



KEITH PRODUCTS, INC.

SERVICE BULLETIN: SB124-1

AIR CONDITIONING SYSTEM

REFRIGERANT CONVERSION TO R134a

**FOR CESSNA AIRCRAFT
MODELS 402B (S/N 402B0301 AND UP),
414 (S/N 414-0351 AND UP),
414A, 421B, AND 421C (ALL S/Ns, 6 – 10 seat)**

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LIST OF REVISIONS

<u>Rev</u>	<u>Date</u>	<u>Description</u>	<u>By</u>	<u>Approved</u>
Orig	7/9/94	Initial release	LCD	TJS
A	7/13/98	Added P/N JBS10-51 Added step 12.16 Added figure 2		
B	8/18/00	Changed format to one presently being used	BAT	HOA
C	11/21/01	Added Spacer (JBS456-5) to Supplied Parts List, Added installation of spacer to comp. to to 12.12 page 5	BCS	JTD
D	11/14/02	Added P/N ES40049-4 to Supplied Parts List	LAW	<i>MAE</i>

1.0 SUBJECT:

Conversion of Cessna aircraft existing air conditioning system refrigerant from R12 to R134a.

2.0 EFFECTIVITY:

Keith Products, Inc., air conditioning system installed on Cessna 402B (S/N 402B0301 and up), 414 (S/N 414-0351 and up), 414A, 421B, and 421C (all S/Ns, 6 – 10 seat), aircraft in accordance with STC SA8RM.

3.0 REASON:

This service bulletin describes the revised configuration of STC SA16RM required to convert from an R12 to R134a refrigerant system.

4.0 DESCRIPTION:

This service bulletin provides for replacement of the compressor, receiver/dryer bottle, and expansion valve; and adds the installation of a pressure switch and service valve assembly to produce an efficient R134a air conditioning system.

5.0 COMPLIANCE:

Optional.

6.0 APPROVAL:

FAA approved.

7.0 ELECTRICAL LOAD DATA:

No change.

8.0 WEIGHT AND BALANCE:

Negligible.

9.0 ACCOMPLISHMENT TIME:

It is estimated to take one mechanic eight hours to accomplish this service bulletin.

10.0 PARTS SUPPLIED WITH KIT:

<u>QUANTITY</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	ES49000-1	Sealant Container
1 (18" length)	ES06022-1	Insulation Tape (suction line use)
1 (4" x 4")	ES02163-2	Insulation with Adhesive
1	JBS2020-1	Pressure Switch Assembly
1	JBS201-16	Compressor Assembly
1	ES43029-3	Receiver/Dryer Bottle
2	ES26101-1	Expansion Valve
2	ES40049-3	Fitting (flare)
2	ES40049-4	Fitting (flare)
1	JBS921-2	Service Valve Assembly (high side)
1	JBS921-1	Service Valve Assembly (low side)
1	JBS162-4	Wire Assembly
1	ES55079-1	Knife Splice
2 (lengths)	JBS570-10	Tubing
4	ES30015-5	Cable Tie
4	JBS10-64	R134a Placard
1	TR-134	Service Manual
1	JBS10-51	Placard Sticker (incomplete)
4	JBS456-5	Spacer

11.0 PUBLICATIONS AFFECTED:

Service Manual TR-134 for vapor cycle air conditioning systems replaces Service Manual TR-128.

12.0 ACCOMPLISHMENT INSTRUCTIONS:

NOTE: Perform the procedural steps of the Accomplishment Instructions (12.0) for ALL aircraft models. When the effectivity of specific aircraft models require a change in the performance of a step, for that specific aircraft installation, the step will indicate the aircraft model effectivity.

- 12.1 Disconnect aircraft battery and ground power cart.
- 12.2 Gain access to the compressor assembly located under the floor panel in the lower aft area of the baggage compartment between Frame Station (FS) 70 and FS 100 and locate the air conditioning system servicing valves on the compressor.
- 12.3 Discharge the R12 refrigerant system in accordance with the recover/recycle unit's manufacturer's instructions. Keith Service Manual TR-134 may be used as reference material.
- 12.4 On the compressor/motor mounting assembly, locate the six mounting bolts, two hose connections (one on the suction line side of the compressor, one on the discharge side of the compressor going to the condenser assembly). On the condenser fan assembly, locate one hose connection (between the condenser and the "in" connection of the receiver/dryer bottle located on the compressor/motor assembly). Locate four electrical connections (one ground strap, two to the relay, one to the condenser fan) near the motor/compressor.

Disconnect and remove the compressor and condenser hoses. Disconnect the electrical connections for the compressor drive motor between the aircraft and the condenser fan assembly. Remove the compressor/motor assembly mounting bolts. Completely remove the compressor/motor assembly mounting and the condenser hoses from the aircraft to a work area.

- 12.5 Disconnect both connections to the receiver/dryer bottle. Remove the receiver/dryer bottle. Scrap the receiver/dryer bottle and dispose of properly. Replace the receiver/dryer with P/N ES43029-3 receiver/dryer bottle. Align the bottle with the "in" marking to face forward in the aircraft. DO NOT reconnect any hoses to the receiver/dryer bottle at this time.
- 12.6 Loosen the belt-tensioning device and remove the compressor drive belt from the compressor pulley. At this time you may inspect the drive belt for signs of wear and may replace it, if necessary.
- 12.7 Remove the compressor mounting bolts, and then remove the old compressor. Remove the existing reducer fitting (ES45016-2) from the

discharge port of the old compressor. KEEP the reducer. It will be reinstalled onto the pressure switch port (reference step 12.12) to provide the connection to the discharge hose. Scrap the compressor and dispose of properly.

12.8 Gain access to the evaporator assembly:

AIRCRAFT EFFECTIVITY:

Model 402B (S/N 402B0301 and up), located above the cabin floor, left-hand side of aircraft, mounted to a cabin divider at FS 154.50. Verify that an optional evaporator assembly does not/does appear on the right-hand side of the aircraft on the same cabin divider installation.

Models 414 (S/N 414-0351 and up), 414A, 421B, & 421C (all S/Ns, 6 – 10 seat), located above the cabin floor, left-hand and right side of the aircraft, mounted to the cabin floor (in a cover assembly), behind the right and left-hand seat supports, at FS 154.50. Some aircraft installations may also have a cabin divider in this area.

12.9 Disconnect the inlet and outlet hoses attached to the evaporator(s). Remove the remote sensing bulb(s) from the evaporator suction line(s) near the coil(s) by removing the insulation and loosening the bulb clamp(s). Remove the expansion valve(s) with attached remote sensing bulb(s), scrap, and dispose of properly.

12.10 With the compressor hoses, the condenser hoses, the receiver/dryer bottle, and the evaporator hoses disconnected, prepare to purge the evaporator coils, condenser, and hoses of the mineral-based refrigerant oil (reference step 12.11). Purge with dry nitrogen at 100 to 200 psig. It is recommended that a typical shop type air nozzle with a rubber tip be adapted to the dry nitrogen regulator.

WARNING: It is recommended that eye protection be worn, and adequate ventilation provided to protect personnel from high velocity oil vapor exiting tube openings, to protect personnel and the airplane.

12.11 Purge the system components as described:

A. Condenser: With both lines removed, insert the air nozzle into the upper fitting of the condenser. Cover the lower fitting with a cloth and purge with dry nitrogen until no oil is visible.

- B. Refrigerant lines: With all lines disconnected, cover the opposite line ends with a cloth and individually purge each line with dry nitrogen until no oil is visible.
 - C. Evaporator(s): With both lines disconnected to each evaporator(s) and expansion valve(s) removed, insert air nozzle in the fitting where the expansion valve was located. Cover the other fitting with a cloth and purge with dry nitrogen until no oil is visible.
- 12.12 Install the new pressure switch P/N JBS2020-1 onto the discharge port of the R134 compressor P/N JBS201-16. Install the existing reducer fitting (ES45016-2), removed from the old compressor (reference step 12.7) onto the hose end of the new pressure switch (JBS2020-1). Use ES49000-1 sealant on all mating surfaces of fitting-to-fitting connections before assembly. Install the spacer P/N JBS456-5 into the bottom 4 mounting holes of the Compressor Assy. P/N JBS201-16. Stake the ends of the ears of the compressor (min. 3 plcs. each side) with a center punch with the AN4-11A bolts installed in the spacer to prevent deforming the spacer i.d.
- 12.13 Mechanically install the new compressor/pressure switch assembly onto the compressor/motor assembly in the reverse order of the removal procedures. The new pressure switch (P/N JBS2020-1) installed onto the R134 compressor (P/N JBS201-16) will require a modification for the electrical connection.
- 12.14 To electrically connect the two pressure switch wires, in series, into the existing compressor control (+28 Vdc) electrical wire between the power source and the relay coil X-1 terminal, see figure 1, electrical diagram. Remove the existing compressor control power wire connected to the relay coil X-1 terminal. Cut the ring terminal from this wire end. Install knife splice ES55079-1 to the end of this wire. Slide one length of tubing JBS570-10 over the splice, to clear the splice. Attach this knife splice to the knife splice of the red/white wire of the pressure switch. Slide the length of tubing so that it is now positioned over/covering both splices and secure in place using two ES30015-5 cable ties, one on each end of the tubing.

NOTE: The red/white wire on the new pressure switch is electrically the same as the black/white wire. Wire colors have been specified in this procedure to ensure installation consistency.

Attach the ring terminal end of wire assembly JBS162-4 to the X-1 terminal on the relay coil. Slide one length of tubing JBS570-10 over the knife splice end of this wire assembly to clear the splice. Attach this knife splice to the knife splice of the black/white wire of the pressure switch. Slide the length of tubing so that it is now positioned over/covering both splices and secure in place using two ES30015-5 cable ties, one on each end of the tubing.

NOTE: During the performance of all mechanical reassembly procedures, use ES49000-1 sealant on all mating surfaces of fitting-to-fitting connections before assembly. Ensure that all existing metal fittings not previously disassembled are now disassembled and reattached using the ES49000-1 sealant on the mating surfaces of fitting-to-fitting connections.

- 12.15 Install the compressor/motor assembly into the aircraft in the reverse order of the removal procedures.
- 12.16 Transfer the serial number from the existing 34-040-20 or -40 pallet assembly, to the provided JBS10-51 placard in typed black ink. The SB after the P/N indicates that this new pallet was created in accordance with this service bulletin (see figure 2).
- 12.17 Reconnect the discharge hose from the condenser to the "in" port of the receiver/dryer bottle. Reconnect the compressor hoses (suction and discharge), and the output side of the receiver/dryer bottle hose. Apply ES49000-1 sealant to all mating surfaces of the fitting-to-fitting connections.
- 12.18 Apply ES49000-1 sealant to the fittings on the new ES26101-1 expansion valve(s), then install onto evaporator inlet connection. The remote sensing bulb(s) must be located on the evaporator suction line copper tube near the evaporator coil. Ensure that the bulb is in complete physical contact with the suction tube, along its entire length. Clamp bulb(s), attach ES02163-2 adhesive backed insulation completely over sensing bulb(s) and tube(s), and then trim off excess insulation.

- 12.19 The service valves assemblies are to be installed in an accessible location as close as possible to the receiver/dryer bottle location (between FS 94.75 and FS 100.00).
- 12.20 Locate the discharge hose (.54 O.D., .38 I.D., attaches to the receiver/dryer bottle outlet) and cut the hose, one time, in a location between FS 94.75 and FS 100.00.
- 12.21 Install one ES40049-3 flare fitting on each of the cut ends of the discharge hose.
- 12.22 Install the JBS921-2 service valve assembly between the two ES40049-3 discharge hose flared fittings. Apply ES49000-1 sealant on the flared mating surfaces of the fitting-to-fitting connections.
- 12.23 Apply one each JBS10-64 placard on the swaged end of the hose fittings on each side of the JBS921-2 service valve assembly.
- 12.24 Locate the suction line (.70 O.D., .50 I.D., attaches to the suction side of the compressor) and cut the hose, one time, in a location between FS 94.75 and FS 100.00.
- 12.25 Install one ES40049-4 flare fitting on each of the cut ends of the suction hose.
- 12.26 Install the JBS921-1 service valve assembly between the two ES40049-4 suction hose flared fittings. Apply ES49000-1 sealant to the mating surfaces of the fitting-to-fitting connections. Wrap insulation tape ES06022-1 around the service line assembly and connecting hose fittings.
- 12.27 Apply one each JBS10-64 placard on the swaged end of the hose fitting on each side of the JBS921-1 service valve assembly.
- 12.28 Connect all hoses, after applying sealant on all mating surfaces of fitting-to-fitting connections. Evacuate and charge the air conditioning system and check for leaks.

CAUTION: Check the polyolester oil level in the JBS201-16 compressor assembly as instructed in Service Manual TR-134. Specific instructions regarding discharging, evacuation, and charging of the air conditioning

system should be done in accordance with the recover/recycle unit's manufacturer's instructions, using TR-134 as reference material.

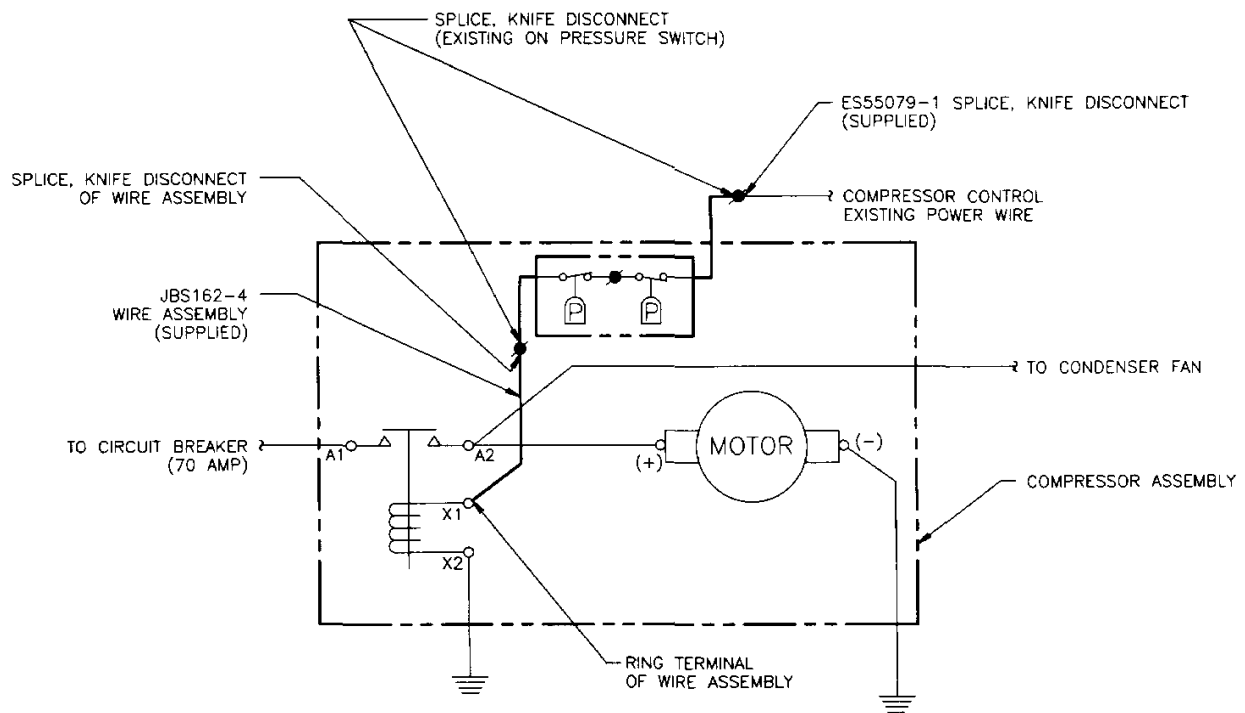


FIGURE 1. ELECTRICAL DIAGRAM

(SB123-1)

IF ORIGINAL PLACARD IS 34-040-20, USE THIS PLACARD:

Keith	JBS10-51
TITLE <u>COMP/COND ASSY</u>	
P/N <u>34-040-41SB</u>	
SER. NO. _____	TRANSFER OLD 34-040-20 S/N HERE

IF ORIGINAL PLACARD IS 34-040-40, USE THIS PLACARD:

Keith	JBS10-51
TITLE <u>COMP/COND ASSY</u>	
P/N <u>34-040-42SB</u>	
SER. NO. _____	TRANSFER OLD 34-040-40 S/N HERE

FIGURE 2