service bulletin

from AVIONIC INSTRUMENTS INC.

1-001-5601-0019

ELECTRICAL POWER-STATIC INVERTER - STANDOFF/INSULATOR SCREW ASSEMBLY INSTALLATION

I PLANNING INFORMATION

A Effectivity - Static Inverter, Part Number 1-111-0102-0714, (Boeing P/N S282T004-8), Mod Level "-": Part Number 1-002-0102-0714, (Boeing S282T004-7), Model 1C1000-1B, Mod Levels "-" thru "B"; and Part Number 1-002-0102-0265, (Boeing S282T004-5), Model 1C1000-1A, Mod Levels "-" thru "F".

B Reason - Engineering Quality Analysis (EQA) conducted by Boeing Commercial Airplane Company on a model 1C1000-1B static inverter determined that a potential arcing condition exists if the bottom cover is depressed or dented by excessive pressure or impact. The addition of four standoff/insulator screw assemblies at two top and two bottom locations for added rigidity to prevent a potential arcing condition from occurring in the event of impact or cover depression.

C Description - Installation to the four standoff/insulator screw assemblies will require removal of the forward top and bottom covers of the static inverter and attachment of the four standoff/insulator assemblies using a 5/16" nutdriver.

D Approval - This Service Bulletin contains no modification information that revises the approved configuration, and therefore does not require FAA or other regulatory agency approval.

E Manpower - The estimated manpower required to accomplish this task is 10 minutes.

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F Material Cost and Availability - Operators who intend to do this change at their facility may obtain the parts shown in paragraph III A., Parts Required Per Component, from vendor as shown below. The data shows the date when the parts are available.

Part Number	Qty	Unit Price	Name	Date Available
1-002-2802-0065	1	N/C	Standoff/ Insulator Screw Assy #4-40	3 Jan 1994
1-002-2803-0056	1	N/C	Standoff/ Insulator Screw Assy #6-32	3 Jan 1994
1-002-2804-0027	2	N/C	Standoff/ Insulator Screw Assy #8-32	3 Jan 1994

1. The parts will be available January 3, 1994 through January 3, 1995. Send parts requests to Product Support Department at the address below and refer to this service bulletin number.

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G Tooling - NONE

H Weight and Balance - Net weight change +/-.01 lbs.

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I	Electrical Load Data	- Not Affected
J	Software Accomplishment Summary	- Not Applicable
K	Reference	- None
L	Other Publications Affected	- Component Maintenance Manual, ATA No. 24-20-27, 1-001-4902-0017 and ATA No. 24-20-23, 1-001-4902-0013 will be revised to include this service bulletin.

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II ACCOMPLISHMENT INSTRUCTIONS

Addition of the standoff/insulator screw assembly requires the installer to remove the forward top and bottom covers of the static inverter.

CAUTION: DISCONNECT INPUT POWER PRIOR TO HANDLING OR REMOVAL OF THE COVER OF THE STATIC INVERTER TO PREVENT ELECTRICAL SHOCK.

Instructions for Part Numbers 1-111-0102-0714 (Boeing S282T004-8) and 1-002-0102-0714 (Boeing S282T004-7) Static Inverters:

1. Remove four (4) screws, item 55 and 55A securing top cover, item 50, on figure 1.
2. Remove eight (8) screws from the front and side panels securing top cover, two (2) of item 10A and six (6) of item 60 on figure 1.
3. Carefully pry off top cover, item 50 on figure 1.
4. Using figure 2, locate position of screws to be removed.
5. Locate and remove #4-40 screw, item number 25 (p/n 1-001-2802-0030) and discard.
6. Carefully thread standoff/insulator screw assembly (p/n 1-002-2802-0065) into hole. Tighten using 5/16" nutdriver and a maximum torque of 5.2 in-lbs.
7. Locate and remove #6-32 screw, item number 30 on figure 1 (p/n 1-001-2802-0039) and discard.
8. Carefully thread standoff/insulator screw assembly (p/n 1-002-2803-0056) into hole. Tighten using 5/16" nutdriver and a maximum torque of 9.6 in-lbs.
9. Carefully install the top cover and replace the eight (8) screws, two (2) of item 10A and six (6) of item 60 removed in step 2.

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10. Apply threadlocking compound such as Loctite Threadlocker 242 to the two (2) screws, item 55A removed in step 1, prior to installation.

11. Carefully install the four (4) screws, item 55 and 55A removed in step 1.

12. Remove seven (7) screws, two (2) of item 90 and five (5) of item 90A securing bottom cover, item 80, on figure 1.

13. Remove eight (8) screws from the front and side panels securing bottom cover, two (2) of item 10B and six (6) of item 85 on figure 1.

14. Carefully pry off bottom cover, item 80 on figure 1.

15. Using figure 2, locate position of screws to be removed.

16. Locate and remove two (2) #8-32 screw, item numbers 60 and 45 (p/n 1-001-2804-0020) and discard.

17. Carefully thread two (2) standoff/insulator screw assemblies (p/n 1-002-2804-0027) into holes. Tighten using 5/16" nutdriver and a maximum torque of 19.8 in-lbs.

18. Carefully install the bottom cover and replace the eight (8) screws, two (2) of item 10B and six (6) of item 85 removed in step 13.

19. Apply threadlocking compound such as Loctite Threadlocker 242 to the five (5) screws, item 90A removed in step 12, prior to installation.

20. Carefully install the seven (7) screws, item 90 and 90A removed in step 12.

21. Reidentify the Mod Level of the Static Inverter as follows:

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

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2.- Use the "A" metal stamp to reidentify the MOD LEVEL by stamping a "A" in the silver area next to the existing letter for S282T004-8 static inverters **or** use the "C" metal stamp to reidentify the MOD LEVEL by stamping a "C" in the silver area next to the existing letter for S282T004-7 static inverters. (See figure 3).

22. Perform function test defined in Addendum 1 to verify inverter performance.

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

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

Instructions for Part Numbers 1-002-0102-0265 (Boeing S282T004-5) Static Inverter:

1. Remove four (4) screws, item 40 and 40A securing top cover, item 35, on figure 4.

2. Remove eight (8) screws from the front and side panels securing top cover, two (2) of item 10A and six (6) of item 40 on figure 4.

3. Carefully pry off top cover, item 35 on figure 4.

4. Using figure 5, locate position of screws to be removed.

5. Locate and remove #4-40 screw, item number 25A (p/n 1-001-2802-0030) and discard.

6. Carefully thread standoff/insulator screw assembly (p/n 1-002-2802-0065) into hole. Tighten using 5/16" nutdriver and a maximum torque of 5.2 in-lbs.

7. Locate and remove #6-32 screw, item number 22 on figure 4 (p/n 1-001-2802-0039) and discard.

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8. Carefully thread standoff/insulator screw assembly (p/n 1-001-2803-0056) into hole. Tighten using 5/16" nutdriver and a maximum torque of 9.6 in-lbs. .

9. Carefully install the top cover and replace the eight (8) screws, two (2) of item 10A and six (6) of item 40 removed in step 2.

10. Apply threadlocking compound such as Loctite Threadlocker 242 to the two (2) screws, item 40A removed in step 1, prior to installation.

11. Carefully install the four (4) screws, item 40 and 40A removed in step 1.

12. Remove seven (7) screws, two (2) of item 75 and five (5) of item 75A securing bottom cover, item 65, on figure 4.

13. Remove eight (8) screws from the front and side panels securing bottom cover, two (2) of item 10B and six (6) of item 70 on figure 4.

14. Carefully pry off bottom cover, item 65 on figure 4.

15. Using figure 5, locate position of screws to be removed.

16. Locate and remove two (2) #8-32 screw, item numbers 41 and 36 (p/n 1-001-2804-0020) and discard.

17. Carefully thread two (2) standoff/insulator screw assemblies (p/n 1-001-2804-0027) into holes. Tighten using 5/16" nutdriver and a maximum torque of 19.8 in-lbs. .

18. Carefully install the bottom cover and replace the eight (8) screws, two (2) of item 10B and six (6) of item 70 removed in step 13.

19. Apply threadlocking compound such as Loctite Threadlocker 242 to the five (5) screws, item 75A removed in step 12, prior to installation.

20. Carefully install the seven (7) screws, item 75 and 75A removed in step 12.

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21. Reidentify the Mod Level of the Static Inverter as follows:

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

    2.- Use the "G" metal stamp to reidentify the MOD LEVEL by stamping a "G" in the silver area next to the existing letter (See figure 6).

22. Perform function test defined in Addendum 1 to verify inverter performance.

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

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

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III MATERIAL INFORMATION

A Parts Required Per Component - To get the parts listed below, refer to paragraph I.F., Material- Cost and Availability.

NOTE: One kit consisting of the components listed below is required for each static inverter.

Part Number	Qty	Unit List Cost	Key Word	Instruction
1-002-2802-0065	1	No Charge	Standoff/ Insulator Screw Assy #4-40	Install
1-002-2803-0056	1	No Charge	Standoff/ Insulator Screw Assy #6-32	Install
1-002-2804-0027	2	No Charge	Standoff Insulator Screw Assy #8-32	Install

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

Description	Qty
3/32" Metal Stamps, Letters "A","X","G","C"	1 each
Loctite Threadlocker #242 Thread-Locking Compound (or equivalent)	A/R

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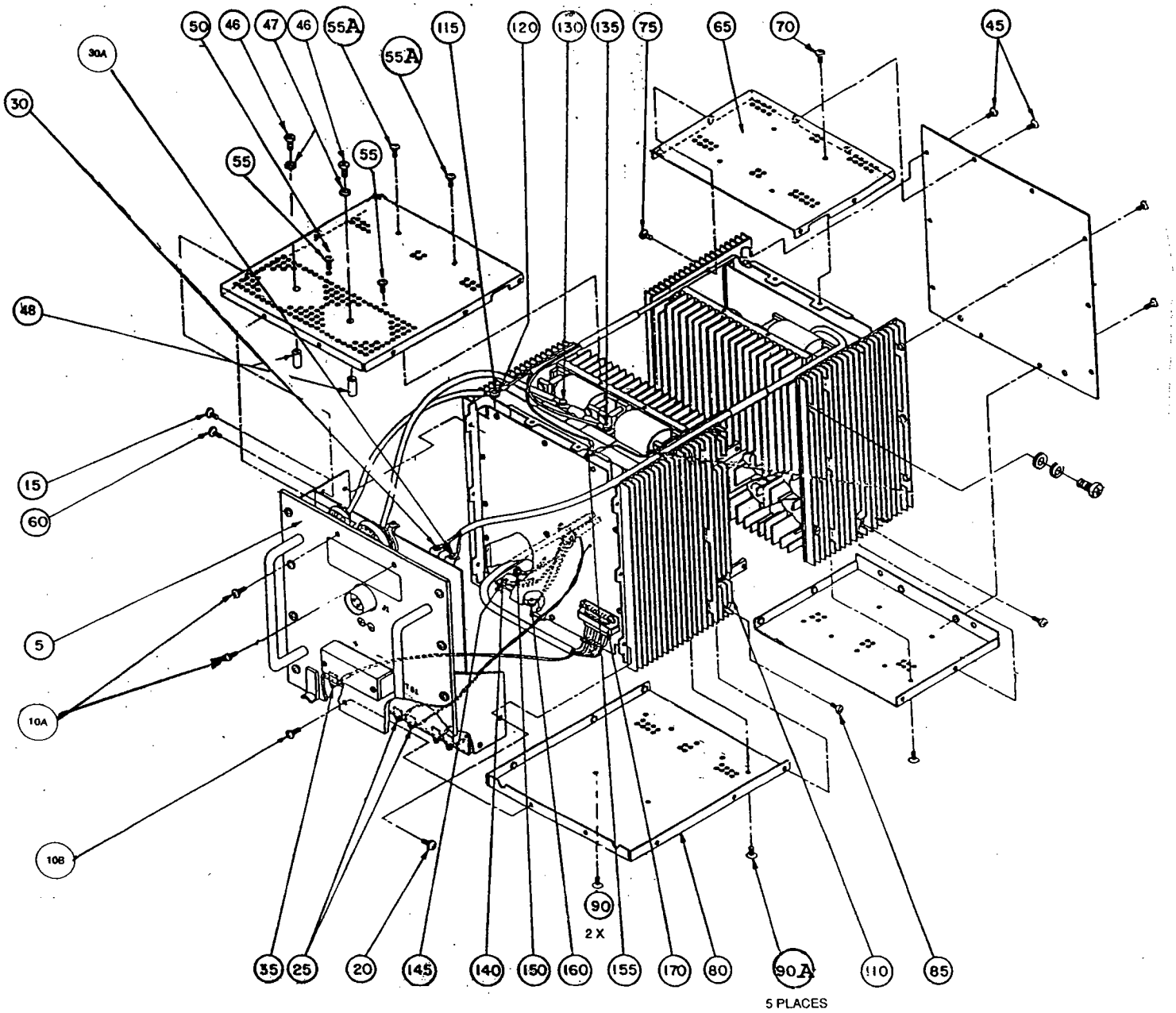

FIGURE 1

FINAL ASSEMBLY MODEL 1C1000-1B
(S282T004-7 and S282T004-8) STATIC INVERTER

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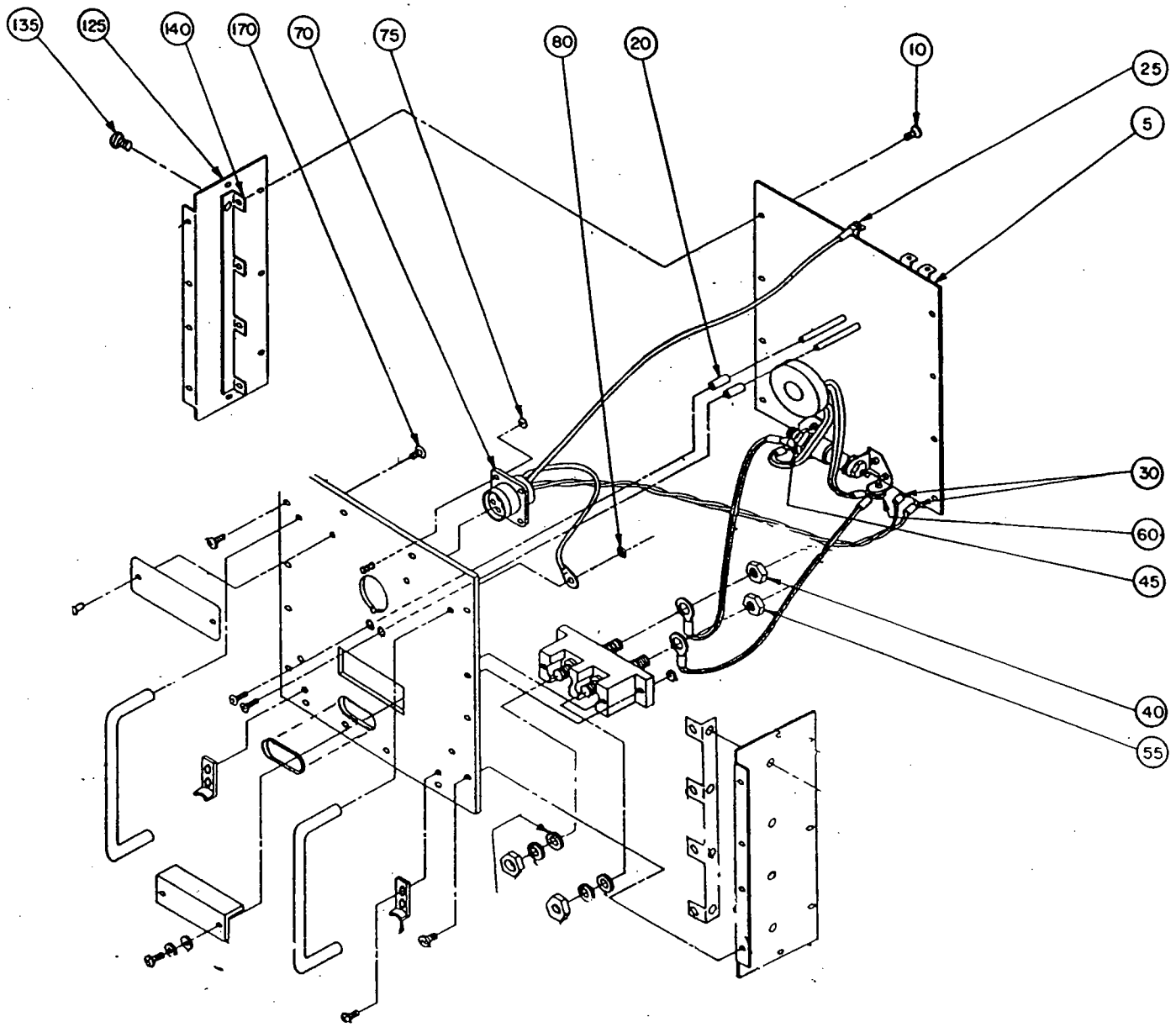

FIGURE 2

LOCATION OF SCREWS ON S282T004-7 and S282T004-8 FRONT PANEL/EMI ASSEMBLY

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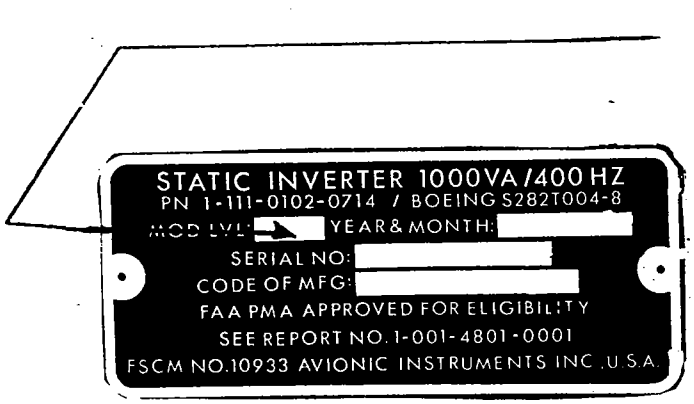

FIGURE 3

NAMEPLATE MARKING INFORMATION FOR MODEL 1C1000-1B (S282T004-7 and S282T004-8) STATIC INVERTER

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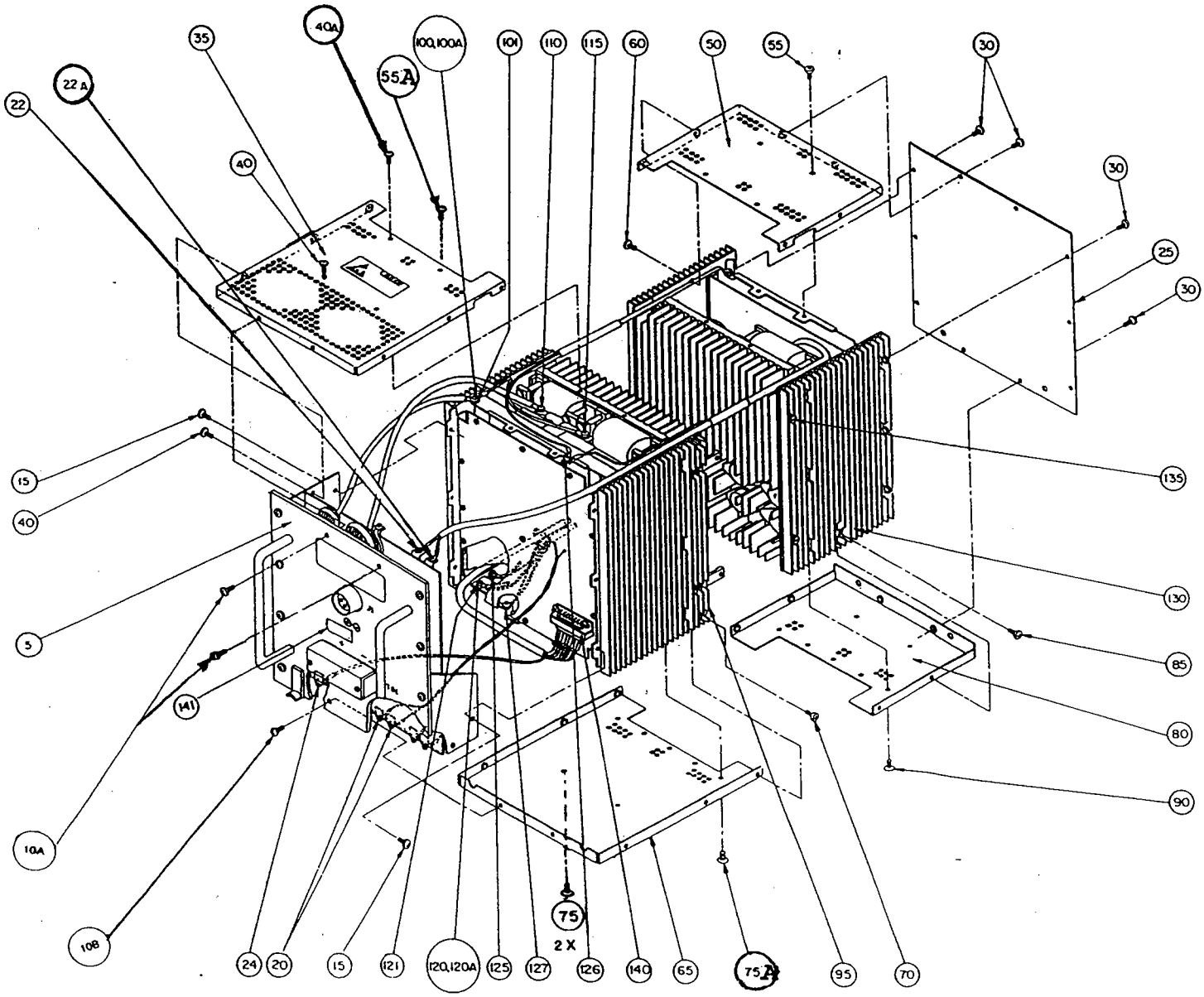

FIGURE 4

FINAL ASSEMBLY MODEL 1C1000-1A
(S282T004-5) STATIC INVERTER

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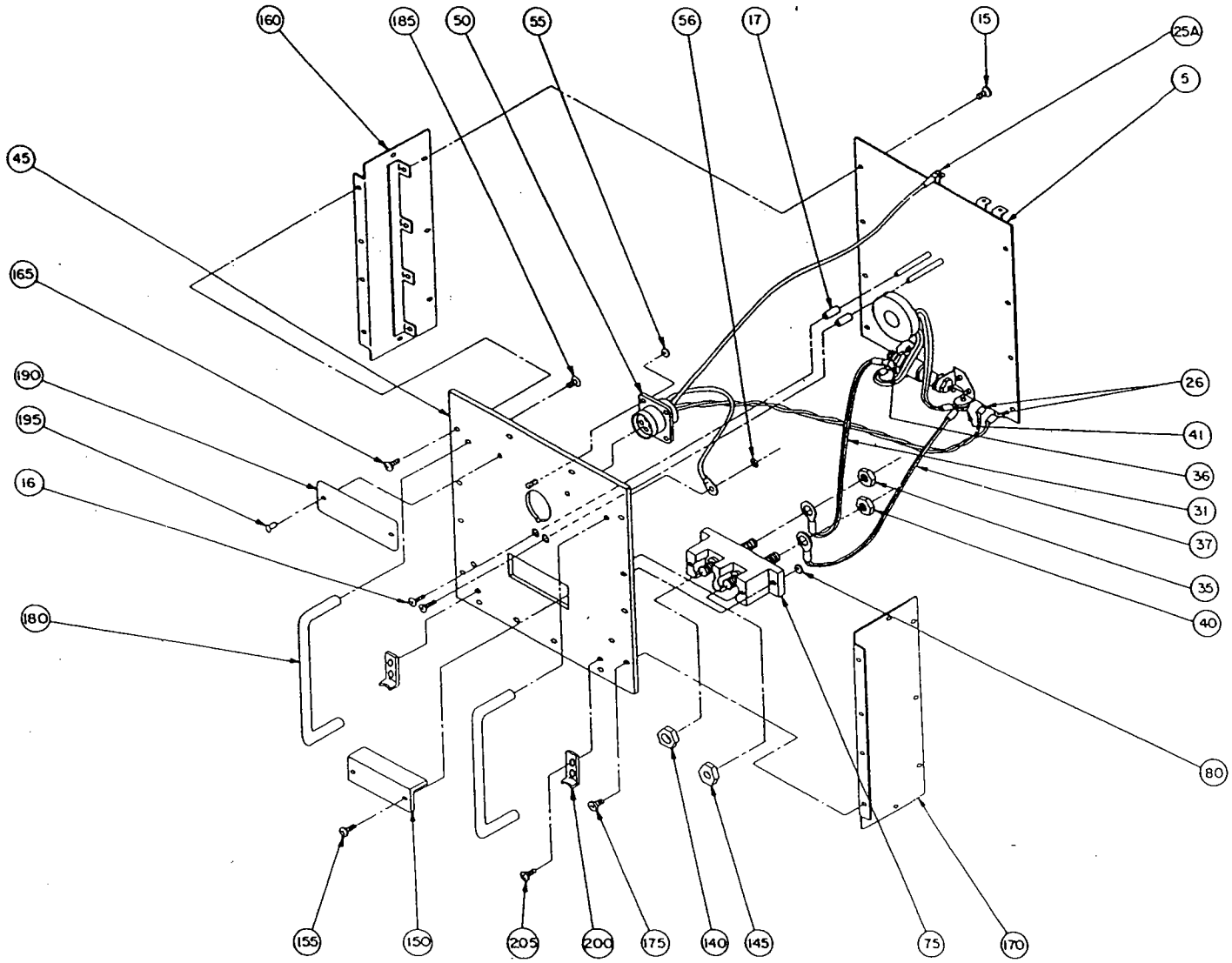

FIGURE 5

LOCATION OF SCREWS ON (S282T004-5) FRONT PANEL/EMI ASSEMBLY

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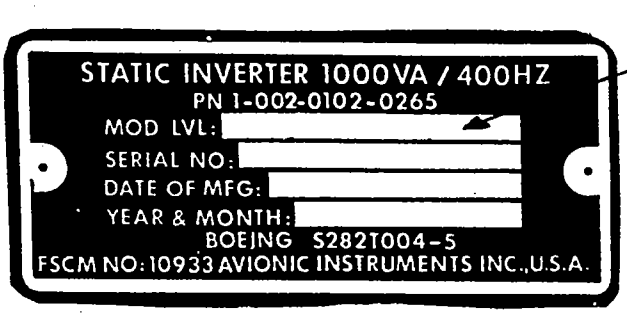

FIGURE 6

NAMEPLATE MARKING INFORMATION FOR MODEL 1C1000-1A (S282T004-5) STATIC INVERTER

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ADDENDUM 1
FUNCTIONAL TEST REQUIREMENTS

1. General

This section contains instructions for testing the Model 1C1000-1B and 1C1000-1A 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.)

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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

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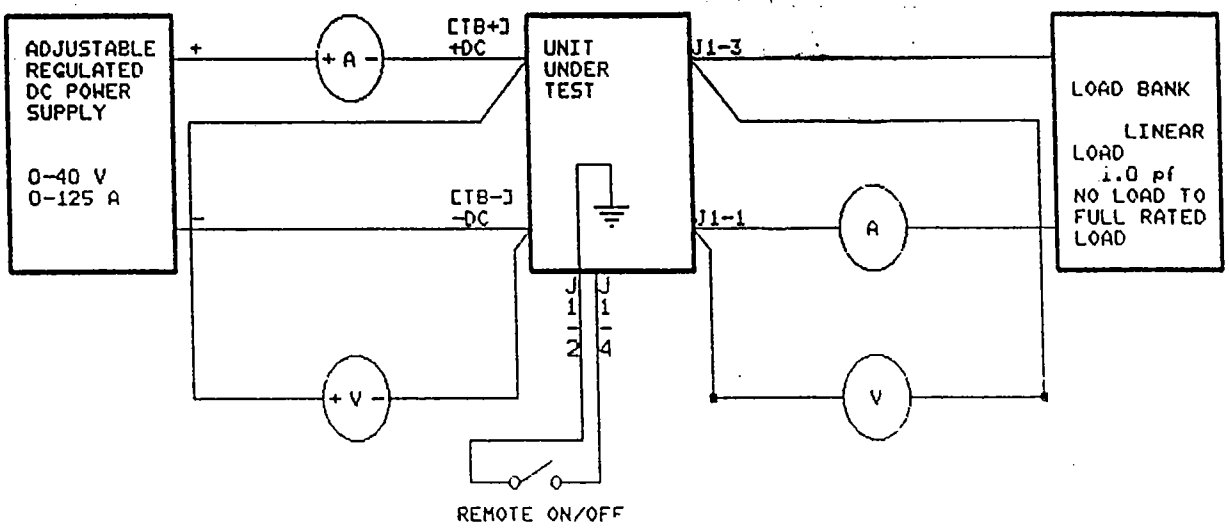

FIGURE 102

CONNECTIONS FOR TEST SETUP

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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: For regulation, power and efficiency measurements to be valid, the AC voltage measurement must be made at P1/J1 and the DC voltage measurement must be made directly at 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.

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2. Full-Load Test

(a) Connect 1000 W nominal linear load to J1 on UUT. Calculate the efficiency at full-rated load and at input voltages of 22 V or greater using the following equation:

$$\text{efficiency} = \frac{V_{out} * I_{out}}{V_{in} * I_{in}} * 100\%$$

The calculated efficiency at full-rated load should be at least:

82% for the model 1C1000-1B (Boeing S282T004-7 & -8) at input voltages of 22 V or greater.

80% for the model 1C1000-1A (Boeing S282T004-5) at input voltages of 22 V or greater.

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

(c) Measure and record input current and voltage ,and output current and 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.

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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)	Load (W) Nominal
22-28	3.5 (1)	110-120	0	0
22-28	70 (1)	110-120	8.7 (2)	1000

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

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

FIGURE 103

LIMITS FOR MEASURED VALUES

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