g GE Energy	**Functional Testing Specification**
Parts & Repair Services ***Louisville, KY***	**LOU-GED-125D460AY**

Test Procedure for a 125D460AY

DOCUMENT REVISION STATUS: Determined by the last entry in the "REV" and "DATE" column

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release Transferred from paper copy to an electronic format.	G. Chandler	3/8/2013
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PREPARED BY	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL
G. Chandler			Charlie Wade
DATE	**DATE**	**DATE**	**DATE**
3/8/2013			3/8/2013

1. SCOPE

1.1 This is a functional testing procedure for a Turbine Control board

2. STANDARDS OF QUALITY

2.1 Refer to the current revision of the IPC-A-610 standard for workmanship standards.

3. APPLICABLE DOCUMENTS

3.1 The following document(s) shall form part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue shall apply.

3.1.1 Check board's electronic folder for more information
3.1.2 Test Instruction 165A663AY, two sets.
3.1.3 Drawing 125D443AY
3.1.4 Test Instruction 165A663BF

4. ENGINEERING REQUIREMENTS

4.1 Equipment Cleaning

4.1.1 Equipment should be clean and free of debris prior to applying power unless performing an initial check. Refer to site specific SRA's for cleaning guidelines.

4.2 Equipment Inspection

4.2.1 Equipment should be visually inspected for any defects prior to applying power. This inspection should include the following as a minimum:

4.2.1.1 Wires - broken, cracked, or loosely connected
4.2.1.2 Terminal strips / connectors - broken or cracked
4.2.1.3 Components - visually damaged
4.2.1.4 Capacitors - bloated or leaking
4.2.1.5 Solder joints - damaged or cold
4.2.1.6 Circuit board - burned or de-laminated
4.2.1.7 Printed wire runs / Traces - burned or damaged

5. EQUIPMENT REQUIRED

5.1 The following equipment is required to perform the process requirements. Equipment may be substituted provided that all accuracy's and test ratios are equivalent or better.

Qty	Reference #	Description
1		10VDC Power Supplies
2		15VDC Power Supplies
2		12VDC Power Supplies
5		Fluke 85 meter or equivalent
1	460 Card Test Fixture	H033933 - Fixture #54
1		Function Generator – Wavetek 111 or equivalent
1		O-Scope
1		Resistor 1K ohm ½ watt
1		Switch SPST 100mA at 15V
1		Frequency Counter

6. Setup

6.1.1 Add components as shown in figure 1, if not already there. Capacitors to 33uf to C902, C905, C907, & C908. Two 20K resistors to R923 and R924, and one 63.4K resistor to R905.

6.1.2 Be sure power switch off

6.1.3 Connect +15VDC, -15VDC, +12VDC, and -12VDC to test kit

6.1.4 Connect PS1 (0 to +10VDC), set to 0.0VDC.

6.1.5 Connect 5VDC square wave generator SG1 to COM test jack, set to 0Hz

6.1.6 Set S1 to the open/off position

7. Testing Process

7.1 All test data is to be recorded on attached data sheet. If measured data is within the prescribed limits, further testing of the board is to be discontinued until the problem is corrected.

7.2 Auto Signal Input Check

7.2.1 Turn on all power supplies and record the readings of A1, A2, A3, and A4.

7.2.2 Close switch S1. Record the reading of A2. Open switch S1.

7.3 F/V Converter

7.3.1 CAUTION – Before connecting the function generator SG1 to the board, set it for the positive pulse output and adjust it for +5V peak voltage.

7.3.2 Turn S1 Off. Connect DVM to TP903, set SG1 to 0Hz.

7.3.3 TP903 should be 0.00 +/- 0.10VDC

7.3.4 Set SG1 to 2000 +/- 2Hz.

7.3.5 TP903 should be 1.98 +/- 0.030VDC

7.3.6 Set SG1 to 6000 +/- 6Hz.

7.3.7 TP903 should be 5.94 +/- 0.070VDC

7.3.8 Set SG1 to 10000 +/- 2Hz.

7.3.9 TP903 should be 9.90 +/- 0.11VDC

7.4 Input Stage

7.4.1 Add a 1K resistor between (+) end of C902 and (+) end of C905, set P901 full CCW. Set P902 full CW. Set SG1 to 0Hz.

7.4.2 Connect DVM to TP905. Set PS1 for 0.0 +/-0.010V at TP905

7.4.3 Connect DVM to TP906. Check range of P903 is at least -3.3 to +3.3VDC.

7.4.4 Set P903 for 0.0 +/- 0.020V at TP906.

7.4.5 Set PS1 to 0.0V.

7.4.6 Connect DVM to TP908, should be 0.13 +/-0.07V

7.4.7 Set SG1 to 0Hz.

7.4.8 Connect DVM to TP903, should be 0.0 +/-0.010V.

7.4.9 Connect DVM to TP908, set PS1 for 0.0 +/-0.010V at TP908.

7.4.10 Set SG1 for +3.0 +/-0.010V at TP908

7.4.11 Connect DVM to TP903, should be +.93 +/-0.050V.

7.4.12 Turn S1 on. Set SG1 to 0Hz, (Wavetek power off).

7.4.13 Connect DVM to TP903, should be 0.0 +/-0.010V.

7.4.14 Connect DVM to TP908, set PS1 for 0.0 +/-0.010V at TP908.

7.4.15 Set SG1 for +3.0 +/-0.010V at TP908

7.4.16 Connect DVM to TP903, should be +1.86 +/-0.090V.

7.4.17 Turn S1 off, set SG1 for +5.00 +/- 0.010V at TP903

7.4.18 Set PS1 to +5.00 +/-0.01V.

7.4.19 Connect DVM to TP908, should be at least -.75 to +1.01V.

7.4.20 Set S1 on, TP908 should be at least -.75 to +1.01V.

7.4.21 Set SG1 to 0Hz, (Wavetek power off).

7.4.22 Set PS1 for 0.0 +/- 0.010 at TP908.

7.4.23 Connect DVM to TP906. Trim P903 for 0.0 +/- 0.020V at TP906.

7.4.24 Connect DVM to TP908. Set PS1 for -1.0 +/- 0.010V at TP908

7.5 Output Stage

7.5.1 Connect DVM to TP905. Check range of P901, at least -0.25 to -0.93V.

7.5.2 Connect DVM to TP906, set P901 for 6.91 +/- 0.010V at TP906.

7.5.3 Remove 1K resistor at (+) end of C902 to (+) end of C905.

7.5.4 Set PS1 to +3.0 +/- 0.010V

7.5.5 Connect DVM to TP908, check range of P902, at least -0.18 to -2.0V.

7.5.6 Set P902 for -1.16 +/- V at TP908

7.5.7 Connect DVM to TP904, -12V VDC Max.

7.5.8 Connect DVM to TP903, set SG1 for +6.0 +/- 0.020V at TP903

7.5.9 Connect DVM TP908, should be +1.16 +/- 0.050V

7.5.10 Connect DVM to TP904, +12V VDC Max.

7.6 Noise Check

7.6.1 Connect scope to TP903, noise must be no more than 50mV Max.

7.6.2 Connect scope to TP904, noise must be no more than 50mV Max.

7.6.3 Connect scope to TP906, noise must be no more than 50mV Max.

7.6.4 Power everything down.

7.7 Post Testing Burn-in **Required** **_X_ Yes** **___ No**

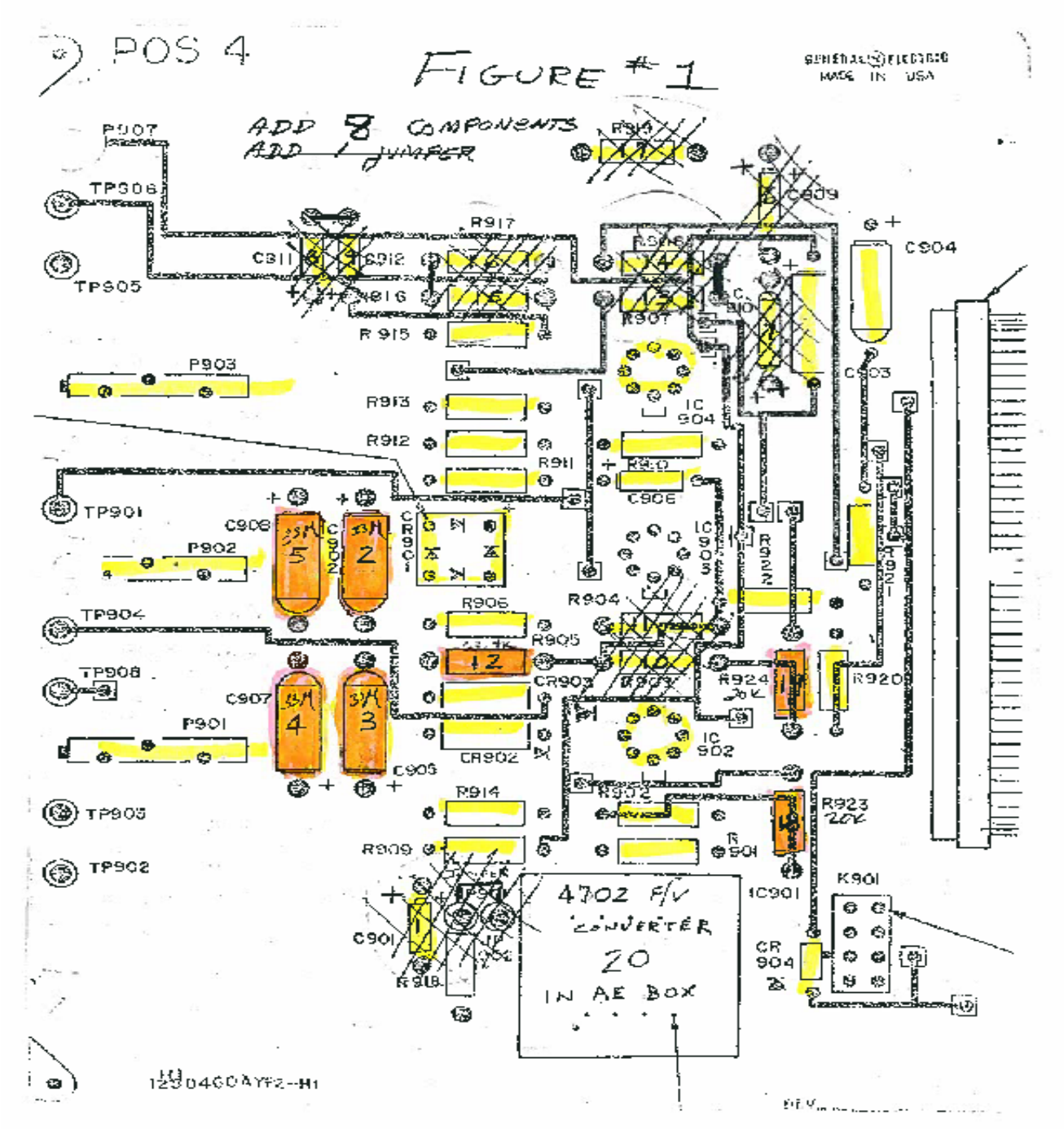
Note: 100 hour burn is required for most Turbine Control Boards

7.7.1 Re-test card after 100 burn-in.

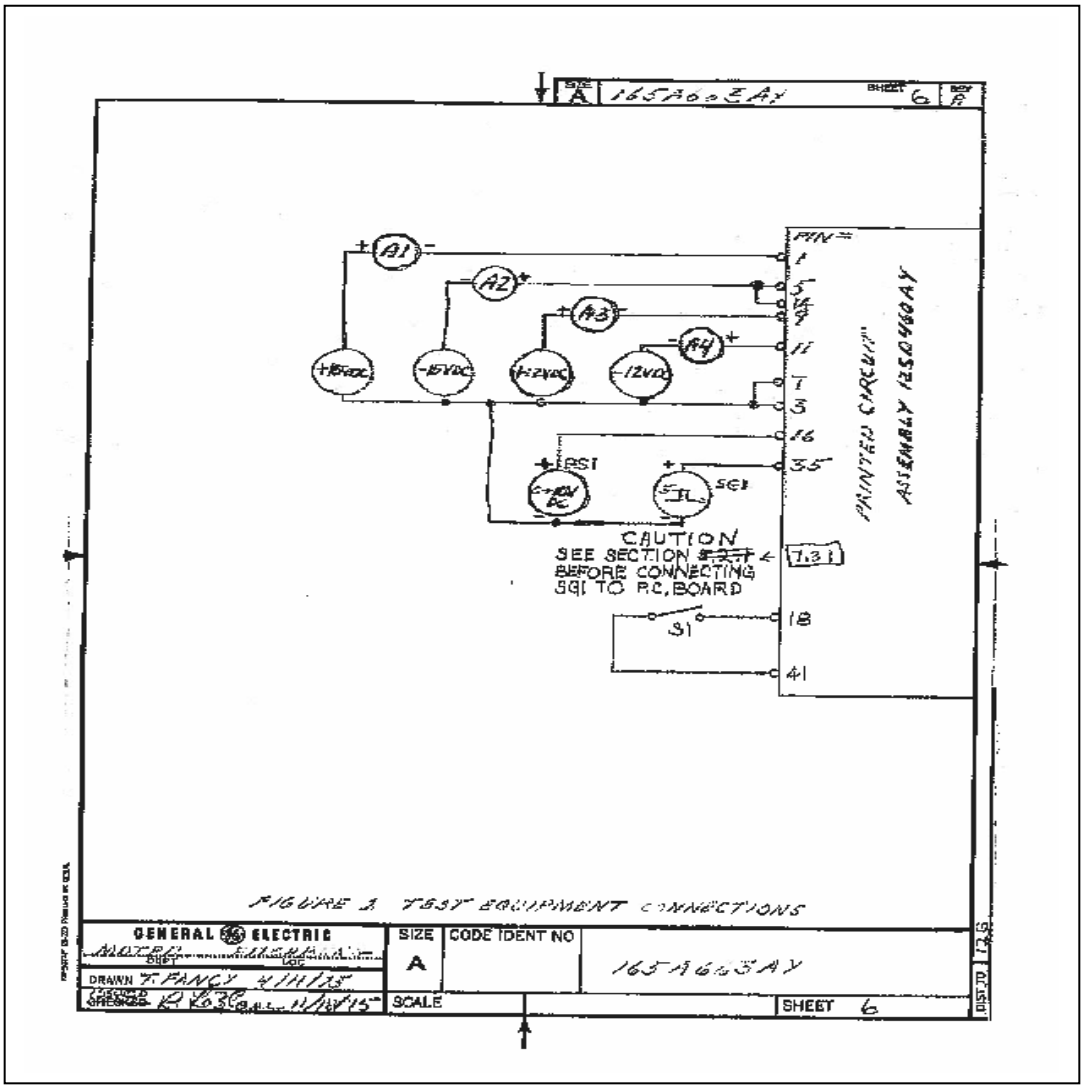
7.8 ***TEST COMPLETE ***

8. Notes

8.1 Figure 1 Component placement



8.2 Figure 2 Test Equipment Connections.



9. Attachments

9.1 The page 8 has a blank copy of the data sheet.

Data sheet

New Step	New Step	Read at	Required Value	Pre-Test Measured	Post-Test Measured	Post-Test Final Measured
7.2.1	5.1	A1 (+15VDC)	50mA MAX			
7.2.1	5.2	A2 (-15VDC)	50mA MAX			
7.2.1	5.3	A3 (+12VDC)	10mA MAX			
7.2.1	5.4	A4 (-12VDC)	10mA MAX			
7.2.2	5.5	S1 Closed - A2	60mA MAX			
7.3.3	5.7	(S1 Open) TP903	0.00 +/- 0.1V			
7.3.5	5.9	TP903	1.98 +/- 0.03V			
7.3.6	5.10	SG1	6,000 +/- 6Hz			
7.3.7	5.11	TP903	5.94 +/- 0.07V			
7.3.9	5.13	TP903	9.90 +/- 0.11V			
7.4.3	5.16	TP906 (P903)	-3.3 to +3.3V			
7.4.6	5.20	TP908	0.13 +/-0.07V			
7.4.8	5.23	TP903	0.00 +/- 0.1V			

New Step	New Step	Read at	Required Value	Pre-Test Measured	Post-Test Measured	Post-Test Final Measured
7.4.11	5.25	TP903	0.93 +/- 0.05V			
7.4.13	5.27	TP903	0.00 +/- 0.1V			
7.4.16	5.30	TP903	1.86 +/- 0.09V			
7.4.19	5.33	TP908	-0.75 to 1.01			
7.4.20	5.34	TP908	-0.75 to 1.01			
7.5.1	5.39	TP905	-0.25 to -0.93V			
7.5.5	5.43	TP908	-0.18 to -2.0V			
7.5.7	5.45	TP904	-12V MAX			
7.5.9	5.47	TP908	1.16 +/- 0.05V			
7.5.10	5.48	TP904	12V MAX			
7.6.1	5.49	TP903	50mV MAX			
7.6.2	5.50	TP904	50mV MAX			
7.6.3	5.51	TP906	50mV MAX			

Data Sheet for 125A460AY, Serial Number_____, Service Order #_____, Date_____