



GE Energy

Functional Testing Specification

*Parts & Repair Services
Louisville, KY*

LOU-GED-118D1347Gx

Test Procedure for a Load Limit and Load Set Runback Card

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1. SCOPE

1.1 This is a functional testing procedure for a Card.

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 **125D6220 Schematic diagram for 118D1347 G1.**

3.1.2 **P3K-AL-0469-A01 Original factory specifications document.**

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		0-30vdc Bench Power Supplies
2		0-20vdc Bench Power Supplies
1		Standard test fixture box for GE MARK II Cards

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6. TESTING PROCESS

6.1 Setup

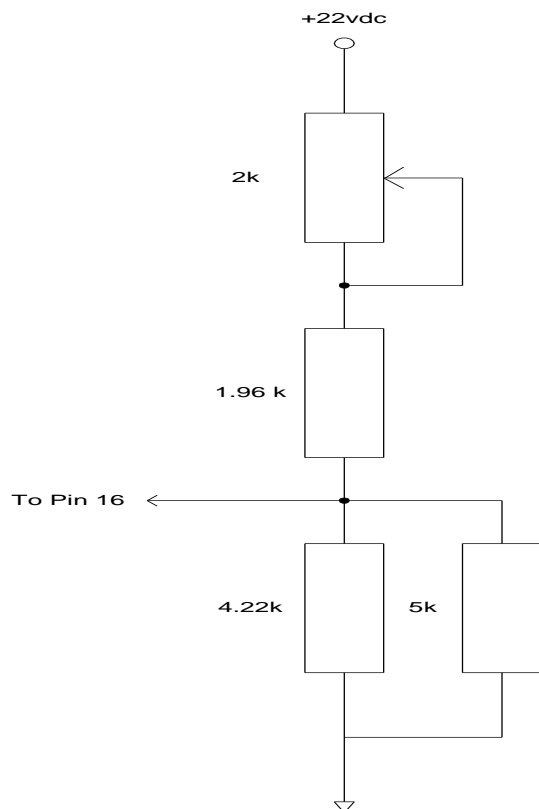



Note:

6.2 Testing Procedure

- 6.2.1 Measure for continuity between pin 1 and pin 39 and TP11.
- 6.2.2 Apply +22vdc to pin 37 and use pin 39 for Common.
- 6.2.3 Apply -22vdc to pin 41 and use pin 39 for Common.
- 6.2.4 Check for +15.7vdc (+/- 1v) at TP1.
- 6.2.5 Check for -15.7vdc (+/- 1v) at TP2.
- 6.2.6 Check for +22vdc at pin 11.
- 6.2.7 Connect a jumper from pin11 to pin 31.
- 6.2.8 Check for 5.6vdc (+/- .2v) at TP14.
- 6.2.9 Move the jumper end connected to pin 31 over to pin 35.
- 6.2.10 Verify that the voltage at TP13 will go from 0 to +21.4vdc (+/- .1v) by turning pot VR53 from fully CCW to fully CW. Turn it back fully CCW.
- 6.2.11 Move jumper end connected to Pin 35 over to Pin 34
- 6.2.12 Verify that the voltage at TP13 will go from 0 to +21.4vdc (+/- .1v) by turning pot VR54 from fully CCW to fully CW. Turn it back fully CCW.
- 6.2.13 Move jumper end connected to Pin 34 over to Pin 33
- 6.2.14 Verify that the voltage at TP13 will go from 0 to +21.4vdc (+/- .1v) by turning pot VR55 from fully CCW to fully CW. Turn it back fully CCW.
- 6.2.15 Move jumper end connected to Pin 33 over to Pin 32
- 6.2.16 Verify that the voltage at TP13 will go from 0 to +21.4vdc (+/- .1v) by turning pot VR56 from fully CCW to fully CW. Turn it back fully CCW
- 6.2.17 Move jumper end connected to Pin 32 over to Pin 22
- 6.2.18 Verify that the voltage at TP7 will go from 0 to +21.4vdc (+/- .1v) by turning pot VR5 from fully CW to fully CCW. Turn it back fully CW.
- 6.2.19 Move jumper end connected to Pin 22 over to Pin 23.
- 6.2.20 Verify that the voltage at TP7 will go from 0 to +21.4vdc (+/- .1v) by turning pot VR4 from fully CW to fully CCW. Turn it back fully CW.
- 6.2.21 Move jumper end connected to Pin 23 over to Pin 24.

- 6.2.22** Verify that the voltage at TP7 will go from 0 to +21.4vdc (+/- .1v) by turning pot VR3 from fully CW to fully CCW. Turn it back fully CW.
- 6.2.23** Move jumper end connected to Pin 24 over to Pin 25.
- 6.2.24** Verify that the voltage at TP7 will go from 0 to +21.4vdc (+/- .1v) by turning pot VR2 from fully CW to fully CCW. Turn it back fully CW.
- 6.2.25** Move jumper end connected to Pin 25 over to Pin 19.
- 6.2.26** Check for 21.4vdc (+/- .1v) at pin 18.
- 6.2.27** Check for +22vdc (+/- .1v) at pin 20 and pin 21 and pin 26.
- 6.2.28** Remove the jumper from pin 11 to pin 19.
- 6.2.29** Verify the voltage at TP3 will go from -9.4vdc to -11.3vdc (+/- .1v) by turning pot VR1 from fully CCW to fully CW. Turn it back fully CCW.
- 6.2.30** Turn off the +/- 22vdc power supplies.
- 6.2.31** Connect the CW end of a 5k external pot to pin 36 and the CCW end to pin 26. Connect the center tap to pin 19 and turn the pot fully CW.
- 6.2.32** Connect the following circuit to pin 16.



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- 6.2.33** Connect a jumper from pin11 to pin 31.
- 6.2.34** Turn the +/- 22vdc power supplies back on.
- 6.2.35** Check at TP10 for the negative saturation of IC1 (-13vdc to -15vdc).
- 6.2.36** Connect a jumper from pin 41 to TP3.
- 6.2.37** Check at TP4 for the positive saturation of IC2 (+13vdc to +15vdc).
- 6.2.38** Adjust the 2k pot in the external circuit above for +10vdc at pin 16.
- 6.2.39** Remove the jumper from pin 41 to TP3.
- 6.2.40** Check for +10vdc +/- .5v at TP4.
- 6.2.41** Slowly turn VR1 CW to achieve +10.5vdc at TP4. Turn VR1 back to fully CCW.
- 6.2.42** Turn the external 5k pot between pins 26 and 36 in the CCW direction to verify that the voltage on pin 16 can be smoothly adjusted from +9vdc to -1.1vdc in the CCW position.
- 6.2.43** Move the meter over to pin 28 and adjust the 5k pot again for exactly +5vdc.
- 6.2.44** Use an external supply to apply exactly +1vdc to pin 5.
- 6.2.45** Check for .5vdc at TP18. (1%tol)
- 6.2.46** Increase the voltage on pin 5 to exactly 10vdc.
- 6.2.47** Check for +5vdc at TP18 (1%tol)
- 6.2.48** Check for -10vdc (+/- .5vdc) at TP12 and pin29 and pin 30.
- 6.2.49** Use a separate external supply to apply -10vdc to pin 27.
- 6.2.50** Adjust VR7 for zero volts at TP12.
- 6.2.51** Remove the voltage from pin 5 and remove the voltage from pin 27.
- 6.2.52** Turn the external 5k pot between pins 26 and 36 fully CW.
- 6.2.53** Check for +10vdc (+/- .3v) at TP4 and +9.3vdc (+/- .1v) at TP6
- 6.2.54** Connect a jumper from pin 11 to pin 22.
- 6.2.55** Connect a separate jumper from pin 11 to pin 35.
- 6.2.56** Adjust VR53 fully CW.
- 6.2.57** Adjust VR5 for +5vdc at TP6.
- 6.2.58** Remove the jumper end going to pin 22 and the voltage at TP6 should snap up to +9.3vdc.
- 6.2.59** Re-connect the jumper end to pin 22 and the voltage at TP6 should ramp back down to +5vdc in about 1.85 to 2 seconds.
- 6.2.60** Remove the jumper from pin 11 to pin 35.
- 6.2.61** Remove the jumper end going to pin 22 and the voltage at TP6 should snap up to +9.3vdc again.

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6.2.62 Re-connect the jumper end to pin 22 again and the voltage at TP6 should ramp back down to +5vdc at a slower rate of about 2.85 to 3 seconds.

6.2.63 End Of Test

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

8. ATTACHMENTS

8.1