

LOU-GED-125D460AA REV. C	g GE Energy <i>Parts & Repair Services</i> <i>Louisville, KY</i>	Page 2 of 7
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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

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
2		10VDC Power Supplies
2		15VDC Power Supplies
2		12VDC Power Supplies
6		Fluke 85 meter or equivalent
1	460 Card Test Fixture	H033933 - Fixture #54

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6. Setup

- 6.1.1** Add R101 (249 ohms) to board.
- 6.1.2** Turn Power Switch off
- 6.1.3** Connect +15VDC, -15VDC, +12VDC, and -12VDC to test kit
- 6.1.4** Use DC Voltage standard: Connect up PS-1 (0 to +10VDC), set to 0.0VDC.
- 6.1.5** Use DC Voltage standard: Connect up PS-2 (0 to +10VDC), set to 0.0VDC.
- 6.1.6** Set S1, S2, and S6 to "OFF", (left position)
- 6.1.7** Turn P109 full CW, P104 CCW, P103 CCW
- 6.1.8** Plug board into AA 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 on
- 7.2.2** Read A1 (+15V) current, 100mA Max
- 7.2.3** Read A2 (+15V) current, 100mA Max
- 7.2.4** Read A3 (+12V) current, 10mA Max
- 7.2.5** Read A4 (-12V) current, 10mA Max
- 7.2.6** Set PS1 to +4.00 +/- 0.010VDC.
- 7.2.7** Apply a 100 ohm variable resistor at PS2 jack to com and load to +1.00V.
- 7.2.8** Read TP101, =3.00 +/- 0.120VDC.
- 7.2.9** Apply a 100 ohm variable resistor at PS1 jack to com and load to +1.00V.
- 7.2.10** Set PS2 to +5.00 +/- 0.010VDC.
- 7.2.11** Read TP101, -4.00 +/- 0.140VDC.
- 7.2.12** Set PS2 to 0.00VDC. (Set polarity to 0)
- 7.2.13** Set PS1 to 0.00 +/- 0.010VDC at TP101.
- 7.2.14** Connect DVM to TP109. Check range of P102, should be at least -4.4 to +0.4VDC.
- 7.2.15** Connect DVM to TP102. Set P102 until TP102 just reaches 0.00 +/- 0.010VDC
- 7.2.16** Set PS1 to +5.00VDC and connect PS2 to common.
- 7.2.17** Connect DVM to TP102. Check range of P101, should be at least -7.2 to -0.1VDC
- 7.2.18** Set PS1 to +3.940VDC.
- 7.2.19** Set P101 for -5.00 +/- 0.10VDC at TP102.
- 7.2.20** Set PS1 to +4.920VDC.

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- 7.2.21** Set P102 for -5.00 +/- 0.010VDC at TP102.
- 7.2.22** Set PS1 to +0.980VDC
- 7.2.23** TP102 should be 0.00 +/- 0.020VDC.
- 7.2.24** Connect DVM to TP103. Set PS1 for 0.00 +/- 0.010VDC at TP103
- 7.2.25** Connect DVM to TP104. Set P103 for 0.00 +/- 0.010VDC
- 7.2.26** Connect DVM to TP103. Set PS1 for (+5.0) for -5.00 +/- 0.010VDC at TP103
- 7.2.27** Connect DVM to TP104. Check range P104, should be at least +1.10 to +10.50VDC. Set P104 fully CCW.
- 7.2.28** Connect DVM to TP103. Set PS1 for 0.00 +/- 0.010VDC at TP103
- 7.2.29** Connect DVM to TP104. Check range of P103, should be at least -1.80 to +6.10VDC
- 7.2.30** Set P103 for 0.00 +/- 0.010VDC at TP104
- 7.2.31** Connect DVM to TP103. Set PS1 for -5.00 +/- 0.010VDC at TP103
- 7.2.32** Connect DVM to TP104. Set P104 for +4.66 +/- 0.010VDC
- 7.2.33** Set P103 for +5.79 +/- 0.010VDC at TP104
- 7.2.34** Connect DVM to TP103. Set PS1 for 0.00 +/- 0.010VDC at TP103
- 7.2.35** Connect DVM to TP104. Should be +1.110 to +1.150VDC. (Tight limit adjust P103 if necessary).
- 7.2.36** Set P1 CW. Connect DVM to TP108. Check range of P106, should be at least +3.80 to +7.00VDC
- 7.2.37** Set P106 to +5.79 +/-0.010V, -0.00VDC at TP108
 - 7.2.37.1** Verify, if exists, R130 should be shorted between stakes for test. R130 is located between pots P107 and P106. It is not present on all cards.
- 7.2.38** Connect DVM to TP107. Should be +5.79 +/-0.010VDC.
- 7.2.39** Press S4. Set S1 and S6 to "ON". Connect DVM to TP105. Check range of P107, should be at least +3.2 to +6.4VDC.
- 7.2.40** Set P107 to 5.49 +/-0.010 at TP105.
- 7.2.41** Set S6 "OFF". Check range of P108 at TP105, should be at least +5.59 to +7.49VDC.
- 7.2.42** Set P108 to +6.10 +/-0.010VDC at TP105.
- 7.2.43** Press S5. Connect DVM to TP104. Set P104 to 1.13 +/-0.010VDC.
- 7.2.44** Connect DVM to TP105. Should be +1.09 to +1.14VDC.
- 7.2.45** Check for less than 1 ohm between P27 and P28
- 7.2.46** Check for infinite ohms between P28 and P29. Set S1 "OFF".
- 7.2.47** Connect DVM to TP107, Set P1 for +2.00 +/- 0.010VDC.

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- 7.2.48** Press S4. Connect DVM to TP105, should be +1.94 to +2.01VDC
- 7.2.49** Check for infinite ohms between P27 and P28.
- 7.2.50** Check for less than 1 ohm between P28 and P29.
- 7.2.51** Connect DVM to TP104. Set PS1 for +5.790 +/-0.001VDC at TP104.
- 7.2.52** Connect DVM to TP107. Set P1 for +5.790 +/-0.001VDC.
- 7.2.53** Connect DVM to P38(+) and P37(-). Set P105 for 0.00 +/-0.010VDC.
- 7.2.54** Set PS1 to 0.0VDC.
- 7.2.55** Connect DVM to TP104. Set P104 to +1.13 +/-0.001VDC
- 7.2.56** Connect DVM to TP107. Set P1 for +1.130 +/- 0.001VDC.
- 7.2.57** Connect DVM to P38(+) and P37(-), should be 0.00 +/-0.030VDC.
- 7.2.58** Connect DVM to TP104. Set PS1 for +5.79 +/-0.10VDC at TP104
- 7.2.59** Connect DVM to TP107. Set P1 fully CCW, then CW for +3.00 +/-0.010VDC. Press S5.
- 7.2.60** Connect DVM to TP111. Should be 5.49 +/-0.10VDC. Set 2 "ON".
- 7.2.61** Connect DVM to TP105. Should be +2.90 +/- 0.20VDC.
- 7.2.62** Connect DVM to TP111. Should be 0.00 +/-0.10VDC. Set 2 "OFF".
- 7.2.63** Set P109 fully CCW. Connect DVM to TP105. Set P1 for 0.00 +/-0.003VDC. NOTE:
Adjust power supplies to +15.00 +/-0.001 for next step to work.
- 7.2.64** S2 resets Pin 17.
- 7.2.65** Connect DVM to P17. Turn P109 CW until P17 changes to +15.00VDC.
- 7.2.66** Press S3. Connect DVM to TP111, should be 5.49 +/-0.10VDC

7.3 Noise Check

- 7.3.1** Connect scope to TP109, should have less than 50mV noise
- 7.3.2** Connect scope to TP104, should have less than 50mV noise
- 7.3.3** Connect scope to TP105, should have less than 50mV noise
- 7.3.4** Connect scope to TP107, should have less than 50mV noise
- 7.3.5** Connect scope to TP106, should have less than 50mV noise
- 7.3.6** Turn power off

7.4 Post Testing Burn-in **Required** ☒ **Yes** ☐ **No**



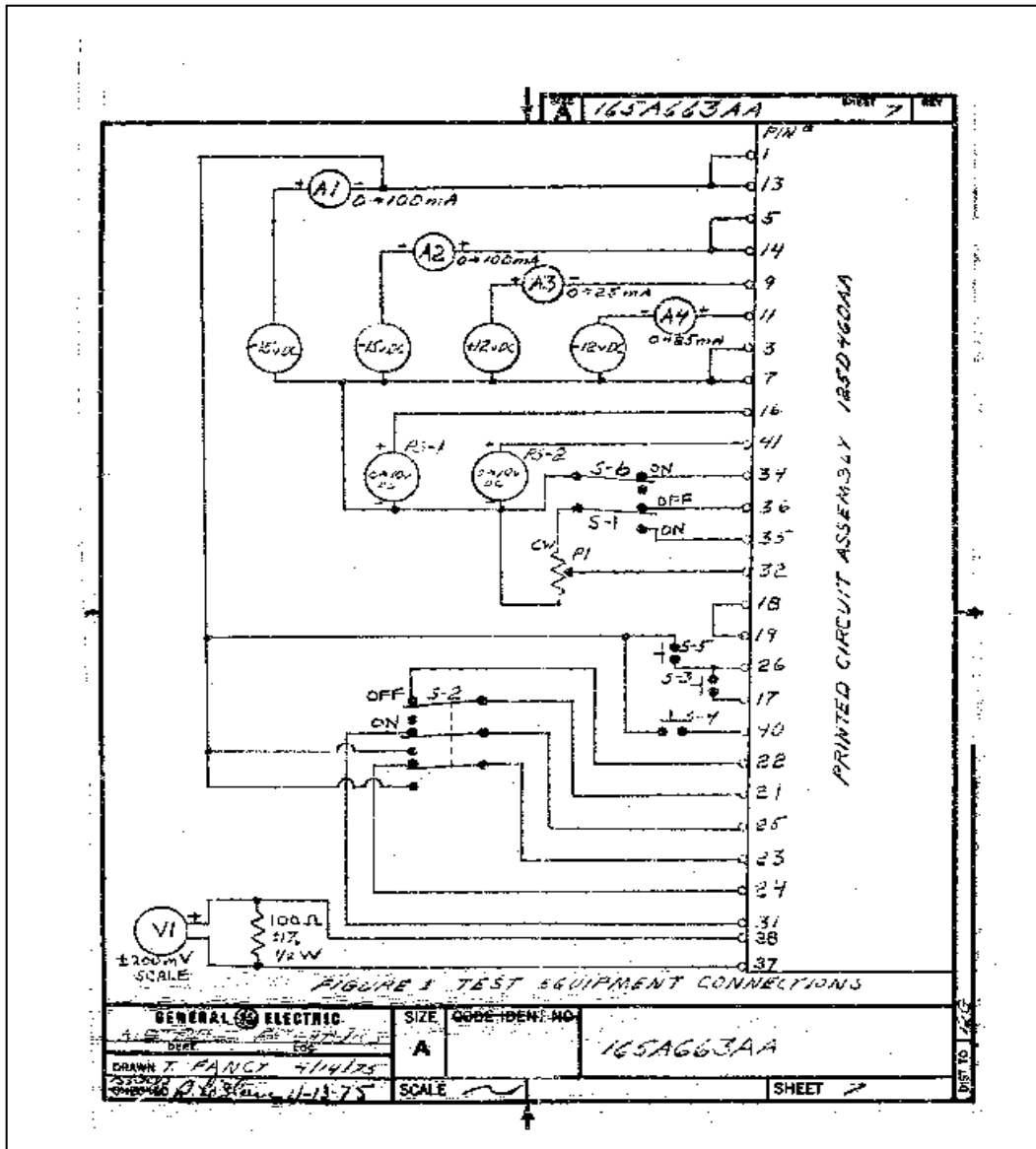
Note: 100 hour burn is required for most Turbine Control Boards

- 7.4.1** Re-test card after 100 burn-in.

7.5 *TEST COMPLETE *****

8. Attachments

8.1 Test circuit for card on page 7.



8.2 The page 7 has a blank copy of the data sheet.

New Step	Ref Sheet	Read at	Required Value	Pre-Test Measured	Post-Test Measured	Post-Test Final Measured		New Step	Ref Sheet	Read at	Required Value	Pre-Test Measured	Post-Test Measured	Post-Test Final Measured
7.2.2	3	A1 (+15VDC)	100mA MAX					7.2.44	45	TP 105	1.09 to 1.14V			
7.2.3	4	A2 (-15VDC)	100mA MAX					7.2.45	46	PIN 27 TO 28	1 Ohm MAX			
7.2.4	5	A3 (+12VDC)	10mA MAX					7.2.46	47	PIN 28 TO 29	Open Circuit			
7.2.5	6	A4 (-12VDC)	10mA MAX					7.2.48	49	TP 105	1.94 to 2.01V			
7.2.8	9	TP 101	+3.00 +/- 0.12V					7.2.49	50	PIN 27 TO 28	Open Circuit			
7.2.11	12	TP 101	-4.00 +/- 0.14V					7.2.50	51	PIN 28 TO 29	1 Ohm MAX			
7.2.14	15	TP 109	(at Least) -4.4 to +0.4V					7.2.57	58	V1	0.0 +/- 30 mV			
7.2.17	18	TP 102	(at Least) -7.2 to -0.1V					7.2.60	61	TP 111	5.49 +/- .1V			
7.2.23	24	TP 102	0.00 +/- .02V					7.2.61	62	TP 105	2.9 +/- .2V			
7.2.27	28	TP 104	(at Least) +1.1 to 10.5V					7.2.62	63	TP 111	0.00 +/- .01V			
7.2.29	30	TP 104	(at Least) -1.8 to +6.1V					7.2.66	67	TP 111	5.49 +/- .1V			
7.2.35	36	TP 104	+1.110 to +1.150V					7.3.1	68	TP 109	50 mV MAX			
7.2.36	37	TP 108	(at Least) +3.80 to +7.00V					7.3.2	69	TP 104	50 mV MAX			
7.2.38	39	TP 107	+5.79 +/- 0.01V					7.3.3	70	TP 105	50 mV MAX			
7.2.39	40	TP 105	(at Least) +3.2 to +6.4V					7.3.4	71	TP 107	50 mV MAX			
7.2.41	42	TP 105	(at Least) +5.49 to +7.49V					7.3.5	72	TP 106	50 mV MAX			

Data Sheet for 125A460AA, Serial Number _____, Service Order # _____, Date _____