



<p>LOU-GED-125D460AD REV. A</p>	<p>g</p> <p>GE Energy <i>Parts & Repair Services</i> <i>Louisville, KY</i></p>	<p>Page 2 of 10</p>
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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.

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Qty	Reference #	Description
1		5VDC Power Supply
2		15VDC Power Supplies
6		Fluke 85 meter or equivalent
1	460 Card Test Fixture	H033933 - Fixture #54
1		O-Scope
2		Switch SPDT 100mA rating at 15VDC
1		Pot 5K 10 turn, 2 Watt
1		Resistor 5K 5%, ¼ watt
2		One Shot Multi-vibrator with a 0.1 sec period 74121 with 4.7 and 30K or Equivalent

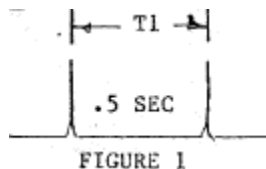
6. Setup

- 6.1.1 Turn Power Switch off
- 6.1.2 Connect +15VDC, -15VDC, +5VDC, and commons to test kit
- 6.1.3 Set S1 and S2 to "OFF" (left position).
- 6.1.4 Plug board in AD Position
- 6.1.5 Connect jumper TP403 to common
- 6.1.6 Connect jumpers from TP405 and TP406 on board to test jacks TP405 and TP406.
- 6.1.7 Turn power switch on.

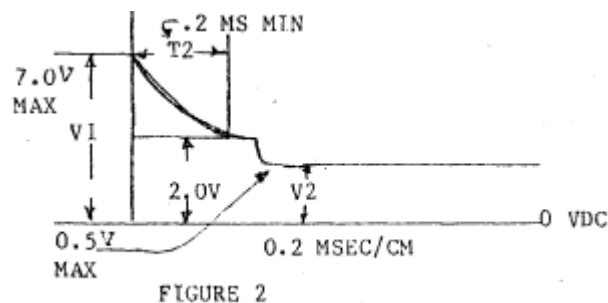
7. Testing Process

7.1 Clock Pulse Check

- 7.1.1 Read +15VDC current, 90mA Max
- 7.1.2 Read -15VDC current, 130mA Max
- 7.1.3 Read +5VDC current, 350mA Max
- 7.1.4 Connect scope (in DC mode) TP410. Set 1V/Div and 100mSec/CM, sweep, slope, and use manual level to trigger pulse. Refer to Figure 1. Record "T1" 0.5 +/- 0.1 Sec.



- 7.1.5 Set sweep to 0.5mSec/CM. Refer to figure 2. Record V1, should be 7.0VDC Max.



- 7.1.6 Refer to Figure 2. V2, should be 0.5VDC Max
- 7.1.7 Refer to Figure 2. T2, should be 0.2mSec Min

- 7.1.8** Set scope to Dual trace, chopped mode, CH1 and CH2 DC mode, 2V/Div, 0.2 Sec/CM, trigger CH1. Connect CH1 to scope 1 test jack. Connect CH2 to scope 2 test jack. Connect CH2(1) common lead only. Leave CH1(2) common lead floating. T4/T3 x 360 must be 180 +/-20 (See figure 3)

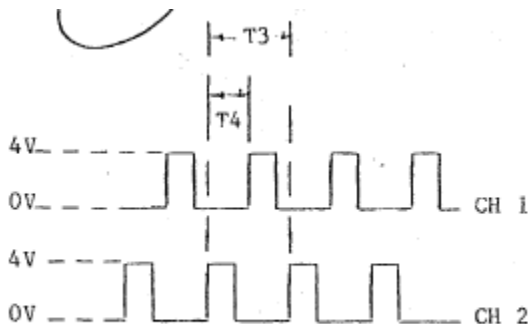


FIGURE 3

7.2 Linearity Adjustment and Check

- 7.2.1** Connect DVM TP409, set P1 for 0.00 +/- 0.010VDC.
- 7.2.2** Connect DVM TP408, set P402 for 0.00 +/- 0.010VDC.
- 7.2.3** Connect DVM TP409, set P1 for -5.00 +/- 0.010VDC.
- 7.2.4** Connect DVM TP408, set P401 for +5.00 +/- 0.010VDC.
- 7.2.5** Connect DVM TP402, set P403 for -5.00 +/- 0.010VDC.
- 7.2.6** Connect DVM TP408, set P1 for 0.00 +/- 0.010VDC.
- 7.2.7** Connect DVM TP402, should be 0.00 +/- 0.010VDC.
- 7.2.8** Connect DVM TP408, set P1 for +1.00 +/- 0.010VDC.
- 7.2.9** Connect DVM TP402, should be -1.00 +/- 0.020VDC.
- 7.2.10** Connect DVM TP408, set P1 for +3.00 +/- 0.010VDC.
- 7.2.11** Connect DVM TP402, should be -3.00 +/- 0.030VDC.
- 7.2.12** Connect DVM TP408, set P1 for +5.00 +/- 0.010VDC.
- 7.2.13** Connect DVM TP402, should be -5.00 +/- 0.050VDC.
- 7.2.14** Connect DVM TP409, set P1 for -3.00 +/- 0.010VDC.

7.3 Update Delay Check

- 7.3.1** Connect O-scope, CH1 to TP409 and CH2 to TP402.
 - 7.3.1.1** Settings: Dual Trace (auto), Chopped DC Mode, 2/Div, 0.5 Sec/CM
 - 7.3.1.2** Set 1 on. CH1 should jump to 0.00 +/-0.10VDC
 - 7.3.1.3** CH2 should jump to 0.00 +/-0.10VDC

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7.3.2 Time delay between CH1 voltage jump and CH2 voltage jump must be .4 to 1.8 Sec. **Turn S1 off.**

7.4 SMF Check

7.4.1 Connect DVM to TP409. Set P1 for -3.00 +/-0.100VDC.

7.4.2 Set S2 on. LED 1 must be on.

7.4.3 Connect DVM to TP401. Must be 0.0 +/-0.2VDC

7.4.4 Connect DVM to TP404. Must be -3.0 +/-0.10VDC. Vary P1. TP404 must not change.
Turn power off. S2 off.

7.5 Post Testing Burn-in Required ☒ Yes ☐ No



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

7.5.1 Re-test card after 100 burn-in.

7.6 *TEST COMPLETE *****

8. Attachments

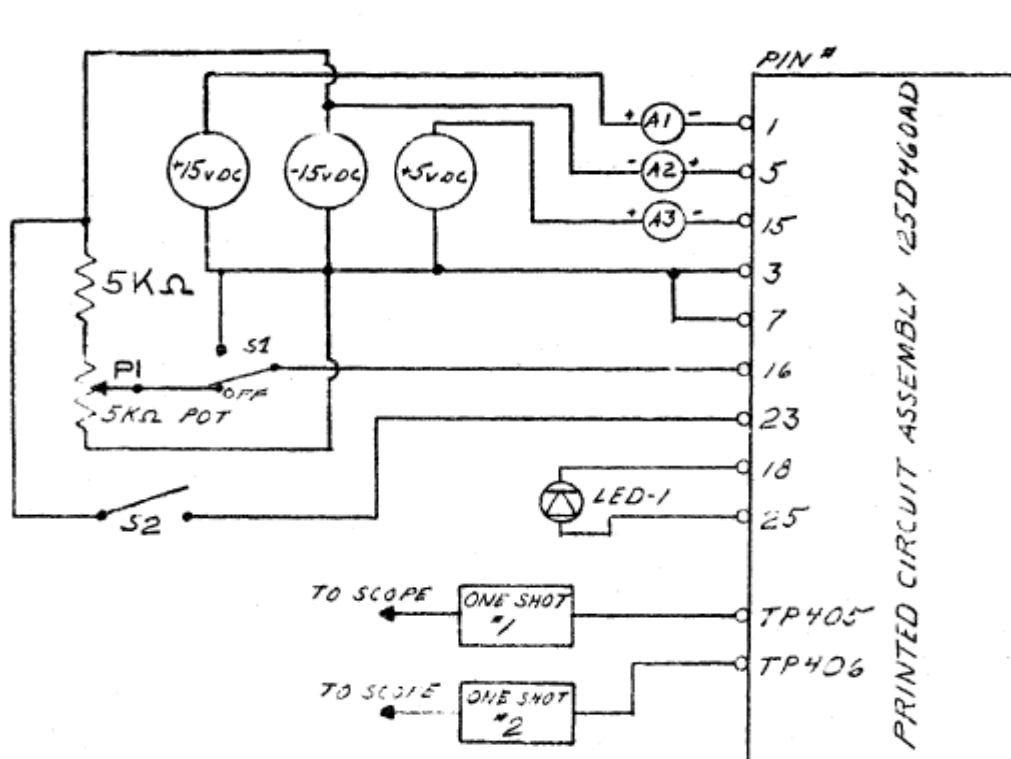
8.1 Test circuit for card on next page.

8.2 Page 7 shows update pulses.

8.3 Page 8 shows one shot configuration.

8.4 The last page has a blank copy of the data sheet.

Test Circuit for card



NOTE: SEE FIGURE 4 FOR TRIGGER ONE SHOT CONNECTIONS

FIGURE 3 TEST EQUIPMENT CONNECTIONS

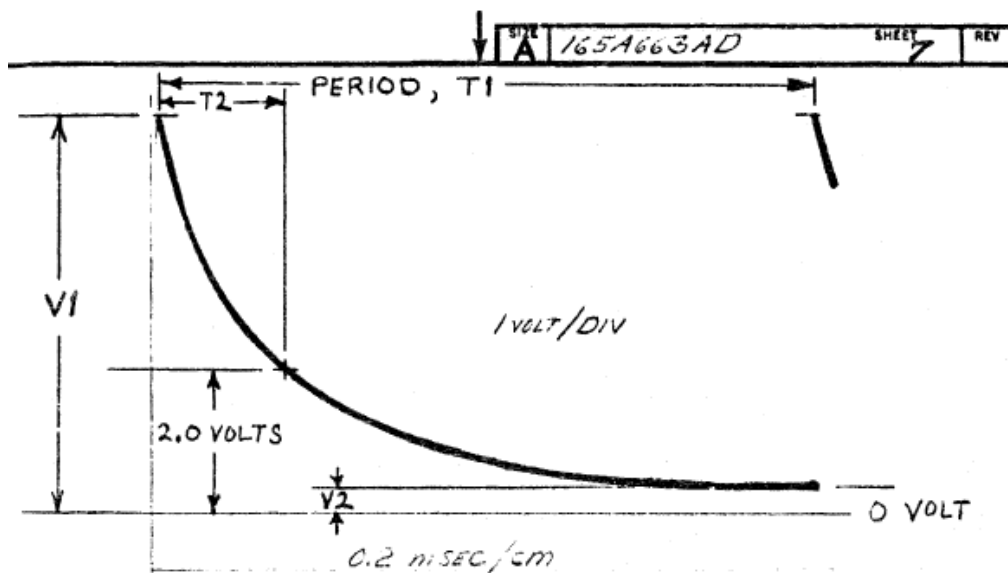


FIGURE 2 CLOCK PULSE SEE 5.1.2

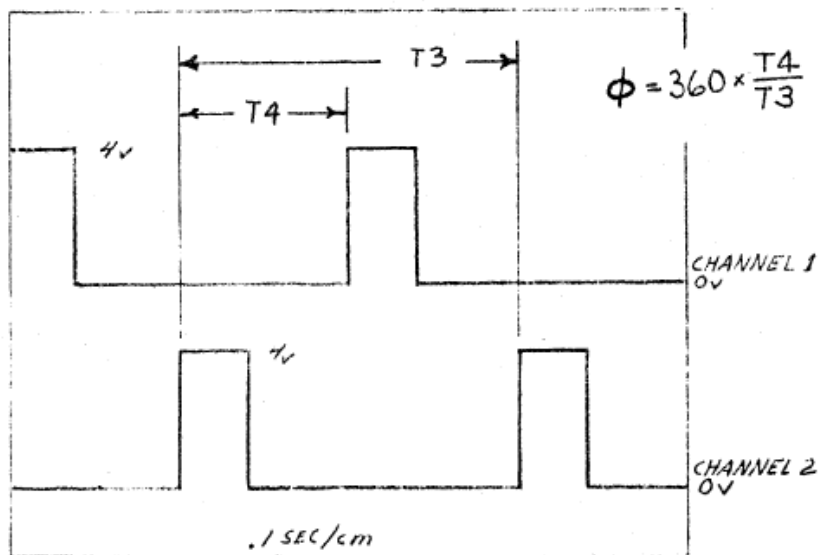


FIGURE 3 UPDATE PULSES

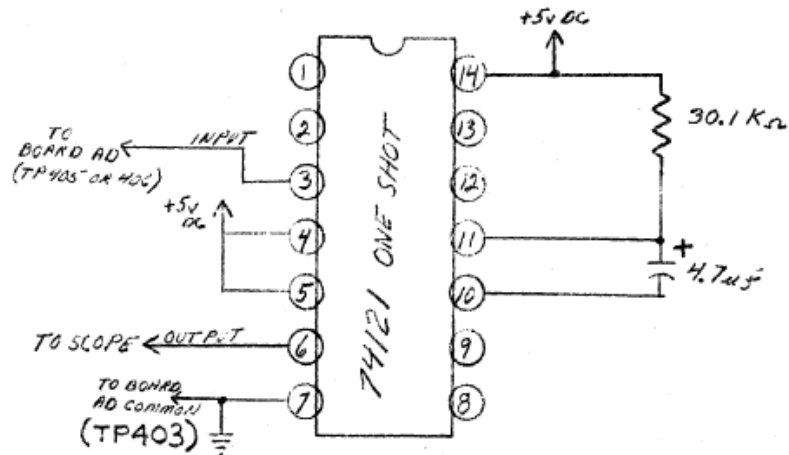


FIGURE 4 TYPICAL ONE SHOT CONNECTIONS

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
7.1.1	A1 (+15.75VDC)	90mA MAX					7.2.8	TP408	1.00 +/-0.01V			
7.1.2	A2 (-15.75VDC)	130mA MAX					7.2.9	TP402	-1.00 +/-0.01V			
7.1.3	A3 (+5VDC)	350mA MAX					7.2.10	TP408	+3.00 +/-0.01V			
7.1.4	TP410 (T1)	0.5 +/-0.1 Sec					7.2.11	TP402	-3.00 +/-0.03V			
7.1.5	TP410 (V1)	7V Max					7.2.12	TP408	+5.00 +/-0.01V			
7.1.6	TP410 (V2)	0.5V Max					7.2.13	TP402	-5.00 +/-0.05V			
7.1.7	TP410 (T2)	0.2mSec Min					7.2.14	TP409	-3.00 +/-0.01V			
7.1.8	TP405 & TP406	Deg = 180 +/- 20 Deg					7.3.1	Channel #1	0.00 +/-0.1V			
7.2.1	TP409	0.00 +/-0.01V					7.2.16	Channel #2	0.00 +/-0.1V			
7.2.2	TP408	0.00 +/-0.01V					7.2.12	Delay	0.4 to 1.8 Sec			
7.2.3	TP409	-5.00 +/-0.01V					7.2.13	TP409	-3.00 +/-0.1V			
7.2.4	TP408	+5.00 +/-0.01V					7.2.13	LED	ON			
7.2.5	TP402	-5.00 +/-0.01V					7.2.14	TP401	0.00 +/-0.2V			
7.2.6	TP408	0.00 +/-0.01V					7.2.14	TP404	-3.00 +/-0.1V			
7.2.7	TP402	0.00 +/-0.01V										

Data Sheet for 125A460AD, Serial Number_____, **Service Order #**_____, **Date**_____