g GE Energy	**Functional Testing Specification**
Inspection & Repair Services ***Louisville, KY***	**LOU-GEF-PERI1**

Test Procedure for PERI1H Printed Circuit Board

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PREPARED BY	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL
Charlie Wade	C. Edlin		Charlie Wade
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Functional test procedure for PERI1 Printed Circuit Board

1. SCOPE

1.1 This specification provides the Engineering Requirements for testing the PERI1 printed circuit board. The process applies only to PERI1 boards model number 44A398714-G02.

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-36093**	Diagnostic Software for 1050T Controls
3.1.2	**GEK-71632**	Diagnostic Software for 1050MC Controls
3.1.3	**GEK-45668**	Computer Access Panel
3.1.4	**44C288517**	Schematics

4. ENGINEERING REQUIREMENTS

4.1 Description

4.1.1 The 1050 Control is a solid-state, integrated circuit controller/processor system using LSI circuits for data processing and control. The static logic circuits are arranged on modular, plug in, printed circuit boards, clearly identified by type. The circuit boards are mounted with functional grouping. In addition, a board identification number marks each rack slot. The backplane consists of printed conductors arranged in a busing structure so that each slot is universal and can accept any board type. The 1050 control uses the AXIS2 board for controlling two or more axis drives.

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 1050T	CPU3 Model
1	GE Computer Access Panel	External Interface
1	Diagnostic Tape Specific to Control	Diagnostic Tape
1	Executive Tape Specific to Control	Executive Tape
1	Part Program	Exercise Tape
1	Axis Cart	Motion Cart for Control
1	Fluke 87	Multimeter

6. TESTING PROCESS

6.1 Diagnostic Test

6.1.1 Configure the PERI Circuit Board per enclosed table.

6.1.2 Load the third section of the Diagnostic Tape.

6.1.2.1 Once the tape is fully loaded it will rewind back to the beginning (Before Test No. 1). The Display should show: Push Control OFF, then ON, follow this instruction at this time. If the Cap Panel is hooked up you will also have to hit the RUN switch to start the control's program

6.1.3 Setup the control for testing.

6.1.3.1 Press NEXT, then 2, then Cycle Start. Alphanumeric characters should scroll on the display and the Option STOP lamp should flash.

6.1.3.2 Press Cycle Start button until display stops scrolling. Press Cycle Start button again until the Option Stop push button quits flashing.

6.1.3.3 Go to the Spindle portion of this test by hitting the Next and Option Stop push buttons until the display shows spindle angle on the screen (Checks for feedback from PERI1H). With spindle disabled, physically turn the spindle servo and you should see the spindle angle on the display count up or down with the first three digits on the right. Reverse direction of the motor and you should see the same thing occur. Power down.

6.2 Null Test

6.2.1 Load the spindle test tape into memory. Simulator should display “Depress next to continue test.”

6.2.2 Depress “next”. Simulator should display “Adjust P2 to 0 volts.”

6.2.3 Set switch to “spindle test”.

6.2.4 Adjust P2 on the PERI board to 0 volts, then depress “next”.

6.2.5 The simulator should display “Adjust to 7.5 volts.” Adjust P1 on the PERI board to 7.5 volts +/-.3 volts. Depress “next”.

6.3 Linear Progression Test

6.3.1 The simulator should display “POS 0% meter should read 0v.” DVM should read 0 volts. Depress “next”.

6.3.2 The simulator should display “POS 25% meter should read 1.87v.” DVM should read approximately 1.87 volts +/-.2 volts. Depress “next”.

6.3.3 The simulator should display “POS 50% meter should read 3.75v.” DVM should read approximately 3.75 volts +/-.2 volts. Depress “next”.

6.3.4 The simulator should display “POS 75% meter should read 5.62v.” DVM should read approximately 5.62 volts +/-.2 volts. Depress “next”.

6.3.5 The simulator should display “POS 100% meter should read 7.5v.” DVM should read approximately 7.5 volts +/-.2 volts. Depress “next”.

6.3.6 The simulator should display “NEG 25% meter should read -1.87v.” DVM should read approximately -1.87 volts +/-.2 volts. Depress “next”.

6.3.7 The simulator should display “NEG 50% meter should read -3.75v.” DVM should read approximately -3.75 volts +/-.2 volts. Depress “next”.

6.3.8 The simulator should display “NEG 75% meter should read -5.62.” DVM should read approximately -5.62 volts +/-.2 volts. Depress “next”.

6.3.9 The simulator should display “NEG 100% meter should read -7.5v.” DVM should read approximately -7.5 volts +/-.2 volts. Depress “next”.

6.4 Functional Test

6.4.1 Calibration of the spindle

6.4.1.1 Load Executive Tape. Turn off Software Load Switch and display should read 44S287840-C5L. Turn off control and then turn control on. Hit control on again to get unit out of an E-Stop condition. Enable axis drives then balance spindle by adjusting P2 on BUT, you should read zero volts on the multimeter when the spindle is balanced.

6.4.1.2 When completed turn Mode switch to MDI and Display switch to Program Edit, enter M03, then S1000, then press Cycle Start. Switch the Display Switch back to status to see what is happening. Be sure spindle pot is turned to 100%. Spindle should now be running, set voltage on front of control to @ 2.25 for a RPM of 1000, you should see plus or minus 20rpms after adjustment is made.

6.4.1.3 Switch back Display Switch to Program Edit and enter M04 from keyboard, then press Cycle Start. This checks the speed of the spindle in the opposite direction. Switch Display Switch back to status to see what is occurring with the control.

6.4.1.4 Now turn Display Switch back to Program Edit, enter S2500 from keyboard, press Cycle Start. Spindle should increase to 2500rpms and voltage should read about 5.65 at the spindle jacks. Turn Display Switch to status to see what is occurring, you should see plus or minus 50rpms.

6.4.1.5 Switch back Display Switch to Program Edit and enter M03 from keyboard, then press Cycle Start. This checks the speed of the spindle in the opposite direction. Switch Display Switch back to status to see what is occurring with the control.

6.4.1.6 You can stop the spindle at any time by entering M05 and Cycle Start when located on the Program Edit page. After stopping spindle remove executive tape and load in short part program tape.

6.4.1.7 Run Part Program Tape by switching Mode Switch back to Auto, enabling all the axis's, and pressing Cycle Start. Switch Display Switch to Status and monitor the display to see that the spindle cycles through different speeds (500, 1000, 1500, and 2500) and directions (FWD and REV) on display. This tape usually runs about 6 minutes. When done with tape, shut down control and remove BUT, disconnect meter, reinstall control's original board.

6.5 ***TEST COMPLETE ***

7. REFERENCES

7.1 None at this time.