



## **ZEE Systems, Inc.**

### ***SERVICE BULLETIN R134-05***

#### 1. PLANNING INFORMATION

A. Effectivity: Bell 212 and 412 aircraft with Zee Systems, Inc. air conditioning equipment installed under STC SH3512SW.

B. Reason: To modify and upgrade the Vapor Cycle Air Conditioning system to use CFC free R-134a refrigerant.

C. Description: This service bulletin gives instructions for converting the Vapor Cycle Air Conditioning system from R-12 (Freon) to EPA approved R-134a refrigerant and servicing instructions. This conversion consists of parts replacement and/or flushing then recharging the system with R-134a refrigerant.

D. Compliance: Compliance is optional. Service Bulletin 65-R134-1 and Service Bulletin 70-R134 must be accomplished prior to installing this modified equipment back on the aircraft.

E. Approval: This service bulletin contains no modification data that changes the fit, form or function of the original design and therefore does not require any additional approvals.

F. Manpower: It is recommended accomplishment of this service bulletin be performed when the components are exposed or removed from the aircraft during regularly scheduled maintenance of the air conditioning system. The time estimated for performing this service bulletin 8.0 man hours. This estimate excludes the time required to discharge the system, expose or remove the M/C/C assembly from the aircraft, replace the system to its normal operating configuration in the aircraft, service the system and perform normal leak detection and functional tests accomplished when returning the system to service on the aircraft.

G. Material Cost and Availability: Refer to paragraph 3 for a detailed listing of parts and materials required to accomplish the modification procedures outlined in this service bulletin. The required parts, materials, equipment and pricing is available from:

ZEE Systems, Inc.  
406 W. Rhapsody  
SAN ANTONIO, TX 78216

1-800-988-COOL<sup>(2665)</sup>  
FAX 210-349-9208  
e-mail: [info@zeeco-zeesys.com](mailto:info@zeeco-zeesys.com)

#### H. Equipment and Tooling:

Refrigerant Recovery/Recycle Equipment  
meeting SAE J1990 or J2209 specifications.

Commercially Available

Manifold Gauge Set, with hoses  
R-134a compatible

Commercially Available

Scale .1 lb. increments or grams (Minimum)

Commercially Available

Leak Detector

Commercially Available

Vacuum Pump

Commercially Available

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## **ZEE Systems, Inc.**

### **SERVICE BULLETIN R134-05**

Any Synthetic Polyol Ester (P.O.E.) refrigerant oil  
with an ISO (viscosity) of 68 to 100  
Nu-Calgon RL68S, CCI Retro-Fix II, Castrol 100

Commercially Available

I. Weight and Balance: No effect.

J. Electrical Load Data: No effect.

K. References: Refer to CMM SZ58-65 and Aircraft Manufacturers Maintenance Manual and Illustrated Parts List instructions and Maintenance Manuals and Illustrated Parts List supplied by STC holder Heli-Dyne, Inc.. Disregard all references to R-12 servicing instructions. Refer to service bulletin R134-05 for R-134a servicing instructions.

#### **2. ACCOMPLISHMENT INSTRUCTIONS**

A. Preparation: The replacement of components should be accomplished in a clean, dry area free of oil, dirt, moisture and other contamination.

B. Disassembly:

#### **CAUTION**

**SYSTEM UNDER PRESSURE. APPROPRIATE SAFETY MEASURES SHOULD BE TAKEN WHEN SERVICING THIS EQUIPMENT. ONLY TRAINED PERSONNEL WITH SAFETY EQUIPMENT SHOULD PERFORM THESE DUTIES.**

#### **NOTE**

**IT IS UNLAWFUL TO RELEASE R-12 TO THE ATMOSPHERE. USE APPROVED RECOVERY/RECYCLE EQUIPMENT TO CAPTURE THE R-12. USE ONLY LAWFUL MEANS TO DISPOSE OF RECOVERED R-12. CHECK WITH LOCAL AGENCIES FOR APPROVED DISPOSAL PROCEDURES.**

#### **NOTE**

**CAP ALL LINES TO PREVENT CONTAMINANTS AND MOISTURE FROM ENTERING THE SYSTEM.**

1. Motor Compressor Condenser Assembly: Remove from aircraft and modify in accordance with Zee Systems Service Bulletin 65-R134-1.
2. Evaporator Assembly: Remove from aircraft and modify in accordance with Zee System Service Bulletin 70-R134.
3. Modulator Valve: Remove from system, discard.
4. Receiver Dryer: Remove from system, discard.
5. Lines: Remove all flex lines and fittings. Note the position of the bulkhead fittings, clamps any chafe guards. Save the 2ea AN924-10D Nut and 2ea AN901-10D Washer. All other components will be replaced.

C. Modification: Modification occurs when components are removed and/or new/modified components are installed and the system is charged with R-134a refrigerant.

D. Assembly: Install and adjust components in accordance with appropriate Zee Systems, Heli-Dyne, Inc. maintenance manuals and standard industry practices.

1. Install modified MCC Assembly, refer to SB 65-R134-1.



## **ZEE Systems, Inc.**

### **SERVICE BULLETIN R134-05**

2. Install modified Evaporator Assembly, refer to SB 70-R134.
3. Modulator Valve: Install new valve, see kit KR134-05.
4. Receiver Dryer: Install new Receiver Dryer, see kit KR134-05.
5. Lines: Refer to Figure 1 for plumbing routing.
6. Reconnect system to its normal configuration.
7. Tighten all connections, do not over tighten. Take care not to damage the O-Ring at each fitting.

E. Servicing Instructions: The servicing instructions are basically the same as with an R-12 system. However, a sight glass is NOT used to determine adequate refrigerant charge. The system is charged with a predetermined amount (by weight) of refrigerant. Only use virgin R-134a (HFC-134a) refrigerant. NEVER use recycled/reclaimed refrigerant.

#### **NOTE**

**IF YOU ARE USING SERVICING EQUIPMENT THAT CAN BE SET TO DISPENSE A PRESET AMOUNT OF REFRIGERANT SOME OF THE FOLLOWING STEPS MAY DIFFER SLIGHTLY. REFER TO THE OPERATING INSTRUCTIONS FOR YOUR EQUIPMENT.**

1. Evacuate the system for a minimum of four hours after a deep vacuum has been achieved.
2. Weigh the refrigerant bottle.
3. Introduce a total maximum R-134a refrigerant charge (by Weight) of 1.5 lbs. (680g) into a dry system using the following procedure:
4. With the system OFF, open the back seating valves on the compressor.
5. Shut OFF High pressure (red) and the Low pressure (blue) valves of the manifold set. Attach the manifold line (yellow) to the refrigerant bottle. Bleed off any air in the manifold line by opening the valve on the refrigerant bottle then crack the connection between the manifold line and the manifold until the trapped air is released. Then tighten the connection and close the valve on the refrigerant bottle. Attach the High side manifold line to the Pressure service port to the hose coming from the compressor to the condenser and the Low side manifold line to the Suction service port on the Modulator Valve. Open the valve on the refrigerant bottle.

#### **CAUTION**

**NEVER INVERT THE REFRIGERANT BOTTLE SO THE DISCHARGE VALVE IS ON THE BOTTOM. THE REFRIGERANT BOTTLE MUST BE KEPT UPRIGHT TO PERMIT THE ENTRY OF GAS ONLY INTO THE COMPRESSOR. INVERTING THE BOTTLE WILL PERMIT LIQUID TO ENTER THE COMPRESSOR RESULTING POSSIBLE COMPRESSOR DAMAGE.**

6. With the system OFF, OPEN the High Pressure manifold valve and the Low Pressure Manifold valve. Allow the system to take a static charge. When the pressures stabilize on both the High and Low gauges or if the maximum charge weight is achieved CLOSE both the High and Low pressure valves at the manifold.
7. Check for leaks. Repair as necessary.
8. With the High and Low pressure valves shut off, turn ON the compressor motor and evaporator blowers. Slowly OPEN the Low pressure manifold valve until the Low pressure gauge reads 30 pounds pressure. Keep close watch on the scale and continue to charge the system. When the target weight of 1.5 lbs. (680g) is reached immediately CLOSE the Low pressure valve. The system should be fully charged. Disconnect the servicing equipment. In low ambient temperature conditions the refrigerant may pass into the system very slowly.



## ZEE Systems, Inc.

### SERVICE BULLETIN R134-05

F. Testing: Check the system in accordance with your normal certification and return to service specifications.

G. Re-identification: Check that the SZ65-001-1 MCC Assy has "R134" added at the end of the serial number and that the MOD A block has been marked on the I. D. Plate. Check that the SZ70-001-1 Evaporator Assy has "R134" added at the end of the serial number and that the MOD A block has been marked on the I. D. Plate. Make appropriate log book entries.

#### 3. MATERIAL INFORMATION

Parts and materials required are listed below. Quantities are for one aircraft. The (#) corresponds to item in Figure 1.

1. Modification Kit P/N: KR134-05. The kit contains the following parts:

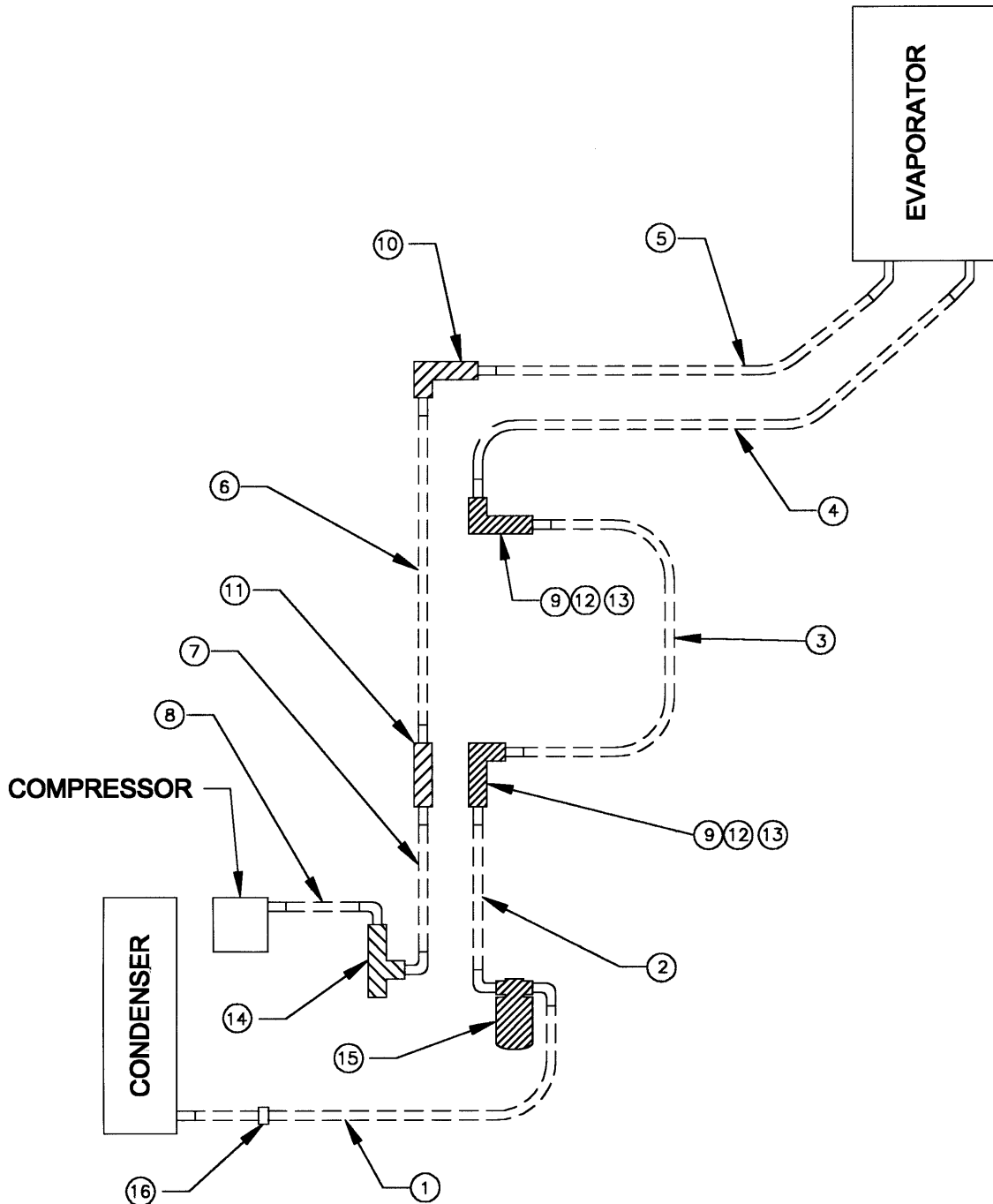
QTY	FIG.1	Part Number	Description	Old Part Number - Disposition
1ea	(1)	Z2016AC256	Hose Assembly	Z1014000V230, Discard
1ea	(2)	Z2016AC126	Hose Assembly	Z1014000V100, Discard.
1ea	(3)	Z2016AA600	Hose Assembly	Z1014000A580, Discard.
1ea	(4)	Z2016090BC563	Hose Assembly	Z1014090W540, Discard.
1ea	(5)	Z20110090BC490	Hose Assembly	Z10110080W450, Discard.
1ea	(6)	Z20110AA634	Hose Assembly	Z10110000A600, Discard.
1ea	(7)	Z20110AC070	Hose Assembly	Z10110000V050, Discard.
1ea	(8)	Z20110AC074	Hose Assembly	Z10110000V054, Discard.
2ea	(9)	DS290B-6	Fitting, 90° Bulkhead	AN833-4D, Discard.
1ea	(10)	DS290B-10	Fitting, 90° Bulkhead	AN833-10D, Discard.
1ea	(11)	DS200B-10	Fitting, ST. Bulkhead	AN932-10D, Discard.
2ea	(12)	AN924-8D	Nut	AN924-4D, Discard.
2ea	(13)	AN901-8D	Washer	AN901-4D, Discard.
1ea	(14)	SZ41-016-6C	Modulator Valve	SZ41-016-1 - Discard.
1ea	(15)	7-8159A	Receiver Dryer	7-8159 - Discard or, 249031-30 - Discard.
1ea	(16)	MS21919WDG11	Clamp	MS21919WDG9, Discard.

1. Modification Kit P/N: KR134-05-1. The kit contains the following parts:

QTY	FIG.1	Part Number	Description	Old Part Number - Disposition
1ea	(1)	Z2026AC256	Hose Assembly	Z1014000V230, Discard
1ea	(2)	Z2026AC126	Hose Assembly	Z1014000V100, Discard.
1ea	(3)	Z2026AA600	Hose Assembly	Z1014000A580, Discard.
1ea	(4)	Z2026090BC563	Hose Assembly	Z1014090W540, Discard.
1ea	(5)	Z20210090BC490	Hose Assembly	Z10110080W450, Discard.
1ea	(6)	Z20210AA634	Hose Assembly	Z10110000A600, Discard.
1ea	(7)	Z20210AC070	Hose Assembly	Z10110000V050, Discard.
1ea	(8)	Z20210AC074	Hose Assembly	Z10110000V054, Discard.
2ea	(9)	DS290B-6	Fitting, 90° Bulkhead	AN833-4D, Discard.
1ea	(10)	DS290B-10	Fitting, 90° Bulkhead	AN833-10D, Discard.
1ea	(11)	DS200B-10	Fitting, ST. Bulkhead	AN932-10D, Discard.
2ea	(12)	AN924-8D	Nut	AN924-4D, Discard.
2ea	(13)	AN901-8D	Washer	AN901-4D, Discard.
1ea	(14)	SZ41-016-6C	Modulator Valve	SZ41-016-1 - Discard.
1ea	(15)	7-8159A	Receiver Dryer	7-8159 - Discard or, 249031-30 - Discard.
1ea	(16)	MS21919WDG11	Clamp	MS21919WDG9, Discard.



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**FIGURE 1.**