COOLING

1. DESCRIPTION

On aircraft serials 1863 and subsequent, an optional air condition system is available. This section contains the maintenance practices pertinent to this system.

Cabin ventilation and cooling is provided by ram air admitted through the fresh air intake on the wing (Serais 1863 thru 2437), or the NACA vent on the RH lower cowl (Serais 2438 & subs) and/or a vapor cycle air-conditioning system. The aircraft engine must be running for the air-conditioning system to operate.

The air conditioning system consists of an engine driven compressor, condenser assembly with integral blower fan and receiver-drier, evaporator assembly with integral expansion valve assembly, and all associated plumbing and control mechanisms.

The air-conditioning system uses refrigerant R134A. The refrigerant enters the engine mounted compressor as a vapor. The compressor pressurizes the heat-laden vapor until the pressure and heat reach a point much hotter than the outside air. The compressor then pumps the vapor to a condenser mounted under the baggage compartment floor, where the vapor cools and changes to a liquid. The liquid then passes to the receiver-drier. The receiver-drier’s function is to filter, remove any moisture, and ensure a steady flow of liquid refrigerant into an expansion valve and evaporator mounted under the RH crew seat. The expansion valve is a temperature controlled metering valve which regulates the flow of liquid refrigerant to the evaporator. Inside the evaporator, the liquid refrigerant changes state to a gas and, in doing so, absorbs heat. The evaporator then absorbs the heat from the air passing over the coils. Moisture from the air condenses in the evaporator and is drained overboard through the belly of the aircraft. From the evaporator, the refrigerant vapor returns to the compressor where the cycle is repeated.

During normal air condition operation, ram air from the fresh air intake flows into the evaporator assembly. The air is cooled as it passes through the evaporator coils, and is then ducted forward to the distribution manifold. Conditioned air is circulated through the system by ram air or a by blower fan adjacent to the evaporator.

During maximum air conditioning operation, the fresh air intake valve closes and valves in the evaporator assembly open allowing cabin air to be recirculated and further cooled as the air passes through the evaporator coils and ducted forward to the distribution manifold. Conditioned air is circulated through the system by ram air or by a blower fan adjacent to the evaporator.

The air conditioning system is powered by 28 VDC supplied through the 15-amp CONDENSER breaker on A/C Bus 1, and the 15-amp FAN breaker and 7.5-amp COMPRESSOR/CONTROL breaker on Main A/C Bus 2.
## 2. TROUBLESHOOTING

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Probable Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insufficient cooling.</td>
<td>Air in system.</td>
<td>Flush system.</td>
</tr>
<tr>
<td></td>
<td>Faulty condenser.</td>
<td>Inspect condenser for dirty and/or bent fins. (Refer to 21-50)</td>
</tr>
<tr>
<td></td>
<td>Blocked high pressure line.</td>
<td>Remove restriction.</td>
</tr>
<tr>
<td></td>
<td>Plugged receiver/drier.</td>
<td>Replace condenser. (Refer to 21-50)</td>
</tr>
<tr>
<td></td>
<td>Faulty compressor.</td>
<td>Replace compressor. (Refer to 21-50)</td>
</tr>
<tr>
<td></td>
<td>Excessive oil in system.</td>
<td>Flush system. Replenish oil.</td>
</tr>
<tr>
<td></td>
<td>Refrigerant low or leaking.</td>
<td>Perform Inspection/Check - Refrigerant Leak Test. Repair leak as necessary. (Refer to 12-10)</td>
</tr>
<tr>
<td>Moisture in system.</td>
<td>Excessive moisture in receiver/drier.</td>
<td>Replace condenser. (Refer to 21-50)</td>
</tr>
<tr>
<td></td>
<td>Ice buildup in expansion valve.</td>
<td>Flush system.</td>
</tr>
<tr>
<td></td>
<td>Refrigerant flow restricted.</td>
<td>Remove restriction.</td>
</tr>
<tr>
<td>Water blown out of evaporator.</td>
<td>Blocked evaporator drain.</td>
<td>Remove restriction in drain line.</td>
</tr>
<tr>
<td>No cooling.</td>
<td>Faulty evaporator expansion valve.</td>
<td>Replace evaporator. (Refer to 21-50)</td>
</tr>
<tr>
<td>Sweating or frosted suction line.</td>
<td>Faulty evaporator expansion valve.</td>
<td>Replace evaporator. (Refer to 21-50)</td>
</tr>
<tr>
<td>Sweating or frosted expansion valve outlet.</td>
<td>Faulty evaporator expansion valve.</td>
<td>Replace evaporator. (Refer to 21-50)</td>
</tr>
<tr>
<td>Conditioned air feels warm.</td>
<td>Hot air valve not sealing tight in HEAT OFF position.</td>
<td>Adjust or connect control linkage. (Refer to 21-60) Replace hot air valve. (Refer to 21-40)</td>
</tr>
</tbody>
</table>
3. MAINTENANCE PRACTICES

A. Compressor (See Figure 21-501)

(1) Servicing - Compressor

If compressor has been disconnected and exposed to air for an extended period of time, or an unapproved oil has been added to compressor, perform the following procedure to flush and lubricate the compressor.

(a) Acquire necessary tools, equipment, and supplies.

(b) Remove compressor. (Refer to 21-50)

(c) Remove caps from high and low pressure fittings on compressor.

(d) Remove drain plug from compressor.

(e) Rotate compressor shaft several times and tilt compressor to drain oil.

(f) Pour isopropyl alcohol into high pressure, low pressure, and drain ports.

(g) Slosh, tilt, and rotate compressor shaft while alcohol drains out.

(h) Repeat previous steps until alcohol runs out clear.

(i) Using dry nitrogen or dry air, blow out ports to evaporate remaining alcohol.

(j) Install compressor drain plug.

(k) Connect vacuum pump to high and low pressure fittings on compressor.

(l) Operate pump for 30 minutes to evacuate compressor.

(m) Remove vacuum pump.

CAUTION: Polyolester oil and polyalkylene glycol oil are not interchangeable. Verify compressor part number to determine which oil type to use. (See Figure 12-101)

(n) Replenish compressor with approved oil. (See Figure 12-101)

(o) Install caps to high and low pressure fittings on compressor.

(p) Install compressor. (Refer to 21-50)

(2) Removal - Compressor

(a) Set BAT 1, BAT 2, and AVIONICS switches to OFF positions.

(b) Pull COMPRESSOR/CONTROL circuit breaker.

(c) Discharge air conditioning system. (Refer to 12-10)

(d) Remove engine cowling. (Refer to 71-10)

CAUTION: Before disconnecting plumbing, ensure vacuum in system is minimal or the O-rings could be pulled into the system.

(e) Disconnect compressor hoses from firewall. Discard O-rings.

(f) Cap fittings and hoses.

(g) Remove clamps securing hoses to engine baffling.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropyl Alcohol</td>
<td>TT-I-735 Grade A or B</td>
<td>Any Source</td>
<td>Flush compressor.</td>
</tr>
<tr>
<td>Vacuum Pump</td>
<td>-</td>
<td>Any Source</td>
<td>Flush compressor.</td>
</tr>
<tr>
<td>Compressor Oil</td>
<td>(See Figure 12-101)</td>
<td>Any Source</td>
<td>Replenish compressor oil.</td>
</tr>
</tbody>
</table>
(h) **Serials 1863 thru 1956:** Remove resistor.
   1. Disconnect resistor wire from wire harness.
   2. Remove bolt, washers, clamp, and nut securing resistor wire to engine baffling.
   3. Remove screws, washers, and nuts securing resistor to engine baffling.

(i) **Serials 1957 & subs:** Remove resistor.
   1. Disconnect resistor wire from wire harness.
   2. Remove nut, washers, and clamp securing resistor wire to alternator mounting stud.
   3. Remove bolt, washers, and clamp securing resistor wire to alternator blast tube bracket.

(j) Remove nuts and washers securing compressor to engine. Remove compressor and old gasket from airplane.

(3) **Disassembly - Compressor - Serials w/ Keith Products Air Conditioning System** (See Figure 21-502)

   - Adjust turnbuckle to reduce belt tension and remove drive belt from compressor drive unit pulley and compressor clutch pulley.
   - Remove bolt, washers, and nut securing turnbuckle to drive unit.
   - Remove bolt, washers, and nut securing drive unit to compressor.
   - Remove bolts, washers, and vibration dampeners securing drive shaft flange to drive unit.
   - To disassemble drive shaft from flange:
     1. Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Puller</td>
<td>-</td>
<td>Any Source</td>
<td>Remove shaft.</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(f) Perform Inspection/Check - Compressor Drive Shaft. (Refer to 21-50)

(4) **Assembly - Compressor - Serials w/ Keith Products Air Conditioning System** (See Figure 21-502)

   - To assemble drive shaft to flange:
     1. Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arbor Press</td>
<td>10 inch minimum</td>
<td>Any Source</td>
<td>Install shaft.</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(b) Position key to slot at end of drive shaft. Use arbor press to install drive shaft into keyed slot of flange.

(g) Install bolt, washers, and nut securing drive unit to compressor.

(h) Install drive belt between compressor drive unit pulley and compressor clutch pulley.

(5) **Installation - Compressor**
CAUTION: If replacement compressor uses a different oil type than the previously installed compressor, the entire air conditioning system must be flushed. (Refer to 12-10)

(a) Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor Oil</td>
<td>(See Figure 12-101)</td>
<td>Any Source</td>
<td>Lubricate O-rings.</td>
</tr>
</tbody>
</table>

(b) Position new gasket and compressor to engine and secure with washers and nuts. Torque nuts to 75 to 85 in-lb (8.5 to 9.6 Nm).

(c) **Serials 1863 thru 1956:** Install resistor.
- 1. Position resistor to engine baffling and secure with screws, washers, and nuts.
- 2. Connect resistor wire to wire harness.
- 3. Position resistor wire to engine baffling and secure with bolt, washers, nut, and clamp.

(d) **Serials 1957 & subs:** Install resistor.
- 1. Connect resistor wire to wire harness.
- 2. Position resistor wire to alternator mounting stud and secure with clamp, washers, and nut.
- 3. Position resistor wire to alternator blast tube bracket and secure with bolt, washers, and clamp.

(e) Remove caps from fittings and hoses.

CAUTION: Polyolester oil and polyalkyline glycol oil are not interchangeable. Verify compressor part number to determine which oil type to use. (See Figure 12-101)

(f) Lubricate new O-rings with compressor oil.

(g) Connect low pressure compressor hose to firewall. Torque hose and fittings to 180 to 240 in-lb (20.3 - 27.1 Nm).

(h) Connect high pressure compressor hose to firewall. Torque hose and fittings to 120 to 160 in-lb (13.6 - 18.0 Nm).

(i) Install clamps securing hoses to engine baffling.

(j) Perform Adjustment/Test - Compressor Drive Belt Tensioning. (Refer to 21-50)

(k) Install engine cowling. (Refer to 71-10)

(l) Perform Inspection/Check - Refrigerant Leak Test. (Refer to 12-10)

(m) Charge air conditioning system. (Refer to 12-10)

(n) Reset COMPRESSOR/CONTROL circuit breaker.

(o) Perform Operational Test - Air Conditioning System. (Refer to 21-50)

6. Inspection/Check - Compressor

(a) Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corrosion Inhibitor (aerosol)</td>
<td>MIL-C-81309 Type II or III</td>
<td>Any Source</td>
<td>Prevent corrosion.</td>
</tr>
</tbody>
</table>

(b) Set BAT 1, BAT 2, and AVIONICS switches to OFF positions.
(c) Pull COMPRESSOR/CONTROL circuit breaker.
(d) Remove engine cowling. (Refer to 71-10)

Note: If it is difficult to distinguish casting features from cracks, refer to Advisory Circular 43.13-1B Acceptable Methods, Techniques, and Practices - Aircraft Inspection And Repair for additional non-destructive testing.

(e) Using inspection mirror and flashlight, visually inspect all surfaces of compressor for cracks, deformation, or signs of distress.
(f) Visually inspect compressor drive assembly for corrosion. Clean minor corrosion as necessary.
   1. Using wire brush, remove minor corrosion from compressor drive assembly.
   2. Apply corrosion inhibitor to compressor drive assembly.
(g) Visually inspect compressor belt for cracks and improper wear.
(h) Install engine cowling. (Refer to 71-10)
(i) Reset COMPRESSOR/CONTROL circuit breaker.

(7) Inspection/Check - Compressor Drive Shaft - Serials w/ Keith Products Air Conditioning System
(a) Visually inspect drive assembly housing for cracks, deformation, or signs of distress.
(b) Visually inspect engine accessory drive for cracks, deformation, or signs of distress.
(c) Verify freedom of movement exists at end of compressor pulley.

(8) Adjustment/Test - Compressor Drive Belt Tensioning
(a) Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calibrated Spring Scale</td>
<td>5A354</td>
<td>Chatillon Kew Gardens, NY 11415 718-847-5000</td>
<td>Tension drive belt.</td>
</tr>
<tr>
<td>Straight Edge</td>
<td>-</td>
<td>Any Source</td>
<td>Tension drive belt.</td>
</tr>
</tbody>
</table>

(b) Position straight edge across compressor drive unit pulley and compressor clutch pulley.
(c) Attach spring scale to compressor drive belt midway between compressor drive unit pulley and compressor clutch pulley.
(d) Pull compressor drive belt downward in a straight line until spring scale indicates approximately 8.0 lb (3.6 kg).
(e) Verify deflection of belt to straight edge measures 0.25 inch (6.4 mm) at mid span of belt.
(f) Adjust compressor turnbuckle as necessary to obtain proper drive belt tension. (Refer to 20-70)
B. Evaporator (See Figure 21-501)

(1) Removal - Evaporator
(a) Set BAT 1, BAT 2, and AVIONICS switches to OFF positions.
(b) Pull FAN circuit breaker.
(c) Pull COMPRESSOR/CONTROL circuit breaker.
(d) Discharge air conditioning system. (Refer to 12-10)
(e) Remove RH crew seat. (Refer to 25-10)
(f) Remove RH sidewall air duct trim. (Refer to 25-10)
(g) Remove RH rear cabin side trim. (Refer to 25-10)
(h) Remove bolts and washers securing evaporator cover and evaporator to fuselage.
(i) Disconnect wire harness connector from evaporator.

CAUTION: Before disconnecting plumbing, ensure vacuum in system is minimal or the O-rings could be pulled into the system.

(j) Disconnect evaporator hose from firewall. Discard O-ring.
(k) Disconnect evaporator hose from plumbing bulkhead. Discard O-ring.
(l) Cap fittings and hoses.
(m) Remove cable ties securing evaporator hoses to fuselage.
(n) Remove cable ties securing ducts to evaporator.
(o) Remove clamp securing drain hose to fuselage rivnut.
(p) Remove evaporator from airplane.

(2) Installation - Evaporator
(a) Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor Oil</td>
<td>(See Figure 12-101)</td>
<td>Any Source</td>
<td>Lubricate O-rings.</td>
</tr>
</tbody>
</table>

(b) Position evaporator to fuselage.
(c) Position drain hose to fuselage rivnut and secure with clamp.
(d) Position ducts to evaporator and secure with cable ties.
(e) Remove caps from fittings and hoses.

CAUTION: Polyolester oil and polyalkylene glycol oil are not interchangeable. Verify compressor part number to determine which oil type to use. (See Figure 12-101)

(f) Lubricate new O-rings with compressor oil.
(g) Connect evaporator hose to firewall. Torque hose and fittings to 180 to 240 in-lb (20.3 - 27.1 Nm).
(h) Connect evaporator hose to plumbing bulkhead. Torque hose and fittings to 120 to 160 in-lb (13.6 - 18.0 Nm).
(i) Install cable ties securing evaporator hoses to fuselage.
(j) Connect wire harness connector to evaporator.
(k) Position cover to evaporator and secure evaporator and cover to fuselage with bolts and washers.
(l) Install RH rear cabin side trim. (Refer to 25-10)
(m) Install RH sidewall air duct trim. (Refer to 25-10)
(n) Install RH crew seat. (Refer to 25-10)
(o) Perform Inspection/Check - Refrigerant Leak Test. (Refer to 12-10)
(p) Charge air conditioning system. (Refer to 12-10)
(q) Reset COMPRESSOR/CONTROL circuit breaker.
(r) Reset FAN circuit breaker.
(s) Perform Operational Test - Air Conditioning System. (Refer to 21-50)

(3) Inspection/Check - Evaporator
   (a) Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuum Cleaner</td>
<td>-</td>
<td>Any Source</td>
<td>Clean evaporator coil.</td>
</tr>
</tbody>
</table>

(b) Set BAT 1, BAT 2, and AVIONICS switches to OFF positions.
(c) Pull FAN circuit breaker.
(d) Pull COMPRESSOR/CONTROL circuit breaker.
(e) Remove RH crew seat. (Refer to 25-10)
(f) Remove bolts and washers securing evaporator cover and evaporator to fuselage.
(g) Open recirculation valves to access evaporator coil.
(h) Visually inspect evaporator inlet for airflow restrictions.
(i) Visually inspect evaporator for bent or dirty fins. Straighten and clean fins as necessary.
(j) Visually inspect evaporator coil for dirt and debris.
(k) Using vacuum cleaner, remove large debris from evaporator coil.
(l) Close recirculation valves.
(m) Position evaporator and cover to fuselage floor and secure with bolts and washers.
(n) Install RH crew seat. (Refer to 25-10)
(o) Reset COMPRESSOR/CONTROL circuit breaker.
(p) Reset FAN circuit breaker.
(q) Perform Operational Test - Air Conditioning System. (Refer to 21-50)
C. Condenser (See Figure 21-501)

(1) Removal - Condenser
   (a) Set BAT 1, BAT 2, and AVIONICS switches to OFF positions.
   (b) Pull CONDENSER circuit breaker.
   (c) Pull COMPRESSOR/CONTROL circuit breaker.
   (d) If removing condenser to perform Inspection/Check or to access pitch trim servo, flap actuator, condenser intake screen, or condenser exhaust screen, perform the following:

   Note: Refrigerant discharging is not required. Hose length allows condenser to be removed from fuselage floor with refrigerant plumbing still connected.

   1 Remove access panel CF5. (Refer to 06-00)
   2 Remove bolt, washer, and nut securing intake screen grounding strap to condenser.
   3 Serials 1602, 1821, 1840, 1863 thru 2043: Remove bolt, washers, and nut securing exhaust screen grounding strap to condenser.
   4 Remove screws securing condenser to fuselage floor.
   5 Remove condenser from fuselage floor as necessary to perform Inspection/Check or to access pitch trim servo, flap actuator, condenser intake screen, or condenser exhaust screen.

   (e) If removing condenser for replacement, perform the following:

   1 Discharge air conditioning system. (Refer to 12-10)
   2 Remove access panel CF5. (Refer to 06-00)
   3 Remove RH rear cabin side trim. (Refer to 25-10)

   CAUTION: Before disconnecting plumbing, ensure vacuum in system is minimal or the O-rings could be pulled into the system.

   4 Disconnect condenser hoses from plumbing bulkhead. Discard O-rings.
   5 Cap fittings and hoses.
   6 Remove cable ties securing condenser hoses to fuselage.
   7 Remove bolt, washer, and nut securing grounding strap to condenser intake screen.
   8 Serials 1863 thru 2043: Remove bolt, washers, and nut securing grounding strap to condenser exhaust screen.
   9 Remove screws securing condenser to fuselage floor. Remove condenser from airplane.

(2) Installation - Condenser
   (a) Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor Oil</td>
<td>(See Figure 12-101)</td>
<td>Any Source</td>
<td>Lubricate O-rings.</td>
</tr>
</tbody>
</table>

   (b) Position condenser to fuselage floor and secure with screws.
   (c) Position intake screen grounding strap to condenser and secure with bolt, washer, and nut.
   (d) Serials 1863 thru 2043: Position exhaust screen grounding strap to condenser and secure with bolt, washers, and nut.
   (e) If condenser was disconnected from refrigerant plumbing, perform the following:

   1 Remove caps from fittings and hoses.
CAUTION: Polyolester oil and polyalkylene glycol oil are not interchangeable. Verify compressor part number to determine which oil type to use. (See Figure 12-101)

2. Lubricate new O-rings with compressor oil.
3. Connect low pressure condenser hose to plumbing bulkhead. Torque hose and fittings to 180 to 240 in-lb (20.3 - 27.1 Nm).
4. Connect high pressure condenser hose to plumbing bulkhead. Torque hose and fittings to 120 to 160 in-lb (13.6 - 18.0 Nm).
5. Install cable ties securing condenser hoses to fuselage.
6. Perform Inspection/Check - Refrigerant Leak Test. (Refer to 12-10)
7. Install RH rear cabin side trim. (Refer to 25-10)
8. Charge air conditioning system. (Refer to 12-10)

(f) Install access panel CF5. (Refer to 06-00)
(g) Reset COMPRESSOR/CONTROL circuit breaker.
(h) Reset CONDENSER circuit breaker.
(i) Perform Operational Test - Air Conditioning System. (Refer to 21-50)

(3) Inspection/Check - Condenser
(a) Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuum Cleaner</td>
<td></td>
<td>Any Source</td>
<td>Clean condenser coil.</td>
</tr>
</tbody>
</table>

(b) Set BAT 1, BAT 2, and AVIONICS switches to OFF positions.
(c) Pull CONDENSER circuit breaker.
(d) Pull COMPRESSOR/CONTROL circuit breaker.
(e) Remove access panel CF5. (Refer to 06-00)
(f) Remove clamps and sleeve securing exhaust duct to condenser.
(g) Remove bolt, washer, and nut securing grounding strap to condenser intake screen.
(h) **Serials 1602, 1821, 1840, 1863 thru 2043:** Remove bolt, washers, and nut securing grounding strap to condenser exhaust screen.
(i) Remove screws securing condenser to fuselage floor.
(j) Raise condenser out of fuselage floor as necessary to inspect and clean.
(k) Visually inspect condenser inlet for airflow restrictions.
(l) Visually inspect condenser for bent or dirty fins. Straighten and clean fins as necessary.
(m) Visually inspect condenser coil for dirt and debris.
(n) Using vacuum cleaner, remove large debris from condenser coil.
(o) Position exhaust duct to condenser and secure with cable tie.
(p) Position grounding strap to intake screen and secure with bolt, washer, and nut.
(q) **Serials 1863 thru 2043:** Position grounding strap to exhaust screen and secure with bolt, washers, and nut.
(r) Position condenser to fuselage floor and secure with screws.
(s) Install access panel CF5. (Refer to 06-00)
(t) Reset COMPRESSOR/CONTROL circuit breaker.
(u) Reset CONDENSER circuit breaker.
(v) Perform Operational Test - Air Conditioning System. (Refer to 21-50)
D. System Plumbing (See Figure 21-501)

(1) Removal - System Plumbing
   (a) Discharge air conditioning system. (Refer to 12-10)
   (b) Remove RH sidewall air duct trim. (Refer to 25-10)
   (c) Remove RH rear cabin side trim. (Refer to 25-10)
   (d) Remove cable ties securing plumbing to fuselage.

   **CAUTION:** Before disconnecting plumbing, ensure vacuum in system is minimal or the O-rings could be pulled into the system.

   (e) Disconnect plumbing.
   (f) Discard O-rings.
   (g) Cap fittings and hoses.

(2) Installation - System Plumbing
   (a) Acquire necessary tools, equipment, and supplies.

<table>
<thead>
<tr>
<th>Description</th>
<th>P/N or Spec.</th>
<th>Supplier</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressor Oil</td>
<td>(See Figure 12-101)</td>
<td>Any Source</td>
<td>Lubricate O-rings.</td>
</tr>
</tbody>
</table>

(b) Remove caps from fittings and hoses.

   **CAUTION:** Polyolester oil and polyalkyline glycol oil are not interchangeable. Verify compressor part number to determine which oil type to use. (See Figure 12-101)

(c) Lubricate new O-rings with compressor oil.
(d) Connect plumbing.
   1. Torque 1/2 inch (13 mm) hose and fittings to 120 - 160 in-lb (13.6 - 18.0 Nm).
   2. Torque 5/8 inch (16 mm) hose and fittings to 180 - 240 in-lb (20.3 - 27.1 Nm).
   3. Torque 3/4 inch (19 mm) hose and fittings to 250 - 350 in-lb (28.2 - 39.5 Nm).
(e) Position plumbing to fuselage and secure with cable ties.
(f) Install RH sidewall air duct trim. (Refer to 25-10)
(g) Install RH rear cabin side trim. (Refer to 25-10)
(h) Charge air conditioning system. (Refer to 12-10)
(i) Perform Operational Test - Air Conditioning System. (Refer to 21-50)
E. Operational Test - Air Conditioning System

(1) Operational Test - Air Conditioning System
(a) Start engine in accordance with Pilot's Operating Handbook procedures.
(b) Open cabin air panel vents.
(c) Set temperature control knob to the snowflake symbol position.
(d) Verify AC ON light illuminates.
(e) At 5 minutes, verify cool air exits cabin air panel vents.
(f) Rotate airflow control knob through all fan positions. Verify fan operates at all speeds and airflow increases at each position.
(g) Rotate temperature control knob to turn off air conditioning system.
(h) Shutdown engine in accordance with Pilot's Operating Handbook procedures.
LEGEND
1. Service Ports
2. Pressure Line

Figure 21-501
Air Conditioning System (Sheet 1 of 4)
EFFECTIVITY:
All

NOTE
Verify compressor drive belt tension equals approximately 8.0 lbs (3.6 kg) with 0.25 inch (6.40 mm) of deflection at mid span of belt.

Figure 21-501
Air Conditioning System (Sheet 2 of 4)
Figure 21-501
Air Conditioning System (Sheet 3 of 4)

SERIALS 1602, 1840, 1863 THRU 2333, 2335 THRU 2419, 2421 THRU 2437.

DETAIL B

EFFECTIVITY:
All

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Figure 21-501
Air Conditioning System (Sheet 4 of 4)

NOTE
Serials 1602, 1821, 1840, 1863 thru 2043: Exhaust grounding strap installed on these airplanes only.

DETAIL C

LEGEND
4. Screw
5. Bolt
6. Washer
8. Nut
25. Condenser
26. Intake Grounding Strap
27. Exhaust Grounding Strap

SR22_MM21_2313A
Figure 21-502
Compressor Assembly - Serials w/ Keith Products Compressor

LEGEND
1. Compressor
2. Drive Unit
3. Drive Shaft
4. Screw
5. Bolt
6. Washer
7. Nut
8. Vibration Dampener
9. Key
10. Flange
11. Turnbuckle
12. Belt

EFFECTIVITY:
Serials w/ Keith Products Compressor

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