g GE Industrial Systems *Renewal Services* *Louisville,KY*	**Functional Testing Specification** **LOU–GED-4136J53**

Test Procedure for a Card

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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	R. Duvall	10/16/03
B			
C			

PREPARED BY	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL
R. Duvall			
DATE 10/16/03	**DATE**	**DATE**	**DATE**

Functional test procedure for a Card

1. SCOPE

1.1 This is a functional testing procedure for a Mark III Pressure Limiter 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

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 or cracked
  - **4.2.1.2** Terminal strips / connectors broken or cracked
  - **4.2.1.3** Loose wires
  - **4.2.1.4** Components visually damaged
  - **4.2.1.5** Capacitors leaking
  - **4.2.1.6** Solder joints damaged or cold
  - **4.2.1.7** Circuit board burned or de-laminated
  - **4.2.1.8** Printed wire runs 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 85 DMM (or Equivalent)

6. TESTING PROCESS

6.1 Setup

6.1.1

Note:

6.2 Testing Procedure

6.2.1 Adjust R2 full CCW and verify 0V +/- 0.1V at Pin 13.

6.2.2 Adjust R2 full CW and verify 15V +/- 0.1V at TP-7.

6.2.3 Connect Pin 30 to COMMON and verify 0V +/- 0.1V at Pin 11.

6.2.4 Connect Pin 30 to +1V and verify -10V +/- 0.1V at TP-10 and –10.5V +/- 0.1V at Pin 8.

6.2.5 Connect Pin 30 to -1V and verify -1V +/- 0.2V at Pin 11 and between +12 V and +15 V at Pin 8.

6.2.6 Disconnect Pin 30.

6.2.7 Connect Pin 29 to +1V and verify -10V +/- 0.1V at TP-10.

6.2.8 Disconnect Pin 29.

6.2.9 Connect Pin 5 to +1V and verify the measurement at TP-10 per the following table.

Card Revision	R7 Value	Measured Value	Tolerance
A	5K	-7.2 V	+/- 0.2 V
B, C, D	10K		+/- 0.2 V
E	20K	-5.2 V	+/- 0.2 V

6.2.10 Adjust R7 to obtain a reading of -10V +/- 0.1V at TP-10.

6.2.11 Disconnect Pin 5.

6.2.12 Connect Pin 3 to +10 V and verify approximately –8.3 V at Pin 12.

6.2.13 Adjust R10 to obtain a reading of -10V +/- 0.02V at Pin 12.

6.2.14 Verify -10V +/- 0.02V at TP-1.

6.2.15 Disconnect Pin 3.

6.2.16 Connect Pin 4 to +5 V and verify approximately –8.3 V at TP 1.

6.2.17 Adjust R14 to obtain a reading of -10V +/- 0.02V at TP 1.

6.2.18 Disconnect Pin 4.

6.2.19 Connect Pin 2 to +10 V and verify approximately –8.0 V at Pin 23.

6.2.20 Adjust R16 to obtain a reading of -10V +/- 0.02V at Pin 23.

6.2.21 Verify -10V +/- 0.02V at TP-8.

6.2.22 Disconnect Pin 2.

6.2.23 Connect Pin 1 to +10 V and verify approximately –8.0 V at TP 8.

6.2.24 Adjust R20 to obtain a reading of -10V +/- 0.02V at TP 8.

6.2.25 Disconnect Pin 1.

6.2.26 Connect Pin 10 to +5V and verify -10V +/- 0.2V at Pin 9.

6.2.27 Verify -10V +/- 0.02V at TP-6.

6.2.28 Disconnect Pin 10.

6.2.29 Adjust R25 full CCW and verify +5V +/- 0.1V at Pin 39.

6.2.30 Adjust R25 full CW and verify -5V +/- 0.1V at Pin 39.

6.2.31 Adjust R25 to obtain a reading of 0V +/- 0.1V at TP 15.

6.2.32 Connect Pin 38 to +10V and verify -10V +/- 0.1V at TP-15.

6.2.33 Disconnect Pin 38.

6.2.34 Connect Pin 37 to +10V and verify -10V +/- 0.1V at TP-15.

6.2.35 Connect Pin 30 and Pin 36 to COMMON.

6.2.36 Disconnect Pin 37.

6.2.37 Connect Pin 35 to +1V.

6.2.38 Connect Pin 34 to Pin 32.

6.2.39 Connect Pin 33 to Common and adjust R53 to obtain a reading of 0V +/- 0.02V at Pin 41.

6.2.40 Disconnect Pin 33.

6.2.41 Connect Pin 33 to –10V and watch for Pin 41 to increase to +6V within 1 second and +10V +/- 0.3V after 10 seconds.

6.2.42 Adjust R42 to obtain a reading of -10V +/- 0.1V at TP 11.

6.2.43 Disconnect Pin 35 from +1V.

6.2.44 Adjust R38 full CCW.

6.2.45 Connect Pin 35 to Pin 24 and verify –1.1V +/- 0.2V at Pin 41.

6.2.46 Verify –1.1V +/- 0.2V at TP 5.

6.2.47 Adjust R58 to obtain a reading of +10V +/- 0.1V at TP 9.

6.2.48 Verify +10V +/- 0.2V at TP 12.

6.2.49 Connect a 10K Ohm resistor between Pin 27 and +15V.

6.2.50 Connect a 10K Ohm resistor between Pin 28 and +15V.

6.2.51 Verify approximately 0V at Pin 27 and Pin 28.

6.2.52 Disconnect Pin 33.

6.2.53 Adjust R38 full CW.

6.2.54 Adjust R58 full CCW.

6.2.55 Adjust R49 full CCW.

6.2.56 Connect Pin 33 to COMMON and verify 0V +/- 0.05V at Pin 41.

6.2.57 Disconnect Pin 33.

6.2.58 Connect Pin 33 to –10V and watch for Pin 41 to increase to +6V in 5 to 7 seconds.

6.2.59 Disconnect Pin 33.

6.2.60 Adjust R49 full CW.

6.2.61 Adjust R41 full CCW.

6.2.62 Connect Pin 33 to –10V and watch for Pin 41 to increase to +2V within 1 second and +10V +/- 0.3V after 4 seconds.

6.2.63 Adjust R41 full CW.

6.2.64 Connect Pin 33 to –1V.

6.2.65 Adjust R54 to obtain a reading of +10V +/- 0.1V at Pin 41 (ADJUST SLOWLY).

6.2.66 Disconnect Pin 33.

6.2.67 Verify approximately 15V at Pin 27 and Pin 28.

6.2.68 Apply +26V to Pin 15 and verify approximately 0V at Pin 27 and Pin 28.

6.2.69 Turn off all supplies and remove all connections.

6.2.70 Use the diode check feature and a DMM to check CR9 between Pin 31 and Pin 25.

6.3 ***TEST COMPLETE ***

7. NOTES

8. Oscilloscope Verification Examples:

Fig. 1

Fig. 2