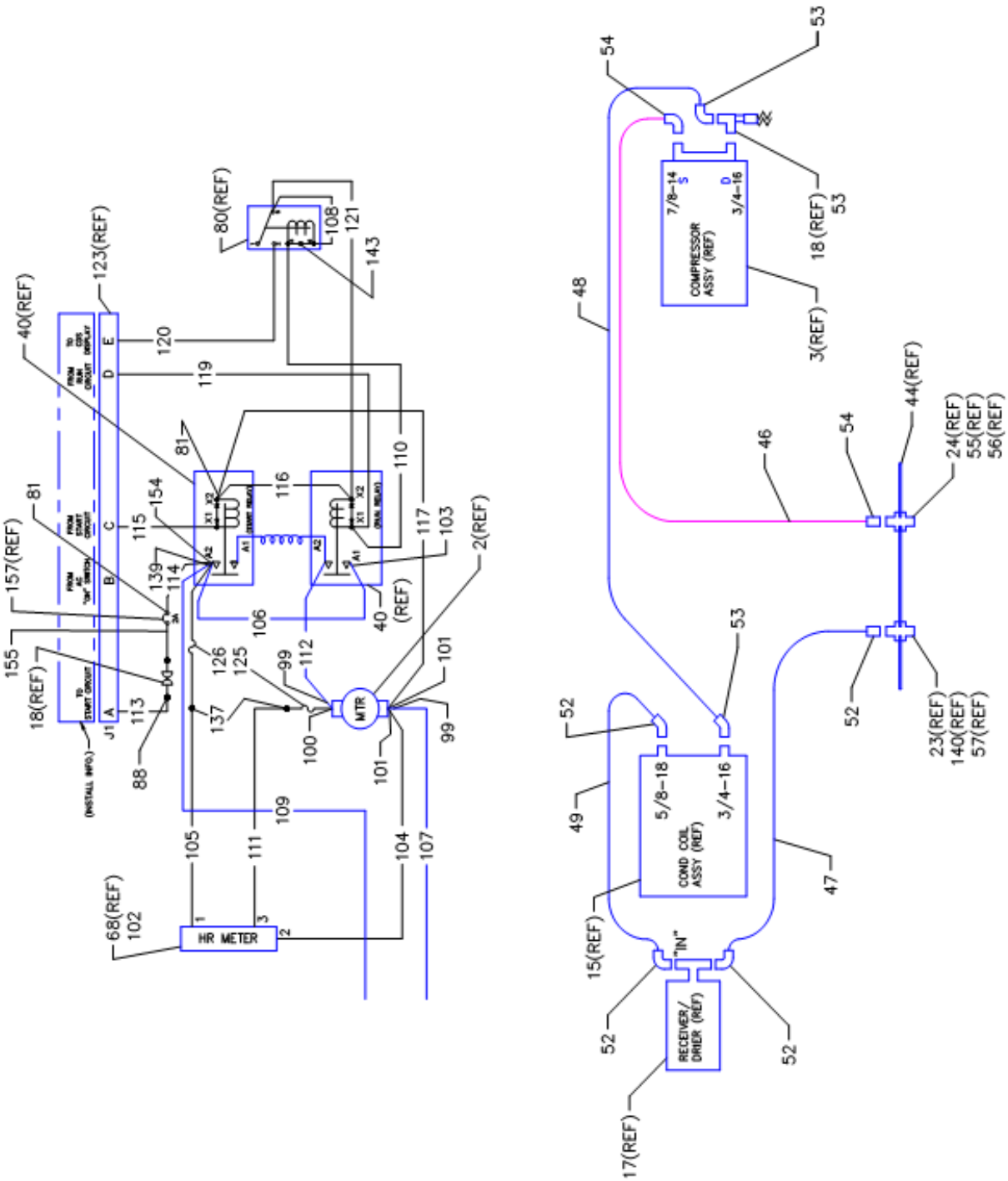


Figure 10:
135-0550 COMP/COND PALLET INSTALLATION

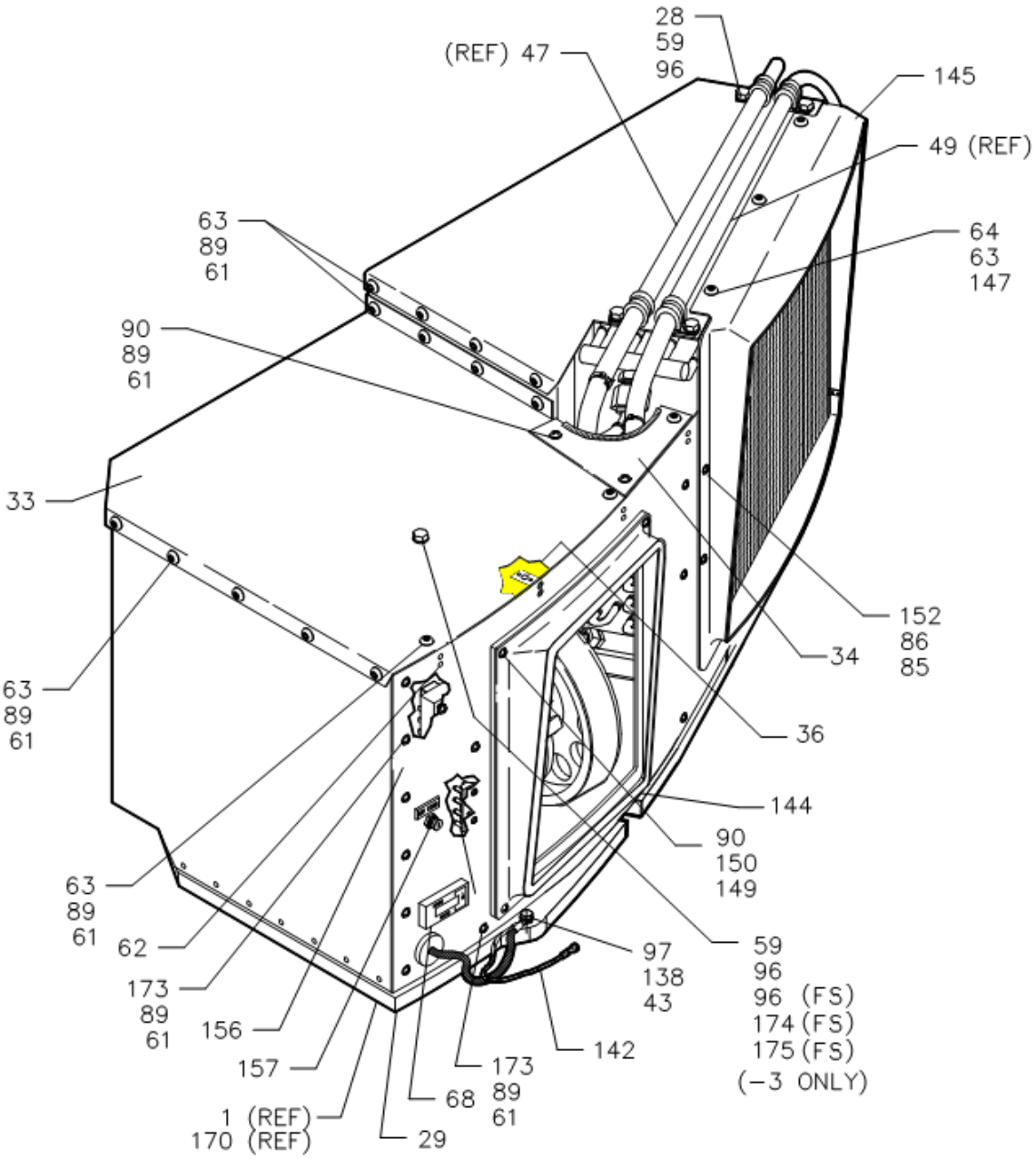


Figure 11:
135-0550 COMP/COND PALLET INSTALLATION

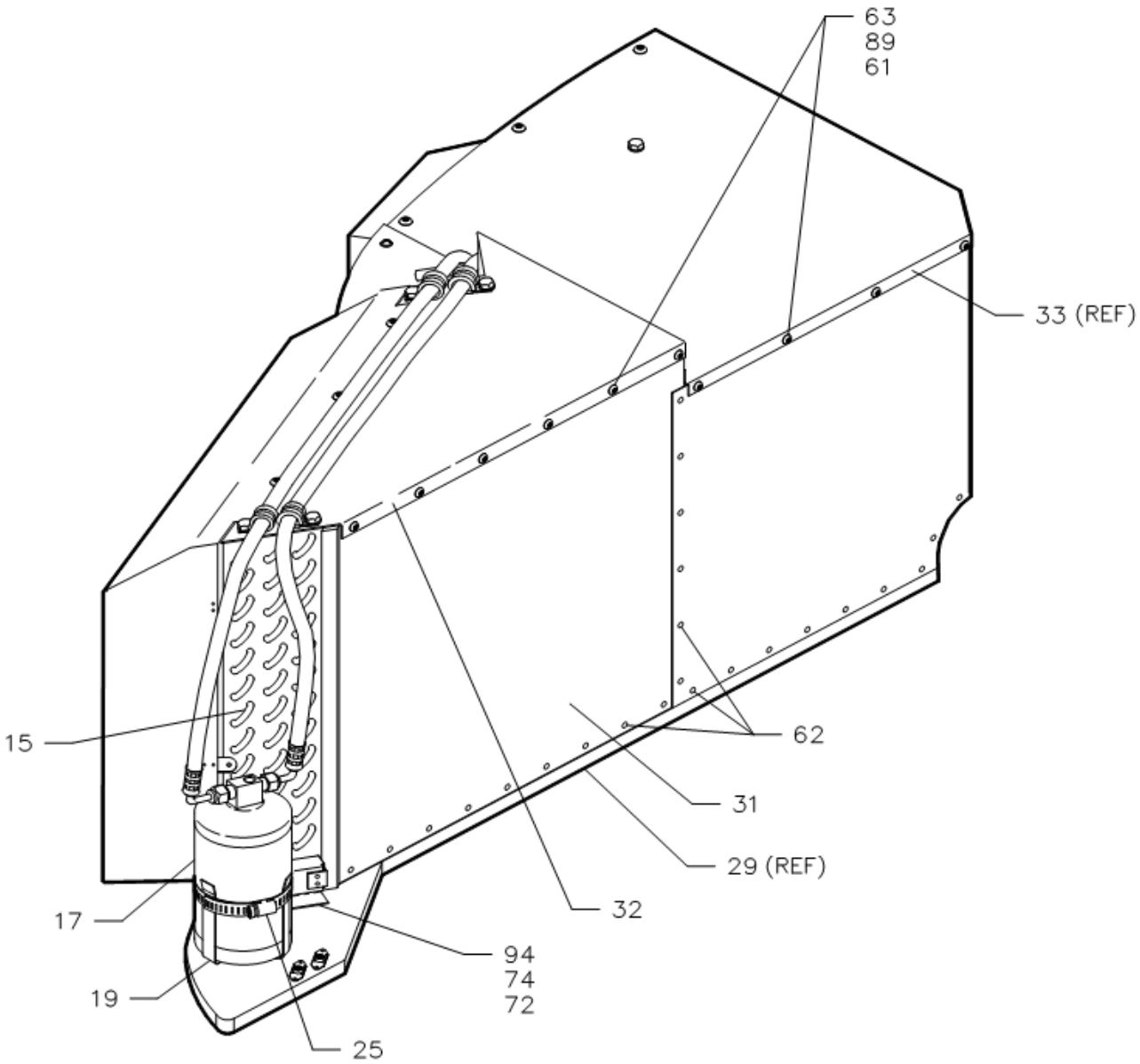


Figure 12:
135-0550 COMP/COND PALLET INSTALLATION

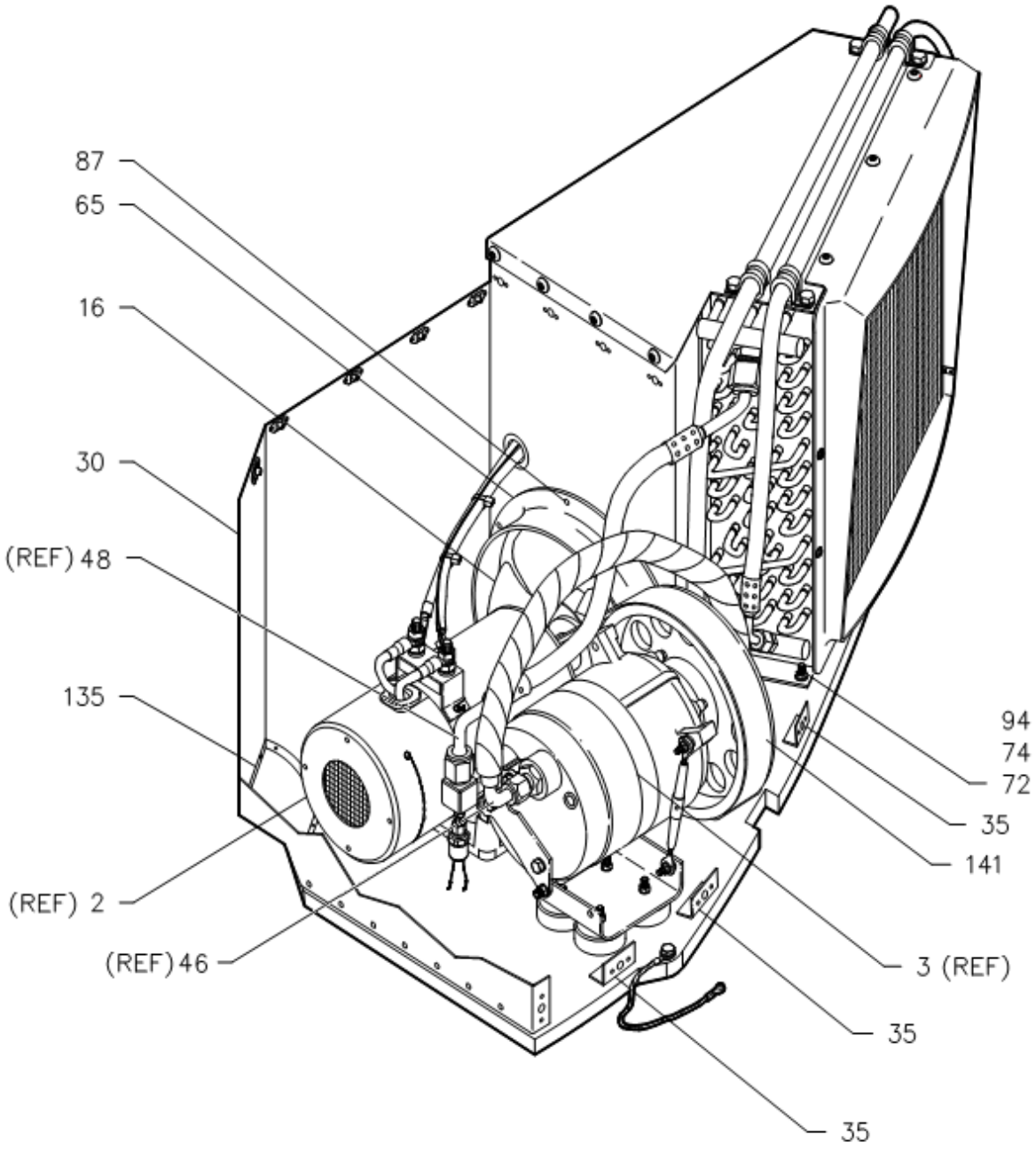


Figure 13:
135-0550 COMP/COND PALLET INSTALLATION

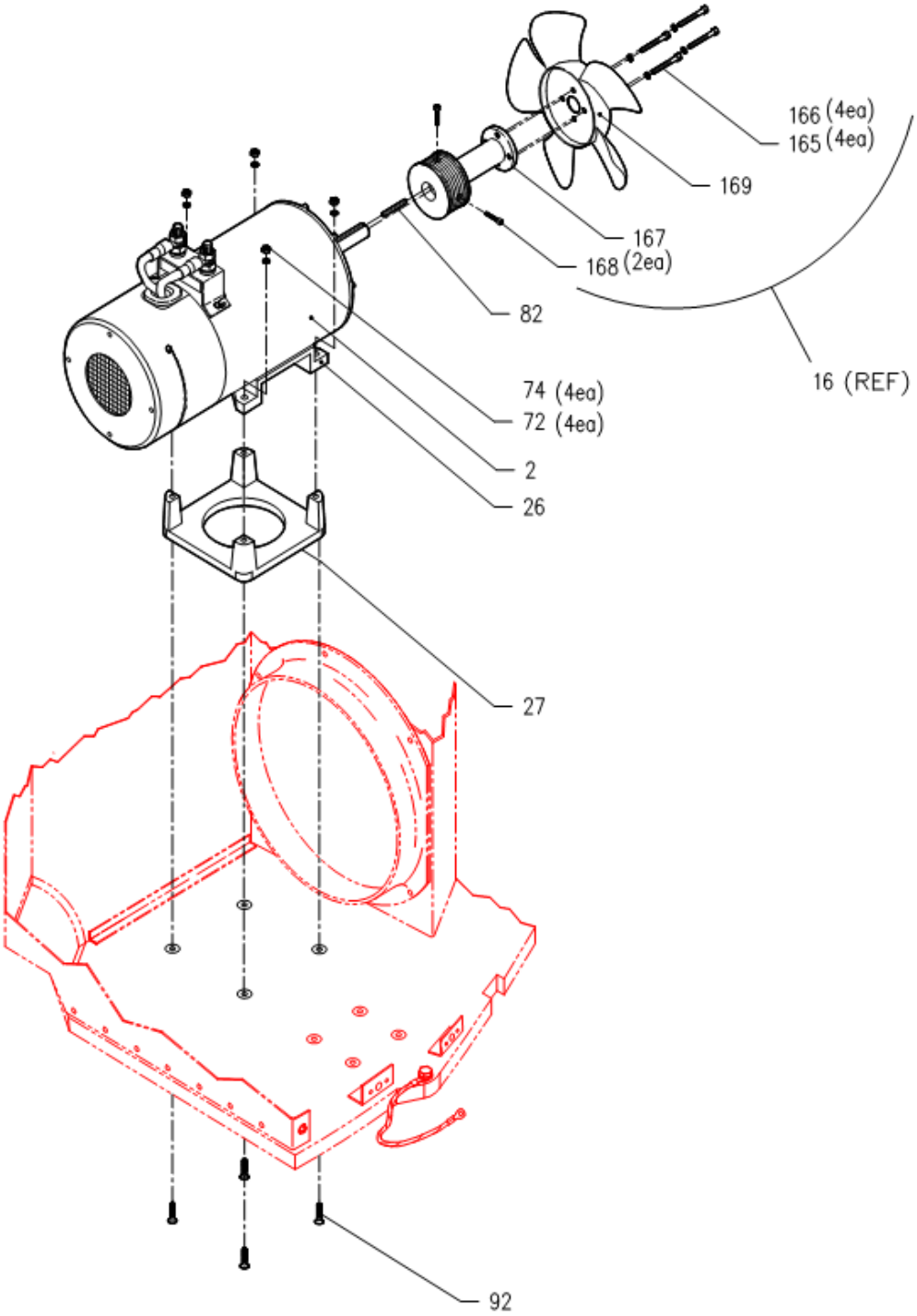


Figure 14:
135-0550 COMP/COND PALLET INSTALLATION

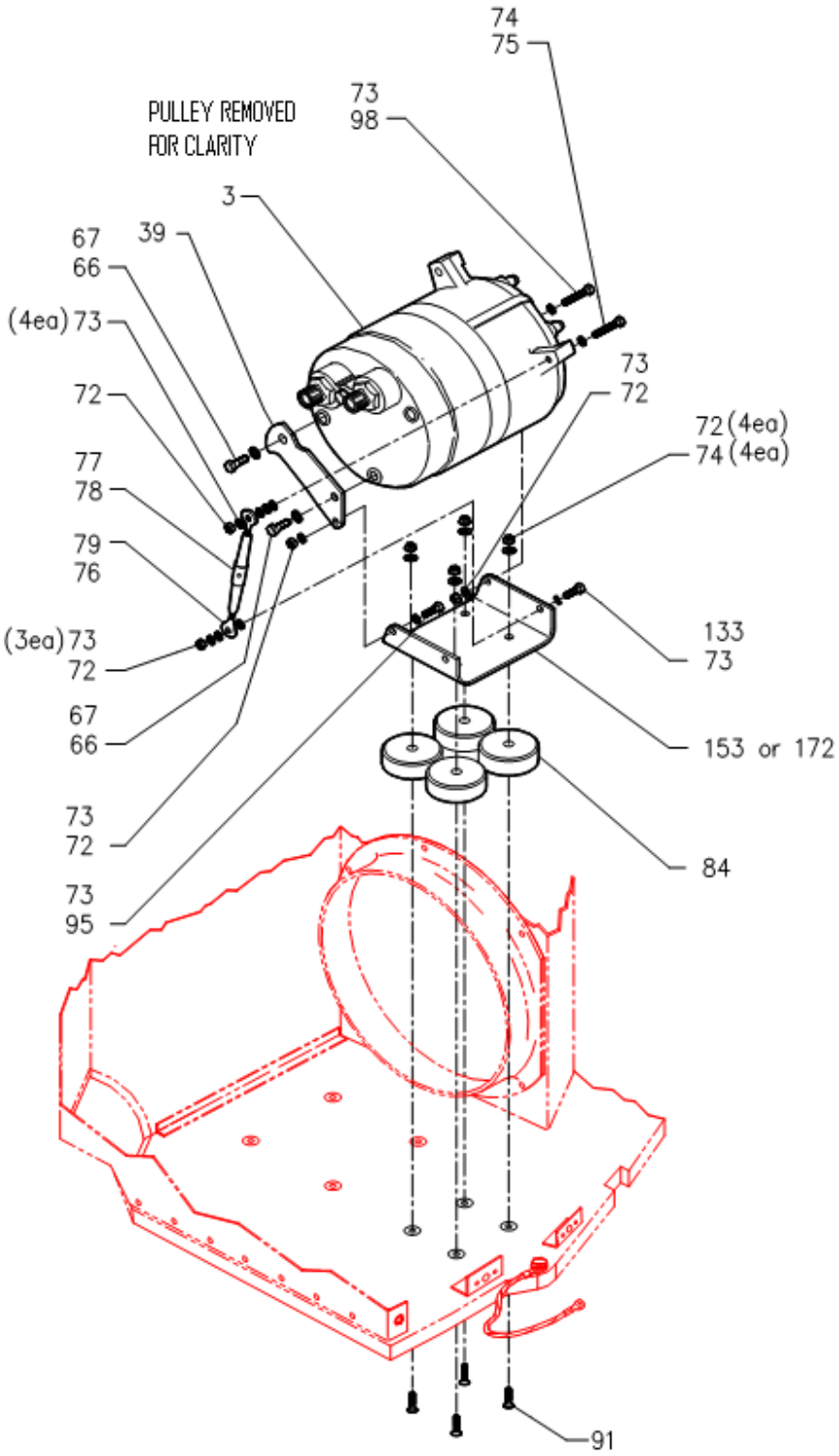


Figure 15:
135-0550 COMP/COND PALLET INSTALLATION

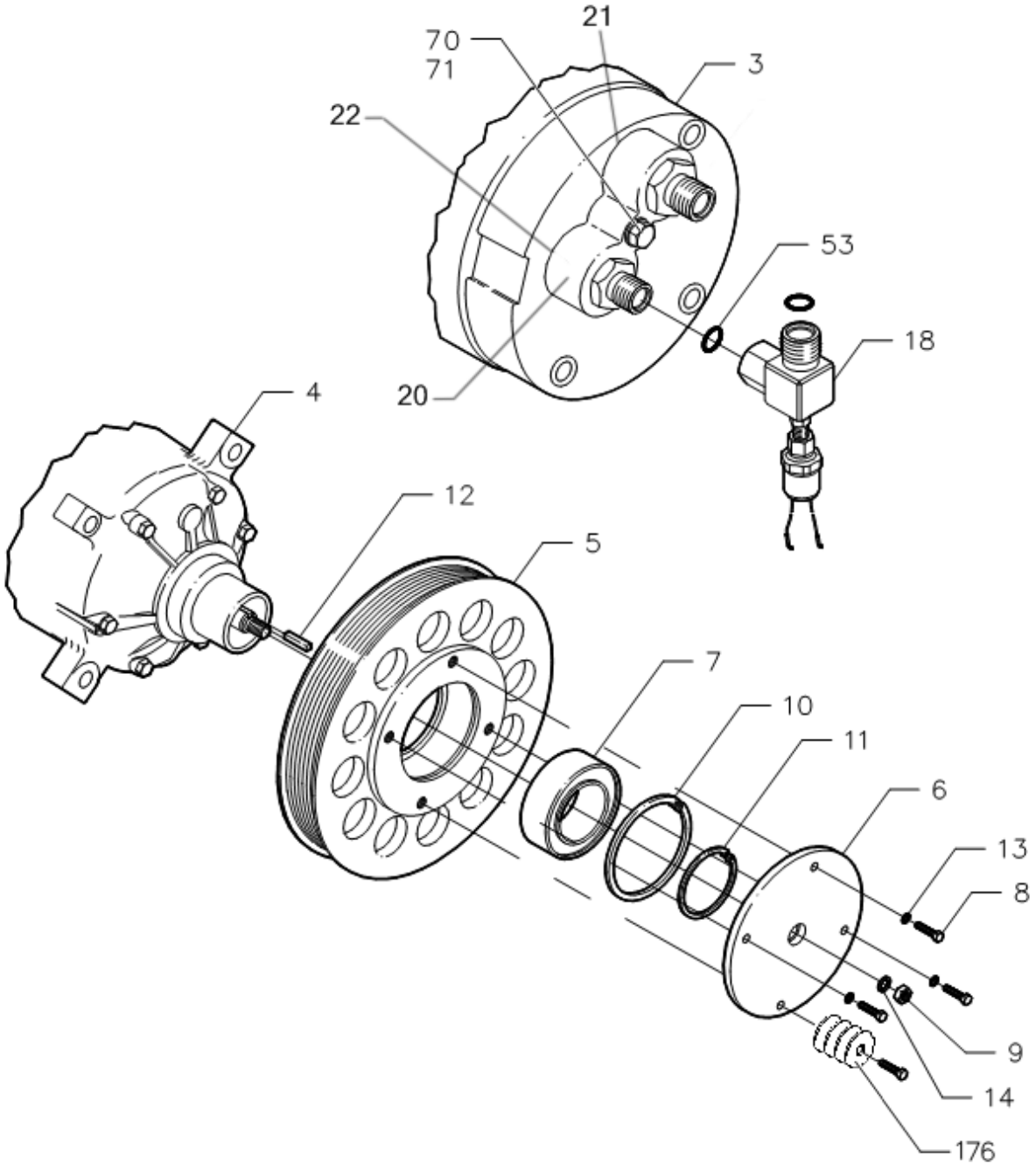


Figure 16:
135-0550 COMP/COND PALLET INSTALLATION

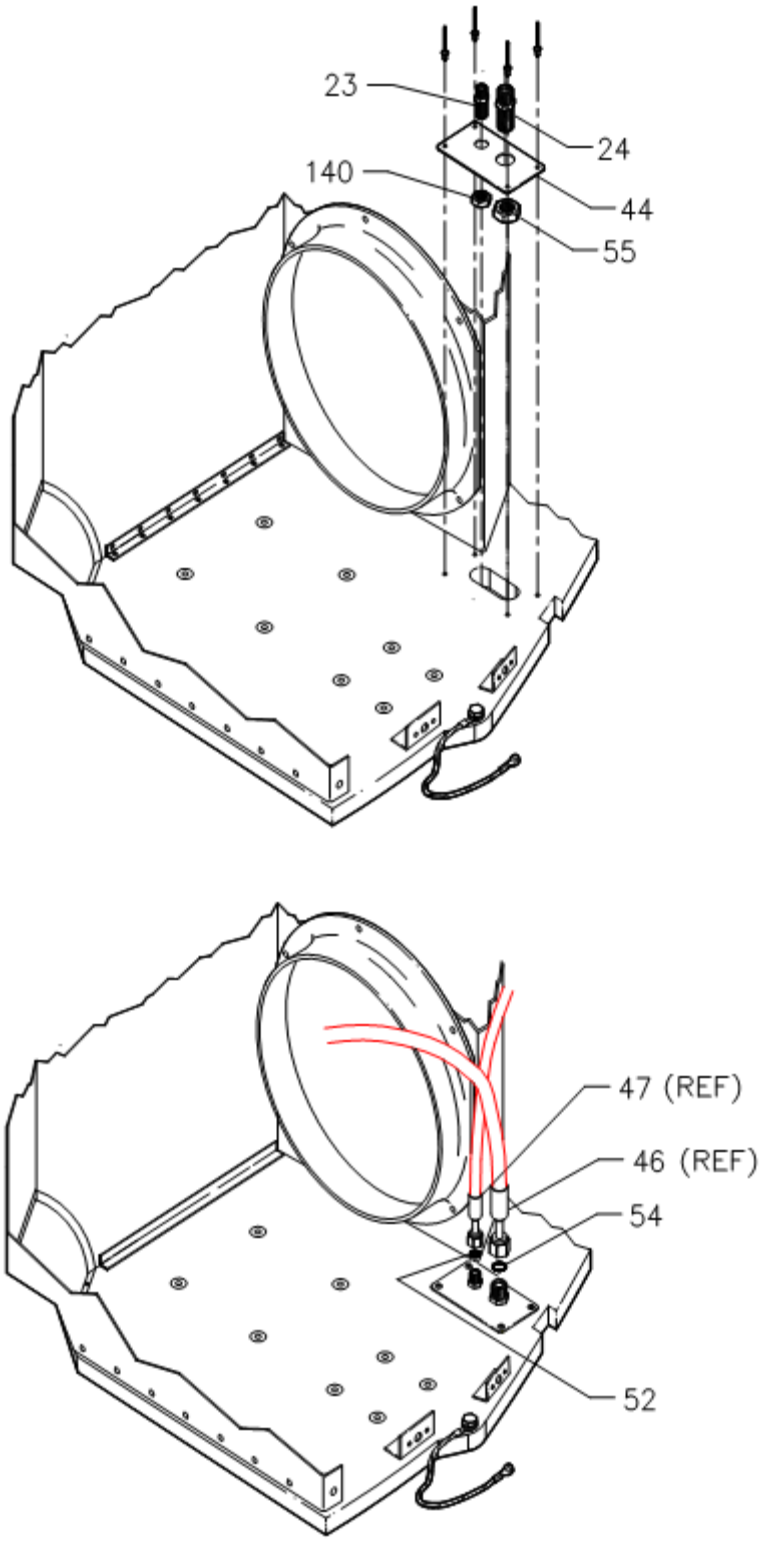


Figure 17:
135-0550 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
7	1	135-0550-2	Comp/Cond Pallet Assy	1
13	2	• ES61110-3	Motor, Compressor	1
15	3	• JBS222-1	Compressor Assy	1
16	4	• • JBS223-1	Compressor Assy	1
16	5	• • JBS14001-10	Pulley	1
16	6	• • JBS14001-8	Pulley End Plate	1
16	7	• • ES20146-4	Bearing	1
16	8	• • AN3H4A	Bolt	4
16	9	• • ES34126-1	Shaft Nut	1
16	10	• • ES39255-1	Retaining Ring	1
16	11	• • ES10306-3	Retaining Ring	1
16	12	• • ES20091-1	Key	1
16	13	• • AN960-10L	Washer	4
16	14	• • AN960-616	Washer	1
12	15	• JBS3006-3	Cond Coil Assy	1
13	16	• JBS13015-2	Fan Blade Assy	1
12	17*	• ES43030-2	Receiver/Drier	1
16	18	• JBS2020-5	Pressure Switch	1
12	19	• JBS21-19	Bracket Assy	1
16	20	• ES49024-1	Manifold Adapter, Compressor	1
16	21	• ES38112-1	Seal Washer, Suction	1
16	22	• ES38113-1	Seal Washer, Disch.	1
17	23	• JBS6009-1	Fitting, Bulkhead	1
17	24	• JBS6009-3	Fitting, Bulkhead	1
12	25	• ES30042-6	Clamp	1
14	26	• ES22043-1	Motor Mount	1
14	27	• JBS430-2	Bracket	1
11	28	• MS21919WDG9	Clamp	4
11	29	• 135-1550-21	Pallet Assy	1
13	30	• 135-1550-22	Closeout Panel Assy	1

* NOTE: Permissible to substitute I/N 17 (ES43030-2) with ES43030-3 (No sight glass)

Table 5:
135-0550 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
12	31	• 135-1550-23	Closeout Panel Assy	1
12	32	• 135-1550-5	Top Panel	1
11	33	• 135-1550-6	Top Panel	1
11	34	• 135-1550-7	Top Closeout	1
13	35	• 135-1550-8	Clip	3
11	36	• 135-1550-9	Clip	4
8	37	• 135-1550-10	Coil Beam	1
8	38	• 135-1550-11	Clip	3
15	39	• 135-1550-12	Comp Bracket	1
8	40	• JBS421-7	Relay Assy	2
8	41	• JBS912-3	Spring Resistor	1
8	42	• AN520-10R10	Screw	4
8/11	43	• MS27130-A25	Rivnut	5
17	44	• 135-1550-18	Plate	1
8	45	• 135-1550-20	Angle	1
10	46	• 135-1800-6	Hose	1
10	47	• 135-1800-5	Hose	1
10	48	• 135-1800-3	Hose	1
10	49	• 135-1800-4	Hose	1
-	50	• DELETED		
-	51	• DELETED		
10/17	52	• ES49011-1	O-Ring	4
10/16	53	• ES49011-2	O-Ring	3
10/17	54	• ES49011-3	O-Ring	2
17	55	• AN6289-10D	Nut	1
10	56	• ES49002-18	O-Ring	1
10	57	• ES49022-7	O-Ring	1
-	58	• DELETED		
11	59	• AN3-5A	Screw	5
8	60	• MS20426AD3-4	Rivet	4

Table 6:
135-0550 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
11/12	61	• MS20426AD3-3	Rivet	78
11/12	62	• MS20470AD4-4	Rivet	26
8/11/12	63	• ES35020-1	Bolt	31
8/11	64	• MS27130-A13	Rivnut	6
13	65	• JBS567-15	Fan Duct	1
15	66	• ES39112-4	Bolt	2
15	67	• ES38128-4	Washer, Lock	2
11	68	• ES59129-1	Hour Meter	1
-	69	• ES31101DS4-2	Rivet	40
16	70	• ES39112-5	Bolt	1
16	71	• ES38128-5	Washer, Split Lock, Metric	1
8/12/13/14/15	72	• MS21042-4	Nut	16
15	73	• AN960-416	Washer	15
8/12/13/14/15	74	• AN960-416L	Washer	13
15	75	• AN4-15A	Bolt	1
15	76	• MS21254-5LS	Eye End	1
15	77	• MS21251-A5S	Turnbuckle	1
15	78	• MS21256-1	Clip Locking, Turnbuckle	2
15	79	• MS21254-5RS	Eye End	1
8	80	• ES56047-1	Relay	1
10	81	• MS25036-101	Terminal	9
14	82	• JBS80-1	Key	1
-	83	• NAS1351-4H8P	Screw	4
15	84	• 85-00-411-60	Spacer	4
8/11	85	• AN743-12	Bracket	4
8/11	86	• ES34124-3	Nut Clip	10
8/13	87	• ES31101DS4-3	Rivet	12
10	88	• ES55079-1	Splice	2
11/12	89	• MS21059L08	Nutplate	39
8/11	90	• AN525-832R7	Screw	12

Table 7:
135-0550 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
15	91	• MS24694-S113	Screw	4
14	92	• MS24694-S131	Screw	4
-	93	• AN960-8	Washer	2
8/12/13	94	• MS24694-S102	Screw	4
15	95	• AN4-6A	Bolt	1
8/11	96	• AN960-10	Washer	14
8/11	97	• MS35338-43	Lock Washer	5
15	98	• AN4-13A	Bolt	1
10	99	• ES55069-2	Terminal	2
10	100	• ES55076-5	Terminal	1
10	101	• ES55077-5	Terminal	2
10	102	• ES55078-2	Receptacle	3
10	103	• MS25036-127	Terminal	4
10	104	• KAC222-20N	Wire	1
10	105	• KAC221-20	Wire	1
10	106	• KAC218-2	Wire	1
10	107	• KAC220-2N	Wire	1
10	108	• KAC230-20	Wire	1
10	109	• KAC211A-2	Wire	1
10	110	• KAC225-20	Wire	1
10	111	• KAC208A-20	Wire	1
10	112	• KAC219-2	Wire	1
10	113	• KAC223-20	Wire	1
10	114	• KAC224-20	Wire	1
10	115	• KAC227-20	Wire	1
10	116	• KAC212-20	Wire	1
10	117	• KAC207A-20	Wire	1
-	118	• AN960-5L	Washer	6
10	119	• KAC226-20	Wire	1
10	120	• KAC228-20	Wire	1

Table 8:
135-0550 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
10	121	• KAC229-20N	Wire	1
-	122	• ES30014-2	Tie Mount	3
8	123	• ES53007-4	Receptacle	1
8	124	• MS35333-37	Washer, Lock	2
10	125	• JBS64-1	Fuse (2 Amp)	2
10	126	• ES51061-1	Fuse Holder	2
8	127	• MS20470AD3-3	Rivet	8
8	128	• MS20470AD3-4	Rivet	8
8	129	• MS27039-1-09	Screw	4
8	130	• AN936-A10	Washer, Lock	4
8	131	• AN515-6R8	Screw	2
8	132	• AN960-6L	Washer	2
15	133	• AN4-7A	Bolt	1
8	134	• MS27130-A7	Rivnut	2
13	135	• 135-1550-25	Closeout	1
-	136	• ES31100-1	Rivet, Pop	13
10	137	• ES55129-7	Splice	2
11	138	• AN3-4A	Bolt	1
10	139	• ES55076-6	Terminal	1
17	140	• ES49016-1	Nut	1
13	141	• ES20040-3	Belt	1
11	142	• MS25083-1BB8	Bonding Jumper	1
10	143	• ES58161-14	Diode	1
11	144	• 135-1550-16	Duct	1
11	145	• 135-1550-17	Duct	1
8	146	• 135-1600-7	Clip	2
8/11	147	• AN936-A8	Washer, Lock	6
8	148	• 135-1550-30	Clip	1
8/11	149	• AN960-8L	Washer	10
11	150	• MS21042-08	Nut	4

Table 9:
135-0550 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
8	151	• 135-1550-29	Angle	1
8/11	152	• AN525-832R8	Screw	5
15	153	• 135-1550-33	Comp Bracket	1
10	154	• ES55077-6	Terminal	1
10	155	• KAC213-20	Wire	1
11	156	• 135-1550-34	Outboard Panel	1
11	157	• JBS75-1	Circuit Breaker	1
-	158	• DELETED		1
9	159	135-1550-26	Spacer	6
9	160	135-1550-27	Foam Gasket	1
9	161	135-1550-28	Foam Gasket	1
9	162	135-1550-31	Doubler	1
9	163	135-1550-32	Foam Gasket	1
9	164	ES51059-1	Limiter Block	1
14	165	• • AN503-8-8	Screw	4
14	166	• • AN960-8L	Washer	4
14	167	• • JBS15015-1	Pulley	1
14	168	• • ES31030-1	Set Screw	2
14	169	• • ES73068-1	Fan	1
7	⊕170	135-0550-3	Comp/Cond Pallet Assy	1
8	171	• JBS912-4	Spring Resistor	1
15	172	• 135-1550-35	Compressor Bracket	1
11	173	• AN525-832R6	Screw	9
11	174	• MS20365-1032	Nut	1
11	175	• MS21919WDG17	Clamp	1
16	176	AN970-3	Washer	4

Table 10:
135-0550 COMP/COND PALLET INSTALLATION

⊕ The 135-0550-3 Compressor/Condenser Pallet Assembly is the same as the 135-0550-2 except for the JBS912-4 Spring Resistor and 135-1550-35 Compressor Bracket.

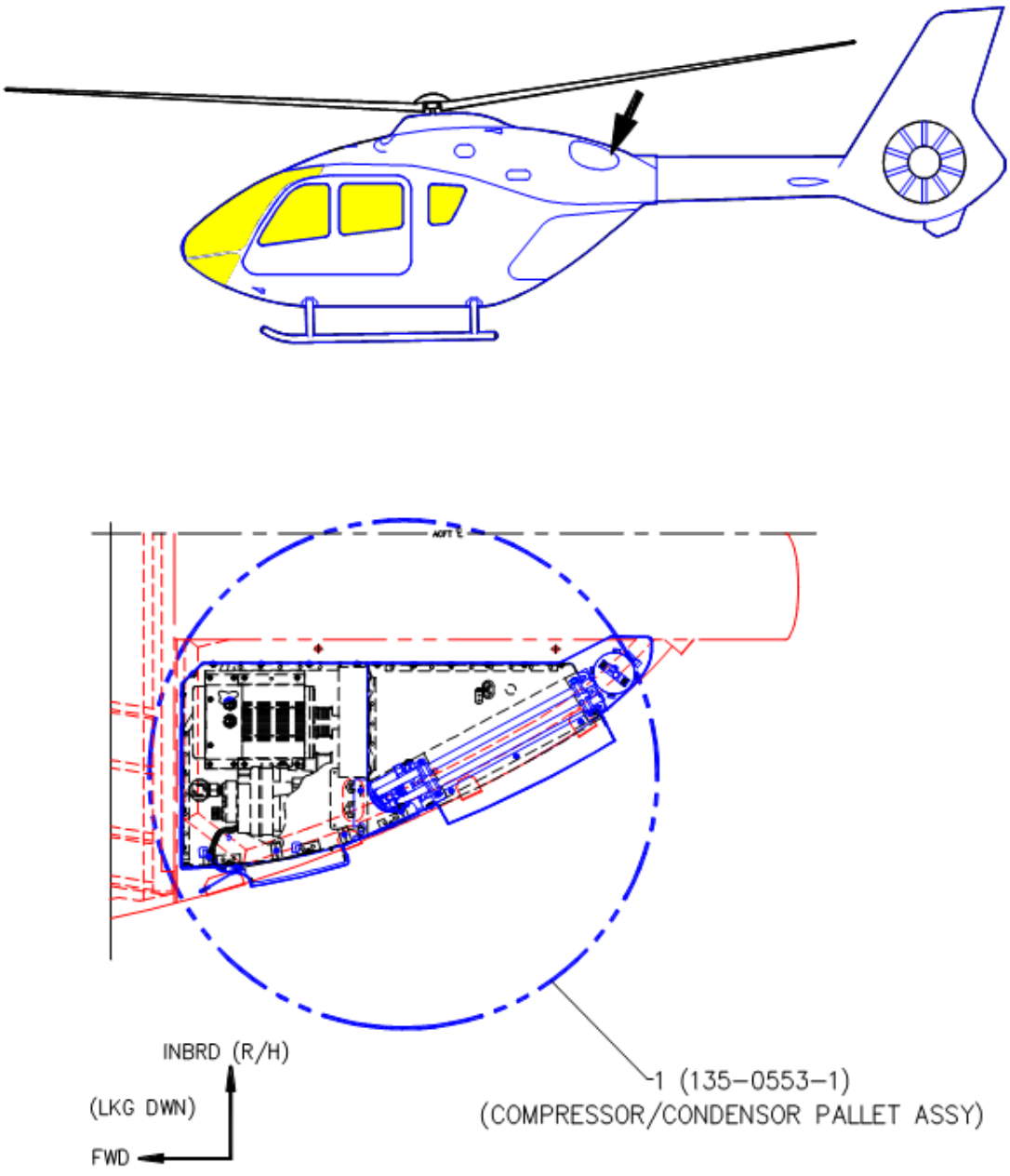


Figure 18:
135-0553-1 COMP/COND PALLET INSTALLATION

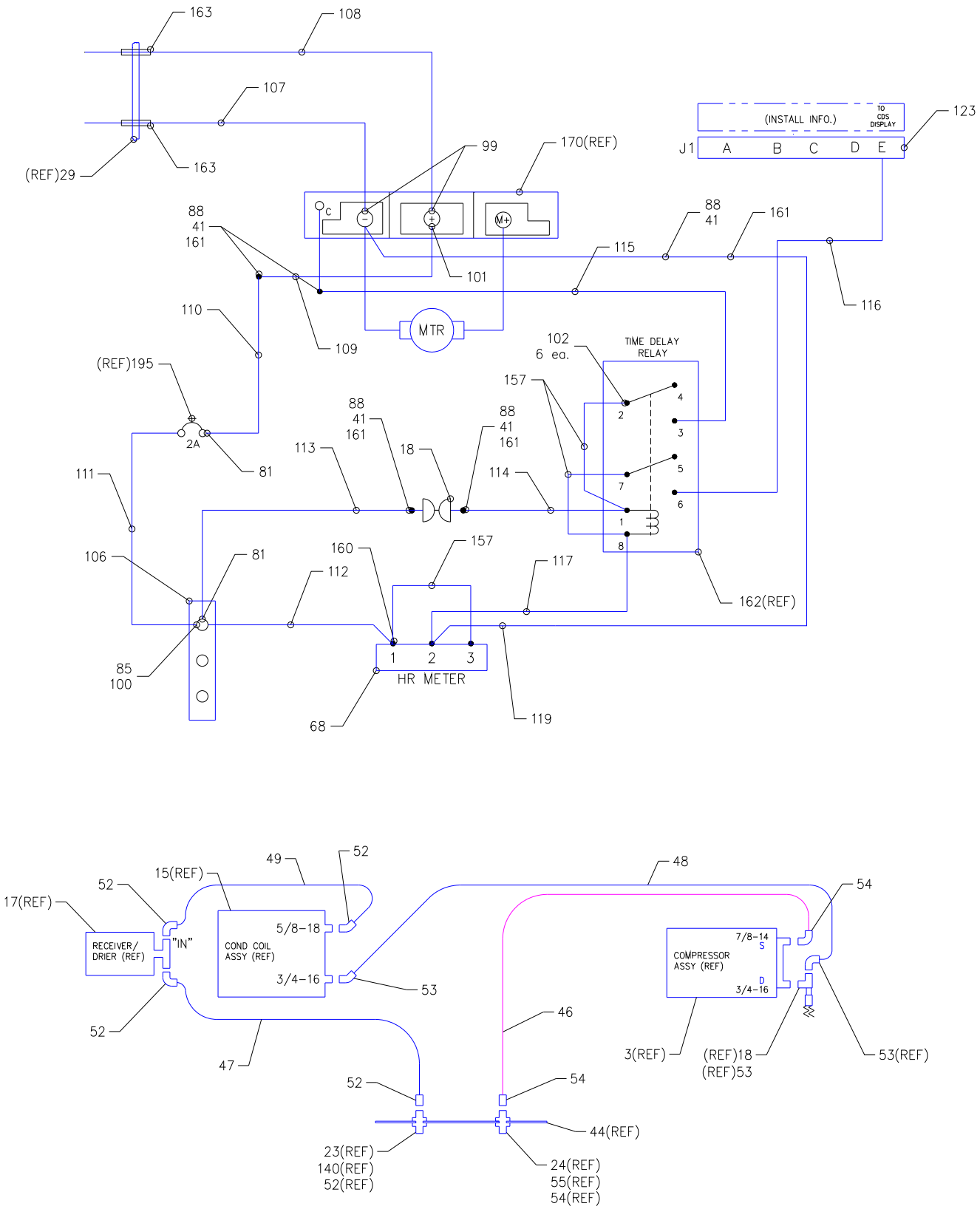


Figure 19:
135-0553-1 COMP/COND PALLET INSTALLATION

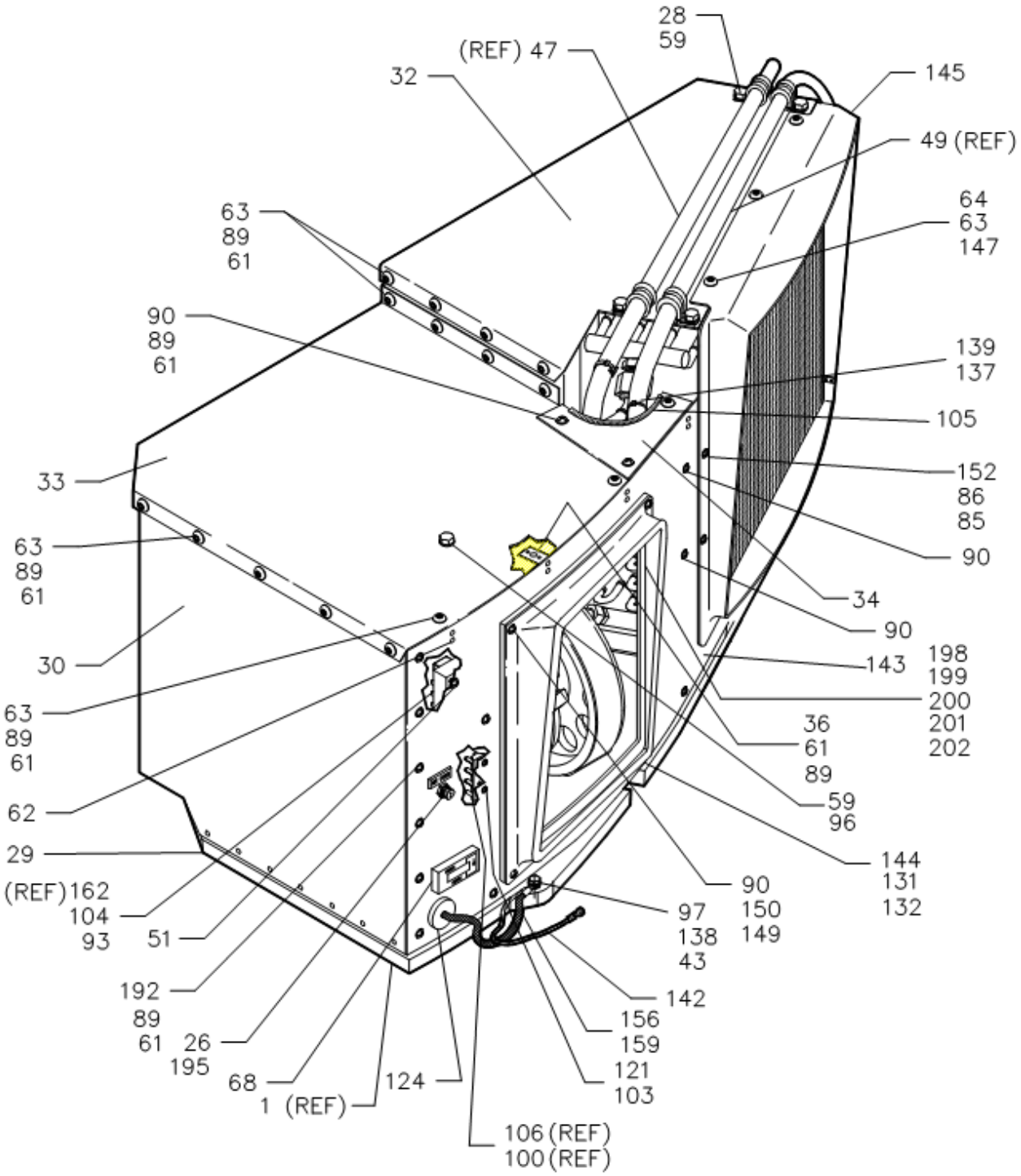


Figure 20:
135-0553-1 COMP/COND PALLET INSTALLATION

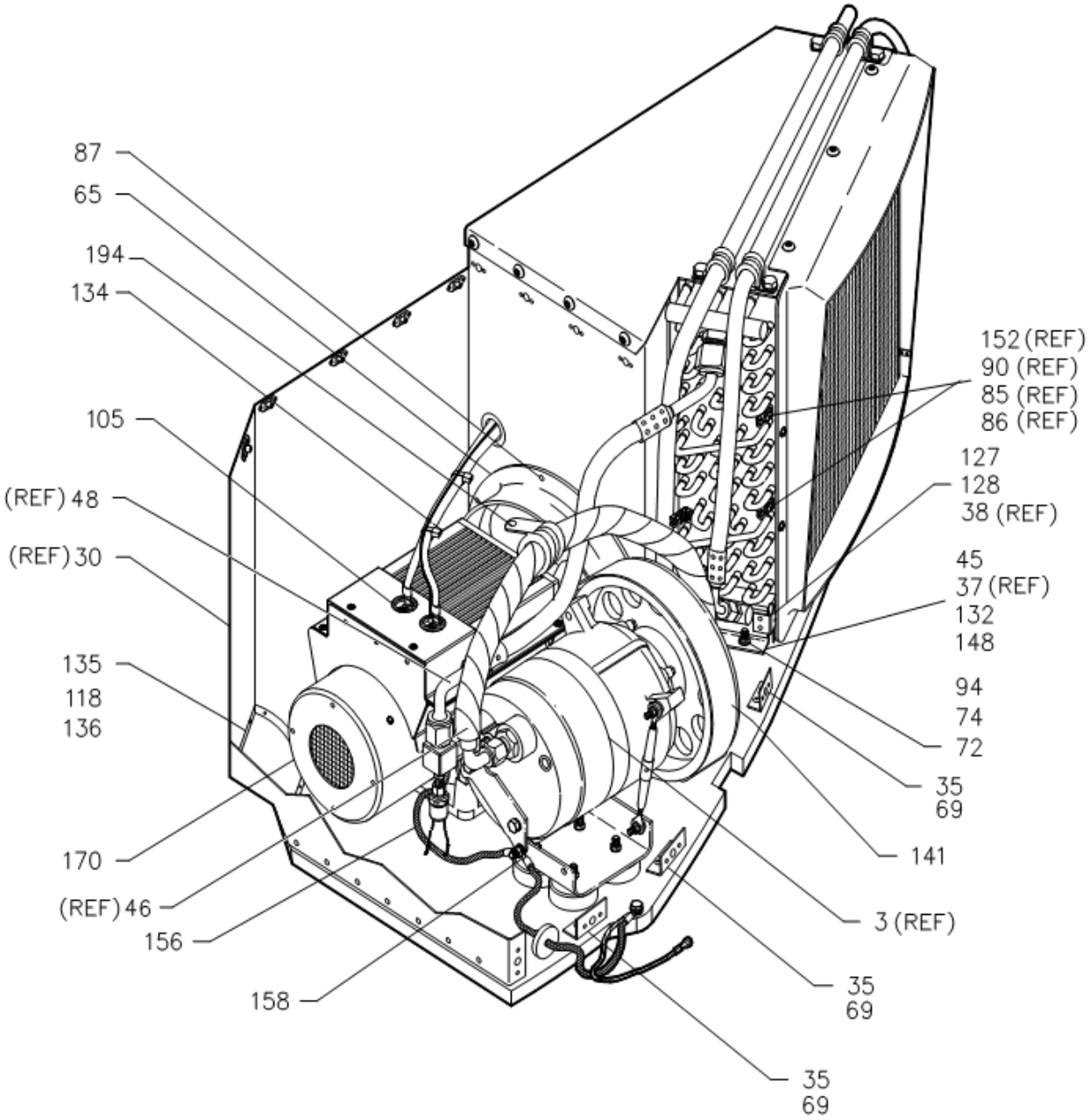


Figure 21:
135-0553-1 COMP/COND PALLET INSTALLATION

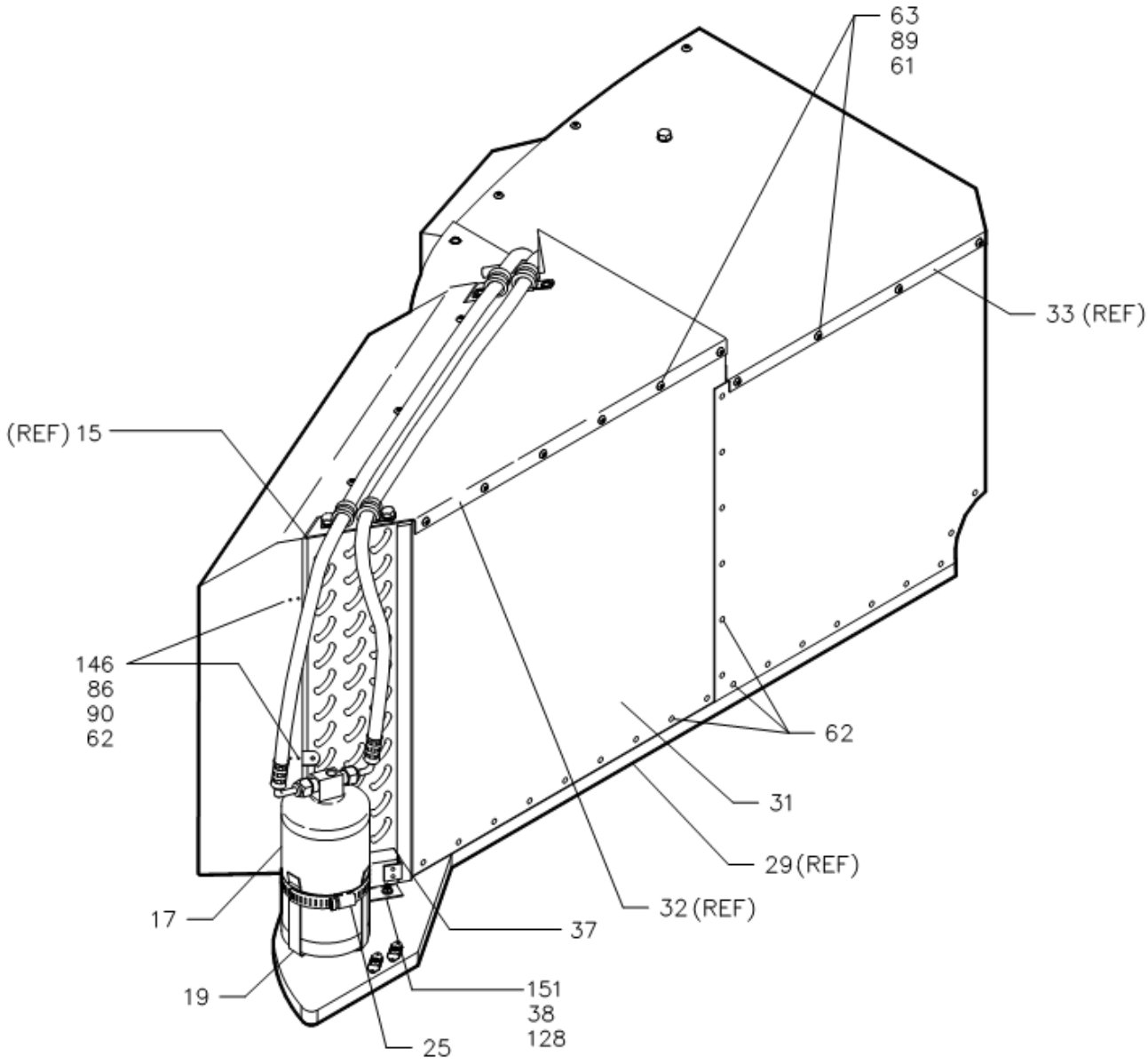


Figure 22:
135-0553-1 COMP/COND PALLET INSTALLATION

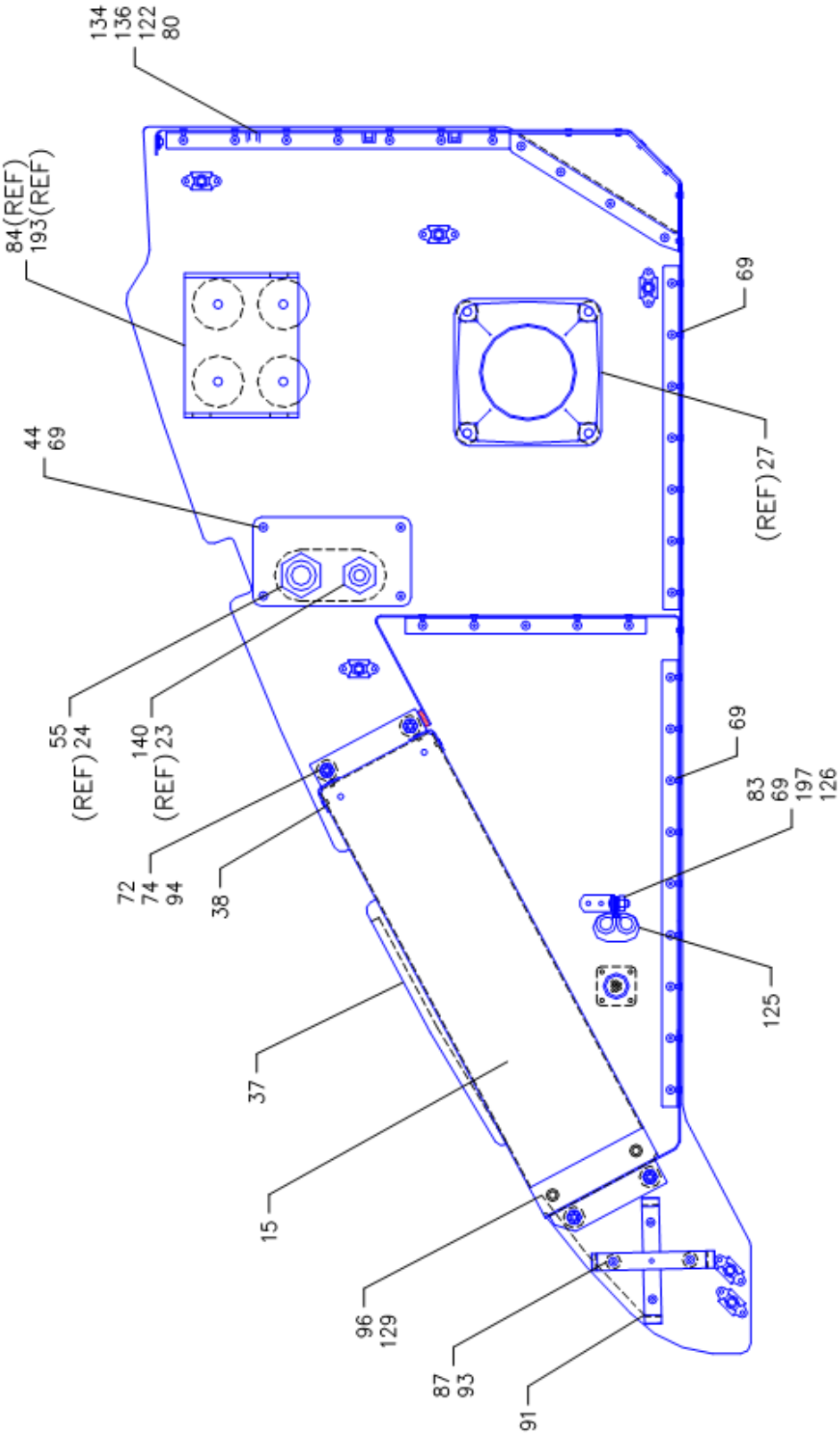


Figure 23:
135-0553-1 COMP/COND PALLET INSTALLATION

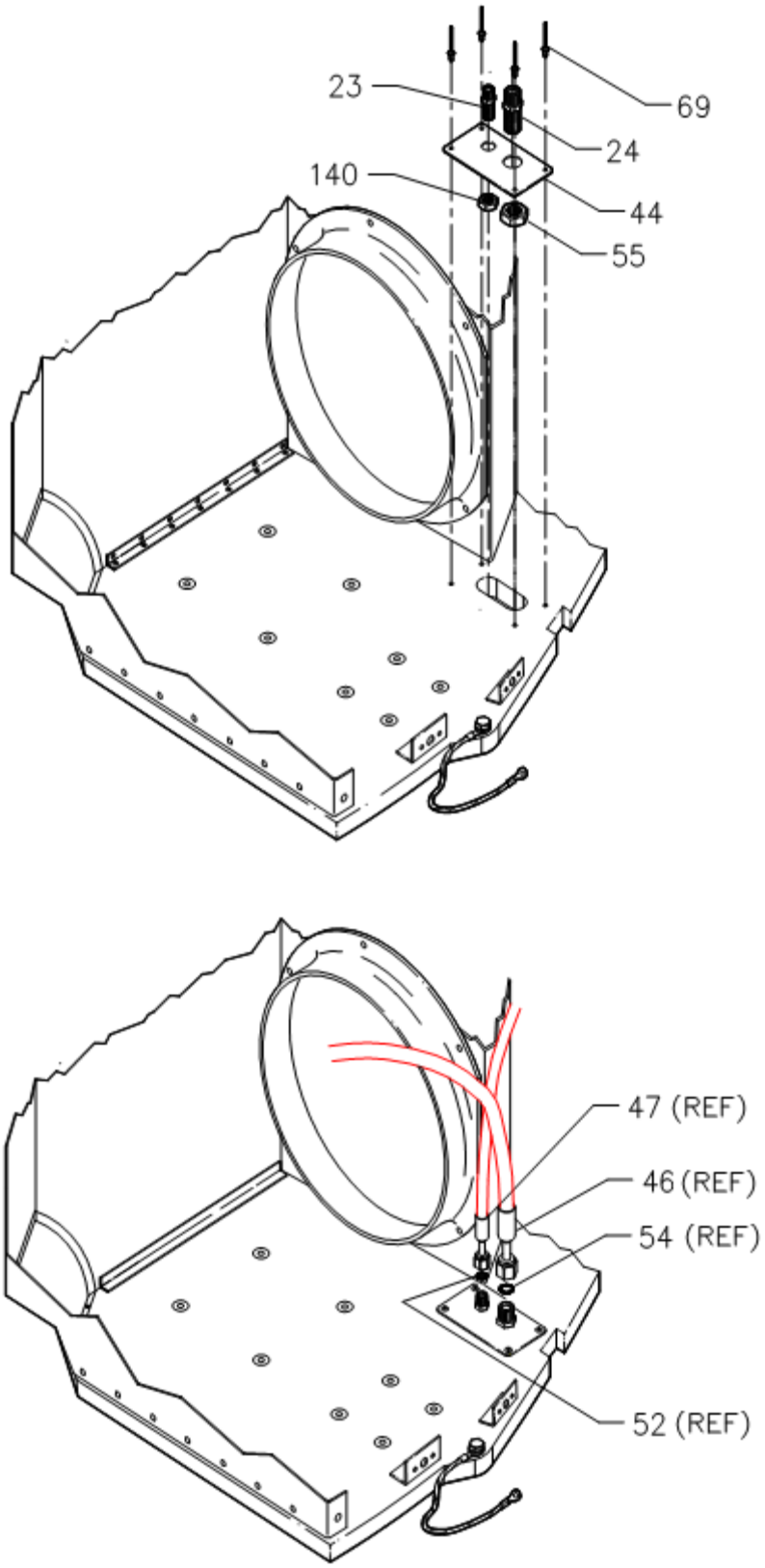


Figure 24:
135-0553-1 COMP/COND PALLET INSTALLATION

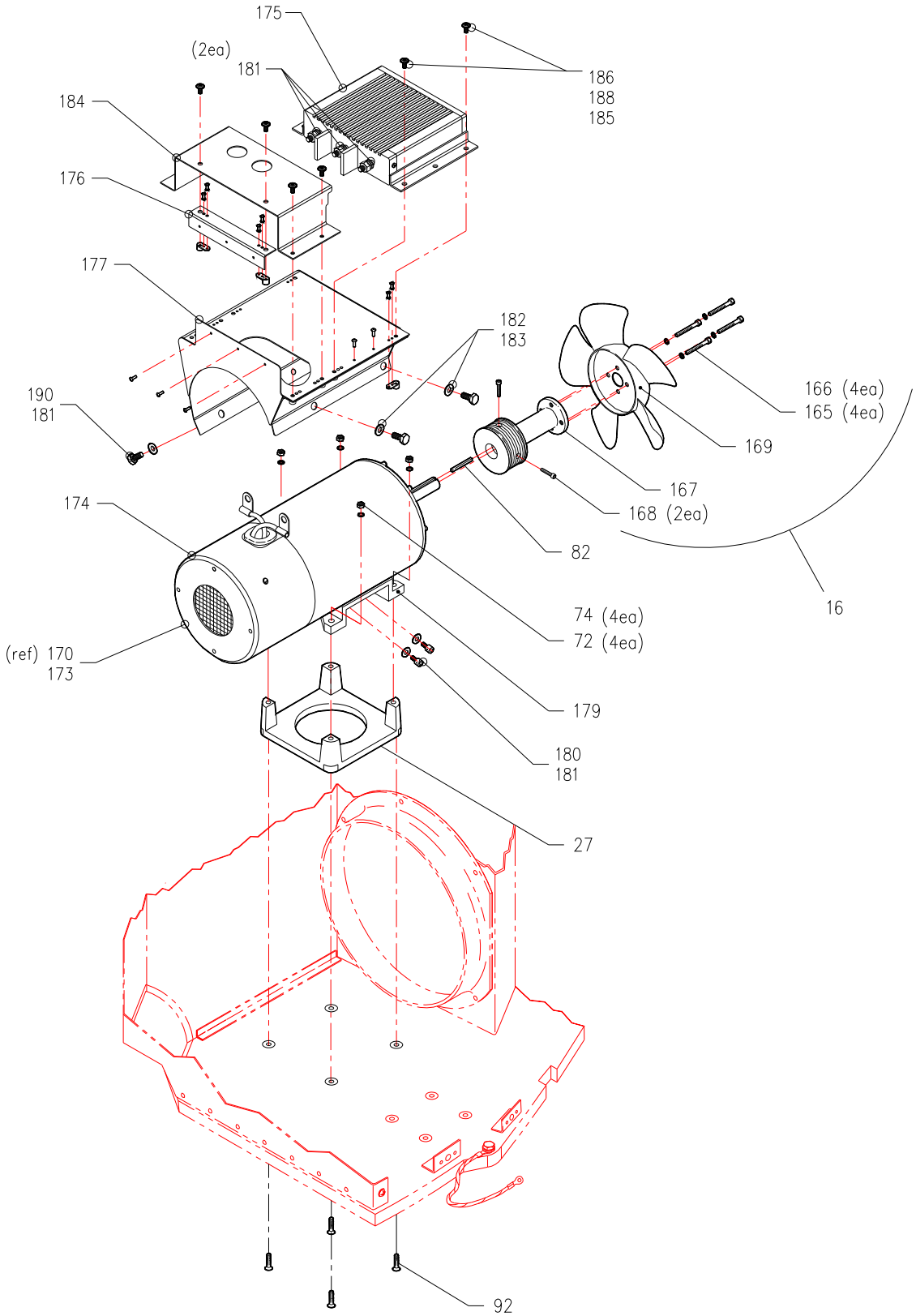


Figure 25:
135-0553-1 COMP/COND PALLET INSTALLATION

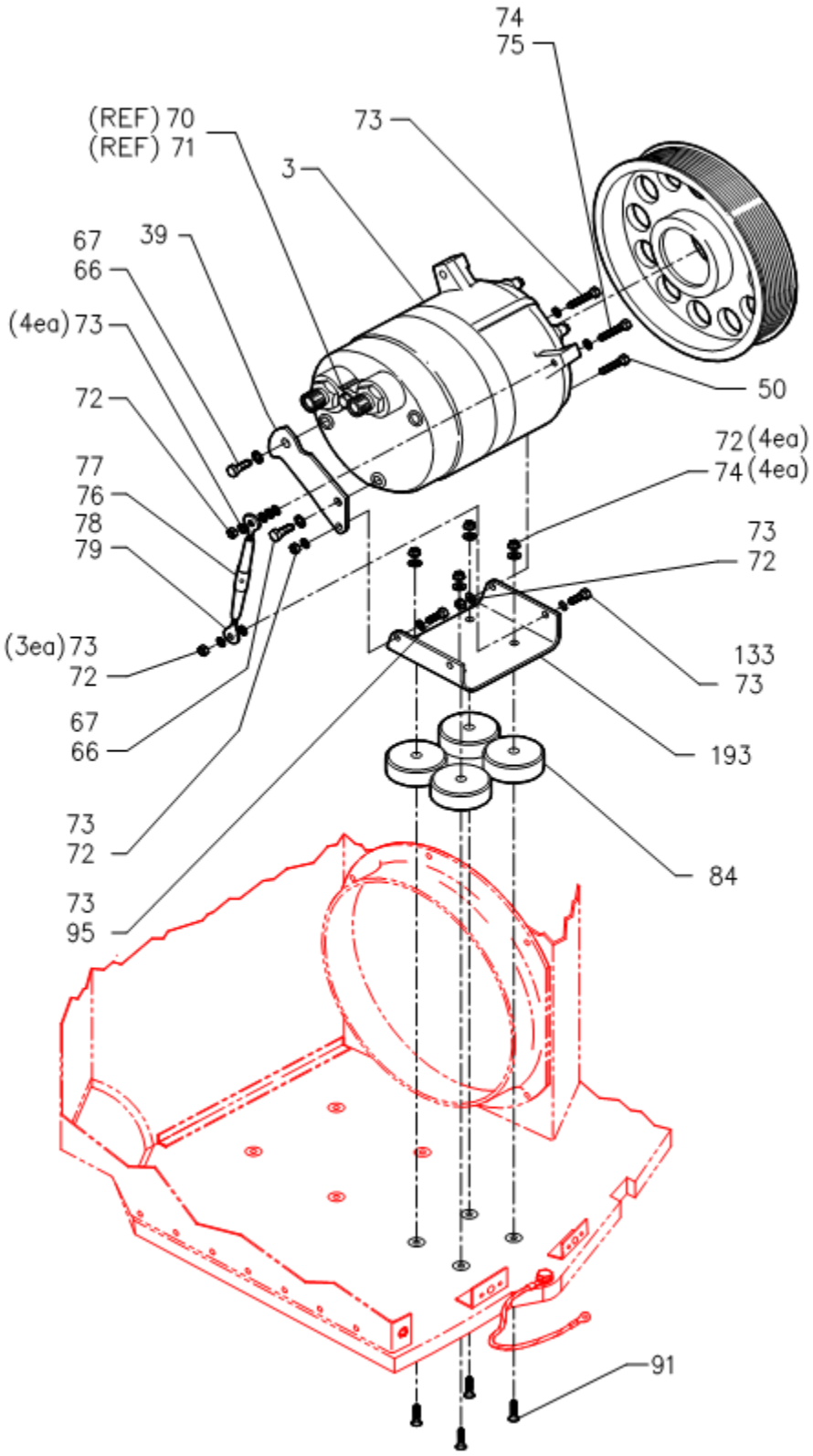


Figure 26:
135-0553-1 COMP/COND PALLET INSTALLATION

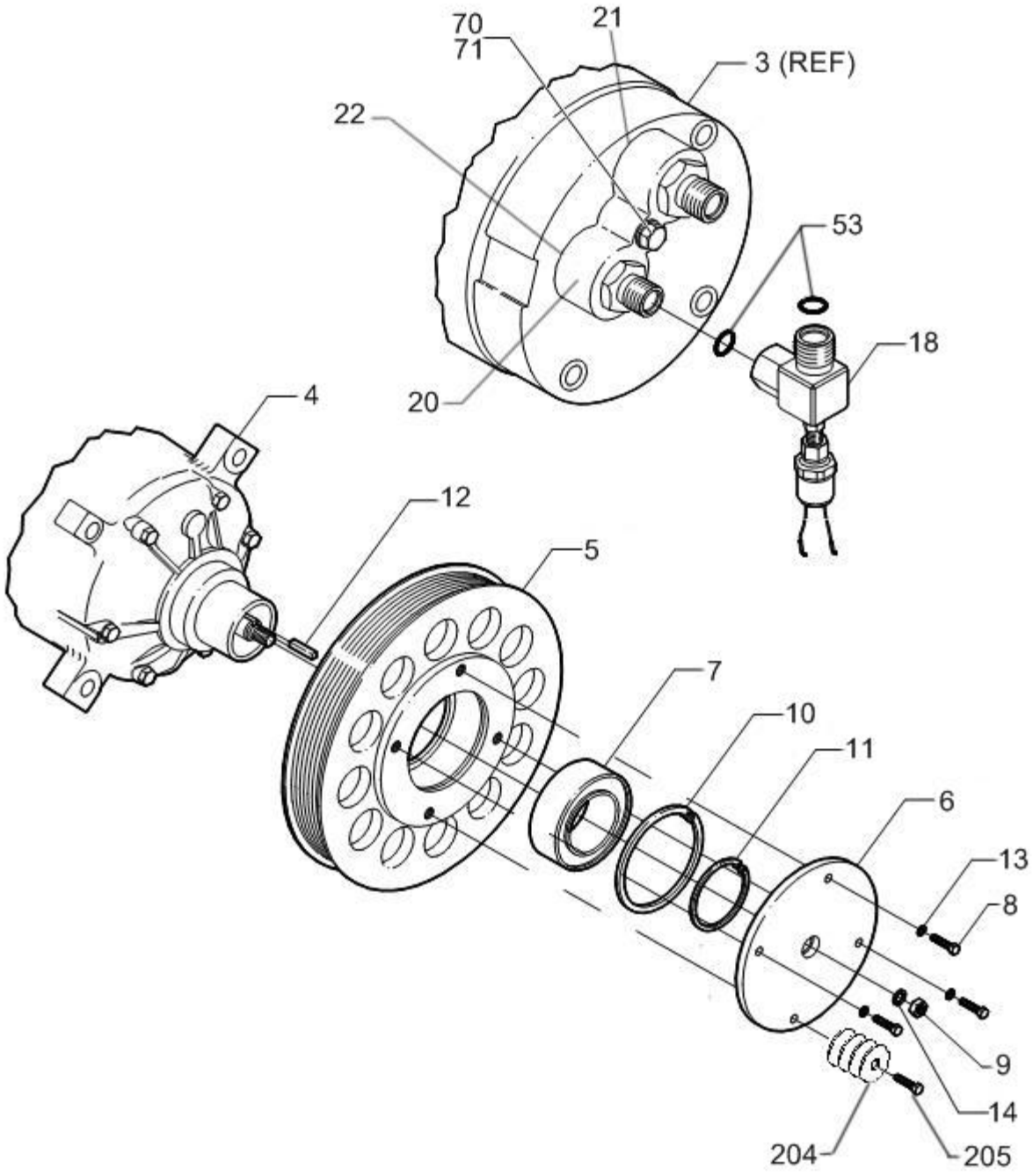


Figure 27:
135-0553-1 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
18	1	135-0553-1	Comp/Cond Pallet Assy	1
-	2	• DELETED		
26	3	• JBS222-1	Compressor Assy	1
27	4	• • JBS223-1	Compressor Assy	1
27	5	• • JBS14001-10	Pulley	1
27	6	• • JBS14001-8	Pulley End Plate	1
27	7	• • ES20146-4	Bearing	1
27	8	• • AN3H4A	Bolt	3
27	9	• • ES34126-1	Shaft Nut	1
27	10	• • ES39255-1	Retaining Ring	1
27	11	• • ES10306-3	Retaining Ring	1
27	12	• • ES20091-1	Key	1
27	13	• • AN960-10L	Washer	3
27	14	• • AN960-616	Washer	1
23	15	• JBS3006-3	Cond Coil Assy	1
25	16	• JBS13015-2	Fan Blade Assy	1
22	17*	• ES43030-2	Receiver/Drier	1
27	18	• JBS2020-5	Pressure Switch	1
22	19	• JBS21-19	Bracket Assy	1
27	20	• ES49024-1	Manifold Adapter, Compressor	1
27	21	• ES38112-1	Seal Washer, Suction	1
27	22	• ES38113-1	Seal Washer, Disch.	1
24	23	• JBS6009-1	Fitting, Bulkhead	1
24	24	• JBS6009-3	Fitting, Bulkhead	1
22	25	• ES30042-6	Clamp	1
20	26	• 87-00-401-4	Placard	1
25	27	• JBS430-2	Bracket	1
20	28	• MS21919WDG9	Clamp	4
20	29	• 135-1550-21	Pallet Assy	1
20	30	• 135-1550-22	Closeout Panel Assy	1

* NOTE: Permissible to substitute I/N 17 (ES43030-2) with ES43030-3 (No sight glass)

Table 11:
135-0553-1 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
22	31	• 135-1550-23	Closeout Panel Assy	1
20	32	• 135-1550-5	Top Panel	1
20	33	• 135-1550-6	Top Panel	1
20	34	• 135-1550-7	Top Closeout	1
21	35	• 135-1550-8	Clip	3
20	36	• 135-1550-9	Clip	4
22	37	• 135-1550-10	Coil Beam	1
22	38	• 135-1550-11	Clip	3
26	39	• 135-1550-12	Comp Bracket	1
-	40	• JBS15004-2	Placard	1
19	41	• JBS570-10	Tube, (inches)	5
-	42	• DELETED		
20	43	• MS27130-A25	Rivnut	1
24	44	• 135-1550-18	Plate	1
21	45	• 135-1550-20	Angle	1
19	46	• 135-1800-6	Hose	1
19	47	• 135-1800-5	Hose	1
19	48	• 135-1800-3	Hose	1
19	49	• 135-1800-4	Hose	1
26	50	• AN4-13A	Bolt	1
20	51	• AN525-832R18	Screw	2
19	52	• ES49011-1	O-Ring	4
19/27	53	• ES49011-2	O-Ring	3
19	54	• ES49011-3	O-Ring	2
24	55	• AN6289-10D	Nut	1
-	56	• DELETED		
-	57	• DELETED		
-	58	• AN960-6	Washer	2
20	59	• AN3-5A	Screw	5
-	60	• MS20426AD3-4	Rivet	4

Table 12:
135-0553-1 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
20/22	61	• MS20426AD3-3	Rivet	78
20/22	62	• MS20470AD4-4	Rivet	14
20/22	63	• ES35020-1	Bolt	31
20	64	• MS27130-A13	Rivnut	6
21	65	• JBS567-15	Fan Duct	1
26	66	• ES39112-4	Bolt	2
26	67	• ES38128-4	Washer, Lock	2
19/20	68	• ES59129-1	Hour Meter	1
21/23/24	69	• ES31101DS4-2	Rivet	42
27	70	• ES39112-5	Bolt	1
27	71	• ES38128-5	Washer, Split Lock, Metric	1
21/23/25/26	72	• MS21042-4	Nut	16
26	73	• AN960-416	Washer	11
21/23/25/26	74	• AN960-416L	Washer	13
26	75	• AN4-15A	Bolt	1
26	76	• MS21254-5LS	Eye End	1
26	77	• MS21251-A5S	Turnbuckle	1
26	78	• MS21256-1	Clip Locking, Turnbuckle	2
26	79	• MS21254-5RS	Eye End	1
23	80	• AN960-4L	Washer	23
19	81	• MS25036-101	Terminal	5
25	82	• JBS80-1	Key	1
23	83	• AN743-13	Bracket	1
26	84	• 85-00-411-60	Spacer	4
19/20/21	85	• AN743-12	Bracket	4
20/21/22	86	• ES34124-3	Nut Clip	10
21/23	87	• ES31101DS4-3	Rivet	12
19	88	• ES55079-1	Splice	10
20/22	89	• MS21059L08	Nutplate	39
20/21/22	90	• AN525-832R7	Screw	12

Table 13:
135-0553-1 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
23/26	91	• MS24694-S113	Screw	4
25	92	• MS24694-S132	Screw	4
20/23	93	• AN960-8	Washer	4
21/23	94	• MS24694-S102	Screw	4
26	95	• AN4-6A	Bolt	1
20/23	96	• AN960-10	Washer	11
20	97	• MS35338-43	Lock Washer	1
-	98	• DELETED		
19	99	• ES55069-2	Terminal	4
19	100	• MS20365-632	Nut	1
19	101	• ES55077-5	Terminal	2
19	102	• ES55078-2	Wire Terminal	6
20	103	• MS21044N04	Nut	2
20	104	• MS21044N08	Nut	2
20/21	105	• MS21266-1N	Grommet Strip, In.	16
19	106	• MS27212-1-3	Terminal Block	1
19	107	• KAC220-2N	Wire	1
19	108	• KAC250-2	Wire	1
19	109	• KAC251-20	Wire	1
19	110	• KAC252-20	Wire	1
19	111	• KAC253-20	Wire	1
19	112	• KAC254-20	Wire	1
19	113	• KAC255-20	Wire	1
19	114	• KAC256-20	Wire	1
19	115	• KAC257-20	Wire	1
19	116	• KAC258-20	Wire	1
19	117	• KAC259-20N	Wire	1
21	118	• AN960-5L	Washer	6
19	119	• KAC260-20N	Wire	1
-	120	• MS27488-22	Sealing Plug	5

Table 14:
135-0553-1 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
20	121	• MS35206-214	Screw	2
23	122	• ES30014-2	Tie Mount	3
19	123	• ES53007-4	Receptacle	1
20	124	• MS35489-11	Grommet	1
23	125	• MS21919WDG6	Clamp	2
23	126	• MS20365-1032	Nut	2
21	127	• MS20470AD3-3	Rivet	8
21/22	128	• MS20470AD3-4	Rivet	8
23	129	• MS27039-1-09	Screw	4
-	130	• AN936-A10	Washer, Lock	4
20	131	• ES00027-5	Seal, In.	48
20/21	132	• ES06022-1	Insulation Tape, In.	144
26	133	• AN4-7A	Bolt	1
21/23	134	• ES30015-5	Cable Tie	36
21	135	• 135-1550-25	Closeout	1
21/23	136	• ES31100-1	Rivet, Pop	13
20	137	• ES30015-6	Cable Tie	11
20	138	• AN3-4A	Bolt	1
20	139	• ES30017-1	Cable Tie Spacer	2
24	140	• ES49016-1	Nut	1
21	141	• ES20040-3	Belt	1
20	142	• MS25083-1BB8	Bonding Jumper	1
20	143	• 135-1564-1	Outboard Panel	1
20	144	• 135-1550-16	Duct	1
20	145	• 135-1550-17	Duct	1
22	146	• 135-1600-7	Clip	2
20	147	• AN936-A8	Washer, Lock	6
21	148	• 135-1550-30	Clip	1
20	149	• AN960-8L	Washer	7
20	150	• MS21042-08	Nut	4

Table 15:
135-0553-1 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
22	151	• 135-1550-29	Angle	1
20/21	152	• AN525-832R8	Screw	5
-	153	• ES48004-3	Wrap	24
-	154	• ES48004-4	Wrap	8
-	155	• ES48004-5	Wrap	48
20/21	156	• ES54060-1	Strap	12
19	157	• ES54145-20	Wire, In.	12
21	158	• ES55072-5	Wire Terminal	2
20	159	• ES55072-4	Wire Terminal	1
19	160	• ES55078-5	Wire Terminal	3
19	161	• ES55079-1	Wire Terminal	10
20	162	• ES56040-1	Time Delay Relay	1
19	163	• ES59123-1	Shrink	10
-	164	• DELETED		
25	165	• • AN503-8-8	Screw	4
25	166	• • AN960-8L	Washer	7
25	167	• • JBS15015-1	Pulley	1
25	168	• • ES31030-1	Set Screw	2
25	169	• • ES73068-1	Fan	1
21	170	135-0552-1	Soft Start Motor Assembly	1
-	171	• DELETED		
-	172	• DELETED		
25	173	• MS35338-41	Lock Washer	2
25	174	• 135-0570-1	Motor	1
25	175	• ES59185-1	Soft Start	1
25	176	• 135-1552-1	Bracket	1
25	177	• 135-0554-1	Soft Start Bracket Assy	1
-	178	• ES55079-1	Knife Splice	1
25	179	• ES22043-1	Motor Mount	1
25	180	• NAS1351-4H8P	Screw	4

Table 16:
135-0553-1 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
25	181	• AN960-416	Washer	6
25	182	• 135-1562-1	Bolt	2
25	183	• AN960-516L	Washer	8
25	184	• 135-1560-1	Cover	1
25	185	• MS21071L08	Nutplate	10
25	186	AN525-832R6	Screw	8
-	187	• MS20470AD3-5	Rivet	3
25	188	• NAS1097AD3-3	Rivet	78
-	189	• MS20426AD3-4	Rivet	8
25	190	• 135-1561-1	Bolt	2
-	191	• DELETED		
20	192	• AN525-832R7	Screw	8
26	193	• 135-1550-35	Bracket	1
21	194	• MS21919WDG17	Clamp	1
20	195	• JBS75-1	Breaker	1
-	196	• KAC-CSA-20	Wire	1
23	197	• AN525-10R8	Screw	1
20	198	• ES31100-2	River, Pop	20
20	199	• 135-1506-1	Stiffener	1
20	200	• 135-1507-1	Stiffener	1
20	201	• 135-1508-1	Stiffener	1
20	202	• 135-1509-1	Stiffener	1
-	203	• ES55072-10	Wire Terminal	1
27	204	••AN970-3	Washer (Part of JBS222-1)	4
27	205	••AN3H-6A	Bolt (Part of JBS222-1)	1

Table 17:
135-0553-1 COMP/COND PALLET INSTALLATION

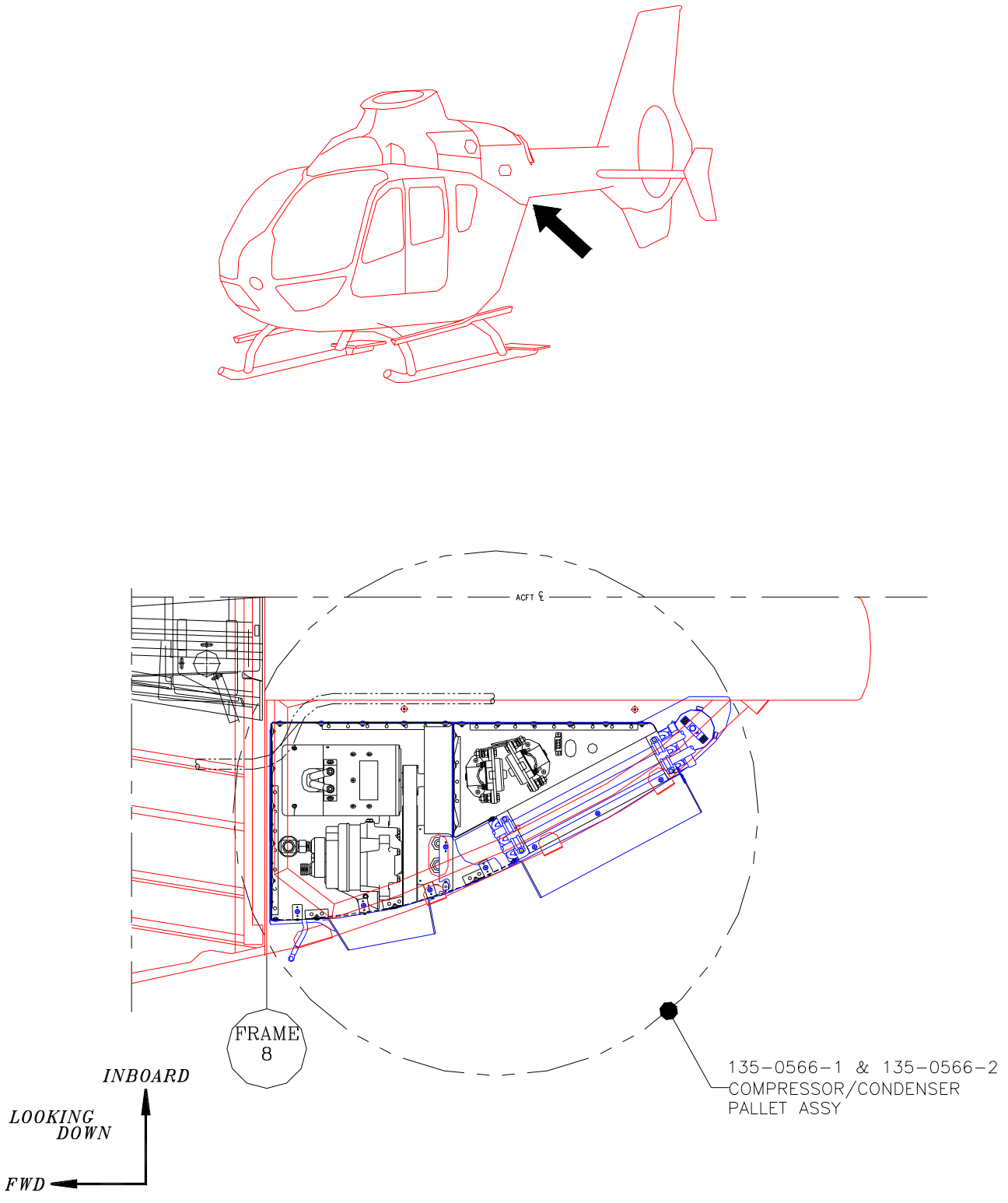


Figure 28:
135-0566 COMP/COND PALLET INSTALLATION

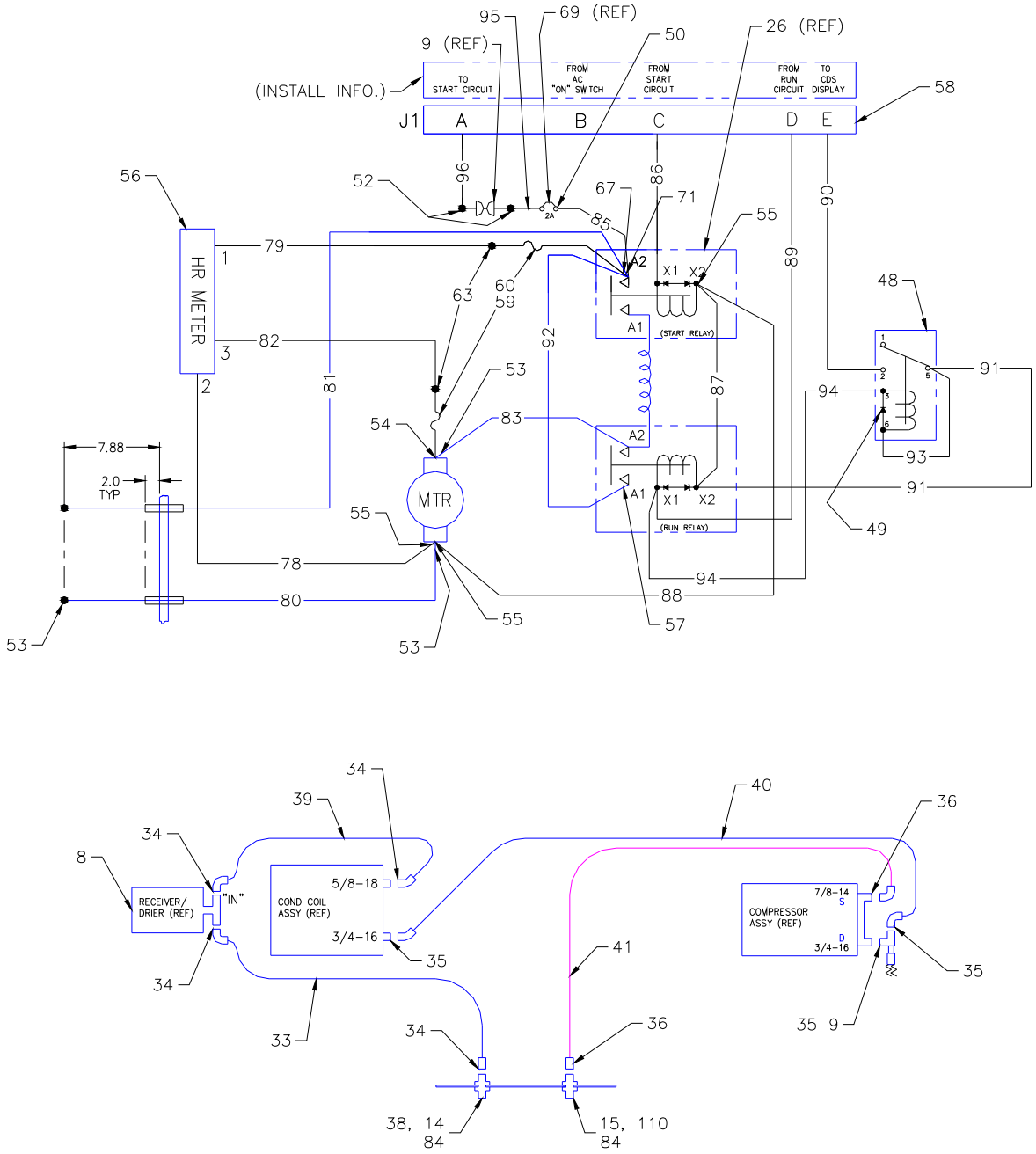


Figure 29:
135-0566-1 COMP/COND PALLET ASSY.

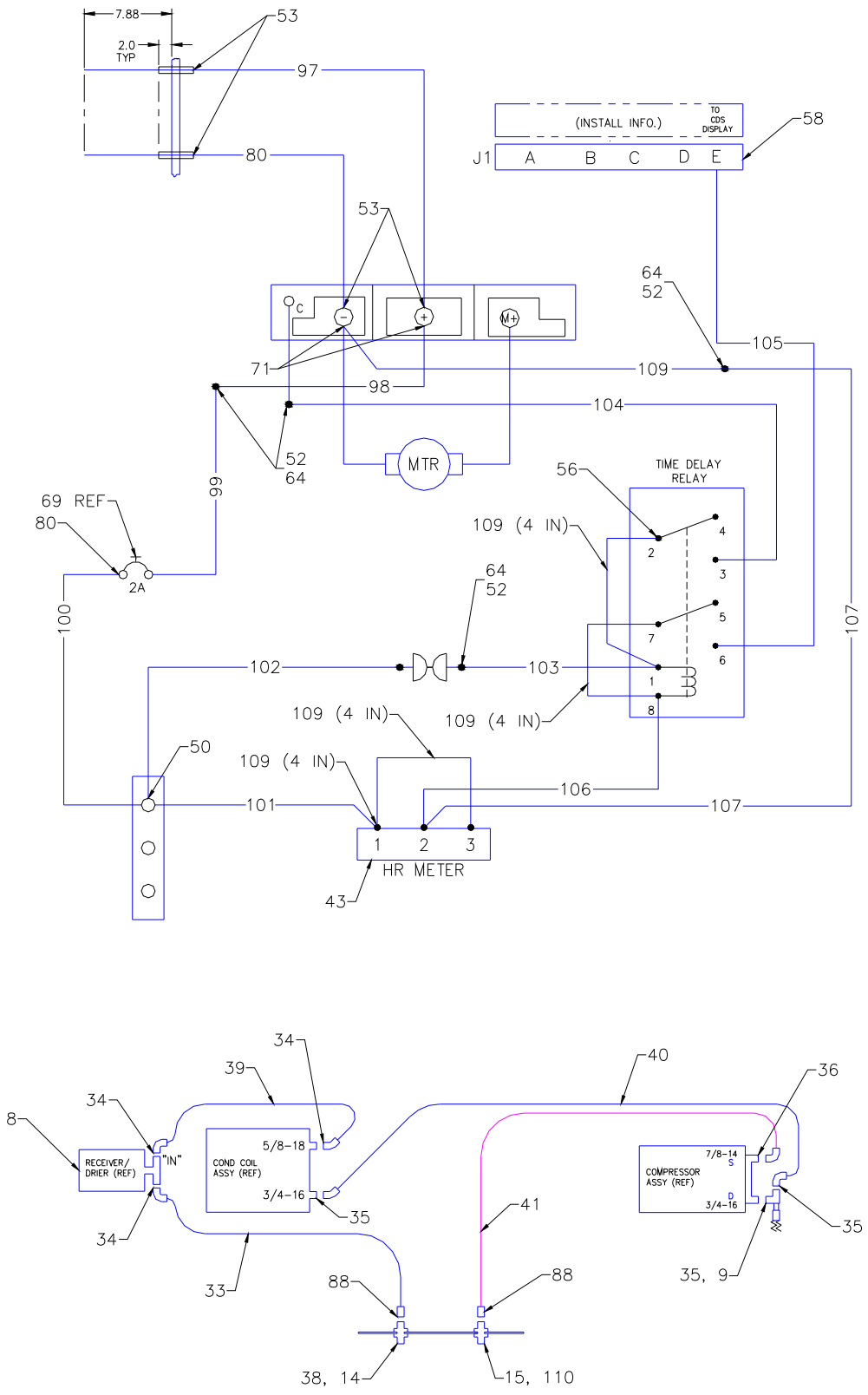


Figure 30:
135-0566-2 COMP/COND PALLET ASSY.

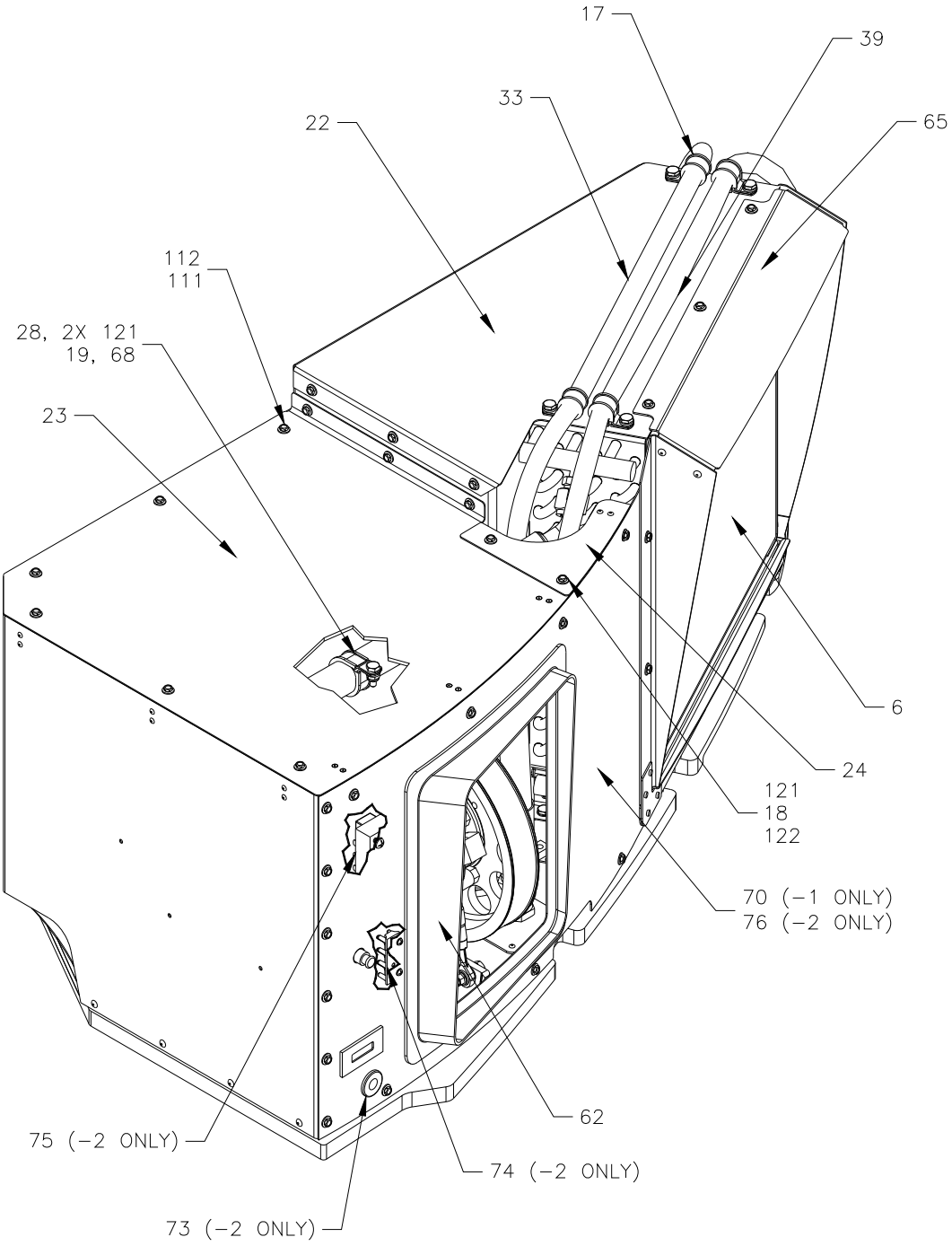


Figure 31:
135-0566 COMP/COND PALLET INSTALLATION

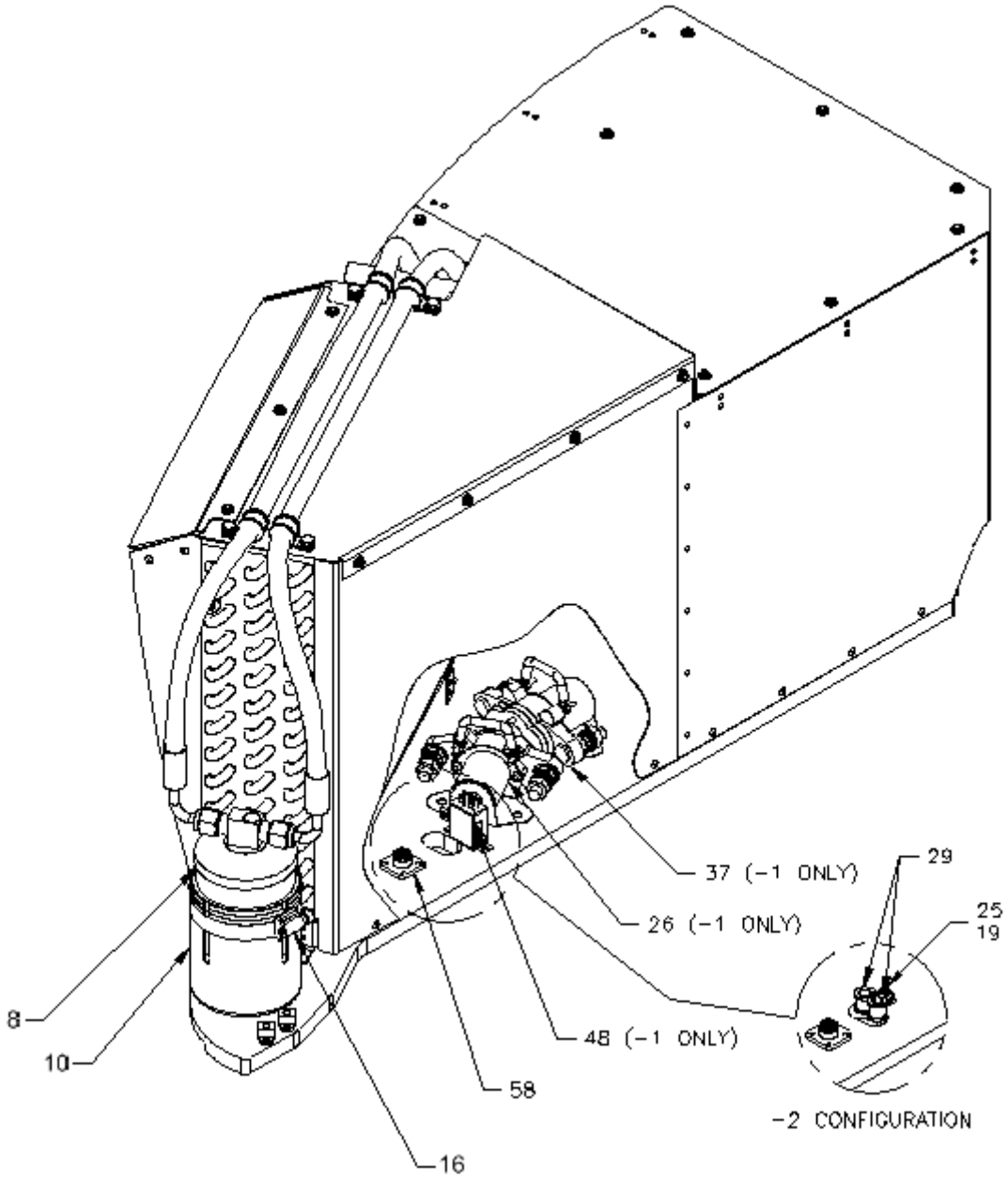


Figure 32:
135-0566 COMP/COND PALLET INSTALLATION

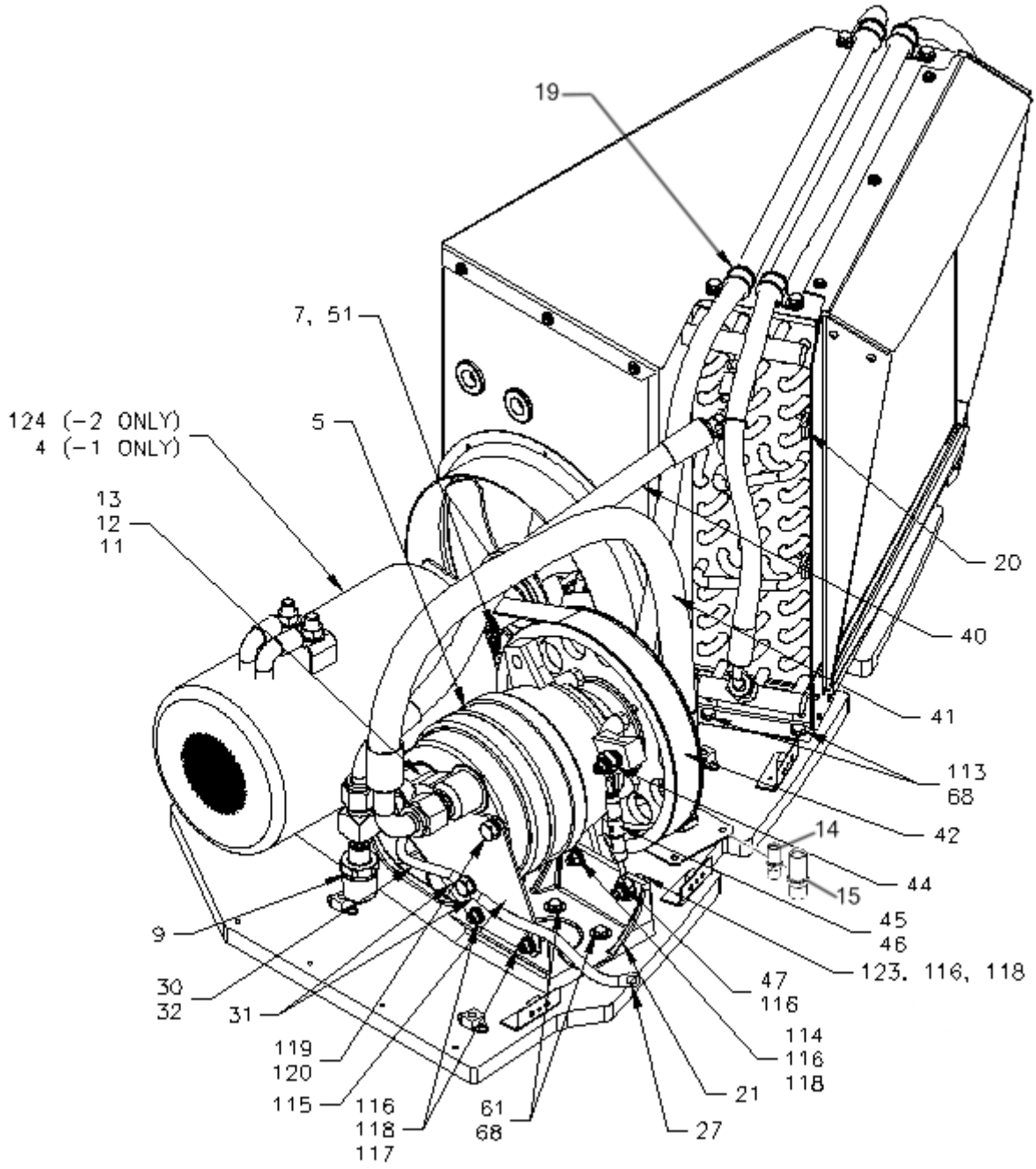


Figure 33:
135-0566 COMP/COND PALLET INSTALLATION

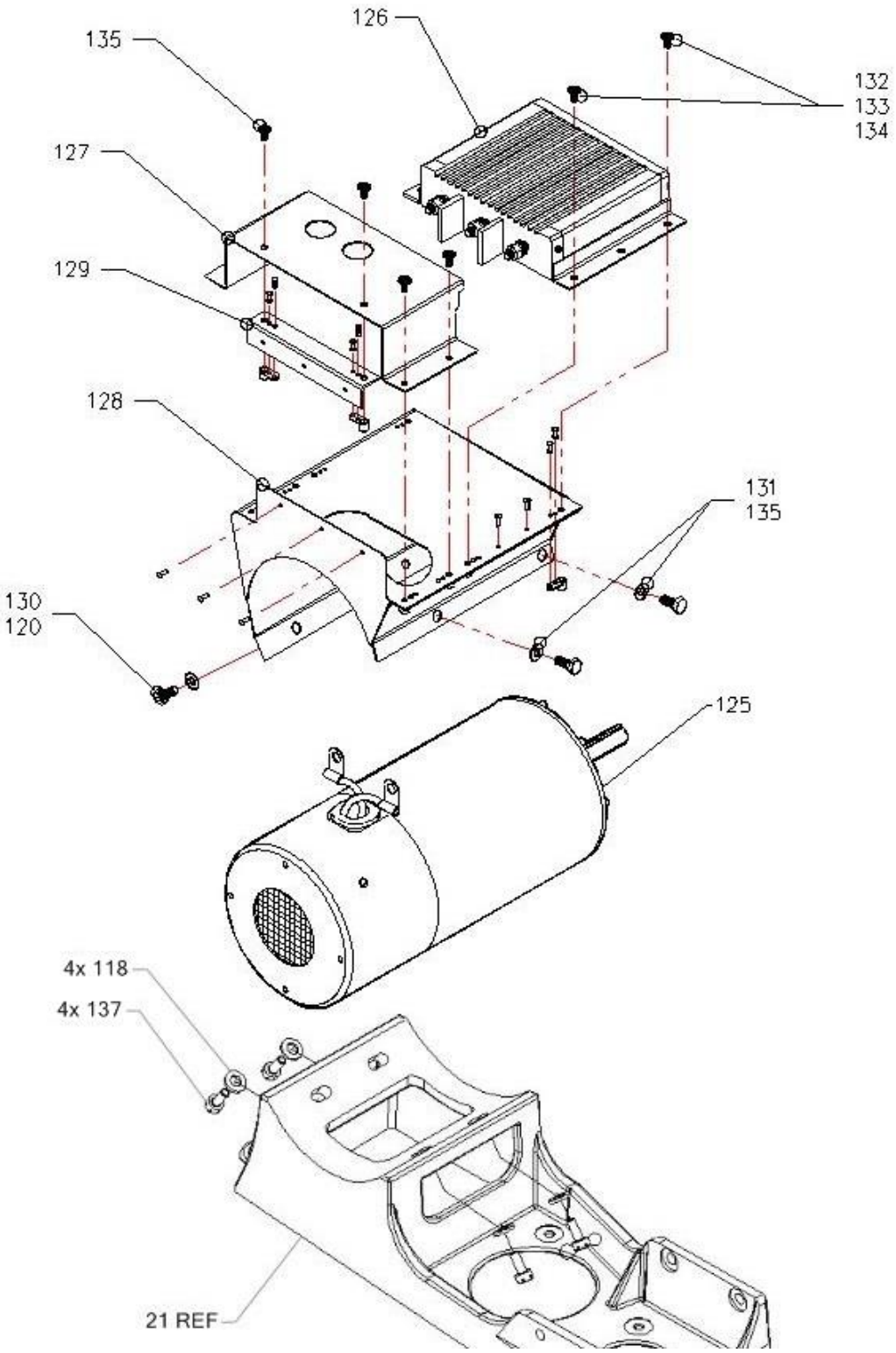


Figure 34:
135-0552-2 SOFT START ASSEMBLY

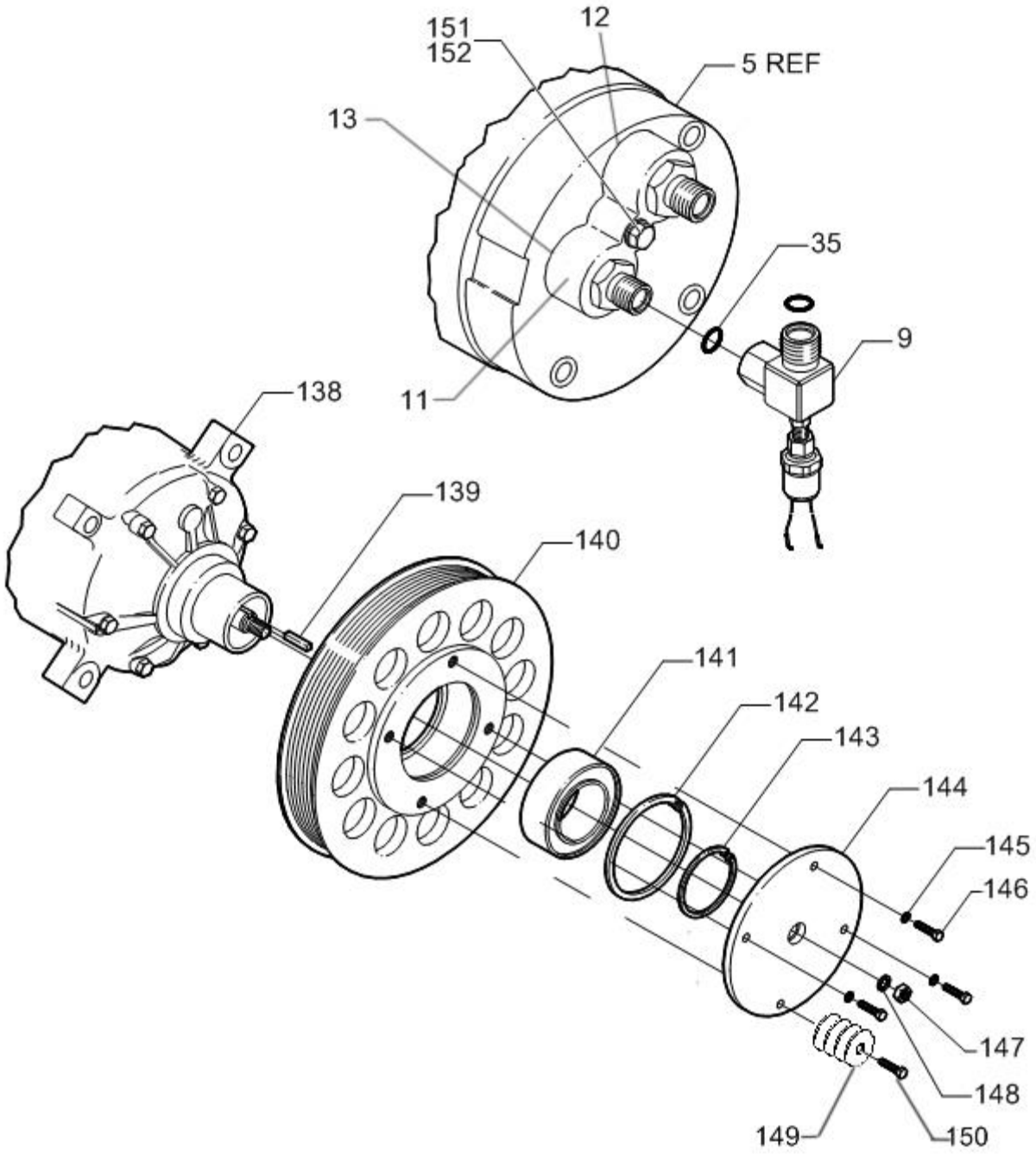


Figure 35:
135-0566-1/135-0566-2 COMPRESSOR PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
-	1	135-0566-1	Comp/Cond Pallet Assy.	
-	2	135-0566-2	Comp/Cond Pallet Assy.	
-	3	• DELETED		
33	4	• ES61110-3	Motor, Comp (For -1 only)	1
33/35	5	• JBS222-1	Comp. Assy.	1
31	6	• JBS3006-3	Cond. Coil Assy.	1
33	7	• JBS13015-2	Fan Blade Assy.	1
32	8*	• ES43030-2	Receiver-Drier	1
35	9	• JBS2020-5	Press. Switch	1
32	10	• 135-1594-1	R/D Bracket	1
35	11	• ES49024-1	Manifold Adapter. Comp	1
35	12	• ES38112-1	Seal Washer, Suction	1
35	13	• ES38113-1	Seal Washer, Discharge	1
33	14	• JBS6009-1	Fitting, Bulkhead	1
33	15	• JBS6009-3	Fitting, Bulkhead	1
32	16	• ES30042-6	Clamp	1
31	17	• MS21919WDG9	Clamp	4
-	18	• AN936-A10	Washer, Lock	4
32	19	• MS20365-1032	Nut (Qty for –1 and –2)	1, 2
33	20	• ES34124-3	Nut Clip	10
33	21	• 135-1556-1	Comp. Bracket	1
31	22	• 135-1515-1	Top Panel	1
31	23	• 135-1516-1	Top Panel	1
31	24	• 135-1550-7	Top Closeout	1
32	25	• AN525-10R8	Screw For –2 Only)	1
32	26	• JBS421-7	Relay (For –1 Only)	2
33	27	• ES55072-10	Wire Terminal	1
31	28	• MS21919WDG17	Clamp	1
32	29	• MS21919WDG6	Clamp (For –2 only)	2
33	30	• ES54060-1	Grounding Strap (IN)	20

* NOTE: Permissible to substitute I/N 17 (ES43030-2) with ES43030-3 (No sight glass)

Table 18:
135-0566 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
33	31	• ES55072-5	Wire Terminal	2
33	32	• ES55072-4	Wire Terminal	1
29/30/31	33	• 135-1800-5	Hose	1
29/30	34	• ES49011-1	O-Ring	4
29/30/35	35	• ES49011-2	O-Ring	3
29/30	36	• ES49011-3	O-Ring	2
32	37	• JBS912-4	Spring Resistor (For –1 Only)	1
29/30	38	• ES49016-1	Nut	1
29/30/31	39	• 135-1800-4	Hose	1
29/30/33	40	• 135-1800-3	Hose	1
29/30/33	41	• 135-1800-6	Hose	1
33	42	• ES20040-3	Belt	1
30	43	• ES59129-1	Hour Meter	1
33	44	• MS21254-5LS	Eye End	1
33	45	• MS21251-A5S	Turnbuckle	1
33	46	• MS21256-1	Clip, Locking Turnbuckle	2
33	47	• MS21254-5RS	Eye End	1
29/32	48	• ES56047-1	Relay (For –1 Only)	1
29	49	• ES58161-14	Diode (For –1 Only)	1
29/30	50	• MS25036-101	Terminal (Qty for –1 and –2)	8, 5
33	51	• JBS80-1	Key	1
29/30	52	• ES55079-1	Splice (Qty for –1 and –2)	2, 8
29/30	53	• ES55069-2	Terminal	4
29	54	• ES55076-5	Terminal (For –1 Only)	1
29	55	• ES55077-5	Terminal	2
29/30	56	• ES55078-2	Receptacle (Qty for –1 and –2)	3, 6
29	57	• MS25036-127	Terminal (For –1 Only)	4
29/30/32	58	• ES53007-4	Connector	1
29	59	• JBS64-1	Fuse (2 AMP) (For –1 Only)	2
29	60	• ES51061-1	Fuse Holder (For –1 Only)	2

Table 19:
135-0566 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
33	61	• AN960-10L	Washer	8
31	62	• 135-1550-16	Intake Duct	1
29	63	• ES55129-7	Splice (For –1 Only)	2
30	64	• ES30015-5	Cable Tie	35
31	65	• 135-0564-1	Exhaust Duct	1
-	66	• ES30015-6	Tie Wrap	12
29	67	• ES55076-6	Terminal (For –1 Only)	1
31/33	68	• AN3-5A	Bolt	17
30	69	• JBS75-1	Circuit Breaker	1
31	70	• 135-1550-34	Outbrd Panel (For –1 Only)	1
29/30	71	• ES55077-6	Terminal (For –1 Only)	1
-	72	• ES30017-1	Cable Tie Spacer	2
31	73	• MS35489-11	Grommet ((For –2 Only)	1
31	74	• MS27212-1-3	Terminal (For –2 Only)	1
31	75	• ES56040-1	Time Delay Relay (For –1 Only)	1
31	76	• 135-1564-1	Outboard Panel (For -2 Only)	1
-	77	• ES55078-5	Wire Terminal (For –2 Only)	3
29	78	• KAC222-20N	Wire (For –1 Only)	1
29	79	• KAC221-20	Wire (For –1 Only)	1
29/30	80	• KAC220-2N	Wire	1
29	81	• KAC211A-2	Wire (For –1 Only)	1
29	82	• KAC208A-20	Wire (For –1 Only)	1
-	83	• KAC219-2	Wire (For –1 Only)	1
29	84	• ES00027-5	Seal (in) (Qty for –1 and –2)	46, 48
29	85	• KAC224-20	Wire (For –1 Only)	1
29	86	• KAC227-20	Wire (For –1 Only)	1
29	87	• KAC212-20	Wire (For –1 Only)	1
29/30	88	• KAC207A-20	Wire (For –1 Only)	1
29	89	• KAC226-20	Wire (For –1 Only)	1
29	90	• KAC228-20	Wire (For –1 Only)	1

Table 20:
135-0566 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
29	91	• KAC229-20N	Wire (For –1 Only)	1
29	92	• KAC218-2	Wire (For –1 Only)	1
29	93	• KAC230-20	Wire (For –1 Only)	1
29	94	• KAC225-20	Wire (For –1 Only)	1
29	95	• KAC213-20	Wire (For –1 Only)	1
29	96	• KAC223-20	Wire (For –1 Only)	1
30	97	• KAC250-2	Wire (For –2 Only)	1
30	98	• KAC251-20	Wire (For –2 Only)	1
30	99	• KAC252-20	Wire (For –2 Only)	1
30	100	• KAC253-20	Wire (For –2 Only)	1
30	101	• KAC254-20	Wire (For –2 Only)	1
30	102	• KAC255-20	Wire (For –2 Only)	1
30	103	• KAC256-20	Wire (For –2 Only)	1
30	104	• KAC257-20	Wire (For –2 Only)	1
30	105	• KAC258-20	Wire (For –2 Only)	1
30	106	• KAC259-20N	Wire (For –2 Only)	1
30	107	• KAC260-20N	Wire (For –2 Only)	1
-	108	• KAC-CSA-20	Wire (For –2 Only)	1
30	109	• ES54145-20	Wire (in)(For –2 only)	12
29/30	110	• AN6289-10D	Nut	1
31	111	• AN960-8	Washer	36
31	112	• ES35021-1	Screw	32
33	113	• AN960-416L	Washer	5
33	114	• AN4-13A	Bolt	1
33	115	• 135-1525-1	Mounting Plate	1
33	116	• MS21042-4	Nut	5
33	117	• AN4-6A	Bolt	2
33	118	• AN960-416	Washer	18
33	119	• ES39112-4	Bolt	3
33/34	120	• ES38128-4	Washer, Lock	3
31	121	• AN960-10	Washer (Qty for –1 and –2)	18, 14

Table 21:
135-0566 COMP/COND PALLET INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
31	122	• MS27039-1-09	Screw	4
33	123	• AN4-7A	Bolt	1
33	124	• 135-0552-2	Soft-Start Assy. (For –2 Only)	1
34	125	• • 135-0570-1	Motor Assembly	1
34	126	• • ES59185-1	Soft Start	1
34	127	• • 135-1560-1	Cover	1
34	128	• • 135-0554-1	Soft-Start Bracket Assembly	1
34	129	• • 135-1552-1	Bracket	1
34	130	• • 135-1561-1	Bolt	2
34	131	• • 135-1562-1	Bolt	2
34	132	• • AN525-832R7	Screw	8
34	133	• • MS20426AD3-4	Rivet	8
34	134	• • MS21071L08	Nutplate	10
34	135	• • AN960-516L	Washer	8
-	136	• • AN525-832R6	Screw	2
-	137	• NAS1351-4H8P	Cap Screw	4
35	138**	••JBS223-1	Compressor Assy	1
35	139	•• ES20091-1	Key	1
35	140	•• JBS14001-10	Pulley	1
35	141	•• ES20146-4	Bearing	1
35	142	•• ES39255-1	Retaining Ring	1
35	143	•• ES10306-3	Retaining Ring	1
35	144	•• JBS14001-8	Pulley End Plate	1
35	145	•• AN960-10L	Washer	3
35	146	•• AN3H4A	Bolt	3
35	147	•• ES34126-1	Shaft Nut	1
35	148	•• AN960-616	Washer	1
35	149	•• AN970-3	Washer	4
35	150	•• AN3H-6A	Bolt	1
35	151	•• ES39112-5	Bolt	1
35	152	•• ES38128-5	Washer, Split Lock Metric	1

**JBS223-1 (I/N 138) is a subassembly of JBS222-1 (I/N 5)

Table 22:
135-0566 COMP/COND PALLET INSTALLATION

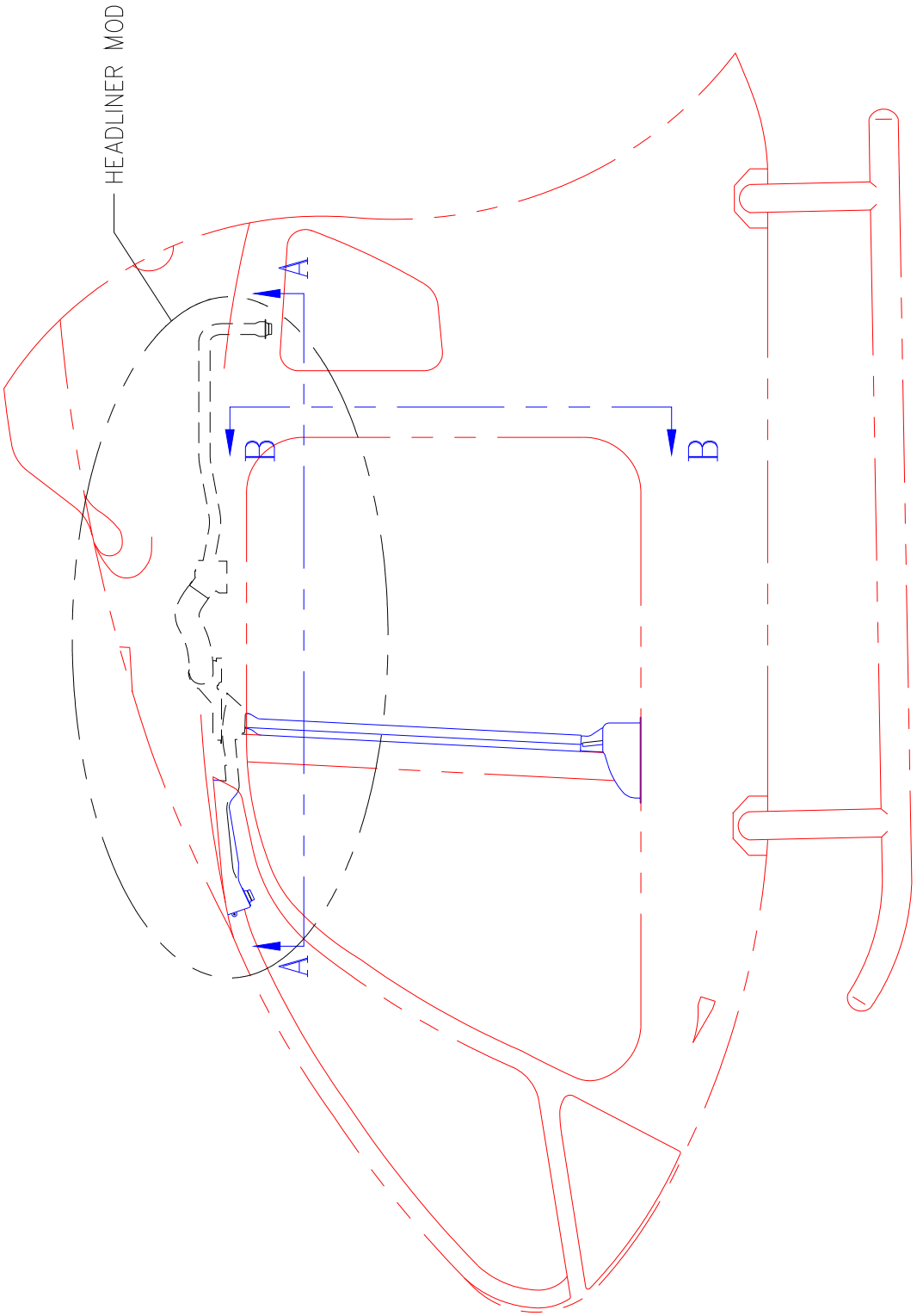


Figure 36:
135-0611-2 HEADLINER & DUCT MODIFICATION

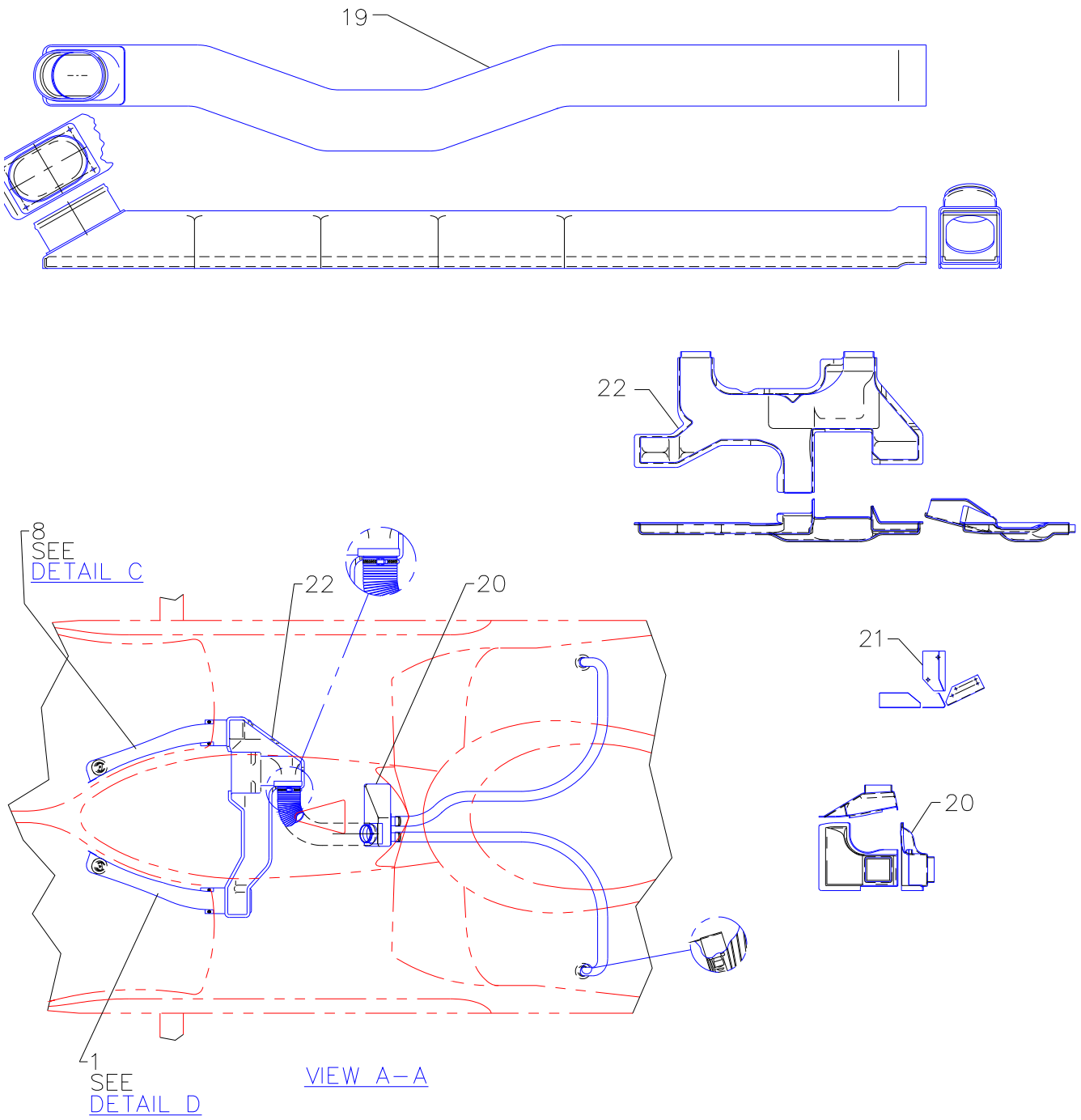


Figure 37:
135-0611-2 HEADLINER & DUCT MODIFICATION

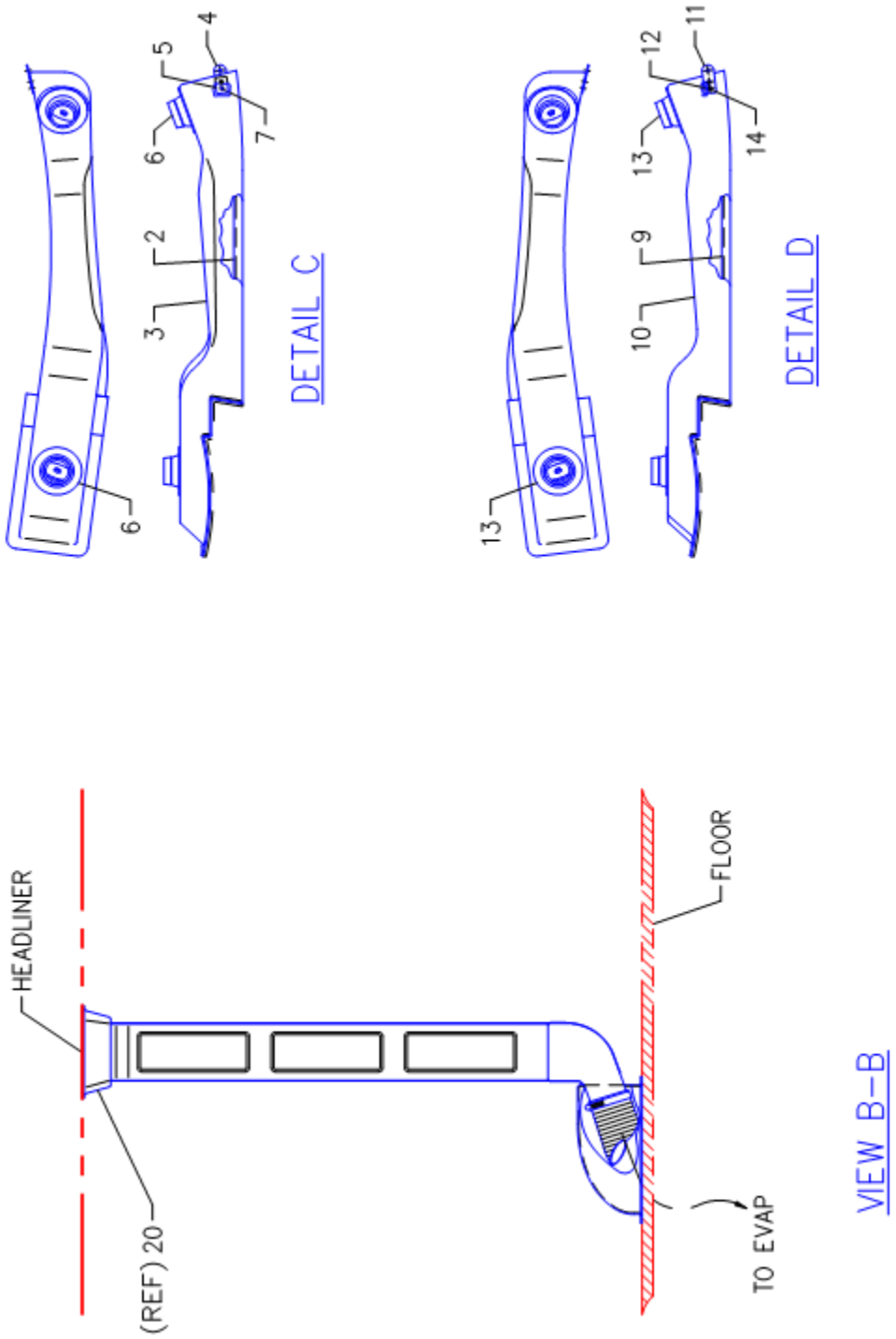


Figure 38:
135-0611-2 HEADLINER & DUCT MODIFICATION

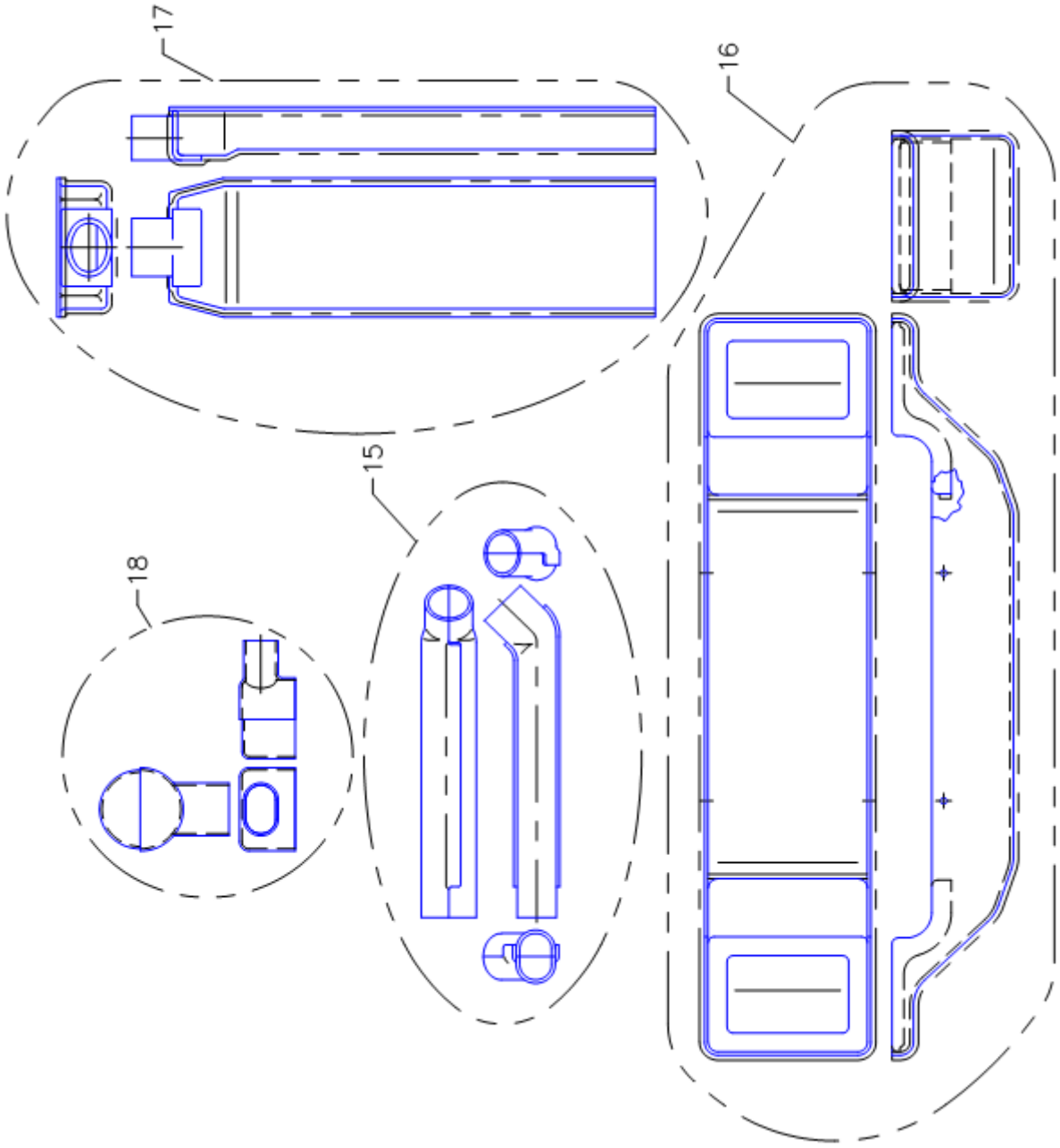


Figure 39:
135-0611-2 HEADLINER & DUCT MODIFICATION

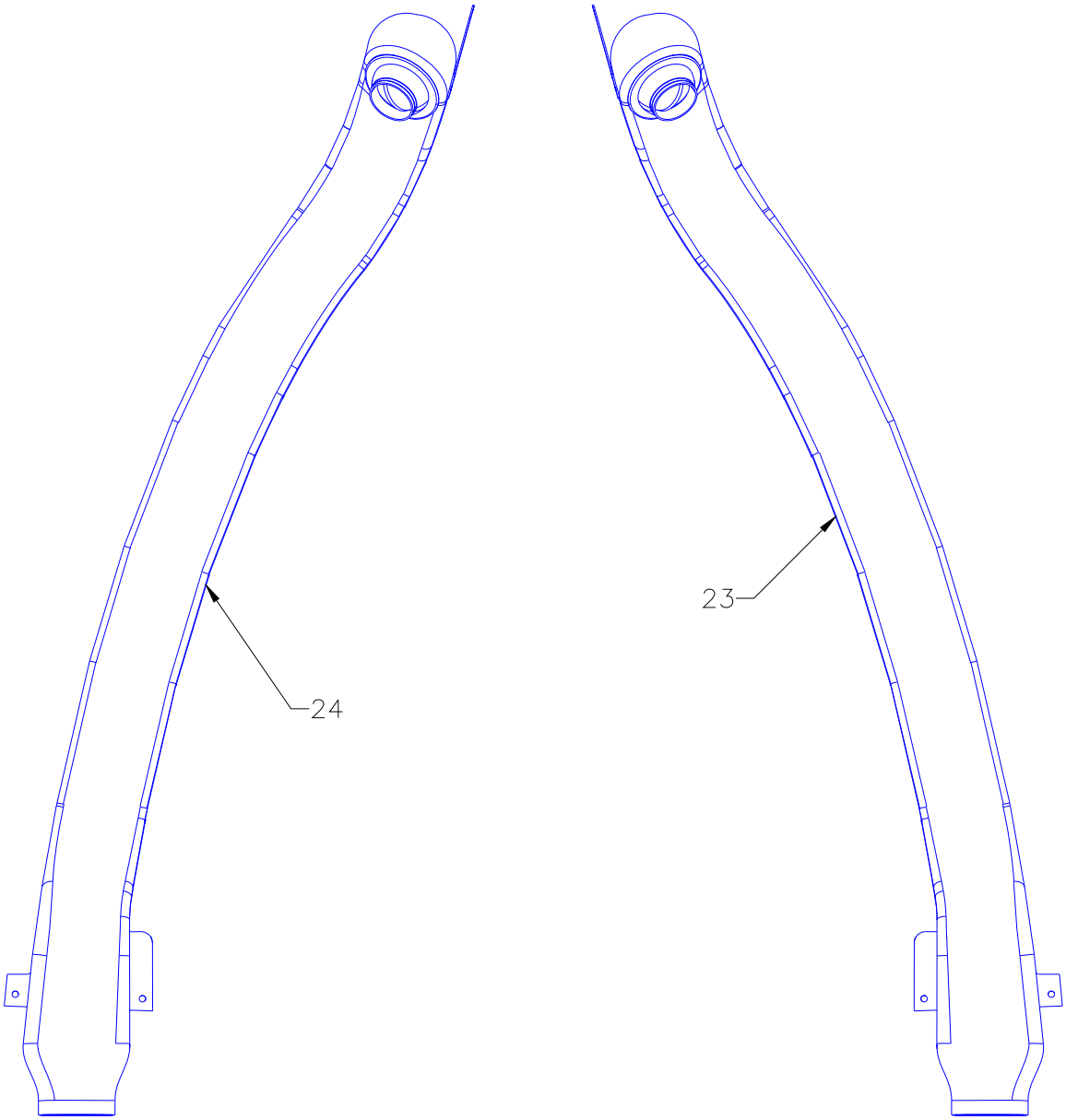


Figure 40:
135-0611-2 HEADLINER & DUCT MODIFICATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
		135-0611-2	Sub-Kit, Hdlnr & Duct Mod	•
37	1	• 135-1600-1	Duct Assy (L/H)	1
38	2	• • 135-1600-3	Closeout (L/H)	1
38	3	• • 135-1600-5	Duct (L/H)	1
38	4	• • 135-1600-7	Clip	1
38	5	• • 135-1600-8	Doubler	1
38	6	• • ES72121-1	Air Outlet	2
38	7	• • MS20426AD3-4	Rivet	2
37	8	• • 135-1600-2	Duct Assy (R/H)	1
38	9	• • 135-1800-4	Closeout (R/H)	1
38	10	• • 135-1600-6	Duct (R/H)	1
38	11	• • 135-1600-7	Clip	1
38	12	• • 135-1600-8	Doubler	1
38	13	• • ES72121-1	Air Outlet	2
38	14	• • MS20426AD3-4	Rivet	2
39	15	• 135-1612-3	Tube Assy	2
39	16	• 135-1612-20	Span Duct Assy	1
39	17	• 135-1612-21	Branch Duct Assy	2
39	18	• 135-1600-10	Duct Connector Assy	2
37	19	• 135-1610-15	Vertical Duct	1
37	20	• 135-1610-18	Top Closeout Assy	1
37	21	• 135-1610-22	Lamp Bracket	1
37	22	• 135-1612-4	Manifold Assy	1
40	23	• 135-0650-1	Overhead Duct LH Assy	1
40	24	• 135-0651-1	Overhead Duct RH Assy	1

Table 23:
135-0611-2 HEADLINER AND DUCT MODIFICATION

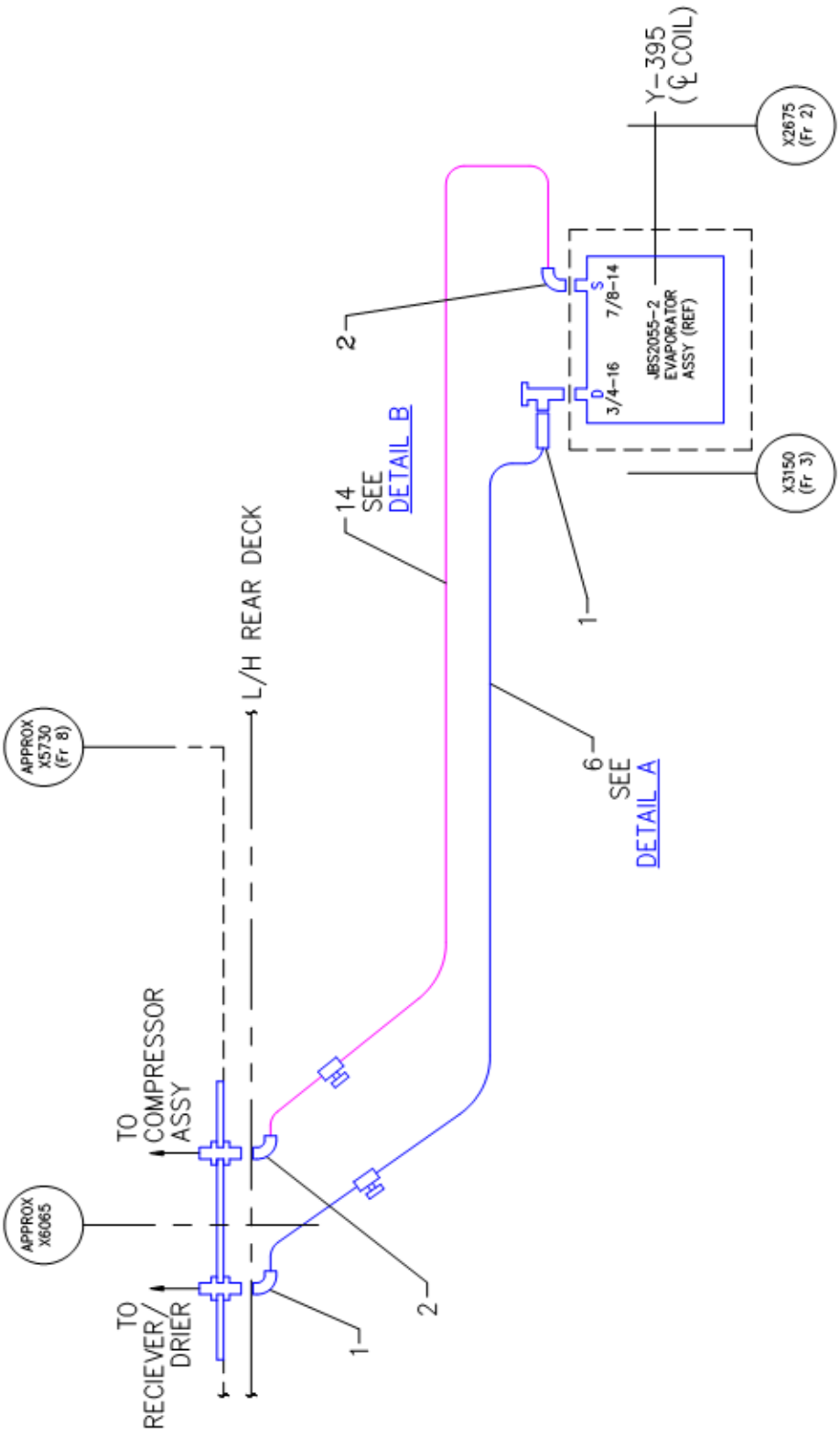


Figure 41:
135-0800-2 &-3 Plumbing Installation

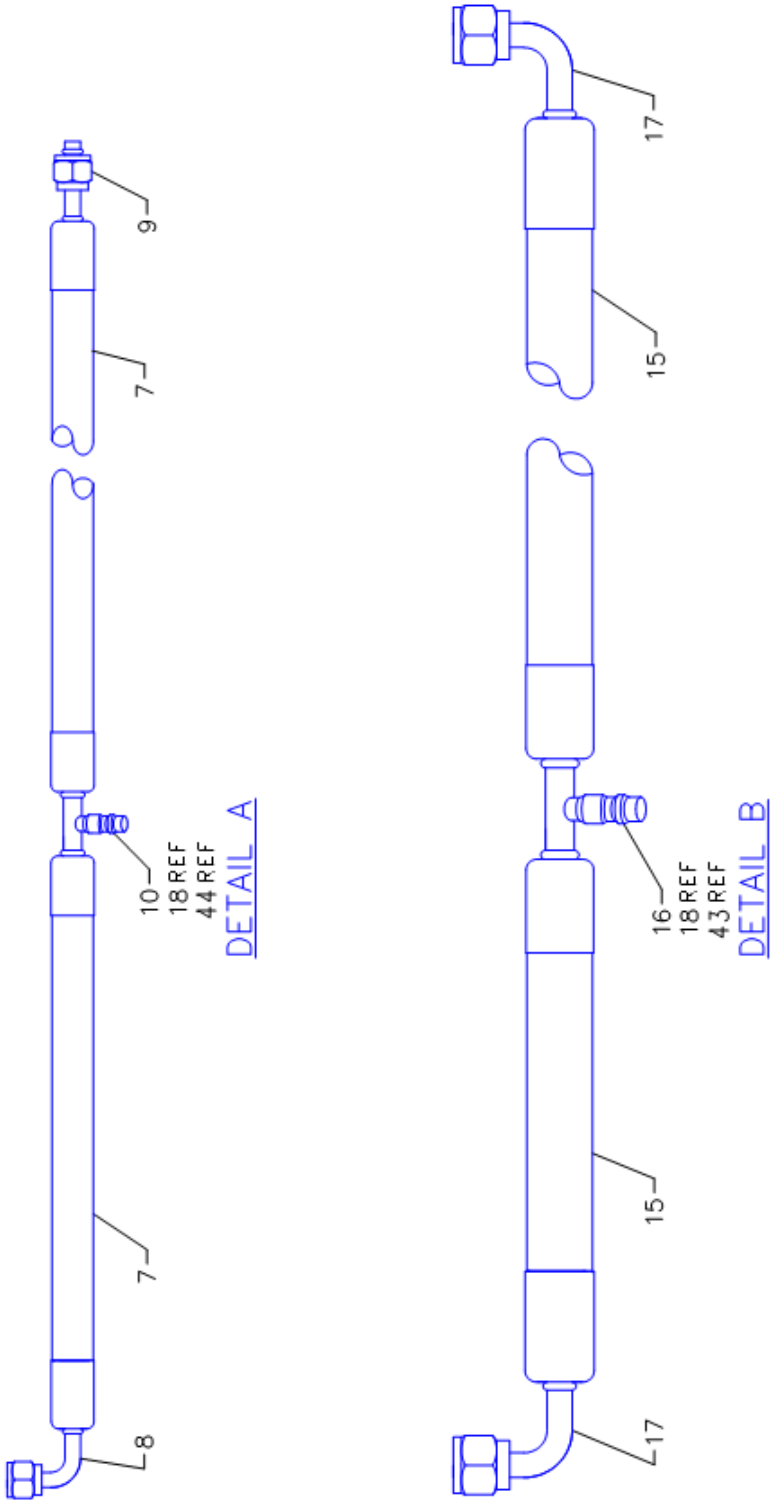


Figure 42:
135-0800-2 &-3 Plumbing Installation

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
		135-0800-2	Sub-Kit, Plumbing Instl	•
		135-0800-3	Sub-Kit, Plumbing Instl	1
41	1	• ES49011-1	O-Ring	2
41	2	• ES49011-3	O-Ring	4
-	3	• MS21919WDG9	Clamp	12
-	4	• MS21919WDG12	Clamp	4
-	5	• MS21919WDG14	Clamp	12
41	6	• 135-1800-2	Hose Assy	1
42	7	• • ES48149-1	Hose (IN.)	180
42	8	• • ES40151-1	Fitting, 90°	1
42	9	• • ES40149-1	Fitting, STR	1
42	10	• • ES40158-1	Splicer, Service Valve	1
-	11	• AN960-10L	Washer	16
-	12	• AN525-10R8	Screw	16
-	13	• MS20365-1032	Nut	16
41	14	• 135-1800-1	Hose Assy	1
42	15	• • ES48149-4	Hose (IN.)	175
42	16	• • ES40158-4	Splicer, Service Valve	1
42	17	• • ES40151-7	Fitting, 90°	2
42	18	• • ES26078-1	Valve Core	REF
42	43	• • ES26077-3	Cap	REF
42	44	• • ES26077-4	Cap	REF

Table 24:
135-0800-2 & -3 PLUMBING INSTALLATION

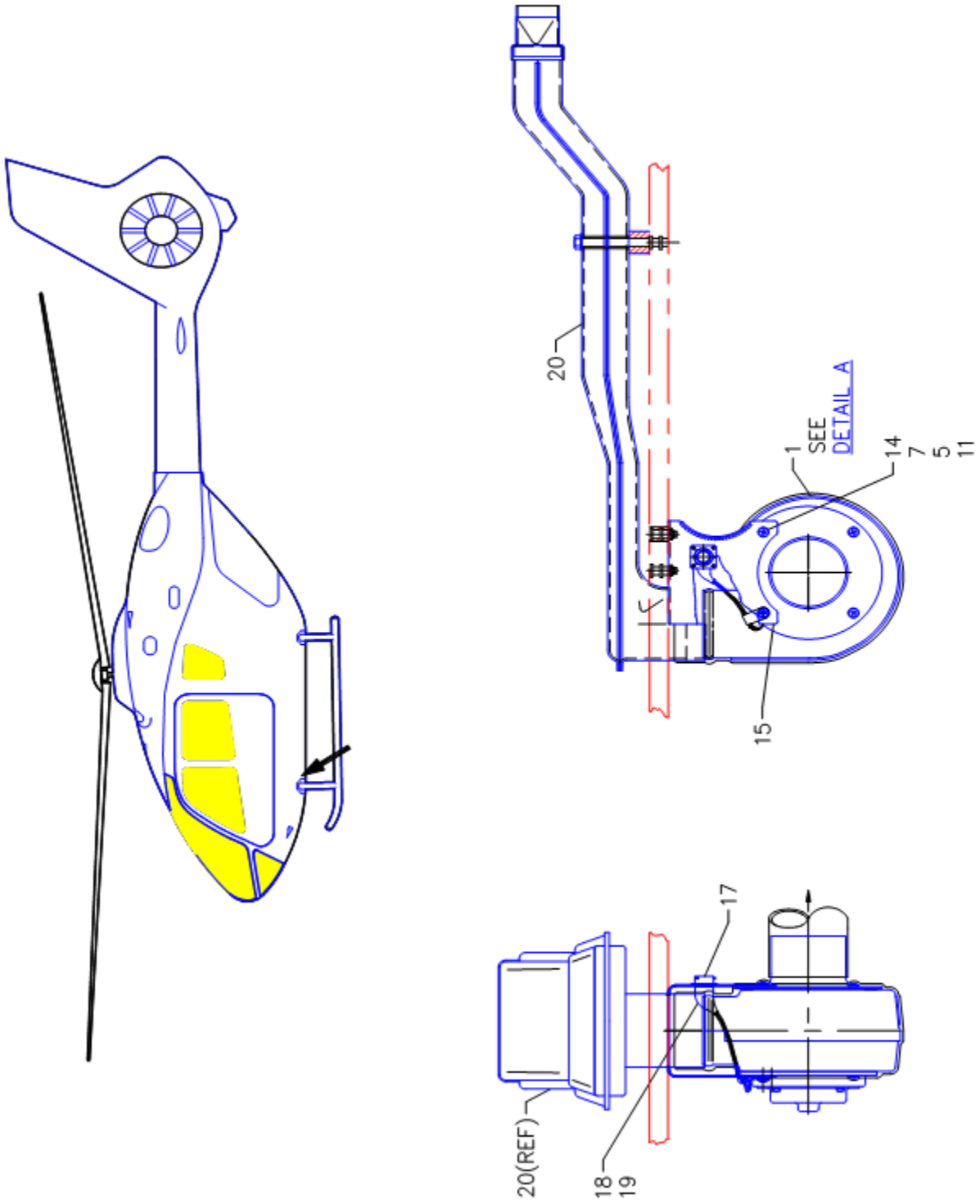


Figure 43:
135-0400 AUXILIARY BLOWER INSTALLATION

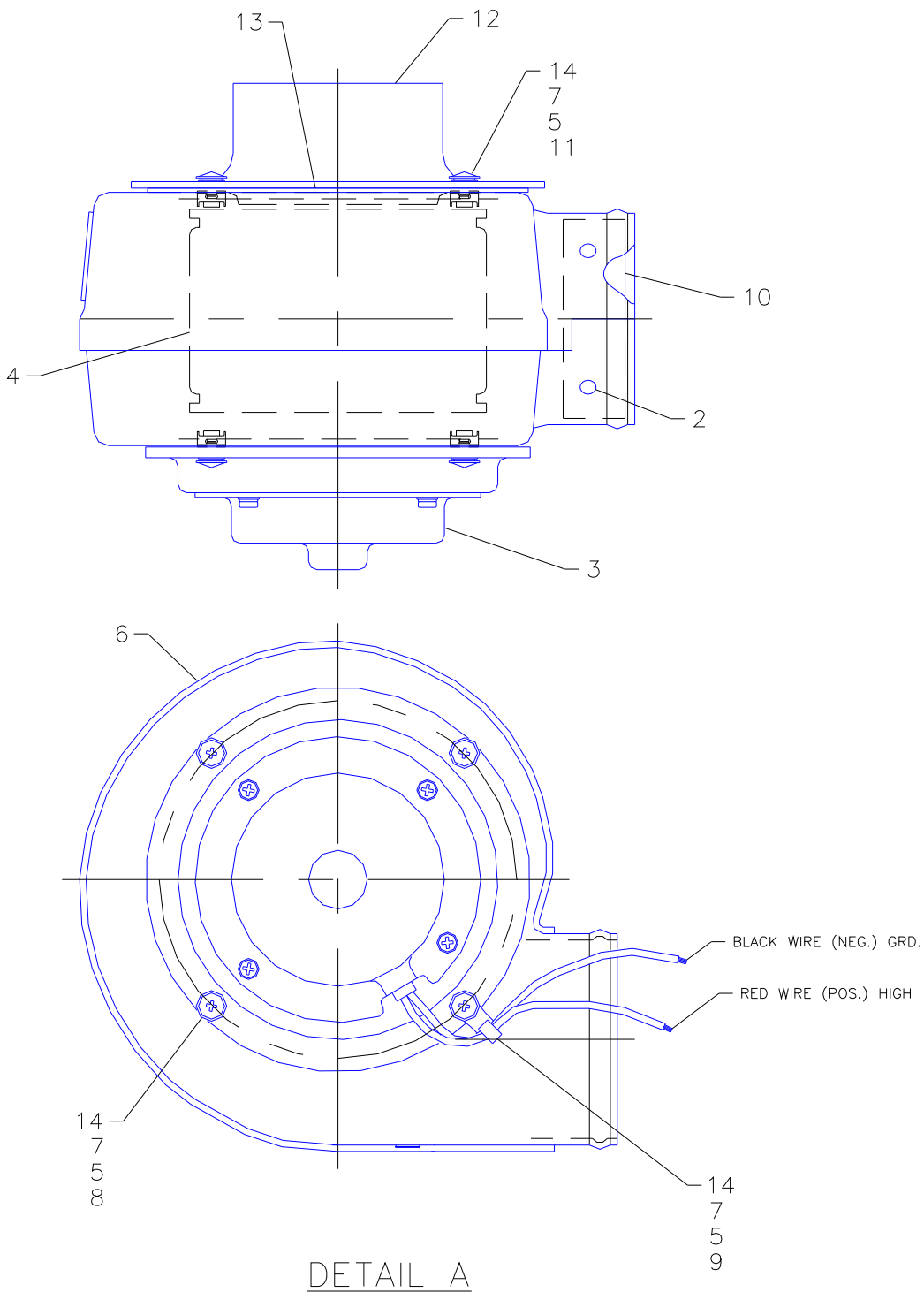


Figure 44:
135-0400 AUXILIARY BLOWER INSTALLATION

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
		135-0400-1	Sub-Kit, Aux Blower Instl	•
43	1	• JBS13001-6	Blower Assy	1
44	2	• • ES31100-1	Rivet, Pop, Dome Head	4
44	3	• • ES61060-2	Motor Assy	1
44	4	• • ES73088-10	Wheel, Blower	1
43/44	5	• • MS35338-42	Washer, Lock	8
44	6	• • JBS862-2	Blower Assy	1
43/44	7	• • AN960-8L	Washer	8
44	8	• • AN525-832R10	Screw	3
44	9	• • AN525-832R14	Screw	1
44	10	• • 81-33-411-17	Reinforcement	1
43/44	11	• • AN525-832R8	Screw	4
44	12	• • JBS272-2	Collar, Duct	1
44	13	• • JBS300-6	Inlet Ring	1
43/44	14	• • ES34124-3	Nut	8
43	15	• 135-1252-8	Blower Bracket	1
-	16	• ES53050-3	Connector, Plug	1
43	17	• MS27472T12B3P	Receptacle	1
43	18	• ES59136-1	Shrink Boot Adapter	1
43	19	• ES59145-1	Right Angle Boot	1
43	20	• 135-1400-10	Bench Seat Duct Assy	1
-	21	• 135-1400-20	Bench Seat Duct Assy	1

Table 25:
135-0611-2 HEADLINER AND DUCT MODIFICATION

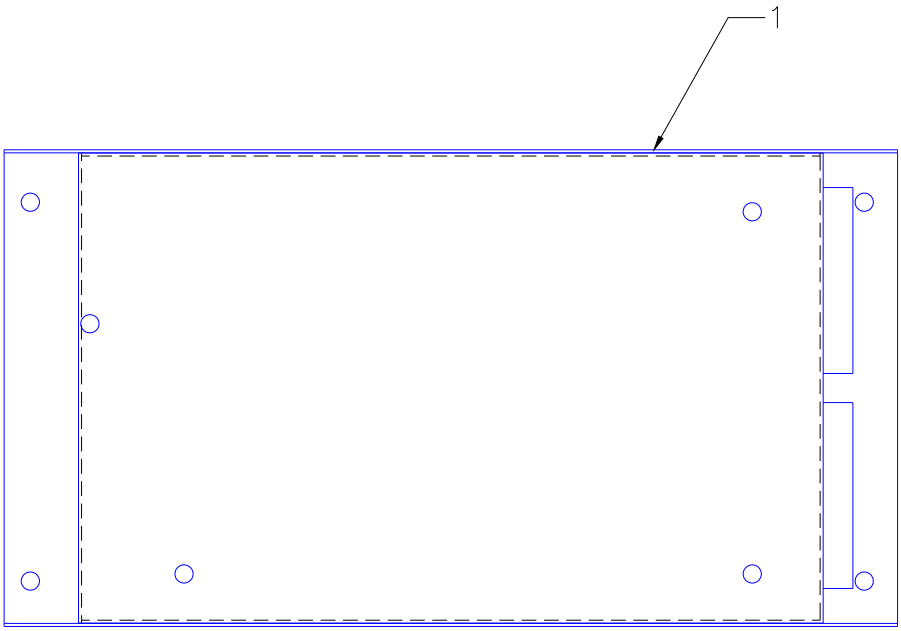


Figure 45:
JBS880-1 HEATER CONTROLLER

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
45	1	JBS881-1	Heater Controller	•

Table 26:
JBS880-1 HEATER CONTROLLER

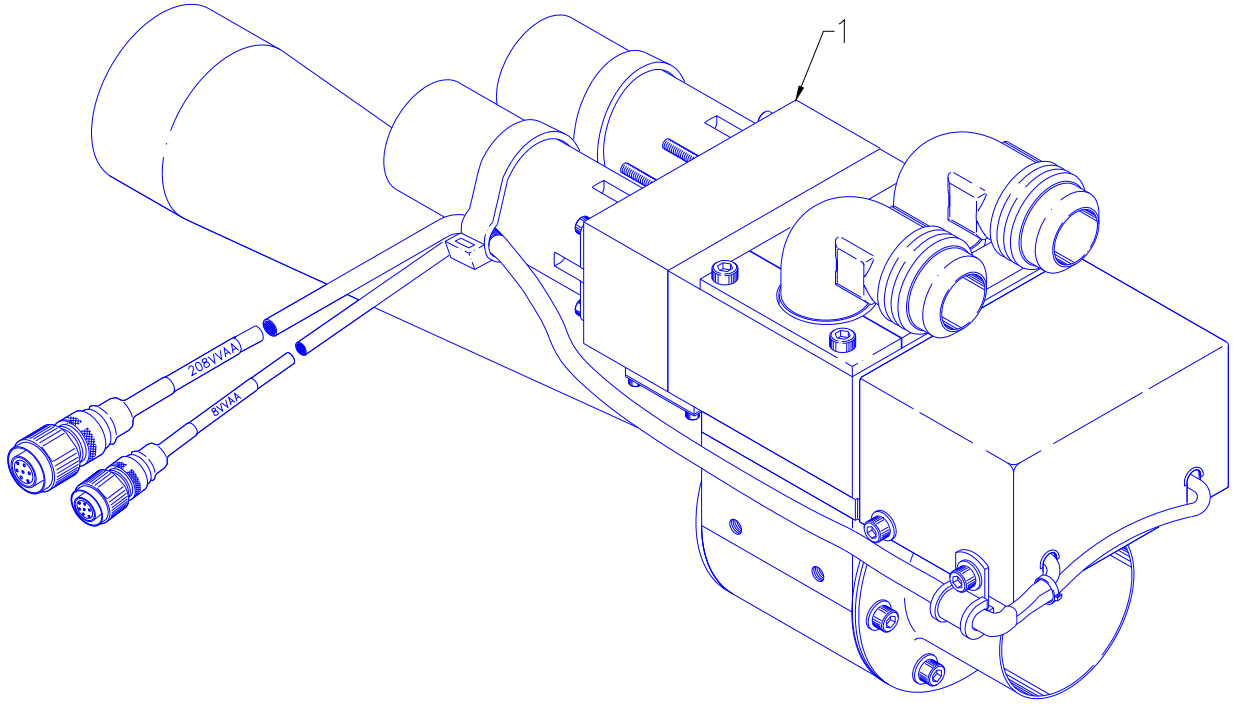


Figure 46:
JBS880-1 HEATER/EJECTOR ASSEMBLY

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
46	1	JBS880-3	Heater/Ejector Assembly	•

Table 27:
JBS880-1 HEATER/EJECTOR ASSEMBLY

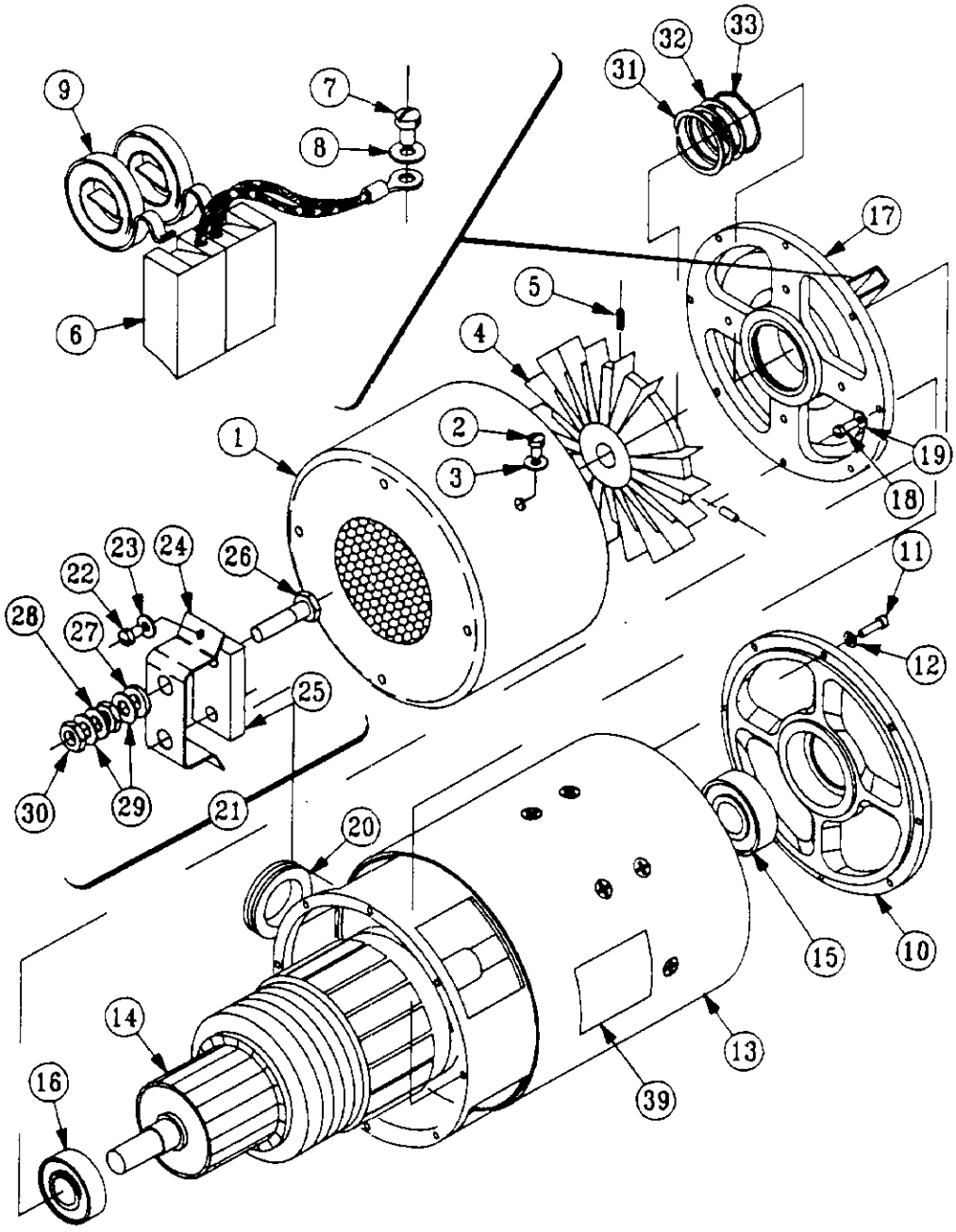


Figure 47:
ES61110 MOTOR ASSEMBLY

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
		ES61110-1	Motor Assembly	•
		ES61110-2	Motor Assembly	•
		ES61110-3	Motor Assembly	•
		ES61110-4	Motor Assembly	•
		135-0570-1	Motor Assembly	•
47	1	• Reference	Cover Assembly	1
47	2	• • Reference	Screw (6-32 x .31)	4
47	3	• • Reference	Flat Washer (#6)	4
47	4	• Reference	Fan	1
47	5	• • Reference	Setscrew, 10-32 x .25	2
47	6	• ES61110-11	Brush and Shunt Assembly	4
47	7	• • Reference	Screw (8-32 x .50)	4
47	8	• • Reference	Lock-Washer (#8)	4
47	9	• Reference	Brush Spring	8
47	10	• Reference	End Bell (Drive End)	1
47	11	• • (MS35265-30)	Screw, 6-32 x .50	8
47	12	• • Reference	Lock-washer, #6	8
47	13	• Reference	Field Housing Assembly	1
47	14	• Reference	Armature Assembly	1
47	15	• ES61110-13	Bearing	1
47	16	• ES61110-12	Bearing	1
47	17	• Reference	End Bell Assy (Anti-Drive End)	1
47	18	• • (MS35265-30)	Screw, 6-32 x .50	8
47	19	• • Reference	Lock-washer, #6	8
47	20	• • Reference	Grommet	1
47	21	• Reference	Terminal Assembly	1
47	22	• • (MS35266-43)	Screw, 10-32 x .38	2
47	23	• • Reference	Washer #10 Flat	2

Table 28:
ES61110 MOTOR ASSEMBLY

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
47	24	• Reference	Terminal Bracket	1
47	25	• • Reference	Insulator	1
47	26	• • Reference	Terminal Stud	2
47	27	• • Reference	Shoulder Washer	1
47	28	• • Reference	Washer, Flat	2
47	29	• • Reference	Lock-Washer	4
47	30	• • Reference	Nut, .312 Brass	2
47	31	• Reference	Retaining Ring	1
47	32	• Reference	Shim	AR
47	33	• Reference	Wave Washer	1
47	39	• Reference	Placard	1

Table 29:
ES61110 MOTOR ASSEMBLY

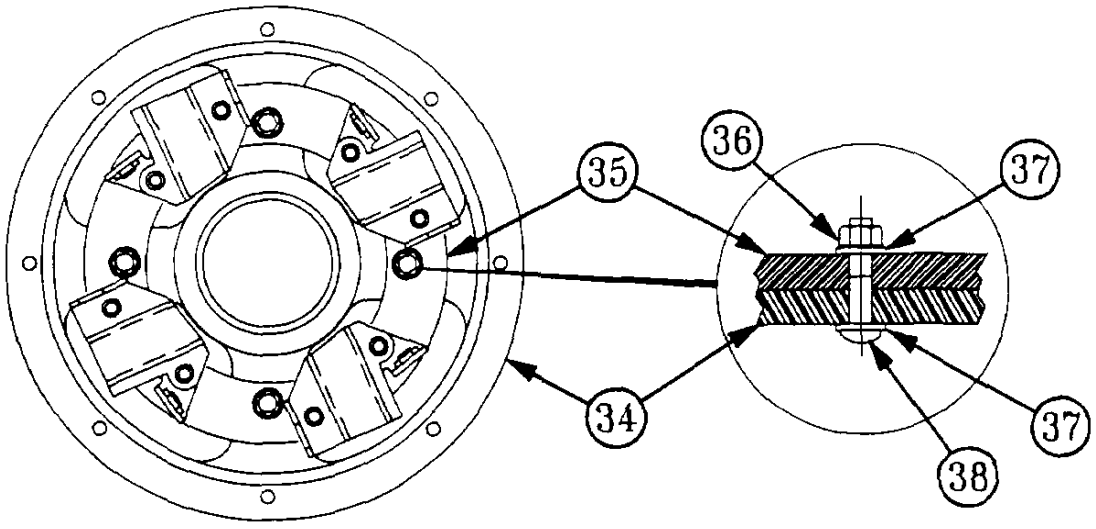


Figure 48:
END BELL ASSEMBLY

FIG	ITEM	PART NUMBER	NOMENCLATURE	UNIT PER ASSY
	-	-	End Bell Assy (Anti-Drive End)	•
48	34	• Reference	End Bell	1
48	35	• Reference	Brush Holder Assembly	1
48	36	• • Reference	Locknut, 8-32	4
48	37	• • Reference	Washer, #8 Flat	8
48	38	• • Reference	Screw, 8-32 x .88	4

Table 30:
ES61110 END BELL ASSEMBLY