



GE Energy

Functional Testing Specification

Parts & Repair Services
Louisville, KY

LOU-GED-125D460AC

Test Procedure for a 125D460AC

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| DATE 3/8/2013 | DATE | DATE | DATE 3/8/2013 |

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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 | | 12VDC Power Supplies |
| 2 | | 15VDC Power Supplies |
| 2 | | 30VDC Power Supplies |
| 8 | | Fluke 85 meter or equivalent |
| 1 | 460 Card Test Fixture | H033933 - Fixture #54 |
| 1 | | O-Scope |
| 1 | | Resistor 50 ohm +/-5%, 5 watt |
| 1 | | Frequency Counter |
| 3 | | Switch SPST 10mA at 15V |
| 1 | | Switch DPST 10mA at 15V |
| 6 | | Resistor 20.0K +/-1%, ½ Watt |
| 1 | | Resistor 1K +/-1%, ½ Watt |
| 3 | | Pot 5K 10 turn, 2 Watt |

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6. Setup

- 6.1.1 Be sure power switch off
- 6.1.2 Connect +15VDC, -15VDC, +12VDC, and -12VDC to test kit.
- 6.1.3 Connect +30VDC and -30VDC, (keep 30VDC common separate from other commons).
- 6.1.4 Do not have +5VDC connected to test kit.
- 6.1.5 Set S1, S2, S3, and S4 to the open/off position.

7. Testing Process

7.1 Adjustments

- 7.1.1 Plug board into AC position
- 7.1.2 Turn P303(+), P302 full CCW, and P301 full CW.
- 7.1.3 Turn power switch on, fill in data sheet.
- 7.1.4 Read +15VDC current, 20mA Max
- 7.1.5 Read -15VDC current, 20mA Max
- 7.1.6 Read +30VDC current, 400mA Max
- 7.1.7 Read -30VDC current, 400mA Max
- 7.1.8 Read +12VDC current, 10mA Max
- 7.1.9 Read -12VDC current, 10mA Max
- 7.1.10 Turn on S2. Turn P1 CW. Turn P302 CW for +290 +/-5mA at A5 test jack. Turn off S2
- 7.1.11 Connect DVM to TP306, set P301 CCW for -0.099 +/-0.016VDC
- 7.1.12 Set S2 on, connect DVM to A5 test jack, set P1 for 0.0 +/-2mA.
- 7.1.13 Connect DVM to TP307, read and record voltage.
- 7.1.14 Add 300mV to voltage recorded in step 13. Set P1 for this voltage at TP307.
- 7.1.15 Connect DVM to A5 test jack, set P303 CW for +200 +/-2mA.
- 7.1.16 Set P1 CW, A5 more positive then +280mA.
- 7.1.17 Set P1 CCW, A5 more negative then -280mA.
- 7.1.18 Set P1 for 0.0 +/- 2mA at A5
- 7.1.19 Connect DVM to TP301(+) and TP304(-), read and record voltage.
- 7.1.20 Connect DVM to TP304(+) and to TP302(-), record reading, should be within +0.2VDC of voltage in previous step.
- 7.1.21 Set S2 off and S3 on, connect DVM to A5 test jack. Set P2 for 0 +/-0.2mA at A5.
- 7.1.22 Connect DVM to TP308, read and record voltage.
- 7.1.23 Connect DVM to A5 test jack, set P2 for +200 +/-2mA.

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7.1.24 Connect DVM to TP308, voltage should be 219 +/- 22mV greater then voltage in step 7.1.22.

7.1.25 Set S3 off and S4 on. Connect DVM to A5 test jack. Set P3 for 0.0 +/-2mA.

7.1.26 Connect DVM to TP309. Read and record voltage.

7.1.27 Connect DVM to A5 test jack. Set P3 for +200 +/- 2mA.

7.1.28 Connect DVM to TP309. Voltage should be 330 +/-33mV greater then step 7.1.26.

7.1.29 Set S3 on. Connect DVM to TP308 and set P2 for -65.8mV +/- 0.5mV.

7.1.30 Set P3 full CCW and S1 on. Connect DVM to TP309. Set P3 for +1.804 +/- 0.025VDC.

7.1.31 Connect DVM to A5 test jack. Set P301 for 0.0 +/- 100mA.

7.2 Noise Check

7.2.1 Connect scope to TP301(+) and +30VDC(-), noise must be no more than 250mV Max, (Do not include spikes).

7.2.2 Connect scope to TP302(+) and -30VDC(-), noise must be no more than 250mV Max, (Do not include spikes).

7.2.3 Connect scope to TP304(+) and TP305(-), noise must be no more than 250mV Max, (Do not include spikes).

7.2.4 Connect scope to R311 top(+) and common (-), noise less then 50mV.

7.2.5 Power everything down.

7.3 Post Testing Burn-in Required ☒ Yes ☐ No



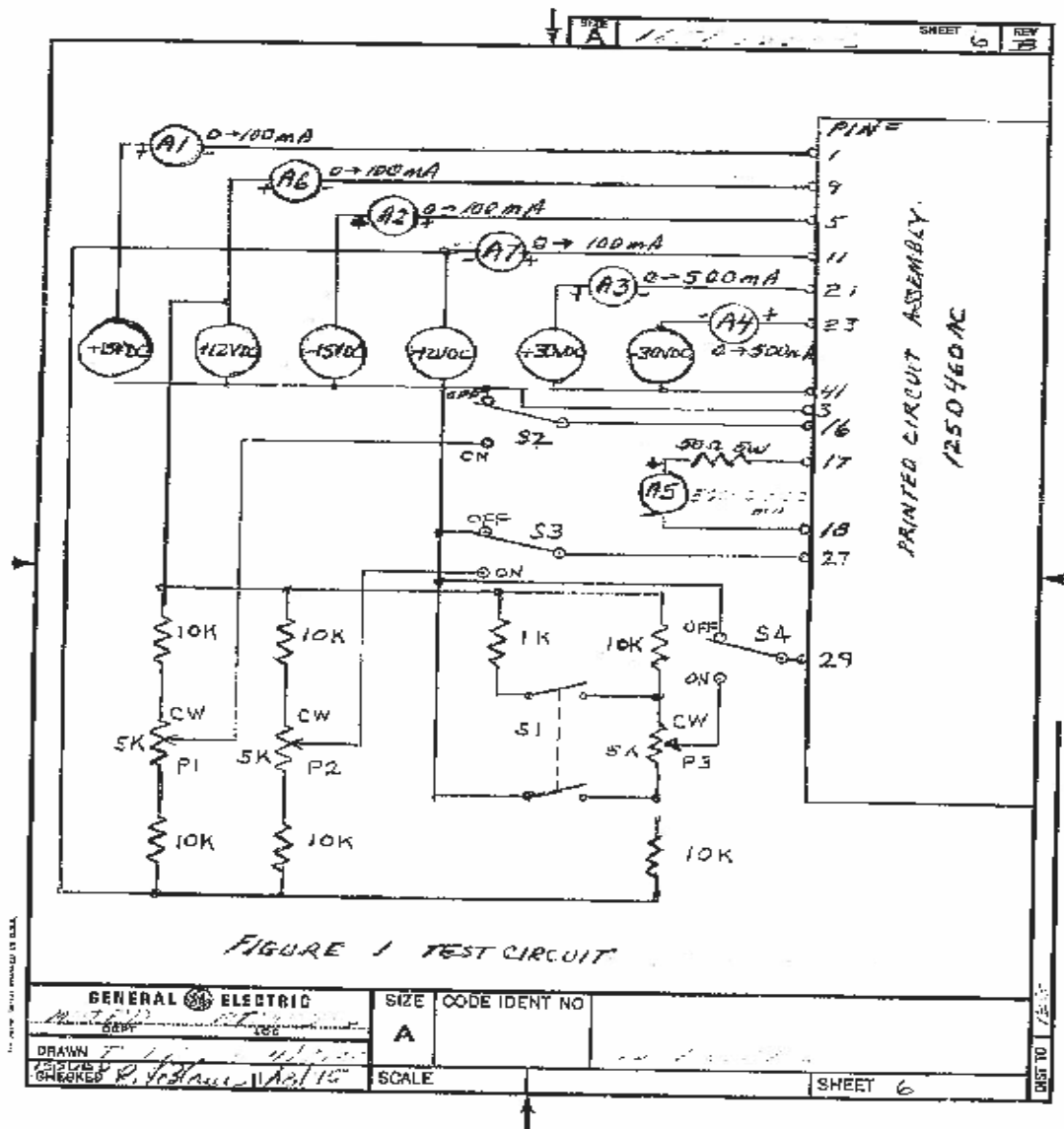
Note: 100 hour burn is required for most Turbine Control Boards

7.3.1 Re-test card after 100 burn-in.

7.4 *TEST COMPLETE *****

8. Notes

8.1 Figure 1 Test Equipment Connections.



9. Attachments

9.1 The next page has a blank copy of the data sheet.

| New Step | Read at | Required Value | Pre-Test Measured | Post-Test Measured | Post-Test Final Measured | | New Step | Read at | Required Value | Pre-Test Measured | Post-Test Measured | Post-Test Final Measured |
|----------|-----------------------|------------------------------|-------------------|--------------------|--------------------------|--|----------|----------------|-----------------------------|-------------------|--------------------|--------------------------|
| 7.1.4 | A1 (+15.75VDC) | 20mA Max | | | | | 7.1.21 | A5 | 0.0 +/- 0.2 mA | | | |
| 7.1.5 | A2 (-15.75VDC) | 20mA Max | | | | | 7.1.22 | TP308 | -----m V | | | |
| 7.1.6 | A3 (+30.75VDC) | 400mA Max | | | | | 7.1.23 | A5 | 200 +/- 2 mA | | | |
| 7.1.7 | A4 (-30.75VDC) | 400mA Max | | | | | 7.1.24 | TP308 | (Step 7.1.22) +219 +/-22 mV | | | |
| 7.1.8 | A6 (+12VDC) | 10mA Max | | | | | 7.1.25 | A5 | 0.0 +/- 2mA | | | |
| 7.1.9 | A7 (-12VDC) | 10mA Max | | | | | 7.1.26 | TP309 | -----mV | | | |
| 7.1.10 | A5 | +290 +/- 5mA | | | | | 7.1.27 | A5 | 200 +/-2 mA | | | |
| 7.1.11 | TP306 | -0.099 +/-0.016VDC | | | | | 7.1.28 | TP309 | (Step 7.1.26) +330 +/-33mV | | | |
| 7.1.12 | A5 | 0.0 +/-2 mA | | | | | 7.1.29 | TP308 | -65.8 +/- 0.5m V | | | |
| 7.1.13 | TP307 | ----- m V | | | | | 7.1.30 | TP309 | 1.804 +/- 0.025VDC | | | |
| 7.1.14 | TP307 | (Step 7.1.13) + 300 +/- 3 mV | | | | | 7.2.1 | A5 | 0.0 +/-100 mA | | | |
| 7.1.15 | A5 | +200 +/- 2 mA | | | | | 7.3.1 | TP301 to +30 V | 250mV Max | | | |
| 7.1.16 | A5 | +280mA Min | | | | | 7.3.2 | TP302 to -30 V | 250mV Max | | | |
| 7.1.17 | A5 | -280mA Min | | | | | 7.3.3 | TP304 to TP305 | 250mV Max | | | |
| 7.1.18 | A5 | 0.0 +/- 2mA | | | | | 7.3.4 | R311 (+) | 50mV Max | | | |
| 7.1.19 | TP301(+) to TP304(-) | -----V | | | | | | | | | | |
| 7.1.20 | TP304(+) to TP302 (-) | (Step 7.1.19) +/- 0.2 V | | | | | | | | | | |

Data Sheet for 125A460AC, Serial Number _____, **Service Order #** _____, **Date** _____

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Board Drawing

