GE Drive Systems

## Replacement Procedures For SDCI Dc Power Supply and Instrumentation Board

DS200SDCIG1A__
DS200SDCIG2A__

*These instructions do not purport to cover all details or variations in equipment, nor to provide for every possible contingency to be met during installation, operation, and maintenance. Should further information be desired or should particular problems arise that are not covered sufficiently for the purchaser's purpose, the matter should be referred to GE Drive Systems, Salem, Virginia U.S.A.*

**WARNING**

**This equipment contains a potential hazard of electrical shock or burn. Only those who are adequately trained and thoroughly familiar with the equipment and the instructions should install, operate, or maintain this equipment.**

### INTRODUCTION

These instructions provide information that may be needed when replacing a DS200SDCI Dc Power Supply and Instrumentation Board (SDCI). This information includes descriptions of configurable hardware jumpers.

The SDCI board provides logic power and interface circuitry for DC2000 drives with input voltages up to 600 V ac. The board includes the following circuits:

- +5 V dc, 4A; ±15 V dc, 0.4 A; ±24 V dc, and 115 V ac, 0.4 A power supplies
- Motor field power circuits (except the SCR module)
- Driver circuits for the armature SCR gating
- Circuits to instrument numerous ac line and dc motor signals, including:
  - Armature current and voltage
  - Field current
  - Ac line currents, voltage magnitude, and phase sequence

There are currently two group numbers of the SDCI (group numbers are explained further in the Board Identification section of this manual). The G1 version of the SDCI includes circuits for an internal ≤10 A field exciter; the G2 version is used with external exciters.

### BOARD IDENTIFICATION

A printed wiring board is identified by an alphanumeric part (catalog) number stamped on its edge. For example, the Dc Power Supply and Instrumentation Board is identified by part number:

DS200SDCIG#ruu

The *DS200SDCI* portion is the base number that identifies the printed wiring board, in this case, the Dc Power Supply and Instrumentation Board. The *G#* identifies a group, which is a variation of a particular board. The *r* and *u* digits are alphabetic characters that indicate the board revision level. The *r* digit reflects a functional change that is not downward compatible. It is essentially a new catalog number. The *u* digits represent revision levels that are downward compatible to the r revision level.

**NOTE**

**All digits are important when ordering or replacing any board.**

## PROCEDURE FOR REPLACING BOARDS

**WARNING**

**Potentially lethal voltages are present on the SDCI board when powered. To prevent electric shock, turn off power to the board, then test to verify that no power remains on the board before touching it or any connected circuits.**

**CAUTION**

**To prevent equipment damage, do not remove boards or connections, or re-insert them, while power is applied to the drive.**

**Treat all boards as static-sensitive. Use a grounding strap when changing boards and always store boards in the boxes in which they were shipped.**

To replace the SDCI board:

1. **Turn off power to the drive**, then wait a few minutes for the power supply's capacitors to discharge. Test any electrical circuits before touching them to make sure power is off.

2. Open the drive's cabinet door to access the printed wiring boards. This exposes the DS200SDCC (SDCC) board, which faces the front. The SDCI is located behind the SDCC.

3. To expose the SDCI, pull the locks on either side of the cabinet. Lift the SDCC, and tilt forward.

4. To remove the SDCI board, carefully disconnect all cables, as follows:

   - For a ribbon cable, place one hand on each side of the cable connector that mates with the board connector. Gently pull the cable connector with both hands.

   - For a cable with a pull tab, carefully pull the tab.

5. The SDCI board is held in place by plastic snaps (holders). Push these holders back to remove the board.

6. On the replacement (new) board, set all configurable items in the exact position as those on the board being replaced (old board).

   If a board revision has added or eliminated a configurable component, or re-adjustment is needed, refer to Table 1.

   **NOTE**

   **Because of upgrades, boards of different revision levels may not contain identical hardware. However, GE Drive Systems ensures compatibility of replacement boards.**

7. Install the new board, ensuring that all holders snap into position.

8. The cables are labeled with the correct connector name, as marked on the board. Reconnect all cables as labeled. Make sure that cables are properly seated at both ends.

## FUSES

The SDCI board contains protective fuses FU1 through FU3, FU5, and FU6, defined in Table 1. Each fuse has an associated light or LED (LT1, CR51, CR55, LT5, and LT6) that turns on if the fuse blows. Refer to Figure 1 for fuse, light, and LED locations on the SDCI board.

## HARDWARE ADJUSTMENTS

The SDCI board includes Berg-type (manually moveable) jumpers, identified by a *JP* nomenclature. These jumpers are used for manufacturing test or customer options. Table 2 lists and defines the SDCI board's hardware and wire jumpers.

Most of the jumper selections have been factory set. The Custom Hardware Summary supplied with each controller (in the drive door pocket) indicates these positions.

As described previously, ensure that the jumpers on the new board are placed the same as on the old board, unless the instructions indicate otherwise. Refer to Table 2, which lists the default setting first. Verify all jumper and switch settings per the ST2000 Toolkit or Drive Configurator, LynxOS Version, if purchased. Figure 1 shows jumper locations.

*Table 1. SDCI Board Fuses*

| Fuse | Function |
|---|---|
| FU1 | *Fuse for 115 V ac power supply brought to 3TB; 1/2 A, 2AG.* FU1 protects the 115 V ac power supplied for customer use. Check for wiring errors or overload if this fuse blows. When the fuse is blown and load is connected, neon light LT1 on the SDCI will be lit. |
| FU2 | *Fuse for +24, +15, and + 5 V dc signal-level power supplies; 7 A, 2AG.* When FU2 is blown, the drive is unable to generate fault messages, but LED CR51 will be illuminated when control power is applied to the drive. The usual cause of this fuse blowing is an accidental short of +24 V, either while probing or due to a wiring error at the terminal board. If the fuse continues to blow when 1PL, 2PL, and 5PL are disconnected from the SDCI, the board should be replaced. |
| FU3 | *Fuse for -24 and -5 V dc signal-level power supplies; 7 A, 2 AG.* When FU3 is blown, the Programmer is unable to display fault messages, but LED CR55 will be illuminated when control power is applied to the drive. The usual cause of this fuse blowing is an accidental short of -24 V, either while probing or due to a wiring error at the terminal board. If the fuse continues to blow when 1PL, 2PL, and 5PL are disconnected from the SDCI, the board should be replaced. |
| FU5 | *Fuse for internal NRX 10 A field and/or MOV assembly; 15 A.* Depending upon the drive frame size, this fuse is unused or can feed the NRX field and/or the MOV assembly. Neon light LT5 lights if the fuse is blown. Possible causes include defective SDCI board, defective MOV assembly, defective field SCR package, and wiring short. |
| FU6 | *Fuse for internal NRX 10 A field and/or MOV assembly; 15 A.* Depending upon the drive frame size, this fuse is unused or can feed the NRX field and/or the MOV assembly. Neon light LT6 lights if the fuse is blown. Possible causes include defective SDCI board, defective MOV assembly, defective field SCR package, and wiring short. |

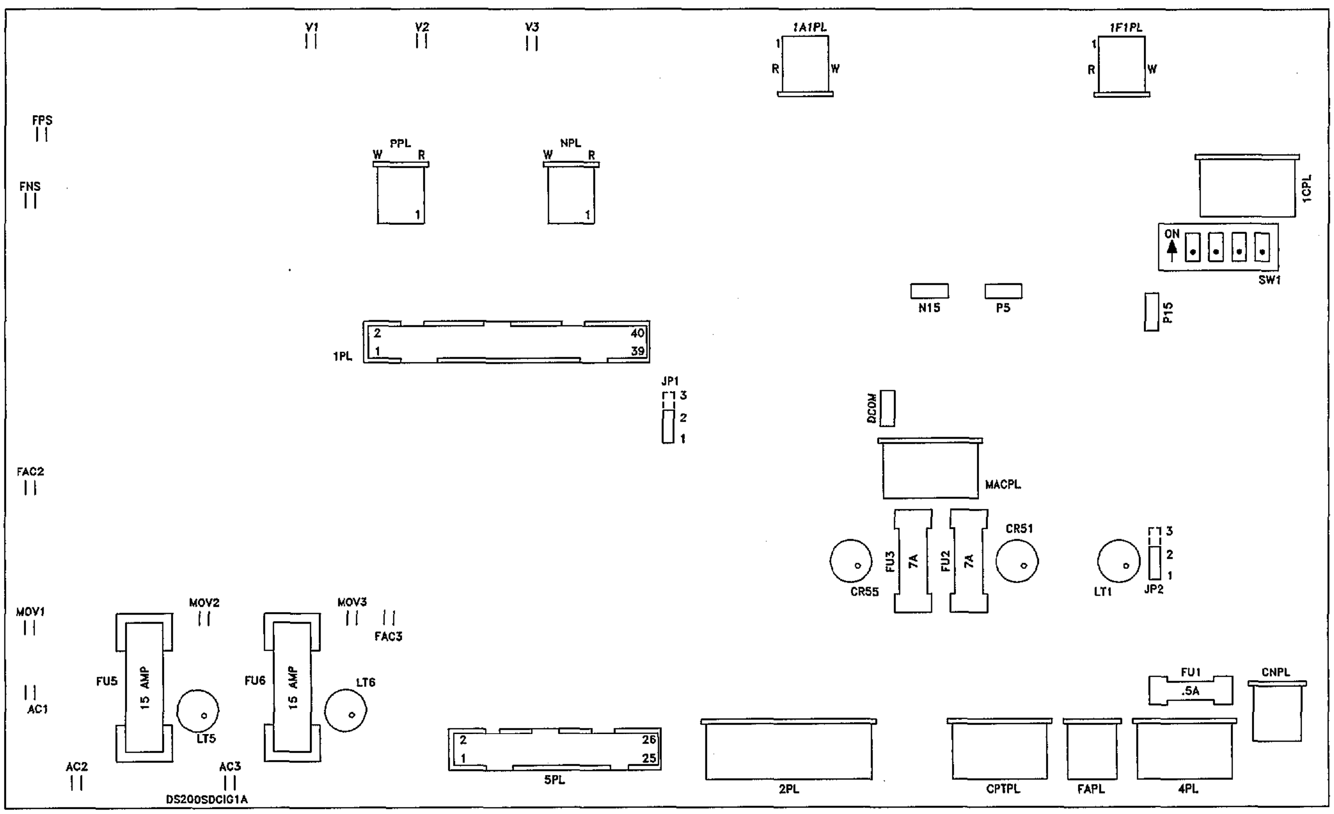


*Figure 1. SDCI Board Layout*

## NOTE

**The following table defines the jumpers used on the SDCI board. The *Revision* column designates the board's revision for the item as defined. The *Name* column indicates the item's identification as marked on the board (JP=jumper). The *Description* column designates the board's group for that item as defined.**

*Table 2. SDCI Board Adjustable Hardware*

| Revision | Name | Description |
|---|---|---|
| All | JP1 | MD control source<br>This jumper allows the MD contactor drive hardware output to be slaved to the MA contactor drive hardware output. *Normally the MD contactor drive output is controlled independently by MCP software (JP1 = 1-2).*<br>1.2 MD controlled by MCP (Normal Operation)<br>2.3 MD hardware slaved to MA operation |
| All | JP2 | MA ac contactor drop-out time<br>Normally, this circuit delays opening of the ac contactor to ensure all load current has been extinguished. Removal of this jumper during normal running can cause the control-on circuit to drop out the MA relay before the current has been brought to zero.<br>1.2 Normal operation, gives about 100 ms delay<br>2.3 Minimum delay, (and manufacturing test) |
| All | SW1 | Select ac line CT burdens as a function of nominal dc output current<br>These switch settings scale the ac line current transformers as a function of dc amps. Correct scaling is essential for proper operation of the ac IOC protective feature. These CTs are mounted on ac lines 1 and 3 of the power bridge and are wired through plug 1CPL to a burden resistor network. Above 144 mA main line ACCT secondary current, the CTs are routed through a set of 10:1 step down CTs on the SHVI/SHVM card, using JP1-JP8 on the SHVI/SHVM card. The enumerations are listed here in terms of the mA input to the SDCI card (ACCT secondary milliamps attenuated by 10:1 SHVI/SHVM attenuation if selected).<br>0 (All off) 0.0 <= Ict,mA < 6.1<br>1 (1 on) 6.1 <= Ict,mA < 13.4<br>2 (2 on) 13.4 <= Ict,mA < 21.1<br>3 (1,2 on) 21.1 <= Ict,mA < 28.4<br>4 (3 on) 28.4 <= Ict,mA < 39.3<br>5 (1,3 on) 39.3 <= Ict,mA < 46.7<br>6 (2,3 on) 46.7 <= Ict,mA < 54.4<br>7 (1,2,3 on) 54.4 <= Ict,mA < 61.8<br>8 (4 on) 61.8 <= Ict,mA < 88.7<br>9 (1,4 on) 88.7 <= Ict,mA < 96.0<br>10 (2,4 on) 96.0 <= Ict,mA < 103<br>11 (1,2,4 on) 103 <= Ict,mA < 111<br>12 (3,4 on) 111 <= Ict,mA < 122<br>13 (1,3,4 on) 122 <= Ict,mA < 129<br>14 (2,3,4 on) 129 <= Ict,mA < 137<br>15 (All on) 137 <= Ict,mA < 144 |

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