



GE Energy

Functional Testing Specification

Parts & Repair Services
Louisville, KY

LOU-GEF-PWMP4/5

Test Procedure for PWMP4/5 Power Boards


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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	C. Wade	06/06/2005
B	Rewrote procedure to comply with the functional design of the new test fixture. Revised grammar.	C. Edlin	11/5/2010
C			

© COPYRIGHT GENERAL ELECTRIC COMPANY

Hard copies are uncontrolled and are for reference only.

PROPRIETARY INFORMATION – THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF GENERAL ELECTRIC COMPANY AND MAY NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF GENERAL ELECTRIC COMPANY.

PREPARED BY Charlie Wade	REVIEWED BY Cristyn Edlin	REVIEWED BY	QUALITY APPROVAL 
DATE 06/6/2005	DATE 11/5/2010	DATE	DATE 6/6/2005

<p>LOU-GEF-PWMP4/5 REV. B</p>	<p>g</p> <p>GE Energy Parts & Repair Services Louisville, KY</p>	<p>Page 2 of 5</p>
--	--	---------------------------

Functional test procedure for PWMP4/U4 and PWMP5/U5 power boards.

1. SCOPE

- 1.1 This specification provides the Engineering Requirements for testing PWMP4/U4 & PWMP5/U5 power boards. The process applies only to control cards model number 44A399729-G01 thru G08.

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 | GEK-45605 | PWM Model II Drives |
| 3.1.2 | 44C283831 | PWMP4/U4 & PWMP5/U5 Schematics |

4. ENGINEERING REQUIREMENTS

- 4.1 Description
- 4.1.1 PWM Model II drives are used in conjunction with GE controls to provide power and control for their complement DC motors. There are generally two power boards and one control board use with each drive. The control board in each drive interprets the signals from the control and applies them to the power board that then applies the correct power and direction to the DC motor.
- 4.2 Equipment Cleaning
- 4.2.1 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.
- 4.3 Equipment Inspection
- 4.3.1 Equipment should be visually inspected for any defects prior to applying power. This inspection should include the following as a minimum:
- 4.3.1.1 Wires broken or cracked
 - 4.3.1.2 Terminal strips / connectors broken or cracked
 - 4.3.1.3 Loose wires
 - 4.3.1.4 Components visually damaged
 - 4.3.1.5 Capacitors leaking
 - 4.3.1.6 Solder joints damaged or cold
 - 4.3.1.7 Circuit board burned or de-laminated
 - 4.3.1.8 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 77 or equivalent	Voltmeter
1	Tenma 72-2080 or equivalent	Dual Power Supply
1	H188655	PWMP4/5 Test Fixture

6. TESTING PROCESS

6.1 Visual Inspection and Pre Test

- 6.1.1 If UUT (unit under test) is covered with oil, you may have to remove all power transistors to clean the unit thoroughly underneath the heat sinks. Oil can cause many kinds of faults when spread throughout the heat sinks.
- 6.1.2 Using a Huntron Tracker, check and compare the active circuits of the UUT to the KGB (known good board).
- 6.1.3 Using a meter, check the resistances of the UUT's resistors as compared to the KGB's respective resistances.

6.2 Connections

- 6.2.1 Set the dual power supply to independent mode.
- 6.2.2 Set channels one and two to 0VDC.
- 6.2.3 Connect channel one to "0-10VDC Brake Input".
- 6.2.4 Connect channel two to "Velocity Command Input".
- 6.2.5 Connect a meter to "Velocity Command Output".
- 6.2.6 Disconnect and remove the KGB.
- 6.2.7 Install the UUT.
- 6.2.8 Connect the PWMP4/5 Test Fixture to a 1-phase 220VAC outlet.

6.3 Operational Procedure

- 6.3.1 **Preemptive warning: Immediately push the "Quick Shut-Off" button in case the "Drive Fault" LED illuminates.**
- 6.3.2 Turn "UUT Quick Shut-Off" to enable the 90VDC Buss.
- 6.3.3 Verify that the "90VDC Enabled" light illuminates.
- 6.3.4 Turn the "UUT Power" switch to on.
- 6.3.5 Verify that the "UUT Power" light illuminates.
- 6.3.6 Flip the "Inhibit/Enable" switch to on. (You should hear a relay kick in).

<p>LOU-GEF-PWMP4/5 REV. B</p>	<p>g</p> <p>GE Energy Parts & Repair Services Louisville, KY</p>	<p>Page 4 of 5</p>
--	--	---------------------------

- 6.3.7** Flip the “Loop Contact” switch to on. (You should hear a relatively high-pitched hum).
- 6.3.8** Ensure that the velocity command pot is adjusted to its most counter clockwise direction.
- 6.3.9** Set the velocity command polarity switch to the center position (0).
- 6.3.10** Turn on the dual power supply.
- 6.3.11** Adjust the power supply's channel two output voltage to NO MORE THAN 7.5VDC.
- 6.3.12** Ensure that the velocity command output meter measures 0VDC.
- 6.3.13** Set the velocity command polarity switch to the positive position.
- 6.3.14** Turn the velocity command pot clockwise until the velocity command meter reads measures 7.5VDC.
- 6.3.15** Ensure that the motor turns in the counter-clockwise direction.
- 6.3.16** Set the velocity command polarity switch to the center position (0).
- 6.3.17** Ensure that the motor stops and the velocity command output meter measures 0VDC.
- 6.3.18** Set the velocity command polarity switch to the negative position.
- 6.3.19** Ensure that the motor turns in the clockwise direction and the velocity command meter reads measures -7.5VDC.
- 6.3.20** Set the velocity command polarity switch to the center position (0).
- 6.3.21** Ensure that the motor stops and the velocity command output meter measures 0VDC.
- 6.3.22** Set the velocity command polarity switch to the positive position.
- 6.3.23** Ensure that the motor turns in the counter-clockwise direction and the velocity command meter reads measures 7.5VDC.
- 6.3.24** Adjust the power supply's channel one output voltage to until the “DC Current” meter measures –30Amps.
- 6.3.25** Adjust the power supply's channel one output voltage back down until the “DC Current” meter measures –10Amps.
- 6.3.26** Allow the unit to run in this direction for approximately 15 minutes.
- 6.3.27** Set the velocity command polarity switch to the negative position.
- 6.3.28** Ensure that the motor turns in the counter-clockwise direction and the velocity command meter reads measures -7.5VDC.

<p>LOU-GEF-PWMP4/5 REV. B</p>	<p>g</p> <p>GE Energy Parts & Repair Services Louisville, KY</p>	<p>Page 5 of 5</p>
--	--	---------------------------

6.3.29 Adjust the power supply's channel one output voltage to until the "DC Current" meter measures 30Amps.

6.3.30 Adjust the power supply's channel one output voltage back down until the "DC Current" meter measures 10Amps.

6.3.31 Allow the unit to run in this direction for approximately 15 minutes.

6.3.32 Adjust the power supply's channel one output voltage back down until the "DC Current" meter measures 0Amps.

6.3.33 Turn the velocity command pot counter clockwise until the velocity command meter reads measures 0VDC.

6.3.34 Set the velocity command polarity switch to the center position (0).

6.3.35 Flip the "Loop Contact" switch to off.

6.3.36 Flip the "Inhibit/Enable" switch to off.

6.3.37 Turn the "UUT Power" switch to off.

6.3.38 Push "UUT Quick Shut-Off" to disable the 90VDC Buss.

6.3.39 Allow the unit approximately 10 to 15 minutes to cool down before removing from the test fixture.

6.4 *TEST COMPLETE *****

7. **REFERENCES**

7.1 None at this time