g GE Industrial Systems	**Functional Testing Specification**
Renewal Services ***Louisville, KY***	**LOU-GED-DS200SBCA**

Test Procedure for a Static Break Control Card

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

REV.	DESCRIPTION	SIGNATURE	REV. DATE
A	Initial release	F. Howard	6/17/02
B	Minor Procedure Change	L. Groves	8/6/02
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D	Added Switch Setup Drawing	D. Laemmle	3/2/04

PREPARED BY	REVIEWED BY	REVIEWED BY	QUALITY APPROVAL
F. Howard	L. Groves		Robert Duvall
DATE	**DATE**	**DATE**	**DATE**
6/14/02	8/6/02		3/2/04

Functional test procedure for a Static Break Control Card

1. SCOPE

1.1 This is a functional testing procedure for a Static Break Card.

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 GEI-100184**
- **3.1.2 Documentation Folder for DS2020BRCA**
- **3.1.3 Documentation Folder for DS200SBCA**

4. ENGINEERING REQUIREMENTS

4.1 Equipment Cleaning
- **4.1.1** 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.

4.2 Equipment Inspection
- **4.2.1** Equipment should be visually inspected for any defects prior to applying power. This inspection should include the following as a minimum:
  - **4.2.1.1** Wires broken or cracked
  - **4.2.1.2** Terminal strips / connectors broken or cracked
  - **4.2.1.3** Loose wires
  - **4.2.1.4** Components visually damaged
  - **4.2.1.5** Capacitors leaking
  - **4.2.1.6** Solder joints damaged or cold
  - **4.2.1.7** Circuit board burned or de-laminated
  - **4.2.1.8** 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 85 DMM (or Equivalent)
1		Inductive Load
1	H033818	Brake Control test Unit
1		Oscilloscope w/probes
1		220/440VAC Power Source

6. TESTING PROCESS

6.1 Setup

6.1.1 Switch Setup (* - indicates dot down)

SW1A	SW1B
[*]	[*]
[*]	[*]
[*]	[*]
[*]	[*]

SW2A	SW2B
[*]	[*]
[*]	[*]
[*]	[*]
[*]	[*]

6.1.2 Jumper Setup

JP1	JP2	JP3	JP4	JP5	JP6	JP7
2-3	1-2	1-2	1-2	1-2	1-2	1-2

Note: If you wash the unit prior to testing it is very important to let it bake for at least 24 hours.

6.1.3 Connect single-phase 240VAC supply to fuses on test unit. Also connect 220/440 converter input to 240VAC supply. Put converter switch in 220 position. Plug in oscilloscope to converter outlet.

6.1.4 Connect 41-ohm inductive load (blue unit) to terminals 4 & 5 of large terminal strip on test fixture. Connect a DC meter across the load.

6.1.5 Connect UUT to test fixture, noting connecting points on test card as it is disconnected.

6.2 Testing Procedure

6.2.1 Apply 240 VAC power to unit and verify that “FLT” and “PWR” LEDs illuminate.

6.2.2 Verify ±15VDC and ±24VDC at test pins on card to com pin.

6.2.3 Set scope for 2ms/Div and 5V/Div and make the following checks.

6.2.3.1 Verify a 25-30VPP square wave with a 50% duty cycle at pin 7 of U17.

6.2.3.2 Verify a 14-19V Peak with an on time of about .2 msec at pin 10 of U15.

6.2.3.3 Verify a 10V Peak sawtooth wave with a 4msec rise time at the cathode of D23.

6.2.3.4 Verify a 14-19V Peak signal with an on time of about .2 msec at test pin “OSC”.

6.2.4 Input 5VDC between 2TB-1(-5vdc) and 2TB-5(com) and make the following measurements.

6.2.4.1 Verify with a DVM +5VDC(± 1V) at test pin “REFX”.

6.2.4.2 Verify with a DVM +3.5VDC(± 1V) at test pin “REFB”.

6.2.4.3 Verify with a DVM +5VDC(± 1V) at test pin “REFA”.

6.2.4.4 Remove input from 2TB-1 and 2TB-5

6.2.5 Remove 240VAC power and place a jumper between 2TB-2 and 2TB-5.

6.2.6 Apply 240VAC power and verify that all LED’s illuminate and the “FLT” and “RLS” LEDs go out after about 5 seconds

6.2.7 Remove 240VAC power and move jumper to 2TB-3 and 2TB-5.

6.2.8 Apply power and verify that all LED’s illuminate and stay on. There will be over 100VDC at output.

6.2.9 Remove 240VAC and connect an Oscilloscope with 100X probes in differential mode to the load terminals; reapply 240VAC and check for waveform similar o Figure 1

6.2.10 Remove 240VAC power and move jumper to 2TB-4 and 2TB-5.

6.2.11 Apply 240VAC and verify that “FLT” and “PWR” LEDs are on and “RLS” LED is off.

6.2.12 Starting with 0VDC apply a negative voltage to 2TB-1 with 2TB-5 (com).

6.2.13 Verify that “RLS” LED illuminates at -.5 to –1.1VDC input.

6.2.14 Verify that "FLT" and "RLS" LEDs go out at –6 to –7VDC signifying a fault. With an ohmmeter check for a short between 1TB-5 and 1TB-7 and an open circuit between 1TB-5 and 1TB-6.

6.2.15 Reduce input to 0VDC and remove 240VAC.

6.2.16 Reapply 240VAC to reset fault and then verify short between 1TB-5 and 1TB-6.

6.2.17 Verify OPEN between 1TB-5 and 1TB-7.

6.2.18 Verify smooth control of output waveform while increasing input on 2TB-1 from zero to –6VDC. Output DC volts should be over 200VDC.

6.3 ***TEST COMPLETE ***

7. NOTES

7.1 None at this time

8. Oscilloscope Verification Examples

8.1