ELECTRICAL POWER-STATIC INVERTER - EMI FILTER ASSEMBLY RESISTOR REPLACEMENT

PLANNING INFORMATION

(1) Effectivity - Static Inverter, Part Number 1-002-0102-0714, (Boeing P/N S282T004-7) Model 1C1000-1B, Mod Levels "-"

(2) Reason - This service bulletin revision extends the part availability dates through August 31, 1994.

A Boeing Commercial Airplane Company operator utilizing the subject static inverter reported traces of an odor which was identified as heating of conformal coating used to coat the EMI Filter Printed Circuit Board Assembly resistor R8. A detailed engineering investigation found that the heat dissipated by the wirewound power resistor R8 discolored the conformal coating during operation. In order to eliminate this potential odor producing situation, AI^2 recommends replacement of the current 2 watt resistor with a 7 watt resistor which increases the resistor surface area thereby reducing the average temperature rise and eliminates the odor detected by the reporting operator. In addition, resistor R9 is increased from 1/2 watt to 2 watts for cooler operation.

(3) Description	-	Implementation of this Service Bulletin will require user to locate the effected static inverter(s), follow disassembly instructions to gain access to EMI Filter PCB Assembly, remove and replace two resistors R8 and R9, reassemble the static inverter, functional verification and return to stock or service, as applicable.
(4) Approval	-	This Service Bulletin has been reviewed by the Federal Aviation Administration (FAA) and the repair and modification herein complies with the applicable Federal Aviation Regulation (FAR) and are FAA approved.
5) Manpower	-	The estimated manpower required to accomplish the tasks outlined herein is 30 minutes.

(6) Material - Implementation of this service bulletin will require the following materials:

Description	Part Number	Qty	Date Available	Cost
Resistor, Fixed Wirewound (5.11 ohm, 7W, 1%)	1-001-0611-0068	1	31 Aug 1992	N/C
Resistor, Fixed Wirewound (5.11 ohm, 2W, 1%)	1-001-0611-0028	1	31 Aug 1992	N/C

These parts will be available August 31, 1992 through August 31, 1994. Send parts requests to Product Support Department at the address below and refer to this service bulletin number.

Avionic Instruments Inc.
1414 Randolph Ave
Avenel, NJ 07001 USA

In addition, the following commercially available items will be required to complete resistor replacement:

Description	Qty
Solder, Kester Type SN 63 or equivalent	approx. 0.5 oz.
Dow Corning Silicone Rubber Sealant (RTV) Type 738 or equivalent	approx. 0.5 oz.
3/32" Metal Stamp, Letter "A"	1
Conformal Coating per MIL-I-46058, Type AR or equivalent	approx. 0.5 oz.
3/32" Metal Stamp, Letter "X"	1

(7) Tooling - No special tools are required. This operation will require the following tools which are commercially available.

Description	Qty
#1 Phillips-head screwdriver	1
Hammer	1
Solder Iron	1
Needlenose Pliers	1

(8) Weight and Balance - Not Affected

(9) Electrical Load Data - Not Affected

(10) Software Accomplishment Summary - Not Affected

(11) References - None

(12) Other Publications Affected - Component Maintenance Manual No. 1-001-4902-0017

INSTRUCTIONS

Replacement of resistors R8 and R9 will require the operator to gain access to the EMI Printed Circuit Board Assembly located in the front half of the static inverter (See Figure 1).

CAUTION: DISCONNECT THE INPUT POWER PRIOR TO REMOVAL OF THE STATIC INVERTER FROM THE INSTALLATION TO AVOID ELECTRICAL SHOCK.

1. Place static inverter on flat surface base down.

   NOTE: Use care when removing and identifying removed hardware as there are screws of various lengths and sizes which must be properly replaced.

2. Remove top front cover by performing the following steps:

   1. - Removing four (4) 4-40 screws on top cover, item (40) of figure 1;
   2. - Remove six (6) 4-40 screws, three (3) on each side of unit, item (45) of figure 1 at location A;
   3. - Remove two (2) 4-40 screws from top of front panel, item (10) of figure 1;
   4. - Carefully remove top cover.

3. Turn inverter over, base up. Remove bottom cover by performing the following steps:

   1. - Remove seven (7) 4-40 screws on bottom cover, item (75) of figure 1.
   2. - Remove six (6) 4-40 screws, three (3) on each side, item (70) of figure 1 at location B.
   3. - Remove two (2) 4-40 screws from bottom of front panel, item (10) of figure 1.
   4. - Carefully remove bottom cover.

4. Turn inverter over so it is base down again.

5. Disconnect the cables connecting the EMI Filter Assembly to the balance of the unit as follows:

   NOTE: Order is not critical as long as all connections are disconnected prior to removal of EMI Filter Assembly.

   1. - Remove two (2) 6-32 screws item (22) of figure 1 and disconnect input filter cable harness.
   2. - Remove one (1) 4-40 screw item (25A) of figure 2 and disconnect on/off lead.
   3. - Remove one (1) 6-32 screw, item (100) of figure 1 and disconnect input power lead.
   4. - Remove one (1) 8-32 screw, item (110) of figure 1 and disconnect input power lead.
   5. - Turn inverter over so it is again top down.
   6. - Remove one (1) 4-40 screw, item (24) of figure 1 and disconnect the remote on/off lead.
   7. - Remove two (2) 4-40 screws, item (21) of figure 1 and disconnect overtemperature sense leads.
   8. - Remove two (2) 4-40 screws, item (26) of figure 2 and disconnect ac filter leads.
   9. - Remove six (6) 4-40 screws, items (20) and (15) of figure 1, three (3) on each side.

6. Carefully separate Front Panel/EMI Filter Assembly from the rest of the inverter.

7. Remove one (1) 6-32 screw, item (41) of figure 2 and disconnect input power cable.

8. Remove one (1) 6-32 screw, item (36) of figure 2 and disconnect other input power cable.

9. Remove two (2) 4-40 screws, item (16) of figure 2.

10. Lay front Panel/EMI Assembly, front side down and carefully remove eight (8) 4-40 screws, item (15) of figure 2.

11. The EMI Filter PCB Assembly can now be separated from the Front Panel Assembly.

12. Locate resistors R8 and R9 on PCB (see figure 3).

13. Desolder resistor R8 and discard.

14. Form new R8 resistor (P/N 1-001-0607-0066) as shown in figure 4 detail H.

15. Place two dollops of RTV Silicone Sealant, Item (39) on PCB as shown in figure 4 prior to installation of resistor R8.

16. Install and solder in new 5.00 ohms, 1%, 5W resistor (Part No. 1-001-0607-0066),in the R8 position on the PCB.

17. Locate resistor R9 (see figure 3).

18. Desolder resistor R9 and discard.

19. Form new resistor R9 (Part No. 1-001-0611-0028), new 5.11 ohms, 1%, 2W and install in PCB.

20. Solder new resistor in R9 position.

21. Touch-up and clean solder area around resistors R8 and R9.

22. Conformal Coat both resistors R8 and R9 following clean-up.

23. Reassemble EMI Filter Assembly following reverse order of Steps 11. thru 1.

    NOTE: Apply loctite to screws item (40) position "C" two places; and item (75) position "D" five places during reassembly.

24. Once reassembled, inspect for damage.

25. Reidentify mod level of the static inverter as follows:

    1. - Use the "X" metal stamp to stamp over the existing mod level.

    2. - Use the "A" metal stamp to reidentify the MOD LEVEL by stamping an "A" in the silver area next to the existing letter (See figure 5).

26. Perform function test to verify inverter performance in accordance with procedure outlined in Addendum 1.

27. Return inverter to stock or installation upon successful completion of functional test.

28. Should the inverter fail the functional test, test and troubleshoot unit or return to Avionic Instruments Inc. for repair.

MATERIAL INFORMATION

The following is a list of material required to implement the change outlined in this service bulletin.

New P/N	Qty	Unit List Price	Key Word	Old P/N	Instructions - Disposition
1-001-0611-0068	1	No Charge	Resistor, Fixed (R8)	1-001-0611-0028	Discard after removal
1-001-0611-0028	1	No Charge	Resistor, Fixed (R9)	1-001-0616-0005	Discard after removal

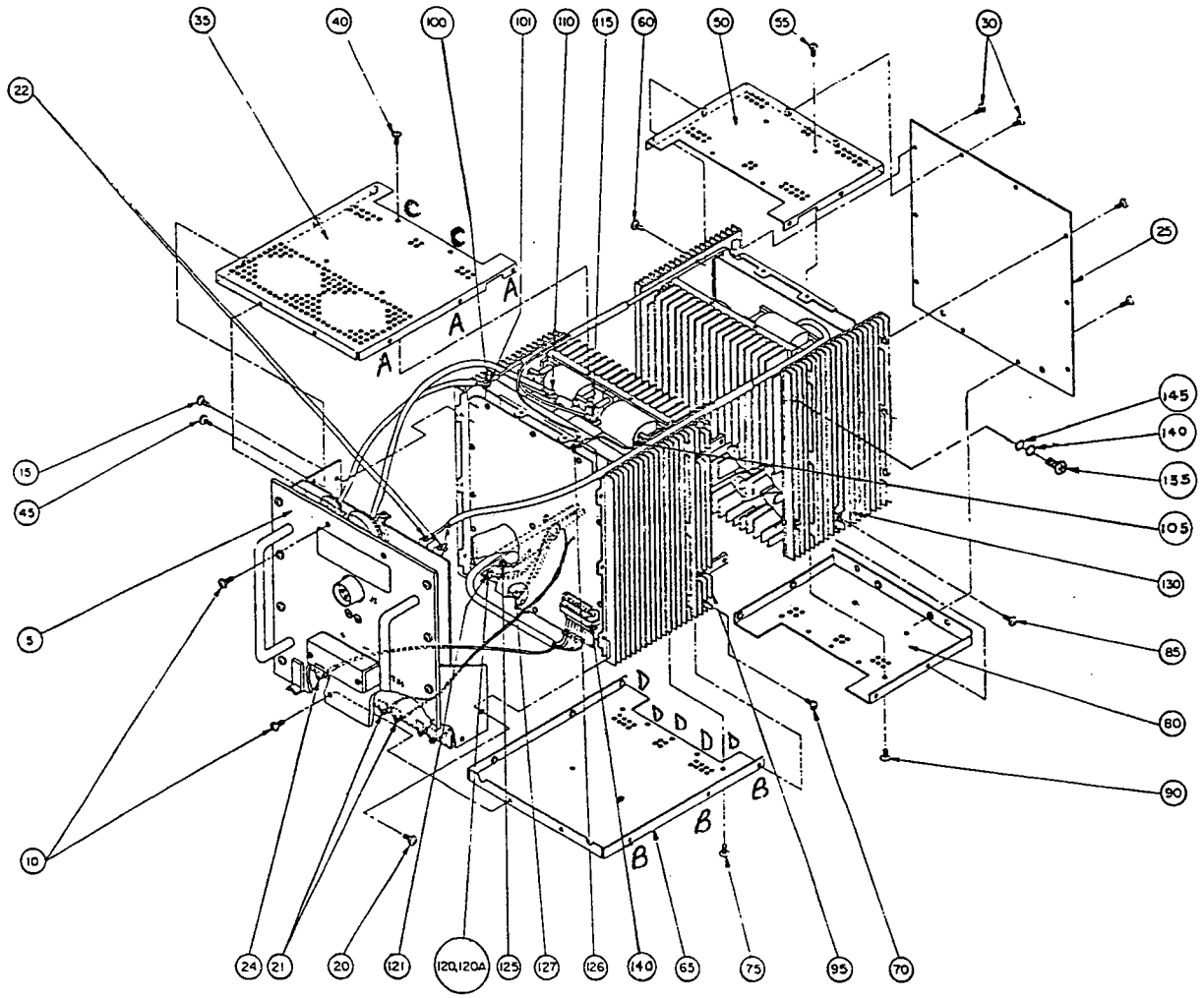

FIGURE 1
EXPOLDED VIEW -
MODEL 1C1000-1B STATIC INVERTER

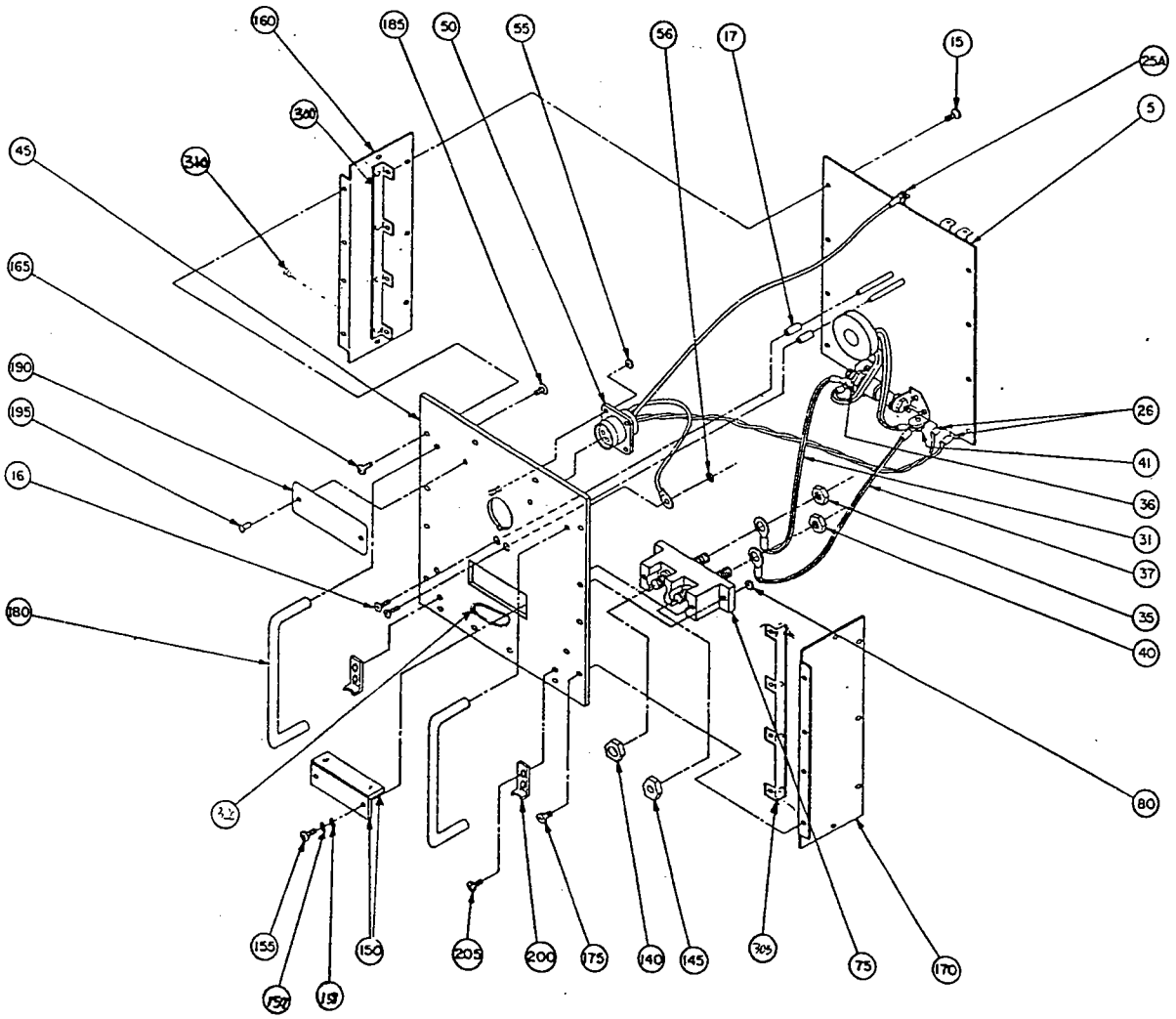

FIGURE 2
EXPOLDED VIEW -
FRONT PANEL/EMI FILTER ASSEMBLY

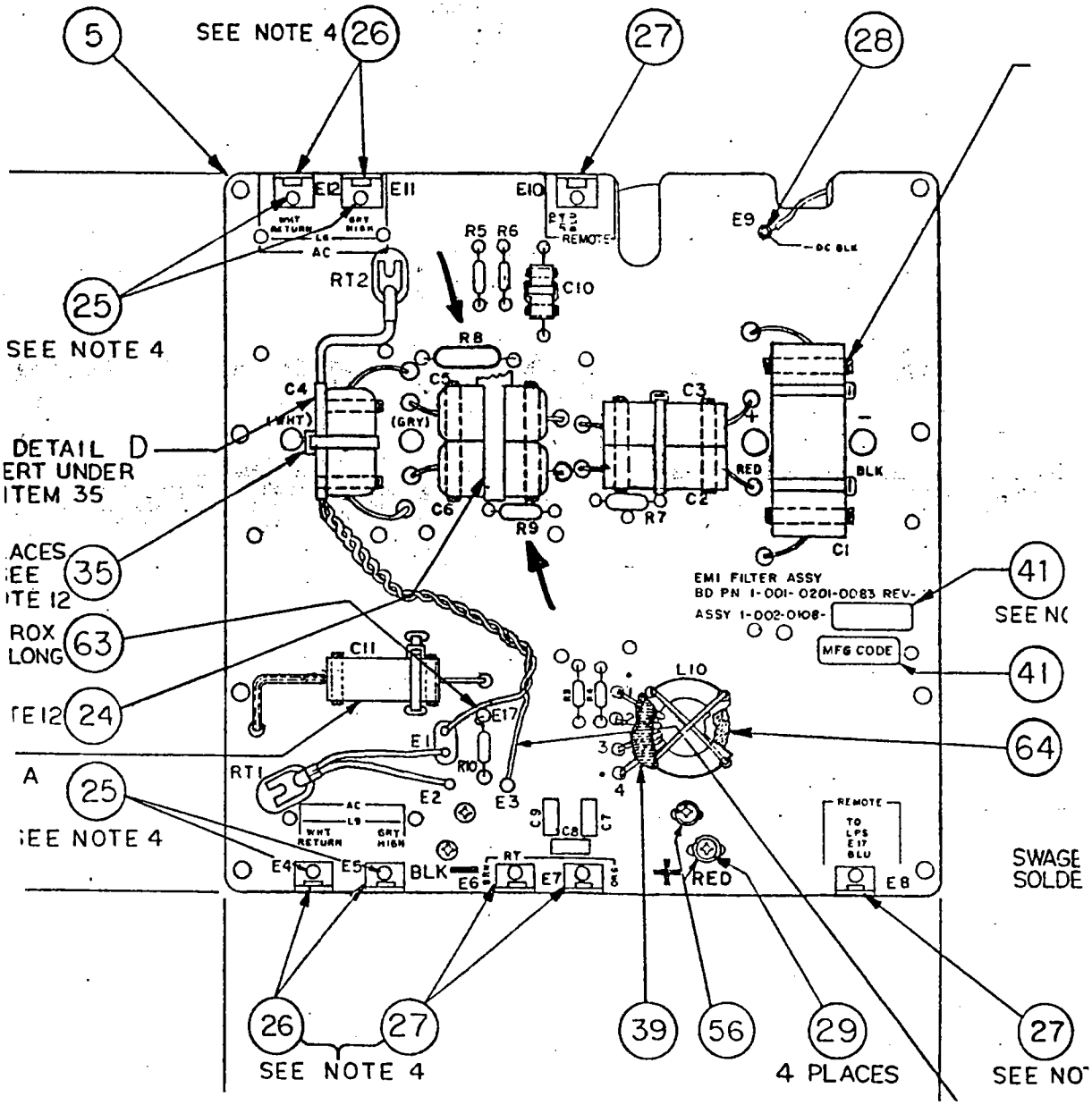

FIGURE 3
CURRENT EMI FILTER CONFIGURATION

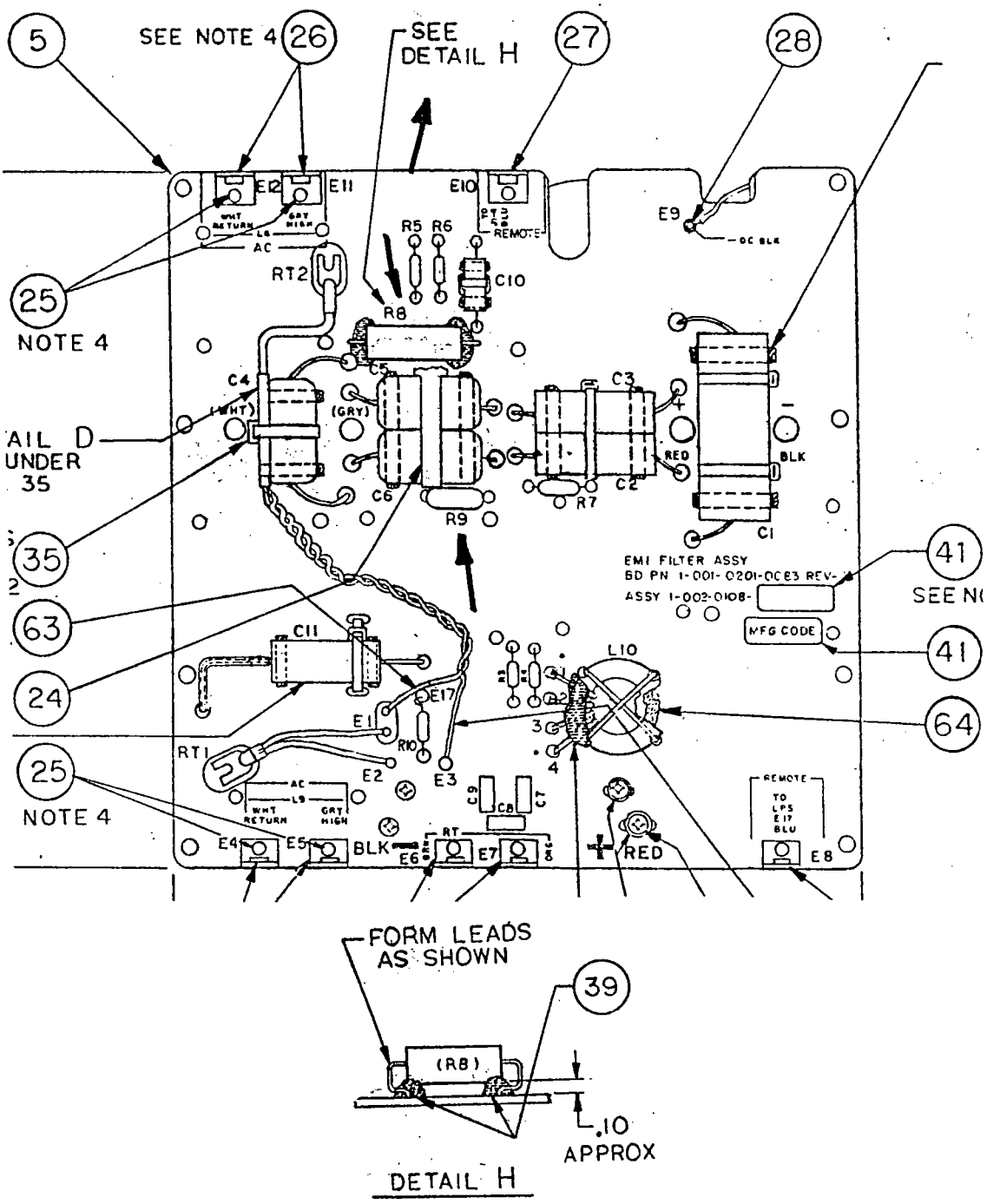

FIGURE 4
NEW EMI FILTER CONFIGURATION
INCLUDING R8 MOUNTING DETAILS

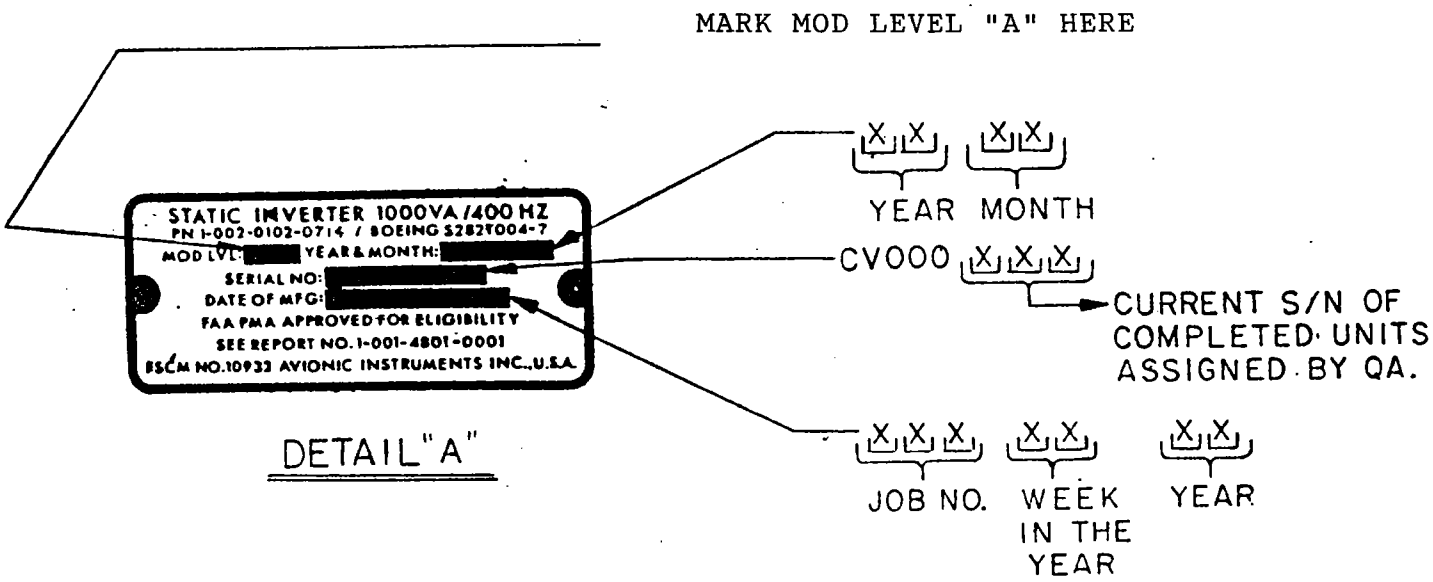

FIGURE 5
NAMEPLATE MARKING INFORMATION

ADDENDUM 1
FUNCTIONAL TEST REQUIREMENTS

1. General

This section contains instructions for testing the Model 1C1000-1B Static Inverter. Testing is performed according to the procedure outlined in this section. The purpose of this test is to demonstrate that the static inverter meets all critical parameters and operates within the specified limits.

2. Test Equipment

A. Required Test Equipment

Figure 101 specifies the test equipment that is required for this test procedure. Alternate test equipment may be substituted provided its accuracy and performance are suitable for obtaining data consistent with the requirements of this procedure.

B. Test Setup

Figure 102 specifies the connections for the test setup.

3. Testing

This procedure establishes the operating conditions for the unit.

WARNING: DISCONNECT ALL POWER FROM THE STATIC INVERTER BEFORE MAKING CONNECTIONS OR PERFORMING ASSEMBLY OR DISASSEMBLY OPERATIONS.

A. Test Setup (See Figure 102)

(1) Connect dc power supply, dc ammeter (with shunt, if required), and dc voltmeter to input of unit-under-test (UUT) -- TB1 on front panel. (Large diameter stud is positive; small diameter stud is negative.)

Equipment	Manufacturer	Model	Specifications
Dc Power Supply	Sorenson	-DCR40 125A	0 to 40 V, 0 to 125 A
Dc Voltmeter	Weston	931	0 to 50 V ± 2%
Dc Ammeter	Weston	931	0 to 100 A
Shunt for Dc Ammeter (if required)			
Ac Voltmeter, True Rms	Weston	433	0 to 150% ± 2%
Ac Ammeter	Weston	904	0 to 50 A ± 2%
Linear Load			1000 W
SPST Switch	Augat (Alco Switch)	TT13A-2T	3A, 28 Vdc

NOTE: Equivalent substitutes may be used

FIGURE 101

REQUIRED EQUIPMENT LIST FOR TEST PROCEDURE

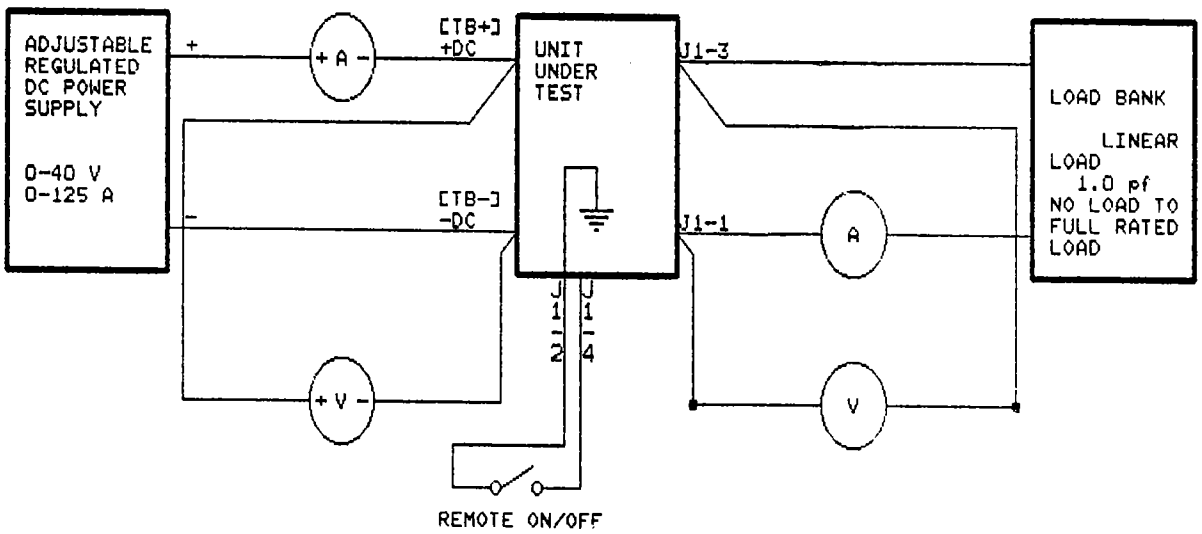

FIGURE 102
CONNECTIONS FOR TEST SETUP

A. Test Setup (See Figure 102) (Continued)

(2) Connect ac ammeter, ac voltmeter, and 1000 W nominal linear load to pins 1 and 3 of J1 on the front panel of the UUT.

NOTE: To minimize voltmeter reading error due to line losses, connect dc voltmeter directly to J1 and ac voltmeter directly to TB1.

B. Test Procedure

Perform steps of test procedure in listed order. Figure 103 specifies limits for each measured value. Testing must be stopped if any reading is out of tolerance and should be continued only after all faults have been corrected.

1. No-Load Test

(a) Disconnect 1000 W nominal linear load from J1 on UUT.

(b) Adjust dc power supply to 24 -2/+4Vdc.

(c) Measure and record input current, output voltage. Record measured values and compare to limits in Figure 103.

2. Full-load Test

   (a) Connect 1000 W nominal liner load to J1 on UUT. The calculated efficiency at full-rated load should be at least 82% for input for input voltages of 22 V or greater using the equation efficiency equals output voltage times output current divided by input voltage times input current multiplied by 100.

   (b) Adjust dc power supply to 24 -2/+4Vdc.

   (c) Measure and record input current, output voltage. Record measured values and compare to limits in Figure 103.

3. Remote On/Off Test

   (a) Adjust dc power supply to 24 -2/+4Vdc.

   (b) Close remote on/off switch for 5 seconds. (This grounds Pin J1-4).

   (c) UUT output should be zero.

   (d) Open remote on/off switch. Verify that output returns.

   (e) Turn off dc power supply and disconnect load.

C. Limits, Measured Values

Check all readings against values specified in Figure 103. Repairs are required if input current, output voltage, or efficiency are not within tolerance.

Input		Output			
Voltage (Vdc)	Current (Adc)	Voltage (Vrms)	Current (A)	Eff. (%)	Load (W) nominal
22-28	3.5 (1)	110-120	0	N/A	0
22-28	70 (1)	110-120	8.7 (2)	82	1000

(1) Worst case input current limit for 22 V input, 1000 W load.

(2) Nominal output current, load dependent. 1000 W load current equal to output voltage divided by load resistance (typically 13.2 ohms at 1000 W).

FIGURE 103
LIMITS FOR MEASURED VALUES