



GE Energy

## Functional Testing Specification

Parts & Repair Services  
Louisville, KY

LOU-GE-118D1357G2

### Test Procedure for a Pressure-Load Gate Amplifier

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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	R Johnson/P Kelley	2/27/2009
B			
C			

© COPYRIGHT GENERAL ELECTRIC COMPANY

Hard copies are uncontrolled and are for reference only.

PROPRIETARY INFORMATION – THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF GENERAL ELECTRIC COMPANY AND MAY NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF GENERAL ELECTRIC COMPANY.

<b>PREPARED BY</b> P Kelley	<b>REVIEWED BY</b> R Johnson	<b>REVIEWED BY</b>	<b>QUALITY APPROVAL</b> <i>Charlie Wade</i>
<b>DATE</b> 2/25/2009	<b>DATE</b> 2/27/2009	<b>DATE</b>	<b>DATE</b> 2/27/2009

<p><b>LOU-GE-118D1357G2</b> <b>REV. A</b></p>	<p><b>g</b></p> <p><b>GE Energy</b> <i>Parts &amp; Repair Services</i> <i>Louisville, KY</i></p>	<p><b>Page 2 of 5</b></p>
---	--	---------------------------

## 1. SCOPE

1.1 This is a functional testing procedure for a Pressure Load Gate Amplifier.

## 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

## 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 the local documented procedures 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		Fluke 87 DMM (or Equivalent)
2		30Volt Power supplies
2		10Volt Power supplies

<p><b>LOU-GE-118D1357G2 REV. A</b></p>	<p><b>g</b></p> <p><b>GE Energy</b> Parts &amp; Repair Services Louisville, KY</p>	<p><b>Page 3 of 5</b></p>
--	--	---------------------------

## 6. TESTING PROCESS

### 6.1 Setup

**6.1.1** Attach the following resistors (1% tolerance) to ground.

4.37K on pin 34  
4.75M on pin 38  
4.75M on pin 28  
4.75M on pin 24

### 6.2 Testing

**6.2.1** Power up the board with +22V on pin 37, -22V on 41, ground on 39.

**6.2.2** Verify the following voltages reading to ground.

**6.2.2.1** TP1 = 15.7V + - 1V

**6.2.2.2** TP2 = -15.7 V + - 1V

**6.2.2.3** TP3 VR1 CW = -11.399V + - .11V

**6.2.2.4** TP3 VR1 CCW = -9.363V + - .26

**6.2.3** Connect pin 13 to 5 (rails TP12, TP15 positive, turning off CR11). Connect pin 10 to 17 (zeros IC3), pin 6 to 17 and 9 to 17.

**6.2.4** Connect pin 4 to 8 (0V into IC1).

**6.2.5** Adjust VR50 (IC1 offset) for 0V + - 1mV at TP10.

**6.2.6** Open pin 4 to 8 connection.

**6.2.7** Adjust VR1 CCW until TP10 reads 9.5V. Then adjust VR1 CW until TP10 reads 10.6V. Adjust VR1 for +10.1V + - .001V at TP10.

**6.2.8** Remove pin 13 to 5 connection and connect pin 5 to 37 (sends TP12 low turning off CR10 and allowing IC3 to take over the TP10 output and feedback from IC1).

**6.2.9** Adjust VR52 for 0V + - 1mV at TP10. (The offset rails should adjust +/- 10MV).

**6.2.10** Disconnect pin 10 from pin 17 and connect pin 10 to -5V.

**6.2.11** Adjust VR4 for +5V + - .001V on TP10. (4.8 V min. to 5.3V max).

**6.2.12** Remove pin 5 to 37 connection and connect pin 5 to -10V (CR10 turns on turning off CR14 and taking over TP10 and the feedback loop).

**6.2.13** Verify TP10 = +10.02V + - .1V.

**6.2.14** Remove -5V from pin 10 and connect pin 10 to 17 (grounds IC3 input).

**6.2.15** Remove the -10v from Pin 5 and connect Pin 5 to Pin 17.

**6.2.16** Remove power from unit.

**6.2.17** Remove all connections from Pins 6 and 9.

- 6.2.18** Connect an ohmmeter from Pin 6 to Pin 9 and adjust VR2 and VR3 CCW meter should read 20Kohms. Remove ohmmeter.
- 6.2.19** Connect Pin 9 to Pin 17. Connect Pin 6 to -10V.
- 6.2.20** Apply power. TP 10 should read +5 V.
- 6.2.21** Adjust VR2 until TP10 reads +10.1V. +/- .01V.
- 6.2.22** Adjust VR2 until TP10 reads +5V.
- 6.2.23** Swap jumpers (connections) Pin 6 and Pin 9. (This connects -10V to Pin 9 and Pin 6 to ground effectively.) TP10 will read +5V.
- 6.2.24** Adjust VR3 until +10.1 V +/- .01V is reached on TP10.
- 6.2.25** Adjust VR3 back to +5V on TP10.
- 6.2.26** VR51 adjustment. Connect +10V to Pin 10. (Puts IC3 to negative rail. TP14 should be at -14V.
- 6.2.27** Remove all connections to Pins 5, 6, and 9. Connect Pins 5, 6, 9 to Pin 17.
- 6.2.28** Ensure Pin 4 to Pin 8 is open.
- 6.2.29** Adjust VR51 to 0V +/- 1mV at TP10.

**6.3 Post Testing Burn-in**                      **Required**      X   **Yes**              **No**



**Note:** All MARK I, II, & III Turbine related cards require a post testing burn-in of 100 hours.

- 6.3.1** Apply BUS or Operational power to the card for a period of 100 hours.
- 6.3.2** Re-test card while warm using the above procedure.

**6.4 \*\*\*TEST COMPLETE \*\*\***

**7. NOTES**

- 7.1** None at this time

**8. ATTACHMENTS**

- 8.1** Data Test Sheet, see next page.

<b>LOU-GE-118D1357G2 REV. A</b>	<b>g</b>  <b>GE Energy</b> <i>Parts &amp; Repair Services</i> <i>Louisville, KY</i>	<b>Page 5 of 5</b>
-------------------------------------	---	--------------------

Data Sheet for Test for \_\_LOU-GE-118D1357G2\_\_

Test Procedure Step	Nominal	Lower Limit	Results	Upper Limit	Pass/Fail
6.2.2.1	15.7V	+14.7V		+16.7V	
6.2.2.2	-15.7V	-16.7V		-14.7V	
6.2.2.3	-11.66V	-11.55V		-11.77V	
6.2.2.4	-9.57V	-9.30V		-9.86V	
6.2.5	0mV	-1.0mV		+1.0mV	
6.2.7	+10.1V	+9.5V		+10.6V	
6.2.9	0mV	-1.0mV		+1.0mV	
6.2.11	+5.0V	+4.999V		+5.001V	
6.2.13	+10.02V	+9.92V		+10.12V	
6.2.18	20K	19.8K		20.2K	
6.2.20	+5.0V	+4.9V		+5.1V	
6.2.21	+10.1V	+10.09V		+10.11V	
6.2.22	+5.0V	+5.0V		+5.0V	
6.2.23	+5.0V	+4.9V		+5.1V	
6.2.24	+10.1V	+10.09V		+10.11V	
6.2.25	+5.0V	+5.0V		+5.0V	
6.2.26	-14.0V	-13.3V		-14.7V	
6.2.29	0mV	-1.0mV		+1.0mV	
End of Test					