SERVICE BULLETIN
NO. SB124-1A

KEITH PRODUCTS, L.P.

SERVICE BULLETIN: SB124-1A

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 421 C (all S/N's; 6-10 seats)

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RELEASE DATE
SEP 2 3 2003

REV: B
DATE: 9/29/03

LIST OF REVISIONS

REV.	DATE	DESCRIPTION	PAGE	APPROVAL
ORIG.	05-14-97	INITIAL RELEASE	ALL	MJR
A	07-13-98	REVISED P/L: ADDED P/N JBS10-51 ADDED P/N ES45016-2 P/N WAS ES41046-6 NOW ES41046-1 ADDED NEW STEP 12.16 REVISED FIGURE 2 ADDED FIGURE 4	 2 2 2 6 9 11	MJR
B	09-23-03	REFORMATTED PAGE NUMBERS REVISED PAGE 1, WAS INC., NOW L.P. REASON: WRONG PAGE NUMBER SEQUENCE, PER ER2213 P/N WAS AN365-428, NOW MS21044-N4 P/N WAS AN365-1032, NOW MS20365-1032 P/N WAS AN935-516, NOW MS35338-45	ALL	mtc

1.0 SUBJECT: Conversion of Cessna aircraft existing Air Conditioning System refrigerant from R12 to R134a.

2.0 EFFECTIVITY: Keith Products, L.P. 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/N's; 6-10 seat), aircraft in accordance with STC SA8RM.

3.0 REASON: This Service Bulletin describes the revised configuration of STC SA8RM required to convert from an R12 to an 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 assemblies 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 1 mechanic 8 hours to accomplish this service bulletin.

10.0 PARTS SUPPLIED WITH KIT:

QUANTITY	PART NO.	DESCRIPTION
1	ES49000-1	Sealant Container
1 (18" length)	ES06022-1	Insulation Tape (Suction Line use)
2 (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	ES40049-4	Fitting (flare)
2	ES40049-3	Fitting (flare)
1	JBS921-2	Service Valve Assembly (high side)
1	JBS921-1	Service Valve Assembly (low side)

10.0 PARTS SUPPLIED WITH KIT (Cont'd):

QUANTITY	PART NO.	DESCRIPTION
1	JBS162-4	Wire Assembly
1	ES55079-1	Knife Splice
2	JBS570-10	Tubing
4	ES30015-5	Ty-Wraps
4	JBS10-64	R134a Placards
4	AN4-11A	Bolt
1	AN5-3A	Bolt
5	MS21044-N4	Nut
1	MS20365-1032	Nut
5	AN960D10	Washer
4	AN960D416	Washer
1	AN960-10L	Washer
1	ES41047-2	Fitting
1	MS35338-45	Locker Washer
1	JBS59-11	Stud
1	JBS211-1	Spacer
1	JBS195-1	Comp. Mount
4	JBS456-5	Spacer
1	03-1552-6	Bracket
1	03-1552-3	Bracket
1	ES20033-2	V Belt
4	AN3-11A	Bolt
1	AN3-14A	Bolt
1	ES41046-1	Fitting
4	AN315-4	Nut
1	TR-134	Service Manual
1	JBS10-51	Placard Sticker (incomplete)
1	ES45016-2	Fitting (Straight Reducer)

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 R-12 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 (6) mounting bolts, two (2) 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 (1) hose connection (between the condenser and the "in" connection of the receiver/dryer bottle located on the compressor/motor assembly). Locate four (4) electrical connections (one ground strap, two to the relay, one to the condenser fan) near the motor/compressor.

NOTE

Before disconnecting the compressor, please make note of its orientation, as the compressor orientation may vary from the diagrams provided with this service bulletin. When installing the compressor the original orientation of the compressor, as it was installed in the aircraft air-conditioning installation, should be maintained.

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 inspect the drive belt for signs of wear and replace it, if necessary.

12.7 Remove the compressor mounting bolts, then remove the old compressor. Remove the existing reducer fitting (ES45016-2) from the discharge port of the old compressor. **KEEP** this 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(s):
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 FS154.50. Verify if an optional evaporator assembly does appears 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/N's; 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 FS154.50. 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. Be sure to make note of the expansion valve fitting location.

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. Covers should be used near 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.

12.13 Mechanically install the new compressor/pressure switch assembly on to the compressor/motor assembly in the reverse order of the removal procedures (See Fig. 2 & 3 on pages 9 and 10 for mounting details).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 (2) pressure switch wires, in series, into the existing compressor control (+28Vdc) 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 (2) ES30015-5 Ty-Wraps; 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 insure installation consistency.

Attach the ring terminal end of wire assembly JBS162-4 to the X-1 terminal of 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 (2) ES30015-5 Ty-Wraps; 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 assy, 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 4, page 11).

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 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), 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).

NOTE

Caution should be taken to ensure that the length of the hose is adequate to complete service valve installation.

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 (1) 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 (1) 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 (1) 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 (1) 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 TR-134 Service Manual. 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.

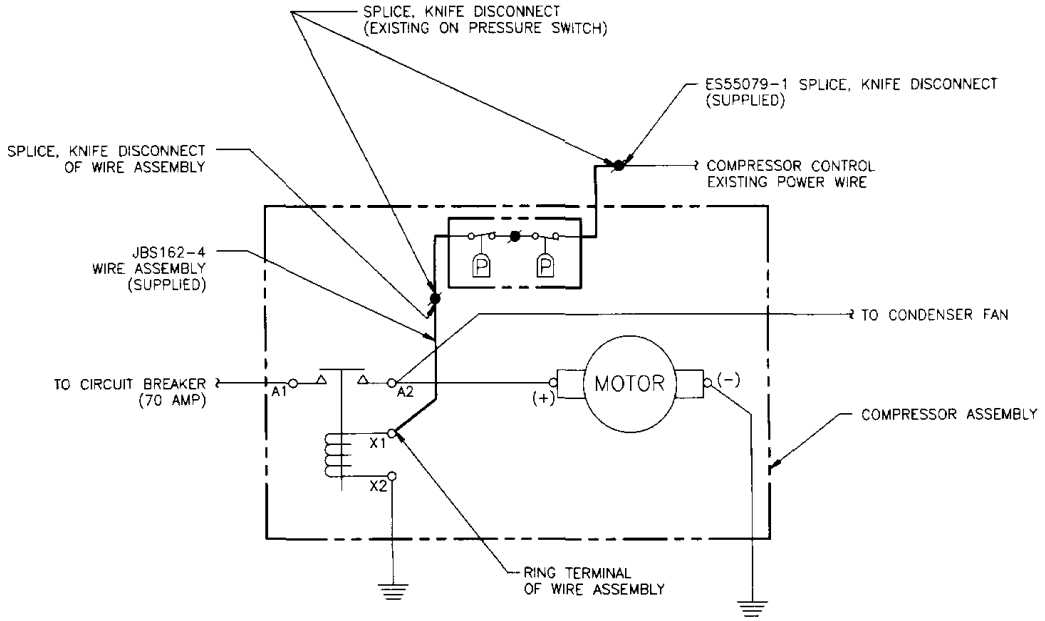


FIGURE 1. ELECTRICAL DIAGRAM (SB123-1)

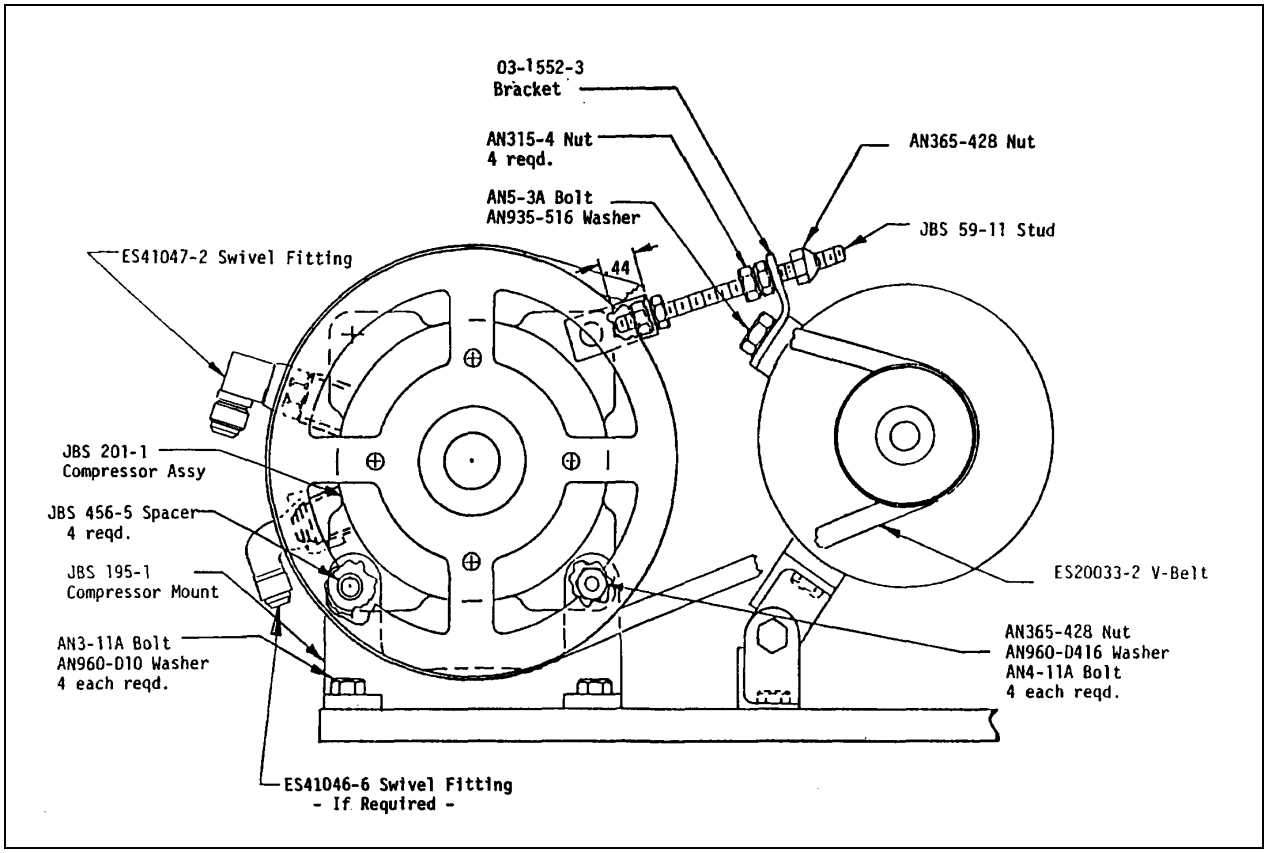

03-1552-3
Bracket
AN315-4 Nut
4 reqd.
AN5-3A Bolt
AN935-516 Washer
AN365-428 Nut
JBS 59-11 Stud
ES41047-2 Swivel Fitting
44
JBS 201-1
Compressor Assy
JBS 456-5 Spacer
4 reqd.
JBS 195-1
Compressor Mount
AN3-11A Bolt
AN960-D10 Washer
4 each reqd.
ES20033-2 V-Belt
AN365-428 Nut
AN960-D416 Washer
AN4-11A Bolt
4 each reqd.
ES41046-6 Swivel Fitting
- If Required -

FIGURE 2.

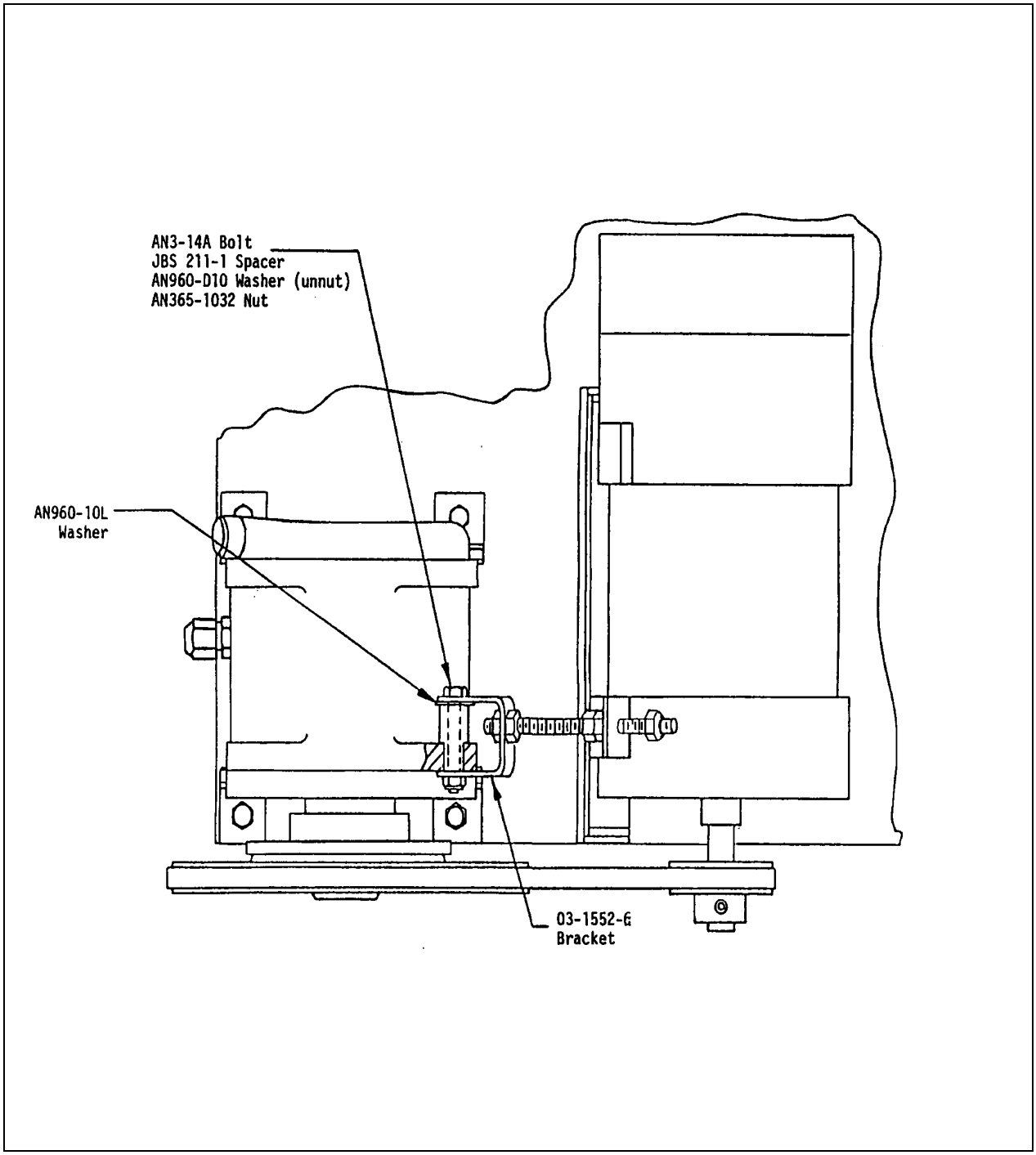
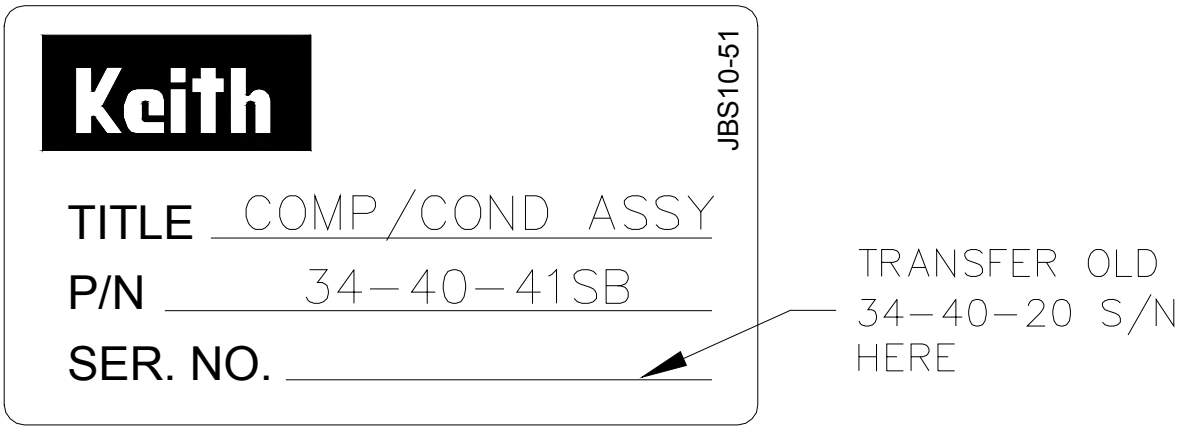

AN3-14A Bolt
JBS 211-1 Spacer
AN960-D10 Washer (unnut)
AN365-1032 Nut
AN960-10L
Washer
03-1552-G
Bracket

FIGURE 3.

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



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

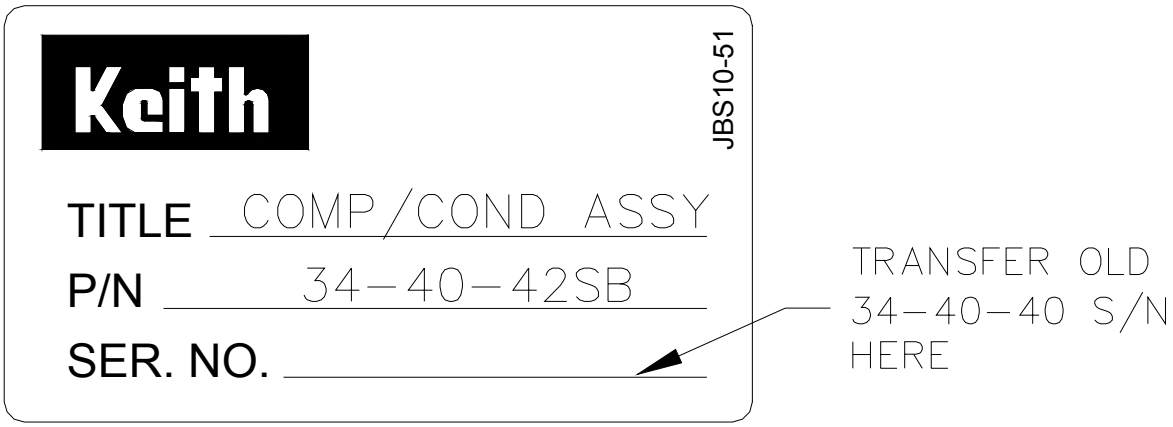


FIGURE 4