



GE Energy

Functional Testing Specification

*Parts & Repair Operations
Louisville, KY*

LOU-900D173-A

Test Procedure for a 900D173


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1. SCOPE

1.1 This is a functional testing procedure for a Card. This card is used in 898A711AB001.

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)
		Tek 465 or equivalent

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6. TESTING PROCESS

6.1 Testing Procedure

- 6.1.1 Test the switching power supply. Connect an adjustable regulated power supply to terminals + and A- (NOT A+). Connect a digital voltmeter to common and TP1. Adjust the power supply to 2.25 volts. The voltage at TP1 should read 10-volts or greater. The regulator is fully powered at this point. Increase the power supply to 3.0 volts and TP1 should read between 13 and 14 volts. TP1 should remain in this range as the power supply voltage is increased. At roughly 14.5-volts the reading at TP1 will begin to rise. At this point the switching regulator on board is turning off and the linear regulator is taking over. As the adjustable power supply voltage is increased the reading at TP1 will hold at approximately 15.5 volts. Note that this reading is not critical. The unit is fully powered and operational with any reading at TP1 between 10-volts and 18-volts.
- 6.1.2 With 20-volts applied to terminals + and A-, connect an oscilloscope to common and TP3. A saw-tooth waveform should be found approx 7-volts P-P, with a duration between 9 and 18mSec. Typical duration is 13-mS.
- 6.1.3 Increase the power supply voltage at terminals + and A- to 125-volts. The reading at TP1 should hold at roughly 15.5-volts. Again, this reading is not critical.
- 6.1.4 Connect a 150-watt rough duty light bulb to terminals F+ and F-. This provides a moderate load for further bench testing. The bulb should light fully.
- 6.1.5 Connect another adjustable power supply negative to Common test point. Connect the positive to a 27-K resistor and the other resistor lead to TP5.
- 6.1.6 Connect an oscilloscope between COM and TP4.
- 6.1.7 By adjusting the voltage from the second supply, applied to TP5 thru a 27K resistor, the light bulb should turn off at roughly 6 or 8 volts. The brightness of the light bulb should vary as the power supply is adjusted in this range. This indicates proper operation of the switching circuit. The waveform on the scope will be a square wave of 18-volts P-P or less and will vary as the light bulb brightness changes. See pictures TP4.
- 6.1.8 Remove the second power supply and 27K resistor.
- 6.1.9 Set P2 and P3 to their fully clockwise position. These are 25-turn pots and the end point is indicated by slight clicking sound.
- 6.1.10 Jumper TP7 to TP8.

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6.1.11 Adjust P1 for roughly a 50% duty cycle on the scope waveform. If TP4 is 0-volts turn P1 clockwise, if TP4 is high (10-18 volts) adjust P1 Counter-clockwise.

6.1.12 This concludes the basic bench test. I typically leave the power on the unit and set the light bulb at near full brightness for about an hour as a basic burn-in. Final adjustment of the regulator must be done after it is connected to the generator it will regulate.

6.2 *TEST COMPLETE *****

7. NOTES

7.1 TP1 = Internal power supply regulated voltage. 10VDC to 18VDC.

7.2 TP2 = Oscillator square wave.

7.3 TP3 = Oscillator triangle wave.

7.4 TP4 = Output drive to Q3.

7.5 TP5 = Base of Q1. Used for basic tests.

7.6 TP6 = Collector of Q1. Used for troubleshooting.

7.7 TP7 = +125 volts. (Generator output for typical installation)

7.8 TP8 = +125 volts. (Generator output for typical installation)

7.9 The onboard header was included in the design to allow quick connections to the major test points by an external test jig. This function has not been used and no test jig was built, although it is quite possible to do so. I also anticipated the possibility of building a portable test or calibration device for use in the field that would connect to this header.

8. ATTACHMENTS

8.1 None at this time.