# StorageWorks™ Solutions

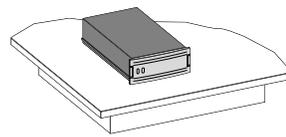# Enterprise Storage Arrays SBB User's Guide

*This guide describes the procedures for handling, removing, and replacing StorageWorks building blocks (SBBs), SBB device addressing, labels, and so forth, for 4.3 GB disk drives (RZ29B–series).*
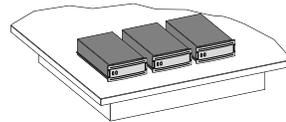
## Handling an SBB

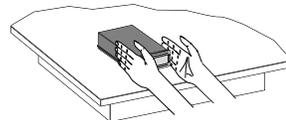*To prevent damaging the disk drive,* **ALWAYS** *handle an SBB as shown.*

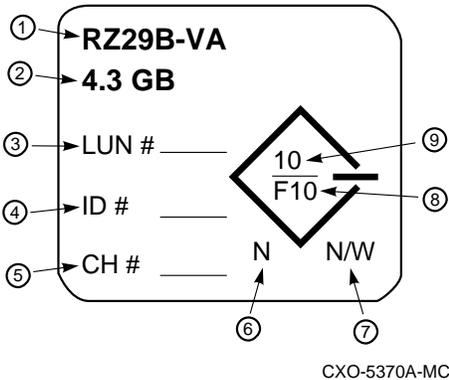| **DO** | **DON'T** |
|---|---|
| Always set the SBB on its side | Never set the SBB on its edge |
| Always set the SBBs side by side | Never stack SBBs |
| Always set the SBB down gently | Never drop the SBB |
| Always push the SBB into the shelf gently, but firmly | Never force the SBB into the shelf |
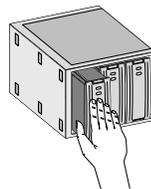
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## Identifying the SBB Storage Device

*The bezel mounted SBB identification label defines the device model, the SCSI bus width, the compatible SBB shelf widths, the SCSI bus speed, and the device transfer rate.*

① ► **RZ29B-VA**

② ► **4.3 GB**

③ ► LUN # _____

④ ► ID # _____

⑤ ► CH # _____    N    N/W

⑥    ⑦

diamond: 10 / F10    ⑨    ⑧

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The components of the device identification label are as follows:

① The device model number.

② The total amount of data the device stores (capacity).

③ The user-assigned SCSI logical unit number (LUN).

④ The user-assigned SCSI identification number (target ID).

⑤ The user-assigned controller channel number, that is the controller port or SCSI bus.

⑥ The SCSI bus device width where—
   **N** is an 8-bit device

⑦ The StorageWorks shelf type (Wide or Narrow) in which you can install the device where—
   **N/W**—the device is compatible with any SBB shelf.

⑧ The bus speed expressed in *megabits* (Mbits) per second where—
   **F**—Fast device

⑨ The rate at which the device can transfer data in *megabytes* (MB) per second.

## Replacing SBBs

*Replacing an SBB is a relatively simple procedure. However, there are several things you must consider.*

The most critical factors in removing or replacing SBBs or expanding a StorageWorks system are:

• The device type or model number.

• The SCSI bus device address.

Once a device has been initialized on a SCSI bus, moving the device to another bus or changing the device address can cause the bus to become erratic.

You can use the SBB identification label to identify the device model, logical unit number (LUN), device address, controller bus, and other device-specific characteristics.

# SBB Replacement Methods

*You can replace an Enterprise Storage Array SBBs, including power supplies, using either the*
***WARM SWAP***
*(power present and SCSI bus quiesced), or*
*the **COLD SWAP***
*(no power to either the SBB or the controller shelves) replacement method.*
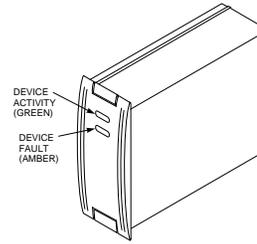*The SBB light emitting diodes (LEDs) indicate the device status.*

The HSZ50-series controllers support WARM SWAP.

**CAUTION**

To prevent corrupting or losing data, use the WARM SWAP method only *after* you have quiesced the SCSI bus and when the device activity LED is OFF.

Use COLD SWAP during initial installation.

After replacing an SBB observe the two LEDs on the 4.3 GB disk drive SBB to determine the device status.



DEVICE ACTIVITY (GREEN)
DEVICE FAULT (AMBER)

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| When the LED display is… | The device SBB status is… |
|---|---|
| | When the green Device Activity LED is ON or FLASHING, and the amber Device Fault LED is OFF, the SBB is operating normally.<br>There is no fault. |
| | When the green Device Activity LED is OFF and the amber Device Fault LED is OFF, the device is inactive and the SBB is operating normally.<br>There is no fault. |
| | **Fault Status.**<br>When the green Device Activity LED is ON and the amber Device Fault LED is ON, the device is probably not responding to control signals.<br><br>**Corrective Action:**<br>1. Quiesce the bus.<br>2. When the drive is spun down, replace the SBB. |
| | **Fault Status**<br>When the green Device Activity LED is ON and the amber Device Fault LED is FLASHING, the SBB is active and is spinning down.<br><br>**Recommended Corrective Action:**<br>1. Quiesce the bus.<br>2. When the device is spun down (the green LED is OFF), replace the SBB. |
| | **Fault Status**<br>When the green Device Activity LED is OFF and the amber Device Fault LED is FLASHING, the controller has identified the SBB as having failed.<br><br>**Recommended Corrective Action:**<br>1. Quiesce the bus.<br>2. When the device is spun down (the green LED is OFF), replace the SBB. |
| | **Fault Status:**<br>When the green Device Activity LED is OFF and the amber Device Fault LED is ON, the SBB is inactive and spun down.<br><br>**Recommended Corrective Action:**<br>1. Quiesce the bus.<br>2. Replace the SBB. |

## SBB Replacement Procedures

*Complete the following procedures in the specified sequence to replace an SBB.*

**CAUTION 1**

Be sure that the replacement device is the same model as the one being replaced. When removing or replacing an SBB, always use both hands to support the weight of the SBB

**CAUTION 2**

Do not touch the SBB connector unless you are properly grounded. Unless you are grounded when touching the SBB connector you can cause electrostatic discharge (ESD) damage to the device.

**CAUTION 3**

When you remove a higher speed disk drive (7200 RPM or more) that is still rotating, the gyroscopic effect may cause you to drop the SBB. To prevent this, do not fully remove the SBB from the shelf until the drive has "spun-down."

1. Press the two mounting tabs together to release the SBB.

2. Use both hands and pull the SBB out of the shelf.
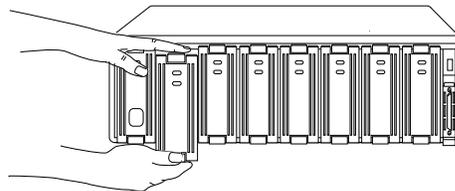


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3. Insert the replacement SBB into the guide slots and push it in until it seats fully and the mounting tabs engage the shelf.

4. After power is applied, observe the status LEDs for the following indications:

| When the Storage SBB … | | |
|---|---|---|
| **is ACTIVE** | **is INACTIVE** | **has a PROBLEM** |
|  |  |  |
| **When the Power SBB is operational…** | | |
|  | | |

## An Overview of the SBB Connector

*The StorageWorks SBB connectors ensure that the SBBs will operate reliably even when replaced many times.*

Each SBB storage device has a 96-pin female DIN connector that provides positive mating with the SBB shelf male connectors. The connector design ensures that *dc power is present until after* the SCSI bus connection is broken and that *dc power is applied before the SCSI bus connection* is made. This feature protects the integrity of the SCSI data bus and avoids introducing noise on the bus that could either distort data or cause the bus to "hang."

The SBB connector is a simple, highly reliable mechanism that can support 200 SBB replacement cycles. A replacement cycle consists of removing and replacing an SBB. Over the active product life of 5 years, this is the equivalent of 40 replacement cycles per year, or approximately 1 cycle every 9 days. The replacement cycle limit applies equally to shelf connectors and device connectors.

If the SBB is replaced more often than the recommended cycle, the gold contact coating will wear away and destroy the integrity of the connection. Environments that require a greater number of replacement cycles are not supported by this product and are considered improper treatment or use (paragraph 9.4b of *U.S. Standard Terms and Conditions*). Products or connectors damaged because of a higher number of replacement cycles are not eligible for return under warranty and standard service plans. Digital Equipment Corporation markets a specific family of removable storage elements for higher replacement cycle environments. Contact your Digital Account Representative for more information.