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GE Energy

**Functional Testing Specification***Parts & Repair Services  
Louisville, KY***LOU-GEF-PWMR2/3****Test Procedure for PWMR2/3 Power Supply Card****DOCUMENT REVISION STATUS:** Determined by the last entry in the "REV" and "DATE" column

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	C. Wade	8/25/2007
B	Revised naming conventions and order of operations to comply with the test fixture that was built after the initial release of this procedure. Revised grammar and added context to key info.	C. Edlin	10/15/2010
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<b>DATE</b> 8/25/2007	<b>DATE</b> 10/15/2010	<b>DATE</b>	<b>DATE</b> 10/15/2010

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Functional test procedure for PWMR2 and PWMR3 power supply control cards.

## 1. SCOPE

- 1.1 This specification provides the Engineering Requirements for testing PWMR2 and PWMR3 control cards. The process applies only to control cards model number 44A398788-G01 thru G05.

## 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

## 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 or more	Bench-top power supply (supplies)	Capable of up to 130VDC output
1	H188721	PWMR2/3 Test fixture
1	Fluke 77 or equivalent	One ammeter
2	Fluke 77 or equivalent	Ohmmeter
2	Fluke 77 or equivalent	DC Voltmeters

## 6. TESTING PROCESS

### 6.1 Pre Test Requirement

**6.1.1** Check and compare active circuits using a Huntron Tracker, if needed compare BUT (board under test) to a KGB (known good board). Check resistance values of resistors.

### 6.2 Connections

**6.2.1** Connect 90VDC supply to the 90VDC input of the fixture.

**6.2.2** Connect the ammeter to the fixture's AMP-GROUND and AMP-HOT outputs.

**6.2.3** Connect the ohmmeters to the fixture's RL1 (relay-1) and RL2 (relay-2) outputs.

**6.2.4** Connect the voltmeters to the fixture's +15VDC and -15VDC outputs.

**6.2.5** Connect the fixture's 8PL cable to the card's 8PL connector.

**6.2.6** Connect the fixture's 1PL/14PL cable to the card's 1PL connector.

**6.2.7** Connect the fixture to 110VAC.

### 6.3 Functional Testing.

**6.3.1** Turn the test fixture on.

**6.3.2** Ensure that the voltage outputs measure +/-15VDC respectively.

**6.3.3** Turn the test fixture off.

**6.3.4** Disconnect the 1PL/14PL cable from 1PL.

**6.3.5** Connect the 1PL/14PL cable to 2PL.

**6.3.6** Repeat steps 5.3.1 through 5.3.5 for the card's 3, 4, 13 and 14PL connectors.

**6.3.7** Ensure that LED1 is off.

**6.3.8** Ensure that the relays measure opened.

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**6.3.8.1** Note: The PWMR2 & PWMR3 cards have only one relay. The PWMR3A has two

- 6.3.9** Turn on the 90VDC power supply.
- 6.3.10** Ensure that the relays close.
- 6.3.11** With power on, jumper together test points TP6 and TP7.
- 6.3.12** Ensure that the output voltages drop to approximately +/-10VDC respectively and that the relays open.
- 6.3.13** Disconnect the jumper.
- 6.3.14** Ensure that the output voltages jump back to +/-15VDC respectively and that the relays close.
- 6.3.15** Jumper together test points TP4 and TP5.
- 6.3.16** Ensure that the relays open and LED1 illuminates.
- 6.3.17** Ensure that this condition remains once the jumper gets removed.
- 6.3.18** Ensure that jumping together test points TP1 and TP2 resets the relay's and LED1's closed and off positions (respectively).
- 6.3.19** Ensure that jumping TP2 and TP8 opens the relays.
- 6.3.20** Ensure that removing the jumper from TP2 and TP8 closes the relays.
- 6.3.21** Turn the load switch of the fixture to +LOAD.
- 6.3.22** Ensure that the ammeter measures approximately 1.2Amps.
- 6.3.23** Turn the load switch of the fixture to -LOAD.
- 6.3.24** Ensure that the ammeter measures approximately -1.2Amps.
- 6.3.25** Turn the load switch back to 0.
- 6.3.26** The following steps will set and test the card's overvoltage trip-point.
- 6.3.27** Slowly increase the 90VDC supply to 130VDC.
- 6.3.28** If the supply reaches 130VDC without the overvoltage circuit tripping (LED1 illuminating), adjust P1 until LED1 illuminates.
- 6.3.29** Decrease the supply voltage to approximately 120VDC.
- 6.3.30** Reset the card by jumping TP1 and TP2.
- 6.3.31** Increase the supply voltage to 130VDC.
- 6.3.32** Repeat steps 5.3.28 through 5.3.31 until the overvoltage circuit trips at 130VDC.
- 6.3.33** Seal P1.

**6.4 \*\*\*TEST COMPLETE \*\*\***

## **7. REFERENCES**

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7.1 None at this time