



## **ZEE Systems, Inc.**

### **AIRBORNE AIR CONDITIONING and HEATING**

406 W. RHAPSODY - SAN ANTONIO, TEXAS 78216 U.S.A.

210-342-9761 - 800-988-COOL - FAX 210-341-2609

EMAIL info@zeeco-zeesys.com www.zeeco-zeesys.com

## ***SERVICE LETTER 96-000-5***

1.0 EFFECTIVITY: De Havilland Dash 8-200 aircraft S/N: 492.

2.0 PURPOSE: To provide service instructions for the vapor cycle air conditioning system designed by ZEE Systems, Inc.

3.0 SPECIAL TOOLS AND EQUIPMENT: The following tools and equipment are required to service the air conditioning system.

ITEM	SOURCE
HFC-134a Refrigerant (R-134a)	Commercially available
SW100 Refrigeration oil, Castrol Alternate P/N 431756C, SW150, any synthetic ester refrigeration lubricant compatible with R-134a 100-150 viscosity.	Commercially available
Manifold Gauge Set (R-134a) with standard R-134 quick disconnect adapters	Commercially available
Leak Detector (R-134a)	Commercially available
Temperature probe	Commercially available
Scale, 0.1 lb. increments (minimum)	Commercially available*
Vacuum Pump, refrigeration system	Commercially available*
Recovery pump for R-134a	Commercially available*
Recovery tank for R-134a	Commercially available*

\* Some refrigeration servicing equipment may incorporate some or all of these capabilities in a single device.

#### 4.0 SERVICING THE SYSTEM

**NOTE: USE A BACKUP WRENCH WHEN TIGHTENING CONNECTIONS. DO NOT OVER TIGHTEN FITTINGS.**

**NOTE: APPLY A LIGHT FILM OF THE SW100 OIL ON NEW O-RINGS.**



## ***SERVICE LETTER 96-000-5***

### 4.1 SERVICE LOCATIONS:

4.1.1 The Discharge (High Side) service port is on the hose from the compressor discharge fitting to the condenser.

4.1.2 The Suction (Low Side) service port is on the Modulator Valve (P/N: SZ41-016-10A/-10C).

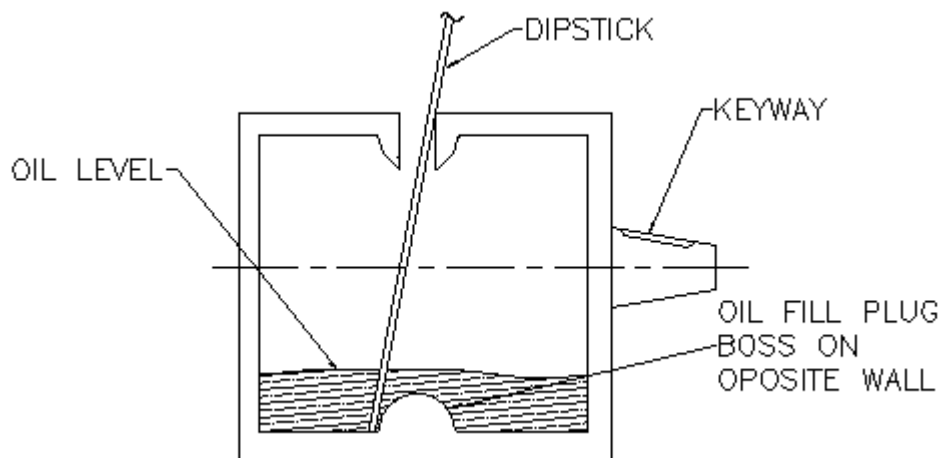
4.1.3 Oil fill plug is on the top of the compressor.

### 4.2 OIL LEVEL

4.2.1 Always check the oil level prior to start up even when installing a new system or new compressor.

4.2.1 Close the back seat valves on both the DISCH and SUCT fittings on the compressor. Turn the stem all the way in to the front seat position. Full CW. This isolates the refrigerant from the compressor and allows compressor service and maintenance without loss of refrigerant.

4.2.2 To check the oil level in the crank case of the compressor remove the oil fill plug. Take care not to damage the o-ring on the plug. Insert the dip stick (see Figure 1). The oil level should be 1-7/16" (37mm) on the dip stick. Add oil as required. Replace plug.



**FIGURE 1.**

Fashion a dip stick from any soft metal bar or rod stock. Make a mark at 1-7/16" and 1-3/16". Insert in oil fill hole as shown above (FIG.1) to check oil level.



### ***SERVICE LETTER 96-000-5***

4.2.3 After compressor break-in run (5 hours) check oil level and replenish as necessary to bring the level to 1-3/16" (30mm).

4.2.4 Move the back seat valve to the full out position (CW) prior to starting the system. Tighten against back seat, replace cap.

**CAUTION: OPERATING THE COMPRESSOR WITH THE BACK SEAT VALVES IN THE FRONT POSITION MAY CAUSE COMPRESSOR FAILURE OR DAMAGE. MAKE SURE THE VALVES ARE IN THE BACK SEAT POSITION PRIOR TO OPERATING THE SYSTEM.**

4.3 REFRIGERANT CHARGING INSTRUCTIONS (DRY SYSTEM):

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

**NOTE: FOR R-134a DO NOT USE THE SIGHT GLASS TO DETERMINE THE REFRIGERANT CHARGE. THE BUBBLES WILL NOT CLEAR.**

4.3.1 Anytime the system has been opened it must be completely evacuated to remove air and moisture. The best way to insure that all contaminants are removed is to pull a deep vacuum for at least one hour after the deep vacuum has been attained.

4.3.1.1 After any service to the system make sure the system is leak free before beginning any evacuation.

4.3.1.2 Connect the high and low side line from the service manifold to the high and low system service connections. Connect the center line of the manifold to the vacuum pump.

4.3.1.3 Operate the vacuum pump in accordance with the manufacturers instructions. Open the both the high and low valves on the service manifold. NOTE: Draw a deep vacuum as close to 30.0 in.Hg as possible. A vacuum of 28.0 in.Hg will only remove about 94% of the air.

4.3.1.4 After the deep vacuum has been achieved continue to evacuate the system for a minimum of one hour. For systems that have been open to ambient conditions for extended period of time or are in areas of high humidity the receiver-dryer should be replaced and the deep vacuum should be maintained for 3-4 hours. Systems that have been exposed to catastrophic component failure or catastrophic contamination should have the receiver-dryer replaced and a deep vacuum evacuation for a minimum of 4 hours with continued evacuation for up to 8 hours.

4.3.2 Weigh the refrigerant bottle. Keep the bottle in a position so the weight can be monitored while the refrigerant is introduced into the system.

4.3.3 Refrigerant Charge:

SL 96-000-5  
I.R. JAN 98

REV. 1  
8-14-02



## ***SERVICE LETTER 96-000-5***

4.3.3.1 Dry system: Introduce a total maximum R-134a refrigerant charge (by weight) of 5.1 lbs (2.3 kg) into a dry system using the procedure beginning on step 4.3.4.

**NOTE: DURING CHARGING NEVER INVERT THE REFRIGERANT BOTTLE TO INTRODUCE A LIQUID CHARGE (VALVE ON THE BOTTOM). ALWAYS INTRODUCE REFRIGERANT AS A GAS. LIQUID CHARGING THE SYSTEM WILL DAMAGE THE COMPRESSOR AND VOID THE WARRANTY.**

4.3.4 Open both back seat valve stems (DISCH and SUCT) on the compressor to the back seat position. Full CCW.

4.3.5 Shut OFF all valves in the manifold gauge set. Attach the manifold line to the refrigerant bottle. Attach the High side manifold to the service port on the hose assembly and the Low side to the service port on the modulator valve. Open the valve on the refrigerant bottle.

4.3.6. With the system NOT RUNNING, OPEN the High side manifold valve and the Low side manifold valve. Allow the system to take a static charge. When the pressures stabilize or if the maximum charge weight is achieved CLOSE both the High and Low valves at the manifold.

4.3.7 Check for leaks. Correct as required.

4.3.8 With the High and Low manifold valves OFF, turn ON the air conditioning system (compressor-motor and evaporator blowers). Slowly OPEN the Low side manifold valve until the pressure gauge reads 30 pounds pressure. Keep close watch on the scale and continue to charge the system. When the appropriate charge weight is reached immediately CLOSE the Low pressure valve. The system should be fully charged. Disconnect the servicing equipment.

### 5.0 BREAK-IN RUN

5.1 New compressors should be run for 5 hours after installation of the system or compressor replacement. The air conditioning system may be operated immediately. Operation during the break-in period will not affect the air worthiness of the system. The current draw may be slightly higher (3-5 amps) than normal operation until the compressor piston rings are seated to the cylinder wall.

5.1.1 The oil level must be checked after the break-in run. It is suggested that for ease in maintenance the break-in run be accomplished on the ground with the compressor is still exposed.

5.2 During the break-in run, oil from the crankcase will by-pass the rings and enter the system. This is normal and the oil is designed to be miscible with the refrigerant. But the oil must be replenished into the crankcase (refer to 4.2).

### 6.0 SYSTEM INSPECTION/SERVICE SCHEDULE

6.0.1 Inspection intervals are based on hobbs meter time.



## ***SERVICE LETTER 96-000-5***

### 6.1 Belts:

HRS	INSPECTION/SERVICE
FIRST 250	Inspect for tightness, deterioration, fraying.
THEN EVERY 500	Adjust or replace as necessary.

### 6.2 Compressor:

HRS	INSPECTION/SERVICE
5 (Break-in)	Check oil level. Replenish as required.

15*	Check oil level. If oil is required replenish and inspect again at 25 hrs. If no oil is required next inspection at 50 hrs.
-----	---

25/50 **	Check oil level. If oil is required replenish and inspect again at 100 hrs. If no oil is required next inspection is at 250hrs.
----------	---

100/250	Check oil level. replenish as required.
---------	---

AFTER OIL LEVEL IS STABILIZED INSPECT EVERY 250 HRS.

EVERY 250	Check oil level. Replenish as required.
-----------	---

### 6.3 Compressor Drive Motor:

1000	Inspect brushes. Refer to ZEE System Maintenance Manual SZ96-8900 and Service Information Letter SIL 58-001 for inspection procedure.
------	---

2000	Remove for overhaul.
------	----------------------

### 7.0 RELATED PUBLICATIONS:

7.1 The following publications provide additional information and procedures to service the equipment listed in this Service Letter.

Service Information Letter SIL58-001, Rev.1, 3-15-01

Maintenance Manual SZ206, May 1996.

Maintenance Manual SZ96-8900, March 1997.