g	GE Energy	**Functional Testing Specification**
	Inspection & Repair Services *Louisville, KY*	**LOU-GEF-AXI01**

Test Procedure for AXI01 Printed Circuit Board in a Wiedemann Control

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Functional test procedure for AXI01 Printed Circuit Board

1. SCOPE

1.1 This specification provides the Engineering Requirements for testing the AXI01 printed circuit board. The process applies only to AXI01 board model number 44A297057-G01.

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 **44A712269** **Troubleshooting Guide for Wiedemann W3**

4. ENGINEERING REQUIREMENTS

4.1 Description
6.1
6.1.1 There are three AXI01 boards used in this 1050 control. One board is required for each individual axis. Even though all the boards are physically the same, the control uses specific parts of each board to operate different functions of the control. This is why when testing a board it needs to be inserted and tested in all three slots X, Y, & Z.

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 the local documented procedures 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	GE Wiedemann Control	W3 Model
1	Simpson 464	Voltmeter
1	Huntron Tracker	Signal Analyzer

6. TESTING PROCESS

6.1 Diagnostic Pre Test Requirement

6.1.1 Ensure all chips have been inserted into their appropriate sockets correctly.

6.1.2 There is an input and output section of this board and it is necessary that all of these eight pin chips be scanned and compared with a known good card and verified they match prior to installing in control. Use a Tracker to scan chips.

6.1.3 Set board address switches for the correct axis. Three boards are required to operate control.

6.1.3.1 For X   All Open
For Y   #1 Closed
For T   # 2 & 8 Closed

6.1.3.2 Berg Jumper Settings are as follows
A to B   F to E   H to G
L to M   P to N   R to S
W to X

6.2 Functionally testing an AXI01 board.

6.2.1 It is recommended that the control be tested to check its integrity prior to installing the BUT.

6.2.2 Close disconnect switch, turn on control and observe the following.

6.2.2.1 All AXI01 boards have LED's on. This indicates these boards have been initialized at power up.

6.2.2.2 All LEDs on BPLW1 board are on. This indicates that all logic power buses are functioning.

6.2.2.3 The display shows a list of test programs that can be selected via the keyboard. This indicates proper board addressing and that the CPU is functioning.

6.2.3 When running the following tests look for consistency between each tests and boards. Since this control has many connections and cables be aware that you may experience problems with these connections.

6.2.4 Press the page button (PGE) this lets you view the second page.

6.2.5 Automatic Test P12

    6.2.5.1 Press P, then 1, then 2, then CR (Carriage Return) to bring up test number 12, Automatic Diagnostic Test. To operate motors, you will have to enable the motors from the switch on front panel.

    6.2.5.2 Check line 5 for X00000, Y00000, T00000, for zero readings. If not their I/O elements could be bad.

    6.2.5.3 Check position registers are all counting the same, if not be sure jumpers are set to H-G and R-S.

    6.2.5.4 Line 3 should read I/O 00 TAPE 00 PSN X00 Y00 T00

    6.2.5.5 See attach sheets pages 15 thru 17 of drawing number 44A712269 for more information.

6.2.6 Keyboard Test P02

    6.2.6.1 After test cycles for a while, press P, then 0, then 2, then CR, the Punch Keyboard Test. Follow instructions from display. When the keyboard test is completed go to test P11.

6.2.7 Axis DAC Test P11

    6.2.7.1 SPECIAL NOTE: On Test P11, The negative voltage readings will be slightly positive with respect to the voltages listed on the display. Positive voltage readings will be less then or equal to displayed voltages. See following table.

    6.2.7.2 Turn control off, then on, then proceed

    6.2.7.3 Press P, then 1, then 1, then CR, the Axis DAC test.

    6.2.7.4 Once activated Press T, then JOG. Adjust P1 (Offset Pot) for 0.00V (Adjust P1 until motor is still. You will have to enable the motor to do so, once adjusted disable the motor.

    6.2.7.5 Press JOG, Adjust P2 (Gain Pot) for 8.00V.

    6.2.7.6 Press JOG after each step to advance to the next check for each axis, until the "Test Complete –Select Next Axis" message appears. Then return to step "A" and select next axis.

Selected Values   Readings taken as of 10/24/2001 (DC)

	X Axis	Y Axis	T Axis
0 Volts	0.19 Volts	0.20 Volts	0.20 Volts
8 Volts	8.20 Volts	8.20 Volts	8.20 Volts
-8 Volts	-7.84 Volts	-7.81 Volts	-7.81 Volts
6 Volts	6.20 Volts	6.20 Volts	6.20 Volts
-6 Volts	-5.83 Volts	-5.81 Volts	-5.81 Volts
4 Volts	4.19 Volts	4.20 Volts	4.20 Volts
-4 Volts	-3.83 Volts	-3.80 Volts	-3.80 Volts
2 Volts	2.19 Volts	2.19 Volts	2.20 Volts
-2 Volts	-1.82 Volts	-1.81 Volts	-1.81 Volts

6.2.7.7 Once these cards have been calibrated turn off control, and then turn on. Go to test P12, once selected enable drives and watch how they respond, act, run. Should slowly increase speed then decrease speed, should run smoothly.

6.2.7.8 Let run for 10m minutes or so, and then disable drives.

6.2.8 Input Test P05

6.2.8.1 Never seen any reason use for this test, looks to be useless.

6.2.9 Output Driver Test P06

6.2.9.1 If you are having I/O trouble, insert output driver board in to circuit and run this test. It should help isolate which output driver is not functioning correctly.

6.2.10 Tape Reader Test P07

6.2.10.1 Go to P07 test tape reader. Run tape then stop, then run tape until it finishes, control button instructions should be listed on screen

6.2.10.2 Once this has been done, move board from Slot T to Slot Y, Slot Y to Slot X, and Slot X to Slot T. Run P12, P07, and P02 tests.

6.2.10.3 Once this has been done, again move the board in Slot T to Slot Y, Slot Y to Slot X, and Slot X to Slot T. Run P12, P07, and P02 tests.

6.3 ***TEST COMPLETE ***

7. <u>NOTES</u>

7.1 Be aware that corrosion has been found on some of these cards that has caused the I/O chips to register bad, when it was just an open run. Also check plug connections for bent over pins.

7.2

8. <u>Attachments</u>

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