| g GE Energy | **Functional Testing Specification** |
|---|---|
| ***Parts & Repair Services***<br>***Louisville, KY*** | **LOU-GEF-SPPC1** |

# Test Procedure for SPPC1 Printed Circuit Board for a 1050HL Control

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| PREPARED BY | REVIEWED BY | REVIEWED BY | QUALITY APPROVAL |
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Functional test procedure for 1050HL SPPC1 44A294562-G01 Printed Circuit Board

## 1. SCOPE

**1.1** The instructions apply to all SPPC1 boards in test.

## 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-25345 1050HLX Blue Book Manual**
**3.1.2 GEK-84815 Test instructions**
**3.1.3 GEK-25346 Board Diagrams for 1050HLX boards.**
**3.1.4 44C704931 SPPC1.1 Elementary**

## 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.

**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 | GE 1050HLX # H188669 | Control with axis cart # H188770 |

## 6. TESTING

### 6.1 Purpose

**6.1.1** To describe the procedure for testing the circuitry of the SPPC1 board using the 1050HLX simulator. Diagnostic Composed of 10 Sub-tests 00-09.

**6.1.2** The SPPC1 Board is the 1050HIL Spindle Control/Axis board for all HL Control. Board has RAM Memory, ALU Functions, and Wave-shaper generation and interrupts. Monitors Spindle RPM Counter/Timing and Resolver angular position.

### 6.2 TESTING PROCESS

### 6.3 Diagnostic Procedure

**6.3.1** First make should PROM3 Diagnostic Board is in Rack Slot 14 and connect Axis/Spindle cables to PWM Cart. X Cable to X, Spindle to Y, and Z to Z

**6.3.2** Remove the test SPPC1 board from slot 24 and insert the board to be tested.

**6.3.3** Special Mode Switch should be on (UP).

**6.3.4** Press "ON".

**6.3.5** Monitor should display Diagnostic Page, remove all tests except Spindle Test. (tested can be removed by moving curser up or down to highlight test to be removed press **"Shift"** and **"Delete".**

**6.3.6** AC Spindle BRD 99 test should be left, Press **"Cycle Start"** to start testing Tests 1-09 run test for @ 1 hour. *** If board fails refer to GEK-84814 in 1050HLX Blue Book GEK-25345. If board passes continue test.

**6.3.7** Depress **"Shift"** and **"Clear"** to stop test.

**6.3.8** Test Spindle Operator-Aided Test

**6.3.9** Remove AC Spindle BRD 99 Test (Shift and Delete).

**6.3.10** Test Sub-Test 01 Spindle RPM Test

**6.3.11** To test Press **"SPCL 1"** display in bottom left corner INSERT NO? Enter in **"06"** depress **"enter"** Subtest NO? Enter in **"01"** depress **"enter"** Repeat test? Enter "**N"**. *** Refer to Diagnostic GEK-84814 page 42 for help.

**6.3.12** Manually run the spindle to track the spindle RPM you can see count on Monitor under operator-aided display.

**6.3.13** Depress **"Shift"** and **"Clear"** to stop test and Delete Sub-Test 01 (Sift and Delete)

**6.3.14** Test Sub-Test 02 Spindle Resolver Test.

**6.3.15** To test Press **"SPCL 1"** display in bottom left corner INSERT NO? Enter in **"06"** depress **"enter"** Subtest NO? Enter in **"02"** depress **"enter"** Repeat test? Enter **"N".** *** Refer to Diagnostic GEK-84814 page 42 for help.

**6.3.16** Manually run the spindle to track the spindle resolver angular position you can see count on Monitor under operator-aided display a smooth count rate from 0-999 in proportion to the amount of the spindle.

**6.3.17** Depress Shift and Clear to stop test.

**6.3.18** If Board passed all test continual to Part Program Test. **Turn Off Control.**

### 6.4 Part Program Test

**6.4.1** Remove PROM3 Diagnostic Board Slot 14 and place in PROM3 Exec Board.

**6.4.2** Turn on Control

MSD must be stored in memory, Depress "**P3"** – MSD Editing Mode. Check to see if MSD is in memory if not enter it in.

| **MSD Program** | |
|---|---|
| **00** | **0050 0054** |
| **01** | **0100 1000** |
| **02** | **0000 0000** |
| **03** | **1500 2525** |
| **04** | **2929 3131** |
| **05** | **1010 5066** |
| **06** | **0000 0000** |
| **07** | **0000 0000** |
| **08** | **1725 0000** |
| **09** | **2000 2500** |
| **10** | **0000 0000** |
| **11** | **0500 1500** |
| **12** | **1725 0000** |
| **13** | **0000 0000** |
| **14** | **0000 0000** |
| **15** | **0000 0000** |
| **29** | **0000 0000** |

**6.4.3** Turn Control Off, Switch Special Mode (UP).

**6.4.4** Turn Control on

**6.4.5** GOTO to Data then go to memory location 01 and add the following:

X at 01 enter 00.00

Z at 01 enter 00.00

**6.4.6** Enter in PART PROGRAM

**6.4.7** Depress **"PRGRAM"** Then **"SUB PG ←"** then "**Page down"**, then **"Curser down"** enter program name (like Test) depress **"enter"** then **"SUB PG →"** Enter in Program.

```
N10:   G94
N20:   G90
N30:   G01    X2   Z2   F25  M03  S500
N40:          X-2  Z-2  F50  M03  S1000
N50:          X0   Z0   F75  M03  S1500
N60:   G04    X10
N70:   G01    X2   Z2   F25  M04  S500
N80:          X-2  Z-2  F50  M04  S1000
N90:          X0   Z0   F75  M04  S1500
N100:  G04    X10
N110:  G25 P1 30    P2 100     P3  50 to 100 cycles
N120:  M30
```

**6.4.8** Turn **off** Control

**6.4.9** Turn Control **on**

**6.4.10** Depress **"PRGRM"**

**6.4.11** Depress **"SUB PG ←"**

**6.4.12** Depress **"Enter"** to select program

**6.4.13** Depress **"SUB PG →"** (program should be displayed)

**6.4.14** Depress **"POSN"**

**6.4.15** Turn on AXIS Cart and enable XYZ (Y will be the Spindle)

**6.4.16** Depress **"AUTO"** then **"CYCLE START"**

**6.4.17** Part Program will run as many cycles that you entered in Program Block **N110**

**6.4.18** After Cycles are complete Disable X Y Z Axis and turn off Axis Cart

**6.4.19** Turn Off Control and remove SPPC1 Board

***6.5 ***TEST COMPLETE ******

## 7. REFERENCE:

**7.1** None at this time.